Memory Module Specifications

**KVR16N11/4**
4GB 2Rx8 512M x 64-Bit PC3-12800
CL11 240-Pin DIMM

**DESCRIPTION**
This document describes ValueRAM's 512M x 64-bit (4GB) DDR3-1600 CL11 SDRAM (Synchronous DRAM) 2Rx8, memory module, based on sixteen 256M x 8-bit FBGA components. The SPD is programmed to JEDEC standard latency DDR3-1600 timing of 11-11-11 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)
- 800MHz fCK for 1600Mb/sec/pin
- 8 independent internal bank
- Programmable CAS Latency: 11, 10, 9, 8, 7, 6
- Programmable Additive Latency: 0, CL - 2, or CL - 1 clock
- 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 1.180” (30.00mm), double sided component

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**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>CL(IDD)</td>
<td>11 cycles</td>
</tr>
<tr>
<td>Row Cycle Time (tRCmin)</td>
<td>48.125ns (min.)</td>
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<tr>
<td>Refresh to Active/Refresh Command Time (tRFCmin)</td>
<td>160ns (min.)</td>
</tr>
<tr>
<td>Row Active Time (tRASmin)</td>
<td>35ns (min.)</td>
</tr>
<tr>
<td>Maximum Operating Power</td>
<td>2.580 W*</td>
</tr>
<tr>
<td>UL Rating</td>
<td>94 V - 0</td>
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<tr>
<td>Operating Temperature</td>
<td>0°C to 85°C</td>
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<tr>
<td>Storage Temperature</td>
<td>-55°C to +100°C</td>
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*Power will vary depending on the SDRAM used.*

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MODULE DIMENSIONS: