



U74LVC04A

CMOS IC

HEX INVERTERS

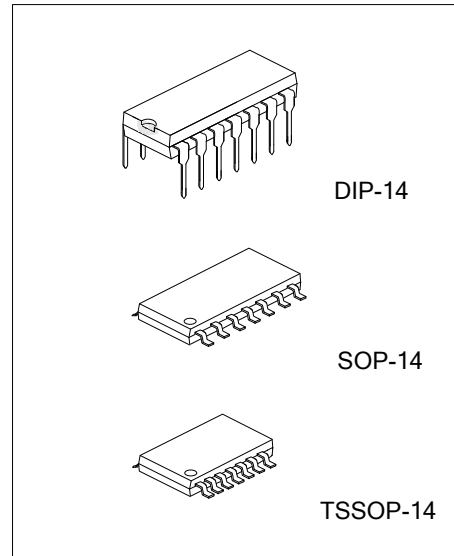
DESCRIPTION

The UTC **U74LVC04A** consists of six independent inverters, it provides the function $Y = \bar{A}$.

Inputs can be driven from either 3.3V or 5V devices, so the device can be used in a mix 3.3V/5V system.

FEATURES

- * Operation Voltage Range: 1.65~3.6V
- * Low Power Dissipation
- * Input accept voltage to 5.5V



ORDERING INFORMATION

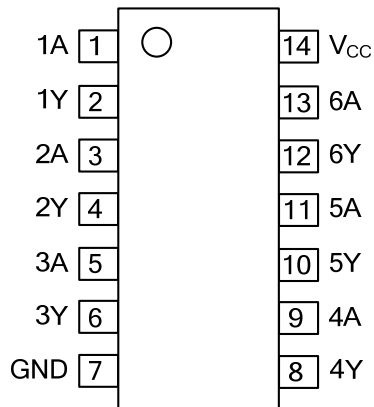
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC04AL-D14-T	U74LVC04AG-D14-T	DIP-14	Tube
-	U74LVC04AG-S14-R	SOP-14	Tape Reel
-	U74LVC04AG-P14-R	TSSOP-14	Tape Reel

<p>U74LVC04AL-D14-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) P14: TSSOP-14, S14: SOP-14, D14: DIP-14 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING

SOP-14	TSSOP-14
<p>Date Code</p> <p>Lot Code</p>	<p>Date Code</p> <p>Lot Code</p>

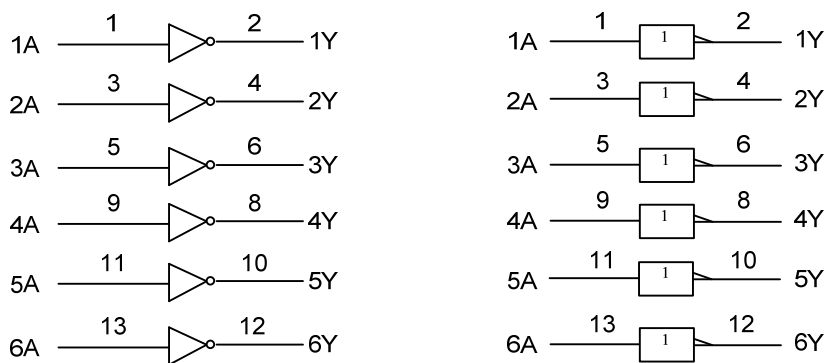
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT	OUTPUT
A	Y
L	H
H	L

■ LOGIC DIAGRAM (positive logic)



