CoreadDvices
承芯微电子

CD2904

Dual-Channel High-Voltage Operational Amplifier

Version: Rev 1.0.0 Date: 2026-1-28

Features

- Internally frequency compensated for unity gain
- Large DC voltage gain: 100dB
- Wide power supply range:3V ~ 32V (or 1.5V ~ 16V)
- Input common-mode voltage range includes ground
- Large output voltage swing: 0V DC to VCC-1.5V DC
- Power drain suitable for battery operation
- Low input offset voltage and offset current
- Differential input voltage range equal to the power supply

Application

- Motor Control
- Portable Audio Device
- Power Supply and Mobile
- Personal Health
- Commercial Network and
- Motor Control

Description

The CD2904 contains two independent high gain operational amplifiers with internal frequency compensation. The two op-amps operate over a wide voltage range from a single power supply. Also use a split power supply. The device has low power supply current drain, regardless of the power supply voltage. The low power drain also makes the CD2904 a good choice for battery operation.

When your project calls for a traditional op-amp function, now you can streamline your design with a simple single power supply. Use ordinary +5VDC common to practically any digital system or personal computer application, without requiring an extra 15V power supply just to have the interface electronics you need.

The CD2904 is a versatile, rugged workhorse with a thousand-and-one uses, from amplifying signals from a variety of transducers to dc gain blocks, or any op-amp function. The attached pages offer some recipes that will have your project cooking in no time.

Contents

Pin Configurations

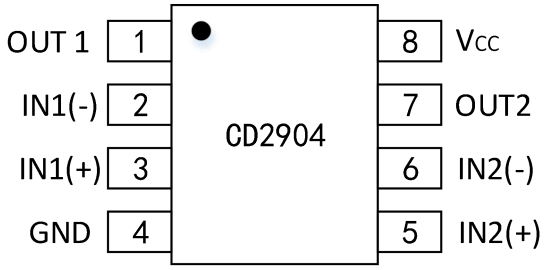


Figure 1. Pin Assignment Diagram

Absolute Maximum Ratings

Symbol	Min	Max
V_{CC}	Power Supply Voltages Single Supply	32V
	Split Supplies	±16V
V_{IDR}	Input Differential Voltage Range (1)	±32V
V_{ICR}	Input Common Mode Voltage Range	-0.3~32V
I_{SC}	Output Short Circuit Duration	Continuous
T_J	Junction Temperature Plastic Packages	150℃
T_{STG}	Storage Temperature Plastic Packages	-55~125℃
I_{IN}	Input Current, per pin (2)	50mA
T_L	Lead Temperature, 1mm from Case for 10 Seconds	260℃

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{CC}	DC Supply Voltage	±2.5 or 5.0	±15 or 30	V
T_A	Operating Temperature, All Package Types	-40	+105	℃

Electrical characteristics

Unless otherwise specified,T_A = 25°C

Symbol	Parameter	Min	Typ	Max	Unit
Offset Voltage					
Input Offset Voltage	V_O=1.4V,V_{CC}=5.0-30V; R_S=0Ω,V_{ICM}=0V to V_{CC}-1.7V	--	--	9.0 5.0*	mV
Input Offset Voltage Drift	R_S=0Ω,V_{CC}=30V	--	7.0	--	μV/℃
Input Bias Current	V_{CC}=5.0V	--	--	500 250*	nA
Input Offset Current	V_{CC}=5.0V	--	--	500 150*	nA
Input Offset Current Drift	R_S=0Ω, V_{CC}=30V	--	10	--	pA/℃
Input Common Mode Voltage Range	V_{CC}=30V	0	--	28	V
Power Supply Current	R_L=∞,V_{CC}=30V,V_O=0V R_L=∞,V_{CC}=5V,V_O=0V	0.3 0.3	--	3 1.2	mA
Common Mode Rejection	V_{CC}=30V, R_S=10KΩ，0V≤VCM≤ V_{CC}-1.5V	65*	--	--	dB
Power Supply Rejection	V_{CC}=5V to 30V，VCM=0V	65*	--	--	dB
Channel Separation	f=1KHz to 20KHz,V_{CC}=30V	-120	--	--	dB
Minimum Large Signal Open-Loop Voltage Gain	V_{CC}=15V, R_L≥2KΩ，VCM=V_{CC}/2, Vo=1.4~11.4V	15 25*	--	--	V/mV
Output High-Level Voltage Swing	V_{CC}=30V,R_L=2KΩ	26	--	--	V
	V_{CC}=30V,R_L=10KΩ	27	--	--	V
Output Low-Level Voltage Swing	V_{CC}=5V,R_L=10KΩ	--	--	20	mV
Power Supply Rejection	V_{CM} = 2.7V 至 5.5V	75	89	--	dB
Output Short Circuit to GND	V_{CC}=5.0V,V_O=0V	--	--	--	mA
Source Output Current	V_{IN+}=1V, V_{IN-}=0V, V_{CC}=15V, V_O=2V	10	--	--	mA
Output Sink Current	V_{IN+}=0V, V_{IN-}=1V,V_{CC}=15V, V_O=15V V_{IN+}=0V, V_{IN-}=1V,V_{CC}=15V, V_O=0.2V	5 10* 12*	--	--	mA μA
Differential Input Voltage Range	All V_{IN} GND or V-Supply (if used)	--	0.01	V_{CC}*	V

