

# LM2901

## DATASHEET

### Specification Revision History:

Version	Date	Description
V1.0	2019/03	New
V1.1	2021/11	Modify Ordering Information
V1.2	2025/02	Modify Ordering Information
V1.3	2025/03	Add application precautions and overall typesetting.

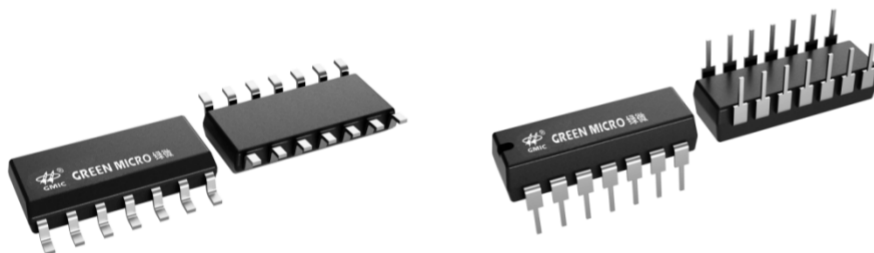
## Description

The LM2901 consists of four independent voltage comparators, designed specifically to operate from a single power supply over a wide voltage range.

## Features

- ※Signal or dual supply operation.
- ※Wide operating supply range( $V_{CC}=2V\sim 30V$ ).
- ※Input common-mode voltage includes ground.
- ※Low supply current drain  $I_{CC}=0.8mA$ (Typical).
- ※Open collector outputs for wired and connection.
- ※Low input bias current  $I_{bias}=25nA$ (Typical).
- ※Low output saturation voltage.
- ※Output compatible with TTL, DTL, and CMOS logic system.

## The appearance of the product



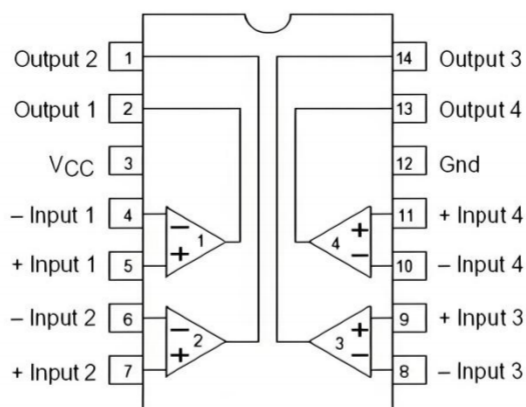
SOP-14

DIP-14

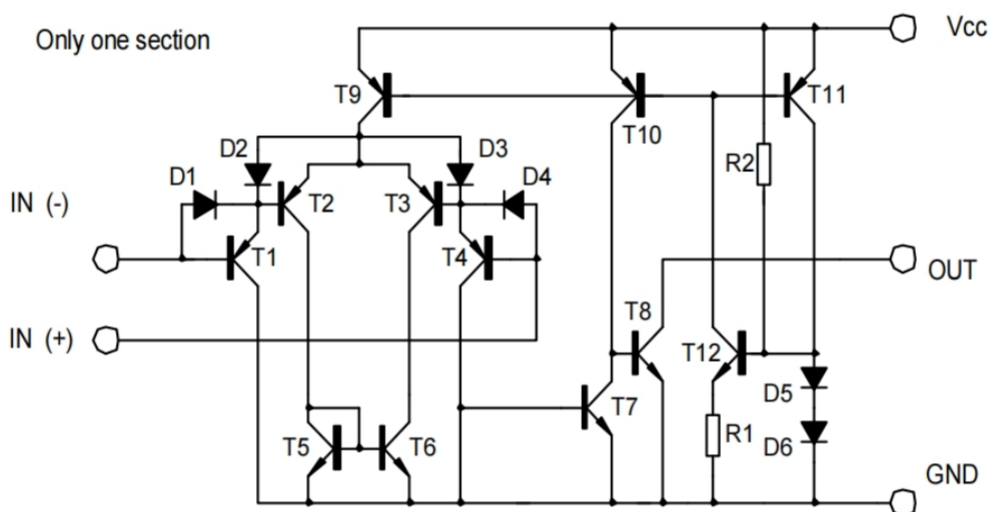
## Ordering Information

Product Model	Package Type	Packing	Packing Qty
LM2901N(GMIC)	DIP-14	TUBE	1000PCS/BOX
LM2901DR(GMIC)	SOP-14	REEL	2500PCS/REEL
LM2901	DIP-14	TUBE	1000PCS/BOX
LM2901	SOP-14	REEL	2500PCS/REEL

