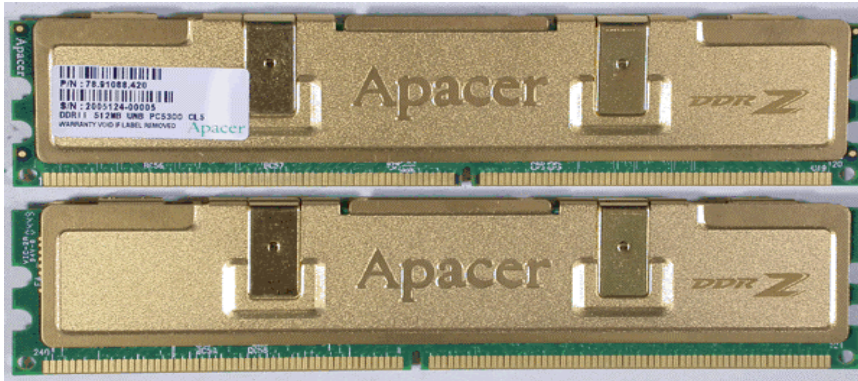


Quality of Apacer DDR2 667 is equal to that of the Kingston and A-data

Apacer PC2-5300 DDR2 667 DDR2 SDRAM 512MB



Committed to developing and manufacturing quality memory modules when it was founded in 1997, Apacer Technology Inc has since introduced to the market a wide variety of high-performance products of premium quality and aimed at fulfilling the needs of consumers and customers with well-established service. Apacer Technology also offers a customization service to meet the special needs of OEM customers. While its products are often sold alone or installed into products by system integrators, Apacer has become one of the most popular brands amongst leading memory modules and the company the fourth biggest in the world.

In addition to DRAMs, in 2002 Apacer formed a multimedia R&D team to develop flash memory, turning toward digital storage applications and service. It has since introduced a wide variety of multimedia products under the "Steno" brand, including flash cards, MP3/USB discs, multimedia storage devices etc, to enter into the consumer electronics market, and become one of the manufacturers stretching across IT and IA products.

The DDR2 667 512MB module from Apacer Technology uses the Elpida E5108AE-6E-E die (part number: 05060W009) in a 512MBx8 single-sided design. Golden color heat-sinks are fitted to the module to ensure operation stability through good ventilation. Though the specification appearing in the label marks is only PC-5300 CL=5, the module is capable of over-clocking. The default timing at 667MHz is 5-4-5-11, but the module is operable at 711MHz (266x2.66) without over-voltage (1.8V), which is equal to that of the DDR2 800 from A-Data also running at 711MHz, in terms of performance. While it works perfectly in dual-channel mode on either 925XE or C19, it can fulfill the needs of both general users and over-clocking users!

SPD Information and Test Data (Apacer Technology DDR2 677)

SPD 資訊與測試數據(宇瞻 DDR2-667)

記憶體模組	宇瞻(Apacer) DDR2 UNB 512MB PC5300 CL5		
SPD 模組名稱	Apacer Tech.		
SPD 製造日期	N/A		
SPD 時脈設定表 (CL-RD-RP-RAS)	333MHz 5.0-5-5-13 200MHz 3.0-3-3-8	266MHz 4.0-4-4-11	
測試設定時脈 (HostClk x Radio)	711MHz (266x2.66) 5-4-5-11 (OC)	667MHz (250x2.66) 5-4-5-11	533MHz (266x2) 4-4-4-11
Sandra 2005			
CPU Memory Bandwidth (MB/s)	6580	6121	6262
FPU Memory Bandwidth (MB/s)	6528	6109	6239
PCMark04			
Memory Score	6425	6016	6142
3DMark05 Pro			
1024x768x32	3524	3499	3167
1600x1200x32	2276	2253	2254
Everest Pro 1.51			
Memory Read (MB/s)	7676	7153	7150
Memory Write (MB/s)	2428	2171	2061
Memory Latency (mu-seconds)	74.8	80.5	83.4

A-Data PC2-5300 DDR2 667 DDR2 SDRAM 512MB

The Vitesta DDR2 667 512MB module from A-Data Technology uses the Elpida E5108AE-6E-E die (part number: 05060W024) in a 512MBx8 single-sided configuration. Though the specification on the label indicates only PC2-5300U-555-12, this choice of module is capable of over-clocking up to 800MHz. Test results indicated that the product supports true 800MHz well, with timing set to 5-4-5-12 without over-voltage (1.8V), and works well in dual-channel mode on either 925XE or C19. Its bandwidth at 12.8GB/s makes it a perfect option to meet the high-speed access demands of PC systems, present and future.

