

Single Inverter with Schmitt Trigger

General Description

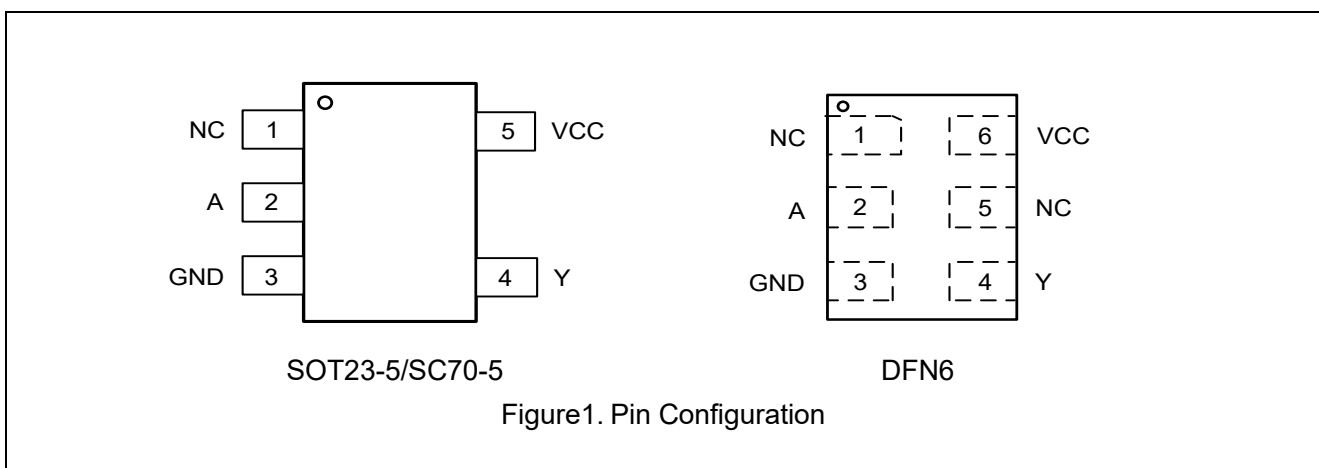
The ET74LV1T14 is a single inverter with Schmitt-trigger input. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of V_{CC} . Schmitt trigger inputs transform slowly changing input signals into sharply defined jitter-free output signals.

Features

- $\pm 8\text{mA}$ Balanced Output Sink and Source Capability
- Over-voltage Tolerant Inputs Accept Voltages to 5.5V
- Designed for 1.6V to 5.5V V_{CC} Operation
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free, Halogen Free/BFR Free and RoHS Compliant.
- ESD Protection Complies with JESD22 Standard
 - HBM: $\pm 4000\text{V}$ Pass (JEDEC JS-001)
 - CDM: $\pm 1000\text{V}$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 100\text{mA}$ per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74LV1T14	SC70-5 (1.3mm $\times$ 2.1mm)	Tape and Reel, 3K/Reel	1
ET74LV1T14T	SOT23-5 (1.6mm $\times$ 2.9mm)	Tape and Reel, 3K/Reel	3
ET74LV1T14Y	DFN6 (1.0mm $\times$ 1.5mm)	Tape and Reel, 3K/Reel	1

Pin Configuration



ET74LV1T14

Pin Function

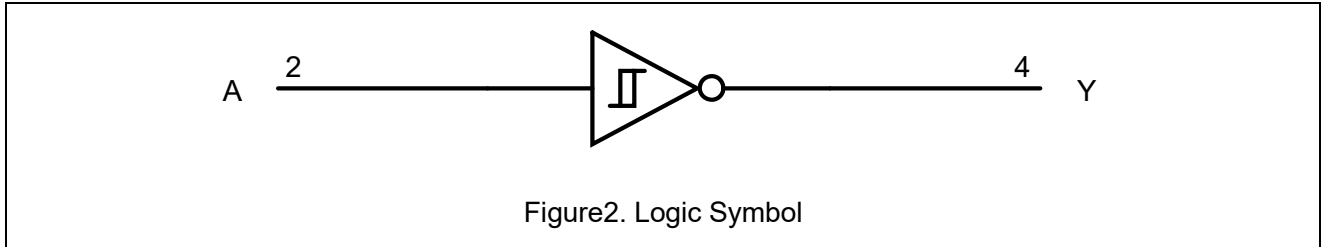
SC70-5/ SOT23-5

Pin No.	Pin Name	Function
1	NC	No Connect
2	A	Input
3	GND	Ground
4	Y	Output
5	VCC	Supply Voltage

