



April 1988
Revised September 2000

74F245

Octal Bidirectional Transceiver with 3-STATE Outputs

General Description

The 74F245 contains eight non-inverting bidirectional buffers with 3-STATE outputs and is intended for bus-oriented applications. Current sinking capability is 24 mA at the A Ports and 64 mA at the B Ports. The Transmit/Receive (T/R) input determines the direction of data flow through the bidirectional transceiver. Transmit (active HIGH) enables data from A Ports to B Ports; Receive (active LOW) enables data from B Ports to A Ports. The Output Enable input, when HIGH, disables both A and B Ports by placing them in a High Z condition.

Features

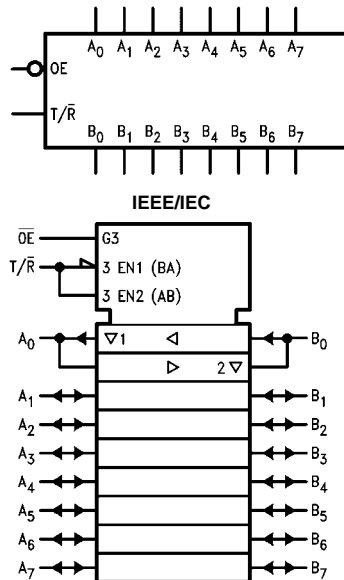
- Non-inverting buffers
- Bidirectional data path
- A outputs sink 24 mA
- B outputs sink 64 mA

Ordering Code:

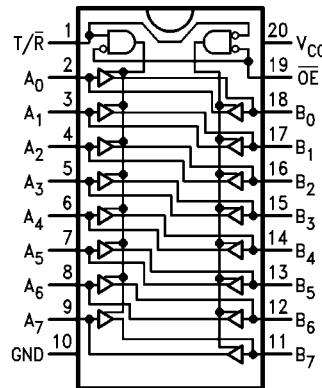
Order Number	Package Number	Package Description
74F245SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
74F245SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74F245MSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
74F245MTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
74F245PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

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

Logic Symbols



Connection Diagram



74F245 Octal Bidirectional Transceiver with 3-STATE Outputs

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Unit Loading/Fan Out

Pin Names	Description	U.L.	
		HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
\overline{OE}	Output Enable Input (Active LOW)	1.0/2.0	20 μA /-1.2 mA
T/\overline{R}	Transmit/Receive Input	1.0/2.0	20 μA /-1.2 mA
A_0 - A_7	Side A Inputs or 3-STATE Outputs	3.5/1.083 150/40(38.3)	70 μA /-0.65 mA -3 mA/24 mA (20 mA)
B_0 - B_7	Side B Inputs or 3-STATE Outputs	3.5/1.083 600/106.6(80)	70 μA /-0.65 mA -12 mA/64 mA (48 mA)

Truth Table

Inputs		Output
\overline{OE}	T/\overline{R}	
L	L	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	High Z State

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial

Absolute Maximum Ratings ^(Note 1)		Recommended Operating Conditions	
Storage Temperature	-65°C to +150°C	Free Air Ambient Temperature	0°C to +70°C
Ambient Temperature under Bias	-55°C to +125°C	Supply Voltage	+4.5V to +5.5V
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 Output in HIGH State (with V _{CC} = 0V)			
Standard Output	-0.5V to V _{CC}		
3-STATE Output	-0.5V to +5.5V		
Current Applied to Output in LOW State (Max)	twice the rated I _{OL} (mA)		
ESD Last Passing Voltage (Min)	4000V		

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.

