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LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

REV																			
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REV STATUS OF SHEETS	REV															
	SHEET	1	2	3	4	5	6	7	8	9	10	11				

PMIC N/A

STANDARD MICROCIRCUIT DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

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DRAWING APPROVAL DATE
99-07-06

REVISION LEVEL

DEFENSE SUPPLY CENTER COLUMBUS
P. O. BOX 3990
COLUMBUS, OHIO 43216-5000

MICROCIRCUIT, LINEAR, VOLTAGE REGULATOR, POSITIVE, ADJUSTABLE, LOW DROPOUT, MONOLITHIC SILICON

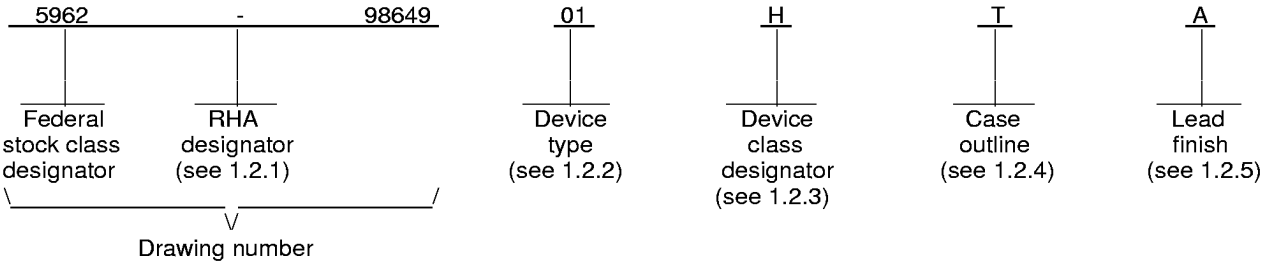
SIZE	CAGE CODE	
A	**67268**	**5962-98649**

SHEET 1 OF 11

1. SCOPE

1.1 Scope. This drawing documents five product assurance classes, class D (lowest reliability), class E, (exceptions), class G (lowest high reliability), class H (high reliability), and class K, (highest reliability) and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of radiation hardness assurance levels are reflected in the PIN.

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 Radiation hardness assurance (RHA) designator. Device classes H and K RHA marked devices shall meet the MIL-PRF-38534 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

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

Device type	Generic number	1/	Circuit function
01	SDP1085		3.0 A, positive voltage regulator, adjustable, low dropout

1.2.3 Device class designator. This device class designator shall be a single letter identifying the product assurance level as follows:

Device class	Device performance documentation
D, E, G, H or K	Certification and qualification to MIL-PRF-38534

1.2.4 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
N	See figure 1	3	Z-tab with nonisolated tab, (TO-257Z), with glass seal
T	See figure 1	3	Flange mount with nonisolated tab, (TO-257), with glass seal
U	See figure 1	3	Flange mount with isolated tab, (TO-257), with glass seal
Z	See figure 1	3	Z-tab with isolated tab, (TO-257Z), with glass seal

1.2.5 Lead finish. The lead finish shall be as specified in MIL-PRF-38534.

1/ The SDP1085 is similar to the LT1085 or OM1850 listed on Standard Microcircuit Drawing 5962-88646.

1.3 Absolute maximum ratings. 1/

Input to output voltage differential	35 V dc
Output current (I_{OUT})	2.0 A
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C
Junction temperature (T_J)	+150°C
Power dissipation (P_D)	Internally limited
Thermal resistance junction-to-case (θ_{JC}):	
Case N and T	3.5°C/W
Case U and Z	4.2°C/W
Thermal resistance junction-to-ambient (θ_{JA})	42°C/W

1.4 Recommended operating conditions.

Input to output voltage differential	25 V dc
Output current (I_{OUT})	10 mA to 2.0 A
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbook. The following specification, standards, and handbook form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38534 - Hybrid Microcircuits, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-973 - Configuration Management.
MIL-STD-1835 - Microcircuit Case Outlines.

