

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Changes in accordance with NOR 5962-R261-92.	92-07-13	M. A. Frye
B	Redrawn with changes. Add device type 03. Editorial changes throughout.	95-07-17	M. A. Frye
C	Changes to table I. Editorial changes throughout. - drw	98-03-27	Raymond Monnin
D	Changes to table I, sheet 5. - drw	99-02-26	Raymond Monnin
E	Change test conditions of supply current tests in table I for device types 01 and 02 sheet 5. - drw	99-09-16	Raymond Monnin
F	Change in table I, sheet 5, for device types 01 and 02. - drw	00-01-03	Raymond Monnin

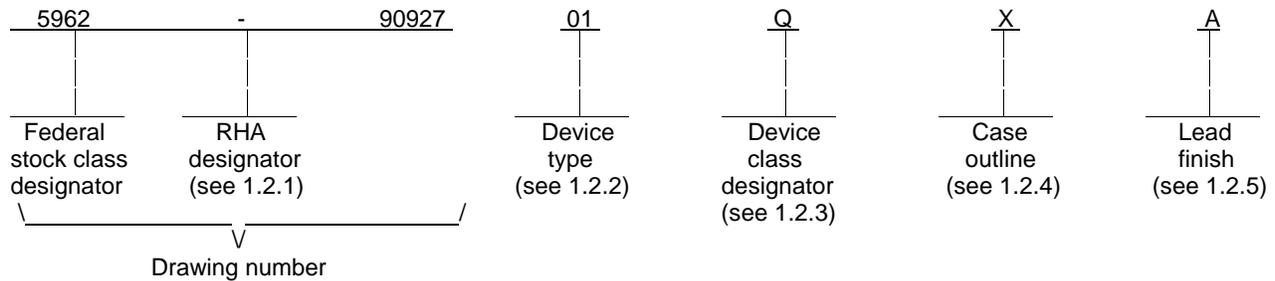
THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED

REV																			
SHEET																			
REV																			
SHEET																			
REV STATUS OF SHEETS	REV	F	C	C	C	F	C	C	C	C	C	C	C	C	C	C	C	C	C
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
PMIC N/A	PREPARED BY Dan Wonnell				DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216														
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY Charles E. Besore																		
	APPROVED BY Michael A. Frye				MICROCIRCUIT, LINEAR, ANALOG-TO-DIGITAL CONVERTER, VIDEO, 8-BIT, MONOLITHIC SILICON														
	DRAWING APPROVAL DATE 92-03-25																		
	REVISION LEVEL F				SIZE A	CAGE CODE 67268	5962-90927												
				SHEET 1 OF 14															

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 are 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>Circuit function</u>	<u>INL/DNL (T_A = +25°C)</u>
01	AD9048T	8-bit video analog-to-digital converter	0.5 LSB
02	AD9048S	8-bit video analog-to-digital converter	0.75 LSB
03	TS83048	8-bit video analog-to-digital converter	0.65 LSB

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	28	dual-in-line, side brazed
3	CQCC1-N28	28	square leadless chip carrier

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/

V _{CC} to DGND.....	-0.5 V dc to +7.0 V dc
AGND to DGND	-0.5 V dc to +0.5 V dc
V _{EE} to AGND	+0.5 V dc to -7.0 V dc
V _{IN} , V _{RT} or V _{RB} to AGND	+0.5 V to V _{EE}
Differential reference voltage (V _{RT} to V _{RB})	-2.2 V dc to +2.2 V dc
CONV, NMINV or NLINV to DGND	-0.5 V dc to +5.5 V dc
Applied output voltage to DGND	-0.5 V dc to +5.5 V dc <u>2/</u>
Applied output current, externally forced	-1.0 mA to +6.0 mA <u>3/</u> , <u>4/</u>
Output short-circuit duration.....	1.0 s <u>5/</u>
Junction temperature	+175°C
Thermal resistance, junction-to-case (θ _{JC})	
Case outline X	15°C/W
Case outline 3.....	21°C/W
Lead temperature, (soldering, 10 sec).....	+300°C
Storage temperature range.....	-65°C to +150°C

1.4 Recommended operating conditions.

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-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

- MIL-STD-883 - Test Method Standard Microcircuits.
- MIL-STD-973 - Configuration Management.
- MIL-STD-1835 - Interface Standard For Microcircuit Case Outlines.

