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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 <i>Christopher A. Rensch</i> CHECKED BY <i>Ray Monnin</i> APPROVED BY <i>Mike [Signature]</i> DRAWING APPROVAL DATE 27 APRIL 1988 REVISION LEVEL	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 MICROCIRCUITS, DIGITAL, BIPOLAR, ADVANCED LOW POWER, SCHOTTKY TTL, INVERTING, OCTAL BUFFER AND LINE DRIVER WITH THREE-STATE OUTPUTS, MONOLITHIC SILICON <table style="width: 100%;"> <tr> <td style="width: 15%;">SIZE A</td> <td style="width: 35%;">CAGE CODE 67268</td> <td style="width: 50%;">5962-88591</td> </tr> <tr> <td colspan="3" style="text-align: center;">SHEET 1 OF 11</td> </tr> </table>	SIZE A	CAGE CODE 67268	5962-88591	SHEET 1 OF 11		
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5962-E904

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:

01

S

*

Device type
(1.2.1)

Lead finish per
MIL-M-38510

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

Inverting octal buffer and line driver with three-state output

1.2.2 Case outline. The case outline shall be as designated in appendix C of MIL-M-38510, and as follows:

§

F-9 (20-lead, .540" x .300" x .100"), flat package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc minimum to +7.0 V dc maximum
Input voltage range	-1.2 V dc at -18 mA to +7.0 V dc
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P _D)	137.5 mW <u>1/</u>
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 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}):		
$T_C = +125^{\circ}\text{C}$	- - - - -	0.7 V dc
$T_C = -55^{\circ}\text{C}$	- - - - -	0.8 V dc
$T_C = +25^{\circ}\text{C}$	- - - - -	0.8 V dc
Case operating temperature range (T_C)	- - - - -	-55°C to $+125^{\circ}\text{C}$

1/ Maximum power dissipation is defined as $V_{CC} * I_{CC}$, and must withstand the added P_D due to short circuit test; e.g., I_0 .

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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 and logic diagram. The terminal connections and logic diagram 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 Switching waveforms and test circuit. The switching waveforms and test circuit 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.

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TABLE I. Electrical performance characteristics. 1/

Test	Symbol	Conditions -55°C < T _C < +125°C unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
High level output voltage	V _{OH1}	V _{IH} = 2.0 V	V _{IL} = 0.8 V	1,3	2.0		V
		V _{CC} = 4.5 V	V _{IL} = 0.7 V	2			
	V _{OH2}	V _{IH} = 2.0 V	V _{IL} = 0.8 V	1,3	2.4		V
		V _{CC} = 4.5 V	V _{IL} = 0.7 V	2			
	V _{OH3}	V _{IH} = 2.0 V	V _{IL} = 0.8 V	1,3	2.5		V
		V _{CC} = 4.5 V	V _{IL} = 0.7 V	2			
Low level output voltage	V _{OL}	V _{IH} = 2.0 V	V _{IL} = 0.8 V	1,3		0.4	V
		V _{CC} = 4.5 V	V _{IL} = 0.7 V	2			
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V		1,2,3		-1.2	V
Off-state output current	I _{OZH}	V _{CC} = 5.5 V	V _{OUT} = 2.7 V	1,2,3		20	μA
	I _{OZL}	V _{IN} = 2.0 V	V _{OUT} = 0.4 V	1,2,3		-20	μA
High level input current	I _{IH1}	V _{CC} = 5.5 V		1,2,3		20	μA
	I _{IH2}	V _{IN} = 2.7 V		1,2,3		100	μA
Low level input current	I _{IL}	All other inputs = 0.0 V					
		V _{CC} = 5.5 V		1,2,3		-0.1	mA
Output current	I _O	V _{IN} = 0.4 V		1,2,3		-30	mA
		All other inputs = 4.5 V		1,2,3		-112	mA

See footnotes at end of table.

**STANDARDIZED
MILITARY DRAWING**

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
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TABLE I. Electrical performance characteristics - Continued. 1/

Test	Symbol	Conditions -55°C < T _C < +125°C unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Supply current	I _{CC} H	V _{CC} = 5.5 V	1,2,3		11	mA
	I _{CC} L		1,2,3		23	mA
Supply current disabled	I _{CC} Z		1,2,3		25	mA
Functional tests		See 4.3.1c <u>4/</u>	7,8			
Propagation delay time, A to Y	t _{PL} H	V _{CC} = 4.5 V to 5.5 V C _L = 50 pF R ₁ = 500Ω <u>5/</u> R ₂ = 500Ω See figure 3	9,10,11	2	12	ns
	t _{PH} L		9,10,11	2	9	ns
Output enable time, G to Y	t _p ZL		9,10,11	5	18	ns
	t _p ZH		9,10,11	4	15	ns
Output disable time, G to Y	t _{PL} Z		9,10,11	3	15	ns
	t _{PH} Z		9,10,11	1	10	ns

- 1/ Unused inputs that do not directly control the pin under test must be ≥ 2.5 V or < 0.4 V. Unused inputs shall not 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 output 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 a time and the 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/ The propagation delay limits are based on single output switching. Unused inputs = 3.5 V or ≤ 0.3 V.

