

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:

5962-87740	01	E	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	1543	Power supply output supervisory circuit
02	1544	Power supply output supervisory circuit

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
V	D-6(18-lead, .960" x .310" x .200"), dual-in-line package

1.3 Absolute maximum ratings.

Input supply voltage (V_{IN})	40 V dc
Sense inputs	V_{IN}
SCR trigger current	-600 mA 1/
Indicator output voltage	40 V dc
Indicator output sink current	50 mA
Power dissipation (P_D)	1000 mW 2/ 3/
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Cases E and V	See MIL-M-38510, appendix C
Junction temperature (T_J)	+150°C

1.4 Recommended operating conditions.

Ambient operating temperature range (T_A)	-55°C to +125°C
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1/ At higher input voltages, a dissipation limiting resistor (R_G) is required:

$$R_G > \frac{V_{IN} - 5 V.}{0.2 A}$$

2/ Derate linearly above $T_A = +25^\circ\text{C}$ at 8.0 mW/°C.

3/ Must withstand the added P_D due to short circuit test, e.g., I_{OS} .

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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. The terminal connections shall be as specified on figure 1.

3.2.2 Functional diagrams. The functional diagrams shall be as specified on figure 2.

3.2.3 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 ambient 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).

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $T_J = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ $V_{IN} = 10\text{ V}$ unless otherwise specified	Device types	Group A subgroups	Limits		Unit
					Min	Max	
Total device							
Input voltage range	V_{INR}		A11	1,2	4.5	40	V
				3	4.7	40	
Supply current	I_S	$V_{IN} = 40\text{ V}$	A11	1		10	mA
				2,3		15	
Reference section (pins V_{REF} and V_{IN})							
Output voltage	V_O		A11	1	2.48	2.52	V
				2,3	2.45	2.55	
Line regulation	V_{LINE}	$V_{IN} = 5.0\text{ V}$ to 30 V	A11	1,2,3		5.0	mV
Load regulation	V_{LOAD}	$I_{REF} = 0\text{ mA}$ to 10 mA	A11	1,2,3		10	
Short circuit current	I_{OS}	$V_{REF} = 0\text{ V}$	A11	1,2,3	-12	-40	mA
SCR TRIGGER section (pins SCR TRIGGER, REMOTE ACTIVATE, and RESET)							
Peak output current	$I_{O(pk)}$	$V_{IN} = 5.0\text{ V}$, $R_G = 0\Omega$, $V_O = 0\text{ V}$	A11	1,2,3	-100	-600	mA
Peak output voltage	$V_{O(pk)}$	$V_{IN} = 15\text{ V}$, $I_O = 100\text{ mA}$	A11	1,2,3	12		V
Output off voltage	$V_{O(off)}$	$V_{IN} = 40\text{ V}$	A11	1,2,3		0.1	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $T_J = -55^{\circ}\text{C to } +125^{\circ}\text{C}$ $V_{IN} = 10\text{ V}$ unless otherwise specified	Device types	Group A subgroups	Limits		Unit
					Min	Max	
SCR TRIGGER section (pins SCR TRIGGER, REMOTE ACTIVATE, and RESET) - continued							
REMOTE ACTIVATE current	I_{ACT}	Pin REMOTE ACTIVATE = GND	A11	1,2,3		-0.8	mA
REMOTE ACTIVATE voltage	V_{ACT}	Pin REMOTE ACTIVATE open	A11	1,2,3		6.0	V
RESET current	I_{RESET}	Pins REMOTE ACTIVATE and RESET = GND	A11	1,2,3		-0.8	mA
RESET voltage	V_{RESET}	Pin RESET = open, Pin REMOTE ACTIVATE = GND	A11	1,2,3		6.0	V
Comparator sections (pins OV INDICATE, OV DELAY, OV INPUT, UV INPUT, UV DELAY, and UV INDICATE, For device 02, OV and UV INPUTS are tested inverted and noninverted)							
Input threshold voltage $\frac{1}{V_{IN(th)}}$	$V_{IN(th)}$		A11	1	2.45	2.55	V
				2,3	2.40	2.60	
Input bias current	I_{IB}	Sense input = 0 V	A11	1,2,3		-1.0	μA
Delay saturation voltage	$V_{D(SAT)}$		A11	1,2,3		0.5	V
Delay high level voltage	V_{DH}		A11	1,2,3		8.0	
Delay charging current	I_D	$V_D = 0\text{ V}$	A11	1,2,3	-200	-300	μA
Indicate saturation	$V_{IND(SAT)}$	$I_L = +10\text{ mA}$	A11	1,2,3		0.5	V
Indicate leakage current	$I_{L(IND)}$	$V_{IND} = 40\text{ V}$	A11	1,2,3		1.0	μA
See footnotes at end of table.							
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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions T _J = -55°C to +125°C V _{IN} = 10 V unless otherwise specified	Device types	Group A subgroups	Limits		Unit
					Min	Max	
Current limit section (pins CL INV INPUT, CL NI INPUT, OFFSET/COMP, CL OUTPUT, GROUND)							
Input voltage range	V _{INR}		A11	1,2,3	0	V _{IN} - 3.0 V	V
Input bias current	I _{IB}	Pin OFFSET/COMP = open, V _{CM} = 0 V	A11	1,2,3		-1.0	μA
Input offset voltage	V _{OS}	Pin OFFSET/COMP = open, V _{CM} = 0 V	A11	1,2,3		10	mV
		10 kΩ ±0.1% from OFFSET/ COMP pin to GROUND. 2 kΩ from C _L OUTPUT to V _{REF}	A11	1,2,3	80	120	
Common mode rejection	CMRR	0 V ≤ V _{CM} ≤ 12 V, V _{IN} = 15 V	A11	4,5,6	60		dB
Open loop voltage gain	AVOL	Pin OFFSET/COMP = open, V _{CM} = 0 V	A11	4,5,6	72		
Output saturation	V _{O(SAT)}	I _L = -10 mA	A11	1,2,3		0.5	V
Output leakage	I _{L(IND)}	V _{IND} = 40 V	A11	1,2,3		1.0	μA

