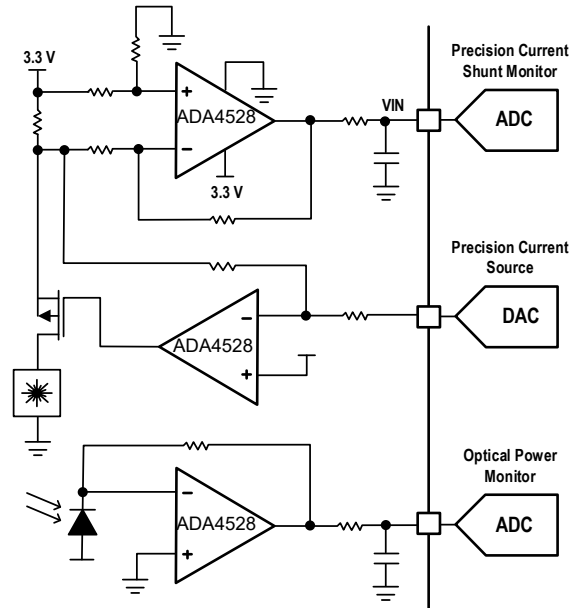


Features

- Continuous time amplifier, no chopper or auto-zero glitch
- Low offset voltage: 30 μV max
- Low offset voltage drift: 0.2 $\mu\text{V}/^\circ\text{C}$ typical
1 $\mu\text{V}/^\circ\text{C}$ max
- Low input bias current: 0.6 pA typical
3 pA max
- Low noise: 9.3 $\text{nV}/\sqrt{\text{Hz}}$ @ 1 kHz
5.2 $\text{nV}/\sqrt{\text{Hz}}$ @ 10 kHz
0.1 Hz to 10Hz 1.86 $\mu\text{V}_{\text{P-P}}$
- High unit gain bandwidth: 11.6 MHz
- High slew rate: 6 $\text{V}/\mu\text{s}$
- Supply current: 0.9 mA per amplifier
- Wide supply voltage: 2.7 V to 5.5 V
- Rail-to-rail input and output
- Drive large capacitive load up to 10 nF
- Large output current: 150 mA
- Wide temperature range: -40°C to $+125^\circ\text{C}$

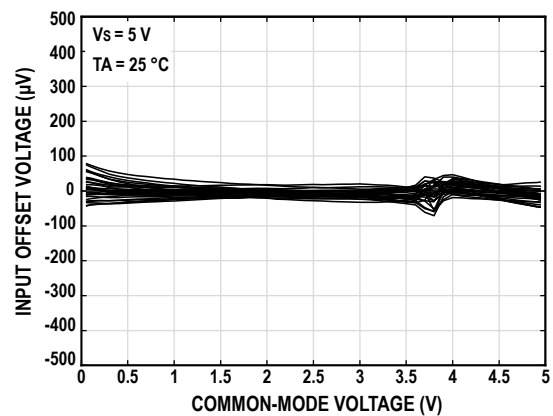
Typical Application



Applications

- Multi-parameter patient monitor
- Chemistry and gas analyzer
- Multi-pole filters
- Sensor analog front end
- ASIC input or output amplifiers
- ADC input driver and DAC output buffer
- Photodiode trans-impedance amplifier

Typical Characteristics



Pin Configurations and Function

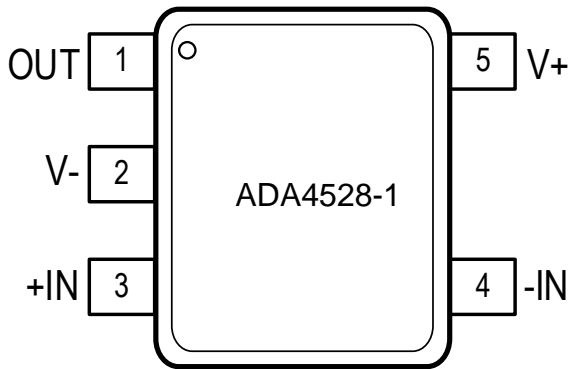


Figure 1. ADA4528 -1 Pin Configuration (5-lead SOT23)

