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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>Rick Offin</i> CHECKED BY <i>Charles E. Besore</i> APPROVED BY DRAWING APPROVAL DATE 15 AUGUST 1989 REVISION LEVEL	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 MICROCIRCUITS, LINEAR, LOW-DROOP-RATE, ACCURATE SAMPLE AND HOLD AMPLIFIER <table style="width: 100%; border: none;"> <tr> <td style="border: none;">SIZE</td> <td style="border: none;">CAGE CODE</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">A</td> <td style="border: none;">67268</td> <td style="border: none;">5962-89541</td> </tr> </table>	SIZE	CAGE CODE		A	67268	5962-89541
SIZE	CAGE CODE							
A	67268	5962-89541						
		SHEET 1 OF 10						

DESC FORM 193
SEP 87

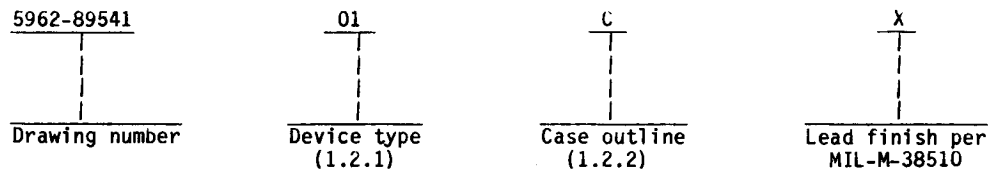
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5962-E1194

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:



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

Device type	Generic number	Circuit function
01	SMP-11A	Low-droop-rate, accurate sample and hold amplifier
02	SMP-11B	Low-droop-rate, accurate sample and hold amplifier
03	SMP-10A	Low-droop-rate, accurate sample and hold amplifier
04	SMP-10B	Low-droop-rate, accurate sample and hold amplifier

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
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 leadless chip carrier package

1.3 Absolute maximum ratings.

Positive supply voltage (V+) - - - - -	+18 V dc
Negative supply voltage (V-) - - - - -	-18 V dc
Power dissipation (P _D) - - - - -	500 mW
For cases C and 2, derate above T _A = 100°C - - - - -	10 mW/°C
Input voltage (V _{IN}) - - - - -	Equal to supply voltage
Logic and logic reference voltage - - - - -	Equal to supply voltage
Output short-circuit duration - - - - -	Indefinite
Hold capacitor short-circuit duration - - - - -	60 seconds
Storage temperature range - - - - -	-65°C to +150°C
Lead temperature (soldering, 60 seconds) - - - - -	+300°C
Thermal resistance, junction-to-case (θ _{JC}) - - - - -	See MIL-M-38510, appendix C
Thermal resistance, junction-to-ambient (θ _{JA}):	
Case C - - - - -	100°C/W
Case 2 - - - - -	110°C/W
Junction temperature (T _J) - - - - -	+175°C

1.4 Recommended operating conditions.

Positive supply voltage (V+) - - - - -	+15 V dc
Negative supply voltage (V-) - - - - -	-15 V dc
Ambient operating temperature range (T _A) - - - - -	-55°C to +125°C
Hold capacitor (C _H) - - - - -	0.005 μF
Logic control (V _{LC}) - - - - -	Connected to ground, or 3.5 V below positive supply and 2.0 V above negative supply

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 2

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 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).

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 3

DESC FORM 193A
SEP 87

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TABLE 1. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < T _A < +125°C V ₊ = +15 V, V ₋ = -15 V, C _H = 5000 pF, V _{LC} = connected to ground, unless otherwise specified	Device types	Group A subgroups	Limits		Unit
					Min	Max	
Zero scale error (hold mode)	V _{ZS}	V _{S/H} = 3.5 V (500 μs after hold) V _{IN} = 0 V	01,03	1		1.5	mV
				2, 3		3.0	
			02,04	1		3.0	
				2, 3		5.5	
Input bias current	I _{IB}	V _{IN} = 0 V	01,03	1		±65	nA
				2, 3		±180	
			02,04	1		±90	
				2, 3		±280	
Input voltage range or output voltage swing	V _{SW}	R _L = 2.5 kΩ	01,03	1		±11	V
				2, 3		±10.5	
			02,04	1		±10.5	
				2, 3		±10.5	
Power supply rejection (sample mode)	PSR	V ₊ = +9 V to +18 V, V ₋ = -9 V to -18 V	01,03	1		82	dB
				2, 3		78	
			02,04	1		77	
				2, 3		72	
Differential logic threshold	V _{TH}		A11	1	0.8	2.0	V
				2, 3	0.6	2.0	
Logic control input current	I _{LC}	V _{LC} = 0 V	01,03	1		-2	μA
				2, 3		-3	
			02,04	1		-3	
				2, 3		-5	

