REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add case outlines K, L, and 3 to device type 01. Add vendor CAGE 18324 to case outlines K, L, and 3. Editorial changes throughout.	88 OCT 14	M. A. Frye

CURRENT CAGE CODE 67268

REV																								
SHEET																								
REV																								
SHEET																								
REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A	A	A												
	SHEET	1	2	3	4	5	6	7	8	9	10	11												

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

CHECKED BY

APPROVED BY

DRAWING APPROVAL DATE
22 OCTOBER 1986

REVISION LEVEL
A

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUIT, DIGITAL, HIGH SPEED CMOS, 4 TO 16 LINE DECORDER, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	14933	5962-86701

SHEET 1 OF 11

DESC FORM 193-1
SEP 87

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

5962-E993-2

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

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:

5962-86701	01	J	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	54HCT154	4 to 16 line decoder

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
K	F-6 (24-lead, .640" x .420" x .090"), flat package
L	D-9 (24-lead, 1.280" x .310" x .200"), dual-in-line package
3	C-4 (28-terminal, .460" x .460" x .100"), square chip carrier package

1.3 Absolute maximum ratings. 1/

Supply voltage (V_{CC})	-0.5 V dc to +7 V dc
Input voltage range, all inputs (V_{IN})	-0.5 V dc to V_{CC} +0.5 V dc
Output voltage range, all outputs (V_{OUT})	-0.5 V dc to V_{CC} +0.5 V dc
Clamp diode current, per pin (I_K)	±20 mA
Drain current, per output (I_{OUT})	±25 mA
V_{CC} or ground current, per pin (I_{CC})	±50 mA
Power dissipation per package (P_D)	500 mW 2/
Thermal resistance, junction-to-case (θ_{JC}):	
Cases J, K, L, and 3	See MIL-M-38510, appendix C
Storage temperature (T_{STG})	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+260°C

1.4 Recommended operating conditions.

Supply voltage range (V_{CC})	4.5 V dc to 5.5 V dc
DC input or output voltage (V_{IN}, V_{OUT})	0 V dc to V_{CC}
Case operating temperature (T_C)	-55°C to +125°C
Input rise and fall times t_r, t_f	
V_{CC} = 5.0 V	0 to 500 ns

1/ Unless otherwise specified, all voltages are referenced to ground.
2/ For T_C = +100°C to +125°C, derate linearly at 12 mW/°C.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1988—550-547

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 solication, 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 outline. The case outline 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		Unit
				Min	Max	
High level input voltage	V_{IH}	V_{CC} = 4.5 V	1,2,3	2		V
Low level input voltage	V_{IL}	V_{CC} = 4.5 V	1,2,3		0.8	V
High level output voltage, CMOS loads	V_{OH1}	V_{CC} = 4.5 V V_{IN} = 0.8 V or 2.0 V I_O = -20 µA	1,2,3	4.4		V
High level output voltage, TTL loads	V_{OH2}	V_{CC} = 4.5 V V_{IN} = 0.8 V or 2.0 V I_O = -4 mA	1,2,3	3.7		V
Low level output voltage, CMOS loads	V_{OL1}	V_{CC} = 4.5 V V_{IN} = 0.8 V or 2.0 V I_O = 20 µA	1,2,3		0.1	V
Low level output voltage, TTL loads	V_{OL2}	V_{CC} = 4.5 V V_{IN} = 0.8 V or 2.0 V I_O = 4 mA	1,2,3		0.4	V
Input leakage current	I_{IN}	V_{IN} = V_{CC} or GND V_{CC} = 6 V	1,2,3		±1	µA
Quiescent device current	I_{CC}	V_{IN} = V_{CC} or GND I_{OUT} = 0 V_{CC} = 6 V	1,2,3		160	µA
Additional quiescent device current per input pin: 1 unit load	ΔI_{CC}		1,2,3		490	µA
Propagation delay time, address or enable to output	t_{PHL}, t_{PLH}	V_{CC} = 4.5 V, C_L = 50 pF Input t_r = t_f = 6 ns See figure 4	9,10,11		53	ns
Functional tests		See 4.3.1d	7			
Input capacitance	C_{IN}	See 4.3.1c	4		10	pF

★ U. S. GOVERNMENT PRINTING OFFICE: 1988—549-904

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 B 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.

d. Subgroup 7 shall verify truth table specified on figure 2.

