

Single Non-inverting Schmitt Trigger Buffer

General Description

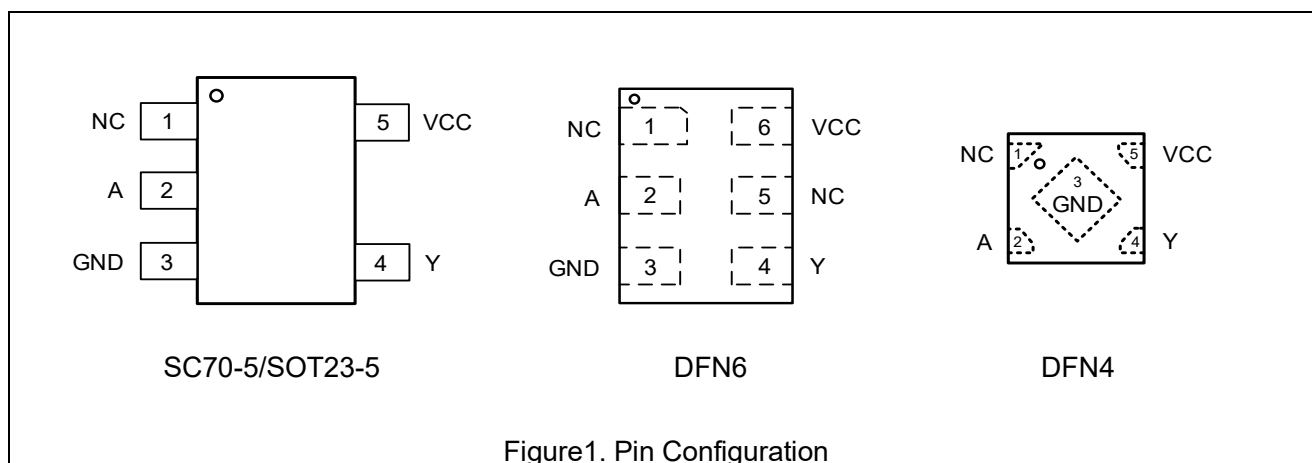
The ET74LVC1G17 is s a single Non-inverting Schmitt Trigger Buffer in three tiny footprint packages. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output driver.

Features

- Designed for 1.65V to 5.5V V_{CC} Operation
- Over-Voltage Tolerant Inputs
- $\pm 32\text{mA}$ Balanced Output Sink and Source Capability
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free and RoHS Compliant
- ESD Protection Complies with JESD22 Standard
 - HBM: $\pm 4000\text{V}$ Pass (JEDEC JS-001)
 - CDM: $\pm 1500\text{V}$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 200\text{mA}$ per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74LVC1G17	SC70-5 (1.3mm $\times$ 2.1mm)	Tape and Reel, 3K/Reel	1
ET74LVC1G17T	SOT23-5 (1.6mm $\times$ 2.9mm)	Tape and Reel, 3K/Reel	3
ET74LVC1G17Y	DFN6 (1.0mm $\times$ 1.5mm)	Tape and Reel, 3K/Reel	1
ET74LVC1G17Y1	DFN4 (0.8mm $\times$ 0.8mm)	Tape and Reel, 10K/Reel	1

Pin Configuration



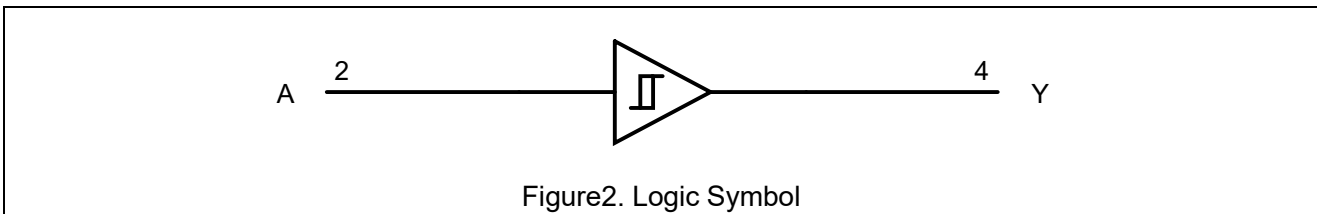
Note*: This electric circuit only supplies for reference. It is recommended to ground the unused I/O ports and ensure they are **not left floating**.

