

# 74ABT241

## Octal Buffer/Line Driver with 3-STATE Outputs

### General Description

The ABT241 is an octal buffer and line driver with 3-STATE outputs designed to be employed as a memory and address driver, clock driver, or bus-oriented transmitter/receiver.

### Features

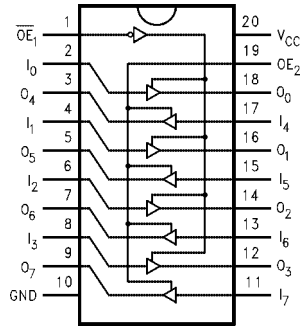
- Non-inverting buffers
- Output sink capability of 64 mA, source capability of 32 mA
- Guaranteed latchup protection
- High impedance glitch free bus loading during entire power up and power down cycle
- Nondestructive hot insertion capability

### Ordering Code:

Order Number	Package Number	Package Description
74ABT241CSC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body
74ABT241CSJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74ABT241CMSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
74ABT241CMTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

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

### Connection Diagram



### Pin Descriptions

Pin Names	Description
$\overline{OE}_1$	Output Enable Input (Active LOW)
$OE_2$	Output Enable Input (Active HIGH)
$I_0-I_7$	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	L	X	Z
L	H	H	H	H	H
L	L	L	H	L	L

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

**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 (Over Comm Operating Range)	-500 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.

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

**DC Electrical Characteristics**

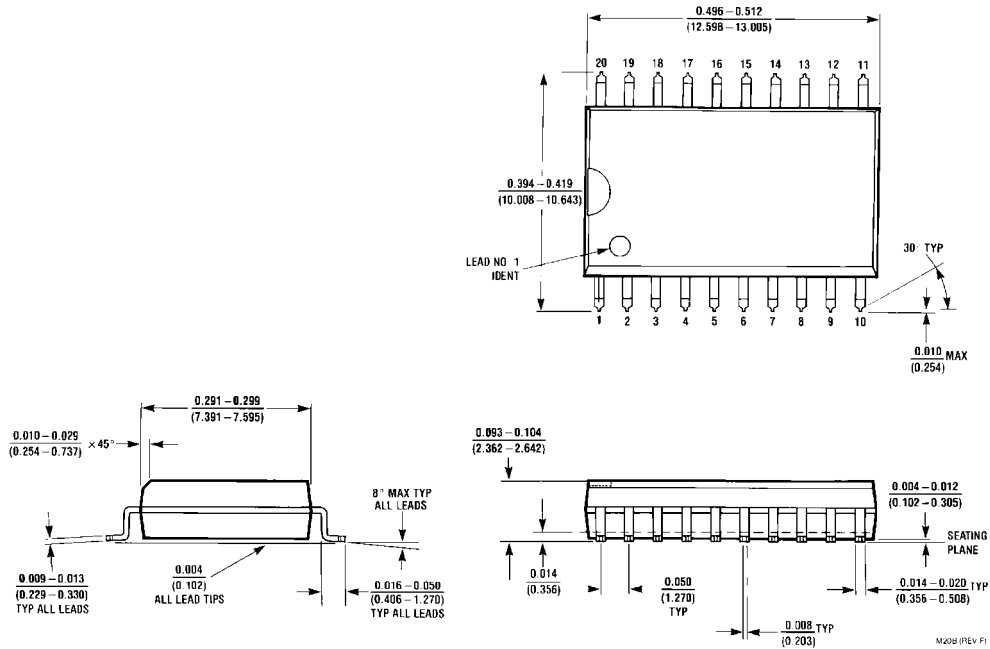
Symbol	Parameter	Min	Typ	Max	Units	V <sub>CC</sub>	Conditions
V <sub>IH</sub>	Input HIGH Voltage	2.0			V		Recognized HIGH Signal
V <sub>IL</sub>	Input LOW Voltage		0.8		V		Recognized LOW Signal
V <sub>CD</sub>	Input Clamp Diode Voltage		-1.2		V	Min	I <sub>IN</sub> = -18 mA
V <sub>OH</sub>	Output HIGH Voltage	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		0.55		V	Min	I <sub>OL</sub> = 64 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	4.75			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; $\overline{OE}_n = 2.0V$
I <sub>OZL</sub>	Output Leakage Current			-10	μA	0 - 5.5V	V <sub>OUT</sub> = 0.5V; $\overline{OE}_n = 2.0V$
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	$\overline{OE}_n = V_{CC}$ ; All Others at V <sub>CC</sub> or Ground
I <sub>CCT</sub>	Additional I <sub>CC</sub> /Input	Outputs Enabled		2.5	mA	Max	V <sub>I</sub> = V <sub>CC</sub> - 2.1V
		Outputs 3-STATE		2.5	mA		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 Ground
I <sub>CCD</sub>	Dynamic I <sub>CC</sub> (Note 4)	No Load		0.1	mA/ MHz	Max	Outputs Open $\overline{OE}_n = GND$ , (Note 3) One Bit Toggling, 50% Duty Cycle

