

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

For A60893-402 and Later Memory Boards



*Revision 50.0
September 2005*

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)
Jan./03	13.0	Added Infineon 256MB, 512MB & 1G parts Added Micron 256MB part. (In shaded area)
Feb/03	14.0	Added Avant 512MB part. (In shaded area)
Mar/03	15.0	Added Dataram, MSC & Micron 1GB parts. Added Samsung 512MB & 1G parts. Added Infineon 512MB & 1G parts. (In shaded area)
Mar/03	16.0	Added Dataram 512MB parts. Added Dataram & ATP 1GB parts.
April/03	17.0	Added Apacer 256MB & 512MB parts. Added Centon 1GB parts. (In shaded area)
May/03	18.0	Added Infineon 128MB & 1GB parts. Added Samsung 256MB parts. Added Micron & Viking 512MB parts. (In shaded area)
June/03	19.0	Added Viking 256MB & 512MB parts. (In shaded area)
June/03	20.0	Added buffalo 256MB and 512MB parts. (In shaded area). . Added Samsung 128MB, 256MB & 512MB parts. Added Infineon & Micron 256MB parts. (In shaded area) Updated EOL status.
July/03	21.0	Added Viking 512MB parts. Added Samsung 1G parts. (In shaded area)
July/03	22.0	Added TRS 256MB and 512MB parts. (In shaded area)
Aug/03	23.0	Added Itaucom 256MB, 512MB, & 1GB parts. Added Buffalo 1GB parts. Added Kingston 512MB part. (In shaded area). Updated EOL status
Sept/03	24.0	Added Centon & Samsung 1GB parts. Added Kingston 128MB part. (In shaded area)
Nov/03	25.0	Correction made for Infineon 512MB part, was listed as a 256MB part. (In shaded area)
Nov/03	26.0	Added Legend 256MB, 512MB, and 1GB parts. Added Viking 1GB parts. (In shaded area)
Nov/03	27.0	Added Smart 1GB parts. (In shaded area)
Dec/03	28.0	Added Smart 1GB parts. (In shaded area)
Jan/04	29.0	Added Legacy 512MB parts. Added Legacy, Legend and TRS 1GB parts. (In shaded area)
Feb/04	30.0	Added Smart 1GB parts. (In shaded area). Also Updated EOL status.
Mar/04	31.0	Added Smart and Micron 2GB parts. (In shaded area)
Mar/04	32.0	Added Dane-Elec 256MB parts. Added TRS 1GB parts. Added Samsung 1G & 2G parts. (In shaded area) Also Updated EOL status
Apr/04	33.0	Added Dataram 1GB parts. (In shaded area)
Jun/04	34.0	Added ATP 1GB parts. (In shaded area)
Aug/04	35.0	Added Smart 1GB parts. (In shaded area)
Sept/04	36.0	Added support for DDR333 modules. Added TRS 512MB parts. Added Dataram 1GB parts. (In shaded area)
Sep/04	37.0	Added Buffalo and Viking 1GB parts. (In shaded area)

Revision History		
Date	Rev	Modifications
Oct/04	38.0	Added Smart 1GB parts. Added Legend 2GB parts. (In shaded area)
Oct/04	39.0	Added Infineon 1GB parts. (In shaded area)
Oct/04	40.0	Added Avant 1GB parts. (In shaded area)
Dec/04	41.0	Added Buffalo 512MB parts. Added TRS 1GB parts. (In shaded area)
Feb/05	42.0	Added Samsung 512MB part. (In shaded area)
Mar/05	43.0	Added note on Lead free modules (these modules are now in bold text). Added Buffalo 512MB parts. (In shaded area)
Apr/05	44.0	Added Legend 256MB parts. Added Smart 1GB parts. (In shaded area)
Apr/05	45.0	Added Kingston 1GB parts. (In shaded area)
May/05	46.0	Updated contact information. Updated Kingston part number from KVR266X72RC25/512 to KVR266S4R25/512i per vendor's request. (In shaded area)
Jun/05	47.0	Added Viking 1GB parts. (In shaded area)
Aug/05	48.0	Added Kingston 512MB and Viking 1GB parts. (In shaded area)
Aug/05	49.0	Added TRS 2GB parts. Added Kingston 512MB parts. (In shaded area)
Sept/05	50.0	Added Infineon 1GB part. (In shaded area)

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The Server Platform SSH4, SPSH4 & SRSH4 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.

