

REVISIONS													
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A	Changed to reflect MIL-H-38534 processing. Editorial changes throughout.	91-04-24	<i>W. Heckman</i>										
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REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A	A	A	
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12
PMIC N/A	PREPARED BY <i>Steve Ziska</i>		DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444										
STANDARDIZED MILITARY DRAWING <small>THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</small> AMSC N/A	CHECKED BY <i>Robert M. Hebel</i>												
	APPROVED BY <i>William K. Heckman</i>												
	DRAWING APPROVAL DATE 9 AUGUST 1989		SIZE A	CAGE CODE 67268	5962-89565								
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5962-E098

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

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

MILITARY

- MIL-M-38510 - Microcircuits, General Specification for.
- MIL-H-38534 - Hybrid Microcircuits, General Specification for.

STANDARD

MILITARY

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

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

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-H-38534 and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-H-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.2 herein.

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 Logic diagram(s). The logic diagram(s) shall be as specified on figure 4.

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

3.4 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.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions ^{1/} -55°C < T _A < +125°C V _{CC} = +15 V dc, V _{EE} = -15 V dc, V _{DD} = +5.0 V dc unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Analog inputs						
Input bias current, per channel	I _B	T _A = +25°C	1		±50	nA
Input impedance ^{2/}	Z _{IN}	ON channel, parallel, C _L = 100 pF	4,5,6		10,000	MΩ
	Z _{IN}	OFF channel, parallel, C _L = 10 pF				
Input fault current ^{2/}	I _F	Internally limited	1,2,3		20	mA
Common mode rejection ratio	CMRR	At 1.0 kHz, 20 V _{p-p} on differential input T _A = +25°C	4	70		dB
MUX crosstalk		Any OFF channel to any ON channel at 1.0 kHz, 20 V _{p-p} T _A = +25°C	4		-80	dB
Input offset voltage ^{2/}	V _{OS}	Channel to channel	1,2,3		±500	μV
Accuracy						
Offset error voltage	V _{OE}	V _{IN} = ±10 V, T _A = +25°C	1		±4.0	mV
Linearity error	L _E		1		±0.005	%FSR
			2,3		±0.010	
Noise error	N _E	At 1.0 mV _{p-p}	4	0.1	1.0	MHz
		At 2.0 mV _{p-p}	5,6			
Gain error	A _E	T _A = +25°C	4		±0.02	%FSR

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _A < +125°C ^{1/} V _{CC} = +15 V dc, V _{EE} = -15 V dc, V _{DD} = +5.0 V dc unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Temperature drift						
Gain drift	ΔA _E /ΔT	V _{IN} = 0 V, T _A = -55°C, +125°C	5,6		±2.0	ppm/°C
Offset drift	ΔV _{OE} /ΔT	V _{IN} = ±10 V, T _A = -55°C, +125°C	2,3		±4.0	ppm/°C
Power supply requirements						
Positive supply current	I _{CC}	No load, grounded	1,2,3		30	mA
Negative supply current	I _{EE}	Inputs track mode	1,2,3		30	mA
Logic supply current	I _{DD}		1,2,3		40	mA
Sample and hold dynamics						
Acquisition time	t _{ACQ}	For 20 V step to ± 0.01% of final value ^{3/}	9,10,11	7.0	10	μs
Sample to hold step		T _A = +25°C	1		6.0	mV
Settling time	t _s	Hold mode to ±1.0 mV of final value	9,10,11		600	ns
Feedthrough	F _T	At 1.0 kHz, 20 V _{p-p} T _A = +25°C	4	-70	-60	dB
Droop rate	V _{DRP}	T _A = +25°C	4		1.0	mV/ms
Aperture delay ^{2/}	t _{AD}		9,10,11		225	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} = +15 V dc, V _{EE} = -15 V dc, V _{DD} = +5.0 V dc unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Sample and hold dynamics - Continued.						
Aperture uncertainty z/t_{AU}			9,10,11		10	ns
Functional test		See 4.3.1c and figure 3	7,8			

- 1/ The power supplies should be sequenced in this order V_{CC}, V_{EE}, and V_{DD} to avoid latch-up.
- 2/ Parameters shall be tested as part of device initial characterization and after design and process change. Parameter shall be guaranteed to the limits specified in table I for all lots not specifically tested.
- 3/ For optimum acquisition time performance the analog input should be buffered with a low output impedance.

