



AiP061/AiP062/AiP064

Low Power JFET Operational Amplifier

Product Specification

Specification Revision History:

Version	Date	Description
2023-02-T1	2023-02	New
2023-10-T2	2023-10	Modify parameters
2023-11-T3	2023-11	Modify offset voltage
2024-04-A1	2024-04	Modify parameters
2026-05-A2	2026-05	Modify input common-mode voltage range



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1、General Description

AiP061/AiP062/AiP064 is high-speed JFET input operational amplifier series. As a low power version of 08x series operational amplifier, it integrates well-matched high-voltage JFET and bipolar transistors in a single chip, with high input impedance, wide bandwidth, high slew rate, low input offset voltage, and low input current characteristics.

Features:

- Low power consumption, single-channel operation current is typically 200uA.
- The range of wide common-mode input voltage and differential mode input voltage
- Low input bias and offset current
- Output short-circuit protection
- JFET input, high input impedance
- Internal frequency compensation
- Running without latches
- High conversion rate: 3.5V/us

Packing form: AiP061/AiP062: DIP8/SOP8

AiP064: DIP14/SOP14/TSSOP14

**Ordering Information:****Tube packing specifications:**

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP061DA8.TB	DIP8	AiP061	50 PCS/tube	40 tube/box	2000 PCS/box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP062DA8.TB	DIP8	AiP062	50 PCS/tube	40 tube/box	2000 PCS/box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP061SA8.TB	SOP8	AiP061	100 PCS/tube	100 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP062SA8.TB	SOP8	AiP062	100 PCS/tube	100 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP064DA14.TB	DIP14	AiP064	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP064SA14.TB	SOP14	AiP064	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm
AiP064TA14.TB	TSSOP14	AiP064	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm



Reel packing specifications:

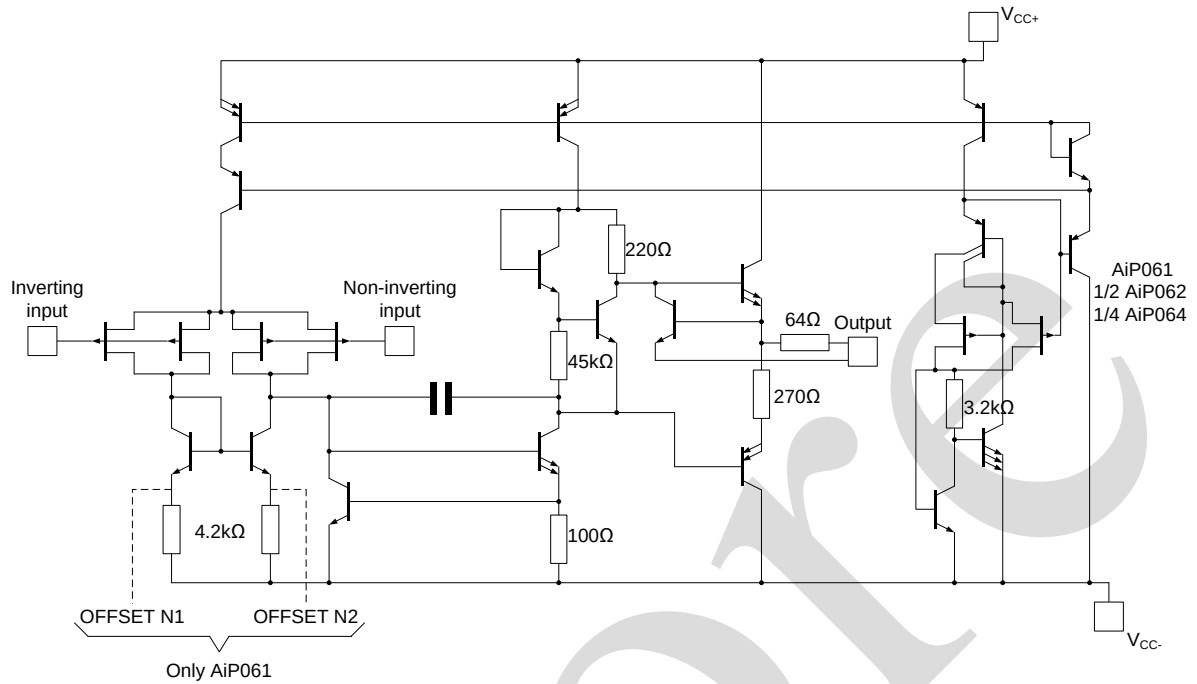
Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP061SA8.TR	SOP8	AiP061	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP062SA8.TR	SOP8	AiP062	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP064SA14.TR	SOP14	AiP064	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm
AiP064TA14.TR	TSSOP14	AiP064	5000PCS/reel	10000PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

