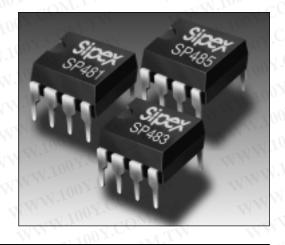




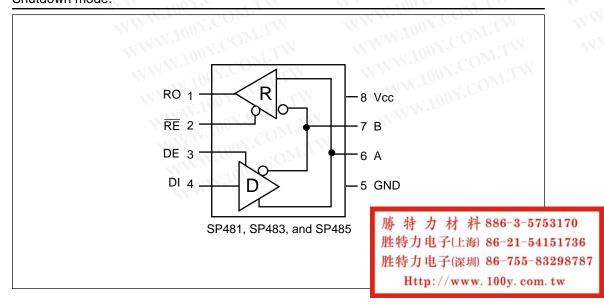
Low Power Half-Duplex RS-485 Transceivers

- +5V Only
- Low Power BiCMOS
- Driver/Receiver Enable
- Slew Rate Limited Driver for Low EMI (SP483)
- Low Power Shutdown Mode (SP481 and SP483)
- RS-485 and RS-422 Drivers/Receivers



DESCRIPTION

The **SP481**, **SP483**, and the **SP485** are a family of half-duplex transceivers that meet the requirements of RS-485 and RS-422. Their BiCMOS design allows low power operation without sacrificing performance. The **SP481** and **SP485** meet the requirements of RS-485 and RS-422 up to 5Mbps. Additionally, the **SP481** is equipped with a low power Shutdown mode. The **SP483** is internally slew rate limited to reduce EMI and can meet the requirements of RS-485 and RS-422 up to 250kbps. The **SP483** is also equipped with a low power Shutdown mode.



ABSOLUTE MAXIMUM RATINGS

These are stress ratings only and functional operation of the device at these ratings or any other above those indicated in the operation sections of the specifications below is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

 V_{cc}
 ±12V

 Input Voltages
 -0.3V to (V_{cc}+0.5V)

 Drivers...
 -0.3V to (V_{cc}+0.5V)

 Receivers...
 ±15V

 Output Voltages
 Logic...
 -0.3V to (V_{cc}+0.5V)

 Drivers...
 ±15V

 Receivers...
 -0.3V to (V_{cc}+0.5V)

 Storage Temperature...
 -65°C to +150°C

 Power Dissipation...
 500mW

勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-54151736 胜特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw

SPECIFICATIONS

 T_{MN} to T_{MN} and $V_{\text{CC}} = 5V \pm 5\%$ unless otherwise noted.

