

# Single Non-Inverting Buffer with Open Drain Output

## General Description

The ET74HC1G07 is a high performance single non-inverting buffer with open drain outputs operating from a 2V to 6V supply. The Output stage is open drain with Over Voltage Tolerance.

This allows the ET74HC1G07 to be used to interface 5.0V circuits to circuits of any voltage between 0V and 7V.

## Features

- Designed for 2V to 6V  $V_{CC}$  Operation
- Over-voltage Tolerant Inputs Accept Voltages to 6V
- 2.6mA 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:  $\pm 4000V$  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
ET74HC1G07	SC70-5 (1.3mm × 2.1mm)	Tape and Reel, 3K/Reel	1
ET74HC1G07T	SOT23-5 (1.6mm × 2.9mm)	Tape and Reel, 3K/Reel	3
ET74HC1G07Y	DFN6 (1.0mm × 1.5mm)	Tape and Reel, 3K/Reel	1

## Pin Configuration

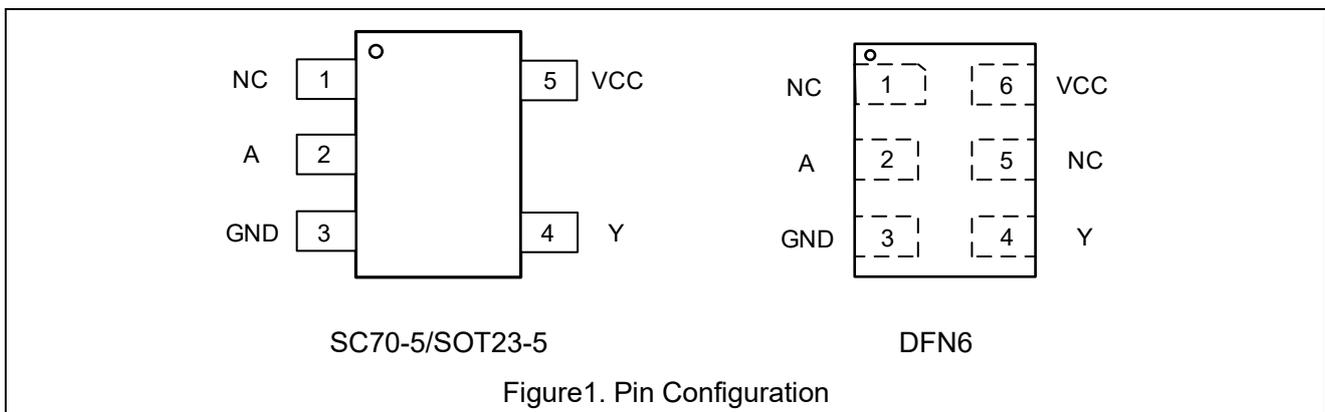


Figure1. Pin Configuration

# ET74HC1G07

## Pin Function

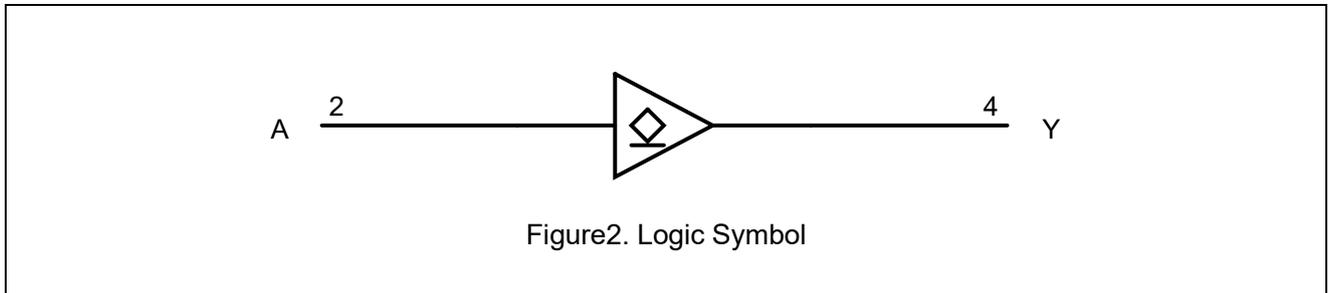
SC70-5/ SOT23-5

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	L
H	Z

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## Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V <sub>CC</sub>	DC Supply Voltage(VCC Pin)		-0.5 to 7.0	V
V <sub>I</sub>	DC Input Voltage <sup>(1)</sup>		-0.5 ≤ V <sub>I</sub> ≤ 7.0	V
V <sub>O</sub>	DC Output Voltage Output in Higher or Low State		-0.5 to V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	DC Input Diode Current, V <sub>I</sub> < GND		-50	mA
I <sub>OK</sub>	DC Output Diode Current, V <sub>O</sub> < GND, V <sub>O</sub> > V <sub>CC</sub>		±50	mA
I <sub>O</sub>	DC Output Sink Current		±50	mA
I <sub>CC</sub>	DC Supply Current Per Supply Pin		100	mA
I <sub>GND</sub>	DC Ground Current Per Supply Pin		-100	mA
R <sub>IN</sub>	A & V <sub>CC</sub> Input Impedance		≥50	MΩ
R <sub>OUT</sub>	OUT Output Impedance at High-Impedance State		≥50	MΩ
	OUT Output Impedance at Low State		100	Ω
