I8286/8287
OCTAL BUS TRANSCEIVER

INDUSTRIAL

- **Data Bus Buffer Driver for iAPX 86,88, MCS-80®, MCS-85®, and MCS-48® Families**
- **High Output Drive Capability for Driving System Data Bus**
- **Fully Parallel 8-Bit Transceivers**
- **3-State Outputs**
- **20-Pin Package with 0.3" Center**
- **No Output Low Noise when Entering or Leaving High Impedance State**
- **Industrial Temperature Range: −40°C to +85°C**

The I8286 and I8287 are 8-bit bipolar transceivers with 3-state outputs. The I8287 inverts the input data at its outputs while the I8286 does not. Thus, a wide variety of applications for buffering in microcomputer systems can be met.

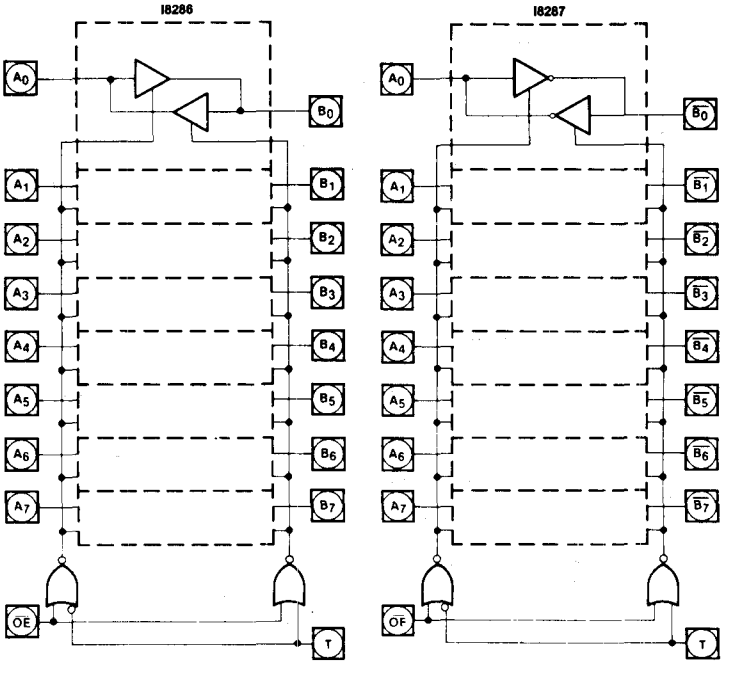


Figure 1. Logic Diagrams

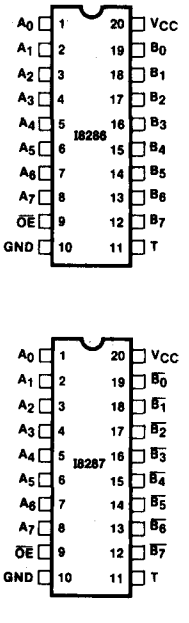


Figure 2. Pin Configuration

Table 1. Pin Description

Symbol	Type	Name and Function
T	I	**Transmit:** T is an input control signal used to control the direction of the transceivers. When HIGH, it configures the transceiver's B_0–B_7 as outputs with A_0–A_7 as inputs. T LOW configures A_0–A_7 as the outputs with B_0–B_7 serving as the inputs.
$\overline{OE}$	I	**Output Enable:** $\overline{OE}$ 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_0–A_7	I/O	**Local Bus Data Pins:** 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_0–B_7 (I8286) $\overline{B_0}$–$\overline{B_7}$ (I8287)	I/O	**System Bus Data Pins:** 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 I8286 and I8287 transceivers are 8-bit transceivers with high impedance outputs. With T active HIGH and $\overline{OE}$ active LOW, data at the A_0-A_7 pins is driven onto the B_0-B_7 pins. With T inactive LOW and $\overline{OE}$ active LOW data at the B_0-B_7 pins is driven onto the A_0-A_7 pins. No output low glitching will occur whenever the transceivers are entering or leaving the high impedance state.

