钛地半导体
Tudi Semiconductor

Product Specification

TUDI-ISL83483

3.3V, Low Power, High Speed or Slew Rate Limited, RS-485/RS-422 Transceivers

网址 www.sztdbdt.com

用芯智造·卓越品质

semiconductor device manufacturer

- Design
- research and development
- production
- and sales

FEATURES

- Single 3.3V power supply (10% tolerance)
- Compatible with 5V logic
- Single unit load allows up to 32 devices on the bus
- Limited slope rate version for error-free data transfer, up to 250kbps
- Common mode input voltage range of -7V to 12V
- Full-duplex half-duplex pinout
- Current limiting thermal shutdown for driver over-current protection
- Lead-free (RoHS compliant)

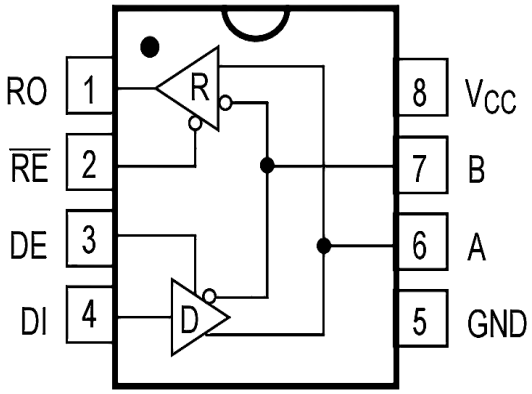


Figure 1. Pin Diagram

Description

The ISL83483 is a transceiver for balanced communication that meets the RS-485 and RS-422 and is powered at 3.3V. The device is specified within a 10% tolerance range (3V to 3. 6V).

The IS83483 features EMI-Limited drivers that reduce EMI and minimize reflections from unterminated transmission lines or unterminated branches in multipoint applications. logic inputs (e.g., DI and DE) accept signals above 5.5V, making them compatible with 5V logic families.

The receive (Rx input has a “ fail-safe ” design that ensures a logic high output if the Rx input is floating. All devices present a “ single unit load ” to RS-485, allowing for a maximum of 32 transceivers on a network.

The driver (Tx) output has short-circuit protection, even if the voltage exceeds power supply. Additionally, an on-chip thermal shutdown circuit disables the Tx output to prevent damage when the power dissipation is too high.

The half-duplex configuration(ISL83483) multiplexes the Rx input and Tx output to provide a transceiver with Rx and Tx disable functions in an 8 Ld package.

Applications

- Factory automation
- Security networks
- Building environmental control systems
- Industrial/process control networks
- Level translators (for example, RS-232 to RS-422)
- RS-232 “ Extension Cords ”

Pin description

Pin Number	Pin Name	FUNCTION
1	RO	Receiver Output.When enabled,ifA-B≥-10mV,then RO=high.IfA-B ≤-200 mV,then RO=low
2	/RE	Receiver Output Enable.Alow level enables the RO;a high level places it in a high impedance state.
3	DE	Driver Output Enable.A high level enables the driver differential outputs,Pin A and Pin B;a low level places the driver in a high impedance state.
4	DI	Driver Input.When the driver is enabled,a logic low on DI forces Pin A low and Pin B high;a logic high on DI forces PinA high and Pin B low.
5	GND	Ground Connection (0V).
6	A	No inverting Receiver Input A/Driver Output A
7	B	Inverting Receiver Input B/Driver Output B.
8	VCC	Power Supply

Parameter limit

PARAMETER	Symbol	Value	Unit
CTR Port	/RE,DE,DI	-0.3~VCC+0.3	V
Driver Output Voltage	A、B	-7~13	V
Receiver Output Voltage	RO	-0.3~VCC+0.3	V
Supply Voltage	VCC	+7	V
Continuous Power Dissipation	MSOP8.SOP8.DIP8	830	mW
Soldering Temperature (reflow)		300	℃
Storage Temperature Range		-60~150	℃
Temperature Range		- 40 ~ 125	℃

Stresses beyond those listed under “Parameter limit” 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 in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability

Receiver Switching Characteristics						
Parameter	symbol	Test condition	Minimum	Typical case	Maximum	Unit
Propagation delay from receiver input to output, from low to high	tRPLH	CL=15pF See Figures 7 and 8		80	150	ns
The propagation delay from receiver input to output is from high to low	tRPHL			80	150	ns
|tRPLH-tRPHL	tRPDS			7	10	ns
Enable low time out	tRPZL	CL=15pF See Figures 7 and 8		20	50	ns
Enable to output high time	tRPZH	CL=15pF See Figures 7 and 8		20	50	ns
Time from output low to disa- ble	tpRLZ	CL=15pF See Figures 7 and 8		20	45	ns
Time from out-put high to disable	tpRHZ	CL=15pF See Figures 7 and 8		20	45	ns
Off stateEnable to output high time	tRPSH	CL=15pF See Figures 7 and 8		200	1400	ns
Off stateEnable low time out	tRPSL	CL=15pF See Figures 7 and 8		200	1400	ns
Time to turn off	tsHDN	NOTE	80		300	ns

