Am27S49/27S49A/29S49SA

8192x8 Generic Series IMOX™ Bipolar PROM

Advanced Micro Devices

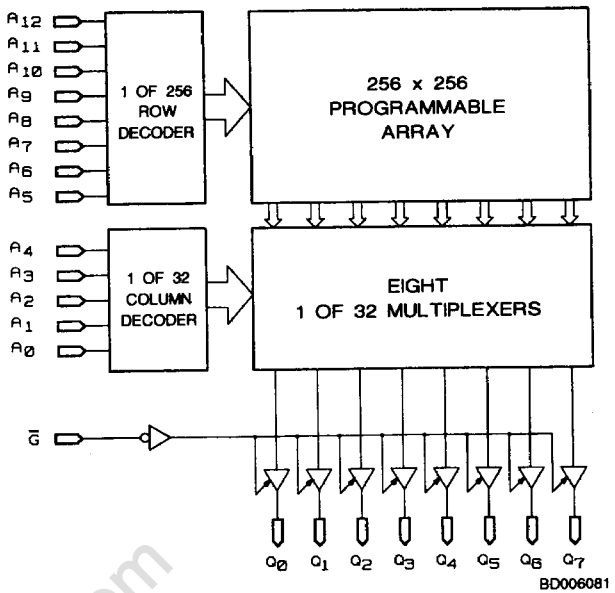
DISTINCTIVE CHARACTERISTICS

- Fast access time
- Platinum-Silicide fuses guarantee high reliability, fast programming and exceptionally high programming yields (typ > 98%)
- AC performance is factory tested utilizing programmed test words and columns
- Voltage and temperature compensation provides extremely flat AC performance over military range

GENERAL DESCRIPTION

The Am27S49 Series are high-speed, electrically programmable Schottky read-only memories, organized in 8192 x 8 configuration. After programming, stored information is read on outputs $Q_0 - Q_7$ by applying unique binary addresses to $A_0 - A_{12}$ and holding the Output Enable ($\overline{G}$) input LOW. When $\overline{G}$ is HIGH, $Q_0 - Q_7$ are in the OFF, or high-impedance state.

BLOCK DIAGRAM



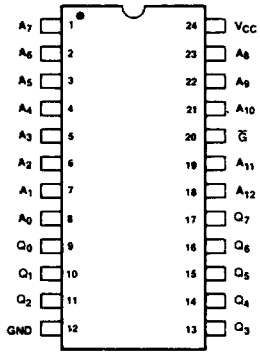
PRODUCT SELECTOR GUIDE

Part Number	Am27S49SA		Am27S49A			Am27S49	
Address Access Time (ns)	25	30	40	45	55	55	65
Operating Range	COM'L	MIL	COM'L	COM'L	MIL	COM'L	MIL

Publication # 04943 Rev. G Amendment /0
Issue Date: January 1989

CONNECTION DIAGRAMS
Top View

DIPs*



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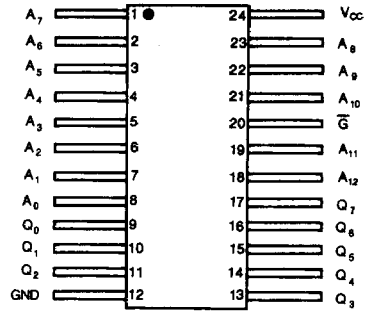
Flatpack



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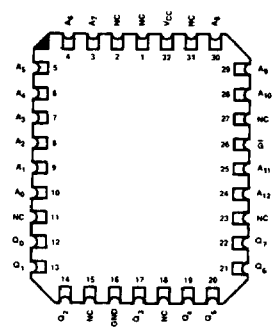
*Also available in 24-pin Slim DIPs (Alternate Packaging Option Only); pinout is identical to standard DIPs.

LCCs



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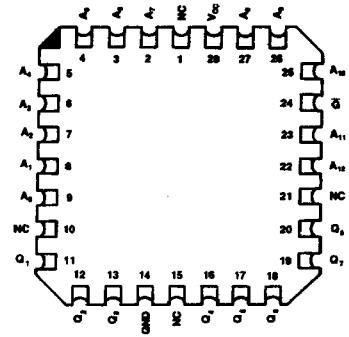

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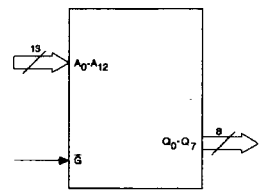
Note: Pin 1 is marked for orientation.

