

Memory Products

In Brief . . .

Motorola's memory product portfolio has been expanded to support a broad range of engineering applications. Included in this portfolio are asynchronous devices with access times of 6 ns at 256K-bit density, 6 ns at 5 V 1 Megabit density, 8 ns at 3.3 V 1 Megabit density, as well as synchronous FSRAMs with access times as fast as 4.5 ns and 7.5 ns.

Motorola's Fast Static RAM Division goal is simple: speed. All of our SRAMs are designed to provide the highest performance, cost efficient solutions available.

The Dynamic Memory Products Division utilizes alliances as a vehicle for global customer support in the DRAM and Flash memory markets. The product portfolio consists of high-density DRAMs, standard and custom memory modules, and low power Flash memory.

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Fast Static RAMs

Introduction

Motorola is designing the fastest, most technologically advanced fast SRAMs. From 0.8 to 0.5 μm with access times as fast as 5 V 6 ns 256K, 6 ns 1M, 13 ns 4M, and 8 ns 3.3 V 1M; these devices are progressively smaller, faster, and lower cost. These SRAMs are designed to provide the highest performance, cost efficient solutions available. Selected fast SRAMs are also available on 2M and 8M memory modules.

Application specific memories are designed for high-performance microprocessors that require more specialization from memory cache than is available from standard devices. Products include those for use with digital signal processors as well as a variety of popular microprocessors.

SYNCHRONOUS

Late Write RAMs

Description	Organization	V _{CC}	Motorola Part Number	Pin Count	Packaging	Cycle Time (ns Max)	Production	Comments		
4M	256K x 18	3.3 V	MCM69R818	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69R818A.		
			MCM69R819	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69R819A.		
			MCM69R820	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69R820A.		
			MCM69L818	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69L818A.		
			MCM69L819	119	(ZP) PBGA	8/9	Now	Not recommended for new designs. Suggest MCM69L819A.		
			MCM69L820	119	(ZP) PBGA	8/9	Now	Not recommended for new designs. Suggest MCM69L820A.		
	128K x 36	3.3 V	MCM69R736	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69R736A.		
			MCM69R737	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69R737A.		
			MCM69R738	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69R738A.		
			MCM69R739A	119	(ZP) PBGA	4.2/4.5/5	Now			
			MCM69L736	119	(ZP) PBGA	7/8	Now	Not recommended for new designs. Suggest MCM69L736A.		
			MCM69L737	119	(ZP) PBGA	8/9	Now	Not recommended for new designs. Suggest MCM69L737A.		
	256K x 18	3.3 V	MCM69R818A	119	(ZP) PBGA	5/6/7/8	2Q97	Late write interface. Register/Register. HSTL I/Os. Samples now.		
			MCM69R819A	119	(ZP) PBGA	5/6/7/8	2Q97	Late write interface. Register/Register. LVTTTL I/Os. Samples now.		
			MCM69R820A	119	(ZP) PBGA	5/6/7/8	2Q97	Late write interface. Register/Register. 2.5 V I/Os. Samples now.		
			MCM69R821A	119	(ZP) PBGA	4.2/4.5/5	2Q97	Late write interface. Register/Register. HSTL I/Os. Dual clock. Samples now.		
			MCM69L818A	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	2Q97	Late write interface. Register/Latch. HSTL I/Os. Samples now.		
			MCM69L819A	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	2Q97	Late write interface. Register/Latch LVTTTL I/Os. Samples now.		
			MCM69L820A	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	2Q97	Late write interface. Register/Latch 2.5 V I/Os. Samples now.		
			128K x 36	3.3 V	MCM69R736A	119	(ZP) PBGA	5/6/7/8	2Q97	Late write interface. Register/Register. HSTL I/Os. Samples now.
					MCM69R737A	119	(ZP) PBGA	5/6/7/8	2Q97	Late write interface. Register/Register. LVTTTL I/Os. Samples now.
					MCM69R738A	119	(ZP) PBGA	5/6/7/8	2Q97	Late write interface. Register/Register. 2.5 V I/Os. Samples now.
					MCM69R739A	119	(ZP) PBGA	4.2/4.5/5	2Q97	Late write interface. Register/Register. HSTL I/Os. Dual clock. Samples now.
					MCM69L736A	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	2Q97	Late write interface. Register/Latch. HSTL I/Os. Samples now.
MCM69L737A	119	(ZP) PBGA			7.5/8.5/9/9.5 Latency	2Q97	Late write interface. Register/Latch. LVTTTL I/Os. Samples now.			
128K x 36	3.3 V	MCM69L738A	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	2Q97	Late write interface. Register/Latch. 2.5 V I/Os. Samples now.			
1M	64K x 18	3.3 V	MCM69R618	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. HSTL I/Os. Samples now.		
			MCM69R619	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. LVTTTL I/Os. Samples now.		
			MCM69R620	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. 2.5 V I/Os. Samples now.		
			MCM69R621	119	(ZP) PBGA	4.5/5	Now	Late write interface. Register/Register. HSTL I/Os. Dual clock. Samples now.		
			MCM69L618	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	Now	Late write interface. Register/Latch HSTL I/Os. Samples now.		
			MCM69L619	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	Now	Late write interface. Register/Latch LVTTTL I/Os. Samples now.		
	32K x 36	3.3 V	MCM69L620	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	Now	Late write interface. Register/Latch 2.5 V I/Os. Samples now.		
			MCM69R536	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. HSTL I/Os. Samples now.		
			MCM69R537	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. LVTTTL I/Os.. Samples now.		
			MCM69R538	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. 2.5 V I/Os. Samples now.		
			MCM69R539	119	(ZP) PBGA	4.5/5	Now	Late write interface. Register/Register. HSTL I/Os. Dual clock. Samples now.		
			MCM69L536	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	Now	Late write interface. Register/Latch HSTL I/Os. Samples now.		
			MCM69L537	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	Now	Late write interface. Register/Latch LVTTTL I/Os. Samples now.		
			MCM69L538	119	(ZP) PBGA	7.5/8.5/9/9.5 Latency	Now	Late write interface. Register/Latch 2.5 V I/Os. Samples now.		

