



## UCD4011B

CMOS IC

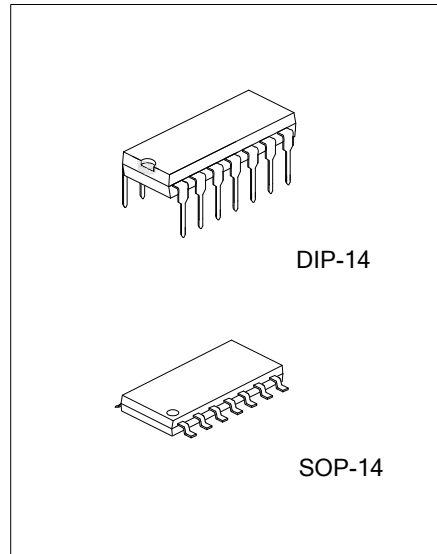
### QUAD 2-INPUT NAND BUFFERED B SERIES GATE

#### DESCRIPTION

The UTC UCD4011B contains four independent 2-input NAND gates which perform the function  $Y = \overline{A \cdot B}$  in positive logic.

#### FEATURES

- \* 5V-10V-15V Parametric Ratings
- \* Quad 2-Input NAND Gate
- \* Symmetrical Output Characteristics
- \* Maximum Input Current of 1uA at 15V Over Full Package Temperature Range



#### ORDERING INFORMATION

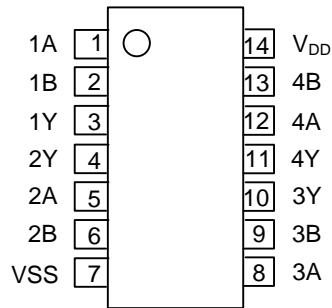
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD4011BL-D14-T	UCD4011BG-D14-T	DIP-14	Tube
UCD4011BL-S14-R	UCD4011BG-S14-R	SOP-14	Tape Reel

<p>UCD4011BG-D14-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) D14: DIP-14, S14: SOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING

DIP-14	SOP-14

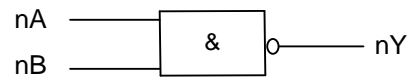
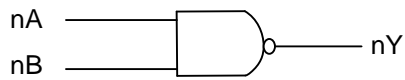
■ **PIN CONFIGURATION**



■ **FUNCTION TABLE** (each gate)

INPUT(A)	INPUT(B)	OUTPUT(Y)
H	H	L
H	L	H
L	H	H
L	L	H

■ **LOGIC DIAGRAM** (positive logic)



### ■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>DD</sub>	-0.5 ~ 18	V
Input Voltage	V(nA,nB)	-0.5 ~ V <sub>DD</sub> +0.5	V
Output Voltage	V(nY)	-0.5 ~ V <sub>DD</sub> +0.5	V
Storage Temperature	T <sub>STG</sub>	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>DD</sub>	3 ~ 15	V
Operating Temperature	T <sub>OP</sub>	-40 ~ +125	°C

