



**AOS**  
**SEMICONDUCTOR**

## 产品规格说明书

Product Data Sheet

### MAX232ESE

WEB | [www.aossemi.cn](http://www.aossemi.cn) 



电源管理IC



通信接口芯片



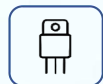
二三极管



LDO稳压器



逻辑器件



MOSFETs



运算放大器



显示驱动



MCU单片机

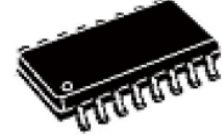


光电器件

# MAX232ESE

Data Sheet

RS-232-Chip



SO16

5V Dual channel RS 232 Drivers/Receivers

## FEATURES

- ★ 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
- ★ Supply voltage range from 5.5V
- ★ Low input current: 1.0 $\mu$ A at 25 $^{\circ}$ C
- ★ Output current 30mA
- ★ Available in SOP-16 Package

## APPLICATIONS

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

## APPLICATIONS

Device	Package
	SOP-16

\* Refer to the ordering information for the details.

## DESCRIPTION

The MAX232ESE is a dual driver/receiver of RS-232 standard with a single supply voltage and bipolar output voltage of the transmitter formed by a built-in

multiplying generator on four 1.0 $\mu$ F external capacitors, designed for use in state-of-the-art high performance computing systems, high-speed electronic devices with high reliability of information exchange between remote objects. Input voltage levels are compatible with standard CMOS and TTL levels.

## ABSOLUTE MAXIMUM RATINGS

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	$V_{RIN}$	-20	20	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	Tstg	-65	150	



## MAX232ESE

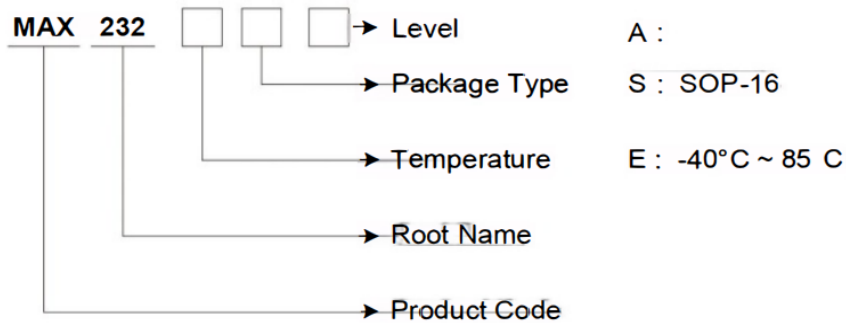
## Data Sheet

## RECOMMENDED OPERATING CONDITIONS

PARAMETER	Symbol	MIN.	MAX.	UNIT
Supply Voltage	$V_{CC}$	4.5	5.5	V
Transmitter Input Voltage	$V_{TIN}$	0	$V_{CC}$	V
Receiver Input Voltage	$V_{RIN}$	-20	20	V
Output Current of Transmitter Short Circuit	$I_{SC}$	-	±60	mA
Ambient Temperature Range	$T_A$	-40	+85	

## ORDERING INFORMATION

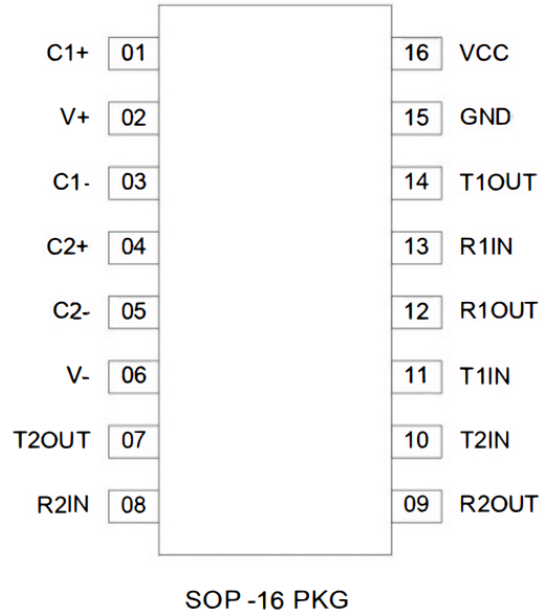
Package	Oder No.	Package Marking	Compliance	Supplied As
SOP-16	MAX232XXX	MAX232XXX	RoHS,Green	Tube



