Intel® Server Board S5000VCL Tested Memory Report

Notice: *This document will be discontinued in March 2009.*

Please refer to the Sever Configuration tool for a complete list of tested hard drives at:
http://serverconfigurator.intel.com/default.aspx

Revision 34.0

February 2009

Revision History

Date	Rev	Modifications
Sept. 06	1.0	Initial release.
Oct. 06	2.0	Added Hynix* 512MB part. (In shaded area)
Oct. 06	3.0	Added Qimonda* (Infineon) 512MB part. Added Legacy* and Nanya* 1GB parts. (In shaded area)
Nov. 06	4.0	Added Kingston* and ATP Electronics* 512MB parts. Added Smart* and Kingston 1GB parts. (In shaded area)
Jan. 07	5.0	Added Kingston and A-Data Technology 512MB parts. Added Smart, Kingston, ATP Electronics, Wintec, Ventura, Super Talent Electronics, and Viking 1GB parts. Added Smart, Kingston, ATP Electronics, Wintec, Viking, and Super Talent Electronics 2GB parts. (In shaded area)
Jan. 07	6.0	Added Buffalo and Legacy 1GB parts. Added Buffalo, Kingston, Qimonda, and Ventura 2GB parts. (In shaded area)
Jan. 07	7.0	Added Micron 512MB part. Added Hynix and Micron 1GB parts. Added Micron and Qimonda 2GB parts. (In shaded area)
Feb. 07	8.0	Added ATP Electronics, Legacy, and Viking 512MB parts. Added Micron, ATP Electronics, Dataram, and Legacy 1GB parts. Added Qimonda, ATP Electronics, Buffalo, and Wintec Industries 2GB parts. (In shaded area)
Feb. 07	9.0	Added Samsung and Dataram 512MB parts. Added Qimonda and Samsung 1GB parts. Added Legacy and Kingston 2GB parts. (In shaded area)
Feb. 07	10.0	Added Qimonda 512MB and 2GB parts. Added Micron 1GB part. Updated vendor contact information. (In shaded area)
Mar. 07	11.0	Added AMB Vendor, AMB Rev, and Heat Sink Type information to some of the parts. Added Hynix 1GB part. Added Qimonda and Samsung 2GB parts. (In shaded area)
Mar. 07	12.0	Updated contact information. Added Netlist, Inc. and Smart 1GB parts. (In shaded area)
Apr. 07	13.0	Added Hynix, Micron, and Qimonda 512MB parts. Added Micron, ATP Electronics, Smart, and Samsung 1GB parts. Added Micron and Qimonda 2GB parts. (In shaded area)
May 07	14.0	Added Dataram, Hynix, and Micron 1GB parts. Added ATP Electronics, Kingston, Dataram, and Micron 2GB parts. (In shaded area)
May 07	15.0	Added section 2.2: clarification for acoustics versus performance mode. Additional memory parts added. (In shaded area)
Jun. 07	16.0	Additional memory parts added. (In shaded area)
Jul. 07	17.0	Additional memory parts added. (In shaded area)
Aug. 07	18.0	Additional memory parts added. (In shaded area)
Oct. 07	19.0	Updated some contact information. Additional memory parts added. (In shaded area)
Nov. 07	20.0	Added a note on product codes covered by this list. Added an AMB revision notes. Added additional memory parts (in shaded area).
Jan. 08	21.0	Removed modules built with Qimonda C1 stepping AMBs. Added additional memory parts (in shaded area).
Mar. 08	22.0	Added additional memory parts (in shaded area).
Apr. 08	23.0	Added additional memory parts (in shaded area).

Date	Rev	Modifications
May 08	24.0	Part number corrections (in shaded area).
May 08	25.0	Added additional memory parts (in shaded area).
June 08	26.0	Added additional memory parts (in shaded area).
June 08	27.0	Added additional memory parts (in shaded area).
July 08	28.0	Added additional memory parts (in shaded area).
July 08	29.0	Added additional memory parts (in shaded area). Update contact information for MSC Vertriebs GmbH
Aug. 08	30.0	Added additional memory parts (in shaded area).
Aug. 08	31.0	Added additional memory parts (in shaded area).
Oct. 08	32.0	Added additional memory parts (in shaded area).
Nov. 08	32.0	Added additional memory parts (in shaded area).
Feb. 09	32.0	Added additional memory parts (in shaded area). **Note:** Supported adapters, peripherals, hard drives and memory have been added for each Intel® Server product in the Server Configurator Tool. This document will be discontinued in March 2009. Please refer to the Sever Configuration tool for a complete list of tested memory at: http://serverconfigurator.intel.com/default.aspx

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The Intel® Server Board S5000VCL may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Please Note: DIMM devices with gold contacts should NOT be placed into DIMM sockets with tin-lead contacts or vice-versa. Mixing dissimilar metal contact types has been shown to result in unreliable memory operation. Intel recommends similar manufacturer and similar speeds in each Rank on the memory module. Mixing of dissimilar memory is NOT recommended.

Table of Contents

1.   Overview of Memory Testing

The following test processes are used to qualify Dual In-Line Memory Modules (DIMMs) for use with the Intel® Server Board S5000VCL.   Memory is a vital subsystem in a server. Intel requires that strict guidelines be met before a DIMM vendor is added to the Tested Memory Report. To be included on the list as a fully supported DIMM, the memory must undergo rigorous tests to ensure that the product will perform the intended server product functions. Memory qualification for Intel server, workstation and RAID controller products is performed both by Intel's Memory Validation Lab (MVL) and by an independent external test lab, Computer Memory Test Lab* (CMTL).

Note: This tested memory list applies to all product codes in the Intel® Server Board S5000VCL family.

The Tested Memory Lists for Intel's server board, workstation board, and RAID controller products categorize memory modules as Advanced Tested. The Advanced Testing process includes a standard paper qualification and then is followed by two levels of functional testing. DIMMs that have completed and passed Advanced Testing are considered to be compatible with the product on which they were tested, and with the test software and operating systems that was used during the test process.

Note: Memory qualification for main memory is done by testing identical memory modules in all DIMM slots. Memory qualification does not include testing of mixed DIMM type and/or vendors. Mixing of DIMM type and/or vendors is not recommended.

1.1   Paper Qualification

A paper qualification is performed to verify that the specifications of a given DIMM meet Intel's memory specifications for a given product. Specification criteria reviewed include: critical timings, electrical characteristics, timing requirements, environmental requirements, and packaging requirements.

1.2   Functional Testing

After a given DIMM passes the standard paper qualification, functionality of the DIMM is then tested with the intended Intel product. Two levels of functional testing is performed; Standard and Advanced.

Standard functional testing requires that the given DIMM and Intel product combination operate with no failures for a period of no less than 24 hours for both minimum and maximum DIMM configurations. Testing is performed using a Microsoft Windows* operating system and a custom test package. The test systems operate with standard voltage and at room temperature.

1.3   Advanced functional testing

Advanced functional testing requires that the given DIMM and Intel product combination operate with no failures for a period of no less than 24 hours for both minimum and maximum DIMM configurations. Testing is performed with multiple operating systems and various custom test packages. Each test configuration is tested with various voltage and temperature margin conditions.

1.4   Computer Memory Test Lab*

Computer Memory Test Lab, also known as "CMTL*" is a leading memory test organization responsible for testing a broad range of memory products. A memory product, which receives a "PASS" after being tested by CMTL, means it functions correctly and consumers can use the product to perform the intended server functions. In order to pass these stringent standards, memory products must maintain the highest manufacturing procedures and pass an exacting battery of tests. Testing is performed with Intel supplied equipment and procedures defined by Intel's various functional testing levels.

