

RS232 CHIP

SP3232EEN

Product Data Sheet

AOTE DCC
RELEASE

◆ Summary :

SP3232EEN is an RS-232 standard dual driver/receiver that uses a single power supply voltage. The bipolar output voltage of the transmitter is formed by a built-in voltage multiplier generator on four 1.0μF external capacitors, designed for highly reliable information exchange between state-of-the-art high-performance computing systems, high-speed electronic devices, and remote objects. The input voltage level is compatible with standard CMOS and TTL levels.

◆ Product features

- Encapsulation: SOP-16
- The output voltage level is compatible with the input level of CMOS and TTL integrated circuits;
- Compliant with all EIA/TIA-232E and V.28/V.24 specifications;
- Power supply voltage range: 3.0 to 5.5V;
- Low input current: 1.0 μA at 25 °C;
- Output current: 30mA;
- The allowable value of static potential shall not be less than 2kV;

◆ Applications

- Portable computer
- Battery powered RS-232 system
- Interface conversion
- Low power modem terminal

◆ Absolute maximum rated value

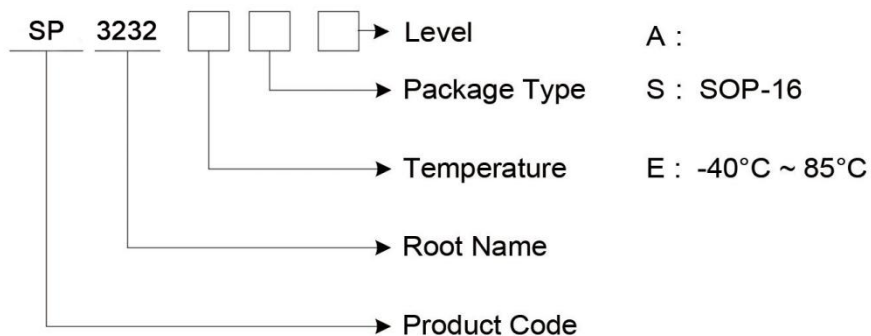
Parameter	Symbol	Min	Max	Unit
power supply voltage	V _{CC}	-0.3	6.0	V
High output voltage of transmitter	V ₊	V _{CC} -0.3	9.8	V
Low output voltage of transmitter	V ₋	-9.0	0.3	V
Input voltage of transmitter	V _{TIN}	-0.3	V ₊ +0.3	V
Receiver input voltage	V _{RIN}	-30	30	V
Output voltage of transmitter	V _{TOUT}	V ₋ -0.3	V ₊ +0.3	V
Voltage applied to the output of the receiver	V _{ROUT}	-0.3	V _{CC} +0.3	V
Storage temperature range	T _{stg}	-65	150	°C

◆ Recommended working conditions

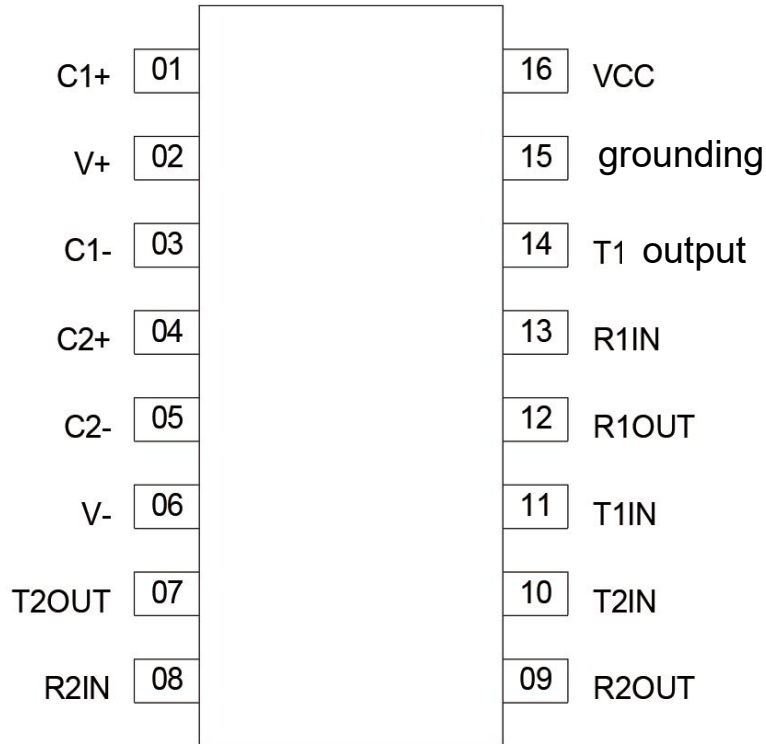
Parameter	Symbol	Min	Max	Unit
power supply voltage	V _{CC}	3.0	5.5	V
Input voltage of transmitter	V _{TIN}	0	V _{CC}	V
Receiver input voltage	V _{RIN}	-30	20	V
Short circuit output current of transmitter	I _{SC}	-	±60	mA
Environmental temperature range	T _A	-40	+85	°C