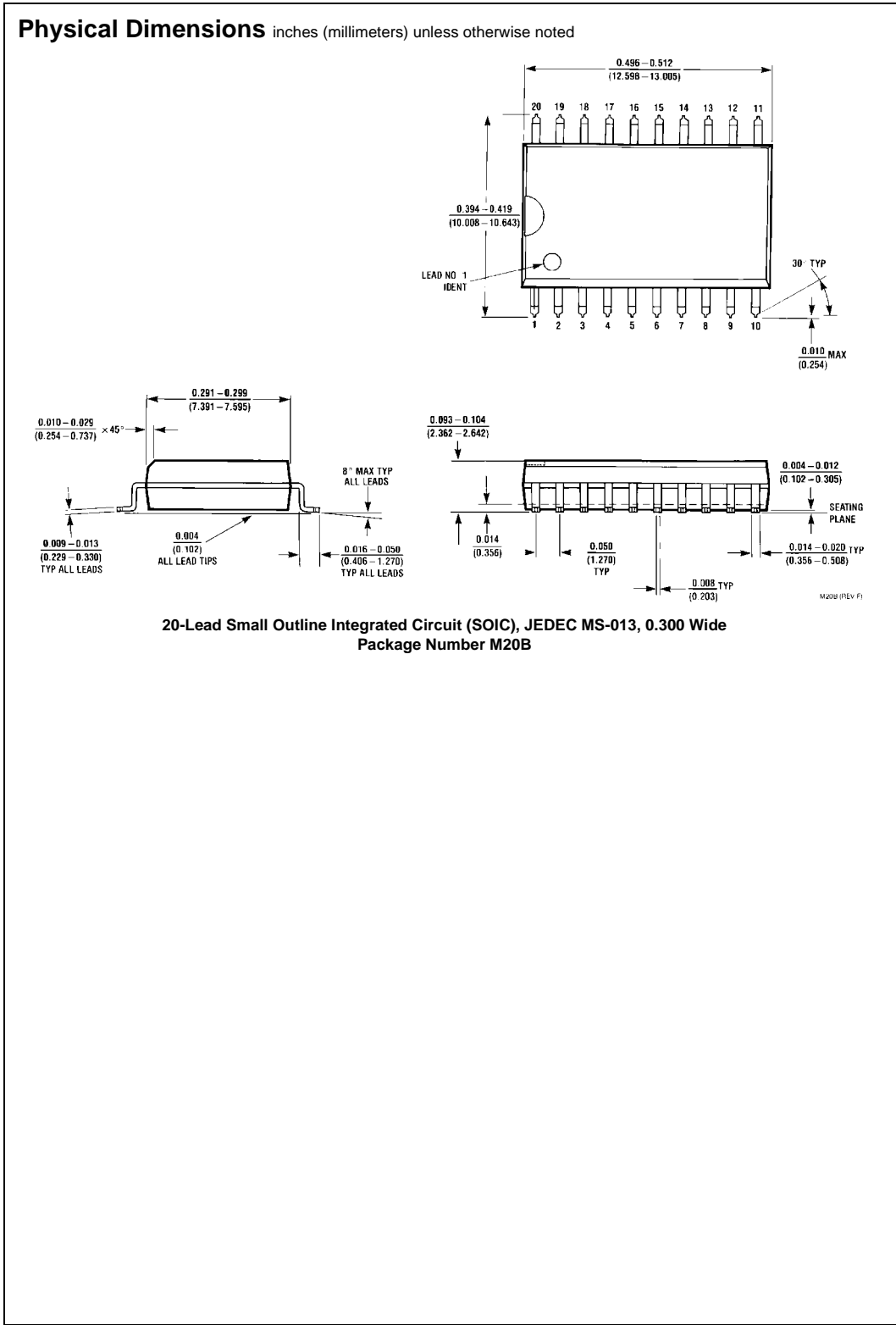
Note 2: Either voltage limit or current limit is sufficient to protect inputs.

DC Electrical Characteristics

Symbol	Parameter	Min	Typ	Max	Units	V _{CC}	Conditions	
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal	
V _{IL}	Input LOW Voltage			0.8	V		Recognized as a LOW Signal	
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA	
V _{OH}	Output HIGH Voltage	10% V _{CC}	2.4			V	Min	I _{OH} = -3 mA (A _n)
		10% V _{CC}	2.0		I _{OH} = -15 mA (B _n)			
		5% V _{CC}	2.7		I _{OH} = -3 mA (A _n)			
V _{OL}	Output LOW Voltage	10% V _{CC}		0.5		V	Min	I _{OL} = 24 mA (A _n)
		10% V _{CC}		0.55				I _{OL} = 64 mA (B _n)
I _{IH}	Input HIGH Current			5.0	μA	Max	V _{IN} = 2.7V	
I _{BVI}	Input HIGH Current Breakdown Test			7.0	μA	Max	V _{IN} = 7.0V (OE, T/R)	
I _{BVIT}	Input HIGH Current Breakdown (I/O)			0.5	mA	Max	V _{IN} = 5.5 V (A _n , B _n)	
I _{CEX}	Output HIGH Leakage Current			50	μA	Max	V _{OUT} = V _{CC} (A _n , B _n)	
V _{ID}	Input Leakage Test	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded	
I _{OD}	Output Leakage Circuit Current			3.75	μA	0.0	V _{ID} = 150 mV All Other Pins Grounded	
I _{IL}	Input LOW Current			-1.2	mA	Max	V _{IN} = 0.5V (T/R, OE)	
I _{IH} + I _{OZH}	Output Leakage Current			70	μA	Max	V _{OUT} = 2.7V (A _n , B _n)	
I _{IL} + I _{OZL}	Output Leakage Current			-650	μA	Max	V _{OUT} = 0.5V (A _n , B _n)	
I _{OS}	Output Short-Circuit Current	-60		-150		mA	Max	V _{OUT} = 0V (A _n)
		-100		-225				V _{OUT} = 0V (B _n)
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V(A _n , B _n)	
I _{CCH}	Power Supply Current		70	90	mA	Max	V _O = HIGH	
I _{CCL}	Power Supply Current		95	120	mA	Max	V _O = LOW	
I _{CCZ}	Power Supply Current		85	110	mA	Max	V _O = HIGH Z	

