AM27S181, 'S181A, 'S281, 'S281A

8,192-Bit (1024x8) Bipolar PROM

The AM27181 (1024 words by 8 bits) is a Schottky TTL Programmable Read-Only Memory (PROM).

This device has three-state outputs which are compatible with low-power Schottky bus standards capable of satisfying the requirements of a variety of microprogrammable controls, mapping functions, code conversion, or logic replacement. Easy word-depth expansion is facilitated by both active LOW ($\overline{G_1}$ and $\overline{G_2}$) and active HIGH ($\overline{G_3}$ and $\overline{G_4}$) output enables.

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-38535
  - Class Q Military
  - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
  - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

Am27S181/27S181A
Am27S281/27S281A
8,192-Bit (1024x8) Bipolar PROM

Advanced
Micro
Devices

DISTINCTIVE CHARACTERISTICS

- Fast access time allows high system speed
- 50% power savings on deselected parts — enhances reliability through total system heat reduction

- Platinum-Silicide fuses guarantee high reliability, fast programming and exceptionally high programming yields (typ > 98%)
- Rapid recovery from power-down state provides minimum delay

GENERAL DESCRIPTION

The Am27S181 (1024 words by 8 bits) is a Schottky TTL Programmable Read-Only Memory (PROM).

This device has three-state outputs which are compatible with low-power Schottky bus standards capable of satisfying the requirements of a variety of microprogrammable controls, mapping functions, code conversion, or logic

replacement. Easy word-depth expansion is facilitated by both active LOW ($\overline{G_1}$ and $\overline{G_2}$) and active HIGH (G_3 and G_4) output enables.

This device is also available in a 300-mil. lateral-center DIP (Am27S281).
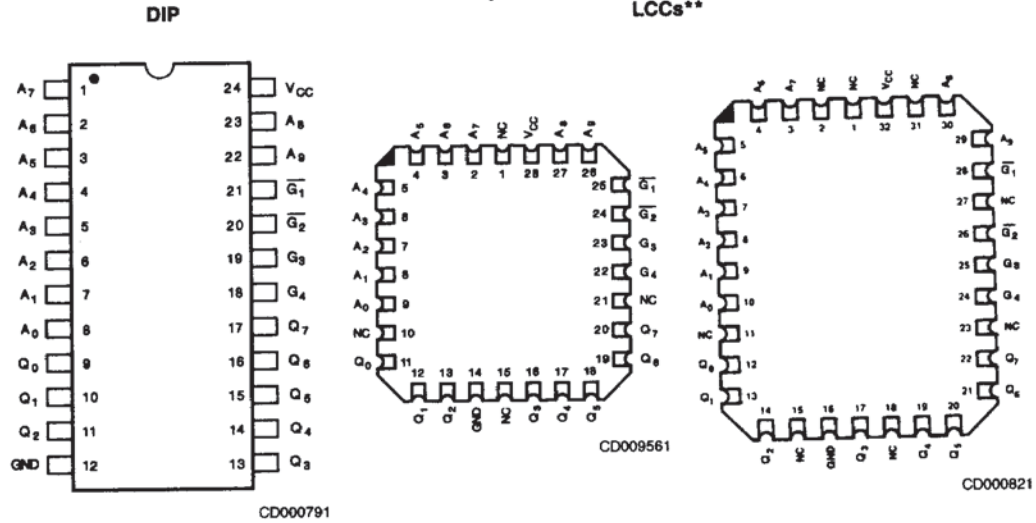
BLOCK DIAGRAM

BD006302
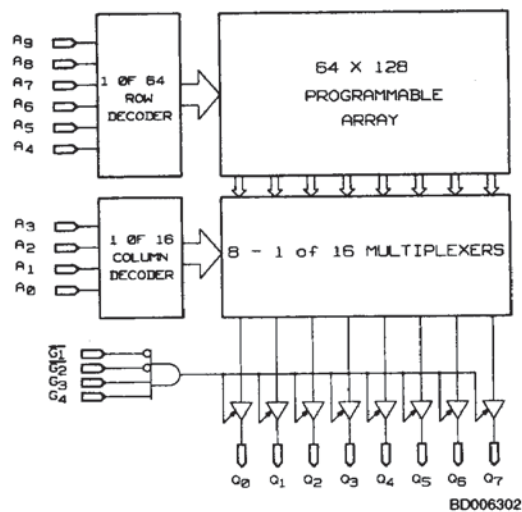
PRODUCT SELECTOR GUIDE

Three-State Part Number	Am27S181A, Am27S281A		Am27S181, Am27S281	
Address Access Time	35 ns	50 ns	60 ns	80 ns
Operating Range	C	M	C	M