DFN6

Pin No.	Pin Name	Function
1	NC	No Connect
2	A	Input
3	GND	Ground
4	Y	Output
5	NC	No Connect
6	VCC	Supply Voltage

Block Diagram



Function Table

Input A	Output Y
L	H
H	L

ET74LV1T14

Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage (VCC Pin)		-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
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±1000	
I _{LU}	Max Latch Up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±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.

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	
P _D	SC70-5	Power Dissipation in Still Air at 85°C	215	mW
	SOT23-5		260	
	DFN6		150	

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage Operating	1.6	5.5	V
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

ET74LV1T14

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 _{IH}	High-level Input Voltage		1.65~1.8	0.94			1.0		V
			2.0	0.99			1.03		
			2.25~2.5	1.135			1.18		
			2.75	1.21			1.23		
			3.0~3.3	1.35			1.37		
			3.6	1.47			1.48		
			4.5~5.0	2.02			2.03		
			5.5	2.10			2.11		
V _{IL}	Low-level Input Voltage		1.65~2.0			0.45		0.40	V
			2.25~2.75			0.75		0.71	
			3.0~3.6			0.80		0.65	
			4.5~5.5			0.80		0.80	
V _{OH}	High-level Output Voltage	I _{OH} = -20μA	1.65~5.5	V _{CC} - 0.1	V _{CC}		V _{CC} - 0.1		V
		I _{OH} = -2mA	1.65	1.28			1.21		
		I _{OH} = -2mA	1.8	1.5			1.45		
		I _{OH} = -2.3mA	2.3	2.0			2.0		
		I _{OH} = -3mA	2.3	2.0			1.93		
		I _{OH} = -3mA	2.5	2.25			2.15		
		I _{OH} = -3mA	3.0	2.78			2.7		
		I _{OH} = -5.5mA	3.0	2.6			2.49		
		I _{OH} = -5.5mA	3.3	2.9			2.8		
		I _{OH} = -4mA	4.5	4.2			4.1		
		I _{OH} = -8mA	4.5	4.1			3.95		
		I _{OH} = -8mA	5.5	4.6			4.5		
V _{OL}	Low-level Output Voltage	I _{OL} = 20μA	1.65~5.5			0.1		0.1	V
		I _{OL} = 2mA	1.65			0.2		0.25	
		I _{OL} = 2.3mA	2.3			0.1		0.15	
		I _{OL} = 3mA	2.3			0.15		0.2	
		I _{OL} = 3mA	3.0			0.1		0.15	
		I _{OL} = 5.5mA	3.0			0.2		0.252	
		I _{OL} = 4mA	4.5			0.15		0.2	
		I _{OL} = 8mA	4.5			0.3		0.35	

ET74LV1T14

DC Electrical Characteristics (Continued)

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
I _I	Input Leakage Current	V _I = 5.5V or GND	0~5.5			±0.1		±1.0	μA
I _{CC}	Quiescent Supply Current	V _I = 5.5V or GND	5.5			1.0		10	μA
ΔI _{CC}	Additional Supply Current	Per Input Pin; V _I = 0.3V or 1.1V; I _O = 0mA; Other Pins at V _{CC} or GND	1.8			10		10	μA
		Per Input Pin; V _I = 0.3V or 3.4V; I _O = 0mA; Other Pins at V _{CC} or GND	5.5			1.35		1.5	mA

