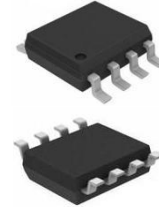


Low Power Dissipation, RS-485 Interface Circuit

PRODUCT DESCRIPTION

The MS2591 is a RS-485 communication interface circuit, which is featured by low power dissipation and high ESD capacity. In receiver mode, the power dissipation is only about 365uA. While in shutdown mode, the dissipation is less than 1uA. The electrostatic discharge (ESD) on A/B terminal can be up to $\pm 25\text{kV}$ and no self-excited phenomena. The maximum data transmission rate can be 5Mbps.



SOP8

FEATURES

- Low Power Dissipation:
Receiver Mode: 365uA(5V)
Shutdown Mode: 1uA at most
- ESD: $\pm 25\text{kV}$ (HBM) on A/B Terminal
- Bus Maximum Connection: 128 Nodes
- Data Rate: 5Mbps (Max)
- Compatible with other 485 chips
- Three-state Outputs

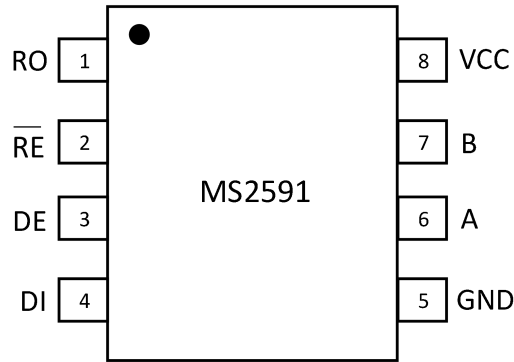
APPLICATIONS

- Industrial Automation
- Electricity Meter, Water Meter
- HVAC Systems
- Process Control
- Motion Control
- RS-485 interface

PRODUCT SPECIFICATION

Part Number	Package	Marking
MS2591	SOP8	MS2591

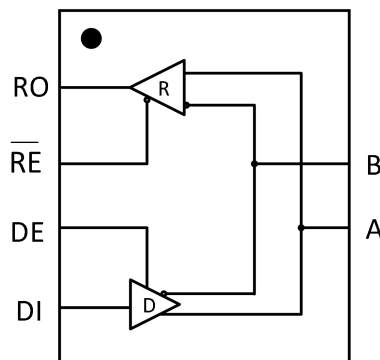
PIN CONFIGURATION



PIN DESCRIPTION

Pin	Name	Type	Description
1	RO	O	Receiver Data Output
2	\overline{RE}	I	Receiver Enable, Active Low.
3	DE	I	Driver Enable, Active High
4	DI	I	Driver Data Input
5	GND	--	Ground
6	A	I/O	Bus Terminal A
7	B	I/O	Bus Terminal B
8	VCC	-	Power Supply. $\overline{RE} = VCC$, $DE = 0V$ in Shut-down Mode

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Any exceeding absolute maximum rating application causes permanent damage to device. Because long-time absolute operation state affects device reliability. Absolute ratings just conclude from a series of extreme tests. It doesn't represent chip can operate normally in these extreme conditions.

Parameter	Symbol	Ratings	Unit
Supply Voltage	VCC	-0.5 ~ +6	V
Input Voltage on Control Pin	V _i	-0.5 ~ +6	V
Driver Input Voltage	V _{DI, IN}	-0.5 ~ +6	V
Driver Output Voltage	V _{A,OUT} ; V _{B,OUT}	-0.5 ~ +6	V
Receiver Input Voltage	V _{A, IN} ; V _{B, IN}	-7 ~ +10	V
Receiver Output Voltage	V _{RO}	-0.5 ~ +6	V
Storage Temperature Range	T _{STORE}	-60 ~ +150	°C
Lead Temperature(10s)	T _{SOLDERING}	260	°C
ESD(HBM, Bus A, B to GND)		±25	kV

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	VCC	+2.5		+5.5	V
Input Voltage on DI, DE, \overline{RE}	V _i	-0.5		VCC	V
Bus Voltage	V _A , V _B	-7		+12	V
Operating Temperature Range	T _{WORK}	-40		+125	°C

ELECTRICAL CHARACTERISTICS

VCC = 5V, TA=+25°C, unless otherwise noted.

