

LM2902

DATASHEET

Specification Revision History:

Version	Date	Description
V1.0	2019/08	New
V1.1	2021/05	Modify Ordering Information
V1.2	2025/02	Modify Ordering Information
V1.3	2025/03	Add application precautions and overall typesetting.

Description

The LM2902 consists of four independent, high gain internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide voltage range.

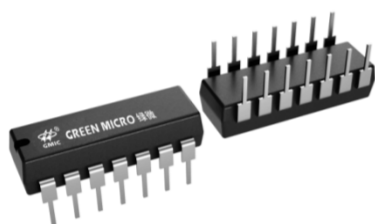
Operation from split power supplies is also possible so long as the difference between the two supplies is 3 Volts to 30 volts.

Application areas include transducer amplifier, DC gain blocks and all the conventional OP amp circuits which now can be easily implemented in single power supply system.

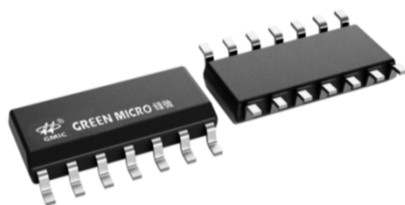
Features

- ※ Internally frequency compensated for unity gain
- ※ Large DC voltage gain: 100dB
- ※ Wide operating supply range ($V_{CC}=3V\sim 30V$)
- ※ Input common-mode voltage includes ground
- ※ Large output voltage swing: From 0V to $V_{CC}-2.0V$
- ※ Power drain suitable for battery operation

The appearance of the product



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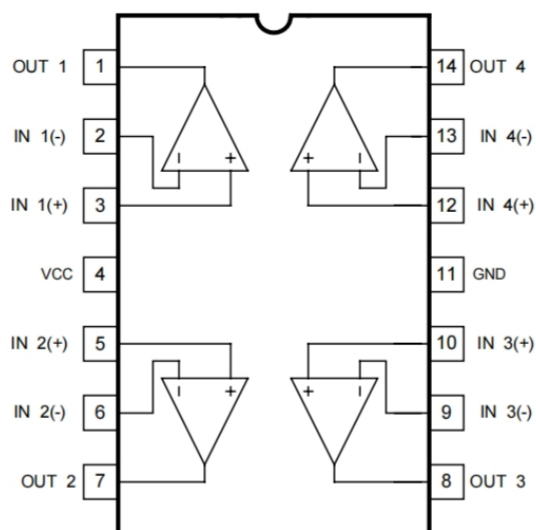


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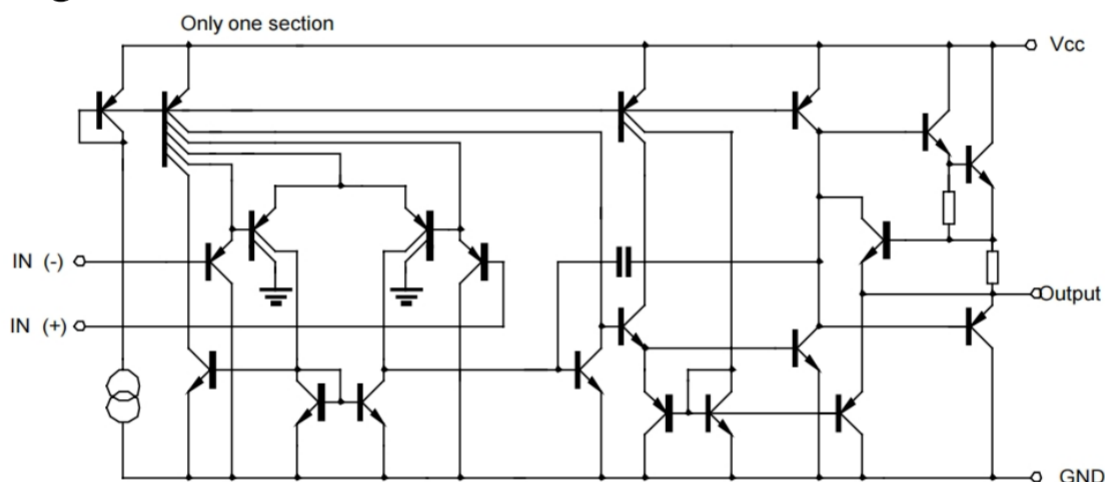
Ordering Information

Product Model	Package Type	Packing	Packing Qty
LM2902N(GMIC)	DIP-14	TUBE	1000PCS/BOX
LM2902DR(GMIC)	SOP-14	REEL	2500PCS/REEL
LM2902	DIP-14	TUBE	1000PCS/BOX
LM2902	SOP-14	REEL	2500PCS/REEL

