General Description
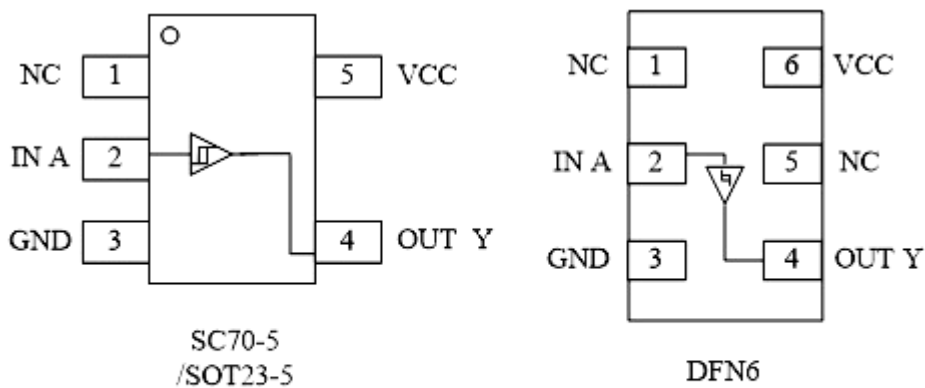
The SN74LVC1G17 is a single Non−inverting Schmitt Trigger Buffer in three tiny footprint packages.

Features

● Tiny SC70-5, SOT23-5 and

  DFN6-1.0mm*1.5mm Packages
● Source/Sink 24mA at 3.0V
● Chip Complexity: FETs = 20
● Designed for 1.65V to 5.5V V_{CC} Operation
● These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Pin Configuration
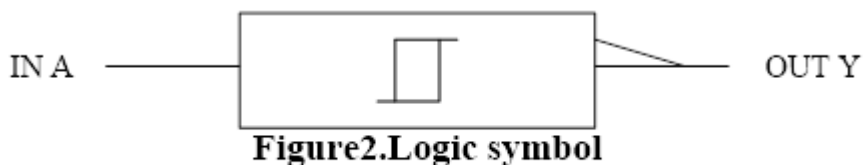

Figure1. Pinouts (Top View)

Pin Function

(SC70-5/ SOT23-5)

PIN	FUNCTION
1	NC
2	IN A
3	GND
4	VCC
5	OUT

DFN6

PIN	FUNCTION
1	NC
2	IN A
3	GND
4	VCC
5	NC
6	OUT

Block Diagram

Figure2.Logic symbol

Functional Description

Function Table

Input	Output
A	Y
L	L
H	H

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	−0.5 to 7.0	V
V_I	DC Input Voltage	$−0.5 \leq V_I \leq +7.0$	V
V_O	DC Output Voltage Output in Higher or Low State (Note 1)	−0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current $\quad V_I < GND$	−50	mA
I_{OK}	DC Output Diode Current $\quad V_O<GND, V_O>V_{CC}$	±50	mA
I_O	DC Output Sink Current	±50	mA
I_{CC}	DC Supply Current per Supply Pin	±100	mA
I_{GND}	DC Ground Current per Supply Pin	±100	mA
T_{STG}	Storage Temperature Range	−65 to 150	°C
T_L	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C
T_J	Junction Temperature Under Bias	150	°C
θ_{JA}	Thermal Resistance $\quad$ SC70-5 (Note 1) SOT23-5 DFN6	435 300 450	°C/W
P_D	Power Dissipation in Still Air at 85°C $\quad$ SC70-5 SOT23-5 DFN6	150 200 130	mW
MSL	Moisture Sensitivity	Level 1	
F_R	Flammability Rating $\quad$ Oxygen Index:28 to 34	UL94V−0@0.12in	
ESD	ESD Classification Human $\quad$ Body Model (Note 2) Machine Model (Note 3) Charged Device Model (Note4)	2000 200 N/A	V
$I_{Latchup}$	Latchup Performance Above V_{CC} and Below GND at 125°C (Note 5)	±100	mA

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Measured with minimum pad spacing on an FR4 board, using 10 mm−by−1 inch, 2−ounce copper trace with no air flow.

