

74F2245

Octal Bidirectional Transceiver with TRI-STATE® Outputs

General Description

The 'F2245 contains eight non-inverting bidirectional buffers with TRI-STATE outputs and is intended for bus-oriented applications. Current sinking capability is 24 mA at the A ports and 12 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.

The 25Ω series resistors in the outputs reduce ringing and eliminate the need for external resistors.

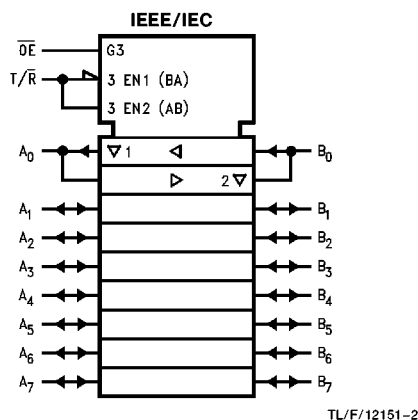
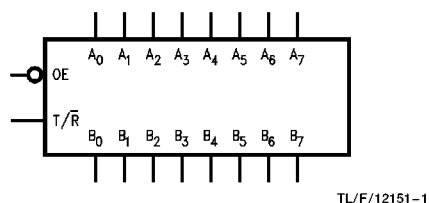
Features

- Non-inverting buffers
- Bidirectional data path
- A outputs sink 24 mA
- B outputs sink 12 mA
- 25Ω series resistors in B outputs eliminate the need for external resistors
- Guaranteed 2000V minimum ESD protection

Commercial	Package Number	Package Description
74F2245SC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC

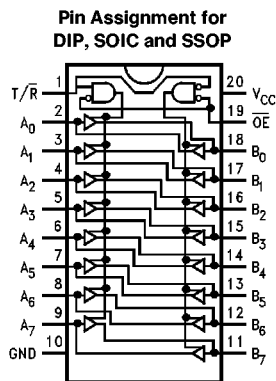
Note 1: Devices also available in 13" reel. Use suffix = SCX.

Logic Symbols



TRI-STATE® is a registered trademark of National Semiconductor Corporation.

Connection Diagram



Unit Loading/Fan Out

Pin Names	Description	74F	
		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 TRI-STATE Outputs	3.5/1.083 150/40(38.3)	70 μA / -0.65 mA -3 mA/24 mA
B_0-B_7	Side B Inputs or TRI-STATE Outputs	3.5/1.083 750/20	70 μA / -0.65 mA -15 mA/12 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)

Storage Temperature	−65°C to +150°C
Ambient Temperature under Bias	−55°C to +125°C
Junction Temperature under Bias Plastic	−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}
TRI-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.

Recommended Operating Conditions

Free Air Ambient Temperature
Commercial

0°C to +70°C

Supply Voltage
Commercial

+4.5V to +5.5V

DC Electrical Characteristics

Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
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} 10% V _{CC} 5% V _{CC}	2.4 2.0 2.7		V	Min	I _{OH} = −3 mA (A _n) I _{OH} = −15 mA (B _n) I _{OH} = −3 mA (A _n)
V _{OL}	Output LOW Voltage	10% V _{CC} 10% V _{CC} 10% V _{CC}		0.5 0.5 0.75	V	Min	I _{OL} = 24 mA (A _n) I _{OL} = 1 mA (B _n) I _{OL} = 12 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 ($\overline{OE}$, T/ $\overline{R}$)
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 _{IOD} = 150 mV All Other Pins Grounded
I _{IL}	Input LOW Current			−1.2	mA	Max	V _{IN} = 0.5V (T/ $\overline{R}$, $\overline{OE}$)
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)

DC Electrical Characteristics (Continued)

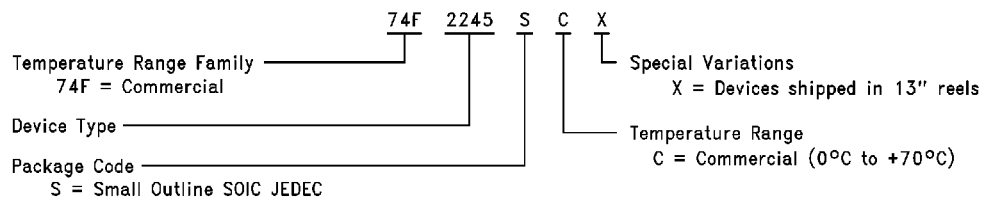
Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
I _{OS}	Output Short-Circuit Current	-60 -100		-150 -225	mA	Max	V _{OUT} = 0V (A _n) V _{OUT} = 0V (B _n)
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V(A _n , B _n)
I _{CCH}	Power Supply Current		70	90	mA	Max	V _O = HIGH
I _{CCL}	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

