CD2902

Quad,high-voltage operational amplifier

Version: Rev 1.0.0 Date: 2025-6-3

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

- Walkie-Talkie

- Battery Management Solution

- Transducer Amplifiers

- Summing Amplifiers

- Multivibrators

- Oscillators

- Portable Systems

Description

The CD29022902 contains four independent high gain operational amplifiers with internal frequency compensation. The four 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 CD29022902 a good choice for battery operation.
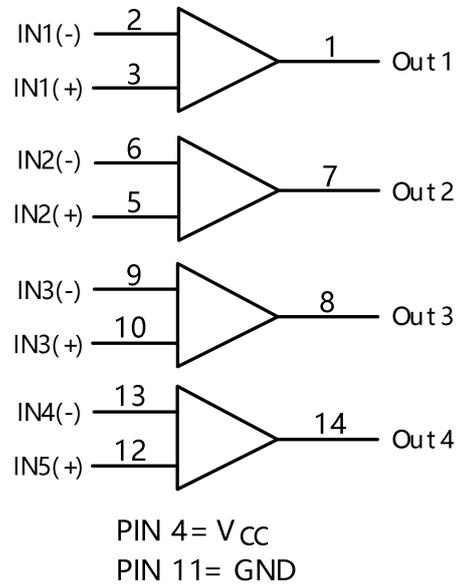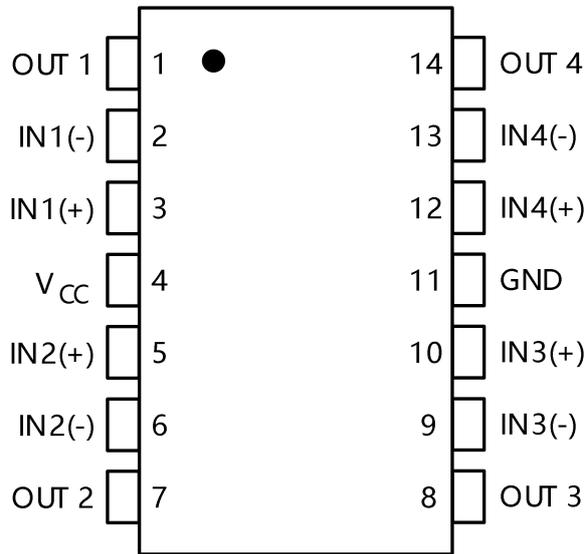
When your project calls for a traditional op-amp function, now you can streamline your design with a simple single power supply. Use ordinary +5V DC common to practically any digital system or personal computer application, without requiring an extra 15V power supply just to have the interface electronics you need.

