

Intel[®] SKA4 Server Board Memory List Test Report Summary



*Revision 48.0
March, 2003*

Revision History		
Date	Rev	Modifications
May/00	0.5	Initial post-launch release.
June/00	1.0	Added Samsung 64MB, 128MB & 256MB parts. Added DataRam 128MB part. Added NEC, Silicon Tech & Simple Tech 512MB parts. Added Infineon 1G part.
July/00	2.0	Added Kentron & DataRam 512MB part. (In shaded area).
July/00	3.0	Added Infineon Technologies 512MB part. (In shaded area).
Aug/00	4.0	Correction made for Infineon Technologies 512MB part. Added Infineon 64MB & 256MB parts. Added Viking & DataRam 256MB parts. Added Smart Modular & Kentron 512MB parts. (In shaded area).
Aug/00	5.0	Added Viking 128MB & 512MB parts. Added Infineon Technologies 128MB part. (In shaded area).
Aug/00	6.0	Added ATP Electronics, Kingston, Simple Tech & Silicon Tech 512MB parts. Added ATP Electronics 256MB part. Added Kingston 128MB part. (In shaded area).
Sept/00	7.0	Added Kingston, Corsair & Smart Modular 256MB parts. Added Dataram 128MB part. Added Viking 512MB part. Added PC-133 supported memory chart. Added PC-133 parts. (In shaded area).
Sept/00	8.0	Added Legend 256MB part. (In shaded area).
Oct/00	9.0	Added Dataram 512MB part. (In shaded area).
Oct/00	10.0	Added Dataram 256MB part. (In shaded area).
Oct/00	11.0	Added Viking & Corsair 512MB part. Added Simple Tech & Silicon Tech 1G parts. Correct part size for Simple Tech & Silicon Tech from 64MB to 512MB. (In shaded area).
Nov/00	12.0	Added Viking 128MB & 512MB parts. (In shaded area).
Nov/00	13.0	Added Centon Electronics 512MB parts. Added Memory Products 256MB parts. (In shaded area).
Dec/00	14.0	Added Hyundai & Micron 64MB parts. Added Hyundai, Micron & Samsung 256MB & 512MB parts. Added Samsung 128MB part. Added Dataram 512MB parts. (In shaded area).
Dec/00	15.0	Added Aved Memory Products & Infineon Technologies 256MB parts. Added Dataram 512MB part. (In shaded area).
Jan/01	16.0	Added Simple Tech & Silicon Tech 512MB parts. Added Viking 256MB part. Added Aved Memory Products 128MB part. (In shaded area).
Jan/01	17.0	Added Aved Memory Products 64MB, 128MB & 512MB parts. Added Kentron & Dataram 1GB part. Added 2 nd part number for some Viking parts. Correction made for Samsung 1G part. Identified EOL part. (In shaded area).
Feb/01	18.0	Correction made for Samsung 1G part. Added 2 nd part number for Samsung 512MB part. Added GoldenRAM, Dataram & Aved Memory Products 512MB parts. (In shaded area).
Mar/01	19.0	Added Silicon Tech & Simple Tech 256MB parts. Added Dataram 256 & 512MB part. Added GoldenRAM 64MB part. Added Viking 128MB & 1G parts. Added Hyundai 64MB part. Added Itaucom 128MB part. Added Infineon 256MB part. Added Samsung 1G part. (In shaded area).
May/01	20.0	Added Itaucom 128MB & 256MB parts. (In shaded area).
June/01	21.0	Added Dataram 256MB parts. Added PNY 128MB & 256MB parts. (In shaded area).
June/01	22.0	Added Viking and Aved Memory Products 256MB parts, Dataram 512MB part, PNY 128MB part, GoldenRam 64MB part. (In shaded area).
June/01	23.0	Added Dataram 256MB part. (In shaded area).
July/01	24.0	Added Dataram 256MB parts, and 1GB parts. (In shaded area)
July/01	25.0	Added PNY 256MB part, and Dataram 1GB part. (In shaded area)
July/01	26.0	Added Aved 256MB part. (In shaded area)