◆ Order Information

Packaging	Order Number	Packaging Marking	compliance	as
SOP-16	SP3232EEN		RoHS,Green	Vacuum tube



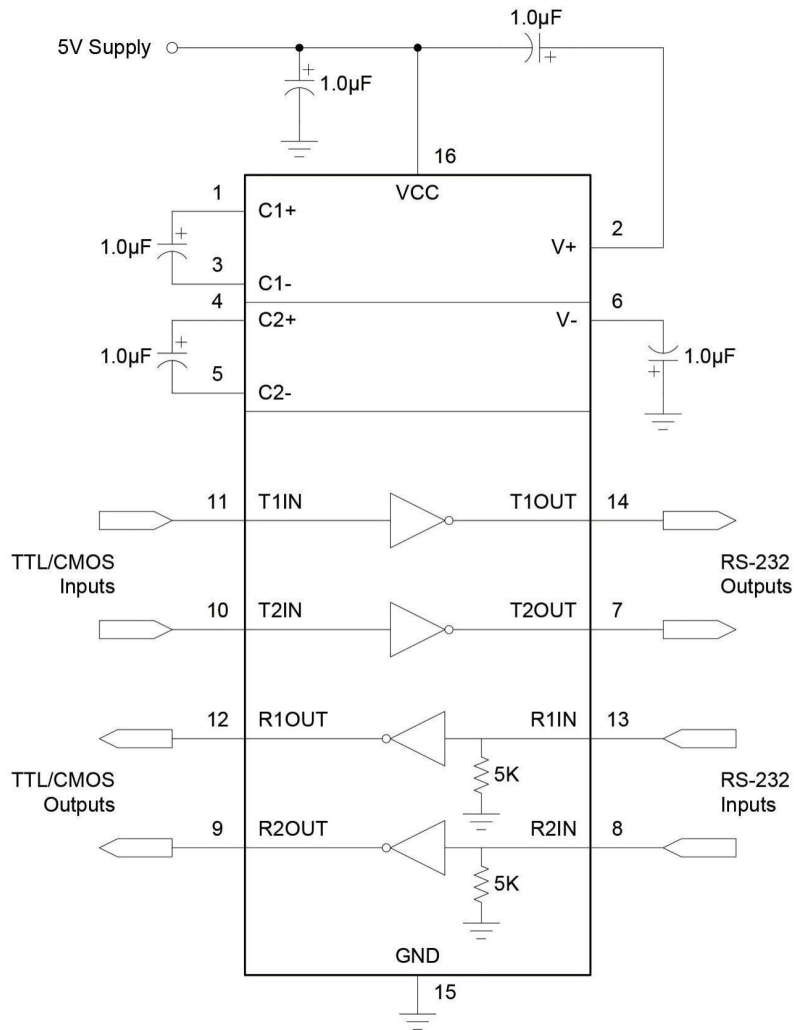
◆ Pin configuration



SOP -16 PKG

Pin number	Pin name	Pin Description
1	C1+	Terminal for positive charging pump C1 capacitor
2	V+	Positive voltage generated by the charging pump
3	C1-	Terminal of negative charge pump C1 capacitor
4	C2+	Terminal of positive charge pump C2 capacitor
5	C2-	Terminal for negative charge pump C2 capacitor
6	V-	Negative voltage generated by the charging pump
7	T2OUT	RS-232 driver output (RS-232 level)
8	R2IN	RS-232 receiver input (RS-232 level)
9	R2OUT	RS-232 receiver output (TTL/CMOS level)
10	T2IN	RS-232 driver input (TTL/CMOS level)
11	T1IN	RS-232 driver input (TTL/CMOS level)
12	R1OUT	RS-232 receiver output (TTL/CMOS level)
13	R1IN	RS-232 receiver input (level RS-232)
14	T1OUT	RS-232 driver output (level RS-232)
15	Grounding	Grounding
16	VCC	Power supply voltage input