The CD29022902 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

```
OUT 1  ┌1  ●      14┐ OUT 4
IN1(-) ┌2          13┐ IN4(-)
IN1(+) ┌3          12┐ IN4(+)
VCC    ┌4          11┐ GND
IN2(+) ┌5          10┐ IN3(+)
IN2(-) ┌6          9 ┐ IN3(-)
OUT 2  ┌7          8 ┐ OUT 3
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IN1(-) 2
IN1(+) 3
        1 Out 1

IN2(-) 6
IN2(+) 5
        7 Out 2

IN3(-) 9
IN3(+) 10
        8 Out 3

IN4(-) 13
IN5(+) 12
        14 Out 4

PIN 4 = V$_{CC}$
PIN 11 = GND

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V$_{CC}$	Power Supply Voltages •Single Supply •Split Supplies	32 ±16	V
V$_{IDR}$	Input Differential Voltage Range (1)	±32	V
V$_{ICR}$	Input Common Mode Voltage Range	-0.3 to 32	V
I$_{SC}$	Output Short Circuit Duration	Continuous	
T$_{J}$	Junction Temperature (Plastic Packages)	150	℃
T$_{stg}$	Storage Temperature (Plastic Packages)	-55 to +125	℃
I$_{IN}$	Input Current, per pin (2)	50	mA
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

Symbol	Parameter	Test Conditions	Guaranteed Limit			Unit
			Min	Typ	Max	
V_{IO}	Maximum Input Offset Voltage	V_O=1.4V V_{CC}=5.0-30V; R_S=0 Ω			9.0	mV
		V_{ICM}=0V to V_{CC}-1.7V			5.0*	
$\triangle V_{IO}/\triangle T$	Input Offset Voltage Drift	R_S=0Ω, V_{CC}=30V		7.0		μV/℃