Revision History - Continued		
Date	Rev	Modifications
Aug/01	27.0	Added Aved 128MB, Dataram 128MB and 256MB parts. (In shaded area)
Aug/01	28.0	Added Aved 128MB and 256MB parts. (In shaded area)
Aug/01	29.0	Added Dataram 256MB parts. (In shaded area)
Aug/01	30.0	Added Dataram 256MB part. (In shaded area)
Sept/01	31.0	Added PNY 1GB parts. (in shaded area)
Oct./01	32.0	Added PNY 512MB part. Added Dataram 256MB part. (in shaded area)
Nov./01	33.0	Added Samsung 64MB, 256MB, 512MB & 1G parts. (in shaded area)
Jan/02	34.0	Added Dataram 1G part. (In shaded area)
Jan./02	35.0	Added Dataram 512MB part. (In shaded area)
Mar./02	36.0	Added ATP 1GB parts. (In shaded area)
April/02	37.0	Updated Dataram part numbers (~ noted with this symbol).
Aug/02	38.0	Added MSC 256MB & 512MB parts. (In shaded area)
Aug/02	39.0	Added MSC 256MB & 512MB parts. (In shaded area)
Sept/02	40.0	Added MSC 512MB parts. (In shaded area)
Oct/02	41.0	Added Dataram 512MB parts. (In shaded area)
Oct/02	42.0	Added Dataram 1GB parts. Added MSC 512MB parts. (In shaded area)
Oct/02	43.0	Added Dataram 256MB & 1GB parts. (In shaded area)
Jan/03	44.0	Added MSC 512MB parts. (In shaded area)
Jan/03	45.0	Added MSC 256MB & 512MB parts. (In shaded area)
Jan/03	46.0	Added Legend 256MB parts. Added Avant & MSC 512MB parts. (In shaded area)
Feb/03	47.0	Added Avant & Buffalo 512MB Parts. (In shaded area)
Mar/03	48.0	Added MSC 512MB parts. (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 boards 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 SKA4 Server Board 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® SKA4 Server Board. Memory is a vital subsystem in a platform. Intel Corporation requires strict guidelines to be met before a memory 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)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 NT* version 4.0 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. 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 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 SKA4 Server Board

The memory module on the SKA4 server board has 16 DIMM sockets, which can hold up to 16 GB of ECC memory using sixteen 72 bit DIMM modules. The following memory features are supported:

- 100 MHz, PC-100 and PC-133 compatible 3.3V registered SDRAM modules (in compliance with the PC-100 and the PC-133 Registered DIMM Specification, Revision 1.2)
- DIMMs with capacity of 64MB, 128MB, 256 MB, 512 MB and 1G. Other DRAM sizes may function correctly but will not be validated.
- Minimum configuration of 256MB using four 64MB DIMMs.

Below are the charts that list the current supported memory types:

PC-100 Registered SDRAM Module Configurations for Cas Latency 2 & 3					
DIMM Capacity	DIMM Organization	SDRAM Density	SDRAM Organization	# SDRAM Devices/rows/Banks	# Address bits rows/Banks/column
64MB	8M x 72	64Mbit	8M x 8	9/1/4	12/2/9
128MB	16M x 72	64Mbit	16M x 4	18/1/4	12/2/10
128MB	16M x 72	128Mbit	16M x 8	9/1/4	12/2/11
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	64M x 4	9/1/4	13/2/11
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

PC-133 Registered SDRAM Module Configurations for Cas Latency 2 & 3					
DIMM Capacity	DIMM Organization	SDRAM Density	SDRAM Organization	# SDRAM Devices/rows/Banks	# Address bits rows/Banks/column
64MB	8M x 72	64Mbit	8M x 8	9/1/4	12/2/9
128MB	16M x 72	64Mbit	16M x 4	18/1/4	12/2/10
128MB	16M x 72	64Mbit	8M x 8	18/2/4	12/2/10
128MB	16M x 72	128Mbit	16M x 8	9/1/4	12/2/10
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	64M x 4	9/1/4	13/2/11
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

Memory features are detailed in *the SKA4 Server Board Technical Product Specification* available on-line at <http://support.intel.com/support/motherboards/server/>

The following table lists DIMM devices known to be compatible with the Intel SKA4 Server Board. 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.