4.3.2 Groups C and D inspections.

a. End-point electrical parameters shall be as specified in table II herein.

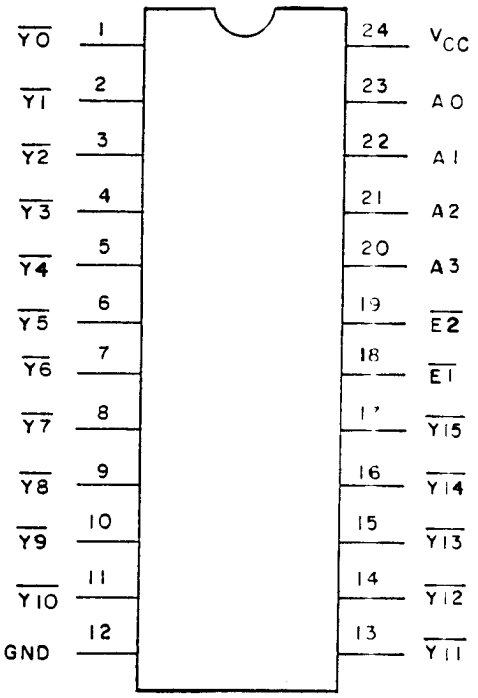
b. Steady-state life test conditions, method 1005 of MIL-STD-883.

(1) Test condition B 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.

Cases J, L, and K



Case 3

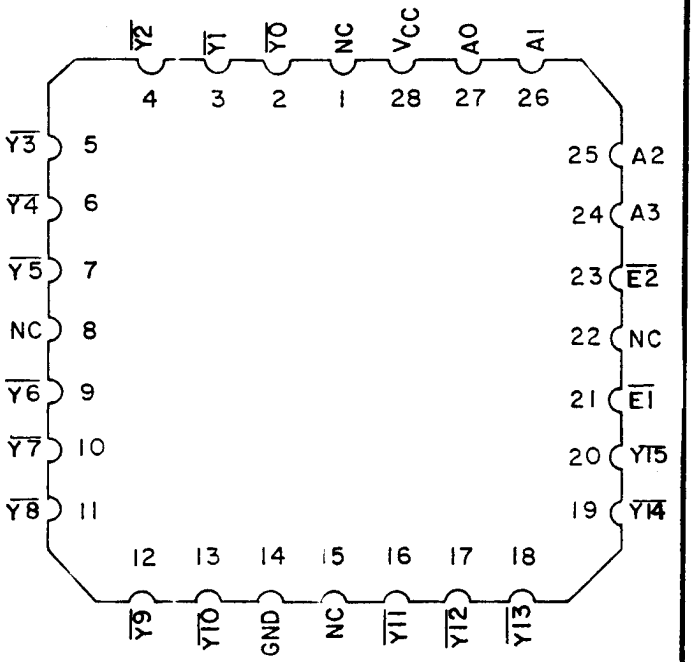


FIGURE 1. Terminal connections.

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 - 748-129-60913

Inputs					Outputs															
$\overline{E1}$	$\overline{E2}$	A3	A2	A1	A0	$\overline{Y0}$	$\overline{Y1}$	$\overline{Y2}$	$\overline{Y3}$	$\overline{Y4}$	$\overline{Y5}$	$\overline{Y6}$	$\overline{Y7}$	$\overline{Y8}$	$\overline{Y9}$	$\overline{Y10}$	$\overline{Y11}$	$\overline{Y12}$	$\overline{Y13}$	$\overline{Y14}$	$\overline{Y15}$
L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	H	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	H	L	L	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H
L	L	L	H	L	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H
L	L	L	H	H	L	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H
L	L	L	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H
L	L	H	L	L	L	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H
L	L	H	L	L	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H
L	L	H	L	H	L	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H
L	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H
L	L	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H
L	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H
L	L	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H
L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L
L	H	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
H	L	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
H	H	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

