钍地半导体
Tudi Semiconductor

Product Specification

TUDI-SN65HVD379DR

3.3 V FULL-DUPLEX RS-485/RS-422 DRIVERS AND BALANCED RECEIVERS

网址 www.sztdbdt.com

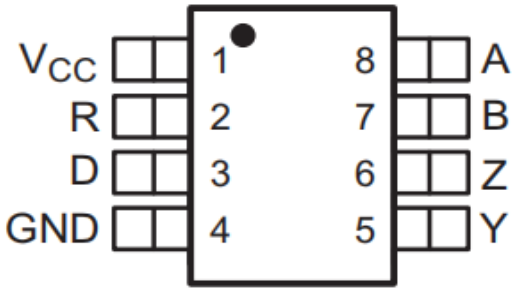
用芯智造·卓越品质

semiconductor device manufacturer

- Design
- research and development
- production
- and sales

FEATURES

- Designed for INTERBUS Applications
- Designed for RS-422 and RS-485 Networks
- Balanced Receiver Thresholds
- 1/2 Unit-Load (up to 64 nodes on the bus)
- Bus-Pin ESD Protection 15KV HBM
- Bus-Fault Protection of-7V to 12V
- Thermal Shutdown Protection
- Power-Up/Down Glitch-free Bus Inputs and Outputs
- High Input Impedance With Low V_{CC}
- Monotonic Outputs During Power Cycling
- 5-V Tolerant Inputs



(TOP VIEW)

APPLICATIONS

- Digital Motor Control
- Utility Meters
- Chassis-to-Chassis Interconnections
- Electronic Security Stations
- Industrial,Process,and Building Automation
- Point-of-Sale(POS)Terminals and Networks
- DTE/DCE Interfaces

DESCRIPTION

The SN65HVD379 is a differential line driver anddifferential-input line receiver that operates with a3.3-V power supply.Each driver and receiver hasseparate input and output pins for full-duplexbus communication designs.They are designed forbalanced transmission lines and interoperation withA NSI TIA/EIA-485A,TIA/EIA-422-B,ITU-T v.11,andSO 8482:1993 standard-compliant devices. These differential bus drivers and receivers aremonolithic,integrated circuits designed for full-duplexbi-directional data communication on multipointbus-transmission lines at signaling rates(1) up to 25Mbps.The SN65HVD379 is ully enabled with noextermal enabling pins.

The 1/2 unit load receiver has a higher receiver inputresistance.This results in lower bus leakage currentsover the common-mode voltage range,and reducesthe total amount of current that an RS-485 driver isforced to source or sink when transmitting.

The balanced differential receiver input thresholdmakes the SN65HVD379 more compatible withfieldbus requirements that define an extemal failsafestructure.

(1)The signaling rate of a line is the number of voltagetransitions that are made per second expressed in the unitsbps (bits per second).

ORDERING INFORMATION

SIGNALING RATE	UNIT LOADS	PART NUMBER(1)	SOIC MARKING
25 Mbps	1/2	SN65HVD379	

(1) These are The D package is available taped and reeled. Add an R suffix to the part number (ie. SN65HVD379DR).

ABSOLUTE MAXIMUM RATINGS

over operating free-air temperature range unless otherwise noted(1) (2)

		UNIT
V_{CC}	Supply voltage range	–0.3 V to 6 V
V_A, V_B, V_Y, V_Z	Voltage range at any bus terminal (A, B, Y, Z)	–9 V to 14 V
V_{TRANS}	Voltage input, transient pulse through 100 Ω. See Figure 8 (A, B, Y, Z)(3)	–50 to 50 V
V_I	Input voltage range (D, DE, $\overline{RE}$)	-0.5 V to 7 V
P_{CONT}	Continuous total power dissipation	Internally limited(4)
I_O	Output current (receiver output only, R)	11 mA

(1) Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under recommended operating conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) All voltage values, except differential I/O bus voltages, are with respect to network ground terminal.
(3) This tests survivability only and the output state of the receiver is not specified.
(4) The Thermal shutdown protection circuit internally limits the continuous total power dissipation. Thermal shutdown typically occurs when the junction temperature reaches 165C.

