

# Memory Module Specifications

## KSM29SES8/8HD

8GB 1Rx8 1G x 72-Bit PC4-2933

CL21 260-Pin ECC SODIMM

### DESCRIPTION

Kingston's KSM29SES8/8HD is a 1G x 72-bit (8GB) DDR4-2933 CL21 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 DDR4-2933 timing of 21-21-21 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: PC4-2666, 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)	21 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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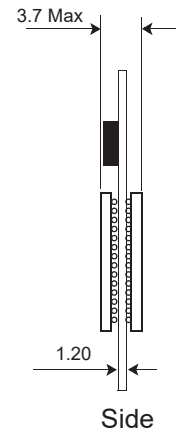
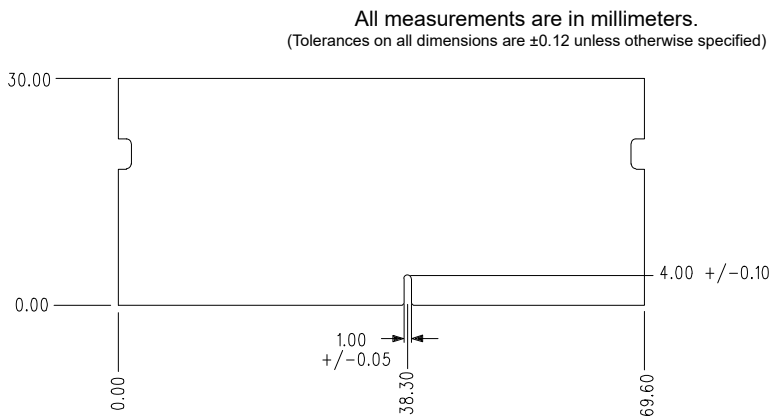
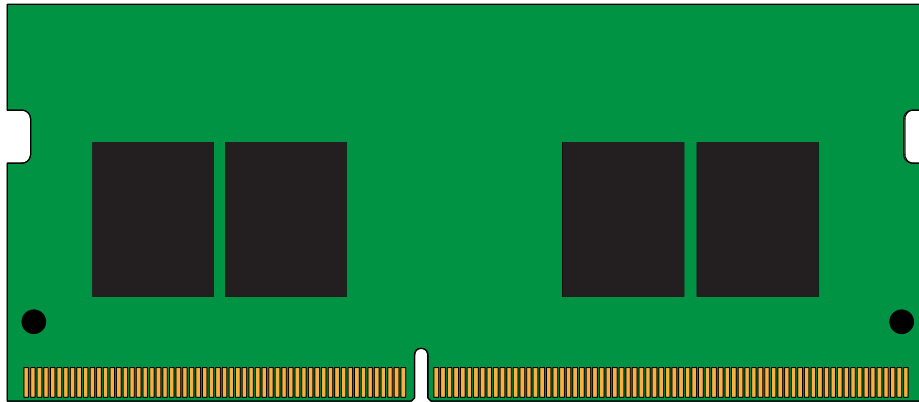
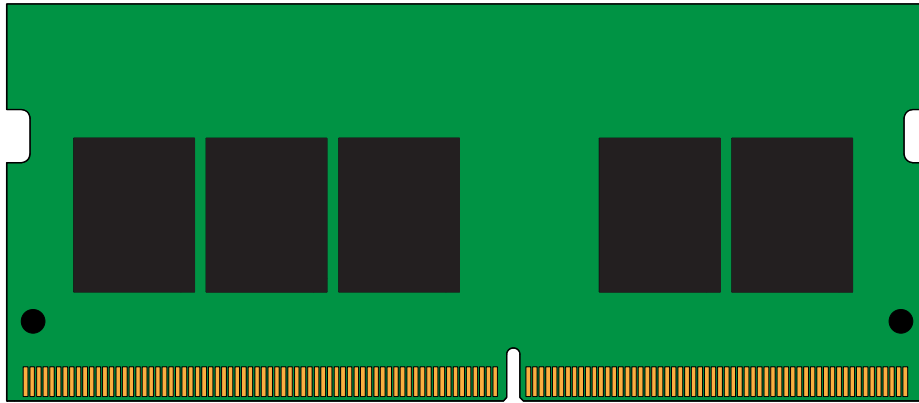
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## IDD Specifications

IDD		unit
Symbol	2933	
IDD0	300	mA
IDD0A	300	mA
IDD1	368	mA
IDD1A	390	mA
IDD2N	240	mA
IDD2NA	241	mA
IDD2NT	285	mA
IDD2NL	166	mA
IDD2NG	239	mA
IDD2ND	230	mA
IDD2NP	244	mA
IDD2P	160	mA
IDD2Q	211	mA
IDD3N	259	mA
IDD3NA	259	mA
IDD3P	196	mA
IDD4R	972	mA
IDD4RA	997	mA
IDD4RB	986	mA
IDD4W	969	mA
IDD4WA	996	mA
IDD4WB	884	mA
IDD4WC	930	mA
IDD4WP	1112	mA
IDD5B	1750	mA
IDD5F2	1256	mA
IDD5F4	1107	mA
IDD6N	169	mA
IDD6E	233	mA
IDD6R	109	mA
IDD6A	233	mA
IDD7	1158	mA
IDD8	88	mA

IPP		unit
Symbol	2933	
IPP0	46	mA
IPP1	53	mA
IPP2N	31	mA
IPP2P	28	mA
IPP3N	122	mA
IPP3P	120	mA
IPP4R	149	mA
IPP4W	149	mA
IPP5B	473	mA
IPP5F2	309	mA
IPP5F4	266	mA
IPP6N	46	mA
IPP6E	62	mA
IPP6R	37	mA
IPP6A	63	mA
IPP7	144	mA
IPP8	29	mA

## MODULE DIMENSIONS



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