### ■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V <sub>IH</sub>	V <sub>DD</sub> = 5V, V <sub>O</sub> =0.5V	3.5			V
		V <sub>DD</sub> = 10V, V <sub>O</sub> =1.0V	7.0			
		V <sub>DD</sub> = 15V, V <sub>O</sub> =1.5V	11.0			
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>DD</sub> = 5V, V <sub>O</sub> =4.5V			1.5	V
		V <sub>DD</sub> = 10V, V <sub>O</sub> =9.0V			3.0	
		V <sub>DD</sub> = 15V, V <sub>O</sub> =13.5V			4.0	
High-Level Output Voltage	V <sub>OH</sub>	V <sub>DD</sub> = 5V,  I <sub>O</sub>   < 1μA	4.95	5		V
		V <sub>DD</sub> = 10V,  I <sub>O</sub>   < 1μA	9.95	10		
		V <sub>DD</sub> = 15V,  I <sub>O</sub>   < 1μA	14.95	15		
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>DD</sub> = 5V,  I <sub>O</sub>   < 1μA		0	0.05	V
		V <sub>DD</sub> = 10V,  I <sub>O</sub>   < 1μA		0	0.05	
		V <sub>DD</sub> = 15V,  I <sub>O</sub>   < 1μA		0	0.05	
High-Level Output Current (NOTE)	I <sub>OH</sub>	V <sub>DD</sub> = 5V, V <sub>O</sub> =4.6V	-0.51	-1.0		mA
		V <sub>DD</sub> = 10V, V <sub>O</sub> =9.5V	-1.3	-2.6		
		V <sub>DD</sub> = 15V, V <sub>O</sub> =13.5V	-3.4	-6.8		
Low-Level Output Current (NOTE)	I <sub>OL</sub>	V <sub>DD</sub> = 5V, V <sub>O</sub> =0.4V	0.51	1		mA
		V <sub>DD</sub> = 10V, V <sub>O</sub> =0.5V	1.3	2.6		
		V <sub>DD</sub> = 15V, V <sub>O</sub> =1.5V	3.4	6.8		
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>DD</sub> = 15V, V <sub>IN</sub> = V <sub>DD</sub> or V <sub>SS</sub>			±0.1	μA
Quiescent Supply Current	I <sub>Q</sub>	V <sub>DD</sub> = 5V, V <sub>IN</sub> = V <sub>DD</sub> or V <sub>SS</sub> , I <sub>OUT</sub> = 0		0.01	0.25	μA
		V <sub>DD</sub> = 10V, V <sub>IN</sub> = V <sub>DD</sub> or V <sub>SS</sub> , I <sub>OUT</sub> = 0		0.01	0.5	
		V <sub>DD</sub> = 15V, V <sub>IN</sub> = V <sub>DD</sub> or V <sub>SS</sub> , I <sub>OUT</sub> = 0		0.01	1.0	

Note: I<sub>OL</sub> and I<sub>OH</sub> are tested one output at a time

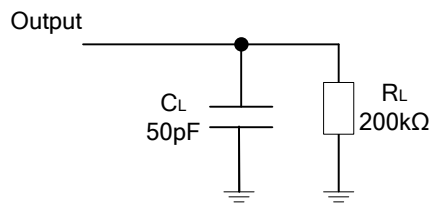
### ■ SWITCHING CHARACTERISTICS (T<sub>A</sub>=25°C, Input: t<sub>R</sub>=t<sub>F</sub>=20ns, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t <sub>PLH</sub> / t <sub>PHL</sub>	V <sub>DD</sub> =5V, C <sub>L</sub> =50pF, R <sub>L</sub> =200kΩ		90	250	ns
		V <sub>DD</sub> =10V, C <sub>L</sub> =50pF, R <sub>L</sub> =200kΩ		55	120	
		V <sub>DD</sub> =15V, C <sub>L</sub> =50pF, R <sub>L</sub> =200kΩ		45	90	
Transition Time	t <sub>TLH</sub> t <sub>THL</sub>	V <sub>DD</sub> =5V, C <sub>L</sub> =50pF, R <sub>L</sub> =200kΩ		100	200	ns
		V <sub>DD</sub> =10V, C <sub>L</sub> =50pF, R <sub>L</sub> =200kΩ		50	100	
		V <sub>DD</sub> =15V, C <sub>L</sub> =50pF, R <sub>L</sub> =200kΩ		40	80	

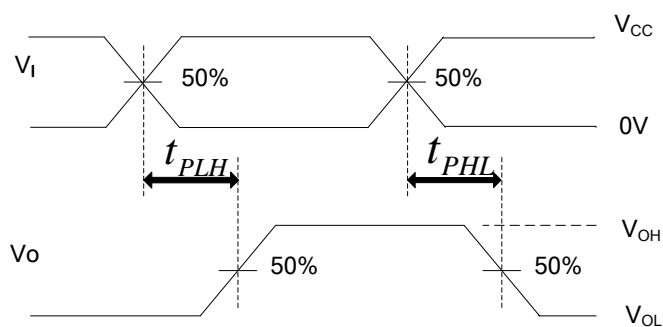
### ■ OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Average Input Capacitance	C <sub>IN</sub>	Any Input		5	7.5	pF

## ■ TEST CIRCUIT AND WAVEFORMS



Definitions for test circuit



Propagation Delay Times

Note:  $C_L$  includes probe and jig capacitance.

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