



## M8286/M8287 OCTAL BUS TRANSCEIVER

*Military*

- Data Bus Buffer Drive for Military M8086, M8088, M80186, M8085A, and M8048AH Processors
- High Output Drive Capability for Driving System Data Bus
- Fully Parallel 8-Bit Transceivers
- 3-State Outputs
- No Output Low Noise When Entering or Leaving High Impedance State
- Military Temperature Range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  ( $T_C$ )

The M8286 and M8287 are 8-bit bipolar transceivers with 3-state outputs. The M8287 inverts the input data at its outputs while the M8286 does not. Thus, a wide variety of applications for buffering in microcomputer systems can be met.

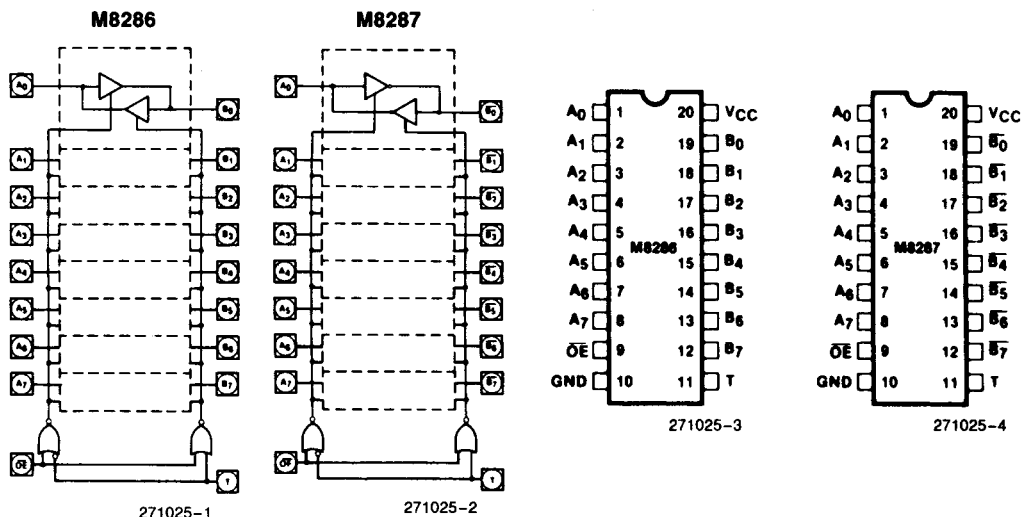


Figure 1. Logic Diagrams

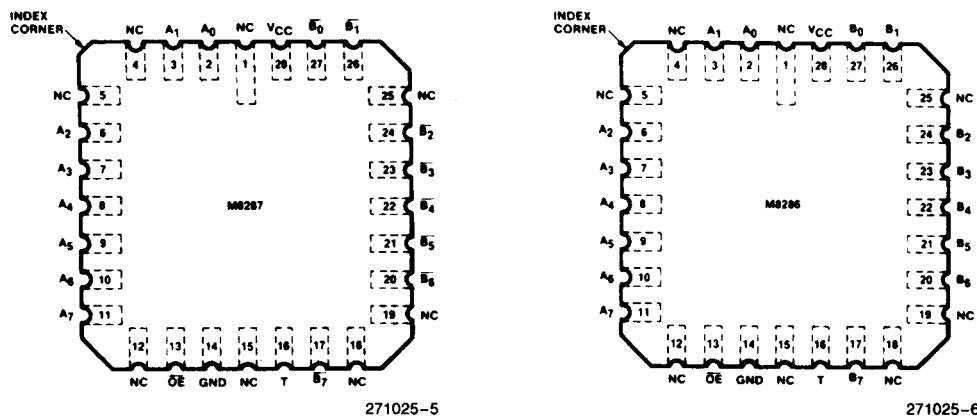


Figure 2. Pin Configurations



Table 1. Pin Description

| Symbol   | Type | Name and Function  |
|--|------|--|
| T  | I    | <b>TRANSMIT:</b> T is an input control signal used to control the direction of the transceivers. When HIGH, it configures the transceiver's B <sub>0</sub> -B <sub>7</sub> as outputs with A <sub>0</sub> -A <sub>7</sub> as inputs. T LOW configures A <sub>0</sub> -A <sub>7</sub> as the outputs with B <sub>0</sub> -B <sub>7</sub> serving as the inputs. |
| $\overline{OE}$  | I    | <b>OUTPUT ENABLE:</b> $\overline{OE}$ is an input control signal used to enable the appropriate output driver (as selected by T) onto its respective bus. This signal is active LOW.   |
| A <sub>0</sub> -A <sub>7</sub>   | I/O  | <b>LOCAL BUS DATA PINS:</b> These pins serve to either present data to or accept data from the processor's local bus depending upon the state of the T pin.  |
| B <sub>0</sub> -B <sub>7</sub> (M8286)<br>B <sub>0</sub> -B <sub>7</sub> (M8287) | I/O  | <b>SYSTEM BUS DATA PINS:</b> These pins serve to either present data to or accept data from the system bus depending upon the state of the T pin.  |

**FUNCTIONAL DESCRIPTION**

The M8286 and M8287 transceivers are 8-bit transceivers with high impedance outputs. With T active HIGH and  $\overline{OE}$  active LOW, data at the A<sub>0</sub>-A<sub>7</sub> pins

is driven onto the B<sub>0</sub>-B<sub>7</sub> pins. With T inactive LOW and  $\overline{OE}$  active LOW data at the B<sub>0</sub>-B<sub>7</sub> pins is driven onto the A<sub>0</sub>-A<sub>7</sub> pins. No output low glitching will occur whenever the transceivers are entering or leaving the high impedance state.

**ABSOLUTE MAXIMUM RATINGS\***

Case Temperature Under Bias<sup>(2)</sup>. -55°C to +125°C  
 Storage Temperature ..... -65°C to +150°C  
 All Output and Supply Voltages ..... -0.5V to +7V  
 All Input Voltages..... -1.0V to +5.5V  
 Power Dissipation.....1.0W

*\*Notice: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

