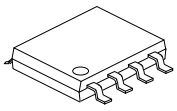
U74LVC3G14

CMOS IC

TRIPLE SCHMITT-TRIGGER INVERTER



SOP-8

■ DESCRIPTION

The **U74LVC3G14** is designed as three independent Inverters with Schmitt-trigger action. it may have different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals.

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

■ FEATURES

* Wide supply voltage range from 1.65V to 5.5V
* Inputs accept voltages up to 5.5V
* I_{OFF} supports partial-power-down mode
* Low static power consumption; I_{CC}=10μA (Max.)

■ ORDERING INFORMATION

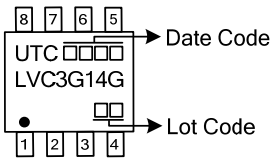
Ordering Number	Package	Packing
U74LVC3G14G-S08-R	SOP-8	Tape Reel

U74LVC3G14G-S08-R

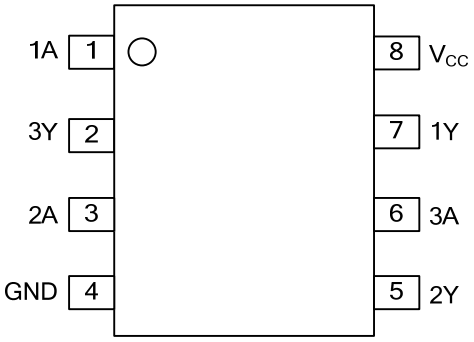
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S08: SOP-8
(3) G: Halogen Free and Lead Free

■ MARKING



■ PIN CONFIGURATION

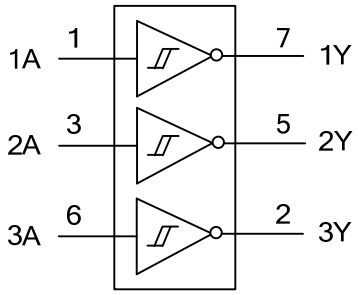


■ FUNCTION TABLE

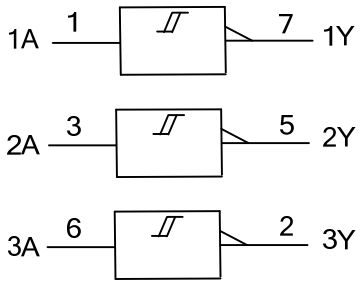
INPUT(A)	OUTPUT(Y)
H	L
L	H

Note: H: High voltage level; L: Low voltage level.

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ 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}	Output in the high or low state	-0.5 ~ + V_{CC}+0.5	V
		Output in the power-off state	-0.5 ~ +6.5	V
Continuous V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}	V_{OUT}=0V ~ V_{CC}	±50	mA
Input Clamp Current	I_{IK}	V_{IN}<0V	-50	mA
Output Clamp Current	I_{OK}	V_{OUT}>V_{CC} or V_{OUT}<0V	-50	mA
Junction Temperature	T_J		+150	°C
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	RATING	UNIT
Junction to Ambient	θ_{JA}	150	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
		Data retention only	1.5			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Operating Temperature (Note)	T_A		-40		125	°C
Input Transition Rise or Fall Rate	Δt/Δv	V_{CC}=1.8V±0.15V, 2.5V±0.2V			20	ns/V
		V_{CC}=3.3V±0.3V			10	ns/V
		V_{CC}=5V±0.5V			5	ns/V