SYNCHRONOUS

BurstRAMs™

Description	Organization	V _{CC}	Motorola Part Number	Pin Count	Packaging	Access Time (ns Max)	Production	Comments	
4M	256K x 18	3.3 V	MCM69F817	119	(ZP) PBGA	6/6.5/7	4Q97	0.5 ns setup time, 1 ns hold time. Highend workstations and servers. Samples available 3Q97.	
			MCM69L817	119	(ZP) PBGA	6/6.5/7	4Q97	0.5 ns setup time, 1 ns hold time. Highend workstations and servers. Samples available 3Q97.	
			MCM69P819	100 119	(TQ) TQFP (ZP) PBGA	3.5/3.8/4/4.5	Now	Pipelined BurstRAM for servers, switches, and workstations.	
			MCM69F819	100 119	(TQ) TQFP (ZP) PBGA	7.5/8/8.5/11	Now	Flow-through BurstRAM for servers, switches, and workstations.	
	128K x 36	3.3 V	MCM69F735	119	(ZP) PBGA	6/6.5/7	4Q97	0.5 ns setup time, 1 ns hold time. Highend workstations and servers. Samples available 3Q97.	
			MCM69L735	119	(ZP) PBGA	6/6.5/7	4Q97	0.5 ns setup time, 1 ns hold time. Highend workstations and servers. Samples available 3Q97.	
			MCM69P737	100 119	(TQ) TQFP (ZP) PBGA	3.5/3.8/4/4.5	Now	Pipelined BurstRAM for servers, switches, and workstations.	
			MCM69F737	100 119	(TQ) TQFP (ZP) PBGA	7.5/8/8.5/11	Now	Flow-through BurstRAM for servers, switches, and workstations.	
	128K x 32	3.3 V	MCM63P733	100	(TQ) TQFP	4/4.5/5	2Q97	133 MHz pipelined BurstRAM, for servers and notebooks.	
			MCM63F733	100	(TQ) TQFP	TBD	2Q97	133 MHz flow-through BurstRAM, for servers.	
	2M	64K x 32	3.3 V	MCM63P631	100	(TQ) TQFP	4.5/7/8	Now	100 MHz pipelined BurstRAM, for desktop PCs and communications applications.
				MCM63PV631	100	(TQ) TQFP	8	Q297	Sampling now. 2.5 V I/O GreenRAM™. For MMX processor, notebooks, and low-power needs.
1M	64K x 18	3.3 V	MCM69F618A	100	(TQ) TQFP	8.5/9/10/12	Now	Flow-through BurstRAM, 3.3 V only. Convert to MCM69F618C.	
			MCM69F618C	100	(TQ) TQFP	8.5/9/10/12	3Q97	5 V tolerant on all pins. 3.3 V core supply. Samples 3Q97.	
			MCM69P618A	100	(TQ) TQFP	4.5/5/6/7	Now	Pipelined BurstRAM, 3.3 V only. Convert to MCM69P618C.	
			MCM69P618C	100	(TQ) TQFP	4.5/5/6/7	3Q97	5 V tolerant on all pins. 3.3 V core supply. Samples 3Q97.	
		5 V	MCM67B618A	52	(FN) PLCC	8.5/9/10/12	Now	Flow-through BurstRAM for Pentium™, MIPS. Convert to MCM69B618C.	
			MCM67B618C	52	(FN) PLCC	8.5/9/10/12	Now	5 V tolerant on all pins. 3.3 V core supply. Samples 3Q97.	
			MCM67C618A	52	(FN) PLCC	5/7	Now	Pipelined BurstRAM for Pentium. Convert to MCM69C618C.	
			MCM67C618C	52	(FN) PLCC	5/7	Now	5 V tolerant on all pins. 3.3 V core supply. Samples 3Q97.	
	32K x 36	3.3 V	MCM69F536A	100	(TQ) TQFP	8.5/9/10/12	Now	Flow-through BurstRAM, 3.3 V only.	
			MCM69F536B	100	(TQ) TQFP	8.5/9/10/12	Now	Flow-through BurstRAM, 5 V tolerant I/Os.	
			MCM69F536C	100	(TQ) TQFP	8.5/9/10/12	3Q97	5 V tolerant on all pins. 3.3 V core supply. Samples 3Q97.	
			MCM69P536A	100	(TQ) TQFP	4.5/5/6/7	Now	Pipelined BurstRAM, 3.3 V only.	
			MCM69P536B	100	(TQ) TQFP	4.5/5/6/7	Now	Pipelined BurstRAM, 5 V tolerant I/Os.	
			MCM69P536C	100	(TQ) TQFP	4.5/5/6/7	3Q97	5 V tolerant on all pins. 3.3 V core supply. Samples 3Q97.	