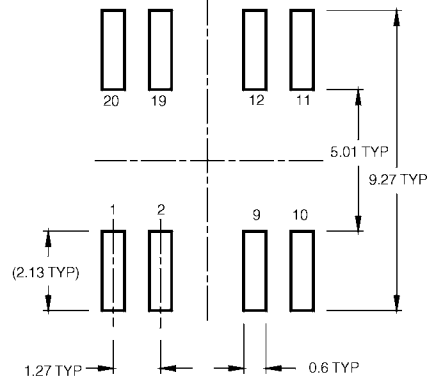
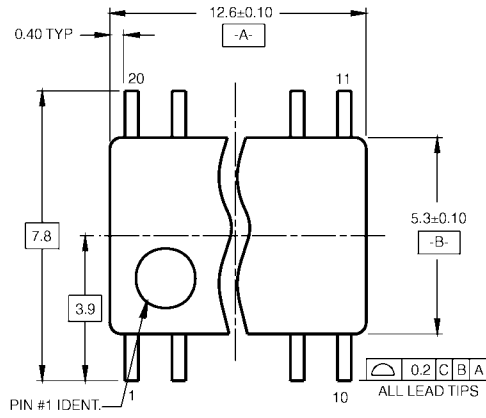
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AC Electrical Characteristics									
Symbol	Parameter	T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A = -55°C to +125°C C _L = 50 pF		T _A = 0°C to +70°C C _L = 50 pF		Units
		Min	Typ	Max	Min	Max	Min	Max	
t _{PLH}	Propagation Delay	2.5	4.2	6.0	2.0	7.5	2.0	7.0	ns
t _{PHL}	A _n to B _n or B _n to A _n	2.5	4.2	6.0	2.0	7.5	2.0	7.0	
t _{PZH}	Output Enable Time	3.0	5.3	7.0	2.5	9.0	2.5	8.0	ns
t _{PZL}		3.5	6.0	8.0	3.0	10.0	3.0	9.0	
t _{PHZ}	Output Disable Time	2.0	5.0	6.5	2.0	9.0	2.0	7.5	
t _{PLZ}		2.0	5.0	6.5	2.0	10.0	2.0	7.5	

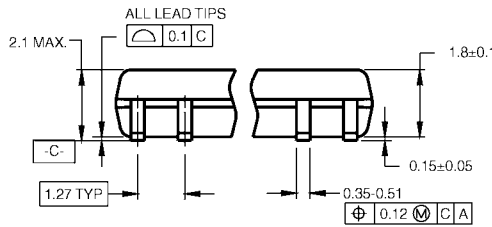


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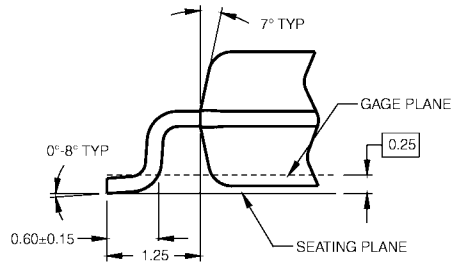
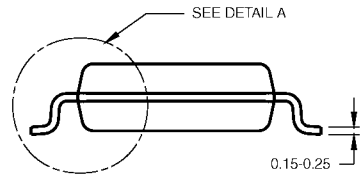
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



