

REVISIONS													
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED										
A	Add one vendor, CAGE 01295. Make changes to 1.3, table I, and editorial changes throughout. Add replacement military specification part number M38510/14802BXX.	1990 JUNE 13	<i>M. d. Lye</i>										
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REV STATUS OF SHEETS	REV SHEET	A	A										
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PMIC N/A	PREPARED BY <i>Rick C. Offin</i>	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444											
STANDARDIZED MILITARY DRAWING	CHECKED BY <i>Charles E. Besore</i>												
	APPROVED BY <i>M. d. Lye</i>												
	DRAWING APPROVAL DATE 26 JUNE 1989												
THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE	REVISION LEVEL A	SIZE A	CAGE CODE 67268										
AMSC N/A		5962-89610											
		SHEET 1											

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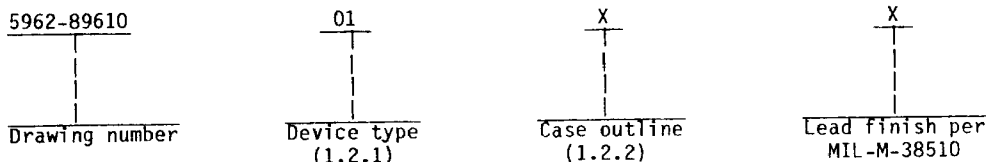
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5962-E1685

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	LT1009	Voltage reference diode

1.2.2 Case outline. The case outline shall be as designated in appendix C of MIL-M-38510, and as follows:

<u>Outline letter</u>	<u>Case outline</u>
X	See figure 1, 3-lead can package

1.3 Absolute maximum ratings.

Reverse current (I_R)	20 mA
Forward current (I_F)	10 mA
Storage temperature range	-65°C to +150°C
Maximum power dissipation, (P_D) ambient	113 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC})	80°C/W
Thermal resistance, junction-to-ambient (θ_{JA})	440°C/W
Junction temperature (T_J)	+150°C

1.4 Recommended operating conditions.

Ambient operating temperature range (T_A)	-55°C to +125°C
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2. APPLICABLE DOCUMENTS

2.1 Government specification, standard, and bulletin. Unless otherwise specified, the following specification, standard, and bulletin of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

(Copies of the specification, standard, and bulletin required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Case outline. The case outline shall be in accordance with 1.2.2 herein and as specified on figure 1.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and apply over the full ambient operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroups are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

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TABLE I. Electrical performance characteristics.						
Test	Symbol	Conditions -55°C ≤ T _A ≤ +125°C unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Reverse breakdown voltage	V _Z	I _R = 1 mA	1	2.495	2.505	V
			2, 3	2.460	2.535	
Reverse breakdown voltage change with current	ΔV _Z	400 μA ≤ I _R ≤ 10 mA	1		6	mV
	ΔI _R		2, 3		10	
Forward bias voltage	V _F	I _F = 2 mA, T _A = +25°C	1	-1	-.4	V
Adjustment range	V _{AR}	I _R = 1 mA V _{ADJ} = +0.6 V to V _Z - 0.6 V	1	15		mV
Reverse dynamic impedance <u>1/</u>	R _Z	I _R = 1 mA	1		0.6	Ω
			2, 3		1.0	
Temperature stability <u>2/</u>	ΔV _Z Δtemp	T _{min} ≤ T _A ≤ T _{max}	2, 3		15	mV
Average temperature coefficient <u>2/ 3/</u>	T _C		2, 3		35	ppm/°C

1/ R_Z is guaranteed by ΔV_Z/ΔI_R test.

2/ If not tested, shall be guaranteed to the limits specified in table I herein.

3/ Average temperature coefficient is defined as the total voltage change divided by the specified temperature range.

