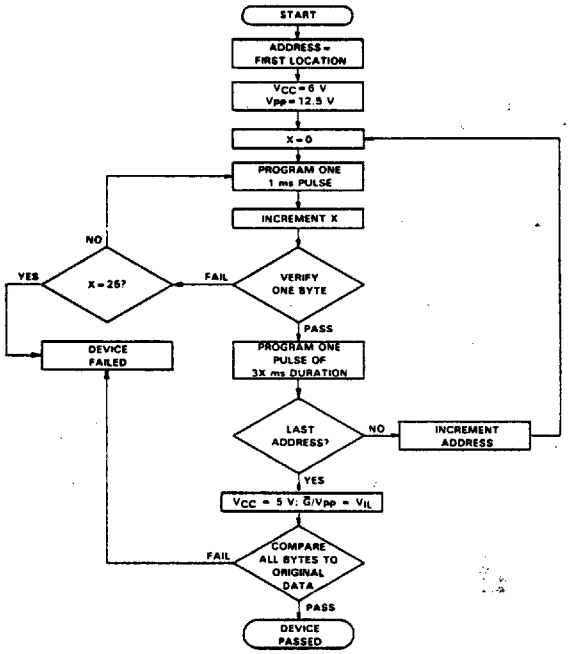
512kbit PROM - Radiation Hardened

27C512RP 64k x 8 PROM Memory Microcircuit

For Space Applications



SEI's 27C512RP (RP for RAD-PAK®) memory microcircuit features a minimum 100 kilorad (Si) total dose tolerance. Using SEI's radiation hardened RAD-PAK® packaging technology, the 27C512RP is fully equivalent to the commercial SMJ27C512 from Texas Instruments and uses HVCMOS technology for high speed and simple interface with MOS and bipolar circuits. All inputs, including program data inputs can be driven by Series 54 TTL circuits without the use of external pull-up resistors, and each output can drive one Series 54 TTL circuit without external resistors. The data outputs are three-state for connecting multiple devices to a common bus. One other (12.5 V) supply is needed for programming, but all programming signals are TTL level. For programming outside the system, existing EPROM programmers can be used. Locations may be programmed singly, in blocks, or at random. The patented radiation hardened RAD-PAK® technology incorporates radiation shielding in the microcircuit package. Capable of surviving in space environments, the 27C512RP is ideal for satellite, space-craft, and space probe missions. This product is available in Class S packaging and screening.

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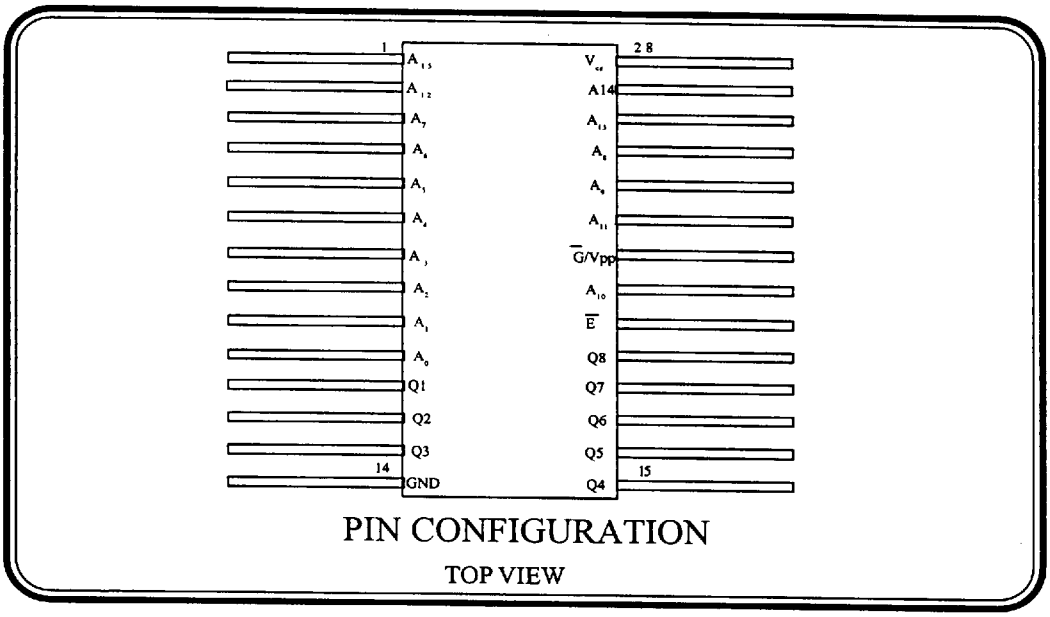
Radiation Hardened
27C512RP

