Low Cost Low Power Instrumentation Amplifier

FEATURES

-Pin-to-pin compatible with industry standard AD620

EASY TO USE

-Gain Set with One External Resistor :
G= 1 + (49,4 kΩ/RG) (Gain Range 1 to 1000)
-Wide Power Supply Range (±2.3 V to ±18 V)
-Higher Performance than Three Op Amp IA Designs
-Available in 8-Lead SOIC Packaging
-Low Power

EXCELLENT DC PERFORMANCE (“B GRADE”)

-50 µV max, Input Offset Voltage
-0.6µV/°C max, Input Offset Drift
-0,8 nA max, Input Bias Current
-100 dB min Common-Mode Rejection Ratio (G = 10)

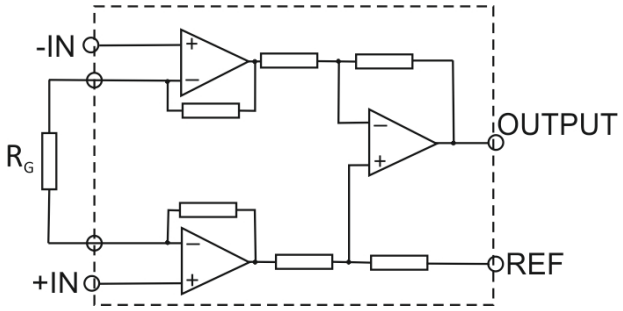
LOW NOISE

-9 nV/Hz ^{0,5}, @ 1 kHz, Input Voltage Noise
-0.28 µV p-p Noise (0.1 Hz to 10 Hz)

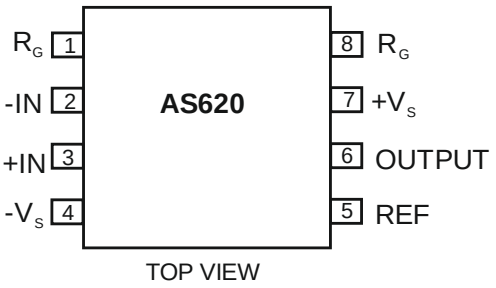
APPLICATIONS

-Weigh Scales
-ECG and Medical Instrumentation
-Transducer Interface
-Data Acquisition Systems
-Industrial Process Controls
-Battery Powered and Portable Equipment

Block diagram AS620



CONNECTION DIAGRAM
DIP-8, SOIC-8 Packages



TOP VIEW

AS620AR, AS620BR: SOIC-8
AS620AN, AS620BN: DIP-8

SPECIFICATION

Table 1. V_S = ±16.5 V, V_{REF} = 0 V, T_A = +25ºC, G = 1, R_L = 2 kΩ, unless otherwise noted.

Parameter, Unit	Symbol	Conditions	AS620A		AS620B	
			Min	Max	Min	Max
GAIN		G= 1 + (49,4 kΩ/R_G)				
Gain Range, V/V		T = +25ºC	1	1000	1	1000
Gain Error[1]		V_{OUT} = ±10 V, V_S = ±15 V				
G=1 ,%	GE0	T = +25ºC		0,1		0,02
Overtemperature		T = -45ºC to +85ºC		0,2		0,12
G=10, G=100 ,%	GE1, GE2	T = +25ºC		0,3		0,15
Overtemperature		T = -45ºC to +85ºC		0,8		0,5
G=1000 ,%	GE3	T = +25ºC		0,7		0,5
Overtemperature		T = -45ºC to +85ºC		1,2		1,0
Gain Nonlinearity	DL	V_{OUT} = -10 V to +10 V, V_S = ±15 V				
G=1, G=10		R_L = 2 kΩ		15		15
G=100		R_L = 2 kΩ		30		30
G=1000		R_L = 10 kΩ		95		40
VOLTAGE OFFSET		Total V_{OS} = V_{OSI} + V_{OSO}/G				
Input Offset, µV	V_{OSI}	V_S = ±4,5 V to ± 16,5 V		125		50
Overtemperature		T = -45ºC to +85ºC		185		85
Average TC, µV/ºC				1		0,6
Output Offset, µV	V_{OSO1}	V_S = ± 16,5 V		1000		500
	V_{OSO2}	V_S = ±4,5 V		1500		750
Overtemperature		V_S = ±4,5 V to ± 16,5 V		2000		1000
Average TC, µV/ºC				15		7
Offset RTI vs. Supply, dB	PSR	V_S = ±2,3 V to ± 18 V				
G=1			80		80	
G=10			95		100	
G=100, G=1000			110		120	
INPUT CURRENT						
Input Bias Current,nA	I_{BIAS}	T = +25ºC		1,5		0,8
Overtemperature		T = -45ºC to +85ºC		2,5		1,5
Input Offset Current,nA	I_{OS}	T = +25ºC		1,0		0,5
Overtemperature		T = -45ºC to +85ºC		1,5		0,75
Input Voltage Range, V [2]	IVR	V_S = ±2,3 V to ± 4,5 V	-Vs + 1,9	+Vs - 1,2	-Vs + 1,9	+Vs -1,2
Overtemperature		T = -45ºC to +85ºC	-Vs + 2,1	+Vs - 1,3	-Vs + 2,1	+Vs - 1,3
		V_S= ±4,5 V to ± 16,5 V	-Vs + 1,9	+Vs - 1,4	-Vs + 1,9	+Vs - 1,4
Overtemperature		T= -45ºC to +85ºC	-Vs + 2,1	+Vs - 1,4	-Vs + 2,1	+Vs - 1,4
REFERFNCE INPUT						
Reference Input Current, µA	I_{IN}	V_{IN+}, V_{REF} = 0		60		60
Voltage Range, V	VR		-Vs + 1,6	+Vs - 1,6	-Vs + 1,6	+Vs - 1,6
Gain to Output Error, ppm	GtO			200		100