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Pin Function

Pin No.				Pin Name	Pin Function
SC70-5	SOT23-5	DFN6	DFN4		
1	1	1	1	NC	No Connect
2	2	2	2	A	Input
3	3	3	3	GND	Ground
4	4	4	4	Y	Output
/	/	5	/	NC	No Connect
5	5	6	5	VCC	Supply Voltage

Block Diagram



Function Table

Input A	Output 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 ⁽¹⁾	-0.5 ≤ V _I ≤ 7.0	V
V _O	DC Output Voltage Output in Higher or Low State	-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current, V _I < GND	-50	mA
I _{OK}	DC Output Diode Current, 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, Soldering 10 Seconds	260	°C
T _J	Max Junction Temperature	150	°C

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Absolute Maximum Ratings (Continued)

Symbol	Parameter		Value	Unit
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±1500	V
I _{LU}	Max Latch up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±200	mA

Stresses exceeding those listed in this table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Note1: I_O absolute maximum rating must be observed.

Note2: HBM tested per JEDEC JS-001.

Note3: CDM tested per JEDEC JS-002.

Note4: Latch Up Current Maximum Rating tested per JEDEC JESD78F.

Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
R _{θJA}	SC70-5	Thermal Characteristics, Thermal Resistance, Junction-to-Air	300	°C/W
	SOT23-5		250	
	DFN6		440	
	DFN4		285	
P _D	SC70-5	Power Dissipation in Still Air at 85°C	215	mW
	SOT23-5		260	
	DFN6		150	
	DFN4		350	

Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V _{CC}	DC Supply Voltage		1.65	5.5	V
	Operating Date Retention		1.5	5.5	
V _I	DC Input Voltage		0	V _{CC}	V
V _O	DC Output Voltage (High or Low State)		0	V _{CC}	V
T _A	Operating Temperature Range		-40	125	°C
t _r , t _f	Input Rise and Fall Time	V _{CC} = 2.5V ± 0.2V	0	20	ns/V
		V _{CC} = 3.0V ± 0.3V	0	10	
		V _{CC} = 5.0V ± 0.5V	0	5	

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied.

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Electrical Characteristics

DC Electrical Characteristics

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
V _{OH}	High-Level Output Voltage	I _{OH} = -100uA	1.65~5.5	V _{CC} - 0.1	V _{CC}		V _{CC} - 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	I _{OH} = 100uA	1.65~5.5		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 _I = 5.5V or GND	0~5.5		±0.1			±1.0	uA
I _{OFF}	Power Off Leakage Current	V _I = 5.5V or V _O = 5.5V	0			1		10	uA
I _{CC}	Quiescent Supply Current	V _I = 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.

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Electrical Characteristics (Continued)

Transfer Characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0V).

Symbol	Parameters	Conditions	T _A = 25°C			-40°C ≤ T _A ≤ 125°C		Unit
			Min	Typ	Max	Min	Max	
V _{T+}	Positive-going Threshold Voltage	See Figure3, 4						
		V _{CC} = 1.8V	0.95	1.15	1.32	0.90	1.37	V
		V _{CC} = 2.3V	1.20	1.45	1.68	1.15	1.73	V
		V _{CC} = 3.0V	1.57	1.80	2.13	1.52	2.18	V
		V _{CC} = 4.5V	2.20	2.56	2.95	2.15	3.00	V
		V _{CC} = 5.5V	2.73	3.06	3.47	2.68	3.52	V
V _{T-}	Negative-going Threshold Voltage	See Figure3, 4						
		V _{CC} = 1.8V	0.45	0.58	0.73	0.40	0.78	V
		V _{CC} = 2.3V	0.51	0.76	0.94	0.46	0.99	V
		V _{CC} = 3.0V	0.72	1.03	1.20	0.67	1.25	V
		V _{CC} = 4.5V	1.16	1.53	1.75	1.11	1.80	V
		V _{CC} = 5.5V	1.47	1.83	2.07	1.42	2.12	V
V _H	Hysteresis Voltage	(V _{T+} - V _{T-}) See Figure3, 4						
		V _{CC} = 1.8V	0.43	0.57	0.67	0.38	0.72	V
		V _{CC} = 2.3V	0.55	0.69	0.85	0.50	0.90	V
		V _{CC} = 3.0V	0.64	0.77	1.13	0.59	1.18	V
		V _{CC} = 4.5V	0.94	1.03	1.43	0.89	1.48	V
		V _{CC} = 5.5V	1.14	1.23	1.61	1.09	1.66	V