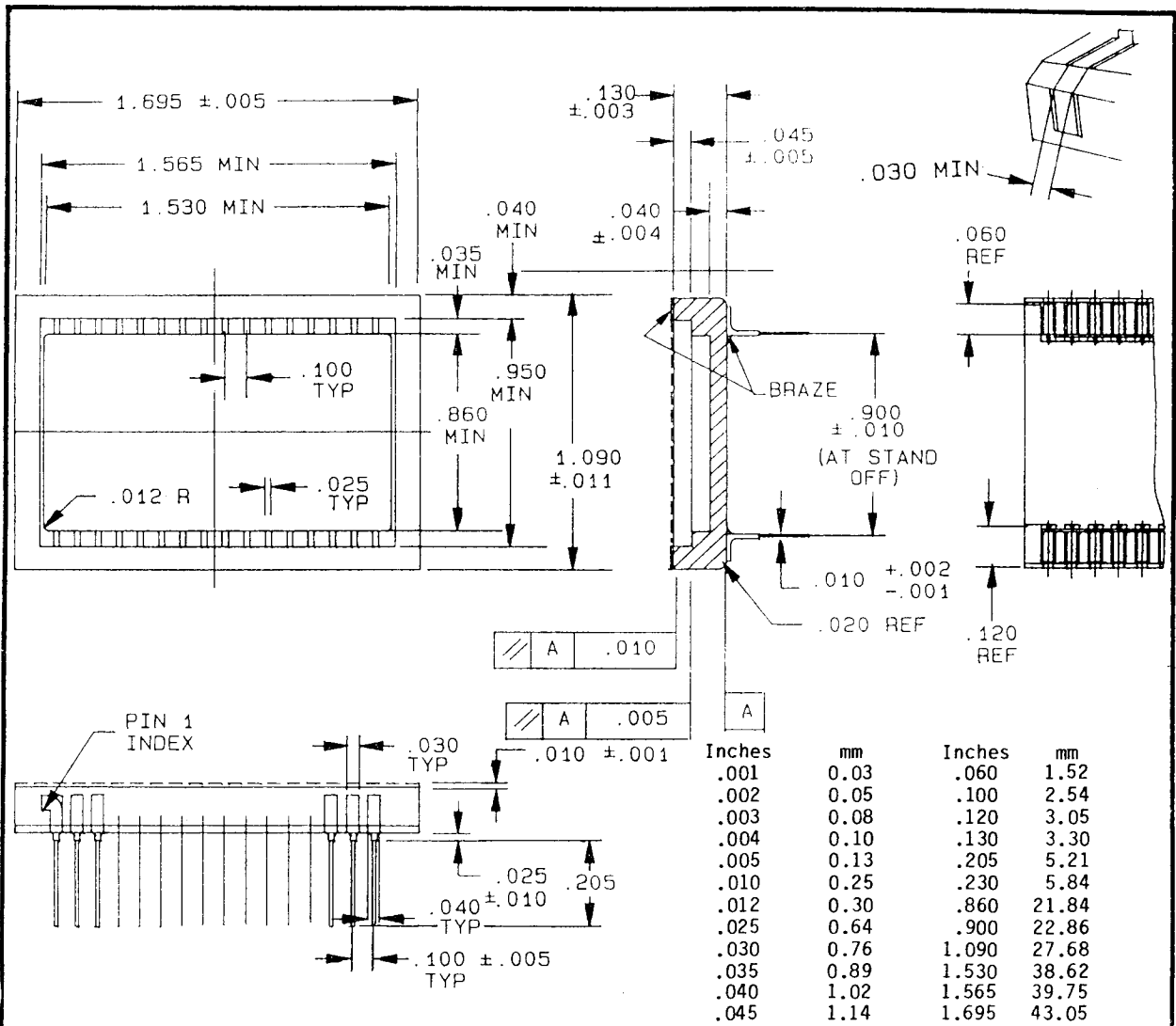
3.5 Marking. Marking shall be in accordance with MIL-H-38534. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in QML-38534 (see 6.6 herein).

