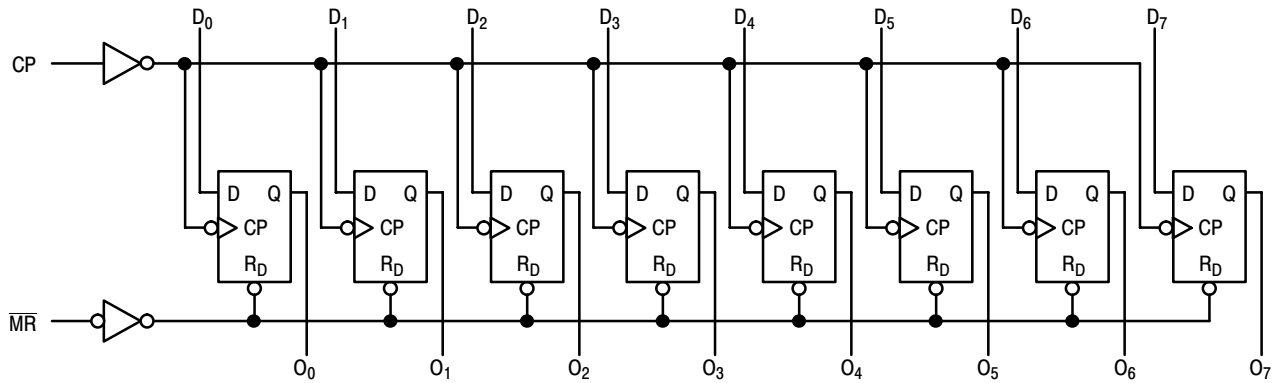


MC74AC273, MC74ACT273



NOTE: That this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Figure 1. Logic Diagram

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage (Referenced to GND)	- 0.5 to + 7.0	V
V_{IN}	DC Input Voltage (Referenced to GND)	- 0.5 to $V_{CC} + 0.5$	V
V_{OUT}	DC Output Voltage (Referenced to GND)	- 0.5 to $V_{CC} + 0.5$	V
I_{IN}	DC Input Current, per Pin	± 20	mA
I_{OUT}	DC Output Sink/Source Current, per Pin	± 50	mA
I_{CC}	DC V_{CC} or GND Current per Output Pin	± 50	mA
T_{stg}	Storage Temperature	- 65 to + 150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	'AC	2.0	5.0	V
		'ACT	4.5	5.0	
V_{in}, V_{out}	DC Input Voltage, Output Voltage (Ref. to GND)	0	-	V_{CC}	V
t_r, t_f	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	$V_{CC} @ 3.0 V$	-	150	ns/V
		$V_{CC} @ 4.5 V$	-	40	
		$V_{CC} @ 5.5 V$	-	25	
t_r, t_f	Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs	$V_{CC} @ 4.5 V$	-	10	ns/V
		$V_{CC} @ 5.5 V$	-	8.0	
T_J	Junction Temperature (PDIP)	-	-	140	°C
T_A	Operating Ambient Temperature Range	-40	25	85	°C
I_{OH}	Output Current - High	-	-	-24	mA
I_{OL}	Output Current - Low	-	-	24	mA

1. V_{IN} from 30% to 70% V_{CC} ; see individual Data Sheets for devices that differ from the typical input rise and fall times.

2. V_{IN} from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

MC74AC273, MC74ACT273

DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74AC		74AC		Unit	Conditions
			T _A = +25°C		T _A = -40°C to +85°C			
			Typ	Guaranteed Limits				
V _{IH}	Minimum High Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V	
V _{IL}	Maximum Low Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V	
V _{OH}	Minimum High Level Output Voltage	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	V	I _{OUT} = -50 μA	
		3.0 4.5 5.5	- - -	2.56 3.86 4.86	2.46 3.76 4.76	V	*V _{IN} = V _{IL} or V _{IH} -12 mA I _{OH} -24 mA -24 mA	
V _{OL}	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	V	I _{OUT} = 50 μA	
		3.0 4.5 5.5	- - -	0.36 0.36 0.36	0.44 0.44 0.44	V	*V _{IN} = V _{IL} or V _{IH} 12 mA I _{OL} 24 mA 24 mA	
I _{IN}	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μA	V _I = V _{CC} , GND	
I _{OLD} I _{OHD}	†Minimum Dynamic Output Current	5.5 5.5	- -	- -	75 -75	mA	V _{OLD} = 1.65 V Max V _{OHD} = 3.85 V Min	
I _{CC}	Maximum Quiescent Supply Current	5.5	-	8.0	80	μA	V _{IN} = V _{CC} or GND	

