REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	Convert to military drawing format. Add device type 02. Changes to 1.3 and 1.4. Changes to table I and II. Changes to figures 1,2,3,4. Editorial changes throughout.	21 May 87.	

REV																										
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REV STATUS OF PAGES	REV	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B								
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Defense Electronics Supply Center
Dayton, Ohio

Original date of drawing:
20 December 1984

AMSC N/A

PREPARED BY
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M C Hauck

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: MICROCIRCUITS, CMOS, OCTAL, LATCHING BUS DRIVER, MONOLITHIC SILICON

DWG NO. 84067

PAGE 1 OF 16

5962-E370

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

DESC FORM 193
MAY 86

1. SCOPE

1.1 Scope. This drawing describes the 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:

84067	01	R	X
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

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

Device type	Generic number	Circuit Function
01	82C82	CMOS octal latching, bus driver
02	82C83H	CMOS octal latching, inverting bus driver

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
R	D-8 (20-lead, 1/4" x 1-1/16") dual-in-line package
2	C-2 (20-terminal, .350" x .350") square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage range (referenced to ground)	8.0 V dc maximum
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P_D)	1 W
Lead temperature (soldering, 10 seconds)	+275°C
Junction temperature (T_J)	+150°C
Thermal resistance, junction to case (θ_{JC}):	
Case R	(see MIL-M-38510, appendix C)
Case 2	23°C/W 1/
Input, output, or I/O voltage applied	GND - 0.5 V dc to V_{CC} + 0.5 V dc

1/ When a thermal resistance value is included in MIL-M-38510, appendix C, it shall supersede the value stated herein.

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	+4.5 V dc minimum to +5.5 V dc maximum
Case operating temperature range (T_C)	-55°C to +125°C
Output disable time (t_{EHOZ})	
Device type 01 2/	35 ns maximum (see figure 1, reference number 3, and figure 2).
Device type 02 2/	22 ns maximum (see figure 1, reference number 3, and figure 2).
Input rise/fall time (t_R/t_F) 2/	20 ns maximum (see figure 1, reference number 8).

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.

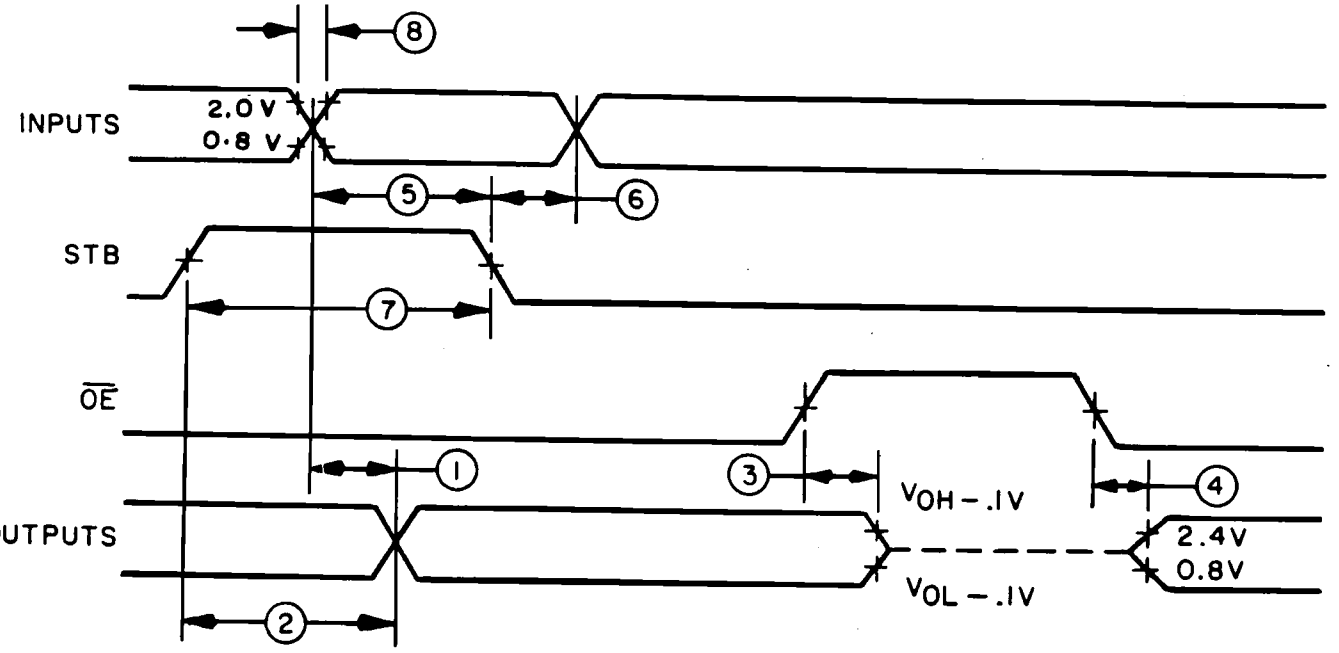
3.2.1 Terminal connections. Terminal connections shall be as specified on figure 3.

