

74ABT2240

Octal Buffer/Line Driver

with 25Ω Series Resistors in the Outputs

General Description

The 74ABT2240 is an inverting 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

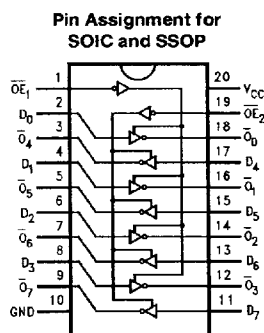
- Guaranteed latchup protection
- High impedance glitch-free bus loading during entire power up and power down cycle
- Nondestructive hot insertion capability

Commercial	Package Number	Package Description
74ABT2240CSC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC
74ABT2240CSJ (Note 1)	M20D	20-Lead (0.300" Wide) Molded Small Outline, EIAJ
74ABT2240CMSA (Note 1)	MSA20	20-Lead Molded Shrink Small Outline, EIAJ Type II
74ABT2240CMTC (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.

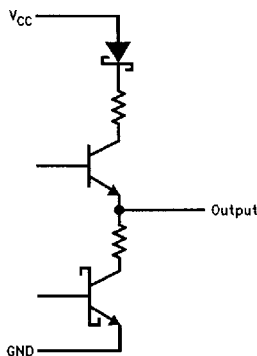
Note 2: Contact factory for package availability

Connection Diagram



TL/F/11665-1

Schematic of Each Output



TL/F/11665-3

Truth Table

Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input (Active Low)
D_0-D_7	Data Inputs
$\overline{O}_0-\overline{O}_7$	Outputs

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

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	−0.5V to 5.5V
in the HIGH State	−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

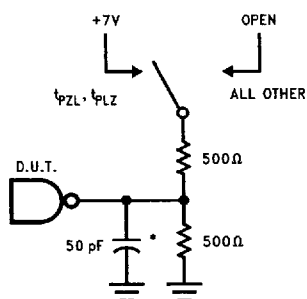
Symbol	Parameter		ABT2240			Units	V _{CC}	Conditions
			Min	Typ	Max			
V _{IH}	Input HIGH Voltage		2.0			V		Recognized HIGH Signal
V _{IL}	Input LOW Voltage				0.8	V		Recognized LOW Signal
V _{CD}	Input Clamp Diode Voltage				−1.2	V	Min	I _{IN} = −18 mA
V _{OH}	Output HIGH Voltage	74ABT	2.5			V	Min	I _{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 _{CCT}	Additional I _{CC} /Input	Outputs Enabled		1.5		mA	Max	V _I = V _{CC} − 2.1V
		Outputs TRI-STATE®		1.5		mA		Enable Input V _I = V _{CC} − 2.1V
		Outputs TRI-STATE		50		μA		Data Input V _I = V _{CC} − 2.1V All Others at V _{CC} or GND
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		4.9	1.0	4.9	ns
		1.5		5.3	1.5	5.3	
t_{PZH} t_{PZL}	Output Enable Time	1.5		6.6	1.5	6.6	ns
		2.7		6.9	2.7	6.9	
t_{PHZ} t_{PLZ}	Output Disable Time	1.9		6.4	1.9	6.4	ns
		1.9		6.4	1.9	6.4	
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.							

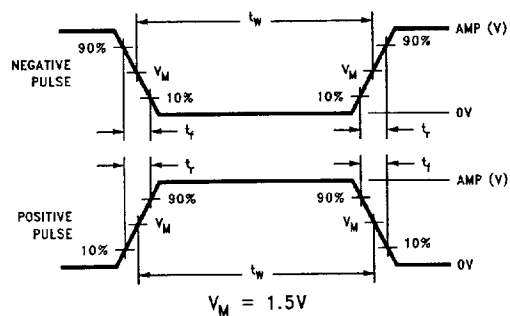
AC Loading



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*Includes jig and probe capacitance

