NOTICE OF REVISION (NOR)

(See MIL-STD-480 for instructions)

This revision described below has been authorized for the document listed.

DATE (YYMMDD) 91/10/21

Form Approved OMB No. 0704-0188

1. ORIGINATOR NAME AND ADDRESS
Defense Electronics Supply Center
Dayton, Ohio 45444-5277

2. CAGE CODE 67268

3. NOR NO. 5962-R007-92

4. CAGE CODE 67268

5. DOCUMENT NO. 5962-87653

6. TITLE OF DOCUMENT
MICROCIRCUIT, MICROPROCESSOR, COMPATIBLE REAL-TIME CLOCK, CMOS MONOLITHIC SILICON

7. REVISION LETTER
(Current) initial
(New) A

8. ECP NO.

9. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES

10. DESCRIPTION OF REVISION

Sheet 1: Revisions ltr column; add "A"
Revisions description column; add "Changes in accordance with NOR 5962-R007-92".
Revisions date column; add "91-10-21".

Sheet 4: Table I
Change Output High Voltage (V_{OH}) from: I_{OH} = 400 μA
to: I_{OH} = -400 μA

Change Standby Current from : Vbackup = V_{CC}-0.3V
to : Vbackup = V_{CC}-3.0V

Add the following test to Table I:

Test	Symbol	Conditions -55°C ≤ T_C ≤ +125°C 4.5 V ≤ V_{CC} ≤ 5.5 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Alarm Interrupt Test 1/		F_{OSC} = 1MHz V_{IN} = 0V	1, 2, 3				

1/ The alarm interrupt test shall verify that while the device is set-up in the alarm interrupt mode, the counters are incremented and the alarm interrupt pin (12) goes low.

11. THIS SECTION FOR GOVERNMENT USE ONLY

a. CHECK ONE

[X] EXISTING DOCUMENT SUPPLEMENTED BY THIS NOR MAY BE USED IN MANUFACTURE.

[ ] REVISED DOCUMENT MUST BE RECEIVED BEFORE MANUFACTURER MAY INCORPORATE THIS CHANGE.

[ ] CUSTODIAN OF MASTER DOCUMENT SHALL MAKE ABOVE REVISION AND FURNISH REVISED DOCUMENT TO:

b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT	SIGNATURE AND TITLE	DATE (YYMMDD)
DESC-ECC	Monica L. Poelking	91/10/21
12. ACTIVITY ACCOMPLISHING REVISION	REVISION COMPLETED (Signature)	DATE (YYMMDD)
DESC-ECC	Thomnas M. Hess	91/10/21

REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

The original first page of this drawing has been replaced.

REV																			
SHEET																			
REV																			
SHEET																			

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

PMIC N/A

MILITARY DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

PREPARED BY
Ray Monnin

CHECKED BY
D. A. Di Cenzo

APPROVED BY
N. A. Hauck

DRAWING APPROVAL DATE
3 August 1987

REVISION LEVEL

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUITS, MICROPROCESSOR, COMPATIBLE REAL-TIME CLOCK, CMOS MONOLITHIC SILICON

SIZE	CAGE CODE	5962-87653
A	67268	

SHEET 1 OF 11

DESC FORM 193
MAY 86

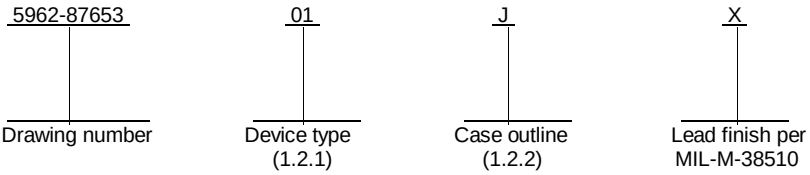
5962-E488

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:



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

Device type	Generic number	Circuit function
01	ICM7170	Microprocessor compatible real-time clock

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, 1/2" x 1-1/4"), dual-in-line package