## MAX232ESE

## Data Sheet

## PIN CONFIGURATION



## PIN DESCRIPTION

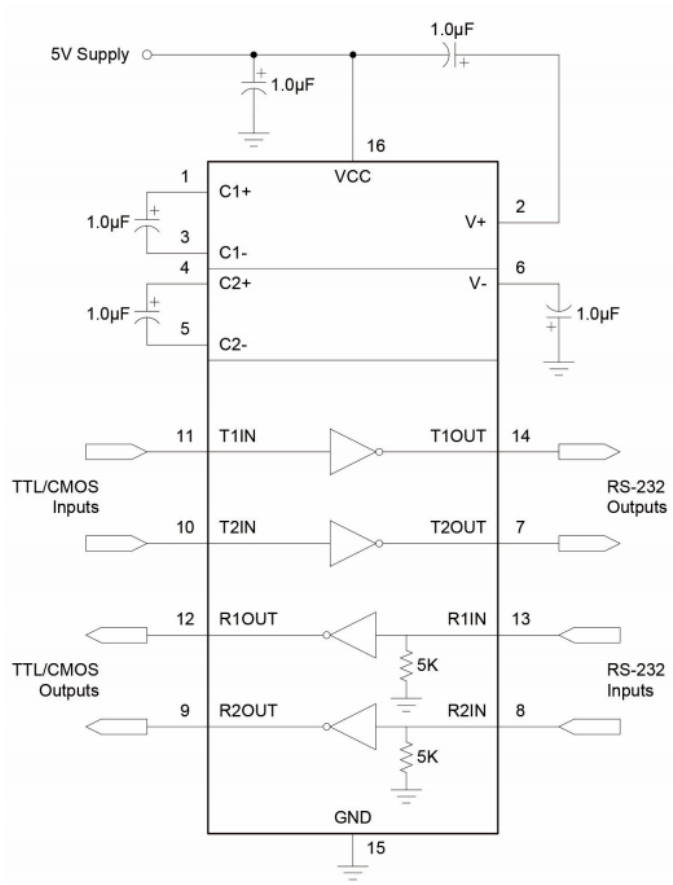
Pin No.	Pin Name	Pin Description
1	C1+	Terminal for Positive Charge-Pump C1 Capacitor
2	V+	Positive Voltage Generated by the Charge-Pump
3	C1-	Terminal for Negative Charge-Pump C1 Capacitor
4	C2+	Terminal for Positive Charge-Pump C2 Capacitor
5	C2-	Terminal for Negative Charge-Pump C2 Capacitor
6	V-	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 (Levels TTL/CMOS)
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



# MAX232ESE

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### TYPICAL APPLICATION CIRCUIT



### FUNCTION TABLE

INPUT(RIN, TIN)	OUTPUT(ROUT, TOUT)
L(Low Level)	H(High Level)
H(High Level)	L(Low Level)



## MAX232ESE

## Data Sheet

## ELECTRICAL CHARACTERISTICS

(Limits in standard typeface are for TA=25°C, and the limits in boldface type apply over full operating temperature range.)

