REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Convert to Military Drawing format. Change V_{IL}, I_{IL}, V_{OH}, and propagation delays. Remove vendor CAGE 01295 for device 02.	14 Oct 1986	C. Reusing
B	Change input voltage range Changes made to table I Change Logic diagram Editorial changes throughout Change code Ident. No. to 67268. Change vendor similar part no. to indicate A version.	11 SEPT. 1987	M. A. Frye

CURRENT CAGE CODE 67268

REV																														
PAGE																														
REV STATUS OF PAGES	REV	B	B	B	B	B	B	B	B	B	B	B	B	B																
	PAGES	1	2	3	4	5	6	7	8	9	10	11	12	13																

Defense Electronics Supply Center
Dayton, Ohio

Original date of drawing:
17 May 1984

AMSC N/A

PREPARED BY: David W. Dassman

CHECKED BY: D A DiCenzo

APPROVED BY: Charles Reusing

SIZE: A

CODE IDENT. NO.: 14933

REV: B

MILITARY DRAWING

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

TITLE: MICROCIRCUIT, DIGITAL, ADVANCED, LOW POWER SCHOTTKY TTL, DUAL 4-BIT TRANSPARENT LATCH, MONOLITHIC SILICON

DWG NO. 84032

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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:

84032	01	L	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	54ALS873	Dual 4-bit D-type transparent latch with three-state outputs
02	54ALS880	Dual 4-bit D-type transparent latch with inverted three-state outputs

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

Outline letter	Case outline
K	F-6 (24-lead, 3/8" x 5/8"), flat package
L	D-9 (24-lead, 1/4" x 1-1/4"), dual-in-line package
3	C-4 (28-terminal, .450" x .450") square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc to +7.0 V dc
Input voltage range	-1.2 V dc at -18 mA to 7.0 V dc
Storage temperature	-65°C to +150°C
Maximum power dissipation (P_D) per device 1/:	
Device types 01 and 02	170.5 mW
Lead temperature (soldering, 10 seconds)	300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Case L	40°C/W
Cases K, 3	60°C/W
Junction temperature (T_J)	175°C

1/ Must withstand the added P_D due to short circuit test (e.g., I_O).

1.4 Recommended operating conditions.

Supply voltage	4.5 V dc minimum to 5.5 V dc maximum
Minimum high level input voltage (V_{IH})	2.0 V dc
Maximum low level input voltage (V_{IL})	0.7 V dc
Case operating temperature range (T_C)	-55°C to +125°C
Input set-up time, $t_{(setup)}$:	
Device types 01, 02	10 ns minimum
Input hold time, $t_{(hold)}$:	
Device type 01	7 ns minimum
Device type 02	10 ns minimum
Input pulse width, (t_p):	
Device type 01 (enable)	10 ns minimum
Device type 02 (enable)	15 ns minimum
Device type 01 (clear)	15 ns minimum
Device type 02 (preset)	15 ns minimum

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 tables. The truth tables shall be as specified on figure 2.

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

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

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$		Device type	Group A subgroups	Limits Min	Limits Max	Unit
High-level output voltage	V_{OH}	V_{CC} = 4.5 V I_{OH} = -1.0 mA V_{IN} = 0.7 V or 2.0 V		All	1, 2, 3	2.4		V
Low-level output voltage	V_{OL}	V_{CC} = 4.5 V I_{OL} = 12 mA V_{IN} = 0.7 V or 2.0 V		All	1, 2, 3		0.4	V
Input clamp voltage	V_{IC}	V_{CC} = 4.5 V I_{IN} = -18 mA T_C = +25°C		All	1		-1.5	V
Low-level input current	I_{IL}	V_{CC} = 5.5 V V_{IL} = 0.4 V		All	1, 2, 3		-200	µA
High-level input current	I_{IH1}	V_{CC} = 5.5 V V_{IH} = 2.7 V		All	1, 2, 3		20	µA
	I_{IH2}	V_{CC} = 5.5 V V_{IH} = 7.0 V		All	1, 2, 3		110	µA
Output current 1/	I_O	V_{CC} = 5.5 V V_O = 2.25 V		All	1, 2, 3	-15	-112	mA
Output current, high level, outputs OFF	I_{OZH}	V_{CC} = 5.5 V V_{OH} = 2.7 V		All	1, 2, 3		20	µA
Output current, low level, outputs OFF	I_{OZL}	V_{CC} = 5.5 V V_{OH} = 0.4 V		All	1, 2, 3		-20	µA
Supply current, outputs high	I_{CCH}	V_{CC} = 5.5 V	V_{IN} = 5.0 V	01	1, 2, 3		21	mA
			V_{IN} = 0 V	02	1, 2, 3		21	

See footnote at end of table.

