

74ABT2240

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

General Description

The ABT2240 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

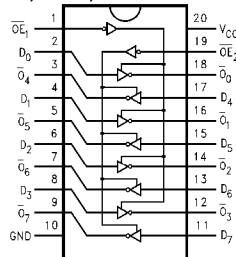
Ordering Code:

Order Number	Package Number	Package Description
74ABT2240CSC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body
74ABT2240CSJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74ABT2240CMSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
74ABT2240CMT	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

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

Connection Diagram

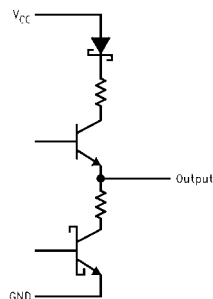
Pin Assignment for SOIC, SSOP, TSSOP and EIAJ



Pin Descriptions

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

Schematic of Each Output



Truth Table

\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

74ABT2240 Octal Buffer/Line Driver with 25Ω Series Resistors in the Outputs

Absolute Maximum Ratings (Note 1)		DC Latchup Source Current (Across Comm Operating Range)	
Storage Temperature	-65°C to +150°C		-300 mA
Ambient Temperature under Bias	-55°C to +125°C	Over Voltage Latchup (I/O)	10V
Junction Temperature under Bias	-55°C to +150°C	Recommended Operating Conditions	
V _{CC} Pin Potential to Ground Pin	-0.5V to +7.0V	Free Air Ambient Temperature	-40°C to +85°C
Input Voltage (Note 2)	-0.5V to +7.0V	Supply Voltage	+4.5V to +5.5V
Input Current (Note 2)	-30 mA to +5.0 mA	Minimum Input Edge Rate ($\Delta V/\Delta t$)	
Voltage Applied to Any Output in the Disabled or Power-off State	-0.5V to 5.5V	Data Input	50 mV/ns
in the HIGH State	-0.5V to V _{CC}	Enable Input	20 mV/ns
Current Applied to Output in LOW State (Max)	twice the rated I _{OL} (mA)	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.	

DC Electrical Characteristics

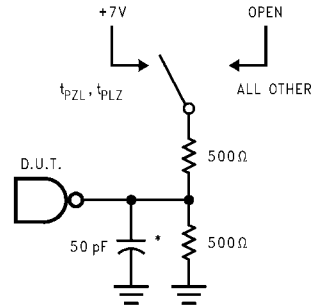
Symbol	Parameter	Min	Typ	Max	Units	V _{CC}	Conditions
V _{IH}	Input HIGH Voltage	2.0			V		Recognized HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	2.5			V	Min	I _{OH} = -3 mA
		2.0			V	Min	I _{OH} = -32 mA
V _{OL}	Output LOW Voltage			0.8	V	Min	I _{OL} = 15 mA
I _{IH}	Input HIGH Current			1	μA	Max	V _{IN} = 2.7V (Note 3)
				1	μA	Max	V _{IN} = V _{CC}
I _{BVI}	Input HIGH Current Breakdown Test			7	μA	Max	V _{IN} = 7.0V
I _{IL}	Input LOW Current			-1	μA	Max	V _{IN} = 0.5V (Note 3)
				-1	μA	Max	V _{IN} = 0.0V
V _{ID}	Input Leakage Test				V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OZH}	Output Leakage Current			10	μA	0 - 5.5V	V _{OUT} = 2.7V; \overline{OE}_n = 2.0V
I _{OZL}	Output Leakage Current			-10	μA	0 - 5.5V	V _{OUT} = 0.5V; \overline{OE}_n = 2.0V
I _{OS}	Output Short-Circuit Current			-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 Outputs Enabled			1.5	mA		V _I = V _{CC} - 2.1V
	I _{CC} /Input Outputs 3-STATE			1.5	mA	Max	Enable Input V _I = V _{CC} - 2.1V
	Outputs 3-STATE			50	μA		Data Input V _I = V _{CC} - 2.1V All Others at V _{CC} or GND
I _{CCD}	Dynamic I _{CC} (Note 3)	No Load		0.1	mA/ MHz	Max	Outputs Open \overline{OE}_n = GND (Note 4) One Bit Toggling, 50% Duty Cycle

Note 3: Guaranteed, but not tested.

Note 4: For 8 bits toggling, I_{CCD} < 0.8 mA/MHz.

