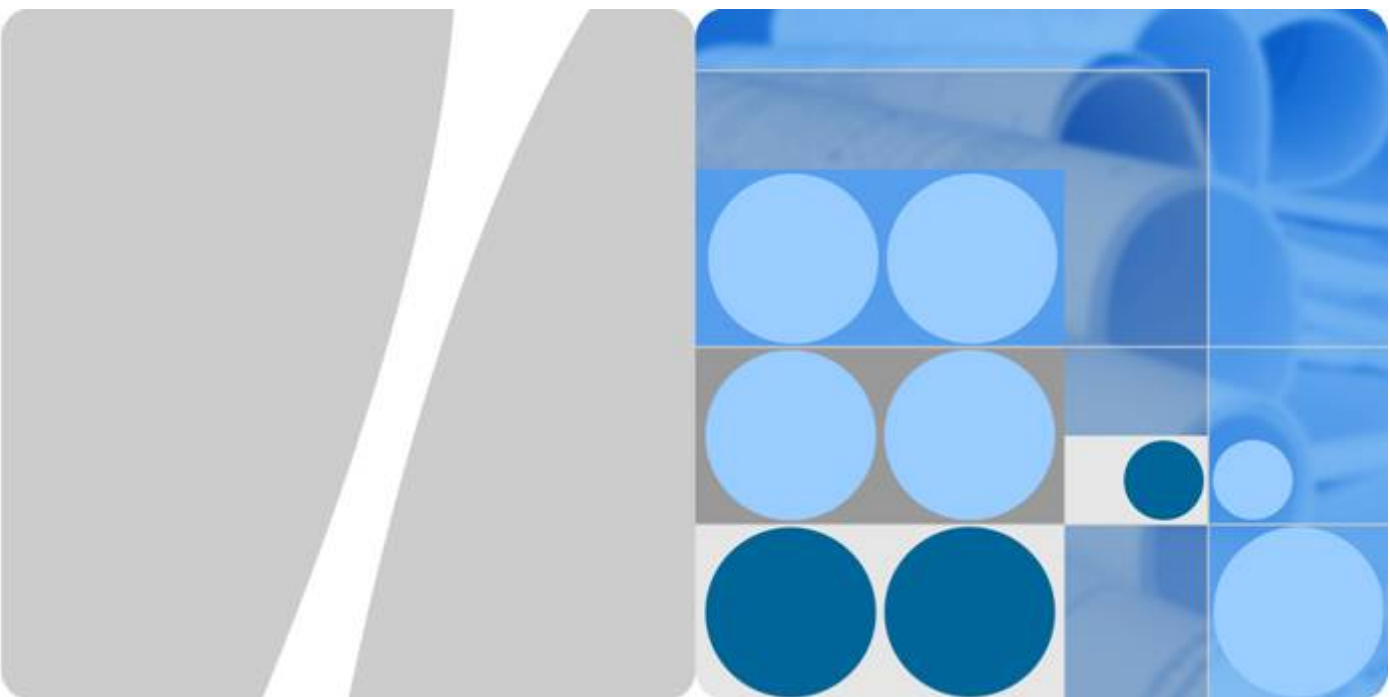




Huawei AR150&160&200&1200&2200&3200 series Enterprise Routers

Hardware Description

Issue 11
Date 2013-06-30

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About This Document

Intended Audience

This document describes hardware components of the AR150&160&200&1200&2200&3200, including the chassis, power modules, fan modules, cards, cables, and optical modules. You can find useful information about hardware components from this document.

This document is intended for:

- Network planning engineers
- Hardware installation engineers
- Commissioning engineers
- Onsite maintenance engineers
- System maintenance engineers

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates a hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury.
 WARNING	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 CAUTION	Indicates a potentially hazardous situation that, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.
 TIP	Provides a tip that may help you solve a problem or save time.
 NOTE	Provides additional information to emphasize or supplement important points in the main text.

Change History

Changes between document issues are cumulative. The latest document issue contains all changes made to previous issues.

Issue 11 (2013-06-30)

This issue has the following updates:

The following sections are added:

- [1.4 AR160 Series](#)
- [4.3.2 9ES2 \(8 Port 100BASE-RJ45 and 1 Port 1000BASE-RJ45 L2 Ethernet Interface Card\)](#)
- [4.3.5 4ES2G-S \(4-Port 1000BASE-RJ45 L2 Ethernet Interface Card\)](#)
- [4.3.6 4ES2GP-S \(4-Port 1000BASE-RJ45 L2 with PoE Ethernet Interface Card\)](#)
- [4.4.5 1E3/CE3/T3/CT3 \(1-Port Channelized/Unchannelized E3/T3 WAN Interface Card\)](#)
- [4.4.11 3G-EVDO \(3G CDMA2000 EVDO Interface Card\)](#)
- [4.4.12 LTE-H \(WCDMA LTE Data Card\)](#)
- [4.5.6 1VE1 \(1-Port Voice E1 Interface Card\)](#)
- Network Data Encryption Card

The following sections are modified:

- [1.3 AR150 Series](#)
- [1.5 AR200 Series](#)
- [4.6.1 ADSL-A/M and ADSL-B/J \(1-Port-ADSL2+ ANNEX A/M and B/J WAN Interface Card\)](#)

Issue 10 (2013-04-15)

This issue has the following updates:

Information about the following components is added:

- [1.3 AR150 Series](#)
- [1.5 AR200 Series](#)
- [2.5 24/36/60 W Power Adapter](#)
- [5.14 WiFi Antenna](#)

Issue 09 (2013-01-31)

This issue has the following updates:

The following content is modified:

- [6 Optical Modules](#)
- [1.6.2 Appearance and Structure](#)

Issue 08 (2012-12-31)

This issue has the following updates:

Information about the following components is added:

- 1CPOS-155M-W card
- 1STM4 card
- Optical modules

The following content is modified:

- Description of cards
- When the RPS cable should be connected or removed

Issue 07 (2012-09-30)

This issue has the following updates:

Information about the following components is added:

- AR2201-48FE
- AR2202-48FE
- AR2204
- 4E1T1-M card
- 8E1T1-M card
- 4E1T1-F card
- 8E1T1-F card
- 4E1-IMA card
- 4GE-2S card

Issue 06 (2012-08-30)

Based on issue 05 (2012-07-10), this issue has the following updates:

- Technical specifications of cables are deleted.
- Description about the 32FXS and 16FXS cables is modified.

Issue 05 (2012-07-10)

Based on issue 04 (2012-06-10), this issue has the following updates:

Descriptions of the following cards are added:

- 32FXS voice card
- 16FXS voice card
- 4FXO voice card

Issue 04 (2012-06-10)

Based on issue 03 (2012-04-20), this issue has the following updates:

- RPS150 power supply system

Issue 03 (2012-04-20)

Based on issue 02 (2012-03-19), this issue has the following updates:

- 3G-HSPA+7 sub card
- 4GEW-T sub card
- 4GEW-S sub card
- VDSL sub card
- AR1220L

Issue 02 (2012-03-19)

Based on issue 01 (2011-12-30), this issue has the following updates:

- The AR1220-DC model is added.

Issue 01 (2011-12-30)

Initial commercial release.

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1 Chassis

About This Chapter

- 1.1 Chassis Models
- 1.2 Naming Conventions
- 1.3 AR150 Series
- 1.4 AR160 Series
- 1.5 AR200 Series
- 1.6 AR1200 Series
- 1.7 AR2200 Series
- 1.8 AR3200 Series

1.1 Chassis Models

Huawei AR enterprise routers (AR routers for short) provide AR150, AR160, AR200, AR1200, AR2200, and AR3200 series models. You can select different models according to your network requirements.

NOTE

- In this document, AR150 series indicates AR151, AR151W-P, AR151G-HSPA+7, AR156, AR157, AR157W, AR157VW, AR157G-HSPA+7, AR158E, and AR158EVW.
- In this document, AR160 series indicates AR168F, and AR169F.
- In this document, AR200 series indicates AR201, AR201VW-P, AR206, AR207, AR207V, AR207VW, AR207V-P, AR207G-HSPA+7, and AR208E.
- In this document, AR1200 series indicates AR1220, AR1220V, AR1220W, AR1220VW and AR1220L.
- In this document, AR2200 series indicates AR2201-48FE, AR2202-48FE, AR2204, AR2220 and AR2240.
- In this document, AR3200 series indicates AR3260.

1.2 Naming Conventions

[Figure 1-1](#) shows naming conventions of the AR series routers.

Figure 1-1 AR series products naming conventions

【AR】【B1 B2 B3 B4】【C1】【-D1】

Example:

1. AR157VW
2. AR1220 V

[Table 1-1](#) describes naming conventions of the AR series routers.

Table 1-1 Naming conventions

Field	Description
B1	Indicates the product series. The value is 0, 1, 2, or 3. A larger value indicates a higher performance. The value 0 indicates low-end box routers that do not have SIC slots. B1 can be omitted if the value is 0.

Field	Description
B2	● When B1 is 0, B2 differentiates hardware platforms of products. The value is 1, 2, or 3. A larger value indicates a higher performance. Only the 1 series and 2 series are available now, and the 3 series is planned in later releases. ● When B1 is not 0, B2 indicates a modular router.
B3	Identifies performance of products with the same B1 and B2 values. The value is an integer ranging from 0 to 6. A larger value indicates a higher performance.
B4	● When B1 and B3 are not 0, B4 is a fixed value 0. ● When B1 is not 0 and B3 is 0, B4 indicates the number of SIC slots on a router. ● When a router has no SIC slot, B4 indicates the type of fixed uplink ports on the router. - B4=1: FE/GE - B4=2: E1/SA - B4=6: ADSL-B - B4=7: ADSL-A/M - B4=8: G.SHDSL
C1	Consists of one to four uppercase letters, indicating the additional function of a router. ● W: WLAN ● V: Voice ● G: 3G ● L: Simplified version ● E: Enhanced version that supports a 4-pair G.SHDSL
D1	Differentiates product functions. ● A: AC power supply (This is the default configuration, and the letter A can be omitted.) ● D: DC power supply ● 48FE: 48 fixed 100M ports ● HSPA+7: WCDMA ● C: CDMA2000 ● P: Power over Ethernet (PoE)

1.3 AR150 Series

1.3.1 Version Mapping

Table 1-2 lists the mapping between the AR150 series routers and software versions.

Table 1-2 Matching between AR150 series routers and software versions

Device Series	Device Model	Software Version
AR150 series	AR151	V200R002C00 and later versions
	AR151W-P	V200R003C00 and later versions
	AR151G-HSPA+7	V200R003C00 and later versions
	AR151G-C	V200R005C00 and later versions
	AR156	V200R002C02 and later versions
	AR157	V200R002C00 and later versions
	AR157W	V200R003C00 and later versions
	AR157VW	V200R003C00 and later versions
	AR157G-HSPA+7	V200R003C00 and later versions
	AR158E	V200R002C02 and later versions
	AR158EVW	V200R003C00 and later versions

1.3.2 Appearance and Structure

Front View

Table 1-3 shows the front views of the AR150 series.

Table 1-3 Front views of the AR150 series routers

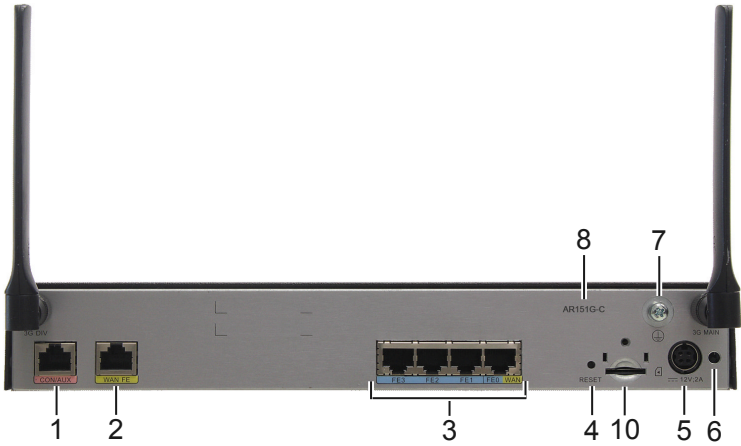
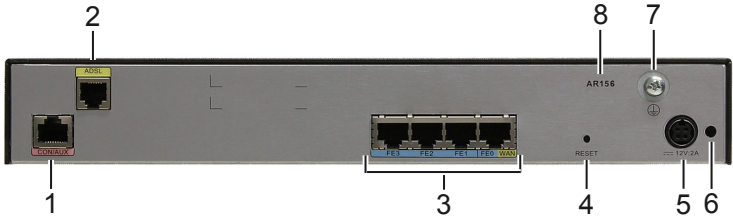
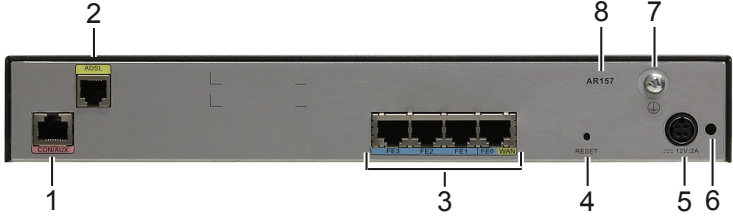
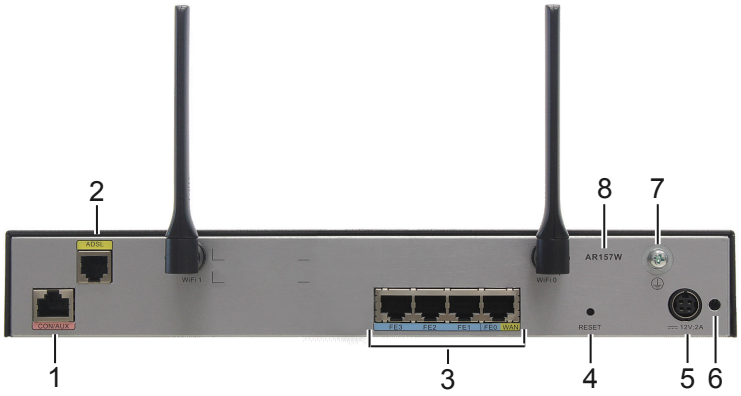
Device Model	Front View
AR151 AR156 AR157 AR158E	
AR151W-P AR157W AR157VW AR158EVW	
AR151G-HSPA+7 AR151G-C AR157G-HSPA+7	

1. USB Interface	2. WiFi whip antenna	3. 3G Whip Antenna
------------------	----------------------	--------------------

Rear View

Table 1-4 shows the rear views of the AR150 series routers.

Device Model	Rear View
AR151	The rear view of the AR151 device shows the following components labeled with numbers 1 through 6: 1: Ethernet port (LAN) 2: Ethernet port (WAN) 3: Four Ethernet ports (LAN 1, LAN 2, LAN 3, LAN 4) 4: Reset button 5: DC power input jack (5V 1A) 6: Ground pin
AR151W-P	The rear view of the AR151W-P device shows the following components labeled with numbers 1 through 9: 1: Ethernet port (LAN) 2: Ethernet port (WAN) 3: Four Ethernet ports (LAN 1, LAN 2, LAN 3, LAN 4) 4: Reset button 5: DC power input jack (5V 1A) 6: Ground pin 7: Antenna 8: Antenna 9: WPS button
AR151G-HSPA+7	The rear view of the AR151G-HSPA+7 device shows the following components labeled with numbers 1 through 10: 1: Ethernet port (LAN) 2: Ethernet port (WAN) 3: Four Ethernet ports (LAN 1, LAN 2, LAN 3, LAN 4) 4: Reset button 5: DC power input jack (5V 1A) 6: Ground pin 7: Antenna 8: Antenna 9: WPS button 10: WPS button

Device Model	Rear View
AR151G-C	
AR156	
AR157	
AR157W	

Device Model	Rear View
AR157VW	The rear view of the AR157VW router chassis shows two antennas (labeled 2 and 8) and a power jack (labeled 7). The ports are numbered 1 through 12. Port 1 is a console port, and port 2 is a USB port. Ports 11 and 12 are Ethernet ports. Ports 3 through 10 are Ethernet ports. Port 4 is a reset button. Port 5 is a power jack, and port 6 is a power button.
AR157G-HSPA+7	The rear view of the AR157G-HSPA+7 router chassis shows two antennas (labeled 2 and 8) and a power jack (labeled 7). The ports are numbered 1 through 10. Port 1 is a console port, and port 2 is a USB port. Ports 3 through 10 are Ethernet ports. Port 4 is a reset button. Port 5 is a power jack, and port 6 is a power button.
AR158E	The rear view of the AR158E router chassis shows two antennas (labeled 2 and 8) and a power jack (labeled 7). The ports are numbered 1 through 10. Port 1 is a console port, and port 2 is a USB port. Ports 3 through 10 are Ethernet ports. Port 4 is a reset button. Port 5 is a power jack, and port 6 is a power button.
AR158EVW	The rear view of the AR158EVW router chassis shows two antennas (labeled 2 and 8) and a power jack (labeled 7). The ports are numbered 1 through 12. Port 1 is a console port, and port 2 is a USB port. Ports 11 and 12 are Ethernet ports. Ports 3 through 10 are Ethernet ports. Port 4 is a reset button. Port 5 is a power jack, and port 6 is a power button.

1. CON/AUX Interface NOTE The AR150 series routers have only console (CON) interfaces and do not support AUX interfaces.	2. WAN port ● AR151, AR151W-P, AR151G-HSPA+7, AR151G-C: FE Electrical Interface ● AR156: ADSL-B/J Interface ● AR157, AR157W, AR157VW, AR157G-HSPA+7: ADSL-A/M interface ● AR158E, AR158EVW: G.SHDSL Interface	3. LAN ports AR150 series: four FE Electrical Interfaces	4. RESET button CAUTION This button is used to reset the device. ● To restore the factory settings, hold the button for 5 seconds. ● To reset the system, press the button. Resetting the device interrupts services. Confirm the action before you press the RESET button.
5. Power jack NOTE A 2.5 24/36/60 W Power Adapter is connected to the power jack to provide 12 V power supply to the device.	6. Jack for power cable locking strap NOTE Insert a power cable locking strap into this jack and secure the power cable with the locking strap to prevent it from loosening or falling.	7. Ground point NOTE The device must be reliably grounded using a ground cable to protect the device from lightning and interference.	8. Product model silkscreen
9. PoE port NOTE Connect the AR150 to 2.4 100 W AC PoE Power Module to provide power for PDs connected to FE interfaces. PDs include IP phones, WLAN APs, and cameras.	10. SIM card slot	11. Four FXS ports	12. One FXO port

1.3.3 Indicator Description

 NOTE

The AR150 series routers have all their indicators on the front panel.

The indicator meanings of the AR150 series routers vary according to device models, as listed in [Table 1-5](#).

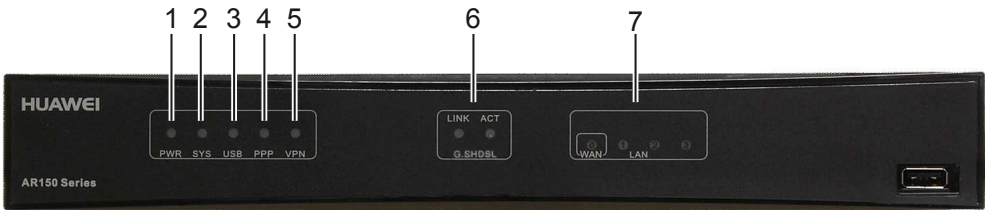
Table 1-5 Differences between indicators of AR150 models

Device Model	Indicator
AR151 AR156 AR157 AR158E	The AR151, AR156, AR157, and AR158E have the same indicators, except that their WAN port indicators have different silkscreens. AR158E router as an example.
AR151W AR151W-P	The AR151W-P has a PoE indicator, whereas the AR151W does not have a PoE indicator. The other indicators of the two models are the same. AR151W-P router as an example.
AR151G-HSPA+7 AR151G-C AR157G-HSPA+7	The AR151G-HSPA+7,AR151G-C and AR157G-HSPA+7 have the same indicators, except that their WAN port indicators have different silkscreens. AR157G-HSPA+7 router as an example.
AR157VW AR158EVW	The AR157VW and AR158EVW have the same indicators, except that their WAN port indicators have different silkscreens. AR158EVW router as an example.

AR158E

Figure 1-2 shows the indicators on the AR158E, Table 1-6 describes the indicator states and meaning.

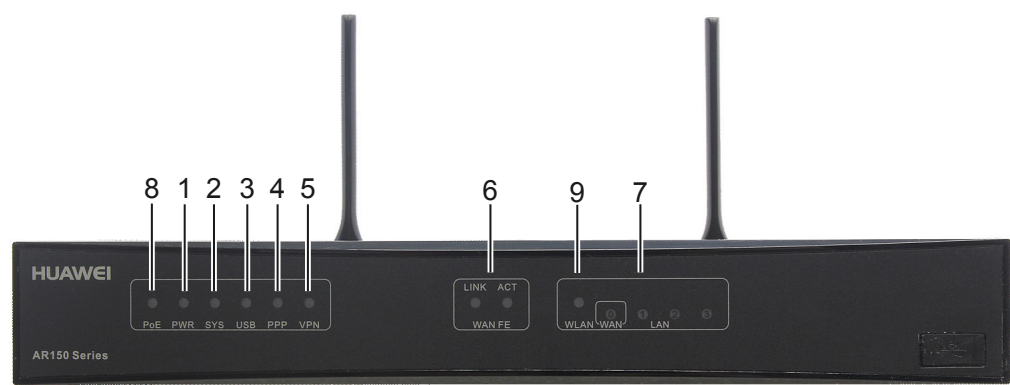
Figure 1-2 Indicators on the AR158E



AR151W-P

Figure 1-3 shows the indicators on the AR151W-P, Table 1-6 describes the indicator states and meaning.

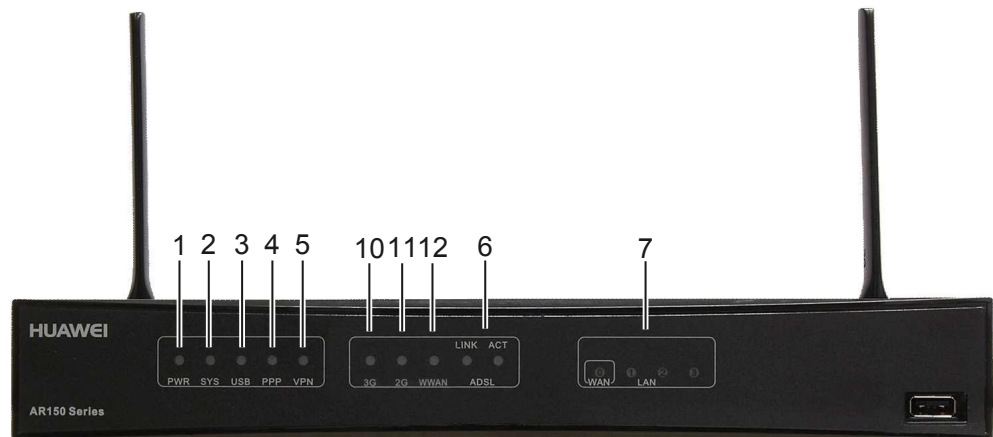
Figure 1-3 Indicators on the AR151W-P



AR157G-HSPA+7

Figure 1-4 shows the indicators on the AR157G-HSPA+7, Table 1-6 describes the indicator states and meaning.

Figure 1-4 Indicators on the AR157G-HSPA+7



AR158EVW

Figure 1-5 shows the indicators on the AR158EVW, Table 1-6 describes the indicator states and meaning.

Figure 1-5 Indicators on the AR158EVW

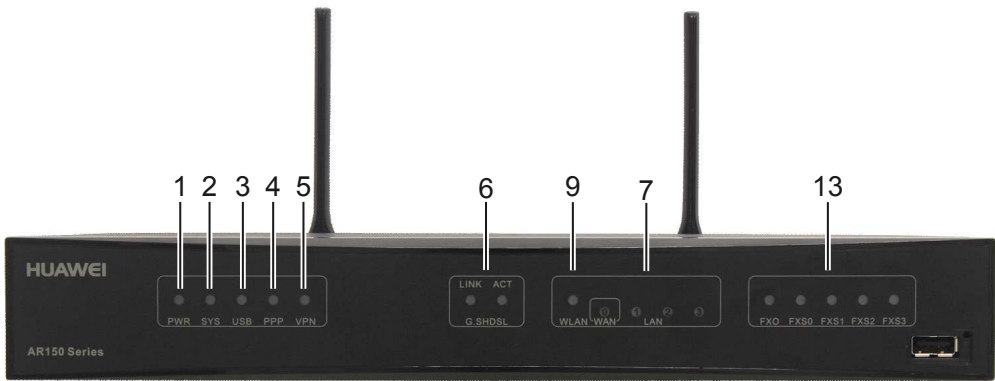


Table 1-6 Description of indicators on the AR150

Number	Indicator	Color	Description
1	PWR	Green	Steady on: The system power supply is normal. Off: The system power is off.
2	SYS	Red and green	Slow blinking green: The switch is running properly.
			Fast blinking green: The system is powering on or restarting.
			Steady red: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
3	USB	Red and green	Off: The system software is not running or the system is resetting.
			Steady green: The system has been upgraded or configured using a USB flash drive.
			Blinking green: The system is being upgraded or configured using a USB flash drive.
			Steady red: The system fails to be upgraded or configured using a USB flash drive.
4	PPP	Green	Steady on: A PPP connection has been set up. Off: No PPP connection is set up.
5	VPN	Green	Steady on: The VPN service is running normally. Off: The VPN service is not running.

Number	Indicator	Color	Description
6	LINK	Green	Steady on: A link is connected on the WAN port. Off: No link is connected on the WAN port.
	ACT	Green	Blinking: The WAN port is transmitting or receiving data. Off: The WAN port is not transmitting or receiving data.
7	LAN	Green	Steady on: A link is connected on the LAN port.
			Blinking: The LAN port is transmitting or receiving data.
			Off: No link is connected on the LAN port.
8	PoE	Green	Steady on: The PoE power supply is normal. Off: The system is not providing PoE power.
9	WLAN	Green	Blinking : The WLAN link is transmitting data. The blinking frequency changes with the traffic transmission rate on the link.
			Off: The WLAN link is shut down.
10	3G	Green	Steady on: The 3G signal strength is high.
			Fast blinking: The 3G signal strength is medium.
			Slow blinking: The 3G signal strength is low.
			Off: No 3G signal is available.
11	2G	Green	Steady on: The 2G signal strength is high.
			Fast blinking: The 2G signal strength is medium.
			Slow blinking: The 2G signal strength is low.
			Off: No 2G signal is available.
12	WWAN	Green	Steady on: The 3G/2G connection has been set up and is active.
			Blinking: Data is being transmitted or received over the 3G/2G connection.
			Off: The 3G/2G connection has not been established or is inactive.
13	FXS0 to FXS3	Green	Steady on: The FXS channel is being occupied by a call.
			Off: The FXS channel is idle.

Number	Indicator	Color	Description
	FXO	Green	Steady on: The FXO channel is being occupied by a call. Off: The FXO channel is idle.

1.3.4 Interface Description

CON/AUX Interface

A console interface can connect to an operation terminal for onsite configuration. An AUX interface connects to a remote management center through a modem to realize remote configuration. A CON/AUX interface must use a [5.4 Console Cable](#). [Table 1-7](#) lists the CON/AUX interface attributes.

Table 1-7 CON/AUX interface attributes

Attribute	Description
Connector type	RJ45
Standards compliance	RS232
Working mode	Full-duplex universal asynchronous receiver/transmitter (UART)
Data equipment type	● Data Circuit-terminating Equipment (DCE) ● AUX interface: Data Terminal Equipment (DTE)

NOTE

The CON/AUX port on the AR150, AR160, AR200, AR1200, AR2200, and AR3200 cannot be used as an AUX port.

FE Electrical Interface

An FE electrical (10Base-T/100Base-TX Interface) interface transmits service data at 10 Mbit/s or 100 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-8](#) lists FE electrical interface attributes.

Table 1-8 FE electrical interface attributes

Attribute	Description
Connector type	RJ45

Attribute	Description
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

WLAN Interface

A WLAN interface connects to a **WiFi whip antenna** to transmit and receive Wi-Fi data. [Table 1-9](#) lists WLAN interface attributes.

Table 1-9 WLAN interface attributes

Attribute	Description
Connector type	Mini PCIe
Standards compliance	802.11b/g/n
Frequency band	2.4 GHz 5.0 GHz
Rate	300 Mbit/s
MIMO mode (Tx x Rx)	2x2
Gain	2.4 GHz: 2.15 dBi 5.0 GHz: 3.0 dBi
Services provided	- Layer 2/3 wireless access - Wireless data encryption - Wireless security

ADSL-B/J Interface

An ADSL-B/J interface connects to a **5.11 Regular Telephone Line** to transmit service data from a LAN to an upstream device at a high speed. [Table 1-10](#) lists ADSL-B/J interface attributes.

Table 1-10 ADSL-B/J interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5
Rate	● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ AnnexJ mode: downlink rate of 24 Mbit/s and uplink rate of 3078 kbit/s
Cable	Telephone cable

ADSL-A/M interface

An ADSL-A/M interface connects to a [5.11 Regular Telephone Line](#) to transmit service data from a LAN to an upstream device at a high speed. [Table 1-11](#) lists ADSL-A/M interface attributes.

Table 1-11 ADSL-A/M interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5

Attribute	Description
Rate	● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 AnnexM mode: downlink rate of 12 Mbit/s and uplink rate of 2 Mbit/s ● ADSL2+ AnnexM mode: downlink rate of 24 Mbit/s and uplink rate of 2 Mbit/s ● T1.413 mode: downlink rate of 8 Mbit/s and uplink rate of 1 Mbit/s
Cable	Telephone cable

G.SHDSL Interface

A single-pair high-speed digital subscriber line (G.SHDSL) interface symmetrically transmits service data between a LAN and an upstream device. The G.SHDSL interface provides high-speed data transmission and has a longer transmission distance than an ADSL interface. It must be used with [5.9 4G.SHDSL Cable](#) or [5.5 Network Cable](#). [Table 1-12](#) lists G.SHDSL interface attributes.

Table 1-12 G.SHDSL interface attributes

Attribute	Description
Connector type	One RJ45 connector on one end and four RJ11 connectors on the other end
Standards compliance	G.991.2
Rate	5.696 Mbit/s/pair

USB Interface

A USB interface can have a USB flash drive or 3G data card installed to upload or download configuration files and system software packages to the flash memory or SD card of the device. The upload or download speed can reach 12 Mbit/s. [Table 1-13](#) lists USB interface attributes.

Table 1-13 USB interface attributes

Attribute	Description
Connector type	TYPE A
Standards compliance	USB 2.0

Attribute	Description
Working mode	Host

1.3.5 Heat Dissipation

The cooling system of a device ensures that the device operates within a normal temperature range. For the operating temperature range, see [1.3.6 Technical Specifications](#).

[Table 1-14](#) lists the heat dissipation modes supported by the AR150 series routers.

Table 1-14 Heat dissipation modes of the AR150 series routers

Heat Dissipation Mode	Device Model	Airflow
Natural heat dissipation	● AR151 ● AR156 ● AR157 ● AR158E ● AR151W ● AR151W-P ● AR157VW ● AR158EVW	These models have no fans and use natural heat dissipation.
Forcible heat dissipation	● AR151G-HSPA+7 ● AR151G-C ● AR157G-HSPA+7	These models have fans for heat dissipation. Air enters the chassis from the left side and is exhausted from the right side. 

1.3.6 Technical Specifications

[Table 1-15](#) lists the technical specifications of the AR150 series routers.

Table 1-15 AR150 technical specifications

Item		Specification
Processor		Dual-core 533 MHz
Forwarding performance		300 kpps
Memory		512 MB
Flash memory		512 MB
Dimensions (W x D x H)		- Without mounting bracket installed: 300.0 mm x 216.4 mm x 44.0 mm (11.81 in. x 8.52 in. x 1.73 in.) - With mounting brackets installed: 482.60 mm x 216.40 mm x 44.0 mm (19 in. x 8.52 in. x 1.73 in.)
Weight (standard configuration)		2.8 kg (7.5 lb)
Maximum power consumption		- AR151: 11.6 W - AR151W-P: 10.4 W - AR151G-HSPA+7: 12.4 W - AR151G-C: 12.4 W - AR156: 16.1 W - AR157: 15.2 W - AR157W: 16.7 W - AR157VW: 20.8 W - AR157G-HSPA+7: 16.9 W - AR158E: 14.7 W - AR158EVW: 19.9 W
Power specifications	AC power input	Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz

Item		Specification
	Maximum output power	● AR151: 36 W ● AR151W-P: 24 W ● AR151G-HSPA+7: 24 W ● AR151G-C: 24 W ● AR156: 36 W ● AR157: 36 W ● AR157W: 24 W ● AR157VW: 60 W ● AR157G-HSPA+7: 24 W ● AR158E: 36 W ● AR158EVW: 60 W
	PoE power supply	● AR151: not supported ● AR151W-P: supported ● AR151G-HSPA+7: not supported ● AR151G-C: not supported ● AR156: not supported ● AR157: not supported ● AR157W: not supported ● AR157VW: not supported ● AR157G-HSPA+7: not supported ● AR158E: not supported ● AR158EVW: not supported
Environment parameters	Operating temperature	● Environment temperature: 0°C to 45°C ● Storage temperature: -40°C to 70°C
	Operating relative humidity	5% to 95%, noncondensing
	Operating altitude	< 5000 m
Safety standards compliance		● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

1.4 AR160 Series

1.4.1 Version Mapping

Table 1-16 describes the mapping between the AR160 series routers and software versions.

Table 1-16 Mapping between the AR160 series routers and software versions

Device Series	Device Model	Software Version
AR160 Series	AR168F	V200R005C00 and later versions
	AR169F	V200R005C00 and later versions

1.4.2 Appearance and Structure

Front View

Table 1-17 shows the front views of the AR160 series.

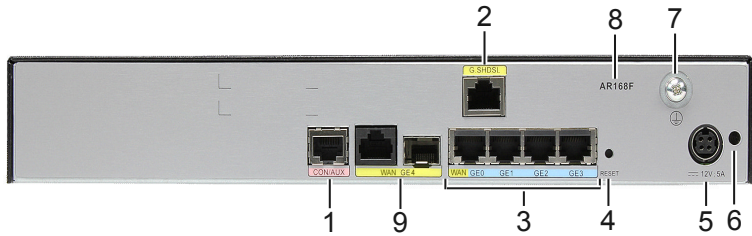
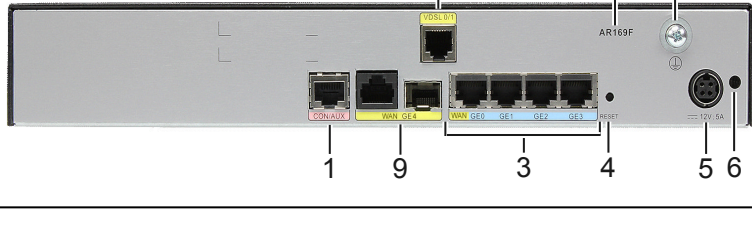
Table 1-17 Front views of the AR160 series routers

Device Model	Image
AR168F	 USB interface
AR169F	 USB interface

Rear View

Table 1-18 shows the rear views of the AR160 series routers.

Table 1-18 Rear views of the AR160 series routers

Device Model	Image
AR168F	 1 9 2 3 4 5 6 7 8 9
AR169F	 1 9 2 3 4 5 6 7 8 9

1. CON/AUX Interface NOTE The AR160 series routers have only console (CON) interfaces and do not support AUX interfaces.	2. WAN interface - AR168F: G.SHDSL Interface - AR169F: VDSL2 Interface	3. LAN interface Four GE Electrical Interfaces NOTE GE0 can be configured as a WAN interface.	4. RESET button CAUTION Press this button to reset the router. - To restore the factory settings, hold the button for at least 5 seconds. - To reset the system, press the button. Resetting the device interrupts services. Confirm your action before you press the RESET button.
5. Power jack NOTE A 2.5 24/36/60 W Power Adapter is connected to this power jack to supply 12 V DC power to the device.	6. Jack for power cable locking strap NOTE Insert a power cable locking strap into this jack and secure the power cable with the locking strap to prevent it from loosening or falling.	7. Ground point NOTE The device must be reliably grounded using a ground cable to protect the device from lightning and interference.	8. Product model silkscreen
9. GE Combo Interface			

1.4.3 Indicator Description

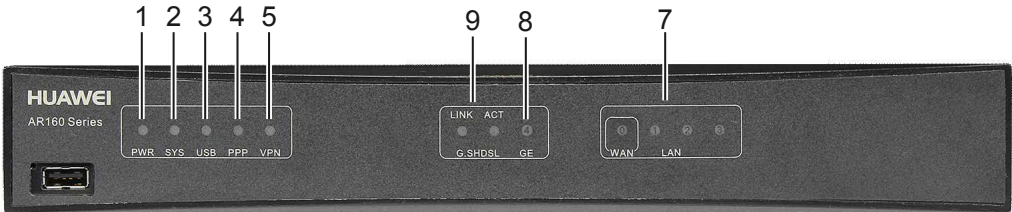
 **NOTE**

The AR160 series routers have all their indicators on the front panel.

AR168F

Figure 1-6 shows indicators on the AR168F, and **Table 1-19** describes the indicator states and meaning.

Figure 1-6 Indicators on the AR168F



AR169F

Figure 1-7 shows indicators on the AR169F, and Table 1-19 describes the indicator states and meaning.

Figure 1-7 Indicators on the AR169F

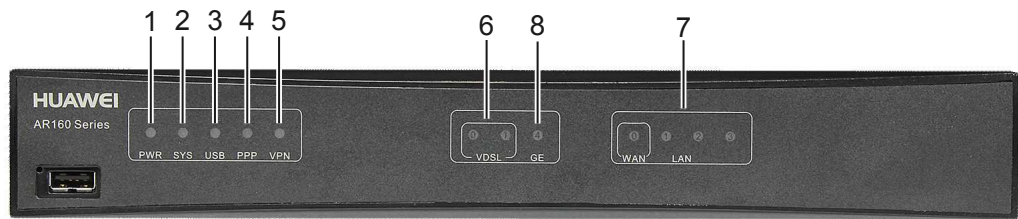


Table 1-19 Description of indicators on the AR160

Number	Indicator/ Button	Color	Description
1	PWR	Green	Steady on: The system power supply is normal. Off: The system power is off.
2	SYS	Red and green	Slow blinking green: The system is running properly.
			Fast blinking green: The system is powering on or restarting.
			Steady red: A fault that affects services has occurred. The fault cannot be rectified automatically and needs to be rectified manually.
3	USB	Red and green	Off: The system software is not running or is resetting.
			Steady green: The system has been upgraded or configured using a USB flash drive.
			Blinking green: The system is being upgraded or configured using a USB flash drive.
			Steady red: The system fails to be upgraded or configured using a USB flash drive.
4	PPP	Green	Steady on: A PPP connection has been set up. Off: No PPP connection is set up.
5	VPN	Green	Steady on: The VPN service is running normally. Of: The VPN service is unavailable.

Number	Indicator/ Button	Color	Description
6	Left VDSL indicator (LINK0)	Green	Steady on: A link is connected on the WAN interface. Blinking: The WAN link on the interface is activating. Off: No link is set up on the WAN interface.
	Right VDSL indicator (LINK1)		
7	Four LAN-side GE electrical interface indicators	Green	Steady on: A link has been established on the GE interface.
			Blinking: The GE interface is transmitting and receiving data.
			Off: No link is established on the GE interface.
8	WAN-side GE combo interface indicator	Green	Steady on: A link has been established on the combo interface.
			Blinking: The combo interface is transmitting and receiving data.
			Off: No link is established on the combo interface.
9	G.SHDSL LINK indicator	Green	Steady on: All the four DSL channels are active.
			● Stays on for 0.25s and blinks three times in the next 0.75s: One DSL channel is active. ● Stays on for 0.5 seconds and blinks twice in the next 0.5 seconds: Two DSL channels are active. ● Stays on for 0.75 seconds and blinks once in the next 0.25 seconds: Three DSL channels are active.
			Off: All the four DSL channels are inactive.
	G.SHDSL ACT indicator	Yellow	Blinking: Data is being transmitted and received on the G.SHDSL channel.
			Off: No data is transmitted or received on the G.SHDSL channel.

1.4.4 Interface Description

CON/AUX Interface

A console interface can connect to an operation terminal for onsite configuration. An AUX interface connects to a remote management center through a modem to realize remote

configuration. A CON/AUX interface must use a [5.4 Console Cable](#). [Table 1-20](#) lists the CON/AUX interface attributes.

Table 1-20 CON/AUX interface attributes

Attribute	Description
Connector type	RJ45
Standards compliance	RS232
Working mode	Full-duplex universal asynchronous receiver/transmitter (UART)
Data equipment type	● Data Circuit-terminating Equipment (DCE) ● AUX interface: Data Terminal Equipment (DTE)

 NOTE

The CON/AUX port on the AR150, AR160, AR200, AR1200, AR2200, and AR3200 cannot be used as an AUX port.

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-21](#) lists GE electrical interface attributes.

Table 1-21 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Combo Interface

A combo interface consists of an optical Ethernet interface and an electrical Ethernet interface on the panel. Each combo interface matches only one internal forwarding interface. A combo

interface is a multiplexing interface, and you can use either the optical interface or electrical interface at one time. When one of the Ethernet interfaces is used, the other interface is disabled. The combo interface must be used with [5.5 Network Cable](#) or [GE Optical Module](#) and [5.6 Optical Fiber](#).

 NOTE

By default, a combo port works as an electrical interface and uses a network cable to transmit data.

G.SHDSL Interface

A single-pair high-speed digital subscriber line (G.SHDSL) interface symmetrically transmits service data between a LAN and an upstream device. The G.SHDSL interface provides high-speed data transmission and has a longer transmission distance than an ADSL interface. It must be used with [5.9 4G.SHDSL Cable](#) or [5.5 Network Cable](#). [Table 1-22](#) lists G.SHDSL interface attributes.

Table 1-22 G.SHDSL interface attributes

Attribute	Description
Connector type	One RJ45 connector on one end and four RJ11 connectors on the other end
Standards compliance	G.991.2
Rate	5.696 Mbit/s/pair

VDSL2 Interface

A very-high-speed digital subscriber line 2 (VDSL2) interface connects to a [5.11 Regular Telephone Line](#) to transmit service data from a LAN to an upstream device at a high speed. [Table 1-23](#) lists VDSL2 interface attributes.

Table 1-23 VDSL2 interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	VDSL2: ITU-T 993.2 ITU-T 992.5 ITU-T 992.3 ITU-T 992.1 G.DMT

Attribute	Description
Rate	VDSL2: ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1 Mbit/s ● VDSL2 mode (ITU-T 993.2): downlink rate of 100 Mbit/s and uplink rate of 50 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1 Mbit/s ● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1 Mbit/s
Cable	Telephone cable

USB Interface

A USB interface can have a USB flash drive or 3G data card installed to upload or download configuration files and system software packages to the flash memory or SD card of the device. The upload or download speed can reach 12 Mbit/s. [Table 1-24](#) lists USB interface attributes.

Table 1-24 USB interface attributes

Attribute	Description
Connector type	TYPE A
Standards compliance	USB 2.0
Working mode	Host

1.4.5 Heat Dissipation

The cooling system of a router ensures that the router operates within a normal temperature range. For the operating temperature range, see [1.4.6 Technical Specifications](#).

The AR160 series routers have no fans and use natural heat dissipation.

1.4.6 Technical Specifications

[Table 1-25](#) lists technical specifications of the AR160 series routers.

Table 1-25 AR160 technical Specifications

Item	Specification
Processor	Dual-core 533 MHz
Forwarding performance	350 kpps

Item		Specification
Memory		512 MB
Flash memory		512 MB
Dimensions (W x D x H)		- Without rack-mounting brackets: 300.0 mm x 216.4 mm x 44.0 mm (11.81 in. x 8.52 in. x 1.73 in.) - With rack-mounting brackets: 482.6 mm x 216.4 mm x 44.0 mm (19 in. x 8.52 in. x 1.73 in.)
Weight (standard configuration)		2.8 kg
Maximum power consumption		- AR168F: 17.8 W - AR169F: 17.8 W
Power parameters	Power adapter AC power input	Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz
	Power adapter maximum output power	- AR168F: 24 W - AR169F: 24 W
Environment parameters	Operating temperature	- Environment temperature: 0°C to 45°C - Storage temperature: -40°C to 70°C
	Operating relative humidity	5% to 95%, noncondensing
	Operating altitude	< 5000 m
Safety standards compliance		- UL 60950-1 - EN 60950-1 - IEC 60950-1 - BS EN 60950-1 - CSA C22.2 No 60950-1 - AS/NZS 60950.1 - IS 13252 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

1.5 AR200 Series

1.5.1 Version Mapping

Table 1-26 lists the mapping between the AR200 series routers and software versions.

Table 1-26 Matching between AR200 series routers and software versions

Device Series	Device Model	Software Version
AR200 series	AR201	V200R002C00 and later versions
	AR201VW-P	V200R003C00 and later versions
	AR206	V200R002C00 and later versions
	AR207	V200R002C00 and later versions

Device Series	Device Model	Software Version
	AR207V	V200R002C00 and later versions
	AR207VW	V200R003C00 and later versions
	AR207V-P	V200R002C00 and later versions
	AR207G-HSPA+7	V200R002C01 and later versions
	AR208E	V200R002C00 and later versions

1.5.2 Appearance and Structure

Front View

Table 1-27 shows the front views of the AR200 series.

Table 1-27 Front views of the AR200 series routers

Device Model	Front View
AR201 AR206 AR207 AR207V AR207V-P AR208E	
AR201VW-P AR207VW	

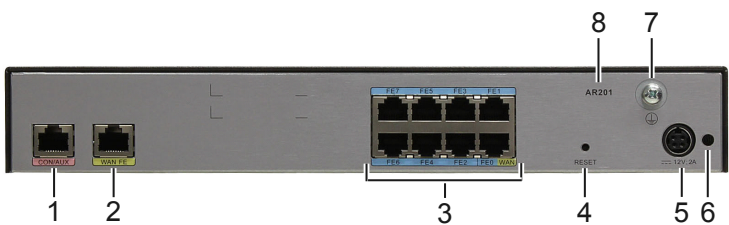
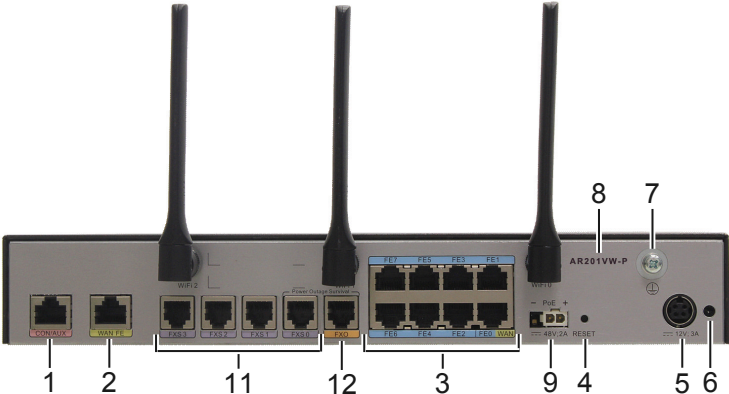
Device Model	Front View
AR207G-HSPA+7	

1. USB Interface	2. WiFi whip antenna	3. 3G Whip Antenna
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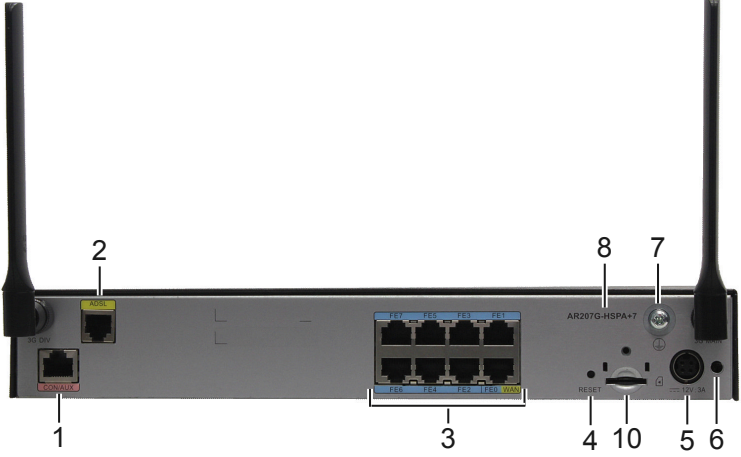
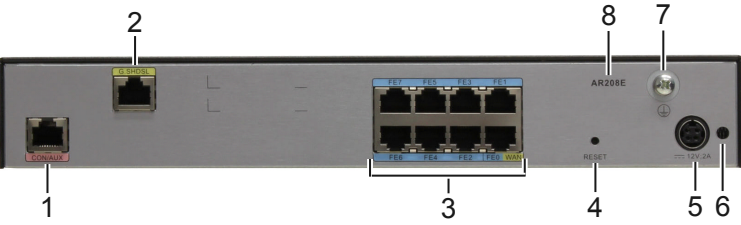
Rear View

Table 1-28 shows the rear views of the AR200 series routers.

Table 1-28 Rear views of the AR200 series routers

Device Model	Rear View
AR201	
AR201VW-P	

Device Model	Rear View
AR206	The diagram shows the rear panel of the AR206 router. It features a CONSOLE port (1), an AUX port (2), a 24-port Ethernet port block (3) with FE1-FE24 labels, a RESET button (4), a status LED (8), a power jack (7), and a power plug (5, 6).
AR207	The diagram shows the rear panel of the AR207 router. It features a CONSOLE port (1), an AUX port (2), a 24-port Ethernet port block (3) with FE1-FE24 labels, a RESET button (4), a status LED (8), a power jack (7), and a power plug (5, 6).
AR207V	The diagram shows the rear panel of the AR207V router. It features a CONSOLE port (1), an AUX port (2), four SFP ports (11), a 24-port Ethernet port block (3) with FE1-FE24 labels, a RESET button (4), a status LED (8), a power jack (7), and a power plug (5, 6).
AR207VW	The diagram shows the rear panel of the AR207VW router. It features a CONSOLE port (1), an AUX port (2), four SFP ports (11), a 24-port Ethernet port block (3) with FE1-FE24 labels, a RESET button (4), a status LED (8), a power jack (7), and a power plug (5, 6). It also has three antenna ports labeled WIF1, WIF2, and WIF3.
AR207V-P	The diagram shows the rear panel of the AR207V-P router. It features a CONSOLE port (1), an AUX port (2), four SFP ports (11), a 24-port Ethernet port block (3) with FE1-FE24 labels, a P/E port (9), a RESET button (4), a status LED (8), a power jack (7), and a power plug (5, 6).

Device Model	Rear View
AR207G-HSPA+7	
AR208E	

1. CON/AUX Interface NOTE The AR200 series routers have only console (CON) interfaces and do not support AUX interfaces.	2. WAN port ● AR201, AR201VW-P: FE Electrical Interface ● AR206: ADSL-B/J Interface ● AR207, AR207V, AR207VW, AR207V-P, and AR207G-HSPA+7: ADSL-A/M interface ● AR208E: G.SHDSL Interface	3. LAN ports AR200 series: eight FE Electrical Interfaces NOTE FE0 can function as a WAN port so that the device provides double WAN ports.	4. RESET button CAUTION This button is used to reset the device. ● To restore the factory settings, hold the button for 5 seconds. ● To reset the system, press the button. Resetting the device interrupts services. Confirm the action before you press the RESET button.
--	--	--	---

5. Power jack NOTE A 2.5 24/36/60 W Power Adapter is connected to the power jack to provide 12 V power supply to the device.	6. Jack for power cable locking strap NOTE Insert a power cable locking strap into this jack and secure the power cable with the locking strap to prevent it from loosening or falling.	7. Ground point NOTE The device must be reliably grounded using a ground cable to protect the device from lightning and interference.	8. Product model silkscreen
9. PoE port NOTE Connect the AR200 to 2.4 100 W AC PoE Power Module to provide power for PDs connected to FE interfaces. PDs include IP phones, WLAN APs, and cameras.	10. SIM card slot	11. Four FXS ports	12. One FXO port

1.5.3 Indicator Description



NOTE

The AR200 series routers have all their indicators on the front panel.

The indicator meanings of the AR200 series routers vary according to device models, as listed in **Table 1-29**.

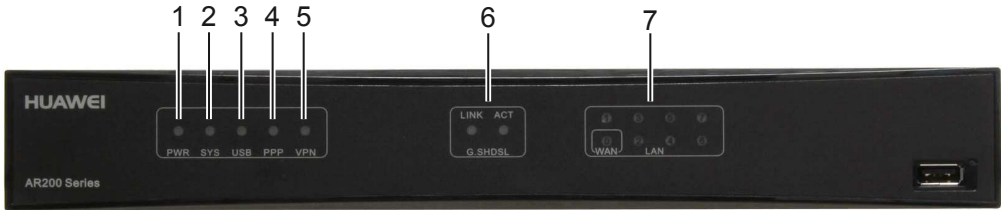
Table 1-29 Differences between indicators of AR200 models

Device Model	Indicator
AR201 AR206 AR207 AR208E	The AR201, AR206, AR207, and AR208E have the same indicators, except that their WAN port indicators have different silkscreens. AR208E router as an example.
AR207V AR207V-P	The AR207V-P has a PoE indicator, whereas the AR207V does not have a PoE indicator. The other indicators of the two models are the same. AR207V-P router as an example.
AR207G-HSPA+7	AR207G-HSPA+7 router as an example.
AR201VW-P AR207VW	The AR201VW-P has a PoE indicator, whereas the AR207VW does not have a PoE indicator. The other indicators of the two models are the same. AR201VW-P router as an example.

AR208E

Figure 1-8 shows the indicators on the AR208E, Table 1-30 describes the indicator states and meaning.

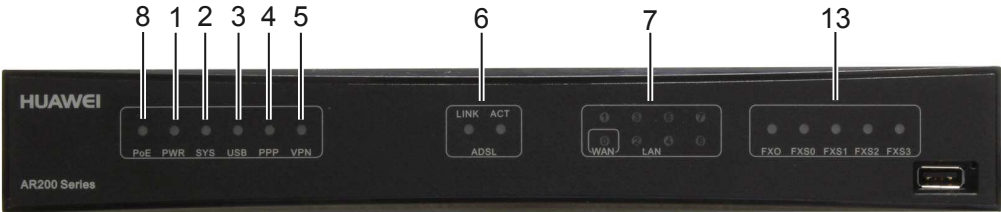
Figure 1-8 Indicators on the AR208E



AR207V-P

Figure 1-9 shows the indicators on the AR207V-P, Table 1-30 describes the indicator states and meaning.

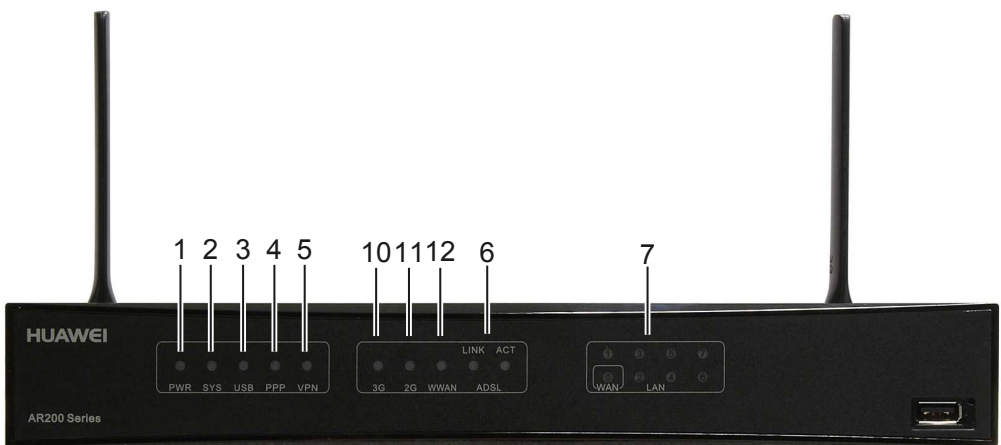
Figure 1-9 Indicators on the AR207V-P



AR207G-HSPA+7

Figure 1-10 shows the indicators on the AR207G-HSPA+7, Table 1-30 describes the indicator states and meaning.

Figure 1-10 Indicators on the AR207G-HSPA+7



AR201VW-P

Figure 1-11 shows the indicators on the AR201VW-P, Table 1-30 describes the indicator states and meaning.

Figure 1-11 Indicators on the AR201VW-P

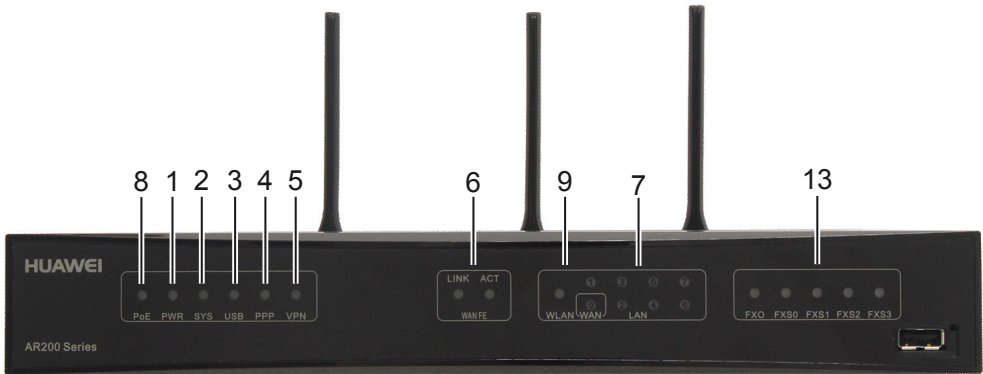


Table 1-30 Description of indicators on the AR200

Number	Indicator	Color	Description
1	PWR	Green	Steady on: The system power supply is normal. Off: The system power is off.
2	SYS	Red and green	Slow blinking green: The switch is running properly. Fast blinking green: The system is powering on or restarting. Steady red: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually. Off: The system software is not running or the system is resetting.
3	USB	Red and green	Steady green: The system has been upgraded or configured using a USB flash drive. Blinking green: The system is being upgraded or configured using a USB flash drive. Steady red: The system fails to be upgraded or configured using a USB flash drive. Off: No USB flash drive is connected, the USB port has failed, or the indicator has failed.

Number	Indicator	Color	Description
4	PPP	Green	Steady on: A PPP connection has been set up. Off: No PPP connection is set up.
5	VPN	Green	Steady on: The VPN service is running normally. Off: The VPN service is not running.
6	LINK	Green	Steady on: A link is connected on the WAN port. Off: No link is connected on the WAN port.
	ACT	Green	Blinking: The WAN port is transmitting or receiving data. Off: The WAN port is not transmitting or receiving data.
7	LAN	Green	Steady on: A link is connected on the LAN port.
			Blinking: The LAN port is transmitting or receiving data.
			Off: No link is connected on the LAN port.
8	PoE	Green	Steady on: The PoE power supply is normal. Off: The system is not providing PoE power.
9	WLAN	Green	Blinking : The WLAN link is transmitting data. The blinking frequency changes with the traffic transmission rate on the link.
			Off: The WLAN link is shut down.
10	3G	Green	Steady on: The 3G signal strength is high.
			Fast blinking: The 3G signal strength is medium.
			Slow blinking green: The 3G signal strength is low.
			Off: No 3G signal is available.
11	2G	Green	Steady on: The 2G signal strength is high.
			Fast blinking: The 2G signal strength is medium.
			Slow blinking green: The 2G signal strength is low.
			Off: No 2G signal is available.
12	WWAN	Green	Steady on: The 3G/2G connection has been set up and is active.
			Blinking: Data is being transmitted or received over the 3G/2G connection.

Number	Indicator	Color	Description
			Off: The 3G/2G connection has not been established or is inactive.
13	FXS0 to FXS3	Green	Steady on: The FXS channel is being occupied by a call. Off: The FXS channel is idle.
	FXO	Green	Steady on: The FXO channel is being occupied by a call. Off: The FXO channel is idle.

1.5.4 Interface Description

CON/AUX Interface

A console interface can connect to an operation terminal for onsite configuration. An AUX interface connects to a remote management center through a modem to realize remote configuration. A CON/AUX interface must use a [5.4 Console Cable](#). [Table 1-31](#) lists the CON/AUX interface attributes.

Table 1-31 CON/AUX interface attributes

Attribute	Description
Connector type	RJ45
Standards compliance	RS232
Working mode	Full-duplex universal asynchronous receiver/transmitter (UART)
Data equipment type	● Data Circuit-terminating Equipment (DCE) ● AUX interface: Data Terminal Equipment (DTE)

NOTE

The CON/AUX port on the AR150, AR160, AR200, AR1200, AR2200, and AR3200 cannot be used as an AUX port.

FE Electrical Interface

An FE electrical (10Base-T/100Base-TX Interface) interface transmits service data at 10 Mbit/s or 100 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-32](#) lists FE electrical interface attributes.

Table 1-32 FE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

WLAN Interface

A WLAN interface connects to a **WiFi whip antenna** to transmit and receive Wi-Fi data. [Table 1-33](#) lists WLAN interface attributes.

Table 1-33 WLAN interface attributes

Attribute	Description
Connector type	Mini PCIe
Standards compliance	802.11b/g/n
Frequency band	● 2.4 GHz ● 5.0 GHz
Rate	300 Mbit/s
MIMO mode (Tx x Rx)	2x2
Gain	● 2.4 GHz: 2.15 dBi ● 5.0 GHz: 3.0 dBi
Services provided	● Layer 2/3 wireless access ● Wireless data encryption ● Wireless security

ADSL-B/J Interface

An ADSL-B/J interface connects to a [5.11 Regular Telephone Line](#) to transmit service data from a LAN to an upstream device at a high speed. [Table 1-34](#) lists ADSL-B/J interface attributes.

Table 1-34 ADSL-B/J interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5
Rate	● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ AnnexJ mode: downlink rate of 24 Mbit/s and uplink rate of 3078 kbit/s
Cable	Telephone cable

ADSL-A/M interface

An ADSL-A/M interface connects to a [5.11 Regular Telephone Line](#) to transmit service data from a LAN to an upstream device at a high speed. [Table 1-35](#) lists ADSL-A/M interface attributes.

Table 1-35 ADSL-A/M interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5

Attribute	Description
Rate	● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 AnnexM mode: downlink rate of 12 Mbit/s and uplink rate of 2 Mbit/s ● ADSL2+ AnnexM mode: downlink rate of 24 Mbit/s and uplink rate of 2 Mbit/s ● T1.413 mode: downlink rate of 8 Mbit/s and uplink rate of 1 Mbit/s
Cable	Telephone cable

G.SHDSL Interface

A single-pair high-speed digital subscriber line (G.SHDSL) interface symmetrically transmits service data between a LAN and an upstream device. The G.SHDSL interface provides high-speed data transmission and has a longer transmission distance than an ADSL interface. It must be used with [5.9 4G.SHDSL Cable](#) or [5.5 Network Cable](#). [Table 1-36](#) lists G.SHDSL interface attributes.

Table 1-36 G.SHDSL interface attributes

Attribute	Description
Connector type	One RJ45 connector on one end and four RJ11 connectors on the other end
Standards compliance	G.991.2
Rate	5.696 Mbit/s/pair

USB Interface

A USB interface can have a USB flash drive or 3G data card installed to upload or download configuration files and system software packages to the flash memory or SD card of the device. The upload or download speed can reach 12 Mbit/s. [Table 1-37](#) lists USB interface attributes.

Table 1-37 USB interface attributes

Attribute	Description
Connector type	TYPE A
Standards compliance	USB 2.0

Attribute	Description
Working mode	Host

1.5.5 Heat Dissipation

The cooling system of a device ensures that the device operates within a normal temperature range. For the operating temperature range, see [1.5.6 Technical Specifications](#).

Table 1-38 lists the heat dissipation modes supported by the AR200 series routers.

Table 1-38 Heat dissipation modes of the AR200 series routers

Heat Dissipation Mode	Device Model	Airflow
Natural heat dissipation	● AR201 ● AR206 ● AR207 ● AR207V ● AR207V-P ● AR208E ● AR201VW-P ● AR207VW	These models have no fans and use natural heat dissipation.
Forcible heat dissipation	AR207G-HSPA+7	This model has fans for heat dissipation. Air enters the chassis from the left side and is exhausted from the right side. 

1.5.6 Technical Specifications

Table 1-39 lists the technical specifications of the AR200 series routers.

Table 1-39 AR200 technical specifications

Item		Specification
Processor		Dual-core 533 MHz
Forwarding performance		450 kpps
Memory		512 MB
Flash memory		512 MB
Dimensions (W x D x H)		- Without mounting bracket installed: 300.0 mm x 216.4 mm x 44.0 mm (11.81 in. x 8.52 in. x 1.73 in.) - With mounting brackets installed: 482.60 mm x 216.40 mm x 44.0 mm (19 in. x 8.52 in. x 1.73 in.)
Weight (standard configuration)		2.8 kg (7.5 lb)
Maximum power consumption		- AR201: 12.3 W - AR201VW-P: 23 W - AR206: 16.1 W - AR207: 16.1 W - AR207V: 22.8 W - AR207VW: 20.7 W - AR207V-P: 22.6 W - AR207G-HSPA+7: 17.1 W - AR208E: 14.7 W
Power specifications	AC power input	Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz
	Maximum output power	- AR201: 36 W - AR201VW-P: 36 W - AR206: 36 W - AR207: 36 W - AR207V: 36 W - AR207VW: 60 W - AR207V-P: 36 W - AR207G-HSPA+7: 36 W - AR208E: 36 W

Item		Specification
	PoE power supply	● AR201: not supported ● AR201VW-P: supported ● AR206: not supported ● AR207: not supported ● AR207V: not supported ● AR207VW: not supported ● AR207V-P: supported ● AR207G-HSPA+7: not supported ● AR208E: not supported
Environment parameters	Operating temperature	● Environment temperature: 0°C to 45°C ● Storage temperature: -40°C to 70°C
	Operating relative humidity	5% to 95%, noncondensing
	Operating altitude	< 5000 m
Safety standards compliance		● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance		● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR150&160&200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

1.6 AR1200 Series

1.6.1 Version Mapping

Table 1-40 describes the matching relationship between AR1200 models and software versions.

Table 1-40 Matching between AR1200 models and software versions

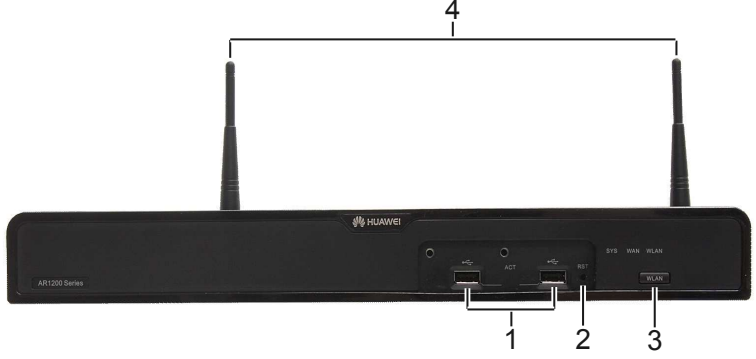
Device Series	Device Model	Software Version
AR1200 series	AR1220 AC model	V200R001C00 and later versions
	AR1220 DC model	V200R001C01, V200R002C02, and later versions NOTE V200R002C00 and V200R002C01 do not provide this model.
	AR1220V	V200R001C00 and later versions
	AR1220W	V200R001C01 and later versions
	AR1220VW	V200R001C01 and later versions
	AR1220L	V200R002C01 and later versions

1.6.2 Appearance and Structure

Front Views of AR1200 Series

Table 1-41 shows the front views of AR1200 series.