CMTL* Contact Information:

Office: (949) 716-8690   Computer Memory Test Lab (CMTL)
Main Fax: (949) 716-8691   24 Hammond Suite F
                                              Irvine, CA 92618
                                              http://www.cmtlabs.com/

2.   Intel® Server Board S5000VCL Memory Sub-system

The Intel® Server Board S5000VCL main memory subsystem was designed to support Fully Buffered Dual In-line (FBD) Registered DDR2-667 FBDIMM memory ECC Synchronous Dynamic Random Access Memory (SDRAM). Other industry naming conventions for DDR2-667 include PC2-5300.

The maximum main memory capacity supported is based on the number of DIMM slots provided and maximum supported memory loads by the chipset. On the Intel® Server Board S5000VCL the maximum supported capacity is 12GB; the minimum supported capacity is 512MB with one single 512MB DIMM.

Supported FBDIMM capacities for main memory include: 512MB, 1GB, and 2GB.

2.1   Main Memory Population

The Intel® Server Board S5000VCL has six DIMM slots grouped into two DIMM channels for main memory. DIMMs within each bank should be identical (same manufacturer, CAS latency, number of rows, columns and devices, timing parameters etc.). Although DIMMs within a bank must be identical, the BIOS supports various DIMM sizes and configurations allowing memory between banks to be different. Memory sizing and configuration is guaranteed only for qualified DIMMs approved by Intel.

DIMM population rules depend on the operating mode of the memory controller, which is determined by the number of DIMMs installed. DIMMs must be populated in pairs. DIMM pairs are populated in the following DIMM slot order: A1 & B1, A2 & B2, A3 & B3. DIMMs within a given pair must be identical with respect to size, speed, and organization. However, DIMM capacities can be different between different DIMM pairs.

For example, a valid mixed DIMM configuration may have 512MB DIMMs installed in DIMM Slots A1 & B1, and 1GB DIMMs installed in DIMM slots A2 & B2.
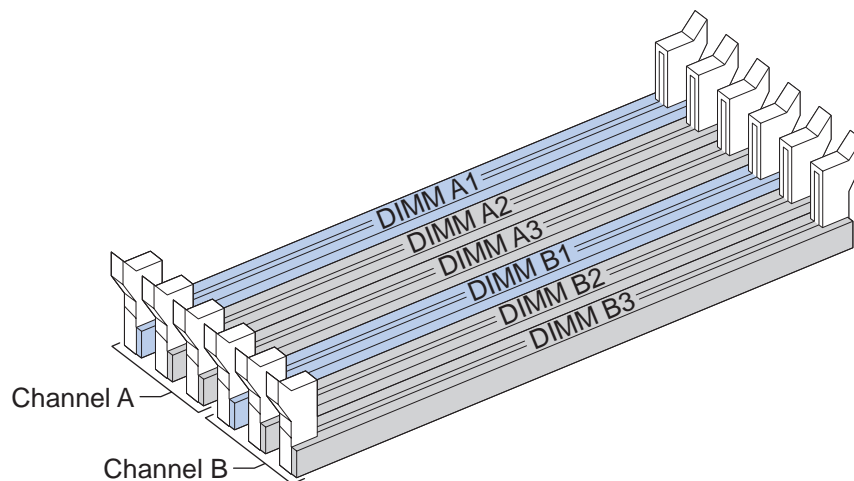
Figure 1. Identifying Banks of Memory

2.1.1   Memory Sub-system

The MCH masters two fully buffered DIMM (FBD) memory channels. FBD memory utilizes a narrow high speed frame oriented interface referred to as a channel. On the server board, two channels are routed to six DIMM slots and are capable of supporting registered DDR2-667 FBDIMM memory (stacked or unstacked).

Note: DDR2 DIMMs that are not fully buffered are NOT supported on this server board.

The following table lists the current supported memory types.

FBDIMM-667 CL5 Memory Matrix						
DIMM Capacity	DIMM Organization	SDRAM Density	SDRAM Organization	# SDRAM Devices/rows/Ranks	# Address bits rows/Ranks/column	Ranked
512MB	64M x72	256Mbit	128M x 4		13/12/2	
512MB	64M x72	256Mbit	64M x 8		13/11/2	
512MB	64M x72	512Mbit	128M x 4		14/11/2h	
512MB	64M x72	512Mbit	64M x 8		14/10/2	
1GB	128M x 72	512Mbit	256M x 4		14/12/2	
1GB	128M x 72	512Mbit	128M x 8		14/11/2	
1GB	128M x 72		256M x 4		14/11/3	
1GB	128M x 72		128M x 8		14/10/3	
2GB	256M x72		512M x 4		15/11/3	
2GB	256M x72		256M x 8			

2.2   Acoustic versus Performance Mode for System Fan Control

2.2.1   Memory Sizing and Configuration

The BIOS supports various memory module sizes and configurations. These combinations of sizes and configurations are valid only for FBDIMMs approved by Intel. The BIOS reads the Serial Presence Detect (SPD) SEEPROMs on each installed memory module to determine the size and timing characteristics of the installed memory modules (FBDIMMs). The memory-sizing algorithm then determines the cumulative size of each row of FBDIMMs. The BIOS programs the memory controller in the chipset accordingly, such that the range of memory accessible from the processor is mapped into the correct FBDIMM, or set of FBDIMMs.

2.2.2   Performance Configuration in BIOS Setup (Default)

In performance mode, the system will utilize fan control over memory throttling to provide primary system cooling. This mode results in a moderately louder system than acoustic mode due to more aggressive fan speed control settings. Independent of the system's temperature level, the fan speed in performance mode will be slightly higher than the fan speed in acoustic mode. Additionally, at a given temperature, the increased airflow from this cooling option diminishes the occurrence of memory throttling. This enables high-power DIMMs (typically DRx4) to operate at their maximum capacity since these DIMMs produce a higher thermal output from their higher bandwidth.

Note: this is the recommended mode when using DRx4 memory modules.

2.2.3   Acoustic Configuration in BIOS Setup

In acoustic mode, the system temperature is maintained primarily by memory throttling, so the utilization of high fan speeds is reduced. As a result, this mode produces a quieter system because the fans will run at a lower speed if the system does not require additional cooling. However, the memory throttling utilized in this mode could lower memory performance for high-power DIMMs (typically DRx4 or better) because these DIMMs cause a higher thermal output when reaching optimal memory bandwidth.

Note: this is the recommended mode when using DRx8 memory modules.

3.   Intel® Server Board S5000VCL Main Memory Tested

The following tables list DIMM devices tested to be compatible with the Intel® Server Board S5000VCL. The list of tested memory is periodically updated as qualified memory is added during the production life of the Intel product.

Intel strongly recommends the use of ECC memory in all server products.

Memory modules not listed in the following tables have not been tested for compatibility and their use with the Intel® Server Board S5000VCL may result in unpredictable operation and data loss.

The use of x4 FBDIMMs will only be supported with the server system operating in "Performance" mode (default). The use of x4 FBDIMMs while the server system is configured to operate in "Acoustics" mode is not supported. Some memory modules may have thermal issues when used in 1U rack solution. It is advised that you verify any thermal limitations with your chassis supplier before purchasing a chassis.

Caution: Third party memory vendors may use the same module part number with different DRAM vendors and die revisions. To insure proper system operation, verify that each DRAM vendor and die revision has been separately tested and qualified. Please notify CMTL if there is a discrepancy. This list is subject to change without notice.

