



Descriptions

The LM2901DR2G is a quad voltage integrated comparators mainly obtained in consumer and industrial electronics products, and designed for use in level detection, low-level sensing.

It is available in SOP-14(SOIC-14) package.

Feature

- Wide Supply Voltage Range
Single Supplies: 2.0V to 36V
Dual Supplies: $\pm 1.0V$ to $\pm 18V$
- Single or Split Supply Operation
- Low Input Biasing Current: 25 nA (Typ)
- Low Input Offset Current: 5.0 nA (Typ)
- Low Output Saturation Voltage: 130 mV (Typ)
- Output Voltage Compatible With TTL, CMOS Logic Systems

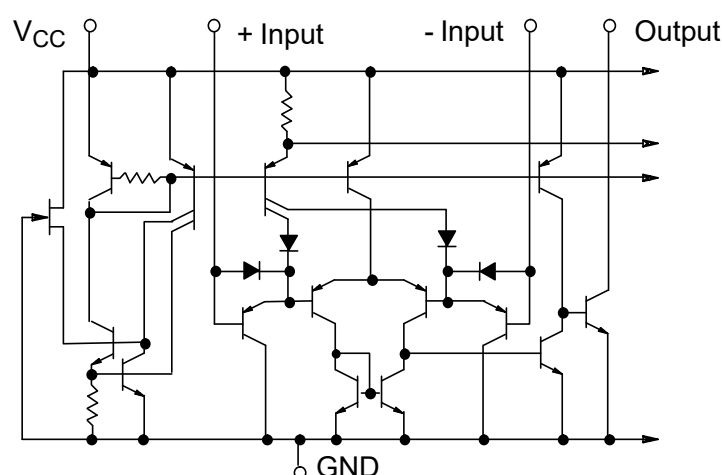
Applications

- Vacuum robot
- Single phase UPS
- Server PSU
- Cordless power tool
- Wireless infrastructure
- Appliances
- Building automation
- Factory automation & control
- Motor drives
- Infotainment & cluster

Ordering Information

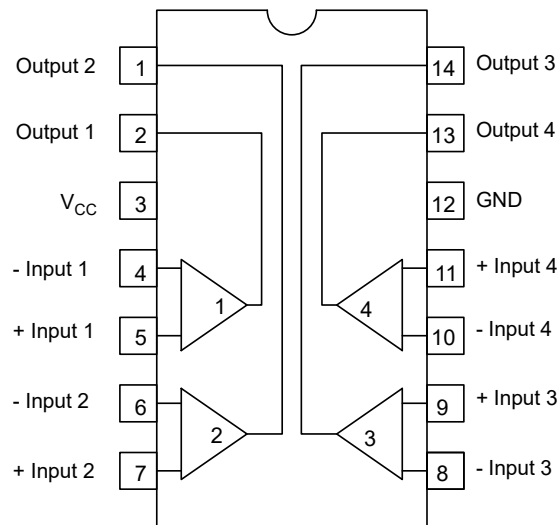
Product Model	Package Type	Packing	Packing Qty
LM2901DR2G	SOP-14(SOIC-14)	Tape	2500Pcs/Reel

Schematic Diagram





Pin Diagram



(Top View)

Pins Configurations

No.	Description	Symbol	No.	Description	Symbol
1	OUTPUT 2	OUT2	8	INVERTING INPUT 3	IN3(-)
2	OUTPUT 1	OUT1	9	NONINVERTING INPUT 3	IN3(+)
3	POWER SUPPLY	V _{CC}	10	INVERTING INPUT 4	IN4(-)
4	INVERTING INPUT 1	IN1(-)	11	NONINVERTING INPUT 4	IN4(+)
5	NONINVERTING INPUT 1	IN1(+)	12	GROUND	GND
6	INVERTING INPUT 2	IN2(-)	13	OUTPUT 4	OUT4
7	NONINVERTING INPUT 2	IN2(+)	14	OUTPUT 3	OUT3



Absolute Maximum Ratings

TA=25°C, unless otherwise noted

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	36 or ±18	V
Input Differential Voltage Range	V _{IDR}	36	V
Input common-mode Voltage Range	V _{ICMR}	-0.3 ~ V _{CC}	V
Output Current	I _{SC}	50	mA
Power Dissipation(Note *)	P _D	1.0	W
Ambient Temperature	T _{amb}	-20 ~ 85	°C
Storage Temperature	T _{stg}	-65 ~ 150	°C

Note *: When used above 25°C, the power consumption decreases by 8mW for every 1°C increase.

