

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

Advanced

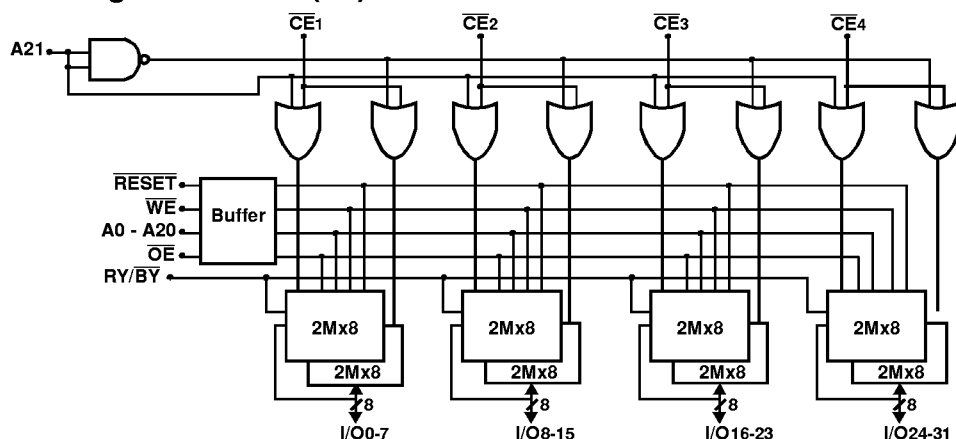
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Features

- 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

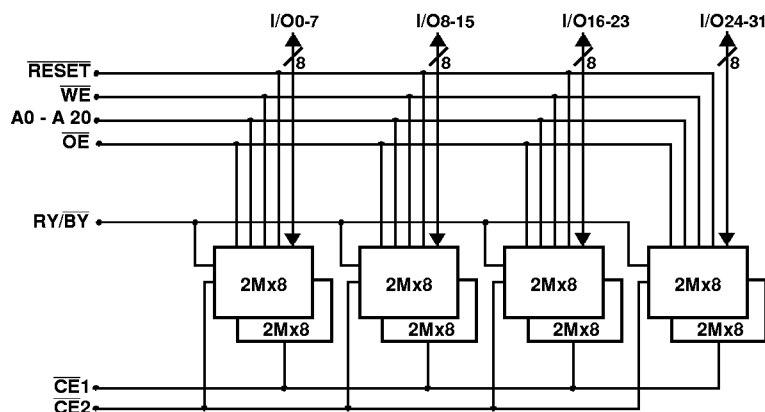
Block Diagram – CQFP(F1)



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°C.

The ACT-F4M32A can be programmed (both read and write functions) in-system using the +5.0V V_{CC} power supply. A 12.0V V_{PP} 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°C.

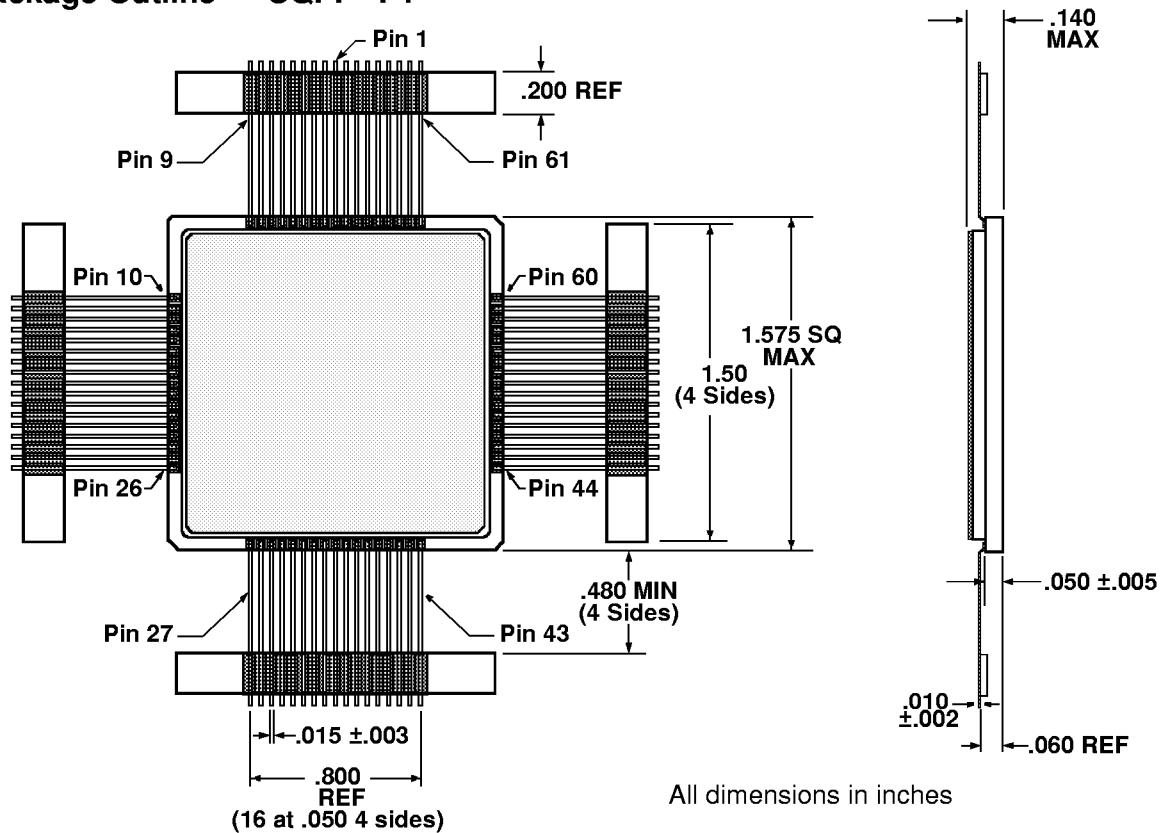
For Detail Information regarding the operation of the Am29F016 Sector Erase Flash Memory, see the AMD datasheet (Publication 18805).

