



+5V RS-232 Powered Driver/Receiver

MAX232/883B

1.0 SCOPE

- 1.1 This specification covers the detail requirements for an RS-232 and v.28 communications interface device. This circuit is processed in accordance with MIL-STD-883 and is fully compliant to paragraph 1.2.1.

It is highly recommended that this data sheet be used as a baseline for new military or aerospace source control drawings.

For typical applications and operating characteristics, consult Maxim's data books.

1.2 Part Numbers

Device	Part Number
-1	MAX232M(X)/883B

1.3 Package

(X)	Package	Description
JE	J-16	16-Pin Ceramic Dual-In-Line Package (CERDIP)
LP	L-20	20-Pin Ceramic Leadless Chip Carrier (LCC)

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Note: See *Package Information* section for package drawings and dimensions.

1.4 Absolute Maximum Ratings

($T_A = +25^\circ\text{C}$, unless otherwise noted.)

Supply Voltage (V_{CC})	+6V
V_+	+12V
V_-	-12V
Driver Input Voltage	-0.3V to ($V_{CC} + 0.3V$)
Receiver Input Voltage	-30V to +30V
Driver Output Voltage	($V_- - 0.3V$) to ($V_+ + 0.3V$)
Receiver Output Voltage	-0.3V to ($V_{CC} + 0.3V$)
Short-Circuit Duration, Driver Only	Continuous
Power Dissipation ($T_A = +70^\circ\text{C}$, $T_j = +150^\circ\text{C}$)	
16-Pin CERDIP (derate 10.00mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	800mW
20-Pin LCC (derate 9.09mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	727mW
Operating Temperature Range	-55°C to $+125^\circ\text{C}$
Storage Temperature Range	-65°C to $+160^\circ\text{C}$
Lead Temperature (soldering, 10 sec)	$+300^\circ\text{C}$

- 1.5 Thermal Resistance
- | | |
|---------------|----------------------------------|
| Θ_{JC} | $= 50^\circ\text{C/W}$ for J-16 |
| Θ_{JC} | $= 55^\circ\text{C/W}$ for L-20 |
| Θ_{JA} | $= 100^\circ\text{C/W}$ for J-16 |
| Θ_{JA} | $= 110^\circ\text{C/W}$ for L-20 |



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2.0 REQUIREMENTS

2.1 Electrical performance characteristics are specified in Table 1 and apply over the full ambient operating temperature range, unless otherwise specified.

TABLE 1. ELECTRICAL PERFORMANCE CHARACTERISTICS (Note 1)

CHARACTERISTICS	SYMBOL	CONDITIONS		DEVICE TYPES	GROUP A SUB-GROUPS	LIMITS		UNITS
						MIN	MAX	
Output Voltage Swing	V_{OUT}	TR1, TR2 each loaded with 3k Ω to GND	Positive Negative	-1	1, 2, 3	5.0 -5.0		V
Low Level Input Voltage	V_{IL}	$V_{OUT} = \text{High}$		-1	1, 2, 3		0.8	V
High Level Input Voltage	V_{IH}	$V_{OUT} = \text{Low}$		-1	1, 2, 3	2.0		V
Logic Pull-Up Current	I_P	$V_{IN} = 0V$		-1	1, 2, 3		200	μA
Output Short-Circuit Current (Transmitter)	I_{OST}	$V_{OUT} = 0V$	Sourcing Current Sinking Current	-1	1		25 -25	mA
Transition Slew Rate ($\Delta V/\Delta T$)	SR	$C_L = 50pF$ to 2500pF, $R_L = 3k\Omega$ to 7k Ω , $V_{CC} = 5V$, $T_A = +25^\circ C$, measured from +3V to -3V or -3V to +3V		-1	4	1.5	30.0	V/ μs
RS-232 Input Threshold Low	V_{TL}	$V_{OUT} = \text{High}$		-1	1, 2, 3	0.4		V
RS-232 Input Threshold High	V_{TH}	$V_{OUT} = \text{Low}$		-1	1, 2, 3		3.0	V
RS-232 Input Hysteresis	V_H			-1	1, 2, 3	0.2	1.0	V
Receiver Input Resistance	R_I			-1	1	3.0	7.0	k Ω
Receiver Output High Voltage	V_{OH}	$I_{OUT} = -1.0mA$		-1	1, 2, 3	3.5		V
Receiver Output Low Voltage	V_{OL}	$I_{OUT} = 3.2mA$		-1	1, 2, 3		0.4	V
Supply Current	I_{CC}	Outputs unloaded		-1	1, 2, 3		10	mA

Note 1: $+4.5V \leq V_{CC} \leq +5.5V$, unless otherwise noted.

