SSH4, SPSH4 & SRSH4 Server Platform Memory List Test Report Summary

For A60893-401 And Earlier Memory Boards

intel.

Revision History		
Date	**Rev**	**Modifications**
June/02	0.5	Initial post-launch release for review.
July/02	1.0	Added Micron 512MB part. Added Samsung 1G part. Added Hynix 128MB part. (In shaded area)
July/02	2.0	Added Samsung 256MB and 512MB parts. Correction made to Hynix 128MB part. (In shaded area)
Aug/02	3.0	Added Netlist 1G part. Added Micron 512MB part. (In shaded area)
Aug/02	4.0	Added Avant 512MB parts. Added Aved 256MB & 512MB parts. Added Dataram 512MB & 1GB parts. (In shaded area)
Sept/02	5.0	Added ATP512MB parts. Added Buffalo 256MB parts. Added Dane-Elec 512MB parts. Infineon 512MB part. (In shaded area)
Sept/02	6.0	Added ATP 128MB & 256MB parts. Added MSC 512MB parts. Added Micron 256MB part. (In shaded area)
Oct/02	7.0	Added ATP 512MB & 1GB parts. Added Avant & Buffalo 512MB parts. Added Samsung 128MB & 512MB parts. Added Infineon 256MB parts. (In shaded area)
Oct/02	8.0	Added Dataram 1Gb parts. Added Apacer & Netlist 512MB parts. Added Samsung 128MB & 512MB parts. (In shaded area)
Oct/02	9.0	Added Avant, Dane-Elec, Dataram & MSC 512MB parts. (In shaded area)
Nov/02	10.0	Added ATP 256MB & 512MB parts. ADDED Dataram 1GB parts. Added Legend 512MB & 1GB parts. (In shaded area)
Dec/02	11.0	Added ITAUCOM 256MB & 512MB parts. Added MSC 512MB parts. Added Ventura 512MB parts. (In shaded area)
Jan./03	12.0	Added MSC 256MB & 512MB parts. Added Viking & Netlist 512MB parts. Added Samsung 128MB part. Added Hynix 256MB part. Added Apacer 256MB, 512MB & 1G parts. Added Infineon & Samsung 2G parts. (In shaded area)

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 bank on the memory module. Mixing of dissimilar memory manufacturer and similar speeds in each bank on the memory module is NOT recommended

Table of Contents

Overview of Memory Testing

The following procedure is used to test memory modules for use in the Intel® SPSH4 and SRSH4 Server Platforms which utilizes the SSH4 server board set. Memory is a vital subsystem in a platform. Intel Corporation requires strict guidelines to be met before a memory vendor and part is put onto the qualified memory list. Each Intel Server Board product has a separate qualified memory list.

Memory qualification for Intel's Server Board products is performed by Intel's Memory Validation Laboratory (MVL), and by an independent external test laboratory, Computer Memory Test Lab (CMTL)[1]. CMTL is a leading memory testing organization responsible for testing a broad range of memory products. Memory devices tested by Intel's MVL or CMTL must undergo rigorous tests to ensure that the product will perform the intended server functions.

Intel®'s Server and Workstation Board qualified memory lists categorize memory modules as Advanced Tested. The Advanced Testing process involves a paper qualification, a standard voltage and room temperature functional test, and a voltage and temperature margin functional test. A paper qualification is a review of critical timings, electrical characteristics, timing requirements, environmental requirements, and packaging requirements in order to see if the memory meets Intel's memory specifications. The standard voltage and room temperature test involves testing the memory module on the particular Intel® board for which it is being qualified with test software operating under Microsoft* Windows*2000 Advanced Server for no less than 24 hours. The voltage and temperature margin testing involves testing the memory module on the particular Intel board for which it is being qualified with various test software and operating systems for 48-72 hours under various voltage and temperature margin conditions. Memory modules that have completed Advanced Testing are known to be compatible with the product on which they were tested, and with the test software and operating system that was utilized during the test procedure.

For information regarding the testing procedure required to reach each phase, please contact your Intel Representative.

