

Single Non-Inverting Buffer with Open Drain Output

General Description

The ET74AUP1G07 is a high performance single non-inverting buffer with open drain outputs operating from 0.8V to 3.6V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

- Designed for 0.8V to 3.6V V_{CC} Operation
- Over-Voltage Tolerant Inputs Accept Voltages to 3.6V
- 4mA Output Sink 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: $\pm 4000V$ Pass (JEDEC JS-001)
 - CDM: $\pm 1000V$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 100mA$ per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74AUP1G07	SC70-5 (1.3mm × 2.1mm)	Tape and Reel, 3K/Reel	1
ET74AUP1G07T	SOT23-5 (1.6mm × 2.9mm)	Tape and Reel, 3K/Reel	3
ET74AUP1G07Y	DFN6 (1.0mm × 1.5mm)	Tape and Reel, 3K/Reel	1

Pin Configuration

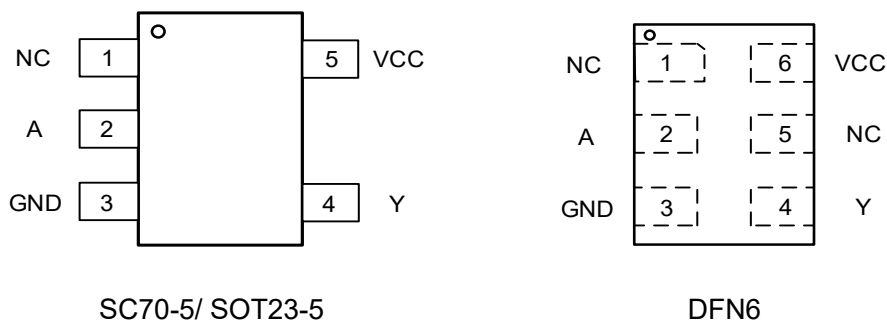


Figure1. Pin Configuration

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Pin Function

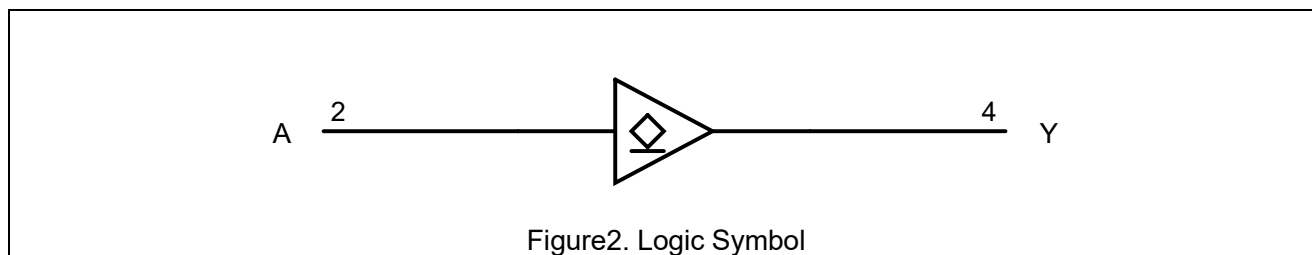
SC70-5/SOT23-5

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



Functional Table

Input A	Output Y
L	L
H	Z

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Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to 4.6	V
V _I	DC Input Voltage		-0.5 ≤ V _I ≤ 4.6	V
V _O	DC Output Voltage Output in Higher or Low State ⁽¹⁾		-0.5 to 4.6	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		±20	mA
I _{CC}	DC Supply Current per Supply Pin		±50	mA
I _{GND}	DC Ground Current per Supply Pin		±50	mA
T _{STG}	Storage Temperature Range		-65 to 150	°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 85°C ⁽⁴⁾		±100	mA

Stresses exceeding those listed in the Maximum Ratings 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	
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		0.8	3.6	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	85	°C
t _r , t _f	Input Rise and Fall Time	V _{CC} = 0.8V to 3.6V	0	20	ns/V

