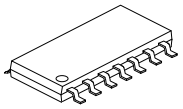
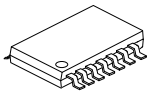
CMOS QUAD EXCLUSIVE-OR GATE



SOP-14



TSSOP-14

■ DESCRIPTION

The **UCD4070B** contains four independent 2-input Exclusive-OR gates, they perform the function Y=A⊕B in positive logic.

■ FEATURES

* High-Voltage Types(20V Rating)
* Quad Exclusive-OR Gate
* Standardized Symmetrical Output Characteristics
*100% Tested for Quiescent Current at 20V
* 5V,10V and 15V Parametric Ratings
*Maximum input current of 1uA at 18V Over Full Package Temperature Range
 - 100nA at 18V and 25°C
*Medium Speed Operation
 -t_{PHL}, t_{PLH}=65ns(TYP) at V_{DD}=10V,C_L=50pF

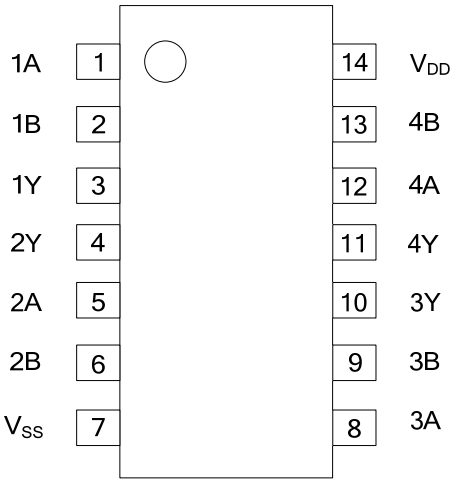
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD4070BL-S14-R	UCD4070BG-S14-R	SOP-14	Tape Reel
UCD4070BL-S14-T	UCD4070BG-S14-T	SOP-14	Tube
UCD4070BL-P14-R	UCD4070BG-P14-R	TSSOP-14	Tape Reel
UCD4070BL-P14-T	UCD4070BG-P14-T	TSSOP-14	Tube

UCD4070BG-S14-T
(1)Packing Type
(2)Package Type
(3)Halogen Free

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

■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)

■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ 20	V
Input Voltage	V(nA,nB)	-0.5 ~ V_{DD} +0.5	V
Operating Temprature	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		18	V
Operating Temperature	T_{OPR}		-40		125	°C

■ ELECTRICAL CHARACTERISTICS(T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{DD}= 5V, V_O=0.5V	3.5			V
		V_{DD}= 10V, V_O=1.0V	7.0			
		V_{DD}= 15V, V_O=1.5V	11.0			
Low-Level Input Voltage	V_{IL}	V_{DD}= 5V, V_O=4.5V			1.5	V
		V_{DD}= 10V, V_O=9.0V			3.0	
		V_{DD}= 15V, V_O=13.5V			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	-0.51	-1		mA
		V_{DD}= 5V, V_O=2.5V	-1.6	-3.2		
		V_{DD}= 10V, V_O=9.5V	-1.3	-2.6		
		V_{DD}= 15V, V_O=13.5V	-3.4	-6.8		
Low-Level Output Current (NOTE)	I_{OL}	V_{DD}= 5V, V_O=0.4V	0.51	1		
		V_{DD}= 10V, V_O=0.5V	1.3	2.6		
		V_{DD}= 15V, V_O=1.5V	3.4	6.8		
Input Leakage Current	$I_{I(LEAK)}$	V_{DD}= 15V ,V_{IN} = V_{DD} or GND			±0.1	μA
Quiescent Supply Current	I_{DD}	V_{DD}= 5V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.01	0.25	μA
		V_{DD}= 10V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.01	0.5	
		V_{DD}= 15V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.01	1.0	
		V_{DD}= 20V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.02	5.0	

