



PM-2108/883

LOW-INPUT-CURRENT OPERATIONAL AMPLIFIER

Precision Monolithics Inc.

1.0 SCOPE

This specification covers the detail requirements for a low-input-current operational amplifier.

It is highly recommended that this data sheet be used as a baseline for new military or aerospace spec control drawings.

1.2 Part Number. The complete part numbers per Table I of this specification follow:

<u>Device</u>	<u>Part Number</u>	<u>Package</u>
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NO LONGER OFFERED AS STANDARD PRODUCT

1.2.3 Case Outline.

<u>Letter</u>	<u>Case Outline (Lead finish per MIL-M-38510)</u>
Q	16-lead ceramic dual-in-line package (CERDIP)

1.3 Absolute Maximum Ratings. ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Supply Voltage.....	$\pm 20\text{V}$
Internal Power Dissipation.....	500mW
Differential Input Current (Note 1).....	$\pm 10\text{mA}$
Input Voltage (Note 2).....	$\pm 15\text{V}$
Output Short-Circuit Duration.....	Indefinite
Storage Temperature Range.....	-65°C to $+150^\circ\text{C}$
Lead Temperature (Soldering, 60 sec).....	$+300^\circ\text{C}$
Operating Temperature Range.....	-55°C to $+125^\circ\text{C}$

NOTES:

1. The inputs are shunted with back-to-back diodes for overvoltage protection. Therefore, if a differential input voltage in excess of 1V is applied between the inputs, excessive current will flow unless some limiting resistance is provided.
2. For supply voltages less than $\pm 15\text{V}$, the absolute maximum input voltage is equal to the supply voltages.

1.5 Thermal Characteristics:

Thermal Resistance, CERDIP (Q) package:

Junction-to-Case (Θ_{JC}) = 29°C/W MAX

Junction-to-Ambient (Θ_{JA}) = 91°C/W MAX

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TABLE 1

$\pm 5V \leq V_S \leq \pm 20V$; $R_S = 50\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

Characteristics	Symbol	Special Conditions	PM-2108/883				Units
			LIMITS A		LIMITS X		
			Min	Max	Min	Max	
Input Offset Voltage	V_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	-	0.5	-	2.0	mV
			-	1.0	-	3.0	mV
Input Offset Current	I_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	-	0.2	-	0.2	nA
			-	0.4	-	0.4	nA
Input Bias Current	I_B	$-55^\circ C \leq T_A \leq +125^\circ C$	-	± 2.0	-	± 2.0	nA
			-	± 3.0	-	± 3.0	nA
Input Voltage Range (Note 1)	IVR	$-55^\circ C \leq T_A \leq +125^\circ C$	± 13.5	-	± 13.5	-	V
Common-Mode Rejection	CMR	$V_S = \pm 15V$ $V_{CM} = IVR = \pm 13.5V$ $-55^\circ C \leq T_A \leq +125^\circ C$	96	-	85	-	dB
Power Supply Rejection Ratio	PSRR	$V_S = \pm 5V$ to $\pm 20V$ $-55^\circ C \leq T_A \leq +125^\circ C$	-	15	-	100	$\mu V/V$
Output Voltage Swing	V_O	$R_L \geq 10k\Omega$, $V_S = \pm 15V$ $-55^\circ C \leq T_A \leq +125^\circ C$	± 13.0	-	± 13.0	-	V
Large-Signal Voltage Gain	A_{VO}	$V_S = \pm 15V$, $V_O = \pm 10V$ $R_L \geq 10k\Omega$ $V_S = \pm 15V$, $V_O = \pm 10V$ $R_L \geq 10k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	80.0	-	50.0	-	V/mV
			40.0	-	25.0	-	V/mV
Supply Current (Each Amplifier)	I_{SY}	No Load	-	0.6	-	0.6	mA
		No Load $-55^\circ C \leq T_A \leq +125^\circ C$	-	0.4	-	0.4	mA

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TABLE 1 (Continued)

$\pm 5V \leq V_S \leq \pm 20V$; $R_S = 50\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

Characteristics	Symbol	Special Conditions	PM-2108/883				Units
			LIMITS A		LIMITS X		
			Min	Max	Min	Max	
Power Dissipation (Each Amplifier)	P_d	No Load, $V_S = \pm 20V$	--	24	--	24	mW
		No Load, $V_S = \pm 20V$	--	16	--	16	mW
		$-55^\circ C \leq T_A \leq +125^\circ C$					
Average Input Offset Voltage Drift	TCV_{OS}		--	5.0	--	15	$\mu V/^\circ C$
Average Input Offset Current Drift	TCI_{OS}		--	2.5	--	2.5	$pA/^\circ C$

NOTES:

1. IVR is defined as the V_{CM} range used for the CMR test.



TABLE 2

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**Electrical Test Requirements
For Class B Devices**

MIL-STD-883 Test Requirements	Subgroups (see Table 3)
Interim Electrical Parameters (pre Burn-In)	1
Final Electrical Test Parameters	1*, 2, 3, 4, 5, 6
Group A Test Requirements	1, 2, 3, 4, 5, 6

* PDA applies to Subgroup 1 only.
No other Subgroups are included in PDA.