Wave-forms Transfer Characteristics

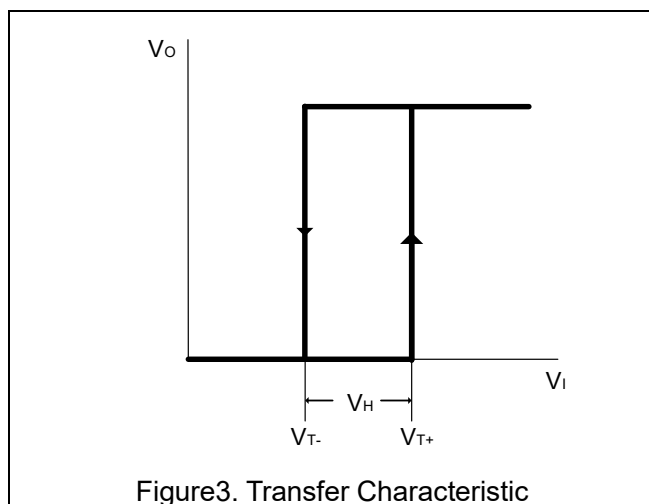


Figure3. Transfer Characteristic

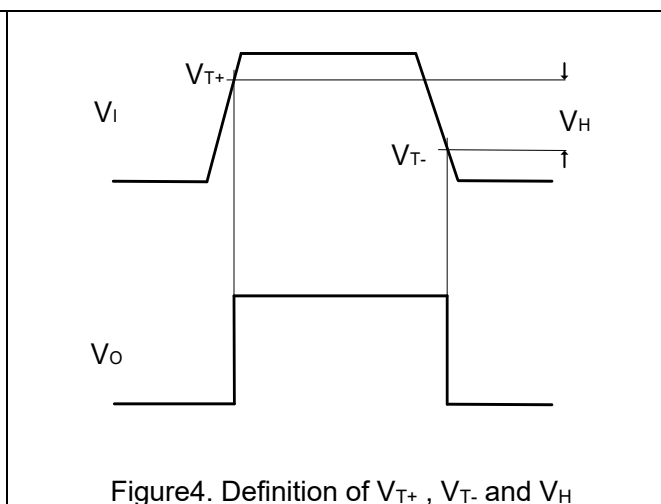


Figure4. Definition of V_{T+}, V_{T-} and V_H

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AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$

Symbol	Parameter	Condition	V_{CC} (V)	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay (Figure 5 & 6)	$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	1.65	2.0	12	16	2.0	20	ns
			1.8	2.0	10.1	14	2.0	17	
		$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	2.5	0.2	6.2	9.1	0.8	11.1	
		$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	3.3	0.8	5.0	7.5	0.5	8.0	
		$R_L = 500\Omega$ $C_L = 50\text{pF}$		1.2	5.6	8.1	1.5	8.6	
		$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	5.0	0.5	4.4	5.6	0.5	6.1	
		$R_L = 500\Omega$ $C_L = 50\text{pF}$		0.8	4.8	6.1	0.8	6.6	

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C_{IN}	Input Capacitance	$V_{CC} = 5.5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	4.5	pF
C_{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, $V_{CC} = 3.3\text{V}$, $V_I = 0\text{V}$ or V_{CC}	20	pF
		10MHz, $V_{CC} = 5.5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	24	