Electrical Characteristics

TA=25°C, V_{CC}=5V, unless otherwise noted

Characteristics	Test Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Input Offset Voltage	Ta=25°C	V _{IO}		2.0	7.0	mV
	0°C≤Ta≤70°C				9.0	
Input Offset Current	Ta=25°C	I _{IO}		5.0	50	nA
	0°C≤Ta≤70°C				150	
Input Bias Current	Ta=25°C	I _{IB}		25	250	nA
	0°C≤Ta≤70°C				400	
Input Common Mode Voltage Range	Ta=25°C	V _{ICR}	0		V _{CC} -1.5	V
	0°C≤Ta≤70°C		0		V _{CC} -2.0	
Supply Current	R _L =∞	I _{CC}		0.8	2.0	mA
	R _L =∞ V _{CC} =30V			1.0	2.5	
Voltage Gain	R _L > 15K, V _{CC} =15V	G _V	50	200		V/ mV
Large Signal Response Time	V _{IN} =TTL Logic Swing, V _{REF} =1.4V, V _{RL} =5.0V, R _L =5.1K	t _{RES}		300		ns
Response Time	V _{RL} =5.0V, R _L =5.1K	t _{RES}		1.3		us
Input Differential Voltage		V _{ID}			V _{CC}	V
Output Sink Current	V _{IN} (-) ≥1.0V, V _{IN} (+) =0V, V _O ≤1.5V	I _{SINK}	6.0	16		mA
Output Saturation Voltage	V _{IN} (-) ≥1.0V, V _{IN} (+) =0V, I _{SINK} ≤4.0mA	V _{SAT}		130	400	mV
	V _{IN} (-) ≥1.0V, V _{IN} (+) =0V, I _{SINK} ≤4.0mA 0°C≤Ta≤70°C				700	
Output Leakage Current	V _{IN(+)} ≥1.0V, V _{IN(-)} =0V, V _O =5V	I _{OL}		0.1		nA
	V _{IN(+)} ≥1.0V, V _{IN(-)} =0V, V _O =30V 0°C≤Ta≤70°C				1000	



Applications

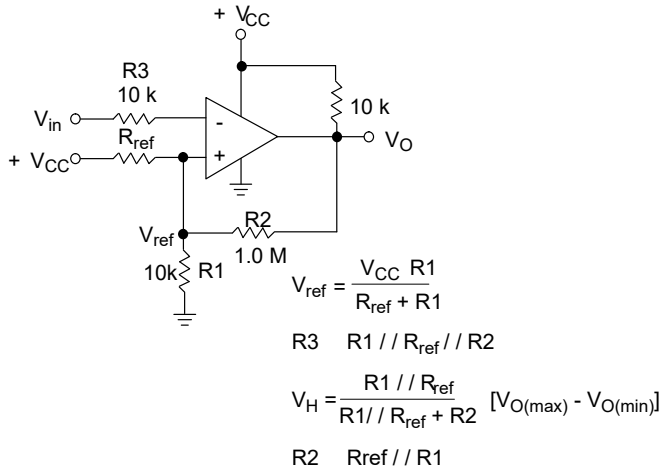


Figure 1. Inverting Comparator with Hysteresis

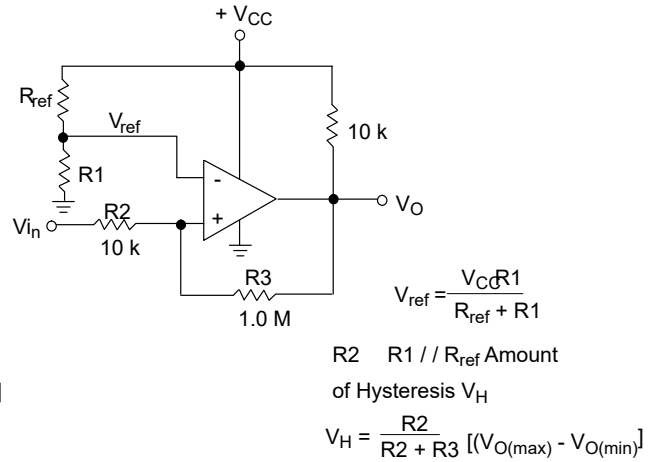
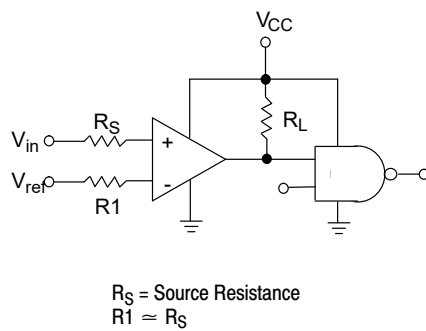


