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Am27C512

512 Kilobit (64 K x 8-Bit) CMOS EPROM

DISTINCTIVE CHARACTERISTICS

- **Fast access time**
  - — Speed options as fast as 55 ns
- **Low power consumption**
  - — 20 µA typical CMOS standby current
- **JEDEC-approved pinout**
- **Single +5 V power supply**
- **±10% power supply tolerance standard**
- **100% Flashrite™ programming**
  - — Typical programming time of 8 seconds
- **Latch-up protected to 100 mA from –1 V to V_{CC} + 1 V**
- **High noise immunity**
- **Versatile features for simple interfacing**
  - — Both CMOS and TTL input/output compatibility
  - — Two line control functions
- **Standard 28-pin DIP, PDIP, and 32-pin PLCC packages**

GENERAL DESCRIPTION

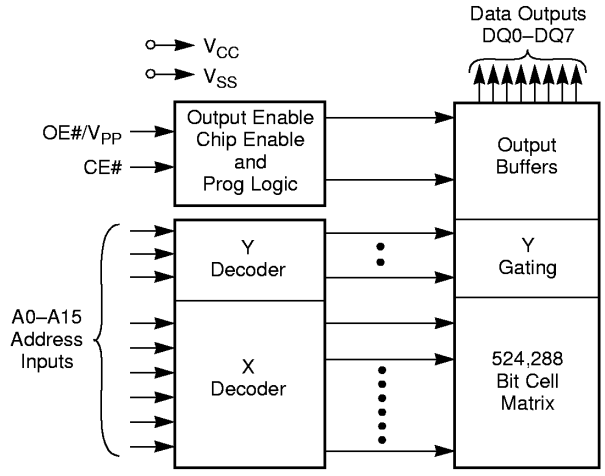
The Am27C512 is a 512-Kbit, ultraviolet erasable programmable read-only memory. It is organized as 64K words by 8 bits per word, operates from a single +5 V supply, has a static standby mode, and features fast single address location programming. Products are available in windowed ceramic DIP packages, as well as plastic one time programmable (OTP) PDIP and PLCC packages.

Data can be typically accessed in less than 55 ns, allowing high-performance microprocessors to operate without any WAIT states. The device offers separate Output Enable (OE#) and Chip Enable (CE#) controls, thus eliminating bus contention in a multiple bus microprocessor system.

AMD's CMOS process technology provides high speed, low power, and high noise immunity. Typical power consumption is only 80 mW in active mode, and 100 µW in standby mode.

All signals are TTL levels, including programming signals. Bit locations may be programmed singly, in blocks, or at random. The device supports AMD's Flashrite programming algorithm (100 µs pulses), resulting in a typical programming time of 8 seconds.

BLOCK DIAGRAM



For complete Rochester ordering guide, please refer to page 2.
Please contact factory for specific package and specification availability.

Rochester Electronics guarantees 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. Rochester Electronics reserves the right to make changes without further notice to any specification herein.

Rochester Ordering Guide

**Most products can also be offered as RoHS compliant, designated by a –G suffix. Please contact factory for more information.*

Rochester Part Number	AMD Part Number	Package	Temperature
AM27C512-55DC	AM27C512-55DC	CDIP-28	0° to +70°C
AM27C512-55DC5	AM27C512-55DC5	CDIP-28	0° to +70°C
AM27C512-55DCB	AM27C512-55DCB	CDIP-28	0° to +70°C
AM27C512-55JC	AM27C512-55JC	LDCC-32, Plastic	0° to +70°C
AM27C512-55JC5	AM27C512-55JC5	LDCC-32, Plastic	0° to +70°C
AM27C512-55PC	AM27C512-55PC	PDIP-28	0° to +70°C
AM27C512-55PC5	AM27C512-55PC5	PDIP-28	0° to +70°C
AM27C512-70DC	AM27C512-70DC	CDIP-28	0° to +70°C
AM27C512-70DCB	AM27C512-70DCB	CDIP-28	0° to +70°C
AM27C512-70DI	AM27C512-70DI	CDIP-28	-40° to +85°C
AM27C512-70DIB	AM27C512-70DIB	CDIP-28	-40° to +85°C
AM27C512-70EC	AM27C512-70EC	TSSOP-32, Plastic	0° to +70°C
AM27C512-70EI	AM27C512-70EI	TSSOP-32, Plastic	-40° to +85°C
AM27C512-70JC	AM27C512-70JC	LDCC-32, Plastic	0° to +70°C
AM27C512-70JI	AM27C512-70JI	LDCC-32, Plastic	-40° to +85°C
AM27C512-90DC	AM27C512-90DC	CDIP-28	0° to +70°C
AM27C512-90DCB	AM27C512-90DCB	CDIP-28	0° to +70°C
AM27C512-90DE	AM27C512-90DE	CDIP-28	-55° to +125°C
AM27C512-90DEB	AM27C512-90DEB	CDIP-28	-55° to +125°C
AM27C512-90DI	AM27C512-90DI	CDIP-28	-40° to +85°C
AM27C512-90DIB	AM27C512-90DIB	CDIP-28	-40° to +85°C
AM27C512-90EC	AM27C512-90EC	TSSOP-32, Plastic	0° to +70°C
AM27C512-90EI	AM27C512-90EI	TSSOP-32, Plastic	-40° to +85°C
AM27C512-90JC	AM27C512-90JC	LDCC-32, Plastic	0° to +70°C
AM27C512-90JI	AM27C512-90JI	LDCC-32, Plastic	-40° to +85°C
AM27C512-90LC	AM27C512-90LC	LLCC-32, Ceramic	0° to +70°C
AM27C512-90LCB	AM27C512-90LCB	LLCC-32, Ceramic	0° to +70°C
AM27C512-90LE	AM27C512-90LE	LLCC-32, Ceramic	-55° to +125°C
AM27C512-90LEB	AM27C512-90LEB	LLCC-32, Ceramic	-55° to +125°C
AM27C512-90LI	AM27C512-90LI	LLCC-32, Ceramic	-40° to +85°C
AM27C512-90LIB	AM27C512-90LIB	LLCC-32, Ceramic	-40° to +85°C
AM27C512-90PC	AM27C512-90PC	PDIP-28	0° to +70°C
AM27C512-90PI	AM27C512-90PI	PDIP-28	-40° to +85°C
AM27C512-120DC	AM27C512-120DC	CDIP-28	0° to +70°C
AM27C512-120DCB	AM27C512-120DCB	CDIP-28	0° to +70°C
AM27C512-120DE	AM27C512-120DE	CDIP-28	-55° to +125°C
AM27C512-120DEB	AM27C512-120DEB	CDIP-28	-55° to +125°C
AM27C512-120DI	AM27C512-120DI	CDIP-28	-40° to +85°C
AM27C512-120DIB	AM27C512-120DIB	CDIP-28	-40° to +85°C
AM27C512-120EC	AM27C512-120EC	TSSOP-32, Plastic	0° to +70°C
AM27C512-120EI	AM27C512-120EI	TSSOP-32, Plastic	-40° to +85°C
AM27C512-120JC	AM27C512-120JC	LDCC-32, Plastic	0° to +70°C
AM27C512-120JI	AM27C512-120JI	LDCC-32, Plastic	-40° to +85°C
AM27C512-120LC	AM27C512-120LC	LLCC-32, Ceramic	0° to +70°C
AM27C512-120LCB	AM27C512-120LCB	LLCC-32, Ceramic	0° to +70°C

Rochester Ordering Guide (continued)

