

芯伯乐®
X I N B O L E

Product Specification

CD4093BPWR

4路2输入施密特与非门

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概述

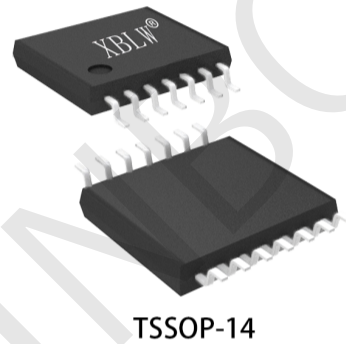
CD4093B 是具有施密特触发功能四 2 输入的与非门。该电路是单片宽电压范围 CMOS 集成电路，因此具有低功耗、抗干扰和使用灵活性强的优点。

特点

- 宽工作电压范围：2~20V
- 驱动能力：2 个低功耗 TTL、1 个低功耗肖特基 TTL 或 2 个 HTL 负载
- 所有的输入端皆有保护网络
- 每一个输入端都有独立的施密特触发器

应用

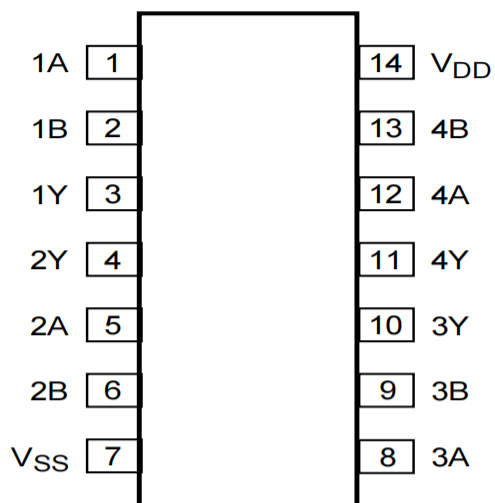
- 电子开关
- 工控应用
- 信号振荡发生器



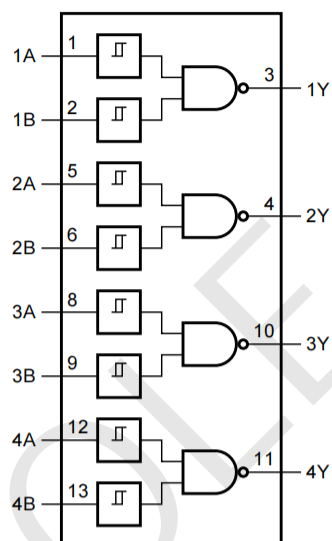
Ordering Information

型号	封装	丝印	包装	包装数量
XBLW CD4093BPWR	TSSOP-14	CD4093B	Tape	2500Pcs/Reel

管脚图



逻辑框图



管脚描述

管脚号	符号	描述
1	1A	data input
2	1B	data input
3	1Y	data output
4	2Y	data output
5	2A	data input
6	2B	data input
7	V _{SS}	ground (0V)
8	3A	data input
9	3B	data input
10	3Y	data output
11	4Y	data output
12	4A	data input
13	4B	data input
14	V _{DD}	supply voltage

极限参数

符号	参数	数值	单位
V _{DD}	电源电压范围	-0.5~+18	V
V _{IN} , V _{OUT}	输入电压范围	-0.5~V _{DD} +0.5	V
I _{IN} , I _{OUT}	输入或输出电流	±10	mA
P _D	最大功率耗散	500	mW
T _{stg}	储存温度范围	-65~+150	°C
T _L	点焊温度	260	°C
T _J	工作结温范围	-55~+125	°C

推荐工作条件

符号	参数	数值	单位
V _{DD}	电源电压范围	3 ~ 15	V
T _A	工作温度范围	-40~+125	°C

电参数

(除非特别说明, 在环境温度 T_{amb}=25°C, 时钟频率 F_{clock}=40KHz 条件下测试。)

