



Intel[®] Server Blade SBX44 Memory List Test Report Summary

Revision 20.0
November 2007

Revision History		
Date	Rev	Modifications
Dec/04	1.0	Initial release.
Apr/05	2.0	Added Smart, Legacy, Ventura and Buffalo 512MB parts. Added Buffalo and Ventura 1GB parts. Added TRS 2GB parts. (In shaded area)
May/05	3.0	Added Kingston 512MB parts. Added TRS 1GB parts. Added Smart 2GB parts. (In shaded area)
May/05	4.0	Updated Contact info
June/05	5.0	Added TRS 512MB parts. (In shaded area)
Jun/05	6.0	Added TRS 512MB parts. (In shaded area)
Aug/05	7.0	Added Kingston 512MB parts. (In shaded area)
Aug/05	8.0	Added TRS 2GB parts. (In shaded area)
Nov/05	9.0	Added Kingston 1GB part. (In shaded area)
Dec/05	10.0	Added Legend 256MB, 1GB and 2GB parts. (In shaded area)
Jan/06	11.0	Added Legacy 1GB part. Added Legend 256MB part. (In shaded area)
Jan/06	12.0	Added Legend 512MB and 1GB parts. Added Viking 1GB part. (In shaded area)
Feb/06	13.0	Added Legend 1GB and 512MB parts. Added Viking 1GB part. (In shaded area)
Mar/06	14.0	Added Smart 1GB part. (In shaded area)
May/06	15.0	Infineon name change to Qimonda effective May 1 st , 2006. (In shaded area)
Oct/06	16.0	Added Kingston 1GB part. (In shaded area)
Nov/06	17.0	Added Kingston 1GB part. (In shaded area)
Apr/07	18.0	Updated vendor contact information. Added Kingston 512MB part. (In shaded area)
May/07	19.0	Additional memory parts added. (In shaded area)
Nov/07	20.0	Additional memory parts added. (In shaded area)

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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 Blades 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 Blade SBX44 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.

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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[®] Server Blade SBX44. 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 Blade 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 room temperature and functional temperature margins 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 functional temperature margins and room temperature test involves testing the memory module on the particular Intel Server Blade for which it is being qualified with test software operating under Microsoft* Windows* Server 2003 Enterprise Edition for no less than 24 hours. The temperature margin testing involves testing the memory module on the particular Intel Server Blade for which it is being qualified with various test software and operating systems for 48-72 hours under various 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)
949-716-8690 (voice)	24 Hammond Suite F
949-716-8691 (fax)	Irvine, CA 92618
	http://www.cmtlabs.com/

Qualified Memory for the Intel® Server Blade SBX44

The memory module on the Intel® Server Blade SBX44 has 8 DIMM sockets, which can hold up to 16 GB of Registered ECC DDR266 or DDR333 memory using eight 72-bit DIMM modules. The following memory features are supported:

- DDR266 or DDR333 Registered ECC in compliance with the standard DDR JEDEC DIMM Specification
- DIMMs with capacity of 256 MB, 512 MB, 1G and 2G. Other DRAM sizes may function correctly but will not be validated.
- Minimum configuration is 512MB using two 256MB DIMMs.

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

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
256MB	32M x 72	64Mbit	16M x 4	36/2/4	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	128Mbit	32M x 4	36/2/4	12/2/11
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
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 *Intel® Server Blade SBX44 Technical Product Specification*.

The following table lists DIMM devices known to be compatible with the Intel Server Blade SBX44. 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.

Intel® Server Blade SBX44

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
Samsung	M312L3310ETS-CB0		Samsung			2.5		(32Mbx4)*18	
~ Qimonda (Infineon)	HYS72D32501GR-7-A	HYB25D128400AT-7	~Qimonda (Infineon)			2.0		(32Mbx4)*18	
+Legend	L3272YC5-RU1HDC5B	HY5DU56822BT-J rev B	Hyundai	DRR1U081 8-A rev 1	12/5/05	2.5		(32Mx8)*9	

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
+Legend	L3272YC6-RU1HDC5B	HY5DU56822BT-D43 rev B	Hyundai	DRR1U081 8-A rev 1	11/22/05	2.5		(32Mx8)*9	

Modules shaded in blue are low profile.

Modules in bold text do not contain Lead.

~ Effective May 1st, 2006, Infineon memory products will be known as Qimonda

(+) This vendor is part of the CMTL Certification program. This means this part has/will be tested across all compatible Intel Server Blades. 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.