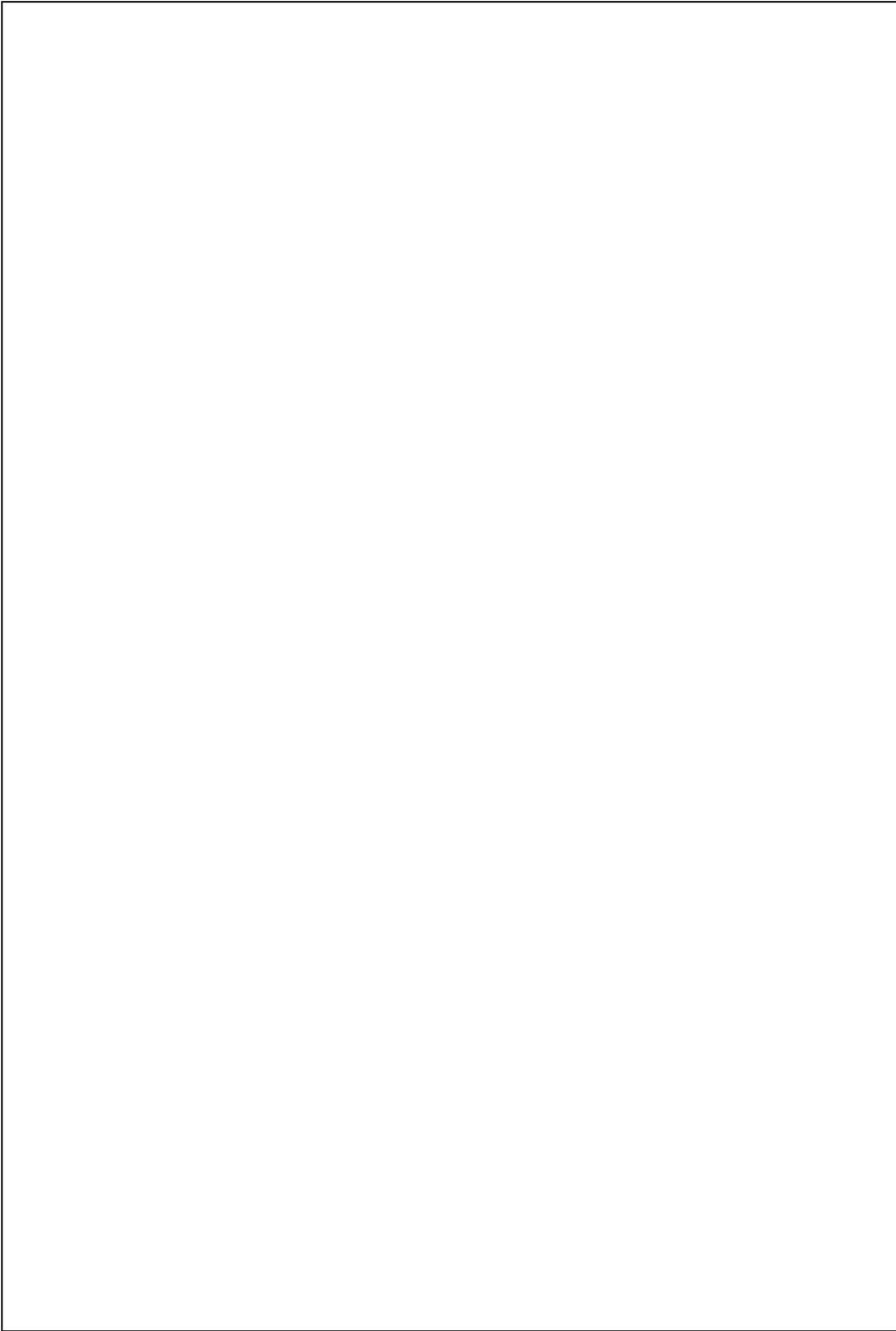
Symbol	Parameter	74F			74F		Units
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A, V_{CC} = \text{Com}$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	
t_{PLH}	Propagation Delay	2.5	4.2	6.5	2.0	7.5	ns
t_{PHL}	A_n to B_n or B_n to A_n	2.5	4.2	7.5	2.0	8.5	
t_{PZH}	Output Enable Time	3.0	5.3	8.0	2.5	9.0	ns
t_{PZL}		3.5	6.0	10.0	3.0	11.0	
t_{PHZ}	Output Disable Time	2.0	5.0	6.5	2.0	7.5	
t_{PLZ}		2.0	5.0	6.5	2.0	7.5	

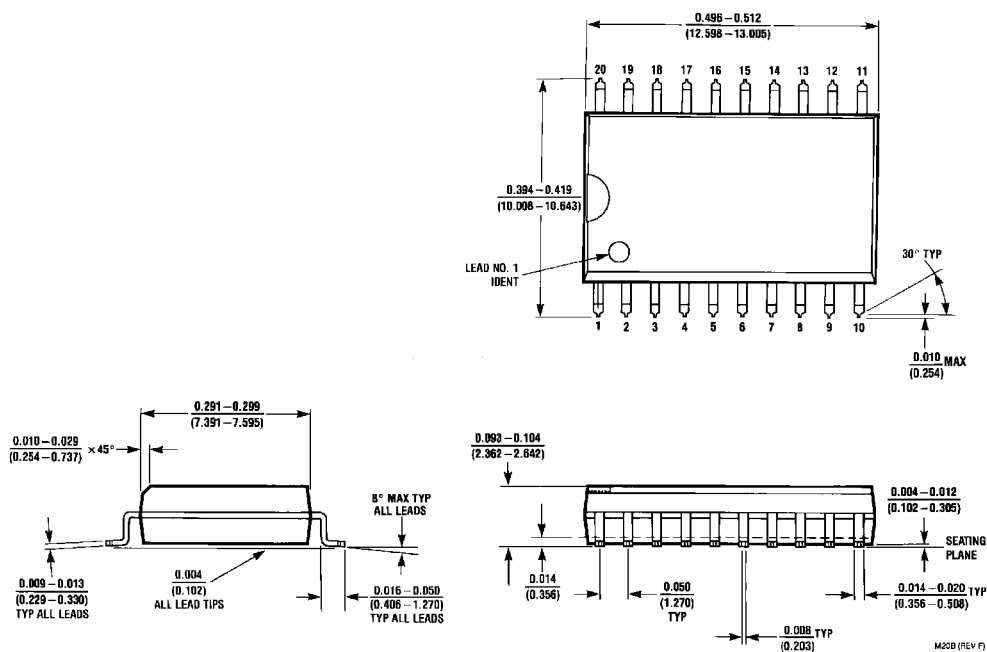
Ordering Information

The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:



TL/F/12151-4





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