*=@25℃

Typical Characteristics

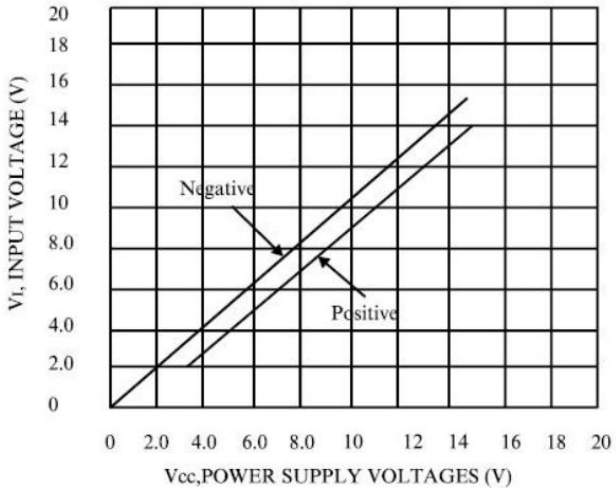


Figure 2.Input Voltage Range

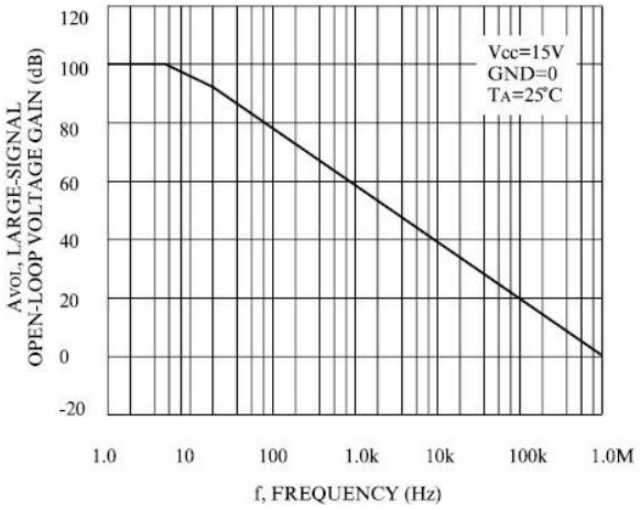


Figure 3.Open-Loop Frequency

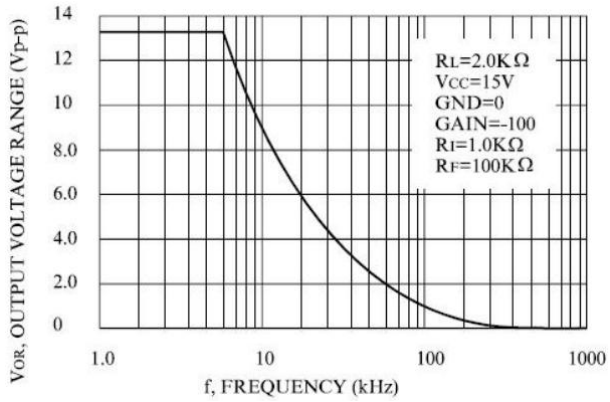


Figure 4.Large Signal Frequency Response

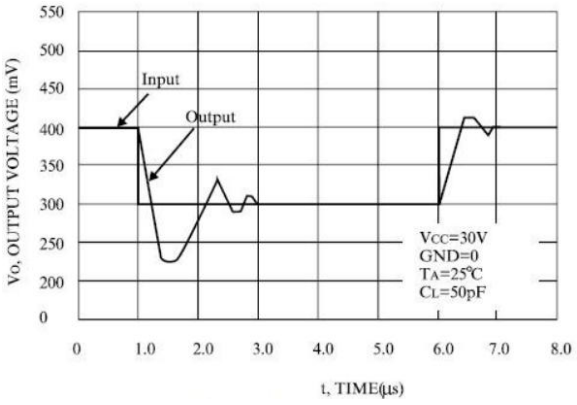


Figure 5.Small-Signal Voltage Follower Pulse Response(Noninverting)