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[1] CMTL is a leading memory testing organization responsible for testing a broad range of memory products. Receiving a "PASS" after being tested by CMTL, means that a product functions correctly and consumers can use it 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 equipment and a procedure as defined by Intel's various functional testing levels. CMTL contact:

> John Deters   Computer Memory Test Lab (CMTL)
> 714-960-1243 (voice)   101 Main Street, Suite 2G
> 714-960-4695 (fax)   Huntington Beach, CA 92648
>   http://www.cmtlabs.com/

Qualified Memory for the Intel® Server Board SSH4

The SPSH4 and SRSH4 Server Platforms utilize the SSH4 server board set. The memory module on the server board SSH4 has 12 DIMM sockets, which can hold up to 24 GB of Registered ECC DDR200 or DDR266 memory using twelve 72-bit DIMM modules. The following memory features are supported:

- DDR200(PC1600) and DDR266(PC2100) registered ECC compatible 2.5V modules (in compliance with the DDR JEDEC DIMM Specification)
- DIMMs with capacity of 128MB, 256 MB, 512 MB, 1G and 2G. Other DRAM sizes may function correctly but will not be validated.
- Minimum configuration is 512 using four 128MB DIMMs.

Below is a chart that lists the current supported memory types: Note:

DDR200 and DDR266 Registered DRAM Module Configurations for Cas Latency 2 & 2.5					
DIMM Capacity	DIMM Organization	DRAM Density	DRAM Organization	# DRAM Devices/rows/Banks	# Address bits rows/Banks/column
128MB	16M x 72	128Mbit	16M x 8	9/1/4	12/2/10
256MB	32M x 72	128Mbit	32M x 4	18/1/4	12/2/11
256MB	32M x 72	128Mbit	16M x 8	18/2/4	12/2/10
256MB	32M x 72	256Mbit	32M x 8	9/1/4	13/2/10
512MB	64M x 72	256Mbit	64M x 4	18/1/4	13/2/11
512MB	64M x 72	256Mbit	32M x 8	18/2/4	13/2/10
512MB	64M x 72	512Mbit	64M x 8	9/1/4	13/2/11
1GB	128M x 72	256Mbit	64M x 4	36/2/4	13/2/11
1GB	128M x 72	512Mbit	64M x 8	18/2/4	13/2/11
1GB	128M x 72	512Mbit	128M x 4	18/1/4	13/2/12
2GB	256M x 72	512Mbit	128M x 4	36/2/4	13/2/12

Memory features are detailed in *the SSH4, SPSH4 & SRSH4 Server Platform Technical Product Specification* available on-line at:
http://support.intel.com/support/motherboards/server/SRSH4/SPSH4/SRSH4

The following table lists DIMM devices known to be compatible with the Intel Server Board SSH4. Intel recommends that Advanced Tested DIMMs be used to establish reliable system operation. DIMM devices not listed can be used; but, in the event of unreliable system operation, the DIMM devices should be replaced with functionally Advanced Tested DIMMs to determine whether the DIMM devices are causing the problem.

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.

Note: This list is not intended 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.

This list is subject to change without notice.

Server Board SSH4

Registered, ECC, DDR200 DIMM Modules
128MB Sizes (16Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Micron	MT9VDDT1672G-202Z1	MT46V16M8-75A	Micron		6/3/02		2	
Infineon	HYS72D16000GR-8-A	HYB25D128800AT-8	Infineon		6/10/02		2	
Samsung	M312L1713DT0-CA0	K4H280838D-TCA0	Samsung		10/31/02		2	Yes

Registered, ECC, DDR266 DIMM Modules
128MB Sizes (16Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Hynix	~HYMD116G725B8M-H	HYMD116G725B8M-H	Hynix		7/7/02		2.5	
+ATP Electronics	AB16L72A8SEB0S	K4H280838D-TCB0 rev D	Samsung	SB184A08L rev 1	9/9/02	J183	2.5	
Samsung	M383L1713DTS-CA2	K4H280838D-TCA2	Samsung		10/01/02		2	
Samsung	M312L1713DT0-CA2	K4H280838D-TCA2	Samsung		10/09/02		2	Yes

Modules shaded in blue are low profile

~ Correction or changed

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

Caution: Some modules on this list may contain "stacked" DRAM parts. These parts may have thermal & physical limitations in some chassis configurations. It is advised to verify that your chassis configuration will support "stacked" parts before purchase. The server board SSH4 does support stacked DIMM parts when used in the SPSH4 and SRSH4 Server platform.

