

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
A	Add device type 03. Add one vendor, CAGE 64155. Make changes to table I and throughout.	91-02-14	<i>M.O. [Signature]</i>																

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

PMIC N/A  <b>STANDARDIZED MILITARY DRAWING</b>  THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE  AMSC N/A	PREPARED BY <i>Rick C. Oppin</i> CHECKED BY <i>Charles E. Besore</i> APPROVED BY <i>[Signature]</i> DRAWING APPROVAL DATE 87-11-17 REVISION LEVEL A	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444  MICROCIRCUITS, LINEAR, PRECISION VOLTAGE REFERENCE, 2.5-VOLT, MONOLITHIC SILICON  <table style="width: 100%;"> <tr> <td style="width: 10%;">SIZE <b>A</b></td> <td style="width: 20%;">CAGE CODE <b>67268</b></td> <td style="width: 70%;"><b>5962-86861</b></td> </tr> <tr> <td colspan="2">SHEET</td> <td style="text-align: right;"><b>1</b></td> </tr> </table>	SIZE <b>A</b>	CAGE CODE <b>67268</b>	<b>5962-86861</b>	SHEET		<b>1</b>
SIZE <b>A</b>	CAGE CODE <b>67268</b>	<b>5962-86861</b>						
SHEET		<b>1</b>						

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5962-E1644

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 or Identifying Number (PIN). The complete PIN shall be as shown in the following example:

5962-86861	01	P	X
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

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

Device type	Generic number	Circuit function
01	580S,1503	Precision 2.5 V reference (1%)
02	580T,1503A	Precision 2.5 V reference (.4%)
03	580U	Precision 2.5 V reference (.4%)

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

Outline letter	Case outline
P	D-4 (8-lead, .405" x .310" x .200"), dual-in-line package
X	See figure 2, T0-52 (3-lead, .230" x .150"), can package

## 1.3 Absolute maximum ratings.

Supply voltage ( $V_{CC}$ )	- - - - -	40 V dc
Storage temperature range	- - - - -	-65°C to +150°C
Maximum power dissipation ( $P_D$ )	- - - - -	
Case P	- - - - -	600 mW <sup>1/</sup>
Case X	- - - - -	350 mW
Lead temperature (soldering, 10 seconds)	- - - - -	+300°C
Thermal resistance, junction-to-case ( $\theta_{JC}$ ):	- - - - -	
Case P	- - - - -	See MIL-M-38510, appendix C
Case X	- - - - -	30°C/W
Thermal resistance, junction-to-ambient ( $\theta_{JA}$ ):	- - - - -	
Case X	- - - - -	150°C/W
Junction temperature ( $T_J$ )	- - - - -	+175°C

## 1.4 Recommended operating conditions.

Supply voltage ( $V_{CC}$ )	- - - - -	+4.5 V dc to +30 V dc
Ambient operating temperature range ( $T_A$ )	- - - - -	-55°C to +125°C

<sup>1/</sup> Derate case P at 4.8 mW/°C above +25°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(s). The case outline(s) shall be in accordance with 1.2.2 herein.

3.3 Electrical performance characteristics. Unless otherwise specified, 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 -55°C < T <sub>A</sub> < +125°C V <sub>CC</sub> = +15 V, I <sub>L</sub> = 0 mA (unless otherwise specified)	Group A subgroups	Device type	Limits		Unit	
					Min	Max		
Quiescent current	I <sub>CC</sub>		1	01,02 03		1.7 1.5	mA	
			2,3	A11		2.0		
Output voltage	V <sub>OUT</sub>	V <sub>O</sub> = 2.5 V T <sub>A</sub> = +25°C	1,2,3	A11	2.475	2.525	V	
			12	02,03	2.49	2.51		
Line regulation	VR <sub>LINE1</sub>	V <sub>CC</sub> = 7 V to 30 V T <sub>A</sub> = +25°C	1	01,02		±6	mV	
				03		±2		
	VR <sub>LINE2</sub>	V <sub>CC</sub> = 4.5 V to 7 V T <sub>A</sub> = +25°C		01,02		±3		
				03		±1		
Load regulation	VR <sub>LOAD</sub>	I <sub>L</sub> = 0 mA to 10 mA T <sub>A</sub> = +25°C	1	A11		±10	mV	
Output voltage temperature coefficient	TCV <sub>OUT</sub>		2,3	01		±25	mV	
				02		±11		
				03		±4.5		

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.