Tag RAMs

Tag RAMs	64K x 18	3.3 V	MCM69T618	100 119	(TQ) TQFP (ZP) PBGA	5/6/7	Now Now	100 MHz Data/Tag RAM. For MIPS R5000, Pentium Pro and graphics accelerators applications.
	16K x 16	3.3 V	MPC27T416	80	(TQ) TQFP	9/10/12	Now	Cache tag RAM for PowerPC. 14 tag bits, 2 status bits.
	16K x 15	3.3 V	MPC27T415	80	(TQ) TQFP	9/10/12	Now	Cache tag RAM for PowerPC. 12 tag bits, 3 status bits. Drop in replacement for IDT71216.

CAMs

CAMs	16K x 64	3.3 V	MCM69C432	100	(TQ) TQFP	180 ns Match Time	2Q97	Content addressable memory for communication applications. 16K connections.
	4K x 64	3.3 V	MCM69C232	100	(TQ) TQFP	160 ns Match Time	Now	Content addressable memory for communication applications. 4K connections.

SYNCHRONOUS

Integrated Cache Solutions

Description	Organization	V _{CC}	Motorola Part Number	Pin Count	Packaging	Access Time (ns Max)	Production	Comments
Integrated Cache Solutions	32K x 72	3.3 V	MPC2605	241	(ZP) PBGA	66 MHz	2Q97	Integrated L2 cache for PowerPC processors. One component for 256KB, two for 512KB, and four for 1MB L2 cache solution. Samples 2Q97.
	32K x 36	5 V	MPC2604GA	357	(ZP) PBGA	66 MHz	Now	Integrated L2 cache for PowerPC processors. Two components for 256KB, four for 512KB L2 cache solution.

Separate and Dual I/O Devices

4M	512K x 9	5 V	MCM67Q909	86	(ZP) PBGA	5/6	Now	General synchronous separate I/O with write pass through. 3.3 V output levels.
1M	128K x 9	5 V	MCM67Q709A	86	(ZP) PBGA	5/6	Now	General synchronous separate I/O with write pass through. 3.3 V output levels. Replaces the MCM67Q709.
	32K x 36	3.3 V	MCM69Q536	176	(TQ) TQFP	6/8/10	2Q97	Single address, separate I/O. NetRAM™ .
			MCM69D536	176	(TQ) TQFP	6/8/10	2Q97	Dual address, dual I/O. NetRAM.
	64K x 18	3.3 V	MCM69Q618	100	(TQ) TQFP	6/8/10	2Q97	Single address, separate I/O. NetRAM.
MCM69D618			100	(TQ) TQFP	6/8/10	2Q97	Dual address, dual I/O. NetRAM.	
Line Buffer	8K x 8	5 V	MCM62X308	28	300 (J) SOJ	15/17	Now	Line buffer for processing digital data.

