

REVISIONS												
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED									
A	Added vendor CAGE code 01295. Table II, deleted subgroups 10 and 11 from group C periodic inspections and added 10 and 11 to group A test requirements. Changed 1.3 input voltage range from -1.5 V to -1.2 V. Editorial changes throughout document.	1989 OCT 19	<i>W. Beckman</i>									
REV												
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REV STATUS OF SHEETS	REV	A	A	A			A			A	A	
	SHEET	1	2	3	4	5	6	7	8	9	10	11
PMIC N/A	PREPARED BY <i>Larry T. Hander</i>		DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444									
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY <i>Tim M. Noh</i>											
	APPROVED BY <i>William Z. Beckman</i>											
	DRAWING APPROVAL DATE 20 July 1987		SIZE A	CAGE CODE 67268	5962-86075							
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DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

5962-E1497

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	54F350	4-bit shifter with three-state outputs

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
E	D-2 (16-lead, .840" x .310" x .200"), dual-in-line package
F	F-5 (16-lead, .440" x .285" x .085"), flat 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 to +7.0 V dc
Input voltage range- - - - -	-1.2 V dc at -18 mA to +7.0 V dc
Storage temperature- - - - -	+65°C to +150°C
Maximum power dissipation (P _D) per device ^{1/} - - - - -	231 mW
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 _{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})- - - - -	0.8 V dc
Case operating temperature range (T _C)- - - - -	-55°C to +125°C

^{1/} Must withstand the added P_D due to short circuit test (e.g., I_{OS}).

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2.1 Government specification, standard, and bulletin. Unless otherwise specified, the following specification, standard, and bulletin 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.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawing (SMD's).

(Copies of the specification, standard, and bulletin 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 Logic diagram. The logic diagram 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 herein, the electrical performance characteristics are as specified in table I and apply over the full case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 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 MIL-BUL-103 (see 6.6 herein).

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < T _C < +125°C unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
High level output voltage	V _{OH}	V _{CC} = 4.5 V I _{OH} = -3 mA V _{IN} = 0.8 V or 2.0 V	1, 2, 3	2.4		V
Low level output voltage	V _{OL}	V _{CC} = 4.5 V I _{OL} = 20 mA V _{IN} = 0.8 V or 2.0 V	1, 2, 3		0.5	V
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V I _{IN} = -18 mA	1		-1.2	V
High level input current	I _{IH1}	V _{CC} = 5.5 V V _{IN} = 2.7 V	1, 2, 3		20	μA
	I _{IH2}	V _{CC} = 5.5 V V _{IN} = 7.0 V	1, 2, 3		100	μA
Low level input current	I _{IL}	V _{CC} = 5.5 V V _{IN} = 0.5 V	1, 2, 3		-1.2	mA
Short circuit output current	I _{OS}	V _{CC} = 5.5 V 1/ V _{OUT} = 0.0 V	1, 2, 3	-60	-150	mA
Off-state output current, high level voltage applied	I _{OZH}	V _{CC} = 5.5 V V _{OUT} = 2.4 V	1, 2, 3		50	μA
Off-state output current, low level voltage applied	I _{OZL}	V _{CC} = 5.5 V V _{OUT} = 0.5 V	1, 2, 3		-50	μA
Supply current	I _{CCH}	V _{CC} = 5.5 V	Outputs high	1, 2, 3	35	mA
	I _{CCL}		Outputs low	1, 2, 3	41	mA
	I _{CCZ}		Outputs disabled	1, 2, 3	42	mA
Functional tests		See 4.3.1c	7			

See footnotes at end of table.

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TABLE V. 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, data to output	tPLH1	V _{CC} = 5.0 V R _L = 500Ω ±5% C _L = 50 pF ±10%	9	3	6	ns
			10, 11	3	8	ns
	tPHL1		9	2	6	ns
			10, 11	2	7	ns
Propagation delay time, select to output	tPLH2	9	4	10	ns	
		10, 11	4	13	ns	
	tPHL2	9	3	9	ns	
		10, 11	3	10	ns	
Output enable time	tpZH	9	2	7	ns	
		10, 11	2	10	ns	
	tpZL	9	4	9	ns	
		10, 11	4	11	ns	
Output disable time	tPHZ	9	2	6	ns	
		10, 11	2	7	ns	
	tPLZ	9	2	6	ns	
		10, 11	2	9	ns	

1/ Not more than one output should be shorted at a time, and the duration of the short circuit condition should not exceed one second.