CONNECTION DIAGRAMS
Top View

DIP

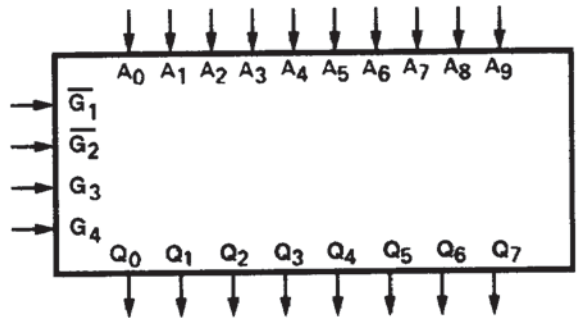|			
A7	1	24	Vcc
A6	2	23	A8
A5	3	22	A9
A4	4	21	$\overline{G_1}$
A3	5	20	$\overline{G_2}$
A2	6	19	G3
A1	7	18	G4
A0	8	17	Q7
Q0	9	16	Q6
Q1	10	15	Q5
Q2	11	14	Q4
GND	12	13	Q3

CD000791

LCCs**

CD009561

CD000821

*Also available in a 300-mil DIP and a 24-pin Flatpack. Pinout identical to those listed here for the 600-mil DIP.
**Also available in a 28-Pin Square PLCC. Pinout identical to the 28-Pin LCC.
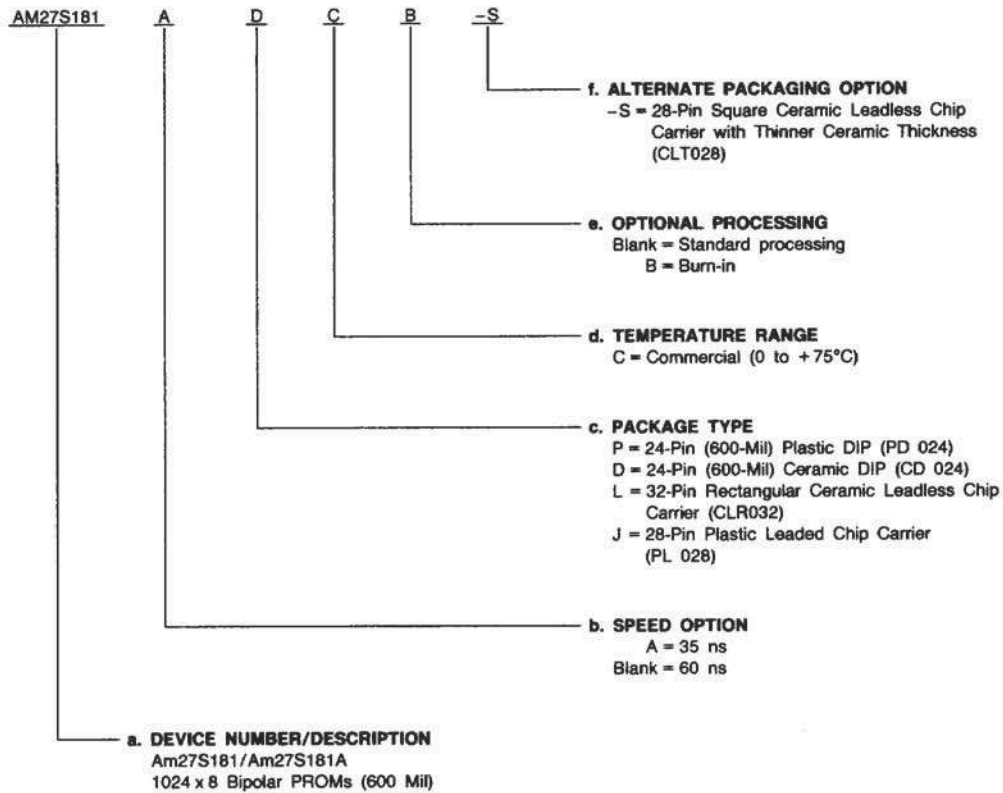
Note: Pin 1 is marked for orientation.