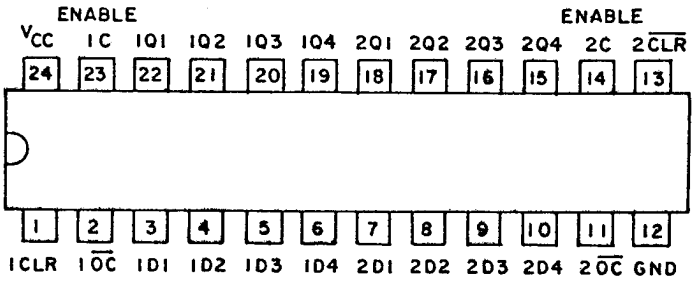
TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$		Device type	Group A subgroups	Limits Min	Limits Max	Unit
Supply current, outputs low	I_{CCL}	V_{CC} = 5.5 V	V_{IN} = 0 V	01	1, 2, 3		29	mA
			V_{IN} = 5.0 V	02	1, 2, 3		29	
Supply current, outputs disabled	I_{CCZ}	V_{CC} = 5.5 V V_{OC} = 5.0 V	V_{IN} = 0 V	01	1, 2, 3		31	mA
			V_{IN} = 5.5 V	02	1, 2, 3		31	
Propagation delay time to low level (clear or preset to output	t_{PHL1}	V_{CC} = 5.0 V C_L = 50 pF ±10% R_L = 500Ω		All	9, 10, 11		27	ns
Propagation delay time to high level (enable to output)	t_{PLH2}			All	9, 10, 11		31	ns
Propagation delay time to low level (enable to output)	t_{PHL2}			All	9, 10, 11		26	ns
Propagation delay time to high level (data to output)	t_{PLH3}			01	9, 10, 11		23	ns
				02	9, 10, 11		23	
Propagation delay time to low level (data to output)	t_{PHL3}			All	9, 10, 11		17	ns
Output control ON to high-level output	t_{PZH}			All	9, 10, 11		24	ns
Output control ON to low-level output	t_{PZL}			All	9, 10, 11		23	ns
High-level output to output control OFF	t_{PHZ}			All	9, 10, 11		12	ns
Low-level output to output control OFF	t_{PLZ}			All	9, 10, 11		30	ns

1/ The output conditions have been chosen to produce a current that closely approximates one-half of the true short-circuit output current, I_{OS}.

Device type 01

Cases L and K



Device type 01

Case 03

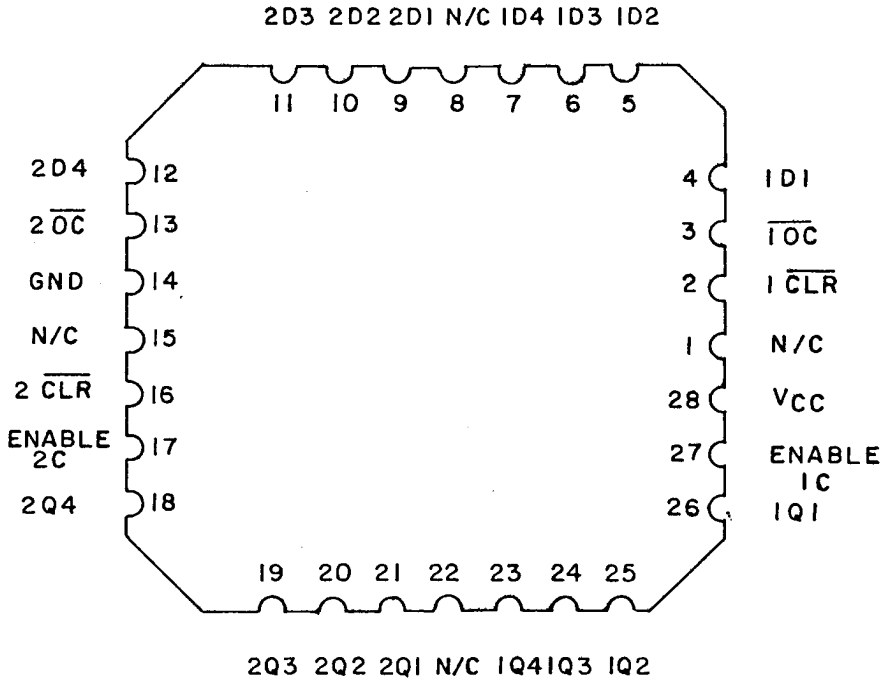


FIGURE 1. Terminal connections.