HANDBOOKS

DEPARTMENT OF DEFENSE

- MIL-HDBK-103 - List of Standard Microcircuit Drawings (SMD's).
- 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.)

- 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/ Applied voltage must be current-limited to specified range.
- 3/ Forcing voltage must be limited to specified range.
- 4/ Current is specified as a negative when flowing into the device.
- 5/ Output High; one pin to ground; one second duration.

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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 outlines. The case outlines 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 Block diagram. The block or logic diagram shall be as specified on figure 3.

3.2.4 Output circuit. The output circuit shall be as specified on figure 4.

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 ambient 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. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103. For packages where marking of the entire SMD PIN number 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 DSCC-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 DSCC-VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-973.

3.9 Verification and review for device class M. For device class M, DSCC, DSCC'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 57 (see MIL-PRF-38535, appendix A).

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE A		5962-90927
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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _A ≤ +125°C V _{CC} = 5.0 V, V _{EE} = -5.2 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Positive supply current	+I _{CC}	<u>1/</u> , <u>2/</u>	1	01, 02		56	mA
			2, 3			58	
		<u>1/</u> , <u>2/</u> , <u>3/</u>	1	03		46	
			2, 3			48	
Negative supply current	-I _{CC}	<u>1/</u> , <u>2/</u>	1	01, 02		110	mA
			2, 3			120	
		<u>1/</u> , <u>2/</u> , <u>4/</u>	1	03		110	
			2, 3			120	
Analog input bias current	I _B	<u>1/</u> , <u>3/</u> , <u>4/</u> , <u>5/</u>	1	All		60	μA
			2, 3			100	
Analog input resistance	R _I	<u>1/</u> , <u>6/</u>	1	All	200		kΩ
			2, 3		40		
Reference ladder resistance	RR	<u>1/</u>	1, 2, 3	01, 02	30	125	Ω
Reference ladder current	I _{RC}	<u>1/</u> , <u>7/</u>	1, 2, 3	All		40	mA
Invert input logic "0" current	I _{IL}	<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>8/</u>	1, 2, 3	01, 02		200	μA
				03		400	
Invert input logic "1" current	I _{IH}	<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>9a/</u> , <u>9b/</u>	1, 2, 3	01, 02		750	μA
		<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>9a/</u>	1, 2, 3	03		250	
		<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>9b/</u>				10	
Digital output logic "0" voltage	V _{OL}	<u>1/</u> , <u>4/</u> , <u>10/</u> , <u>11/</u>	1, 2, 3	All		0.5	V
Digital output logic "1"	V _{OH}	<u>1/</u> , <u>10/</u> , <u>11/</u>	1, 2, 3	All	2.4		V
Short circuit current <u>12/</u>	I _{OS}	<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>13/</u>	1, 2, 3	All	-175	-30	mA
Conversion rate	F _S	<u>1/</u> , <u>7/</u> , <u>11/</u> , <u>14/</u>	9	01, 02	35		MSPS
				03	50		
Transient response		<u>1/</u> , <u>13/</u> , <u>14/</u> , <u>15/</u> , <u>27/</u>	9	01, 02		20	ns
		<u>1/</u> , <u>13/</u> , <u>14/</u> , <u>15/</u>		03		20	
Convert input logic "0" current	I _{IL}	<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>8/</u>	1, 2, 3	All		500	μA
Convert input logic "1" current	I _{IH}	<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>9a/</u> , <u>9b/</u>	1, 2, 3	01, 02		150	μA
		<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>9a/</u>	1, 2, 3	03		250	
		<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>9b/</u>	1, 2			40	
			3			10	
Convert pulse width <u>14/</u> (low)	t _{PWL}	<u>1/</u>	9	All	18		ns
Convert pulse width <u>14/</u> (high)	t _{PWH}	<u>1/</u>	9	All	10		ns

