

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
A	Add one vendor, CAGE 24355. Make changes to table I and editorial changes throughout. Change drawing CAGE to 67268.	1990 JUNE 26	<i>M. L. Pelky</i>																

CURRENT CAGE CODE 67268

REV																				
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REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SHEET	1	2	3	4	5	6	7	8	9									

PMIC N/A STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	PREPARED BY <i>Rick C. Offner</i> CHECKED BY <i>Charles E. Besore</i> APPROVED BY <i>M. L. Pelky</i> DRAWING APPROVAL DATE 31 MARCH 1987 REVISION LEVEL A	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 MICROCIRCUIT, LINEAR, PRECISION VOLTAGE REFERENCE, +10 VOLT, MONOLITHIC SILICON <table style="width: 100%;"> <tr> <td style="width: 10%;">SIZE A</td> <td style="width: 20%;">CAGE CODE 14933</td> <td style="width: 70%;">5962-86882</td> </tr> </table> SHEET 1	SIZE A	CAGE CODE 14933	5962-86882
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5962-E1697

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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:

5962-86882	01	X	X
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Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

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

Device type	Generic number	Circuit function
01	See 6.6	Precision 10-volt voltage reference
02	See 6.6	Precision 10-volt voltage reference
03	See 6.6	Precision 10-volt voltage reference

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

Outline letter	Case outline
X	See figure 1 (3-lead, .370" x .185"), can package

1.3 Absolute maximum ratings.

Supply voltage - - - - -	40 V dc
Input-output voltage differential - - - - -	35 V dc
Output short circuit duration	
$V_{IN} = 35\text{ V}$ - - - - -	10 seconds
$V_{IN} < 20\text{ V}$ - - - - -	Indefinite
Trim pin to ground voltage:	
Positive - - - - -	Equal to V_{OUT}
Negative - - - - -	-20 V
Storage temperature range - - - - -	-65°C to +150°C
Power dissipation total package at +25°C - - - - -	600 mW
Lead temperature (soldering, 10 seconds) - - - - -	+300°C
Junction temperature (T_J) - - - - -	+150°C
Thermal resistance, junction-to-case (θ_{JC}) - - - - -	100°C/W
Thermal resistance, junction-to-ambient (θ_{JA}) - - - - -	200°C/W

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 Case outline. The case outline shall be as specified on figure 1.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 2.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall 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 subgroup 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 <u>1/</u>	Device Type	Group A subgroups	Limits		Unit
					Min	Max	
Output voltage	V_R	$T_A = +25^\circ\text{C}$	01,02 03	1 1	9.990 9.995	10.010 10.005	V
			01,02 03	1,2,3 1,2,3	9.970 9.980	10.030 10.020	
Output voltage change with temperature	$\frac{\Delta V_R}{\Delta T}$		01 02 03	<u>2/</u>		± 0.2 ± 0.1 ± 0.04	%
Line regulation	$\frac{\Delta V_R}{\Delta V_{IN}}$	$13\text{ V} < V_{IN} \leq 33\text{ V}$ $T_A = +25^\circ\text{C}$	01,02 03	1 1		0.1 0.03	
Input voltage range	V_{IN}		A11	1,2,3	11.4	40	V
Load regulation	$\frac{\Delta V_R}{\Delta I_{OUT}}$	$0\text{ mA} \leq I_{OUT} \leq 5\text{ mA}$	A11	1,2,3		0.03	%
Quiescent current	I_Q	$13\text{ V} \leq V_{IN} \leq 33\text{ V}$	A11	1,2,3		5	mA
Change in quiescent current	$\frac{\Delta I_Q}{\Delta V_{IN}}$	$\Delta V_{IN} = 20\text{ V}$ from 13 V to 33 V	A11	1,2,3		1.5	
Output resistance	R_O	$0\text{ mA} \leq I_{OUT} \leq 5\text{ mA}$	A11	1,2,3		0.6	Ω

