

REVISIONS																	
REV	DESCRIPTION	DATE (YR-MO-DA)	APPROVED														
A	Added CAGE number 50507. Added device types 03 and 04, and case outline Y, (figure 2). Corrected table I gain error (GE).	91-01-25	W. Heckman														
B	Changes in accordance with NOR 5962-R017-91.	91-10-07	G. A. Lude														
C	Changes in accordance with NOR 5962-R157-92.	92-03-12	A. Barone														
D	Changes in accordance with NOR 5962-R111-94.	94-02-04	K. A. Cottongim														
E	Changes in accordance with NOR 5962-R127-94.	94-03-15	K. A. Cottongim														
F	Changes in accordance with NOR 5962-R200-94.	94-05-31	K. A. Cottongim														
G	Changes in accordance with NOR 5962-R201-95.	95-09-29	K. A. Cottongim														
H	Correct case outline X package height dimension.	97-09-10	K. A. Cottongim														
J	Table I, change maximum limits to LE and UOE tests.	98-01-22	K. A. Cottongim														
REV																	
SHEET																	
REV	J																
SHEET	15																
REV STATUS OF SHEETS		REV	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
		SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
PMIC N/A		PREPARED BY Donald R. Osborne				<b>DEFENSE SUPPLY CENTER COLUMBUS</b> P. O. BOX 3990 COLUMBUS, OHIO 43216-5000											
<b>STANDARD MICROCIRCUIT DRAWING</b>  THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE  AMSC N/A		CHECKED BY Robert M. Heber															
		APPROVED BY William K. Heckman															
		DRAWING APPROVAL DATE 90-07-11															
		REVISION LEVEL  J															
		SIZE	CAGE CODE	<b>5962-89531</b>													
		<b>A</b>	<b>67268</b>														
		SHEET	1	OF	15												

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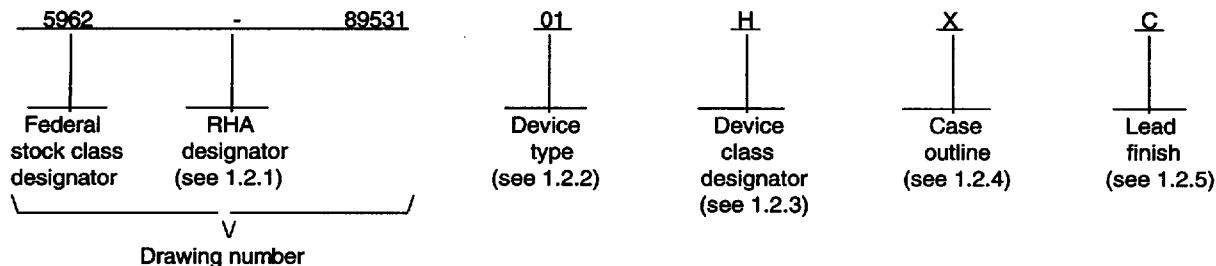
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[查询 9962-8953101HXC"供应商](#)

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	Circuit function
01	DAC-HPB	16-bit D/A converter; 0 to +10 V and ±5 V output
02	DAC-HPB-1, MN3292-VM	16-bit D/A converter; ±10 V output
03	MN3290-VM	16-bit D/A converter; 0 to +10 V output
04	MN3291-VM	16-bit D/A converter; ±5 V output

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
X	See figure 1	24	Dual-in-line
Y	See figure 1	24	Dual-in-line

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

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1.3 Absolute maximum ratings 1/ [查询 5962-89531 THXC 供应商](#)

Positive supply voltage ( $V_{CC}$ ) .....	-0.3 to +18 V dc
Negative supply voltage ( $V_{EE}$ ) .....	+0.3 to -18 V dc
Digital inputs (pins 1 through 16) .....	+5.5 V
Output current .....	$\pm 20$ mA
Analog output voltage .....	$\pm 18$ V (supply voltage)
Junction temperature ( $T_J$ ) .....	+175°C
Storage temperature .....	-65°C to +150°C
Lead temperature (soldering, 10 seconds) .....	+300°C
Power dissipation ( $P_D$ ) .....	1.35 W
Thermal resistance:	
Junction-to-case ( $\theta_{JC}$ ) .....	13°C/W
Junction-to-ambient ( $\theta_{JA}$ ) .....	49°C/W

1.4 Recommended operating conditions.

Supply voltage ranges:	
Positive supply voltage ( $V_{CC}$ ) .....	+14.5 V to +15.5 V dc
Negative supply voltage ( $V_{EE}$ ) .....	-14.5 V to -15.5 V dc
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.

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3.2 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 the applicable device class. Therefore, the tests and inspections herein may not be performed for the applicable device class (see MIL-PRF-38534). Furthermore, 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.

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 Analog output data. The analog output data shall be as specified on figure 3.

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.

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TABLE I. Electrical performance characteristics

Test	Symbol	Conditions <sup>1/</sup> -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Resolution	RES	Complementary binary	1, 2, 3	01, 03	16		Bits
Resolution	RES	Complementary offset binary	1, 2, 3	01, 02, 04	16		Bits
Linearity error	LE	Major sums, carries	4	All		0.0038	%FSR
			5, 6			0.012	
Differential linearity error	DLE	14-bit monotonic	4	All		0.006	%FSR
		13-bit monotonic	5, 6			0.024	
Gain error	GE	V <sub>O</sub> = +FS, +10 V and ±10 V FSR	4	All		0.1	%FSR
			5, 6			0.24	
Unipolar offset error	UOE	V <sub>O</sub> = 0 V to +10 V range	4	01, 03		0.15	%FSR
			5, 6			0.20	
Bipolar offset error	BOE	V <sub>O</sub> = ±10 V range	4	02		0.1	%FSR
			5, 6			0.3	
		V <sub>O</sub> = ±5 V range	4	01, 04		0.1	
			5, 6			0.3	
Reference error	V <sub>REF</sub>	V <sub>REF</sub> = 6.300 V ideally	4	All	6.23	6.37	V
			5, 6		6.2147	6.3826	
Reference current <sup>2/</sup>	I <sub>REF</sub>	For external use, <sup>3/</sup> T <sub>A</sub> = +25°C	1	All	2		mA
Slew rate <sup>2/</sup>	SR	10 V step, T <sub>A</sub> = +25°C <sup>3/</sup>	4	All	10		mA
Settling time <sup>2/</sup>	t <sub>s</sub>	10 V step to .003% FSR T <sub>A</sub> = +25°C	9	All		20	μs
		1 LSB step to .003% FSR T <sub>A</sub> = +25°C				15	
Bipolar output voltage, positive (full scale) <sup>4/</sup>	+V <sub>BO</sub>	±5 V range, T <sub>A</sub> = +25°C	7	01, 04	+4.9999		V
		±10 V range, T <sub>A</sub> = +25°C, Input = 0000 0000 0000 0000		02	+9.9999		

See footnotes at end of table.

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Test	Symbol	Conditions 1/ -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Bipolar output voltage, negative (full scale) 4/	-V <sub>BO</sub>	±5 V range, T <sub>A</sub> = +25°C	7	01, 04	-5.0000		V
		±10 V range, T <sub>A</sub> = +25°C, Input = 1111 1111 1111 1111		02	-10.0000		
Unipolar output voltage, positive (full scale) 4/	+V <sub>UO</sub>	±10 V range, T <sub>A</sub> = +25°C, Input = 0000 0000 0000 0000	7	01, 03	+9.9999		V
Unipolar output voltage, negative (full scale) 4/	-V <sub>UO</sub>	0 to +10 V FSR, T <sub>A</sub> = +25°C, Input = 1111 1111 1111 1111	7	01, 03	0.0000		V
Output current	I <sub>O</sub>	V <sub>O</sub> = ±10 V	4, 5, 6	All		±5	mA
Power supply rejectio ratio	PSRR	Worst case, V <sub>S</sub> = ±0.5 V	4, 5, 6	All		0.006	%FSR/ %VS
Supply currents	I <sub>CC</sub>	V <sub>CC</sub> = +15.5 V	1, 2, 3	All		+33	mA
	I <sub>EE</sub>	V <sub>EE</sub> = -15.5 V				-38	
Power dissipation	P <sub>D</sub>	V <sub>S</sub> = ±15.5 V	1, 2, 3	All		1100	mW
Digital input voltage high	V <sub>IH</sub>	I <sub>IH</sub> = +40 μA	1, 2, 3	All	2.7		V
Digital input voltage low	V <sub>IL</sub>	I <sub>IL</sub> = -0.5 mA	1, 2, 3	All		0.8	V
Digital input current high	I <sub>IH</sub>	V <sub>IH</sub> = +2.7 V	1, 2, 3	All		+40	μA
Digital input current low	I <sub>IL</sub>	V <sub>IL</sub> = +0.8 V	1, 2, 3	All		-1.6	mA

- 1/ Unless otherwise specified, the following conditions apply: V<sub>CC</sub> = +15.0 V, V<sub>EE</sub> = -15.0 V, logic "0" = +0.8 V dc, logic "1" = 2.4 V dc. Device types 01 and 03, FSR = 10 V with testing over 0 V to +10 V range. Device type 02, FSR = 20 V with testing over -10 V to +10 V range. Device types 01 and 04, FSR = 10 V with testing over -5 V to +5 V range. Devices tested with no load applied, using internal reference. Ambient temperature as simulated by a temperature forcing hood.
- 2/ Parameter shall be tested as part of device initial characterization and after design and process changes. Parameter shall be guaranteed to the limits specified in table 1 for all lot(s) not specifically tested.
- 3/ If more than 10 μA is drawn externally, the reference temperature coefficient will increase resulting in a proportional change in the gain and bipolar offset performance.
- 4/ See figure 4 listing of additional digital input codes to nominal analog outputs.

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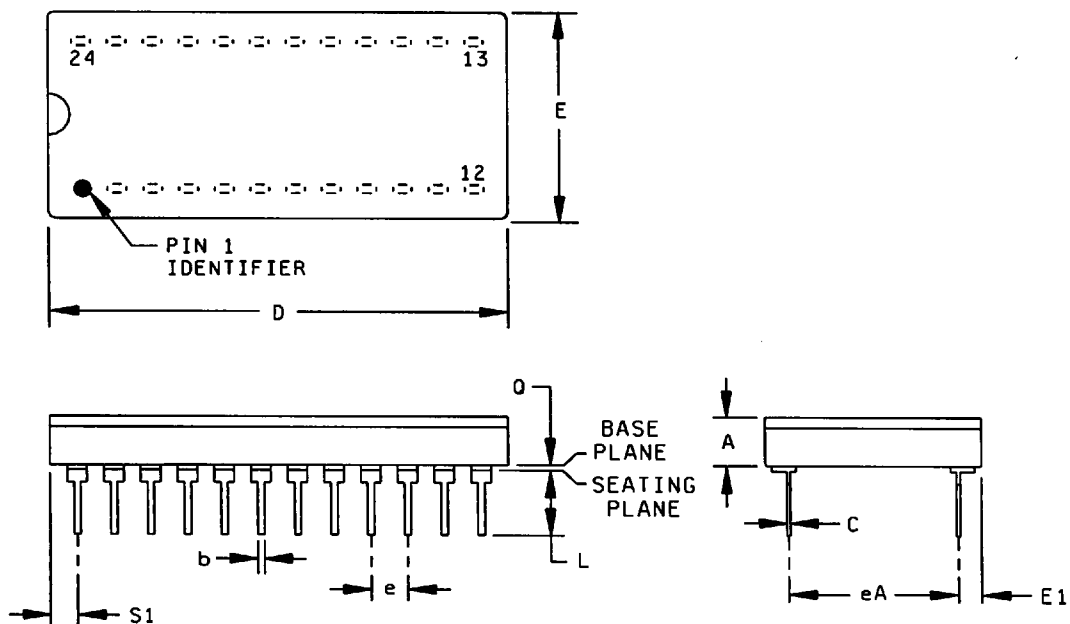


FIGURE 1. Case outline(s).

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Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	----	4.83	----	0.190
b	----	0.46	----	0.018
C	----	0.25	----	0.010
D	----	33.27	----	1.310
E	----	20.32	----	0.800
E1/S1	----	2.54	----	0.100
e	----	2.54	----	0.100
eA	----	15.24	----	0.600
L	3.81		0.150	----
Q	0.61	0.66	0.024	0.026

**NOTES:**

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. Pin numbers are for reference only.

FIGURE 1. Case outline(s) - Continued.

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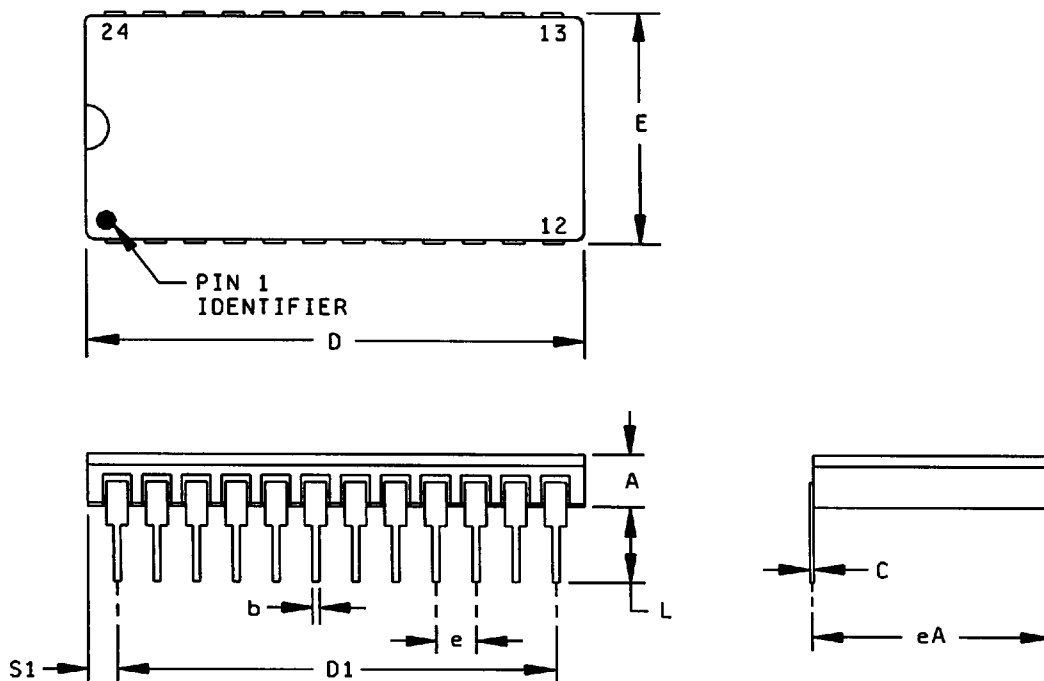