NOTE: When /RE=1 and DE=0, the device will not enter shutdown mode if the duration is less than 80ns;however, it will definitely enter shutdown mode if the duration exceeds 300ns

supply current						
Parameter	symbol	Test condition	Minimum	Typical canse	Maximum	Unit
Supply current	Icc_1	/RE=0V,DE=0V		520	800	uA
	Icc_2	/RE=VCC,DE=VCC		540	700	uA
Turn-off current	IsHDN	/RE=VCC,DE=0V		0.5	10	uA
Drive Switch Characterist-ics						
Parameter	symbol	Test condition	Minimum	Typical case	Maximum	Unit
Driver differen-tial output delay	tDD	RDIFF=60 Ω,CL_1 =CL2=100pF(see Fi-gure 3 and Figure 4)		10	35	ns
Drive differentialoutput transition time	tTD			12	25	ns
Drive propagation delay from low to high	tPLH	RDIFE=27Ω(see Figure 3 and Figure 4)		8	35	ns
Drive propagationdelay from high to low	tPHL			8	35	ns
|tPLH-tPHL	tPDS			1	8	ns
Enable to output high	tpZH	RL=110Ω(see Figure 5 and 6)		20	90	ns
Enable to output low	tpzL			20	90	ns
Input low to disable	tPLZ	RL=110Ω(see Figure 5 and 6)		20	80	ns
Enable high input	tPHZ			20	80	ns
Enable high outputunder off condition	tDSH	R=110Ω(see Figure 5 and 6)		500	900	ns
Enable low output under shutdown conditions	tDSL	RL=110Ω(see Figure 5 and 6)		500	900	ns

DC electrical characteristics of the driver						
Parameter	symbol	Test condition	Minimum	Typical case	Maximum	Unit
Driver differential output (non-loaded)	VoD_1			3.3		V
Drive differential output	VoD_2	graph 2,RL=54Ω	1.5		VCC	V
		graph 2,RL=100Ω	2		VCC	
Variation in the amplitude of the output voltage (NOTE1)	△VoD	graph 2,RL=54Ω			0.2	V
Output common mode voltage	Voc	graph 2,RL=54Ω			3	V
Amplitude Variation of Common Mode Output Voltage (NOTE1)	△Voc	graph 2,RL=54Ω			0.2	V
High-level input	VH	DE,DI,/RE	2.0			V
Low level input	Vπ	DE,DI,/RE			0.8	V
Logic input current	IN1	DE,DI,/RE	-2		2	uA
Output the current during ashort circuit,with highshort-circuit	$IosD_1$	Short circuit to 0V~12V			250	mA
Output the current during ashort circuit, down to low	$IosD_2$	Short circuit to -7V~0V	-250			mA
Overtemperature shutdown threshold temperature				140		℃
Overtemperature turm-off hysteresis temp-erature				20		℃

DC Electrical Characteristics of the Receiver						
Parameter	symbol	Test condition	Minimum	Typical case	Maximum	Unit
Input current(A,B)	IN2	DE=0V,VCC=0 or 3.3V VIn=12V			125	uA
		DE=0V,VCC=0 or 3.3V VIn=-7V	-100			uA
Forward input threshold voltage	VIT+	-7V≤Vcm≤12V			+200	mV
Reverse input threshold voltage	VIT-	-7V≤Vcm≤12V	-200			mV
Input hysteresis voltage	Vhys	-7V≤Vcm≤12V	10	30		mV
High level output voltage	VoH	IoUT=-2.5mA,VID=+200 mV	VCC-1.5			V
Low level output voltage	VoL	IoUT=+2.5mA,VD=-200 mV			0.4	V
Three-state input leakage cur-rent	IozR	0.4V<Vo<2.4V			±1	uA
Input resistance of receiver	RIn	-7V≤Vcm≤12V	96			kΩ
Receiver short circuit curr-ent	IosR	0V≤Vo≤VCC	±8		±60	mA

FUNCTION TABLES

TRANSMITTING						RECEIVING			
CTR	/RE	X	X	0	1	0	0	0	1
	DE	1	1	0	0	X	X	X	X
INPUTS	DI	1	0	X	X				
	A-B					≥-10mV	≤-200mV	Open/shorted	X
OUTPUTS	A	H	L	Z					
	B	L	H	Z					
	RO					H	L	H	Z
X:Don't care;Z:high impedance.									

