

8-CHANNEL GENERAL-PURPOSE INTERFACE BUS TRANSCEIVER

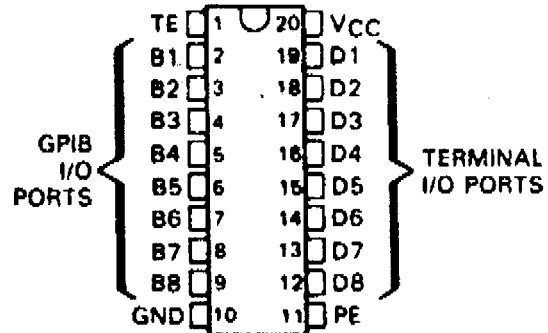
D2525

MEETS IEEE STANDARD 488-1978 (GPIB)

- 8-Channel Bidirectional Transceiver
- Power-Up/Power-Down Protection (Glitch-Free)
- High-Speed, Low-Power Schottky Circuitry
- Low-Power Dissipation . . . 72 mW Max per Channel
- Fast Propagation Times . . . 22 ns Max
- High-Impedance P-N-P Inputs
- Receiver Hysteresis . . . 650 mV Typ
- Open-Collector Driver Output Option
- No Loading of Bus When Device is Powered Down ($V_{CC} = 0$)

SN75160B DUAL-IN-LINE PACKAGE

(TOP VIEW)



FUNCTION TABLES

EACH DRIVER

EACH RECEIVER

EACH DRIVER				EACH RECEIVER			
INPUTS			OUTPUT	INPUTS			OUTPUT
D	TE	PE	B	D	TE	PE	D
H	H	H	H	L	L	X	L
L	H	X	L	H	L	X	H
H	X	L	Z ¹	X	H	X	Z
X	L	X	Z ¹				

H = High level, L = low level, X = irrelevant, Z = High-impedance state.

¹ This is the high-impedance state of a normal 3-state output modified by the internal resistors to V_{CC} and ground.

description

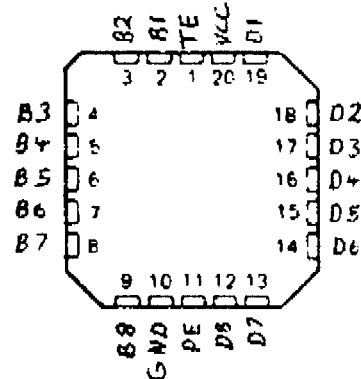
The SN75160B 8-channel general-purpose interface bus transceiver is a monolithic, high-speed, low-power Schottky device designed for two-way data communications over single-ended transmission lines. It is designed to meet the requirements of IEEE Standard 488-1978. The transceiver features driver outputs that can be operated in either the passive-pullup or three-state mode. If Talk Enable (TE) is high, these ports have the characteristics of passive-pullup outputs when Pullup Enable (PE) is low, and of three-state outputs when PE is high. Taking TE low places these ports in the high-impedance state. The driver outputs are designed to handle loads up to 48 milliamperes of sink current.

Output glitches during power-up and power-down are eliminated by an internal circuit that disables both the bus and receiver outputs. The outputs do not load the bus when $V_{CC} = 0$ volts. When combined with the SN75161B or SN75162B management bus transceivers, the pair provides the complete 16-wire interface for the IEEE 488 bus.

The SN75160B is characterized for operation from 0°C to 70°C .

-55°C to 100°C .

75160B
SN75160B... FT Package
(TOP VIEW)



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Only

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PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

