



# U74ACT04

**CMOS IC**

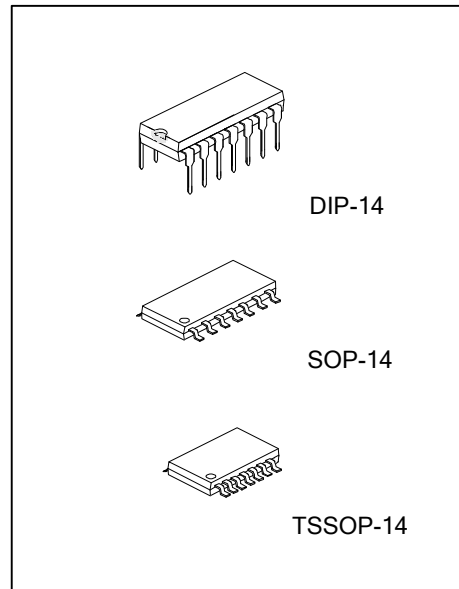
## HEX INVERTERS

### DESCRIPTION

The UTC **U74ACT04** contains six independent inverters and each of them performs the Boolean function  $Y = \bar{A}$ .

### FEATURES

\* Inputs are TTL Voltage Compatible



### ORDERING INFORMATION

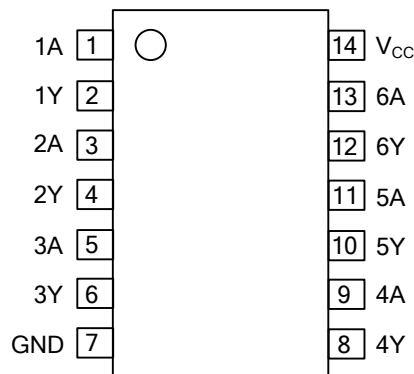
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74ACT04L-D14-T	U74ACT04G-D14-T	DIP-14	Tube
-	U74ACT04G-S14-R	SOP-14	Tape Reel
-	U74ACT04G-P14-R	TSSOP-14	Tape Reel

<p>U74ACT04L-D14-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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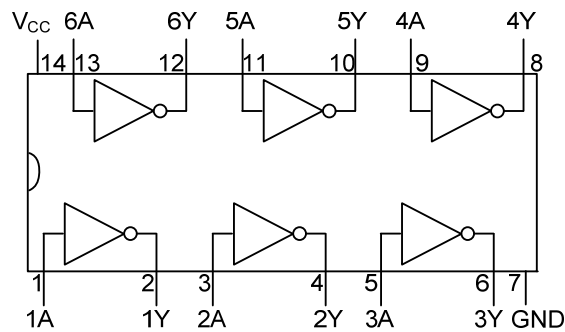
### MARKING

DIP-14	SOP-14 / TSSOP-14
<p>14 13 12 11 10 9 8 UTC □□□□ → Date Code L: Lead Free U74ACT04 □ → G: Halogen Free □□ → Lot Code 1 2 3 4 5 6 7</p>	<p>14 13 12 11 10 9 8 → Date Code UTC □□□□ U74ACT04G □□ → Lot Code 1 2 3 4 5 6 7</p>

■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM

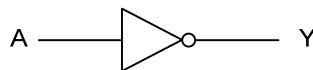


■ FUNCTION TABLE

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

Note: H=High level; L=Low Level

■ LOGIC DIAGRAM



## ■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
DC Supply Voltage		$V_{CC}$	-0.5 ~ 7	V
Input Voltage		$V_{IN}$	-0.5 ~ $V_{CC}+0.5$	V
Output Voltage		$V_{OUT}$	-0.5 ~ $V_{CC}+0.5$	V
DC Input Clamp Current	For $V_{IN} < 0$ or $V_{IN} > V_{CC}$	$I_{IK}$	$\pm 20$	mA
DC Output Clamp Current	For $V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	$I_{OK}$	$\pm 20$	mA
Continuous Output Current	For $V_{OUT}=0$ to $V_{CC}$	$I_{OUT}$	$\pm 50$	mA
Continuous Current Through $V_{CC}$ or GND			$\pm 200$	mA
Operating Temperature		$T_{OPR}$	-40 ~ +85	$^{\circ}C$
Storage Temperature		$T_{STG}$	-65 ~ +150	$^{\circ}C$

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.