Rochester Part Number	AMD Part Number	Package	Temperature
AM27C512-120LE	AM27C512-120LE	LLCC-32, Ceramic	-55° to +125°C
AM27C512-120LEB	AM27C512-120LEB	LLCC-32, Ceramic	-55° to +125°C
AM27C512-120LI	AM27C512-120LI	LLCC-32, Ceramic	-40° to +85°C
AM27C512-120LIB	AM27C512-120LIB	LLCC-32, Ceramic	-40° to +85°C
AM27C512-120PC	AM27C512-120PC	PDIP-28	0° to +70°C
AM27C512-120PI	AM27C512-120PI	PDIP-28	-40° to +85°C
AM27C512-150DC	AM27C512-150DC	CDIP-28	0° to +70°C
AM27C512-150DCB	AM27C512-150DCB	CDIP-28	0° to +70°C
AM27C512-150DE	AM27C512-150DE	CDIP-28	-55° to +125°C
AM27C512-150DEB	AM27C512-150DEB	CDIP-28	-55° to +125°C
AM27C512-150DI	AM27C512-150DI	CDIP-28	-40° to +85°C
AM27C512-150DIB	AM27C512-150DIB	CDIP-28	-40° to +85°C
AM27C512-150EC	AM27C512-150EC	TSSOP-32, Plastic	0° to +70°C
AM27C512-150EI	AM27C512-150EI	TSSOP-32, Plastic	-40° to +85°C
AM27C512-150JC	AM27C512-150JC	LDCC-32, Plastic	0° to +70°C
AM27C512-150JI	AM27C512-150JI	LDCC-32, Plastic	-40° to +85°C
AM27C512-150LC	AM27C512-150LC	LLCC-32, Ceramic	0° to +70°C
AM27C512-150LCB	AM27C512-150LCB	LLCC-32, Ceramic	0° to +70°C
AM27C512-150LE	AM27C512-150LE	LLCC-32, Ceramic	-55° to +125°C
AM27C512-150LEB	AM27C512-150LEB	LLCC-32, Ceramic	-55° to +125°C
AM27C512-150LI	AM27C512-150LI	LLCC-32, Ceramic	-40° to +85°C
AM27C512-150LIB	AM27C512-150LIB	LLCC-32, Ceramic	-40° to +85°C
AM27C512-150PC	AM27C512-150PC	PDIP-28	0° to +70°C
AM27C512-150PI	AM27C512-150PI	PDIP-28	-40° to +85°C
AM27C512-200DC	AM27C512-200DC	CDIP-28	0° to +70°C
AM27C512-200DCB	AM27C512-200DCB	CDIP-28	0° to +70°C
AM27C512-200DE	AM27C512-200DE	CDIP-28	-55° to +125°C
AM27C512-200DEB	AM27C512-200DEB	CDIP-28	-55° to +125°C
AM27C512-200DI	AM27C512-200DI	CDIP-28	-40° to +85°C
AM27C512-200DIB	AM27C512-200DIB	CDIP-28	-40° to +85°C
AM27C512-200EC	AM27C512-200EC	TSSOP-32, Plastic	0° to +70°C
AM27C512-200EI	AM27C512-200EI	TSSOP-32, Plastic	-40° to +85°C
AM27C512-200JC	AM27C512-200JC	LDCC-32, Plastic	0° to +70°C
AM27C512-200JI	AM27C512-200JI	LDCC-32, Plastic	-40° to +85°C
AM27C512-200LC	AM27C512-200LC	LLCC-32, Ceramic	0° to +70°C
AM27C512-200LCB	AM27C512-200LCB	LLCC-32, Ceramic	0° to +70°C
AM27C512-200LE	AM27C512-200LE	LLCC-32, Ceramic	-55° to +125°C
AM27C512-200LEB	AM27C512-200LEB	LLCC-32, Ceramic	-55° to +125°C
AM27C512-200LI	AM27C512-200LI	LLCC-32, Ceramic	-40° to +85°C
AM27C512-200LIB	AM27C512-200LIB	LLCC-32, Ceramic	-40° to +85°C
AM27C512-200PC	AM27C512-200PC	PDIP-28	0° to +70°C
AM27C512-200PI	AM27C512-200PI	PDIP-28	-40° to +85°C
AM27C512-255DC	AM27C512-255DC	CDIP-28	0° to +70°C
AM27C512-255DCB	AM27C512-255DCB	CDIP-28	0° to +70°C
AM27C512-255DE	AM27C512-255DE	CDIP-28	-55° to +125°C

Rochester Ordering Guide (continued)

