



U74LVC14C

CMOS IC

HEX SCHMITT-TRIGGER INVERTERS

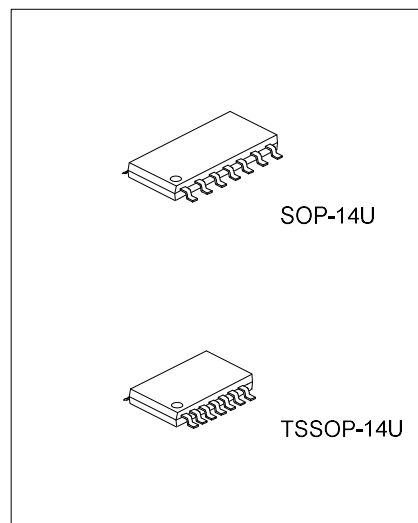
DESCRIPTION

The **U74LVC14C** devices contain six independent inverters with Schmitt-trigger action which perform the Boolean function $Y = \overline{A}$ in positive logic.

This device has power-down protective circuit preventing destruction of the device when it is powered down.

FEATURES

- * Operate From 1.65V to 3.6V
- * Inputs Accept Voltages to 5.5V
- * I_{OFF} Supports Partial-Power-Down Mode
- * Low Power Dissipation
- * Max. t_{PD} of 9 ns at 3.3V

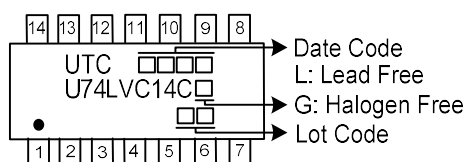


ORDERING INFORMATION

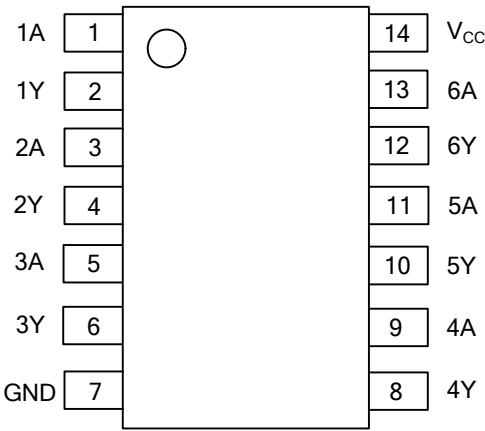
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC14CL-UEA-R	U74LVC14CG-UEA-R	SOP-14U	Tape Reel
U74LVC14CL-UEB-R	U74LVC14CG-UEB-R	TSSOP-14U	Tape Reel

U74LVC14CG-UEA-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) UEA: SOP-14U, UEB: TSSOP-14U (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



PIN CONFIGURATION

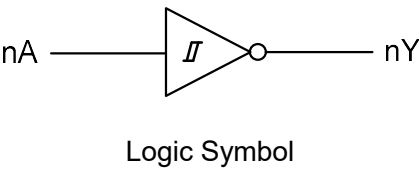


FUNCTION TABLE (Each Inverter)

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

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

LOGIC DIAGRAM (Each Inverter)



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage		V _{CC}		-0.5 ~ +6.5	V
Input Voltage		V _{IN}		-0.5 ~ +6.5	V
Output Voltage		V _{OUT}		-0.5 ~ V _{CC} +0.5	V
V _{CC} or GND Current		I _{CC}		±100	mA
Continuous Output Current		I _{OUT}	V _{OUT} = 0 to V _{CC}	±50	mA
Input Clamp Current		I _{IK}	V _{IN} < 0	-50	mA
Output Clamp Current		I _{OK}	V _{OUT} < 0	-50	mA
Power Dissipation	SOP-14U	P _D	T _A =-40°C to +125°C	600	mW
	TSSOP-14U			500	mW
Storage Temperature Range		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	SOP-14U	95	$^{\circ}\text{C/W}$
	TSSOP-14U	115	$^{\circ}\text{C/W}$

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		3.6	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
High-Level Output Current	I_{OH}	$V_{CC}=1.65\text{V}$			-4	mA
		$V_{CC}=2.3\text{V}$			-8	mA
		$V_{CC}=2.7\text{V}$			-12	mA
		$V_{CC}=3\text{V}$			-24	mA
Low-Level Output Current	I_{OL}	$V_{CC}=1.65\text{V}$			4	mA
		$V_{CC}=2.3\text{V}$			8	mA
		$V_{CC}=2.7\text{V}$			12	mA
		$V_{CC}=3\text{V}$			24	mA
Ambient Operating Temperature	T_A		-40		+125	$^{\circ}\text{C}$

