

## KVR1333D3D4R9S/4G

4GB 512M x 72-Bit PC3-10600

CL9 Registered w/Parity 240-Pin DIMM

### DESCRIPTION

This document describes ValueRAM's 512M x 72-bit 4GB (4096MB) DDR3-1333 CL9 SDRAM (Synchronous DRAM) registered w/parity, dual-rank memory module, based on thirty-six 256M x 4-bit DDR3-1333 FBGA components. The SPD is programmed to JEDEC standard latency 1333Mhz timing of 9-9-9 at 1.5V. This 240-pin DIMM uses gold contact fingers and requires +1.5V. The electrical and mechanical specifications are as follows:

### FEATURES

- JEDEC standard 1.5V  $\pm$  0.075V Power Supply
- VDDQ = 1.5V  $\pm$  0.075V
- 667MHz fCK for 1333Mb/sec/pin
- 8 independent internal bank
- Programmable CAS Latency: 6,7,8,9,10
- Programmable Additive Latency: 0, CL - 2, or CL - 1 clock
- Programmable CAS Write Latency(CWL) = 7(DDR3-1333)
- 8-bit pre-fetch
- Burst Length: 8 (Interleave without any limit, sequential with starting address "000" only), 4 with tCCD = 4 which does not allow seamless read or write [either on the fly using A12 or MRS]
- Bi-directional Differential Data Strobe
- Internal(self) calibration : Internal self calibration through ZQ pin (RZQ : 240 ohm  $\pm$  1%)
- On Die Termination using ODT pin
- On-DIMM thermal sensor (Grade B)
- Average Refresh Period 7.8us at lower than TCASE 85°C, 3.9us at 85°C < TCASE  $\leq$  95°C
- Asynchronous Reset
- PCB : Height 18.75mm, double sided component

### SPECIFICATIONS

|                                                  |                     |
|--------------------------------------------------|---------------------|
| CL(IDD)                                          | 9 cycles            |
| Row Cycle Time (tRCmin)                          | 49.5ns (min.)       |
| Refresh to Active/Refresh Command Time (tRFCmin) | 110ns (min.)        |
| Row Active Time (tRASmin)                        | 36ns (min.)         |
| Power                                            | 3.960 W (operating) |
| UL Rating                                        | 94 V - 0            |
| Operating Temperature                            | 0° C to 85° C       |
| Storage Temperature                              | -55° C to +100° C   |

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