

R296XX/R297XX

Standard PROMs and Power-Switched SPROMs

Description

Raytheon Semiconductor's Bipolar Field Programmable Read-Only Memories include both standard and power-switched versions. CS/PS inputs provide logic flexibility and ease of memory expansion decoding. SPROM power-switch circuitry is activated by the PS input.

Raytheon PROMs and SPROMs are manufactured with nichrome fuses and low power Schottky technology. The devices are shipped with all bits in the HIGH (logical ONE) state. To achieve a LOW state in a given bit location the nichrome link is fused open by passing a short, high current pulse through the link. All devices are programmed using the same programming technique.

Standard PROMs are enabled by a single active LOW CS or by both active LOW $\overline{\text{CS}}$ and high CS inputs.

Power-switched PROMs (SPROMs) are enabled by a single active LOW $\overline{\text{PS}}$ or by both active LOW $\overline{\text{PS}}$ and HIGH PS inputs. See the individual block diagrams for the enable scheme.

Features

- ◆ Devices are available in military (-55°C to +125°C) temperature range
- ◆ Standard PROMs are offered in power-switched SPROM versions
- ◆ Typically, 75% power savings achieved by deselected SPROMs
- ◆ Reliable nichrome fuses
- ◆ Three-state outputs
- ◆ Devices programmed on standard PROM programmers
- ◆ High immunity or resistance to high levels of constant or burst radiation
- ◆ Device pinouts comply with JEDEC standards
- ◆ Available in surface mount and through-hole packaging
- ◆ PROMs and SPROMs are offered in 24-pin, 0.3" wide DIPs

Applications

- ◆ Microprogram control store
- ◆ Microprocessor program store
- ◆ Programmable logic
- ◆ Custom look-up tables
- ◆ Security encoding/decoding
- ◆ Code converter
- ◆ Character generator
- ◆ Use in redundant systems

R296XX/R297XX

Absolute Maximum Ratings

(above which the useful life may be impaired)

Supply Voltage to Ground Potential (continuous), V_{CC}	-0.5V to +7.0V
DC Input Current	-30 mA to +5.0 mA
DC Input Voltage (address inputs)	-0.5V to +5.5V
DC Input Voltage (chip/power select input pin)	
R296XX	-0.5V to +33V
R297XX	-0.5V to +28V
DC Voltage Applied to Outputs (except during programming)	-0.5V to + V_{CC} max.
Output Current into Outputs During Programming	240 mA
DC Voltage Applied to Outputs During Programming	
R296XX	26V
R297XX	24V
Junction Temperature	+175°C
Storage Temperature	-65°C to +150°C
Programming Temperature	25 ±5°C
Lead Temperature (soldering, 10 seconds)	300°C
Current Density (metallization)	< 5 x 10 ⁵ A/cm ²
Thermal Resistance, Junction-to-Case θ_{JC}	
Dual-In-Line	≤ 11°C/W
Leadless Chip Carrier	≤ 10°C/W
Flat Pack	≤ 10°C/W

Operating Conditions

Parameter	Description	Military		Unit
		Min.	Max.	
V_{CC}	Supply Voltage	4.5	5.5	V
T_C	Case Operating Temperature	-55	+125	°C
V_{IL1}	DC/Functional Low Level Input Voltage		0.8	V
V_{IH1}	DC/Functional High Level Input Voltage	2.0		V
V_{IL}	AC Low Level Input Voltage		0	V
V_{IH}	AC High Level Input Voltage	3.0		V

Note:

- Functional tests shall be conducted at input test conditions as follows: $V_{IH} = V_{IH}(\text{min}) + 20\%$, -0% ; $V_{IL} = V_{IL}(\text{max}) + 0\%$, -50% . Devices may be tested using any input voltage within this input voltage range but shall be guaranteed to $V_{IH}(\text{min})$ and $V_{IL}(\text{max})$. CAUTION: To avoid test correlation problems, the test system noise (e.g., testers, handlers, etc.) should be verified to assure that $V_{IH}(\text{min})$ and $V_{IL}(\text{max})$ requirements are not violated at the device terminals.

Electrical Characteristics

Over Operating Range

Devices conform to MIL-STD-883, Group A, Subgroups 1, 2 and 3

Parameter	Description	Test Conditions	Min	Max	Units
V_{OH}	Output High Voltage	$V_{CC} = \text{Min}, I_{OH} = -2 \text{ mA}$ $V_{IN} = V_{IH} \text{ or } V_{IL}$	2.4		V
$V_{OL}^{(1)}$	Output Low Voltage	$V_{CC} = \text{Min},$ $V_{IN} = V_{IH} \text{ or } V_{IL}$		0.4	V
		$I_{OL} = 8 \text{ mA}$ $I_{OL} = 16 \text{ mA}$		0.5	
I_L	Input Low Current	$V_{CC} = \text{Max}, V_{IN} = 0.4V$	R296XX	-250	μA
			R297XX	-100	
I_{IH}	Input High Current	$V_{CC} = \text{Max}, V_{IN} = 2.7V$		10	μA
		$V_{CC} = \text{Max}, V_{IN} = 5.5V$		40	
$I_{OS}^{(2)}$	Output Short Circuit Current	$V_{CC} = \text{Max}, V_{OUT} = 0.2V^{(3)}$	-15	-85	mA
V_{IC}	Input Clamp Voltage	$V_{CC} = \text{Min}, I_{IN} = -18 \text{ mA}$		-1.2	V
I_{CEX}	Output Leakage Current	$V_{CC} = \text{Max},$ Chip Disabled	$V_{OUT} = 5.5V$ $V_{OUT} = 0.4V$	+40 -40	μA

