



AiP1330

Ultra-Small Low Voltage Operation CMOS Dual Operational Amplifier

Product Specification

Specification Revision History:

Version	Date	Description
2016-06-A1	2016-06	New
2022-02-A2	2022-02	Update the template
2023-02-B1	2023-02	Update the template
2023-10-B2	2023-10	Modify the offset voltage



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1、General Description

The AiP1330 is a dual CMOS Operational Amplifiers realizing high slew rate, low voltage operation, low input offset voltage and low power dissipation. In addition to a low operating voltage from 1.8V, the device output can achieve full swing output voltage capability extending to either supply.

Features:

- Supply voltage range: 1.8V to 5.5V
- Quiescent current: 800uA per channel
- High slew rate: 8V/us
- Maximum output voltage: $V_{OH}=2.9V$ (at $V_{DD}=3V$)
- Low input offset voltage: 6mV (Max.)
- Package form: MSOP8/TSSOP14

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP1330MA8.TB	MSOP8	AiP1330	100 PCS/tube	100 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP1330TA14.TB	TSSOP14	AiP1330	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

Reel packing specifications:

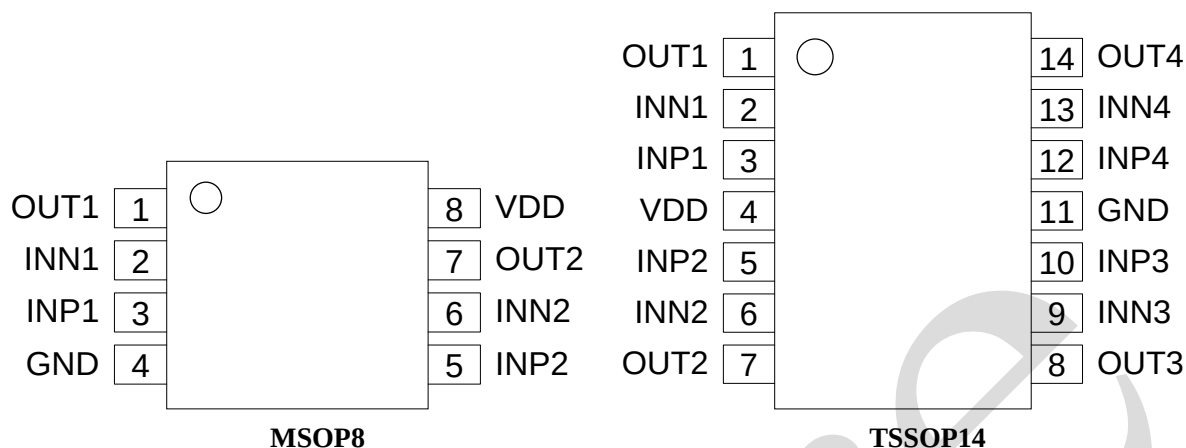
Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP1330MA8.TR	MSOP8	AiP1330	5000PCS/reel	10000PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP1330TA14.TR	TSSOP14	AiP1330	5000PCS/reel	10000PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

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



2、Pin Description

2.1、Pin Configurations



2.2、Pin Description

Pin No.		Pin Name	Description
MSOP8	TSSOP14		
1	1	OUT1	Amp 1 output
2	2	INN1	Amp 1 negative input
3	3	INP1	Amp 1 positive input
4	11	GND	Ground
5	5	INP2	Amp 2 positive input
6	6	INN2	Amp 2 negative input
7	7	OUT2	Amp 2 output
8	4	VDD	Supply voltage
-	8	OUT3	Amp 3 output
-	9	INN3	Amp 3 negative input
-	10	INP3	Amp 3 positive input
-	12	INP4	Amp 4 positive input
-	13	INN4	Amp 4 negative input
-	14	OUT4	Amp 4 output



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_{DD}	-	7	V
Differential input voltage	$V_{IN(dif)}$	-	-VDD to +VDD	V
Input voltage	V_{IN}	-	-0.3 to +VDD	V
Power dissipation	P_D	-	240/145	mW
Ambient temperature	T_{amb}	-	-40 to +85	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-	-65 to +150	$^{\circ}\text{C}$
Soldering temperature	T_L	10s	260	$^{\circ}\text{C}$

