

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add device type 02. -gjc.	03-03-13	Raymond Monnin
B	Update drawing to the latest requirements. -sld	07-03-27	Robert M. Heber
C	Made changes to paragraphs 1.3 and 1.4 along with footnote 3, sheet 3. Table I, made corrections to Supply currents test, Address input currents test, Enable input current tests, Output leakage current tests, and the Switching tests. Changed footnote 1 to add power supply turn on sequence. Made corrections to Figures 2, 3, 4, and 5. -sld	10-05-05	Charles F. Saffle
D	Added radiation hardness assurance requirements. Table I: sheet 6, under the Group A subgroups column added footnote 4 for the Address input currents and Enable input current tests. Table I: sheet 7, under the Group A subgroups column added footnote 4 for all current tests. Updated drawing paragraphs. -sld	13-05-06	Charles F. Saffle
E	Updated drawing to the latest requirements of MIL-PRF-38534. -sld	21-05-18	James R. Eschmeyer
F	Table I; Corrected the max limit for the switching test t_{HL} from "1500 ns" to "5000" for subgroup 11 and added note 9 for this parameter. -sld	21-06-08	James R. Eschmeyer
G	Table I: Correct switching test t_{HL} maximum limit from "1500" ns to "2000" ns for subgroups 9 and 10. -gc	22-08-12	James R. Eschmeyer



Revision Status of Sheets

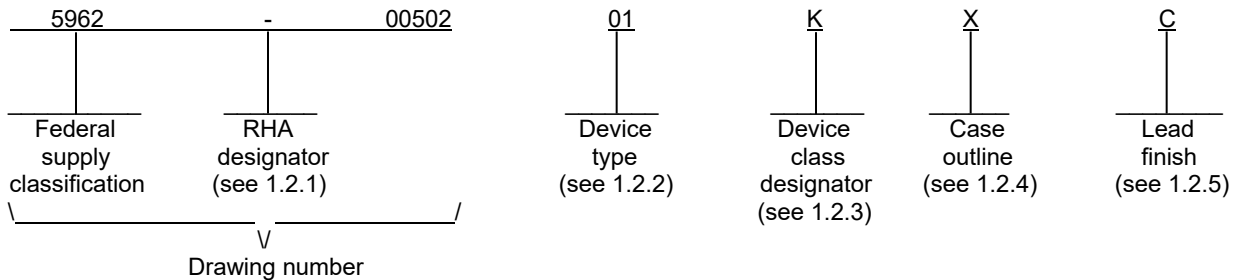
REV																					
SHEET																					
REV	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

PMIC N/A																					
<p align="center">STANDARD MICROCIRCUIT DRAWING</p> <p align="center">THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p>	PREPARED BY Gary Zahn									<p align="center">DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 https://www.dla.mil/LandandMaritime</p>											
	CHECKED BY Greg Cecil																				
	APPROVED BY Raymond Monnin									<p align="center">MICROCIRCUIT, HYBRID, LINEAR, 64 CHANNEL, ANALOG MULTIPLEXER</p>											
	DRAWING APPROVAL DATE 02-11-14																				
AMSC N/A		REVISION LEVEL G									SIZE A	CAGE CODE 67268	5962-00502								
											SHEET	1 OF 21									

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 are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of radiation hardness assurance levels is reflected in the PIN.

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



1.2.1 Radiation hardness assurance (RHA) designator. RHA marked devices meet the MIL-PRF-38534 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>
01	ACT8500	64 channel analog multiplexer, high impedance analog input with ESD protection, 32 channels Voltage, 32 channels Voltage and Current
02	ACT8501	64 channel analog multiplexer, high impedance analog input with ESD protection

1.2.3 Device class designator. This device class designator is 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	96	Ceramic quad flat pack

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

1.3 Absolute maximum ratings. 1/

Positive supply voltage between +V _{EE} and GND.....	+16.5 V dc
Negative supply voltage between -V _{EE} and GND.....	-16.5 V dc
V _{REF} to GND.....	+16.5 V dc
Digital input overvoltage range:	
V _{EN} (pins 5, 6, 91, and 92).....	(< V _{REF} + 4)V, (> GND - 4)V
V _A (pins 1, 3, 93, and 95).....	(< V _{REF} + 4)V, (> GND - 4)V
V _B (pins 2, 4, 94, and 96).....	(< V _{REF} + 4)V, (> GND - 4)V
Analog input overvoltage range.....	-18 V dc ≤ V _S ≤ +18 V dc
Power dissipation (P _D), T _C = -55°C to +125°C:	
Device type 01.....	99 mW
Device type 02.....	66 mW
Thermal resistance junction-to-case (θ _{JC}).....	5.5°C/W <u>2/</u>
Storage temperature.....	-65°C to +150°C
Lead temperature (soldering, 10 seconds).....	+300°C

1.4 Recommended operating conditions.

Positive supply voltage (+V _{EE}).....	+15 V dc <u>3/</u>
Negative supply voltage (-V _{EE}).....	-15 V dc <u>3/</u>
V _{REF}	+5 V dc <u>3/</u>
Logic low level voltage (V _{AL}).....	+0.8 V dc
Logic high level voltage (V _{AH}).....	+4.0 V dc
Case operating temperature range (T _C).....	-55°C to +125°C

1.5 Radiation features. 4/

Maximum Total Ionizing Dose (TID) (dose rate = 50 - 300 rad(Si)/s) ...	300 krad(Si) <u>5/ 6/</u>
Enhanced Low Dose Rate Sensitivity (ELDRS).....	150 krad(Si) <u>5/</u>
Single Event Phenomenon (SEP) effective linear energy transfer (LET):	
Single Event Latchup (SEL).....	Immune <u>5/</u>
Single Event Upset (SEU).....	≤ 86 MeV-cm ² /mg <u>7/</u>
Single Event Transient (SET).....	≤ 86 MeV-cm ² /mg <u>7/</u>

- 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.
- 2/ Based on the maximum power dissipation spread over all six die.
- 3/ Recommended power supply turn on sequence : +V_{EE}, -V_{EE}, followed by V_{REF}.
- 4/ See section 4.3.5 for the manufacturer's radiation hardness assurance analysis and testing.
- 5/ The only active element in these devices are purchased as SMD 5962F9563002V9A which assures TID, ELDRS, and SEL.
- 6/ The package in this drawing is a larger version of the same type (flat package) as the one in SMD 5962-95630, the lid underside is nickel plate (no gold), and IGA data shows negligible amounts of hydrogen.
- 7/ SEU and SET testing performed at 86 MeV-cm²/m with no upsets or single event transients. These devices will be re-tested after design or process changes that can affect RHA response of these devices.

