



## U74HC07

CMOS IC

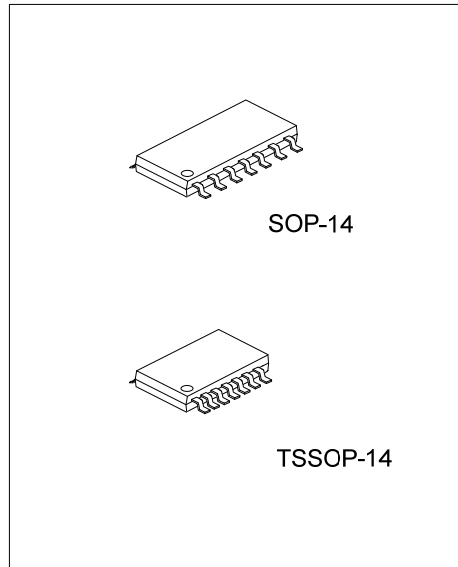
### HEX BUFFER (OPEN DRAIN)

#### DESCRIPTION

The **U74HC07** is a high speed CMOS hex open drain buffer fabricated with UTC advanced CMOS technology.

The internal circuit is composed of 2 stages including buffer output, which enables high noise immunity and stable output.

All inputs are equipped with protection circuits against static discharge and transient excess voltage.

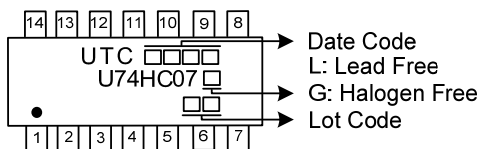


#### ORDERING INFORMATION

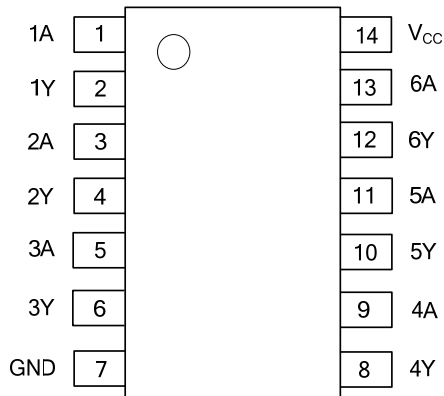
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC07L-S14-R	U74HC07G-S14-R	SOP-14	Tape Reel
U74HC07L-P14-R	U74HC07G-P14-R	TSSOP-14	Tape Reel

<p>U74HC07G-S14-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S14: SOP-14, P14: TSSOP-14</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



■ PIN CONFIGURATION



■ PIN CONFIGURATION

PIN No	SYMBOL	NAME AND FUNCTION
1, 3, 5, 9, 11, 13	1A to 6A	Data Inputs
2, 4, 6, 8, 10, 12	1Y to 6Y	Data Outputs
7	GND	Ground(0V)
14	V <sub>CC</sub>	Positive Supply Voltage

■ FUNCTION TABLE

A	Y
L	L
H	Z

Z: High Impedance

### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5 to +7	V
DC Input Voltage	$V_I$	-0.5 to $V_{CC}+0.5$	V
DC Output Voltage	$V_O$	-0.5 to $V_{CC}+0.5$	V
DC Input Diode Current	$I_{IK}$	$\pm 20$	mA
DC Output Diode Current	$I_{OK}$	$\pm 20$	mA
DC Output Current	$I_O$	$\pm 25$	mA
DC $V_{CC}$ or Ground Current	$I_{CC}$	$\pm 50$	mA
Power Dissipation (Note 2)	$P_D$	500	mW
Lead Temperature	$T_L$	300	$^{\circ}\text{C}$
Operating Temperature	$T_{OPR}$	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-65 ~ + 150	$^{\circ}\text{C}$

Note: 1. 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.

2. 500mW at 65 $^{\circ}\text{C}$ , derate to 300mW by 10mW/ $^{\circ}\text{C}$  from 65 $^{\circ}\text{C}$  to 85 $^{\circ}\text{C}$ .

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage	$V_{CC}$		2 ~ 6	V
Input Voltage	$V_I$		0 ~ $V_{CC}$	V
Output Voltage	$V_O$		0 ~ $V_{CC}$	V
Input Rise and Fall Time	$t_r, t_f$	$V_{CC}=2\text{V}$	0 ~ 1000	ns
		$V_{CC}=4.5\text{V}$	0 ~ 500	
		$V_{CC}=6\text{V}$	0 ~ 400	

