



AiP4558S

Dual Low-Noise Operational Amplifiers

Product Specification

Specification Revision History:

Version	Date	Description
2020-11-A1	2020-11	New
2021-09-A2	2021-09	Modify the supply voltage and differential input voltage in the Absolute Maximum Ratings; Modify the typical input offset voltage value (25℃) and typical/maximum operating current value (25℃) in the Electrical Characteristics
2021-11-B1	2021-11	Change the product model
2022-01-B2	2022-01	Add SOP8 (W) package information
2022-03-B3	2022-03	Modify the order information
2022-08-B4	2022-08	Modify the voltage range
2023-02-C1	2023-02	Update the template



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1、General Description

The AiP4558S provides two independent, high-gain and internal frequency-compensated general-purpose operational amplifiers. It can operate with either a single power supply over a wide voltage range or dual power supplies. The internal frequency compensation ensures the stable work of the circuit without external components. The wide common-mode input voltage range and latch-up performance make the circuit suitable for voltage followers, DC gain components, industrial controls and all common operational amplifiers.

Features:

- Wide common-mode and differential voltage range
- No frequency compensation required
- Low power
- Unit gain bandwidth: 3MHz (typical)
- Gain and phase matching between amplifiers
- Low noise: $8 \text{ nV}/\sqrt{\text{Hz}}$ (typical)
- Package information: SOP8/DIP8/SIP8

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

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP4558SSA8.TB	SOP8	AiP4558S	100 PCS/tube	100 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP4558SDA8.TB	DIP8	AiP4558S	50 PCS/tube	40 tube/box	2000 PCS/box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP4558SSIP8.TB	SIP8	AiP4558S	25 PCS/tube	60 tube/box	1500 PCS/box	Dimensions of plastic enclosure: 19.2mm×6.5mm Pin spacing: 2.54mm

Reel packing specifications:

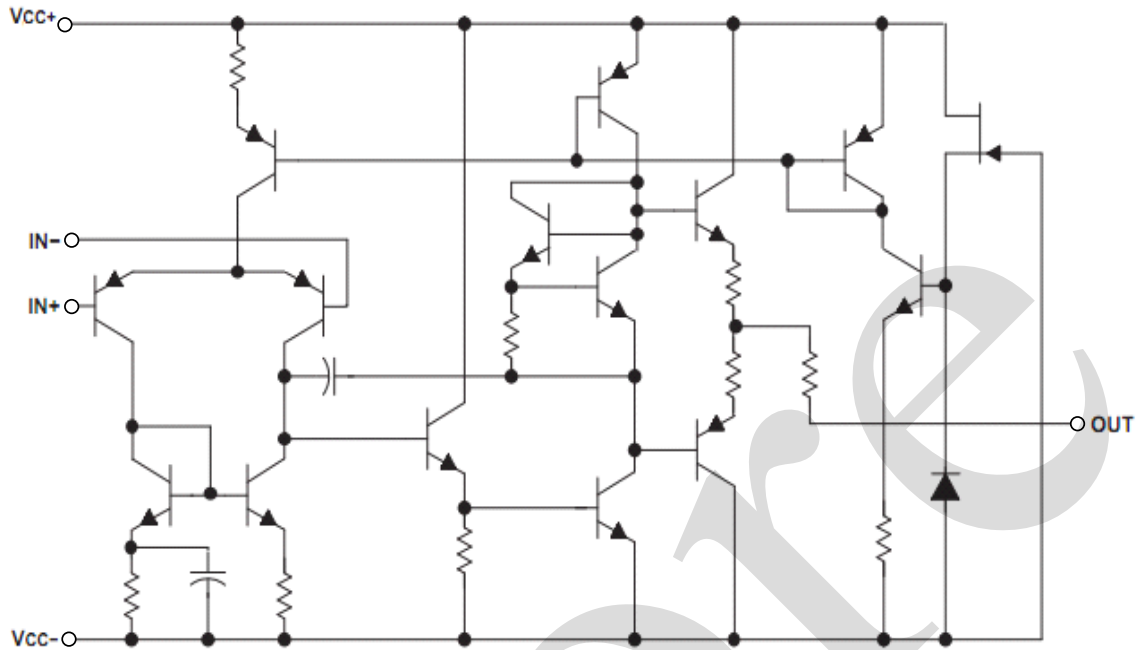
Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP4558SSA8.TR	SOP8	AiP4558S	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm

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

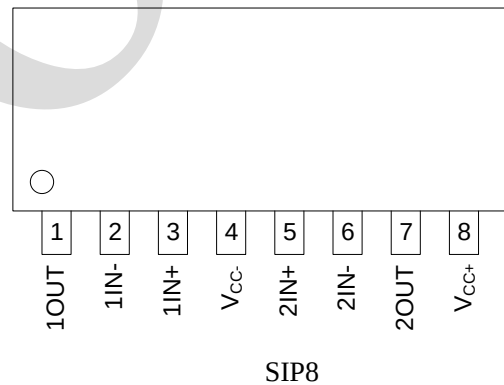
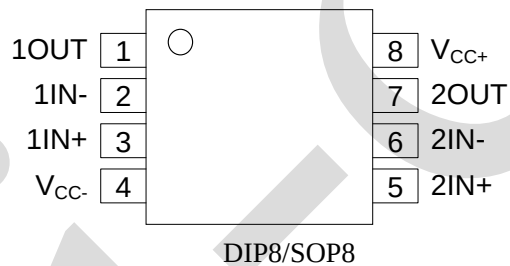


2、Block Diagram And Pin Description

2.1、Block Diagram



2.2、Pin Configurations



2.3、Pin Description

Pin No.	Symbol	Description
1	1OUT	channel-1output
2	1IN-	channel-1 negative input
3	1IN+	channel-1 positive input
4	V _{CC-}	negative power
5	2IN+	channel-2 positive input
6	2IN-	channel-2 negative input
7	2OUT	channel-2 output
8	V _{CC+}	Positive power



3、Electrical Parameter

3.1、Absolute Maximum Ratings

Parameter		Symbol	Conditions		Rated value	Unit
supply voltage		V_{CC}	-		40 or ± 20	V
differential input voltage		V_{ID}	-		± 36	V
input voltage		V_I	-		36	V
thermal resistance	DIP8	θ_{JA}	-		110	$^{\circ}\text{C}/\text{W}$
	SOP8		-		160	
	SIP8		-		110	
ambient temperature		T_{amb}	-		-40 to 85	$^{\circ}\text{C}$
junction temperature		T_J	-		150	$^{\circ}\text{C}$
storage temperature		T_{stg}	-		-65 to 150	$^{\circ}\text{C}$
soldering temperature		T_L	10s	SIP	245	$^{\circ}\text{C}$
				DIP	250	
				SOP	260	

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	3	-	36	V
common-mode voltage	V_{CM}	-	0	-	$V_{CC}-2$	V
ambient temperature	T_{amb}	-	-40	-	85	$^{\circ}\text{C}$

3.3、Electrical Characteristics

3.3.1、Electrical Characteristics

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

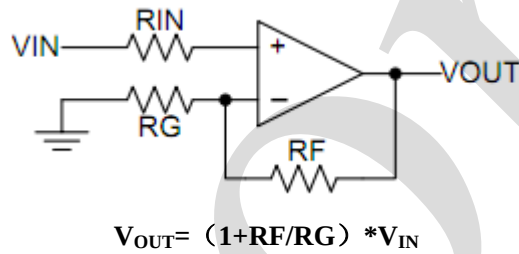
Parameter	Symbol	Conditions	T _{amb}	Value			Unit
				Min.	Typ.	Max.	
input offset voltage	V_{IO}	$V_O=0\text{V}$	25 $^{\circ}\text{C}$	-	1	6	mV
			full range	-	-	7.5	
input offset current	I_{IO}	$V_O=0\text{V}$	25 $^{\circ}\text{C}$	-	2	200	nA
			full range	-	-	300	
input bias current	I_{IB}	$V_O=0\text{V}$	25 $^{\circ}\text{C}$	-	150	500	nA
			full range	-	-	800	
common mode voltage	V_{ICR}	-	25 $^{\circ}\text{C}$	± 12	± 14	-	V
maximum output voltage swing	V_{OM}	$R_L=10\text{K}\Omega$	25 $^{\circ}\text{C}$	± 12	± 14	-	V
		$R_L=2\text{K}\Omega$	25 $^{\circ}\text{C}$	± 10	± 13	-	V
unit gain bandwidth	B1	-	full range	-	3	-	MHz
input impedance	Ri	-	25 $^{\circ}\text{C}$	0.3	5	-	M Ω
large signal differential voltage amplification	AVD	$V_O=\pm 10\text{V}$, $R_L\geq 2\text{K}\Omega$	25 $^{\circ}\text{C}$	20	300	-	V/mV
			full range	15	-	-	
common-mode rejection ratio	CMRR	-	25 $^{\circ}\text{C}$	70	90	-	dB
power supply voltage rejection ratio	KSVR	$V_{CC}=\pm 9$ to $\pm 15\text{V}$	25 $^{\circ}\text{C}$	-	30	150	$\mu\text{V}/\text{V}$
equivalent input noise voltage	V_n	AVD=100, $R_S=100\Omega$, $f=1\text{KHz}$, BW=1Hz	full range	-	8	-	nV/ $\sqrt{\text{Hz}}$