## Pin Configurations



## Block Diagram



## Absolute Maximum Ratings (Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V <sub>CC</sub>	±15 OR 30	V
Differential input Voltage	V <sub>ID</sub>	30	V
Input Voltage	V <sub>I</sub>	-0.3~30V	V
Power Dissipation	P <sub>d</sub>	570	mW
Operating Temperature	T <sub>opr</sub>	0 to+70	°C
Storage Temperature	T <sub>stg</sub>	-65 to 150	°C

## Electrical Characteristics

(V<sub>cc</sub>=5.0V, T<sub>a</sub>=25°C, All voltage referenced to GND unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
Input Offset Voltage	V <sub>IO</sub>	V <sub>CM</sub> =0 to V <sub>cc</sub> -1.5 V <sub>o(p)</sub> =1.4V, R <sub>s</sub> =0		±1.5	±5.0	mV
Input Offset Current	I <sub>IO</sub>			±2.3	±50	nA
Input Bias Current	I <sub>b</sub>			57	200	nA
Input Common-Mode Voltage Range	V <sub>I(R)</sub>		0		V <sub>cc</sub> -1.5	V
Supply Current	I <sub>cc</sub>	R <sub>L</sub> =∞		1.1	2.0	mA
Large Signal Voltage Gain	G <sub>v</sub>	V <sub>cc</sub> =15V, R <sub>L</sub> >15kΩ	50	200		V/mV
Large Signal Response Time	t <sub>res</sub>	V <sub>i</sub> =TTL logic wing V <sub>ref</sub> =1.4V, V <sub>RL</sub> =5V, R <sub>L</sub> =5.1kΩ		350		ns
Response Time	t <sub>res</sub>	V <sub>RL</sub> =5V, R <sub>L</sub> =5.1kΩ		1400		ns
Output Sink Current	I <sub>sink</sub>	V <sub>i(-)</sub> >1V, V <sub>i(+)</sub> =0V, V <sub>o(p)</sub> <1.5V	6	18		mA
Output Saturation Voltage	V <sub>sat</sub>	V <sub>i(-)</sub> >1V, V <sub>i(+)</sub> =0V, I <sub>sink</sub> =4mA		140	400	mV
Output Leakage Current	I <sub>leakage</sub>	V <sub>i(+)</sub> =1V, V <sub>i(-)</sub> =0 V <sub>o(p)</sub> = 5V V <sub>o(p)</sub> =30V		0.1	1.0	nA μA
Differential Input Voltage	V <sub>I(diff)</sub>				32	V

