REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Change to one part-one part number format. Added table III.	91-12-11	M. A. FRYE

REV																				
SHEET																				
REV	A	A	A	A	A	A	A	A	A	A	A	A	A	A						
SHEET	15	16	17	18	19	20	21	22	23	24	25	26	27	28						

REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

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
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CHECKED BY
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APPROVED BY
MICHAEL A. FRYE

DRAWING APPROVAL DATE
88-07-25

REVISION LEVEL
A

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUIT, LOW OFFSET, LOW POWER DUAL OPERATIONAL AMPLIFIER, MONOLITHIC SILICON

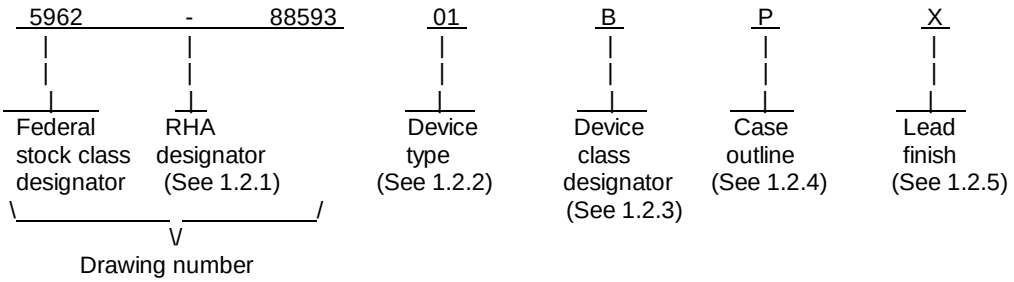
SIZE	CAGE CODE	
A	**67268**	**5962-88593**

SHEET 1 OF 28

1. SCOPE

1.1 Scope. This drawing forms a part of a one part - one part number documentation system (see 6.6 herein). Two product assurance classes consisting of military high reliability (device classes B, Q, and M) and space application (device classes S and V), and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). Device class M microcircuits represent non-JAN 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". When available, a choice of radiation hardness assurance (RHA) levels are reflected in the PIN.

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 Radiation hardness assurance (RHA) designator. Device classes M, B, and S RHA marked devices shall meet the MIL-M-38510 specified RHA levels and shall be marked with the appropriate RHA designator. Device classes Q and V RHA marked devices shall meet MIL-38535 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	OP200A	Dual, low offset, low power operational amplifier

1.2.3 Device class designator. The device class designator shall be a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
M	Vendor self certification to the requirements for non-JAN class B microcircuits in accordance with 1.2.1 of MIL-STD-883
B or S	Certification and qualification to MIL-M-38510
Q or V	Certification and qualification to MIL-I-38535

1.2.4 Case outline(s). For device classes M, B, and S, case outline(s) shall meet the requirements in appendix C of MIL-M-38510 and as listed below. For device classes Q and V, case outline(s) shall meet the requirements of MIL-I-38535, appendix C of MIL-M-38510, and as listed below.

Outline letter	Case outline
P	D-4 (8-lead, .405" x .310" x .200"), dual-in-line package
2	C-2 (20-terminal, .358" x .358" x .100"), square chip carrier package

1.2.5 Lead finish. The lead finish shall be as specified in MIL-M-38510 for classes M, B, and S or MIL-I-38535 for classes Q and V. Finish letter "X" shall not be marked on the microcircuit or its packaging. The "X" designation is for use in specifications when lead finishes A, B, and C are considered acceptable and interchangeable without preference.

1.3 Absolute maximum ratings. 1/

Supply voltage range	±20 V dc
Input voltage	Supply voltage
Output short-circuit duration	Indefinite
Differential input voltage	±30 V dc
Storage temperature range	-65°C to +150°C
Lead temperature range (soldering, 60 seconds)	+300°C
Junction temperature (T_J)	+150°C
Thermal resistance, junction-to-case (Θ_{JC})	See MIL-M-38510, appendix C
Thermal resistance (Θ_{JA}):	
Case P	148°C/W
Case 2	98°C/W

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	±15 V dc
Source resistance from ground to input terminals (R_S)	50Ω
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specifications, standards, bulletin, and handbook. Unless otherwise specified, the following specifications, standards, bulletin, and handbook 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.

SPECIFICATIONS

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.
MIL-I-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

MILITARY

MIL-STD-480 - Configuration Control-Engineering Changes, Deviations and Waivers.
MIL-STD-883 - Test Methods and Procedures for Microelectronics.

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

BULLETIN

MILITARY

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

HANDBOOK

MILITARY

MIL-HDBK-780 - Standardized Military Drawings.

(Copies of the specifications, standards, bulletin, and handbook 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 for device class M 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. The individual item requirements for device classes B and S shall be in accordance with MIL-M-38510 and as specified herein. This is a fully characterized military detail specification and is suitable for qualification of device classes B and S to the requirements of MIL-M-38510. The individual item requirements for device classes Q and V shall be in accordance with MIL-I-38535, the device manufacturer's Quality Management (QM) plan, 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 for device classes M, B, and S and MIL-I-38535 for device classes Q and V and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein and figure .

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

3.2.3 Schematic diagram. The schematic diagram shall be as specified on figure 2.

3.3 Electrical performance characteristics and post irradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table I and shall apply over the full ambient operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table IIA. The electrical tests for each subgroup are defined in table I and table III.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. Marking for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein). In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103. Marking for device classes B and S shall be in accordance with MIL-M-38510. Marking for device classes Q and V shall be in accordance with MIL-I-38535.

3.5.1 Certification/compliance mark. The compliance mark for device class M shall be a "C" as required in MIL-STD-883 (see 3.1 herein). The certification mark for device classes B and S shall be a "J" or "JAN" as required in MIL-M-38510. The certification mark for device classes Q and V shall be a "QML" as required in MIL-I-38535.