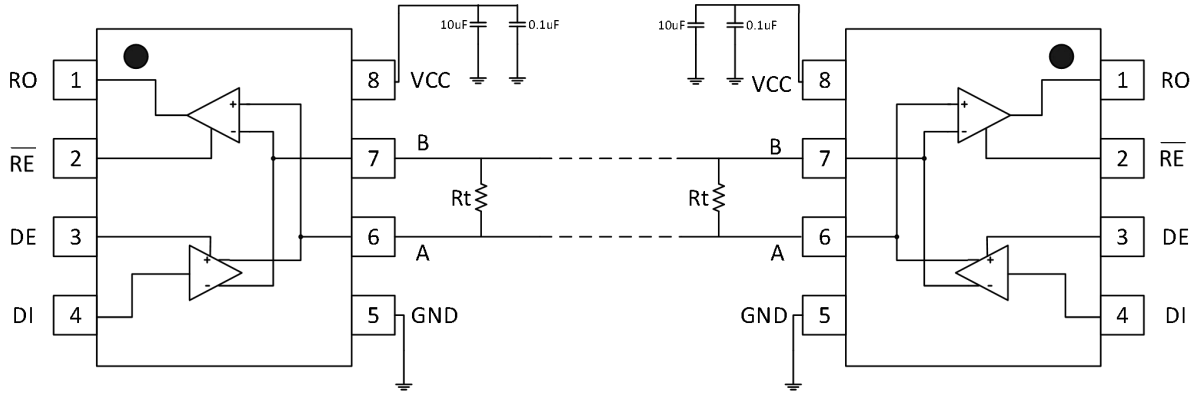
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage	VCC		2.5		5.5	V
Differential Output Voltage(No Load)	VOD1			4.7	5	V
Differential Output Voltage(Load)	VOD2	R = 50Ω	2	3.6		V
		R = 27Ω	1.5	2	5	
Change in Magnitude of Differential Output Voltage	ΔVOD	R = 50Ω or 27Ω			0.2	V
Common-mode Output Voltage	VOC	R = 50Ω or 27Ω		2.4	3	V
Change in Magnitude of Common-mode Output Voltage	ΔVOC	R = 50Ω or 27Ω			0.2	V
Input High Voltage	VIH	DE, DI, \overline{RE}	2			V
Input Low Voltage	VIL	DE, DI, \overline{RE}			0.8	V
Input Current	IIN1	DE, DI, \overline{RE}			±2	uA
Input Current(A, B)	IIN2	VIN = 12V			0.25	mA
		VIN = -7V			-0.2	mA
Receiver Differential Threshold Voltage	VTH	-7V ≤ VCM ≤ 12V	-0.2		0.2	V
Receiver Input Hysteresis	ΔVTH	VCM = 0		70		mV
Receiver Output High Voltage	VOH	IO = -4mA, VID = 200mV	3.5	4.9		V
Receiver Output Low Voltage	VOL	IO = +4mA, VID = 200mV		0.03	0.4	V
Receiver Input Resistance	RIN	-7V ≤ VCM ≤ 12V		160		kΩ
Three-state Output Current at Receiver	IOZR	0.4V ≤ VO ≤ 2.4V			±1	uA
No Load Current	ICC	\overline{RE} = 0V, DE = 5V		365	450	uA
Shutdown Current	ISHDN	\overline{RE} = VCC, DE = 0V		0.1	10	uA
Driver Short-circuit Current	IOSD2	Driver Mode Short-circuit A, B	35		250	mA
Receiver Short-circuit Current	IOSR	0V ≤ VO ≤ VCC	7		200	mA

Switching Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Driver Input to Output	tPLH	RDIF = 54Ω,	15	20	100	ns
	tPHL	CLA = CLB = 100pF	12	15	100	
Time Difference for Driver Output Level Change	tSKEW	RDIF = 54Ω, CLA = CLB = 100pF			10	ns
Driver Output Rising and Falling Edge	tR, tF	RDIF = 54Ω, CLA = CLB = 100pF	10	20	100	ns
Driver Enable to Output High	tZH	CL = 100pF	50	70	100	ns
Driver Enable to Output Low	tZL	CL = 100pF	15	20	100	ns
Driver Disable Time from Low	tLZ	CL = 15pF	80	100	150	ns
Driver Disable Time from High	tHZ	CL = 15pF	300	80	120	ns
Receiver Input to Output	tPLH	RDIF = 54Ω,	60	87	100	ns
	tPHL	CLA = CLB = 100pF	60	80	100	
Receiver Input Delay Skew	tSKD	RDIF = 54Ω, CL1 = CL2 = 100pF			50	ns
Receiver Enable to Output Low	tZL	CL = 15pF		150	200	ns
Receiver Enable to Output High	tZH	CL = 15pF		10	30	ns
Receiver Disable Time from Low	tLZ	CL = 15pF		30	50	ns
Receiver Disable Time from High	tHZ	CL = 15pF		30	50	ns
Maximum Data Rate	fMAX	tPLH, tPHL < 45% Data Period		5		Mbp s