IEC logic symbol

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.5~6.5	V
Input Voltage	V _{IN}	-0.5~6.5	V
Output Voltage(active mode)	V _{OUT}	-0.5~V _{CC} +0.5	V
Input Clamp Current(V _{IN} <0)	I _{IK}	-50	mA
Output Clamp Current(V _{OUT} <0)	I _{OK}	-50	mA
Output Current	I _{OUT}	±50	mA
V _{CC} or GND Current	I _{CC}	±100	mA
Power Dissipation	P _D	500	mW
Derated Above 60°C		5.5	mW/°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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}	Operating	1.65		3.6	V
		Data retention only	1.5			V
Input Voltage	V _{IN}		0		5.5	V
Output Voltage	V _{OUT}		0		V _{CC}	V
Operating Temperature	T _A		-40		125	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V _{IH}	V _{CC} = 1.65V~1.95V	0.65 × V _{CC}			V
		V _{CC} =2.3V~2.7V	1.7			V
		V _{CC} = 2.7V~3.6V	2			V
Low-Level Input Voltage	V _{IL}	V _{CC} = 1.65V~1.95V			0.35 × V _{CC}	V
		V _{CC} =2.3V~2.7V			0.7	V
		V _{CC} = 2.7V~3.6V			0.8	V
High-Level Output Voltage	V _{OH}	V _{CC} = 1.65V~3.6V, I _{OH} =-100μA	V _{CC} -0.2			V
		V _{CC} = 1.65V, I _{OH} =-4mA	1.29			V
		V _{CC} = 2.3V, I _{OH} =-8mA	1.9			V
		V _{CC} = 2.7V, I _{OH} =-12mA	2.2			V
		V _{CC} = 3V, I _{OH} =-12mA	2.4			V
Low-Level Output Voltage	V _{OL}	V _{CC} = 1.65V~3.6V, I _{OL} =100μA			0.1	V
		V _{CC} = 1.65V, I _{OL} =4mA			0.24	V
		V _{CC} = 2.3V, I _{OL} =8mA			0.3	V
		V _{CC} = 2.7V, I _{OL} =12mA			0.4	V
		V _{CC} = 3V, I _{OL} =24mA			0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} = 3.6V, V _{IN} =5.5V or GND			±1	μA
Quiescent Supply Current	I _Q	V _{CC} = 3.6V, V _{IN} =V _{CC} or GND, I _{OUT} =0			1	μA
Additional quiescent Supply Current	Δ I _Q	V _{CC} = 2.7V ~ 3.6V One input at V _{CC} - 0.6V, other inputs at V _{CC} or GND			500	μA
Input Capacitance	C _{IN}	V _{CC} = 3.3V, V _{IN} =V _{CC} or GND		5		pF

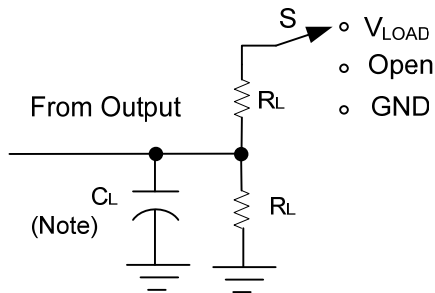
■ DYNAMIC CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From Input (A) to Output(Y)	t _{PLH} /t _{PHL}	V _{CC} =1.8V±0.15V	1	4.1	7.5	ns
		V _{CC} =2.5V±0.2V	1	3.6	7	ns
		V _{CC} =2.7V	1	3	5.3	ns
		V _{CC} =3.3V±0.3V	1	2.5	4.3	ns

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	V _{CC} =1.8V, f=10MHz		6		pF
		V _{CC} =2.5V, f=10MHz		7		pF
		V _{CC} =3.3V, f=10MHz		8		pF

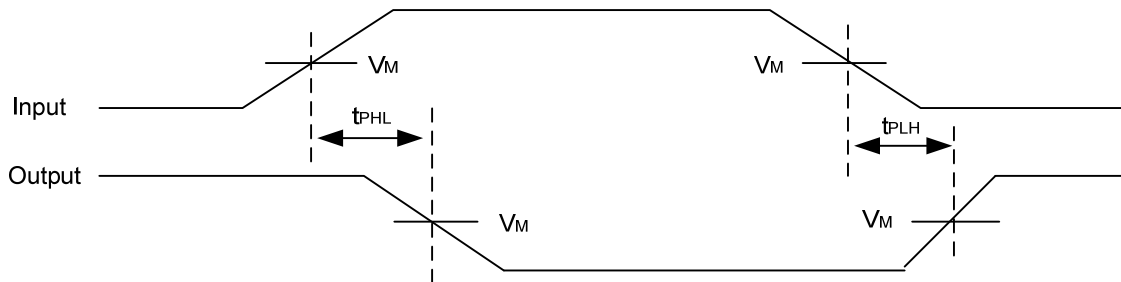
■ TEST CIRCUIT AND WAVEFORMS



TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{LOAD}

Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R/t_F	V_M	V_{LOAD}	C_L	R_L	V_{Δ}
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1K Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
2.7V	2.7V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V



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