3.6 Certificate of compliance. For device class M, 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 6.7.3 herein). For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.7.2 herein). The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device class M the requirements of MIL-STD-883 (see 3.1 herein), or for device classes Q and V, the requirements of MIL-I-38535 and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required for device class M in MIL-STD-883 (see 3.1 herein) or device classes B and S in MIL-M-38510 or for device classes Q and V in MIL-I-38535 shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DESC-ECS of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-480.

3.9 Verification and review for device class M. For device class M, 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.

3.10 Microcircuit group assignment for device classes M, B, and S. Device classes M, B, and S devices covered by this drawing shall be in microcircuit group number 49 (see MIL-M-38510, appendix E).

3.11 Serialization for device class S. All device class S devices shall be serialized in accordance with MIL-M-38510.

3.12 Supersession ans substitution. PIN substitution information shall be as specified in appendix .

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. For device class M, 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). For device classes B and S, sampling and inspection procedures shall be in accordance with MIL-M-38510 and method 5005 of MIL-STD-883, except as modified herein. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-I-38535 and the device manufacturer's QM plan.

4.2 Screening. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. For device classes B and S, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to qualification and quality conformance inspection. For device classes Q and V, screening shall be in accordance with MIL-I-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ $V_{CC} = \pm15$ V, $R_S = 50\ \Omega$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Input offset voltage	V_{IO}		1	-75	+75	µV
			2,3	-125	+125	
Input offset current	I_{IO}	$V_{CM} = 0$ V	1	-1.0	+1.0	nA
			2,3	-2.5	+2.5	
Input bias current	$\pm I_{IB}$	$V_{CM} = 0$ V	1	-2.0	+2.0	nA
			2,3	-5.0	+5.0	
Common mode rejection ratio 1/	CMRR	$V_{CM} = I_{VR} = \pm11$ V	1	120		dB
			2,3	115		
Power supply rejection ratio	PSRR	$V_{CC} = \pm3$ V to ±18 V	1		1.8	µV/V
			2,3		3.2	
Supply current 2/ no load	I_{SY}		1		1.45	mA
			2,3		1.55	
Large signal voltage gain	A_{VS}	$V_{OUT} = \pm10$ V, $R_L = 2$ kΩ	4	2000		V/mV
			5,6	1000		
		$V_{OUT} = \pm10$ V, $R_L = 10$ kΩ	4	5000		
			5,6	3000		
Output voltage swing	$+V_{OP}$	$R_L = 2$ kΩ	4,5,6	+11		V
		$R_L = 10$ kΩ		+12		
	$-V_{OP}$	$R_L = 2$ kΩ	4,5,6		-11	
		$R_L = 10$ kΩ			-12	

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55^{\circ}C \le T_A \le +125^{\circ}C$ $V_{CC} = \pm 15$ V, $R_S = 50\ \Omega$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Input noise voltage	E_n	f_O = 1 Hz to 100 Hz, $T_A = +25^{\circ}C$	7		250	nV_{rms}
Slew rate	SR	$T_A = +25^{\circ}C$, $A_V = +1$, $V_{IN} = \pm 0.5$ V, Measured at $V_{OUT} = \pm 0.25$ V	7	0.1		V/µs
Input offset voltage temperature coefficient	TC_{VIO}	$T_A = +125^{\circ}C$, $-55^{\circ}C$ See table III	8		0.5	µV/°C

1/ I_{VR} is defined as the V_{CM} range used for the CMRR test.

2/ I_{SY} limit = total of all four amplifiers.

TABLE IIA. Electrical test requirements.

Test requirements	Subgroups (per method 5005, table I)			Subgroups (per MIL-I-38535, table III)	
	Device class M	Device class B	Device class S	Device class Q	Device class V
Interim electrical parameters (see 4.2)	1	1	1	1	1
Final electrical parameters (see 4.2)	1,2,3, 1/ 4,5,6	1,2,3, 1/ 4,5,6	1,2,3, 1/ 4,5,6	1,2,3, 1/ 4,5,6	1,2,3,1/ 4,5,6
Group A test requirements (see 4.4)	1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8
Group B end-point electrical parameters (see 4.4)	---	---	1,2,3 2/	---	1,2,3
Group C end-point electrical parameters (see 4.4)	1	1 2/	---	1	---
Group D end-point electrical parameters (see 4.4)	1	1	1	1	1
Group E end-point electrical parameters (see 4.4)	1,4,7	1,4,7	1,4,7	1,4,7	1,4,7

1/ PDA applies to subgroup 1.
2/ See table IIC for delta measurement parameters.

4.2.1 Additional criteria for device class M, B, and S.

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D. For device class M, the test circuit shall be submitted to DESC-ECS for review with the certificate of compliance. For device classes B and S, the test circuit shall be submitted to the qualifying activity.

(2) T_A = +125°C, minimum.

b. The percent defective allowable (PDA) for class S and class B devices shall be as specified in MIL-M-38510, based on failures from group A, subgroup 1 test after cooldown as final electrical electical test in accordance with method 5004 of MIL-STD-883 and with no intervening electrical measurements. If interim electrical parameter tests are performed prior to interim electrical parameter tests prior to burn-in are omitted, then all screening failures shall be included in the PDA. The verified failures of group A subgroup 1 after burn-in divided by the total number of devices submitted for burn-in that lot shall be used to determine the percent defective for that lot, and the lot shall be accepted or rejected based on the PDA for the applicable device class.

c. Interim and final electrical test parameters shall be as specified in table IIA herein.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The burn-in test circuit shall be submitted to DESC-ECS with the certificate of compliance and shall be under the control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-I-38535.

b. Interim and final electrical test parameters shall be as specified in table IIA herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in appendix B of MIL-I-38535 and as detailed in table IIB herein.

