



AiP358L

Dual Operational Amplifier

Product Specification

Specification Revision History:

Version	Date	Description
2021-10-A1	2021-10	New
2023-02-B1	2023-02	Update the template
2023-07-B2	2023-07	Add TSSOP8-3*4.4 package form



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1、General Description

AiP358L consists of two independent, high-gain frequency-compensated dual operational amplifier that are appropriate for not only single power supplies with a wide voltage range but also dual power mode. Under recommended conditions, the supply current is independent of the supply voltage. Applications include audio amplifier, industrial control, DC amplification blocks and all the occasions using the conventional operational amplifiers.

Features:

- Supply voltage range
Single supply: 3V to 18V
Dual supply: $\pm 1.5\text{V}$ to $\pm 9\text{V}$
- Low supply-current drain independent of supply voltage: 0.5mA Typical
- Wide unity gain bandwidth: 0.7MHz
- Low input bias and offset parameters
Input offset voltage: 3mV Typical
Input offset current: 2nA Typical
Input bias current: 20nA Typical
- Differential input voltage range equal to maximum-rated supply voltage: 16V
- Open-loop differential voltage amplification: 95dB Typical
- Internal frequency compensation
- Package form: SOP8/DIP8/TSSOP8



Ordering Information:

Tube packing specifications:

Material number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP358LDA8.TB	DIP8	AiP358L	50 PCS/tube	40 tube/box	2000 PCS/box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing:2.54mm
AiP358LSA8.TB	SOP8	AiP358L	100 PCS/tube	100 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing:1.27mm
AiP358LTB8.TB	TSSOP8	AiP358L	100 PCS/tube	200 tube/box	20000 PCS/box	Dimensions of plastic enclosure: 3.0mm×4.4mm Pin spacing:0.65mm

Reel packing specifications:

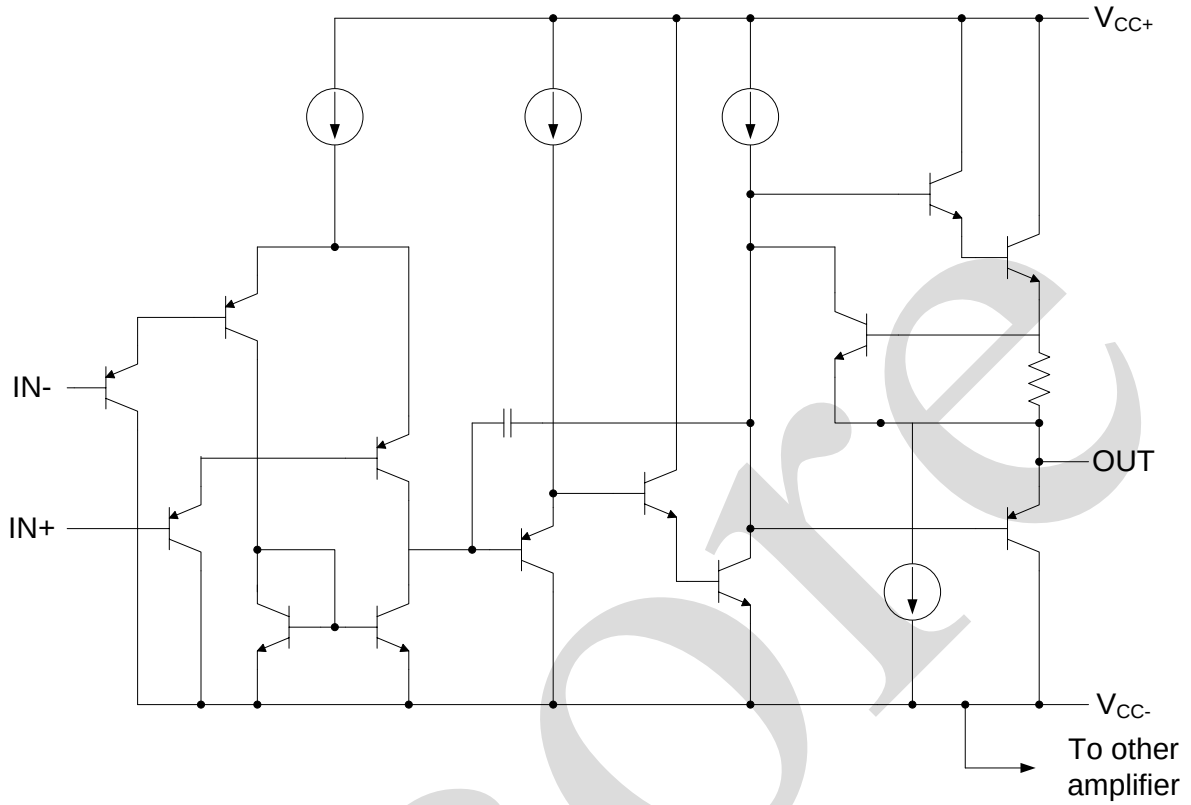
Material number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP358LSA8.TR	SOP8	AiP358L	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing:1.27mm
AiP358LTB8.TR	TSSOP8	AiP358L	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×4.4mm Pin spacing:0.65mm

