General Description

The MAX3232 is a dual driver/receiver of RS-232 standard with a single supply voltage and bipolar output

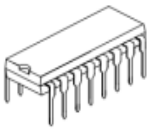
voltage of the transmitter formed by a built-In voltage multiplying generator on four 1.0μF external capacitors,

designed for use in state-of-the-art high performance computing systems, high-speed electronic devices with high

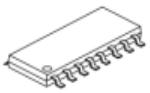
reliability of information exchange between remote objects.

Input voltage levels are compatible with standard CMOS and TTL levels

DIP-16



SOP-16



Features

- Output voltage levels are compatible with input levels of CMOS and TTL integrated circuits
- Meets All EIA/TIA-232E and V.28/V.24 Specifications
- Supply voltage range from 5.5V
- Low input current: 1.0μA at 25°C
- Output current 30mA
- Available in SOP-16 DIP-16 Package

Applications

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

Order Information

Product Model	Package Type	Marking	Packing	Packing Qty	Additional Remarks
XBLW MAX3232N	DIP-16	MAX3232N	Tape	1000/Box	
XBLW MAX3232EDTR	SOP-16	MAX3232E	Tube	2500/Reel	
XBLW MAX3232EEDTR	SOP-16	MAX3232EE	Tube	2500/Reel	ESD

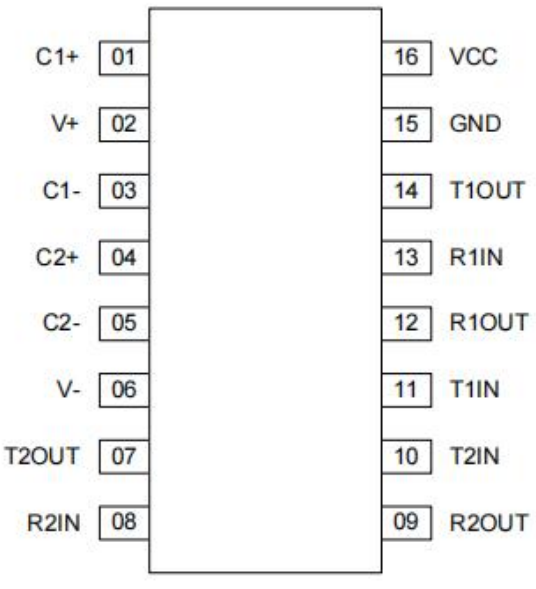
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V_{CC}	-0.3	5.5	V
Transmitter High Output Voltage	V_+	V_{CC}-0.3	7	V
Transmitter Low Output Voltage	V_-	-7.0	0.3	V
Transmitter Input Voltage	V_{TIN}	-0.3	V_++0.3	V
Receiver Input Voltage	V_{RIN}	- 12	12	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 OPERATING 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}	- 12	12	V
Output Current of Transmitter Short Circuit	I_{SC}	-	±60	mA
Ambient Temperature Range	T_A	-40	+85	°C

