

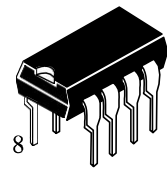
General Description

The JSM-MAX485 is low-power transceivers for RS-485 and RS-422 communication. IC contains one driver and one receiver.

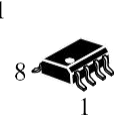
The driver slew rates of the JSM-MAX485 is not limited, allowing them to transmit up to 2.5Mbps.

These transceivers draw between 120 μ A and 500 μ A of supply current when unloaded or fully loaded with disabled drivers. All parts operate from a single 5V supply. Drivers are short-circuit current limited and are protected against excessive power dissipation by thermal shutdown circuitry that places the driver outputs into a high-impedance state. The receiver input has a fail-safe feature that guarantees a logic-high output if the input is open circuit.

The JSM-MAX485 is designed for half-duplex applications.



N SUFFIX
PLASTIC



D SUFFIX
SOIC

Features

Low Quiescent Current: 300 μ A

-7V to +12V Common-Mode Input Voltage Range

Three-State Outputs

30ns Propagation Delays, 5ns Skew

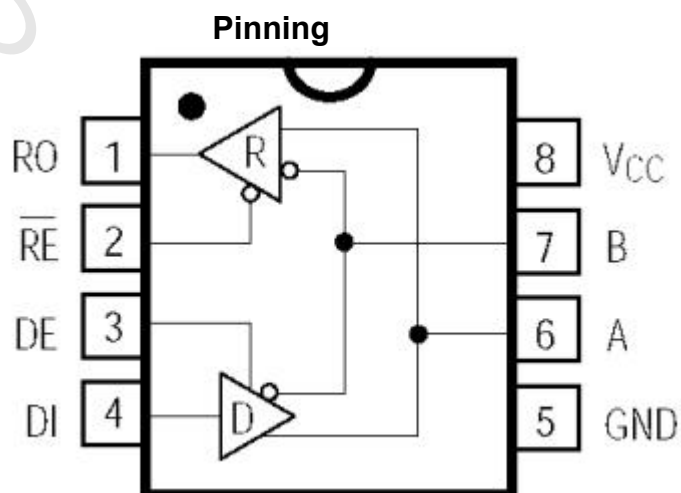
Full-Duplex and Half-Duplex Versions Available

Operate from a Single 5V Supply

Allows up to 32 Transceivers on the Bus

Data rate: 2,5 Mbps

Current-Limiting and Thermal Shutdown for Driver Overload Protection



ABSOLUTE MAXIMUM RATINGS

Supply Voltage (VCC) 12V
 Control Input Voltage -0.5V to (VCC + 0.5V)

Continuous Power Dissipation (TA= +70°C)

Driver Input Voltage (DI) -0.5V to (VCC+ 0.5V)

8-Pin SO (derate 5.88mW/°C above +70°C)
 471mW

Driver Output Voltage (A, B) -8V to +12.5V

Operating Temperature Ranges 0°C to +70°C

Receiver Input Voltage (A, B) -8V to +12.5V

Storage Temperature Range -65°C to +160°C

Receiver Output Voltage (RO) -0.5V to (VCC+0.5V) Lead Temperature (soldering, 10sec) +300°C

DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Differential Driver Output (no load)	V _{OD1}					5	V
Differential Driver Output (with load)	V _{OD2}	R = 50 Ω (RS-422)		2			V
		R = 27 Ω (RS-485), Figure 4		1.5		5	
Change in Magnitude of Driver Differential Output Voltage for Complementary Output States	ΔV _{OD}	R = 27 Ω or 50 Ω, Figure 4				0.2	V
Driver Common-Mode Output Voltage	V _{OC}	R = 27 Ω or 50 Ω, Figure 4				3	V
Change in Magnitude of Driver Common-Mode Output Voltage for Complementary Output States	ΔV _{OD}	R = 27 Ω or 50 Ω, Figure 4				0.2	V
Input High Voltage	V _{IH}	DE, DI, RE		2.0			V
Input Low Voltage	V _{IL}	DE, DI, RE				0.8	V
Input Current	I _{IN1}	DE, DI, RE				±2	μA
Input Current (A, B)	I _{IN2}	DE = 0V; V _{CC} = 0V or 5.25V,	V _{IN} = 12V			1.0	mA
			V _{IN} = -7V			-0.8	
Receiver Differential Threshold Voltage	V _{TH}	-7V ≤ V _{CM} ≤ 12V		-0.2		0.2	V
Receiver Input Hysteresis	ΔV _{TH}	V _{CM} = 0V			70		mV
Receiver Output High Voltage	V _{OH}	I _O = -4mA, VID = 200mV		3.5			V
Receiver Output Low Voltage	V _{OL}	I _O = 4mA, VID = -200mV				0.4	V
Three-State (high impedance) Output Current at Receiver	I _{OZR}	0.4V ≤ V _O ≤ 2.4V				±1	μA
Receiver Input Resistance	R _{IN}	-7V ≤ V _{CM} ≤ 12V		12			k Ω