PARAMETERS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
SP481/SP483/SP485 DRIVER	V	- 44	-41	00 7-	CITY WELLOW
DC Characteristics					
Differential Output Voltage	GND		V _{cc}	Volts	Unloaded; $R = \infty$; see figure 1
Differential Output Voltage	2		VCC	Volts	with load; $R = 50\Omega$; (RS422);
Differential Output Voltage			V _{cc}	VOILS	see figure 1
Differential Output Voltage	1.5		V	Volts	with load; $R = 27\Omega$; (RS485); see figure
Change in Magnitude of Driver	1.5		V _{cc}	VOILS	with load, 11 = 2752, (110403), see figure
Differential Output Voltage for		i.T		M.r.	
		N	0.2	Volts	D 270 or D 500; and figure 1
Complimentary States		«T	0.2	VOIIS	$R = 27\Omega$ or $R = 50\Omega$; see figure 1
Driver Common-Mode		M		Valua	D 070 as D 500; as a finite 4
Output Voltage	0.0		3	Volts	R = 27Ω or R = $50Ω$; see figure 1
Input High Voltage	2.0			Volts	Applies to DE, DI, RE
Input Low Voltage		-7	0.8	Volts	Applies to DE, DI, RE
Input Current			±10	μΑ	Applies to DE, DI, RE
Driver Short-Circuit Current		L. L			
V _{OUT} = HIGH	35		250	mA	-7V ≤ V _O ≤ +12V
$V_{OUT} = LOW$	35	Mr.	250	mA	-7V ≤ V _O ≤ +12V
SP481/SP485 DRIVER	7.	-177		444	1100
AC Characteristics		DIAT.	* I		
	5	TIL	M	Mhno	$\overline{RE} = 5V$, DE = 5V
Maximum Data Rate		20	00	Mbps	
Driver Input to Output	20	30	60	ns	t_{PLH} ; $R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$; see figures 3 and 6
Dairen lanut ta Outrut	00	20	00		
Driver Input to Output	20	30	60	ns	t_{PHL} ; $R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$;
Dei van Olassa		-coN	40		see figures 3 and 6
Driver Skew		5	10	ns	see figures 3 and 6,
D. D. EHT.	1.100	40	10		$t_{\text{SKEW}} = t_{\text{DPLH}} - t_{\text{DPHL}} $ From 10% to 90%; $R_{\text{DIFF}} = 54\Omega$,
Driver Rise or Fall Time	3	15	40	ns	From 10% to 90%; $R_{DIFF} = 54\Omega$,
			W	e T	$C_{L1} = C_{L2} = 100pF$; see figures 3 and
Driver Enable to Output High		40	70	ns	C _L = 100pF; see figures 4 & 7; S ₂ closed
Driver Enable to Output Low		40	70	ns	$C_L = 100pF$; see figures 4 & 7; S_1 closed
Driver Disable Time from Low		40	70	ns	C _L = 15pF; see figures 2 & 9; S ₁ closed
Driver Disable Time from High		40	70	ns	C _L = 15pF; see figures 2 & 9; S ₂ closed
SP481/SP483/SP485 RECEIVE	P	11107	- 11		
DC Characteristics		.10	CO_{2i}		
Differential Input Threshold	-0.2	-1003	+0.2	Volte	7\/ -\/ - 112\/
·	-0.2	10	+0.2	Volts	-7V ≤ V _{CM} ≤ +12V
Input Hysteresis	2.5	10		mV Volto	$V_{CM} = 0V$
Output Voltage High	3.5		0.4	Volts	$I_{O} = -4\text{mA}, V_{ID} = +200\text{mV}$
Output Voltage Low			0.4	Volts	$I_{O}^{\circ} = +4\text{mA}, \ V_{ID}^{\circ} = -200\text{mV}$
Three-State (High Impedance)			l .		0.0/
Output Current			±1	μΑ	$0.4V \le V_0 \le 2.4V; \overline{RE} = 5V$
Input Resistance	12	15		kΩ	-/V ≤ V _{CM} ≤ +12V
Input Current (A, B); V _{IN} = 12V			+1.0	mA	$-7V \le V_{CM} \le +12V$ DE = 0V, $V_{CC} = 0V$ or 5.25V, $V_{IN} = 12$
Input Current (A, B); $V_{IN} = -7V$			-0.8	mA	$DL = 0.0$, $V_{CC} = 0.0$ of 5.250 , $V_{IN} = -7$
Short-Circuit Current	7		95	mA	$0V \le V_{CM} \le V_{CC}$