3.2.2 Truth table and functional diagram. The truth table and functional diagram shall be as specified on figure 4.

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

2/ Not tested but characterized at initial device design and after major process or design changes affecting this parameter.

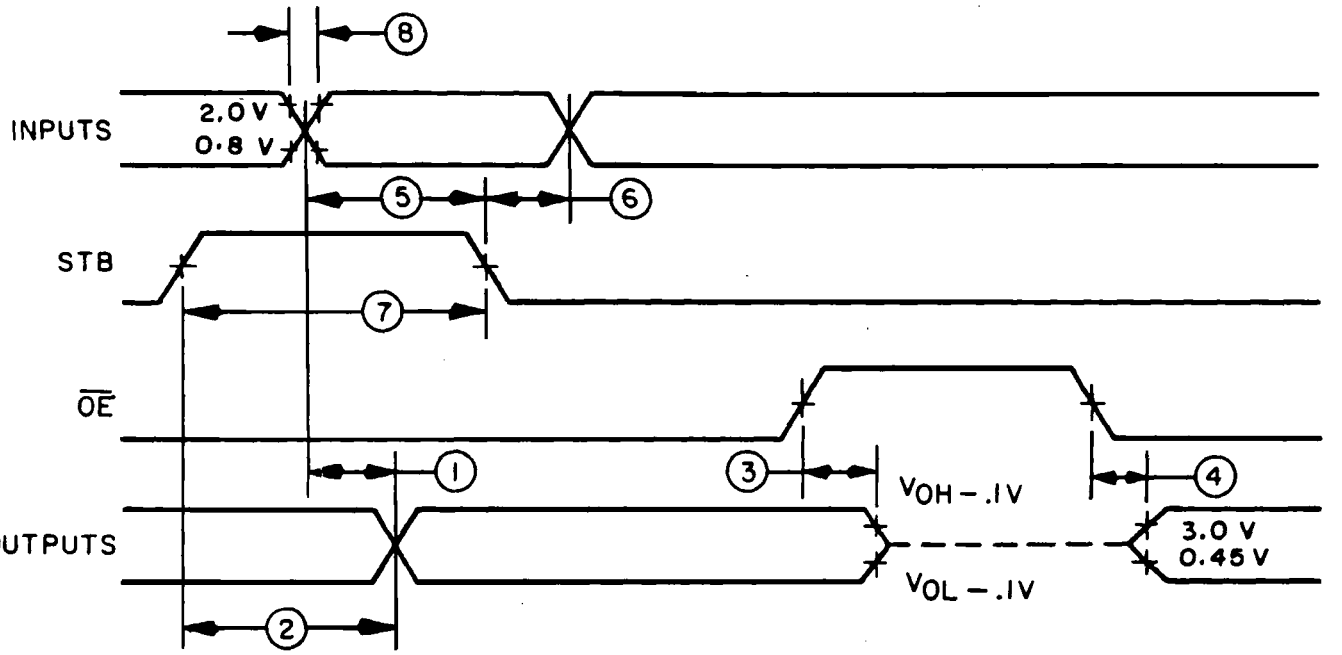
Device type 01



NOTES:
1. All timing measurements are made at 1.5 V unless otherwise noted.
2. Inputs must switch between V_{IL} -0.4 V and V_{IH} +0.4 V.

