

ACT-F4M32A High Speed 128 Megabit Sector Erase FLASH Multichip Module

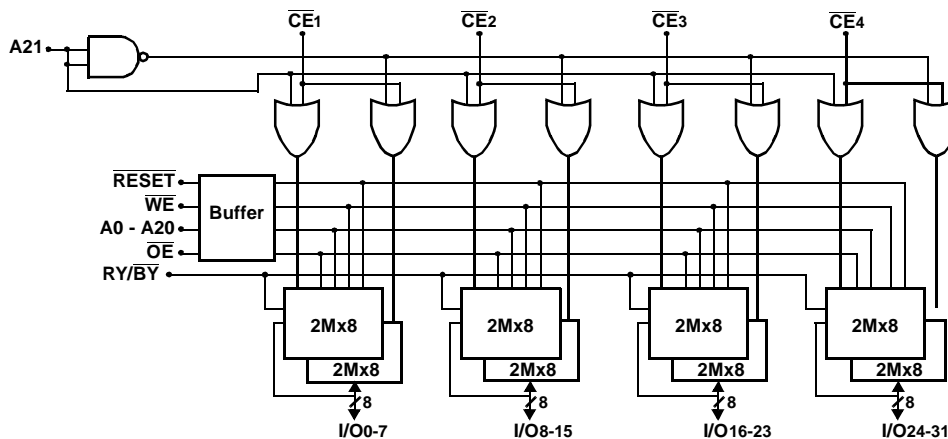
Advanced



Features

- 8 Low Voltage/Power AMD 2M x 8 FLASH Die in One MCM Package
- Overall Configuration is 4M x 32
- +5V Power Supply / +5V Programming Operation
- Access Times of 100, 120 and 150 ns
- Erase/Program Cycles – 100,000 Minimum (+25°C)
- Sector erase architecture (Each Die)
 - 32 uniform sectors of 64 Kbytes each
 - Any combination of sectors can be erased. Also supports full chip erase
 - Sector group protection is user definable
- Embedded Erase Algorithms – Automatically pre-programs and erases the die or any sector
- Embedded Program Algorithms – Automatically programs and verifies data at specified address
- Ready/Busy output (RY/BY) – Hardware method for detection of program or erase cycle completion
- Hardware RESET pin – Resets internal state machine to the read mode
- Erase Suspend/Resume – Supports reading or programming data to a sector not being erased
- Packaging – Hermetic Ceramic
 - 68-Lead, Low Profile CQFP(F1), 1.56"SQ x .140"max
 - 68-Lead, Dual-Cavity CQFP(F2), 0.88"SQ x .20"max (.18 max thickness available, contact factory for details) (Drops into the 68 Lead JEDEC .99"SQ CQFJ footprint)
- Internal Decoupling Capacitors for Low Noise Operation
- Commercial, Industrial and Military Temperature Ranges
- MIL-PRF-38534 Compliant MCMs Available

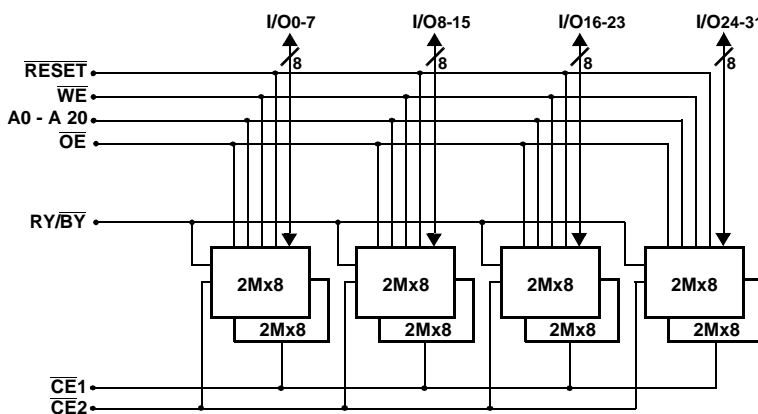
Block Diagram – CQFP(F1)



