



# 53/63RS881/A

## High Performance 1024x8 Registered PROM

### FEATURES/BENEFITS

- Edge triggered "D" registers
- Synchronous and asynchronous enables
- Versatile 1:16 initialization words
- 8-Bit-wide In 24-pin SKINNYDIP® package for high board density
- Simplifies system timing
- Faster cycle times
- 16 mA IOL output drive capability
- Reliable titanium-tungsten fuses (TIW), with programming yields typically greater than 98%

### APPLICATIONS

- Microprogram control store
- State sequencers
- Next address generation
- Mapping PROM
- Programmable Logic Element (PLE™) 10 Inputs, 8 Registered Outputs, 1024 product terms

### DESCRIPTION

The 53/63RS881 and 53/63RS881A are 1Kx8 PROMs with on-chip "D" type registers, versatile output enable control through synchronous and asynchronous enable inputs, and flexible start-up sequencing through programmable initialization.

Data is transferred into the output registers on the rising edge of the clock. Provided that the asynchronous ( $\bar{E}$ ) and synchronous ( $\bar{ES}$ ) enables are LOW, the data will appear at the outputs. Prior to the positive clock edge, register data are not affected by changes in addressing or synchronous enable inputs.

Memory expansion and data control is made flexible with synchronous and asynchronous enable inputs. Outputs may be set to the high-impedance state at any time by setting  $\bar{E}$  to a HIGH or if  $\bar{ES}$  is HIGH when the rising clock edge occurs. When  $V_{cc}$  power is first ap-

plied, the synchronous enable flip-flop will be in the set condition, causing the outputs to be in the high-impedance state.

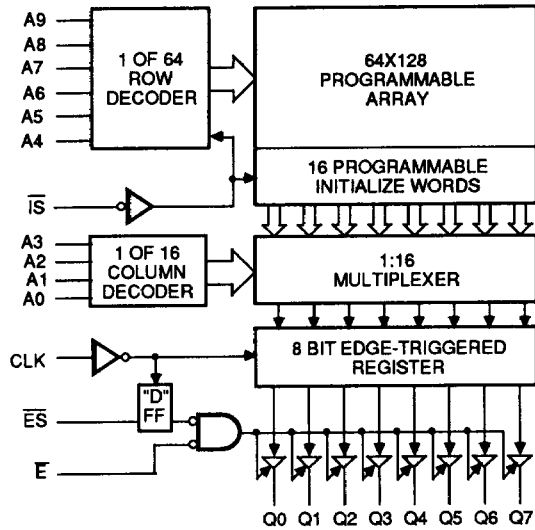
The flexible initialization feature allows start-up and time-out sequencing with 1:16 programmable words to be loaded into the output registers. With the synchronous INITIALIZE ( $\bar{IS}$ ) pin LOW, one of the sixteen column words (A3-A0) will be set in the output registers independent of the row addresses (A9-A4). The unprogrammed state of  $\bar{IS}$  words are LOW, presenting a CLEAR with  $\bar{IS}$  pin LOW. With all  $\bar{IS}$  column words (A3-A0) programmed to the same pattern, the  $\bar{IS}$  function will be independent of both row and column addressing and may be used as a single pin control. With all  $\bar{IS}$  words programmed HIGH, a PRESET function is performed.

5

### SELECTION GUIDE

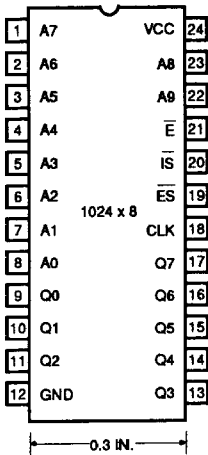
Memory		Package		Performance	Part Number	
Size	Organization	Pins	Type		0°C to +75°C	-55°C to +125°C
8K	1024x8	24 (28)	CD 3024	Enhanced	63RS881A	53RS881A
			PD 3024			
			PL 028	Standard	63RS881	53RS881
			CL 024			
			CFM 024			