Table 1-41 Front views of AR1200 series

Model	Appearance
AR1220 AC model AR1220 DC model AR1220V AR1220L	 The image shows the front view of the AR1220 AC/DC models. It is a black, rectangular device. On the right side, there are several ports and buttons: a USB port (labeled 1), an ACT button, a WLAN button (labeled 2), and a RST button. The ports are labeled 'USB', 'ACT', 'WLAN', and 'RST'. The device has a 'HUAWEI' logo on the top left and 'AR1200 Series' on the bottom left.
AR1220W AR1220VW	 The image shows the front view of the AR1220W/VW models. It is a black, rectangular device with two antennas on top. On the right side, there are several ports and buttons: a USB port (labeled 1), an ACT button, a WLAN button (labeled 2), a RST button, and a WLAN switch (labeled 3). The ports are labeled 'USB', 'ACT', 'WLAN', 'RST', and 'WLAN'. The device has a 'HUAWEI' logo on the top left and 'AR1200 Series' on the bottom left. A bracket labeled 4 indicates the two antennas.

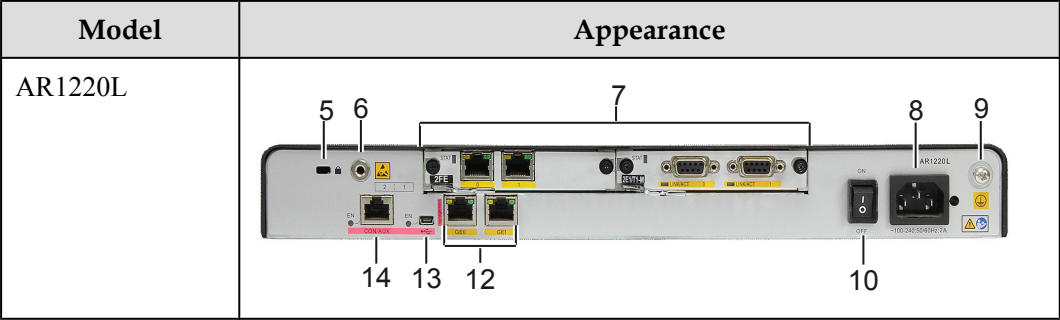
1. USB Interface NOTE After a 3G USB modem is inserted, you can choose to install a protection cap (optional) on it, as shown in 	2. RST NOTE This button is used to reset the AR1200. Resetting the AR1200 interrupts services. Confirm the action before you press this button.	3. WLAN switch NOTE You can enable or disable the WLAN function by a light touch on the button.	4. WiFi Rod Antenna
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Rear Views of AR1200 Series

Table 1-42 shows the rear views of AR1200 series.

Table 1-42 Rear views of AR1200 series

Model	Appearance
AR1220 AC model	
AR1220 DC model	
AR1220V	
AR1220W	
AR1220VW	



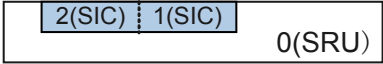
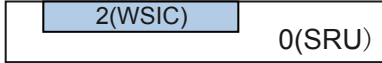
5. Security lock	6. ESD jack NOTE When maintaining the AR1200, wear an ESD wrist strap. Connect the ESD wrist strap to the ESD jack.	7. Removable card slot NOTE The AR1200 provides two SIC slots. Two SIC slots can be combined into one WSIC slot by removing the guide rail.	8. AC Power jack NOTE Connect the AR1200 to an external power supply using 5.1 AC Power Cable .
9. Ground point NOTE To protect the chassis from lightning and electromagnetic interference, use 5.3 Ground Cable to ground the chassis.	10. Switch	11. Fixed 8FE interfaces (FE Electrical Interface) on the panel	12. Fixed 2GE interfaces (GE Electrical Interface) on the panel
13. MiniUSB Interface	14. CON/AUX Interface NOTE The AR1200 series routers have only console (CON) interfaces and do not support AUX interfaces.	15. PoE port NOTE Connect the AR1200 to 2.4 100 W AC PoE Power Module to provide power for PDs connected to FE interfaces. PDs include IP phones, WLAN APs, and cameras.	16. WLAN Interface
17. DC power terminal NOTE Connect the AR1200 to an external power supply using 5.2 DC Power Cables .			

Slot Distribution

Figure 1-12 shows slot distribution on the AR1200.

-  **NOTE**
- Two SIC slots can be combined into one WSIC slot by removing the guide rail.
 - Slots can be combined into one, but one slot cannot be divided into multiple slots.
 - After two slots are combined into one, the slot ID is the larger one between the original two slots.

Figure 1-12 Slot distribution on the AR1200

Device Model		Slot Distribution	Slot Combination
AR1200	Front view	NA	NA
	Rear view		Two SIC slots are combined into one WSIC slot 

As shown in Figure 1-12, the slots of the AR1200 can be combined.

Slot 1 and slot 2 are combined into new slot 2.

1.6.3 Indicator Description

The indicator meanings of the AR1200 vary with models as listed in Table 1-43 and Table 1-44.

Table 1-43 Description of indicators on the AR1200 front panel

Model	Indicator
AR1220 AC model AR1220 DC model AR1220V AR1220W AR1220VW AR1220L	● The AR1220 AC model, AR1220 DC model, AR1220V, and AR1220L have the same indicators on the front panels. ● The AR1220W and AR1220VW have the same indicators on the front panels. Compared with the AR1220 AC model, AR1220 DC model, AR1220V, and AR1220L, they have a WLAN indicator and switch button. The AR1220VW is used as an example to describe the indicators. See AR1220VW (front).

Table 1-44 Description of indicators on the AR1200 rear panel

Model	Indicator
AR1220 AC model AR1220 DC model AR1220V AR1220W AR1220VW AR1220L	The AR1220 AC model, AR1220 DC model, AR1220V, AR1220W, AR1220VW, and AR1220L have the same indicators on the rear panels. The AR1220VW is used as an example to describe the indicators. See AR1220VW (rear) .

AR1220VW (front)

Figure 1-13 shows the indicators on the AR1220VW front panel.

Figure 1-13 Indicators on the AR1220VW front panel



Table 1-45 describes the indicators on the AR1220VW front panel.

Table 1-45 Description of indicators on the AR1220VW front panel

Number in Figure 1-13	Indicator	Color	Description
1	SYS	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.

Number in Figure 1-13	Indicator	Color	Description
2	WAN	Green	Steady on: At least one GE interface has been connected or activated.
			Off: Two GE interfaces are not connected or activated.
3	ACT (USB)	Red and green	Steady green: The device has been deployed properly by using a USB flash drive.
			Blinking green: The device is being deployed by using a USB flash drive.
			Steady red: The device fails to be deployed by using a USB flash drive.
			Off: No USB flash drive for deployment is inserted, the USB port fails, or the indicator fails.
4	WLAN	Green	Blinking : The WLAN link is transmitting data. The blinking frequency changes with the traffic transmission rate on the link.
			Off: The WLAN link is shut down.

AR1220VW (rear)

Figure 1-14 shows the indicators on the AR1220VW rear panel.

Figure 1-14 Indicators on the AR1220VW rear panel

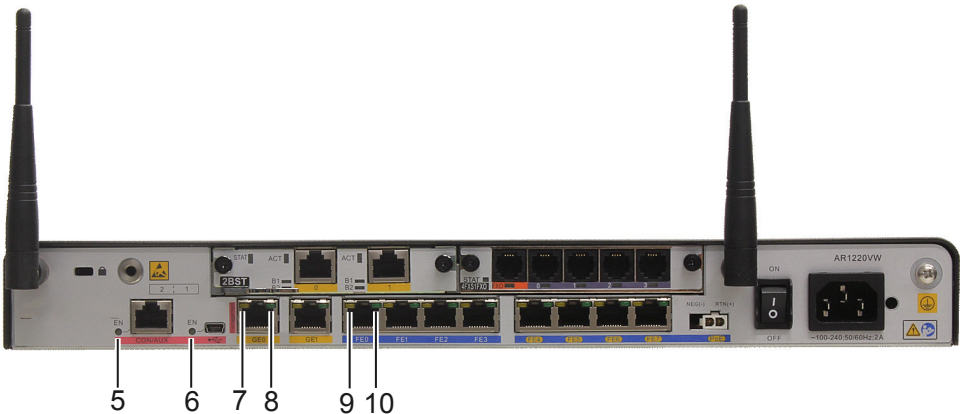


Table 1-46 describes the indicators on the AR1220VW rear panel.

Table 1-46 Description of indicators on the AR1220VW rear panel

Number in Figure 1-14	Indicator	Color	Description
5	EN (CON/AUX port) NOTE - Either the CON/AUX port or the Mini USB port can be used at a time. - By default, the port is used as the CON/AUX port. The EN indicator is green no matter whether a cable is installed.	Green	Steady on: The port is used as a CON/AUX port.
			Off: The port does not function as a CON/AUX port.
6	EN (Mini USB port)	Green	Steady on: The port is used as a Mini USB port.
			Off: The port does not function as a Mini USB port.
7 and 8	GE electrical interface indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
9 and 10	FE electrical interface indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

1.6.4 Interface Description

CON/AUX Interface

A console interface can connect to an operation terminal for onsite configuration. An AUX interface connects to a remote management center through a modem to realize remote configuration. A CON/AUX interface must use a [5.4 Console Cable](#). [Table 1-47](#) lists the CON/AUX interface attributes.

Table 1-47 CON/AUX interface attributes

Attribute	Description
Connector type	RJ45
Standards compliance	RS232
Working mode	Full-duplex universal asynchronous receiver/transmitter (UART)
Data equipment type	● Data Circuit-terminating Equipment (DCE) ● AUX interface: Data Terminal Equipment (DTE)

 NOTE

The CON/AUX port on the AR150, AR160, AR200, AR1200, AR2200, and AR3200 cannot be used as an AUX port.

FE Electrical Interface

An FE electrical (10Base-T/100Base-TX Interface) interface transmits service data at 10 Mbit/s or 100 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-48](#) lists FE electrical interface attributes.

Table 1-48 FE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.

Attribute	Description
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-49](#) lists GE electrical interface attributes.

Table 1-49 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE • A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. • A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Optical Interface

A GE optical interface (100Base-FX/1000Base-X Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [GE Optical Module](#) and [5.6 Optical Fiber](#). [Table 1-50](#) lists GE optical interface attributes.

Table 1-50 GE optical interface attributes

Attribute	Description
Connector type	LC/SC/FC
Optical interface attribute	Depending on the optical module used

Attribute	Description
Standards compliance	IEEE 802.3z
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

WLAN Interface

A WLAN interface connects to a **WiFi Rod Antenna** to transmit and receive Wi-Fi data. [Table 1-51](#) lists WLAN interface attributes.

Table 1-51 WLAN interface attributes

Attribute	Description
Connector type	PCI
Standards compliance	802.11b/g/n
Rate	300 Mbit/s
Frequency band	2.4 GHz
Gain	2.4 GHz: 2.15 dBi
MIMO mode (Tx x Rx)	2x2
Services provided	● Layer 2/3 wireless access ● Wireless data encryption ● Wireless security

USB Interface

A USB interface can have a USB flash drive or 3G data card installed to upload or download configuration files and system software packages to the flash memory or SD card of the device. The upload or download speed can reach 12 Mbit/s. [Table 1-52](#) lists USB interface attributes.

Table 1-52 USB interface attributes

Attribute	Description
Connector type	TYPE A
Standards compliance	USB 2.0
Working mode	Host

MiniUSB Interface

A MiniUSB interface connects to an operation terminal for on-site configuration. The MiniUSB interface and console interface cannot be used together. By default, the console interface works. [Table 1-53](#) lists MiniUSB interface attributes.

Table 1-53 MiniUSB interface attributes

Attribute	Description
Connector type	MiniUSB-B-angle
Standards compliance	USB 2.0
Working mode	Device

1.6.5 Heat Dissipation

The cooling system of a router ensures that the router operates within a normal temperature range. For the operating temperature range, see [1.6.6 Technical Specifications](#).

The AR1200 series routers use the forcible heat dissipation mode. [Table 1-54](#) shows the airflow in the chassis.

Table 1-54 Heat dissipation modes of the AR1200 series routers

Heat Dissipation Mode	Device Model	Airflow
Forcible heat dissipation	● AR1220 AC model ● AR1220 DC model ● AR1220V ● AR1220L ● AR1220W ● AR1220VW	The router has fans for heat dissipation. Air enters the chassis from the left side and is exhausted from the right side. 

1.6.6 Technical Specifications

[Table 1-55](#) lists technical specifications of the AR1200 series routers.

Table 1-55 AR1200 technical specifications

Item		Specification
Processor		Dual-core 500 MHz
Switching capacity		8 Gbit/s
Forwarding performance		450 kpps
Memory		512 MB
Flash memory		256 MB
Dimensions (W x D x H)		- Without rack-mounting brackets: 390.0 mm x 232.5 mm x 44.5 mm (15.35 in. x 9.2 in. x 1.75 in.) - With rack-mounting brackets: 482.6 mm x 232.5 mm x 44.5 mm (19 in. x 9.2 in. x 1.75 in.)
Weight (empty chassis)		2.9 kg
Power consumption (empty chassis)	Typical power consumption	- AR1220 AC model: 27 W - AR1220 DC model: 27 W - AR1220V: 29 W - AR1220W: 36 W - AR1220VW: 37 W - AR1220L: 25 W
	Maximum power consumption	- AR1220 AC model: 32 W - AR1220 DC model: 32 W - AR1220V: 34 W - AR1220W: 42 W - AR1220VW: 42 W - AR1220L: 30 W
Power parameters	AC power input	Rated voltage: 100 V AC to 240 V AC, 50/60 Hz Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz
	DC power input	Rated voltage: -48 V DC to -60 V DC Maximum voltage range: -38.4 V DC to -72 V DC
	Maximum output power	- AR1220 AC model: 60 W - AR1220 DC model: 54 W - AR1220V: 60 W - AR1220W: 60 W - AR1220VW: 60 W - AR1220L: 60 W

Item		Specification
	PoE power supply	● AR1220 AC model: does not support PoE ● AR1220 DC model: does not support PoE ● AR1220V: supports PoE ● AR1220W: supports PoE ● AR1220VW: supports PoE ● AR1220L: does not support PoE
Environment parameters	Operating temperature	● Environment temperature: 0°C to 45°C ● Storage temperature: -40°C to 70°C
	Operating relative humidity	5% to 95%, noncondensing
	Operating altitude	< 4000 m
Safety standards compliance		● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance		● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

1.7 AR2200 Series

1.7.1 Version Mapping

Table 1-56 describes the matching relationship between AR2200 models and software versions.

Table 1-56 Matching between AR2200 models and software versions

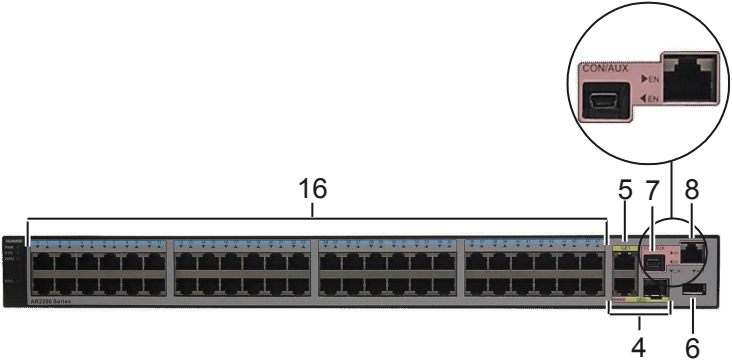
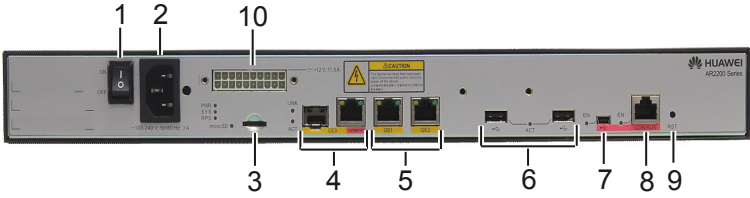
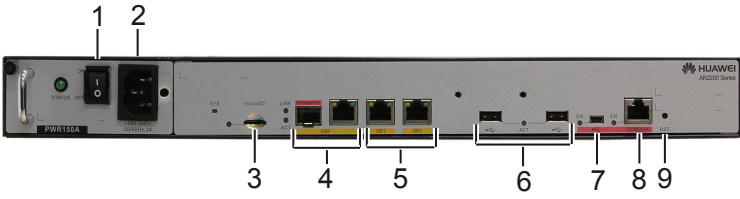
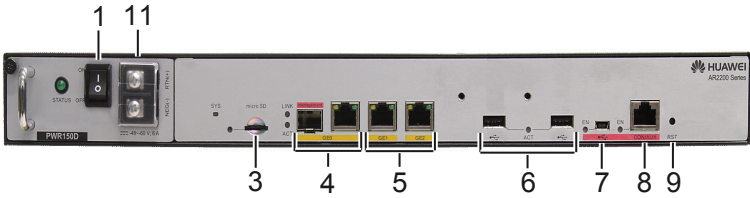
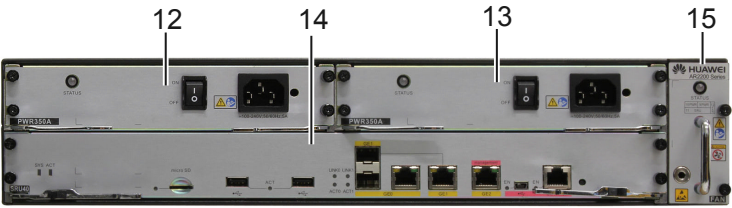
Device Series	Device Model	Software Version
AR2200 series	AR2201-48FE	V200R003C00 and later versions
	AR2202-48FE	V200R003C00 and later versions
	AR2204	V200R003C00 and later versions
	AR2220 AC model	V200R001C00 and later versions
	AR2220 DC model	V200R001C01 and later versions
	AR2240	V200R001C00 and later versions

1.7.2 Appearance and Structure

Front Views of AR2200 Series

Table 1-57 shows the front views of AR2200 series.

Table 1-57 Front views of AR2200 series

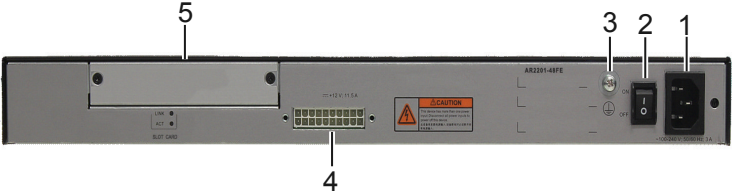
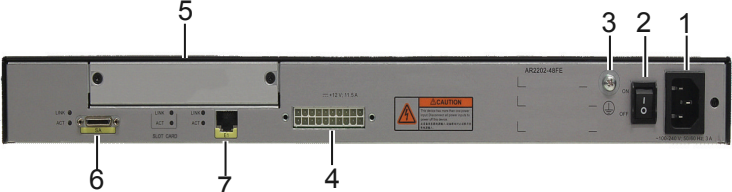
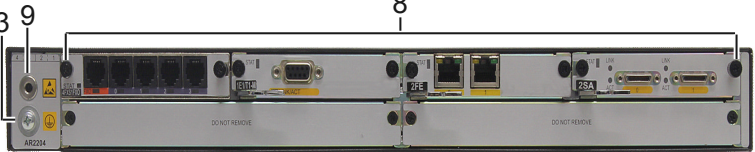
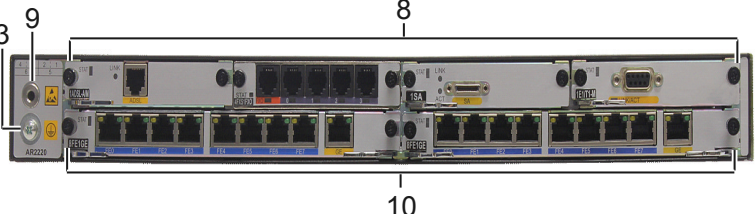
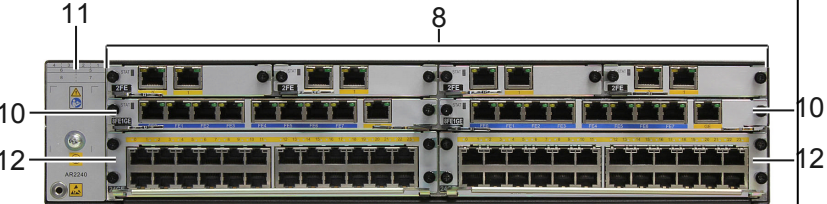
Model	Appearance
AR2201-48FE AR2202-48FE	
AR2204	
AR2220 AC model	
AR2220 DC model	
AR2240	

1. Power switch	2. AC power jack NOTE Connect the AR2200 to an external power supply using 5.1 AC Power Cable .	3. Micro SD card slot	4. GE Combo Interface
5. Fixed GE Electrical Interface	6. USB Interface NOTE When a 3G USB modem is installed, it must be covered with a plastic USB protection cover (optional), as shown in 	7. MiniUSB Interface NOTE Only one of the Mini USB interface and console interface can be enabled at a time.	8. CON/AUX Interface NOTE The AR2200 series routers have only console (CON) interfaces and do not support AUX interfaces.
9. RST NOTE This button is used to reset the AR2200. Resetting the AR2200 interrupts services. Confirm the action before you press this button.	10. RPS power jack NOTE Insert an 5.17 RPS150 Power Cable to this jack to connect the AR2200 to an 2.1 150 W RPS Power Supply System .	11. DC power terminal NOTE Connect the AR2200 to an external power supply using 5.2 DC Power Cables .	● 12. Power module slot 1 ● 13. Power module slot 2 The AR2200 supports the following power modules: ● 2.2 350 W AC Power Module ● 2.3 350 W DC Power Module NOTE AC and DC power modules cannot be installed on the AR2200 simultaneously.
14. SRU slot	15. 3.1 AR2240 Fan Module slot	16. 48 FE Electrical Interfaces	

Rear Views of AR2200 Series

Table 1-58 shows the rear views of AR2200 series.

Table 1-58 Rear views of AR2200 series

Model	Appearance
AR2201-48FE	
AR2202-48FE	
AR2204	
AR2220 AC model AR2220 DC model	
AR2240	

1. AC power jack NOTE Connect the AR2200 to an external power source using 5.1 AC Power Cable .	2. Switch	3. Ground point NOTE To protect the chassis from lightning and electromagnetic interference, use 5.3 Blue Ground Cable to ground the chassis.	4. RPS power interface NOTE Connect the RPS power interface to 2.1 150 W RPS Power Supply System with 5.17 RPS150 Power Cable .
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5. Extended slot	6. Synchronous/ Asynchronous serial (SA) interface	7. E1 interface	8. Four SIC slots
9. ESD jack NOTE When installing the AR2200, wear an ESD wrist strap. Connect the ESD wrist strap to the ESD jack.	10. Two WSIC slots	11. 3.1 AR2240 Fan Module slot	12. Two XSIC slots

Slot Distribution

Figure 1-15 and Figure 1-16 show slot distribution of AR2200 series.

-  NOTE
- Two SIC slots can be combined into one WSIC slot by removing the guide rail.
 - The two SIC slots and the WSIC slot below them can be combined into one XSIC slot by removing the guide rail.
 - Two XSIC slots can be combined into one EXSIC slot by removing the guide rail.
 - Slots can be combined into one, but one slot cannot be divided into multiple slots.
 - After two slots are combined into one, the slot ID is the larger one between the original two slots.
 - In V200R002C00, a WSIC card can be inserted into an XSIC slot with a special component. The WSIC card is in the lower side of the slot and uses the XSIC slot ID as its own slot ID.
 - The AR2201-48FE and AR2202-48FE have no SIC slot.

Figure 1-15 Slot distribution on the AR2204

Device Model		Slot Distribution	Slot Combination															
AR2204	Front view	NA	NA															
	Rear view	<table><tr><td></td><td>4(SIC)</td><td>3(SIC)</td><td>2(SIC)</td><td>1(SIC)</td></tr><tr><td></td><td colspan="2">NA</td><td colspan="2">NA</td></tr></table>		4(SIC)	3(SIC)	2(SIC)	1(SIC)		NA		NA		Two SIC slots are combined into one WSIC slot <table><tr><td></td><td>4(WSIC)</td><td>2(WSIC)</td></tr><tr><td></td><td>NA</td><td>NA</td></tr></table>		4(WSIC)	2(WSIC)		NA
	4(SIC)	3(SIC)	2(SIC)	1(SIC)														
	NA		NA															
	4(WSIC)	2(WSIC)																
	NA	NA																

Figure 1-16 Slot distribution on the AR2220 and AR2240

Device Model		Slot Distribution	Slot Combination
AR2220	Front view	NA	NA
	Rear view		Two SIC slots are combined into one WSIC slot Two WSIC slots are combined into one XSIC slot
AR2240	Front view		NA
	Rear view		Two SIC slots are combined into one WSIC slot Two WSIC slots are combined into one XSIC slot Two XSIC slots are combined into one EXSIC slot

As shown in [Figure 1-15](#) and [Figure 1-16](#), slots of AR2200 series can be combined.

- AR2204:
 - Slot 1 and slot 2 are combined into new slot 2.
 - Slot 3 and slot 4 are combined into new slot 4.
- AR2220:
 - Slot 1 and slot 2 are combined into new slot 2.
 - Slot 3 and slot 4 are combined into new slot 4.
 - New slot 2 and slot 5 are combined into new slot 5.

- New slot 4 and slot 6 are combined into new slot 6.
- AR2240:
 - Slot 1 and slot 2 are combined into new slot 2.
 - Slot 3 and slot 4 are combined into new slot 4.
 - New slot 2 and slot 5 are combined into new slot 5.
 - New slot 4 and slot 6 are combined into new slot 6.
 - Slot 7 and slot 8 are combined into new slot 8.

1.7.3 Indicator Description

The indicator meanings of the AR2200 vary with models as listed in [Table 1-59](#) and [Table 1-60](#).

Table 1-59 Description of indicators on the AR2200 front panel

Model	Indicator
AR2201-48FE	AR2201-48FE and AR2202-48FE have the same indicators on the front panels. AR2202-48FE is used as an example to describe the indicators. See AR2202-48FE .
AR2202-48FE	
AR2204	● AR2220 AC model and AR2220 DC model have the same indicators on the front panels. ● The AR2204 has an RPS indicator that is unavailable on the AR2220 AC model and AR2220 DC model. AR2204 is used as an example to describe the indicators. See AR2204
AR2220 AC model	
AR2220 DC model	
AR2240	There is no independent indicator on the panel of the AR2240 model. Indicators on the panel of the AR2240 are indicators of modules inserted in slots. Indicators on the front panel of the AR2240: ● With 2.2 350 W AC Power Module or 2.3 350 W DC Power Module configured ● SRU 4.2.4 Indicators and Interfaces ● 3.1 AR2240 Fan Module

Table 1-60 Description of indicators on the AR2200 rear panel

Model	Indicator
AR2201-48FE	Compared with AR2201-48FE, AR2202-48FE has SA port and E1 port indicators. AR2202-48FE is used as an example to describe the indicators. See AR2202-48FE .
AR2202-48FE	
AR2204	There is no independent indicator on the rear panel of the AR2204, AR2220 AC model, AR2220 DC model, or AR2240. Indicators on the panel of the preceding model are indicators of modules inserted in slots.
AR2220 AC model	

Model	Indicator
AR2220 DC model	Indicators on the rear panel of the AR2204, AR2220 AC model, AR2220 DC model, and AR2240. ● Service subcard indicators, See "Interfaces and Indicators" for specific subcards.
AR2240	

AR2202-48FE

Figure 1-17 shows the indicators on the AR2202-48FE front panel.

Figure 1-17 Indicators on the AR2202-48FE front panel

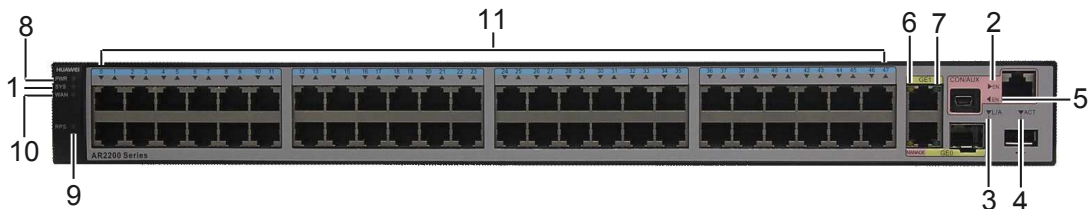


Figure 1-18 shows the indicators on the AR2202-48FE rear panel.

Figure 1-18 Indicators on the AR2202-48FE rear panel



Table 1-61 describes the indicators on the AR2202-48FE panel.

Table 1-61 Description of indicators on the AR2202-48FE panel

Number in Figure 1-18	Indicator	Color	Description
1	SYS	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.

Number in Figure 1-18	Indicator	Color	Description
		Off	The software is not running or is being reset.
2	EN (CON/ AUX port) NOTE - Either the CON/AUX port or the MiniUSB port can be used at a time. - By default, the port is used as the CON/AUX port. The EN indicator is green no matter whether a cable is installed.	Green	Steady on: The port is used as a CON/AUX port.
			Off: The port does not function as a CON/AUX port.
3	EN (SFP port)	Green	Steady on: The SFP port has been connected. When the indicator blinks, the SFP port is sending or receiving data. Off: The SFP port is not connected.
4	ACT (USB)	Red and green	Steady green: The device has been deployed properly by using a USB flash drive.
			Blinking green: The device is being deployed by using a USB flash drive.
			Steady red: The device fails to be deployed by using a USB flash drive.
			Off: No USB flash drive for deployment is inserted, the USB port fails, or the indicator fails.
5	EN (MiniUSB port)	Green	Steady on: The port is used as a Mini USB port. Off: The port does not function as a Mini USB port.
6 and 7	GE interface indicators:	Green	Steady on: A link has been established.

Number in Figure 1-18	Indicator	Color	Description
	- The LINK indicator is in green. - The ACT indicator is in yellow.		Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
8	PWR	Green	The power supply is normal.
		Off	The AR2200 is powered off.
9	RPS	Green	Steady on: The RPS is installed properly.
		Yellow	Steady on: The RPS is connected but its status is abnormal.
			Blinking: The RPS is providing power.
		Off	The RPS is not connected.
10	WAN	Green	Steady on: The WAN connection is being established or is active.
			Off: The WAN connection is not established or is inactive.
11	48FE port	Green	Steady on: The FE port has been connected.
			Blinking: The FE port is transmitting data.
			Off: The FE port is not connected.
12 and 13	SA port indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
14 and 15	E1 port indicators: The LINK indicator is in green.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.

Number in Figure 1-18	Indicator	Color	Description
	The ACT indicator is in yellow.		Off: No data is being transmitted or received.

AR2204

Figure 1-19 shows the indicators on the front panel of the AR2204.

Figure 1-19 Indicators on the front panel of the AR2204

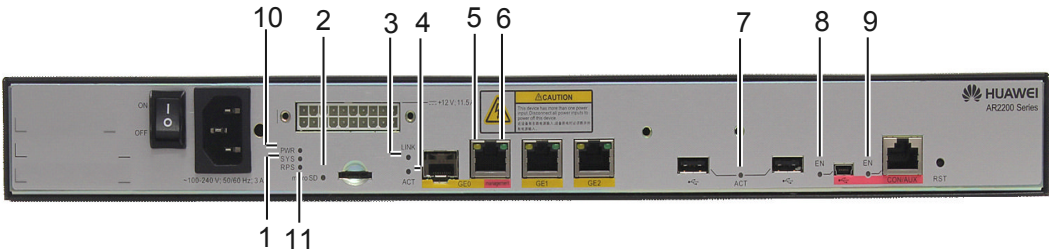


Table 1-62 describes the indicators on the front panel of the AR2204.

Table 1-62 Description of indicators on the front panel of the AR2204

Number in Figure 1-19	Indicator	Color	Description
1	SYS	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	Micro SD card indicator	Green	Steady on: A link has been established.
			Blinking: Data is being transmitted or received.
			Off: There is no MiniSD card.

Number in Figure 1-19	Indicator	Color	Description
3 and 4	SFP interface indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
5 and 6	GE interface indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
7	ACT (USB)	Red and green	Steady green: The device has been deployed properly by using a USB flash drive.
			Blinking green: The device is being deployed by using a USB flash drive.
			Steady red: The device fails to be deployed by using a USB flash drive.
			Off: No USB flash drive for deployment is inserted, the USB port fails, or the indicator fails.
8	EN (MiniUSB port)	Green	Steady on: The port is used as a Mini USB port.
			Off: The port does not function as a Mini USB port.
9	EN (CON/AUX port)	Green	Steady on: The port is used as a CON/AUX port.

Number in Figure 1-19	Indicator	Color	Description
	NOTE - Either the CON/AUX port or the MiniUSB port can be used at a time. - By default, the port is used as the CON/AUX port. The EN indicator is green no matter whether a cable is installed.		Off: The port does not function as a CON/AUX port.
10	PWR	Green	The power supply is normal.
		Red	The power supply is abnormal.
		Off	The AR2200 is powered off.
11	RPS	Green	Steady green: The RPS is installed properly.
		Yellow	Steady yellow: The RPS is connected but its status is abnormal.
			Blinking yellow: The RPS is providing power.
		Off	Off: The RPS is not connected.

1.7.4 Interface Description

CON/AUX Interface

A console interface can connect to an operation terminal for onsite configuration. An AUX interface connects to a remote management center through a modem to realize remote configuration. A CON/AUX interface must use a [5.4 Console Cable](#). [Table 1-63](#) lists the CON/AUX interface attributes.

Table 1-63 CON/AUX interface attributes

Attribute	Description
Connector type	RJ45
Standards compliance	RS232
Working mode	Full-duplex universal asynchronous receiver/transmitter (UART)
Data equipment type	● Data Circuit-terminating Equipment (DCE) ● AUX interface: Data Terminal Equipment (DTE)



NOTE

The CON/AUX port on the AR150, AR160, AR200, AR1200, AR2200, and AR3200 cannot be used as an AUX port.

FE Electrical Interface

An FE electrical (10Base-T/100Base-TX Interface) interface transmits service data at 10 Mbit/s or 100 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-64](#) lists FE electrical interface attributes.

Table 1-64 FE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [5.5 Network Cable](#). [Table 1-65](#) lists GE electrical interface attributes.

Table 1-65 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Combo Interface

A combo interface consists of an optical Ethernet interface and an electrical Ethernet interface on the panel. Each combo interface matches only one internal forwarding interface. A combo interface is a multiplexing interface, and you can use either the optical interface or electrical interface at one time. When one of the Ethernet interfaces is used, the other interface is disabled. The combo interface must be used with [5.5 Network Cable](#) or [GE Optical Module](#) and [5.6 Optical Fiber](#).



NOTE

By default, a combo port works as an electrical interface and uses a network cable to transmit data.

USB Interface

A USB interface can have a USB flash drive or 3G data card installed to upload or download configuration files and system software packages to the flash memory or SD card of the device. The upload or download speed can reach 12 Mbit/s. [Table 1-66](#) lists USB interface attributes.

Table 1-66 USB interface attributes

Attribute	Description
Connector type	TYPE A
Standards compliance	USB 2.0
Working mode	Host

MiniUSB Interface

A MiniUSB interface connects to an operation terminal for on-site configuration. The MiniUSB interface and console interface cannot be used together. By default, the console interface works. [Table 1-67](#) lists MiniUSB interface attributes.

Table 1-67 MiniUSB interface attributes

Attribute	Description
Connector type	MiniUSB-B-angle
Standards compliance	USB 2.0
Working mode	Device

1.7.5 Heat Dissipation

The heat dissipation system ensures that the device operates at a normal temperature. The operating temperature of the AR2200 is the long-term operating temperature in [1.7.6 Technical Specifications](#).

The AR2200 series routers use the forcible heat dissipation mode. [Table 1-68](#) shows the airflow in the chassis.

Table 1-68 Heat dissipation of AR2200 series

Heat Dissipation Mode	Device Model	Air Circulation
Forcible heat dissipation	● AR2201-48 FE ● AR2202-48 FE	The AR2201-48FE, and AR2202-48FE heat dissipation system uses fans to create a left-to-right air channel. 
	AR2204	The AR2204 heat dissipation system uses fans to create a left-to-right air channel. 

Heat Dissipation Mode	Device Model	Air Circulation
	AR2220	The AR2220 heat dissipation system uses fans to create a left-to-right air channel. 
	AR2240	The AR2240 heat dissipation system uses fans to create a left-to-right air channel. 

1.7.6 Technical Specifications

Table 1-69 lists technical specifications of the AR2200 series.

Table 1-69 AR2200 technical specifications

Item	Specification
Processor	● AR2201-48FE: 2-core 533 MHz ● AR2202-48FE: 2-core 533 MHz ● AR2204: 2-core 800 MHz ● AR2220: 4-core 600 MHz ● AR2240 - SRU40: 8-core 600 MHz - SRU60: 8-core 600 MHz - SRU80: 12-core 750 MHz
Switching capacity	● AR2201-48FE: N/A ● AR2202-48FE: N/A ● AR2204: 10 Gbit/s ● AR2220: 32 Gbit/s ● AR2240: 80 Gbit/s

Item	Specification
Forwarding capacity	● AR2201-48FE: 350 kpps ● AR2202-48FE: 350 kpps ● AR2204: 450 kpps ● AR2220: 1 Mpps ● AR2240 - SRU40: 2 Mpps - SRU60: 2.5 Mpps - SRU80: 4.0 Mpps
Memory	● AR2201-48FE: 512 MB ● AR2202-48FE: 512 MB ● AR2204: 1 GB ● AR2220: 2 GB ● AR2240: 2 GB
Flash memory	● AR2201-48FE: 512 MB ● AR2202-48FE: 512 MB ● AR2204: 512 MB ● AR2220: 16 MB ● AR2240: 16 MB
Micro SD card (default)	● AR2201-48FE: N/A ● AR2202-48FE: N/A ● AR2204: N/A ● AR2220: 2 GB ● AR2240: 2 GB

Item		Specification
Dimensions (W x D x H)		● With no mounting bracket installed - AR2201-48FE: 442.0 mm x 314.9 mm x 43.6 mm (17.4 in. x 12.4 in. x 1.71 in.) - AR2202-48FE: 442.0 mm x 314.9 mm x 43.6 mm (17.4 in. x 12.4 in. x 1.71 in.) - AR2204: 442.0 mm x 420.0 mm x 44.5 mm (17.4 in. x 16.5 in. x 1.73 in.) - AR2220: 442.0 mm x 420.0 mm x 44.5 mm (17.4 in. x 16.5 in. x 1.73 in.) - AR2240: 442.0 mm x 470.0 mm x 88.1 mm (17.4 in. x 16.5 in. x 3.47 in.) ● With mounting brackets installed - AR2201-48FE: 482.6 mm x 314.9 mm x 43.6 mm (19.00 in. x 12.4 in. x 1.71 in.) - AR2202-48FE: 482.6 mm x 314.9 mm x 43.6 mm (19.00 in. x 12.4 in. x 1.71 in.) - AR2204: 482.6 mm x 420.0 mm x 44.5 mm (19 in. x 16.5 in. x 1.73 in.) - AR2220: 482.6 mm x 420.0 mm x 44.5 mm (19 in. x 16.5 in. x 1.73 in.) - AR2240: 482.6 mm x 470.0 mm x 88.1 mm (19 in. x 18.5 in. x 3.47 in.)
Weight (empty chassis)		● AR2201-48FE: 4.5 kg ● AR2202-48FE: 4.5 kg ● AR2204: 6 kg ● AR2220: 7 kg ● AR2240: 8.85 kg
Power consumption (empty chassis)	Typical power consumption	● AR2201-48FE: 35 W ● AR2202-48FE: 35 W ● AR2204: 35 W ● AR2220: 47 W ● AR2240 - SRU40: 67 W - SRU60: 67 W - SRU80: 100 W

Item		Specification
	Maximum power consumption	● AR2201-48FE: 40 W ● AR2202-48FE: 40 W ● AR2204: 55 W ● AR2220: 65 W ● AR2240 - SRU40: 97 W - SRU60: 97 W - SRU80: 129 W
Power specifications	AC power input	Rated voltage range: 100 V AC or 240 V AC, 50 or 60 Hz Maximum voltage range: 90 V AC to 264 V AC, 47 to 63 Hz
	DC power input	Rated voltage range: -48 V DC or -60 V DC Maximum voltage range: -38.4 V DC to -72 V DC
	Maximum power	● AR2201-48FE: 60 W ● AR2202-48FE: 60 W ● AR2204: 150 W ● AR2220: 150 W ● AR2240 - One power module configured: 350 W - Two power modules configured: - 1+1 backup: 350 W - Non 1+1 backup: 700 W
	RPS power supply	● AR2201-48FE: supported ● AR2202-48FE: supported ● AR2204: supported ● AR2220: not supported ● AR2240: not supported
Environment parameters	Operating temperature	● Environment temperature: 0°C to 45°C ● Storage temperature: -40°C to 70°C
	Operating relative humidity	5% to 95%, noncondensing
	Operating altitude	< 4000 m

Item	Specification
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

1.8 AR3200 Series

1.8.1 Version Mapping

Table 1-70 describes the matching relationship between AR3200 models and software versions.

Table 1-70 Matching between AR3200 models and software versions

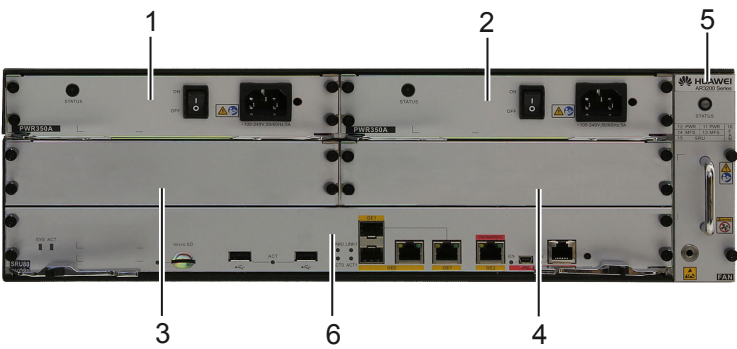
Device Series	Device Model	Software Version
AR3200 series	AR3260	V200R001C00 and later versions

1.8.2 Appearance and Structure

Front Views of AR3200 Series

Table 1-71 shows the front views of AR3200 series.

Table 1-71 Front views of AR3200 series

Model	Appearance
AR3260	

- 1. Power module slot 1
- 2. Power module slot 2

The AR3200 supports the following power modules:

- [2.2 350 W AC Power Module](#)
- [2.3 350 W DC Power Module](#)

NOTE

AC and DC power modules cannot be installed on the AR3200 simultaneously.

- 3. Versatile slot 1
- 4. Versatile slot 2

NOTE

- The versatile slots can have power modules installed.
- The two versatile slots can be combined into one for an SRU by removing the guide rails between them.

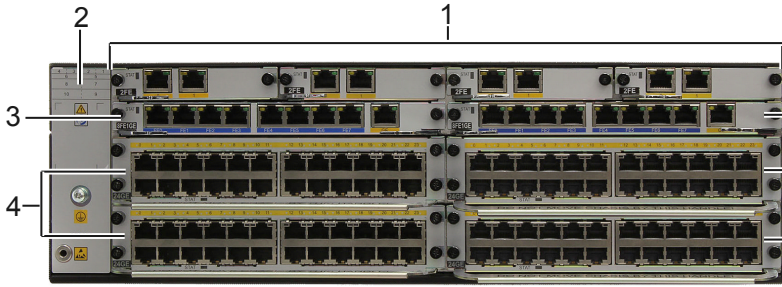
5. [3.2 AR3260 Fan Module slot](#)

6. SRU slot

Rear Views of AR3200 Series

Table 1-72 shows the rear views of AR3200 series.

Table 1-72 Rear views of AR3200 series

Model	Appearance
AR3260	

1. SIC slot NOTE The AR3260 provides four SIC slots.	2. 3.2 AR3260 Fan Module slot	3. WSIC slot NOTE The AR3260 provides two WSIC slots.	4. XSIC slot NOTE The AR3260 provides four XSIC slots.
---	--------------------------------------	--	---

Slot Distribution

Figure 1-20 shows slot distribution of AR3200 series.

-  **NOTE**
- Two SIC slots can be combined into one WSIC slot by removing the guide rail.
 - Two SIC slots and one WSIC slot can be combined into one XSIC slot by removing the guide rail.
 - Two XSIC slots can be combined into one EXSIC slot by removing the guide rail.
 - Slots can be combined into one, but one slot cannot be divided into multiple slots.
 - After two slots are combined into one, the slot ID is the larger one between the original two slots.
 - Since V200R002C00, a WSIC card can be inserted into an XSIC slot with a special component. The WSIC card is in the lower side of the slot and uses the XSIC slot ID as its own slot ID.
 - MFS: multiple function slot for power module or SRU. An SRU occupies two MFSS. Before installing an SRU, remove the guide rail between the two MFS.

Figure 1-20 Slot distribution on the AR3200

Device Model		Slot Distribution			Slot Combination										
AR3260	Front view	12(Power)		11(Power)	F A N	Insert the SRU into slot 15.									
		14(MFS)		13(MFS)											
		15(SRU)													
	Rear view						Two SIC slots are combined into one WSIC slot								
							<table><tr><td>4(WSIC)</td><td>2(WSIC)</td></tr><tr><td>6(WSIC)</td><td>5(WSIC)</td></tr><tr><td>8(XSIC)</td><td>7(XSIC)</td></tr><tr><td>10(XSIC)</td><td>9(XSIC)</td></tr></table>	4(WSIC)	2(WSIC)	6(WSIC)	5(WSIC)	8(XSIC)	7(XSIC)	10(XSIC)	9(XSIC)
		4(WSIC)	2(WSIC)												
		6(WSIC)	5(WSIC)												
		8(XSIC)	7(XSIC)												
		10(XSIC)	9(XSIC)												
							Two WSIC slots are combined into one XSIC slot								
					<table><tr><td>6(XSIC)</td><td>5(XSIC)</td></tr><tr><td>8(XSIC)</td><td>7(XSIC)</td></tr><tr><td>10(XSIC)</td><td>9(XSIC)</td></tr></table>	6(XSIC)	5(XSIC)	8(XSIC)	7(XSIC)	10(XSIC)	9(XSIC)				
6(XSIC)	5(XSIC)														
8(XSIC)	7(XSIC)														
10(XSIC)	9(XSIC)														
					Two XSIC slots are combined into one EXSIC slot										
					<table><tr><td>6(EXSIC)</td><td>5(EXSIC)</td></tr><tr><td colspan="2">8(EXSIC)</td></tr><tr><td colspan="2">10(EXSIC)</td></tr></table>	6(EXSIC)	5(EXSIC)	8(EXSIC)		10(EXSIC)					
6(EXSIC)	5(EXSIC)														
8(EXSIC)															
10(EXSIC)															

As shown in [Figure 1-20](#), the slots of the AR3200 can be combined.

- Slot 1 and slot 2 are combined into new slot 2.
- Slot 3 and slot 4 are combined into new slot 4.
- New slot 2 and slot 5 are combined into new slot 5.
- New slot 4 and slot 6 are combined into new slot 6.
- Slot 7 and slot 8 are combined into new slot 8.
- Slot 9 and slot 10 are combined into new slot 10.
- Slot 13 and slot 14 are combined into new slot 14, which is used for the backup SRU.

1.8.3 Indicator Description

The indicator meanings of the AR3200 vary with models as listed in [Table 1-73](#) and [Table 1-74](#).

Table 1-73 Description of indicators on the AR3200 front panel

Model	Indicator
AR3260	There is no independent indicator on the panel of the AR3260. Indicators on the panel of the AR3260 are indicators of modules inserted in slots. Indicators on the front panel of the AR3260 with 2.2 350 W AC Power Module configured: ● With 2.2 350 W AC Power Module or 2.3 350 W DC Power Module configured ● SRU 4.2.4 Indicators and Interfaces ● 3.2 AR3260 Fan Module

Table 1-74 Description of indicators on the AR3260 rear panel

Model	Indicator
AR3260	There is no independent indicator on the rear panel of the AR3260. Indicators on the panel of the AR3260 are indicators of modules inserted in slots. Service subcard indicators, See "Interfaces and Indicators" for specific subcards.

1.8.4 Heat Dissipation

The heat dissipation system ensures that the device operates at a normal temperature. The operating temperature of the AR3200 is the long-term operating temperature in **1.8.5 Technical Specifications**.

The AR3200 series routers use the forcible heat dissipation mode. **Table 1-75** shows the airflow in the chassis.

Table 1-75 Heat dissipation of AR3200 series

Heat Dissipation Mode	Model	Air Circulation
Forcible heat dissipation	AR3260	The AR3260 heat dissipation system uses fans to create a left-to-right air channel. 

1.8.5 Technical Specifications

Table 1-76 lists technical specifications of the AR3200 series.

Table 1-76 AR3200 series technical specifications

Item		AR3260
System parameters		● Processor – SRU40: 8-core 600 MHz – SRU60: 8-core 600 MHz – SRU80: 12-core 750 MHz ● Switching capacity: 160 Gbit/s ● forwarding capacity – SRU40: 2 Mpps – SRU60: 2.5 Mpps – SRU80: 4.0 Mpps ● memory: 2 GB ● Flash memory: 16 MB ● Micro SD card (default): 2 GB
Power consumption (empty chassis)	Typical power consumption	● SRU40: 67 W ● SRU60: 67 W ● SRU80: 104 W
	Maximum power consumption	● SRU40: 97 W ● SRU60: 97 W ● SRU80: 179 W
Physical specifications		● Dimensions (W x D x H) – With no mounting bracket installed: 442.0 mm x 470.0 mm x 130.5 mm (17.4 in. x 18.5 in. x 5.14 in.) – With mounting brackets installed: 482.6 mm x 470.0 mm x 130.5 mm (19 in. x 18.5 in. x 5.14 in.) ● Weight (empty chassis): 11 kg (29.47 lb)
Power specifications	AC power input	Rated voltage range: 100 V AC or 240 V AC, 50 or 60 Hz Maximum voltage range: 90 V AC to 264 V AC, 47 to 63 Hz
	DC power input	Rated voltage range: -48 V DC or -60 V DC Maximum voltage range: -38.4 V DC to -72 V DC

Item		AR3260
	Maximum power	● One power module configured: 350 W ● Two power modules configured: - 1+1 backup: 350 W - Non 1+1 backup: 700 W
Environment parameters	Operating temperature	● Environment temperature: 0°C to 45°C ● Storage temperature: -40°C to 70°C
	Operating relative humidity	5% to 95%, noncondensing
	Operating altitude	< 4000 m
Safety standards compliance		● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance		● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	AR3260
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

2 Power Module

About This Chapter



CAUTION

- Only power modules of the same power can be used on an AR router.
 - Powering off the AR router before removing and reinstalling power modules.
 - To power off an AR router, power off all its power modules.
-

[2.1 150 W RPS Power Supply System](#)

[2.2 350 W AC Power Module](#)

[2.3 350 W DC Power Module](#)

[2.4 100 W AC PoE Power Module](#)

[2.5 24/36/60 W Power Adapter](#)

2.1 150 W RPS Power Supply System

Version Mapping

Table 2-1 describes the mapping between the 150 W RPS power supply system and software versions.

Table 2-1 Mapping between the 150 W RPS power supply system and software versions

Power Module Name	AR1200 Series	AR2201-48FE	AR2202-48FE	AR2204	AR2220	AR2240	AR3260
RPS150	N	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	N	N	N

-  **NOTE**
- Y: supported
 - N: not supported

Appearance

Figure 2-1 show the appearance of the 150 W RPS power supply system.

Figure 2-1 Front view of the 150 W RPS



Figure 2-2 show the rear view of the 150 W RPS.

Figure 2-2 Rear view of the 150 W RPS



Functions

The 150 W RPS has the following features:

- When the built-in power module of an AR router fails, the 150 W RPS starts to provide power for the AR router.
- The 150 W RPS can power only one AR router at a time when the built-in power module of the AR router fails.
- When the built-in power module of the AR router starts to work again, the 150 W RPS stops providing power for the AR router and switches to cold backup state. When the 150 W RPS detects that the built-in power module of the AR router fails, it automatically provides power for the AR router.



NOTE

A 150 W RPS cannot be used as the main power supply unit to power on a router. A router must be powered on by its internal power module, and then it can use a 150 W RPS as its backup power supply.

Panel

Figure 2-3 and **Figure 2-4** show the panel of the 150 W RPS power supply system.

Figure 2-3 Front view of the 150 W RPS



1: Indicator

Figure 2-4 Rear view of the 150 W RPS



2: Ground point

3: One DC output terminal 4: AC jack

NOTE

To protect the chassis from lightning and electromagnetic interference, use [5.3 Ground Cable](#) to ground the chassis.

Use [5.17 RPS150 Power Cable](#) to connect to the router.

Use [5.1 AC Power Cable](#) to connect the AR router to the mains supply.

[Table 2-2](#) lists indicators on the 150 W RPS.

Table 2-2 Description of indicators on the 150 W RPS

Name	Status	Description
PWR	Green	The power input is normal.
	Off	The device is powered off.
TEMP	Green	The temperature is within the allowed range.
	Red	The temperature is out of the allowed range.
	Off	The device is powered off.
FAN	Green	The fan module works properly.
	Red	The fan module does not work properly.
	Off	The device is powered off.
OUTPUT	Green	The RPS150 is in cold backup state.
	Blinking green	The RPS150 is providing power.
	Off	The device is powered off.

Technical Specifications

[Table 2-3](#) describes the technical specifications of the 150 W RPS.

Table 2-3 Technical specifications of the 150 W RPS

Technical Specifications	RPS150
Dimensions (W x D x H)	442.0 mm x 310.0 mm x 43.6 mm (17.4 in. x 12.2 in. x 1.7 in.)
Weight	4.0 kg (8.8 lb)
Relative humidity	5% to 95%
Rated input voltage	220 V AC/110 V AC; 50/60 Hz
Input voltage range	200 V AC to 240 V AC (220 V Input)/100 V AC to 120 V AC (110 V Input);47 Hz to 63 Hz
Rated input current	3 A
Maximum output current	12 V: 11.5 A
Maximum output power	12 V: 140 W

2.2 350 W AC Power Module

Version Mapping

Table 2-4 describes the mapping between the 350 W AC power module and software versions.

Table 2-4 Mapping between the 350 W AC power module and software versions

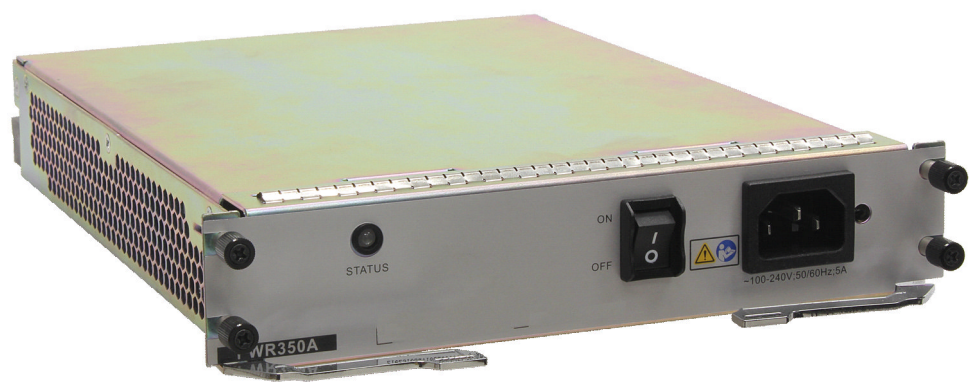
Power Module Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
PWR350A	N	N	N	Y	Y

-  **NOTE**
- Y: supported
 - N: not supported

Appearance

Figure 2-5 shows the appearance of the 350 W AC power module.

Figure 2-5 Appearance of the 350 W AC power module



Functions

A 350 W AC power module receives 90 V AC to 290 V AC input power and provides 12V/350 W output power with fans running in the system. Table 2-5 describes the functions of a 350 W AC power module.

Table 2-5 350 W AC power module functions

Function	Description
Input protection	Input undervoltage protection, input overvoltage protection, and input overcurrent protection
Output protection	Output overvoltage protection, output overcurrent protection, and output short-circuit protection
Overtemperature protection	Supported
Hot swap	Supported

A 350 W AC power module can automatically recover after it enters the protection state, as described in Table 2-6.

Table 2-6 Automatic recovery feature of a 350 W AC power module

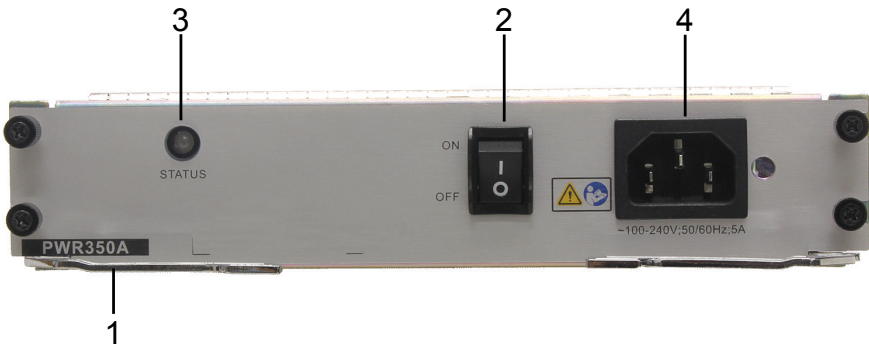
Protection Function	Automatic Recovery
Input undervoltage protection	The power module can automatically resume power supply.
Input overvoltage protection	The power module can automatically resume power supply.

Protection Function	Automatic Recovery
Input overcurrent protection	The power module cannot automatically resume power supply.
Output overvoltage protection	The power module cannot automatically resume power supply.
Output overcurrent protection	The power module cannot automatically resume power supply.
Output short-circuit protection	The power module can automatically resume power supply.

Panel

Figure 2-6 shows the appearance of the 350 W AC power module panel.

Figure 2-6 Appearance of the 350 W AC power module panel



1: Handle	2: Switch	3: Indicator	4: AC jack Cable: 5.1 AC Power Cable
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Table 2-7 describes the indicators on the 350 W AC power module panel.

Table 2-7 Indicators on the 350 W AC power module panel

Indicator	Color	Description
Power indicator (STATUS)	Red and green	Steady green: The AC output power module is in the normal range.

Indicator	Color	Description
		When the indicator is steady red: ● The input power is abnormal. (The input voltage is too high or too low.) ● The output power is abnormal, for example, the output voltage is too low or the temperature is too high. (The indicator is blinking red when the power supply is in hiccup protection mode.)

Technical Specifications

Table 2-8 describes the technical specifications of the 350 W AC power module.

Table 2-8 Technical specifications of the 350 W AC power module

Item	Specification
Dimensions (W x D x H)	201 mm x 260.5 mm 38.5 mm (7.91 in. x 10.26 in. x 1.52 in.)
Weight	1.45 kg (3.2 lb)
AC input voltage	90 V AC to 290 V AC; Rated: 110 V AC/220 V AC
AC input voltage	47 Hz to 63 Hz; typical: 50 Hz/60 Hz
Input current	5 A
Rated output voltage	12 V DC
Output voltage range	11.64 V DC to 12.36 V DC
Output power	350 W
Operating relative humidity	5% to 95%, noncondensing

2.3 350 W DC Power Module

Version Mapping

Table 2-9 describes the mapping between the 350 W DC power module and software versions.

Table 2-9 Mapping between the 350 W AC power module and software versions

Power Module Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
PWR350D	N	N	N	Y	Y

-  NOTE
- Y: supported
 - N: not supported

Appearance

Figure 2-7 shows the appearance of the 350 W DC power module.

Figure 2-7 Appearance of the 350 W DC power module



Functions

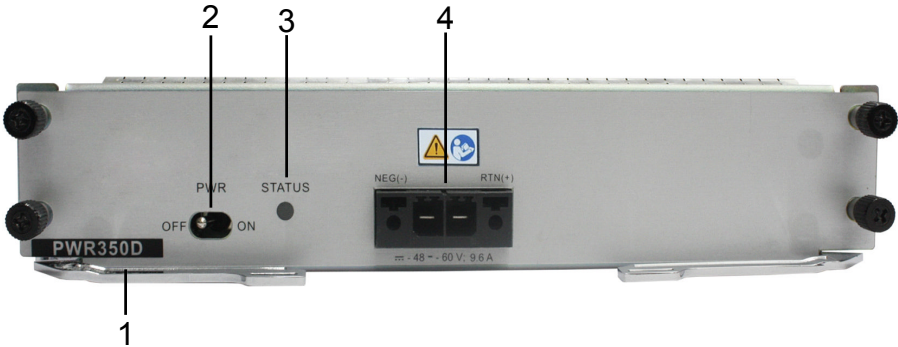
The 350 W DC power module provides +12 V DC power. It has the following functions:

- EMC filtering, surge protection, and short circuit protection.
- Various alarms, for example, the alarm triggered when there is no power input, the alarm for the air breaker status, the alarm for ineffective surge protection, and the alarm for undervoltage input.

Panel

Figure 2-8 shows the appearance of the 350 W DC power module panel.

Figure 2-8 Appearance of the 350 W DC power module panel



1. Handle	2. Switch	3. Indicator	4. DC jack
-----------	-----------	--------------	------------

Table 2-10 describes the indicators on the 350 W DC power module panel.

Table 2-10 Indicators on the 350 W DC power module panel

Name	Status	Description
STATUS	Off	- The input power is abnormal. (No input DC power is provided or the DC input voltage is too high or too low.) - The output power is abnormal, for example, the output voltage is too low or the temperature is too high. (The indicator is blinking red when the power supply is in hiccup protection mode.)
	Green	The DC output power module is within range.

Technical Specifications

Table 2-11 describes the technical specifications of the 350 W DC power module.

Table 2-11 Technical specifications of the 350 W DC power module

Item	Specification
Dimensions (height x width x depth)	40.0 mm x 201.0 mm x 240.0 mm (1.57 in. x 7.91 in. x 9.45 in.)
Weight	≤ 0.8 kg (1.77 lb)
Rated input voltage	-48V DC or -60V DC

Item	Specification
Input voltage range	-38.4 V DC to -72 V DC
Rated output voltage	12 V
Output power	350 W
Operating relative humidity	5% to 95%

2.4 100 W AC PoE Power Module

Version Mapping

Table 2-12 describes the mapping between the 100 W AC PoE power module and software versions.

Table 2-12 Mapping between the 100 W AC PoE power module and software versions

Power Module Name	AR1220	AR1220 V	AR1220 W	AR1220 VW	AR1220 L	AR2200 Series	AR3200 Series
100 W AC PoE power module	N	Y	Y NOTE V200R001C01 and later versions	Y NOTE AR200R001C01 and later versions	N	N	N

-  **NOTE**
- Y: supported
 - N: not supported

Appearance

Figure 2-9 shows the appearance of the 100 W AC PoE power module.

Figure 2-9 Appearance of the 100 W AC PoE power module



Functions

The 100 W AC PoE power module uses 90 V AC to 264 V AC input power, and provides 48 V/100 W output power when no fan is used. Table 2-13 describes the protection functions provided by the 100 W AC PoE power module.

Table 2-13 100 W AC PoE power module functions

Function	Description
Input protection	Input undervoltage protection
Output protection	Output overvoltage protection, output overcurrent protection, and output short-circuit protection
Overtemperature protection	Supported

Table 2-14 describes whether a 100 W AC PoE power module can automatically recover after it enters a protection state.

Table 2-14 Automatic recovery feature of a 100 W AC PoE power module

Protection Function	Automatic Recovery
Input undervoltage protection	The power module can automatically resume power supply.

Protection Function	Automatic Recovery
Output overvoltage protection	The power module can automatically resume power supply.
Output overcurrent	The power module can automatically resume power supply.
Output short-circuit protection	The power module can automatically resume power supply.

Panel

Figure 2-10 shows the appearance of the 100 W AC PoE power module panel.

Figure 2-10 Appearance of the 100 W AC PoE power module panel

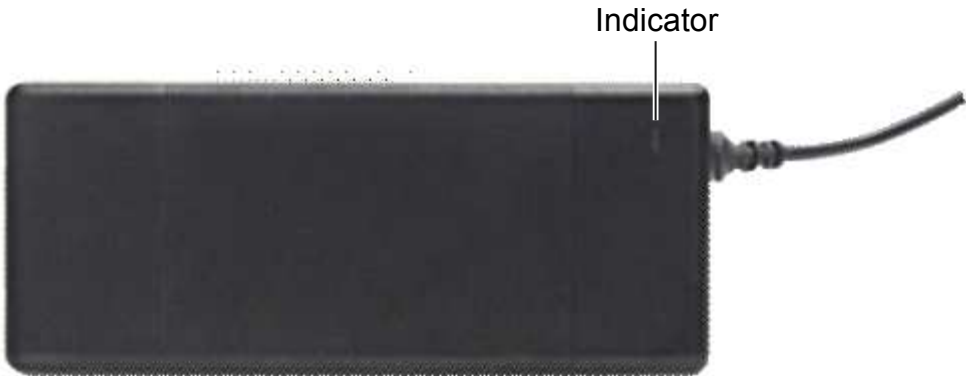


Table 2-15 describes the indicators on the 100 W AC PoE power module panel.

Table 2-15 Indicators on the 100 W AC PoE power module panel

Indicator	Color	Description
Power indicator	Blue	If the indicator is steady on, the output power is in the normal range.
		If the indicator is off, the power module does not have output power.

Technical Specifications

Table 2-16 describes the technical specifications of the 100 W AC PoE power module.

Table 2-16 Technical specifications of the 100 W AC PoE power module

Item	Specification
Dimensions (height x width x depth)	40 mm x 72 mm x 171 mm (1.57 in. x 2.83 in. x 6.73 in.)
Weight	0.65 kg (1.5 lb)
AC input voltage	90 V AC to 264 V AC; Rated: 110 V AC/220 V AC
AC input voltage	47 Hz to 63 Hz; typical: 50 Hz/60 Hz
Rated operating voltage	100 V AC to 240 V AC; typical: 110 V AC/220 V AC
Rated output current	2.08 A
Rated output voltage	48 V
Output power	100 W

2.5 24/36/60 W Power Adapter

Version Mapping

Table 2-17 lists the mapping between 24/36/60 W power adapters and AR150&160&200 series routers.

Table 2-17 Mapping between 24/36/60 W power adapters and AR150&160&200 series routers

Device Model	24 W Power Adapter	36 W Power Adapter	60 W Power Adapter
AR151W-P AR151G-HSPA+7 AR157W AR157G-HSPA+7 AR160 series	Y	N	N

Device Model	24 W Power Adapter	36 W Power Adapter	60 W Power Adapter
AR151 AR156 AR157 AR158E AR201 AR201VW-P AR206 AR207 AR207V AR207V-P AR207G-HSPA+7 AR208E	N	Y	N
AR157VW AR158EVW AR207VW	N	N	Y

-  **NOTE**
- Y: indicates that a device model supports a power adapter.
 - N: indicates that a device model does not support a power adapter.

Appearance

Figure 2-11 shows the appearance of a 24 W power adapter.

Figure 2-11 24 W power adapter



Figure 2-12 shows the appearance of a 36 W power adapter.

Figure 2-12 36 W power adapter



Figure 2-13 shows the appearance of a 60 W power adapter.

Figure 2-13 60 W power adapter



3 Fan Module

About This Chapter

[3.1 AR2240 Fan Module](#)

[3.2 AR3260 Fan Module](#)

3.1 AR2240 Fan Module

Version Mapping

Table 3-1 describes the mapping between the AR2240 fan module and software versions.

