

RS-485 Interface Circuit

PRODUCT DESCRIPTION

The MS1285/MS1285M/MS1285D is a RS-485 transceiver, which is suitable for half-duplex communication. The data rate can transmit up to 10Mbps. The integrated transient protection function protects the device from electrostatic discharge (ESD) and transient discharge (EFT).

FEATURES

- Bus-Pin Protection:
 - ±20kV HBM Protection
 - ±12kV IEC61000-4-2 Contact Discharge
 - +4kV IEC61000-4-4 Fast Transient Burst
- Bus Maximum Connection: 256 Nodes
- Data Rate: 300 bps to 10Mbps
- Operating Power Supply Range: 4.5V to 6.0V
- Three-state Output
- Compatible with other 485 chips

APPLICATIONS

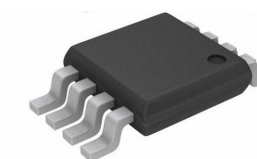
- E-Metering Networks
- Industrial Automation
- HVAC Systems
- Process Control
- Motion Control
- RS-485 interface

PRODUCT SPECIFICATION

Part Number	Package	Marking
MS1285	SOP8	MS1285
MS1285M	MSOP8	MS1285M
MS1285D	DIP8	MS1285D



SOP8

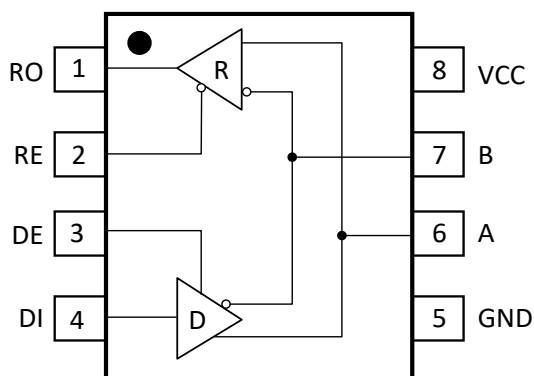


MSOP8



DIP8

PIN CONFIGURATION



PIN DESCRIPTION

Pin	Name	Type	Description
1	RO	O	Receiver Data Output
2	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	Driver Output or Receiver Input (Complementary to B)
7	B	I/O	Driver Output or Receiver Input (Complementary to A)
8	VCC	-	Power Supply

FUNCTION CONTROL

Data Driver Mode

Input			Output	
RE	DE	DI	A	B
X	1	1	1	0
X	1	0	0	1
0	0	X	H	H
1	0	X	H	H

Data Receiver Mode

Input			Output
RE	DE	A-B	RO
0	0	$\geq +200\text{mV}$	1
0	0	$\leq -200\text{mV}$	0
0	0	Input Open	1
1	0	X	H

“X” means high or low level. “H” means high impedance state.

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 ~ +8	V
Input Voltage on Control Pin	VDE, VRE	-0.5 ~ +8	V
Driver Input Voltage	VDI	-0.5 ~ +8	V
Driver Output Voltage	VA,OUT; VB, OUT	-0.5 ~ +8	V
Receiver Input Voltage	VA, VB	-7 ~ +12	V
Receiver Output Voltage	VRO	-0.5 ~ +8	V
Continuous Power Dissipation(TA=70°C)	PC	470 (SOP8)	mW
		725 (DIP8)	
Storage Temperature Range	TSTORE	-60 ~ +150	°C
Lead Temperature(5s)	TSOLDERING	+260	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	VCC	+4.5		+6	V
Input Voltage on DI, DE, RE	VDE, VRE	-0.5		VCC	V
Bus voltage	VA, VB	-7		+12	V
Operating Temperature Range	TWORK	-40		+120	°C