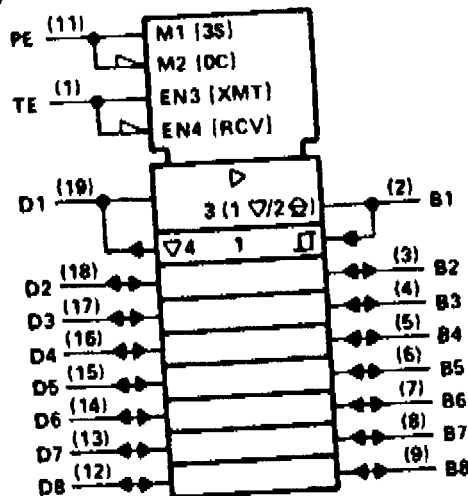
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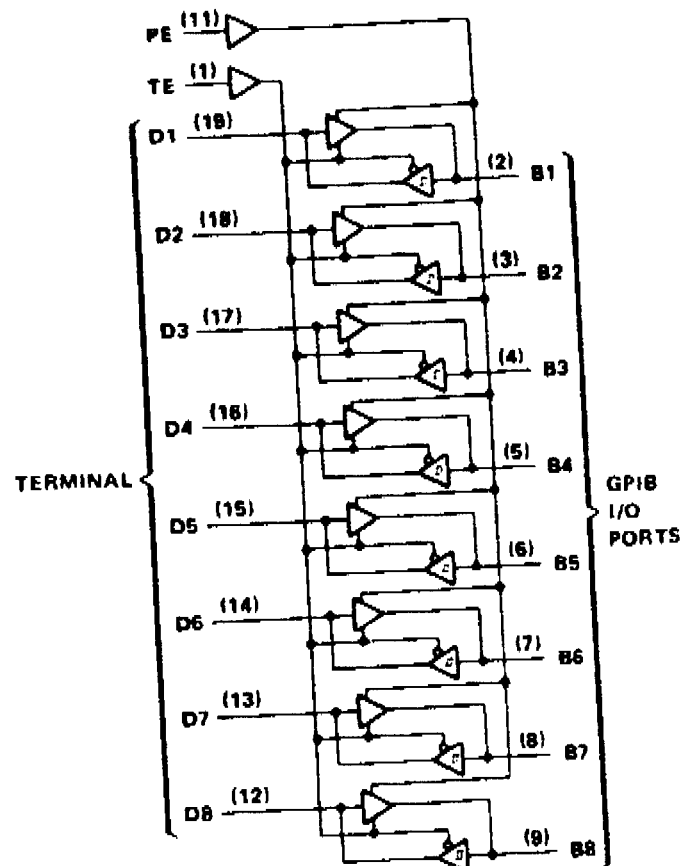
SN75160B 5N95160B OCTAL GENERAL-PURPOSE INTERFACE BUS TRANSCEIVER