HANDBOOK

DEPARTMENT OF DEFENSE

MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbook are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item performance requirements for device classes D, E, G, H, and K shall be in accordance with MIL-PRF-38534. Compliance with MIL-PRF-38534 may include the performance of all tests herein or as designated in the device manufacturer's Quality Management (QM) plan or as designated for applicable device class. Therefore, the tests and inspections herein may not be performed for applicable device class (see MIL-PRF-38534). Futhermore, the manufacturers may take exceptions or use alternate methods to the tests and inspections herein and not perform them. However, the performance requirements as defined in MIL-PRF-38534 shall be met for the applicable device class. The modification in the QM plan shall not affect the form, fit, or function as described herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein and 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 specified 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 defined in table I.

3.5 Marking of device(s). Marking of device(s) shall be in accordance with MIL-PRF-38534. The device shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's vendor similar PIN may also be marked as listed in QML-38534.

3.6 Data. In addition to the general performance requirements of MIL-PRF-38534, the manufacturer of the device described herein shall maintain the electrical test data (variables format) from the initial quality conformance inspection group A lot sample, for each device type listed herein. Also, the data should include a summary of all parameters manually tested, and for those which, if any, are guaranteed. This data shall be maintained under document revision level control by the manufacturer and be made available to the preparing activity (DSCC-VA) upon request.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to supply to this drawing. The certificate of compliance (original copy) submitted to DSCC-VA shall affirm that the manufacturer's product meets the performance requirements of MIL-PRF-38534 and herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38534 shall be provided with each lot of microcircuits delivered to this drawing.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38534 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

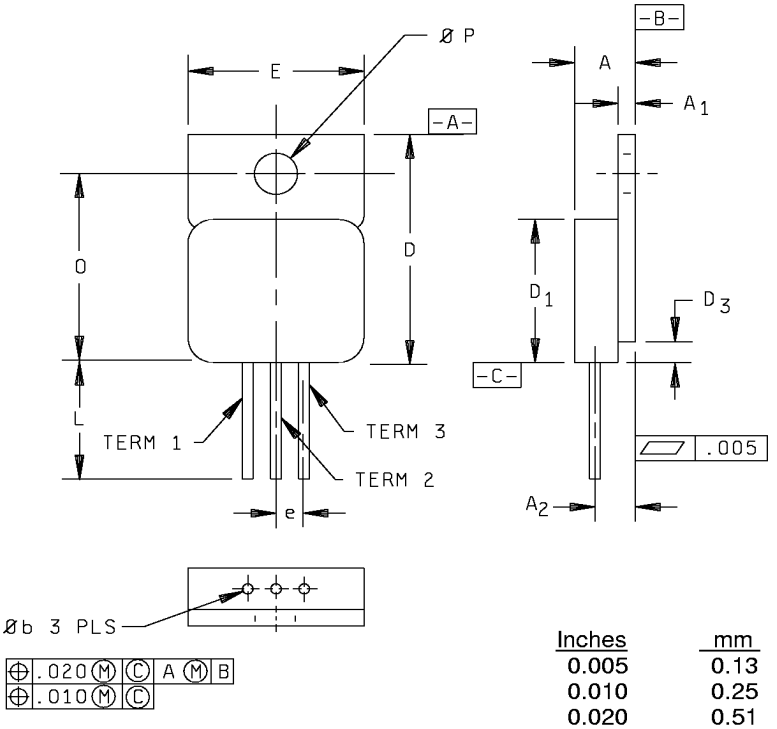
TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Reference voltage	V_{REF}	$(V_{IN} - V_{OUT}) = 3.0$ V, $I_{OUT} = 10$ mA	1	01	1.238	1.262	V
		$1.5 \text{ V} \le (V_{IN} - V_{OUT}) \le 25$ V, $10 \text{ mA} \le I_{OUT} \le 2.0$ A	1, 2, 3		1.220	1.270	
Line regulation 1/	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	$1.5 \text{ V} \le (V_{IN} - V_{OUT}) \le 15$ V, $I_{OUT} = 10$ mA	1	01		0.2	%
		$1.5 \text{ V} \le (V_{IN} - V_{OUT}) \le 35$ V, $I_{OUT} = 10$ mA	2, 3			0.5	
Load regulation 1/	$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	$(V_{IN} - V_{OUT}) = 3.0$ V, $10 \text{ mA} \le I_{OUT} \le 2.0$ A	1	01		0.8	%
			2, 3			1.0	
Dropout voltage	V_{DO}	$I_{OUT} = 2.0$ A, $\Delta V_{REF} = 1.0\%$	1, 2, 3	01		1.5	V
Thermal regulation	- - -	30 ms pulse, $T_A = +25°C$	1	01		0.02	%/W
Ripple rejection	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	f = 120 Hz, $C_{ADJ} = 25$ µF, $C_{OUT} = 25$ µF (tantalum), $I_{OUT} = 2.0$ A, $(V_{IN} - V_{OUT}) = 3.0$ V	4, 5, 6	01	60		dB
Adjust pin current	I_{ADJ}	$1.5 \text{ V} \le (V_{IN} - V_{OUT}) \le 25$ V, $10 \text{ mA} \le I_{OUT} \le 2.0$ A	1, 2, 3	01		120	µA
Adjust pin current change	ΔI_{ADJ}	$1.5 \text{ V} \le (V_{IN} - V_{OUT}) \le 25$ V, $10 \text{ mA} \le I_{OUT} \le 2.0$ A, $T_A = +25°C$	1	01		5.0	µA
Minimum load current	I_{MIN}	$(V_{IN} - V_{OUT}) = 25$ V	1, 2, 3	01		10	mA
Current limit	I_{LIM}	$(V_{IN} - V_{OUT}) = 5.0$ V	1, 2, 3	01	3.2		A
		$(V_{IN} - V_{OUT}) = 25$ V			0.2		
Temperature stability 2/	ΔV_{OUT}	$-55°C \le T_J \le +125°C$	1, 2, 3	01		1.5	%
Long term stability 2/	ΔV_{OUT}	t = 1000 hrs, $T_A = +125°C$	2	01		1.0	%

