

REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add device type 02 and RHA designator "R" requirements. Make changes to 1.2.2, 1.4, and Table I. Make a change to case outline X pin 32 under Figure 2. Add paragraphs 1.5, 4.4.4.1, and Table IIB. Delete AV <sub>CC</sub> , DV <sub>CC</sub> , and t <sub>CMIN</sub> tests as specified under Table I. - ro	08-10-31	R. HEBER
B	Add device type 03 tested at low dose rate. Make change to paragraphs 1.2.2, 1.4, and 1.5. Make changes to footnotes <u>1/</u> , <u>2/</u> , and <u>3/</u> as specified under Table I. Make change to Table IIB and paragraph 4.4.4.1. -rrp	11-06-14	C. SAFFLE

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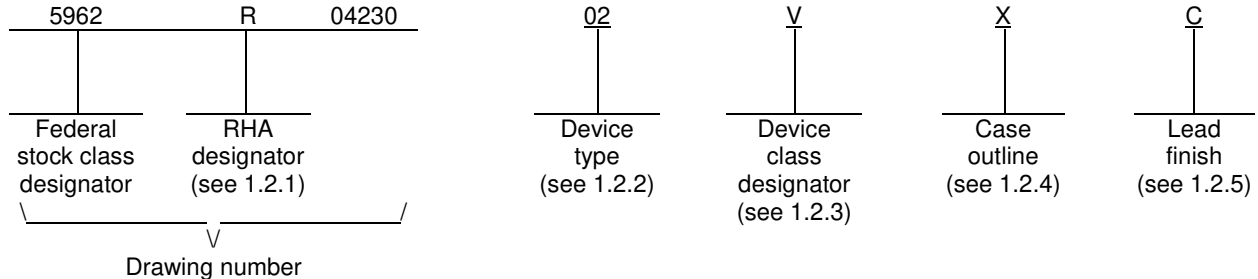
REV STATUS	REV	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13			

PMIC N/A	PREPARED BY DAN WONNELL	<p align="center"><b>DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990</b>  <a href="http://www.dsccl.dla.mil">http://www.dsccl.dla.mil</a></p>																	
<p align="center"><b>STANDARD MICROCIRCUIT DRAWING</b></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 RAYMOND MONNIN																		
	APPROVED BY RAYMOND MONNIN	<p align="center">MICROCIRCUIT, DIGITAL-LINEAR, A/D CONVERTER, 14-BIT, 80 MSPS, MONOLITHIC SILICON</p>																	
	DRAWING APPROVAL DATE 04-10-25																		
	REVISION LEVEL B	<table border="1"> <tr> <td>SIZE A</td> <td>CAGE CODE <b>67268</b></td> <td><b>5962-04230</b></td> </tr> </table>	SIZE A	CAGE CODE <b>67268</b>	<b>5962-04230</b>														
SIZE A	CAGE CODE <b>67268</b>	<b>5962-04230</b>																	
		SHEET	1 OF 13																

1. SCOPE

1.1 Scope. This drawing documents two product assurance class levels consisting of high reliability (device classes Q and M) and space application (device class V). 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 (RHA) levels is reflected in the PIN.

1.2 PIN. The PIN is as shown in the following example:



1.2.1 RHA designator. Device classes Q and V RHA marked devices meet the MIL-PRF-38535 specified RHA levels and are marked with the appropriate RHA designator. Device class M RHA marked devices meet the MIL-PRF-38535, appendix A specified RHA levels and are 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>Operating temperature</u>	<u>Circuit function</u>
01	AD6645	-35°C ≤ T <sub>C</sub> ≤ +85°C	A/D converter, 14-bit, 80 MSPS
02	AD6645	-55°C ≤ T <sub>A</sub> ≤ +125°C	Radiation hardened A/D converter, 14-bit, 80 MSPS
03	AD6645	-55°C ≤ T <sub>A</sub> ≤ +125°C	Radiation hardened A/D converter, 14-bit, 80 MSPS

