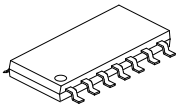
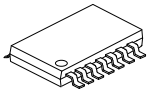
UCD4023B **Preliminary** ***CMOS IC***

TRIPLE 3-INPUT NAND GATE



SOP-14



TSSOP-14

■ DESCRIPTION

The **UCD4023B** contains three independent 3-input NAND gates, they perform the function $Y=\overline{A\times B\times C}$ in positive logic.

■ FEATURES

* 5V-10V-15V Parametric Ratings
* Triple 3-Input NAND Gate
* Symmetrical Output Characteristics
* Maximum Input Current of 1uA at 15V Over Full Package Temperature Rage

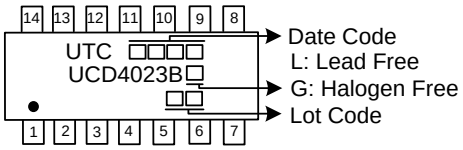
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD4023BL-S14-R	UCD4023BG-S14-R	SOP-14	Tape Reel
UCD4023BL-P14-R	UCD4023BG-P14-R	TSSOP-14	Tape Reel

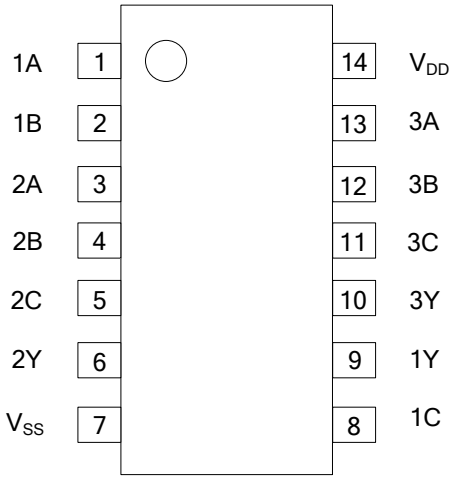
UCD4023BG-S14-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S14: SOP-14, P14: TSSOP-14
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

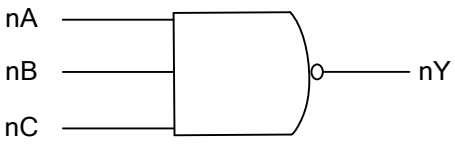


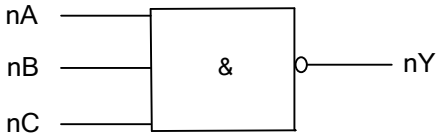
■ FUNCTION TABLE (each gate)

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

Note: X = DON'T CARE CASE

■ LOGIC DIAGRAM (positive logic)





■ ABSOLUTE MAXIMUM RATING (T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ 18	V
Input Voltage	V(nA,nb,nc)	-0.5 ~ V_{DD}+0.5	V
Output Voltage	V(nY)	-0.5 ~ V_{DD}+0.5	V
Storage Temperature	T_{STG}	-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	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{DD}		3		15	V
Operating Temprature	T_{OPR}		-40		+85	°C

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{DD}=5V, V_O=0.5V	3.5	3		V
		V_{DD}=10V, V_O=1.0V	7.0	6		
		V_{DD}=5V, V_O=1.5V	11.0	9		
Low-Level Input Voltage	V_{IL}	V_{DD}=5V, V_O=4.5V		2	1.5	V
		V_{DD}=10V, V_O=9.0V		4	3.0	
		V_{DD}=15V, V_O=13.5V		6	4.0	
High-Level Output Voltage	V_{OH}	V_{DD}=5V, No Load	4.95	5		V
		V_{DD}=10V, No Load	9.95	10		
		V_{DD}=15V, No Load	14.95	15		
Low-Level Output Voltage	V_{OL}	V_{DD}=5V, No Load		0	0.05	V
		V_{DD}=10V, No Load		0	0.05	
		V_{DD}=15V, No Load		0	0.05	
High-Level Output Current (NOTE)	I_{OH}	V_{DD}=5V, V_O=4.6V	-0.44	-0.88		mA
		V_{DD}=10V, V_O=9.5V	-1.1	-2.25		
		V_{DD}=15V, V_O=13.5V	-3.0	-8.8		
Low-Level Output Current (NOTE)	I_{OL}	V_{DD}=5V, V_O=0.4V	0.44	0.88		mA
		V_{DD}=10V, V_O=0.5V	1.1	2.25		
		V_{DD}=15V, V_O=1.5V	3.0	8.8		
Input Leakage Current	$I_{I(LEAK)}$	V_{DD}=15V ,V_{IN}=V_{DD} or GND			±0.1	µA
Quiescent Supply Current	I_Q	V_{DD}=5V, V_{IN}=V_{DD} or V_{SS}, I_{OUT}=0		0.004	0.25	µA
		V_{DD}=10V, V_{IN}=V_{DD} or V_{SS}, I_{OUT}=0		0.005	0.5	
		V_{DD}=15V, V_{IN}=V_{DD} or V_{SS}, I_{OUT}=0		0.006	1.0	

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

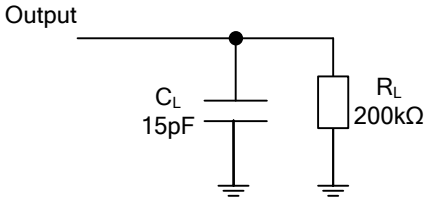
■ SWITCHING CHARACTERISTICS (T_A=25°C, Input: t_R=t_F=20ns, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}	V_{DD}=5V, C_L=15pF, R_L=200kΩ		75	100	ns
		V_{DD}=10V, C_L=15pF, R_L=200kΩ		40	50	
	t_{PHL}	V_{DD}=5V, C_L=15pF, R_L=200kΩ		75	100	ns
		V_{DD}=10V, C_L=15pF, R_L=200kΩ		40	50	
Transition Time Low-to-High Level	t_{TLH}	V_{DD}=5V, C_L=15pF, R_L=200kΩ		75	125	ns
		V_{DD}=10V, C_L=15pF, R_L=200kΩ		40	75	
Transition Time High-to-Low Level	t_{THL}	V_{DD}=5V, C_L=15pF, R_L=200kΩ		75	150	ns
		V_{DD}=10V, C_L=15pF, R_L=200kΩ		50	100	

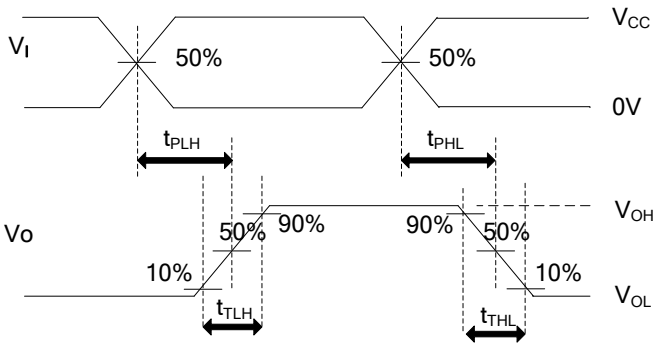
■ OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Average Input Capacitance	C_{IN}	Any Input		5	7.5	pF
Power Dissipation Capacitance	C_{PD}	Any Gate		17		pF

■ TEST CIRCUIT AND WAVEFORMS



Definitions for test circuit



Propagation Delay Times

Note: C_L includes probe and jig capacitance.