

RS232 CHIP

MAX3232ESE

Product Data Sheet

AOTE DCC
RELEASE

◆ Summary :

MAX3232XX 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 1.0 μ F external capacitors. It is designed for high reliability 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
- Output voltage levels are compatible with input levels of CMOS and TTL integrated circuits
- Meets AI EIA/TIA-232E and V.28/N.24 Specifications
- Power supply voltage range: 3.0 to 5.5V
- Low input current: 1.0 μ A at 25°C
- Output current 30mA
- The allowable value of static potential shall not be less than 2KV

◆ Applications

- Portable Computers
- Battery-Powered RS-232 Systems
- Interface Translation
- Low-Power Modems
- Terminals

◆ Absolute maximum rated value

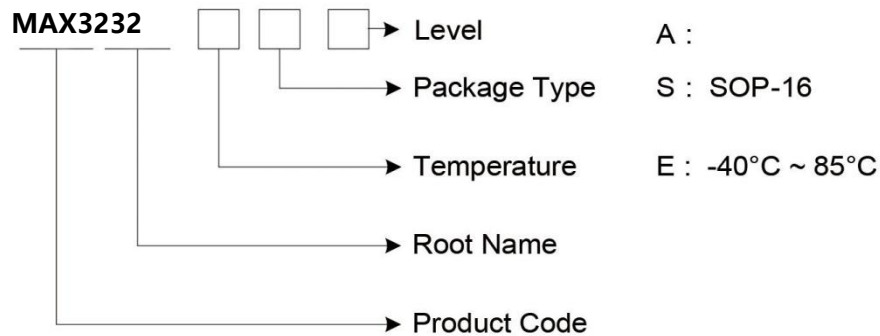
Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	-0.3	6.0	V
Transmitter High Output Voltage	V_+	$V_{CC}-0.3$	9.8	V
Transmitter Low Output Voltage	V_-	-9.0	0.3	V
Transmitter Input Voltage	V_{TIN}	-0.3	$V_++0.3$	V
Receiver Input Voltage	V_{RIN}	-30	30	V
Voltage Applied to Transmitter Output	V_{TOUT}	$V_- - 0.3$	$V_++0.3$	V
Voltage Applied to Receiver Output	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
Supply Voltage	V _{CC}	3.0	5.5	V
Transmitter Input Voltage	V _{TIN}	0	V _{CC}	V
Receiver Input Voltage	V _{RIN}	-30	20	V
Output Current of Transmitter Short Circuit	I _{SC}	-	±60	mA
Ambient Temperature Range	T _A	-40	+85	°C

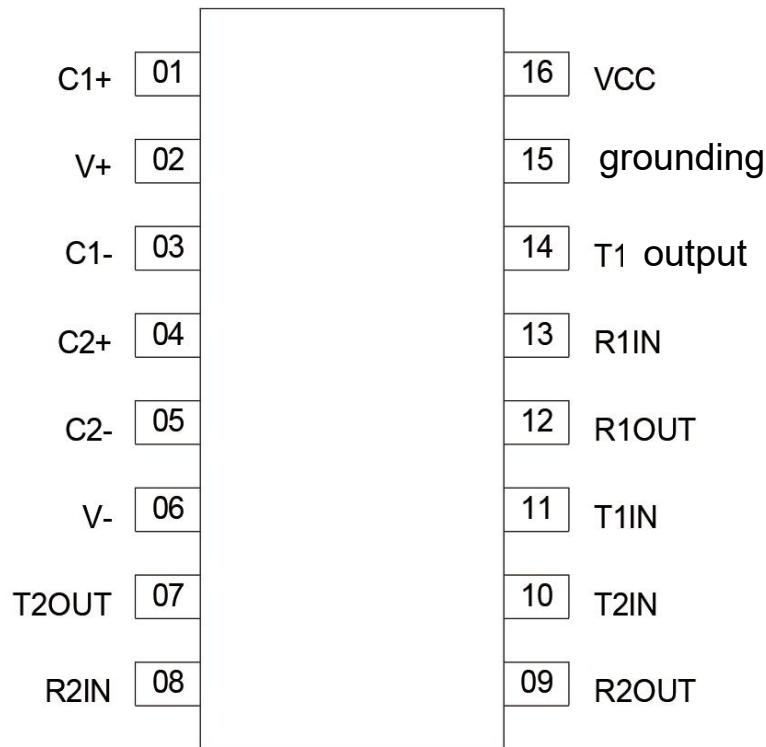
◆ Order Information

Packaging	Order Number	Packaging Marking	compliance	as
SOP-16	MAX3232XXX		RoHS,Green	Tube