## BLOCK DIAGRAM

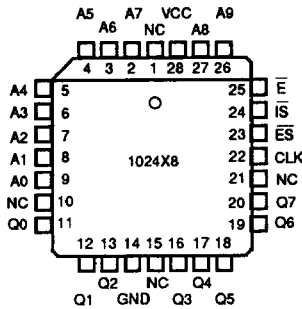


1316 01

## PIN CONFIGURATIONS

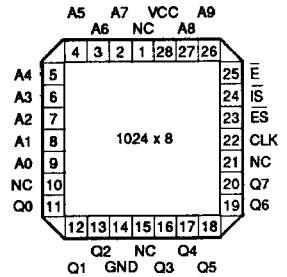


1316 02



Plastic Chip Carrier

1316 03



Leadless Chip Carrier

1316 04

## ABSOLUTE MAXIMUM RATINGS

### Operating Programming

Supply voltage $V_{CC}$ .....	-0.5 V to 7 V .....	12 V
Input voltage .....	-1.5 V to 7 V .....	7 V
Input current .....	-30 mA to +5 mA	
Off-state output voltage .....	-0.5 V to 5.5 V .....	12 V
Storage temperature .....	-65°C to +150°C	

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only, and 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 to Absolute Maximum Rating conditions for extended periods of time may affect reliability. Absolute Maximum Ratings are for system design reference; parameters given are not tested.

## Operating Conditions

Symbol	Parameter	Typ†	Military††				Commercial				Unit
			53RS881A		53RS881		63RS881A		63RS881		
			Min	Max	Min	Max	Min	Max	Min	Max	
$t_w$	Width of clock (High or Low)	10	20		20		20		20		ns
$t_{s(A)}$	Setup time from address to clock	25	40		45		30		35		ns
$t_{s(ES)}$	Setup time from $\overline{ES}$ to clock	8	15		15		15		15		ns
$t_{s(\overline{IS})}$	Setup time from $\overline{IS}$ to clock	20	30		35		25		30		ns
$t_{h(A)}$	Hold time address to clock	-5	0		0		0		0		ns
$t_{h(ES)}$	Hold time ( $\overline{ES}$ )	-3	5		5		5		5		ns
$t_{h(\overline{IS})}$	Hold time ( $\overline{IS}$ )	-5	0		0		0		0		ns
$V_{CC}$	Supply voltage	5	4.5	5.5	4.5	5.5	4.75	5.25	4.75	5.25	V
$T_A$	Operating temperature*	25	-55	125	-55	125	0	75	0	75	°C

\* This is defined as the instant-on case temperature.\*

† Typicals at 5.0 V  $V_{CC}$  and 25°C  $T_A$ .

†† 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.

**Electrical Characteristics** Over Operating Conditions. For APL Products, Group A, Subgroups 1, 2, 3 are tested unless otherwise noted.

Symbol	Parameter	Test Conditions		Min	Typ†	Max	Unit
$V_{IL}$	Low-level input voltage**					0.8	V
$V_{IH}$	High-level input voltage**			2.0			V
$V_{IC}$	Input clamp voltage	$V_{CC} = \text{MIN}$	$I_I = -18 \text{ mA}$			-1.2	V
$I_{IL}$	Low-level input current	$V_{CC} = \text{MAX}$	$V_I = 0.4 \text{ V}$			-0.25	mA
$I_{IH}$	High-level input current	$V_{CC} = \text{MAX}$	$V_I = V_{CC} \text{ MAX}$			40	$\mu\text{A}$
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{MIN}$	$I_{OL} = 16 \text{ mA}$			0.5	V
$V_{OH}$	High-level output voltage	$V_{CC} = \text{MIN}$	Com	$I_{OH} = -3.2 \text{ mA}$	2.4		V
			Mil	$I_{OH} = -2 \text{ mA}$			
$I_{OZL}$	Off-state output current	$V_{CC} = \text{MAX}$	$V_O = 0.4 \text{ V}$			-40	$\mu\text{A}$
$I_{OZH}$			$V_O = 2.4 \text{ V}$			40	
$I_{OS}$	Output short-circuit current*	$V_{CC} = 5 \text{ V}$	$V_O = 0 \text{ V}$		-20	-90	mA
$I_{CC}$	Supply current	$V_{CC} = \text{MAX}$ . All inputs TTL. All outputs open.			130	180	mA

\* Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

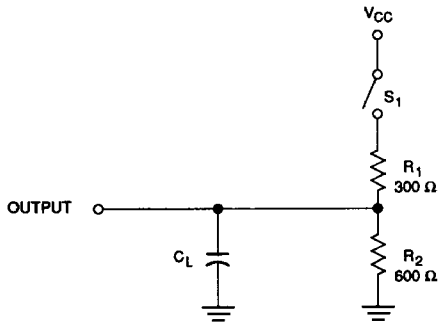
\*\*  $V_{IL}$  and  $V_{IH}$  are input conditions of output tests and are not themselves directly tested.  $V_{IL}$  and  $V_{IH}$  are absolute voltages with respect to device ground and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.

