

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
C	Change to military drawing format. Table I, change V_{RB} specification. Editorial changes throughout.	87 MAY 4	<i>M.A. Fyfe</i>																
D	Change on absolute maximum rating for operating temperature range. Delete 4.3.1c. Change code ident. no. to 67268. Remove subgroups 5 and 6 from table II.	87 SEP 17	<i>M.A. Fyfe</i>																
E	Add vendor CAGE 34333 to device types 01, 05, and 11. Add vendor CAGE 15818 to device type 01. Delete vendor 27014 for device types 01, 02, 03, 04, 05, 10, 11, 12, and 13. Editorial changes throughout. Device types 02, 03, 04, and 10 inactive for new design.	88 SEP 26	<i>M.A. Fyfe</i>																
<p>CURRENT CAGE CODE 67268</p>																			

REV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

PMIC N/A	PREPARED BY <i>Marcia B Kelleher</i>	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444		
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY <i>[Signature]</i>	MICROCIRCUITS, LINEAR, VOLTAGE REFERENCE, MONOLITHIC SILICON		
	APPROVED BY <i>[Signature]</i>			
	DRAWING APPROVAL DATE 16 SEPTEMBER 1977	SIZE A	CAGE CODE 14933	77028
	REVISION LEVEL E	SHEET 1 OF 9		

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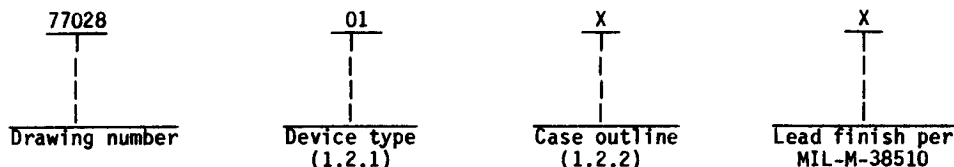
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5962-E997

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:



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

Device type	Generic number	Circuit function	V _B at I _R = 1 mA
01	LM103H-1.8	Voltage reference	1.8
02	LM103H-2.0	Voltage reference	2.0
03	LM103H-2.2	Voltage reference	2.2
04	LM103H-2.4	Voltage reference	2.4
05	LM103H-2.7	Voltage reference	2.7
06	LM103H-3.0	Voltage reference	3.0
07	LM103H-3.3	Voltage reference	3.3
08	LM103H-3.6	Voltage reference	3.6
09	LM103H-3.9	Voltage reference	3.9
10	LM103H-4.3	Voltage reference	4.3
11	LM103H-4.7	Voltage reference	4.7
12	LM103H-5.1	Voltage reference	5.1
13	LM103H-5.6	Voltage reference	5.6

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

Outline letter

X

Case outline

Modified 2 lead can (T0-46) (see figure 1)

1.3 Absolute maximum ratings.

Power dissipation (P _D)	1/ - - - - -	250 mW
Reverse current (I _R)	- - - - -	20 mA
Forward current (I _F)	- - - - -	100 mA
Storage temperature range	- - - - -	-65°C to +150°C
Lead temperature (soldering, 60 seconds)	- - - - -	+300°C
Junction temperature (T _J)	- - - - -	+150°C/W

1.4 Recommended operating conditions.

Ambient operating temperature range (T _A)	- - - - -	-55°C to +125°C
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1/ Operation at elevated temperatures requires device derating based on +150°C maximum junction temperature, thermal resistance of +80°C/W junction to case or +440°C/W junction to ambient.

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2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of this 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.

(Copies of the specification and standard 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 2.

3.2.2 Case outline. The case outline 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 apply over the full ambient operating temperature range.

3.4 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 6.4 herein.

3.5 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 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.6 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.

3.7 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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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions ^{1/} -55°C < T _A < 125°C unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
Reference breakdown voltage	V _B	400 μA ≤ I _R ≤ 3.0 mA T _A = +25°C	1	01	1.62	1.98	V
				02	1.80	2.20	
				03	1.98	2.42	
				04	2.16	2.64	
				05	2.43	2.97	
				06	2.70	3.30	
				07	2.97	3.63	
				08	3.24	3.96	
				09	3.51	4.29	
				10	3.87	4.73	
				11	4.23	5.17	
				12	4.59	5.61	
				13	5.04	6.16	
Reference breakdown voltage change	$\frac{\Delta V_B}{\Delta I_R}$	10 μA ≤ I _R ≤ 100 μA	1	A11	---	120	mV
			2, 3		---	200	
		100 μA ≤ I _R ≤ 1 mA	1		---	50	
			2		---	70	
			3		---	60	
		1 mA ≤ I _R ≤ 5 mA	1		---	150	
			2, 3		---	200	
Reverse breakdown voltage temperature coefficient ^{2/}	$\frac{\Delta V_B}{\Delta t}$	100 μA ≤ I _R ≤ 1 mA	1, 2, 3	A11	---	-8.0	mV/°C
Reverse leakage current	I _L	V _R = V _B - 0.2 V	1	A11	---	5.0	μA
			2, 3		---	50	
Forward voltage drop	V _F	I _F = 5 mA	1	A11	-0.7	-1.0	V
			2, 3		-0.5	-1.5	
Reverse dynamic resistance ^{3/}	R _R	I _{R1} = 3.15 mA I _{R2} = 2.85 mA T _A = +25°C	4	A11	---	25	Ω