# Typical Performance Characteristics

Fig.1 supply current

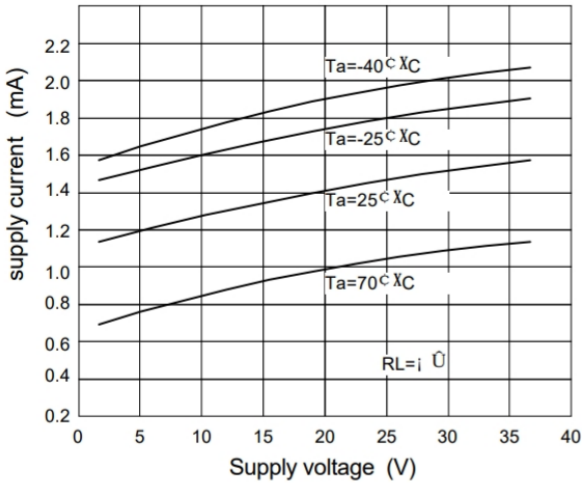


Fig.2 Input current

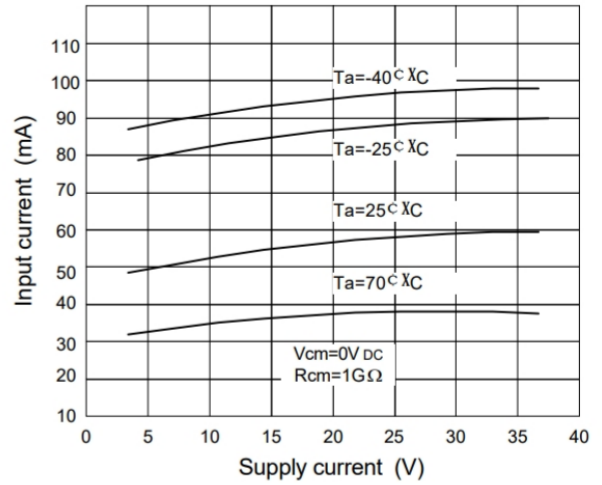


Fig.3 Output saturation voltage

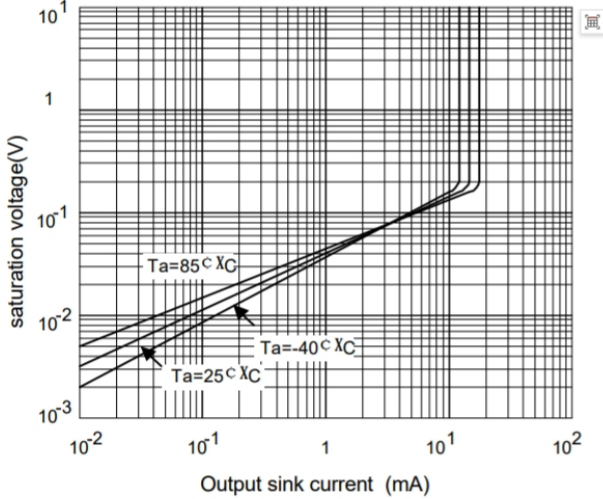


Fig.4 Reponse time for various input overdrive negative transition

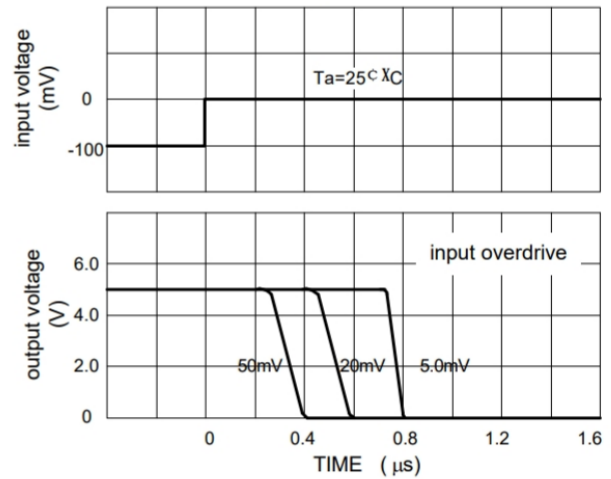


Fig.5 Reponse time for various input overdrive positive transition

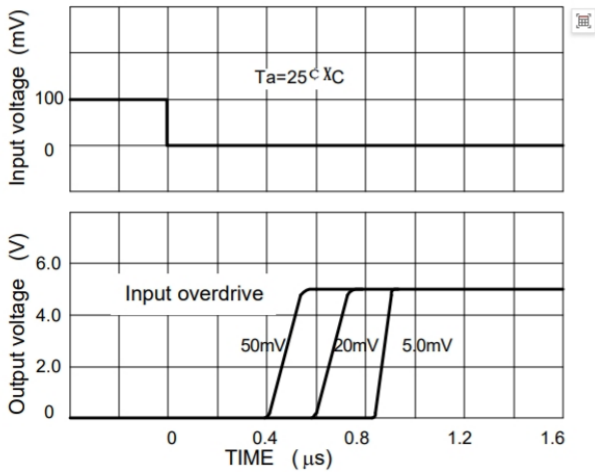


Fig.6

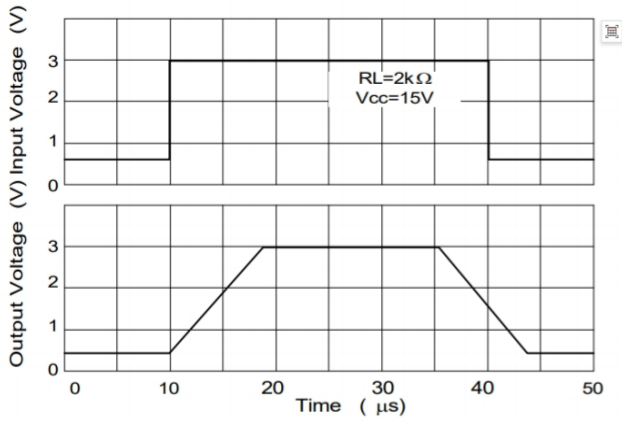


Fig.7 voltage Follower pulse response (small signal)

