REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
D	Add vendor CAGE 27014. Remove vendor CAGE 07263. Device 01FX inactive for new design. Editorial changes throughout. Convert to military drawing format.	1986 Mar 28	M. A. Frye
E	Technical changes in table I, table II, and 1.4. Change CAGE code to 67268. Delete vendor CAGE 31019. Editorial changes throughout. Change vendor CAGE 27014 part number from MM4640BJ/883B to CD4040BMJ/883.	1989 Feb 09	M. A. Frye

CURRENT CAGE CODE 67268

REV STATUS OF SHEETS											
REV											
SHEET											
REV											
SHEET											
REV	E	E	E	E	E	E	E	E	E		
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

PREPARED BY: Marcia B Kelleher

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APPROVED BY: M. A. Frye

DRAWING APPROVAL DATE: 1978 February 24

REVISION LEVEL: E

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUITS, DIGITAL, CMOS, 12-BIT BINARY COUNTER, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	14933	77058

SHEET 1 OF 9

DESC FORM 193-1
SEP 87

* U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60912

5962-E1063

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:

77058	01	E	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
01	4040B	CMOS, 12-bit, binary counter

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
E	D-2 (16-lead, .840" x .310" x .200"), dual-in-line package
F	F-5 (16-lead, .440" x .285" x .085"), flat package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc to +18 V dc
Input voltage range	-0.5 V dc to V_{DD} + 0.5 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})	See MIL-M-38510, appendix C
Junction temperature (T_J)	+175°C

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	+3.0 V dc to +15 V dc
Case operating temperature range (T_C)	-55°C to +125°C
Minimum CP width, low or high (t_W):	
T_C = +25°C	335 ns
T_C = -55°C, T_C = +125°C	503 ns
Minimum reset pulse width (t_{WR}):	
T_C = +25°C	640 ns
T_C = -55°C, T_C = +125°C	950 ns

1/ For T_C = +100°C 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 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 case 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 $-55°C \le T_C \le +125°C$, unless otherwise specified	Group A subgroups	Limits Min	Limits Max	Unit
Quiescent device current	I_{DD}	V_{DD} = 15 V V_{IN} = 0.0 V or V_{DD}	1		100	µA
			2		600	
			3		80	
Low level output voltage	V_{OL}	V_{DD} = 15 V V_{IN} = 0.0 V or V_{DD}	1, 2, 3		.05	V
High level output voltage	V_{OH}	V_{DD} = 15 V V_{IN} = 0.0 V or V_{DD}	1, 2, 3	14.95		V
Low level input voltage	V_{IL}	V_{DD} = 5 V V_O = 0.5 V or 4.5 V	1, 2, 3		1.5	V
		V_{DD} = 15 V V_O = 1.5 V or 13.5 V	1, 2, 3		4.0	V
High level input voltage	V_{IH}	V_{DD} = 5 V V_O = 0.5 V or 4.5 V	1, 2, 3	3.5		V
		V_{DD} = 15 V V_O = 1.5 V or 13.5 V	1, 2, 3	11		V
Low level output current	I_{OL}	V_{DD} = 5 V V_O = 0.4 V	1	.51		mA
			2	.36		
			3	.64		
		V_{DD} = 15 V V_O = 1.5 V	1	3.4		mA
			2	2.4		
			3	4.2		
High level output current	I_{OH}	V_{DD} = 5 V V_O = 4.6 V	1	-.20		mA
			2	-.14		
			3	-.25		
		V_{DD} = 15 V V_O = 13.5 V	1	-1.5		mA
			2	-1.1		
			3	-1.8		
Input current	I_{IN}	V_{DD} = 15 V V_{IN} = 0.0 V or V_{DD}	1, 3		±0.1	µA
			2		±1.0	

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C < T_C < +125°C$, unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
Input capacitance	C_{IN}	V_{IN} = 0 V T_C = +25°C See 4.3.1c		4		7.5	pF
Functional test		See 4.3.1.d		7			
Minimum clock frequency	f_{MAX}	V_{DD} = 5 V C_L = 50 pF ±10% R_L = 200 kΩ $t_r = t_f$ = 20 ns	T_C = +25°C	9	1.5		MHz
			T_C = -55°C T_C = +125°C	10, 11	1.0		MHz
Transition time	t_{THL}, t_{TLH}		T_C = +25°C	9	2	350	ns
			T_C = -55°C T_C = +125°C	10, 11	2	525	ns
Propagation delay time, RESET to QN	t_{PLH1}, t_{PHL1}		T_C = +25°C	9	2	1080	ns
			T_C = -55°C T_C = +125°C	10, 11	2	1620	ns
Interstage propagation delay time QN to QN + 1	t_{PLH2}, t_{PHL2}		T_C = +25°C	9	2	700	ns
			T_C = -55°C T_C = +125°C	10, 11	2	1050	ns

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.

Top view

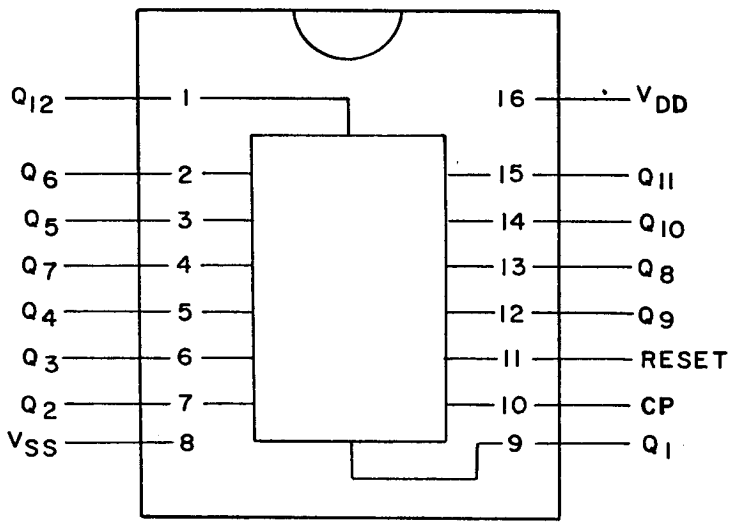

FIGURE 1. Terminal connections.

CP	Reset	Output state
⌐	0	No change
¬	0	Advanced to next state
x	1	All outputs are low

x = Don't care.

FIGURE 2. Truth table.

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 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 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 capacitance. Test all applicable pins on 5 devices with zero failures.

d. Subgroup 7 tests shall include verification of the truth table.

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 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)	---
Final electrical test parameters (method 5004)	1*,2,3,9
Group A test requirements (method 5005)	1,2,3,4,7,9, 10**,11**
Groups C and D end-point electrical parameters (method 5005)	1,2,3

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

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, OH 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/
7705801EX	27014	CD4040BMJ/883
7705801FX	2/	BCL4040BF

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.

Vendor CAGE number	Vendor name and address
27014	National Semiconductor P. O. Box 58090 Santa Clara, CA 95052-8090

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