



AiP07 Precision Operational Amplifier

Product Specification

Specification Revision History:

Version	Date	Description
2021-08-A1	2021-08	New
2022-01-A2	2022-01	Modify Ordering Information



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1、 General Description

These devices represent a breakthrough in operational amplifier performance. Low offset and long-term stability are achieved by means of a low-noise, chopperless, bipolar-input-transistor amplifier circuit. For most applications, external components are not required for offset nulling and frequency compensation. The true differential input, with a wide input voltage range and outstanding common-mode rejection, provides maximum flexibility and performance in high-noise environments and in noninverting applications. Low bias currents and extremely high input impedances are maintained over the entire temperature range. The AiP07 is unsurpassed for low-noise, high-accuracy amplification of very low-level signals.

Features:

- Wide input voltage range: 0 to $\pm 14\text{V}$ (Typical)
- Wide supply voltage range: $\pm 3\text{V}$ to $\pm 18\text{V}$
- Low noise
- No external components required
- Replaces chopper amplifiers at a lower cost
- Specified from -40°C to $+85^{\circ}\text{C}$
- Packaging information: SOP8

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP07SA8.TB	SOP8(1)	AiP07	100 PCS/tube	100 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP07SA8.TB	SOP8(2)	AiP07	100 PCS/tube	200 tube/box	20000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm

Reel packing specifications:

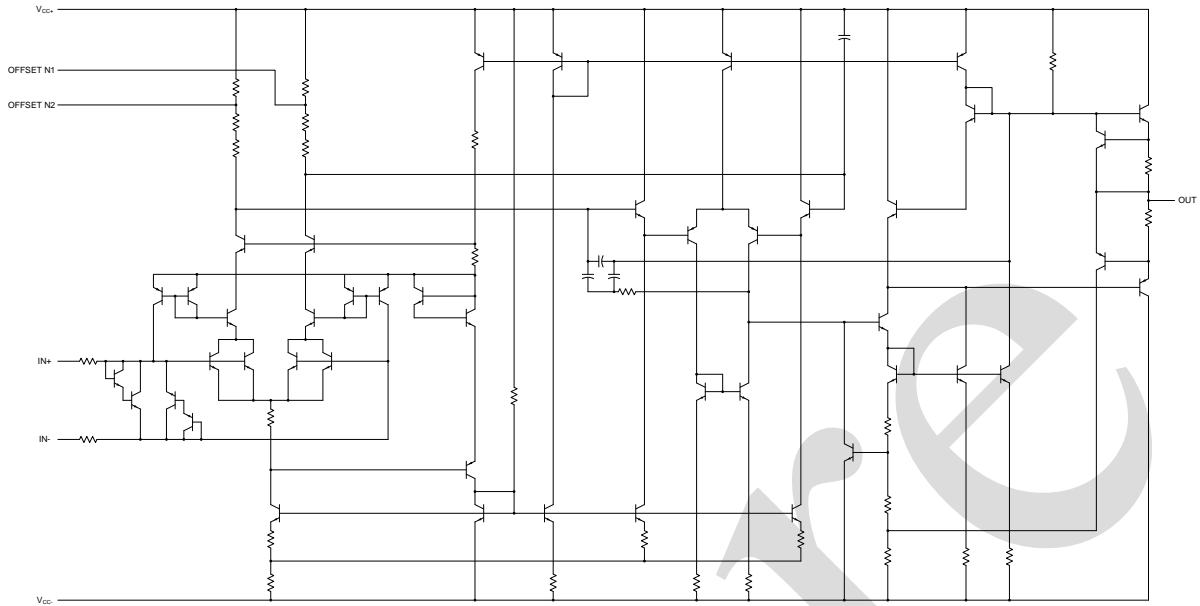
Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP07SA8.TR	SOP8	AiP07	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing:1.27mm

Note: If the physical information is inconsistent with the ordering information, please refer to the actual product.

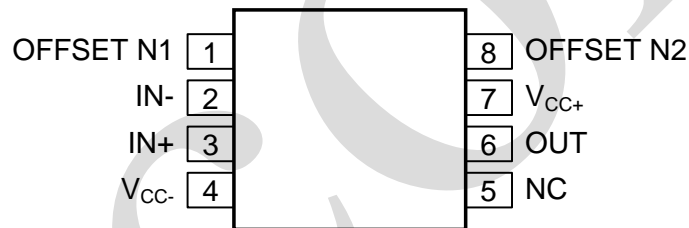


2、Block Diagram And Pin Description

2.1、Block Diagram



2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Type	Description
1	OFFSET N1	I	input offset adjustment
2	IN-	I	inverting input
3	IN+	I	non-inverting input
4	V _{CC-}	-	negative supply voltage
5	NC	-	not connected
6	OUT	O	output
7	V _{CC+}	-	positive supply voltage
8	OFFSET N2	I	input offset adjustment