Server Board SSH4

Registered, ECC, DDR200 DIMM Modules
256MB Sizes (32Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Samsung	M383L3310CT1-CA0	K4H2804380-TCA0	Samsung		6/24/02		2	
Infineon	HYS72D32501GR-8-A	HYB25D128400AT-8	Infineon		9/30/02		2	
Hynix	HYMD132G7258-L	HY5DU28822T-L	Hyundai		10/31/02		2	

Registered, ECC, DDR266 DIMM Modules
256MB Sizes (32Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Samsung	M383L3310DTS-CA2	K4H280438D-TCA2	Samsung		6/14/02		2	
Samsung	M312L3310DT0-CA2	K4H280438D-TCA2	Samsung		7/23/02		2	Yes
+Aved Memory Products	AMP383D3313DT1-CA2/S	K4H280838D-TCA2 rev D	Samsung	105601 rev A	8/19/02	000636	2	
+Buffalo	DD266-R256/SD	K4H280838D-TCB0 rev D	Samsung	RCE0501-AB	8/21/02	000851	2.5	
+ATP Electronics	AB32L72R4S4B0S	K4H280438C-TCB0 rev C	Samsung	SB184R04L1	9/3/02	J309	2.5	Yes
+ATP Electronics	AB32L72A8S4B0	NT5DS16M8AT-7K rev D	Nanya	SB184A08L rev.1	9/9/02	J179	2.5	
+ATP Electronics	AB32L72A8S4B0S	K4H280838D-TCB0 rev D	Samsung	SB184A08L rev1	9/12/02	J186	2.5	
Micron	MT9VDDT3272G-265B1	MT46V32M8-75 B	Micron		9/13/02		2.5	
+ATP Electronics	AB32L72Q8SQB0S	K4H560838D-TCB0 rev D	Samsung	SB184Q08L1	11/8/02	001050		Yes
ITAUCOM	256E2665R28	ICM4L560807-65	Micron	0162 B	11/25/02	001689	2.5	
+MSC Vertriebs GmbH	MSC 256M00093	HYB25D256800BT-7 rev B	Infineon	PCB M0481LA2	12/9/02	001137	2	
+MSC Vertriebs GmbH	MSC 256M00097	MT46V32M8TG-75 revB	Micron	PCB M0481LA2	12/9/02	001173	2.5	
Apacer	Apacer 77.10162.460	K4H560838D-TCB0	Samsung		12/23/02		2.5	

Modules shaded in blue are low profile

~ Correction or changed

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

Caution: Some modules on this list may contain "stacked" DRAM parts. These parts may have thermal & physical limitations in some chassis configurations. It is advised to verify that your chassis configuration will support "stacked" parts before purchase. The server board SSH4 does support stacked DIMM parts when used in the SPSH4 and SRSH4 Server platform.

Server Board SSH4

Registered, ECC, DDR200 DIMM Modules
512 MB Sizes (64Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Samsung	M383L6420DTS-CA0	K4H560438D-TCA0	Samsung		6/3/02		2	
Samsung	M312L6420DT0-CA0	K4H560438D-TCA0	Samsung		10/16/02		2	Yes