(V_{CC} = 5V ±5%, T_A = T_{MIN} to T_{MAX}, unless otherwise noted.) (Notes 1, 2)

DC ELECTRICAL CHARACTERISTICS (continued)

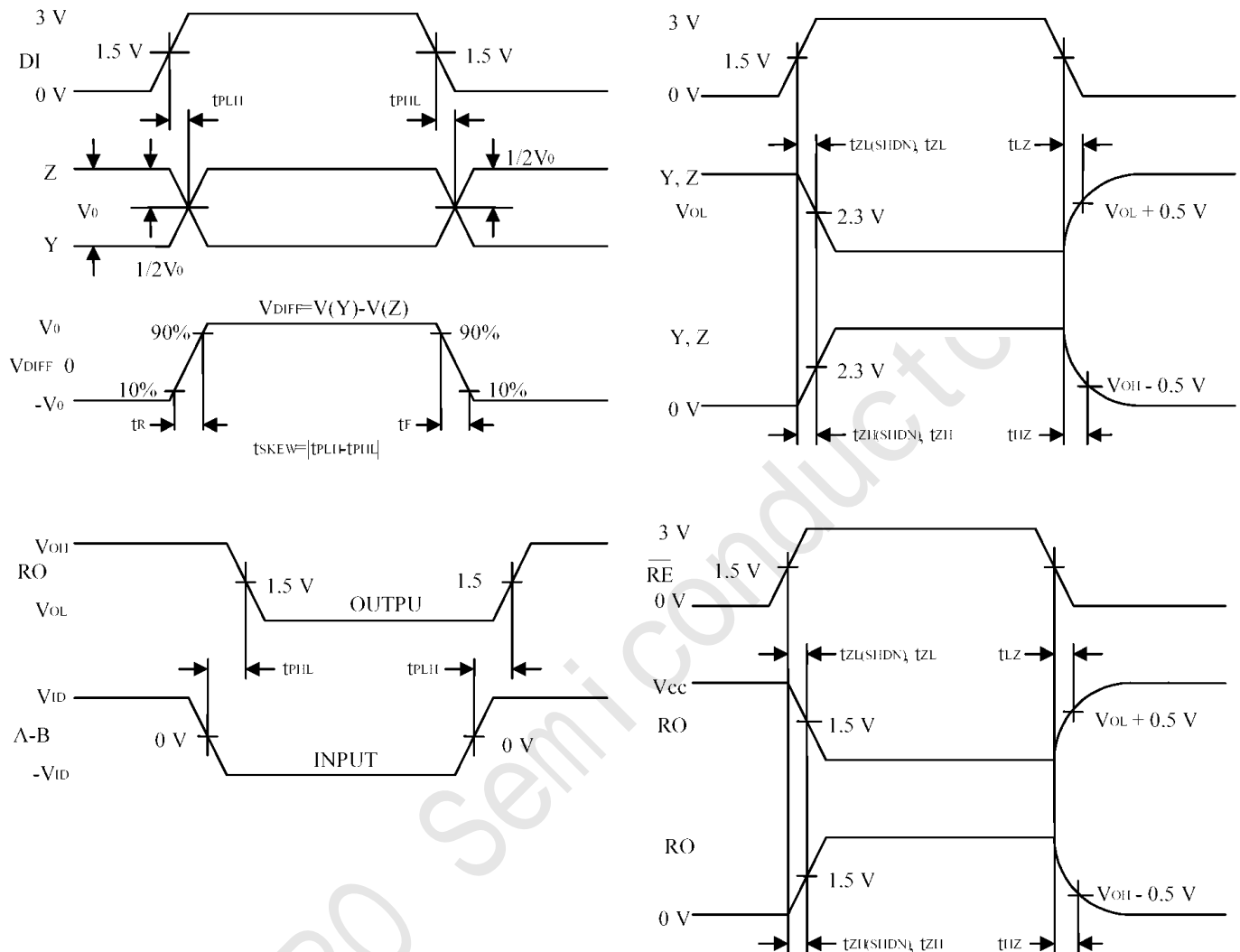
 ($V_{CC} = 5V \pm 5\%$, $T_A = T_{MIN}$ to T_{MAX} , unless otherwise noted.) (Notes 1, 2)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
No-Load Supply Current (Note 3)	I_{CC}	DE = VCC		500	900	
		RE = 0V or V _{CC} DE = 0V		300	500	μA
Driver Short-Circuit Current, V _O = High	I_{OSD1}	-7V ≤ V _O ≤ 12V (Note 4)	35		250	mA
Driver Short-Circuit Current, V _O = Low	I_{OSD2}	-7V ≤ V _O ≤ 12V (Note 4)	35		250	mA
Receiver Short-Circuit Current	I_{OSR}	0V ≤ V _O ≤ V _{CC}	7		95	mA