3、Electrical Parameter

3.1、Absolute Maximum Ratings

($T_{amb}=25^{\circ}\text{C}$, unless otherwise specified)

Characteristic	Symbol	Conditions	Value	Unit
supply voltage	V_{CC+}	-	22	V
	V_{CC-}	-	-22	V
differential input voltage	V_{DI}	-	± 30	V
input voltage	V_I	either input	± 22	V
duration of output short circuit	-	-	unlimited	-
operating temperature	T_{amb}	-	-40 to 85	$^{\circ}\text{C}$
storage temperature	T_{stg}	-	-65 to 150	$^{\circ}\text{C}$
power dissipation	P_D	-	500	mW
soldering temperature	T_L	10s	250	$^{\circ}\text{C}$

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	$V_{CC\pm}$	-	± 3	-	± 18	V
common-mode input voltage	V_{IC}	$V_{CC\pm}=\pm 15\text{V}$	-13	-	13	V
operating temperature	T_{amb}	-	-40	-	85	$^{\circ}\text{C}$

3.2、Electrical Characteristics

($T_{amb}=25^{\circ}\text{C}$, $V_{CC\pm}=15\text{V}$, unless otherwise specified)

Parameter	Symbol	Conditions	T_{amb}	Min.	Typ.	Max.	Unit
input offset voltage	V_{IO}	$V_O=0$, $R_S=50\Omega$	25°C	-	60	150	μV
			-40°C to $+85^{\circ}\text{C}$	-	85	250	μV
temperature coefficient of input offset voltage	α_{VIO}	$V_O=0$, $R_S=50\Omega$	-40°C to $+85^{\circ}\text{C}$	-	0.7	2.5	$\mu\text{V}/^{\circ}\text{C}$
long-term drift of input offset voltage	-	-	-	-	0.5	-	$\mu\text{V}/\text{m o}$
offset adjustment range	-	$R_S=20\text{k}\Omega$, see Figure 1	25°C	-	± 4	-	mV
input offset current	I_{IO}	-	25°C	-	0.8	6	nA
			-40°C to $+85^{\circ}\text{C}$	-	1.6	8	nA
temperature coefficient of input offset current	α_{IIO}	-	-40°C to $+85^{\circ}\text{C}$	-	12	50	$\text{pA}/^{\circ}\text{C}$
input bias current	I_{IB}	-	25°C	-	± 2	± 12	nA
			-40°C to $+85^{\circ}\text{C}$	-	± 3	± 14	nA
temperature coefficient of input bias current	α_{IIB}	-	-40°C to $+85^{\circ}\text{C}$	-	18	50	$\text{pA}/^{\circ}\text{C}$
common-mode input voltage	V_{ICR}	-	25°C	± 13	± 14	-	V
			-40°C to $+85^{\circ}\text{C}$	± 13	± 13.5	-	V
peak output voltage	V_{OM}	$R_L \geq 10\text{k}\Omega$	25°C	± 12	± 13	-	V
		$R_L \geq 2\text{k}\Omega$	25°C	± 11.5	± 12.8	-	V
		$R_L \geq 1\text{k}\Omega$	25°C	-	± 12	-	V



		$R_L \geq 2k\Omega$	-40°C to $+85^\circ\text{C}$	± 1	± 12.6	-	V
large-signal differential voltage amplification	A_{VD}	$V_{CC\pm} = \pm 3V$, $V_O = \pm 0.5V$, $R_L \geq 500k\Omega$	25°C	-	400	-	V/mV
			25°C	120	400	-	V/mV
		$V_O = \pm 10V$, $R_L = 2k\Omega$	-40°C to $+85^\circ\text{C}$	100	400	-	V/mV
unity-gain bandwidth	B_1	-	25°C	0.4	0.6	-	MHz
input resistance	R_I	-	25°C	7	31	-	M Ω
common-mode rejection ratio	CMRR	$V_{IC} = \pm 13V$, $R_S = 50\Omega$	25°C	94	110	-	dB
			-40°C to $+85^\circ\text{C}$	94	106	-	dB
supply voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC}$)	k_{SVS}	$V_{CC\pm} = \pm 3V$ to $\pm 18V$, $R_S = 50\Omega$	25°C	-	7	32	$\mu\text{V}/\text{V}$
			-40°C to $+85^\circ\text{C}$	-	10	51	$\mu\text{V}/\text{V}$
power dissipation	P_D	$V_O = 0$, no load	25°C	-	80	150	mW
		$V_{CC\pm} = \pm 3V$, $V_O = 0$, no load	25°C	-	4	8	mW
equivalent input noise voltage	V_N		$f = 10\text{Hz}$	25°C	-	10.5	-
			$f = 100\text{Hz}$	25°C	-	10.3	-
			$f = 1\text{kHz}$	25°C	-	9.8	-
peak-to-peak equivalent input noise voltage	$V_{N(PP)}$	$f = 0.1\text{Hz}$ to 10Hz	25°C	-	0.38	-	μV
equivalent input noise current	I_N		$f = 10\text{Hz}$	25°C	-	0.35	-
			$f = 100\text{Hz}$	25°C	-	0.15	-
			$f = 1\text{kHz}$	25°C	-	0.13	-
peak-to-peak equivalent input noise current	$I_{N(PP)}$	$f = 0.1\text{Hz}$ to 10Hz	25°C	-	15	-	pA
slew rate	SR	$R_L \geq 2k\Omega$	25°C	-	0.3	-	V/ μs

