REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

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

PMIC N/A

STANDARDIZED MILITARY DRAWING

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AMSC N/A

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CHECKED BY Wm Johnson

APPROVED BY

DRAWING APPROVAL DATE 13 SEPTEMBER 1988

REVISION LEVEL

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUIT, DIGITAL, BIPOLAR, ADVANCED LOW POWER SCHOTTKEY, TTL, OCTAL BUFFER AND DRIVER, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	67268	5962-88738

SHEET 1 OF 11

DESC FORM 193
SEP 87

☆ U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60911

5962-E1048

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:

5962-88738	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 type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	54ALS1244	Octal Buffer and Driver with 3-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
R	D-8 (20-lead, 1.060" x .310" x .200"), dual-in-line package
2	C-2 (20-terminal, .358" x .358" x .100"), square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage range - - - - - - - - - - - - - - - -	-0.5 V dc minimum to +7.0 V dc maximum
Input voltage range - - - - - - - - - - - - - - - - -	-1.5 V dc at -18 mA to +7.0 V dc
Voltage applied to a disabled 3-state output - - -	+5.5 V dc
Storage temperature range - - - - - - - - - - - - -	-65°C to +150°C
Lead temperature (soldering, 10 seconds) - - - - -	+300°C
Junction temperature (T_J) - - - - - - - - - - - - -	+175°C
Maximum power dissipation (P_D) 1/ - - - - - - - -	137.5 mW
Thermal resistance, junction to case (θ_{JC}) - - - -	See MIL-M-38510, appendix C

1.4 Recommended operating conditions.

Supply voltage range (V_{CC}) - - - - - - - - - - - - -	+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}):	
T_C = +125°C -	0.7 V dc
T_C = -55°C -	0.8 V dc
T_C = +25°C -	0.8 V dc
Maximum high level output current (I_{OH}) - - - - - - -	-12 mA
Maximum low level output current (I_{OL}) - - - - - - -	8 mA
Case operating temperature range (T_C) - - - - - - - -	-55°C to +125°C

1/ Maximum power dissipation is defined as V_{CC} x I_{CC}, and must withstand the added P_D due to short circuit test; e.g., I_O.

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

3.2.3 Test circuit and switching waveforms. The test circuit and switching waveforms shall be as specified on figure 3.

3.2.4 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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55^\circ C \le T_C \le +125^\circ C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
High level output voltage	V_{OH}	$V_{CC} = 4.5$ V $V_{IH} = 2.0$ V $I_{OH} = -0.4$ mA	V_{IL} at: $+125^\circ C = 0.7$ V $-55^\circ C = 0.8$ V $+25^\circ C = 0.8$ V 2/	1,2,3	2.5		V
		$V_{CC} = 4.5$ V $I_{OH} = -3$ mA $V_{IH} = 2.0$ V		1,2,3	2.4		
		$V_{CC} = 4.5$ V $I_{OH} = -12$ mA $V_{IH} = 2.0$ V		1,2,3	2		
Low level output voltage	V_{OL}	$V_{CC} = 4.5$ V $I_{OL} = 8$ mA 2/ $V_{IH} = 2.0$ V	$V_{IL} = 0.7$ V	2		0.4	V
			$V_{IL} = 0.8$ V	1,3			
Input clamp voltage	V_{IC}	$V_{CC} = 4.5$ V $I_{IN} = -18$ mA		1,2,3		-1.5	V
Low level input current	I_{IL}	$V_{CC} = 5.5$ V $V_{IN} = 0.4$ V Unused inputs ≥ 4.5 V		1,2,3		-0.1	mA
High level input current	I_{IH1}	$V_{CC} = 5.5$ V $V_{IN} = 2.7$ V Unused inputs = 0.2 V		1,2,3		20	µA
	I_{IH2}	$V_{CC} = 5.5$ V $V_{IN} = 7.0$ V Unused inputs = 0.0 V		1,2,3		0.1	mA
Output current	I_O	$V_{CC} = 5.5$ V 3/ $V_{OUT} = 2.25$ V		1,2,3	-30	-112	mA
Output current, high level, outputs off	I_{OZH}	$V_{CC} = 5.5$ V $V_{OUT} = 2.7$ V		1,2,3		20	µA
Output current, low level, outputs off	I_{OZL}	$V_{CC} = 5.5$ V $V_{OUT} = 0.4$ V		1,2,3		-20	µA

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55^\circ C \leq T_C \leq +125^\circ C$ unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
Supply current	I_{CC}	$V_{CC} = 5.5$ V	Outputs high	1,2,3		15	mA
			Outputs low			20	
			Outputs disabled			25	
Functional tests		See 4.3.1c 4/		7,8			
Propagation delay time, from A to Y	t_{PLH}	$V_{CC} = 4.5$ to 5.5 V $C_L = 50$ pF $R_1 = 500\Omega$ $R_2 = 500\Omega$ See figure 3 5/		9,10,11	3	20	ns
	t_{PHL}				3	16	
Output enable time, from $\overline{G}$ to any Y	t_{PZH}			9,10,11	6	28	ns
	t_{PZL}				6	26	
Output disable time, from $\overline{G}$ to any Y	t_{PHZ}			9,10,11	2	12	ns
	t_{PLZ}				3	22	

1/ Unused inputs that do not directly control the pin under test must be put at ≥ 2.5 V or ≤ 0.4 V. No unused inputs shall exceed 5.5 V or go less than 0.0 V. No inputs shall be floated.