◆ **Typical Application Circuit**



Function Menu

Input(RIN, TIN)	Output(ROUT, TOUT)
L(low level)	H(high level)
H(high level)	L(low level)

◆ Electrical Characteristics

(The limit values in standard fonts apply to TA=25 °C, while bold font limits apply to the entire operating temperature range)

Parameter	Symbol	Test conditions		Min	Typ	Max	Unit
power supply current	I _{CC}	V _{CC} =5.5V V _{IL} =0V		-	-	10.0 14.0	mA
Receiver parameters							
Hysteresis voltage	V _h	V _{CC} =5.0V		0.2 0.2	-	0.9 1.0	V
Connect(working)voltage	V _{on}	V _O ≤0.1V,I _{OL} ≤20 μA		-	-	2.4 2.3	V
Turnoff(voltage difference) voltage	V _{off}	V _O ≥V _{CC} -0.1V I _{OH} ≤-20 μA		0.8 0.9	-	-	V
Output low voltage	V _{OL}	I _L =3.2mA,V _{cc} =4.5V, V _{IH} =2.4V		-	-	0.4 0.4	V
Output high and low voltage	V _{OH}	I _{OH} =-1.0mA, V _{cc} =4.5V, V _{IL} =0.8V		3.6 3.5	-	-	V
Input resistance	R _I	V _{CC} =5.0V		3.0 3.0	-	7.0 7.0	kΩ
Tran Smitter parameter							
Output low voltage	V _{OL}	V _{CC} =4.5V,V _{IH} =2.0V, R _L =3.0k Ω		-	-	-5.2 -5.0	V
Output high and low voltage	V _{OH}	V _{CC} =4.5V,V _{IL} =0.8V, R _I =3.0k Ω		5.2 5.0	-	-	V
Input low current	I _L	V _{CC} =5.5V,V _{IL} =0V		-	-	-1.0 -10.0	μA
Input high current	I _{IH}	V _{CC} =5.5V,V _{IH} =V _{CC}		-	-	1.0 10.0	μA
Output frontier charging speed	SR	V _{CC} =5.0V,C _L =50-1000pF, R _L =3.0-7.0k Ω		3.0 2.7	-	30 27	V/μ s
output impedance	R _o	V _{CC} =V ₊ =V ₋ =0V V _O =±2V		350 300	-	-	Ω
Short circuit output current	I _{SC}	V _{CC} =5.5V V _O =0V	V _I =V _{CC}	-	-	-50 -60	mA
			V _I =0	-	-	50 60	
Information transmission speed	ST	V _{CC} =4.5V,C _L =1000pF, R _L =3.0k Ω , t _W =7 μs (for extreme,t _W =8 μs)		140 120	-	-	kbit /s
Dynamic parameter							
Signal propagation delay time when turned on (off)	t _{PHLR} (t _{PLHR})	V _{CC} =4.5V,C _L =150pF, V _{IL} =0V,V _{IH} =3.0V, t _{LH} =t _{HL} ≤10ns		-	-	9.7 10.0	μs
Signal propagation delay time when connected (disconnected)	t _{PHLT} (t _{PLHT})	V _{CC} =4.5V,C _L =2500pF, V _{IL} = 0V,V _{IH} =3.0V,R=3k Ω , t _{LH} =t _{HL} ≤10ns		-	-	5.0 6.0	μs