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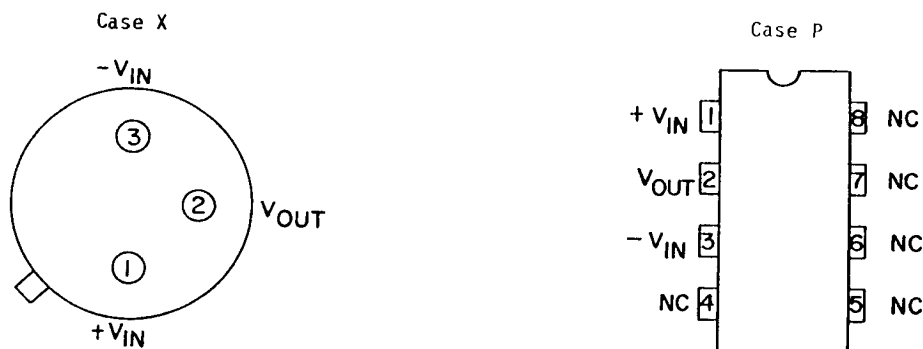
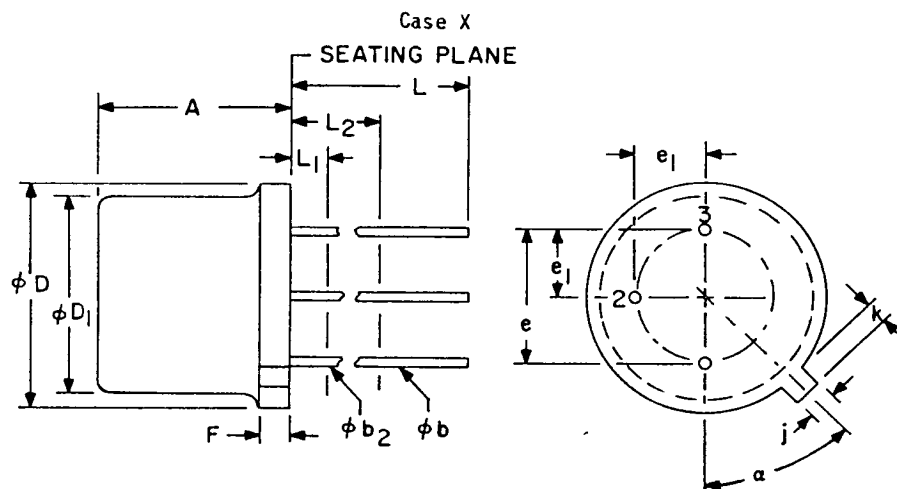


FIGURE 1. Terminal connections.



NOTES:

1. (Three leads)  $\phi b_2$  applies between  $L_1$  and  $L_2$ .  $\phi b$  applies between  $L_2$  and 0.5 inch (12.70 mm) from seating plane. Diameter is uncontrolled in  $L_1$  and beyond 0.5 inch (12.70 mm) from seating plane.
2. Leads having maximum diameter 0.019 inch (0.48 mm) measured in gauging plane 0.054 inch (1.4 mm)  $\pm$  0.001 inch (0.03 mm) -0.000 inch (0.00 mm) below the seating plane of the device are within 0.007 inch (0.18 mm) of their true positions relative to a maximum-width tab.
3. Measured from maximum diameter of the actual device.
4. All leads - increase maximum limit by 0.003 inch (0.08 mm) when hot solder dip finish is applied.

FIGURE 2. Case outline.

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Case X

Symbol	Inches		Millimeters		Notes
	Min	Max	Min	Max	
A	0.115	0.150	2.92	3.81	
Øb		0.021		0.53	1, 4
Øb <sub>2</sub>	0.016	0.019	0.41	0.48	1, 4
ØD	0.209	0.230	5.31	5.84	
ØD <sub>1</sub>	0.178	0.195	4.52	4.95	
e	0.100 T.P.		2.54 T.P.		2
e <sub>1</sub>	0.050 T.P.		1.27 T.P.		2
F		0.030		0.76	
j	0.036	0.046	0.91	1.17	
k	0.028	0.048	0.71	1.22	3
L	0.500		12.70		1
L <sub>1</sub>		0.050		1.27	1
L <sub>2</sub>	0.250		6.35		
α	45° T.P.				

FIGURE 2. Case outline - Continued.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table 1)
Interim electrical parameters	1
Final electrical test parameters	1*, 2, 3, 12
Group A test requirements	1, 2, 3, 12
Groups C and D end-point electrical parameters	1

\* PDA applies to subgroup 1.

#### 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.
- c. Optional subgroup 12 is used for grading and part selection at  $T_A = +25^{\circ}\text{C}$ . It is not included in PDA.

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 in table 1, method 5005 of MIL-STD-883 shall be omitted.
- c. Optional subgroup 12 is used for grading and part selection at  $T_A = +25^{\circ}\text{C}$ .

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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.

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. 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 Electronics 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.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. 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.

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