



CD2903

Dual Channel Differential Comparator

Version: Rev 1.0.0 Date: 2025-5-26

Features ■■

- Wide power supply voltage range: +2V to +30V
- Input offset voltage: $\pm 1\text{mV}$ (typ)
- Low supply current: $V_{\text{SUPPLY}} = 30\text{V}$, $0.7\mu\text{A}(\text{max})$ for each
- Common mode input voltage range includes grounding
- Low output saturation voltage
- Fast response time: $1.3\mu\text{s}$
- Open drain output
- The output is compatible with TTL, MOS and CMOS
- Working temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Micro package: SOIC-8 (SOP8), TSSOP8

Application ■■

- Vacuum robot
- Single phase UPS
- Server PSU
- Cordless power tool
- Wireless infrastructure
- Building automation
- Factory automation &

Description ■■

CD2903 is a dual channel comparator whose output can be connected to other open collector outputs to realize line and logic. It can operate between 2V and 30V, and the power consumption of each channel (typical value) is as low as μA level.

The CD2903 consists of two independent voltage comparators designed to operate from a single power supply over a wide voltage range. Quiescent current has nothing to do with power supply voltage. For the application of low input offset voltage, high power supply voltage, low power supply current and space saving are the main technical indicators of portable consumer goods circuit design, this device is the most cost-effective solution.

CD2903 supports green sop-8 and tssop-8 packaging. Its operating temperature range is -40°C to $+125^{\circ}\text{C}$.

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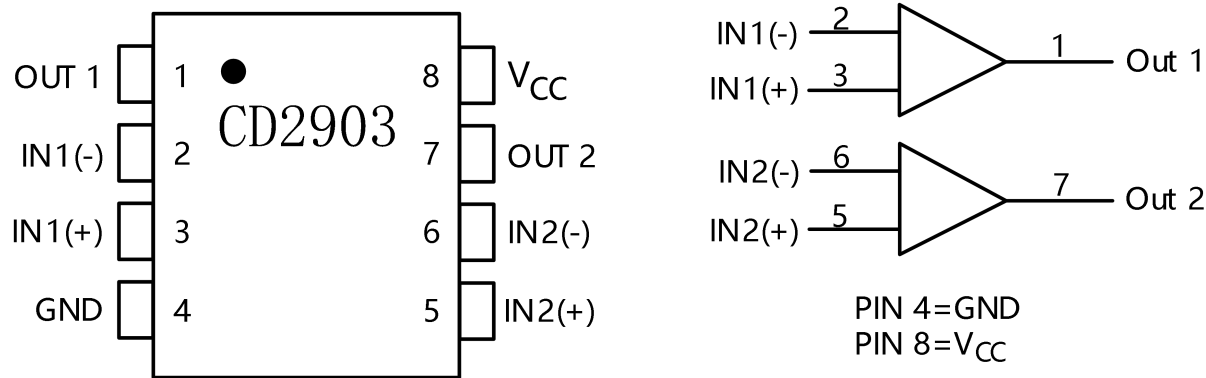
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Pin Configurations



PIN_N	SYMBOL/SOP-8（CD2903）	I/O	NAME AND FUNCTION
1	OUT 1	O	Output 1
2	IN1（-）	I	inverting input A
3	IN1（+）	I	None inverting input A
4	GND	--	Negative power supply
5	IN2（+）	I	None inverting input B
6	IN2（-）	I	inverting input B
7	OUT 2	O	Output 2
8	V _{CC}	--	Positive power supply

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{CC}	Power Supply Voltage		
	Single Supply	36	V
	Split Supplies	±18	V
V _{IDR}	Input Differential Voltage Range	36	V
V _{ICR}	Input Common Mode Voltage Range (1)	-0.3 to VCC	V
I _{SC}	Output Short Circuit to Ground	Continuous	
I _{IN}	Input Current, per pin (2)	50	mA

T_J	Junction Temperature		
	Plastic Packages	150	°C
T_{STG}	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature, 1mm from Case for 10 Seconds	260	°C
P_D	Power Dissipation @$T_A=25^{\circ}\text{C}$		
	Plastic Package	570	mW
	Derate above 25°C	5.7	mW/°C

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{CC}	DC Supply Voltage	2	30	V
T_A	Operating Temperature, All Package Types	-40	+125	°C

Electrical characteristics

$V_{CC} = 5\text{ V}, T_A=25^{\circ}\text{C}$ (unless otherwise noted)