Note: All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-14	76	$^{\circ}\text{C}/\text{W}$
	TSSOP-14	113	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	$V_{IH}$	$V_{CC}=2\text{V}$	1.5	1.2		V
		$V_{CC}=4.5\text{V}$	3.15	2.4		
		$V_{CC}=6\text{V}$	4.2	3.2		
Low-level Input Voltage	$V_{IL}$	$V_{CC}=2\text{V}$		0.8	0.5	V
		$V_{CC}=4.5\text{V}$		2.1	1.35	
		$V_{CC}=6\text{V}$		2.8	1.8	
Output Voltage Low-Level	$V_{OL}$	$V_{CC}=2\text{V}, I_{OL}=20\mu\text{A}$		0	0.1	V
		$V_{CC}=4.5\text{V}, I_{OL}=20\mu\text{A}$		0	0.1	
		$V_{CC}=6\text{V}, I_{OL}=20\mu\text{A}$		0	0.1	
		$V_{CC}=4.5\text{V}, I_{OL}=4\text{mA}$		0.15	0.26	
		$V_{CC}=6\text{V}, I_{OL}=5.2\text{mA}$		0.16	0.26	
Input Leakage Current	$I_I$	$V_{CC}=6\text{V}, V_I = V_{CC}$ or GND			$\pm 0.1$	$\mu\text{A}$
Output Leakage Current	$I_{OZ}$	$V_{CC}=6\text{V}, V_I = V_{IH}$ or $V_{IL}, V_O = V_{CC}$ or GND			$\pm 0.5$	$\mu\text{A}$
Quiescent Supply Current	$I_{CC}$	$V_{CC}=6\text{V}, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			1	$\mu\text{A}$

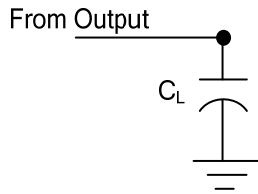
■ SWITCHING CHARACTERISTICS ( $t_r = t_f = 6\text{ns}$ ,  $C_L = 50\text{pF}$ ,  $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Transition Time	$t_{\text{THL}}$	$V_{\text{CC}}=2\text{V}$		30	75	ns
		$V_{\text{CC}}=4.5\text{V}$		8	15	
		$V_{\text{CC}}=6\text{V}$		7	13	
Propagation Delay Time	$t_{\text{PLZ}}$	$V_{\text{CC}}=2\text{V}, R_L=1\text{K}\Omega$		10	90	ns
		$V_{\text{CC}}=4.5\text{V}, R_L=1\text{K}\Omega$		7	18	
		$V_{\text{CC}}=6\text{V}, R_L=1\text{K}\Omega$		6	15	
Propagation Delay Time	$t_{\text{PZL}}$	$V_{\text{CC}}=2\text{V}, R_L=1\text{K}\Omega$		17	90	ns
		$V_{\text{CC}}=4.5\text{V}, R_L=1\text{K}\Omega$		7	18	
		$V_{\text{CC}}=6\text{V}, R_L=1\text{K}\Omega$		5	15	

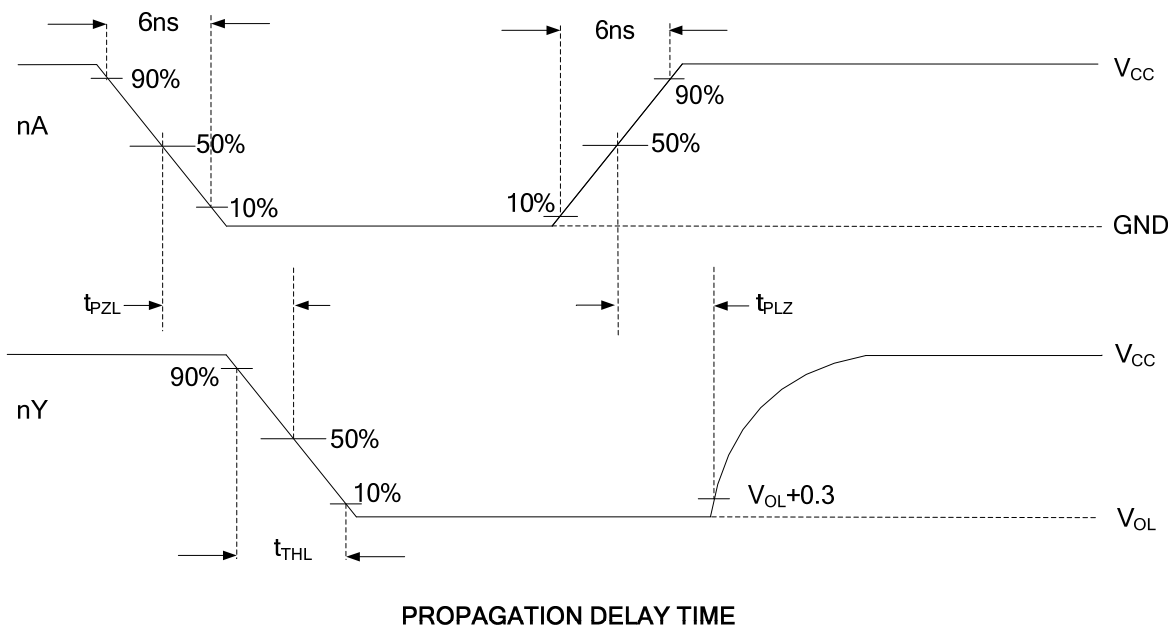
■ CAPACITIVE CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	$C_{\text{IN}}$	$V_{\text{CC}}=5\text{V}$		5	10	pF
Output Capacitance	$C_{\text{OUT}}$	$V_{\text{CC}}=5\text{V}$		3		pF
Power Dissipation Capacitance	$C_{\text{PD}}$	$V_{\text{CC}}=5\text{V}$		4		pF

■ TEST CIRCUIT AND WAVEFORMS (f=1MHz, 50% duty cycle)



TEST CIRCUIT



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