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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 SPECIFICATIONS

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 <https://quicksearch.dla.mil/>.)

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 classes D, E, G, H, and K shall be in accordance with MIL-PRF-38534 as specified herein. Compliance with MIL-PRF-38534 shall 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(s). The case outline(s) 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 Truth table(s). The truth table(s) shall be as specified on figure 3.

3.2.4 Switching waveform(s). The switching waveform(s) shall be as specified on figure 4.

3.2.5 Block diagram. The block diagram shall be as specified on figure 5.

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 described 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.

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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 (DLA Land and Maritime-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 DLA Land and Maritime-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.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/ 2/</u> -55°C ≤ T _A ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Supply currents	+I _{EE}	V _{EN(0-63)} = V _{A(0-3)} = V _{B(0-3)} = 0	1,2,3	01	0.3	3	mA
				02	0.2	2	
	-I _{EE}	V _{EN(0-63)} = V _{A(0-3)} = V _{B(0-3)} = 0	1,2,3	01	-3	-0.3	mA
				02	-2	-0.2	
	+I _{SBY}	V _{EN(0-63)} = 4 V, V _{A(0-3)} = V _{B(0-3)} = 0 <u>3/</u>	1,2,3	01	0.3	3	mA
				02	0.2	2	
	I _{SBY}	V _{EN(0-63)} = 4 V, V _{A(0-3)} = V _{B(0-3)} = 0 <u>3/</u>	1,2,3	01	-3	-0.3	mA
				02	-2	-0.2	
Address input currents	I _{AL(0-3)B}	V _B = 0 V <u>2/</u>	1,2,3 <u>4/</u>	01,02	-2	2	μA
	I _{AH(0-3)B}	V _B = 5 V <u>2/</u>	1,2,3 <u>4/</u>	01,02	-2	2	μA
	I _{AL(0-3)A}	V _A = 0 V <u>2/</u>	1,2,3 <u>4/</u>	01	-4	4	μA
				02	-2	2	
	I _{AH(0-3)A}	V _A = 5 V <u>2/</u>	1,2,3 <u>4/</u>	01	-4	4	μA
Enable input current	I _{ENL(0-15)}	V _{EN(0-15)} = 0 V	1,2,3 <u>4/</u>	01,02	-1	1	μA
	I _{ENH(0-15)}	V _{EN(0-15)} = 5 V	1,2,3 <u>4/</u>	01,02	-1	1	μA
	I _{ENL(16-31)}	V _{EN(16-31)} = 0 V	1,2,3 <u>4/</u>	01,02	-1	1	μA
	I _{ENH(16-31)}	V _{EN(16-31)} = 5 V	1,2,3 <u>4/</u>	01,02	-1	1	μA
	I _{ENL(32-47)}	V _{EN(32-47)} = 0 V	1,2,3 <u>4/</u>	01	-2	2	μA
				02	-1	1	
	I _{ENH(32-47)}	V _{EN(32-47)} = 5 V	1,2,3 <u>4/</u>	01	-2	2	μA
				02	-1	1	
I _{ENL(48-63)}	V _{EN(48-63)} = 0 V	1,2,3 <u>4/</u>	01	-2	2	μA	
			02	-1	1		
I _{ENH(48-63)}	V _{EN(48-63)} = 5 V	1,2,3 <u>4/</u>	01	-2	2	μA	
				02	-1	1	μA

