

White Paper

Energy Consumption ESPRIMO Q900

In order to strengthen the leadership in implementing European environmental protection regulations, Fujitsu Technology Solutions provides all important energy information about their products. With the publication of energy consumption values and the typical Annual Energy Consumption (AEC), we join the proposal from the preparatory studies for the EU Commission regarding energy using products (e.g. <http://www.ecocomputer.org>). In addition we calculate the typical energy consumption (TEC) based on ENERGY STAR® 5 certification.

Fujitsu Technology Solutions is also taking significant effort to reduce the energy consumption in data centres by providing highest energy efficiency with PRIMERGY servers. To underline these efforts Fujitsu Technology solutions joined the "Green Grid" and "Climate Savers Computing" initiatives and publishes SPECpower benchmark results for PRIMERGY servers.

A. Web page addresses for information on Energy, Environment and End-of-life treatment

Fujitsu Technology Solutions supports important information for energy, environment and End-of-life treatment on basis of European directives and beyond, for:

Energy: <http://ts.fujitsu.com/energy>

Environment: <http://ts.fujitsu.com/environment>

End-of-life treatment: <http://ts.fujitsu.com/recycling>

B. Software to use hardware power management

All Clients are designed to use the hardware power management potential efficiently. The defaults for the power management settings ex factory even exceed the Energy Star shipment requirements.

Settings in Microsoft® Windows® for	Desktop, Notebook	Notebook (Battery)
Turn off the display	10 min	5 min
Turn off the hard disc	10 min	5 min
Standby	20 min	15 min
Hibernating	60 min	60 min

C. Power Consumption and typical Annual Energy Consumption for Clients

Intel® Core i5-2520M

Operational modes	Modes used in Energy Star calculator	power consumption for standard configuration
Configuration Information		2 x2 GB, HDD, ODD, Windows® 7™
Related Processor for power consumption		Intel® Core i5-2520M
Power consumption notes		ACPI S5 power level after 10 minutes
Power consumption: Maximum (S0*, running appl., CD in use) 1)		53.2 W
Power consumption: Idle (S0, running OS, Idle-mode)		12.5 W
	On-mode 2)	16.6 W
Power consumption: Standby (S3*, energy saving mode, WOL enabled)	Standby-Modus	1.28 W
Power consumption: Minimum (ACPI status S5*, soft off, WOL enabled)	Off-mode 3)	0.81 W
Power consumption: Minimum (ACPI status S5, soft off, wake up power button)		0.81 W
Typical Annual Energy Consumption (WOL enabled) 4)		40.1 kWh/year
Typical Energy Consumption (TEC), ENERGY STAR® 5 based 5)		48.3 kWh/year
Heat dissipation, WOL enabled (MJ, 1 W = 3.6 kJ/h)		144.4 MJ/year
Heat dissipation, WOL enabled (kBTU, 1 W = 3.4121 BTU/h)		136.9 kBTU/year

Intel® Core i3-2310M

Operational modes	Modes used in Energy Star calculator	power consumption for standard configuration
Configuration Information		2 x2 GB, HDD, ODD, Windows® 7™
Related Processor for power consumption		Intel® Core i3-2310M
Power consumption notes		ACPI S5 power level after 10 minutes
Power consumption: Maximum (S0*, running appl., CD in use) 1)		53.4 W
Power consumption: Idle (S0, running OS, Idle-mode)		12.9 W
	On-mode 2)	17.0 W
Power consumption: Standby (S3, energy saving mode, WOL enabled)	Standby-Modus	1.0 W
Power consumption: Minimum (ACPI status S5*, soft off, WOL enabled)	Off-mode 3)	0.79 W
Power consumption: Minimum (ACPI status S5, soft off, wake up power button)		0.79 W
Typical Annual Energy Consumption (WOL enabled) 4)		40.6 kWh/year
Typical Energy Consumption (TEC), ENERGY STAR® 5 based 5)		49.4 kWh/year
Heat dissipation, WOL enabled (MJ, 1 W = 3.6 kJ/h)		146.3 MJ/year
Heat dissipation, WOL enabled (kBTU, 1 W = 3.4121 BTU/h)		138.7 kBTU/year

1) The Maximum Mode is measured according to SYSTEST 32 of Fujitsu for PCs (to be replaced by Energy Star standard benchmarking tool when

available).

2) The "On-mode" is determined by the proposal of the European MEEuP Product Cases Report (2005) based on the MEEuP Methodology Report for the European Commission (2005):

"On-mode" for Office PC is calculated by: 90% Idle, 10% full load / maximum.

3) Display power consumption of 0.0 watt in Off-Mode realized either with 0-Watt-Power-Save-Mode on selected Fujitsu display models or switched monitor outlet on power supply unit of certain PC models.

4) The typical Annual Energy Consumption (AEC) is calculated similar to the energy calculator of Energy Star: www.eu-energystar.org
Power management is set to normal. The choice of use for calculation is Busy Office with the following usage patterns:

Power measurement at: 230 V / 50 Hz

Hours / day	Business: Office (260 days/a)
On-mode 2)	8
Standby-Modus	2
Off-mode 3)	14

Other day's per year are calculated in Off-mode; WOL: Wake on LAN

*) ACPI: Advanced Configuration and Power Interface specification, an open industry standard, first released in December 1996

ACPI S0: Working, the normal working state of the computer

ACPI S3: known as Suspend to RAM (STR), Standby in versions of Windows through Windows Vista

ACPI S5: Soft Off - some components remain powered so the computer can "wake up" from input from the keyboard, clock, modem, LAN or USB device

The measurements of Fujitsu Technology Solutions are based on the Business Usage Szenario.

Used formula for business office: On mode = $0,9 \times \text{Power consumption Idle} + 0,1 \times \text{Power Consumption Maximum}$; Typical annual energy consumption = $((8h \times \text{Power consumption on mode} + 2h \times \text{Power consumption Standby} + 14h \times \text{Power consumption Minimum WOL enabled}) \times 260d + 105d \times \text{Power consumption Minimum WOL enabled} \times 24h) / 1000$

5) Used formula for Typical Energy Consumption (TEC), ENERGY STAR® 5 based

$TEC = (8760 / 1000) \times (\text{Power consumption: Minimum (S5, soft off, wake up power button)} \times 0,55 + \text{Power consumption: Standby (S3)} \times 0,05 + \text{Power consumption: idle} \times 0,4)$

Fujitsu platform solutions

In addition to Fujitsu ESPRIMO Q900, Fujitsu provides a range of platform solutions. They combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships.

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With the Fujitsu Dynamic Infrastructures approach, Fujitsu offers a full portfolio of IT products, solutions and services, ranging from clients to datacenter solutions, Managed Infrastructure and Infrastructure as-a-Service. How much you benefit from Fujitsu technologies and services depends on the level of cooperation you choose. This takes IT flexibility and efficiency to the next level.

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www.fujitsu.com/global/services/computing/

Software

www.fujitsu.com/software/

More information

Learn more about Fujitsu ESPRIMO Q900, please contact your Fujitsu sales representative or Fujitsu Business partner, or visit our website.
<http://ts.fujitsu.com/ESPRIMO>

Fujitsu green policy innovation

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at <http://www.fujitsu.com/global/about/environment/>



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