1.2.3 Device class designator. The device class designator is a single letter identifying the product assurance level as follows:

<u>Device class</u>	<u>Device requirements documentation</u>
M	Vendor self-certification to the requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A
Q or V	Certification and qualification to MIL-PRF-38535

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	52	Quad flat pack with non-conductive tie bars

1.2.5 Lead finish. The lead finish is as specified in MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

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1.3 Absolute maximum ratings. 1/

Analog supply voltage (AV <sub>CC</sub> ) .....	0 V dc to 7 V dc
Digital supply voltage (DV <sub>CC</sub> ) .....	0 V dc to 7 V dc
Analog input voltage .....	0 V dc to AV <sub>CC</sub>
Analog input current .....	25 mA
Digital input voltage .....	0 V dc to AV <sub>CC</sub>
Digital output current .....	4 mA
Junction temperature (T <sub>J</sub> ) .....	+175°C
Lead temperature (soldering, 10 seconds) .....	+300°C
Storage temperature range .....	-65°C to +150°C
Thermal resistance, junction-to-case (θ <sub>JC</sub> ) .....	7.2°C/W

1.4 Recommended operating conditions.

Analog supply voltage (AV <sub>CC</sub> ) .....	4.75 V dc to 5.25 V dc
Digital supply voltage (DV <sub>CC</sub> ) .....	3.0 V dc to 3.6 V dc
Case operating temperature range (T <sub>C</sub> ) for device type 01 .....	-35°C to +85°C
Ambient operating temperature range (T <sub>A</sub> ) for device types 02 and 03 .....	-55°C to +125°C

1.5 Radiation features:

Device type 02:	
Maximum total dose available (dose rate = 50 – 300 rads(Si)/s) .....	100 krad (Si) <u>2/</u>
Device type 03:	
Maximum total dose available (dose rate ≤ 10 mrad(Si)/s) .....	50 krad (Si) <u>3/</u>

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-38535 - Integrated Circuits, Manufacturing, 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.daps.dla.mil/quicksearch/> or 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.
- 2/ These parts may be dose rate sensitive in a space environment and may demonstrate enhanced low dose rate effects. Radiation end point limits for the noted parameters are guaranteed only for the conditions as specified in MIL-STD-883, method 1019, condition A.
- 3/ For device type 03, radiation end point limits for the noted parameters are guaranteed for the conditions specified in MIL-STD-883, method 1019, condition D.

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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 requirements for device classes Q and V shall be in accordance with MIL-PRF-38535 and as specified herein 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. The individual item requirements for device class M shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein for device classes Q and V or MIL-PRF-38535, appendix A and herein for device class M.

3.2.1 Case outline. The case outline 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 Timing waveforms. The timing waveforms shall be as specified on figure 3.

3.2.4 Radiation exposure circuit. The radiation exposure circuit 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 and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table I and shall apply over the full case operating temperature range for device type 01 and ambient operating temperature range for device types 02 and 03.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table IIA. The electrical tests for each subgroup are defined in table I.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked. For packages where marking of the entire SMD PIN is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device. For RHA product using this option, the RHA designator shall still be marked. Marking for device classes Q and V shall be in accordance with MIL-PRF-38535. Marking for device class M shall be in accordance with MIL-PRF-38535, appendix A.

3.5.1 Certification/compliance mark. The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-PRF-38535. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, appendix A.

3.6 Certificate of compliance. For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.6.1 herein). For device class M, a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6.2 herein). The certificate of compliance submitted to DLA Land and Maritime-VA prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device classes Q and V, the requirements of MIL-PRF-38535 and herein or for device class M, the requirements of MIL-PRF-38535, appendix A and herein.

3.7 Certificate of conformance. A certificate of conformance as required for device classes Q and V in MIL-PRF-38535 or for device class M in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DLA Land and Maritime -VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change that affects this drawing.

3.9 Verification and review for device class M. For device class M, DLA Land and Maritime, DLA Land and Maritime'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.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 81 (see MIL-PRF-38535, appendix A).

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/ 2/ 3/</u> AV <sub>CC</sub> = 5 V, DV <sub>CC</sub> = 3.3 V, f <sub>c</sub> = 80 MSPS unless otherwise specified	Group A subgroups	Device type	Limits		Unit	
					Min	Max		
Resolution	RES	<u>4/ 5/</u>	1, 2, 3	All	14		Bits	
Offset error	O <sub>E</sub>		1, 2, 3	All	-10	+10	mV	
			M,D,P,L,R	1	02	-10		+10
			M,D,P,L	1	03	-10		+10
Gain error	A <sub>E</sub>		1, 2, 3	01	-10	+10	%FS	
			1	02, 03	-10	+10		
			2,3		-14	+14		
			M,D,P,L,R	1	02	-10		+10
			M,D,P,L	1	03	-10		+10
			Analog supply current	I <sub>AVCC</sub>	AV <sub>CC</sub> = 5.0 V	1, 2, 3		All
		M,D,P,L,R	1	02		320		
		M,D,P,L	1	03		320		
Digital supply current	I <sub>DVCC</sub>	DV <sub>CC</sub> = 3.3 V	1, 2, 3	All		45	mA	
			M,D,P,L,R	1	02			45
			M,D,P,L	1	03			45
Power consumption	P <sub>D</sub>	<u>4/</u>	1, 2, 3	All		1.75	W	
Differential input voltage	V <sub>DIFF</sub>	<u>5/</u>	1, 2, 3	01	0.4		V <sub>p-p</sub>	
Output voltage, logic "1"	V <sub>OH</sub>	DV <sub>CC</sub> = 3.3 V, I <sub>OH</sub> = 0 <u>5/</u>	1, 2, 3	01	2.85		V	
		DV <sub>CC</sub> = 3.3 V, I <sub>OH</sub> = 0 <u>4/</u>		02, 03	2.8			
Output voltage, logic "0"	V <sub>OL</sub>	DV <sub>CC</sub> = 3.3 V, I <sub>OL</sub> = 0 <u>5/</u>	1, 2, 3	01		0.5	V	
		DV <sub>CC</sub> = 3.3 V, I <sub>OL</sub> = 0 <u>4/</u>		02, 03		0.5		
No missing codes		<u>4/</u>	4,5,6	02, 03	0	0		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – continued.

Test	Symbol	Conditions <u>1/ 2/ 3/</u> AV <sub>CC</sub> = 5 V, DV <sub>CC</sub> = 3.3 V, f <sub>c</sub> = 80 MSPS unless otherwise specified	Group A subgroups	Device type	Limits		Unit			
					Min	Max				
Differential non-linearity	DNL	<u>6/</u>	4,5	02, 03	-1	1.5	LSB			
			6		-1	2.0				
		M,D,P,L,R	4	02	-1	1.5				
		M,D,P,L	4	03	-1	1.5				
Signal to noise ratio (SNR) at -1 dBFS	SNR	70.1 MHz <u>4/ 6/</u>	4, 5, 6	01	68.5		dB			
		150.1 MHz <u>4/ 6/</u>			67					
		30 MHz <u>4/ 6/</u>	4,5	02, 03	72					
			6		70.5					
		70 MHz <u>4/ 6/</u>	4,5		71.5					
			6		70					
		Signal to noise ratio and distortion (SINAD) at -1 dBFS	SINAD	70.1 MHz <u>4/ 6/</u>	4, 5, 6	01		68		dB
				150.1 MHz <u>4/ 6/</u>				65		
30 MHz <u>4/ 6/</u>	4,5			02, 03	71.5					
	6				70					
70 MHz <u>4/ 6/</u>	4,5				71					
	6				69.5					
Spurious free dynamic range (SFDR) at -1 dBFS	SFDR			70.1 MHz <u>4/ 6/</u>	4, 5, 6	01	76		dBc	
				150.1 MHz <u>4/ 6/</u>			67			
Worst case second or third harmonic at -1 dBFS	2nd or 3rd	30 MHz <u>4/ 6/</u>	4	02, 03	82		dB			
			5		80					
			6		79					
		70 MHz <u>4/ 6/</u>	4		82					
			5		80					
			6		79					
Worst case fourth or higher harmonic at -1 dBFS	4 th plus	30 MHz <u>4/ 6/</u>	4,5	02, 03	84		dB			
			6		80					
		70 MHz <u>4/ 6/</u>	4,5		84					
			6		80					