Note: This list is not intended to be all-inclusive. It is provided as a convenience to Intel's general customer base, but Intel does not make any representations or warranties whatsoever regarding the quality, reliability, functionality, or compatibility of these memory modules.

Intel® Server Board S5000VCL
Fully Buffered ECC, DDR2-667 DIMM Modules
512 MB Sizes (64Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	AMB Vendor	AMB Revision	Heat-sink Vendor	Rank	Date
Samsung	M395T6553CZ4-CE601	K4T51083QC	Samsung		IDT	1.5	FDHS	2	8/28/06
Hynix	HYMP564F72BP8N2-Y5	HY5PS12821BFP-Y5	Hynix		Intel	GB C0[1]	FDHS	1	9/13/06
Qimonda	HYS72T64400HFN-3S-A	HYB18T512800AF	Qimonda		Intel	GB C0[1]		1	10/17/06
Kingston	KVR667D2S8F5/512I	E5108AGBG-6E-E rev G	Elpida	2025285-002.A00 na	Intel	D1	Foxconn	1	10/23/06
ATP Electronics	AP64K72A8BHE6S	K4T51083QC-ZCE6 rev C	Samsung	SP240A08K1 na	IDT	A1.5	Foxconn	1	11/3/06
Kingston	KVR667D2S8F5/512I	E5108AGBG-6E-E rev G	Elpida	2025285-002.A00 na	Intel	D1	Foxconn	1	12/12/06
A-Data Technology	M2OEL5G3HAB71I1C5Z	EDE5108AGSE-6E rev G	Elpida	B62FRCA na	NEC	B5[2]	Foxconn	1	12/18/06
Micron	MT9HTF6472FY-667B4E3	MT47H64M8CB-3	Micron		Intel	GB C0[1]	FDHS	1	12/13/06
ATP Electronics	AP64K72A8BHE6S	K4T51083QC-ZCE6 rev C	Samsung	SP240A08K1 na	NEC	B5[2]	Foxconn	1	1/18/07
ATP Electronics	AP64K72A8BHE6S	K4T51083QE-ZCE6 rev E	Samsung	D2F18A na	NEC	B5[2]	Foxconn	1	1/24/07
Legacy Electronics Inc.	N557K4C90AN-30R	EDE5108AHBG-6E-E rev H	Elpida	D2F18A	NEC	B5[2]	AVC	1	1/14/07
Legacy Electronics Inc.	B557K4C90AN-30R	K4T51083QC-ZCE6 rev C	Samsung	D2F18A rev A	NEC	B5[2]	AVC	1	1/13/07
Legacy Electronics Inc.	N557K4C90AE-30R	E5108AHBG-6E-E rev H	Elpida	D2F18A rev A	IDT	A1.5	AVC	1	1/19/07
Legacy Electronics Inc.	B557K4C90AE-30R	K4T51083QC-ZCE6 rev C	Samsung	D2F18A rev A	IDT	A1.5	AVC	1	1/19/07
Viking	VR5EF647218EBWL1	HYB18T512800BF3S rev B	Qimonda	D2F18A	IDT	A1.5	Foxconn	1	1/19/07
Dataram	DTM65506C	HY5PS12821CFP-Y5 rev C	Hynix	40053A rev B	INTEL	D1	Foxconn	1	1/27/07
Samsung	M395T6553CZ4-CE60	K4T51083QC	Samsung		Intel	GB C0[1]	FDHS	1	2/5/07
Samsung	M395T6553EZ4-CE65	K4T51083QE	Samsung		Intel	GB D1	FDHS	1	2/5/07
Qimonda	HYS72T64400HFD-3S-B	HYB18T512800AF-3S-B	Qimonda		IDT	C1	FDHS	1	2/26/07
Qimonda	HYS72T64400HFN-3S-B	HYB18T512800AF-3S-B	Qimonda		Intel	D1	FDHS	1	2/26/07
Hynix	HYMP564F72BP8D2-Y5	HY5PS12821BFP-Y5	Hynix		IDT	1.5	FDHS	1	3/28/07
Micron	MT9HTF6472FY-667D5E4	MT47H64M8-3	Micron		Intel	GB D1	FDHS	1	3/28/07

[1] The GB C0 AMB revision does not support closed-loop throttling.

[2] This part may show voltage errors in the System Event Log (SEL) during boot. These errors will not affect system operation and can be ignored.

Fully Buffered ECC, DDR2-667 DIMM Modules 512 MB Sizes (64Mx72)									
Manufacturer	**Part Number**	**DRAM Part Number**	**DRAM Vendor**	**PCB Part Number**	**AMB Vendor**	**AMB Revision**	**Heat-sink Vendor**	**Rank**	**Date**
Kingston	KVR667D2S8F5/512I	NT5TU64M8BE-3C rev B	Nanya	2025285-002.A00 na	Intel	D1	Foxconn	1	5/15/07
Micron	MT9HTF6472FY-667D5D4	MT47H64M8B6-3:D	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT6472AF667.9FD5D4	MT47H64M8B6-3:D	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT6472AF667.9FD5E4	MT47H64M8B6-3:D	Micron		Intel	GB D1	FDHS	1	6/18/07
Samsung	M395T6553EZ4-CE66	K4T51083QE	Samsung		IDT	C1	FDHS	1	6/18/07
Hynix	HYMP564F72CP8N3-Y5	HY5PS12821CFP-Y5	Hynix		Intel	GB D1	FDHS	1	6/18/07
Hynix	HYMP564F72CP8D3-Y5	HY5PS12821CFP-Y5	Hynix		IDT	C1	FDHS	1	6/18/07
Qimonda	HYS72T64400HFE-3S-B	HYB18T512800AF	Qimonda		NEC	B5+	FDHS	1	6/18/07
Smart Modular Technologies	SG647FBD64852IBD5	HYB18T512800BF-3S rev B	Qimonda	PG54G240NFBUB4RAS rev A	IDT	A1.5	Foxconn	1	8/06/07
Buffalo	D2F667CW-S512EGJ	E5108AGBG-6E-E rev G	Elpida	2DFA18F-AA	IDT	C1	Foxconn	1	9/13/07
Qimonda	HYS72T64520HFD-3S-B	HYB18T512800BF-3S-B	Qimonda		IDT	C1	FDHS	1	11/19/07
Dataram	DTM65506F	HYB18T512800B2F-3S rev B2	Qimonda	40053A rev B	IDT	C1	Foxconn	1	2/29/08
Dataram	DTM65506F	HYB18T512800B2F-3S rev B2	Qimonda	40053A rev B	IDT	C1	Foxconn	1	2/29/08
Ventura Technology Group	D2-52VD98SIV-555	K4T51083QE-ZCE6 rev E	Samsung	B62FRCA 0.93 na	IDT	A1.5	AVC	1	3/20/08
Crucial	CT6472AF667.9FD5E4	MT47H64M8B6-3	Micron		Intel	GB D1	FDHS	1	6/16/08

(+) This vendor is part of the CMTL Certification program. This means this part has been/will be tested across all compatible Intel® Server Boards.   For further information contact CMTL @ http://cmtlabs.com/

Note: Some memory modules may have thermal issues when used in a non-Intel 1U rack solution. It is advised that you verify any thermal limitations with your chassis supplier before purchasing a chassis.

Note: The use of x4 FBDIMMs will only be supported with the server system operating in "Performance" mode (default). The use of x4 FBDIMMs while the server system is configured to operate in "Acoustics" mode is not supported.

