

54F/74F588

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

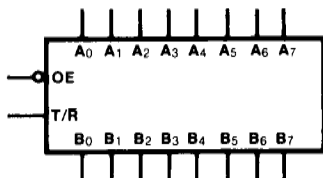
Description

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/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.

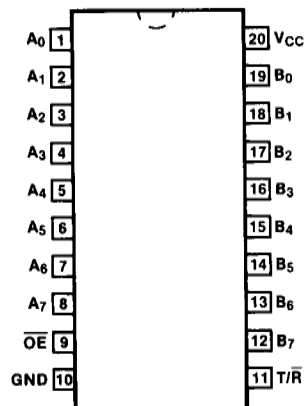
- Non-Inverting Buffers
- Bidirectional Data Path
- B Outputs Sink 48 mA, Source 15 mA

Ordering Code: See Section 5

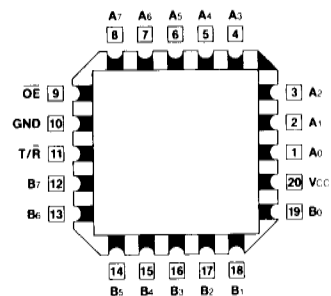
Logic Symbol



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

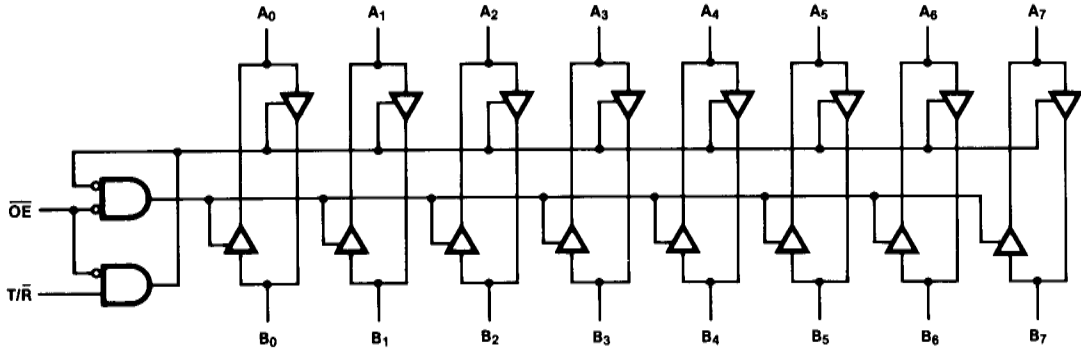
| Pin Names | Description | 54F/74F(U.L.) HIGH/LOW |
|--------------------------------|-------------------------------------|---------------------------|
| OE | Output Enable Input (Active LOW) | 0.5/0.75 |
| T/R | Transmit/Receive Control Input | 0.5/0.75 |
| A ₀ -A ₇ | A Port Inputs or 3-State Outputs | 1.75/0.406 75/12.5 |
| B ₀ -B ₇ | B Port Inputs or 3-State Outputs | T*/2.0 75/15 (12.5) |

*T = Resistive Termination per IEEE-488 Standard

Truth Table

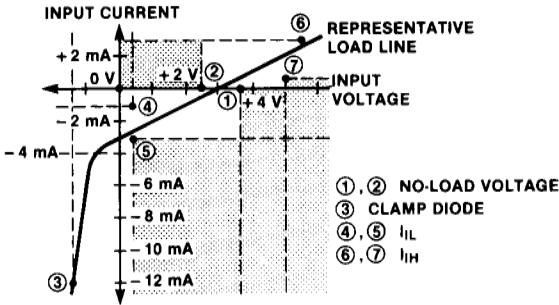
| Inputs | | Outputs |
|-----------------|-------------------|---------------------|
| \overline{OE} | T/ \overline{R} | |
| L | L | Bus B Data to Bus A |
| L | H | Bus A Data to Bus B |
| H | X | High Impedance |

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{R} LOW



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, $V_{CC} = \text{Min}$ $V_{IN} = V_{IH}$, $\overline{OE} = \text{LOW}$ $T/\overline{R} = \text{HIGH}$ | |
| V_{OL} | Output LOW Voltage | XM | 0.55 | | | V | $I_{OL} = 48$ mA | $\overline{OE} = \text{LOW}$ |
| | B_0 - B_7 | XC | | | | | $I_{OL} = 64$ mA | $T/\overline{R} = \text{HIGH}$ |
| V_{NL} | No-load Voltage B_0 - B_7 | | 2.5 ² | 3.7 ¹ | | V | $T/\overline{R} = \text{LOW}$, $I_{OUT} = 0$ | |
| V_{CD} | Input Clamp Diode Voltage | | -1.2 ³ | | | V | $I_{IN} = -18$ mA $V_{CC} = \text{Min}$ | |
| 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, $T/\overline{R} = \text{LOW}$ $V_{IN} = 5.5$ V, $T/\overline{R} = \text{LOW}$ | |
| I_{IL} | Input LOW Current B_0 - B_7 | | 1.3 | 3.2 ⁵ | | mA | $V_{IN} = 0.4$ V, $T/\overline{R} = \text{LOW}$ | |
| $I_{IH} + I_{OZH}$ | 3-State Output OFF Current HIGH, A_0 - A_7 | | 70 | | | μA | $V_{IN} = 2.7$ V, $T/\overline{R} = \text{LOW}$ $V_{CC} = \text{Max}$ | |
| I_{CCH} I_{CCL} I_{CCZ} | Power Supply Current | | | 67 90 83 | 100 135 125 | mA | $\overline{OE} = \text{LOW}$, $V_{CC} = \text{Max}$ $A_n = \text{LOW}$, $T/\overline{R} = \text{HIGH}$ $\overline{OE} = \text{HIGH}$, $V_{CC} = \text{Max}$ | |

AC Characteristics: See Section 3 for waveforms and load configurations

| Symbol | Parameter | 54F/74F | | | 54F | | 74F | | Units | Fig. No. |
|------------------------|--|---|------------|------------|--|-----|--|-------------|-------|--------------------|
| | | $T_A = +25^\circ\text{C}$ $V_{CC} = +5.0$ V $C_L = 50$ pF | | | T_A , $V_{CC} = \text{Mil}$ $C_L = 50$ pF | | T_A , $V_{CC} = \text{Com}$ $C_L = 50$ pF | | | |
| | | 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 | | |