See footnotes at end of table.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ 2/ -55°C ≤ T _A ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Positive input leakage current (CH0-CH63)	+I _{SOFFOUTPUT(ALL)}	V _{IN} = +10 V, V _{EN} = 4 V, output and all unused inputs = -10 V <u>5/ 6/</u>	1,2,3 <u>4/</u>	01,02	-100	+700	nA
	+I _{SOFFCURRENT(ALL)}	V _{IN} = +10 V, V _{EN} = 4 V, output and all unused inputs = -10 V <u>5/ 6/</u>	1,2,3 <u>4/</u>	01,02	-100	+700	nA
Negative input leakage current (CH0-CH63)	-I _{SOFFOUTPUT(ALL)}	V _{IN} = -10 V, V _{EN} = 4 V, output and all unused inputs = +10 V <u>5/ 6/</u>	1,2,3 <u>4/</u>	01,02	-100	+700	nA
	-I _{SOFFCURRENT(ALL)}	V _{IN} = -10 V, V _{EN} = 4 V, output and all unused inputs = +10 V <u>5/ 6/</u>	1,2,3 <u>4/</u>	01,02	-100	+700	nA
Output leakage current outputs (pins 25, 26, 68, and 70) Currents (pins 67 and 69 Device Type 01 only)	+I _{DOFFOUTPUT(ALL)}	V _{OUT} = +10 V, V _{EN} = 4 V, output and all unused inputs = -10 V <u>6/ 7/</u>	1,2,3 <u>4/</u>	01,02	-100	+100	nA
	+I _{DOFFCURRENT(ALL)}	V _{OUT} = +10 V, V _{EN} = 4 V, output and all unused inputs = -10 V <u>6/ 7/</u>	1,2,3 <u>4/</u>	01,02	-100	+100	nA
	-I _{DOFFOUTPUT(ALL)}	V _{OUT} = -10 V, V _{EN} = 4 V, output and all unused inputs = +10 V <u>6/ 7/</u>	1,2,3 <u>4/</u>	01,02	-100	+100	nA
	-I _{DOFFCURRENT(ALL)}	V _{OUT} = -10 V, V _{EN} = 4 V, output and all unused inputs = +10 V <u>6/ 7/</u>	1,2,3 <u>4/</u>	01,02	-100	+100	nA
Input clamped voltage (CH0-CH63)	+V _{CLMP(0-63)}	V _{EN} = 4 V, all unused inputs are open <u>6/</u>	1	01,02	18.0	23.0	V
			2		18.0	23.5	
			3		17.5	22.5	
	-V _{CLMP(0-63)}	V _{EN} = 4 V, all unused inputs are open <u>6/</u>	1	01,02	-23.0	-18.0	V
			2		-23.5	-18.0	
			3		-22.5	-17.5	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/ 2/</u> -55°C ≤ T _A ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Switch ON resistance outputs (pins 25, 26, 68, and 70)	R _{DS(ON)(0-63)A}	V _{IN} = +15 V, V _{EN} = 0.8 V, I _{OUT} = -1 mA <u>5/ 6/ 8/</u>	1,2,3	01,02	500	3000	Ω
	R _{DS(ON)(0-63)B}	V _{IN} = +5 V, V _{EN} = 0.8 V, I _{OUT} = -1 mA <u>5/ 6/ 8/</u>	1,2,3	01,02	500	3000	Ω
	R _{DS(ON)(0-63)C}	V _{IN} = -5 V, V _{EN} = 0.8 V, I _{OUT} = +1 mA <u>5/ 6/ 8/</u>	1,2,3	01,02	500	3000	Ω
Switch ON resistance outputs (pins 67 and 69 Device type 01 only)	R _{DS(ON)(32-63)A}	V _{IN} = +15 V, V _{EN} = 0.8 V, I _{OUT} = -1 mA <u>5/ 6/ 8/</u>	1,2,3	01	500	3000	Ω
	R _{DS(ON)(32-63)B}	V _{IN} = +5 V, V _{EN} = 0.8 V, I _{OUT} = -1 mA <u>5/ 6/ 8/</u>	1,2,3	01	500	3000	Ω
	R _{DS(ON)(32-63)C}	V _{IN} = -5 V, V _{EN} = 0.8 V, I _{OUT} = +1 mA <u>5/ 6/ 8/</u>	1,2,3	01	500	3000	Ω
Switching tests	t _{AHL}	R _L = 10 kΩ, C _L = 50 pF, see figure 4.	9,10	01,02	10	2000	ns
			11 <u>9/</u>		10	5000	
	t _{ALH}	R _L = 10 kΩ, C _L = 50 pF, see figure 4.	9,10	01,02	10	2000	ns
			11		10	5000	
	t _{ONEN}	R _L = 1 kΩ, C _L = 50 pF, see figure 4.	9,10,11	01,02	10	1500	ns
t _{OFFEN}	R _L = 1 kΩ, C _L = 50 pF, see figure 4.	9,10,11	01,02	10	1000	ns	

- 1/ +V_{EE} = +15 V dc, -V_{EE} = -15 V dc, and V_{REF} = +5 V dc, unless otherwise specified. Recommended power supply turn on sequence : +V_{EE}, -V_{EE}, followed by V_{REF}.
- 2/ Measure inputs sequentially. Ground all unused inputs. V_A is the applied input voltage to the address lines A(0-3). V_B is the applied input voltage to the address lines B(0-3).
- 3/ If not tested, shall be guaranteed to the limits specified in table I.
- 4/ Subgroup 3 for these parameters is guaranteed, but not production tested.
- 5/ V_{IN} is the applied input voltage to the input channels (CH0-CH63).
- 6/ V_{EN} is the applied input voltage to the enable lines EN(0-15), EN(16-31), EN(32-47), and EN(48-63).
- 7/ V_{OUT} is the applied input voltage to the output lines (OUTPUT(1-15), OUTPUT(16-31), OUTPUT(32-47), OUTPUT(48-63), CURRENT(32-47), and CURRENT(48-63). (Current outputs for device type 01 only).
- 8/ Negative current is the current flowing out of each of the pins. Positive current is the current flowing into each of the pins.
- 9/ Subgroup 11 for this parameter is guaranteed with R_L = 10 kΩ, but production tested with No Load.

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Case outline X.