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

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

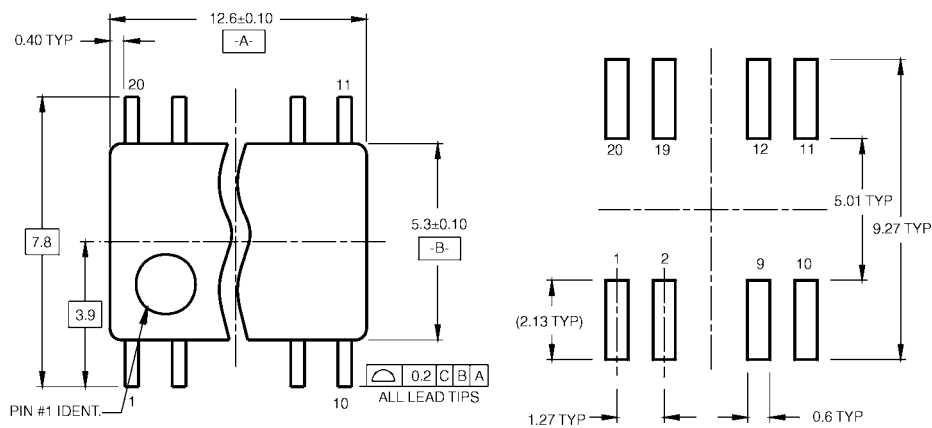
DC Electrical Characteristics							
(SOIC package)							
Symbol	Parameter	Min	Typ	Max	Units	V <sub>CC</sub>	Conditions C <sub>L</sub> = 50 pF, R <sub>L</sub> = 500Ω
V <sub>OLP</sub>	Quiet Output Maximum Dynamic V <sub>OL</sub>		0.5	0.8	V	5.0	T <sub>A</sub> = 25°C (Note 5)
V <sub>OLV</sub>	Quiet Output Minimum Dynamic V <sub>OL</sub>	-1.3	-0.8		V	5.0	T <sub>A</sub> = 25°C (Note 5)
V <sub>OHV</sub>	Minimum HIGH Level Dynamic Output Voltage	2.7	3.1		V	5.0	T <sub>A</sub> = 25°C (Note 7)
V <sub>IHD</sub>	Minimum HIGH Level Dynamic Input Voltage	2.0	1.5		V	5.0	T <sub>A</sub> = 25°C (Note 6)
V <sub>ILD</sub>	Maximum LOW Level Dynamic Input Voltage		1.1	0.8	V	5.0	T <sub>A</sub> = 25°C (Note 6)
<p><b>Note 5:</b> Max number of outputs defined as (n). n – 1 data inputs are driven 0V to 3V. One output at LOW. Guaranteed, but not tested.</p> <p><b>Note 6:</b> Max number of data inputs (n) switching. n – 1 inputs switching 0V to 3V. Input-under-test switching: 3V to threshold (V<sub>ILD</sub>), 0V to threshold (V<sub>IHD</sub>). Guaranteed, but not tested.</p> <p><b>Note 7:</b> Max number of outputs defined as (n). n – 1 data inputs are driven 0V to 3V. One output HIGH. Guaranteed, but not tested.</p>							
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 Delay	1.0		4.6	1.0	4.6	ns
t <sub>PHL</sub>	Data to Outputs	1.0		4.6	1.0	4.6	
t <sub>PZH</sub>	Output Enable	1.1		6.8	1.1	6.8	ns
t <sub>PZL</sub>	Time	1.3		6.8	1.3	6.8	
t <sub>PHZ</sub>	Output Disable	1.6		6.8	1.6	6.8	ns
t <sub>PLZ</sub>	Time	1.0		5.9	1.0	5.9	
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 8)	Output Capacitance	9.0	pF	V <sub>CC</sub> = 5.0V			
<p><b>Note 8:</b> C<sub>OUT</sub> is measured at frequency f = 1 MHz, per MIL-STD-883, Method 3012.</p>							

**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

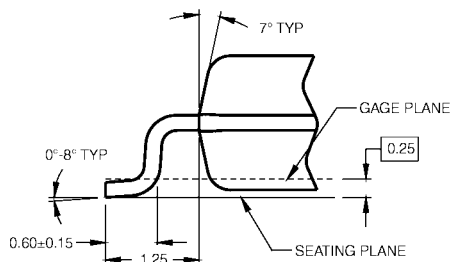


DIMENSIONS ARE IN MILLIMETERS

NOTES:

- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
- B. DIMENSIONS ARE IN MILLIMETERS.
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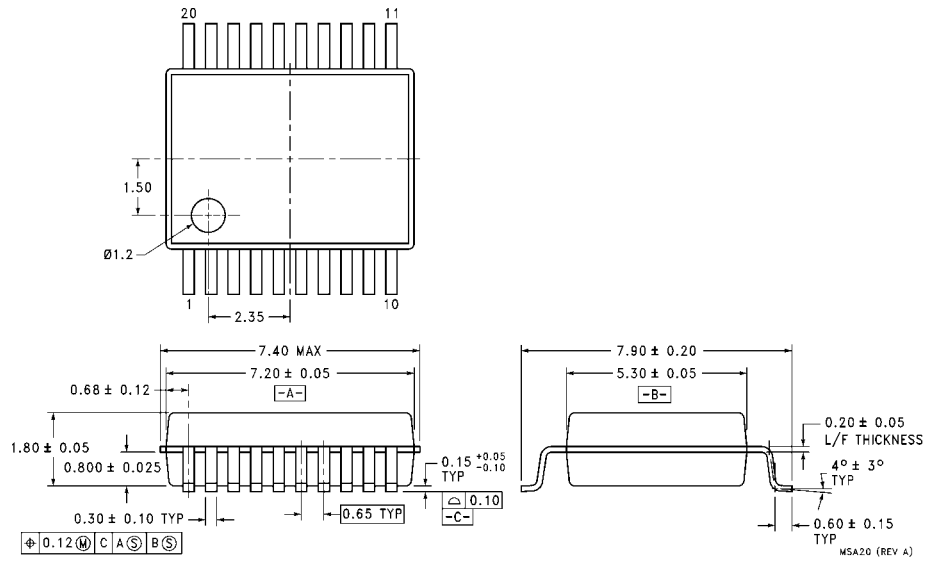
M20DRevB1



DETAIL A

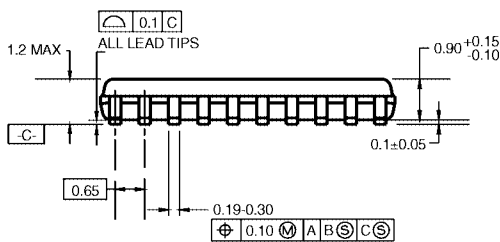
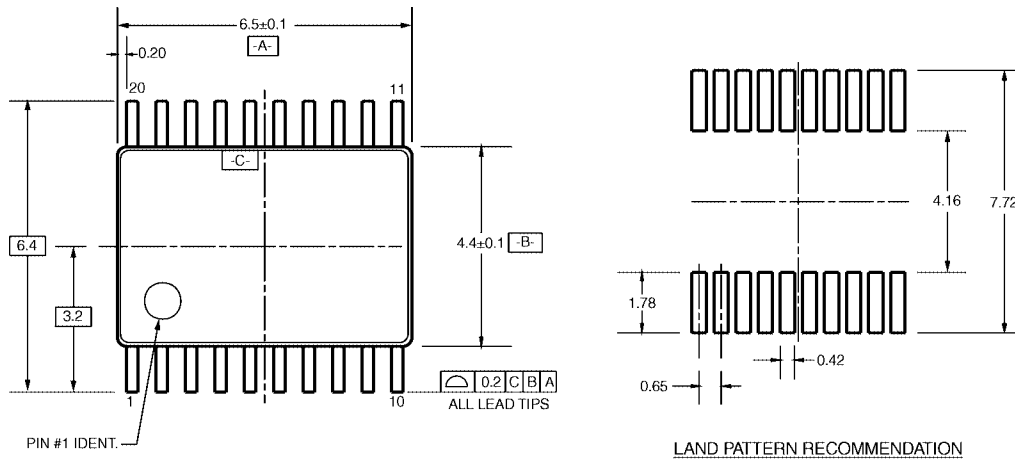
**20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide  
Package Number M20D**

**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)



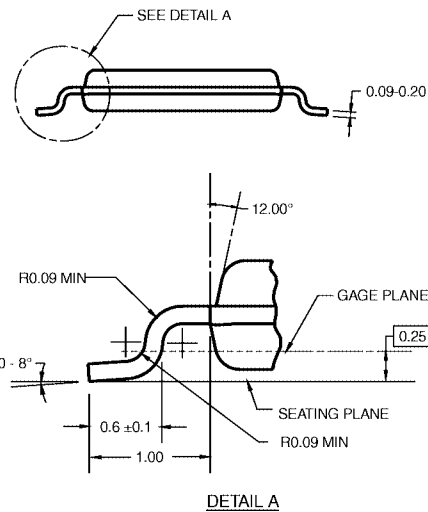
DIMENSIONS ARE IN MILLIMETERS

**NOTES:**

- 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

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



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