



# 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.

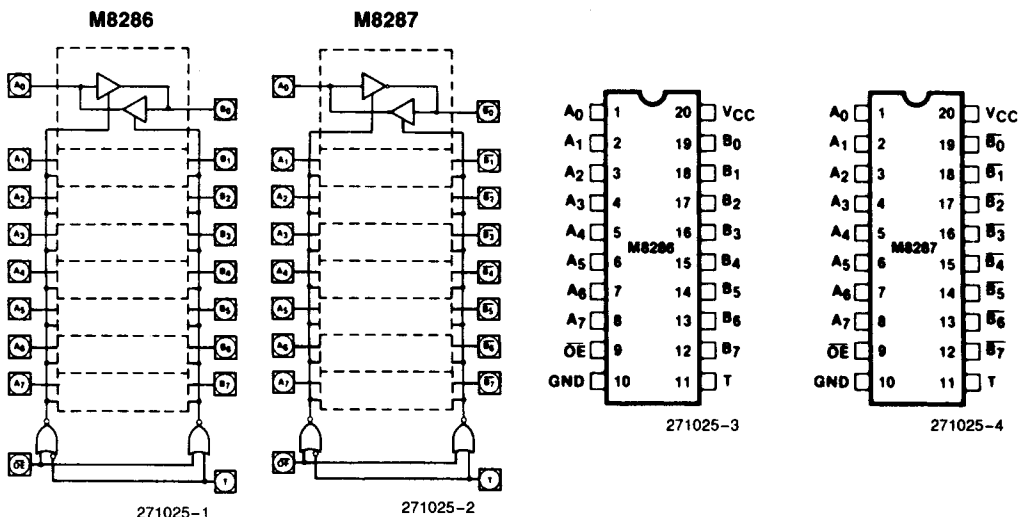


Figure 1. Logic Diagrams

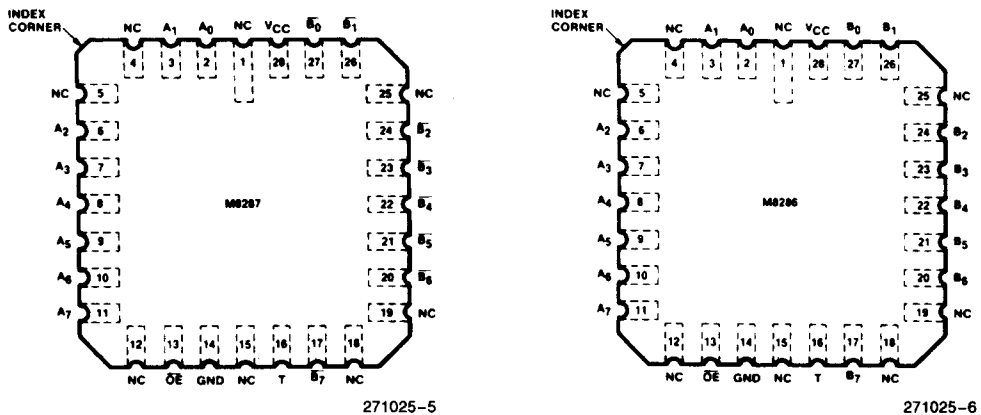


Figure 2. Pin Configurations

**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) 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> I <sub>OFF</sub>	Output Off Current Output Off Current		I <sub>F</sub> I <sub>R</sub>		V <sub>OFF</sub> = 0.45V 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 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".

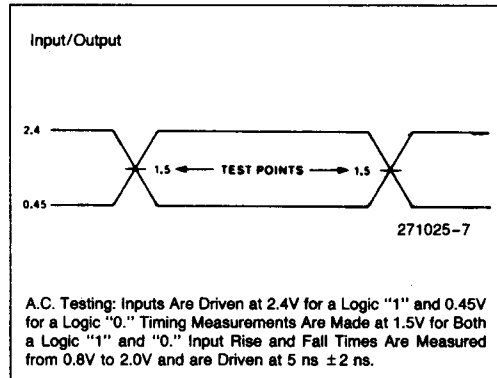
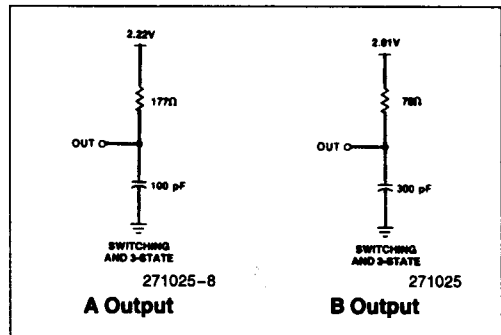
**A.C. CHARACTERISTICS**  $V_{CC} = 5V \pm 5\%$ ,  $T_C^{(2)} = -55^\circ C$  to  $+125^\circ C$ 

