



U74ACT04

CMOS IC

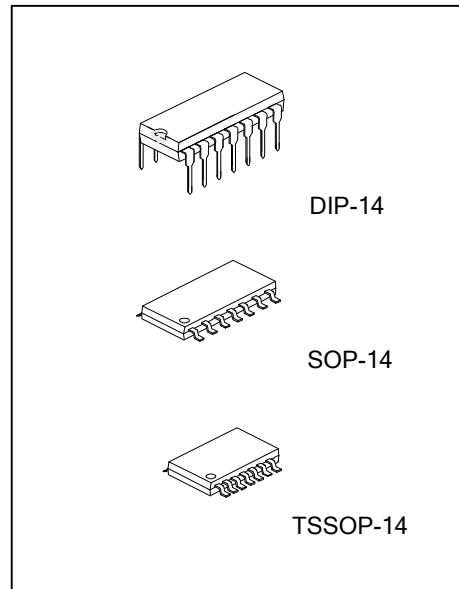
HEX INVERTERS

■ 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

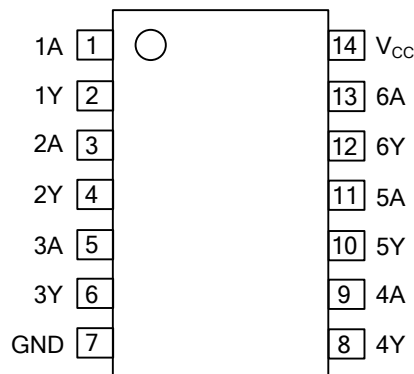
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74ACT04L-D14-T	U74ACT04G-D14-T	DIP-14	Tube
-	U74ACT04G-S14-R	SOP-14	Tape Reel
-	U74ACT04G-P14-R	TSSOP-14	Tape Reel

<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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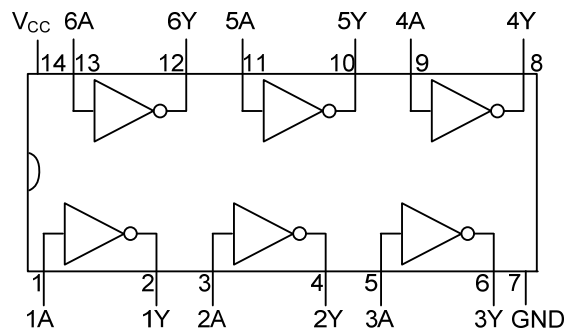
■ MARKING

DIP-14	SOP-14 / TSSOP-14
<p>14 13 12 11 10 9 8 → Date Code UTC □□□□ 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

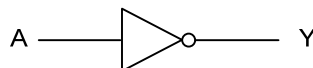


■ FUNCTION TABLE

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}	±20	mA
DC Output Clamp Current	For $V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	I_{OK}	±20	mA
Continuous Output Current	For $V_{OUT}=0$ to V_{CC}	I_{OUT}	±50	mA
Continuous Current Through V_{CC} or GND			±200	mA
Operating Temperature		T_{OPR}	-40 ~ +85	°C
Storage Temperature		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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	θ_{JA}	81	°C/W
	SOP-14		112	
	TSSOP-14		141	

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, 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}	$V_{CC}=4.5\sim 5.5\text{V}$	2			V	
Low Level Input Voltage	V_{IL}	$V_{CC}=4.5\sim 5.5\text{V}$			0.8	V	
High Level Output Voltage	V_{OH}	$V_{CC}=4.5\text{V}$	$I_{OUT}=-50\mu\text{A}$	4.4	4.49	V	
		$V_{CC}=5.5\text{V}$		5.4	5.49	V	
		$V_{CC}=4.5\text{V}$	$I_{OUT}=-24\text{mA}$	3.86		V	
		$V_{CC}=5.5\text{V}$		4.86		V	
Low Level Output Voltage	V_{OL}	$V_{CC}=4.5\text{V}$	$I_{OUT}=-50\mu\text{A}$		0.001	0.1	V
		$V_{CC}=5.5\text{V}$			0.001	0.1	V
		$V_{CC}=4.5\text{V}$	$I_{OUT}=24\text{mA}$			0.36	V
		$V_{CC}=5.5\text{V}$				0.36	V
Input Leakage Current	$I_{I(Leak)}$	$V_{CC}=5.5\text{V}$, $V_{IN}=V_{CC}$ or GND			±0.1	μA	
Quiescent Device Current	I_Q	$V_{CC}=5.5\text{V}$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			2	μA	
Additional quiescent Supply Current	ΔI_Q	$V_{CC}=5.5\text{V}$, One input at 3.4V, Other inputs at GND or V_{CC}		0.6		mA	
Input Capacitance	C_{IN}	$V_{CC}=5\text{V}$, $V_{IN}=V_{CC}$ or GND		4.5		pF	

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

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

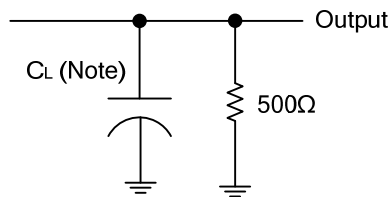


Fig.1: Load circuitry for switching times.
 Note: C_L includes probe and jig capacitance.

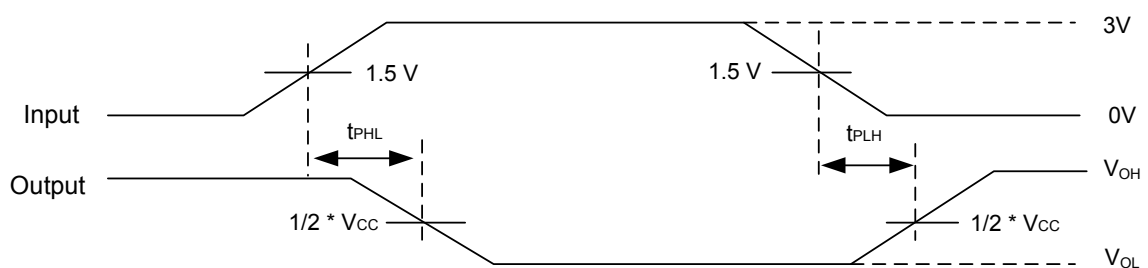


Fig.2: Propagation delay from Input(A) to Output(Y).

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