ASYNCHRONOUS

Density	Organization	V _{CC}	Motorola Part Number	Pin Count	Packaging Package width in mils	Access Time (ns Max)	Production	Comments	
4M	512K x 8	5 V	MCM6246	36	400 (WJ) SOJ	20/25/35	Now	Output enable. Revolutionary pinout.	
		5 V	MCM6246A	36	400 (WJ) SOJ	15/20/25/35	4Q97	Replaces MCM6246.	
		3.3 V	MCM6946	36 44	400 (WJ) SOJ TSOP	10/12/15	3Q97	For telecom, storage and computing applications. Samples 3Q97.	
	256K x 16	3.3 V	MCM6343	44 44	400 (YJ) SOJ TSOP	10/12/15	1Q98	For telecom, storage and computing applications. Samples 4Q97.	
	1M x 4	5 V	MCM6249	32	400 (WJ) SOJ	20/25/35	Now	Output enable. Revolutionary pinout.	
		5 V	MCM6249A	32	400 (WJ) SOJ	15/20/25/35	Now	Replaces MCM6249.	
		3.3 V	MCM6949	32 44	400 (WJ) SOJ TSOP	10/12/15	4Q97	For telecom, storage, and computing applications. Samples 3Q97.	
	128K x 24	3.3 V	MCM6341	119	(ZP) PBGA	10/12/15	1Q98	DSP applications for base stations and other communication applications. Samples early 4Q97.	
	1M	64K x 18	5 V	MCM67A618A	52	(FN) PLCC	10/12/15	Now	Not recommended for new designs. Suggest MCM67A618B.
			5 V	MCM67A618B	52	(FN) PLCC	10/12/15	3Q97	General asynchronous, latched address and data. Samples available late 2Q97.
64K x 16		3.3 V	MCM6323	44	400 (YJ) SOJ	12/15	Now	Revolutionary pinout. DSP applications.	
		3.3 V	MCM6323A	44	400 (YJ) SOJ TSOP	10/12/15	4Q97	Industrial temperature offered. DSP applications. Samples 2Q97. Replaces MCM6323.	
128K x 8		5 V	MCM6226BB	32	300 (EJ), 400 (XJ) SOJ	15/17/20/25	Now	Evolutionary pinout.	
		5 V	MCM6726B	32	400 (WJ) SOJ	8/10/12	Now	Not recommended for new designs. Suggest MCM6726D.	
		5 V	MCM6726C	32	400 (WJ) SOJ	6/7	Now	Revolutionary pinout.	
		5 V	MCM6726D	32	400 (WJ) SOJ	7.5/8/10/12	Now	Revolutionary pinout. Will replace MCM6726B.	
		3.3 V	MCM6926	32	400 (WJ) SOJ	8/10/12/15	Now	Revolutionary pinout.	
		3.3 V	MCM6926A	32	400 (WJ) SOJ	8/10/12/15	3Q97	Revolutionary pinout. Will replace MCM6926. Samples now.	
256K x 4		5 V	MCM6229BB	28	300 (EJ), 400 (XJ) SOJ	15/17/20/25	Now	Evolutionary pinout.	
		5 V	MCM6729B	32	400 (WJ) SOJ	8/10/12	Now	Not recommended for new designs. Suggest MCM6729D.	
		5 V	MCM6729C	32	400 (WJ) SOJ	6/7	Now	Revolutionary pinout.	
		5 V	MCM6729D	32	400 (WJ) SOJ	7.5/8/10/12	Now	Revolutionary pinout. Will replace MCM6729B.	
		3.3 V	MCM6929	32	400 (WJ) SOJ	8/10/12/15	Now	Revolutionary pinout.	
		3.3 V	MCM6929A	32	400 (WJ) SOJ	8/10/12/15	3Q97	Revolutionary pinout. Will replace MCM6929. Samples now.	
1M x 1		5 V	MCM6227B	28	300 (J), 400 (WJ) SOJ	15/17/20/25	Now	For telecom, IC tester applications, and storage.	
DSPRAM™		8K x 24	5 V	MCM56824A	52	(FN) PLCC	20/25/35	Now	Designed for DSP56001 applications. Replaces 38K x 8s.
256K		32K x 8	5 V	MCM6206BA	28	300 (EJ) SOJ	12/15/20/25	Now	Replaces MCM6206D.
			5 V	MCM6206BB	28	300 (EJ) SOJ	12/15/20/25	3Q97	Replaces MCM6206BA.
	5 V		MCM6706B	28	300 (J) SOJ	8/10	Now	Evolutionary pinout.	
	5 V		MCM6706BR	32	300 (J) SOJ	6/7/8	Now	Revolutionary pinout.	
	64K x 4	5 V	MCM6709B	28	300 (J) SOJ	8/10	Now	Evolutionary pinout.	
		5 V	MCM6709BR	28	300 (J) SOJ	6/7/8	Now	Revolutionary pinout.	

FAST STATIC RAM MODULES

(Contact Fast Static RAM Marketing for Custom Fast SRAM Modules)

PowerPC Processor Applications

Description	Chip Set	Functionality	Cache Size	Bus Speed (Max)	Pro-duction	Packaging	Motorola Part Number
PowerPC Cache Modules with 16K x 15 CacheTag	PowerPC CHRP Platforms	Flow-Through Burst	512KB Cache	66 MHz	Now	178 Pin Card Edge DIMM (DG)	MPC2105A
		Flow-Through Burst	1MB	66 MHz	Now		MPC2106A
PowerPC Cache Modules with 16K x 15 CacheTag	PowerPC CHRP Platforms	Pipelined Burst	256KB Cache	Up to 66 MHz	1Q97	178 Pin Card Edge DIMM (DG)	MPC2104P
		Pipelined Burst	512KB Cache	Up to 66 MHz	1Q97		MPC2105P

Pentium Processor Applications

Description	Organization	Functionality	Cache Size	Bus Speed (Max)	Pro-duction	Packaging	Motorola Part Number
Coast Modules	32K x 64	Piped Burst 8 Bit TAG	256KB Cache	66 MHz	1Q97	160 Pin Card Edge DIMM (DG)	MCM64PE32
	64K x 64	Piped Burst 8 Bit TAG	512KB Cache	66 MHz	1Q97	160 Pin Card Edge DIMM (DG)	MCM64PE64