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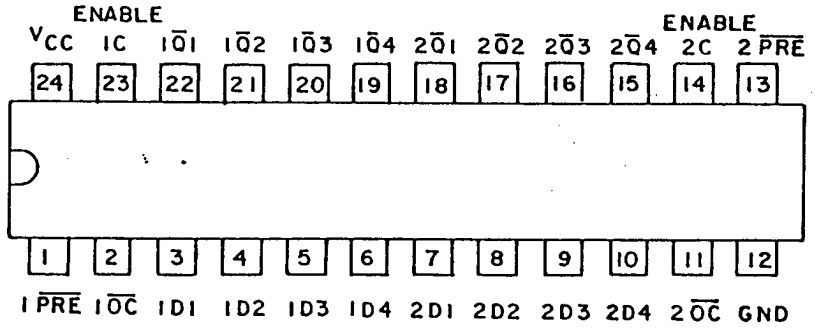
Device type 02

Cases L and K



Device type 02

Case 03

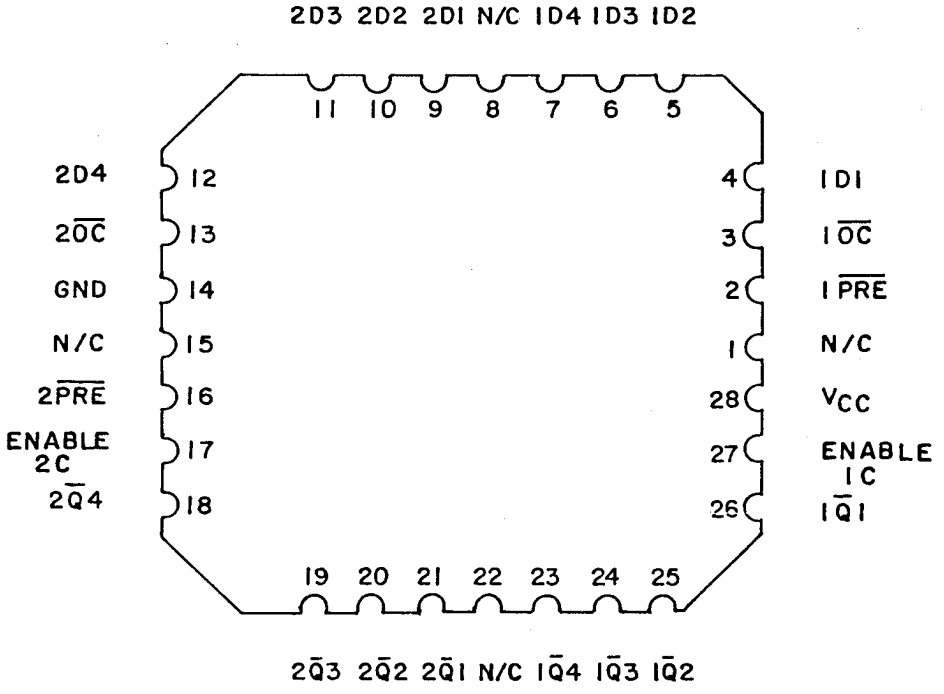


FIGURE 1. Terminal connections - Continued.

Device type 01

Output Control	Clear	Enable	Data	Output
$\overline{OC}$	$\overline{CLR}$	EN C	D	Q
H	X	X	X	Z
L	L	X	X	L
L	H	L	X	Q_0
L	H	H	L	L
L	H	H	H	H

Device type 02

Output Control	Clear	Enable	Data	Output
$\overline{OC}$	$\overline{PRE}$	EN C	D	$\overline{Q}$
H	X	X	X	Z
L	L	X	X	L
L	H	L	X	Q_0
L	H	H	L	H
L	H	H	H	L

H = High level (steady state).
L = Low level (steady state).
Z = High impedance state.
X = Irrelevant.
Q_0 = The level of Q or $\overline{Q}$ before the indicated input conditions were established.

FIGURE 2. Truth tables.

