

FAIRCHILD
SEMICONDUCTOR™

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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

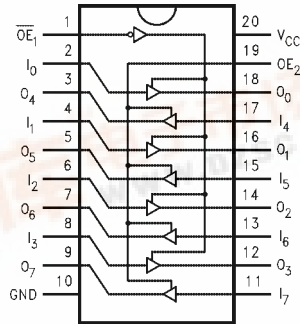
- Non-inverting buffers
- Output sink capability of 64 mA, source capability of 32 mA
- Guaranteed latching protection
- High impedance glitch free bus loading during entire power up and power down cycle
- Nondestructive hot insertion capability

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

74ABT241 Octal Buffer/Line Driver with 3-STATE 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 _{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 (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 _{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			0.55	V	Min	I _{OL} = 64 mA
I _{IH}	Input HIGH Current			1	μA	Max	V _{IN} = 2.7V (Note 4)
				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 4)
				-1	μA	Max	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			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	-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 Ground
I _{CCT}	Additional I _{CC} /Input	Outputs Enabled		2.5	mA		V _I = V _{CC} - 2.1V
		Outputs 3-STATE		2.5	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 Ground
I _{CCD}	Dynamic I _{CC} (Note 4)	No Load		0.1	mA/ MHz	Max	Outputs Open \overline{OE}_n = GND, (Note 3) One Bit Toggling, 50% Duty Cycle

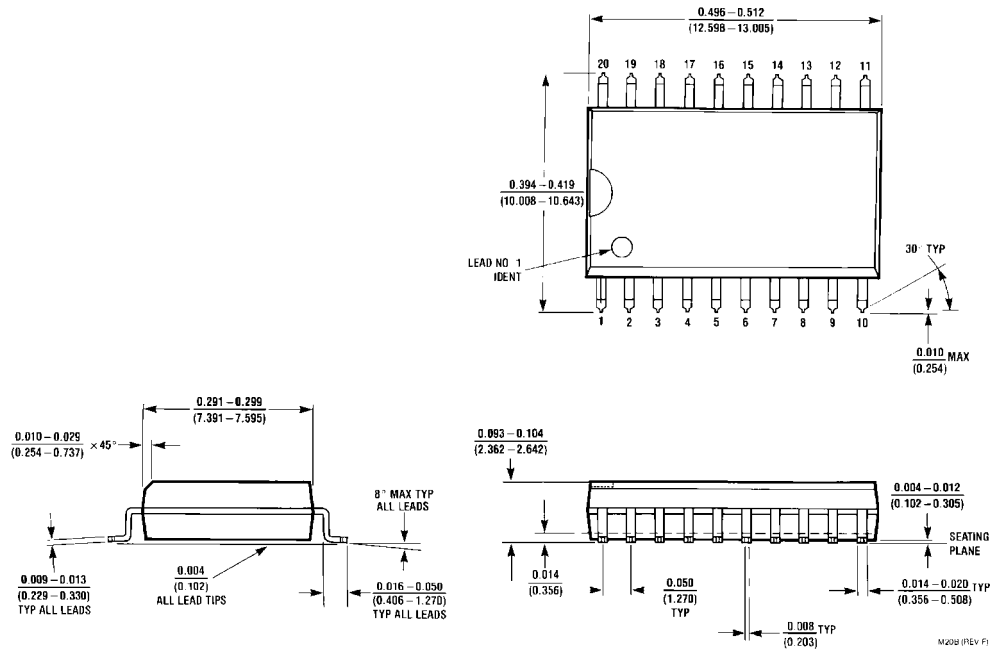
Note 3: For 8 bits toggling, I_{CCD} < 0.8 mA/MHz.

Note 4: Guaranteed, but not tested.