**D.C. CHARACTERISTICS** V<sub>CC</sub> = 5V ± 5%. T<sub>C</sub><sup>(2)</sup> = -55°C to +125°C

| Symbol                               | Parameter                                | Min                        | Max                              | Units | Test Conditions  |
|--------------------------------------|--|----------------------------|----------------------------------|-------|--|
| V <sub>C</sub>                       | Input Clamp Voltage                      |                            | -1                               | V     | I <sub>C</sub> = -5 mA   |
| I <sub>CC</sub>                      | Power Supply Current                     | M8287                      | 130                              | mA    |  |
|                                      |  | M8286                      | 160                              | mA    |  |
| I <sub>F</sub>                       | Forward Input Current                    |                            | -0.2                             | mA    | V <sub>F</sub> = 0.45V   |
| I <sub>R</sub>                       | Reverse Input Current                    |                            | 50                               | μA    | V <sub>R</sub> = 5.25V   |
| V <sub>OL</sub>                      | Output Low Voltage                       | B Outputs                  | 0.45                             | V     | I <sub>OL</sub> = 20 mA  |
|                                      |  | A Outputs                  | 0.45                             | V     | I <sub>OL</sub> = 10 mA  |
| V <sub>OH</sub>                      | Output High Voltage                      | B Outputs                  | 2.4                              | V     | I <sub>OH</sub> = -5 mA  |
|                                      |  | A Outputs                  | 2.4                              | V     | I <sub>OH</sub> = -1 mA  |
| I <sub>OFF</sub><br>I <sub>OFF</sub> | Output Off Current<br>Output Off Current |                            | I <sub>F</sub><br>I <sub>R</sub> |       | V <sub>OFF</sub> = 0.45V<br>V <sub>OFF</sub> = 5.25V                                   |
| V <sub>IL</sub>                      | Input Low Voltage                        | A Side                     | 0.8                              | V     | V <sub>CC</sub> = 5.0V (Note 1)  |
|                                      |  | B Side                     | 0.9                              | V     | V <sub>CC</sub> = 5.0V (Note 1)  |
| V <sub>IH</sub>                      | Input High Voltage                       | 2.0                        |                                  | V     | V <sub>CC</sub> = 5.0V (Note 1)  |
| C <sub>IN</sub>                      | Input Capacitance                        | $\overline{OE}$ and T only | 12                               | pF    | F = 1 MHz  |
|                                      |  | All Other Inputs           | 25                               | pF    | V <sub>BIAS</sub> = 2.5V, V <sub>CC</sub> = 5V<br>T <sub>C</sub> <sup>(2)</sup> = 25°C |

