

September 1995

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

General Description

The 74ABT2244 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

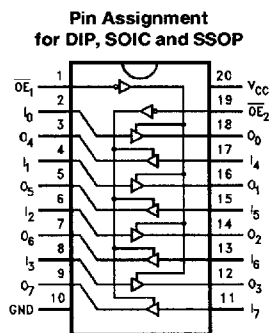
- Guaranteed latchup protection
- High impedance glitch-free bus loading during entire power up and power down cycle
- Nondestructive hot insertion capability

Commercial	Package Number	Package Description
74ABT2244CSC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC
74ABT2244CSJ (Note 1)	M20D	20-Lead (0.300" Wide) Molded Small Outline, EIAJ
74ABT2244CPC	N20B	20-Lead (0.300" Wide) Molded Dual-in-Line
74ABT2244CMSA (Note 1)	MSA20	20-Lead Molded Shrink Small Outline, EIAJ Type II
74ABT2244CMTC (Notes 1, 2)	MTC20	20-Lead Molded Thin Shrink Small Outline, JEDEC

Note 1: Devices also available in 13" reel. Use suffix = SCX, SJX, MSAX and MTCX.

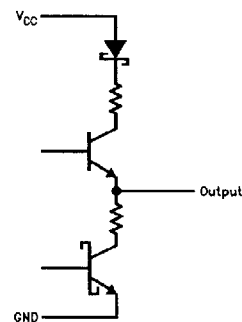
Note 2: Contact factory for package availability.

Connection Diagrams



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Schematic of Each Output



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Truth Table

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

$\overline{OE}_1$	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

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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 Plastic	−55°C to +150°C
V _{CC} 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 in the HIGH State	−0.5V to 5.5V −0.5V to V _{CC}
Current Applied to Output in LOW State (Max)	twice the rated I _{OL} (mA)

DC Latchup Source Current (Across Comm Operating Range)	−300 mA
Over Voltage Latchup (I/O)	10V

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.

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

Recommended Operating Conditions

Free Air Ambient Temperature Commercial	−40°C to +85°C
Supply Voltage Commercial	+4.5V to +5.5V
Minimum Input Edge Rate (ΔV/Δt) Data Input	50 mV/ns
Enable Input	20 mV/ns

DC Electrical Characteristics

Symbol	Parameter	ABT2244			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized LOW Signal
V _{CD}	Input Clamp Diode Voltage			−1.2	V	Min	I _{IN} = −18 mA
V _{OH}	Output HIGH	74ABT		2.5	V	Min	I _{OH} = −3 mA
		74ABT		2.0	V	Min	I _{OH} = −32 mA
V _{OL}	Output LOW Voltage	74ABT		0.8	V	Min	I _{OL} = 15 mA
I _{IH}	Input HIGH Current			5 5	μA	Max	V _{IN} = 2.7V (Note 2) V _{IN} = V _{CC}
I _{BVI}	Input HIGH Current Breakdown Test			7	μA	Max	V _{IN} = 7.0V
I _{IL}	Input LOW Current			−5 −5	μA	Max	V _{IN} = 0.5V (Note 2) V _{IN} = 0.0V
V _{ID}	Input Leakage Test	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OZH}	Output Leakage Current			50	μA	0 − 5.5V	V _{OUT} = 2.7V; $\overline{OE}$ n = 2.0V
I _{OZL}	Output Leakage Current			−50	μA	0 − 5.5V	V _{OUT} = 0.5V; $\overline{OE}$ n = 2.0V
I _{OS}	Output Short-Circuit Current	−100		−275	mA	Max	V _{OUT} = 0.0V
I _{CEX}	Output High Leakage Current			50	μA	Max	V _{OUT} = V _{CC}
I _{ZZ}	Bus Drainage Test			100	μA	0.0	V _{OUT} = 5.5V; All Others GND
I _{CCH}	Power Supply Current			50	μA	Max	All Outputs HIGH
I _{CCL}	Power Supply Current			30	mA	Max	All Outputs LOW
I _{CCZ}	Power Supply Current			50	μA	Max	$\overline{OE}$ n = V _{CC} All Others at V _{CC} or GND
I _{CC} T	Additional I _{CC} /Input	Outputs Enabled		2.5	mA	Max	V _I = V _{CC} − 2.1V Enable Input V _I = V _{CC} − 2.1V Data Input V _I = V _{CC} − 2.1V All Others at V _{CC} or GND
		Outputs TRI-STATE®		2.5	mA		
		Outputs TRI-STATE		50	μA		
I _{CCD}	Dynamic I _{CC} (Note 2)	No Load		0.1	mA/ MHz	Max	Outputs Open $\overline{OE}$ n = GND (Note 1) One Bit Toggling, 50% Duty Cycle