FIGURE 1. Waveforms.

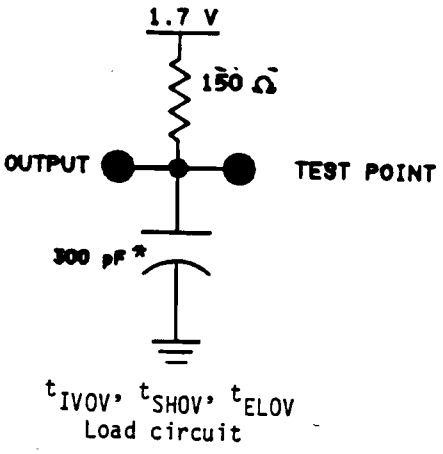
Device type 02



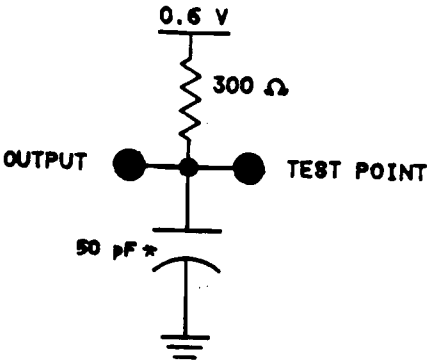
NOTES:
1. All timing measurements are made at 1.5 V unless otherwise noted.
2. Inputs must switch between V_{IL} -0.4 V and V_{IH} +0.4 V.

FIGURE 1. Waveforms - Continued.

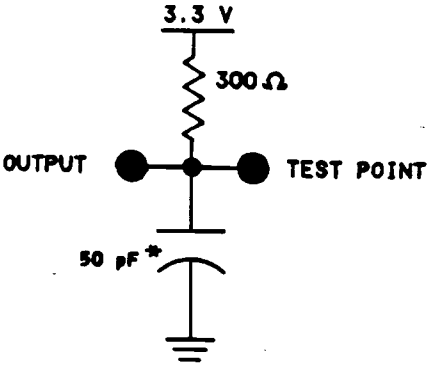
Device type 01



t_{IVOV}, t_{SHOV}, t_{ELOV}
Load circuit



t_{EHOZ}
OUTPUT HIGH DISABLE
Load circuit

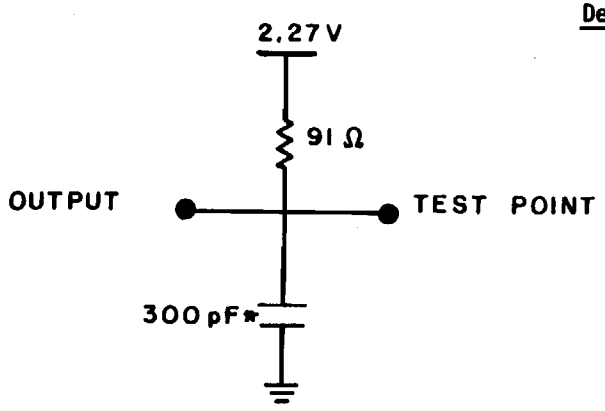


t_{EHOZ}
OUTPUT LOW DISABLE
Load circuit

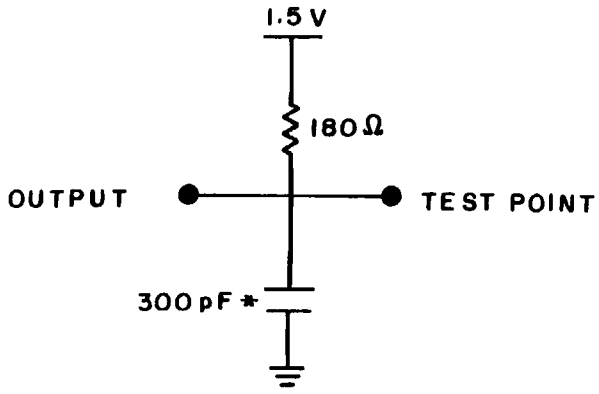
* INCLUDES JIG AND STRAY CAPACITANCE

FIGURE 2. AC test circuit specifications .

