Intel® Server System SR9000MK4U
Tested Memory List

Revision 8.0

June 2008

Revision History

Date	Rev	Modifications
November 2006	1.0	Initial release.
January 2007	1.1	Correction made to Elpida 2GB DIMM part number.
April 2007	1.2	Updates/additions made to 4GB, 2GB and 1GB DIMM tested memory tables.
May 2007	2.0	Added Dataram 1GB part. Added Hynix and Dataram 2GB parts. Added Hynix 4GB part. (In shaded area)
July 2007	3.0	Additional memory parts added. (In shaded area)
August 2007	4.0	Additional memory parts added. (In shaded area)
October 2007	5.0	Updated some contact information. Additional memory parts added. (In shaded area)
May 2008	6.0	Additional memory parts added. (In shaded area)
May 2008	7.0	Additional memory parts added. (In shaded area)
June 2008	8.0	Additional memory parts added. (In shaded area)

Disclaimer

INTEL DISCLAIMS ALL LIABILITY FOR THESE DEVICES, INCLUDING LIABILITY FOR INFRINGEMENT OF ANY PROPRIETARY RIGHTS RELATING TO THESE DEVICES OR THE IMPLEMENTATION OF INFORMATION IN THIS DOCUMENT. INTEL DOES NOT WARRANT OR REPRESENT THAT SUCH DEVICES OR IMPLEMENTATION WILL NOT INFRINGE SUCH RIGHTS. INTEL IS NOT OBLIGATED TO PROVIDE ANY SUPPORT, INSTALLATION, OR OTHER ASSISTANCE WITH REGARD TO THESE DEVICES.

THE INTEL PRODUCT REFERRED TO IN THIS DOCUMENT IS INTENDED FOR STANDARD COMMERCIAL USE ONLY. CUSTOMERS ARE SOLELY RESPONSIBLE FOR ASSESSING THE SUITABILITY OF THE PRODUCT AND/OR DEVICES FOR USE IN PARTICULAR APPLICATIONS. THE REFERENCED INTEL PRODUCT IS NOT INTENDED FOR USE IN CRITICAL CONTROL OR SAFETY SYSTEMS OR IN NUCLEAR FACILITY APPLICATIONS.

Information in this document is provided in connection with Intel products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by the sale of Intel products. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life sustaining applications. Intel retains the right to make changes to its test specifications and memory list at any time, without notice.

The hardware vendor remains solely responsible for the design, sale and functionality of its product, including any liability arising from product infringement or product warranty. Only approved software drivers and accessories that are recommended for the revision number of the boards and system being operated should be used with Intel products. Please note that, as a result of warranty repairs or replacements, alternate software and firmware versions may be required for proper operation of the equipment.

The Intel® Server System SR9000MK4U 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.

* Other brands and names are the property of their respective owners.

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 and similar speeds in each Rank on the memory module 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 System SR9000MK4U. 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 List. 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).

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.

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. The DIMMs are tested under environmental conditions which may include margining of temperature, voltage, and/or frequency across min and max memory configurations.

1.3 Computer Memory Test Lab

Computer Memory Test Lab (CMTL) is a leading memory test organization responsible for testing a broad range of memory products. A memory product that receives a PASS after being tested by CMTL functions correctly and consumers can use the product to perform the intended server functions. 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 functional testing levels.

CMTL Contact Info:
Main Office: (949) 716-8690
Main Fax: (949) 716-8691

Computer Memory Test Lab (CMTL)
24 Hammond Suite F
Irvine, CA 92618
http://www.cmtlabs.com/

2. Memory Subsystem

The Intel® Server System SR9000MK4U is capable of supporting DDR2-533 and DDR2-667 memory technologies.