2/ All outputs must be tested. In the case where only one input at V_{IL} maximum or V_{IH} minimum produces the proper state, the test must be performed with each input being selected as the V_{IL} maximum or V_{IH} minimum input.

3/ The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS}. Not more than one output will be tested at one time and duration of the test condition shall not exceed one second.

4/ Functional tests shall be conducted at input test conditions of Gnd $\leq V_{IL} \leq V_{OL}$ and $V_{OH} \leq V_{IH} \leq V_{CC}$.

5/ Propagation delay limits are based on single output switching. Unused inputs = 3.5 V or ≤ 0.3 V.

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SIZE A			5962-88738
	REVISION LEVEL	SHEET 5	

DESC FORM 193A
SEP 87

Case outlines	R and 2
Terminal number	Terminal connections
1	1$\overline{G}$
2	1A1
3	2Y4
4	1A2
5	2Y3
6	1A3
7	2Y2
8	1A4
9	2Y1
10	GND
11	2A1
12	1Y4
13	2A2
14	1Y3
15	2A3
16	1Y2
17	2A4
18	1Y1
19	2$\overline{G}$
20	V_{CC}

FIGURE 1. Terminal connections.

Input		Output
$\overline{G}$	A	Y
H	X	Z
L	H	H
L	L	L

L = low voltage level
H = high voltage level
X = irrelevant
Z = high impedence

FIGURE 2. Truth table

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		REVISION LEVEL	**SHEET** 6

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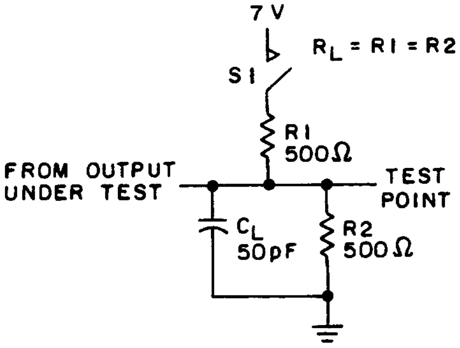
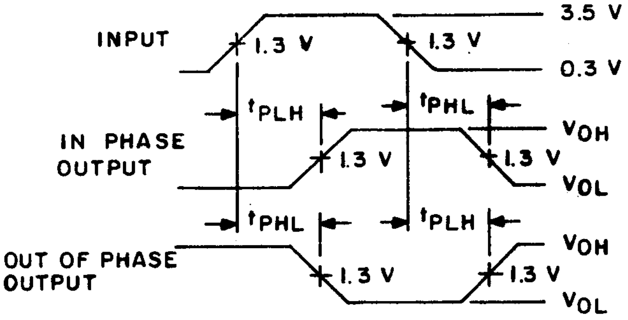


TEST CIRCUIT



VOLTAGE WAVEFORMS

FIGURE 3. Test circuit and switching waveforms.

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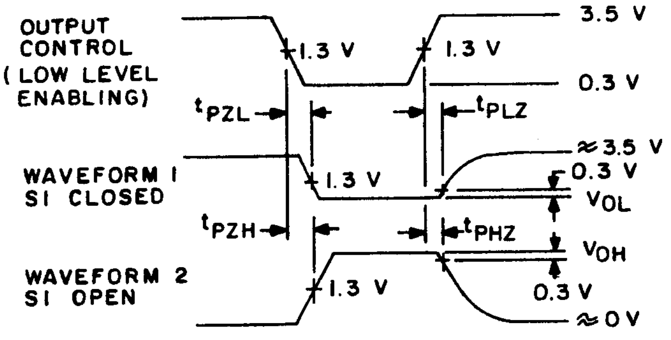

VOLTAGE WAVEFORMS

NOTES:

1. C_L includes probe and jig capacitance.
2. All input pulses have the following characteristics: PRR $\leq$ 10 MHz, duty cycle = 50%, $t_r = t_f = 3$ ns ±1 ns.
3. The outputs are measured one at a time with one input transition per measurement.
4. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.
   Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
5. When measuring propagation delay items of three-state outputs, switch S1 is open.

FIGURE 3. Test circuit and switching waveforms - Continued.

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 or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

  (2) $T_A = +125^\circ C$, 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, and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroups 7 and 8 shall verify the truth table as specified on figure 2 herein.

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) $T_A = +125^\circ C$, minimum.

  (3) Test duration: 1,000 hours except as permitted by 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, 7, 8, 9, 10, 11
Group A test requirements (method 5005)	1, 2, 3, 7, 8, 9, 10, 11
Group C and D end-point electrical parameters (method 5005)	1, 2, 3

*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.

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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 1/ similar part number
5962-8873801RX	01295	SNJ54ALS1244AJ
5962-88738012X	01295	SNJ54ALS1244AFK

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
01295	Texas Instuments, Incorporated P.O. Box 6448 Midland, TX 79711

STANDARDIZED MILITARY DRAWING **DEFENSE ELECTRONICS SUPPLY CENTER** **DAYTON, OHIO 45444**	**SIZE** **A**		5962-88738
		REVISION LEVEL	**SHEET** 11

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