

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.

Flash memory is the most cost-effective non-volatile semiconductor memory. Motorola's Flash products can be easily programmed while remaining in the system.

	Page
Fast Static RAMs	2.8-2
Introduction	2.8-2
Synchronous	2.8-2
Asynchronous	2.8-3
Fast Static RAM Modules	2.8-4
Flash Memory	2.8-5
Standard MobileFLASH™ Memory	2.8-6
MobileFLASH™ Memory	2.8-6
Flash Component Part Nomenclature	2.8-7

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	MCM69R818A	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. HSTL I/Os.	
			MCM69R819A	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. LVTTTL I/Os.	
			MCM69R820A	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. 2.5 V I/Os.	
			MCM69L818A	119	(ZP) PBGA	8.5/9/9.5 Latency	Now	Late write interface. Register/Latch. HSTL I/Os	
			MCM69L819A	119	(ZP) PBGA	8.5/9/9.5 Latency	Now	Late write interface. Register/Latch LVTTTL I/Os.	
			MCM69L820A	119	(ZP) PBGA	8.5/9/9.5 Latency	Now	Late write interface. Register/Latch 2.5 V I/Os.	
	128K x 36			MCM69R736A	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. HSTL I/Os.
				MCM69R737A	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. LVTTTL I/Os.
				MCM69R738A	119	(ZP) PBGA	5/6/7/8	Now	Late write interface. Register/Register. 2.5 V I/Os.
				MCM69L736A	119	(ZP) PBGA	8.5/9/9.5 Latency	Now	Late write interface. Register/Latch. HSTL I/Os.
				MCM69L737A	119	(ZP) PBGA	8.5/9/9.5 Latency	Now	Late write interface. Register/Latch. LVTTTL I/Os.
				MCM69L738A	119	(ZP) PBGA	8.5/9/9.5 Latency	Now	Late write interface. Register/Latch. 2.5 V I/Os.

Tag RAMs

Description	Organization	V _{CC}	Motorola Part Number	Pin Count	Packaging	Access Time (ns Max)	Production	Comments
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	5 V	MPC27T416	80	(TQ) TQFP	9/10/12	Now	Cache tag RAM for PowerPC. 14 tag bits, 2 status bits.
	16K x 15	5 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	4Q97	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.

Integrated Cache Solutions

Integrated Cache Solutions	32K x 72	3.3 V	MPC2605	241	(ZP) PBGA	66 MHz	4Q97	Integrated L2 cache for PowerPC processors. One component for 256KB, two for 512KB, and four for 1MB L2 cache solution.
	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	4Q97	Single address, separate I/O. NetRAM. Sampling now.
			MCM69D536	176	(TQ) TQFP	6/8/10	4Q97	Dual address, dual I/O. NetRAM. Sampling now.
	64K x 18	3.3 V	MCM69Q618	100	(TQ) TQFP	6/8/10	4Q97	Single address, separate I/O. NetRAM. Sampling now.
MCM69D618			100	(TQ) TQFP	6/8/10	4Q97	Dual address, dual I/O. NetRAM. Sampling now.	
Line Buffer	8K x 8	5 V	MCM62X308	28	300 (J) SOJ	15/17	Now	Line buffer for processing digital data. Sampling 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	MCM69P819	100 119	(TQ) TQFP (ZP) PBGA	3.5/3.8/4	1Q98	Pipelined BurstRAM for servers, switches, and workstations. XCM available now.
			MCM69F819	100 119	(TQ) TQFP (ZP) PBGA	7.5/8/8.5/11	1Q98	Flow-through BurstRAM for servers, switches, and workstations. XCM available now.
	128K x 36	3.3 V	MCM69P737	100 119	(TQ) TQFP (ZP) PBGA	3.5/3.8/4	1Q98	Pipelined BurstRAM for servers, switches, and workstations. XCM available now.
			MCM69F737	100 119	(TQ) TQFP (ZP) PBGA	7.5/8/8.5/11	1Q98	Flow-through BurstRAM for servers, switches, and workstations. XCM available now.
	128K x 32	3.3 V	MCM63P733	100	(TQ) TQFP	4/4.5/5	1Q98	133 MHz pipelined BurstRAM, for servers and notebooks. Sampling now at 100 MHz.
			MCM63F733	100	(TQ) TQFP	10/11	1Q98	75 MHz flow-through BurstRAM, for servers and datacomm.
2M	64K x 32	3.3 V	MCM63P631	100	(TQ) TQFP (DW) TrueDie	117 MHz 4.5/7/8 ns 4.5/7/8 ns	Now 4Q97	117 MHz pipelined BurstRAM, for desktop PCs and communications applications. Pipelined BurstRAM for ultraportable computing.
			MCM63PV631	100	(TQ) TQFP	133/117/66/60 MHz	Now	2.5 V I/O GreenRAM. For MMX processor, notebooks, and low-power communication applications needs.
	32K x 32	3.3 V	MCM63P535	—	(DW) TrueDie	4.5/7/8	4Q97	Pipelined BurstRAM for ultraportable computing.
1M	64K x 18	3.3 V	MCM69F618C	100	(TQ) TQFP	8.5/9/10/12	4Q97	5 V tolerant on all pins. Samples 3Q97.
			MCM69P618C	100	(TQ) TQFP	4/4.5/5/6/7	4Q97	5 V tolerant on all pins. Samples 3Q97.
		5 V	MCM67B618A	52	(FN) PLCC	8.5/9/10/12	Now	Flow-through BurstRAM for Pentium™, MIPS. Not for new designs, suggest MCM67B618B.
			MCM67B618B	52	(FN) PLCC	8.5/9/10/12	4Q97	Flow-through BurstRAM for Pentium, MIPS.
		MCM67C618A	52	(FN) PLCC	5/7	Now	Pipelined BurstRAM for Pentium. Not for new designs, suggest MCM67C618B.	
		MCM67C618B	52	(FN) PLCC	5/7	4Q97	Pipelined BurstRAM for Pentium and communication applications.	
		MCM67M618A	52	(FN) PLCC	9/10/12	Now	Flow-through BurstRAM for PowerPC™. Not for new designs, suggest MCM67M618B.	
		MCM67M618B	52	(FN) PLCC	9/10/12	4Q97	Flow-through BurstRAM for PowerPC.	
	32K x 36	3.3 V	MCM69F536B	100	(TQ) TQFP	8.5/9/10/12	Now	Flow-through BurstRAM, 5 V tolerant I/Os. Not for new designs, suggest MCM69F536C.
			MCM69F536C	100	(TQ) TQFP	8.5/9/10/12	4Q97	5 V tolerant on all pins. Samples 3Q97.
MCM69P536B			100	(TQ) TQFP	4/4.5/5/6/7	Now	Pipelined BurstRAM, 5 V tolerant I/Os. Not for new designs, suggest MCM69P536C.	
MCM69P536C			100	(TQ) TQFP	4/4.5/5/6/7	4Q97	5 V tolerant on all pins. Samples 3Q97.	