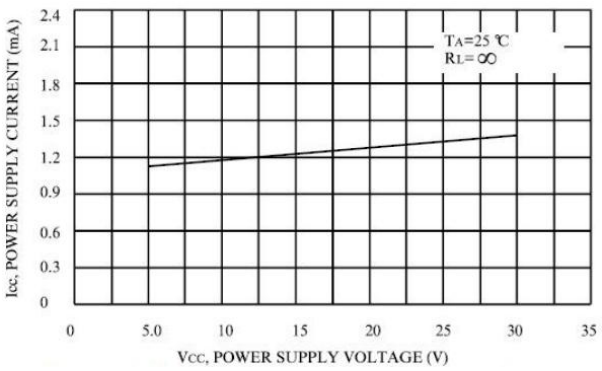


Figure 6.Power Supply Voltage VS Current

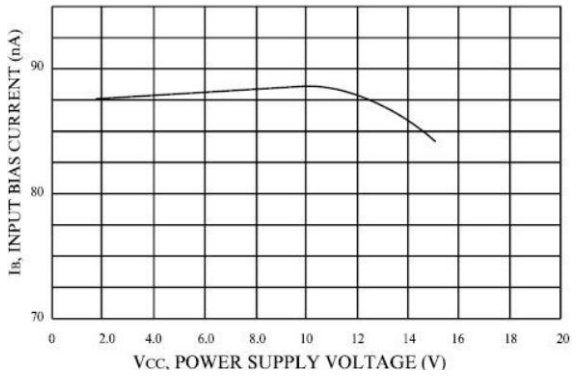
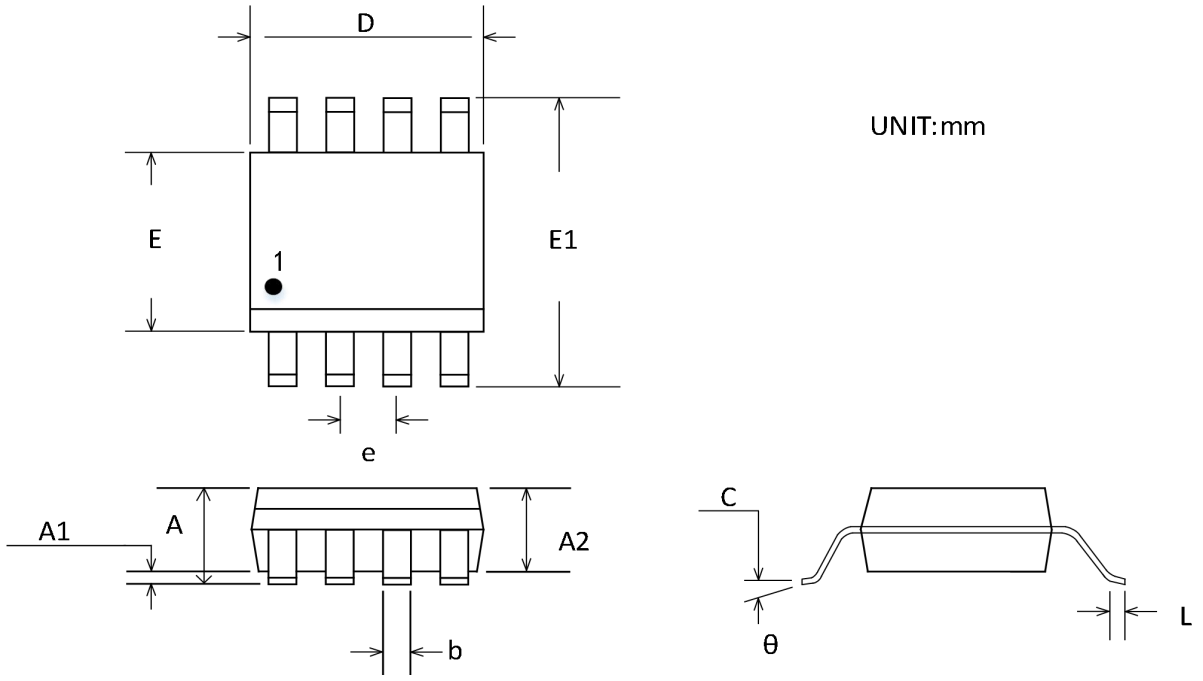


