Selection Guide

		7C274-30	7C271-35 7C274-35	7C271-45 7C274-45	7C271-55	Unit
Maximum Access Time		30	35	45	55	ns
Maximum Operating Current	Com'l	120	120	120	120	mA
	Military		130	130	130	mA
Standby Current	Com'l	30	30	30	30	mA
	Military		40	40	40	mA

Maximum Ratings[1]

(Above which the useful life may be impaired. For user guide-lines, not tested.)

Storage Temperature .... −65°C to +150°C

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

Supply Voltage to Ground Potential .... −0.5V to +7.0V

DC Voltage Applied to Outputs
in High Z State .... −0.5V to +7.0V

DC Input Voltage .... −3.0V to +7.0V

DC Program Voltage 13.0V

Static Discharge Voltage... >2001V
(per MIL-STD-883, Method 3015)

Latch-Up Current .... >200 mA

UV Exposure .... 7258 Wsec/cm^2

Operating Range

Range	Ambient Temperature	V_{CC}
Commercial	0°C to +70°C	5V ±10%
Military[2]	−55°C to +125°C	5V ±10%

Electrical Characteristics Over the Operating Range[3]

Parameter	Description	Test Conditions		7C271- 35, 45, 55 7C274-30, 35, 45, Min.	Max.	Unit
V_{OH}	Output HIGH Voltage	V_{CC} = Min., I_{OH} = −2.0 mA		2.4		V
V_{OL}	Output LOW Voltage	V_{CC} = Min., I_{OL} = 8.0 mA[4]			0.4	V
V_{IH}	Input HIGH Level	Guaranteed Input Logical HIGH Voltage for All Inputs		2.0	V_{CC}	V
V_{IL}	Input LOW Level	Guaranteed Input Logical LOW Voltage for All Inputs			0.8	V
I_{IX}	Input Current	GND ≤ V_{IN} ≤ V_{CC}		−10	+10	μA
I_{OZ}	Output Leakage Current	GND ≤ V_{OUT} ≤ V_{CC}, Output Disabled		−40	+40	μA
I_{OS}	Output Short Circuit Current[5]	V_{CC} = Max., V_{OUT} = GND		−20	−90	mA
I_{CC}	Power Supply Current	V_{CC} = Max., V_{IN} = 2.0V, I_{OUT} = 0 mA, $\overline{CE}$=V_{IL}	Commercial		120	mA
			Military		130	
I_{SB}	Standby Supply Current	V_{CC} = Max., $\overline{CE}$ = V_{IH}, I_{OUT} = 0 mA	Commercial		30	mA
			Military		40	
V_{PP}	Programming Supply Voltage			12	13	V
I_{PP}	Programming Supply Current				50	mA

Notes
1. The voltage on any input or I/O pin cannot exceed the power pin during power-up.
2. T_A is the "instant on" case temperature.
3. See the last page of this specification for Group A subgroup testing information.
4. 6.0 mA military
5. For test purposes, not more than one output at a time should be shorted. Short circuit test duration should not exceed 30 seconds.

[+] Feedback

Electrical Characteristics Over the Operating Range[3]
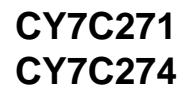
Parameter	Description	Test Conditions	7C271- 35, 45, 55 7C274-30, 35, 45,		Unit
			Min.	Max.	
V_{IHP}	Input HIGH Programming Voltage		3.0		V
V_{ILP}	Input LOW Programming Voltage			0.4	V

Capacitance[6]

Parameter	Description	Test Conditions	Max.	Unit
C_{IN}	Input Capacitance	$T_A = 25°C$, f = 1 MHz, $V_{CC} = 5.0V$	10	pF
C_{OUT}	Output Capacitance		10	pF

AC Test Loads and Waveforms[6]

R1 500Ω
658Ω MIL
5V
OUTPUT
30 pF
INCLUDING JIG AND SCOPE
R2 333Ω (403Ω MIL)

(a) Normal Load

R1 500Ω
658Ω MIL
5V
OUTPUT
5 pF
INCLUDING JIG AND SCOPE
R2 333Ω (403Ω MIL)

(b) High Z Load

ALL INPUT PULSES
3.0V
90%
90%
10%
GND
10%
≤ 5 ns
≤ 5 ns

Equivalent to: THÉVENIN EQUIVALENT

OUTPUT   200Ω   2.00V COMMERCIAL   OUTPUT   250Ω   1.90V MILITARY

Note
6. See Introduction to CMOS PROMs for general information on testing.

