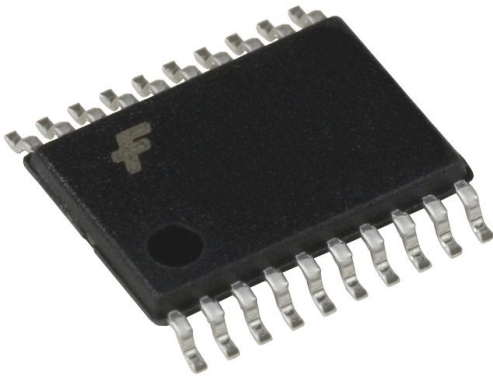


74ACT574MTCX Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	74ACT574MTCX-DG
Manufacturer	onsemi
Manufacturer Product Number	74ACT574MTCX
Description	IC FF D-TYPE SNGL 8BIT 20TSSOP
Detailed Description	Flip Flop 1 Element D-Type 8 Bit Positive Edge 20-T SSOP (0.173", 4.40mm Width)



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

74ACT574MTCX

Series:

74ACT

Function:

Standard

Output Type:

Tri-State, Non-Inverted

Number of Bits per Element:

8

Max Propagation Delay @ V, Max CL:

11ns @ 5V, 50pF

Current - Output High, Low:

24mA, 24mA

Current - Quiescent (Iq):

40 μ A

Operating Temperature:

-40°C ~ 85°C (TA)

Supplier Device Package:

20-TSSOP

Base Product Number:

74ACT574

Manufacturer:

onsemi

Product Status:

Obsolete

Type:

D-Type

Number of Elements:

1

Clock Frequency:

110 MHz

Trigger Type:

Positive Edge

Voltage - Supply:

4.5V ~ 5.5V

Input Capacitance:

4.5 pF

Mounting Type:

Surface Mount

Package / Case:

20-TSSOP (0.173", 4.40mm Width)

Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001



September 1988
Revised November 1999

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Octal D-Type Flip-Flop with 3-STATE Outputs

General Description

The AC/ACT574 is a high-speed, low power octal flip-flop with a buffered common Clock (CP) and a buffered common Output Enable (\overline{OE}). The information presented to the D-type inputs is stored in the flip-flops on the LOW-to-HIGH Clock (CP) transition.

The AC/ACT574 is functionally identical to the AC/ACT374 except for the pinouts.

Features

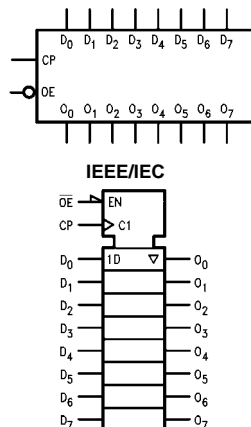
- I_{CC} and I_{OZ} reduced by 50%
- Inputs and outputs on opposite sides of package allowing easy interface with microprocessors
- Useful as input or output port for microprocessors
- Functionally identical to AC/ACT374
- 3-STATE outputs for bus-oriented applications
- Outputs source/sink 24 mA
- ACT574 has TTL-compatible inputs

Ordering Code:

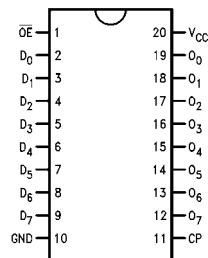
Order Number	Package Number	Package Description
74AC574SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body
74AC574SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74AC574MTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
74AC574PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
74ACT574SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-01
74ACT574SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74ACT574MTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
74ACT574PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

Logic Symbols



Connection Diagram



Pin Descriptions

Pin Names	Description
D_0 - D_7	Data Inputs
CP	Clock Pulse Input
\overline{OE}	3-STATE Output Enable Input
Q_0 - Q_7	3-STATE Outputs