LOGIC SYMBOL



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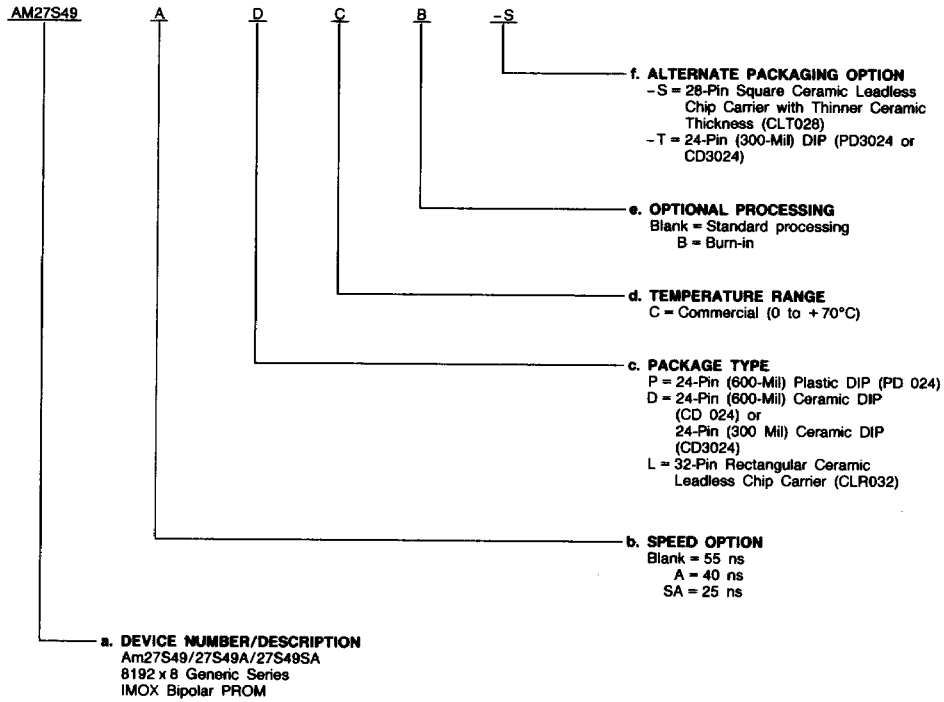
ORDERING INFORMATION

Standard Products

AMD standard products are available in several packages and operating ranges. The order number (Valid Combination) is formed by a combination of: **a. Device Number**
b. Speed Option (if applicable)
c. Package Type
d. Temperature Range
e. Optional Processing
f. Alternate Packaging Option



Valid Combinations	
AM27S49	DC, DCB, PC, PCB, LC, LCB, LC-S, LCB-S, DC-T, DCB-T, PC-T, PCB-T
AM27S49A	
AM27S49SA	

Valid Combinations

Valid Combinations list configurations planned to be supported in volume for this device. Consult the local AMD sales office to confirm availability of specific valid combinations, to check on newly released valid combinations, and to obtain additional data on AMD's standard military grade products.

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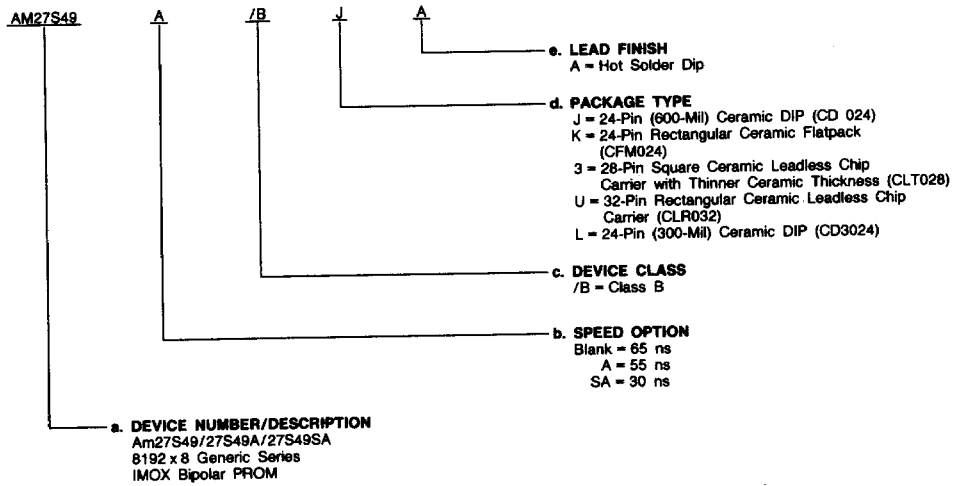
MILITARY ORDERING INFORMATION

