

Am27S51

T-46-13-25

131,072-Bit (16,384 x 8) Bipolar PROM

ADVANCE INFORMATION

Am27S51

DISTINCTIVE CHARACTERISTICS

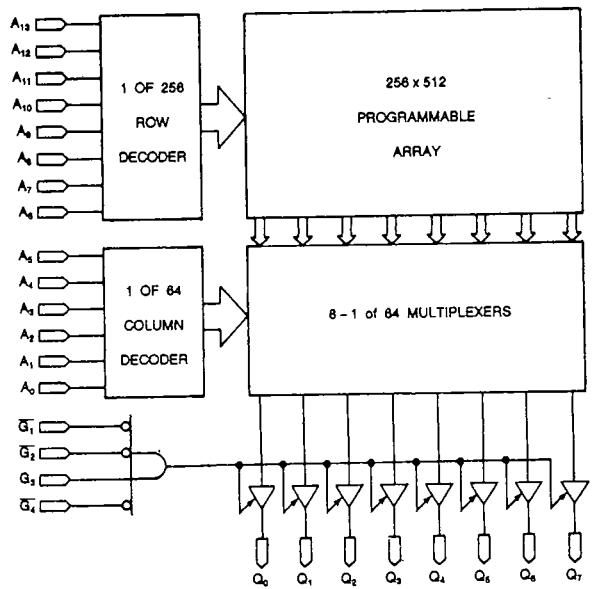
- Ultra fast access time (35 ns max.) "A" version, and fast access time (55 ns max.) standard version
- Platinum-Silicide fuses guarantee high reliability, fast programming and exceptionally high programming yields (typ > 98%).
- AC performance is factory tested, utilizing programmed test words and columns.
- Voltage and temperature compensated, providing extremely flat AC performance over Military Range.
- Member of generic PROM series, utilizing standard programming algorithm.

GENERAL DESCRIPTION

The Am27S51/51A (16,384 words by 8 bits) is a Schottky TTL Programmable Read-Only Memory (PROM). This device has three-state outputs, compatible with low-power

Schottky bus standards, capable of satisfying the requirements of a variety of microprogrammable controls.

BLOCK DIAGRAM



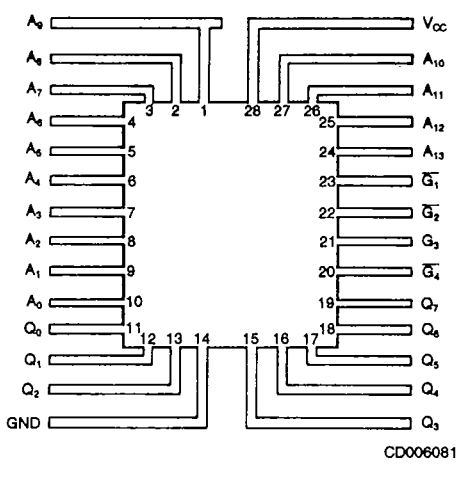
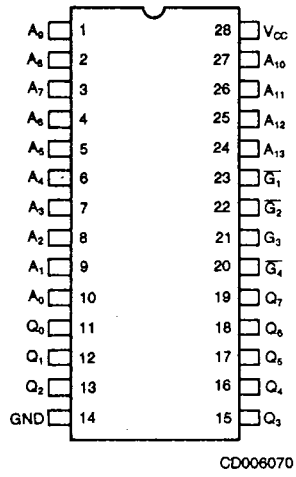
PRODUCT SELECTOR GUIDE

Part Number	Am27S51A		Am27S51	
	35 ns	45 ns	55 ns	65 ns
Address Access Time				
Operating Range	C	M	C	M

Publication # 06915
Rev. B
Issue Date: May 1986
Amendment /0

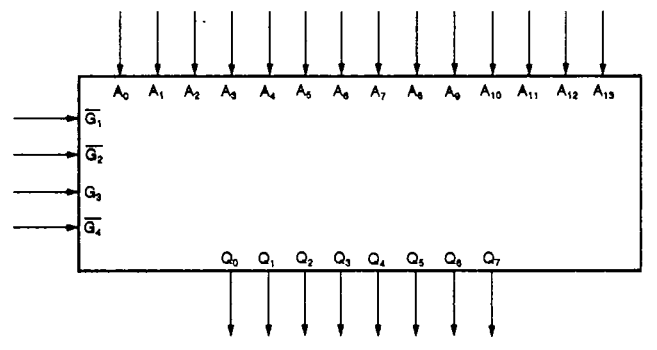
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CONNECTION DIAGRAMS
Top View