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

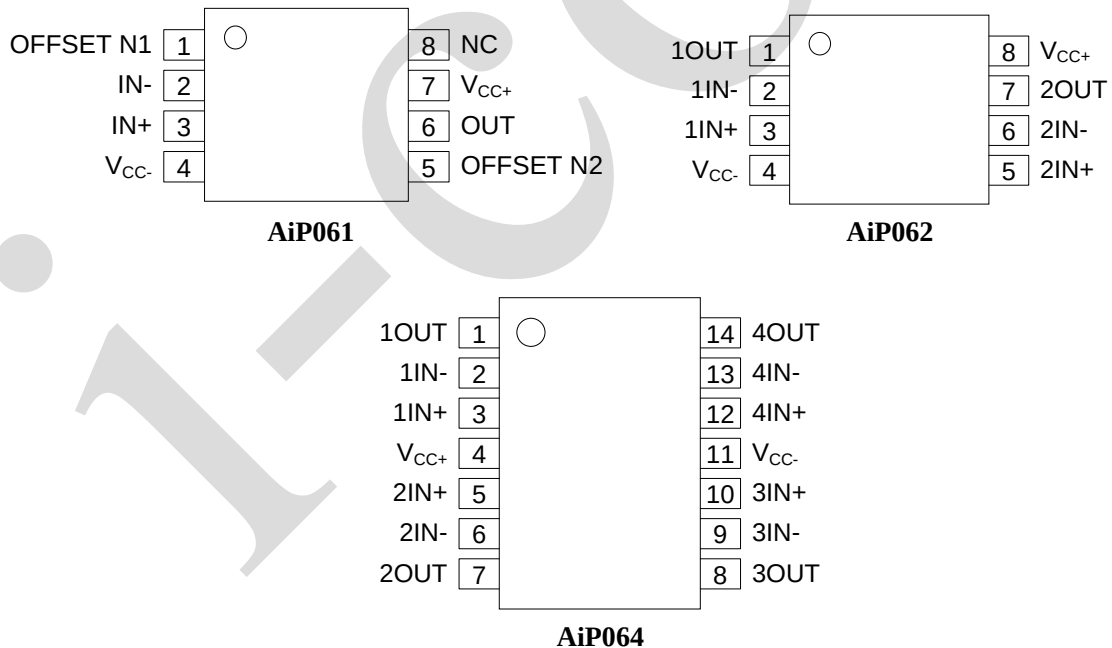


2、Block Diagram And Pin Description

2.1、Block Diagram



2.2、Pin Configurations





2.3、Pin Description

Pin			Symbol	Type	Description
AiP061	AiP062	AiP064			
-	2	2	1IN-	I	Negative input
-	3	3	1IN+	I	Positive input
-	1	1	1OUT	O	Output
-	6	6	2IN-	I	Negative input
-	5	5	2IN+	I	Positive input
-	7	7	2OUT	O	Output
-	-	9	3IN-	I	Negative input
-	-	10	3IN+	I	Positive input
-	-	8	3OUT	O	Output
-	-	13	4IN-	I	Negative input
-	-	12	4IN+	I	Positive input
-	-	14	4OUT	O	Output
2	-	-	IN-	I	Negative input
3	-	-	IN+	I	Positive input
8	-	-	NC	-	No contact
1	-	-	OFFSET N1	-	Input offset adjustment
5	-	-	OFFSET N2	-	Input offset adjustment
6	-	-	OUT	O	Output
4	4	11	V _{CC-}	-	Negative power source
7	8	4	V _{CC+}	-	Positive power source

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, unless otherwise specified)

Characteristic	Symbol	Conditions		Value	Unit
Power Supply Voltage ⁽¹⁾	V _{CC+}	-		20	V
	V _{CC-}	-		-20	
Input Voltage ⁽²⁾	V _i	-		±15	
Differential Input Voltage ⁽³⁾	V _{id}	-		±36	
Junction Temperature	T _J	-		150	℃
Junction-to-ambient Thermal Resistance	R _{0JA}	DIP8		110	℃/W
		SOP8		160	
		DIP14		88	
		SOP14		131	
		TSSOP14		175	
Output Short-circuit Duration ⁽⁶⁾	-	-		Unlimited	-
Operating Temperature	T _{amb}	-		-40~+85	℃
Storage Temperature	T _{stg}	-		-65~+150	℃
Soldering	T _L	10s	DIP8	250	℃