Figure 2. Noninverting Comparator with Hysteresis



Logic	Device	V _{CC} (V)	R _L kΩ
CMOS	1/4 MC14001	+15	100
TTL	1/4 MC7400	+5.0	10

Figure 3. Driving Logic

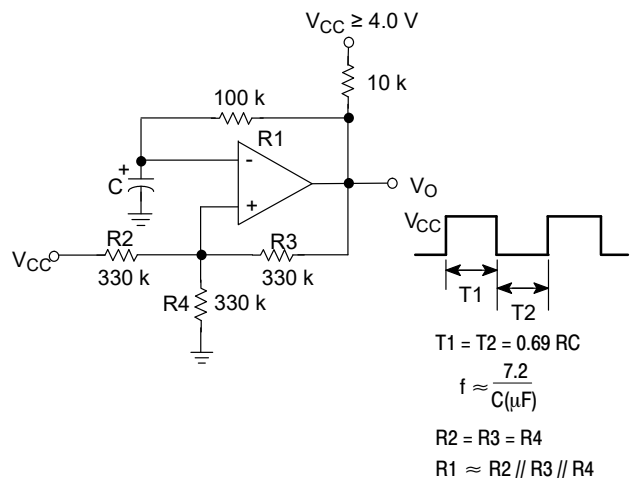


Figure 4. Squarewave Oscillator

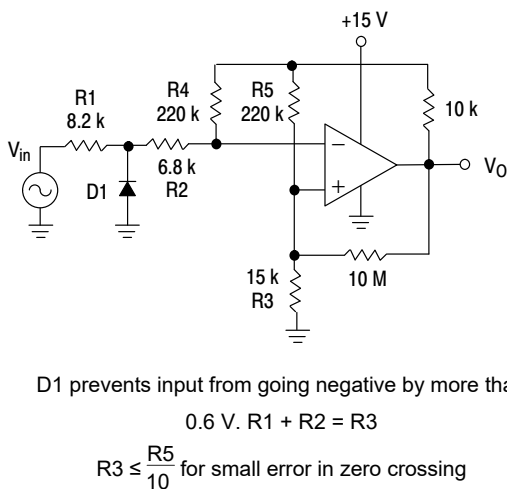


Figure 5. Zero Crossing Detector (Single Supply)

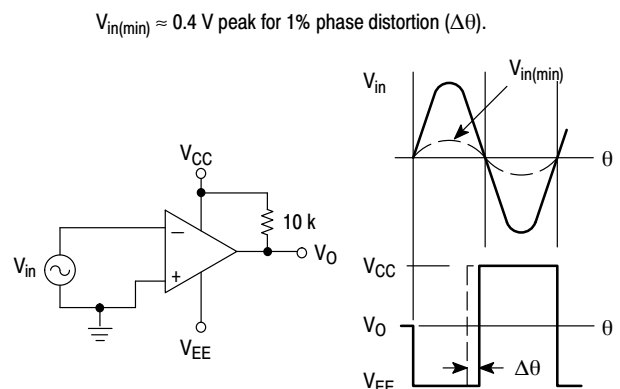


Figure 6. Zero Crossing Detector (Split Supplies)



Typical Characteristics Curves

($V_{CC} = 15\text{ Vdc}$, $T_A = +25^\circ\text{C}$ (each comparator) unless otherwise noted.)