RECOMMENDED OPERATING CONDITIONS

over operating free-air temperature range unless otherwise noted

PARAMETER			MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage		3		3.6	V
V_I or V_{IC}	Voltage at any bus terminal (separately or common mode)		–7(1)		12	V
$1/t_{UI}$	Signaling rate	SN65HVD379			25	Mbps
R_L	Differential load resistance		54	60		Ω
V_{IH}	High-level input voltage	D	2		V_{CC}	V
V_{IL}	Low-level input voltage	D	0		0.8	V
V_{ID}	Differential input voltage		–12		12	V
I_{OH}	High-level output current	Driver	–60			mA
		Receiver	–8			mA
I_{OL}	Low-level output current	Driver			60	mA
		Receiver			8	mA
T_A	Ambient still-air temperature		–40		85	C

(1) The algebraic convention, in which the least positive (most negative) limit is designated as minimum is used in this data sheet.

RECEIVER ELECTRICAL CHARACTERISTICS

over recommended operating conditions unless otherwise noted

PARAMETER		TEST CONDITIONS		MIN	TYP(1)	MAX	UNIT
V_{IT+}	Positive-going differential input threshold voltage	I_O = –8 mA				0.2	V
V_{IT-}	Negative-going differential input threshold voltage	I_O = 8 mA		–0.2			
V_{hys}	Hysteresis voltage ($V_{IT+} – V_{IT-}$)				50		mV
V_O	Output voltage	V_{ID} = 200 mV, I_O = –8 mA, See Figure 7		2.4			V
		V_{ID} = –200 mV, I_O = 8 mA, See Figure 7				0.4	
I_A or I_B	Bus input current	V_A or V_B = 12 V	Other input at 0 V		0.20	0.35	mA
		V_A or V_B = 12 V, V_{CC} = 0 V			0.24	0.40	
		V_A or V_B = -7 V		–0.35	–0.18		
		V_A or V_B = -7 V, V_{CC} = 0 V		–0.25	–0.13		
C_{ID}	Differential input capacitance	V_{ID} = 0.4 sin (4E6πt) + 0.5 V, DE at 0 V			15		pF
I_{CC}	Supply current	D at 0 V or V_{CC} and No Load				2.1	mA

(1) All typical values are at 25C and with a 3.3-V supply.

RECEIVER SWITCHING CHARACTERISTICS

over recommended operating conditions unless otherwise noted

PARAMETER		TEST CONDITIONS	MIN	TYP(1)	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	V_{ID} = –1.5 V to 1.5 V, C_L = 15 pF, See Figure 7		26	45	ns
t_{PHL}	Propagation delay time, high-to-low-level output					
$t_{sk(p)}$	Pulse skew ($\|t_{PHL} - t_{PLH}\|$)				7	
$t_{sk(pp)}$	Part-to-part skew(2)			5		
t_r	Output signal rise time				5	
t_f	Output signal fall time				6	

(1) All typical values are at 25C and with a 3.3-V supply
(2) $t_{sk(pp)}$ is the magnitude of the difference in propagation delay times between any specified terminals of two devices when both devices operate with the same supply voltages, at the same temperature, and have identical packages and test circuits.