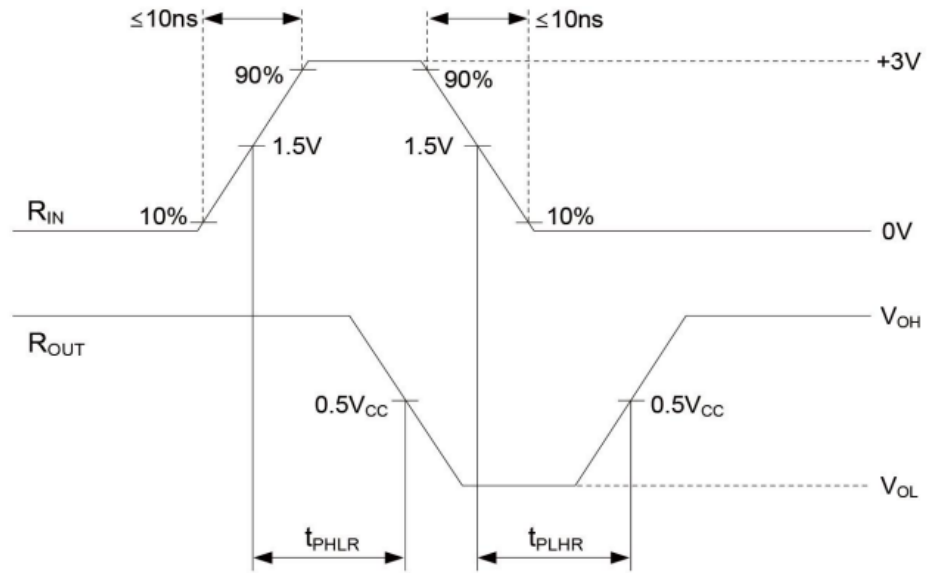
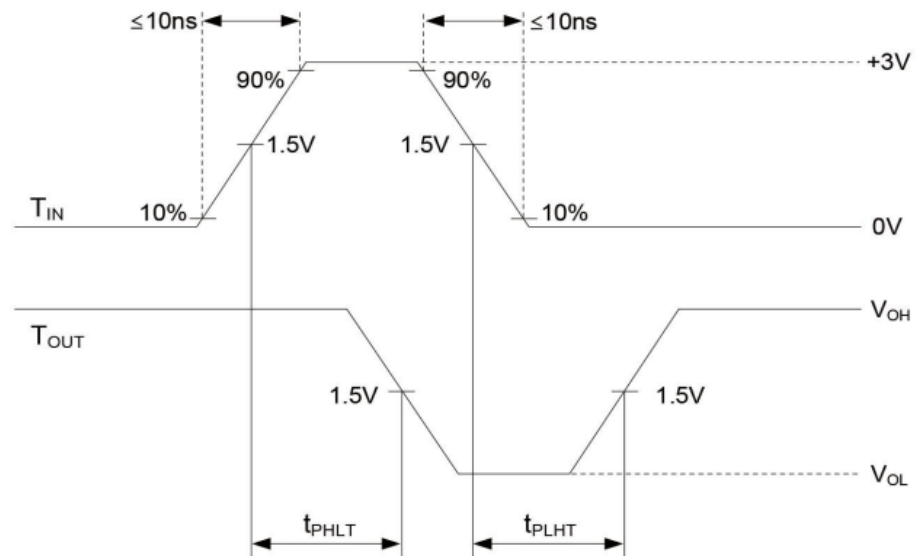
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP.	MAX.	UNIT.	
Supply Current	$I_{CC}$	$V_{CC}=5.5V$ $V_{IL}=0V$	-	-	10.0 14.0	mA	
<b>Receiver Parameters</b>							
Hysteresis Voltage	$V_h$	$V_{CC}=5.0V$	0.2 0.2	-	0.9 1.0	V	
On(Operation) Voltage	$V_{on}$	$V_o \leq 0.1V, I_{oL}$ $\leq 20\mu A$	-	-	2.4 2.3	V	
Off(Dropout) Voltage	$V_{off}$	$V_o^- V_{CC}-0.1V, I_{oH} \leq 20\mu A$	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 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	k $\Omega$	
<b>Transmitter Parameters</b>							
Output Low Voltage	$V_{oL}$	$V_{CC}=4.5V, V_{IH}=2.0V, R_L=3$ $.0k\Omega$	-	-	-5.2 -5.0	V	
Output High Voltage	$V_{oH}$	$V_{CC}=4.5V, V_{IL}=0.8V, R_I=3.$ $0k\Omega$	5.2 5.0	-	-	V	
Input Low Current	$I_L$	$V_{CC}=5.5V, V_{IL}=0V$	-	-	-1.0 -10.0	$\mu A$	
Input High Current	$I_{IH}$	$V_{CC}=5.5V, V_{IH}=V_{CC}$	-	-	1.0 10.0	$\mu A$	
Speed Of Output Front Charge	$S_R$	$V_{CC}=5.0V, C_L=50-$ $1000pF, R_L=3.0-7.$ $0k\Omega$	3.0 2.7	-	30 27	V/ $\mu s$	
Output Resistance	$R_o$	$V_{CC}=V_+=V_-=0V$ $V_o=\pm 2V$	350 300	-	-	$\Omega$	
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	
Speed Of Information Transmission	$S_T$	$V_{CC}=4.5V, C_L=1000pF, R_L=$ $3.0k\Omega, t_w=7\mu s()$ for extreme, $t_w=8 \mu s$	140 120	-	-	kbit/s	
<b>Dynamic Parameters</b>							
Signal Propagation Delay Time When Switching On (off)	$t_{PHLR}$ ( $t_{PLHR}$ )	$V_{CC}=4.5V, C_L=150pF, V_{IL}$ $=0V, V_{IH}=3.0V, t_{LH}$ $=t_{HL} \leq 10ns$	-	-	9.7 10.0	$\mu s$	
Signal Propagation Delay Time When Switching On (off)	$t_{PHLT}$ ( $t_{PLHT}$ )	$V_{CC}=4.5V, C_L=2500pF, V_{IL}=$ $0V, V_{IH}=3.0V, R=3k\Omega,$ $t_{LH}=t_{HL} \leq 10ns$	-	-	5.0 6.0	$\mu s$	



