
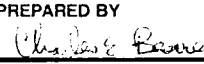

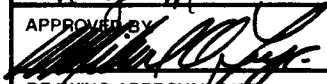


REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
C	Change to Standardized Military Drawing format. Change CAGE code to 67268. Add case outline 2. Inactivate -01AX and -01CX for new design. Not available from an approved source is -01AX. Extensive changes to table I. Remove vendor CAGE 34335, 07263, 27014, 04713, and 01295. Add vendor CAGE 06665 and 07933. Editorial changes throughout.	1988 NOV 8																	

CURRENT CAGE CODE 67268

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

<p>PMIC N/A</p> <p style="text-align: center; font-weight: bold; font-size: 1.1em;">STANDARDIZED MILITARY DRAWING</p> <p style="font-size: 0.8em;">THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p style="font-weight: bold; font-size: 0.9em;">AMSC N/A</p>	<p>PREPARED BY </p> <p>CHECKED BY </p> <p>APPROVED BY </p> <p>DRAWING APPROVAL DATE 25 MAY 1977</p> <p>REVISION LEVEL C</p>	<p style="text-align: center; font-weight: bold;">DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444</p> <hr/> <p style="font-size: 0.9em;">MICROCIRCUIT, LINEAR, QUAD VOLTAGE COMPARATOR, MONOLITHIC SILICON</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 15%; border: none;">SIZE A</td> <td style="width: 40%; border: none;">CAGE CODE 14933</td> <td style="width: 45%; border: none;">77008</td> </tr> </table> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; border: none;">SHEET</td> <td style="width: 33%; border: none;">1</td> <td style="width: 33%; border: none;">OF</td> <td style="width: 33%; border: none;">9</td> </tr> </table>	SIZE A	CAGE CODE 14933	77008	SHEET	1	OF	9
SIZE A	CAGE CODE 14933	77008							
SHEET	1	OF	9						

DESC FORM 193-1
SEP 87

U.S. GOVERNMENT PRINTING OFFICE: 1987 - 748-129/60912

5962-E388

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:

77008	01	A	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	LM139	Quad voltage comparator

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
A	F-1 (14-lead, .280" x .260" x .085"), flat package
C	D-1 (14-lead, .785" 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	- - - - -	36 V dc or ±18 V dc
Input voltage range	- - - - -	-0.3 V dc to 36 V dc
Maximum power dissipation ^{1/}	- - - - -	900 mW
Sink current	- - - - -	20 mA
Lead temperature (soldering, 10 seconds)	- - - - -	+300°C
Storage temperature	- - - - -	-65°C to +150°C
Thermal resistance (θ_{JC})	- - - - -	See MIL-M-38510, appendix C
Junction temperature (T_J)	- - - - -	+150°C

1.4 Recommended operating conditions.

Supply voltage	- - - - -	5 V dc to 30 V dc
Ambient operating temperature range	- - - - -	-55°C to +125°C

^{1/} Derate above +100°C ambient, 10 mW/°C.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77008
		REVISION LEVEL C	SHEET 2

DESC FORM 193A
SEP 87

U. S. GOVERNMENT PRINTING OFFICE: 1968-550-547

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 diagram. The functional diagram 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.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77008
		REVISION LEVEL C	SHEET 3

DESC FORM 193A
SEP 87

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < T _A < +125°C unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Input offset voltage	V _{IO}	R _S = 0Ω, V _O = 1.4 V V ⁺ = 5 V to 30 V	1		±5.0	mV
			2,3		±9.0	
Input offset current	I _{IO}	I _{IN} (+) - I _{IN} (-) with output in the linear range	1		±25	nA
			2,3		±100	
Input bias current	I _{IB}	I _{IN} (+) or I _{IN} (-) with output in the linear range	1	-100	-1	nA
			2,3	-300	-1	
Input common-mode voltage range	V _{ICR}	V ⁺ = 5 V to 30 V	1,2,3	0	V ⁺ -2.0	V
Voltage gain	A _V	R _L ≥ 15 kΩ, V ⁺ = 15 V	4	50		V/mV
			5,6	25		
Output sink current	I(sink)	V _{IN} (-) = 1 V, V _{IN} (+) = 0 V, V _O ≥ 1.5 V, T _A = +25°C	1	6		mA
Saturation voltage	V(sat)	V _{IN} (-) = 1 V, V _{IN} (+) = 0 V, I(sink) ≤ 4 mA	1		400	mV
			2,3		700	
Output leakage current	I _{OL}	V _{IN} (+) ≥ 1 V, V _O = 30 V, V _{IN} (-) = 0 V	1		.5	μA
			2,3		1	
Supply current	I _{CC}	R _L = ∞, V ⁺ = 5 V to 30 V	1,2,3		3	mA
Input voltage common mode rejection ratio	CMRR	R _L ≥ 15 kΩ, V ⁺ = 30 V, V _{CM} = 0 V to 28 V	1,2,3	70		dB
Power supply rejection ratio	PSRR	V ⁺ = 5 V to 30 V 1/	1,2,3	70		dB
Response time	t _{RLH}	V _{RI} = 5 V, R _L = 5.1 kΩ, 100 mV input step, T _A = +25°C	9		5	μs
	t _{RHL}	5 mV overdrive, T _A = +25°C	9		2.5	