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Functional Description

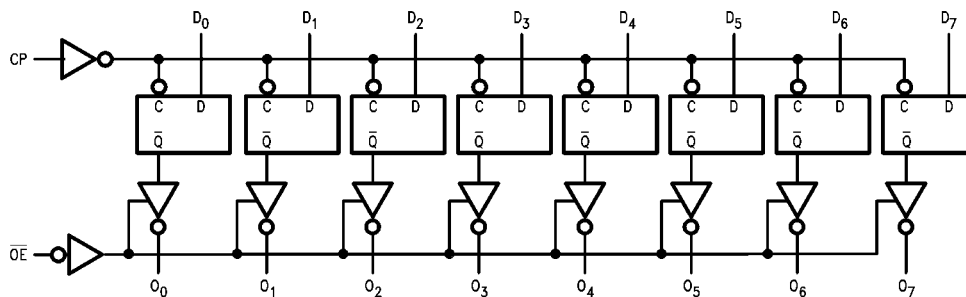
The AC/ACT574 consists of eight edge-triggered flip-flops with individual D-type inputs and 3-STATE true outputs. The buffered clock and buffered Output Enable are common to all flip-flops. The eight flip-flops will store the state of their individual D-type inputs that meet the setup and hold time requirements on the LOW-to-HIGH Clock (CP) transition. With the Output Enable (\overline{OE}) LOW, the contents of the eight flip-flops are available at the outputs. When \overline{OE} is HIGH, the outputs go to the high impedance state. Operation of the \overline{OE} input does not affect the state of the flip-flops.

Function Table

Inputs			Internal	Outputs	Function
\overline{OE}	CP	D	Q	O_N	
H	H	L	NC	Z	Hold
H	H	H	NC	Z	Hold
H	↗	L	L	Z	Load
H	↗	H	H	Z	Load
L	↗	L	L	L	Data Available
L	↗	H	H	H	Data Available
L	H	L	NC	NC	No Change in Data
L	H	H	NC	NC	No Change in Data

H = HIGH Voltage Level
 L = LOW Voltage Level
 X = Immaterial
 Z = High Impedance
 ↗ = LOW-to-HIGH Transition
 NC = No Change

Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Absolute Maximum Ratings ^(Note 1)		Recommended Operating Conditions	
Supply Voltage (V_{CC})	-0.5V to +7.0V	Supply Voltage (V_{CC})	AC 2.0V to 6.0V
DC Input Diode Current (I_{IK})		ACT 4.5V to 5.5V	
$V_I = -0.5V$	-20 mA	Input Voltage (V_I)	0V to V_{CC}
$V_I = V_{CC} + 0.5V$	+20 mA	Output Voltage (V_O)	0V to V_{CC}
DC Input Voltage (V_I)	-0.5V to $V_{CC} + 0.5V$	Operating Temperature (T_A)	-40°C to +85°C
DC Output Diode Current (I_{OK})		Minimum Input Edge Rate ($\Delta V/\Delta t$)	
$V_O = -0.5V$	-20 mA	AC Devices	
$V_O = V_{CC} + 0.5V$	+20 mA	V_{IN} from 30% to 70% of V_{CC}	
DC Output Voltage (V_O)	-0.5V to $V_{CC} + 0.5V$	V_{CC} @ 3.3V, 4.5V, 5.5V	125 mV/ns
DC Output Source or Sink Current (I_O)	± 50 mA	Minimum Input Edge Rate ($\Delta V/\Delta t$)	
DC V_{CC} or Ground Current Per Output Pin (I_{CC} or I_{GND})	± 50 mA	ACT Devices	
Storage Temperature (T_{STG})	-65°C to +150°C	V_{IN} from 0.8V to 2.0V	
Junction Temperature (T_J)		V_{CC} @ 4.5V, 5.5V	125 mV/ns
PDIP	140°C	Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. Fairchild does not recommend operation of FACT™ circuits outside databook specifications.	

DC Electrical Characteristics for AC								
Symbol	Parameter	V_{CC} (V)	$T_A = 25^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		Units	Conditions
			Typ	Guaranteed Limits				
V_{IH}	Minimum HIGH Level Input Voltage	3.0	1.5	2.1	2.1	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	
		4.5	2.25	3.15	3.15			
		5.5	2.75	3.85	3.85			
V_{IL}	Maximum LOW Level Input Voltage	3.0	1.5	0.9	0.9	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	
		4.5	2.25	1.35	1.35			
		5.5	2.75	1.65	1.65			
V_{OH}	Minimum HIGH Level Output Voltage	3.0	2.99	2.9	2.9	V	$I_{OUT} = -50 \mu A$	
		4.5	4.49	4.4	4.4			
		5.5	5.49	5.4	5.4			
		3.0		2.56	2.46	V	$V_{IN} = V_{IL}$ or V_{IH} $I_{OH} = -12$ mA $I_{OH} = -24$ mA I_{OH} $I_{OH} = -24$ mA (Note 2)	
		4.5		3.86	3.76			
5.5		4.86	4.76					
V_{OL}	Maximum LOW Level Output Voltage	3.0	0.002	0.1	0.1	V	$I_{OUT} = 50 \mu A$	
		4.5	0.001	0.1	0.1			
		5.5	0.001	0.1	0.1			
		3.0		0.36	0.44	V	$V_{IN} = V_{IL}$ or V_{IH} $I_{OL} = 12$ mA $I_{OL} = 24$ mA $I_{OL} = 24$ mA (Note 2)	
		4.5		0.36	0.44			
5.5		0.36	0.44					
I_{IN} (Note 4)	Maximum Input Leakage Current	5.5		± 0.1	± 1.0	μA	$V_I = V_{CC}, GND$	
I_{OZ}	Maximum 3-STATE Leakage Current	5.5		± 0.25	± 2.5	μA	V_I (OE) = V_{IL}, V_{IH} $V_I = V_{CC}, V_{GND}$ $V_O = V_{CC}, GND$	
I_{OLD}	Minimum Dynamic Output Current (Note 3)	5.5			75	mA	$V_{OLD} = 1.65V$	
I_{OHD}	Output Current (Note 3)	5.5			-75	mA	$V_{OHD} = 3.85V$	
I_{CC} (Note 4)	Maximum Quiescent Supply Current	5.5		4.0	40.0	μA	$V_{IN} = V_{CC}$ or GND	