Pin Configuration



Block Diagram



Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	± 15	V
Differential input voltage	$V_{i(\text{diff})}$	30	V
Input Voltage	V_i	-0.3~30V	V
Power Dissipation	P_d	570	mW
Operating Temperature	T_{opr}	0 to +70	C
Storage Temperature	T_{stg}	-65 to 150	$^{\circ}\text{C}$

Electrical Characteristics_(Ta=25°C)

(Vcc=5.0V, All voltage referenced to GND unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V_{IO}	$V_{CM}=0$ to $V_{CC}-1.5$ $V_{O(p)}=1.4V, R_s=0$		2.0	7.0	mV
Input offset current	I_{IO}			3.0	50	nA
Input Bias current	I_b			40	250	nA
Input Common-mode voltage range	$V_{I(R)}$	$V_{CC}=30V$	0	$V_{CC}-2.0$		V
Supply Current	I_{CC}	$R_L=\infty, V_{CC}=30V$		1.0	4	mA
		$V_{CC}=5V$		0.7	2	mA
Large signal Voltage Gain	G_V	$V_{CC}=15V, R_L>2k\Omega$ $V_{O(p)}=1V$ to $11V$	25	100		V/mV
Output voltage Swing	$V_{(OH)}$	$V_{CC}=30V, R_L=2k\Omega$	26			V
		$V_{CC}=30V, R_L=10k\Omega$	26	28		V
	$V_{(OL)}$	$V_{CC}=5, R_L>10k\Omega$		5	20	mV
Common-mode rejection Ratio	CMRR		65	75		dB
Power supply rejection Ratio	PSRR		65	100		dB
Channel Separation	CS	$f=1kHz$ to $20kHz$		5	20	mV
Short circuit to GND	I_{sc}			40	60	mA
Output current	I_{source}	$V_I(+)=1V, V_I(-)=0$ $V_{CC}=15V, V_{O(p)}=2V$	20	40		mA
	I_{sink}	$V_I(+)=0V, V_I(-)=1V$ $V_{CC}=15V, V_{O(p)}=2V$	10	13		mA
		$V_I(+)=1V, V_I(-)=0$ $V_{CC}=15V, V_{O(p)}=200mV$	12	45		μA
Differential input voltage	$V_{I(diff)}$				V_{CC}	V