**+5V RS-232 Powered
Driver/Receiver****MAX232/883B****2****3.0 QUALITY ASSURANCE**

- 3.1** Sampling and inspection procedures shall be in accordance with MIL-M-38510 and, to the extent specified, with MIL-STD-883.
- 3.2** Screening shall be in accordance with Method 5004 of MIL-STD-883. Burn-in test (Method 1015):
- (1) Test condition A, B, C, or D.
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
 - (3) Interim and final electrical test requirements shall be as specified in Table 2.
- 3.3** Quality conformance inspection shall be in accordance with Method 5005 of MIL-STD-883 including Groups A, B, C, and D inspection.
- Group A inspection:
- (1) Tests as specified in Table 2.
 - (2) Selected subgroups in Table 1, Method 5005 of MIL-STD-883 shall be omitted.
- 3.4** Groups C and D inspections:
- a. End-point electrical parameters shall be specified in Table 1.
 - b. Steady-state life test (Method 1005 of MIL-STD-883):
- (1) Test condition A, B, C, or D.
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
 - (3) Test duration, 1000 hours, except as permitted by Method 1005 of MIL-STD-883.

TABLE 2. ELECTRICAL TEST REQUIREMENTS

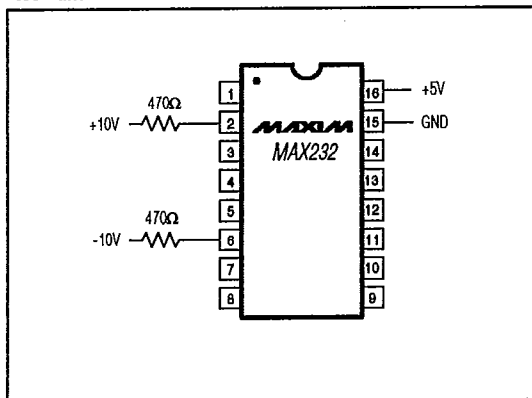
MIL-STD-883 Test Requirements	Subgroups (per Method 5005, Table 1)
Interim Electrical Parameters (Method 5004)	1
Final Electrical Parameters (Method 5004)	1, * 2, 3
Group A Test Requirements (Method 5005)	1, 2, 3, 4**
Groups C and D End-Point Electrical Parameters (Method 5005)	1

* PDA applies to Subgroup 1 only.

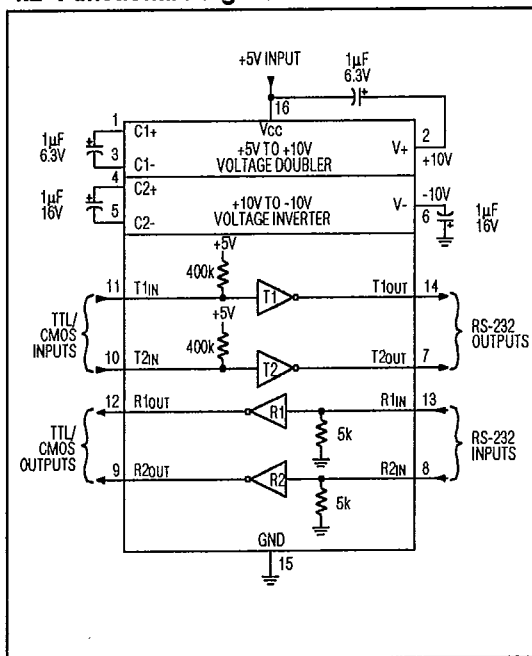
** Subgroup 4 shall be tested at initial qualification and upon redesign. Sample size will be 5 units.

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4.0 Life Test/Burn-In Circuit

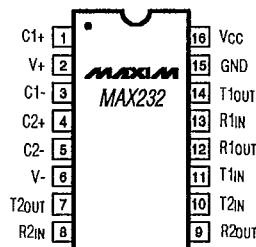


4.2 Functional Diagram

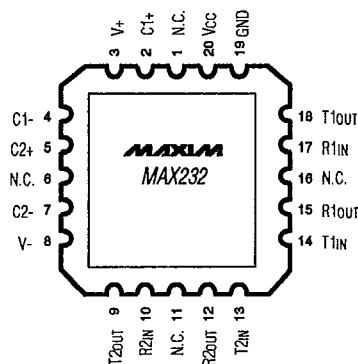


4.1 Pin Configurations

TOPVIEW



16-PIN CERDIP



20-PIN LCC

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