2. Tested to EIA/JESD22−A114−A, rated to EIA/JESD22−A114−B.

3. Tested to EIA/JESD22−A115−A, rated to EIA/JESD22−A115−A.

4. Tested to JESD22−C101−A.

5. Tested to EIA/JESD78.

Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V_{CC}	DC Supply Voltage Operating		1.65	5.5	V
	Date Retention		1.5	5.5	
V_{IN}	DC Input Voltage		0	5.5	V
V_{OUT}	DC Output Voltage (High or Low State) (SOT−353/ SOT-23-5L /SOT−553 Packages)		0	5.5	V
T_A	Operating Temperature Range		-55	125	°C
t_r, t_f	Input Rise and Fall Time	V_{CC} = 2.5 V ± 0.2 V	0	20	ns/V
		V_{CC} = 3.0 V ± 0.3 V	0	10	
		V_{CC} = 5.0 V ± 0.5 V	0	5	

Electrical Characteristics

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	VCC(V)	TA = 25 °C			−55°C ≤TA≤125°C		Unit
				Min	Typ	Max	Min	Max	
V_{IH}	High−Level Input Voltage		1.65to1.95	0.75Vcc			0.75Vcc		V
			2.3 to 5.5	0.7Vcc			0.7Vcc		
V_{IL}	Low−Level Input Voltage		1.65to1.95			0.25Vcc		0.25Vcc	V
			2.3 to 5.5			0.3Vcc		0.3Vcc	
V_{OH}	High−Level Output Voltage $V_{IN} = V_{IL}$	I_{OH} =−100uA	1.65to5.5	Vcc−0.1	Vcc		Vcc−0.1		V
		I_{OH} =−3mA	1.65	1.29	1.52		1.29		
		I_{OH} =−8mA	2.3	1.9	2.1		1.9		
		I_{OH} =−12mA	2.7	2.2	2.4		2.2		
		I_{OH} =−16mA	3.0	2.4	2.7		2.4		
		I_{OH} =−24mA	3.0	2.3	2..5		2.3		
		I_{OH} =-32mA	4.5	3.8	4.0		3.8		
V_{OL}	Low−Level Output Voltage $V_{IN} = V_{IH}$	I_{OH} =100uA	1.65to5.5		0.0	0.1		0.1	V
		I_{OL} =3mA	1.65		0.08	0.24		0.24	
		I_{OL} =8mA	2.3		0.20	0.3		0.3	
		I_{OL} =12mA	2.7		0.22	0.4		0.4	
		I_{OL} =16mA	3.0		0.28	0.4		0.4	
		I_{OL} =24mA	3.0		0.38	0.55		0.55	
		I_{OL} =32mA	4.5		0.42	0.55		0.55	
I_{IN}	Input Leakage Current	V_{IN} = 5.5V or GND	0 to 5.5		±0.1			±1.0	uA
I_{OFF}	Power Off Leakage Current	V_{IN} = 5.5V or V_{OUT} = 5.5V	0			1		10	uA
I_{CC}	Quiescent Supply Current	V_{IN} = 5.5V or GND	5.5					10	uA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless

otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS tr=tf= 2.5ns; C_L = 50pF; R_L = 500 Ω

Symbol	Parameter	Condition	V_{CC}(V)	TA = 25 °C			−55°C ≤TA≤125°C		Unit
				Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay (Figure3and4)	R_L= 1MΩ C_L= 15 pF	1.65	2.0	5.3	11.4	2.0	12.0	ns
			1.8	2.0	4.4	9.5	2.0	10.0	
		R_L= 1MΩ C_L= 15 pF	2.5 ±0.2	0.2	3.5	6.5	0.8	7.0	
		R_L= 1MΩ C_L= 15 pF	3.3 ±0.3	0.8	2.1	4.5	0.5	4.7	
		R_L= 500Ω C_L =50 pF		1.2	2.9	5.5	1.5	5.2	
		R_L= 1MΩ C_L= 15 pF	5.0 ±0.5	0.5	1.8	3.9	0.5	4.1	
		R_L= 500Ω C_L=50 pF		0.8	2.4	4.3	0.8	4.5	

