1.0 SCOPE

This specification covers the detail requirements for a quad micropower 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:

Device	Part Number	Package
B	OP-420BY/883	Y
C	OP-420CY/883	Y obs.
C	OP-420CRC/883	RC

1.2.3 **Case Outline.**

Letter	Case Outline (Lead finish per MIL-M-38510)
Y	14-lead ceramic dual-in-line package (CERDIP)
RC	20-contact hermetic leadless chip carrier (LCC)

1.3 **Absolute Maximum Ratings.** (T_A = 25°C, unless otherwise noted)

Supply Voltage	±18V
Power Dissipation	500mW
Differential Input Voltage	±30V
Input Voltage	Supply Voltage
Output Short-Circuit Duration	Continuous
Operating Temperature Range	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 60 sec)	+300°C
DICE Junction Temperature Range (T_J)	-65°C to +150°C

1.5 Thermal Characteristics:

Thermal Resistance, CERDIP (Y) 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}) = 35°C/W MAX
Junction-to Ambient (Θ_{JA}) = 110°C/W MAX

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TABLE 1

V_S = ±15V; R_S = 50Ω; T_A = 25°C unless otherwise specified.

Characteristics	Symbol	Special Conditions	OP-420/883 LIMITS B Min	LIMITS B Max	LIMITS C Min	LIMITS C Max	Units
Input Offset Voltage	V_{OS}	V_S = ±2.5V to ±15V	--	2.5	--	4.0	mV
		V_S = ±2.5V to ±15V -55°C ≤ T_A ≤ +125°C	--	3.5	--	5.5	mV
Input Offset Current	I_{OS}	V_S = ±2.5V to ±15V	--	1.5	--	2.5	nA
		V_S = ±2.5V to ±15V -55°C ≤ T_A ≤ +125°C	--	3.0	--	4.0	nA
Input Bias Current	I_B	V_S = ±2.5V to ±15V	--	±20	--	±30	nA
		V_S = ±2.5V to ±15V -55°C ≤ T_A ≤ +125°C	--	±30	--	±40	nA
Input Voltage Range (Note 1)	IVR	V+ = 5V, V- = 0V	0 to 3.5	--	0 to 3.5	--	V
		V+ = 5V, V- = 0V -55°C ≤ T_A ≤ +125°C	0 to 3.2	--	0 to 3.2	--	V
			-15 to +13.5	--	-15 to +13.5	--	V
		-55°C ≤ T_A ≤ +125°C	-15 to +13.2	--	-15 to +13.2	--	V
Common-Mode Rejection	CMR	V+ = 5V, V- = 0V V_{CM} = 0V to 3.5V	83	--	80	--	dB
		V+ = 5V, V- = 0V V_{CM} = 0V to 3.2V -55°C ≤ T_A ≤ +125°C	76	--	73	--	dB
		V_{CM} = -15V to 13.5V	83	--	80	--	dB
		V_{CM} = -15V to 13.2V -55°C ≤ T_A ≤ +125°C	76	--	73	--	dB

TABLE 1 (Continued)

V_S = ±15V; R_S = 50Ω; T_A = 25°C unless otherwise specified.

Characteristics	Symbol	Special Conditions	OP-420/883 LIMITS B Min	LIMITS B Max	LIMITS C Min	LIMITS C Max	Units
Power Supply Rejection Ratio	PSRR	V_S = ±2.5V to ±15V V+ = 5V to 30V, V- = 0V	--	30	--	50	µV/V
		V_S = ±2.5V to ±15V V+ = 5V to 30V; V- = 0V -55°C ≤ T_A ≤ +125°C	--	50	--	80	µV/V
Large-Signal Voltage Gain	A_{VO}	V_O = ±10V, R_L = 25kΩ	600	--	400	--	V/mV
		V_O = ±10V, R_L = 50kΩ	300	--	200	--	V/mV
		-55°C ≤ T_A ≤ +125°C					
Supply Current (All 4 Amplifiers)	I_{SY}	V_S = ±2.5V, No Load	--	200	--	300	µA
		V_S = ±2.5V, No Load	--	300	--	400	µA
		-55°C ≤ T_A ≤ +125°C					
		No Load	--	360	--	460	µA
		No Load	--	500	--	640	µA
		-55°C ≤ T_A ≤ +125°C					
Power Dissipation (All 4 Amplifiers) (Note 2)	P_d	V_S = ±2.5V, No Load	--	1.0	--	1.5	mW
		V_S = ±2.5V, No Load	--	1.5	--	2.0	mW
		-55°C ≤ T_A ≤ +125°C					
		No Load	--	10.8	--	13.8	mW
		No Load	--	15.0	--	19.2	mW
		-55°C ≤ T_A ≤ +125°C					

TABLE 1 (Continued)

V_S = ±15V; R_S = 50Ω; T_A = 25°C unless otherwise specified.

		R_L = 10kΩ V+ = 5V, V- = 0V	0.7 to 4.1	--	0.8 to 4.0	--	V
Output Voltage Swing	V_O	R_L = 20kΩ V+ = 5V, V- = 0V -55°C ≤ T_A ≤ +125°C	0.9 to 3.9	--	1.0 to 3.8	--	V
		R_L = 25kΩ	±14.0	--	±14.0	--	V
		R_L = 50kΩ -55°C ≤ T_A ≤ +125°C	±13.8	--	±13.8	--	V

NOTES:
1. IVR is defined as the V_{CM} range used for the CMR test.
2. P_d is derived from I_{SY} by the relationship $P_d = V_S \times I_{SY}$.