1/ Guaranteed if not tested to the limits specified.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77008
		REVISION LEVEL C	SHEET 4

DESC FORM 193A
SEP 87

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Device type	01	
Case outlines	A and C	2
Terminal number	Terminal symbol	
1	OUT 2	NC
2	OUT 1	OUT 2
3	V+	OUT 1
4	IN 1-	V+
5	IN 1+	NC
6	IN 2-	IN 1-
7	IN 2+	NC
8	IN 3-	IN 1+
9	IN 3+	IN 2-
10	IN 4-	-IN 2+
11	IN 4+	NC
12	GND	IN 3-
13	OUT 4	IN 3+
14	OUT 3	IN 4-
15		NC
16		IN 4+
17		NC
18		GND
19		OUT 4
20		OUT 3

FIGURE 1. Terminal connections.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77008
		REVISION LEVEL C	SHEET 5

DESC FORM 193A
SEP 87

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 - 748-129-60913

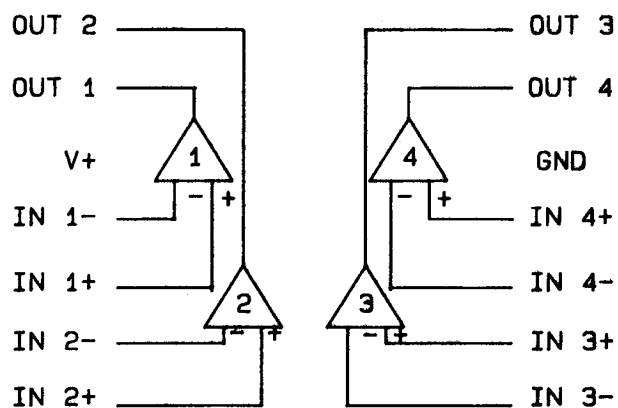


FIGURE 2. Functional diagram.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77008
		REVISION LEVEL C	SHEET 6

DESE FORM 193A
SEP 87

U.S. GOVERNMENT PRINTING OFFICE: 1967 - 748-129-60913

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 7, 8, 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.

STANDARDIZED MILITARY DRAWING

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

77008

REVISION LEVEL

C

SHEET

7

DESC FORM 193A
SEP 87

★ U. S. GOVERNMENT PRINTING OFFICE: 1988-549-904

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, 5, 6, 9
Group A test requirements (method 5005)	1, 2, 3, 4, 5, 6, 9
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:

- a. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- b. When a QPL source is established, the part numbered device specified in this drawing will be replaced by the microcircuit identified as part number M38510/11201B--.

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		77008
		REVISION LEVEL C	SHEET 8

DESC FORM 193A
SEP 87

☆ U. S. GOVERNMENT PRINTING OFFICE: 1988-549-904

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
7700801AX <u>2/</u>	<u>3/</u>		M38510/11201BAX
7700801CX <u>2/</u>	06665 07933 18324	PM-139Y/883 LM139J/883B LM139/BCA	M38510/11201BCX
77008012X	06665	PM139RC/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.
2/ Inactive for new design. Use applicable M38510/11201 device.
3/ Unavailable from an approved source.

Vendor CAGE
number

Vendor name
and address

06665

Precision Monolithics Incorporated
1500 Space Park Drive
P.O. Box 58020
Santa Clara, CA 95050

07933

Raytheon Company
Semiconductor Division
350 Ellis Street
Mountain View, CA 94040

18324

Signetics Incorporated
4130 S. Market Court
Sacramento, CA 95834

**STANDARDIZED
MILITARY DRAWING**

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

77008

REVISION LEVEL
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9

DESC FORM 193A
SEP 87

☆ U. S. GOVERNMENT PRINTING OFFICE: 1988-550-147