*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

NOTE: Note: I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V_{CC}.

AC CHARACTERISTICS (For Figures and Waveforms – See Section 3 of the ON Semiconductor FACT Data Book, DL138/D)

Symbol	Parameter	V _{CC} * (V)	74AC			74AC		Unit	Figure No.
			T _A = +25°C C _L = 50 pF			T _A = -40°C to +85°C C _L = 50 pF			
			Min	Typ	Max	Min	Max		
f _{max}	Maximum Clock Frequency	3.3 5.0	90 140	125 175	– –	75 125	– –	Mhz	3–3
t _{PLH}	Propagation Delay Clock to Output	3.3 5.0	4.0 3.0	7.0 5.5	12.5 9.0	3.0 2.5	14.0 10.0	ns	3–6
t _{PHL}	Propagation Delay Clock to Output	3.3 5.0	4.0 3.0	7.0 5.0	13.0 10.0	3.5 2.5	14.5 11.0	ns	3–6
t _{PHL}	Propagation Delay MR to Output	3.3 5.0	4.0 3.0	7.0 5.0	13.0 10.0	3.5 2.5	14.0 10.5	ns	3–6

*Voltage Range 3.3 V is 3.3 V ±0.3 V. Voltage Range 5.0 V is 5.0 V ±0.5 V.

AC OPERATING REQUIREMENTS

Symbol	Parameter	V _{CC} * (V)	74AC		74AC		Unit	Figure No.
			T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF			
			Typ	Guaranteed Minimum				
t _s	Setup Time, HIGH or LOW Data to CP	3.3 5.0	3.5 2.5	5.5 4.0	6.0 4.5	ns	3-9	
t _h	Hold Time, HIGH or LOW Data to CP	3.3 5.0	-2.0 -1.0	0 1.0	0 1.0	ns	3-9	
t _w	Clock Pulse Width HIGH or LOW	3.3 5.0	3.5 2.5	5.5 4.0	6.0 4.5	ns	3-6	
t _w	MR Pulse Width HIGH or LOW	3.3 5.0	2.0 1.5	5.5 4.0	6.0 4.5	ns	3-6	
t _{rec}	Recovery Time MR to CP	3.3 5.0	1.5 1.0	3.5 2.0	4.5 3.0	ns	3-9	

*Voltage Range 3.3 V is 3.3 V ±0.3 V. Voltage Range 5.0 V is 5.0 V ±0.5 V.

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DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74ACT		74ACT		Unit	Conditions
			T _A = +25°C		T _A = −40°C to +85°C			
			Typ	Guaranteed Limits				
V _{IH}	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V	V _{OUT} = 0.1 V or V _{CC} − 0.1 V	
V _{IL}	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V	V _{OUT} = 0.1 V or V _{CC} − 0.1 V	
V _{OH}	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V	I _{OUT} = −50 μA	
		4.5 5.5	− −	3.86 4.86	3.76 4.76	V	*V _{IN} = V _{IL} or V _{IH} I _{OH} −24 mA −24 mA	
V _{OL}	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V	I _{OUT} = 50 μA	
		4.5 5.5	− −	0.36 0.36	0.44 0.44	V	*V _{IN} = V _{IL} or V _{IH} 24 mA I _{OL} 24 mA	
I _{IN}	Maximum Input Leakage Current	5.5	−	±0.1	±1.0	μA	V _I = V _{CC} , GND	
ΔI _{CCT}	Additional Max. I _{CC} /Input	5.5	0.6	−	1.5	mA	V _I = V _{CC} − 2.1 V	
I _{OLD} I _{OHD}	†Minimum Dynamic Output Current	5.5 5.5	− −	− −	75 −75	mA	V _{OLD} = 1.65 V Max V _{OHD} = 3.85 V Min	
I _{CC}	Maximum Quiescent Supply Current	5.5	−	8.0	80	μA	V _{IN} = V _{CC} or GND	