## ■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	$\theta_{JA}$	81	$^{\circ}C/W$
	SOP-14		112	
	TSSOP-14		141	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Supply Voltage	$V_{CC}$		4.5		5.5	V	
High Level Input Voltage	$V_{IH}$	$V_{CC}=4.5\sim 5.5V$	2			V	
Low Level Input Voltage	$V_{IL}$	$V_{CC}=4.5\sim 5.5V$			0.8	V	
High Level Output Voltage	$V_{OH}$	$V_{CC}=4.5V$	$I_{OUT}=-50\mu A$	4.4	4.49	V	
		$V_{CC}=5.5V$		5.4	5.49	V	
		$V_{CC}=4.5V$	$I_{OUT}=-24mA$	3.86		V	
		$V_{CC}=5.5V$		4.86		V	
Low Level Output Voltage	$V_{OL}$	$V_{CC}=4.5V$	$I_{OUT}=-50\mu A$		0.001	0.1	V
		$V_{CC}=5.5V$			0.001	0.1	V
		$V_{CC}=4.5V$	$I_{OUT}=24mA$			0.36	V
		$V_{CC}=5.5V$				0.36	V
Input Leakage Current	$I_{I(Leak)}$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND			$\pm 0.1$	$\mu A$	
Quiescent Device Current	$I_Q$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			2	$\mu A$	
Additional quiescent Supply Current	$\Delta I_Q$	$V_{CC}=5.5V$ , One input at 3.4V, Other inputs at GND or $V_{CC}$		0.6		mA	
Input Capacitance	$C_{IN}$	$V_{CC}=5V, V_{IN}=V_{CC}$ or GND		4.5		pF	

## ■ SWITCHING SPECIFICATIONS ( $T_A=25^{\circ}C$ , Input $t_R, t_F = 2.5ns$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay, A to Y	$t_{PLH}$	$V_{CC}=5\pm 0.5V, C_L=50pF, R_L=500\Omega$	1	6	8.5	ns
	$t_{PHL}$	$V_{CC}=5\pm 0.5V, C_L=50pF, R_L=500\Omega$	1	5.5	8	ns
Power Dissipation Capacitance (Notes 1, 2)	$C_{PD}$	$V_{CC}=5V, C_L=50pF, f=1MHz$		45		pF

Notes: 1.  $C_{PD}$  is used to determine the dynamic power consumption, per inverter.

2.  $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$  where  $f_i$  = Input Frequency,  $C_L$  = Output Load Capacitance,  $V_{CC}$  = Supply Voltage.

## ■ TEST CIRCUITS AND WAVEFORMS

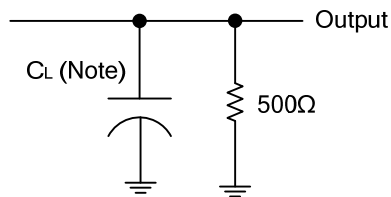


Fig.1: Load circuitry for switching times.  
 Note:  $C_L$  includes probe and jig capacitance.

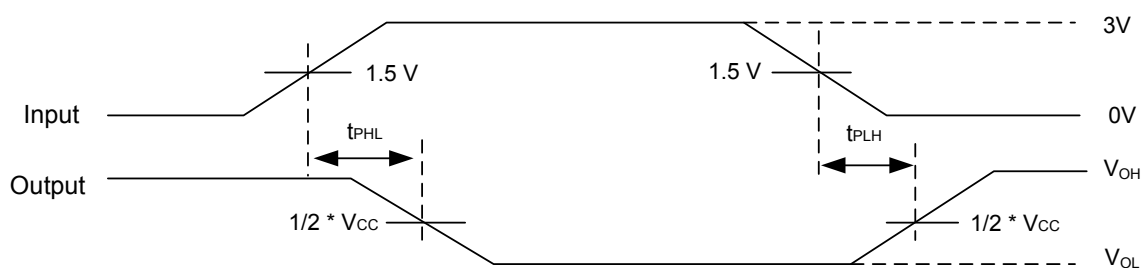


Fig.2: Propagation delay from Input(A) to Output(Y).

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