UMW ADM485ARZ

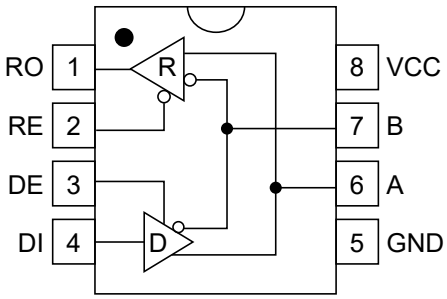
1.Description

The ADM485 is low-power transceivers for RS-485 and RS-422 communication. IC contains one driver and one receiver. The driver slew rates of the ADM485 is not limited, allowing them to transmit up to 2.5Mbps. These transceivers draw between 120μA and 500μA 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 ADM485 is designed for half-duplex applications.

2.Features

- Low Quiescent Current: 300μA
- -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

3.Pinning information



SOP-8

4.Absolute Maximum Ratings

- Supply Voltage (V_{CC}) 12V
- Control Input Voltage -0.5V to (V_{CC}+ 0.5V)
- Driver Input Voltage (DI) -0.5V to (V_{CC}+ 0.5V)
- Driver Output Voltage (A, B) -8V to +12.5V
- Receiver Input Voltage (A, B) -8V to +12.5V
- Receiver Output Voltage (RO) -0.5V to (V_{CC}+0.5V)
- Continuous Power Dissipation (T_A= +70°C)
- 8-Pin Plastic DIP (derate 9.09mW/°C above +70°C) 727mW
- 8-Pin SO (derate 5.88mW/°C above +70°C) 471mW
- Operating Temperature Ranges-40°C to +85°C
- Storage Temperature Range -65°C to +160°C
- Lead Temperature (soldering, 10sec) +300°C

5.Electrical Characteristics

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

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Differential Driver Output (noload)	V_{OD1}					5	V
Differential Driver Output (with load)	V_{OD2}	R=50Ω (RS-422)		2			V
		R=27Ω (RS-485), Figure 4		1.5		5	V
Change in Magnitude of Driver Differential Output Voltage for Complementary Output States	ΔV_{OD}	R=27Ω or 50Ω, Figure 4				0.2	V
Driver Common-Mode Output Voltage	V_{OC}	R=27Ω or 50Ω, Figure 4				3	V
Change in Magnitude of Driver Common-Mode Output Voltage for Complementary Output States	ΔV_{OD}	R=27Ω or 50Ω, Figure 4				0.2	V
Input High Voltage	V_{IH}	DE, DI, $\overline{RE}$		2			V
Input Low Voltage	V_{IL}	DE, DI, $\overline{RE}$				0.8	V
Input Current	I_{IN1}	DE, DI, $\overline{RE}$				±2	μA
Input Current (A, B)	I_{IN2}	DE=0V	V_{IN}=12V			1	mA
		V_{CC}= 0V or 5.25V	V_{IN}=-7V			-0.8	mA
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,V_{ID}=200mV		3.5			V
Receiver Output Low Voltage	V_{OL}	I_O= 4mA, V_{ID}=-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			KΩ

6.DC Electrical Characteristics (continued)

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
POWER SUPPLY CURRENT						
Outputs Enabled	I_{CC}	Digital inputs = GND or V_{CC}		1	2.2	mA
Outputs Disabled				0.6	1	mA
Driver Short-Circuit Current						
	I_{OSD1}	-7V≤ V_O≤ 12V	35		250	mA
V_O=High						
Driver Short-Circuit Current						
	I_{OSD2}	-7V≤ V_O ≤12V	35		250	mA
V_O=LoW						
Receiver Short-Circuit Curent	I_{OSR}	0V≤ V_O≤ V_{CC}	7		95	mA

7.Switching Characteristics

(V_{CC}=5V±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_{LDIFF}=54Ω, C_{L1}=C_{L2}=100pF	10	30	60	ns
	t_{PHL}		10	30	60	ns
Driver Output Skew to Qutput	t_{SKEW}	R_{LDIFF}=54Ω, C_{L1}=C_{L2}=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_{LDIFF}=54Ω		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