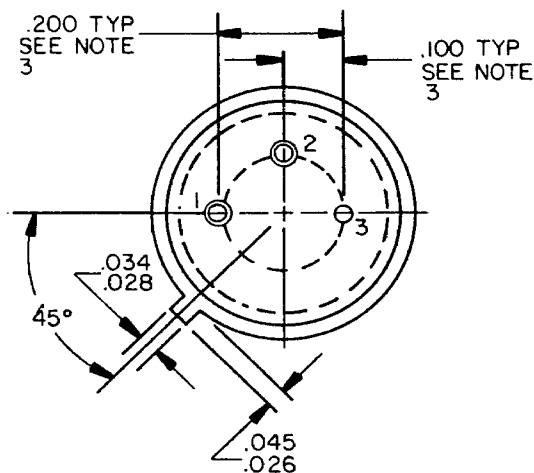
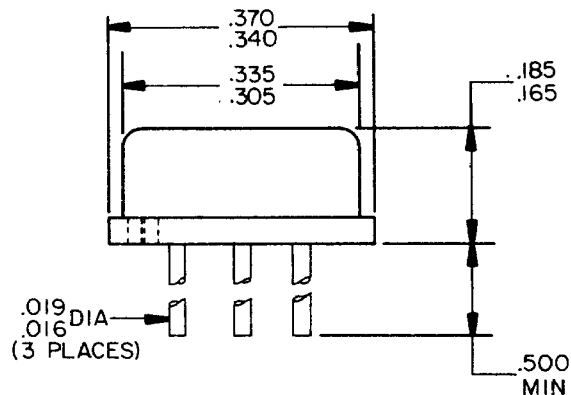
1/ Unless otherwise specified $V_{IN} = 15\text{ V}$, $R_L = 10\text{ k}\Omega$, $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$.

2/ Output voltage change with temperature is guaranteed from -25°C to $+85^\circ\text{C}$.

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Inches	mm
.016	0.41
.019	0.48
.026	0.66
.028	0.71
.034	0.86
.045	1.14
.100	2.54
.165	4.19
.185	4.70
.200	5.08
.305	7.75
.335	8.51
.340	8.64
.370	9.40
.500	12.70

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Leads having a maximum diameter of .019 (0.48 mm) measured in gauging plane .054 $\pm$.001 (1.37 $\pm$ 0.03 mm) below the base plane of the product shall be within .007 (0.18 mm) of their true position relative to the maximum tab width.

FIGURE 1. Case outline X (device types 01, 02, and 03).

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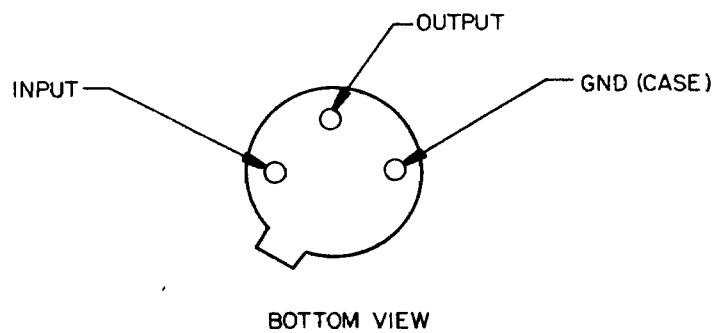


FIGURE 2. Terminal connections.

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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).

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. Test shall be as specified in table II herein.

b. Subgroups 4, 5, 6, 7, 8, 9, 10, and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

4.3.2 Groups C and D inspections.

a. End-points electrical parameters shall be as specified in table II herein.

b. Steady-state life test conditions method 1005 of MIL-STD-883.

(1) Test conditions 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)	1
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

*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 exist 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. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

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 Change 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 <u>1/</u>	Replacement military specification part number
5962-8688201XX	24355	AD581SH/883B	---
	64155	LH0070-0H/883	
5962-8688202XX	24355	AD581TH/883B	---
	64155	LH0070-1H/883B	
5962-8688203XX	24355	AD581UH/883B	---
	64155	LH0070-2H/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.

Vendor CAGE number

Vendor name and address

24355

Analog Devices
Route 1 Industrial Park
P.O. Box 9106
Norwood, MA 02062
Point of contact: 804 Woburn Street
Wilmington, MA 01887

64155

Linear Technology Corporation
1630 McCarthy Boulevard
Milipitas, CA 95035

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