

**FAIRCHILD**  
SEMICONDUCTOR™

May 1992  
Revised November 1999

## 74ABT2244

### Octal Buffer/Line Driver with 25Ω Series Resistors in the Outputs

#### General Description

The ABT2244 is an octal buffer and line driver designed to drive the capacitive inputs of MOS memory drivers, address drivers, clock drivers, and bus-oriented transmitters/receivers.

The 25Ω series resistors in the outputs reduce ringing and eliminate the need for external resistors.

#### Features

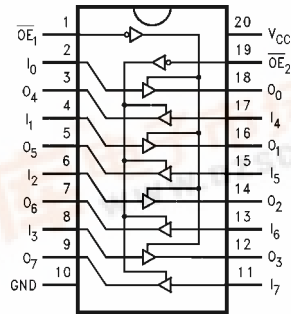
- Guaranteed latchup protection
- High impedance glitch-free bus loading during entire power up and power down cycle
- Nondestructive hot insertion capability

#### Ordering Code:

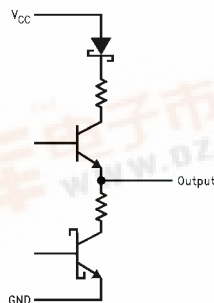
Order Number	Package Number	Package Description
74ABT2244CSC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body
74ABT2244CSJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74ABT2244CMSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
74ABT2244CMTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
74ABT2244CPC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

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

#### Connection Diagram



#### Schematic of Each Output



#### Pin Descriptions

Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input (Active LOW)
$I_0-I_7$	Inputs
$O_0-O_7$	Outputs

#### Truth Table

$\overline{OE}_1$	$I_{0-3}$	$O_{0-3}$	$\overline{OE}_2$	$I_{4-7}$	$O_{4-7}$
H	X	Z	H	X	Z
L	H	H	L	H	H
L	L	L	L	L	L

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial  
Z = High Impedance

74ABT2244 Octal Buffer/Line Driver with 25Ω Series Resistors in the Outputs



**Absolute Maximum Ratings**(Note 1)

Storage Temperature	–65°C to +150°C
Ambient Temperature under Bias	–55°C to +125°C
Junction Temperature under Bias	–55°C to +150°C
V <sub>CC</sub> Pin Potential to Ground Pin	–0.5V to +7.0V
Input Voltage (Note 2)	–0.5V to +7.0V
Input Current (Note 2)	–30 mA to +5.0 mA
Voltage Applied to Any Output in the Disabled or Power-off State	–0.5V to 5.5V
in the HIGH State	–0.5V to V <sub>CC</sub>
Current Applied to Output in LOW State (Max)	twice the rated I <sub>OL</sub> (mA)
DC Latchup Source Current (Across Comm Operating Range)	–300 mA
Over Voltage Latchup (I/O)	10V

**Recommended Operating Conditions**

Free Air Ambient Temperature	–40°C to +85°C
Supply Voltage	+4.5V to +5.5V
Minimum Input Edge Rate ( $\Delta V/\Delta t$ )	
Data Input	50 mV/ns
Enable Input	20 mV/ns