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LOGIC SYMBOL



LS002510

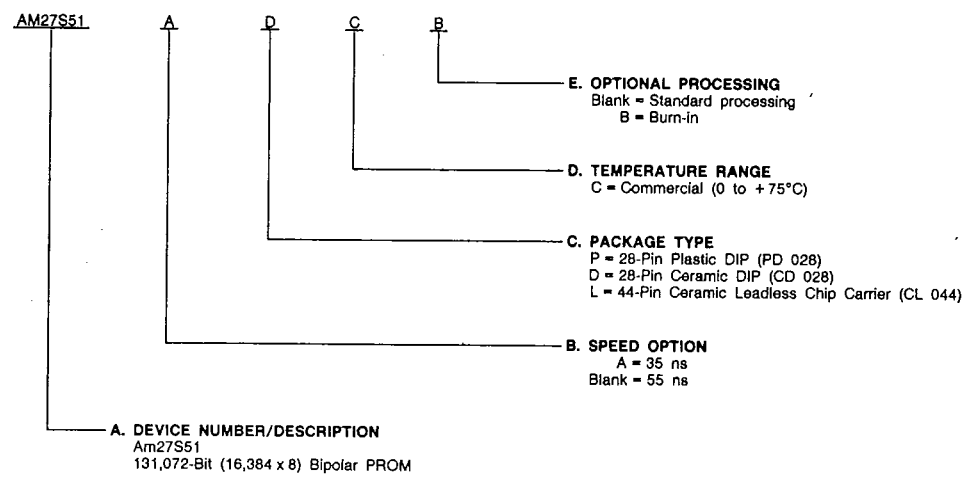
ORDERING INFORMATION (Cont'd.)

T.46-13-25

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



Valid Combinations	
AM27S51	DC, DCB PC, PCB
AM27S51A	LC, LCB

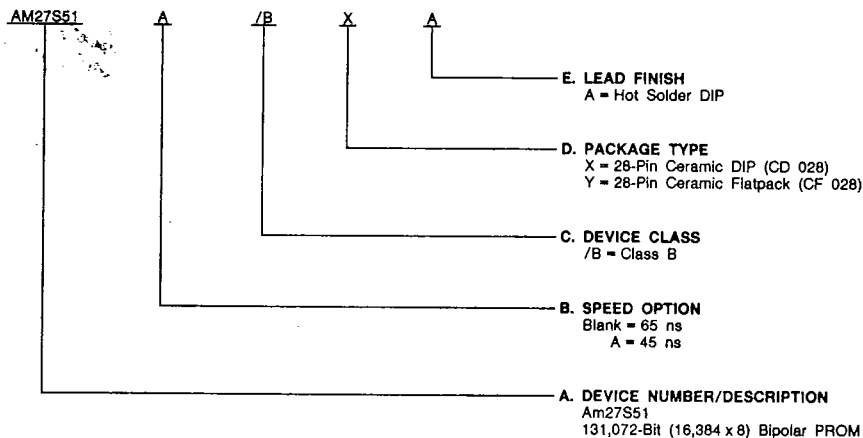
Valid Combinations
Valid Combinations list configurations planned to be supported in volume for this device. Consult the local AMD sales office to confirm availability of specific valid combinations, to check on newly released combinations, and to obtain additional data on AMD's standard military grade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

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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. CPL (Controlled Products List) products are processed in accordance with MIL-STD-883C, but are inherently non-compliant because of package, solderability, or surface treatment exceptions to those specifications. 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	
AM27S51	/BXA, /BYA
AM27S51A	

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 or to check for newly released valid combinations.

PIN DESCRIPTION

A₀ - A₁₃ Address (Inputs)

The 14-bit field presented at the address inputs select one of 16,384 memory locations to be read from.

Q₀ - Q₇ Data Out Port (Output, Three-State)

The outputs whose state represents the data read from the selected memory locations. These outputs are three-state

buffers which when enabled, are in a floating or high-impedance state.

$\overline{G}_1, \overline{G}_2, G_3, \overline{G}_4$ Output Enables

Provides direct control of the Q-output three-state buffers.

$$\text{Disable} = G_1 + G_2 + \overline{G}_3 + G_4 - \text{FALSE}$$

$$\text{Enable} = \overline{G}_1 \cdot \overline{G}_2 \cdot G_3 \cdot \overline{G}_4 - \text{TRUE}$$

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ABSOLUTE MAXIMUM RATINGS

Storage Temperature -65 to +150°C
 Ambient Temperature with
 Power Applied -55 to +125°C
 Supply Voltage -0.5 to +7.0 V
 DC Voltage Applied to Outputs
 (Except During Programming) -0.5 V 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 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 +4.75 to +5.25 V
 Military (M) Devices
 Case Temperature, T_C -55 to +125°C
 Supply Voltage +4.5 to +5.5 V

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

Military product 100% tested at -55°C, 25°C, and 125°C.