SKA4 Server Board

Registered, ECC, 100MHz SDRAM DIMM Modules 64MB Sizes (8Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Samsung	KMM377S823CT1-GL				4/20/00		3	
Samsung	KMM377S823DT3-GH1				5/11/00		2	
Infineon Technologies	HYS72V8200GR-8-B	HYB39S64800BT-8	Infineon	P564168NE BS6GCX	7/20/00	B186		
Hyundai	HYM7V75AS801BTHG-10S				7/27/00		2	
Micron	MT9LSDT8726-10EC3				10/3/00		2	
~Aved Memory Products	AMP377P0823BT2-C1H/H	HY57V658020BTC-10P-A rev B	Hyundai	105399 rev B	1/5/01	B993	2	
Hyundai	GMM2739230EPTG-7K				12/14/00		2	
Samsung	M377S823ET3-C1H		Samsung		3/19/01		2	

Registered, ECC, 133MHz SDRAM DIMM Modules 64MB Sizes (8Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Micron	MT9LSDT872G-133C3				8/14/20		3	
Samsung	M390S0823DT1-C75				8/16/00		3	
~GoldenRAM	7550010-GR	MT48LC8M8A2-7.5 rev A	Micron	1030238-001A rev A	2/15/01	B629	3	
~GoldenRAM	7550010-GR	MT48LC8M8A2-75 rev C	Micron	1030238-001A rev A	5/26/01	C986	3	

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

SKA4 Server Board

**Registered, ECC, 100MHz SDRAM DIMM Modules
128MB Sizes (16Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Micron	MT9LSDT1672G-10EB1				4/12/00		2	
Samsung	KMM377S1620DT3-GH				4/21/00		2	
NEC	MC-4516DA726EFC-A80				4/22/00		2	
~DataRam	DTM60089	MT48LC16M4A2T G-8E	Micron		6/5/00	B144		
Samsung	M377S1723BT3-C1H				6/5/00		2	
~Viking	INT12816 And PC10016X72RCL2-1A	UPD45128841G5-A80	NEC	9001742G	8/1/00	B169		
Infineon Technologies	HYS72V16200GR-8-B	HYB39S64400BT-8	Infineon	P512168 NESS6G CX rev A	8/8/00	B168		
Kingston	KVR100X72RC2/128-IS	UPD4564441G5-A80-9JF	NEC	2022146-001 rev C00	8/25/00	B402		
~Dataram	DTM60089	HY57V654020BTC-10P	Hyundai	40455 rev B	9/6/00	B382		
~Viking	PE16721R4SN3-UN05	UPD4564441G5-A80	NEC	9001690 rev A	10/20/00	B627		
~Aved Memory Products	AMP377P1723BT2-C1H/S	K4S280832B-TC1H rev B	Samsung	105399 rev B	1/2/01	B736	2	
~Aved Memory Products	AMP377P1723AT2-C1H/H	HY57V28820AT-P rev A	Hyundai	105399 rev B	1/4/01	B734	2	
~Viking	PE16721R4SN3-UN04	MT48LC16M8A2-8E REV. B	Micron	9001742 REV.A	2/23/01	C271	2	
Samsung	M377S1620ET3-C1H		Samsung		2/26/01		2	
~Aved Memory Products	AMP377P1723AT2-C1H/MI	MT48LC16M8A2T G-7E rev A	Micron	105399 rev B	8/9/01	C992	2	
Samsung	M377S1723DT3-C1H		Samsung		9/28/01		2	
Micron	MT9LSDT1672G-133B1				8/14/00		3	
Samsung	M390S1620DT1-C75				8/22/00		3	
Samsung	M390S1723AT1-C75				8/22/00		3	
Samsung	M390S1723BT1-C75				8/28/00		3	
Infineon	HYS72V16300GR-7.5-B				8/28/00		3	
Samsung	M390S1723CT1-C75				11/01/00		3	
~Aved Memory Products	AMP377P1723AT2-C75/H	HY57V28820AT-H rev A	Hyundai	105399 rev B	1/8/01	B760	3	
Itaucom	ICMM16M6472A6HYR-5Q				3/5/01		3	
Itaucom	ICMM16M6872A6MCK-5Q	ICM4V280806-5	Micron	4200-06A2	4/26/01	C476	3	
# ~PNY	7216ZHSTM4G13TWI-PK0	TC59SM708AFT-75 rev A	Toshiba	40000494 rev A	5/23/01	C125	3	
#~PNY	7216ZHSTM4G13TWI-PH0	HYB39S128800CT-7.5 rev C	Infineon	40000494 rev A	6/6/01	C185	3	