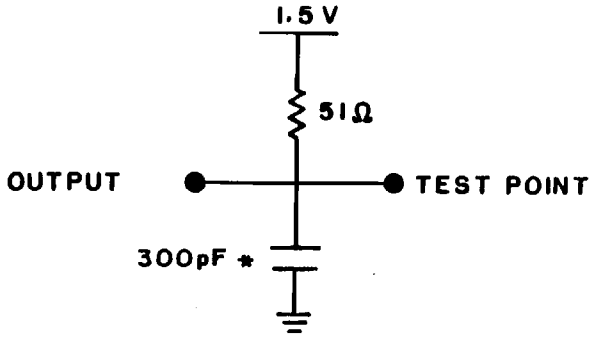
Device type 02



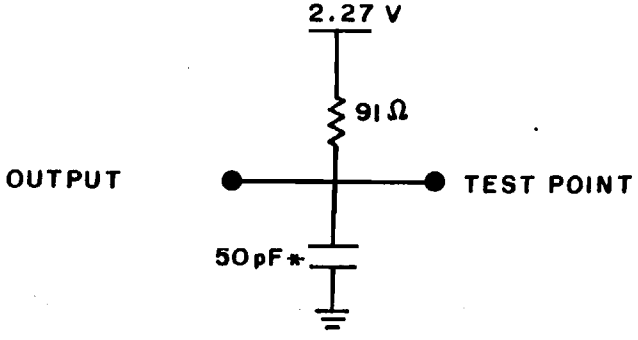
t_{IVOV}, t_{SHOV}
LOAD CIRCUIT



t_{ELOV}
OUTPUT HIGH ENABLE
LOAD CIRCUIT



t_{ELOV}
OUTPUT LOW ENABLE
LOAD CIRCUIT



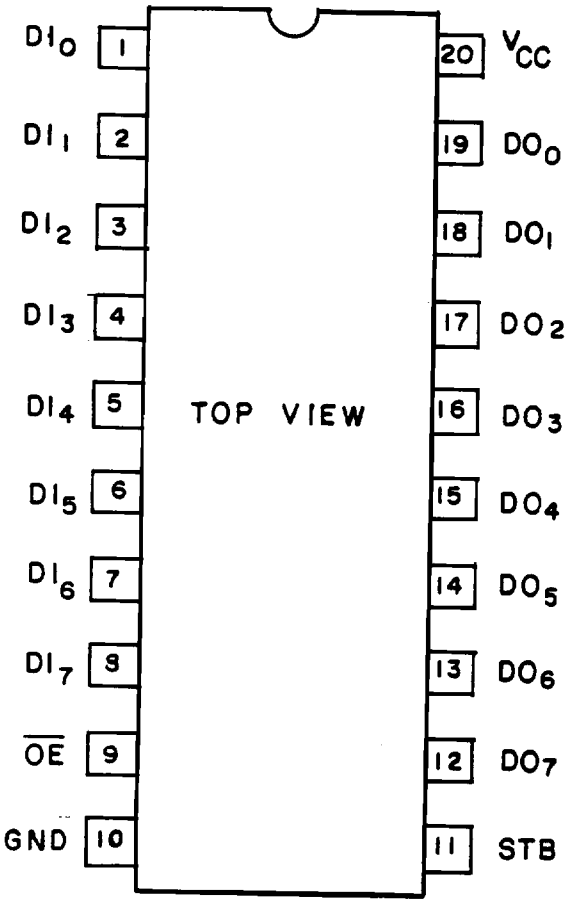
t_{EHOZ}
OUTPUT LOW/HIGH DISABLE
LOAD CIRUIT

* INCLUDES JIG AND STRAY CAPACITANCE

FIGURE 2. AC test circuit specifications - Continued.