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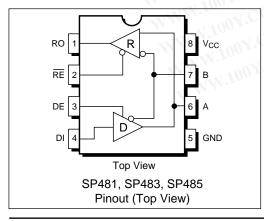
SP481/SP485 RECEIVER AC Characteristics Maximum Data Rate Receiver Input to Output 60 90 200 ns Receiver Input to Output 60 90 200 ns C _{P,H} : R _{DIFF} = 54Ω, C _{L1} = C _{L2} = 100pF; Figures 3 & 8 t _{PH} : R _{DIFF} = 54Ω, C _{L1} = C _{L2} = 100pF; Figures 3 & 8 t _{PH} : R _{DIFF} = 54Ω, C _{L1} = C _{L2} = 100pF; Figures 3 & 8 ns Receiver Enable to Cutput Low 20 50 ns C _{RL} = 15pF; Figures 2 & 9; S ₁ closed Coutput High Cutput High Cutput High Cutput High Cutput High Cutput High Cutput Low Cutput Lo	DADAMETERS	se noted.			- 11 11	
Maximum Data Rate Seciver Input to Output 60 90 200 ns RE = 0V, DE = 0V tp.H; Rp.IFF = 54Ω, C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 3 & 8 tp.H; Rp.IFF = 54Ω, C1 = C1 = 100pF; Figures 2 & 9; S1, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Figures 4 & 7; S2, closed C1 = 100pF; Figures 2 & 9; S2, closed C1 = 100pF; Fig		MIN.	TYP.	MAX.	UNITS	CONDITIONS
Receiver Input to Output	AC Characteristics	WV	77.	N.C.		N MM 100X.C.
Receiver Input to Output 60 90 200 ns Diff. Receiver Skew It p_{LH} - $t_{p_{HL}}$ l 13 ns p_{LH} l p_{LH	4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		$\times 10^{-10}$	-7 C	Mbps	
Receiver Input to Output Diff. Receiver Skew It _{PLH} -t _{PHL} I Diff. Receiver Skew It _{PLH} -t _{PHL} I Receiver Enable to Output Low Receiver Enable to Output High Receiver Disable from Low Receiver Disable from High Receiver Disable from Shutdown to Output High Driver Enable from Shutdown to Output High Driver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output	Receiver Input to Output	60	90	200	ns	t_{PLH} ; $R_{\text{DIFF}} = 54\Omega$,
Diff. Receiver Skew ItpLHTPHLI 13	Receiver Input to Output	60 🦪	90	200	ns	t_{DHI} ; $R_{\text{DIFF}} = 54\Omega$,
Output Low Receiver Enable to Output High Receiver Disable from Low Receiver Disable from High 20 50 ns C _{RL} = 15pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed C _R	Diff. Receiver Skew It _{PLH} -t _{PHL} I		13	N.1007	ns	$R_{DIFF} = \overline{54}\Omega; C_{L1} = C_{L2} = 100pF;$
Receiver Enable to Output High Receiver Disable from Low Receiver Disable from High 20 50 ns Receiver Disable from Shutdown Timing 20 50 ns Receiver Enable from Shutdown to Output High 20 100 ns Receiver Enable from Shutdown to Output Low 20 100 ns CL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 2 & 9; S2 closed CRL = 100pF; See figures 2 & 9; S2 closed CRL = 100pF; See figures 2 & 9; S2 closed CRL = 100pF; See figures 2 & 9; S2 closed CRL = 100pF; See figures 2 & 9; S2 closed CRL = 100pF; See figures 4 & 7; S2 closed CRL = 100pF; See figures 2 & 9;	- 111111			31 100	1	VIII N 10
Receiver Disable from Low Receiver Disable from Low Receiver Disable from High 20 50 ns C _{RL} = 15pF; Figures 2 & 9; S ₁ closed C _{RL} = 15pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed C _{RL} = 10pF; Figures 2 & 9; S ₂ closed 2 & 9; S ₂			20	50	ns	C _{RL} = 15pF; Figures 2 & 9; S ₁ closed
