

74F545 Octal Bidirectional Transceiver with 3-STATE Outputs

General Description

The 74F545 is an 8-bit, 3-STATE, high-speed transceiver. It provides bidirectional drive for bus-oriented microprocessor and digital communications systems. Straight through bidirectional transceivers are featured, with 24 mA bus drive capability on the A Ports and 64 mA bus drive capability on the B Ports.

One input, Transmit/Receive (T/\bar{R}) determines the direction of logic signals through the bidirectional transceiver. Transmit enables data from A-to-B Ports; Receive enables data from B-to-A Ports. The Output Enable input disables both A and B Ports by placing them in a 3-STATE condition.

Features

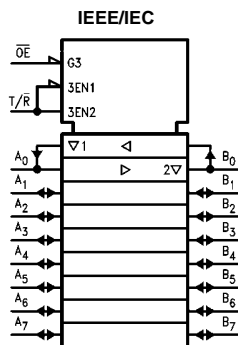
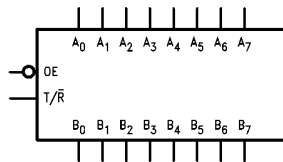
- Higher drive than 8304
- 8-bit bidirectional data flow reduces system package count
- 3-STATE inputs/outputs for interfacing with bus-oriented systems
- 24 mA and 64 mA bus drive capability on A and B Ports, respectively
- Transmit/Receive and Output Enable simplify control logic
- Guaranteed 4000V minimum ESD protection

Ordering Code:

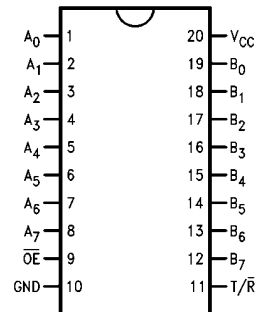
| Order Number | Package Number | Package Description |
|--------------|----------------|---|
| 74F545SC | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| 74F545PC | N20A | 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbols



Connection Diagram



Unit Loading/Fan Out

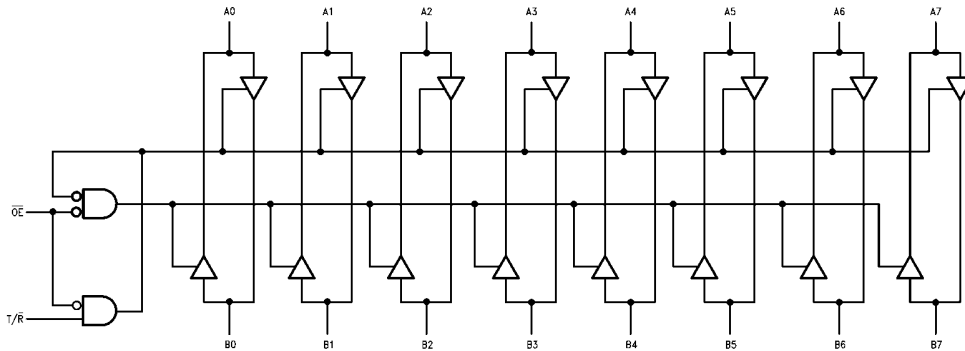
| Pin Names | Description | U.L. | |
|------------------|---|-----------------------------|---|
| | | HIGH/LOW | Input I_{IH}/I_{IL} Output I_{OH}/I_{OL} |
| \overline{OE} | Output Enable Input (Active LOW) | 1.0/2.0 | 20 μ A/-1.2 mA |
| T/\overline{R} | Transmit/Receive Input | 1.0/2.0 | 20 μ A/-1.2 mA |
| A_0-A_7 | Side A 3-STATE Inputs or 3-STATE Outputs | 3.5/1.083 150/40 (33.3) | 70 μ A/-650 μ A -3 mA/24 mA (20 mA) |
| B_0-B_7 | Side B 3-STATE Inputs or 3-STATE Outputs | 3.5/1.083 600/106.6 (80) | 70 μ A/-650 μ A -12 mA/64 mA (48 mA) |

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 Z |

H = HIGH Voltage Level
 L = LOW Voltage Level
 X = Immaterial
 Z = 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.

| Absolute Maximum Ratings ^(Note 1) | | Recommended Operating Conditions | |
|--|--------------------------------------|----------------------------------|----------------|
| Storage Temperature | -65°C to +150°C | Free Air Ambient Temperature | 0°C to +70°C |
| Ambient Temperature under Bias | -55°C to +125°C | Supply Voltage | +4.5V to +5.5V |
| Junction Temperature under Bias | -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} | | |
| 3-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.

