



U74LVC1G14

CMOS IC

SINGLE SCHMITT-TRIGGER INVERTER

DESCRIPTION

The U74LVC1G14 is a single Schmitt-trigger inverter, it provides the function $Y=\bar{A}$.

The device have different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals because of the Schmitt-trigger action in the input.

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

FEATURES

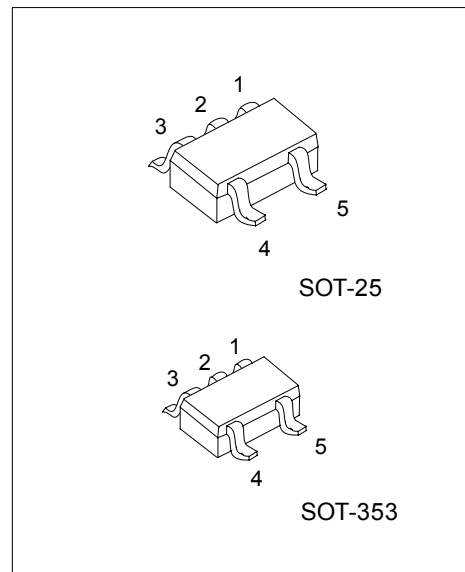
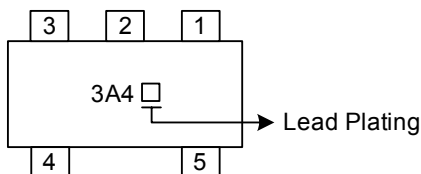
- * Operation Voltage Range: 1.65~5.5V
- * Low Power Dissipation: $I_{CC}=10\mu A(\text{Max})$
- * 24mA output drive ($V_{CC}=3.0V$)
- * High Noise Immunity
- * Power Down Protection

ORDERING INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
U74LVC1G14-AF5-R	U74LVC1G14L-AF5-R	SOT-25	Tape Reel
U74LVC1G14-AL5-R	U74LVC1G14L-AL5-R	SOT-353	Tape Reel

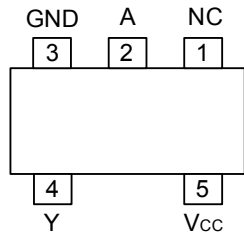
<p>U74LVC1G14L-AF5-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Plating</p>	<p>(1) R: Tape Reel</p> <p>(2) AF5: SOT-25, AL5: SOT-353</p> <p>(3) L: Lead Free Plating, Blank: Pb/Sn</p>
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MARKING



*Pb-free plating product number:
U74LVC1G14L

■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT	OUTPUT
A	Y
L	H
H	L

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)(Note 1)

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
Output Voltage(power-down mode)	V_{OUT}	-0.5~6.5	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
Storage Temperature	T_{STG}	-65 ~ +150	

Note 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. 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		5.5	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		85	

■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-Going Input Threshold Voltage	V_{T+}	$V_{CC}=1.65V$	0.76		1.16	V
		$V_{CC}=2.3V$	1.08		1.56	
		$V_{CC}=3.0V$	1.48		1.92	
		$V_{CC}=4.5V$	2.16		2.74	
		$V_{CC}=5.5V$	2.61		3.33	
Negative-Going Input Threshold Voltage	V_{T-}	$V_{CC}=1.65V$	0.35		0.62	V
		$V_{CC}=2.3V$	0.56		0.88	
		$V_{CC}=3.0V$	0.84		1.2	
		$V_{CC}=4.5V$	1.41		1.97	
		$V_{CC}=5.5V$	1.87		2.4	
Hysteresis Voltage ($V_{T+}-V_{T-}$)	V_T	$V_{CC}=1.65V$	0.36		0.64	V
		$V_{CC}=2.3V$	0.45		0.78	
		$V_{CC}=3.0V$	0.51		0.87	
		$V_{CC}=4.5V$	0.58		1.04	
		$V_{CC}=5.5V$	0.69		1.11	
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65V \sim 4.5V, I_{OH}=-100 \mu A$	$V_{CC}-0.1$			V
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2			
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.9			
		$V_{CC}=3.0V, I_{OH}=-16mA$	2.4			
		$V_{CC}=3.0V, I_{OH}=-24mA$	2.3			
		$V_{CC}=4.5V, I_{OH}=-32mA$	3.8			

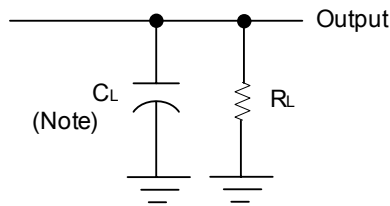
■ STATIC CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65V \sim 4.5V, I_{OL}=100 \mu A$			0.1	V
		$V_{CC}=1.65V, I_{OL}=4mA$			0.45	
		$V_{CC}=2.3V, I_{OL}=8mA$			0.3	
		$V_{CC}=3.0V, I_{OL}=16mA$			0.4	
		$V_{CC}=3.0V, I_{OL}=24mA$			0.55	
		$V_{CC}=4.5V, I_{OL}=32mA$			0.55	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0V \sim 5.5V, V_{IN}=V_{CC}$ or GND			± 5	μA
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0V, V_{IN}$ or $V_{CC}=5.5V$			± 10	μA
Quiescent Supply Current	I_q	$V_{CC}=1.65V \sim 5.5V, V_{IN}=V_{CC}$ or GND $I_{OUT}=0$			10	μA
Additional Quiescent Supply Current	ΔI_q	$V_{CC}=3V \sim 5.5V$, 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		4.5		pF

■ DYNAMIC CHARACTERISTICS

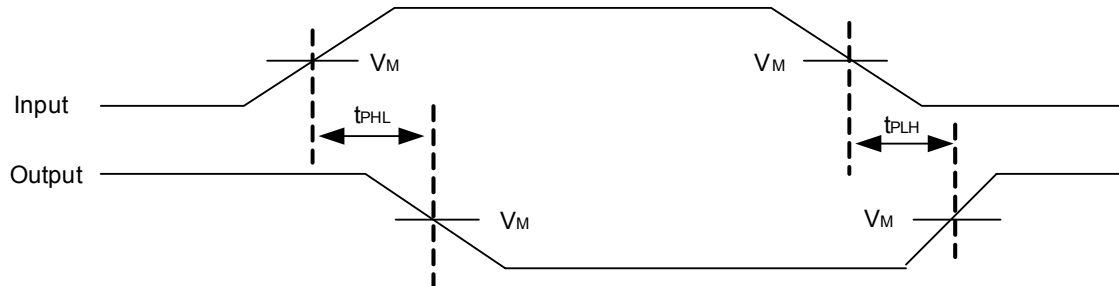
PARAMETER	SYMBOL	$V_{CC}(V)$	$C_L=15 \text{ pF}$		$C_L=30 \text{ or } 50 \text{ pF}$		UNIT
			MIN	MAX	MIN	MAX	
Propagation delay from input (A or B) to output(Y)	t_{PLH}/t_{PHL}	1.8 ± 0.15	2.8	9.9	3.8	11	ns
		2.5 ± 0.2	1.6	5.5	2	6.5	
		3.3 ± 0.3	1.5	4.6	1.8	5.5	
		5 ± 0.5	0.9	4.4	1.2	5	
Operating Characteristics							
Power Dissipation Capacitance	Cpd	f=10MHz	20	21	22	25	pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R, t_F	V_M	C_L	R_L
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	15pF	1M
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	15pF	1M
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	1K
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	500
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	50pF	500
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	50pF	500



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