DEVICE POWER DISSIPATION – P_D

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
P_D	Device power dissipation	R_L = 60 , C_L = 50 pF, Input to D a 50% duty cycle square wave at indicated signaling rate T_A = 85C			197	mW

FUNCTION TABLES

DRIVER			RECEIVER	
INPUT	OUTPUTS		DIFFERENTIAL INPUTS	OUTPUTS
D	Y	Z	$V_{ID} = V_A – V_B$	R
H	H	L	$V_{ID} \le$ –0.2 V	L
L	L	H	–0.2 V < V_{ID} < 0.2 V	?
Open	L	H	0.2 V $\le V_{ID}$	H

PARAMETER MEASUREMENT INFORMATION

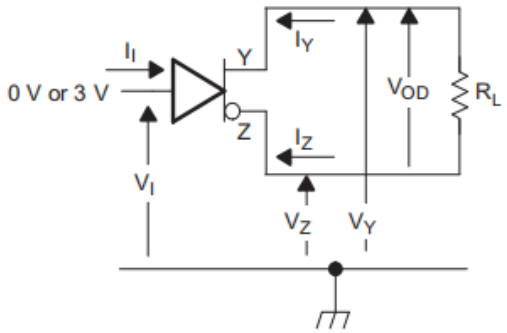


Figure 1. Driver V_{OD} Test Circuit and Voltage and Current Definitions

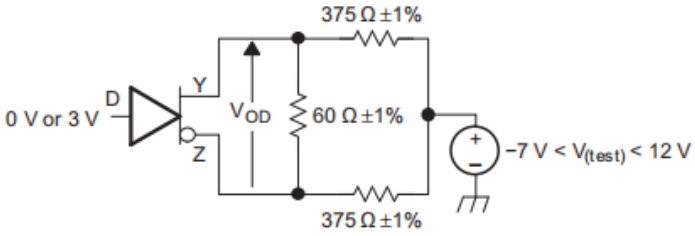


Figure 2. Driver V_{OD} With Common-Mode Loading Test Circuit

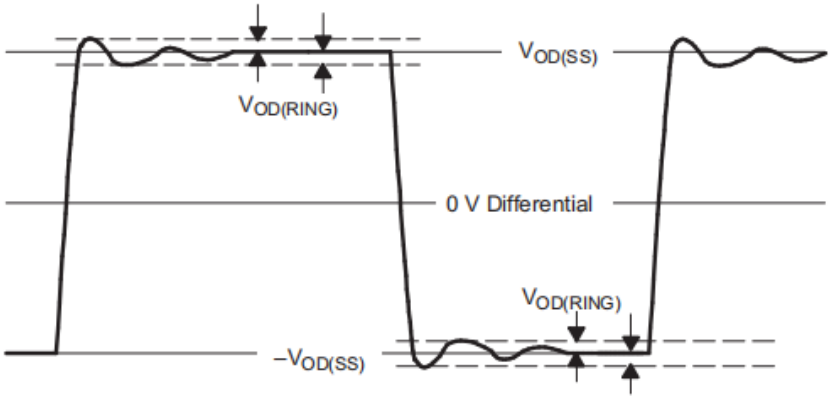
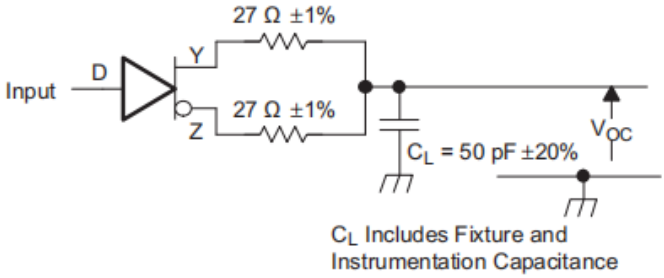


Figure 3. $V_{OD(RING)}$ Waveform and Definitions

$V_{OD(RING)}$ is measured at four points on the output waveform, corresponding to overshoot and undershoot from the$V_{OD(H)}$ and $V_{OD(L)}$ steady state values.



