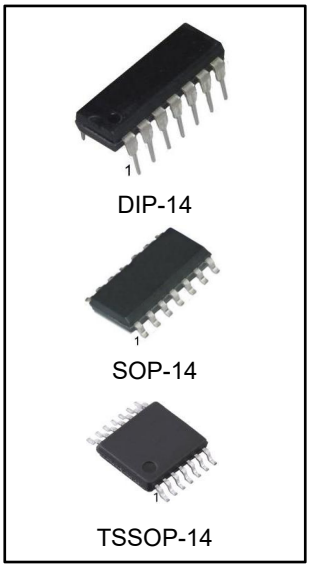
Features

- Wide supply voltage range from 5V to 15V
- Fully static operation
- 5V, 10V, and 15V parametric ratings
- Standardized symmetrical output characteristics
- Inputs and outputs are protected against electrostatic effects
- Specified from -40℃ to +85℃
- Packaging information: DIP14/SOP14/TSSOP14



Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
CD4075BE/ CD4075BN	DIP-14	CD4075B	TUBE	1000pcs/Box
CD4075BM/TR	SOP-14	CD4075B	REEL	2500pcs/Reel
CD4075BMT/TR	TSSOP-14	CD4075B	REEL	2500pcs/Reel

General Description

The CD4075B provides the positive triple 3-input OR function. The outputs are fully buffered for highest noise immunity and pattern insensitivity of output impedance.

It operates over a recommended V_{DD} power supply range of 5V to 15V referenced to GND (usually ground). Unused inputs must be connected to V_{DD}, GND, or another input.

Block Diagram

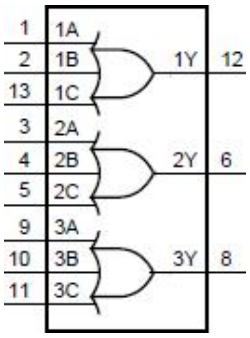


Figure 1. Functional diagram

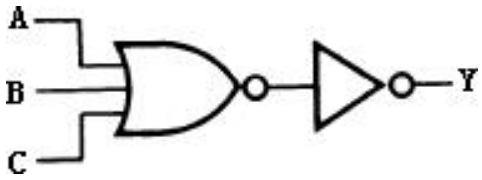
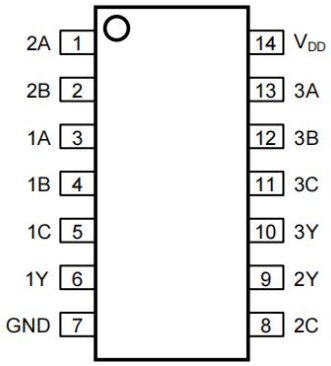


Figure 2. Logic diagram (one gate)

Pin Configurations



DIP-14,SOP-14,TSSOP-14

Pin Description

Pin No.	Pin Name	Description
1	2A	data input
2	2B	data input
3	1A	data input
4	1B	data input
5	1C	data input
6	1Y	data output
7	GND	ground (0V)
8	2C	data input
9	2Y	data output
10	3Y	data output
11	3C	data input
12	3B	data input
13	3A	data input
14	VDD	supply voltage

Function Table

Input			Output
nA	nB	nC	nY
L	L	L	L
X	X	H	H
X	H	X	H
H	X	X	H

Note: H=HIGH voltage level; L=LOW voltage level; X=don't care.

Electrical Parameter

Absolute Maximum Ratings

(Voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Max.	Unit
supply voltage	V_{DD}	-		-0.5	+18	V
DC input current	I_{IK}	any one input		-	±10	mA
input voltage	V_I	all inputs		-0.5	V_{DD}+0.5	V
storage temperature	T_{stg}	-		-65	+150	℃
total power dissipation	P_{tot}	-		-	500	mW
device dissipation	P	per output transistor		-	100	mW
Soldering temperature	T_L	10s	DIP	245		℃
			SOP	245		

Note:(1)Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not ensured.

(2)For DIP14 packages: above 70℃ the value of Ptot derates linearly with 12mW/K.

(3)For SOP14 packages: above 70℃ the value of Ptot derates linearly with 8mW/K.

(4)For (T)SSOP14 packages: above 60℃ the value of Ptot derates linearly with 5.5mW/K.

Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{DD}	-	5	-	15	V
Ambient temperature	Tamb	in free air	-40	-	+85	℃

Electrical Characteristics

DC Characteristics 1

(T_{amb}=25℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions (V)			Tamb=25℃			Unit
		VO	VIN	VDD	Min.	Typ.	Max.	
supply current	I_{DD}	-	0, 5	5	-	0.01	0.25	uA
		-	0, 10	10	-	0.01	0.5	uA
		-	0, 15	15	-	0.01	1	uA
LOW-level output current	I_{OL}	0.4	0, 5	5	0.51	1	-	mA
		0.5	0, 10	10	1.1	2.6	-	mA
		1.5	0, 15	15	3.4	6.8	-	mA
HIGH-level output current	I_{OH}	4.6	0, 5	5	-0.51	-1	-	mA
		2.5	0, 5	5	-1.6	-3.2	-	mA
		9.5	0, 10	10	-1.3	-2.6	-	mA
		13.5	0, 15	15	-3.4	-6.8	-	mA
LOW-level output voltage	V_{OL}	-	0, 5	5	-	0	0.05	V
		-	0, 10	10	-	0	0.05	V
		-	0, 15	15	-	0	0.05	V
HIGH-level output voltage	V_{OH}	-	0, 5	5	4.95	5	-	V
		-	0, 10	10	9.95	10	-	V
		-	0, 15	15	14.95	15	-	V
LOW-level input voltage	V_{IL}	0.5, 4.5	-	5	-	-	1.5	V
		1, 9	-	10	-	-	3	V
		1.5, 13.5	-	15	-	-	4	V
HIGH-level input voltage	V_{IH}	4.5	-	5	3.5	-	-	V
		9	-	10	7	-	-	V
		13.5	-	15	11	-	-	V
input leakage current	I_I	-	0, 15	15	-	$\pm10^{-5}$	±0.1	uA

DC Characteristics 2

(Tamb=-40℃ to +85, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions (V)			Tamb=-40℃		Tamb=+85℃		Unit
		VO	VIN	VDD	Min.	Max.	Min.	Max.	
supply current	I_{DD}	-	0, 5	5	-	0.25	-	7.5	uA
		-	0, 10	10	-	0.5	-	15	uA
		-	0, 15	15	-	1	-	30	uA
LOW-level output current	I_{OL}	0.4	0, 5	5	0.61	-	0.42	-	mA
		0.5	0, 10	10	1.5	-	1.1	-	mA
		1.5	0, 15	15	4	-	2.8	-	mA
HIGH-level output current	I_{OH}	4.6	0, 5	5	-0.61	-	-0.42	-	mA
		2.5	0, 5	5	-1.8	-	-1.1	-	mA
		9.5	0, 10	10	-1.5	-	-1.1	-	mA
		13.5	0, 15	15	-4	-	-2.8	-	mA
LOW-level output voltage	V_{OL}	-	0, 5	5	-	0.05	-	0.05	V
		-	0, 10	10	-	0.05	-	0.05	V
		-	0, 15	15	-	0.05	-	0.05	V
HIGH-level output voltage	V_{OH}	-	0, 5	5	4.95	-	4.95	-	V
		-	0, 10	10	9.95	-	9.95	-	V
		-	0, 15	15	14.95	-	14.95	-	V
LOW-level input voltage	V_{IL}	0.5, 4.5	-	5	-	1.5	-	1.5	V
		1, 9	-	10	-	3	-	3	V
		1.5, 13.5	-	15	-	4	-	4	V
HIGH-level input voltage	V_{IH}	4.5	-	5	3.5	-	3.5	-	V
		9	-	10	7	-	7	-	V
		13.5	-	15	11	-	11	-	V
input leakage current	I_I	-	0, 15	15	-	±0.1	-	±1	uA

AC Characteristics

(Tamb=25℃, GND=0V, tr, tf=20ns, CL=50pF, RL=200kΩ, unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
propagation delay time	t_{PHL}, t_{PLH}	see Figure 4	V_{DD}=5V	-	125	250	ns
			V_{DD}=10V	-	60	120	ns
			V_{DD}=15V	-	45	90	ns
transition time	t_{THL}, t_{TLH}	see Figure 4	V_{DD}=5V	-	100	200	ns
			V_{DD}=10V	-	50	100	ns
			V_{DD}=15V	-	40	80	ns
input capacitance	C_I	any input		-	5	7.5	pF

AC Testing Circuit

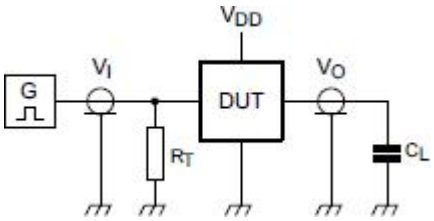


Figure 3. Test circuit for switching times

Definitions for test circuit:

DUT=Device Under Test.

C_L=Load capacitance including jig and probe capacitance.

R_T=Termination resistance should be equal to the output impedance Zo of the pulse generator.

AC Testing Waveforms

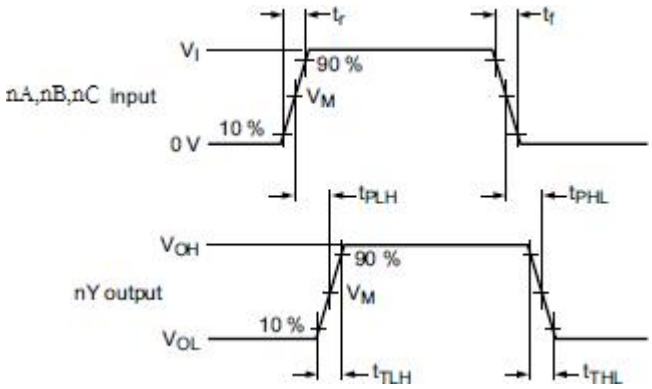


Figure 4. Propagation delay, output transition time

Measurement Points

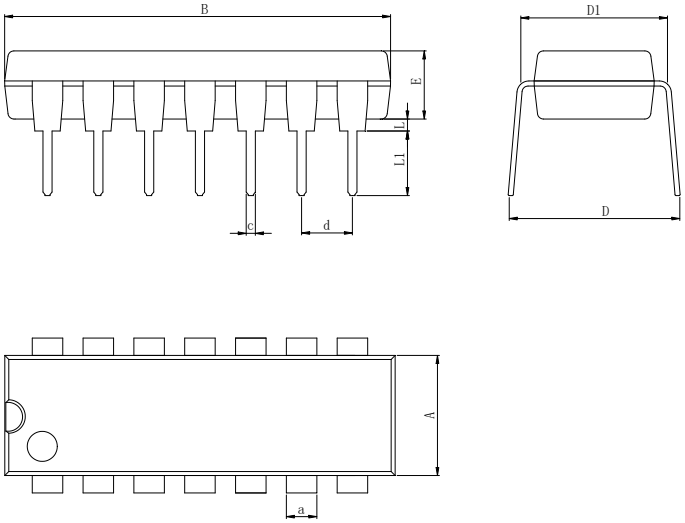
Supply voltage	Input	Output
VDD	VM	VM
5V to 15V	0.5×V DD	0.5×V DD

Test Data

Supply voltage	Input		Load
VDD	VI	tr , tf	CL
5V to 15V	GND or VDD	≤ 20ns	50pF

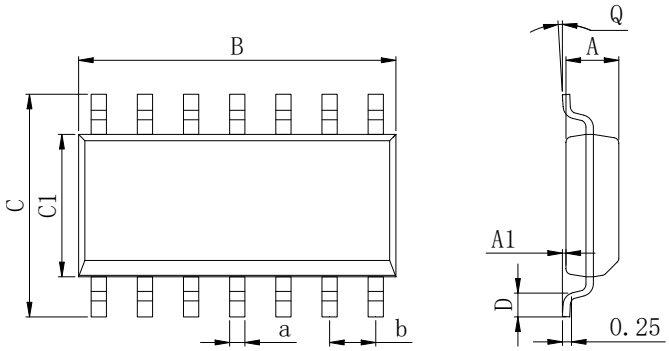
Physical Dimensions

DIP-14



Dimensions In Millimeters(DIP-14)										
Symbol:	A	B	D	D1	E	L	L1	a	c	d
Min:	6.10	18.94	8.10	7.42	3.10	0.50	3.00	1.50	0.40	2.54 BSC
Max:	6.68	19.56	10.9	7.82	3.55	0.70	3.60	1.55	0.50	

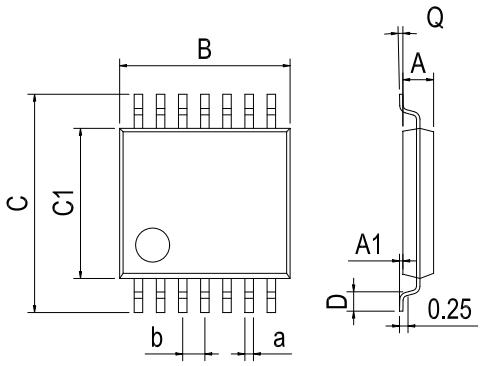
SOP-14



Dimensions In Millimeters(SOP-14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	8.55	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	8.75	6.20	4.00	0.80	8°	0.45	

Physical Dimensions

TSSOP-14



Dimensions In Millimeters(TSSOP14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	

Revision History

DATE	REVISION	PAGE
2012-3-8	New	1-10
2023-11-14	Update encapsulation type 、 Update Lead Temperature 、 Updated DIP-14 dimension、Add annotation for Maximum Ratings、Updated Ambient temperature and supply voltage range、Update DIP Package New Model	1、3、7

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