TEXAS INSTRUMENTS

# MAX232x Dual EIA-232 Drivers/Receivers

1 Features

- Meets or Exceeds TIA/EIA-232-F and ITU Recommendation V.28
- Operates From a Single 5-V Power Supply With 1.0-μF Charge-Pump Capacitors
- Operates up to 120 kbit/s
- Two Drivers and Two Receivers
- ±30-V Input Levels
- Low Supply Current: 8 mA Typical
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
- Upgrade With Improved ESD (15-kV HBM) and 0.1-μF Charge-Pump Capacitors is Available With the MAX202 Device

2 Applications

- TIA/EIA-232-F
- Battery-Powered Systems
- Terminals
- Modems
- Computers
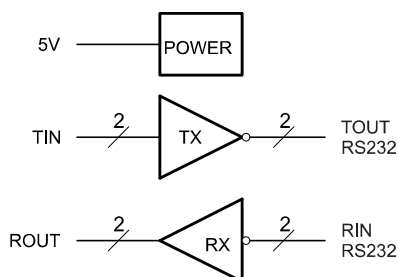
3 Description

The MAX232 device is a dual driver/receiver that includes a capacitive voltage generator to supply TIA/EIA-232-F voltage levels from a single 5-V supply. Each receiver converts TIA/EIA-232-F inputs to 5-V TTL/CMOS levels. These receivers have a typical threshold of 1.3 V, a typical hysteresis of 0.5 V, and can accept ±30-V inputs. Each driver converts TTL/CMOS input levels into TIA/EIA-232-F levels.

Device Information[1]

ORDER NUMBER	PACKAGE (PIN)	BODY SIZE
MAX232x	SOIC (16)	9.90 mm × 3.91 mm
	SOIC (16)	10.30 mm × 7.50 mm
	PDIP (16)	19.30 mm × 6.35 mm
	SOP (16)	10.3 mm × 5.30 mm

(1) For all available packages, see the orderable addendum at the end of the datasheet.

4 Simplified Schematic

6 Pin Configuration and Functions

Top View

MAX232 . . . D, DW, N, OR NS PACKAGE
MAX232I . . . D, DW, OR N PACKAGE
(TOP VIEW)

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        ┌───∪───┐
 C1+  [ │1    16│ ] VCC
 VS+  [ │2    15│ ] GND
 C1−  [ │3    14│ ] T1OUT
 C2+  [ │4    13│ ] R1IN
 C2−  [ │5    12│ ] R1OUT
 VS−  [ │6    11│ ] T1IN
T2OUT [ │7    10│ ] T2IN
 R2IN [ │8     9│ ] R2OUT
        └───────┘
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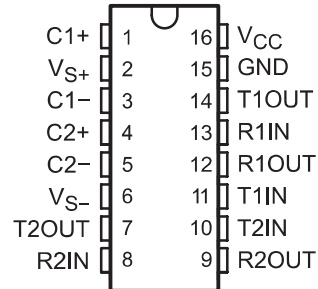
Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
C1+	1	—	Positive lead of C1 capacitor
VS+	2	O	Positive charge pump output for storage capacitor only
C1-	3	—	Negative lead of C1 capacitor
C2+	4	—	Positive lead of C2 capacitor
C2-	5	—	Negative lead of C2 capacitor
VS-	6	O	Negative charge pump output for storage capacitor only
T2OUT, T1OUT	7, 14	O	RS232 line data output (to remote RS232 system)
R2IN, R1IN	8, 13	I	RS232 line data input (from remote RS232 system)
R2OUT, R1OUT	9, 12	O	Logic data output (to UART)
T2IN, T1IN	10, 11	I	Logic data input (from UART)
GND	15	—	Ground
VCC	16	—	Supply Voltage, Connect to external 5V power supply