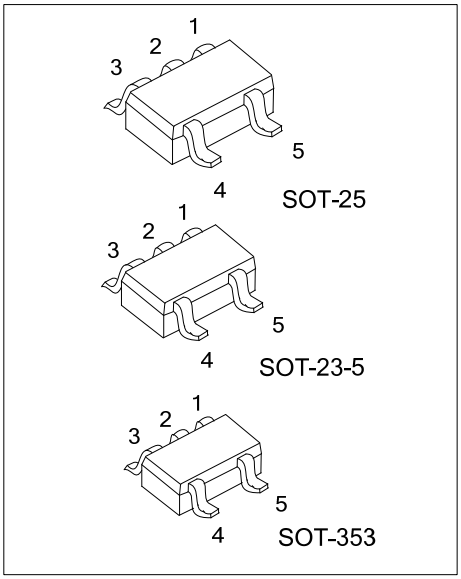
U74LVC1G17

CMOS IC

SINGLE SCHMITT-TRIGGER BUFFER



■ DESCRIPTION

The UTC **U74LVC1G17** is a single Schmitt-trigger buffer, it provides the function Y=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}=10μA (Max)
* 24mA Output Drive(V_{CC}=3.0V)
* High Noise Immunity I_{CC}=10μA (Max)
* Power Down Protection I_{CC}=10μA (Max)

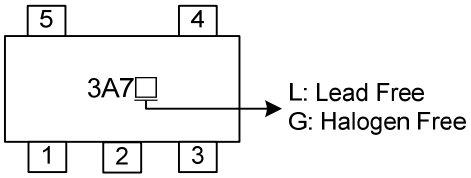
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G17L-AE5-R	U74LVC1G17G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G17L-AF5-R	U74LVC1G17G-AF5-R	SOT-25	Tape Reel
U74LVC1G17L-AL5-R	U74LVC1G17G-AL5-R	SOT-353	Tape Reel

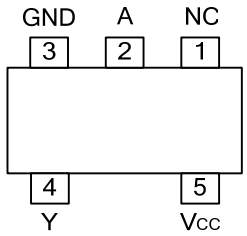
U74LVC1G17L-AF5-R
(1)Packing Type
(2)Package Type
(3)Lead Free

(1) R: Tape Reel
(2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353
(3) G: Halogen Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT	OUTPUT
A	Y
L	L
H	H

■ 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_O<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	°C

Notes: 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 COMDITIONS

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	°C

■ 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-})	$\triangle V_T$	V_{CC}= 1.65V	0.36		0.64	
		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~4.5V, I_{OH}=-100μA	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			
Low-Level Output Voltage	V_{OL}	V_{CC}= 1.65V~4.5V, I_{OL}=100μA			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	

■ STATIC CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}= 0~5.5V, 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~5.5V, V_{IN}=V_{CC} or GND I_{OUT}=0			10	μA
Additional Quiescent Supply Current	ΔI_Q	V_{CC}= 3V~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

C_L=15pF

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH} / t_{PHL}	V_{CC}=1.8±0.15V	2.8		9.9	ns
		V_{CC}=2.5±0.2V	1.6		5.5	ns
		V_{CC}=3.3±0.3V	1.5		4.6	ns
		V_{CC}=5±0.5V	0.9		4.4	ns

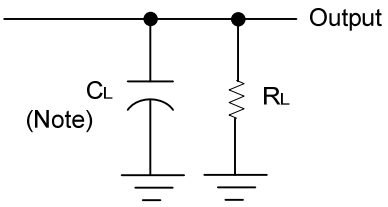
C_L=30 or 50 pF

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH} / t_{PHL}	V_{CC}=1.8±0.15V	3.8		11	ns
		V_{CC}=2.5±0.2V	2		6.5	ns
		V_{CC}=3.3±0.3V	1.8		5.5	ns
		V_{CC}=5±0.5V	1.2		5	ns

■ OPERATING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V	f=10MHz		20		pF
		V_{CC}=2.5V			21		pF
		V_{CC}=3.3V			22		pF
		V_{CC}=5V			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±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	15pF	1MΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	15pF	1MΩ
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	15pF	1MΩ
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