T <sub>STG</sub>	Storage Temperature Range		-65 to 150	°C
T <sub>L</sub>	Lead Temperature, Soldering 10 Seconds		260	°C
T <sub>J</sub>	Max Junction Temperature		150	°C
V <sub>ESD</sub>	ESD Classification	Human Body Model <sup>(2)</sup>	±4000	V
		Charged Device Model <sup>(3)</sup>	±1000	
I <sub>LU</sub>	Max Latch Up Current Above V <sub>CC</sub> and GND at 125°C <sup>(4)</sup>		±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<sub>O</sub> 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 <sub>θJA</sub>	SC70-5	Thermal Characteristics, Thermal Resistance, Junction-to-Air	300	°C/W
	SOT23-5		250	
	DFN6		440	
P <sub>D</sub>	SC70-5	Power Dissipation in Still Air at 85°C	215	mW
	SOT23-5		260	
	DFN6		150	

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## Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V <sub>CC</sub>	DC Supply Voltage	2	6	V
V <sub>I</sub>	DC Input Voltage	0	V <sub>CC</sub>	V
V <sub>O</sub>	DC Output Voltage(High or Low State)	0	V <sub>CC</sub>	V
T <sub>A</sub>	Operating Temperature Range	-40	125	°C

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

## Electrical Characteristics

### DC Electrical Characteristics

Symbol	Parameter	Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			-40°C ≤ T <sub>A</sub> ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
V <sub>IH</sub>	High-Level Input Voltage		2.0	1.5			1.5		V
			4.5	3.15			3.15		
			6.0	4.2			4.2		
V <sub>IL</sub>	Low-Level Input Voltage		2.0			0.5		0.5	V
			4.5			1.35		1.35	
			6.0			1.8		1.8	
V <sub>OL</sub>	Low-Level Output Voltage	I <sub>OL</sub> = 20uA	2~6		0.0	0.1		0.1	V
		I <sub>OL</sub> = 2mA	4.5		0.15	0.33		0.4	
		I <sub>OL</sub> = 2.6mA	6.0		0.16	0.33		0.4	
I <sub>IN</sub>	Input Leakage Current	V <sub>I</sub> = 6V or GND	0~6		±0.1			±1.0	μA
I <sub>OFF</sub>	Power Off Leakage Current	V <sub>I</sub> = 6V or V <sub>O</sub> = 6V	0			1		10	μA
I <sub>CC</sub>	Quiescent Supply Current	V <sub>I</sub> = 6V or GND	6			1		10	μA