^{1/} Unless otherwise stated, -55°C < T_A < +125°C. The diode should not be operated with shunt capacitance between 100 pF and 0.01 μF unless isolated by at least a 270Ω resistor or oscillation may occur.

^{2/} If not tested shall be guaranteed to specified limits herein.

^{3/} Reverse dynamic resistance (R_R) is defined as (V_{B1} - V_{B2})/(I_{R1} - I_{R2}) where V_{B1} is voltage across the device under test when reverse current is equal to I_{R1} and V_{B2} is voltage across the device under test when reverse current is equal to I_{R2}.

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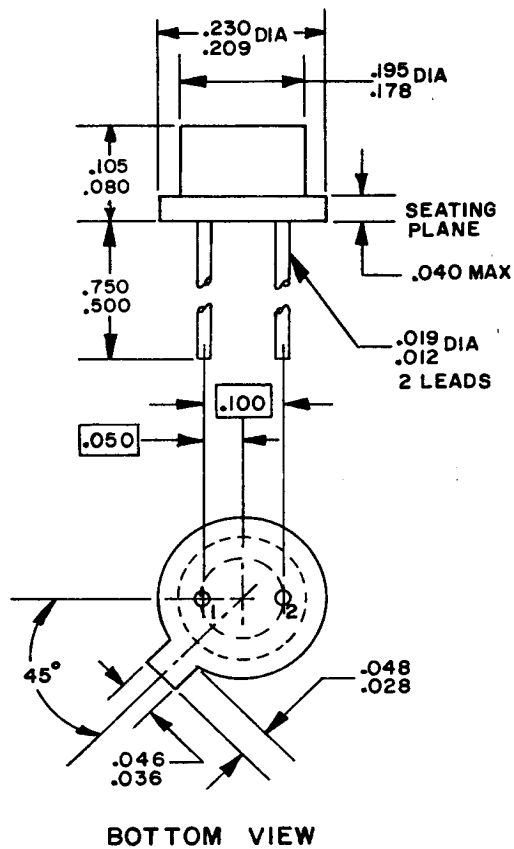
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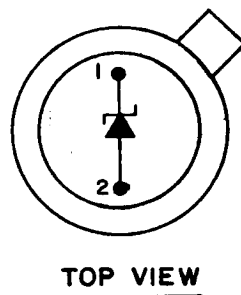
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Inches	mm	Inches	mm
.012	0.30	.080	2.03
.019	0.48	.100	2.54
.028	0.71	.178	4.52
.036	0.91	.195	4.95
.040	1.02	.209	5.31
.046	1.17	.230	5.84
.048	1.22	.500	12.70
.050	1.27	.750	19.05

- NOTES:
1. Dimensions are in inches.
 2. Metric equivalents are given for general information only.

FIGURE 1. Package dimensions.



NOTE: Pin 2 is connected to case.

FIGURE 2. Terminal connections.

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3.8 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 3.5 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.

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, 4
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.

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

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

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6.4 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have agreed to this drawing and a certificate of compliance (see 3.5 herein) has been submitted to DESC-ECS.

	Military drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>
032349	7702801XX	15818 34333	TSC103H-1.8MRM SG103Z-1.8
033426	7702802XX <u>2/</u>		
033427	7702803XX <u>2/</u>		
033428	7702804XX <u>2/</u>		
033429	7702805XX	34333	SG103Z-2.7
033430	7702806XX	27014	LM103H-3.0
033431	7702807XX	27014	LM103H-3.3
033432	7702808XX	27014	LM103H-3.6
033433	7702809XX	27014	LM103H-3.9
033434	7702810XX <u>2/</u>		
033435	7702811XX	34333	SG103Z-4.7
033436	7702812XX <u>2/</u>		
033437	7702813XX <u>2/</u>		

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

2/ Devices are no longer available from an approved source of supply. Inactive for new design.

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Vendor CAGE
number

Vendor name
and address

15818

Teledyne Semiconductor
1300 Terra Bella Avenue
Mountain View, CA 94039-7267

27014

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, CA 95051

34333

Silicon General
11861 Western Avenue
Garden Grove, CA 92641

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