Note 2: All outputs loaded; thresholds on input associated with output under test.

Note 3: Maximum test duration 2.0 ms, one output loaded at a time.

Note 4: I_{IN} and I_{CC} @ 3.0V are guaranteed to be less than or equal to the respective limit @ 5.5V V_{CC} .

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DC Electrical Characteristics for ACT								
Symbol	Parameter	V _{CC} (V)	T _A = 25°C		T _A = -40°C to +85°C		Units	Conditions
			Typ	Guaranteed Limits				
V _{IH}	Minimum HIGH Level Input Voltage	4.5	1.5	2.0	2.0		V	V _{OUT} = 0.1V or V _{CC} - 0.1V
		5.5	1.5	2.0	2.0			
V _{IL}	Maximum LOW Level Input Voltage	4.5	1.5	0.8	0.8		V	V _{OUT} = 0.1V or V _{CC} - 0.1V
		5.5	1.5	0.8	0.8			
V _{OH}	Minimum HIGH Level	4.5	4.49	4.4	4.4		V	I _{OUT} = -50 μA
		5.5	5.49	5.4	5.4			
		4.5		3.86	3.76		V	V _{IN} = V _{IL} or V _{IH} I _{OH} = -24 mA I _{OH} = -24 mA (Note 5)
		5.5		4.86	4.76			
V _{OL}	Maximum LOW Level Output Voltage	4.5	0.001	0.1	0.1		V	I _{OUT} = 50 μA
		5.5	0.001	0.1	0.1			
		4.5		0.36	0.44		V	V _{IN} = V _{IL} or V _{IH} I _{OL} = 24 mA I _{OL} = 24 mA (Note 5)
		5.5		0.36	0.44			
I _{IN}	Maximum Input Leakage Current	5.5		±0.1	±1.0		μA	V _I = V _{CC} , GND
I _{OZ}	Maximum 3-STATE Leakage Current	5.5		±0.25	±2.5		μA	V _I = V _{IL} , V _{IH} V _O = V _{CC} , GND
I _{CC1}	Maximum I _{CC} /Input	5.5	0.6		1.5		mA	V _I = V _{CC} - 2.1V
I _{JOLD}	Minimum Dynamic	5.5			75		mA	V _{OLD} = 1.65V
I _{OHD}	Output Current (Note 6)	5.5			-75		mA	V _{OHD} = 3.85V
I _{CC}	Maximum Quiescent Supply Current	5.5		4.0	40.0		μA	V _{IN} = V _{CC} or GND

Note 5: All outputs loaded; thresholds on input associated with output under test.
Note 6: Maximum test duration 2.0 ms, one output loaded at a time.