4、Typical Application Circuit

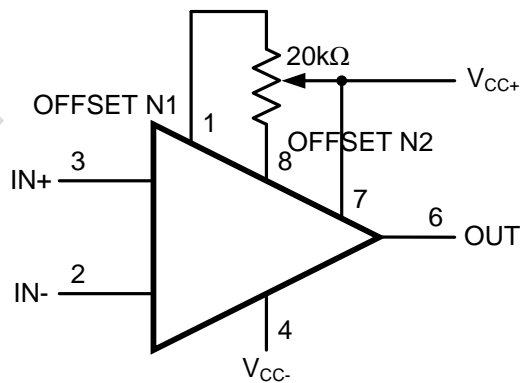
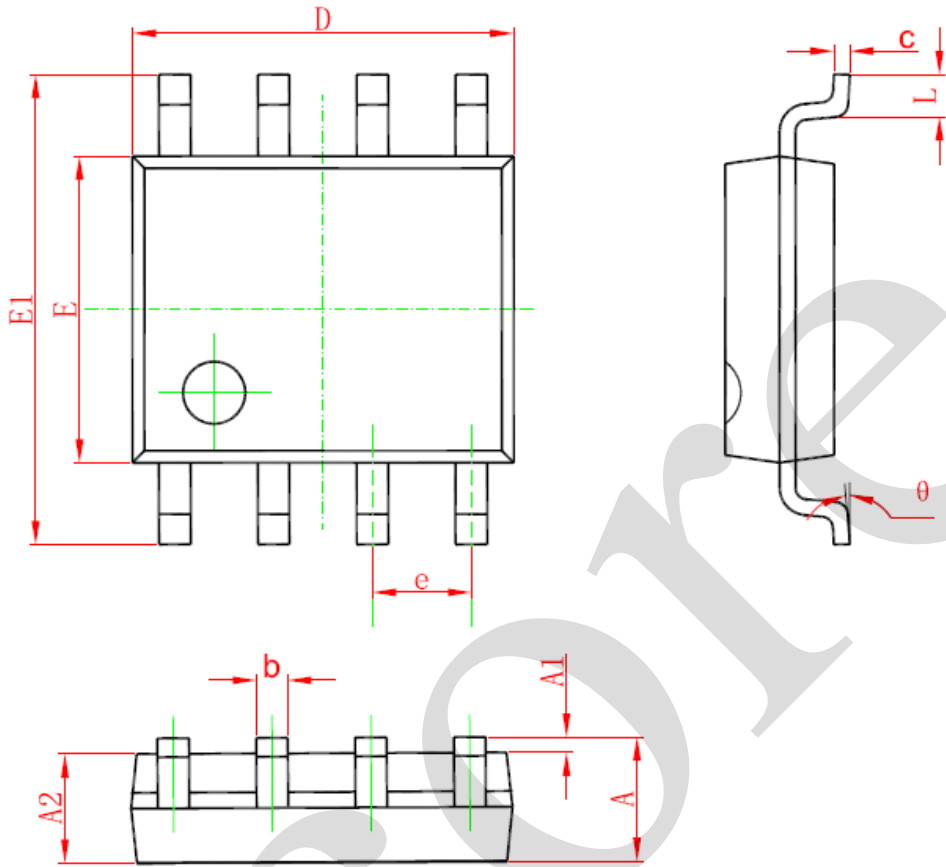


Figure 1



5、Package Information

5.1、SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



6、 Statements And Notes

6.1、 The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、 Notion

Recommended carefully reading this information before the use of this product;

The information in this document are subject to change without notice;

This information is using to the reference only, the company is not responsible for any loss;

The company is not responsible for the any infringement of the third party patents or other rights of the responsibility.