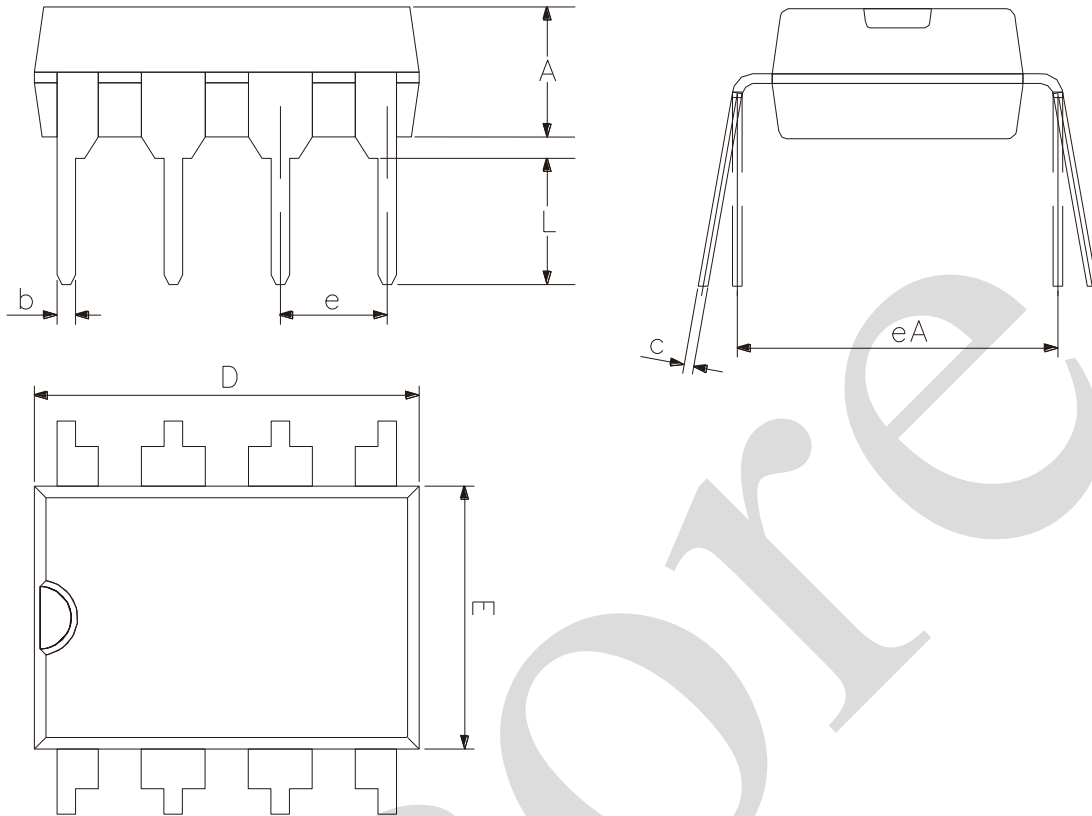


supply current	I _{CC}	V _O =0V, no load	25°C	-	2.8	5	mA
			T _{amb} min	-	3	6.6	
			T _{amb} max	-	2.3	5	
power dissipation	P _D	V _O =0V, no load	25°C	-	75	170	mW
			T _{amb} min	-	90	200	
			T _{amb} max	-	70	150	
crosstalk attenuation	V _{O1} /V _{O2}	open-loop	25°C	-	85	-	dB
		AVD=100		-	105	-	dB
rise time	t _r	R _L =2KΩ, C _L =100pF, V _I =20mV	-	-	0.13	-	us
overshoot	-	R _L =2KΩ, C _L =100pF, V _I =20mV	-	-	5	-	%
slew rate	SR	R _L =2KΩ, C _L =100pF, V _I =10V	-	0.8	1.1	-	V/us