Registered, ECC, DDR266 DIMM Modules
512 MB Sizes (64Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Micron	MT19VDDT6472G-256B2	MT46V64M4-75B	Micron		7/1/02		2.5	Yes
Samsung	M383L6420DTS-CA2	K4H560438D-TCA2	Samsung		7/23/02		2	
Micron	MT18VDDT6472G-265B1	MT46V64M4-75B	Micron		7/30/02		2.5	
+Avant Technology	AVM7264R38C5266K0-A	K4H560438C-TCB0 rev C	Samsung	50-1415-01 rev B	8/19/02	000268	2.5	Yes
+Aved Memory Products	AMP383D6420CT3-CB0/S	K4H560438C-TCB0 rev C	Samsung	105611 rev A	8/9/02	000624	2.5	Yes
+Dataram	DTM63641B	MT46V64M4TG-75 rev B	Micron	40581A	8/12/02	J366	2.5	Yes
+Dataram	DTM63641A	HYB25D256400AT-7 rev A	Infineon	40581AA	8/7/02	J370	2.5	Yes
+ATP Electronics	AB64L72A8S8B0	NT5DS32M8AT rev D	Nanya	SB184A08L rev1	8/29/02	J178	2.5	
+ATP Electronics	AB64L72R4S8B0S	K4H560438D-TCB0 rev D	Samsung	SB184R04L1	8/26/02	J313	2.5	Yes
+Dane-Elec	D1D266R072642I	NT5DS32M8AT-7K rev A	Nanya	DR513872 rev A	8/21/02	000782	2	
Infineon	HYS72D64500GR-7-A	HYB25D256400AT-7	Infineon		8/27/02		2	Yes
+Legend	L6472TC5-RR2HDC5A	HY5DU56822AT-H rev A	Hyundai	DRR720818A rev 2	9/12/02	001001	2.5	
+ATP Electronics	AB64L72A8S8B0S	K4H560838D-TCB0 rev D	Samsung	SB184A08L rev1	9/20/02	J190	2.5	
+Avant Technology	AVM7264R39C2266K1-A	NT5DS32M8AT-7K rev A	Nanya	50-1411-01-A rev A	9/25/02	000960	2	Yes
+Buffalo	DD266-R512/MB	46V32M8-75 rev B	Micron	RCE0501-AB	9/25/02	000861	2.5	
Samsung	M312L6420DT0-CA2	K4H560438D-TCA2	Samsung		9/25/02		2	Yes
Apacer	Apacer-75.96280.791	HYB25D256400BT-7	Infineon		10/7/02		2	Yes
Netlist	M312L1713DT0-CA2	K4H280838D-TCA2	Samsung		10/9/02		2.5	Yes

Continued

Registered, ECC, DDR266 DIMM Modules 512 MB Sizes (64Mx72)								
+Avant Technology	AVM7264R39C5266K1-A	K4H560838C-TCB0 rev C	Samsung	50-1411-01-A rev A	10/14/02	001564	2.5	Yes
+Dane-Elec	D1D266R072642H	HYB25D256400AT-7 rev A	Infineon	DE042036 rev B	10/21/02	000809	2	Yes
+Dataram	DTM63641E	HYB25D256400BT-7 rev B	Infineon	40581A rev A	10/16/02	001437	2.5	Yes
+MSC Vertriebs GmbH	MSC512M00154	MSCD8608A8A-75B	MSC Vertriebs GmbH	M0481LA2	10/23/02	001534	2.5	
+ATP Electronics	AB64L72Q8S8B0S	K4H560838D-TCB0 rev D	Samsung	SB184Q08 L1 rev 1	11/13/02	001057	2.5	Yes
+Legend	L6472YC5-PPASDC5D	K4H560438D-TCB0 rev D	Samsung	18-25141A rev A	10/31/02	000997	2.5	Yes
ITAUCOM	512E2665R24	ICM4L560407-65	Micron	0163 A	11/19/02	001695	2.5	
+MSC Vertriebs GmbH	MSC 512M00098	MT46V32M8TG-75 rev B	Micron	PCB M0481LA2	11/21/02	001209	2.5	
Ventura Technology Group	D52WVK25SV	K4H560838D-TCB0 rev D	Samsung	V208	12/2/02	001812	2.5	
+MSC Vertriebs GmbH	MSC 512M00094	HYB25D256800BT-7 rev B	Infineon	PCB M0481LA2	12/16/02	001101	2	
+Viking	VI4CR647224DTHL1	K4H560438D-TCB0 rev D	Samsung	03-0291 rev A	12/5/02	001989	2.5	Yes
Apacer	Apacer 75.96280.791	HYB25D256400BT-7	Infineon		10/07/02		2	Yes
Netlist	NL9647RD64042-D21J	K4H560438D-TCB0	Samsung		10/16/02		2.5	Yes

Modules shaded in blue are low profile

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Caution: *Some modules on this list may contain "stacked" DRAM parts. These parts may have thermal & physical limitations in some chassis configurations. It is advised to verify that your chassis configuration will support "stacked" parts before purchase. The server board SSH4 does support stacked DIMM parts when used in the SPSH4 and SRSH4 Server platform.*

Server Board SSH4

Registered, ECC, DDR200 DIMM Modules
1G Sizes (128Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Samsung	M312L2828DT0-CA0	K4H560438D-TCA0	Samsung		6/24/02		2	Yes