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 V _{CC} = 5.0 V, V _{EE} = -5.2 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Signal-to-noise ratio	SNR	A _{IN} = 1.248 MHz, <u>15</u> , <u>16</u> , T _A = +25°C	4	01	45		dB
		A _{IN} = 2.438 MHz, <u>15</u> , <u>16</u> , T _A = +25°C			44		
		A _{IN} = 1.248 MHz, <u>15</u> , <u>17</u> , T _A = +25°C			54		
		A _{IN} = 2.438 MHz, <u>15</u> , <u>17</u> , T _A = +25°C			53		
		A _{IN} = 1.248 MHz, <u>15</u> , <u>16</u> , T _A = +25°C	4	02, 03	43.5		
		A _{IN} = 2.438 MHz, <u>15</u> , <u>16</u> , T _A = +25°C			43		
		A _{IN} = 1.248 MHz, <u>15</u> , <u>17</u> , T _A = +25°C			52.5		
		A _{IN} = 2.438 MHz, <u>15</u> , <u>17</u> , T _A = +25°C			52		
		A _{IN} = 1.248 MHz, <u>16</u> , <u>18</u> / T _A = +25°C	4	01	45		
				02, 03	43.5		
Differential linearity	DNL	<u>19</u> /	4	01		0.5	LSB
			5, 6			0.75	
			4	02		0.75	
			<u>5</u> , 6			1.0	
			4	03		0.65	
			5, 6			0.75	
Integral linearity	INL	<u>19</u> /	4	01		0.5	LSB
			5, 6			0.75	
			4	02		0.75	
			5, 6			1.0	
			4	03		0.65	
			5, 6			0.75	
No missing codes	Q _{MISS}	<u>19</u> /	4, 5, 6	All			PASS/FAIL
Top of reference ladder offset	E _{OT}	<u>19</u> , <u>20</u> /	4, 5, 6	01, 02		12	mV
				03		20	
Bottom of reference ladder offset	E _{OB}	<u>19</u> , <u>21</u> /	4, 5, 6	01, 02		8	mV
				03		10	
Convert input logic "1" _ voltage	V _{IH}	<u>19</u> , <u>22</u> /	4, 5, 6	All	2.0		V
Convert input logic "0" voltage	V _{IL}	<u>19</u> , <u>22</u> /	4, 5, 6	All		0.8	V

See footnotes at end of table.

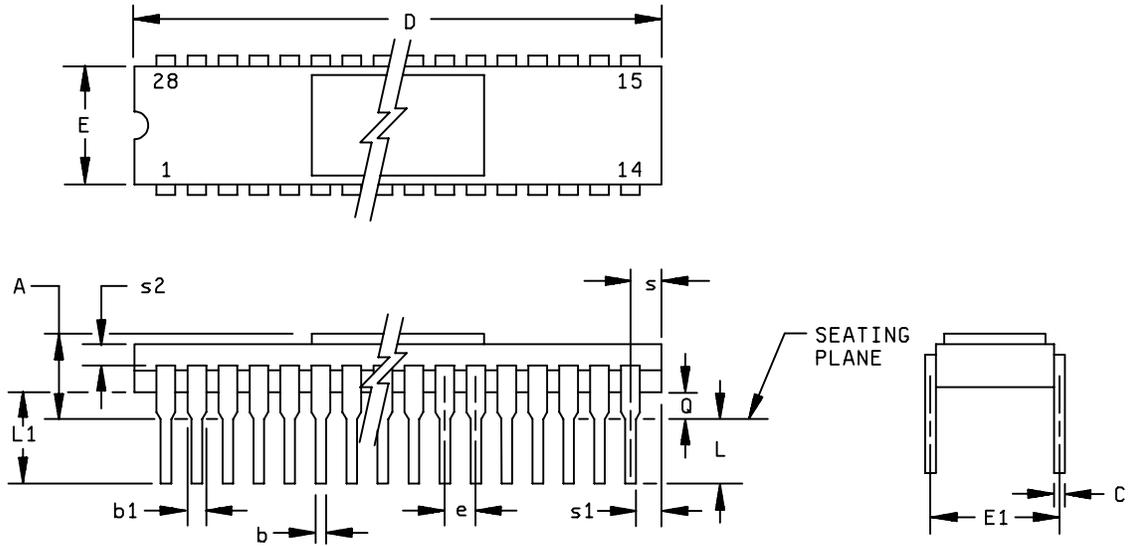
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TABLE I. Electrical performance characteristics - continued.

