Generic
NiCR PROM Family
53/63XX-1 53/63XX-2

Features/Benefits

- **From 2048-bit to 8192-bit memory**
- **8-bit wide for byte-oriented applications**
- **-1 series for standard performance**
- **-2 series for enhanced performance**
- **Reliability-proven nichrome fusible links (qualified for MIL-M-38510)**
- **PNP inputs for low input current**
- **Compatible pin configurations for upward expansion**

Application

- **Microprogram store**
- **Microprocessor program store**
- **Look up table**
- **Character generator**
- **Random logic**
- **Code converter**

Description

The 53/63XX series generic PROM family offers a wide selection of size and organizations. The 8-bit wide PROMs range from 256x8 to 1024x8 in a wide selection of package sizes including the space-saving SKINNYDIP® 24-pin .300-inch wide package. All PROMs have the same programming specifications allowing a single generic programmer.

The family features low input current PNP inputs, full Schottky clamping, three-state and open-collector outputs. The nichrome fuses store a logical high and are programmed to the low state. Special on-chip circuitry and extra fuses provide preprogramming tests which assure high programming yields and high reliability.

The 63 series is specified for operation over the commercial temperature and voltage range. The 53 series is specified for the military ranges.

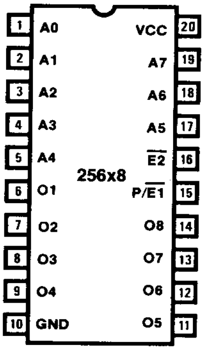
Generic PROM Selection Guide

MEMORY			PACKAGE		DEVICE TYPE	
SIZE	ORGANIZATION		PINS	TYPE	COMMERCIAL	MILITARY
2K	256x8	OC TS	20	N,J	6308-1 6309-1	5308-1 5309-1
4K	512x8	OC TS	24 (28)	N, J, JS*, F, (L)	6340-1 6341-1, -2	5340-1 5341-1, -2
		OC TS	20	N, J	6348-1 6349-1, -2	5348-1 5349-1, -2
8K	1024x8	OC TS	24	N,J,JS*,F	6380-1, -2 6381-1, -2	5380-1, -2 5381-1, -2

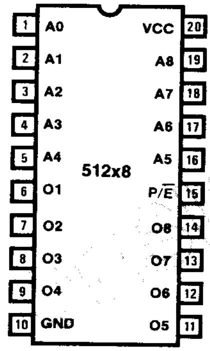
* JS is the .300 inch wide SKINNYDIP package.

Pin Configurations

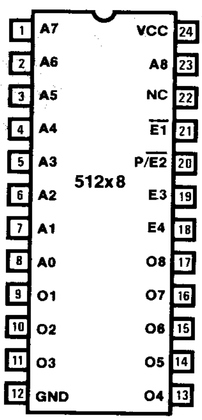
53/6308-1
53/6309-1



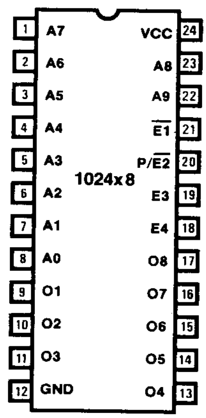
53/6348-1
53/6349-1, -2



53/6340-1
53/6341-1, -2



53/6380-1, -2
53/6381-1, -2



Absolute Maximum Ratings

Supply voltage V_{CC} .... −0.5 V to 7 V
Input voltage .... −1.5 V to 7 V
Off-state output voltage .... −0.5 V to 5.5 V
Storage temperature .... −65°C to +150°C

Operating Conditions

SYMBOL	PARAMETER	MILITARY MIN	MILITARY NOM	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL NOM	COMMERCIAL MAX	UNIT
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
T_A	Operating free-air temperature	−55		125	0		75	°C