AC Electrical Characteristics

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay (Figure 3 & 4)	C _L = 15pF	1.8		7.5	10.7		12.7	ns
		C _L = 30pF	1.8		8.4	11.9		12.9	
		C _L = 15pF	2.5		5.9	7.9		9.5	
		C _L = 30pF	2.5		6.6	8.8		10.5	
		C _L = 15pF	3.3		3.8	5.4		6.5	
		C _L = 30pF	3.3		4.4	6		7.3	
		C _L = 15pF	5.0		3	3.9		4.7	
		C _L = 30pF	5.0		3.4	4.4		5.3	

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C _{IN}	Input Capacitance	V _{CC} = 5.5V, V _I = 0V or V _{CC}	5	pF
C _{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, V _{CC} = 3.3V, V _I = 0V or V _{CC}	10	pF
		10MHz, V _{CC} = 5.5V, V _I = 0V or V _{CC}	12	

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;

Σ(C_L × V_{CC}² × f_o) = sum of outputs.

ET74LV1T14

AC Test Circuit

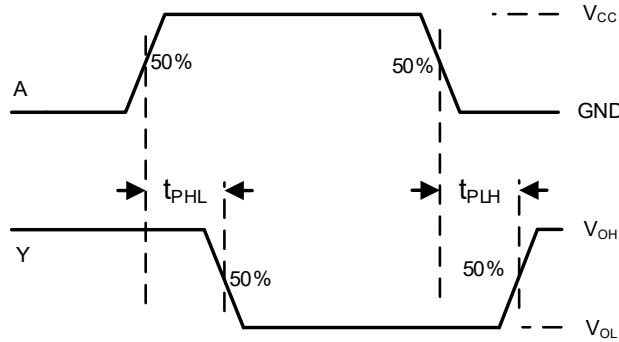
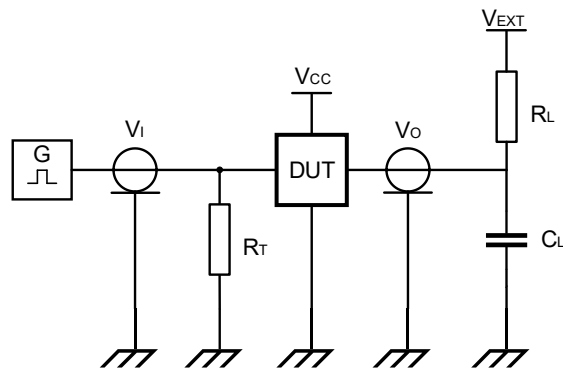


Figure3. Switching Waveform



Measurement points are given in [Table 1](#).

Definitions test circuit:

R_L = Load resistance;

C_L = Load capacitance including jig and probe capacitance;

R_T = Termination resistance should be equal to output impedance Z_O of the pulse generator;

V_{EXT} = External voltage for measuring switching times.