Intel® Server Blade SBX44

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
Samsung	M312L6420ETS-CB0	K4H560438E-TCB0	Samsung			2.5		(64Mbx4)*18	
~ Qimonda (Infineon)	HYS72D64500GR-7-B	HYB25D256400BT-7	~ Qimonda (Infineon)			2.0		(64Mbx4)*18	
Samsung	M312L6420FTS-CB0	K4H560438F-TCB0	Samsung			2.5		(64Mbx4)*18	
+Smart Modular Technologies	SM6472RDDR325LP-S	K4H560438E-TCB0 rev E	Samsung	M312L3310 ETS	4/6/05	2.5		(64Mbx4)*18	
+TRS	TRS21151	HYB25D256400BT-7 rev B	~ Qimonda (Infineon)	M0530LA1 rev 1	6/2/05	2		(64Mbx4)*18	
+TRS	TRS21202	HYB25D256400CE-7 rev C	~ Qimonda (Infineon)	M0530LA1 rev 1	6/9/05	2		(64Mbx4)*18	
+Legend	L6472YC5-RU1HDC5B	HY5DU56822BT-J rev B	Hyundai	DDR1U0818 -A rev 1	12/22/05	2.5		(32Mbx8)*18	

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
~ Qimonda (Infineon)	HYS72D64300GBR-6-B	HYB25D256400BC-6	~ Qimonda (Infineon)			2.5		(64Mbx4)*18	
~ Qimonda (Infineon)	HYS72D64300GBR-6-C	HYB25D256400CC-6	~ Qimonda (Infineon)			2.5		(64Mbx4)*18	
+Legacy Electronics Inc.	88S6JDGR-1NDG	HYB25D256400BC6 rev B	~ Qimonda (Infineon)	LE36DDF18 44RC rev B	3/25/05	2.5		(64Mbx4)*18	
+Buffalo	DD333L-R512/SF	K4H560838F-TCB3 rev F	Samsung	1D188EF-AA	3/14/05	2.5		(32Mbx8)*18	
+Buffalo	DD333L-R512/MG	MT46V32M8TG(P)-6T rev G	Micron	1D188EF-AA	3/23/05	2.5		(32Mbx8)*18	
+Ventura Technology Group	D52YCK44MV	MT46V64M4FG-6 rev G	Micron	DR1G472B	3/31/05	2.5		(64Mbx4)*18	
+Kingston	KVR333S4R25/512I	HYB25D256400CC-6 rev C	~ Qimonda (Infineon)	2025161-001.B00	4/18/05	2.5		(64Mbx4)*18	
+Kingston	KVR333S4R25/512I	K4H560438E-GCB3 rev E	Samsung	2025161-001.B00 na	7/15/05	2.5		(64Mbx4)*18	
+Legend	L6472YC6-RU1HDHSC	HY5DU12822CTP-J rev C	Hynix	DDR1U0818 rev A	2/1/06	2.5	Yes	(64Mbx8)*9	
Kingston	KVR333S4R25/512I	HYB25D256400CF-5 rev C	Qimonda	2025161-001.B00 na	3/29/07	2.5	Yes	(64Mbx4)*18	

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Intel® Server Blade SBX44

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
Samsung	M312L2828ET0-CB0	K4H510638E-TCB0	Samsung			2.5		(64Mbx4)*36	
~ Qimonda (Infineon)	HYS72D128521GR-7-B	HYB25D256400BT-7	~ Qimonda (Infineon)			2.0		(64Mbx4)*36	
Elpida	EBD10RD4ABFA-7B		Elpida			2.5		(128Mbx4)*18	
Samsung	M312L2920BTS-CB0		Samsung			2.5		(128Mbx4)*18	
+TRS	TRS21203	HYB25D512400BE-7 rev B	~ Qimonda (Infineon)	M0530LA1 rev 1	4/22/05	2		(128Mbx4)*18	
+TRS	TRS21171	HYB25D256400BC-7 rev B	~ Qimonda (Infineon)	M0533LA1 rev 1	4/28/05	2		(64Mbx4)*36	
+Legend	L1272YC5-RU1HDD5A	HY5DU12822AT-H rev A	Hyundai	DRR1U0818 -A rev 1	11/17/05	2.5		(64Mx8)*18	
+Legend	L1272YC5-183HDD5A	HY5DU56422AS-H rev A	Hyundai	184RL rev 3	1/6/06	2.5		(64Mbx4)*36	
+Smart Modular Technologies	SG12872RDDR3H1LPI C	HYB25D512400CE-6 rev C	~ Qimonda (Infineon)	PG52G184 NESZ6G001 rev A	3/9/06	2.5	Yes	(128Mbx4)*18	

