



U74LVC17A

CMOS IC

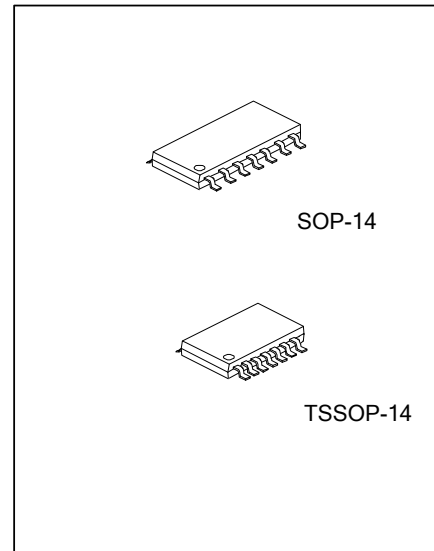
HEX SCHMITT-TRIGGER BUFFER

DESCRIPTION

The UTC **U74LVC17A** is a high-performance, low-power, low-voltage, Si-gate CMOS device and provides six non-inverting buffers with Schmitt trigger action. It is capable for transforming slowly changing input signals into sharply defined, jitter-free output signals.

FEATURES

- * Operate From 1.65V to 5.5V
- * 5 V Tolerant Input/Output For Interfacing With 5 V Logic
- * ±32 mA Output Drive ($V_{CC} = 4.5V$)
- * CMOS Low-Power Consumption And High Noise Immunity
- * I_{OFF} Supports Partial-Power-Down Mode Operation
- * Latch-Up Performance Exceeds 100 mA

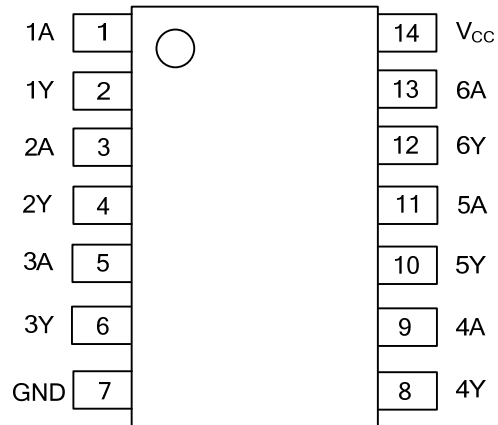


ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC17AL-S14-R	U74LVC17AG-S14-R	SOP-14	Tape Reel
U74LVC17AL-S14-T	U74LVC17AG-S14-T	SOP-14	Tube
U74LVC17AL-P14-R	U74LVC17AG-P14-R	TSSOP-14	Tape Reel
U74LVC17AL-P14-T	U74LVC17AG-P14-T	TSSOP-14	Tube

<p>U74LVC17AL-S14-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel, T: Tube (2) S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free, L: Lead Free</p>
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■ PIN CONFIGURATION

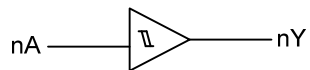


■ FUNCTION TABLE (Each Gate)

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

Note: H=High level, L=Low Level

■ LOGIC SYMBOL (Each Gate)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~6.5	V
Input Voltage (Note 2)	V_{IN}	-0.5~6.5	V
Output Voltage (Note 2,3)	High-Impedance	-0.5~6.5	V
	Power-Off State		
	High State	-0.5~ $V_{CC}+0.5$	V
	Low State		
Input Clamp Current	I_{IK}	-50	mA
Output Clamp Current	I_{OK}	-50	mA
Output Current	I_{OUT}	± 50	mA
V_{CC} or GND Current	I_{CC}	± 100	mA
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-65 ~ +150	$^{\circ}C$

- Notes: 1. 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.
2. The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
3. The value of V_{CC} is provided in the recommended operating conditions table.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
High-Level Input Voltage	V_{T+}	$V_{CC} = 1.65\text{ V}$	0.70		1.40	V
		$V_{CC} = 2.3\text{ V}$	1.00		1.70	V
		$V_{CC} = 3.0\text{ V}$	1.30		2.20	V
		$V_{CC} = 4.5\text{ V}$	1.90		3.10	V
		$V_{CC} = 5.5\text{ V}$	2.20		3.70	V
Low-Level Input Voltage	V_{T-}	$V_{CC} = 1.65\text{ V}$	0.30		0.70	V
		$V_{CC} = 2.3\text{ V}$	0.40		1.00	V
		$V_{CC} = 3.0\text{ V}$	0.60		1.30	V
		$V_{CC} = 4.5\text{ V}$	1.10		2.00	V
		$V_{CC} = 5.5\text{ V}$	1.40		2.50	V
Hysteresis Voltage	ΔV_T	$V_{CC} = 1.65\text{ V}$	0.30		0.80	V
		$V_{CC} = 2.3\text{ V}$	0.40		0.90	V
		$V_{CC} = 3.0\text{ V}$	0.40		1.10	V
		$V_{CC} = 4.5\text{ V}$	0.60		1.30	V
		$V_{CC} = 5.5\text{ V}$	0.70		1.40	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or Low State	0		V_{CC}	V
Ambient Operating Temperature	T_{OPR}		-40		85	$^{\circ}C$

