

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Update drawing boilerplate. Editorial changes throughout.	03-06-24	Raymond Monnin

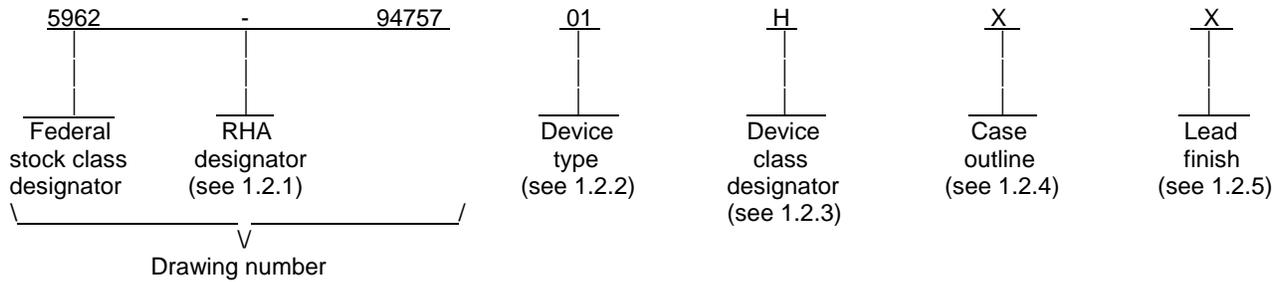
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REV STATUS	REV	A	A	A	A	A	A	A	A	A	A									
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9										

PMIC N/A	PREPARED BY Steve L. Duncan	<p align="center">DEFENSE SUPPLY CENTER COLUMBUS POST OFFICE BOX 3990 COLUMBUS, OHIO 43216-5000 http://www.dsc.dla.mil</p>		
<p align="center">STANDARD MICROCIRCUIT DRAWING</p>	CHECKED BY Michael C. Jones			
	APPROVED BY Kendall A Cottongim			
	DRAWING APPROVAL DATE 96-04-02			
<p align="center">THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p>	<p align="center">MICROCIRCUIT, HYBRID, LINEAR, SAMPLING ANALOG TO DIGITAL CONVERTER, 14-BIT, 1 MHZ</p>			
AMSC N/A	REVISION LEVEL A	SIZE A	CAGE CODE 67268	<p align="center">5962-94757</p>
		SHEET	1 OF 9	

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:



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:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	ADS-927/883	Sampling A/D converter, 14-bit, 1 MHz

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:

<u>Device class</u>	<u>Device performance documentation</u>
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.

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

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
X	See figure 1	24	Dual-in-line

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

1.3 Absolute maximum ratings. ^{1/}

Positive supply voltage range (V_{CC}).....	0 to +16 V dc
Negative supply voltage range (V_{EE}).....	0 to -16 V dc
Logic supply voltage (V_{DD}).....	0 to +6 V dc
Digital input voltage range.....	-0.3 V dc to $V_{DD} + 0.3$ V dc
Analog input.....	± 15 V
Lead temperature (soldering, 10 seconds).....	+300°C
Junction temperature (T_J).....	+175°C
Storage temperature range.....	-65°C to +150°C
Power dissipation (P_D).....	1.95 W
Thermal resistance:	
Junction-to-case (θ_{JC}).....	5°C/W
Junction-to-ambient (θ_{JA}).....	27°C/W

1.4 Recommended operating conditions.

Positive supply voltage range (V_{CC}).....	+14.25 V dc to +15.75 V dc
Negative supply voltage range (V_{EE}).....	-14.25 V dc to -15.75 V dc
Logic supply voltage range (V_{DD}).....	+4.75 V dc to +5.25 V dc
Ambient operating temperature range (T_A).....	-55°C to +125°C

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

HANDBOOKS

DEPARTMENT OF DEFENSE

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

(Unless otherwise indicated, copies of the specification, standards, and handbooks are available 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.

^{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.

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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 manufacturer 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 1.2.2 herein and figure 1.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 2.

3.2.3 Timing diagram. The timing diagram 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.

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.