Intel® Server Board S5000VCL
Fully Buffered ECC, DDR2-667 DIMM Modules
1 GB Sizes (128Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	AMB Vendor	AMB Revision	Heat-sink Vendor	Rank	Date
Qimonda	HYS72T128420H FN-3S-A	HYB18T512800AF5	Qimonda		Intel	GB C0[1]	FDHS	2	9/1/06
Legacy	B517K4C90BN-30R	K4T51083QC-ZCE6	Samsung		NEC	B5[2]		2	10/17/06
Nanya	NT1GT72U8PA5 BD-3C	NT5U64M8AE-3C	Nanya		IDT	1.5		2	10/17/06
Smart Modular Technologies	SG1287FBD6485 2-IAI	HYB18T512800AF3 S rev A	Qimonda	K0545 na	Intel	D1	Logitex	2	10/16/06
Smart Modular Technologies	SG1287FBD6485 2SCD5	K4T51083QC-ZCE6 rev C	Samsung	PG58G240 NFBUB3RB S rev B	IDT	A1.5	Foxconn	2	10//17/06
Kingston	KVR667D2D8F5/ 1GI	E5108AGBG-6E-E rev G	Elpida	2025286-002.A00 na	Intel	D1	Foxconn	2	10/31/06
Smart Modular Technologies	SG1287FBD6485 2NAD5	NT5TU64M8AE-3C rev A	Nanya	PG58G240 NFBUB3RB S rev B	IDT	A1.5	Foxconn	2	11/9/06
Smart Modular Technologies	SG1287FBD6485 2IAD5	HYB18T512800AF3 S rev A	Qimonda	PG58G240 NFBUB3RB S rev B	IDT	A1.5	Foxconn	2	11/22/06
Smart Modular Technologies	SG1287FBD6485 2-SCI	K4T51083QC-ZCE6 rev C	Samsung	M395T2953 CZ0 na	Intel	D1	Samsung	2	12/4/06
Kingston	KVR667D2D8F5/ 1GI	E5108AGBG-6E-E rev G	Elpida	2025286-002.A00 na	Intel	D1	Foxconn	2	12/8/06
Smart Modular Technologies	SG1287FBD6485 2-HBD	HY5PS12821BFP-Y5 rev B	Hynix	KS-11 (0634-5)	Intel	D1	Hynix	2	12/8/06
Kingston	KVR667D2D8F5/ 1GI	E5108AG-6E-E rev G	Elpida	2025286-001.F00 na	Intel	D1	Foxconn	2	12/11/06
ATP Electronics	AP28K72S8BHE 6S	K4T51083QC-ZCE6 rev C	Samsung	SP240S08K 1 na	IDT	A1.5	Foxconn	2	12/12/06
Wintec Industries	39C935284C	K4T51083QC-ZCE6 rev C	Samsung	D2F28B rev B	IDT	A1.5	Foxconn	2	12/14/06
Smart Modular Technologies	SG1287FBD6485 2-ECD	E5108AG-6E-E rev G	Elpida	BFA1=AM-1 na	IDT	A1.5	Elpida	2	12/16/06
Ventura Technology Group	D2-54VD80LIV-555	EDE-5108AGBG-6E-E rev G	Elpida	D2F28B na	IDT	A1.5	Foxconn	2	12/18/06
Super Talent Electronics	T667FB1G(Chan nel)/S1GTF8AM S(OEM)	K4T51083QC-ZCE6 rev C	Samsung	B62FRCB na	IDT	A1.5	Foxconn	2	12/22/06
Viking	VR5EF287218EB WL1	HYB18T512800BF3 S rev B	Qimonda	D2F28B	IDT	A1.5	Foxconn	2	12/26/06
Buffalo	D2F667CW-1GMDJ	E5108AG-6E-E rev G	Elpida	2DFB28F-AC na	NEC	B5[2]	Foxconn	2	1/9/07
Legacy Electronics Inc.	B517K4C90BE-30R	K4T51083QC-ZCE6 rev C	Samsung	D2F28B na				2	1/12/07
Hynix	HYMP512F72BP 8D2-Y5	HY5PS12821BFP-Y5	Hynix		IDT	1.5	FDHS	2	11/14/06
Micron	MT18HTF12872 FDY-667D5E3	MT47H64M8B6-3	Micron		Intel	GB C01	FDHS	2	11/14/06
Dataram	DTM65507C	HY5PS12821CFP-Y5 rev C	Hynix	40053A rev B	Intel	D1	Foxconn	2	1/23/07

[1] The GB C0 AMB revision does not support closed-loop throttling.

[2] This part may show voltage errors in the System Event Log (SEL) during boot. These errors will not affect system operation and can be ignored.

Fully Buffered ECC, DDR2-667 DIMM Modules 1 GB Sizes (128Mx72)									
Manufacturer	**Part Number**	**DRAM Part Number**	**DRAM Vendor**	**PCB Part Number**	**AMB Vendor**	**AMB Revision**	**Heat-sink Vendor**	**Rank**	**Date**
ATP Electronics	AP28K72S8BHE6S	K4T51083QC-ZCE6 rev C	Samsung	SP240S08K1 na	NEC	B5^2	Foxconn	2	1/16/07
Legacy Electronics Inc.	B517K4C90BE-30R	K4T51083QC-ZCE6 rev C	Samsung	D2F28B na	IDT	A1.5	Foxconn	2	1/12/07
Legacy Electronics Inc.	B517K4C90BN-30R	K4T51083QC-ZCE6 rev C	Samsung	D2F28B	NEC	B5^2	AVC	2	1/14/07
Legacy Electronics Inc.	B517K4C90BE-30R	K4T51083QC-ZCE6 rev C	Samsung	D2F28B na	IDT	A1.5	AVC	2	1/23/07
Legacy Electronics Inc.	N517K4C90BE-30R	E5108AE-6E-E rev E	Elpida	D2F28B na	IDT	A1.5	AVC	2	1/26/07
Micron	MT18HTF12872FDY-667D6E4	MT47H64M8-3	Micron		Intel	GB-D1	FDHS	2	1/29/07
Samsung	M395T2953CZ4-CE60	K4T51083QC	Samsung		Intel	GB C0^1	FDHS	2	2/5/07
Qimonda	HYS72T128420HFN-3S-B	HYB18T512800AF-3S-B	Qimonda		Intel	GB D1	FDHS	2	2/13/07
Samsung	M395T2953CZ4-CE61	K4T51083QC	Samsung		IDT	1.5	FDHS	2	2/13/07
Micron	MT9HTF12872FY-667E1N6	MT47H129M8HQ-3:E	Micron		NEC	B5+	FDHS	1	2/26/07
Hynix	HYMP512F72CP8N3-Y5	HY5PS12821CFP-Y5	Hynix		Intel	GB D1	FDHS	2	3/12/07
Netlist, Inc.	NLC127A26407FD53I1SC1	K4T51083QC-ZCE6 rev C	Samsung	0296-10A rev A	IDT	C1	Foxconn	2	3/14/07
Smart Modular Technologies	SG1287FBD64852-HB	HY5PS12821CFP-Y5 rev C	Hynix	KS-11 (0646-3F)	IDT	A1.5	Hynix	2	3/16/07
Micron	MT18HTF12872FDY-667B5E3	MT47H64M8CB-3	Micron		Intel	GB C0^1	FDHS	2	3/28/07
Samsung	M395T2953EZ4-CE65	K4T51083QE	Samsung		Intel	GB D1	FDHS	2	3/28/07
ATP Electronics	AP28K72S8BHE6S	K4T51083QE-ZCE6 rev E	Samsung	SP240S08K1 na	NEC	B5^2	Foxconn	2	4/3/07
Smart Modular Technologies	SG1287FBD64852IBD5	HYB18T512800BF3S rev B	Qimonda	PG58G240NFBUB4RBS rev A	IDT	A1.5	Foxconn	2	4/5/07
Micron	MT9HTF12872FY-667E1E4	MT47H128M8HQ-3:E	Micron		Intel	GB D1	FDHS	1	4/9/07
Micron	MT9HTF12872FY-667E1D4	MT47H128M8HQ-3:E	Micron		IDT	C1	FDHS	1	4/9/07
Dataram	DTM65507D	HYB18T512800BF3S rev B	Qimonda	40053A rev B	Intel	D1	Foxconn	2	4/10/07
Hynix	HYMP512F72BP8N2-Y5	HY5PS12821BFP-Y5	Hynix		Intel	GB C01	FDHS	2	4/20/07
Micron	MT18HTF12872FY-667D6E4	MT47H128M4	Micron		Intel	GB D1	FDHS	1	5/1/07
Kingston	KVR667D2D8F5/1GI	NT5TU64M8BE-3C rev B	Nanya	2025286-002.A00 na	Intel	D1	Foxconn	2	5/16/07
Apacer	75.063AI.G00	K4T51083QE-ZCE6 rev E	Samsung	48.16203.095 rev 5	Intel	D1	AVC	2	5/18/07
Wintec Industries	39C935284E-IL	K4T51083QE-ZCE6 rev E	Samsung	D2F28B rev B	Intel	D1	Foxconn	2	6/07/07
Micron	MT18HTF12872FDY-667D6D4	MT47H64M8B6-3:D	Micron		IDT	C1	FDHS	2	6/18/07