Figure.4 Test circuit for measuring switching times

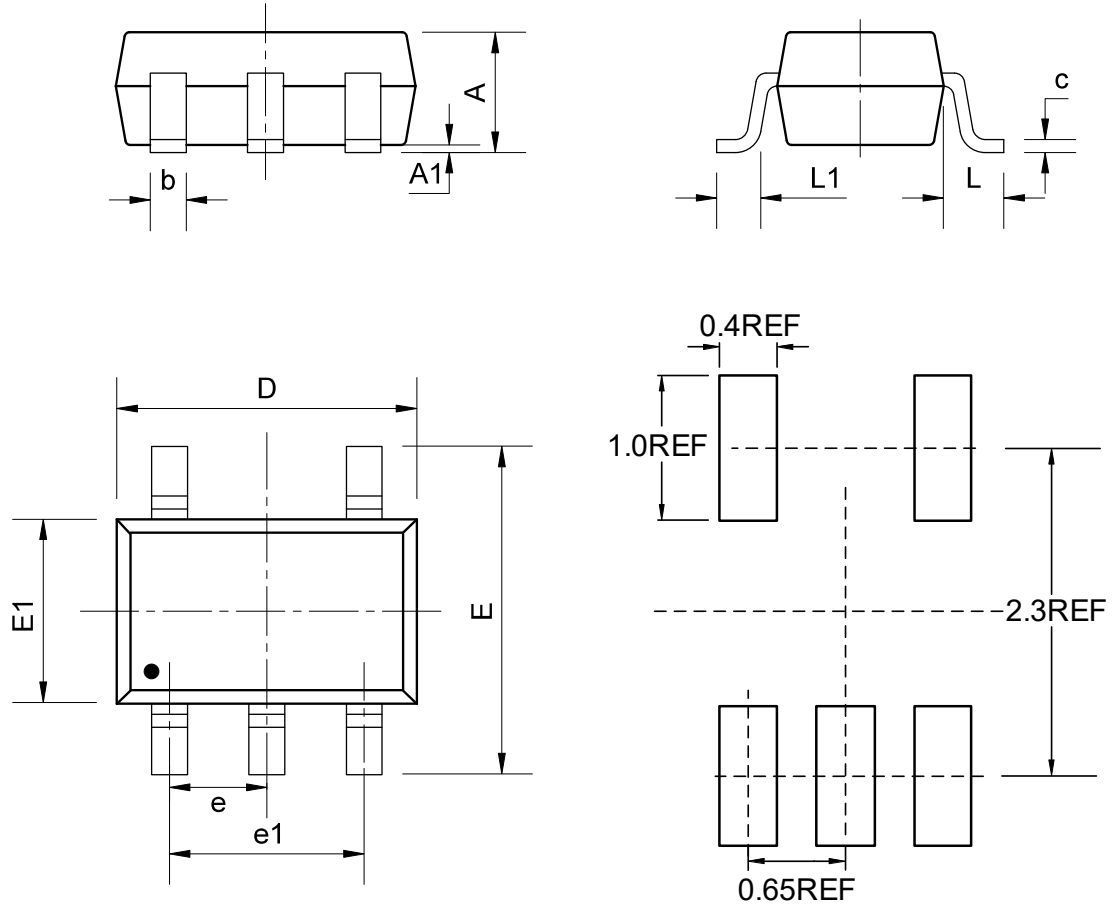
Table1. Test Data

Supply Voltage	Input			Load		V_{EXT}
V_{CC}	V_I	$t_r = t_f$	f_{max}	C_L	R_L	t_{PLH}, t_{PHL}
1.8V	V_{CC}	$\leq 3ns$	15MHz	15pF, 30pF	1M Ω	open
2.5V	V_{CC}	$\leq 3ns$	25MHz	15pF, 30pF	1M Ω	open
3.3V	3V	$\leq 3ns$	50MHz	15pF, 30pF	1M Ω	open
5.0V	3V	$\leq 3ns$	50MHz	15pF, 30pF	1M Ω	open

ET74LV1T14

Package Dimension

SC70-5 (1.3mm × 2.1mm)



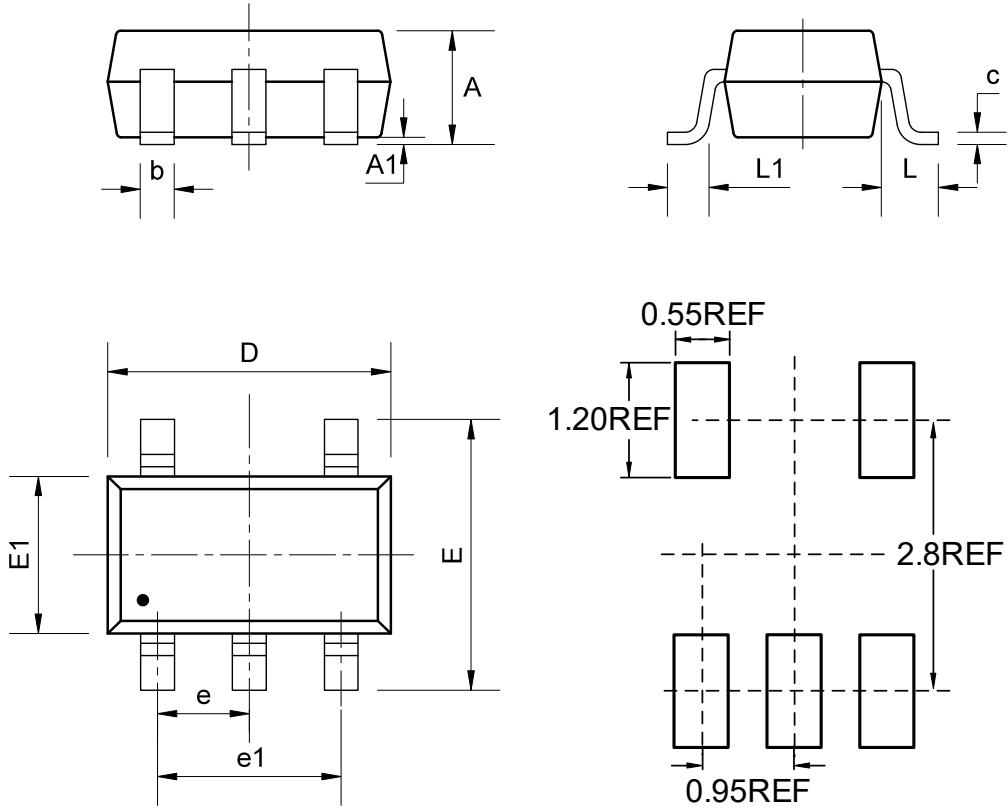
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	-	-	1.10
A1	0.00	-	0.15
b	0.15	-	0.35
c	0.08	-	0.20
D	2.00	2.10	2.30
e	0.65BSC		
e1	1.30BSC		
E	2.15	2.30	2.50
E1	1.15	1.30	1.45
L	0.50REF		
L1	0.33REF		