TABLE 2

OP-420/883

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
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 = ±15V; R_S = 50Ω; T_A = T_J unless otherwise specified.

			OP-420/883				
			LIMITS B		LIMITS C		
Subgroup	Symbol	Special Conditions	Min	Max	Min	Max	Units
Subgroup 1	V_{OS}	V_S = ±2.5V, ±15V	--	2.5	--	4.0	mV
T_A = +25°C	I_{OS}	V_S = ±2.5V, ±15V	--	1.5	--	2.5	nA
	I_B	V_S = ±2.5V, ±15V	--	±20	--	±30	nA
	I_{SY}	V_S = ±2.5V, No Load	--	200	--	300	µA
		No Load	--	360	--	460	µA
	CMR	V+ = 5V, V- = 0V V_{CM} = 0V, 3.5V	83	--	80	--	dB
		V_{CM} = -15V, 13.5V	83	--	80	--	dB
	PSRR	V_S = ±2.5V, ±15V V+ = 5V, 30V; V- = 0V	--	30	--	50	µV/V
Subgroup 2	V_{OS}	V_S = ±2.5V, ±15V	--	3.5	--	5.5	mV
T_A = +125°C	I_{OS}	V_S = ±2.5V, ±15V	--	3.0	--	4.0	nA
	I_B	V_S = ±2.5V, ±15V	--	±30	--	±40	nA
	CMR	V+ = 5V, V- = 0V V_{CM} = 0V, 3.2V	76	--	73	--	dB
		V_{CM} = -15V, 13.2V	76	--	73	--	dB
	PSRR	V_S = ±2.5V, ±15V V+ = 5V, 30V; V- = 0V	--	50	--	80	µV/V
	I_{SY}	V_S = ±2.5V, No Load	--	300	--	400	µA
		No Load	--	500	--	640	µA

TABLE 3

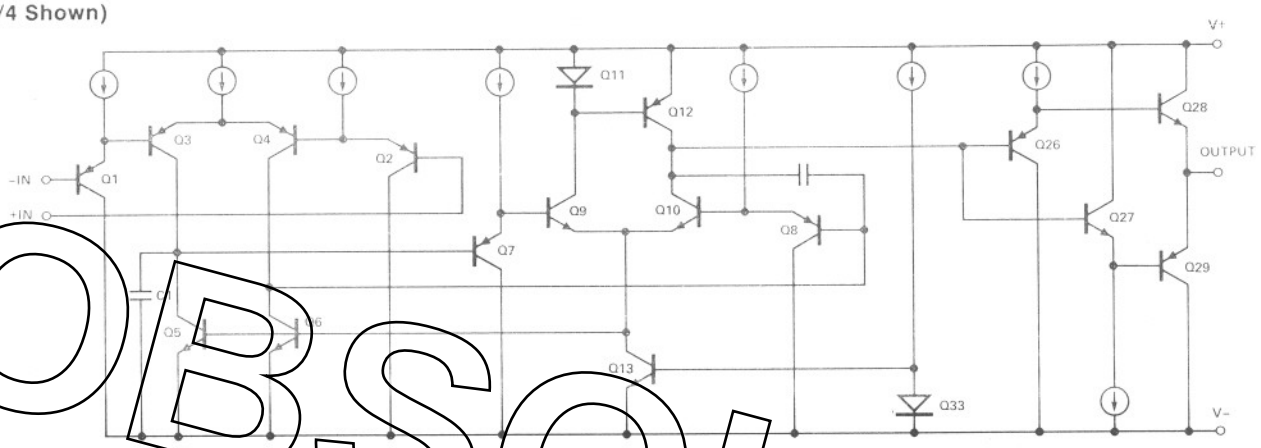
Group A Inspection (Continued)

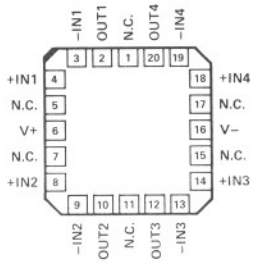
V_S = ±15V; R_S = 50Ω; T_A = T_J unless otherwise specified.

			OP-420/883				
			LIMITS B		LIMITS C		
Subgroup	Symbol	Special Conditions	Min	Max	Min	Max	Units
Subgroup 3 T_A = -55°C		All Tests, Limits and Conditions are the same as for Subgroup 2.					
Subgroup 4 T_A = +25°C	V_O	R_L = 10kΩ V+ = 5V, V- = 0V	0.7 to 4.1	--	0.8 to 4.0	-	V
		R_L = 25kΩ	±14.0	--	±14.0	--	V
	A_{VO}	V_O = ±10V, R_L = 25kΩ	600	--	400	--	V/mV
Subgroup 5 T_A = +125°C	V_O	R_L = 20kΩ V+ = 5V, V- = 0V	0.9 to 3.9	--	1.0 to 3.8	--	V
		R_L = 50kΩ	±13.8	--	±13.8	--	V
	A_{VO}	V_O = ±10V, R_L = 50kΩ	300	--	200	--	V/mV
Subgroup 6 T_A = -55°C		All Tests, Limits and Conditions are the same as for Subgroup 5.					

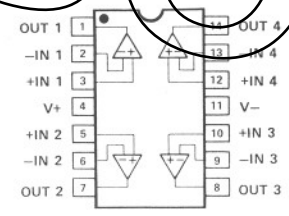
3.2.1 Simplified Schematic and Pin Connections.

(1/4 Shown)





OP-420CRC/883
20-LEAD LCC
(RC-Suffix)



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.