FIGURE 1. Standard AC Test Load

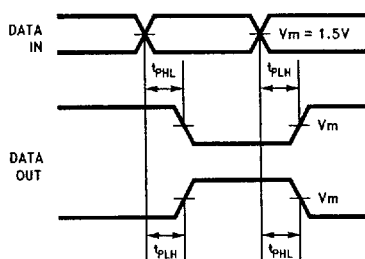


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FIGURE 2a. Test Input Signal Levels

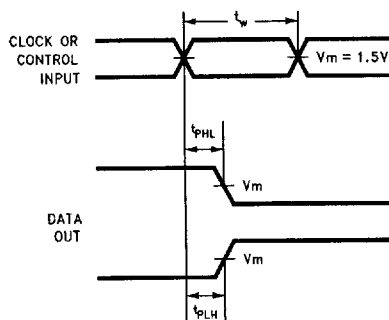
Amplitude	Rep. Rate	t_w	t_r	t_f
3.0V	1 MHz	500 ns	2.5 ns	2.5 ns

FIGURE 2b. Test Input Signal Requirements



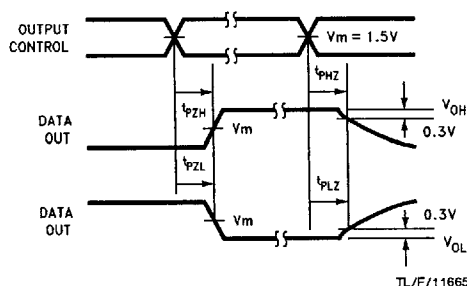
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FIGURE 3. Propagation Delay Waveforms for Inverting and Non-Inverting Functions



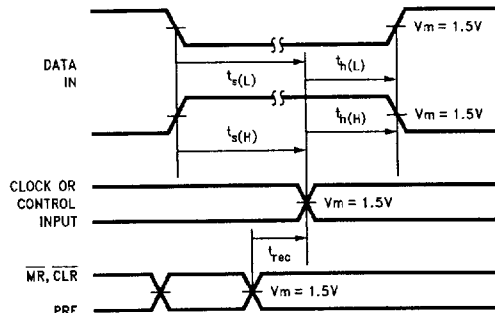
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FIGURE 4. Propagation Delay, Pulse Width Waveforms



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

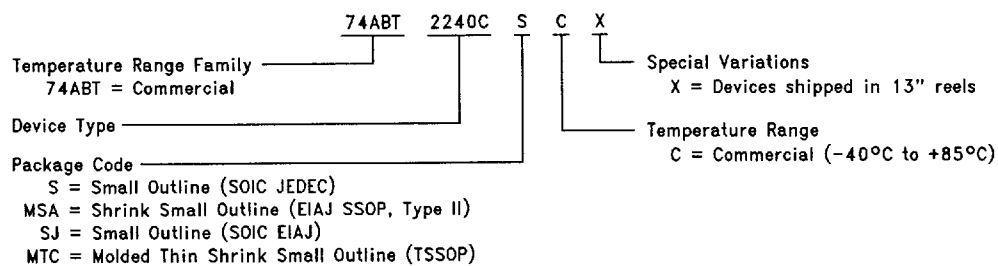


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FIGURE 6. Setup Time, Hold Time and Recovery Time Waveforms