**NOTE:**

1. B outputs—I<sub>OL</sub> = 20 mA, I<sub>OH</sub> = -5 mA, C<sub>L</sub> = 300 pF  
 A outputs—I<sub>OL</sub> = 10 mA, I<sub>OH</sub> = -1 mA, C<sub>L</sub> = 100 pF
2. Case temperatures are "instant on".

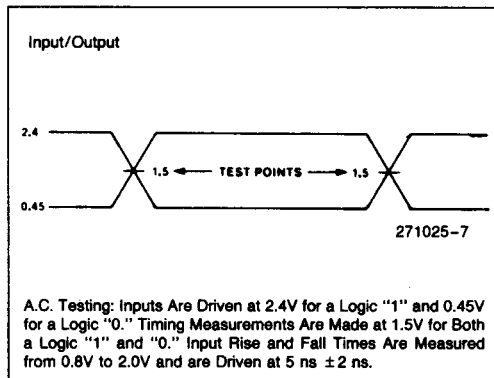
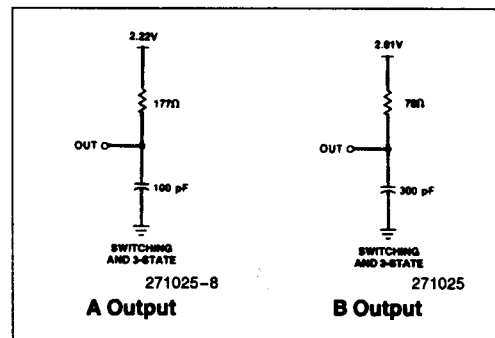
**A.C. CHARACTERISTICS**  $V_{CC} = 5V \pm 5\%$ ,  $T_C^{(2)} = -55^\circ C$  to  $+125^\circ C$ 

 Loading: B Outputs— $I_{OL} = 20\text{ mA}$ ,  $I_{OH} = -5\text{ mA}$ ,  $C_L = 300\text{ pF}$   
 A Outputs— $I_{OL} = 10\text{ mA}$ ,  $I_{OH} = -1\text{ mA}$ ,  $C_L = 100\text{ pF}$ 

