

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:

5962-87677	01	C	X
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

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

Device type	Generic number	Circuit function
01	HA-5330	High speed sample and hold amplifier

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
C	D-1 (14-lead, .785" x .310" x .200"), dual-in-line package
2	C-2 (20-terminal, .358" x .358" x .100"), square chip carrier package

1.3 Absolute maximum ratings.

Voltage between V+ and supply/signal ground	- - - - -	+20 V dc
Voltage between V- and supply/signal ground	- - - - -	-20 V dc
Voltage between supply ground and signal ground	- - - - -	±2.0 V dc
Differential input voltage	- - - - -	±24 V dc
Digital input voltage (S/H pin)	- - - - -	+8.0 V dc, -6.0 V dc
Output current I _O	- - - - -	±17 mA
Storage temperature range	- - - - -	-65°C to +150°C
Maximum power dissipation (P _D):		
Case C	- - - - -	1.33 W 2/
Case 2	- - - - -	1.32 W 3/
Lead temperature (soldering, 10 seconds)	- - - - -	+275°C
Thermal resistance, junction-to-case (θ _{JC}):		
Cases C and 2	- - - - -	See MIL-M-38510, appendix C
Thermal resistance, junction-to-ambient (θ _{JA}):		
Case C	- - - - -	75°C/W
Case 2	- - - - -	76°C/W
Junction temperature (T _J)	- - - - -	+175°C

1.4 Recommended operating conditions.

Operating supply voltage (V _{SUPPLY})	- - - - -	±15 V dc
Analog input voltage (V _I)	- - - - -	±10 V dc
Input logic low voltage (V _{IL})	- - - - -	0 V dc to 0.8 V dc
Input logic high voltage (V _{IH})	- - - - -	2.0 V dc to 5.0 V dc
Ambient operating temperature range (T _A)	- - - - -	-55°C to +125°C

1/ Internal power dissipation may limit output current below ±17 mA.

2/ Derate linearly above T_A = +75°C at 13.3 mW/°C.

3/ Derate linearly above T_A = +75°C at 13.2 mW/°C.

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2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

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 shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full ambient operating temperature range.

3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein

3.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < T _A < +125°C 1/ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Input offset voltage	V _{IO}		1,2,3		±2.0	mV
Input bias current	I _B ⁺		1,2,3		±500	nA
	I _B ⁻		1,2,3		±500	nA
Input offset current	I _{IO}		1,2,3		±500	nA
Open loop voltage gain	+A _{VOL}	R _L = 1 kΩ, V _{OUT} = +10 V	1,2,3	2X10 ⁶		V/V
	-A _{VOL}	R _L = 1 kΩ, V _{OUT} = -10 V	1,2,3	2X10 ⁶		V/V
Common mode rejection ratio	-CMRR	V ₊ = 25 V, V ₋ = -5.0 V, V _{OUT} = 10 V, S/H = 10.8 V	1,2,3	86		dB
	+CMRR	V ₊ = 5.0 V, V ₋ = -25 V, V _{OUT} = -10 V, S/H = -9.2 V	1,2,3	86		dB
Output current	+I _{OUT}	V _{OUT} = +10 V	1,2,3	10		mA
	-I _{OUT}	V _{OUT} = -10 V	1,2,3	-10		mA
Output voltage swing	+V _{OUT}	R _L = 1 kΩ	1,2,3	+10		V
	-V _{OUT}	R _L = 1 kΩ	1,2,3	-10		V
Power supply current	+I _{CC}		1,2,3		22	mA
	-I _{CC}		1,2,3		-23	mA
Power supply rejection ratio	+PSRR	V ₊ = +13.5 V, +16.5 V, V ₋ = -15 V, -15 V	1,2,3	86		dB