8.Operation Timing Diagrams Of Adm485

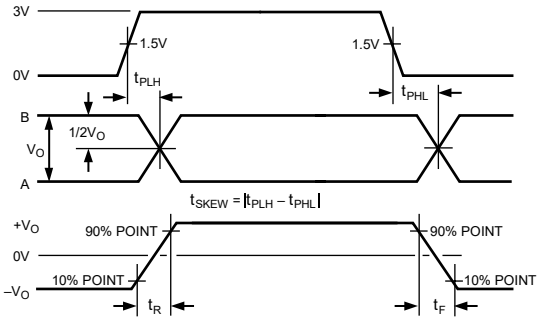


Figure 1. Driver Propagation Delay, Rise/Fall Timing

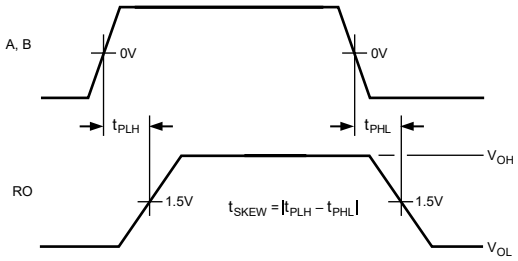


Figure 2. Receiver Propagation Delay

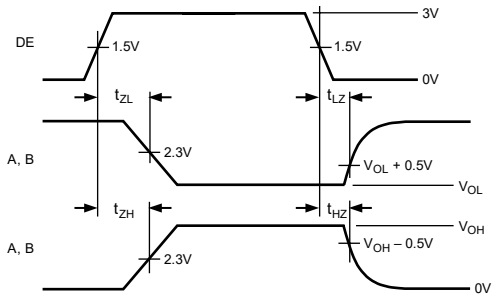


Figure 3. Driver Enable/Disable Timing

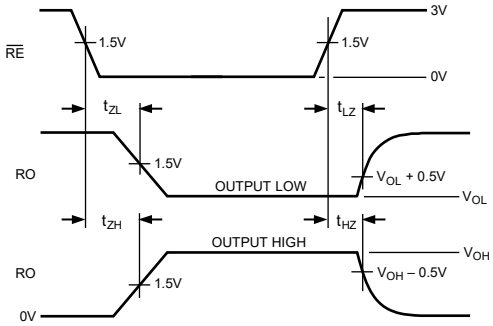


Figure 4. Receiver Enable/Disable Timing

9.Table of ADM485 Operation

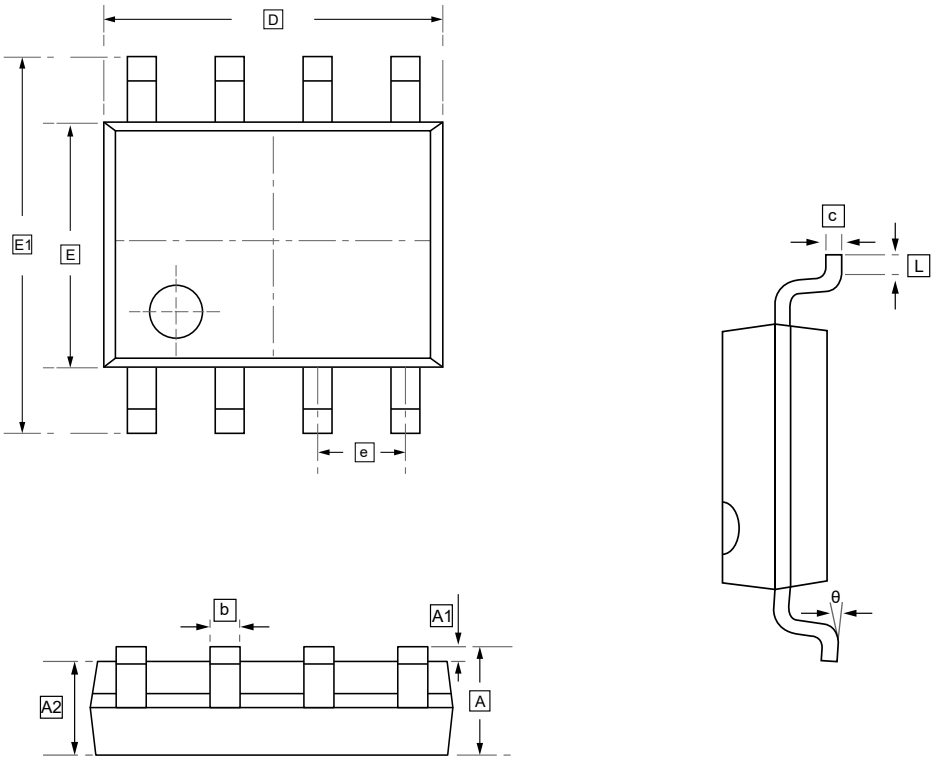
Transmission					Receipt			
Inputs			Outputs X		Inputs			Outputs
RE	DE	DI	Z	Y	RE	DE	A-B	RO
X	1	1	0	1	0	0	+0.2V	1
X	1	0	1	0	0	0	-0.2V	0
0	0	X	Z	Z	0	0	open	1
1	0	X	Z	Z	1	0	X	Z

Notes:

X-don't care

Z-high resistance

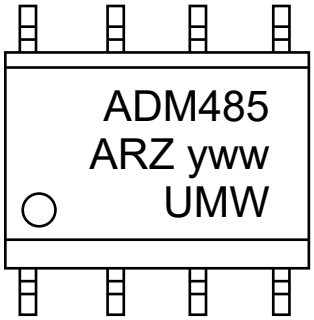
10.SOP-8 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°

11.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW ADM485ARZ	SOP-8	2500	Tape and reel

12.Disclaimer

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