REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
G	Add two packages, F-5 and C-2. Change to military drawing format. Made changes to 1.3, table I, 6.4, figure 1, and editorial changes throughout. Add one vendor CAGE 34371.	89-09-13	M. Frye
H	Add new device type 02. Editorial changes throughout. Add vendor CAGE 1ES66. Change PDA from 10 percent to 5 percent. Make changes to 1.3 and table I. Remove vendor CAGE 32293.	92-11-13	M. Frye
J	Changes in accordance with NOR 5962-R134-95.	95-05-09	M. Frye
K	Drawing updated to reflect current requirements. Incorporate NOR revision J. Editorial changes throughout. - drw	00-09-15	R. Monnin
L	Drawing updated to current requirements. Editorial changes throughout. - drw	03-02-12	R. Monnin
M	Make correction to Marking paragraph 3.5. - ro	05-04-08	R. Monnin

CURRENT CAGE CODE 67268

THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.

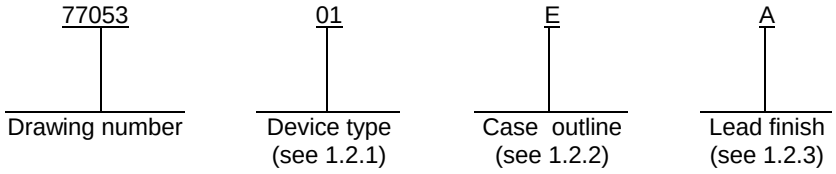
REV																				
SHEET																				
REV																				
SHEET																				
REV STATUS				REV			M	M	M	M	M	M	M	M	M					
OF SHEETS				SHEET			1	2	3	4	5	6	7	8	9					

PMIC N/A	PREPARED BY A. J. Foley	**DEFENSE SUPPLY CENTER COLUMBUS** **COLUMBUS, OHIO 43218-3990** **http://www.dscc.dla.mil**
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY C. R. Jackson	
	APPROVED BY N. A. Hauck	MICROCIRCUIT, CMOS, QUAD ANALOG SWITCH, MONOLITHIC SILICON
	DRAWING APPROVAL DATE 77-11-04	
	REVISION LEVEL M	SIZE A CAGE CODE **14933** **77053**
		SHEET 1 OF 9

1. SCOPE

1.1 Scope. This drawing describes device requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A.

1.2 Part or Identifying Number (PIN). The complete PIN is as shown in the following example:



1.2.1 Device type(s). The device type(s) identify the circuit function as follows:

Device type	Generic number	Circuit function
01	DG201A	Quad SPST analog switch
02	HI-201	Quad SPST analog switch, with dielectric isolation

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

Outline letter	Descriptive designator	Terminals	Package style
2	CQCC1-N20	20	Square leadless chip carrier package
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line package
F	GDFP2-F16 or CDFP3-F16	16	Flat pack
X	CDFP4-F16	16	Flat pack

1.2.3 Lead finish. The lead finish is as specified in MIL-PRF-38535, appendix A.

1.3 Absolute maximum ratings.

Supply voltage (between V+ and V-):
- Device type 01 ..... 44 V dc
- Device type 02 ..... 40 V dc

Digital input voltage (V_{IN}):
- Device type 01 ..... V- -0.3 V dc to V+
- Device type 02 ..... V- -4 V dc to V+ +4 V dc

Analog input voltage (V_S) ..... V- -2 V dc to V+ +2 V dc

Current (any terminal except S or D):
- Device type 01 ..... 30 mA
- Device type 02 ..... 25 mA

Continuous current, S or D:
- Device type 01 ..... 20 mA
- Device type 02 ..... 25 mA

Peak current, S or D
(pulsed at 1 ms, 10 percent duty cycle maximum):
- Device type 01 ..... 70 mA
- Device type 02 ..... 40 mA