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _A < +125°C 1/ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Power supply rejection ratio	-PSRR	V ₊ = +15 V, +15 V, V ₋ = -13.5 V, -16.5 V	1,2,3	86		dB
Digital input current	I _{IN1}	V _{IN1} = 0 V	1,2,3		40	μA
	I _{IN2}	V _{IN2} = 5.0 V	1,2,3		40	μA
Digital input voltage	V _{IL}		1,2,3		0.8	V
	V _{IH}		1,2,3	2.0		V
Output voltage droop rate	V _D	See figure 2 2/	1,3		±10	μV/μs
		See figure 2	2		±100	μV/μs
Acquisition time 0.1%	+t _{acq1} (0.1%)	R _L = 2 kΩ, C _L = 50 pF, A _V = +1, V _{OUT} = 0 V, +10 V 2/	9,10,11		500	ns
	-t _{acq1} (0.1%)	R _L = 2 kΩ, C _L = 50 pF, A _V = +1, V _{OUT} = 0 V, -10 V 2/	9,10,11		500	ns
Acquisition time 0.01%	+t _{acq2} (0.01%)	R _L = 2 kΩ, C _L = 50 pF, A _V = +1, V _{OUT} = 0 V, +10 V 2/	9,10,11		900	ns
	-t _{acq2} (0.01%)	R _L = 2 kΩ, C _L = 50 pF, A _V = +1, V _{OUT} = 0 V, -10 V 2/	9,10,11		900	ns
Positive slew rate	+SR	V _{IN} = -10 V to +10 V, step measured from 25% to 75% R _L = 2 kΩ, C _L = 50 pF, A _V = +1 2/	9	55		V/μs
			10,11	40		
Negative slew rate	-SR	V _{IN} = +10 V to -10 V, step measured from 75% to 25% R _L = 2 kΩ, C _L = 50 pF, A _V = +1 2/	9	-55		V/μs
			10,11	-40		

1/ V₊ = +15 V, V₋ = -15 V, V_{IL} = 0.8 V (sample), V_{IH} = 2.0 V (hold), C_H = internal = 90 pF,
-IN tied to output and signal ground = supply ground, unless otherwise specified.

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

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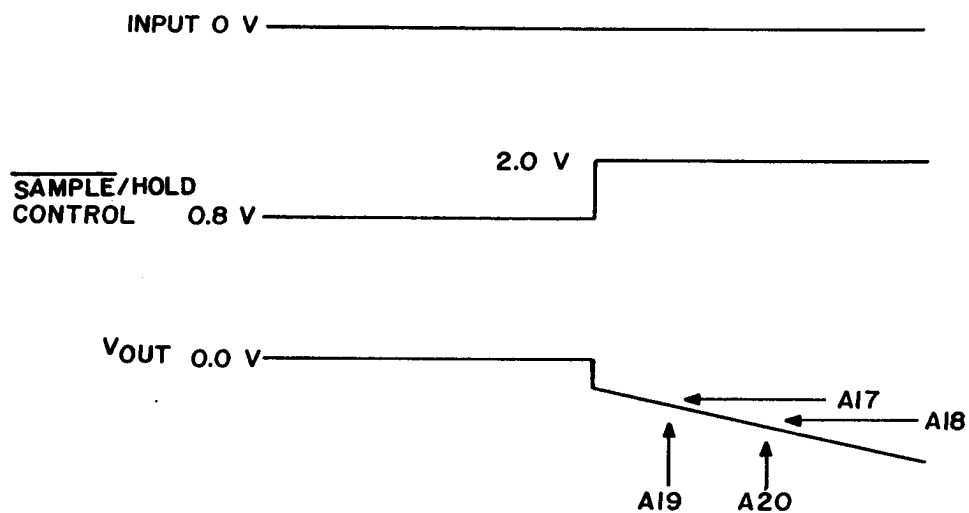
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Device type	01	01
Package	C	2
Terminal number	Terminal connection	Terminal connection
1	+IN	No connection
2	No connection	+IN
3	Offset adjust	No connection
4	Offset adjust	Offset adjust
5	V-	No connection
6	No connection	Offset adjust
7	Output	No connection
8	S/H control	V-
9	No connection	No connection
10	V+	Output
11	Supply ground	No connection
12	Signal ground	S/H control
13	No connection	No connection
14	-IN	V+
15	---	No connection
16	---	Supply ground
17	---	No connection
18	---	Signal ground
19	---	No connection
20	---	-IN

FIGURE 1. Terminal connections.

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Note: Droop rate = $\frac{A18 - A17}{A20 - A19}$. $A20 - A19 = 10 \text{ ms}$.

FIGURE 2. Droop rate waveforms.

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3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.8 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

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

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(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.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

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

b. Subgroups 4, 5, 6, 7, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

4.3.2 Groups C and D inspections.

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

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

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) $T_A = +125^{\circ}\text{C}$, minimum.

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

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*, 2, 3
Group A test requirements (method 5005)	1,2,3,9,10,11
Groups C and D end-point electrical parameters (method 5005)	1

* PDA applies to subgroup 1.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

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6.4 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has agreed to this drawing and a certificate of compliance (see 3.5 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>
5962-8767701CX	34371	HA1-5330/883
5962-87677012X	34371	HA4-5330/883

1/ 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

34371

Vendor name
and address

Harris Semiconductor
P.O. Box 883
Melbourne, FL 32901

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