

***RoHS Compliant***

16GB DDR4 SDRAM UDIMM **Halogen free**

***Product Specifications***

**November 4, 2015**

*Version 0.2*



***Apacer Technology Inc.***

1F., No.32, Zhongcheng Rd., Tucheng Dist., New Taipei City 236, Taiwan

Tel: +886-2-2267-8000 Fax: +886-2-2267-2261

[www.apacer.com](http://www.apacer.com)

## General Description

Apacer **78.D1GMM.4010B** is a 2048M x 64 DDR4 SDRAM (Synchronous DRAM) DIMM. This high-density memory module consists of 16 pieces 1024M x 8 bits with 4 banks DDR4 synchronous DRAMs in FBGA packages and a 4K Bits EEPROM. The module is a 288-pins dual in-line memory module and is intended for mounting into a connector socket. The following provides general specifications of this module.

## Ordering Information

Part Number	Bandwidth	Speed Grade	Max Frequency	CAS Latency
78.D1GMM.4010B	19.2 GB/sec	2400 Mbps	1200 MHz	CL17

Density	Organization	Component	Rank
16GB	2048M x 64	1024M x8*16	2

## Key Parameters

MT/s	DDR4-1866	DDR4-2133	DDR4-2400	Unit
Grade	-CL13	-CL15	-CL17	
tCK (min)	1.07	0.93	0.83	ns
CAS latency	13	15	17	tCK
tRCD (min)	13.92	14.06	14.16	ns
tRP (min)	13.92	14.06	14.16	ns
tRAS (min)	34	33	32	ns
tRC (min)	47.92	47.05	46.16	ns
CL-tRCD-tRP	13-13-13	15-15-15	17-17-17	tCK

## Specifications:

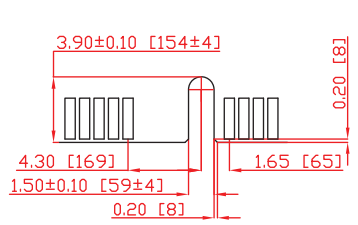
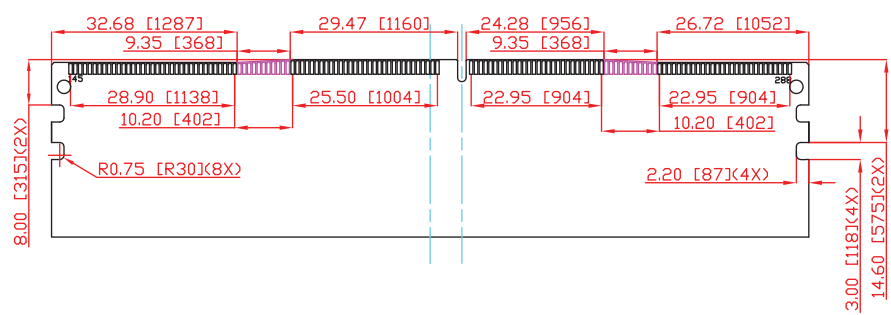
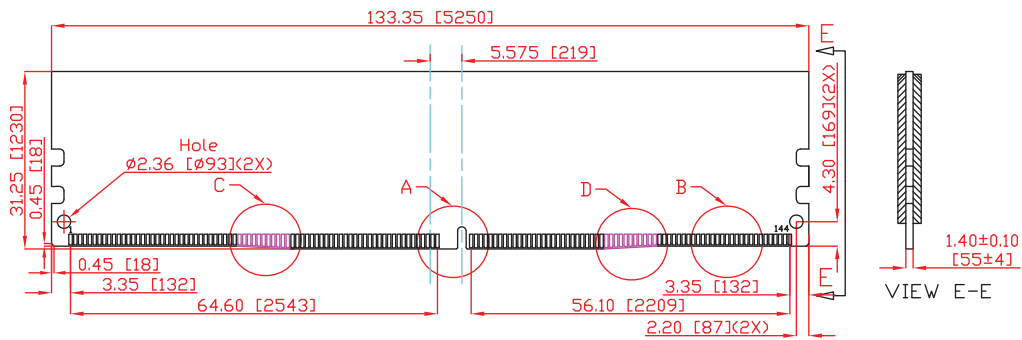
- ◆ On-DIMM thermal sensor : No
- ◆ Organization: 2048 words x 64 bits, 2 ranks
- ◆ Integrating 16 pieces of 8G bits DDR4 SDRAM sealed FBGA
- ◆ Package: 288-pin socket type dual in-line memory module (DIMM)
- ◆ PCB: height 31.25 mm, lead pitch 0.85 mm (pin),
- ◆ Serial Presence Detect (SPD)
- ◆ Power Supply: VDD=1.2V (1.14V to 1.26V)
- ◆ VDDQ = 1.2V (1.14V to 1.26V)
- ◆ VPP = 2.5V (2.375V to 2.75V)
- ◆ VDDSPD = 2.2V to 3.6V
- ◆ 16 internal banks (4 Bank Groups)
- ◆ CAS Latency (CL): 13, 14, 15, 16, 17
- ◆ CAS Write Latency (CWL): 12, 16
- ◆ Average refresh period
  - 7.8us at  $0^{\circ}\text{C} \leq \text{TC} \leq 85^{\circ}\text{C}$
  - 3.9us at  $85^{\circ}\text{C} \leq \text{TC} \leq 95^{\circ}\text{C}$
- ◆ Lead-free (RoHS compliant)
- ◆ Halogen free