Rochester Part Number	AMD Part Number	Package	Temperature
AM27C512-255DEB	AM27C512-255DEB	CDIP-28	-55° to +125°C
AM27C512-255DI	AM27C512-255DI	CDIP-28	-40° to +85°C
AM27C512-255DIB	AM27C512-255DIB	CDIP-28	-40° to +85°C
AM27C512-255EC	AM27C512-255EC	TSSOP-32, Plastic	0° to +70°C
AM27C512-255EI	AM27C512-255EI	TSSOP-32, Plastic	-40° to +85°C
AM27C512-255JC	AM27C512-255JC	LDCC-32, Plastic	0° to +70°C
AM27C512-255JI	AM27C512-255JI	LDCC-32, Plastic	-40° to +85°C
AM27C512-255LC	AM27C512-255LC	LLCC-32, Ceramic	0° to +70°C
AM27C512-255LCB	AM27C512-255LCB	LLCC-32, Ceramic	0° to +70°C
AM27C512-255LE	AM27C512-255LE	LLCC-32, Ceramic	-55° to +125°C
AM27C512-255LEB	AM27C512-255LEB	LLCC-32, Ceramic	-55° to +125°C
AM27C512-255LI	AM27C512-255LI	LLCC-32, Ceramic	-40° to +85°C
AM27C512-255LIB	AM27C512-255LIB	LLCC-32, Ceramic	-40° to +85°C
AM27C512-255PC	AM27C512-255PC	PDIP-28	0° to +70°C
AM27C512-255PI	AM27C512-255PI	PDIP-28	-40° to +85°C

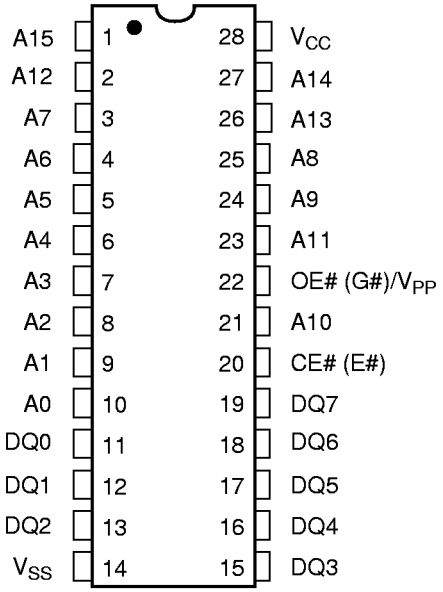
PRODUCT SELECTOR GUIDE

Family Part Number		Am27C512						
Speed Options	V_{CC} = 5.0 V ± 5%	**-55**						**-255**
	V_{CC} = 5.0 V ± 10%	**-55**	**-70**	**-90**	**-120**	**-150**	**-200**	
Max Access Time (ns)		55	70	90	120	150	200	250
CE# (E#) Access (ns)		55	70	90	120	150	200	250
OE# (G#) Access (ns)		35	40	40	50	50	50	50

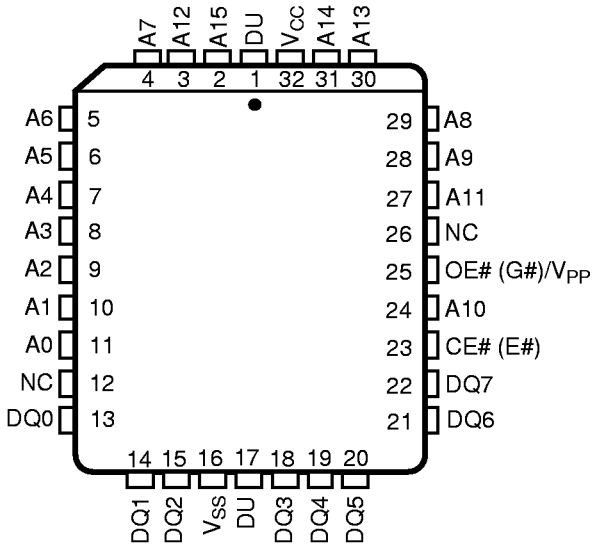
CONNECTION DIAGRAMS

Top View

DIP



PLCC



Notes:

1. *JEDEC nomenclature is in parenthesis.*
2. *Don't use (DU) for PLCC.*

PIN DESIGNATIONS

A0–A15 = Address Inputs

CE# (E#) = Chip Enable Input

DQ0–DQ7 = Data Input/Outputs

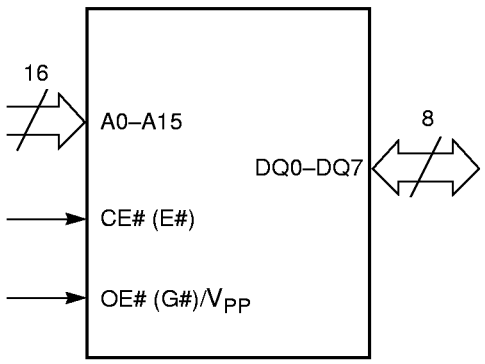
OE# (G#)/V_{PP} = Output Enable Input
Program Voltage Input