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Electrical Characteristics

DC Electrical Characteristics

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		0.8	0.75V _{CC}			0.75V _{CC}		V
			0.9~1.95	0.7V _{CC}			0.7V _{CC}		
			2.3~2.7	1.6			1.6		
			3.0~3.6	2.0			2.0		
V _{IL}	Low-Level Input Voltage		0.8			0.25V _{CC}		0.25V _{CC}	V
			0.9~1.95			0.3V _{CC}		0.3V _{CC}	
			2.3~2.7			0.7		0.7	
			3.0~3.6			0.9		0.9	
V _{OL}	Low-Level Output Voltage	I _{OL} = 20uA	0.8~3.6			0.1		0.1	V
		I _{OL} = 1.1mA	1.1		0.11	0.33		0.33	
		I _{OL} = 1.7mA	1.4		0.12	0.31		0.37	
		I _{OL} = 1.9mA	1.65		0.11	0.31		0.35	
		I _{OL} = 2.3mA	2.3		0.14	0.31		0.33	
		I _{OL} = 3.1mA			0.19	0.44		0.45	
		I _{OL} = 2.7mA	3.0		0.11	0.31		0.33	
		I _{OL} = 4.0mA			0.16	0.44		0.45	
I _{IN}	Input Leakage Current	V _I = V _{CC} or GND	0~3.6			±0.1		±0.2	uA
I _{OFF}	Power Off Leakage Current	V _I = 3.6V or V _O = 3.6V	0			±0.2		±0.5	uA
I _{CC}	Quiescent Supply Current	V _I = 3.6V or GND	3.6			±0.2		±0.7	uA

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AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$, $R_L = 5\text{k}\Omega$

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
t _{PLZ} t _{PZL}	Propagation Delay (Figure 3 & 4)	C _L = 15pF ⁽⁵⁾	0.8		30.4	86.1		226.5	ns
			1.2		9.8	13.6		13.9	
			1.5		7.1	8.6		9.3	
			1.8		6.8	7.8		8.4	
			2.5		4.8	5.3		5.8	
			3.3		5.7	6.0		6.6	
		C _L = 30pF ⁽⁵⁾	0.8		37.4	105.6		285.5	ns
			1.2		13.2	16.7		17.1	
			1.5		9.7	11.3		11.8	
			1.8		10.2	11.2		11.8	
			2.5		7.1	7.7		8.2	
			3.3		9.3	9.7		10.3	

Note5: C_L includes probe and jig capacitance.

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Capacitance Characteristics

Symbol	Parameter	Condition		Typ	Unit
C _{IN}	Input Capacitance	V _{CC} = 3.6V, V _I = 0V or V _{CC}		2	pF
C _O	output capacitance	V _{CC} = 0V, V _O = GND		3	pF
C _{PD}	Power Dissipation Capacitance ⁽⁶⁾	1MHz, V _I = 0V to V _{CC}	V _{CC} = 0.8V	7.6	pF
			V _{CC} = 1.2V	8.1	
			V _{CC} = 1.5V	8.5	
			V _{CC} = 1.8V	8.6	
			V _{CC} = 2.5V	9.0	
			V _{CC} = 3.3V	9.6	