[+] Feedback

Switching Characteristics Over the Operating Range[3,6]

Parameter	Description	7C274-30		7C271-35 7C274-35		7C271-45 7C274-45		7C271-55		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{AA}	Address to Output Valid		30		35		45		55	ns
t_{HZCS}	Chip Select Inactive to High Z ($\overline{CS}_1$ and CS_2, 7C271 Only)		20		25		30		30	ns
t_{ACS}	Chip Select Active to Output Valid ($\overline{CS}_1$ and CS_2, 7C271 Only)		20		25		30		30	ns
t_{HZOE}	Output Enable Inactive to High Z ($\overline{OE}$, 7C274 Only)		20		20		25		25	ns
t_{OE}	Output Enable Active to Output Valid ($\overline{OE}$, 7C274 Only)		20		20		25		25	ns
t_{HZCE}	Chip Enable Inactive to High Z ($\overline{CE}$ Only)		35		40		50		60	ns
t_{ACE}	Chip Enable Active to Output Valid ($\overline{CE}$ Only)		35		40		50		60	ns
t_{PU}	Chip Enable Active to Power Up	0		0		0		0		ns
t_{PD}	Chip Enable Inactive to Power Down		35		40		50		60	ns
t_{OH}	Output Hold from Address Change	0		0		0		0		ns

Switching Waveform
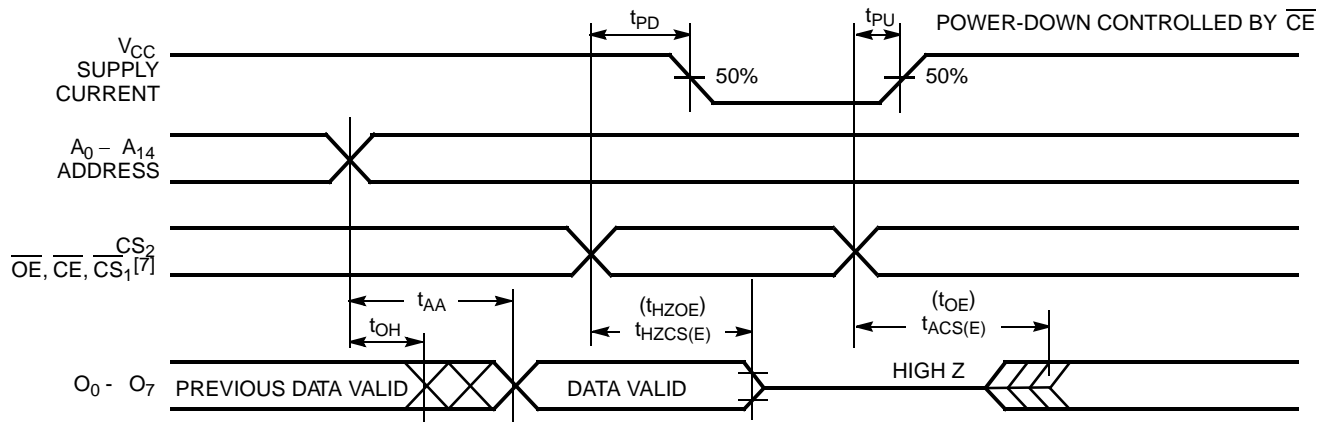
Erasure Characteristics

Wavelengths of light less than 4000 angstroms begin to erase the CY7C271 and CY7C274 in the windowed package. For this reason, an opaque label should be placed over the window if the PROM is exposed to sunlight or fluorescent lighting for extended periods of time.

The recommended dose of ultraviolet light for erasure is a wavelength of 2537 angstroms for a minimum dose (UV intensity $\times$ exposure time) of 25 Wsec/cm^2. For an ultraviolet lamp with a 12 mW/cm^2 power rating, the exposure time would be approximately 35 minutes. The CY7C271 or CY7C274 needs to be within 1 inch of the lamp during erasure. Permanent damage may result if the

PROM is exposed to high-intensity UV light for an extended period of time. 7258 Wsec/cm^2 is the recommended maximum dosage.