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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## AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$ ,  $R_1 = R_L = 1\text{K}\Omega$ ;

Symbol	Parameter	Condition	$V_{CC}(\text{V})$	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
$t_{PLZ}$ $t_{PZL}$	Propagation Delay (Figure3 and 4)	$C_L = 50\text{pF}$	2.0		31	121		141	ns
		$C_L = 50\text{pF}$	4.5		11	25		29	
		$C_L = 15\text{pF}$	5.0		8				
		$C_L = 50\text{pF}$	6.0		8.5	20.5		23.5	

## Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
$C_{IN}$	Input Capacitance	$V_{CC} = 6\text{V}$ , $V_I = 0\text{V}$ or $V_{CC}$	5	pF
$C_{PD}$	Power Dissipation Capacitance <sup>(5)</sup>	10MHz, $V_{CC} = 3.3\text{V}$ , $V_I = 0\text{V}$ or $V_{CC}$	26	pF
		10MHz, $V_{CC} = 6\text{V}$ , $V_I = 0\text{V}$ or $V_{CC}$	30	

**Note5.**  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).

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

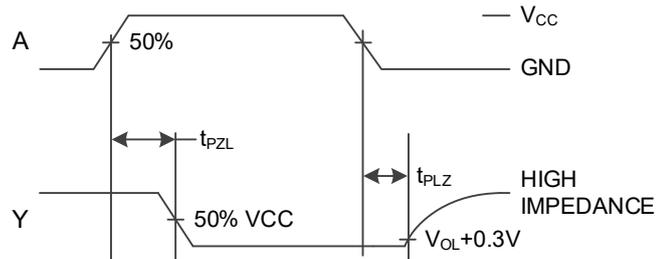


Figure3. Switching Waveforms

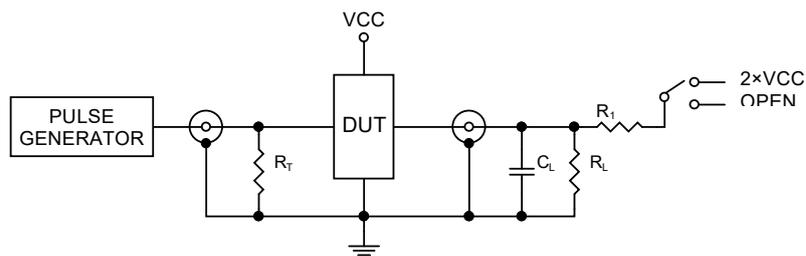
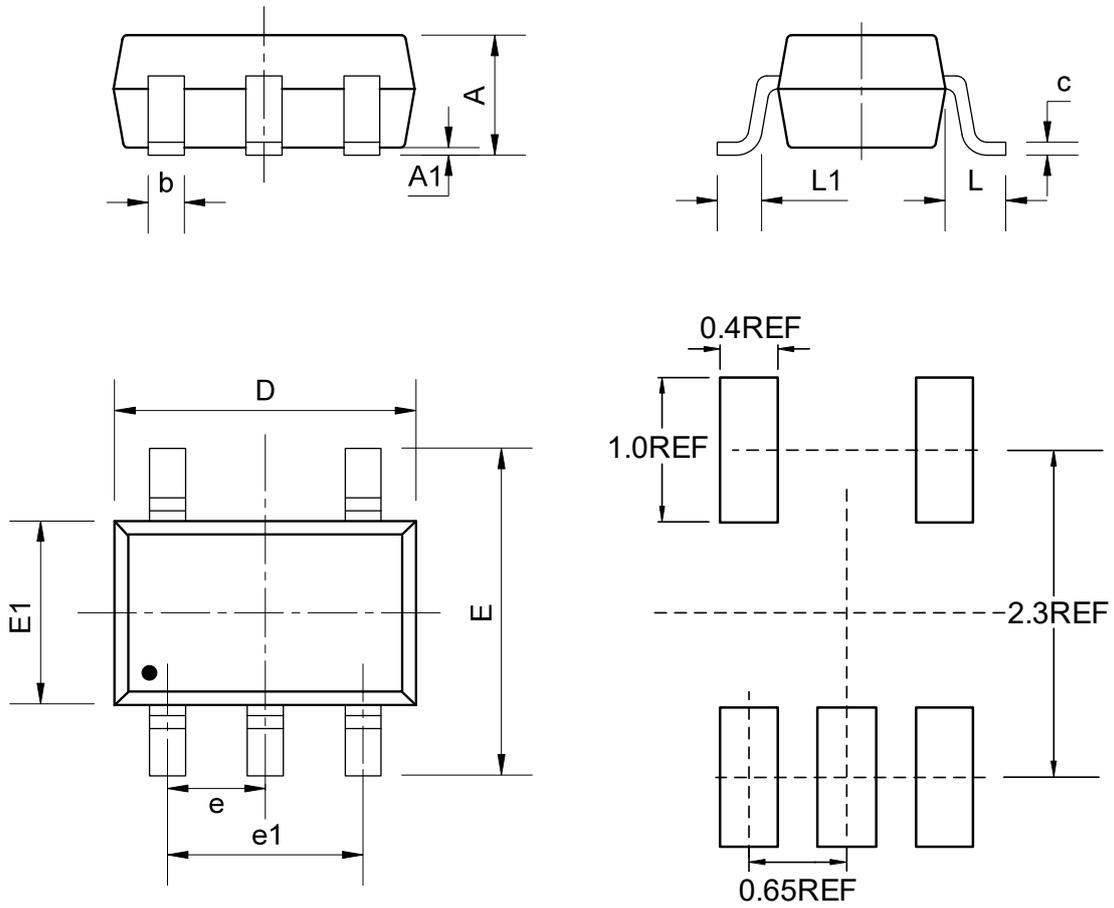