Temperature			DIP14	245	°C
			SOP8/SOP14/TSSOP14	260	°C

- 1、 Except for differential voltages, all voltage values are related to the zero reference level (ground) of the supply voltage, where the zero reference level is the midpoint between V_{CC+} and V_{CC-} .
- 2、 The input voltage must not exceed the size of the supply voltage or 15V, whichever is smaller.
- 3、 The differential; voltage is the voltage difference between the non-inverting input and the inverting input.
- 4、 Short circuits can cause overheating and destructive losses.
- 5、 R_{th} refers to typical value.
- 6、 The output may be short-earthed or the power supply may be short-circuited. The temperature and/or supply voltage must be limited to ensure that the loss is not exceeded.

3.2、 Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V_{CC+}	5	-	18	V
	V_{CC-}	-5	-	-18	V
Common-mode Voltage	V_{cm}	$V_{CC-}+4$	-	$V_{CC+}-4$	V
Operating Temperature	T_{amb}	-40	-	+85	°C

3.3、 Electrical Characteristics

3.3.1、 DC Characteristics

($V_{CC}=\pm 15V$, unless otherwise specified)

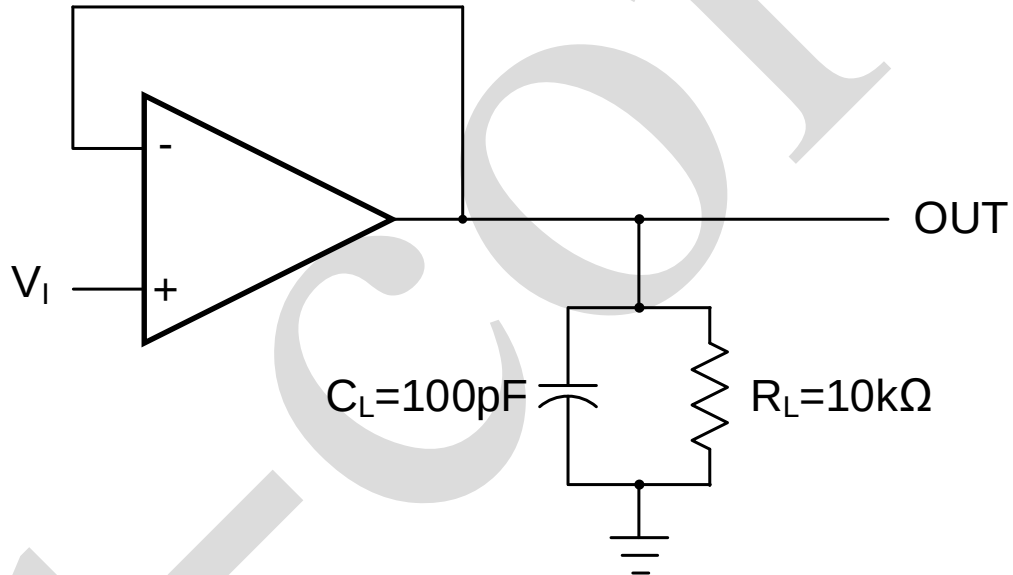
Parameter	Symbol	Conditions	Temperature	Min.	Typ.	Max.	Unit
Input Offset Voltage	V_{io}	$V_O=0, R_S=50\Omega$	$T_{amb}=25^\circ C$	-	3	6	mV
			Full range	-	-	7.5	
Offset Voltage Temperature Drift	$\Delta V_{io}/\Delta T$	$V_O=0, R_S=50\Omega$	Full range	-	10	-	$\mu V/^\circ C$
Input Offset Current	I_{io}	$V_O=0$	$T_{amb}=25^\circ C$	-	5	200	pA
			Full range	-	-	5	nA
Input Bias Current	I_{ib}	$V_O=0$	$T_{amb}=25^\circ C$	-	30	400	pA
			Full range	-	-	10	nA
Input Common-mode Voltage Range	V_{icm}	-	$T_{amb}=25^\circ C$	± 11	-12 to 15	-	V
Output Voltage Swing	V_{opp}	$R_L=10k\Omega$	$T_{amb}=25^\circ C$	± 10	± 13.5	—	
		$R_L \geq 10k\Omega$	Full range	± 10	-	-	
Large-signal Magnification	A_{vd}	$R_L \geq 10k\Omega, V_O = \pm 10V$	$T_{amb}=25^\circ C$	3	6	-	V/mV
			Full range	3	-	-	
Unity-gain Bandwidth	GBW	$R_L=10k\Omega$	$T_{amb}=25^\circ C$	-	1	-	MHz
Input Impedance	R_i	-	$T_{amb}=25^\circ C$	-	10^{12}	-	Ω
Common-mode Rejection Ratio	CMRR	$V_{ic} = V_{icmin}, V_O=0, R_S=50\Omega$	$T_{amb}=25^\circ C$	70	86	-	dB
Power Supply Rejection Ratio	PSRR	$V_{CC} = \pm 9V \sim \pm 15V, V_O=0,$	$T_{amb}=25^\circ C$	70	95	-	



		$R_s=50\Omega$					
Operating Current	I_{CC}	AiP061	$T_{amb}=25^{\circ}\text{C}$	-	300	500	μA
		AiP062/064, single channel	$T_{amb}=25^{\circ}\text{C}$	-	200	250	μA
Channel Isolation	V_{O1}/V_{O2}	$A_{vd}=100$	$T_{amb}=25^{\circ}\text{C}$	-	120	-	dB
Power Dissipation	P_D	$V_O=0$, No load	$T_{amb}=25^{\circ}\text{C}$	-	6	7.5	mW
Switching Rate	SR	$V_i=10\text{V}$, $R_L=10\text{k}\Omega$, $C_L=100\text{pF}$	$T_{amb}=25^{\circ}\text{C}$	1.5	3.5	-	V/us
Rising Time	t_r	$A_v=1$, $V_i=20\text{mV}$, $R_L=10\text{k}\Omega$, $C_L=100\text{pF}$	$T_{amb}=25^{\circ}\text{C}$	-	0.2	-	μs
Overshoot	K_{ov}		$T_{amb}=25^{\circ}\text{C}$	-	10	-	%
Equivalent Input Noise Voltage	e_n	$R_s=20\Omega$, $f=1\text{KHz}$	$T_{amb}=25^{\circ}\text{C}$	-	42	-	$\frac{nV}{\sqrt{\text{Hz}}}$

