

SN75136 **QUADRUPLER BUS TRANSCEIVER** **WITH 3-STATE OUTPUTS**

D2291, JANUARY 1977—REVISED SEPTEMBER 1986

- P-N-P Inputs for Minimal Input Loading (200 μ A Maximum)
- High-Speed Schottky Circuitry
- 3-State Outputs for Driver and Receiver
- Party-Line (Data-Bus) Operation
- Single 5-V Supply
- Driver Has 40-mA Current Sink Capability
- Designed to Be Functionally Interchangeable with Signetics N8T26, also Called 8T26

description

The SN75136 is a quadruple transceiver utilizing Schottky-diode-clamped transistors. Both the driver and receiver have 3-state outputs. With p-n-p inputs, the input loading is reduced to a maximum input current of 200 μ A.

The SN75136 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE (DRIVER)

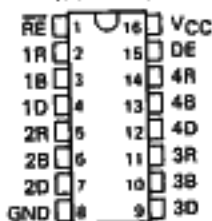
INPUTS		OUTPUT
D	DE	S
L	H	H
H	H	L
X	L	Z

FUNCTION TABLE (RECEIVER)

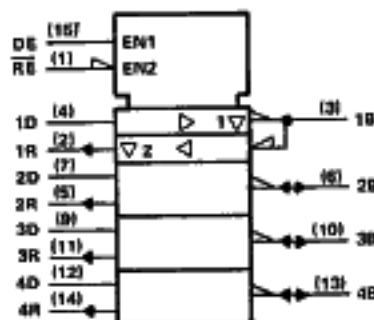
INPUTS		OUTPUT
S	RE	R
L	L	H
H	L	L
X	H	Z

H = high level
 L = low level
 X = irrelevant
 Z = high impedance

**D, J, OR N PACKAGE
 (TOP VIEW)**

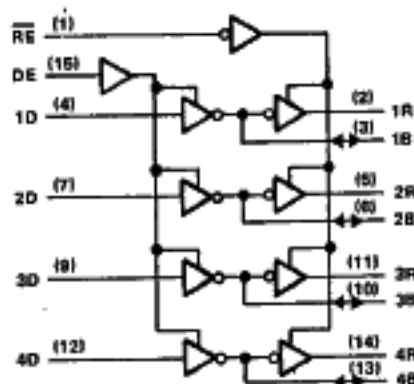


logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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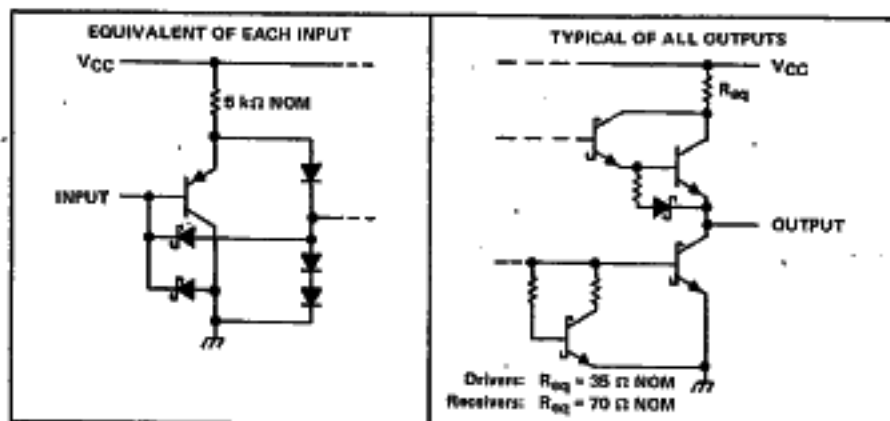
**TEXAS
 INSTRUMENTS**

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schematics of inputs and outputs



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	5.5 V
Continuous total power dissipation	See Dissipation Rating Table
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C
Lead temperature 1.6 mm (1/16 inch) from case for 80 seconds: J package	300°C
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds: D or N package	260°C

NOTE 1: Voltage values are with respect to network ground terminal.

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ POWER RATING
D	950 mW	7.6 mW/°C	608 mW
J	1025 mW	8.2 mW/°C	658 mW
N	1150 mW	9.2 mW/°C	738 mW

recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}		4.75	5	5.25	V
High-level input voltage, V_{IH}	B, D, DE, RE	2			V
Low-level input voltage, V_{IL}	B, D, DE, RE			0.85	V
High-level output current, I_{OH}	Driver, B			-10	mA
	Receiver, R			-2	mA
Low-level output current, I_{OL}	Driver, B			40	mA
	Receiver, R			16	mA
Operating free-air temperature, T_A		0		70	°C