1/ Input voltage rising on pin OV input and falling on pin UV input.

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).

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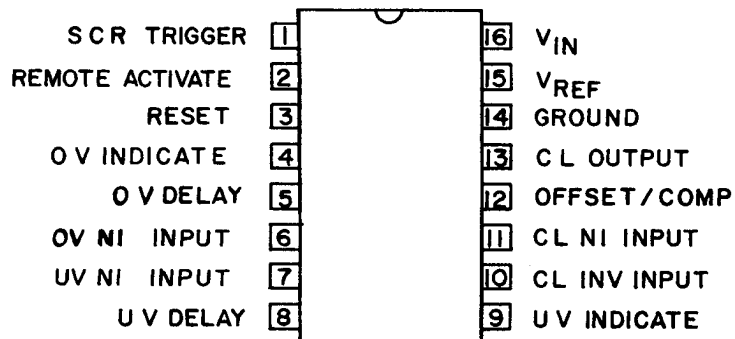
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Device type 01

Case E



Device type 02

Case V

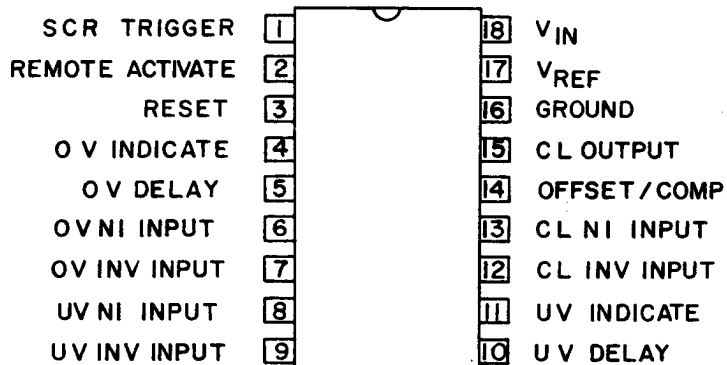


FIGURE 1. Terminal connections (top view).