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/O8	36	$\overline{CE4}$	53	I/O23
3	A5	20	I/O9	37	A17	54	I/O22
4	A4	21	I/O10	38	A18	55	I/O21
5	A3	22	I/O11	39	A19	56	I/O20
6	A2	23	I/O12	40	A20	57	I/O19
7	A1	24	I/O13	41	A21	58	I/O18
8	A0	25	I/O14	42	$\overline{RESET}$	59	I/O17
9	RY/ $\overline{BY}$	26	I/O15	43	NC	60	I/O16
10	I/O0	27	V _{CC}	44	I/O31	61	V _{CC}
11	I/O1	28	A11	45	I/O30	62	A10
12	I/O2	29	A12	46	I/O29	63	A9
13	I/O3	30	A13	47	I/O28	64	A8
14	I/O4	31	A14	48	I/O27	65	A7
15	I/O5	32	A15	49	I/O26	66	A6
16	I/O6	33	A16	50	I/O25	67	$\overline{WE}$
17	I/O7	34	$\overline{CE2}$	51	I/O24	68	$\overline{CE3}$

Consult Factory for Special order: Pin 9 -NC

Package Outline — CQFP "F1"



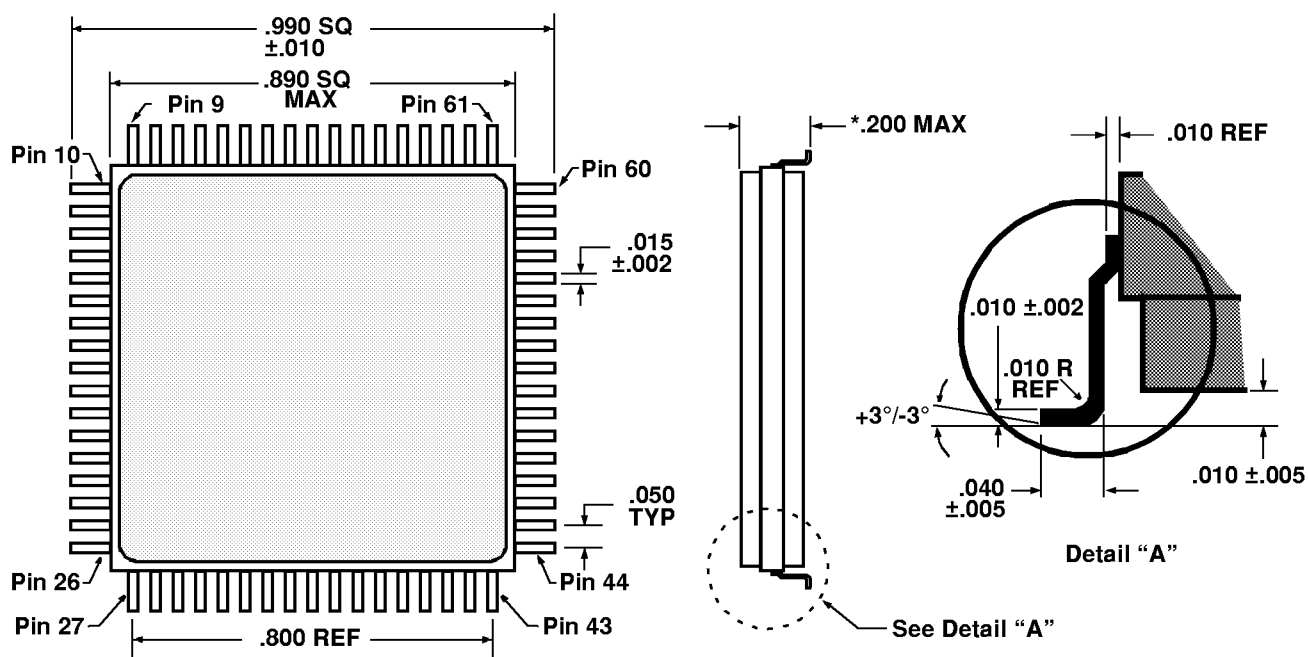
Pin Numbers & Functions