Note5: C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

AC Test Circuit

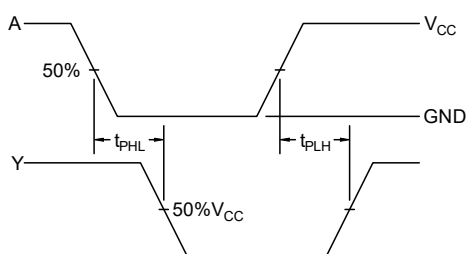


Figure5. Switching Waveform

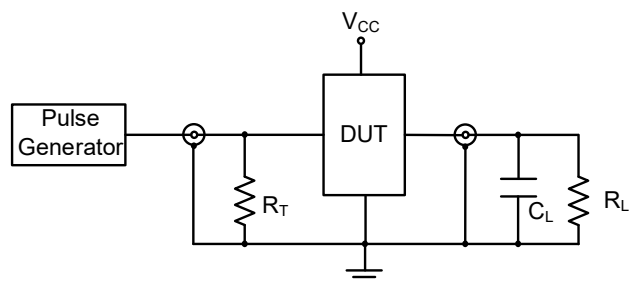
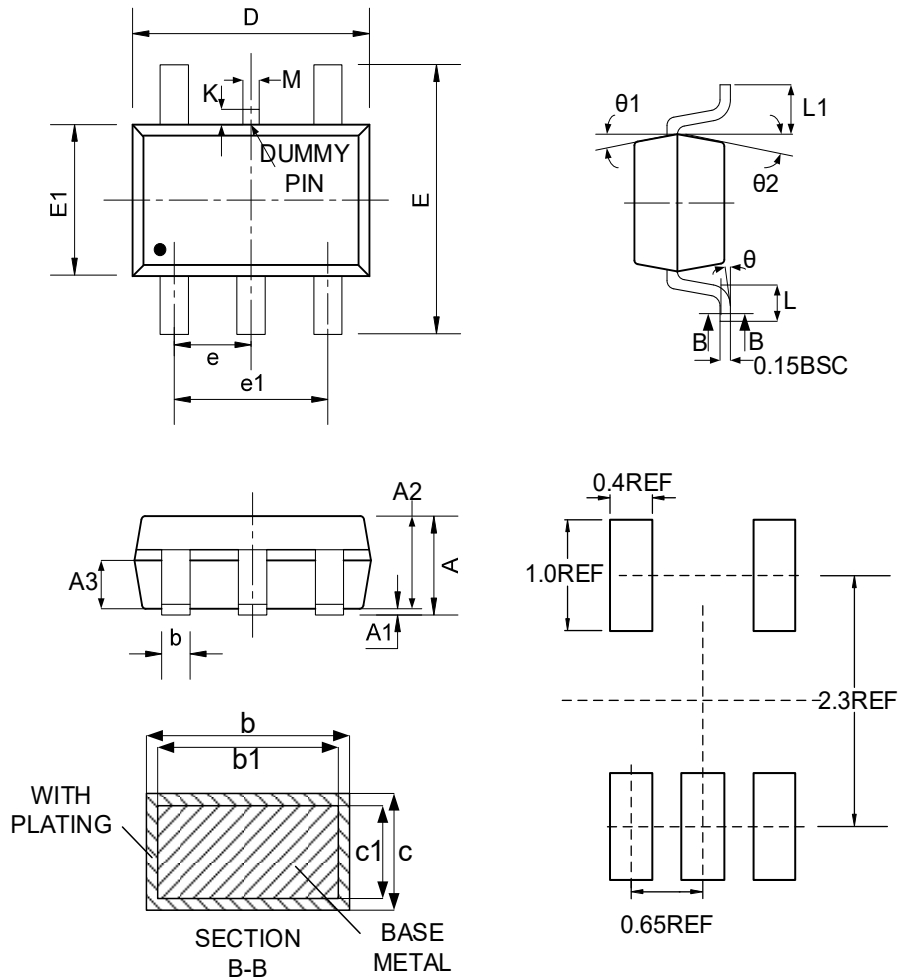


Figure6. Test Circuit

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Package Dimension

SC70-5 (1.3mm × 2.1mm)



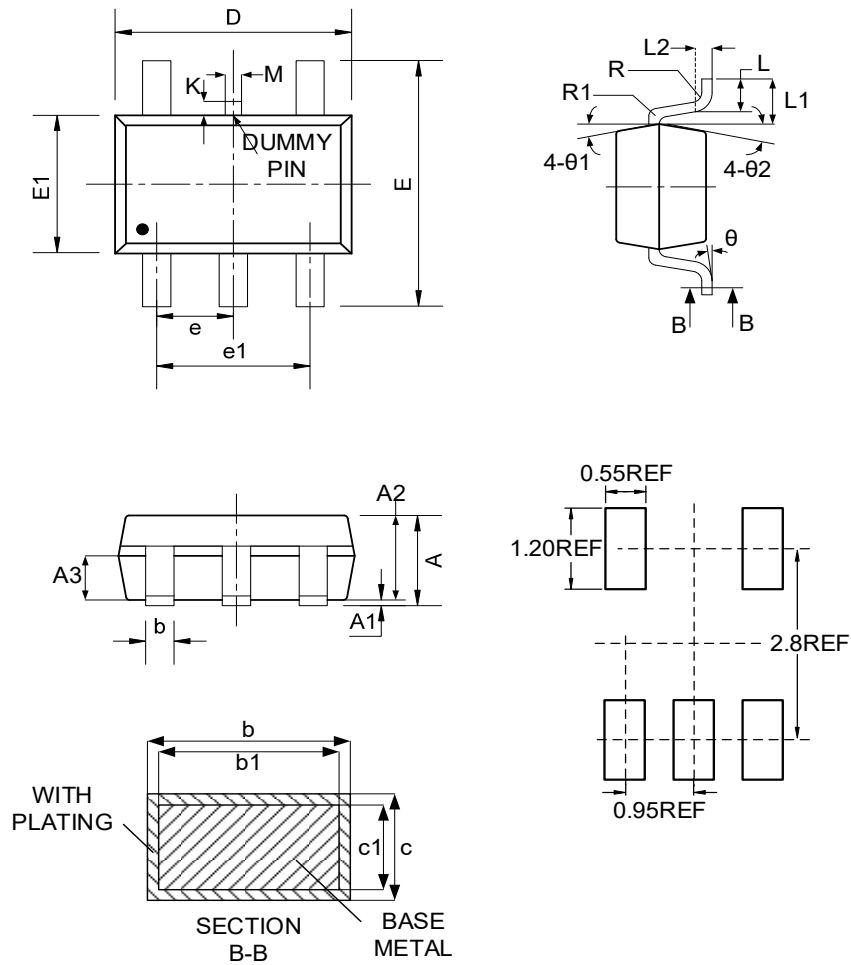
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	0.80	-	1.10	e	0.60	0.65	0.70
A1	0.00	-	0.10	e1	1.20	1.30	1.40
A2	0.80	0.90	1.00	L	0.26	0.33	0.46
b	0.17	-	0.30	L1	0.52REF		
b1	0.17	0.22	0.25	M	0.10	0.15	0.20
c	0.12	-	0.20	K	0.00	-	0.20
c1	0.12	0.15	0.16	θ	0°	-	8°
D	2.02	2.07	2.12	θ1	10°	12°	14°
E	2.20	2.30	2.40	θ2	10°	12°	14°
E1	1.21	1.26	1.31				