3.2、Electrical Characteristics

($T_{amb}=25^{\circ}\text{C}$, $V_{DD}=3.0\text{V}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input offset voltage	V_{IO}	$V_{IN}=1.5\text{V}$	-	-	6	mV
Input offset current	I_{IO}	$V_{IN}=1.5\text{V}$	-	1.0	-	pA
Input bias current	I_{IB}	$V_{IN}=1.5\text{V}$	-	1.0	-	pA
Output HIGH level voltage	V_{OH}	$R_L=100\text{K}\Omega$	2.9	-	-	V
Output sink current	$I_{OSOURCE}$	$V_{OH}=2.5\text{V}$	400	800	-	μA
Output LOW level voltage	V_{OL}	$R_L=100\text{K}\Omega$	-	-	0.1	V
Output sink current	I_{OSINK}	$V_{OL}=0.5\text{V}$	-	6.5	-	mA
Slew rate	SR	$C_L=20\text{pF}$	-	8	-	V/ μs
Open-loop voltage gain	Aud	-	60	90	-	dB
Gain bandwidth product	BW	$C_L=20\text{pF}$	-	3600	-	kHz
Common mode rejection ratio	CMRR	-	50	70	-	dB
Power supply rejection ratio	PSRR	-	50	70	-	dB
Quiescent current	I_{DD}	-	-	1600	3400	μA



4、Characteristic Curve

Select the typical value of $V_{DD}=3V$, the THD with the output voltage changes in the characteristics of the curve:

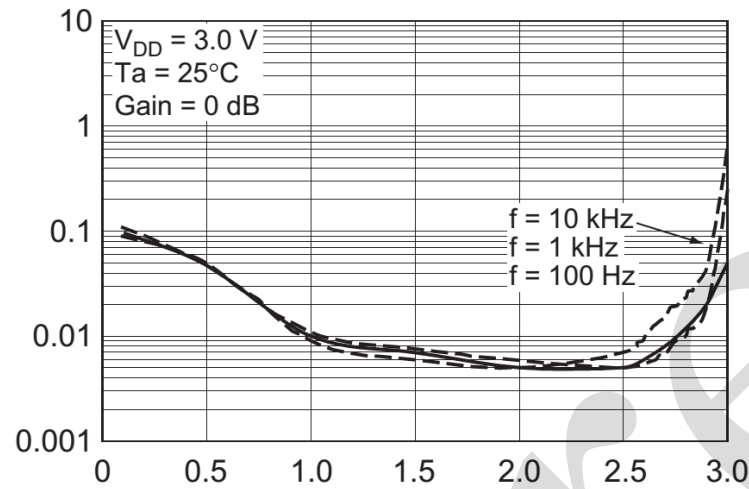


Figure 1: $RF/RS = 20\text{LOG}(100K\Omega/100K\Omega) = 0\text{dB}$, THD at different frequencies