† Typical at 5.0 V  $V_{CC}$  and 25°C  $T_A$ .

**Switching Characteristics** Over Operating Conditions and using Standard Test Load. For APL Products, Group A, subgroups 9, 10, 11 are tested unless otherwise noted.††

Symbol	Parameter	Typ†	Military				Commercial				Unit
			53RS881A		53RS881		63RS881A		63RS881		
			Min	Max	Min	Max	Min	Max	Min	Max	
$t_{CLK}$	Clock to output Delay	10		20		25		15		20	ns
$t_{ESA}$	Clock to output access time (ES)	18		30		35		25		30	ns
$t_{ESR}$	Clock to output recovery time (ES)	17		30		35		25		30	ns
$t_{EA}$	Enable to output access time (E)	18		30		35		25		30	ns
$t_{ER}$	Disable to output recovery time (E)	17		30		35		25		30	ns

†† Subgroups 7 and 8 apply to Functional tests.



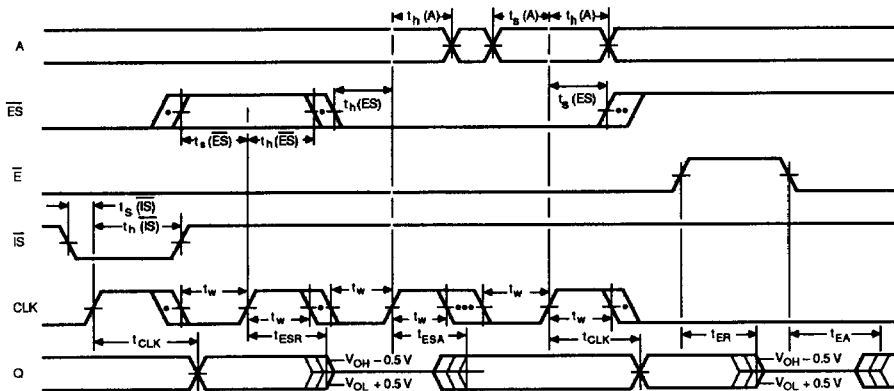
1318 05

Figure 1. Switching Test Load

WAVEFORM	INPUTS	OUTPUTS
	DON'T CARE: CHANGE PERMITTED	CHANGING: STATE UNKNOWN
	NOT APPLICABLE	CENTER LINE IS HIGH IMPEDANCE STATE
	MUST BE STEADY	WILL BE STEADY

1318 06

Figure 2. Definition of Timing Diagrams



- NOTES:
1. INPUT PULSE AMPLITUDE 0 V TO 3.0 V.
  2. INPUT RISE AND FALL TIMES 2-5 ns FROM 0.8 V TO 2.0 V.
  3. INPUT ACCESS MEASURED AT THE 1.5 V LEVEL.
  4.  $t_{AA}$  IS TESTED WITH SWITCH  $S_1$  CLOSED,  $C_L = 30$  pF AND MEASURED AT 1.5 V OUTPUT LEVEL.
  5.  $t_{EA}$  AND  $t_{ESA}$  ARE MEASURED AT THE 1.5 V OUTPUT LEVEL WITH  $C_L = 30$  pF.  $S_1$  IS OPEN FOR HIGH IMPEDANCE TO "1" TEST, AND CLOSED FOR HIGH IMPEDANCE TO "0" TEST.
- $t_{ER}$  AND  $t_{ESR}$  ARE TESTED WITH  $C_L = 5$  pF.  $S_1$  IS OPEN FOR "1" TO HIGH IMPEDANCE TEST, MEASURED AT  $V_{OH} - 0.5$  V OUTPUT LEVEL;  $S_1$  IS CLOSED FOR "0" TO HIGH IMPEDANCE TEST, MEASURED AT  $V_{OL} + 0.5$  V OUTPUT LEVEL.

1318 07

Figure 3. Definition of Waveforms