



Enterprise Server Group

Intel[®] R440LX DP Server System & Baseboard

Tested Memory List

Revision 4.0
February, 1999



Revision History

Revision	Revision History
June, 1998	Updated list with recently tested memory devices.
August, 1998	Updated list with recently tested memory devices. Corrected errors to MFG part numbers. Added information on third-party memory testing and lists.
September, 1998	Updated list with recently tested memory devices (shaded modules in table). Corrected errors in information: H Co. DIMM type, Peripheral Enhancements part number. Both modules are shaded in the list.
February, 1999	Updated document structure & memory list.

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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.

Overview of Memory Testing

The following procedure is used to qualify Dual In-Line Memory Modules (DIMMs) for use with the R440LX server board. Memory is a vital subsystem in a server. Intel requires strict guidelines to be met before a DIMM vendor is put onto the qualified memory list. To be acknowledged on the list as a fully functional DIMM, the memory must pass two different phases of testing:

1. Advanced Environmental Testing
2. Basic Electrical Testing

Advanced Tested – DIMMs listed as Advanced Tested have been electrically tested by CMTL or Intel®'s MVL with temperature and voltage margining, and various test software and operating systems for 48-96 hours. The DIMM device is known to be compatible with the Server Board, test software and operating system that was utilized during the test procedure. DIMMs listed as Advanced Tested have also completed all of the requirements of Basic Testing.

Basic Tested – DIMMs listed as Basic Tested have completed a paper qualification by the memory vendor. A paper qualification is a review of critical timings, electrical characteristics, timing requirements, environmental requirements, and packaging requirements in order to see if the DIMM meets Intel®'s memory specifications. In addition to the paper qualification, a DIMM listed as Basic Tested has been electrically tested at room temperature on the Intel Server Board for which it is qualified. A small sample (normally four DIMMs) has been tested by CMTL† at standard voltage and room temperature for 24-72 hours. These devices are listed by Intel as a convenience to Intel's general customer base, but neither CMTL or Intel make any representations or warranties whatsoever regarding quality, reliability, functionality or compatibility of these devices on the Intel Server Board.

A full description of the testing procedure required to reach each phase is described in the document "Qualified Memory Test Procedure Summary" located at:

<http://support.intel.com/support/motherboards/server/>

†CMTL is a leading memory testing organization responsible for testing a broad range of memory products. A memory product, which receives a "PASS" after being tested by CMTL, means it functions correctly and consumers can use the product to perform the intended server functions. In order to pass these stringent standards, memory products must maintain the highest manufacturing procedures and pass an exacting battery of tests. Testing is performed with equipment and a procedure as defined by Intel's various functional testing levels. Testing is performed on a number of Intel R440LX server boards.

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Qualified SDRAM Memory for the R440LX Server Board

The following tables list DIMM devices known to be compatible with the Intel R440LX Pentium® II processor-ready server board. This document and the DIMM list will be updated as qualified memory is added during the life of the R440LX product. This server product support the following memory features:

- 168-pin gold-plated SDRAM DIMM modules
- Support for single or double-sided DIMMs
- Support for up to 512 MB SDRAM
- 3.3V memory only
- Support for DIMM sizes of 32, 64, 128 MB

Memory features are detailed in the *R440LX DP Server Technical Product Specification* available on-line at www.intel.com/support.

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

Memory modules not listed in the following tables may be used, however, Intel recommends the use of Advanced Tested ECC modules, and in the event of unreliable system operation, the modules should be replaced with Advanced Tested ECC modules to determine whether the unlisted or non -ECC modules are causing the problem. Intel recommends that module and DRAM vendors not be mixed in the same system.

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.

R440LX DP SERVER SYSTEM & BASEBOARD - INTEL & CMTL TESTED MEMORY LIST

Shading indicates the latest additions to the list. The levels of testing are defined in the Introduction of this document.