Table 3-1 Mapping between the AR2240 fan module and software versions

Fan Module Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
AR2240 fan module	N	N	N	Y	N

-  **NOTE**
- Y: supported
 - N: not supported

Appearance

The fan module of the AR2240 consists of a fan tray, five 12 V fans with dimensions 80 mm [3.16 in.] (width) x 25 mm [0.99 in.] (depth), and a fan control board (FCB).

Figure 3-1 shows the appearance of the fan module.

Figure 3-1 Appearance of the fan module



Functions

The fan module is located on the right side of the AR2240 chassis for heat dissipation and ventilation. If a single fan failed, the device will be oveated and its performance is then affected. When this occurs, replace the entire fan module immediately.

Panel

Figure 3-2 shows the panel of the fan module.

Figure 3-2 Fan module panel of the AR2240

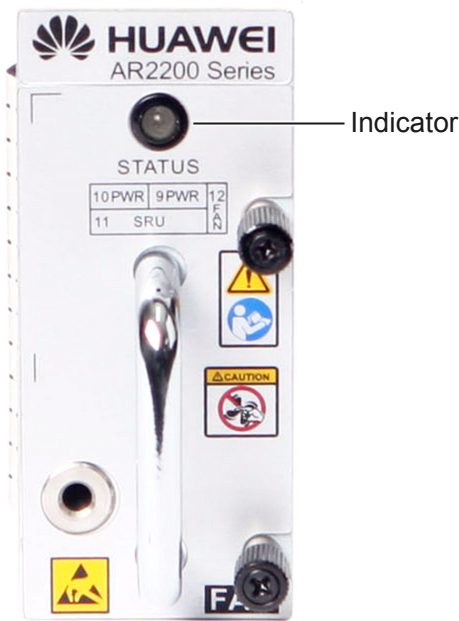


Table 3-2 describes the fan module indicator of the AR2240.

Table 3-2 Fan module indicator of the AR2240

Indicator	Color	Description
STATUS	Red and green	If the indicator blinks green once every 2s (0.5 Hz), the fan module is operating properly.
		If the indicator blinks green once every 0.25s (4 Hz), the fan module cannot communicate with the device.
		If the indicator is steady red, the fan module is faulty and an alarm is generated.

Technical Specifications

Table 3-3 describes the technical specifications of the fan module on the AR2240.

Table 3-3 Technical specifications of the fan module

Item	Specification
Dimensions (height x width x depth)	84.3 mm x 27.4 mm x 478.6 mm (3.32 in. x 1.08 in. x 18.85 in.)
Number of fans	5
Weight	1.05 kg (2.31 lb)
Maximum power consumption	60 W
Maximum wind pressure	150 Pa
Maximum wind rate	400 CFM
Maximum noise	61 dB
Operating voltage of a fan	7 V DC to 15 V DC

3.2 AR3260 Fan Module

Version Mapping

Table 3-4 describes the mapping between the AR3260 fan module and software versions.

Table 3-4 Mapping between the AR3260 fan module and software versions

Fan Module Name	AR1200 Series	AR2200 Series	AR3200 Series
AR3260 fan module	N	N	Y

NOTE

- Y: supported
- N: not supported

Appearance

The fan module of the AR3260 consists of a fan tray, three 12 V fans with dimensions 120 mm [4.72 in.] (width) x 25 mm [0.98 in.] (depth), and a fan control board (FCB).

Figure 3-3 shows the appearance of the AR3260 fan module.

Figure 3-3 Appearance of the fan module



Functions

The fan module is located on the right side of the AR3260 chassis for heat dissipation and ventilation. If a single fan failed, the heat dissipation for the AR3260 will be affected. When this occurs, replace the entire fan module immediately.

Panel

Figure 3-4 shows the panel of the fan module.

Figure 3-4 Fan module panel of the AR3260



Table 3-5 describes the fan module indicator of the AR3260.

Table 3-5 Fan module indicator of the AR3260

Indicator	Color	Description
STATUS	Red and green	Slow blinking green: The fan module is operating properly.
		Fast blinking green: The fan module cannot communicate with the device.
		Steady red: The fan module is faulty and an alarm is generated.

Technical Specifications

Table 3-6 describes the technical specifications of the fan module on the AR3260.

Table 3-6 Technical specifications of the fan module

Item	Specification
Dimensions (W x D x H)	27.4 mm x 478.6 mm x 125.7 mm (1.08 in. x 18.85 in. x 4.95 in.)
Number of fans	3
Weight	1.45 kg (3.2 lb)
Maximum power consumption	90 W
Maximum wind pressure	226 Pa
Maximum wind rate	543 CFM
Maximum noise	66.8 dB
Operating voltage of a fan	7 V DC to 15 V DC

4 Cards

About This Chapter

- 4.1 Basic Concepts
- 4.2 SRU
- 4.3 Ethernet LAN Interface Card
- 4.4 WAN Interface Card
- 4.5 Voice Interface Card
- 4.6 xDSL/xPON Interface Card

4.1 Basic Concepts

4.1.1 Card Category

Table 4-1 describes the cards supports by the AR router.

Table 4-1 cards supports by the AR router.

Card Type	Card Name	Card Description	Maximum Power Consumption	Weight
MPU	SRU40	Service and Router Unit 40	66.9 W	2.1 kg (4.63 lb)
	SRU60	Service and Router Unit 60	66.9 W	2.1 kg (4.63 lb)
	SRU80	Service and Router Unit 80	96.2 W	2.1 kg (4.63 lb)
Ethernet LAN interface card	8FE1GE	8-port 100M-RJ45+1-port 1000M-RJ45-L2/L3 Ethernet electrical interface card	11.2 W	0.6 kg (1.33 lb)
	9ES2	8 Port 100BASE-RJ45 and 1 Port 1000BASE-RJ45 L2 Ethernet Interface Card	7.6 W	0.6 kg (1.33 lb)
	24GE	24-port 1000M-RJ45-L2/L3 Ethernet electrical interface card	25.7 W	0.85 kg (1.88 lb)
	4GE-2S	4-Port 1000BASE-SFP-L2 Ethernet Interface Card	8 W	0.3 kg (0.66 lb)

Card Type	Card Name	Card Description	Maximum Power Consumption	Weight
	4ES2G-S	4-Port 1000BASE-RJ45 L2 Ethernet Interface Card	6.7 W	0.3 kg (0.66 lb)
	4ES2GP-S	4-Port 1000BASE-RJ45 L2 with PoE Ethernet Interface Card	6.7 W	0.3 kg (0.66 lb)
WAN interface card	1GEC	1-port-GE combo WAN interface card	3.2 W	0.25 kg (0.55 lb)
	2FE	2-port-FE WAN interface card	3.1 W	0.3 kg (0.66 lb)
	1E1T1-M/ 2E1T1-M/4E1/ T1-M/8E1/T1-M	1/2/4/8-port-channelized E1/T1/PRI/VE1 multifunctional interface card	● 1E1T1-M: 4.7 W ● 2E1T1-M : 4.8 W ● 2E1T1-M-W: 4.8 W ● 4E1/T1-M: 11 W ● 8E1/T1-M: 12 W	● 1E1T1-M/2E1T1-M/2E1T1-M-W: 0.3 kg (0.66 lb) ● 4E1/T1-M/8E1/T1-M: 0.6 kg (1.33 lb)
	1E1T1-F/ 2E1T1-F/4E1/ T1-F/8E1/T1-F	1/2/4/8-port-fractional channelized E1/T1 WAN interface card	● 1E1T1-F: 4.7 W ● 2E1T1-F: 4.8 W ● 4E1/T1-F: 11 W ● 8E1/T1-F: 12 W	● 1E1T1-F/2E1T1-F: 0.3 kg (0.66 lb) ● 4E1/T1-F/8E1/T1-F: 0.6 kg (1.33 lb)
	1E3/CE3/T3/CT3	1-Port Channelized/Unchannelized E3/T3 WAN Interface Card	11.2 W	0.6 kg (1.33 lb)

Card Type	Card Name	Card Description	Maximum Power Consumption	Weight
	1SA/2SA	1/2-port-synchronous/asynchronous WAN interface card	1SA: 5.5 W 2SA: 6.2 W	0.3 kg (0.66 lb)
	8AS	8-port-asynchronous WAN interface card	4.7 W	0.6 kg (1.33 lb)
	1BST	1-port ISDN S/T WAN interface card	7.4 W	0.3 kg (0.66 lb)
	1CPOS-155M 1CPOS-155M-W	1-port CPOS interface card	12 W	0.3 kg (0.66 lb)
	3G-HSPA+7	3G interface card	6.5 W	0.2 kg (0.44 lb)
	3G-EVDO	3G CDMA2000 EVDO Interface Card	7 W	0.2 kg (0.44 lb)
	LTE-H	WCDMA LTE Data Card	7 W	0.2 kg (0.44 lb)
	4GEW-T	4-port-GE electrical WAN interface card	10.2 W	0.3 kg (0.66 lb)
	4GEW-S	4-port-GE optical WAN interface card	8 W	0.3 kg (0.66 lb)
	1STM1/1STM	1-Port-155M/622M POS Optical Interface Card	12 W	0.6 kg (1.33 lb)
Voice interface card	4E1-IMA	4-port-E1 ATM IMA interface card	12 W	0.6 kg (1.33 lb)
	2BST	2-port-ISDN S/T voice interface card	14.2 W	0.3 kg (0.66 lb)

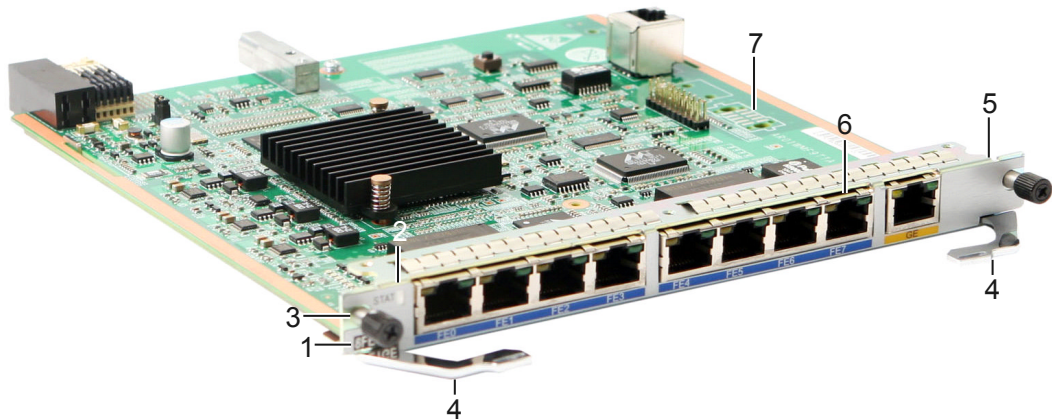
Card Type	Card Name	Card Description	Maximum Power Consumption	Weight
	4FXS1FXO	4-port FXS + 1-port FXO voice interface card	12.78 W	0.3 kg (0.66 lb)
	16/32/64/128-channel DSP module	DSP module	2.89 W	0.05 kg (0.11 lb)
	16/32FXS	16/32-port-FXS voice interface card	● 16FXS: 29 W ● 32FXS: 37.24 W	0.2 kg (0.44 lb)
	4FXO	4-port-FXO voice interface card	6.6 W	0.1 kg (0.22 lb)
	1VE1	1-Port Voice E1 Interface Card	4.7 W	0.3 kg (0.66 lb)
xDSL/xPON interface card	1ADSL-A/M and 1ADSL-B/J	1-port-ADSL2+ ANNEX A/M and B/J WAN interface card	● 1ADSL-A/M: 5.5 W ● 1ADSL-B/J: 5.5 W	● 1ADSL-A/M: 0.3 kg (0.66 lb) ● 1ADSL-B/J: 0.3 kg (0.66 lb)
	4G.SHDSL	1-port-4G.SHDSL WAN interface card	8.2 W	0.35 kg (0.77 lb)
	1PON	1-port-EPON/GPON interface card	8.72 W	0.3 kg (0.66 lb)
	VDSL2	1-port-VDSL2 over POTS WAN interface card	9.5 W	0.2 kg (0.44 lb)

4.1.2 Card Structure and Dimensions

Card Structure

Figure 4-1 shows the appearance of a card.

Figure 4-1 Appearance of a card



1: Card name silkscreen	2: Indicator	3: Captive screw
4: Handle	5: Front panel plate	6: Ports
7: Printed circuit board (PCB)		

A card consists of:

- PCB
The PCB contains all the functional chips of the board and is the core of the board. The PCB provides indicators, buttons, and ports on the front panel. PBCs of some cards provide space for installing daughter cards.

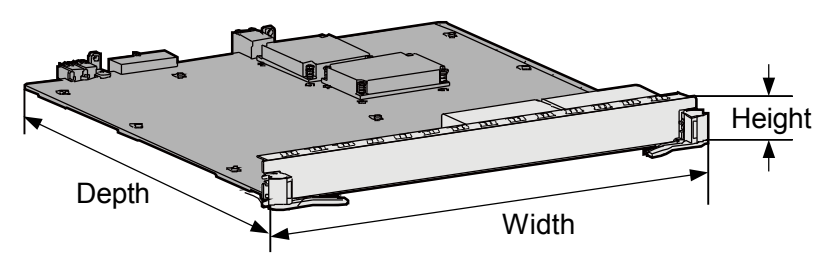
NOTE

Different cards provide different indicators, buttons, and ports. Some cards support daughter cards, while some cards do not. For details, see the description of specific cards.
- Front panel, consisting of screws, ejector levers, and plate
 - Screws: fix the card into the chassis.
 - Ejector lever: allows you to insert and remove the card.
 - Plate: connects the ejector levers and the PCB. Labels, such as the bar code and laser label, are also attached on the plate.

Card Dimensions

Figure 4-2 illustrates the dimensions of a card.

Figure 4-2 Card dimensions



NOTE

- The card dimensions are defined as follows:
- Depth: distance between the top of an ejector lever and the end of PCB
 - Width: longest distance between the tops of two ejector levers
 - Height: height of the front panel

Figure 4-3 shows the cards supported by the AR router and Table 4-2 lists the card dimensions.

Figure 4-3 Card appearances

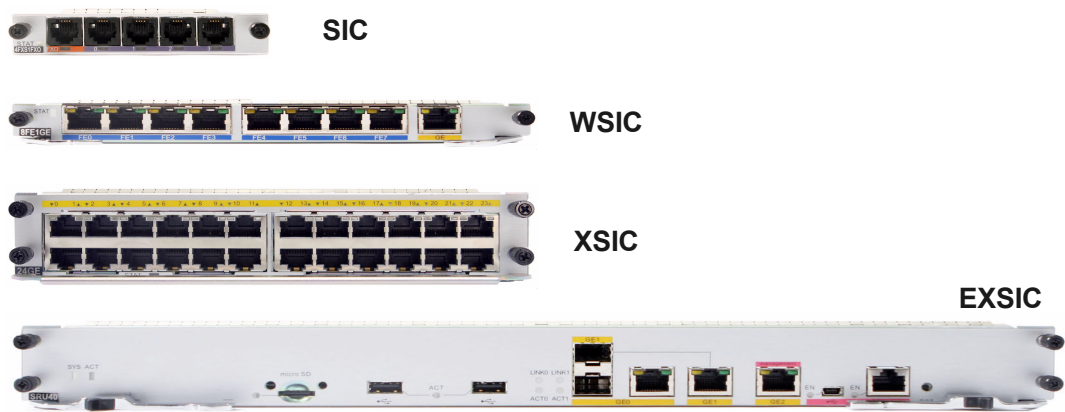


Table 4-2 Card dimensions

Card Type	Dimensions (Height x Width x Depth)
SIC card	19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.)
WSIC card	19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.)
XSIC card	40.14 mm x 201 mm x 223.5 mm (1.58 in. x 7.91 in. x 8.8 in.)
EXSIC card	40.14 mm x 402.8 mm x 223.5 mm (1.58 in. x 15.86 in. x 8.8 in.)

Card Type	Dimensions (Height x Width x Depth)
SRU	40.14 mm x 402.8 mm x 270.85 mm (1.58 in. x 15.86 in. x 10.66 in.)

4.1.3 Interface Numbering

On the AR router, interfaces are numbered in the format of slot ID/subcard ID/interface sequence number.

- Slot ID

The slot ID identifies in which slot a card is installed.

- The AR150, AR200, AR1200, AR2201-48FE, AR2202-48FE, AR2204, or AR2220 supports only one card that integrates the control, switching, and service functions, so the slot ID is always 0.
- When slots need to be combined into one slot, the greater slot ID is used as the new slot ID. For example, when slot 1 and slot 2 are combined, slot ID 2 is used as the new slot ID.

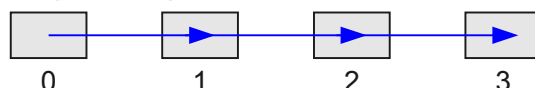
- Subcard ID

The subcard ID specifies the ID of a subcard. The AR router does not support subcards. Therefore, the subcard ID of the AR router is always 0.

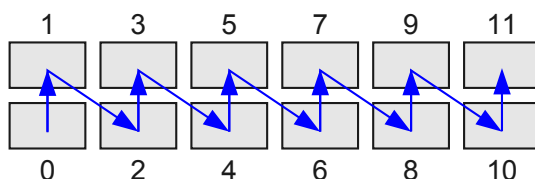
- Interface sequence number

The interface sequence number indicates the number of each interface on a card.

- There is only one row of interfaces on a card. These interfaces are numbered from left to right starting with 0.



- There are two rows of interfaces on a card. These interfaces are numbered from top to bottom and left to right starting with 0.



4.2 SRU

4.2.1 Card Overview

The SRU integrates the control and management functions and provides the control plane, management plane, and switching plane for the system.

- Control plane: provides functions such as protocol processing, service processing, route calculation, forwarding control, service scheduling, traffic statistics, and system security.
- Management plane: provides functions such as system monitoring, environment monitoring, log and alarm processing, system loading, and system upgrade.
- Switching plane: provides high-speed and non-blocking data channels to implement service switching between service modules.

The SRUs are classified into SRU40, SRU60, and SRU80. [Table 4-3](#) describes the comparison between the SRUs.

Table 4-3 Comparison between the SRU40, SRU60, and SRU80

Card Name	Performance	Function
SRU40	600 MHZ CPU with eight kernels	Traffic management is not supported.
SRU60	600 MHZ CPU with eight kernels	Traffic management is not supported.
SRU80	750 MHZ CPU with 12 kernels	Traffic management is supported.

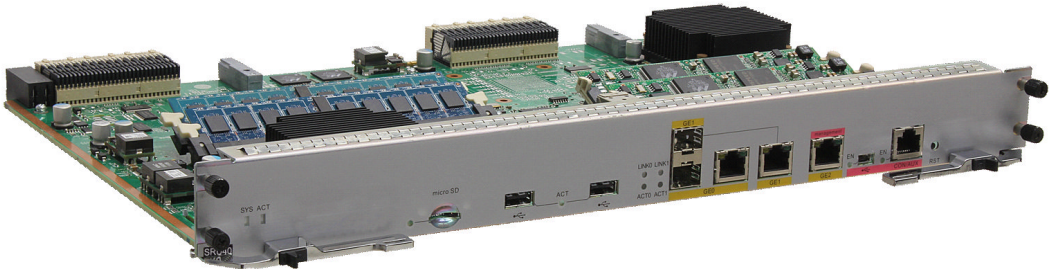
Appearance

 **NOTE**

The SRU40, SRU60, and SRU80 panels are identical except for having different silkscreens. The SRU40 is used as an example.

[Figure 4-4](#) shows the appearance of the SRU40.

Figure 4-4 Appearance of the SRU40



4.2.2 Version Mapping

[Table 4-4](#) describes the mapping between the SRU and software versions.

Table 4-4 Mapping between the SRU and software versions

Card Name	AR2240	AR3260
SRU40	Y NOTE V200R001C00 and later versions	Y NOTE V200R001C01 and later versions
SRU60	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions
SRU80	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C00 and later versions



NOTE

- Y: supported
- N: not supported

4.2.3 Functions and Features

Table 4-5 describes the functions and features of the SRU.

Table 4-5 Functions and features of the SRU

Function and Feature	Description
Basic functions	Stores information such as system configuration data, startup files, upgrade software, and system logs.
Control module	Functions as the control and management plane for the system, implementing protocol processing, route calculation, forwarding control, system management, and system security.
Switching module	Functions as the service switching plane and provides high-speed service channels to implement service switching, including voice switching, data switching, and conversion between voice and data services.
Power module	Provides power for the SRU.
Clock module	Provides synchronous clock signals for voice cards and local voice switching.

4.2.4 Indicators and Interfaces

Indicators on the SRU panel

Figure 4-5 shows the indicators on the SRU panel.

Figure 4-5 Indicators on the SRU panel

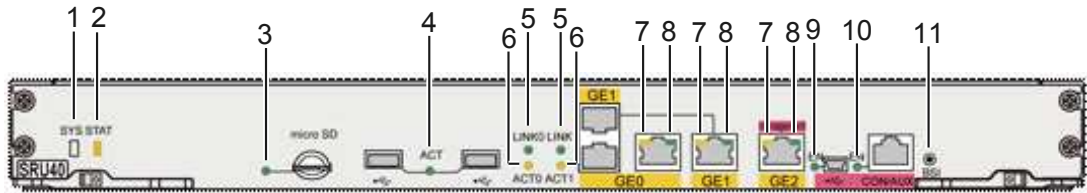


Table 4-6 describes the indicators on the SRU panel.

Table 4-6 Indicators on the SRU panel

Number in Figure 4-5	Indicator	Color	Description
1	SYS	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	The software is not running or is being reset.
2	ACT (active/standby status indicator) NOTE Only one SRU can be installed on the AR2240.	Green	Steady on: The SRU is in active state.
			Off: The SRU is in standby state.
3	Micro SD	Green	Steady on: A link has been established.
			Blinking: Data is being transmitted or received.
			Off: There is no SD card.
4	ACT (USB)	Red and green	Steady green: The device has been deployed properly by using a USB flash drive.

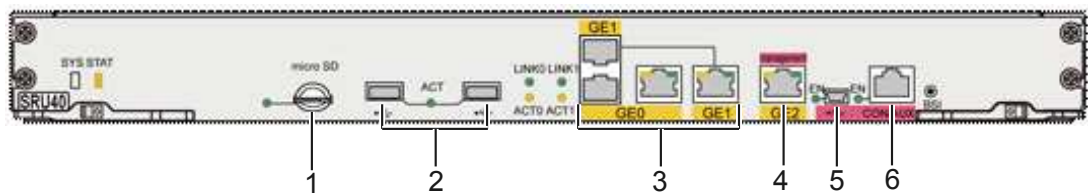
Number in Figure 4-5	Indicator	Color	Description
			Blinking: The device is being deployed by using a USB flash drive.
			Steady red: The device fails to be deployed by using a USB flash drive.
			Off: No USB flash drive for deployment is inserted, the USB port fails, or the indicator fails.
5 and 6	SFP interface indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
		Yellow	Off: No link is established.
			Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
7 and 8	GE interface indicators: - The LINK indicator is in green. - The ACT indicator is in yellow.	Green	Steady on: A link has been established.
		Yellow	Off: No link is established.
			Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
9	MiniUSB EN	Green	Stead on: The port is used as a Mini USB port.
			Off: The port does not function as a Mini USB port.
10	CON/AUX EN NOTE - Either the CON/AUX port or the MiniUSB port can be used at a time. - By default, the port is used as the CON/AUX port. The EN indicator is green no matter whether a cable is installed.	Green	Stead on: The port is used as a CON/AUX port.
			Off: The port does not function as a CON/AUX port.

Number in Figure 4-5	Indicator	Color	Description
11	RST	CAUTION	The Reset button is used for resetting cards manually. Resetting a card interrupts services. Confirm the action before you press this button.

Description of Interfaces

Figure 4-6 shows the interfaces on the SRU.

Figure 4-6 Interfaces on the SRU



1: Two Micro SD card interfaces ● SD0: installed in a reserved SD card on the front panel, an external extended card ● SD1: built-in, default setting	2: Two USB interfaces	3: GE optical/electrical combo interface
4. One GE electrical interface	5: MiniUSB interface	6: CON/AUX interface

Micro SD card interface

The micro SD card interface connects to the MiniSD card to store system data.

USB interface

The USB interface connects to the USB flash drive and is used to deploy devices.

MiniUSB interface

A MiniUSB interface is connected to the console for onsite configuration. The MiniUSB and console interface cannot be used together. By default, an RJ45 interface is connected to the console for onsite configuration.

Combo interface

A combo interface consists of an optical Ethernet interface and an electrical Ethernet interface on the panel. Each combo interface matches only one internal forwarding interface. A combo interface is a multiplexing interface, and you can use either the optical interface or electrical

interface at one time. When one of the Ethernet interfaces is used, the other interface is disabled. The combo interface must be used with [5.5 Network Cable](#) or [GE Optical Module](#) and [5.6 Optical Fiber](#).

 NOTE

By default, a combo port works as an electrical interface and uses a network cable to transmit data.

GE electrical interface (10/100/1000BASE-T Ethernet interface)

A 10/100/1000BASE-T Ethernet interface receives and sends services on 10M/100M/1000M Ethernet electrical interfaces and must be used with [5.5 Network Cable](#).

Table 4-7 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

CON/AUX interface

A console interface is connected to the console for onsite configuration and must be used with [5.4 Console Cable](#).

Table 4-8 CON/AUX interface attributes

Attribute	Description
Connector type	RJ45
Standards compliance	RS232
Working mode	Full-duplex universal asynchronous receiver/transmitter (UART)
Data equipment type	● Data Circuit-terminating Equipment (DCE) ● AUX interface: Data Terminal Equipment (DTE)

4.2.5 Technical Specifications

Table 4-9 describes the technical specifications of the SRU.

Table 4-9 Technical specifications of the SRU

Item	Specification
CPU	● SRU40: 8-core 600 MHz ● SRU60: 8-core 600 MHz ● SRU80: 12-core 750 MHz
Memory (default value)	2 GB
Flash memory	16 MB
Micro SD card (default)	2 GB
In-service upgrade	In-service upgrade through the system management channel
Hot swap	Supported
Physical specifications	● Dimensions (height x width x depth): 40.14 mm x 402.8 mm x 270.85 mm (1.58 in. x 15.86 in. x 10.66 in.) ● Maximum power consumption - SRU40: 66.9W - SRU60: 66.9W - SRU80: 96.2W ● Weight: 2.1 kg (4.63 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3

4.2.6 Ordering Information

To order the SRU, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-10 provides the ordering information.

Table 4-10 Ordering information

Part Number	Card Name	Card Description
03020MXL	SRU40	Service and Router Unit 40
03021SCA	SRU60	Service and Router Unit 60
03020RTC	SRU80	Service and Router Unit 80

4.3 Ethernet LAN Interface Card

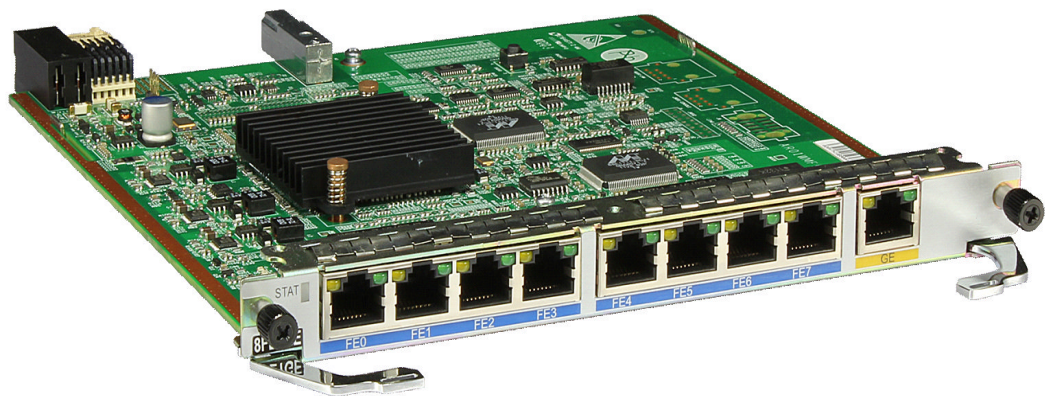
4.3.1 8FE1GE (8-Port 100M-RJ45+1-Port 1000M-RJ45-L2/L3 Ethernet Electrical Interface Card)

Card Overview

The 8FE1GE provides Ethernet access for medium- and small-scale enterprises and enterprise branches, and supports Layer 2 and Layer 3 line-speed switching and device management. It is a WSIC interface card and provides eight FE interfaces and one GE interface, which can connect to office terminals, PCs, IP phones, and switches.

Figure 4-7 shows the appearance of the 8FE1GE.

Figure 4-7 Appearance of the 8FE1GE



Version Mapping

Table 4-11 describes the mapping between the 8FE1GE and software versions.

Table 4-11 Mapping between the 8FE1GE and software versions

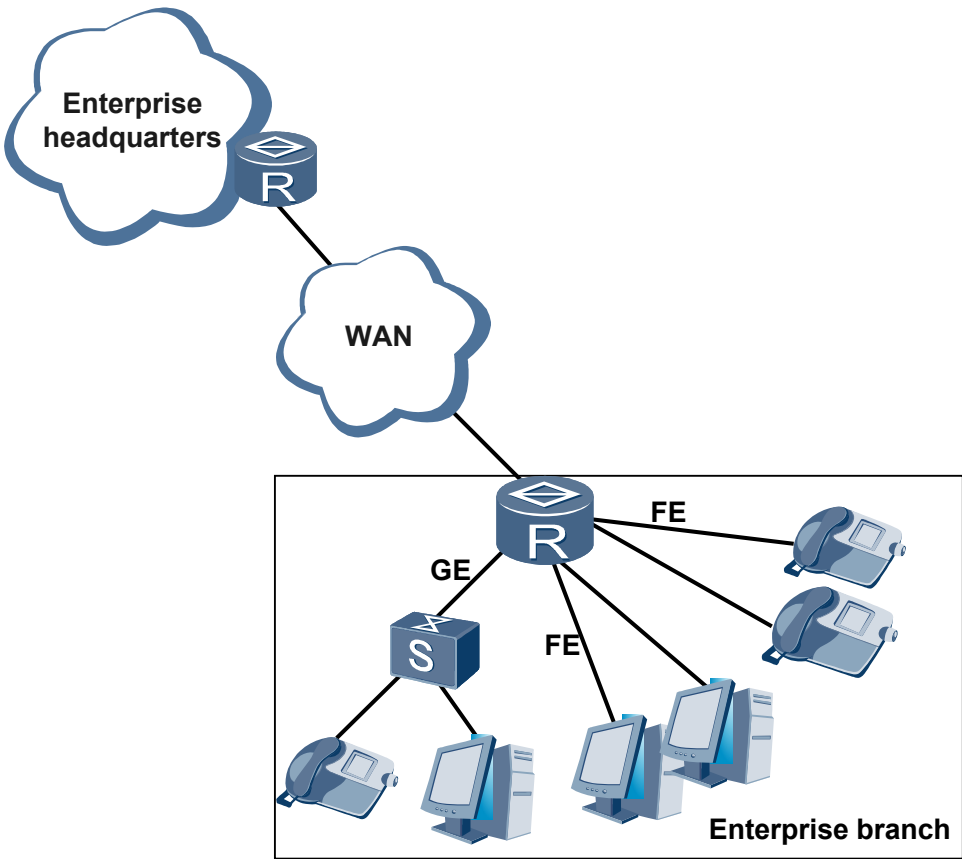
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
8FE1GE	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-8, the 8FE1GE provides eight FE interfaces and one GE interface to connect to enterprise branch devices. FE electrical interfaces connect to various desktop terminals such as PCs and IP phones, and the GE electrical interface connects to a switch or server to implement line-speed forwarding of Layer 2 and Layer 3 data.

Figure 4-8 8FE1GE application



Functions and Features

Table 4-12 describes the functions and features of the 8FE1GE.

Table 4-12 Functions and features of the 8FE1GE

Function and Feature	Description
Eight FE interfaces	Provides up to 100 Mbit/s line-speed switching.
One GE interface	Provides up to 1000 Mbit/s line-speed switching.
Duplex mode	Supports the half duplex mode and full duplex mode. The full duplex mode is most commonly used.
VLAN	Supports a maximum of 4094 VLANs.
Voice VLAN	Allows voice data flows to be transmitted preferentially, ensuring high quality voice services.
Link aggregation	Bundles multiple physical links to form a logical interface to increase bandwidth and improve link reliability.

Function and Feature	Description
VLANIF interface	Supports VLANIF interfaces.
Layer 2 features	Supports MAC, GVRP, STP, RSTP, MSTP, and LLDP.

Indicators and Interfaces

Indicators on the 8FE1GE

Figure 4-9 shows the indicators on the 8FE1GE panel.

Figure 4-9 Indicators on the 8FE1GE panel

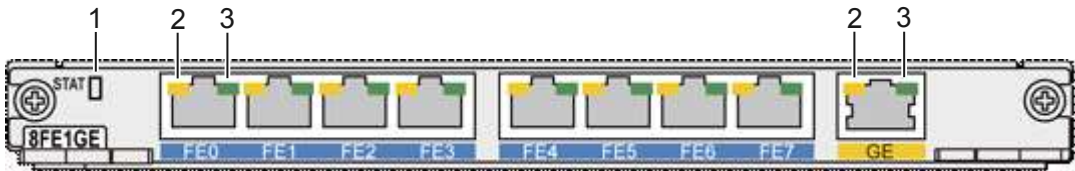


Table 4-13 describes the indicators on the 8FE1GE panel.

Table 4-13 Indicators on the 8FE1GE panel

Number in Figure 4-9	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	ACT	Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
3	LINK	Green	Steady on: A link has been established.

Number in Figure 4-9	Indicator	Color	Description
			Off: No link is established.

Description of Interfaces

Figure 4-10 shows the interfaces on the 8FE1GE.

Figure 4-10 Interfaces on the 8FE1GE



1: Eight FE electrical interfaces	2. One GE electrical interface
-----------------------------------	--------------------------------

FE Electrical Interface

An FE electrical (10Base-T/100Base-TX Interface) interface transmits service data at 10 Mbit/s or 100 Mbit/s. It works with a 5.5 Network Cable. Table 4-14 lists FE electrical interface attributes.

Table 4-14 FE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [5.5 Network Cable](#). [Table 4-15](#) lists GE electrical interface attributes.

Table 4-15 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

[Table 4-16](#) describes the technical specifications of the 8FE1GE.

Table 4-16 Technical specifications of the 8FE1GE

Item	Specification
Card type	WSIC
External interfaces	Eight FE electrical interfaces and one GE electrical interface
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	● FE electrical interface: 10/100 Mbit/s, in auto-sensing mode ● GE electrical interface: 10/100/1000 Mbit/s, in auto-sensing mode
Connector type	RJ45
Cables	Ethernet cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel

Item	Specification
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 11.2 W ● Weight: 0.6 kg (1.33 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 8FE1GE, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-17 provides the ordering information.

Table 4-17 Ordering information

Part Number	Card Name	Card Description
03020XTN	8FE1GE	8-Port 10/100BASE(RJ45) and 1-Port 10/100/1000BASE(RJ45)-L2/L3 Ethernet Switch Interface Card

4.3.2 9ES2 (8 Port 100BASE-RJ45 and 1 Port 1000BASE- RJ45 L2 Ethernet Interface Card)

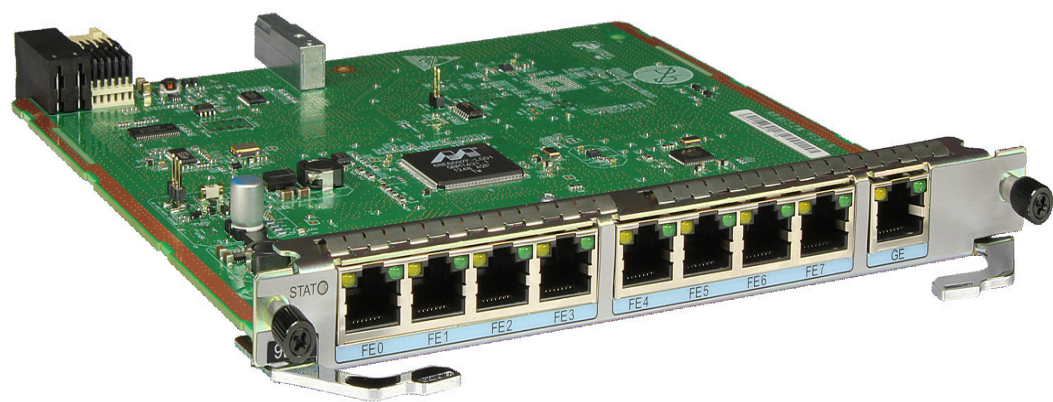
Card Overview

-  **NOTE**
- Meaning of characters in the card name:
- 9: nine RJ45 interfaces on the card
 - ES: Ethernet switch
 - 2: Layer 2

A 9ES2 card provides eight FE electrical interfaces and one GE electrical interface. This card is installed in a WSIC slot and provides line-speed Layer 2 switching and device management functions.

Figure 4-11 shows the appearance of a 9ES2 card.

Figure 4-11 9ES2 card appearance



Version Mapping

Table 4-18 describes the mapping between the 9ES2 card and software versions of different product models.

Table 4-18 Mapping between the 9ES2 card and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
9ES2	Y NOTE This card is supported in V200R005C00 and later versions.				

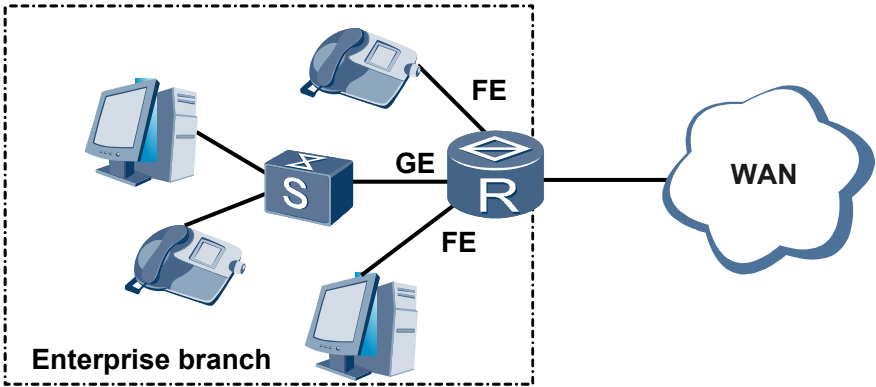
NOTE

- Y: indicates that a product model supports the card.

Application

9ES2 cards provide low-density Ethernet access for enterprise branches, as shown in Figure 4-12. The FE electrical interfaces on a 9ES2 card can connect to various terminals such as computers and IP phones, and the GE electrical interface can connect to a switch or server.

Figure 4-12 9ES2 card application



Functions and Features

Table 4-19 describes functions and features of a 9ES2 card.

Table 4-19 Functions and features of a 9ES2 card

Function and Feature	Specification
Eight FE interfaces	Each interface provides up to 100 Mbit/s line-speed switching.
One GE electrical interface	The interface provides up to 1000 Mbit/s line-speed switching.
Duplex mode	The interfaces support the half-duplex and full-duplex modes. The full-duplex mode is more commonly used.
VLAN	4094 VLANs can be created.
Voice VLAN	Voice data traffic is transmitted in the voice VLAN with a high priority to ensure high-quality voice communication.
Link aggregation	Bundles multiple physical links into a logical link to increase link bandwidth and reliability.
Layer 2 features	MAC, Generic VLAN Registration Protocol (GVRP), Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), and Link Layer Discovery Protocol (LLDP).

Indicators and Interfaces

Indicator Description

Figure 4-13 shows indicators on a 9ES2 card, and Table 4-20 describes indicator states and meaning of each state.

Figure 4-13 Indicators on a 9ES2 card

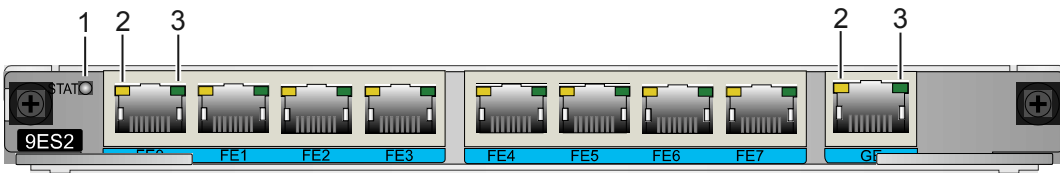


Table 4-20 9ES2 card indicator description

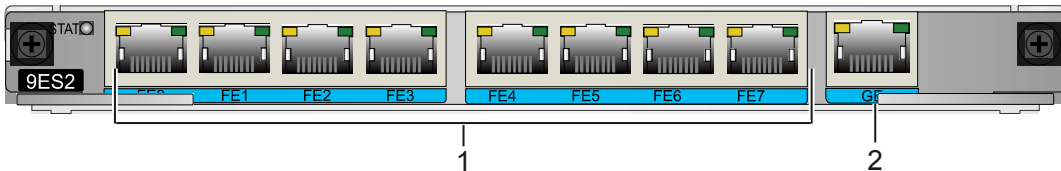
Number	Indicator	Color	Description
1	STAT	Green	Steady on: The system software is running normally. Off: The card is not powered on.

Number	Indicator	Color	Description
2	ACT	Yellow	Blinking: The interface is transmitting and receiving data.
			Off: The interface is not transmitting or receiving data.
3	LINK	Green	Steady on: A link has been established on the interface.
			Off: No link is established on the interface.

Interface Description

Figure 4-14 shows interfaces on a 9ES2 card.

Figure 4-14 Interfaces on a 9ES2 card



1. Eight FE electrical interfaces	2. One GE electrical interface
-----------------------------------	--------------------------------

FE Electrical Interface

An FE electrical (10Base-T/100Base-TX Interface) interface transmits service data at 10 Mbit/s or 100 Mbit/s. It works with a [5.5 Network Cable](#). [Table 4-21](#) lists FE electrical interface attributes.

Table 4-21 FE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.

Attribute	Description
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [5.5 Network Cable](#). [Table 4-22](#) lists GE electrical interface attributes.

Table 4-22 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

[Table 4-23](#) lists technical specifications of a 9ES2 card.

Table 4-23 9ES2 card technical specifications

Item	Specification
Card type	WSIC
External interface	Eight FE electrical interfaces and one GE electrical interface
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab

Item	Specification
Interface speed	● FE electrical interface: 10/100 Mbit/s auto-sensing ● GE electrical interface: 10/100/1000 Mbit/s auto-sensing
Connector type	RJ45
Cable	Ethernet cable
Hot swap	Supported
Physical specifications	● Dimensions (W x D x H): 201 mm x 223.5 mm x 19.82 mm (7.91 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 7.6 W ● Weight: 0.6 kg (1.32 lb)
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-24 provides the ordering information.

Table 4-24 9ES2 ordering information

Part Number	Card Name	Card Description
03021UJL	9ES2	8 port 100BASE-RJ45 and 1 port 1000BASE-RJ45 L2 Ethernet interface card

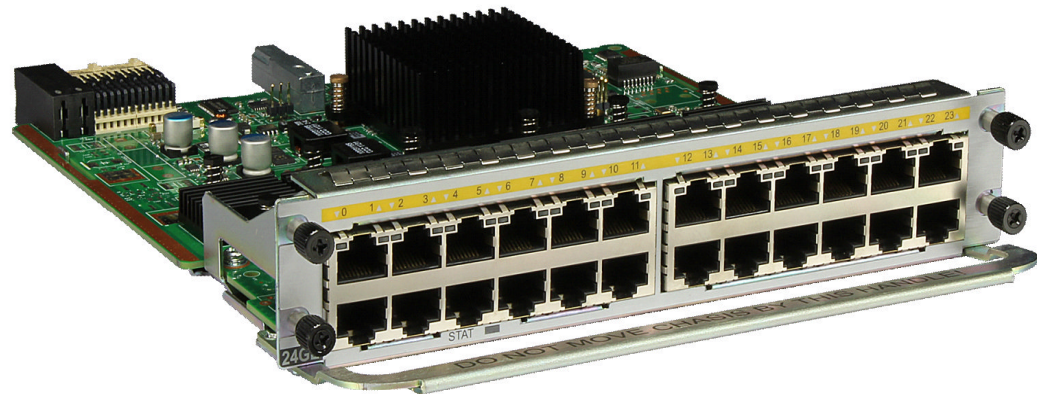
4.3.3 24GE (24-Port 1000M-RJ45-L2/L3 Ethernet Electrical Interface Card)

Card Overview

The 24GE is an XSIC interface card and provides 24 GE electrical interfaces, which extend Ethernet forwarding and Layer 2 and Layer 3 switching capabilities. The 24GE often applies to the enterprise headquarters and can connect to multiple devices by using the 24 GE interfaces.

Figure 4-15 shows the appearance of the 24GE.

Figure 4-15 Appearance of the 24GE



Version Mapping

Table 4-25 describes the mapping between the 24GE and software versions.

Table 4-25 Mapping between the 24GE and software versions

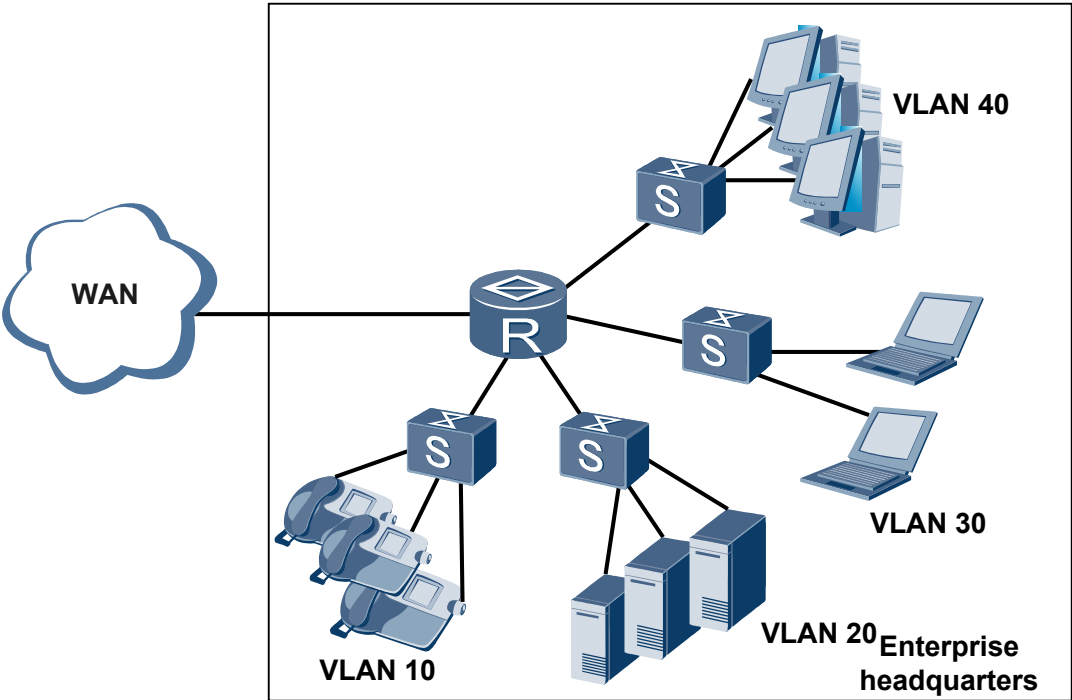
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
24GE	N	N	Y NOTE V200R001C00 and later versions	Y NOTE V200R001C00 and later versions	Y NOTE V200R001C00 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-16, the 24GE provides 24 GE interfaces that can connect to multiple devices in the enterprise headquarters. The GE electrical interfaces can connect to switches or servers to transmit a large number of data, voice, and video services.

Figure 4-16 24GE application



Functions and Features

Table 4-26 describes the functions and features of the 24GE.

Table 4-26 Functions and features of the 24GE

Function and Feature	Description
24 GE interfaces	Provides up to 1000 Mbit/s line-speed switching.
Duplex mode	Supports the half duplex mode and full duplex mode. The full duplex mode is most commonly used.
VLAN	Supports a maximum of 4094 VLANs.
Voice VLAN	Allows voice data flows to be transmitted preferentially, ensuring high quality voice services.
Link aggregation	Bundles multiple physical links to form a logical interface to increase bandwidth and improve link reliability.
VLANIF	Supports VLANIF interfaces.
Layer 2 features	Supports MAC, GVRP, STP, RSTP, MSTP, and LLDP.

Indicators and Interfaces

Indicators on the 24GE Panel

Figure 4-17 shows the indicators on the 24GE panel.

Figure 4-17 Indicators on the 24GE panel

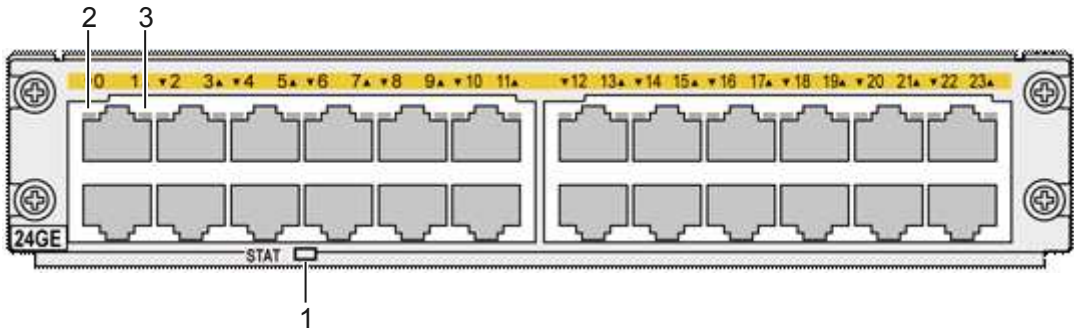


Table 4-27 describes the indicators on the 24GE panel.

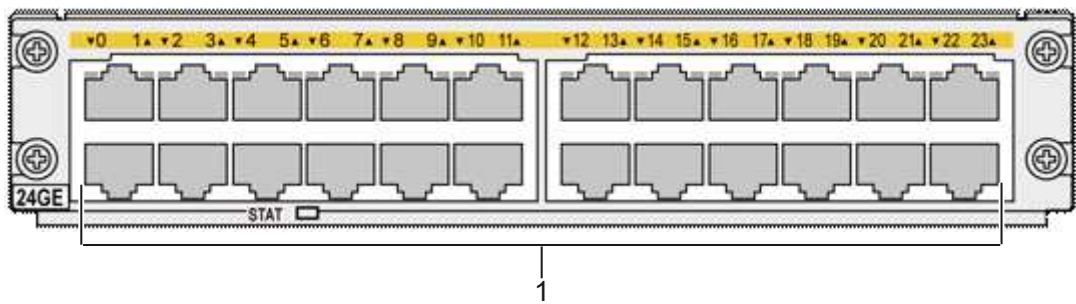
Table 4-27 Indicators on the 24GE panel

Number in Figure 4-17	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2: indicators of interfaces in the second row	LINK	Green	Steady on: A link has been established.
3: indicators of interfaces in the first row			Blinking: Data is being transmitted or received.
			Off: No link is established.

Description of Interfaces

Figure 4-18 shows the interfaces on the 24GE.

Figure 4-18 Interfaces on the 24GE



1: 24 GE electrical interfaces

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a 5.5 Network Cable. Table 4-28 lists GE electrical interface attributes.

Table 4-28 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

Table 4-29 describes the technical specifications of the 24GE.

Table 4-29 Technical specifications of the 24GE

Item	Specification
Card type	XSIC
External interfaces	24 GE electrical interfaces
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	10/100/1000 Mbit/s, in auto-sensing mode
Connector type	RJ45
Cable	Ethernet cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 40.14 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 25.7 W ● Weight: 0.85 kg (1.87 lb)

Item	Specification
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 24GE, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-30 provides the ordering information.

Table 4-30 Ordering information

Part Number	Card Name	Card Description
03020MNS	24GE	24-Port 10/100/1000BASE (RJ45)-L2/L3 Ethernet Switch Interface Card

4.3.4 4GE-2S (4-Port 1000BASE-SFP-L2 Ethernet Interface Card)

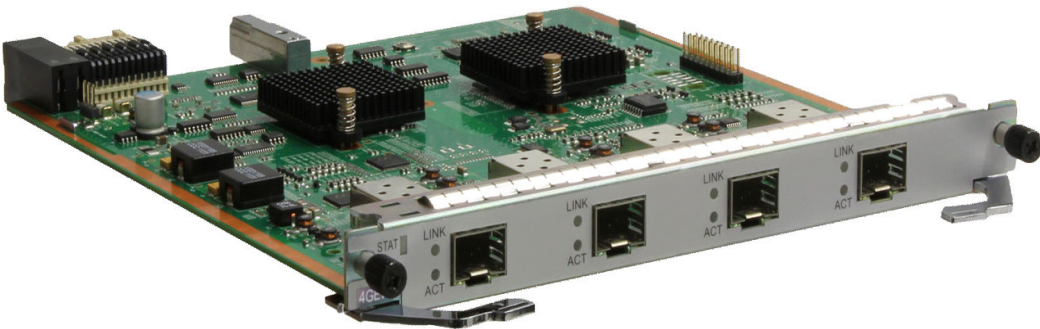
Card Overview

-  NOTE
- 4: indicates four interfaces.
 - GE: indicates 1000M Ethernet.
 - 2: indicates L2 switching.
 - S: indicates optical interfaces.

The 4GE-2S often applies to medium-sized enterprises and provides large-capacity gigabit Ethernet access. It is an WSIC interface card and provides four GE optical interfaces. It and can connect to optical interface switches.

Figure 4-19 shows the appearance of the 4GE-2S.

Figure 4-19 Appearance of the 4GE-2S



Version Mapping

Table 4-31 describes the mapping between the 4GE-2S and software versions.

Table 4-31 Mapping between the 4GE-2S and software versions

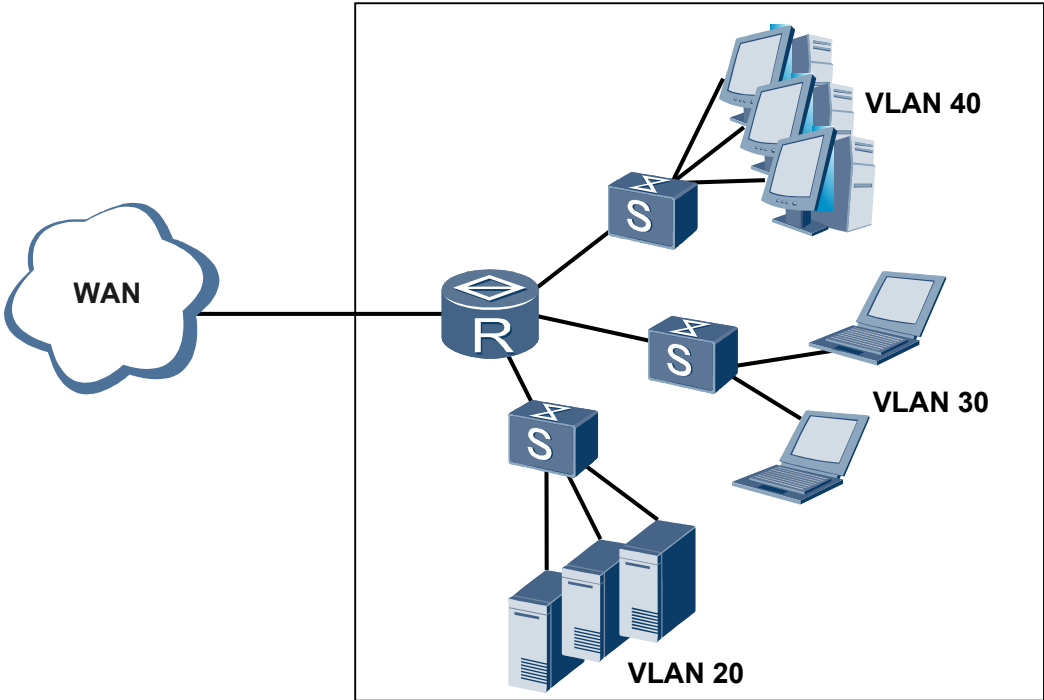
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
4GE-2S	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-20](#), the 4GE-2S provides four GE optical interfaces to connect to optical interface switches, meeting requirements for long-distance transmission of enterprises.

Figure 4-20 4GE-2S application



Functions and Features

[Table 4-32](#) describes the functions and features of the 4GE-2S.

Table 4-32 Functions and features of the 4GE-2S

Function and Feature	Description
Four GE optical interfaces	The GE optical interfaces provide up to 1000 Mbit/s line-speed switching.
Duplex mode	The interfaces support the half duplex mode and full duplex mode. The full duplex mode is most commonly used.
VLAN	Supports a maximum of 128 VLANs.
Voice VLAN	The voice VLAN function allows voice data flows to be transmitted preferentially, ensuring high quality voice services.
	The interfaces do not support the automatic mode.
Link aggregation	Link aggregation bundles multiple physical links to form a logical interface to increase bandwidth and improve link reliability.
VLANIF	Supports VLANIF interfaces.
	Inter-card port isolation is not supported. Only intra-card port isolation is supported.
Layer 2 features	MAC, GVRP, STP, RSTP, MSTP, and LLDP.

Indicators and Interfaces

Indicators on the 4GE-2S Panel

Figure 4-21 shows the indicators on the 4GE-2S panel.

Figure 4-21 Indicators on the 4GE-2S panel



Table 4-33 describes the indicators on the 4GE-2S panel.

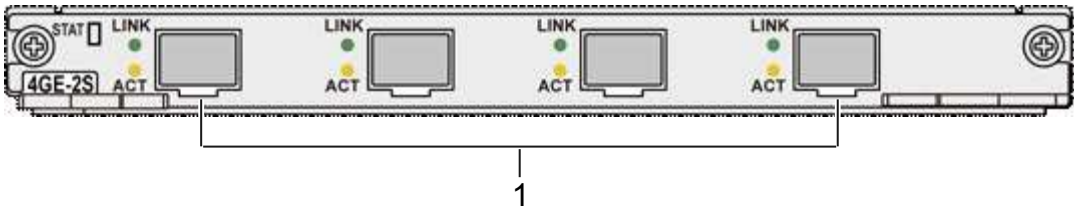
Table 4-33 Indicators on the 4GE-2S panel

Number in Figure 4-21	Indicator	Color	Description
1	STAT	Green	Stead on: The router has been powered on, but the system software is not running. Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	LINK	Green	Steady on: A link has been established.
			Off: No link is established.
3	ACT	Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-22 shows the interfaces on the 4GE-2S.

Figure 4-22 Interfaces on the 4GE-2S



1: Four GE optical interfaces

GE optical interface (100/1000BASE-TX Ethernet Optical Interface)

A GE optical interface (100Base-FX/1000Base-X Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [GE Optical Module](#) and [5.6 Optical Fiber](#). [Table 4-34](#) lists GE optical interface attributes.

Table 4-34 GE optical interface attributes

Attribute	Description
Connector type	LC/SC/FC
Optical interface attribute	Depending on the optical module used
Standards compliance	IEEE 802.3z
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Table 4-35 Attributes of GE optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
eSFP-GE-SX-MM850	≤ 0.5	1000base-SX	● Fiber mode: multimode ● Pattern bandwidth: 400 MHz*km ● Core diameter: 50 μm ● Connector type: LC	0°C to 70°C
SFP-GE-LX-SM1310	≤ 10	1000base-LX/LH	● Fiber mode: single-mode ● Connector type: LC	
S-SFP-GE-LH40-SM1310	≤ 40			
S-SFP-GE-LH40-SM1550				
S-SFP-GE-LH80-SM1550	≤ 80	1000base-ZX		
eSFP-GE-ZX100-SM1550	≤ 100			
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	≤ 10	1000base-BX		
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)				
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	≤ 40			
LE2MGSC40ED0 (Single-fiber bidirectional optical module)				

Table 4-36 Attributes of GE optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-GE-SX-MM850	850	-9.5 to -2.5	≤ -17.0	0	9
SFP-GE-LX-SM1310	1310	-9.0 to -3.0	≤ -20.0	-3.0	9
S-SFP-GE-LH40-SM1310	1310	-5.0 to 0	≤ -23	-3.0	6
S-SFP-GE-LH40-SM1550	1550	-5.0 to 0	≤ -22	-3.0	8.5
S-SFP-GE-LH80-SM1550	1550	-2.0 to 5.0	≤ -23.0	-3.0	9
eSFP-GE-ZX100-SM1550	1550	0 to 5	≤ -30.0	-9.0	8
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	TX1310/ RX1490	-9.0 to -3.0	≤ -19.5	-3.0	6
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)	RX1310/ TX1490	-9.0 to -3.0	≤ -19.5	-3.0 6	6
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	TX1310/ RX1490	-2.0 to 3.0	≤ -23	-3.0	9
LE2MGSC40ED0 (Single-fiber bidirectional optical module)	RX1310/ TX1490	-2.0 to 3.0	≤ -23	-3.0	9

Technical Specifications

Table 4-37 describes the technical specifications of the 4GE-2S.

Table 4-37 Technical specifications of the 4GE-2S

Item	Specification
Card type	WSIC
External interfaces	Four GE optical interfaces
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	1000 Mbit/s
Connector type	SFP
Cable	● 62.5/125 μm multi-mode fiber, center wavelength 850 nm ● 9/125 μm single-mode fiber, center wavelength 1310 nm ● 9/125 μm single-mode fiber, center wavelength 1550 nm
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 8 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 4GE-2S, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-38 provides the ordering information.

Table 4-38 Ordering information

Part Number	Card Name	Card Description
03021RSM	4GE-2S	4-port 1000BASE-SFP-L2 Ethernet interface card

4.3.5 4ES2G-S (4-Port 1000BASE-RJ45 L2 Ethernet Interface Card)

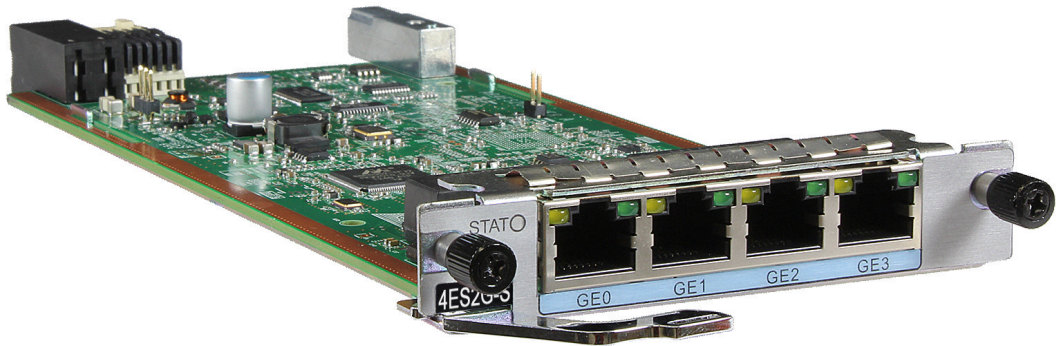
Card Overview

-  **NOTE**
- Meaning of characters in the card name:
- 4: four interfaces on the card
 - ES: Ethernet switch
 - 2: Layer 2
 - G: GE electrical interfaces
 - -S: SIC

A 4ES2G-S card provides four GE electrical interfaces. This card is installed in a SIC slot and provides line-speed Layer 2 switching and device management functions.

Figure 4-23 shows the appearance of a 4ES2G-S card.

Figure 4-23 4ES2G-S card appearance



Version Mapping

Table 4-39 describes the mapping between the 4ES2G-S card and software versions of different product models.

Table 4-39 Mapping between the 4ES2G-S card and software versions

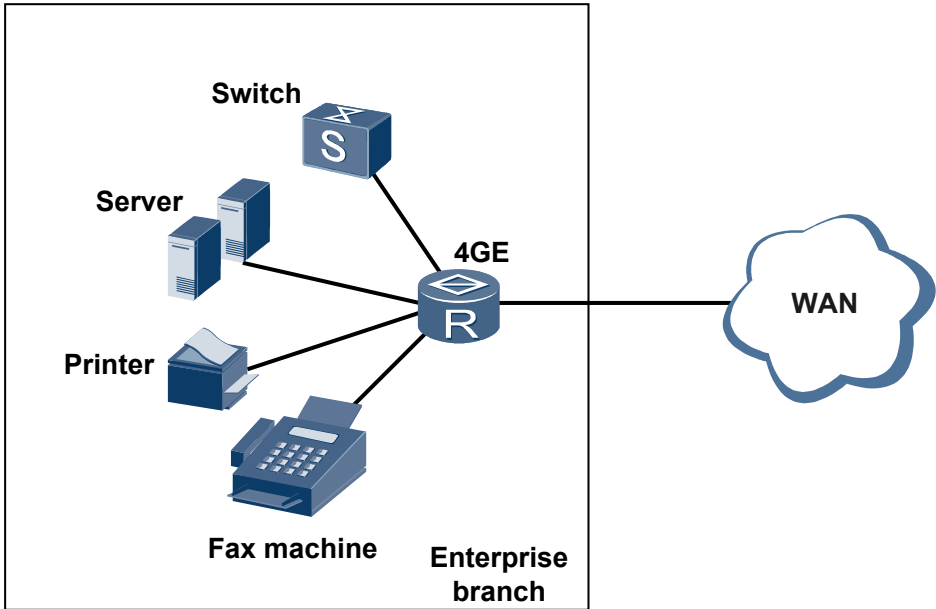
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
4ES2G-S	Y NOTE This card is supported in V200R005C00 and later versions.				

-  **NOTE**
- Y: indicates that a product model supports the card.

Application

4ES2G-S cards are used for GE access for small and medium enterprises or enterprise branches, as shown in [Figure 4-24](#). GE electrical interfaces on a 4ES2G-S card can connect to switches, servers, printers, and fax machines.

Figure 4-24 4ES2G-S card application



Functions and Features

[Table 4-40](#) describes functions and features of a 4ES2G-S card.

Table 4-40 Functions and features of a 4ES2G-S card

Function and Feature	Description
Four GE electrical interfaces	Each interface provides up to 1000 Mbit/s line-speed switching.
Duplex mode	The interfaces support the half-duplex and full-duplex modes. The full-duplex mode is more commonly used.
VLAN	A maximum of 4094 VLANs can be created to group users flexibly.
Voice VLAN	Voice data traffic is transmitted in the voice VLAN with a high priority to ensure high-quality voice communication.
Link aggregation	Bundles multiple physical links into a logical link to increase link bandwidth and reliability.
VLANIF	VLANIF interfaces are used as Layer 3 interfaces to support Layer 3 services.

Function and Feature	Description
Layer 2 features	MAC, Generic VLAN Registration Protocol (GVRP), Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), and Link Layer Discovery Protocol (LLDP).

Indicators and Interfaces

Indicator Description

Figure 4-25 shows indicators on a 4ES2G-S card.

Figure 4-25 Indicators on a 4ES2G-S card

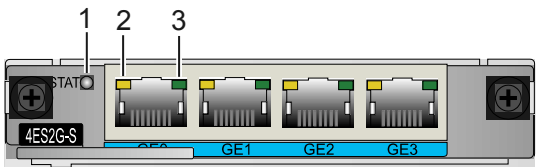


Table 4-41 describes indicators on a 4ES2G-S card.

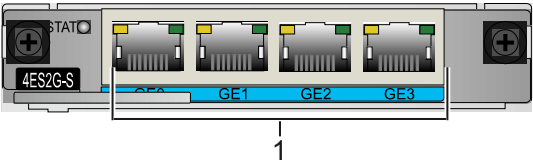
Table 4-41 4ES2G-S card indicator description

Number	Indicator	Color	Description
1	STAT	Green	Steady on: The system software is running normally.
			Off: The card is not powered on.
2	ACT	Yellow	Blinking: The interface is transmitting and receiving data.
			Off: The interface is not transmitting or receiving data.
3	LINK	Green	Steady on: A link has been established on the interface.
			Off: No link is established on the interface.

