



OP-64/883

HIGH-SPEED, WIDE-BANDWIDTH,
OPERATIONAL AMPLIFIER

Precision Monolithics Inc.

1.0 SCOPE

1.1 Scope.

This specification covers the detail requirements for a high-speed, wide-bandwidth 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-64AJ/883	J
A	OP-64AZ/883	Z
A	OP-64ARC/883	RC

1.2.3 Case Outline. The case outline is designated as follows:

<u>Letter</u>	<u>Case Outline</u> (Lead Finish per MIL-STD-38510)
J	8-lead metal can (TO-99)
Z	8-lead ceramic dual-in-line package
RC	20-contact, hermetic, leadless chip carrier (LCC)

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

Supply Voltage.....	$\pm 18\text{V}$
Differential Input Voltage	20V
Input Voltage	Supply Voltage
DISABLE Input Voltage.....	Supply Voltage
Output Short-Circuit Duration	10 Seconds
Storage Temperature.....	-65°C to $+175^{\circ}\text{C}$
Lead Temperature (soldering, 60 sec).....	$+300^{\circ}\text{C}$
Operating Temperature Range.....	-55°C to $+125^{\circ}\text{C}$
Maximum Junction Temperature	$+175^{\circ}\text{C}$

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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

Thermal Resistance, Cerdip (Z) package:

Junction-to-Case (Θ_{JC}) = 26°C/W MAX

Junction-to-Ambient (Θ_{JA}) = 119°C/W MAX

Thermal Resistance, LCC (RC) package:

Junction-to-Case (Θ_{JC}) = 30°C/W MAX

Junction-to-Ambient (Θ_{JA}) = 120°C/W MAX



TABLE 1

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

Characteristic	Symbol	Special Conditions	OP-64/883 LIMITS		Units
			MIN	MAX	
Input Offset Voltage	V_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	--	1.0 2.0	mV
Input Offset Current	I_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	--	1 2	μA
Input Bias Current	I_B	$-55^\circ C \leq T_A \leq +125^\circ C$	--	1 2	μA
Common Mode Rejection (Note 1)	CMR	$V_{CM} = IVR = \pm 11V$ $V_{CM} = IVR = \pm 11V$, $-55^\circ C \leq T_A \leq +125^\circ C$	90 86	--	dB
Power Supply Rejection Ratio	PSRR	$V_S = \pm 5V$ to $\pm 18V$ $V_S = \pm 5V$ to $\pm 18V$, $-55^\circ C \leq T_A \leq +125^\circ C$	--	17.8 31.6	$\mu V/V$
Output Voltage Swing	V_O	$R_L = 2k\Omega$	± 11.0	--	V
		$R_L = 2k\Omega$, $-55^\circ C \leq T_A \leq +125^\circ C$	± 11.0	--	
		$R_L = 200\Omega$	± 10	--	V
		$R_L = 200\Omega$, $-55^\circ C \leq T_A \leq +125^\circ C$	± 7.5	--	
Supply Current	I_{SY}	$V_O = 0V$, No Load	--	8	mA
		$V_O = 0V$, No Load, $-55^\circ C \leq T_A \leq +125^\circ C$	--	8.5	
DISABLE Supply Current	$I_{SY \overline{DIS}}$	$\overline{DISABLE} = 0V$	--	1	mA
Slew Rate	SR	$A_{VCL} = +5$, (Note 2)	130	--	V/ μs



TABLE 1 (Cont'd)

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

Characteristic	Symbol	Special Conditions	OP-64/883 LIMITS		Units
			MIN	MAX	
Large Signal Voltage Gain	A_{VO}	$V_O = \pm 10V$			
		$R_L = 2k\Omega$	30	--	V/mV
		$R_L = 2k\Omega$, $-55^\circ C \leq T_A \leq +125^\circ C$	20	--	
		$V_O = \pm 5V$			
		$R_L = 200\Omega$	12.5	--	V/mV
		$R_L = 200\Omega$, $-55^\circ C \leq T_A \leq +125^\circ C$	7.5	--	

NOTES:

1. IVR is defined as the V_{CM} range used for the CMR test.
2. Effective load resistance is $1k\Omega$ which is the parallel combination of the feedback resistance ($2k\Omega$) and the load resistance ($2k\Omega$).



TABLE 2

OP-64/883

**Electrical Test Requirements
For Class B Devices**

MIL-STD-883 Test Requirement	Subgroups (see Table 3)
Interim Electrical Parameters (pre Burn-In)	1
Final Electrical Test Parameters	1*, 2, 3, 4, 5, 6, 7
Group A Test Requirements	1, 2, 3, 4, 5, 6, 7

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



TABLE 3

Group A Inspection

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

Subgroup	Symbol	Special Conditions	OP-64/883 LIMITS		Units
			MIN	MAX	
Subgroup 1 $T_A = +25^\circ C$	V_{OS}		--	1.0	mV
	I_B		--	1	μA
	I_{OS}		--	1	μA
	CMR	$V_{CM} = \pm 11V$	90	--	dB
	PSRR	$V_S = \pm 10V, \pm 20V$	--	17.8	$\mu V/V$
	I_{SY}	$V_O = 0V$, No Load	--	8	mA
	$I_{SY \overline{DIS}}$	$\overline{DISABLE} = 0V$	--	1	mA
Subgroup 2 $T_A = +125^\circ C$	V_{OS}		--	2.0	mV
	I_B		--	2	μA
	I_{OS}		--	2	μA
	CMR	$V_{CM} = \pm 11V$	86	--	dB
	PSRR	$V_S = \pm 5V, \pm 18V$	--	31.6	$\mu V/V$
	I_{SY}	$V_O = 0V$, No Load	--	8.5	mA



