Am8T26A•Am8T28

Schottky Three-State Quad Bus Driver/Receiver

Distinctive Characteristics

- Advanced Schottky technology
- 48mA driver sink current
- Three-state outputs on driver and reciever
- PNP inputs
- Am8T26A has inverting outputs
- Am8T28 has non-inverting outputs
- Driver propagation delay — 14ns max. for 8T26A
  17ns max. for 8T28
- Receiver propagation delay — 14ns max. for 8T26A
  17ns max. for 8T28
- 100% reliability assurance testing in compliance with
  MIL-STD-883

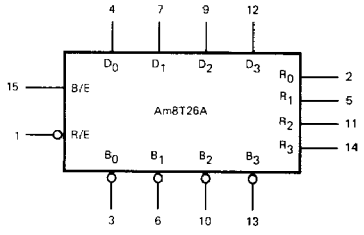
FUNCTIONAL DESCRIPTION

The Am8T26A/Am8T28 are high speed bus transceivers consisting of four bus drivers with three-state outputs and four bus receivers, also with three-state outputs. Each driver output is internally connected to a receiver input. Both the drivers and receivers have PNP inputs.

One buffered common "bus enable" input is connected to the four drivers and another buffered common "receiver enable" input is connected to the receivers. A LOW on the bus enable (B/E) input forces the four driver outputs to the high-impedance state. A HIGH on the bus enable allows input data to be transferred onto the data bus.

A HIGH on the receiver enable (R/E) input forces the four receiver outputs to the high-impedance state while a LOW on the receiver enable input allows the received data to be transferred to the output. The complementary design of the bus enable and receiver enable inputs allows these control inputs to be connected together externally such that a single transmit/receive function is derived.

LOGIC SYMBOL

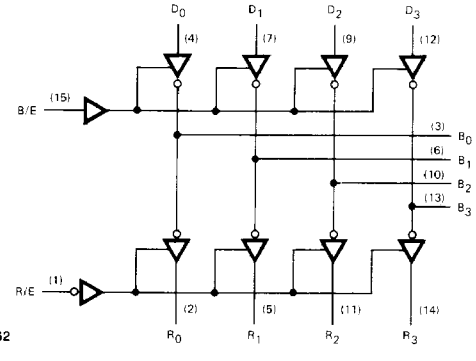


V_{CC} = Pin 16
GND = Pin 8

LIC-561

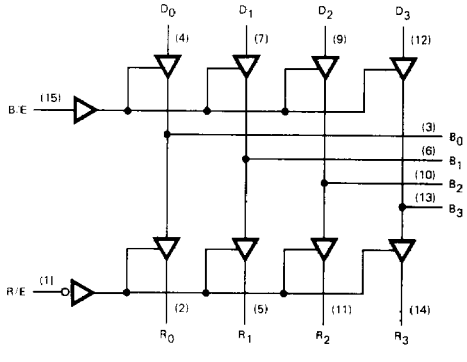
LOGIC DIAGRAMS

Am8T26A
Inverting Output (Three-State)



LIC-562

Am8T28
Non-Inverting Output (Three-State)

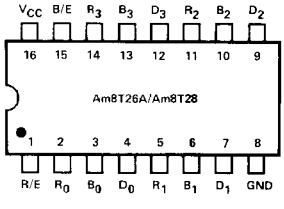


LIC-563

ORDERING INFORMATION

Package Type	Temperature Range	Am8T26A Order Number	Am8T28 Order Number
Molded DIP	0°C to +75°C	N8T26AB	N8T28B
Hermetic DIP	0°C to +75°C	N8T26AF	N8T28F
Dice	0°C to +75°C	AM8T26AXC	AM8T28XC
Hermetic DIP	−55°C to +125°C	S8T26AF	S8T28F
Dice	−55°C to +125°C	AM8T26AXM	AM8T28XM

CONNECTION DIAGRAM
(Top View)



Note: Pin 1 is marked for orientation.

LIC-564

MAXIMUM RATINGS (Above which the useful life may be impaired)

Storage Temperature	−65°C to +150°C
Temperature (Ambient) Under Bias	−55°C to +125°C
Supply Voltage to Ground Potential (Pin 16 to Pin 8) Continuous	−0.5V to +7V
DC Voltage Applied to Outputs for HIGH Output State	−0.5V to +V_{CC} max.
DC Input Voltage	−0.5V to +5.5V
DC Output Current, Into Outputs (Receiver)	30mA
DC Output Current, Into Outputs (BUS)	80mA
DC Input Current	−30mA to +5.0mA

ELECTRICAL CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

The Following Conditions Apply Unless Otherwise Noted:

Am8T26A, Am8T28 T_A = 0°C to +75°C (COM'L) MIN. = 4.75V MAX. = 5.25V

Am8T26A, Am8T28 T_A = −55°C to +125°C (MIL) MIN. = 4.50V MAX. = 5.50V

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

Parameters	Description	Test Conditions (Note 1)	Min.	Typ. (Note 2)	Max.	Units
Driver						
I_{IL}	Low Level Input Current	V_{IN} = 0.4V			−200	μA
I_{IL}	Low Level Input Current (Disabled)	V_{IN} = 0.4V			−50	μA
I_{IH}	High Level Input Current (D_{IN}, D_E)	V_{IN} = V_{CC}MAX.			25	μA
V_{OL}	Low Level Output Voltage	I_{OUT} = 48mA (Note 5)			0.5	Volts
V_{OH}	High Level Output Voltage	I_{OUT} = −10mA, V_{CC} = V_{CC}MIN. (Note 6)	2.4			Volts
I_{OS}	Short Circuit Output Current	V_{OUT} = 0V, V_{CC} = V_{CC}MAX. (Note 4)	−50		−150	mA
Receiver						
I_{IL}	Low Level Input Current	V_{IN} = 0.4V			−200	μA
I_{IH}	High Level Input Current (R_E)	V_{IN} = V_{CC}MAX.			25	μA
V_{OL}	Low Level Output Voltage	I_{OUT} = 20mA (Note 5)			0.5	Volts
V_{OH}	High Level Output Voltage	I_{OUT} = −100μA, V_{CC} = 5.0V	3.5			Volts
		I_{OUT} = −2.0mA (Note 6)	2.4			
I_{OS}	Short Circuit Output Current	V_{OUT} = 0V, V_{CC} = V_{CC}MAX.	−30		−75	mA
Both Driver and Receiver						
V_{TL}	Low Level Input Threshold Voltage		0.85			Volts
V_{TH}	High Level Input Threshold Voltage				2.0	Volts
I_O	Low Level Output Off Leakage Current	V_{OUT} = 0.5V			−100	μA
	High Level Output Off Leakage Current	V_{OUT} = 2.4V			100	μA
V_I	Input Clamp Voltage	I_{IN} = −12mA			−1.0	Volts
P_{WR}/I_{CC}	Power/Current Consumption Am8T26A	V_{CC} = V_{CC}MAX.			457/87	mW/mA
	Power/Current Consumption Am8T28	V_{CC} = V_{CC}MAX.			578/110	

Switching Characteristics (T_A = +25°C, V_{CC} = 5.0V)

Parameters	Description	Test Conditions	Am8T26A Min.	Am8T26A Typ.	Am8T26A Max.	Am8T28 Min.	Am8T28 Typ.	Am8T28 Max.	Units
t_{PLH}	Driver Input to Bus	Figure 1		10	14		13	17	ns
t_{PHL}				10	14		13	17	
t_{PLH}	Bus to Receiver Output	Figure 2		9.0	14		12	17	ns
t_{PHL}				6.0	14		9.0	17	
t_{ZL}	Driver Enable to Bus	Figure 3		19	25		21	28	ns
t_{LZ}				15	20		18	23	
t_{ZL}	Receiver Enable to Receiver Output	Figure 4		15	20		18	23	ns
t_{LZ}				10	15		13	18	

Notes:
1. For conditions shown as MIN. or MAX., use the appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical limits are at V_{CC} = 5.0V, 25°C ambient and maximum loading.
3. Actual input currents = Unit Load Current x Input Load Factor (See Loading Rules).
4. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.
5. Output sink current is supplied through a resistor to V_{CC}.
6. Measurements apply to each output and the associated data input independently.

12

DEFINITION OF FUNCTIONAL TERMS

D_0, D_1, D_2, D_3 The four driver inputs.

B_0, B_1, B_2, B_3 The four driver outputs and receiver inputs (data is inverted).

R_0, R_1, R_2, R_3 The four receiver outputs. Data from the bus is inverted while data from the driver inputs is non-inverted.

B/E Bus enable input. When the bus enable input is LOW, the four driver outputs are in the high-impedance state.

R/E Receiver enable input. When the receiver enable input is HIGH, the four receiver outputs are in the high-impedance state.

LOADING RULES (In Unit Loads)

Input/Output	Pin No.'s	LOW Input Unit Load	Fan-out Output HIGH	Fan-out Output LOW
R/E	1	1/8	–	–
R_0	2	–	50	10
B_0	3	1/16	250	25
D_0	4	1/8	–	–
R_1	5	–	50	10
B_1	6	1/16	250	25
D_1	7	1/8	–	–
GND	8	–	–	–
D_2	9	1/8	–	–
B_2	10	1/16	250	25
R_2	11	–	50	10
D_3	12	1/8	–	–
B_3	13	1/16	250	25
R_3	14	–	50	10
B/E	15	1/8	–	–
V_{CC}	16	–	–	–

A TTL Unit Load is defined as −1.6mA measured at 0.4V LOW and 40μA measured at 2.4V HIGH.

