

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

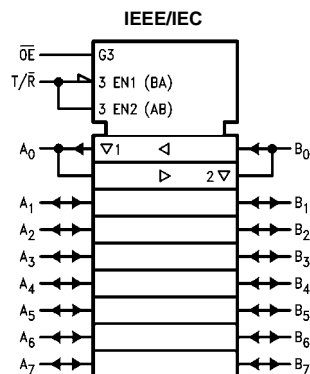
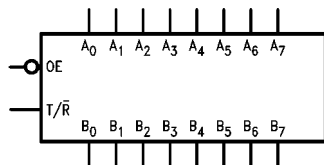
Ordering Code:

Order Number	Package Number	Package Description
74F245SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74F245SC_NL (Note 1)	M20B	Pb-Free 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74F245SJ	M20D	Pb-Free 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74F245MSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 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
74F245PC_NL (Note 1)	N20A	Pb-Free 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

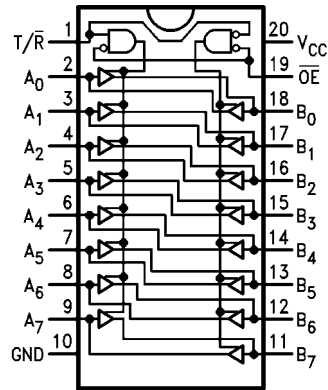
Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Note 1: "_NL" indicates Pb-Free package (per JEDEC J-STD-020B). Please use order number as indicated.

Logic Symbols



Connection Diagram



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 μ A/-1.2 mA
T/\overline{R}	Transmit/Receive Input	1.0/2.0	20 μ A/-1.2 mA
A_0-A_7	Side A Inputs or 3-STATE Outputs	3.5/1.083	70 μ A/-0.65 mA
B_0-B_7	Side B Inputs or 3-STATE Outputs	3.5/1.083	70 μ A/-0.65 mA
		600/106.6(80)	-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 2)

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 3)	-0.5V to +7.0V
Input Current (Note 3)	-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

Recommended Operating Conditions

Free Air Ambient Temperature	0°C to +70°C
Supply Voltage	+4.5V to +5.5V

Note 2: 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 3: Either voltage limit or current limit is sufficient to protect inputs.

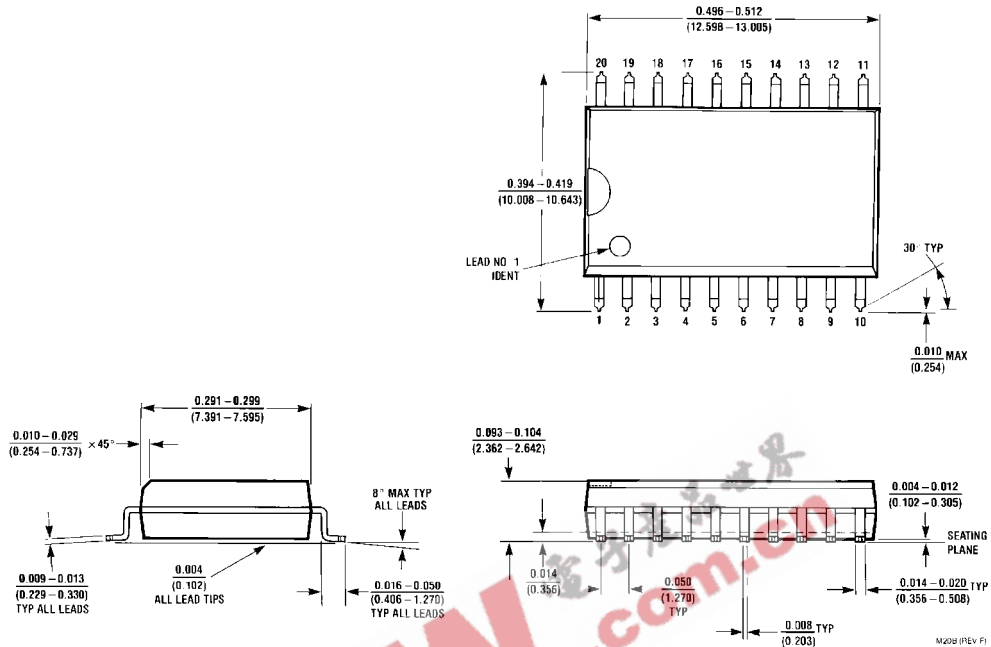
DC Electrical Characteristics

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 (\overline{OE} , \overline{TR})
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 _{IOD} = 150 mV All Other Pins Grounded
I _{IL}	Input LOW Current			-1.2	mA	Max	V _{IN} = 0.5V (\overline{TR} , \overline{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