AC Electrical Characteristics for AC								
Symbol	Parameter	V _{CC} (V) (Note 7)	T _A = +25°C C _L = 50 pF			T _A = -40°C to +85°C C _L = 50 pF		Units
			Min	Typ	Max	Min	Max	
f _{MAX}	Maximum Clock Frequency	3.3	75	112		60		MHz
		5.0	95	153		85		
t _{PLH}	Propagation Delay CP to O _n	3.3	3.5	8.5	13.5	3.5	15.0	ns
		5.0	2.0	6.0	9.5	2.0	11.0	
t _{PHL}	Propagation Delay CP to O _n	3.3	3.5	7.5	12.0	3.5	13.5	ns
		5.0	2.0	5.5	8.5	2.0	9.5	
t _{PZH}	Output Enable Time	3.3	2.5	7.0	11.0	2.5	12.0	ns
		5.0	2.0	5.0	8.5	2.0	9.0	
t _{PZL}	Output Enable Time	3.3	3.0	6.5	10.5	3.0	11.5	ns
		5.0	2.0	5.0	8.0	1.5	9.0	
t _{PHZ}	Output Disable Time	3.3	3.5	7.5	12.0	2.5	13.0	ns
		5.0	2.0	6.0	9.5	1.5	10.5	
t _{PLZ}	Output Disable Time	3.3	2.0	5.5	9.0	1.5	10.0	ns
		5.0	1.0	4.5	7.5	1.0	8.5	

Note 7: Voltage Range 3.3 is 3.3V ± 0.3V
Voltage Range 5.0 is 5.0V ± 0.5V

AC Operating Requirements for AC						
Symbol	Parameter	V _{CC} (V) (Note 8)	T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF	Units
			Typ	Guaranteed Minimum		
t _S	Set-Up Time, HIGH or LOW D _n to CP	3.3 5.0	0.5	2.5	3.0	ns
			0	1.5	2.0	
t _H	Hold Time, HIGH or LOW D _n to CP	3.3 5.0	-0.5	1.5	1.5	ns
			0	1.5	1.5	
t _W	CP Pulse Width HIGH or LOW	3.3 5.0	3.5	6.0	7.0	ns
			2.0	4.0	5.0	

Note 8: Voltage Range 3.3 is 3.3V ± 0.3V
Voltage Range 5.0 is 5.0V ± 0.5V

AC Electrical Characteristics for ACT								
Symbol	Parameter	V _{CC} (V) (Note 9)	T _A = +25°C C _L = 50 pF			T _A = -40°C to +85°C C _L = 50 pF		Units
			Min	Typ	Max	Min	Max	
f _{MAX}	Maximum Clock Frequency	5.0	100	110		85	ns	
t _{PLH}	Propagation Delay CP to O _n	5.0	2.5	7.0	11.0	2.0	12.0	ns
t _{PHL}	Propagation Delay CP to O _n	5.0	2.0	6.5	10.0	1.5	11.0	ns
t _{PZH}	Output Enable Time	5.0	2.0	6.4	9.5	1.5	10.0	ns
t _{PZL}	Output Enable Time	5.0	2.0	6.0	9.0	1.5	10.0	ns
t _{PHZ}	Output Disable Time	5.0	2.0	7.0	10.5	1.5	11.5	ns
t _{PLZ}	Output Disable Time	5.0	2.0	5.5	8.5	1.5	9.0	ns

Note 9: Voltage Range 5.0 is 5.0V ± 0.5V

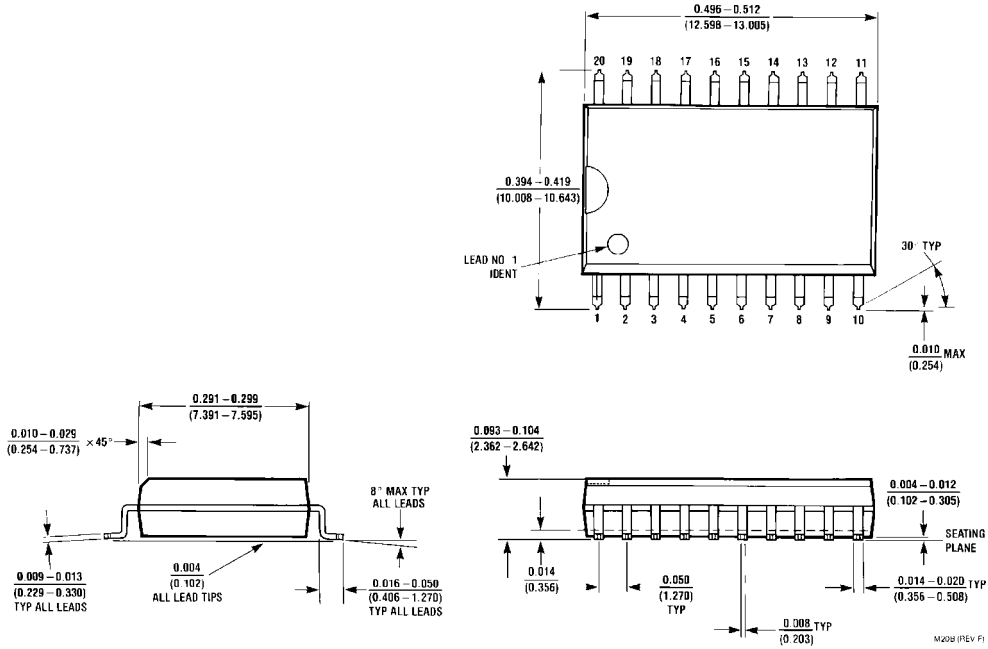
AC Operating Requirements for ACT						
Symbol	Parameter	V _{CC} (V) (Note 10)	T _A = +25°C C _L = 50 pF	T _A = -40°C to +85°C C _L = 50 pF		Units
			Typ	Guaranteed Minimum		
t _S	Set-Up Time, HIGH or LOW D _n to CP	5.0	1.5	2.5		ns
t _H	Hold Time, HIGH or LOW D _n to CP	5.0	-0.5	1.0		ns
t _W	CP Pulse Width HIGH or LOW	5.0	2.5	4.0		ns

