

# Memory Module Specifications

## KVR13N9S8/4

4GB 1Rx8 512M x 64-Bit PC3-10600

CL9 240-Pin DIMM

### DESCRIPTION

This document describes ValueRAM's 512M x 64-bit (4GB) DDR3-1333 CL9 SDRAM (Synchronous DRAM), 1Rx8 memory module, based on eight 512M x 8-bit DDR3-1333 FBGA components. The SPD is programmed to JEDEC standard latency DDR3-1333 timing of 9-9-9 at 1.5V. This 240-pin DIMM uses gold contact fingers. The electrical and mechanical specifications are as follows:

### FEATURES

- JEDEC standard 1.5V (1.425V ~1.575V) Power Supply
- VDDQ = 1.5V (1.425V ~ 1.575V)
- 667MHz fCK for 1333Mb/sec/pin
- 8 independent internal bank
- Programmable CAS Latency: 9, 8, 7, 6
- 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 ± 1%)
- On Die Termination using ODT pin
- Average Refresh Period 7.8us at lower than TCASE 85°C, 3.9us at 85°C < TCASE ≤ 95°C
- Asynchronous Reset
- PCB: Height 0.740" (18.75mm), single sided component

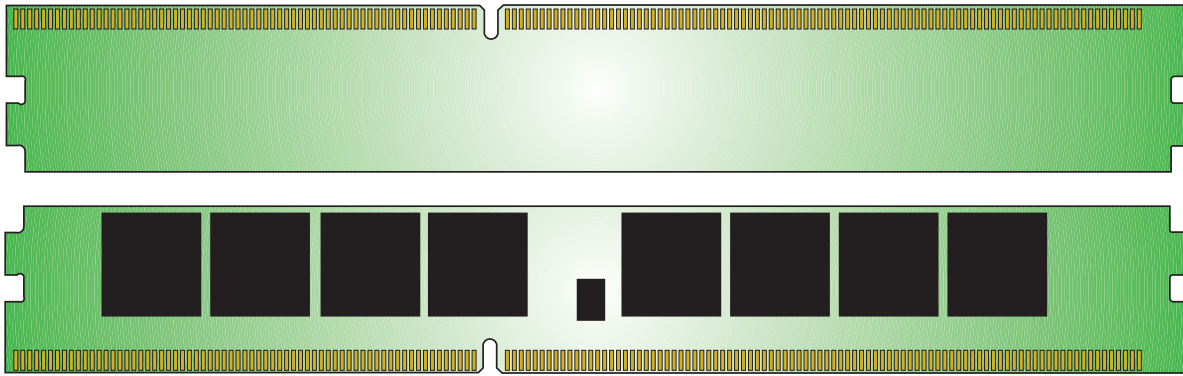
### SPECIFICATIONS

|  |                   |
|--|-------------------|
| CL(IDD)  | 9 cycles          |
| Row Cycle Time (tRCmin)                          | 49.5ns (min.)     |
| Refresh to Active/Refresh Command Time (tRFCmin) | 260ns (min.)      |
| Row Active Time (tRASmin)                        | 36ns (min.)       |
| Maximum Operating Power                          | 2.100 W*          |
| UL Rating  | 94 V - 0          |
| Operating Temperature                            | 0° C to 85° C     |
| Storage Temperature                              | -55° C to +100° C |

\*Power will vary depending on the SDRAM used.

Continued >>

### MODULE DIMENSIONS:



Units = Millimeters