Networking and Buffer Applications Asynchronous Modules

Description	Organization	Access Time (Max)	Production	Packaging	Comments	Motorola Part Number
Standard Asynchronous FSRAM Modules	1M x 32	20/25 ns	1Q97	72 Pin SIMM (SG)	Uses eight 1M x 4 SRAMs	MCM321024
	512K x 32	20/25 ns	1Q97	72 Pin SIMM (SG)	Uses four 512K x 8 SRAMs	MCM32515
	1M x 8	15 ns	1Q97	72 Pin SIMM (SG)	Uses eight 1M x 1 SRAMs	MCM8A10SG

Networking and Buffer Applications Synchronous Modules

Description	Organization	Access Time (Max)	Production	Packaging	Comments	Motorola Part Number
Standard Synchronous FSRAM Modules	64K x 72 512KB	9/10/12 ns	Now	168 Pin DIMM (DG)	Flow-through synchronous BurstRAM	MCM72F6DG
	128K x 32 1 MB	9/10/12 ns	Now	168 Pin DIMM (DG)	Flow-through synchronous BurstRAM	MCM72F7DG
	512K x 72 2MB	8/10/12 ns	Now	168 Pin DIMM (DG)	Flow-through synchronous BurstRAM	MCM72F8DG
	1M x 72 4 MB	8/10/12 ns	Now	168 Pin DIMM (DG)	Flow-through synchronous BurstRAM	MCM72F9DG
	2M x 72 8 MB	8/10/12 ns	Now	168 Pin DIMM (DG)	Flow-through synchronous BurstRAM	MCM72F10DG
	4M x 72 16 MB	8/10/12 ns	Now	168 Pin DIMM (DG)	Flow-through synchronous BurstRAM	MCM72F11DG

Flash Memory

Flash memory is the most cost-effective non-volatile semiconductor memory. Flash possesses a distinct advantage over traditional non-volatile memories in that it can be easily programmed while remaining in the system.

Motorola's Dynamic Memory Products Division will offer a portfolio of low power flash memory devices. Please contact your Motorola sales representative for more information.

Dynamic RAMs Introduction

DRAMs offer the lowest cost per bit of any memory. Because of this, they are popular for a wide range of applications, particularly in the computing and communication environments. Motorola's Dynamic Memory Products include DRAM components and memory modules. The 16 MByte DRAM component is offered in various organizations and surface mount packaging. Motorola's DRAM memory modules include densities up to 32 MByte in both standard and custom configurations. All devices are fabricated using HCMOS technology.

DYNAMIC RAMS (HCMOS) (Contact DRAM Marketing)