**Registered, ECC, 133MHz SDRAM DIMM Modules
128MB Sizes (16Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
#~Dataram	DTM60158(60158Z)(M)	MT48LC16M8A2T G-75 rev E	Micron	40484 rev A	8/9/01	D698	3	
~Aved Memory Products	AMP377P1723AT2- C7B/MI	MT48LC16M8A2T G-7E rev A	Micron	105399 rev B	08/17/01	D004	3	

Low Profile part.

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

Part Numbers are subject to change at any time.

NOTE: Preliminary testing has shown that stacked DIMMs can potentially have thermal issues when all DIMM sites are populated and either the Cabrillo-2 or SR4000 chassis is used. Populating only in a staggered configuration (i.e. Banks A and C or B and D only) will reduce the chance of thermal issues arising.

SKA4 Server Board

Registered, ECC, 100MHz SDRAM DIMM Modules 256MB Sizes (32Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Toshiba	THMY7232FOEG-80				4/14/00		2	
NEC	MC-4532DA726EFB-A80				4/19/00		2	
Micron	MT18LSDT3272G-10EB1				5/3/00		2	
Samsung	KMM377S3323AT-GH				5/15/00		2	
~Viking	INT25601 And PC10032X72RCL3-IA	D45128441G5-A10-9JF	NEC	9001690	7/15/00	B170		
~Dataram	DTM60287(60087Y)	HY57V1298020TC-10P	Hyundai	40454 rev C	7/21/00	B200		
Infineon Technologies	HYS72V32200GR-8-A	HYB39S256800T-8	Infineon	P564168NEB S6GCX Rev:A	7/27/00	B167		
~Dataram	DTM60122	HY57V1294020TC-10P	Hyundai	40455 rev B	7/23/00	B198		
ATP Electronics	AR32V72C4S4GLS	K4S280432B-TC1L rev B	Samsung	SR168C04V rev 1	8/22/00	B420		
Kingston	KVR100X72RC2/256-IS	TC59SM704FT-80	Toshiba	2022146-001 rev B00	8/29/00	B407		
Corsair	CM764S256-GX2/T	TC59SM708FT-80	Toshiba	50-00099 rev A	8/30/00	B421		
Smart Modular	SM572324574E0BP	KM44S32030BT-GH	Samsung	P512168NES S6GCX rev B	9/15/00	B453		
Legend	L3272QC3	MT48LC16M8A2TG-75	Micron	B5982 rev A	9/22/00	B520		
~Dataram	DTM60287(60087Y)	MT48LC16M8A2TG-8E	Micron	40454 rev C	10/5/00	B286		
~Aved Memory Products	AMP377P3323BT2- C1H/S	K4S280832B-TC1H rev B	Samsung	105352 rev B	11/14/00	B752		
Samsung	M377S3323CT0-C1H				10/16/00		2	
Hyundai	HYM71V32C755AT4-P				11/17/00		2	
~Aved Memory Products	AMP377R3323AT2- C1H/H	HY57V28820AT-P rev A	Hyundai	105352 rev B	12/6/00	B754		
Infineon Technologies	HYS72V32200GR-8-C2	HYB39S256800CT-8 rev C2	Infineon	E53863-X30	12/2/00	B825		
~Dataram	DTM60287(60087Y)	MT48LC16M8A2TG-75 rev A	Micron	40454 rev C	5/10/01	C300	2	
# ~Dataram	DTM60171(60171Z)	K4S560832B-TC1H rev B	Samsung	40506 rev A	5/16/01	C215	2	
# ~Dataram	DTM60171(60171Z)	HM5225805BTT-A6 rev B	Hitachi	40506 rev A	5/16/01	C222	2	
~Viking	PE32721R4SN3-UN01	UPD45128441G5-A80	NEC	9001603	5/26/01	C264	2	
Samsung	M377S3320DT3-C1H		Samsung		9/27/01		2	
Samsung	M377S3323DT0-C1H		Samsung		9/27/01		2	
Samsung	M377S3253CT0-C1H		Samsung		9/28/01		2	
Samsung	M390S3320AT1-C75				8/22/00		3	
Samsung	M390S3320BT1-C75				8/23/00		3	
~Aved Memory Products	AMP377P3323AT2- C75/H	HY57V28820AT-H rev A	Hyundai	105352 rev B	11/16/00	B763		
Micron	MT18LSDT3272G-133B1				10/3/00		3	