MAX3232XXX(XXX:CSE、CDR、EESE、ESE、IDR)

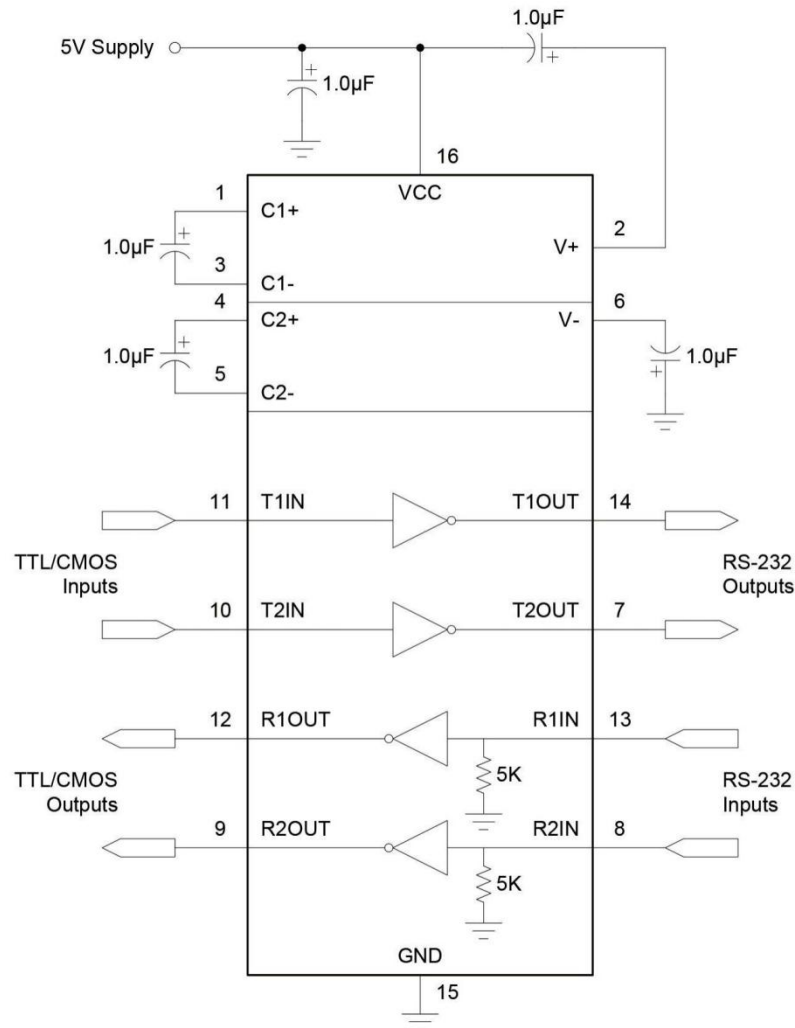
◆ **Pin configuration**



SOP -16 PKG

Pin number	Pin name	Pin Description
1	C1+	Terminal for Positive Charge-Pump C1 Capacitor
2	V+	Positive Voltage Generated by the Charge-Pump
3	C1-	Terminal for Negative Charge-Pump C1 Capacitor
4	C2+	Terminal for Positive Charge-Pump C2 Capacitor
5	C2-	Terminal for Negative Charge-Pump C2 Capacitor
6	V-	Negative Voltage Generated by the Charge-Pump
7	T2OUT	RS-232 Driver Output (Levels RS-232)
8	R2IN	RS-232 Receiver Input (Levels RS-232)
9	R2OUT	RS-232 Receiver Output(LevelsTTLCMOS)
10	T2IN	RS-232 Driver Input (Levels TTL/CMOS)
11	T1IN	RS-232 Driver Input (Levels TTL/CMOS)
12	R1OUT	RS-232 Receiver Output (Levels TTL/CMOS)
13	R1IN	RS-232 Receiver Input (Levels RS-232)
14	T1OUT	RS-232 Driver Output (Levels RS-232)
15	GND	Ground
16	VCC	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
Supply Current	ICC	VCC=5.5V VIL=0V		-	-	10.0 14.0	mA
Receiver Parameters							
Hysteresis Voltage	Vh	VCC=5.0V		0.2 0.2	-	0.9 1.0	V
On(Operation) Voltage	Von	VO ≤0.1V, IOL ≤20 μA		-	-	2.4 2.3	V
Off(Dropout) Voltage	Voff	VO ≥VCC-0.1V IOH ≤-20 μA		0.8 0.9	-	-	V