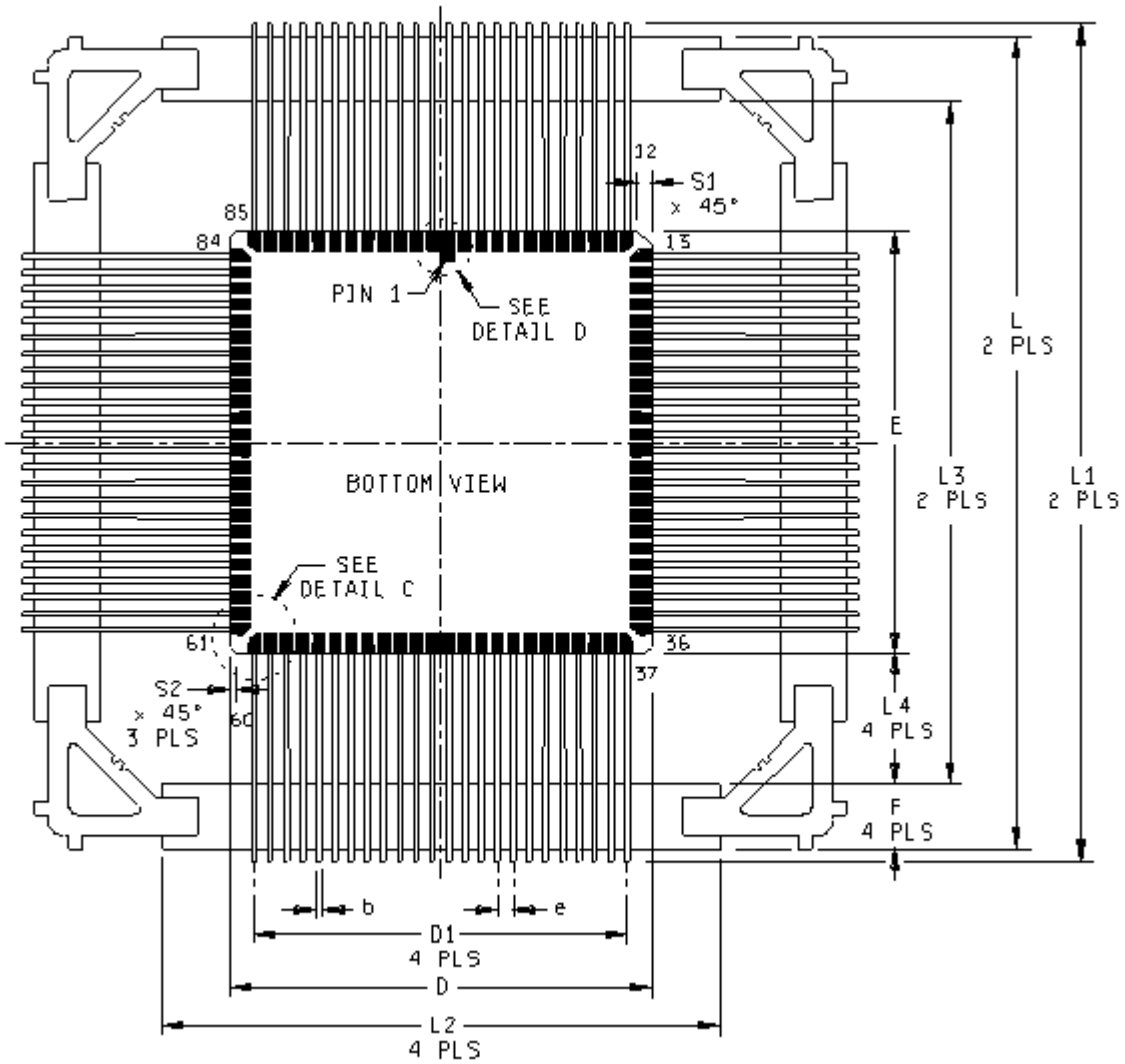


FIGURE 1. Case outline.

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Case outline X - Continued.

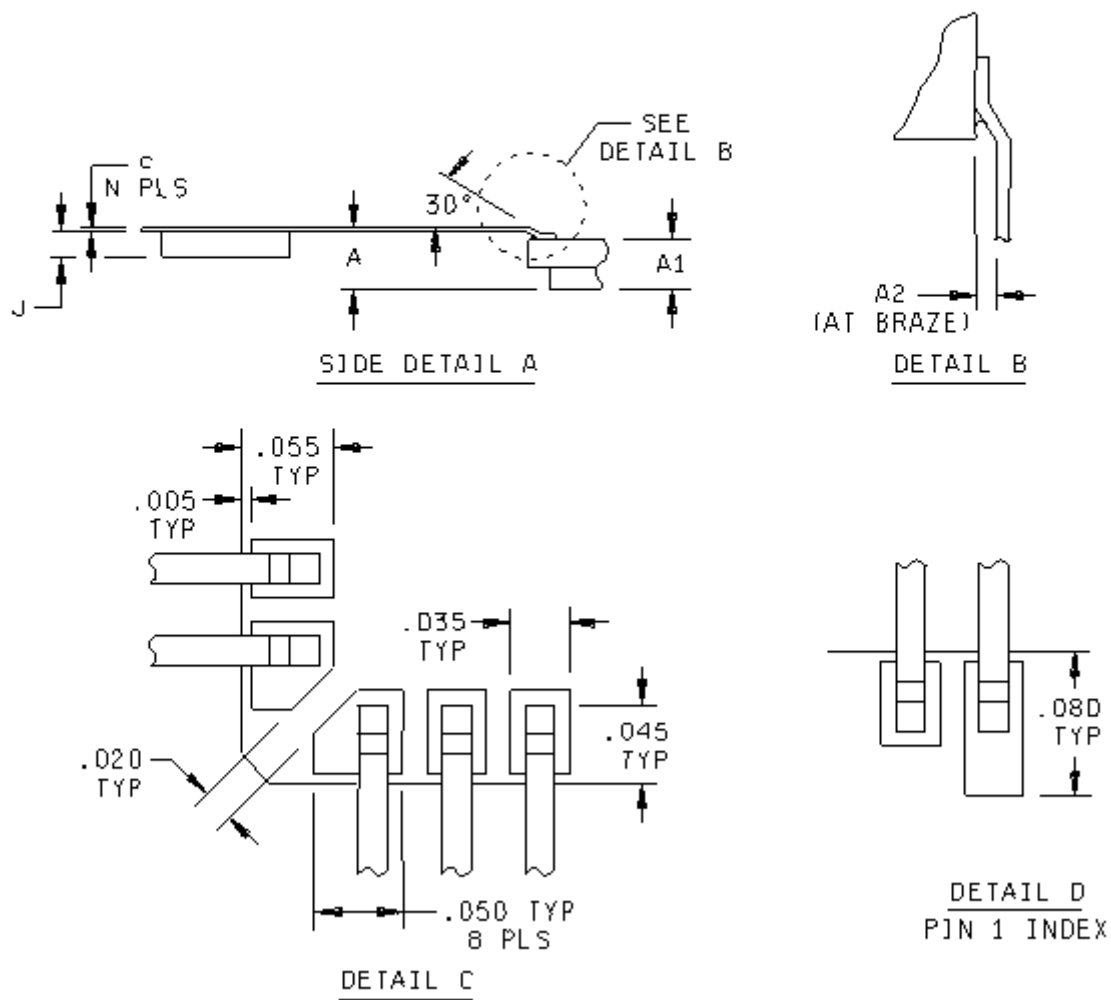


FIGURE 1. Case outline - Continued.

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Case outline X - Continued.

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		.200		5.08
A1		.180		4.57
A2	.005	.011	0.13	0.28
b	.0135	.0195	0.34	0.50
c	.005	.008	0.13	0.20
D/E	1.287	1.313	32.69	33.35
D1	1.145	1.155	29.08	29.34
e	.050 BSC		1.27 BSC	
F	.200 TYP		5.08 TYP	
J	.035 TYP		0.89 TYP	
L	2.490	2.510	63.25	63.75
L1		2.580		65.53
L2	1.700	1.740	43.18	44.20
L3	2.090	2.110	53.09	53.59
L4	.400 TYP		10.16 TYP	
N	96		96	
S1	.030 TYP		0.76 TYP	
S2	.015 TYP		0.38 TYP	

NOTES:

1. Pin 1 is indicated by an ESD triangle on top of the package and by an index on the bottom of the package.
2. 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.
3. N equals 96, the total number of leads on the package.
4. Pin numbers are for reference only.