Registered, ECC, DDR266 DIMM Modules
1G Sizes (128Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
Samsung	M312L2828DT0-CA2	K4H560438D-TCA2	Samsung		7/7/02		2	Yes
Netlist	NL9127RD64052-D21J	K4H560438D-TCB0	Netlist		7/30/02		2.5	Yes
+Dataram	DTM63621C	HYB25D256400AT-7 rev A	Infineon	40556 rev B	8/14/02	J281	2.5	Yes
+Dataram	DTM63621D	MT46V64M4TG-75 rev B	Micron	40556 rev B	8/14/02	J282	2.5	Yes
+ATP Electronics	AB28L72P4SMB0S	K4H560438D-TCB0 rev D	Samsung	SB184P04L1	9/17/02	J305	2.5	Yes
+Avant Technology	AVM7264R39C5266K1-A	K4H560838C-TCB0 rev C	Samsung	50-1411-01-A rev A	10/14/02	001564	2.5	Yes
+Dataram	DTM60193E	MT48LC64M4A2FB-75 rev C	Micron	40554A rev A	10/29/02	001713	3	Yes
+Dataram	DTM63621F	HYB25D256400BT-7 rev B	Infineon	40556 rev B	11/4/02	001430	2	Yes
+Legend	L1272YC5-PPBSDD5D	K4H560438D-TCB0 rev D	Samsung	18-21040B rev B	10/29/02	001545	2.5	Yes
Apacer	Apacer 75.06280.792	HYB25D256400BT-7	Infineon		11/13/02		2	Yes

Modules shaded in blue are low profile

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Caution: Some modules on this list may contain "stacked" DRAM parts. These parts may have thermal & physical limitations in some chassis configurations. It is advised to verify that your chassis configuration will support "stacked" parts before purchase. The server board SSH4 does support stacked DIMM parts when used in the SPSH4 and SRSH4 Server platform.

Server Board SSH4

Registered, ECC, DDR200 DIMM Modules
2G Sizes (256Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	Low Profile
*Samsung	M383L5628MT1-CA0	K4H1G0638M-TCA0	Samsung		12/30/02		2	

Modules shaded in blue are low profile

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

Caution: Some modules on this list may contain "stacked" DRAM parts. These parts may have thermal & physical limitations in some chassis configurations. It is advised to verify that your chassis configuration will support "stacked" parts before purchase. The server board SSH4 does support stacked DIMM parts when used in the SPSH4 and SRSH4 Server platform.

Sales Information

Vendor Name	Web URL	Vendor Direct Sales Info
ATP Electronics, Inc	http://www.atpusa.com	Florence Hsieh Tel 408-732-5831 Fax 408-732-5055 sales@atpusa.com
ATP Electronics, Inc Taiwan	http://www.atpusa.com	Patty Kuo 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	http://www.buffalotech.com/	(800) 456-9799 memory@buffalotech.com
Centon Electronics	http://www.centon.com	Tel: 949-855-9111 Fax: 949-855-6035
Dane-Elec	http://www.dane-memory.com/	Michal Hassan @ (949)450-2941 or email @ Michal@Dane-memory.com
Dataram	http://www.dataram.com/	
ITUACOM	http://www.ituacom.com.br/	
Legend	http://www.legend.com.au	
MSC Vertriebs GmbH	http://www.msc-ge.com	William Perrigo 49-7249-910-417 Fax: 49-7249-910-229 wpe@msc-ge.com
Netlist, Inc	http://www.netlistinc.com	Christopher Lopes 949.435.0025 tel 949.435.0031 fax sales@netlistinc.com
SMART Modular Technologies	http://www.smartm.com	Leo Alafriz 888-753-0116 ext. 125 leo.alafriz@smartm.com
Viking	http://www.vikingcomponents.com	800-338-2361 orderdesk@vikingcomponents.com

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 Validation Lab. Intel routinely audits the CMTL facility to ensure all procedures, process handling, and testing methodologies are met.

Intel® Product Dealers and Product Integrators

The Intel Product Dealer program was designed in North America to support system integrators building and selling a limited number of systems per year. More information on this program is available through the Intel web site at http://channel.intel.com. Similar programs exist in European, Middle Eastern, African, Asia-Pacific and South American regions.