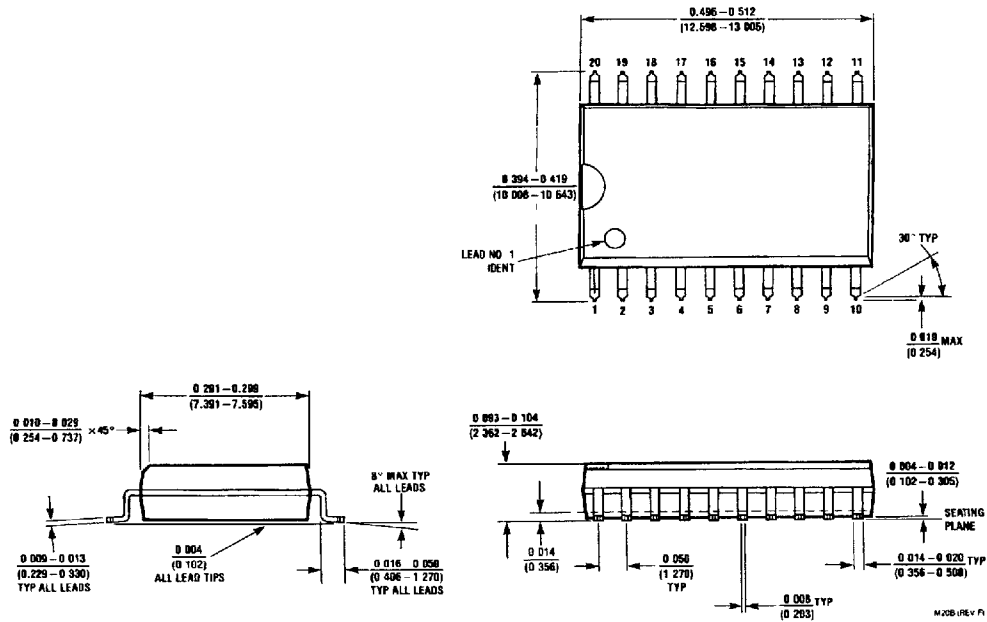
Ordering Information

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



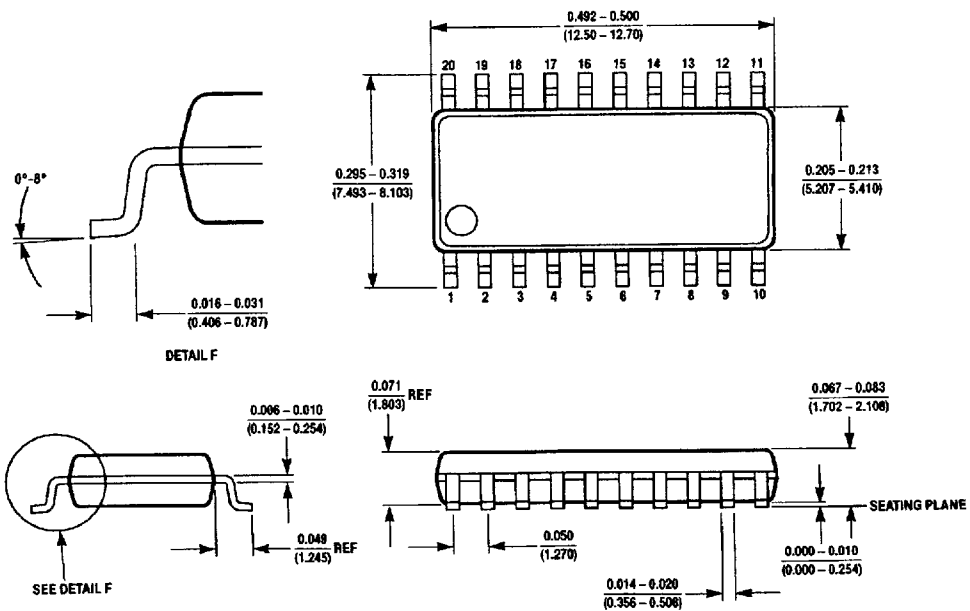
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Physical Dimensions inches (millimeters)