ABSOLUTE MAXIMUM RATINGS*

Temperature Under Bias ..... −40°C to +85°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 Watt

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_{CC} = 5V ±10%, T_A = −40°C to +85°C)

Symbol	Parameter	Min	Max	Units	Test Conditions
V_C	Input Clamp Voltage		-1	V	I_C = -5 mA
I_{CC}	Power Supply Current—8287 —8286		130 160	mA mA	
I_F	Forward Input Current		-0.2	mA	V_F = 0.45V
I_R	Reverse Input Current		50	μA	V_R = 5.25V
V_{OL}	Output Low Voltage —B Outputs —A Outputs		.45 .45	V V	I_{OL} = 20 mA I_{OH} = 10 mA
V_{OH}	Output High Voltage —B Outputs —A Outputs	2.4 2.4		V V	I_{OH} = -5 mA I_{OH} = -1 mA
I_{OFF} I_{OFF}	Output Off Current Output Off Current		I_F I_R		V_{OFF} = 0.45V V_{OFF} = 5.25V
V_{IL}	Input Low Voltage —A Side —B Side		0.8 0.9	V V	V_{CC} = 5.0V, See Note 1 V_{CC} = 5.0V, See Note 1
V_{IH}	Input High Voltage	2.0		V	V_{CC} = 5.0V, See Note 1
C_{IN}	Input Capacitance		12	pF	F = 1 MHz V_{BIAS} = 2.5V, V_{CC} = 5V T_A = 25°C

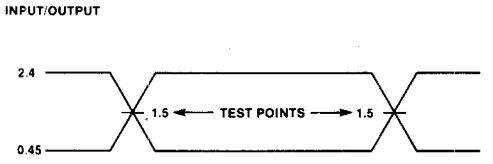
A.C. CHARACTERISTICS (V_{CC} = 5V ±10%, T_A = −40°C to +85°C)

(Loading: B Outputs—I_{OL} = 20 mA, I_{OH} = −5 mA, C_L = 300 pF;
A Outputs—I_{OL} = 10 mA, I_{OH} = −1 mA, C_L = 100 pF)

Symbol	Parameter	Min.	Max.	Units	Test Conditions
TIVOV	Input to Output Delay Inverting Non-Inverting		 25 35	 ns ns	(See Note 2)
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	
TILIH, TOLOH	Input, Output Rise Time		20	ns	From 0.8V to 2.0V
TIHIL, TOHOL	Input, Output Fall Time		12	ns	From 2.0V to 0.8V

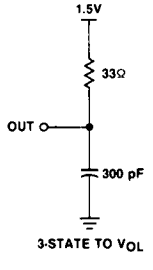
NOTES:
1. B Outputs—I_{OL} = 20 mA, I_{OH} = −5 mA, C_L = 300 pF; A Outputs—I_{OL} = 10 mA, I_{OH} = −1 mA, C_L = 100 pF.
2. See waveforms and test load circuit following.

A.C. TESTING INPUT, OUTPUT WAVEFORM

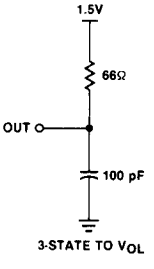


A.C. TESTING: INPUTS ARE DRIVEN AT 2.4V FOR A LOGIC "1" AND 0.45V FOR A LOGIC "0." TIMING MEASUREMENTS ARE MADE AT 1.5V FOR BOTH A LOGIC "1" AND "0."