Interface Description

Figure 4-26 shows interfaces on a 4ES2G-S card.

Figure 4-26 Interfaces on a 4ES2G-S card



1. Four GE electrical interfaces

GE electrical interface (100Base-TX/1000Base-T Ethernet electrical interface)

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a 5.5 Network Cable. Table 4-42 lists GE electrical interface attributes.

Table 4-42 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

Table 4-43 lists technical specifications of a 4ES2G-S card.

Table 4-43 4ES2G-S card technical specifications

Item	Specification
Card type	SIC
External interface	Four GE electrical interfaces

Item	Specification
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Interface speed	10/100/1000 Mbit/s auto-sensing
Connector type	RJ45
Cable	Ethernet cable
Hot swap	Supported
Physical specifications	● Dimensions (W x D x H): 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 6.7 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-44 provides the ordering information.

Table 4-44 4ES2G-S ordering information

Part Number	Card Name	Card Description
03021VCC	4ES2G-S	4-port 1000BASE-RJ45 L2 Ethernet interface card (SIC)

4.3.6 4ES2GP-S (4-Port 1000BASE-RJ45 L2 with PoE Ethernet Interface Card)

Card Overview



NOTE

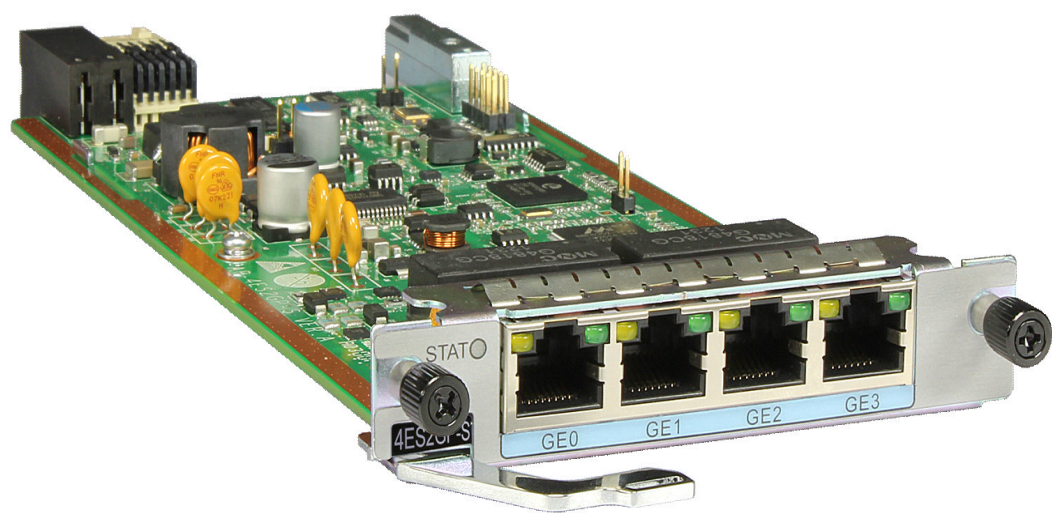
Meaning of characters in the card name:

- 4: four interfaces on the card
- ES: Ethernet switch
- 2: Layer 2
- G: GE electrical interfaces
- P: power over Ethernet (PoE) supported
- -S: SIC

A 4ES2GP-S card provides four GE electrical interfaces. This card is installed in a SIC slot and provides line-speed Layer 2 switching and device management functions. The GE electrical interfaces also support PoE.

Figure 4-27 shows the appearance of a 4ES2GP-S card.

Figure 4-27 4ES2GP-S card appearance



Version Mapping

Table 4-45 describes the mapping between the 4ES2GP-S card and software versions of different product models.

Table 4-45 Mapping between the 4ES2GP-S card and software versions

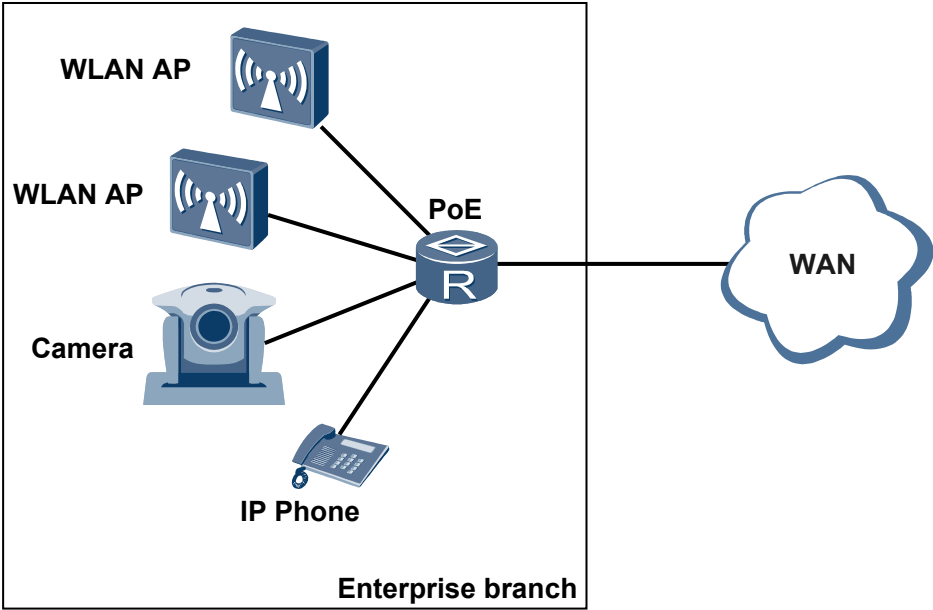
Card Name	AR1220V	AR1220W	AR1220V W	AR2200 Series	AR3200 Series
4ES2GP-S	Y NOTE This card is supported in V200R005C00 and later versions.	Y NOTE This card is supported in V200R005C00 and later versions.	Y NOTE This card is supported in V200R005C00 and later versions.	N	N

- NOTE
- Y: indicates that a product model supports the card.
 - N: indicates that a product model does not support the card.

Application

4ES2GP-S cards are used for GE access for small and medium enterprises or enterprise branches, as shown in Figure 4-28. All the four GE electrical interfaces on a 4ES2GP-S card support the PoE function and can supply powers to powered devices (PDs) that comply with IEEE 802.3af and 802.3at, for example, IP phones, WLAN APs, and cameras.

Figure 4-28 4ES2GP-S card application



Functions and Features

Table 4-46 describes functions and features of a 4ES2GP-S card.

Table 4-46 Functions and features of a 4ES2GP-S card

Function and Feature	Specification
Four GE electrical interfaces	Each interface provides up to 1000 Mbit/s line-speed switching.
PoE	Supplies power to four PDs that comply with IEEE 802.3af and 802.3at.
Duplex mode	The interfaces support the half-duplex and full-duplex modes. The full-duplex mode is more commonly used.
VLAN	A maximum of 4094 VLANs can be created to group users flexibly.
Voice VLAN	Voice data traffic is transmitted in the voice VLAN with a high priority to ensure high-quality voice communication.
Link aggregation	Bundles multiple physical links into a logical link to increase link bandwidth and reliability.
VLANIF	VLANIF interfaces are used as Layer 3 interfaces to support Layer 3 services.

Function and Feature	Specification
Layer 2 features	MAC, Generic VLAN Registration Protocol (GVRP), Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), and Link Layer Discovery Protocol (LLDP).

Indicators and Interfaces

Indicator Description

Figure 4-29 shows indicators on a 4ES2GP-S card.

Figure 4-29 Indicators on a 4ES2GP-S card

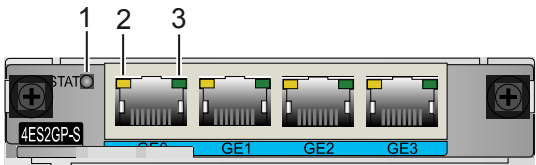


Table 4-47 describes indicators on a 4ES2GP-S card.

Table 4-47 4ES2GP-S card indicator description

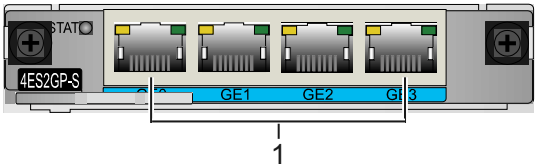
Number	Indicator	Color	Description
1	STAT	Green	Steady on: The card has been powered on, but the system software is not running. Slow blinking: The system software is running normally. Fast blinking: The card is loading the system software or is resetting.
		Red	Steady on: A fault that affects services has occurred. The fault cannot be rectified automatically and needs to be rectified manually.
		Off	The software is not running or the card is resetting.
2	ACT	Yellow	Blinking: The interface is transmitting and receiving data.
			Off: The interface is not transmitting and receiving data.

Number	Indicator	Color	Description
3	LINK	Green	Steady on: A link has been established on the interface.
			Off: No link is established on the interface.

Interface Description

Figure 4-30 shows interfaces on a 4ES2GP-S card.

Figure 4-30 Interfaces on a 4ES2GP-S card



1. Four GE electrical interfaces

GE electrical interface (100Base-TX/1000Base-T Ethernet electrical interface)

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a 5.5 Network Cable. Table 4-48 lists GE electrical interface attributes.

Table 4-48 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

Table 4-49 lists technical specifications of a 4ES2GP-S card.

Table 4-49 4ES2GP-S card technical specifications

Item	Specification
Card type	SIC
External interface	Four GE electrical interfaces, all of which support PoE
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab, IEEE802.3af, IEEE802.3at
Interface speed	10/100/1000 Mbit/s auto-sensing
Connector type	RJ45
Cable	Ethernet cable
Hot swap	Supported
In-service upgrade	In-service upgrade through system management channel
Physical specifications	● Dimensions (W x D x H): 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 6.7 W ● Maximum PoE power on each GE electrical interface: 37 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-50 provides the ordering information.

Table 4-50 4ES2GP-S ordering information

Part Number	Card Name	Card Description
03021WXP	4ES2GP-S	4-port 1000BASE-RJ45 L2 PoE Ethernet interface card (SIC)

4.4 WAN Interface Card

4.4.1 1GEC (1-Port-GE Combo WAN Interface Card)

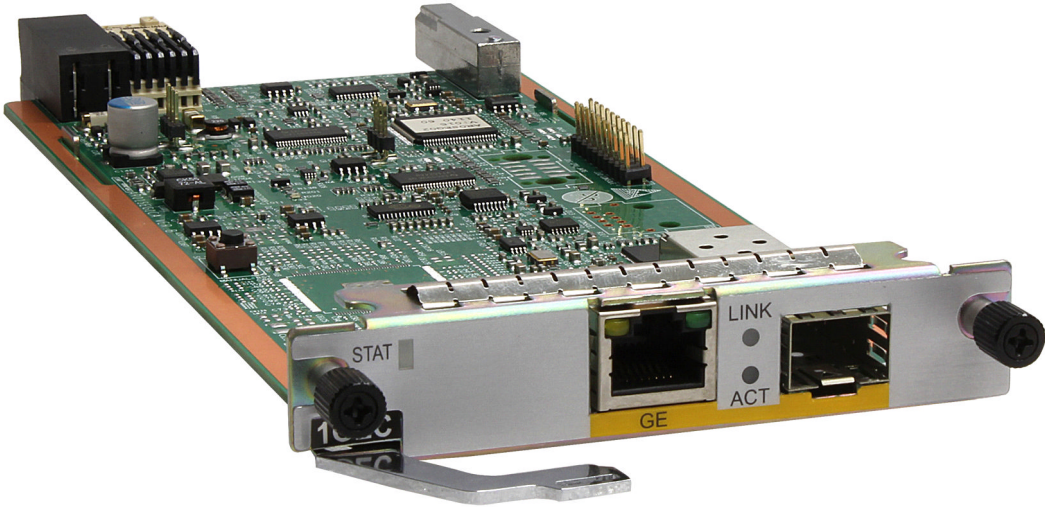
Card Overview

-  **NOTE**
- 1: indicates one interface.
 - GE: indicates 1000M Ethernet.
 - C: indicates a combo interface.

The 1GEC is a 1GEC high-speed WAN access module and a combo interface that can function as the GE electrical or optical interface. You can flexibly select the interface to connect to a WAN.

Figure 4-31 shows the appearance of the 1GEC.

Figure 4-31 Appearance of the 1GEC



Version Mapping

Table 4-51 describes the mapping between the 1GEC and software versions.

Table 4-51 Mapping between the 1GEC and software versions

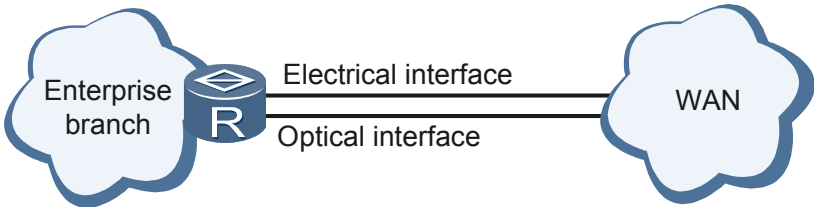
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1GEC	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-32](#), the enterprise branch uses the GE electrical interface and GE optical interface to connect to a WAN. Either the GE electrical or optical interface can work at one time, and the other interface is used as the backup, improving link reliability.

Figure 4-32 WAN access



Functions and Features

[Table 4-52](#) describes the functions and features of the 1GEC.

Table 4-52 Functions and features of the 1GEC

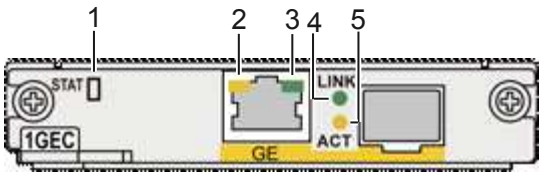
Function and Feature	Description
One GE electrical interface and one GE optical interface	You can flexibly use the electrical or optical interface to connect to a network.
	The GE electrical or optical interface can connect to a WAN at the rate of 1000 Mbit/s to provide Layer 3 services.
Layer 3 protocols	IPv4, IPv6, and MPLS.

Indicators and Interfaces

Indicators on the 1GEC Panel

[Figure 4-33](#) shows the indicators on the 1GEC panel.

Figure 4-33 Indicators on the 1GEC panel



[Table 4-53](#) describes the indicators on the 1GEC panel.

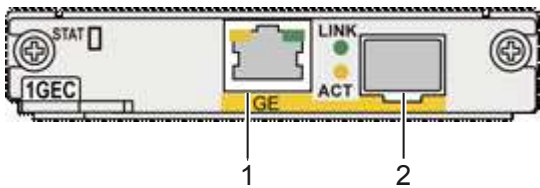
Table 4-53 Indicators on the 1GEC panel

Number in Figure 4-33	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2 and 5	ACT	Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
3 and 4	LINK	Green	Steady on: A link has been established.
			Off: No link is established.

Description of Interfaces

Figure 4-34 shows the interfaces on the 1GEC.

Figure 4-34 Interfaces on the 1GEC



1: One GE electrical interface	2. One GE optical interface
--------------------------------	-----------------------------

GE electrical interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a 5.5 Network Cable. Table 4-54 lists GE electrical interface attributes.

Table 4-54 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

GE optical interface

A GE optical interface (100Base-FX/1000Base-X Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [GE Optical Module](#) and [5.6 Optical Fiber](#). [Table 4-55](#) lists GE optical interface attributes.

Table 4-55 GE optical interface attributes

Attribute	Description
Connector type	LC/SC/FC
Optical interface attribute	Depending on the optical module used
Standards compliance	IEEE 802.3z
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Table 4-56 Attributes of GE optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
eSFP-GE-SX-MM850	≤ 0.5	1000base-SX	- Fiber mode: multimode - Pattern bandwidth: 400 MHz*km - Core diameter: 50 μm - Connector type: LC	0°C to 70°C
SFP-GE-LX-SM1310	≤ 10	1000base-LX/LH	- Fiber mode: single-mode - Connector type: LC	
S-SFP-GE-LH40-SM1310	≤ 40			
S-SFP-GE-LH40-SM1550				
S-SFP-GE-LH80-SM1550	≤ 80	1000base-ZX		
eSFP-GE-ZX100-SM1550	≤ 100			
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	≤ 10	1000base-BX		
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)				
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	≤ 40			
LE2MGSC40ED0 (Single-fiber bidirectional optical module)				

Table 4-57 Attributes of GE optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-GE-SX-MM850	850	-9.5 to -2.5	≤ -17.0	0	9
SFP-GE-LX-SM1310	1310	-9.0 to -3.0	≤ -20.0	-3.0	9
S-SFP-GE-LH40-SM1310	1310	-5.0 to 0	≤ -23	-3.0	6
S-SFP-GE-LH40-SM1550	1550	-5.0 to 0	≤ -22	-3.0	8.5
S-SFP-GE-LH80-SM1550	1550	-2.0 to 5.0	≤ -23.0	-3.0	9
eSFP-GE-ZX100-SM1550	1550	0 to 5	≤ -30.0	-9.0	8
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	TX1310/ RX1490	-9.0 to -3.0	≤ -19.5	-3.0	6
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)	RX1310/ TX1490	-9.0 to -3.0	≤ -19.5	-3.0 6	6
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	TX1310/ RX1490	-2.0 to 3.0	≤ -23	-3.0	9
LE2MGSC40ED0 (Single-fiber bidirectional optical module)	RX1310/ TX1490	-2.0 to 3.0	≤ -23	-3.0	9

Technical Specifications

Table 4-58 describes the technical specifications of the 1GEC.

Table 4-58 Technical specifications of the 1GEC

Item	Specification
Card type	SIC
External interfaces	One GE electrical interface and one GE optical interface
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	● GE electrical interface: 10/100/1000 Mbit/s, in auto-sensing mode ● GE optical interface: 1000 Mbit/s
Connector type	● GE electrical interface: RJ45 ● GE optical interface: SFP
Cable	● GE electrical interface: Ethernet cable ● GE optical interface: - 62.5/125 μm multi-mode fiber, center wavelength 850 nm - 9/125 μm single-mode fiber, center wavelength 1310 nm - 9/125 μm single-mode fiber, center wavelength 1550 nm
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 3.2 W ● Weight: 0.25 kg (0.55 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1GEC, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-59 provides the ordering information.

Table 4-59 Ordering information

Part Number	Card Name	Card Description
03020XTR	1GEC	1-Port GE Combo WAN Interface Card

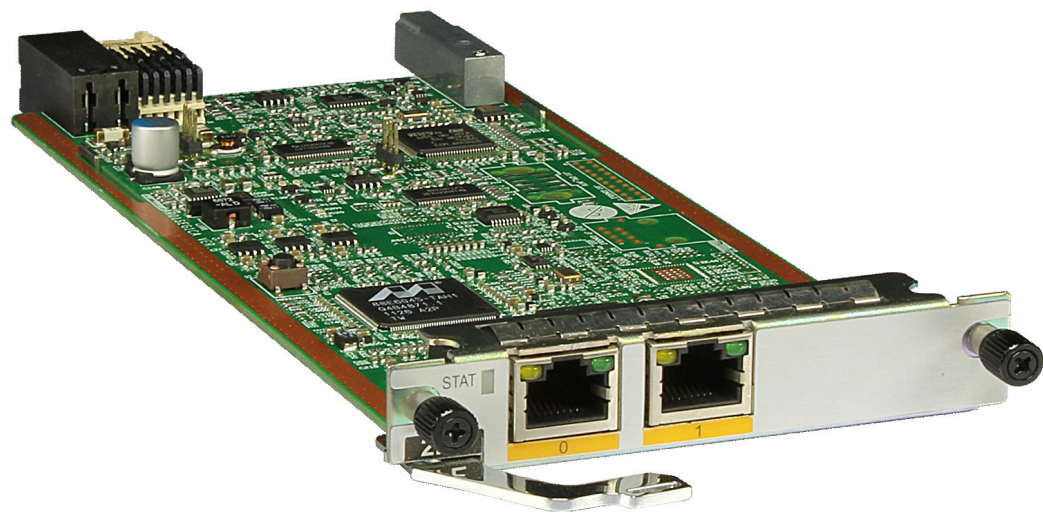
4.4.2 2FE (2-Port-FE WAN Interface Card)

Card Overview

The 2FE is a high-speed Ethernet WAN access module and provides two FE electrical interfaces. The 2FE can connect to a WAN at the rate of 100 Mbit/s.

Figure 4-35 shows the appearance of the 2FE.

Figure 4-35 Appearance of the 2FE



Version Mapping

Table 4-60 describes the mapping between the 2FE and software versions.

Table 4-60 Mapping between the 2FE and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
2FE	Y	Y NOTE V200R003C00 and later versions	Y	Y	Y

-  NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-36, the enterprise branch uses one FE interface to connect to a WAN at the rate of 100 Mbit/s.

Figure 4-36 WAN uplink



Functions and Features

Table 4-61 describes the functions and features of the 2FE.

Table 4-61 Functions and features of the 2FE

Function and Feature	Description
Two FE electrical interfaces	The 2FE can connect to a WAN at the rate of 100 Mbit/s to provide Layer 3 services.
	Two FE electrical interfaces can comprise an uplink interface at the line speed of 200 Mbit/s.
Layer 3 protocols	IPv4, IPv6, and MPLS.

Indicators and Interfaces

Indicators on the 2FE Panel

Figure 4-37 shows the indicators on the 2FE panel.

Figure 4-37 Indicators on the 2FE panel

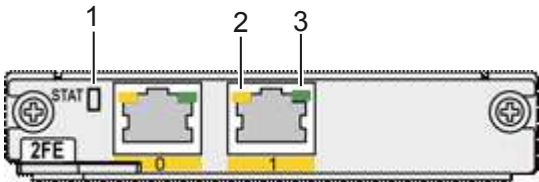


Table 4-62 describes the indicators on the 2FE panel.

Table 4-62 Indicators on the 2FE panel

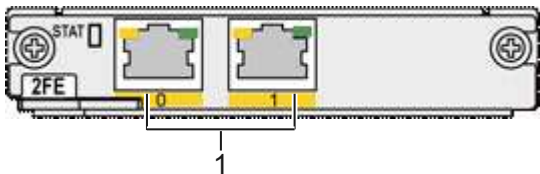
Number in Figure 4-37	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.

Number in Figure 4-37	Indicator	Color	Description
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	ACT	Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.
3	LINK	Green	Steady on: A link has been established.
			Off: No link is established.

Description of Interfaces

Figure 4-38 shows the interfaces on the 2FE.

Figure 4-38 Interfaces on the 2FE



1: Two FE electrical interfaces

FE electrical interface (10/100BASE-TX Ethernet interface)

A 10/100BASE-TX Ethernet interface receives and sends services on 10M/100M Ethernet electrical interfaces and must be used with [5.5 Network Cable](#).

Table 4-63 FE electrical interface attributes

Attribute	Description
Connector type	RJ45

Attribute	Description
Interface attribute	MDI/MDIX NOTE ● A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. ● A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

Table 4-64 describes the technical specifications of the 2FE.

Table 4-64 Technical specifications of the 2FE

Item	Specification
Card type	SIC
External interfaces	Two FE electrical interfaces
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	10/100 Mbit/s, in auto-sensing mode
Connector type	RJ45
Cable	Ethernet cable (FE electrical interfaces support MDIX.)
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 3.1 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)

Item	Specification
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 2FE, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-65 provides the ordering information.

Table 4-65 Ordering information

Part Number	Card Name	Card Description
03020XTQ	2FE	2-Port FE WAN Interface Card

4.4.3 1E1T1-M/2E1T1-M/4E1T1-M/8E1T1-M (1/2/4/8 Port-Channelized E1/T1/PRI/VE1 Multiflex Trunk Interface Card)

Card Overview

-  **NOTE**
- 1/2/4/8: indicates one, two, four, or eight interfaces.
 - E1: indicates E1 interfaces.
 - T1: indicates T1 interfaces.
 - M: indicates multiflex trunks.
 - PRI: indicate ISDN primary rate interfaces.
 - VE1: indicates voice E1 interfaces.
 - The 4E1T1-M/8E1T1-M supports only CE1 functions and can provide T1/PRI in the future.

The channelized E1/T1/PRI multifunctional interface card processes data and voice flows and provides 1-8 CE1/PRI interfaces. It implements high-density WAN interconnection, WAN aggregation, analog voice, digital voice, and dialup.

Channelized E1/T1/PRI Multifunctional Interface Card have five types. [Table 4-66](#) lists the differences between the five types.

Table 4-66 Slots of channelized E1/T1/PRI multifunctional interface cards

Card Name	Interface Quantity	Connector Type	Slot
1E1T1-M	1	DB9	SIC slot
2E1T1-M	2	DB9	SIC slot
2E1T1-M-W	2	DB9	WSIC slot or XSIC slot NOTE In an XSIC slot, the WSIC card is installed in the lower part of the slot. The WSIC card uses the XSIC slot ID as its own slot ID.
4E1T1-M	4	RJ45	
8E1T1-M	8	RJ45	

[Figure 4-39](#) shows the appearance of the 1E1T1-M.

Figure 4-39 Appearance of the 1E1T1-M

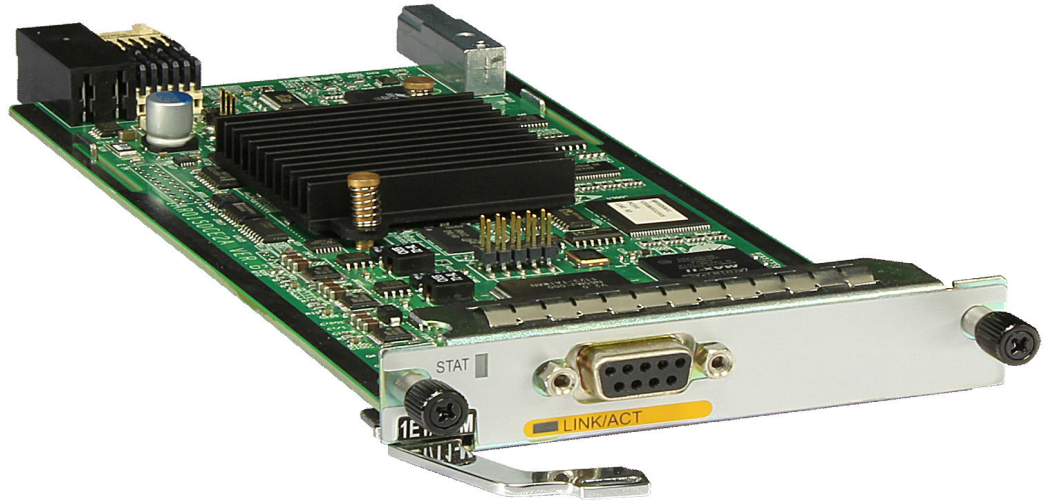


Figure 4-40 shows the appearance of the 2E1T1-M.

Figure 4-40 Appearance of the 2E1T1-M

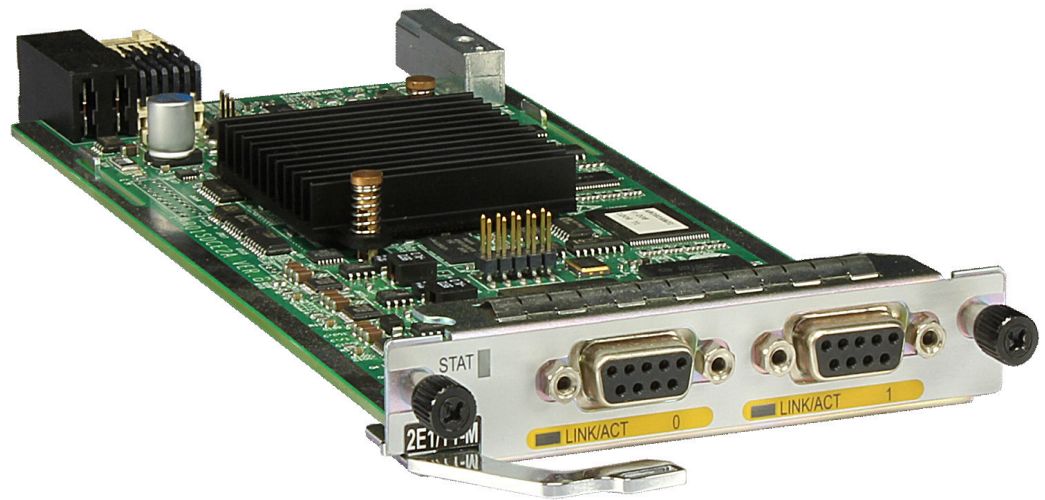


Figure 4-41 shows the appearance of the 2E1T1-M-W.

Figure 4-41 Appearance of the 2E1T1-M-W

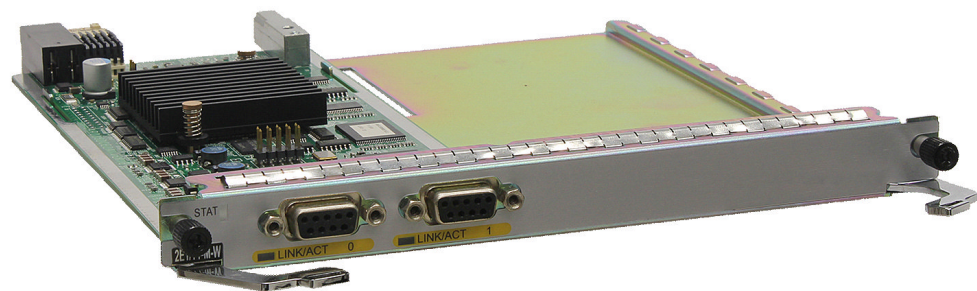


Figure 4-42 shows the appearance of the 4E1T1-M.

Figure 4-42 Appearance of the 4E1T1-M

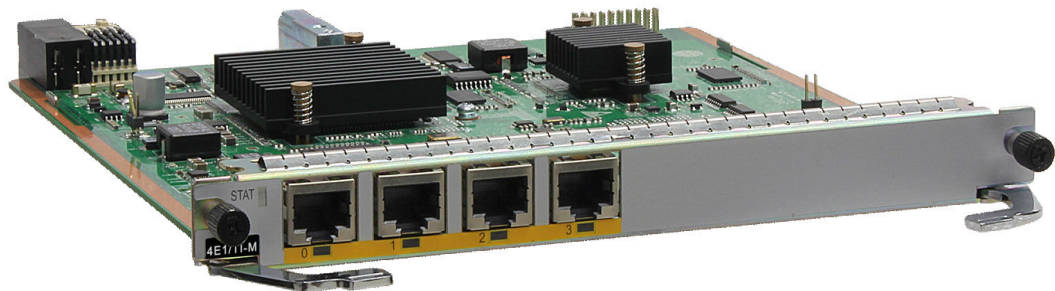
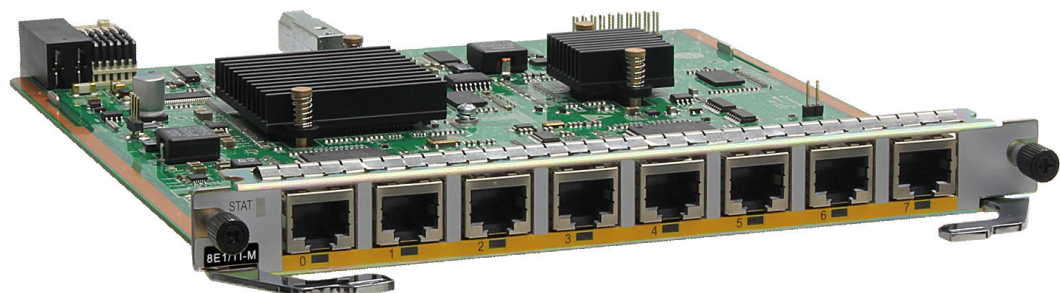


Figure 4-43 shows the appearance of the 8E1T1-M.

Figure 4-43 Appearance of the 8E1T1-M



Version Mapping

Table 4-67 describes the mapping between the channelized E1/T1/PRI multifunctional interface card and software versions.

Table 4-67 Mapping between the channelized E1/T1/PRI multifunctional interface card and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1E1T1-M	Y	Y NOTE V200R003C00 and later versions	Y	Y	Y
2E1T1-M	Y	Y NOTE V200R003C00 and later versions	Y	Y	Y
2E1T1-M-W	Y NOTE V200R002C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R002C00 and later versions	Y NOTE V200R002C00 and later versions	Y NOTE V200R002C00 and later versions
4E1T1-M 8E1T1-M	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions

 NOTE

- Y: supported
- N: not supported

Application

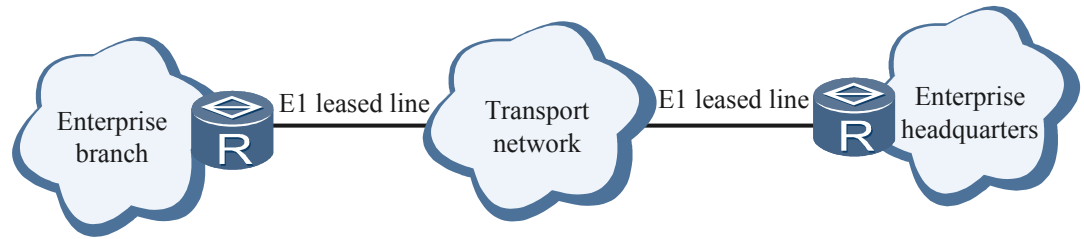
The channelized E1/T1/PRI multifunctional interface card often applies to the following scenarios:

- **WAN Interconnection**
- **WAN Aggregation in CE1 Mode**
- **Dialup Connection in PRI Mode**
- **Voice Connection in VE1 Mode**

WAN Interconnection

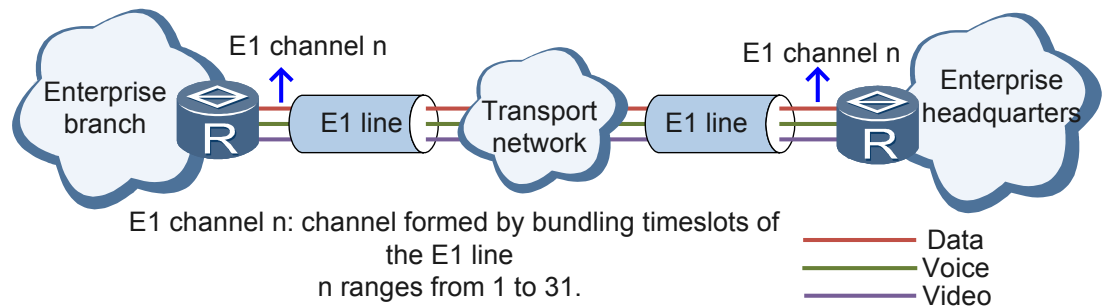
As shown in [Figure 4-44](#), the enterprise headquarters and branch are connected through E1 lines. When the channelized E1/T1/PRI multifunctional interface card works in E1 mode, the enterprise can connect to the transport network through E1 lines to transmit data services with a total bandwidth of 2 Mbit/s.

Figure 4-44 Connecting the enterprise headquarters and branch through E1 lines



As shown in **Figure 4-45**, timeslots of the E1 channel in channelized mode can be bundled to form multiple low-speed links to synchronously transmit various services. When the channelized E1/T1/PRI multifunctional interface card works in CE1 mode, CE1 flexibly bundles timeslots of the E1 line to form multiple low-speed E1 channels such as 128 or 256 kbit/s. Each E1 channel can transmit one service. CE1 allows multiple services to be transmitted through the E1 channels and independent of each other.

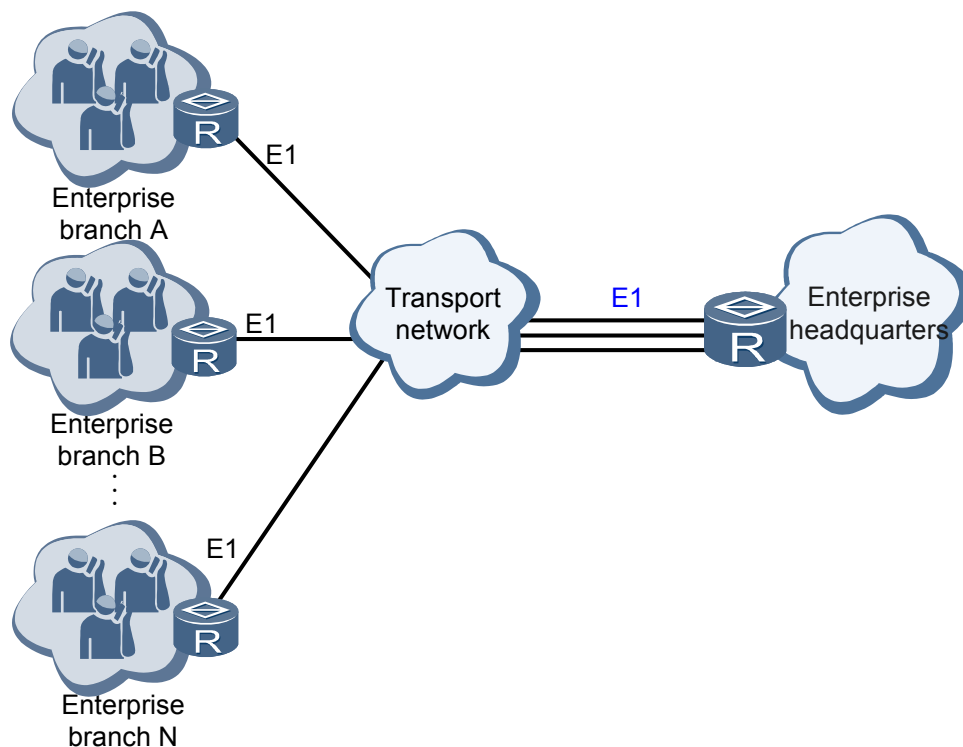
Figure 4-45 Connecting the enterprise headquarters and branch through CE1



WAN Aggregation in CE1 Mode

As shown in **Figure 4-46**, the channelized E1/T1/PRI multifunctional interface card works in CE1 mode, the enterprise headquarters uses multiple E1 lines to connect to the transport network, and the enterprise branches connect to the transport network through E1 lines.

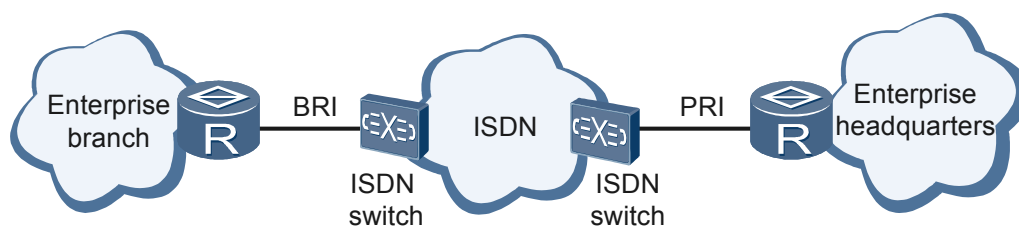
Figure 4-46 Connecting the enterprise headquarters and branches through multiple E1 lines



Dialup Connection in PRI Mode

As shown in [Figure 4-47](#), the enterprise headquarters and branch are connected through the ISDN. When the channelized E1/T1/PRI multifunctional interface card works in PRI mode, the enterprise headquarters and branch connect to the ISDN through a PRI interface and a BRI interface respectively. In PRI mode, two or more timeslots can be bundled to form a TDM channel to transmit data and voice services exchanged between the enterprise headquarters and branch.

Figure 4-47 Connecting the enterprise headquarters and branch through PRI

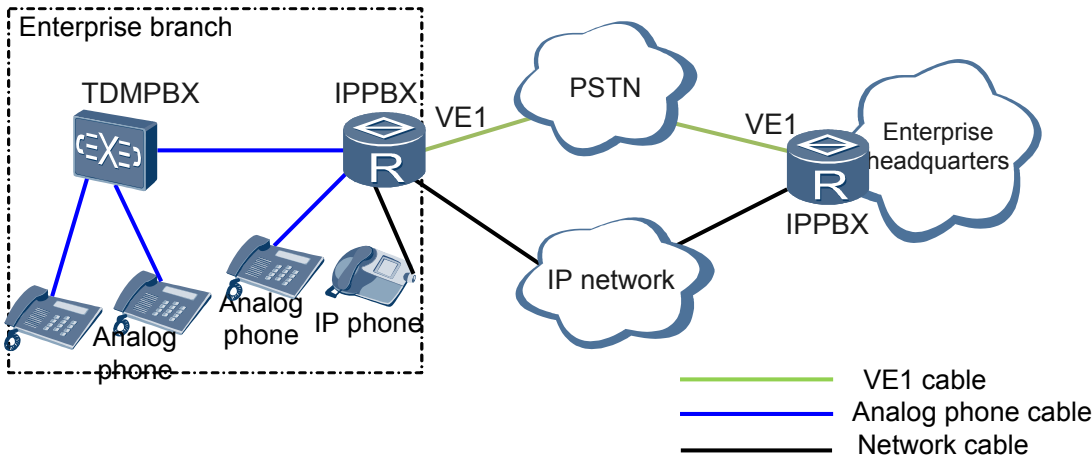


Voice Connection in VE1 Mode

As shown in [Figure 4-48](#), the enterprise headquarters and branch are connected to the PTSN through VE1 interfaces and exchange voice services through the PSTN. When the channelized E1/T1/PRI multifunctional interface card works in VE1 mode, a VE1 line supports a maximum

of 30-channel voice calls. The enterprise headquarters can use multiple VE1 lines to connect to the PSTN and existing TDM PBXs of the enterprise branch.

Figure 4-48 Using VE1 to transmit voice services



Functions and Features

Table 4-68 describes the functions and features of the channelized E1/T1/PRI multifunctional interface card.

Table 4-68 Functions and features of the channelized E1/T1/PRI multifunctional interface card

Function and Feature	Description
Data transmission	Uses E1 or CE1 interfaces to connect to a WAN for data transmission.
	E1 leased lines supports a maximum of 32 channel groups, providing a maximum of 2 Mbit/s bandwidth.
	The 31 timeslots can be randomly bundled into multiple channels at a rate of n multiplied by 64 kbit/s. n is an integer that ranges from 1 to 31.
Multi-service transmission	Separately transmits data, voice, and video services.
WAN aggregation	Uses multiple E1 lines to connect the enterprise headquarters and branch.
ISDN access	Supports various services, including voice, high-speed fax, video conference, intelligent telegraph, and teletext services and provides a maximum of 2 Mbit/s transmission rate.
Flexible and easy deployment	An interface can be flexibly configured as a WAN interface, data interface, or voice interface, which simplifies networking.

Function and Feature	Description
Voice gateway	Functions as a gateway to connect to the PSTN or TDM PBX network, and supports a maximum of 30-channel voice calls.
Investment protection	In VE1 mode, the card can connect to existing TDM PBXs, protecting investments and facilitating expansion.

Indicators and Interfaces

Indicators on the E1T1-M Panel

 **NOTE**

The 1E1T1-M, 2E1T1-M, and 2E1T1-M-W have the same indicators except for having different CE1/PRI interfaces. 2E1T1-M-W is used as an example to describe the indicators.

The 4E1T1-M and 8E1T1-M have the same indicators except for having different CE1 interfaces. 8E1T1-M is used as an example to describe the indicators.

Figure 4-49 shows the indicators on the 2E1T1-M-W panel.

Figure 4-49 Indicators on the 2E1T1-M-W panel

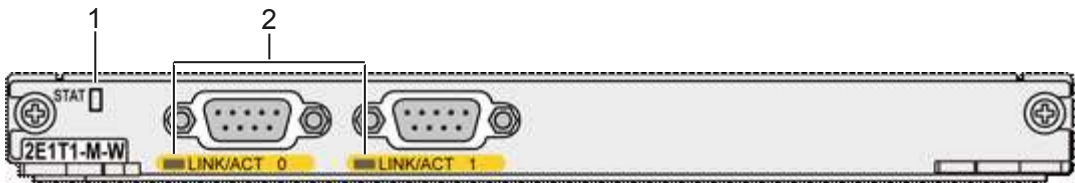


Table 4-69 describes the indicators on the 2E1T1-M-W panel.

Table 4-69 Indicators on the 2E1T1-M-W panel

Number in Figure 4-49	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.

Number in Figure 4-49	Indicator	Color	Description
2	LINK/ACT	Green	Steady on: A link has been established.
		Yellow	Blinking: Data is being transmitted or received.
		Off	Off: There is no connection.

Figure 4-50 shows the indicators on the 8E1T1-M panel.

Figure 4-50 Indicators on the 8E1T1-M panel

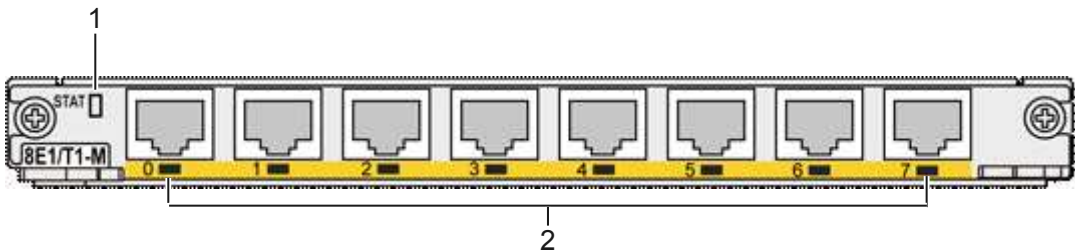


Table 4-70 describes the indicators on the 8E1T1-M panel.

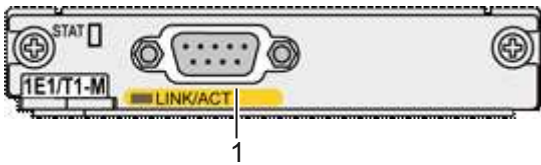
Table 4-70 Indicators on the 8E1T1-M panel

Number in Figure 4-50	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	CE1 interface	Green	Steady on: A link has been established.
		Amber	Blinking: Data is being transmitted or received.
		Off	Off: There is no connection.

Description of Interfaces

Figure 4-51 shows the interfaces on the 1E1T1-M.

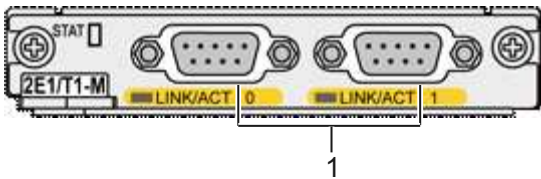
Figure 4-51 Interfaces on the 1E1T1-M



1: One CE1/CT1/PRI interface

Figure 4-52 shows interfaces on the 2E1T1-M.

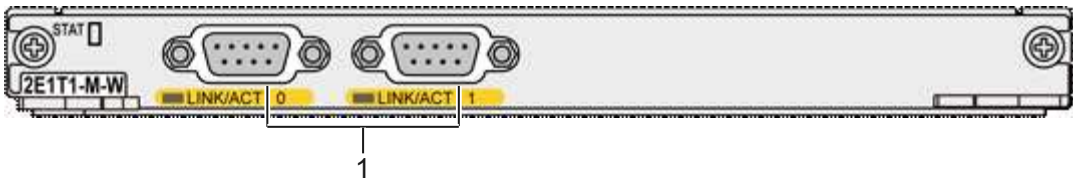
Figure 4-52 Interfaces on the 2E1T1-M



1: Two CE1/CT1/PRI interfaces

Figure 4-53 shows interfaces on the 2E1T1-M-W.

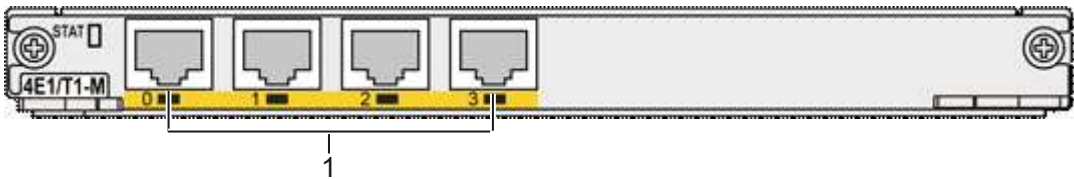
Figure 4-53 Interfaces on the 2E1T1-M-W



1: Two CE1/CT1/PRI interfaces

Figure 4-54 shows the interfaces on the 4E1T1-M.

Figure 4-54 Interfaces on the 4E1T1-M



1: Four CE1 interfaces

Figure 4-55 shows the interfaces on the 8E1T1-M.

Figure 4-55 Interfaces on the 8E1T1-M



1: Eight CE1 interfaces

Channelized E1 interface

An E1 interface is used to transmit voice, data, and video service packets. The 1E1T1-M, 2E1T1-M, and 2E1T1-M-W must be used with 5.7 1E1/T1 Cable. The 4E1T1-M and 8E1T1-M must be used with 5.18 4E1/T1 Cable. Table 4-71 describes the attributes of the E1 interface.

Table 4-71 Attributes of the channelized E1 interface

Attribute	Description
Connector type	1E1T1-M, 2E1T1-M, and 2E1T1-M-W: DB9 4E1T1-M and 8E1T1-M: RJ45
Standards compliance	1E1T1-M, 2E1T1-M, and 2E1T1-M-W: G.703 and G.704 4E1T1-M and 8E1T1-M: G.703
Interface rate	2.048 Mbit/s

Attribute	Description
Cable type	● 1E1T1-M, 2E1T1-M, and 2E1T1-M-W - E1 75-ohm unbalanced coaxial cable - E1 120-ohm balanced twisted pair cable - E1 trunk cable extension ● 4E1T1-M and 8E1T1-M - E1 75-ohm unbalanced transit cable - E1 120-ohm unbalanced transit cable
Working mode	● 1E1T1-M, 2E1T1-M, and 2E1T1-M-W: E1, CE1, ISDN PRI, and VE1 ● 4E1T1-M and 8E1T1-M: E1 and CE1
Function	● 1E1T1-M, 2E1T1-M, and 2E1T1-M-W - Backup - Terminal access - ISDN PRI ● 4E1T1-M and 8E1T1-M - Backup - Terminal access

Channelized T1 interface

A T1 interface is used to transmit voice, data, and video service packets. The 1E1T1-M, 2E1T1-M, and 2E1T1-M-W must be used with [5.7 1E1/T1 Cable](#). [Table 4-72](#) describes the attributes of the fractional channelized T1 interface.

Table 4-72 Attributes of the channelized T1 interface

Attribute	Description
Connector type	DB9
Standards compliance	G.703, G.704
Transmission rate	1.544 Mbit/s
Cable type	T1 100-ohm coaxial cable
Working mode	CT1, ISDN PRI, VT1
Function	● Backup ● Terminal access ● ISDN PRI

Technical Specifications

Table 4-73 describes the technical specifications of the channelized E1/T1/PRI multifunctional interface card.

Table 4-73 Technical specifications of the channelized E1/T1/PRI multifunctional interface card

Item	Specification
Card type	● 1E1T1-M: SIC ● 2E1T1-M: SIC ● 2E1T1-M-W: WSIC ● 4E1T1-M: WSIC ● 8E1T1-M: WSIC
External interfaces	● 1E1T1-M: One CE1/CT1 interface ● 2E1T1-M: Two CE1/CT1 interfaces ● 2E1T1-M-W: Two CE1/CT1 interfaces ● 4E1T1-M: Four CE1 interfaces ● 8E1T1-M: Eight CE1 interfaces
Standards compliance	● 1E1T1-M/2E1T1-M/2E1T1-M-W: - E1/T1 line codec and electrical attributes: ITUT G.703 - E1 line codec: HDB3 - T1: AML, B8ZS - E1/T1 line frame format: ITUT G.704 - E1: CRC Multiframe, DoubleFrame - T1: F12 Frame (Super Frame), F24 Frame (Extended Super Frame) - Channelized E1/T1, unchannelized E1/T1, PRI, and VE1 ● 4E1T1-M/8E1T1-M: - E1 line codec and electrical attributes: ITUT G.703 - E1 line codec: HDB3 - E1 line frame format: ITUT G.704 - E1: CRC Multiframe, DoubleFrame
Transmission rate	● 1E1T1-M/2E1T1-M/2E1T1-M-W: - E1: 2.048 Mbit/s - T1: 1.544 Mbit/s ● 4E1T1-M/8E1T1-M: - E1: 2.048 Mbit/s
Connector type	● 1E1T1-M/2E1T1-M/2E1T1-M-W: DB9 ● 4E1T1-M/8E1T1-M: RJ45

Item	Specification
Cable	● 1E1T1-M/2E1T1-M/2E1T1-M-W: - E1 120-ohm balanced cable - E1 75-ohm unbalanced coaxial cable - T1 100-ohm balanced cable ● 4E1T1-M/8E1T1-M: - E1 120-ohm balanced cable - E1 75-ohm unbalanced coaxial cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): - 1E1T1-M: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 2E1T1-M: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 2E1T1-M-W: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) - 4E1T1-M: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) - 8E1T1-M: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: - 1E1T1-M: 4.7 W (10.36 lb) - 2E1T1-M: 4.8 W (10.58 lb) - 2E1T1-M-W: 4.8 W (10.58 lb) - 4E1T1-M: 11 W (24.25 lb) - 8E1T1-M: 12 W (26.45 lb) ● Weight: - 1E1T1-M: 0.3 kg (0.66 lb) - 2E1T1-M: 0.3 kg (0.66 lb) - 2E1T1-M-W: 0.3 kg (0.66 lb) - 4E1T1-M: 0.6 kg (1.32 lb) - 8E1T1-M: 0.6 kg (1.32 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)

Item	Specification
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1E1T1-M/2E1T1-M/2E1T1-M-W/4E1T1-M/8E1T1-M, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-74 provides the ordering information.

Table 4-74 Ordering information

Part Number	Card Name	Card Description
03020YNU	1E1T1-M	1-Port Channelized E1/T1/PRI/VE1 multifunctional Interface Card
03020YNR	2E1T1-M	2-Port Channelized E1/T1/PRI/VE1 multifunctional Interface Card (SIC)
03021MSX	2E1T1-M-W	2-Port Channelized E1/T1/PRI/VE1 multifunctional Interface Card (WSIC)
03021RCR	4E1T1-M	4-Port Channelized E1/PRI multifunctional Interface Card
03021FXE	8E1T1-M	8-Port Channelized E1/PRI multifunctional Interface Card

4.4.4 1E1T1-F/2E1T1-F/4E1T1-F/8E1T1-F (1/2/4/8-Fractional Channelized E1/T1 WAN Interface Card)

Card Overview



NOTE

- 1/2/4/8: indicates one, two, four, or eight interfaces.
- E1: indicates E1 interfaces.
- T1: indicates T1 interfaces.
- F: indicates fractional channelized E1.

The fractional channelized E1/T1 interface card transmits voice, data, and video service packets, and provides 1-8 E1-F interfaces to connect to a WAN.

Fractional channelized E1/T1 interface cards have four types. [Table 4-75](#) lists the number and type of interfaces on the fractional channelized E1/T1 interface card.

Table 4-75 Number and type of interfaces on the fractional channelized E1/T1 interface card

Card Name	Interface Quantity	Interface Type
1E1T1-F	1	DB9
2E1T1-F	2	DB9
4E1T1-F	4	RJ45

Card Name	Interface Quantity	Interface Type
8E1T1-F	8	RJ45

Table 4-76 describes the differences between the fractional channelized E1/T1 interface card and the channelized E1/T1 interface card.

Table 4-76 Differences between the fractional channelized E1/T1 interface card and the channelized E1/T1 interface card

Card Name	Fractional E1 Mode	Whether to Support the PRI Mode
Fractional channelized interface card	Timeslots of an E1/T1 interface can only be bundled into a channel at a rate of $n \times 64$ kbit/s. n specifies the number of bundled timeslots and ranges from 1 to 31.	No
Channelized interface card	Timeslots of an E1/T1 interface can be bundled into multiple channels.	Yes

Figure 4-56 shows the appearance of the 1E1T1-F.

Figure 4-56 Appearance of the 1E1T1-F

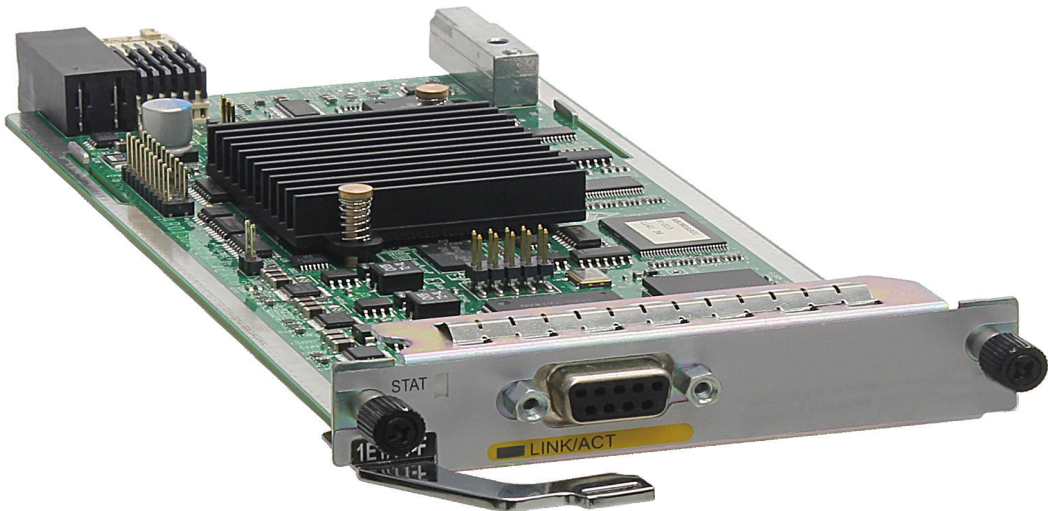


Figure 4-57 shows the appearance of the 2E1T1-F.

Figure 4-57 Appearance of the 2E1T1-F

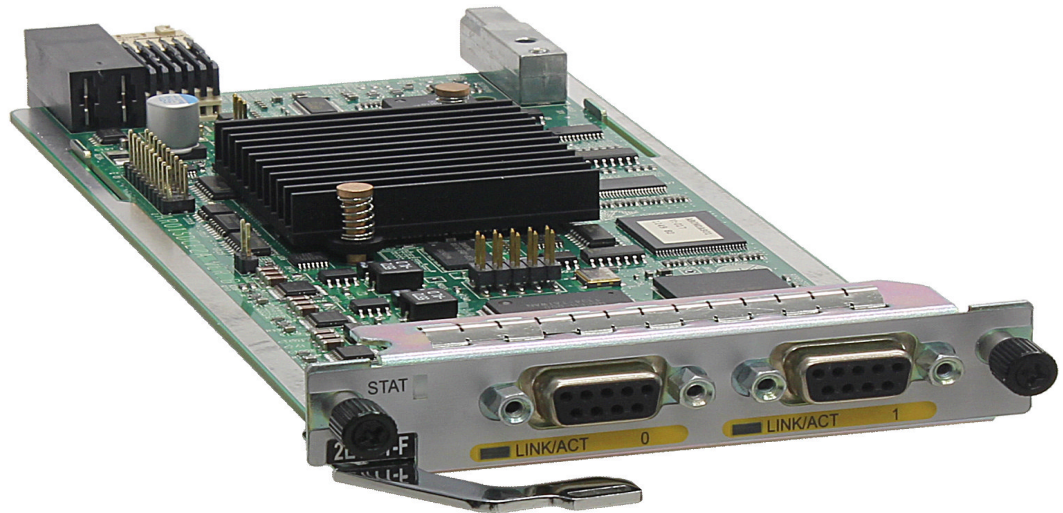


Figure 4-58 shows the appearance of the 4E1T1-F.

Figure 4-58 Appearance of the 4E1T1-F

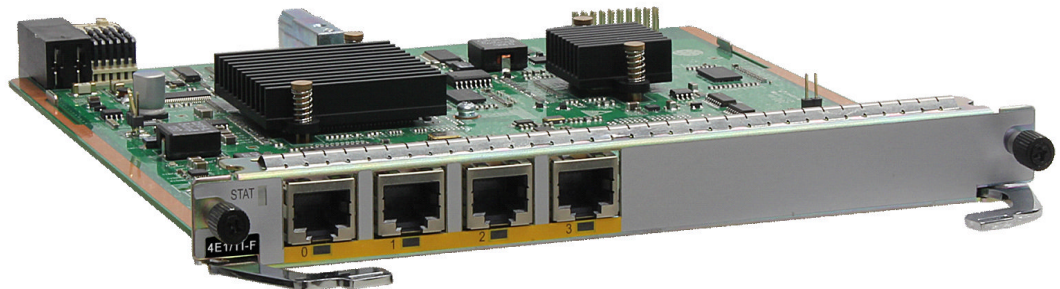
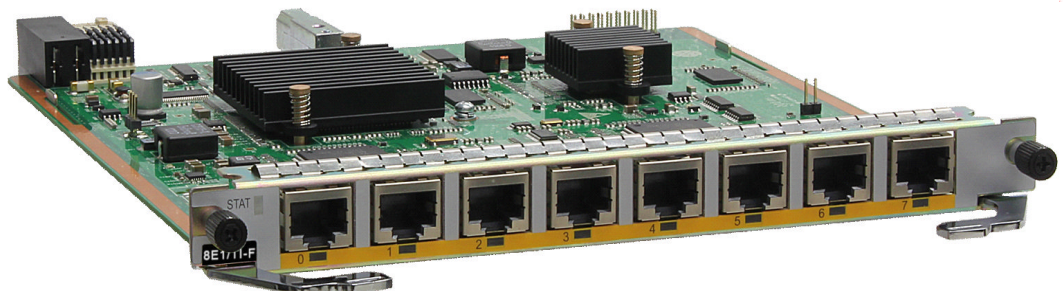


Figure 4-59 shows the appearance of the 8E1T1-F.

Figure 4-59 Appearance of the 8E1T1-F



Version Mapping

Table 4-77 describes the mapping between the fractional channelized E1/T1 interface card and software versions.

Table 4-77 Mapping between the fractional channelized E1/T1 interface card and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1E1T1-F	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions
2E1T1-F	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions
4E1T1-F 8E1T1-F	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions

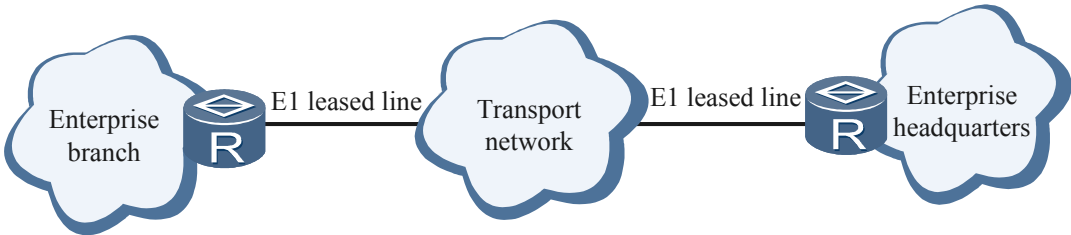
- NOTE
- Y: supported
 - N: not supported

Application

WAN Interconnection

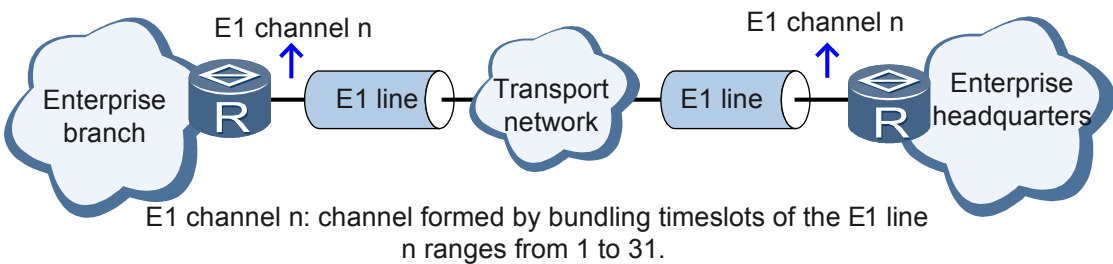
As shown in **Figure 4-60**, the enterprise uses an E1 leased line with a bandwidth of 2 Mbit/s to connect to the transport network to transmit data, voice, and video services exchanged between the enterprise headquarters and branch.

Figure 4-60 Connecting the enterprise headquarters and branch through the E1 leased line



As shown in **Figure 4-61**, the headquarters and branch of an enterprise are connected through the transmission network. A low-rate (512 kbit/s for example) E1 channel is required to transmit services of the enterprise. In this scenario, timeslots in the E1 line need to be bundled into a channel. For example, eight timeslots are bundled to transmit the data service.

Figure 4-61 Connecting the enterprise headquarters and branch through fractional channelized E1



Functions and Features

Table 4-78 describes the functions and features of the fractional channelized E1/T1 interface card.

Table 4-78 Functions and features of the fractional channelized E1/T1 interface card

Function and Feature	Description
Data transmission	Uses E1-F interfaces to connect to a WAN for data transmission.
	Timeslots of an E1 interface can be randomly bundled into a channel at a rate of $n \times 64$ kbit/s at only one time. n specifies the number of bundled timeslots and ranges from 1 to 31.
Interconnection	● In framed mode, an E1-F interface works at a rate of 2 Mbit/s without timeslot division. ● In unframed mode, the line is divided into 32 timeslots that can be bundled into a low-speed E1 channel.
Low-cost access	Compared with channelized E1/T1 interface cards, fractional channelized E1/T1 interface cards have low costs.

Indicators and Interfaces

Indicators on the E1T1-F Panel

 **NOTE**

The 1E1T1-F and 2E1T1-F have the same indicators except for having different E1/T1-F interfaces. 2E1T1-F is used as an example to describe the indicators.

The 4E1T1-F and 8E1T1-F have the same indicators except for having different E1-F interfaces. 8E1T1-F is used as an example to describe the indicators.

Figure 4-62 shows the indicators on the 2E1T1-F panel.

Figure 4-62 Indicators on the 2E1T1-F panel

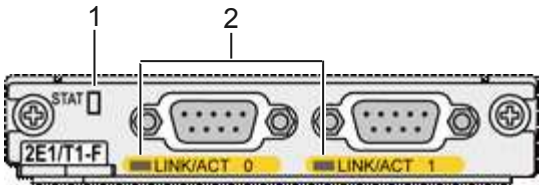


Table 4-79 describes the indicators on the 2E1T1-F panel.

Table 4-79 Indicators on the 2E1T1-F panel

Number in Figure 4-62	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	The software is not running or is being reset.
2	LINK/ACT	Green	Steady on: A link has been established.
		Yellow	Blinking: Data is being transmitted or received.
		Off	There is no connection.

Figure 4-63 shows the indicators on the 8E1T1-F panel.

Figure 4-63 Indicators on the 8E1T1-F panel

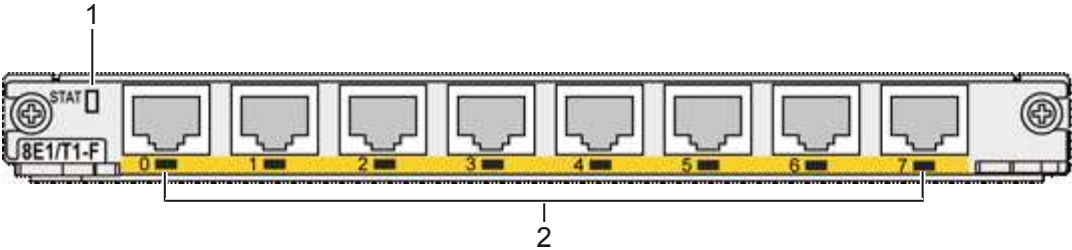


Table 4-80 describes the indicators on the 8E1T1-F panel.