**Registered, ECC, 133MHz SDRAM DIMM Modules
256MB Sizes (32Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Hyundai	HYM71V32C735AT4-H				10/9/00		3	
GoldenRAM	7550030-GR	MT48LC16M8A2-7.5	Micron	1030238-001A rev A	12/27/00	B635	3	
Infineon	HYS72V32300GR-7.5-C2				12/7/00	3		
Silicon Tech	INT72R8E32M4H-A75AV	K4S280832C-TC75	Samsung	814	2/6/01	C192	3	
Simple Tech	SINT7232118RD2-75AVG	K4S280832C-TC75	Samsung	814	2/6/01	C197	3	
~Dataram	DTM60125	MT48LC32M4A2TG-75 rev B	Micron	40481 rev A	2/19/01	C475	3	
Itaucom	ICMM32M6872A6MCK-6P	ICM4V2806-6A	Micron	4200-06A2	4/26/01	C481	2	
~PNY	7232ZHSTM4G24TWR-PK0	TC59SM708AFT-75 rev A	Toshiba	40000476 rev B	5/16/01	C132	3	
~Aved Memory Products	AMP377P3323AT2-C75/MV	V54C3128804VAT-7 rev A	Mosel-Vitellic	105352 Rev.B	6/6/2001	C516	3	
~Dataram	DTM60189(M)(60189Z)	MT48LC16M8A2TG-75 rev E	Micron	40532 rev B	6/27/01	C905	2	
~Dataram	~DTM60087Y (Old Part# DTM60287(60087Y)(M))	MT48LC16M8A2TG-75 rev E	Micron	40054 rev C	6/30/01	D636	2	
~Dataram	DTM60122 60122Z (M)	MT48LC32M4A2TG-75 rev E	Micron	40455 rev B	6/30/01	D881	2	
~PNY	7232ZHSTM4G24TWR-PH0	HYB39S128800CT-7.5 rev C	Infineon	40000476 rev B	7/18/01	C118	3	
~Aved Memory Products	AMP377P3323AT2-C7B/MI	MT48LC16M8A2TG-7E rev A	Micron	105352 rev B	7/26/01	C952	2	
~#Dataram	DTM60188(60188Z)(I)	HYB39S128400CT-7.5 rev C	Infineon	40506 rev A	8/7/01	C911	3	
~Dataram	DTM60125(60125Z)(M)	MT48LC32M4A2TG-75 rev E	Micron	40481 rev A	8/7/01	D648	3	
~Aved Memory Products	AMP377P3323AT2-C1H/MI	MT48LC16M8A2TG-7E rev A	Micron	105352 rev B	08/17/01	D069	2	
~#Dataram	DTM60172(60172Z)(Y)	HM5225805BTT-75 rev B	Hitachi	40506 rev A	8/24/01	C230	3	
~#Dataram	DTM60188 (60188) (M)	MT48LC32M4A2TG-75 rev E	Micron	40506 rev A	08/30/01	E005	3	
~Dataram	DTM60125 (68014Z) (Y)	HY57V28420AT-H rev A	Hyundai	651219-G1 rev 1	9/24/01	E456	3	
Samsung	M390S3320CT1-C75		Samsung		4/4/01		3	
Samsung	M390S3253CT1-C75		Samsung		10/05/01		3	
Samsung	M390S3320DT1-C75		Samsung		10/12/01		3	
~MSC Vertriebs GmbH	MSC256M00036	K4S560832C-TC rev C	Samsung	M0508LA1	8/1/02	J799	3	
~MSC Vertriebs GmbH	MSC256M00040	HYB39S256800CT-7.5 rev C	Infineon	M0508LA1	8/12/02	J803	3	