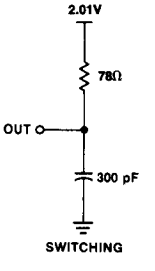
TEST LOAD CIRCUITS



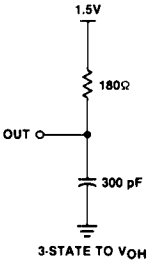
B OUTPUT



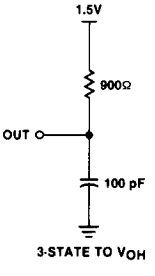
A OUTPUT



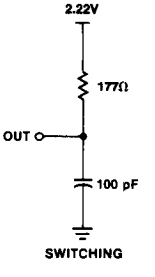
B OUTPUT



B OUTPUT

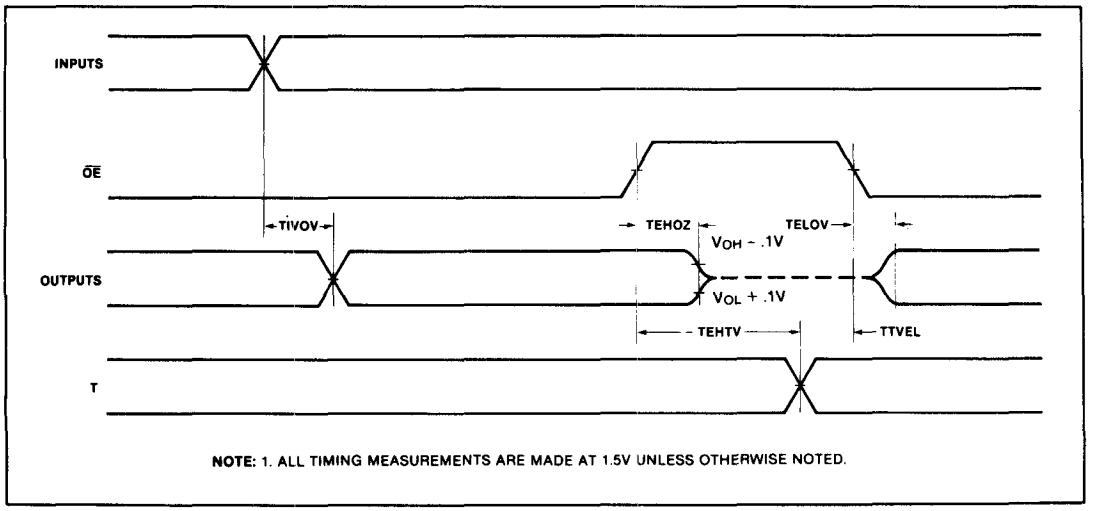


A OUTPUT

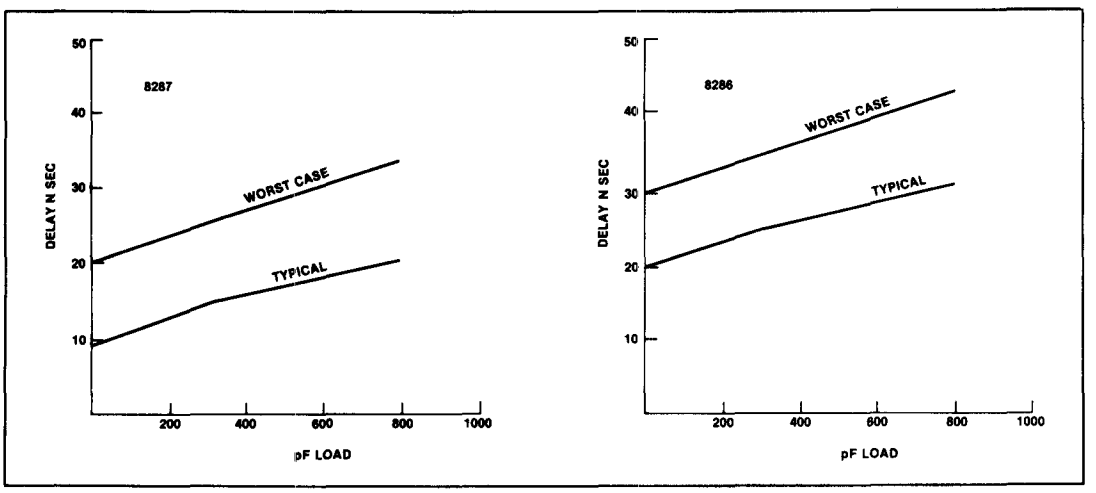


A OUTPUT

WAVEFORMS



NOTE: 1. ALL TIMING MEASUREMENTS ARE MADE AT 1.5V UNLESS OTHERWISE NOTED.



Output Delay vs. Capacitance