**Note 1:** Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**DC Electrical Characteristics**

Symbol	Parameter	Min	Typ	Max	Units	V <sub>CC</sub>	Conditions
V <sub>IH</sub>	Input HIGH Voltage	2.0			V		Recognized HIGH Signal
V <sub>IL</sub>	Input LOW Voltage			0.8	V		Recognized LOW Signal
V <sub>CD</sub>	Input Clamp Diode Voltage			–1.2	V	Min	I <sub>IN</sub> = –18 mA
V <sub>OH</sub>	Output HIGH	2.5			V	Min	I <sub>OH</sub> = –3 mA
		2.0			V	Min	I <sub>OH</sub> = –32 mA
V <sub>OL</sub>	Output LOW Voltage			0.8	V	Min	I <sub>OL</sub> = 15 mA
I <sub>IH</sub>	Input HIGH Current			1	μA	Max	V <sub>IN</sub> = 2.7V (Note 4)
				1	μA	Max	V <sub>IN</sub> = V <sub>CC</sub>
I <sub>BVI</sub>	Input HIGH Current Breakdown Test			7	μA	Max	V <sub>IN</sub> = 7.0V
I <sub>IL</sub>	Input LOW Current			–1	μA	Max	V <sub>IN</sub> = 0.5V (Note 4)
				–1	μA	Max	V <sub>IN</sub> = 0.0V
V <sub>ID</sub>	Input Leakage Test	475			V	0.0	I <sub>ID</sub> = 1.9 μA All Other Pins Grounded
I <sub>OZH</sub>	Output Leakage Current			10	μA	0 – 5.5V	V <sub>OUT</sub> = 2.7V; $\overline{\text{OE}}$ n = 2.0V
I <sub>OZL</sub>	Output Leakage Current			–10	μA	0 – 5.5V	V <sub>OUT</sub> = 0.5V; $\overline{\text{OE}}$ n = 2.0V
I <sub>OS</sub>	Output Short-Circuit Current	–100		–275	mA	Max	V <sub>OUT</sub> = 0.0V
I <sub>CEX</sub>	Output HIGH Leakage Current			50	μA	Max	V <sub>OUT</sub> = V <sub>CC</sub>
I <sub>ZZ</sub>	Bus Drainage Test			100	μA	0.0	V <sub>OUT</sub> = 5.5V; All Others GND
I <sub>CCH</sub>	Power Supply Current			50	μA	Max	All Outputs HIGH
I <sub>CCL</sub>	Power Supply Current			30	mA	Max	All Outputs LOW
I <sub>CCZ</sub>	Power Supply Current			50	μA	Max	$\overline{\text{OE}}$ n = V <sub>CC</sub>
							All Others at V <sub>CC</sub> or GND
I <sub>CCT</sub>	Additional Outputs Enabled			2.5	mA		V <sub>I</sub> = V <sub>CC</sub> – 2.1V
	I <sub>CC</sub> /Input Outputs 3-STATE			2.5	mA	Max	Enable Input V <sub>I</sub> = V <sub>CC</sub> – 2.1V
	Outputs 3-STATE			50	μA		Data Input V <sub>I</sub> = V <sub>CC</sub> – 2.1V All Others at V <sub>CC</sub> or GND
I <sub>CCD</sub>	Dynamic I <sub>CC</sub> No Load (Note 4)			0.1	mA/ MHz	Max	Outputs OPEN
							$\overline{\text{OE}}$ n = GND (Note 3) One Bit Toggling, 50% Duty Cycle

**Note 2:** Either voltage limit or current limit is sufficient to protect inputs.

**Note 3:** For 8 bits toggling, I<sub>CCD</sub> < 0.8 mA/MHz.

**Note 4:** Guaranteed, but not tested.

**AC Electrical Characteristics**

(SOIC and SSOP Package)

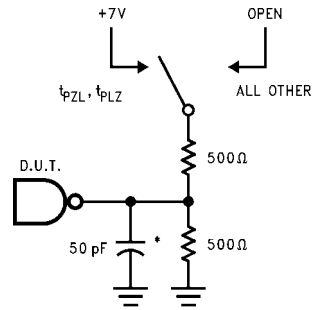
Symbol	Parameter	T <sub>A</sub> = +25°C V <sub>CC</sub> = +5V C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C V <sub>CC</sub> = 4.5V–5.5V C <sub>L</sub> = 50 pF		Units
		Min	Typ	Max	Min	Max	
t <sub>PLH</sub>	Propagation	1.0	2.2	3.9	1.0	3.9	ns
t <sub>PHL</sub>	Delay Data to Outputs	1.0	2.9	4.4	1.0	4.4	
t <sub>PZH</sub>	Output Enable	1.5	3.7	6.0	1.5	6.0	ns
t <sub>PZL</sub>	Time	2.1	4.3	7.0	2.1	7.0	
t <sub>PHZ</sub>	Output Disable	1.7	3.5	5.8	1.7	5.8	ns
t <sub>PLZ</sub>	Time	1.7	3.7	5.8	1.7	5.8	