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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.

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Overview of Memory Testing

The following procedure is used to test memory modules for use in the Intel® SPSH4 and SRS4 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.

¹ CMTL* is an independent 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 Server Platforms SPSH4 and SRS4 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, DDR266 or DDR333 memory using twelve 72-bit DIMM modules. The following memory features are supported:

- DDR200, DDR266 and DDR333 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
DDR333 Registered DRAM Module Configuration Matrix					
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	512Mbit	128M x 4	18/1/4	13/2/12
1GB	128M x 72	512Mbit	64M x 8	18/2/4	13/2/11
1GB	128M x 72	1Gbit	128M x 4	9/1/4	14/2/11
2GB	256M x 72	1Gbit	128M x 4	18/1/4	14/2/12
2GB	256M x 72	1Gbit	128M x 8	18/2/4	14/2/11

Memory features are detailed in *the Server Platform SSH4, SPSH4 & SRSH4 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	CAS Latency	Low Profile	EOL
Micron	MT9VDDT1672G-202Z1	MT46V16M8-75A	Micron		6/3/02	2		
Infineon	HYS72D16000GR-8-A	HYB25D128800A T-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	CAS Latency	Low Profile	EOL
Hynix	~HYMD116G725B8M-H	HYMD116G725B 8M-H	Hynix		7/7/02	2.5		
+ATP Electronics	AB16L72A8SEB0S	K4H280838D- TCB0 rev D	Samsung	SB184A0 8L rev 1	9/9/02	2.5		EOL
Samsung	M383L1713DTS-CA2	K4H280838D- TCA2	Samsung		10/01/02	2		
Samsung	M312L1713DT0-CA2	K4H280838D- TCA2	Samsung		10/09/02	2	Yes	
Samsung	MT383L1713ETS-CB0	K4H280838E- TCB0	Samsung		2/12/03	2.5		
Infineon	HYS72D16500GR-7-A	HYB25D128800A T-7	Infineon		3/10/03	2	Yes	
Infineon	HYS72D16000GR-7-A	HYB25D128800A T-7A	Infineon		3/10/03	2		
Samsung	M312L1713ETS-CA2	K4H280838E- TCA	Samsung		6/17/02	2	Yes	
Kingston	KVR266X72RC25/128	HY5DU28822BT- H	Hynix		9/8/03		Yes	

Modules shaded in blue are low profile.

Modules in bold text do not contain Lead.

(~) Correction or changed

(+) This vendor is part of the CMTL Certification program. This means this part has/will be 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.

Server Board SSH4

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
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	CAS Latency	Low Profile	EOL
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	2		EOL
+Buffalo	DD266-R256/SD	K4H280838D-TCB0 rev D	Samsung	RCE0501-AB	8/21/02	2.5		
+ATP Electronics	AB32L72R4S4B0S	K4H280438C-TCB0 rev C	Samsung	SB184R04L1	9/3/02	2.5	Yes	EOL
+ATP Electronics	AB32L72A8S4B0	NT5DS16M8AT-7K rev D	Nanya	SB184A08L rev.1	9/9/02	2.5		EOL
+ATP Electronics	AB32L72A8S4B0S	K4H280838D-TCB0 rev D	Samsung	SB184A08L rev1	9/12/02	2.5		EOL
Micron	MT9VDDT3272G-265B1	MT46V32M8-75 B	Micron		9/13/02	2.5		
+ATP Electronics	AB32L72Q8SQB0S	K4H560838D-TCB0 rev D	Samsung	SB184Q08L1	11/8/02		Yes	EOL
ITAUCOM	256E2665R28	ICM4L560807-65	Micron	0162 B	11/25/02	2.5		EOL
+MSC Vertriebs GmbH	MSC 256M00093	HYB25D256800BT-7 rev B	Infineon	PCB M0481LA2	12/9/02	2		EOL
+MSC Vertriebs GmbH	MSC 256M00097	MT46V32M8TG-75 revB	Micron	PCB M0481LA2	12/9/02	2.5		EOL
Apacer	Apacer 77.10162.460	K4H560838D-TCB0	Samsung		12/23/02	2.5		
Micron	MT9VDDT3272G-265B2	MT46V32M8-75 B	Micron		1/9/03	2.5	Yes	
Infineon	HYS72D32500GR-7-B	HYB25D256800BT-7	Infineon		1/22/03	2	Yes	
Samsung	M312L3323DT0-CB0	K4H560838D-TCB0	Samsung		2/6/03	2.5	Yes	
Apacer	AM256LD53R266	HYB25D256800BT-7	Infineon	48.18115.012	4/4/03	2	Yes	EOL