^{1} The GB C0 AMB revision does not support closed-loop throttling.

^{2} This part may show voltage errors in the System Event Log (SEL) during boot. These errors will not affect system operation and can be ignored.

Fully Buffered ECC, DDR2-667 DIMM Modules 1 GB Sizes (128Mx72)									
Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	AMB Vendor	AMB Revision	Heat-sink Vendor	Rank	Date
Qimonda	HYS72T128501EFD-3S-C2	HYB18T1G800C2F-3S-C2	Qimonda		IDT	AMB+	FDHS	1	9/18/08
Micron	MT18HTF12872FY-667D6D4	MT47H128M4B6-3:D	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT12872AF667.18FD6D4	MT47H64M8B6-3:D	Micron		IDT	C1	FDHS	2	6/18/07
Crucial Technology	CT12872AF667.18F4D6D4	MT47H128M4B6-3:D	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT12872AF667.18FD6E4	MT47H64M8B6-3:D	Micron		Intel	GB D1	FDHS	2	6/18/07
Crucial Technology	CT12872AF667.18F4D6E4	MT47H128M4B6-3:D	Micron		Intel	GB D1	FDHS	1	6/18/07
Crucial Technology	CT12872AF667.9FE1D4	MT47H128M8HQ-3:E	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT12872AF667.9FE1N6	MT47H128M8HQ-3:E	Micron		NEC	B5+	FDHS	1	6/18/07
Samsung	M395T2953EZ4-CE66	K4T51083QE	Samsung		IDT	C1	FDHS	2	6/18/07
Hynix	HYMP512F72CP8D3-Y5	HY5PS12821CFP-Y5	Hynix		IDT	C1	FDHS	2	6/18/07
Qimonda	HYS72T128420HFE-3S-B	HYB18T512800BF	Qimonda		NEC	B5+	FDHS	2	6/18/07
Qimonda	HYS72T128520HFD-3S-B	HYB18T512800BF	Qimonda		IDT	C1	FDHS	2	6/18/07
Ventura Technology Group	D2-54VD80SIV-555	K4T51083QE-ZCE6 rev E	Samsung	D2F28B na	IDT	A1.5	AVC	2	7/13/07
Crucial Technology	CT12872AF667.9FE1E4	MT47H128M8HQ-3:E	Micron		Intel	GB D1	FDHS	1	6/18/07
Smart Modular Technologies	SG1287FBD64852-SEI	K4T510830QE-ZCE6 rev E	Samsung	M395T2953EZ0 na	IDT	C1	Foxconn	2	9/10/07
Buffalo	D2F667CW-S1GMEJ	MT47H128M8HQ-3 rev E	Micron	2DFA18F-AA	IDT	C1	Foxconn	1	9/12/07
Kingston	KVR667D2D8F5/1GI	HYB18T512800BF-3S rev B	Qimonda	2025286-002.A00 na	Intel	D1	Foxconn	2	10/03/07
Smart Modular Technologies	SG1287FBD64852SEC1	K4T51083QE-ZCE6 rev E	Samsung	PG58G240NFBUB4RBS rev A	IDT	C1	Foxconn	2	10/06/07
Smart Modular Technologies	SG1287FBD64852IBDC	HYB18T512800BF3S rev B	Qimonda	PG58G240NFBUB4RBS rev A	IDT	C1	Foxconn	2	10/20/07
ATP Electronics	AP28K72S8BHE6S	K4T51083QE-ZCE6 rev E	Samsung	D2F28B na	NEC	D1	Foxconn	2	1/15/08
Dataram	DTM65507G	HYB18T512800B2F3S rev B2	Qimonda	40053A rev B	IDT	C1	Foxconn	2	3/04/08
Hynix	HYMP112F72CP8N3-Y5	HY5PS1G831CFP-Y5	Hynix		Intel	GB D1	FDHS	1	3/2/08
Hynix	HYMP112F72CP8D3-Y5	HY5PS1G831CFP-Y5	Hynix		IDT	C1	FDHS	1	3/16/08
Samsung	M395T2863QZ4-CE66	K4T1G084QQ-HCE6	Samsung		IDT	C1	FDHS	1	3/10/08
Avant Technology	AVF7228B52E5667F1NYBP-IS	NT5TU64M8BE-25C rev B	Nanya	D2F28B rev B	IDT	C1	Foxconn	2	5/26/08
Avant Technology	AVF7228B52E5667F1ELJP-IS	EDE5108AJBG-8E-E rev J	Elpida	D2F28B rev B	IDT	C1	Foxconn	2	5/27/08
Micron	MT9HTF12872FY-667E2D6	MT47H128M8HQ-3:E	Micron		IDT	L4	FDHS	1	6/17/08

Fully Buffered ECC, DDR2-667 DIMM Modules 1 GB Sizes (128Mx72)									
Manufacturer	**Part Number**	**DRAM Part Number**	**DRAM Vendor**	**PCB Part Number**	**AMB Vendor**	**AMB Revision**	**Heat-sink Vendor**	**Rank**	**Date**
Crucial	CT12872AF667.9 E2D6	MT47H128M8HQ-3:E	Micron		IDT	L4	FDHS	1	6/17/08
TRS	TRS32403X	K4T1G084QQ-HCE6 rev Q	Samsung	M395T6553E Z0-P150 rev 4	IDT	C1	Samsung	1	07/10/08
Micron	MT18HTF12872 FDY-667F1D4	MT47H64M8CF-3:F	Micron		IDT	C1	FDHS	2	6/24/08
Crucial	CT12872AF667.1 8FF1D4	MT47H64M8CF-3:F	Micron		IDT	C1	FDHS	2	6/24/08
Qimonda	HYS72T128420E FD-3S-B2	HYB18T512805B2 F-3S	Qimonda		IDT	C1	FDHS	2	7/8/08
TRS	TRS32400X	HY5PS1G831CFP-Y5 rev C	Hynix	0806-2DC	IDT	C1	Hynix	1	07/27/08
Dataram	DTM65526A	HY5PS1G831CFP-Y5 rev C	Hynix	40053A rev B	IDT	C1	Foxconn	1	8/15/08
Hynix	HYMP112F72CP 8D5-Y5	HY5PS1G831CFP-Y5	Hynix		IDT	L4	FDHS	1	11/5/08
Apacer	78.0KGAB.424	EDE1108ACBG-8E-E rev C	Elpida	48.16203.09 4 rev 4	Intel	D1	Foxconn	1	02/12/09

(+) This vendor is part of the CMTL Certification program. This means this part has been/will be tested across all compatible Intel® Server Boards.   For further information contact CMTL @ http://cmtlabs.com/

Note: Some memory modules may have thermal issues when used in a non-Intel 1U rack solution. It is advised that you verify any thermal limitations with your chassis supplier before purchasing a chassis.

