



752-31-00

54F/74F2243

Quad Bus Transceiver with 25Ω Series Resistors in the Outputs

General Description

The 'F2243 is a quad bus transmitter/receiver which can be used for 4-line asynchronous 2-way data communications between data busses. It is designed to drive the capacitive inputs of MOS memory drivers, address drivers, clock drivers, and bus-oriented transmitters/receivers.

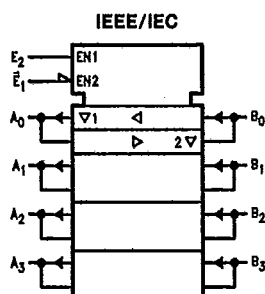
The 25Ω series resistors in the outputs reduce ringing and eliminate the need for external resistors.

Features

- 25Ω series resistors in outputs eliminate the need for external resistors
- 2-Way asynchronous data bus communication
- TRI-STATE® outputs
- 12 mA source current
- Designed to drive the capacitive inputs of MOS devices
- Guaranteed 4000V minimum ESD protection

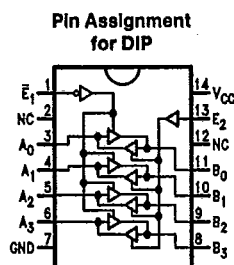
Ordering Code: See Section 5

Logic Symbol



TL/F/9530-1

Connection Diagram



TL/F/9530-2

Unit Loading/Fan Out: See Section 2 for U.L. definitions

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
$\bar{E}_1$	Enable Input (Active LOW)	1.0/1.67	20 μ A / -1 mA
E_2	Enable Input (Active HIGH)	1.0/1.67	20 μ A / -1 mA
A_n, B_n	Inputs	3.5/2.67	70 μ A / -1.6 mA
	Outputs	750/20	-15 mA / 12 mA

Truth Table

Inputs		Inputs/Outputs	
$\bar{E}_1$	E_2	A_n	B_n
L	L	Input	$B = A$
L	H	N/A	N/A
H	L	Z	Z
H	H	$A = B$	Input

H = HIGH Voltage Level
L = LOW Voltage Level
Z = High Impedance
N/A = Not Allowed

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Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias	-55°C to +175°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

Military
Commercial

Supply Voltage

Military
Commercial

T-52-31

-55°C to +125°C
0°C to +70°C

+4.5V to +5.5V
+4.5V to +5.5V

DC Electrical Characteristics

Symbol	Parameter	54F/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	54F 10% V _{CC}	2.4		V	Min	I _{OH} = -3 mA (A _n , B _n)
		54F 10% V _{CC}	2.0				I _{OH} = -12 mA (A _n , B _n)
		74F 10% V _{CC}	2.4				I _{OH} = -3 mA (A _n , B _n)
		74F 10% V _{CC}	2.0				I _{OH} = -15 mA (A _n , B _n)
		74F 5% V _{CC}	2.7				I _{OH} = -3 mA (A _n , B _n)
V _{OL}	Output LOW Voltage		0.50		V	Min	I _{OL} = 1 mA (A _n , B _n)
			0.75				I _{OL} = 12 mA (A _n , B _n)
I _{IH}	Input HIGH Current		20		μA	Max	V _{IN} = 2.7V (E ₁ , E ₂)
I _{BVI}	Input HIGH Current Breakdown Test		100		μA	Max	V _{IN} = 7.0V (E ₁ , E ₂)
I _{BVIT}	Input HIGH Current Breakdown Test (I/O)		1.0		mA	Max	V _{IN} = 5.5V (A _n , B _n)
I _{IL}	Input LOW Current		-1.0		mA	Max	V _{IN} = 0.5V (E ₁ , E ₂)
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		-1.6		mA	Max	V _{OUT} = 0.5V (A _n , B _n)
I _{OS}	Output Short-Circuit Current	-100	-225		mA	Max	V _{OUT} = 0V (A _n , B _n)
I _{CEX}	Output HIGH Leakage Current		250		μA	Max	V _{OUT} = V _{CC}
I _{CCH}	Power Supply Current	64	80		mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current	64	90		mA	Max	V _O = LOW
I _{CCZ}	Power Supply Current	71	90		mA	Max	V _O = HIGH Z

AC Electrical Characteristics: See Section 2 for Waveforms and Load Configurations

Symbol	Parameter	74F			54F		74F		Units	Fig. No.
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A, V_{CC} = \text{Mil}$ $C_L = 50\text{ pF}$		$T_A, V_{CC} = \text{Com}$ $C_L = 50\text{ pF}$			
		Min	Typ	Max	Min	Max	Min	Max		
t_{PLH} t_{PHL}	Propagation Delay A_n to B_n , B_n to A_n	1.5 2.5		7.0 8.0	1.5 2.0	7.0 8.0	1.5 2.0	7.0 8.0	ns	2-3
t_{pZH} t_{pZL}	Output Enable Time $\bar{E}_1$ to B_n , E_2 to A_n	1.5 2.5		9.0 11.5	1.0 2.5	9.5 12.0	1.0 2.5	9.5 12.0	ns	2-5
t_{PHZ} t_{PLZ}	Output Disable Time $\bar{E}_1$ to B_n , E_2 to A_n	1.5 1.5		9.0 8.5	1.0 1.5	9.5 9.5	1.0 1.5	9.5 9.5		