

# Memory Module Specifications

## KSM29ES8/8HD

8GB 1Rx8 1G x 72-Bit PC4-2933  
CL21 288-Pin DIMM

### DESCRIPTION

Kingston's KSM29ES8/8HD is a 1G x 72-bit (8GB) DDR4-2933 CL21 SDRAM (Synchronous DRAM), 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 288-pin DIMM uses gold contact fingers. The electrical and mechanical specifications are as follows:

### FEATURES

- Power Supply: VDD = 1.2V Typical
- VDDQ = 1.2V Typical
- VPP = 2.5V Typical
- VDDSPD = 2.2V to 3.6V
- Nominal and dynamic on-die termination (ODT) for data, strobe, and mask signals
- Low-power auto self refresh (LPASR)
- Data bus inversion (DBI) for data bus
- On-die VREFDQ generation and calibration
- Single-rank
- On-board I2 serial presence-detect (SPD) EEPROM
- Temperature sensor with integrated SPD
- 16 internal banks; 4 groups of 4 banks each
- Fixed burst chop (BC) of 4 and burst length (BL) of 8 via the mode register set (MRS)
- Selectable BC4 or BL8 on-the-fly (OTF)
- Fly-by topology
- Terminated control command and address bus
- PCB: Height 1.23" (31.25mm)
- 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>
----------------------------

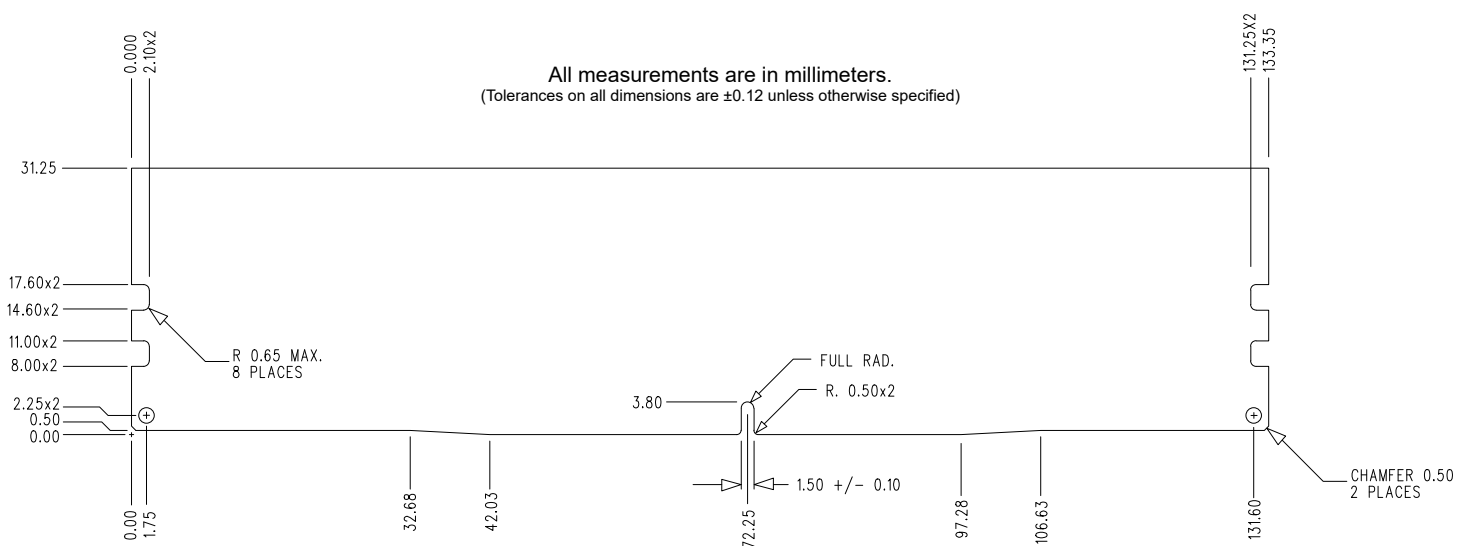
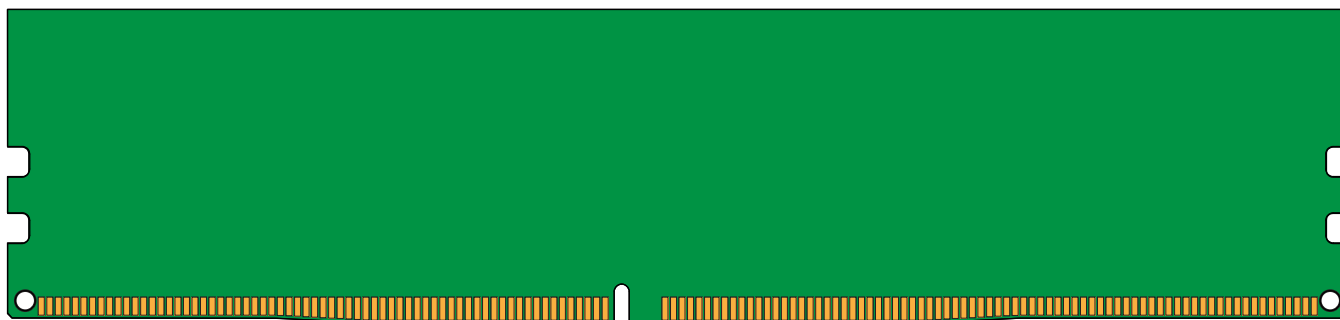
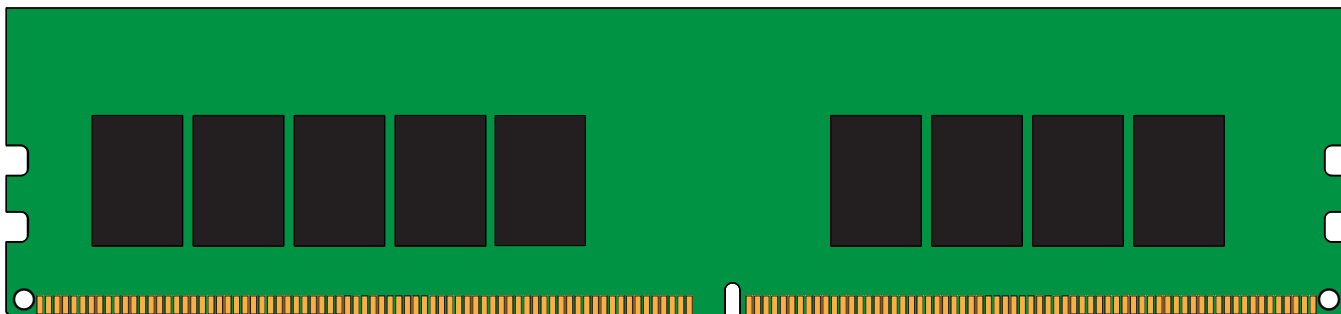
Continued >>

## 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



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.