FIGURE 1. Case outline - Continued.

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Device type	01				
Case outline	X				
Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	A2	33	CH11	65	CH49
2	B2	34	CH27	66	CH48
3	A3	35	CH12	67	OUTPUT I(48-63)
4	B3	36	CH28	68	OUTPUT V(48-63)
5	\overline{EN} (0-15)	37	CH13	69	OUTPUT I(32-47)
6	\overline{EN} (16-31)	38	CH29	70	OUTPUT V(32-47)
7	CH0	39	CH14	71	GND
8	CH16	40	CH30	72	GND
9	CH1	41	CH15	73	CH47
10	CH17	42	CH31	74	CH46
11	CH2	43	NC	75	CH45
12	CH18	44	+V _{EE}	76	CH44
13	CH3	45	NC	77	CH43
14	CH19	46	-V _{EE}	78	CH42
15	CH4	47	NC	79	CH41
16	CH20	48	V _{REF}	80	CH40
17	CH5	49	NC	81	CH39
18	CH21	50	Case GND	82	CH38
19	CH6	51	CH63	83	CH37
20	CH22	52	CH62	84	CH36
21	CH7	53	CH61	85	CH35
22	CH23	54	CH60	86	CH34
23	GND	55	CH59	87	CH33
24	GND	56	CH58	88	CH32
25	OUTPUT V(0-15)	57	CH57	89	GND
26	OUTPUT V(16-31)	58	CH56	90	GND
27	CH8	59	CH55	91	\overline{EN} (48-63)
28	CH24	60	CH54	92	\overline{EN} (32-47)
29	CH9	61	CH53	93	A0
30	CH25	62	CH52	94	B0
31	CH10	63	CH51	95	A1
32	CH26	64	CH50	96	B1

NOTE: NC is a no connect pin. NC pins should be grounded to eliminate or minimize electrostatic discharge (ESD) or static buildup.

FIGURE 2. Terminal connections.

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Device type	02				
Case outline	X				
Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	A2	33	CH11	65	CH49
2	B2	34	CH27	66	CH48
3	A3	35	CH12	67	NC
4	B3	36	CH28	68	OUTPUT V(48-63)
5	\overline{EN} (0-15)	37	CH13	69	NC
6	\overline{EN} (16-31)	38	CH29	70	OUTPUT V(32-47)
7	CH0	39	CH14	71	GND
8	CH16	40	CH30	72	GND
9	CH1	41	CH15	73	CH47
10	CH17	42	CH31	74	CH46
11	CH2	43	NC	75	CH45
12	CH18	44	+V _{EE}	76	CH44
13	CH3	45	NC	77	CH43
14	CH19	46	-V _{EE}	78	CH42
15	CH4	47	NC	79	CH41
16	CH20	48	V _{REF}	80	CH40
17	CH5	49	NC	81	CH39
18	CH21	50	Case GND	82	CH38
19	CH6	51	CH63	83	CH37
20	CH22	52	CH62	84	CH36
21	CH7	53	CH61	85	CH35
22	CH23	54	CH60	86	CH34
23	GND	55	CH59	87	CH33
24	GND	56	CH58	88	CH32
25	OUTPUT V(0-15)	57	CH57	89	GND
26	OUTPUT V(16-31)	58	CH56	90	GND
27	CH8	59	CH55	91	\overline{EN} (48-63)
28	CH24	60	CH54	92	\overline{EN} (32-47)
29	CH9	61	CH53	93	A0
30	CH25	62	CH52	94	B0
31	CH10	63	CH51	95	A1
32	CH26	64	CH50	96	B1

NOTE: NC is a no connect pin. NC pins should be grounded to eliminate or minimize electrostatic discharge (ESD) or static buildup.

FIGURE 2. Terminal connections - Continued.

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Truth table (CH0-CH15) and (CH16-CH31)							
B3	B2	B1	B0	\overline{EN} (0-15)	"ON" Channel <u>1/</u>	\overline{EN} (16-31)	"ON" Channel <u>2/</u>
X	X	X	X	H	None	H	None
L	L	L	L	L	CH0	L	CH16
L	L	L	H	L	CH1	L	CH17
L	L	H	L	L	CH2	L	CH18
L	L	H	H	L	CH3	L	CH19
L	H	L	L	L	CH4	L	CH20
L	H	L	H	L	CH5	L	CH21
L	H	H	L	L	CH6	L	CH22
L	H	H	H	L	CH7	L	CH23
H	L	L	L	L	CH8	L	CH24
H	L	L	H	L	CH9	L	CH25
H	L	H	L	L	CH10	L	CH26
H	L	H	H	L	CH11	L	CH27
H	H	L	L	L	CH12	L	CH28
H	H	L	H	L	CH13	L	CH29
H	H	H	L	L	CH14	L	CH30
H	H	H	H	L	CH15	L	CH31

- 1/ Between (CH0-CH15) and OUTPUT(0-15).
2/ Between (CH16-CH31) and OUTPUT(16-31).

Truth table (CH32-CH47) and (CH48-CH63)							
A3	A2	A1	A0	\overline{EN} (32-47)	"ON" Channel <u>1/</u>	\overline{EN} (48-63)	"ON" Channel <u>2/</u>
X	X	X	X	H	None	H	None
L	L	L	L	L	CH32	L	CH48
L	L	L	H	L	CH33	L	CH49
L	L	H	L	L	CH34	L	CH50
L	L	H	H	L	CH35	L	CH51
L	H	L	L	L	CH36	L	CH52
L	H	L	H	L	CH37	L	CH53
L	H	H	L	L	CH38	L	CH54
L	H	H	H	L	CH39	L	CH55
H	L	L	L	L	CH40	L	CH56
H	L	L	H	L	CH41	L	CH57
H	L	H	L	L	CH42	L	CH58
H	L	H	H	L	CH43	L	CH59
H	H	L	L	L	CH44	L	CH60
H	H	L	H	L	CH45	L	CH61
H	H	H	L	L	CH46	L	CH62
H	H	H	H	L	CH47	L	CH63

- 1/ Between (CH32-CH47) and OUTPUT(32-47) and CURRENT(32-47).
2/ Between (CH48-CH63) and OUTPUT(48-63) and CURRENT(48-63).