**Registered, ECC, 133MHz SDRAM DIMM Modules
256MB Sizes (32Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
~#Dataram	DTM60172F	MT48LC32M8A2TG-75 rev C	Micron	40506 rev A	10/23/02	K626	3	
~#MSC Vertriebs GmbH	MSC256M00142	HYB39S256800CT-7.5 rev C	Infineon	M0493LA2	12/30/02	J874	3	
~Legend	L3272QC3-59BHSC3B	HY57V56820BT-H rev B	Hyundai	B5982 rev B	1/21/03	001553	3	

Low Profile part.

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Part Numbers are subject to change at any time.

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SKA4 Server Board

**Registered, ECC, 100MHz SDRAM DIMM Modules
512 MB Sizes (64Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Samsung	KMM377S6453AT-GH / M377S6450AT3-C1H				4/19/00		2	
Toshiba	THMY7264EOLEG-80				4/21/00		2	
Samsung	KMM377S6450AT-GH				5/1/00		2	
NEC	MC-4564EC726EFB-A80				5/9/00		2	
Silicon Tech	INT72R4J64M4H-A10DV	D45128441G5-A80 die A	NEC	734 rev A	6/8/00	B177		
Simple Tech	SINT7264118IRD2-10DVG	D45128441G5-A80 die A	NEC	734 rev A	6/8/00	B178		
~Viking	INT51204	UPD45128441G5-A10	NEC	9923717/9923715BG/9923716	6/19/00	B171		
Kentron	KT6472SRN0R-14V3	KM44S32030BT-GH	Samsung	3272SRN3-PCB	6/27/00	B195		
~Dataram	DTM60091	HY57V1294020TC-10S	Hyundai	40455 rev B	7/6/00	B143		
Infineon Technologies	~HYS72V64200GR-8-A	HYB39S256400T-8	Infineon	P512168NE SS6GCX Rev:A	7/7/00	B166	2	
Smart Modular	SM572644578E6BP	KM44S64230AT-GH	Samsung	P512168NE SS6GCX	7/26/00	B225		
Kentron	KT6472SRN0R-07V3	MT48LC32M4A2TG-8E B	Micron	3272SRN3-PCB	7/28/00	B311		
~Viking	INT51202	KM44S32030T-GL	Samsung	9923715B.9 923716 rev A, 9923717A	8/3/00	B371		EOL
Simple Tech	INT72R8F64M8H-A10CV	HYB39S256800AT-8	Infineon	814 rev A	8/10/00	B372		
Silicon Tech	SINT7264218RD2-10CVG	HYB39S256800AT-8	Infineon	814 rev A	8/10/00	B373		
Kingston	KVR100X72RC3/512-IS	HYB39S256400AT-8	Infineon	2022254-001 rev A00	8/17/00	B405		
ATP Electronics	AR64V72C4S8GLS	K4S560432A-TC1L rev A	Samsung	SR168C04V rev 1	8/21/00	B419		
~Viking	INT51208	0312404CT3 rev A	IBM	9923715 rev C/9923716 rev A 9923717A	9/11/00	B457		
~Dataram	DTM60291(60163Z)	HYB39S256800T-8A	Infineon	40454 rev C	9/26/00	B425		
Corsair	CM764S512-100/S	K4S560832A-TC1L rev. A	Samsung	50-00099 rev. A	10/12/00	B583		