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

■ SWITCHING CHARACTERISTICS

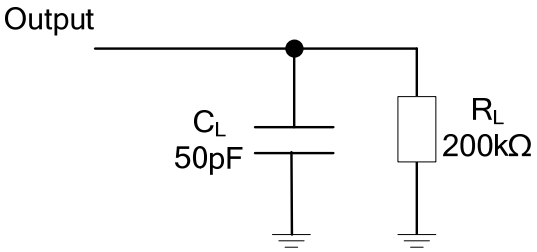
(T_A=25°C, Input: t_R=t_F=20ns, C_L=50pF, R_L=200KΩ, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}	V_{DD}=5V		140	280	ns
		V_{DD}=10V		65	130	
		V_{DD}=15V		50	100	
	t_{PHL}	V_{DD}=5V		140	280	
		V_{DD}=10V		65	130	
		V_{DD}=15V		50	100	
Transition Time	t_{TLH} t_{THL}	V_{DD}=5V		100	200	ns
		V_{DD}=10V		50	100	
		V_{DD}=15V		40	80	

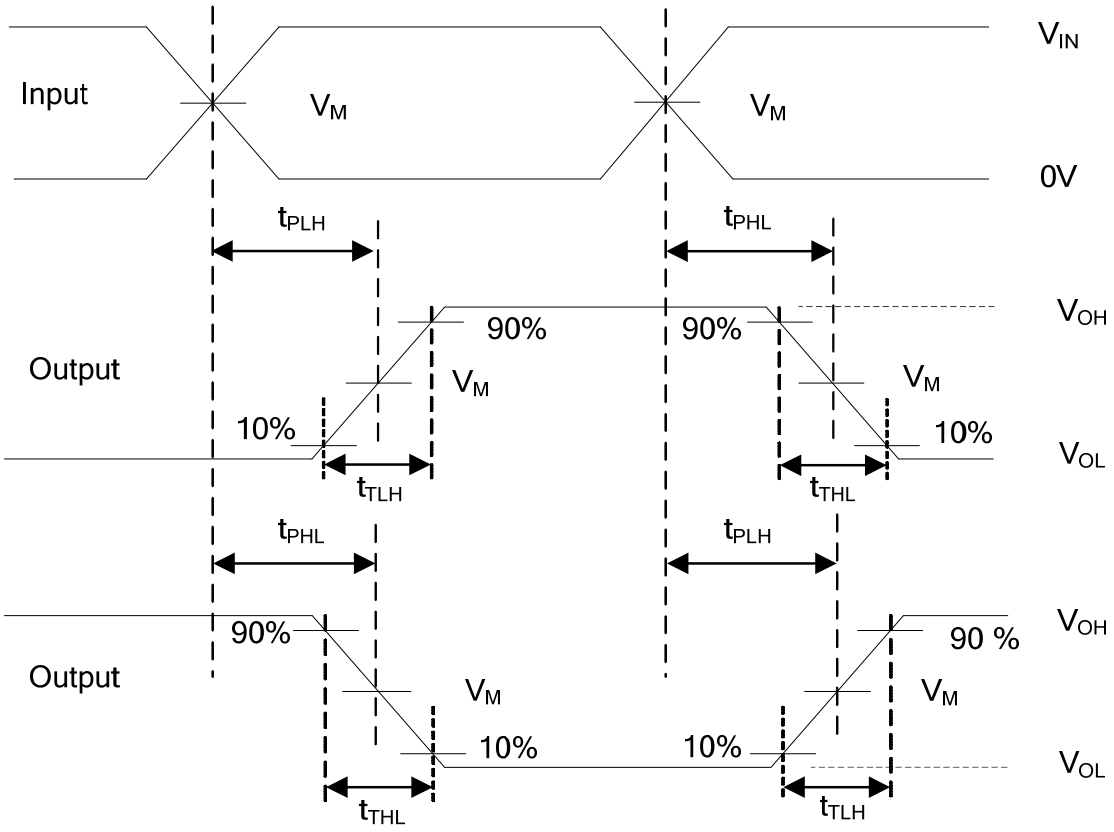
■ OPERATING CHARACTERISTICS(T_A=25°C)

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



VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT TRANSITION TIMES

Note: C_L includes probe and jig capacitance.