Programming Modes

Programming support is available from Cypress as well as from a number of third-party software vendors. For detailed programming information, including a listing of software packages, please see the PROM Programming Information located at the end of this section. Programming algorithms can be obtained from any Cypress representative.

Note
7. CS_2 and $\overline{CS}_1$ are used on the 7C271 only. $\overline{OE}$ is used on the 7C274 only.

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Table 1. CY7C271 Mode Selection

Mode		$A_{14}–A_0$	CE	CS_2	CS_1	$O_7–O_0$
	Read or Output Disable	$A_{14}–A_0$	VFY	PGM	V_{PP}	$D_7–D_0$
	Other					
Read		$A_{14}–A_0$	V_{IL}	V_{IH}	V_{IL}	$O_7–O_0$
Power Down		$A_{14}–A_0$	V_{IH}	X	X	High Z
Output Disable		$A_{14}–A_0$	X	V_{IL}	X	High Z
Output Disable		$A_{14}–A_0$	X	X	V_{IH}	High Z
Program		$A_{14}–A_0$	V_{IHP}	V_{ILP}	V_{PP}	$D_7–D_0$
Program Verify		$A_{14}–A_0$	V_{ILP}	V_{IHP}/V_{ILP}	V_{PP}	$O_7–O_0$
Program Inhibit		$A_{14}–A_0$	V_{IHP}	V_{IHP}	V_{PP}	High Z
Blank Check		$A_{14}–A_0$	V_{ILP}	V_{IHP}/V_{ILP}	V_{PP}	$O_7–O_0$

Pin Function[8] (header spanning $A_{14}–A_0$ through $O_7–O_0$)

Table 2. CY7C274 Mode Selection

Mode		$A_{14}–A_0$	OE	CE	V_{PP}	$O_7–O_0$
	Read or Output Disable	$A_{14}–A_0$	VFY	PGM	V_{PP}	$D_7–D_0$
	Other					
Read		$A_{14}–A_0$	V_{IL}	V_{IL}	Note 9	$O_7–O_0$
Output Disable		$A_{14}–A_0$	V_{IH}	X	X	High Z
Power Down		$A_{14}–A_0$	X	V_{IH}	X	High Z
Program		$A_{14}–A_0$	V_{IHP}	V_{ILP}	V_{PP}	$D_7–D_0$
Program Verify		$A_{14}–A_0$	V_{ILP}	V_{IHP}/V_{ILP}	V_{PP}	$O_7–O_0$
Program Inhibit		$A_{14}–A_0$	V_{IHP}	V_{IHP}	V_{PP}	High Z
Blank Check		$A_{14}–A_0$	V_{ILP}	V_{IHP}/V_{ILP}	V_{PP}	$O_7–O_0$

Pin Function[8] (header spanning $A_{14}–A_0$ through $O_7–O_0$)

Notes
8. X can be V_{IL} (V_{ILP}) or V_{IH} (V_{IHP}).
9. V_{PP} should be tied to $V_{CC} \pm 5\%$ in read mode.

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Figure 1. Programming Pinouts

DIP
Top View

A_9	1		28	V_{CC}
A_8	2		27	A_{10}
A_7	3		26	A_{11}
A_6	4		25	A_{12}
A_5	5	7C271	24	A_{13}
A_4	6		23	A_{14}
A_3	7		22	V_{PP}
A_2	8		21	$\overline{PGM}$
A_1	9		20	$\overline{VFY}$
A_0	10		19	D_7
D_0	11		18	D_6
D_1	12		17	D_5
D_2	13		16	D_4
GND	14		15	D_3

LCC
Top View

7C271

DIP
Top View

V_{PP}	1		28	V_{CC}
A_{12}	2		27	A_{14}
A_7	3		26	A_{13}
A_6	4		25	A_8
A_5	5	7C274	24	A_9
A_4	6		23	A_{11}
A_3	7		22	$\overline{VFY}$
A_2	8		21	A_{10}
A_1	9		20	$\overline{PGM}$
A_0	10		19	D_7
D_0	11		18	D_6
D_1	12		17	D_5
D_2	13		16	D_4
GND	14		15	D_3

