REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Correct notes 4 and 5 of table I. Correct table II subgroups for final electrical and Group A test requirements. Update figure 1, case outline X. Update drawing boilerplate. Editorial changes throughout.	02-06-11	Raymond Monnin
B	Update drawing. -gz	07-02-05	Joseph Rodenbeck

REV																				
SHEET																				
REV																				
SHEET																				
REV STATUS	REV	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								

PMIC N/A

PREPARED BY
Gary Zahn

CHECKED BY
Michael C. Jones

APPROVED BY
Kendall A. Cottongim

DRAWING APPROVAL DATE
96-10-30

REVISION LEVEL
B

STANDARD MICROCIRCUIT DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

DEFENSE SUPPLY CENTER COLUMBUS
POST OFFICE BOX 3990
COLUMBUS, OHIO 43218-3990
http://www.dscc.dla.mil

MICROCIRCUIT, HYBRID, DIGITAL-LINEAR, 12-BIT, DUAL CHANNEL, ANALOG TO DIGITAL CONVERTER

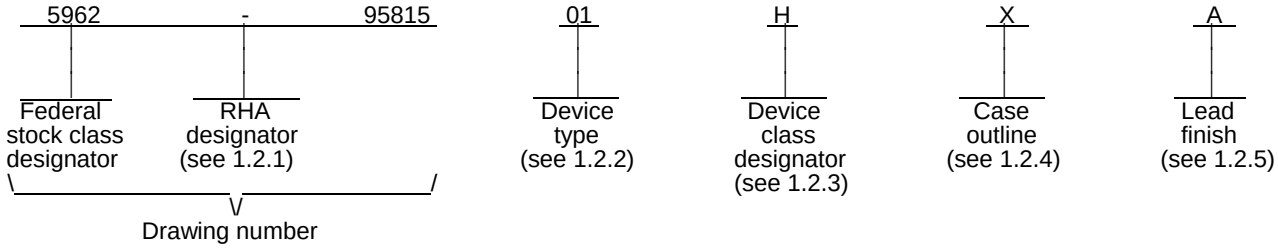
SIZE	CAGE CODE	
A	**67268**	**5962-95815**

SHEET 1 OF 11

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

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 Radiation hardness assurance (RHA) designator. RHA marked devices shall meet the MIL-PRF-38534 specified RHA levels and shall be 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:

Device type	Generic number	Circuit function
01	AD10242	Dual channel, 12-bit, 40 MSPS, MCM, analog to digital converter

1.2.3 Device class designator. This device class designator shall be 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:

Device class	Device performance documentation
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.

1.2.4 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
X	See figure 1	68	Leaded ceramic chip carrier

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

1.3 Absolute maximum ratings. 1/

Positive supply voltage (V_{CC})	0 V dc to +7.0 V dc
Negative supply voltage (V_{EE})	0 V dc to -7.0 V dc
Analog input voltage	-7.0 V dc to +7.0 V dc
Analog input current	-10 mA to +10 mA
Digital input voltage (ENCODE)	0 V dc to +7.0 V dc
ENCODE, $\overline{\text{ENCODE}}$ differential voltage	+4 V dc
Digital output current	-40 mA to +40 mA
Gain and offset adjust voltage range	V_{EE} to V_{CC}
Digital input voltage range	+0.5 V to V_{EE}
Power dissipation (P_D)	2.0 W
Thermal resistance junction-to-case (θ_{JC})	11°C/W
Thermal resistance junction-to-ambient (θ_{JA})	30°C/W
Junction temperature (T_J)	+175°C
Storage temperature	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C

1.4 Recommended operating conditions.

Positive supply voltage (V_{CC})	+4.75 V dc to +5.25 V dc
Negative supply voltage (V_{EE})	-5.46 V dc to -4.96 V dc
Case operating temperature range (T_C)	-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 cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

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 http://assist.daps.dla.mil/quicksearch/ or http://assist.daps.dla.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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.

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.

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. Compliance with MIL-PRF-38534 may 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.

3.3 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 defined 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.

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 (DSCC-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 DSCC-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.

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 DSCC-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 method 1015 of MIL-STD-883.