Note 1: For 8 bits toggling, I_{CCD} < 0.8 mA/MHz

Note 2: Guaranteed, but not tested

AC Electrical Characteristics (SOIC and SSOP package)

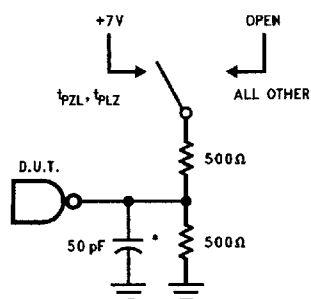
Symbol	Parameter	74ABT			74ABT		Units
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5\text{V}$ $C_L = 50\text{ pF}$			$T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$ $V_{CC} = 4.5\text{V} - 5.5\text{V}$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay Data to Outputs	1.0	2.2	3.9	1.0	3.9	ns
		1.0	2.9	4.4	1.0	4.4	
t_{PZH} t_{PZL}	Output Enable Time	1.5	3.7	6.0	1.5	6.0	ns
		2.1	4.3	7.0	2.1	7.0	
t_{PHZ} t_{PLZ}	Output Disable Time	1.7	3.5	5.8	1.7	5.8	ns
		1.7	3.7	5.8	1.7	5.8	

Capacitance

Symbol	Parameter	Typ	Units	Conditions $T_A = 25^{\circ}\text{C}$
C_{IN}	Input Capacitance	5.0	pF	$V_{CC} = 0\text{V}$
C_{OUT} (Note 1)	Output Capacitance	9.0	pF	$V_{CC} = 5.0\text{V}$

Note 1: C_{OUT} is measured at frequency $f = 1\text{ MHz}$, per MIL-STD-883B, Method 3012

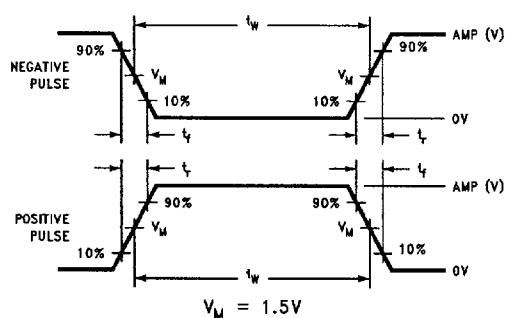
AC Loading



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*Includes jig and probe capacitance

FIGURE 1. Standard AC Test Load

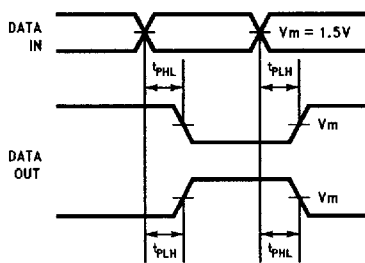


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FIGURE 2a. Test Input Signal Levels

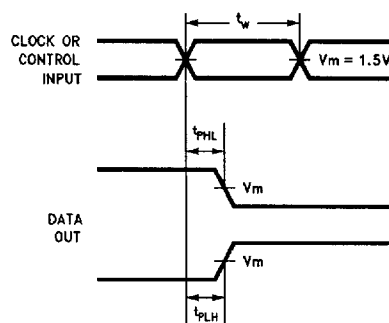
Amplitude	Rep. Rate	t_w	t_r	t_f
3.0V	1 MHz	500 ns	2.5 ns	2.5 ns