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
Samsung	M383L3310ETS-CB0	K4H280438E-TCB0	Samsung		3/17/03	2.5		
Samsung	M312L3223DT0-CAA	K4H560838D-TCAA	Samsung		3/25/03	2	Yes	
+Buffalo	DD266L-RS256/SD	K4H560838D-TCB0 rev D	Samsung	1D188EF-AA	4/16/03	2.5	Yes	
+Viking	VI4CR327228DTHL2	MT46V32M8TG-75 rev B	Micron	0000905A	4/9/03	2.5	Yes	EOL
+Viking	VI4CR327228DTHL3	MT46V32M8TG-75 rev C	Micron	0000905A	5/16/03	2.5	Yes	
+Buffalo	DD266-R256/SE	K4H280838E-TCB0 rev E	Samsung	RCE0502-AA	6/6/03	2.5		
Infineon	HYS72D32000GR-8-B	HYB25D256800BT-8	Infineon		4/18/03	2		
Micron	MT9VDDT3272G-265C3	MT46V32M8-75 C	Micron		6/2/03	2.5	Yes	
Samsung	M312L3223ETS-CAA	K4H560838E-TCAA	Samsung		6/9/03	2	Yes	
Samsung	M312L3223ETS-CA2	K4H560838E-TCCA2	Samsung		6/13/03	2	Yes	
+TRS* Tele-Radio-Space GmbH	TRS21150	HYB25D256800BT-7 rev B	Infineon	M0529LA1 rev 1	7/14/03	2	Yes	
ITAUCOM	256E2665R28	ICM4L560807-65	Micron	0247 A	7/19/03	2.5	Yes	
+Legend	L3272YC5-RU1HDC5B	HY5DU56822BT-J rev B	Hyundai	DRR1U0818-A rev 1	11/3/03	2.5	Yes	
+Dane-Elec	ODLD266R072325I-1MC	MT46V32M8TG(P)-6T rev C	Micron	DR1G872-A rev A	3/5/04	2.5	Yes	

**Registered, ECC, DDR333 DIMM Modules
256MB Sizes (32Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
+Legend	L3272YC6-RU1HDC5B	HY5DU56822BT-D43 rev B	Hyundai	DRR1U0818-A rev 1	3/22/05	2.5	Yes	

Modules shaded in blue are low profile.

Modules in bold text do not contain Lead.

(~) Correction or changed

(+) This vendor is part of the CMTL Certification program. This means this part has/will be 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.

Server Board SSH4

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
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	CAS Latency	Low Profile	EOL
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	2.5	Yes	EOL
+Aved Memory Products	AMP383D6420CT3-CB0/S	K4H560438C-TCB0 rev C	Samsung	105611 rev A	8/9/02	2.5	Yes	EOL
+Dataram	DTM63641B	MT46V64M4TG-75 rev B	Micron	40581A	8/12/02	2.5	Yes	EOL
+Dataram	DTM63641A	HYB25D256400AT-7 rev A	Infineon	40581AA	8/7/02	2.5	Yes	
+ATP Electronics	AB64L72A8S8B0	NT5DS32M8AT rev D	Nanya	SB184A08L rev1	8/29/02	2.5		EOL
+ATP Electronics	AB64L72R4S8B0S	K4H560438D-TCB0 rev D	Samsung	SB184R04L 1	8/26/02	2.5	Yes	EOL
+Dane-Elec	D1D266R072642I	NT5DS32M8AT-7K rev A	Nanya	DR513872 rev A	8/21/02	2		EOL
Infineon	HYS72D64500GR-7-A	HYB25D256400AT-7	Infineon		8/27/02	2	Yes	
+Legend	L6472TC5-RR2HDC5A	HY5DU56822AT-H rev A	Hyundai	DRR720818 A rev 2	9/12/02	2.5		EOL
+ATP Electronics	AB64L72A8S8B0S	K4H560838D-TCB0 rev D	Samsung	SB184A08L rev1	9/20/02	2.5		EOL
+Avant Technology	AVM7264R39C2266K1-A	NT5DS32M8AT-7K rev A	Nanya	50-1411-01-A rev A	9/25/02	2	Yes	EOL
+Buffalo	DD266-R512/MB	46V32M8-75 rev B	Micron	RCE0501-AB	9/25/02	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	
+Avant Technology	AVM7264R39C5266K1-A	K4H560838C-TCB0 rev C	Samsung	50-1411-01-A rev A	10/14/02	2.5	Yes	EOL
+Dane-Elec	D1D266R072642H	HYB25D256400AT-7 rev A	Infineon	DE042036 rev B	10/21/02	2	Yes	EOL
+Dataram	DTM63641E	HYB25D256400BT-7 rev B	Infineon	40581A rev A	10/16/02	2.5	Yes	EOL
+MSC Vertriebs GmbH	MSC512M00154	MSCD8608A8A-75B	MSC Vertriebs GmbH	M0481LA2	10/23/02	2.5		EOL