Device type 01

Case R



Device type 01

Case 2

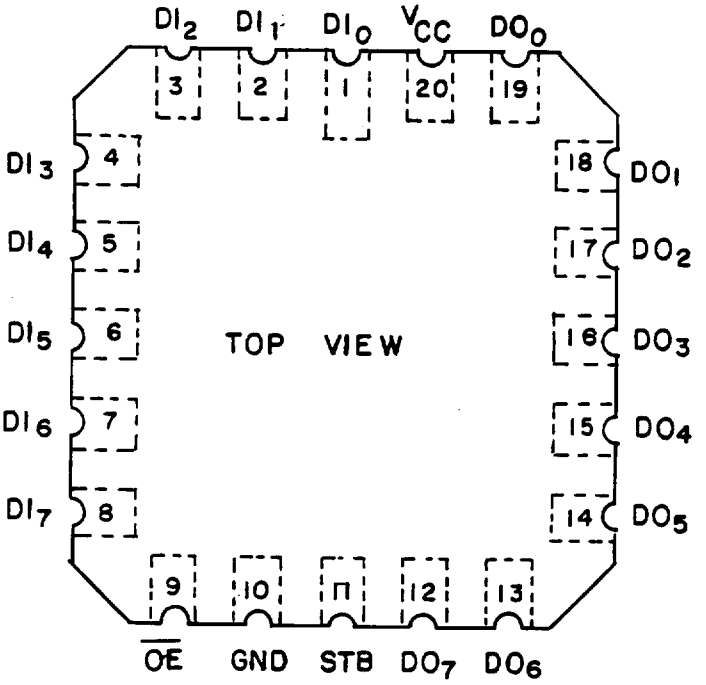
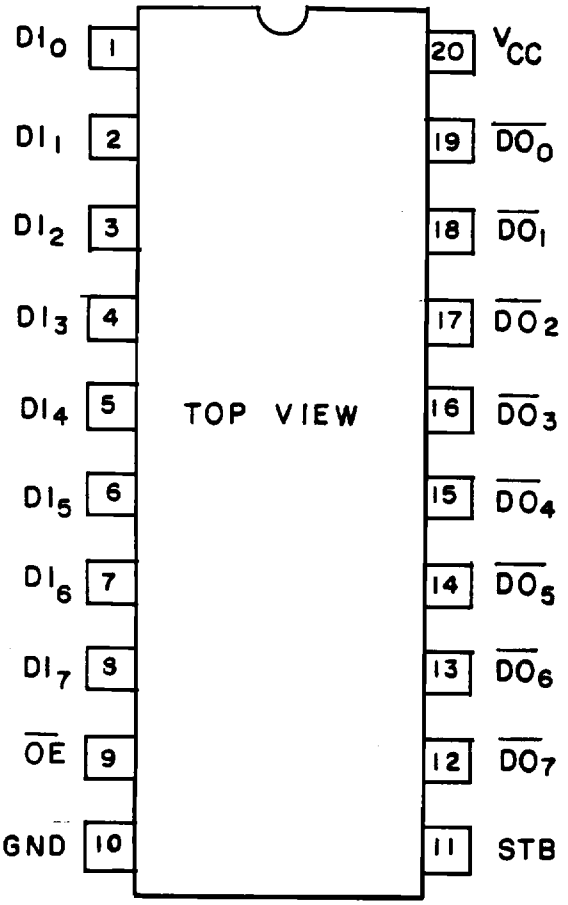


FIGURE 3. Terminal connections.