Receiver Disable from High SP481 Shutdown Timing Time to Shutdown Driver Enable from Shutdown to Output High Driver Enable from Shutdown to Output Low Receiver Enable from Shutdown Shutdown to Output High Driver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low POWER REQUIREMENTS Supply Voltage Supply Current SP481/485 No Load SP483 No Load SP483 No Load SP483 No Load SP481/SP483 Shutdown Mode RE, DI = 0V or V _{CC} ; DE = V _{CC} RE = 0V, DI = 0V or 5V; DE = 0V RE, DI = 0V or V _{CC} ; DE = V _{CC} RE = 0V, DI = 0V or 5V; DE = 0V RE, DI = 0V or 5V; DE = 0V RE, DI = 0V or 5V; DE = 0V RE, DI = 0V or 5V; DE = 0V RE, DI = 0V or 5V; DE = 0V RE = 0V, DI = 0V or 5V; DE = 0V RE = 0V, DI = 0V or 5V; DE = 0V RE = 0V, DI = 0V or 5V; DE = 0V RE = 0V, RE = V _{CC} RE = 0V, RE = 0V RE = V _{CC} RE = 0V, RE = 0V RE		κT				C _{RL} = 15pF; Figures 2 & 9; S ₂ closed
SP481 Shutdown Timing Time to Shutdown 50 200 600 ns RE = 5V, DE = 0V Driver Enable from Shutdown to Output High 40 100 ns C _L = 100pF; See figures 4 & 7; S ₂ closed 50 50 50 50 50 50 50 5					0	C _{RL} = 15pF; <i>Figures 2 & 9</i> ; S ₁ closed
Shutdown Timing Time to Shutdown Driver Enable from Shutdown to Output High Driver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low POWER REQUIREMENTS Supply Voltage Supply Current SP481/485 No Load SP483 No Load SP481/SP483 Shutdown Mode SP481/SP483 Shutdown Mode Shutdown Mode Time to Shutdown Timing Time to Shutdown Time to Step figures 4 & 7; S2 clos Time to Step figures 4 &	Receiver Disable from high	V	20	50	IIS	C _{RL} = 15pF; Figures 2 & 9; 5 ₂ closed
Time to Shutdown Driver Enable from Shutdown to Output High Driver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 100 pF$; See figures 4 & 7; S ₂ close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S ₂ close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S ₃ close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S ₃ close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S ₃ close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S ₃ close Receiver Enable from Shutdown Note 4.75 volts Supply Current SP481/485 No Load 4.75 volts Supply Current SP481/485 No Load 4.75 volts SP481/SP483 No Load 5.00 page 5.00 p	SP481	W	1	MIN	TOON.	COM MAIN
Time to Shutdown Driver Enable from Shutdown to Output High Driver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown to Output Low 300 1000 ns C _L = 15pF; See figures 2 & 9; S ₂ clos Receiver Enable from Shutdown Note 40.	Shutdown Timing	T V		- XIVIV	(Too	COM.
to Output High Driver Enable from Shutdown to Output Low Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S2 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S3 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 4 & 7; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S4 close Receiver Enable from Shutd	Time to Shutdown	50	200	600	ns	RE = 5V, DE = 0V
to Output Low Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output High Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15pF$; See figures 2 & 9; S_2 closs Shutdown to Output Low 300 1000 ns $C_L = 15pF$; See figures 2 & 9; S_2 closs Supply Voltage Supply Voltage Supply Current SP481/485 No Load 900 μA	to Output High	M.T.V	40	100	ns	C _L = 100pF; <i>See figures 4 & 7;</i> S ₂ clos