- ◆ **Sequence diagram**

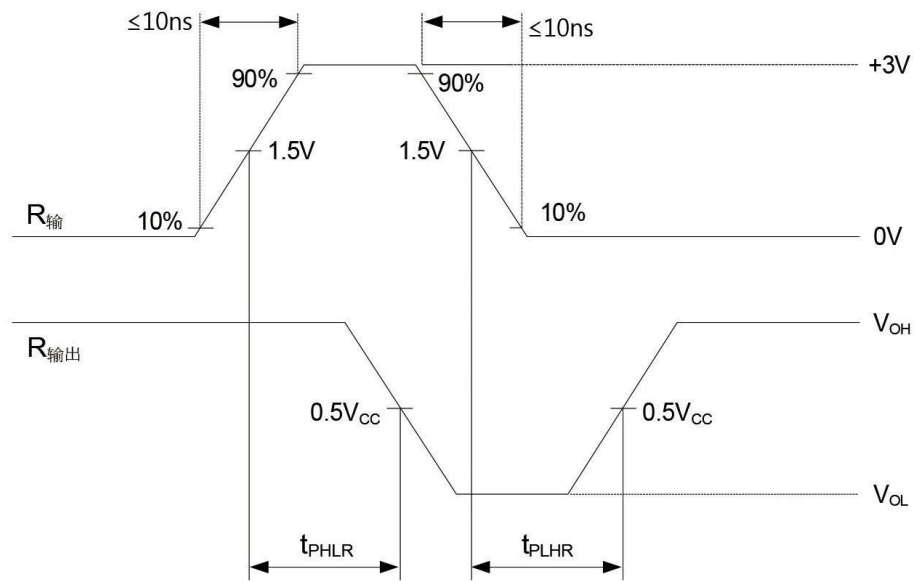


Figure 1. tPHL and tpLH waveforms

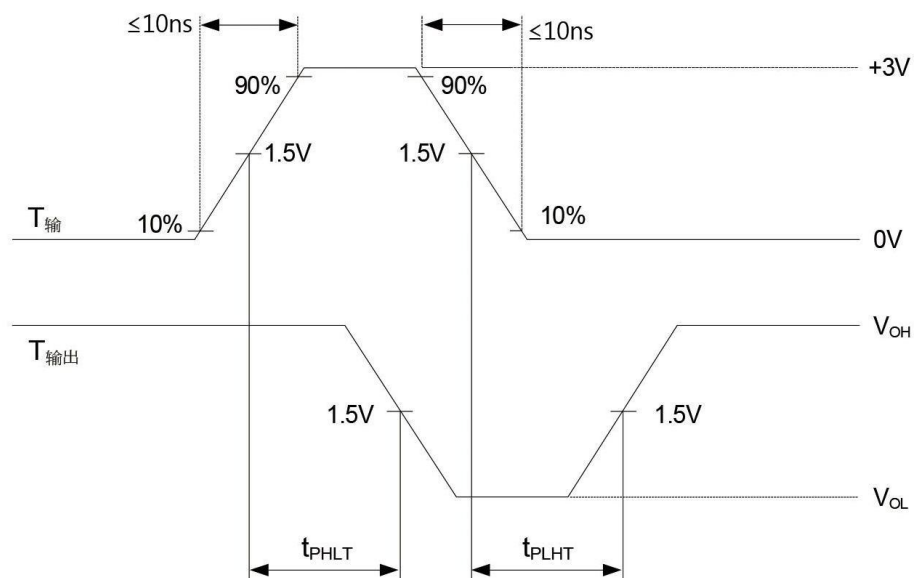


Figure 2. tPHL and tpLH transmitter waveforms

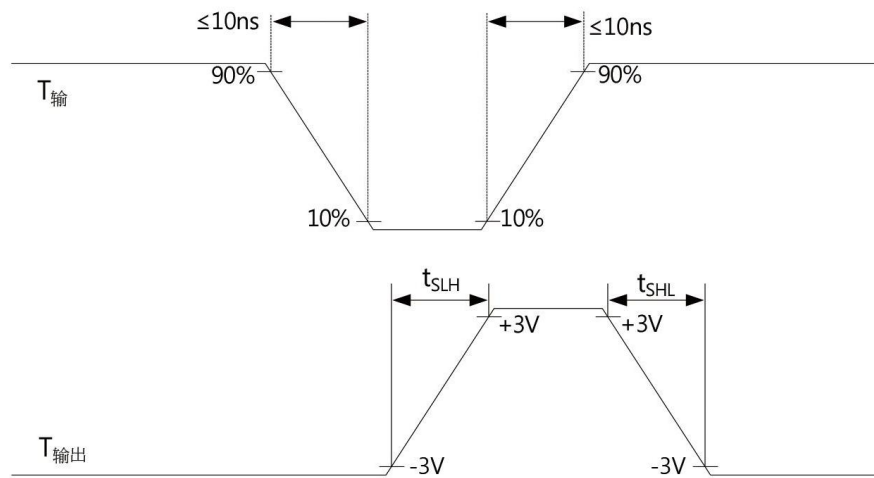


Figure 3. tSLH and tSHL transmitter waveforms

◆ Attention

- AOTE implements dynamic technical updates. Specifications are subject to change. Refer to the official website for the latest version.
- Users must strictly adhere to specified conditions. Failures caused by misuse (overload, high temperature, incompatible circuits) are excluded from warranty.
- Contact technical support for customized validation in critical applications (medical devices, industrial control).
- This document is valid until December 31, 2026 Updates will be notified on the official website.
- For further clarification on technical specifications or application solutions, please contact us through official channels: