



PM-148/883

QUAD 741
OPERATIONAL AMPLIFIER

Precision Monolithics Inc.

1.0 SCOPE

This specification covers the detail requirements for a quad 741 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>
Y	14-lead ceramic dual-in-line package (CERDIP)

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

Supply Voltage.....	$\pm 22\text{V}$
Differential Input Voltage.....	$\pm 44\text{V}$
Input Voltage.....	$\pm 22\text{V}$
Output Short-Circuit Duration.....	Indefinite
Power Dissipation (P_d at 25°C).....	900mW
Maximum Junction Temperature (T_j).....	$+150^\circ\text{C}$
Operating Temperature Range.....	-55°C to $+125^\circ\text{C}$
Storage Temperature Range.....	-65°C to $+150^\circ\text{C}$
Lead Temperature (Soldering, 60 sec).....	$+300^\circ\text{C}$

NOTES:

- Any of the amplifier outputs can be shorted to ground indefinitely; however, more than one should not be simultaneously shorted as the maximum junction temperature will be exceeded.

1.5 Thermal Characteristics:

Thermal Resistance, CERDIP (Z) package:

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

Junction-to-Ambient (θ_{JA}) = 100°C/W MAX

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TABLE 1

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

Characteristics	Symbol	Special Conditions	PM-148/883 LIMITS X		Units
			Min	Max	
Input Offset Voltage	V_{OS}	$R_S \leq 10k\Omega$	—	2.5	mV
		$-55^\circ C \leq T_A \leq +125^\circ C$	—	6.0	mV
Input Offset Current	I_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	—	10	nA
			—	25	nA
Input Bias Current	I_B	$-55^\circ C \leq T_A \leq +125^\circ C$	—	± 75	nA
			—	± 100	nA
Input Voltage Range (Note 1)	IVR	$-55^\circ C \leq T_A \leq +125^\circ C$	± 12	—	V
Common-Mode Rejection	CMR	$V_{CM} = IVR = \pm 12V$	80	—	dB
		$R_S \leq 10k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$			
Power Supply Rejection	PSR	$V_S = \pm 13.5V$ to $\pm 16.5V$ $R_S \leq 10k\Omega$	85	—	dB
		$V_S = \pm 13.5V$ to $\pm 16.5V$ $R_S \leq 10k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	80	—	dB
Output Voltage Swing	V_O	$R_L = 10k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	± 12.0	—	V
		$R_L = 2k\Omega$	± 11.0	—	V
		$R_L = 2k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	± 10.0	—	V
Large-Signal Voltage Gain	A_{VO}	$V_O = \pm 10V$, $R_L \geq 2k\Omega$	50	—	V/mV
		$V_O = \pm 10V$, $R_L \geq 2k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	25	—	V/mV
Supply Current (All Four Amplifiers)	I_{SY}	$+25^\circ C \leq T_A \leq +125^\circ C$	—	3.6	mA
		$T_A \geq -55^\circ C$	—	4.5	mA

OPERATIONAL AMPLIFIERS

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TABLE 1 (Continued)

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

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<u>LIMITS X</u>					
Characteristics	Symbol	Special Conditions	Min	Max	Units
Input Resistance					
Differential-Mode (Note 2)	R _{IN}		0.8	—	MΩ

NOTES:

1. IVR is defined as the V_{CM} range used for the CMR test.
2. R_{IN} is derived from I_B by the relationship $R_{IN} = \frac{4kT}{qI_B}$, where $\frac{kT}{q} = 0.026V @ +25^\circ C$



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

			PM-148/883		
			LIMITS X		
Subgroup	Symbol	Special Conditions	Min	Max	Units
Subgroup 1 T _A = +25°C	V _{OS}	R _S = 50n, 10kn	--	2.5	mV
	I _{OS}		--	10	nA
	I _B		--	±75	nA
	CMR	V _{CM} = ±12V; R _S = 50n, 10kn	80	--	dB
	PSR	V _S = ±13.5V, ±16.5V R _S = 50n, 10kn	85	--	dB
	I _{SY}		--	3.6	mA
Subgroup 2 T _A = +125°C	V _{OS}	R _S = 50n, 10kn	--	6.0	mV
	I _{OS}		--	25	nA
	I _B		--	±100	nA
	CMR	V _{CM} = ±12V; R _S = 50n, 10kn	80	--	dB
	PSR	V _S = ±13.5V, ±16.5V R _S = 50n, 10kn	80	--	dB
	I _{SY}		--	3.6	mA
Subgroup 3	I _{SY}		--	4.5	mA
T _A = -55°C	All remaining Tests, Limits and Conditions are the same as for Subgroup 2.				
Subgroup 4 T _A = +25°C	V _O	R _L = 10kn R _L = 2kn	±12 ±11	-- --	V V
	A _{VO}	V _{OUT} = ±10V, R _L = 2kn	50	--	V/mV



TABLE 3

Group A Inspection (Continued)

