

Single Non-Inverting Buffer with Open Drain Output

General Description

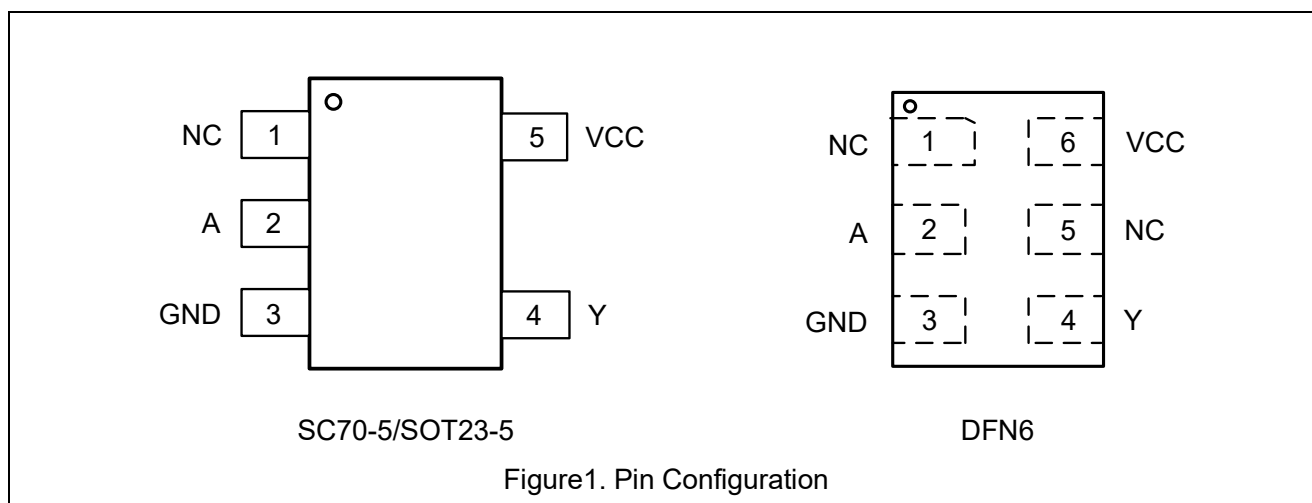
The ET74HC1G07 is a high-performance single non-inverting buffer with open drain outputs operating from a 2V to 6V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

- Designed for 2V to 6V V_{CC} Operation
- Over-voltage Tolerant Inputs Accept Voltages to 6V
- 5.2mA 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: $\pm 2000V$ 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 $\times$ 2.1mm)	Tape and Reel, 3K/Reel	1
ET74HC1G07T	SOT23-5 (1.6mm $\times$ 2.9mm)	Tape and Reel, 3K/Reel	3
ET74HC1G07Y	DFN6 (1.0mm $\times$ 1.5mm)	Tape and Reel, 3K/Reel	1