Pin Description

I/O0-31	Data I/O
A0-21	Address Inputs
WE	Write Enables
CE1-4	Chip Enables
OE	Output Enable
RESET	Reset
RY/BY	Ready/Busy
VCC	Power Supply
GND	Ground
NC	Not Connected

Block Diagram – CQFP(F2)



Pin Description

I/O0-31	Data I/O
A0-20	Address Inputs
WE	Write Enable
CE1,2	Chip Enables
OE	Output Enable
RESET	Reset
RY/BY	Ready/Busy
VCC	Power Supply
GND	Ground
NC	Not Connected

General Description

Utilizing AMD's Sector Erase Flash Memory Die, the ACT-F4M32A is a high speed, 128 megabit CMOS flash multichip module (MCM) designed for full temperature range, military, space, or high reliability applications.

The ACT-F4M32A consists of eight high-performance AMD Am29F016 16Mbit (16,777,216 bit) memory die. Each die contains 8 separately write or erase sector groups of 256Kbytes (A sector group consists of 4 adjacent sectors of 64Kbytes each).

The command register is written by bringing \overline{WE} to a logic low level (V_{IL}), while \overline{CE} is low and \overline{OE} is high (V_{IH}). Reading is accomplished by chip Enable (\overline{CE}) and Output Enable (\overline{OE}) being logically active. Access time grades of 100ns, 120ns and 150ns maximum are standard.

The ACT-F4M32A is offered in two different hermetically sealed co-fired 68 lead ceramic packages. This allows operation in a military environment temperature range of -55°C to $+125^{\circ}\text{C}$.

The ACT-F4M32A can be programmed (both read and write functions) in-system using the +5.0V VCC power supply. A 12.0V VPP is not required for programming or erase operations. The end of program or erase is detected by the RY/ \overline{BY} pin, Data Polling of DQ7, or by the Toggle bit (DQ6).

The ACT-F4M32A also has a hardware \overline{RESET} pin. When this pin is driven low, execution of any Embedded Program Algorithm or Embedded Erase Algorithm will be terminated.

Each block can be independently erased and programmed 100,000 times at $+25^{\circ}\text{C}$.

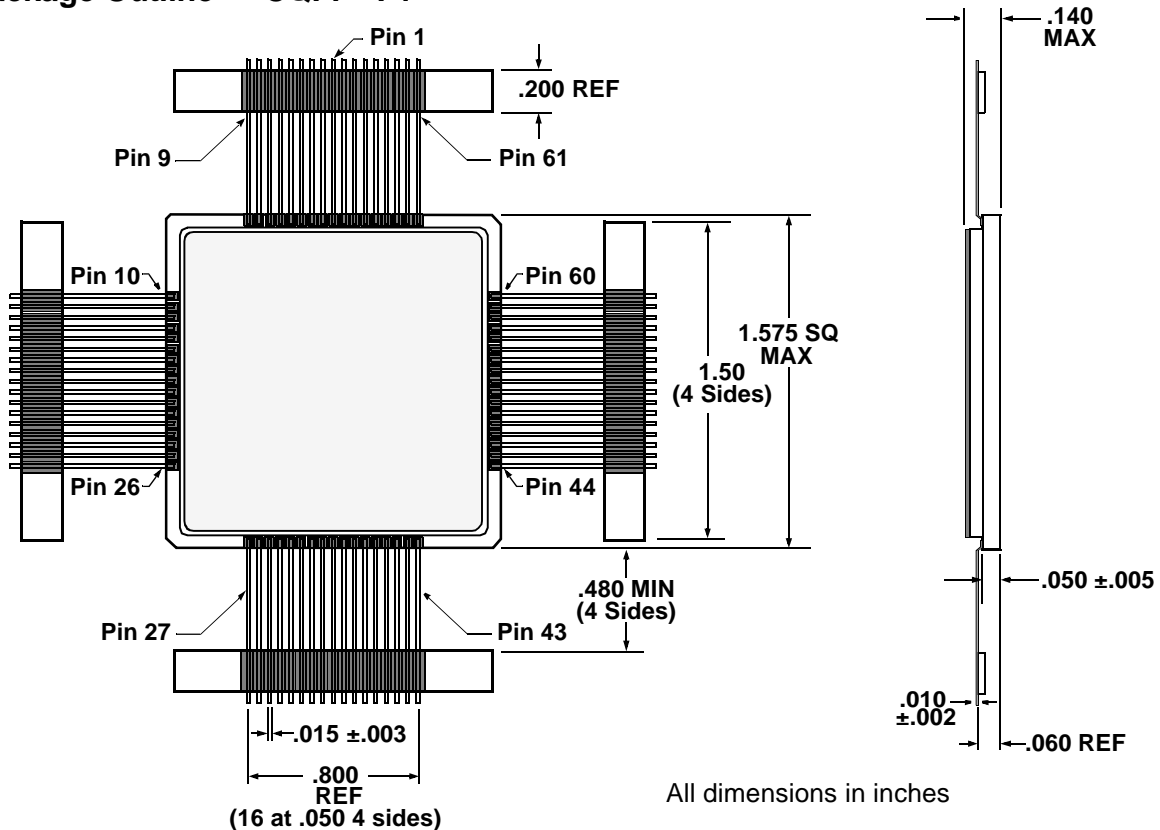
For Detail Information regarding the operation of the Am29F016 Sector Erase Flash Memory, see the AMD datasheet (Publication 18805).