Notes:

1. This characteristic cannot be tested prior to programming; it is guaranteed by factory testing.
2. Not more than one output should be shorted at a time. Duration of the short circuit should not exceed 1 second.
3. $V_{OUT} = 0.0V$ for R29791/R29793
4. Typical $C_{IN} = 5 \text{ pF}$

Pin Names

Symbol	Description
$A^0 - A^n$	Address Inputs
$\overline{CS}$	Chip Select Active Low (PROM)
CS	Chip Select Active High (PROM)
$\overline{PS}$	Chip Select Active Low (SPROM)
PS	Chip Select Active High (SPROM)
$O^1 - O^n$	Data Outputs

R296XX/R297XX

512 x 8 PROM — R29621/R29621A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			29621AM	R29621M	
I_{CC}	Power Supply Current	$V_{CC} = \text{Max}$ All Inputs GND	155	155	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	60	80	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega \text{ to } V_{CC}$	40	40	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega \text{ to GND, } 16 \text{ mA Load}$	40	40	ns
P_D	Power Dissipation		853	853	mW

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29621DM	D	-55°C to +125°C
R29621DM/883B	D	-55°C to +125°C
R29621DMS	D	-55°C to +125°C
R29621ADM	D	-55°C to +125°C
R29621ADM/883B	D	-55°C to +125°C
R29621ADMS	D	-55°C to +125°C

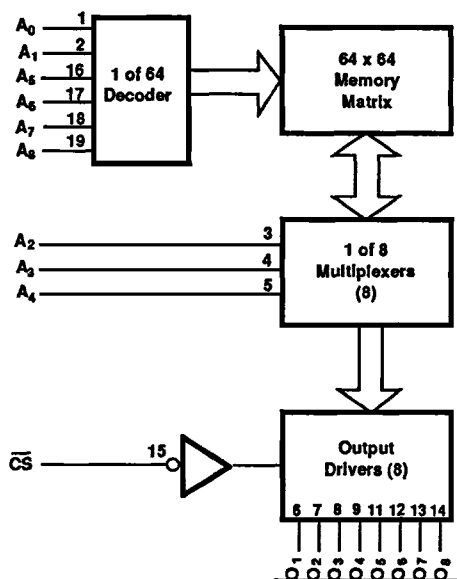
Notes:

/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

D = 20-lead ceramic DIP

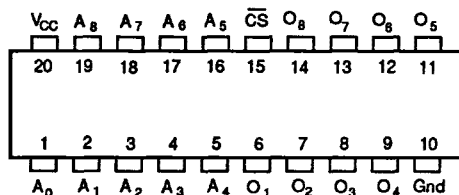
Block Diagram



65-0112

Pin-Out Information

Dual In-Line Package



Pin 15 is also the programming pin (pp)

65-1314

R296XX/R297XX

512 x 8 SPROM — R29623/R29623A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29623AM	R29623M	
I_{CCD}	Power Down, Supply Current (disabled)	$V_{CC} = \text{Max}$ $PS = V_{IH}$, All other inputs = GND	45	45	mA
I_{CC}	Supply Current (enabled)	$V_{CC} = \text{Max}$ All inputs = Gnd	155	155	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$ $R1 = 300\Omega \text{ to } V_{CC}$ $R2 = 600\Omega \text{ to GND, } 16 \text{ mA Load}$	60	85	ns
t_{EA}	Enable Access Time		65	85	ns
t_{ER}	Enable Recovery Time		40	40	ns
P_D	Power Dissipation (Disabled)		248	248	mW
P_D	Power Dissipation (Enabled)		853	853	mW

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29623DM	D	-55°C to +125°C
R29623DM/883B	D	-55°C to +125°C
R29623DMS	D	-55°C to +125°C
R29623ADM	D	-55°C to +125°C
R29623ADM/883B	D	-55°C to +125°C
R29623ADMS	D	-55°C to +125°C

Notes:

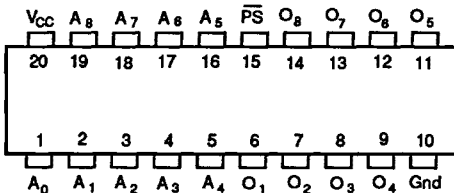
/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

D = 20-lead ceramic DIP

Pin Out Information

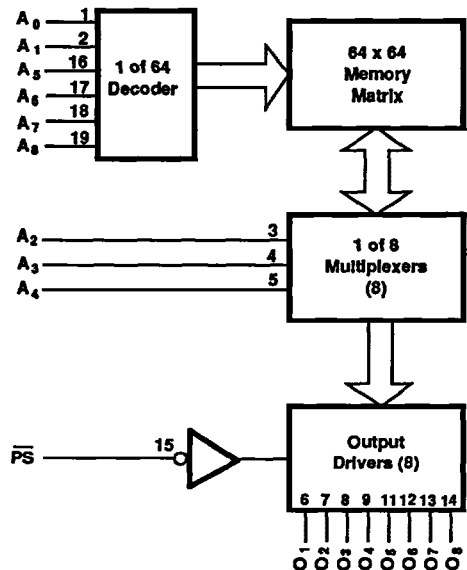
Dual In-Line Package



Pin 15 is also the programming pin (pp)