4.3 Qualification inspection.

4.3.1 Qualification inspection for device classes B and S. Qualification inspection for device classes B and S shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.3.2 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-I-38535. Inspections to be performed shall be those specified in MIL-I-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4 Conformance inspection. Quality conformance inspection for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein) and as specified herein. Quality conformance inspection for device classes B and S shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed for device classes M, B, and S shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5). Technology conformance inspection for classes Q and V shall be in accordance with MIL-I-38535 including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-I-38535 permits alternate in-line control testing.

4.4.1 Group A inspection.

a. Tests shall be as specified in table IIA and table III herein.

b. For device class M, subgroups 7 and 8 tests shall be sufficient to verify the truth table. For device classes B and S, subgroups 7 and 8 tests shall be sufficient to verify the truth table as approved by the qualifying activity. For device classes Q and V, subgroups 7 and 8 shall include verifying the functionality of the device.

c. Subgroups 9, 10, and 11 of table I of method 5005 of MIL-STD-883 shall be omitted.

4.4.2 Group B inspection. Group B inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.3 Group C inspection. Group B inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.3.1 Additional criteria for device classes M, B, and S. Steady-state life test conditions, method 1005 of MIL-STD-883:

a. Test conditions A, B, C, or D. For device class M, the test circuit shall be submitted to DESC-ECS for review with the certificate of compliance. For device classes B and S, the test circuit shall be submitted to the qualifying activity.

b. T_A = +125°C, minimum.

c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.3.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature or approved alternatives shall be as specified in the device manufacturer,s QM plan in accordance with MIL-I-38535. The steady-state life tests circuit shall be submitted to DESC-ECS with the certificate of compliance and shall be under the control of the device manufacturer'e TRB in accordance with MIL-I-38535.

4.4.4 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.5 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels for device classes B, S, Q, and V shall be M, D, R, and H and for device class M shall be M and D. RHA quality conformance inspection sample tests shall be performed at the RHA level specified in the acquisition document.

a. RHA tests for device classes B and S for levels M, D, R, and H or for device class M for levels M and D shall be performed through each level to determine at what levels the devices meet the RHA requirements. These RHA tests shall be performed for initial qualification and after design or process changes which may affect the RHA performance of the device.

b. End-point electrical parameters shall be as specified in table IIA herein.

c. Prior to total dose irradiation, each selected sample shall be assembled in its qualified package. It shall pass the specified group A electrical parameters in table I for subgroups specified in table IIA herein.

d. For device classes M, B, and S, the devices shall be subjected to radiation hardness assured tests as specified in MIL-M-38510 for RHA level being tested, and meet the post irradiation end-point electrical parameter limits as defined in table I at T_A = +25°C ±5 percent, after exposure.

e. Prior to and during total dose irradiation testing, the devices shall be biased to establish a worst case condition as specified in the radiation exposure circuit.

f. For device classes M, B, and S, subgroups 1 and 2 in table V, method 5005 of MIL-STD-883 shall be tested as appropriate for device construction.

g. When specified in the purchase order of contract, a copy of the RHA delta limts shall be supplied.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510 for device classes M, B, and S and MIL-I-38535 for device classes Q and V.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.1.1 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

TABLE IIB. Additional screening for device class V.

Test	MIL-STD-883, test method	Lot requirement
Particle impact noise detection	2020	100%
Internal visual	2010, condition A or approved alternate	100%
Nondestructive bond pull	2023 or approved alternate	100%
Reverse bias burn-in	1015	100%
Burn-in	1015, total of 240 hours at +125°C	100%
Radiographic	2012	100%

TABLE IIC. Group C end-point electrical parameters.

Test	Limit		Delta	
	Min	Max	Min	Min	Units
V_{IO}	-75	75	-50	50	µV
$\pm I_{IB}$	-2	2	-1.5	1.5	nA

6.1.2 Substitutability. Device classes B and Q devices will replace device class M devices.

6.2 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).

6.3 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and which SMD's are applicable to that system. 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 microelectronic devices (FSC 5962) should contact DESC-ECS, telephone (513) 296-6022.

TABLE III. Group A inspection.

Subgroup number	Symbol	Test number 1/	Adapter pin number V_{S1}	V_{S2}	V_{S3}	V_{S4}	P1	P2	Relays energized
1 T_A = +25°C	V_{IO}	1 A	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
		1 B	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
	I_{IO}	2 A	0 V	0 V	0 V	0 V	15 V	-15 V	
		2 B	0 V	0 V	0 V	0 V	15 V	-15 V	
	$+I_{IB}$	3 A	0 V	0 V	0 V	0 V	15 V	-15 V	K2
		3 B	0 V	0 V	0 V	0 V	15 V	-15 V	K2
	$-I_{IB}$	4 A	0 V	0 V	0 V	0 V	15 V	-15 V	
		4 B	0 V	0 V	0 V	0 V	15 V	-15 V	
	CMRR	5 A	-12 V	-12 V	-12 V	-12 V	27 V	-3 V	K1, K2
		5 B	-12 V	-12 V	-12 V	-12 V	27 V	-3 V	K1, K2
		6 A	12 V	12 V	12 V	12 V	3 V	-27 V	K1, K2
		6 B	12 V	12 V	12 V	12 V	3 V	-27 V	K1, K2
	PSRR	7 A	0 V	0 V	0 V	0 V	3 V	-3 V	K1, K2
		7 B	0 V	0 V	0 V	0 V	3 V	-3 V	K1, K2
		8 A	0 V	0 V	0 V	0 V	18 V	-18 V	K1, K2
		8 B	0 V	0 V	0 V	0 V	18 V	-18 V	K1, K2
	ISY	9	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
2 T_A = +125°C	V_{IO}	10 A	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
		10 B	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
	I_{IO}	11 A	0 V	0 V	0 V	0 V	15 V	-15 V	
		11 B	0 V	0 V	0 V	0 V	15 V	-15 V	
	$+I_{IB}$	12 A	0 V	0 V	0 V	0 V	15 V	-15 V	K2
		12 B	0 V	0 V	0 V	0 V	15 V	-15 V	K2
	$-I_{IB}$	13 A	0 V	0 V	0 V	0 V	15 V	-15 V	K1
		13 B	0 V	0 V	0 V	0 V	15 V	-15 V	K1