AC Electrical Characteristics							
Symbol	Parameter	T _A = +25°C V _{CC} = +5V C _L = 50 pF			T _A = -40°C to +85°C V _{CC} = 4.5V-5.5V C _L = 50 pF		Units
		Min	Typ	Max	Min	Max	
t _{PLH}	Propagation	1.0		4.9	1.0	4.9	ns
t _{PHL}	Delay Data to Outputs	1.5		5.3	1.5	5.3	
t _{PZH}	Output Enable	1.5		6.6	1.5	6.6	ns
t _{PZL}	Time	2.7		6.9	2.7	6.9	
t _{PHZ}	Output Disable	1.9		6.4	1.9	6.4	ns
t _{PLZ}	Time	1.9		6.4	1.9	6.4	
Capacitance							
Symbol	Parameter	Typ	Units	Conditions T _A = 25°C			
C _{IN}	Input Capacitance	5.0	pF	V _{CC} = 0V			
C _{OUT} (Note 5)	Output Capacitance	9.0	pF	V _{CC} = 5.0V			
Note 5: C _{OUT} 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

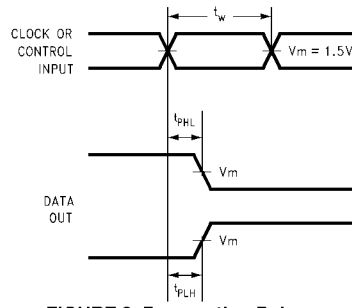


FIGURE 2. Propagation Delay, Pulse Width Waveforms

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

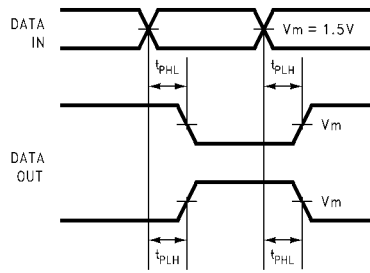


FIGURE 4. Propagation Delay Waveforms for Inverting and Non-Inverting Functions

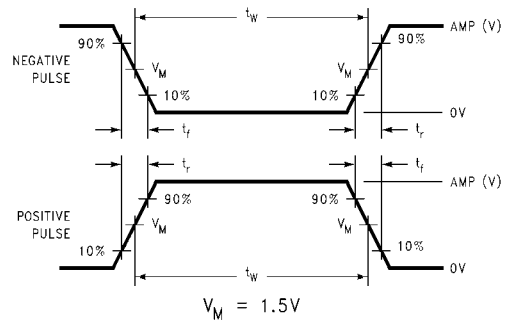


FIGURE 6. Test Input Signal Levels

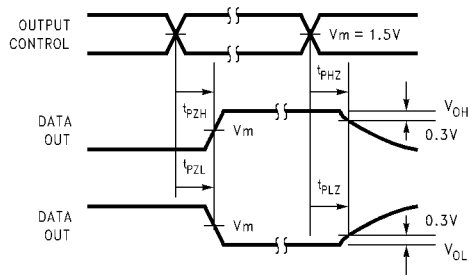


FIGURE 5. 3-STATE Output HIGH and LOW Enable and Disable Times

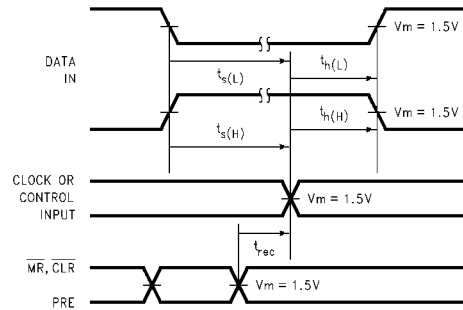
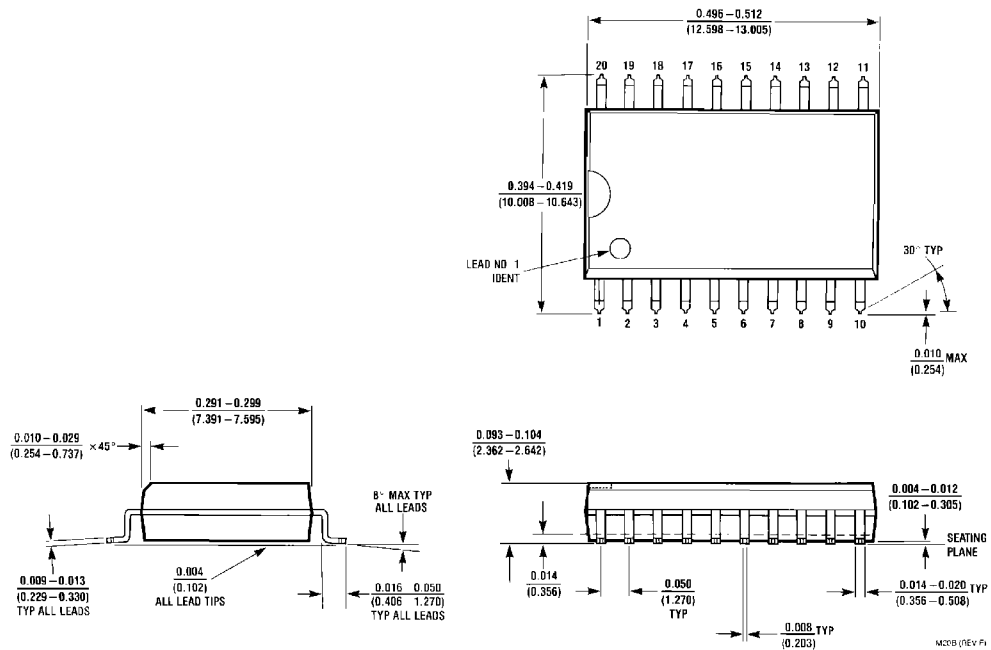
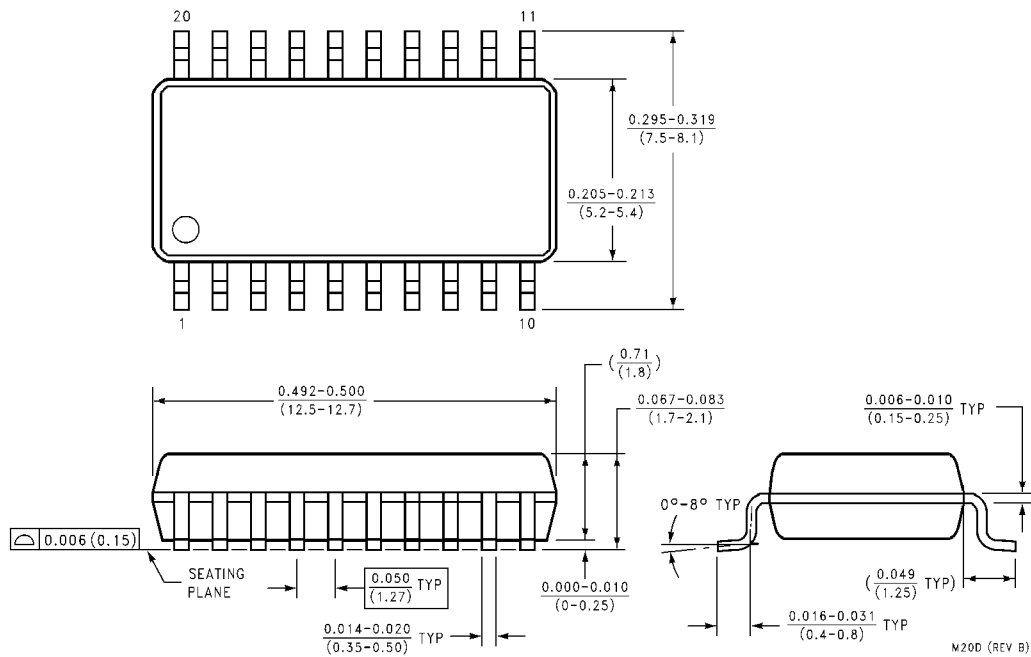