C_L Includes Fixture and Instrumentation Capacitance

Input: PRR = 500 kHz, 50% Duty Cycle, t_r < 6 ns, t_f < 6 ns, Z_O = 50 Ω

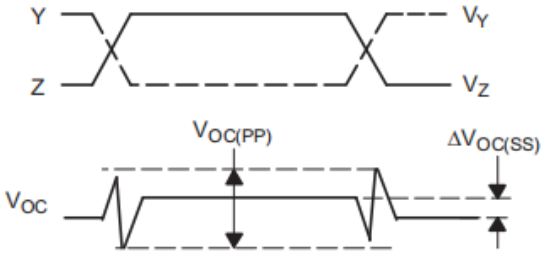
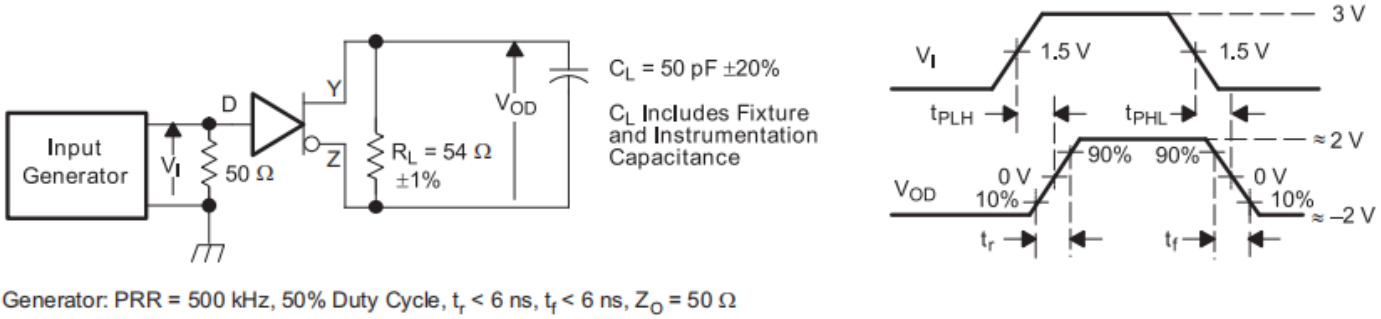


Figure 4. Test Circuit and Definitions for the Driver Common-Mode Output Voltage

PARAMETER MEASUREMENT INFORMATION (continued)



Generator: PRR = 500 kHz, 50% Duty Cycle, t_r < 6 ns, t_f < 6 ns, Z_O = 50 Ω

Figure 5. Driver Switching Test Circuit and Voltage Waveforms

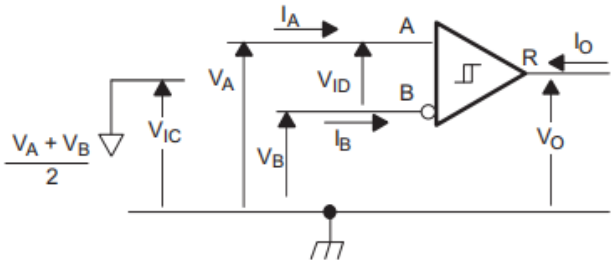
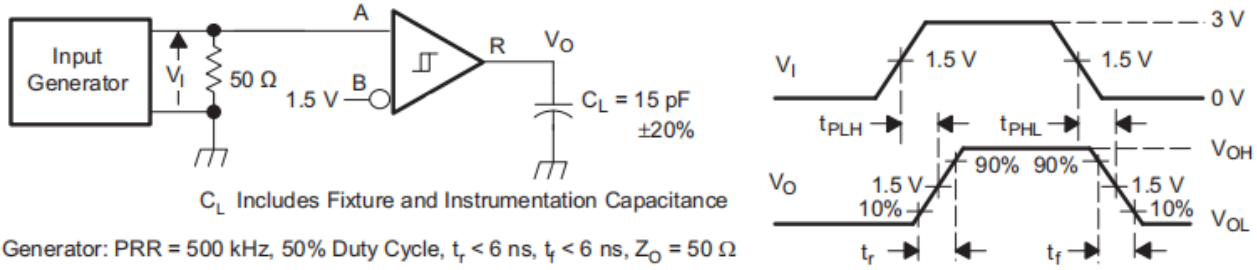


