

# Memory Module Specifications

## KSM32ES8/8HE

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

CL22 288-Pin DIMM

### DESCRIPTION

Kingston's KSM32ES8/8HE is a 1G x 72-bit (8GB) DDR4-3200 CL22 SDRAM (Synchronous DRAM), 1Rx8, ECC, memory module, based on nine 1G x 8-bit FBGA components. The SPD is programmed to JEDEC standard latency DDR4-3200 timing of 22-22-22 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)	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:</b> Hynix (E-DIE)
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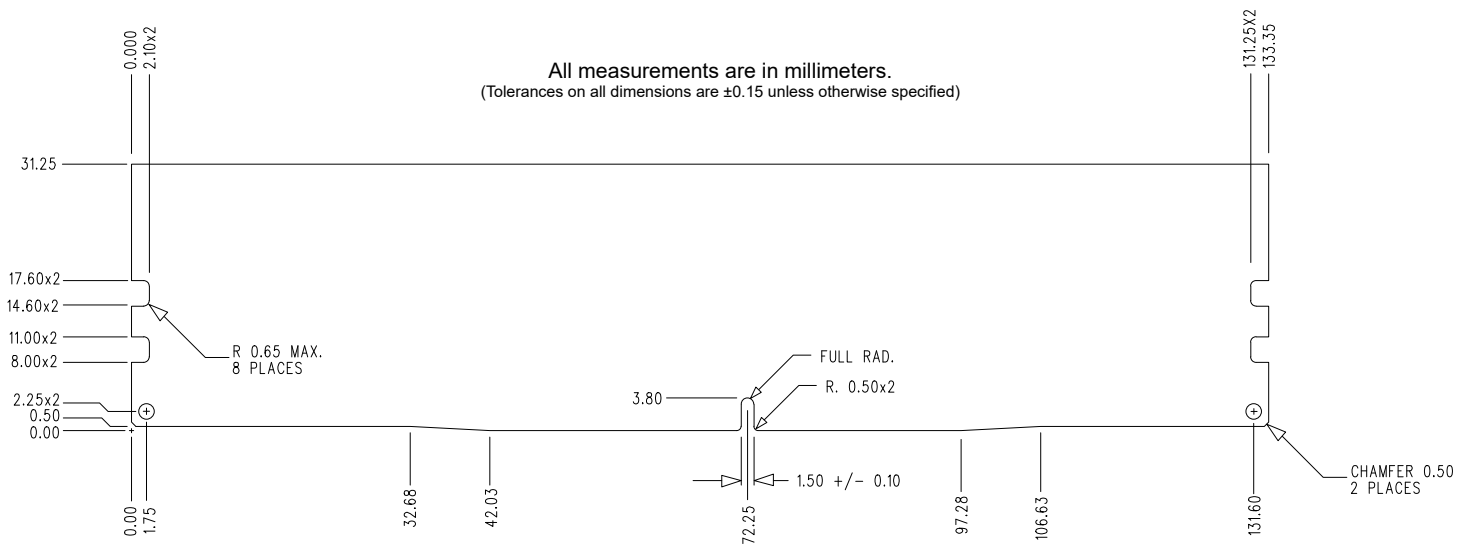
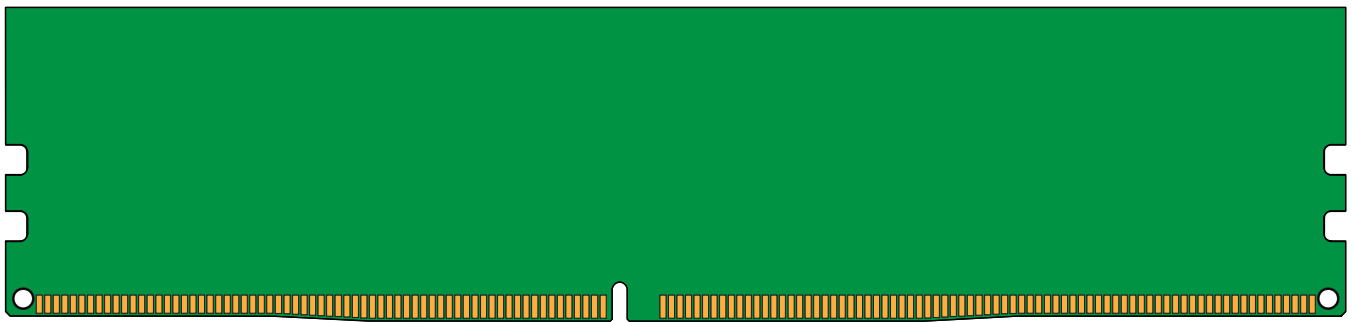
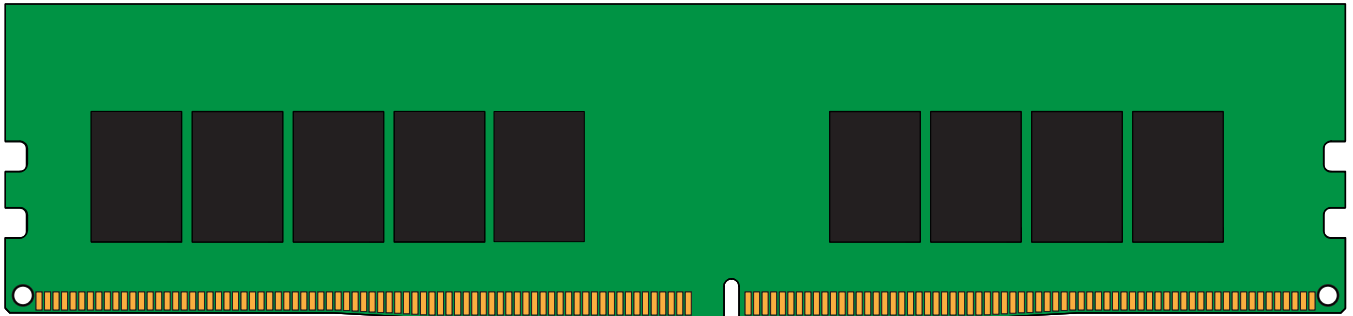
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## IDD Specifications