Note 10: Voltage Range 5.0 is 5.0V ± 0.5V

Capacitance				
Symbol	Parameter	Typ	Units	Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = OPEN
C _{PD}	Power Dissipation Capacitance	40.0	pF	V _{CC} = 5.0V

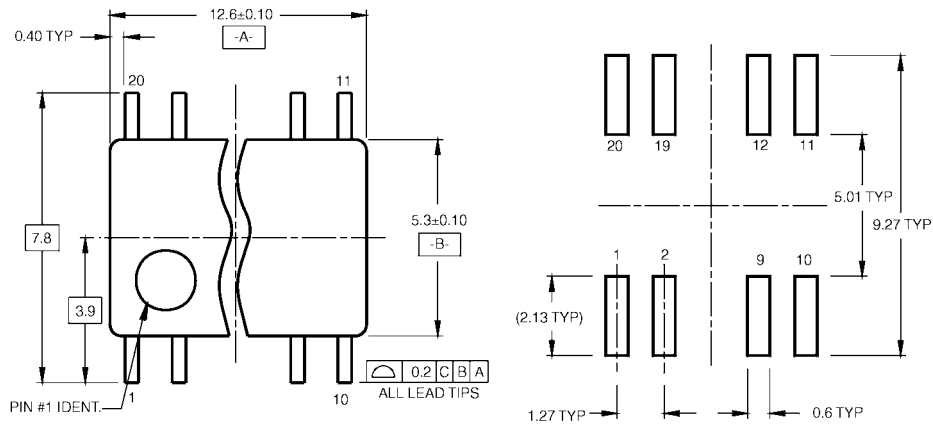
74AC574 • 74ACT574

Physical Dimensions inches (millimeters) unless otherwise noted

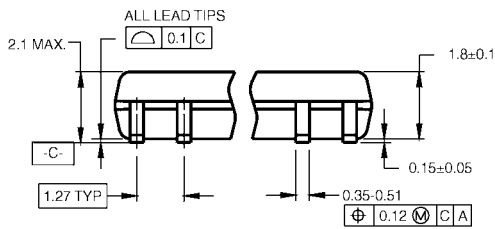


20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body Package Number M20B

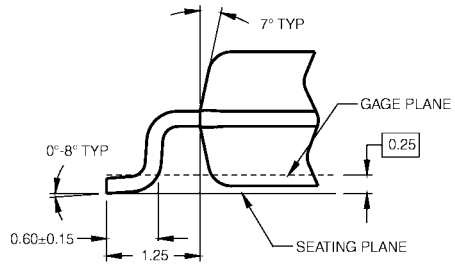
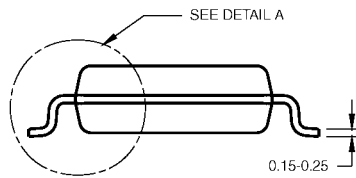
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