## Features:

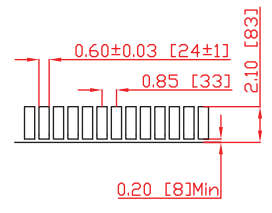
- ◆ Functionality and operations comply with the DDR4 SDRAM datasheet
- ◆ Bank Grouping is applied, and CAS to CAS latency (tCCD\_L, tCCD\_S) for the banks in the same or different bank group accesses are available
- ◆ Bi-Directional Differential Data Strobe
- ◆ 8 bit pre-fetch
- ◆ Burst Length (BL) switch on-the-fly BL8 or BC4(Burst Chop)
- ◆ Per DRAM Addressability is supported
- ◆ Internal Vref DQ level generation is available
- ◆ Write CRC is supported at all speed grades
- ◆ DBI (Data Bus Inversion) is supported(x8)
- ◆ CA parity (Command/Address Parity) mode is supported

# Mechanical Drawing

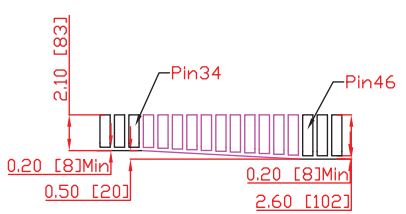
Unit: mm



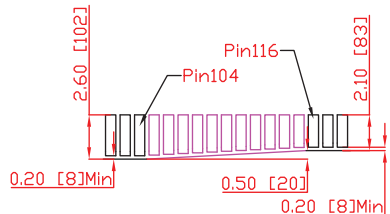
Detail A



Detail B



Detail C



Detail D

(All dimensions are in millimeters with  $\pm 0.15$ mm tolerance unless specified otherwise.)

## Global Presence

### Taiwan (Headquarters)

**Apacer Technology Inc.**

1F., No.32, Zhongcheng Rd., Tucheng Dist.,

New Taipei City 236, Taiwan R.O.C.

Tel: +886-2-2267-8000

Fax: +886-2-2267-2261

[amtsales@apacer.com](mailto:amtsales@apacer.com)

### U.S.A.

**Apacer Memory America, Inc.**

46732 Lakeview Blvd., Fremont, CA 94538

Tel: 1-408-518-8699

Fax: 1-510-249-9568

[sa@apacerus.com](mailto:sa@apacerus.com)

### Japan

**Apacer Technology Corp.**

5F, Matsura Bldg., Shiba, Minato-Ku

Tokyo, 105-0014, Japan

Tel: 81-3-5419-2668

Fax: 81-3-5419-0018

[jpservices@apacer.com](mailto:jpservices@apacer.com)

### Europe

**Apacer Technology B.V.**

Science Park Eindhoven 5051 5692 EB Son,

The Netherlands

Tel: 31-40-267-0000

Fax: 31-40-290-0686

[sales@apacer.nl](mailto:sales@apacer.nl)

### China

**Apacer Electronic (Shanghai) Co., Ltd.**

Room D, 22/FL, No.2, Lane 600, JieyunPlaza,

Tianshan RD , Shanghai , 200051, China

Tel: 86-21-6228-9939

Fax: 86-21-6228-9936

[sales@apacer.com.cn](mailto:sales@apacer.com.cn)

### India

**Apacer Technologies Pvt Ltd.**

Unit No.201, "Brigade Corner", 7th Block Jayanagar,

Yediyur Circle, Bangalore – 560082, India

Tel: 91-80-4152-9061

Fax: 91-80-4170-0215

[sales\\_india@apacer.com](mailto:sales_india@apacer.com)