



U74LVC2G14

CMOS IC

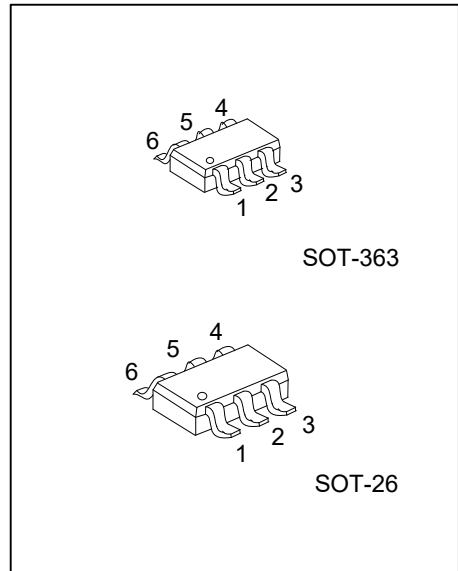
DUAL SCHMITT-TRIGGER INVERTER WITH 5V TOLERANT INPUT

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
- * ±24mA Output Drive ($V_{CC} = 3.3V$)
- * CMOS Low-Power Consumption and High Noise Immunity

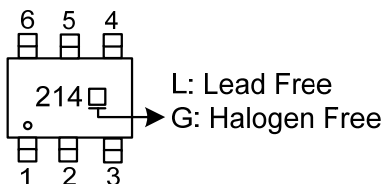


ORDERING INFORMATION

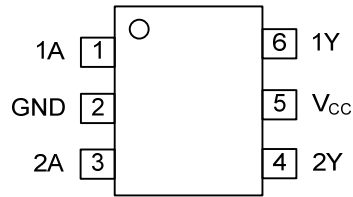
Ordering Number		Package	Packing
U74LVC2G14L-AL6-R	U74LVC2G14G-AL6-R	SOT-363	Tape Reel
U74LVC2G14L-AG6-R	U74LVC2G14G-AG6-R	SOT-26	Tape Reel

<p>U74LVC2G14G-AL6-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AL6: SOT-363, AG6: SOT-26 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION



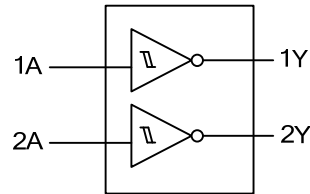
■ FUNCTION TABLE

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

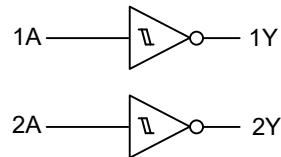
H=High level

L=Low Level

■ LOGIC SYMBOL



■ FUNCTIONAL DIAGRAM



■ ABSOLUTE MAXIMUM RATING (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	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}	350	°C/W
	SOT-26		230	°C/W

■ RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		1.65		5.5	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_A		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V _{T+}	V _{CC} =1.65V	0.7	1.24	1.5	0.7		1.7	V
		V _{CC} =2.3V	1.0	1.54	1.8	1.0		2.0	V
		V _{CC} =3V	1.3	1.86	2.2	1.3		2.4	V
		V _{CC} =4.5V	1.9	2.59	3.1	1.9		3.3	V
		V _{CC} =5.5V	2.2	3.08	3.7	2.2		3.8	V
Negative-Going Input Threshold Voltage	V _{T-}	V _{CC} =1.65V	0.25	0.61	0.9	0.25		1.1	V
		V _{CC} =2.3V	0.4	0.82	1.15	0.4		1.35	V
		V _{CC} =3V	0.6	1.15	1.5	0.6		1.7	V
		V _{CC} =4.5V	1.0	1.73	2.0	1.0		2.2	V
		V _{CC} =5.5V	1.2	2.13	2.5	1.2		2.5	V
Hysteresis Voltage (V _{T+} - V _{T-})	ΔV _T	V _{CC} =1.65V	0.15	0.67	1.0	0.15		1.2	V
		V _{CC} =2.3V	0.25	0.72	1.1	0.25		1.3	V
		V _{CC} =3V	0.4	0.73	1.2	0.4		1.4	V
		V _{CC} =4.5V	0.6	0.92	1.5	0.6		1.7	V
		V _{CC} =5.5V	0.7	1.02	1.7	0.7		1.9	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65~5.5V, I _{OH} =-100uA	V _{CC} -0.1			V _{CC} -0.1			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.20			0.95			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.90			1.7			V
		V _{CC} =3V, I _{OH} =-16mA	2.20			1.9			V
		V _{CC} =3V, I _{OH} =-24mA	2.30			2.0			V
		V _{CC} =4.5V, I _{OH} =-32mA	3.80			3.4			V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65~5.5V, I _{OL} =100uA			0.10			0.1	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45			0.7	V
		V _{CC} =2.3V, I _{OL} =8mA			0.30			0.45	V
		V _{CC} =3V, I _{OL} =16mA			0.40			0.6	V
		V _{CC} =3V, I _{OL} =24mA			0.55			0.8	V
		V _{CC} =4.5V, I _{OL} =32mA			0.55			0.8	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0V to 5.5V, V _{IN} =0 or 5.5V			±5			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V,			±10			±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			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			500	μA

■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

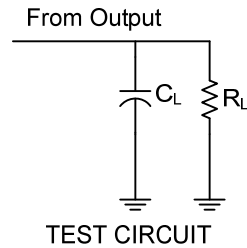
(see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+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, V _{IN} =V _{CC} C _L =30pF, R _L =1KΩ	3.9		13	1.0		15	ns
		V _{CC} =2.5V±0.2V, V _{IN} =V _{CC} C _L =30pF, R _L =500Ω	1.9		6.5	1.0		8.5	ns
		V _{CC} = 3.3V±0.3V, V _{IN} =3V C _L =50pF, R _L =500Ω	2.0		6.1	1.0		8.1	ns
		V _{CC} =5V±0.5V, V _{IN} =V _{CC} C _L =50pF, R _L =500Ω	1.5		5	0.5		6.0	ns

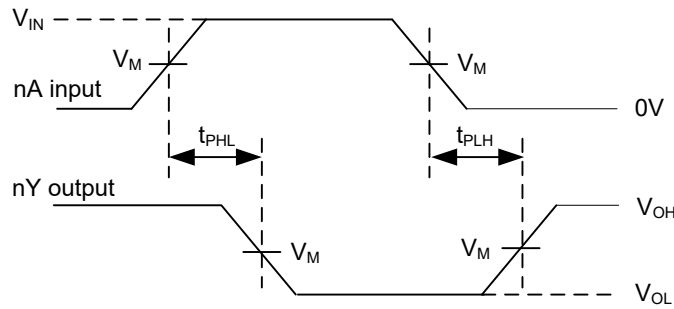
■ OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		4		pF
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±0.15V	V _{CC}	≤2ns	V _{CC} /2	30pF	1kΩ
2.5V±0.2V	V _{CC}	≤2ns	V _{CC} /2	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0.5V	V _{CC}	≤2.5ns	V _{CC} /2	50pF	500Ω



- Note: 1. C_L includes probe and jig capacitance.
 2. All input pulses are supplied by generators having the following characteristics:
 PRR≤1MHz, Z_O = 50Ω: t_R≤2ns, t_F ≤2ns (V_{CC}=1.8V±0.15V and V_{CC}=2.5V±0.2V)
 t_R ≤2.5ns, t_F ≤2.5ns (V_{CC} =3.3V±0.3V and V_{CC}=5V±0.5V)

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