**Capacitance**

Symbol	Parameter	Typ	Units	Conditions T <sub>A</sub> = 25°C
C <sub>IN</sub>	Input Capacitance	5.0	pF	V <sub>CC</sub> = 0V
C <sub>OUT</sub> (Note 5)	Output Capacitance	9.0	pF	V <sub>CC</sub> = 5.0V

**Note 5:** C<sub>OUT</sub> is measured at frequency f = 1 MHz, per MIL-STD-883, Method 3012.

## AC Loading



\*Includes jig and probe capacitance

FIGURE 1. Standard AC Test Load

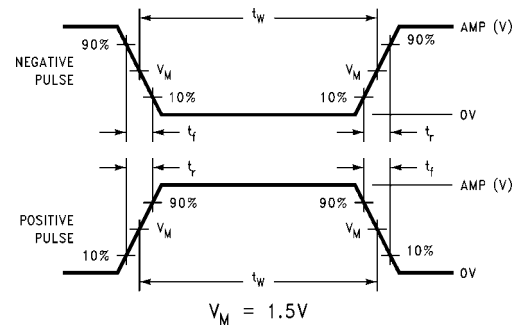


FIGURE 2. Test Input Signal Levels

Amplitude	Rep. Rate	$t_w$	$t_r$	$t_f$
3.0V	1 MHz	500 ns	2.5 ns	2.5 ns

FIGURE 3. Test Input Signal Requirements