Shutdown to Output High Receiver Enable from Shutdown to Output Low 300 1000 ns $C_L = 15 pF$; See figures 2 & 9; S ₂ close Shutdown to Output Low ns $C_L = 15 pF$; See figures 2 & 9; S ₂ close Shutdown to Output Low ns $C_L = 15 pF$; See figures 2 & 9; S ₃ close $C_L = 15 pF$; See figures 2 & 9; S ₄ close $C_L = 15 pF$; See fig	to Output Low	M.T	40	100	ns	C _L = 100pF; <i>See figures 4 & 7;</i> S ₁ clo
Shutdown to Output Low 300 1000 ns $C_L = 15pF$; See figures 2 & 9; S_1 close POWER REQUIREMENTS Supply Voltage Supply Current SP481/485 No Load 900 μA \overline{RE} , DI = 0V or V_{CC} ; DE = V_{CC} $\overline{RE} = 0V$, DI = 0V or S_C ; DE = S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$, DI = 0V or S_C $\overline{RE} = 0V$	Shutdown to Output High	OM	300	1000	ns	C _L = 15pF; See figures 2 & 9; S ₂ close
Supply Voltage Supply Current SP481/485 No Load 900		COM	300	1000	ns	C _L = 15pF; See figures 2 & 9; S ₁ clos
Supply Current SP481/485 No Load SP483 No Load SP483 No Load SP481/SP483 Shutdown Mode ENVIRONMENTAL AND MECHANICAL Operating Temperature Commercial (_C_) Industrial (_E_) SP481/SP483 Shutdown Mode P00 ARE, DI = 0V or V _{CC} ; DE = V _{CC} RE = 0V, DI = 0V or 5V; DE = 0V RE = 0V, DI = 0V or 5V; DE = 0V RE = 0V, DI = 0V or 5V; DE = 0V RE = 0V, RE = 0V RE = 0V, RE = 0V RE = 0V, RE = 0V RE	POWER REQUIREMENTS		LT			N.100X.
No Load 900 μA		+4.75	MTW	+5.25	Volts	W.100Y.COM.TW
SP483		N.C	LT I	N	W	= 1007 ~107.
SP483	No Load	N C	900	N.		RE , DI = 0V or V_{CC} ; DE = V_{CC}
No Load SP481/SP483 Shutdown Mode 10 μA μA μA RE, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or 5V; DE = 0V DE = 0V, RE=V _{CC} ENVIRONMENTAL AND MECHANICAL Operating Temperature Commercial (_C_) Industrial (_E_) 0 +70 -40 RE, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or 5V; DE = 0V RE=0V, RE=V _{CC} RE=0V, RE=V _{CC} RE=0V, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or V _{CC} ; DE = V _{CC} RE=0V, DI = 0V or 5V; DE = 0V RE=0V, RE=V _{CC} ENVIRONMENTAL AND MECHANICAL Operating Temperature Commercial (_C_) RE=0V, RE=V _{CC} RE=0V, RE=V _{CC} RE=0V, RE=V _{CC} RE=0V, RE=V _{CC}	SP483	Mr.	· M.		μΑ	KE = 00, DI = 00 01 30, DE = 00
SP481/SP483 Shutdown Mode 10 μA DE = 0V, RE=V _{CC} ENVIRONMENTAL AND MECHANICAL Operating Temperature Commercial (_C_) 0 +70 °C Industrial (_E_) 0 -40 +85 °C		100X.	600	LM		\overline{RE} , DI = 0V or V_{CC} ; DE = V_{CC} \overline{RE} =0V, DI = 0V or 5V; DE = 0V
ENVIRONMENTAL AND MECHANICAL Operating Temperature Commercial (_C_) 0 +70 °C		1007		TW	`.	N 1 - 100 7 - 1 IN
MECHANICAL Operating Temperature Commercial (_C_) Industrial (_E_) -40 +70 -70 -85 © C -85 -85 © C -86 -87 -88 -86 -86 -86 -86 -86	Shutdown Mode	.10	V.COM	10	μΑ	$DE = 0V, RE=V_{CC}$
Operating Temperature Commercial (_C_) Industrial (_E_) 0 +70 °C +85 °C 勝 特 力 材 料 886-3-5		N.100	N.CO		Ĭ	MAN, 100 X COM.
Industrial (_E_) -40 +85 °C 勝 持 力 材 料 886-3-5	· · · · · · · · · · · · · · · · · · ·	11.70	- ×1 CS	Divi-	- NI	TIWW.IC
			001.	V / V / V / V - V - V / V / V / V / V /	°C	
	Industrial (_E_) Storage Temperature	-40 -65	0.V.C	+85 +150	°C	▶ 勝 特 力 材 料 886-3-5
	Package Plastic DIP (_S)		4007			胜特力电子(上海) 86-21-54 胜特力电子(深圳) 86-755-8