参数	符号	条件	V _D	-40°C		25°C			+125°C		单位
				最小	最大	最小	典型	最大	最小	最大	
静态电流	I _{DD}	V _{IN} =V _D 或V _{SS}	5		0.25		0.0005	0.25		7.5	uA
			10		0.5		0.001	0.5		15	
			15		1		0.0015	1		30	
输出低电平	V _{OL}	V _{IN} =V _{DD}	5		0.05		0	0.05		0.05	V
			10		0.05		0	0.05		0.05	
			15		0.05		0	0.05		0.05	
输出高电平	V _{OH}	V _{IN} =V _{SS}	5	4.95		4.95	5		4.95		V
			10	9.95		9.95	10		9.95		
			15	14.95		14.95	15		14.95		
低电平输出电流	I _{OL}	V _{OL} =0.4	5	0.64		0.51	0.88		0.36		mA
		V _{OL} =0.5V	10	1.6		1.3	2.25		0.9		
		V _{OL} =1.5V	15	4.2		3.4	8.8		2.4		
高电平输出电流	I _{OH}	V _{OH} =2.5V	5	-3		-2.4	-4.2		-1.7		mA
		V _{OH} =4.6V	5	-0.64		-0.51	-0.88		-0.36		
		V _{OH} =9.5V	10	-1.6		-1.3	-2.25		-0.9		
		V _{OH} =13.5V	15	-4.2		-3.4	-8.8		-2.4		
输入电流	I _{IN}	V _{IN} =15V	15		3		10 ⁻⁵	0.3		1	uA
输入电容	C _{IN}	V _{IN} =0	-				5	7.5			pF
总电源电流*	I _T	C _L =50pF	5	I _T =(1.2uA/kHz)f+IDD							uA
			10	I _T =(2.4uA/kHz)f+IDD							
			15	I _T =(3.6uA/kHz)f+IDD							
阈值电压	V _{T+}	正触发	5	2.2	3.6	2.2	2.9	3.6	2.2	3.6	V
			10	4.6	7.1	4.6	5.9	7.1	4.6	7.1	
			15	6.8	10.8	6.8	8.8	10.8	6.8	10.8	
	V _{T-}	负触发	5	0.9	2.8	0.9	1.9	2.8	0.9	2.8	V
			10	2.5	5.2	2.5	3.9	5.2	2.5	5.2	
			15	4	7.4	4	5.8	7.4	4	7.4	
滞后电压	V _H		5	0.3	2	0.3	1.1	2	0.3	2	V
			10	1.2	3.4	1.2	1.7	3.4	1.2	3.4	
			15	1.6	5	1.6	2.1	5	1.6	5	

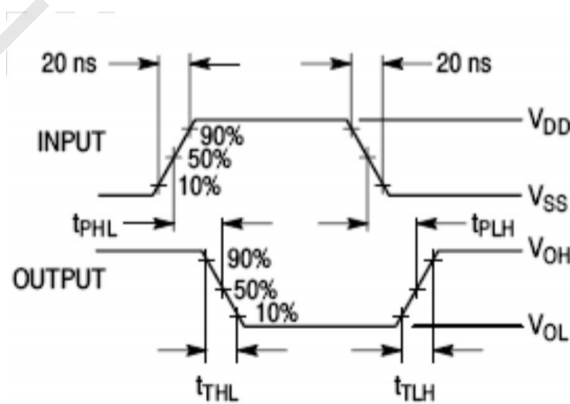
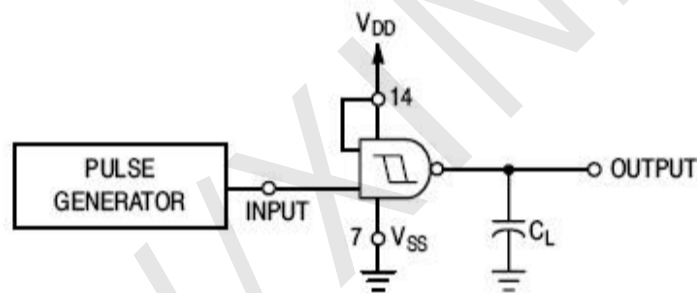
* I_{OH} 和 I_{OL} 是同时测试一个输出得出的结果。

动态电参数

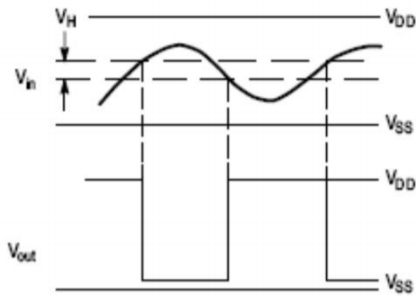
($C_L=50PF, T_A=25^{\circ}C$)

符号	项目	V_{DD}	最小值	典型值	最大值	单位
t_{TLH}	输出上升时间	5V		100	200	ns
		10V		50	100	
		15V		40	80	
t_{THL}	输出下降时间	5V		100	200	ns
		10V		50	100	
		15V		40	80	
t_{PLH} t_{PHL}	传输延迟时间	5V		125	250	ns
		10V		50	100	
		15V		40	80	

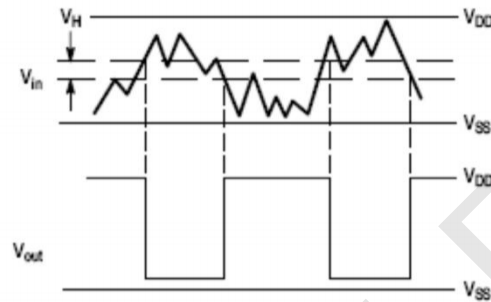
测试电路及波形图



施密特触发器典型应用



(a) Schmitt Triggers will square up inputs with slow rise and fall times.