ET74LV1T14

SOT23-5 (1.6mm × 2.9mm)



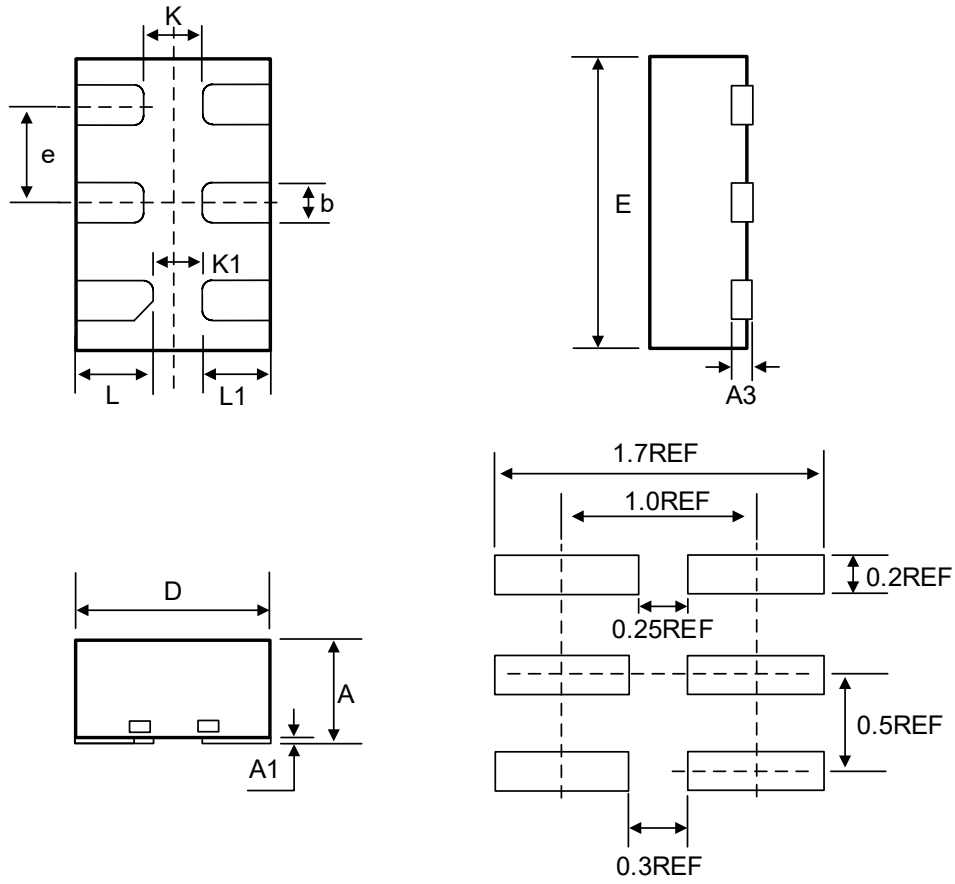
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	-	-	1.45
A1	0.00	-	0.15
b	0.28	0.35	0.50
c	0.08	0.15	0.22
D	2.75	2.9	3.05
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
E	2.60	2.80	3.00
E1	1.45	1.6	1.75
L	0.60REF		
L1	0.30	0.45	0.60

