



Intel[®] AC450NX Server System Tested Memory List & Report Summary



*Revision 6.0
June, 2000*

Revision History		
Date	Rev	Modifications
February, 1999	1.0	Initial release.
March 29, 1999	1.1	Update AC450NX Buffered EDO/ECC DIMM Modules Table
May 6, 1999	1.2	Added Hyundai 128MB DIMM
June 29, 1999	1.3	Added DataRam 128MB DIMM
Sept 28, 1999	2.0	Updated Table information for MVL and CMTL Advanced Tested Memory
Dec. 10, 1999	3.0	Part number changes on Samsung. Changed format.
March, 2000	4.0	Part number update on Samsung.
June 2000	5.0	Added DataRam 256MB part. (In shaded area)
June 2000	6.0	Added DataRam 64MB part. (In shaded area)

© 2000 Intel Corporation

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. The L440GX+ product 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.

Information in this document is provided in connection with Intel® products. This test report is provided "as is" with no warranties whatsoever, including any warranty of merchantability, fitness for any particular purpose, or any warranty otherwise arising out of any product or testing proposal, specification or sample. No license, express, implied, 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 may make changes to specifications and product descriptions at any time, without notice.

Pentium is a registered trademarks of Intel Corporation. MMX is trademarks of Intel Corporation.

* Third-party brands and names are the property of their respective owners

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	4
<u>QUALIFIED DRAM DIMM MEMORY FOR THE AC450NX SERVER SYSTEM.....</u>	5
BUFFERED EDO/ECC DIMM MODULES	6
32MB SIZES	6
AC450NX SERVER SYSTEM	6
BUFFERED, ECC, EDO DIMM MODULE	6
64MB SIZES	6
AC450NX SERVER SYSTEM	7
BUFFERED, ECC, EDO DIMM MODULES	7
128MB SIZES.....	7
AC450NX SERVER SYSTEM	7
BUFFERED, ECC, EDO DIMM MODULES.....	7
256MB SIZES.....	7
COMPUTER MEMORY TEST LABS (CMTLSM)	8
INTEL® PRODUCT DEALERS AND PRODUCT INTEGRATORS.....	8

Overview of Memory Testing

The following procedure is used to qualify dual inline memory modules (DIMMs) for use in the Intel® AD450NX server system. Memory is a vital subsystem in a platform. Intel Corporation requires strict guidelines to be met before a DIMM vendor 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). 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 DIMM 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 NT* v4.0 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. DIMMs 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.

†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. Testing is performed on a number of Intel® AD450NX server boards.

John Deters
714-960-1243 (voice)
714-960-4695 (fax)

Computer Memory Test Lab
(CMTLSM)
101 Main Street, Suite 2G
Huntington Beach, CA 92648
<http://www.cmtlabs.com>

Qualified DRAM DIMM Memory for the AC450NX Server System

The AC450NX memory module has 16 DIMM sockets, which support up to 4 GB of EDO/ECC system memory. These sockets are divided into four banks of four sockets labeled A through D on the memory module. These banks support 4:1 interleaving only. All DIMMs within a given bank should be identical. From bank to bank, the Intel® 82450NX PCIset supports different varieties of DIMM size, manufacturer, and speed. The BIOS automatically detects the memory type, size, and speed. The following memory features are supported:

- 168-pin DIMMs with gold-plated contacts
- Buffered EDO/ECC DIMMs; 50 ns or 60 ns
 - 16* MB: 16 Mbit, 2Mx8 DRAM; 2K refresh
 - 32 MB: 16 Mbit, 4Mx4 DRAM; 2K or 4K refresh
 - 64 MB: 64 Mbit, 8Mx8 DRAM; 4K refresh
 - 128* MB: 64 Mbit, 16x4 DRAM; 4K or 8K refresh
 - 256 MB: Double-high, 64 Mbit, 16x4 DRAM; 4K or 8K refresh
- 3.3 V memory only
- CAS-before-RAS refresh only
- Single or double-sided DIMMs
- Double-high DIMMs with maximum height of 2.1 inches
- TSOP package only, SOJ not supported due to spacing

*Should function correctly, but will not be validated

Intel strongly recommends the use of ECC memory in all server systems. The EDO/ECC DIMMs can be installed four at a time on the memory module used on the AC450NX server platform. The AC450NX with the Intel® Pentium® II Xeon™ processors can meet a wide range of needs, with processing speeds starting at 400 MHz and cache sizes ranging from 512KB to 2 MB. In addition, the AC450NX offers true scalability by supporting from one to four Pentium II Xeon processors. This document will be updated with the latest tested EDO/ECC memory modules as qualified memory is added for the life of the AC450NX server system product. The most recent version of this document supercedes all other versions.