PIN CONFIGURATION

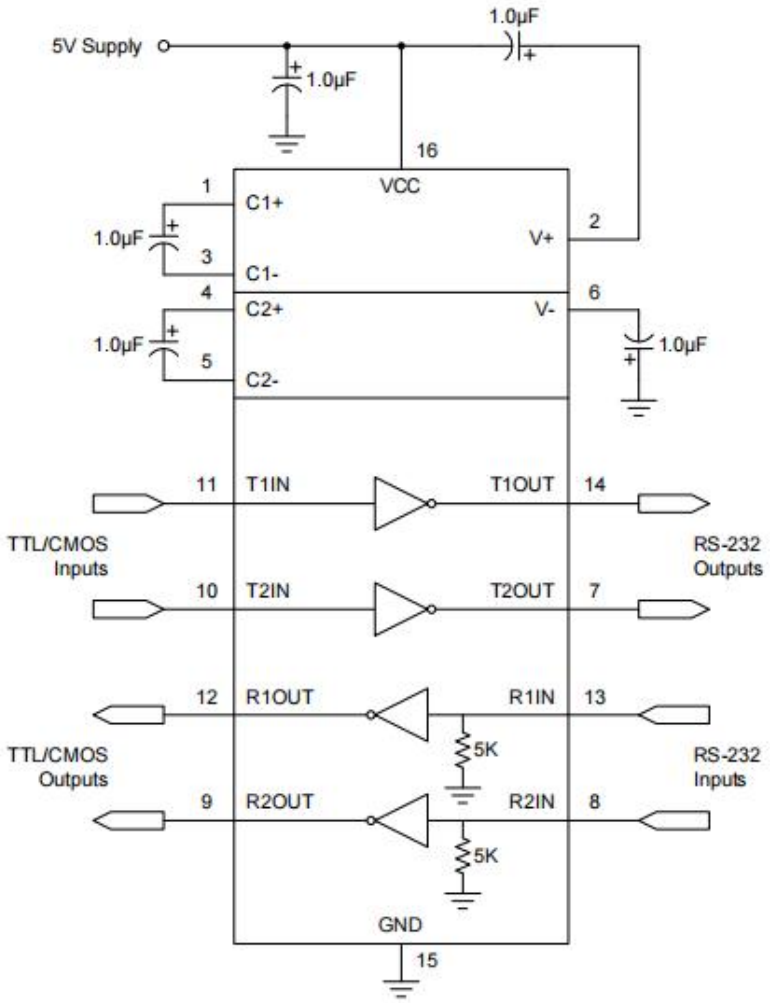


SOP -16 PKG

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

TYPICAL APPLICATION CIRCUIT



FUNCTION TABLE

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

ELECTRICAL CHARACTERISTICS

(Limits in standard typeface are for T_A=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	-	-	8 **10.0**	mA
Receiver Parameters						
Hysteresis Voltage	V_h	V_{CC} = 5.0V	0.2 **0.2**	-	0.9 **1.0**	V
On (Operation) Voltage	V_{on}	V_O ≤ 0.1V, I_{OL} ≤ 20μA	-	-	2.4 **2.3**	V
Off (Dropout) Voltage	V_{off}	V_O ≥ V_{CC} - 0.1V I_{OH} ≤ -20μA	0.8 **0.9**	-	-	V
Output Low Voltage	V_{OL}	I_L = 3.2mA, V_{CC} = 4.5V, V_{IH} = 2.4V	-	-	0.3 **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**	kΩ
Transmitter Parameters						
Output Low Voltage	V_{OL}	V_{CC} = 4.5V, V_{IH} = 2.0V, R_L = 3.0kΩ	-	-	-5.2 **-5.0**	V
Output High Voltage	V_{OH}	V_{CC} = 4.5V, V_{IL} = 0.8V, R_L = 3.0kΩ	5.2 **5.0**	-	-	V
Input Low Current	I_{IL}	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
Speed Of Output Front Charge	SR	V_{CC} = 5.0V, C_L = 50 - 1000pF, R_L = 3.0 - 7.0kΩ	3.0 **2.7**	-	30 **27**	V/μs
Output Resistance	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_{CC} = 5.5V V_O = 0V; V_I = 0	-	-	50 **60**	mA
Speed Of Information Transmission	ST	V_{CC} = 4.5V, C_L = 1000pF, R_L = 3.0kΩ , t_W = 7 μs (for extreme, t_W = 8 μs)	250 **300**	-	-	kbit/s
Dynamic Parameters						
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} ≤ 10ns	-	-	9.7 **10.0**	μs
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_L = 3kΩ , t_{LH} = t_{HL} ≤ 10ns	-	-	5.0 **6.0**	μs