Device type 02

Case R



Device type 02

Case 2

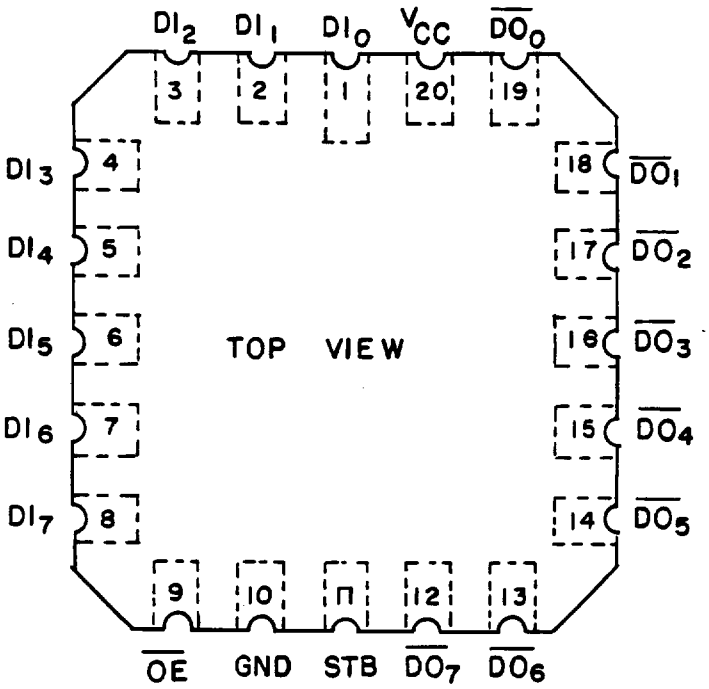
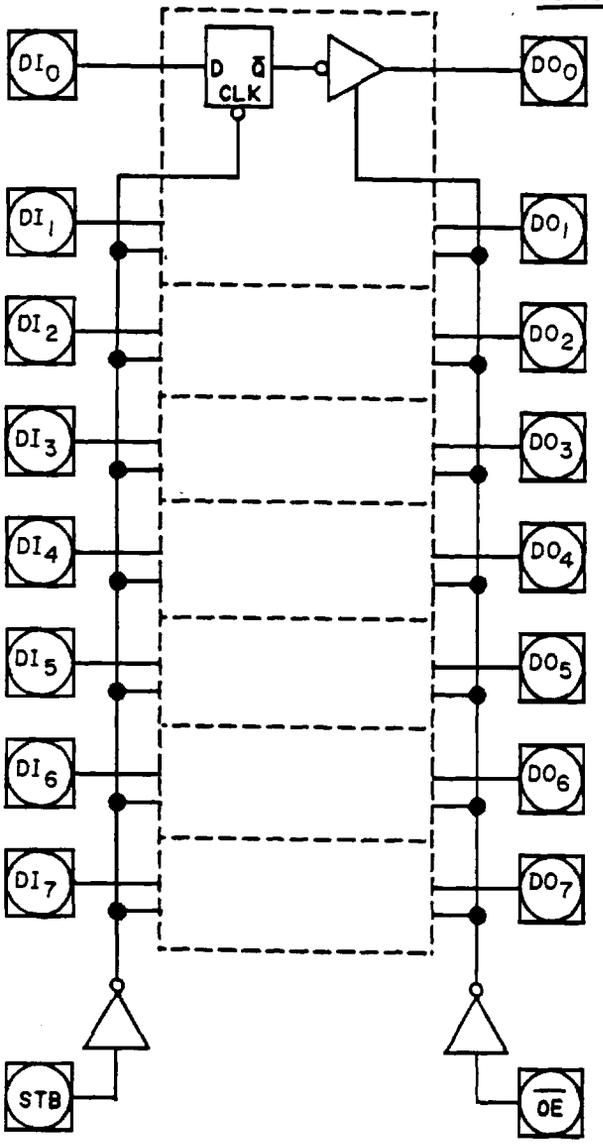


FIGURE 3. Terminal connections - Continued.