Note6: 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

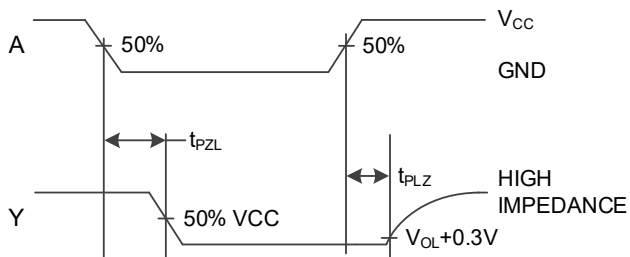


Figure3. Switching Waveform

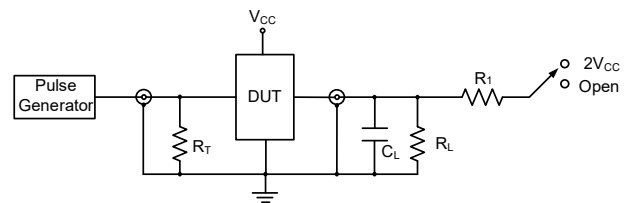
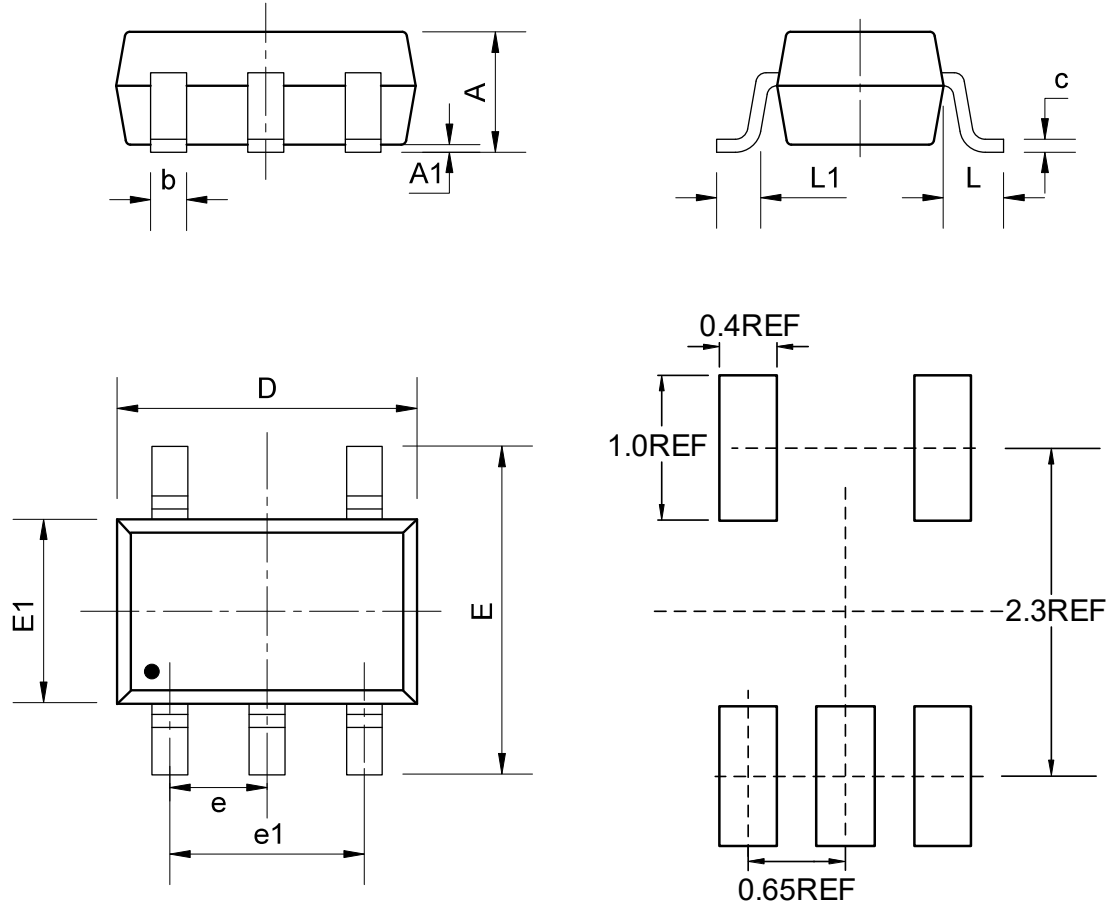


Figure4. Test Circuit $R_T = 50\Omega$ (Typ)