3.6 Manufacturer eligibility. In addition to the general requirements of MIL-H-38534, the manufacturer of the part described herein shall submit for DESC-ECC review and approval electrical test data (variables format) on 22 devices from the initial quality conformance inspection group A lot sample, produced on the certified line, for each device type listed herein. The data should also include a summary of all parameters manually tested, and for those which, if any, are guaranteed.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in QML-38534 (see 6.6 herein). The certificate of compliance submitted to DESC-ECC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-H-38534 and the requirements herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-H-38534 shall be provided with each lot of microcircuits delivered to this drawing.

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- NOTES:
1. Dimensions are in inches.
 2. Metric equivalents are for general information.

FIGURE 1. Case outline.

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Device type	01
Case outline	X
Terminal number	Terminal symbol
1	SE/DIFF mode select
2	Digital ground
3	V _{DD}
4	Analog input, channel 7
5	Analog input, channel 6
6	Analog input, channel 5
7	Analog input, channel 4
8	Analog input, channel 3
9	Analog input, channel 2
10	Analog input, channel 1
11	Analog input, channel 0
12	Hold capacitor
13	Sample/hold command
14	Offset adjust
15	Offset adjust
16	Analog output
17	Analog ground
18	Analog input, channel 15
19	Analog input, channel 14
20	V _{EE}
21	V _{CC}
22	Analog input, channel 13
23	Analog input, channel 12
24	Analog input, channel 11
25	Analog input, channel 10
26	Analog input, channel 9
27	Analog input, channel 8
28	Input channel address, bit A _E
29	Input channel address, bit A ₀
30	Input channel address, bit A ₁
31	Input channel address, bit A ₂
32	Channel latch

FIGURE 2. Terminal connections.

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$\overline{SE}/DIFF$ mode select (pin 1)	TTL logic input	MUX configuration
	1	Single-ended, 16 channels
	0	Differential, 8 channels

$\overline{SE}/DIFF$ mode select truth table.

Address				On channel (pin number)		
A_E	A_2	A_1	A_0	Single-ended	Differential "Hi" "Lo"	
0	0	0	0	0 (11)		None
0	0	0	1	1 (10)		None
0	0	1	0	2 (9)		None
0	0	1	1	3 (8)		None
0	1	0	0	4 (7)		None
0	1	0	1	5 (6)		None
0	1	1	0	6 (5)		None
0	1	1	1	7 (4)		None
1	0	0	0	8 (27)	0(11)	0(27)
1	0	0	1	9 (26)	1(10)	1(26)
1	0	1	0	10 (25)	2(9)	2(25)
1	0	1	1	11 (24)	3(8)	3(24)
1	1	0	0	12 (23)	4(7)	4(23)
1	1	0	1	13 (22)	5(6)	5(22)
1	1	1	0	14 (19)	6(5)	6(19)
1	1	1	1	15 (18)	7(4)	7(18)

Input channel addressing truth table.

Channel latch inputs (pin 32)	TTL logic input	Input address
	1	Address passes to MUX
	0	Address latched

Channel latch truth table.

FIGURE 3. Truth tables.