Byte Density	Organization	Motorola Part Number	Pins	Package Options	Access Time (ns Max)	Operating Current (mA Max)	Production	Volt	FPM or EDO	Refresh	
4 MB	4M x 1	MCM44100C	20/26	300 SOJ(N)	60/70	110/100	NOW	5	FPM	1K	
		MCM4L4100C	20/26	300 SOJ(N)	60/70	110/100	NOW	5	FPM	1K	
		MCM54100A	20/26	300 SOJ(N), 300 TSOP(T)	60/70	120/100	NOW	5	FPM	1K	
		MCM5L4100A	20/26	300 SOJ(N), 300 TSOP(T)	60/70	120/100	NOW	5	FPM	1K	
		MCM54100A-C	20/26	300 SOJ(N), 300 TSOP(T)	70/80	100/85	NOW	5	FPM	1K	
		MCM54100A-V	20/26	300 SOJ(N), 300 TSOP(T)	70/80	70/60	NOW	3.3	FPM	1K	
		MCM5L4100A-V	20/26	300 SOJ(N), 300 TSOP(T)	70/80	70/60	NOW	3.3	FPM	1K	
		MCM44400C	20/26	300 SOJ(N)	60/70	110/100	NOW	5	FPM	1K	
	1M x 4	MCM4L4400C	20/26	300 SOJ(N)	60/70	110/100	NOW	5	FPM	1K	
		MCM54400A	20/26	300 SOJ(N), 300 TSOP(T)	60/70	120/100	NOW	5	FPM	1K	
		MCM5L4400A	20/26	300 SOJ(N), 300 TSOP(T)	60/70	120/100	NOW	5	FPM	1K	
		MCM54400A-C	20/26	300 SOJ(N)	70/80	100/85	NOW	5	FPM	1K	
		MCM5L4400A-C	20/26	300 SOJ(N), 300 TSOP(T)	70/80	100	NOW	5	FPM	1K	
		MCM54400A-V	20/26	300 SOJ(N), 300 TSOP(T)	70/80	70/60	NOW	3.3	FPM	1K	
16 MB	4M x 4	MCM5L4400A-V	20/26	300 SOJ(N), 300 TSOP(T)	70/80	70/60	NOW	3.3	FPM	1K	
		MCM317400C	24/26	300 SOJ(J), 300 TSOP(T)	60/70	120/105	NOW	5	FPM	2K	
		MCM417400C	24/26	300 SOJ(J)	60/70	110/100	NOW	5	FPM	2K	
		MCM417400B	24/26	300 SOJ(J), 300 TSOP(T)	60/70	110/100	4Q96	5	FPM	2K	
		MCM417405B	24/26	300 SOJ(J), 300 TSOP(T)	60/70	110/100	4Q96	5	EDO	2K	
		MCM516400B	24/26	300 SOJ(J), 300 TSOP(T)	50/60/70	100/80/70	Call Mktg	5	FPM	4K	
		MCM517400B	24/26	300 SOJ(J), 300 TSOP(T)	50/60/70	130/110/95	NOW	5	FPM	2K	
		MCM517400C	24/26	300 SOJ(J), 300 TSOP(T)	60/70	110/95	4Q96	5	FPM	2K	
	1M x 16	MCM517400CV	24/26	300 SOJ(J), 300 TSOP(T)	60/70	75/65	4Q96	3.3	FPM	2K	
		MCM517405C	24/26	300 SOJ(J), 300 TSOP(T)	60/70	110/95	4Q96	5	EDO	2K	
		MCM517405CV	24/26	300 SOJ(J), 300 TSOP(T)	60/70	75/65	4Q96	3.3	EDO	2K	
		MCM218160B	42	400 SOJ(J)	60/70	180/170	1Q97	5	FPM	1K	
		MCM218160B	44/50	400 TSOP(T)	60/70	180/170	1Q97	5	FPM	1K	
		MCM218165B	42	400 SOJ(J)	60/70	170/160	1Q97	5	EDO	1K	
	1M x 16	MCM218165B	44/50	400 TSOP(T)	60/70	170/160	1Q97	5	EDO	1K	
		MCM518160B	42	400 SOJ(J)	60/70	185/155	TBD	5	FPM	1K	
		MCM518160B	44/50	400 TSOP(T)	60/70	185/155	NOW	5	FPM	1K	
		MCM518165B	42	400 SOJ(J)	60/70	185/155	TBD	5	EDO	1K	
			MCM518165B	44/50	400 TSOP(T)	60/70	185/155	NOW	5	EDO	1K
			MCM518165B	42	400 SOJ(J)	60/70	185/155	TBD	5	EDO	1K
			MCM518165BV	44/50	400 TSOP(T)	60/70	185/155	NOW	5	EDO	1K
			MCM518165BV	42	400 SOJ(J)	60/70	175/145	TBD	3.3	EDO	1K
		MCM518165BV	44/50	400 TSOP(T)	60/70	175/145	NOW	3.3	EDO	1K	

DRAM MODULES (Contact DRAM Marketing for Custom DRAM Modules) (See Notes 1 and 2)