**QUADRUPLE BUS TRANSCEIVER
WITH 3-STATE OUTPUTS**

electrical characteristics over recommended operating free-air temperature and supply voltage range (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP [†]	MAX	UNIT
V_{IK} Input clamp voltage	B,D,DE,RE	$I_I = -5 \text{ mA}$			-1	V
V_{OH} High-level output voltage	B	$V_{IH} = 2 \text{ V}, V_{IL} = 0.85 \text{ V}, I_{OH} = -10 \text{ mA}$	2.6	3.1		V
	R	$V_{IH} = 0.85 \text{ V}, I_{OH} = -2 \text{ mA}$	2.6	3.1		
V_{OL} Low-level output voltage	B	$V_{IH} = 2 \text{ V}, I_{OL} = 40 \text{ mA}$			0.5	V
	R	$V_{IH} = 2 \text{ V}, V_{IL} = 0.85 \text{ V}, I_{OL} = 18 \text{ mA}$			0.5	
I_{OZ} Off-state (high-impedance state) output current	B,R	DE at 0.85 V, RE at 2 V, $V_D = 2.8 \text{ V}$			100	μA
	R	RE at 2 V, $V_D = 0.5 \text{ V}$			-100	
I_{IH} High-level input current	D,DE,RE	$V_I = 5.25 \text{ V}$			25	μA
I_{IL} Low-level input current	B,D,DE,RE	$V_I = 0.4 \text{ V}$			-200	μA
I_{OS} Short-circuit output current [‡]	B	$V_{CC} = 5.25 \text{ V}$	-50	-150		mA
	R		-30	-75		
I_{CC} Supply current		$V_{CC} = 5.25 \text{ V}$, No load			87	mA

switching characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	FROM	TO	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH} Propagation delay time, low-to-high-level output	B	R	$C_L = 30 \text{ pF}$, See Figure 1		8	18	ns
t_{PHL} Propagation delay time, high-to-low-level output					7	14	
t_{PLH} Propagation delay time, low-to-high-level output	D	B	$C_L = 300 \text{ pF}$, See Figure 2		11	20	ns
t_{PHL} Propagation delay time, high-to-low-level output					16	24	
t_{pLZ} Output disable time from low level	RE	R	$C_L = 30 \text{ pF}$, See Figure 3		16	24	ns
t_{pZL} Output enable time to low level					15	30	
t_{pLZ} Output disable time from low level	DE	B	$C_L = 300 \text{ pF}$, See Figure 4		9	24	ns
t_{pZL} Output enable time to low level					31	38	

[†]All typical values are at $T_A = 25^\circ\text{C}$ and $V_{CC} = 5 \text{ V}$.

[‡]Only one output should be shorted to ground at a time, and duration of the short circuit should not exceed one second.