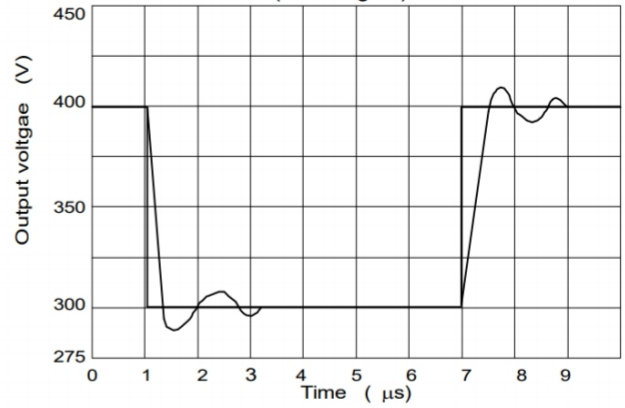


Fig.8 Large signal Frequency Response

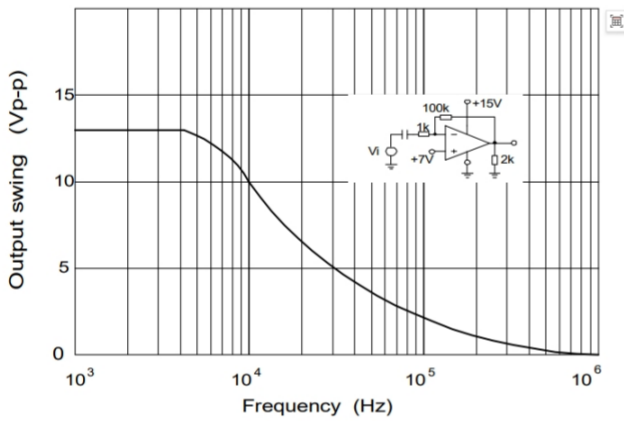


Fig.9 Output Characteristics current sourcing

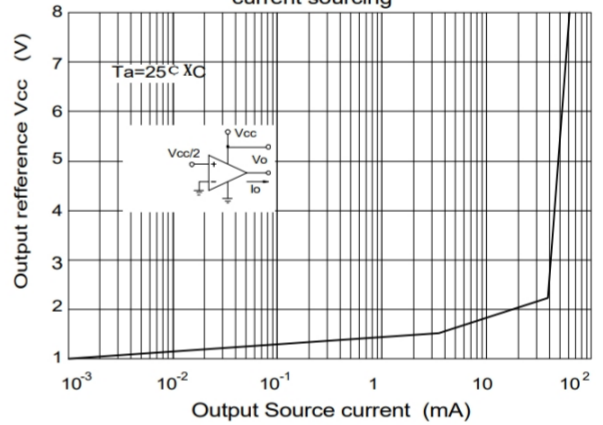


Fig.10 Output Characteristics Current sinking

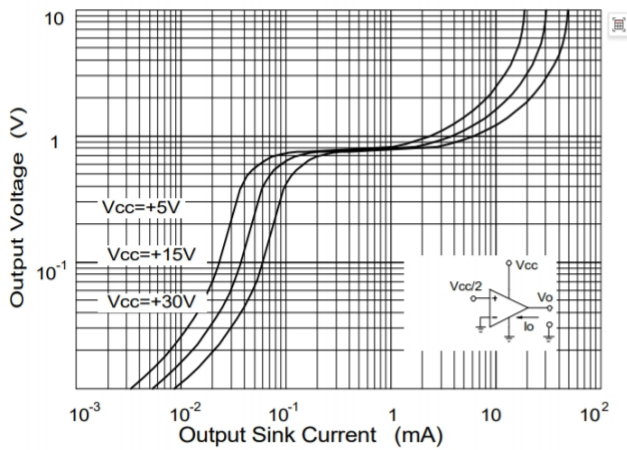