1.3 Absolute maximum ratings.

Supply voltage (V_{CC})	+8.0 V dc
Power dissipation (P_D)	500 mW 1/
Input voltage (any terminal)	V_{CC} +0.3 V dc to V_{SS} -0.3 V dc
Storage temperature range (T_S)	-65° C to +150° C
Thermal resistance, junction-to-case (θ_{JC}):	
Case J	See MIL-M-38510, appendix C
Lead temperature (soldering, 10 seconds)	+300° C

1.4 Recommended operating conditions.

Case operating temperature range, (T_C)	-55° C to +125° C
Supply voltage (V_{CC})	4.5 V dc to 5.5 V dc

1/ Derate at 40° C/W above T_C = +25° C

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 Functional diagram. The functional diagram shall be as specified on figure 2.

3.2.3 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 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 herein. 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).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ $4.5\ V\ dc \le V_{CC} \le 5.5\ V\ dc$ $V_{BACKUP} = V_{CC}$ (unless otherwise specified)		Group A subgroups	Limits		Unit
					Min	Max	
V_{CC} Supply range	V_{CC}	F_{OSC} = 32 kHz		1, 2, 3	1.9	5.5	V
		F_{OSC} = 1.2 MHz			2.6	5.5	
Standy current	I_{STBY1}	V_{CC} = VSS, V_{BACKUP} = V_{CC} -0.3 V,	F_{OSC} = 32 kHz			40	µA
	I_{STBY2}	All chip I/O to V_{CC}	F_{OSC} = 1.2 Mhz			200	
Operating supply current	I_{CC1}	F_{OSC} = 32 kHz	Read/write at 100 Hz			1.2	mA
	I_{CC2}		Read/write at 1 MHz			2.0	
Input low voltage (except oscillator input)	V_{IL}	VCC = 5.0 V				0.8	V
Input high voltage (except oscillator input)	V_{IH}				2.8		
Output low voltage (except oscillator output)	V_{OL}	I_{OL} = 1.6 mA				0.5	
Output high voltage (except INTERRUPT and oscillator output)	V_{OH}	I_{OH} = 400 µA			2.5		
Input leakage current	I_{IL}	$V_{IN} = V_{CC}$ or V_{SS}			-10	+10	µA
3-State leakage current (outputs D_0 through D_7)	I_{OL}				-10	+10	
Backup battery voltage	V_{BACKUP}	F_{OSC} = 32 kHz			1.9	V_{CC} -1.5	V
INTERRUPT leakage current	I_{OLINT}	$V_O = V_{CC}$ or V_{SS}				10	µA
Input capacitance	C_I	See 4.3.1c		4		10	pF
Output capacitance	C_O	See 4.3.1c		4		10	pF

See footnotes at end of table.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ $4.5\ V\ dc \le V_{CC} \le 5.5\ V\ dc$ $V_{BACKUP} = V_{CC}$ (unless otherwise specified)	Group A subgroups	Limits		Unit
				Min	Max	
I/O capacitance	$C_{I/O}$	See 4.3.1c	4		10	pF
READ to Data valid	t_{RD}	$C_L = 150\ pF$, $V_{IL} = 0.4\ V$,	9, 10, 11		250	ns
ADDRESS valid to DATA valid	t_{ACC}	$V_{IH} = 3.20\ V$, see figure 3			350	
READ cycle time	t_{CYC}			450		
RD high to bus 3-state	t_{RX}				100	
ADDRESS to READ setup time	t_{AS}			100		
ADDRESS HOLD time after READ	t_{AR}			50		
READ high time	t_{RH}			200		
ADDRESS valid to WRITE strobe	t_{AD}			100		
ADDRESS hold time for WRITE	t_{WA}			50		
WRITE pulse width low	t_{WL}			125		
WRITE pulse width high	t_{WH}			325		
DATA IN to WRITE set up time	t_{DW}			125		
DATA IN hold time after WRITE	t_{WD}			50		
WRITE cycle time	t_{CYC}			450		
ALE width	t_{LL}			50		
ADDRESS to ALE set up time	t_{AL}			30		
ADDRESS hold time after ALE	t_{LA}			40		