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.

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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 type	Limits		Unit
					Min	Max	
Bipolar input	V _{IN}	-5 V to +5 V range	7	01	Pass		
Gain error	BGE	-5 V to +5 V range	4	01		±0.15	%FSR
			5, 6			±0.40	
Bipolar offset error	BOE	-5 V to +5 V range	4	01		±0.10	%FSR
			5, 6			±0.40	
Full scale absolute accuracy	FSE		4	01		±0.15	%FSR
			5, 6			±0.5	
Differential non-linearity	DNL		4	01		±0.95	LSB
			5, 6			±0.99	
No missing codes	NMC	Abbreviated test	4, 5, 6	01	Pass		
Conversion rate	CONR		4, 5, 6	01	1		MHz
Resolution	RES		1, 2, 3	01	14		Bits
Digital output coding	OC	Offset binary	1, 2, 3	01	Pass		
Peak harmonics	PHAR	Analog input at -0.5 dB	4	01		-78	dB
		100 kHz to 500 kHz	5, 6			-77	
Total harmonic distortion	THD	Analog input at -0.5 dB	4	01		-76	dB
		100 kHz to 500 kHz	5, 6			-74	
Signal to noise ratio without distortion	SNR	Analog input at -0.5 dB	4	01	+75		dB
		100 kHz to 500 kHz	5, 6		+73		
Signal to noise ratio with distortion	SNRD	Analog input at -0.5 dB	4	01	+73		dB
		100 kHz to 500 kHz	5, 6		+71		
Positive supply current	I _{CC}	V _{CC} = +15.0 V dc	1, 2, 3	01		+65	mA
Negative supply current	I _{EE}	V _{EE} = -15.0 V dc	1, 2, 3	01		-45	mA
Logic supply current	I _{DD}	V _{DD} = +5.0 V dc	1, 2, 3	01		+80	mA
Power dissipation	P _D		1, 2, 3	01		1.95	Watts
Power supply rejection ratios	PSRR		4, 5, 6	01		0.02%	FSR/ %V

^{1/} Unless otherwise specified, the following conditions apply:
V_{CC} = +15.0 V dc, V_{EE} = -15.0 V dc, and V_{DD} = +5.0 V dc.
Logic "0" = +0.8 V, Logic "1" = +2.0 V.
VFSR = ±5.0 V.
Sampling rate = 1 MHz.
1 minute warm-up time.

**STANDARD
MICROCIRCUIT DRAWING**

DEFENSE SUPPLY CENTER COLUMBUS
COLUMBUS, OHIO 43216-5000

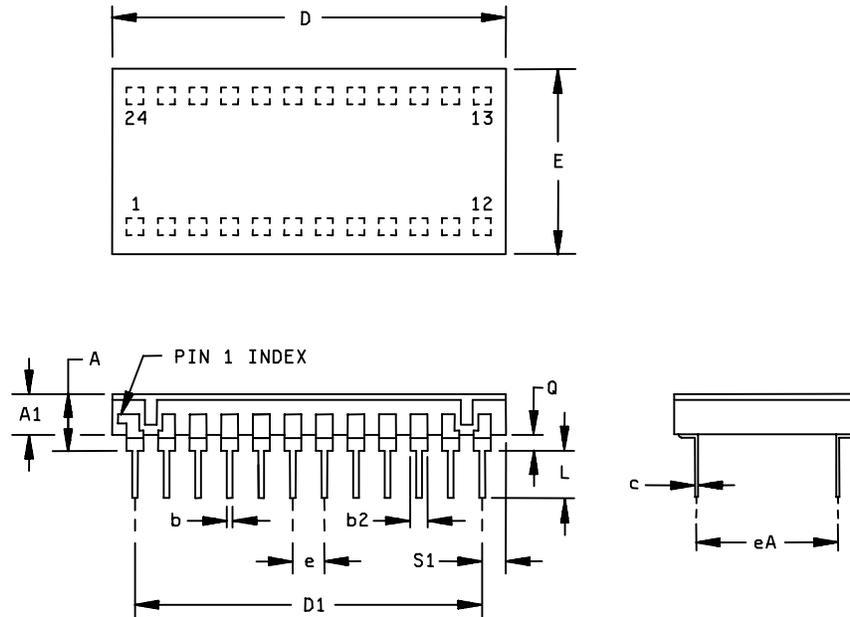
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Case outline X.