DETAIL A

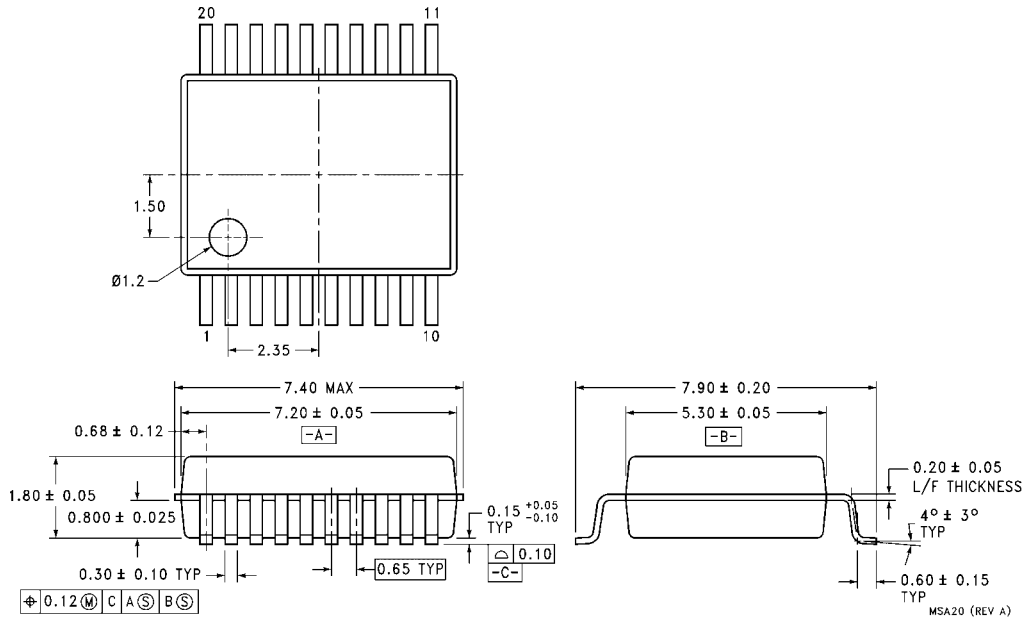
NOTES:

- 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**

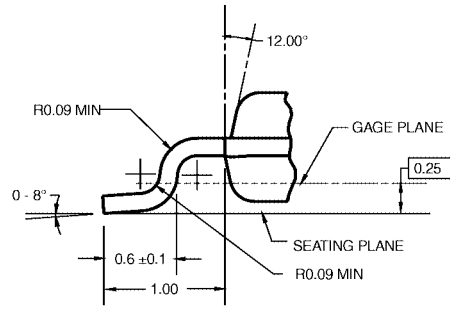
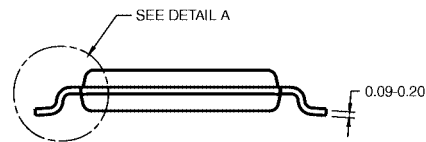
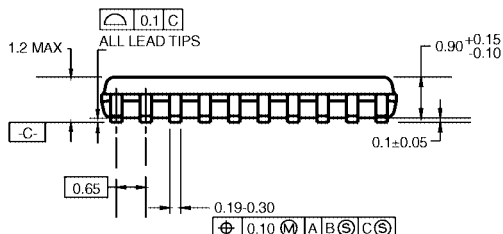
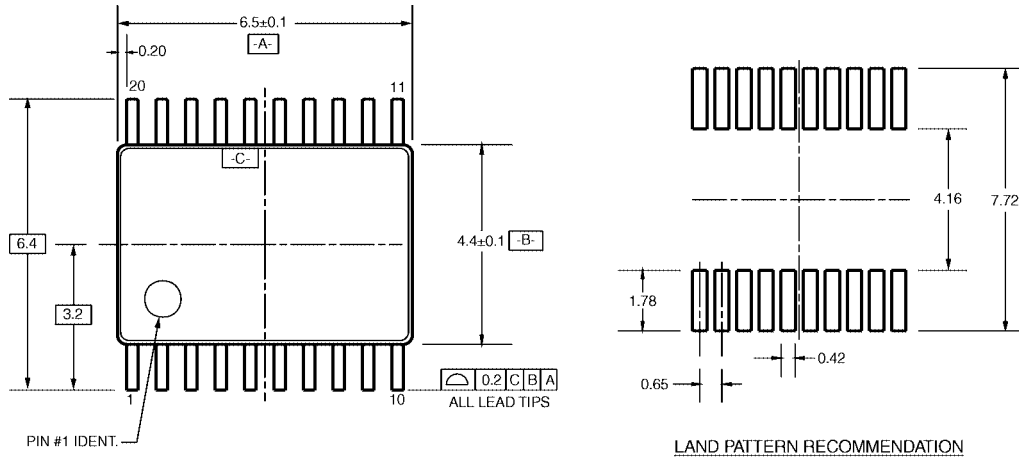
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



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

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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**