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V _{OH}	I _{OH} = -100μA V _{CC} = 1.65~5.5 V	V _{CC} -0.1			V
		I _{OH} = -4mA V _{CC} = 1.65 V	1.20			
		I _{OH} = -8mA V _{CC} = 2.3 V	1.90			
		I _{OH} = -16mA V _{CC} = 3.0 V	2.40			
		I _{OH} = -24 mA V _{CC} = 3.0 V	2.30			
		I _{OH} = -32mA V _{CC} = 4.5 V	3.80			
Low-Level Output Voltage	V _{OL}	I _{OL} = 100μA V _{CC} = 1.65~5.5 V			0.10	V
		I _{OL} = 4mA V _{CC} = 1.65 V			0.45	
		I _{OL} = 8mA V _{CC} = 2.3 V			0.30	
		I _{OL} = 12mA V _{CC} = 3.0 V			0.40	
		I _{OL} = 24mA V _{CC} = 3.0 V			0.55	
		I _{OL} = 32mA V _{CC} = 4.5 V			0.55	
Input Leakage Current	I _{I(LEAK)}	V _{IN} = 0 to 5.5V, V _{CC} = 0~5.5 V			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{IN} or V _O = 5.5V, V _{CC} = 0			±10	μA
Quiescent Supply Current	I _Q	V _{IN} = V _{CC} or GND, I _O = 0, V _{CC} = 1.65~5.5 V			10	μA
Additional Quiescent Supply Current	ΔI _Q	One input at V _{CC} -0.6v, Other inputs at V _{CC} or GND, I _O = 0, V _{CC} = 3~5.5 V			500	μA
Input Capacitance	C _{IN}	V _O = V _{CC} or GND, V _{CC} = 3.3 V		4		pF

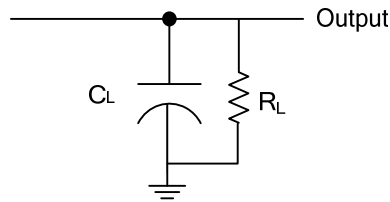
■ SWITCHING CHARACTERISTICS (See Test Circuit And Waveforms)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation Delay nA to nY	t _{PLH} / t _{PHL}	V _{CC} = 1.8V ± 0.15V, R _L = 1KΩ	C _L = 30pF	3.9		9.3	ns
		V _{CC} = 2.5V ± 0.2V, R _L = 500Ω		1.9		5.7	ns
		V _{CC} = 3.3V ± 0.3V, R _L = 500Ω	C _L = 50pF	2.2		5.4	ns
		V _{CC} = 5.0V ± 0.5V, R _L = 500Ω		1.5		4.3	ns

■ OPERATING CHARACTERISTICS (T_A = 25°C)

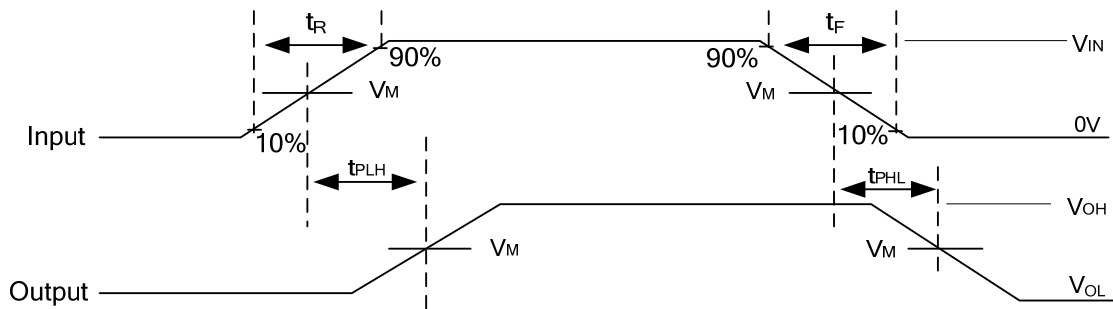
PARAMETER	SYMBOL	TEST CONDITIONS	TYP	UNIT	
Power Dissipation Capacitance	C _{PD}	f = 10MHz	V _{CC} = 1.8V	17	pF
			V _{CC} = 2.5V	18	pF
			V _{CC} = 3.3V	19	pF
			V _{CC} = 5V	21	pF

■ TEST CIRCUITS AND WAVEFORMS



V_{CC}	V_{IN}	t_R, t_F	V_M	C_L	R_L
1.65V~1.95V	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	30pF	1k Ω
2.3V~2.7V	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	30pF	500 Ω
3.0V~3.6V	3V	$\leq 2.5\text{ns}$	1.5V	50pF	500 Ω
4.5V~5.5V	V_{CC}	$\leq 2.5\text{ns}$	$V_{CC}/2$	50pF	500 Ω

Definitions for test circuit: R_L = Load resistance, C_L = Load capacitance including jig and probe capacitance.



- Note:
1. V_{OL} and V_{OH} are typical output drop that occur with the output load.
 2. t_{PLH} and t_{PHL} are the same as t_{PD} .

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