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	17/20/25	Now	Output enable. Revolutionary pinout.
		5 V	MCM6246A	36	400 (WJ) SOJ	15	Now	For switches and basestations.
		3.3 V	MCM6946	36	400 (YJ) SOJ	10/12/15	1Q98	For telecom, storage and computing applications. Samples 4Q97.
	256K x 16	3.3 V	MCM6343	44 44	400 (YJ) SOJ TSOP	10/12/15	2Q98	For telecom, modems, cellular, storage and computing applications. Samples 1Q98.
	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	Now	Replaces MCM6249. For switches, routers and basestations.
		3.3 V	MCM6949	32	400 (YJ) SOJ	10/12/15	1Q98	For telecom, storage, and computing applications. Samples 4Q97.
3M	128K x 24	3.3 V	MCM6341	119	(ZP) PBGA	10/12/15	1Q98	DSP applications for base stations, cost, and other communication applications. Samples late 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	Now	General asynchronous, latched address and data.
	64K x 16	3.3 V	MCM6323	44	400 (YJ) SOJ	12/15	Now	Not recommended for new designs. Suggest MCM6323A.
		3.3 V	MCM6323A	44	400 (YJ) SOJ (TS) TSOP	10/12/15	4Q97	Industrial temperature offered. Revolutionary pinout. DSP applications. Samples 3Q97.
	128K x 8	5 V	MCM6226BB	32	300 (EJ), 400 (XJ) SOJ	15/17/20/25	Now	Evolutionary pinout.
		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.
		3.3 V	MCM6326	32	400 (YJ) SOJ	12/15/20	1Q98	Revolutionary pinout. Samples January 98.
		3.3 V	MCM6926A	32	400 (WJ) SOJ	8/10/12/15	Now	Revolutionary pinout.
		256K x 4	5 V	MCM6229BB	28	300 (EJ), 400 (XJ) SOJ	15/17/20/25	Now