AC Electrical Characteristics									
Symbol	Parameter	$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A = -55^\circ\text{C to } +125^\circ\text{C}$ $C_L = 50\text{ pF}$		$T_A = 0^\circ\text{C to } +70^\circ\text{C}$ $C_L = 50\text{ pF}$		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



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

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



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS

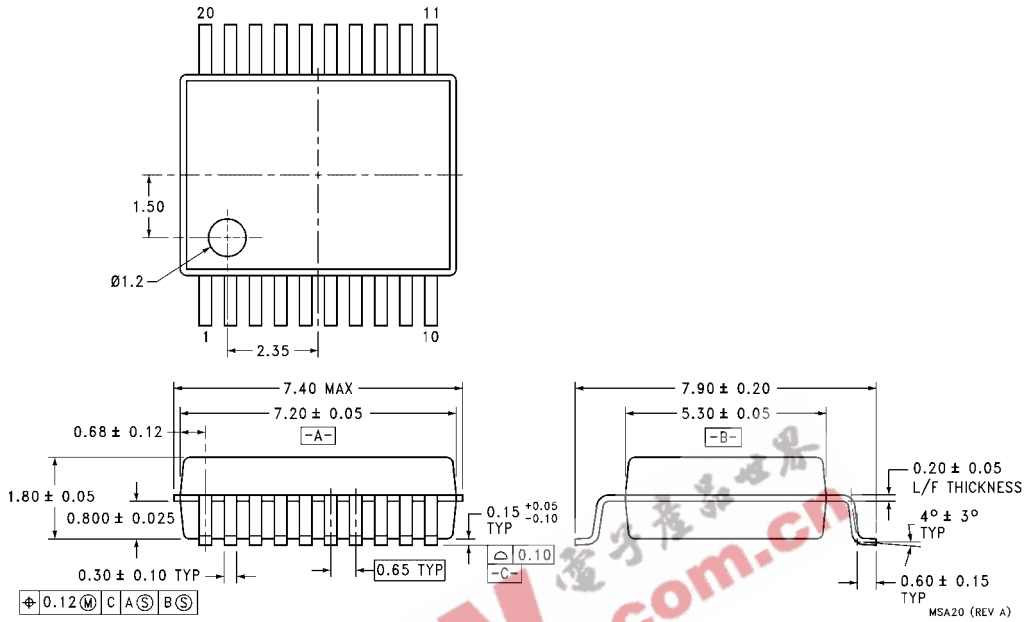
- NOTES:
- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1996.
 - B. DIMENSIONS ARE IN MILLIMETERS.
 - C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M20DRevB1

DETAIL A

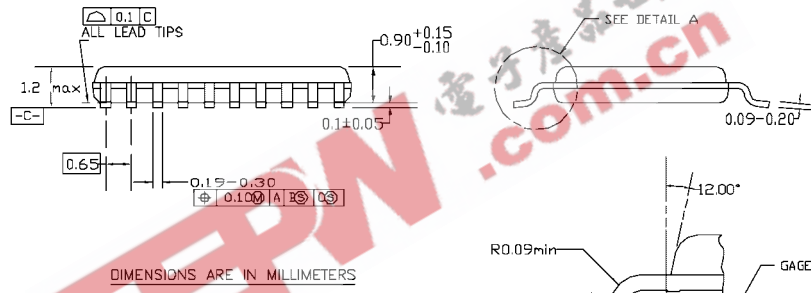
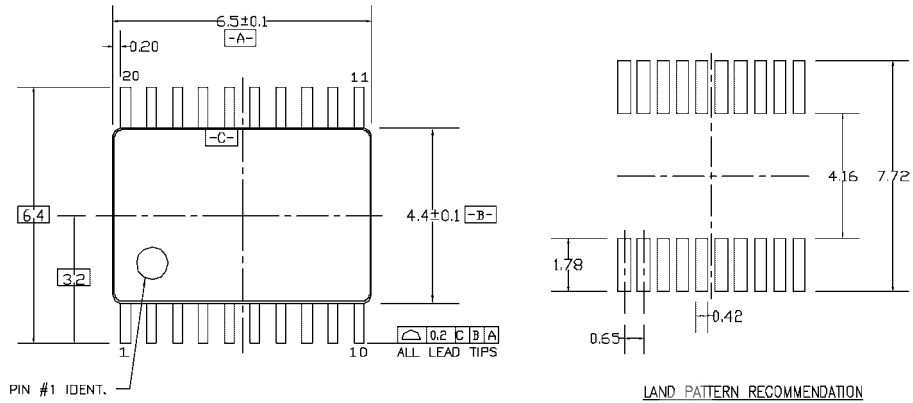
**Pb-Free 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M20D**