65-1316

Block Diagram



65-0113

PRODM

R296XX/R297XX

1024 x 8 PROM — R29631/R29631A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29631AM	R29631M	
I_{CC}	Power Supply Current	$V_{CC} = \text{Max}$ All inputs = Gnd	170	170	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	60	90	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega \text{ to } V_{CC}$	40	40	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega \text{ to GND, 16 mA Load}$	40	40	ns
P_D	Power Dissipation		935	935	mW

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29631DM	D	-55°C to +125°C
R29631DM/883B	D	-55°C to +125°C
R29631DMS	D	-55°C to +125°C
R29631FM	F	-55°C to +125°C
R29631FM/883B	F	-55°C to +125°C
R29631FMS	F	-55°C to +125°C
R29631ADM	D	-55°C to +125°C
R29631ADM/883B	D	-55°C to +125°C
R29631AFMS	D	-55°C to +125°C
R29631ADM	F	-55°C to +125°C
R29631AFM/883B	F	-55°C to +125°C
R29631AFMS	F	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

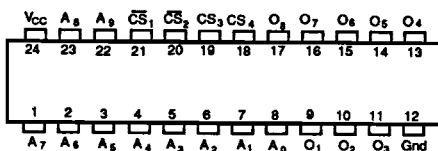
S suffix denotes Level S processing

D = 24-lead .600 wide ceramic DIP

F = 24-lead ceramic flat pack (cerpak)

Pin Out Information

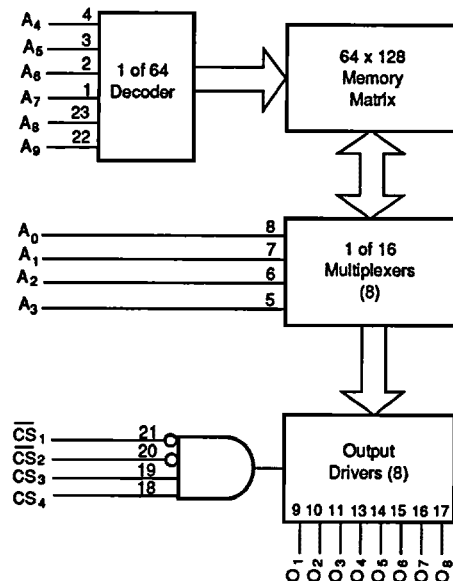
Dual-In-Line/Flat Pack Package



Pin 20 is also the programming pin (pp)

65-4069

Block Diagram



65-0116

R296XX/R297XX

1024 x 8 SPROM — R29633/R29633A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29633AM	R29633M	
I_{CCO}	Power Down, Supply Current (Disabled)	$V_{CC} = \text{Max}$, $PS = V_{HH}$ All other Inputs = GND	45	45	mA
I_{CC}	Supply Current (Enabled)	$V_{CC} = \text{Max}$ All Inputs = GND	170	170	mA
t_{AA}	Address Access Time	$CL = 30 \text{ pF}^*$ $R1 = 300\Omega \text{ to } V_{CC}$ $R2 = 600\Omega \text{ to GND, } 16 \text{ mA Load}$	70	90	ns
t_{EA}	Enable Access Time		70	115	ns
t_{ER}	Enable Recovery Time		40	40	ns
P_D	Power Dissipation (Disabled)		248	248	mW
P_D	Power Dissipation Enabled		935	935	mW

* See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29633DM	D	-55°C to +125°C
R29633DM/883B	D	-55°C to +125°C
R29633DMS	D	-55°C to +125°C
R29633FM	F	-55°C to +125°C
R29633FM/883B	F	-55°C to +125°C
R29633FMS	F	-55°C to +125°C
R29633ADM	D	-55°C to +125°C
R29633ADM/883B	D	-55°C to +125°C
R29633ADMS	D	-55°C to +125°C
R29633AFM	F	-55°C to +125°C
R29633AFM/883B	F	-55°C to +125°C
R29633AFMS	F	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

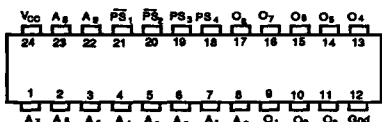
S suffix denotes Level S processing

D = 24-lead .600 wide ceramic DIP

F = 24 lead ceramic flat pack (cerpak)

Pin Out Information

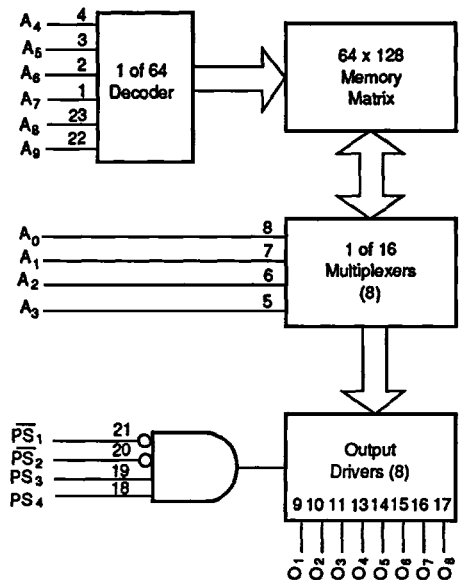
Dual In-Line/Flat Pack Package



Pin 20 is also the programming pin (pp)