LOGIC SYMBOL

Inputs: A0 A1 A2 A3 A4 A5 A6 A7 A8 A9

$\overline{G_1}$
$\overline{G_2}$
G3
G4

Outputs: Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7

LS000193

ORDERING INFORMATION

(Am27S181/181A)

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**

AM27S181   A   D   C   B   –S

f. ALTERNATE PACKAGING OPTION
–S = 28-Pin Square Ceramic Leadless Chip
Carrier with Thinner Ceramic Thickness
(CLT028)

e. OPTIONAL PROCESSING
Blank = Standard processing
B = Burn-in

d. TEMPERATURE RANGE
C = Commercial (0 to +75°C)

c. PACKAGE TYPE
P = 24-Pin (600-Mil) Plastic DIP (PD 024)
D = 24-Pin (600-Mil) Ceramic DIP (CD 024)
L = 32-Pin Rectangular Ceramic Leadless Chip
Carrier (CLR032)
J = 28-Pin Plastic Leaded Chip Carrier
(PL 028)

b. SPEED OPTION
A = 35 ns
Blank = 60 ns

a. DEVICE NUMBER/DESCRIPTION
Am27S181/Am27S181A
1024 x 8 Bipolar PROMs (600 Mil)

Valid Combinations	
AM27S181	PC, PDB, DC, DCB, LC, LCB, LC-S, LCB-S,
AM27S181A	JC, JCB

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.
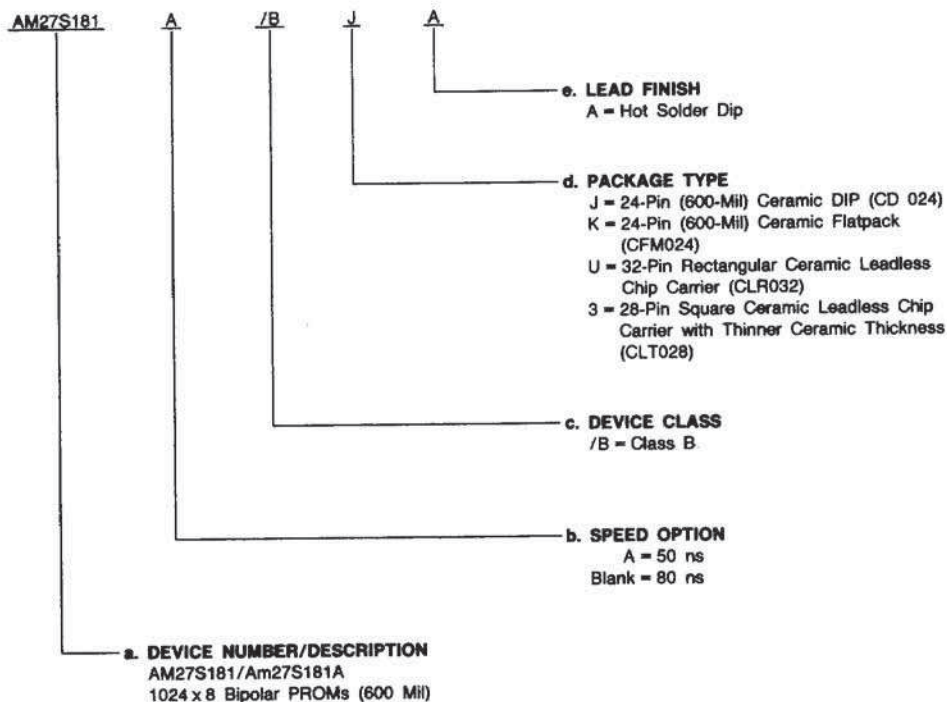
MILITARY ORDERING INFORMATION

(Am27S181/181A)

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

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AM27S181    A    /B    J    A
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e. LEAD FINISH
A = Hot Solder Dip

d. PACKAGE TYPE
J = 24-Pin (600-Mil) Ceramic DIP (CD 024)
K = 24-Pin (600-Mil) Ceramic Flatpack (CFM024)
U = 32-Pin Rectangular Ceramic Leadless Chip Carrier (CLR032)
3 = 28-Pin Square Ceramic Leadless Chip Carrier with Thinner Ceramic Thickness (CLT028)

c. DEVICE CLASS
/B = Class B

b. SPEED OPTION
A = 50 ns
Blank = 80 ns

a. DEVICE NUMBER/DESCRIPTION
AM27S181/Am27S181A
1024 x 8 Bipolar PROMs (600 Mil)

Valid Combinations	
AM27S181	/BJA, /BKA, /BUA,
AM27S181A	/B3A

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.