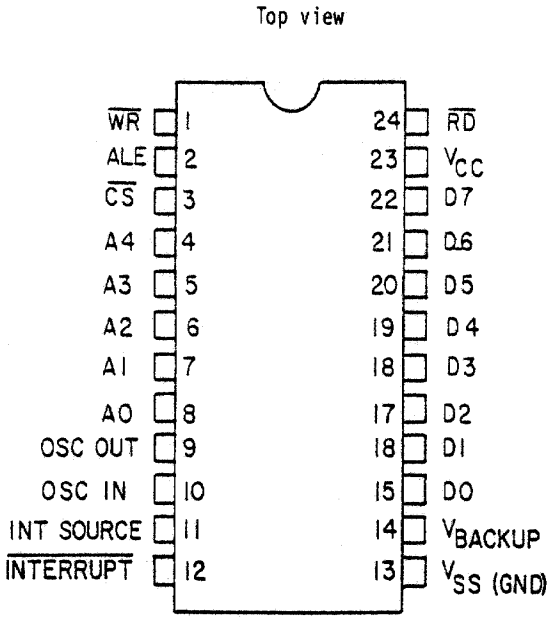


FIGURE 1. Terminal connections

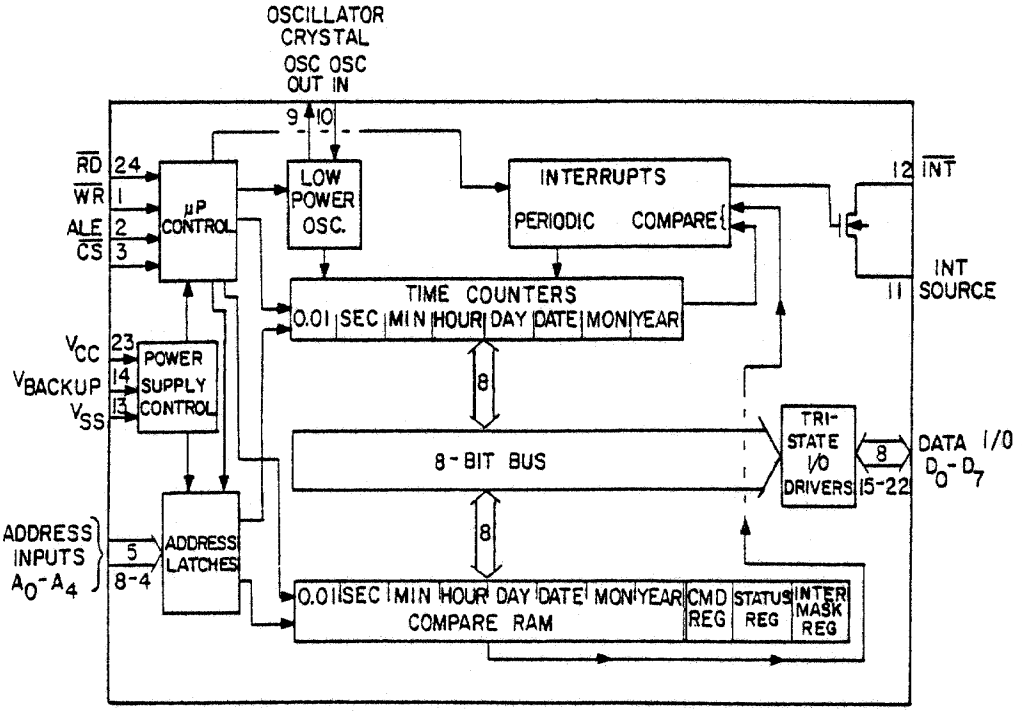


FIGURE 2. Functional diagram.