Industry naming conventions for equivalent memory technologies include:

- DDR2 - 533 = PC2-4200
- DDR2 - 667 = PC2-5300

The following maximum memory capacities are supported based on the number of DIMM slots and maximum supported memory loads by the chipset:

- 256 GB maximum capacity for DDR2-533 / DDR2-667 system memory (8GB DIMMs x 32 DIMM slots)

The minimum memory supported with the system running in single channel memory mode is:

- 4 GB minimum capacity for DDR2-533 / DDR2-667 system memory (512MB DIMMs x 4 DIMM slots per memory box- 2 memory boxes per system standard shipping configuration)

Supported DIMM capacities are as follows:

- DDR2-533 and DDR2-667 Memory DIMM sizes include: 512 MB, 1 GB, 2 GB, and 4 GB, 8 GB. For initial publication, no 8 GB DIMMs are available to test. 8 GB will be tested when available.

2.1 Memory Population

The Intel® Server System SR9000MK4U supports up to 32 DIMM sockets, or four memory boxes. DIMMs should be identical (same manufacturer, CAS latency, number of rows, columns and devices, timing parameters etc.). Memory sizing and configuration is guaranteed only for qualified DIMMs approved by Intel.

See the *Intel® Server System SR9000MK4U Technical Product Specification* for memory population information.

The following table lists the current supported memory types:

Table 1. DDR2-533 CL4 and DDR2-667 CL5 Memory Matrix

Capacity / Module	Capacity / 1 Rank	Rank	Bank Qty	Row Addr	Column Addr	Chip Type		Frequency
512 MB	512 MB	1	4	14-bit	11-bit	256 Mb	x4 type	533 Mbps is supported. 667 Mbps is supported.
1 GB	512 MB	2	4	14-bit	11-bit	256 Mb	x4 type	
1 GB	1 GB	1	4	14-bit	12-bit	512 Mb	x4 type	
2 GB	1 GB	2	4	14-bit	12-bit	512 Mb	x4 type	
2 GB	2 GB	1	8	14-bit	12-bit	1 Gb	x4 type	
4 GB	2 GB	2	8	14-bit	12-bit	1 Gb	x4 type	
4 GB	4 GB	1	8	15-bit	12-bit	2 Gb	x4 type	
8 GB	4 GB	2	8	15-bit	12-bit	2 Gb	x4 type	

3. Tested Memory

The following tables list DIMM devices tested to be compatible with the Intel® Server System SR9000MK4U running at 533MTS. DDR2-667 memory listed in this section have been tested at 533MTS. The list of tested memory is periodically updated.

These lists are subject to change without notice.

In the tables:

- M: module date code
- D: device date code
- (+) This vendor is part of the CMTL Certification program. This means this part has been or will be tested across all compatible Intel Server Boards. For further information contact the CMTL at http://cmtlabs.com/

Notes and Cautions:

- Some modules in these lists may contain stacked DRAM parts. These parts may have thermal and physical limitations in some chassis configurations. Verify that your chassis configuration supports stacked parts before purchase.
- Verify that the DRAM part number matches the DRAM on these lists.
- Third party memory vendors may use the same module part number with different DRAM vendors and die revisions. To ensure proper system operation, verify that each DRAM vendor and die revision has been tested and qualified. Notify CMTL of discrepancies.
- 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 System SR9000MK4U may result in unpredictable operation and possible data loss.
- These lists are not all-inclusive. They are provided as a convenience to Intel's customer base, but Intel does not make any representations or warranties regarding the quality, reliability, functionality, or compatibility of these memory modules.

Intel® Server System SR9000MK4U

Registered ECC, DDR2-533 DIMM Modules

512 MB Sizes (64Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Micron	MT18HTF6472Y-53E	MT47H64M4	Micron		M:0608	(64Mx4) x 18	1	

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

Intel® Server System SR9000MK4U

Registered ECC, DDR2-533 DIMM Modules
1 GB Sizes (128Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Samsung	M393T2950CZ3-CD5	K4T51043QC	Samsung		M: 0617	(128Mx4) x 18	1	
Micron	MT18HTF12872Y-53E	MT47H128M4	Micron		M: 0639	(128Mx4) x 18	1	
Elpida	EBE10RD4AGFA-5C-E	EDE5104AGSE-5C-E	Elpida		M: 0612 M: 0614	(128Mx4) x 18	1	
(+) Dataram	DTM63329A	HY5PS12421CFP-Y5 rev C	Hynix	40081A rev A		(128Mx4) x 18	1	4/14/07