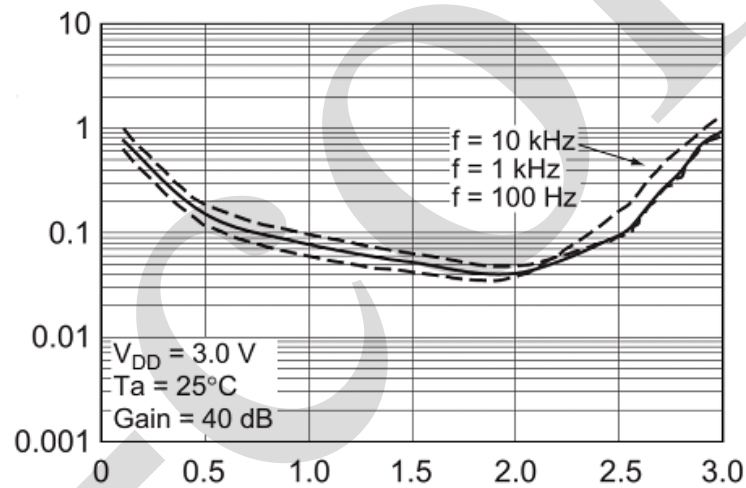
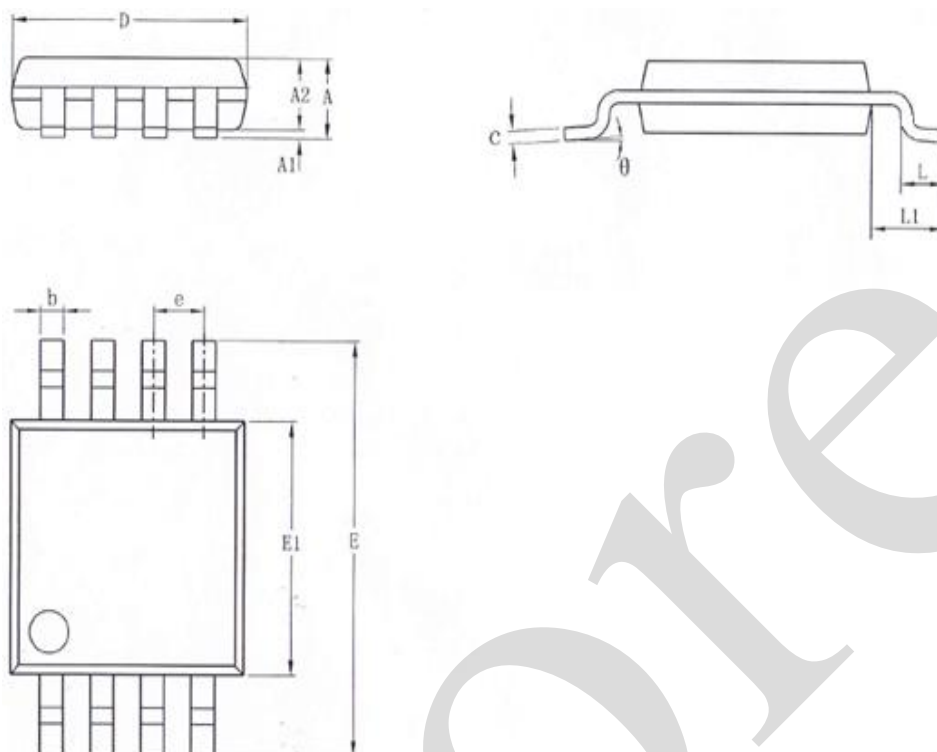


Figure 2: $RF/RS = 20\text{LOG}(100K\Omega/1K\Omega) = 40\text{dB}$, THD at different frequencies



5、Package Information

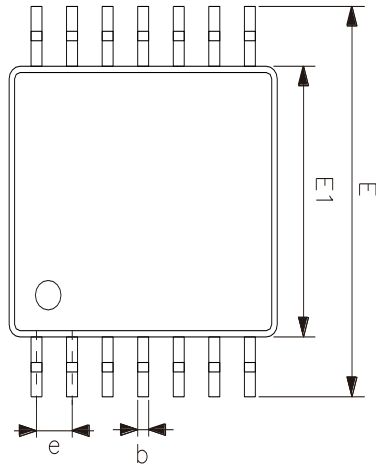
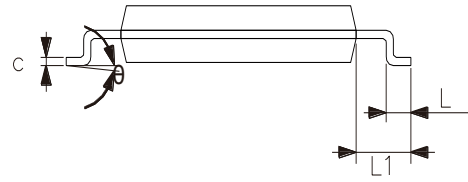
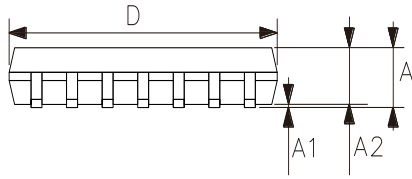
5.1、MSOP8



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.10
A1	0.05	0.15
A2	0.75	0.95
b	0.22	0.38
c	0.08	0.23
D	2.90	3.10
E	4.70	5.10
E1	2.90	3.10
e	0.65	
L	0.40	0.80
L1	0.95	
θ	0°	8°



5.2、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°



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

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

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