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

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Case X

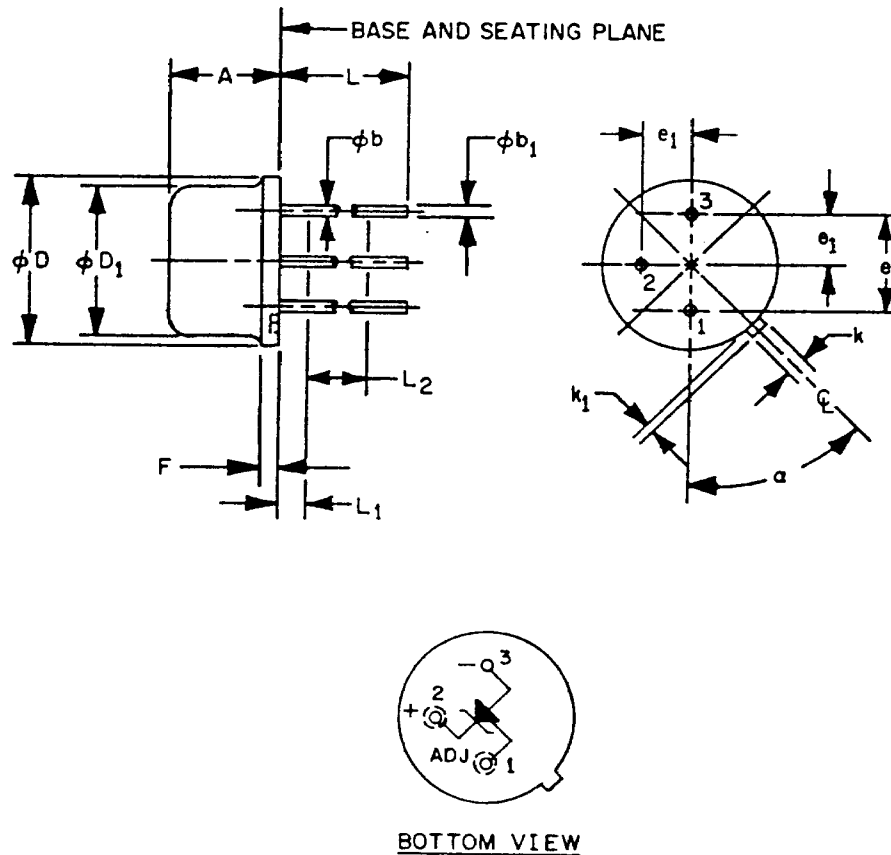


FIGURE 1. Dimensions and configuration.

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Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
A	.085	.105	2.16	2.67	
ϕb	.016	.019	0.41	0.48	3
ϕb_1	.016	.021	0.41	0.53	3, 8
ϕD	.209	.219	5.31	5.56	
ϕD_1	.178	.195	4.52	4.95	
ϕe	.100 T.P.		2.54 T.P.		5
ϕe_1	.050 T.P.		1.27 T.P.		5
F	---	.030	---	7.62	
k	.036	.046	0.91	1.17	
k_1	.028	.048	0.71	1.22	4
L	.500	---	12.7	---	
L_1	---	.050	---	1.27	
L_2	.250	---	6.35	---	
α	45° T.P.		45° T.P.		5

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Three leads: ϕb applies between L_1 and L_2 . ϕb_1 applies between L_2 and .500 (12.70 mm) from the reference plane. Diameter is uncontrolled in L_1 and beyond .500 (12.70 mm) from the reference plane.
4. Three leads.
5. Measured from the maximum diameter of the product.
6. Leads having a maximum diameter .019 (0.48 mm) measured in gauging plane .054 (1.37 mm) $+ .001$ (0.03 mm) $- .000$ (0.00 mm) below the base plane of the product shall be within .007 (0.18 mm) of their true position relative to a maximum width tab.
7. The product may be measured by direct methods or by gauge.
8. All leads: Increase maximum limit by .003 (0.08 mm) when lead finish A or B is applied.

FIGURE 1. Dimensions and configuration - Continued.

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3.9 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

- a. Burn-in test, method 1015 of MIL-STD-883.
 - (1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
- b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 5, 6, 7, 8, 9, 10, and 11 of method 5005 of MIL-STD-883 shall be omitted.

4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
 - (1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test 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, 2, 3

* PDA applies to subgroup 1.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Replaceability is determined as follows:

- a. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- b. When a QPL source is established, the part numbered device specified in this drawing will be replaced by the microcircuit identified as part number M38510/1480BXX.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Changes Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronic Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECS, telephone (513) 296-6022.

6.5 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone (513) 296-5375.

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6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. Additional sources will be added to MIL-BUL-103 as they become available. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECS. The approved sources of supply listed below are for information purposes only and are current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number ^{1/}	Replacement military specification part number
5962-8961001XX	01295	LT1009MLDB	M38510/14802BXX
	64155	LT1009MH/883	

^{1/} Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

<u>Vendor CAGE number</u>	<u>Vendor name and address</u>
01295	Texas Instruments, Incorporated 13500 N. Central Expressway P.O. Box 655303 Dallas, TX 75265 Point of contact: I-20 at FM 1788 Midland, TX 79711-0448
64155	Linear Technology Corporation 1630 McCarthy Boulevard Milpitas, CA 95035-7487

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