FIGURE 3. Truth table(s). (Device type 01).

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Truth table (CH0-CH15) and (CH16-CH31)							
B3	B2	B1	B0	\overline{EN} (0-15)	"ON" Channel 1/	\overline{EN} (16-31)	"ON" Channel 2/
X	X	X	X	H	None	H	None
L	L	L	L	L	CH0	L	CH16
L	L	L	H	L	CH1	L	CH17
L	L	H	L	L	CH2	L	CH18
L	L	H	H	L	CH3	L	CH19
L	H	L	L	L	CH4	L	CH20
L	H	L	H	L	CH5	L	CH21
L	H	H	L	L	CH6	L	CH22
L	H	H	H	L	CH7	L	CH23
H	L	L	L	L	CH8	L	CH24
H	L	L	H	L	CH9	L	CH25
H	L	H	L	L	CH10	L	CH26
H	L	H	H	L	CH11	L	CH27
H	H	L	L	L	CH12	L	CH28
H	H	L	H	L	CH13	L	CH29
H	H	H	L	L	CH14	L	CH30
H	H	H	H	L	CH15	L	CH31

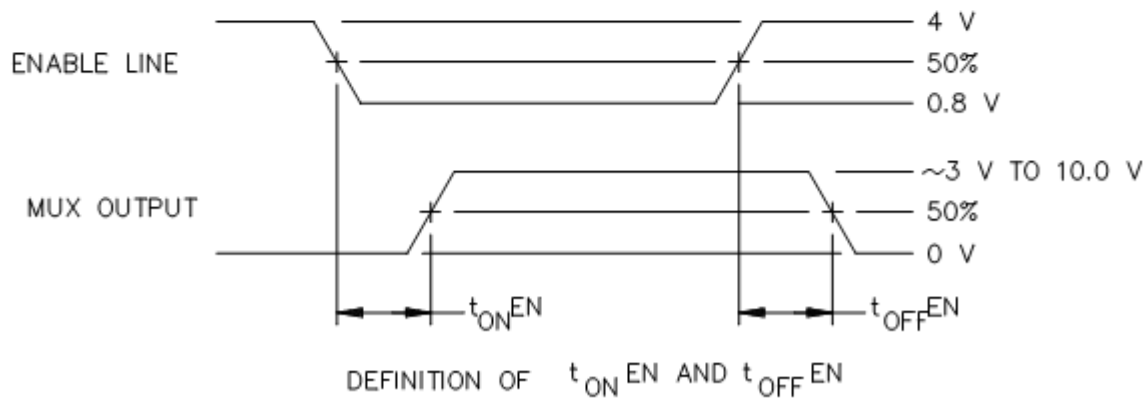
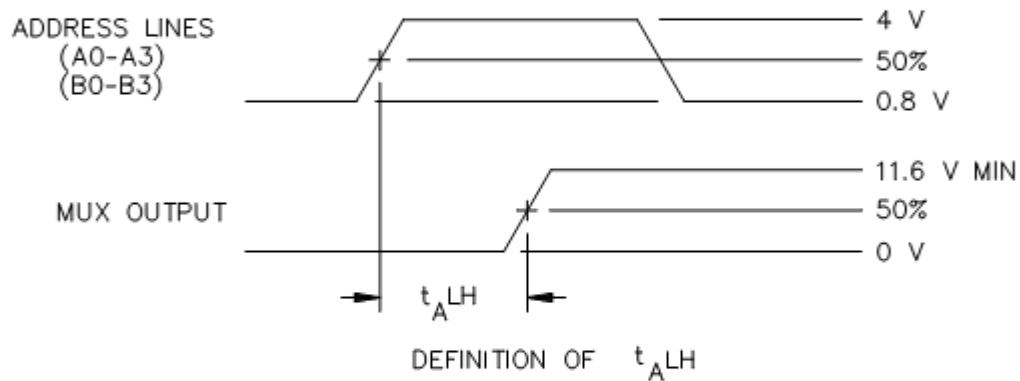
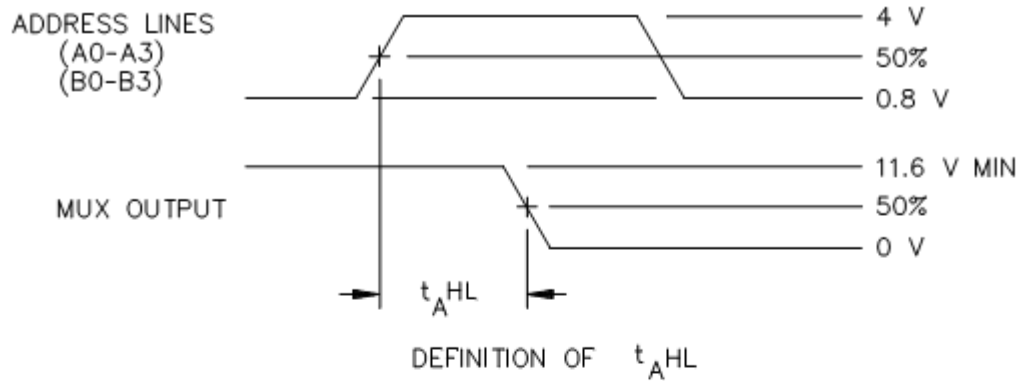
- 1/ Between (CH0-CH15) and OUTPUT(0-15).
 2/ Between (CH16-CH31) and OUTPUT(16-31).

