



# U74AHC17

**CMOS IC**

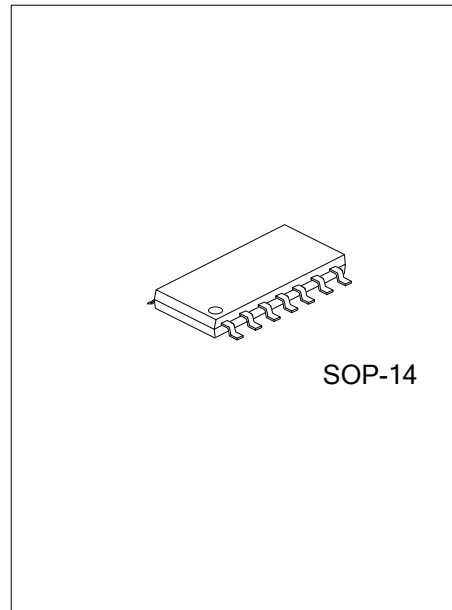
## HEX SCHMITT-TRIGGER BUFFERS

### ■ DESCRIPTION

The **U74AHC17** contains hex Schmitt-trigger buffers and each buffer provides the function  $Y = \overline{A}$ .

### ■ FEATURES

- \* Operate From 2V to 5.5V
- \* Max  $t_{PD}$  of 8.6ns at 5 V ( $C_L=15pF$ )
- \* High Noise Immunity
- \* Low Power Dissipation

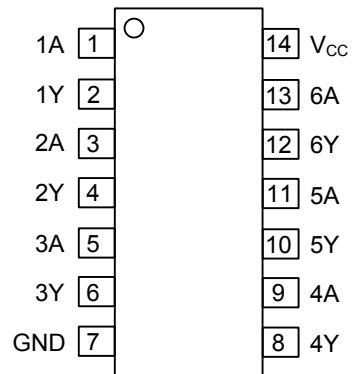


### ■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC17L-S14-R	U74AHC17G-S14-R	SOP-14	Tape Reel

<p>U74AHC17L-S14-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p>	<p>(1) R: Tape Reel (2) S14: SOP-14 (3) G: Halogen Free, L:Lead Free</p>
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## ■ PIN CONFIGURATION

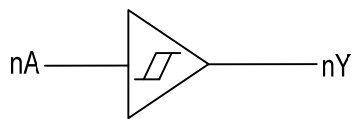


## ■ FUNCTION TABLE (Each Gate)

INPUT A	OUTPUT Y
L	L
H	H

Note: H: HIGH voltage level; L: LOW voltage level.

## ■ LOGIC SYMBOL



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5 ~ +7	V
Input Voltage	$V_{IN}$	-0.5 ~ +7	V
Output Voltage	$V_{OUT}$	-0.5 ~ $V_{CC} + 0.5$	V
$V_{CC}$ or GND Current	$I_{CC}$	±50	mA
Output Sink Current	$I_{OUT}$	±25	mA
Input Clamp Current ( $V_{IN} < 0$ )	$I_{IK}$	-20	mA
Output Clamp Current ( $V_{OUT} < 0$ or $V_{OUT} > V_{CC}$ )	$I_{OK}$	±20	mA
Storage Temperature	$T_{STG}$	-65 ~ +150	°C

Note 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	76	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2.0		5.5	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
High-Level Input Current	$I_{OH}$	$V_{CC}=2V$			-50	µA
		$V_{CC}=3.3V \pm 0.3V$			-4	mA
		$V_{CC}=5V \pm 0.5V$			-8	mA
Low-Level Input Current	$I_{OL}$	$V_{CC}=2V$			50	µA
		$V_{CC}=3.3V \pm 0.3V$			4	mA
		$V_{CC}=5V \pm 0.5V$			8	mA
Operating Temperature	$T_A$		-40	+25	+85	°C