Figure4. Test Circuit  $R_T = 50\Omega(\text{Typ})$

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## Package Dimension

SC70-5 (1.3mm × 2.1mm)



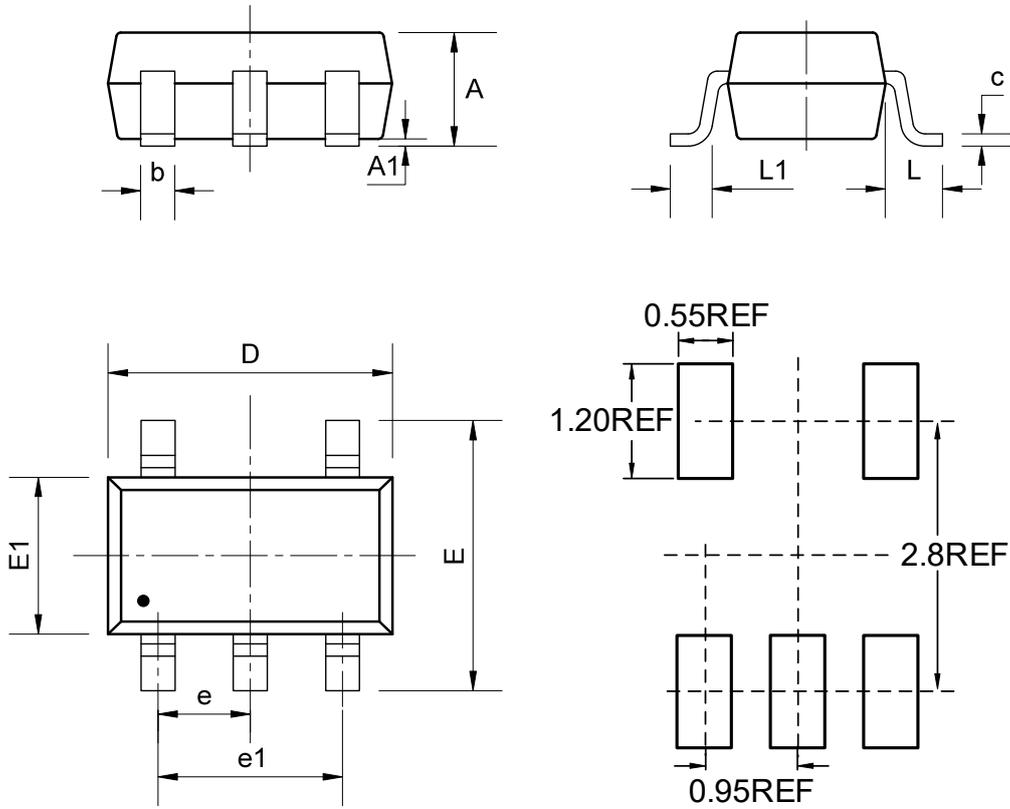
### COMMON DIMENSIONS

(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)