Typical Characteristics Performance

Fig.1 Input Voltage Range

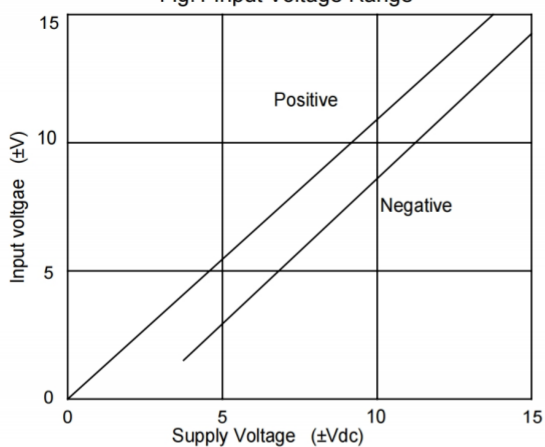


Fig.2 Input Current

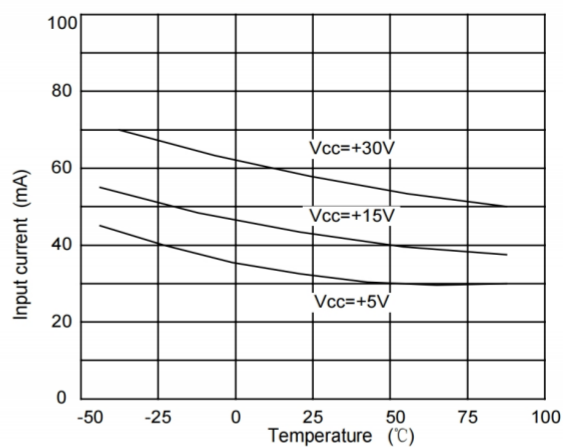


Fig.3 Supply Current

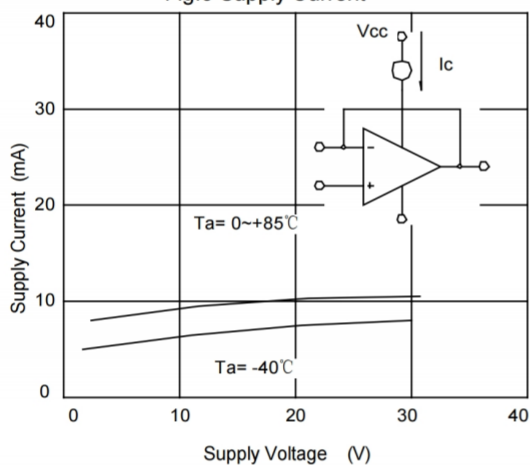


Fig.4 Voltage Gain

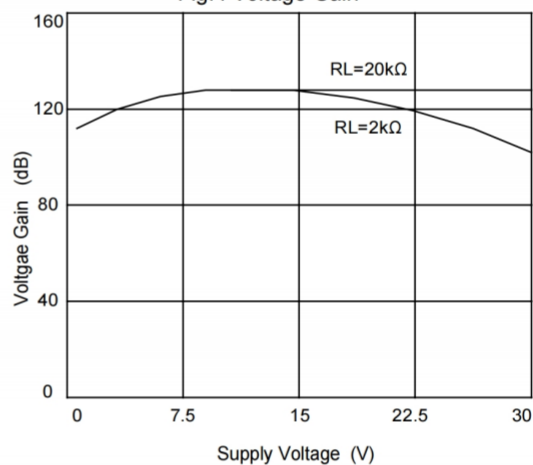


Fig.5 Open Loop Frequency response

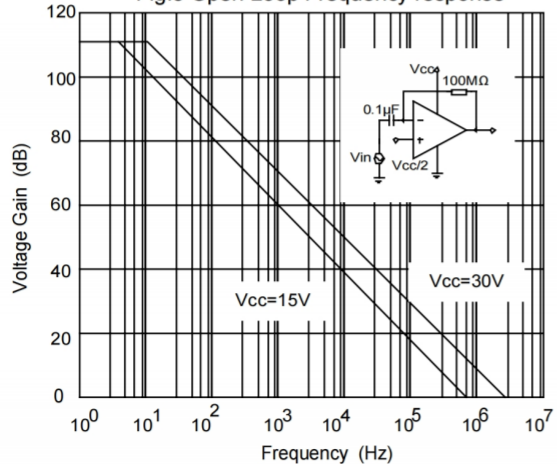


Fig.6 Common-mode rejection Ratio

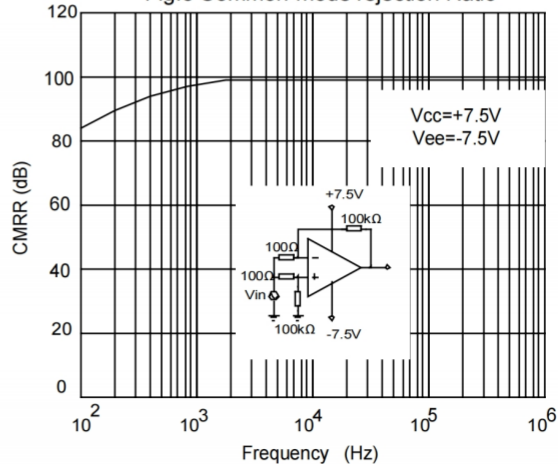


Fig.7

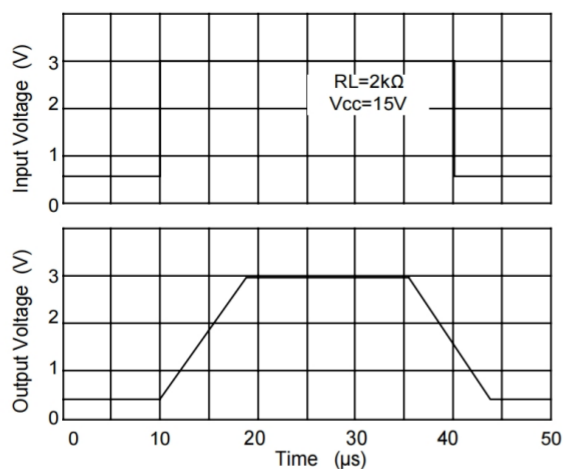


Fig.8 voltage Follower pulse response (small signal)