Note: This condition is only determined from design. It can't be 100% tested in mass production.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-Going Input Threshold Voltage	V_{T+}	V_{CC}=1.65V	0.7		1.4	V
		V_{CC}=2.3V	1		1.7	V
		V_{CC}=3V	1.3		2.2	V
		V_{CC}=4.5V	1.9		3.1	V
		V_{CC}=5.5V	2.2		3.7	V
Negative-Going Input Threshold Voltage	V_{T-}	V_{CC}=1.65V	0.3		0.7	V
		V_{CC}=2.3V	0.4		1.1	V
		V_{CC}=3V	0.6		1.3	V
		V_{CC}=4.5V	1.1		2	V
		V_{CC}=5.5V	1.4		2.5	V
Hysteresis Voltage (V_{T+}-V_{T-})	$\triangle V_T$	V_{CC}=1.65V	0.3		0.8	V
		V_{CC}=2.3V	0.4		0.9	V
		V_{CC}=3V	0.4		1.1	V
		V_{CC}=4.5V	0.6		1.3	V
		V_{CC}=5.5V	0.7		1.4	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-Level Output Voltage	V_{OH}	V_{CC}=1.65 ~ 4.5V, I_{OH}=-100μA		V_{CC}-0.1			V
		V_{CC}=1.65V, I_{OH}=-4mA		1.2			V
		V_{CC}=2.3V, I_{OH}=-8mA		1.9			V
		V_{CC}=3V	I_{OH}=-16mA	2.4			V
			I_{OH}=-24mA	2.3			V
		V_{CC}=4.5V, I_{OH}=-32mA		3.8			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65 ~ 4.5V, I_{OH}=100μA				0.1	V
		V_{CC}=1.65V, I_{OH}=4mA				0.45	V
		V_{CC}=2.3V, I_{OH}=8mA				0.3	V
		V_{CC}=3V	I_{OH}=16mA			0.4	V
			I_{OH}=24mA			0.55	V
		V_{CC}=4.5V, I_{OH}=32mA				0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 5.5V, V_{IN}=5.5V or GND				±5	μA
Power OFF Leakage Current	I_{off}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V				±10	μA
Quiescent Supply Current	I_{CC}	V_{CC}=1.65 ~ 5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0A				10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	V_{CC}=3 ~ 5.5V, One input at V_{CC}-0.6V, Other inputs at V_{CC} or GND				500	μA
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=V_{CC} or GND			4.5		pF

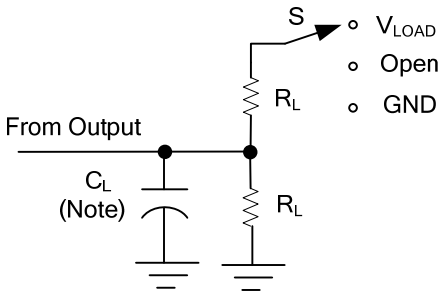
■ SWITCHING CHARACTERISTICS (T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A) to output(Y)	t_{PD}	V_{CC}=1.8±0.15V,C_L=30pF, R_L=1kΩ	3.9		9.2	ns
		V_{CC}=2.5±0.2V,C_L=30pF, R_L=500Ω	1.9		5.7	ns
		V_{CC}=3.3±0.3V,C_L=50pF, R_L=500Ω	2.3		5.4	ns
		V_{CC}=5±0.5V,C_L=50pF, R_L=500Ω	1.5		4.3	ns

■ OPERATING CHARACTERISTICS (f=10MHz, T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V		17		pF
		V_{CC}=2.5V		18		pF
		V_{CC}=3.3V		19		pF
		V_{CC}=5V		22		pF

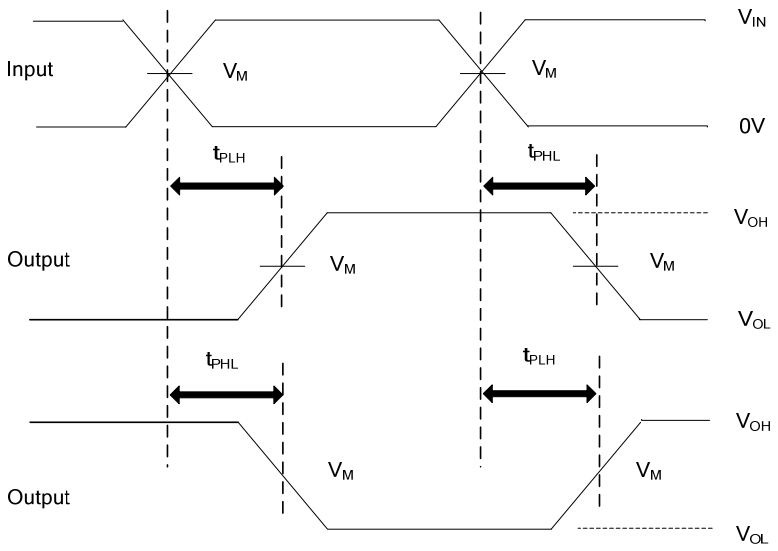
■ TEST CIRCUIT AND WAVEFORMS



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

Note: C_L includes probe and jig capacitance.

V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_{IN}	t_R, t_F					
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	30pF	1KΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	30pF	500Ω	0.15V
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	2 x V_{CC}	50pF	500Ω	0.3V



PROPAGATION DELAY TIMES

Notes: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_O = 50Ω.