logic symbol¹

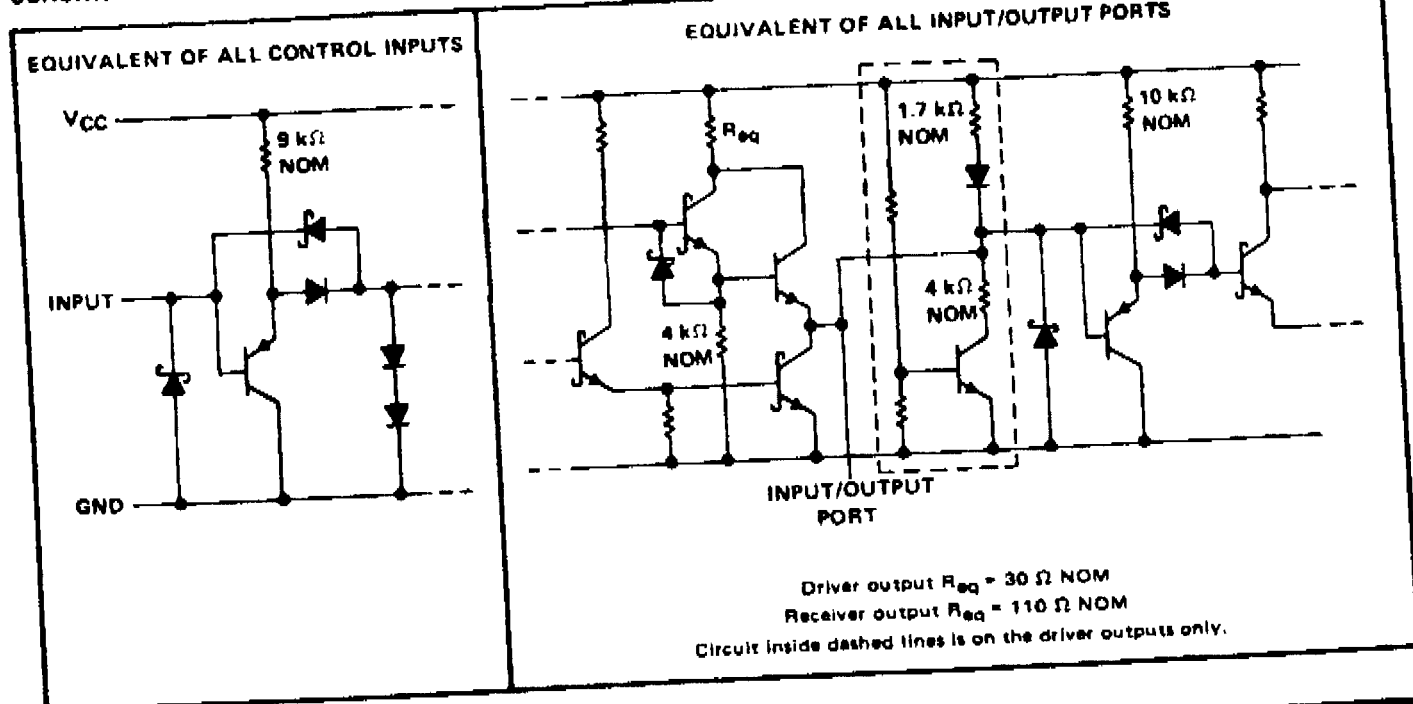


¹ This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
 ▽ Designates 3-state outputs.
 ⊕ Designates passive-pullup outputs.

logic diagram (positive logic)



schematics of inputs and outputs



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OCT 09, 87 11:02 MILITARY MARKETING EXT 6716

SN95160B SN75160B

OCTAL GENERAL-PURPOSE INTERFACE BUS TRANSCEIVER

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

Supply voltage, VCC (see Note 1)	7 V
Input voltage	5.5 V
Low-level driver output current	100 mA
Continuous total dissipation at (or below) 25°C free-air temperature (see Note 2):	
DW package	1125 mW
J package	1375 mW
FK package	1375 1150 mW
Operating free-air temperature range	-55°C to 70°C 100°C
Storage temperature range	-65°C to 150°C
Lead temperature 1.6 mm (1/16 inch) from the case for 60 seconds: J package	300°C
Lead temperature 1.6 mm (1/16 inch) from the case for 10 seconds: DW or N package	260°C

- NOTES 1. All voltage values are with respect to network ground terminal.
2. For operation above 25°C free-air temperature, derate the ~~DW package~~ at the rate of 0.0 mW/°C, the ~~N package~~ at the rate of 0.2 mW/°C, and the J package at the rate of 11.0 mW/°C. In the J package, SN75160B chips are alloy mounted.

recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, VCC		4.75	5	5.25	V
High-level input voltage, VIH, PE & TE		2			V
Low-level input voltage, VIL, PE & TE				0.8	V
High-level output current, IOH	Bus ports with pull-ups active			- 5.2	mA
	Terminal ports			- 800	µA
Low-level output current, IOL	Bus ports			48	mA
	Terminal ports			16	
Operating free air temperature, TA		-55		70	°C

HIGH-level input voltage, VIH, Bus & Terminal	25°C	2	V
	Full Range	2.1	V
Low-level input voltage, VIL, Bus & Terminal	25°C	.8	V
	Full Range	.7	V

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OCAL GENERAL-PURPOSE INTERFACE BUS TRANSCEIVER

5N95160B

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

PARAMETER			TEST CONDITIONS	MIN	TYP [†]	MAX	UNIT
V _{IK}	Input clamp voltage		I _I = -18 mA, V _{CC} = Min		-0.8	-1.5	V
V _{HYS}	Hysteresis (V _{T+} - V _{T-})	Bus	V _{CC} = 5V	0.4	0.65		V
V _{OH}	High-level output voltage	Terminal	I _{OH} = -800 μ A, TE at 0.8 V, V _{CC} = Min	2.7	3.5		V
		Bus	I _{OH} = -5.2 mA, PE and TE at 2 V, V _{CC} = Min	2.5	3.3		
V _{OL}	Low-level output voltage	Terminal	I _{OL} = 16 mA, TE at 0.8 V, V _{CC} = Min		0.3	0.5	V
		Bus	I _{OL} = 48 mA, TE at 2 V, V _{CC} = Min		0.35	0.5	
I _I	Input current at maximum input voltage	Terminal	V _I = 5.5 V, V _{CC} = Max		0.2	100	μ A
I _{IH}	High-level input current	Terminal	V _I = 2.7 V, V _{CC} = Max		0.1	20	μ A
I _{IL}	Low-level input current	Terminal	V _I = 0.5 V, V _{CC} = Max		-10	-100	μ A
V _{I/O(bus)}	Voltage at bus port		Driver disabled V _{CC} = 5V	I _{I(bus)} = 0 I _{I(bus)} = -12 mA	2.5 -1.5	3.7 -1.5	V
I _{I/O(bus)}	Current into bus port	Power on	Driver disabled V _{CC} = 5V	V _{I(bus)} = -1.5 V to 0.4 V	-1.3		
				V _{I(bus)} = 0.4 V to 2.5 V	0	-3.2	mA
				V _{I(bus)} = 2.5 V to 3.7 V		+2.5	
				V _{I(bus)} = 3.7 V to 5 V	0	-3.2	
				V _{I(bus)} = 5 V to 5.5 V	0.7	2.5	
				V _{I(bus)} = 0 V to 2.5 V		+40	μ A
I _{OS}	Short-circuit output current	Terminal	V _{CC} = Max		-15	-35	mA
		Bus	V _{CC} = Max		-25	-50	
I _{CC}	Supply current	No load V _{CC} = Max		Receivers low and enabled	70	90	mA
				Drivers low and enabled	85	110	
C _{I/O(bus)}	Bus-port capacitance	V _{CC} = 5 V to 0 V, f = 1 MHz		V _{I/O} = 0 to 2 V	30		pF