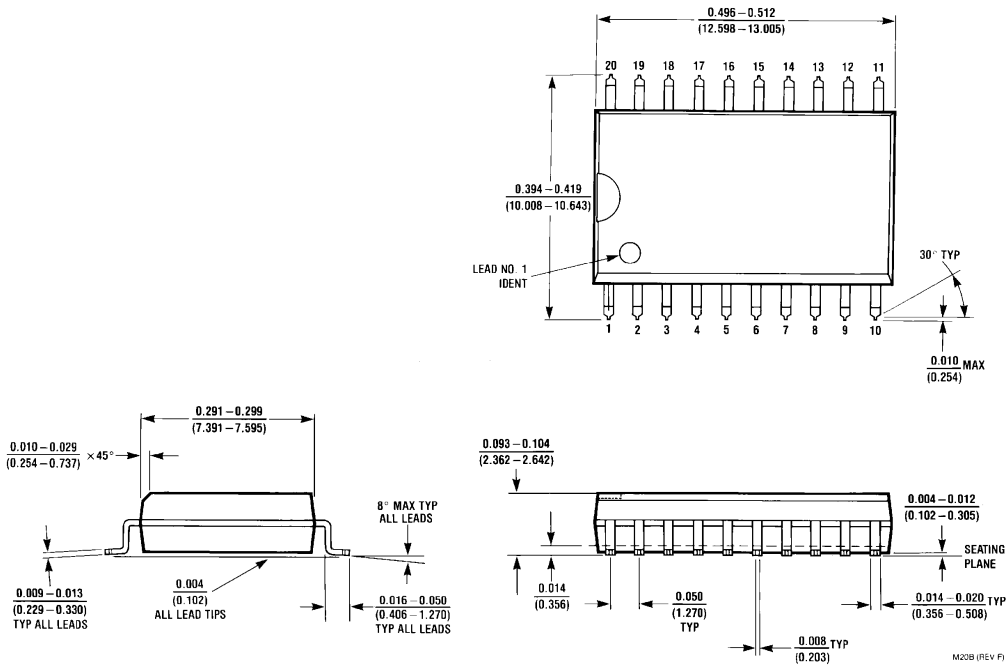
DC Electrical Characteristics

| Symbol | Parameter | Min | Typ | Max | Units | V _{CC} | Conditions |
|------------------------------------|------------------------------------|---|---------------------------------|--------------|-------|-----------------|--|
| 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 (\overline{OE} , $\overline{T/R}$) |
| V _{OH} | Output HIGH Voltage | 10% V _{CC} 10% V _{CC} 10% V _{CC} 5% V _{CC} 5% V _{CC} | 2.5 2.4 2.0 2.7 2.7 | | V | Min | I _{OH} = -1 mA (A _n) I _{OH} = -3 mA (A _n) I _{OH} = -15 mA (B _n) I _{OH} = -1 mA (A _n) I _{OH} = -3 mA (A _n) |
| V _{OL} | Output LOW Voltage | 10% V _{CC} 10% V _{CC} | | 0.5 0.55 | V | Min | I _{OL} = 24 mA (A _n) I _{OL} = 64 mA (B _n) |
| I _{IH} | Input HIGH Current | | | 5.0 | μA | Max | V _{IN} = 2.7V (\overline{OE} , $\overline{T/R}$) |
| I _{BVI} | Input HIGH Current Breakdown Test | | | 7.0 | μA | Max | V _{IN} = 7.0V (\overline{OE} , $\overline{T/R}$) |
| I _{BVIT} | Input HIGH Current Breakdown (I/O) | | | 0.5 | mA | Max | V _{IN} = 5.5V (A _n , B _n) |
| I _{CEX} | Output HIGH Leakage Current | | | 50 | μA | Max | V _{OUT} = V _{CC} |
| 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 (\overline{OE} , $\overline{T/R}$) |
| 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) |
| 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 |
| 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 | T _A = +25°C V _{CC} = +5.0V C _L = 50 pF | | | T _A = -55°C to +125°C V _{CC} = +5.0V C _L = 50 pF | | T _A = 0°C to +70°C V _{CC} = +5.0V C _L = 50 pF | | Units |
|------------------|--|---|-----|-----|---|------|--|-----|-------|
| | | Min | Typ | Max | Min | Max | Min | Max | |
| t _{PLH} | Propagation Delay | 2.5 | 4.2 | 6.0 | 2.0 | 7.5 | 2.5 | 7.0 | ns |
| t _{PHL} | A _n to B _n or B _n to A _n | 2.5 | 4.6 | 6.0 | 2.0 | 7.5 | 2.5 | 7.0 | |
| t _{PZH} | Output Enable Time | 3.0 | 5.3 | 7.0 | 2.5 | 9.0 | 3.0 | 8.0 | ns |
| t _{PZL} | | 3.5 | 6.0 | 8.0 | 3.0 | 10.0 | 3.5 | 9.0 | |
| t _{PHZ} | Output Disable Time | 3.0 | 5.0 | 6.5 | 2.5 | 9.0 | 3.0 | 7.5 | |
| t _{PLZ} | | 2.0 | 5.0 | 6.5 | 2.0 | 10.0 | 2.0 | 7.5 | |

Physical Dimensions inches (millimeters) unless otherwise noted



**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
Package Number M20B**

