54F/74F588

## Octal Bidirectional Transceiver With 3-State Inputs/Outputs and IEEE-488 Termination Resistors

Description

The 'F588 contains eight non-inverting bidirectional buffers with 3-state outputs and is intended for bus-oriented applications. The B ports have termination resistors as specified in the IEEE-488 specifications. Current sinking capability is 20 mA at the A ports and 48mA at the B ports. The Transmit/Receive (T/$\overline{R}$) 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 impedance condition.
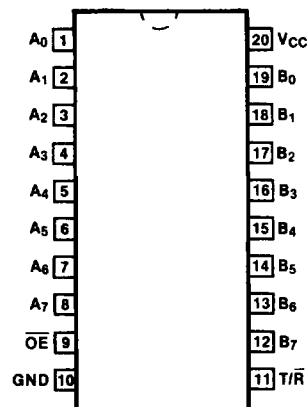
- **Non-Inverting Buffers**
- **Bidirectional Data Path**
- **B Outputs Sink 48 mA, Source 15 mA**
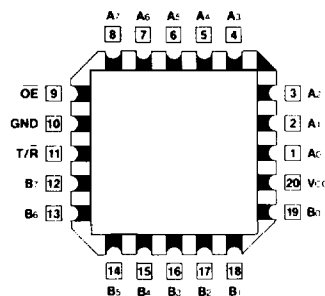
Ordering Code: See Section 5

Logic Symbol
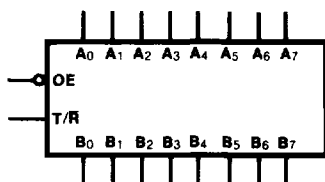
Connection Diagrams

Pin Assignment for DIP and SOIC

Pin Assignment for LCC and PCC

Input Loading/Fan-Out: See Section 3 for U.L. definitions

Pin Names	Description	54F/74F(U.L.) HIGH/LOW
$\overline{OE}$	Output Enable Input (Active LOW)	0.5/0.75
T/$\overline{R}$	Transmit/Receive Control Input	0.5/0.75
A_0-A_7	A Port Inputs or	1.75/0.406
	3-State Outputs	75/12.5
B_0-B_7	B Port Inputs or	T*/2.0
	3-State Outputs	75/15 (12.5)

*T = Resistive Termination per IEEE-488 Standard

Truth Table

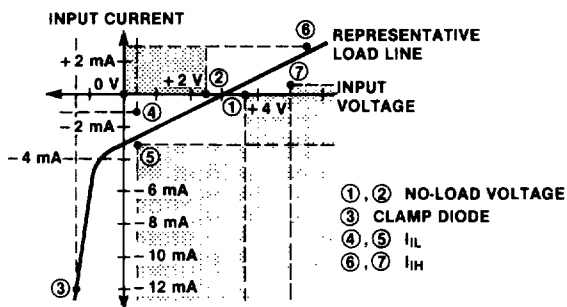| Inputs		Outputs
$\overline{\text{OE}}$	T/$\overline{\text{R}}$	
L	L	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	High Impedance

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Logic Diagram
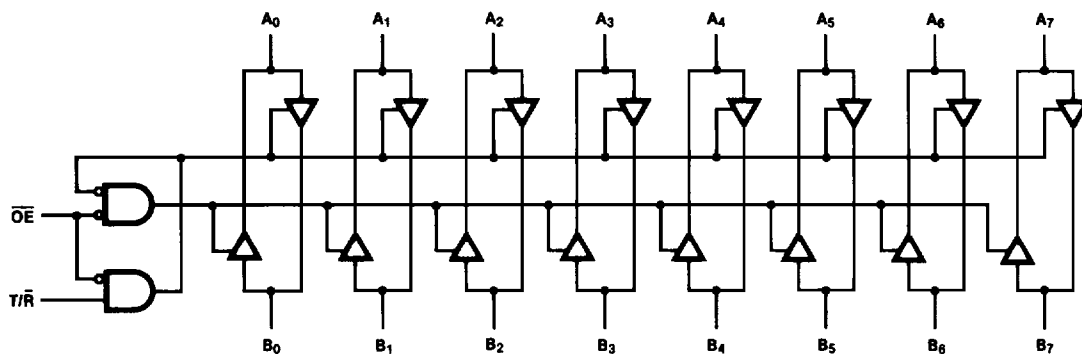
Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

