

74F2645

Octal Bus Transceiver with 25Ω Series Resistors in the Outputs

General Description

This device is an octal bus transceiver designed for asynchronous two-way data flow between the A and B busses and is functionally equivalent to the 'F645. The 25Ω series resistors in the outputs reduce ringing and eliminate the need for external resistors. Both busses are capable of sinking 12 mA, sourcing 15 mA, have TRI-STATE outputs, and a common output enable pin. The direction of data flow is determined by the transmit/receive (T/ \bar{R}) input. The 'F2645 is a low power version of the 'F245 with 25Ω series resistors in the outputs.

Features

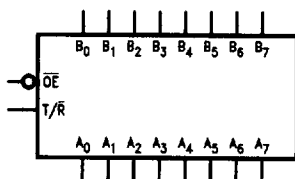
- 25Ω series resistors in the outputs eliminates the need for external resistors
- Designed for asynchronous two-way data flow between busses
- Outputs sink 12 mA and source 15 mA
- Transmit/receive (T/ \bar{R}) input controls the direction of data flow
- Guaranteed 4000V minimum ESD protection
- 'F2645 is a low power version of the 'F245 with 25Ω series resistors in the outputs

Ordering Code: See Section 11

| Commercial | Package Number | Package Description |
|--------------------|----------------|---|
| 74F2645SC (Note 1) | M20B | 20-Lead (0.300" Wide) Molded Small Outline, JEDEC |

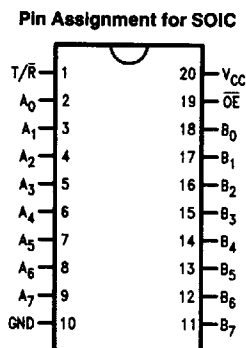
Note 1: Devices also available in 13" reel. Use suffix = SCX.

Logic Symbol



TL/F/10629-1

Connection Diagram



TL/F/10629-2

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

| Pin Names | Description | 74F | |
|--------------------------------|------------------------------------|---------------|---|
| | | U.L. HIGH/LOW | Input I_{IH}/I_{IL} Output I_{OH}/I_{OL} |
| $\bar{O}E$ | Output Enable Input (Active LOW) | 1.0/1.0 | 20 μ A/ -0.6 mA |
| T/ \bar{R} | Transmit/Receive Input | 1.0/1.0 | 20 μ A/ -0.6 mA |
| A ₀ -A ₇ | Side A Inputs or TRI-STATE Outputs | 3.5/0.667 | 70 μ A/ -0.4 mA -15 mA/12 mA |
| B ₀ -B ₇ | Side B Inputs or TRI-STATE Outputs | 3.5/0.667 | 70 μ A/ -0.4 mA -15 mA/12 mA |

Functional Description

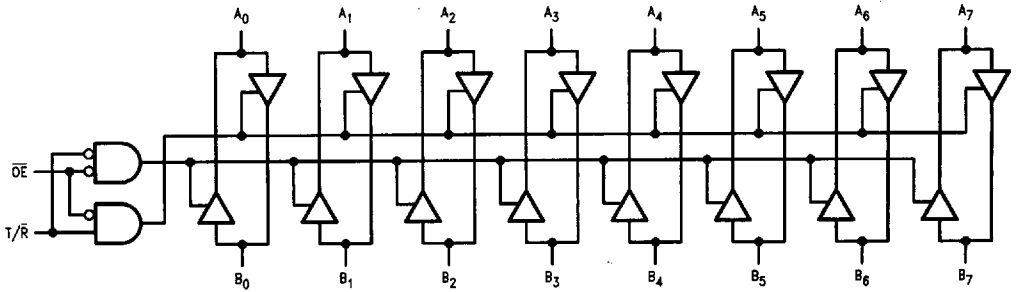
The output enable (\overline{OE}) is active LOW. If the device is disabled (\overline{OE} HIGH), the outputs are in the high impedance state. The transmit/receive input (T/\overline{R}) controls whether data is transmitted from the A bus to the B bus or from the B bus to the A bus. When T/\overline{R} is LOW, B data is sent to the A bus. If T/\overline{R} is HIGH, A data is sent to the B bus.