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Test number 1/	Measured Pin No.	Measured Pin Value	Measured Pin Units	Equation	Limits Min	Limits Max	Units
1 A	MP 1	E 1	V	V_{IO} = E1/1000	-75	+75	µV
1 B	MP 2	E 2	V	V_{IO} = E2/1000	-75	+75	µV
2 A	MP 1	E 3	V	I_{IO} = (E3 - E1)/(1000 x 100000)	-1.0	+1.0	nA
2 B	MP 2	E 4	V	I_{IO} = (E4 - E2)/(1000 x 100000)	-1.0	+1.0	nA
3 A	MP 1	E 5	V	$+I_{IB}$ = (E5 - E1)/(1000 x 100000)	-2.0	+2.0	nA
3 B	MP 2	E 6	V	$+I_{IB}$ = (E6 - E2)/(1000 x 100000)	-2.0	+2.0	nA
4 A	MP 1	E 7	V	$-I_{IB} = +I_{IB} - (I_{IO})$	-2.0	+2.0	nA
4 B	MP 2	E 8	V	$-I_{IB} = +I_{IB} - (I_{IO})$	-2.0	+2.0	nA
5 A	MP 1	E 9	V	---			
5 B	MP 2	E 10	V	---			
6 A	MP 1	E 11	V	CMRR = 20 LOG (24000)/(ABS(E9 - E11))	120		dB
6 B	MP 2	E 12	V	CMRR = 20 LOG (24000)/(ABS(E10 - E12))	120		dB
7 A	MP 1	E 13	V	---			
7 B	MP 2	E 14	V	---			
8 A	MP 1	E 15	V	PSRR = ABS(E15 - E13)/30000		1.8	µV/V
8 B	MP 2	E 16	V	PSRR = ABS(E16 - E14)/30000		1.8	µV/V
9	P1	I1	mA	ISY = I1		1.45	mA
10 A	MP 1	E 17	V	V_{IO} = E17/1000	-125	+125	µV
10 B	MP 2	E 18	V	V_{IO} = E18/1000	-125	+125	µV
11 A	MP 1	E19	V	I_{IO} = (E19 - E17)/(1000 x 100000)	-2.5	+2.5	nA
11 B	MP 2	E20	V	I_{IO} = (E20 - E18)/(1000 x 100000)	-2.5	+2.5	nA
12 A	MP 1	E21	V	$+I_{IB}$ = (E21 - E17)/(1000 x 100000)	-5.0	+5.0	nA
12 B	MP 2	E22	V	$+I_{IB}$ = (E22 - E18)/(1000 x 100000)	-5.0	+5.0	nA
13 A	MP 1	E23	V	$-I_{IB}$ = (E23 - E17)/(1000 x 100000)	-5.0	+5.0	nA
13 B	MP 2	E24	V	$-I_{IB}$ = (E24 - E18)/(1000 x 100000)	-5.0	+5.0	nA

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Subgroup number	Symbol	Test number 1/	Adapter pin number						Relays energized
			V_{S1}	V_{S2}	V_{S3}	V_{S4}	P1	P2	
2	CMRR	14 A	-12 V	-12 V	-12 V	-12 V	27 V	-3 V	K1, K2
		14 B	-12 V	-12 V	-12 V	-12 V	27 V	-3 V	K1, K2
T_A =									
+125°C		15 A	12 V	12 V	12 V	12 V	3 V	-27 V	K1, K2
		15 B	12 V	12 V	12 V	12 V	3 V	-27 V	K1, K2
	PSRR	16 A	0 V	0 V	0 V	0 V	3 V	-3 V	K1, K2
		16 B	0 V	0 V	0 V	0 V	3 V	-3 V	K1, K2
		17 A	0 V	0 V	0 V	0 V	18 V	-18 V	K1, K2
		17 B	0 V	0 V	0 V	0 V	18 V	-18 V	K1, K2
	I_{SY}	18	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
3	V_{IO}	19 A	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
		19 B	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2
T_A =									
-55°C	I_{IO}	20 A	0 V	0 V	0 V	0 V	15 V	-15 V	
		20 B	0 V	0 V	0 V	0 V	15 V	-15 V	
	$+I_{IB}$	21 A	0 V	0 V	0 V	0 V	15 V	-15 V	K2
		21 B	0 V	0 V	0 V	0 V	15 V	-15 V	K2
	$-I_{IB}$	22 A	0 V	0 V	0 V	0 V	15 V	-15 V	
		22 B	0 V	0 V	0 V	0 V	15 V	-15 V	
	CMRR	23 A	-12 V	-12 V	-12 V	-12 V	27 V	-3 V	K1, K2
		23 B	-12 V	-12 V	-12 V	-12 V	27 V	-3 V	K1, K2
		24 A	12 V	12 V	12 V	12 V	3 V	-27 V	K1, K2
		24 B	12 V	12 V	12 V	12 V	3 V	-27 V	K1, K2
	PSRR	25 A	0 V	0 V	0 V	0 V	3 V	-3 V	K1, K2
		25 B	0 V	0 V	0 V	0 V	3 V	-3 V	K1, K2
		26 A	0 V	0 V	0 V	0 V	18 V	-18 V	K1, K2
		26 B	0 V	0 V	0 V	0 V	18 V	-18 V	K1, K2
	I_{SY}	27	0 V	0 V	0 V	0 V	15 V	-15 V	K1, K2