Truth table (CH32-CH47) and (CH48-CH63)							
A3	A2	A1	A0	\overline{EN} (32-47)	"ON" Channel 1/	\overline{EN} (48-63)	"ON" Channel 2/
X	X	X	X	H	None	H	None
L	L	L	L	L	CH32	L	CH48
L	L	L	H	L	CH33	L	CH49
L	L	H	L	L	CH34	L	CH50
L	L	H	H	L	CH35	L	CH51
L	H	L	L	L	CH36	L	CH52
L	H	L	H	L	CH37	L	CH53
L	H	H	L	L	CH38	L	CH54
L	H	H	H	L	CH39	L	CH55
H	L	L	L	L	CH40	L	CH56
H	L	L	H	L	CH41	L	CH57
H	L	H	L	L	CH42	L	CH58
H	L	H	H	L	CH43	L	CH59
H	H	L	L	L	CH44	L	CH60
H	H	L	H	L	CH45	L	CH61
H	H	H	L	L	CH46	L	CH62
H	H	H	H	L	CH47	L	CH63

- 1/ Between (CH32-CH47) and OUTPUT(32-47).
 2/ Between (CH48-CH63) and OUTPUT(48-63).

FIGURE 3. Truth table(s). (Device type 02).

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NOTE: $f = 10 \text{ kHz}$, duty cycle = 50%.

FIGURE 4. Switching test waveform(s).

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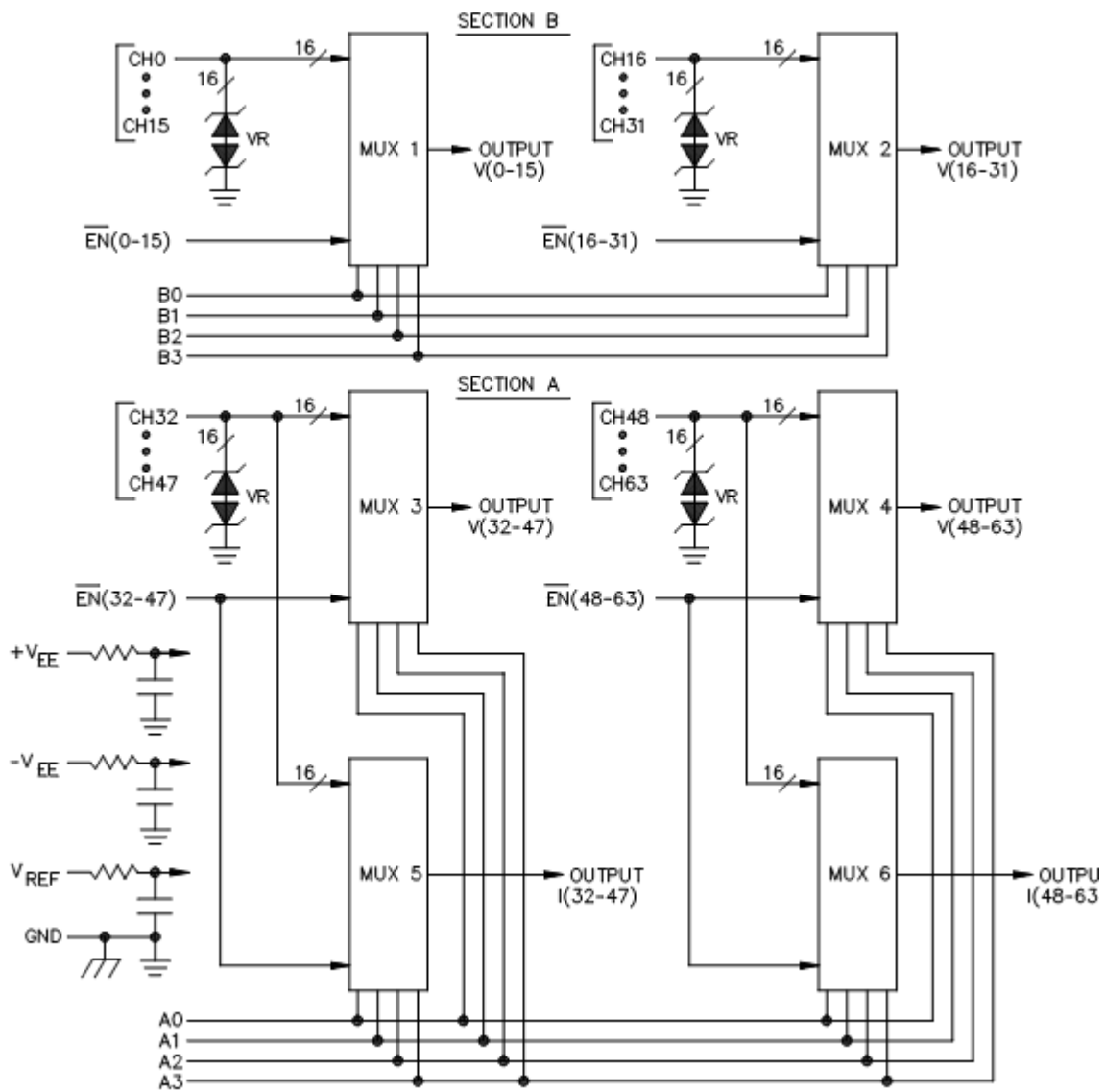


FIGURE 5. Block diagram. (Device Type 01)

