

# Memory Module Specifications

## KSM29SES8/16ME

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

CL21 260-Pin ECC SODIMM

### DESCRIPTION

Kingston's KSM29SES8/16ME 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

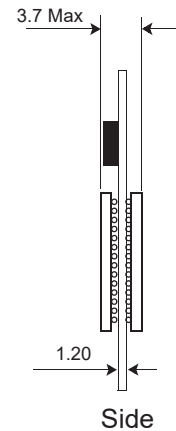
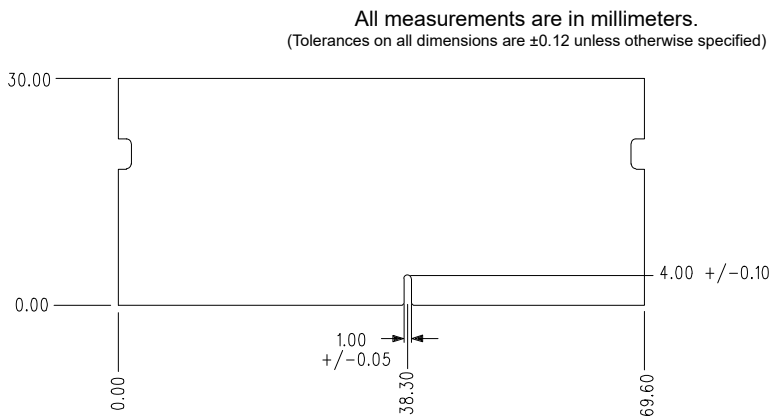
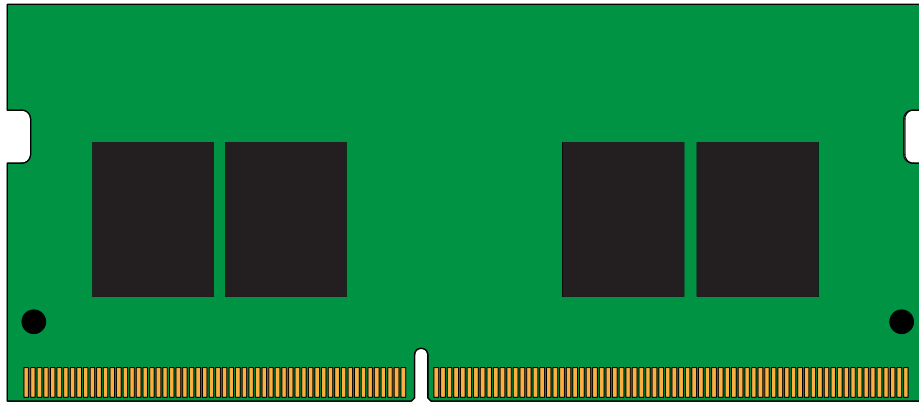
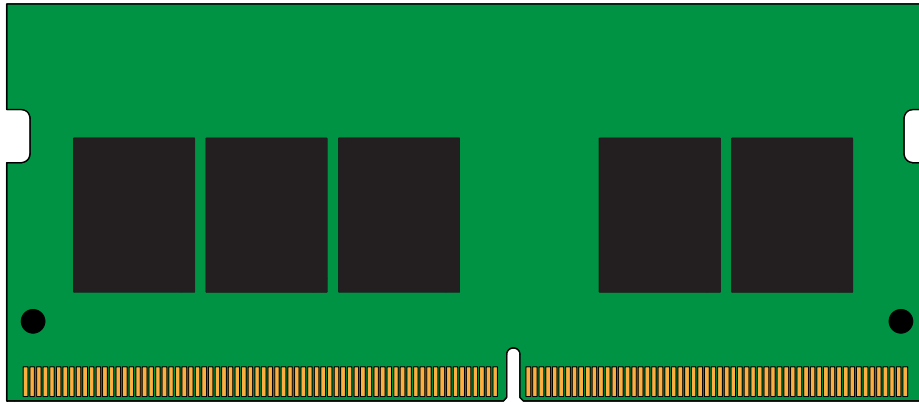
DRAM: MICRON (E-DIE)
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## IDD Specifications

Symbol	2933	Units
I <sub>DD0</sub>	531	mA
I <sub>PP0</sub>	27	mA
I <sub>DD1</sub>	630	mA
I <sub>DD2N</sub>	396	mA
I <sub>DD2NT</sub>	450	mA
I <sub>DD2P</sub>	342	mA
I <sub>DD2Q</sub>	378	mA
I <sub>DD3N</sub>	540	mA
I <sub>PP3N</sub>	18	mA
I <sub>DD3P</sub>	441	mA
I <sub>DD4R</sub>	1386	mA
I <sub>DD4W</sub>	1107	mA
I <sub>DD5R</sub>	612	mA
I <sub>PP5R</sub>	36	mA
I <sub>DD6N</sub>	477	mA
I <sub>DD6E</sub>	1017	mA
I <sub>DD6R</sub>	180	mA
I <sub>DD6A</sub> (25°C)	99	mA
I <sub>DD6A</sub> (45°C)	180	mA
I <sub>DD6A</sub> (75°C)	459	mA
I <sub>DD6A</sub> (95°C)	1017	mA
I <sub>PP6X</sub>	54	mA
I <sub>DD7</sub>	1647	mA
I <sub>PP7</sub>	72	mA
I <sub>DD8</sub>	324	mA

## MODULE DIMENSIONS



The product images shown are for illustration purposes only and may not be an exact representation of the product. Kingston reserves the right to change any information at anytime without notice.