ASYNCHRONOUS

Density	Organization	V _{CC}	Motorola Part Number	Pin Count	Packaging Package width in mils	Access Time (ns Max)	Production	Comments
		5 V	MCM6229CA	28	300 (EJ), 400 (XJ) SOJ	15/17/20/25	1Q98	Replaces MCM6226BB. Evolutionary pinout. Samples 4Q97.
		5 V	MCM6729D	32	400 (WJ) SOJ	7.5/8/10/12	Now	Revolutionary pinout.
		3.3 V	MCM6929A	32	400 (WJ) SOJ	8/10/12/15	Now	Revolutionary pinout.
	1M x 1	5 V	MCM6227B	28	300 (J), 400 (WJ) SOJ	15/17/20/25	Now	For telecom, IC tester applications, and storage.
		5 V	MCM6227BB	28	300 (J), 400 (WJ) SOJ	15/20/25	1Q98	Replaces MCM6227B. For telecom, IC tester applications, and storage. Samples available 4Q97.
DSPRAM	8K x 24	5 V	MCM56824A	52	(FN) PLCC	20/25/35	Now	Designed for DSP56001 applications. Replaces 32K x 8s.
256K	32K x 8	5 V	MCM6206BA	28	300 (EJ) SOJ	12/15/20/25	Now	Not recommended for new designs. Suggest MCM6206BB.
		5 V	MCM6206BB	28	300 (EJ) SOJ	12/15/20/25	4Q97	Replaces MCM6206BA.
		5 V	MCM6706B	28	300 (J) SOJ	8/10	Now	Evolutionary pinout. Not recommended for new designs. Suggest MCM6706D.
		5 V	MCM6706BR	32	300 (J) SOJ	6/7/8	Now	Revolutionary pinout. Not recommended for new designs. Suggest MCM6706DR.
		5 V	MCM6706D	28	300 (J) SOJ	8/10	1Q98	Evolutionary pinout. Samples late 4Q97.
		5 V	MCM6706DR	32	300 (J) SOJ	6/7/8	1Q98	Revolutionary pinout. Samples late 4Q97.
	64K x 4	5 V	MCM6709B	28	300 (J) SOJ	8/10	Now	Evolutionary pinout. Not recommended for new designs.
		5 V	MCM6709BR	28	300 (J) SOJ	6/7/8	Now	Revolutionary pinout. Not recommended for new designs.

FAST STATIC RAM MODULES

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

Desktop Computing Applications

Description	Organization and Function	Access Time	Packaging	Production	Motorola Part Number
PowerPC Cache Modules	64K x 72 Flow-Through Burst	9 ns	178 Pin Card Edge DIMM (DG)	Now	MPC2105B
	128K x 72 Flow-Through Burst	9 ns		Now	MPC2106B
Coast Modules	64K x 64 Pipelined Burst	8 ns	160 Pin Card Edge DIMM (DG)	Now	MCM64PE64

Data Communications Applications

Standard BurstRAM Modules	64K x 72 Flow-Through Burst	9/12 ns	168 Pin DIMM (DG)	3Q97	MCM72F6DG
	128K x 72 Flow-Through Burst	9/12 ns	168 Pin DIMM (DG)	3Q97	MCM72F7DG
	256K x 72 Flow-Through Burst	8/12 ns	168 Pin DIMM (DG)	4Q97	MCM72F8DG
	512K x 72 Flow-Through Burst	8/12 ns	168 Pin DIMM (DG)	4Q97	MCM72F9DG
Standard BurstRAM Multichip Packages	256K x 72 Flow-Through Burst	7.5/8 ns	Multichip Module on Laminate (ML)	4Q97	MCM72FB8ML
	256K x 72 Pipelined Burst	3.5/4 ns		4Q97	MCM72PB8ML
	512K x 36 Flow-Through Burst	7.5/8 ns		4Q97	MCM36FB9ML
	512K x 36 Pipelined Burst	3.5/4 ns		4Q97	MCM36PB9ML

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 low power flash memory products are ideally suited for portable cellular phones, handheld electronic devices, networking equipment and telecom applications. Please contact your Motorola sales representative for more information.

STANDARD MobileFLASH™ MEMORY

Motorola Part Number	Density	Organization	Package Options	Boot Block	Power Supply	Speed	Production
M29F800A3UT	8 Mbit	1M x 8 or 512K x 16	48 Pin TSOP	Top	3.3 Volt	80, 100, 120 ns	NOW
M29F800A3UR	8 Mbit	1M x 8 or 512K x 16	48 Pin Reverse TSOP	Top	3.3 Volt	80, 100, 120 ns	NOW
M29F800A3BT	8 Mbit	1M x 8 or 512K x 16	48 Pin TSOP	Bottom	3.3 Volt	80, 100, 120 ns	NOW
M29F800A3BR	8 Mbit	1M x 8 or 512K x 16	48 Pin Reverse TSOP	Bottom	3.3 Volt	80, 100, 120 ns	NOW

MobileFLASH™ MEMORY WITH BACKGROUND OPERATION

Motorola Part Number	Density	Organization	Package Options	Boot Block	Power Supply	Speed	Production
M28F800A2UT12	8 Mbit	1M x 8, 512K x 16	48 Pin TSOP	Top	V _{CC} = 3.3 V, V _{pp} = 5.0 V	120 ns	NOW
M28F800A2UR12	8 Mbit	1M x 8, 512K x 16	48 Pin TSOP	Bottom	V _{CC} = 3.3 V, V _{pp} = 5.0 V	120 ns	NOW
M28F800A2UA12	8 Mbit	1M x 8, 512K x 16	.65 pitch µBGA	Top	V _{CC} = 3.3 V, V _{pp} = 5.0 V	120 ns	2Q98
M28F800A2BA12	8 Mbit	1M x 8, 512K x 16	.65 pitch µBGA	Bottom	V _{CC} = 3.3 V, V _{pp} = 5.0 V	120 ns	2Q98

FLASH DINOR I COMPONENT PART NOMENCLATURE