4、Typical Application Circuit

4.1、Application circuit

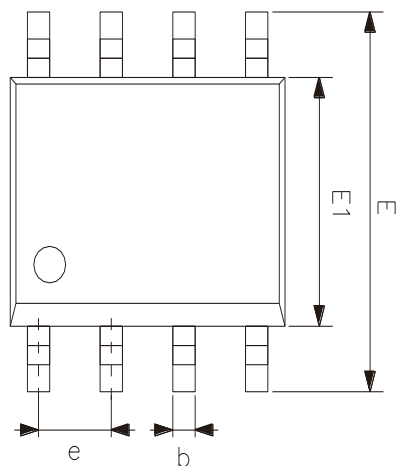
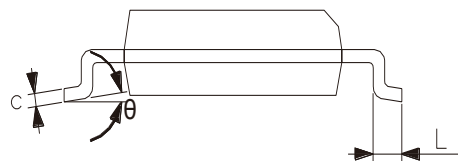
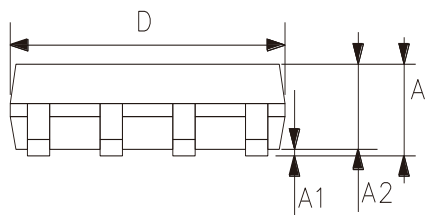


**5、Package Information****5.1、DIP8**

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	—



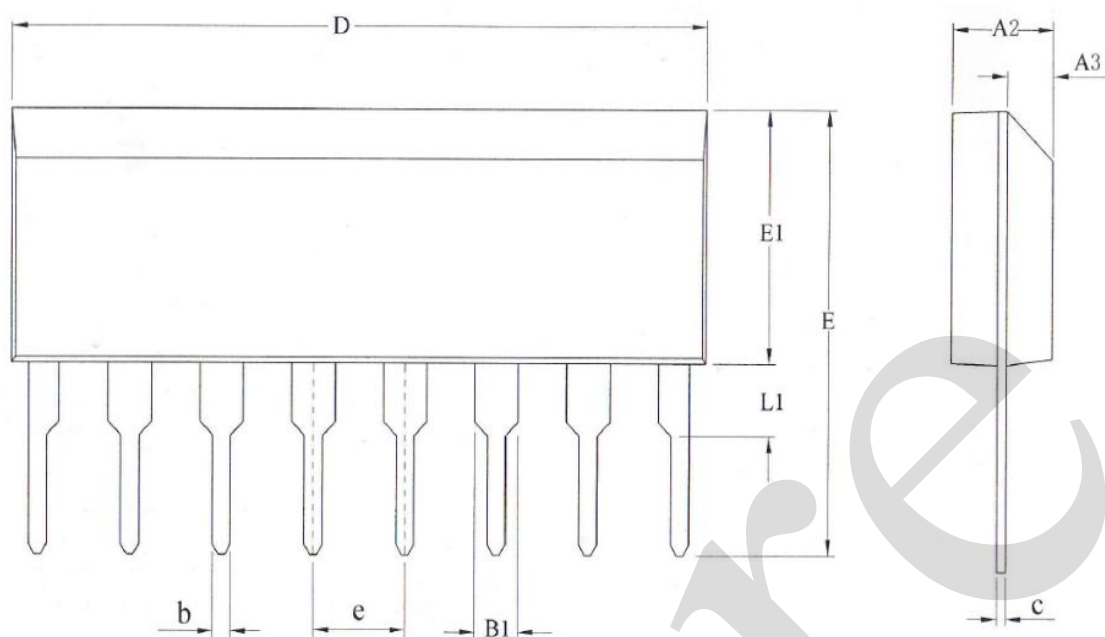
5.2、SOP8



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°



5.3、SIP8



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A2	2.70	2.90
A3	1.35	1.45
b	0.48	0.56
B1	1.20	
c	0.25	0.29
D	19.10	19.30
e	2.54	
E	11.20	11.60
E1	6.40	6.60
L1	1.30	1.70



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、Notes

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