1/ Line and load regulation are measured at a constant junction temperature using a low duty cycle pulse technique. Although power dissipation is internally limited, regulation is guaranteed up to the maximum power dissipation of 30 W. Power dissipation is determined by the input/output differential voltage and the output current. Guaranteed maximum power dissipation will not be available over the full input/output voltage range.

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

Case outlines T and U.



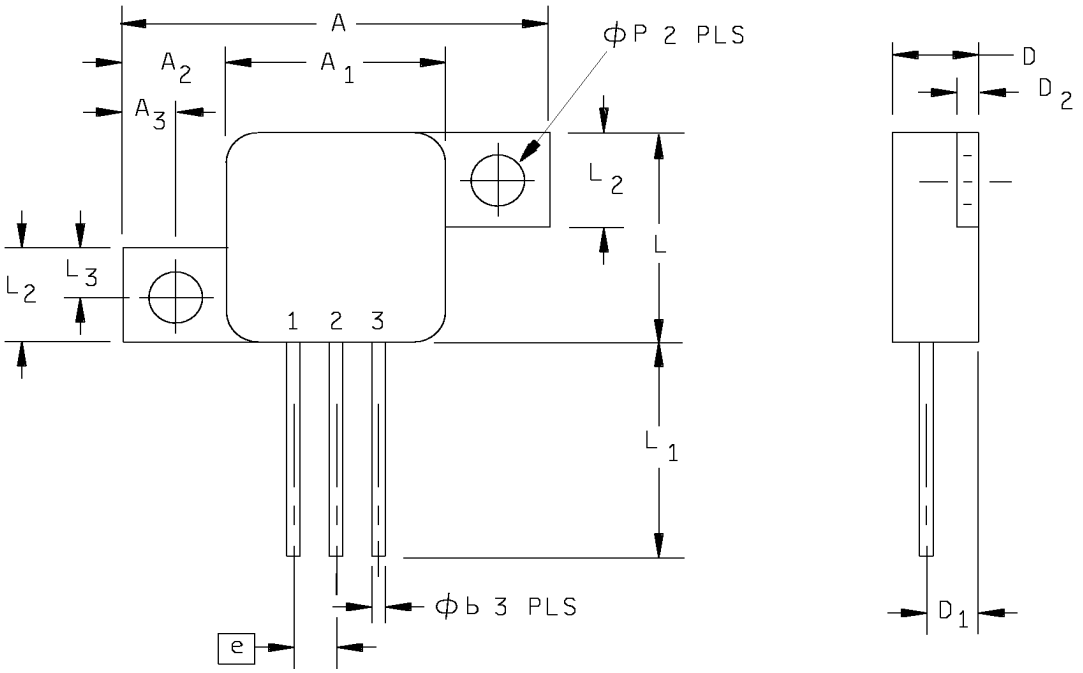
Inches	mm
0.005	0.13
0.010	0.25
0.020	0.51