DC CHARACTERISTICS over operating range unless otherwise specified*

Parameter Symbol	Parameter Description	Test Conditions	Min.	Typ.	Max.	Units
V _{OH}	Output HIGH Voltage	V _{CC} = Min., I _{OH} = -2.0 mA V _{IN} = V _{IH} or V _{IL}	2.4			Volts
V _{OL}	Output LOW Voltage	V _{CC} = Min., I _{OL} = 18 mA V _{IN} = V _{IH} or V _{IL}			0.50	Volts
V _{IH}	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs (Note 1)	2.0			Volts
V _{IL}	Input LOW Level	Guaranteed input logical LOW voltage for all inputs (Note 1)			0.8	Volts
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = 0.45 V			-0.250	mA
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}			40	μA
I _{SC}	Output Short Circuit Current	V _{CC} = Max., V _{OUT} = 0.0 V (Note 2)	-15		-100	mA
I _{CC}	Power Supply Current	All inputs = GND, V _{CC} = Max.			190	mA
V _I	Input Clamp Voltage	V _{CC} = Min., I _{IN} = -18 mA			-1.2	Volts
I _{CEX}	Output Leakage Current	V _{CC} = Max., G ₃ = 2.4 V V _O = V _{CC} V _O = 0.4 V			40 -40	μA
C _{IN}	Input Capacitance	V _{IN} = 2.0 V @ f = 1 MHz (Note 3)		5.0		pF
C _{OUT}	Output Capacitance	V _{OUT} = 2.0 V @ f = 1 MHz (Note 3)		8.0		

Notes: 1. These are absolute voltages with respect to device ground pin 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 periodically sampled.

*See the last page of this spec for Group A Subgroup Testing information.

SWITCHING CHARACTERISTICS over operating range unless otherwise specified*

No.	Parameter Symbol	Parameter Description	"A" Version				Standard Version				Units
			COM'L		MIL		COM'L		MIL		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	TAVQV	Address Valid to Output Valid Access Time		35		45		55		65	
2	TGVQZ	Delay from Output Enable Valid to Output Hi-Z		25		30		25		30	ns
3	TGVQV	Delay from Output Enable Valid to Output Valid		25		30		25		30	

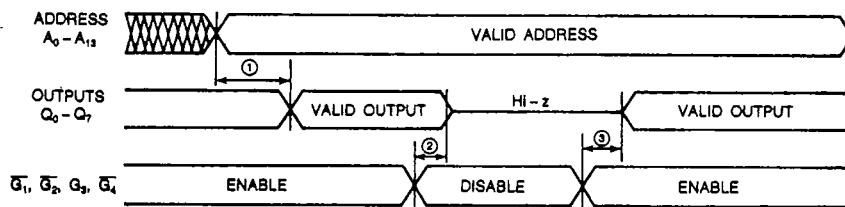
See also Switching Test Circuits.

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 using test load in A. under Switching Test Circuits.
 2. TGVQZ is measured to the steady state HIGH - 0.5 V and steady state LOW + 0.5 V output levels using the test load in B. under Switching Test Circuits.

*See the last page of this spec for Group A Subgroup Testing information.

SWITCHING WAVEFORM

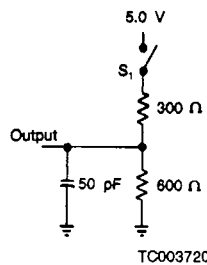
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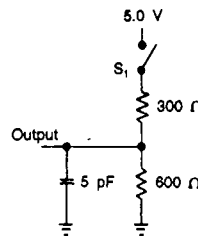
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SWITCHING TEST CIRCUITS



TC003720



TC003730

A. Output Load for all A-C tests except TGVQZ

B. Output Load for TGVQZ

- Notes: 1. All device test loads should be located within 2" of device output pin.
 2. S₁ is open for Output Data HIGH to Hi-Z and Hi-Z to Output Data HIGH tests. S₁ is closed for all other AC tests.
 3. Load capacitance includes all stray and fixture capacitance.

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

KS000010

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DC CHARACTERISTICS

Parameter Symbol	Subgroups
V _{OH}	1, 2, 3
V _{OL}	1, 2, 3
V _{IH}	1, 2, 3
V _{IL}	1, 2, 3
I _{IL}	1, 2, 3
I _{IH}	1, 2, 3
I _{SC}	1, 2, 3
I _{CC}	1, 2, 3
I _{CEX}	1, 2, 3

SWITCHING CHARACTERISTICS

No.	Parameter Symbol	Subgroups
1	TAVQV	9, 10, 11
2	TGVQZ	9, 10, 11
3	TGVQV	9, 10, 11
	Functional Tests	7, 8

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.