FIGURE 1. Case outline(s) - Continued.

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Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.89	4.65	0.153	0.183
b	0.38	0.48	0.015	0.019
C	0.20	0.30	0.008	0.012
D	31.24	32.26	1.230	1.270
D1	27.81	28.07	1.095	1.105
E	15.62	15.87	0.615	0.625
e	2.49	2.59	0.098	0.102
eA	15.11	15.37	0.595	0.605
L	5.08	5.84	0.200	0.230
S1	1.65	2.03	0.065	0.080

**NOTES:**

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. Pin numbers are for reference only.

FIGURE 1. Case outline(s) - Continued.

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Device types	All		
Case outlines	(X, device types 01, 02) and (Y, device types 02, 03, 04)		
Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	Bit 1 (MSB)	13	Bit 13
2	Bit 2	14	Bit 14
3	Bit 3	15	Bit 15
4	Bit 4	16	Bit 16 (LSB)
5	Bit 5	17	Output
6	Bit 6	18	Bipolar offset
7	Bit 7	19	V <sub>EE</sub>
8	Bit 8	20	Ground
9	Bit 9	21	Sum junction
10	Bit 10	22	Gain adjust
11	Bit 11	23	V <sub>CC</sub>
12	Bit 12	24	Reference output

FIGURE 2. Terminal connections.

<b>STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000</b>	<b>SIZE A</b>		<b>5962-89531</b>
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Bipolar operation - complementary offset binary.

Digital input code		Scale	Analog output voltage range	
MSB	LSB		Device types 01 and 04, ±5 V range	Device type 02, ±10 V range
0000	0000	+FS -1 LSB	+4.99985 V	+9.99969 V
0011	1111	+1/2 FS	+2.50000 V	+5.00000 V
0111	1111	0	0.00000 V	0.00000 V
1011	1111	-1/2 FS	-2.50000 V	-5.00000 V
1111	1111	-FS +1 LSB	-4.99985 V	-9.99969 V
1111	1111	-FS	-5.00000 V	-10.00000 V

Unipolar operation - complementary binary.

Digital input code		Scale	Analog output voltage range
MSB	LSB		Device types 01 and 03, 0 to +10 V range
0000	0000	+FS -1 LSB	+9.99969 V
0011	1111	+3/4 FS	+7.50000 V
0111	1111	+1/2 FS	+5.00000 V
1011	1111	+1/4 FS	+2.50000 V
1111	1111	+1 LSB	+153 μV
1111	1111	0	0 V

FIGURE 3. Analog output data.

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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, 7
Group A test requirements	1, 2, 3, 4, 5, 6, 7, 9**
Group C end-point electrical parameters	1
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.
- \*\* Parameter shall be tested as part of device initial characterization and after design and process changes. Parameter shall be guaranteed to the limits specified in table I for all lot(s) not specifically tested.
- \*\*\* 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 8, 10, and 11 shall be omitted.

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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 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 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. 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  $T_A = +25^\circ\text{C} \pm 5$  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.

<b>STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000</b>	<b>SIZE A</b>		<b>5962-89531</b>
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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) 692-7603.

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.

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STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN

DATE: 98-01-22

Approved sources of supply for SMD 5962-89531 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/	Vendor CAGE number	Vendor similar PIN 2/
5962-8953101HXC	50721	DAC-HPB/883
5962-8953102HXC 5962-8953102HYA 5962-8953102HYC	50721 50507 50507	DAC-HPB-1/883 MN3292-VMYA MN3292-VMYC
5962-8953103HYA 5962-8953103HYC	50507 50507	MN3290-VMYA MN3290-VMYC
5962-8953104HYA 5962-8953104HYC	50507 50507	MN3291-VMYA MN3291-VMYC

- 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/ **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

50507

Micro Networks Company  
324 Clarke Street  
Worcester, MA 01606-1293

50721

Datel, Incorporated  
11 Cabot boulevard  
Mansfield, MA 02048-1194

The information contained herein is disseminated for convenience only and the Government assumes no liability whatsoever for any inaccuracies in this information bulletin.