See footnotes at end of table.

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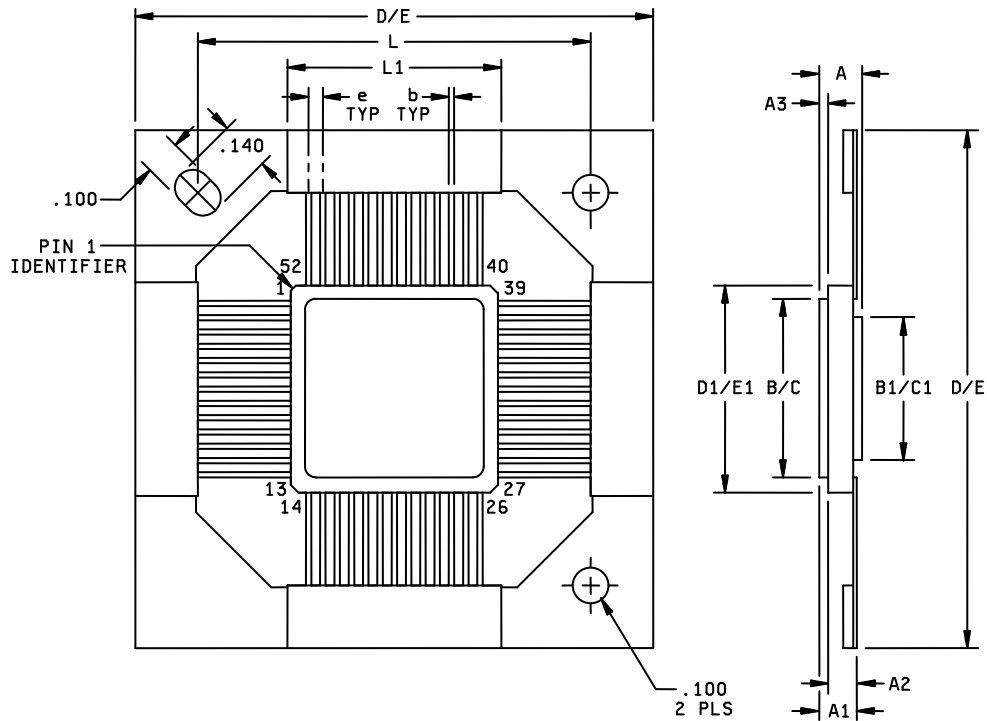
TABLE I. Electrical performance characteristics - continued.