SP483 AC SPECIFICATIONS

 T_{MIN} to T_{MAX} and $V_{\text{CC}} = 5V \pm 5\%$ unless otherwise noted.

勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-54151736 胜特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw

PARAMETERS	MIN.	TYP.	MAX.	UNITS	CONDITIONS Http://www.100y
SP483 DRIVER	44.	-3110	03.	MIT	121/100
AC Characteristics	N.	MM	V.C	Dr. 1	W WWW. COX.CC
Maximum Data Rate	250	-TXV .	00 -	kbps	W.Io.
Driver Input to Output	250	800	2000	ns	t_{PLH} ; $R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$;
1.100 COM. 1		WIN	700	COM	see figures 3 & 6
Driver Skew	250	800	2000	ns	t_{PHL} ; $R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$;
M'Ing CONF.			1.10		see figures 3 & 6
Driver Rise and Fall Time		100	800	ns	see figures 3 & 6,
	250	TAT VA	2000	V _n CU	t _{SKEW} = t _{DPLH} - t _{DPHL}
	250		2000	ns	From 10% to 90%; $R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$, see figures 3 & 6
Driver Enable to Output High	250	11/1	2000	ns	$C_1 = 100 \text{pF}$; See figures 4 & 7; S_2 closed
Driver Enable to Output Low	250		2000	ns	C ₁ = 100pF; <i>See figures 4 & 7;</i> S ₁ closed
Driver Disable Time from Low	300	V	3000	ns	C ₁ = 15pF; See figures 4 & 7; S ₁ closed
Driver Disable Time from High	300		3000	ns	$C_L^L = 15pF$; See figures 4 & 7; S_2^L closed
SP483 RECEIVER	1.11		- 127	1.100 1	COM
AC Characteristics			11 11	-1100	I. M.Th
Maximum Data Rate	250		- TVV	kbps	A COMP
Receiver Input to Output	250		2000	ns	t_{PLH} ; $R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$;
receiver input to output	200	N	2000	113	Figures 3 & 8
Diff. Receiver Skew It _{PLH} -t _{PHL} I	T.M.	100	111	ns	$R_{DIFF} = 54\Omega$, $C_{L1} = C_{L2} = 100pF$;
PLN FIL	72.	W	11	Maria	Figures 3 & 8
Receiver Enable to	OM.	-		www.	In. COM.
Output Low	,0-	20	50	ns	C _{RL} = 15pF; <i>Figures 2 & 9;</i> S ₁ closed
Receiver Enable to	COM	. 1		-TANV	· To
Output High		20	50	ns	C _{RL} = 15pF; Figures 2 & 9; S ₂ closed
Receiver Disable from Low		20	50	ns	C _{RL} = 15pF; Figures 2 & 9; S ₁ closed
Receiver Disable from High		20	50	ns	C _{RL} = 15pF; Figures 2 & 9; S ₂ closed
SP483	N.C.	TIL	N	MA	11001. CM:I'M
Shutdown Timing	V C	OMr.	KN	TA	MAN. ON COM. TAN
Time to Shutdown	50	200	600	ns	$\overline{RE} = 5V$, $DE = 0V$
Driver Enable from Shutdown	ON!	COL	W	1	TWY CONT. CO. TW
to Output High	100 .	Mos	2000	ns	$C_L = 100pF$; See figures 4 & 7; S_2 closed
Driver Enable from Shutdown	· onY	Co	Mar		
to Output Low	The.	CON	2000	ns	C _L = 100pF; See figures 4 & 7; S ₁ closed
Receiver Enable from	400	1.00	2500		C 15p5, Configures 4 9 7, C stand
Shutdown to Output High Receiver Enable from	N'Ing	-1 CO	2500	ns	C _L = 15pF; See figures 4 & 7; S ₂ closed
Shutdown to Output Low	-110	01.0	2500	ns	$C_1 = 15pF$; See figures 4 & 7; S_1 closed
Chalacter to Output Low	M.To	-1 C.	2500	110	O _L = 10ρ1, 000 liguies 4 & 7, 3 ₁ closed



PIN FUNCTION

Pin#	Name	Description
1	RO	Receiver Output.
2	$\overline{\text{RE}}$	Receiver Output Enable
		Active LOW.
3	DE	Driver Output Enable
		Active HIGH.
4	DI	Driver Input.
5	GND	Ground Connection.
6	Α	Driver Output/Receiver Input
		Non-inverting.
7	В	Driver Output/Receiver Input
		Inverting.
8	Vcc	Positive Supply 4.75V <vcc< 5.25v.<="" td=""></vcc<>

DESCRIPTION SP481, SP483, SP485

The SP481, SP483, and SP485 are half-duplex differential transceivers that meet the requirements of RS-485 and RS-422. Fabricated with a Sipex proprietary BiCMOS process, all three products require a fraction of the power of older bipolar designs.

The RS-485 standard is ideal for multi-drop applications and for long-distance interfaces. RS-485 allows up to 32 drivers and 32 receivers to be connected to a data bus, making it an ideal choice for multi-drop applications. Since the cabling can be as long as 4,000 feet, RS-485 transceivers are equipped with a wide (-7V to +12V) common mode range to accommodate ground potential differences. Because RS-485 is a differential interface, data is virtually immune to noise in the transmission line.

Drivers SP481, SP483, SP485

The driver outputs of the **SP481**, **SP483**, and **SP485** are differential outputs meeting the RS-485 and RS-422 standards. The typical voltage output swing with no load will be 0 volts to +5 volts. With worst case loading of 54Ω across the differential outputs, the drivers can maintain greater than 1.5V voltage levels. The drivers of the **SP481**, **SP483** and **SP485** have an enable control line which is active HIGH. A logic HIGH on DE (pin 5) will enable the differential driver outputs. A logic LOW on DE (pin 5) will tri-state the driver outputs.