Registered ECC, DDR2-667& DIMM Modules
1 GB Sizes (128Mx72)

(&Note: these parts were tested at DDR2-533 speed; currently these parts are only supported at DDR2-533 speeds.)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Micron	MT18HTF12872Y-667	MT47H128M4	Micron		M: 0627 M:0648	(128Mx4) x 18	1	
Elpida	EBE10RD4AGFA-6E-E	EDE5104AGSE-6E-E	Elpida		M: 0535 M: 0540 M: 0635	(128Mx4) x 18	1	
Kingston	KVR667D2S4P5/1GI	E5104AHSE-6E-E rev H	Elpida	2025308-001.A00 na		(128Mx4) x 18	1	7/5/07
Samsung	M393T2950EZA-CE6		Samsung			(128Mx4) x 18	1	5/31/07

Registered ECC, DDR2-667 DIMM Modules
1 GB Sizes (128Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Samsung	M393T2950GZA-CE6	K4T51043QG-HCE6 rev G	Samsung	M393T2950CZ0 rev 10		(128Mx4) x 18	1	4/18/08
Kingston	KVR667D2S4P5/1GI	HYB18T512400B2F25F rev B2	Qimonda	2025308-001.A00		128M x 4	1	06/11/08

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

Intel® Server System SR9000MK4U

Registered ECC, DDR2-533 DIMM Modules
2 GB Sizes (256Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Samsung	M393T5750CZ3-CD5	K4T51043QC	Samsung		M: 0622	(128Mx4) x 36	2	
Elpida	EBE21RD4AGFA-5C-E	EDE5104AGSE-5C-E	Elpida		M: 0611	(128Mx4) x 36	2	
Micron	MT36HTF25672Y-53E	MT47H128M4	Micron		M: 0638	(128Mx4) x 36	2	
(+) Dataram	DTM63330D	HY5PS12421CFP-Y5 rev C	Hynix	40040A rev A		(128Mx4) x 36	2	4/10/07

Registered ECC, DDR2-667& DIMM Modules
2 GB Sizes (256Mx72)

(&Note: these parts were tested at DDR2-533 speed; currently these parts are only supported at DDR2-533 speeds.)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Hynix	HYMP525P72BP4-Y5				M: 0628	(128Mx4) x 36	2	
Micron	MT36HTF25672Y-667	MT47H128M4	Micron		M: 0627	(128Mx4) x 36	2	
Elpida	EBE21RD4AGFB-6E-E	EDE5104AGSE-6E-E	Elpida		M: 0634	(128Mx4) x 36	2	
Kingston	KVR667D2D4P5/2GI	E5104AHSE-6E-E rev H	Elpida	2025292-001.C00 na		(128Mx4) x 36	2	7/11/07
Samsung	M393T5750EZA-CE6		Samsung			(128Mx4) x 36	2	5/31/07
Apacer	75.A72A6.G01	K4T51043QE-ZCE6 rev E	Samsung	48.1A189.012 rev 2		(128Mx4) x 36	2	7/31/07
Smart Modular Technologies	SG2567RDR212452IB	HYB18T512400BF3S rev B	Qimonda	PG52G240NESUB3RJ rev A		(128Mx4) x 36	2	8/29/07

Registered ECC, DDR2-667 DIMM Modules
2 GB Sizes (256Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Samsung	M393T5750GZA-CE6	K4T51043QG-HCE6 rev G	Samsung	M393T5750EZ0 rev 1		128M x 4	2	05/02/08
Kingston	KVR667D2D4P5/2GI	HYB18T512400B2F25F rev B2	Qimonda	2025292-001.C00		128M x 4	2	06/12/08

