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LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																																																																																																																							
E	Add vendor CAGE 18714. Delete vendor CAGE 31019. Technical changes in table I. Change drawing CAGE code to 67268. Editorial changes throughout.	1989 JUN 23	<i>M.O. Lye</i>																																																																																																																							
<div style="border: 1px solid black; padding: 5px; margin-bottom: 20px;"> Device type 01ZX inactive for new design as of 27 June 1986. </div> <div style="text-align: center; font-weight: bold; font-size: 1.2em; margin-bottom: 20px;"> CURRENT CAGE CODE 67268 </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>REV</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>SHEET</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>REV</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>SHEET</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td rowspan="2" style="text-align: center;">REV STATUS OF SHEETS</td> <td style="text-align: center;">REV</td> <td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td></td><td></td><td></td></tr> <tr> <td style="text-align: center;">SHEET</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td></td><td></td><td></td><td></td></tr> </table>				REV																				SHEET																				REV																				SHEET																				REV STATUS OF SHEETS	REV	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E				SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
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PMIC N/A <div style="text-align: center; font-weight: bold; font-size: 1.1em;"> STANDARDIZED MILITARY DRAWING </div> <p style="font-size: 0.8em;">THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p style="font-weight: bold; font-size: 0.8em;">AMSC N/A</p>	PREPARED BY <i>Marcia B. Kelleher</i> CHECKED BY <i>Ray Monnin</i> APPROVED BY <i>[Signature]</i> DRAWING APPROVAL DATE 26 September 1977 REVISION LEVEL <div style="text-align: center; font-weight: bold; font-size: 1.1em;">E</div>	<div style="text-align: center; font-weight: bold;"> DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 </div> <hr/> MICROCIRCUITS, DIGITAL, CMOS, 4-BIT LATCH, 4-TO-16 LINE DECODERS, MONOLITHIC SILICON
		SIZE A
		CAGE CODE 14933
		77032
		SHEET 1 OF 1

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SEP 87

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

5962-E1337-2

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:

77032	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
01	4515B	4-bit latch, 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
Z	F-8 (24-lead, .430" x .285" x .090"), flat package

1.3 Absolute maximum ratings.

Supply voltage range (V_{DD})	- - - - -	-0.5 V dc to +20 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_{DD})	- - - - -	+3.0 V dc to +15 V dc
Case operating temperature range (T_C)	- - - - -	-55°C to +125°C
Minimum high level input voltage (V_{IH})	- - - - -	+3.5 V dc
Maximum low level input voltage (V_{IL})	- - - - -	+1.5 V dc

1/ For $T_C = +100^\circ\text{C}$ to $+125^\circ\text{C}$, derate linearly at 12 mW/°C to 200 mW.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77032
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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 and logic diagram. The truth table and logic diagram 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.

STANDARDIZED MILITARY DRAWING

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
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U. S. GOVERNMENT PRINTING OFFICE: 1988-549-904