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Threshold	V _{T+}	V _{CC} =1.65V	0.4		1.3	0.4		1.3	V
		V _{CC} =1.95V	0.6		1.5	0.6		1.5	V
		V _{CC} =2.3V	0.8		1.7	0.8		1.7	V
		V _{CC} =2.5V	0.8		1.7	0.8		1.7	V
		V _{CC} =2.7V	0.8		2	0.8		2	V
		V _{CC} =3V	0.9		2	0.9		2	V
		V _{CC} =3.6V	1.1		2	1.1		2	V
Negative-Going Threshold	V _{T-}	V _{CC} =1.65V	0.15		0.85	0.15		0.85	V
		V _{CC} =1.95V	0.25		0.95	0.25		0.95	V
		V _{CC} =2.3V	0.4		1.2	0.4		1.2	V
		V _{CC} =2.5V	0.4		1.2	0.4		1.2	V
		V _{CC} =2.7V	0.4		1.4	0.4		1.4	V
		V _{CC} =3V	0.6		1.5	0.6		1.5	V
		V _{CC} =3.6V	0.8		1.7	0.8		1.7	V
Hysteresis(V _{T+} - V _{T-})	ΔV _T	V _{CC} =1.65V	0.1		1.15	0.1		1.15	V
		V _{CC} =1.95V	0.15		1.25	0.15		1.25	V
		V _{CC} =2.3V	0.25		1.3	0.25		1.3	V
		V _{CC} =2.5V	0.25		1.3	0.25		1.3	V
		V _{CC} =2.7V	0.3		1.1	0.3		1.1	V
		V _{CC} =3V	0.3		1.2	0.3		1.2	V
		V _{CC} =3.6V	0.3		1.2	0.3		1.2	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65V ~ 3.6V, I _{OH} =-100μA	V _{CC} -0.2			V _{CC} -0.3			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2			1.05			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.8			1.65			V
		V _{CC} =2.7V, I _{OH} =-12mA	2.2			2.05			V
		V _{CC} =3V, I _{OH} =-12mA	2.4			2.25			V
		V _{CC} =3V, I _{OH} =-24mA	2.2			2			V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65V ~ 3.6V, I _{OL} =100μA			0.2			0.3	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45			0.65	V
		V _{CC} =2.3V, I _{OL} =8mA			0.6			0.8	V
		V _{CC} =2.7V, I _{OL} =12mA			0.4			0.6	V
		V _{CC} =3V, I _{OL} =24mA			0.55			0.8	V
Input Leakage Current	I _{I(LEAK)}	V _{IN} =5.5V or GND, V _{CC} =3.6V			±5			±20	μA
Quiescent Supply Current	I _Q	V _{IN} = V _{CC} or GND, I _{OUT} =0A, V _{CC} =3.6V			10			40	μA
Additional Quiescent Supply Current Per Input Pin	ΔI _Q	V _{CC} =2.7V ~ 3.6V, I _{OUT} =0A One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND			500			5000	μA

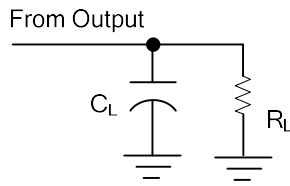
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (nA) to Output (nY)	t _{PLH} / t _{PHL}	V _{CC} =1.8V±0.15V R _L =1KΩ	1	9	14	1		16	ns
		V _{CC} =2.5V±0.2V R _L =500Ω							
		V _{CC} =2.7V R _L =500Ω	1	6	10	1		12	ns
		V _{CC} =3.3V±0.3V R _L =500Ω							

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

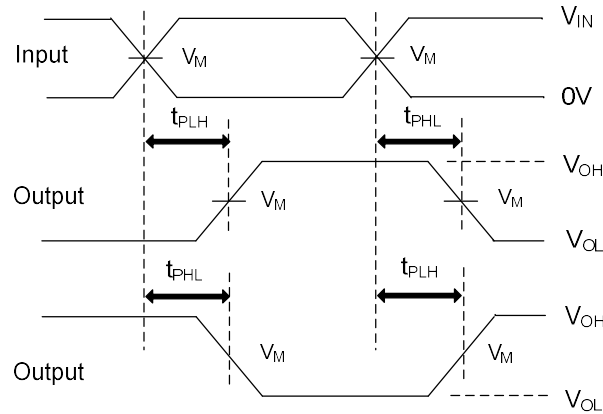
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{IN} = V _{CC} or GND		5		pF
Power Dissipation Capacitance Per Inverter	C _{PD}	f=10MHz		11		pF
		V _{CC} =1.8V		12		pF
		V _{CC} =2.5V		15		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

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



PROPAGATION DELAY TIMES

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 10MHz$, $Z_O = 50\Omega$.

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