Output Low Voltage	VOL	IL=3.2mA, Vcc=4.5V, VIH=2.4V		-	-	0.4 0.4	V
Output High Voltage	VOH	IOH=-1.0mA,Vcc=4.5V, VIL=0.8V		3.6 3.5	-	-	V
Input Resistance	RI	VCC=5.0V		3.0 3.0	-	7.0 7.0	k Ω
Transmitter Parameters							
Output Low Voltage	VOL	VCC=4.5V,VIH=2.0V, RL=3.0k Ω		-	-	-5.2 -5.0	V
Output High Voltage	VOH	VCC=4.5V,VIL=0.8V, RI=3.0k Ω		5.2 5.0	-	-	V
Input Low Current	IL	VCC=5.5V,VIL=0V		-	-	-1.0 -10.0	μA
Input High Current	IIH	VCC=5.5V,VIH=VCC		-	-	1.0 10.0	μA
Speed Of Output Front Charge	SR	VCC=5.0V, CL=50-1000pF,RL=3.0-7.0k Ω		3.0 2.7	-	30 27	V/ μs
Output Resistance	RO	VCC=V+=V-=0V VO=±2V		350 300	-	-	Ω
Short Circuit Output Current	ISC	VCC=5.5V VO=0V	VI=VCC	-	-	-50 -60	mA
			VI=0	-	-	50 60	
Speed Of Information Transmission	ST	VCC=4.5V, CL=1000pF, RL=3.0k Ω , tW=7 μs(for extreme, tW=8 μs)		140 120	-	-	kbit/s
Dynamic Parameters							
Signal Propagation Delay Time When Switching On(off)	tPHLR (tPLHR)	VCC=4.5V,CL=150pF, VIL=0V,VIH=3.0V, tLH=tHL ≤10ns		-	-	9.7 10.0	μs
Signal Propagation Delay Time When Switching On(off)	tPHLT (tPLHT)	VCC=4.5V,CL=2500pF, VIL= 0V, VIH=3.0V,R=3k Ω , tLH=tHL ≤10ns		-	-	5.0 6.0	μs