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < T _C < +125°C, unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Quiescent supply current	I _{DD}	V _{DD} = 5 V V _{IN} = 0.0 V or V _{DD} <u>1/</u>	1, 3		5	μA
			2		150	
		V _{DD} = 10 V V _{IN} = 0.0 V or V _{DD} <u>1/</u>	1, 3		10	
			2		300	
		V _{DD} = 15 V V _{IN} = 0.0 V or V _{DD} <u>1/</u>	1, 3		20	
			2		600	
Low level output voltage	V _{OL}	V _{IN} = 0.0 V or V _{DD} I _O < 1 μA	V _{DD} = 5 V <u>1/</u>	1, 2, 3		V
			V _{DD} = 10 V <u>1/</u>	1, 2, 3		
			V _{DD} = 15 V	1, 2, 3		
		V _{IN} = 0.0 V or V _{DD} I _O < 1 μA	V _{DD} = 5 V <u>1/</u>	1, 2, 3	4.95	
			V _{DD} = 10 V <u>1/</u>	1, 2, 3	9.95	
			V _{DD} = 15 V	1, 2, 3	14.95	
High level output voltage	V _{OH}	V _{IN} = 0.0 V or V _{DD} I _O < 1 μA	V _{DD} = 5 V <u>1/</u>	1, 2, 3		
			V _{DD} = 10 V <u>1/</u>	1, 2, 3		
			V _{DD} = 15 V	1, 2, 3		
		V _{DD} = 5 V V _O = 0.5 V or 4.5 V	1, 2, 3		1.5	
			1, 2, 3		3.0	
			1, 2, 3		4.0	
Low level input voltage	V _{IL}	V _{DD} = 10 V V _O = 1.0 V or 9.0 V <u>1/</u>	1, 2, 3		3.0	
			1, 2, 3		4.0	
		V _{DD} = 15 V V _O = 1.5 V or 13.5 V	1, 2, 3		4.0	
			1, 2, 3		4.0	
		V _{DD} = 5 V V _O = 0.5 V or 4.5 V	1, 2, 3		1.5	
			1, 2, 3		3.0	

See footnote at end of table.

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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		Unit
				Min	Max	
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} = 10 V V _O = 1.0 V or 9.0 V <u>1/</u>	1, 2, 3	7.0		
		V _{DD} = 15 V V _O = 1.5 V or 13.5 V	1, 2, 3	11		
Low level output current	I _{OL}	V _{DD} = 5 V V _O = 0.4 V	1	.51		mA
			2	.36		
			3	.64		
		V _{DD} = 10 V V _O = 0.5 V <u>1/</u>	1	1.3		
			2	0.9		
			3	1.6		
		V _{DD} = 15 V V _O = 1.5 V <u>1/</u>	1	3.4		
			2	2.4		
			3	4.2		
High level output current	I _{OH}	V _{DD} = 5 V V _O = 4.6 V	1	-.51		
			2	-.36		
			3	-.64		
		V _{DD} = 5 V V _O = 2.5 V	1	-1.6		
			2	-1.15		
			3	-2.0		
		V _{DD} = 10 V V _O = 9.5 V <u>1/</u>	1	-1.3		
			2	-0.9		
			3	-1.6		

See footnote at end of table.

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DEFENSE ELECTRONICS SUPPLY CENTER
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TABLE 1. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _C < +125°C, unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
High level output current	I _{OH}	V _{DD} = 15 V V _O = 13.5 V 1/	1	-3.4		mA
			2	-2.4		
			3	-4.2		
Input current	I _{IN}	V _{DD} = 20 V V _{IN} = 0.0 V or V _{DD}	1, 3		±0.1	μA
			2		±1.0	
Input capacitance	C _{IN}	V _{IN} = 0 V T _C = +25°C See 4.3.1c	4		7.5	pF
Functional test		See 4.3.1d	7			
Minimum strobe pulse width (any input)	t _w	R _L = 200 kΩ C _L = 50 pF ±10% t _r = t _f = 20 ns See figure 3	V _{DD} = 5 V 1/	9, 10, 11	250	ns
			V _{DD} = 10 V 1/	9, 10, 11	100	
			V _{DD} = 15 V 1/	9, 10, 11	75	
Minimum data setup time	t _s		V _{DD} = 5 V 1/	9, 10, 11	150	
			V _{DD} = 10 V 1/	9, 10, 11	70	
			V _{DD} = 15 V 1/	9, 10, 11	40	
Transition time	t _{THL} , t _{TLH}		V _{DD} = 5 V	9	2	360
				10, 11	2	540
			V _{DD} = 10 V 1/	9	2	180
				10, 11	2	270
			V _{DD} = 15 V 1/	9	2	130
				10, 11	2	190

See footnote at end of table.