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 4

TABLE 1. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _A < +125°C V ₊ = +15 V, V ₋ = -15 V, C _H = 5000 pF, V _{LC} = connected to ground, unless otherwise specified	Device types	Group A subgroups	Limits		Unit
					Min	Max	
Supply current	I _{SY}		01,03	1	2.0	6.0	mA
				2, 3	2.0	8.4	
			02,04	1	2	7.0	
				2, 3	2	8.4	
Logic input current (sample mode)	I _{S/H}	V _{S/H} = 0.6 V	A11	1, 2, 3		-15	μA
Logic input current (hold mode)	I _{S/H}	V _{S/H} = 5 V	A11	1, 2, 3	-1	1	μA
Droop rate	dV _{CH} dt		01	4		200	μV/ms
				5		4000	
				6		1500	
			02	4		500	
				5		5000	
				6		2000	
			03	4		20	
				5		4000	
				6		100	
			04	4		50	
				5		5000	
				6		250	

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 5

DESC FORM 193A
SEP 87

TABLE I. Electrical performance characteristics - Continued.							
Test	Symbol	Conditions -55°C < T _A < +125°C V ₊ = +15 V, V ₋ = -15 V, C _H = 5000 pF, V _{LC} = connected to ground, unless otherwise specified	Device types	Group A subgroups	Limits		Unit
					Min	Max	
Leakage (droop) current	I _{DR}		01	4		1.0	μA/ms
				5		20.0	
				6		7.5	
			02	4		2.5	
				5		25.0	
				6		10.0	
			03	4		0.10	
				5		20.0	
				6		0.5	
			04	4		0.25	
				5		25.0	
				6		1.22	
Voltage gain (sample mode)	A _v	V _{IN} = ±10 V, R _L = 5 kΩ or V _{IN} = ±5 V, R _L = 2.5 kΩ	01,03	4	0.99963		V/V
				5, 6	0.99950		
			02,04	4	0.99953		
				5, 6	0.99940		
Hold capacitor charging current	I _{CH} ⁺	V _{IN} - V _{OUT} ≥ +3 V	01,03	4, 5, 6	20		mA
				02,04	4, 5, 6	15	
	I _{CH} ⁻	V _{IN} - V _{OUT} ≤ -3 V	01,03	4, 5, 6	-20		
				02,04	4, 5, 6	-15	
Sample/hold current ratio	I _{CH}		01,02	1, 2, 3	2x10 ⁶		mA/mA
	I _{DR}						

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-89541
		REVISION LEVEL	SHEET 6

Device types	01, 02, 03, and 04	
Case outlines	C	2
Terminal number	Terminal symbol	
1	*NC	NC
2	INPUT	NC
3	NULL	INPUT
4	NULL	NULL
5	V-	NC
6	NC	NULL
7	OUTPUT	NC
8	*NC	V-
9	V+	NC
10	NC	OUTPUT
11	C _H	NC
12	NC	NC
13	V _L C	V+
14	**S/H	NC
15	---	NC
16	---	C _H
17	---	NC
18	---	NC
19	---	V _L C
20	---	**S/H

*Pins 1 and 8 are not internally connected.

** Sample/Hold Control

FIGURE 1. Terminal connections

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-89541
		REVISION LEVEL	SHEET 7

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, 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.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 8

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
Group A test requirements (method 5005)	1,2,3,4,5,6
Groups C and D end-point electrical parameters (method 5005)	1

* PDA applies to subgroup 1. For device types 01 and 03, VZS is excluded from PDA.

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.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 9

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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 similar part number ^{1/}
5962-8954101CX	06665	SMP-11AY/883
5962-8954102CX	06665	SMP-11BY/883
5962-89541022X	06665	SMP-11BRC/883
5962-8954103CX	06665	SMP-10AY/883
5962-8954104CX	06665	SMP-10BY/883
5962-89541042X	06665	SMP-10BRC/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.

Vendor CAGE number

06665

Vendor name and address

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

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-89541
	REVISION LEVEL	SHEET 10

DESC FORM 193A
 SEP 87

★ U. S. GOVERNMENT PRINTING OFFICE: 1988-550-547

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