Byte Density	Organization	Motorola Part Number	Pins	Package Options	Access Time	Production	Operating Current (mA Max)	Volt	FPM or EDO	(B)uffered or (U)nbuffered	Parity, Non-Parity, ECC, or ECC Pin for Parity	Refresh	Comp. Pkg.
1 MB	1M x 8	MCM81430	30	(S)	60/70	NOW	240/200	5	FPM	U	Non-Parity	1K	SOJ
4 MB	4M x 8	MCM84000	30	(AS)	60/70	NOW	960/800	5	FPM	U	Non-Parity	2K	SOJ
		MCM84C430	30	(S)	60/70	NOW	220/190	5	FPM	U	Non-Parity	2K	SOJ
	MCM84CT430	30	(S)	60/70	NOW	220/190	5	FPM	U	Non-Parity	2K	TSOP	
	4M x 9	MCM94000	30	(AS)	60/70	NOW	1080/900	5	FPM	U	Parity	2K	SOJ
8 MB	2M x 32	MCM94C430	30	(S)	60/70	NOW	340/290	5	FPM	U	Parity	2K	SOJ
		MCM94CT430	30	(S)	60/70	NOW	340/290	5	FPM	U	Parity	2K	TSOP
		MCM32100	72	(DG), (D)	60/70	NOW	960/800	5	FPM	U	Non-Parity	1K	TSOP
		MA321BT08T	72	(ADG), (AD)	60/70	NOW	370/310	5	FPM	U	Non-Parity	1K	TSOP
		MB321BT08T	72	(ADG), (AD), (ASN)	60/70	NOW	370/310	5	EDO	U	Non-Parity	1K	TSOP
		MB321BT18T	72	(ADG), (ADN)	60/70	NOW	350/290	3.3	EDO	U	Non-Parity	1K	TSOP
		MCM32B116	72	(S), (SG)	60/70	TBD	370/310	5	FPM	U	Non-Parity	1K	SOJ
		MB321BJ08T	72	(ASN)	60/70	TBD	360/300	5	EDO	U	Non-Parity	1K	SOJ
		MCM32BT116	72	(SH)	60/70	NOW	370/310	5	FPM	U	Non-Parity	1K	TSOP
		MCM32130	72	(SH), (SHG)	60/70	NOW	960/800	5	FPM	U	Non-Parity	1K	SOJ
		MCM32T100	72	(SH), (SHG)	60/70	NOW	960/800	5	FPM	U	Non-Parity	1K	TSOP
		16 MB	4M x 32	MA322BT08T	72	(ADG)	60/70	NOW	374/314	5	FPM	U	Non-Parity
MB322BT08T	72			(ADG), (ASN)	60/70	NOW	374/314	5	EDO	U	Non-Parity	1K	TSOP
MB322BT18T	72			(ADG)	60/70	NOW	352/292	3.3	EDO	U	Non-Parity	1K	TSOP
MCM32B216	72			(S), (SG)	60/70	TBD	374/314	5	FPM	U	Non-Parity	1K	SOJ
MB322BJ08T	72			(ASN)	60/70	TBD	374/314	5	EDO	U	Non-Parity	1K	SOJ
MCM32BT216	72			(SH)	60/70	NOW	374/314	5	FPM	U	Non-Parity	1K	TSOP
MCM32230	72			(SH), (SHG)	60/70	NOW	976/816	5	FPM	U	Non-Parity	1K	SOJ
MCM32T200	72			(S), (SG)	60/70	NOW	976/816	5	FPM	U	Non-Parity	1K	TSOP
MCM32C400	72			(ASH), (ASHG)	60/70	4Q96	880/760	5	FPM	U	Non-Parity	2K	SOJ
MB324CJ00T	72			(BSN)	60/70	4Q96	880/760	5	EDO	U	Non-Parity	2K	SOJ
MCM32CT400	72			(ASH), (ASHG)	60/70	4Q96	880/760	5	FPM	U	Non-Parity	2K	TSOP
MCM32CT420	72			(ADG)	60/70	4Q96	880/760	5	FPM	U	Non-Parity	2K	TSOP
32 MB	8M x 32	MB324CT00T	72	(BDG), (BSN)	60/70	4Q96	880/760	5	EDO	U	Non-Parity	2K	TSOP
		MCM32CT423	72	(ADG)	60/70	4Q96	600/520	3.3	FPM	U	Non-Parity	2K	TSOP
		MB324CT10T	72	(BDG)	60/70	4Q96	880/760	3.3	EDO	U	Non-Parity	2K	TSOP
		MCM32C800	72	(ASH), (ASHG)	60/70	4Q96	896/776	5	FPM	U	Non-Parity	2K	SOJ
4 MB	1M x 36	MB328CJ00T	72	(BSN)	60/70	4Q96	896/776	5	EDO	U	Non-Parity	2K	SOJ
		MCM32CT800	72	(ASH), (ASHG)	60/70	4Q96	896/776	5	FPM	U	Non-Parity	2K	TSOP
		MB328CT00T	72	(BSN)	60/70	4Q96	896/776	5	EDO	U	Non-Parity	2K	TSOP
8 MB	2M x 36	MCM36104	72	(S), (SG)	60/70	NOW	1080/900	5	FPM	U	ECC for Parity	1K	SOJ
	2M x 36	MCM36204	72	(S), (SG)	60/70	NOW	1098/918	5	FPM	U	ECC for Parity	1K	SOJ

DRAM MODULES (Contact DRAM Marketing for Custom DRAM Modules) (See Notes 1 and 2)