FIGURE 2b. Test Input Signal Requirements



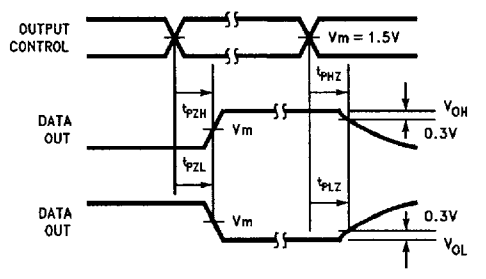
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FIGURE 3. Propagation Delay Waveforms for Inverting and Non-Inverting Functions



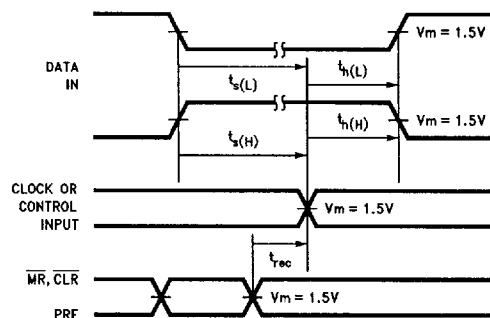
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FIGURE 4. Propagation Delay, Pulse Width Waveforms



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

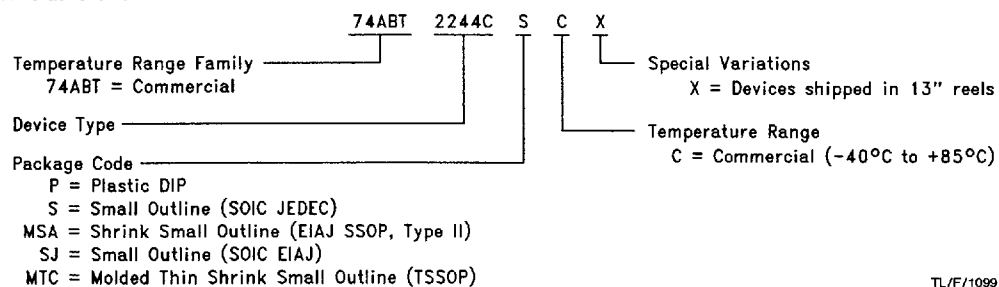


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FIGURE 6. Setup Time, Hold Time and Recovery Time Waveforms

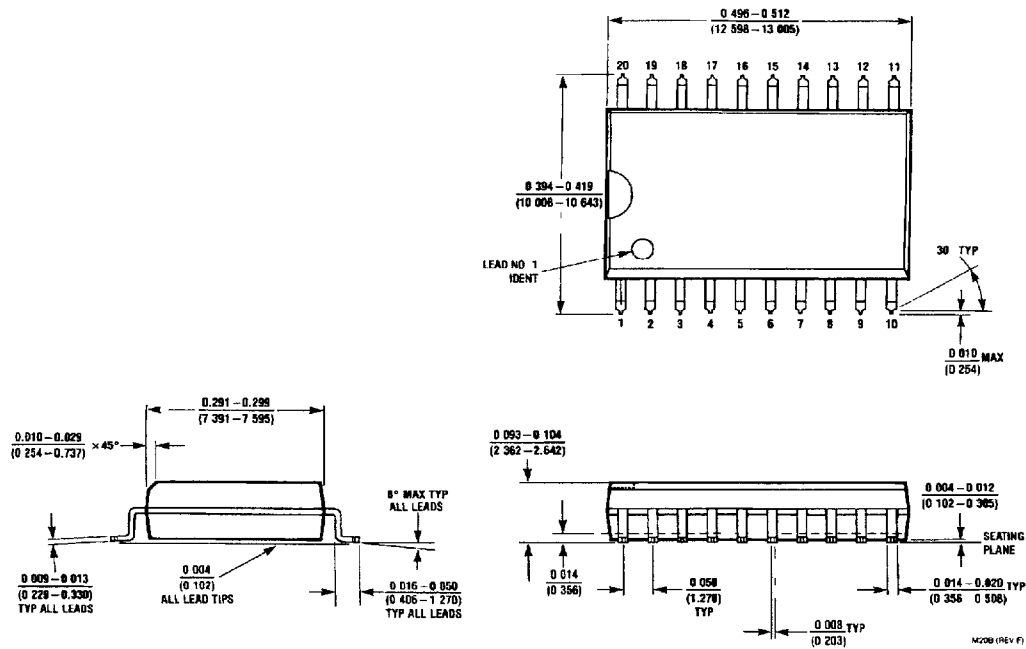
Ordering Information

The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:

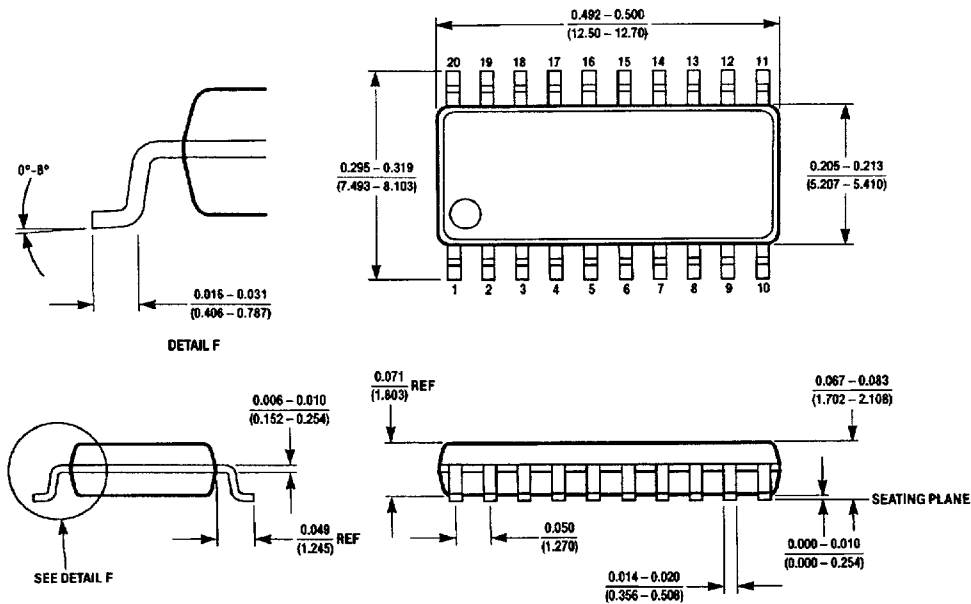


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Physical Dimensions inches (millimeters)