SPD Information and Test Data (A-Data Technology DDR2 677)

SPD 資訊與測試數據(威剛 DDR2-667)

記憶體模組	威剛(A-Data) Vitesta PC2-5300U-555-12 (512MB) DDR2-667			
SPD 模組名稱	A-DATA M2OEL5G3H3160B0B1C0Z			
SPD 製造日期	Week 9 / 2005			
SPD 時脈設定表 (CL-RD-RP-RAS)	333MHz 5.0-5-5-15 266MHz 4.0-4-4-12 200MHz 3.0-3-3-9			
測試設定時脈 (HostClk x Radio)	800MHz (266x3) 5-4-5-12 (OC)	711MHz (266x 2.66) 5-4-5-12	667MHz (250x 2.66) 4-4-4-12	533MHz (266x2) 4-4-4-12
Sandra 2005				
CPU Memory Bandwidth (MB/s)	6686	6543	6181	6235
FPU Memory Bandwidth (MB/s)	6675	6531	6165	6215
PCMark04				
Memory Score	6613	6412	6110	6132
3DMark05 Pro				
1024x768x32	3519	3504	3511	3488
1600x1200x32	2271	2277	2267	2251
Everest Pro 1.51				
Memory Read (MB/s)	7820	7674	7211	7043
Memory Write (MB/s)	2628	2385	2574	2245
Memory Latency (microseconds)	71.4	75.5	76.7	85.3

資料來源：DigiTimes Lab · 2005/4

製表：陳兆宏、柯博偉

TwinMOS PC2-5300 DDR2-667 SDRAM 512MB

The DDR2 667 512MB module from TwinMOS Technologies uses the Elpida E5108AE-6E-E die (part number: 05060W065) in a 512MBx8 single-sided configuration. The specification in the label indicates only PC2 5300 512MB CL5, without a timing value. Therefore, general users can run the module with the default SPD settings. Test results indicated that the product works well, without any problem, at 667MHz and 711MHz with timing set to 5-4-5-12 without over-voltage (1.8V). Unfortunately, it seems that it supports only single-channel mode on C19. This problem should be fixed after C19 is introduced into the market.

SPD Information and Test Data (TwinMOS Technologies DDR2 677)

SPD 資訊與測試數據(勤茂 DDR2-667)

記憶體模組	勤茂(TwinMOS)		
SPD 模組名稱	PC2-5300 512MB U-DIMM/CL5		
SPD 製造日期	7G-25JK5-EB0		
SPD 製造日期	Week 16 / 2005		
SPD 時脈設定表 (CL-RD-RP-RAS)	333MHz 5.0-5-5-15 266MHz 4.0-4-4-12 200MHz 3.0-3-3-9		
測試設定時脈 (HostClk x Radio)	711MHz (266x2.66) 5-4-5-12	667MHz (250x2.66) 5-4-5-12	533MHz (266x2) 4-4-4-12
Sandra 2005			
CPU Memory Bandwidth (MB/s)	6533	6128	6267
FPU Memory Bandwidth (MB/s)	6495	6108	6225
PCMark04			
Memory Score	6437	5993	6136
3DMark05 Pro			
1024x768x32	3519	3499	3343
1600x1200x32	2271	2269	1986
Everest Pro 1.51			
Memory Read (MB/s)	7674	7167	7120
Memory Write (MB/s)	2342	2173	2115
Memory Latency (mu-seconds)	75.7	80.8	84.1

資料來源：DigiTimes Lab，2005/4

製表：陳兆宏、柯博偉

Kingmax PC2-5300 DDR2 667 SDRAM 512MB

The DDR2 667 512MB version from Kingmax Technologies uses the Elpida E5108AE-6E-E die (part number: 05060W009) in a 512MBx8 single-sided configuration. We can also see the red ASIC decrypted chip for anti-piracy on the module. The specification in the label indicates only DDR2 667. Therefore, general users only need to run the module with the default SPD settings. SPD inquiry indicates that in addition to the timing value for 266MHz, there are 2 values for 333MHz: CL=4 and CL=5. Our experience tells that the latter should be for over-clocking. While JEDEC supports only 333MHz, the SPD can only indicate data at 333MHz. Therefore, users can use the SPD settings when running the product at 667MHz. For over-clocking users, they must change the settings, or the system will not start up. Users can set SPD to AUTO when running it on 925XE platforms, but they must change the settings to 4-5-5-13-18 and increase voltage by 0.3V in order to start up on C19 platforms. Over-voltage will not be necessary after certification by C19.

