REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

REV																									
SHEET																									
REV																									
SHEET																									
REV STATUS OF SHEETS	REV																								
	SHEET	1	2	3	4	5	6	7	8	9															

PMIC N/A

STANDARDIZED MILITARY DRAWING

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

AMSC N/A

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DRAWING APPROVAL DATE
17 OCTOBER 1988

REVISION LEVEL

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUITS, LINEAR, 16 BIT D/A CONVERTER
MONOLITHIC SILICON

SIZE	CAGE CODE	
A	67268	5962-88563

SHEET 1 OF 9

DESC FORM 193
SEP 87

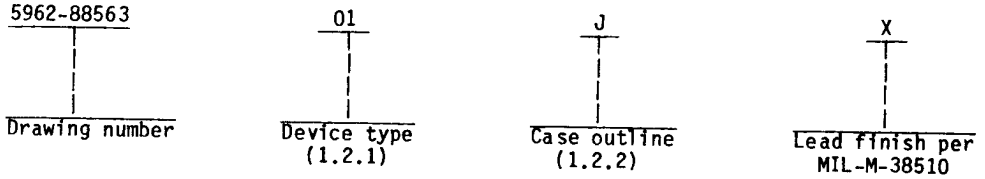
* U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60911

5962-E798

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	DAC703	16 bit D/A converter

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
J	D-3 (24-lead, 1.290" x .610" x .225"), dual-in-line package
3	C-4 (28-terminal, .460" x .460" x .100"), square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage:	
$+V_{CC}$ to common	+18 V dc
$-V_{CC}$ to common	-18 V dc
Supply voltage, V_{DD} to common	0 V to +18 V dc
Digital data input voltage to common	-1 V to +7 V dc
Power dissipation (P_D)	1.0 W
Short circuit duration:	
V_{REF} output to common	Continuous
V_{OUT} to common	Continuous
External voltage applied to D/A output	-5 V dc to +5 V dc
Lead temperature (soldering, 10 seconds)	+300°C
Junction temperature (T_J)	+175°C
Thermal resistance, junction-to-case (θ_{JC})	See MIL-M-38510, appendix C
Thermal resistance, junction-to-ambient (θ_{JA}):	
Case J	50°C/W
Case 3	120°C/W

1.4 Recommended operating conditions.

Supply voltage ($\pm V_{CC}$)	±15 V dc
Supply voltage (V_{DD})	5 V dc
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification 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.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

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

(Copies of the specification 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 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

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 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein.

3.5 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 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ $+V_{CC}$ = +15 V, $-V_{CC}$ = -15 V, V_{DD} = 5 V unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Resolution			1, 2, 3		16	Bits
High input voltage	V_{IH}	Hex input code = FFFF T_A = +25°C	1	+2.4	$+V_{CC}$	V
Low input voltage	V_{IL}	Hex input code = 0000 T_A = +25°C	1	-1.0	+0.8	V
High input current	I_{IH}	V_{IN} = +2.7 V, T_A = +25°C	1		+40	µA
Low input current	I_{IL}	V_{IN} = +0.4 V, T_A = +25°C	1		-0.5	mA
Linearity error	NLE		1		±.003	% of FSR 1/
			2, 3		±.006	
Differential linearity	DLE		1		±.006	
			2, 3	-.006	+.009	
Gain error	AE	Hex input codes = 0000,FFFF T_A = +25°C 1/	1	+0.1		
Gain error drift	dAE/dT	Hex input codes = 0000,FFFF T_A = -55°C and +125°C	2, 3		±20	ppm/°C
Zero error	ZE	Hex input code = 7FFF T_A = +25°C	1		±0.1	% of FSR 2/
Zero error drift	dZE/dT	Hex input code = 7FFF T_A = -55°C and +125°C	2, 3		±15	ppm/°C
Monotinicity			1, 2, 3	14		Bits

See footnote at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ $+V_{CC}$ = +15 V, $-V_{CC}$ = -15 V, V_{DD} = 5 V unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Settling time	t_s	to ±0.003% of FSR, R_L= 2 kΩ, T_A = +25°C	9		8	µs
Slew rate	SR	R_L = 2 kΩ, T_A = +25°C	7	10		V/µs
Output current	I_O	T_A = +25°C	1	±5		mA
Reference voltage	V_{REF}	Hex input code = 0000	1, 2, 3	+6.0	+6.6	V
Reference tempco	dV_{REF}/dT	Hex input code = 0000 T_A = -55°C and +125°C	2, 3		±15	ppm/°C
Power supply current	$+I_{CC}$	V_{OUT} = 0 V, T_A = +25°C	1		+30	mA
	$-I_{CC}$				-30	
	$+I_{DD}$				+8	
Power supply sensitivity	PSS1it	Δ $+V_{CC}$ = ±1 V, T_A = +25°C	1		±4	mV/V
	PSS2	Δ $-V_{CC}$ = ±1 V, T_A = +25°C			±4	
	PSS3	Δ $+V_{DD}$ = ±1 V, T_A = +25°C			±4	

1/ V_o inherently ±10 V.

2/ FSR means full scale range and is 20 V for the ±10 V range.

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Device type	01	
Case outlines	J	3
Terminal number	Terminal symbol	
1	Bit 1 (MSB)	NC
2	Bit 2	Bit 1 (MSB)
3	Bit 3	Bit 2
4	Bit 4	Bit 3
5	Bit 5	Bit 4
6	Bit 6	Bit 5
7	Bit 7	Bit 6
8	Bit 8	NC
9	Bit 9	Bit 7
10	Bit 10	Bit 8
11	Bit 11	Bit 9
12	Bit 12	Bit 10
13	Bit 13	Bit 11
14	Bit 14	Bit 12
15	Bit 15	NC
16	Bit 16(LSB)	Bit 13
17	V_{OUT}	Bit 14
18	V_{DD}	Bit 15
19	$-V_{CC}$	Bit 16(LSB)
20	Common	V_{OUT}
21	Summing Junction	V_{DD}
22	Gain Adjust	NC
23	$+V_{CC}$	$-V_{CC}$
24	+6.3 V_{REF} output	Common
25		Summing Junction
26		Gain Adjust
27		$+V_{CC}$
28		+6.3 V_{REF} output

FIGURE 1. Terminal connections.

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3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.8 Verification and review. DESC, DESC'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.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. 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 3.5 herein).

(2) T_A = +125°C, minimum.

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 method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, 6, 8, 10, and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

4.3.2 Groups C and D inspections.

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 3.5 herein).

(2) T_A = +125°C, minimum.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	1
Final electrical test parameters (method 5004)	1*,2,3
Group A test requirements (method 5005)	1,2,3,7,9
Groups C and D end-point electrical parameters (method 5005)	1

* PDA applies to subgroup 1.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

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

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

6.4 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendors listed herein has agreed to this drawing and a certificate of compliance (see 3.5 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/
5962-8856301JX	13919	DAC703VG/883B
5962-88563013X	13919	DAC703VL/883B

1/ 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
13919	Burr Brown Corporation P.O. Box 11400 Tucson, AZ 85734