REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Corrected title mis-spelling. Added cage code 88379 for device type 02. Removed footnote 3 from the Standrard Microcircuit Drawing Bulletin. -sld	10-01-20	Charles F. Saffle
B	Updated drawing paragraphs. -sld	12-02-02	Charles F. Saffle
C	Added Device type 03. -sld	12-03-27	Charles F. Saffle
D	Added radiation hardness assurance requirements. -sld	12-07-30	Charles F. Saffle

REV																				
SHEET																				
REV	D	D	D	D																
SHEET	15	16	17	18																

REV STATUS OF SHEETS	REV	D	D	D	D	D	D	D	D	D	D	D	D	D
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

PMIC N/A

PREPARED BY
Steve Duncan

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COLUMBUS, OHIO 43218-3990
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STANDARD MICROCIRCUIT DRAWING

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

AMSC N/A

CHECKED BY
Greg Cecil

APPROVED BY
Charles F. Saffle

DRAWING APPROVAL DATE
09-12-01

MICROCIRCUIT, HYBRID, VOLTAGE REGULATOR LOW DROPOUT, POSITIVE AND NEGATIVE, ADJUSTABLE

REVISION LEVEL	SIZE	CAGE CODE	
D	A	**67268**	**5962-09207**

SHEET 1 OF 18

DSCC FORM 2233
APR 97

5962-E410-12

1. SCOPE

1.1 Scope. This drawing documents five product assurance classes as defined in paragraph 1.2.3 and MIL-PRF-38534. A choice of case outlines and lead finishes which 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:

5962	R	09207	01	K	X	X
½	½		½	½	½	½
½	½		½	½	½	½
½	½		½	½	½	½
Federal stock class designator	RHA designator (see 1.2.1)		Device type (see 1.2.2)	Device class designator (see 1.2.3)	Case outline (see 1.2.4)	Lead finish (see 1.2.5)
_____	_____	_____/				
	\/					
	Drawing number					

1.2.1 Radiation hardness assurance (RHA) designator. 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) identify the circuit function as follows:

Device type	Generic number	Circuit function
01	8662	Voltage regulator, positive, low dropout, adjustable
02	8663	Voltage regulator, negative, low dropout, adjustable
03	8682	Voltage regulator, positive, low dropout, adjustable

1.2.3 Device class designator. This device class designator shall be a single letter identifying the product assurance level. All levels are defined by the requirements of MIL-PRF-38534 and require QML Certification as well as qualification (Class H, K, and E) or QML Listing (Class G and D). The product assurance levels are as follows:

Device class	Device performance documentation
K	Highest reliability class available. This level is intended for use in space applications.
H	Standard military quality class level. This level is intended for use in applications where non-space high reliability devices are required.
G	Reduced testing version of the standard military quality class. This level uses the Class H screening and In-Process Inspections with a possible limited temperature range, manufacturer specified incoming flow, and the manufacturer guarantees (but may not test) periodic and conformance inspections (Group A, B, C and D).
E	Designates devices which are based upon one of the other classes (K, H, or G) with exception(s) taken to the requirements of that class. These exception(s) must be specified in the device acquisition document; therefore the acquisition document should be reviewed to ensure that the exception(s) taken will not adversely affect system performance.
D	Manufacturer specified quality class. Quality level is defined by the manufacturers internal, QML certified flow. This product may have a limited temperature range.

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

Outline letter	Descriptive designator	Terminals	Package style
X	See figure 1	3	Bottom terminal chip carrier, ceramic
Y	See figure 1	5	Bottom terminal chip carrier, ceramic

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

1.3 Absolute maximum ratings. 1/

Input voltage:	
Positive regulator:	
Device types 01and 03	$25+V_{REF}$
Negative regulator:	
Device type 02	-35 V
Input-Output differential voltage:	
Positive regulator:	
Device types 01and 03	25 V
Negative regulator:	
Device type 02	30 V
DC output current:	
Positive regulator:	
Device types 01and 03	1.5 A
Operating junction temperature range	-55°C to +150°C
Junction temperature (T_J)	+150°C
Thermal resistance, junction-to-case (q_{JC}) each regulator	3°C/W
Lead temperature (soldering, 10 seconds)	300°C
Storage temperature range	-65°C to +150°C

1.4 Recommended operating conditions.

Output voltage range:	
Postive voltage regulator:	
Device type 01and 03	+1.275 V to +23 V dc
Negative voltage regulator:	
Device type 02	-2.45 V to -28 V dc
Case operating temperature range (T_C)	-55°C to +125°C

1.5 Radiation features. 2/

Maximum total dose available (dose rate = 50 - 300 rads(Si)/s)	
Device types 01, 02, and 03	100 krads(Si) 3/
Enhanced Low Dose Rate Sensitvity (ELDRS):	
(dose rate ≤ 10 mrads(Si)/s) Device types 01 and 03 only	50 krads(Si) 4/

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

2/ Bipolar device types may degrade from displacement damage from radiation which could affect RHA levels. These device types have not been characterized for displacement damage.

3/ The active elements that make up the devices on this drawing have been tested for Total Ionizing Dose (TID) in accordance with MIL-STD-883 test method 1019 condition A. RHA testing of the active elements covered on this SMD are tested in alternate packages (TO3) and (TO39), not the packages as specified in paragraph 1.2.4.

4/ The active elements that make up the devices on this drawing have been tested (device types 01and 03 only) for Enhanced Low Dose Rate Sensitivity (ELDRS) in accordance with MIL-STD-883, Method 1019 condition D and paragraph 3.13.1 for initial qualification. No ELDRS effect was observed. The active elements (device types 01and 03 only) will be re-tested after design or process changes that can affect RHA response of these elements. RHA testing of the active elements covered on this SMD were done in alternate packages (TO3) and (TO39), not the packages as specified in paragraph 1.2.4.

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.
MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-103 - List of Standard Microcircuit Drawings.
MIL-HDBK-780 - Standard Microcircuit Drawings.

(Copies of these documents are available online at https://assist.dla.mil/quicksearch/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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 shall include the performance of all tests herein or as designated in the device manufacturer's Quality Management (QM) plan or as designated for the applicable device class. The manufacturer may eliminate, modify or optimize the tests and inspections herein, however the performance requirements as defined in MIL-PRF-38534 shall be met for the applicable device class. In addition, the modification in the QM plan shall not affect the form, fit, or function of the device for the applicable device class.

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.

3.2.3 Block diagram. The block diagram shall be as specified on figure 3.

3.2.4 Maximum power dissipation verses case temperature chart. The maximum power dissipation verses case temperature is specified on figure 4.

3.2.5 Radiation exposure circuits. The radiation exposure circuits shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing and acquiring activity upon request.

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.

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 (DLA Land and Maritime -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 DLA Land and Maritime -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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ $P \le P_{MAX}$, I_{OUT} = 0.5 A unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
POSITIVE REGULATOR							
Reference voltage 1/	V_{REF}	1.5 V ≤ (V_{IN} - V_{OUT}) ≤ 15 V, I_{LOAD} = 10 mA	1,2,3	01,03	1.210	1.275	V
Line regulation 1/ 2/ 3/	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	1.5 V ≤ (V_{IN} - V_{OUT}) ≤ 15 V, I_{LOAD} = 10 mA	1,2,3	01,03		0.25	%
Load regulation 1/ 2/	$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	10 mA ≤ I_{OUT} ≤ 1.0 A, (V_{IN} - V_{OUT}) = 3 V	1,2,3	01,03		0.4	%
Thermal regulation 4/		30 ms pulse, T_C = +25°C	1	01,03		0.04	%/W
Dropout voltage 1/	V_{DROP}	ΔV_{REF} = 1%, I_{OUT} = 1.0 A	1,2,3	01,03		1.30	V
Ripple rejection 4/		I_{OUT} = 1.0 A, (V_{IN} - V_{OUT}) = 3 V, f = 120 Hz, C_{ADJ} = C_{OUT} = 25 µF	1,2,3	01,03	60		dB
Adjustment pin current 1/	I_{ADJ}	T_C = +25°C	1	01,03		120	µA
Adjustment pin current change 1/	ΔI_{ADJ}	10 mA ≤ I_{OUT} ≤ 1.0 A, 1.5 V ≤ (V_{IN} - V_{OUT}) ≤ 15 V	1,2,3	01,03		5	mA
Minimum load current 1/ 4/	I_{MIN}	(V_{IN} - V_{OUT}) = 25 V	1,2,3	01,03		10	mA
V_{REF} Long term stability 4/	$\frac{\Delta V_{OUT}}{\Delta TIME}$	Burn-in: T_C = +125°C at 1000 hours minimum, tested at +25°C	1	01,03		0.3	%
NEGATIVE REGULATOR							
Reference voltage 1/	V_{REF}	V_{IN} - V_{OUT} = -1.2 V to -28 V, 1 mA ≤ I_{OUT} ≤ 3 A, V_{OUT} = -5 V	1,3	02	-2.29	-2.45	V
Dropout Voltage 1/	V_{DROP}	I_{OUT} = 0.5 A, V_{OUT} = -5 V	1,2,3	02		-0.425	V
		I_{OUT} = 3 A, V_{OUT} = -5 V				-1.05	

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ $P \le P_{MAX}$, I_{OUT} = 0.5 A unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
NEGATIVE REGULATOR - CONTINUED							
Ripple rejection 4/		I_{OUT} = 1.0 A, (V_{IN} - V_{OUT}) = 3 V, f = 120 Hz, C_{ADJ} = C_{OUT} = 25 µF	1,2,3	02	60		dB
Line regulation 1/ 2/	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	1 V ≤ (V_{IN} - V_{OUT}) ≤ 20 V, V_{OUT} = -5 V	1,2,3	02		0.02	%/V
Load regulation 1/ 2/	$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	5 mA ≤ I_{OUT} ≤ 3 A, (V_{IN} - V_{OUT}) = -1.5 V to -10 V, V_{OUT} = -5 V	1,2,3	02		0.8	%
Thermal regulation 4/		V_{IN} - V_{OUT} = 10 V, I_{OUT} = 5 mA to 2 A, T_C = +25°C	1	02		0.014	%/W
Minimum input voltage 1/	V_{IN} MIN	I_{OUT} = 3 A, V_{OUT} = V_{REF}	1,2,3	02		-4.5	V
Internal Current limit 1/	I_{MAX}	-1.5 V ≤ (V_{IN} - V_{OUT}) ≤ -10 V, T_C = +25°C	1	02	3.3	4.55	A
		(V_{IN} - V_{OUT}) = -15 V, T_C = +25°C			2.0	4.5	
		(V_{IN} - V_{OUT}) = -20 V, T_C = +25°C			1.0	3.1	
		(V_{IN} - V_{OUT}) = -30 V , T_C = +25°C 2/			0.2	1.6	
External current limit 1/	I_{LIM}	R_{LIM} = 5 kΩ	1,2,3	02	2.7	3.7	A
		R_{LIM} = 15 kΩ			0.9	1.75	
Quiescent supply current 1/	I_Q	I_{OUT} = 5 mA, V_{OUT} = V_{REF}, (-4 V ≤ V_{IN} ≤ -25 V)	1,2,3	02		3.5	mA
Supply current change with load 1/ 5/	I_{QD}	(V_{IN} - V_{OUT}) = .25 V +(.25Ω x I_{OUT})	1,2,3	02		35	mA/A
		(V_{IN} - V_{OUT}) ≥ -2 V				21	

See notes at top of next page.

TABLE I. Electrical performance characteristics - Continued.

1/ The active elments that make up these devices have been tested to 200 krads(Si)) to ensure RHA designator level "R" (100 krads(Si)) of Method 1019, condition A of MIL-STD-883 and low dose rate tested (device types 01 and 03 only) to the requirements of Method 1019, condition D and paragraph 3.13.1 of MIL-STD-883 to 50 krads(Si) at +25°C for these parameters. No ELDRS effect was observed. The elements will be re-tested after design or process changes that can affect RHA response of these elements. RHA testing of the active elements covered on this SMD were done in alternate packages (TO3) and (TO39), not the packages as specified in paragraph 1.2.4.

2/ Regulation is measured at a constant junction temperature, using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation. Measurements taken at the output lead must be adjusted for lead resistance.

3/ The test limit at 200 krads(Si) for line regulation is 0.30% max.

4/ Parameter shall be tested at intial device characterization and after design or process changes. Parameter shall be guaranteed to the limits specified in table I for all lots not specifically tested.

5/ The test limits at 200 krads(Si) when $(V_{IN} - V_{OUT}) = .25\ V + (.25W \times I_{OUT})$ is 45 mA max and for $(V_{IN} - V_{OUT}) \geq -2\ V$ is 27 mA max.

Case X

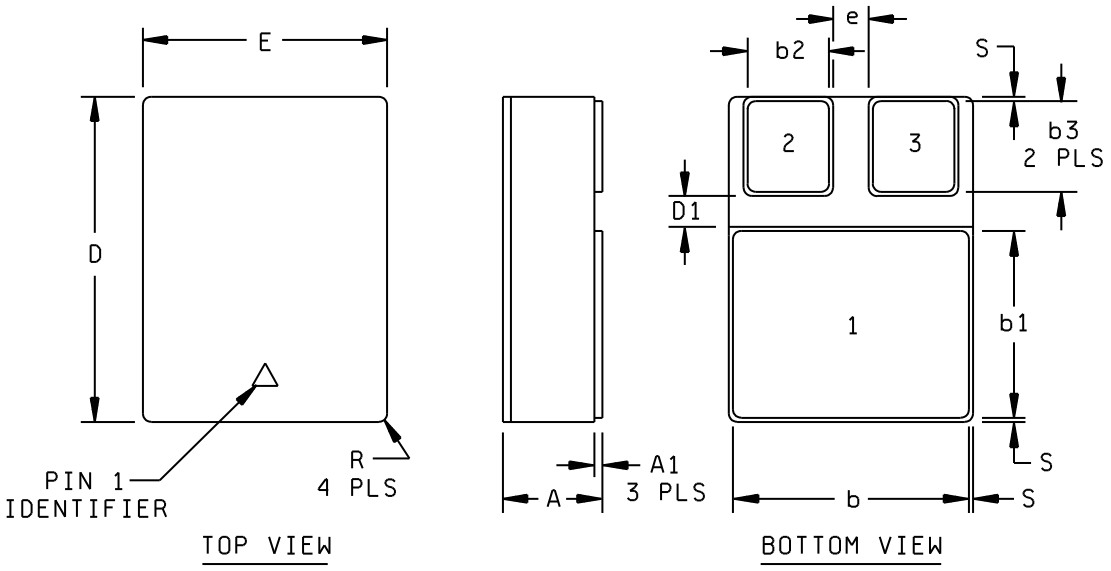

FIGURE 1. Case outline(s).

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		REVISION LEVEL D	SHEET 9

Case X - Continued.

Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A		.127		3.23
A1	.010	.020	.25	.51
b	.281	.291	7.14	7.39
b1	.220	.230	5.59	5.84
b2	.090	.100	2.29	2.54
b3	.115	.125	2.92	3.18
D		.405		10.29
D1	.030		7.62	
E		.301		7.65
e	.030		7.62	
R	.015	.025	.38	.64
S		.010		.25

NOTE:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. The package and lid are electrically isolated.

FIGURE 1. Case outline(s) - Continued.