Note: The use of x4 FBDIMMs will only be supported with the server system operating in "Performance" mode (default). The use of x4 FBDIMMs while the server system is configured to operate in "Acoustics" mode is not supported.

Intel® Server Board S5000VCL Fully Buffered ECC, DDR2-667 DIMM Modules 2 GB Sizes (256Mx72)									
Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	AMB Vendor	AMB Revision	Heat-sink Vendor	Rank	Date
Smart Modular Technologies	SG2567FBD28452-IAI	HYB18T512400AF3S rev A	Qimonda	240-25-4 na	IDT	A1.5	Logitex	2	12/2/06
Kingston	KVR667D2D4F5/2GI	HYB18T512400AF3S rev A	Qimonda	2025372-002.A00 na				2	12/8/06
ATP Electronics	AP56K72G4BHE6S	K4T51043QC-ZCE6 rev C	Samsung	SP240G04K1 na	IDT	A1.5	Foxconn	2	12/11/06
Smart Modular Technologies	SG2567FBD28452IBD5	HYB18T512400BF-3S rev B	Qimonda	PG54G240NFSUB1RES rev B	IDT	A1.5	Foxconn	2	12/14/06
Wintec Industries	39945344C	K4T51043QC-ZCE6 rev C	Samsung	D2F24E rev E	IDT	A1.5	Foxconn	2	12/14/06
Kingston	KVR667D2D4F5/2GI	E5104AG-6E-E rev G	Elpida	2025378-001.A00 na	Intel	D1	Foxconn	2	12/15/06
Viking	VR5EF567214EBWL1	HYB18T512400BF3S rev B	Qimonda	D2F24E	IDT	A1.5	Foxconn	2	12/20/06
Super Talent Electronics	T667FB2G4(Channel)/S2GTF4EMS(OEM)	K4T51043QC-ZCE6 rev C	Samsung	BA2FRCE na	IDT	A1.5	Foxconn	2	12/22/06
Smart Modular Technologies	SG2567FBD28452-SCD	K4T51043QC-ZCE6 rev C	Samsung	M395T5750-CZ0 na	IDT	A1.5	Samsung	2	12/26/06
Buffalo	D2F667CW-W2GMBJ	MT47H128M4B6-3 rev D	Micron	2DFE24F-AA na	NEC	B5[2]	Foxconn	2	1/11/07
Kingston	KVR667D2D4F5/2GI	NT5TU128M4AE-3C rev A	Nanya	2025372-002.A00 na	Intel	D1	Foxconn	2	1/12/07
Ventura Technology Group	D2-56VF82SIV-555	K4T51043QC-ZCE6 rev C	Samsung	D2F24E na	IDT	A1.5	AVC	2	1/4/07
Qimonda	HYS72T256420HFN-3S-A	HYB18T512400AF-3.7	Qimonda		Intel	GB C0[1]	FDHS	2	1/4/07
Qimonda	HYS72T256420HFN-3S-A	HYB18T512400AF-3.7	Qimonda		Intel	GB C0[1]	FDHS	2	1/5/07
Kingston	KVR667D2D4F5/2GI (INT/ELP)	E5104AG-6E-E	Elpida		IDT	D1	FDHS	2	1/16/07
Qimonda	HYS72T256420HFN-3S-A	HYB18T512400AF-3.7	Qimonda		Intel	GB C0[1]	FDHS	2	11/14/06
Micron	MT36HTF25672FY-667D1E3	MT47H128M4B6-3	Micron		Intel	GB C0[1]	FDHS	2	11/14/06
ATP Electronics	AP56K72G4BHE6S	K4T51043QC-ZCE6 rev C	Samsung	SP240G04K1 na	NEC	B5[2]	Foxconn	2	1/18/07
Kingston	KVR667D2D4F5/2GI	NT5TU128M4AE-3C rev A	Nanya	2025372-002.A00 na	Intel	D1	Foxconn	2	1/12/07
Wintec Industries	39C945341B-IL	HYB18T512400BF3S rev B	Qimonda	D2F24E rev E	Intel	F	Foxconn	2	1/13/07
Qimonda	HYS72T256420HFN-3S-B	HYB18T512400AF-3S-B	Qimonda		Intel	GB D1	FDHS	2	1/29/07
Kingston	KVR667D2D4F5/2GI	HYB18T512400BF3S rev B	Qimonda	2025372-002.A00 na	Intel	D1	Foxconn	2	1/27/07
Legacy Electronics Inc.	N527MYG90EN-30R	EDE5104AG-6E-E rev G	Elpida	D2F24E rev E	NEC	B52	AVC	2	2/7/07
Legacy Electronics Inc.	B527M4C90EN-30R	K4T51043QC-ZCE6 rev C	Samsung	D2F24E rev E	NEC	B52	AVC	2	2/8/07

[1] The GB C0 AMB revision does not support closed-loop throttling.

[2] This part may show voltage errors in the System Event Log (SEL) during boot. These errors will not affect system operation and can be ignored.

