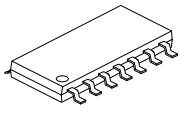
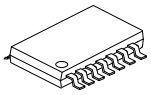
U74LVC17A

CMOS IC

HEX SCHMITT-TRIGGER BUFFER



SOP-14U



TSSOP-14U

■ 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

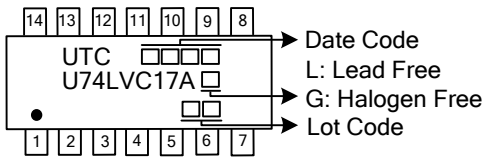
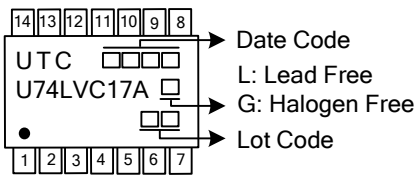
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC17AL-UEA-R	U74LVC17AG-UEA-R	SOP-14U	Tape Reel
U74LVC17AL-UEB-R	U74LVC17AG-UEB-R	TSSOP-14U	Tape Reel

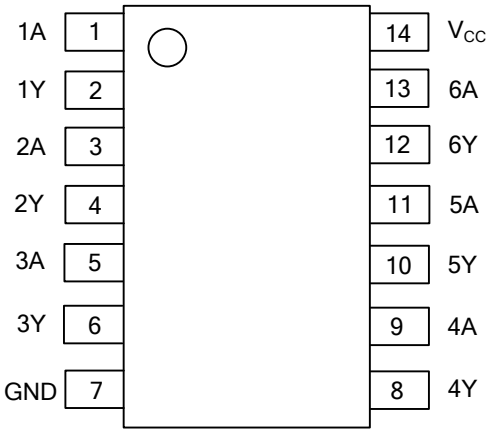
U74LVC17AG-UEA-R
- (1)Packing Type
- (2)Packing Type
- (3)Green Package

(1) R: Tape Reel
(2) UEA: SOP-14U, UEB: TSSOP-14U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOP-14U	TSSOP-14U
	

■ PIN CONFIGURATION

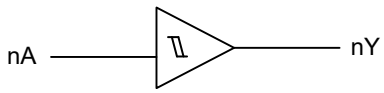


■ FUNCTION TABLE (Each Gate)

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

Note: H=High level, L=Low Level.

■ LOGIC SYMBOL (Each Gate)



■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

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	V_{OUT}	-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	°C
Storage Temperature		T_{STG}	-65 ~ +150	°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 (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
High-Level Input Voltage	VT^+	V_{CC} = 1.65 V	0.70		1.40	V
		V_{CC} = 2.3 V	1.00		1.70	V
		V_{CC} = 3.0 V	1.30		2.20	V
		V_{CC} = 4.5 V	1.90		3.10	V
		V_{CC} = 5.5 V	2.20		3.70	V
Low-Level Input Voltage	VT^-	V_{CC} = 1.65 V	0.30		0.70	V
		V_{CC} = 2.3 V	0.40		1.00	V
		V_{CC} = 3.0 V	0.60		1.30	V
		V_{CC} = 4.5 V	1.10		2.00	V
		V_{CC} = 5.5 V	1.40		2.50	V
Hysteresis Voltage	ΔV_T	V_{CC} = 1.65 V	0.30		0.80	V
		V_{CC} = 2.3 V	0.40		0.90	V
		V_{CC} = 3.0 V	0.40		1.10	V
		V_{CC} = 4.5 V	0.60		1.30	V
		V_{CC} = 5.5 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
Operating Temperature	T_A		-40		+125	°C

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

■ ELECTRICAL CHARACTERISTICS (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}=-100μA	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}=3.0V, I_{OH}=-16mA	2.40			V
		V_{CC}=3.0V, 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}=100μA			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}=3.0V, I_{OL}=12mA			0.40	V
		V_{CC}=3.0V, I_{OL}=24mA			0.55	V
		V_{CC}=4.5V, I_{OL}=32mA			0.55	V
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

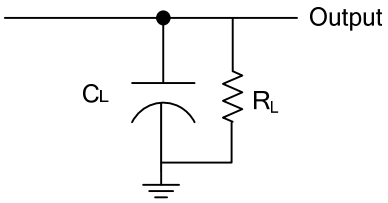
■ SWITCHING CHARACTERISTICS (See Test Circuit And Waveforms)

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

■ OPERATING CHARACTERISTICS (Unless otherwise specified)

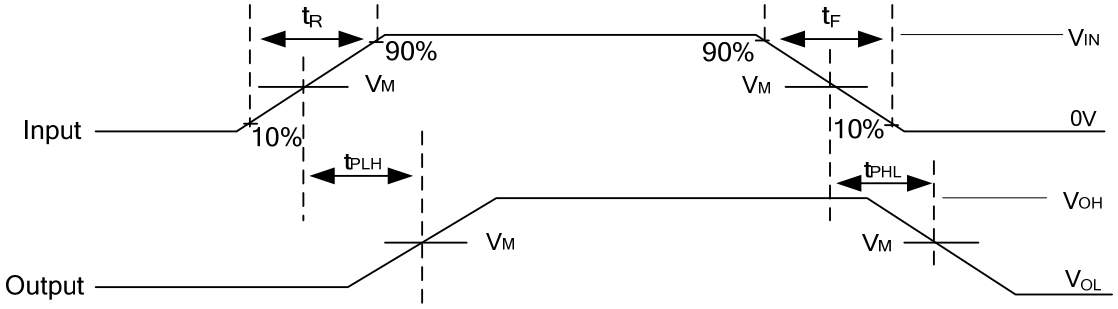
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	f=10MHz	V_{CC}=1.8V		17		pF
			V_{CC}=2.5V		18		pF
			V_{CC}=3.3V		19		pF
			V_{CC}=5V		21		pF

■ TEST CIRCUITS AND WAVEFORMS



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

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



Notes: 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}.