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Package Dimension

SC70-5 (1.3mm × 2.1mm)



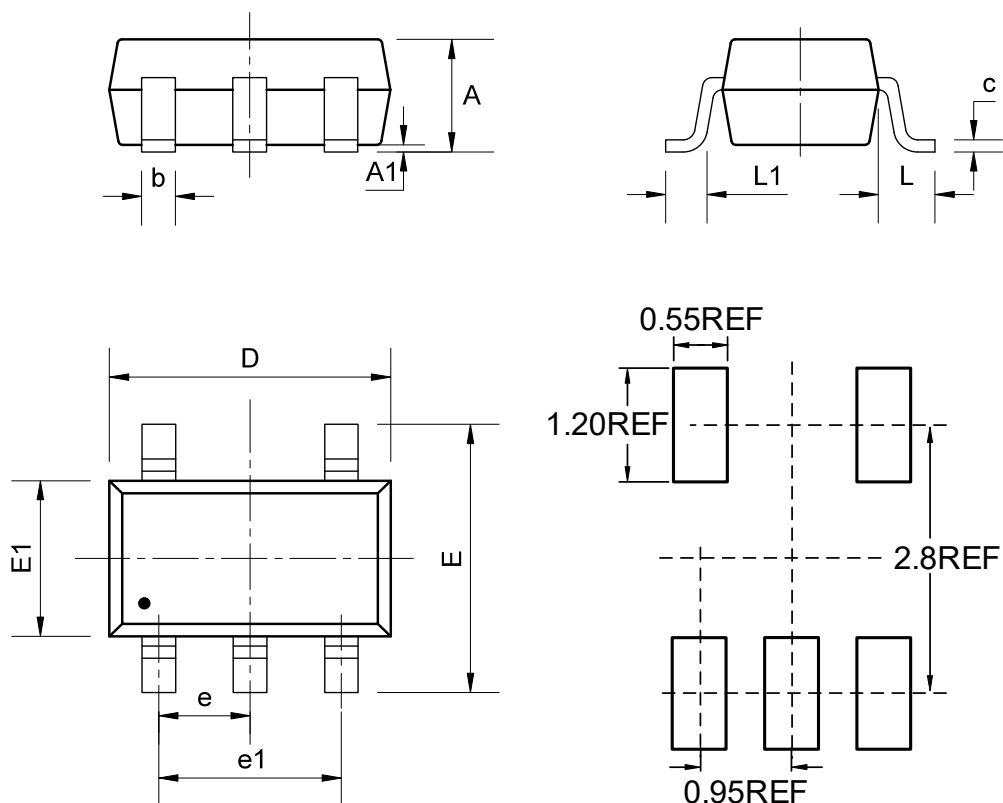
COMMON DIMENSIONS

(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		

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SOT23-5 (1.6mm × 2.9mm)