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
~ Qimonda (Infineon)	HYS72D128320GBR-6-B	HYB25D256400BC-6	~ Qimonda (Infineon)			2.5		(64Mbx4)*36	
+Buffalo	DD333L-R1G/SB	K4H510838B-TCB3 rev B	Samsung	1D188EF-AA	3/29/05	2.5		(64Mbx8)*18	
+Ventura Technology Group	D54YFK44SV	K4H510438C-ZCB3 rev C	Samsung	DR1G472B	4/12/05	2.5		(128Mbx4)*18	
+Kingston	KVR333S4R25/1GI	HYB25D512400BC-6 rev B	~ Qimonda (Infineon)	2025318-001.A00 na	11/7/05	2.5		(128Mbx4)*18	
+Legacy Electronics Inc.	89B6MDZR-1NDG	K4H510438C-ZCB3 rev C	Samsung	LE18DDF1844R rev A	12/20/05	2.5		(128Mbx4)*18	
+Legend	L1272YC6-PPXSDM1B	K4H510438B-GCB3 rev B	Samsung	M312L6420G0 na	1/10/06	2.5		(128Mbx4)*18	
+Viking	VR4CR287228ETKL1	K4H510838C-UCCC rev C	Samsung	0001060A rev A	1/17/06	2.5	Yes	(64Mbx8)*18	
+Legend	L1272YC6-PPXSDD2E	K4H560438E-GCB3 rev E	Samsung	DR2G472B na	1/23/06	2.5		(64Mbx4)*36	
+Viking	VR4CR287228ETKL2	HY5DU12822CTP-D43 rev C	Hynix	0001060A rev A	1/26/06	2.5	Yes	(64Mbx8)*18	
Kingston	KVR333S4R25/1GI	K4H510438C-ZCB3 rev C	Samsung	2025324-001.A00 na	8/25/06	2.5	Yes	(128Mbx4)*18	
Kingston	KVR333S4R25/1GI	K4H510438C-ZCCC rev C	Samsung	2025324-001.A00 na	10/20/06	2.5	Yes	(128Mbx4)*18	
Kingston	KVR333S4R25/1GI	HYB25D512400CF-5 rev C	Qimonda	2025324-001.A00 na	5/18/07	2.5	Yes	(128Mbx4)*18	
Kingston	KVR333S4R25/1GI	HYB25D512400BF-5 rev B	Qimonda	2025324-001.A00 na	10/12/07	2.5	Yes	(128Mbx4)*18	

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Intel® Server Blade SBX44

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
Elpida	EBD21RD4ABNA-7B		Elpida			2.5		(128Mbx4)*36	
Samsung	M312L5628BT0-CB0	K4H1G0638B-TCB0	Samsung			2.5		(128Mbx4)*36	
+TRS	TRS21155	HYB25D512400AT-7 rev A	~ Qimonda (Infineon)	M0531LA1 rev 1	4/14/05	2		(128Mbx4)*36	
+Smart Modular Technologies	SX25672RDDR301LPIB	HYB25D512400BE-7 rev B	~ Qimonda (Infineon)	P54G184NE SZKRCN rev A	4/20/05	2		(128Mbx4)*36	
+TRS	TRS21218	HYB25D512400BE-7 rev B	~ Qimonda (Infineon)	M0531LA1 rev 1	08/12/05	2		(128Mbx4)*36	

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

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CAS Latency	Lead-Free	DRAM Organization	EOL
+TRS	TRS21208	K4H510438B-TCB3 rev B	Samsung	M0531LA1 rev 1	4/4/05	2.5		(128Mbx4)*36	
+Legend	L2572YC6-PPXSDM5B	K4H510438B-TCB3 rev B	Samsung	18-21040B rev B	11/10/05	2.5		(128Mbx4)*36	
Kingston	KVR333D4R25/2GI	HYB25D512400BF-5 rev B	Qimonda	2025294-001.A00 na	10/10/07	2.5	Yes	(128Mbx4)*36	
Kingston	KVR333D4R25/2GI	HYB25D512400CF-5 rev C	Qimonda	2025294-001.A00 na	10/17/07	2.5	Yes	(128Mbx4)*36	

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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
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/	
~ Qimonda (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: Gary Ridenour, 949-498-9600, Ext 350 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/	
PNY	http://www.pny.com/internet_explorer/LPB.HTML	
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	http://www.smartm.com/channel	Gene Patino (949) 439-6167 Gene.Patino@Smartm.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
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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-based Blade. 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 Blade 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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