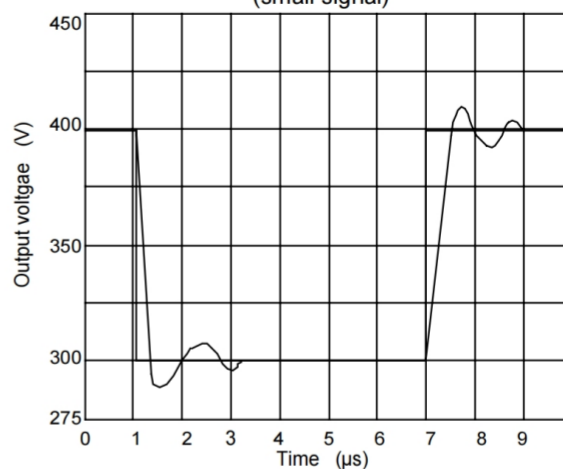


Fig.9 Large signal Frequency Response

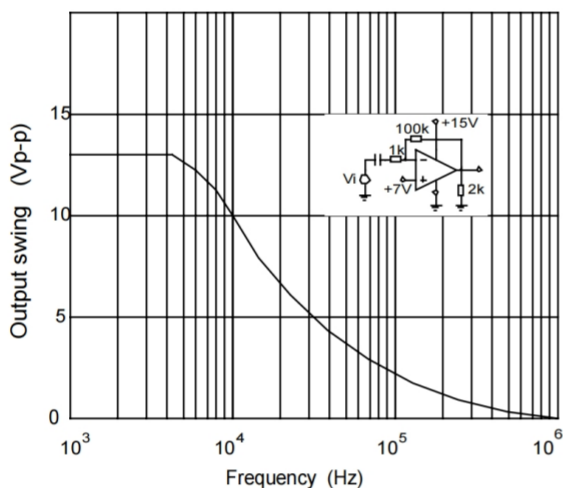


Fig.10 Output Characteristics current sourcing

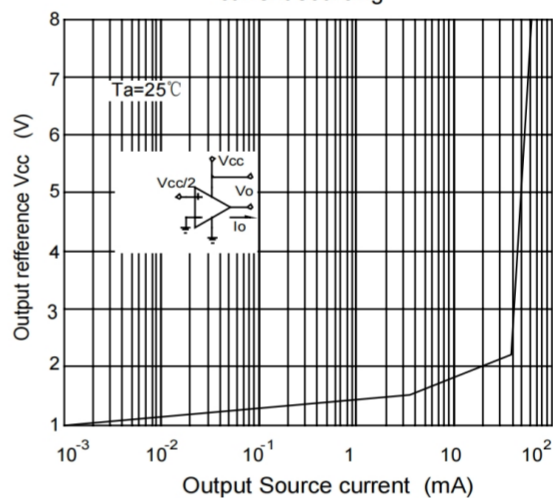


Fig.11 Output Characteristics Current sinking

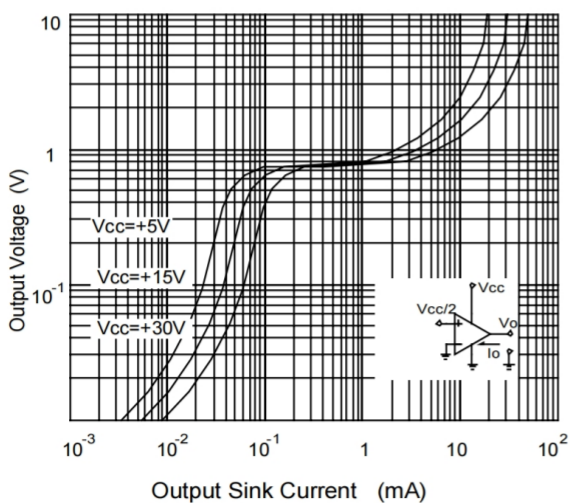
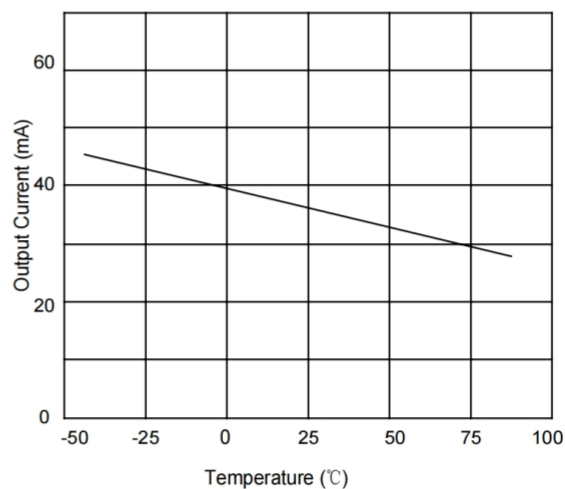
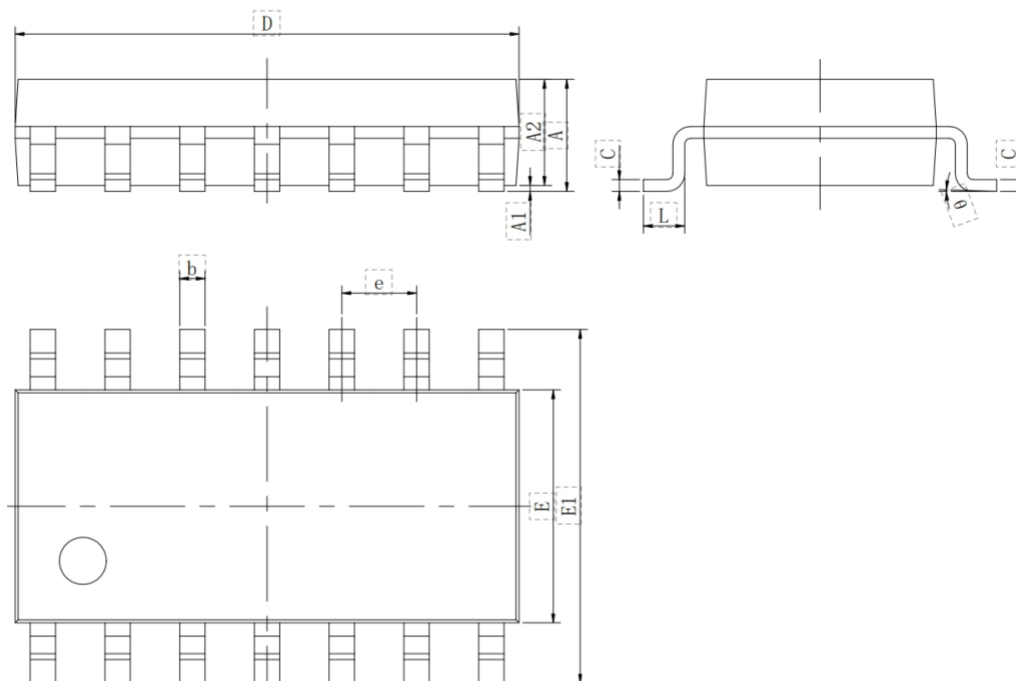