TEST CIRCUIT

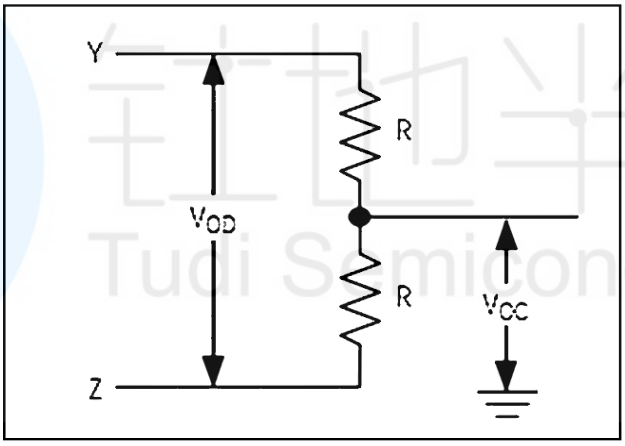


Figure 2 DC test load of the driver

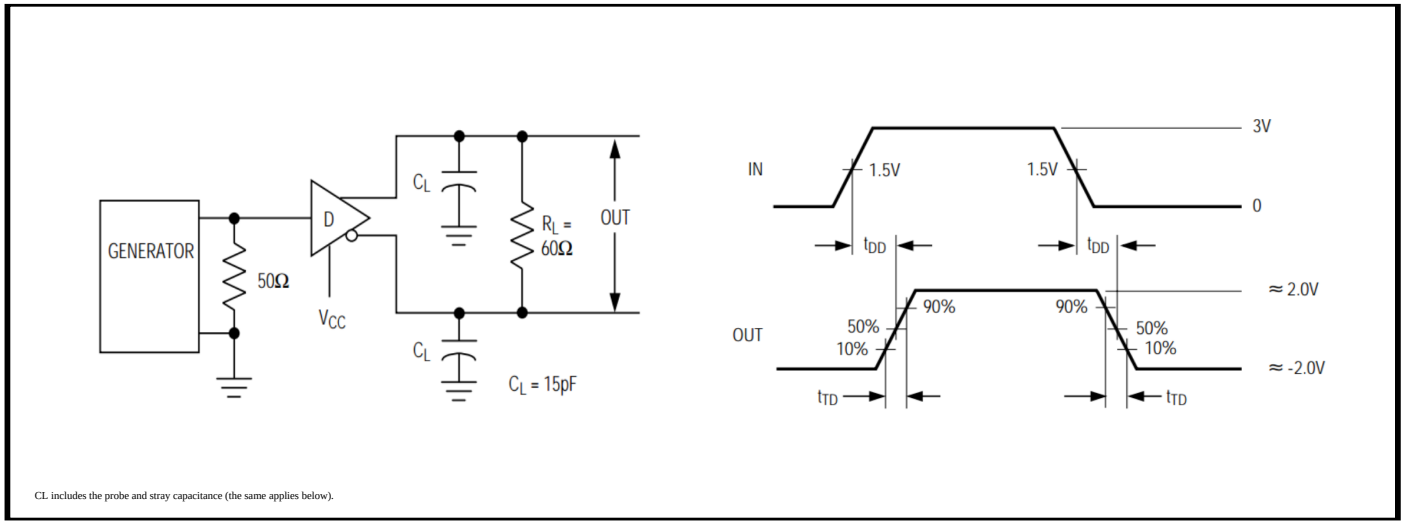


Figure 3 Differential delay and transit time of driver

