



+5V Precision Voltage Reference/ Temperature Transducer

REF-02/883B

1.0 SCOPE

- 1.1** This specification covers the detail requirements for a precision voltage reference that provides a stable +5V output that can be adjusted over a $\pm 3\%$ range with minimal effect on temperature stability. 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	REF-02A(X)/883B
-2	REF-02(X)/883B

1.3 Package

(X)	Package	Description
J	TV	8-Pin TO-99
Z	JA	8-Pin Ceramic Dual-In-Line Package (CERDIP)
RC	L-20	20-Pin Ceramic Leadless Chip Carrier (LCC)

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

1.4 Absolute Maximum Ratings

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

Input Voltage	40V
Output Short-Circuit Duration (to GND or V_{IN})	Indefinite
Power Dissipation ($T_A = +70^\circ\text{C}$, $T_j = +150^\circ\text{C}$)	
8-Pin TO-99 (derate 6.67mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	533mW
8-Pin CERDIP (derate 8.00mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	640mW
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 $+150^\circ\text{C}$
Lead Temperature (soldering, 10 sec)	$+300^\circ\text{C}$

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- 1.5 Thermal Resistance**
- $\Theta_{JC} = 45^\circ\text{C/W}$ for H-08
 - $\Theta_{JC} = 55^\circ\text{C/W}$ for Q-8
 - $\Theta_{JC} = 55^\circ\text{C/W}$ for E-20
 - $\Theta_{JA} = 150^\circ\text{C/W}$ for H-08
 - $\Theta_{JA} = 125^\circ\text{C/W}$ for Q-8
 - $\Theta_{JA} = 110^\circ\text{C/W}$ for E-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	
Quiescent Supply Current	I _{IN}	No load	-1, -2	1	1.4		mA
				2, 3	2.0		
Output Adjustment Range	ΔV _{TRIM}	R _P = 10kΩ	-1, -2	1	-3.0	3.0	%
Output Voltage	V _O	I _L = 0mA	-1	1	4.985	5.015	V
				2, 3	4.978	5.022	
			-2	1	4.975	5.025	
				2, 3	4.953	5.047	
Short-Circuit Current	I _{SC}	V _O = 0V	-1, -2	1	15	60	mA
Sink Current	I _S		-1, -2	1	-0.3		mA
Load Regulation (Note 2)	LD reg	I _L = 0mA to 10mA	1	1	0.01		% / mA
				2, 3	0.012		
Line Regulation (Note 2)	LN reg	V _{IN} = 8V to 33V	-1, -2	1	0.01		% / V
				2, 3	0.015		
Load Current (Note 3)	I _L		-1, -2	1	10		mA
Output Voltage Noise	e _{n,p-p}	0.1Hz to 10Hz	-1, -2	1	15		μV _{p-p}
Output Voltage Temperature Coefficient (Note 4)	TCV _O		-1	1, 2, 3	-8.5	8.5	ppm / °C
			-2	1, 2, 3	-25	25	

Note 1: $V_{DD} = +15V$, $V_{IN} = +15V$, unless otherwise noted.

Note 2: Line and load regulation specifications include the effect of self-heating.

Note 3: Minimum 10mA load current guaranteed by load regulation test.

Note 4: $TCV_O = \left(\frac{I V_{MAX} - V_{MIN}}{10V} \right) \left(\frac{1}{180^\circ C} \times 10^6 \right)$ where $-55^\circ C \leq T_A \leq +125^\circ C$.

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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.

TABLE 2. ELECTRICAL TEST REQUIREMENTS

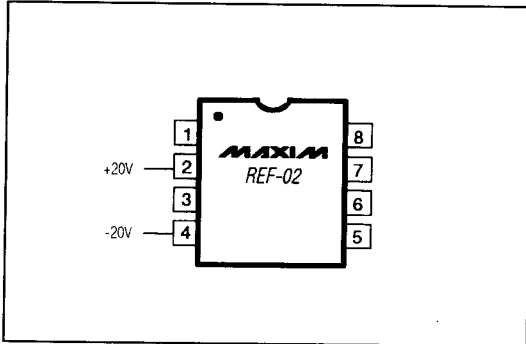
MIL-STD-883 Test Requirements	Subgroups (per Method 5005, Table 1)
Interim Electrical Parameters (Method 5004)	1
Final Electrical Parameters (Method 5004)	1,* 2, 3
Group A Test Requirements (Method 5005)	1, 2, 3
Groups C and D End-Point Electrical Parameters (Method 5005)	1

*PDA applies to Subgroup 1 only.