Fig.12 Current Limiting



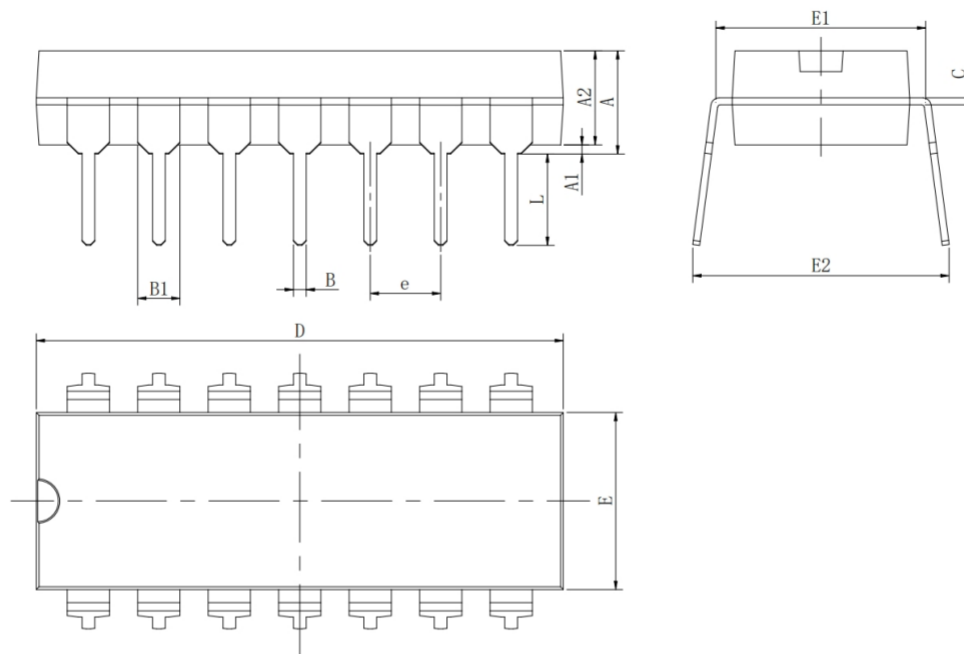
Outline Dimensions

SOP-14



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	8.360	8.760	0.329	0.345
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

DIP-14



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

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