Case Y

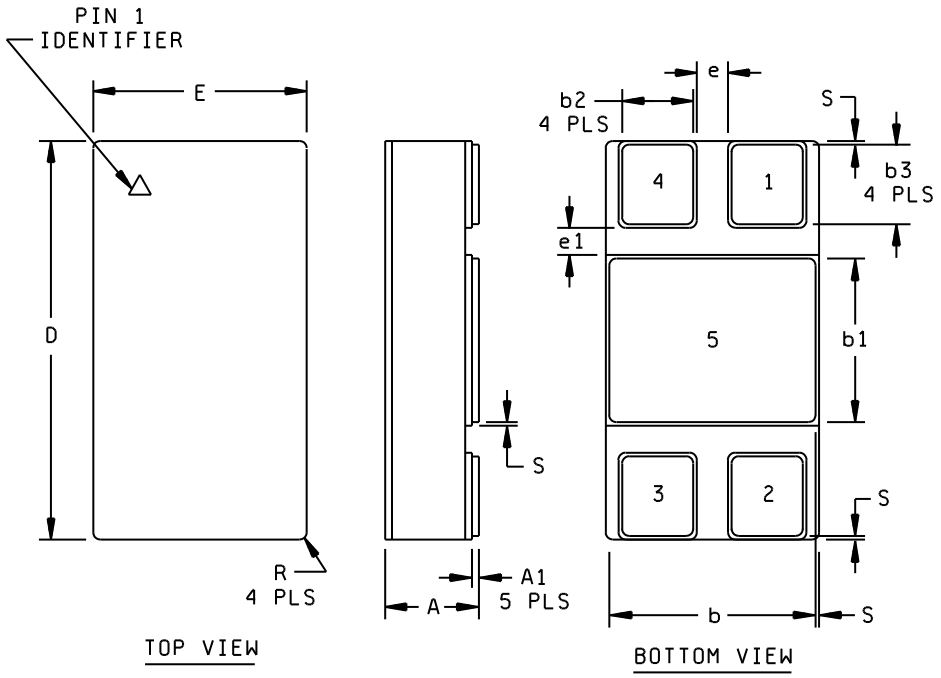

FIGURE 1. Case outlines(s) - Continued.

Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A		.127		3.23
A1	.010	.020	.25	.51
b	.281	.291	7.14	7.39
b1	.220	.230	5.59	5.84
b2	.090	.100	2.29	2.54
b3	.115	.125	2.92	3.18
D		.550		12.83
E		.301		7.65
e	.030		7.62	
e1	.030		7.62	
R	.015	.025	.38	.64
S		.010		.25

NOTE:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. The package and lid are electrically isolated.

FIGURE 1. Case outline(s) - Continued.

Device types	01	02	03
Case outlines	X	Y	X
Terminal number	Terminal symbol		
1	POS V_{OUT}	NEG Feedback	POS V_{OUT}
2	POS V_{IN}	NEG Reference	POS Adj
3	POS Adj	NEG V_{OUT}	POS V_{IN}
4	---	NEG Gnd	---
5	---	NEG V_{IN}	---

FIGURE 2. Terminal connections.

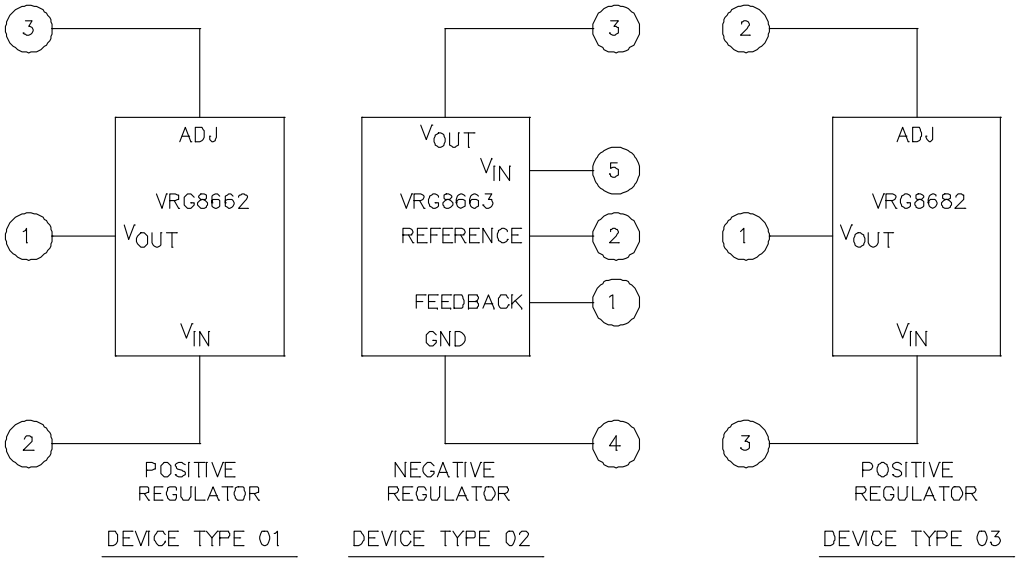

FIGURE 3. Block diagram.