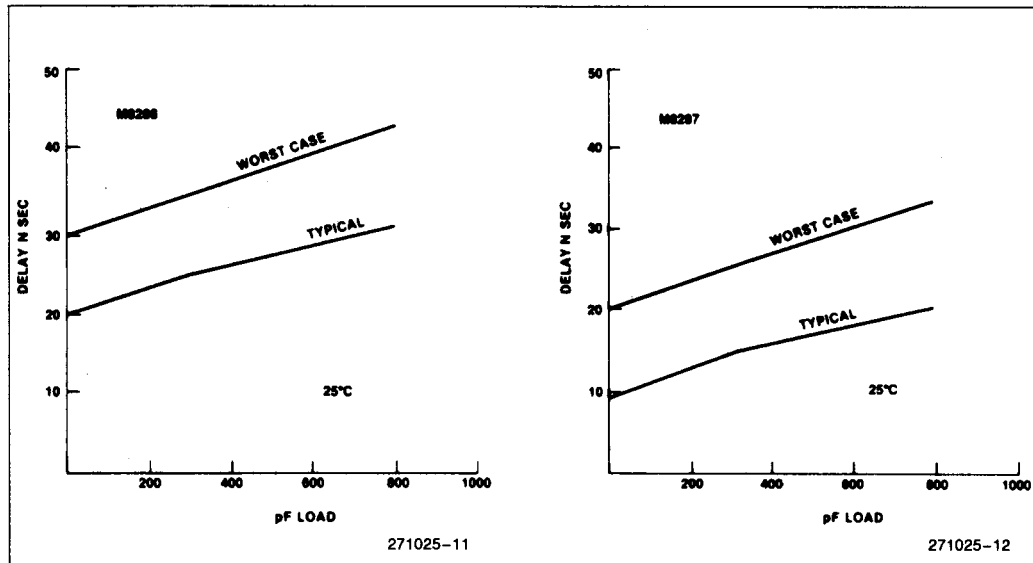
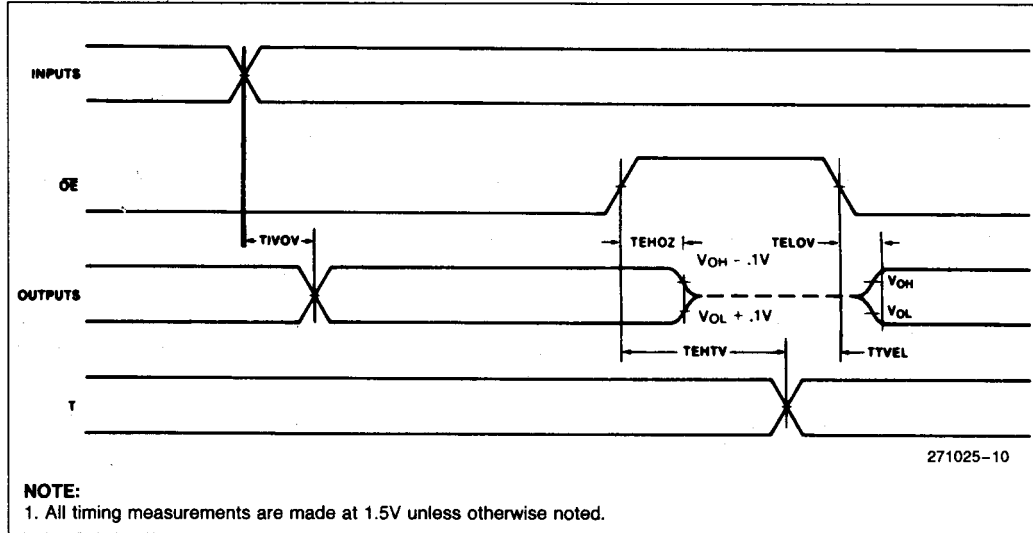
| Symbol | Parameter                  | Min   | Max | Units | Test Conditions   |
|--------|----------------------------|-------|-----|-------|-------------------|
| TIOV   | Input to Output Delay      |       |     |       | (Note 1)          |
|        | Inverting                  |       | 25  | ns    |                   |
|        | Non-inverting              |       | 35  | ns    |                   |
| TEHTV  | Transmit/Receive Hold Time | TEHOZ |     | ns    |                   |
| TTVEL  | Transmit/Receive Setup     | 30    |     | ns    |                   |
| TEHOZ  | Output Disable Time        |       | 25  | ns    |                   |
| TELOV  | Output Enable Time         | 10    | 50  | ns    |                   |
| TOLOH  | Output Rise Time           |       | 20  | ns    | From 0.8V to 2.0V |
| TOHOL  | Output Fall Time           |       | 12  | ns    | From 2.0V to 0.8V |

**NOTES:**

- See waveforms and test load circuit on following pages.
- Case temperatures are "instant on."

**A.C. TESTING INPUT, OUTPUT WAVEFORM**

**TEST LOAD CIRCUITS**


WAVEFORM



Output Delay vs. Capacitance