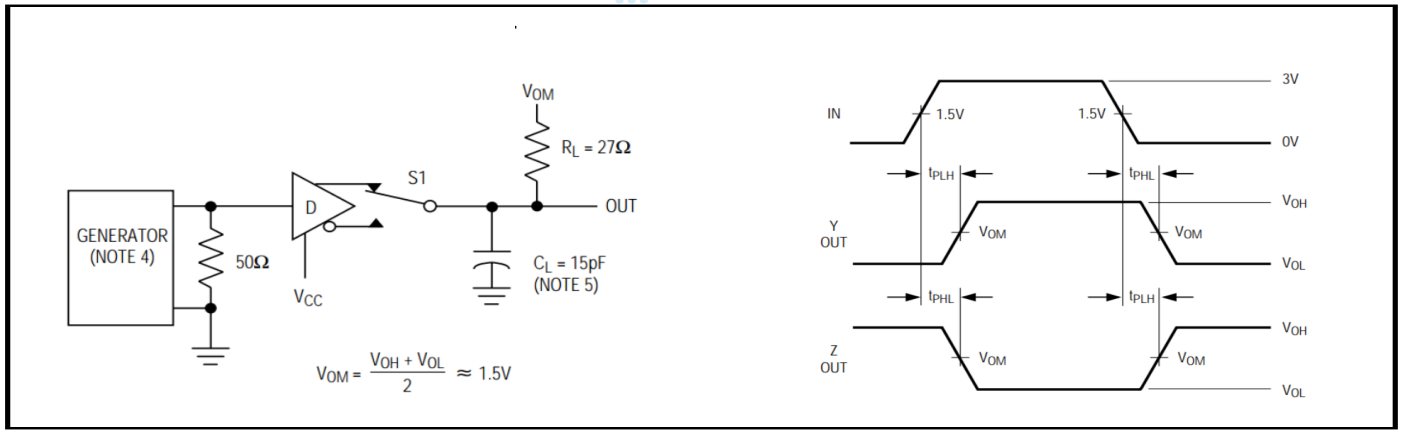


Figure 4 Propagation Delay of Driver

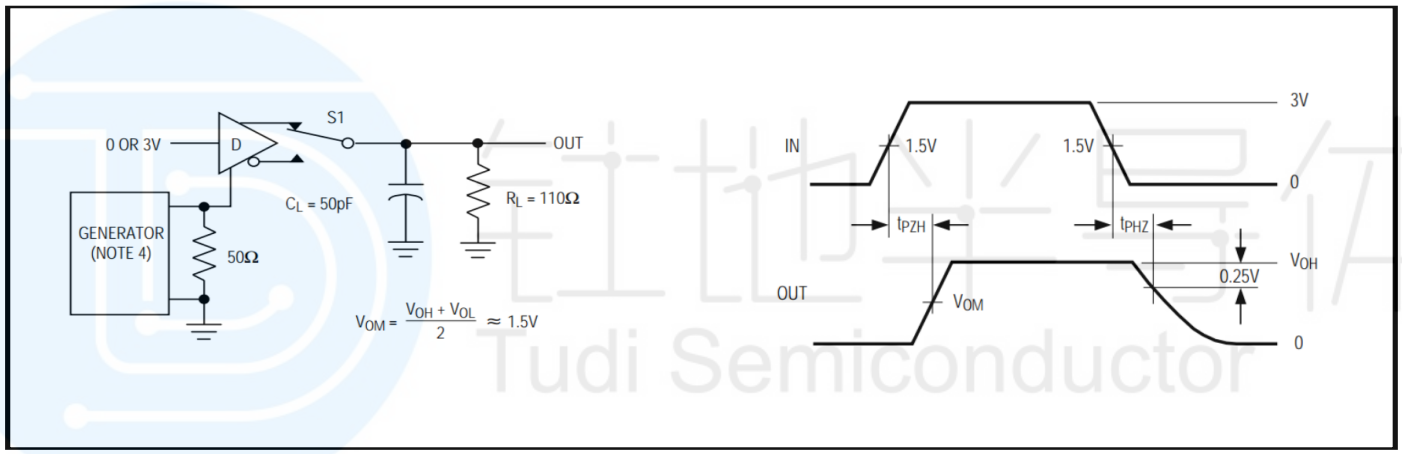


Figure 5 Driver enable and disable time