IDD		unit
Symbol	3200	
IDD0	378	mA
IDD0A	378	mA
IDD1	459	mA
IDD1A	486	mA
IDD2N	270	mA
IDD2NA	270	mA
IDD2NT	315	mA
IDD2NL	171	mA
IDD2NG	270	mA
IDD2ND	252	mA
IDD2NP	270	mA
IDD2P	162	mA
IDD2Q	270	mA
IDD3N	513	mA
IDD3NA	513	mA
IDD3P	414	mA
IDD4R	1197	mA
IDD4RA	1233	mA
IDD4RB	1224	mA
IDD4W	1116	mA
IDD4WA	1179	mA
IDD4WB	1071	mA
IDD4WC	1116	mA
IDD4WP	1215	mA
IDD5B	2439	mA
IDD5F2	1737	mA
IDD5F4	1467	mA
IDD6N	189	mA
IDD6E	297	mA
IDD6R	99	mA
IDD6A	297	mA
IDD7	1314	mA
IDD8	72	mA

IPP		unit
Symbol	3200	
IPP0	27	mA
IPP1	27	mA
IPP2N	9	mA
IPP2P	9	mA
IPP3N	18	mA
IPP3P	18	mA
IPP4R	45	mA
IPP4W	45	mA
IPP5B	315	mA
IPP5F2	216	mA
IPP5F4	180	mA
IPP6N	27	mA
IPP6E	45	mA
IPP6R	18	mA
IPP6A	36	mA
IPP7	135	mA
IPP8	9	mA

## MODULE DIMENSIONS



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