ET74LV1T14

DFN6 (1.0mm × 1.5mm)



COMMON DIMENSIONS

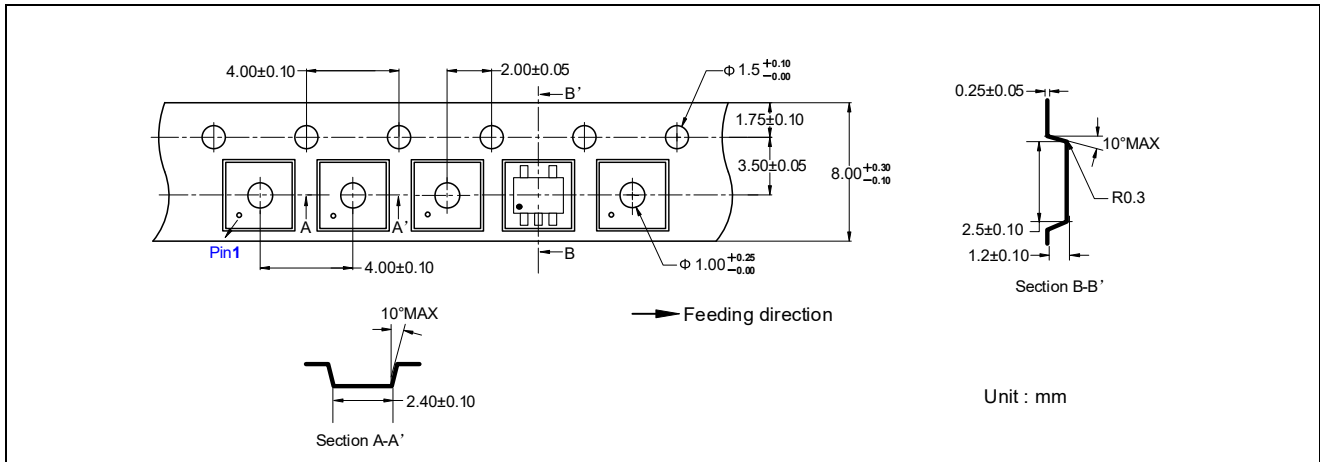
(Unit: mm)