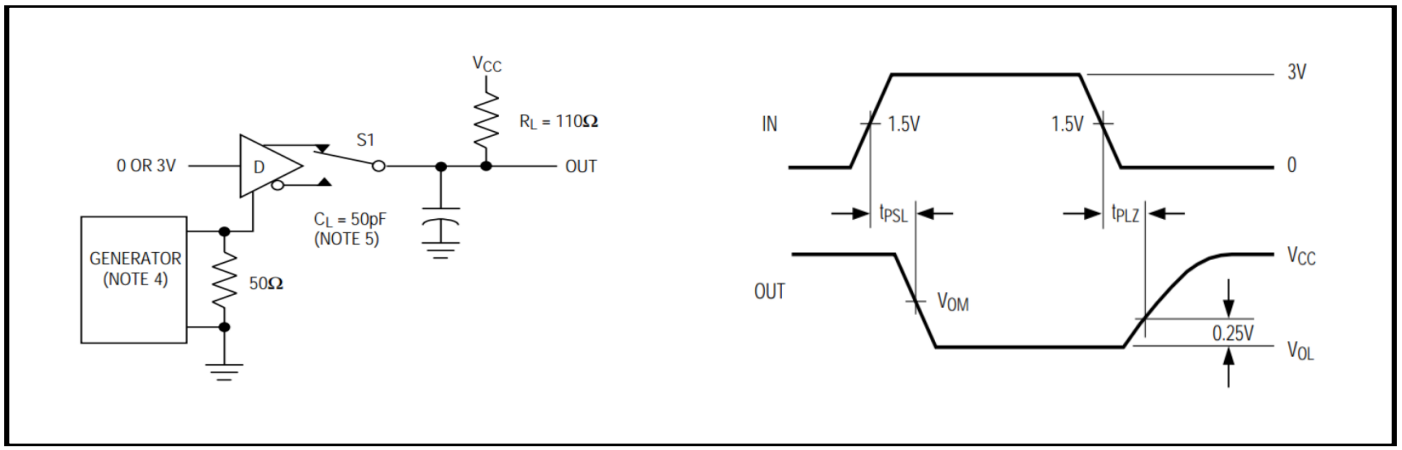


Figure 6 Driver enable and disable time

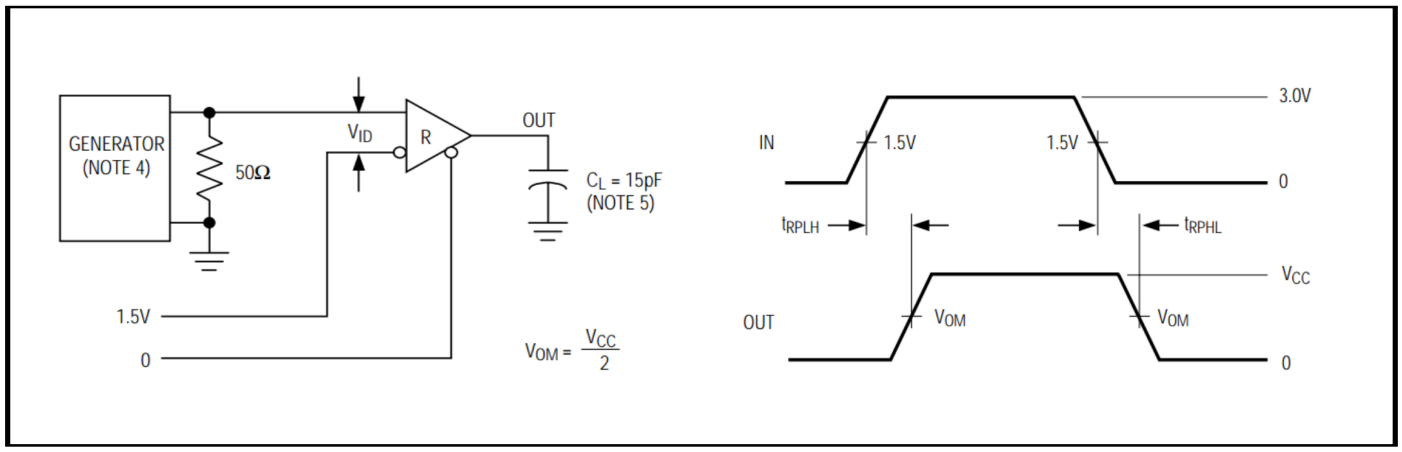


Figure 7 Receiver propagation delay test circuit