Test	Symbol	Conditions <u>1/ 2/ 3/</u> AV <sub>CC</sub> = 5 V, DV <sub>CC</sub> = 3.3 V, f <sub>c</sub> = 80 MSPS unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Two tone intermodulation distortion (IMD) rejection	IMDR	At -7 dBFS, F1, F2 <u>4/ 6/ 7/</u>	4, 5, 6	01	75.5		dBc
ENCODE pulse width HIGH	t <sub>ENCH</sub>	<u>4/ 5/ 8/</u>	9, 10, 11	All	5.625		ns
ENCODE pulse width LOW	t <sub>ENCL</sub>	<u>4/ 5/ 8/</u>	9, 10, 11	All	5.625		ns
Encode rising to dataready falling	t <sub>DR</sub>	<u>4/ 5/</u>	9, 10, 11	All	1.0	3.1	ns
Encode rising to dataready rising	t <sub>E_DR</sub>	50% duty cycle <u>4/ 5/</u>	9, 10, 11	All	7.3	9.4	ns
ENCODE to DATA falling low	t <sub>E_FL</sub>	<u>4/ 5/</u>	9, 10, 11	All	2.4	7.0	ns
ENCODE to DATA rising low	t <sub>E_RL</sub>	<u>4/ 5/</u>	9, 10, 11	All	1.4	4.7	ns
ENCODE to DATA delay (hold time)	t <sub>H_E</sub>	<u>4/ 5/</u>	9, 10, 11	All	1.4	4.7	ns
ENCODE to DATA delay (setup time)	t <sub>S_E</sub>	<u>4/ 5/</u>	9, 10, 11	All	t <sub>ENC</sub> <sup>-</sup> t <sub>E_FL</sub> (MAX)	t <sub>ENC</sub> <sup>-</sup> t <sub>E_FL</sub> (MIN)	ns
		50% duty cycle <u>4/ 5/</u>			5.3	10.0	
Dataready to DATA delay (hold time)	t <sub>H_DR</sub>	50% duty cycle <u>4/ 5/ 9/</u>	9, 10, 11	All	6.6	7.9	ns
Dataready to DATA delay (setup time)	t <sub>S_DR</sub>	50% duty cycle <u>4/ 5/ 9/</u>	9, 10, 11	All	2.1	5.1	ns

- 1/ For device type 01; -35°C ≤ T<sub>C</sub> ≤ +85°C. For device types 02 and 03; -55°C ≤ T<sub>A</sub> ≤ +125°C.
- 2/ Device type 02 supplied to this drawing has been characterized through all levels M, D, P, L, R of irradiation. Device type 03 supplied to this drawing has been characterized through all levels M, D, P, L of irradiation. However, device type 02 is only tested at the "R" level and device type 03 is only tested at the "L" level. Pre and Post irradiation values are identical unless otherwise specified in Table I. When performing post irradiation electrical measurements for any RHA level, T<sub>A</sub> = +25°C.
- 3/ For device type 02, this part may be dose rate sensitive in a space environment and may demonstrate enhanced low dose rate effects. Radiation end point limits for the noted parameters are guaranteed only for the conditions specified in MIL-STD-883, method 1019, condition A for device type 02 and condition D for device type 03. Device type 03, has been tested at low dose rate.
- 4/ Not tested post irradiation.
- 5/ Parameter tested as part of device initial characterization and after design and process changes.
- 6/ All AC parameters tested by driving ENCODE and ENCODE differentially.
- 7/ F1 = 70.1 MHz, F2 = 72.1 MHz.
- 8/ Parameter is a function of t<sub>ENCL</sub> and t<sub>ENCH</sub>.
- 9/ Dataready to DATA delay (t<sub>H\_DR</sub> and t<sub>S\_DR</sub>) is dependent on t<sub>ENC</sub> and duty cycle.

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Case outline X



Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	.099	.131	2.155	3.327
A1	.090	.120	2.286	3.048
A2	.063	.077	1.600	1.956
A3	.019	.031	0.483	0.787
b	0.015 BSC		0.381 BSC	
B / C	.495	.505	12.573	12.827
B1 / C1	.395	.405	10.033	10.287
D / E	1.440	1.460	36.576	37.084
D1 / E1	.575	.585	14.605	14.859
e	.040 BSC		1.016 BSC	
L	1.090	1.110	27.686	28.194
L1	.590	.610	14.986	15.494

NOTE:

1. The U.S. Government preferred system of measurement is the metric S.I. system. However, since this item was originally designed using inch-pound units of measurements, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.
2. Dimensions B1/C1 identify the exposed heat sink.

FIGURE 1. Case outline.