Storage temperature range ..... -65°C to +150°C

1.3 Absolute maximum ratings – continued.

Power dissipation (P_D)	750 mW 1/
Lead temperature (soldering, 10 seconds)	+275°C
Thermal resistance, junction-to-case (θ_{JC})	See MIL-STD-1835
Junction temperature (T_J):	
Device type 01	+150°C
Device type 02	+175°C
V+ to ground:	
Device type 01	+25 V
Device type 02	+20 V
V- to ground:	
Device type 01	-25 V
Device type 02	-20 V

1.4 Recommended operating conditions.

Positive supply voltage (V+)	+15 V dc
Negative supply voltage (V-)	-15 V dc
Minimum digital high level input voltage (V_{IH})	+2.4 V dc
Maximum digital low level input voltage (V_{IL})	+0.8 V dc
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 cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

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

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.
MIL-STD-1835 - Interface Standard 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/ For case E, derate at 12 mW/°C above T_A = +75°C. For case 2, F and X, derate at 10 mW/°C above T_A = +75°C.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-PRF-38535 may be processed as QML product in accordance with the manufacturers approved program plan and qualifying activity approval in accordance with MIL-PRF-38535. This QML flow as documented in the Quality Management (QM) plan may make modifications to the requirements herein. These modifications shall not affect form, fit, or function of the device. These modifications shall not affect the PIN as described herein. A "Q" or "QML" certification mark in accordance with MIL-PRF-38535 is required to identify when the QML flow option is used.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535, appendix A and herein.

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

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

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 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.

3.5 Marking. Marking shall be in accordance with MIL-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked.

3.5.1 Certification/compliance mark. A compliance indicator “C” shall be marked on all non-JAN devices built in compliance to MIL-PRF-38535, appendix A. The compliance indicator “C” shall be replaced with a "Q" or "QML" certification mark in accordance with MIL-PRF-38535 to identify when the QML flow option is used.

3.6 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 MIL-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38535, appendix A and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DSCC-VA shall be required for any change that affects this drawing.

3.9 Verification and review. 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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 2/		Unit
					Min	Max	
Analog signal range	V_S	3/	1, 2, 3	All		±15	V
Drain-source ON resistance	$R_{DS(ON)}$	V_D = ±10 V, V_{IN} = 0.8 V, I_D = ±1 mA	1, 3	01		175	Ω
			2			250	
		V_S = ±10 V, V_{IN} = 0.8 V, I_D = ∓1 mA, all unused channels, V_A = 2.4 V	1	02		70	
			2, 3			100	
Off input leakage current	$I_{S(OFF)}$	V_{IN} = 2.4 V, V_S = ±14 V, V_D = ∓14 V	1	All		±2	nA
			2, 3			±100	
Off output leakage current	$I_{D(OFF)}$	V_{IN} = 2.4 V, V_S = ±14 V	1	01		±1	nA
				02		±2	
			2, 3	All		±100	
On leakage current	$I_{D(ON)}$	V_{IN} = 0.8 V, V_D = V_S = ±14 V	1	01		±1	nA
				02		±2	
			2, 3	All		±200	
Low level input voltage	V_{IL}		1, 2, 3	All		0.8	V
High level input voltage	V_{IH}		1, 2, 3	All	2.4		V
Low level input leakage current	I_{IL}	V_{IN} = 0 V	1	01		±1	µA
			2			±10	
		V_{IN} = 0.8 V	1	02		±0.5	
			2, 3			±1	
High level input leakage current	I_{IH}	V_{IN} = 2.4 V, 15 V	1	01		±1	µA
			2			±10	
			1	02		±0.5	
			2, 3			±1	

