

# Memory Module Specifications

## KHX16S9P1/4

4GB 1Rx8 512M x 64-Bit DDR3-1600

CL9 204-Pin SODIMM

Supports Kingston HyperX Plug and Play (PnP)



## SPECIFICATIONS

CL(IDD)	9 cycles
Row Cycle Time (tRCmin)	48.125ns (min.)
Refresh to Active/Refresh Command Time (tRFCmin)	260ns (min.)
Row Active Time (tRASmin)	33.75ns (min.)
Maximum Operating Power	TBD W*
UL Rating	94 V - 0
Operating Temperature	0° C to 85° C
Storage Temperature	-55° C to +100° C

\*Power will vary depending on the SDRAM used.

## DESCRIPTION

Kingston's 512M x 64-bit (4GB) DDR3-1600 CL9 SDRAM (Synchronous DRAM) 1Rx8 memory module, based on eight 512M x 8-bit DDR3 FBGA components. This module has been tested to run at JEDEC DDR3-1600 at a low latency timing of 9-9-9 at 1.5V. Additional timing parameters are shown in the PnP Timing Parameters section. Each 204-pin SODIMM uses gold contact fingers and requires +1.5V. The electrical and mechanical specifications are as follows:

**Note:** PnP implementation is only possible in configurations that include a BIOS that supports the PnP function. Your maximum speed will be determined by your BIOS.

## PnP JEDEC TIMING PARAMETERS:

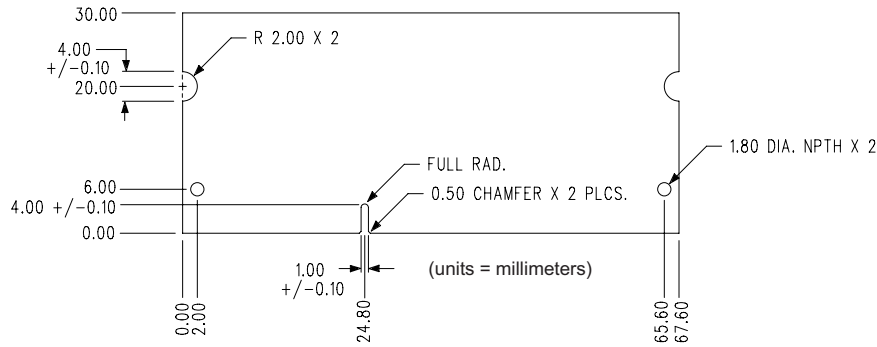
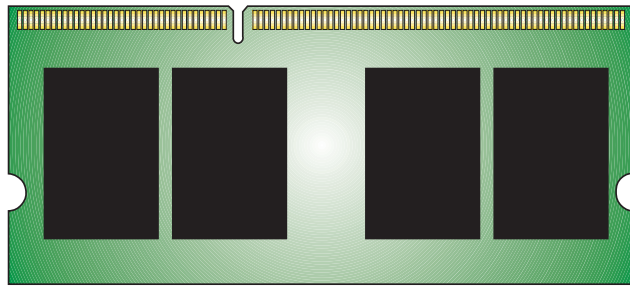
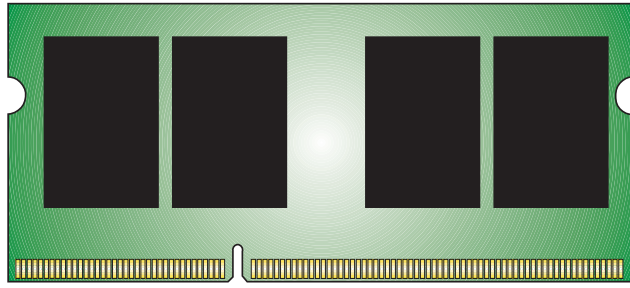
- DDR3-1600 CL9-9-9 @1.5V
- DDR3-1333 CL8-8-8 @1.5V
- DDR3-1066 CL6-6-6 @1.5V

## FEATURES

- JEDEC standard 1.5V (1.425V ~ 1.575V) Power Supply
- VDDQ = 1.5V (1.425V ~ 1.575V)
- 800MHz fCK for 1600Mb/sec/pin
- 8 independent internal bank
- Programmable CAS Latency: 11, 10, 9, 8, 7, 6, 5
- Posted CAS
- Programmable Additive Latency: 0, CL - 2, or CL - 1 clock
- Programmable CAS Write Latency(CWL) = 8 (DDR3-1600)
- 8-bit pre-fetch
- Burst Length: 8 (Interleave without any limit, sequential with starting address "000" only), 4 with tCCD = 4 which does not allow seamless read or write [either on the fly using A12 or MRS]
- Bi-directional Differential Data Strobe
- Internal(self) calibration : Internal self calibration through ZQ pin (RZQ : 240 ohm ± 1%)
- On Die Termination using ODT pin
- Average Refresh Period 7.8us at lower than TCASE 85°C, 3.9us at 85°C < TCASE ≤ 95°C
- Asynchronous Reset
- PCB : Height 1.180" (30.00mm), double sided component

Continued >>

## MODULE DIMENSIONS



FOR MORE INFORMATION, GO TO [WWW.KINGSTON.COM](http://WWW.KINGSTON.COM)

All Kingston products are tested to meet our published specifications. Some motherboards or system configurations may not operate at the published HyperX memory speeds and timing settings. Kingston does not recommend that any user attempt to run their computers faster than the published speed. Overclocking or modifying your system timing may result in damage to computer components.