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Condition	Typical	Unit
C_{IN}	Input Capacitance	V_{CC}= 5.5 V, V_I = 0 V or V_{CC}	>2.5	pF
C_{PD}	Power Dissipation Capacitance (Note 6)	10 MHz,V_{CC}= 3.3 V, V_I = 0 V or V_{CC}	9	pF(Note 6)
		10 MHz,V_{CC}= 5.5 V, V_I= 0 V or V_{CC}	11	

6. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation:

$I_{CC(OPR)}$=C_{PD}*V_{CC}*fin+I_{CC}*C_{PD} is used to determine the no−load dynamic power consumption;

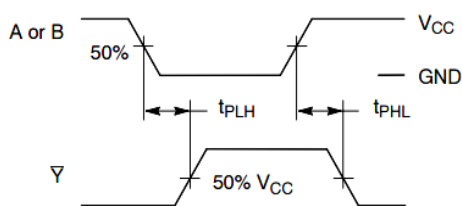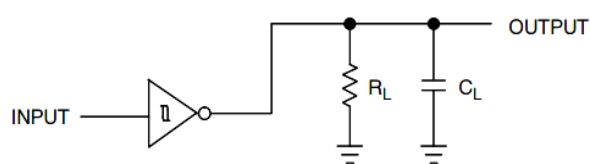P_D=C_{PD}*V_{CC}^2*fin+I_{CC}*V_{CC}*Fig.
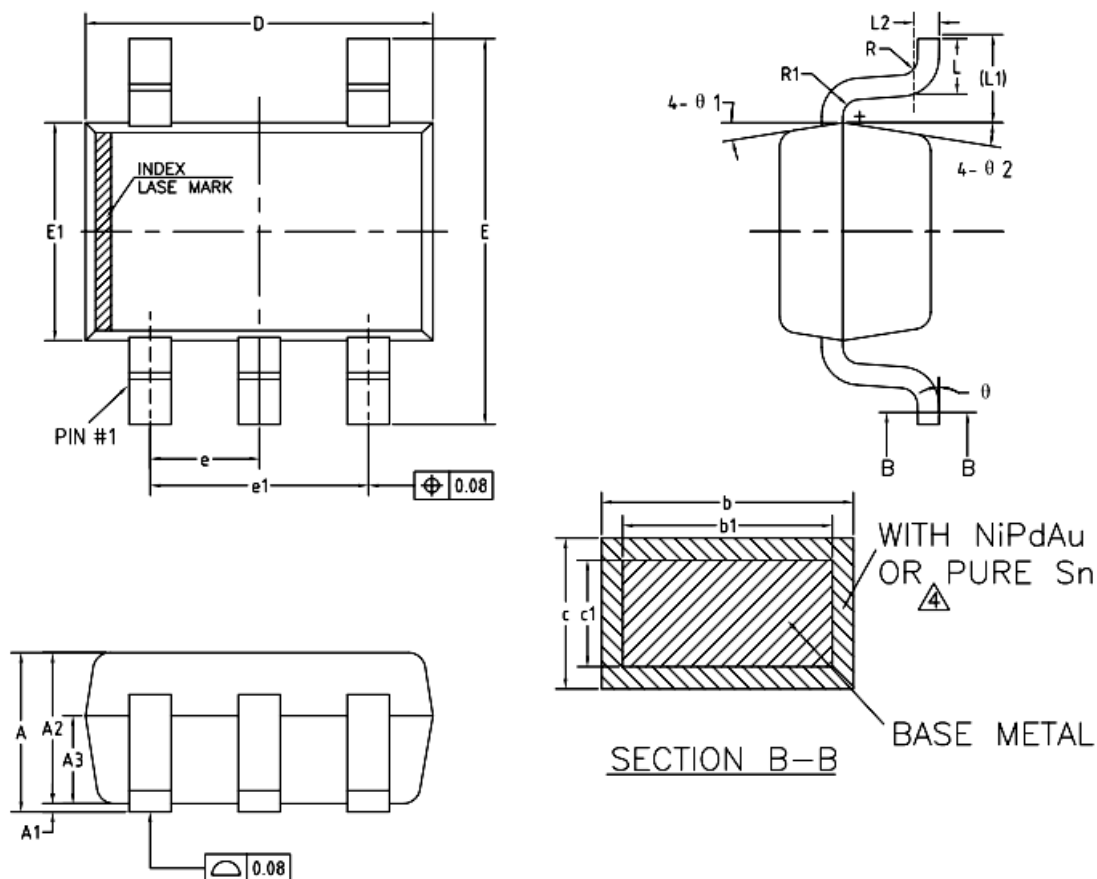

Figure 3. Switching Waveform

A 1−MHz square input wave is recommended for propagation delay tests.