Device type 01



PIN NAMES

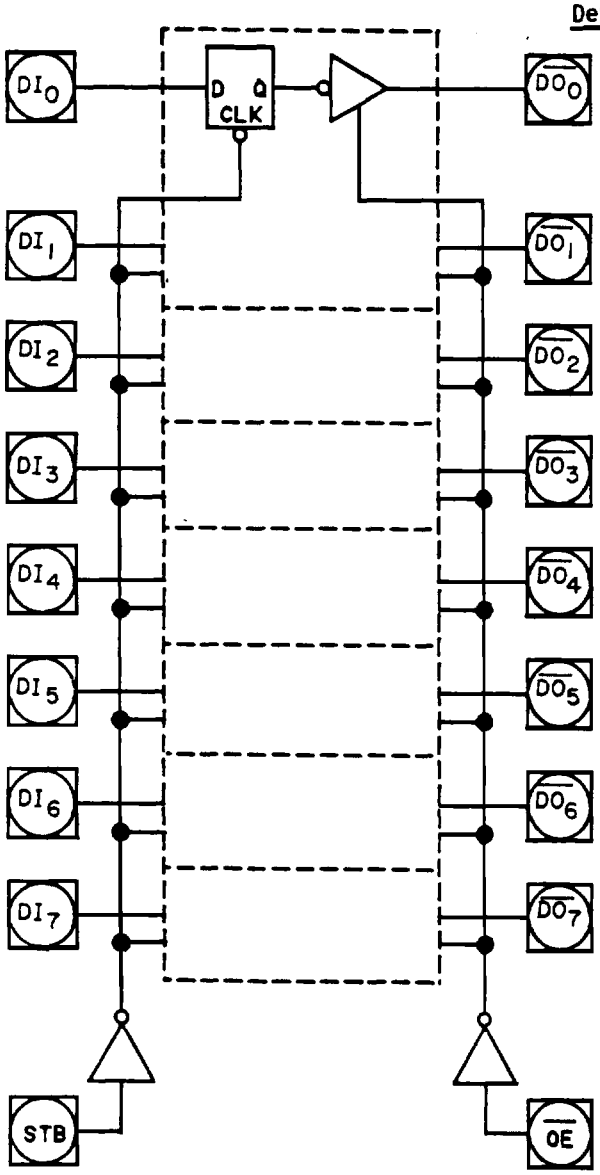
DI_0 - DI_7	Data Input Pins
DO_0 - DO_7	Data Output Pins
STB	Active High Strobe Input
$\overline{OE}$	Active Low Output Enable

STB	$\overline{OE}$	DI	DO
X	H	X	Hi-Z
H	L	L	L
H	L	H	H
↓	L	X	.

H = Logic One
L = Logic Zero
X = Don't Care
Hi-Z = High Impedance
↓ = Negative Transition
. = Latched to value of last data

FIGURE 4. Truth table and functional diagram.

Device type 02



PIN NAMES

DI_0 - DI_7	Data Input Pins
$\overline{DO}_0$ - $\overline{DO}_7$	Data Output Pins
STB	Active High Strobe Input
$\overline{OE}$	Active Low Output Enable

STB	$\overline{OE}$	DI	$\overline{DO}$
X	H	X	Hi-Z
H	L	L	H
H	L	H	L
↓	L	X	.

