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## NTE7142 Integrated Circuit +5V-Powered, Multichannel RS-232 Driver/Receiver

### **Description:**

The NTE7142 is a multichannel RS-232 driver/receiver in a 16-Lead DIP type package intended for all EIA/TIA-232E and V.28/V.24 communications interfaces, particularly applications where ±12V is not available.

### **Features:**

- Operate From Single +5V Power Supply
- Meet All EIA/TIA-232E and V.28 Specifications
- Multiple Drivers and Receivers
- 3-State Driver and Receiver Outputs

### **Applications:**

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

### **Absolute Maximum Ratings:** (Note 1)

Supply Voltage, $V_{CC}$ .....	-0.3V to +6V
Input Voltage, $T_{IN}$ .....	-0.3V to ( $V_{CC}-0.3V$ )
Input Voltage, $R_{IN}$ .....	±30V
Output Voltage (Note 2), $T_{OUT}$ .....	±15V
Output Voltage, $R_{OUT}$ .....	-0.3V to ( $V_{CC}+0.3V$ )
Driver/Receiver Output Short Circuited to GND .....	Continuous
Continuous Power Dissipation ( $T_A = +70^{\circ}C$ ), $P_D$ .....	842mW
Dreate Above $+70^{\circ}C$ .....	10.53mW/ $^{\circ}C$
Operating Temperature Range, $T_{opr}$ .....	0° to $+70^{\circ}C$
Storage Temperature Range, $T_{stg}$ .....	-65° to $+160^{\circ}C$
Lead Temperature (During Soldering, 10sec), $T_L$ .....	$+300^{\circ}C$

Note 1. Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational section of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Note 2. Input voltage measured with  $T_{OUT}$  in high-impedance state,  $V_{CC} = 0V$ .

**Electrical Characteristics:** ( $V_{CC} = +5V \pm 10\%$ ,  $T_A = 0^\circ$  to  $+70^\circ C$ ,  $C1-C4 = 0.1\mu F$  unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
<b>RS-232 Transmitter</b>					
Output Voltage Swing	All transmitter output loaded with $3k\Omega$ to GND	$\pm 5$	$\pm 8$	–	V
Input Logic Threshold Low		–	1.4	0.85	V
Input Logic Threshold High		2.0	1.4	–	V
Logic Pull-Up/Input Current	Normal operation	–	5	40	$\mu A$
Output Leakage Current	$V_{CC} = 0V$ , $V_{OUT} = \pm 15V$	–	$\pm 0.01$	$\pm 10$	$\mu A$
Data Rate	Normal operation	–	200	116	kb/s
Transmitter Output Resistance	$V_{CC} = V+ = V- = 0V$ , $V_{OUT} = \pm 2V$	300	10M	–	$\Omega$
Output Short-Circuit Current	$V_{OUT} = 0V$	$\pm 7$	$\pm 22$	–	mA
<b>RS-232 Receiver</b>					
RS-232 Input Voltage Operating Range		–	–	$\pm 30$	V
RS-232 Input Threshold Low	$V_{CC} = 5V$ , $R_{2IN}$	0.8	1.3	–	V
RS-232 Input Threshold High	$V_{CC} = 5V$ , $R_{2IN}$	–	1.8	2.4	V
RS-232 Input Hysteresis	$V_{CC} = 5V$	0.2	0.5	1.0	V
RS-232 Input Resistance		3	5	7	$k\Omega$
TTL/CMOS Output Voltage Low	$I_{OUT} = 3.2mA$	–	0.2	0.4	V
TTL/CMOS Output Voltage High	$I_{OUT} = -1.0mA$	3.5	$V_{CC}-0.2$	–	V
TTL/CMOS Output Short-Circuit Current	Sourcing, $V_{OUT} = GND$	–2	–10	–	mA
	Shrinking, $V_{OUT} = V_{CC}$	10	30	–	mA
TTL/CMOS Output Leakage Current	$0V \leq V_{OUT} \leq V_{CC}$	–	$\pm 0.05$	$\pm 10$	$\mu A$
Operating Supply Voltage		4.5	–	5.5	V
$V_{CC}$ Supply Current	No load	–	4	10	mA
	$3k\Omega$ load, both inputs	–	15	–	mA
Transition Slew Rate	$C_L = 50pF$ to $2500pF$ , $R_L = 3k\Omega$ to $7k\Omega$ , $V_{CC} = 5V$ , $T_A = +25^\circ C$ , measured from $+3V$ to $-3V$ or $-3V$ to $+3V$	6	12	30	V/ $\mu s$
Transmitter Propagation Delay TTL to RS-232 (normal operation)	$t_{PHLT}$	–	1.3	3.5	$\mu s$
	$t_{PLHT}$	–	1.5	3.5	$\mu s$
Receiver Propagation Delay RS-232 to TTL (normal operation)	$t_{PHLR}$	–	0.5	1.0	$\mu s$
	$t_{PLHR}$	–	0.6	1.0	$\mu s$
Transmitter + to – Propagation Delay Difference (normal operation)	$t_{PHLT} - t_{PLHT}$	–	300	–	ns
Receiver + to – Propagation Delay Difference (normal operation)	$t_{PHLR} - t_{PLHR}$	–	100	–	ns

### Pin Connection Diagram