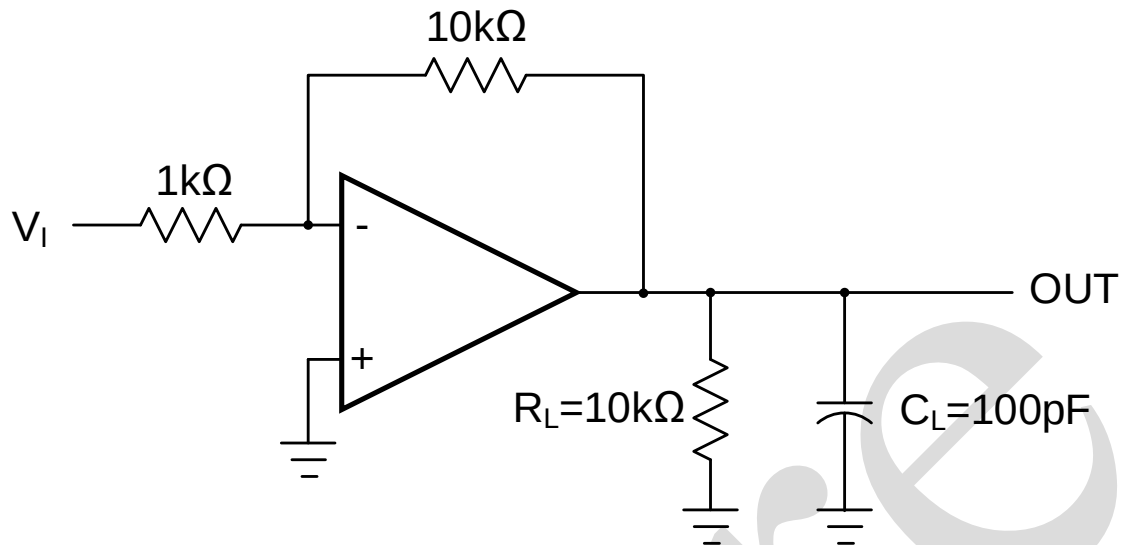
4、Testing Circuit

4.1、Unit Gain Amplifier

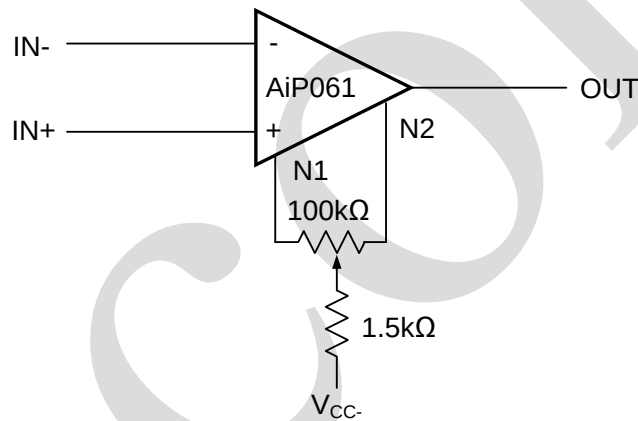




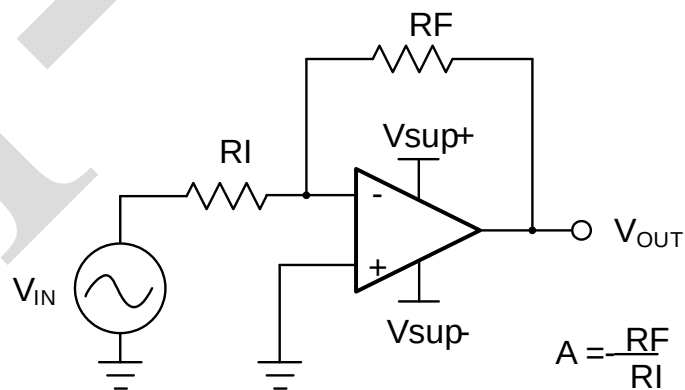
4.2、10 Gain Inverting Amplifier



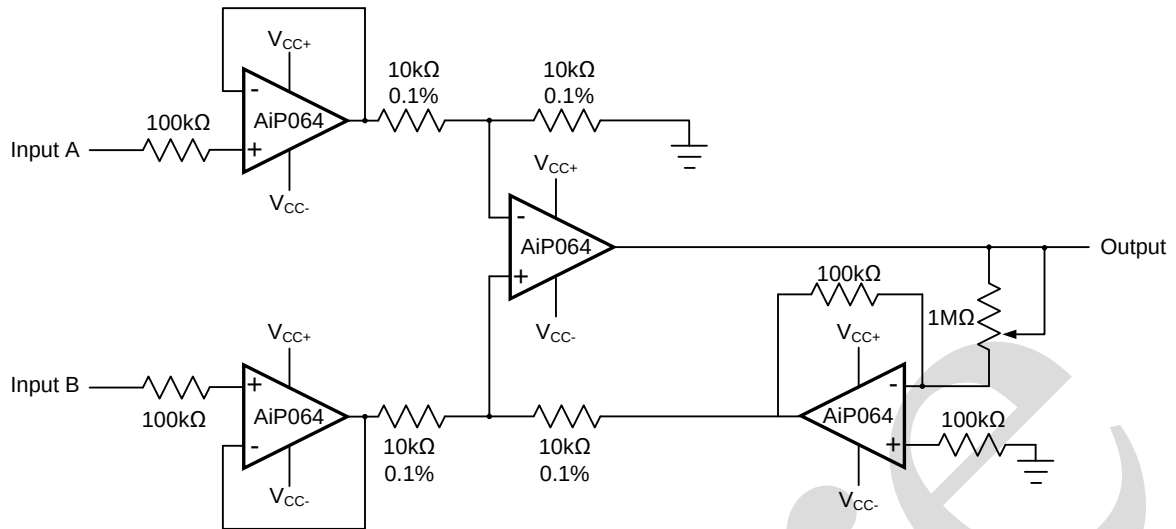
4.3、Input Offset Voltage Zero Potential Circuit