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	4.83	5.08	0.190	0.200
A1	0.89	1.14	0.035	0.045
A2	3.05 BSC		0.120 BSC	
øb	0.64	1.02	0.025	0.040
D	16.38	16.89	0.645	0.665
D1	10.41	10.92	0.410	0.430
D3	0.00	0.97	0.000	0.038
e	2.54 BSC		0.100 BSC	
E	10.41	10.67	0.410	0.420
L	12.70	19.05	0.500	0.750
O	13.39	13.64	0.527	0.537
øP	3.56	3.81	0.140	0.150

NOTE:
The U.S. government preferred system of measurement is the metric SI system. However, this item was originally designed using inch-pound units of measurement. In the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.

FIGURE 1. Case outlines.

Case outlines N and Z.

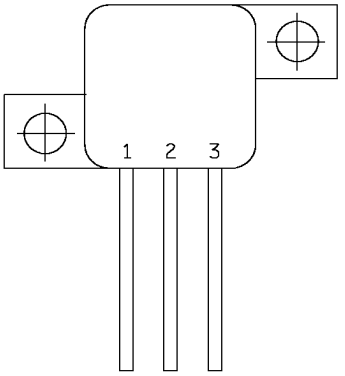


Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	23.11	23.37	0.910	0.920
A1	10.41	10.67	0.410	0.420
A2	6.22	6.48	0.245	0.255
A3	3.05	3.30	0.120	0.130
øb	0.71	0.81	0.028	0.032
D	4.70	5.59	0.135	0.220
D1	2.92	3.18	0.115	0.125
D2	0.89	1.14	0.035	0.045
e	2.54 BSC		0.100 BSC	
L	10.41	10.67	0.410	0.420
L1	12.70	19.05	0.500	0.750
L2	6.22	6.48	0.245	0.255
L3	3.05	3.30	0.120	0.130
øP	3.05	3.30	0.120	0.130

NOTE:
The U.S. government preferred system of measurement is the metric SI system. However, this item was originally designed using inch-pound units of measurement. In the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.

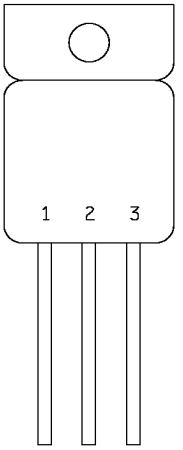
FIGURE 1. Case outlines - Continued.

Case outlines N and Z



Top view

Case outlines T and U



Top view

Device type	01	
Case outlines	N and T (nonisolated tab)	U and Z (isolated tab)
Terminal number	Terminal symbol	Terminal symbol
1 2 3 Tab	Adjust No connection Input Output	Adjust Output Input No connection

FIGURE 2. Terminal connections.

TABLE II. Electrical test requirements.