*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

AC CHARACTERISTICS (For Figures and Waveforms – See Section 3 of the ON Semiconductor FACT Data Book, DL138/D)

Symbol	Parameter	V _{CC} * (V)	74ACT			74ACT		Unit	Figure No.
			T _A = +25°C C _L = 50 pF			T _A = −40°C to +85°C C _L = 50 pF			
			Min	Typ	Max	Min	Max		
f _{max}	Maximum Clock Frequency	5.0	125	200	–	125	–	MHz	3–3
t _{PHL}	Propagation Delay Clock to Output	5.0	3.0	6.0	10	2.5	11.0	ns	3–6
t _{PLH}	Propagation Delay Clock to Output	5.0	3.0	6.5	11	2.5	12.0	ns	3–6
t _{PHL}	Propagation Delay $\overline{\text{MR}}$ to Output	5.0	3.0	7.0	11	2.5	11.5	ns	3–6

*Voltage Range 5.0 V is 5.0 V ±0.5 V.

AC OPERATING REQUIREMENTS

Symbol	Parameter	V _{CC} * (V)	74ACT		74ACT	Unit	Figure No.
			T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF		
			Typ	Guaranteed Minimum			
t _s	Setup Time, HIGH or LOW – Data to CP	5.0	3.0	4.5	5.0	ns	3–9
t _h	Hold Time, HIGH or LOW – Data to CP	5.0	–2.5	2.0	2.0	ns	3–9
t _w	Clock Pulse Width – HIGH or LOW	5.0	2.5	4.0	4.5	ns	3–6
t _w	$\overline{\text{MR}}$ Pulse Width – HIGH or LOW	5.0	2.5	4.0	4.5	ns	3–6
t _{rec}	Recovery Time – $\overline{\text{MR}}$ to CP	5.0	–1.0	2.0	3.0	ns	3–6

*Voltage Range 5.0 V is 5.0 V ±0.5 V.

CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = 5.0 V
C _{PD}	Power Dissipation Capacitance	50	pF	V _{CC} = 5.0 V