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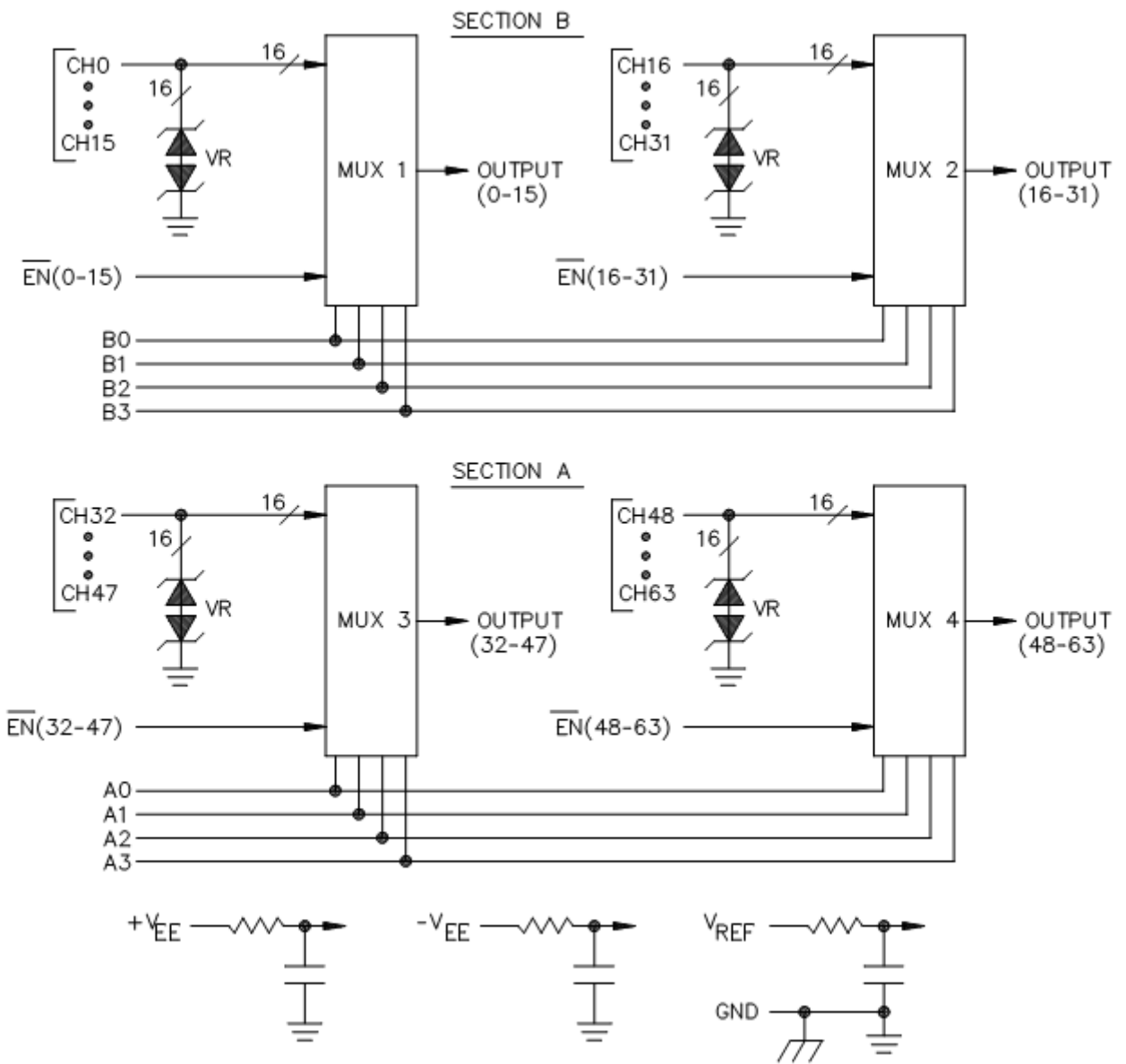


FIGURE 5. Block diagram - Continued. (Device Type 02)

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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	1, 9
Final electrical parameters	1*, 2, 3, 9, 10, 11
Group A test requirements	1, 2, 3, 9, 10, 11
Group C end-point electrical parameters	1, 2, 3, 9, 10, 11
End-point electrical parameters for radiation hardness assurance (RHA) devices	Not applicable

* PDA applies to subgroup 1.

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 DLA Land and Maritime -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) TA 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.

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 4, 5, 6, 7, and 8 shall be omitted.

4.3.2 Group B inspection (PI). Group B inspection shall be in accordance with MIL-PRF-38534.

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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 DLA Land and Maritime -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). RHA qualification is required only for those devices with the RHA designator as specified herein.

4.3.5.1 Radiation Hardness Assurance (RHA) inspection. RHA qualification is required for those devices with the RHA designator as specified herein. End-point electrical parameters for radiation hardness assurance (RHA) devices shall be specified in table II. Radiation testing will be in accordance with the qualifying activity (DLA Land and Maritime -VQ) approved plan and with MIL-PRF-38534, Appendix G.

- a. The hybrid device manufacturer shall establish procedures controlling component radiation testing, and shall establish radiation test plans used to implement component lot qualification during procurement. Test plans and test reports shall be filed and controlled in accordance with the manufacturer's configuration management system.
- b. The hybrid device manufacturer shall designate a RHA program manager to oversee component lot qualification, and to monitor design changes for continued compliance to RHA requirements.

4.3.5.1.1 Hybrid level RHA qualification. Hybrid level testing is not performed since the only active element other than diodes is a QML class V RHA-Radhard to level F (300 krad(Si) ELDRS and SEL free device. The hybrid package is a larger version of the class V flat package on 5962-95630 with a nickel underside lid, seam-sealed and with internal gas analysis data supporting negligible amounts of hydrogen in the package.

4.3.5.2 Qualification by similarity. The devices on this SMD are considered similar differing only in the number of 5962F9563002V9A die and the supporting diodes, capacitors, and resistors that go with each one.

4.3.5.3 Element level qualification.

4.3.5.3.1 Total ionizing dose irradiation. See SMD 5962-95630.

4.3.5.3.1.1 Single Event Phenomena (SEP). See SMD 5962-95630.

4.3.5.3.1.2 Radiation Lot Acceptance Testing (RLAT). The only active element other than diodes in these devices are purchased as 5962F9563002V9A. The radiation performance and post radiation electrical specifications in table I of this drawing are reflective of those specified in 5962-95630 device type 02.

4.3.5.4 Technologies not tested. Testing is not performed on device technologies including diodes, that the manufacturer considers to be radiation hardened.

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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 using DD Form 1692, Engineering Change Proposal, or email communication.

6.4 Record of users. Military and industrial users should inform DLA Land and Maritime when a system application requires configuration control and the applicable SMD 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) 692-8108.

6.5 Comments. Comments on this drawing should be directed to DLA Land and Maritime-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 DLA Land and Maritime-VA and have agreed to this drawing.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 22-08-12

Approved sources of supply for SMD 5962-00502 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38534 during the next revision. 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 DLA Land and Maritime-VA. This information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38534. DLA Land and Maritime maintains an online database of all current sources of supply at <https://landandmaritimeapps.dla.mil/programs/smcr/>.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-0050201KXC 5962F0050201KXC	88379 88379	ACT8500-S ACT8500-901-1S
5962-0050202KXC 5962F0050202KXC	88379 88379	ACT8501-S ACT8501-901-1S

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

88379

Vendor name
and address

Cobham Advanced Electronic Solutions Inc.
35 South Service Road
Plainview, NY 11803-4193

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