The transmitters of the **SP481** and **SP485** will operate up to at least 5Mbps. The **SP483** has internally slew rate limited driver outputs to minimize EMI. The maximum data rate for the **SP483** driver is 250kbps.

Receivers SP481, SP483, SP485

The SP481, SP483, and SP485 receivers have differential inputs with an input sensitivity as low as $\pm 200 mV$. Input impedance of the receivers is typically $15k\Omega$ ($12k\Omega$ minimum). A wide common mode range of -7V to +12V allows for large ground potential differences between systems. The receivers of the SP481, SP483 and SP485 have a tri-state enable control pin. A logic LOW on \overline{RE} (pin 4) will enable the receiver, a logic HIGH on \overline{RE} (pin 4) will disable the receiver.

The receiver for the **SP481** and **SP485** will operate up to at least 5Mbps. The **SP483** receiver is rated for data rates up to 250kbps. The receiver for each of the three devices is equipped with the fail-safe feature. Fail-safe guarantees that the receiver output will be in a HIGH state when the input is left unconnected.

Shutdown Mode SP481/SP483

The **SP481** and **SP483** are equipped with a Shutdown mode. To enable the Shutdown state, both the driver and receiver must be disabled simultaneously. A logic LOW on DE (pin 5) and a logic HIGH on \overline{RE} (pin 4) will put the **SP481** or **SP483** into Shutdown mode. In Shutdown, supply current will drop to typically 1µA.

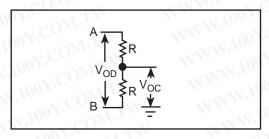


Figure 1. Driver DC Test Load Circuit

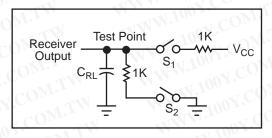


Figure 2. Receiver Timing Test Load Circuit

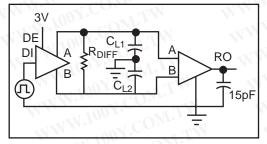


Figure 3. Driver/Receiver Timing Test Circuit

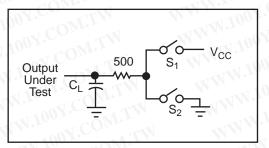
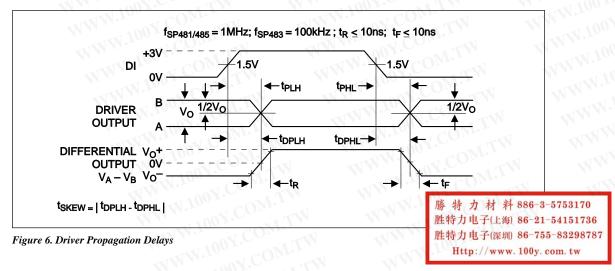


Figure 4. Driver Timing Test Load #2 Circuit



I	NPUT	S		OUTI	PUTS
RE	DE	DI	LINE CONDITION	В	A
X	1	1	No Fault	0	1
X	1	0	No Fault	1	0
X	0	X	X	Z	Z
X	1	X	Fault	Z	Z