Unbuffered, ECC, 66 MHz, SDRAM DIMM Modules					
Manufacturer	Part #	Level	Intel Part #	DIMM Type	Size
32 MB Memory					
Celestica	CLB0032GCBBSCG	Advanced	N/A	4Mx72	32MB
Fujitsu	SDC4UV728A-100T-S	Advanced	N/A	4Mx72	32MB
Hitachi	HB526472EN-I0IN	Advanced	N/A	4Mx72	32MB
Hyundai	HYM7V72A400BTFG-10	Advanced	N/A	4Mx72	32MB
Hyundai	HYM7V72A400CTFG-10	Advanced	N/A	4Mx72	32MB
Kingston	KIN0001TATAFA15	Advanced	N/A	4Mx72	32MB
Micron	MT18LSDT472AG-66CL2	Advanced	691006-001	4Mx72	32MB
Micron	MT18LSDT472AG-662C1	Advanced	691006-001	4Mx72	32MB
NEC†	MC-454AC724F-A10	Advanced	691006-001	4Mx72	32MB
NEC	MC-454AC725F-A10	Advanced	691006-001	4Mx72	32MB
PNY	72403ASNANAAA-10	Advanced	N/A	4Mx72	32MB
Samsung	KMM374S403BTL-G0	Advanced	691006-001	4Mx72	32MB
Samsung	KMM374S403CTL-G0	Advanced	691006-001	4Mx72	32MB
Simple Tech.	I724118UD1-1GVNANAA	Advanced	N/A	4Mx72	32MB
Southland	S7204BBSBSBBA10	Advanced	N/A	4Mx72	32MB
TI	TM4SR72EPU-12A	Advanced	691006-001	4Mx72	32MB
TI	TM4TR72EPH-8A	Advanced	N/A	4Mx72	32MB
Viking	INT472USBABA0A-10	Advanced	N/A	4Mx72	32MB
64 MB Memory					
Celestica	CLB0064JCBBSAG	Advanced	N/A	8Mx72	64MB
H Co.	HINR44LX-64EC	Advanced	N/A	8Mx72	64MB
Hyundai	HYM7V72A801TFG-10	Advanced	N/A	8Mx72	64MB
Kingston	KIN0002SASAAA15	Advanced	N/A	8Mx72	64MB
Micron	MT9LSDT872AG-662D3	Advanced	691006-002	8Mx72	64MB
Mitsubishi	MH8S72ALD-10	Advanced	N/A	8Mx72	64MB
NEC	MC-458CA724F-A10	Advanced	691006-002	8Mx72	64MB
Peripheral Enhancements	DM168-33-064M-EP66SAM	Advanced	N/A	8Mx72	64MB
PNY	72814ASNKNKAA-10	Advanced	N/A	8Mx72	64MB
Samsung	KMM374S823ATL-G0	Advanced	691006-002	8Mx72	64MB
Samsung	KMM374S823BTL-G0	Advanced	691006-002	8Mx72	64MB
Simple Tech	I728118UD2-1GVNANAA	Advanced	N/A	8Mx72	64MB
Southland	S7208BDSASAAA10	Advanced	N/A	8Mx72	64MB
Visiontek	N0302.0SASAA-10	Advanced	N/A	8Mx72	64MB
Viking	INT872USSASA0A-10	Advanced	N/A	8Mx72	64MB

Unbuffered, ECC, 66 MHz, SDRAM DIMM Modules (con't)					
Manufacturer	Part #	Level	Intel Part #	DIMM Type	Size
128 MB Memory					
Celestica	CLB0128JCBBSAG	Advanced	N/A	16Mx72	128MB
Fujitsu	SDC16UV7284-100TS	Advanced	N/A	16Mx72	128MB
H Co.	HINR44LX-128E	Advanced	N/A	16Mx72	64MB
Hyundai	HYM7V72A1601TFG-10	Advanced	N/A	16Mx72	128MB
Kingston	KIN0003NANAAA15	Advanced	N/A	16Mx72	128MB
Micron	MT18LSDT1672AG-662D2	Advanced	691006-003	16Mx72	128MB
Mitsubishi	MH16S72AMD-10	Advanced	N/A	16Mx72	128MB
NEC	MC-4516CC724F-A10	Advanced	691006-003	16Mx72	128MB
Peripheral Enhancements	DM168-33-128M-EP66SAM	Advanced	N/A	16Mx72	128MB
PricePoint	PP16M72SYN3V	Advanced	N/A	16Mx72	128MB
Samsung	KMM374S1623ATL-G0	Advanced	691006-003	16Mx72	128MB
Southland	S7216BDSASAAA10	Advanced	N/A	16Mx72	128MB
Visiontek	N0402.0SASAA-10	Advanced	N/A	16Mx72	128MB
Viking	INT1672USSASA0A-10	Advanced	N/A	16Mx72	128MB
256 MB Memory					
Dense Pac	D626D3273S4U4410	Advanced	N/A	32Mx72	256MB
Dynamem	DPSD32MS72RW5-10C	Advanced	N/A	32Mx72	256MB

Note: No more than two 256MB SDRAM DIMM modules are supported on the R440LX DP Server baseboard (Max. of 512MB SDRAM is supported on this Intel baseboard).

COMPUTER MEMORY TEST LABS (CMTL) MEMORY TESTING

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.

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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 Pentium® II 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 Pentium II 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 L440GX+ 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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