Pin Numbers & Functions

68 Pins — CQFP							
Pin #	Function	Pin #	Function	Pin #	Function	Pin #	Function
1	GND	18	GND	35	\overline{OE}	52	GND
2	$\overline{CE1}$	19	I/O ₈	36	$\overline{CE4}$	53	I/O ₂₃
3	A ₅	20	I/O ₉	37	A ₁₇	54	I/O ₂₂
4	A ₄	21	I/O ₁₀	38	A ₁₈	55	I/O ₂₁
5	A ₃	22	I/O ₁₁	39	A ₁₉	56	I/O ₂₀
6	A ₂	23	I/O ₁₂	40	A ₂₀	57	I/O ₁₉
7	A ₁	24	I/O ₁₃	41	A ₂₁	58	I/O ₁₈
8	A ₀	25	I/O ₁₄	42	\overline{RESET}	59	I/O ₁₇
9	RY/ \overline{BY}	26	I/O ₁₅	43	NC	60	I/O ₁₆
10	I/O ₀	27	V _{CC}	44	I/O ₃₁	61	V _{CC}
11	I/O ₁	28	A ₁₁	45	I/O ₃₀	62	A ₁₀
12	I/O ₂	29	A ₁₂	46	I/O ₂₉	63	A ₉
13	I/O ₃	30	A ₁₃	47	I/O ₂₈	64	A ₈
14	I/O ₄	31	A ₁₄	48	I/O ₂₇	65	A ₇
15	I/O ₅	32	A ₁₅	49	I/O ₂₆	66	A ₆
16	I/O ₆	33	A ₁₆	50	I/O ₂₅	67	\overline{WE}
17	I/O ₇	34	$\overline{CE2}$	51	I/O ₂₄	68	$\overline{CE3}$

Consult Factory for Special order: Pin 9 -NC

Package Outline — CQFP "F1"