FIGURE 7. Setup Time, Hold Time and Recovery Time Waveforms

Physical Dimensions inches (millimeters) unless otherwise noted

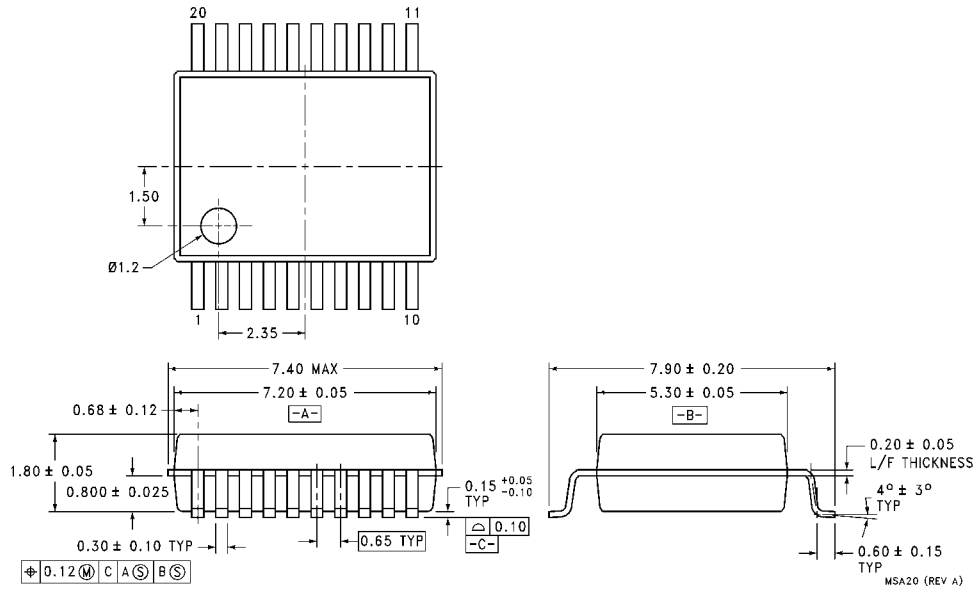


**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body
Package Number M20B**



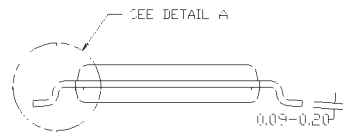
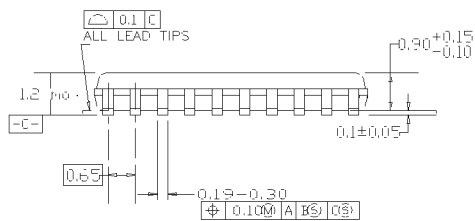
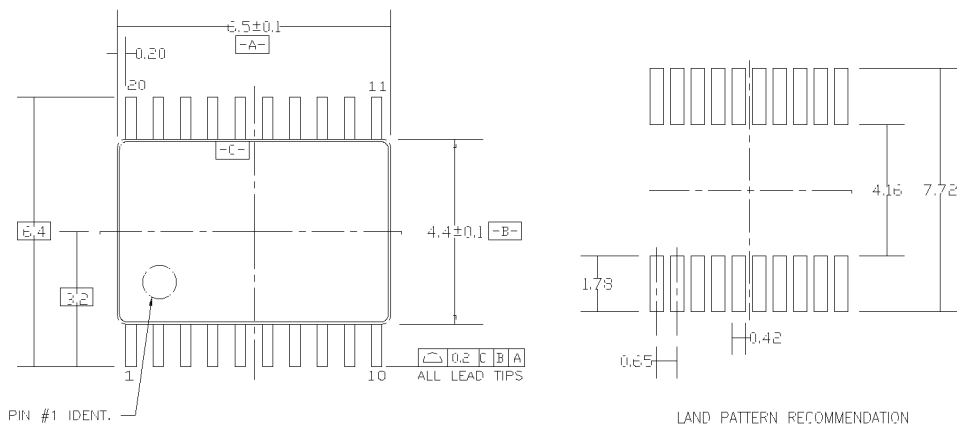
**20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M20D**

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

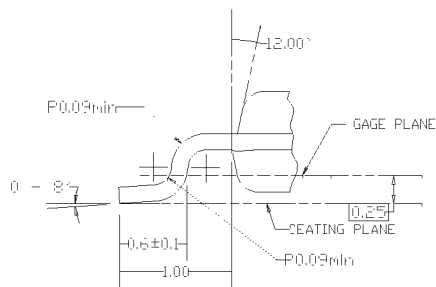


**20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
Package Number MSA20**

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



DIMENSIONS ARE IN MILLIMETERS



DETAIL A

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, MOLDS FLASH, AND TIE BAR EXTRUSIONS.
- D. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M, 1982.

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

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