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
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	
+Legend	L6472YC5-PPASDC5D	K4H560438D-TCB0 rev D	Samsung	18-25141A rev A	10/31/02	2.5	Yes	EOL
+ATP Electronics	AB64L72Q8S8B0S	K4H560838D-TCB0 rev D	Samsung	SB184Q08 L1 rev 1	11/13/02	2.5	Yes	EOL
ITAUCOM	512E2665R24	ICM4L560407-65	Micron	0163 A	11/19/02	2.5		EOL
+MSC Vertriebs GmbH	MSC 512M00098	MT46V32M8TG-75 rev B	Micron	PCB M0481LA2	11/21/02	2.5		EOL
Ventura Technology Group	D52WVK25SVD (Old Part# D52WVK25SV)	K4H560838D-TCB0 rev D	Samsung	V208	12/2/02	2.5		EOL
+Viking	VI4CR647224DTHL1	K4H560438D-TCB0 rev D	Samsung	03-0291 rev A	12/5/02	2.5	Yes	EOL
+MSC Vertriebs GmbH	MSC 512M00094	HYB25D256800BT-7 rev B	Infineon	PCB M0481LA2	12/16/02	2		EOL
Infineon	HYS72D64500GR-7-B	HYB25D256400BT-7	Infineon		1/14/03	2	Yes	
Infineon	HYS72D64320GBR-7-B	HYB25D256800BC-7	Infineon		1/22/03	2	Yes	
+Avant Technology	AVM7264R38C5266K0-A	MT46V64M4TG-75 B rev B	Micron	50-1415-01 rev B	2/19/03	2.5	Yes	EOL
Infineon	HYS72D64000GR-7-B	HYB25D256400BT-7	Infineon		2/28/03	2		
Samsung	AM312L6420DT0-CAA	K4H560438D-TCAA	Samsung		3/10/03	2	Yes	
+Dataram	DTM63641G	MT46V64M4TG-75 rev C	Micron	40581A rev A	3/19/03	2.5	Yes	
Micron	MT18VDDT6472G-265C3	MT46V64M4-75 C	Micron		3/25/03	2.5	Yes	
Apacer	AM512LD53R266	HYB25D256800BT-7	Infineon	48.18115.0 12	3/31/03	2	Yes	EOL
Samsung	M383L6420ETS-CB0	K4H560438E-TCB0	Samsung		4/18/03	2.5		
+Viking	VI4CR647228DTHL2	K4H560838D-TCB0	Samsung	0000905A	4/25/03	2.5	Yes	EOL
+Viking	VI4CR647224DTHL2	MT46V64M4TG-75 rev B	Micron	03-0291 rev A	5/5/03	2.5	Yes	EOL
+Buffalo	DD266L-R512/SD	K4H560838D-TCB0 rev D	Samsung	1D188EF-AA	6/2/03	2.5	Yes	
Samsung	M312L6420ETS-CA2	K4H560438E-TCA2	Samsung		6/9/03	2	Yes	
+Viking	VI4CR647228DTHL4	MT46V32M8TG-75 rev C	Micron	0000905A rev A	6/13/03	2.5	Yes	
+TRS* Tele-Radio-Space GmbH	TRS21152	HYB25D256800BT-7 rev B	Infineon	M0529LA1 rev 1	7/1/03	2	Yes	
Kingston	KVR266S4R25/512i	HYB25D256400BT-7	Infineon	2025127-001A00	7/10/03	2.5	Yes	
+TRS* Tele-Radio-Space GmbH	TRS21151	HYB25D256400BT-7 rev B	Infineon	M0530LA1 rev 1	7/11/03	2	Yes	
ITAUCOM	512E2665R24	ICM4L560407-65	Micron	0269 A	7/19/03	2.5	Yes	
+Legend	L6472YC5-RU1HDC5B	HY5DU56822BT-J rev B	Hyundai	DRR1U081 8-A rev 1	10/31/03	2.5	Yes	