Figure 7.Input Bias Current VS Power Supply Voltage

Package Outline Dimensions

SOP-8



UNIT:mm

Symbol	Dimensions In Millimeters	
	Min	Max
A	1.350	1.750
A1	0.100	0.250
A2	1.350	1.550
b	0.330	0.510
c	0.170	0.250
D	4.800	5.000
E	3.800	4.000
E1	5.800	6.200
e	1.270 BSC	
L	0.400	1.270
θ	0°	8°

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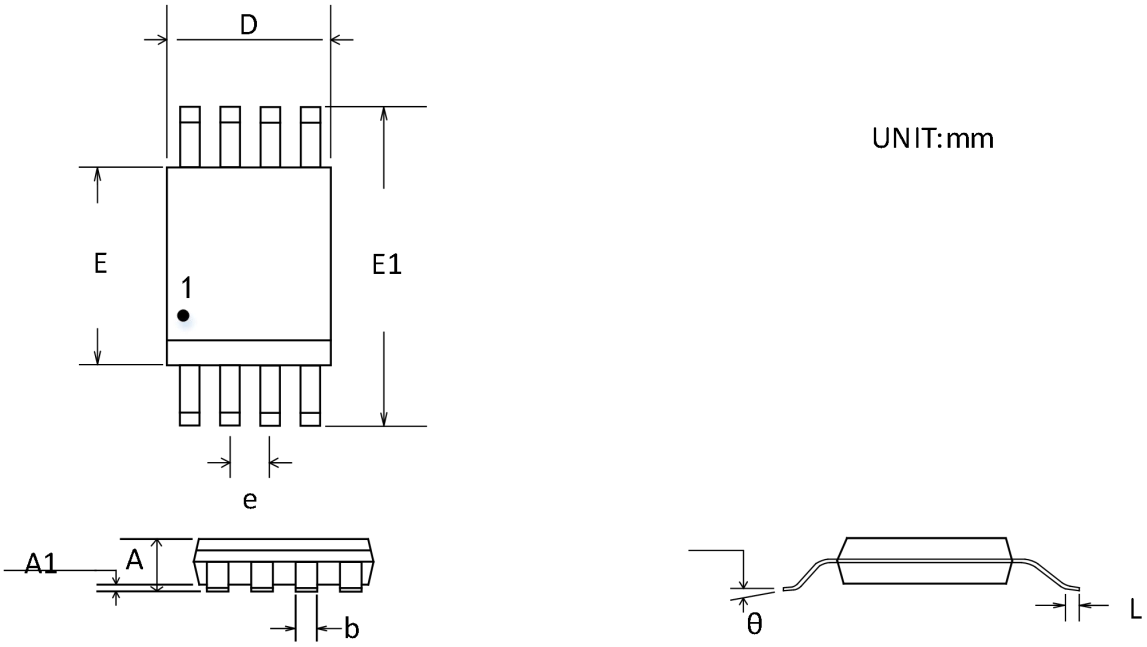
TSSOP-8



UNIT:mm

Symbol	Dimensions In Millimeters	
	Min	Max
A	--	1.20
A1	0.05	0.15
b	0.19	0.30
D	2.90	3.10
E	4.30	4.50
E1	6.40BSC	
e	0.65 BSC	
L	0.45	0.75
θ	0°	8°

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Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD2904AS8	-40℃~105℃	SOP-8	Tape and Reel, 2500
CD2904ATS8	-40℃~105℃	TSSOP-8	Tape and Reel, 3000

Revision Log

Version	Revision date	Change content	Reason for Change	Modified by	Reviewed By	Note
V1.0	2025.5.26	Initial version	Regular update	WW	LYL	
V1.1	2026.1.28	Add test conditions for AOL, CMRR and PSRR; add TSSOP8 POD	Regular Update	WW	LYL	