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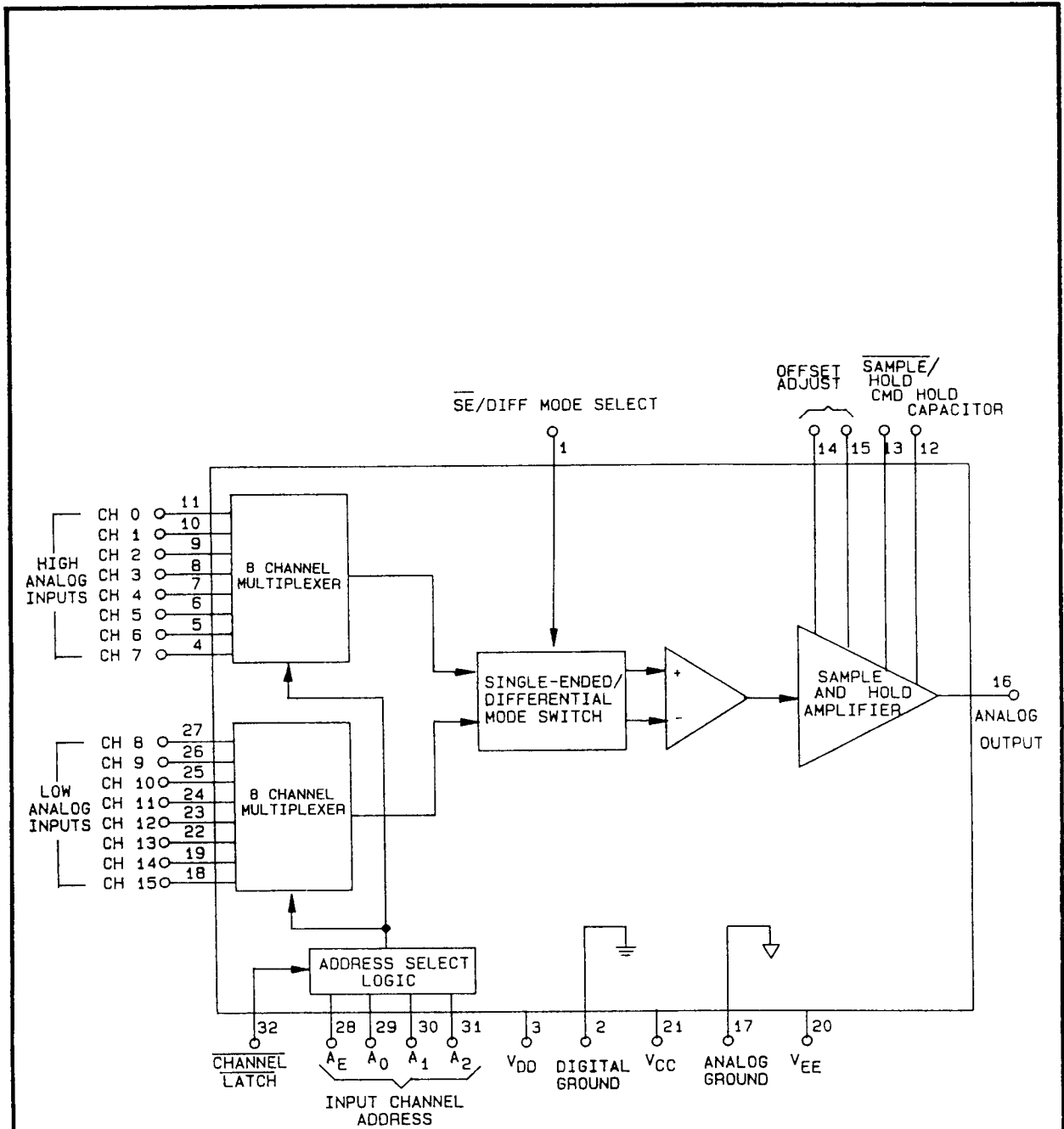


FIGURE 4. Logic diagram.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-H-38534.

4.2 Screening. Screening shall be in accordance with MIL-H-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 using the circuit submitted with the certificate of compliance (see 3.7 herein).
 - (2) T_A 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 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-H-38534 and as specified herein.

4.3.1 Group A inspection. Group A inspection shall be in accordance with MIL-H-38534 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 7 and 8 shall include verification of the truth tables.

4.3.2 Group B inspection. Group B inspection shall be in accordance with MIL-H-38534.

4.3.3 Group C inspection. Group C inspection shall be in accordance with MIL-H-38534 and as follows:

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
 - (1) Test condition A, B, C or D using the circuit submitted with the certificate of compliance (see 3.7 herein).
 - (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.

4.3.2 Group D inspection. Group D inspection shall be in accordance with MIL-H-38534.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5008, group A test table)
Interim electrical parameters	1
Final electrical test parameters	1*,2,3,4, 5,6,7,9
Group A test requirements	1,2,3,4,5,6, 7,8,9,10**,11**
Group C end-point electrical parameters	1,2,3

- * PDA applies to subgroup 1.
- ** Subgroups 10 and 11, if not tested, shall be guaranteed to the limits specified in table 1.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-H-38534.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for original equipment design applications and logistic support of existing equipment.

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 in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC 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 microelectronics devices (FSC 5962) should contact DESC-ECC, telephone (513) 296-8527.

6.5 Comments. Comments on this drawing should be directed to DESC-ECC, Dayton, Ohio 45444, or telephone (513) 296-8525.

6.6 Approved sources of supply. Approved sources of supply are listed in QML-38534. Additional sources will be added to QML-38534 as they become available. The vendors listed in QML-38534 have agreed to this drawing and a certificate of compliance (see 3.7 herein) has been submitted to and accepted by DESC-ECC.

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