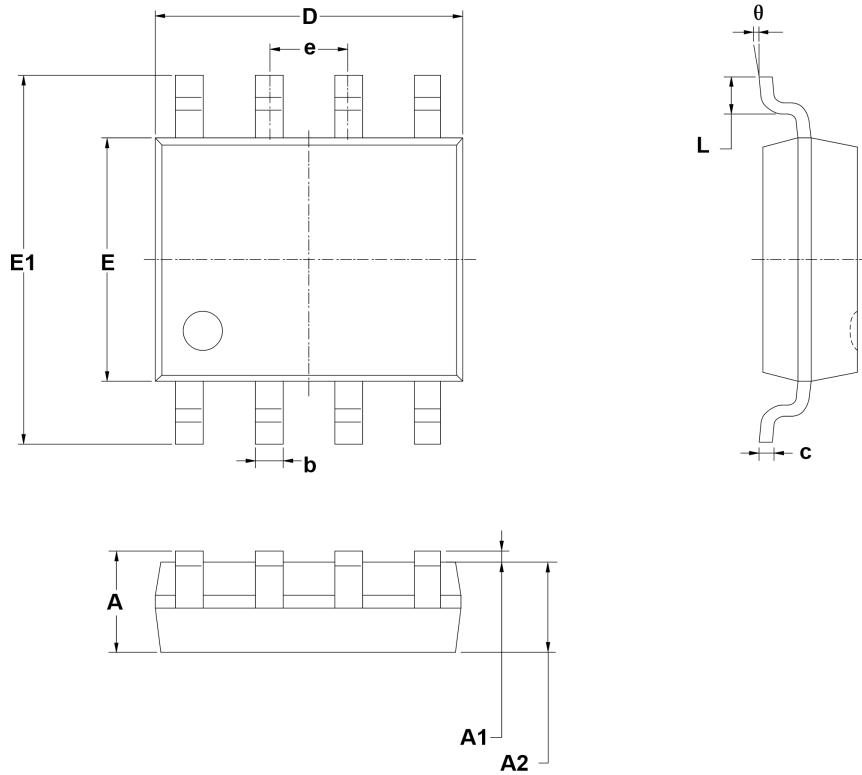
TYPICAL APPLICATION DIAGRAM

The basic connection of the MS2591 is as follows:



PACKAGE OUTLINE DIMENSIONS

SOP8



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	--	--	1.750
A1	0.100	--	0.225
A2	1.300	1.400	1.500
b	0.390	--	0.470
c	0.200	--	0.240
D	4.800	4.900	5.000
E	3.800	3.900	4.000
E1	5.800	6.000	6.200
e	1.27(BSC)		
L	0.500	--	0.800
θ	0°	--	8°

MARKING and PACKAGING SPECIFICATIONS

1. Marking Drawing Description



Product Name: MS2591

Product Code : XXXXXX

2. Marking Drawing Demand

Laser printing, contents in the middle, font type Arial.

3. Packaging Specifications

Device	Package	Piece/Reel	Reel/Box	Piece /Box	Box/Carton	Piece/Carton
MS2591	SOP8	4000	1	4000	8	32000

STATEMENT

- All Revision Rights of Datasheets Reserved for Ruimeng. Don't release additional notice.
Customer should get latest version information and verify the integrity before placing order.
- When using Ruimeng products to design and produce, purchaser has the responsibility to observe safety standard and adopt corresponding precautions, in order to avoid personal injury and property loss caused by potential failure risk.
- The process of improving product is endless. And our company would sincerely provide more excellent product for customer.



MOS CIRCUIT OPERATION PRECAUTIONS

Static electricity can be generated in many places. The following precautions can be taken to effectively prevent the damage of MOS circuit caused by electrostatic discharge:

1. The operator shall ground through the anti-static wristband.
2. The equipment shell must be grounded.
3. The tools used in the assembly process must be grounded.
4. Must use conductor packaging or anti-static materials packaging or transportation.



+86-571-89966911



Rm701, No.9 Building, No. 1 WeiYe Road, Puyan Street, Binjiang District, Hangzhou, Zhejiang



[http:// www.relmon.com](http://www.relmon.com)