V_{CC} = V_{CC} Supply Voltage

V_{SS} = Ground

NC = No Internal Connection

LOGIC SYMBOL



ABSOLUTE MAXIMUM RATINGS

Storage Temperature
OTP Products. . . . . –65°C to +125°C
All Other Products . . . . . –65°C to +150°C

Ambient Temperature
with Power Applied . . . . . –55°C to +125°C

Voltage with Respect to V_{SS} (Note 1)

All pins except A9, V_{PP}, V_{CC} . . –0.6 V to V_{CC} + 0.6 V

A9 and V_{PP} (Note 2) . . . . . .–0.6 V to 13.5 V

V_{CC}. . . . . .–0.6 V to 7.0 V

Notes:

1. *Minimum DC voltage on input or I/O pins –0.5 V. During voltage transitions, the input may overshoot V_{SS} to –2.0 V for periods of up to 20 ns. Maximum DC voltage on input and I/O pins is V_{CC}+0.5 V. During voltage transitions, input and I/O pins may overshoot to V_{CC} + 2.0 V for periods up to 20 ns.*
2. *Minimum DC input voltage on A9 is –0.5 V. During voltage transitions, A9 and V_{PP} may overshoot V_{SS} to –2.0 V for periods of up to 20 ns. A9 and V_{PP} must not exceed +13.5 V at any time.*

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure of the device to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices

Ambient Temperature (T_A) . . . . . .0°C to +70°C

Industrial (I) Devices

Ambient Temperature (T_A) . . . . . .–40°C to +85°C

Extended (E) Devices

Ambient Temperature (T_A) . . . . . .–55°C to +125°C

Supply Read Voltages

V_{CC} for ± 5% devices . . . . . +4.75 V to +5.25 V
V_{CC} for ± 10% devices . . . . . +4.50 V to +5.50 V

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

DC CHARACTERISTICS over operating range (unless otherwise specified)

Parameter Symbol	Parameter Description	Test Conditions		Min	Max	Unit
V_{OH}	Output HIGH Voltage	I_{OH} = –400 µA		2.4		V
V_{OL}	Output LOW Voltage	I_{OL} = 2.1 mA			0.45	V
V_{IH}	Input HIGH Voltage			2.0	V_{CC} + 0.5	V
V_{IL}	Input LOW Voltage			–0.5	+0.8	V
I_{LI}	Input Load Current	V_{IN} = 0 V to V_{CC}			1.0	µA
I_{LO}	Output Leakage Current	V_{OUT} = 0 V to V_{CC}	C/I Devices		1.0	µA
			E Devices		5.0	
I_{CC1}	V_{CC} Active Current (Note 2)	CE# = V_{IL}, f = 10 MHz, I_{OUT} = 0 mA			25	mA
I_{CC2}	V_{CC} TTL Standby Current	CE# = V_{IH}			1.0	mA
I_{CC3}	V_{CC} CMOS Standby Current	CE# = $V_{CC} \pm 0.3$ V			100	µA

***Caution**: The device must not be removed from (or inserted into) a socket when V_{CC} or V_{PP} is applied.*

Notes:

1. *V_{CC} must be applied simultaneously or before V_{PP}, and removed simultaneously or after V_{PP}.*
2. *I_{CC1} is tested with OE# = V_{IH} to simulate open outputs.*
3. *Minimum DC Input Voltage is –0.5 V. During transitions, the inputs may overshoot to –2.0 V for periods less than 20 ns. Maximum DC Voltage on output pins is V_{CC} + 0.5 V, which may overshoot to V_{CC} + 2.0 V for periods less than 20 ns.*