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Test number 1/	Measured Pin No.	Measured Pin Value	Measured Pin Units	Equation	Limits Min	Limits Max	Units
14 A	MP 1	E25	V	---			
14 B	MP 2	E26	V	---			
15 A	MP 1	E27	V	CMRR = 20 LOG (24000)/(ABS(E25 - E27))	115		dB
15 B	MP 2	E28	V	CMRR = 20 LOG (24000)/(ABS(E26 - E28))	115		dB
16 A	MP 1	E29	V	---			
16 B	MP 2	E30	V	---			
17 A	MP 1	E31	V	PSRR = ABS(E31 - E29)/30000		3.2	µV/V
17 B	MP 2	E32	V	PSRR = ABS(E32 - E30)/30000		3.2	µV/V
18	P1	I1	mA	I_{SY} = I2		1.55	mA
19 A	MP 1	E33	V	V_{IO} = E33/1000	-125	+125	µV
19 B	MP 2	E34	V	V_{IO} = E34/1000	-125	+125	µV
20 A	MP 1	E35	V	I_{IO} = (E35 - E33)/(1000 x 100000)	-2.5	+2.5	nA
20 B	MP 2	E36	V	I_{IO} = (E36 - E34)/(1000 x 100000)	-2.5	+2.5	nA
21 A	MP 1	E37	V	$+I_{IO}$ = (E37 - E33)/(1000 x 100000)	-5.0	+5.0	nA
22 B	MP 2	E38	V	$+I_{IO}$ = (E38 - E34)/(1000 x 100000)	-5.0	+5.0	nA
22 A	MP 1	E39	V	$-I_{IB}$ = (E39 - E33)/(1000 x 100000)	-5.0	+5.0	nA
22 B	MP 2	E40	V	$-I_{IB}$ = (E40 - E34)/(1000 x 100000)	-5.0	+5.0	nA
23 A	MP 1	E41	V	---			
23 B	MP 2	E42	V	---			
24 A	MP 1	E43	V	CMRR = 20 LOG (24000)/(ABS(E41 - E43))	115		dB
24 B	MP 2	E44	V	CMRR = 20 LOG (24000)/(ABS(E42 - E44))	115		dB
25 A	MP 1	E45	V	---			
25 B	MP 2	E46	V	---			
26 A	MP 1	E47	V	PSRR = ABS(E47 - E45)/30000		3.2	µV/V
26 B	MP 2	E48	V	PSRR = ABS(E48 - E46)/30000		3.2	µV/V
27	P1	I3	mA	I_{SY} = I3		1.55	mA

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Subgroup number	Symbol	Test number 1/	Adapter pin number						Relays energized
			V_{S1}	V_{S2}	V_{S3}	V_{S4}	P1	P2	
4	A_{VS}	28 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K105
		28 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K106
T_A = +25°C	R_L = 2 kΩ	29 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K105
		29 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K106
	A_{VS}	30 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K10, K105
		30 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K10, K106
	R_L = 10 kΩ	31 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K10, K105
		31 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K10, K106
	V_{OP}	32 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K105
		32 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K106
	R_L = 2 kΩ	33 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K105
		33 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K106
	V_{OP}	34 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K105
		34 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K106
	R_L = 10 kΩ	35 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K105
		35 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K106
5	A_{VS}	36 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K105
		36 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K106
T_A = +125°C	R_L = 2 kΩ	37 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K105
		37 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K106
	A_{VS}	38 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9 K105
		38 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9 K106
	R_L = 10 kΩ	39 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9 K105
		39 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9 K106

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Test number 1/	Measured Pin No.	Measured Pin Value	Measured Pin Units	Equation	Limits Min	Limits Max	Units
28 A	MP 5	E 49	V	---			
28 B	MP 6	E 50	V	---			
29 A	MP 5	E 51	V	AVS = 20000/(ABS(E51 - E49))	2000		V/mV
29 B	MP 6	E 52	V	AVS = 20000/(ABS(E52 - E50))	2000		V/mV
30 A	MP 5	E 53	V	---			
30 B	MP 6	E 54	V	---			
31 A	MP 5	E 55	V	AVS = 20000/(ABS(E53 - E54))	5000		V/mV
31 B	MP 6	E 56	V	AVS = 20000/(ABS(E55 - E56))	5000		V/mV
32 A	MP 5	E 57	V	$+V_{OP}$ = E57	11		V
32 B	MP 6	E 58	V	$+V_{OP}$ = E58	11		V
33 A	MP 5	E 59	V	$-V_{OP}$ = E59		-11	V
33 B	MP 6	E 60	V	$-V_{OP}$ = E60		-11	V
34 A	MP 5	E 61	V	$+V_{OP}$ = E61	12		V
34 B	MP 6	E 62	V	$+V_{OP}$ = E62	12		V
35 A	MP 5	E 63	V	$-V_{OP}$ = E63		-12	V
35 B	MP 6	E 64	V	$-V_{OP}$ = E64		-12	V
36 A	MP 5	E 65	V	---			
36 B	MP 6	E 66	V	---			
37 A	MP 5	E 67	V	AVS = 20000/(ABS(E65 - E67))	1000		V/mV
37 B	MP 6	E 68	V	AVS = 20000/(ABS(E66 - E68))	1000		V/mV
38 A	MP 5	E 69	V	---			
38 B	MP 6	E 70	V	---			
39 A	MP 5	E 71	V	AVS = 20000/(ABS(E69 - E71))	3000		V/mV
39 B	MP 6	E 72	V	AVS = 20000/(ABS(E70 - E72))	3000		V/mV

