



UCD4049UB

Preliminary

CMOS IC

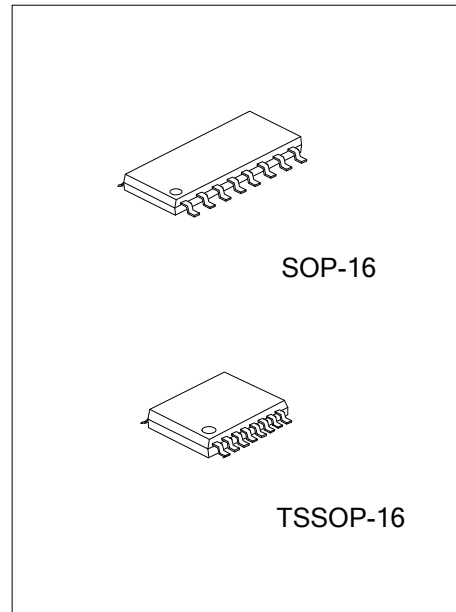
CMOS HEX INVERTERS

■ DESCRIPTION

The **UCD4049UB** devices are inverters with unbuffered output, and feature logic-level conversion using only one supply voltage (V_{CC}). The input-signal high level (V_{IH}) can exceed the V_{CC} supply voltage when these devices are used for logic-level conversions. These devices are intended for use as CMOS to DTL/TTL converters and can drive directly two DTL/TTL loads.

■ FEATURES

- * High Sink Current for Driving 2 TTL Loads
- * High-To-Low Level Logic Conversion
- * Maximum Input Current of 1uA at 18V Over Full Package Temperature Range
- * 5V, 10V and 15V Parametric Ratings

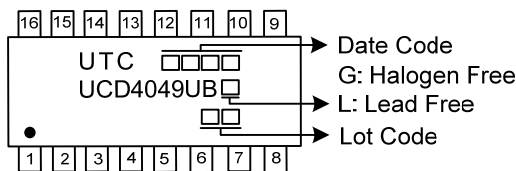


■ ORDERING INFORMATION

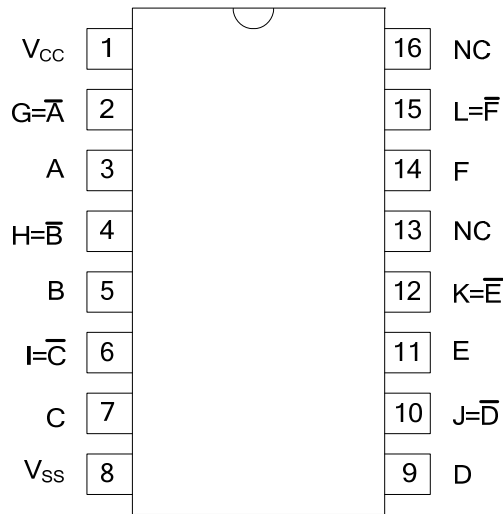
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD4049UBL-S16-R	UCD4049UBG-S16-R	SOP-16	Tape Reel
UCD4049UBL-P16-R	UCD4049UBG-P16-R	TSSOP-16	Tape Reel

<p>UCD4049UBG-S16-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S16: SOP-16, TSSOP-16 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



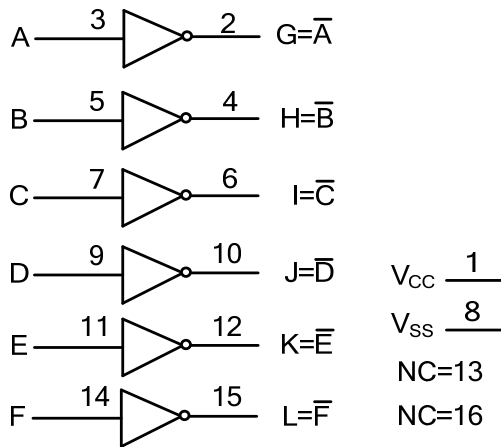
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT(A)	OUTPUT(G)
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_{CC}	-0.5 ~ 18	V
Input Voltage	V_{IN}	-0.5 ~ $V_{CC}+0.5$	V
Output Voltage	V_{OUT}	-0.5 ~ $V_{CC}+0.5$	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_{CC}	3 ~ 15	V
Operating Temperature	T_{OPR}	-40 ~ +125	$^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	SOP-16	θ_{JA}	73	$^{\circ}\text{C/W}$
	TSSOP-16		108	$^{\circ}\text{C/W}$