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SOT23-5 (1.6mm × 2.9mm)



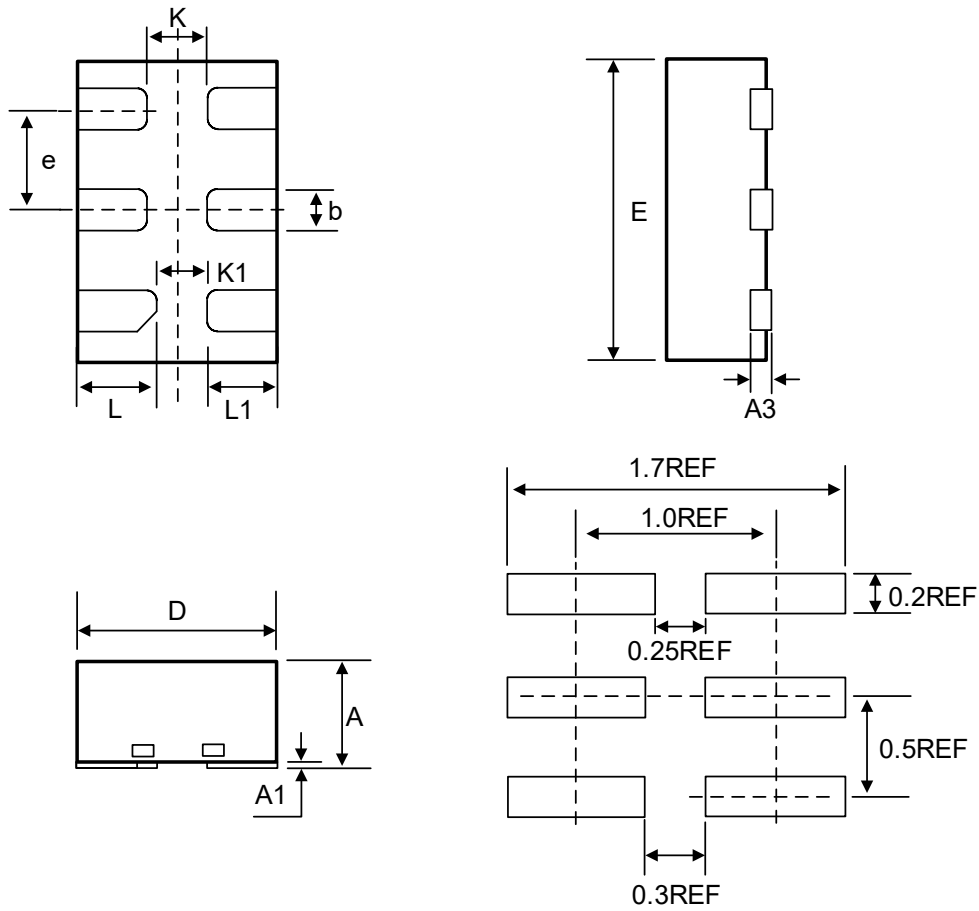
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	-	-	1.25	K	0	-	0.20
A1	0.00	-	0.15	M	0.10	0.15	0.20
A2	1.00	1.10	1.20	L	0.30	0.40	0.60
A3	0.60	0.65	0.70	L1	0.59REF		
b	0.34	-	0.45	L2	0.25BSC		
b1	0.34	0.38	0.41	R	0.05	-	0.20
c	0.12	-	0.20	R1	0.05	-	0.20
c1	0.12	0.15	0.16	θ	0°	-	8°
D	2.826	2.926	3.026	θ1	8°	10°	12°
E	2.60	2.80	3.00	θ2	10°	12°	14°
E1	1.526	1.626	1.70				
e	0.90	0.95	1.00				
e1	1.80	1.90	2.00				