(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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Offset error	OFF_{ERROR}		1	01	-0.5	+0.5	%FS
			2,3		-2.0	+2.0	
Gain error 2/	AV_{ERROR}		1	01	-1.0	+1.0	%FS
			2,3		-1.5	+1.5	
Analog input resistance	A_{IN1}	2/	1,2,3	01	99	101	ohms
	A_{IN2}				198	202	
	A_{IN3}				396	404	
Input capacitance	C_{IN}	T_A = +25°C 3/ 4/	1	01		7.0	pF
Logic "1" voltage (analog)	V_{IH}	5/ 6/	1,2,3	01	2.0	5.0	V
Logic "0" voltage (analog)	V_{IL}	5/ 6/	1,2,3	01	0	0.8	V
Logic "1" current (analog)	I_{IH}	V_{INH} = 5 V 5/ 6/	1,2,3	01		800	µA
Logic "0" current (analog)	I_{IL}	V_{INL} = 0 V 5/ 6/	1,2,3	01	-400		µA
Logic "1" voltage output (digital)	V_{OH}	7/	1,2,3	01	3.5		V
Logic "0" voltage output (digital)	V_{OL}	8/	1,2,3	01		0.65	V
Supply currents	$I_{CCTOTAL}$		1,2,3	01		400	mA
ENCODE pulse width high	ENC_{HI}	3/	4,5,6	01	12		ns
ENCODE pulse width low	ENC_{LO}	3/	4,5,6	01		41	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Output delay	t_{OD}	$T_A = +25°C$ 3/	4,5,6	01	10	14	ns
Maximum conversion rate	CNV_{MAX}	9/	4,5,6	01	40		MSPS
Signal-to-noise ratio 10/	SNR	Analog input at 4.85 MHz and 9.9 MHz	4	01	63		dB
			5,6		62		
		Analog input at 19.5 MHz	4		60		
			5,6		59		
Signal-to-noise and distortion 11/	SINAD	Analog input at 4.85 MHz	4	01	62		dB
			5,6		61		
		Analog input at 9.9 MHz	4,5,6		60		
		Analog input at 19.5 MHz	4,5,6		58		
Spurious free dynamic range 12/	SPUR	Analog input at 4.85 MHz	4,5,6	01	70		dBFS
		Analog input at 9.9 MHz	4,5,6		63		
		Analog input at 19.5 MHz	4,5,6		60		
Two tone intermodulation distortion rejection 13/	IMD	F1, F2 are -7 dBFS	4,5,6	01	-70		dBc
Channel to channel isolation 3/ 14/	ISO	$T_A = +25°C$	1	01	-75		dB
Overvoltage recovery time 15/	ORT	V_{IN} = 2.0 x full scale	4,5,6	01		100	ns
		V_{IN} = 4.0 x full scale				200	

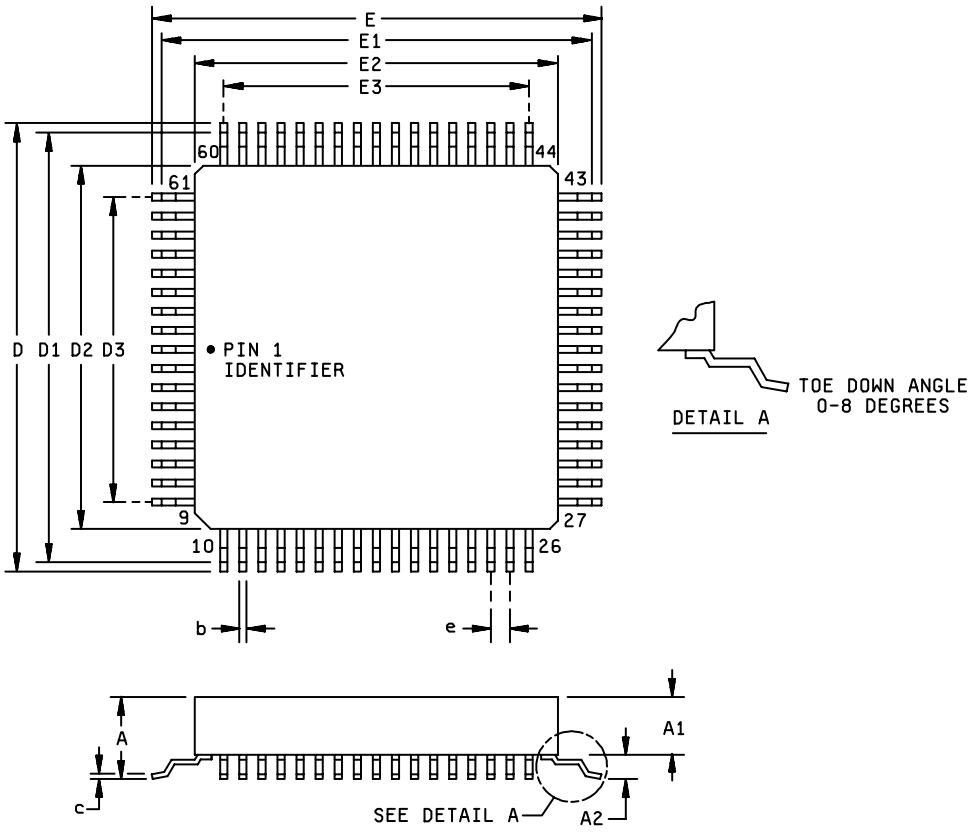
See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Power supply rejection ratio	PSRR	$+4.75\ V \le V_{CC} \le +5.25\ V$	7,8	01		0.02	%FSR/ % V_{CC}
		$-5.45\ V \le V_{EE} \le -4.96\ V$				0.02	%FSR/ % V_{EE}