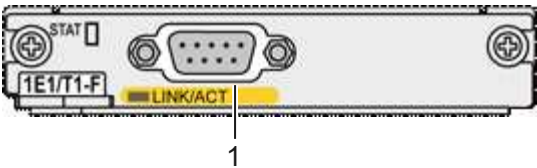
Table 4-80 Indicators on the 8E1T1-F panel

Number in Figure 4-63	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	E1 interface indicator	Green	Steady on: A link has been established.
		Amber	Blinking: Data is being transmitted or received.
		Off	Off: There is no connection.

Description of Interfaces

Figure 4-64 shows the interfaces on the 1E1T1-F.

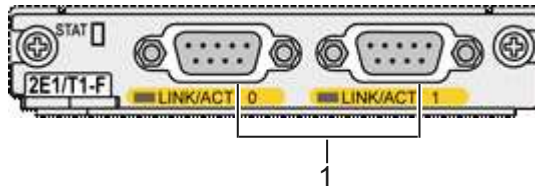
Figure 4-64 Interfaces on the 1E1T1-F



1: One E1/T1-F interface

Figure 4-65 shows interfaces on the 2E1T1-F.

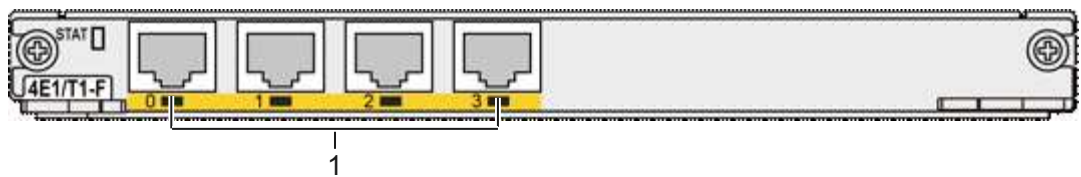
Figure 4-65 Interfaces on the 2E1T1-F



1: Two E1/T1-F interfaces

Figure 4-66 shows the interfaces on the 4E1T1-F.

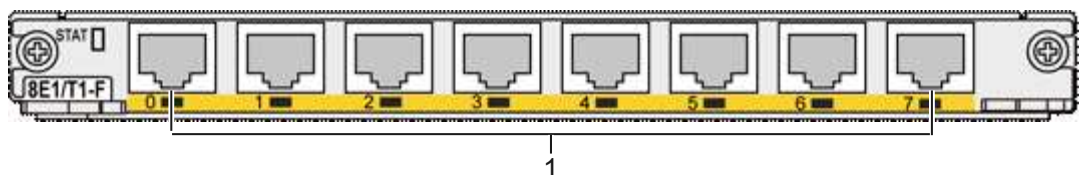
Figure 4-66 Interfaces on the 4E1T1-F



1: Four E1-F interfaces

Figure 4-67 shows the interfaces on the 8E1T1-F.

Figure 4-67 Interfaces on the 8E1T1-F



1: Eight E1-F interfaces

Fractional channelized E1 interface

An E1-F interface is used to transmit data and video service packets. 1E1T1-F/2E1T1-F must be used with [5.7 1E1/T1 Cable](#), and 4E1T1-F/8E1T1-F must be used with [5.18 4E1/T1 Cable](#). [Table 4-81](#) describes the attributes of the E1-F interface.

Table 4-81 Attributes of the fractional channelized E1 interface

Attribute	Description
Connector type	DB9
Standards compliance	G.703, G.704
Transmission rate	2.048 Mbit/s
Cable type	● E1 75-ohm unbalanced coaxial cable ● E1 120-ohm balanced twisted pair cable ● E1 trunk cable extension
Working mode	Fractional channelized E1
Function	● Backup ● Terminal access

Fractional channelized T1 interface

A T1-F interface is used to transmit data and video service packets. 1E1T1-F/2E1T1-F must be used with [5.7 1E1/T1 Cable](#). [Table 4-82](#) describes the attributes of the T1-F interface.

Table 4-82 Attributes of the fractional channelized T1 interface

Attribute	Description
Connector type	DB9
Standards compliance	G.703, G.704
Transmission rate	1.544 Mbit/s
Cable type	T1 100-ohm coaxial cable
Working mode	Fractional channelized T1
Function	● Backup ● Terminal access

Technical Specifications

[Table 4-83](#) describes the technical specifications of the fractional channelized interface card.

Table 4-83 Technical specifications of the fractional channelized interface card

Item	Specification
Card type	● 1E1T1-F: SIC ● 2E1T1-F: SIC ● 4E1T1-F: WSIC ● 8E1T1-F: WSIC
External interfaces	● 1E1T1-F: One E1/T1-F interface ● 2E1T1-F: Two E1/T1-F interfaces ● 4E1T1-F: Four E1-F interfaces ● 8E1T1-F: Eight E1-F interfaces
Standards compliance	1E1T1-F/1E1T1-F: ● E1/T1 line codec and electrical attributes: ITUT G.703 ● E1 line codec: HDB3 ● T1: AMI, B8ZS ● E1/T1 line frame format: ITUT G.704 ● E1: CRC Multiframe, DoubleFrame ● T1: F12 Frame (Super Frame), F24 Frame (Extended Super Frame) 4E1T1-F/8E1T1-F: ● E1 line codec and electrical attributes: ITUT G.703 ● E1 line codec: HDB3 ● E1 line frame format: ITUT G.704 ● E1: CRC Multiframe, DoubleFrame
Transmission rate	● E1: 2.048 Mbit/s ● T1: 1.544 Mbit/s
Connector type	● 1E1T1-F/1E1T1-F: DB9 ● 4E1T1-F/8E1T1-F: RJ45
Cable	1E1T1-F/1E1T1-F: ● E1 120-ohm balanced cable ● E1 75-ohm unbalanced coaxial cable ● T1 100-ohm balanced cable 4E1T1-F/8E1T1-F: ● E1 120-ohm balanced cable ● E1 75-ohm unbalanced coaxial cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel

Item	Specification
Physical specifications	● Dimensions (height x width x depth): - 1E1T1-F: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 2E1T1-F: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 4E1T1-F: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) - 8E1T1-F: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: - 1E1T1-F: 4.7 W (10.36 lb) - 2E1T1-F: 4.8 W (10.58 lb) - 4E1T1-F: 11 W (24.25 lb) - 8E1T1-F: 12 W (26.45 lb) ● Weight: - 1E1T1-F: 0.3 kg (0.66 lb) - 2E1T1-F: 0.3 kg (0.66 lb) - 4E1T1-F: 0.6 kg (1.32 lb) - 8E1T1-F: 0.6 kg (1.32 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1E1T1-F/2E1T1-F/4E1T1-F/8E1T1-F, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-84 provides the ordering information.

Table 4-84 Ordering information

Part Number	Card Name	Card Description
03020YNT	1E1T1-F	1-Port Fractional Channelized E1/T1 WAN Interface Card
03020UDU	2E1T1-F	2-Port Fractional Channelized E1/T1 WAN Interface Card
03021RCS	4E1T1-F	4-Port Fractional E1 WAN Interface Card
03021RCQ	8E1T1-F	8-Port Fractional E1 WAN Interface Card

4.4.5 1E3/CE3/T3/CT3 (1-Port Channelized/Unchannelized E3/T3 WAN Interface Card)

Card Overview

NOTE

Meaning of characters in the card name:

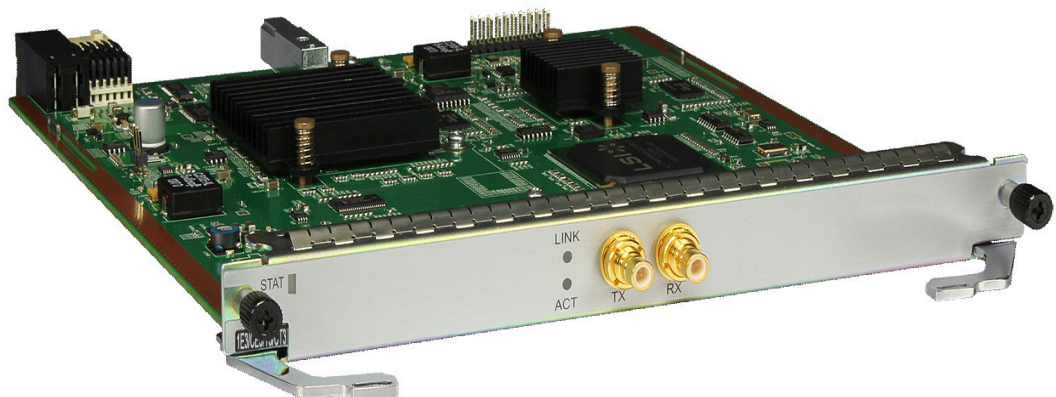
- 1: one interface on the card
- E3: unchannelized E3 interface
- CE3: channelized E3 interface
- T3: unchannelized T3 interface
- CT3: channelized T3 interface

Currently, the 1E3/CE3/T3/CT3 card provides only an unchannelized E3 interface. The CE3/T3/CT3 interface will be supported in later software releases. The card can provide CE3/T3/CT3 interface after the software is upgraded.

A 1E3/CE3/T3/CT3 card is a high-speed WAN access module. This card provides an unchannelized E3 interface, with a transmitter and a receiver. It is installed in a WSIC slot to provide high-speed data transmission.

Figure 4-68 shows the appearance of a 1E3/CE3/T3/CT3 card.

Figure 4-68 1E3/CE3/T3/CT3 card appearance



Version Mapping

Table 4-85 describes the mapping between the 1E3/CE3/T3/CT3 card and software versions of different product models.

Table 4-85 Mapping between the 1E3/CE3/T3/CT3 card and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1E3/CE3/T3/CT3	Y NOTE This card is supported in V200R005C00 and later versions.				

 **NOTE**

- Y: indicates that a product model supports the card.

Application

1E3/CE3/T3/CT3 cards can provide high-speed transmission channels between enterprise headquarters and branches, as shown in [Figure 4-69](#). An E3 channel is not divided into multiple timeslots and provides 34.368 Mbit/s bandwidth.

Figure 4-69 E3 channels between enterprise headquarters and branches



Functions and Features

[Table 4-86](#) describes functions and features of a 1E3/CE3/T3/CT3 card.

Table 4-86 Functions and features of a 1E3/T3 card

Function and Feature	Specification
Data transmission	The E3 interface connects to a WAN to complete data transmission.
	The E3 interface provides a maximum of 34.368 Mbit/s.
Protocol	Supports Frame Relay (FR), Point-to-Point Protocol (PPP), and High-level Data Link Control (HDLC).
	Supports G.751 frame format.

Indicators and Interfaces

Indicator Description

Figure 4-70 shows indicators on a 1E3/CE3/T3/CT3 card.

Figure 4-70 Indicators on a 1E3/CE3/T3/CT3 card

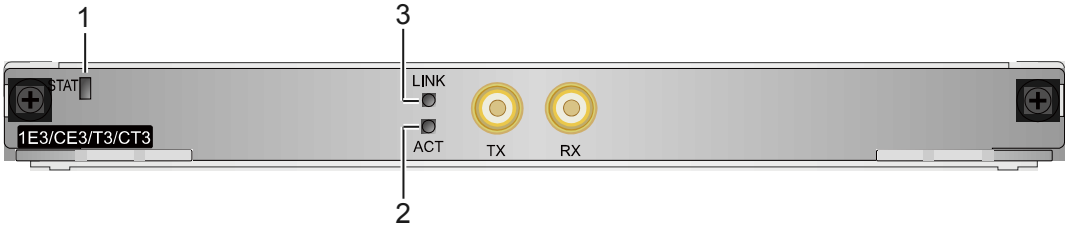


Table 4-87 describes indicators on a 1E3/CE3/T3/CT3 card.

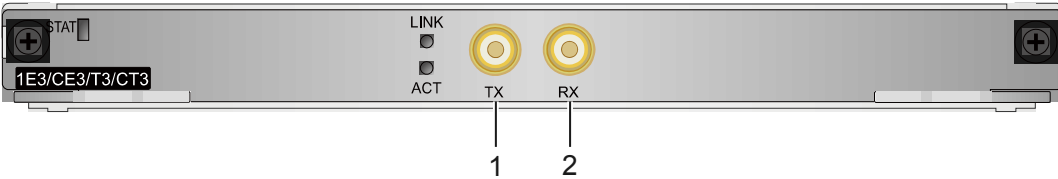
Table 4-87 1E3/CE3/T3/CT3 card indicator description

Number	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system software is running normally. Fast blinking: The card is loading the system software or is resetting.
		Red	Steady on: A fault that affects services has occurred. The fault cannot be rectified automatically and needs to be rectified manually.
		Off	The software is not running or the card is resetting.
2	ACT	Yellow	Blinking: The interface is transmitting and receiving data.
			Off: The interface is not transmitting or receiving data.
3	LINK	Green	Steady on: A link has been established on the interface.
			Off: No link is established on the interface.

Interface Description

Figure 4-71 shows the interface on a 1E3/CE3/T3/CT3 card.

Figure 4-71 Interface on a 1E3/CE3/T3/CT3 card



1. Signal transmitter	2. Signal receiver
-----------------------	--------------------

E3/T3 interface

An E3/T3 interface transmits data and image signals. A 1E3/CE3/T3/CT3 card must use an [5.19 E3/T3 Cable](#). [Table 4-88](#) describes the E3/T3 interface attributes.

Table 4-88 E3/T3 interface attributes

Attribute	Specification
Connector type	SMB
Standards compliance	G.703, G.704, G.751, G.823
Interface speed	34.368 Mbit/s
Cable	E3/T3 cable (75-ohm coaxial cable)
Working mode	E3
Services provided	E3 leased line

Technical Specifications

[Table 4-89](#) lists technical specifications of a 1E3/CE3/T3/CT3 card.

Table 4-89 1E3/CE3/T3/CT3 card technical specifications

Item	Specification
Card type	WSIC
External interface	One E3 interface, with a receiver (RX) and a transmitter (TX)
Standards compliance	G.703, G.704, G.751, G.823
Interface speed	E3: 34.368 Mbit/s
Connector type	SMB

Item	Specification
Cable	E3 cable (75-ohm coaxial cable)
Hot swap	Supported
In-service upgrade	In-service upgrade through system management channel
Physical specifications	● Dimensions (W x D x H): 201 mm x 223.5 mm x 19.82 mm (7.91 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 11.2 W ● Weight: 0.6 kg (1.32 lb)
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-90 provides the ordering information.

Table 4-90 1E3/T3 ordering information

Part Number	Card Name	Card Description
03021QFT	1E3/CE3/T3/CT3	1-Port Channelized/ Unchannelized E3/T3 WAN Interface Card

4.4.6 1SA/2SA (1/2-Port-Synchronous/Asynchronous WAN Interface Card)

Card Overview

 NOTE

- 1/2: indicates one or two interfaces.
- S: indicates synchronous serial interfaces.
- A: indicates asynchronous serial interfaces.

The 1SA/2SA is an enhanced high-speed synchronous/asynchronous serial interface module and an SIC interface card. It works in synchronous or asynchronous mode, and often uses the synchronous mode to implement WAN access.

Table 4-91 lists the number of interfaces on the 1SA and 2SA.

Table 4-91 Number of interfaces on the 1SA and 2SA

Card Name	Interface Quantity
1SA	1
2SA	2

Figure 4-72 shows the appearance of the 1SA.

Figure 4-72 Appearance of the 1SA

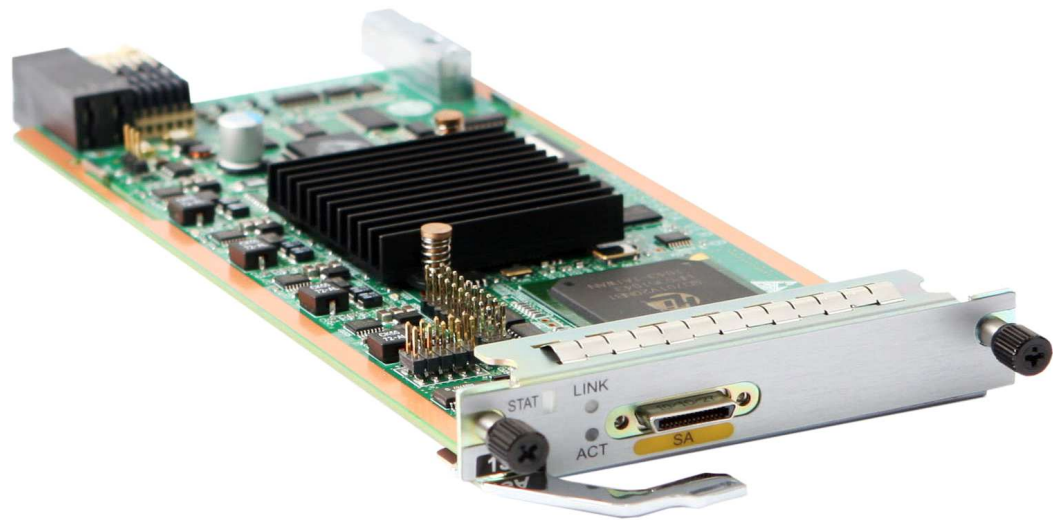
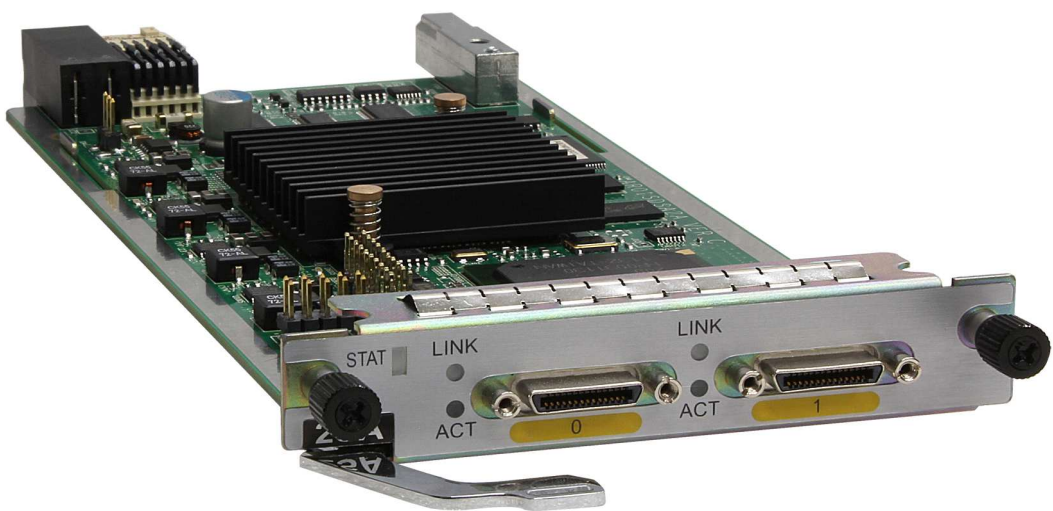


Figure 4-73 shows the appearance of the 2SA.

Figure 4-73 Appearance of the 2SA



Version Mapping

Table 4-92 describes the mapping between the 1SA/2SA and software versions.

Table 4-92 Mapping between the 1SA/2SA and software versions

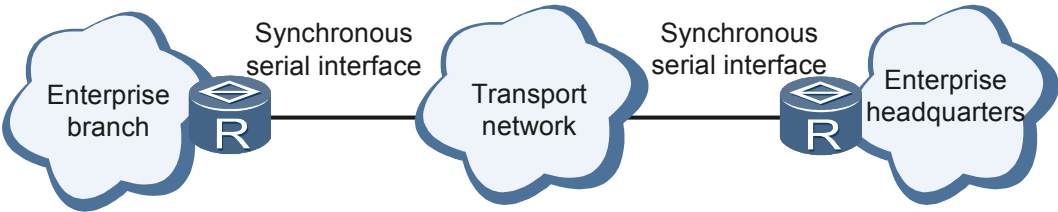
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1SA	Y	Y NOTE V200R003C00 and later versions	Y	Y	Y
2SA	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-74](#), the SA works in synchronous mode. The enterprise can connect to the transport network through synchronous serial interfaces to transmit data services exchanged between the enterprise headquarters and branch with a total bandwidth of 2 Mbit/s.

Figure 4-74 Connecting the enterprise headquarters and branch through synchronous serial interfaces



Functions and Features

[Table 4-93](#) describes the functions and features of the 1SA/2SA.

Table 4-93 Functions and features of the 1SA/2SA

Function and Feature	Description
Synchronous mode	Uses a synchronous serial interface to connect to a WAN.

Function and Feature	Description
	A synchronous serial interface can function as a DCE or DTE. It supports multiple physical layer protocols, such as V.24, V.35, and X.21, but does not support X.21 DCE.
	The maximum rate of V.24 is 64 kbit/s and V.35 is 2.048 Mbit/s.
	Link layer protocols include the Point-to-Point Protocol (PPP), Frame Relay (FR), and High-Level Data Link Control (HDLC).
	Use IP as the network layer protocol.
Asynchronous mode	Supports the RS232 protocol and provides a maximum transmission rate of 115.2 kbit/s.
	Uses the protocol or flow mode.
	In protocol mode, the interfaces support PPP and IP.
	In flow mode, the interfaces do not support link layer protocols or IP.

Indicators and Interfaces

Indicators on the 1SA/2SA Panel

 **NOTE**

The 1SA and 2SA have the same indicators except for having different quantities of interfaces. 2SA is used as an example to describe the indicators.

Figure 4-75 shows the indicators on the 2SA panel.

Figure 4-75 Indicators on the 2SA panel

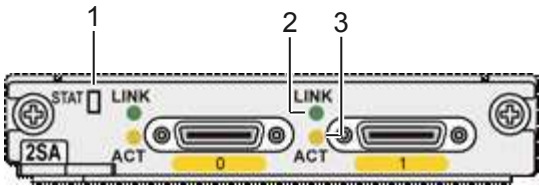


Table 4-94 describes the indicators on the 2SA panel.

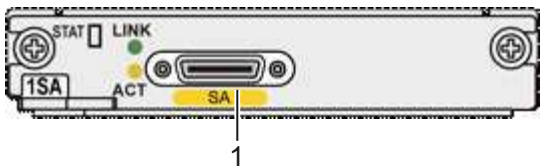
Table 4-94 Indicators on the 1SA/2SA panel

Number in Figure 4-75	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2 and 3	Synchronous/Asynchronous serial interface indicators: ● The LINK indicator is in green. ● The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-76 shows the interfaces on the 1SA panel.

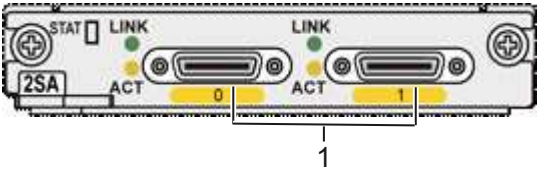
Figure 4-76 Interfaces on the 1SA panel



1: One SA interface

Figure 4-77 shows interfaces on the 2SA panel.

Figure 4-77 Interfaces on the 2SA panel



1: Two SA interfaces

Synchronous/Asynchronous serial (SA) interface

The SA interface in synchronous mode is used to implement interworking between enterprise branches and the headquarters over PPP links. The SA interface in asynchronous mode is used to redirect to another device and must be used with [5.8 Synchronous/Asynchronous Serial Cable](#). [Table 4-95](#) describes the attributes of synchronous/asynchronous serial interfaces.

Table 4-95 Attributes of synchronous/asynchronous serial interfaces

Attribute	Description		
	Synchronous Serial Interface		Asynchronous Serial Interface
Connector type	DB28		
Standards compliance and working mode	● V.24 DTE ● V.24 DCE	● V.35 DTE ● V.35 DCE ● X.21 DTE ● RS449 DTE ● RS449 DCE ● RS530 DTE ● RS530 DCE	RS232
Minimum baud rate (bit/s)	1200	1200	600
Maximum baud rate (bit/s)	64 k	2.048 M	115.2 k

Attribute	Description	
	Synchronous Serial Interface	Asynchronous Serial Interface
Cable type	● V.24 DTE cable ● V.24 DCE cable ● V.35 DTE cable ● V.35 DCE cable ● X.21 DTE cable ● RS449 DTE cable ● RS449 DCE cable ● RS530 DTE cable ● RS530 DCE cable	
Function	DDN leased line	● Modem dial-up ● Backup
	Terminal access	● Asynchronous leased line ● Terminal access

Technical Specifications

Table 4-96 describes the technical specifications of the 1SA/2SA.

Table 4-96 Technical specifications of the 1SA/2SA

Item	Specification
Card type	● 1SA: SIC ● 2SA: SIC
External interfaces	● 1SA: One SA interface ● 2SA: Two SA interfaces
Standards compliance	● Synchronous serial interface: V.35 DCE/DTE, X.21 DTE, V.24 DCE/DTE, RS449 DCE/DTE, RS530 DCE/DTE ● Asynchronous serial interface: RS232 DCE/DTE
Transmission rate	● V.24: 1200 bit/s to 64 kbit/s ● V.35/X.21/RS449/RS530: 1200 bit/s to 2.048 Mbit/s ● RS232: 300 to 115200 bit/s
Connector type	DB28

Item	Specification
Cable	● V.24 DTE cable ● V.24 DCE cable ● V.35 DTE cable ● V.35 DCE cable ● RS449 DTE cable ● RS449 DCE cable ● RS530 DTE cable ● RS530 DCE cable ● X.21 DTE cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): - 1SA: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 2SA: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: - 1SA: 5.5 W - 2SA: 6.2 W ● Weight: - 1SA: 0.3 kg (0.66 lb) - 2SA: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1SA/2SA, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-97 provides the ordering information.

Table 4-97 Ordering information

Part Number	Card Name	Card Description
03020YNB	1SA	1-Port Sync/Async Serial Port Interface Card
03020SAY	2SA	2-Port Sync/Async Serial Port Interface Card

4.4.7 8AS (8-Port-Asynchronous WAN Interface Card)

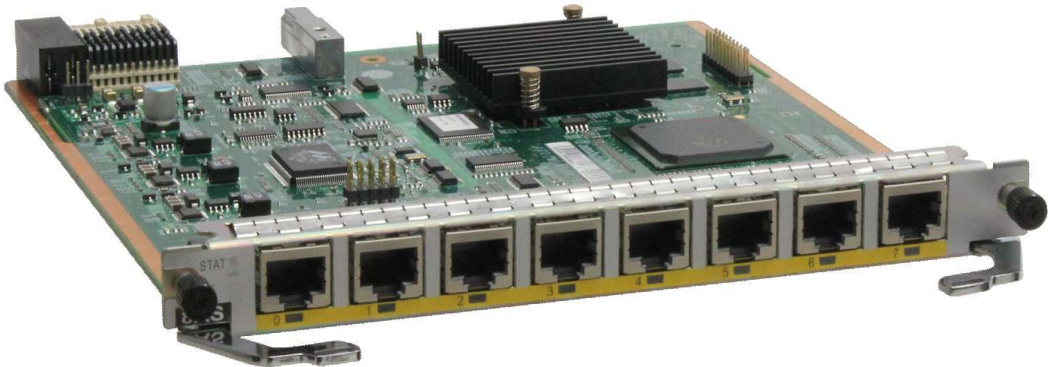
Card Overview

-  **NOTE**
- 8: indicates eight interfaces.
 - AS: indicates asynchronous serial interfaces.

The 8AS is a high-speed asynchronous serial interface module and a WSIC interface card working in protocol or flow mode. The 8AS can connect to the PSTN through a modem or function as a serial port server to implement remote management for terminals.

Figure 4-78 shows the appearance of the 8AS.

Figure 4-78 Appearance of the 8AS



Version Mapping

Table 4-98 describes the mapping between the 8AS and software versions.

Table 4-98 Mapping between the 8AS and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
8AS	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

Application

The 8AS applies to the following scenarios:

- Connecting to the PSTN Through Modems
- Serial Port Server

Connecting to the PSTN Through Modems

As shown in [Figure 4-79](#), enterprise A and enterprise B connect to the PSTN through modems. Enterprise A and enterprise B can send connection requests to each other and establish the connection only when they require communication, which saves enterprise communication expenses.

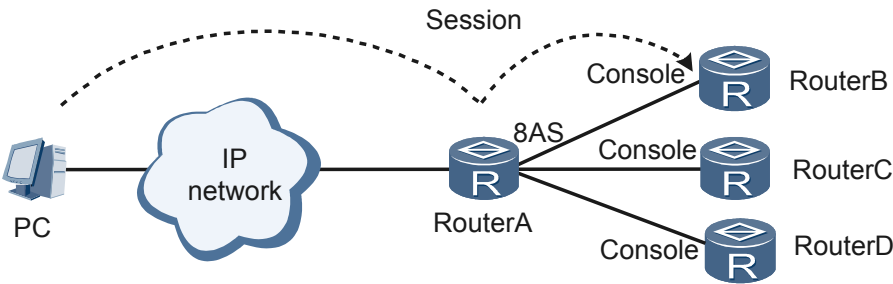
Figure 4-79 Connecting enterprises through modems



Serial Port Server

In telecommunication and financial fields, some terminals provide only access through the serial port or cannot access the Internet using Telnet. The 8AS can be configured as a serial port server to provide the redirection function. As shown in [Figure 4-80](#), you can use a remote PC to configure and manage terminals connected to RouterA.

Figure 4-80 Using the redirection function to manage terminals



Functions and Features

[Table 4-99](#) describes the functions and features of the 8AS.

Table 4-99 Functions and features of the 8AS

Function and Feature	Description
Asynchronous serial interface	Connects to the PSTN through a modem or functions as a serial port server to implement remote management for terminals.

Function and Feature	Description
Basic functions	Functions as a dialup access server for small- and medium-sized ISPs when asynchronous serial interfaces are used for dialup.
	Supports redirection to other devices when the asynchronous serial interface functions as a serial port server.
Interface rate	Supports a maximum of 115.2 kbit/s transmission rate for each asynchronous serial interface.
Protocols supported	● In protocol mode, the asynchronous serial interfaces support PPP and IP. ● In flow mode, the asynchronous serial interfaces do not support link layer protocols or IP.

Indicators and Interfaces

Indicators on the 8AS Panel

Figure 4-81 shows the indicators on the 8AS panel.

Figure 4-81 Indicators on the 8AS panel

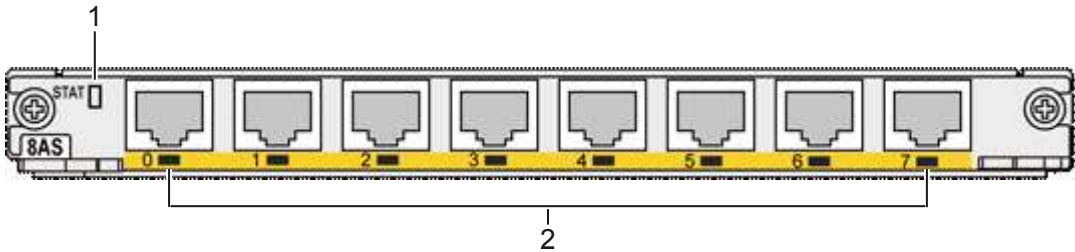


Table 4-100 describes the indicators on the 8AS panel.

Table 4-100 Indicators on the 8AS panel

Number in Figure 4-81	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.

Number in Figure 4-81	Indicator	Color	Description
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	LINK (interface status indicator)	Green	Steady on: A link has been established.
			Off: No link is established.

Description of Interfaces

Figure 4-82 shows the interfaces on the 8AS.

Figure 4-82 Interfaces on the 8AS



1: Eight asynchronous serial interfaces (RJ45)

Asynchronous serial interface

An asynchronous serial interface is one of the most commonly used WAN interface. It can be used to establish an asynchronous leased line or is used for modem dial-up, data backup, or terminal access. The asynchronous serial interface must be used with 5.12 8AS Cable. Table 4-101 describes the attributes of the asynchronous serial interface.

Table 4-101 Attributes of the asynchronous serial interface

Attribute	Description
Connector type	RJ45
Standards compliance and working mode	RS232
Minimum baud rate	300 bit/s
Maximum baud rate	115.2 kbit/s

Attribute	Description
Cable type	Customized RJ45 cable
Function	● Modem dial-up ● Backup ● Asynchronous leased line ● Terminal access

Technical Specifications

Table 4-102 describes the technical specifications of the 8AS.

Table 4-102 Technical specifications of the 8AS

Item	Specification
Card type	WSIC
External interfaces	Eight asynchronous serial interfaces
Standards compliance	RS232
Transmission rate	300 bit/s to 115200 bit/s
Connector type	RJ45
Cable	● Standard network cable ● AUX cable ● Dumb terminal cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 4.7 W ● Weight: 0.6 kg (1.33 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)

Item	Specification
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 8AS, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-103 provides the ordering information.

Table 4-103 Ordering information

Part Number	Card Name	Card Description
03020XBH	8AS	8-Port Async Serial Port Interface Card

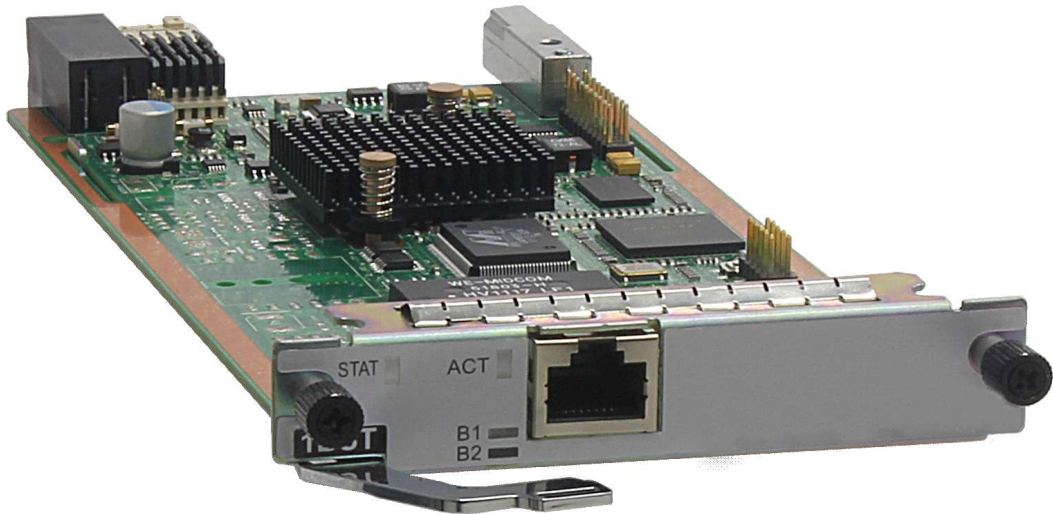
4.4.8 1BST (1-Port-ISDN S/T WAN Interface Card)

Card Overview

The 1BST is an ISDN SIC interface card that connects the enterprise headquarters and branches over the ISDN.

Figure 4-83 shows the appearance of the 1BST.

Figure 4-83 Appearance of the 1BST



Version Mapping

Table 4-104 describes the mapping between the 1BST and software versions.

Table 4-104 Mapping between the 1BST and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1BST	Y NOTE V200R001C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

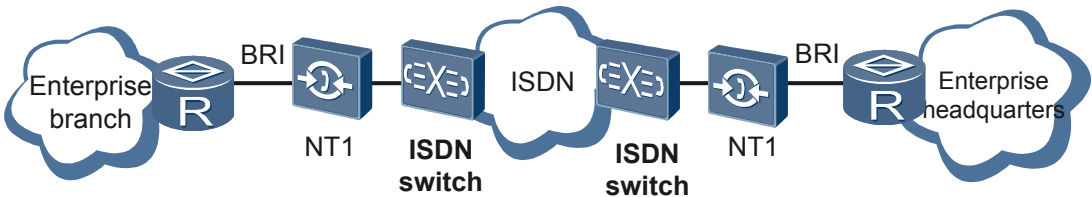
Application

As shown in [Figure 4-84](#), an enterprise can use two modes to connect to the ISDN: BRI leased line and BRI interface dialup. The BRI leased line mode applies to the scenario where a large number of data services need to be transmitted between the enterprise headquarters and branches. The BRI interface dialup mode applies to the scenario where a small number of data services or traffic bursts need to be transmitted between the enterprise headquarters and branches. You can select the two modes based on actual requirements.

 **NOTE**

NT1 implements the ISDN physical layer functions, including subscriber line transmission, loop detection, and D channel preemption.

Figure 4-84 1BST application



Functions and Features

[Table 4-105](#) describes the functions and features of the 1BST.

Table 4-105 Functions and features of the 1BST

Function and Feature	Description
One ISDN BRI interface	Connects to the ISDN through a Network Termination 1 (NT1) device.
	Provides 64 kbit/s or 128 kbit/s connections.
Basic functions	Provides the TE mode to transmit data services.
	Allows you to connect to the ISDN through the BRI leased line or dialup, protecting investments.
Protocols supported	Supports PPP, FR, and IP.

Indicators and Interfaces

Indicators on the 1BST Panel

[Figure 4-85](#) shows the indicators on the 1BST panel.

Figure 4-85 Indicators on the 1BST panel

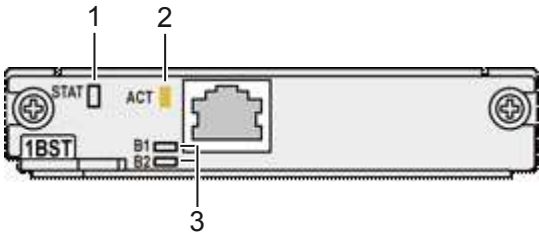


Table 4-106 describes the indicators on the 1BST panel.

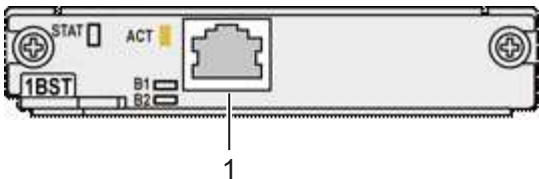
Table 4-106 Indicators on the 1BST panel

Number in Figure 4-85	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	ACT (interface status indicator)	Green	Stead on: The ISDN channel has been activated.
		Off	Off: The ISDN channel in inactive.
3	B1/B2	Green	Blinking: The B1/B2 channel is used.
			Off: The B1/B2 channel is idle.

Description of Interfaces

Figure 4-86 shows the interfaces on the 1BST.

Figure 4-86 Interfaces on the 1BST



1: One ISDN S/T interface

ISDN S/T interface

The ISDN S/T interface connects to the ISDN to transmit data services, and must be used with [5.10 ISDN-ST Cable](#). [Table 4-107](#) describes the attributes of the ISDN S/T interface.

Table 4-107 Attributes of the ISDN S/T interface

Attribute	Description
Connector type	RJ45
Standards compliance	ITU-T I.430, Q.921, Q.931
Transmission rate	192 kbit/s
Bandwidth	0 to 100 MHz
Cable type	● TE: standard ISDN S/T interface cables (straight-through cables) ● NT: ISDN S/T interface crossover cables

Technical Specifications

[Table 4-108](#) describes the technical specifications of the 1BST.

Table 4-108 Technical specifications of the 1BST

Item	Specification
Card type	SIC
External interfaces	One ISDN S/T interface
Standards compliance	ITU-T I.430, Q.921, Q.931
Transmission rate	192 kbit/s
Connector type	RJ45
Cable	● Standard ISDN cable ● ISDN crossover cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel

Item	Specification
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 7.4 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1BST, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-109 provides the ordering information.

Table 4-109 Ordering information

Part Number	Card Name	Card Description
03020YKE	1BST	1-Port ISDN S/T WAN Interface Card

4.4.9 1CPOS-155M (1-Port Channelized POS Interface Card)

Card Overview

 NOTE

- 1: indicates one interface.
- C: indicates channelized interface.
- POS: is short for Packet Over SDH/SONET.
- 155M: indicates a rate of 155 Mbit/s.

The 1CPOS is a WAN aggregation card and has two types: SIC and WSIC. An enterprise branch connects to the SDH through an E1 line, and the enterprise headquarters connects to the E1 line through the 1CPOS. By doing this, the enterprise headquarters and branch are connected through a WAN.

Table 4-110 describes the differences between two types of the 1CPOS.

Table 4-110 List of 1CPOS cards

Card Name	Slot
1CPOS-155M	SIC slot
1CPOS-155M-W	WSIC slot or XSIC slot NOTE In an XSIC slot, the WSIC card is installed in the lower part of the slot. The WSIC card uses the XSIC slot ID as its own slot ID.

Figure 4-87 shows the appearance of the 1CPOS-155M.

Figure 4-87 Appearance of the 1CPOS-155M

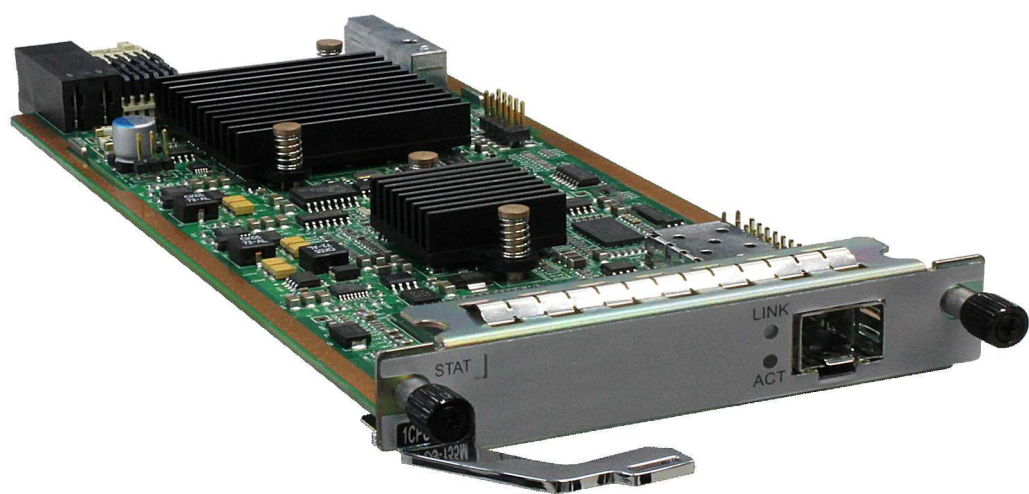


Figure 4-88 shows the appearance of the 1CPOS-155M-W.

Figure 4-88 Appearance of the 1CPOS-155M-W



Version Mapping

Table 4-111 describes the mapping between the 1CPOS-155M and software versions.

Table 4-111 Mapping between the 1CPOS-155M and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1CPOS-155M	N	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

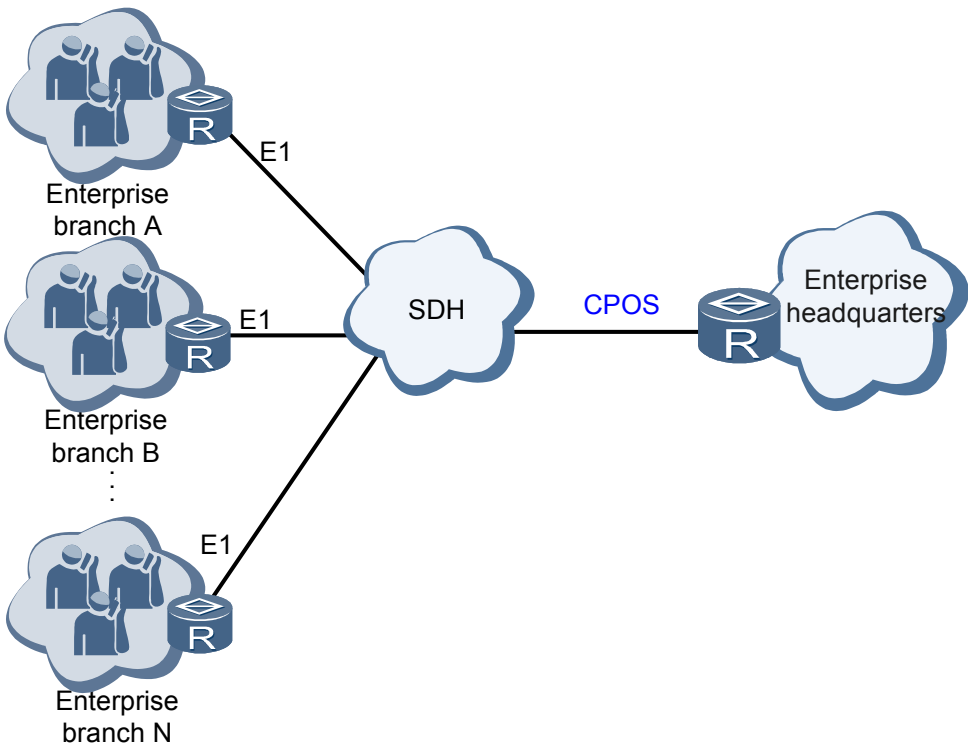
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1CPOS-155 M-W	N	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-89](#), enterprise branches connect to the SDH through E1 lines, and the enterprise headquarters uses the 1CPOS-155M to connect to the SDH. The 1CPOS-155M supports 63 E1 lines and its bandwidth ranges from 2 Mbit/s to 126 Mbit/s (63x2 Mbit/s). Its maximum bandwidth can reach 155 Mbit/s.

Figure 4-89 1CPOS-155M application



Functions and Features

Table 4-112 describes the functions and features of the 1CPOS-155M.

Table 4-112 Functions and features of the 1CPOS-155M

Function and Feature	Description
One channelized POS interface	Supports 63 E1 channels or 84 T1 channels.
	Provides a maximum of 155 Mbit/s bandwidth.
Basic functions	Connects to the SDH to transmit services on multiple E1/T1 lines of branches.
	Flexibly selects bandwidth by bundling E1 channels and reduces enterprise operation costs.
Working mode	Works in channelized or non-channelized E1/T1 mode.
Protocols supported	Supports HDLC and PPP and a maximum of 1024 HDLC channels.

Indicators and Interfaces

Indicators on the 1CPOS-155M Panel

 **NOTE**

The 1CPOS-155M and 1CPOS-155M-W have the same indicators except for having different card types. 1CPOS-155M-W is used as an example to describe the indicators.

Figure 4-90 shows the indicators on the 1CPOS-155M-W panel.

Figure 4-90 Indicators on the 1CPOS-155M-W panel

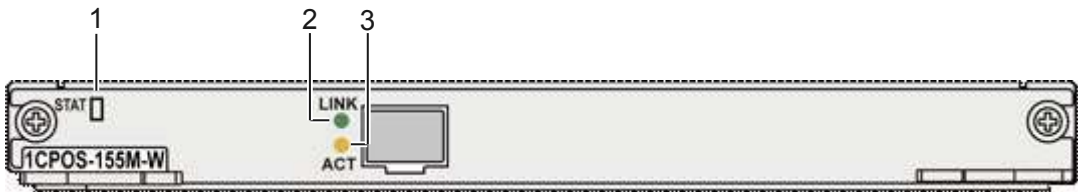


Table 4-113 describes the indicators on the 1CPOS-155M-W panel.

Table 4-113 Indicators on the 1CPOS-155M-W panel

Number in Figure 4-90	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	LINK	Green	Steady on: A link has been established.
			Off: No link is established.
3	ACT	Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-91 shows the interfaces on the 1CPOS-155M.

Figure 4-91 Interfaces on the 1CPOS-155M



1: One Channelized POS interface

Figure 4-92 shows the interfaces on the 1CPOS-155M-W.

Figure 4-92 Interfaces on the 1CPOS-155M-W



1: One Channelized POS interface

CPOS interface

A CPOS interface transmits optical signals at a rate higher than 155 Mbit/s. The CPOS interface must be used with [POS Optical Module](#) and [5.6 Optical Fiber](#). [Table 4-114](#) describes the attributes of the CPOS interface .

Table 4-114 Attributes of the CPOS interface

Attribute	Specification
Connector type	LC/PC
Optical interface attribute	Determined by the selected SFP optical module
Standards compliance	● ITUT G.707 SONET OC-3 ● ITUT G.707 SDH STM-1
Frame format	SDH/SONET
Network protocol	IP

Table 4-115 Attributes of POS optical modules

Model	Trans mission Distance (km)	Fiber Type	Operating Temperature
eSFP-SM1310-155M-2.5 G-15km	≤ 15	● Fiber mode: single-mode ● Connector type: LC	0°C to 70°C
eSFP-1310nm-L-16.1	≤ 40		
eSFP-1550nm-L-16.2	≤ 80		

Table 4-116 Attributes of POS optical modules

Model	Center Wavelength (nm)	Usage Scenario (Service Rate)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-SM1310-155M-2.5 G-15km	1310	622M	-15.0 to -8.0	≤ -31.0	-8.0	8.2
		155M	-15.0 to -8.0	≤ -31.0	-8.0	
eSFP-1310nm-L-16.1	1310	622M	-3.0 to 2.0	≤ -30.0	-8.0	8.5
		155M	-5.0 to 0	≤ -37.0	-10.0	
eSFP-1550nm-L-16.2	1550	622M	-3.0 to 2.0	≤ -30.0	-8.0	8.2
		155M	-5.0 to 0	≤ -37.0	-10.0	

Technical Specifications

Table 4-117 describes the technical specifications of the 1CPOS-155M.

Table 4-117 Technical specifications of the 1CPOS-155M

Item	Specification
Card type	● 1CPOS-155M: SIC ● 1CPOS-155M-W: WSIC
External interfaces	One POS optical interface
Standards compliance	● ITUT G.707 SONET OC-3 ● ITUT G.707 SDH STM-1 ● Channelized E1: 63 channels ● Channelized T1: 84 channels ● AUG-1 supporting AU-3 and AU-4 (default) multiplexing ● 512 logical channels
Transmission rate	155 Mbit/s
Connector type	SFP/LC

Item	Specification
Supported optical module	● Optical Transceiver,SFP,1310nm,STM1,-19 to -14dBm,-30dBm,LC,MM,2km ● Optical Transceiver,eSFP,1310nm,STM1,-15 to -8dBm,-31dBm,LC,SM,15km ● Optical Transceiver,eSFP,1310nm,STM1,-5 to 0dBm,-37dBm,LC,SM,40km ● Optical Transceiver,eSFP,1550nm,STM1,-5 to 0dBm,-37dBm,LC,SM,80km
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth) - 1CPOS-155M: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 1CPOS-155M-W: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption - 1CPOS-155M: 11.9 W - 1CPOS-155M-W: 11.9 W ● Weight - 1CPOS-155M: 0.3 kg (0.66 lb) - 1CPOS-155M-W: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1CPOS-155M/1CPOS-155M-W, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-118 provides the ordering information.

Table 4-118 Ordering information

Part Number	Card Name	Card Description
03021AQU	1CPOS-155M	1-Port 155M Channelized POS Optical Interface Card
03021WWY	1CPOS-155M-W	1-Port 155M Channelized POS Optical Interface Card (WSIC)

4.4.10 3G-HSPA+7 (3G WCDMA HSPA+7 Interface Card)

Card Overview

The 3G-HSPA+7 is a 3G access SIC card. It can function as the primary or backup link of an enterprise to connect to the Internet and transmit voice, video, and data services.

Figure 4-93 shows the appearance of the 3G-HSPA+7.

Figure 4-93 Appearance of the 3G-HSPA+7



Version Mapping

Table 4-119 describes the mapping between the 3G-HSPA+7 and software versions.

Table 4-119 Mapping between the 3G-HSPA+7 and software versions

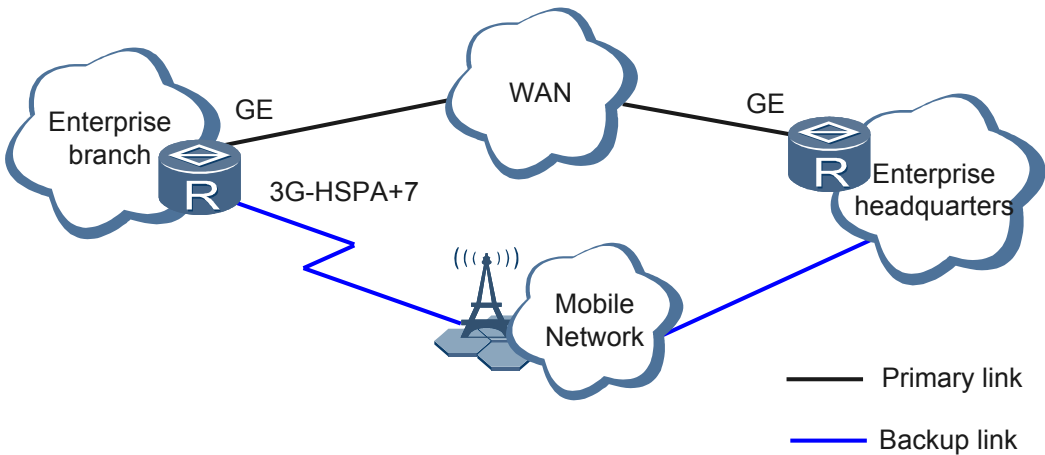
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
3G-HSPA+7	Y NOTE V200R002C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R002C01 and later versions	Y NOTE V200R002C01 and later versions	Y NOTE V200R002C01 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-94](#), the enterprise uses the GE card to connect to the primary link of a WAN and the 3G-HSPA+7 to connect to a 3G network as the backup. When the primary link is faulty, the enterprise can use the backup link to transmit services, improving reliability of interconnection between the enterprise headquarters and branch.

Figure 4-94 3G-HSPA+7 application



Functions and Features

[Table 4-120](#) describes the functions and features of the 3G-HSPA+7.

Table 4-120 Functions and features of the 3G-HSPA+7

Function and Feature	Description
Basic functions	Functions as the primary or backup link of an enterprise to connect to the Internet and transmit enterprise communication services.
	Is often used as a backup link of a WAN, which improves reliability of the connection between the enterprise headquarters and branches.
Good 3G experience	Implements on-demand dialup and provides wireless QoS.
	Provides automatic search at different 3G frequency bands.
	Transmits voice services in PS/CS domains.
	Uses advanced wireless technologies and provides super high-speed 3G wireless experience.
Flexible wireless standards	Flexibly switches between 2G and 3G.
	Supports GSM, GPRS, EDGE, WCDMA, HSPA and HSPA+.
	Provides wireless solutions on LTE migration for carriers and enterprises.

Indicators and Interfaces

Indicators on the 3G-HSPA+7 Panel

Figure 4-95 shows the indicators on the 3G-HSPA+7 panel.

Figure 4-95 Indicators on the 3G-HSPA+7 panel

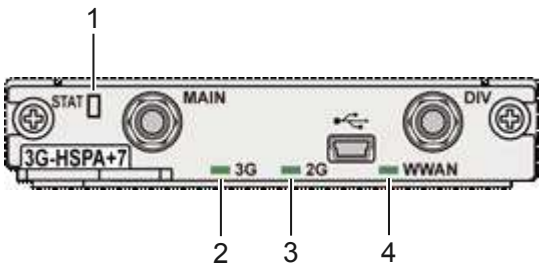


Table 4-121 describes the indicators on the 3G-HSPA+7 panel.

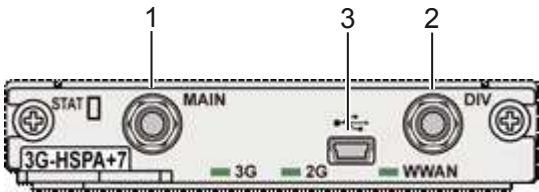
Table 4-121 Indicators on the 3G-HSPA+7 panel

Number in Figure 4-95	Indicator	Color	Description
1	STAT	Green	Stead on: The router has been powered on, but the system software is not running. Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	3G	Green	Stead on: The 3G signal strength is high. Slow blinking: The 3G signals strength is low. Fast blinking: The 3G signals strength is medium. Off: No 3G signal is available.
3	2G	Green	Stead on: The 2G signal strength is high. Slow blinking: The 2G signals strength is low. Fast blinking: The 2G signals strength is medium. Off: No 2G signal is available.
4	WWAN	Green	Stead on: The 3G/2G connection is being established or is active. Blinking: Data is being transmitted or received over the 3G/2G connection. Off: The 3G/2G connection has not been established or is inactive.

Description of Interfaces

Figure 4-96 shows the interfaces on the 3G-HSPA+7.

Figure 4-96 Indicators on the 3G-HSPA+7



1: One primary 3G antenna interface	2: One secondary 3G antenna interface	3. One MiniUSB interface
-------------------------------------	---------------------------------------	--------------------------

Primary/Secondary 3G antenna interface

The primary and secondary 3G antenna interfaces are collectively called 3G interfaces. The two antenna interfaces on a device work together. The primary 3G antenna interface transmit and receive 3G service data, and the secondary 3G antenna interface assists the primary 3G antenna interface in receiving 3G service data. The 3G antenna interfaces must be used with [5.13 3G Antenna](#). [Table 4-122](#) describes the attributes of the 3G antenna interfaces.

Table 4-122 Attributes of the 3G antenna interface

Attribute	Description
Connector type	SMA RF: connects to an antenna to provide wireless access.
Standards compliance and frequency bands supported	GSM/GPRS/EDGE: 850/900/1800/1900 (MHz) HSPA+/HSUPA/HSDPA/WCDMA: 2100/1900/900/850 (MHz)

Attribute	Description
Rate	GSM CS: ● Upstream (Tx): 9.6 kbit/s ● Downstream (Rx): 9.6 kbit/s GPRS/EDGE: Multi-slot Class 12, Class B WCDMA CS: ● Upstream (Tx): 64 kbit/s ● Downstream (Rx): 64 kbit/s WCDMA PS: ● Upstream (Tx): 384 kbit/s ● Downstream (Rx): 384 kbit/s HSPA: ● Upstream (Tx): 5.76 Mbit/s ● Downstream (Rx): 14.4 Mbit/s HSPA+: ● Upstream (Tx): 5.76 Mbit/s ● Downstream (Rx): 21 Mbit/s
Network protocol	GSM/GPRS/EDGE/WCDMA/HSPA/HSPA+

MiniUSB interface

The MiniUSB interface is used to debug a 3G card. [Table 4-123](#) describes the attributes of the MiniUSB interface.

Table 4-123 Attributes of the MiniUSB interface

Attribute	Description
Connector type	MiniUSB-B-R/A
Standards compliance	USB2.0
Working mode	Device

Technical Specifications

[Table 4-124](#) describes the technical specifications of the 3G-HSPA+7.

Table 4-124 Technical specifications of the 3G-HSPA+7

Item	Specification
Card type	SIC

Item	Specification
External interfaces	Two 3G antenna interfaces and one MiniUSB interface
Standards compliance	● GSM/GPRS/EGPRS MSC12/DTM ● WCDMA R5/HSDPA Cat14 21Mbps/HSUPA Cat6 5.76Mbps/HSPA+ R7
Transmission rate	● GSM CS: UL 9.6kbps/DL 9.6kbps ● GPRS/EDGE: Multi-slot Class 12, Class B ● WCDMA CS: UL 64kbps/DL 64kbps ● WCDMA PS: UL 384kbps/DL 384kbps ● UL/DL HSPA: UL 5.76Mbps/DL 7.2Mbps ● UL/DL HSPA+: UL 5.76Mbps/DL 21Mbps
Connector type	BNC
Cable	● Whip omnidirectional antenna ● Indoor Remote antenna
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 7 W ● Weight: 0.2 kg (0.44 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 3G-HSPA+7, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-125 provides the ordering information.

Table 4-125 Ordering information

Part Number	Card Name	Card Description
02310JVX	3G-HSPA+7	3G WAN interface card

4.4.11 3G-EVDO (3G CDMA2000 EVDO Interface Card)

Card Overview

The 3G-EVDO is a CDMA2000 network access module. It is installed in a SIC slot to provide high-speed wireless data transmission, enabling enterprise users to connect to CDMA2000 networks.

Figure 4-97 shows the appearance of a 3G-EVDO card.

Figure 4-97 3G-EVDO card appearance



Version Mapping

Table 4-126 describes the mapping between the 3G-EVDO card and software versions of different product models.

Table 4-126 Mapping between the 3G-EVDO card and software versions

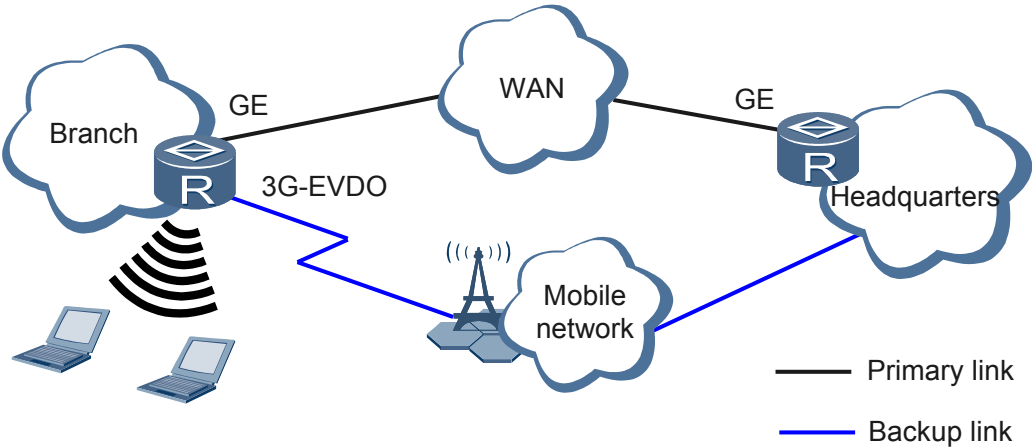
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
3G-EVDO	Y NOTE This card is supported in V200R005C00 and later versions.				

-  NOTE
- Y: indicates that a product model supports the card.

Application

As shown in Figure 4-98, an enterprise's headquarters and branch networks connect to the WAN through GE interfaces and connect to a 3G network through 3G-EVDO interfaces. The WAN link is the primary link, and the 3G link is the backup link. When the primary link fails, service data is transmitted over the 3G backup link. The use of 3G-EVDO cards improves communication reliability between the enterprise headquarters and branch.

Figure 4-98 3G-EVDO card application



Functions and Features

Table 4-127 describes functions and features of a 3G-EVDO card.

Table 4-127 Functions and features of a 3G-EVDO card

Function and Feature	Description
Basic functions	Provides a backup link for a WAN link, to improve communication reliability between an enterprise's headquarters and branch networks.
	Provides a primary link for Internet access.
Excellent 3G experience	Provides wireless QoS guarantee through the dial-on-demand function.
	Automatically scans different 3G frequency bands.
	Delivers fast 3G access service using industry-leading wireless technologies.
Flexible wireless format	Flexibly switches between 2G and 3G formats.
	Complies with CDMA2000 1X, CDMA2000 EV-DO Rev 0, and CDMA2000 EV-DO Rev A.
	Provides CDMA2000 wireless access solution for carriers and enterprises.

Indicators and Interfaces

Indicator Description

Figure 4-99 shows indicators on a 3G-EVDO card.

Figure 4-99 Indicators on a 3G-EVDO card

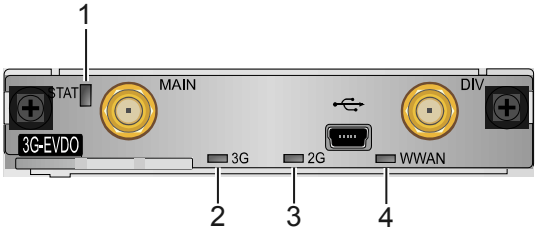


Table 4-128 describes indicators on a 3G-EVDO card.

Table 4-128 3G-EVDO card indicator description

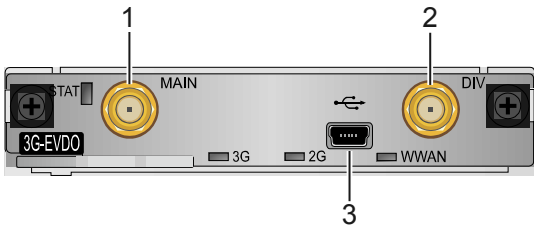
Number	Indicator	Color	Description
1	STAT	Green	Steady on: The card has been powered on, but the system software is not running. Slow blinking: The system software is running normally. Fast blinking: The card is loading the system software or is resetting.
		Red	Steady on: A fault that affects services has occurred. The fault cannot be rectified automatically and needs to be rectified manually.
		Off	The software is not running or the card is resetting.
2	3G	Green	Steady on: The 3G signal strength is high. Slow blinking: The 3G signal strength is low. Fast blinking: The 3G signal strength is medium. Off: No 3G signal is available.

Number	Indicator	Color	Description
3	2G	Green	Steady on: The 2G signal strength is high. Slow blinking: The 2G signal strength is low. Fast blinking: The 2G signal strength is medium. Off: No 2G signal is available.
4	WWAN	Green	Steady on: The 3G/2G connection has been set up and is active. Blinking: Data is being transmitted or received over the 3G/2G connection. Off: The 3G/2G connection has not been established or is inactive.

Interface Description

Figure 4-100 shows interfaces on a 3G-EVDO card.

Figure 4-100 Interfaces on a 3G-EVDO card



1. One 3G primary antenna interface	2. One 3G secondary antenna interface	3. One MiniUSB interface
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3G primary and secondary antenna interfaces

The 3G primary and secondary antenna interfaces on a 3G-EVDO card are called 3G interfaces for short. The 3G interfaces must use [5.13 3G Antenna](#). The primary antenna transmits and receives 3G signals, and the secondary 3G antenna assists the primary antenna. [Table 4-129](#) describes the 3G interface attributes.

Table 4-129 3G interface attributes

Attribute	Description
Connector type	SMA RF: connects to an antenna to provide wireless access.

Attribute	Description
Standards compliance and frequency bands supported	CDMA2000 1x, CDMA2000 1x/EVDO Rev.0, CDMA2000 1x/EVDO Rev A: 800/1900 (MHz)
Rate	CDMA2000 1X: ● Uplink: 153.6 kbit/s ● Downlink: 153.6 kbit/s CDMA2000 1X/EVDO Rev.0: ● Uplink: 153.6 kbit/s ● Downlink: 2.4 Mbit/s CDMA2000 1X/EVDO Rev A: ● Uplink: 1.8 Mbit/s ● Downlink: 3.1 Mbit/s
Network protocol	CDMA2000

MiniUSB interface

The MiniUSB interface is used to debug a 3G card. [Table 4-130](#) describes the attributes of the MiniUSB interface.

Table 4-130 Attributes of the MiniUSB interface

Attribute	Description
Connector type	MiniUSB-B-R/A
Standards compliance	USB2.0
Working mode	Device

Technical Specifications

[Table 4-131](#) lists technical specifications of a 3G-EVDO card.

Table 4-131 3G-EVDO card technical specifications

Item	Specification
Card type	SIC
External interface	Two 3G RF antenna interfaces and one MiniUSB interfaces

Item	Specification
Standards compliance	● 3G RF antenna interface standards: CDMA2000 1X, CDMA2000 1X/EVDO Rev.0, and CDMA2000 1X/EVDO Rev A ● MiniUSB interface standards: USB2.0
Interface speed	CDMA2000 1X: ● Uplink: 153.6 kbit/s ● Downlink: 153.6 kbit/s CDMA2000 1X/EVDO Rev.0: ● Uplink: 153.6 kbit/s ● Downlink: 2.4 Mbit/s CDMA2000 1X/EVDO Rev A: ● Uplink: 1.8 Mbit/s ● Downlink: 3.1 Mbit/s
Connector type	SMA RF
Cable	● Whip omnidirectional antenna ● Indoor remote antenna
Hot swap	Supported
In-service upgrade	In-service upgrade through system management channel
Physical specifications	● Dimensions (W x D x H): 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 7 W ● Weight: 0.2 kg (0.44 lb)
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-132 provides the ordering information.

Table 4-132 3G-EVDO ordering information

Part Number	Card Name	Card Description
03021WXB	3G-EVDO	3G EVDO interface card

4.4.12 LTE-H (WCDMA LTE Data Card)

Card Overview

The LTE-H is a wireless high-speed WAN access module. It is installed in a SIC slot to provide high-speed wireless data transmission, enabling enterprise users to connect to Long Term Evolution (LTE) networks.