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DFN6 (1.0mm × 1.5mm)



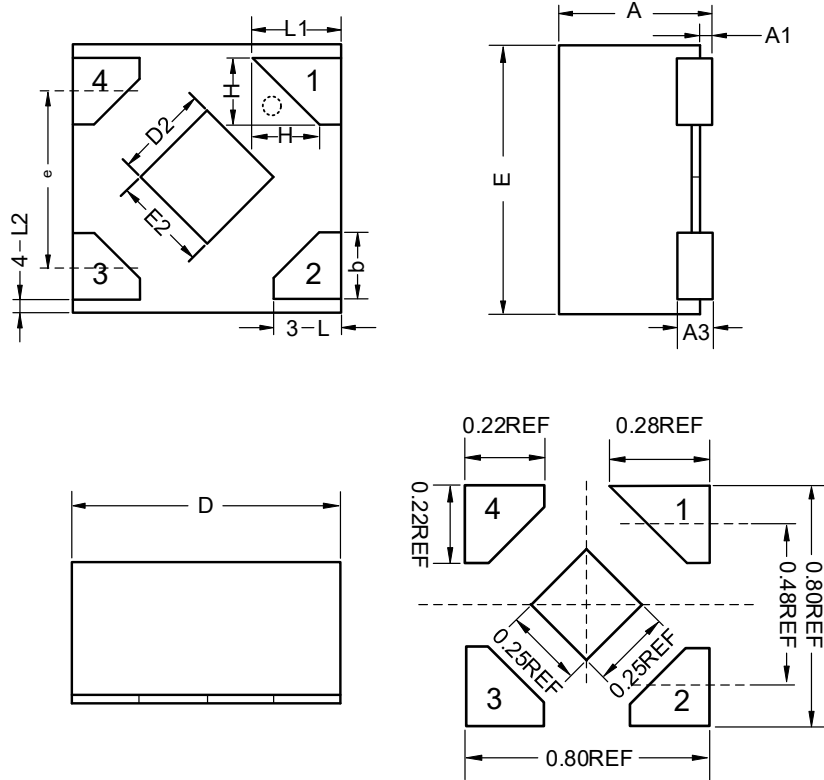
COMMON DIMENSIONS

(Unit: mm)

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	0.50BSC		
K	0.30REF		
K1	0.25REF		
L	0.35	0.40	0.45
L1	0.30	0.35	0.40

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DFN4 (0.8mm × 0.8mm)



COMMON DIMENSIONS

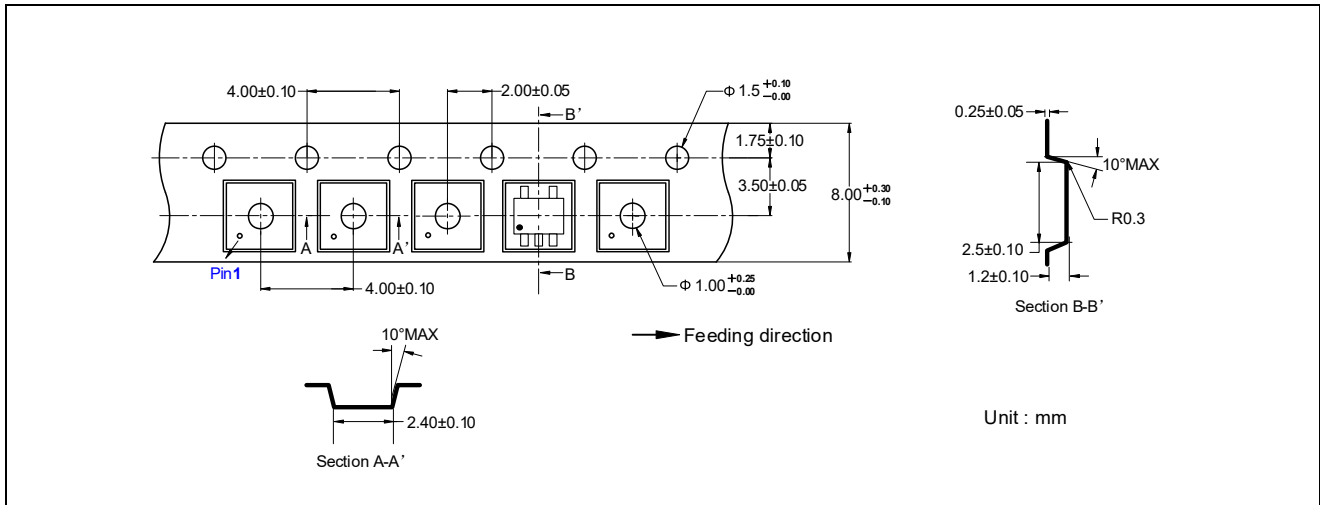
(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	0.34	0.37	0.40
A1	0.00	0.02	0.05
A3	0.10REF		
b	0.17	0.22	0.27
D	0.75	0.80	0.85
E	0.75	0.80	0.85
D2	0.20	0.25	0.30
E2	0.20	0.25	0.30
e	0.43	0.48	0.53
H	0.22REF		
L	0.17	0.22	0.27
L1	0.18	0.28	0.38
L2	0.05REF		