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
+Legend	L6472YC5-182HDD5A	HY5DU56422AT-K rev A	Hyundai	184RL rev 2	10/24/03	2.5	Yes	
+Legacy Electronics Inc.	88L6JDLR-1LDG	LED64408TA-6	Legacy	LE36DDT 1844R rev A	12/16/03	2.5	Yes	
+TRS	TRS21202	HYB25D256400CE-7 rev C	Infineon	M0530LA 1 rev 1	8/26/04	2	Yes	
Samsung	M312L6420ETS-CB0	K4H560438E-TCB0 rev E	Samsung	M312L33 10ETS	1/19/05	2.5	Yes	

**Registered, ECC, DDR333 DIMM Modules
512 MB Sizes (64Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
+Buffalo	DD333L-R512/MG	MT46V32M8TG(P)-6T rev G	Micron	1D188EF- AA	11/3/04	2.5	Yes	
+Buffalo	DD333L-R512/SF	K4H560838F-TCB3 rev F	Samsung	1D188EF- AA	3/11/05	2.5	Yes	
+Kingston	KVR333S4R25/512I	K4H560438E-GCB3 rev E	Samsung	2025161- 001.B00 na	7/22/05	2.5	Yes	
+Kingston	KVR333S4R25/512I	HYB25D256400CC-6 rev C	Infineon	2025161- 001.B00	07/29/05	2.5	Yes	

Modules shaded in blue are low profile.

Modules in bold text do not contain Lead.

(A) This is a 2-2-2 part.

(+) This vendor is part of the CMTL Certification program. This means this part has/will be 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.

Server Board SSH4

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

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

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
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	2.5	Yes	
+Dataram	DTM63621D	MT46V64M4TG-75 rev B	Micron	40556 rev B	8/14/02	2.5	Yes	
+ATP Electronics	AB28L72P4SMB0S	K4H560438D-TCB0 rev D	Samsung	SB184P04 L1	9/17/02	2.5	Yes	EOL
+Avant Technology	AVM7264R39C5266K 1-A	K4H560838C-TCB0 rev C	Samsung	50-1411-01-A rev A	10/14/02	2.5	Yes	EOL
+Dataram	DTM60193E	MT48LC64M4A2FB-75 rev C	Micron	40554A rev A	10/29/02	3	Yes	
+Dataram	DTM63621F	HYB25D256400BT-7 rev B	Infineon	40556 rev B	11/4/02	2	Yes	
+Legend	L1272YC5-PPBSDD5D	K4H560438D-TCB0 rev D	Samsung	18-21040B rev B	10/29/02	2.5	Yes	EOL
Apacer	Apacer 75.06280.792	HYB25D256400BT-7	Infineon		11/13/02	2	Yes	
Infineon	HYS72D128021GR-8-B	HYB25D256400BT-8	Infineon		1/9/03	2		
Infineon	HYS72D128320GBR-7-B	HYB25D256400BC-7	Infineon		1/14/03	2	Yes	
Micron	MT36VDDT12872G-265C2	MT46V64M4-75 C	Micron		1/30/03	2.5	Yes	
Samsung	M312L2828DT0-CB0	K4H510638D-TCB0	Samsung		2/19/03	2.5	Yes	
Samsung	M383L2828DT1-CA2	K4H560438D-TCA2	Samsung		2/19/03	2		
+MSC Vertriebs GmbH	MSC001G00096	HYB25D512800AT-7 rev A	Infineon	M0481LA2	3/3/03	2		EOL
+Dataram	DTM63653B	HYB25D256400BC-7 rev B	Infineon	40599A rev A	3/6/03	2.5	Yes	EOL
Infineon	HYS72D128500GR-7-A	HYB25D512400AT-7	Infineon		3/6/03	2	Yes	
+ATP Electronics	AB28L72P4SUB0S	K4H560438D-TCB0 rev D	Samsung	SB184P04 L1	3/17/03	2.5	Yes	EOL
+Dataram	DTM63653C	K4H560438D-GCA2 rev D	Samsung	40599A rev A	3/12/03	2.5	Yes	EOL
+Centon Electronics	TOP02-D006F	MT46V64M4TG-75C rev C	Micron	LE36DDT1 844R rev A	3/24/03	2.5	Yes	EOL
Infineon	HYS72D128521GR-7-B	HYB25D256400BT-7	Infineon		4/3/2003	2	Yes	