Device type 01

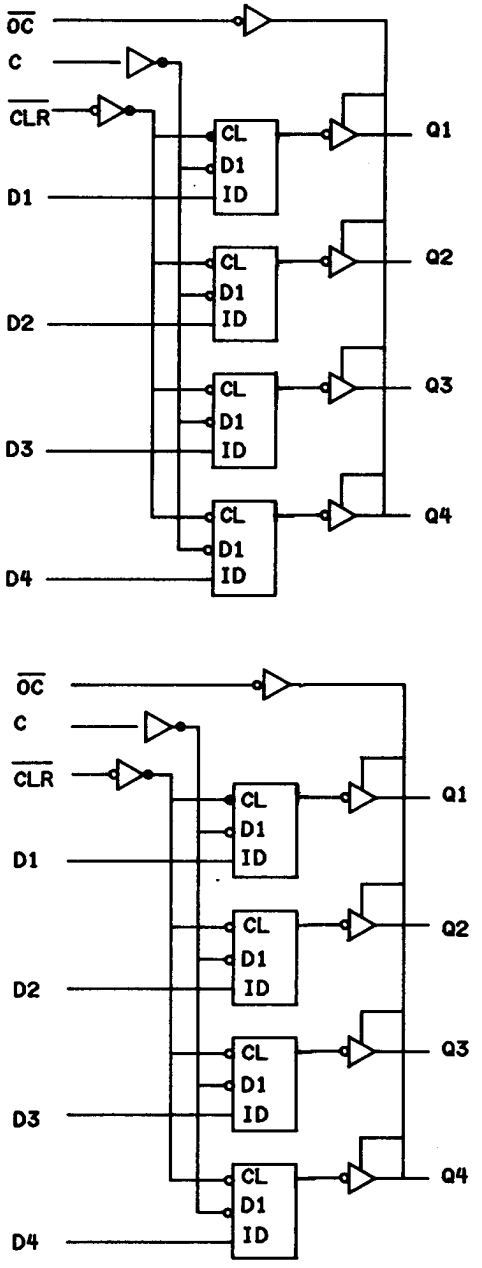


FIGURE 3. Logic diagrams.

Device type 02

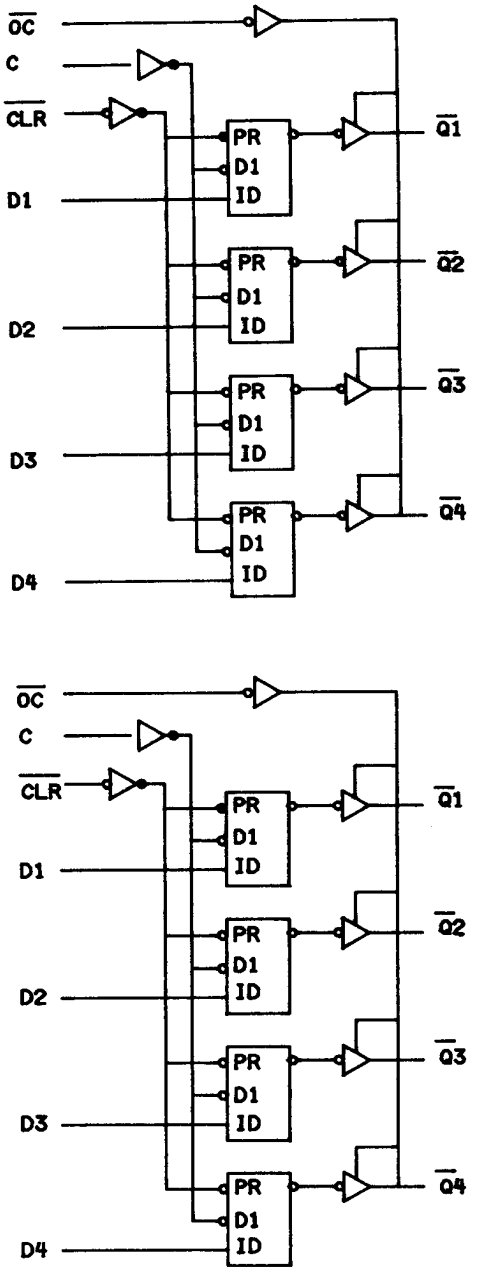


FIGURE 3. Logic diagrams - Continued.

3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full recommended 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.

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, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 7 tests shall verify the truth table.

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

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

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 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 appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

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. Replaceability is determined as follows:

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

b. When a QPL source is established, the part numbered device specified in this drawing will be replaced by the microcircuit identified as part number M38510/3820XB--.

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) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/	Replacement military specification part number
8403201LX	01295	SNJ54ALS873BJT	M38510/38203BLX
8403201KX	01295	SNJ54ALS873BW	M38510/38203BKX
84032013X	01295	SNJ54ALS873BFK	M38510/38203B3X
8403202LX	2/	SNJ54ALS880AJT	M38510/38204BLX
8403202KX	2/	SNJ54ALS880AW	M38510/38204BKX
84032023X	2/	SNJ54ALS880AFK	M38510/38204B3X

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/ Not available from an approved source of supply.

Vendor CAGE number	Vendor name and address
01295	Texas Instruments, Incorporated PO Box 6448 Midland, TX 79701