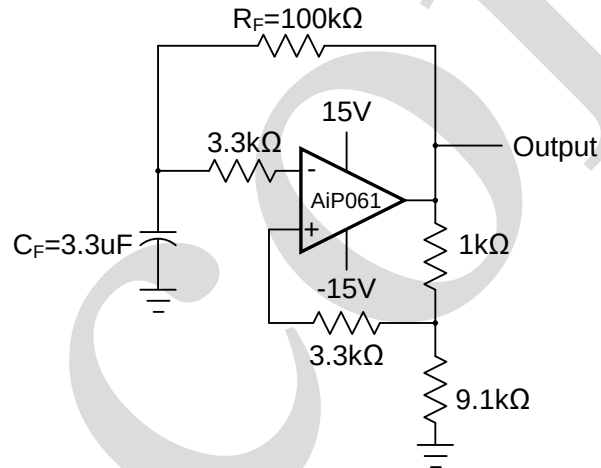
5、Typical Application



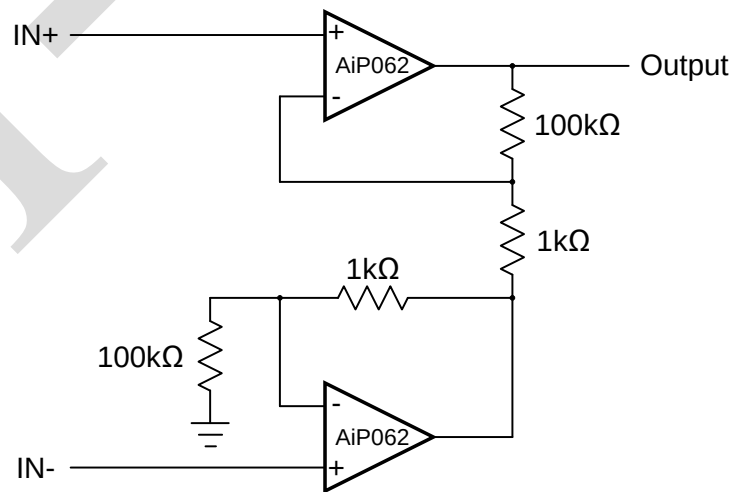
The Application Schematic Diagram of The Inverting Amplifier