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

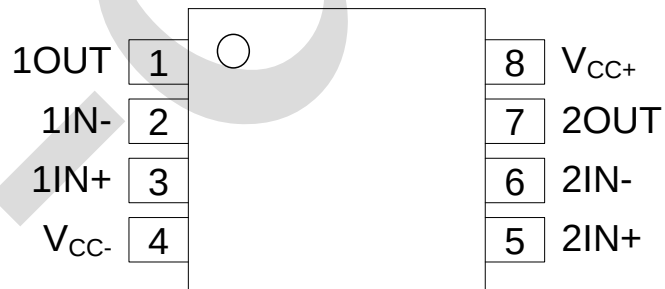


2、Block Diagram And Pin Description

2.1、Block Diagram



2.2、Pin Configurations





2.3、Pin Description

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

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, All voltage referenced to GND, unless otherwise specified)

Characteristic		Symbol	Conditions		Value	Unit
Supply voltage		V _{CC}	-		20 or ±10	V
Differential input voltage		V _{ID}	-		20	V
Input voltage		V _I	-		-0.3 to 20	V
Thermal resistance	DIP8	θ _{JA}	-		110	°C/W
	SOP8				160	
Junction temperature		T _J	-		150	°C
Storage temperature		T _{stg}	-		-65 to 150	°C
Soldering temperature		T _L	10s	DIP8	250	°C
				SOP8	260	
				TSSOP8	260	

3.2、Recommended Operating Conditions

Characteristic	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	V _{CC}	-	3	-	18	V
Common-mode voltage	V _{CM}	-	0	-	V _{CC} -2	V
Ambient temperature	T _{amb}	-	-40	-	85	℃



3.3、Electrical Characteristics

3.3.1、Electrical Characteristics

($V_{CC}=5V$, $T_{amb}=25^{\circ}C$, unless otherwise noted)