LCC
Top View

7C274

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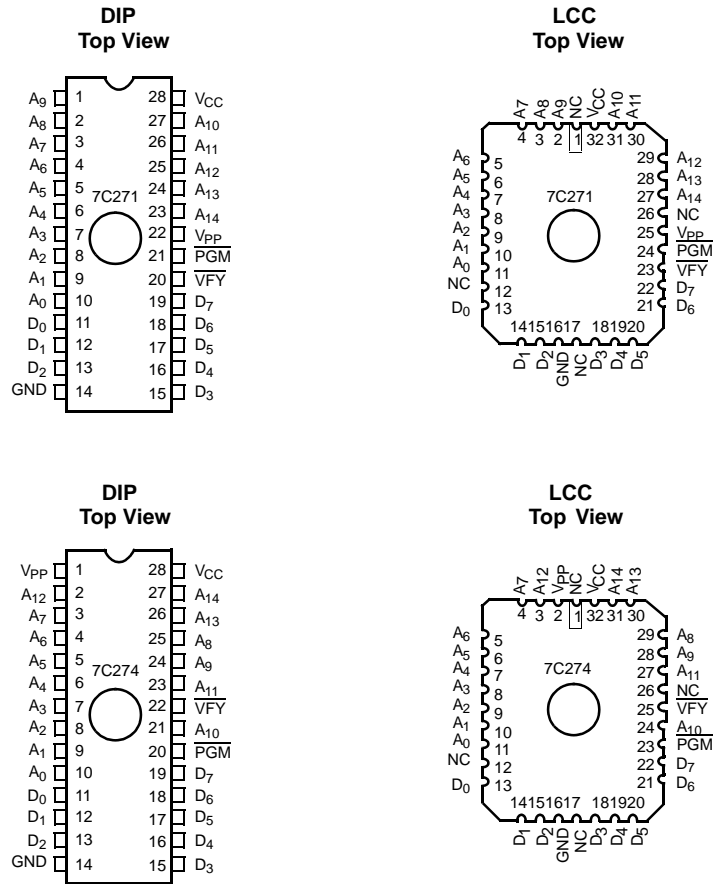
Typical DC and AC Characteristics