TIMING DIAGRAM

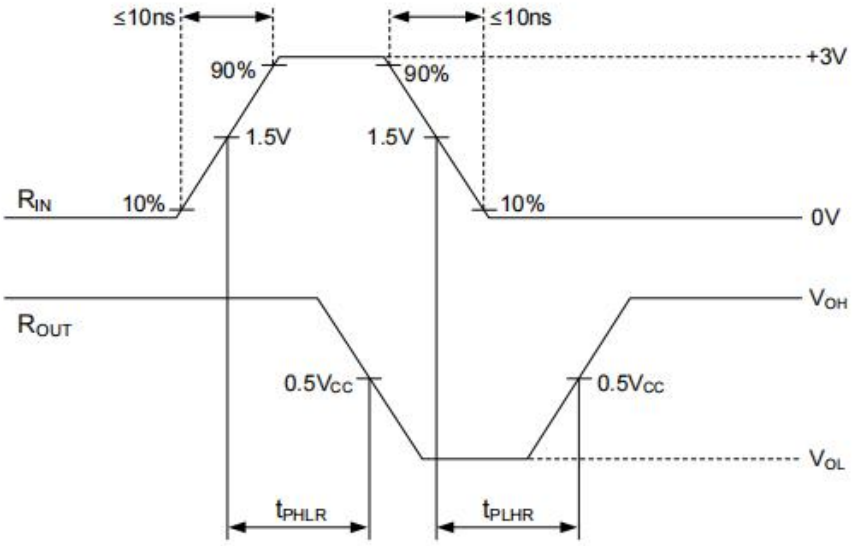


Figure 1. t_{PHL} and t_{PLH} waveforms of Receiver

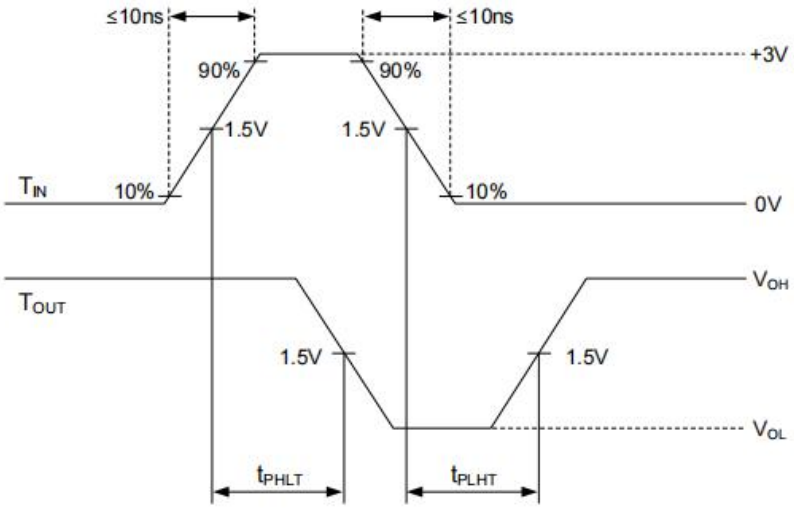


Figure 2. t_{PHL} and t_{PLH} waveforms of Transmitter

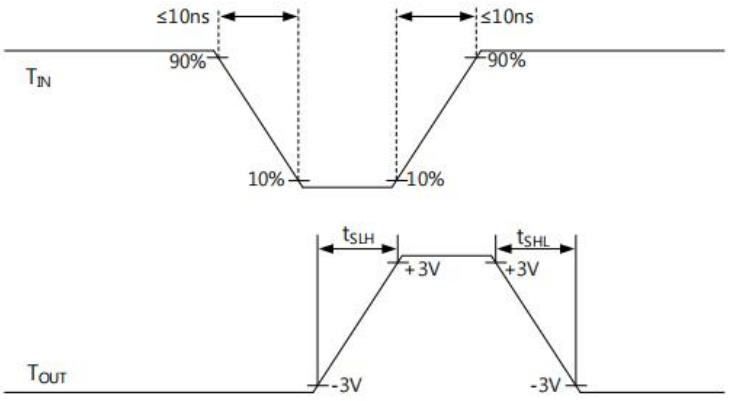
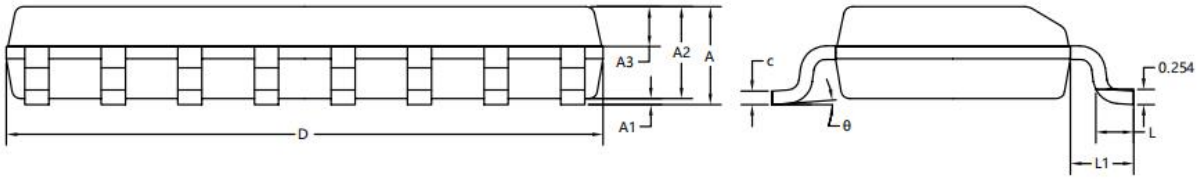
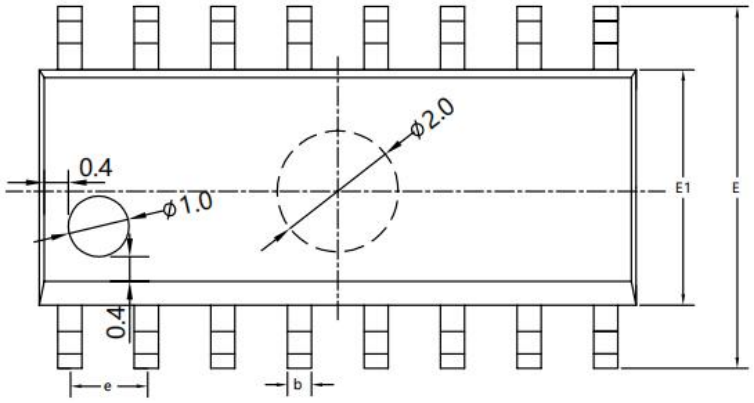


Figure 3. t_{SLH} and t_{SHL} waveforms of Transmitter

Package Information

SOP16





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.50	1.60	1.70
A1	0.10	0.15	0.25
A2	1.40	1.45	1.50
A3	0.60	0.65	0.70
b	0.30	0.40	0.50
c	0.15	0.20	0.25
D	9.80	9.90	10.00
E	5.80	6.00	6.20
E1	3.85	3.90	3.95
e	1.27BSC		
L	0.50	0.60	0.70
L1	1.05BSC		
θ	0°	4°	8°

Statement：

✧ Shenzhen xinbole electronics co., ltd. reserves the right to change the product specifications, without notice! Before placing an order, the customer needs to confirm whether the information obtained is the latest version, and verify the integrity of the relevant information.

✧ Any semiconductor product is liable to fail or malfunction under certain conditions, and the buyer shall be responsible for complying with safety standards in the system design and whole machine manufacturing using Shenzhen xinbole electronics co., ltd products, and take appropriate security measures to avoid the potential risk of failure may result in personal injury or property losses of the situation occurred!

✧ Product performance is never ending, Shenzhen xinbole electronics co., ltd will be dedicated to provide customers with better performance, better quality of integrated circuit products.