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

Intel® Server System SR9000MK4U

Registered ECC, DDR2-667& DIMM Modules

4 GB Sizes (512Mx72)

(&Note: these parts were tested at DDR2-533 speed; currently these parts are only supported at DDR2-533 speeds.)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Hynix	HYMP351P72AMP4-Y5				M: 0632	(512Mx4) x18		
Elpida	EBE41RE4ABHA-6E-E	EDE1104ABSE-6E-E	Elpida		M: 0632	(256Mx4) x 36	2	
Samsung	M393T5160CZA-CE6		Samsung			(256Mx4) x 36	2	5/31/07
Smart Modular Technologies	SG5127RDR225652-SA	K4T2G264QA-ZCE6 rev A	Samsung	M393T1G68MZ0 na		(256Mx4) x 36	2	8/10/07

Registered ECC, DDR2-667 DIMM Modules

4 GB Sizes (512Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date Code	DRAM Organization	Rank	Date
Samsung	M393T5160QZA-CE6	K4T1G044QQ-HCE6 rev Q	Samsung	M393T5750EZ0-V01 rev 1		(256Mx4) x 36	2	4/16/08

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

4. 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/	Phone: 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/	Phone: (800) 967-0959 memory@buffalotech.com
Centon Electronics	http://www.centon.com	Phone: 949-855-9111 Fax: 949-855-6035
Corsair	http://www.corsairmicro.com/	Phone: 510-657-8747 Fax: 510-657-8748
Dane-Elec	http://www.dane-memory.com/	Michal Hassan Phone: (949)450-2941 Michal@Dane-memory.com
Dataram	http://www.dataram.com/	Paul Henke Phone: 800-328-2726 x2239 or 609-799-0071 phenke@dataram.com
GoldenRAM	http://www.goldenram.com	Jason M. Barrette Phone: 800-222-861 x7546 jasonb@goldenram.com or Michael E. Meyer Phone: 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 Phone:82-32-817-9740 s.jeon@jitco.net
Kingston	http://www.kingston.com	USA (877) 435-8726 Asia 886-3-564-1539 Europe +44-1932-755205
Legacy Electronics Inc.	http://www.legacyelectronics.com	USA: Gary Ridenour, 949-498-9600, Ext 350 Europe: 49 89 370 664 11
Legend	http://www.legend.com.au	
Micron	http://silicon.micron.com/mktg/'http://silicon.micron.com/mktg/mbqual/qual_data.cfm	
MSC Vertriebs GmbH	http://www.msc-ge.com	William Perrigo Phone: 49-7249-910-417

Vendor Name	Web URL	Vendor Direct Sales Info
		Fax: 49-7249-910-229 wpe@msc-ge.com
Nanya Technology	http://www.ntc.com.tw	Winson Shao Phone: 886-3-328-1688, Ext 6018 winsonshao@ntc.com.tw
Netlist, Inc	http://www.netlistinc.com	Christopher Lopes Phone: 949.435.0025 Fax: 949.435.0031 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 Phone: (949) 260-8230 Rdarwish@Simpletech.com
SMART Modular Technologies	http://www.smartm.com/channel	Gene Patino Phone: (949) 439-6167 Gene.Patino@Smartm.com
Super Talent Electronics	http://www.supertalentmemory.com	David Crume Phone: (408) 957-8181 support@supertalentmemory.com
Swissbit	http://www.swissbit.com	Tony Cerreta Phone: 914-935-1400 x240 Fax: 914-935-9865 tony.cerreta@swissbitna.com
TechnoLinc Corporation	http://www.technolinc.com	David Curtis Phone: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 +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 Phone: (949) 460-0020 ext. 146 tod.skelton@virtium.com
Wintec Industries	http://www.wintecindustries.com	Phone: 510-360-6300 Fax: 510-770-9338

5. Computer Memory Test Labs (CMTL)

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 System. 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 System. 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 System, 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.

Product and corporate names listed in this document may be trademarks of their respective companies.