SPD Information and Testing Data (Kingmax Technology DDR2 677)

SPD 資訊與測試數據(勝創 DDR2-667)

記憶體模組	勝創(Kingmax) Mars 512MB DDR2-667 KLCC28F-A8EB5		
SPD 模組名稱	Kingmax KLCC28F-A8EB5-ECAS		
SPD 製造日期	N/A		
SPD 時脈設定表 (CL-RD-RP-RAS)	333MHz 5.0-5-5-13	333MHz 4.0-5-5-13	266MHz 3.0-4-4-11
測試設定時脈 (HostClk x Radio)	711MHz (266x2.66) 5-4-5-11 (OC)	667MHz (250x2.66) 4-5-5-13	533MHz (266x2) 3-4-4-11
Sandra 2005			
CPU Memory Bandwidth (MB/s)	6560	6079	6305
FPU Memory Bandwidth (MB/s)	6545	6084	6260
PCMark04			
Memory Score	6415	6002	6199
3DMark05 Pro			
1024x768x32	3521	3491	3503
1600x1200x32	2276	2257	2259
Everest Pro 1.51			
Memory Read (MB/s)	7617	7263	7173
Memory Write (MB/s)	2621	2334	2318
Memory Latency (mu-seconds)	76.0	76.7	80.9

資料來源: DigiTimes Lab · 2005/4

製表: 陳兆宏、柯博偉

Kingston PC2-6000 DDR2 750 SDRAM 256MB

The subject is "air-fresh" from the USA, the latest HyperX DDR2 256MB from Kingston. As shown in the label, PC2-6000, it is the top model DDR2 750 module. Other data in the label includes: Assembled in USA and voltage 1.9V etc. Tests indicated that even when running at DDR2 750MHz (250x3) and the timing is set to uncompromising the SPD value, it runs perfectly well without over-voltage, suggesting that Kingston is an ideal option for 925XE platforms. When running on the C19 platform at 667MHz, if we force the default CL=5 to CL=4, it only needs to adjust the timing to 4-4-4-28-20 and increase voltage by 0.2V (2.0V), it can work well, and even much faster than 5-5-5-13 recommended by SPD.

SPD Information and Testing Data (Kingston Technology DDR2 750)

SPD 資訊與測試數據(金士頓 DDR2-750)

記憶體模組	金士頓(Kingston) HyperX DDR2 KHX6000D2/256(256MB) DDR2-750 1.9V			
SPD 模組名稱	Kingston			
SPD 製造日期	Week 11 / 2005			
SPD 時脈設定表 (CL-RD-RP-RAS)	333MHz 5.0-5-5-13 266MHz 4.0-5-5-13 200MHz 3.0-4-4-11			
測試設定時脈 (HostClk x Radio)	750MHz (250x3) 5-5-5-15 (Recycle Time=28)	711MHz (266x 2.66) 5-4-5-12	667MHz (250x 2.66) 5-4-5-12	533MHz (266x2) 4-4-4-12
Sandra 2005				
CPU Memory Bandwidth (MB/s)	6117	6557	6136	6264
FPU Memory Bandwidth (MB/s)	6102	6558	6106	6249
PCMark04				
Memory Score	6069	6441	5999	6118
3DMark05 Pro				
1024x768x32	3494	3521	3500	3505
1600x1200x32	2269	2267	2262	2264
Everest Pro 1.51				
Memory Read (MB/s)	7202	7629	7179	7173
Memory Write (MB/s)	2331	2650	2175	2036
Memory Latency (mu-seconds)	80.7	75.8	80.1	84.0

資料來源：DigiTimes Lab，2005/4

製表：陳兆宏、柯博偉