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



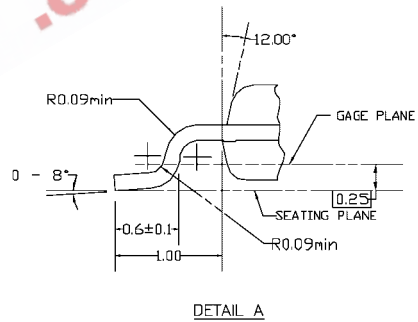
20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide
Package Number MSA20

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



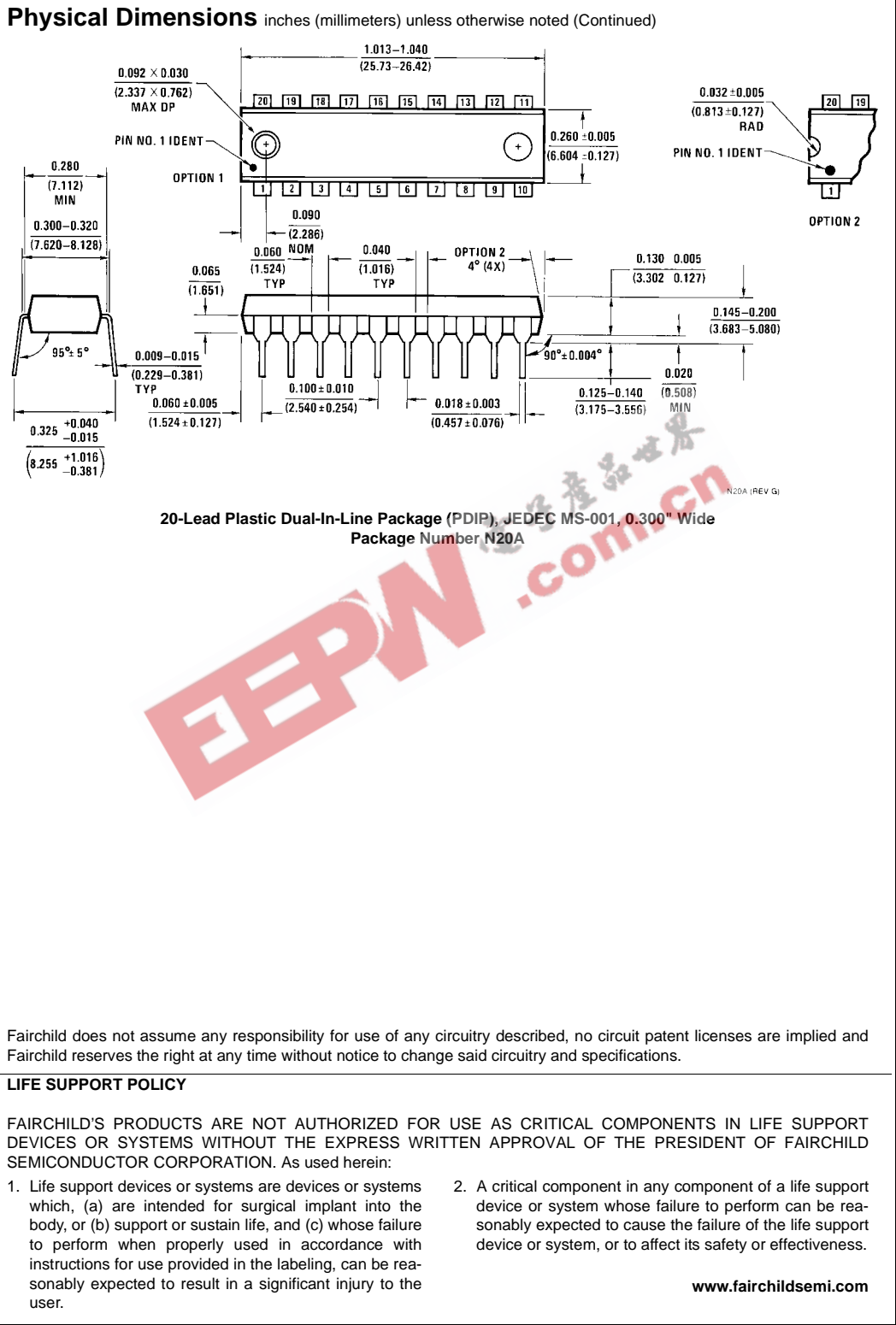
NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AC, REF NOTE 8, 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.



MTC20REV D1

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



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