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

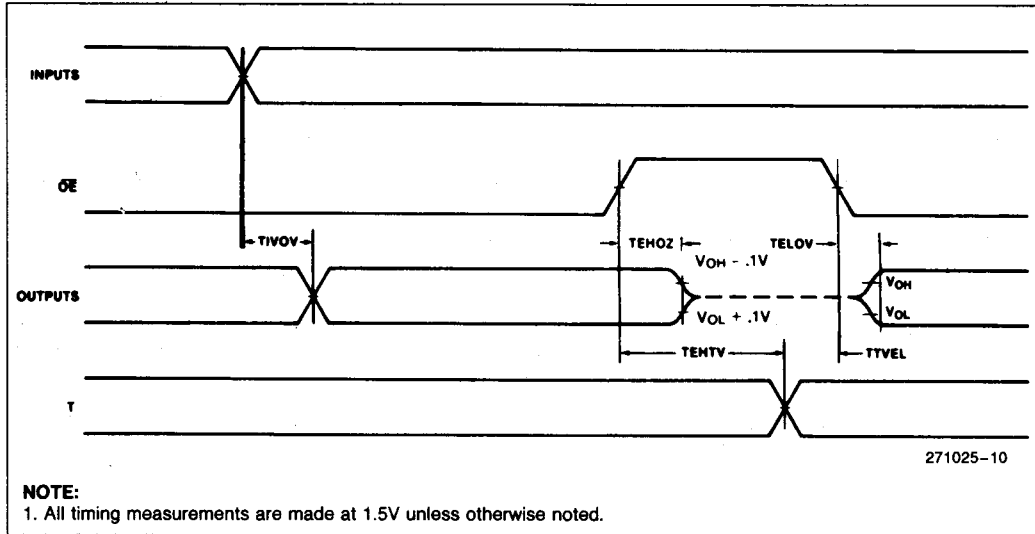
Symbol	Parameter	Min	Max	Units	Test Conditions
T1VOV	Input to Output Delay				(Note 1)
	Inverting		25	ns	
	Non-Inverting		35	ns	
TEHTV	Transmit/Receive Hold Time	TEHOZ		ns	
TTVEL	Transmit/Receive Setup	30		ns	
TEHOZ	Output Disable Time		25	ns	
TELOV	Output Enable Time	10	50	ns	
TOLOH	Output Rise Time		20	ns	From 0.8V to 2.0V
TOHOL	Output Fall Time		12	ns	From 2.0V to 0.8V

**NOTES:**

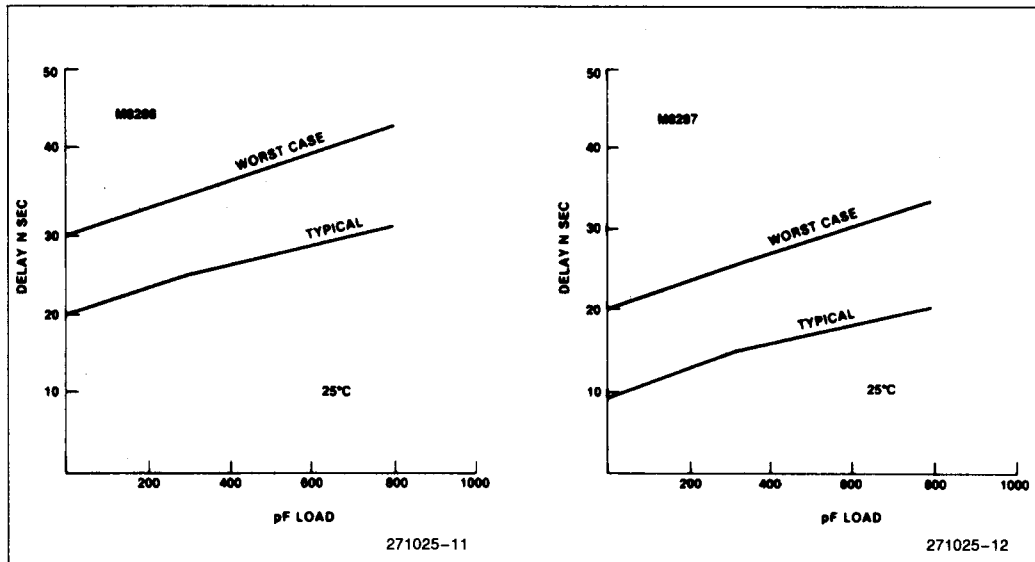
- See waveforms and test load circuit on following pages.
- Case temperatures are "instant on."

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

**TEST LOAD CIRCUITS**


WAVEFORM



NOTE:  
1. All timing measurements are made at 1.5V unless otherwise noted.



Output Delay vs. Capacitance