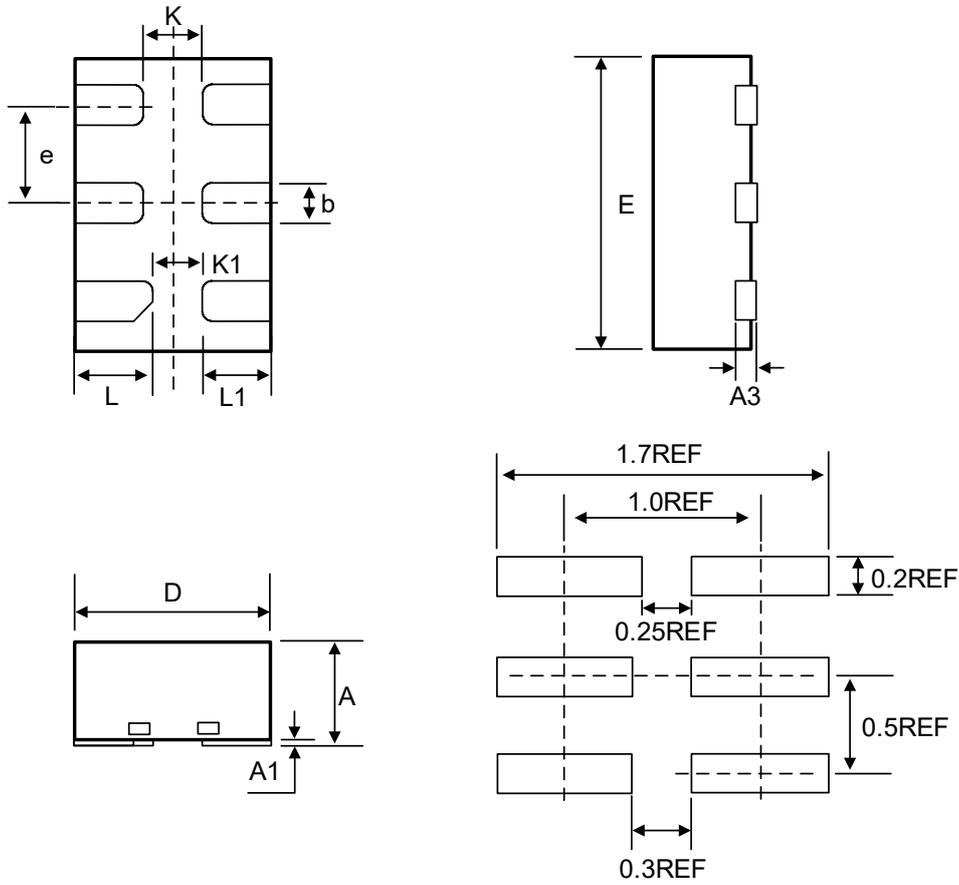
## COMMON DIMENSIONS

(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

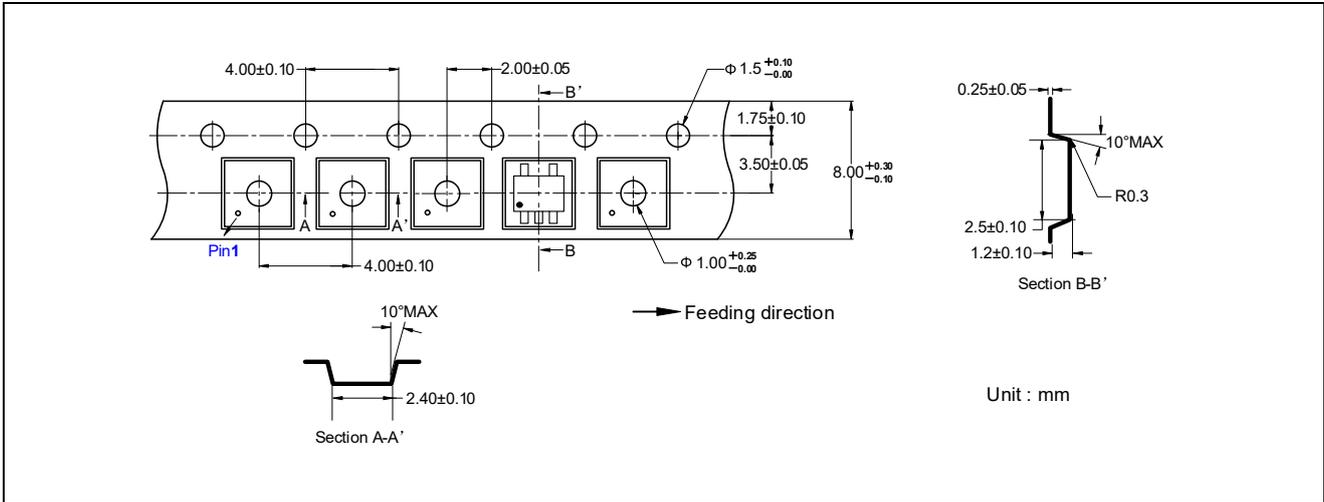
(Unit: mm)