65-4071

Block Diagram



65-0117

PROM

R296XX/R297XX

2048 x 4 PROM — R29651/R29651A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29651AM	R29651M	
I_{CC}	Power Supply Current	$V_{CC} = \text{Max}$ All inputs = Gnd	170	170	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	70	90	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega \text{ to } V_{CC}$	45	50	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega \text{ to GND, } 16 \text{ mA Load}$	45	45	ns
P_D	Power Dissipation		935	935	mW

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29651DM	D	-55°C to +125°C
R29651DM/883B	D	-55°C to +125°C
R29651DMS	D	-55°C to +125°C
R29651ADM	D	-55°C to +125°C
R29651ADM/883B	D	-55°C to +125°C
R29651ADMS	D	-55°C to +125°C

Notes:

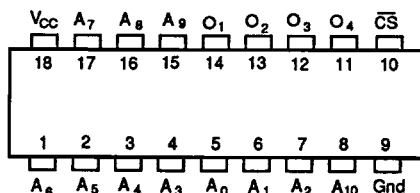
/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

D = 18-lead wide ceramic DIP

Pin Out Information

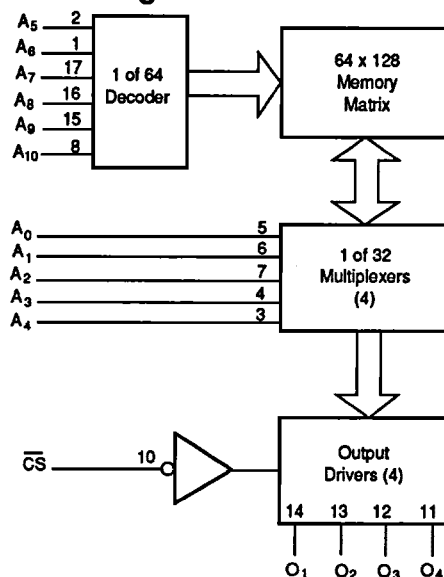
Dual In-Line Package



Pin 10 is also the programming pin (pp)

65-1324

Block Diagram



65-0122

R296XX/R297XX

2048 x 4 SPROM — R29653/R29653A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29653AM	R29653M	
I_{CCD}	Power Down, Supply Current (disabled)	$V_{CC} = \text{Max}$ $PS = V_{IH}$, All other inputs = GND	45	45	mA
I_{CC}	Supply Current (enabled)	$V_{CC} = \text{Max}$ All inputs = Gnd	170	170	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	75	90	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega$ to V_{CC}	80	95	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega$ to GND, 16 mA Load	45	45	ns
P_D	Power Dissipation (Disabled)		248	248	mW
P_D	Power Dissipation (Enabled)		935	935	mW

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29653DM	D	-55°C to +125°C
R29653DM/883B	D	-55°C to +125°C
R29653DMS	D	-55°C to +125°C
R29653ADM	D	-55°C to +125°C
R29653ADM/883B	D	-55°C to +125°C
R29653ADMS	D	-55°C to +125°C

Notes:

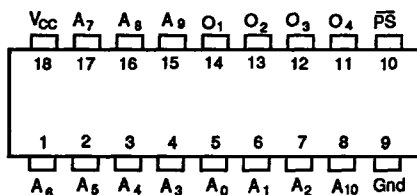
/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

D = 18-lead wide ceramic DIP

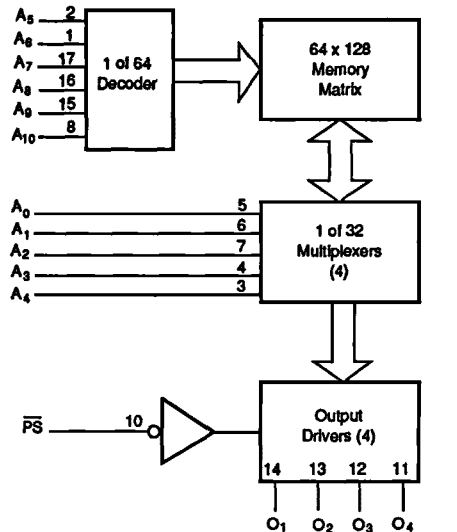
Pin Out Information

Dual In-Line Package



65-1328

Block Diagram



65-0123

PROM

R296XX/R297XX

2048 x 8 PROM — R29681/R29681A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29681AM	R29681M	
I_{CC}	Power Supply Current	$V_{CC} = \text{Max}$ All inputs = Gnd	180	180	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	70	100	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega \text{ to } V_{CC}$	45	50	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega \text{ to GND, 16 mA Load}$	35	45	ns
P_D	Power Dissipation		990	990	mW

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29681DM	D	-55°C to +125°C
R29681DM/883B	D	-55°C to +125°C
R29681DMS	D	-55°C to +125°C
R29681LM	L	-55°C to +125°C
R29681LM/883B	L	-55°C to +125°C
R29681LMS	L	-55°C to +125°C
R29681SM	S	-55°C to +125°C
R29681SM/883B	S	-55°C to +125°C
R29681SMS	S	-55°C to +125°C
R29681ADM	D	-55°C to +125°C
R29681ADM/883B	D	-55°C to +125°C
R29681ADMS	D	-55°C to +125°C
R29681ALM	L	-55°C to +125°C
R29681ALM/883B	L	-55°C to +125°C
R29681ALMS	L	-55°C to +125°C
R29681ASM	S	-55°C to +125°C
R29681ASM/883B	S	-55°C to +125°C
R29681ASMS	S	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