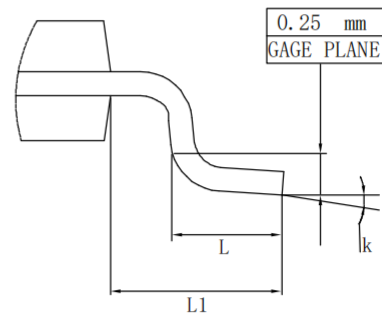
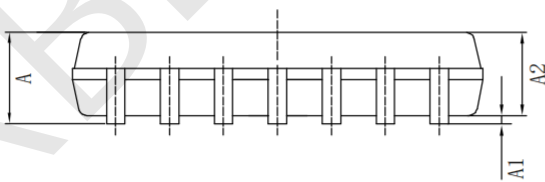
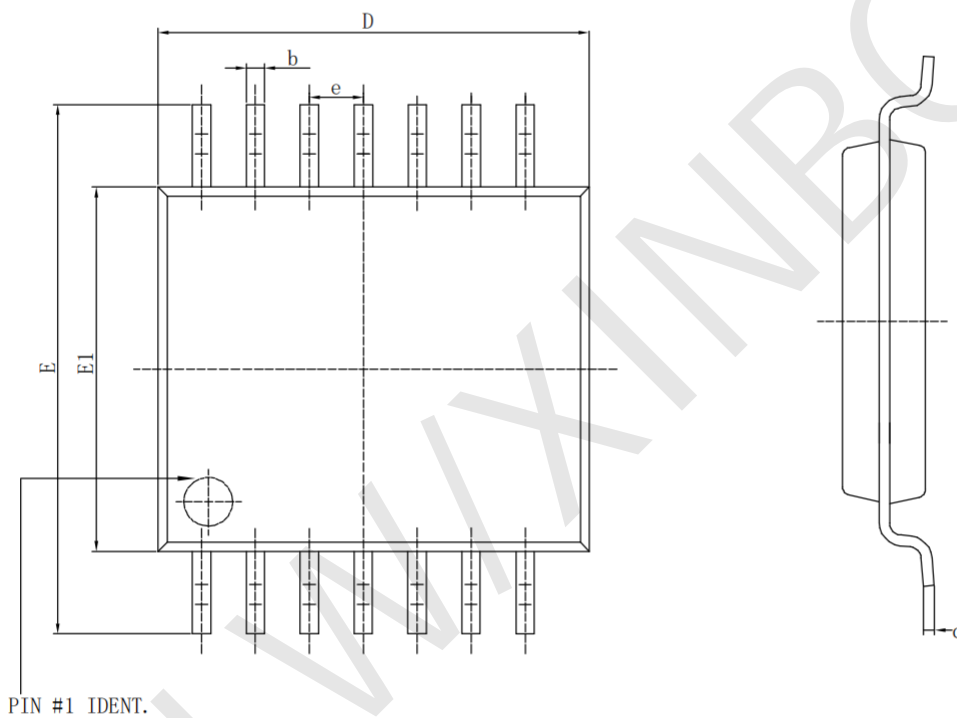
(b) A Schmitt trigger offers maximum noise immunity in gate applications.

(a) Schmitt Triggers will square up inputs with slow rise and fall times.

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· TSSOP-14

Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min (mm)	Max (mm)		Min (in)	Max (in)
A		1.200	A		0.047
A1	0.050	0.150	A1	0.002	0.006
A2	0.800	1.050	A2	0.031	0.041
b	0.190	0.300	b	0.007	0.012
c	0.090	0.200	c	0.004	0.0089
D	4.900	5.100	D	0.193	0.201
E	6.200	6.600	E	0.244	0.260
E1	4.300	4.500	E1	0.169	0.176
e		0.65	e		0.0256
L	0.450	0.750	L	0.018	0.030
L1		1.00	L1		0.039
k	0°	8°	k	0°	8°



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