DETAIL A

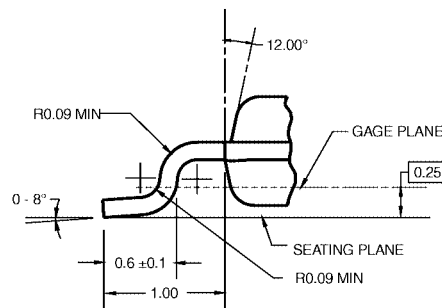
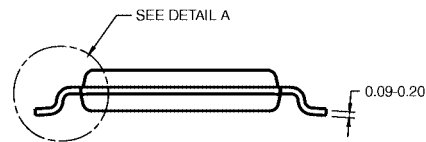
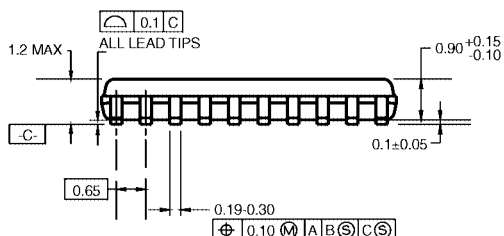
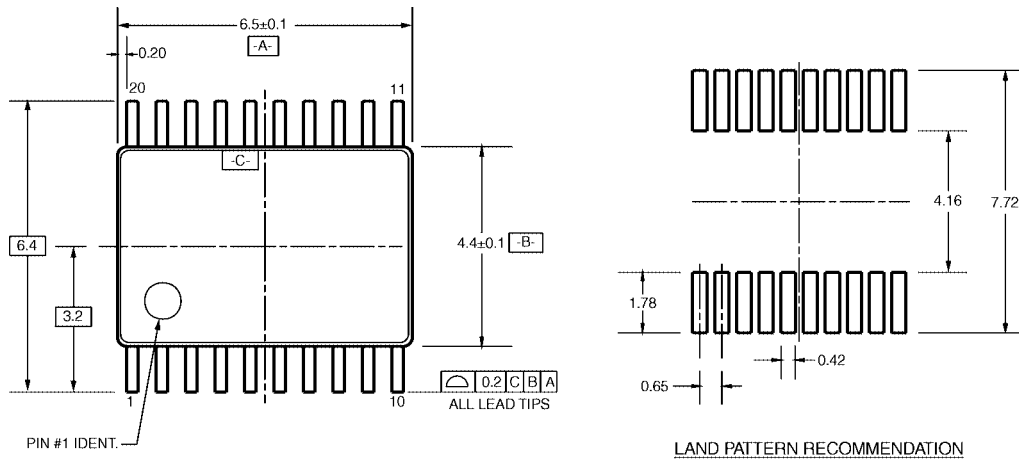
- NOTES:
- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
 - B. DIMENSIONS ARE IN MILLIMETERS.
 - C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M20DRevB1

20-Lead Small Outline Package (SOP), EIAJ Type II 5.3mm Wide Package Number M20D

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Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

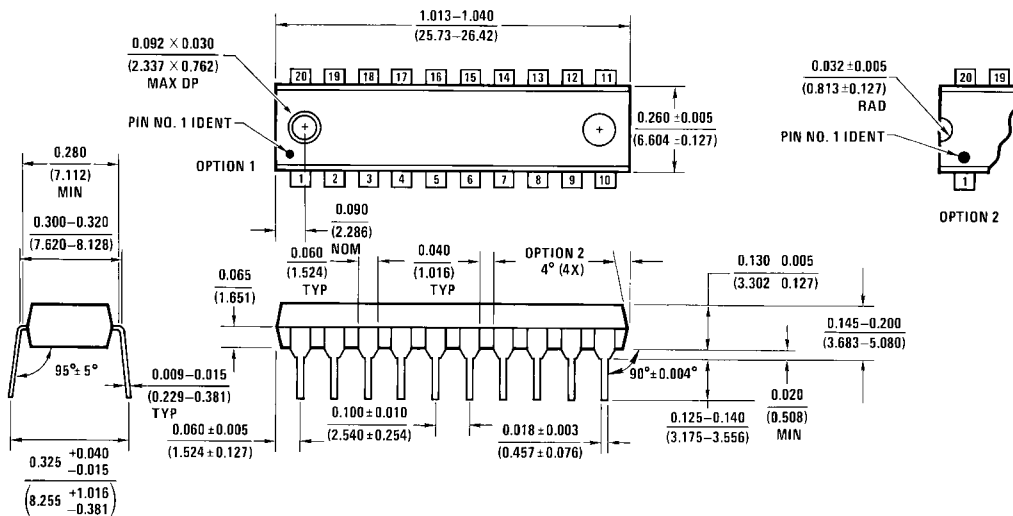


- NOTES:
- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AC, REF NOTE 6, DATE 7/93.
 - B. DIMENSIONS ARE IN MILLIMETERS.
 - C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
 - D. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M, 1982.

MTC20RevD1

DETAIL A

**20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
Package Number MTC20**

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
Package Number N20A

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