SWITCHING CHARACTERISTICS

 ($V_{CC} = 5V \pm 5\%$, $T_A = T_{MIN}$ to T_{MAX} , unless otherwise noted.) (Notes 1, 2)

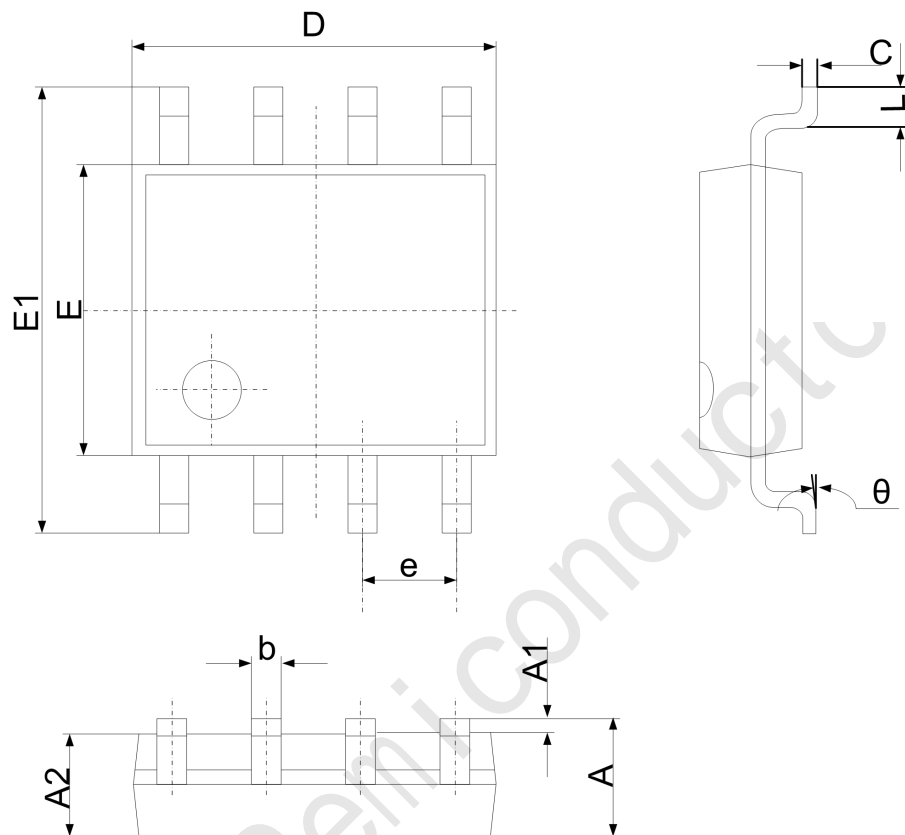
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Driver Input to Output	t_{PLH}	R _{DIFF} = 54 Ω ,	10	30	60	ns
	t_{PHL}	C _{L1} = C _{L2} = 100pF	10	30	60	
Driver Output Skew to Output	t_{SKEW}	R _{DIFF} = 54 Ω , CL1 = CL2 = 100pF		5	10	ns
Driver Enable to Output High	t_{ZH}	C _L = 100pF, S2 closed		40	70	ns
Driver Enable to Output Low	t_{ZL}	C _L = 100pF, S1 closed		40	70	ns
Driver Disable Time from Low	t_{LZ}	C _L = 15pF, S1 closed		40	70	ns
Driver Disable Time from High	t_{HZ}	C _L = 15pF, S2 closed		40	70	ns
t _{PLH} - t _{PHL} Differential	t_{SKD}	R _{DIFF} = 54 Ω ,		13		ns
Receiver Skew		C _{L1} = C _{L2} = 100pF				
Receiver Enable to Output Low	t_{ZL}	C _{RL} = 15pF, S1 closed		20	50	ns
Receiver Enable to Output High	t_{ZH}	C _{RL} = 15pF, S2 closed		20	50	ns
Receiver Disable Time from Low	t_{LZ}	C _{RL} = 15pF, S1 closed		20	50	ns
Receiver Disable Time from High	t_{HZ}	C _{RL} = 15pF, S2 closed		20	50	ns
Maximum Data Rate	f_{MAX}		2.5			Mbps

Operation timing diagrams of JSM-MAX485.

Table of JSM-MAX485 operation.

Transmission					Receipt			
Inputs			Outputs		Inputs			Outputs
RE	DE	DI	Z	Y	RE	DE	A-B	RO
X	1	1	0	1	0	0	+0.2V	1
X	1	0	1	0	0	0	-0.2V	0
0	0	X	Z	Z	0	0	open	1
1	0	X	Z	Z	1	0	X	Z

X-don't care

Z-high resistance

PackageDimension
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	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°