Figure 6. Receiver Voltage and Current Definitions



Generator: PRR = 500 kHz, 50% Duty Cycle, t_r < 6 ns, t_f < 6 ns, Z_O = 50 Ω

Figure 7. Receiver Switching Test Circuit and Voltage Waveforms

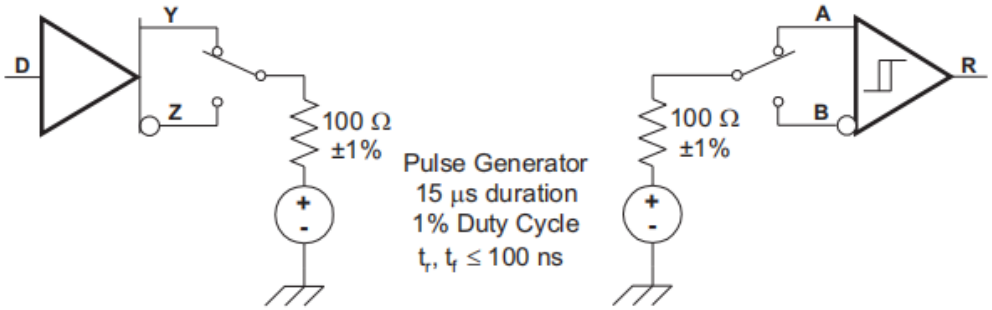
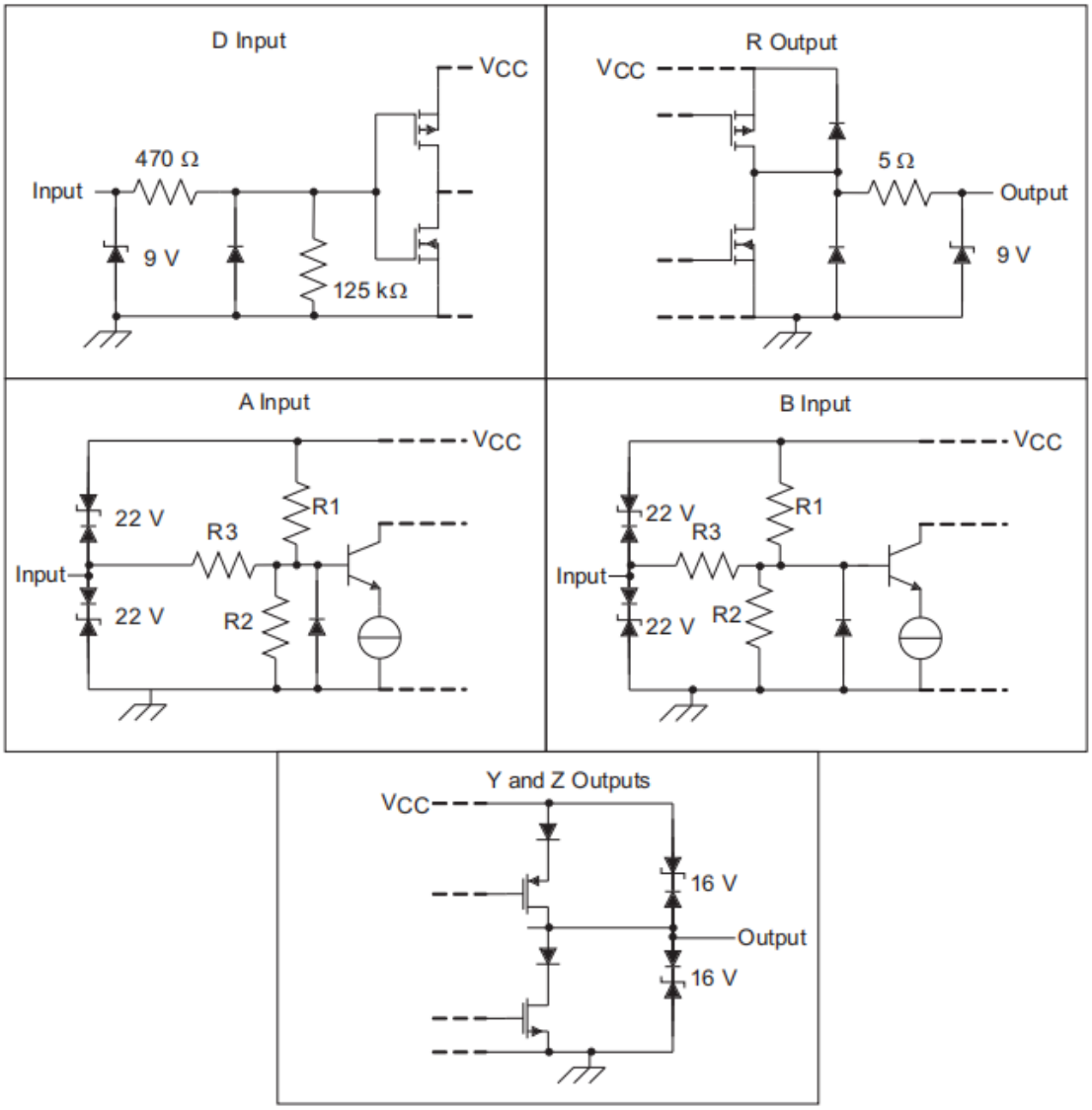