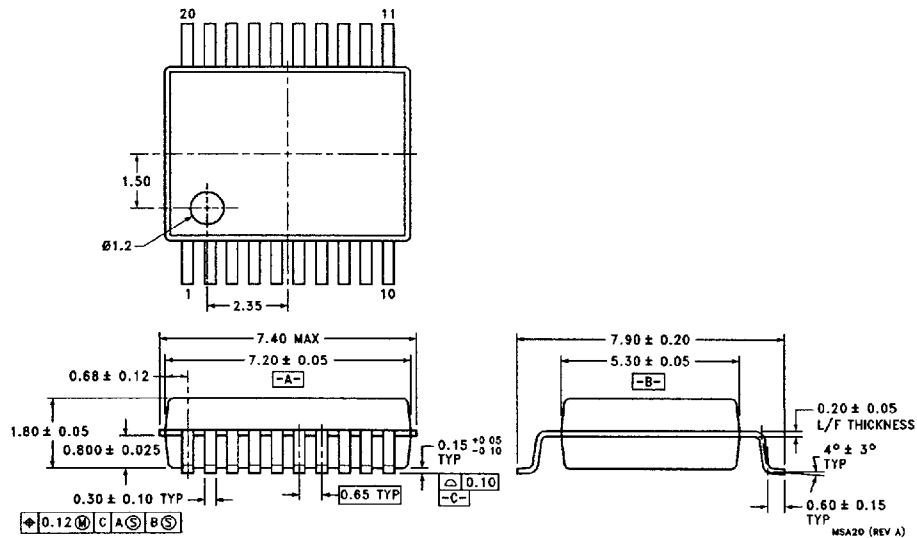


**20-Lead Small Outline Integrated Circuit JEDEC (S)
NS Package Number M20B**

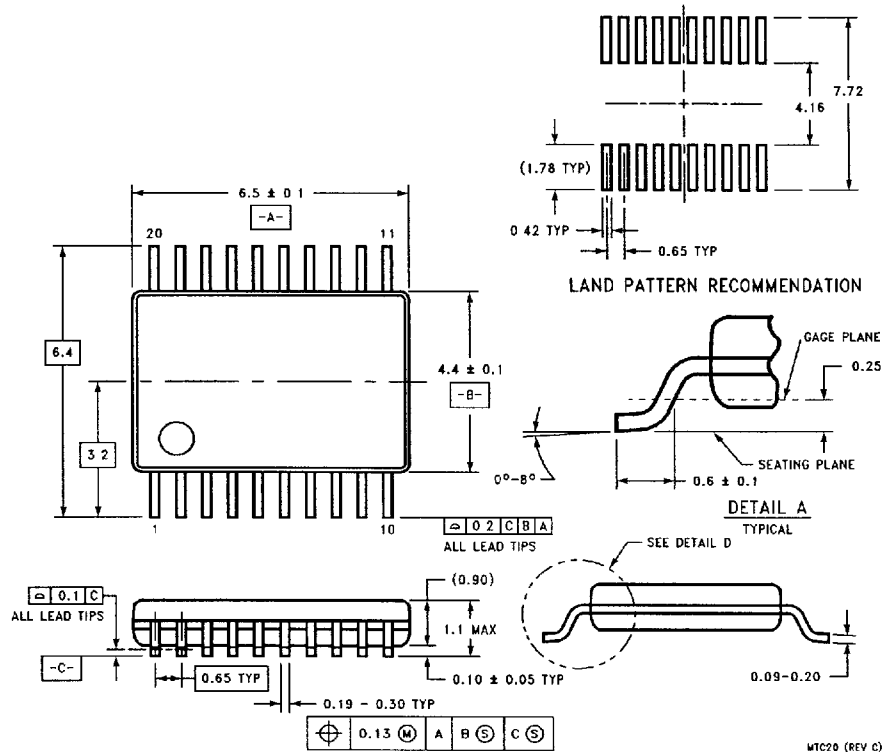


**20-Lead Small Outline Integrated Circuit EIAJ (SJ)
NS Package Number M20D**

Physical Dimensions millimeters (Continued)

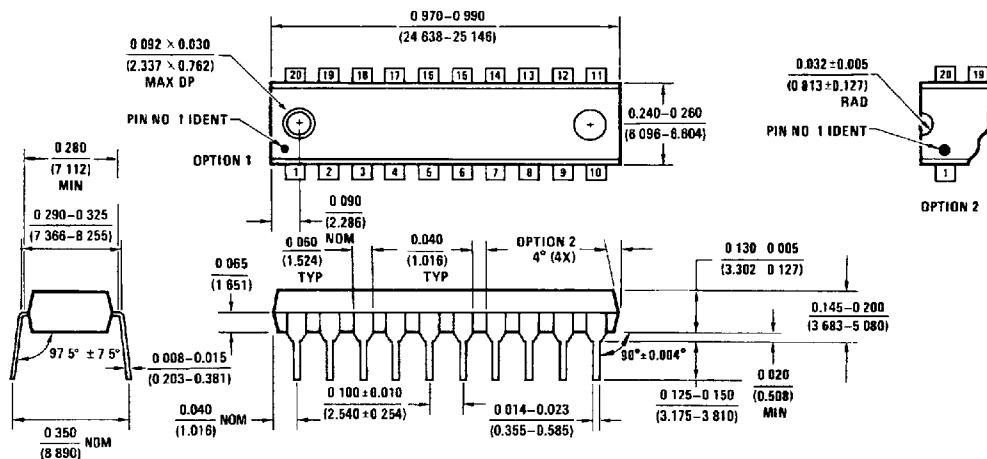


20-Lead Plastic EIAJ SSOP, Type II (MSA)
NS Package Number MSA20



20-Lead Molded Thin Shrink Small Outline Package, JEDEC
NS Package Number MTC20

Physical Dimensions inches (millimeters) (Continued)



20-Lead Plastic Dual-In-Line Package (P)
NS Package Number N20B

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