Case Temperature (°C)	Maximum power dissipation (Watts)
0	50.00
5	48.33
10	46.67
15	45.00
20	43.33
25	41.67
30	40.00
35	38.33
40	36.67
45	35.00
50	33.33
55	31.67
60	30.00
65	28.33
70	26.67
75	25.00
80	23.33
85	21.67
90	20.00
95	18.33
100	16.67
105	15.00
110	13.33
115	11.67
120	10.00
125	8.33
130	6.67
135	5.00
140	3.33
145	1.67
150	0.00

FIGURE 4. Maximum power dissipation verses case temperature chart.

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
Group A test requirements	1,2,3
Group C end-point electrical parameters	1,2,3
End-point electrical parameters for Radiation Hardness Assurance (RHA) devices	1

* PDA applies to subgroup 1.

4. VERIFICATION

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.

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 DLA Land and Maritime -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 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 4, 5, 6, 7, 8A, 8B, 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 DLA Land and Maritime -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 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. Radiation hardness assurance (RHA). RHA qualification is required only for those devices with the RHA designator as specified herein. See table IIIA and table IIIB.

Table IIIA. Radiation Hardness Assurance Method Table.

RHA method Employed	**Testing at 2X rated for total dose**		**Worst Case Analysis Performed No**				**End points after dose is achieved includes minimum maximum, and room temperatures**	
	Element Level	Hybrid Device Level	Includes temperature effects	Combines temperature and radiation effects	Combines total dose and displacement effects	End-of-life	Element Level	Hybrid device level
	Yes	Yes See 4.3.5.1.1.2	N/A	N/A	N/A	N/A	No	No

See notes at end of table.

Table IIIB. Hybrid level and element level test table.

	Radiation Test								
	Total Dose			**Heavy Ion**		**Proton**		**Neutron**	
	Low Dose Rate	High Dose Rate (HDR)	ELDRS	SEU (upset)	SEL (latch-up)	Low Energy	High Energy	SEE (upset)	Displacement Damage (DD)
Hybrid	X Device types 01 and 03 only See 4.3.5.1.1.2 (N) Device type 02	X See 4.3.5.1.1.2	X Device types 01 and 03 only See 4.3.5.1.1.2 (N) Device type 02	(N)	(N)	(N)	(N)	(N)	(N)

See notes at end of table.

Table IIIB. Hybrid level and element level test table - Continued.

	Radiation Test								
	Total Dose			Heavy Ion		Proton		Neutron	
	Low Dose Rate	High Dose Rate (HDR)	ELDRS	SEU (upset)	SEL (latch-up)	Low Energy	High Energy	SEE (upset)	Displacement Damage (DD)
Element									
Bipolar, linear or mixed signal > 90 nm	X (50 krads) Device types 01 and 03 only (N) Device type 02	X (200 krads)	X (50 krads) Device types 01 and 03 only (N) Device type 02	(N)	(N)	(N)	(N)	(N)	(N)

NOTES:
X = Radiation testing done (Level)
G = Guaranteed by design or process
(N) = Not yet tested
N/A = Not applicable for this SMD

4.3.5.1 Radiation Hardness Assurance (RHA) inspection. RHA qualification is required for those devices with the RHA designator as specified herein. End-point electrical parameters for radiation hardness assurance (RHA) devices shall be specified in table II. Radiation testing will be in accordance with the qualifying activity (DLA Land and Maritime -VQ) approved plan and with MIL-PRF-38534, Appendix G.

a. The hybrid device manufacturer shall establish procedures controlling component radiation testing, and shall establish radiation test plans used to implement component lot qualification during procurement. Test plans and test reports shall be filed and controlled in accordance with the manufacturer's configuration management system.

b. The hybrid device manufacturer shall designate a RHA program manager to oversee component lot qualification, and to monitor design changes for continued compliance to RHA requirements.