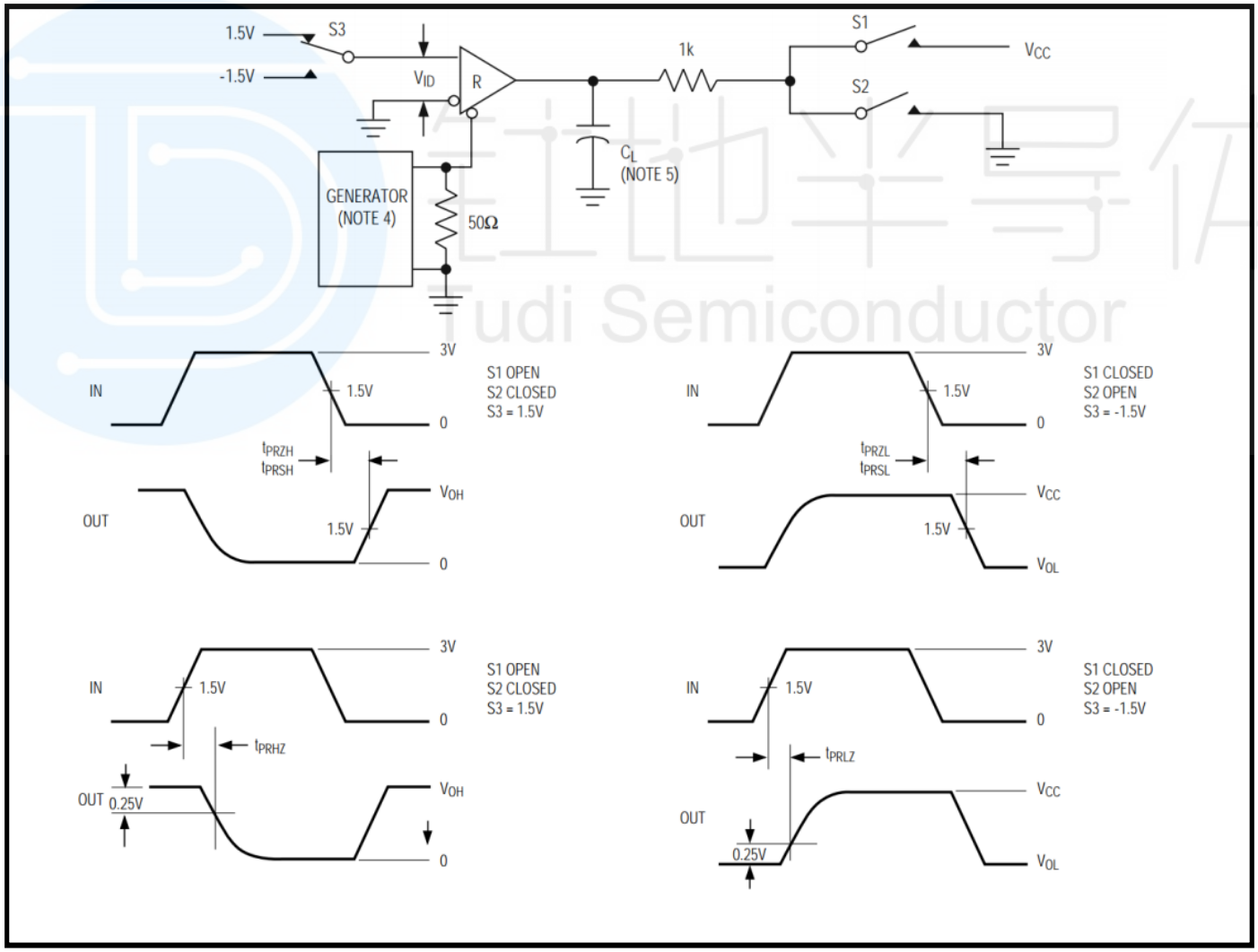


Figure 8 Receiver Enable and Disable Time

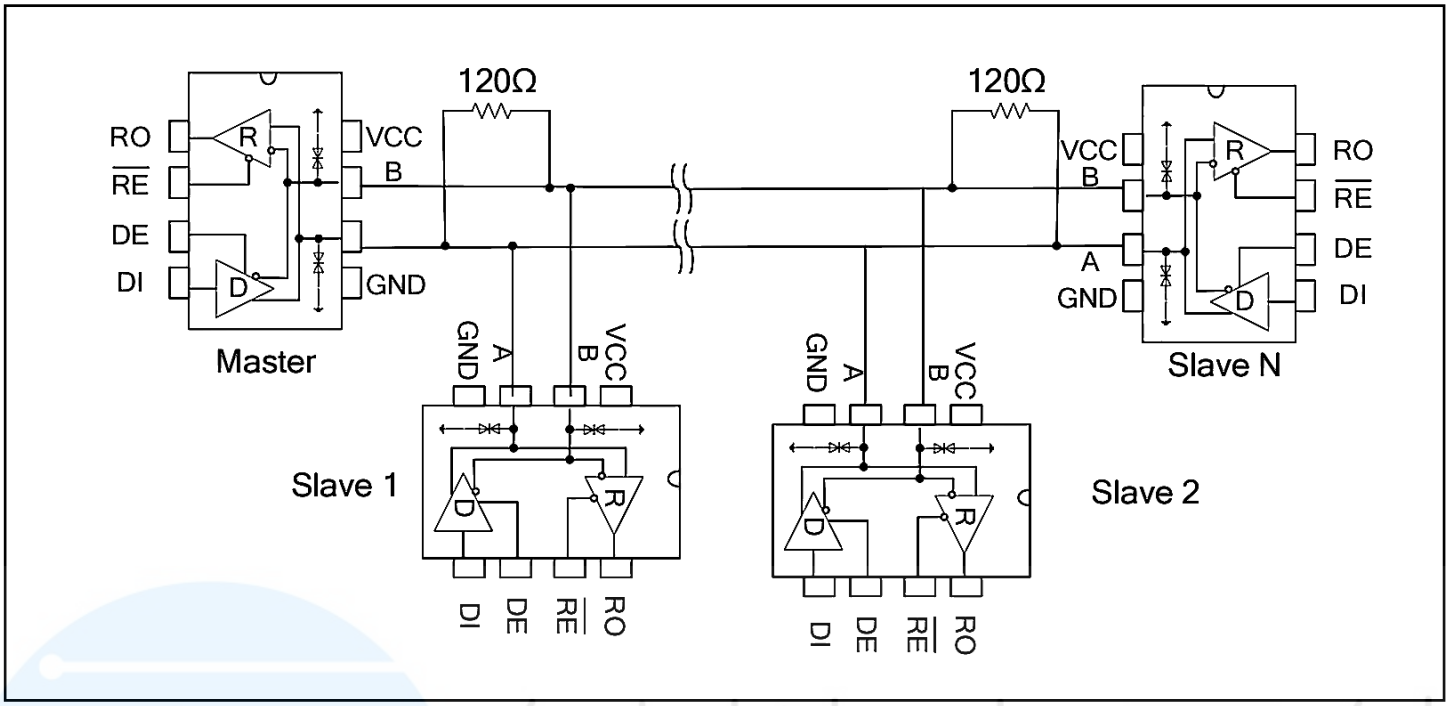


Fig11 Backbone cable type RS485 communications network