Pin Configuration



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Pin Function

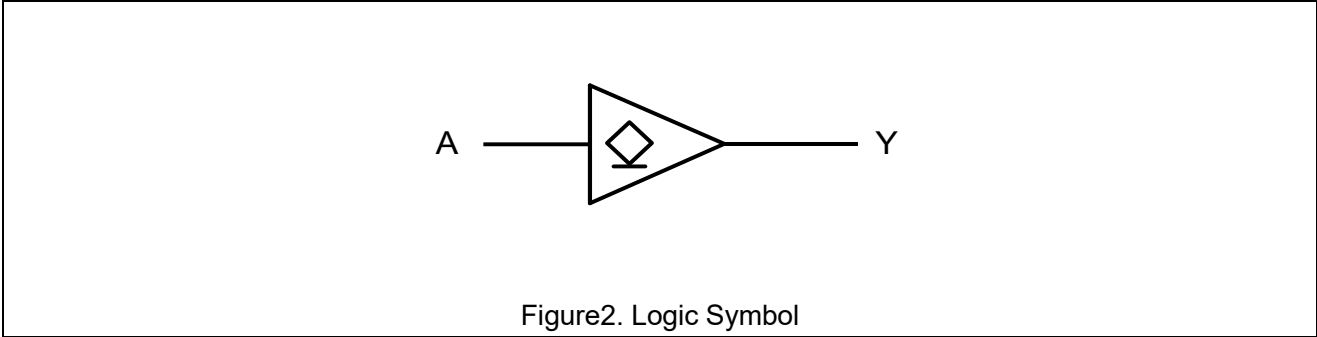
SC70-5/SOT23-5

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

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 (V _{CC} Pin)		-0.5 to 7.0	V
I _{IK}	DC Input Diode Current, V _I < GND		±20	mA
V _I	DC Input Voltage ⁽¹⁾		-0.5 ≤ V _I ≤ 7.0	V
I _{OK}	DC Output Diode Current, V _O < GND		±20	mA
V _O	DC Output Voltage Output in Higher or Low State		-0.5 to V _{CC} + 0.5	V
I _O	DC Output Sink Current, V _O = -0.5V to V _{CC} + 0.5V		25	mA
I _{CC}	DC Supply Current per Supply Pin		50	mA
I _{GND}	DC Ground Current per Supply Pin		-50	mA
T _J	Max Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-65 to 150	°C
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±2000	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 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	280	°C/W
	SOT23-5		180	
	DFN6		440	
P _D	SC70-5	Power Dissipation in Still Air at 85°C	230	mW
	SOT23-5		360	
	DFN6		150	

Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V _{CC}	DC Supply Voltage Operating		2	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	125	°C
t _r , t _f	Input Rise and Fall Time	V _{CC} = 2.0V		625	ns/V
		V _{CC} = 4.5V		139	
		V _{CC} = 6.0V		83	

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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 _{IH}	High-Level Input Voltage		2.0	1.5			1.5		V
			4.5	3.15			3.15		
			6.0	4.2			4.2		
V _{IL}	Low-Level Input Voltage		2.0			0.5		0.5	V
			4.5			1.35		1.35	
			6.0			1.8		1.8	
V _{OL}	Low-Level Output Voltage	I _{OL} = 20μA	2~6	V _{CC} - 0.1	V _{CC}		V _{CC} - 0.1		V
		I _{OL} = 4mA	4.5	4.13	4.32		3.7		
		I _{OL} = 5.2mA	6.0	5.63	5.81		5.2		
I _I	Input Leakage Current	V _I = 6V or GND	0~6		±0.1			±1.0	μA
I _{OFF}	Power Off Leakage Current	V _I = 6V or V _O = 6V	0			1		10	μA
I _{CC}	Quiescent Supply Current	V _I = 6V or GND	6			1		10	μA

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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 _{PLZ}	Propagation Delay	xA to xY; See Figure3	2.0		13	33		39	ns
			4.5		4.3	4.9		5.6	
t _{PZL}			6.0		3.9	4.4		4.9	

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C _{IN}	Input Capacitance	V _{CC} = 6V, V _I = 0 V or V _{CC}	5	pF
C _{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, V _{CC} = 3.3V, V _I = 0 V or V _{CC}	25	pF

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;

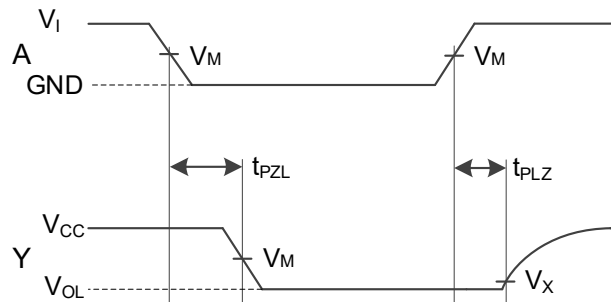
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

Test Waveform



Measurement points are given in [Table1](#).

V_{O_L} is typical output voltage levels that occur with the output load.