D = 24-lead .600 wide ceramic DIP

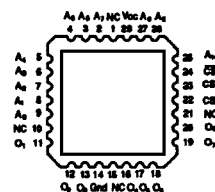
L = 28-terminal ceramic leadless chip carrier

S = 24-lead .300 wide side-brazed ceramic DIP

Contact factory regarding flat pack package

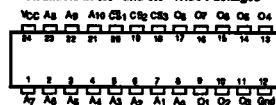
Pin Out Information

Leadless Chip Carrier (28-Terminal)



Pin 24 is also the programming pin (pp)

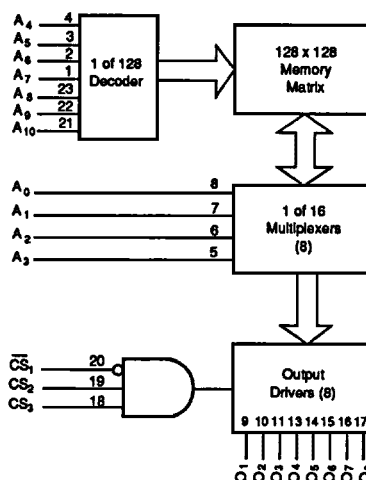
Dual-In-Line
Available in 0.3" and 0.6" Wide Packages



Pin 20 is also the programming pin (pp)

65-4073

Block Diagram



65-0128

R296XX/R297XX

2048 x 8 SPROM — R29683/R29683A

Power and AC Characteristics Over Operating Range

ICC conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3.

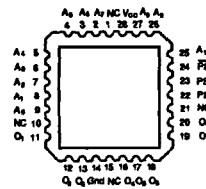
AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11.

Parameter	Description	Test Conditions	Maximum Limits		Units
			R29683AM	R29683M	
I_{CCD}	Power Down, Supply Current (disabled)	$V_{CC} = \text{Max}$ $PS = V_{IH}$, All other inputs = GND	50	50	mA
I_{CC}	Supply Current (enabled)	$V_{CC} = \text{Max}$ All inputs = Gnd	180	180	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	70	105	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega$ to V_{CC}	85	105	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega$ to GND, 16 mA Load	45	50	ns
P_D	Power Dissipation (Disabled)		275	275	mW
P_D	Power Dissipation (Enabled)		990	990	mW

*See AC Test Load Circuit and Switching Waveforms

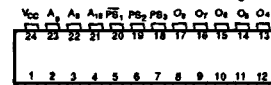
Pin Out Information

Leadless Chip Carrier (28-Terminal)



Pin 24 is also the programming pin (pp)

Dual-In-Line
Available in 0.3" and 0.6" Wide Packages



Pin 20 is also the programming pin (pp)

65-4074

Ordering Information

Part Type	Package	Operating Temperature Range
R29681DM	D	-55°C to +125°C
R29681DM/883B	D	-55°C to +125°C
R29683DMS	D	-55°C to +125°C
R29683LM	L	-55°C to +125°C
R29683LM/883B	L	-55°C to +125°C
R29683LMS	L	-55°C to +125°C
R29683SM	S	-55°C to +125°C
R29683SM/883B	S	-55°C to +125°C
R29683SMS	S	-55°C to +125°C
R29683ADM	D	-55°C to +125°C
R29683ADM/883B	D	-55°C to +125°C
R29683ADMS	D	-55°C to +125°C
R29683ALM	L	-55°C to +125°C
R29683ALM/883B	L	-55°C to +125°C
R29683ALMS	L	-55°C to +125°C
R29683ASM	S	-55°C to +125°C
R29683ASM/883B	S	-55°C to +125°C
R29683ASMS	S	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

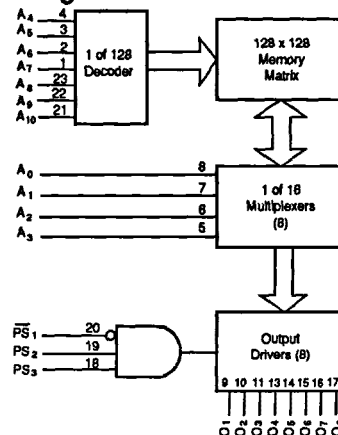
D = 24-lead, .600 wide ceramic DIP

L = 28-terminal ceramic leadless chip carrier

S = 24-lead, .300 wide side-braced ceramic DIP

Contact factory regarding flat pack package

Block Diagram



65-0129

R296XX/R297XX

4096 x 8 PROM — R29771

Power and AC Characteristics Over Operating Range

I_{CC} conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3. AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits	Units
			R29771M	
I_{CC}	Power Supply Current	$V_{CC} = \text{Max}$ All Inputs GND	190	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	65	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega$ to V_{CC}	35	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega$ to GND 16 mA Load	35	ns
P_D	Power Dissipation		1.04	W