## AC Waveforms

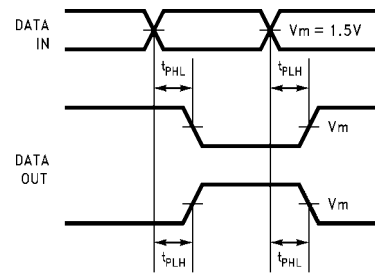


FIGURE 4. Propagation Delay Waveforms for Inverting and Non-Inverting Functions

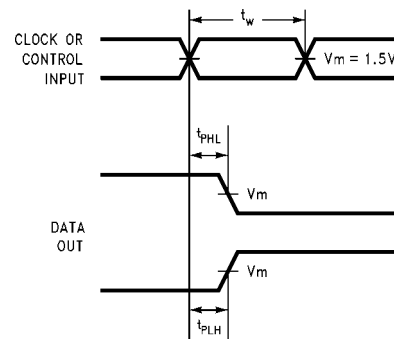


FIGURE 6. Propagation Delay, Pulse Width Waveforms

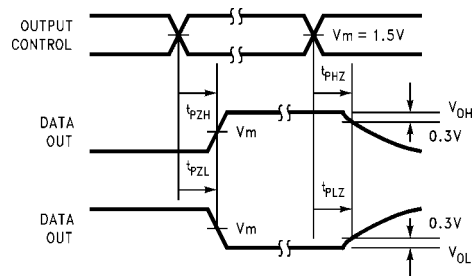


FIGURE 5. 3-STATE Output HIGH and LOW Enable and Disable Times

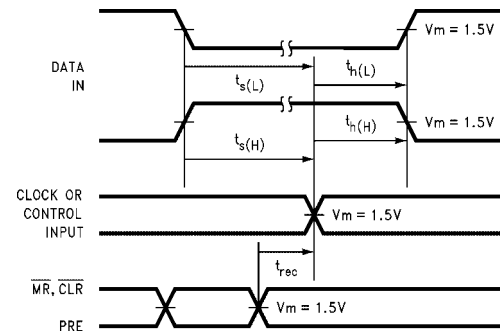
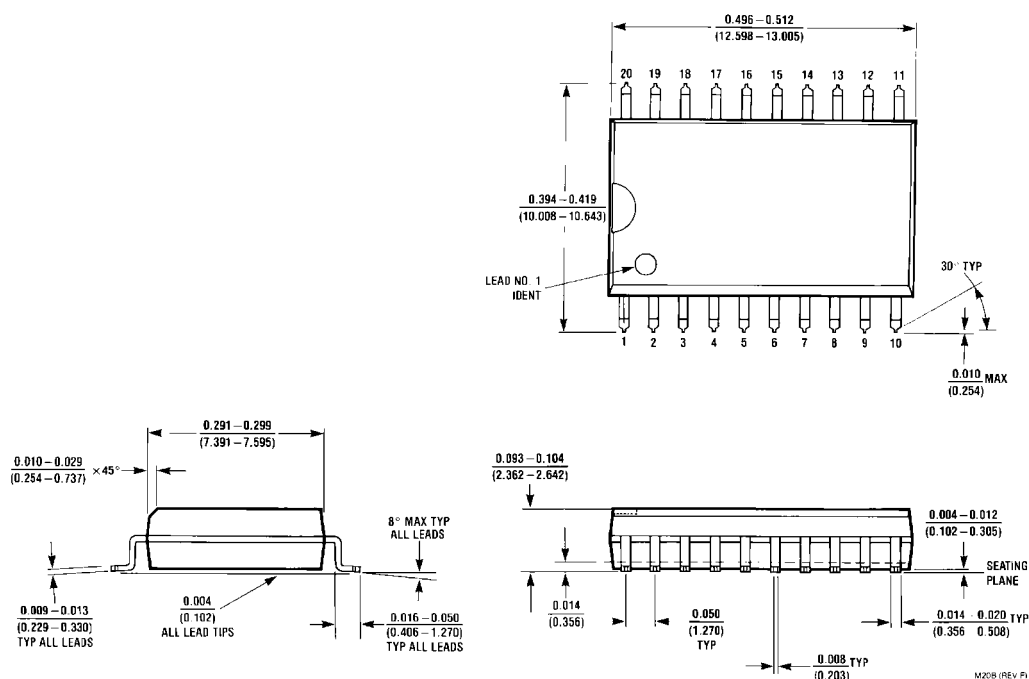


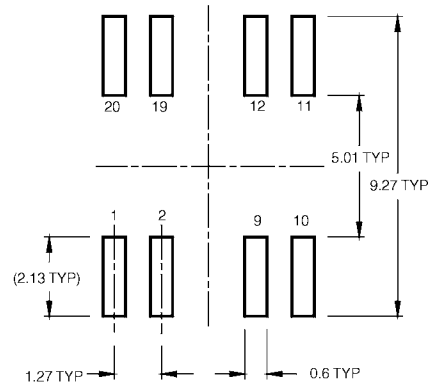
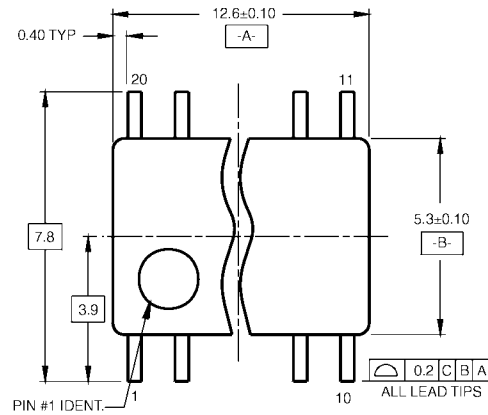
FIGURE 7. Setup Time, Hold Time and Recovery Time Waveforms