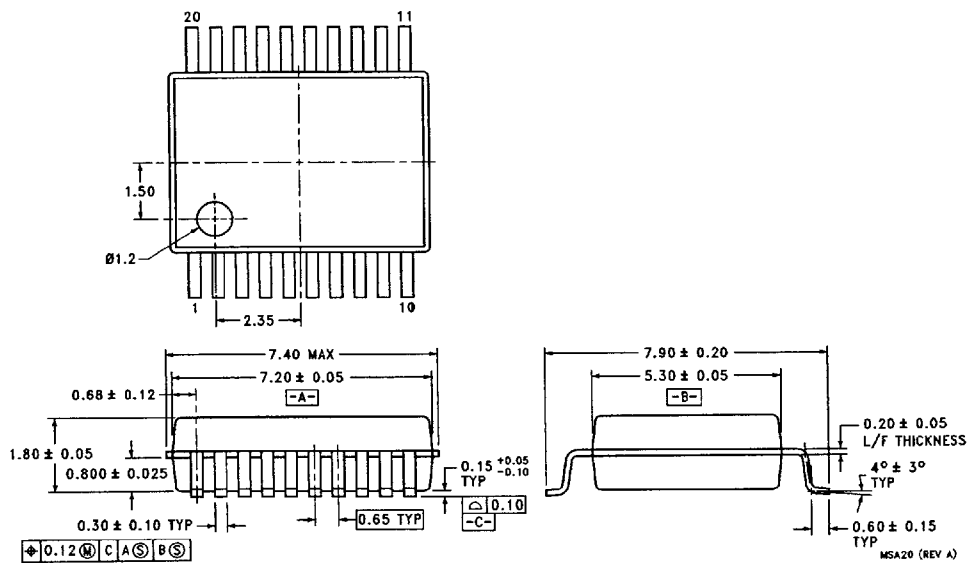


20-Lead Small Outline Integrated Circuit JEDEC (S)
NS Package Number M20B

Physical Dimensions inches (millimeters) (Continued)

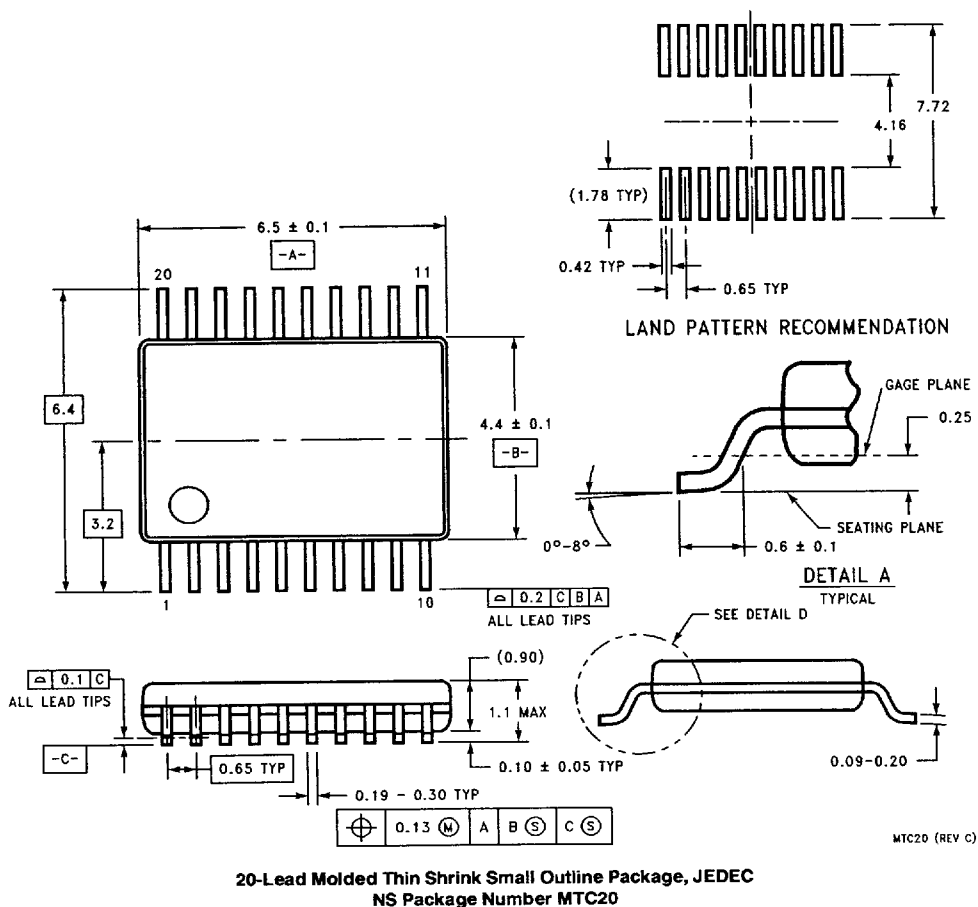


20-Lead Small Outline Integrated Circuit EIAJ (SJ)
NS Package Number M20D



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

Physical Dimensions millimeters (Continued)



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