

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Update drawing boilerplate to most current format.	02-03-29	Raymond Monnin
B	Table II, add note to Group C end-point test parameters. -gz	09-06-16	Joseph D. Rodenbeck

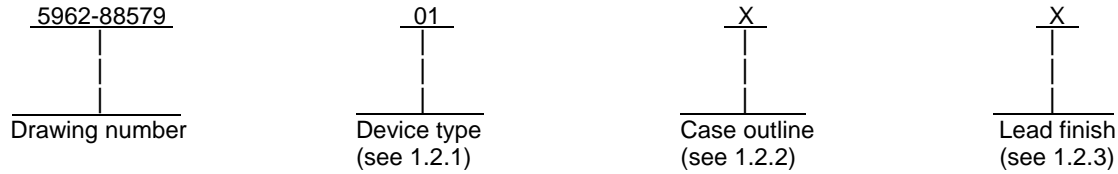
THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.

REV																			
SHEET																			
REV																			
SHEET																			
REV STATUS OF SHEETS	REV	B	B	B	B	B	B	B	B	B	B	B	B						
	SHEET	1	2	3	4	5	6	7	8	9	10								
PMIC N/A	PREPARED BY Donald R. Osborne				<p align="center">DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990 http://www.dsc.dla.mil</p>														
<p align="center">STANDARD MICROCIRCUIT DRAWING</p> <p>THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p align="center">AMSC N/A</p>	CHECKED BY Ray Monnin																		
	APPROVED BY Michael A. Frye				<p align="center">MICROCIRCUIT, HYBRID, LINEAR, FAST SETTLING VIDEO OPERATIONAL AMPLIFIER</p>														
	DRAWING APPROVAL DATE 88-11-30																		
	REVISION LEVEL B				SIZE A	CAGE CODE 67268	5962-88579												
				SHEET 1 OF 10															

1. SCOPE

1.1 Scope. This drawing describes device requirements for class H hybrid microcircuits to be processed in accordance with MIL-PRF-38534 and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN).

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



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

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>	<u>V_{IO} (T_A = +25°C)</u>
01	HOS-050A	Fast settling video operational amplifier	±15 mV
02	HOS-060SH	Fast settling video operational amplifier	±1.5 mV

1.2.2 Case outline(s). The case outline(s) shall be 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	12	Can package

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

1.3 Absolute maximum ratings. 1/

Supply voltage range (V _S).....	±18 V dc
Input voltage range.....	±18 V dc
Power dissipation (P _D), T _A = +25°C	1.5 W
Storage temperature range.....	-65°C to +150°C
Lead temperature (soldering, 10 seconds).....	+300°C
Junction temperature (T _J)	+165°C
Thermal resistance, junction-to-case (θ _{JC}).....	12°C/W
Thermal resistance, junction-to-ambient (θ _{JA})	98°C/W

1.4 Recommended operating conditions.

Ambient operating temperature range (T _A).....	-55°C to +125°C
--	-----------------

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.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 2

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 SPECIFICATION

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.
 MIL-STD-1835 - Interface Standard for 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 <http://assist.daps.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 class H 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. 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. The case outline 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.

3.3 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.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 3

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. 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 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 method 1015 of MIL-STD-883.
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
- b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 4

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _A ≤ +125°C V _S = ±15.0 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Input offset voltage	V _{IO}	R _S = 100 kΩ, T _A = +25°C	1	01		±15.0	mV
				02		±1.5 1/	
		R _S = 100 kΩ, T _A = -55°C to +125°C	2,3	01		±18.5	mV
				02		±5.0	
Temperature coefficient of input offset voltage	$\frac{\Delta V_{IO}}{\Delta T}$	T _A = -55°C to +125°C	2,3	All		±35	μV
Input offset current	I _{IO}	T _A = +25°C	1	All		±0.1	nA
		T _A = -55°C to +125°C	2,3			±25	
Input bias current	I _{IB}	T _A = +25°C	1	All		±2.0	nA
		T _A = -55°C to +125°C	2,3			±50	
Supply current	I _{CC}	T _A = +25°C	1	All		25	mA
		T _A = -55°C to +125°C	2,3			35	
Supply voltage rejection ratio	-SVRR	V ₋ = -12 V, (V ₊ = +15 V) V ₋ = -18 V	4,5,6	All	50		dB
	+SVRR	V ₊ = +12 V, (V ₋ = -15 V) V ₊ = +18 V	4,5,6	All	50		dB
Large signal voltage gain	AVS(±)	V _{OUT} = ±10 V, R _L = 200Ω	4,5,6	All	80		dB
Input voltage common mode rejection ratio	CMRR	V _{IN} = 10 V, T _A = +25°C	4	All	60		dB
		V _{IN} = 10 V, T _A = -55°C to +125°C	5,6		55		

See footnotes at end of table.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 5