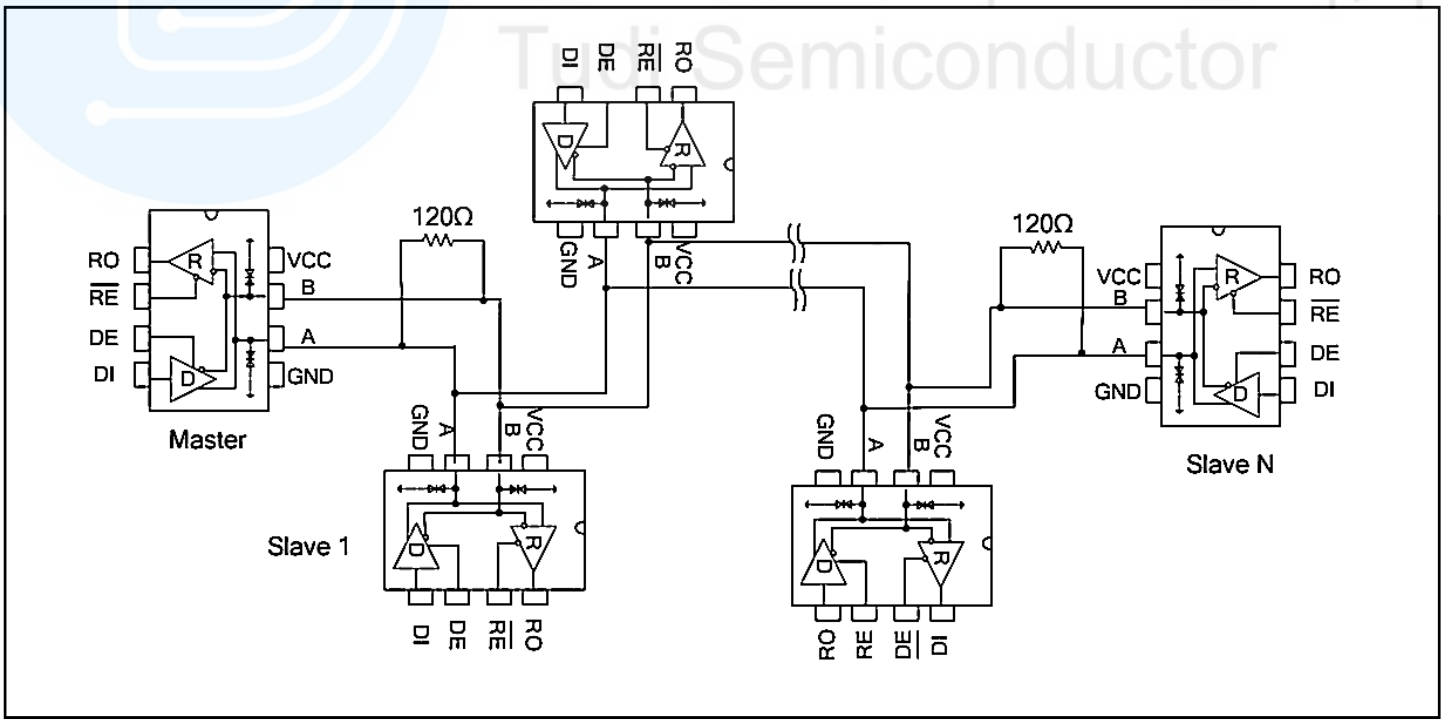


Fig12 Daisy chain topology type RS485 communications network

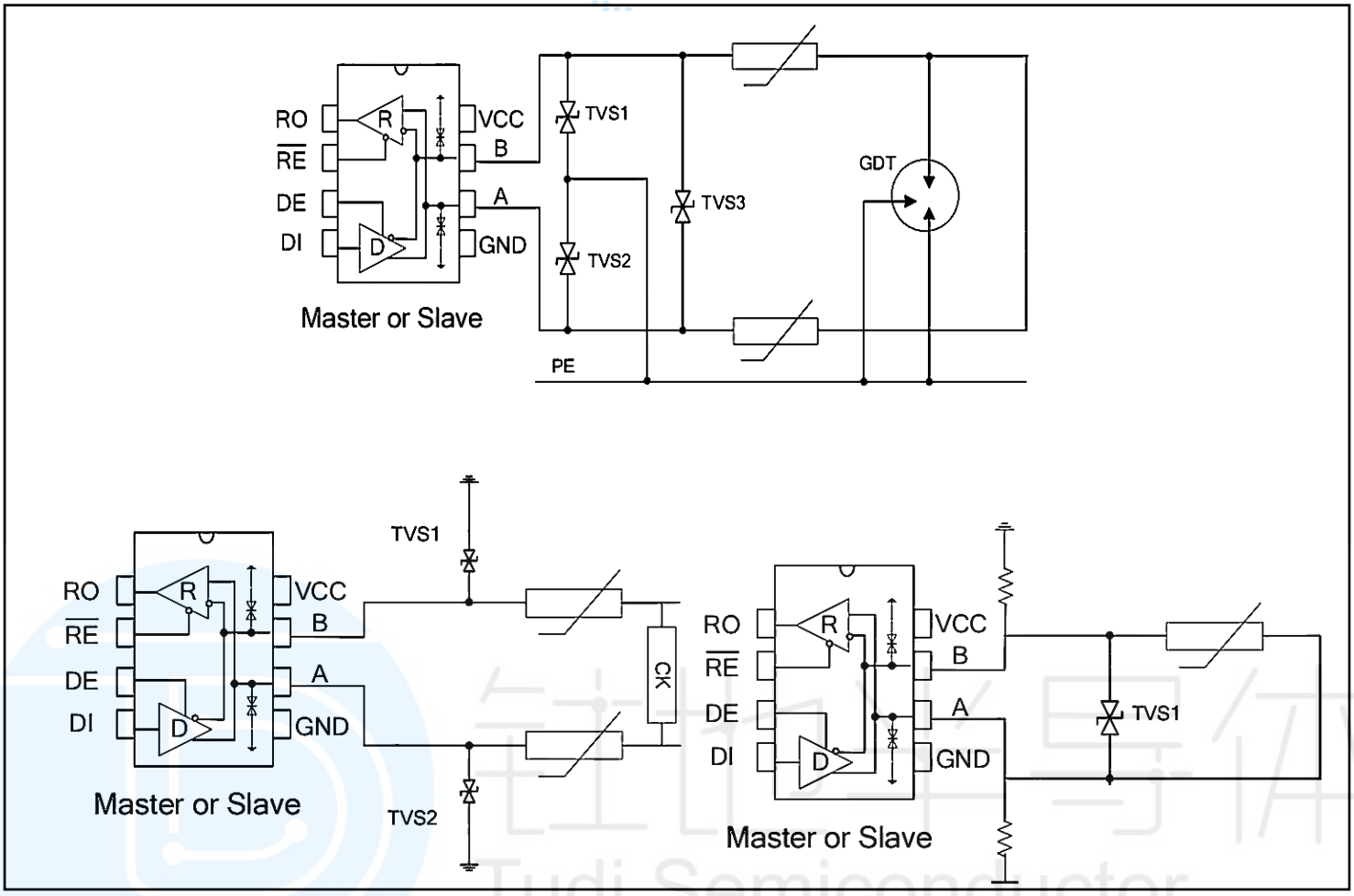
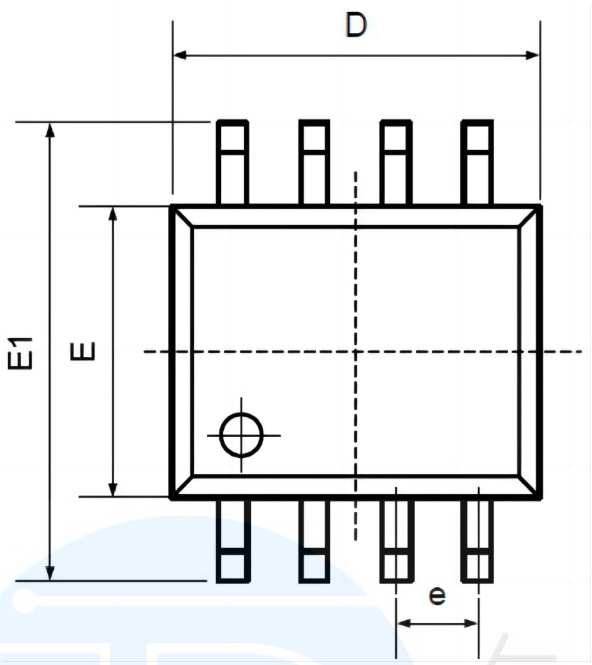