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Subgroup number	Symbol	Test number 1/	Adapter pin number						Relays energized
			V_{S1}	V_{S2}	V_{S3}	V_{S4}	P1	P2	
5	V_{OP}	40 A	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K9, K105
		40 B	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K9, K106
T_A =	R_L =								
+125°C	2 kΩ	41 A	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K9, K105
		41 B	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K9, K106
	V_{OP}	42 A	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K10, K105
		42 B	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K10, K106
	R_L =								
	10 kΩ	43 A	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K10, K105
		43 B	15 V	15 V	1 V	15 V	15 V	-15 V	K1, K2, K10, K106
6	A_{VS}	44 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K105
		44 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K9, K106
T_A =	R_L =								
-55°C	2 kΩ	45 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K105
		45 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K9, K106
	A_{VS}	46 A	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K10, K105
		46 B	-10 V	-10 V	-10 V	-10 V	15 V	-15 V	K1, K2, K10, K106
	R_L =								
	10 kΩ	47 A	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K10, K105
		47 B	10 V	10 V	10 V	10 V	15 V	-15 V	K1, K2, K10, K106
	V_{OP}	48 A	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K9, K105
		48 B	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K9, K106
	R_L =								
	2 kΩ	49 A	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K9, K105
		49 B	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K9, K106
	V_{OP}	50 A	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K10, K105
		50 B	-15 V	-15 V	-15 V	-15 V	15 V	-15 V	K1, K2, K10, K106
	R_L =								
	10 kΩ	51 A	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K10, K105
		51 B	15 V	15 V	15 V	15 V	15 V	-15 V	K1, K2, K10, K106

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Test number 1/	Measured Pin No.	Value	Units	Equation	Limits Min	Max	Units
40 A	MP 5	E 73	V	$+V_{OP}$ = E73	11		V
40 B	MP 6	E 74	V	$+V_{OP}$ = E74	11		V
41 A	MP 5	E 75	V	$-V_{OP}$ = E75		-11	V
41 B	MP 6	E 76	V	$-V_{OP}$ = E76		-11	V
42 A	MP 5	E 77	V	$+V_{OP}$ = E77	12		V
42 B	MP 6	E 78	V	$+V_{OP}$ = E78	12		V
43 A	MP 5	E 79	V	$-V_{OP}$ = E79		-12	V
43 B	MP 6	E 80	V	$-V_{OP}$ = E80		-12	V
44 A	MP 5	E 81	V	---			
44 B	MP 6	E 82	V	---			
45 A	MP 5	E 83	V	AVS = 20000/(ABS(E81 - E83))	1000		V/mV
45 B	MP 6	E 84	V	AVS = 20000/(ABS(E82 - E84))	1000		V/mV
46 A	MP 5	E 85	V	---			
46 B	MP 6	E 86	V	---			
47 A	MP 5	E 87	V	AVS = 20000/(ABS(E85 - E87))	3000		V/mV
47 B	MP 6	E 88	V	AVS = 20000/(ABS(E86 - E88))	3000		V/mV
48 A	MP 5	E 89	V	$+V_{OP}$ = E89	11		V
48 B	MP 6	E 90	V	$+V_{OP}$ = E90	11		V
49 A	MP 5	E 91	V	$-V_{OP}$ = E91		-11	V
49 B	MP 6	E 92	V	$-V_{OP}$ = E92		-11	V
50 A	MP 5	E 93	V	V_{OP} = E93	12		V
50 B	MP 6	E 94	V	V_{OP} = E94	12		V
51 A	MP 5	E 95	V	V_{OP} = E95		-12	V
51 B	MP 6	E 96	V	V_{OP} = E96		-12	V

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Subgroup number	Symbol	Test number 1/	Adapter pin number						Relays energized
			V_{S1}	V_{S2}	V_{S3}	V_{S4}	P1	P2	
7	En	52 A	0 V	0 V	0 V	0 V	15 V	-15 V	
		52 B	0 V	0 V	0 V	0 V	15 V	-15 V	
T_A = +25°C									
									K1, K5, K6, K13,
	SR+	53 A	0 V	0 V	0 V	0 V	15 V	-15 V	and K101, K105
		53 B	0 V	0 V	0 V	0 V	15 V	-15 V	and K102, K106
	SR-	54 A	0 V	0 V	0 V	0 V	15 V	-15 V	and K101, K105
		54 B	0 V	0 V	0 V	0 V	15 V	-15 V	and K102, K106
8	TC_{VIO}	55 A	Temperature co-efficient is calculated using the V_{IO} readings from subgroups 1 and 3.						
T_A = +125°C		55 B							
8	TC_{VIO}	56 A	Temperature co-efficient is calculated using the V_{IO} readings from subgroups 1 and 3.						
T_A = -55°C		56 B							

See footnote at end of table.

TABLE III. Group A inspection - Continued.

Test number 1/	Measured Pin No.	Measured Pin Value	Measured Pin Units	Equation	Limits Min	Limits Max	Units
52 A		E 97	V			250	nV rms
52 B		E 98	V			250	nV rms
53 A	Timer	t1	µs	5/t1, relays closed	0.1		V/µs
53 B	Timer	t2	µs	5/t2, relays closed	0.1		V/µs
54 A	Timer	t3	µs	5/t3, relays closed	0.1		V/µs
54 B	Timer	t4	µs	5/t4, relays closed	0.1		V/µs
55 A				(E1 - E17 at 125°C)/100		0.5	µV/°C
55 B				(E1 - E18 at 125°C)/100		0.5	µV/°C
56 A				(E1 - E33 at -55°C)/80		0.5	µV/°C
56 B				(E1 - E34 at -55°C)/80		0.5	µV/°C

1/ All tests apply to figures 4 and 5, unless otherwise specified.