TABLE 3

Group A Inspection

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

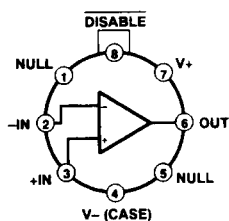
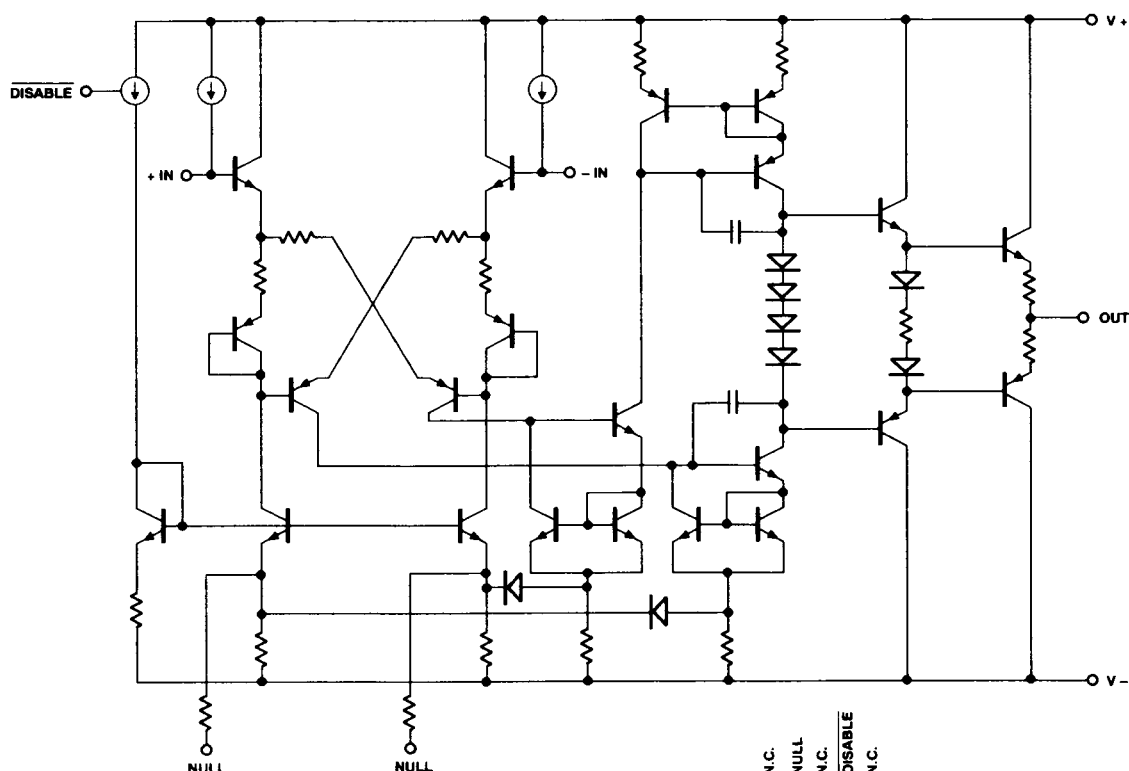
Subgroup	Symbol	Special Conditions	OP-64/883 LIMITS		Units
			MIN	MAX	
Subgroup 3 $T_A = -55^\circ C$		All tests, limits and conditions are the same as for Subgroup 2			
Subgroup 4 $T_A = +25^\circ C$	V_O	$R_L = 2k\Omega$ $R_L = 200\Omega$	± 11.0 ± 10	-- --	V
	A_{VO}	$V_O = \pm 10V, R_L = 2k\Omega$ $V_O = \pm 5V, R_L = 200\Omega$	30 12.5	-- --	V/mV
Subgroup 5 $T_A = +125^\circ C$	V_O	$R_L = 2k\Omega$ $R_L = 200\Omega$	± 11.0 ± 7.5	-- --	V
	A_{VO}	$V_O = \pm 10V, R_L = 2k\Omega$ $V_O = \pm 5V, R_L = 200\Omega$	20 7.5	-- --	V/mV
Subgroup 6 $T_A = -55^\circ C$		All tests, limits and conditions are the same as for Subgroup 5			
Subgroup 7 $T_A = +25^\circ C$	SR	$A_{VCL} = +5$ (Note 1)	130	--	V/ μs

NOTES:

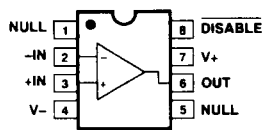
1. Effective load resistance is $1k\Omega$ which is the parallel combination of the feedback resistance ($2k\Omega$) and the load resistance ($2k\Omega$).



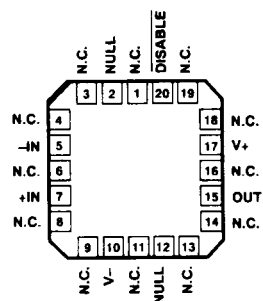
3.2.1 Simplified Schematic and Pin Connections



TO-99
(J-Suffix)



8-PIN CERDIP
(Z-Suffix)



20-LEAD HERMETIC LCC
(RC-Suffix)

3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 80.

4.2 Life Test/Burn-In Circuit. Pinout shown for DIP package.

