



U74LVC2G14

CMOS IC

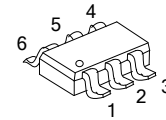
DUAL SCHMITT-TRIGGER INVERTER WITH 5V TOLERANT INPUT

DESCRIPTION

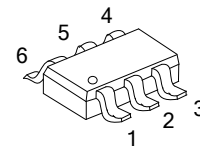
The UTC **U74LVC2G14** is a high-performance, low-power, low-voltage, Si-gate CMOS device which provides two inverters with Schmitt trigger action. It is capable of transforming slowly changed input signals into sharply defined, jitter-free output signals.

FEATURES

- * Operate From 1.65V to 5.5V
- * 5V Tolerant Input/Output for Interfacing with 5V logic
- * $\pm 24\text{mA}$ Output Drive ($V_{CC} = 3.3\text{V}$)
- * CMOS Low-Power Consumption and High Noise Immunity
- * Halogen Free



SOT-363



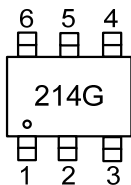
SOT-26

ORDERING INFORMATION

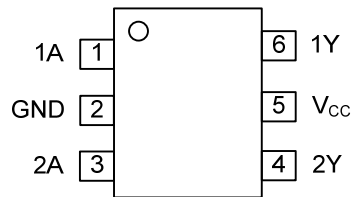
Ordering Number	Package	Packing
U74LVC2G14G-AL6-R	SOT-363	Tape Reel
U74LVC2G14G-AG6-R	SOT-26	Tape Reel

U74LVC2G14G-AL6-R	(1)Packing Type (2)Package Type (3)Halogen Free	(1) R: Tape Reel (2) AL6: SOT-363, AG6: SOT-26 (3) G: Halogen Free
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MARKING



■ PIN CONFIGURATION



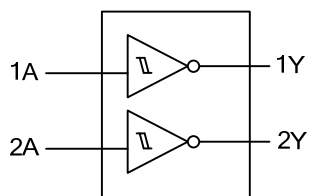
■ FUNCTION TABLE

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

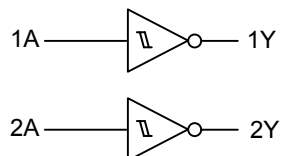
H=High level

L=Low Level

■ LOGIC SYMBOL



■ FUNCTIONAL DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5 ~ +6.5	V
Input Voltage		V_{IN}	-0.5 ~ +6.5	V
Output Voltage	High-impedance	V_{OUT}	-0.5 ~ 6.5	V
	Power-off			
	High State		-0.5 ~ $V_{CC}+0.5$	V
	Low State			
V_{CC} or GND Current		I_{CC}	±100	mA
Continuous Output Current		I_O	±50	mA
Input Clamp Current		I_{IK}	-50	mA
Output Clamp Current		I_{OK}	-50	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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-363	θ_{JA}	259	°C/W
	SOT-26		250	