APL Products

AMD products for Aerospace and Defense applications are available in several packages and operating ranges. APL (Approved Products List) products are fully compliant with MIL-STD-883C requirements. The order number (Valid Combination) for APL products is formed by a combination of: **a. Device Number**
b. Speed Option (if applicable)
c. Device Class
d. Package Type
e. Lead Finish



Valid Combinations	
AM27S49	/BJA, /BKA, /B3A, /BUA, /BLA
AM27S49A	
AM27S49SA	

Valid Combinations

Consult the local AMD sales office to confirm availability of specific valid combinations or to check for newly released valid combinations.

Group A Tests

Group A tests include Subgroups 1, 2, 3, 7, 8, 9, 10, and 11.

MILITARY BURN-IN

Military burn-in is in accordance with the current revision of MIL-STD-883, Test Method 1015, Conditions A through E. Test conditions are selected at AMD's option.

PIN DESCRIPTION

$A_0 - A_{12}$ Address (Inputs)
The 13-bit field presented at the address inputs selects one of 8192 memory locations to be read from.

$\overline{G}$ Output Enable (Input, Active LOW)
Provides direct control of the Q-output three-state buffers.

$Q_0 - Q_7$ Data Output Port (Outputs, Three-State)
The outputs whose state represents the data read from the selected memory locations. These outputs are three-state buffers which when disabled, are in a floating or high-impedance state.

GENERIC PROGRAMMING INFORMATION

Advanced Micro Devices' Bipolar PROMs are members of a generic series incorporating common programming procedures. All parts in this series are produced with a fusible link at each memory location storing a logic LOW and can be selectively programmed to a logic HIGH by applying appropriate voltages to the circuit.

See the AMD Bipolar/MOS Memories Data Book for detailed programming information.

ABSOLUTE MAXIMUM RATINGS

Storage Temperature ..... −65 to +150°C
Ambient Temperature with
Power Applied ..... −55 to +125°C
Supply Voltage ..... −0.5 V to +7.0 V
DC Voltage Applied to Outputs
(Except During Programming) ..... −0.5 to +V_{CC} Max.
DC Voltage Applied to Outputs
During Programming ..... 21 V
Output Current into Outputs During
Programming (Max Duration of 1 sec) ..... 250 mA
DC Input Voltage ..... −0.5 V to +5.5 V
DC Input Current ..... −30 to +5 mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices
Ambient Temperature (T_A) ..... 0 to +75°C
Supply Voltage (V_{CC}) ..... +4.75 V to +5.25 V

Military (M) Devices*
Case Temperature (T_C) ..... −55 to +125°C
Supply Voltage (V_{CC}) ..... +4.5 V to +5.5 V

Operating ranges define those limits between which the functionality of the device is guaranteed.

*Military Product 100% tested at T_C = +25°C, +125°C, and −55°C.

DC CHARACTERISTICS over operating ranges unless otherwise specified (for APL Products, Group A, Subgroups 1, 2, 3 are tested unless otherwise noted)

Parameter Symbol	Parameter Description	Test Conditions			Min.	Typ.	Max.	Unit
V_{OH}	Output HIGH Voltage	V_{CC} = Min., I_{OH} = −2.0 mA V_{IN} = V_{IH} or V_{IL}			2.4			V
V_{OL}	Output LOW Voltage	V_{CC} = Min., I_{OL} = 16 mA V_{IN} = V_{IH} or V_{IL}					0.50	V
V_{IH}	Input HIGH Level	Guaranteed Input Logical HIGH Voltage for All Inputs (Note 1)			2.0			V
V_{IL}	Input LOW Level	Guaranteed Input Logical LOW Voltage for All Inputs (Note 1)					0.8	V
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = 0.45 V					−250	μA
I_{IH}	Input HIGH Current	V_{CC} = Max.	COM'L	V_{IN} = 5.0 V			40	μA
			MIL	V_{IN} = V_{CC}				
I_{SC}	Output Short-Circuit Current	V_{CC} = Max., V_{OUT} = 0.0 V (Note 2)	−20	−90	mA			
I_{CC}	Power Supply Current	All Inputs = GND, V_{CC} = Max.		COM'L			190	mA
				MIL			190	
V_I	Input Clamp Voltage	V_{CC} = Min., I_{IN} = −18 mA					−1.2	V
I_{CEX}	Output Leakage Current	V_{CC} = Max. $\overline{G}$ = 2.4 V	COM'L	V_O = 5.0 V			40	μA
			MIL	V_O = V_{CC}				
				V_O = 0.4 V			−40	
C_{IN}	Input Capacitance	V_{CC} = 5.0 V, T_A = 25°C V_{IN}/V_{OUT} = 2.0 V at f = 1 MHz (Note 3)				5		pF
C_{OUT}	Output Capacitance					8		