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/O8	36	$\overline{CE}_2$	53	I/O23
3	A5	20	I/O9	37	A17	54	I/O22
4	A4	21	I/O10	38	RY/ $\overline{BY}$	55	I/O21
5	A3	22	I/O11	39	NC	56	I/O20
6	A2	23	I/O12	40	NC	57	I/O19
7	A1	24	I/O13	41	A18	58	I/O18
8	A0	25	I/O14	42	A19	59	I/O17
9	$\overline{RESET}$	26	I/O15	43	A20	60	I/O16
10	I/O0	27	V _{CC}	44	I/O31	61	V _{CC}
11	I/O1	28	A11	45	I/O30	62	A10
12	I/O2	29	A12	46	I/O29	63	A9
13	I/O3	30	A13	47	I/O28	64	A8
14	I/O4	31	A14	48	I/O27	65	A7
15	I/O5	32	A15	49	I/O26	66	A6
16	I/O6	33	A16	50	I/O25	67	$\overline{WE}$
17	I/O7	34	$\overline{CE}_1$	51	I/O24	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**

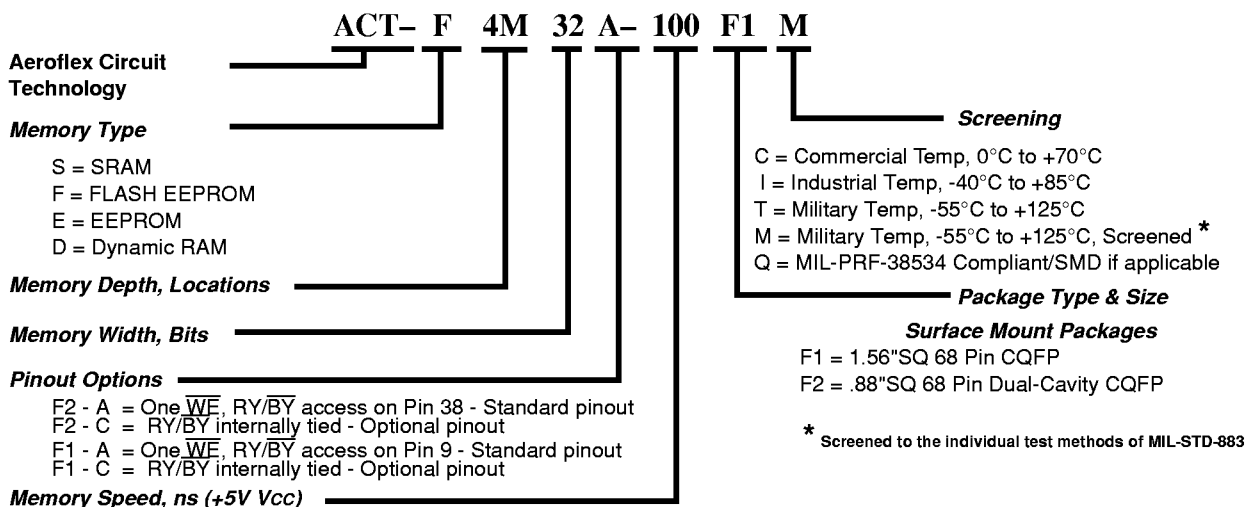
All dimensions in inches



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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