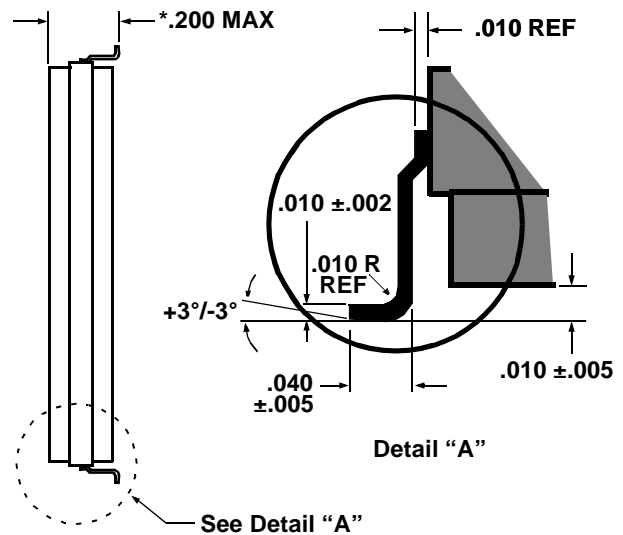
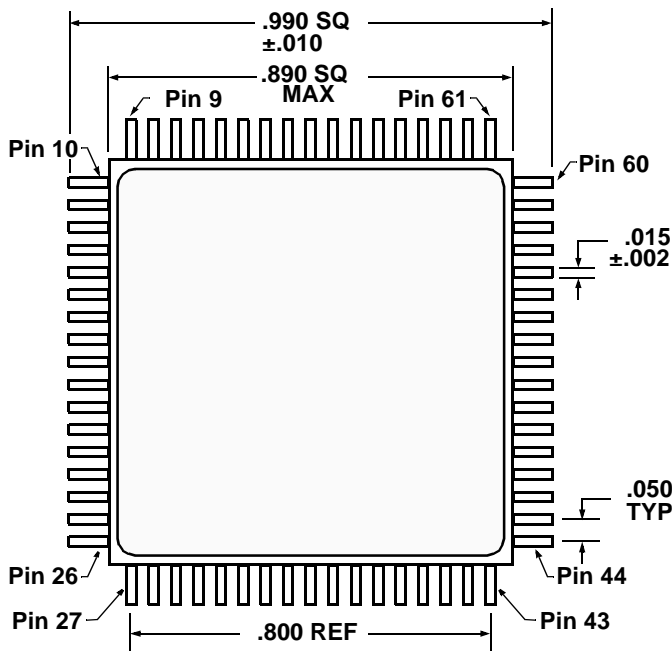
Pin Numbers & Functions

68 Pins — Dual-Cavity CQFP (Standard Configuration)							
Pin #	Function	Pin #	Function	Pin #	Function	Pin #	Function
1	GND	18	GND	35	\overline{OE}	52	GND
2	NC	19	I/O ₈	36	\overline{CE}_2	53	I/O ₂₃
3	A ₅	20	I/O ₉	37	A ₁₇	54	I/O ₂₂
4	A ₄	21	I/O ₁₀	38	RY/ \overline{BY}	55	I/O ₂₁
5	A ₃	22	I/O ₁₁	39	NC	56	I/O ₂₀
6	A ₂	23	I/O ₁₂	40	NC	57	I/O ₁₉
7	A ₁	24	I/O ₁₃	41	A ₁₈	58	I/O ₁₈
8	A ₀	25	I/O ₁₄	42	A ₁₉	59	I/O ₁₇
9	\overline{RESET}	26	I/O ₁₅	43	A ₂₀	60	I/O ₁₆
10	I/O ₀	27	V _{CC}	44	I/O ₃₁	61	V _{CC}
11	I/O ₁	28	A ₁₁	45	I/O ₃₀	62	A ₁₀
12	I/O ₂	29	A ₁₂	46	I/O ₂₉	63	A ₉
13	I/O ₃	30	A ₁₃	47	I/O ₂₈	64	A ₈
14	I/O ₄	31	A ₁₄	48	I/O ₂₇	65	A ₇
15	I/O ₅	32	A ₁₅	49	I/O ₂₆	66	A ₆
16	I/O ₆	33	A ₁₆	50	I/O ₂₅	67	\overline{WE}
17	I/O ₇	34	\overline{CE}_1	51	I/O ₂₄	68	NC