PARAMETER MEASUREMENT INFORMATION

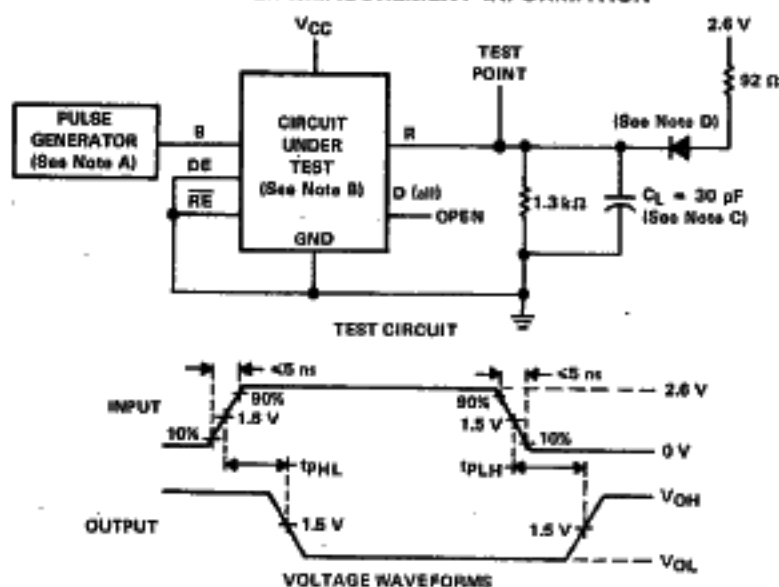


FIGURE 1. PROPAGATION DELAY TIMES FROM BUS TO RECEIVER OUTPUT

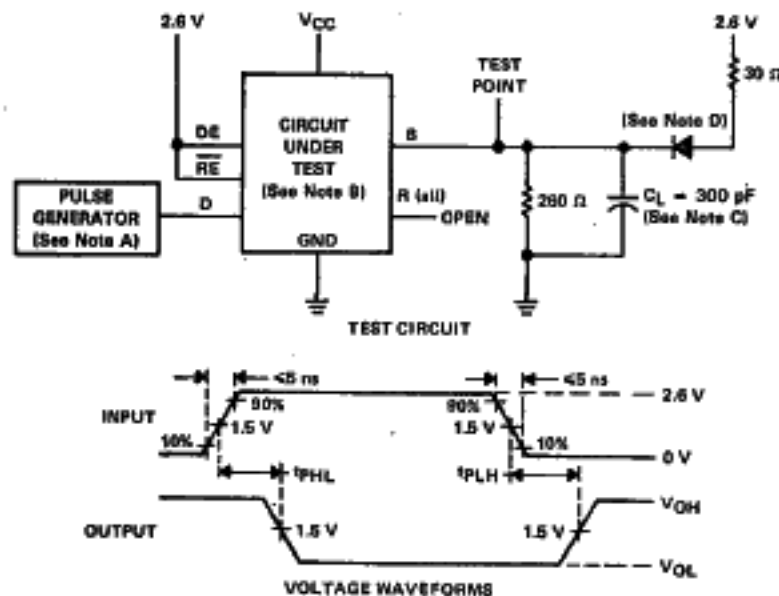


FIGURE 2. PROPAGATION DELAY TIMES FROM DRIVER INPUT TO BUS

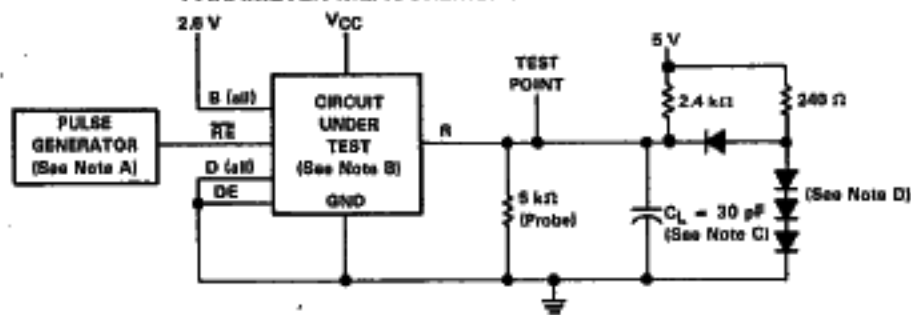
- NOTES: A. The pulse generator in Figures 1 and 2 has the following characteristics: PRR $\leq$ 10 MHz, duty cycle = 50%, $Z_0 = 50 \Omega$.
B. All inputs and outputs not shown are open.
C. C_L includes probe and jig capacitance.
D. All diodes are 1N816 or 1N3084.

TEXAS
INSTRUMENTS

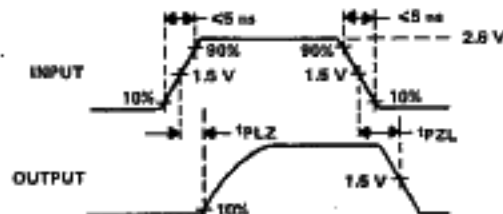
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 QUADRUPLE BUS TRANSCEIVER
 WITH 3-STATE OUTPUTS

PARAMETER MEASUREMENT INFORMATION

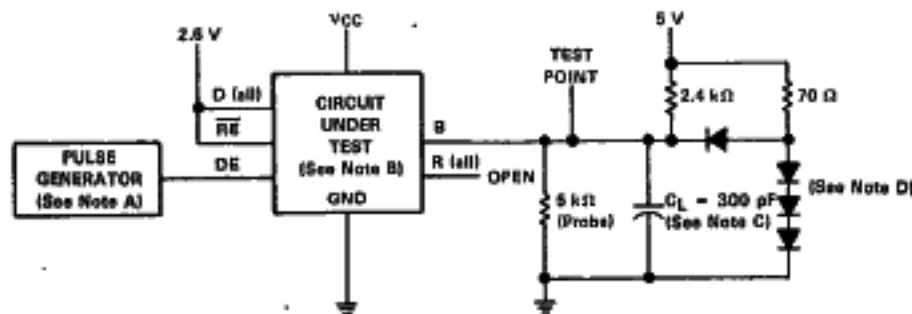


TEST CIRCUIT

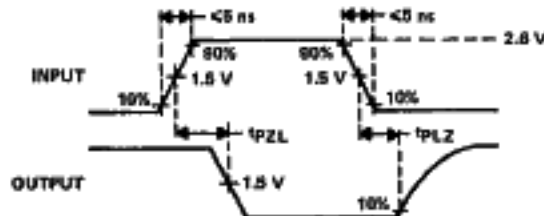


VOLTAGE WAVEFORMS

FIGURE 3. RECEIVER ENABLE AND DISABLE TIMES



TEST CIRCUIT



VOLTAGE WAVEFORMS

FIGURE 4. DRIVER ENABLE AND DISABLE TIMES

- NOTES: A. The pulse generator in Figures 3 and 4 has the following characteristics: PRR $\leq$ 5 MHz, duty cycle = 50%, $Z_0 = 50 \Omega$.
 B. All inputs and outputs now shown are open.
 C. C_L includes probe and jig capacitance.
 D. All diodes are 1N916 or 1N3064.