Figure 4. Test Circuit

Package Dimension

SC70-5

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL		MIN	NOM	MAX
A		0.85	–	1.05
A1		0	–	0.10
A2		0.80	0.90	1.00
A3		0.47	0.52	0.57
b	NiPdAu	0.22	–	0.29
	PURE Sn	0.23	–	0.33
b1		0.22	0.25	0.28
c	NiPdAu	0.115	–	0.15
	PURE Sn	0.12	–	0.18
c1		0.115	0.13	0.14
D		2.02	2.07	2.12
E		2.20	2.30	2.40
E1		1.25	1.30	1.35
e		0.60	0.65	0.70
e1		1.20	1.30	1.40
L		0.28	0.33	0.38
L1		0.50REF		
L2		0.15BSC		
R		0.10	–	–
R1		0.10	–	0.25
θ		0°	–	8°
θ1		6°	9°	12°
θ2		6°	9°	12°

SOT23-5
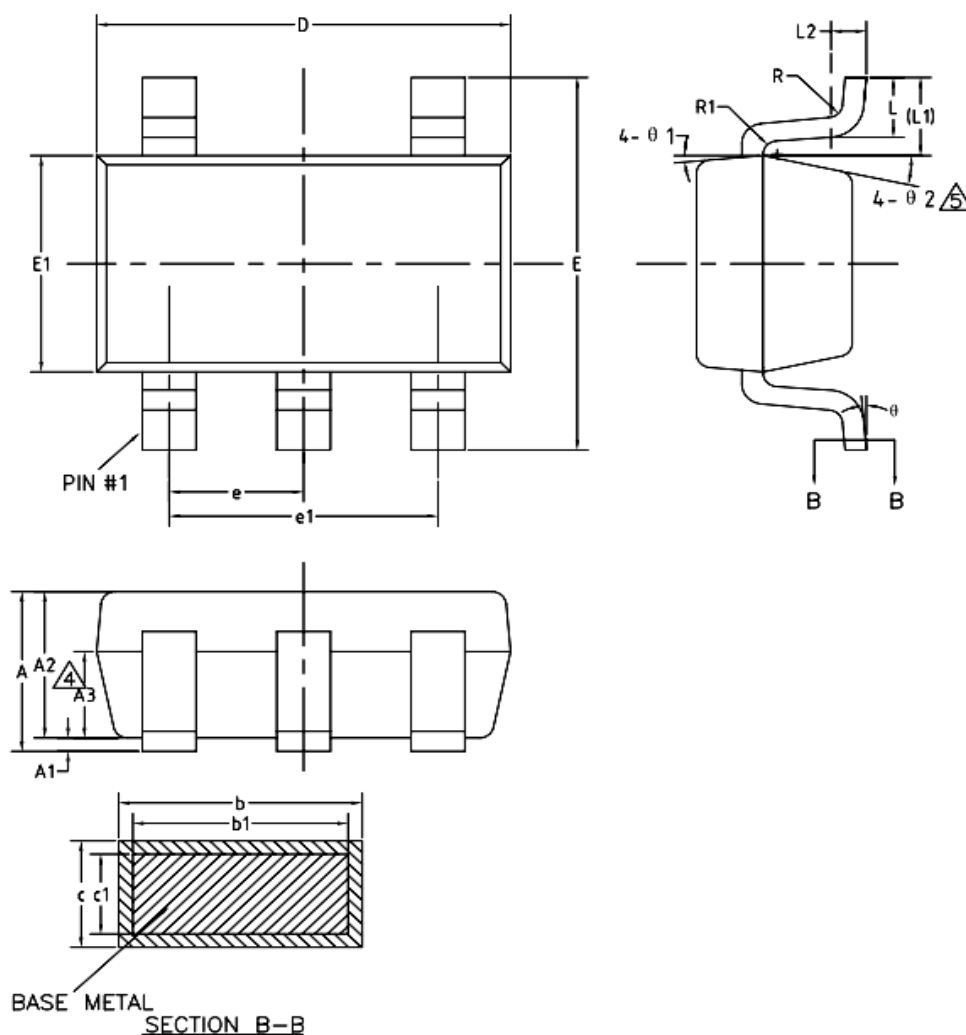
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	–	–	1.25
A1	0	–	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	–	0.50
b1	0.36	0.38	0.45
c	0.14	–	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	–	–
R1	0.10	–	0.25
θ	0°	–	8°
θ1	3°	5°	7°
θ2	6°	–	14°