[†]All typical values are at V_{CC} = 5 V, T_A = 25°C.

switching characteristics, V_{CC} = 5 V, C_L = 15 pF, T_A = 25°C (unless otherwise noted)

PARAMETER	FROM	TO	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t _{PLH}	Terminal	Bus	C _L = 30 pF, See Figure 1		14	20	ns
t _{PHL}					14	20	
t _{PLH}	Bus	Terminal	C _L = 30 pF, See Figure 2		10	20	ns
t _{PHL}					15	22	
t _{PZH}	TE	Bus	See Figure 3		25	35	ns
t _{PHZ}					13	22	
t _{PZL}					22	35	
t _{PLZ}					22	32	
t _{PZH}	TE	Terminal	See Figure 4		20	30	ns
t _{PHZ}					12	20	
t _{PZL}					23	32	
t _{PLZ}					19	30	
t _{en}	PE	Bus	See Figure 5		15	22	ns
t _{dis}					13	20	

PARAMETER MEASUREMENT INFORMATION

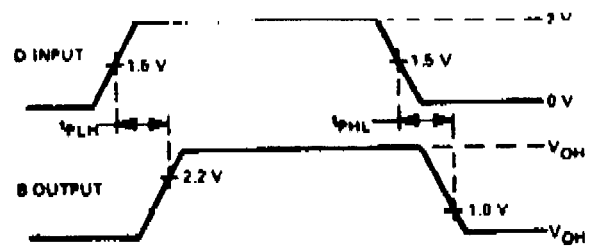
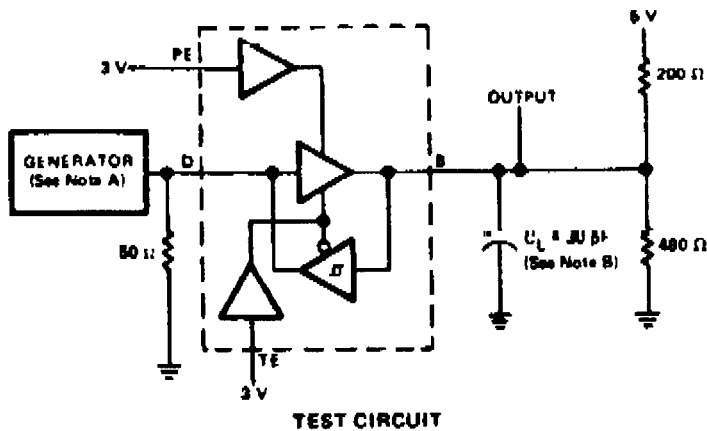


FIGURE 1. TERMINAL-TO-BUS PROPAGATION DELAY TIMES

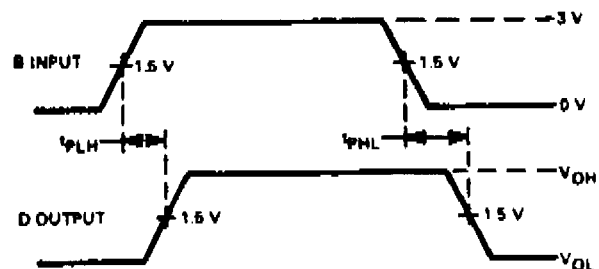
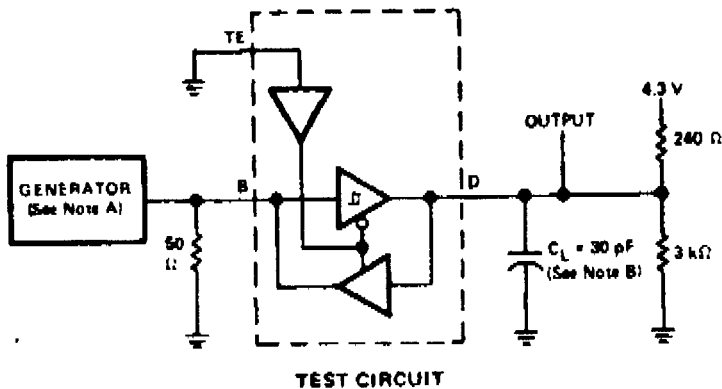