I_{IO}	Maximum Input Offset Current	V_{CC}=5.0V			150	nA
					50*	
$\triangle I_{IO}/\triangle T$	Input Offset Current Drift	R_S=0Ω, V_{CC}=30V		10		pA/ ℃
I_{IB}	Maximum Input Bias Current	V_{CC} = 5.0V			500	nA
					250*	
V_{ICR}	Input Common Mode Voltage Range	V_{CC} = 30V	0		28	V
I_{CC}	Maximum Power Supply Current	R_L=∞, V_{CC}=30V, V0=0V			3	mA
		R_L=∞, V_{CC}=5V, V0=0V			1.2	
A_{VOL}	Minimum Large Signal Open-Loop Voltage Gain	V_{CC} =15V, R_L ≥ 2KΩ	15			V/mV
			25*			
V_{OH}	Minimum Output	V_{CC}=30V,R_L=2KΩ	26			V
	High-Level Voltage Swing	V_{CC}=30V,R_L=10KΩ	27			
V_{OL}	Maximum Output Low-Level Voltage Swing	V_{CC}=5V,R_L=10KΩ			20	mV
C_{MR}	Common Mode Rejection	V_{CC}=30V, R_S=10KΩ	65*			dB
P_{SR}	Power Supply Rejection	V_{CC}=30V	65*			dB
C_S	Channel Separation	f=1KHz to 20KHz,V_{CC}=30V	120			dB
I_{SC}	Maximum Output Short Circuit to GND	V_{CC}=5.0V			60*	mA
I_{source}	Minimum Output Source Current	V_{IN}+=1V, V_{IN}-=0V, V_{CC}=15V, V_0=0V	10			mA
I_{sink}	Minimum Output Sink Current	V_{IN}+=0V, V_{IN}-=1V, V_{CC}=15V,	5			mA
		V_0=15V	10*			
		V_{IN}+=0V, V_{IN}-=1V,	12*			μA

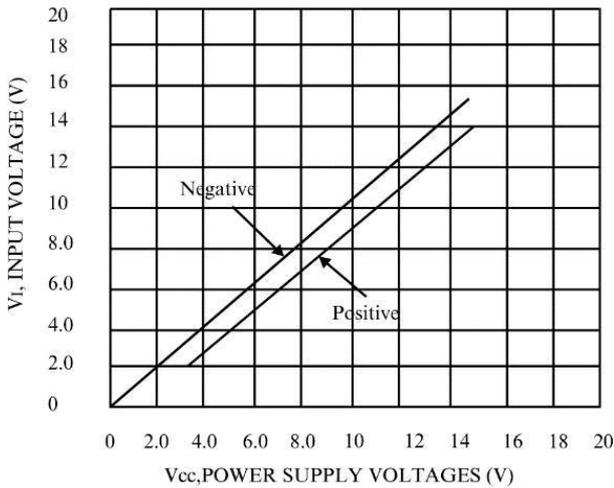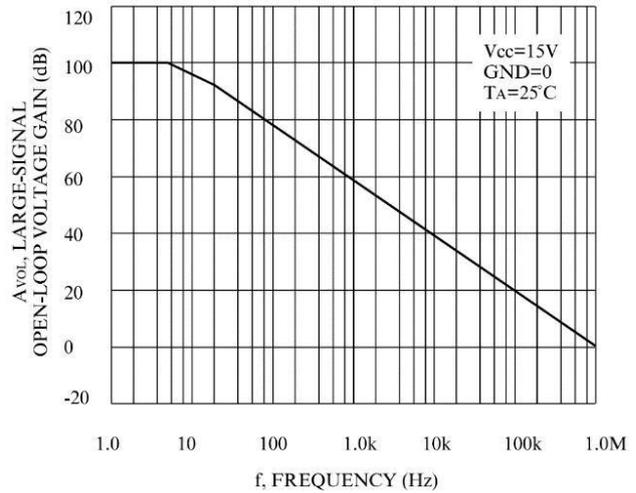|		V_{CC}=15V,V_0=0.2V				
VIDR	Differential Input Voltage Range	All V_{IN} ≥ GND or V-Supply (if used)			V_{CC}*	V

*=@25℃