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile
Samsung	M312L2828ET0-CA2	K4H510638E-TCA2	Samsung		7/3/2003	2	Yes
Samsung	M383L2828ET1-CB0	K4H510638E-TCB0	Samsung		7/8/2003	2.5	
+Buffalo	DD266L-RW1G/SD	K4H560438D-TCB0 rev D	Samsung	4D248EF-AA	7/25/03	2.5	Yes
ITAUCOM	01GE2665R24	MT46V64M4TG-75 rev C	Micron	0232 A	7/28/03	2.5	Yes
+Centon Electronics	TOP02-D023W	HYB25D256400BT-7 rev B	Infineon	LE36DDT1 844R rev A	8/29/03	2.5	Yes
Samsung	M312L2828ET0-CAA	K4H510638E-TCAA	Samsung		9/17/03	2	Yes
+Viking	VI4CR287224DYHL3	MT46V64M4TG-75 rev C	Micron	03-0291 rev A	11/5/03	2.5	Yes
+Legend	L1272YC5-183HDD5A	HY5DU56422AS-H rev A	Hyundai	184RL rev 3	10/29/03	2.5	Yes
+Smart Modular Technologies	SM12872RDDR3H1L P-S	K4H510638D-TCB0 rev D	Samsung	M312L2828T0	11/21/03	2.5	Yes
+Smart Modular Technologies	SM12872RDDR301B G-I	HYB25D256400BC-6 rev B	Infineon	P54G184N ESZBRCD rev A	12/09/03	2	Yes
+TRS	TRS21174	HYB25D512800AT-7 rev A	Infineon	M0529LA1 rev 1	12/23/03	2	Yes
+Legacy Electronics Inc.	89L6MDLR-1LDG	LED128408TA-6	Legacy	LE36DDT1 844R rev A	12/12/03	2.5	Yes
+Legend	L1272YC5-RU1HDH5A	HY5DU12822AT-H rev A	Hyundai	DRR1U0818-A rev 1	12/18/03	2.5	Yes
+Smart Modular Technologies	SM12872RDDR301L P-I	HYB25D256400BT-7 rev B	Infineon	P54G184N ESZKRCN rev A	1/15/04	2	Yes
+TRS	TRS21171	HYB25D256400BC-7 rev B	Infineon	M0533LA1 rev 1	3/9/04	2	Yes
Samsung	M312L2828ET0-CB0	K4H510638E-TCB0	Samsung		3/18/04	2.5	Yes
+Dataram	DTM63653H	HYB25D256400BC-6 rev B	Infineon	40599A rev A	3/19/04	2	Yes
+ATP Electronics	AB28L72Q8SHB0S	K4H510838B-TCB3 rev B	Samsung	SB184Q08 L1 rev 1	5/12/04	2.5	Yes
+Smart Modular Technologies	SM12872RDDR301B GIC	HYB25D256400CC-6 rev C	Infineon	P54G184N ESZBRCD	7/21/04	2	Yes
+Dataram	DTM63698B	HYB25D512400BE-7 rev B	Infineon	40581A rev A	7/27/04	2	Yes
+Smart Modular Technologies	SX12872RDDR308B TIB	HYB25D512800BE-6 rev B	Infineon	P52G184N EBZ6RCL rev B	9/20/04	2	Yes
+TRS	TRS21203	HYB25D512400BE-7 rev B	Infineon	M0530LA1 rev 1	11/5/04	2	Yes
+Smart Modular Technologies	SX12872RDDR302L PIB	HYB25D512400BE-7 rev B	Infineon	P52G184N ESZ6G001 rev A	3/24/05	2	Yes
+Kingston	KVR266D4R25/1GI	HYB25D256400BT-7 rev B	Infineon	2025148-001.A00	4/6/05	2.5	Yes