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 DEFENSE ELECTRONICS SUPPLY CENTER
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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		Unit	
				Min	Max		
Propagation delay time, strobe or data	t _{PHL1} , t _{PLH1}	R _L = 200 kΩ C _L = 50 pF ±10% t _r = t _f = 20 ns See figure 3	V _{DD} = 5 V	9	2	1100	ns
				10, 11	2	1650	
			V _{DD} = 10 V <u>1/</u>	9	2	450	
				10, 11	2	675	
			V _{DD} = 15 V <u>1/</u>	9	2	330	
				10, 11	2	495	
Inhibit propagation delay time	t _{PHL2} , t _{PLH2}		V _{DD} = 5 V	9	2	800	
				10, 11	2	1200	
			V _{DD} = 10 V <u>1/</u>	9	2	300	
				10, 11	2	450	
			V _{DD} = 15 V <u>1/</u>	9	2	250	
				10, 11	2	375	

1/ This test is guaranteed, if not tested, to the specified limits on table I.

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.

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Device type 01

Cases J and Z

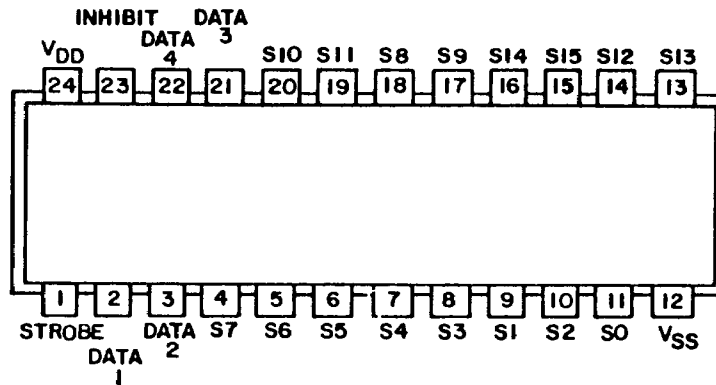


FIGURE 1. Terminal connections (top view).

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Device type 01

Cases J and Z

Decode truth table (strobe = 1)

Inhibit	Data Inputs				Select output
	D	C	B	A	Logic 0 (low)
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	0	0	0	S8
0	1	0	0	1	S9
0	1	0	1	0	S10
0	1	0	1	1	S11
0	1	1	0	0	S12
0	1	1	0	1	S13
0	1	1	1	0	S14
0	1	1	1	1	S15
1	X	X	X	X	All outputs = 1

X = Don't care

Logic 1 = high

Logic 0 = low

FIGURE 2. Truth table and logic diagram.

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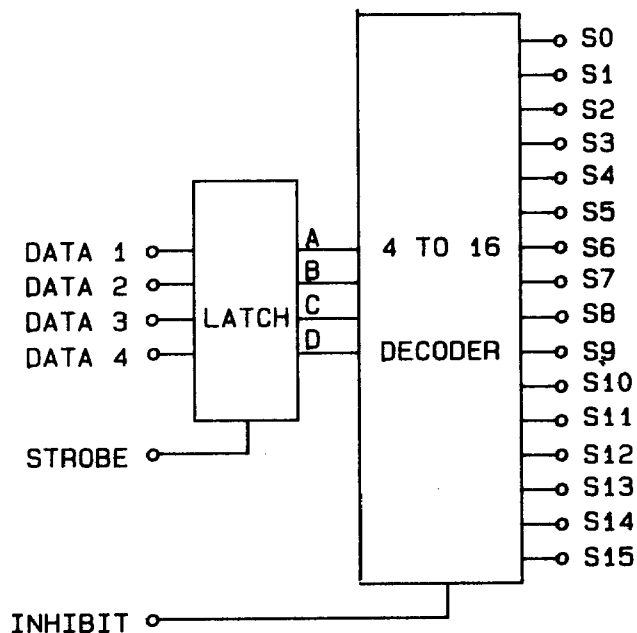


FIGURE 2. Truth table and logic diagram - Continued.

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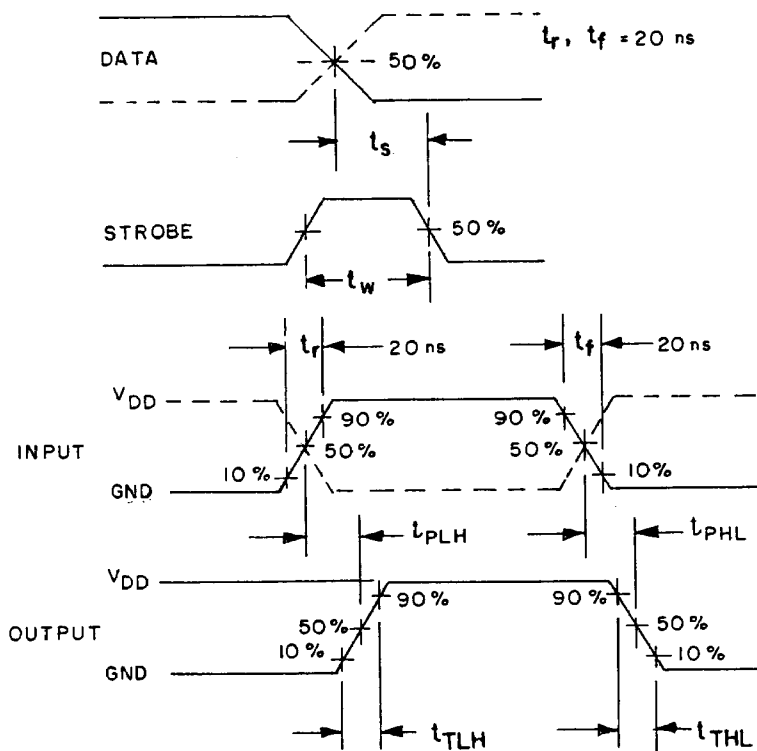
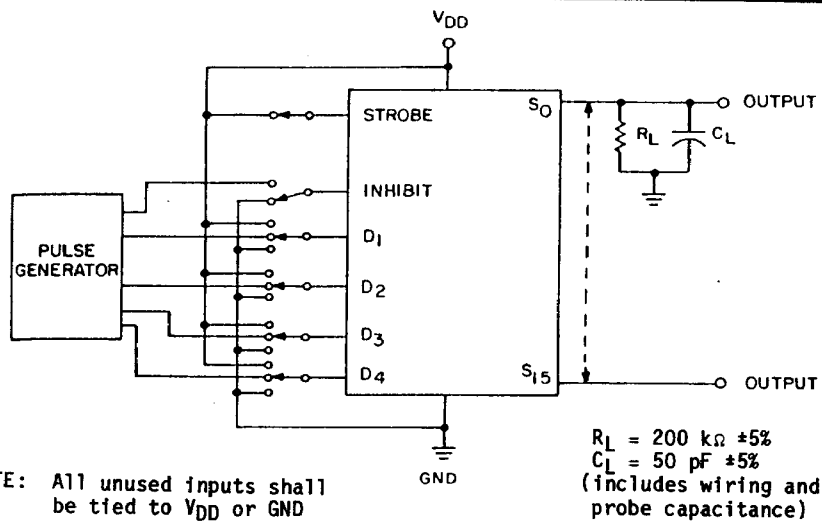


FIGURE 3. Test circuit and switching waveforms.

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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) $T_A = +125^{\circ}\text{C}$, 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 verify the truth table as 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 A or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) $T_A = +125^{\circ}\text{C}$, minimum.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

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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. 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 M38510/17302B.

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, OH 45444, or telephone 513-296-5375.

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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 <u>1/</u>	Replacement military specification part number
7703201JX	18714	CD4515F/3A	M38510/17302BJX
7703201ZX	<u>2/</u>	BCL4515BF	

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

18714

Vendor name
and address

RCA Corporation
Semiconductor Sector
Route 202
Somerville, NJ 08876

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