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		5.97		.235
A1		4.83		.190
b	0.41	0.51	.016	.020
b2	0.89	1.14	.035	.045
c	0.23	0.30	.009	.012
D		33.3		1.31
D1	27.81	28.07	1.095	1.105
e	2.41	2.67	.095	.105
eA	14.97	15.49	0.59	0.61
E		20.3		.80
L		5.08		0.200
Q	0.5	0.8	0.02	0.03
S1	2.41	2.67	0.095	0.105

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.

FIGURE 1. Case outline(s).

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Device type	01
Case outline	X
Terminal number	Terminal symbol
1	Bit 14 (LSB)
2	Bit 13
3	Bit 12
4	Bit 11
5	Bit 10
6	Bit 9
7	Bit 8
8	Bit 7
9	Bit 6
10	Bit 5
11	Bit 4
12	Bit 3
13	V _{DD}
14	Digital ground
15	EOC
16	Start convert
17	Bit 2
18	Bit 1 (MSB)
19	Analog ground
20	Analog input
21	+10 V reference out
22	V _{CC}
23	Analog ground
24	V _{EE}

FIGURE 2. Terminal connections.

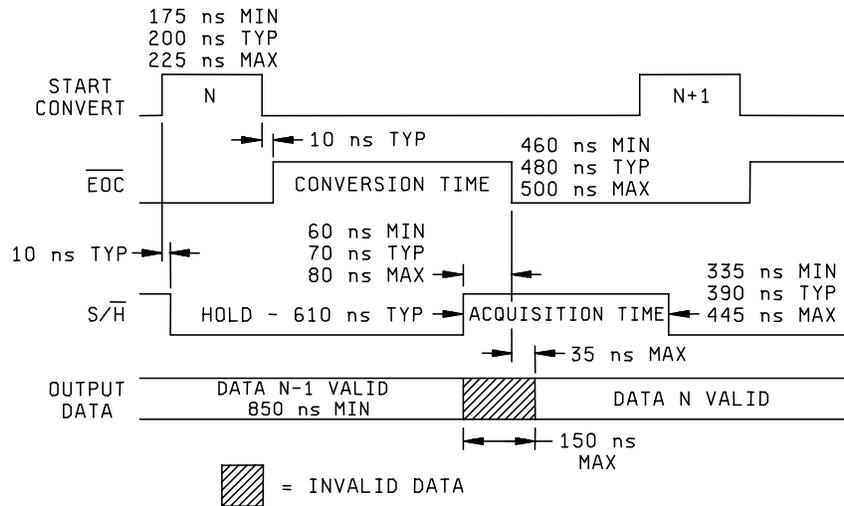


FIGURE 3. Timing diagram.

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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	---
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
End-point electrical parameters for radiation hardness assurance (RHA) devices	Not applicable

* PDA applies to subgroup 1.

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, 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 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 Radiation Hardness Assurance (RHA) inspection. RHA inspection is not currently applicable to this drawing.

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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-PRF-38534.

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, Post Office Box 3990, Columbus, Ohio 43216-5000, or telephone (614) 692-0536.

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 DSCC-VA and have agreed to this drawing.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 03-06-24

Approved sources of supply for SMD 5962-94757 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 DSCC-VA. This bulletin is superseded by the next dated revisions of MIL-HDBK-103 and QML-38534.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-9475701HXA	50721	ADS-927/883
5962-9475701HXC	50721	ADS-927/883

- 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.
- 3/ Not available from a QML source.

Vendor CAGE
number

50721

Vendor name
and address

Datel, Incorporated
11 Cabot Boulevard
Mansfield, MA 02048-1151

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