■ STATIC CHARACTERISTICS ( $T_A=25^\circ C$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-Going Input Threshold Voltage	$V_{T+}$	$V_{CC} = 3.0V$	1.2		2.2	V
		$V_{CC} = 4.5V$	1.75		3.15	
		$V_{CC} = 5.5V$	2.15		3.85	
Negative-Going Input Threshold Voltage	$V_{T-}$	$V_{CC} = 3.0V$	0.9		1.9	V
		$V_{CC} = 4.5V$	1.35		2.75	
		$V_{CC} = 5.5V$	1.65		3.35	
Hysteresis( $V_{T+}-V_{T-}$ )	$\Delta V_T$	$V_{CC} = 3.0V$	0.3		1.2	V
		$V_{CC} = 4.5V$	0.4		1.4	
		$V_{CC} = 5.5V$	0.5		1.6	
High-Level Output Voltage	$V_{OH}$	$I_{OH} = -50\mu A$	$V_{CC} = 2.0V$	1.9		V
			$V_{CC} = 3.0V$	2.9		
		$I_{OH} = -4 mA$ $I_{OH} = -8mA$	$V_{CC} = 4.5V$	4.4		
			$V_{CC} = 3.0V$ $V_{CC} = 4.5V$	2.58 3.94		
Low-Level Output Voltage	$V_{OL}$	$I_{OL} = 50\mu A$	$V_{CC} = 2.0V$		0.1	V
			$V_{CC} = 3.0V$		0.1	
			$V_{CC} = 4.5V$		0.1	
		$I_{OL} = 4 mA$ $I_{OL} = 8mA$	$V_{CC} = 3.0V$		0.36	
			$V_{CC} = 4.5V$		0.36	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC} = 0V$ to $5.5V, V_{IN} = 5.5V$ or GND			±0.1	µA
Quiescent Supply Current	$I_Q$	$V_{CC} = 5.5V, V_{IN} = V_{CC}$ or GND, $I_{OUT} = 0$			2	µA
Input Capacitance	$C_{IN}$	$V_{IN} = V_{CC}$ or GND		2	10	pF

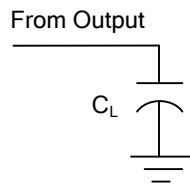
■ SWITCHING CHARACTERISTICS( $T_A=25^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation Delay, From Input(A) To Output(Y)	$t_{PLH}/t_{PHL}$	$V_{CC} = 3.3 \pm 0.3 \text{ V}$	$C_L = 15 \text{ pF}$		8.3	12.8	ns
			$C_L = 50 \text{ pF}$		10.8	16.3	
	$t_{PLH}/t_{PHL}$	$V_{CC} = 5.0 \pm 0.5 \text{ V}$	$C_L = 15 \text{ pF}$		5.5	8.6	
			$C_L = 50 \text{ pF}$		7	10.6	

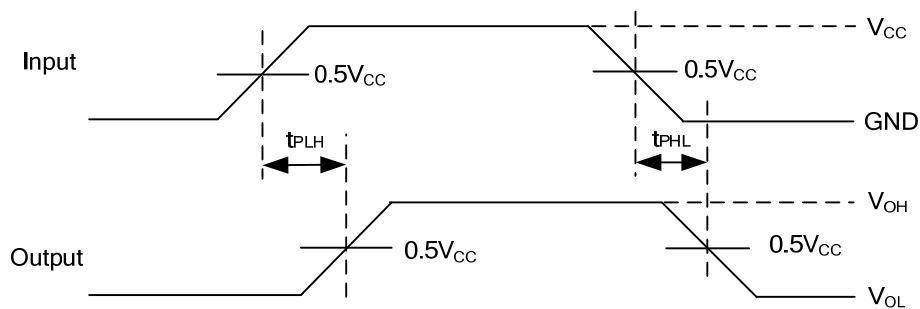
■ OPERATING CHARACTERISTICS( $T_A=25^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	No Load, $f=1\text{MHz}$		9		pF

■ TEST CIRCUIT AND WAVEFORMS



Test circuit for measuring propagation delay



Waveforms showing the Input(A) to Output(Y) propagation delays

Note:  $C_L$  includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR  $\leq 1$ MHz,  $Z_o = 50\Omega$ ,  $t_R \leq 3$ ns,  $t_F \leq 3$ ns.

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