4.3.5.1.1 Hybrid level qualification.

4.3.5.1.1.1 Qualification by similarity. This device has not been indentified as "similar".

4.3.5.1.1.2 Total ionizing dose irradiation testing. Hybrid level and element level testing are the same for the devices on this SMD since the active elements are independent of each other and accessible to the device leads for test. The qualification was performed on the active elements, independent of the hybrid.

4.3.5.1.2 Element level qualification.

4.3.5.1.2.1 Total Ionizing dose irradiation testing. A minimum of ten samples of each element is tested at initial qualification and after any design or process changes which may affect the RHA response of the device type. Five biased and five unbiased are tested at High Dose Rate (HDR) in accordance with condition A of method 1019 of MIL-STD-883 to 200 krads(Si). In addition for device types 01 and 03 only, another ten devices are tested at Low Dose Rate (LDR) in accordance with method 1019, condition D and paragraph 3.13.1 of MIL-STD-883 to 50 krads(Si). The resulting data is evaluated in accordance with Condition D, ELDRS characterization. 0.9000/90% statistics are applied to the device parameter designations which are compared againist established limits for acceptance.

4.3.5.2 Radiation Lot Acceptance. Each wafer lot of active elements shall be evaluated for acceptance in accordance with MIL-PRF-38534 and herein.

4.3.5.2.1 Total Ionizing Dose. Samples from every wafer lot will be assembled into packages (TO3) or (TO39) and tested for wafer lot acceptance Radiation Lot Acceptance Testing (RLAT). Five biased and five unbiased devices are tested in accordance with condition A, of method 1019 of MIL-STD-883 to 200 krads(Si). 0.9000/90% statistics are applied to the device parameter designations which are compared againist established limits for acceptance.

4.3.5.2.2 Technologies not tested. All active components in these devices are RHA tested.

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 as specified in MIL-PRF-38534.

6.4 Record of users. Military and industrial users shall inform DLA Land and Maritime when a system application requires configuration control and the applicable SMD to that system. DLA Land and Maritime 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 DLA Land and Maritime-VA, telephone (614) 692-0547.

6.5 Comments. Comments on this drawing should be directed to DLA Land and Maritime-VA, Columbus, Ohio 43218-3990, or telephone (614) 692-1081.

6.6 Sources of supply. Sources of supply are listed in MIL-HDBK-103 and QML-38534. The vendors listed in MIL-HDBK-103 and QML-38534 have submitted a certificate of compliance (see 3.7 herein) to DLA Land and Maritime-VA and have agreed to this drawing.

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 12-07-30

Approved sources of supply for SMD 5962-09207 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38534 during the next revisions. MIL-HDBK-103 and 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 DLA Land and Maritime -VA. This information bulletin is superseded by the next dated revisions of MIL-HDBK-103 and QML-38534. DLA Land and Maritime maintains an online database of all current sources of supply at http://www.landandmaritime.dla.mil/Programs/Smcr/.

Standard microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-0920701KXA	88379	VRG8662-201-2S
5962R0920701KXA	88379	VRG8662-901-2S
5962-0920701KXC	88379	VRG8662-201-1S
5962R0920701KXC	88379	VRG8662-901-1S
5962-0920702KYA	88379	VRG8663-201-2S
5962R0920702KYA	88379	VRG8663-901-2S
5962-0920702KYC	88379	VRG8663-201-1S
5962R0920702KYC	88379	VRG8663-901-1S
5962-0920703KXA	88379	VRG8682-201-2S
5962R0920703KXA	88379	VRG8682-901-2S
5962-0920703KXC	88379	VRG8682-201-1S
5962R0920703KXC	88379	VRG8682-901-1S

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 its availability.

2/ 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
88379	Aeroflex Plainview Incorporated, (Aeroflex Microelectronic Solutions) 35 South Service Road Plainview, NY 11803