■ 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}	$V_{CC}=5\text{V}, V_O=0.5\text{V}$	4.0			V
		$V_{CC}=10\text{V}, V_O=1.0\text{V}$	8.0			
		$V_{CC}=15\text{V}, V_O=1.5\text{V}$	12.5			
Low-Level Input Voltage	V_{IL}	$V_{CC}=5\text{V}, V_O=4.5\text{V}$			1.0	V
		$V_{CC}=10\text{V}, V_O=9.0\text{V}$			2.0	
		$V_{CC}=15\text{V}, V_O=13.5\text{V}$			2.5	
High-Level Output Voltage	V_{OH}	$V_{CC}=5\text{V}, V_I=0\text{V}, \text{No Load}$	4.95	5		V
		$V_{CC}=10\text{V}, V_I=0\text{V}, \text{No Load}$	9.95	10		
		$V_{CC}=15\text{V}, V_I=0\text{V}, \text{No Load}$	14.95	15		
Low-Level Output Voltage	V_{OL}	$V_{CC}=5\text{V}, V_I=5\text{V}, \text{No Load}$		0	0.05	V
		$V_{CC}=10\text{V}, V_I=10\text{V}, \text{No Load}$		0	0.05	
		$V_{CC}=15\text{V}, V_I=15\text{V}, \text{No Load}$		0	0.05	
High-Level Output Current (Note)	I_{OH}	$V_{CC}=5\text{V}, V_O=4.6\text{V}$	-0.65	-1.2		mA
		$V_{CC}=5\text{V}, V_O=2.5\text{V}$	-2.1	-7.2		
		$V_{CC}=10\text{V}, V_O=9.5\text{V}$	-1.65	-3.5		
		$V_{CC}=15\text{V}, V_O=13.5\text{V}$	-4.3	-13		
Low-Level Output Current (Note)	I_{OL}	$V_{CC}=4.5\text{V}, V_O=0.4\text{V}$	2.6	6.8		mA
		$V_{CC}=5\text{V}, V_O=0.4\text{V}$	3.2	7.8		
		$V_{CC}=10\text{V}, V_O=0.5\text{V}$	8.0	16		
		$V_{CC}=15\text{V}, V_O=1.5\text{V}$	24.0	67		
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=15\text{V}, V_{IN} = V_{CC} \text{ or } \text{GND}$			0.1	μA
Quiescent Supply Current	I_{DD}	$V_{CC}=5\text{V}, V_{IN} = V_{CC} \text{ or } V_{SS}, I_{OUT} = 0$		0.02	1	μA
		$V_{CC}=10\text{V}, V_{IN} = V_{CC} \text{ or } V_{SS}, I_{OUT} = 0$		0.02	2	
		$V_{CC}=15\text{V}, V_{IN} = V_{CC} \text{ or } V_{SS}, I_{OUT} = 0$		0.02	4	

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

■ SWITCHING CHARACTERISTICS

($T_A=25^\circ\text{C}$, Input: $t_R=t_F=20\text{ns}$, $C_L=50\text{pF}$, $R_L=200\text{K}\Omega$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}	$V_{CC}=5\text{V}$		35	85	ns
		$V_{CC}=10\text{V}$		20	45	
		$V_{CC}=15\text{V}$		15	35	
	t_{PHL}	$V_{CC}=5\text{V}$		20	65	
		$V_{CC}=10\text{V}$		15	40	
		$V_{CC}=15\text{V}$		10	30	
Transition Time	t_{TLH}	$V_{CC}=5\text{V}$		50	120	ns
		$V_{CC}=10\text{V}$		35	55	
		$V_{CC}=15\text{V}$		30	45	
	t_{THL}	$V_{CC}=5\text{V}$		25	60	
		$V_{CC}=10\text{V}$		20	40	
		$V_{CC}=15\text{V}$		15	30	

■ 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		15	22.5	pF

■ TEST CIRCUIT AND WAVEFORMS

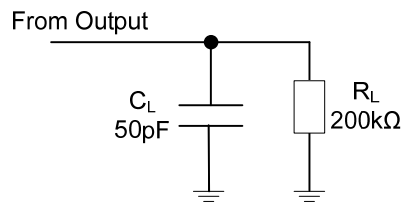


Fig 1. Definitions for test circuit

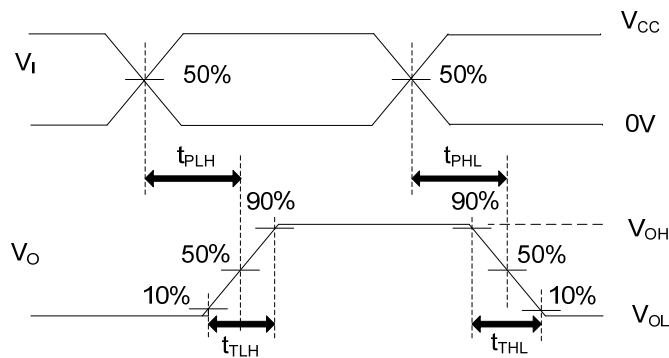


Fig 2. Propagation Delay Times

Note: C_L includes probe and jig capacitance.

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