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CASE S

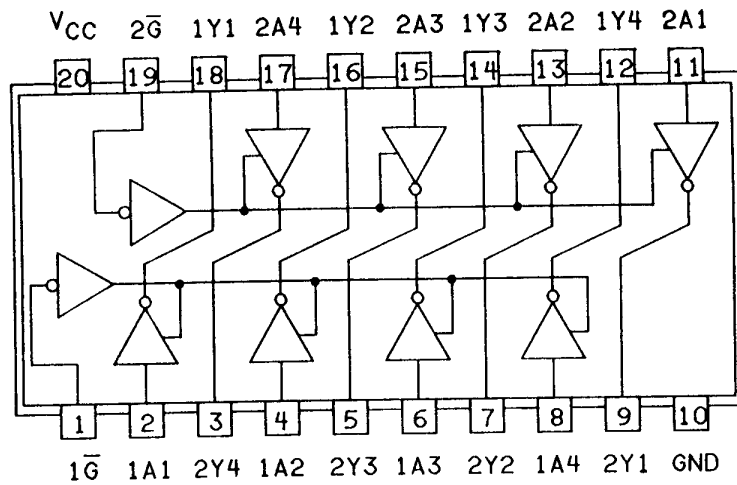


FIGURE 1. Logic diagram and terminal connections.

Inputs		Output
\bar{G}	A	Y
H	X	Z
L	H	L
L	L	H

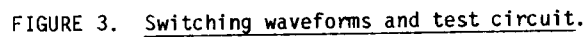
H = High level
L = Low level
X = Irrelevant

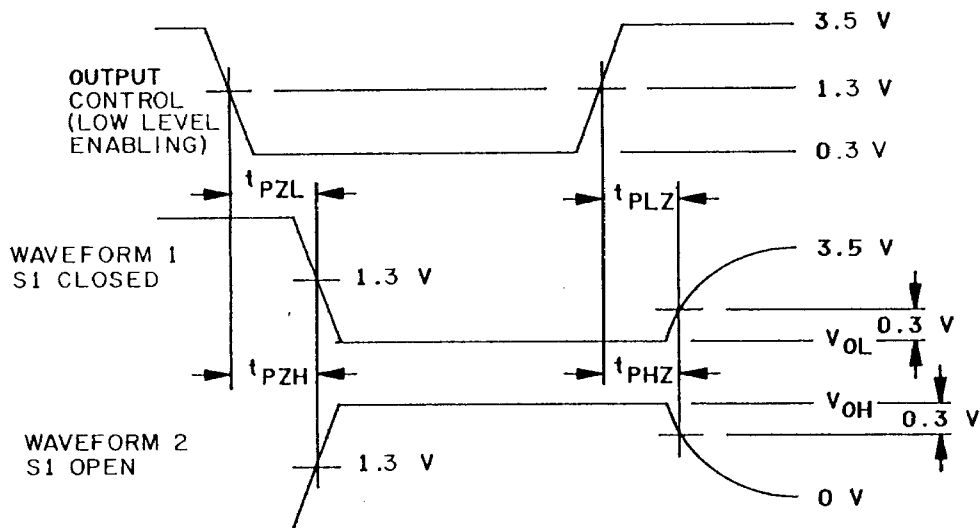
FIGURE 2. Truth table.

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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 times of three-state outputs, switch S1 is open.

FIGURE 3. Switching waveforms and test circuit - Continued.

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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) $T_A = +125^{\circ}\text{C}$, 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 4, 5, and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroups 7 and 8 tests 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, B, C, 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, 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)	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. Replaceability is determined as follows:

- Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- When a QPL source is established, the part numbered device specified in this drawing will be replaced by the microcircuit identified as part number M38510/38301B--.

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 sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have 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
5962-8859101SX	27014 18324 01295	54ALS240AW/883 54ALS240A/BSA SNJ54ALS240AW	M38510/38301BSX

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

01295

18324

27014

Vendor name
and address

Texas Instruments Incorporated
P.O. Box 6448
Midland, TX 79701

Signetics Corporation
4130 South Market Court
Sacramento, CA 95834

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, CA 95051

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