Test	Symbol	Conditions -55°C ≤ T _A ≤ +125°C V _{CC} = 5.0 V, V _{EE} = -5.2 unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Output propagation delay	t _{PD}	<u>1/</u> , <u>3/</u> , <u>7/</u> , <u>14/</u> , <u>23/</u> , <u>24/</u>	9	All		15	ns
Output rise time	t _R	<u>1/</u> , <u>14/</u> , <u>23/</u> , <u>25/</u>	9	All		9	ns
Output fall time	t _F	<u>1/</u> , <u>14/</u> , <u>23/</u> , <u>25/</u>	9	All		14	ns
Output hold time	t _{OH}	<u>1/</u> , <u>3/</u> , <u>4/</u> , <u>14/</u> , <u>23/</u> , <u>24/</u>	9	01, 02	5		ns
				03	4		
Output time skew	t _S	<u>1/</u>	9	All		7	ns
In-band harmonics		T _A = +25°C, <u>1/</u> , <u>26/</u>	4	01	49		dBc
		T _A = +25°C, <u>1/</u> , <u>26/</u> , <u>27/</u>		02	47		
				03	47		

- 1/ Differential reference voltage = 2.0 V.
- 2/ Tested worst case with all outputs low, and all digital inputs at logic "0".
- 3/ V_{CC} = 5.5 V.
- 4/ V_{EE} = -5.5 V.
- 5/ Measured with V_{IN} = 0V and CONVERT low.
- 6/ Calculate dV/dI. Measure input current at A_{IN} = +V_{RT} and -V_{RB} for dI.
- 7/ V_{EE} = -4.9 V.
- 8/ Tested logic "0" = 0.4 V.
- 9a/ Tested logic "1" = 2.4 V.
- 9b/ Tested logic "1" = 5.5 V.
- 10/ Output Logic "0" voltage measured at 10 mA current sink. Output Logic "1" voltage measured at 0.7 mA current source.
- 11/ V_{CC} = 4.5 V.
- 12/ The algebraic convention, whereby the most negative value is a minimum and the most positive a maximum, is used for these limits.
- 13/ Single output at logic high to ground, one second duration maximum.
- 14/ See figure 5.
- 15/ Measured at 20 MSPS encode rate with analog input 1 dB below full scale.
- 16/ RMS signal to RMS noise.
- 17/ Peak signal to RMS noise.
- 18/ Measured at 35 MSPS encode rate with analog input 1 dB below full scale.
- 19/ V_{CC} = 5.0 V nominal, V_{EE} = -5.2 V nominal, differential reference voltage = 2.0 V, +V_{REF} = 0 V, -V_{REF} = -2.0 V.
- 20/ V_{IN} = midpoint of code 0.
- 21/ V_{IN} = midpoint of code 255.
- 22/ Tested as Pass/Fail.
- 23/ Outputs terminated as shown in Figure 4.
- 24/ Measured from the 50% point of rising convert to 50% point of output data.
- 25/ Measured from output signal from 10% to 90% on all bits.
- 26/ Measured with analog input 1 dB below full scale.
- 27/ Parameter is guaranteed, but not tested.

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Ltr	Inches		Millimeters	
	Min	Max	Min	Max
A		.225		5.72
b	.014	.023	.36	.58
b1	.038	.085	.97	2.16
C	.008	.015	.20	.38
D		1.490		37.85
E	.500	.610	12.70	15.49
E1	.590	.620	14.99	15.75

Ltr	Inches		Millimeters	
	Min	Max	Min	Max
e	.100 BSC		2.54 BSC	
L	.125	.200	3.18	5.08
L1	.150		3.81	
Q	.015	.080	.38	2.03
s		.100		2.54
s1	.005		.13	
s2	.005		.13	

NOTE:

The US government preferred system of measurement is the metric SI system. However, since this item was originally designed using inch-pound units of measurement, in the event of conflict between the metric and inch-pound units, the inch-pound units shall take precedence.

FIGURE 1. Case outline.

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Device type	01, 02, 03
Case outline	X, 3
Terminal number	Terminal symbol
1	D1 (MSB)
2	D2
3	D3
4	D4
5	DGND
6	V _{CC}
7	V _{EE}
8	V _{EE}
9	V _{EE}
10	V _{CC}
11	DGND
12	NLINV
13	D5
14	D6
15	D7
16	D8 (LSB)
17	CONVERT
18	R _T
19	AGND
20	NC
21	NC
22	NC
23	V _{IN}
24	NC
25	AGND
26	R _B
27	R _M
28	NMINV

FIGURE 2. Terminal connections.