Characteristic	Symbol	Conditions		T_{amb}	Value			Unit
					Min.	Typ.	Max.	
Input offset voltage	V_{IO}	$V_{CC}=5$ to $16V$, $V_{IC}=V_{ICR(min)}$, $V_O=1.4V$		$25^{\circ}C$	-	3	7	mV
				Full range	-	-	9	
Input offset current	I_{IO}	$V_O=1.4V$		$25^{\circ}C$	-	2	50	nA
				Full range	-	-	150	
Input bias current	I_{IB}	$V_O=1.4V$		$25^{\circ}C$	-	-20	-250	nA
				Full range	-	-	-500	
Common-mode input voltage range	V_{ICR}	$V_{CC}=5$ to $16V$		$25^{\circ}C$	0 to $V_{CC}-1.5$	-	-	V
				Full range	0 to $V_{CC}-2$	-	-	
High-level output voltage	V_{OH}	$R_L \geq 2k\Omega$		$25^{\circ}C$	3.5	-	-	V
		$V_{CC}=16V$	$R_L \geq 2k\Omega$	Full range	12	-	-	
			$R_L \geq 10k\Omega$	Full range	13	14	-	
Low-level output voltage	V_{OL}	$R_L \leq 10k\Omega$		Full range	-	5	20	mV
Large-signal differential voltage amplification	A_{VD}	$V_{CC}=15V$, $V_O=1V$ to $11V$, $R_L \geq 2k\Omega$		$25^{\circ}C$	88	95	-	dB
				Full range	83	-	-	
Common-mode rejection ratio	CMRR	$V_{CC}=5$ to $16V$, $V_{IC}=V_{ICR(min)}$		$25^{\circ}C$	65	80	-	dB
Power supply rejection ratio	PSRR	$V_{CC}=5$ to $16V$		$25^{\circ}C$	65	100	-	dB
Crosstalk attenuation	V_{O1}/V_{O2}	$f=1kHz$ to $20kHz$		$25^{\circ}C$	-	120	-	dB
Output current	I_O	$V_{CC}=10V$, $V_{ID}=1V$, $V_O=0$	Source	$25^{\circ}C$	-20	-30	-	mA
				Full range	-10	-	-	
		$V_{CC}=10V$, $V_{ID}=-1V$, $V_O=10V$	Sink	$25^{\circ}C$	10	20	-	
				Full range	5	-	-	
		$V_{ID}=-1V$, $V_O=200mV$		$25^{\circ}C$	12	30	-	uA
Short-circuit output current	I_{OS}	$V_{CC}=5V$, $V_O=0V$ $GND=-5V$		$25^{\circ}C$	-	± 40	± 60	mA
Supply current	I_{CC}	$V_O=2.5V$, No Load		Full range	-	0.5	1.2	mA



		$V_{CC}=16V, V_O=0.5V_{CC},$ No Load	Full range	-	1	2	
Slew rate	SR	$V_{CC}=\pm 8V, R_L=1M\Omega,$ $CL=30pF, V_I=\pm 5V$	Full range	-	0.3	-	V/us
Unity-gain bandwidth	B_1	$V_{CC}=\pm 8V, R_L=1M\Omega,$ $CL=20pF$	Full range	-	0.7	-	MHz
Equivalent input noise voltage	V_N	$V_{CC}=\pm 8V, R_s=100\Omega,$ $f=1kHz, V_I=0V$	Full range	-	40	-	nV/ $\sqrt{Hz}$

4、Testing Circuit

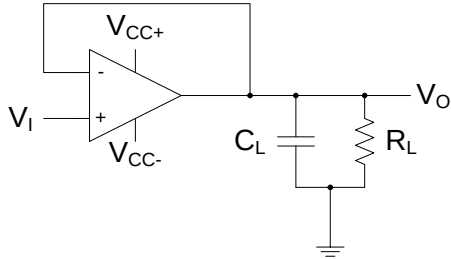


Figure 1: Unity-Gain Amplifier

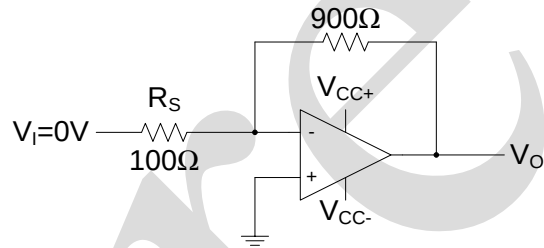
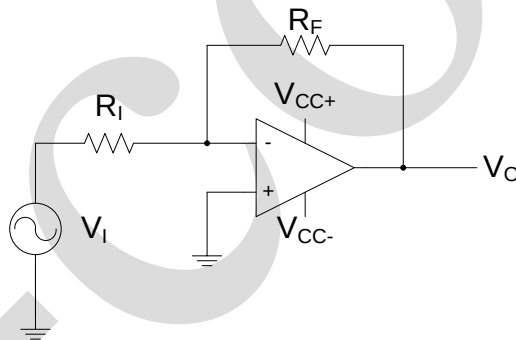