Group A Tests

Group A tests consist of Subgroups 1, 2, 3, 7, 8, 9, 10, 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.
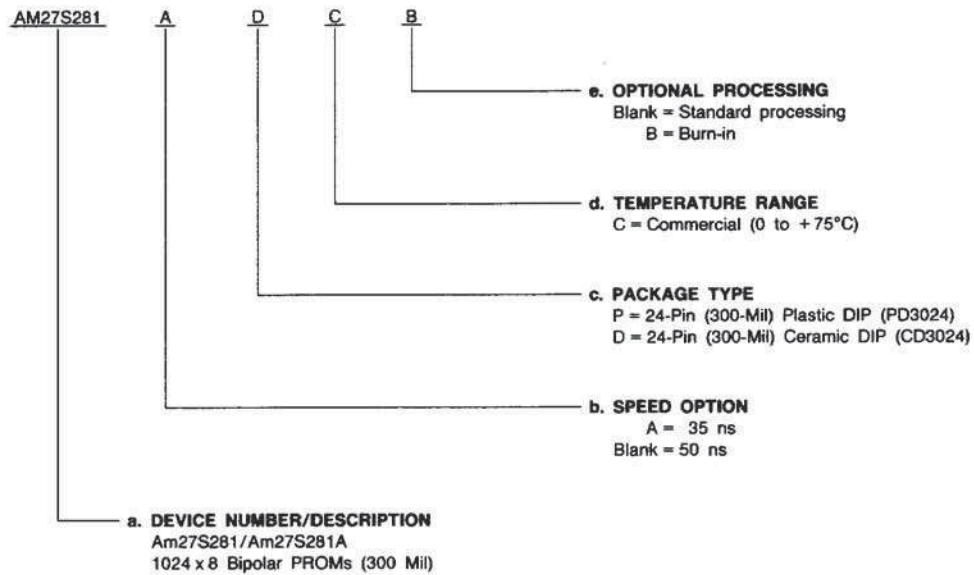
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ORDERING INFORMATION

(Am27S281/281A)

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**

AM27S281   A   D   C   B

e. OPTIONAL PROCESSING
Blank = Standard processing
B = Burn-in

d. TEMPERATURE RANGE
C = Commercial (0 to +75°C)

c. PACKAGE TYPE
P = 24-Pin (300-Mil) Plastic DIP (PD3024)
D = 24-Pin (300-Mil) Ceramic DIP (CD3024)

b. SPEED OPTION
A = 35 ns
Blank = 50 ns

a. DEVICE NUMBER/DESCRIPTION
Am27S281/Am27S281A
1024 x 8 Bipolar PROMs (300 Mil)

Valid Combinations	
AM27S281	PC, PCB, DC, DCB
AM27S281A	

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.
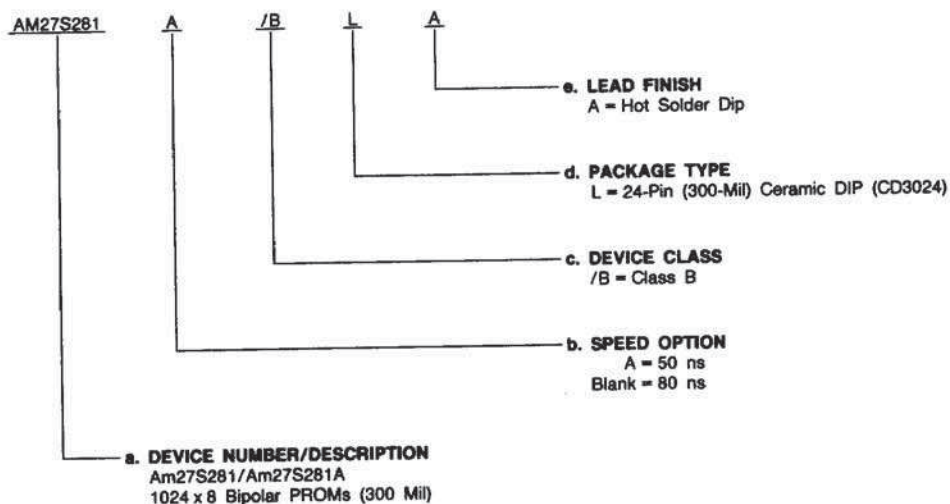
MILITARY ORDERING INFORMATION

(Am27S281/281A)

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

AM27S281   A   /B   L   A

e. LEAD FINISH
A = Hot Solder Dip

d. PACKAGE TYPE
L = 24-Pin (300-Mil) Ceramic DIP (CD3024)

c. DEVICE CLASS
/B = Class B

b. SPEED OPTION
A = 50 ns
Blank = 80 ns

a. DEVICE NUMBER/DESCRIPTION
Am27S281/Am27S281A
1024 x 8 Bipolar PROMs (300 Mil)

Valid Combinations	
AM27S281	/BLA
AM27S281A	

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.