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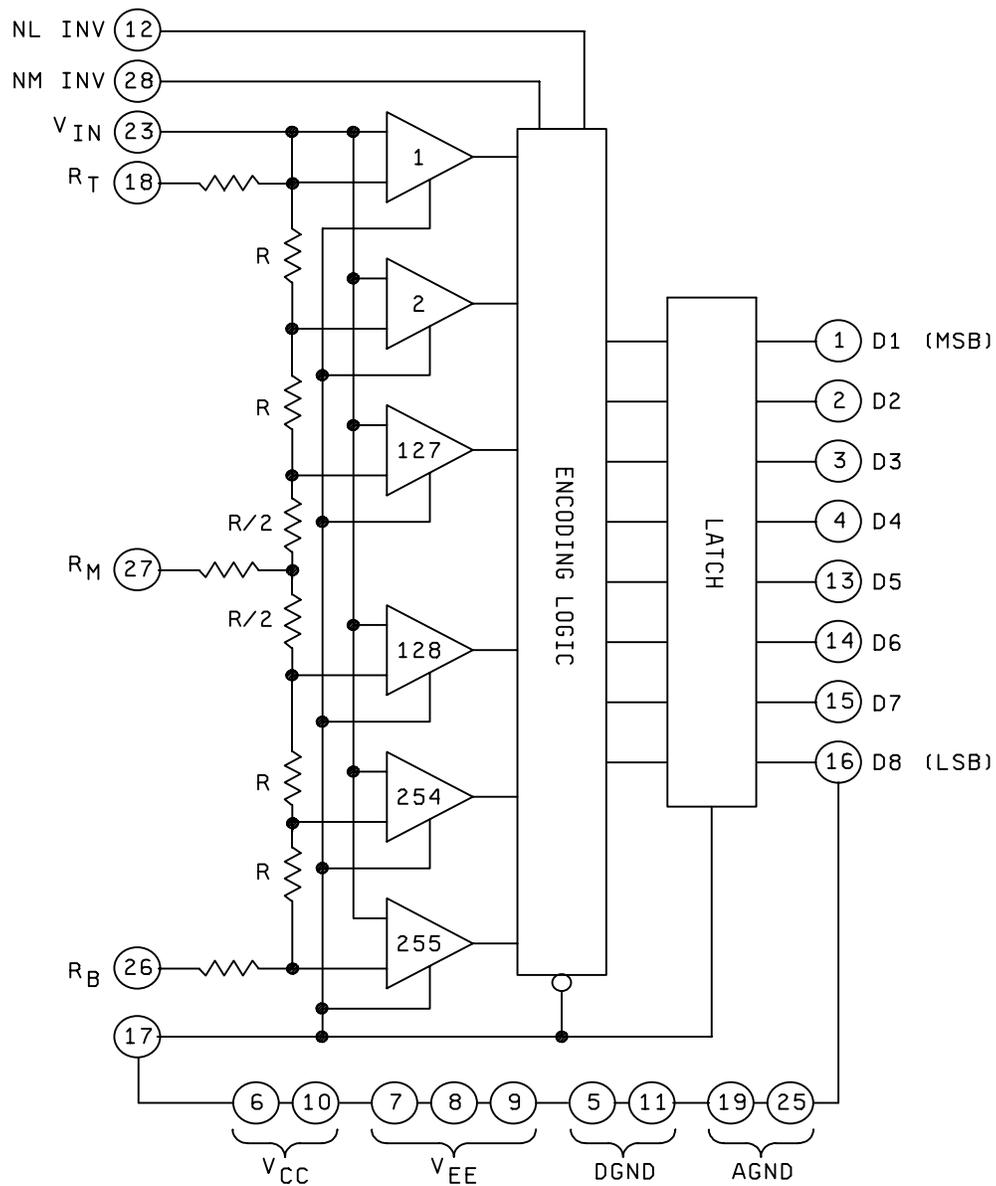


FIGURE 3. Block diagram.