Figure 2: Noise-Test Circuit

5、Typical Application Circuit And Application Note

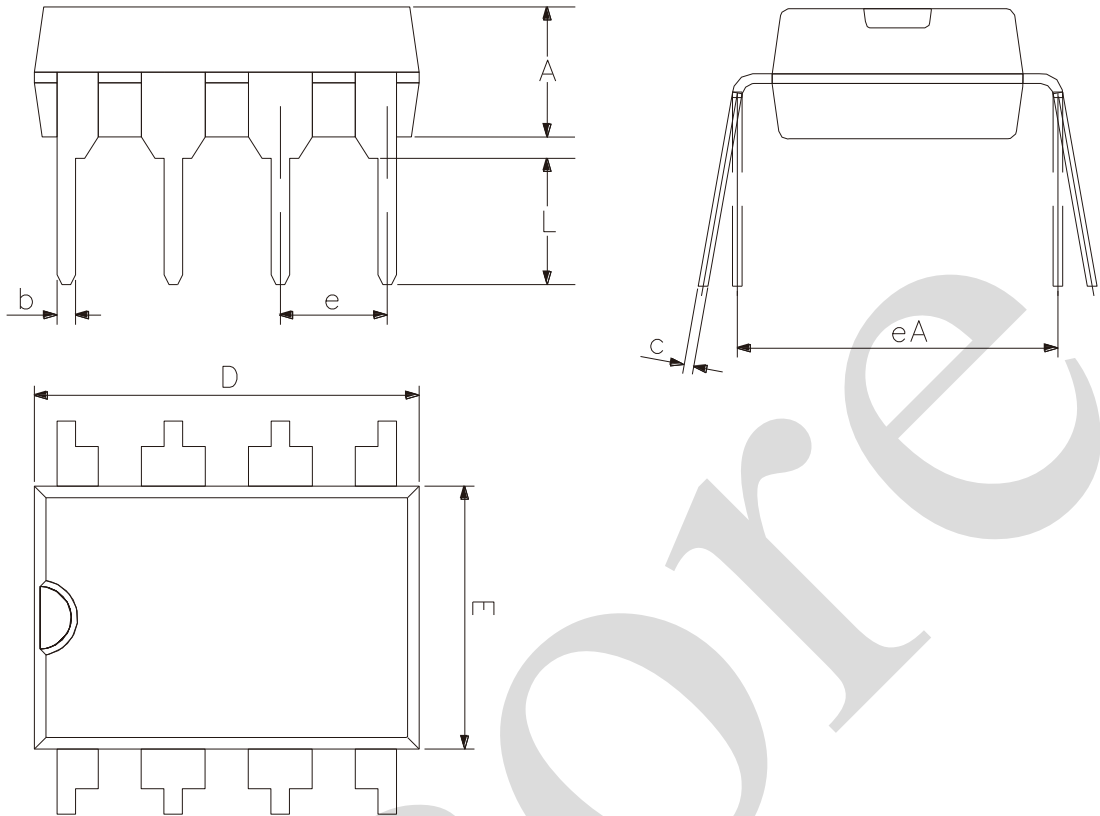
5.1、Application Circuit





6、Package Information

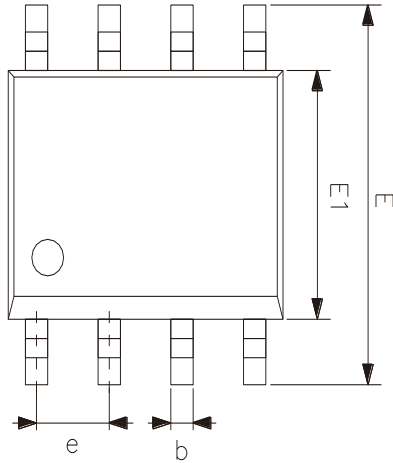
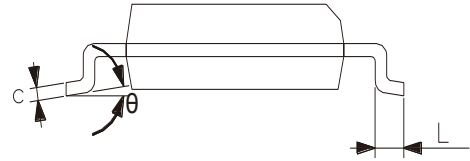
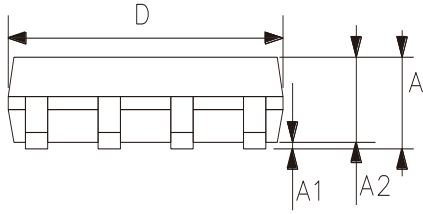
6.1、DIP8