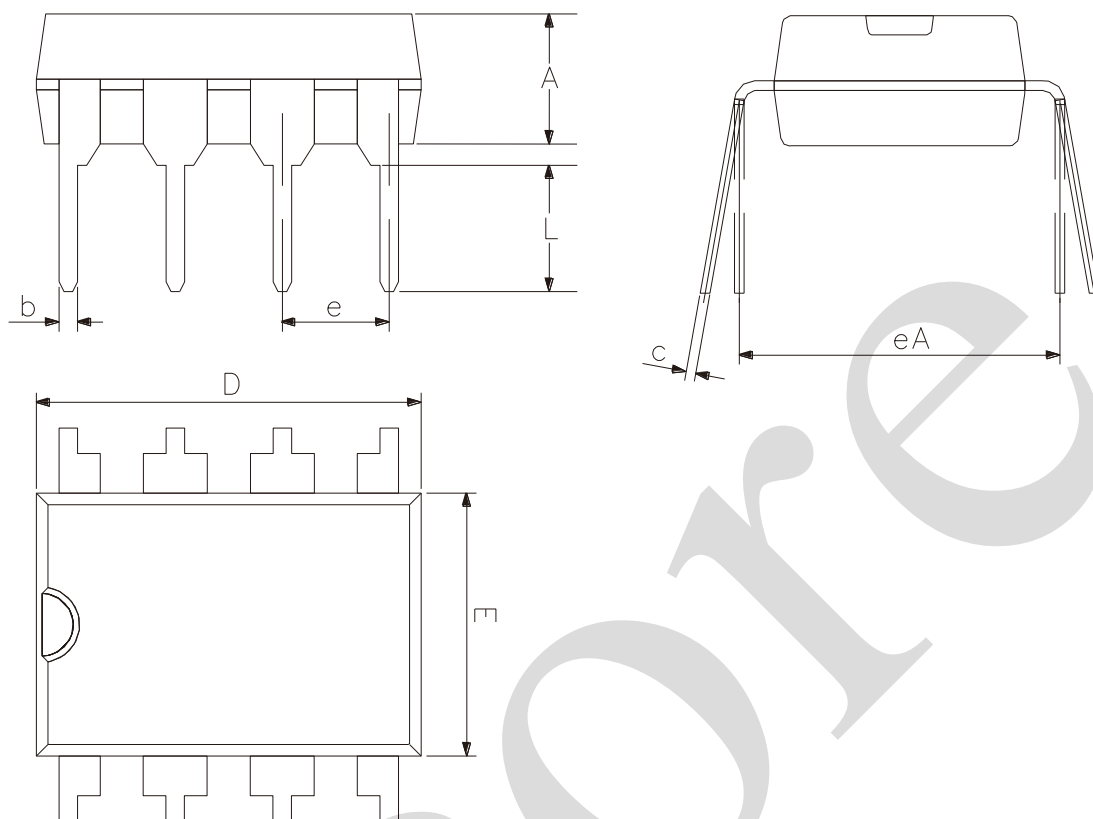
Instrument Amplifier



0.5Hz Square-wave Oscillator



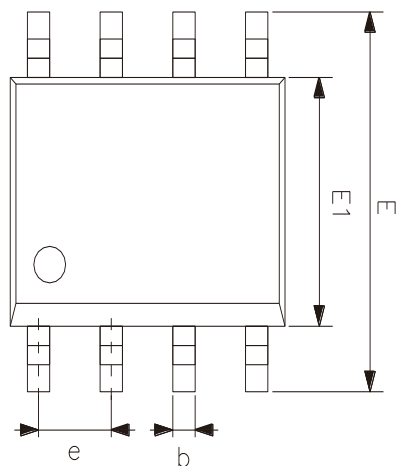
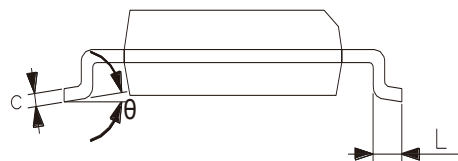
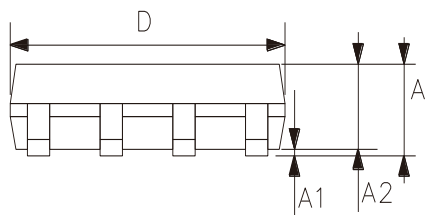
Instrument Amplifier

**6、Package Information****6.1、DIP8**

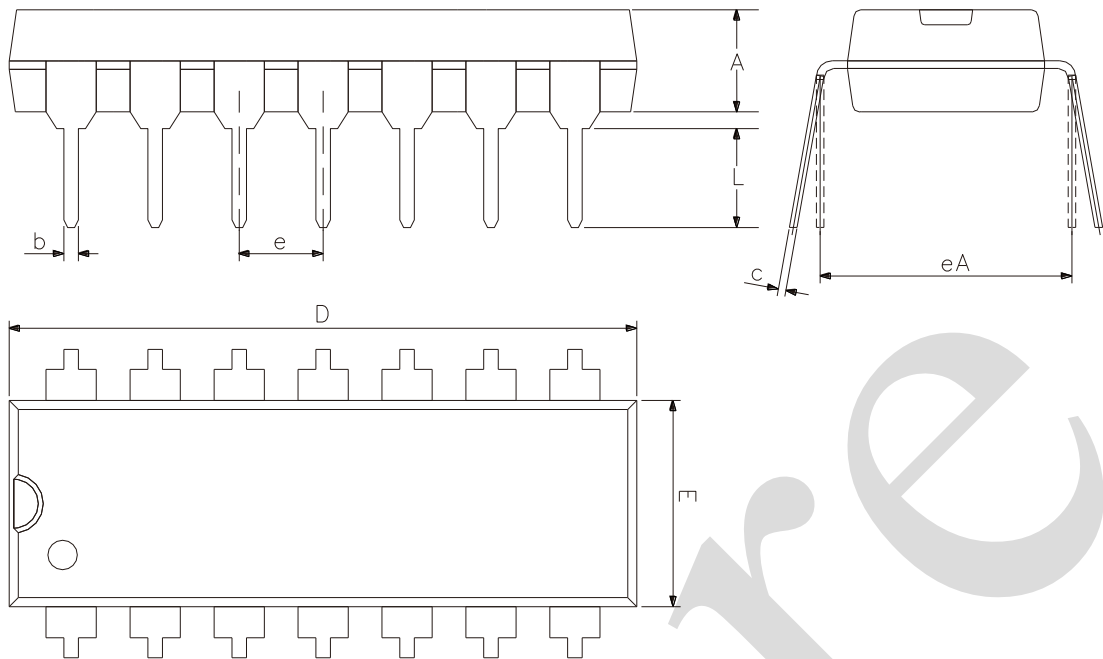
2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	3.00	3.60
b	0.36	0.56
c	0.20	0.36
D	9.00	9.45
E	6.15	6.60
e	2.54	
eA	7.62	9.30
L	3.00	—



6.2、SOP8



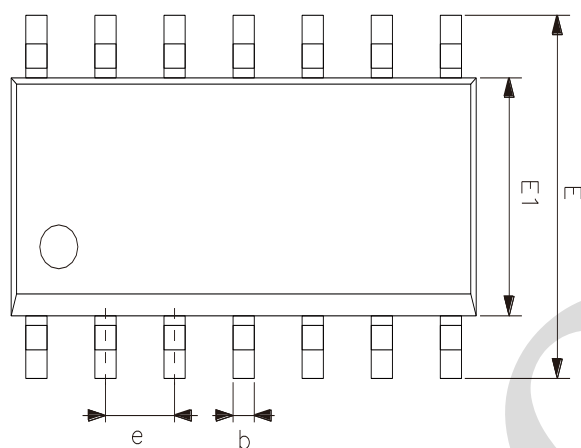
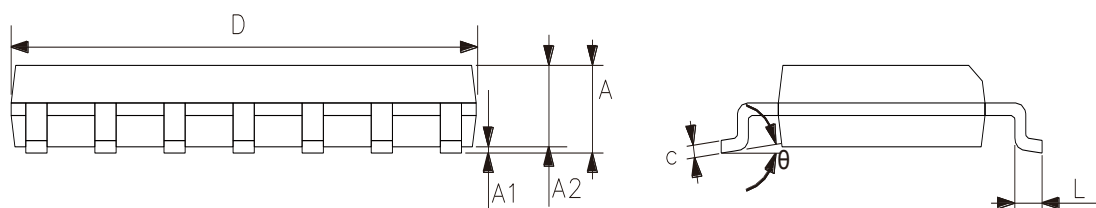
2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	1.35	1.80
A1	0.05	0.25
A2	1.25	1.55
D	4.70	5.10
E	5.80	6.30
E1	3.70	4.10
b	0.306	0.51
c	0.19	0.25
e	1.27	
L	0.40	0.89
θ	0°	8°