Device type	01	
Case outlines	P	2
Terminal number	Terminal symbol	
1	OUT A	NC
2	-IN A	OUT A
3	+IN A	NC
4	$-V_{CC}$	NC
5	+IN B	-IN A
6	-IN B	NC
7	OUT B	+IN A
8	$+V_{CC}$	NC
9	---	NC
10	---	$-V_{CC}$
11	---	NC
12	---	+IN B
13	---	NC
14	---	NC
15	---	-IN B
16	---	NC
17	---	OUT B
18	---	NC
19	---	NC
20	---	$+V_{CC}$

NC = No connection.

FIGURE 1. Terminal connection.

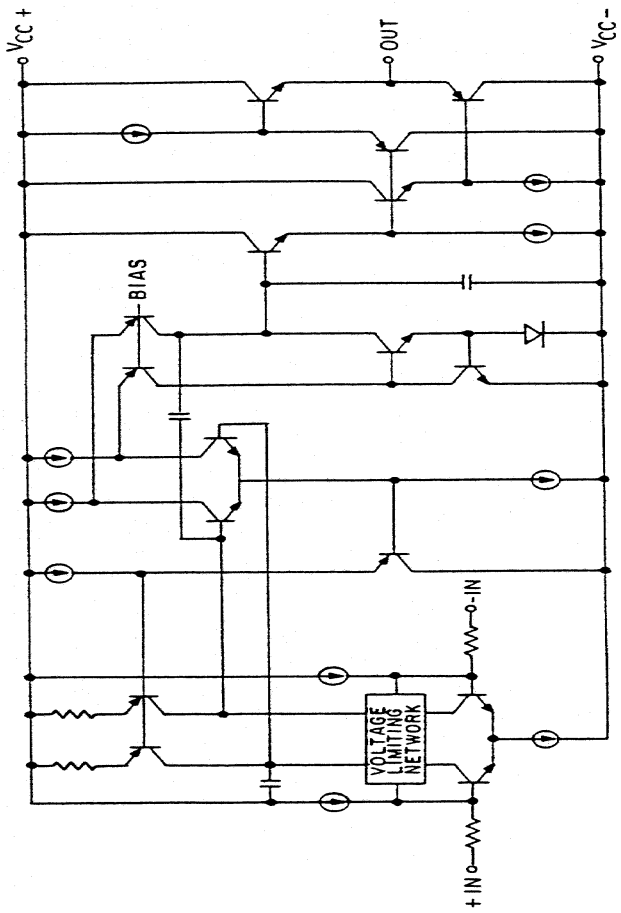
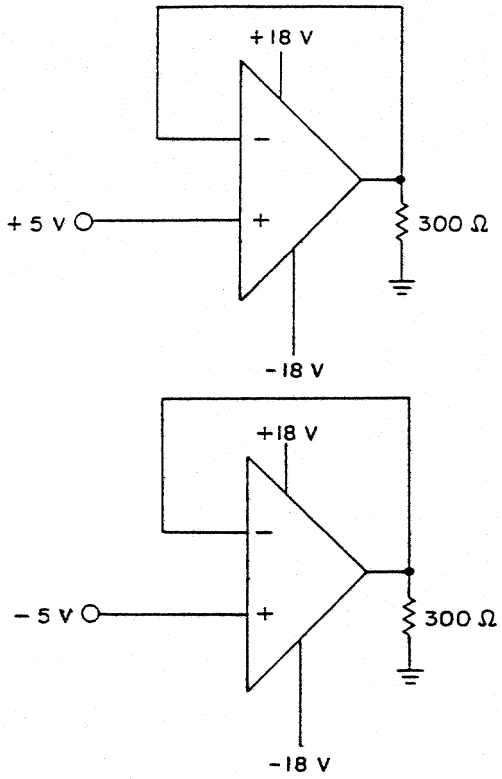
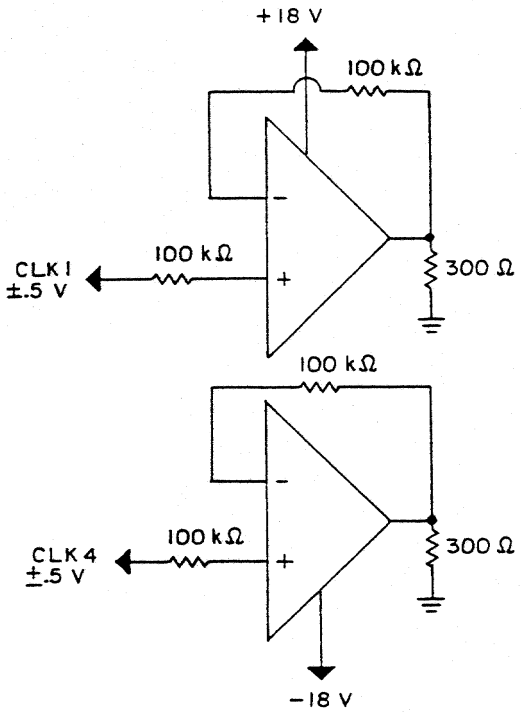


FIGURE 2. Schematic diagram.



NOTES:
1. Burn in voltgae tolerances are ±0.2 V.
2. All resistors are metal film with ±1 % tolerance.

FIGURE 3. Burn-in and steady state life test circuit.



NOTE: All resistors are metal film with ±1 % tolerance.

FIGURE 4. Dynamic burn-in test circuit.