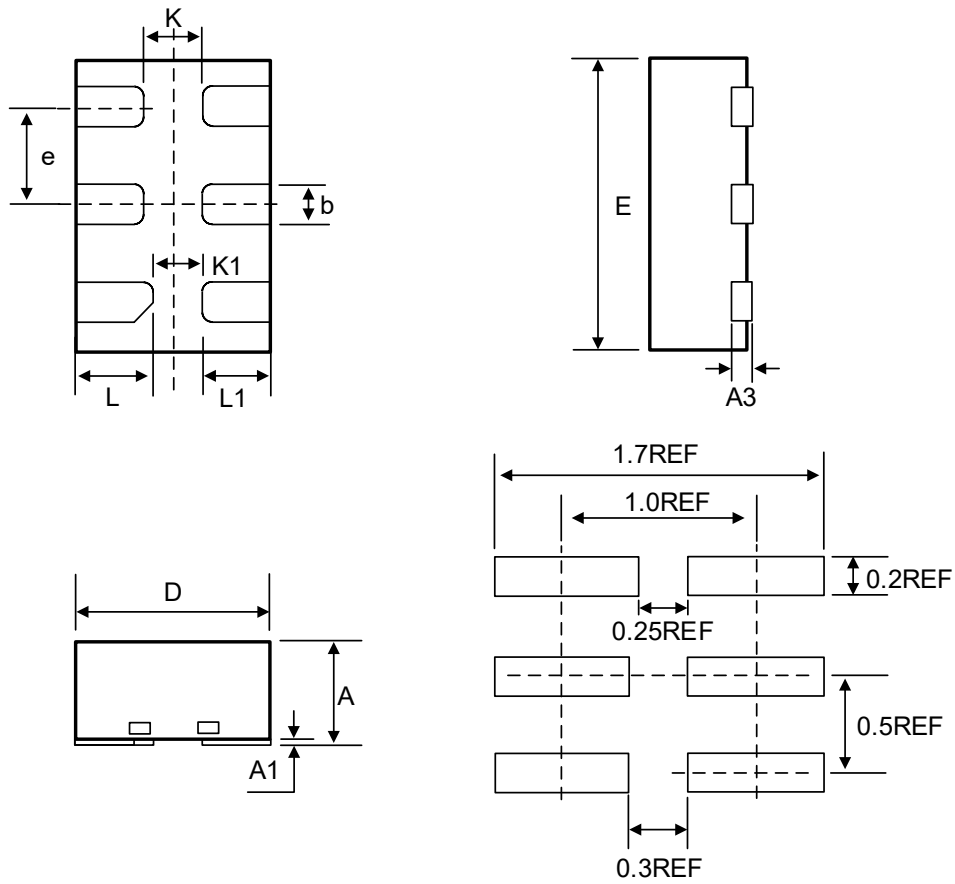
COMMON DIMENSIONS

(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

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DFN6 (1.0mm × 1.5mm)



COMMON DIMENSIONS

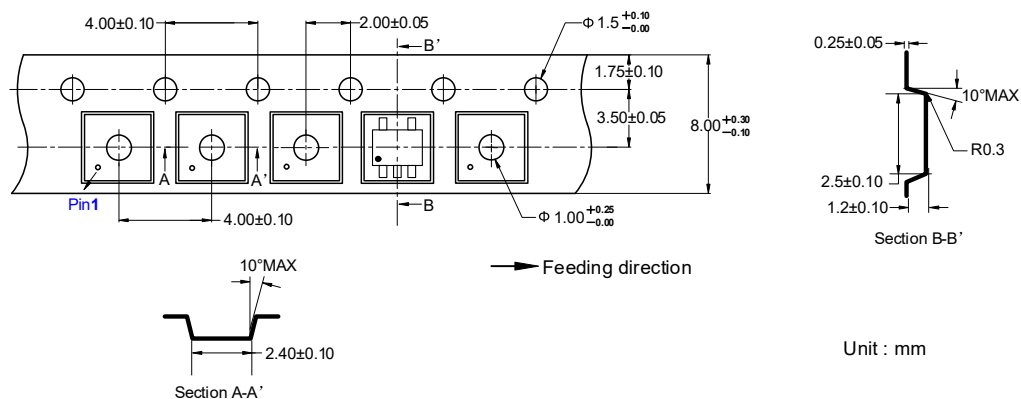
(Unit: mm)