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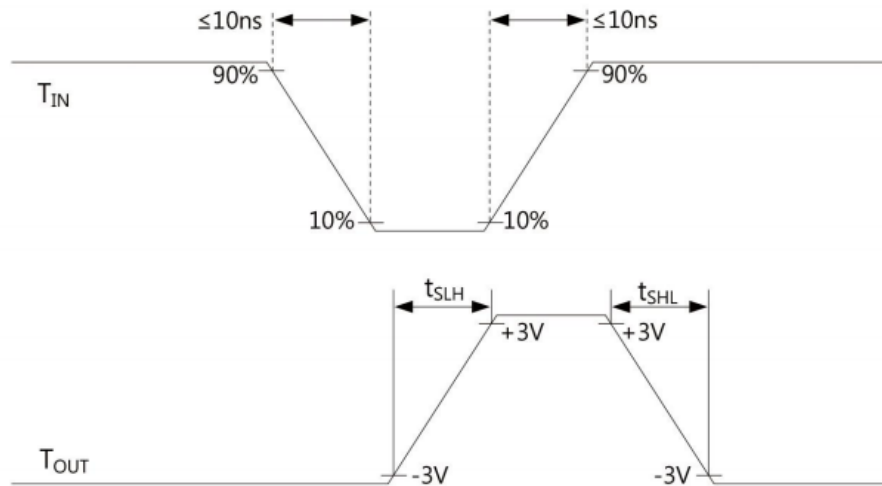
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## TIMING DIAGRAM

Figure 1.  $t_{PHL}$  and  $t_{PLH}$  waveforms of ReceiverFigure 2.  $t_{PLH}$  and  $t_{PLH}$  waveforms of Transmitter

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Figure 3.  $t_{SLH}$  and  $t_{SHL}$  waveforms of Transmitter

## REVISION NOTICE

The description in this datasheet is subject to change without any notice to describe its electrical characteristics properly.

