

Apacer DDR2 PC4300 1GB Memory Module – Genuine DDR2 533

(By Janus Yeh / D-CROSS)

Apacer DDR2 PC4300 1GB Memory Module

The Apacer DDR2 PC4300 product is one of Apacer's leading product models and comes with a lifetime factory warranty. The Apacer DDR2 PC4300 1GB is comprised of two 512 MB DDR2 533MHz memory modules, using single-sided chip mounting with 8 memory chips of 64MB each, making up the 512MB capacity per module.



For many users, the quality of chips is the most important deciding purchasing factor. The Apacer DDR2 PC4300 1GB uses the Samsung K4T51083QB-ZKD5. This ZKD5 chip name is correct; it is a brand new memory chip from Samsung. So new in fact, you cannot even find any product related information from Samsung (Samsung is a tad slow in updating their product info on its website, aren't they!). It is probably another "secret weapon" from Samsung.

Although no public information can be found on the K4T51083QB-ZKD5 series chips, we can still apply the naming rule used for Samsung products. The "51" in K4T51083QB represents 512MB DDR2 SDRAM chips, and while we are unclear about what the "K" stands for, the "Z" in the ZKD5 stands for FBGA-LF packaging, and D5 is used to represent it is a DDR2-533MHz grade (266MHz@CL=4 · tRCD=4 · tRP=4) chip. The significance here means the Apacer DDR2 PC4300 1GB uses genuine DDR2 533 memory chips, instead of the adjusted DDR2 400MHz memory chips.

Relevant Details

According to Samsung's specifications, the major features of the K4T51083QB series memory chip are shown as follows:



K4T51083QB-ZKD5 chips

- VDDQ = 1.8V ± 0.1V
- 200 MHz fCK for 400Mb/sec/pin , 267MHz fCK for 533Mb/sec/pin
- 4Banks
- Posted /CAS
- Programmable /CAS Latency: 3 、 4 、 5
- Programmable Additive Latency: 0 、 1 、 2 、 3 and 4
- Write Latency (WL) = Read Latency (RL) -1
- Burst Length: 4 、 8 (Interleave/nibble sequential)
- Programmable Sequential / Interleave Burst Mode
- Bi-directional Differential Data-Strobe (Single-ended data-strobe is an optional feature)
- Off-Chip Driver (OCD) Impedance Adjustment
- On Die Termination
- Average Refresh Period 7.8us at lower then TCASE 85°C , 3.9us at 85°C < TCASE 95°C
- Package: 60ball FBGA - 128M x 4/64M x 8 , 84ball FBGA - 32M x16
- All Lead-free products are compliant for RoHS

Apart from the Samsung's specifications, we can also test how this memory module works with motherboards through software. For example, CPU-Z version 1.27 shows the CL value = 4, tRCD=4, tRP=4 when the memory module is operating at the standard 266MHz frequency (Due to the Clock IC on the motherboard, the actual operating frequency of the chip is the same as CPU external frequency at 268MHz), which is consistent with the Samsung specifications. Furthermore, if users are thinking of lowering the settings of the CL value, they may consider slowing down the settings of the memory module's frequency to 200MHz (i.e. DDR2 400MHz). If there are still concerns on stability when the settings are at 266MHz, the user can even adjust the CL value to 5 to obtain higher stability. All this can be adjusted freely under the memory module's SPD settings.

Timings	
Frequency	268.0 MHz
FSB:DRAM	1:1
CAS# Latency	4.0 clocks
RAS# to CAS# Delay	4 clocks
RAS# Precharge	4 clocks
Cycle Time (Tras)	12 clocks
Bank Cycle Time (Trc)	

 Memory module's internal test settings

SPD Timings Table			
Frequency	200 MHz	266 MHz	266 MHz
CAS# Latency	3.0	4.0	5.0
RAS# to CAS#	3	4	4
RAS# Precharge	3	4	4
TRas#	6	8	8

SPD settings overview

Details on Testing Platform

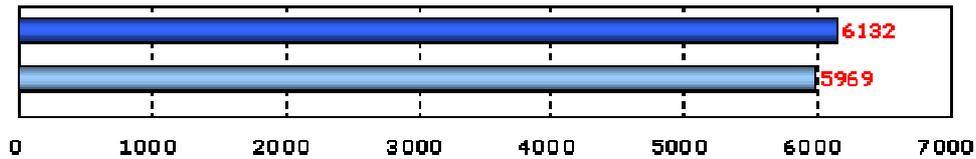
The testing platform used by Janus below uses the latest P4EE 3.73 GHz CPU from Intel, compared with the Intel P4EE 3.46 GHz CPU from the previous DDR2 test. You can use it to compare with memory modules from other suppliers (the dark blue color is P4EE 3.73 GH and the light blue is P4EE 3.46 GHz). The testing platform settings are of course, exactly the same as in previous memory module tests.

Hardware Item	
Item	Description
CPU	Intel P4EE 3.73 GHz Intel P4EE 3.46 GHz
Display Card	NVIDIA GeForce 6800 Ultra
Hard Disk	WD Reptor 74GB
Motherboard	Gigabyte GA-8AENXP-D
Power Supply	Seasonic 300W PFC
Software Item	
Item	Description
Display Card Driver	NVIDIA Forceware 71.22 WHQL
Motherboard Driver	Intel INF Ver 6.2.0 Intel IAA 4.5.0.6581
O/S	Microsoft Windows XP SP2
Testing Software	PCMark04 ver 130 · SiSoftware Sandra Professional 2005 · CPU-Z 1.27

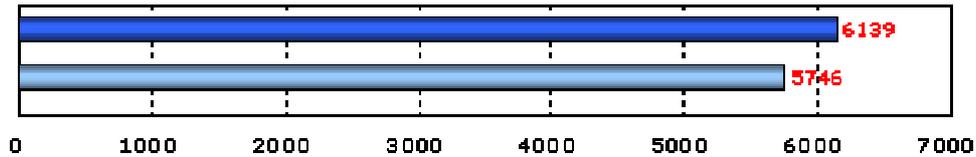
Testing Platform Performance

Under the tests using PCMark 2004 and SiSoftware Sandra Professional software, we found the Apacer DDR2 PC4300 1GB does perform quite well, proving synchronization of CPU external clock rate and memory module's clock rate does help, delivering excellent performance and a boost from the higher frequency P4EE 3.73 GHz CPU.

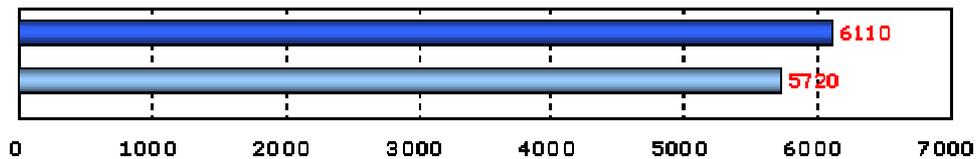
1. **PCMark 2004 Memory Score** (higher number means better performance)



2. **SiSoftware Sandra Professional 2005 Memory Bandwidth Benchmark RAM Bandwidth Int ALU** (higher number means better performance)



3. **SiSoftware Sandra Professional 2005 Memory Bandwidth Benchmark RAM Bandwidth Float FPU** (higher number means better performance)



Test Results and Analysis

The stability of the Apacer DDR2 PC4300 1GB memory module was quite good when tested under standard conditions. The lifetime warranty and after-sales service makes this product very competitive in the market. You may have noticed that Janus did not perform an overclocking test. This is because the majority of users do not have a need to overclock, maybe you can try to overclock a system by yourself. As far as the pros and cons of this product, Janus has summarized them below for your reference.

- **Pros** : Manufactured with standard DDR2 533MHz memory chips, not the adjusted DDR2 400MHz memory chips. A lifetime warranty provides very good after-sales service.
- **Cons** : N/A