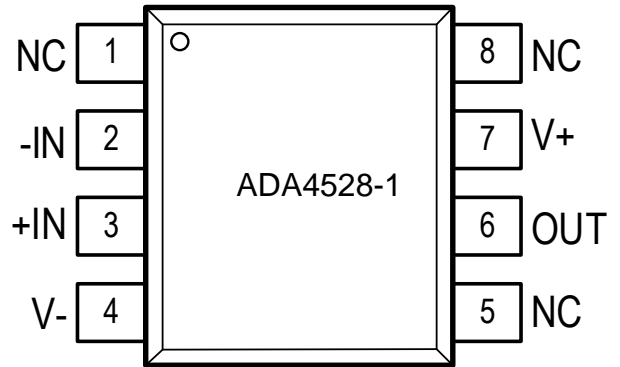


Figure 2. ADA4528 -1 Pin Configuration (8-lead SOIC and MSOP)

Mnemonic	Pin No.	I/O ¹	Description
OUTA	1	AO	Amplifier output
V-	2	P	Negative power supply
+INA	3	AI	Amplifier non-inverting input
-INA	4	AI	Amplifier inverting input
V+	5	P	Positive power supply

Mnemonic	Pin No.	I/O	Description
NC	1, 5, 8	--	No internal circuit connection
-IN	2	AI	Inverting input
+IN	3	AI	Non-inverting input
V-	4	--	Negative power supply
OUT	6	AO	Output

¹ AI: Analog Input; P: Power; AO: Analog Output.

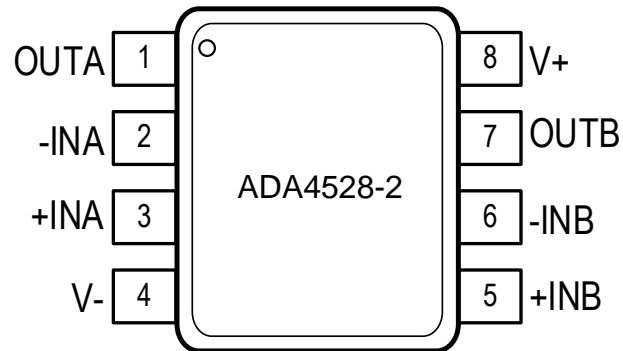


Figure 3. ADA4528-2 Pin Configuration (8-lead SOIC and MSOP)

Mnemonic	Pin No.	I/O ¹	Description
OUTA	1	AO	Channel A output
-INA	2	AI	Channel A inverting input
+INA	3	AI	Channel A Non-inverting input
V-	4	P	Negative power supply
+INB	5	AI	Channel B Non-inverting input
-INB	6	AI	Channel B inverting input
OUTB	7	AO	Channel B output
V+	8	P	Positive power supply

¹ AI: Analog Input; P: Power; AO: Analog Output.

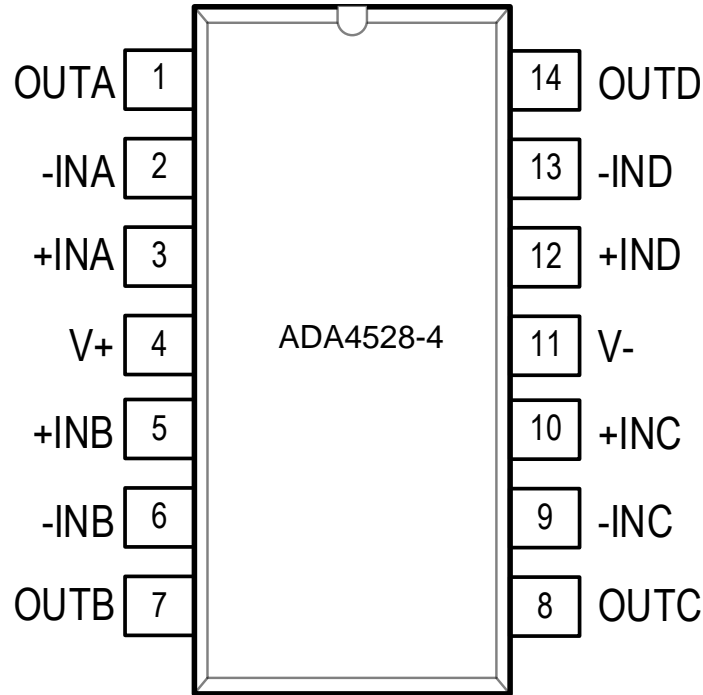


Figure 4. ADA4528-4 Pin Configuration (14-lead SOIC and TSSOP)

