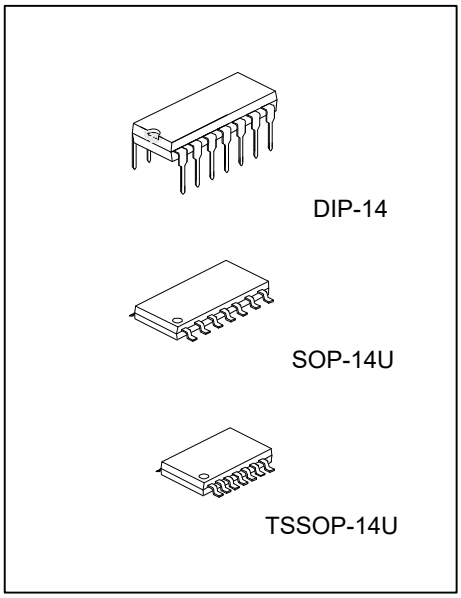
U74ACT04

CMOS IC

HEX INVERTERS



■ DESCRIPTION

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

■ FEATURES

* Inputs are TTL Voltage Compatible

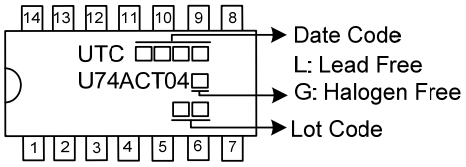
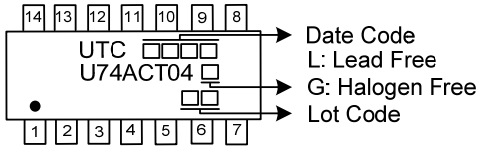
■ ORDERING INFORMATION

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

U74ACT04G-D14-T
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) D14: DIP-14, UEA: SOP-14U, UEB: TSSOP-14U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

DIP-14	SOP-14U / TSSOP-14U
	

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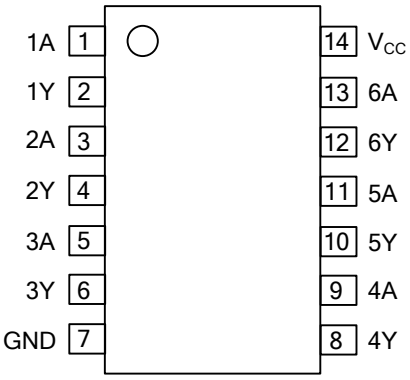
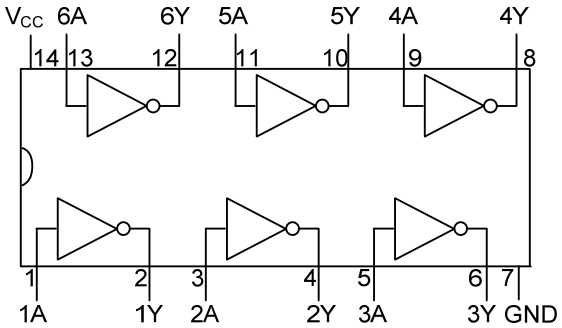
■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM

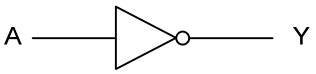


■ FUNCTION TABLE

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

Note: H=High level; L=Low Level

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7.0	V
Input Voltage	V_{IN}	-0.5 ~ V_{CC} +0.5	V
Output Voltage	V_{OUT}	-0.5 ~ V_{CC} +0.5	V
Input Clamp Current (V_{IN} < 0 or V_{IN} > V_{CC})	I_{IK}	±20	mA
Output Clamp Current (V_{OUT} < 0 or V_{OUT} > V_{CC})	I_{OK}	±20	mA
Output Current (V_{OUT}=0 to V_{CC})	I_{OUT}	±50	mA
V_{CC} or GND Current	I_{CC}	±200	mA
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.

■ RECOMMENDED OPERATING CONDITIONS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	4.5 ~ 5.5	V
Input Voltage	V_{IN}	0 ~ V_{CC}	V
Output Voltage	V_{OUT}	0 ~ V_{CC}	V
Input Transition Rise or Fall Rate	Δt/Δv	8	ns/V
Operating Temperature	T_A	-40 ~ +125	°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	θ_{JA}	75	°C/W
	SOP-14U		95	°C/W
	TSSOP-14U		120	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High Level Input Voltage	V_{IH}	V_{CC}=4.5~5.5V		2			V
Low Level Input Voltage	V_{IL}	V_{CC}=4.5~5.5V				0.8	V
High-Level Output Voltage	V_{OH}	V_{CC}=4.5V	I_{OH}=-24mA	3.86			V
			I_{OH}=-50μA	4.4	4.49		V
		V_{CC}=5.5V	I_{OH}=-24mA	4.86			V
			I_{OH}=-50μA	5.4	5.49		V
Low-Level Output Voltage	V_{OL}	V_{CC}=4.5V	I_{OL}=24mA			0.36	V
			I_{OL}=50μA		0.001	0.1	V
		V_{CC}=5.5V	I_{OL}=24mA			0.36	V
			I_{OL}=50μA		0.001	0.1	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=5.5V, V_{IN}=V_{CC} 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
Additional Quiescent Supply Current Per Input Pin	ΔI_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 CHARACTERISTICS (Input t_R, t_F = 2.5ns, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A) to output(Y)	t_{PLH}	V_{CC}=5±0.5V, C_L=50pF, R_L=500Ω	1	6	8.5	ns
	t_{PHL}		1	5.5	8	ns

■ OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	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

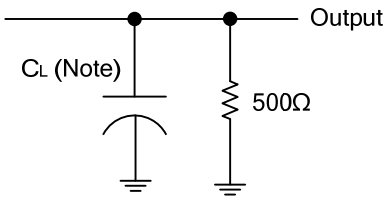


Figure 1. Load circuitry for switching times

Note: C_L includes probe and jig capacitance.

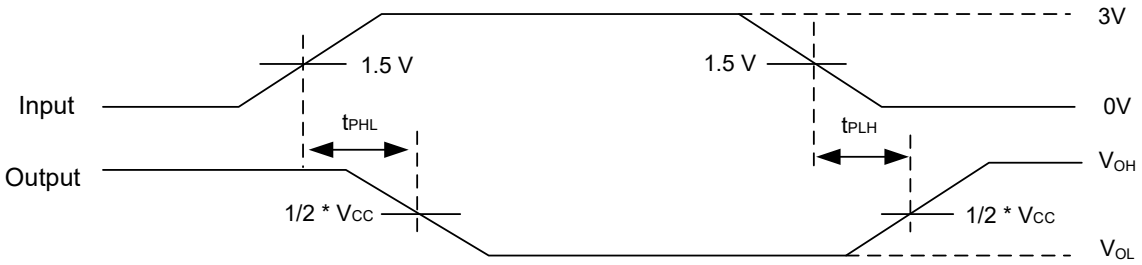


Figure 2. Propagation delay from Input (A) to Output (Y)

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