



CD2901

Quad Channel Differential Comparator

Version: Rev 1.0.0 Date: 2025-5-26

Features ■■

- Single or Split Supply Operation
- Low Input Bias Current
- Low Input Offset Current
- Input Common Mode Voltage Range to GND
- Low Output Saturation Voltage
- TTL and CMOS Compatible

Application ■■

- Robotic Vacuum Cleaner
- Single-Phase UPS (Uninterruptible Power Supply)
- Server PSU (Power Supply Unit)
- Cordless Power Tools
- Wireless Infrastructure
- Building Automation
- Factory Automation and Control
- Motor Driver
- Infotainment System and Instrument

Description ■■

The CD2901 consists of four independent precision voltage comparators with an offset voltage specification as low as 5.0 mV max for four comparators which were designed specifically to operate from a single power supply over a wide range of voltages.

Application areas include limit comparators, simple analog to digital converters, pulse, square wave, Zero crossing detector (single power supply) and time delay generators.

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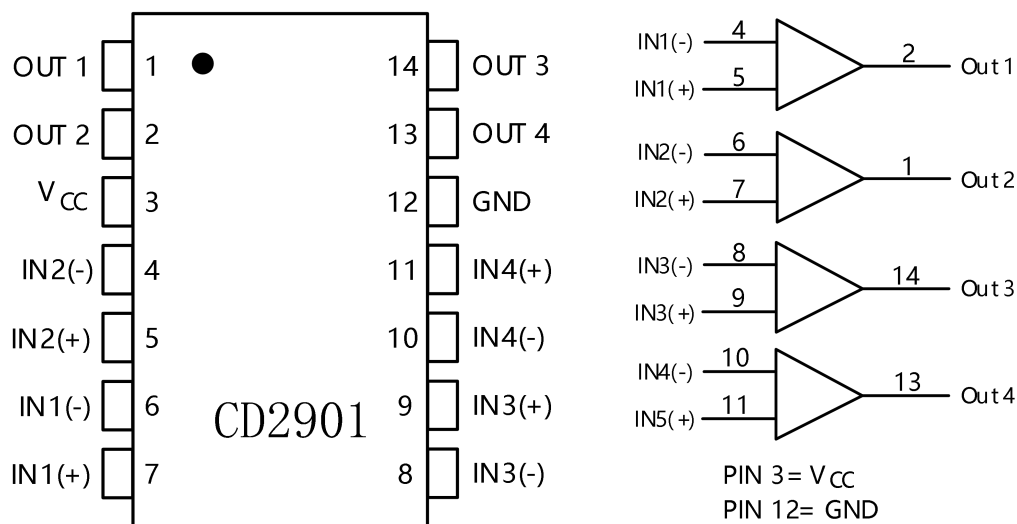
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Pin Configurations



Absolute Maximum Ratings

(T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Value	Unit
V _{CC}	Power Supply Voltages		
	Single Supply	36	V
	Split Supplies	±18	
V _{IDR}	Input Differential Voltage Range	36	V
V _{ICR}	Input Common Mode Voltage Range (1)	-0.3 to V _{CC}	V
--	Output Short Circuit to Ground(2)	Unlimited	--
I _{IN}	Input Current, per pin (3)	50	mA
I _o	Output Current	20	mA
T _J	Junction Temperature		
	Plastic Packages	150	°C
T _A	Operating Ambient Temperature	-40 to +125	°C
T _{STG}	Storage Temperature Range	-65 to +150	°C
T _L	Lead Temperature, 1mm from Case for 10 Seconds	260	°C

P _D	Power Dissipation @T _A =25°C		
	Plastic Package	1.0	W
	Derate above 25°C	8.0	mW/°C

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	+125	°C

Electrical characteristics

(V_{CC} = 5.0V, GND = 0V, T_A = -40~+125°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Guaranteed Limit			Unit
			Min	Typ	Max	
V _{IO}	Input Offset Voltage	V _O =1.4V V _{CC} =5.0V to 30V, R _S ≤100Ω V _{ICR} =0V - (V _{CC} -1.5)V	-		7.0*	mV
I _B	Input Bias Current	V _O =1.4V, V _{CC} =5.0-30V V _{ICR} =0V to (V _{CC} -1.5)V	-		250	nA
I _{OS}	Input Offset Current	V _O =1.4V, V _{CC} =5.0-30V V _{ICR} =0V to (V _{CC} -1.5)V	-	5*	200*	nA
V _{ICR}	Input Common Mode Voltage Range	V _{CC} =5.0V to 30V	0		V _{CC} -2.0V	V
I _{CC}	Supply Current	R _L =∞, V _{CC} =5.0 R _L =∞, V _{CC} =30V	-	1.0*	2.5*	mA
AVOL	Voltage Gain	V _{CC} =15V, R _L =15KΩ	50	100*	-	V/mV
t ₁	Large Signal Response Time	V _{IN} =TTL Logic Swing, V _{ref} =1.4V, V _{CC} =5.0V, R _L =5.1Ω, V _{RL} =5.0V	-	300*	-	ns
t ₂	Response Time (Note 6)	V _{CC} =5.0V, R _L =5.1KΩ, V _{RL} =5.0V	-	1.3*	-	μs
I _{SINK}	Output Sink Current	V _I (-)=1.0V, V _I (+)=0V, V _O ≤1.5V, V _{CC} =5.0V	6.0*	16	-	mA
V _{SAT}	Saturation Voltage	V _I (-)=1.0V, V _I (+)=0V, I _{sink} ≤4.0mA, V _{CC} =5.0V	-	-	700	mV
I _{OL}	Output Leakage Current	V _I (+)=1.0V, V _I (-)=0V	V _O =5.0V	0.1*		nA
			V _O =30V		1000	

