



+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°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°C, T _j = +150°C)	
16-Pin CERDIP (derate 10.00mW/°C above +70°C)	800mW
20-Pin LCC (derate 9.09mW/°C above +70°C)	727mW
Operating Temperature Range	-55°C to +125°C
Storage Temperature Range	-65°C to +160°C
Lead Temperature (soldering, 10 sec)	+300°C

1.5 Thermal Resistance

Θ _{JC}	= 50°C/W for J-16
Θ _{JC}	= 55°C/W for L-20
Θ _{JA}	= 100°C/W for J-16
Θ _{JA}	= 110°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 3kΩ to GND	Positive	-1	1, 2, 3	5.0		V
			Negative			-5.0		
Low Level Input Voltage	V _{IL}	V _{OUT} = High		-1	1, 2, 3	0.8		V
High Level Input Voltage	V _{IH}	V _{OUT} = 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	-1	1	25		mA
			Sinking Current			-25		
Transition Slew Rate (ΔV/ΔT)	SR	C _L = 50pF to 2500pF, R _L = 3kΩ to 7kΩ, V _{CC} = 5V, T _A = +25°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} = High		-1	1, 2, 3	0.4		V
RS-232 Input Threshold High	V _{TH}	V _{OUT} = 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	kΩ
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 ≤ V_{CC} ≤ +5.5V, unless otherwise noted.

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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.

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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

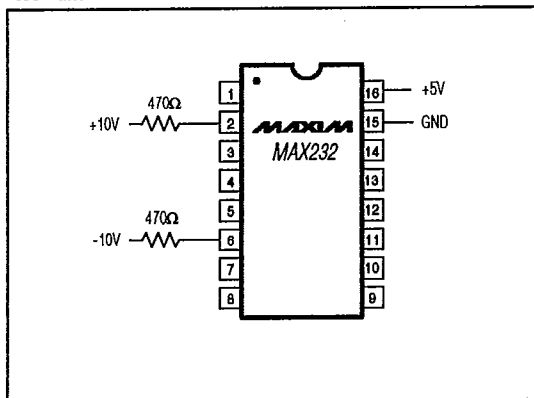
* PDA applies to Subgroup 1 only.

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

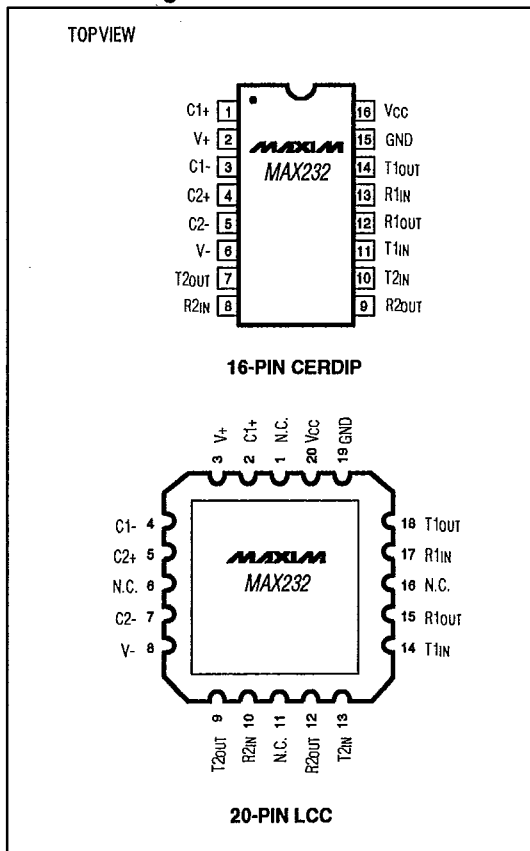
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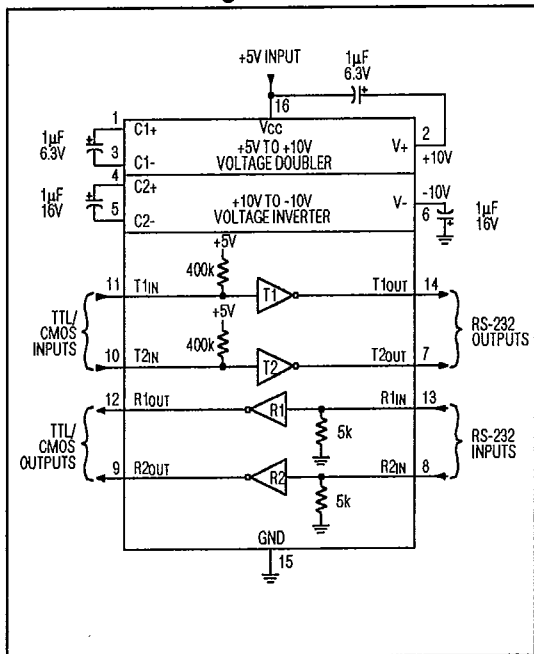
4.0 Life Test/Burn-In Circuit



4.1 Pin Configurations



4.2 Functional Diagram



Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.

2-8 Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 (408) 737-7600