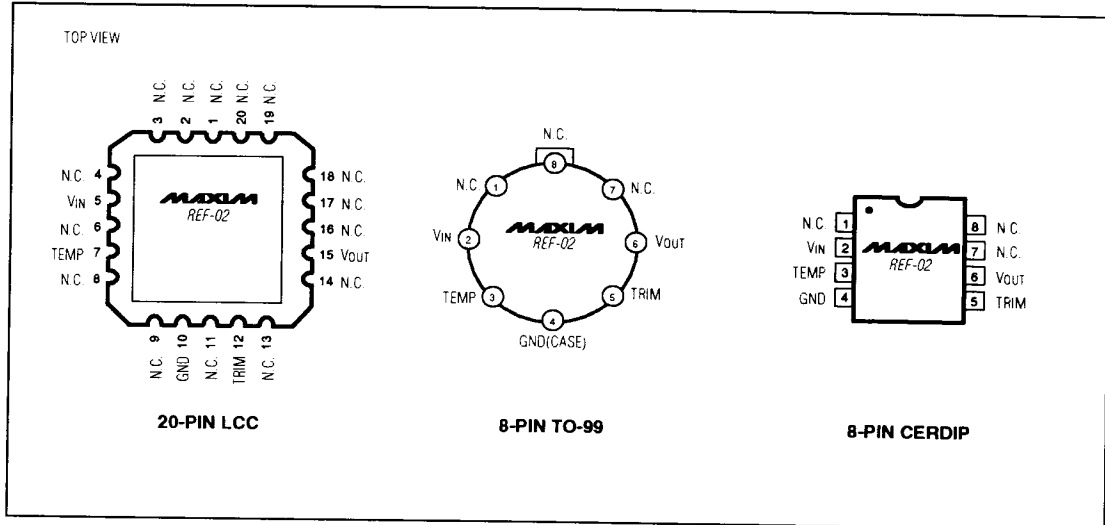
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4.0 Life Test/Burn-In Circuit

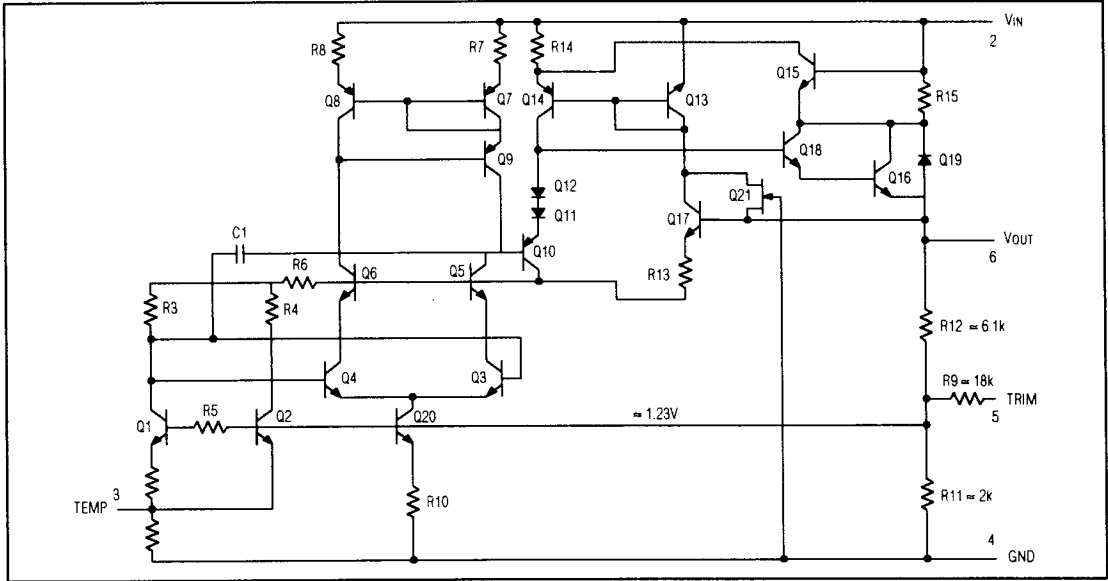


4.1 Pin Configurations



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4.2 Simplified Schematic and Pin Connections



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