Symbol	Parameter	Test Conditions	Guaranteed Limit			Unit
			Min	Typ	Max	
V_{IO}	Input Offset Voltage	$V_0=1.4\text{V}$ $V_{CC}=5.0\text{-}30\text{V}; R_S \leq 100\Omega$ $V_{ICR}=0\text{V} - (V_{CC}-1.5)\text{V}$	-5	--	5	mV
I_B	Input Bias Current	$V_0=1.4\text{V}$ $V_{CC}=5.0\text{-}30\text{V}$ $V_{ICR}=0\text{V} - (V_{CC}-1.5)\text{V}$	--	--	400	nA
I_O	Input Offset Current	$V_0=1.4\text{V}$ $V_{CC}=5.0\text{-}30\text{V}$	--	--	± 50	nA
V_{ICR}	Input Common Mode Voltage Range		GN D	--	$(V_{CC}-1.5)$	V
I_{SC}	Supply Current	$R_L=\infty, V_{CC}=5.0;$ $R_L=\infty, V_{CC}=30\text{V}$	-	--	1.0	mA
			-		2.5	
AVD	Voltage Gain	$V_{CC}=15\text{V}, R_L=10\text{K}\Omega$	70	--	--	dB
t_{RT}	t1	$V_{IN}=\text{TTL Logic Swing}, V_{ref}=1.4\text{V},$ $V_{CC}=5.0\text{V}, R_L=5.1\Omega, V_{RL}=5.0\text{V}$	--	300	--	ns
	t2	$V_{CC}=5.0\text{V}, R_L=5.1\text{K}\Omega, V_{RL}=5.0\text{V}$	--	1.3	--	μs

I_{SINK}	Output Sink Current	$V_I(-)=1.0V, V_I(+)=0V,$ $V_0\leq 1.5V, V_{CC}=5.0V$	6.0	--	--	mA
V_{OL}	Low-Level output voltage	$I_{OL}=4\text{ mA}, V_{ID}=-1\text{ V}$	--	110	400	mV
V_{SAT}	Saturation Voltage	$V_I(-)=1.0V, V_I(+)=0V,$ $I_{SINK}\leq 4.0mA, V_{CC}=5.0V$	--	--	700	mV
I_{OH}	High-Level Output Leakage Current	$V_{OH}=5V, V_{ID}=1V$	--	0.1	50	nA
I_{OL}	Output Current(sinking)	$V_0=1.5V; V_{ID}=-1V; V_s=5V$	--	6	--	mA
		All $V_{IN}\geq GND$ or V_- Supply (if used)	--	--	V_{CC}	V
V_{IDR}	Differential Input Voltage Range	$V_I(-)=1.0V, V_I(+)=0V,$ $V_0\leq 1.5V, V_{CC}=5.0V$	6.0	--	--	mA

Typical Characteristics

($V_{CC}=1.5V, T_A=+25^{\circ}C$, (each comporator))