Electrical Characteristics Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS			-1 SERIES MIN	-1 SERIES MAX	-2 SERIES MIN	-2 SERIES MAX	UNIT
V_{IL}	Low-level input voltage					0.8		0.8	V
V_{IH}	High-level input voltage				2		2		V
V_{IC}	Input clamp voltage	V_{CC} = MIN	I_I = −18 mA			−1.5		−1.5	V
I_{IL}	Low-level input current	V_{CC} = MAX	V_I = 0.45 V			−0.25		−0.25	mA
I_{IH}	High-level input current	V_{CC} = MAX	V_I = 4.5 V (Program pin) V_I = V_{CC} MAX (Other pins)			40		40	μA
V_{OL}	Low-level output voltage	V_{CC} = MIN V_{IL} = 0.8 V V_{IH} = 2 V	MIL I_{OL} = 12 mA COM I_{OL} = 16 mA			0.5		0.5	V
V_{OH}	High-level output voltage*	V_{CC} = MIN V_{IL} = 0.8 V V_{IH} = 2 V	MIL I_{OH} = −2 mA COM I_{OH} = −3.2 mA		2.4		2.4		V
I_{OZL}	Off-state output current*	V_{CC} = MAX	V_O = 0.5 V			−100		−40	μA
I_{OZH}	Off-state output current*	V_{CC} = MAX	V_O = 2.4 V			100		40	μA
I_{CEX}	Open collector output current	V_{CC} = MAX	V_O = 2.4 V			100		40	μA
I_{CEX}	Open collector output current	V_{CC} = MAX	V_O = 5.5 V					100	μA
I_{OS}	Output short-circuit current*†	V_{CC} = 5 V	V_O = 0 V		−20	−90	−20	−90	mA
I_{CC}	Supply current	V_{CC} = MAX All inputs grounded. All Outputs open	'08, '09			155		155	mA
			'40, '41, '48, '49	MIL		155		175	mA
				COM		155		155	mA
			'80, '81	MIL		175		175	mA
				COM		175		170	mA

* Three-state only.
† Not more than one output should be shorted at a time and duration of the short-circuit should not exceed one second.

Switching Characteristics Over Commercial Operating Conditions

DEVICE TYPE	t_{AA} (ns) ADDRESS ACCESS TIME	t_{EA} AND t_{ER} (ns) ENABLE ACCESS TIME RECOVERY TIME	CONDITIONS (See standard test load)	
	MAX	MAX	R1 (Ω)	R2 (Ω)
6308-1, 6309-1	70	30	300	600
6340-1, 6341-1	70	30		
6341-2	55	30		
6348-1, 6349-1	70	30		
6349-2	55	30		
6380-1, 6381-1	90	40		
6380-2	70	30		
6381-2	55	30		

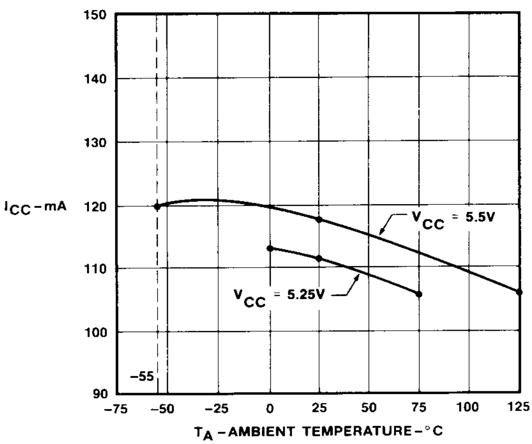
Switching Characteristics Over Military Operating Conditions

DEVICE TYPE	t_{AA} (ns) ADDRESS ACCESS TIME	t_{EA} AND t_{ER} (ns) ENABLE ACCESS TIME RECOVERY TIME	CONDITIONS (See standard test load)	
	MAX	MAX	R1 (Ω)	R2 (Ω)
5308-1, 5309-1	80	40	375	750
5340-1, 5341-1	80	40		
5341-2	70	40		
5348-1, 5349-1	80	40		
5349-2	70	40		
5380-1, 5381-1	125	40		
5380-2	90	40		
5381-2	70	40		