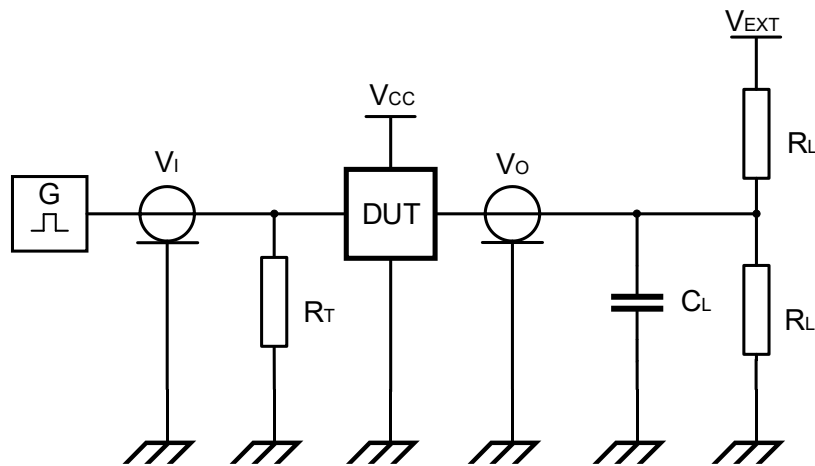
Figure3. Input xA to Output xY Propagation Delay Times

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Table1. Measurement Points

Supply Voltage	Input	Output	
V_{CC}	V_M	V_M	V_X
2V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$
4.5V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$
6V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$

Test Circuit



Measurement points are given in [Table2](#).

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.