CMOS 64k x 8 PROM
Memory Microcircuit



PIN CONFIGURATION

TOP VIEW

Features:

- 64k x 8 Bit PROM Organization
  - One time programmable
- Pin Compatible with Texas Instruments SMJ27C512
- RAD-PAK® Radiation Hardened Against Natural Space Radiation
  - Total Dose Hardness >100 krad (Si)
- Package:
  - 28 Pin RAD-PAK® flat pack (410 mils x 720 mils)
  - Weight – 5.0 grams
- Operating Temperature Range: -55°C to 125°C
- JEDEC Approved Byte Wide Pinout
- High Speed: 200, 250, 300 ns Maximum Access Times Available
- Advanced HVCMOS Technology
  - Single 5V Power Supply
  - Latchup Immunity of 250 mA on All Input and Output Pins
  - 400 mV Guaranteed DC Noise Immunity with Standard TTL Loads
- Low Operating Power
  - 263 mW max Active
  - 1.8 mW max Standby

Specifications and design are subject to change without notice.

TQM
Total Quality Management

June 1994

For Further Information Contact:
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27C512RP Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage range	V_{CC}	-0.6	7	V
Supply voltage range	V_{PP}	-0.6	14	V
Input voltage range All inputs except A9 A9		 -0.6 -0.6	 6.5 13.5	 V V
Output voltage range		-0.6	V_{CC}+1	V
Normal operating temperature range		-55	+125	°C
Storage temperature range		-65	150	°C

27C512RP Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply voltage	V_{CC}	4.5	5.5	V
Supply voltage[1]	V_{PP}	12.0	13.0	V
High-level input voltage TTL CMOS	V_{IH}	 2 V_{CC}-0.2	 V_{CC}+1 V_{CC}+0.2	 V V
Low-level input voltage TTL CMOS	V_{IL}	 -0.5 GND-0.2	 0.8 GND+0.2	 V V
Operating temperature range	T_A	-55	125	°C

Note:
1. V_{CC} = 6V, V_{PP} = 12.5V

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27C512RP DC Electrical Characteristics

Parameter	Symbol	Min	Max	Unit
High-level output voltage I_{OH}=-400 uA	V_{OH}	2.4		V
Low-level output voltage I_{OL}=2.1 mA	V_{OL}		0.4	V
Input current (leakage) V_I=0 V to 5.5 V	I_I		±10	uA
Output current (leakage) V_O=0 V to V_{CC}	I_O		±10	uA
V_{PP} supply current G\V$_{PP}$=13V	I_{PP}		70	mA
V_{CC} standby current TTL-input level V_{CC}=5.5 V, E\=V_{IH} CMOS-input level V_{CC}=5.5 V, E\=V_{CC}	I_{CC1}		 500 350	 uA uA
V_{CC} supply current (active) V_{CC}=5.5 V, E\=V_{IL} t_{cycle}= minimum cycle time, outputs open	I_{CC2}		50	ns

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27C512RP AC Electrical Performance

Parameter	Symbol	Min	Max	Unit
Access time from address 27C512-20 27C512-25 27C512-30	$t_{a(A)}$		 200 250 300	ns
Access time from chip enable 27C512-20 27C512-25 27C512-30	$t_{a(E)}$		 200 250 300	ns
Output enable time from G\ 27C512-20 27C512-25 27C512-30	$t_{en(G)}$		 75 100 120	ns
Output disable time from G\ or E\, whichever occurs first 27C512-20 27C512-25 27C512-30	t_{dis}	 0 0 0	 60 60 105	ns
Output data valid time after change of address, E\, or G\, whichever occurs first 27C512-20 27C512-25 27C512-30	$t_{v(A)}$	 0 0 0		ns
Input capacitance V_I = 0 V, f = 1 MHz	C_i		10	pF
Output capacitance V_O = 0 V, f = 1 MHz	C_o		12	pF

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27C512RP Timing Requirements

Parameter	Symbol	Min	Max	Unit
Initial program pulse duration	$t_{W(IPGM)}$	0.95	1.05	ms
Final pulse duration	$t_{W(FPGM)}$	2.85	78.75	ms
Address setup time	$t_{su(A)}$	2		us
Output disable time from G\	$t_{dis(G)}$	0	130	ns
Data valid from E\ low	t_{EHD}		1	us
Data setup time	$t_{su(D)}$	2		us
V_{PP} setup time	$t_{su(VPP)}$	2		us
V_{CC} setup time	$t_{su(VCC)}$	2		us
Address hold time	$t_{h(A)}$	0		us
Data hold time	$t_{h(D)}$	2		us
V_{PP} rise time	$t_{r(PG)G}$	50		ns
V_{PP} hold time	$t_{h(VPP)}$	2		us
V_{PP} recovery time	$t_{rec(PG)}$	2		us