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TABLE 3

Group A Inspection

$V_S = \pm 5V$ and $V_S = \pm 20V$ for each test; $R_S = 50\Omega$; $T_A = T_J$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	PM-2108/883				Units
			LIMITS A		LIMITS X		
			Min	Max	Min	Max	
Subgroup 1 $T_A = +25^\circ C$	V_{OS}		--	0.5	--	2.0	mV
	I_{OS}		--	0.2	--	0.2	nA
	I_B		--	± 2.0	--	± 2.0	nA
	CMR	$V_{CM} = \pm 13.5V$ $V_S = \pm 15V$	96	--	85	--	dB
	PSRR		--	15	--	100	$\mu V/V$
	I_{SY}	No Load	--	0.6	--	0.6	mA
Subgroup 2 $T_A = +125^\circ C$	V_{OS}		--	1.0	--	3.0	mV
	I_{OS}		--	0.4	--	0.4	mV
	I_B		--	± 3.0	--	± 3.0	nA
	CMR	$V_{CM} = \pm 13.5V$ $V_S = \pm 15V$	96	--	85	--	dB
	PSRR		--	15	--	100	$\mu V/V$
	I_{SY}	No Load	--	0.4	--	0.4	mA
Subgroup 3 $T_A = -55^\circ C$	All Tests, Limits and Conditions are the same as for Subgroup 2.						
Subgroup 4 $T_A = +25^\circ C$	V_O	$R_L = 10k\Omega, V_S = \pm 15V$	± 13.0	--	± 13.0	--	V
	A_{VO}	$V_S = \pm 15V, V_O = \pm 10V$ $R_L = 10k\Omega$	80.0	--	50.0	--	V/mV



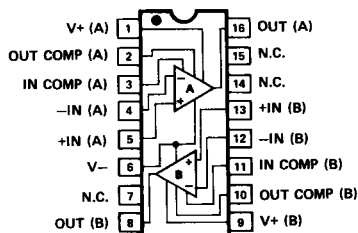
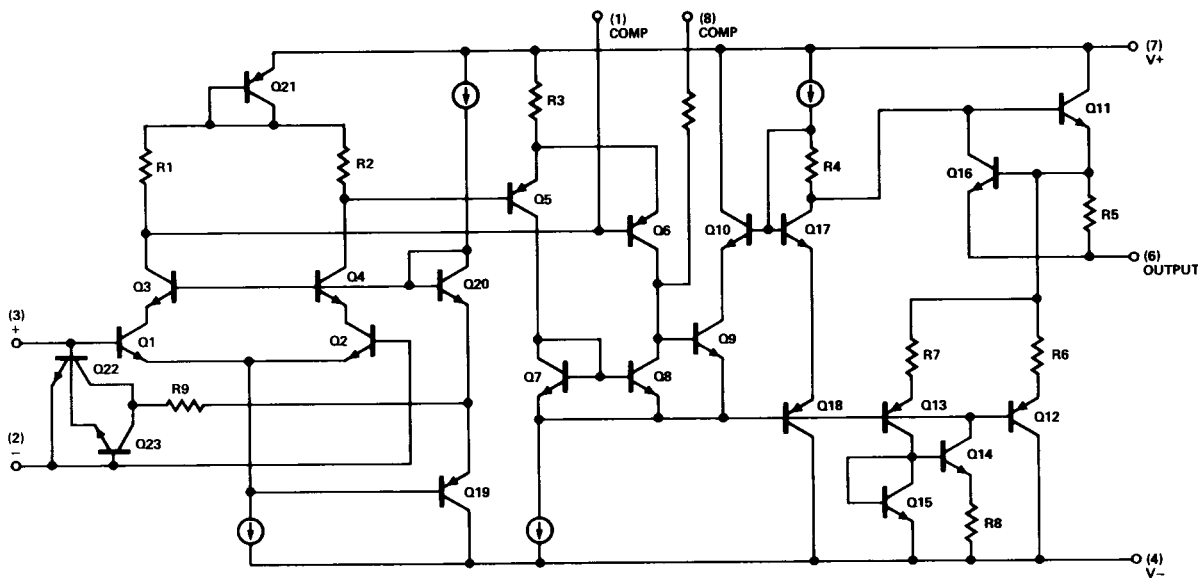
TABLE 3

Group A Inspection (Continued)

$V_S = \pm 5V$ and $V_S = \pm 20V$ for each test; $R_S = 50\Omega$; $T_A = T_J$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	PM-2108/883				Units
			LIMITS A		LIMITS X		
			Min	Max	Min	Max	
Subgroup 5	V_O	$V_S = \pm 15V, R_L = 10k\Omega$	± 13.0	—	± 13.0	—	V
$T_A = +125^\circ C$	A_{VO}	$V_S = \pm 15V, V_O = \pm 10V$ $R_L = 10k\Omega$	40.0	—	25.0	—	V/mV
Subgroup 6	$T_A = -55^\circ C$	All Tests, Limits and Conditions are the same as for Subgroup 5.					

3.2.1 Simplified Schematic and Pin Connections.



**16-PIN HERMETIC DIP
(Q-Suffix)**

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3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 49.

4.2 Life Test/Burn-In Circuit.