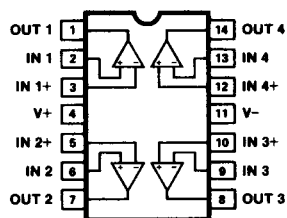
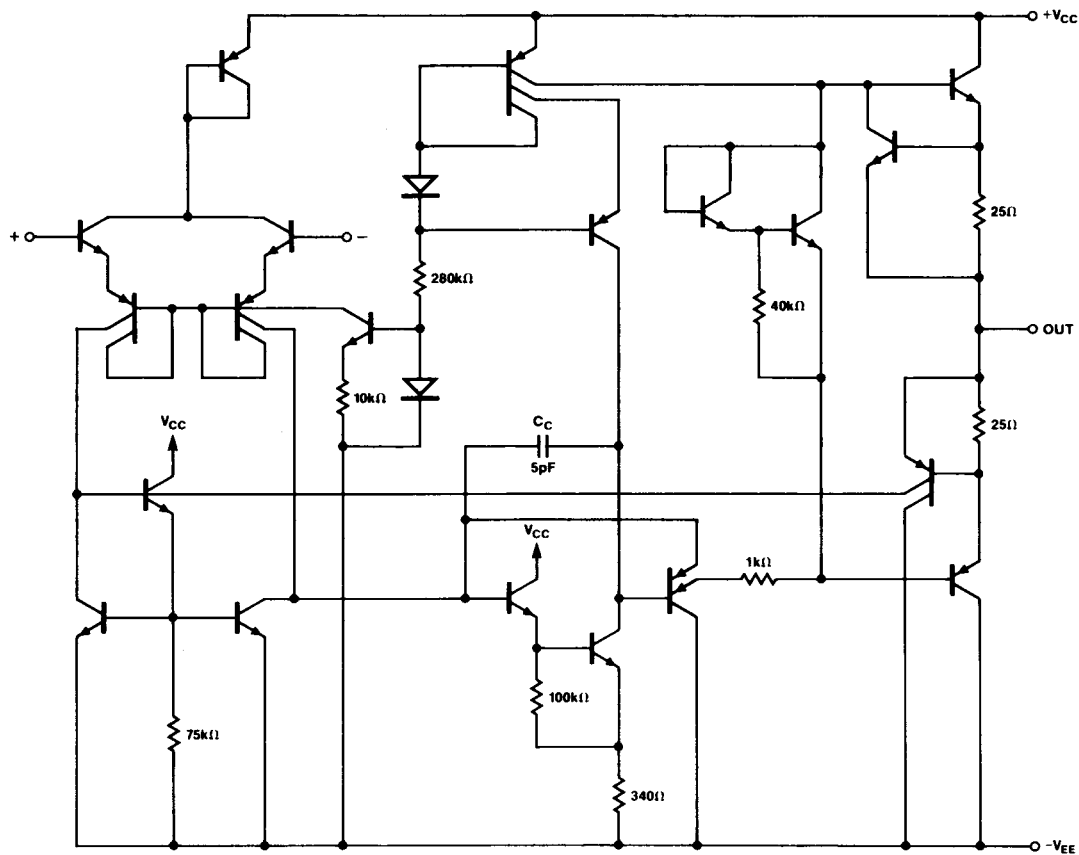
$V_{CM} = 0V$; $R_S = 50\Omega$; $V_S = \pm 15V$; $T_A = T_J$ unless otherwise specified.

PM-148/883					
Subgroup	Symbol	Special Conditions	LIMITS X		Units
			Min	Max	
Subgroup 5	V_O	$R_L = 10k\Omega$	± 12	—	V
		$R_L = 2k\Omega$	± 10		
$T_A = +125^\circ C$	A_{VO}	$V_{OUT} = \pm 10V, R_L = 2k\Omega$	25	—	V/mV
Subgroup 6		All Tests, Limits and Conditions are the same as for Subgroup 5.			
$T_A = -55^\circ C$					



3.2.1 Simplified Schematic and Pin Connections.

(One of Four Amplifiers)

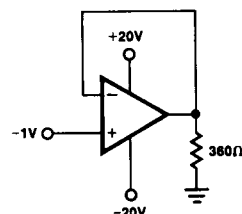
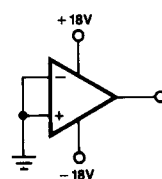
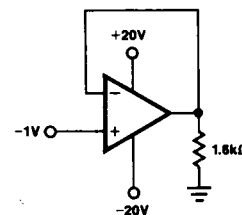
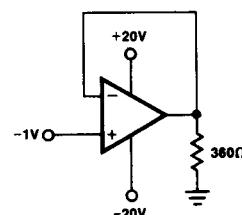
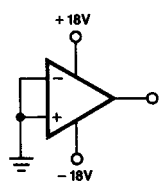
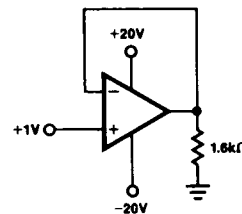
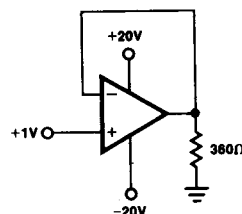
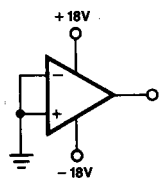
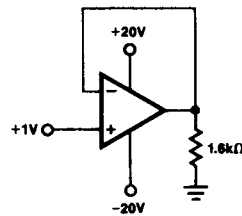
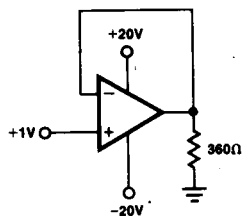
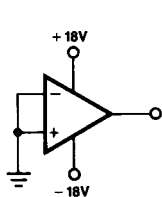


14-PIN HERMETIC DIP (Y-Suffix)

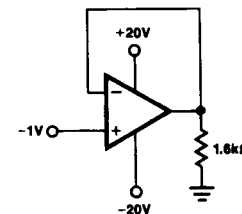


3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 49.

4.2 Life Test/Burn-In Circuit.



(Alternate)



(Alternate)