MC74AC273, MC74ACT273

ORDERING INFORMATION

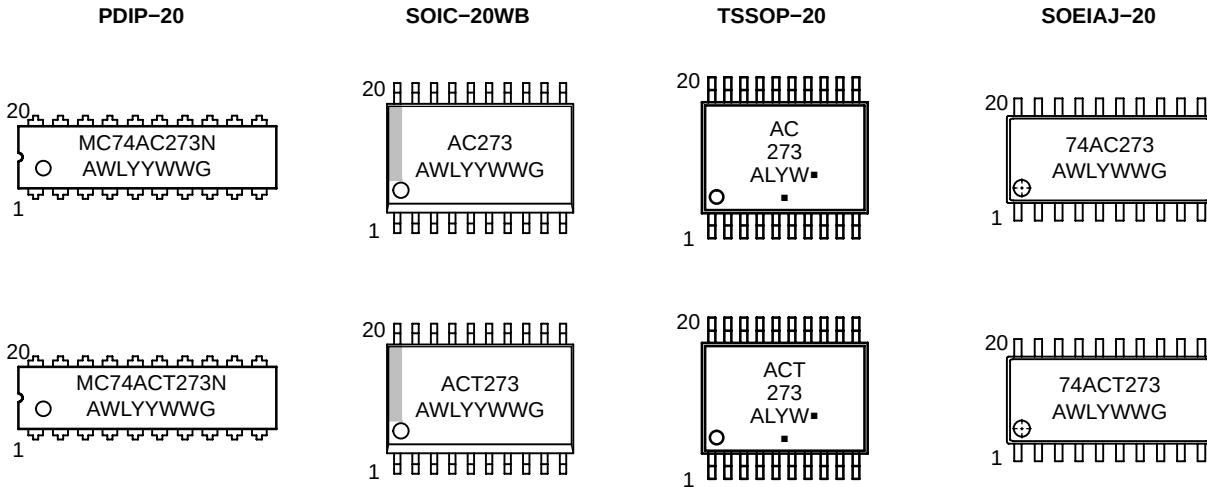
Device	Package	Shipping [†]
MC74AC273N	PDIP-20	18 Units / Rail
MC74AC273NG	PDIP-20 (Pb-Free)	18 Units / Rail
MC74ACT273N	PDIP-20	18 Units / Rail
MC74ACT273NG	PDIP-20 (Pb-Free)	18 Units / Rail
MC74AC273DW	SOIC-20WB	38 Units / Rail
MC74AC273DWG	SOIC-20WB (Pb-Free)	38 Units / Rail
MC74AC273DWR2	SOIC-20WB	1000 / Tape & Reel
MC74AC273DWR2G	SOIC-20WB (Pb-Free)	1000 / Tape & Reel
MC74AC273DTR2	TSSOP-20*	2500 / Tape & Reel
MC74AC273DTR2G	TSSOP-20*	2500 / Tape & Reel
MC74ACT273DW	SOIC-20WB	38 Units / Rail
MC74ACT273DWG	SOIC-20WB (Pb-Free)	38 Units / Rail
MC74ACT273DWR2	SOIC-20WB	1000 / Tape & Reel
MC74ACT273DWR2G	SOIC-20WB (Pb-Free)	1000 / Tape & Reel
MC74ACT273DTR2	TSSOP-20*	2500 / Tape & Reel
MC74ACT273DTR2G	TSSOP-20*	2500 / Tape & Reel
MC74AC273MEL	SOEIAJ-20	2000 / Tape & Reel
MC74AC273MELG	SOEIAJ-20 (Pb-Free)	2000 / Tape & Reel
MC74ACT273M	SOEIAJ-20	40 Units / Rail
MC74ACT273MG	SOEIAJ-20 (Pb-Free)	40 Units / Rail
MC74ACT273MEL	SOEIAJ-20	2000 / Tape & Reel
MC74ACT273MELG	SOEIAJ-20 (Pb-Free)	2000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*This package is inherently Pb-Free.

MC74AC273, MC74ACT273

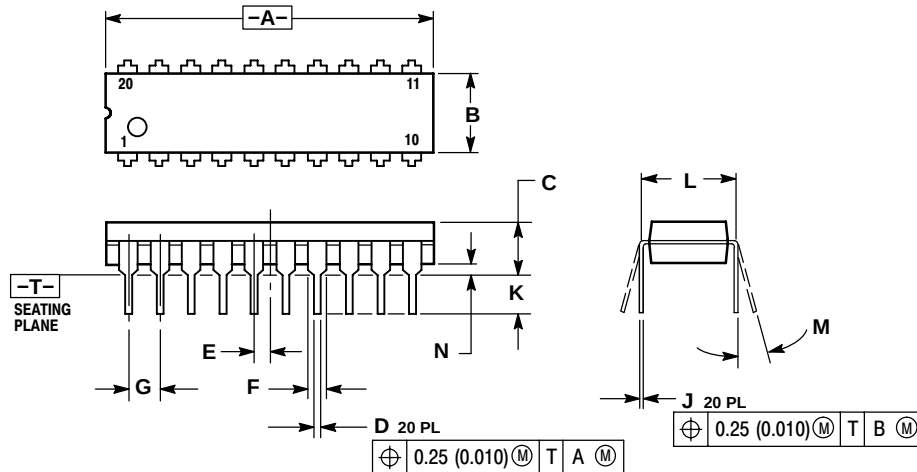
MARKING DIAGRAMS



A = Assembly Location
 WL, L = Wafer Lot
 YY, Y = Year
 WW, W = Work Week
 G or ■ = Pb-Free Package
 (Note: Microdot may be in either location)