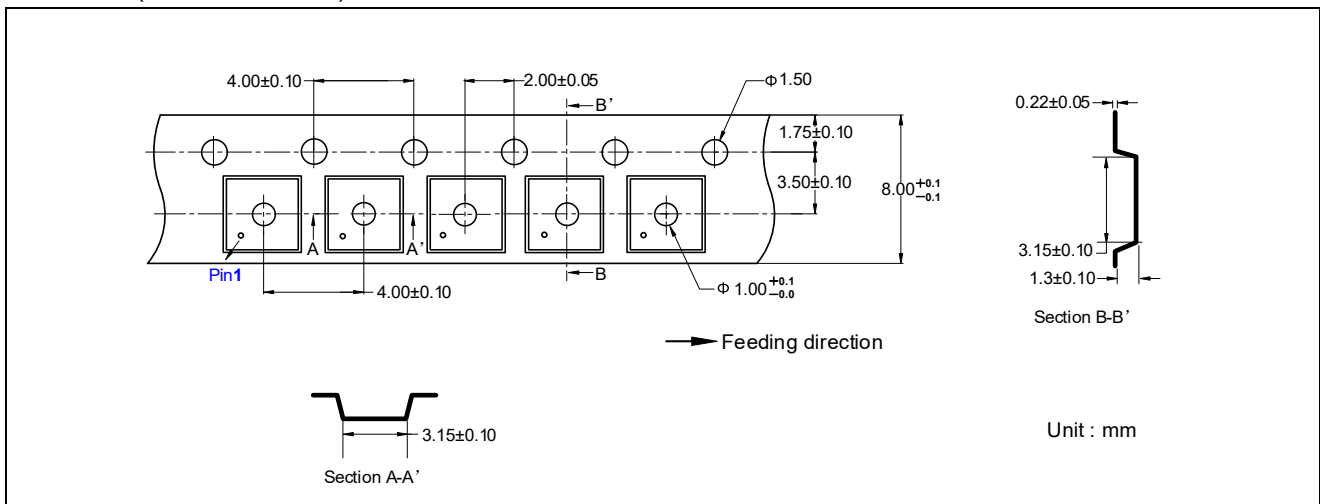
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Tape Information

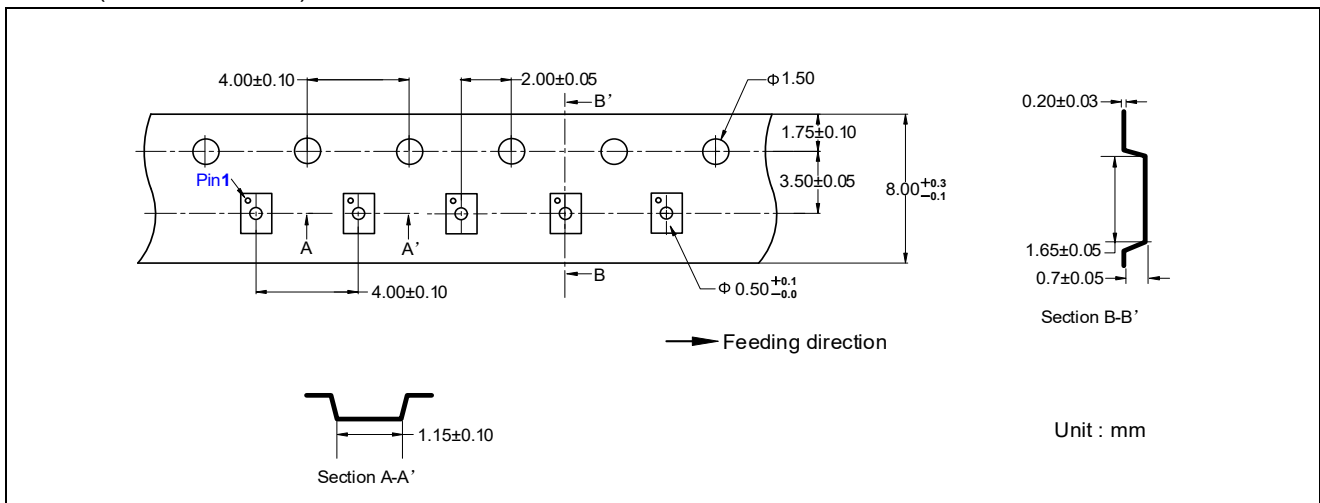
SC70-5 (1.3mm × 2.1mm)