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DEFENSE SUPPLY CENTER COLUMBUS
COLUMBUS, OHIO 43216-5000

SIZE
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C

SHEET

10

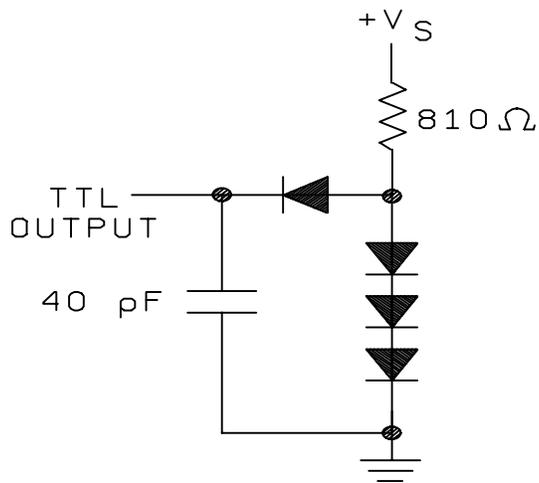


FIGURE 4. Output circuit.

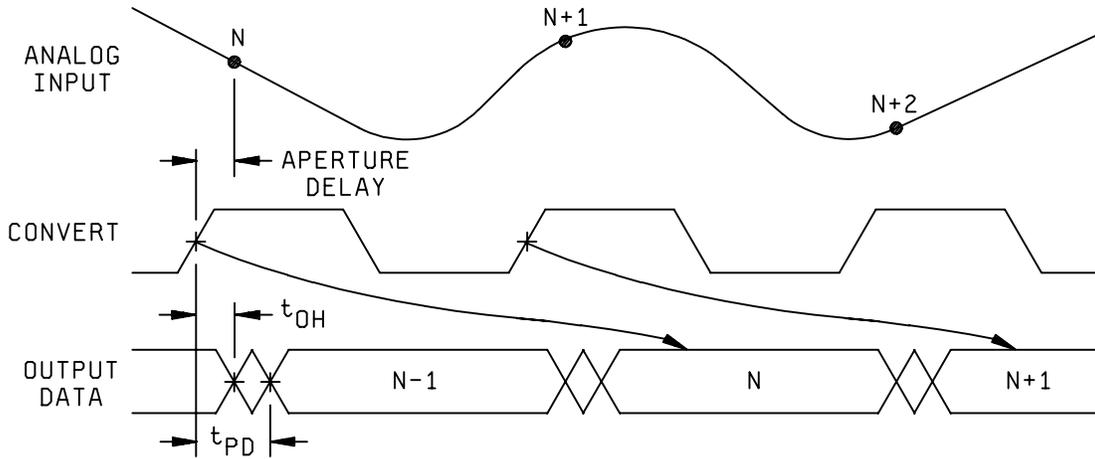


FIGURE 5. Timing waveforms.

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4. QUALITY ASSURANCE PROVISIONS

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 test method 1015.
 - (2) T_A = +125°C, minimum.
- b. Interim and final electrical test parameters shall be as specified in table II 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 test method 1015 of MIL-STD-883.
- b. Interim and final electrical test parameters shall be as specified in table II 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 except where option 2 of MIL-PRF-38535 permits alternate in-line control testing. 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 II herein.
- b. Subgroups 7, 8, 10, and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

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

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TABLE II. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, TM 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)	<u>1/</u> 1, 2, 3, 4, 5, 6, 9	<u>1/</u> 1, 2, 3, 4, 5, 6, 9	<u>1/</u> 1, 2, 3, 4, 5, 6, 9
Group A test requirements (see 4.4)	1, 2, 3, 4, 5, 6, 9	1, 2, 3, 4, 5, 6, 9	1, 2, 3, 4, 5, 6, 9
Group C end-point electrical parameters (see 4.4)	1	1	1
Group D end-point electrical parameters (see 4.4)	1	1	1
Group E end-point electrical parameters (see 4.4)	1	1	1

1/ PDA applies to subgroup 1.

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 test 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.

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 test 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 II herein.

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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 II 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 II herein.
- c. 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-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 in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users should inform Defense Supply Center Columbus when a system application requires configuration control and which SMD's are applicable to that system. 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) 692-0525.

6.4 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43216-5000, or telephone (614) 692-0674.

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 DSCC-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 DSCC-VA.

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