PACKAGE DIMENSIONS

PDIP-20
 N SUFFIX
 CASE 738-03
 ISSUE E



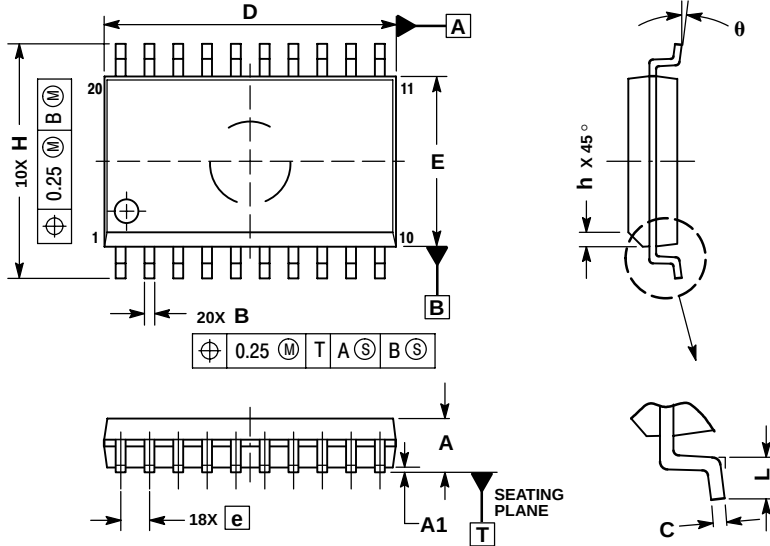
NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
 4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.010	1.070	25.66	27.17
B	0.240	0.260	6.10	6.60
C	0.150	0.180	3.81	4.57
D	0.015	0.022	0.39	0.55
E	0.050 BSC		1.27 BSC	
F	0.050	0.070	1.27	1.77
G	0.100 BSC		2.54 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.140	2.80	3.55
L	0.300 BSC		7.62 BSC	
M	0°	15°	0°	15°
N	0.020	0.040	0.51	1.01