*See AC Test Load Circuit and Switching Waveforms

Pin-Out Information

Ordering Information

Part Type	Package	Operating Temperature Range
R29771DM	D	-55°C to +125°C
R29771DM/883B	D	-55°C to +125°C
R29771DMS	D	-55°C to +125°C
R29771FM	F	-55°C to +125°C
R29771FM/883B	F	-55°C to +125°C
R29771FMS	F	-55°C to +125°C
R29771LM	L	-55°C to +125°C
R29771LM/883B	L	-55°C to +125°C
R29771LMS	L	-55°C to +125°C
R29771SM	S	-55°C to +125°C
R29771SM/883B	S	-55°C to +125°C
R29771SMS	S	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

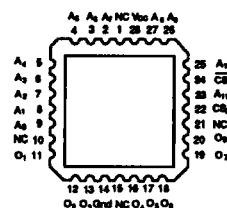
D = 24-lead .600 wide ceramic DIP

F = 24-lead ceramic bottom-brazed flat pack

L = 28-terminal ceramic leadless chip carrier

S = 24-lead, .300 wide side-brazed ceramic DIP

Leadless Chip Carrier (28-Terminal)



R296XX/R297XX

4096 x 8 SPROM — R29773

Power and AC Characteristics Over Operating Range

I_{CC} conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3.

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits	Units
			R29773M	
I_{CCD}	Power Down, Supply Current (disabled)	$V_{CC} = \text{Max}$, $\overline{PS} = V_{IH}$, All other inputs = GND	55	mA
I_{CC}	Supply Current (enabled)	$V_{CC} = \text{Max}$, All inputs = Gnd	190	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$	65	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega$ to V_{CC}	115	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega$ to GND, 16 mA Load	35	ns
P_D	Power Dissipation (Disabled)		303	mW
P_D	Power Dissipation (Enabled)		1.04	W

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29773DM	D	-55°C to +125°C
R29773DM/883B	D	-55°C to +125°C
R29773DMS	D	-55°C to +125°C
R29773FM	F	-55°C to +125°C
R29773FM/883B	F	-55°C to +125°C
R29773FMS	F	-55°C to +125°C
R29773LM	L	-55°C to +125°C
R29773LM/883B	L	-55°C to +125°C
R29773LMS	L	-55°C to +125°C
R29773SM	S	-55°C to +125°C
R29773SM/883B	S	-55°C to +125°C
R29773SMS	S	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

S suffix denotes Level S processing

D = 24-lead .600 wide ceramic DIP

F = 24-lead ceramic bottom-brazed flat pack

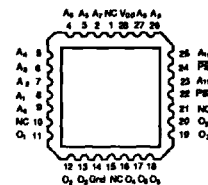
L = 28-terminal ceramic leadless chip carrier

S = 24-lead, .300 wide side-brazed ceramic DIP

Contact factory regarding flat pack package

Pin Out Information

Leadless Chip Carrier (28-Terminal)



R296XX/R297XX

8196 x 8 PROM — R29791

Power and AC Characteristics Over Operating Range

I_{CC} conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3.

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits	Units
			R29791M	
I_{CC}	Power Supply Current	$V_{CC} = \text{Max}$, All Inputs GND	190	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}$	75	ns
t_{EA}	Enable Access Time	$R1 = 300\Omega$ to V_{CC}	30	ns
t_{ER}	Enable Recovery Time	$R2 = 600\Omega$ to GND, 16 mA Load	30	ns
P_D	Power Dissipation		1.04	W

Note:

1. See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29791DM	D	-55°C to +125°C
R29791DM/883B	D	-55°C to +125°C
R29791DMS	D	-55°C to +125°C
R29791FM	F	-55°C to +125°C
R29791FM/883B	F	-55°C to +125°C
R29791FMS	F	-55°C to +125°C
R29791SM	S	-55°C to +125°C
R29791SM/883B	S	-55°C to +125°C
R29791SMS	S	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

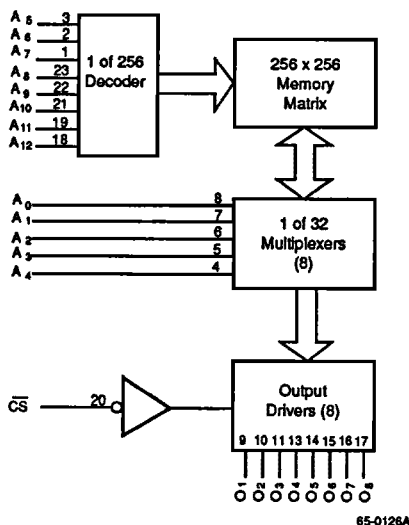
S suffix denotes Level S processing

D = 24-lead .600 wide ceramic DIP

F = 24-lead ceramic bottom-brazed flat pack

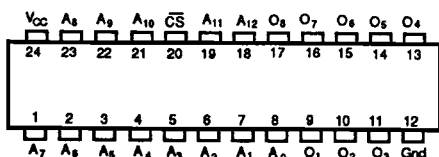
S = 24-lead, .300 wide side-brazed ceramic DIP

Block Diagram



Pin-Out Information

Dual-In-Line/Flat Pack Package
Available in 0.3" and 0.6" Wide Packages



Pin 20 is also the programming pin (pp)

65-4062A

R296XX/R297XX

8192 x 8 SPROM — R29793

Power and AC Characteristics Over Operating Range

I_{CC} conforms to MIL-STD-883, Group A, Subgroups 1, 2 and 3.