VIDR	Differential Input Voltage Range	All VIN≥GND or V-Supply (if used)			V _{CC} *	V
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*=@25°C

Typical Characteristics

(V_{CC}=1.5V, T_A= +25°C, (each comporator))

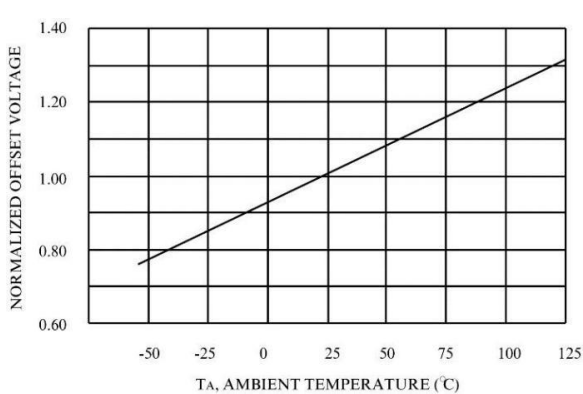


Figure 1. Normalized Input Offset Voltage

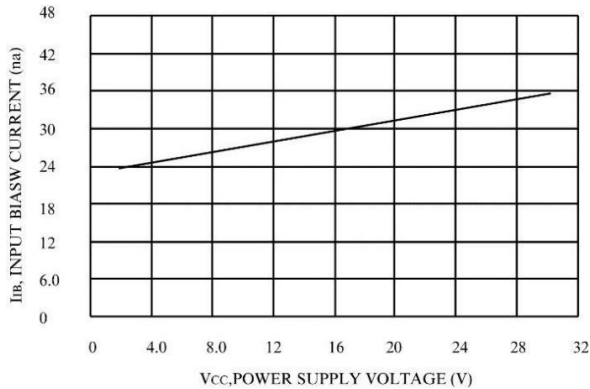


Figure 2. Input Bias Current

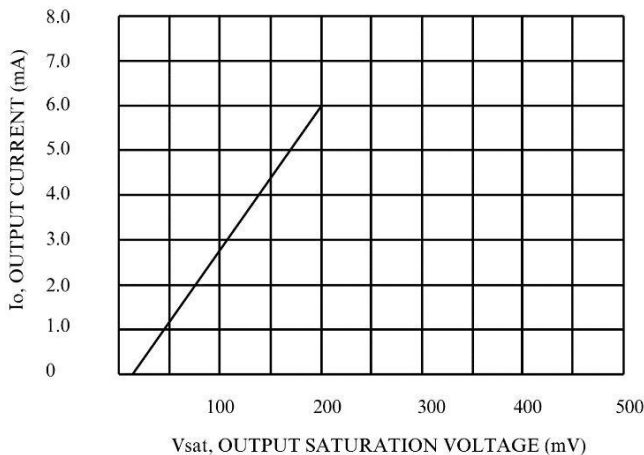
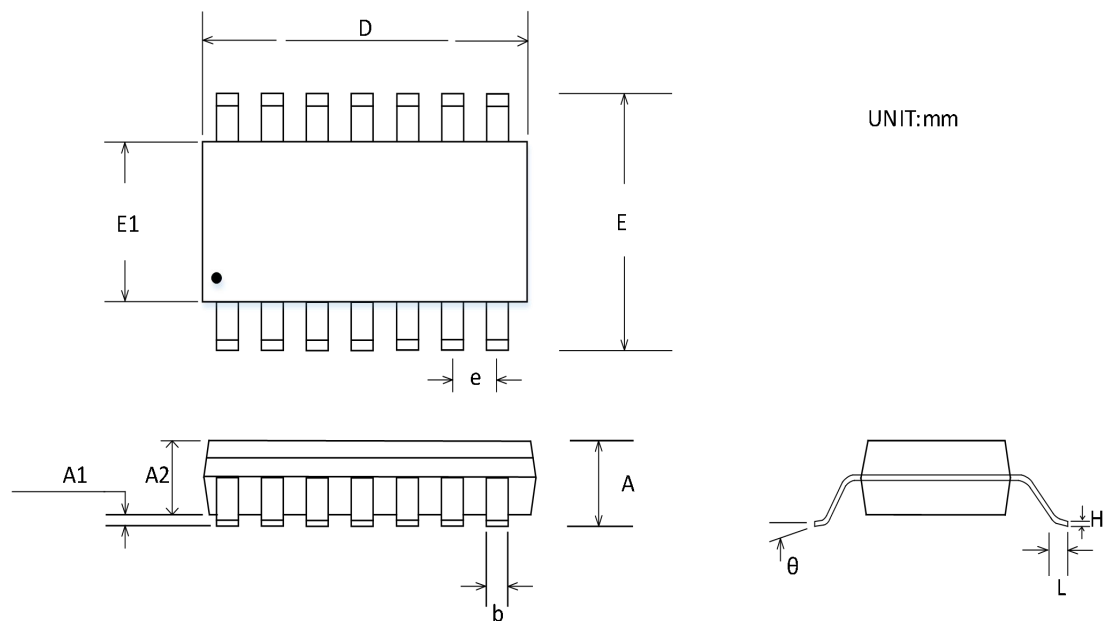


Figure 3. Output Sink Current versus Output Saturation Voltage

Package Outline Dimensions

SOP-14



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
CD2901AS14	-40°C~125°C	SOP-14	Tape and Reel, 2500
CD2901AS14-RL	-40°C~125°C	SOP-14	Tape and Reel, 3000
CD2901AS14-REEL	-40°C~125°C	SOP-14	Tape and Reel, 4000

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	