ELECTRICAL CHARACTERISTICS

DC Characteristics

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

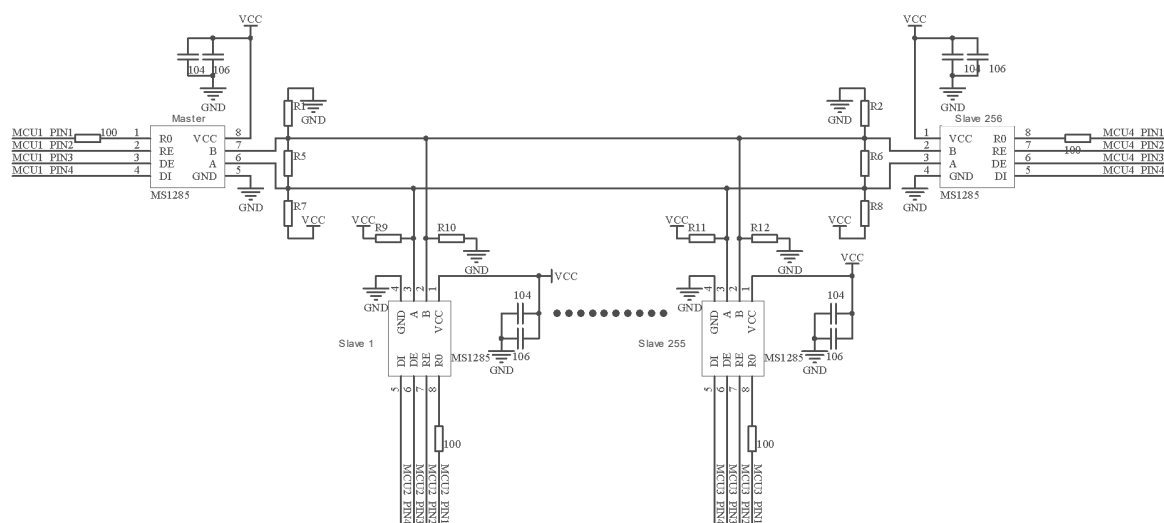
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Driver Differential Output Voltage	VOD	No Load	4	4.5		V
		RL=50Ω	2	2.5		
Change in Magnitude of Driver Differential Output Voltage	ΔVOD	RL=50Ω			0.2	V
Driver Common-mode Output Voltage	VOC	RL=50Ω			3	V
Change in Magnitude of Driver Common-mode Output Voltage	ΔVOC	RL=50Ω			0.2	V
Input High Voltage	VIH	DE, RE, DI	2			V
Input Low Voltage	VIL	DE, RE, DI			0.8	V
Logic Input Current	IIN, LOGIC	DE, RE, DI			±2	μA
Input Current(A, B)	IIN,BUS	DE=0V, VCC=5V	VIN=5V	40	90	μA
			VIN=0V	60	100	
Receiver Differential Threshold Voltage	VTH	-7V≤VCM≤12V	-0.2		0.2	V
Receiver Input Hysteresis	ΔVTH	VCM=0V		25		mV
Receiver Output High Voltage	VOH	IOUT=-1.5mA, VID=200mV	4.2	4.8		V
Receiver Output Low Voltage	VOL	IOUT=-1.5mA, VID=200mV		0.1	0.2	V
Three-state Output Current at Receiver	IOSR	VCC=5V, 0V≤VOUT≤VCC			±1	μA
Receiver Input Resistance	RIN	-7V≤VCM≤12V		100		kΩ
Supply Current	ICC	No Load, RE=DE=DI=0V or VCC		0.48	0.9	mA
Driver Short-circuit Current	IOSD	VOUT = -7V	25			mA
		VOUT = 12V	25			
Receiver Short-circuit Current	IOSR	0V≤VRO≤VCC	7			mA
ESD Protection(A,B)	VESD	HBM		±20		kV

Switching Characteristics

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Driver Input to Output	tPLH	RDIF=50Ω, CL=CLB=100pF	10	35	70	ns
	tPHL		10	50	90	
Driver Input to Output	tPDS	RDIF=50Ω, CL=CLB=100pF		30		ns
Driver Rise I Time	tTTR	RDIF=50Ω, CL=CLB=100pF		40	70	ns
Driver Fall Time	tTTF	RDIF=50Ω, CL=CLB=100pF		40	70	ns
Driver Enable to Output High	tPZH	CL=100pF		30	70	ns
Driver Enable to Output Low	tPZL	CL=100pF		30	70	ns
Driver Disable Time from Low	tPHZ	CL=100pF		90	110	ns
Driver Disable Time from High	tPLZ	CL=100pF		100	120	ns
Receiver Input to Output	tPLH	CL=15pF	20	60	200	ns
	tPHL		20	40	200	
Differential Receiver Skew	tPDS	CL=15pF, tPLH -tPHL		20		ns
Receiver Enable to Output High	tPZH	CL=15pF		50	80	ns
Receiver Enable to Output Low	tPZL	CL=15pF		60	90	ns
Receiver Disable Time from High	tPHZ	CL=15pF		50	80	ns
Receiver Disable Time from Low	tPLZ	CL=15pF		60	90	ns
Maximum Data Rate	fMAX				10	Mbps

