



Precision Monolithics Inc.

1.0 SCOPE

This specification covers the detail requirements for a low bias current JFET 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>
A	OP-41AJ/883	J
B	OP-41BJ/883	J

1.2.3 Case Outline.

<u>Letter</u>	<u>Case Outline (Lead finish per MIL-M-38510)</u>
J	8-lead metal can (TO-99)

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

Supply Voltage.....	$\pm 18\text{V}$
Power Dissipation.....	500mW
Differential Input Voltage (Note 1).....	$\pm 18\text{V}$
Input Voltage (Note 1).....	$\pm 18\text{V}$
Output Short-Circuit Duration.....	Indefinite
Storage Temperature Range.....	-65°C to $+150^\circ\text{C}$
Lead Temperature (Soldering, 60 sec).....	$+300^\circ\text{C}$
Maximum Junction Temperature (T_J).....	$\pm 150^\circ\text{C}$

NOTES:

1. For supply voltages less than $\pm 18\text{V}$, the maximum input voltage is equal to the supply voltages.

1.5 Thermal Characteristics:

Thermal Resistance, TO-99 (J) package:

Junction-to-Case (θ_{JC}) = 45°C/W MAX

Junction-to-Ambient (θ_{JA}) = 150°C/W MAX

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TABLE 1

$V_S = \pm 15V$; $V_{CM} = 0V$; $R_S = 50\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

Characteristics	Symbol	Special Conditions	OP-41/883				Units
			LIMITS A		LIMITS B		
			Min	Max	Min	Max	
Input Offset Voltage	V_{OS}		-	500	-	1000	μV
		$-55^\circ C \leq T_A \leq +125^\circ C$	-	1000	-	2000	μV
Input Offset Current	I_{OS}	(Note 1)	-	1	-	2	pA
		$-55^\circ C \leq T_A \leq +125^\circ C$	-	1	-	2	nA
Input Bias Current	I_B	(Note 1) Either Input	-	± 5.0	-	± 10.0	pA
		$-55^\circ C \leq T_A \leq +125^\circ C$	-	± 7.5	-	± 15.0	nA
Input Voltage Range (Note 2)	IVR		± 11.0	-	± 11.0	-	V
		$-55^\circ C \leq T_A \leq +125^\circ C$	± 11.0	-	± 11.0	-	V
Common-Mode Rejection	CMR	$V_{CM} = \pm 11V$	100	-	90	-	dB
		$V_{CM} = \pm 11V$	95	-	85	-	dB
		$-55^\circ C \leq T_A \leq +125^\circ C$					
Power Supply Rejection Ratio	PSRR	$V_S = \pm 10V$ to $\pm 18V$	-	25	-	80	$\mu V/V$
		$V_S = \pm 10V$ to $\pm 18V$ $-55^\circ C \leq T_A \leq +125^\circ C$	-	40	-	100	$\mu V/V$
Large-Signal Voltage Gain	A_{VO}	$V_O = \pm 10V, R_L = 2k\Omega$	1000	-	500	-	V/mV
		$V_O = \pm 10V, R_L = 2k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	1000	-	500	-	V/mV
Supply Current	I_{SY}	No Load	-	1.0	-	1.2	mA
		No Load $-55^\circ C \leq T_A \leq +125^\circ C$	-	1.2	-	1.2	mA
Output Voltage Swing	V_O	$R_L = 2k\Omega$	± 12.3	-	± 12.0	-	V
		$R_L = 2k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	± 12.0	-	± 11.5	-	V

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TABLE 1 (Continued)

$V_S = \pm 15V$; $V_{CM} = 0V$; $R_S = 50\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

Characteristics	Symbol	Special Conditions	OP-41/883				Units
			LIMITS A		LIMITS B		
			Min	Max	Min	Max	
Output Short-Circuit Current	I_{SC}	Short circuit to ground	± 12	± 36	± 12	± 36	mA
		Short circuit to ground $-55^\circ C \leq T_A \leq +125^\circ C$	± 6	± 36	± 6	± 36	mA
Slew Rate	SR	$A_V = +1$ $-55^\circ C \leq T_A \leq +125^\circ C$	1	—	1	—	V/ μ s
Temperature Coefficient of Input Offset Voltage	TCV_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	—	5	—	10	$\mu V/^\circ C$

NOTES:

- I_B and I_{OS} are tested at $+25^\circ C$ ambient with devices warmed up.
- IVR is defined as the V_{CM} range used for the CMR test.



