

74F2245 Octal Bidirectional Transceiver with TRI-STATE® Outputs

General Description

The 74F2245 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/ $\bar{R}$) 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 25 Ω series resistors in the outputs reduce ringing and eliminate the need for external resistors.

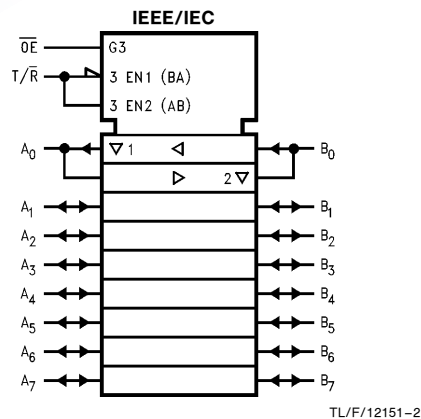
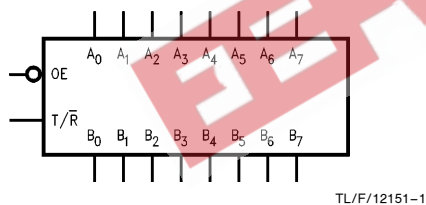
Features

- Non-inverting buffers
- Bidirectional data path
- A outputs sink 24 mA
- B outputs sink 12 mA
- 25 Ω 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

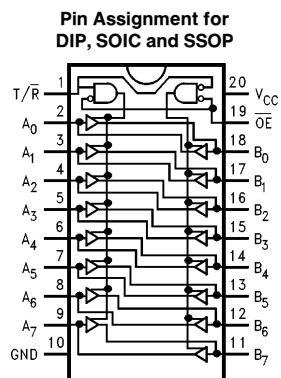
Note 1: Devices also available in 13" reel. Use suffix = SCX.

Logic Symbols



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Connection Diagram



TL/F/12151-3

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}	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}		0.5			I _{OL} = 1 mA (B _n)
		10% V _{CC}		0.75			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)

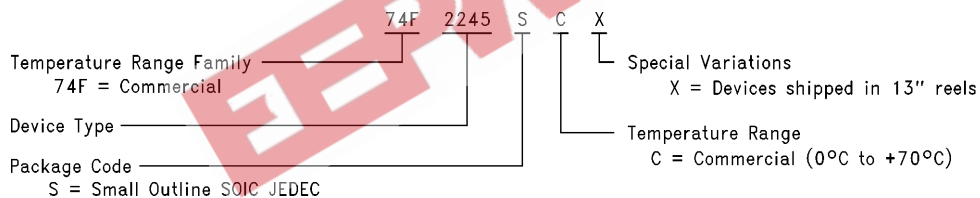
Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
I _{OS}	Output Short-Circuit Current	−60 −100		−150 −225	mA	Max	V _{OUT} = 0V (A _n) V _{OUT} = 0V (B _n)
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V(A _n , B _n)
I _{CC} H	Power Supply Current		70	90	mA	Max	V _O = HIGH
I _{CC} L	Power Supply Current		95	120	mA	Max	V _O = LOW
I _{CC} Z	Power Supply Current		85	110	mA	Max	V _O = HIGH Z

AC Electrical Characteristics

Symbol	Parameter	74F			74F		Units
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Com C _L = 50 pF		
		Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay A _n to B _n or B _n to A _n	2.5 2.5	4.2 4.2	6.5 7.5	2.0 2.0	7.5 8.5	ns
t _{PZH} t _{PZL}	Output Enable Time	3.0 3.5	5.3 6.0	8.0 10.0	2.5 3.0	9.0 11.0	ns
t _{PHZ} t _{PLZ}	Output Disable Time	2.0 2.0	5.0 5.0	6.5 6.5	2.0 2.0	7.5 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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2. A critical component is 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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