◆ Sequence diagram

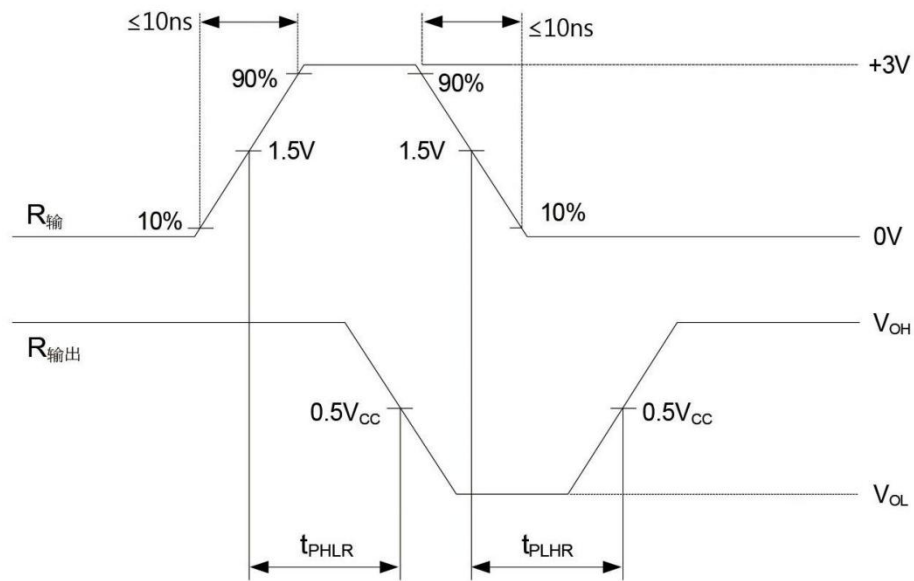


Figure 1. tPHL and tpLH waveforms

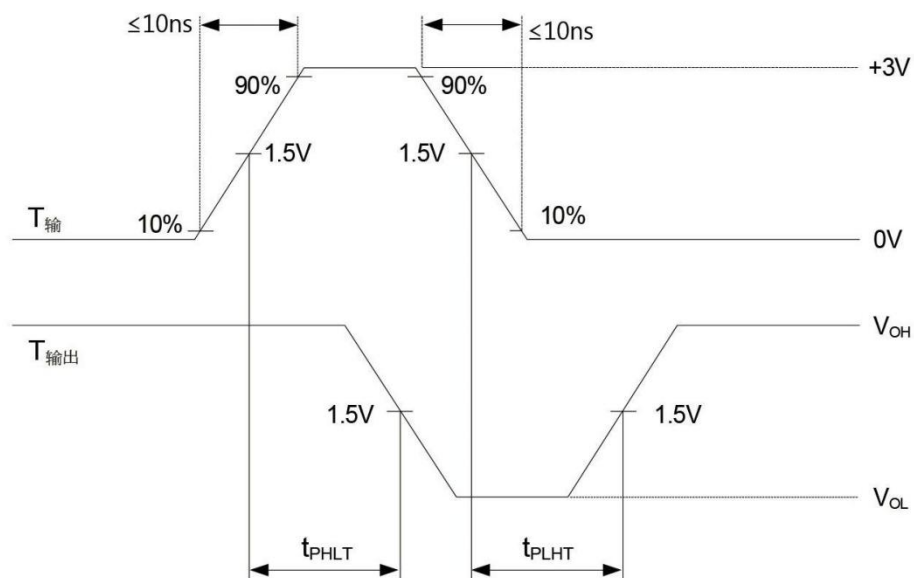


Figure 2. tPHL and tpLH transmitter waveforms

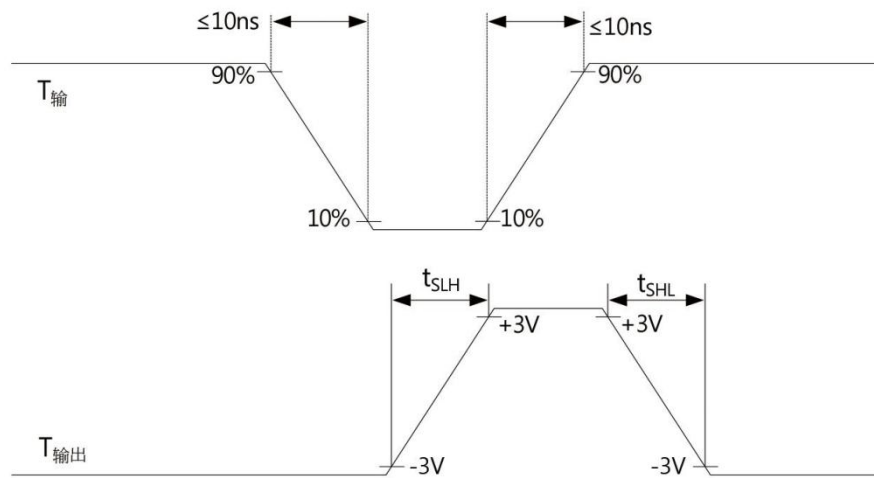


Figure 3. t_{SLH} and t_{SHL} transmitter waveforms

◆ 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: