



Ultralow Noise Precision Op Amp

ANALOG DEVICES INC

65E D

AD OP-27

1.1 Scope.

This specification covers the detail requirements for an ultralow noise and low offset voltage bipolar amplifier.

1.2 Part Number.

The complete part number per Table 1 of this specification is as follows:

Device	Part Number
-1	AD OP-27C(X)/883B
-2	AD OP-27B(X)/883B
-3	AD OP-27A(X)/883B

1.2.3 Case Outline.

See Appendix 1 of General Specification ADI-M-1000; package outline:

(X)	Package	Description
Q	Q-8	8-Pin Cerdip
H	H-08A	8-Pin TO-99 Metal Can

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

Supply Voltage	$\pm 18\text{V}$
Internal Power Dissipation ¹	500mW
Differential Input Voltage ²	$\pm 0.7\text{V}$
Input Voltage	$\pm V_S$
Output Short Circuit Duration	Indefinite
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Operating Temperature Range	
AD OP-27A, AD OP-27B, AD OP-27C	-55°C to $+125^\circ\text{C}$
Lead Temperature Range (Soldering 60sec)	$+300^\circ\text{C}$
Differential Input Current ²	$\pm 25\text{mA}$

NOTE

¹Maximum package power dissipation vs. ambient temperature.

	MAXIMUM AMBIENT Temperature for Rating	DERATE ABOVE MAXIMUM Ambient Temperature
Package Type		
TO-99 (H)	80°C	$7.1\text{mW}/^\circ\text{C}$
Cerdip (Q)	75°C	$6.7\text{mW}/^\circ\text{C}$

²The input pins of this amplifier are protected by back-to-back diodes. If the differential voltage exceeds $\pm 0.7\text{V}$, external series protection resistors should be added to limit the input current to less than 25mA.

1.5 Thermal Characteristics.

Thermal Resistance θ_{JC}	$= 65^\circ\text{C}/\text{W}$ for H-08A
θ_{JA}	$= 150^\circ\text{C}/\text{W}$ for H-08A
θ_{JC}	$= 22^\circ\text{C}/\text{W}$ for Q-8
θ_{JA}	$= 110^\circ\text{C}/\text{W}$ for Q-8

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Table 1.

Test	Symbol	Device	Sub Group 1	Sub Group 2, 3	Sub Group 4	Test Condition ¹	Units
Gain Open Loop	A_{OL}	-1	700	300		$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	V/mV min
		-2	1000	500		$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	
			800			$R_L \geq 1k\Omega$, $V_{OUT} = \pm 10V$	
		-3	1000	600		$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	
			800			$R_L \geq 1k\Omega$, $V_{OUT} = \pm 10V$	
Output Voltage Swing	V_{OUT}	-1	11.5	10.5		$R_L \geq 2k\Omega$	$\pm V$ min
			10.0			$R_L = 600\Omega$	
		-2	12.0	11.0		$R_L \geq 2k\Omega$	
			10.0			$R_L = 600\Omega$	
		-3	12.0	11.5		$R_L \geq 2k\Omega$	
			10.0			$R_L = 600\Omega$	
Input Offset Voltage	V_{OS}	-1	100	300			$\pm \mu V$ max
		-2	60	200			
		-3		60	25		
Input Offset Drift ²	TCV_{OS}	-1		1.8			$\pm \mu V/^\circ C$ max
		-2		1.3			
		-3		0.6			
Input Offset Current	I_{OS}	-1	75	135			$\pm nA$ max
		-2	50	85			
		-3	35	50			
Input Bias Current	I_B	-1	80	150			$\pm nA$ max
		-2	55	95			
		-3	40	60			
Common-Mode Rejection Ratio	CMRR	-1	100	94		$V_{CM} = \pm 11V$	dB min
		-2	106	100		$V_{CM} = \pm 10V$ for	
		-3	114	108		Subgroup 2, 3	
Common-Mode Voltage Range	CMVR	-1	11.0	10.2			$\pm V$ min
		-2, 3	11.0	10.3			
Power Supply Current	I_Q	-1	5.6			$V_S = \pm 15V$	mA max
		-2, 3	4.6				
Power Consumption	P_D	-1	170			$V_{OUT} = 0V$	mW max
		-2, 3	140				
Power Supply Rejection	PSR	-1	20	51		$V_S = \pm 4V$ to $\pm 18V$	$\mu V/V$ max
		-2	10	20		$V_S = \pm 4.5V$ to $\pm 18V$	
		-3	10	16		Subgroup 2, 3	

NOTES

¹ $V_S = \pm 15$ unless otherwise noted.

² TCV_{OS} is within specification unnullled, or when nulled with $R_P = 8$ to $20k\Omega$.

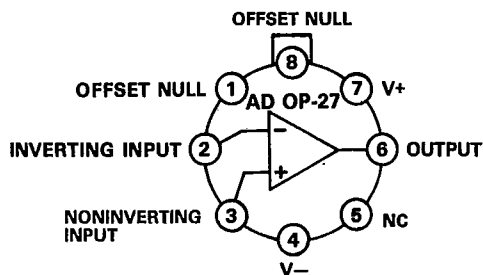
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3.2.1 Functional Block Diagram and Terminal Assignments.

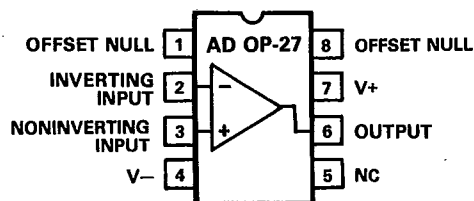
Top View

H Package



NOTE: PIN 4 CONNECTED TO CASE

Q Package (Cerdip)



3.2.4 Microcircuit Technology Group.

This microcircuit is covered by technology group (49).

4.2.1 Life Test/Burn-In Circuit.

Steady state life test is per MIL-STD-883 Method 1005. Burn-in is per MIL-STD-883 Method 1015 test condition (B).