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

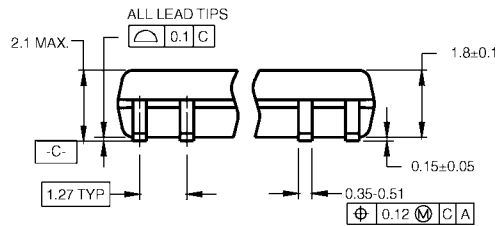


**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body  
Package Number M20B**

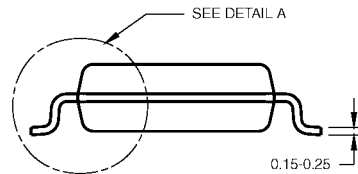
# Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



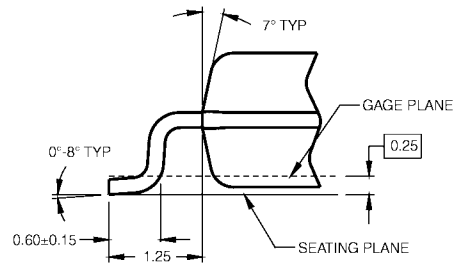
DIMENSIONS ARE IN MILLIMETERS



## NOTES:

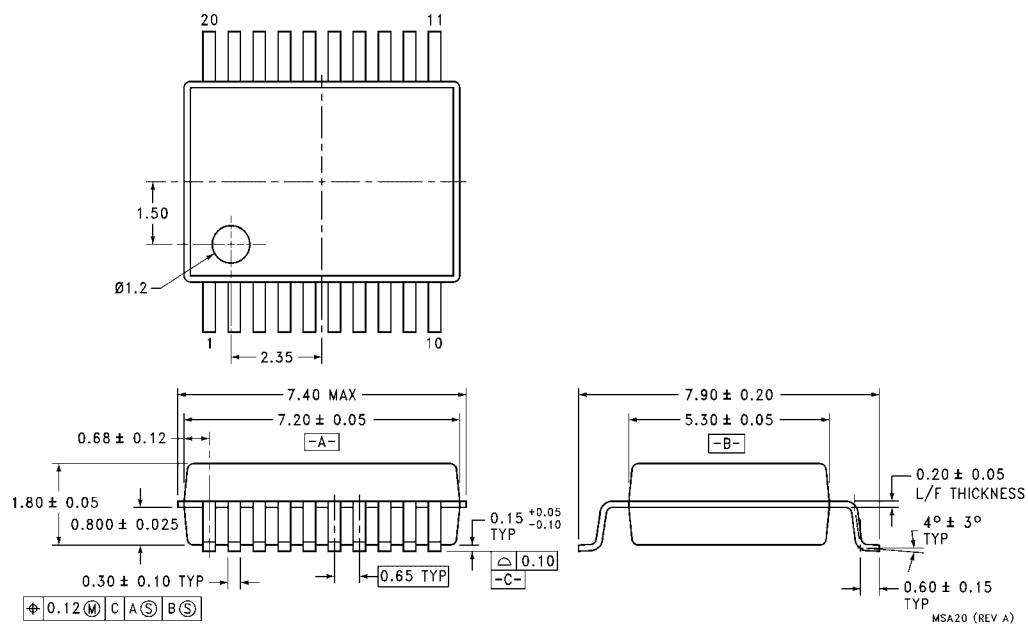
- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M20DRevB1