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Device type 01

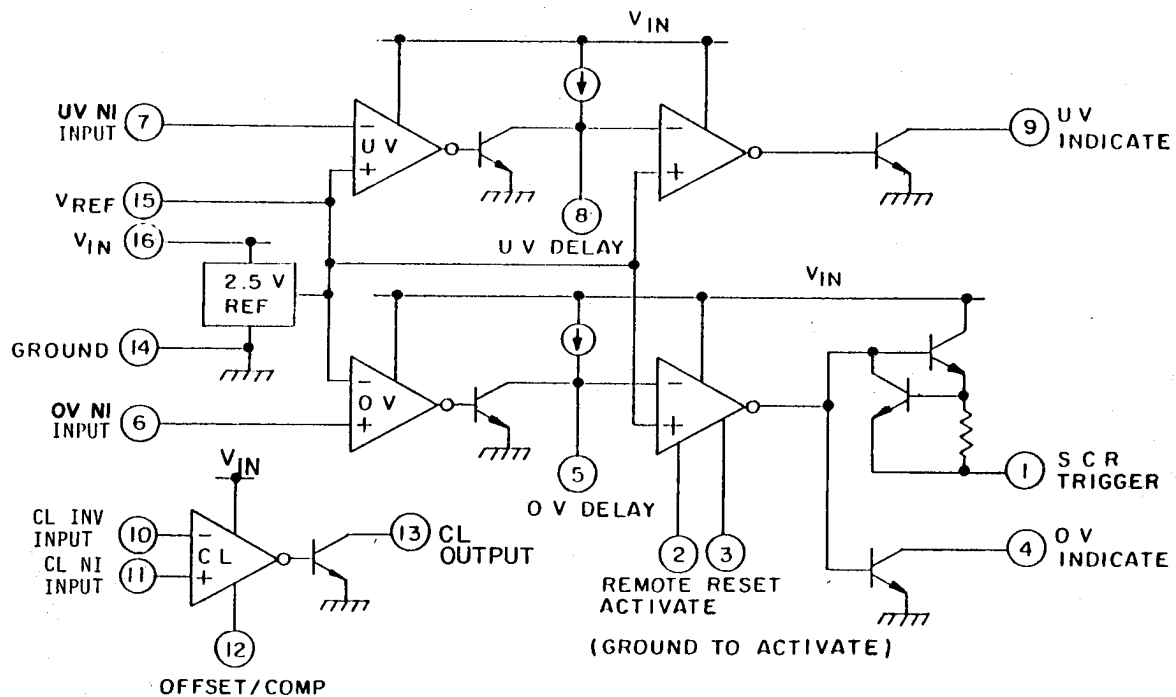


FIGURE 2. Functional diagrams.

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Device type 02

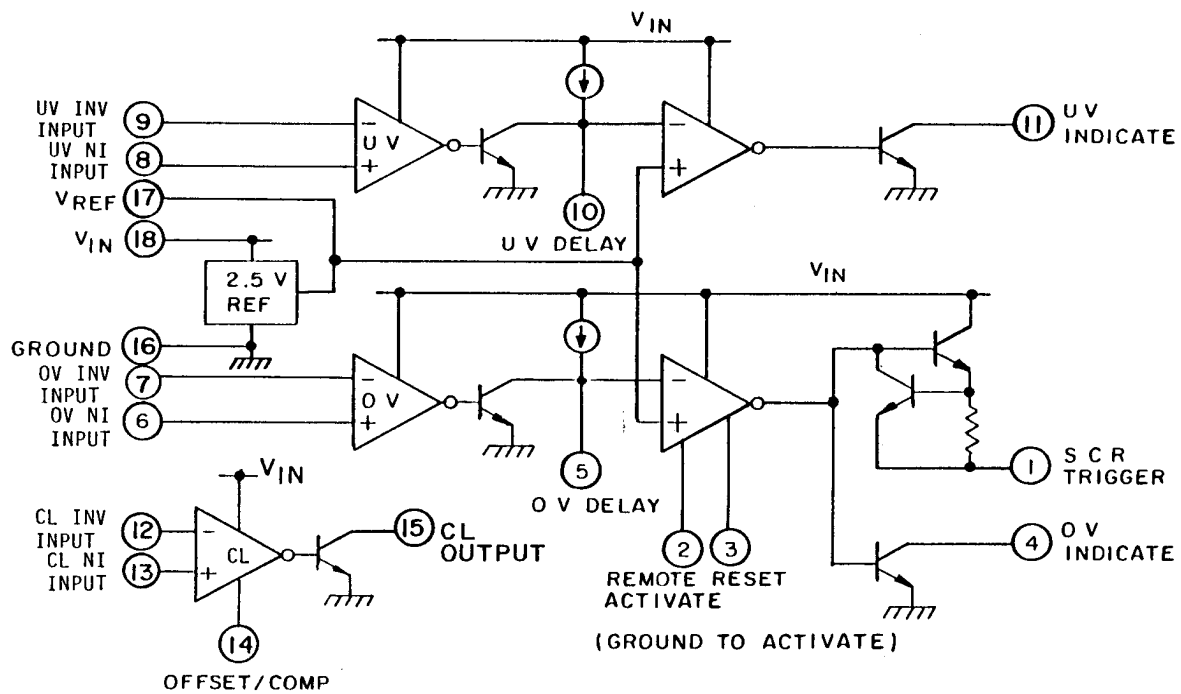


FIGURE 2. Functional diagrams - Continued.

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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 7, 8, 9, 10, and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

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.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	1
Final electrical test parameters (method 5004)	1*,2,3,4
Group A test requirements (method 5005)	1,2,3,4,5,6
Groups C and D end-point electrical parameters (method 5005)	1,2,3

* PDA applies to subgroup 1.

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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. 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 1/
032 311	5962-8774001EX	34333 48726	SG1543J/883B UC1543J/883B
039271	5962-8774002VX	34333 48726	SG1544J/883B UC1544J/883B

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

Vendor CAGE number

Vendor name and address

34333

Silicon General, Inc.
11651 Monarch St.
Garden Grove, CA 92641

48726

Unitrode Corp.
7 Continental Blvd.
Merrimack, NH 03054

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