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

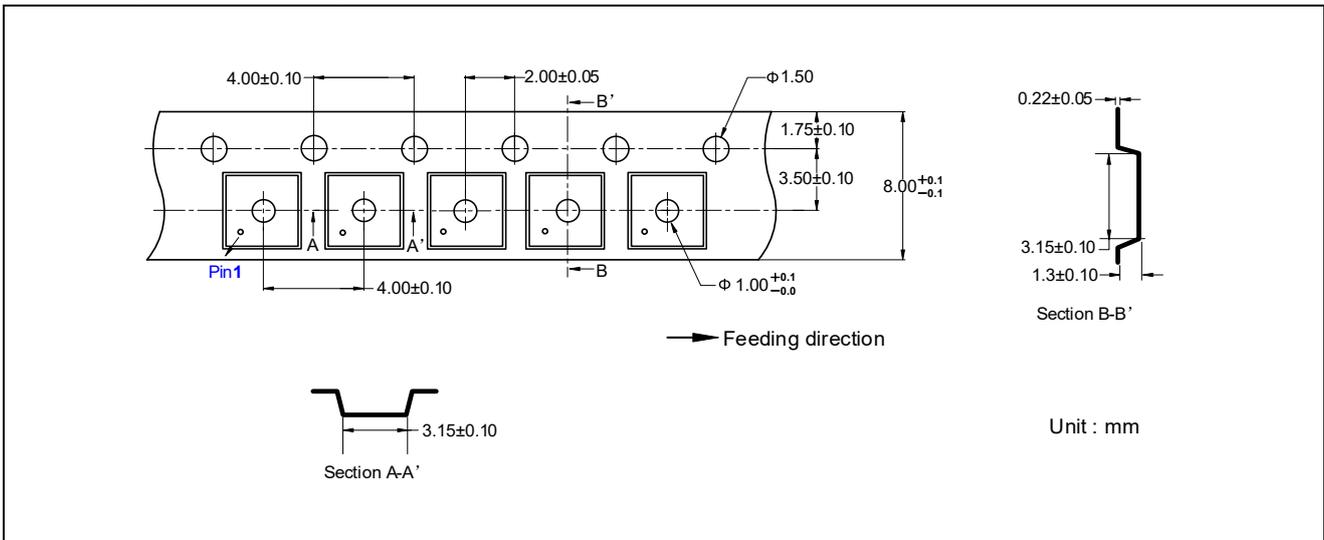
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## Tape Information