Figure 4-101 shows the appearance of a LTE-H card.

Figure 4-101 LTE-H appearance



Version Mapping

Table 4-133 describes the mapping between the LTE-H card and software versions of different product models.

Table 4-133 Mapping between the LTE-H card and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
LTE-H	Y NOTE This card is supported in V200R005C00 and later versions.				

NOTE

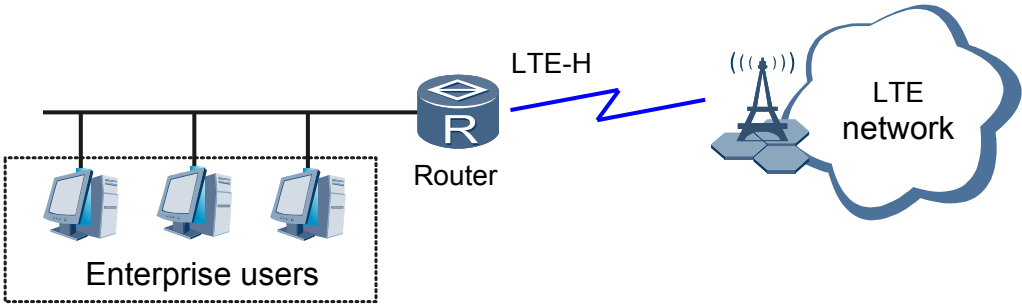
- Y: indicates that a product model supports the card.

Application

Connecting to a LTE Network

As shown in Figure 4-102, enterprise users can connect to a LTE network through a LTE-H card. The LTE-H card provides fast, secure, reliable wireless access service for enterprise users.

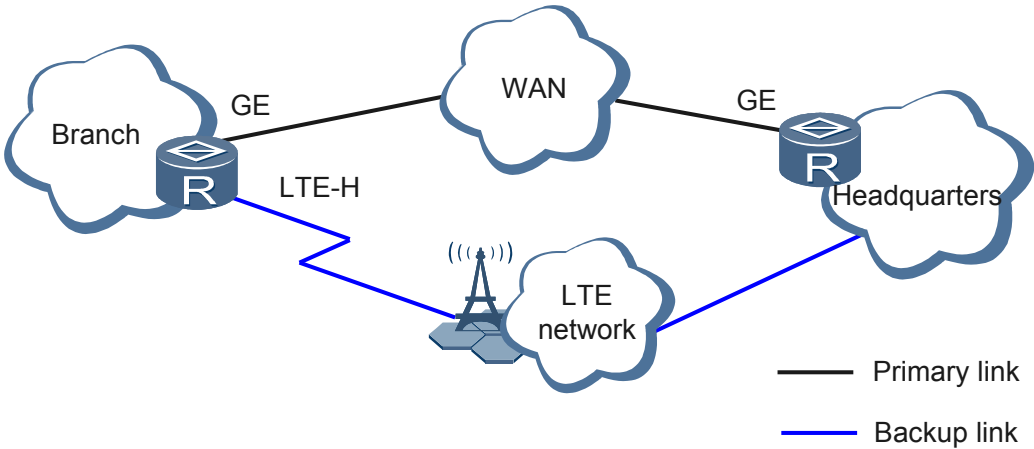
Figure 4-102 LTE network access



Providing a Backup Link for Interconnection

As shown in [Figure 4-103](#), an enterprise's headquarters and branch networks connect to the WAN through GE interface cards and connect to a LTE network through LTE-H cards. The WAN link is the primary link, and the LTE link is the backup link. When the primary link fails, service data is transmitted over the backup link. The use of LTE-H cards improves communication reliability between the enterprise headquarters and branch.

Figure 4-103 LTE link as a backup link



Functions and Features

[Table 4-134](#) describes functions and features of a LTE-H card.

Table 4-134 Functions and features of a LTE-H card

Function and Feature	Description
Basic functions	Dials up to a LTE network to provide high-speed data transmission.

Function and Feature	Description
	Provides a backup link for a WAN link, to improve communication reliability between an enterprise's headquarters and branch networks.
High bandwidth	Supports LTE frequency division duplex (FDD) and provides up to 50 Mbit/s uplink rate and 100 Mbit/s downlink rate.
Excellent 4G experience	Provides wireless QoS guarantee through the dial-on-demand function.
	Automatically scans different 4G frequency bands.
	Delivers fast 4G access service using industry-leading wireless technologies.
Flexible wireless format	Backward compatible with 3G services.
	Supports LTE, WCDMA, and GSM.
	Provides 4G LTE wireless access solution for carriers and enterprises.
Rapid deployment	Allows users to connect to a LTE network as soon as a SIM card is installed on the card.

Indicators and Interfaces

Indicator Description

Figure 4-104 shows indicators on a LTE-H card.

Figure 4-104 Indicators on a LTE-H card

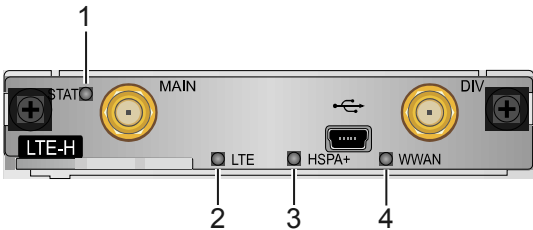


Table 4-135 describes indicators on a LTE-H card.

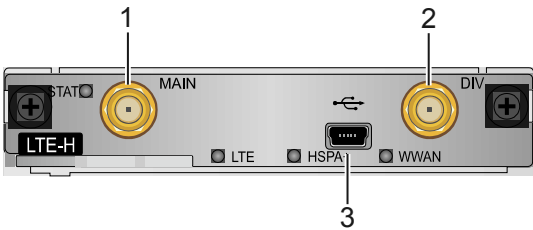
Table 4-135 LTE-H card indicator description

Number	Indicator	Color	Description
1	STAT	Green	Steady on: The card has been powered on, but the system software is not running. Slow blinking: The system software is running normally. Fast blinking: The card is loading the system software or is resetting.
		Red	Steady on: A fault that affects services has occurred. The fault cannot be rectified automatically and needs to be rectified manually.
		Off	The software is not running or the card is resetting.
2	LTE	Green	Steady on: The LTE signal strength is high. Fast blinking: The LTE signal strength is medium. Slow blinking: The LTE signal strength is low. Off: No LTE signal is available.
3	HSPA+	Green	Steady on: The High Speed Packet Access plus (HSPA+) signal strength is high. Fast blinking: The HSPA+ signal strength is medium. Slow blinking: The HSPA+ signal strength is low. Off: No HSPA+ signal is available.
4	WWAN	Green	Steady on: A LTE or HSPA+ link has been set up and is active. Blinking: Data is being transmitted or received over the LTE or HSPA+ link connection. Off: The LTE or HSPA+ link has not been set up and is inactive.

Interface Description

Figure 4-105 shows interfaces on a LTE-H card.

Figure 4-105 Interfaces on a LTE-H card



1. Primary LTE antenna interface	2. Secondary LTE antenna interface	3. MiniUSB interface
----------------------------------	------------------------------------	----------------------

Primary and secondary LTE antenna interfaces

The primary and secondary LTE antenna interfaces are called LTE interfaces for short. They must work with [5.20 LTE Antenna](#). The primary antenna transmits and receives LTE signals, and the secondary antenna helps improve quality of received LTE signals. [Table 4-136](#) lists LTE interface attributes.

Table 4-136 LTE interface attributes

Attribute	Description
Connector type	SMA RF: connects to an antenna to provide wireless access.
Standards compliance and frequency bands supported	● GSM/GPRS/EDGE: 850/900/1800/1900 (MHz) ● WCDMA/HSDPA/HSUPA/HSPA+: Band 1/2/5/8 ● LTE FDD: Band 1/2/3/5/7/8/20
Rate	● Global System for Mobile Communications circuit switched (GSM CS): 14.4 kbit/s uplink rate and 14.4 kbit/s downlink rate ● General packet radio service (GPRS): 85.6 kbit/s uplink rate and 85.6 kbit/s downlink rate ● Enhanced Data Rates for GSM Evolution (EDGE) 236.8 kbit/s uplink rate and 236.8 kbit/s downlink rate ● Wideband Code Division Multiple Access (WCDMA) CS: 64 kbit/s uplink rate and 64 kbit/s downlink rate ● WCDMA packet switched (PS): 384 kbit/s uplink rate and 384 kbit/s downlink rate ● HSPA+: 5.76 Mbit/s uplink rate and 21.6 Mbit/s downlink rate ● DC-HSPA+: 5.76 Mbit/s uplink rate and 42 Mbit/s downlink rate ● LTE FDD: 50 Mbit/s uplink rate and 100 Mbit/s downlink rate
Network protocol	LTE, WCDMA, GSM

MiniUSB interface

The MiniUSB interface is used to debug a 3G card. [Table 4-137](#) describes the attributes of the MiniUSB interface.

Table 4-137 Attributes of the MiniUSB interface

Attribute	Description
Connector type	MiniUSB-B-R/A
Standards compliance	USB2.0
Working mode	Device

Technical Specifications

[Table 4-138](#) lists technical specifications of a LTE-H card.

Table 4-138 LTE-H card technical specifications

Item	Specification
Card type	SIC
External interface	One primary LTE antenna interface, one secondary LTE antenna interface, and one MiniUSB interface.
Standards compliance	LTE/HSPA+/EDGE/GPRS/GSM
Interface speed	LTE FDD: ● Uplink: 50 Mbit/s ● Downlink: 100 Mbit/s
Connector type	SMA RF
Cable	● Whip omnidirectional antenna ● Indoor remote antenna
Hot swap	Supported
In-service upgrade	In-service upgrade through system management channel
Physical specifications	● Dimensions (W x D x H): 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 7 W ● Weight: 0.2 kg (0.44 lb)

Item	Specification
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-139 provides the ordering information.

Table 4-139 LTE-H ordering information

Part Number	Card Name	Card Description
03021WXD	1LTE-H	WCDMA LTE data card

4.4.13 4GEW-T (4-Port 1000BASE-RJ45-L3 Ethernet WAN Interface Card)

Card Overview

-  **NOTE**
- 4: indicates four interfaces.
 - GE: indicates 1000M Ethernet.
 - W: indicates WAN interface card.
 - T: indicates the electrical interface.

The 4GEW-T is a high-speed WAN access module and provides four GE electrical interfaces to connect to a WAN, which improves network reliability and increases bandwidth.

Figure 4-106 shows the appearance of the 4GEW-T.

Figure 4-106 Appearance of the 4GEW-T



Version Mapping

Table 4-140 describes the mapping between the 4GEW-T and software versions.

Table 4-140 Mapping between the 4GEW-T and software versions

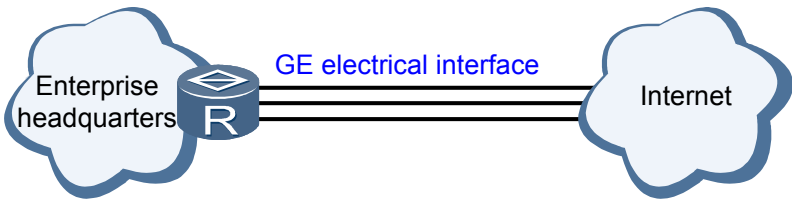
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
4GEW-T	Y NOTE V200R002C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R002C01 and later versions	Y NOTE V200R002C01 and later versions	Y NOTE V200R002C01 and later versions

-  NOTE
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-107](#), the enterprise headquarters uses two GE electrical interfaces to connect to the Internet, which improves network reliability and increases bandwidth.

Figure 4-107 WAN uplink



Functions and Features

[Table 4-141](#) describes the functions and features of the 4GEW-T.

Table 4-141 Functions and features of the 4GEW-T

Function and Feature	Description
Four GE electrical interfaces	The four GE electrical interfaces can connect to a WAN, which improves network reliability and increases bandwidth.
Layer 3 protocols	IPv4, IPv6, and MPLS.

Indicators and Interfaces

Indicators on the 4GEW-T Panel

Figure 4-108 shows the indicators on the 4GEW-T panel.

Figure 4-108 Indicators on the 4GEW-T panel

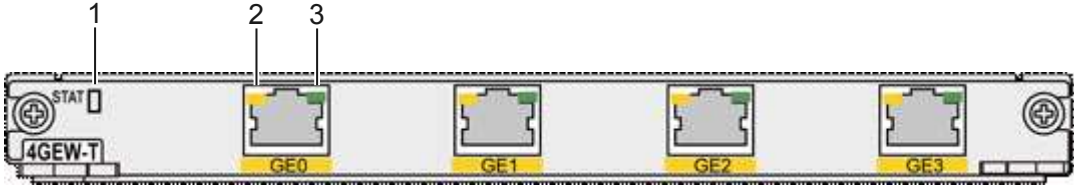


Table 4-142 describes the indicators on the 4GEW-T panel.

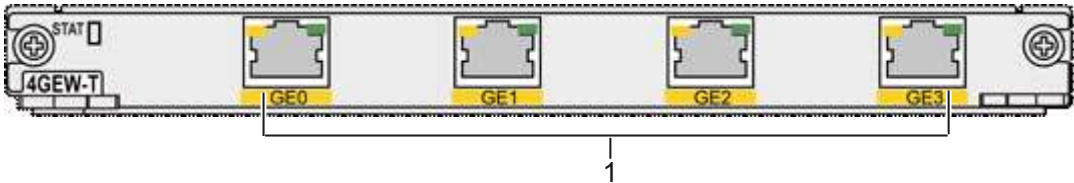
Table 4-142 Indicators on the 4GEW-T panel

Number in Figure 4-108	Indicator	Color	Description
1	STAT	Green	Stead on: The router has been powered on, but the system software is not running. Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2 and 3	GE interface indicators: ● The LINK indicator is in green. ● The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-109 shows the interfaces on the 4GEW-T.

Figure 4-109 Interfaces on the 4GEW-T



1: Four GE electrical interfaces

GE Electrical Interface

A GE electrical interface (100Base-TX/1000Base-T Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a 5.5 Network Cable. Table 4-143 lists GE electrical interface attributes.

Table 4-143 GE electrical interface attributes

Attribute	Description
Connector type	RJ45
Interface attribute	MDI/MDIX NOTE - A medium dependent interface (MDI) provides the physical and electrical connection to the cabling medium. Ethernet interfaces of most NICs are MDIs. - A medium dependent interface crossover (MDIX) enables connection between like devices. MDIX interfaces are usually used on hubs or LAN switches.
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Technical Specifications

Table 4-144 describes the technical specifications of the 4GEW-T.

Table 4-144 Technical specifications of the 4GEW-T

Item	Specification
Card type	WSIC
External interfaces	Four GE electrical interfaces

Item	Specification
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	10/100/1000 Mbit/s, in auto-sensing mode
Connector type	RJ45
Cable	Ethernet cable (Electrical interfaces support MDI.)
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 11 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 4GEW-T, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-145 provides the ordering information.

Table 4-145 Ordering information

Part Number	Card Name	Card Description
03021LCU	4GEW-T	4-port 1000BASE-RJ45-L3 Ethernet WAN interface card

4.4.14 4GEW-S (4-Port 1000BASE-SFP-L3 Ethernet WAN Interface Card)

Card Overview

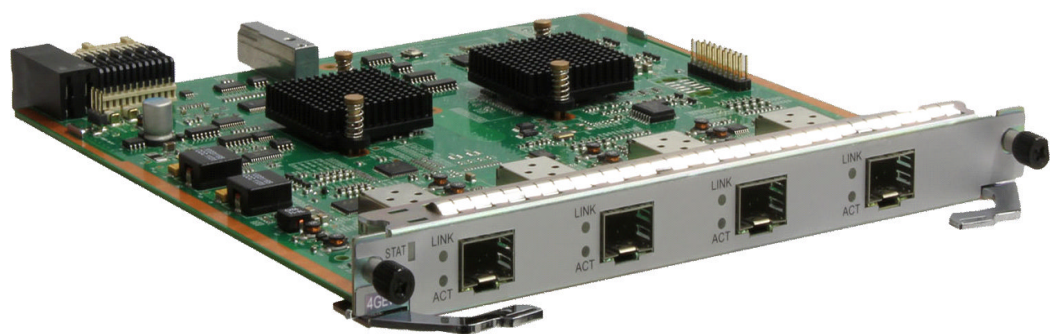
NOTE

- 4: indicates four interfaces.
- GE: indicates 1000M Ethernet.
- W: indicates WAN interface card.
- S: indicates the optical interface.

The 4GEW-S is a high-speed WAN access module and provides four GE optical interfaces to connect to a WAN, which improves network reliability, increases bandwidth, and implements long-distance transmission.

Figure 4-110 shows the appearance of the 4GEW-S.

Figure 4-110 Appearance of the 4GEW-S



Version Mapping

Table 4-146 describes the mapping between the 4GEW-S and software versions.

Table 4-146 Mapping between the 4GEW-S and software versions

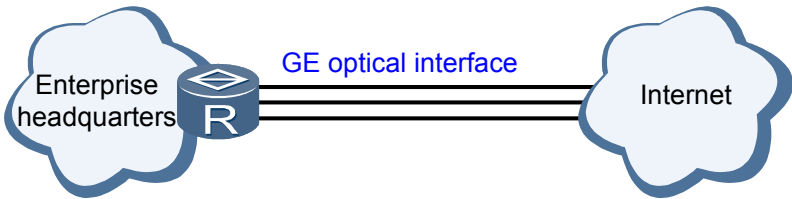
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
4GEW-S	Y NOTE V200R002C 01 and later versions	Y NOTE V200R003C 00 and later versions	Y NOTE V200R002C 01 and later versions	Y NOTE V200R002C 01 and later versions	Y NOTE V200R002C 01 and later versions

-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in Figure 4-111, the enterprise headquarters uses two GE optical interfaces to connect to the Internet, which improves network reliability and increases bandwidth. Compared with 4GEW-T, 4GEW-S provides longer transmission distance.

Figure 4-111 WAN uplink



Functions and Features

Table 4-147 describes the functions and features of the 4GEW-S.

Table 4-147 Functions and features of the 4GEW-S

Function and Feature	Description
Four GE optical interfaces	The interfaces connect to an Ethernet WAN, which improves network reliability, increases bandwidth, and implements long-distance transmission.
Layer 3 protocols	IPv4, IPv6, and MPLS.

Indicators and Interfaces

Indicators on the 4GEW-S Panel

Figure 4-112 shows the indicators on the 4GEW-S panel.

Figure 4-112 Indicators on the 4GEW-S panel

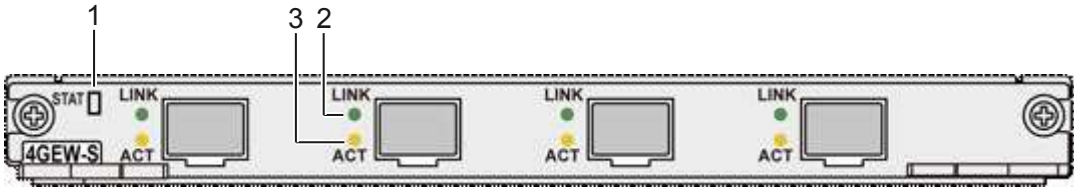


Table 4-148 describes the indicators on the 4GEW-S panel.

Table 4-148 Indicators on the 4GEW-S panel

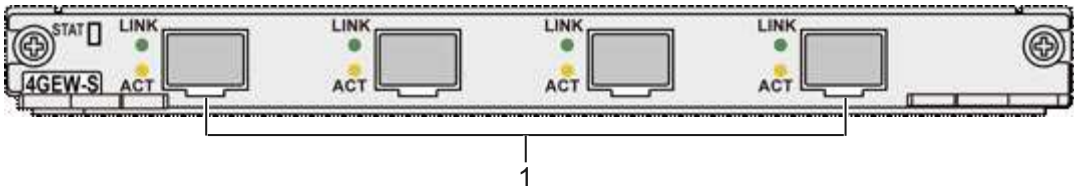
Number in Figure 4-112	Indicator	Color	Description
1	STAT	Green	Stead on: The router has been powered on, but the system software is not running. Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.

Number in Figure 4-112	Indicator	Color	Description
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2 and 3	GE interface indicators: ● The LINK indicator is in green. ● The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-113 shows the interfaces on the 4GEW-S.

Figure 4-113 Interfaces on the 4GEW-S



1: Four GE optical interfaces

GE optical interface(100/1000BASE-TX Ethernet Optical Interface)

A GE optical interface (100Base-FX/1000Base-X Interface) transmits service data at 100 Mbit/s or 1000 Mbit/s. It works with a [GE Optical Module](#) and [5.6 Optical Fiber](#). [Table 4-149](#) lists GE optical interface attributes.

Table 4-149 GE optical interface attributes

Attribute	Description
Connector type	LC/SC/FC

Attribute	Description
Optical interface attribute	Depending on the optical module used
Standards compliance	IEEE 802.3z
Frame format	Ethernet_II, Ethernet_SAP, Ethernet_SNAP
Network protocol	IP

Table 4-150 Attributes of GE optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
eSFP-GE-SX-MM850	≤ 0.5	1000base-SX	● Fiber mode: multimode ● Pattern bandwidth: 400 MHz*km ● Core diameter: 50 μm ● Connector type: LC	0°C to 70°C
SFP-GE-LX-SM1310	≤ 10	1000base-LX/LH	● Fiber mode: single-mode ● Connector type: LC	
S-SFP-GE-LH40-SM1310	≤ 40			
S-SFP-GE-LH40-SM1550				
S-SFP-GE-LH80-SM1550	≤ 80	1000base-ZX		
eSFP-GE-ZX100-SM1550	≤ 100			
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	≤ 10	1000base-BX		
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)				
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	≤ 40			
LE2MGSC40ED0 (Single-fiber bidirectional optical module)				

Table 4-151 Attributes of GE optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-GE-SX-MM850	850	-9.5 to -2.5	≤ -17.0	0	9
SFP-GE-LX-SM1310	1310	-9.0 to -3.0	≤ -20.0	-3.0	9
S-SFP-GE-LH40-SM1310	1310	-5.0 to 0	≤ -23	-3.0	6
S-SFP-GE-LH40-SM1550	1550	-5.0 to 0	≤ -22	-3.0	8.5
S-SFP-GE-LH80-SM1550	1550	-2.0 to 5.0	≤ -23.0	-3.0	9
eSFP-GE-ZX100-SM1550	1550	0 to 5	≤ -30.0	-9.0	8
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	TX1310/ RX1490	-9.0 to -3.0	≤ -19.5	-3.0	6
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)	RX1310/ TX1490	-9.0 to -3.0	≤ -19.5	-3.0 6	6
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	TX1310/ RX1490	-2.0 to 3.0	≤ -23	-3.0	9
LE2MGSC40ED0 (Single-fiber bidirectional optical module)	RX1310/ TX1490	-2.0 to 3.0	≤ -23	-3.0	9

Technical Specifications

Table 4-152 describes the technical specifications of the 4GEW-S.

Table 4-152 Technical specifications of the 4GEW-S

Item	Specification
Card type	WSIC
External interfaces	Four GE optical interfaces
Standards compliance	IEEE802.3, IEEE802.3u, IEEE802.3ab
Transmission rate	1000 Mbit/s
Connector type	SFP
Cable	● 62.5/125 μm multi-mode fiber, center wavelength 850 nm ● 9/125 μm single-mode fiber, center wavelength 1310 nm ● 9/125 μm single-mode fiber, center wavelength 1550 nm
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 8 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 4GEW-S, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-153 provides the ordering information.

Table 4-153 Ordering information

Part Number	Card Name	Card Description
03021LXK	4GEW-S	4-Port 1000BASE-SFP-L3 Ethernet WAN interface card

4.4.15 1STM1/1STM4 (1-Port-155M/622M POS Optical Interface Card)

Card Overview

1STM series cards are high-speed WAN access modules and WSIC interface cards. They can connect to the SDH at a rate of 155 or 622 Mbit/s, and are often used on MANs and WANs.

Table 4-154 describes the differences between two types of the 1STM series cards.

Table 4-154 Differences between two types of the 1STM series cards

Card Name	Rate
1STM1	155 Mbit/s
1STM4	622 Mbit/s

Figure 4-114 shows the appearance of the 1STM1.

Figure 4-114 Appearance of the 1STM1

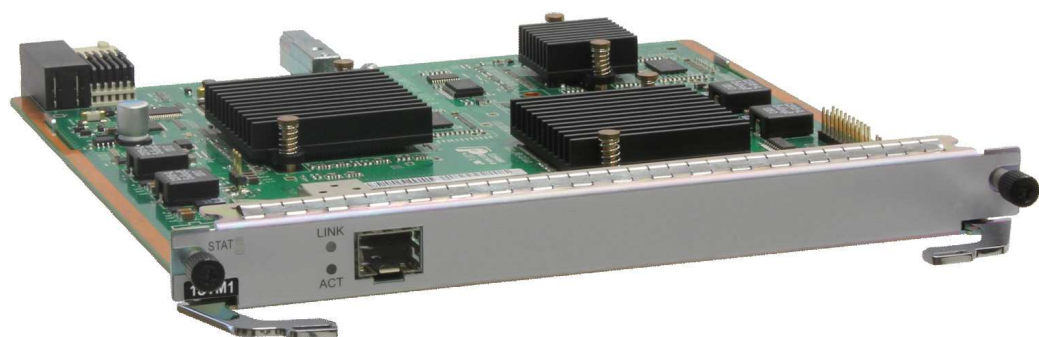


Figure 4-115 shows the appearance of the 1STM4.

Figure 4-115 Appearance of the 1STM4



Version Mapping

Table 4-155 describes the mapping between the 1STM series and software versions.

Table 4-155 Mapping between the 1STM series and software versions

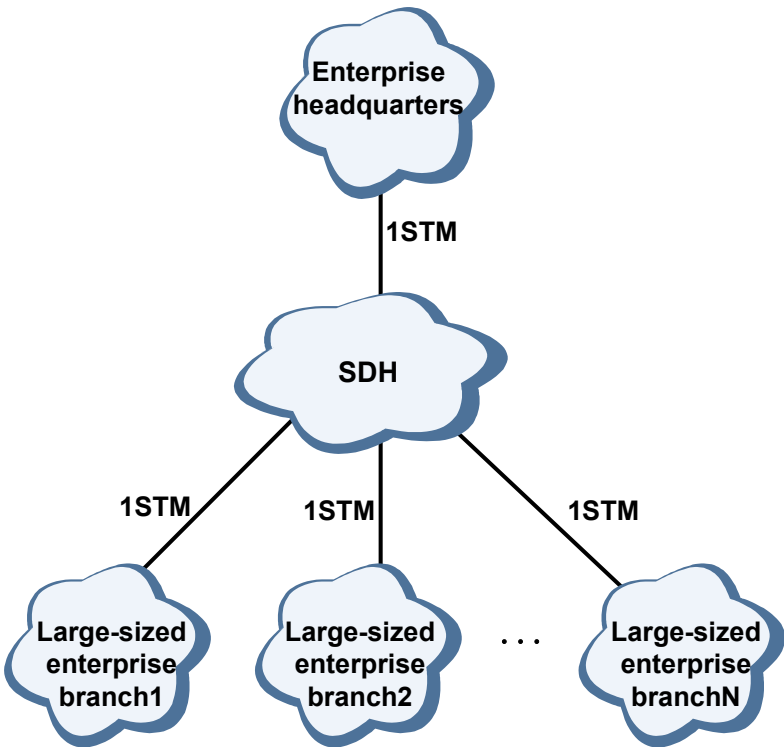
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1STM1	N	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions
1STM4	N	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-116, large- and medium-sized enterprise branches and enterprise headquarters can use 1STM to connect to the SDH/SONET network to implement high-speed and long-distance point-to-point transmission of IP data services.

Figure 4-116 1STM application



Functions and Features

Table 4-156 describes the functions and features of the 1STM series.

Table 4-156 Functions and features of the 1STM series

Function and Feature	Description
Basic functions	Connects to the SDH with high bandwidth, and efficiently and securely transmits IP data.
	Provides transmission rates of 155 Mbit/s and 622 Mbit/s.
Protocols supported	Complies with SDH or SONET.
	Supports HDLC, PPP, and FR.

Indicators and Interfaces

Indicators on the 1STM1 Panel

 **NOTE**
The 1STM1 and 1STM4 have the same indicators. 1STM1 is used as an example to describe the indicators.

Figure 4-117 shows the indicators on the 1STM1 panel.

Figure 4-117 Indicators on the 1STM1 panel

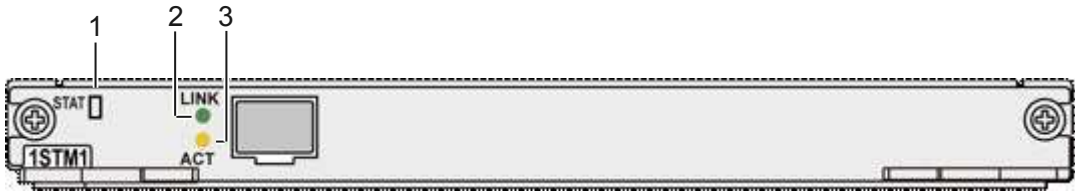


Table 4-157 describes the indicators on the 1STM1 panel.

Table 4-157 Indicators on the 1STM1 panel

Number in Figure 4-117	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting. Stead on: The card is powered on but the system software is not running.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Orange	Steady on: The card is installed in the slot.
2 and 3	SFP interface indicators: ● The LINK indicator is in green. ● The ACT indicator is in yellow.	Green	Steady on: A link has been established.
			Off: No link is established.
		Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-118 shows the interfaces on the 1STM1.

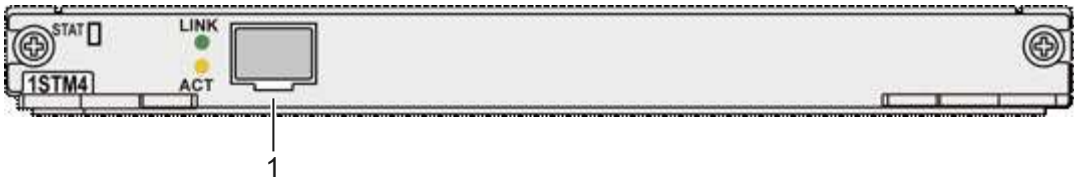
Figure 4-118 Interfaces on the 1STM1



1: One 155M POS optical interface

Figure 4-119 shows the interfaces on the 1STM4.

Figure 4-119 Interfaces on the 1STM4



1: One 622M POS optical interface

A POS optical interface provides high-speed and reliable point-to-point data connections, and must be used with **POS Optical Module** and **5.6 Optical Fiber**. **Table 4-158** describes the attributes of the POS optical interface.

Table 4-158 Attributes of the POS optical interface

Attribute	Description
Connector type	LC/PC
Optical interface attribute	Determined by the selected SFP optical module
Standards compliance	STM-1
Frame format	SDH/SONET
Network protocol	IP

Table 4-159 Attributes of POS optical modules

Model	Trans mission Distance (km)	Fiber Type	Operating Temperature
eSFP-SM1310-155M-2.5 G-15km	≤ 15	● Fiber mode: single-mode ● Connector type: LC	0°C to 70°C
eSFP-1310nm-L-16.1	≤ 40		
eSFP-1550nm-L-16.2	≤ 80		

Table 4-160 Attributes of POS optical modules

Model	Center Wavelength (nm)	Usage Scenario (Service Rate)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-SM1310-155M-2.5G-15km	1310	622M	-15.0 to -8.0	≤ -31.0	-8.0	8.2
		155M	-15.0 to -8.0	≤ -31.0	-8.0	
eSFP-1310nm-L-16.1	1310	622M	-3.0 to 2.0	≤ -30.0	-8.0	8.5
		155M	-5.0 to 0	≤ -37.0	-10.0	
eSFP-1550nm-L-16.2	1550	622M	-3.0 to 2.0	≤ -30.0	-8.0	8.2
		155M	-5.0 to 0	≤ -37.0	-10.0	

Technical Specifications

Table 4-161 describes the technical specifications of the 1STM series.

Table 4-161 Technical specifications of the 1STM series

Item	Specification
Card type	WSIC
External interfaces	One POS optical interface
Standards compliance	● ITUT G.707 SONET OC-3 ● ITUT G.707 SONET SDH STM-1 ● ITUT G.707 SONET SDH STM-4
Transmission rate	● 1STM1: 155Mbit/s ● 1STM4: 622Mbit/s
Connector type	SFP/LC

Item	Specification
Cable	● Optical Transceiver,eSFP,1310nm,STM1,-15 to -8dBm,-31dBm,LC,SM,15km ● Optical Transceiver,eSFP,1310nm,STM1,-5 to 0dBm,-37dBm,LC,SM,40 km ● Optical Transceiver,eSFP,1550nm,STM1,-5 to 0dBm,-37dBm,LC,SM,80km ● Optical Transceiver,eSFP,1310nm,STM4,-15 to -8dBm,-31dBm,LC,SM,15km ● Optical Transceiver,eSFP,1310nm,STM4,-3 to 2dBm,-30dBm,LC,SM,40 km ● Optical Transceiver,eSFP,1550nm,STM4,-3 to 2dBm,-30dBm,LC,SM,80km
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 12 W ● Weight: 0.6 kg (1.33 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1STM1/1STM4, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-162 provides the ordering information.

Table 4-162 Ordering information

Part Number	Card Name	Card Description
03021RJW	1STM1	1-Port 155M Packet over SDH/Sonet Optical Interface Card
03021XHD	1STM4	1-Port 622M Packet over SDH/Sonet Optical Interface Card

4.4.16 4E1-IMA (4-Port-E1 ATM IMA Interface Card)

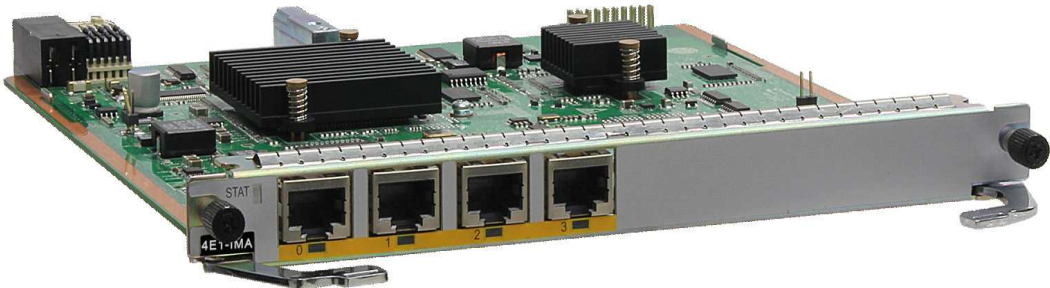
Card Overview

-  **NOTE**
- 4: indicates four interfaces.
 - E1: indicates E1 interfaces.
 - IMA: is short for Inverse Multiplexing for ATM.

The 4E1-IMA is a WAN connection module and an WSIC interface card. It uses inverse multiplexing over ATM (IMA) to bundle multiple E1 lines to form a high-bandwidth IMA group link. The IMA group link transmits multimedia services for enterprises.

Figure 4-120 shows the appearance of the 4E1-IMA.

Figure 4-120 Appearance of the 4E1-IMA



Version Mapping

Table 4-163 describes the mapping between the 4E1-IMA and software versions.

Table 4-163 Mapping between the 4E1-IMA and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
4E1-IMA	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R003C00 and later versions

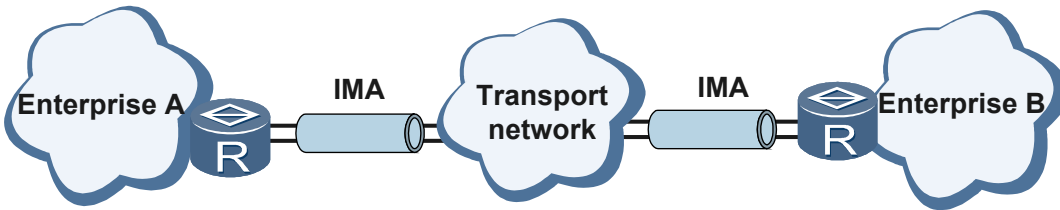
-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in Figure 4-121, enterprise A and enterprise B are connected through two E1-IMA links. On large-sized enterprises, as multimedia services develop and a large number of documents need to be transmitted, a single E1 line cannot meet requirements. E1-IMA provides

higher bandwidth. For example, cell flows of 8 Mbit/s can be transmitted by multiplexing four E1 lines. E1-IMA allows you to flexibly adjust the network and reduces enterprise costs.

Figure 4-121 Connecting enterprises through E1-IMA



Functions and Features

Table 4-164 describes the functions and features of the 4E1-IMA.

Table 4-164 Functions and features of the 4E1-IMA

Function and Feature	Description
Basic functions	Uses IMA to transmit ATM cell streams at a high rate.
	● Transmit end: Distributes ATM cell streams over multiple low-speed link. ● Receive end: Multiplexes the links to restore the cell streams.
Flexible bandwidth adjustment	The multiplexed E1 links can be added and deleted anytime, meeting various bandwidth requirements.
Low cost	Transmits ATM cell streams on multiple T1 or E1 lines at a high rate, preventing high expenses for network upgrade due to traffic burst.
ATM transmission advantages	Provides traffic management, fault tolerance capability, compatibility with traditional devices, and QoS.

Indicators and Interfaces

Indicators on the 4E1-IMA Panel

Figure 4-122 shows the indicators on the 4E1-IMA panel.

Figure 4-122 Indicators on the 4E1-IMA panel

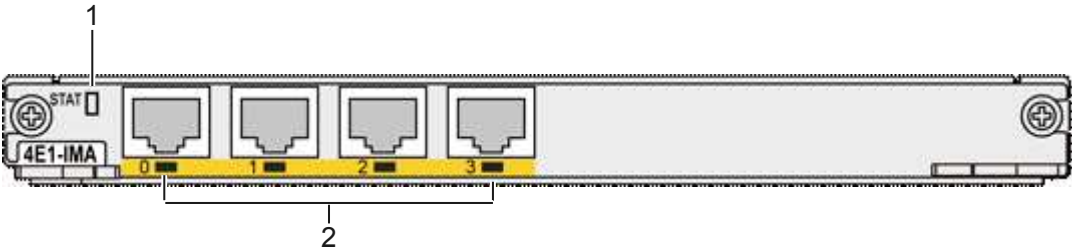


Table 4-165 shows the indicators on the 4E1-IMA panel.

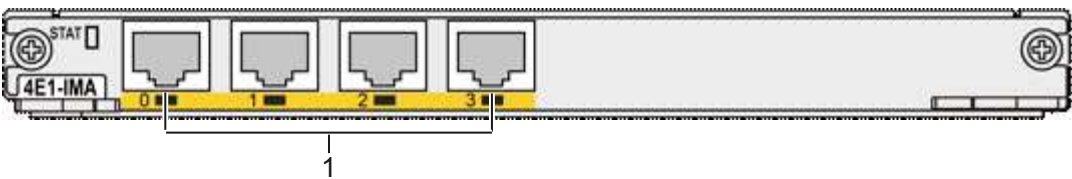
Table 4-165 Indicators on the 4E1-IMA panel

Number in Figure 4-122	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	E1-IMA interface indicator	Green	Steady on: A link has been established.
		Amber	Blinking: Data is being transmitted or received.
		Off	Off: There is no connection.

Description of Interfaces

Figure 4-123 shows the interfaces on the 4E1-IMA.

Figure 4-123 Interfaces on the 4E1-IMA



1: Four E1-IMA interfaces

E1-IMA interface

An E1-IMA interface is used to transmit ATM cells at a high rate and must be used with [5.18 4E1/T1 Cable](#). [Table 4-166](#) describes the attributes of the E1-IMA interface.

Table 4-166 Attributes of the E1-IMA interface

Attribute	Description
Connector type	RJ45
Standards compliance	ITU-G.703, ITU-G.704
Transmission rate	2.048 Mbit/s
Cable type	● E1 75-ohm unbalanced transit cable ● E1 120-ohm unbalanced transit cable
Working mode	● ATM E1 independent mode ● IMA bundling mode
Protocols supported	PPPoA, PPPoEoA, IPoA, IPoEoA
Supported service type	CBR/VBR-rt/VBR-nrt/UBR
Function	AAL5

Technical Specifications

[Table 4-167](#) describes the technical specifications of the 4E1-IMA.

Table 4-167 Technical specifications of the 4E1-IMA

Item	Specification
Card type	WSIC
External interfaces	E1-IMA interface
Standards compliance	● E1 line codec and electrical attributes: ITUT G.703 ● E1 line codec: HDB3 ● E1 line frame format: ITUT G.704 ● E1: CRC Multiframe, DoubleFrame ● IMA: af-phy-0086.001

Item	Specification
Transmission rate	E1: 2.048 Mbit/s
Connector type	RJ45
Cable	● E1 120-ohm balanced cable ● E1 75-ohm unbalanced coaxial cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 12 W ● Weight: 0.6 kg (1.33 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 4E1-IMA, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-168 provides the ordering information.

Table 4-168 Ordering information

Part Number	Card Name	Card Description
03021RCT	4E1-IMA	4-port E1 Inverse Multiplexing for ATM Interface Card

4.5 Voice Interface Card

4.5.1 2BST (2-Port-ISDN S/T Voice Interface Card)

Card Overview

The 2BST is a voice access module and an SIC or WSIC interface card. It can connect to the ISDN to transmit voice services of internal enterprise users and external ISDN users.

2BST cards have two types: SIC and WSIC. **Table 4-169** lists the slots where the SIC card and WSIC card are installed.

Table 4-169 Slots of 2BST SIC and WSIC cards

Card Name	Slot
2BST	SIC slot

Card Name	Slot
2BST-W	WSIC slot or XSIC slot NOTE In an XSIC slot, the WSIC card is installed in the lower part of the slot. The WSIC card uses the XSIC slot ID as its own slot ID.

Table 4-170 lists the differences between the 1BST and 2BST.

Table 4-170 Differences between the 1BST and 2BST

Card Name	Interface Quantity	Usage Scenario	Mode	Feed Supported
2BST	Two S/T interfaces	Voice services	NT	-40 V feed
1BST	One S/T interface	Data services	TE	Not supported

Figure 4-124 shows the appearance of the 2BST.

Figure 4-124 Appearance of the 2BST

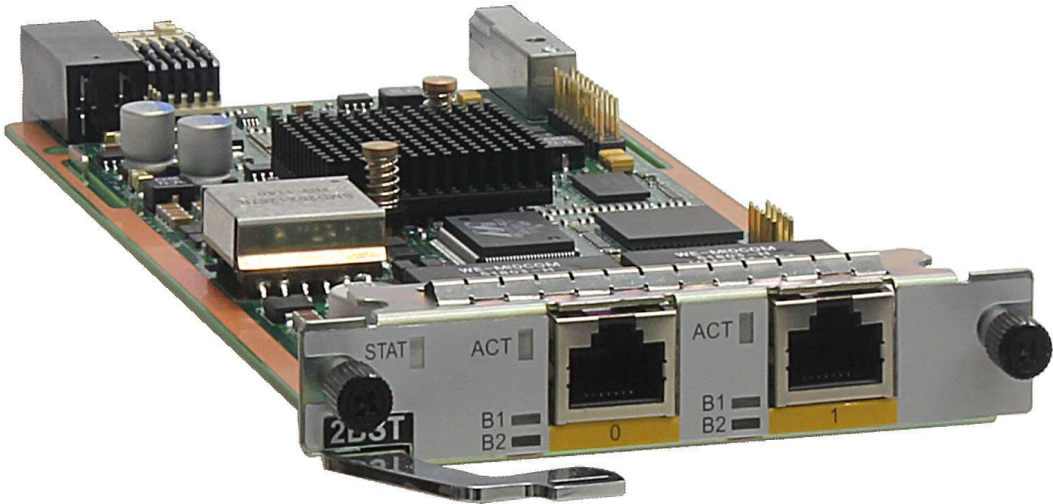


Figure 4-125 shows the appearance of the 2BST-W.

Figure 4-125 Appearance of the 2BST-W



Version Mapping

Table 4-171 describes the mapping between the 2BST and software versions.

Table 4-171 Mapping between the 2BST and software versions

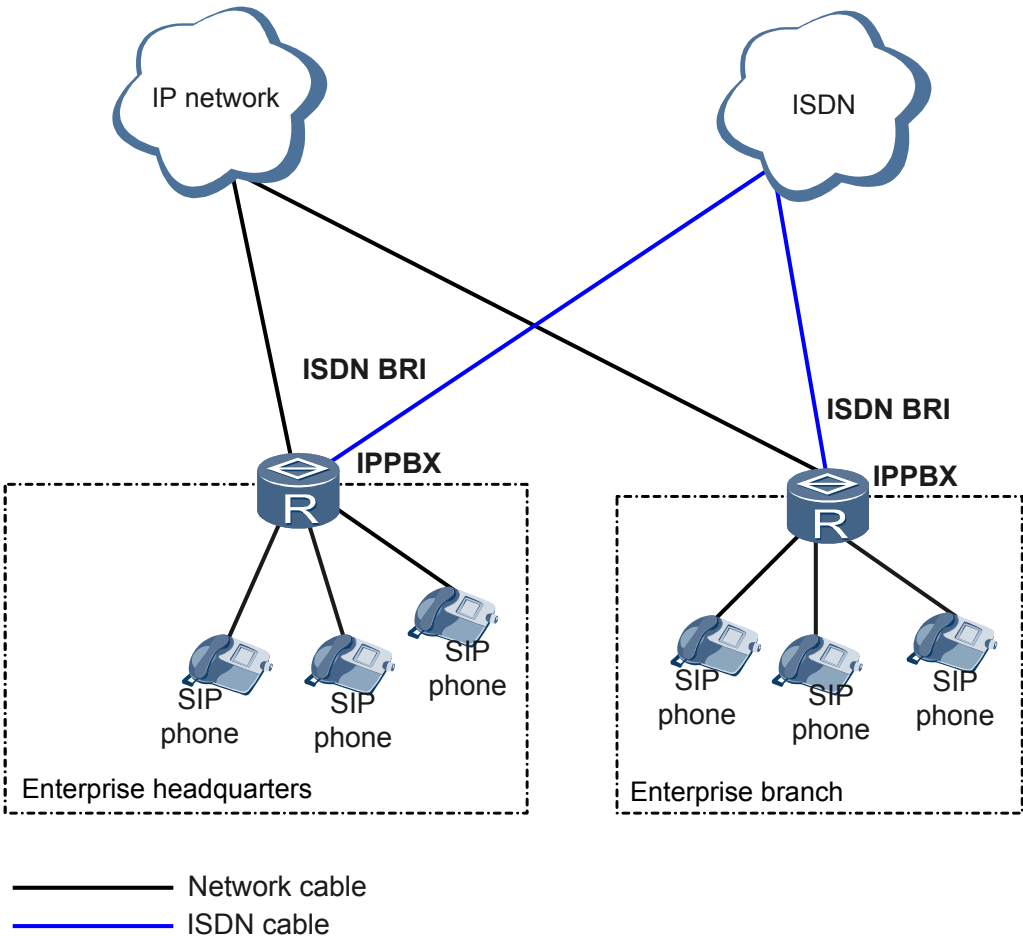
Card Name	AR1220V	AR1220V W	AR2204	AR2220	AR2240	AR3260
2BST	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 3C00 and later versions	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 1C01 and later versions
2BST-W	Y NOTE V200R00 2C00 and later versions	Y NOTE V200R00 2C00 and later versions	Y NOTE V200R00 3C00 and later versions	Y NOTE V200R00 2C00 and later versions	Y NOTE V200R00 2C00 and later versions	Y NOTE V200R00 2C00 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-126](#), the enterprise headquarters and branch are connected through IP PBXs to make incoming and outgoing calls. The IP PBXs in the enterprise headquarters and branch use ISDN BRI interfaces to connect to the ISDN, which functions as the backup network. When the IP link becomes faulty, voice services are transmitted through the ISDN.

Figure 4-126 2BST application



Functions and Features

[Table 4-172](#) describes the functions and features of the 2BST.

Table 4-172 Functions and features of the 2BST

Function and Feature	Description
Basic functions	Provides the NT mode to transmit voice services.
	Connects to the ISDN.
BEST	When a fault occurs on the WAN-side network, internal communication of an enterprise is not affected.

Function and Feature	Description
Link backup	The ISDN functions as a backup for the VoIP network, ensuring reliability of voice communication.
Seamless migration to VoIP	On the enterprise's IP network, you can only add ARs to support VoIP. This protects investments and facilitates expansion.
Low cost	The AR provides VoIP. With VoIP, an enterprise only needs to pay the local call fee, saving the toll call fee.
Diagnosis and maintenance	Provides signaling tracing, simulation, diagnosis test, and remote packet header capture.

Indicators and Interfaces

Indicators on the 2BST Panel

 **NOTE**

The 2BST and 2BST-W have the same indicators except for having different card types. 2BST-W is used as an example to describe the indicators.

Figure 4-127 shows the indicators on the 2BST-W panel.

Figure 4-127 Indicators on the 2BST-W panel



Table 4-173 describes the indicators on the 2BST-W panel.

Table 4-173 Indicators on the 2BST-W panel

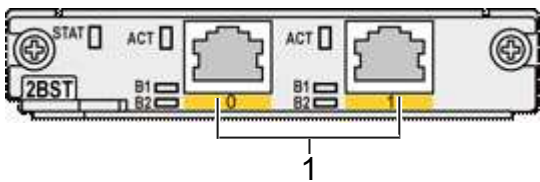
Number in Figure 4-127	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.

Number in Figure 4-127	Indicator	Color	Description
		Off	Off: The software is not running or is being reset.
2	ACT (interface status indicator)	Green	Stead on: The ISDN channel has been activated.
			Off: The ISDN channel is inactive.
3	B1/B2	Green	Blinking: The B1/B2 channel is used.
			Off: The B1/B2 channel is idle.

Description of Interfaces

Figure 4-128 shows the interfaces on the 2BST.

Figure 4-128 Interfaces on the 2BST



1: Two ISDN S/T interfaces

Figure 4-129 shows the interfaces on the 2BST-W.

Figure 4-129 Interfaces on the 2BST-W



1: Two ISDN S/T interfaces

ISDN S/T interface

The ISDN S/T interface connects to the ISDN to transmit voice services, and must be used with [5.10 ISDN-ST Cable](#). [Table 4-174](#) describes the attributes of the ISDN S/T interface.

Table 4-174 Attributes of the ISDN S/T interface

Attribute	Description
Connector type	RJ45
Standards compliance	ITU-T, I.430, Q.921, Q.931
Transmission rate	192 kbit/s
Bandwidth	0 to 100 MHz
Cable type	● TE: standard ISDN S/T interface cables (straight-through cables) ● NT: ISDN S/T interface crossover cables

Technical Specifications

[Table 4-175](#) describes the technical specifications of the 2BST.

Table 4-175 Technical specifications of the 2BST

Item	Specification
Card type	● 2BST: SIC ● 2BST-W: WSIC
External interfaces	● 2BST: Two ISDN S/T interfaces ● 2BST-W: Two ISDN S/T interfaces
Standards compliance	ITU-T I.430, Q.921, Q.931
Transmission rate	192 kbit/s
Connector type	RJ45
Cable	● Standard ISDN S/T interface cables ● ISDN S/T interface crossover cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel

Item	Specification
Physical specifications	● Dimensions (height x width x depth): - 2BST: 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) - 2BST-W: 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: - 2BST: 14.2 W - 2BST-W: 14.2 W ● Weight: - 2BST: 0.3 kg (0.66 lb) - 2BST-W: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 2BST, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-176 provides the ordering information.

Table 4-176 Ordering information

Part Number	Card Name	Card Description
02310FVM	2BST	2-port-ISDN S/T voice interface card (SIC)
02310HVC	2BST-W	2-port-ISDN S/T voice interface card (WSIC)

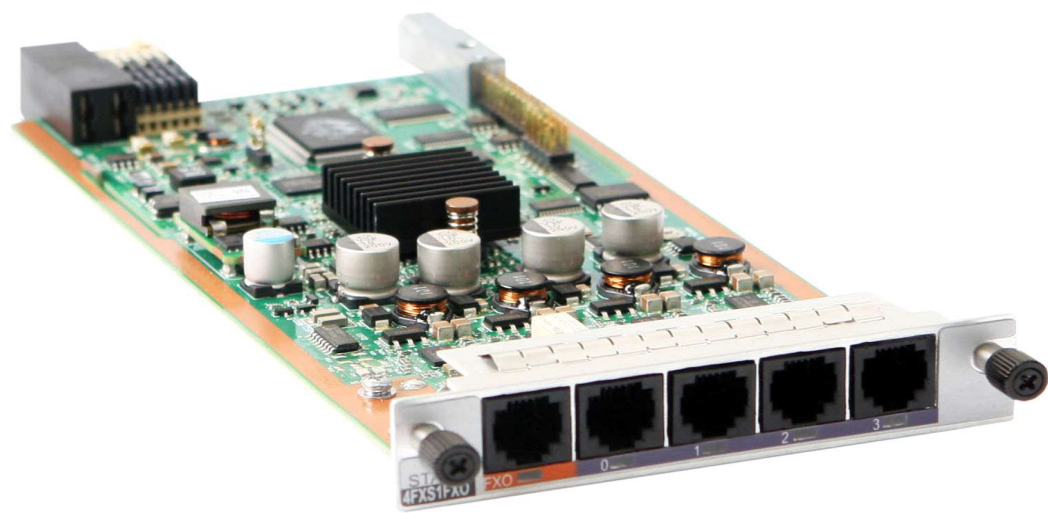
4.5.2 4FXS1FXO (4-Port FXS + 1-Port FXO Voice Interface Card)

Card Overview

The 4FXS1FXO is a voice access module and an SIC interface card. It provides four FXS interfaces and one FXO interface that can connect to the PSTN and traditional telephone devices such as TDM PBXs, analog phones, and fax machines to transmit internal and external voice services.

Figure 4-130 shows the appearance of the 4FXS1FXO.

Figure 4-130 Appearance of the 4FXS1FXO



Version Mapping

Table 4-177 describes the mapping between the 4FXS1FXO and software versions.

Table 4-177 Mapping between the 4FXS1FXO and software versions

Card Name	AR1220V	AR1220V W	AR2204	AR2220	AR2240	AR3260
4FXS1FXO	Y NOTE All versions	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 3C00 and later versions	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 1C01 and later versions	Y NOTE V200R00 1C01 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-131, enterprise users use FXS interfaces to transmit voice services. The FXO interface is used to transmit voice services exchanged between enterprise users and external users.

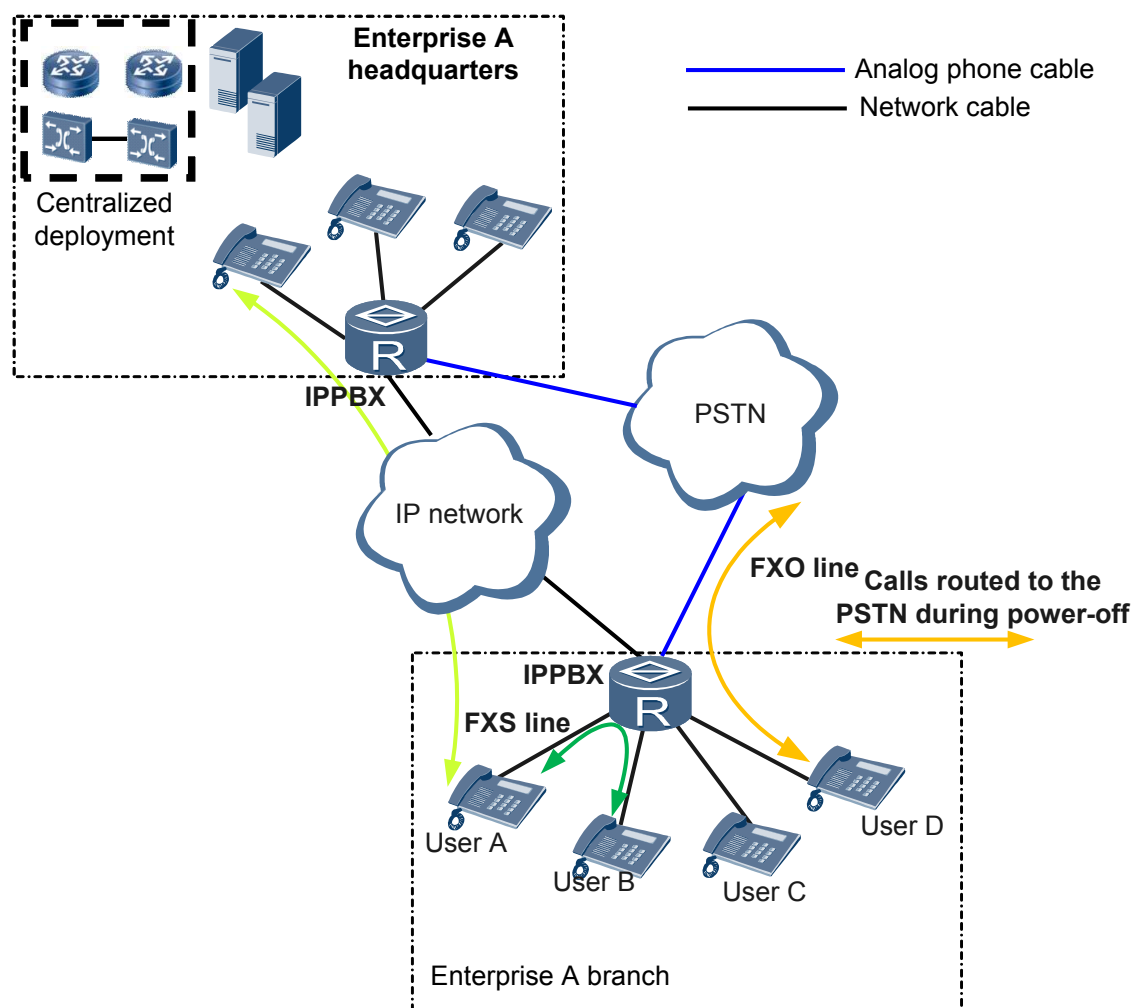
FXS interfaces connect to analog phones, fax machines, and branch IP PBX to transmit voice services exchanged between enterprise branch users and between the enterprise headquarters and branch.

The FXO interface connects to the PSTN. The link of the FXO interface can function as the branch egress and best-effort link of the VoIP network to transmit voice services exchanged between enterprise users and external users and to implement link backup.

Power outage survival and BEST:

- Power outage survival: When the router (IP PBX) is powered off, all IP phones are unavailable. In this case, power outage survival is enabled. Then the router connects the FXO line to the first FXS interface to ensure nonstop service communication.
- BEST: When a fault occurs on the WAN-side IP network, BEST configured on the router ensures voice communication.

Figure 4-131 4FXS1FXO application



Functions and Features

Table 4-178 describes the functions and features of the 4FXS1FXO.

Table 4-178 Functions and features of the 4FXS1FXO

Function and Feature	Description
Basic functions	Connects to common analog phones, IP phones, fax machines, and TDM PBXs.
	Connects to the PSTN.
Power outage survival	Implements power outage survival and ensures nonstop service transmission when the enterprise egress transmission channel becomes faulty.
BEST	When a fault occurs on the WAN-side network, internal communication of an enterprise is not affected.
Link backup	The PSTN functions as a backup for the enterprise's IP network. When the IP network between the headquarters and a branch fails, calls can be connected through the PSTN.
Seamless migration to VoIP	On the enterprise's IP network, you can only add ARs to support VoIP. This protects investments and facilitates expansion.
Low cost	The AR provides VoIP. With VoIP, an enterprise only needs to pay the local call fee, saving the toll call fee.
Various services	The AR provides various services including call center, secretary service, wake-up service, blacklist and whitelist, three-party service, and ONLY service.
Diagnosis and maintenance	Provides signaling tracing, simulation, diagnosis test, and remote packet header capture.

Indicators and Interfaces

Indicators on the 4FXS1FXO Panel

Figure 4-132 shows the indicators on the 4FXS1FXO panel.

Figure 4-132 Indicators on the 4FXS1FXO panel

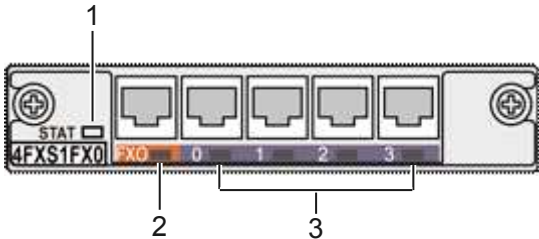


Table 4-179 describes the indicators on the 4FXS1FXO panel.

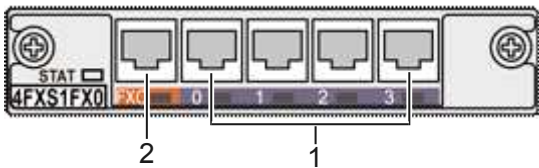
Table 4-179 Indicators on the 4FXS1FXO panel

Number in Figure 4-132	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	ACT (interface status indicator)	Green	Stead on: The FXO channel is being occupied by a call.
		Off	Off: The FXO channel is idle.
3	ACT (interface status indicator)	Green	Stead on: The FXS channel is being occupied by a call.
		Off	Off: The FXS channel is idle.

Description of Interfaces

Figure 4-133 shows the indicators on the 4FXS1FXO panel.

Figure 4-133 Indicators on the 4FXS1FXO panel



1: Four FXS interfaces (RJ11)	2: One FXO interface (RJ11)
-------------------------------	-----------------------------

FXS interface (RJ11)

An FXS interface is a simulated subscriber line interface and provides access to AT0 loop trunk of the analog phone, fax, and telephone exchange. It must be used with [5.11 Regular Telephone Line](#). [Table 4-180](#) describes the attributes of the FXS interface.

Table 4-180 Attributes of the FXS (RJ11) interface

Attribute	Description
Connector type	RJ11
Standards compliance	ITU Q.512 for FXS interfaces ITU K.20 for protection against overcurrent and overvoltage
Cable type	Telephone cable
Dialing mode	● DTMF in accordance with GB3378 ● Pulse dialing
Bandwidth	300 Hz to 3400 Hz

FXO interface (RJ11)

An FXO interface is a loop trunk interface that can connect to the PSTN. It must be used with [5.11 Regular Telephone Line](#). [Table 4-181](#) describes the attributes of the FXO interface.

Table 4-181 Attributes of the FXO (RJ11) interface

Attribute	Description
Connector type	RJ11
Standards compliance	ITU Q.552 for FXO interfaces ITU K.20 for protection against overcurrent and overvoltage
Cable type	Telephone cable
Dialing mode	● DTMF in accordance with GB3378 ● Pulse dialing
Bandwidth	300 Hz to 3400 Hz

Technical Specifications

[Table 4-182](#) describes the technical specifications of the 4FXS1FXO.

Table 4-182 Technical specifications of the 4FXS1FXO

Item	Specification
Card type	SIC
External interfaces	Four FXS interfaces and one FXO interface

Item	Specification
Standards compliance	● ITU Q.512 for FXS interfaces ● ITU Q.552 for FXO interfaces ● ITU K.20 for protection against overcurrent and overvoltage
Bandwidth	300 Hz to 3.4 kHz
Dialing mode	● DTMF in accordance with GB3378 ● Pulse dialing
Connector type	RJ11
Cable	Standard telephone cable with RJ11 connector
Hot swap	Supported
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 12.8 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 4FXS1FXO, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-183 provides the ordering information.

Table 4-183 Ordering information

Part Number	Card Name	Card Description
03020RMY	4FXS1FXO	4-Port FXS and 1-Port FXO Voice Interface Card

4.5.3 16/32/64/128-Channel DSP Module

Card Overview

The 16/32/64/128-channel DSP module is a VoIP voice processing DIMM that provides the voice over IP (VoIP) functions.

Figure 4-134 shows the appearance of the 16/32/64/128-channel DSP module.

Figure 4-134 Appearance of the 16/32/64/128-channel DSP module



CAUTION
Only the DSP module supported by the AR router can be inserted into the DSP DIMM slot. The DDR3 memory board or unsupported DIMMs cannot be inserted; otherwise, the AR router may be damaged or does not function properly.

Version Mapping

Table 4-184 describes the mapping between the 16/32/64/128-channel DSP module and software versions.

Table 4-184 Mapping between the 16/32/64/128-channel DSP module and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
16/32/64/128-channel DSP module	N	Y NOTE V200R003C00 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions	Y NOTE V200R001C01 and later versions

NOTE

- Y: supported
- N: not supported

Functions and Features

Table 4-185 describes the functions and features of the 16/32/64/128-channel DSP module.

Table 4-185 Functions and features of the 16/32/64/128-channel DSP module

Function and Feature	Description
Basic functions	Processes the dial tone.
	Parses telephone numbers.

Function and Feature	Description
	Generates interactive voice response (IVR) and signal voice.
	Encode, decode, and convert voice.
	Implements voice conferences and echo canceler (EC).
	Processes IP packets.

Technical Specifications

Table 4-186 describes the technical specifications of the 16/32/64/128-channel DSP module.

Table 4-186 Technical specifications of the 16/32/64/128-channel DSP module

Item	Specification
Model	DDR3 DIMM
External interfaces	1-channel 8MHW+1GE
Standards compliance	G.723.1, G.728, G.729
DSP module specifications	16/32/64/128-channel DSP
Physical specifications	● Dimensions (width x height): 133.35 mm x 28 mm (5.25 in. x 1.1 in.) ● Maximum power consumption: 3.5 W ● Weight: 0.05 kg (0.11 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 16/32/64/128-channel DSP module, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-187 provides the ordering information.

Table 4-187 Ordering information

Part Number	Card Description
03021HWQ	16-channel voice DSP module
03021HWT	32-channel voice DSP module
03021HWU	64-channel voice DSP module
03020XPK	128-channel voice DSP module

4.5.4 16/32FXS (16/32-Channel FXS Voice Interface Card)

Card Overview

The 16/32FXS is an voice access module and a WSIC interface card. It provides 16 or 32 FXS interfaces that can connect to a large number of analog terminals.

Figure 4-135 shows the appearance of the 16FXS.

Figure 4-135 Appearance of the 16FXS

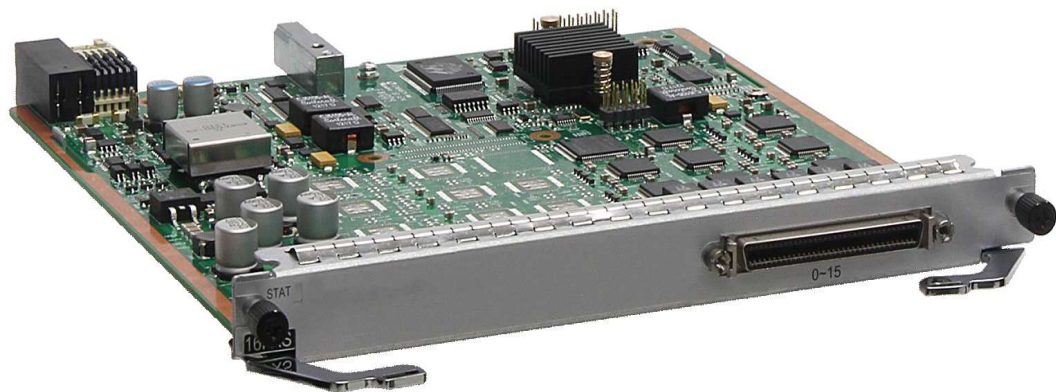
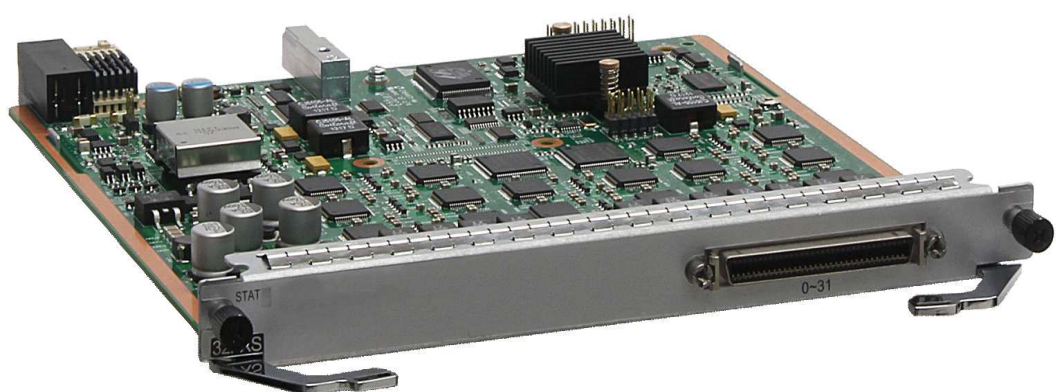


Figure 4-136 shows the appearance of the 32FXS.