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3.6 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 MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-ECC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 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.

3.8 Notification of change. Notification of change to DESC-ECC shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 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 3.6 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, 6, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 7 tests shall verify the truth table.

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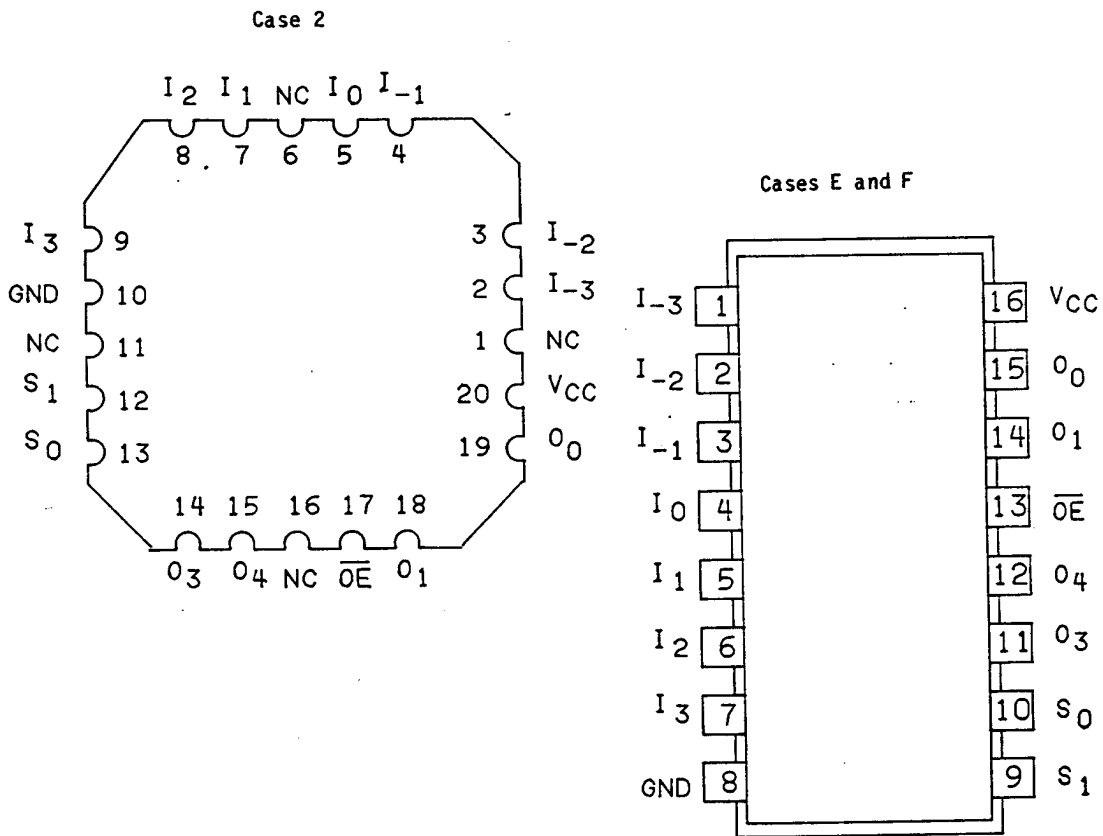


FIGURE 1. Terminal connections.

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Inputs			Outputs			
OE	S ₁	S ₀	O ₀	O ₁	O ₂	O ₃
H	X	X	Z	Z	Z	Z
L	L	L	I ₀	I ₁	I ₂	I ₃
L	L	H	I ₋₁	I ₀	I ₁	I ₂
L	H	L	I ₋₂	I ₋₁	I ₀	I ₁
L	H	H	I ₋₃	I ₋₂	I ₋₁	I ₀

H = High voltage level
 L = Low voltage level
 X = Immaterial
 Z = High impedance

FIGURE 2. Truth table.