DRIVER FUNCTION TABLE

INPUTS		Am8T26A OUTPUT	Am8T28 OUTPUT
B/E	D_i	B_i	B_i
L	X	Z	Z
H	L	H	L
H	H	L	H

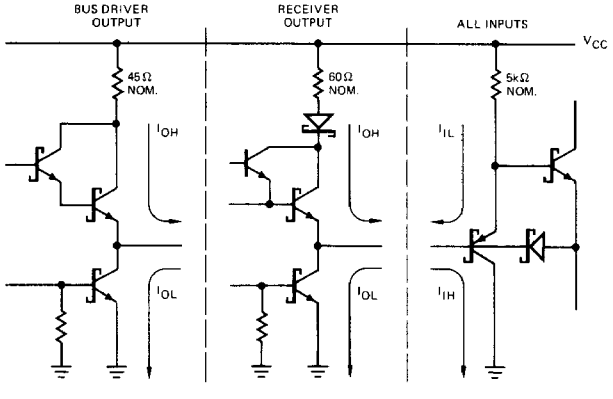
L = LOW X = Don't Care
H = HIGH Z = High Impedance
i = 0, 1, 2, or 3

RECEIVER FUNCTION TABLE

INPUTS		Am8T26A OUTPUT	Am8T28 OUTPUT
R/E	B_i	R_i	R_i
H	X	Z	Z
L	L	H	L
L	H	L	H

L = LOW X = Don't Care
H = HIGH Z = High Impedance
i = 0, 1, 2, or 3

INPUT/OUTPUT CURRENT INTERFACE CONDITIONS



Note: Actual current flow direction shown.

LIC-565

AC TEST CIRCUITS AND WAVEFORMS

PROPAGATION DELAY (Data In to Bus)

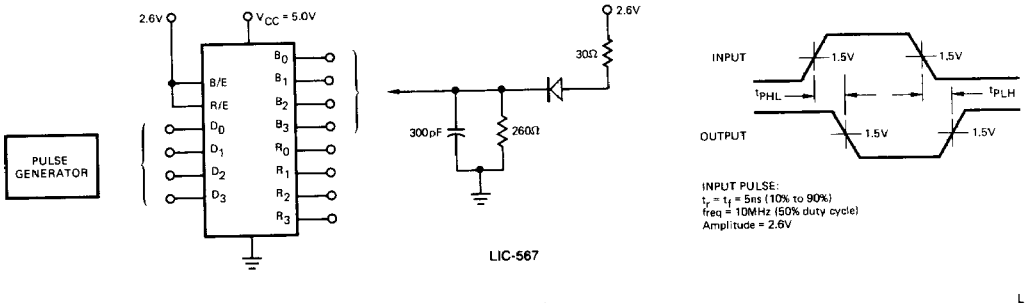


Figure 1

PROPAGATION DELAY (Bus to Receiver Out)

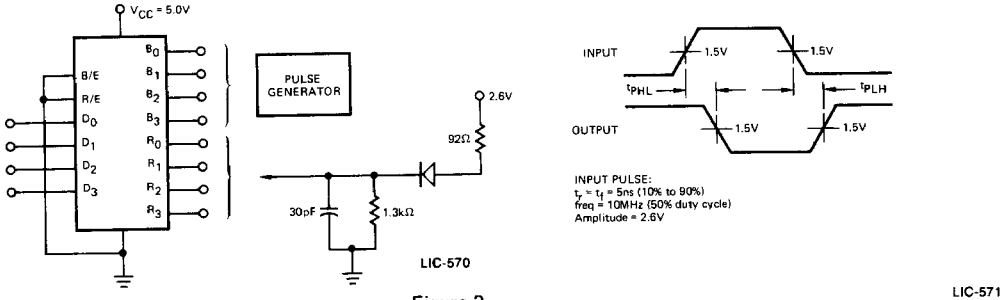


Figure 2

PROPAGATION DELAY (Bus Enable to Bus Output)

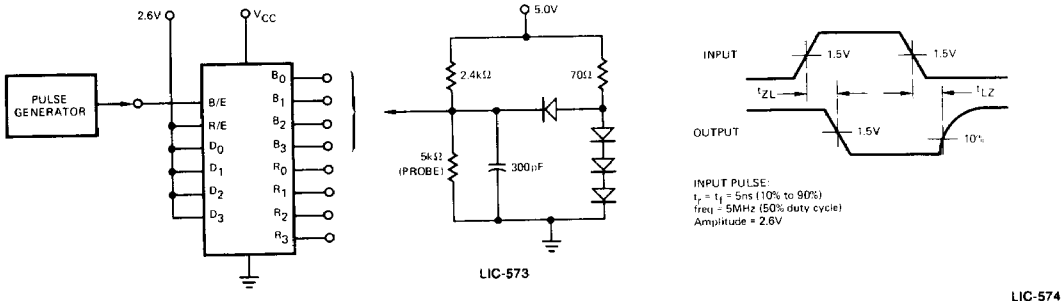


Figure 3

PROPAGATION DELAY (Receive Enable to Receive Output)