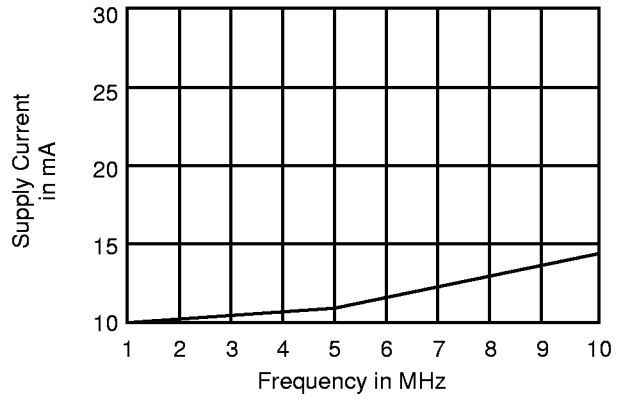


Figure 1. Typical Supply Current vs. Frequency V_{CC} = 5.5 V, T = 25°C

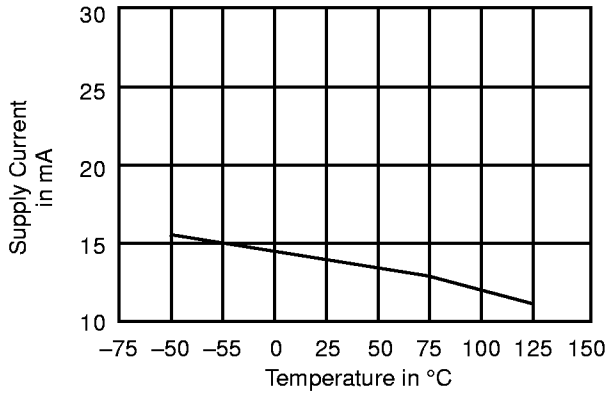
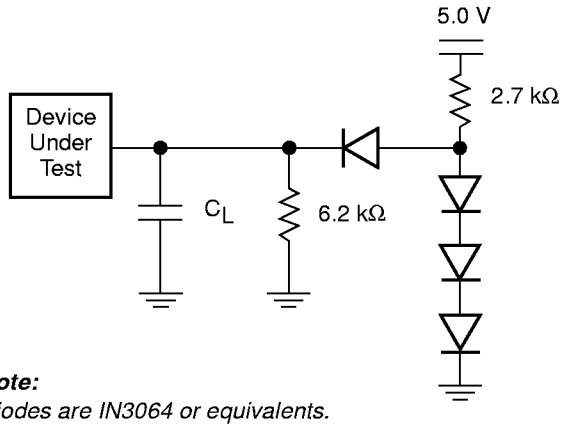


Figure 2. Typical Supply Current vs. Temperature V_{CC} = 5.5 V, f = 10 MHz

TEST CONDITIONS



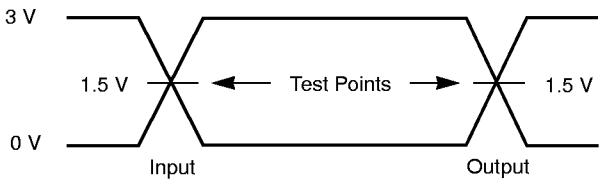
Note:
Diodes are IN3064 or equivalents.

Figure 3. Test Setup

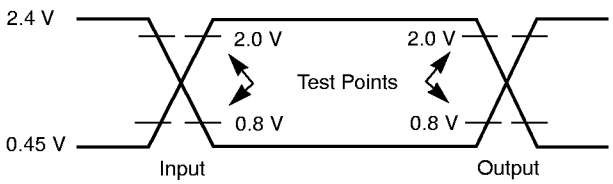
Table 1. Test Specifications

Test Condition	-55	All others	Unit
Output Load	1 TTL gate		
Output Load Capacitance, C_L (including jig capacitance)	30	100	pF
Input Rise and Fall Times	≤ 20		ns
Input Pulse Levels	0.0–3.0	0.45–2.4	V
Input timing measurement reference levels	1.5	0.8, 2.0	V
Output timing measurement reference levels	1.5	0.8, 2.0	V

SWITCHING TEST WAVEFORM

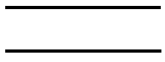
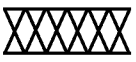
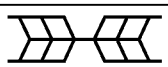