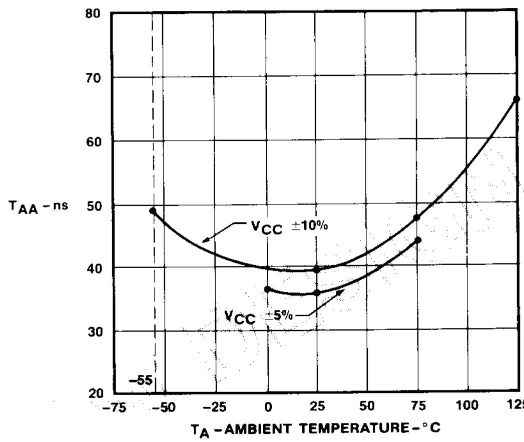
Typical Characteristics

53/6309

Typical I_{CC} vs Temperature

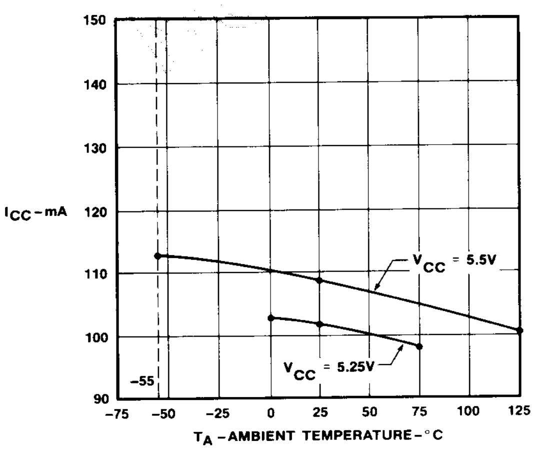


Typical T_{AA} vs Temperature

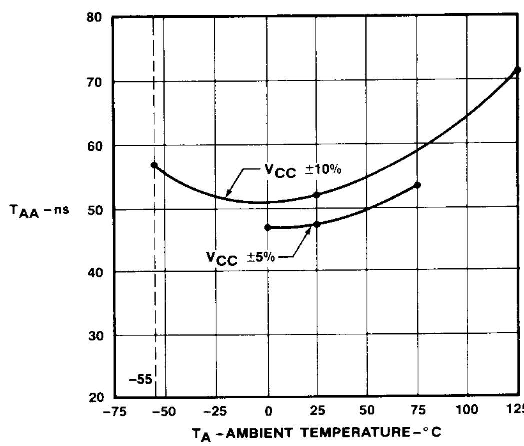


53/6341
53/6349

Typical I_{CC} vs Temperature



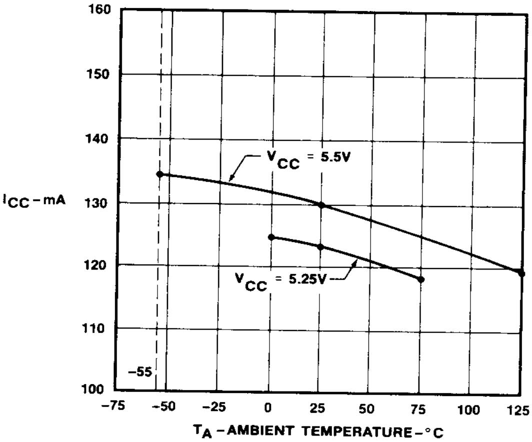
Typical T_{AA} vs Temperature



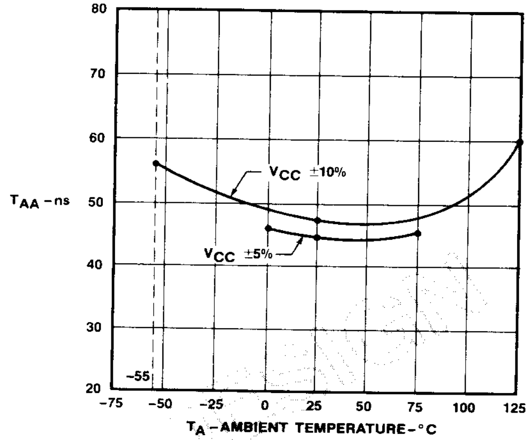
Typical Characteristics

53/6381

Typical I_{CC} vs Temperature

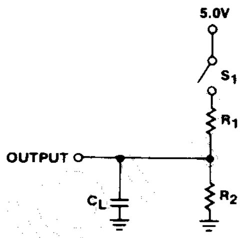


Typical T_{AA} vs Temperature

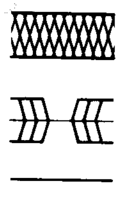


NOTE: Typical characteristic curves are for three-state devices. Equivalent open collector devices decrease in I_{CC} approximately 10 mA and increase in T_{AA} approximately 6 ns.

