

## Memory Module Specifications

### KSM29RS4/16HDR

16GB 1Rx4 2G x 72-Bit PC4-2933

CL21 Registered w/Parity 288-Pin DIMM

#### DESCRIPTION

Kingston's KSM29RS4/16HDR is a 2G x 72-bit (16GB) DDR4-2933 CL21 SDRAM (Synchronous DRAM) registered w/ parity, 1Rx4, ECC, memory module, based on eighteen 2G x 4-bit FBGA components. The SPD is programmed to JEDEC standard latency DDR4-2933 timing of 21-21-21 at 1.2V. Each 288-pin DIMM uses gold contact fingers. The electrical and mechanical specifications are as follows:

#### FEATURES

- Power Supply: VDD = 1.2V
- VDDQ = 1.2V
- VPP = 2.5V
- VDDSPD = 2.41V to 2.75V
- Functionality and operations comply with the DDR4 SDRAM datasheet
- 16 internal banks
- Bank Grouping is applied, and CAS to CAS latency (tCCD\_L, tCCD\_S) for the banks in the same or different bank group accesses are available
- Data transfer rates: PC4-2933, PC4-2666, PC4-2400, PC4-2133, PC4-1866, PC4-1600
- Bi-Directional Differential Data Strobe
- 8 bit pre-fetch
- Burst Length (BL) switch on-the-fly BL8 or BC4(Burst Chop)
- Supports ECC error correction and detection
- On-Die Termination (ODT)
- Temperature sensor with integrated SPD
- This product is in compliance with the RoHS directive.
- Per DRAM Addressability is supported
- Internal Vref DQ level generation is available
- Write CRC is supported at all speed grades
- CA parity (Command/Address Parity) mode is supported

#### SPECIFICATIONS

|  |                   |
|--|-------------------|
| CL(IDD)  | 21 cycles         |
| Row Cycle Time (tRCmin)                          | 46.32ns(min.)     |
| Refresh to Active/Refresh Command Time (tRFCmin) | 350ns(min.)       |
| Row Active Time (tRASmin)                        | 32ns(min.)        |
| Maximum Operating Power                          | *                 |
| UL Rating  | 94 V - 0          |
| Operating Temperature                            | 0° C to +85° C    |
| Storage Temperature                              | -55° C to +100° C |

\*See IDD Specifications (page 2)

#### Module Assembly

|                            |
|----------------------------|
| <b>DRAM:</b> HYNIX (D-DIE) |
| <b>RCD:</b> Rambus         |