TABLE 2

OP-41/883

**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, 8, 9, 10, 11
Group A Test Requirements	1, 2, 3, 4, 5, 6, 8, 9, 10, 11

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



TABLE 3

Group A Inspection

$V_S = \pm 15V$; $V_{CM} = 0V$; $R_S = 50\Omega$; $T_A = T_J$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	OP-41/883				Units
			LIMITS A		LIMITS B		
			Min	Max	Min	Max	
Subgroup 1	V_{OS}		--	500	--	1000	μV
$T_A = +25^\circ C$	A_{VO}	$V_O = \pm 10V, R_L = 2k\Omega$	1000	--	500	--	V/mV
	V_O	$R_L = 2k\Omega$	± 12.3	--	± 12.0	--	V
	CMR	$V_{CM} = \pm 11V$	100	--	90	--	dB
	PSRR	$V_S = \pm 10V, \pm 18V$	--	25	--	80	$\mu V/V$
	I_{SC}	Short circuit to ground	± 12	± 36	± 12	± 36	mA
	I_{SY}	No Load	--	1.0	--	1.2	mA
Subgroup 2	V_{OS}		--	1000	--	2000	μV
$T_A = +125^\circ C$	I_{OS}		--	1	--	2	nA
	I_B	Either Input	--	± 7.5	--	± 15.0	nA
	CMR	$V_{CM} = \pm 11V$	95	--	85	--	dB
	PSRR	$V_S = \pm 10V, \pm 18V$	--	40	--	100	$\mu V/V$
	I_{SC}	Short circuit to ground	± 6	± 36	± 6	± 36	mA
	I_{SY}	No Load	--	1.2	--	1.2	mA
Subgroup 3		All Tests, Limits and Conditions are the same as for Subgroup 2.					
$T_A = -55^\circ C$							



TABLE 3

Group A Inspection (Continued)

$V_S = \pm 15V$; $V_{CM} = 0V$; $R_S = 50\Omega$; $T_A = T_J$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	OP-41/883				Units
			LIMITS A		LIMITS B		
			Min	Max	Min	Max	
Subgroup 4	I_{OS}	(Note 1)	1	—	2	—	pA
$T_A = +25^\circ C$	I_B	(Note 1) Either Input	5	—	10	—	pA
Subgroup 5	V_O	$R_L = 2k\Omega$	± 12.0	—	± 11.5	—	V
$T_A = +125^\circ C$	A_{VO}	$V_O = \pm 10V$, $R_L = 2k\Omega$	1000	—	500	—	V/mV
Subgroup 6 $T_A = -55^\circ C$	All Tests, Limits and Conditions are the same as for Subgroup 5.						
Subgroup 8 $T_A = -55^\circ C, +125^\circ C$	TCV_{OS}		—	5	—	10	$\mu V/^\circ C$
Subgroup 9 $T_A = +25^\circ C$	SR		1	—	1	—	V/ μs
Subgroup 10 $T_A = +125^\circ C$	All Tests, Limits and Conditions are the same as for Subgroup 9.						
Subgroup 11 $T_A = -55^\circ C$	All Tests, Limits and Conditions are the same as for Subgroup 9.						

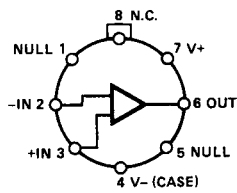
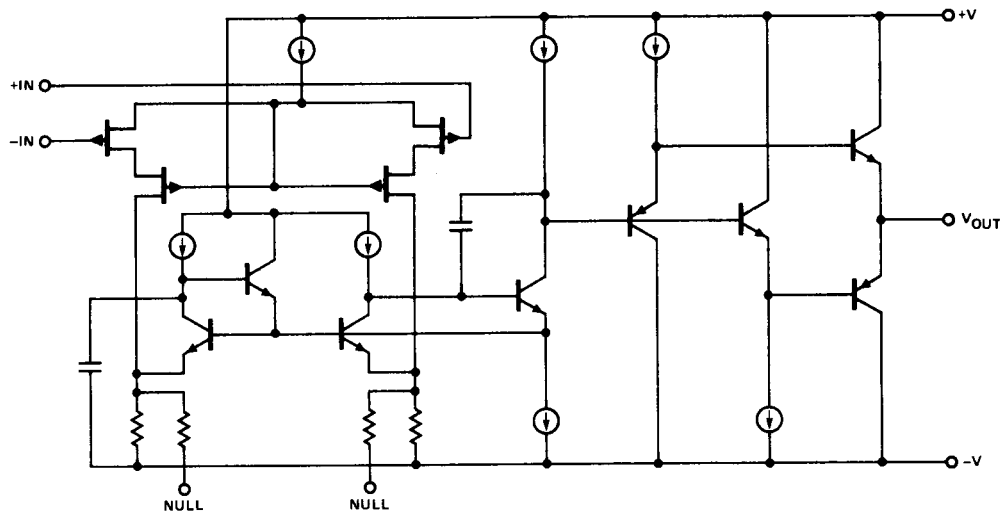
NOTES:

1. I_B and I_{OS} in Subgroup 4 are tested at $+25^\circ C$ ambient with devices warmed up.

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3.2.1 Simplified Schematic and Pin Connections.



**TO-99
(J-Suffix)**

3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 61.

4.2 Life Test/Burn-In Circuit.