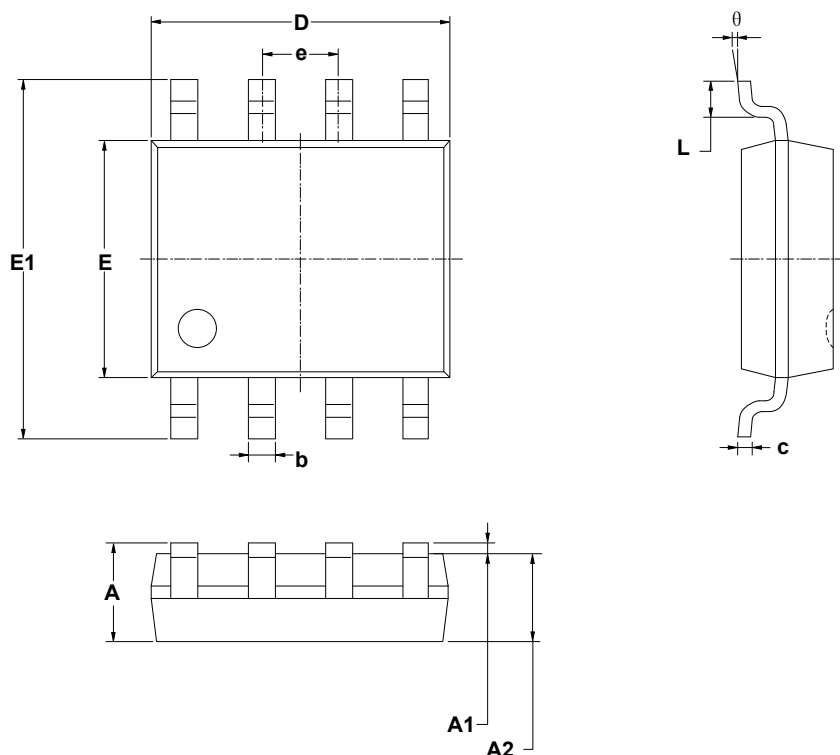
TYPICAL APPLICATION DIAGRAM



1. R1 resistance value ranges from (slave number+1)k to (slave number+1)×10k.
2. R5 resistance value ranges from 100 to 1k. R5 is only needed to connect on the MS1285 farthest to both ends, in order to reduce signal reflex, instead of connecting R5 on AB line of all masters.
3. When many slaves are connected, adopt daisy chain rather than topology.
4. It is recommended to use twisted pair, and the farthest distance doesn't exceed 1.5km.