SOT23-5 (1.6mm × 2.9mm)

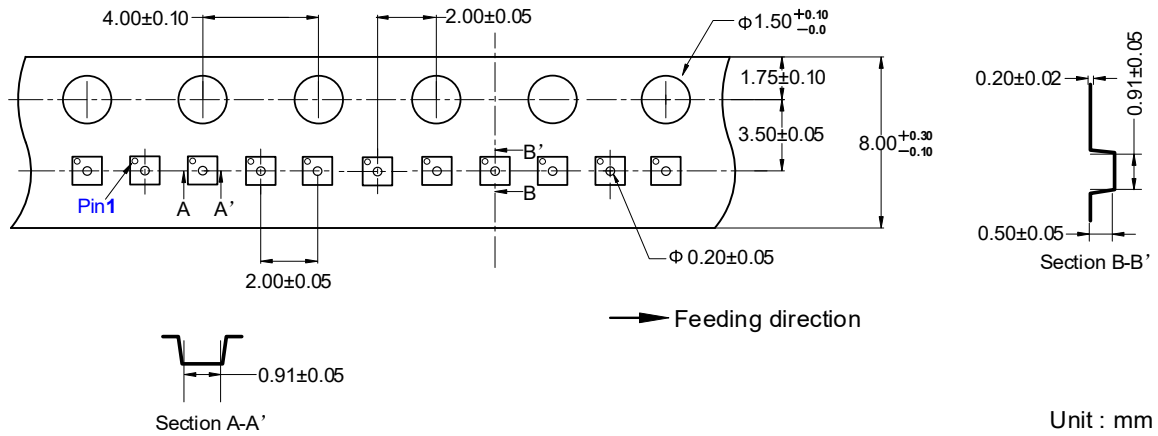


DFN6 (1.0mm × 1.5mm)

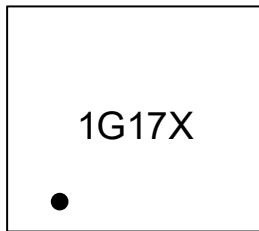


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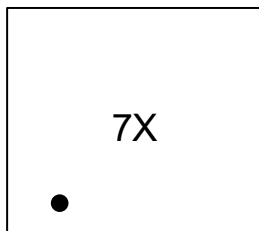
DFN4 (0.8mm × 0.8mm)



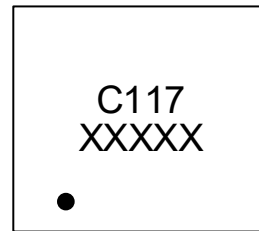
Marking Information



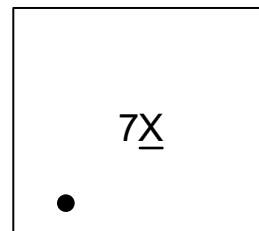
ET74LVC1G17
1G17 = Part Number
X = Tracking Number



ET74LVC1G17Y
7 = Part Number
X = Tracking Number



ET74LVC1G17T
C117 = Part Number
XXXXX = Tracking Number



ET74LVC1G17Y1
7 = Part Number
X = Tracking Number

ET74LVC1G17

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2017-10-23	Original Version	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.1	2019-07-18	Update AC Table and Device Information	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.2	2022-08-01	Update Typeset	Shibo	Shibo	Shibo
1.3	2022-10-14	Update format and Thermal Characteristics	Wuhan	Shibo	Shibo
1.4	2023-11-29	Update Typeset /ESD	Shibo	Shibo	Shibo
1.5	2024-1-24	Update AC Electrical Characteristics	Shibo	Shibo	Shibo
1.6	2025-05-29	Add Packing Option	Yang xiaoxu	Yang xiaoxu	Liu jiaying
1.7	2025-7-20	Update Capacitance Characteristics	Zhang wang	Yang xiaoxu	Liu jiaying
1.7.a	2025-12-11	Add marking and Tape Information	Yang xiaoxu	Yang xiaoxu	Liu jiaying
1.8	2026-01-23	Add DFN4 Package, Update Format	Xu tao	Yang xiaoxu	Liu jiaying
1.9	2026-05-26	Update EC Table	Wang anran	Yang xiaoxu	Liu jiaying
1.10	2026-06-08	Update Marking	Xu tao	Yang xiaoxu	Liu jiaying
1.11	2026-7-31	Update Package	Lu Shao jie	Yang Xiao xu	Liu Jiaying