MILITARY DRAWING **DEFENSE ELECTRONICS SUPPLY CENTER** **DAYTON, OHIO 45444**	SIZE **A**	CODE IDENT NO. **67268**	DWG NO 5962-87653
		REV	PAGE 6

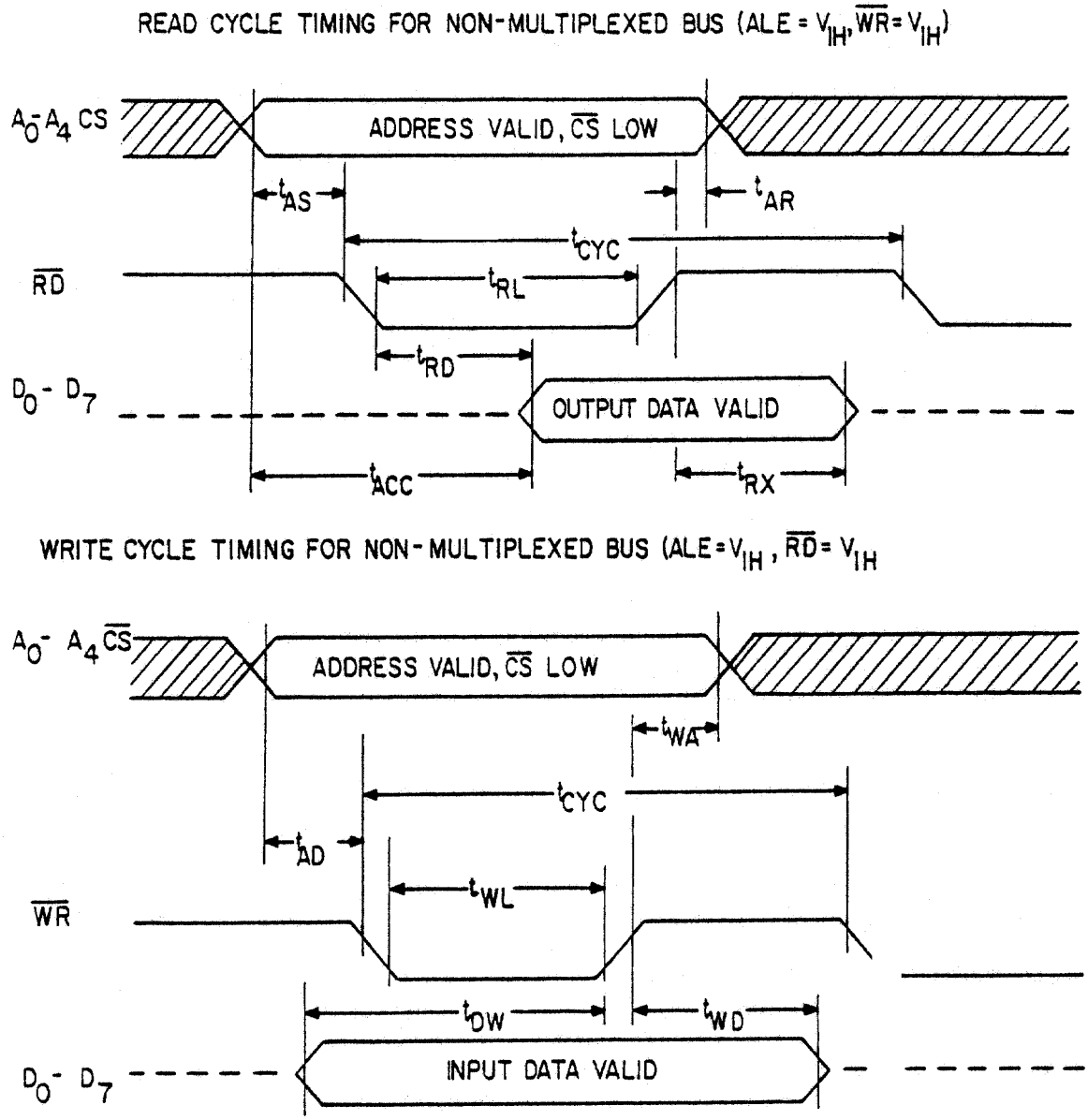


FIGURE 3. Switching time waveforms.