AC parameters conform to MIL-STD-883, Group A, Subgroups 9, 10 and 11

Parameter	Description	Test Conditions	Maximum Limits	Units
			R29793M	
I_{CCD}	Power Down, Supply Current (disabled)	$V_{CC} = \text{Max}$, $\overline{PS} = V_{IH}$ All other inputs = GND	50	mA
I_{CC}	Supply Current (enabled)	$V_{CC} = \text{Max}$, All inputs = Gnd	190	mA
t_{AA}	Address Access Time	$C_L = 30 \text{ pF}^*$ $R_1 = 300\Omega \text{ to } V_{CC}$	75	ns
t_{EA}	Enable Access Time		125	ns
t_{ER}	Enable Recovery Time	$R_2 = 600\Omega \text{ to GND}$, 16 mA Load	30	ns
P_D	Power Dissipation (Disabled)		275	mW
P_D	Power Dissipation (Enabled)		1.04	W

*See AC Test Load Circuit and Switching Waveforms

Ordering Information

Part Type	Package	Operating Temperature Range
R29793DM	D	-55°C to +125°C
R29793DM/883B	D	-55°C to +125°C
R29793DMS	D	-55°C to +125°C
R29793FM	F	-55°C to +125°C
R29793FM/883B	F	-55°C to +125°C
R29793FMS	F	-55°C to +125°C
R29793SM	S	-55°C to +125°C
R29793SM/883B	S	-55°C to +125°C
R29793SMS	S	-55°C to +125°C

Notes:

/883B suffix denotes MIL-STD-883, Level B processing

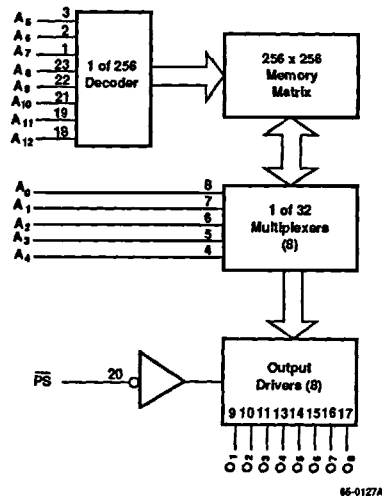
S suffix denotes Level S processing

D = 24-lead .600 wide ceramic DIP

F = 24-lead ceramic bottom-brazed flat pack

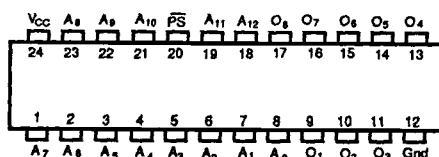
S = 24-lead, .300 wide side-brazed ceramic DIP

Block Diagram



Pin Out Information

Dual-In-Line/Flat Pack Package
Available in 0.3" and 0.6" Wide Packages

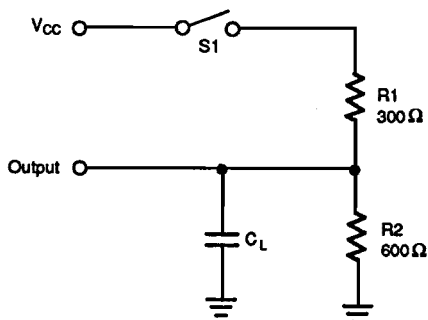


Pin 20 is also the programming pin (pp)

65-4072A

R296XX/R297XX

AC Test Load Circuit

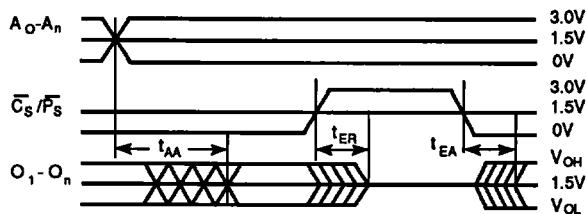


65-4059

Notes:

1. t_{AA} is tested with switch S_1 closed and $C_L = 30$ pF.
2. t_{EA} is tested with $C_L = 30$ pF; S_1 is open for high impedance to "1" test and closed for high impedance to "0" test.
3. t_{ER} is tested with $C_L = 5$ pF; S_1 is open for "1" to high impedance test and measured at $V_{OH} - 0.5V$ output level and is closed for "0" to high impedance test and measured at $V_{OL} + 0.5V$ output level.

Switching Waveforms



Keys to Timing Diagram

Waveforms	Inputs	Outputs
	Must be Steady	Will be Steady
	Don't Care. Any Change Permitted	Changing State Unknown
	Does Not Apply	Center Line is High Impedance Off State