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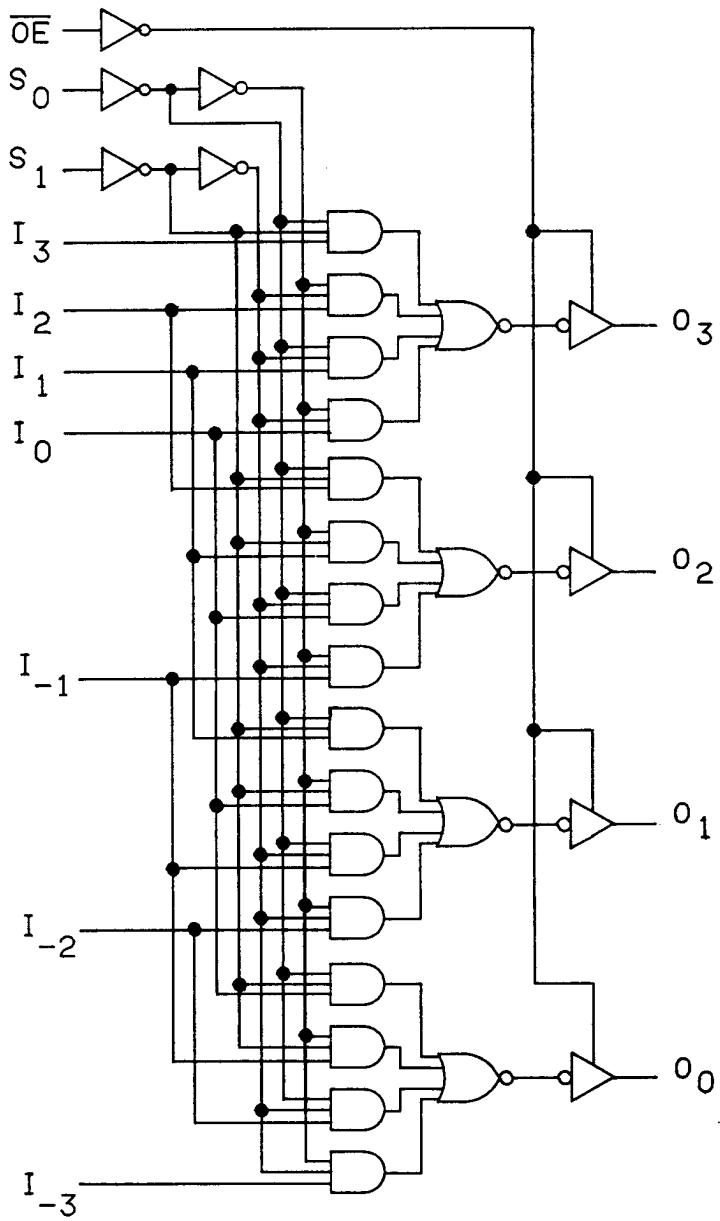


FIGURE 3. Logic diagram.

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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, 7, 9, 10, 11
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

*PDA applies to subgroup 1.

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 3.6 herein).
 - (2) $T_A = +125^\circ\text{C}$, 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 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

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6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECC, telephone (513) 296-6022.

6.5 Comments. Comments on this drawing should be directed to DESC-ECC, Dayton, Ohio 45444, or telephone (513) 296-8525.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. Additional sources will be added to MIL-BUL-103 as they become available. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECC. The approved sources listed below are for information purposes only and are current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/
5962-8607501EX	18324 01295	54F350/BEA SNJ54F350J
5962-8607501FX	18324 01295	54F350/BFA SNJ54F350W
5962-86075012X	18324 01295	54F350/B2X SNJ54F350FK

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

<u>Vendor CAGE number</u>	<u>Vendor name and address</u>
01295	Texas Instruments, Incorporated P.O. Box 60448 Midland, TX 79711-0448
18324	Signetics Corporation 4130 S. Market Court Sacramento, CA 95834

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