Fully Buffered ECC, DDR2-667 DIMM Modules 2 GB Sizes (256Mx72)									
Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	AMB Vendor	AMB Revision	Heat-sink Vendor	Rank	Date
Qimonda	HYS72T256420HFD-3S-B	HYB18T512400AF	Qimonda		IDT	1.5	FDHS	2	2/26/07
Qimonda	HYS72T256420HFE-3S-B	HYB18T512400AF-3S-A	Qimonda		NEC	B5+	FDHS	2	3/12/07
Samsung	M395T5750CZ4-CE61	K4T51043QC	Samsung		IDT	1.5	FDHS	2	3/12/07
Samsung	M395T5750EZ4-CE65	K4T51043QE	Samsung		Intel	GB D1	FDHS	2	3/12/07
Micron	MT18HTF25672FDY-667E1D4	MT47H128M8HQ-3:E	Micron		IDT	C1	FDHS	2	3/28/07
Qimonda	HYS72T256420HFD-3S-A	HYB18T512800AF5	Qimonda		IDT	1.5	HS	2	3/28/07
Micron	MT18HTF25672FDY-667E1E4	MT47H128M8HQ-3:E	Micron		Intel	GB D1	FDHS	2	4/9/07
Micron	MT18HTF25672FDY-667E1N6	MT47H128M8HQ-3:E	Micron		NEC	B5+	FDHS	2	4/9/07
ATP Electronics	AP56K72G4BHE6S	K4T51043QE-ZCE6 rev E	Samsung	SP240G04K1 na	NEC	B5[2]	Foxconn	2	4/07/07
Kingston	KVR667D2D8F5/2GI	MT47H128M8HQ-3 rev E	Micron	2025286-002.A00 na	Intel	D1	Foxconn	2	4/09/07
Kingston	KVR667D2D4F5/2GI	HY5PS12421BFP-Y5 rev B	Hynix	0708-6A	IDT	A1.5	AVC	2	4/14/07
Dataram	DTM65508D	HYB18T512400BF3S rev B	Qimonda	40060A rev A	Intel	D1	Foxconn	2	4/17/07
Micron	MT18HTF25672FY-667E1E4	MT47H256M4	Micron		Intel	GB D1	FDHS	1	5/1/07
Micron	MT36HTF25672FY-667D1E4	MT47H128M4	Micron		Intel	GB D1	FDHS	2	5/1/07
Dataram	DTM65508E	HY5PS12421CFP-Y5 rev C	Hynix	40060A rev A	Intel	D1	Foxconn	2	4/25/07
Smart Modular Technologies	SG2567FBD28452IBD5	HYB18T512400BF3S rev B	Qimonda	PG54G240NFSUB1RES rev C	IDT	A1.5	Foxconn		5/21/07
Apacer	75.A72AI.G00	K4T51043QE-ZCE6 rev E	Samsung	48.1A205.011 rev 1	Intel	D1	AVC		5/24/07
Legacy Electronics Inc.	M527NAE90BE-30R	MT47H128M8HQ-3 rev E	Micron	D2F28B rev B	IDT	A1.5	AVC		6/09/07
Micron	MT18HTF25672FY-667E1D4	MT47H256M4HQ-3:E	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT25672AF667.18F4E1D4	MT47H256M4HQ-3:E	Micron		IDT	C1	FDHS	1	6/18/07
Crucial Technology	CT25672AF667.18FE1E4	MT47H128M8HQ-3:E	Micron		Intel	GB D1	FDHS	2	6/18/07
Crucial Technology	CT25672AF667.18F4E1E4	MT47H256M4HQ-3:E	Micron		Intel	GB D1	FDHS	1	6/18/07
Crucial Technology	CT25672AF667.36FD1E4	MT47H128M4B6-3:D	Micron		Intel	GB D1	FDHS	2	6/18/07
Crucial Technology	CT25672AF667.18FE1D4	MT47H128M8HQ-3:E	Micron		IDT	C1	FDHS	2	6/18/07
Crucial Technology	CT25672AF667.18FE1N6	MT47H128M8HQ-3:E	Micron		IDT	C1	FDHS	2	6/18/07

[2] This part may show voltage errors in the System Event Log (SEL) during boot. These errors will not affect system operation and can be ignored.

Fully Buffered ECC, DDR2-667 DIMM Modules 2 GB Sizes (256Mx72)									
Manufacturer	**Part Number**	**DRAM Part Number**	**DRAM Vendor**	**PCB Part Number**	**AMB Vendor**	**AMB Revision**	**Heat-sink Vendor**	**Rank**	**Date**
Kingston	KVR667D2D4F5/2GI	NT5TU128M4BE-3C rev B	Nanya	2025378-001.A00 na	Intel	D1	Foxconn	2	10/02/07
Qimonda	HYS72T256520HFD-3S-B	HYB18T512400BF-3S-B	Qimonda		IDT	C1	FDHS	2	11/19/07
Kingston	KVR667D2D8F5/2GI	E1108ACBG-6E-E rev C	Elpida	2025286-002.A00 na	Intel	D1	Foxconn	2	2/14/08
ATP Electronics	AP56K72G4BHE6S	K4T51043QE-ZCE6 rev E	Samsung	D2F24E na	NEC	D1	Foxconn	2	1/22/08
Dataram	DTM65508F	HYB18T512400B2F3S rev B2	Qimonda	40084A rev A	IDT	C1	Foxconn	2	3/01/08
Hynix	HYMP125F72CP8N3-Y5	HY5PS1G831CFP-Y5	Hynix		Intel	GB D1	FDHS	2	3/8/08
Hynix	HYMP125F72CP8D3-Y5	HY5PS1G831CFP-Y5	Hynix		IDT	C1	FDHS	2	3/17/08
Samsung	M395T5663QZ4-CE66	K4T1G084QQ-HCE6	Samsung		IDT	C1	FDHS	2	3/4/08
Kingston	KVR667D2D8F5/2Gi	HY5PS1G831CFP-Y5 rev C	Hynix	2025286-002.A00 na	Intel	D1	Foxconn	2	05/04/08
Micron	MT18HTF25672FDY-667E1N8	MT47H128M8HQ-3:E	Micron		NEC	D1	FDHS	2	4/26/08
Micron	MT18HTF25672FDY-667E2D6	MT47H128M8HQ-3:E	Micron		IDT	L4	FDHS	2	4/29/08
Crucial	CT25672AF667.18FE1N8	MT47H128M8HQ-3:E	Micron		NEC	D1	FDHS	2	5/21/08
Crucial	CT25672AF667.18FE2D6	MT47H128M8HQ-3:E	Micron		IDT	L4	FDHS	2	5/21/08
Crucial	CT25672AF667.36FD1D4	MT47H128M4B6-3:D	Micron		IDT	C1	FDHS	2	5/21/08
Avant Technology	AVF7256B61E5667F1ELCP-IS	EDE1108ACBG-8E-E rev C	Elpida	D2F28B rev B	IDT	C1	Foxconn	2	5/29/08
Kingston	KVR667D2D4F5/2GI	HYB18T512400B2F25F rev B2	Qimonda	2025378-001.A00	INTEL	D1	Foxconn	2	06/10/08
Smart Modular Technologies	SG2567FB212852HCDL	HY5PS1G831CFP-Y5 rev C	Hynix	PG58G240NFBUB4RBS rev A	IDT	L4	Foxconn	2	06/20/08
Smart Modular Technologies	SG2567FBD12852HCDC	HY5PS1G831CFP-Y5 rev C	Hynix	PG58G240NFBUB4RBS rev A	IDT	C1	Foxconn	2	06/19/08
Micron	MT18HTF25672FY-667E2D6	MT47H256M4HQ-3:E	Micron		IDT	L4	FDHS	1	6/17/08
Crucial	CT25672AF667.18F4E2D6	MT47H256M4HQ-3:E	Micron		IDT	L4	FDHS	1	6/17/08
TRS	TRS32406X	K4T1G084QQ-HCE6 rev Q	Samsung	M395T2953EZ0-P110 rev 4	IDT	C1	Samsung	2	07/09/08
Qimonda	HYS72T256420EFD-3S-B2	HYB18T512400B2F-3S	Qimonda		IDT	C1	FDHS	2	6/18/08
TRS	TRS32401X	HY5PS1G831CFP-Y5 rev C	Hynix	0821-1DC	IDT	C1	Hynix	2	07/28/08
Dataram	DTM65521A	HY5PS1G831CFP-Y5 rev C	Hynix	40053A rev B	IDT	C1	Foxconn	2	8/4/08
Qimonda	HYS72T256521EFD-3S-C2	HYB18T1G800C2F-3S	Qimonda		IDT	AMB+	FDHS	2	7/18/08
Kingston	KVR667D2D4F5/2GI	HYB15T512400CF25 rev C	Qimonda	240-35-1	IDT	C1	Logitex	2	10/23/08
Hynix	HYMP125F72CP8D5-Y5	HY5PS1G831CFP-Y5	Hynix		IDT	L4	FDHS	2	11/5/08

(+) This vendor is part of the CMTL Certification program. This means this part has been/will be tested across all compatible Intel® Server Boards.   For further information contact CMTL @ http://cmtlabs.com/

Note: Some memory modules may have thermal issues when used in a non-Intel 1U rack solution. It is advised that you verify any thermal limitations with your chassis supplier before purchasing a chassis.