NORMALIZED SUPPLY CURRENT
vs. SUPPLY VOLTAGE

NORMALIZED SUPPLY CURRENT
vs. AMBIENT TEMPERATURE

NORMALIZED ACCESS TIME
vs. SUPPLY VOLTAGE

NORMALIZED ACCESS TIME
vs. TEMPERATURE

OUTPUT SOURCE CURRENT
vs. VOLTAGE

TYPICAL ACCESS TIME CHANGE
vs. OUTPUT LOADING

OUTPUT SINK CURRENT
vs. OUTPUT VOLTAGE

NORMALIZED SUPPLY CURRENT
vs. CYCLE PERIOD
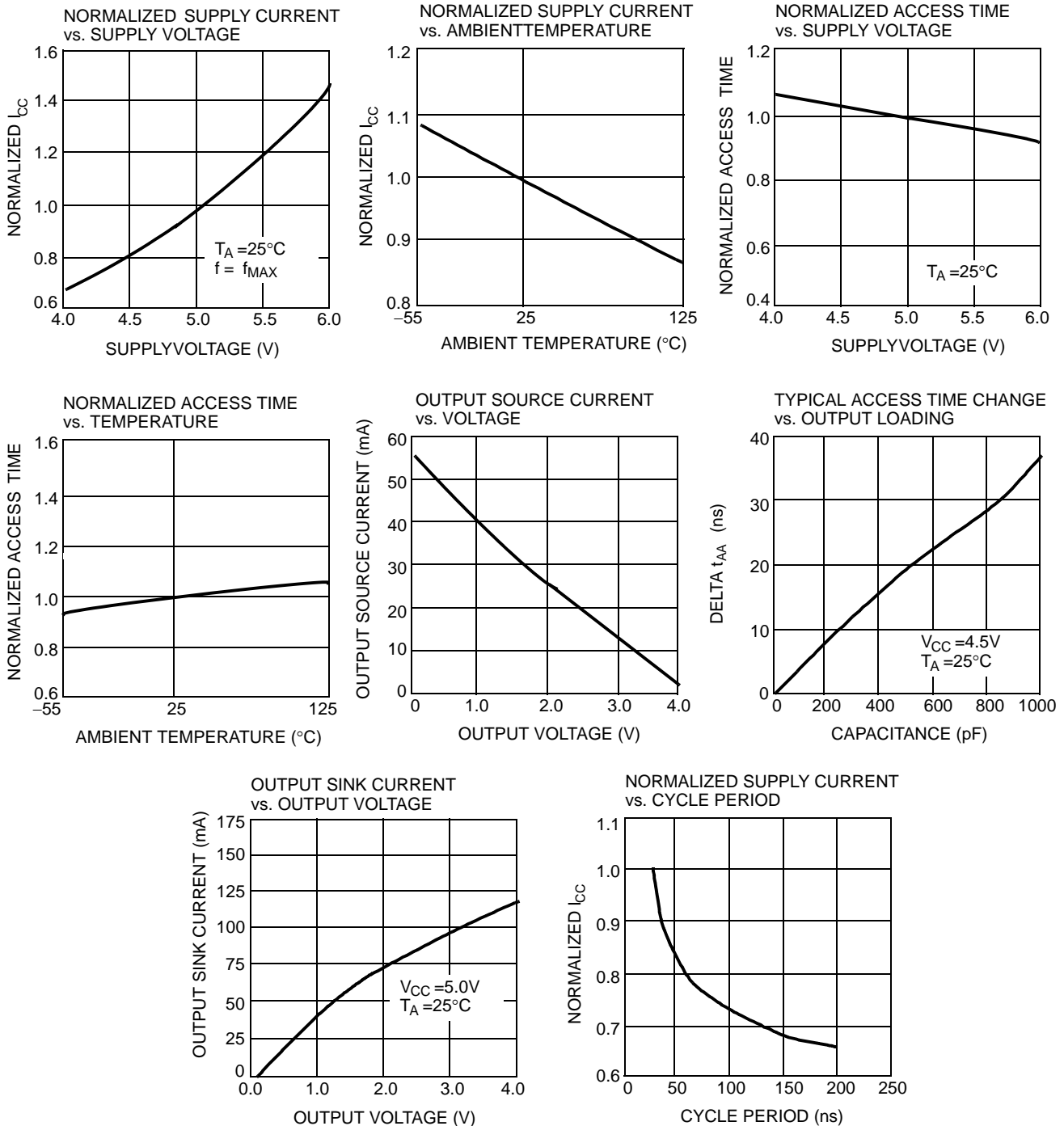
C271-14

Ordering Information

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
35	CY7C271-35WMB	W22	28-Lead (300-Mil) Windowed CerDIP	Military
45	CY7C271-45WMB	W22	28-Lead (300-Mil) Windowed CerDIP	Military
	CY7C274-45WMB	W16	28-Lead (600-Mil) Windowed CerDIP	
55	CY7C271-55WMB	W22	28-Lead (300-Mil) Windowed CerDIP	Military

MILITARY SPECIFICATIONS
Group A Subgroup Testing

DC Characteristics

Parameter	Subgroups
V_{OH}	1, 2, 3
V_{OL}	1, 2, 3
V_{IH}	1, 2, 3
V_{IL}	1, 2, 3
I_{IX}	1, 2, 3
I_{OZ}	1, 2, 3
I_{CC}	1, 2, 3
I_{SB}	1, 2, 3

Switching Characteristics

Parameter	Subgroups
t_{AA}	7, 8, 9, 10, 11
t_{ACS}[10]	7, 8, 9, 10, 11
t_{OE}[11]	7, 8, 9, 10, 11
t_{ACE}	7, 8, 9, 10, 11

SMD Cross Reference

SMD Number	Suffix	Cypress Number
5962-89817	01ZX	CY7C271-55QMB
5962-89817	02XX	CY7C271-45WMB
5962-89817	02ZX	CY7C271-45QMB

Notes
10. 7C271 only ($\overline{CS}_1$ and CS_2).
11. 7C274 only.