FIGURE 2. BUS-TO-TERMINAL PROPAGATION DELAY TIMES

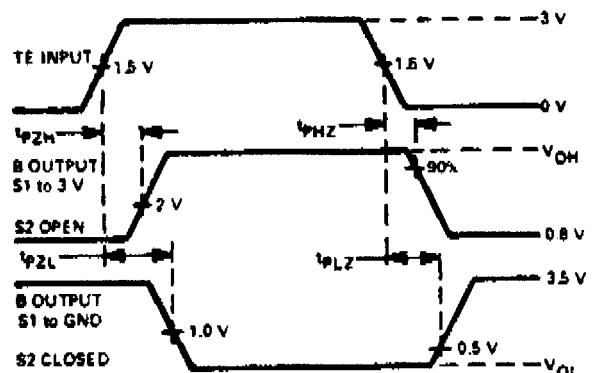
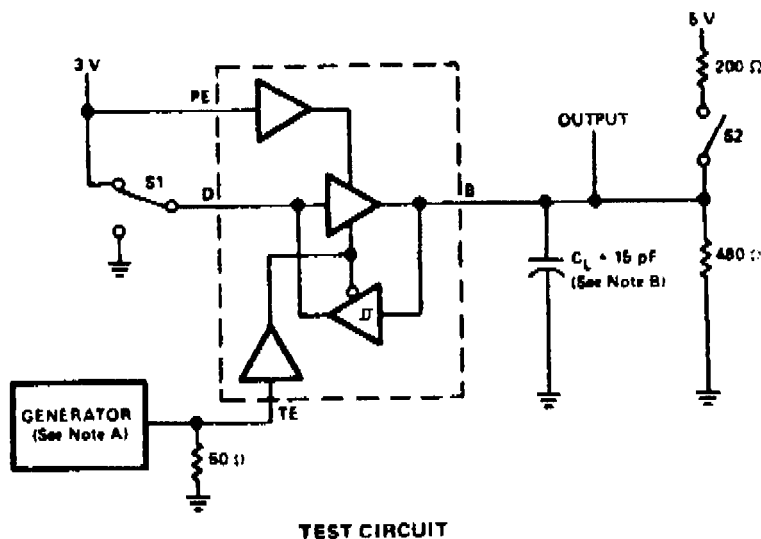


FIGURE 3. TE-TO-BUS ENABLE AND DISABLE TIMES

NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR $\leq$ 1 MHz, 50% duty cycle, $t_r \leq$ 6 ns, $t_f \leq$ 6 ns, $Z_{out} = 50 \Omega$.
 B. C_L includes probe and jig capacitance.