**6.3、DIP14**

2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	3.05	3.60
b	0.33	0.56
c	0.20	0.36
D	18.80	19.40
E	6.20	6.60
e	2.54	
eA	7.62	10.90
L	2.92	—



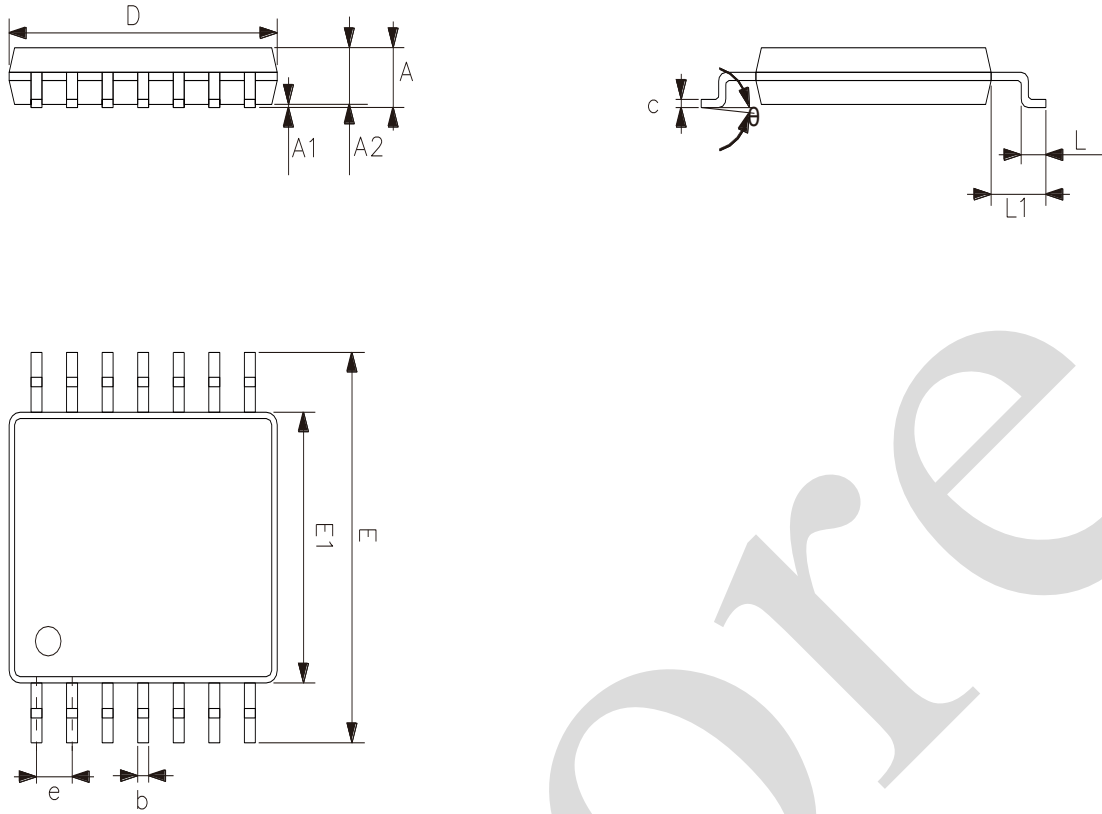
6.4、SOP14



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	1.50	1.75
A1	0.05	0.25
A2	1.30	—
b	0.33	0.50
c	0.19	0.25
D	8.43	8.76
E	5.80	6.25
E1	3.75	4.00
e	1.27	
L	0.40	0.89
θ	0°	8°



6.5、TSSOP14



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°



7、Statements And Notes

7.1、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.									

7.2、Notes

We recommend you to read this chapter carefully before using this product.

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