Consult Factory for Special order: Pin 38 -NC

Package Outline — Dual-Cavity CQFP "F2"

Top View



*.180 MAX available, call factory for details

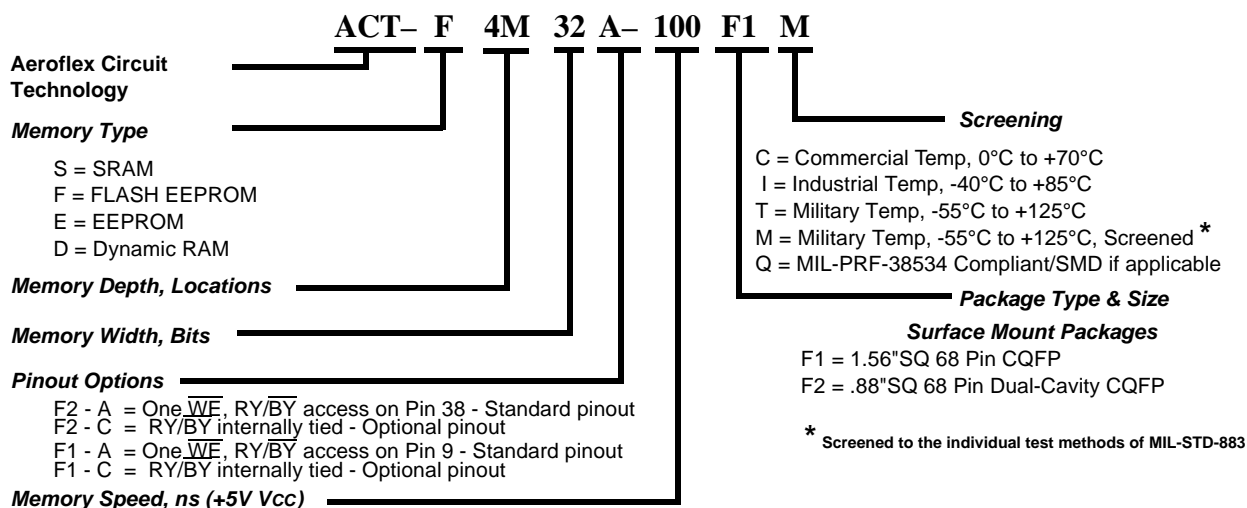
All dimensions in inches



Ordering Information

Model Number	Screening	Speed	Package
ACT-F4M32C-100F1C	Commercial (0°C to +70°C)	100 ns	1.56"sq CQFP
ACT-F4M32A-100F2C	Commercial (0°C to +70°C)	100 ns	.88"sq CQFP
ACT-F4M32C-100F2C	Commercial (0°C to +70°C)	100 ns	.88"sq CQFP
ACT-F4M32A-100F1C	Commercial (0°C to +70°C)	100 ns	1.56"sq CQFP
ACT-F4M32C-100F1I	Industrial (-40°C to +85°C)	100 ns	1.56"sq CQFP
ACT-F4M32A-100F2I	Industrial (-40°C to +85°C)	100 ns	.88"sq CQFP
ACT-F4M32C-100F2I	Industrial (-40°C to +85°C)	100 ns	.88"sq CQFP
ACT-F4M32A-100F1I	Industrial (-40°C to +85°C)	100 ns	1.56"sq CQFP
ACT-F4M32C-100F1M	Military (-55°C to +125°C)	100 ns	1.56"sq CQFP
ACT-F4M32A-100F2M	Military (-55°C to +125°C)	100 ns	.88"sq CQFP
ACT-F4M32C-100F2M	Military (-55°C to +125°C)	100 ns	.88"sq CQFP
ACT-F4M32A-100F1M	Military (-55°C to +125°C)	100 ns	1.56"sq CQFP

Part Number Breakdown



Specifications subject to change without notice

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