PARAMETER MEASUREMENT INFORMATION

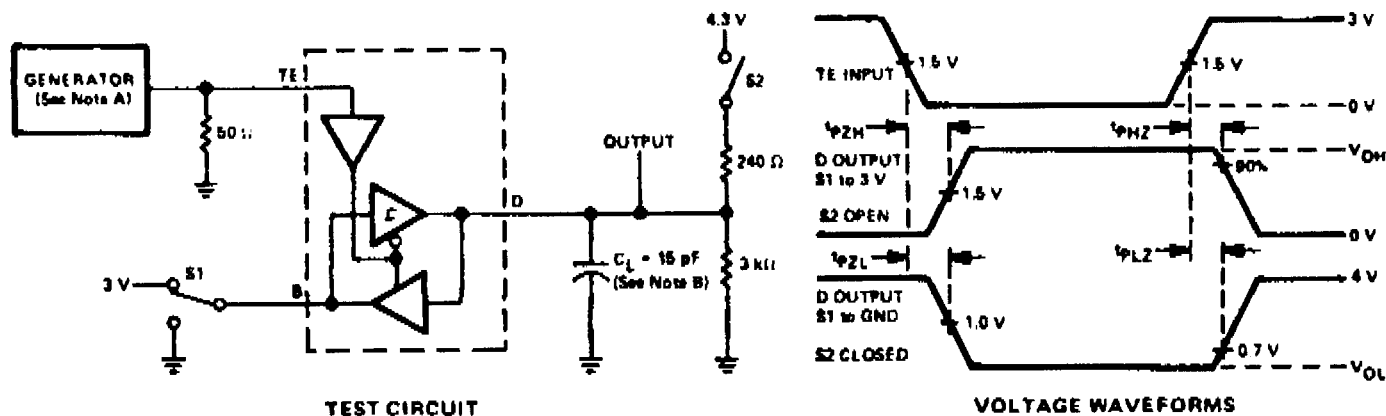


FIGURE 4. TE-TO-TERMINAL ENABLE AND DISABLE TIMES

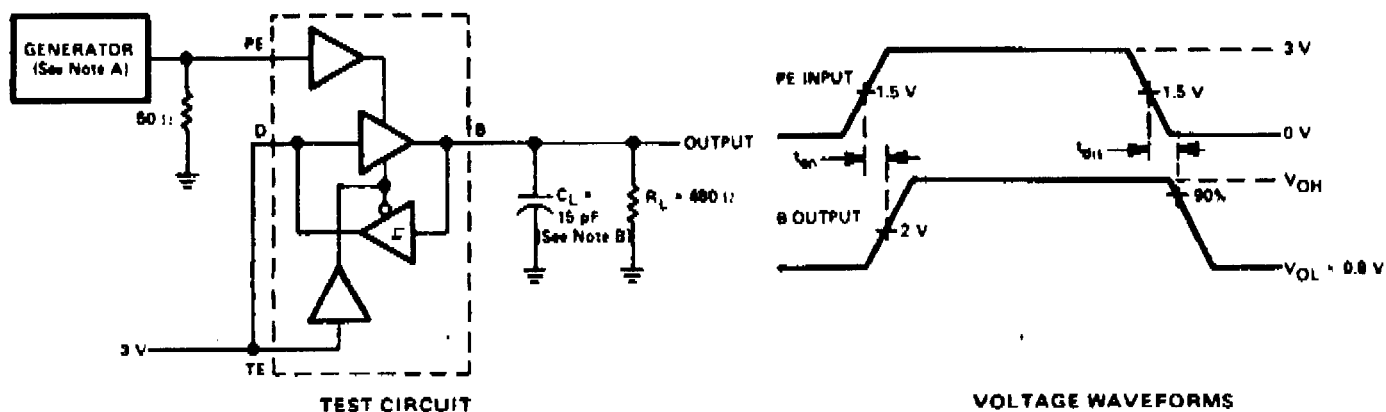


FIGURE 5. PE-TO-BUS PULLUP ENABLE AND DISABLE TIMES

- NOTES A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 1 \text{ MHz}$, 50% duty cycle, $t_f \leq 6 \text{ ns}$, $t_r \leq 6 \text{ ns}$, $Z_{out} = 50 \Omega$.
B. C_L includes probe and jig capacitance