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	—



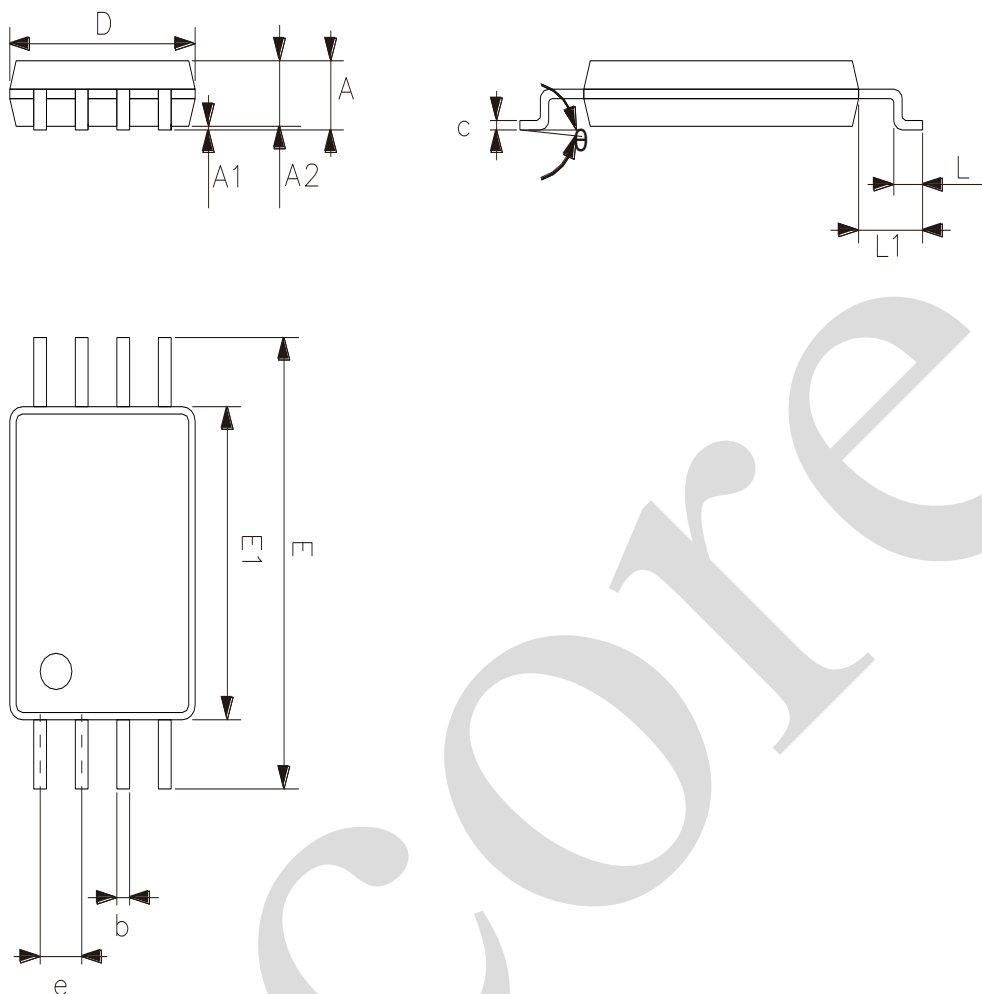
6.2、SOP8



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、TSSOP8



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	2.90	3.10
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

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