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		1.65		5.5	V
Positive-Going Input Threshold Voltage	V_{T+}	$V_{CC}=1.65V$	0.70		1.40	V
		$V_{CC}=2.3V$	1.00		1.70	V
		$V_{CC}=3V$	1.30		2.20	V
		$V_{CC}=4.5V$	1.90		3.10	V
		$V_{CC}=5.5V$	2.20		3.70	V
Negative-Going Input Threshold Voltage	V_{T-}	$V_{CC}=1.65V$	0.30		0.70	V
		$V_{CC}=2.3V$	0.40		1.00	V
		$V_{CC}=3V$	0.60		1.30	V
		$V_{CC}=4.5V$	1.10		2.00	V
		$V_{CC}=5.5V$	1.40		2.50	V
Hysteresis Voltage($V_{T+} - V_{T-}$)	ΔV_T	$V_{CC}=1.65V$	0.30		0.80	V
		$V_{CC}=2.3V$	0.40		0.90	V
		$V_{CC}=3V$	0.40		1.10	V
		$V_{CC}=4.5V$	0.60		1.30	V
		$V_{CC}=5.5V$	0.70		1.40	V
Control Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
High Level Output Current	I_{OH}	$V_{CC} = 1.65V$			-4	mA
		$V_{CC} = 2.3V$			-8	mA
		$V_{CC} = 3V$			-16	mA
		$V_{CC} = 3V$			-24	mA
		$V_{CC} = 4.5V$			-32	mA
Low Level Output Current	I_{OL}	$V_{CC} = 1.65V$			4	mA
		$V_{CC} = 2.3V$			8	mA
		$V_{CC} = 3V$			16	mA
		$V_{CC} = 3V$			24	mA
		$V_{CC} = 4.5V$			32	mA
Operating Temperature	T_{OPR}		-40		85	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V _{OH}	V _{CC} =1.65~5.5V, I _{OH} =-100uA	V _{CC} -0.1			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.20			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.90			V
		V _{CC} =3V, I _{OH} =-16mA	2.40			V
		V _{CC} =3V, I _{OH} =-24mA	2.30			V
		V _{CC} =4.5V, I _{OH} =-32mA	3.80			V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65~5.5V, I _{OL} =100uA			0.10	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45	V
		V _{CC} =2.3V, I _{OL} =8mA			0.30	V
		V _{CC} =3V, I _{OL} =12mA			0.40	V
		V _{CC} =3V, I _{OL} =24mA			0.55	V
		V _{CC} =4.5V, I _{OL} =32mA			0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0V to 5.5V, V _{IN} =0 or 5.5V			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V,			±10	μA
Quiescent Supply Current	I _Q	V _{CC} =1.65V to 5.5V, I _{OUT} =0 V _{IN} =5.5V or GND		0.1	10	μA
Additional Quiescent Supply Current Per Pin	ΔI _Q	V _{CC} =3V to 5.5V One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND, I _{OUT} =0			500	μA
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		4		pF

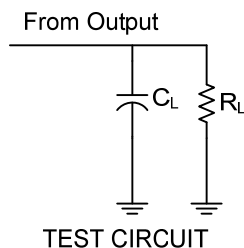
■ SWITCHING CHARACTERISTICS (see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay from Input (nA) to Output(nY)	t _{PLH} / t _{PHL}	V _{CC} =1.8V±0.15V, V _{IN} =V _{CC} C _L =30pF, R _L =1KΩ	3.90		9.50	ns
		V _{CC} =2.5V±0.2V, V _{IN} =V _{CC} C _L =30pF, R _L =500Ω	1.90		5.70	ns
		V _{CC} =3.3V±0.3V, V _{IN} =3V C _L =50pF, R _L =500Ω	2.00		5.40	ns
		V _{CC} =5V±0.5V, V _{IN} =V _{CC} C _L =50pF, R _L =500Ω	1.5		4.3	ns

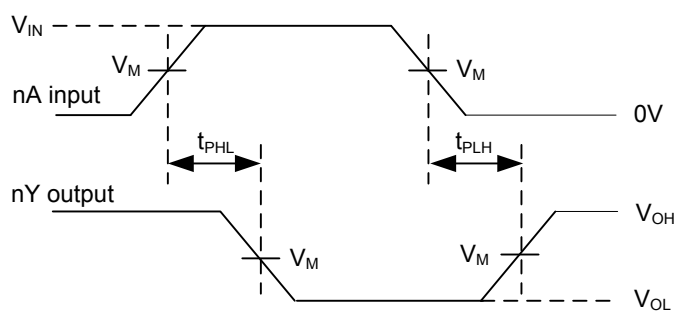
■ OPERATING CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V,f=10MHz		16		pF
		V _{CC} =2.5V,f=10MHz		17		pF
		V _{CC} =3.3V,f=10MHz		18		pF
		V _{CC} =5V,f=10MHz		21		pF

■ TEST CIRCUITS AND WAVEFORMS



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
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	50pF	500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	50pF	500 Ω



Note: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics:

PRR $\leq 1MHz$, $Z_O = 50\Omega$: $t_R \leq 2ns$, $t_F \leq 2ns$ ($V_{CC} = 1.8V \pm 0.15V$ and $V_{CC} = 2.5V \pm 0.2V$)

$t_R \leq 2.5ns$, $t_F \leq 2.5ns$ ($V_{CC} = 3.3V \pm 0.3V$ and $V_{CC} = 5V \pm 0.5V$)

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