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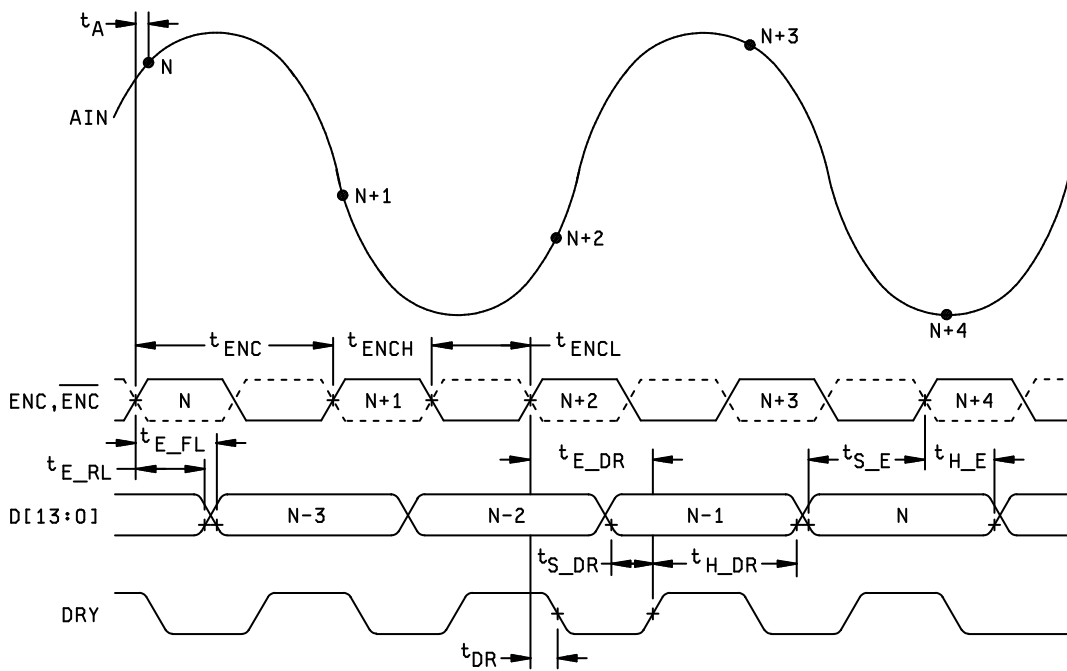


Device types	All
Case outline	X
Terminal number	Terminal symbol
1	DV <sub>CC</sub>
2	GND
3	VREF
4	GND
5	ENC
6	$\overline{\text{ENC}}$
7	GND
8	AV <sub>CC</sub>
9	AV <sub>CC</sub>
10	GND
11	A <sub>IN</sub>
12	$\overline{\text{A}}_{\text{IN}}$
13	GND
14	AV <sub>CC</sub>
15	GND
16	AV <sub>CC</sub>
17	GND
18	AV <sub>CC</sub>
19	GND
20	C1
21	GND
22	AV <sub>CC</sub>
23	GND
24	C2
25	GND
26	AV <sub>CC</sub>

Device types	All
Case outline	X
Terminal number	Terminal symbol
27	GND
28	AV <sub>CC</sub>
29	GND
30	AV <sub>CC</sub>
31	Do not connect
32	Do not connect
33	DV <sub>CC</sub>
34	GND
35	DMID
36	D0 (LSB)
37	D1
38	D2
39	D3
40	D4
41	D5
42	GND
43	DV <sub>CC</sub>
44	D6
45	D7
46	D8
47	D9
48	D10
49	D11
50	D12
51	D13 (MSB)
52	DRY

FIGURE 2. Terminal connections.

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NOTE: Normally,  $t_A = -500$  ps.

FIGURE 3. Timing waveforms.

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SIZE  
**A**

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REVISION LEVEL  
**B**

SHEET  
10

4. VERIFICATION

4.1 Sampling and inspection. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-PRF-38535 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. For device class M, sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. For device classes Q and V, screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection.

4.2.1 Additional criteria for device class M.

- 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 the preparing or acquiring activity upon request. 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 IIA herein.

