REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	Add case outline F-2 to vendor device type 01. Inactivate device type 01AX for new design. Convert to military drawing format. Delete subgroups 10 and 11 from group C periodic inspections. Editorial changes throughout. Change drawing Cage to 67268.	3 Aug. 87	M. A. Frye

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Defense Electronics Supply Center
Dayton, Ohio

Original date of drawing:
28 September 1977

AMSC N/A

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SIZE: A
CODE IDENT. NO.: 67268
REV: B

MILITARY DRAWING

This drawing is available for use by all Departments and Agencies of the Department of Defense

TITLE: MICROCIRCUIT, DIGITAL, CMOS QUAD 2-INPUT AND GATE, MONOLITHIC SILICON

DWG NO. 77036

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5962-E412

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

DESC FORM 193
MAY 86

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:

77036	01	A	X
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

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

Device type	Generic number	Circuit function
01	54C08	Quad 2-input AND gate

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
A	F-1 (14-lead, 1/4" x 1/4"), flat package
C	D-1 (14-lead, 1/4" x 3/4"), dual-in-line package
D	F-2 (14-lead, 1/4" x 3/8"), flat package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc to +18 V dc
Input voltage range	-0.3 to V_{CC} +0.3 V dc
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P_D)	500 mW dc 1/
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction to case (θ_{JC})	0.09°C/mW for flat package 0.08°C/mW for dual-in-line package
Junction temperature (T_J)	+175°C

1.4 Recommended operating conditions.

Supply voltage	+3.0 V dc to +15 V dc
Ambient operating temperature range (T_A)	-55°C to +125°C

1/ For T_A = +100 to +125°C, derate linearly at 12 mW/°C to 200 mW.

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 Truth table. The truth table shall be as specified on figure 2.

3.2.3 Logic diagram. The logic diagram shall be as specified on figure 3.

3.2.4 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 recommended 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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$	Group A subgroups	Limits		Unit
				Min	Max	
High level output voltage	V_{OH}	V_{CC} = 5.0 V; I_O = -10 µA V_{CC} = 10 V; I_O = -10 µA	1, 2, 3	4.5 9.0		V
Low level output voltage	V_{OL}	V_{CC} = 5.0 V; I_O = 10 µA V_{CC} = 10 V; I_O = 10 µA	1, 2, 3		0.5 1.0	V
High level input voltage	V_{IH}	V_{CC} = 5.0 V V_{CC} = 10 V	1, 2, 3	3.5 8.0		V
Low level input voltage	V_{IL}	V_{CC} = 5.0 V V_{CC} = 10 V	1, 2, 3		1.5 2.0	V
High level input current	I_{IH}	V_{CC} = 15 V; V_{IN} = 15 V	1, 2, 3		1.0	µA
Low level input current	I_{IL}	V_{CC} = 15 V; V_{IN} = 0 V	1, 2, 3	-1.0		µA
Output drive current (source) P-channel	$I_D{}^P$	V_{CC} = 5.0 V; V_{OUT} = 0 V V_{CC} = 10 V; V_{OUT} = 0 V T_A = 25°C	1	-1.75 -8.0		mA
Output drive current (sink) N-channel	$I_D{}^N$	V_{CC} = 5.0 V; V_{OUT} = V_{CC} V_{CC} = 10 V; V_{OUT} = V_{CC} T_A = 25°C	1	1.75 8.0		mA
Propagation delay time	t_{PHL} t_{PLH}	V_{CC} = 5.0 V C_L = 50 pF ±10%	9		140	ns
			10		195	
			11		110	
Input capacitance	C_{IN}	V_{IN} = 0 V	4		7.5	pF
Functional tests		See 4.3.1(c)	7			

Device type 01

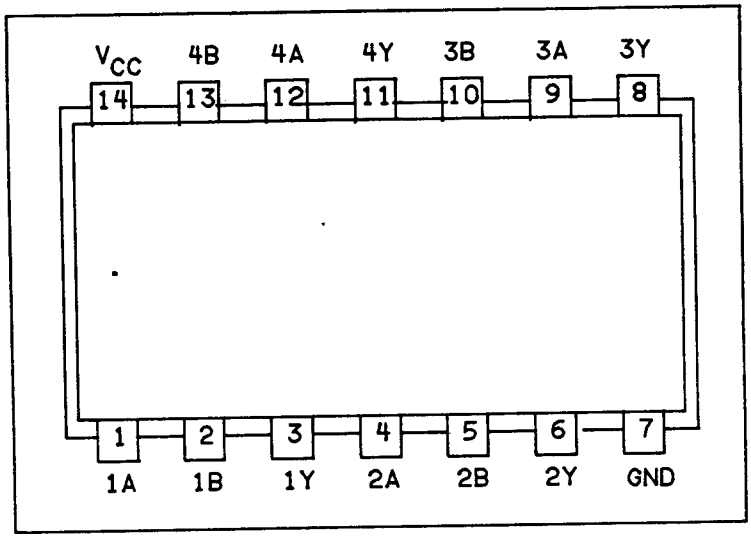

FIGURE 1. Terminal connections (top view).

Device type 01

Inputs		Output
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

FIGURE 2. Truth table.

Device type 01

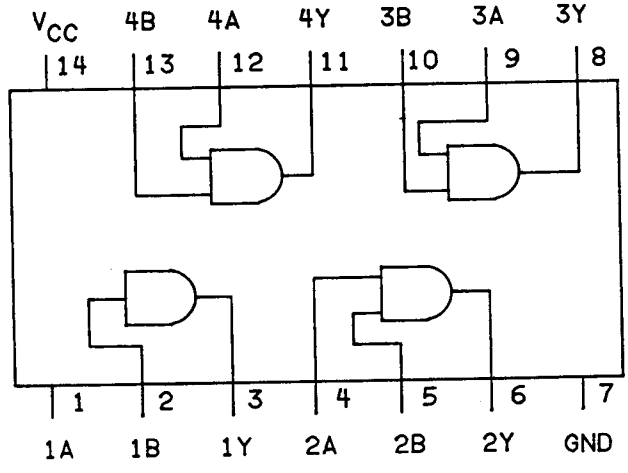

FIGURE 3. Logic diagram.

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.

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, D, or E 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 5, 6, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 4 (C_{IN} measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance.

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 (method 1005 of MIL-STD-883) conditions:

(1) Test condition D or E 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 appendix B of MIL-M-38510 and 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)	---
Final electrical test parameters (method 5004)	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 7, 9, 10, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3
Additional electrical subgroups for group C periodic inspections	---

* PDA applies to subgroup 1.
** If not tested, subgroups 10 and 11 shall be guaranteed to the specified limits.

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 vendor 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/	Replacement military specification part number
7703601AX	2/		
7703601CX	27014	MM54C08J/883	
7703601DX	27014	MM54C08W/883	

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

2/ Inactive for new design. Not available from an approved source of supply.

Vendor CAGE number	Vendor name and address
27014	National Semiconductor Corp. 2900 Semiconductor Drive Santa Clara, CA 95051