NOTES:

1. $T_A = 25°C$, $V_{CC} = 6V$, $V_{PP} = 12.5V$

27C512RP Package Ordering Guide

Package Style	Case Outline 1/	Description
F	F-28	28 Pin Flat Package

Note:

1/ For outline information, see Appendix A (Package Information - Outline Dimension)

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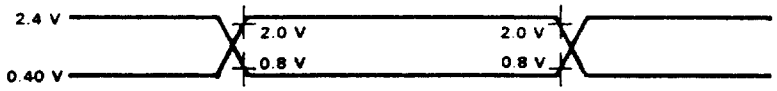
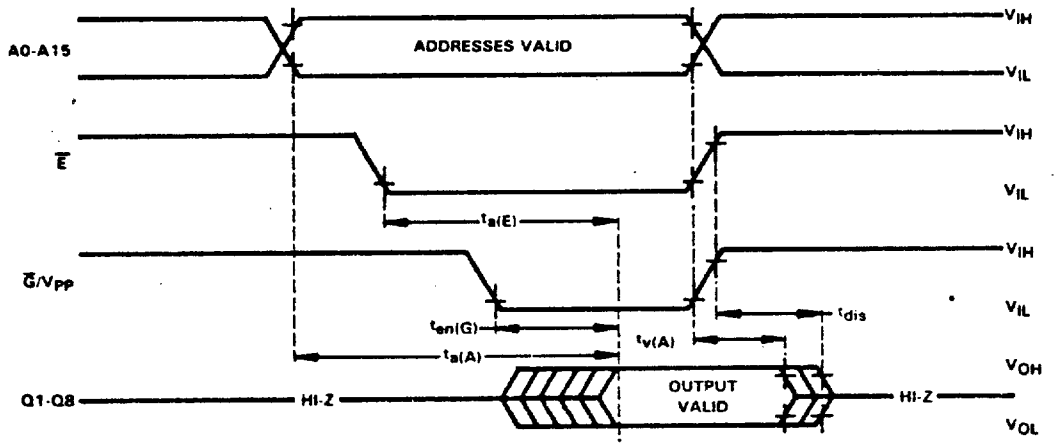
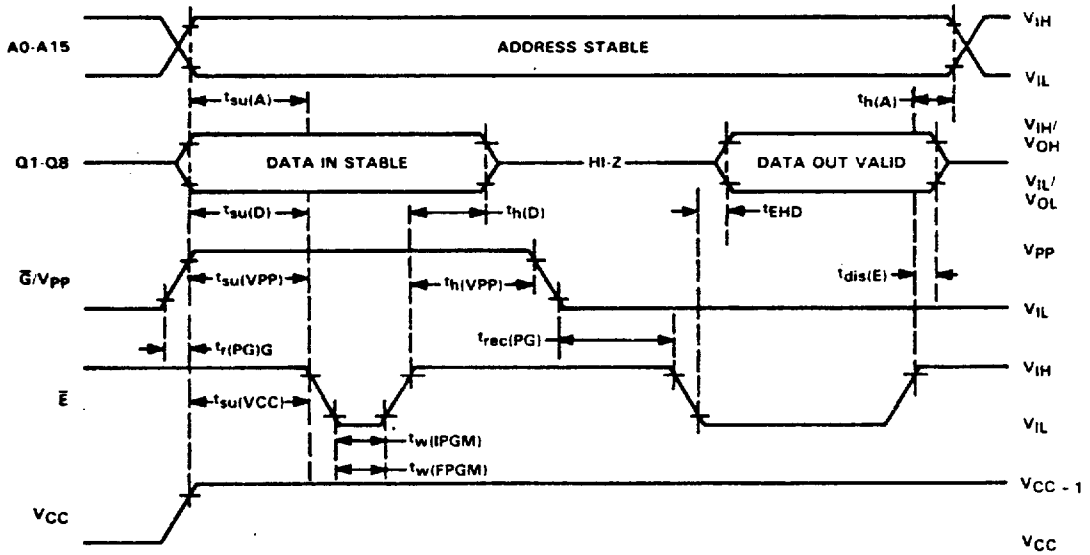
AC Testing Input/Output Wave Forms



Read Cycle Timing



Program Cycle Timing



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