Figure4. Test Circuit for Measuring Switching Times

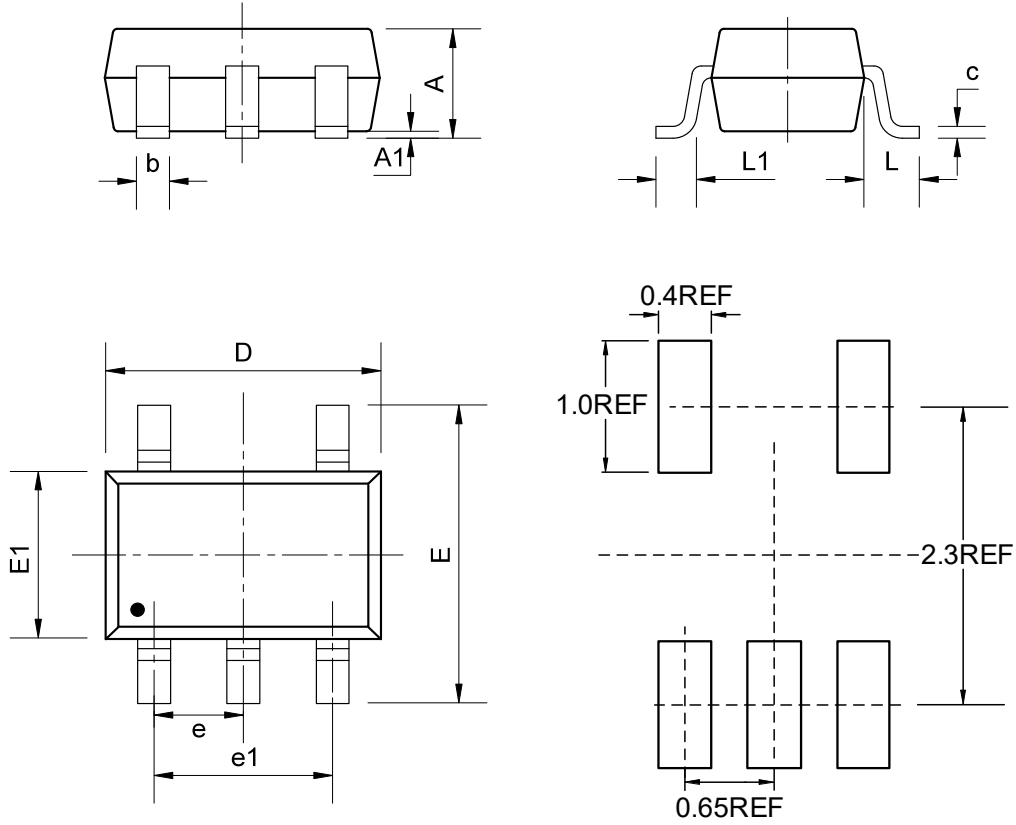
Table2. Test Data

Supply Voltage	Input		Load		V_{EXT}
V_{CC}	V_i	$t_r = t_f$	C_L	R_L	t_{PZL}, t_{PLZ}
2V	V_{CC}	3.0ns	50pF	1k Ω	$2 \times V_{CC}$
4.5V	V_{CC}	3.0ns	50pF	1k Ω	$2 \times V_{CC}$
6V	V_{CC}	3.0ns	50pF	1k Ω	$2 \times V_{CC}$

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Package Dimension

SC70-5 (1.3mm × 2.1mm)



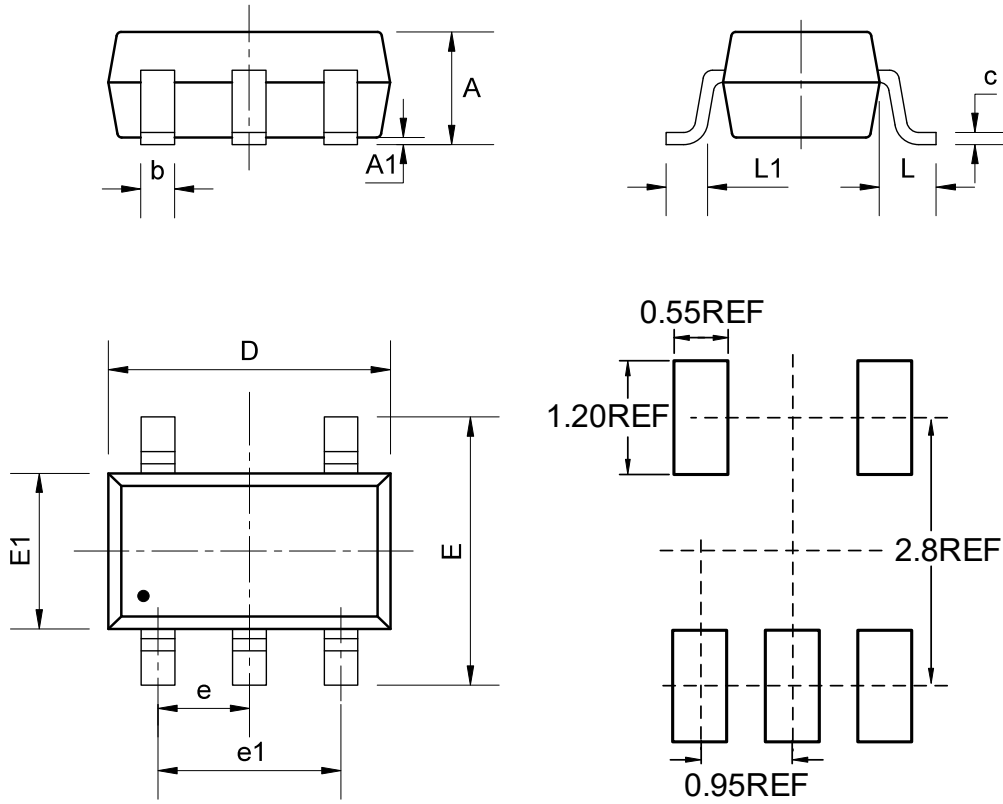
COMMON DIMENSIONS

(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)



