

## KSM32SES8/8HD

8GB 1Rx8 1G x 72-Bit PC4-3200

CL22 260-Pin ECC SODIMM

### DESCRIPTION

Kingston's KSM32SES8/8HD is a 1G x 72-bit (8GB) DDR4-3200 CL22 SDRAM (Synchronous DRAM) w/ parity, 1Rx8, ECC, memory module, based on nine 1G x 8-bit FBGA components. The SPD is programmed to JEDEC standard latency DDR4-3200 timing of 22-22-22 at 1.2V. Each 260-pin SODIMM 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 = 2.20V to 3.60V
- 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: PC4-3200, 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
- RoHS Compliant and Halogen-Free

### SPECIFICATIONS

|  |                   |
|--|-------------------|
| CL(IDD)  | 22 cycles         |
| Row Cycle Time (tRCmin)                          | 45.75ns(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: HYNIX (D-DIE)</b> |
|----------------------------|

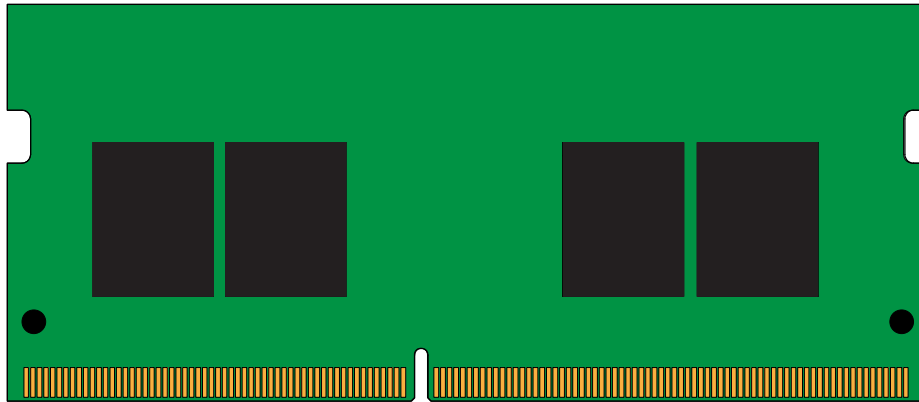
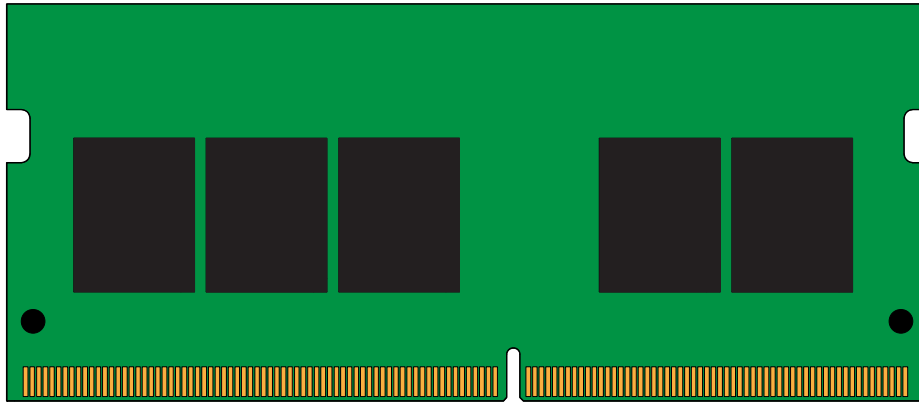
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## IDD Specifications

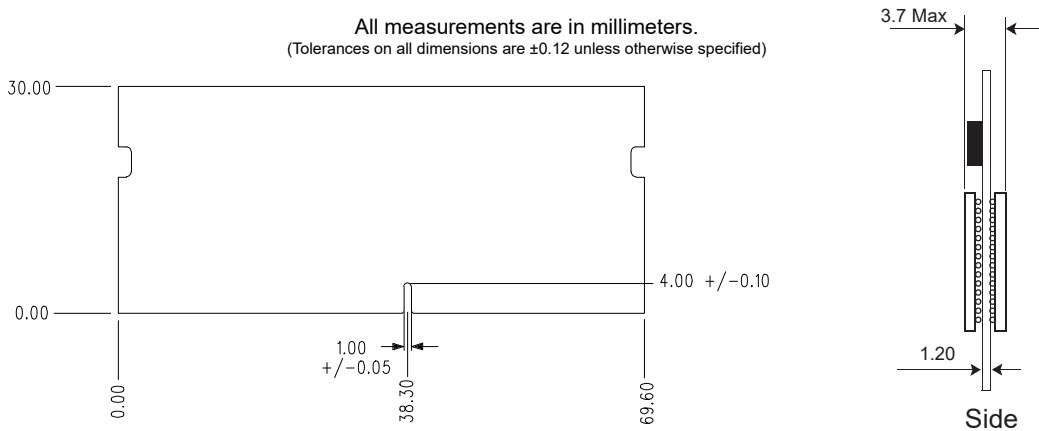
| IDD    |      | unit |
|--------|------|------|
| Symbol | 3200 |      |
| IDD0   | 309  | mA   |
| IDD0A  | 309  | mA   |
| IDD1   | 378  | mA   |
| IDD1A  | 405  | mA   |
| IDD2N  | 251  | mA   |
| IDD2NA | 252  | mA   |
| IDD2NT | 295  | mA   |
| IDD2NL | 174  | mA   |
| IDD2NG | 250  | mA   |
| IDD2ND | 240  | mA   |
| IDD2NP | 253  | mA   |
| IDD2P  | 168  | mA   |
| IDD2Q  | 214  | mA   |
| IDD3N  | 268  | mA   |
| IDD3NA | 268  | mA   |
| IDD3P  | 203  | mA   |
| IDD4R  | 1043 | mA   |
| IDD4RA | 1071 | mA   |
| IDD4RB | 1059 | mA   |
| IDD4W  | 1026 | mA   |
| IDD4WA | 1071 | mA   |
| IDD4WB | 946  | mA   |
| IDD4WC | 999  | mA   |
| IDD4WP | 1222 | mA   |
| IDD5B  | 1749 | mA   |
| IDD5F2 | 1261 | mA   |
| IDD5F4 | 1115 | mA   |
| IDD6N  | 169  | mA   |
| IDD6E  | 233  | mA   |
| IDD6R  | 109  | mA   |
| IDD6A  | 233  | mA   |
| IDD7   | 1183 | mA   |
| IDD8   | 88   | mA   |

| IPP    |      | unit |
|--------|------|------|
| Symbol | 3200 |      |
| IPP0   | 46   | mA   |
| IPP1   | 53   | mA   |
| IPP2N  | 31   | mA   |
| IPP2P  | 28   | mA   |
| IPP3N  | 122  | mA   |
| IPP3P  | 120  | mA   |
| IPP4R  | 151  | mA   |
| IPP4W  | 149  | mA   |
| IPP5B  | 473  | mA   |
| IPP5F2 | 309  | mA   |
| IPP5F4 | 266  | mA   |
| IPP6N  | 46   | mA   |
| IPP6E  | 62   | mA   |
| IPP6R  | 37   | mA   |
| IPP6A  | 62   | mA   |
| IPP7   | 144  | mA   |
| IPP8   | 29   | mA   |

## MODULE DIMENSIONS



All measurements are in millimeters.  
(Tolerances on all dimensions are  $\pm 0.12$  unless otherwise specified)



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