**Registered, ECC, DDR333 DIMM Modules
1GB Sizes (128Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
+Buffalo	DD333L-R1G/SB	K4H510838B-TCB3 rev B	Samsung	1D188EF-AA	8/30/04	2.5	Yes	
+Viking	VI4CR287224DBKL2	K4H560438E-GCB3 rev E	Samsung	0000972B	9/2/04	2.5	Yes	
Infineon Technologies	HYS72D128320GBR-6-B	HYB25D256400BC-6 rev B	Infineon	L-DIM-184-24-2 rev 2	10/1/04	2.5	Yes	
+Avant Technology	AVM7228R52C5333K1-MTD	MT46V64M8TG(P)-6T rev D	Micron	50-1411-01-A rev A	10/22/04	2.5	Yes	
+TRS	TRS21197	HYB25D256400CC-6 rev C	Infineon	M0533LA1 rev 1	11/10/04	2.5	Yes	
+Viking	VI4CR287228ETKL1	MT46V64M8TG-6T rev D	Micron	0000985A	6/17/05	2.5	Yes	
Infineon	HYS72D128300GBR-6-B	HYB25D512400BC-6 rev B	Infineon	184-22-2 (0350 & 0409) na	8/29/05	2.5	Yes	

Modules shaded in blue are low profile.

Modules in bold text do not contain Lead.

(^) This is a 2-2-2 part.

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

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Server Board SSH4

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

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

Registered, ECC, DDR266 DIMM Modules 2GB Sizes (256Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
*Infineon	HYS72D256520GR-7-A	HYB25D512400AT-7	Infineon		12/23/02	2	Yes	
Micron	MT36VDDF25672G-265C2	MT46V128M4FN-75	Micron	0328 rev A	2/17/04	2.5	Yes	
+Smart Modular Technologies	SM25672RDDR301LP-I	HYB25D512400AT-7 rev A	Infineon	P54G184 NESZKR CN rev A	2/27/04	2	Yes	
Samsung	M312L5628BT0-CB0	K4H1G0638B-TCB0	Samsung		3/17/04	2.5	Yes	
+TRS	TRS21218	HYB25D512400BE-7 rev B	Infineon	M0531LA 1 rev 1	08/08/05	2	Yes	

Registered, ECC, DDR333 DIMM Modules 2GB Sizes (256Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Low Profile	EOL
+Legend	L2572YC6-PPXSDM5B	K4H510438B-TCB3 rev B	Samsung	18-21040B rev B	9/14/04	2.5	Yes	

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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.

Sales Information

Vendor Name	Web URL	Vendor Direct Sales Info
ATP Electronics	http://www.atpusa.com/	Florence Hsieh Tel 408-732-5831 Fax 408-732-5055 sales@atpusa.com
ATP Electronics -- Taiwan Inc.	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 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
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.he.com/	
Infineon	http://www.infineon.com/business/distribut/index.htm	
ITAUCOM	http://www.itauc.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: Keri Albers 888 466 3853 ext. 307 European Contact: 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 49-7249-910-417 Fax: 49-7249-910-229 wpe@msc-ge.com

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/salescontactacts.shtml	
Simple Tech	http://www.simpletech.com	Ron Darwish @ (949) 260-8230 or email @ Rdarwish@Simpletech.com
SMART Modular Technologies	http://www.smartm.com/channel	Gene Patino (949) 439-6167 Gene.Patino@Smartm.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	Don Hummel @ 805-581-0800 x 108 or email @ don@venturatech.com
Viking InterWorks	http://www.vikinginterworks.com	
Virtium Technology Inc	http://www.virtium.com	Tod Skelton @ (949) 460-0020 ext. 146 or email @ tod.skelton@virtium.com
Legend	http://www.legend.com.au	Tel: 800-338-2361 Fax: 949-459-8577 orderdesk@vikingcomponents.com
Wintec Industries	http://www.wintecindustries.com	Tel 510-360-6300 Fax 510-770-9338

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.

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 bank 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 boxed processors. 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 on the boxed processor baseboard. 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 a 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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