Switching Test Load

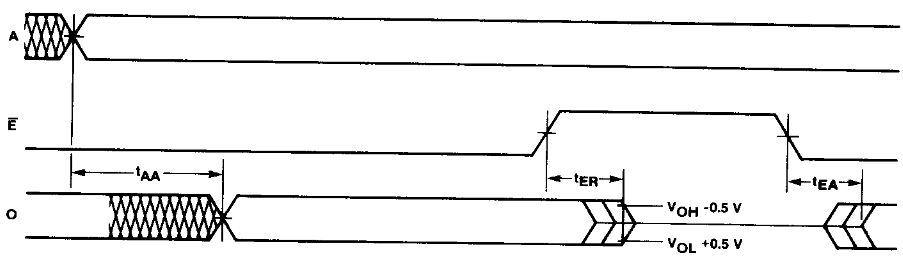


Definition of Timing Diagram



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

Definition of Waveforms



NOTES:
1. Input pulse amplitude 0 V to 3.0 V.
2. Input rise and fall times 2-5 ns from 1.0 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_1 = 30 pF and measured at 1.5 V output level.
5. For open collector devices, TEA and TER are measured at the 1.5 V output level with S_1 closed and C_L = 30 pF.
6. For three-state devices, TEA is 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.

   TER is tested with C_L = 5 pF. S_1 is open for "1" to high-impedance test, measured at V_{OH} −0.5 output level; S_1 is closed for "0" to high-impedance test measured at V_{OL} +0.5 V output level.

Commercial Programmers

Monolithic Memories PROMs are designed and tested to give a programming yield greater than 98%. If your programming yield is lower, check your programmer. It may not be properly calibrated.

Programming is final manufacturing — it must be quality-controlled. Equipment must be calibrated as a regular routine, ideally under the actual conditions of use. Each time a new board or a new programming module is inserted, the whole system should be checked. Both timing and voltages must meet published specifications for the device.

Remember — The best PROMs available can be made unreliable by improper programming techniques.

PROM PROGRAMMING EQUIPMENT INFORMATION

SOURCE AND LOCATION

Data I/O Corp.
10525 Willows Rd. N.E.
Redmond, WA 98073

Kontron Electronics, Inc.
630 Price Ave.
Redwood City, CA 94063

Digelec Inc.
586 Weddell Dr. Suite 1
Sunnyvale, CA 94089

Stag Microsystems Inc.
528-5 Weddell Dr.
Sunnyvale, CA 94089

MONOLITHIC MEMORIES PROM PROGRAMMER REFERENCE CHART

Source and Location	**Data I/O** **10525 Willows Rd. N.E.** **Redmond, WA 98073**	**Kontron Electronics** **630 Price Ave.** **Redwood City, CA 94063**	**Stag Microsystems** **528-5 Weddell Dr.** **Sunnyvale, CA 94089**	**Digelec** **586-1 Weddell Dr.** **Sunnyvale, CA 94089**	**Varix** **1210 E. Campbell Rd.** **Richardson, TX 75081**
Programmer Model(s)	Model 19/29 Model 22	Model MPP-805	Model PPX Model PP17	UP803	OMNI
MMI Generic Bipolar PROM Personality Module	UniPak Rev 07 UniPak II Rev 05 (All NiCr PROMs should be programmed on these or later revisions)	MOD4		FAM Mod. No. 12	
Socket Adapter(s) and Device Code					
6308/09	FD1 P08 Model 22A - Adapter 351A-064	SA6-1	AM120-2 Code 20	DA No. 27 Pinout 2B Switch Pos. 5-15 (6308) Switch Pos. 5-14 (6309)	6308 6309
6340/41	FD1 P15 Model 22A - Adapter 351A-074 (300 mil pkg)	SA5-1	AM100-3 Code 20	DA No. 7 Pinout 1J Switch Pos. 4-13 (6340) Switch Pos. 4-12 (6341)	6340 6341
6348/49	FD1 P09 Model 22A - Adapter 531A-064	SA6	AM120-3 Code 20	DA No. 4 Pinout 1Q Switch Pos. 4-15 (6348) Switch Pos. 4-14 (6349)	6348 6349
6380/81	FD1 P16 Model 22A - Adapter 351A-074 (300 mil pkg)	SA5	AM100-4 Code 20	DA No. 7 Pinout 1K Switch Pos. 4-11 (6380) Switch Pos. 4-10 (6381)	6380 6381