



## UCD4011B

CMOS IC

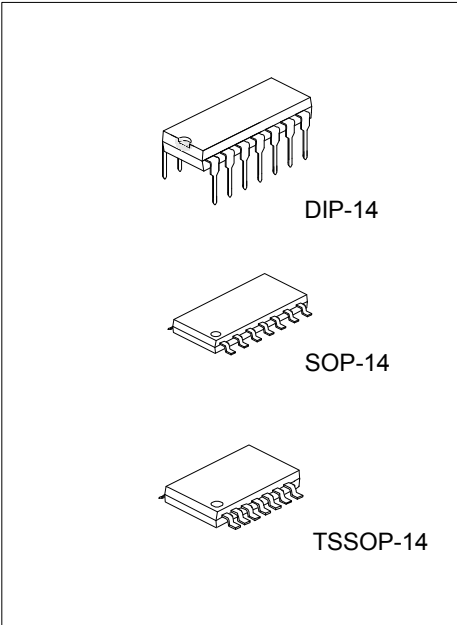
### QUAD 2-INPUT NAND BUFFERED B SERIES GATE

#### DESCRIPTION

The **UTC UCD4011B** contains four independent 2-input NAND gates which perform the function  $Y=A \cdot B$  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

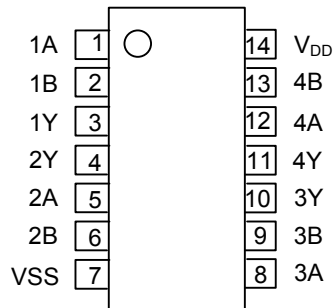
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD4011BL-D14-T	UCD4011BG-D14-T	DIP-14	Tube
UCD4011BL-S14-R	UCD4011BG-S14-R	SOP-14	Tape Reel
UCD4011BL-P14-R	UCD4011BG-P14-R	TSSOP-14	Tape Reel

<p>UCD4011BG-D14-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
---	--

#### MARKING

DIP-14	SOP-14 / TSSOP-14

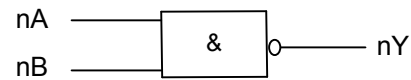
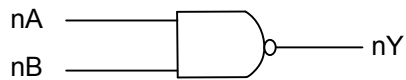
■ PIN CONFIGURATION



■ 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 ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{DD}$	-0.5 ~ 18	V
Input Voltage	$V(\text{nA}, \text{nB})$	-0.5 ~ $V_{DD}+0.5$	V
Output Voltage	$V(\text{nY})$	-0.5 ~ $V_{DD}+0.5$	V
Storage Temperature	$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

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	$V_{DD}$	3 ~ 15	V
Operating Temperature	$T_{OPR}$	-40 ~ +125	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	$V_{IH}$	$V_{DD}=5\text{V}, V_O=0.5\text{V}$	3.5			V
		$V_{DD}=10\text{V}, V_O=1.0\text{V}$	7.0			
		$V_{DD}=15\text{V}, V_O=1.5\text{V}$	11.0			
Low-Level Input Voltage	$V_{IL}$	$V_{DD}=5\text{V}, V_O=4.5\text{V}$			1.5	V
		$V_{DD}=10\text{V}, V_O=9.0\text{V}$			3.0	
		$V_{DD}=15\text{V}, V_O=13.5\text{V}$			4.0	
High-Level Output Voltage	$V_{OH}$	$V_{DD}=5\text{V},  I_O  < 1\mu\text{A}$	4.95	5		V
		$V_{DD}=10\text{V},  I_O  < 1\mu\text{A}$	9.95	10		
		$V_{DD}=15\text{V},  I_O  < 1\mu\text{A}$	14.95	15		
Low-Level Output Voltage	$V_{OL}$	$V_{DD}=5\text{V},  I_O  < 1\mu\text{A}$		0	0.05	V
		$V_{DD}=10\text{V},  I_O  < 1\mu\text{A}$		0	0.05	
		$V_{DD}=15\text{V},  I_O  < 1\mu\text{A}$		0	0.05	
High-Level Output Current (NOTE)	$I_{OH}$	$V_{DD}=5\text{V}, V_O=4.6\text{V}$	-0.51	-1.0		mA
		$V_{DD}=10\text{V}, V_O=9.5\text{V}$	-1.3	-2.6		
		$V_{DD}=15\text{V}, V_O=13.5\text{V}$	-3.4	-6.8		
Low-Level Output Current (NOTE)	$I_{OL}$	$V_{DD}=5\text{V}, V_O=0.4\text{V}$	0.51	1		mA
		$V_{DD}=10\text{V}, V_O=0.5\text{V}$	1.3	2.6		
		$V_{DD}=15\text{V}, V_O=1.5\text{V}$	3.4	6.8		
Input Leakage Current	$I_{I(LEAK)}$	$V_{DD}=15\text{V}, V_{IN}=V_{DD}$ or $V_{SS}$			$\pm 0.1$	$\mu\text{A}$
Quiescent Supply Current	$I_Q$	$V_{DD}=5\text{V}, V_{IN}=V_{DD}$ or $V_{SS}, I_{OUT}=0$		0.01	0.25	$\mu\text{A}$
		$V_{DD}=10\text{V}, V_{IN}=V_{DD}$ or $V_{SS}, I_{OUT}=0$		0.01	0.5	
		$V_{DD}=15\text{V}, V_{IN}=V_{DD}$ or $V_{SS}, I_{OUT}=0$		0.01	1.0	

Note:  $I_{OL}$  and  $I_{OH}$  are tested one output at a time.

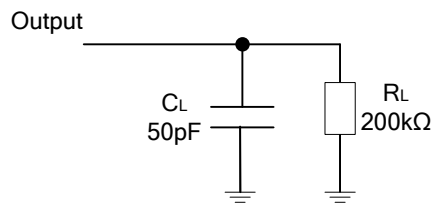
■ SWITCHING CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , Input:  $t_R=t_F=20\text{ns}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	$t_{PLH} / t_{PHL}$	$V_{DD}=5\text{V}, C_L=50\text{pF}, R_L=200\text{k}\Omega$		90	250	ns
		$V_{DD}=10\text{V}, C_L=50\text{pF}, R_L=200\text{k}\Omega$		55	120	
		$V_{DD}=15\text{V}, C_L=50\text{pF}, R_L=200\text{k}\Omega$		45	90	
Transition Time	$t_{TLH} / t_{THL}$	$V_{DD}=5\text{V}, C_L=50\text{pF}, R_L=200\text{k}\Omega$		100	200	ns
		$V_{DD}=10\text{V}, C_L=50\text{pF}, R_L=200\text{k}\Omega$		50	100	
		$V_{DD}=15\text{V}, C_L=50\text{pF}, R_L=200\text{k}\Omega$		40	80	

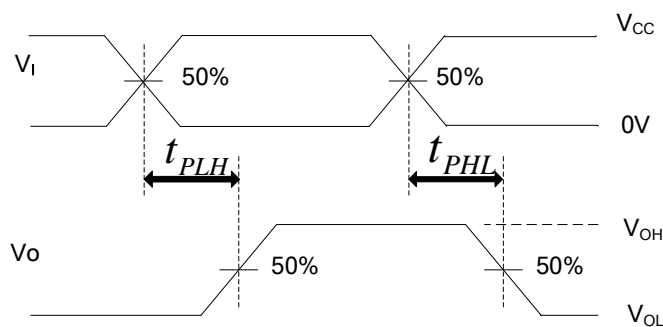
■ OPERATING CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Average Input Capacitance	$C_{IN}$	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.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.