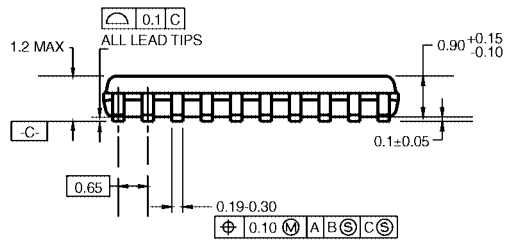
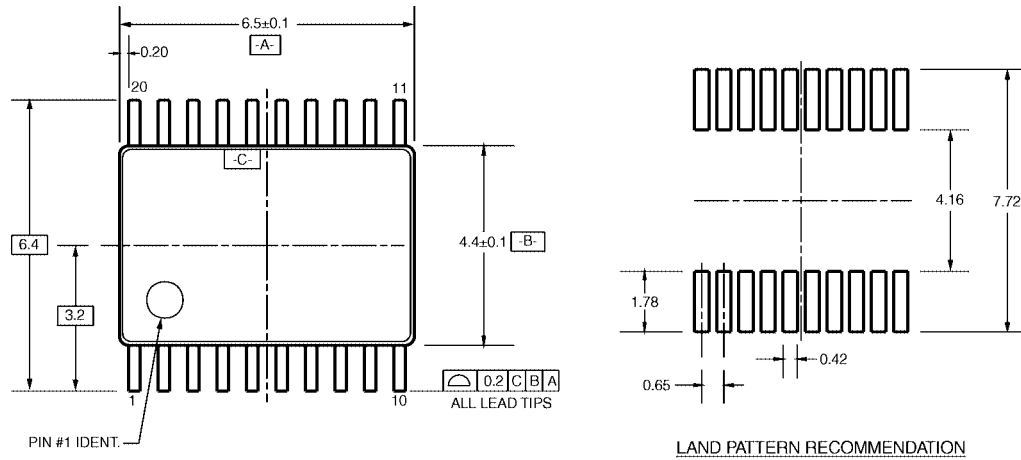
DETAIL A

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

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


**20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide  
Package Number MSA20**

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

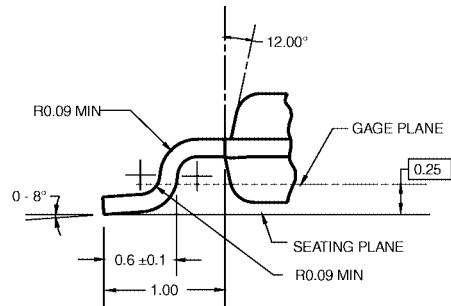
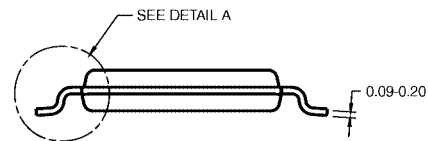


DIMENSIONS ARE IN MILLIMETERS

### NOTES:

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

MTC20RevD1

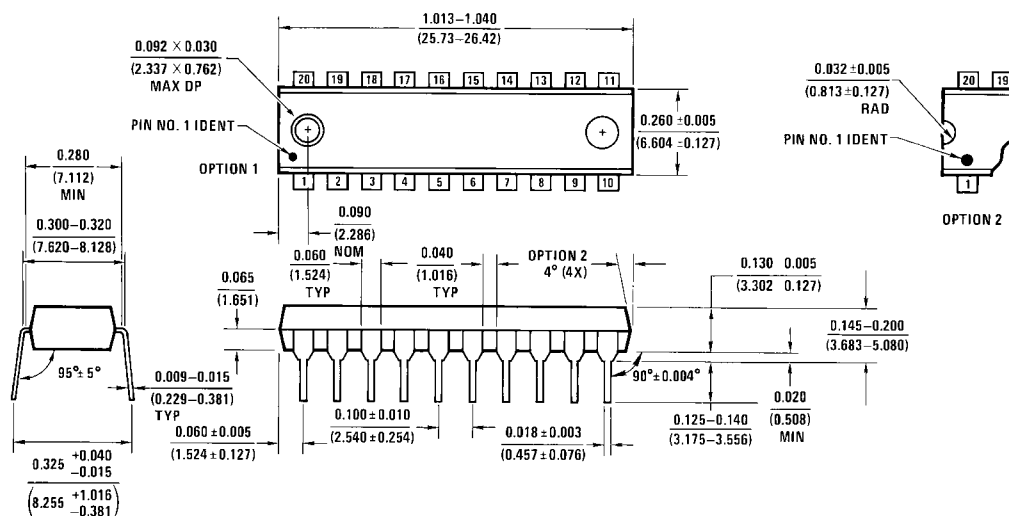


DETAIL A

**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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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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