Byte Density	Organization	Motorola Part Number	Pins	Package Options	Access Time	Production	Operating Current (mA Max)	Volt	FPM or EDO	(B)uffered or (U)nbuffered	Parity, Non-Parity, ECC, or ECC Pin for Parity	Refresh	Comp. Pkg.
16 MB	4M x 36	MCM36C400	72	(AS), (ASG), (ASH), (ASHG)	60/70	NOW	1360/1160	5	FPM	U	Parity	2K	SOJ
		MCM36C404	72	(ASH), (ASHG)	60/70	4Q96	990/855	5	FPM	U	ECC for Parity	2K	SOJ
32 MB	8M x 36	MCM36C800	72	(AS), (ASG)	60/70	NOW	1384/1184	5	FPM	U	Parity	2K	SOJ
		MCM36C804	72	(ASH), (ASHG)	60/70	NOW	1008/873	5	FPM	U	ECC for Parity	2K	SOJ
4 MB	1M x 40	MCM40100	72	(AS), (ASG)	60/70	NOW	1200/1000	5	FPM	U	ECC	1K	SOJ
8 MB	2M x 40	MCM40200	72	(AS), (ASG)	60/70	NOW	1220/1020	5	FPM	U	ECC	1K	SOJ
16 MB	4M x 40	MCM40C400	72	(SH), (SHG)	60/70	NOW	1100/950	5	FPM	U	ECC	2K	SOJ
32 MB	8M x 40	MCM40C800	72	(SH), (SHG)	60/70	NOW	1120/970	5	FPM	U	ECC	2K	SOJ
8 MB	1M x 64	MA641AJ40T	168	(ADG)	60/70	NOW	2050/1715	5	FPM	B	Non-Parity	1K	SOJ
		MCM64BT116	168	(DG)	60/70	NOW	828/700	5	FPM	B	Non-Parity	1K	TSOP
		MB641BT48T	168	(ADG)	60/70	NOW	828/700	5	EDO	B	Non-Parity	1K	TSOP
		MA641BT08T	168	(ADG)	60/70	4Q96	740/620	5	FPM	U	Non-Parity	1K	TSOP
		MB641BT08T	168	(ADG)	60/70	4Q96	740/620	5	EDO	U	Non-Parity	1K	TSOP
		MB641BT18T	168	(ADG)	60/70	4Q96	700/580	3.3	EDO	U	Non-Parity	1K	TSOP
16 MB	2M x 64	MCM64BT216	168	(DG)	60/70	NOW	836/704	5	FPM	B	Non-Parity	1K	TSOP
		MB642BT48T	168	(ADG)	60/70	NOW	836/704	5	EDO	B	Non-Parity	1K	TSOP
		MA642BT08T	168	(ADG)	60/70	4Q96	748/628	5	FPM	U	Non-Parity	1K	TSOP
		MB642BT08T	168	(ADG)	60/70	4Q96	748/628	5	EDO	U	Non-Parity	1K	TSOP
		MB642BT18T	168	(ADG)	60/70	4Q96	708/588	3.3	EDO	U	Non-Parity	1K	TSOP
32 MB	4M x 64	MA644CT00T	168	(ADG)	60/70	4Q96	1760/1520	5	FPM	U	Non-Parity	2K	TSOP
		MB644CT00T	168	(ADG)	60/70	4Q96	1760/1520	5	EDO	U	Non-Parity	2K	TSOP
		MA644CT10T	168	(ADG)	60/70	4Q96	1200/1040	3.3	FPM	U	Non-Parity	2K	TSOP
		MB644CT10T	168	(ADG)	60/70	4Q96	1200/1040	3.3	EDO	U	Non-Parity	2K	TSOP
	1M x 72	MA721BT08T	168	(ADG)	60/70	4Q96	980/820	5	FPM	U	ECC	1K	TSOP
	2M x 72	MA722BT08T	168	(ADG)	60/70	4Q96	990/835	5	FPM	U	ECC	1K	TSOP
	4M x 72	MA724CT00T	168	(ADG)	60/70	4Q96	1980/1710	5	FPM	U	ECC	2K	TSOP
		MB724CT00T	168	(ADG)	60/70	4Q96	1980/1710	5	EDO	U	ECC	2K	TSOP
		MA724CT10T	168	(ADG)	60/70	4Q96	1350/1170	3.3	FPM	U	ECC	2K	TSOP
		MB724CT10T	168	(ADG)	60/70	4Q96	1350/1170	3.3	EDO	U	ECC	2K	TSOP
		MA724CJ40T	168	(ADG)	60/70	4Q96	2060/1770	5	FPM	B	ECC	2K	SOJ
		MB724CJ40T	168	(ADG)	60/70	4Q96	2060/1770	5	EDO	B	ECC	2K	SOJ

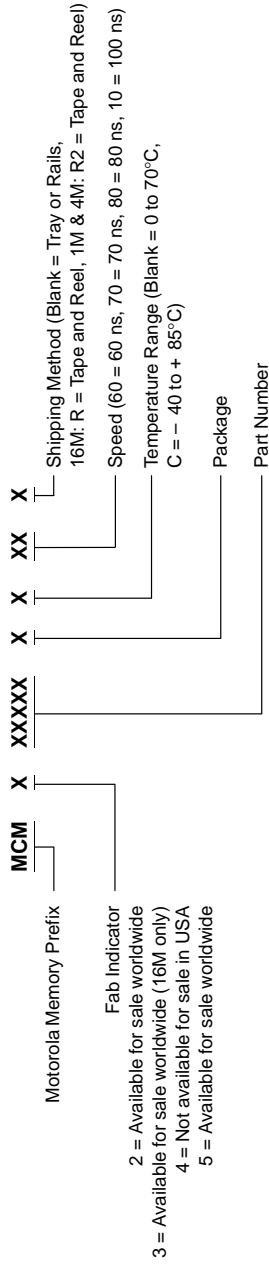
NOTES:

- Package suffixes are enclosed by () in package column
 AD/ADG = DIMM/Gold Pad DIMM (Board Revision)
 AS and ASN/ASG = Tin Pad SIMM (Board Revision)/Gold Pad SIMM (Board Revision)
 ASH/ASHG = Low Profile SIMM/Low Profile Gold Pad SIMM
 BDG = Board Revision DIMM Gold Lead
- BSN/BSG = Board Revision SIMM Tin Lead/Board Revision SIMM Gold Lead
 D/DG = Dual Inline Memory Module (DIMM)/Dual Inline Gold Pad Module
 S/SG = Single Inline Memory Module/Gold Pad SIMM
 SH/SHG = Short Height SIMM/Short Height Gold Pad SIMM

2. Please consult factory before ordering a gold module package type.

ORDERING INFORMATION

COMPONENT AND FIRST GENERATION MODULE PART NOMENCLATURE



NEXT GENERATION MODULE PART NOMENCLATURE

