

## KSM29SES8/16HA

16GB 1Rx8 2G x 72-Bit PC4-2933

CL21 260-Pin ECC SODIMM

### DESCRIPTION

Kingston's KSM29SES8/16HA is a 2G x 72-bit (16GB) DDR4-2933 CL21 SDRAM (Synchronous DRAM) w/ parity, 1Rx8, ECC, memory module, based on nine 2G 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: PC4-2933, 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)	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 (A-DIE)</b>
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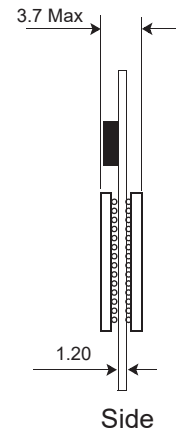
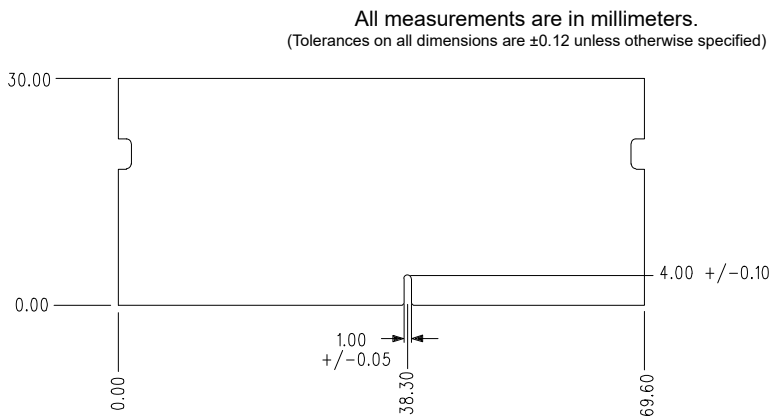
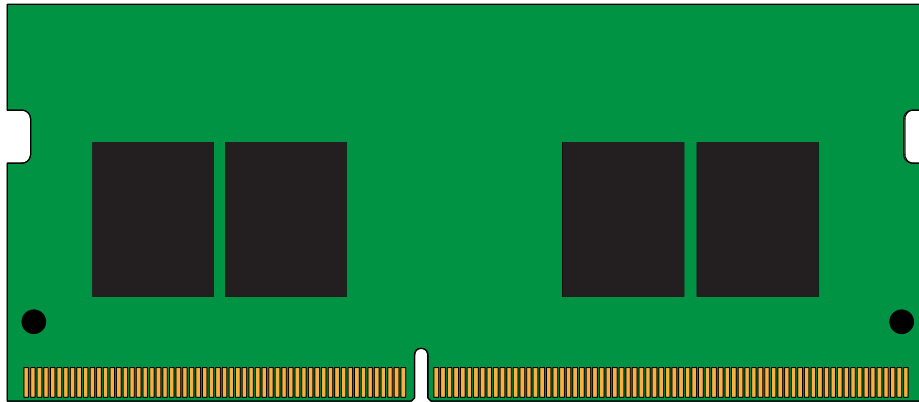
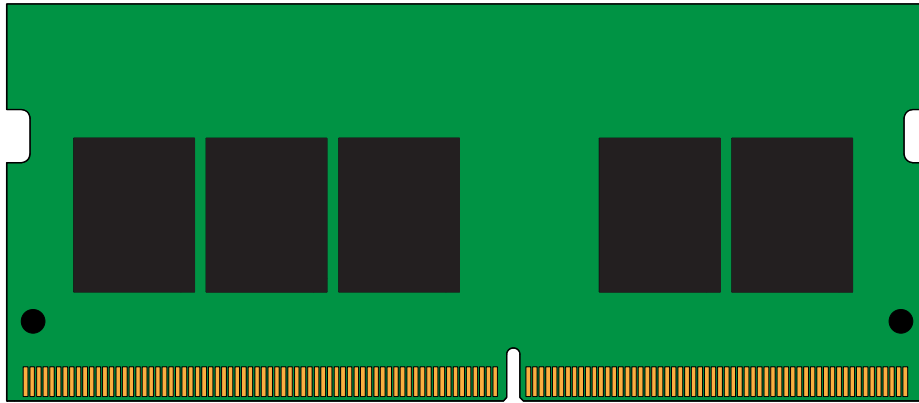
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## IDD Specifications

IDD		unit
Symbol	2933	
IDD0	414	mA
IDD0A	414	mA
IDD1	480	mA
IDD1A	511	mA
IDD2N	333	mA
IDD2NA	333	mA
IDD2NT	380	mA
IDD2NL	229	mA
IDD2NG	327	mA
IDD2ND	319	mA
IDD2NP	343	mA
IDD2P	222	mA
IDD2Q	304	mA
IDD3N	498	mA
IDD3NA	498	mA
IDD3P	399	mA
IDD4R	1279	mA
IDD4RA	1285	mA
IDD4RB	1290	mA
IDD4W	1084	mA
IDD4WA	1128	mA
IDD4WB	1024	mA
IDD4WC	1077	mA
IDD4WP	1336	mA
IDD5B	3544	mA
IDD5F2	2491	mA
IDD5F4	2088	mA
IDD6N	296	mA
IDD6E	445	mA
IDD6R	168	mA
IDD6A	445	mA
IDD7	1273	mA
IDD8	126	mA

IPP		unit
Symbol	2933	
IPP0	19	mA
IPP1	19	mA
IPP2N	12	mA
IPP2P	12	mA
IPP3N	18	mA
IPP3P	18	mA
IPP4R	18	mA
IPP4W	18	mA
IPP5B	592	mA
IPP5F2	391	mA
IPP5F4	323	mA
IPP6N	38	mA
IPP6E	65	mA
IPP6R	20	mA
IPP6A	57	mA
IPP7	75	mA
IPP8	12	mA

## MODULE DIMENSIONS



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