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

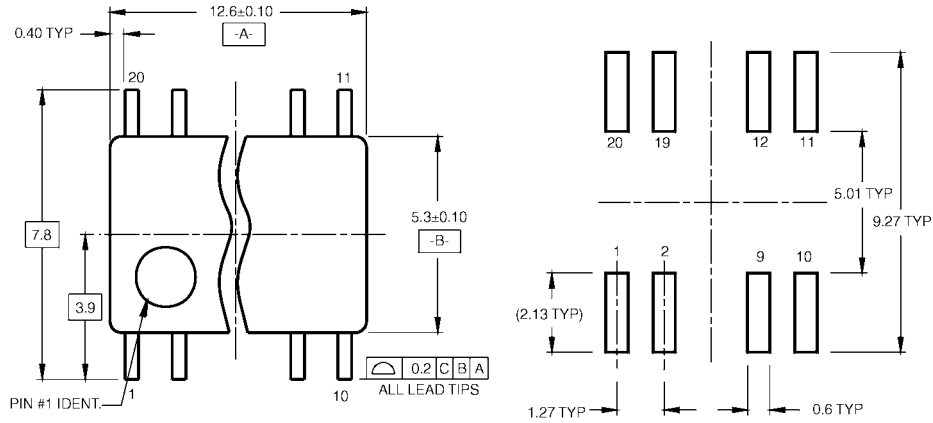
74ABT241

Physical Dimensions inches (millimeters) unless otherwise noted

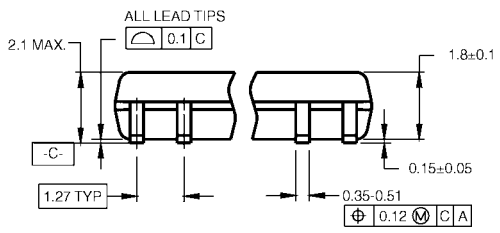


**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Body
Package Number M20B**

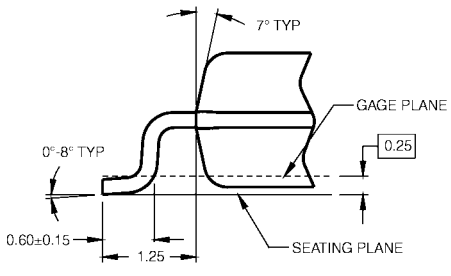
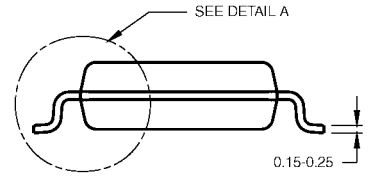
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



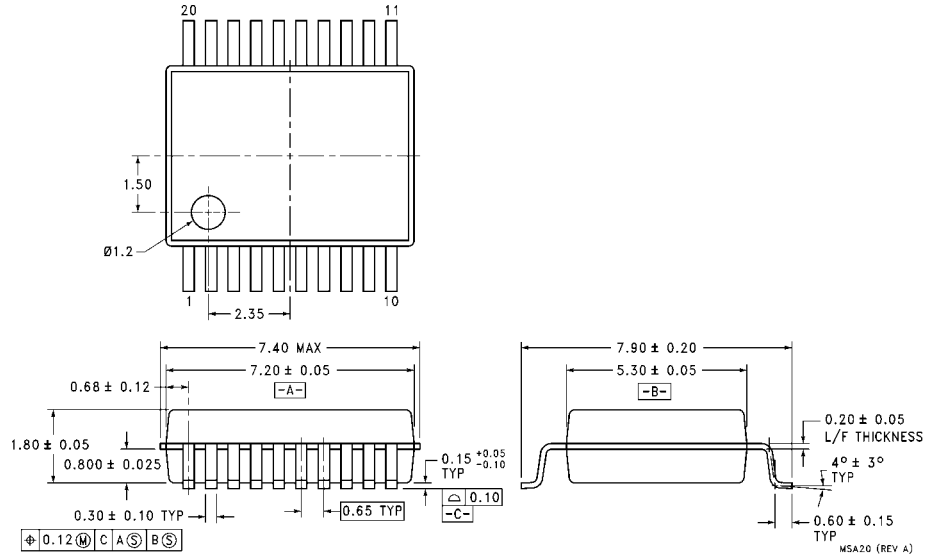
DETAIL A

- 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

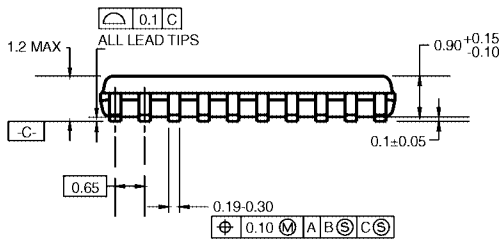
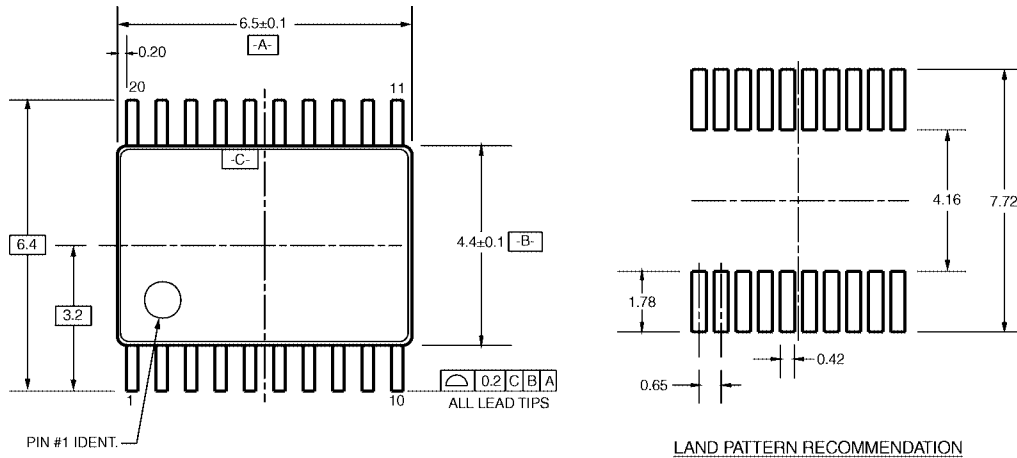
**20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
 Package Number M20D**

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)

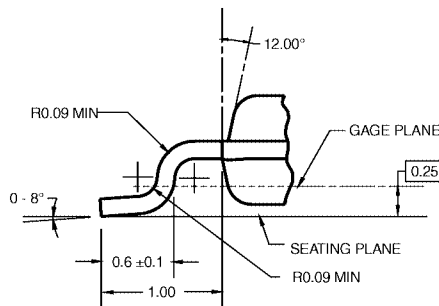
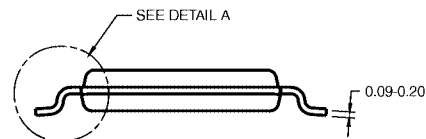


DIMENSIONS ARE IN MILLIMETERS

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



DETAIL A

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

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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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