Mnemonic	Pin No.	I/O ¹	Description
OUTA	1	AO	Channel A output
-INA	2	AI	Channel A inverting input
+INA	3	AI	Channel A non-inverting input
V+	4	P-	Positive power supply
+INB	5	AI	Channel B non-inverting input
-INB	6	AI	Channel B inverting input
OUTB	7	AO	Channel B output
OUTC	8	AO	Channel C output
-INC	9	AI	Channel C inverting input
+INC	10	AI	Channel C non-inverting input
V-	11	P	Negative power supply
+IND	12	AI	Channel D non-inverting input
-IND	13	AI	Channel D inverting input
OUTD	14	AO	Channel D output

¹ AI: Analog Input; P: Power; AO: Analog Output.

Absolute Maximum Ratings¹

Parameter	Rating
Supply Voltage	6 V
Input Voltage	GND to 6 V
Output Short-Circuit Duration to GND	Indefinite
Operating Temperature Range	-40 °C to 125 °C
Storage Temperature Range	-65 °C to 150 °C
Junction Temperature Range	-65 °C to 150 °C
Lead Temperature, Soldering (10 sec)	300 °C
ESD Rating (ESD) ²	
Human Body Model (HBM) ³	
Charge Device Model (CDM) ⁴	

Thermal Resistance⁵

Package Type	θ_{JA}	θ_{JC}	Unit
5-lead SOT23	230	76	°C/W
8-lead SOIC	158	43	°C/W
8-lead MSOP	190	44	°C/W
14-lead SOIC	120	36	°C/W
14-lead TSSOP	240	43	°C/W

Specifications

The ● denotes the specification which apply over the full operating temperature range, otherwise specifications are at $V_S=5\text{ V}$, $V_{CM}=V_S/2$, $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
INPUT CHARACTERISTICS						
Offset Voltage	V_{OS}	$V_{CM}=2.5\text{ V}$ and 4.5 V	●	70	30 150	μV μV
		$V_{CM}=0\text{ V}$ to 5 V	●		250	μV
Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	$-40\text{ }^\circ\text{C} < T_A < +125\text{ }^\circ\text{C}$			1	$\mu\text{V}/^\circ\text{C}$
Input Bias Current	I_B		●	0.6	3 700	pA pA
		$-40\text{ }^\circ\text{C} < T_A < +85\text{ }^\circ\text{C}$			40	pA
Input Offset Current	I_{OS}		●			pA pA
		$-40\text{ }^\circ\text{C} < T_A < +85\text{ }^\circ\text{C}$				pA
Input Voltage Range	IVR		0		5	V
Common-Mode Rejection Ratio	CMRR	$V_{CM}=0\text{ V}$ to 4.5 V		100		dB
Large Signal Voltage Gain	A_{VO}	$R_L=2\text{ k}\Omega$, $V_O=0.5\text{ V}$ to 4.5 V		147		dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	$I_L=1\text{ mA}$	●	4.988		V V
		$I_L=10\text{ mA}$	●	4.895		V V
Output Voltage Low	V_{OL}	$I_L=1\text{ mA}$	●	10.8		mV mV
		$I_L = 10\text{ mA}$	●	93.8		mV mV
Output Current	I_{OUT}			150		mA
Power Supply						
Supply Current Per Amplifier	I_S	No load current	●	0.9		mA mA
Power Supply Rejection Ratio	PSRR	$V_S=2.7\text{ V}$ to 5.5 V		94		dB
DYNAMIC PERFORMANCE						
Slew Rate	SR	$R_L=2\text{ k}\Omega$		6		V/ μs
Unit Gain Bandwidth	UGB			11.6		MHz
Settling Time		To 0.01%				μs
THD+Noise	THD+N					%
Phase Margin	ϕ_M			67		Degree
Channel Separation	C_S	$f=10\text{ kHz}$				dB