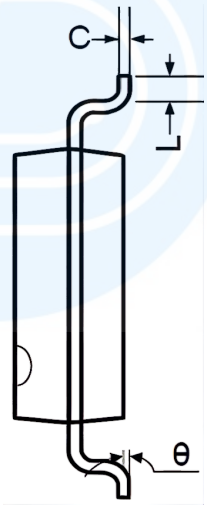
Fig13 RS485 bus ports Protection configuration

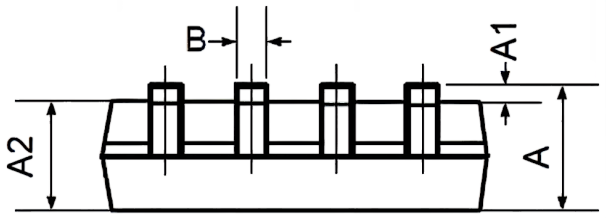
Order information

Order Number	Package	Package Quantity	Marking On The park	Temperature
ISL83483IBZ-T-TUDI	SOP8	Tape,Reel,2500	83483IBZ	- 40°C to 85°C
ISL83483IPZ-TUDI	DIP8	Tube,50,A box of 2000	ISL83483IP	

Package SOP8

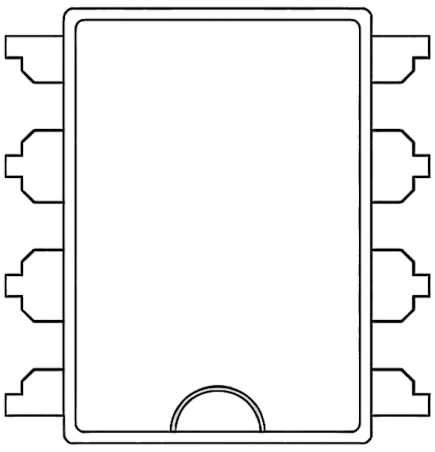


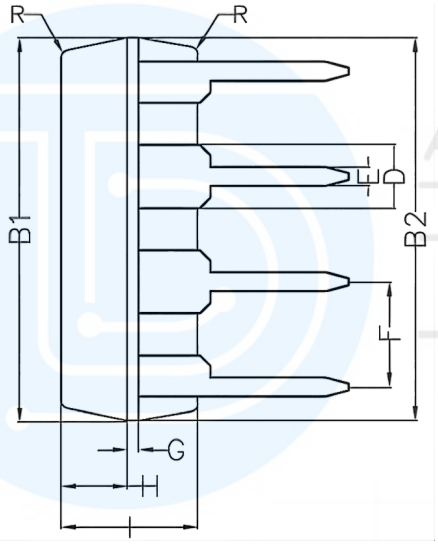


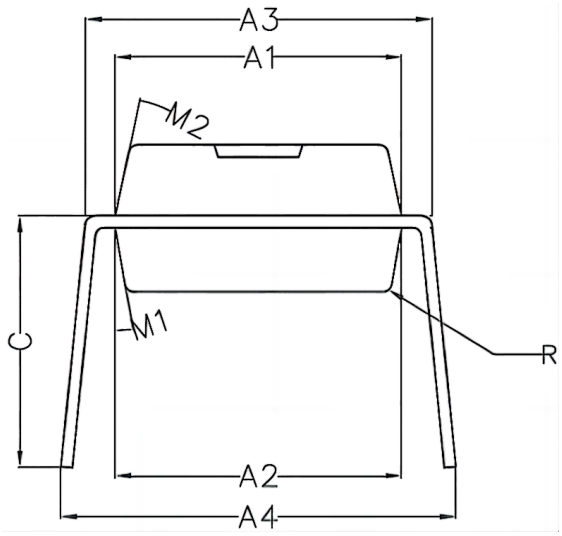


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP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

Package DIP8







Symbol	Min	Non	Max
A1	6.28	6.33	6.38
A2	6.33	6.38	6.43
A3	7.52	7.62	7.72
A4	7.80	8.40	9.00
B1	9.15	9.20	9.25
B2	9.20	9.25	9.30
C		5.57	
D		1.52	
E	0.43	0.45	0.47
F		2.54	
G		0.25	
H	1.54	1.59	1.64
工	3.22	3.27	3.32
R		0.20	
M1	9°	10°	11°
M2	11°	12°	13°

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