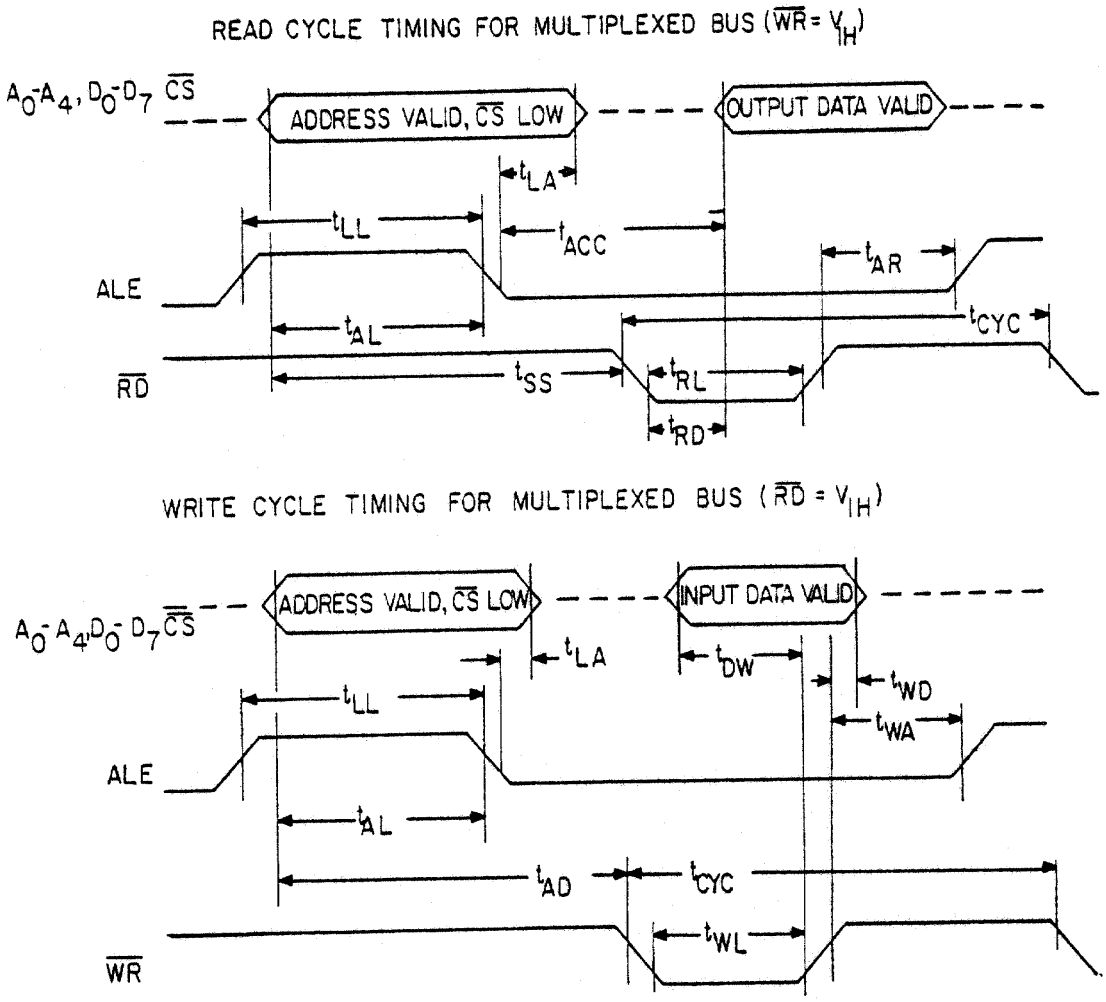


FIGURE 3. Switching time waveforms.

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 5, 6, 7, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroups 4 (C_I, C_O, and $C_{I/O}$ measurements) shall be measured only for the initial test and after process or design changes which may affect 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 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.

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, 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.

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 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/
5962-8765301JX	32293	ICM7170MDG/88

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
32293	Intersil, Inc. 10600 Ridgeview Court Cupertino, CA 95014