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

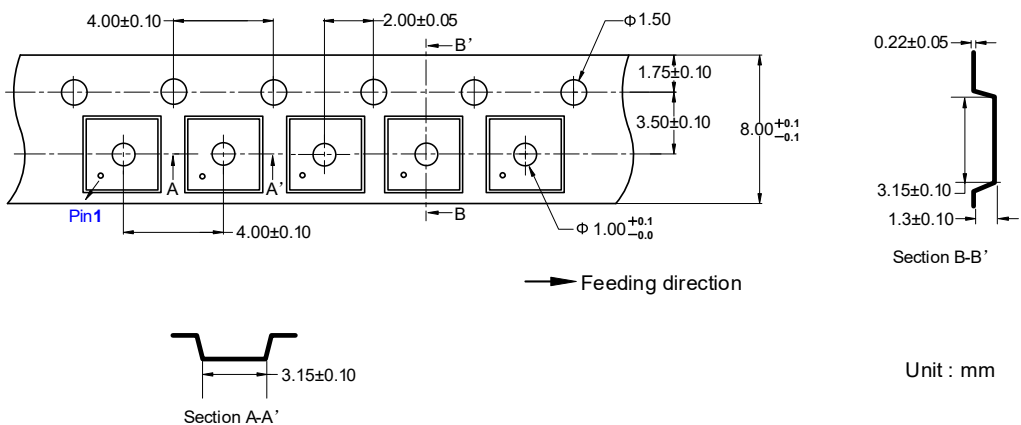
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Tape Information

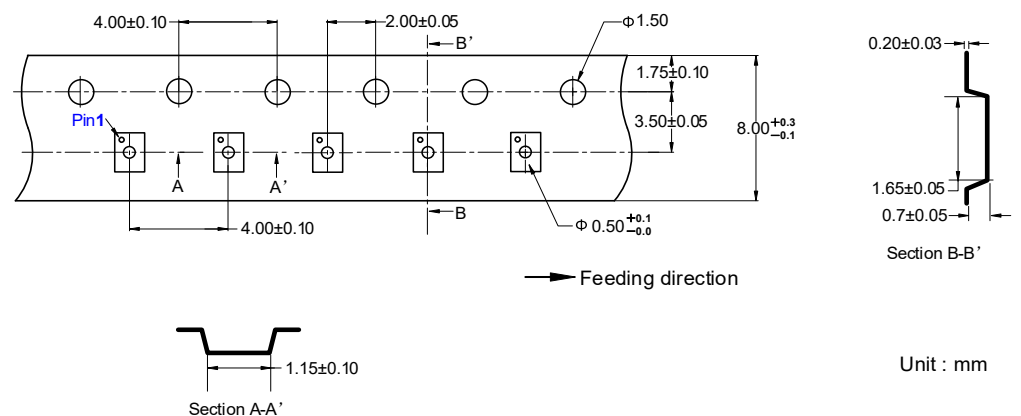
SC70-5 (1.3mm × 2.1mm)



SOT23-5 (1.6mm × 2.9mm)

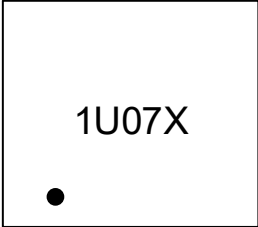
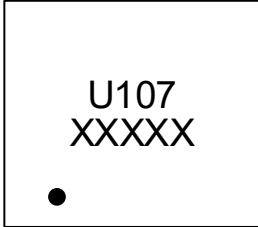


DFN6 (1.0mm × 1.5mm)



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Marking Information

	
ET74AUP1G07	ET74AUP1G07T
1U07 = Part Number	U107 = 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	2019-10-23	Original Version	Yuan guangrui	Yuan guangrui	Liu Jiaying
1.1	2023-11-29	Update Typeset	Shi bo	Shi bo	Shi bo
1.2	2025-01-16	Add package type	Yang xiaoxu	Yang xiaoxu	Liu Jiaying
1.3	2025-05-27	Add Packing Option	Yang xiaoxu	Yang xiaoxu	Liu jiaying
1.3.a	2025-12-25	Update Format ,Add Tape and Marking	Xu tao	Yang xiaoxu	Liu jiaying
1.3.b	2026-04-22	Update Package	Xu tao	Yang xiaoxu	Liu jiaying
1.4	2026-07-29	Correct Words	Xu tao	Yang xiaoxu	Liu jiaying