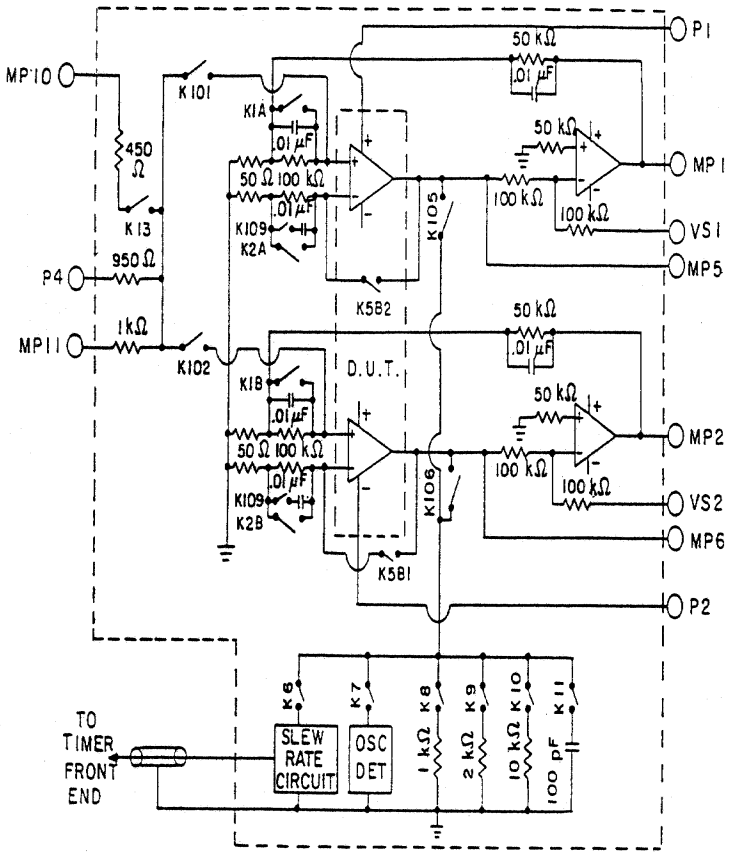


FIGURE 5. Static and dynamic test circuit.

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

6.5 Symbols, definitions and functional descriptions.

6.6 One part - one part number system. The one part - one part number system described below has been developed to allow for transitions between identical generic devices covered by the four major microcircuit requirements documents (MIL-M-38510, MIL-H-38534, MIL-I-38535, and 1.2.1 of MIL-STD-883) without the necessity for the generation of unique PIN's. The four military requirements documents represent different class levels, and previously when a device manufacturer upgraded military product from one class level to another, the benefits of the upgraded product were unavailable to the Original Equipment Manufacturer (OEM), that was contractually locked into the original unique PIN. By establishing a one part number system covering all four documents, the OEM can acquire to the highest class level available for a given generic device to meet system needs without modifying the original contract parts selection criteria.

Military documentation format	Example PIN under new system	Manufacturing source listing	Document listing
New MIL-M-38510 Military Detail Specifications (in the SMD format)	5962-XXXXXZZ(B or S)YY	QPL-38510 (Part 1 or 2)	MIL-BUL-103
New MIL-H-38534 Standardized Military Drawings	5962-XXXXXZZ(H or K)YY	QML-38534	MIL-BUL-103
New MIL-I-38535 Standardized Military Drawings	5962-XXXXXZZ(Q or V)YY	QML-38535	MIL-BUL-103
New 1.2.1 of MIL-STD-883 Standardized Military Drawings	5962-XXXXXZZ(M)YY	MIL-BUL-103	MIL-BUL-103

6.7 Sources of supply.

6.7.1 Sources of supply for device classes B and S. Sources of supply for device classes B and S are listed in QPL-38510.

6.7.2 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DESC-ECS and have agreed to this drawing.

6.7.3 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-BUL-103. 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-ECS.

APPENDIX

SUBSTITUTION DATA

10. SCOPE

10.1 Scope. This appendix contains the PIN substitution information to support the one part-one part number system. For new designs, after the date of this document the new PIN shall be used in lieu of the old PIN. For existing designs prior to the date of this document the new PIN can be used in lieu of the old PIN. The appendix is a mandatory part of the specification. The information herein is intended for compliance. The PIN substitution data shall be as follows:

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. SUBSTITUTION DATA

NEW PIN	OLD PIN
5962-8859301MPX	5962-8859301PX
5962-8859301M2X	5962-88593012X

STANDARDIZED MILITARY DRAWING SOURCE APPROVAL BULLETIN

DATE: 91-12-11

Approved sources of supply for SMD 5962-88593 are listed below for immediate acquisition only and shall be added to MIL-BUL-103 during the next revision. MIL-BUL-103 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DESC-ECS. This bulletin is superseded by the next dated revision of MIL-BUL-103.

Standardized military drawing PIN	Vendor CAGE number	Vendor similar PIN 1/
5962-8859301MPX	06665	OP-200AZ/883
5962-8859301M2X	06665	OP-200ARC/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	Vendor name and address
06665	Analog Devices Precision Monolithics, Division 1500 Space Park Drive Santa Clara, CA 95050

The cross-reference information below is presented for the convenience of users. Microcircuits covered by SMD will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges, post irradiation performance, or reliability factors equivalent to the listed SMD device types and may have slight physical variations in relation to case size. The presence of this information shall not be deemed as permitting substitution of generic-industry types for SMD types or as a waiver of any of the provisions of the applicable general specification.

Standardized military drawing PIN	Generic-industry PIN
5962-8859301BPX	OP200AZ
5962-8859301B2X	OP200ARC
5962-8859301SPX	OP200AZ
5962-8859301S2X	OP200ARC