**Registered, ECC, 100MHz SDRAM DIMM Modules
512 MB Sizes (64Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
~Viking	4D64722R4SN3-UN01	UPD45128441G5-A80	NEC	9923715C G- 9923716A- 9923717A	11/01/00	B609		
Centon Electronics	CINT512M/RP100S	MT48LC32M4A2TG-8E dram A2	Micron	CPCB-00401-G rev C	11/17/00	B601		
Hyundai	HYM72V64C756T4-S				10/3/00		3	
~Dataram	DTM60292 (60161Z)	K4S560832B-TC1H rev B	Samsung	40454 rev C	11/28/00	B395		
~Dataram	DTM60123	HYB39S256400CT-8	Infineon	40455 rev B	11/30/00	B142		
~Dataram	DTM60291 (60163Z)	K4S560832A-TCIL rev A	Samsung	40454 rev C	12/15/00	B815	3	
~Aved Memory Products	AMP377P6453BT2-C1H/S	K4S560832B-TC1H000	Samsung	1053352 rev 2	1/14/01	B910	2	
~Dataram	DTM60291(60163Z)(I)	HYB39S256800CT-8 rev C	Infineon	40454 rev C	5/26/01	D011	3	

**Registered, ECC, 133MHz SDRAM DIMM Modules
512 MB Sizes (64Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Hyundai	HYM72V64C736T4-H				8/23/00		3	
Infineon	HYS72V64300GR-7.5-C2				8/28/00		3	
Samsung	M390S6450AT1-C75				11/1/00		3	
Simple Tech	SINT7264118IRD2-75AVG	K4S280432C-TC75	Samsung	758	12/26/00	B938	3	
Silicon Tech	INT72R4J64M4H-A75AV	K4S280432C-TC75	Samsung	758	12/26/00	B939	3	
GoldenRAM	7550040-GR	K4S560832A-TC75	Samsung	1030238-001 rev A	1/30/01	B638	3	
~Dataram	DTM60133(60133Z)	K4S560432A-TC75 rev A	Samsung	40481 rev A2	1/30/01	C018	3	
~Aved Memory Products	AMP377P6453BT2-C75/S	K4S560832B-TC75	Samsung	105352 REV. B	1/31/01	C099	3	
~Dataram	DTM60133(60133Z)	HM5225405BTT-75 rev A	Hitachi	40481 rev a2	2/14/01	C025		
Samsung	M390S6450BT1-C75				2/20/01		3	
~PNY	7264WHSTM8G24TWR-PK0	TC59SM808BFT-75 rev B	Toshiba	40000476 rev B	9/11/01	C148	3	
Samsung	M390S6450CT1-C75		Samsung		10/25/01		3	
Dataram	DTM68015 (Y)	HY57V56420T-H	Hyundai	651219-G rev 1	1/11/02	G070	3	
~Dataram	DTM60194A	MT48LC64M4A2TG-75 rev B	Micron	40551 rev A	2/6/2002	H279	3	
~MSC Vertriebs GmbH	MSC512M00002	K4S560432C-TC75 rev C	Samsung	M0507LA1	7/29/02	J800	3	
~MSC Vertriebs GmbH	MSC512M00041	HYB39S256800CT-7.5 rev C	Infineon	M0508LA1	8/19/02	J797	3	
~MSC Vertriebs GmbH	MSC512M00003	MT48LC64M4A2TG-75 rev A	Micron	M0507LA1	9/3/02	J795	3	