Function 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 | Z |

H = High voltage level
 L = Low voltage level
 X = Don't care
 Z = High-impedance state

Logic Diagram



TL/F/10629-6

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 +175°C -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

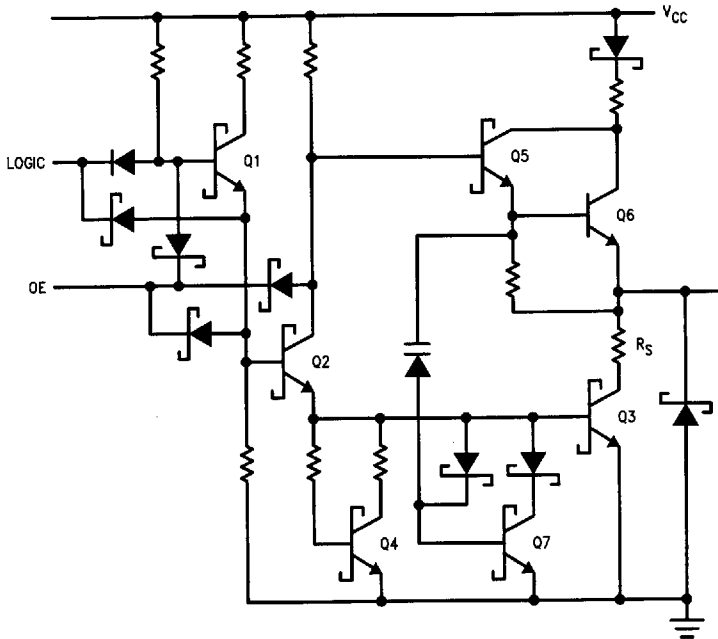
| | |
|------------------------------|----------------|
| Free Air Ambient Temperature | |
| Commercial | 0°C to +70°C |
| Supply Voltage | |
| Commercial | +4.5V to +5.5V |

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 (Non I/O Pins) |
| V _{OH} | Output HIGH Voltage | 74F 10% V _{CC} | 2.0 | | V | Min | I _{OH} = -15 mA (A _n , B _n) |
| V _{OL} | Output LOW Voltage | 74F 10% V _{CC} 74F 10% V _{CC} | | 0.50 0.75 | V | Min | I _{OL} = 1 mA (A _n , B _n) I _{OL} = 12 mA (A _n , B _n) |
| I _{IH} | Input HIGH Current | 74F | | 5.0 | μA | Max | V _{IN} = 2.7V (Non I/O Pins) |
| I _{BVI} | Input HIGH Current Breakdown Test | 74F | | 7.0 | μA | Max | V _{IN} = 7.0V (Non I/O Pins) |
| I _{BVIT} | Input HIGH Current Breakdown (I/O) | 74F | | 0.5 | mA | Max | V _{IN} = 5.5V (A _n , B _n) |
| I _{CEX} | Output HIGH Leakage Current | 74F | | 50 | μA | Max | V _{OUT} = V _{CC} |
| V _{ID} | Input Leakage Test | 74F | 4.75 | | V | 0.0 | I _{ID} = 1.9 μA All Other Pins Grounded |
| I _{OD} | Output Leakage Circuit Current | 74F | | 3.75 | μA | 0.0 | V _{IOD} = 150 mV All Other Pins Grounded |
| I _{IL} | Input LOW Current | | | -0.6 | mA | Max | V _{IN} = 0.5V (Non I/O Pins) |
| 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 | | -100 | -225 | mA | Max | V _{OUT} = 0V |
| I _{ZZ} | Bus Drainage Test | | | 500 | μA | 0.0V | V _{OUT} = 5.25 |
| I _{CCL} | Power Supply Current (*F2645) | | | 82 | mA | Max | V _O = LOW, V _{IN} = 0.2V |
| I _{CCZ} | Power Supply Current (*F2645) | | | 95 | mA | Max | V _O = HIGH Z |

'F2645 AC Electrical Characteristics: See Section 2 for Waveforms and Load Configurations

| Symbol | Parameter | 74F | | | 74F | | Units | Fig. No. |
|--------------------------------------|--|---|-----|------------|--|------------|-------|----------|
| | | 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 Input to B Output | 1.5 2.5 | | 6.0 7.5 | 1.5 2.5 | 7.0 8.0 | ns | 2-3 |
| t _{PLH} t _{PHL} | Propagation Delay B Input to A Output | 1.5 2.5 | | 6.0 7.5 | 1.5 2.5 | 7.0 8.0 | ns | 2-3 |
| t _{PZH} t _{PZL} | Enable Time OE Input to A Output | 2.5 2.5 | | 8.0 8.5 | 2.0 2.0 | 9.0 8.5 | ns | 2-5 |
| t _{PHZ} t _{PLZ} | Disable Time OE Input to A Output | 1.5 1.0 | | 7.0 5.5 | 1.0 1.0 | 8.0 5.5 | | |
| t _{PZH} t _{PZL} | Enable Time OE Input to B Output | 2.5 2.5 | | 7.5 8.5 | 2.0 2.5 | 9.5 9.0 | ns | 2-5 |
| t _{PHZ} t _{PLZ} | Disable Time OE Input to B Output | 1.5 1.0 | | 6.5 6.5 | 1.0 1.0 | 7.5 6.5 | | |

Basic FAST Circuit Showing Series Resistor Placement

TL/F/10629-7