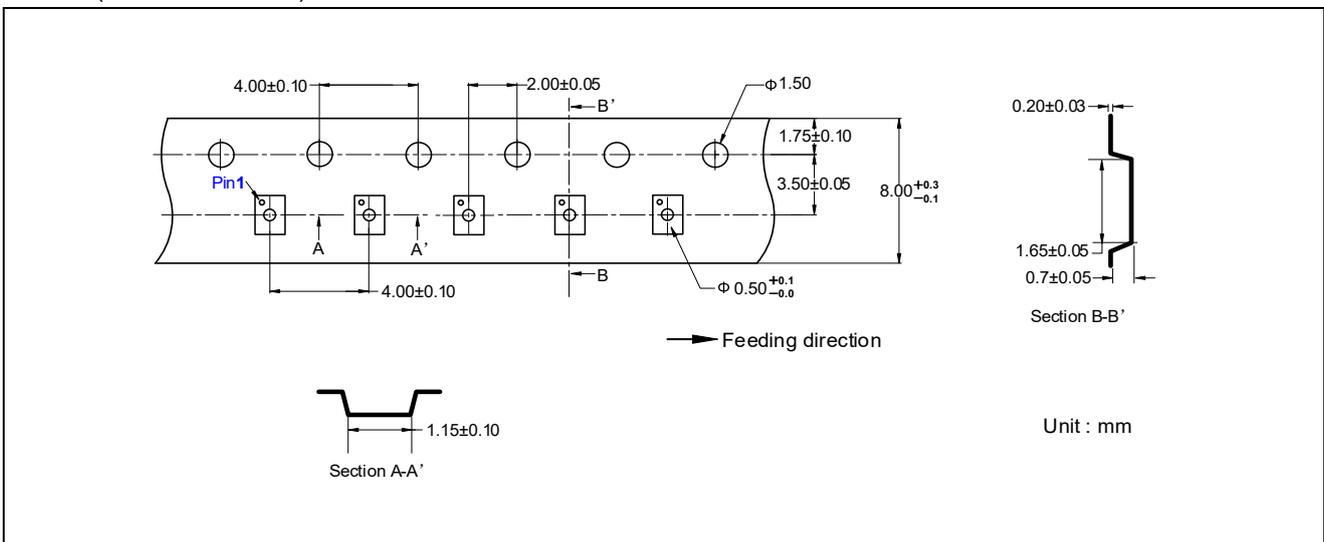
SC70-5 (1.3mm × 2.1mm)



SOT23-5 (1.6mm × 2.9mm)



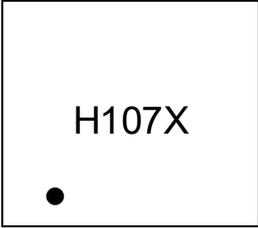
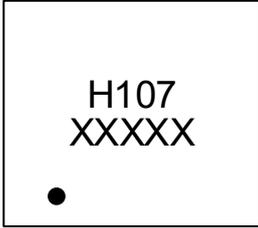
DFN6 (1.0mm × 1.5mm)



# ET74HC1G07

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## Marking Information

	
ET74HC1G07 H107 = Part Number X = Tracking Number	ET74HC1G07T H107 = Part Number XXXXX = Tracking Number

## Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2025-09-03	Official Version	Wang anran	Yang xiaoxu	Liu jiaoying