Figure 4-136 Appearance of the 32FXS



Version Mapping

Table 4-188 describes the mapping between the 16/32FXS and software versions.

Table 4-188 Mapping between the 16/32FXS and software versions

Card Name	AR1220V	AR1220V W	AR2204	AR2220	AR2240	AR3260
16FXS	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 3C00 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions
32FXS	N	N	Y NOTE V200R00 3C00 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions

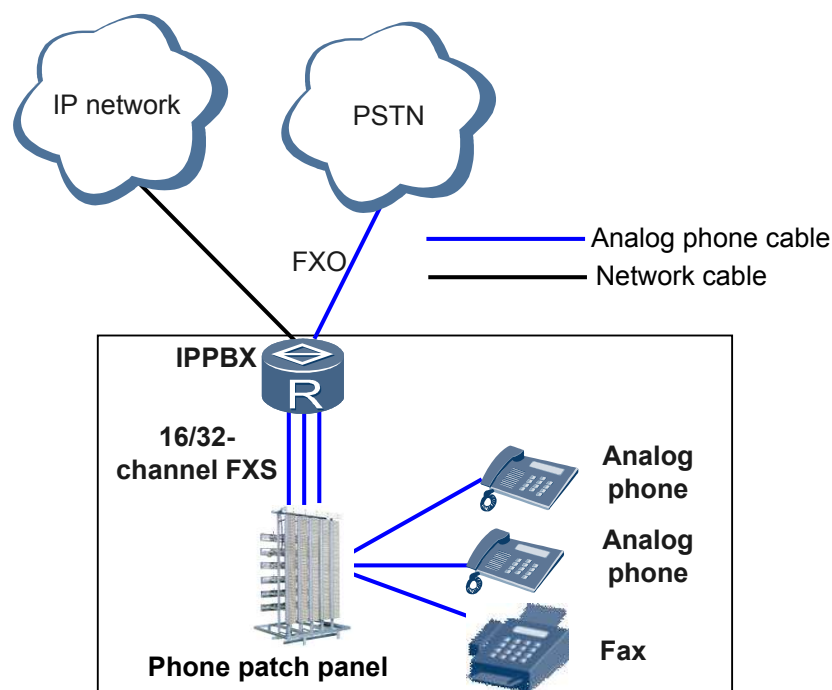
 NOTE

- Y: supported
- N: not supported

Application

As shown in [Figure 4-137](#), the 16FXS/32FXS provides access to 16 or 32 analog terminals. The 16FXS/32FXS can connect to the phone patch panel or directly connect to POTS phones, fax machines, modems, and POTS machines.

Figure 4-137 16FXS/32FXS application



Functions and Features

Table 4-189 describes the functions and features of the 16/32FXS.

Table 4-189 Functions and features of the 16/32FXS

Function and Feature	Description
Basic functions	Provides 16/32-channel analog terminal access, meeting enterprise high-density voice service requirements.
BEST	When a fault occurs on the WAN-side network, internal communication of an enterprise is not affected.
Seamless migration to VoIP	On the enterprise's IP network, you can only add ARs to support VoIP. This protects investments and facilitates expansion.
Low cost	The AR provides VoIP. With VoIP, an enterprise only needs to pay the local call fee, saving the toll call fee.
Various services	The AR provides various services including call center, secretary service, wake-up service, blacklist and whitelist, three-party service, and ONLY service.
Diagnosis and maintenance	Provides signaling tracing, simulation, diagnosis test, and remote packet header capture.

Indicators and Interfaces

 **NOTE**

The 16FXS and 32FXS have the same indicators except for having different channels. 32FXS is used as an example to describe the indicators.

Indicators on the 32FXS Panel

Figure 4-138 shows the indicators on the 32FXS panel.

Figure 4-138 Indicators on the 32FXS panel



Table 4-190 describes the indicators on the 32FXS panel.

Table 4-190 Indicators on the 32FXS panel

Number in Figure 4-138	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.

Description of Interfaces

Figure 4-139 shows the interfaces on the 32FXS panel.

Figure 4-139 Interfaces on the 32FXS panel



1: One FXS interface (DB68)

FXS interface (DB68)

An FXS interface is a simulated subscriber line interface and provides access to AT0 loop trunk of the analog phone, fax, and telephone exchange. The 16FXS must be used with 5.16 16FXS Cable, and the 32FXS must be used with 5.15 32FXS Cable. Table 4-191 describes the attributes of the FXS interface (DB68).

Table 4-191 Attributes of the FXS (DB68) interface

Attribute	Description
Connector type	DB68
Standards compliance	IEEE 1284C Interface as a 36 contact connector
Cable type	Twisted pair

Attribute	Description
Dialing mode	DTMF in accordance with GB3378 Pulse dialing
Bandwidth	300 Hz to 3400 Hz

Technical Specifications

Table 4-192 describes the technical specifications of the 16/32FXS.

Table 4-192 Technical specifications of the 16/32FXS

Item	Specification
Card type	WSIC
External interfaces	One FXS interface (DB68)
Standards compliance	● ITU Q.512 for FXS interfaces ● ITU K.20 for protection against overcurrent and overvoltage
Bandwidth	300 Hz to 3.4 kHz
Dialing mode	● DTMF (GB3378) ● Pulse dialing
Connector type	DB68
Cable	● 16FXS: 16FXS cable ● 32FXS: 32FXS cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 201 mm x 223.5 mm (0.78 in. x 7.91 in. x 8.8 in.) ● Maximum power consumption: 37.2 W ● Weight: 0.2 kg (0.44 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)

Item	Specification
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 16/32FXS, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-193 provides the ordering information.

Table 4-193 Ordering information

Part Number	Card Name	Card Description
03021QSU	16FXS	16-Port FXS Voice Interface Card

Part Number	Card Name	Card Description
03020XJT	32FXS	32-Port FXS Voice Interface Card

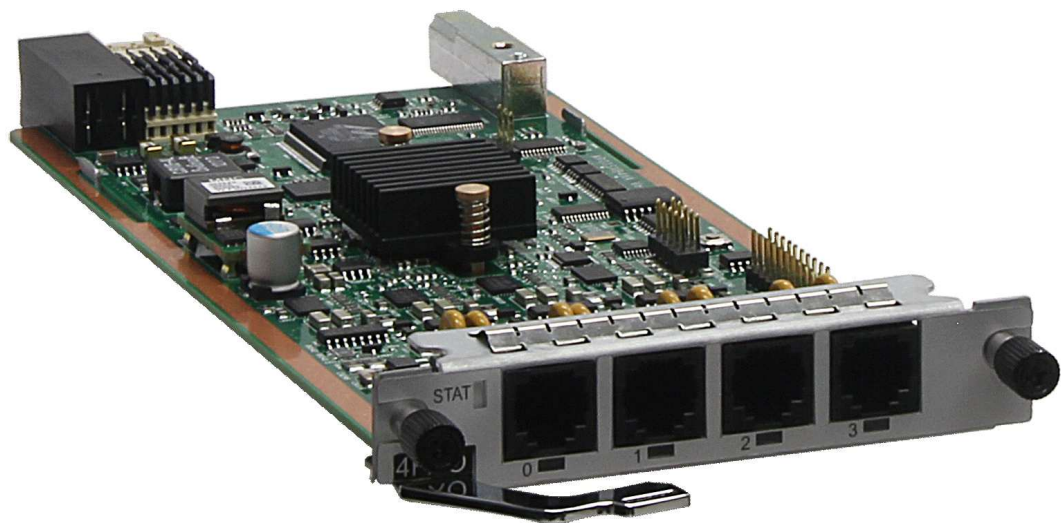
4.5.5 4FXO (4-Port FXO Voice Interface Card)

Card Overview

The 4FXO is a voice access module and an SIC interface module. It provides four FXO interfaces to connect to the PSTN to transmit voice services.

Figure 4-140 shows the appearance of the 4FXO.

Figure 4-140 Appearance of the 4FXO



Version Mapping

Table 4-194 describes the mapping between the 4FXO and software versions.

Table 4-194 Mapping between the 4FXO and software versions

Card Name	AR1220V	AR1220V W	AR2204	AR2220	AR2240	AR3260
4FXO	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 3C00 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions	Y NOTE V200R00 2C02 and later versions

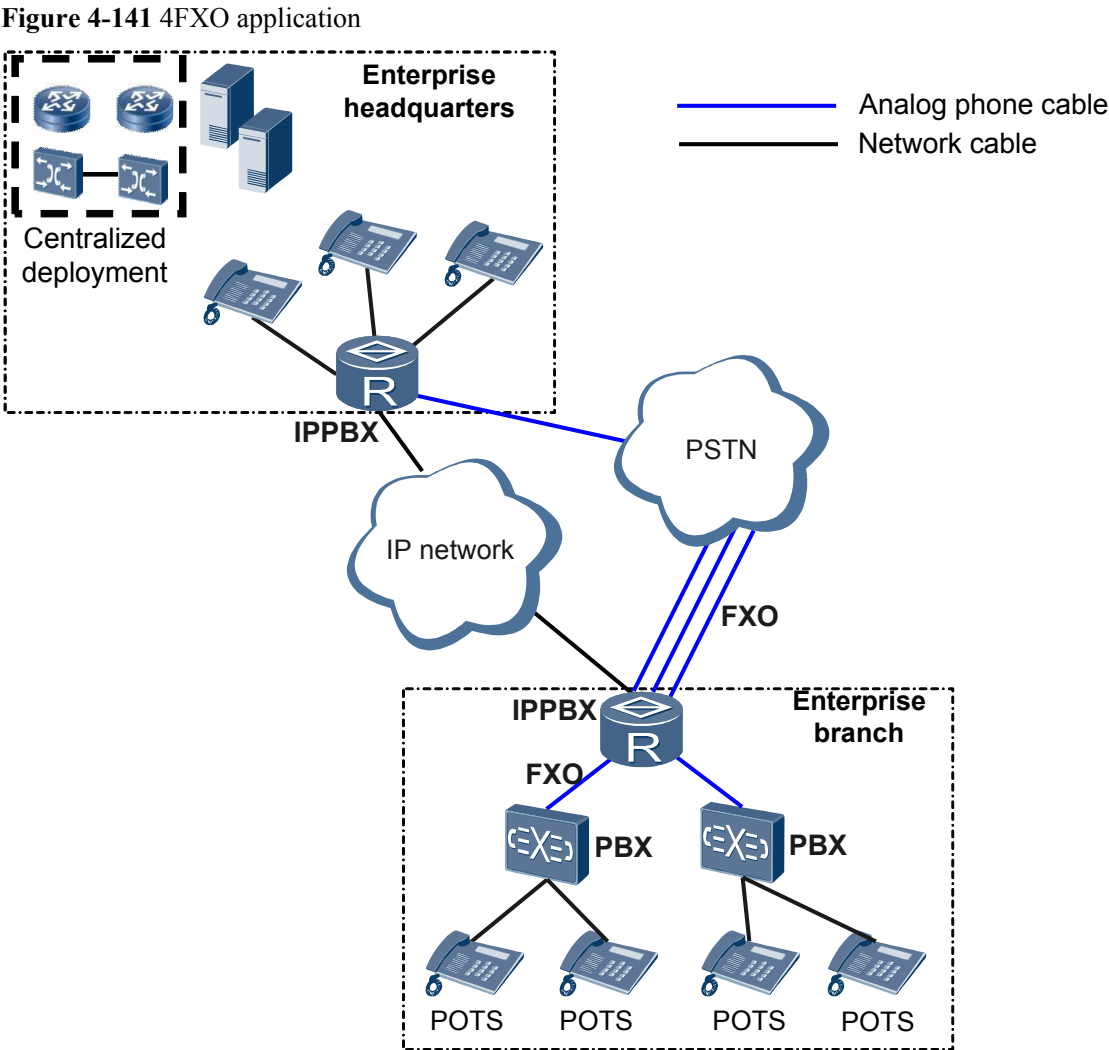
-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-141](#), the 4FXO provides FXO interfaces to connect to TDM PBXs. The FXO interfaces can be used to connect to the TDM PBXs if the enterprise branch needs to use TDM PBXs to connect to more phones, and connect to the PSTN to transmit voice services between enterprise users and external users.

When the enterprise branch needs to use TDM PBXs to connect to more phones, FXO interfaces can be used to connect to the TDM PBXs and the IP network to provide the VoIP function. This implementation makes full use of existing devices and reduces investment costs.

When multiple users in the enterprise branch want to communicate with external users simultaneously, FXO interfaces can be used to connect to the PSTN.



Functions and Features

Table 4-195 describes the functions and features of the 4FXO.

Table 4-195 Functions and features of the 4FXO

Function and Feature	Description
Basic functions	Provides multiple interfaces to connect to traditional PBXs, protecting investments.
	Provides multiple interfaces to connect to the PSTN.
BEST	When a fault occurs on the WAN-side network, internal communication of an enterprise is not affected.

Function and Feature	Description
Link backup	The PSTN functions as a backup for the enterprise's IP network. When the IP network between the headquarters and a branch fails, calls can be connected through the PSTN.
Seamless migration to VoIP	On the enterprise's IP network, you can only add ARs to support VoIP. This protects investments and facilitates expansion.
Low cost	The AR provides VoIP. With VoIP, an enterprise only needs to pay the local call fee, saving the toll call fee.
Various services	The AR provides various services including call center, secretary service, wake-up service, blacklist and whitelist, three-party service, and ONLY service.
Diagnosis and maintenance	Provides signaling tracing, simulation, diagnosis test, and remote packet header capture.

Indicators and Interfaces

Indicators on the 4FXO Panel

Figure 4-142 shows the indicators on the 4FXO panel.

Figure 4-142 Indicators on the 4FXO panel



Table 4-196 describes the indicators on the 4FXO panel.

Table 4-196 Indicators on the 4FXO panel

Number in Figure 4-142	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly.
			Fast blinking: The system is powering on or restarting.

Number in Figure 4-142	Indicator	Color	Description
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	ACT (interface status indicator)	Green	Stead on: The FXO channel is being occupied by a call.
			Off: The FXO channel is idle.

Description of Interfaces

Figure 4-143 shows the indicators on the 4FXO panel.

Figure 4-143 Indicators on the 4FXO panel



1: Four FXO interfaces (RJ11)

FXO interface (RJ11)

An FXO interface is a loop trunk interface and provides access to the telephone exchange by using regular subscriber lines. It must be used with [5.11 Regular Telephone Line](#).

Table 4-197 Attributes of the FXO (RJ11) interface

Attribute	Description
Connector type	RJ11
Standards compliance	ITU Q.552 for FXO interfaces ITU K.20 for protection against overcurrent and overvoltage
Cable type	Telephone cable

Attribute	Description
Dialing mode	● DTMF in accordance with GB3378 ● Pulse dialing
Bandwidth	300 Hz to 3400 Hz

Technical Specifications

Table 4-198 describes the technical specifications of the 4FXO.

Table 4-198 Technical specifications of the 4FXO

Item	Specification
Card type	SIC
External interfaces	Four FXO interfaces
Standards compliance	● ITU Q.552 for FXO interfaces ● ITU K.20 for protection against overcurrent and overvoltage
Bandwidth	300 Hz to 3.4 kHz
Dialing mode	● DTMF (GB3378) ● Pulse dialing
Connector type	RJ11
Cable	Standard telephone cable with RJ11 connector
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 6.6 W ● Weight: 0.1 kg (0.22 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)

Item	Specification
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Order Information

To order the 4FXO, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-199 provides the ordering information.

Table 4-199 Ordering information

Part Number	Card Name	Card Description
03020XJU	4FXO	4-Port FXO Voice Interface Card

4.5.6 1VE1 (1-Port Voice E1 Interface Card)

Card Overview

-  **NOTE**
- Meaning of characters in the card name:
- 1: one interface on the card
 - VE1: E1 voice interface

The 1VE1 is a voice processing module for AR routers. It provides a VE1 interface and is installed in a SIC slot to provide high-density analog voice service.

Figure 4-144 shows the appearance of a 1VE1 card.

Figure 4-144 1VE1 card appearance



Version Mapping

Table 4-200 describes the mapping between the 1VE1 card and software versions of different product models.

Table 4-200 Mapping between the 1VE1 card and software versions

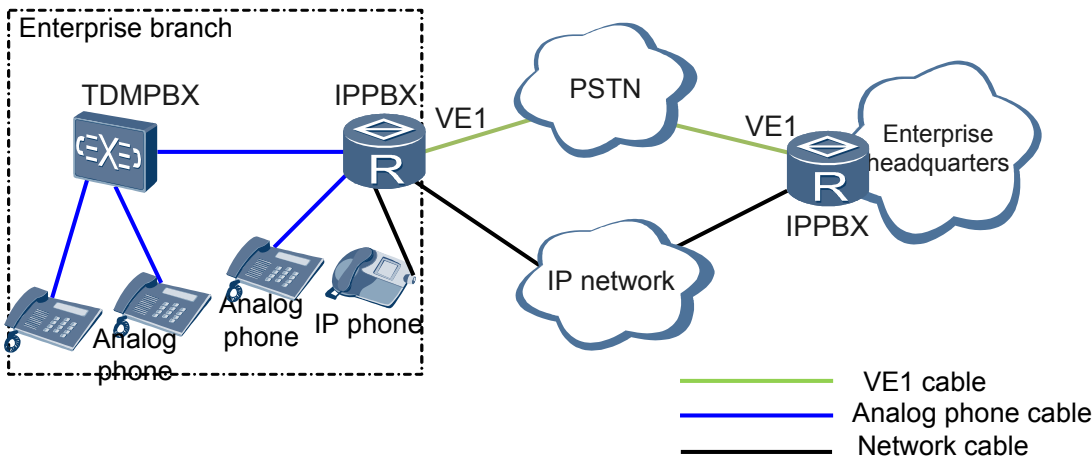
Card Name	AR1220V	AR1220V W	AR2204	AR2220	AR2240	AR3260
1VE1	Y					
	NOTE This card is supported in V200R005C00 and later versions.					

-  **NOTE**
- Y: indicates that a product model supports the card.

Application

As shown in [Figure 4-145](#), an enterprise's headquarters and branch communicate through a public switched telephone network (PSTN). The P PBXs have 1VE1 cards installed to provide VE1 lines for PSTN access. When a 1VE1 card works in VE1 mode, each VE1 line supports a maximum of 30 voice connections. With the 1VE1 cards installed, the IP PBXs provide high-density access to the PSTN and can work with the TDM PBXs on the enterprise network.

Figure 4-145 Enterprise voice communication through VE1 lines



Functions and Features

[Table 4-201](#) describes functions and features of a 1VE1 card.

Table 4-201 Functions and features of a 1VE1 card

Function and Feature	Description
Data transmission	The VE1 interface connects to a WAN to complete voice data transmission.
ISDN dial-up access	Transmits various services, such as voice, high-speed fax, video call, intelligent telegraph, and teletext, at a rate of up to 2 Mbit/s.
Voice gateway	Works as a gateway to provide high-density access to a PSTN or TDM network, and supports a maximum of 30 call connections on a VE1 line.
Investment protection	1VE1 cards can connect to TDM PBX devices on an enterprise network. The use of 1VE1 cards protects customers' investment and facilitates network expansion.

Indicators and Interfaces

Indicator Description

Figure 4-146 shows indicators on a 1VE1 card.

Figure 4-146 Indicators on a 1VE1 card

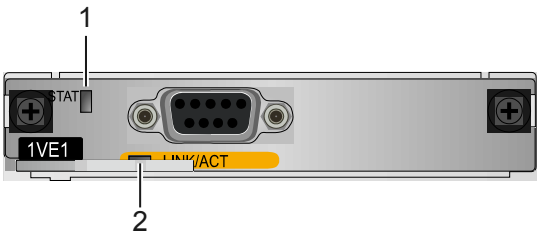


Table 4-202 describes indicators on a 1VE1 card.

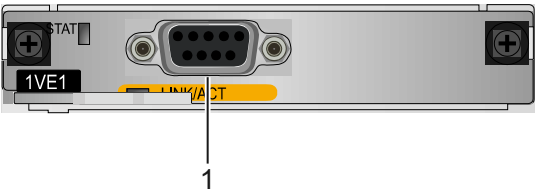
Table 4-202 1VE1 card indicator description

Number	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system software is running normally. Fast blinking: The card is loading the system software or is resetting.
		Red	Steady on: A fault that affects services has occurred. The fault cannot be rectified automatically and needs to be rectified manually.
		Off	The software is not running or the card is resetting.
2	LINK/ACT	Green	Steady on: A link has been established on the interface.
		Yellow	Blinking: The interface is transmitting and receiving data.
		Off	No link is established on the interface.

Interface Description

Figure 4-147 shows interfaces on a 1VE1 card.

Figure 4-147 Interfaces on a 1VE1 card



1. One VE1 interface

VE1 interface

A VE1 interface uses a 5.7 1E1/T1 Cable to transmit voice signals. Table 4-203 describes the VE1 interface attributes.

Table 4-203 VE1 interface attributes

Attribute	Description
Connector type	DB9
Standards compliance	G.703, G.704
Interface speed	2.048 Mbit/s
Cable	● 75-ohm unbalanced coaxial cable ● 120-ohm balanced twisted pair cable ● Trunk cable extension
Working mode	VE1
Services provided	● Backup ● Terminal access

Technical Specifications

Table 4-204 lists technical specifications of a 1VE1 card.

Table 4-204 1VE1 technical specifications

Item	Specification
Card type	SIC
External interface	One VE1 interface

Item	Specification
Standards compliance	● E1 line coding and physical/electrical characteristics: ITU-T G.703 ● E1 line coding: HDB3 ● E1 line frame format: ITU-T G.704 ● E1: CRC Multiframe, DoubleFrame
Interface speed	2.048 Mbit/s
Connector type	DB9
Cable	● 120-ohm balanced twisted pair cable ● 75-ohm unbalanced coaxial cable
Hot swap	Supported
In-service upgrade	In-service upgrade through system management channel
Physical specifications	● Dimensions (W x D x H): 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: 4.7 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To place an order, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-205 provides the ordering information.

Table 4-205 1VE1 ordering information

Part Number	Card Name	Card Description
03020YNU	1VE1	1-Port Voice E1 Interface Card

4.6 xDSL/xPON Interface Card

4.6.1 ADSL-A/M and ADSL-B/J (1-Port-ADSL2+ ANNEX A/M and B/J WAN Interface Card)

Card Overview

An ADSL card is installed in a SIC slot for WAN connection. It provides the asymmetrical digital subscriber line service for enterprises, transmitting video, voice, and data at a high speed on the Internet.

Two types of ADSL cards are available: 1ADSL-A/M and 1ADSL-B/J. [Table 4-206](#) describes their differences.

Table 4-206 Differences between 1ADSL-A/M and 1ADSL-B/J

Card Name	Usage Scenario
1ADSL-A/M	● Annex A is applied to ADSL over POTS and compatible with POTS services. ● Annex M expands the uplink frequency band of ADSL and provides a higher uplink bandwidth.
1ADSL-B/J	● Annex B is applied to ADSL over ISDN and compatible with ISDN services. ● Annex J expands the uplink frequency band of ADSL and provides a higher uplink bandwidth.

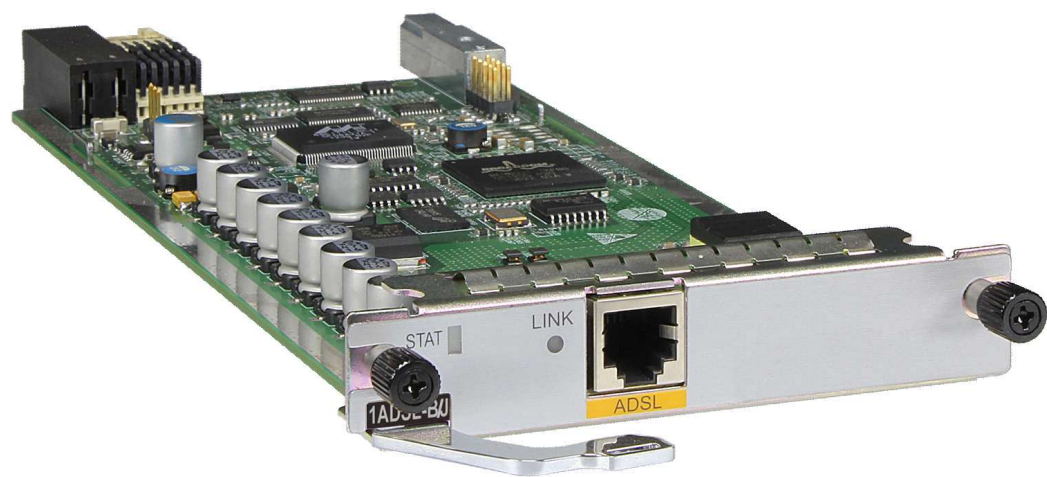
[Figure 4-148](#) shows the appearance of the 1ADSL-A/M.

Figure 4-148 1ADSL-A/M appearance



[Figure 4-149](#) shows the appearance of the 1ADSL-B/J.

Figure 4-149 1ADSL-B/J appearance



Version Mapping

Table 4-207 describes the mapping between 1ADSL-A/M/1ADSL-B/J and software versions of different product models.

Table 4-207 Mapping between 1ADSL-A/M/1ADSL-B/J and software versions

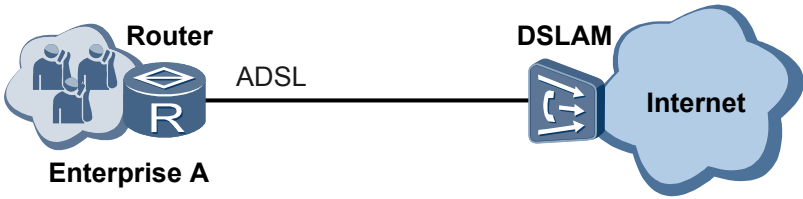
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1ADSL-A/M	Y	Y NOTE This card is supported in V200R003C00 and later versions.	Y	Y	Y
1ADSL-B/J	Y NOTE This card is supported in V200R005C00 and later versions.				

- NOTE
- Y: indicates that a product model supports the card.

Application

As shown in Figure 4-150, enterprise A connects to the DSLAM through the ADSL line to transmit voice and VoD services.

Figure 4-150 ADSL application



Functions and Features

Table 4-208 lists the functions and features of an ADSL card.

Table 4-208 Functions and features of an ADSL card

Function and Feature	Description
Basic functions	Dials up to the Internet to provide high-speed data communication and video on demand (VoD) services.
	Provides asymmetrical uplink and downlink transmission rates (up to 3 Mbit/s uplink rate and 24 Mbit/s downlink rate).
Compatibility with PSTN	The Internet access and voice services share the same telephone cable.
	Users connect to the Internet and make a call over a telephone cable at the same time, with a high Internet access rate and good voice communication quality.
Easy installation	Users can connect to the Internet by simply connecting a telephone cable to a modem.
Quick fault identification	The ADSL channel can be manually activated or deactivated for fault identification.
Standard Compliance	G.DMT(G992.1), ADSL2(G992.3), AnnexL, ADSL2+ (G992.5), AnnexM, AnnexJ, T1.413

Indicators and Interfaces

Indicator Description

NOTE

The 1ADSL-A/M and 1ADSL-B/J have the same indicators and interfaces but different silkscreen. The 1ADSL-B/J is used as an example here.

Figure 4-151 shows indicators on a 1ADSL-B/J card.

Figure 4-151 Indicators on a 1ADSL-B/J card

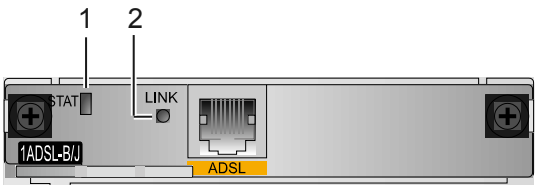


Table 4-209 describes indicators on a 1ADSL-B/J card.

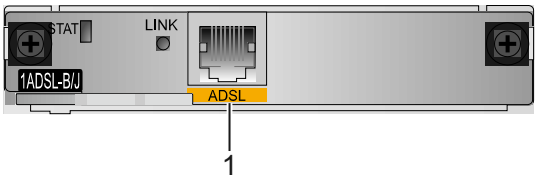
Table 4-209 1ADSL-B/J card indicator description

Number	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system software is running normally. Fast blinking: The card is loading the system software or is resetting.
		Red	Steady on: A fault that affects services has occurred. The fault cannot be rectified automatically and must be rectified manually.
		Off	The software is not running or the card is resetting.
2	LINK	Green	Steady on: The DSL channel has been activated.
			Off: The DSL channel has not been activated.
			Fast blinking: The DSL channel is being activated.

Interface Description

Figure 4-152 shows interfaces on a 1ADSL-B/J card.

Figure 4-152 Interfaces on a 1ADSL-B/J card



1. One ADSL (RJ11) interface

ADSL-B/J interface

An ADSL-B/J interface connects to a [5.11 Regular Telephone Line](#) to transmit service data from a LAN to an upstream device at a high speed. [Table 4-210](#) lists ADSL-B/J interface attributes.

Table 4-210 ADSL-B/J interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5
Rate	● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ AnnexJ mode: downlink rate of 24 Mbit/s and uplink rate of 3078 kbit/s
Cable	Telephone cable

ADSL-A/M interface

An ADSL-A/M interface connects to a [5.11 Regular Telephone Line](#) to transmit service data from a LAN to an upstream device at a high speed. [Table 4-211](#) lists ADSL-A/M interface attributes.

Table 4-211 ADSL-A/M interface attributes

Attribute	Description
Connector type	RJ11
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5

Attribute	Description
Rate	● ADSL full rate mode (ITU-T 992.1 G.DMT): downlink rate of 8 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 full rate mode (ITU-T 992.3): downlink rate of 12 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2+ full rate mode (ITU-T 992.5): downlink rate of 24 Mbit/s and uplink rate of 1024 kbit/s ● ADSL2 AnnexM mode: downlink rate of 12 Mbit/s and uplink rate of 2 Mbit/s ● ADSL2+ AnnexM mode: downlink rate of 24 Mbit/s and uplink rate of 2 Mbit/s ● T1.413 mode: downlink rate of 8 Mbit/s and uplink rate of 1 Mbit/s
Cable	Telephone cable

Technical Specifications

Table 4-212 describes the technical specifications of the ADSL-A/M and ADSL-B/J.

Table 4-212 Technical specifications of the ADSL-A/M and ADSL-B/J

Item	Specification
Card type	● ADSL-A/M: SIC ● ADSL-B/J: SIC
External interface	● ADSL-A/M: one ADSL-A/M interface ● ADSL-B/J: one ADSL-B/J interface
Standards compliance	● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5
Interface speed	● ADSL full rate mode (ITU-T 992.1 G.DMT/ANSI T1.413): uplink rate of 1 Mbit/s and downlink rate of 8 Mbit/s ● ADSL2 full rate mode (ITU-T 992.3): uplink rate of 1 Mbit/s and downlink rate of 12 Mbit/s ● ADSL2+ full rate mode (ITU-T 992.5): uplink rate of 1 Mbit/s and downlink rate of 24 Mbit/s
Connector type	RJ11
Cable	Standard RJ11 telephone cable
Hot swap	Supported
In-service upgrade	In-service upgrade through system management channel

Item	Specification
Physical specifications	● Dimensions (W x D x H): - ADSL-A/M: 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) - ADSL-B/J: 100.1 mm x 223.5 mm x 19.82 mm (3.94 in. x 9.2 in. x 0.78 in.) ● Maximum power consumption: - ADSL-A/M: 5.5 W - ADSL-B/J: 5.5 W ● Weight: - ADSL-A/M: 0.3 kg - ADSL-B/J: 0.3 kg
Environment parameters	● Operating temperature: 0°C to 45°C ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to 70°C ● Operating altitude: 0 m to 4000 m
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1ADSL-A/M or 1ADSL-B/J, contact the product manager of the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-213 provides the ordering information.

Table 4-213 ADSL card ordering information

Part Number	Card Name	Card Description
02310GAX	1ADSL-A/M	1-port ADSL2+ ANNEX A/M WAN interface module
03021WWX	1ADSL-B/J	1-port ADSL2+ ANNEX B/J WAN interface card

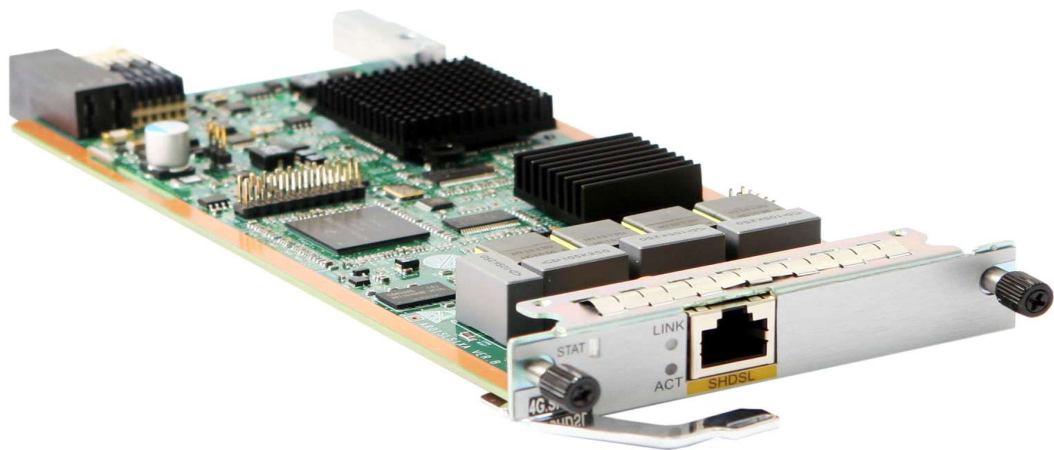
4.6.2 4G.SHDSL (1-Port-4-Channel G.SHDSL WAN Interface Card)

Card Overview

The 4G.SHDSL is a WAN connection module and an SIC interface card. It provides symmetrical DSL services and transmits video, audio, and data packets on the Internet at a high rate.

Figure 4-153 shows the appearance of the 4G.SHDSL.

Figure 4-153 Appearance of the 4G.SHDSL



Version Mapping

Table 4-214 describes the mapping between the 4G.SHDSL and software versions.

Table 4-214 Mapping between the 4G.SHDSL and software versions

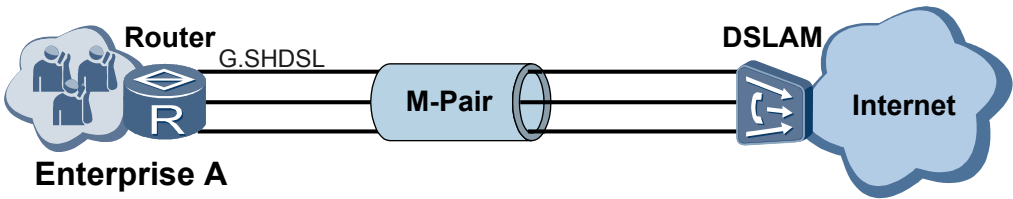
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
4G.SHDSL	Y	Y NOTE V200R003C00 and later versions	Y	Y	Y

- NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-154, enterprise A connects to the DSLAM through the 4G.SHDSL line to transmit voice and VoD services. 4G.SHDSL is easy to deploy and provides symmetrical uplink and downlink bandwidth. When enterprise A finds that the current bandwidth cannot meet data transmission requirements, 4G.SHDSL interfaces can be bundled to provide higher bandwidth.

Figure 4-154 4G.SHDSL application



Functions and Features

Table 4-215 describes the functions and features of the 4G.SHDSL.

Table 4-215 Functions and features of the 4G.SHDSL

Function and Feature	Description
Basic functions	Connects to the Internet through dialup, and implements high-speed data communication and video on demand (VoD).
Symmetrical service	Provides symmetrical uplink and downlink rates and a maximum rate of 5.696 Mbit/s, and provides high bandwidth by bundling interfaces.
Good compatibility	G.SHDSL is compatible with other access transmission technologies including Digital Subscriber Line (DSL). This extends the transmission distance.
High-speed transmission	G.SHDSL is rate-adaptive and meets diverse customer requirements.
Long transmission distance and strong anti-interference	G.SHDSL provides a longer transmission distance for the same transmission rate.
Good performance and wide range of services	G.SHDSL provides comprehensive solutions for networks of small- and medium-scale enterprises and branch networks of medium- and large-scale enterprises. It meets diverse requirements of enterprises, such as security, Virtual Private Network (VPN), and service extension plan. It also provides service providers with voice and video conference services.

Indicators and Interfaces

Indicators on the 4G.SHDSL Panel

Figure 4-155 shows the indicators on the 4G.SHDSL panel.

Figure 4-155 Indicators on the 4G.SHDSL panel

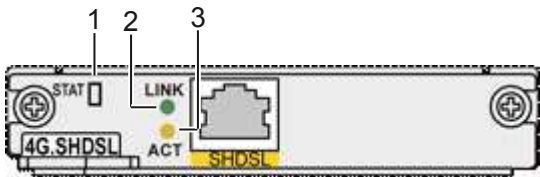


Table 4-216 describes the indicators on the 4G.SHDSL panel.

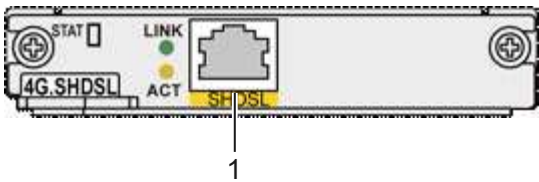
Table 4-216 Indicators on the 4G.SHDSL panel

Number in Figure 4-155	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	LINK	Green	Stead on: The four DSL channels have been activated.
			Off: The four DSL channels have not been activated.
			● Steady on for 0.25 seconds and blinks three times in the next 0.75 seconds: The DSL channel has been activated. ● Steady on for 0.5 seconds and blinks twice in the next 0.5 seconds: The two DSL channels have been activated. ● Steady on for 0.75 seconds and blinks in the next 0.25 seconds: The three DSL channels have been activated.
3	ACT	Yellow	Blinking: Data is being transmitted or received.
			Off: No data is being transmitted or received.

Description of Interfaces

Figure 4-156 shows the interfaces on the 4G.SHDSL.

Figure 4-156 Interfaces on the 4G.SHDSL



1: One G.SHDSL interface (RJ45)

G.SHDSL interface

A G.SHDSL interface symmetrically transmits LAN-side services to upper-layer devices at a high rate. G.SHDSL provides a longer transmission distance than ADSL. The G.SHDSL interface must be used with **5.9 4G.SHDSL Cable** or **5.5 Network Cable**. **Table 4-217** describes the attributes of the G.SHDSL interface.

Table 4-217 Attributes of the G.SHDSL interface

Attribute	Description
Connector type	One RJ45 connector on one end and four RJ11 connectors on the other end
Standards compliance	G.991.2
Transmission rate	5.696 Mbit/s per pair

Technical Specifications

Table 4-218 describes the technical specifications of the 4G.SHDSL.

Table 4-218 Technical specifications of the 4G.SHDSL

Item	Specification
Card type	SIC
External interfaces	One 4G.SHDSL interface
Standards compliance	G.991.2
Transmission rate	5.696 Mbit/s per pair
Connector type	RJ45
Cable	4G.SHDSL cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 8.2 W ● Weight: 0.35 kg (0.78 lb)

Item	Specification
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 4G.SHDSL, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-219 provides the ordering information.

Table 4-219 Ordering information

Part Number	Card Name	Card Description
02310DRN	4G.SHDSL	1-Port 4 Pair G.SHDSL WAN Interface card

4.6.3 1PON (1-Port GPON/EPON Dual-Mode Interface Card)

Card Overview

-  **NOTE**
- 1 port: There are two ports on the 1PON card, one of which is the backup port. Therefore, the 1PON card is also called the 1PON.
 - One ARrouter can have only one PON installed. Excess PON cards cannot be powered on.

The 1PON is a WAN connection module and an SIC interface card. It uses the point-to-multipoint optical access technology to transmit video, audio, and data services on the Internet at a high rate.

Figure 4-157 shows the appearance of the 1PON.

Figure 4-157 Appearance of the 1PON



Version Mapping

Table 4-220 describes the mapping between the 1PON and software versions.

Table 4-220 Mapping between the 1PON and software versions

Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
1PON	Y NOTE V200R002C00 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R002C00 and later versions	Y NOTE V200R002C00 and later versions	Y NOTE V200R002C00 and later versions

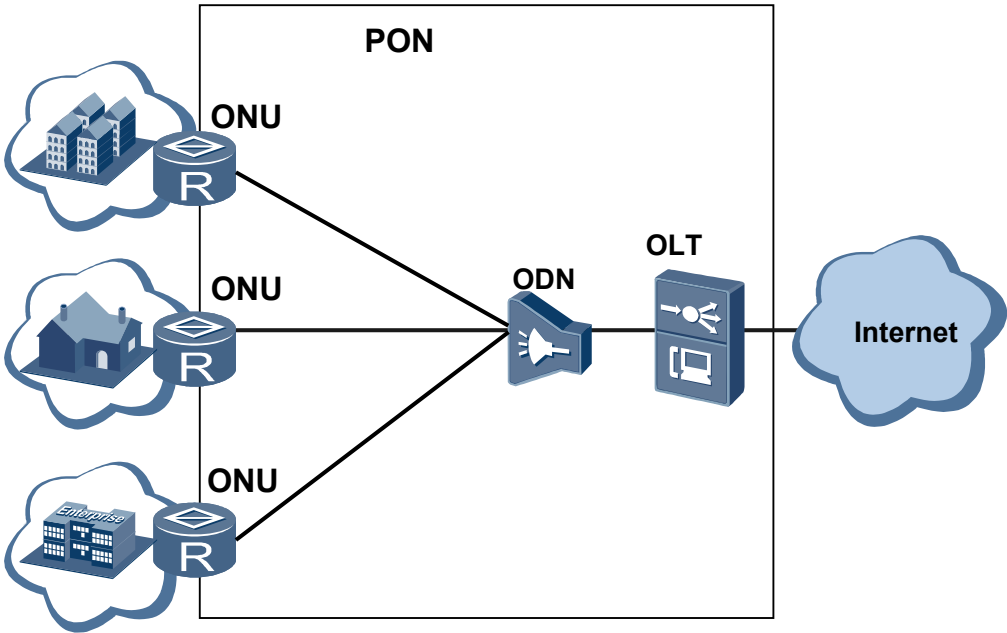
-  **NOTE**
- Y: supported
 - N: not supported

Application

As shown in [Figure 4-158](#), a PON system consists of optical line terminals (OLTs), passive optical splitters (POSs), and optical network units (ONUs). The enterprise connects to the Internet through 1PON.

- An OLT is an aggregation device that terminates PON protocol packets on a carrier network.
- A POS is a passive device that connects ONUs to an OLT. It distributes data to downstream ONUs and aggregates data sent to the upstream OLT.
- An ONU is a user-side device that provides interfaces for users.

Figure 4-158 1PON application



Functions and Features

Table 4-221 describes the functions and features of the 1PON.

Table 4-221 Functions and features of the 1PON

Function and Feature	Description
Basic functions	Uses fibers to connect to the Internet so that services can be transmitted with high bandwidth and high reliability.
	Supports EPON/GPON but not GE.
	As FTTH becomes popular, PON access gradually becomes the mainstream mode.
High bandwidth	The PON network provides the bandwidth of 1 Gbit/s and allows migration to 10 Gbit/s.
High reliability	Compared with traditional leased lines, PON technology provides higher reliability and longer transmission distance.
Optical interface shutdown	The CPU of the SD5103 implements optical interface shutdown.
Power-off alarm	If the card is powered off, the PON interface reports a power-off alarm to the OLT.
DDM detection	Detects the receiving optical power and monitors the transmitting optical power.
ONU function	● Receives cells broadcast in TDM mode at a downlink rate of 1.25 Gbit/s (EPON) or 2.488 Gbit/s (GPON). ● Supports burst transmission in TDMA mode at an uplink rate of 1.25 Gbit/s (EPON) or 1.244 Gbit/s (GPON).

Indicators and Interfaces

Indicators on the 1PON Panel

Figure 4-159 shows the indicators on the 1PON panel.

Figure 4-159 Indicators on the 1PON panel

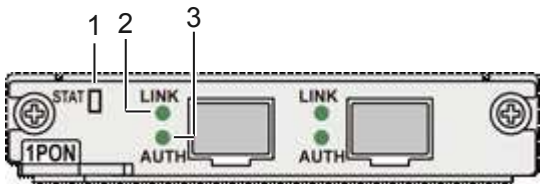


Table 4-222 describes the indicators on the 1PON panel.

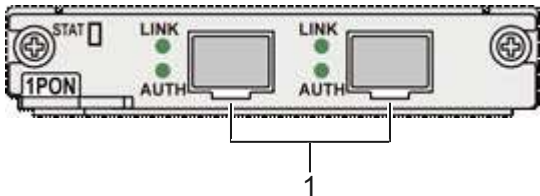
Table 4-222 Indicators on the 1PON panel

Number in Figure 4-159	Indicator	Color	Description
1	STAT	Green	Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2 and 3	PON interface indicators: ● The LINK indicator indicates whether the PON is requesting data transmission. ● The AUTH indicator indicates the authentication status.	Green	If both the LINK indicator and AUTH indicator are steady on, the 1PON is registered successfully.
			If the LINK indicator is steady on and the AUTH indicator fast blinking, the 1PON card is being registered.
			If both the LINK indicator and AUTH indicator fast blinking, the 1PON keeps requesting data transmission. When this occurs, the 1PON card is a rogue ONU.
			If both the LINK indicator and AUTH indicator are off, the 1PON does not request data transmission.

Description of Interfaces

Figure 4-160 shows the interfaces on the 1PON panel.

Figure 4-160 Interfaces on the 1PON panel



1: Two PON interfaces

PON interface

PON interfaces include EPON and GPON services and transmit data, voice, and video services. A PON interface must be used with **EPON Optical Module** and **5.6 Optical Fiber**.

Table 4-223 Attributes of EPON optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
OSG002005	≤ 20	1000base-PX20	- Fiber mode: single-mode - Connector type: LC	0°C to 70°C

Table 4-224 Attributes of EPON optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
OSG002005	Tx1490/ Rx1310	2.5 to 7	≤ -30	-6	9

Technical Specifications

Table 4-225 describes the technical specifications of the 1PON.

Table 4-225 Technical specifications of the 1PON

Item	Specification
Card type	SIC
External interfaces	Two PON optical interfaces
Standards compliance	- EPON: IEEE 802.3ah - GPON: ITUT G.984-1 to 4

Item	Specification
Transmission rate	● GPON: - Downstream transmission rate: 1244/2488 Mbit/s - Upstream transmission rate: 155/622/1244/2488 Mbit/s ● EPON: - Downstream transmission rate: 1250 Mbit/s - Upstream transmission rate: 1250 Mbit/s
Connector type	SFP optical transceiver
Cable	Single-core bidirectional fiber
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 8.8 W ● Weight: 0.3 kg (0.66 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Item	Specification
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the 1PON, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-226 provides the ordering information.

Table 4-226 Ordering information

Part Number	Card Name	Card Description
03020TJE	1PON	1-Port GPON/EPON Dual-mode Interface Card

4.6.4 VDSL2 (1-Port VDSL2 over POTS WAN Interface Card)

Card Overview

The VDSL2 is a WAN connection module and an SIC interface card. It provides symmetrical DSL services and transmits video, audio, and data packets on the Internet at a high rate.

Figure 4-161 shows the appearance of the VDSL2.

Figure 4-161 Appearance of the VDSL2



Version Mapping

Table 4-227 describes the mapping between the VDSL2 and software versions.

Table 4-227 Mapping between the VDSL2 and software versions

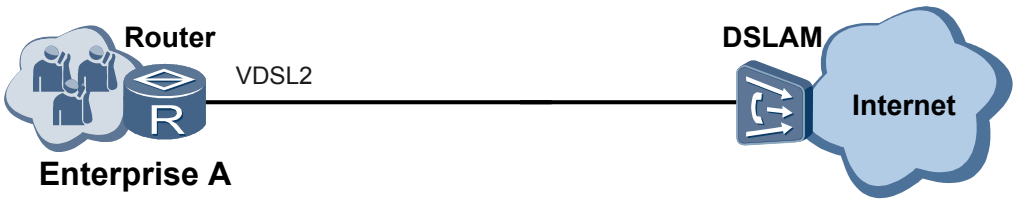
Card Name	AR1200 Series	AR2204	AR2220	AR2240	AR3260
VDSL2	Y NOTE V200R002C01 and later versions	Y NOTE V200R003C00 and later versions	Y NOTE V200R002C01 and later versions	Y NOTE V200R002C01 and later versions	Y NOTE V200R002C01 and later versions

- NOTE
- Y: supported
 - N: not supported

Application

As shown in Figure 4-162, enterprise A connects to the DSLAM through the VDSL2 line to transmit voice and VoD services. VDSL2 is easy to deploy and provides symmetrical uplink and downlink bandwidth, meeting high-bandwidth requirements.

Figure 4-162 VDSL2 application



Functions and Features

Table 4-228 describes the functions and features of the VDSL2.

Table 4-228 Functions and features of the VDSL2

Function and Feature	Description
Basic functions	Connects to the Internet through dialup, and implements high-speed data communication and video on demand (VoD).
Flexible transmission mode	Provides both asymmetrical and symmetrical transmission.
Fast transmission rate	Provides asymmetric uplink and downlink rates, with a maximum of 6.4 Mbit/s uplink rate and 52 Mbit/s downlink rate.
	Within 1 km, VDSL2 provides 10 Mbit/s uplink and downlink transmission rates.
Good transmission quality	Provides good transmission quality and supports HD video conference, VoD, and BTV.
Low cost	Transmits signals over a copper twisted pair without layout new lines or reconstructing the existing network.
Enhanced compatibility	Supports both traditional voice services and ISDN services. VDSL2 can use the same phone line with the existing phone line and ISDN.
Standard compliance	Works in VDSL2 mode that complies with ITU-T G.993.2 and supports profile 17a defined in G.993.2.
	Rolls back to ADSL2+ mode that complies with G.992.5.
DyingGasp	When the VDSL2 is powered off, it sends a message to the connected DSLAM.

Indicators and Interfaces

Indicators on the VDSL2 Panel

Figure 4-163 shows the indicators on the VDSL2 panel.

Figure 4-163 Indicators on the VDSL2 panel



Table 4-229 describes the indicators on the VDSL2 panel.

Table 4-229 Indicators on the VDSL2 panel

Number in Figure 4-163	Indicator	Color	Description
1	STAT	Green	Stead on: The router has been powered on, but the system software is not running. Slow blinking: The system is running properly. Fast blinking: The system is powering on or restarting.
		Red	Steady on: A fault that affects services has occurred and cannot be rectified automatically. The fault needs to be rectified manually.
		Off	Off: The software is not running or is being reset.
2	LINK	Green	Stead on: The VDSL2 channel has been activated.
			Off: The VDSL2 channel has not been activated.
			Fast blinking: The VDSL2 channel is being activated.

Description of Interfaces

Figure 4-164 shows the interfaces on the VDSL2.

Figure 4-164 Interfaces on the VDSL2



1: One VDSL2 interface

VDSL2 interface

A VDSL2 interface transmits LAN-side services to upper-layer devices at a high rate through twisted cables. It must be used with [5.11 Regular Telephone Line](#). [Table 4-230](#) describes the attributes of the VDSL2 interface.

Table 4-230 Attributes of the VDSL2 interface

Attribute	Description
Connector type	RJ11
Standards compliance	VDSL2: ITU-T 993.2 ITU-T 992.5 ITU-T 992.3 ITU-T 992.1 G.DMT
Transmission rate	VDSL2: ● ADSL2+ full rate mode (ITU-T 992.5): a downstream transmission rate of 24 Mbit/s and an upstream transmission rate of 1 Mbit/s ● VDSL2 mode (ITU-T 993.2): a downstream transmission rate of 100 Mbit/s and an upstream transmission rate of 50 Mbit/s ● ADSL2 full rate mode (ITU-T 992.3): a downstream transmission rate of 12 Mbit/s and an upstream transmission rate of 1 Mbit/s ● ADSL full rate mode (992.1 G.DMT): a downstream transmission rate of 8 Mbit/s and an upstream transmission rate of 1 Mbit/s
Cable type	Telephone cable

Technical Specifications

[Table 4-231](#) describes the technical specifications of the VDSL2.

Table 4-231 Technical specifications of the VDSL2

Item	Specification
Card type	SIC
External interfaces	One VDSL2 interface
Standards compliance	● ITUT-993.2 ● ITU-T 992.1 G.DMT ● ANSI T1.413 Issue 2 ● ITU-T 992.3 ● ITU-T 992.5
Transmission rate	Profile 17a, 0 km: uplink 50 Mbit/s, downlink 100 Mbit/s
Connector type	RJ11

Item	Specification
Cable	Telephone cable
Hot swap	Supported
In-service upgrade	In-service upgrade through the system management channel
Physical specifications	● Dimensions (height x width x depth): 19.82 mm x 100.1 mm x 223.5 mm (0.78 in. x 3.94 in. x 8.8 in.) ● Maximum power consumption: 9.5 W ● Weight: 0.2 kg (0.44 lb)
Environment parameters	● Operating temperature: 0°C to 45°C (32°F to +113°F) ● Relative humidity: 5% to 95%, noncondensing ● Storage temperature: -40°C to +70°C (-104°F to +158°F) ● Operating altitude: 0 to 4000 m (13123.2 ft.)
Safety standards compliance	● UL 60950-1 ● EN 60950-1 ● IEC 60950-1 ● BS EN 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1 ● IS 13252 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
EMC standards compliance	● FCC 47CFR Part15 Class A ● ICES 003 Class A ● EN55022 Class A ● CISPR22 Class A ● CISPR24 ● AS/NZS CISPR22 Class A ● VCCI Class A ● ETSI EN 300 386 Class A ● EN55024 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.
Environmental standards compliance	● RoHS ● ETSI EN 300 019-2-1 ● ETSI EN 300 019-2-2 ● ETSI EN 300 019-2-3 For details, see the <i>Huawei AR1200&2200&3200 Series Enterprise Routers Safety and Regulatory Compliance Information</i>.

Ordering Information

To order the VDSL2, contact the Huawei local office. To download the system software, visit the Huawei Enterprise website (<http://enterprise.huawei.com>).

Table 4-232 provides the ordering information.

Table 4-232 Ordering information

Part Number	Card Name	Card Description
02310JLJ	VDSL2	1-Port VDSL2 over POTS WAN Interface card

5 Cables

About This Chapter

- 5.1 AC Power Cable
- 5.2 DC Power Cables
- 5.3 Ground Cable
- 5.4 Console Cable
- 5.5 Network Cable
- 5.6 Optical Fiber
- 5.7 1E1/T1 Cable
- 5.8 Synchronous/Asynchronous Serial Cable
- 5.9 4G.SHDSL Cable
- 5.10 ISDN-ST Cable
- 5.11 Regular Telephone Line
- 5.12 8AS Cable
- 5.13 3G Antenna
- 5.14 WiFi Antenna
- 5.15 32FXS Cable
- 5.16 16FXS Cable
- 5.17 RPS150 Power Cable
- 5.18 4E1/T1 Cable
- 5.19 E3/T3 Cable
- 5.20 LTE Antenna

5.1 AC Power Cable

Cable Types

Two types of AC power cables are available:

- Common AC power cable
- RPS150 AC power cable

Appearance and Structure

Figure 5-1 shows the appearance of the AC power cable.

Figure 5-1 Appearance of the AC power cable



NOTE

The RPS AC power cable used by the RPS150 has the same appearance with a common AC power cable. However, RPS AC power cable and common AC power cable connect to different connectors.

Figure 5-2 shows the appearance of the RPS150 AC power cable.

Figure 5-2 Appearance of the RPS150 AC power cable



Connection

An AC power cable connects the following:

- The AC input power jack on the chassis
- The other end is connected to the AC power supply

5.2 DC Power Cables

Appearance and Structure

The black -48 V DC power return cable and the blue -48 V DC power cable are shown in [Figure 5-3](#) and [Figure 5-4](#).

Figure 5-3 -48 V DC power return cable



Figure 5-4 -48 V DC power cable



Connection

A DC power cable connects the following two interfaces:

- Input power jack on the chassis
- Output power interface on an external power system

 NOTE

A -48 V power return cable is black and is connected to the RTN(+) terminal of the DC power supply. A -48 V power cable is blue and is connected to the NEG(-) terminal of the DC power supply.

5.3 Ground Cable

Appearance and Structure

Figure 5-5 shows the appearance of the ground cable.

Figure 5-5 Appearance of the ground cable



Connection

A ground cable connects the chassis to the ground.

5.4 Console Cable

Appearance and Structure

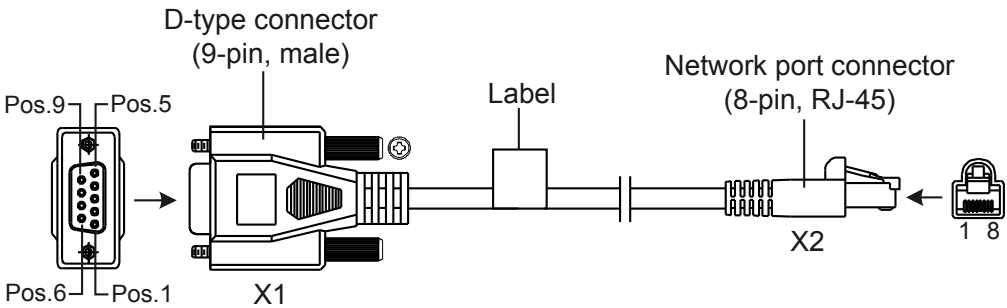
Figure 5-6 shows the appearance of a console cable.

Figure 5-6 Appearance of a console cable



Figure 5-7 shows the structure of the console cable.

Figure 5-7 Structure of the console cable



Pin Assignment

Table 5-1 describes the pin assignments of the console cable.

Table 5-1 Pin assignments of the console cable

Connector	X1(DB9)	X2(RJ45)
Pin assignment	2	3
	3	6
	5	5

Connection

A console cable connects the console port of the device to the serial port of an operation terminal to transmit configuration data. A shielded cable or an unshielded cable can be used according to the onsite situation.

A console cable connects the device and terminal as follows:

- The 8-pin RJ45 connector is inserted into the console port of the device.
- The DB9 male connector is connected to an operation terminal, which is usually a PC.

5.5 Network Cable

Cable Types

The network cables are classified into straight-through cables and crossover cables.

- The straight-through cable uses two RJ45 connectors, which have the same pinout.
- The crossover cable uses two RJ45 connectors, which have difference pinouts.

Appearance and Structure

-  **NOTE**
- Generally, a network cable is a standard unshielded network cable that uses RJ45 connectors.
 - The appearances of the straight-through cable and the crossover cable are the same.

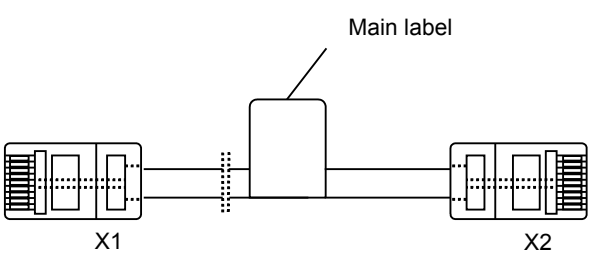
Figure 5-8 shows the appearance of the network cable.

Figure 5-8 Appearance of the network cable



Figure 5-9 shows the appearance of the network cable.

Figure 5-9 Structure of the network cable



Pin Assignment

Table 5-2 describes the pin assignments of the straight-through cable.

Table 5-2 Pin assignments of the straight-through cable

X1 Pin	Tip Color	X2 Pin
1	White and orange	1
2	Orange	2
3	White and Green	3
4	Blue	4
5	White and Blue	5
6	Green	6
7	White and brown	7
8	Brown	8

Table 5-3 describes the pin assignments of the crossover cable.

Table 5-3 Pin assignments of the crossover cable

X1 Pin	Tip Color	X2 Pin
1	White and orange	3
2	Orange	6
3	White and Green	1
4	Blue	4
5	White and Blue	5
6	Green	2
7	White and brown	7
8	Brown	8

 NOTE

To achieve the optimum electrical transmission performance, ensure that the wires connected to pins 1 and 2 and to pins 3 and 6 are twisted pairs.

Connection

A network cable connects a maintenance terminal to the console port on the main control board for local or remote maintenance.

- A straight-through cable connects a terminal, such as a computer or switch, to the network.
- A crossover cable connects two terminals, such as computers or switches.

5.6 Optical Fiber

Cable Types

Table 5-4 lists the classification of optical fibers.

Table 5-4 Optical fiber classification

No.	Purpose	Local End Connector	Remote End Connector	Mode
1	To connect LPU of the device to the ODF	LC/PC	FC/PC	Single mode, indoor
2	To connect LPUs of two devices	LC/PC	LC/PC	Single mode/multimode, indoor
3	To connect LPU of the device to another device	LC/PC	SC/PC or LC/PC	Single mode/multimode, indoor

Appearance and Structure

The appearances of the single-mode optical fiber and the multimode optical fiber are the same, but their colors are different. The single-mode optical fiber is yellow, and the multi-mode optical fiber is orange.

 CAUTION

When connecting or removing the LC/PC optical connector, align the connector with the optical interface, and do not rotate the fiber. Pay attention to the following points:

- Align the head of the fiber jumper with the optical interface and insert the optical fiber into the interface gently.
- To remove the fiber, press the latch on the connector and pull the fiber out.

Figure 5-10 and **Figure 5-11** show the appearances of the single mode fiber.

Figure 5-10 Single mode fiber with LC/PC connectors

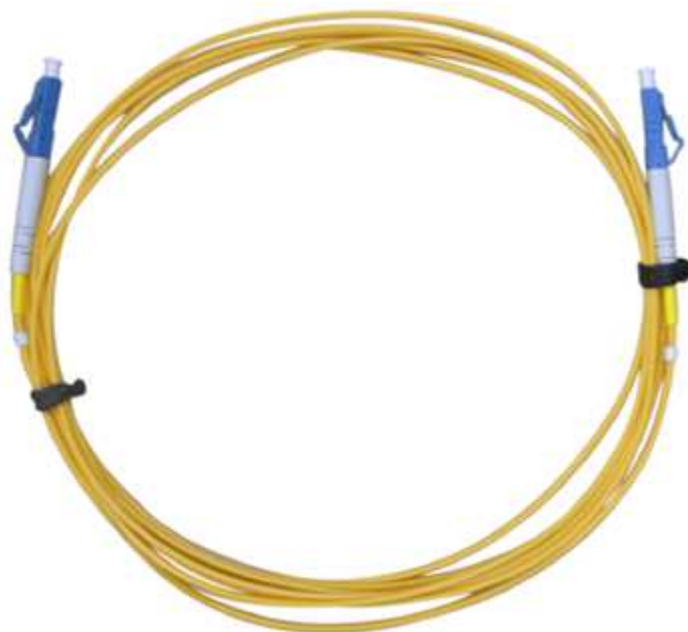


Figure 5-11 Single mode fiber with SC/PC connectors



Figure 5-12 shows the appearance of the multimode fiber.

Figure 5-12 Multimode fiber with LC/PC connectors



Pin Assignment

Table 5-5 describes the pin assignments of the optical fiber.

Table 5-5 Pin assignments of the optical fiber

Local End Terminal	Signal Direction	Remote End Terminal
Optical interface Tx terminal	->	Optical interface Rx terminal
Optical interface Rx terminal	<-	Optical interface Tx terminal

Connection

An optical fiber carries optical signals and transmits them over short distance. An optical fiber connects the following:

- The optical interface on a board
- The optical distribution frame (ODF) or the optical interface on another device

Fiber Selection Criterion

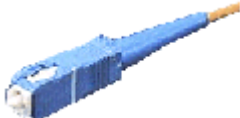
Table 5-6 lists the criteria for selecting optical fibers. Table 5-7 lists common optical connectors.

Table 5-6 Fiber selection criterion

Parameter	Criterion
Length	Onsite survey result

Parameter	Criterion
Single mode or multimode	Optical module type ● The optical transmitting module of the multitransverse mode is connected to the multimode fiber. ● The optical transmitting module of the single-longitudinal mode or multi-longitudinal mode is connected to the single mode fiber. NOTE If the optical fiber jumper is used, the connector connected to the device must be the LC/PC connector, and the connector connected to the remote end must be of the same type as the remote end interface.
Connector shape	● Cube: SC/PC, LC/PC, and MTRJ/PC ● Column: ST/PC and FC/PC

Table 5-7 Common optical connectors

Appearance of common optical connectors	
 SC/PC optical connector	 LC/PC optical connector
 FC/PC optical connector	 MTRJ/PC optical connector
 ST/PC optical connector	-

5.7 1E1/T1 Cable

Appearance and Structure

Figure 5-13 shows the appearance of an 1E1 75-ohm cable.

Figure 5-13 Appearance of an 1E1 75-ohm cable



Figure 5-14 shows the appearance of the 1E1 120-ohm or 1T1 100-ohm cable.

Figure 5-14 Appearance of the 1E1 120-ohm or 1T1 100-ohm cable



Figure 5-15 shows the structure of an 1E1 75-ohm cable.

Figure 5-15 Structure of an 1E1 75-ohm cable

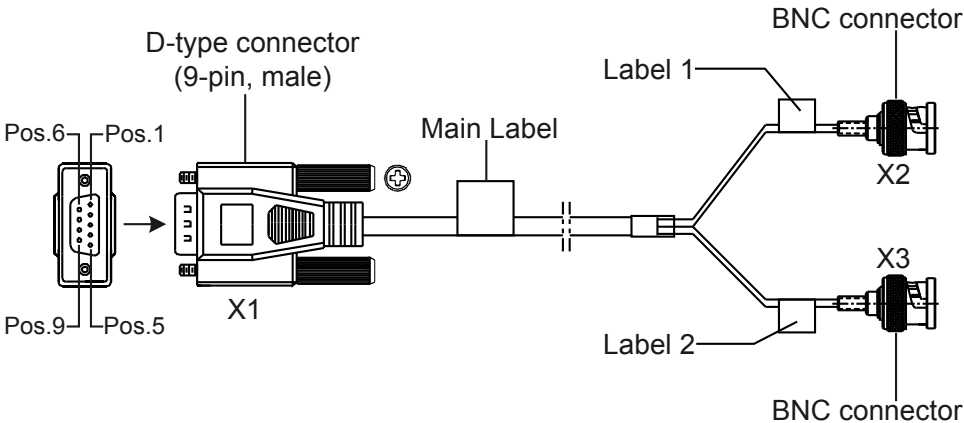
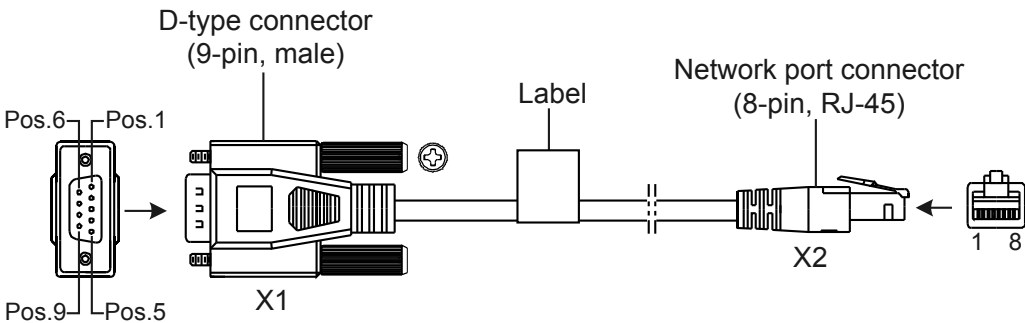


Figure 5-16 shows the structure of the 1E1 120-ohm or 1T1 100-ohm cable.