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Package Diagrams

Figure 2. 28-Lead (300-Mil) PDIP P21

DIMENSIONS IN INCHES [MM] MIN.
MAX.

REFERENCE JEDEC MO-095
PACKAGE WEIGHT: 2.15 gms

51-85014-*D

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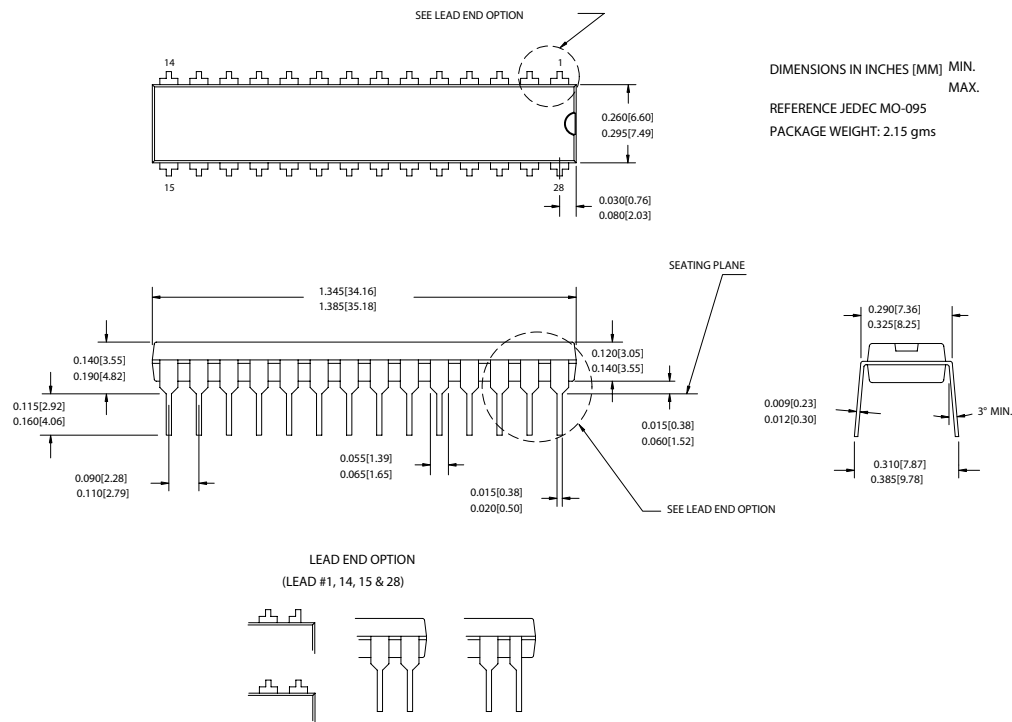
Package Diagrams (continued)