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
		f=100 kHz				dB
NOISE PERFORMANCE						
Voltage Noise Density	e_n	f=1k Hz		9.3		nV/ $\sqrt{\text{Hz}}$
		f=10k Hz		5.2		nV/ $\sqrt{\text{Hz}}$
Peak-to-Peak Voltage Noise	$e_{n\text{P-P}}$	0.1 Hz to 10 Hz		1.86		$\mu\text{V}_{\text{P-P}}$
Current Noise Density	i_n	f=1 kHz		0.4		fA/ $\sqrt{\text{Hz}}$

Outline Information

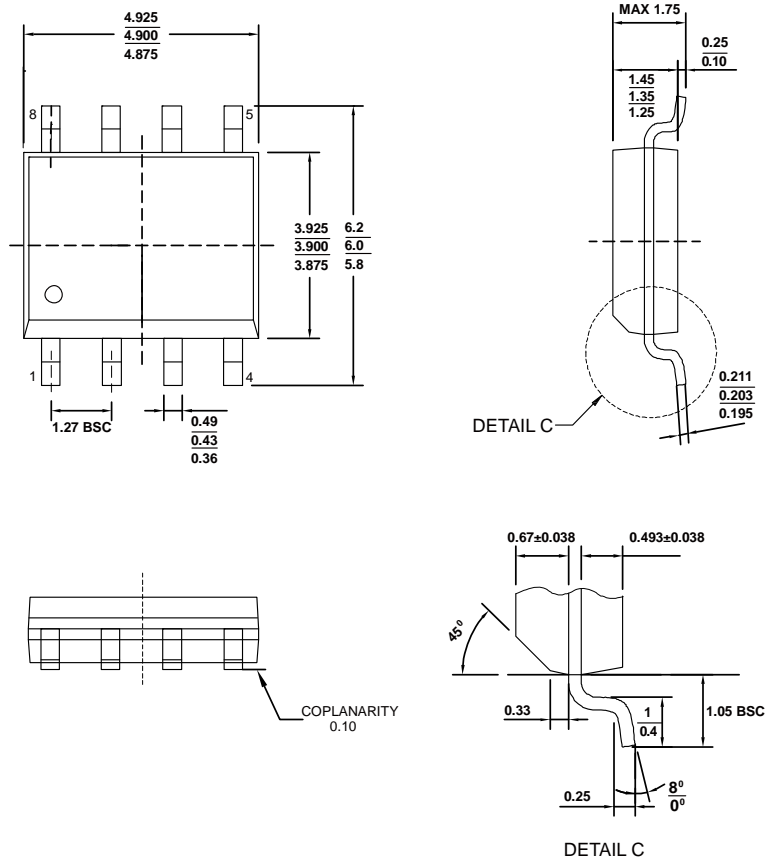


Figure 5. 8-Lead SOIC Package Dimensions shown in millimeters

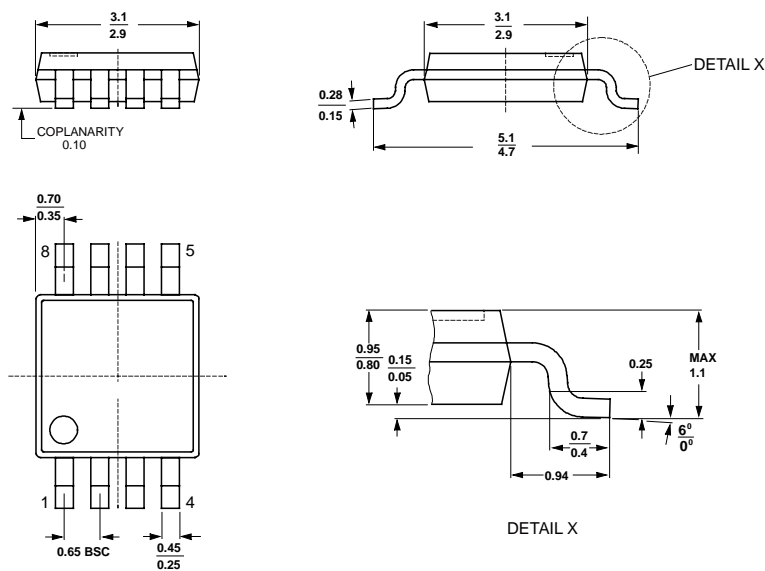


Figure 6. 8-Lead MSOP Package Dimensions shown in millimeters