Figure 8. Test Circuit, Transient Over Voltage Test

EQUIVALENT INPUT AND OUTPUT SCHEMATIC DIAGRAMS

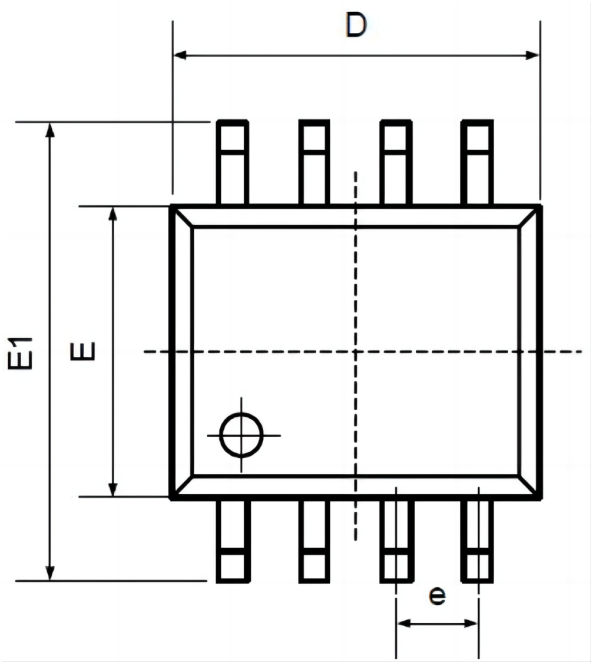


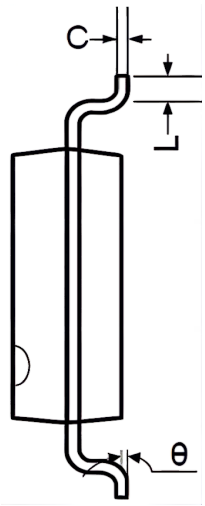
	R1/R2	R3
SN65HVD379	9 kΩ	45 kΩ

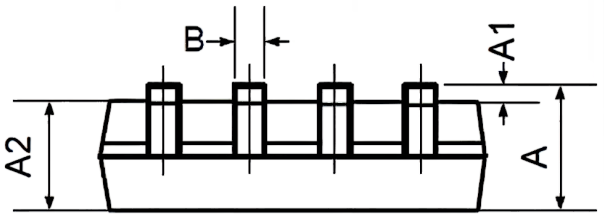
Order information

Order Number	Package	Package Quantity	Marking On The park
SN65HVD379DR-TUDI	SOP8	Tape,Reel,2500	SN65HVD379DR

Package SOP8







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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