Figure 3. 32-Pin Windowed Rectangular Leadless Chip Carrier Q55

MIL-STD-1835 C-12

51-80103-*A

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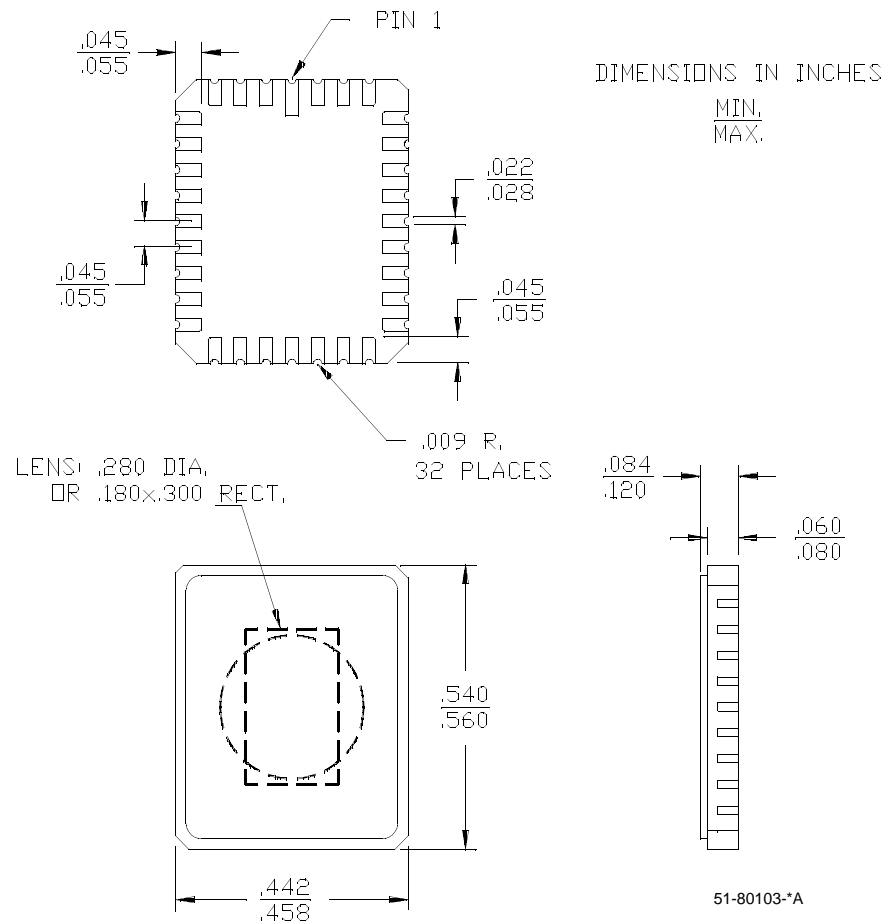
Package Diagrams (continued)

Figure 4. 28-Lead (600-Mil) Windowed CerDIP W16

MIL-STD-1835 D-10 Config. A

DIMENSIONS IN INCHES
$\frac{MIN.}{MAX.}$

51-80020-**

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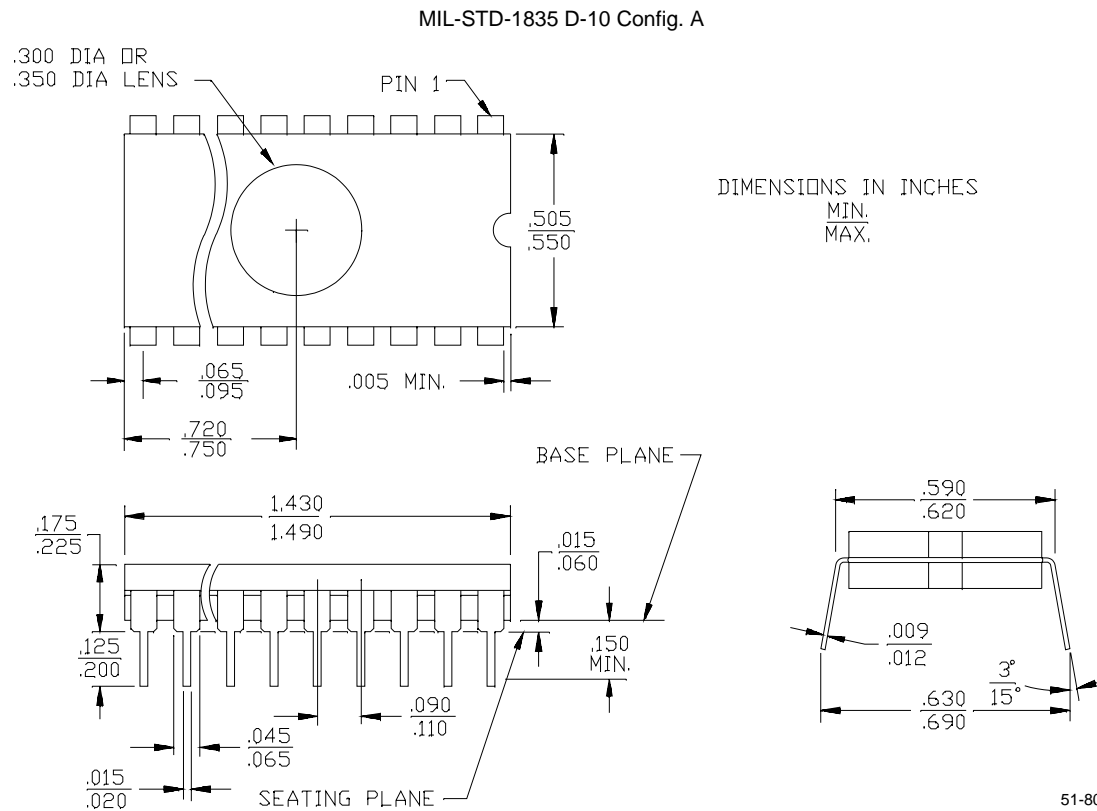
Package Diagrams (continued)