Note: The use of x4 FBDIMMs will only be supported with the server system operating in "Performance" mode (default). The use of x4 FBDIMMs while the server system is configured to operate in "Acoustics" mode is not supported.

Sales Information

Vendor Name	Web URL	Vendor Direct Sales Info
ATP Electronics	http://www.atpinc.com/	Tel (1) 408-732-5000, ext 5858 Fax 408-732-5893 sales@atpusa.com
ATP Electronics -- Taiwan Inc.	http://www.atpinc.com/	Tel 011-886-2-2659-6368 Fax 886-2-2659-4982
Avant Technology	http://www.avanttechnology.com	Brad Scoggins Phone: (512)491-7411 Fax: (512)491-7412 brads@avanttechnology.com
Aved Memory Products	http://www.avedmemory.com/	
Buffalo Technology	http://www.buffalotech.com/	(800) 967-0959 memory@buffalotech.com
Centon Electronics	http://www.centon.com	Tel: 949-855-9111 Fax: 949-855-6035
Corsair	http://www.corsairmicro.com/	Tel: 510-657-8747 Fax: 510-657-8748
Crucial	http://www.crucial.com/intel	Toll-free: 888-363-4167 (US & Canada only) Tel: 208-363-5790 Fax: 208-363-5560 crucial.sales@micron.com
Dane-Elec	http://www.dane-memory.com/	Michal Hassan @ (949)450-2941 or email @ Michal@Dane-memory.com
Dataram	http://www.dataram.com/	Paul Henke, 800-328-2726 x2239 in USA 609-799-0071 phenke@dataram.com
GoldenRAM	http://www.goldenram.com	Jason M. Barrette @ 800-222-861 x7546 jasonb@goldenram.com or Michael E. Meyer @800-222-8861 x7512 michaelm@goldenram.com
Hitachi	http://semiconductor.hitachi.com/pointer/	
Hyundai/Hynix Semiconductor	http://www.hea.com/	
Infineon	http://www.infineon.com/business/distribut/index.htm	
ITAUCOM	http://www.itaucom.com.br	
JITCO CO LTD	http://www.jitco.net/	Seong Jeon Tel: 82-32-817-9740 s.jeon@jitco.net
Kingston	http://www.kingston.com	US.- Call (877) 435-8726 Asia – Call 886-3-564-1539 Europe – Call +44-1932-755205
Legacy Electronics Inc.	http://www.legacyelectronics.com	U.S. Contact: Gary Ridenour, 949-498-9600, Ext 350 European Contact: 49 89 370 664 11
Legend	http://www.legend.com.au	
Micron	http://www.micron.com	
MSC Vertriebs GmbH	http://www.msc-ge.com	Andreas Gruendl Tel: +49-89-945532-34 Fax: +44-89-945532-4 agru@msc-ge.com
Nanya Technology	http://www.ntc.com.tw	Winson Shao 886-3-328-1688, Ext 6018 winsonshao@ntc.com.tw

Vendor Name	Web URL	Vendor Direct Sales Info
Netlist, Inc	http://www.netlistinc.com	Christopher Lopes 949.435.0025 tel 949.435.0031 fax sales@netlistinc.com
Peripheral Enhancements	http://www.peripheral.com/	
Samsung	http://www.korea.samsungsemi.com/locate/buy/list_na.html	For US customers go to: http://www.mymemorystore.com/
Silicon Tech	http://www.silicontech.com/contact/salescontacts.shtml	
Simple Tech	http://www.simpletech.com	Ron Darwish @ (949) 260-8230 or email @ Rdarwish@Simpletech.com
SMART Modular Technologies	www.smartm.com/channel/hpc/	Gene Patino (949) 439-6167 Gene.Patino@Smartm.com
Super Talent Electronics	http://www.supertalentmemory.com	David Crume (408) 957-8181 support@supertalentmemory.com
Swissbit	http://www.swissbit.com	Tony Cerreta Tel: 914-935-1400 x240 Fax: 914-935-9865 tony.cerreta@swissbitna.com
TechnoLinc Corporation	http://www.technolinc.com	David Curtis 510-445-7400 davidc@technolinc.com
TRS* Tele-Radio-Space GmbH	http:www.certified-memory.com http://www.certified-memory.de	Vendor Direct Sales Info: Andreas Gründl, Pho.: +49(0)89/94553234, Fax.: +49(0)89/94553293, agruendl@trs-space.de
Unigen	http://www.unigen.com	
Ventura Technology Inc	http://www.venturatech.com	Sam Lewis 760 724-8700 ext. 103
Viking InterWorks	http://www.vikinginterworks.com	Adrian Proctor Tel: 949-643-7255 adrian.proctor@sanmina-sci.com
Virtium Technology Inc	http://www.virtium.com	Tod Skelton @ (949) 460-0020 ext. 146 or email @ tod.skelton@virtium.com
Wintec Industries	http://www.wintecindustries.com	Tel 510-360-6300 Fax 510-770-9338

4.   CMTL* (Computer Memory Test Labs)

CMTL is a privately owned and operated memory testing organization responsible for testing a broad range of memory products. Memory devices tested by CMTL must undergo a rigorous battery of tests to ensure that the product will perform the intended server functions. Memory capability is a major factor your customers consider.   CMTL has the ability to test and certify memory on Intel-based server platforms. The list of memory modules, which have undergone testing through the CMTL facility, should be referenced when considering modules for integration into this Intel server product. Stringent standards with regard to manufacturing procedures and quality must be met to pass the exacting tests required for qualification through the independent testing facility. Testing is performed by CMTL with Intel server products and test procedures defined by Intel's Memory Qualification Lab. Intel routinely audits the CMTL facility to ensure all procedures, process handling, and testing methodologies are met.

IMPORTANT NOTE
DIMM devices with gold contacts should NOT be placed into DIMM sockets with tin-lead contacts or vice-versa. Mixing dissimilar metal contact types has been shown to result in unreliable memory operation. Intel recommends similar manufacturer and similar speeds in each Rank on the memory module. Mixing of dissimilar memory manufacturer devices or dissimilar memory device speeds is not recommended. This document contains information which is the proprietary property of Intel Corporation. Nothing in this document constitutes a guaranty, warranty, or license, express or implied. Intel has tested the following DIMMs for minimum electrical and functional compatibility with the Intel® Server Board. This listing is not intended to be all inclusive; it only represents the DIMMs Intel or CMTL has tested. Users of this list are reminded to check with the DIMM manufacturer or Distributor to ensure that a particular DIMM model is adequate for the intended purpose of the Intel® Server Board. Intel provides no indemnities for and expressly disclaims all liabilities for any and all such guaranties, representations, and warranties (oral or written) whether express or implied, related to DIMMs in an Intel® Server Board product, including without limitation to: fitness for a particular purpose; merchantability; noninfringement of intellectual property or other rights of any third party or of Intel. The reader is advised that third parties may have intellectual property rights which may be relevant to this document and the technologies discussed herein, and is advised to seek the advice of competent legal counsel, without obligation of Intel. Intel retains the right to make changes to this document at any time, without notice. Intel makes no warranty or representation with respect to the use of this document or reliance by the reader upon its contents, and assumes no responsibility for any errors which may appear in the document nor does it make a commitment to update the information contained herein.

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