

1.0 SCOPE

- 1.1 Scope.** This specification covers the detail requirements for a high-speed, low noise dual operational amplifier.

It is highly recommended that this datasheet be used as a baseline for new military or aerospace specification control drawings.

- 1.2 Part Number.** The complete part numbers per Table 1 of this specification follow:

Device	Part Number	Package
A	OP-270AZ/883	Z
A	OP-270ARC/883	RC

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

Letter	Case Outline (Lead Finish per MIL-STD-38510)
Z	8-lead ceramic dual-in-line package
RC	20-pin leadless chip carrier

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

Supply Voltage	$\pm 18\text{V}$
Differential Input Voltage (Note 1)	$\pm 1\text{V}$
Differential Input Current (Note 1)	$\pm 25\text{mA}$
Input Voltage	Supply Voltage
Output Short-Circuit Duration	Continuous
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Operating Temperature Range	$-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$
Lead Temperature Range (Soldering, 60 sec)	300°C
Maximum Junction Temperature (T_J)	150°C

NOTE:

- The OP-270's inputs are protected by back-to-back diodes. Current limiting resistors are not used in order to achieve low noise performance. If the differential input voltage exceeds $\pm 1.0\text{V}$, the input current should be limited to $\pm 25\text{mA}$.

1.5 Thermal Characteristics:

Thermal Resistance, Cerdip (Z) package: Junction-to-Case (θ_{JC}) = 45°C/W MAX
Junction-to-Ambient (θ_{JA}) = 150°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

TABLE 1

$V_S = \pm 15V$; $R_S = 50\Omega$; $T_J = T_A = +25^\circ C$ unless otherwise specified.

Characteristic	Symbol	Special Conditions	OP-270/883 LIMITS A		Units
			MIN	MAX	
Input Offset Voltage	V_{OS}		--	75	μV
		$-55^\circ \leq T_A \leq +125^\circ C$	--	175	μV
Input Offset Current	I_{OS}	$V_{CM} = 0V$	--	10	nA
		$V_{CM} = 0V$ $-55^\circ \leq T_A \leq +125^\circ C$	--	30	nA
Input Bias Current	I_B	$V_{CM} = 0V$	--	20	nA
		$V_{CM} = 0V$ $-55^\circ \leq T_A \leq +125^\circ C$	--	60	nA
Input Noise Voltage	E_{nt}	$f_O = 1Hz$ to 100Hz see test circuit	--	80	nV_{RMS}
Large-Signal Voltage Gain	A_{VO}	$V_O = \pm 10V$ $R_L = 10k\Omega$	1500	--	V/mV
		$V_O = \pm 10V$ $R_L = 10k\Omega$ $-55^\circ \leq T_A \leq +125^\circ C$	750	--	V/mV
		$V_O = \pm 10V$ $R_L = 2k\Omega$	750	--	V/mV
		$V_O = \pm 10V$ $R_L = 2k\Omega$ $-55^\circ \leq T_A \leq +125^\circ C$	400	--	V/mV
Output Voltage Swing	V_O	$R_L = 2k\Omega$	± 12	--	V
		$R_L = 2k\Omega$ $-55^\circ \leq T_A \leq +125^\circ C$	± 12	--	V
Common-Mode Rejection (Note 1)	CMR	$V_{CM} = \pm 12V$	106	--	dB
		$V_{CM} = \pm 12V$ $-55^\circ \leq T_A \leq +125^\circ C$	100	--	dB

TABLE 1

$V_S = \pm 15V$; $R_S = 50\Omega$; $T_J = T_A = +25^\circ C$ unless otherwise specified.

Characteristic	Symbol	Special Conditions	OP-270/883 LIMITS A		Units
			MIN	MAX	
Power-Supply Rejection Ratio	PSRR	$V_S = \pm 4.5V$ to $\pm 18V$	--	3.2	$\mu V/V$
		$V_S = \pm 4.5V$ to $\pm 18V$	--	5.6	$\mu V/V$
		$-55^\circ \leq T_A \leq +125^\circ C$			
Supply Current (Note 2)	I_{SY}	No Load	--	6.5	mA
		No Load	--	7.5	mA
		$-55^\circ \leq T_A \leq +125^\circ C$			
Slew Rate	SR	$A_{VCL} = +20$, $R_L = 10k\Omega$	± 1.7	--	$V/\mu s$
Input Offset Voltage Temperature Coefficient	TCV_{OS}	$-55^\circ \leq T_A \leq +125^\circ C$	--	1.0	$\mu V/^\circ C$

Note 1. IVR is defined as the V_{CM} range used for the CMR test.

Note 2. SY limit = total for both amplifiers.

TABLE 2

OP-270/883

**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
Group A Test Requirements	1,2,3,4,5,6,7,8

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

TABLE 3
Group A Inspection

$V_S = \pm 15V$; $R_S = 50\Omega$; $T_J = T_A$ unless otherwise specified.