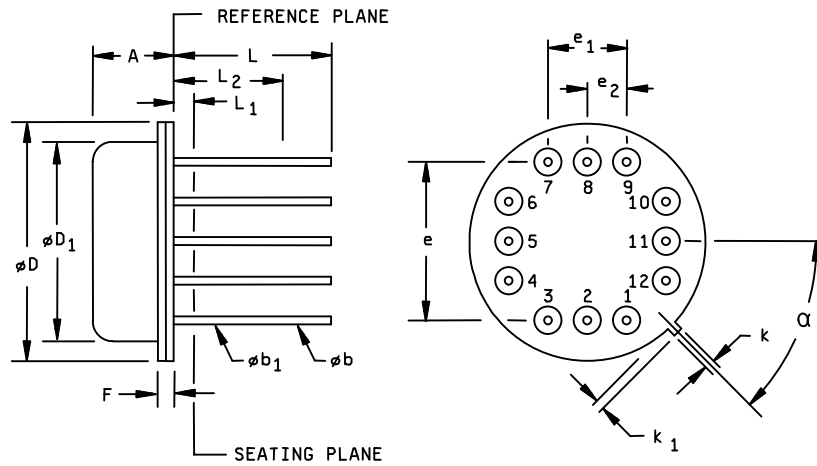
TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _A ≤ +125°C V _S = ±15.0 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Maximum output voltage swing	V _{OP}	R _L = 200Ω	1,2,3	All	±10		V
Voltage gain	A _V	R _L = 200Ω, f = 1.0 kHz	4,5,6	All	80		dB
Slew rate	SR	R _L = 200Ω, A _V = 2 or -1, T _A = +25°C	4	All	230		V/μs
		R _L = 200Ω, A _V = -1 T _A = -55°C to +125°C	5,6	All	210		V/μs
Settling time to 0.1% of final value	t _{SET}	A _V = -1, R _L = 200Ω T _A = +25°C	9	All		100	ns
		A _V = -1, R _L = 200Ω T _A = -55°C to +125°C	10,11	All		120	ns

1/ For group C end-point tests, the maximum input offset voltage (V_{IO}) limit for device type 02 is ±3.5 mV.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 6

Case outline X.



Symbol	Inches		Millimeters		Notes
	Min	Max	Min	Max	
A	.148	.181	3.76	4.60	
ϕb	.016	.019	.41	.48	1,5
ϕb_1	.016	.021	.41	.53	1,5
ϕD	.595	.605	15.11	15.37	
ϕD_1	.545	.555	13.84	14.10	
e	.400 BSC		10.16 BSC		3
e ₁	.200 BSC		5.08 BSC		3
e ₂	.100 BSC		2.54 BSC		3
F	.022	.030	.56	.76	
k	.026	.036	.66	.91	
k ₁	.026	.036	.66	.91	2
L	.500	.560	12.70	14.22	1
L ₁	---	.050	---	1.27	1
L ₂	.250	---	6.35	---	1
α	45° BSC		45° BSC		3

NOTES:

1. All leads ϕb applies between L₁ and L₂. ϕb_1 applies between L₂ and 0.500 (12.70 mm) from the reference plane. Diameter is uncontrolled in L₁ and beyond 0.500 (12.70 mm) from the reference plane.
2. Measured from the maximum diameter of the product.
3. Leads having a maximum diameter 0.019 (0.48 mm) measured in gauging plane 0.054 (1.37 mm) + 0.001 (0.03 mm) - 0.000 (0.00 mm) below the base plane of the product shall be within 0.007 (0.18 mm) of their true position relative to a maximum tab width.
4. The product may be measured by direct methods or by gauge.
5. All leads: Increase maximum limit by 0.003 (0.08 mm) when lead finish A is applied.

FIGURE 1. Case outline.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 7

Device types	All
Case outline	X
Terminal number	Terminal symbol
1	V+
2	Ground
3	Offset adjust*
4	Offset adjust*
5	Inverting input
6	Non-inverting input
7	No connection
8	Ground
9	V-
10	V-
11	Output
12	V+

*These pins are for connecting an optional offset adjust potentiometer. Recommended value is 10 k Ω with center arm connected to +15 V.

FIGURE 2. Terminal connections.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 8

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, 9
Group A test requirements	1, 2, 3, 4, 5, 6, 9, 10**, 11**
Group C end-point electrical parameters <u>1/</u>	1,2,3
End-point electrical parameters for radiation hardness assurance (RHA) devices	Not applicable

* PDA applies to subgroup 1.

** If not tested, shall be guaranteed to the specified limits of table I.

1/ As a minimum, for all Group C testing performed after June 16, 2009, manufacturers shall perform subgroups 1, 2, and 3 from the Group A electrical test table (Table C-Xa of MIL-PRF-38534).

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 and 8 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 method 1005 of MIL-STD-883.
 - (2) $T_A = +125^\circ\text{C}$, minimum.
 - (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.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 9

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

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 Defense Supply Center Columbus (DSCC) 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, 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 DSCC-VA and have agreed to this drawing.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE A		5962-88579
		REVISION LEVEL B	SHEET 10

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 09-06-16

Approved sources of supply for SMD 5962-88579 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 information bulletin is superseded by the next dated revisions of MIL-HDBK-103 and QML-38534. DSCC maintains an online database of all current sources of supply at <http://www.dscclia.mil/Programs/Smcr/>.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-8857901XC	<u>3/</u>	HOS-050A/883B
5962-8857902XC	<u>3/</u>	HOS-060SH/883B

- 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.
- 3/ Not available from an approved source of supply. The last known supplier is listed below.

Vendor CAGE
number

34031

Vendor name
and address

Analog Devices
7910 Triad Center Drive
Greensboro, NC 27409-9605

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