65-4811

R296XX/R297XX

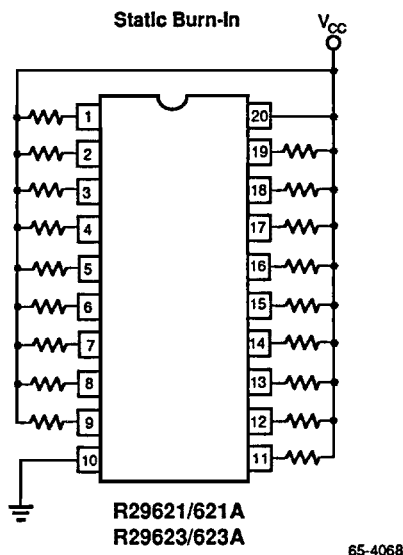
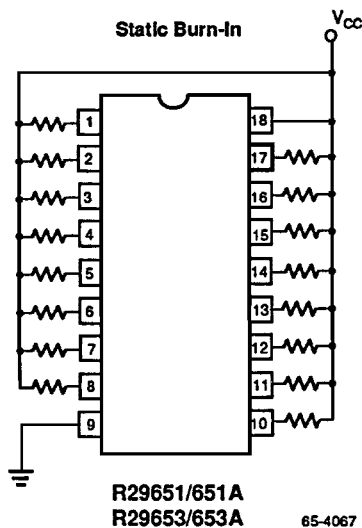
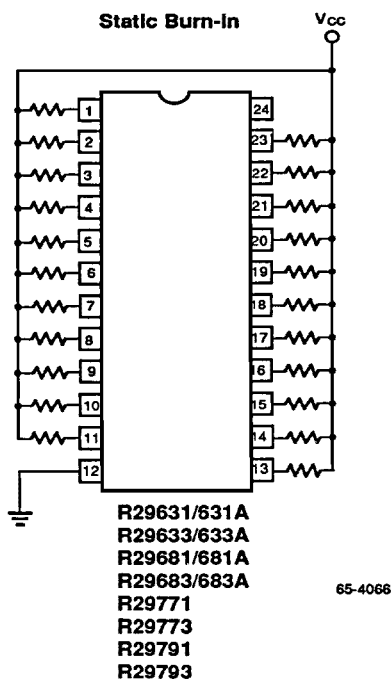
Static Life Test/Burn-In Circuits

In accordance with MIL-STD-883, Methods 1005/1015, Condition C

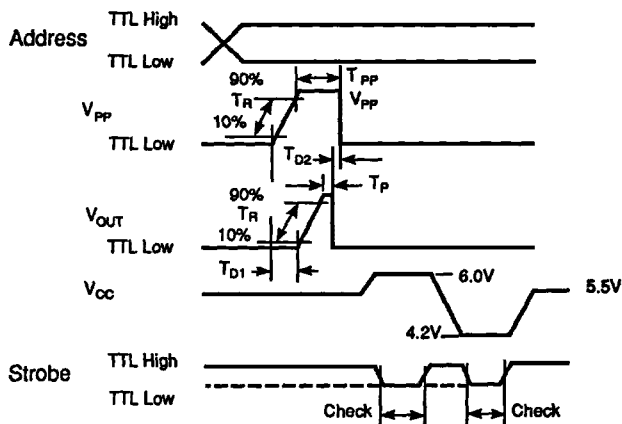
$$T_A = 125^{+10}_{-0} \text{ } ^\circ\text{C minimum}$$

$$V_{CC} = 5.25\text{V} \pm 0.25\text{V}$$

Resistors are optional on input pins
($R = 300\Omega \pm 10\%$)



Programming Characteristics



R296XX Series

$T_R = 0.34V/\mu S$ Min. — $1.25V/\mu S$ Max.
 $T_{PP} = 80 \mu S$ Min. — $110 \mu S$ Max.
 $T_P = 1 \mu S$ Min. — $40 \mu S$ Max.
 $T_{D1} = 70 \mu S$ Min. — $90 \mu S$ Max.
 $T_{D2} = 100 nS$ Min.
 $V_{PP} = 27V$ Min. — $33V$ Max.
 $V_{OUT} = 20V$ Min. — $26V$ Max.

R297XX Series

$T_R = 0.34V/\mu S$ Min. — $1.25V/\mu S$ Max.
 $T_{PP} = 70 \mu S$ Min. — $120 \mu S$ Max.
 $T_P = 20 \mu S$ Min. — $40 \mu S$ Max.
 $T_{D1} = 60 \mu S$ Min. — $100 \mu S$ Max.
 $T_{D2} = 100 nS$ Min.
 $V_{PP} = 26V$ Min. — $28V$ Max.
 $V_{OUT} = 22V$ Min. — $24V$ Max.

Notes:

Output Load = $0.2 mA$ During $6.0V$ Check
 Output Load = $12 mA$ During $4.2V$ Check

65-4810

Programming Timing

Device Programming Inputs

If you would like to have Raytheon program your devices, please submit one of the following:

- ◆ Two masters and truth table
- ◆ Two masters and checksum

In either case, we require customer approval prior to programming the devices.

If you need blank devices in order to supply programming masters, please do not hesitate to contact Raytheon for unprogrammed samples.

PROM

R296XX/R297XX

Commercial Programmers (subject to change)

Equipment must be calibrated at regular intervals. 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.

Please contact the following manufacturers for equipment information:

Data I/O Corp.
10525 Willows Road, N.E.
P.O. Box 97046
Redmond, WA 98073-9746
(800) 247-5700

Stag Microsystems Inc. (R296XX Series)
1600 Wyatt Drive, Suite 3
Santa Clara, CA 95054
(408) 988-1118

Commercial Surface Mount Socket Adapter Manufacturer (subject to change)

Please contact the following manufacturer for equipment information:

Emulation Technology, Inc.
2344 Walsh Avenue, Bldg. F
Santa Clara, CA 95051
(408) 982-0660

The companies listed above are not intended to be a complete guide of manufacturers of programmers or adapters, nor does Raytheon endorse any specific company.