Table 1. Transmit Function Truth Table

INP	UTS		OUTPUTS
RE	DE	A - B	R
0	0	+0.2V	1
0	0	-0.2V	0
0	0	Inputs Open	1
1	0	X	Z

Table 2. Receive Function Truth Table

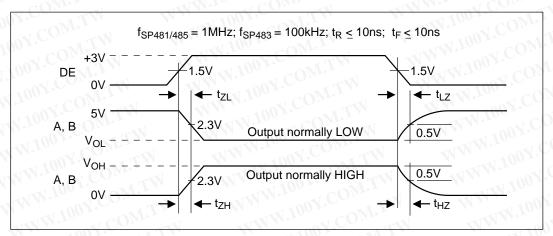


Figure 7. Driver Enable and Disable Times

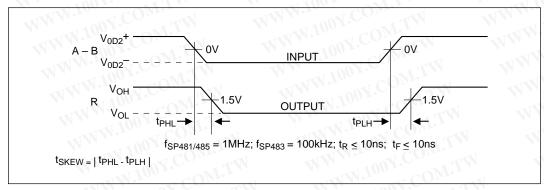


Figure 8. Receiver Propagation Delays

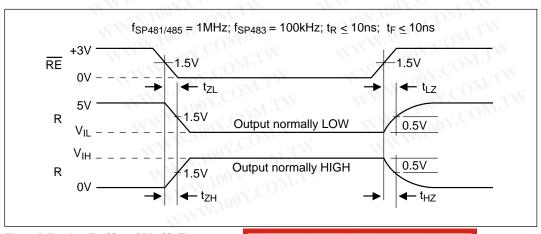
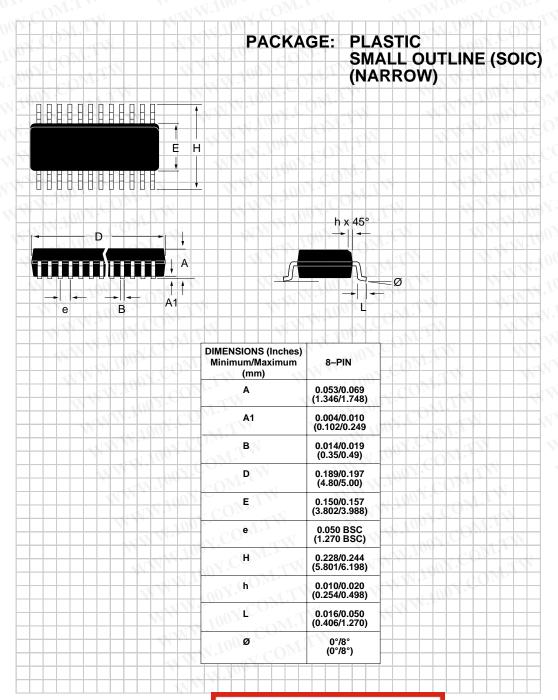
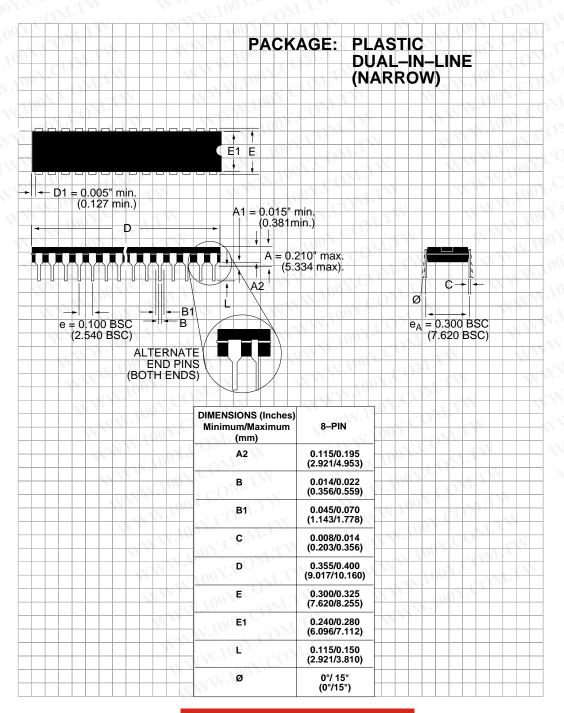


Figure 9. Receiver Enable and Disable Times





ORDERING INFORMATION Temperature Range Model Package SP481CN 0°C to +70°C ... 8-pin Narrow SOIC SP481CS 0°C to +70°C ... 8-pin Plastic DIP-40°C to +85°C 8-pin Narrow SOIC-40°C to +85°C 8-pin Plastic DIP 0°C to +70°C SP483CN 8-pin Narrow SOIC SP483CS 0°C to +70°C8-pin Plastic DIP SP483ES-40°C to +85°C 8-pin Plastic DIP 0°C to +70°C -40°C to +85°C 8-pin Narrow SOIC SP485FN SP485ES-40°C to +85°C 8-pin Plastic DIP

Please consult the factory for pricing and availability on a Tape-On-Reel option.