Figure 5. 28-Lead (300-Mil) Windowed CerDIP W22

MIL-STD-1835 D-15 Config. A

51-80087-**
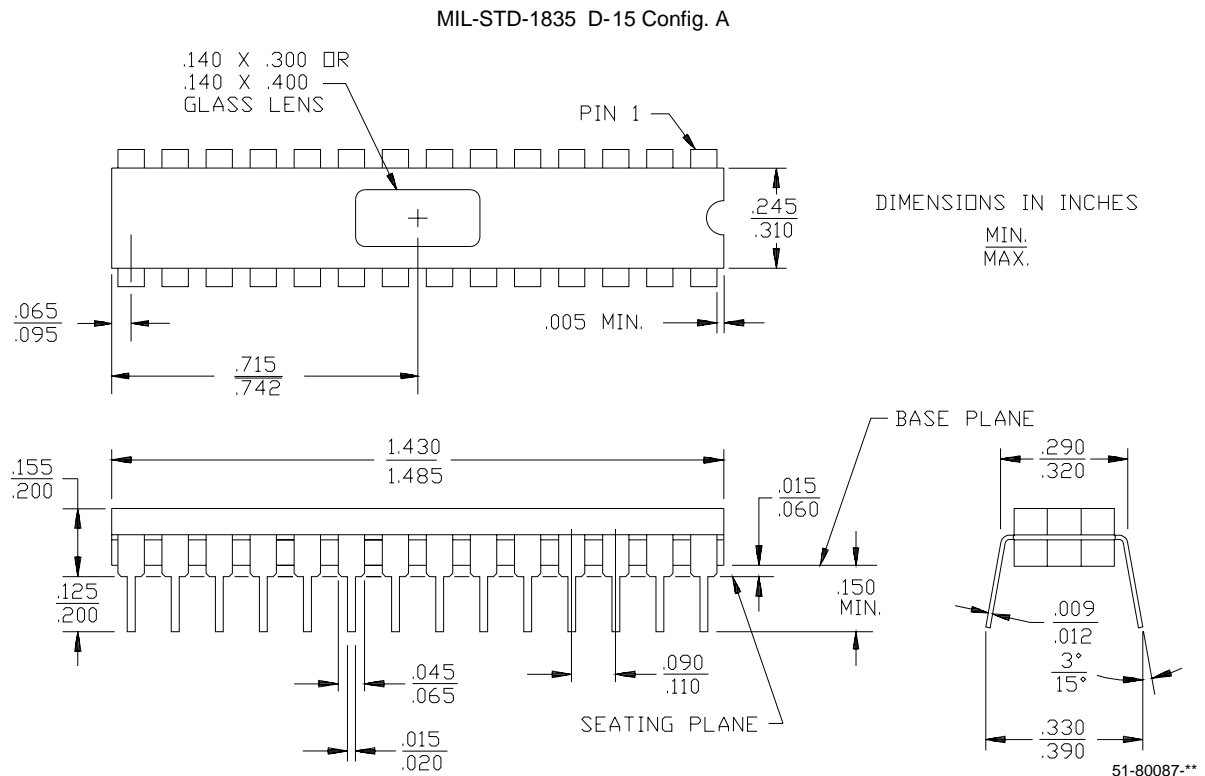
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Document History Page

	Document Title: CY7C271 CY7C274 32K x 8 Power Switched and Reprogrammable PROM Document Number: 38-04008				
REV.	**ECN NO.**	**Issue Date**	**Orig. of Change**	**Description of Change**	
**	113864	3/8/02	DSG	Changed from Spec number: 38-00068 to 38-04008	
A*	118899	10/10/02	GBI	Updated Ordering Information	
*B	122249	12/27/02	RBI	Added power up requirements to Operating Conditions information	
*C	499542	See ECN	PCI	Updated Ordering Information	

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