DFN6

TOP VIEW

SIDE VIEW

BOTTOM VIEW

SIDE VIEW ⌒ 0.05
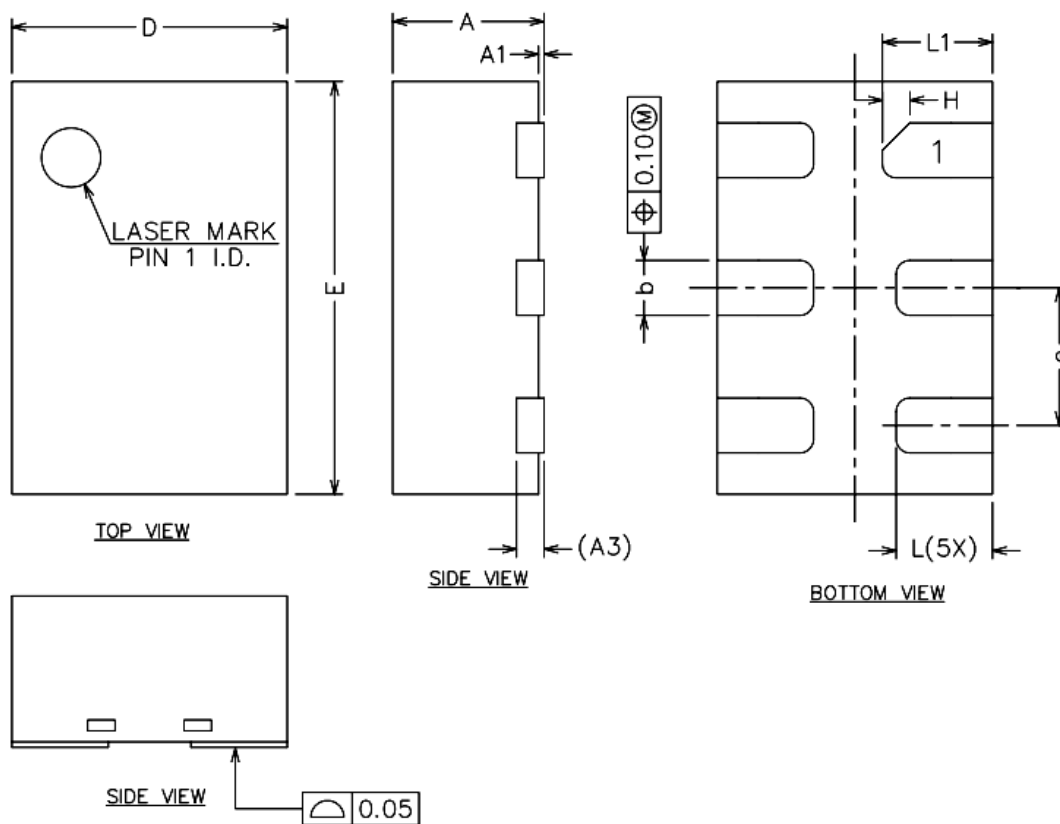
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.50	–	0.60
A1	0.00	0.02	0.05
A3		0.10REF	
b	0.15	0.20	0.25
D	0.90	1.00	1.10
E	1.40	1.50	1.60
e	0.40	0.50	0.60
H		0.10REF	
L	0.30	0.35	0.40
L1	0.35	0.40	0.45

Ordering Information

Order code	Marking code	Package	Baseqty	Deliverymode
UMW SN74LVC1G17DBVR	C17J	SOT23-5	3000	Tape and reel
UMW SN74LVC1G17DCKR	C75	SC70-5	3000	Tape and reel
UMW SN74LVC1G17DRYR	C7	DFN6	3000	Tape and reel

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