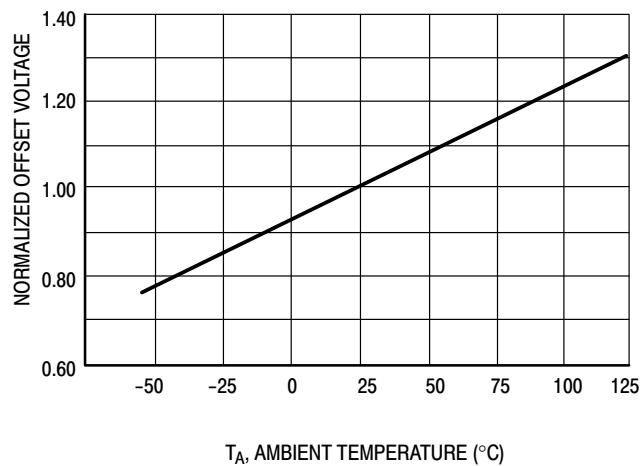


Figure 7. Normalized Input Offset Voltage

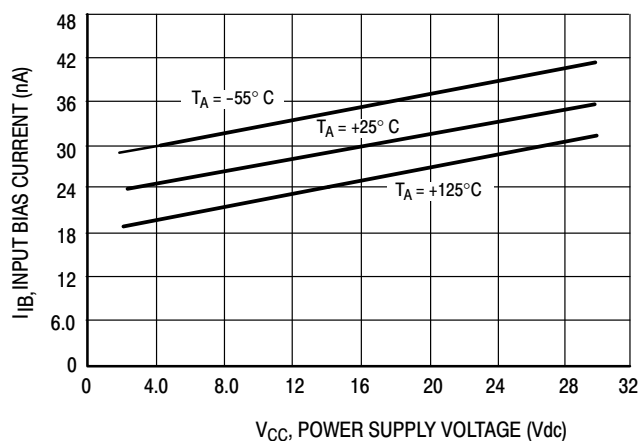


Figure 8. Input Bias Current

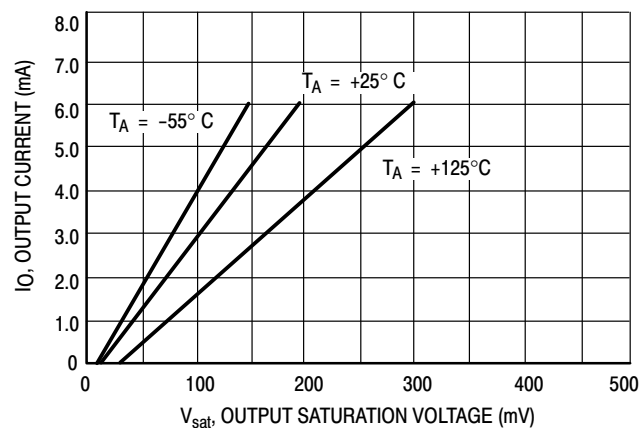
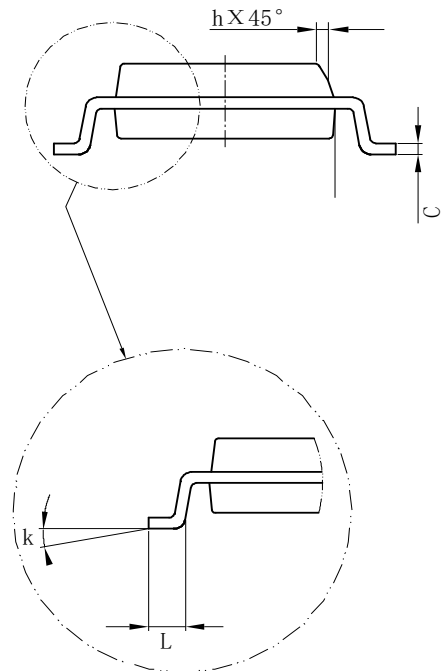
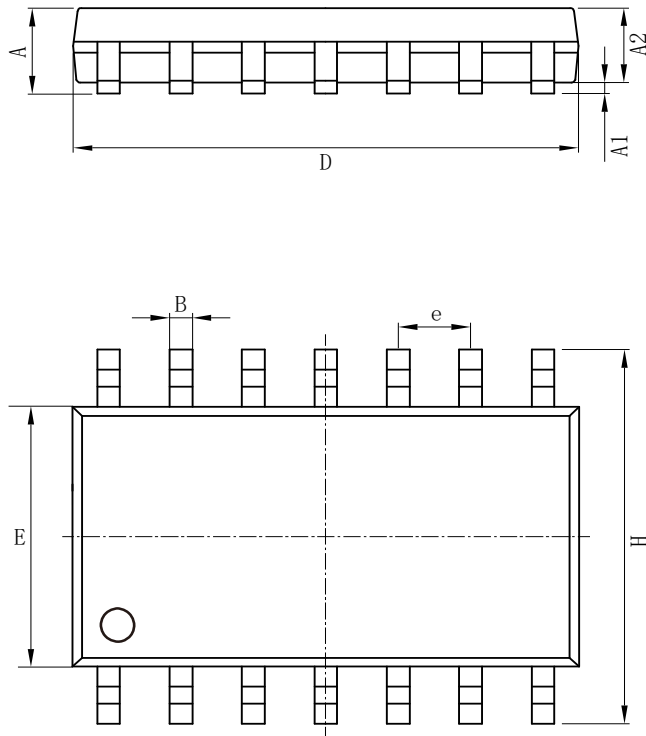


Figure 9. Output Sink Current versus Output Saturation Voltage



Package Information

SOP-14(SOIC-14)



Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	1.350	1.750	A	0.050	0.068
A1	0.100	0.250	A1	0.004	0.009
A2	1.100	1.650	A2	0.040	0.060
B	0.330	0.510	B	0.010	0.020
C	0.190	0.250	C	0.007	0.009
D	8.550	8.750	D	0.330	0.340
E	3.800	4.000	E	0.150	0.150
e	1.27		e	0.05	
H	5.800	6.200	H	0.220	0.240
h	0.250	0.500	h	0.009	0.020
L	0.400	1.270	L	0.015	0.050
k	8°(max)		k	8°(max)	



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