H = Logic One
L = Logic Zero
X = Don't Care

Hi-Z = High Impedance
↓ = Negative Transition
. = Latched to value of last data

FIGURE 4. Truth table and functional diagram - Continued.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$	Group A subgroups	Device types	Limits Min	Limits Max	Unit
Input high voltage	V_{IH}	V_{CC} = 5.5 V 1/	1, 2, 3	01, 02	2.2		V
Input low voltage	V_{IL}	V_{CC} = 4.5 V	1, 2, 3	01, 02		0.8	V
Output high voltage	V_{OH}	V_{CC} = 4.5 V I_{OH} = -8 mA, $\overline{OE}$ = GND 2/	1, 2, 3	01	2.9		V
				02	3.0		
		I_{OH} = -100 µA V_{CC} = 4.5 V, $\overline{OE}$ = GND 2/		01, 02	V_{CC} -0.4		
Output low voltage	V_{OL}	I_{OL} = 8 mA V_{CC} = 4.5 V, $\overline{OE}$ = GND 2/	1, 2, 3	01		0.4	V
		I_{OL} = 15 mA V_{CC} = 4.5 V, $\overline{OE}$ = GND 2/		02		0.45	
Input leakage current	I_I	V_{CC} = 5.5 V V_{IN} = GND or V_{CC}	1, 2, 3	01	-1.0	1.0	µA
				02	-10	10	
Output leakage current	I_O	V_{CC} = 5.5 V V_O = GND or V_{CC}, $\overline{OE} \ge V_{CC}$ - 0.5 V	1, 2, 3	01, 02	-10	10	µA
Standby supply current	I_{CCSB}	V_{CC} = 5.5 V V_{IN} = V_{CC} or GND, outputs open	1, 2, 3	01, 02		10	µA
Input capacitance	C_{IN}	f = 1 MHz, T_C = +25°C All measurements referenced to device ground. See 4.3.1c	4	01,02 Case R		13	pF
				01,02 Case 2		12	
Output capacitance	C_O		4	01, 02 Case R		20	pF
				01, 02 Case 2		15	

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C < T_C < +125°C$	Group A subgroups	Device types	Limits Min	Limits Max	Unit
Functional test	F_T	V_{CC} = 4.5 V and 5.5 V See 4.3.1d 3/	7, 8	01, 02			
Propagation delay input to output time	t_{IVOV}	See figure 1, reference number 1 V_{CC} = 4.5 V and 5.5 V 3/ 4/	9,10,11	01		35	ns
				02		25	
Propagation delay STB to output time	t_{SHOV}	See figure 1, reference number 2 V_{CC} = 4.5 V and 5.5 V 3/ 4/	9,10,11	01		55	ns
				02		50	
Output enable time	t_{ELOV}	See figure 1, reference number 4 V_{CC} = 4.5 V and 5.5 V 3/ 4/	9,10,11	01		50	ns
				02		45	
Input to STB setup time	t_{IVSL}	See figure 1, reference number 5 V_{CC} = 4.5 V and 5.5 V 3/ 4/	9,10,11	01,02	0		ns
Input to STB hold time	t_{SLIX}	See figure 1, reference number 6 V_{CC} = 4.5 V and 5.5 V 3/ 4/	9,10,11	01	25		ns
				02	30		
STB high time	t_{SHSL}	See figure 1, reference number 7 V_{CC} = 4.5 V and 5.5 V 3/ 4/	9,10,11	01	25		ns
				02	15		

1/ V_{IH} is measured by applying a pulse of magnitude = V_{IH} minimum to one data input at a time and checking the corresponding device output for a valid logical "one" during valid input high time. Control pins, STB (strobe) and $\overline{OE}$, are tested separately with all device data input pins at V_{CC} - 0.4 V.

2/ Interchanging of force and sense conditions is permitted.

3/ Tested as follows: f = 1 MHz, V_{IH} = 2.6 V, V_{IL} = 0.4 V, C_L = 50 pF (unless otherwise specified). $V_{OH} \geq$ 1.5 V, $V_{OL} \leq$ 1.5 V, and V_{IH} for STB (strobe) $\geq V_{CC}$ - 0.5 V. Input rise and fall times are driven at 1 ns/V.

4/ See figure 2.

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

c. Subgroup 4 (C_{IN} and C_O measurements) shall be measured only for the initial test and after process or design changes which may affect capacitance.

d. Subgroups 7 and 8, functional tests, shall include verification of programming set.

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, 7, 8, 9, 10,11
Group A test requirements (method 5005)	1, 2, 3, 7, 8, 9, 10, 11
Groups C and D end-point electrical parameters (method 5005)	2, 8 (125°C only), 10
Additional electrical subgroups for group C periodic inspections	---

* PDA applies to subgroup 1 (see 4.2c).

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. 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 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/
8406701RX	34371	MD82C82/883
84067012X	34371	MR82C82/883
8406702RX	34371	MD82C83H/883
84067022X	34371	MR82C83H/883

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
34371	Harris Semiconductor P.O. Box 883 Melbourne, FL 32901