	Symbol	Special Conditions	OP-270/883 LIMITS A		Units
			MIN	MAX	
Subgroup 1. $T_A = +25^\circ C$	V_{OS}		--	75	μV
	I_{OS}	$V_{CM} = 0V$	--	10	nA
	I_B	$V_{CM} = 0V$	--	20	nA
	CMR	$V_{CM} = \pm 12V$	106	--	dB
	PSRR	$V_S = \pm 4.5V$ to $\pm 18V$	--	3.2	$\mu V/V$
	I_{SY}	No Load (Note 1)	--	6.5	mA
Subgroup 2. $T_A = +125^\circ C$	V_{OS}		--	175	μV
	I_{OS}	$V_{CM} = 0V$	--	30	nA
	I_B	$V_{CM} = 0V$	--	60	nA
	CMR	$V_{CM} = \pm 12V$	100	--	dB
	PSRR	$V_S = \pm 4.5V$ to $\pm 18V$	--	5.6	$\mu V/V$
	I_{SY}	No Load (Note 1)	--	7.5	mA

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OPERATIONAL AMPLIFIERS

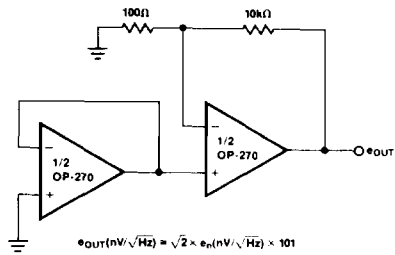
TABLE 3
Group A Inspection

$V_S = \pm 15V$; $R_S = 50\Omega$; $T_J = T_A$ unless otherwise specified.

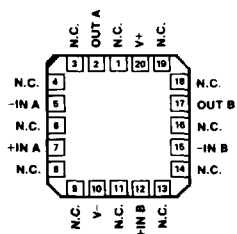
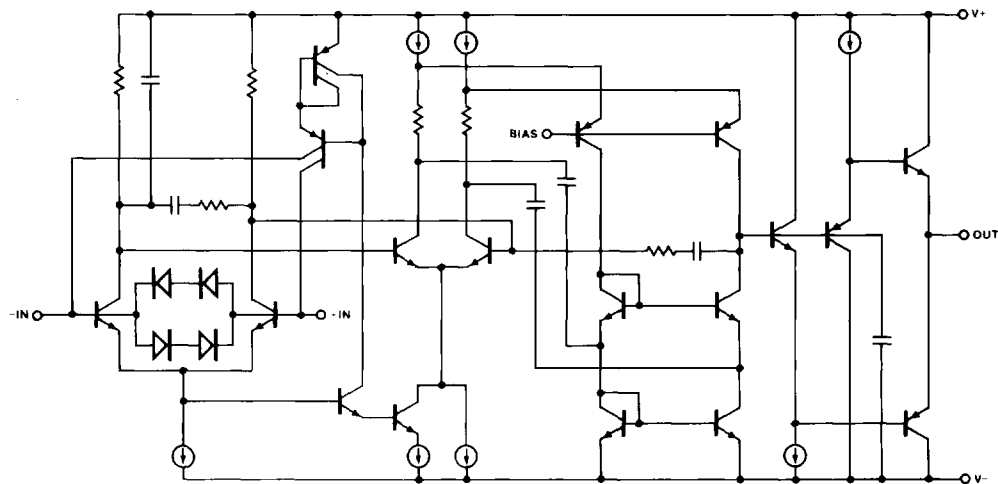
	Symbol	Special Conditions	OP-270/883 LIMITS A		Units
			MIN	MAX	
Subgroup 3. $T_A = -55^\circ C$		All Tests, Limits and Conditions are the same as for Subgroup 2.			
Subgroup 4. $T_A = +25^\circ C$	AV_O	$V_O = \pm 10V, R_L = 10k\Omega$	1500	--	V/mV
		$V_O = \pm 10V, R_L = 2k\Omega$	750	--	V/mV
	V_O	$R_L = 2k\Omega$	± 12	--	V
Subgroup 5. $T_A = +125^\circ C$	AV_O	$V_O = \pm 10V, R_L = 10k\Omega$	750	--	V/mV
		$V_O = \pm 10V, R_L = 2k\Omega$	400	--	V/mV
	V_O	$R_L = 2k\Omega$	± 12	--	V
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	$A_{VCL} = +20$ $R_L = 10k\Omega$	± 1.7	--	V/ μs
	E_{nt}	$f_O = 1Hz$ to 100Hz	--	80	nV _{RMS}
Subgroup 8. $T_A = -55^\circ C, +125^\circ C$	TCV_{OS}		--	1.0	$\mu V/^\circ C$

Note 1. I_{SY} limit = total of both amplifiers.

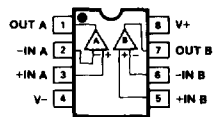
Noise Test Circuit Schematic



3.2.1 Simplified Schematic and Pin Connections



LCC
(RC-Suffix)



8-PIN HERMETIC DIP
(Z-Suffix)

OP-270

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

4.2 Life Test/Burn-In Circuit.

Burn-in performed per 883/1005 condition A, B, C, or D.