The following tables list DIMM devices known to be compatible with the Intel AD450NX Pentium II Xeon processor-ready server platform system. 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. The memory devices shown are categorized according to three levels of qualification: 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.

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.

AC450NX Server System
Buffered EDO/ECC DIMM Modules
32MB Sizes

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	EOL
Samsung	M372F0400CF0-C5000				9/14/98		
Samsung	M372F0400CF0-C6000				10/1/98		
Samsung	M372F0404BT0-C6000				12/10/98		
Samsung	KMM372F404BS-5						EOL
Samsung	M372F0404CT0-C6000				12/23/98; 3/17/99		
Samsung	M372F0404CT0-C5000				12/22/98; 3/11/99		
Mitsubishi	MH4V7245DATJ-6				10/5/98		

AC450NX Server System
Buffered, ECC, EDO DIMM Module
64MB Sizes

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	EOL
Hyundai	HYM5V72A804ATHG-50	HY51V65804ATC-50	Hyundai	9801-4	3/27/99	A231	
Hyundai	HYM5V72A804ATHG-50				3/27/99		
Samsung	KMM372F803CS-5						EOL
Samsung	KMM372F803BS-5						EOL
Samsung	KMM372F803BS-6						EOL
Samsung	KMM372F1600CS-5						EOL
*DataRam	DTM60093				6/25/99		
*DataRam	DTM60092	MT4LC8M8C2TG-5	Micron	40442	9/17/99	A400	
*DataRam	DTM60092	MT4LC8M8C2TG-5	Micron	40442 rev B	6/1/00	A874	

* For further information contact CMTL at www.GOLD@cmtlabs.com.

AC450NX Server System

Buffered, ECC, EDO DIMM Modules 128MB Sizes

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	EOL
*DataRam	DTM60093	MT4LC16M4H9TG-5	Micron	40379	6/23/99	A401	
Micron	MT18LDT1672G-6X (D die DRAM)				1/5/99; 3/11/99		

* For further information contact CMTL at www.GOLD@cmtlabs.com.

AC450NX Server System

Buffered, ECC, EDO DIMM Modules 256MB Sizes

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	EOL
*DataRam	DTM60094	MT4LC16M4H9TG-5	Micron	40404	9/27/99	A403	
Micron	MT36LDT3272G-6X (D die DRAM)				1/18/99; 3/11/99		
Micron	MT36LDT3272G-6X (C die DRAM)				9/11/98		
+Samsung	(Old #) KMM372F3200Cs1-5 (New #) M372F3200CT1-C5000				2/1/99		
Samsung	M372F3280BT1-C5000				10/19/98		
*DataRam	DTM60094	MT4LC16M4H9TG-5	Micron	40404 rev B	5/30/00	A868	

~Part number change

+Samsung parts are available under both part numbers.

* For further information contact CMTL at www.GOLD@cmtlabs.com.

Computer Memory Test Labs (CMTLSM)

CMTLSM is a privately owned and operated memory testing organization responsible for testing a broad range of memory products. Memory devices tested by CMTLSM must undergo a rigorous battery of tests to ensure that the product will perform the intended server functions. Memory capability is a major factor customers consider. CMTLSM has the ability to test and certify memory on Intel-based server platforms. The list of memory modules, which have undergone testing through the CMTLSM 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 CMTLSM with Intel server products and test procedures defined by Intel's Memory Qualification Lab. Intel routinely audits the CMTLSM factuality 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.

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 Xeon™ processors. This listing is not intended to be all inclusive; it only represents the DIMMs Intel or CMTLSM 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 Pentium® II Xeon™ 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 SC450NX 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.

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