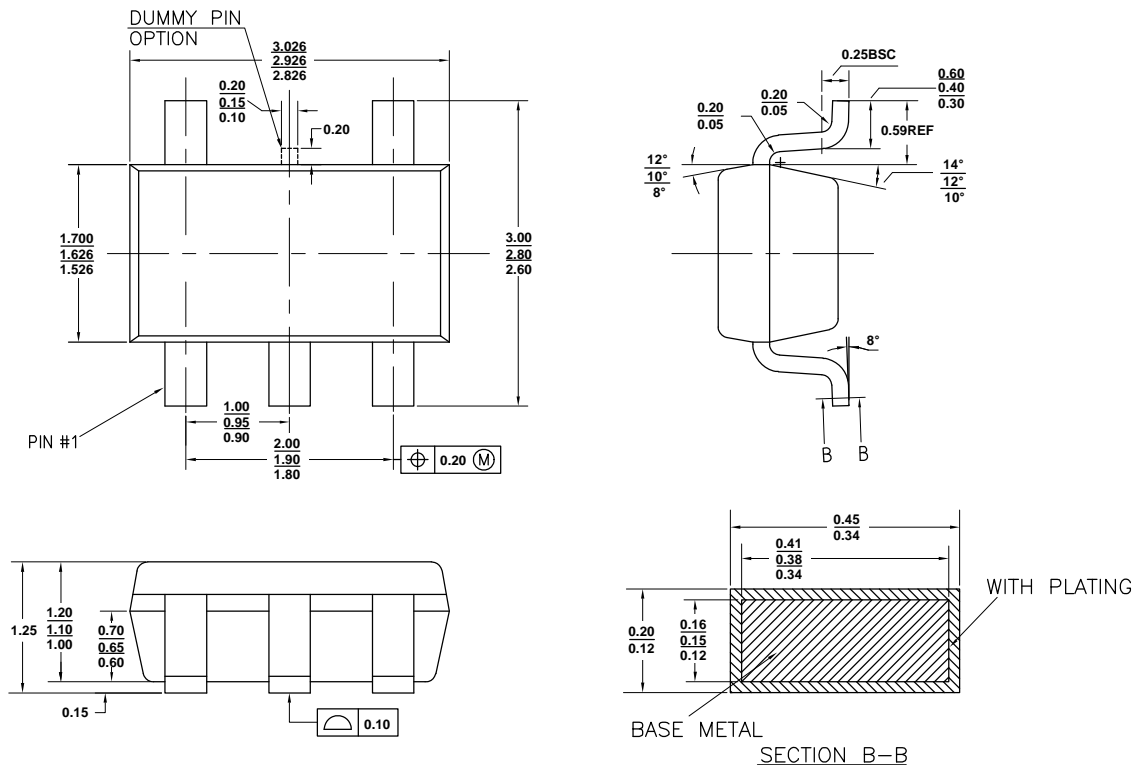


Figure 7. 5-Lead SOT23 Package Dimensions shown in millimeters

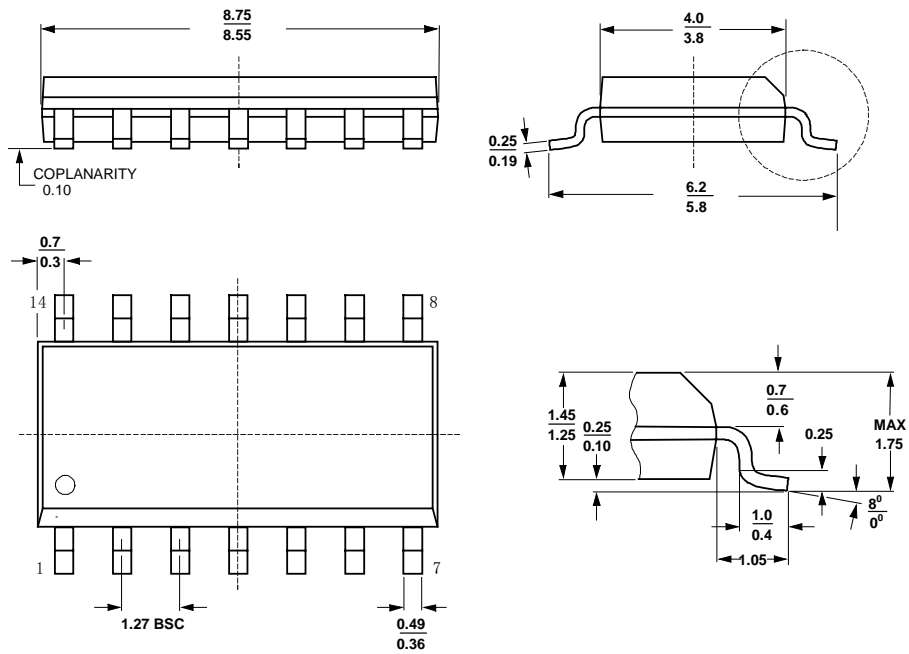


Figure 8. 14-Lead SOIC Package Dimensions shown in millimeters

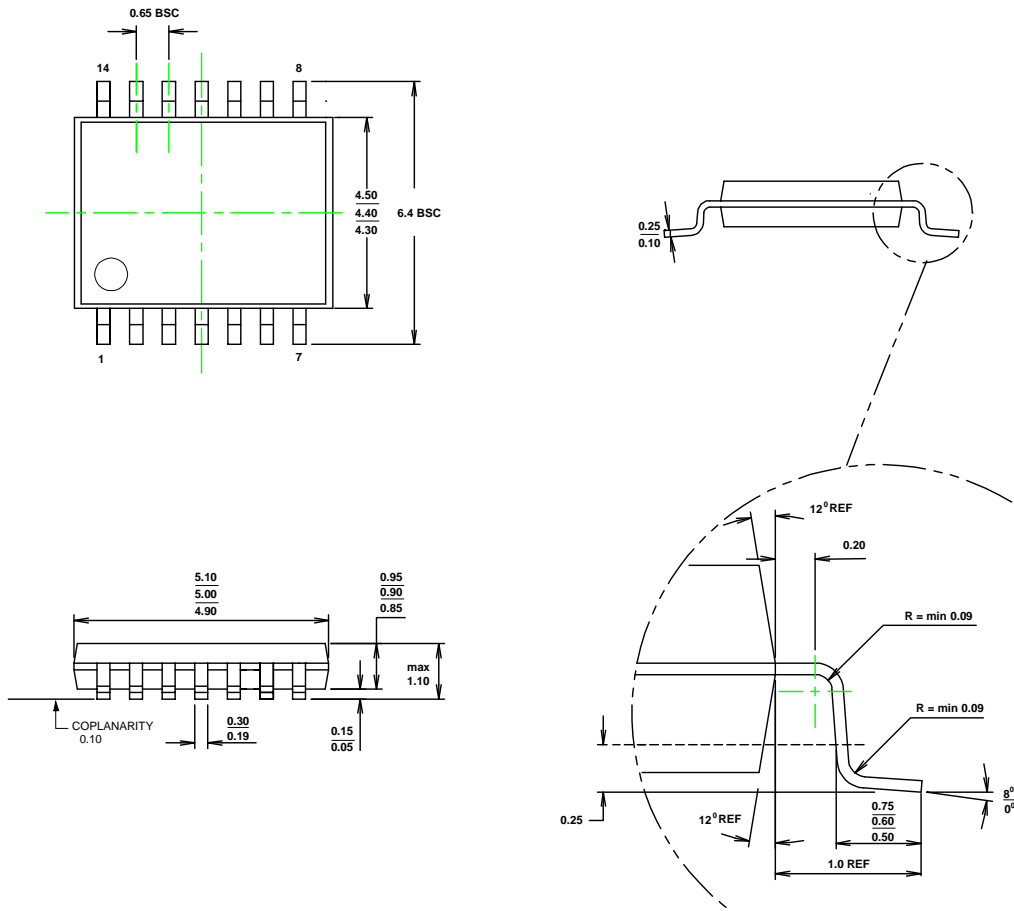


Figure 9. 14-Lead TSSOP Package Dimensions shown in millimeters