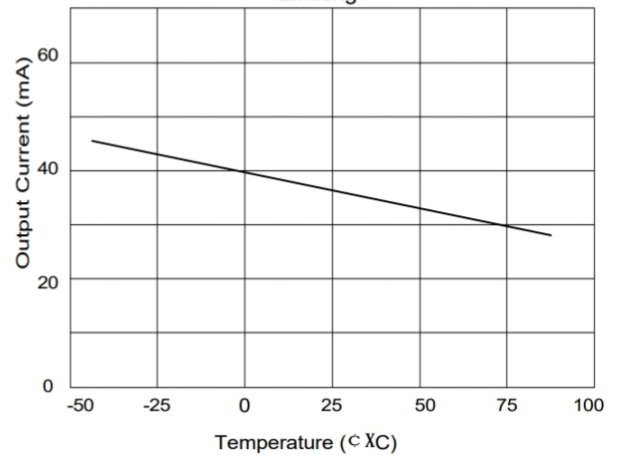
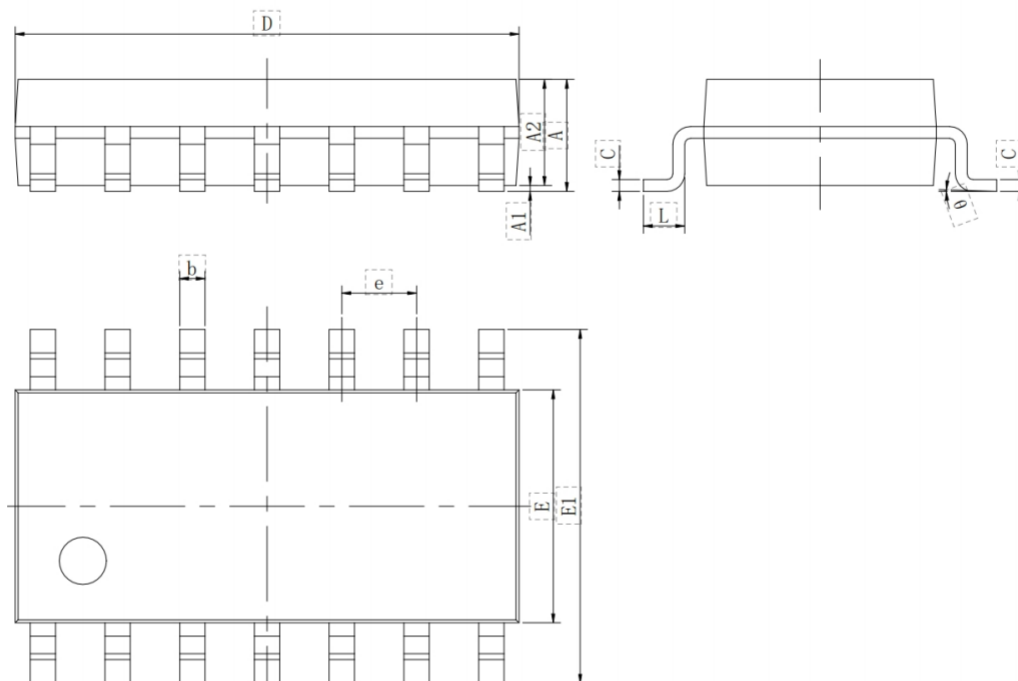


Fig.11 Current Limiting



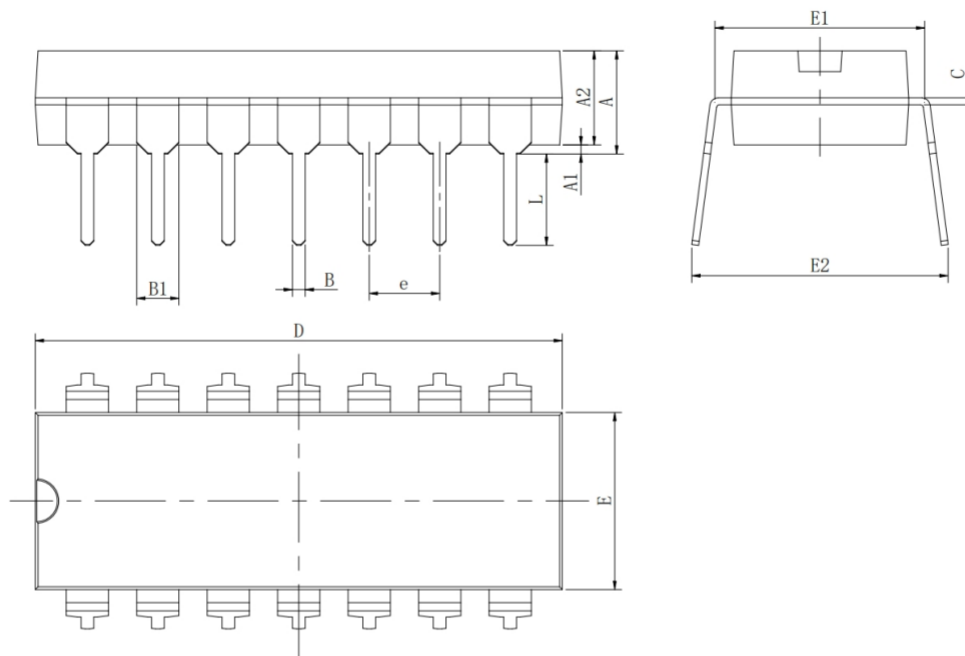
### Outline Dimensions

#### 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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