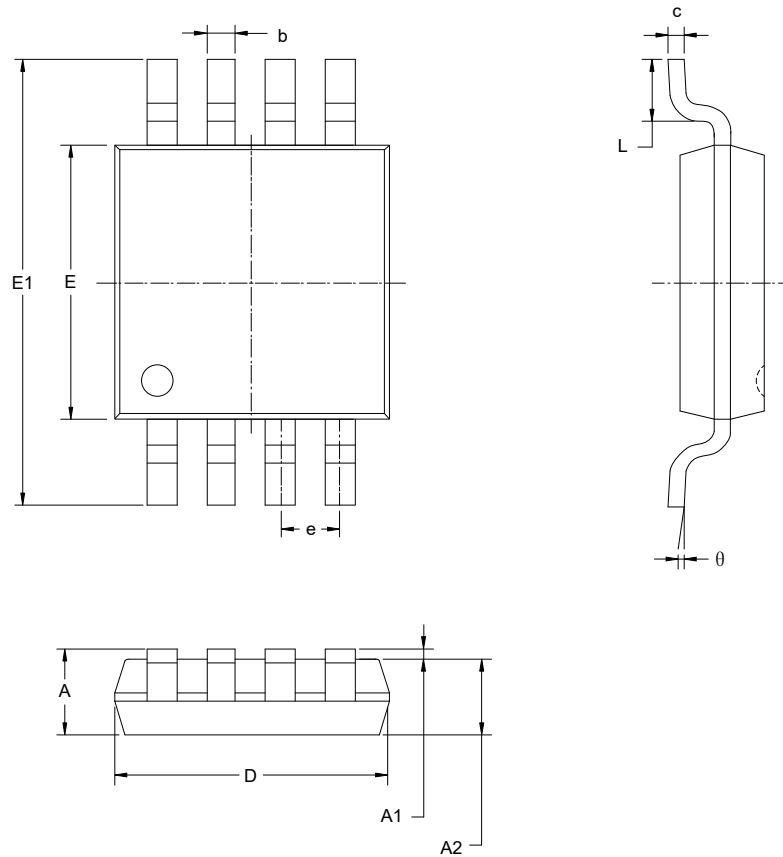
PACKAGE OUTLINE DIMENSIONS

SOP8



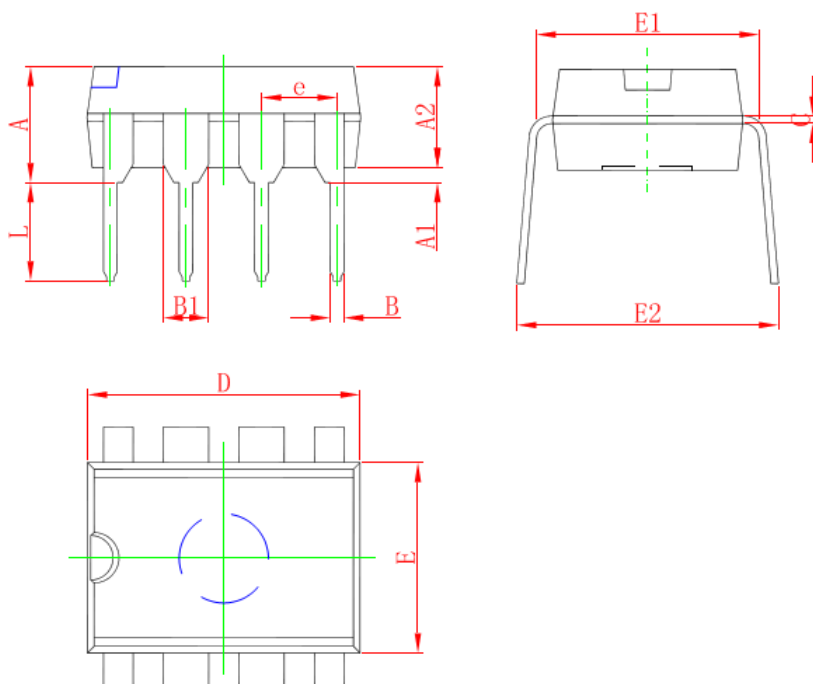
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

MSOP8



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.650(BSC)		0.026(BSC)	
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

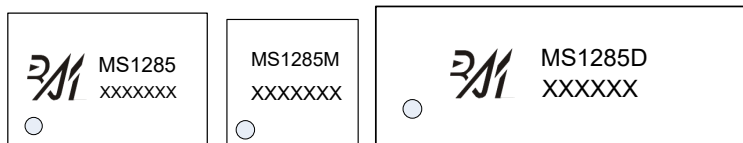
DIP8



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

MARKING and PACKAGING SPECIFICATION

1. Marking Drawing Description



Product Name : MS1285, MS1285M, MS1285D

Product Code : XXXXXX, XXXXXX

2. Marking Drawing Demand

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

3. Packaging Specification

Device	Package	Piece/Reel	Reel/Box	Piece /Box	Box/Carton	Piece/Carton
MS1285	SOP8	2500	1	2500	8	20000
MS1285M	MSOP8	3000	1	3000	8	24000

Device	Package	Piece/Tube	Tube/Box	Piece /Box	Box/Carton	Piece/Carton
MS1285D	DIP8	50	40	2000	10	20000

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.



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