



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.

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Characteristics	Symbol	Special Conditions	LIMITS A		LIMITS X		Units
			Min	Max	Min	Max	
Input Offset Voltage	V _{OS}		—	0.5	—	2.0	mV
		-55°C ≤ T _A ≤ +125°C	—	1.0	—	3.0	mV
Input Offset Current	I _{OS}		—	0.2	—	0.2	nA
		-55°C ≤ T _A ≤ +125°C	—	0.4	—	0.4	nA
Input Bias Current	I _B		—	±2.0	—	±2.0	nA
		-55°C ≤ T _A ≤ +125°C	—	±3.0	—	±3.0	nA
Input Voltage Range (Note 1)	IVR	-55°C ≤ T _A ≤ +125°C	±13.5	—	±13.5	—	V
Common-Mode Rejection	CMR	V _S = ±15V V _{CM} = IVR = ±13.5V -55°C ≤ T _A ≤ +125°C	96	—	85	—	dB
Power Supply Rejection Ratio	PSRR	V _S = ±5V to ±20V -55°C ≤ T _A ≤ +125°C	—	15	—	100	μV/V
Output Voltage Swing	V _O	R _L ≥ 10kΩ, V _S = ±15V -55°C ≤ T _A ≤ +125°C	±13.0	—	±13.0	—	V
Large-Signal Voltage Gain	A _{VO}	V _S = ±15V, V _O = ±10V R _L ≥ 10kΩ	80.0	—	50.0	—	V/mV
		V _S = ±15V, V _O = ±10V R _L ≥ 10kΩ -55°C ≤ T _A ≤ +125°C	40.0	—	25.0	—	V/mV
Supply Current (Each Amplifier)	I _{SY}	No Load	—	0.6	—	0.6	mA
		No Load	—	0.4	—	0.4	mA
		-55°C ≤ T _A ≤ +125°C					

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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.

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Characteristics	Symbol	Special Conditions	LIMITS A		LIMITS X		Units
			Min	Max	Min	Max	
Power Dissipation (Each Amplifier)	P _d	No Load, V _S = ±20V	—	24	—	24	mW
		No Load, V _S = ±20V	—	16	—	16	mW
		-55°C ≤ T _A ≤ +125°C					
Average Input Offset Voltage Drift	TCV _{OS}		—	5.0	—	15	μV/°C
Average Input Offset Current Drift	TCI _{OS}		—	2.5	—	2.5	pA/°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.



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.

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Subgroup	Symbol	Special Conditions	LIMITS A		LIMITS X		Units
			Min	Max	Min	Max	
Subgroup 1	V _{OS}		--	0.5	--	2.0	mV
T _A = +25°C	I _{OS}		--	0.2	--	0.2	nA
	I _B		--	±2.0	--	±2.0	nA
	CMR	V _{CM} = ±13.5V V _S = ±15V	96	--	85	--	dB
	PSRR		--	15	--	100	μV/V
	I _{SY}	No Load	--	0.6	--	0.6	mA
	Subgroup 2	V _{OS}		--	1.0	--	3.0
T _A = +125°C	I _{OS}		--	0.4	--	0.4	mV
	I _B		--	±3.0	--	±3.0	nA
	CMR	V _{CM} = ±13.5V V _S = ±15V	96	--	85	--	dB
	PSRR		--	15	--	100	μV/V
	I _{SY}	No Load	--	0.4	--	0.4	mA
	Subgroup 3	All Tests, Limits and Conditions are the same as for Subgroup 2.					
T _A = -55°C							
Subgroup 4	V _O	R _L = 10kΩ, V _S = ±15V	±13.0	--	±13.0	--	V
T _A = +25°C	A _{VO}	V _S = ±15V, V _O = ±10V R _L = 10kΩ	80.0	--	50.0	--	V/mV



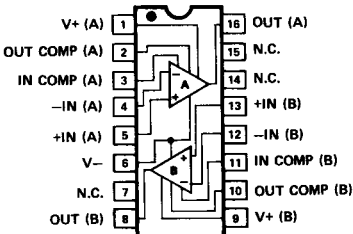
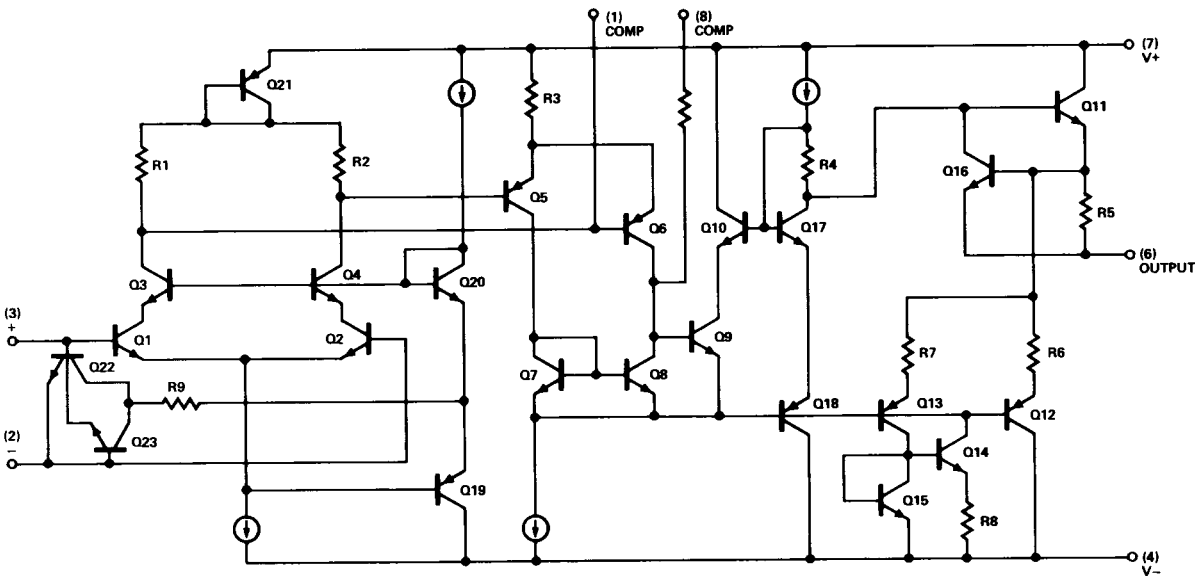
TABLE 3

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 = ±15V, R _L = 10kΩ	±13.0	—	±13.0	—	V
T _A = +125 °C	A _{VO}	V _S = ±15V, V _O = ±10V R _L = 10kΩ	40.0	—	25.0	—	V/mV
Subgroup 6	All Tests, Limits and Conditions are the same as for Subgroup 5.						
T _A = -55 °C							

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.