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

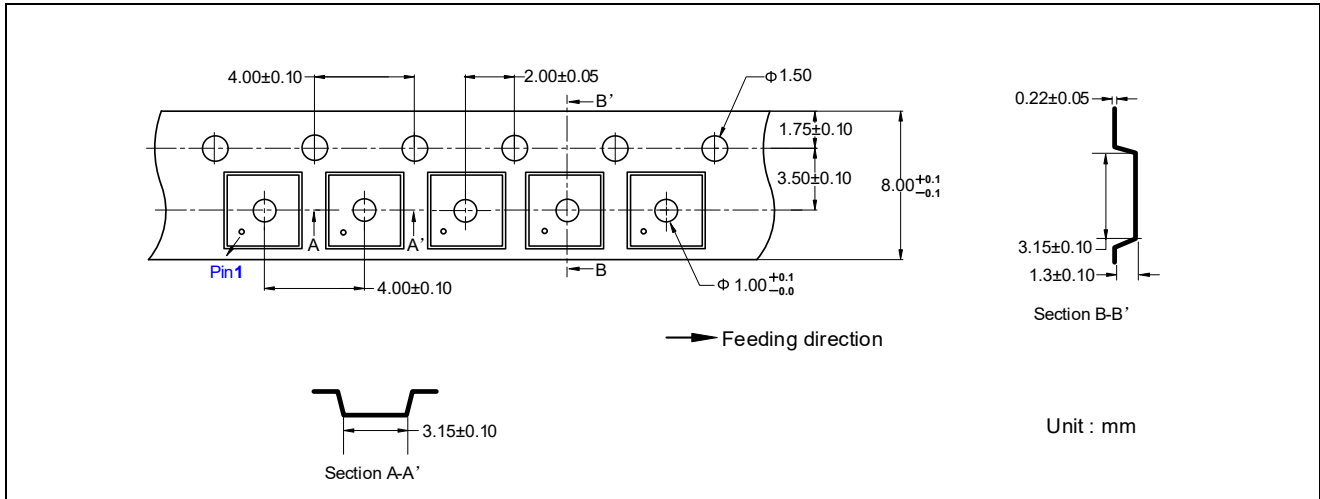
ET74LV1T14

Tape Information

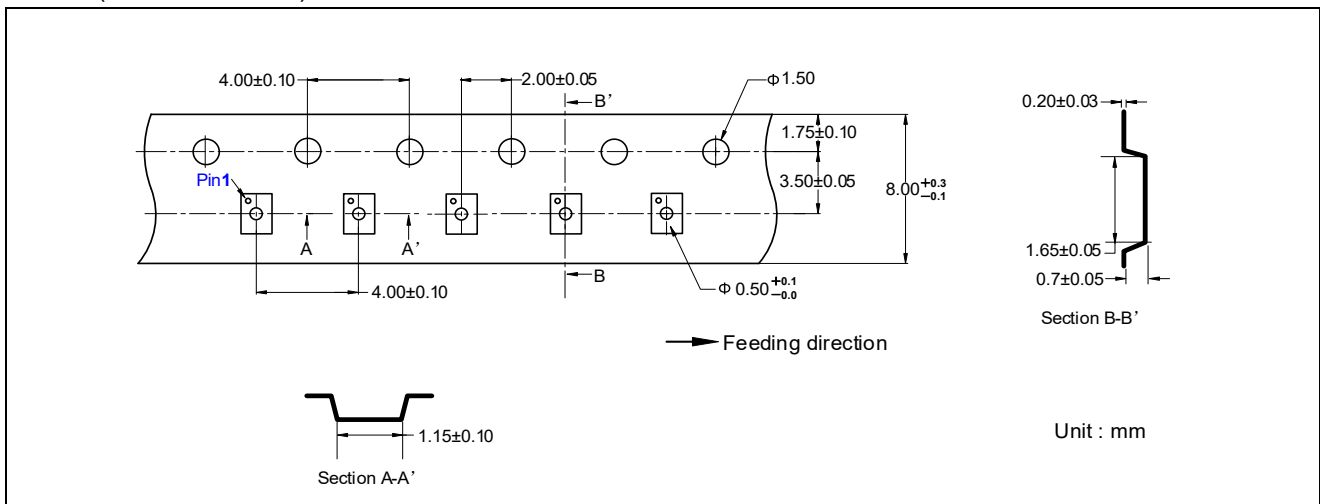
SC70-5 (1.3mm × 2.1mm)



SOT23-5 (1.6mm × 2.9mm)

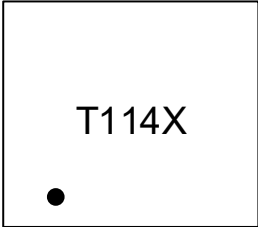
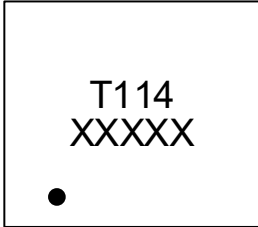


DFN6 (1.0mm × 1.5mm)



ET74LV1T14

Marking Information

	
ET74LV1T14	ET74LV1T14T
T114 = Part Number	T114 = Part Number
X = Tracking Number	XXXXX = Tracking Number

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2025-12-02	Official Version	Wang anran	Yang xiaoxu	Liu jiaying
1.0.a	2026-01-06	Update Format, Add Tape and Marking	Xu tao	Yang xiaoxu	Liu jiaying