OUTPUT						
Output Swing, V						
	Osw1	R_L=10 kΩ, Vs=±2,3 V	-Vs + 1,1	+Vs - 1,2	-Vs + 1,1	+Vs - 1,2
Overtemperature		T = -45ºC to +85ºC	-Vs + 1,4	+Vs - 1,3	-Vs + 1,4	+Vs - 1,3
	Osw2	R_L=10 kΩ, Vs =±4,5 V	-Vs + 1,1	+Vs - 1,2	-Vs + 1,1	+Vs - 1,2
Overtemperature		T = -45ºC to +85ºC	-Vs + 1,4	+Vs - 1,3	-Vs + 1,4	+Vs - 1,3
	Osw3	R_L=10 kΩ, Vs=±18 V	-Vs + 1,2	+Vs - 1,4	-Vs + 1,2	+Vs - 1,4
Overtemperature		T = -45ºC to +85ºC	-Vs + 1,6	+Vs - 1,5	-Vs + 1,6	+Vs - 1,5
Common-Mode Rejection						
Ratio DC to 60 Hz with 1 kΩ Source Imbalance						
G=1	CMRR	V_{CM} = 0 V to ± 10 V	73		80	
G=10		V_{CM} = 0 V to ± 10 V	93		100	
G=100, G=1000		V_{CM} = 0 V to ± 10 V	110		120	
NOISE						
Voltage Noise, 1 kHz	Total RTI Noise = $\sqrt{((e^2_{ni})+(e_{no}/G)^2)}$					
Input Voltage Noise, nV/√Hz	e_{ni}			13		13
Output Voltage Noise, nV/√Hz	e_{no}			100		100
RTI, µV p-p						
G=1		f = 0,1 Hz to 10 Hz		6,0		6,0
G=10		f = 0,1 Hz to 10 Hz		0,8		0,8
G=100÷1000		f = 0,1 Hz to 10 Hz		0,4		0,4
Slew Rate, V/µs	SR		0,75		0,75	
POWER SUPPLY						
Operating Range, V			± 2,3	± 18	± 2,3	± 18
Quiscent Current, mA	Icc+, Icc-			1,6		1,6
Overtemperature				1,9		1,9

[1]) Does not include effects of external resistor R_G.

[2]) One input grounded. G= 1.

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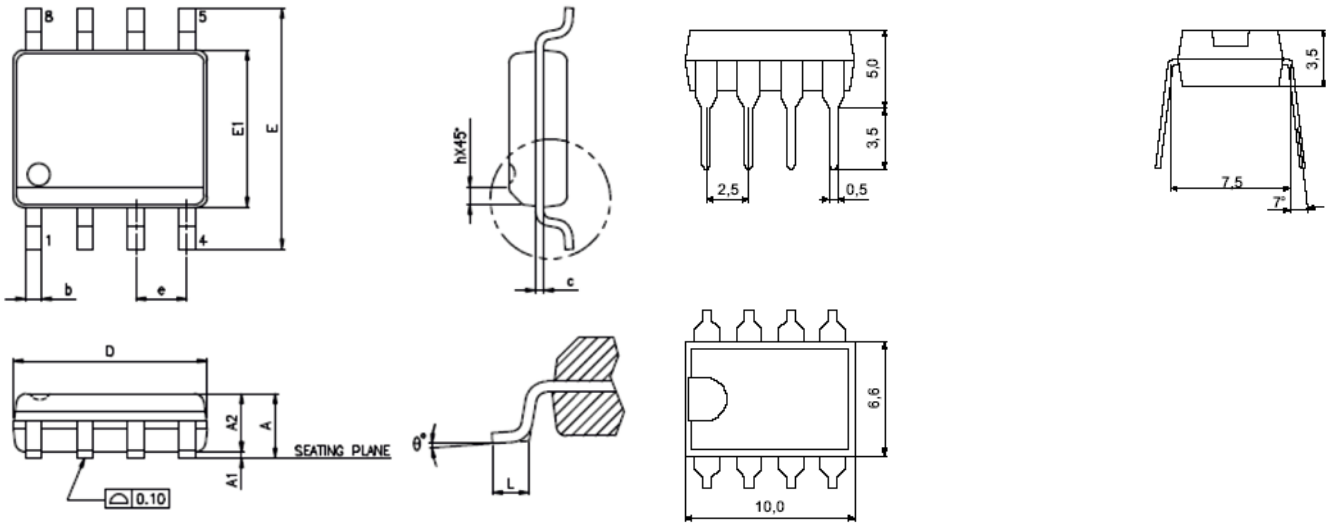
SOIC-8 **DIP-8**



UNIT - mm

SYMBOLS	MIN.	MAX.
A	—	1.75
A1	0.10	0.25
A2	1.25	—
b	0.31	0.51
c	0.10	0.25
D	4.90 BSC	
E	6.00 BSC	
E1	3.90 BSC	
e	1.27 BSC	
L	0.40	1.27
h	0.25	0.50
θ°	0	8