6 ns

TYPICAL CHARACTERISTICS

TERMINAL HIGH-LEVEL OUTPUT VOLTAGE
vs
HIGH-LEVEL OUTPUT CURRENT

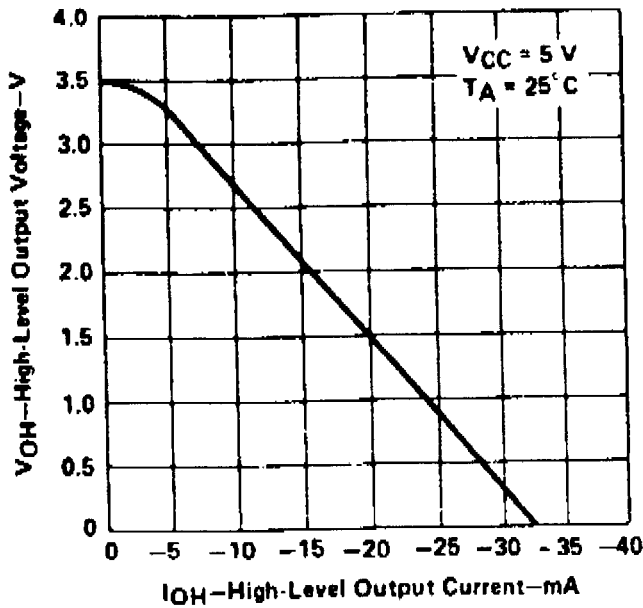


FIGURE 6

TERMINAL LOW-LEVEL OUTPUT VOLTAGE
vs
LOW-LEVEL OUTPUT CURRENT

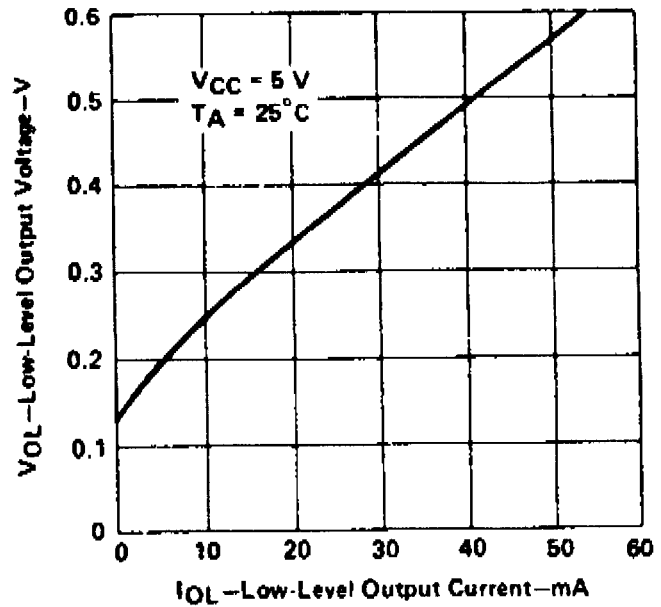


FIGURE 7

TERMINAL OUTPUT VOLTAGE
vs