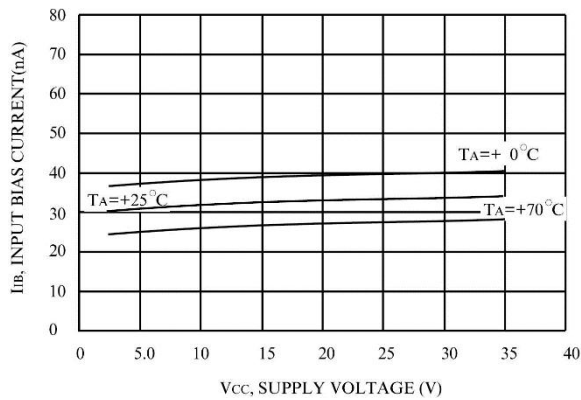


Figure 1. Normalized Input Offset Voltage

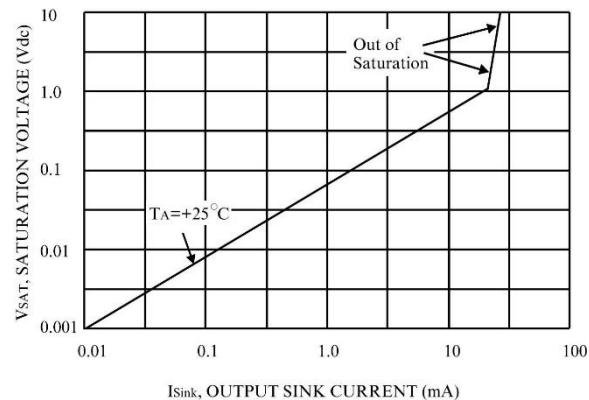


Figure 2. Input Bias Current

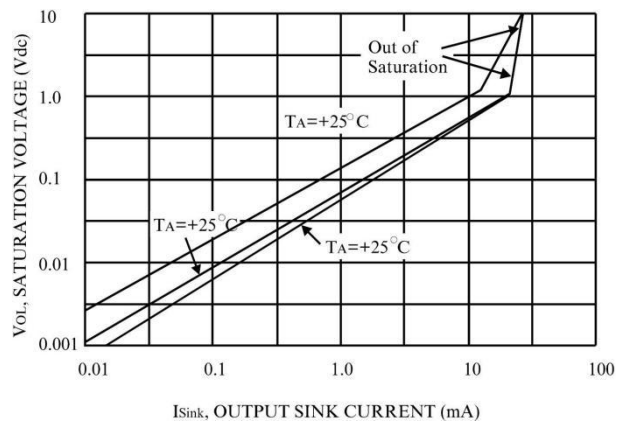


Figure 3. Output Sink Current versus Output Saturation Voltage

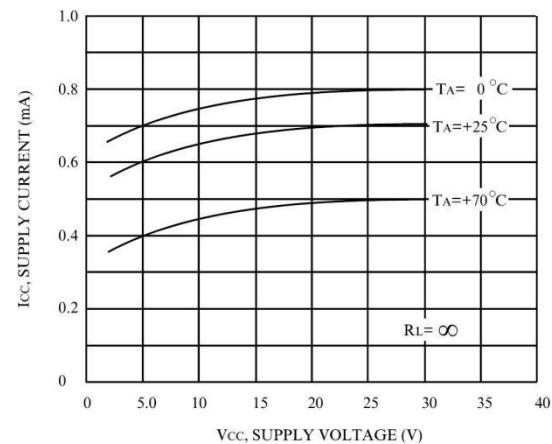
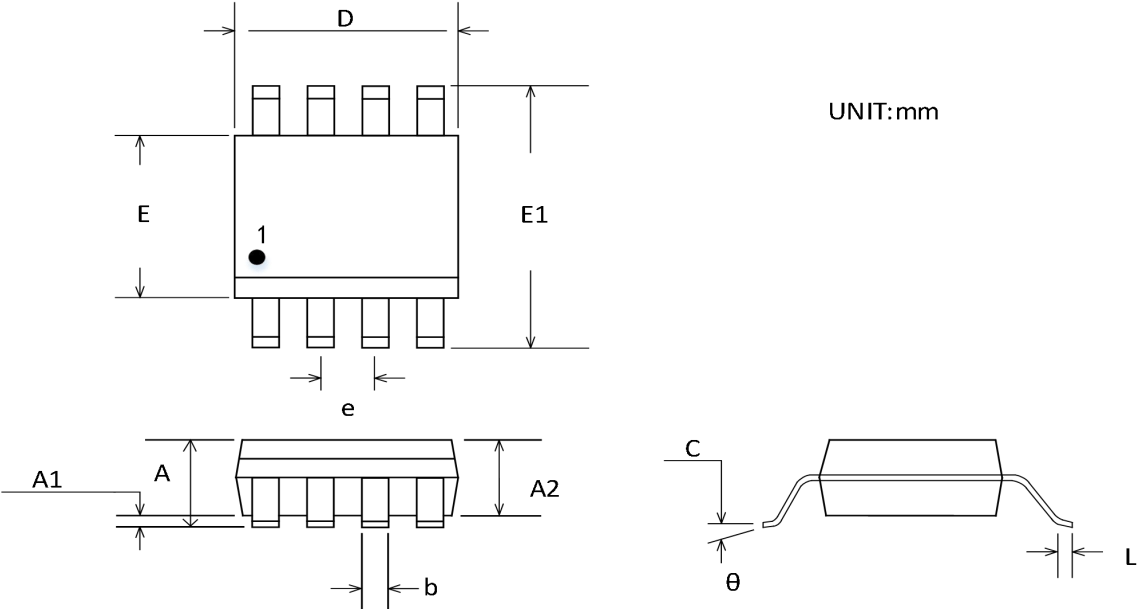


Figure 4. Power Supply Current versus Power Supply Voltage

Package Outline Dimensions

SOP-8



Symbol	Dimensions In Millimeters	
	Min	Max
A	1.350	1.750
A1	0.100	0.250
A2	1.350	1.550
b	0.330	0.510
c	0.170	0.250
D	4.800	5.000
E	3.800	4.000
E1	5.800	6.200
e	1.270 BSC	
L	0.400	1.270
θ	0°	8°

Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD2903AS8	-40°C~125°C	SOP-8	Tape and Reel, 2500
CD2903AS8-RL	-40°C~125°C	SOP-8	Tape and Reel, 3000
CD2903AS8-REEL	-40°C~125°C	SOP-8	Tape and Reel, 4000
CD2903ATS8	-40°C~125°C	TSSOP-8	Tape and Reel, 2500
CD2903ATS8-RL	-40°C~125°C	TSSOP-8	Tape and Reel, 3000
CD2903ATS8-REEL	-40°C~125°C	TSSOP-8	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	