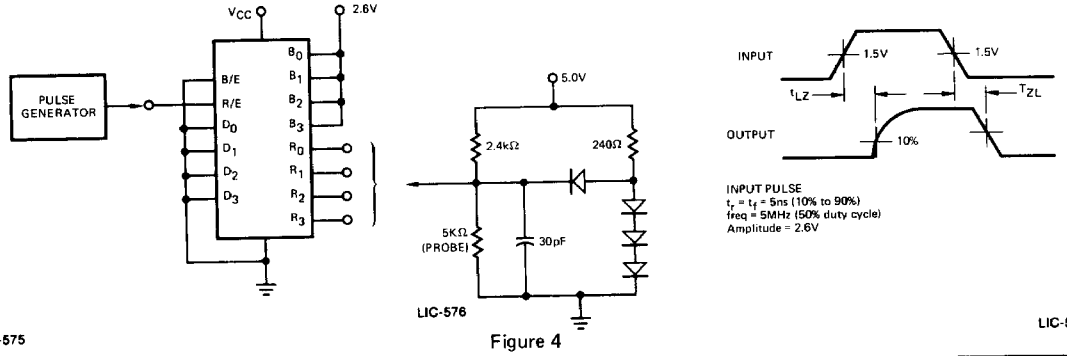
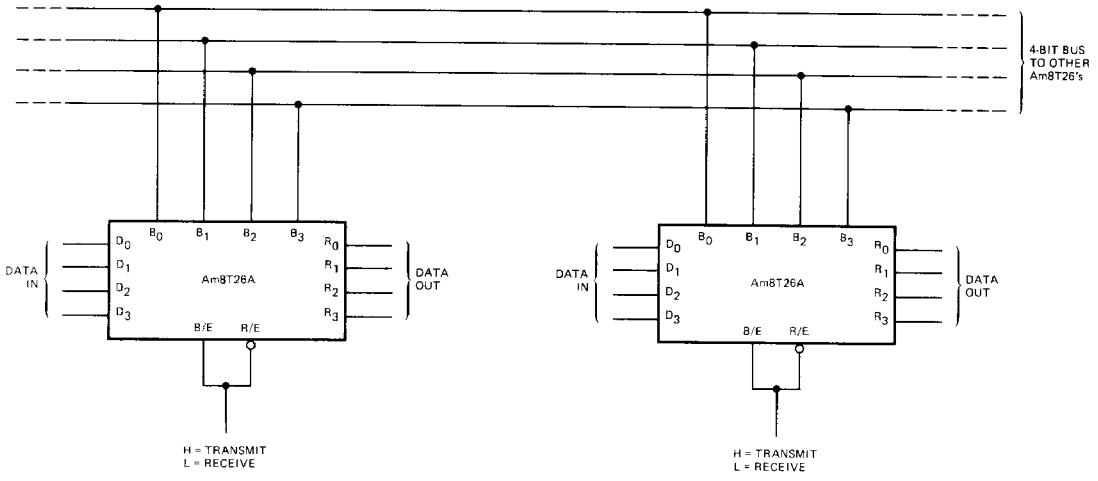


Figure 4

12

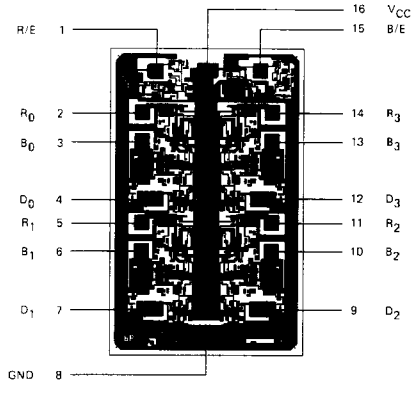
APPLICATION



LIC-578

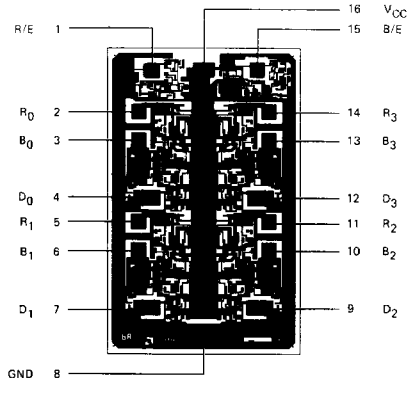
Metallization and Pad Layouts

Am8T26A



DIE SIZE 0.058" X 0.091"

Am8T28



DIE SIZE 0.058" X 0.091"