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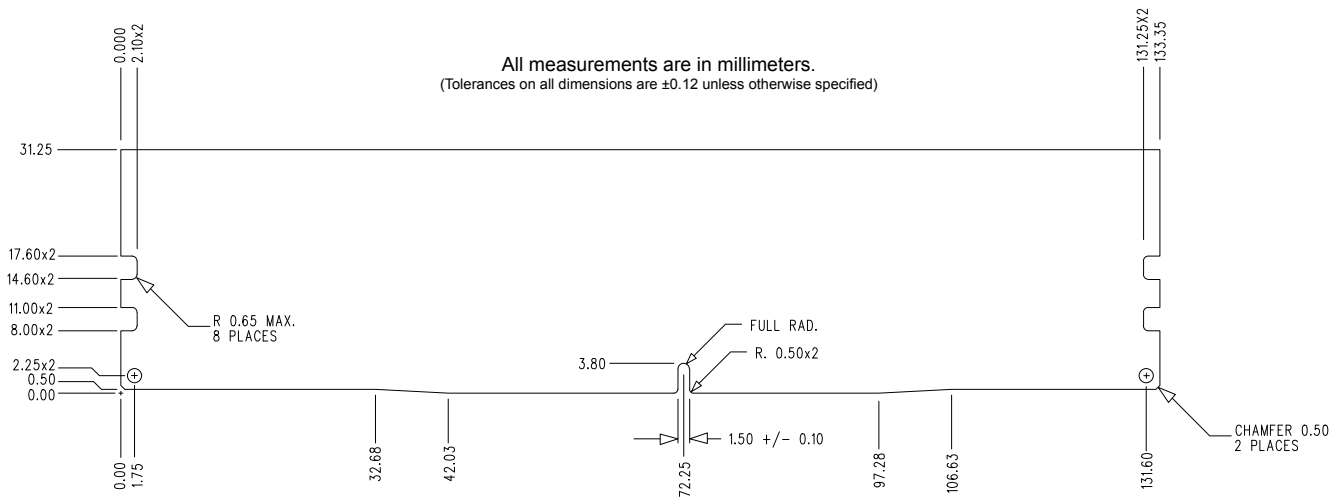
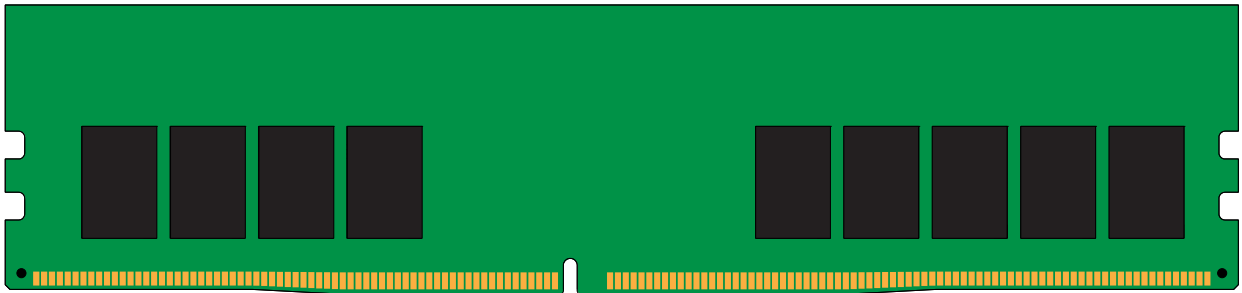
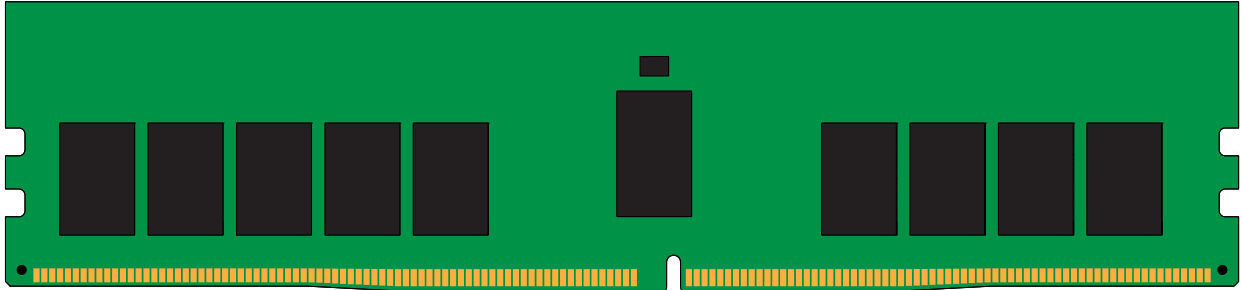
## IDD Specifications

| IDD    |      | unit |
|--------|------|------|
| Symbol | 2933 |      |
| IDD0   | 1047 | mA   |
| IDD0A  | 1047 | mA   |
| IDD1   | 1205 | mA   |
| IDD1A  | 1263 | mA   |
| IDD2N  | 929  | mA   |
| IDD2NA | 930  | mA   |
| IDD2NT | 1015 | mA   |
| IDD2NL | 796  | mA   |
| IDD2NG | 926  | mA   |
| IDD2ND | 912  | mA   |
| IDD2NP | 938  | mA   |
| IDD2P  | 592  | mA   |
| IDD2Q  | 868  | mA   |
| IDD3N  | 961  | mA   |
| IDD3NA | 961  | mA   |
| IDD3P  | 660  | mA   |
| IDD4R  | 2085 | mA   |
| IDD4RA | 2134 | mA   |
| IDD4RB | 2102 | mA   |
| IDD4W  | 2120 | mA   |
| IDD4WA | 2190 | mA   |
| IDD4WB | 1935 | mA   |
| IDD4WC | 2111 | mA   |
| IDD4WP | 2447 | mA   |
| IDD5B  | 3980 | mA   |
| IDD5F2 | 2980 | mA   |
| IDD5F4 | 2666 | mA   |
| IDD6N  | 325  | mA   |
| IDD6E  | 454  | mA   |
| IDD6R  | 206  | mA   |
| IDD6A  | 455  | mA   |
| IDD7   | 3803 | mA   |
| IDD8   | 159  | mA   |

| IPP    |      | unit |
|--------|------|------|
| Symbol | 2933 |      |
| IPP0   | 71   | mA   |
| IPP1   | 80   | mA   |
| IPP2N  | 42   | mA   |
| IPP2P  | 34   | mA   |
| IPP3N  | 200  | mA   |
| IPP3P  | 193  | mA   |
| IPP4R  | 256  | mA   |
| IPP4W  | 253  | mA   |
| IPP5B  | 977  | mA   |
| IPP5F2 | 646  | mA   |
| IPP5F4 | 526  | mA   |
| IPP6N  | 73   | mA   |
| IPP6E  | 104  | mA   |
| IPP6R  | 50   | mA   |
| IPP6A  | 102  | mA   |
| IPP7   | 479  | mA   |
| IPP8   | 36   | mA   |

continued

## MODULE DIMENSIONS



The product images shown are for illustration purposes only and may not be an exact representation of the product.  
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