

RoHS Compliant

4GB DDR4 SDRAM SO-DIMM **Halogen free**

Product Specifications

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Version 0.4



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

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General Description

Apacer **D22.27190S.001** is a 512M x 64 DDR4 SDRAM (Synchronous DRAM) SO-DIMM. This high-density memory module consists of 4 pieces 512M x 16 bits DDR4 synchronous DRAMs in FBGA packages and a 4K Bits EEPROM. The module is a 260-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
D22.27190S.001	25.6 GB/sec	3200 Mbps	1600 MHz	CL22

Density	Organization	Component	Rank
4GB	512M x 64	512M x16*4	1

Key Parameters

MT/s	DDR4-2400	DDR4-2666	DDR4-2933	DDR4-3200	Unit
Grade	-CL17	-CL19	-CL21	-CL22	
tCK (min)	0.83	0.75	0.68	0.62	ns
CAS latency	17	19	21	22	tCK
tRCD (min)	14.16	14.25	14.32	13.75	ns
tRP (min)	14.16	14.25	14.32	13.75	ns
tRAS (min)	32	32	32	32	ns
tRC (min)	46.16	46.25	46.32	45.75	ns
CL-tRCD-tRP	17-17-17	19-19-19	21-21-21	22-22-22	tCK

Specifications:

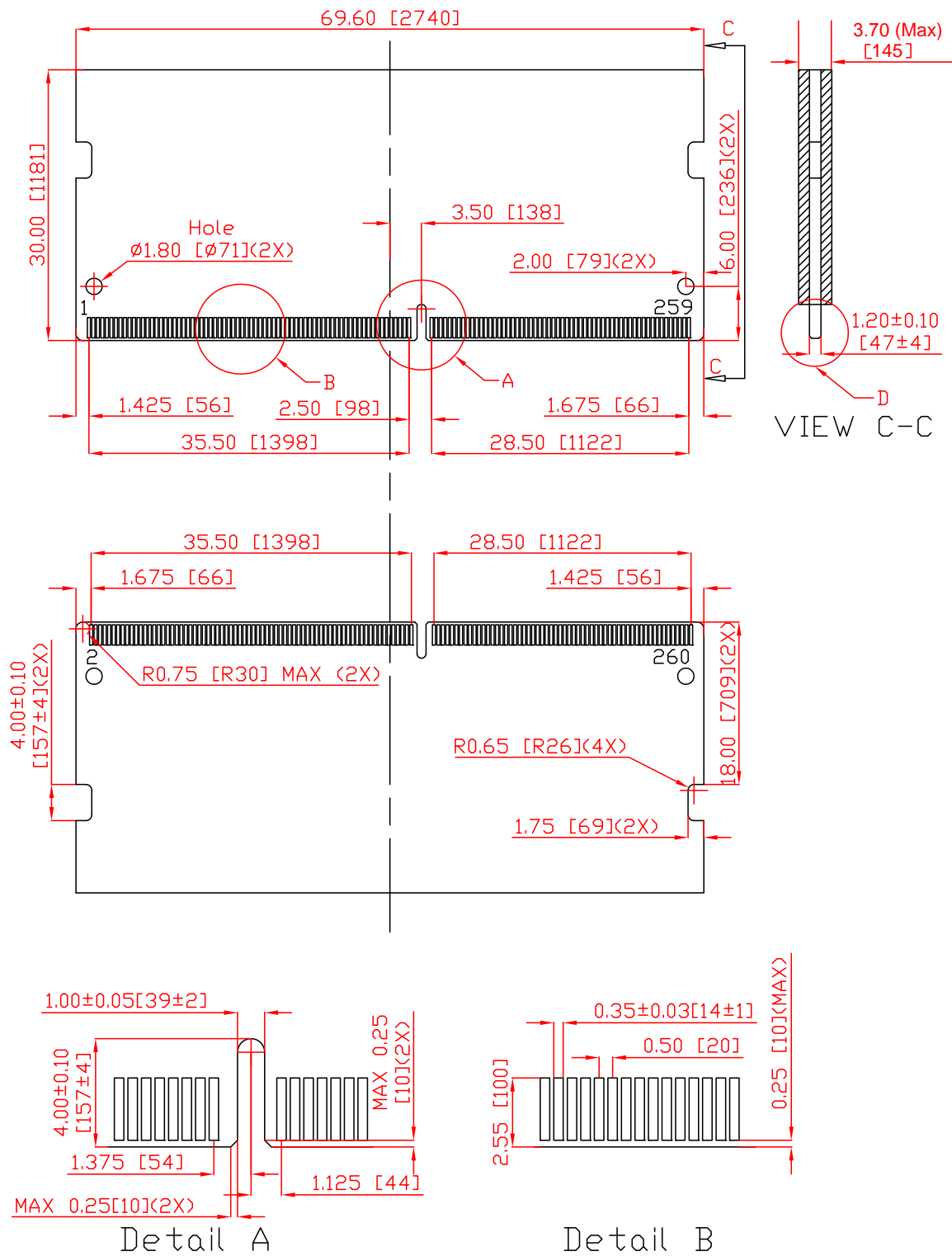
- ◆ On-DIMM thermal sensor : No
- ◆ Organization: 512 words x 64 bits, 1 rank
- ◆ Integrating 4 pieces of 8G bits DDR4 SDRAM sealed FBGA
- ◆ Package: 260-pin socket type small outline dual in-line memory module (SO-DIMM)
- ◆ PCB: height 30.00 mm, lead pitch 0.50 mm (pin),
- ◆ Serial Presence Detect (SPD)
- ◆ 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
- ◆ CAS Latency (CL): 10, 11, 12, 13, 14, 15,16,17,18,19, 20, 21, 22,24
- ◆ CAS Write Latency (CWL): 16,20
- ◆ 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



(All dimensions are in millimeters with ±0.15mm tolerance unless specified otherwise.)

Revision History

Revision	Date	Description	Remark
0.1	5/5/2014	Initial release	
0.2	11/2/2015	Updated VDDSPD	
0.3	03/15/2017	Add Environmental Requirements	
0.4	09/04/2017	Remove TOPR (Operating Temperature (ambient))	

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

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

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

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

China

Apacer Electronic (Shanghai) Co., Ltd.

Room D, 22/FL, No.2, Lane 600, Jieyun Plaza,

Tianshan RD, Shanghai, 200051, China

Tel: 86-21-6228-9939

Fax: 86-21-6228-9936

sales@apacer.com.cn

India

Apacer Technologies Pvt Ltd.

1874, South End C Cross, 9th Block Jayanagar,

Bangalore-560069, INDIA.

Tel: 91-80-4152-9061/62

Fax: 91-80-4170-0215

sales_india@apacer.com