4.2.2 Additional criteria for device classes Q and V.

- a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. 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.
- b. Interim and final electrical test parameters shall be as specified in table IIA herein.
- c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-PRF-38535. Inspections to be performed shall be those specified in MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Technology conformance inspection for classes Q and V shall be in accordance with MIL-PRF-38535 including groups A, B, C, D, and E inspections and as specified herein. Quality conformance inspection for device class M shall be in accordance with MIL-PRF-38535, appendix A and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection.

- a. Tests shall be as specified in table IIA herein.
- b. Subgroups 7 and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

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TABLE IIA. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)	Subgroups (in accordance with MIL-PRF-38535, table III)	
	Device class M	Device class Q	Device class V
Interim electrical parameters (see 4.2)	1	1	1
Final electrical parameters (see 4.2)	1,2,3,4,5,6, <u>1</u> / 9,10,11	1,2,3,4,5,6, <u>1</u> / 9,10,11	1,2,3,4,5,6, <u>1</u> / <u>2</u> / 9,10,11
Group A test requirements (see 4.4)	1,2,3,4,5,6,9,10,11	1,2,3,4,5,6,9, 10,11	1,2,3,4,5,6,9,10,11
Group C end-point electrical parameters (see 4.4)	1	1	1 <u>2</u> /
Group D end-point electrical parameters (see 4.4)	1	1	1
Group E end-point electrical parameters (see 4.4)	1,4	1,4	1,4

1/ PDA applies to subgroup 1.

2/ Delta limits as specified in table IIB shall be computed with reference to the previous interim electrical parameters. Delta parameters are excluded from PDA.

TABLE IIB. 240 hour burn-in and group C end-point electrical parameters.  $T_A = +25^\circ\text{C}$ .

Parameter	Device type	240 hour delta limits	Group C Delta limits	Units
I <sub>AVCC</sub>	02, 03	±6	±6	mA
I <sub>DVCC</sub>	02, 03	±2	±2	mA
O <sub>E</sub>	02, 03	±4	±4	mV

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

- a. 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 the preparing or acquiring activity upon request. 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.
- b.  $T_A = +125^\circ\text{C}$ , minimum.
- c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

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4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. 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.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein).

- a. End-point electrical parameters shall be as specified in table IIA herein.
- b. For device classes Q and V, the devices or test vehicle shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535 for the RHA level being tested. For device class M, the devices shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535, appendix A for the RHA level being tested. All device classes must meet the postirradiation end-point electrical parameter limits as defined in table I at  $T_A = +25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , after exposure, to the subgroups specified in table IIA herein.

4.4.4.1 Total dose irradiation testing. Total dose irradiation testing shall be performed in accordance with MIL-STD-883 method 1019, condition A device type 02, condition D for device type 03 and as specified herein.

## 5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

## 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.

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

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 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 using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users should inform DLA Land and Maritime when a system application requires configuration control and which SMD's are applicable 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) 692-0544.

6.4 Comments. Comments on this drawing should be directed to DLA Land and Maritime -VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0540.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535 and MIL-HDBK-1331.

6.6 Sources of supply.

6.6.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DLA Land and Maritime -VA and have agreed to this drawing.

6.6.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DLA Land and Maritime -VA.

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DATE: 11-06-14

Approved sources of supply for SMD 5962-04230 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 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 revision of MIL-HDBK-103 and QML-38535. DLA Land and Maritime maintains an online database of all current sources of supply at <http://www.dscc.dla.mil/Programs/Smcr/>.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-0423001QXC	24355	AD6645ASQ/QMLQ
5962R0423002VXC	24355	AD6645ASQ/QMLR
5962L0423003VXC	24355	AD6645ASQ/QMLL

- 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

24355

Vendor name  
and address

Analog Devices  
Route 1 Industrial Park  
P.O. Box 9106  
Norwood, MA 02062  
Point of contact: 7910 Triad Center Drive  
Greensboro, NC 27409-9605

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