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits 2/		Unit
					Min	Max	
Switch ON time	t_{ON}	R_L = 1 kΩ, C_L = 35 pF, V_{IH} = +3 V, V_{IL} = 0 V	9, 10, 11	01		1000	ns
		R_L = 1 kΩ, C_L = 100 pF, V_{IH} = +4 V, V_{IL} = 0 V	9	02		600	
			10, 11			800	
Switch OFF time	t_{OFF}	R_L = 1 kΩ, C_L = 35 pF, V_{IH} = +3 V, V_{IL} = 0 V	9	01		500	ns
			10, 11			650	
		R_L = 1 kΩ, C_L = 100 pF, V_{IH} = +4 V, V_{IL} = 0 V	9	02		500	
			10, 11			650	
Positive supply current	I+	V_{IN} = 0 V	1, 2	01		4	mA
			3			6.5	
		V_{IN} = 5 V	1, 2			3	
			3			4.5	
		V_{IN} = 0.8 V	1, 2	02		1.5	
			3			2	
		V_{IN} = 2.4 V	1, 2			1.5	
			3			2	
Negative supply current	I-	V_{IN} = 0 V	1, 2	01		-4	mA
			3			-6.5	
		V_{IN} = 5 V	1, 2			-3	
			3			-4.5	
		V_{IN} = 0.8 V	1, 2	02		-1.5	
			3			-2	
		V_{IN} = 2.4 V	1, 2			-1.5	
			3			-2	

1/ Unless otherwise specified, V+ = +15 V dc and V- = -15 V dc.
2/ The limiting terms “min” (minimum) and “max” (maximum) shall be considered to apply to magnitudes only. Negative current shall be defined as conventional current flow out of a device terminal.
3/ Guaranteed, if not tested, to the limits specified.

Device type	01		02	
Case outlines	E, F, and X	2	E	2
Terminal number	Terminal symbols			
1	IN_1	NC	IN_1	NC
2	D_1	IN_1	D_1	IN_1
3	S_1	D_1	S_1	D_1
4	V-	S_1	V-	S_1
5	GND	V-	GND	V-
6	S_4	NC	S_4	NC
7	D_4	GND	D_4	GND
8	IN_4	S_4	IN_4	S_4
9	IN_3	D_4	IN_3	D_4
10	D_3	IN_4	D_3	IN_4
11	S_3	NC	S_3	NC
12	NC	IN_3	V_{REF} 1/	IN_3
13	V+	D_3	V+	D_3
14	S_2	S_3	S_2	S_3
15	D_2	NC	D_2	V_{REF} 1/
16	IN_2	NC	IN_2	NC
17	---	V+	---	V+
18	---	S_2	---	S_2
19	---	D_2	---	D_2
20	---	IN_2	---	IN_2

1/ V_{REF} is normally floating, but voltage up to 10 V can be applied to raise the threshold voltage.

FIGURE 1. Terminal connections.

4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

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, D, or E. 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 method 1015 of MIL-STD-883.

(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, 7, and 8 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, D, or E. 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 method 1005 of MIL-STD-883.

(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 (in accordance with MIL-STD-883, method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*,2,3,9
Group A test requirements (method 5005)	1,2,3,9,10,11
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-PRF-38535, appendix A.

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.

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 microelectronics devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0547.

6.6 Approved sources of supply. Approved sources of supply 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.

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 05-04-08

Approved sources of supply for SMD 77053 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 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 revision of MIL-HDBK-103 and QML-38535. 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/	Reference military specification PIN
77053012A	17856	DG201AAZ/883	
77053012C	1ES66	DG201AAZ/883B	
7705301EA	17856	DG201AAK/883	M38510/12302BEA
	1ES66	DG201AAK/883B	
7705301FA	3/		
7705301XA	17856	DG201AAL/883	
7705301XC	1ES66	DG201AAL/883B	
77053022A	3/	HI4-201/883	
77053022C	1ES66	HI4-201/883B	
7705302EA	1ES66	HI1-201/883B	
	3/	HI1-201/883	

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.
3/ Not available from an approved source of supply.

Vendor CAGE number	Vendor name and address
1ES66	Maxim Integrated Products 120 San Gabriel Drive Sunnyvale, CA 94086-5125
17856	Siliconix Incorporated 2201 Laurelwood Road Santa Clara, CA 95054-1516