Figure 5-16 Structure of the 1E1 120-ohm or 1T1 100-ohm cable



Pin Assignments

Table 5-8 describes the pin assignments of an 1E1 75-ohm cable.

Table 5-8 Pin assignments of an 1E1 75-ohm cable

Connector	X1 (DB9)	BNC Connector
Pin assignment	1	X2
	2	
	6	X3
	7	

Table 5-9 describes the pin assignments of the 1E1 120-ohm or 1T1 100-ohm cable.

Table 5-9 Pin assignments of the 1E1 120-ohm or 1T1 100-ohm cable

Connector	X1 (DB9)	X2 (RJ45)	Wire Color
Pin assignment	1	4	White and orange
	2	5	Orange
	6	1	White and blue
	7	2	Blue

Cable Connection

1E1 cables are classified into 75-ohm cables and 120-ohm cables. The connectors of the cables are as follows:

- 75-ohm cable (DB9 to BNC):
 - One end provides a DB9 connector.
 - The other end provides two BNC connectors.
- 120-ohm cable (DB9 to RJ45):
 - One end provides a DB9 connector.
 - The other end provides an RJ45 connector.

A T1 cable is a T1 100-ohm cable. Its appearance is the same as the appearance of an E1 120-ohm cable.

Trunk cable

NOTE

The 1E1/T1 cable is 3 m long. If the connection distance is long, a trunk cable is required.

- E1 75-ohm trunk cable: BNC to BNC (The two connectors are BNC 75 angle male-II.)
- E1 120-ohm or T1 100-ohm trunk cable: RJ45 to RJ45 (The two connectors are RJ45.)

The E1 75-ohm trunk cable is connected as follows:

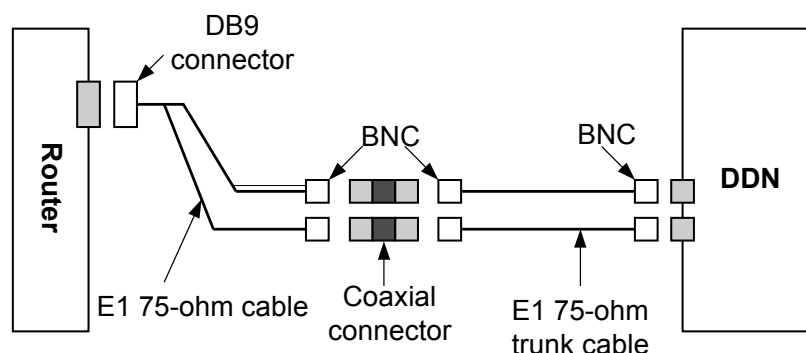
- If the 1E1 cable extension is not used, the BNC connector is connected to the remote device.
- If the 1E1 cable extension is used, the BNC connector is connected to a coaxial connector, and the coaxial connector is connected to the remote device through the trunk cable, as shown in [Figure 5-17](#).



CAUTION

The Tx end of the 1E1 cable is connected to the Rx end of the remote device, and the Rx end is connected to the Tx end.

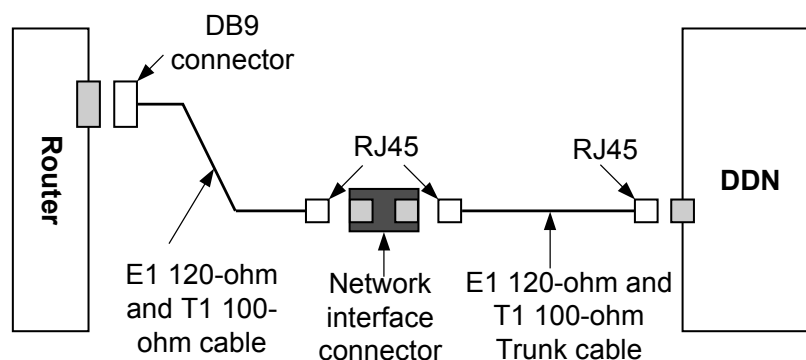
Figure 5-17 E1 75-ohm trunk cable



The E1 120-ohm or T1 100-ohm trunk cable is connected as follows:

- If the 1E1/T1 cable extension is not used, the RJ45 connector is connected to the RJ45 interface of the remote device.
- If the 1E1/T1 cable extension is used, the RJ45 connector is connected to a network interface connector, and the network interface connector is connected to the remote device through the trunk cable, as shown in [Figure 5-18](#).

Figure 5-18 E1 120-ohm or T1 100-ohm trunk cable



5.8 Synchronous/Asynchronous Serial Cable

Types of Synchronous/Asynchronous Serial Cable



CAUTION

Before selecting synchronous/asynchronous serial cables for a router, obtain the remote device type (including the synchronous/asynchronous mode and DTE/DCE role), and the signal standard, baud rate, and clock required for the connected devices.

Table 5-10 lists synchronous/asynchronous serial cables of different types.

Table 5-10 Synchronous/asynchronous serial interface cables

Synchronous/ Asynchronous Serial Cable	Local End Connector	Network-side Connector
V.24 DTE Cable	DB28 connector	DB25 (male) connector
V.24 DCE Cable		DB25 (female) connector
V.35 DTE Cable		DB28 (male) connector
V.35 DCE Cable		DB28 (female) connector
X.21 DTE Cable		DB15 (male) connector
RS449 DTE Cable		DB28 (male) connector
RS449 DCE Cable		DB28 (female) connector
RS530 DTE Cable		DB25 (male) connector
RS530 DCE Cable		DB25 (female) connector

V.24 DTE Cable

Figure 5-19 shows the appearance of a V.24 DTE cable.

Figure 5-19 Appearance of a V.24 DTE cable



Figure 5-20 shows the structure of a V.24 DTE cable.

Figure 5-20 Structure of a V.24 DTE cable

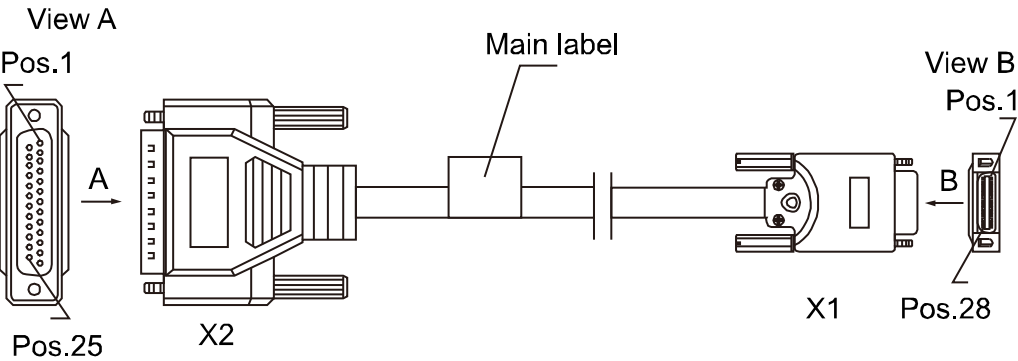


Table 5-11 lists the pin assignments of a V.24 DTE cable.

Table 5-11 Pin assignments of a V.24 DTE cable

X1	X2	Relationship
1	2	A pair
19	3	
13	4	A pair
23	5	
27	20	A pair
25	6	
11	8	A pair
22	18	
3	15	A pair
15	24	
17	17	—
21	1	—
6+10+7	7	—

V.24 DCE Cable

Figure 5-21 shows the appearance of a V.24 DCE cable.

Figure 5-21 Appearance of a V.24 DCE cable



Figure 5-22 shows the structure of a V.24 DCE cable.

Figure 5-22 Structure of a V.24 DCE cable

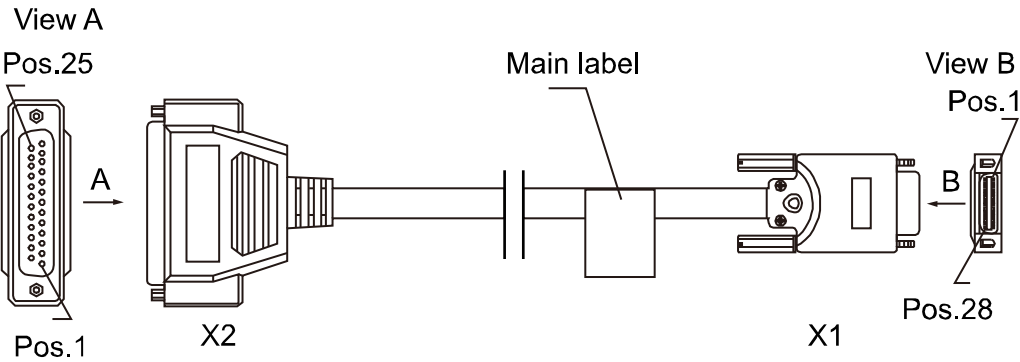


Table 5-12 lists the pin assignments of a V.24 DCE cable.

Table 5-12 Pin assignments of a V.24 DCE cable

X1	X2	Relationship
19	2	A pair
1	3	

X1	X2	Relationship
23	4	A pair
13	5	
25	20	A pair
27	6	
11	8	A pair
22	18	
3	15	A pair
17	24	
15	17	—
21	1	—
6+7	7	—

V.35 DTE Cable

Figure 5-23 shows the appearance of a V.35 DTE cable.

Figure 5-23 Appearance of a V.35 DTE cable



Figure 5-24 shows the structure of a V.35 DTE cable.

Figure 5-24 Structure of a V.35 DTE cable

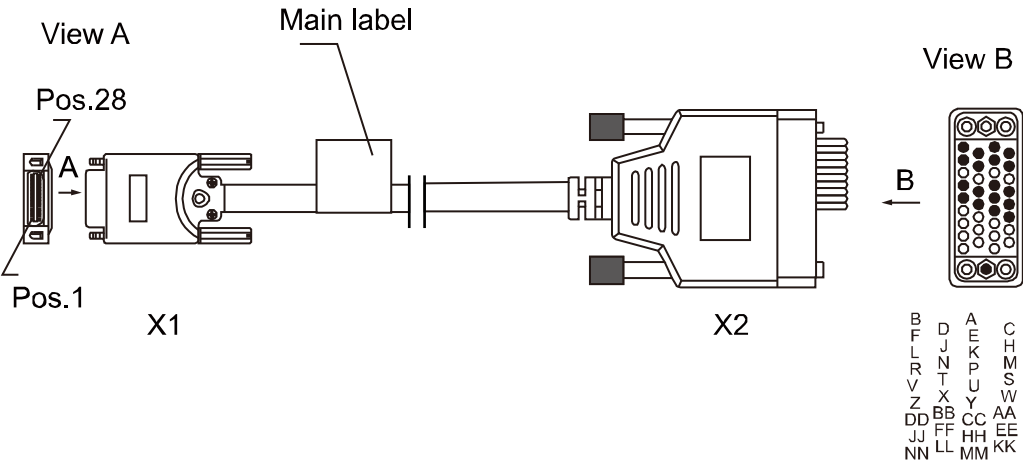


Table 5-13 lists the pin assignments of a V.35 DTE cable.

Table 5-13 Pin assignments of a V.35 DTE cable

X1	X2	Relationship
1	P	A pair
2	S	
19	R	A pair
20	T	
17	V	A pair
18	X	
3	Y	A pair
4	AA	
15	U	A pair
16	W	
11	F	—
22	J	—
13	C	—
23	D	—
27	H	—
25	E	—
21	B	—

X1	X2	Relationship
6+10+7+8	A	—

V.35 DCE Cable

Figure 5-25 shows the appearance of a V.35 DCE cable.

Figure 5-25 Appearance of a V.35 DCE cable



Figure 5-26 shows the structure of a V.35 DCE cable.

Figure 5-26 Structure of a V.35 DCE cable

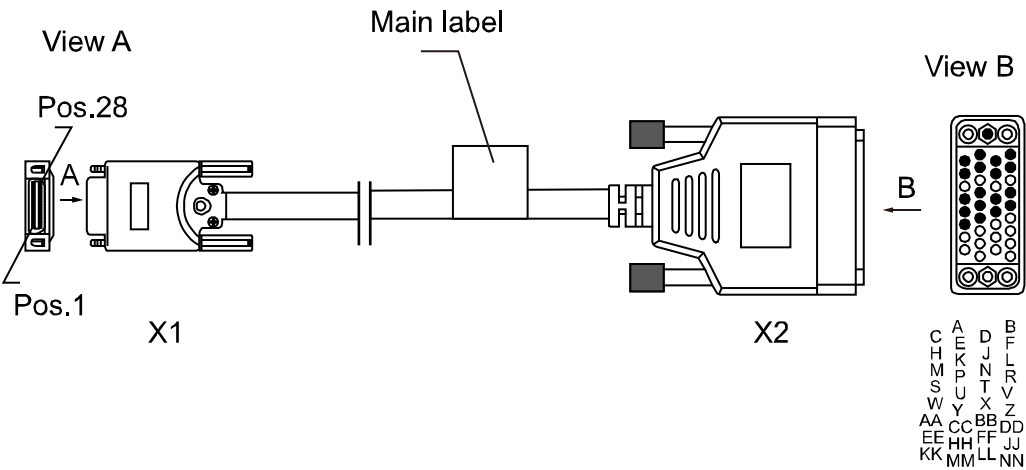


Table 5-14 lists the pin assignments of a V.35 DCE cable.

Table 5-14 Pin assignments of a V.35 DCE cable

X1	X2	Relationship
19	P	A pair
20	S	
1	R	A pair
2	T	
15	V	A pair
16	X	
3	Y	A pair
4	AA	
17	U	A pair
18	W	
11	F	A pair
22	J	
23	C	A pair
13	D	
25	H	A pair
27	E	
21	B	—
6	A	A pair
7		
8		—

X.21 DTE Cable

Figure 5-27 shows the appearance of an X.21 DTE cable.

Figure 5-27 Appearance of an X.21 DTE cable



Figure 5-28 shows the structure of an X.21 DTE cable.

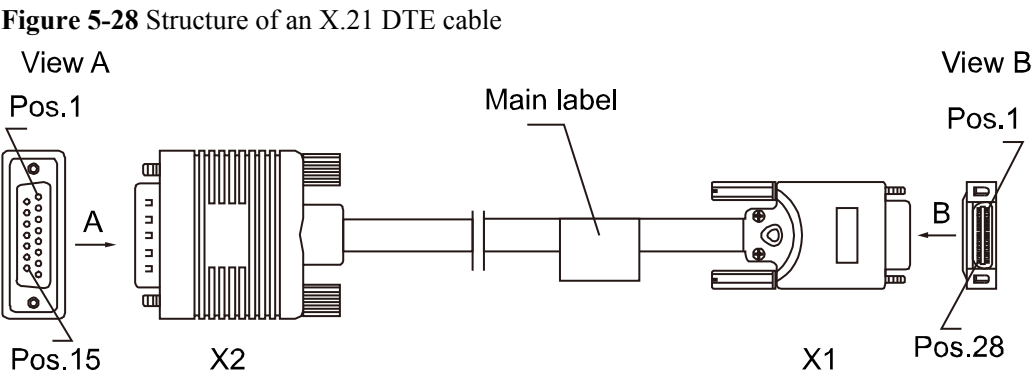


Table 5-15 lists the pin assignments of an X.21 DTE cable.

Table 5-15 Pin assignments of an X.21 DTE cable

X1	X2	Relationship
13	3	A pair
14	10	
23	5	A pair

X1	X2	Relationship
24	12	A pair
19	4	
20	11	
1	2	A pair
2	9	
17	6	A pair
18	13	
21	1	—
6+10+9	8	—

RS449 DTE Cable

Figure 5-29 shows the appearance of an RS449 DTE cable.

Figure 5-29 Appearance of an RS449 DTE cable



Figure 5-30 shows the structure of an RS449 DTE cable.

Figure 5-30 Structure of an RS449 DTE cable

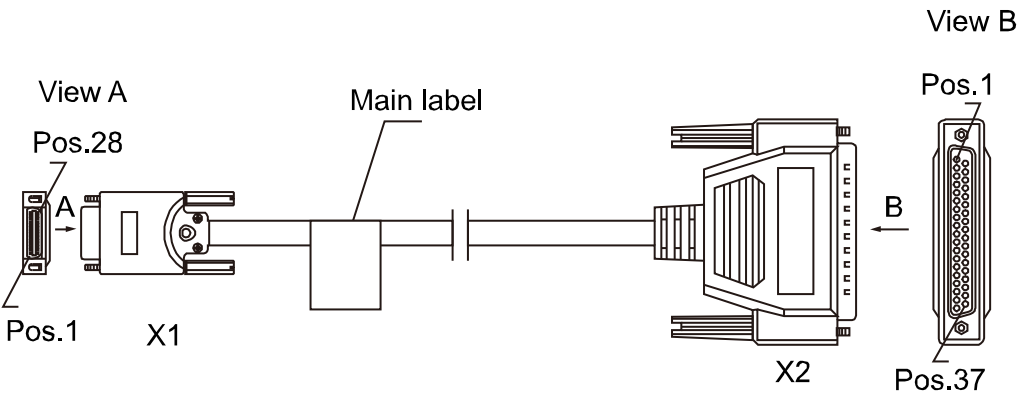


Table 5-16 lists the pin assignments of an RS449 DTE cable.

Table 5-16 Pin assignments of an RS449 DTE cable

X1	X2	Relationship
27	12	A pair
28	30	
25	11	A pair
26	29	
13	7	A pair
14	25	
23	9	A pair
24	27	
11	13	A pair
12	31	
19	6	A pair
20	24	
1	4	A pair
2	22	
15	17	A pair
16	35	
17	8	A pair
18	26	
3	5	A pair

X1	X2	Relationship
4	23	
22	10	—
21	1	—
6+8+10	19	—

RS449 DCE Cable

Figure 5-31 shows the appearance of an RS449 DCE cable.

Figure 5-31 Appearance of an RS449 DCE cable



Figure 5-32 shows the structure of an RS449 DCE cable.

Figure 5-32 Structure of an RS449 DCE cable

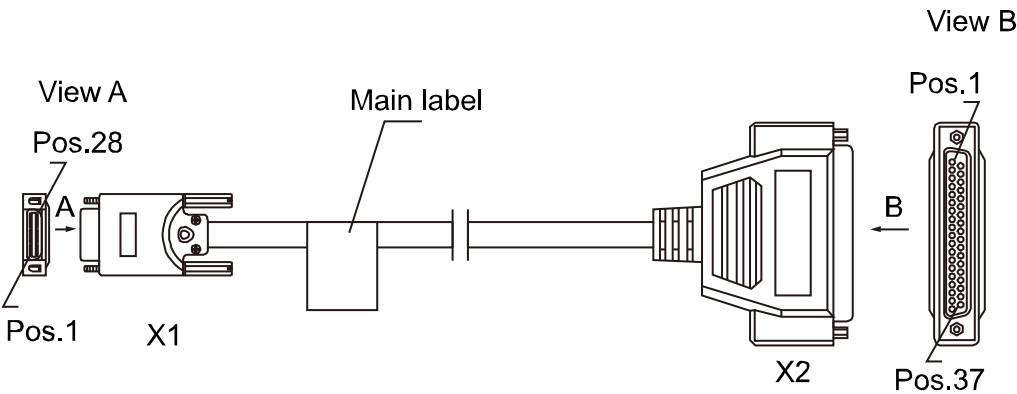


Table 5-17 lists the pin assignments of an RS449 DCE cable.

Table 5-17 Pin assignments of an RS449 DCE cable

X1	X2	Relationship
27	11	A pair
28	29	
25	12	A pair
26	30	
13	9	A pair
14	27	
23	7	A pair
24	25	
11	13	A pair
12	31	
19	4	A pair
20	22	
1	6	A pair
2	24	
15	8	A pair
16	26	
17	17	A pair
18	35	
3	5	A pair

X1	X2	Relationship
4	23	
22	10	—
21	1	—
6+8	19	—

RS530 DTE Cable

Figure 5-33 shows the appearance of an RS530 DTE cable.

Figure 5-33 Appearance of an RS530 DTE cable



Figure 5-34 shows the structure of an RS530 DTE cable.

Figure 5-34 Structure of an RS530 DTE cable

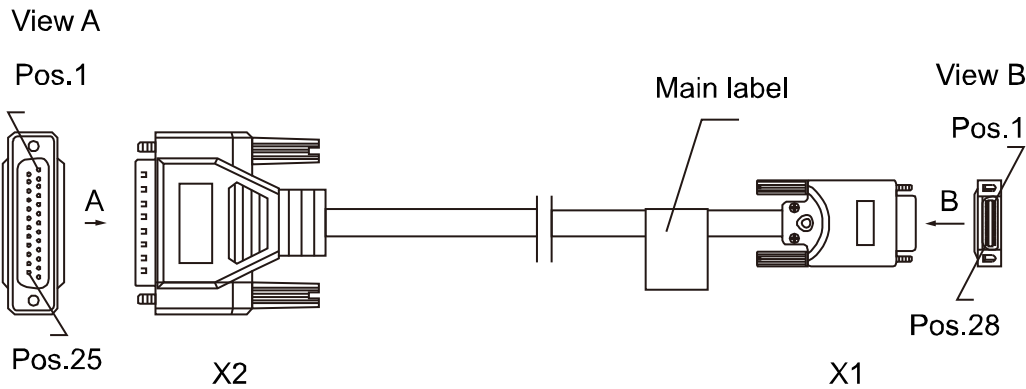


Table 5-18 lists the pin assignments of an RS530 DTE cable.

Table 5-18 Pin assignments of an RS530 DTE cable

X1	X2	Relationship
27	20	A pair
28	23	
25	6	A pair
26	22	
13	4	A pair
14	19	
23	5	A pair
24	13	
11	8	A pair
12	10	
19	3	A pair
20	16	
1	2	A pair
2	14	
15	24	A pair
16	11	
17	17	A pair
18	9	
3	15	A pair
4	12	
22	18	—
21	1	—
6+7+9+10	7	—

RS530 DCE Cable

Figure 5-35 shows the appearance of an RS530 DCE cable.

Figure 5-35 Appearance of an RS530 DCE cable



Figure 5-36 shows the structure of an RS530 DCE cable.

Figure 5-36 Structure of an RS530 DCE cable
View A

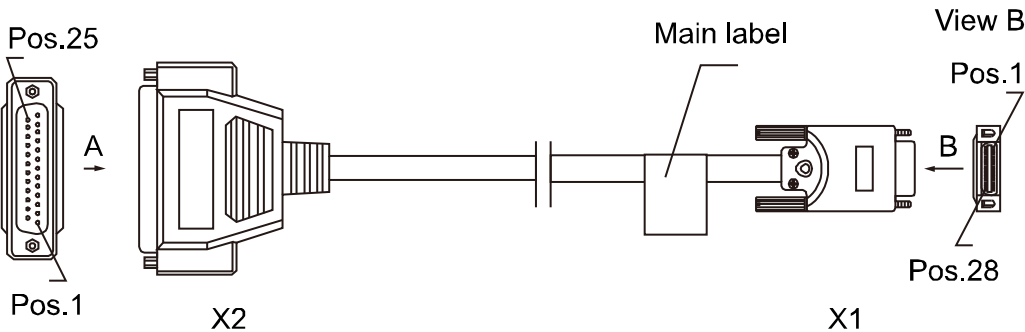


Table 5-19 lists the pin assignments of an RS530 DCE cable.

Table 5-19 Pin assignments of an RS530 DCE cable

X1	X2	Relationship
28	22	A pair
27	6	
26	23	A pair
25	20	

X1	X2	Relationship
24	19	A pair
23	4	
22	18	A pair
21	1	
20	14	A pair
19	2	
18	11	A pair
17	24	
16	9	A pair
15	17	
14	13	A pair
13	5	
12	10	A pair
11	8	
4	12	A pair
3	15	
2	16	—
1	3	—
6+7+9	7	—

Connection

A synchronous/asynchronous serial cable is connected as follows:

- The DB28 connector is connected to a DB28 port on a card.
- Connection of the other end depends on the type of the WAN link:
 - If WAN link is a digital data network (DDN) line, connect the other end of the cable to a port on a channel service unit (CSU) or data service unit (DSU).
 - If the WAN link is a dial-up line, connect the other end of the cable to the serial port on a modem.

5.9 4G.SHDSL Cable

Appearance and Structure

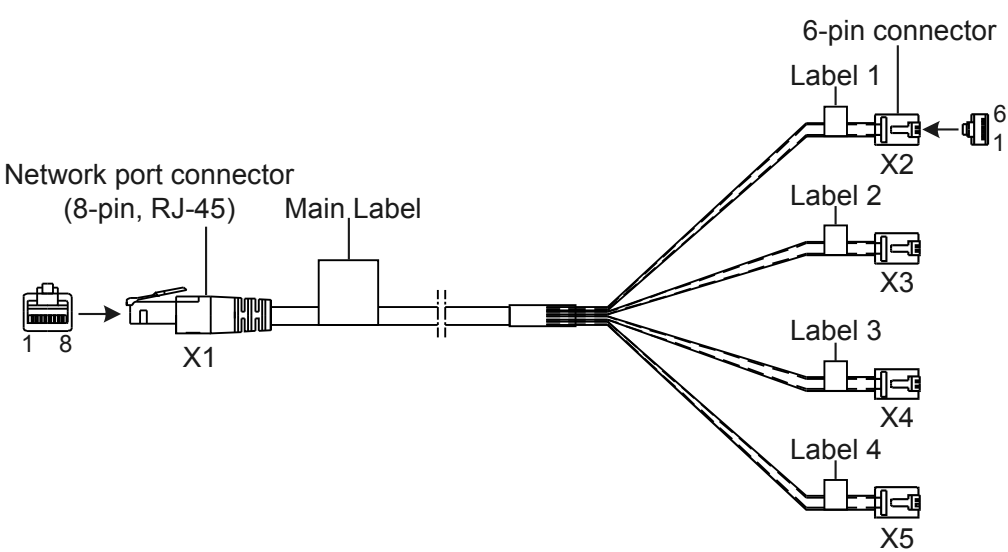
Figure 5-37 shows the appearance of the 4G.SHDSL cable.

Figure 5-37 Appearance of the 4G.SHDSL cable



Figure 5-38 shows the structure of the 4G.SHDSL cable.

Figure 5-38 Structure of the 4G.SHDSL cable



Pin Assignments

Table 5-20 describes the pin assignments of the 4G.SHDSL cable.

Table 5-20 Pin assignments of the 4G.SHDSL cable

Connector	X1 (RJ45)	X2/X3/X4/X5 (RJ11)	Wire Color
Pin assignment	1 (LINE1 A)	2.3	White and orange
	2 (LINE1 B)	2.4	Orange
	3 (LINE2 A)	3.3	White and green
	6 (LINE2 B)	3.4	Green
	4 (LINE0 A)	4.3	White and blue
	5 (LINE0 B)	4.4	Blue
	7 (LINE3 A)	5.3	White and brown
	8 (LINE3 B)	5.4	Brown

 NOTE

As shown in **Table 5-20**, a G.SHDSL cable uses the standard pin assignment. A cable has four ports, each of them has two lines (A/B). The two lines in a port can be assigned in any sequence, but the wire pairs must be assigned in certain sequence.

Cable Connection

The connectors of a 4G.SHDSL cable are as follows:

- An RJ45 connector on the local end
- Four RJ11 connector on the network side

5.10 ISDN-ST Cable

Cable Category

ISDN-ST cables are classified into the following types:

- TE: standard ISDN S/T interface cables (straight-through cables)
- NT: ISDN S/T interface crossover cables

Appearance and Structure

Figure 5-8 shows the appearance of a standard ISDN S/T interface cable (straight-through cable).

Figure 5-39 Appearance of a standard ISDN S/T interface cable



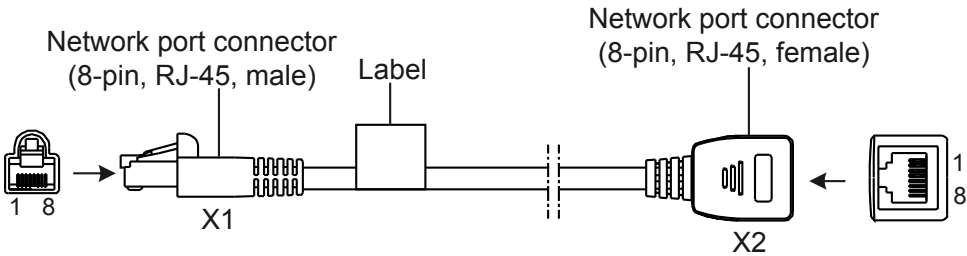
Figure 5-40 shows the appearance of an ISDN S/T interface crossover cable.

Figure 5-40 Appearance of an ISDN S/T interface crossover cable



Figure 5-41 shows the structure of an ISDN S/T interface crossover cable.

Figure 5-41 Structure of an ISDN S/T interface crossover cable



Pin Assignments

Table 5-21 describes the pin assignments of the standard ISDN S/T interface cable. Pins 3 and 6 are the sending end, and pins 4 and 5 are the receiving end.

Table 5-21 Pin assignments of the standard ISDN S/T interface cable

RJ45	Signal	RJ45
1	-	1
2	-	2
3	Tx+	3
4	Rx+	4
5	Rx-	5
6	Tx-	6
7	-	7
8	-	8

Table 5-22 describes the pin assignments of the ISDN S/T interface crossover cable. Pins 4 and 5 are the sending end, and pins 3 and 6 are the receiving end.

Table 5-22 Pin assignments of the ISDN S/T interface crossover cable

RJ45 (TE)	Signal	RJ45 (NT)
1	-	1
2	-	2
3	Tx+	4

RJ45 (TE)	Signal	RJ45 (NT)
4	Rx+	3
5	Rx-	6
6	Tx-	5
7	-	7
8	-	8

Cable Connection

- TE: standard ISDN S/T interface cables (straight-through cables) that use RJ45 connectors
- NT: ISDN S/T interface crossover cables
 - RJ45 connector on the local end
 - RJ45 socket on the network side

5.11 Regular Telephone Line

Appearance and Structure

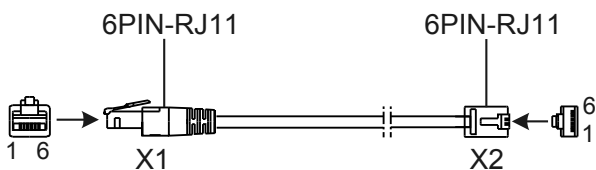
Figure 5-42 shows the appearance of a regular telephone line.

Figure 5-42 Appearance of a regular telephone line



Figure 5-43 shows the structure of a regular telephone line.

Figure 5-43 Structure of a regular telephone line



Pin Assignments

Table 5-23 provides the pin assignment of a regular telephone line.

Table 5-23 Pin assignment of a regular telephone line

X1 Pin	Wire Color	X2 Pin	Remarks
3	Red	3	Tip(+)
4	Green	4	Ring(-)

Connection

A regular telephone line is connected as follows:

- The RJ11 connector is connected to a device such as a phone and fax machine.
- Another RJ11 connector is connected to the voice card of the AR router.

5.12 8AS Cable

Cable Category

An 8AS cable connects the console port on an 8AS interface card to the serial port of an operation terminal. You can use shielded cables or unshielded cables as required in different scenarios.

The common usage scenarios of 8AS cables are:

- To connect an 8AS interface card to automatic teller machines in a bank, use shielded straight-through cables. You can buy shielded straight-through cables from Huawei or made these cables onsite.
- To connect an 8AS interface card to a dumb terminal, use a transit cable and a shielded straight-through cable. A transit cable has an RJ45 plug on one end and an RJ45 socket on the other end. The transit cable converts the pin assignments on the dumb terminal to the standard pin assignments, which are the same as those on the straight-through cable. Then the straight-through cable can connect to the dumb terminal.
- To connect an 8AS interface card to a serial port device, such as a PC or modem, use an asynchronous serial cable and a transit cable. One end of an asynchronous serial cable is an RJ45 socket, and the other end has a DB25 plug and a DB9 plug. The asynchronous serial cable connects to the PC or modem through the transit cable.

Straight-through Cable

Figure 5-44 shows the appearance of a straight-through cable.

Figure 5-44 Appearance of a straight-through cable



Figure 5-45 shows the structure of a straight-through cable.

Figure 5-45 Structure of a straight-through cable

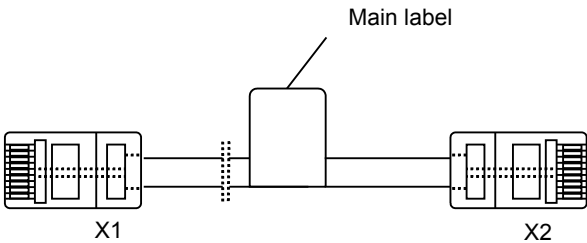


Table 5-24 lists the pin assignments of a straight-through cable.

Table 5-24 Pin assignments of a straight-through cable

X1 Pin (8AS)	X2 Pin (Console)
1	4
2	7
3	2
4	5

X1 Pin (8AS)	X2 Pin (Console)
5	3
6	6
7	1
8	8

Transit Cable

Figure 5-46 shows the appearance of a transit cable.

Figure 5-46 Appearance of a transit cable



Figure 5-47 shows the structure of a transit cable.

Figure 5-47 Structure of a transit cable

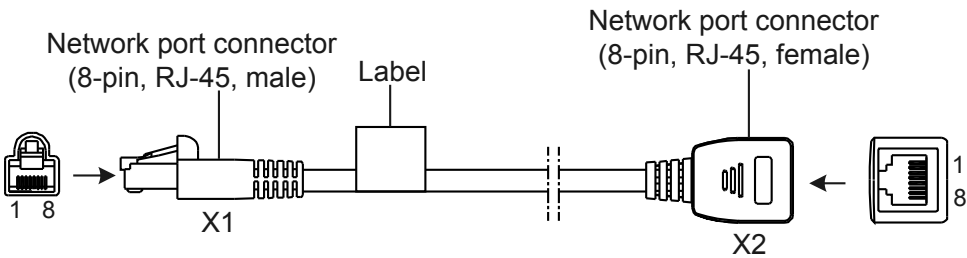


Table 5-25 lists the pin assignments of a transit cable.

Table 5-25 Pin assignments of a transit cable

X1	X2
1	4
2	2
3	7
4	5
5	6
6	3
7	8
8	1

Asynchronous Serial Interface Cable

Figure 5-48 shows the appearance of an asynchronous serial interface cable.

Figure 5-48 Appearance of an asynchronous serial interface cable



Figure 5-49 shows the structure of an asynchronous serial interface cable.

Figure 5-49 Structure of an asynchronous serial interface cable

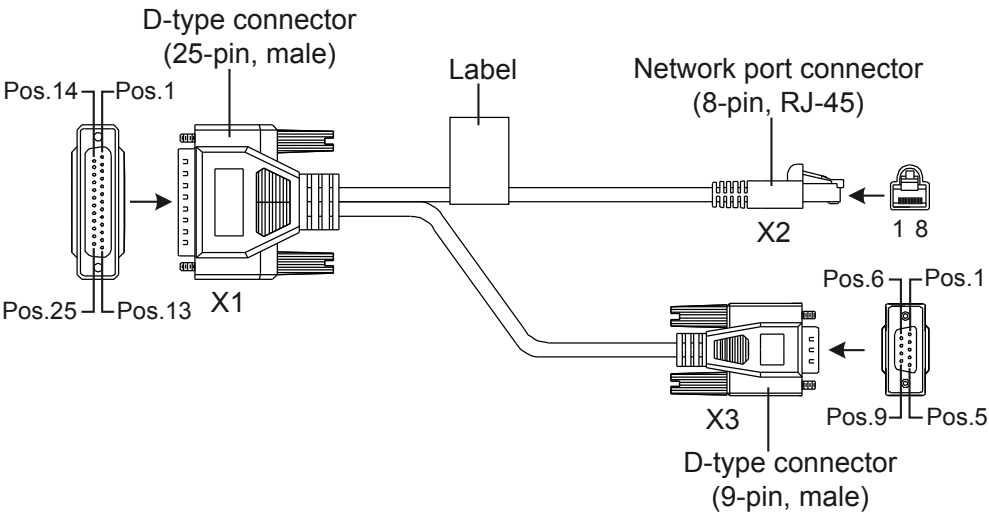


Table 5-26 lists the pin assignments of an asynchronous serial interface cable.

Table 5-26 Pin assignments of an asynchronous serial interface cable

X1	X2	X3
4	1	7
20	2	4
2	3	3
8	4	1
7	5	5
3	6	2
6	7	6
5	8	8

5.13 3G Antenna

Cable Category

3G antennas are classified into 3G whip antennas and 3G indoor remote antennas:

- 3G Whip antennas are directly installed on an router and are recommended when a router is desk installed or wall mounted.

- 3G Indoor remote antennas have a 3 m long feed line and are recommended when an router is installed in a cabinet or rack. Indoor remote antennas need to be ordered separately if needed.

3G Whip Antenna

Figure 5-50 shows the appearance of a 3G whip antenna.

Figure 5-50 3G Whip antenna



3G Indoor Remote Antenna

Figure 5-51 shows the appearance of a 3G indoor remote antenna.

Figure 5-51 3G Indoor Remote Antenna



5.14 WiFi Antenna

WiFi Rod Antenna

Figure 5-52 shows the appearance of a WiFi rod antenna.

Figure 5-52 WiFi rod antenna



WiFi whip antenna

Figure 5-53 shows the appearance of a WiFi whip antenna.

Figure 5-53 WiFi whip antenna



5.15 32FXS Cable

Appearance and Structure

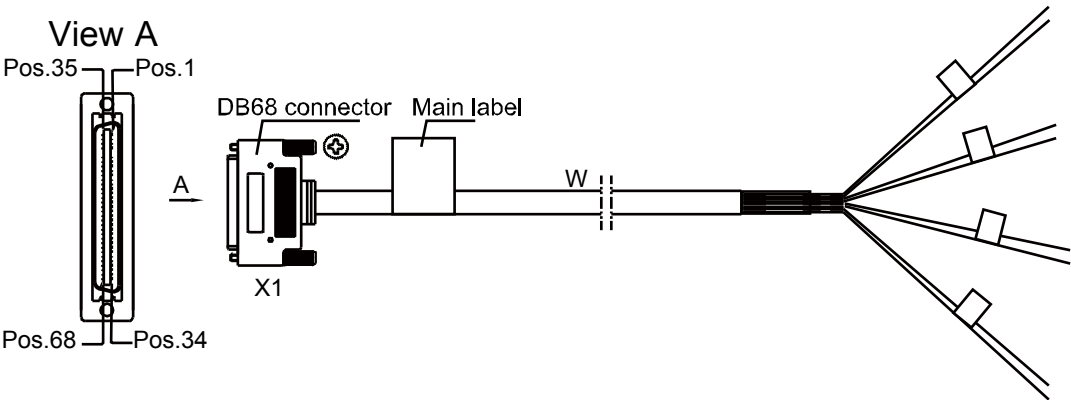
Figure 5-54 shows the appearance of a 32FXS cable.

Figure 5-54 Appearance of a 32FXS cable



Figure 5-55 shows the structure of a 32FXS cable.

Figure 5-55 Structure of a 32FXS cable



Pin Assignments

Table 5-27, Table 5-28, Table 5-29, and Table 5-30 list the pin assignments of the 32FXS cable.

Table 5-27 Pin assignments of the 32FXS cable

Connector	Group Color	X1 (DB68)	Wire Color	Port No.
Assignment	Blue	36	Blue	1
		35	White	
		38	Orange	2
		37	White	
		40	Green	3
		39	White	
		42	Brown	4
		41	White	
		44	Grey	5
		43	White	
		46	Blue	6
		45	Red	
		48	Orange	7
		47	Red	
		50	Green	8
		49	Red	

Table 5-28 Pin assignments of the 32FXS cable

Connector	Group Color	X1 (DB68)	Wire Color	Port No.
Assignment	Blue	2	Brown	9
		1	Red	
		4	Grey	10
		3	Red	
		6	Blue	11
		5	Black	
		8	Orange	12
		7	Black	
		10	Green	13
		9	Black	

Connector	Group Color	X1 (DB68)	Wire Color	Port No.
		12	Brown	14
		11	Black	
		14	Grey	15
		13	Black	
		16	Blue	16
		15	Yellow	

Table 5-29 Pin assignments of the 32FXS cable

Connector	Group Color	X1 (DB68)	Wire Color	Port No.
Assignment	Orange	54	Blue	17
		53	White	
		56	Orange	18
		55	White	
		58	Green	19
		57	White	
		60	Brown	20
		59	White	
		62	Grey	21
		61	White	
		64	Blue	22
		63	Red	
		66	Orange	23
		65	Red	
		68	Green	24
		67	Red	

Table 5-30 Pin assignments of the 32FXS cable

Connector	Group Color	X1 (DB68)	Wire Color	Port No.
Assignment	Orange	20	Brown	25

Connector	Group Color	X1 (DB68)	Wire Color	Port No.
		19	Red	26
		22	Grey	
		21	Red	
		24	Blue	27
		23	Black	
		26	Orange	28
		25	Black	
		28	Green	29
		27	Black	
		30	Brown	30
		29	Black	
		32	Grey	31
		31	Black	
		34	Blue	32
		33	Yellow	

Cable Connection

- A 32FXS cable is connected as follows:
- One DB68 connector on the local end
 - 32 RJ11 connectors on the network side

5.16 16FXS Cable

Appearance and Structure

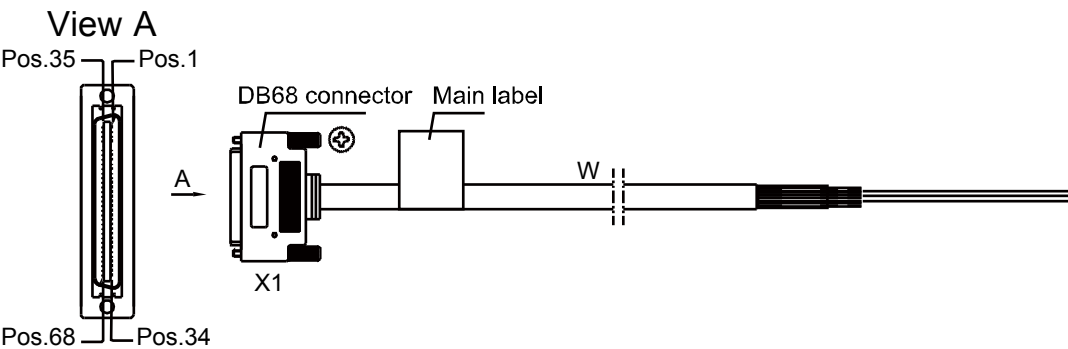
Figure 5-56 shows the appearance of a 16FXS cable.

Figure 5-56 Appearance of a 16FXS cable



Figure 5-57 shows the structure of a 16FXS cable.

Figure 5-57 Structure of a 16FXS cable



Pin Assignments

Table 5-31 lists the pin assignments of a 16FXS cable.

Table 5-31 Pin assignments of the 16FXS cable

Connector	X1 (DB68)	Wire Color	Port No.
Assignment	36	Blue	1
	35	White	
	38	Orange	2
	37	White	

Connector	X1 (DB68)	Wire Color	Port No.
	40	Green	3
	39	White	
	42	Brown	4
	41	White	
	44	Grey	5
	43	White	
	46	Blue	6
	45	Red	
	48	Orange	7
	47	Red	
	50	Green	8
	49	Red	
	2	Brown	9
	1	Red	
	4	Grey	10
	3	Red	
	6	Blue	11
	5	Black	
	8	Orange	12
	7	Black	
	10	Green	13
	9	Black	
	12	Brown	14
	11	Black	
	14	Grey	15
	13	Black	
	16	Blue	16
	15	Yellow	

Cable Connection

A 16FXS cable is connected as follows:

- One DB68 connector on the local end
- 16 RJ11 connectors on the network side

5.17 RPS150 Power Cable

Appearance

[Figure 5-58](#) shows the appearance of an RPS150 power cable.

Figure 5-58 Appearance of an RPS150 power cable



Cable Connection

An RPS150 power cable connects an RPS150 power supply system to AR2200 so that the RPS150 provides power supply for the AR2200.

NOTE

An RPS cable is a common power cable. Do not connect the RPS to the AR router with power on.

- To power on the AR router, connect the RPS cable, and then switch on the AR router and RPS150.
- To power off the AR router, switch off the AR router and RPS150, and then remove the RPS cable.

5.18 4E1/T1 Cable

Appearance

[Figure 5-59](#) shows the appearance of an 4E1 75-ohm cable.

Figure 5-59 Appearance of an 4E1 75-ohm cable



Figure 5-60 shows the appearance of an 4E1 120-ohm cable.

Figure 5-60 Appearance of an 4E1 120-ohm cable



Figure 5-61 shows the structure of an 4E1 75-ohm cable.

Figure 5-61 Structure of an 4E1 75-ohm cable

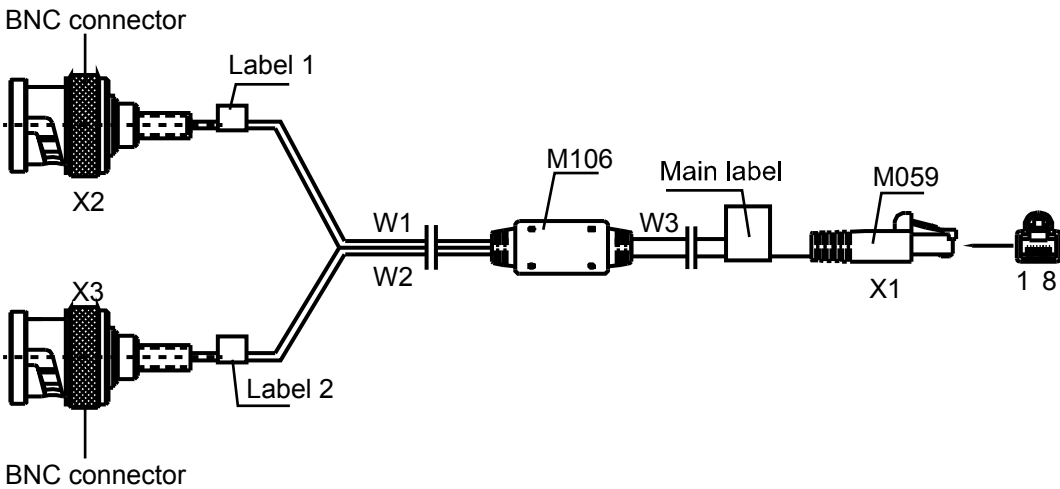
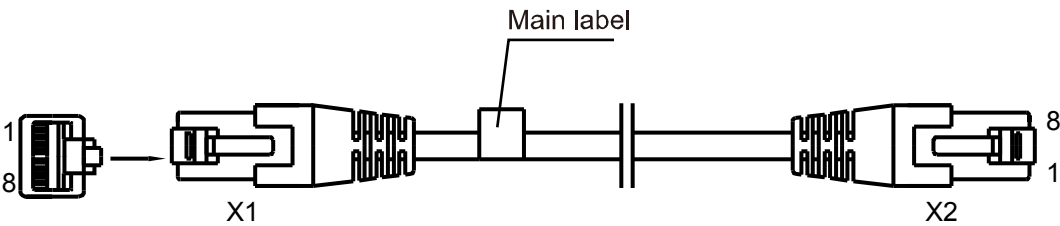


Figure 5-62 shows the structure of an 4E1 120-ohm cable.

Figure 5-62 Structure of an 4E1 120-ohm cable



Pin Assignments

Table 5-32 describes the pin assignments of an 4E1 75-ohm cable.

Table 5-32 Pin assignments of an 4E1 75-ohm cable

Connector	X1 (RJ45)	BNC Connector
Pin assignment	1	X2
	2	
	4	X3
	5	

Table 5-33 describes the pin assignments of an 4E1 120-ohm cable.

Table 5-33 Pin assignments of an 4E1 120-ohm cable

Connector	X1 (RJ45)	X2 (RJ45)	Wire Color	Remarks
Pin assignment	1	4	White	One pair
	2	5	Blue	
	3	6	Orange	-
	4	1	White	One pair
	5	2	Green	
	6	3	Brown	-

Cable Connection

4E1/T1 cables are classified into 75-ohm cables and 120-ohm cables. The connectors of the cables are as follows:

- 75-ohm cable (RJ45 to BNC):
 - One end provides a RJ45 connector.
 - The other end provides two BNC connectors.
- 120-ohm cable (RJ45 to RJ45):
 - One end provides a RJ45 connector.
 - The other end provides an RJ45 connector.

Trunk cable

NOTE

The 4E1/T1 cable is 3 m long. If the connection distance is long, a trunk cable is required.

- E1 75-ohm trunk cable: BNC to BNC (The two connectors are BNC 75 angle male-II.)
- E1 120-ohm trunk cable: RJ45 to RJ45 (The two connectors are RJ45.)

The E1 75-ohm trunk cable is connected as follows:

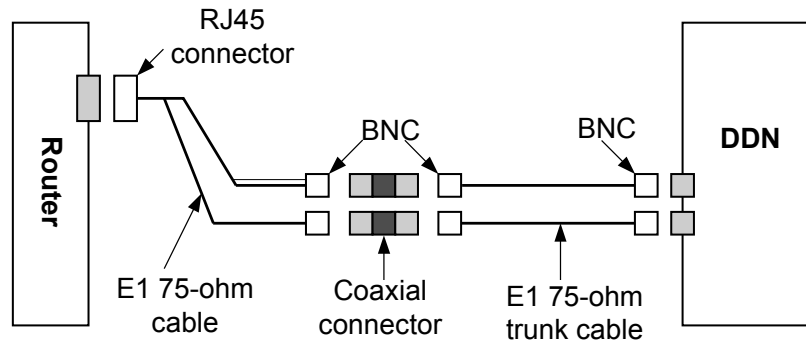
- If the 4E1 cable extension is not used, the BNC connector is connected to the remote device.
- If the 4E1 cable extension is used, the BNC connector is connected to a coaxial connector, and the coaxial connector is connected to the remote device through the trunk cable, as shown in [Figure 5-63](#).



CAUTION

The Tx end of the 4E1 cable is connected to the Rx end of the remote device, and the Rx end is connected to the Tx end.

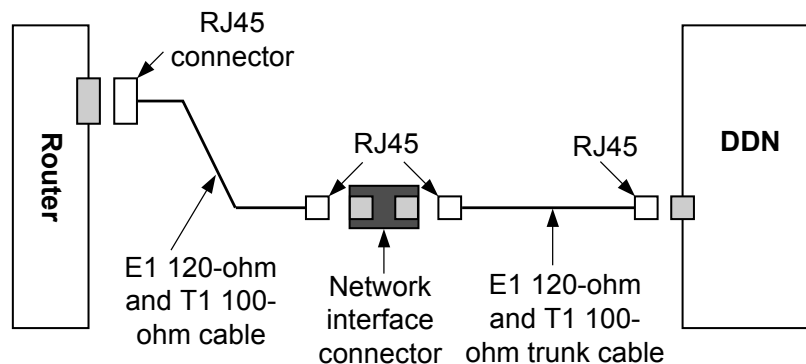
Figure 5-63 E1 75-ohm trunk cable



The E1 120-ohm trunk cable is connected as follows:

- If the E1 cable extension is not used, the RJ45 connector is connected to the RJ45 interface of the remote device.
- If the E1 cable extension is used, the RJ45 connector is connected to a network interface connector, and the network interface connector is connected to the remote device through the trunk cable, as shown in [Figure 5-64](#).

Figure 5-64 E1 120-ohm trunk cable



5.19 E3/T3 Cable

Appearance and Structure

[Figure 5-65](#) shows the appearance of an E3/T3 cable.

Figure 5-65 E3/T3 cable appearance

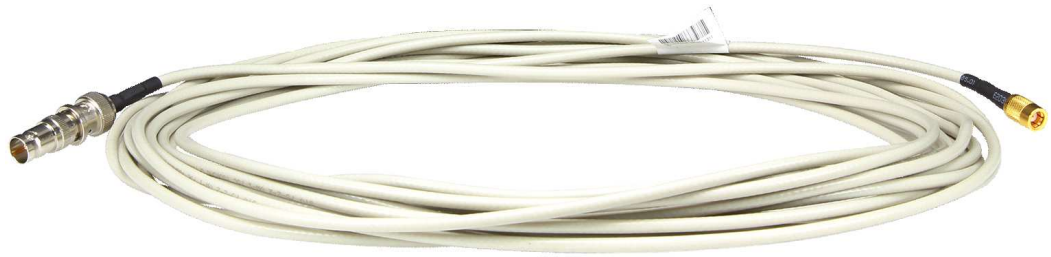
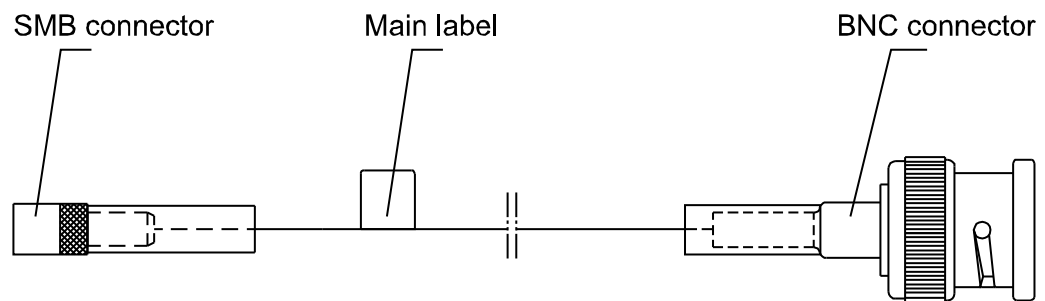


Figure 5-66 shows the structure of an E3/T3 cable.

Figure 5-66 E3/T3 cable structure



Connection

- Connect the SMB connector of one E3/T3 cable to the Tx interface on the 1E3/CE3/T3/CT3 interface card, and the other end to the Rx interface on the remote device.
- Connect the SMB connector of the other E3/T3 cable to the Rx interface on the 1E3/CE3/T3/CT3 interface card, and the other end to the Tx interface on the remote device.

5.20 LTE Antenna

Types of LTE Antennas

LTE antennas include LTE whip antennas and LTE indoor remote antennas.

- LTE whip antennas are connected to the primary and secondary LTE interfaces on a router. They are recommended in desk mounting and wall mounting scenarios.
- A LTE indoor remote antenna is connected to the primary LTE interface on a router through a self-contained 3 m feeder line. It is recommended in cabinet/rack mounting scenarios.

NOTE

- LTE antennas are delivered with LTE interface cards.
- LTE indoor remote antennas are optional and need to be purchased separately if required.

LTE Whip Antenna

Figure 5-67 shows the appearance of a LTE whip antenna.

Figure 5-67 LTE whip antenna



LTE Indoor Remote Antenna

Figure 5-68 shows the appearance of a LTE indoor remote antenna.

Figure 5-68 LTE indoor remote antenna



6 Optical Modules

About This Chapter

NOTE

- In this document, optical modules are classified based on encapsulation types, and optical modules of each encapsulation type are classified based on interface rates.
- Appearances of optical modules in this document are only for reference, and appearances of actually delivered optical modules may differ.
- Only Huawei-certified optical modules can be installed on the AR router. Reliability of other non-Huawei-certified optical modules cannot be ensured and these modules may cause service interruption. Huawei assumes no liability for problems caused by non-Huawei-certified optical modules.

[6.1 Basic Concepts](#)

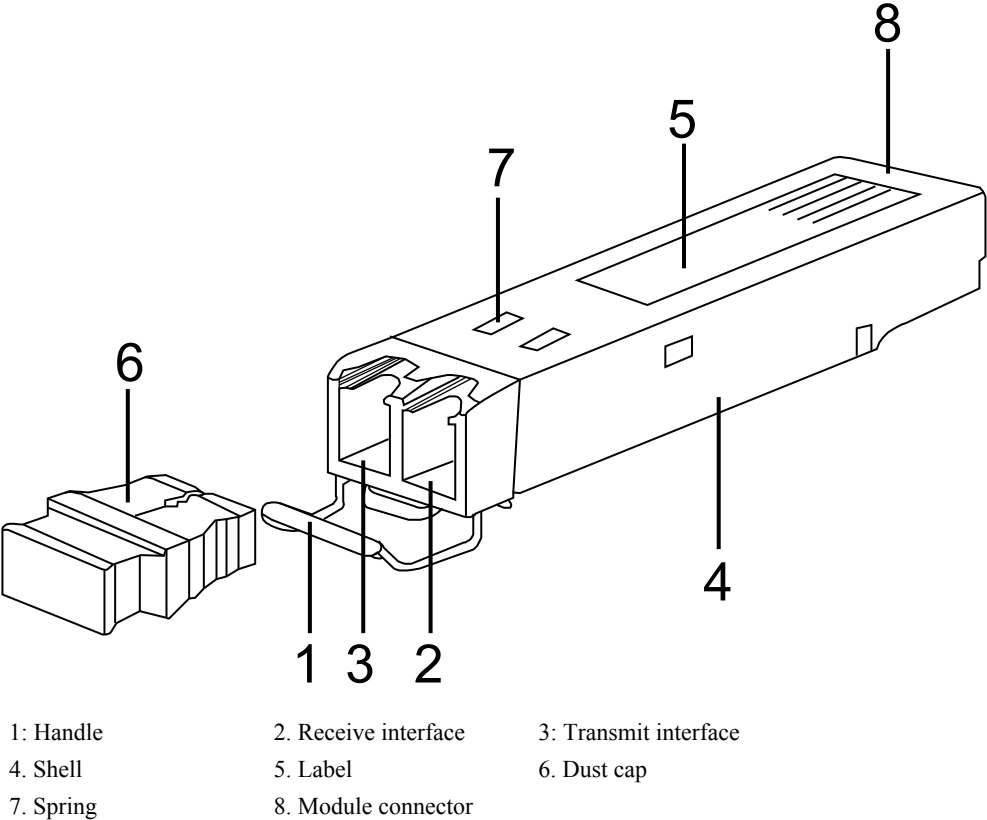
[6.2 SFP/eSFP Optical Module](#)

6.1 Basic Concepts

Appearance

Figure 6-1 shows the appearance of an optical module.

Figure 6-1 Appearance of an optical module



Terms

- Transmission distance**

Maximum distance over which optical signals can transmit. Optical signals sent from different types of sources can transmit over different distances due to negative effects of optical fibers, such as dispersion and attenuation.
- Interface rate**

Maximum rate of electrical signals that an optical device can transmit without bit errors. The interface rates defined in Ethernet standards include 100 Mbit/s, 1.25 Gbit/s, 10.3125 Gbit/s, and 41.25 Gbit/s.

Encapsulation type

Appearance type of an optical module. Encapsulation types of optical modules include SFP, eSFP, as described in [Table 6-1](#).

Table 6-1 Encapsulation types of optical modules

Encapsulation Type	Description	Optical Module
SFP(Small Form-factor Pluggable)	Small form-factor pluggable.	FE Optical Module
eSFP(Enhanced Small Form-factor Pluggable)	Enhanced small form-factor pluggable. An eSFP module is an SFP module that supports monitoring of voltage, temperature, bias current, transmit optical power, and receive optical power. Sometimes, eSFP is called SFP.	FE Optical Module (including the single-fiber bidirectional optical module)
		GE Optical Module (including the single-fiber bidirectional optical module)
		POS Optical Module
		EPON Optical Module

Center wavelength

Wavelength measured at the midpoint of the half-amplitude line in the transmit spectrum.

Fiber mode

Mode of fibers defining based on core diameters and features of optical fibers. Optical fibers are classified into single-mode fibers and multi-mode fibers. Generally, multi-mode fibers have large core diameters and severe dispersion, so they transmit optical signals over short distances when working with multi-mode optical modules. Single-mode fibers have small dispersion and can transmit optical signals over long distances when working with single-mode optical modules.

Pattern bandwidth	Bandwidth measured at a point with transmit power several dB lower than that of the point with the peak center wavelength. Pattern bandwidth reflects spectrum characteristics of an optical module.
Fiber diameter	Diameter of the core of a fiber. According to international standards for optical fibers, the diameter of a multi-mode fiber is 62.5 um or 50 um, and the diameter of a single-mode fiber is 9 um.
Fiber class	Optical signals with different wavelengths have their best working windows in different optical fibers. To help efficiently adjust wavelengths or dispersion features of optical fibers and change their refractive indexes, the following classes are defined: multi-mode fiber (G.651), common single-mode fiber (G.652), shifted dispersion fiber (G.653), and non-zero shifted dispersion fiber (G.655). G.651 and G.652 are commonly used fiber classes.
Connector type	Type of the interface on an optical module to accommodate a fiber. Commonly used connector types are LC (applicable to all the SFP, SFP+, and XFP modules), SC (PON) and MPO (applicable to 150 m QSFP+ and CXP modules).
Transmit optical power	Output optical power of an optical module when it is working properly.
Maximum receiver sensitivity	Minimum average input optical power that the receiver of an optical module can receive within a range of bit error rate (BER = 10 to 12).
Overload optical power	Maximum average input optical power that the receiver of an optical module can receive within a range of bit error rate (BER = 10 to 12).
Extinction ratio	Minimum ratio of the average optical power with signals transmitted against the average optical power without signals transmitted in complete modulation mode. The extinction ratio indicates the capability of an optical module to identify signal 0 and signal 1.

6.2 SFP/eSFP Optical Module

Appearance

Figure 6-2 shows the appearance of the SFP/eSFP optical module.

Figure 6-2 Appearance of the SFP/eSFP optical module



FE Optical Module

Table 6-2 and **Table 6-3** lists the attributes of the FE optical module.

Table 6-2 Attributes of FE optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
SFP-FE-SX-MM1310 (SFP optical module)	≤ 2	100base-FX	● Fiber mode: multimode ● Core diameter: 62.5/125 ● Connector type: LC	0°C to 70°C
eSFP-FE-LX-SM1310	≤ 15	100base-LX	● Fiber mode: single-mode ● Connector type: LC	
eSFP-FE-LH40-SM1310	≤ 40			
eSFP-FE-LH80-SM1550	≤ 80			
SFP-FE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	≤ 15	100base-BX		
SFP-FE-LX-SM1550-BIDI (Single-fiber bidirectional optical module)				

Table 6-3 Attributes of FE optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
SFP-FE-SX-MM1310 (SFP optical module)	1310	-19.0 to -14.0	≤ -30.0	-14.0	10
eSFP-FE-LX-SM1310		-15.0 to -8.0	≤ -31.0	-8.0	8.2
eSFP-FE-LH40-SM1310		-5.0 to 0	≤ -37.0	-10.0	10.5
eSFP-FE-LH80-SM1550	1550				
SFP-FE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	RX1550/ TX1310	-15.0 to -8.0	≤ -32.0	-8.0	8.5
SFP-FE-LX-SM1550-BIDI (Single-fiber bidirectional optical module)	TX1550/ RX1310				

GE Optical Module

Table 6-4 and **Table 6-5** lists the attributes of the GE optical module.

Table 6-4 Attributes of GE optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
eSFP-GE-SX-MM850	≤ 0.5	1000base-SX	- Fiber mode: multimode - Pattern bandwidth: 400 MHz*km - Core diameter: 50 μm - Connector type: LC	0°C to 70°C
SFP-GE-LX-SM1310	≤ 10	1000base-LX/LH	- Fiber mode: single-mode - Connector type: LC	
S-SFP-GE-LH40-SM1310	≤ 40			
S-SFP-GE-LH40-SM1550				
S-SFP-GE-LH80-SM1550	≤ 80	1000base-ZX		
eSFP-GE-ZX100-SM1550	≤ 100			
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	≤ 10	1000base-BX		
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)				
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	≤ 40			
LE2MGSC40ED0 (Single-fiber bidirectional optical module)				

Table 6-5 Attributes of GE optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-GE-SX-MM850	850	-9.5 to -2.5	≤ -17.0	0	9
SFP-GE-LX-SM1310	1310	-9.0 to -3.0	≤ -20.0	-3.0	9
S-SFP-GE-LH40-SM1310	1310	-5.0 to 0	≤ -23	-3.0	6
S-SFP-GE-LH40-SM1550	1550	-5.0 to 0	≤ -22	-3.0	8.5
S-SFP-GE-LH80-SM1550	1550	-2.0 to 5.0	≤ -23.0	-3.0	9
eSFP-GE-ZX100-SM1550	1550	0 to 5	≤ -30.0	-9.0	8
SFP-GE-LX-SM1310-BIDI (Single-fiber bidirectional optical module)	TX1310/ RX1490	-9.0 to -3.0	≤ -19.5	-3.0	6
SFP-GE-LX-SM1490-BIDI (Single-fiber bidirectional optical module)	RX1310/ TX1490	-9.0 to -3.0	≤ -19.5	-3.0 6	6
LE2MGSC40DE0 (Single-fiber bidirectional optical module)	TX1310/ RX1490	-2.0 to 3.0	≤ -23	-3.0	9
LE2MGSC40ED0 (Single-fiber bidirectional optical module)	RX1310/ TX1490	-2.0 to 3.0	≤ -23	-3.0	9

POS Optical Module

Table 6-6 and **Table 6-7** lists the attributes of the POS optical module.

Table 6-6 Attributes of POS optical modules

Model	Transmission Distance (km)	Fiber Type	Operating Temperature
eSFP-SM1310-155M-2.5G-15km	≤ 15	- Fiber mode: single-mode - Connector type: LC	0°C to 70°C
eSFP-1310nm-L-16.1	≤ 40		
eSFP-1550nm-L-16.2	≤ 80		

Table 6-7 Attributes of POS optical modules

Model	Center Wavelength (nm)	Usage Scenario (Service Rate)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
eSFP-SM1310-155M-2.5G-15km	1310	622M	-15.0 to -8.0	≤ -31.0	-8.0	8.2
		155M	-15.0 to -8.0	≤ -31.0	-8.0	
eSFP-1310nm-L-16.1	1310	622M	-3.0 to 2.0	≤ -30.0	-8.0	8.5
		155M	-5.0 to 0	≤ -37.0	-10.0	
eSFP-1550nm-L-16.2	1550	622M	-3.0 to 2.0	≤ -30.0	-8.0	8.2
		155M	-5.0 to 0	≤ -37.0	-10.0	

EPON Optical Module

Table 6-8 and **Table 6-9** lists the attributes of the EPON optical module.

Table 6-8 Attributes of EPON optical modules

Model	Transmission Distance (km)	Standard	Fiber Type	Operating Temperature
OSG002005	≤ 20	1000base-PX20	● Fiber mode: single-mode ● Connector type: LC	0°C to 70°C

Table 6-9 Attributes of EPON optical modules

Model	Center Wavelength (nm)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Overload Optical Power (dBm)	Extinction Ratio (dB)
OSG002005	Tx1490/ Rx1310	2.5 to 7	≤ -30	-6	9