1/ V_{CC}(analog) = +5 V dc, V_{EE} = -5 V dc, and V_{CC}(digital) = +5 V dc, unless otherwise specified.
2/ Gain test is preformed on $A_{IN}3$ over the specified input voltage range.
3/ Parameter shall be tested as part of device initial characterization and after design and process changes. Parameter shall be guaranteed to the limits specified in table I for all lots not specifically tested.
4/ Input capacitance specifications combines die and package capacitance..
5/ ENCODE (pins 29 and 51) driven single-ended source: ENCODE (pins 28 and 52) bypassed to ground through 0.01 μF capacitor.
6/ ENCODE (pins 29 and 51) may also be driven differentially in conjunction with $\overline{\text{ENCODE}}$ (pins 28 and 52).
7/ Outputs sourcing 10 μA.
8/ Outputs sinking 10 μA.
9/ Maximum conversion rate allows for variation in ENCODE DUTY CYCLE of 50%, ±5%.
10/ Analog input signal power at -1 dBFS; signal-to-noise ratio (SNR) is the ratio of signal level to total noise (first 5 harmonics removed). ENCODE = 40 MSPS.
11/ Analog input signal power at -1 dBFS; signal-to-noise and distortion (SINAD) is the ratio of signal level to total noise plus harmonics. ENCODE = 40 MSPS.
12/ Analog input signal equals -1 dBFS; spurious free dynamic range (SPUR) is the ratio of converter full scale to worst spur.
13/ Both input zones at -7 dBFS; two tone intermodulation distortion (IMD) rejection is the ratio of either tone to the worst third order intermod product. f1 = 10.0 MHz ±100 kHz, 50 kHz ≤ f1 - f2 ≤ 300 kHz.
14/ Channel to channel isolation tested with A channel grounded and a full scale signal applied to B channel ($A_{IN}1$).
15/ Input driven to 2 times and 4 times. $A_{IN}1$ range for >4 clock cycles. Output recovers inband in specific time with ENCODE = 40 MSPS. No foldover guaranteed.

Case outline X.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		5.97		.235
A1		4.45		.175
A2	1.02	1.52	.040	.060
b	0.36	0.51	.014	.020
c	0.18	0.25	.007	.010
e	1.14	1.40	.045	.055
D/E	29.72	30.23	1.170	1.190
D1/E1	27.18		1.070	
D2/E2	23.88	24.38	.940	.960
D3/E3	20.32 BSC		.800 BSC	

NOTES:
1. 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.
2. Pin 1 dot and pin numbers are for reference only.

FIGURE 1. Case outline(s).

Device type	01	Device type	01	Device type	01
Case outline	X	Case outline	X	Case outline	X
Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	Shield	24	D7A	47	D9B
2	Channel A Ground	25	D8A	48	D10B
3	Unipolar negative A	26	Channel A Ground	49	D11B (MSB)
4	Unipolar common A	27	Channel A Ground	50	DV_{CC}
5	Channel A Ground	28	$\overline{\text{ENCODE}}$ A	51	ENCODE B
6	Analog input A1	29	ENCODE A	52	$\overline{\text{ENCODE}}$ B
7	Analog input A2	30	DV_{CC}	53	Channel B Ground
8	Analog input A3	31	D9A	54	Channel B Ground
9	Channel A Ground	32	D10A	55	Unipolar common B
10	Channel A Ground	33	D11A (MSB)	56	Unipolar negative B
11	Channel A Ground	34	No connect	57	Unipolar positive B
12	Unipolar positive A	35	No connect	58	Channel B Ground
13	AV_{EE}	36	D0B (LSB)	59	Channel B Ground
14	AV_{CC}	37	D1B	60	Channel B Ground
15	No connect	38	D2B	61	Channel B Ground
16	No connect	39	D3B	62	Analog input B1
17	D0A (LSB)	40	D4B	63	Analog input B2
18	D1A	41	D5B	64	Analog input B3
19	D2A	42	D6B	65	Channel B Ground
20	D3A	43	Channel B Ground	66	AV_{CC}
21	D4A	44	Channel B Ground	67	AV_{EE}
22	D5A	45	D7B	68	Channel B Ground
23	D6A	46	D8B		

FIGURE 2. Terminal connections.

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
Final electrical parameters	1*,2,3,4,5,6,7,8
Group A test requirements	1,2,3,4,5,6,7,8
Group C end-point electrical parameters	1
End-point electrical parameters for radiation hardness assurance (RHA) devices	Not applicable

* PDA applies to subgroup 1.

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 9, 10, and 11 shall be omitted.

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

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 DSCC-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 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) inspection. RHA inspection is not currently applicable to this drawing.

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 as specified in MIL-PRF-38534.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus (DSCC) when a system application requires configuration control and the applicable SMD. 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) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Post Office Box 3990, 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 DSCC-VA and have agreed to this drawing.

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 07-02-05

Approved sources of supply for SMD 5962-95815 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38534 during the next revisions. 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 DSCC-VA. This information bulletin is superseded by the next dated revisions of MIL-HDBK-103 and QML-38534. DSCC maintains an online database of all current sources of supply at http://www.dscc.dla.mil/Programs/Smcr/.

Standard microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-9581501HXA	34031	AD10242TZ/883B

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	Vendor name and address
34031	Analog Devices, Incorporated 7910 Triad Center Drive Greensboro, NC 27409-9605

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- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А