MIL-PRF-38534 test requirements	Subgroups (in accordance with MIL-PRF-38534, group A test table)
Interim electrical parameters	1
Final electrical parameters	1*, 2, 3, 4, 5, 6
Group A test requirements	1, 2, 3, 4, 5, 6
Group C end-point electrical parameters	1, 2, 3
MIL-STD-883, group E end-point electrical parameters for RHA devices	Subgroups** (in accordance with method 5005, group A test table)

* PDA applies to subgroup 1.
** When applicable to this standard microcircuit drawing, the subgroups shall be defined.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38534. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

(2) T_A as specified in accordance with table I of method 1015 of MIL-STD-883.

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 Conformance and periodic inspections. Conformance inspection (CI) and periodic inspection (PI) shall be in accordance with MIL-PRF-38534 and as specified herein.

4.3.1 Group A inspection (CI). Group A inspection shall be in accordance with MIL-PRF-38534 and as follows:

a. Tests shall be as specified in table II herein.

b. Subgroups 7, 8, 9, 10, and 11 shall be omitted.

4.3.2 Group B inspection (PI). Group B inspection shall be in accordance with MIL-PRF-38534.

4.3.3 Group C inspection (PI). Group C inspection shall be in accordance with MIL-PRF-38534 and as follows:

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

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

(1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

(2) T_A as specified in accordance with table I of method 1005 of MIL-STD-883.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.3.4 Group D inspection (PI). Group D inspection shall be in accordance with MIL-PRF-38534.

4.3.5 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels for device classes H and K shall be M, D, R, and H. RHA quality conformance inspection sample tests shall be performed at the RHA level specified in the acquisition document.

a. RHA tests for device classes H and K for levels M, D, R, and H shall be performed through each level to determine at what levels the devices meet the RHA requirements. These RHA tests shall be performed for initial qualification and after design or process changes which may affect the RHA performance of the device.

b. End-point electrical parameters shall be as specified in table II herein.

c. Prior to total dose irradiation, each selected sample shall be assembled in its qualified package. It shall pass the specified group A electrical parameters in table I for subgroups specified in table II herein.

d. For device classes H and K, the devices shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38534 for RHA level being tested, and meet the postirradiation end-point electrical parameter limits as defined in table I at T_A = +25°C ±5 percent, after exposure.

e. Prior to and during total dose irradiation testing, the devices shall be biased to establish a worst case condition as specified in the radiation exposure circuit.

f. For device classes H and K, subgroups 1 and 2 in table V, method 5005 of MIL-STD-883 shall be tested as appropriate for device construction.

g. When specified in the purchase order or contract, a copy of the RHA delta limits shall be supplied.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38534.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

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-973 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus when a system application requires configuration control and the applicable SMD. DSCC 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 microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, P. O. Box 3990, Columbus, Ohio 43216-5000, or telephone (614) 692-0512.

6.6 Sources of supply. Sources of supply are listed in QML-38534. The vendors listed in QML-38534 have submitted a certificate of compliance (see 3.7 herein) to DSCC-VA and have agreed to this drawing.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN

DATE: 99-07-06

Approved sources of supply for SMD 5962-98649 are listed below for immediate acquisition only and shall be added to QML-38534 during the next revision. QML-38534 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of QML-38534.

Standard microcircuit drawing PIN 1/ 2/	Vendor CAGE number	Vendor similar PIN 3/
5962-9864901HNA 5962-9864901HNC	21845 21845	SDP1085NHD SDP1085NHG
5962-9864901HTA 5962-9864901HTC	21845 21845	SDP1085THD SDP1085THG
5962-9864901HUA 5962-9864901HUC	21845 21845	SDP1085UHD SDP1085UHG
5962-9864901HZA 5962-9864901HZC	21845 21845	SDP1085ZHD SDP1085ZHG

1/ The lead finish shown for each PIN, representing a hermetic package, is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the Vendor to determine availability.
2/ The SMD device types listed above are similar to the device types listed on SMD 5962-88646. 5962-9864901HUA or C is similar to 5962-8864601UX.
3/ 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
21845	Solitron Devices, Incorporated 3301 Electronics Way West Palm Beach, FL 33407-4697