H = High level
L = Low level
X = Irrelevant

FIGURE 2. Truth table.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86701
		REVISION LEVEL A	SHEET 7

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 - 748-129-60913

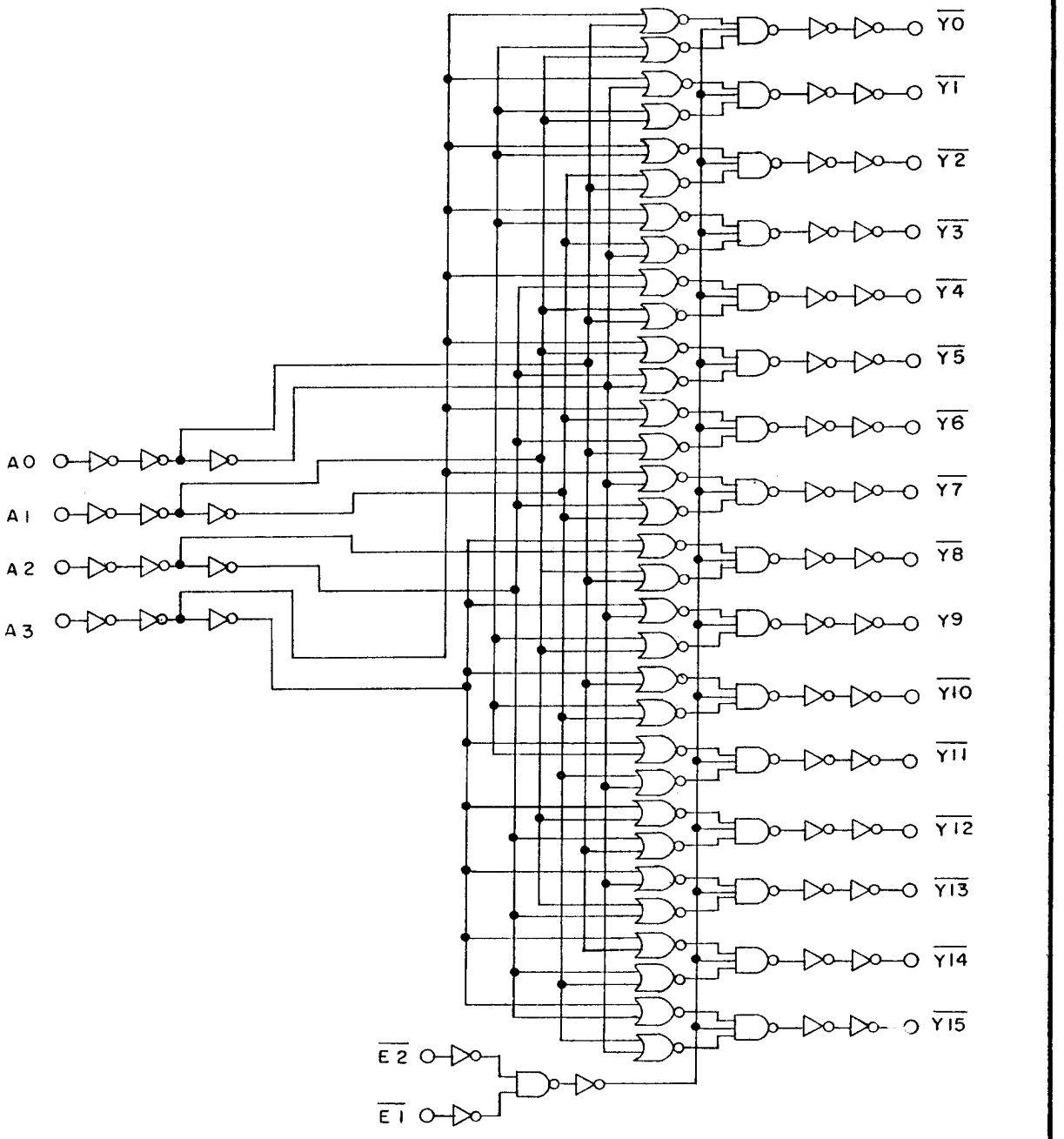
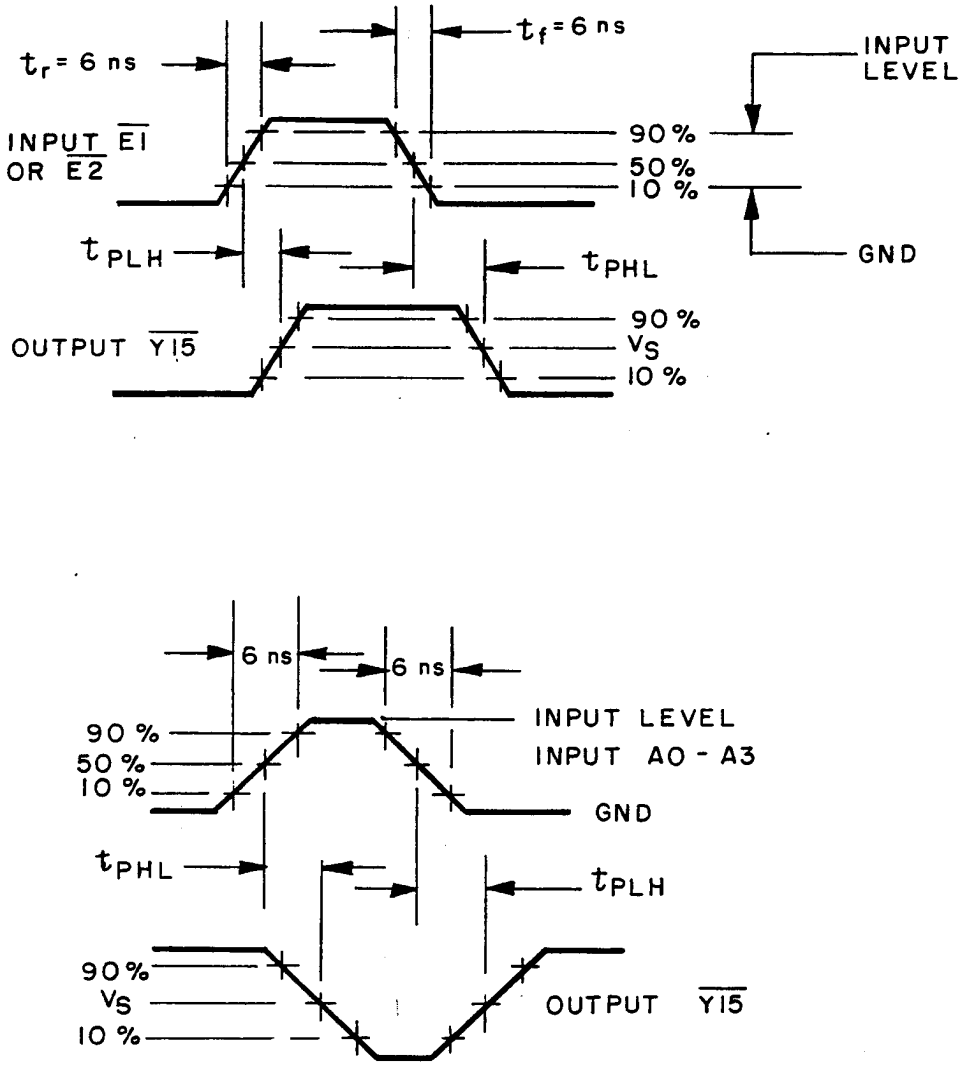


FIGURE 3. Logic diagram.

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 - 748-129-60913



NOTES:
1. Input level = 3.0 V.
2. Switching voltage, V_S = 1.3 V.

FIGURE 4. Switching waveforms.

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, Ohio 45444, or telephone 513-296-5375.

6.4 Approved sources of supply. An approved sources 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/
5962-8670101JX	18714	CD54HCT154F/3A
5962-8670101KX	18324	54HCT154/BKA
5962-8670101LX	18324	54HCT154/BLA
5962-86701013X	18324	54HCT154/B3A

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
18324	Signetics Corporation 4130 South Market Court Sacramento, CA 95834
18714	GE/RCA Corporation Solid State Division Route 202 Somerville, NJ 08876