B Port Input Characteristic with T/$\overline{\text{R}}$ LOW

① , ② NO-LOAD VOLTAGE
③ CLAMP DIODE
④ , ⑤ I_{IL}
⑥ , ⑦ I_{IH}

DC Characteristics over Operating Temperature Range (unless otherwise specified)

Symbol	Parameter		54F/74F			Units	Conditions	
			Min	Typ	Max			
V_{OH}	Output HIGH Voltage A_0-A_7, B_0-B_7		2.4			V	$I_{OH} = -3.0$ mA, $V_{CC} = $ Min $V_{IN} = V_{IH}$, $\overline{OE} = $ LOW $T/\overline{R} = $ HIGH	
V_{OL}	Output LOW Voltage B_0-B_7	XM			0.55	V	$I_{OL} = 48$ mA	$\overline{OE} = $ LOW
		XC					$I_{OL} = 64$ mA	$T/\overline{R} = $ HIGH
V_{NL}	No-load Voltage B_0-B_7		2.5[2]		3.7[1]	V	$T/\overline{R} = $ LOW, $I_{OUT} = 0$	
V_{CD}	Input Clamp Diode Voltage				-1.2[3]	V	$I_{IN} = -18$ mA $V_{CC} = $ Min	
I_{IH}	Input HIGH Current Breakdown Test, A_0-A_7				-1.0	mA	$V_{IN} = 5.5$ V	
I_{IH}	Input HIGH Current B_0-B_7		0.7[7]		2.5[6]	mA	$V_{IN} = 5.0$ V, $T/\overline{R} = $ LOW $V_{IN} = 5.5$ V, $T/\overline{R} = $ LOW	
I_{IL}	Input LOW Current B_0-B_7		1.3		3.2[5]	mA	$V_{IN} = 0.4$ V, $T/\overline{R} = $ LOW	
$I_{IH} + I_{OZH}$	3-State Output OFF Current HIGH, A_0-A_7				70	μA	$V_{IN} = 2.7$ V, $T/\overline{R} = $ LOW $V_{CC} = $ Max	
I_{CCH} I_{CCL} I_{CCZ}	Power Supply Current			67 90 83	100 135 125	mA	$\overline{OE} = $ LOW, $V_{CC} = $ Max $A_n = $ LOW, $T/\overline{R} = $ HIGH $\overline{OE} = $ HIGH, $V_{CC} = $ Max	

AC Characteristics: See Section 3 for waveforms and load configurations

Symbol	Parameter	54F/74F $T_A = +25°C$ $V_{CC} = +5.0$ V $C_L = 50$ pF			54F T_A, $V_{CC} = $ Mil $C_L = 50$ pF		74F T_A, $V_{CC} = $ Com $C_L = 50$ pF		Units	Fig. No.
		Min	Typ	Max	Min	Max	Min	Max		
t_{PLH} t_{PHL}	Propagation Delay A to B or B to A	2.5 2.5	4.5 5.0	6.0 6.5			2.5 2.5	7.0 7.5	ns	3-1 3-4
t_{PZH} t_{PZL}	Output Enable Time $T/\overline{R}$ or $\overline{OE}$ to A or B	2.5 2.5	5.0 7.0	7.0 9.0			2.5 2.5	8.0 10.0	ns	3-1 3-2 3-13
t_{PHZ} t_{PLZ}	Output Disable Time $T/\overline{R}$ or $\overline{OE}$ to A or B	2.5 2.5	5.5 5.5	7.0 7.0			2.5 2.5	8.0 8.0		