Typical Characteristics

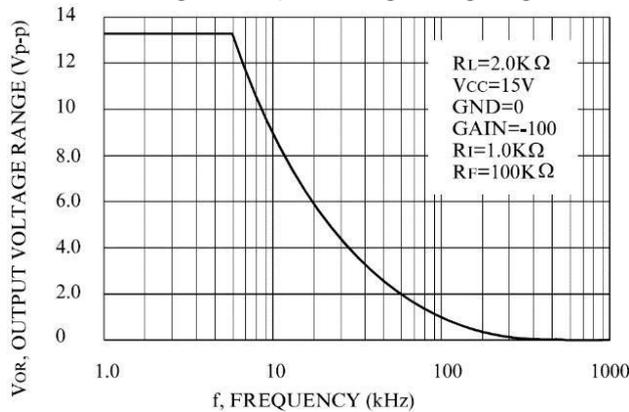Figure 1.Input Voltage Range Figure

2. Open-Loop Frequency

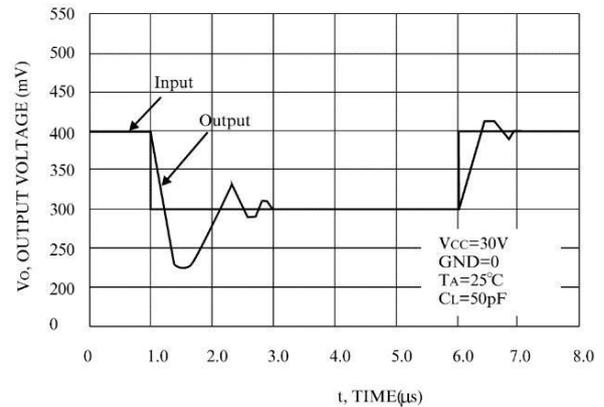Figure 3. Large-Signal Frequency Response

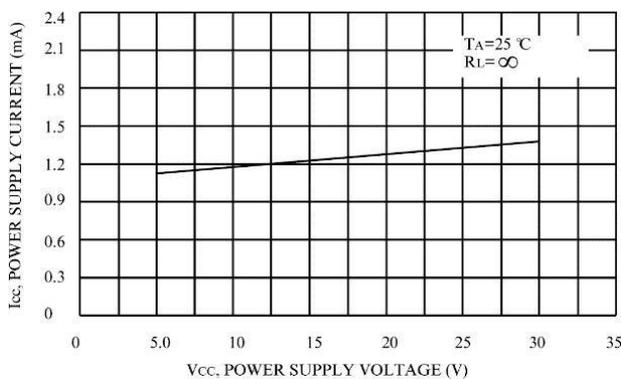Figure 4. Small-Signal Voltage Follower Pulse Response (Noninverting)

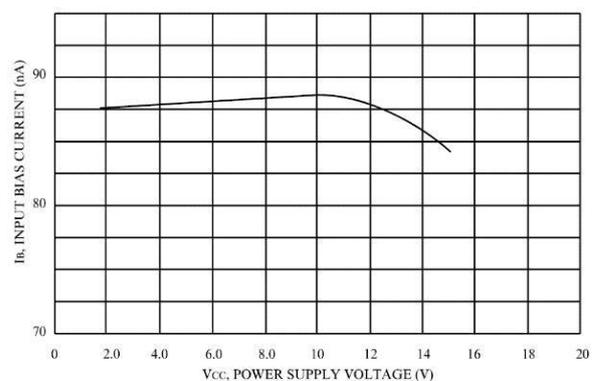Figure 5. Power Supply Current versus Power Supply Voltage

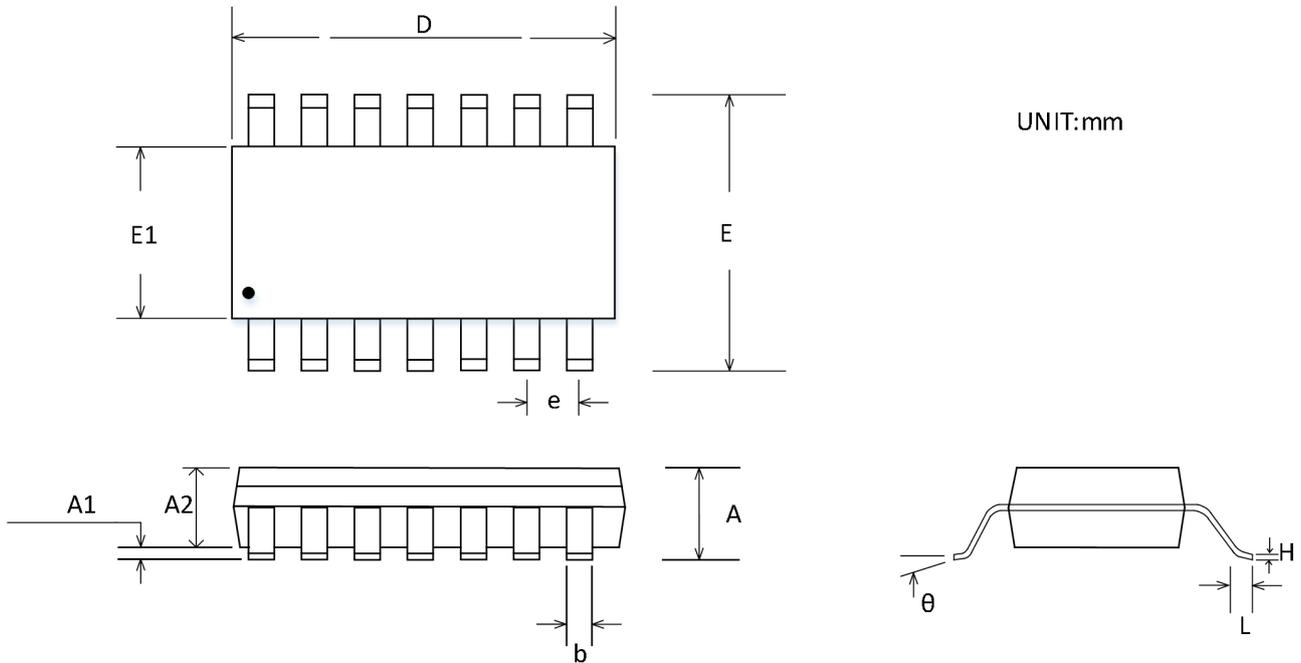Figure 6. Input Bias Current versus Power Supply Voltage

Package Outline Dimensions

SOP-14

UNIT:mm

Symbol	Dimensions In Millimeters	
	Min	Max
A	1.35	1.75
A1	0.10	0.25
A2	1.25	1.50
b	0.31	0.51
D	8.55	8.75
E	5.80	6.20
E1	3.80	4.00
e	1.27BSC	
H	0.17	0.25
L	0.40	1.27
θ	0°	8°

Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD29022902AS14	-40℃~105℃	SOP-14	Tape and Reel, 2500
CD29022902AS14-RL	-40℃~105℃	SOP-14	Tape and Reel, 3000
CD29022902AS14-REEL	-40℃~105℃	SOP-14	Tape and Reel, 4000
CD29022902ATS14	-40℃~105℃	TSSOP-14	Tape and Reel, 2500
CD29022902ATS14-RL	-40℃~105℃	TSSOP-14	Tape and Reel, 3000
CD29022902ATS14-REEL	-40℃~105℃	TSSOP-14	Tape and Reel, 4000

Revision Log

Version	Revision date	Change content	Reason for Change	Modified by	Reviewed By	Note
V1.0	2025.6.3	Initial version	Regular update	WW	LYL	

Chinese version:CD2902