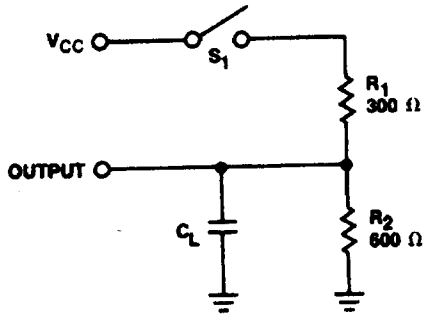
Notes: 1. V_{IL} and V_{IH} are input conditions of output tests and are not themselves directly tested. V_{IL} and V_{IH} are absolute voltages with respect to device ground and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.
2. Not more than one output should be shorted at a time. Duration of the short circuit should not be more than one second.
3. These parameters are not 100% tested, but are evaluated at initial characterization and at any time the design is modified where capacitance may be affected.

SWITCHING CHARACTERISTICS over operating range unless otherwise specified (for APL Products, Group A, Subgroups 9, 10, 11 are tested unless otherwise noted*)

No.	Parameter Symbol	Parameter Description		Am27S49SA Min.	Am27S49SA Max.	Am27S49A Min.	Am27S49A Max.	Am27S49 Min.	Am27S49 Max.	Unit
1	TAVQV	Address Valid to Output Valid Access Time	COM'L		25		40		55	ns
			MIL		30		55		65	
2	TGHQZ	Delay from Output Enable Valid to Output High Z	COM'L		15		30		35	ns
			MIL		20		35		40	
3	TGLQV	Delay from Output Enable Valid to Output Valid	COM'L		15		30		35	ns
			MIL		20		35		40	

Notes: 1. Tests are performed with input transition time of 5 ns or less, timing reference levels of 1.5 V, and input pulse levels of 0 to 3.0 V — See Switching Test Circuit diagram.
*Subgroups 7 and 8 apply to functional tests.

SWITCHING TEST CIRCUIT



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Notes: 1. TAVQV is tested with switch S_1 closed and C_L = 50 pF.
2. For three-state outputs, TGLQV is tested with C_L = 50 pF to the 1.5 V level; S_1 is open for high impedance to HIGH tests and closed for high impedance to LOW tests. TGHQZ is tested with C_L = 5 pF. HIGH to high impedance tests are made with S_1 open to an output voltage of Steady State HIGH −0.5 V; LOW to high-impedance tests are made with S_1 closed to the Steady State LOW + 0.5 V level.

SWITCHING WAVEFORMS

KEY TO SWITCHING WAVEFORMS

WAVEFORM	INPUTS	OUTPUTS
———	MUST BE STEADY	WILL BE STEADY
———		
⟋⟋⟋	MAY CHANGE FROM H TO L	WILL BE CHANGING FROM H TO L
⟋⟋⟋	MAY CHANGE FROM L TO H	WILL BE CHANGING FROM L TO H
⟋⟍⟋⟍	DON'T CARE; ANY CHANGE PERMITTED	CHANGING; STATE UNKNOWN
⟋⟍⟋⟍	DOES NOT APPLY	CENTER LINE IS HIGH IMPEDANCE "OFF" STATE

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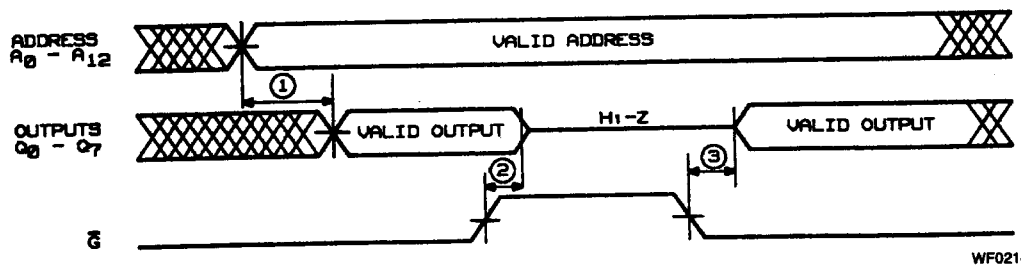

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