**Registered, ECC, 133MHz SDRAM DIMM Modules
512 MB Sizes (64Mx72)**

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
~MSC Vertriebs GmbH	MSC512M00148	K4S510832C-KC75 rev C	Samsung	M0493LA2	9/11/02	J796	3	
~Dataram	DTM60194F	MT48LC64M4A2TG-75 rev C	Micron	40551 rev A	9/23/02	000565	3	
~MSC Vertriebs GmbH	MSC512M00037	K4S560832C-TC rev C	Samsung	M0508LA1	7/23/02	J798	3	
~MSC Vertriebs GmbH	MSC512M00149	HYB39S256400DT-7 rev D	Infineon	M0507LA1	12/19/02	J884	2	
~MSC Vertriebs GmbH	MSC 512M00152	K4S560832D-TC75 rev D	Samsung	PCB M0508LA1	1/10/03	000593	3	
~#Avant Technology	AVE7264R38A3133E1-A	K4S560432D-TC75 rev D	Samsung	501412-01A rev A	1/29/03	001517	3	
~MSC Vertriebs GmbH	MSC 512M00152	K4S560832D-TC75 rev D	Samsung	PCB M0508LA1	1/10/03	000593	3	
~#Avant Technology	AVE7264R38A3133E1-A	K4S560432D-TC75 rev D	Samsung	501412-01A rev A	1/29/03	001517	3	
~Buffalo	VS133-R512/MC	MT48LC32M8A2TG-75 rev C	Micron	ZEY8RWF-AA	2/6/03	002677	3	
~MSC Vertriebs GmbH	MSC 512M00153	HYB 39S256800DT-7.5 rev D	Infineon	PCB M0508LA1	3/12/03	L220	3	

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SKA4 Server Board
Registered, ECC, 100MHz SDRAM DIMM Modules
1G Sizes (64Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
Samsung	~KMM377S2858AT3-GL And M377S2858AT3-C1L00				4/17/00		3	
Infineon	HYS72V128220GR-8A				5/3/00		3	
Infineon	HYS72V128220GR-8-A				6/13/00		2	
Simple Tech	SINT72128218IRD2-10DVG	HYB39S256400T-8	Infineon	734 rev A	6/19/00	B172		
Silicon Tech	INT72R4L128M8H-A10DV	HYB39S256400T-8	Infineon	734 rev A	6/19/00	B173		
Kentron	KT12872SRN0R-14V3	K4S560432A-TC75	Samsung	3272SRN3-PCB	1/18/01	C040	3	
~Viking	4D128722R8SN3-UN01	K4S560432A-TC1H	Samsung	9923717A/ 9923716A/ 9923715C REV.A-C	2/21/01	C250	2	
~Dataram	DTM60117(60117Z)(I)	HYB39S256400AT-8 rev B	Infineon	40455 rev B	7/17/01	C282	2	
~ATP Electronics	AR128V72N4SMGHS	K4S560432A-TC1H rev A	Samsung	SR168N04 V rev 2	3/7/02	H784	2	

Registered, ECC, 133MHz SDRAM DIMM Modules
1G Sizes (64Mx72)

Manufacturer	Part Number	DRAM Part Number	DRAM Vendor	PCB Part Number	Date	CMTL Test #	CAS Latency	EOL
~Dataram	DTM60126(60126Z)	HM5225405BTT-75 rev B	Hitachi	40481 rev A2	1/23/01	C052		
Samsung	M390S2858BT1-C75				2/20/01		3	
~Dataram	DTM60126(60126Z)(S)	K4S560432B-TC75 rev B	Samsung	40481 rev A	7/12/01	D944	3	
~PNY	72A0UHSTM8G24KWR-PK0	TC59SM804BFT-75 rev B	Toshiba	40000475 rev B	9/4/01	D735	3	
Samsung	M390S2858CT1-C7A		Samsung		10/17/01		3	
~Dataram	~DTM60192A (Old Part# DTM60192(M))	MT48LC64M4A2TG-75 rev B	Micron	40481 rev A	12/13/01	G061	3	
~Dataram	DTM60193A	MT48LC64M4A2FB-75 rev B	Micron	40554 rev A	1/30/02	G461	3	
~Dataram	DTM60193C	MT48LC64M4A2FB-75 rev B	Micron	40554A rev A	10/7/02	000200	3	
~Dataram	DTM60192F	MT48LC64M4A2TG-75 rev C	Micron	40481 rev A	10/15/02	000575	3	

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CMTL® (Computer Memory Test Labs)

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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 Xeon™ 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 SKA4 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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