MC74AC273, MC74ACT273

PACKAGE DIMENSIONS

SOIC-20 WB
DW SUFFIX
CASE 751D-05
ISSUE G

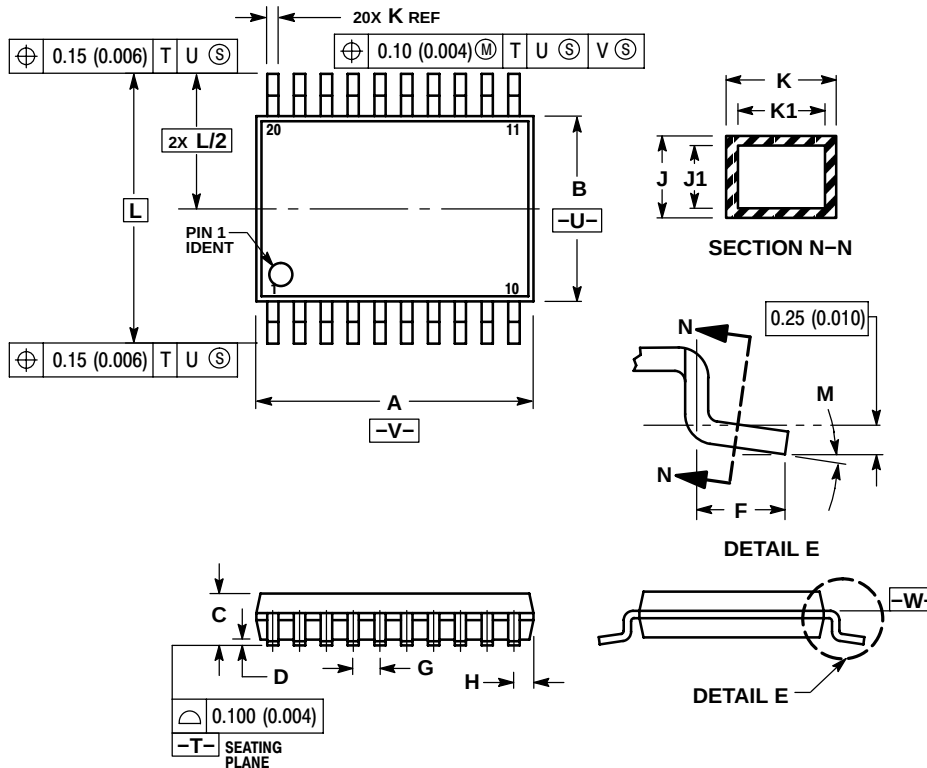


NOTES:

1. DIMENSIONS ARE IN MILLIMETERS.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.13 TOTAL IN EXCESS OF B DIMENSION AT MAXIMUM MATERIAL CONDITION.

MILLIMETERS		
DIM	MIN	MAX
A	2.35	2.65
A1	0.10	0.25
B	0.35	0.49
C	0.23	0.32
D	12.65	12.95
E	7.40	7.60
e	1.27 BSC	
H	10.05	10.55
h	0.25	0.75
L	0.50	0.90
θ	0°	7°

TSSOP-20
D5 SUFFIX
CASE 948E-02
ISSUE B



NOTES:

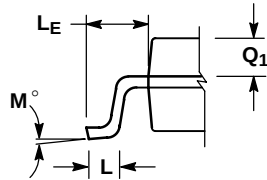
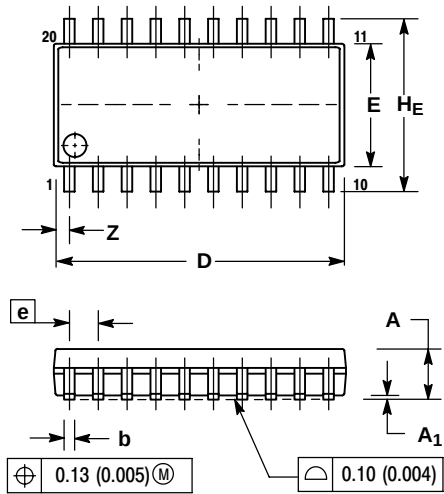
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

MILLIMETERS			INCHES	
DIM	MIN	MAX	MIN	MAX
A	6.40	6.60	0.252	0.260
B	4.30	4.50	0.169	0.177
C	---	1.20	---	0.047
D	0.05	0.15	0.002	0.006
F	0.50	0.75	0.020	0.030
G	0.65 BSC		0.026 BSC	
H	0.27	0.37	0.011	0.015
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.19	0.30	0.007	0.012
K1	0.19	0.25	0.007	0.010
L	6.40 BSC		0.252 BSC	
M	0°	8°	0°	8°

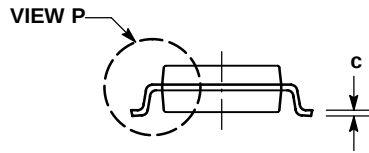
MC74AC273, MC74ACT273

PACKAGE DIMENSIONS

SOEIAJ-20
M SUFFIX
CASE 967-01
ISSUE A



DETAIL P



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS AND ARE MEASURED AT THE PARTING LINE. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
5. THE LEAD WIDTH DIMENSION (b) DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE LEAD WIDTH DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSIONS AND ADJACENT LEAD TO BE 0.46 (0.018).

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	---	2.05	---	0.081
A ₁	0.05	0.20	0.002	0.008
b	0.35	0.50	0.014	0.020
c	0.15	0.25	0.006	0.010
D	12.35	12.80	0.486	0.504
E	5.10	5.45	0.201	0.215
e	1.27 BSC		0.050 BSC	
H _E	7.40	8.20	0.291	0.323
L	0.50	0.85	0.020	0.033
L _E	1.10	1.50	0.043	0.059
M	0°	10°	0°	10°
Q ₁	0.70	0.90	0.028	0.035
Z	---	0.81	---	0.032

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