Group A Tests

Group A tests consist of Subgroups
1, 2, 3, 7, 8, 9, 10, 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

$A_0 - A_9$ Address Inputs
The 10-bit field presented at the address inputs selects one of 1,048 memory locations to be read from.

$Q_0 - Q_7$ Data Output Port
The outputs whose state represents the data read from the selected memory locations.

$\overline{G}_1, \overline{G}_2, G_3, G_4$ Output Enable
Provides direct control of the Q output buffers. Outputs disabled force all outputs to a floating or high-impedance state.

Enable = $\overline{\overline{G}_1 \cdot \overline{G}_2 \cdot G_3 \cdot G_4}$

Disable = $\overline{\overline{G}_1 \cdot \overline{G}_2 \cdot G_3 \cdot G_4}$
       = $G_1 + G_2 + \overline{G}_3 + \overline{G}_4$

V_{CC} Device Power Supply Pin
The most positive of the logic power supply pins

GND   Device Power Supply Pin
The most negative of the logic power supply pins.

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 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 V to +5.5 V
DC Input Current .... −30 mA 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 3)		2.0			V
V$_{IL}$	Input LOW Level	Guaranteed input logical LOW voltage for all inputs (Note 3)				0.8	V
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 1)	COM'L	−20		−90	mA
			MIL	−15		−90	
I$_{CC}$	Power Supply Current	All Inputs = GND				185	mA
V$_I$	Input Clamp Voltage	V$_{CC}$ = Min., I$_{IN}$ = −18 mA				−1.2	V
I$_{CEX}$	Output Leakage Current	V$_{CC}$ = Max. V$_{\overline{G1}}$ = 2.4 V	V$_O$ = V$_{CC}$			40	µA
			V$_O$ = 0.4 V			−40	
C$_{IN}$	Input Capacitance	V$_{IN}$ = 2.0 V @ f = 1 MHz (Note 2) V$_{CC}$ = 5 V, T$_A$ = 25°C			4.0		pF
C$_{OUT}$	Output Capacitance	V$_{OUT}$ = 2.0 V @ f = 1 MHz (Note 2) V$_{CC}$ = 5 V, T$_A$ = 25°C			8.0		

Notes: 1. Not more than one output should be shorted at a time. Duration of the short-circuit test should not be more than one second.
2. 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.
3. 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.

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

| No.	Parameter Symbol	Parameter Description	Version	COM'L Max.	MIL Max.	Unit
1	TAVQV	Address Valid to Output Valid Access Time	A	35	50	ns
			STD	60	80	
2	TGVQZ TEVQZ	Delay from Output Enable Valid to Output Hi-Z	A	25	30	ns
			STD	40	50	
3	TGVQV TEVQV	Delay from Output Enable Valid to Output Valid	A	25	30	ns
			STD	40	50	

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 Figure A.
2. TGVQZ is measured at steady state HIGH output voltage −0.5 V and steady state LOW output voltage +0.5 V output levels using the test load in Figure B.

Am27S181/27S181A Am27S281/27S281A

SWITCHING TEST CIRCUITS

TC003441
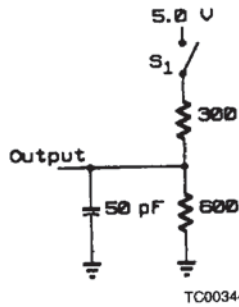
A. Output Load for all Switching tests except TGVQZ

TC003452
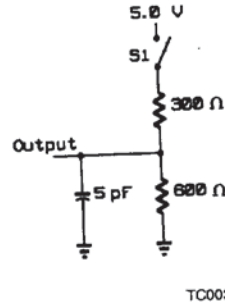
B. Output Load for TGVQZ

Notes: 1. All device test loads should be located within 2" of device output pin.
2. S_1 is open for Output Data HIGH to Hi-Z and Hi-Z to Output Data HIGH tests.
S_1 is closed for all other Switching tests.
3. Load capacitance includes all stray and fixture capacitance.

SWITCHING WAVEFORM

KEY TO SWITCHING WAVEFORMS

KS000010

WF021683