Note: *For C_L = 30 pF.*



Note: *For C_L = 100 pF.*

KEY TO SWITCHING WAVEFORMS

WAVEFORM	INPUTS	OUTPUTS
	Steady	
	Changing from H to L	
	Changing from L to H	
	Don't Care, Any Change Permitted	Changing, State Unknown
	Does Not Apply	Center Line is High Impedance State (High Z)

AC CHARACTERISTICS

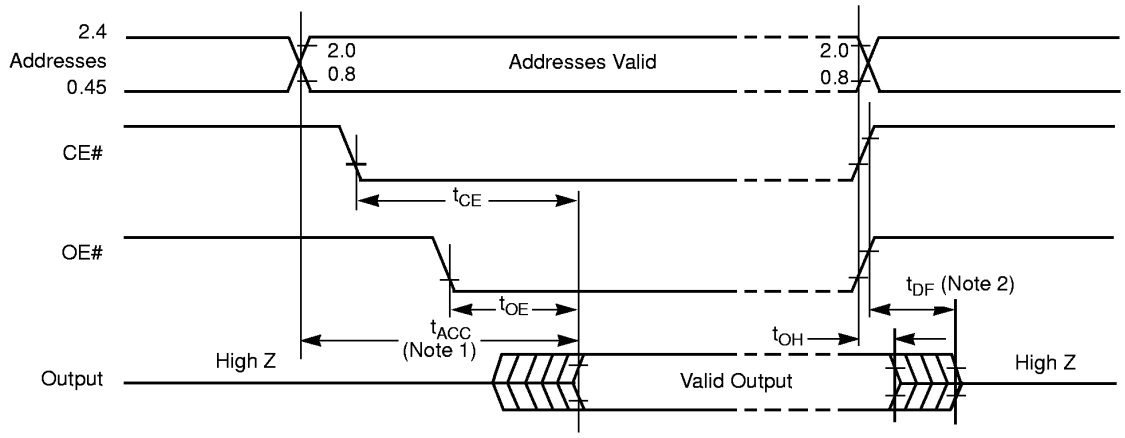
Parameter Symbols		Description	Test Setup		Am27C512							Unit
JEDEC	Standard				-55	-70	-90	-120	-150	-200	-255	
t_{AVQV}	t_{ACC}	Address to Output Delay	CE#, OE# = V_{IL}	Max	55	70	90	120	150	200	250	ns
t_{ELQV}	t_{CE}	Chip Enable to Output Delay	OE# = V_{IL}	Max	55	70	90	120	150	200	250	ns
t_{GLQV}	t_{OE}	Output Enable to Output Delay	CE# = V_{IL}	Max	35	40	40	50	50	75	75	ns
t_{EHQZ} t_{GHQZ}	t_{DF} (Note 2)	Chip Enable High or Output Enable High to Output High Z, Whichever Occurs First		Max	25	25	25	30	30	30	30	ns
t_{AXQX}	t_{OH}	Output Hold Time from Addresses, CE# or OE#, Whichever Occurs First		Min	0	0	0	0	0	0	0	ns

Caution: *Do not remove the device from (or insert it into) a socket or board that has V_{PP} or V_{CC} applied.*

Notes:

1. *V_{CC} must be applied simultaneously or before V_{PP}, and removed simultaneously or after V_{PP}.*
2. *This parameter is sampled and not 100% tested.*
3. *Switching characteristics are over operating range, unless otherwise specified.*
4. *See Figure 3 and Table 1 for test specifications.*

SWITCHING WAVEFORMS



Notes:

1. *OE# may be delayed up to $t_{ACC} - t_{OE}$ after the falling edge of the addresses without impact on t_{ACC}.*
2. *t_{DF} is specified from OE# or CE#, whichever occurs first.*

PACKAGE CAPACITANCE

Parameter Symbol	Parameter Description	Test Conditions	CDV028		PL 032		PD 028		Unit
			Typ	Max	Typ	Max	Typ	Max	
C_{IN}	Input Capacitance	V_{IN} = 0	10	12	9	12	6	10	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0	10	13	9	12	6	10	pF

Notes:

1. *This parameter is only sampled and not 100% tested.*
2. *T_A = +25°C, f = 1 MHz.*

Rochester Electronics guarantees 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. Rochester Electronics reserves the right to make changes without further notice to any specification herein.