BUS INPUT VOLTAGE

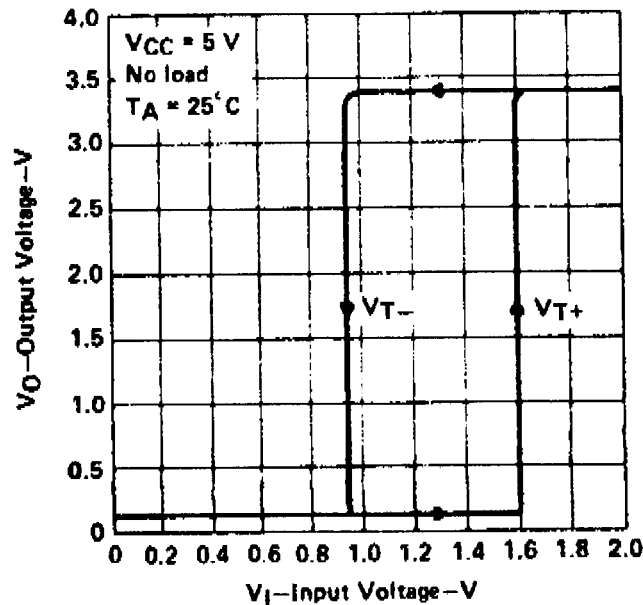


FIGURE 8

TYPICAL CHARACTERISTICS

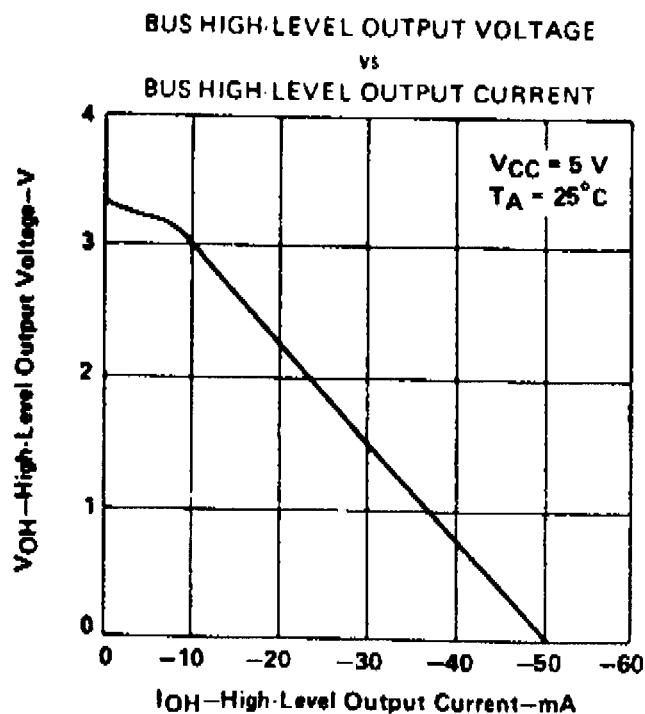


FIGURE 9

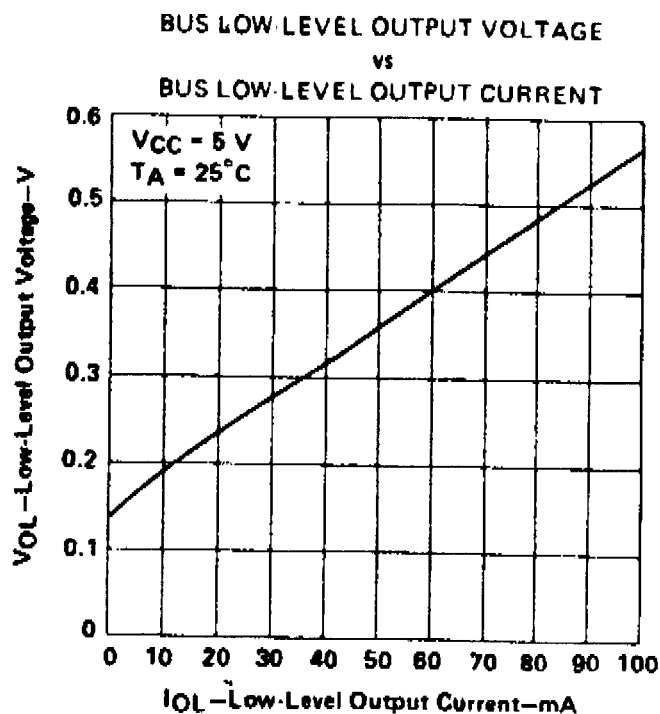


FIGURE 10

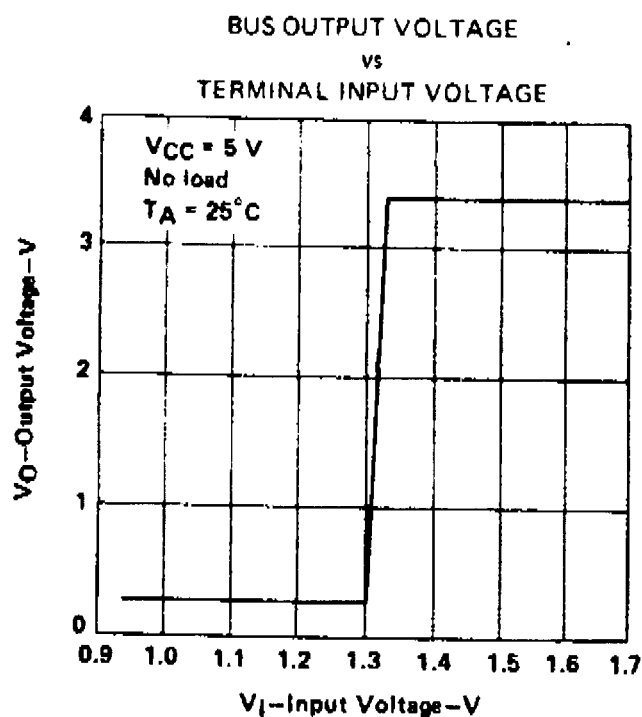


FIGURE 11

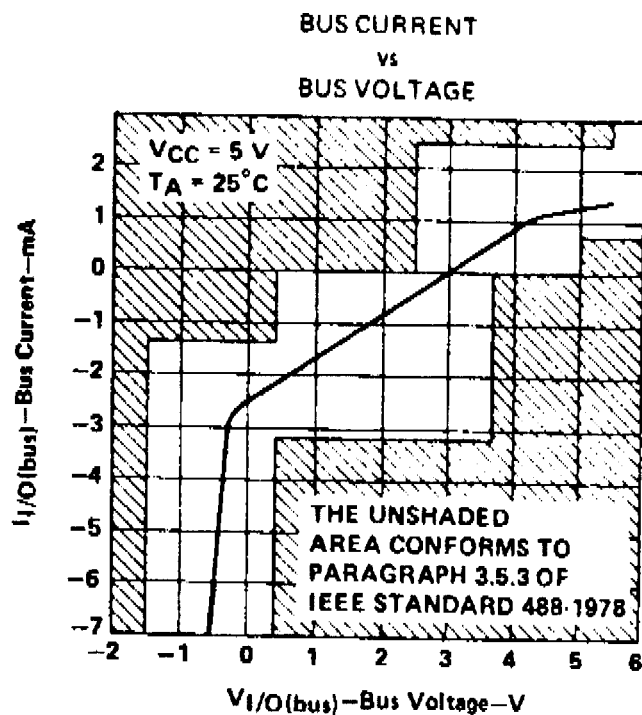


FIGURE 12