



# Memory Module Specifications

## NTBSD3P16SP-04

4GB (1Rx8 512M x 64-Bit) PC3-12800

CL11 240-Pin DIMM

### DESCRIPTION

NTBSD4P16SP-04 is a 512M x 64-bit (4GB) DDR3-1600 CL11 SDRAM (Synchronous DRAM), 1Rx8, memory module, based on eight 512M x 8-bit FBGA components per module. The SPD is programmed to JEDEC standard latency DDR3-1600 timing of 11-11-11 at 1.5V. Each 240-pin DIMM uses gold contact fingers. The electrical and mechanical specifications are as follows:

### FEATURES

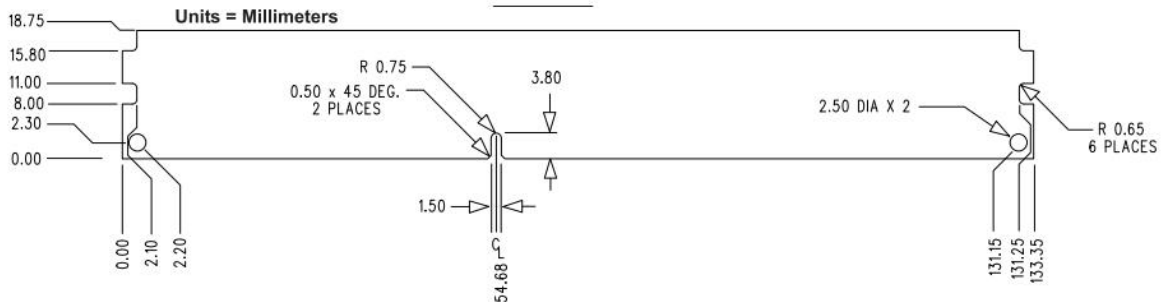
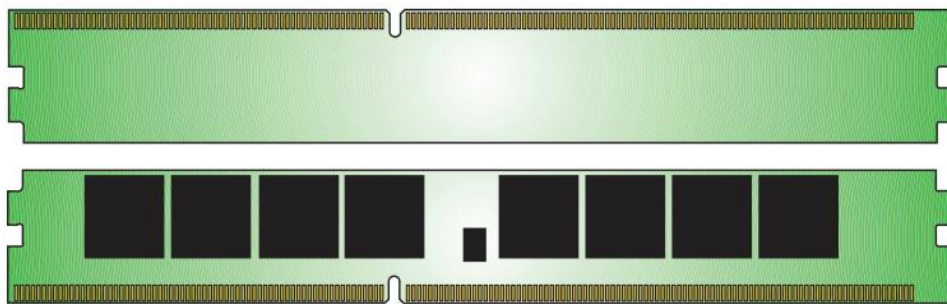
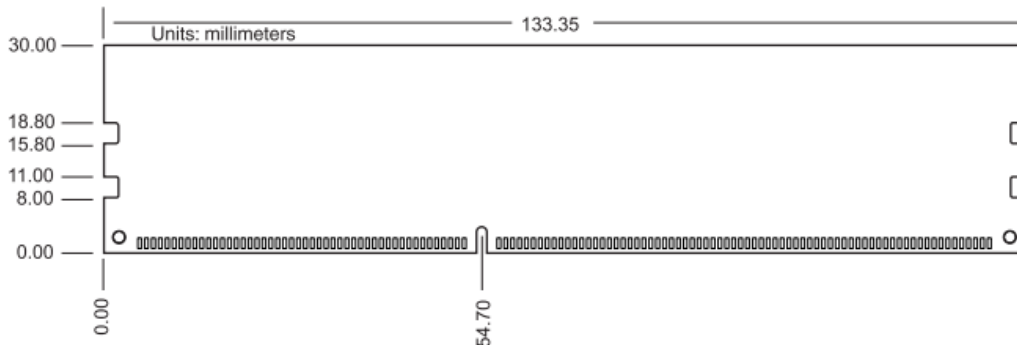
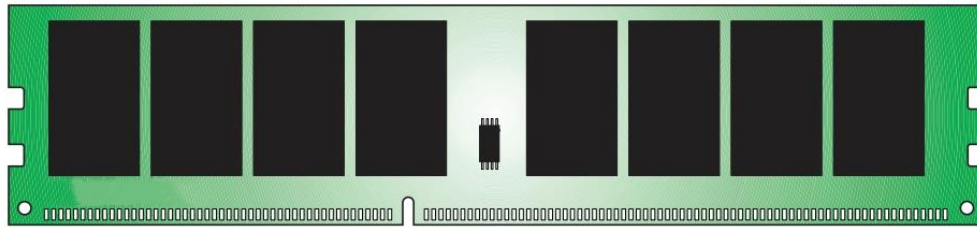
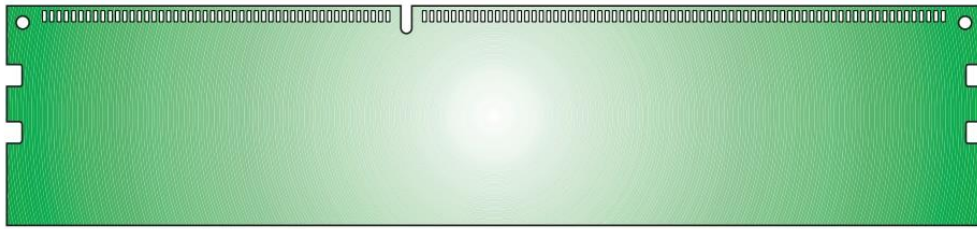
- JEDEC standard 1.5V (1.425V ~1.575V) Power Supply
- $V_{DDQ} = 1.5V$  (1.425V ~ 1.575V)
- 800MHz fCK for 1600Mb/sec/pin
- 8 independent internal bank
- Programmable CAS Latency: 11, 10, 9, 8, 7, 6
- Programmable Additive Latency: 0, CL - 2, or CL - 1 clock
- 8-bit pre-fetch
- Burst Length: 8 (Interleave without any limit, sequential with starting address "000" only), 4 with  $t_{CCD} = 4$  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  $\pm$  1%)
- On Die Termination using ODT pin
- Average Refresh Period 7.8us at lower than TCASE 85°C, 3.9us at 85°C < TCASE  $\leq$  95°C
- Asynchronous Reset
- PCB : Height 0.740" (18.75mm) or 1.180" (30.00mm)
- RoHS Compliant and Halogen-Free

### SPECIFICATIONS

CL(IDD)	11 cycles
Row Cycle Time (tRCmin)	48.125ns(min.)
Refresh to Active/Refresh	260ns(min.)
Command Time (tRFCmin)	
Row Active Time (tRASmin)	35ns(min.)
Maximum Operating Power	TBD W*
UL Rating	94V-0
Operating Temperature	0° C to +70° C
Storage Temperature	-40° C to +85° C

\*Power will vary depending on the SDRAM used.

# MODULE DIMENSIONS



※The module defined in this data sheet is one of several configurations available under this part number. While all configurations are compatible, the DRAM combination and/or the module height may vary from what is described here.