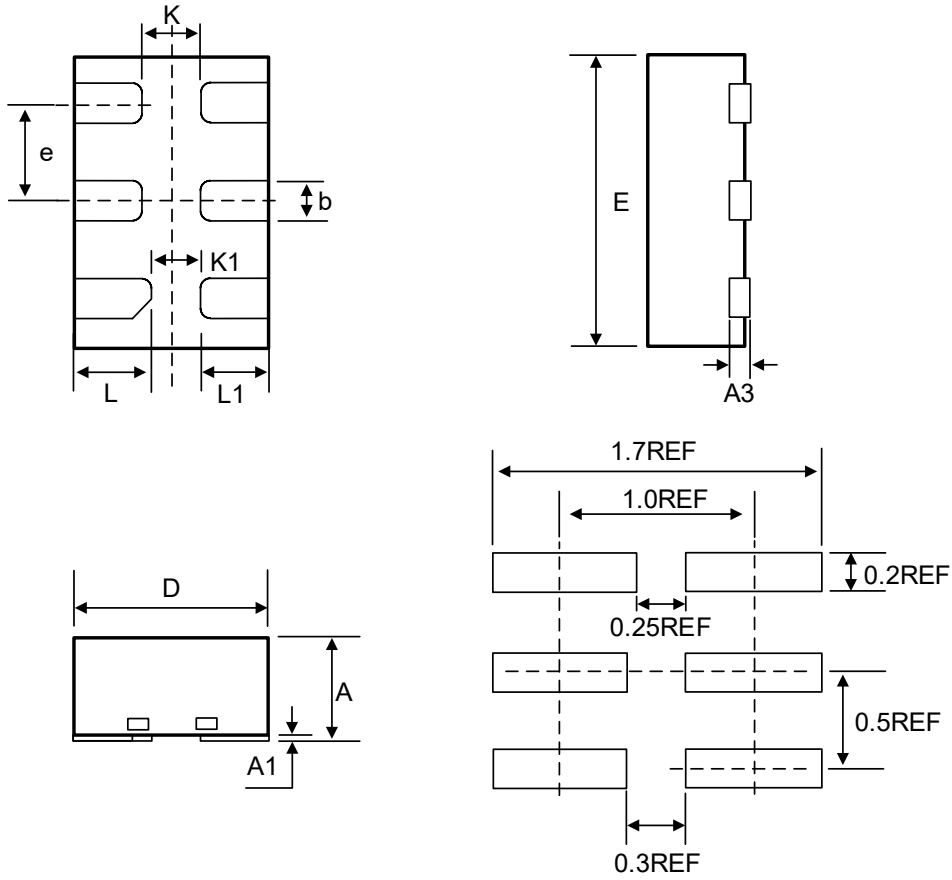
COMMON DIMENSIONS

(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)



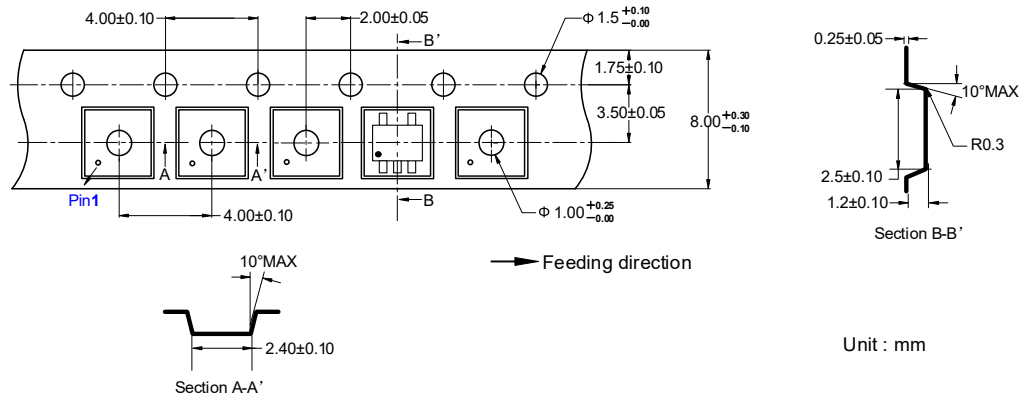
COMMON DIMENSIONS
(Unit: mm)

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

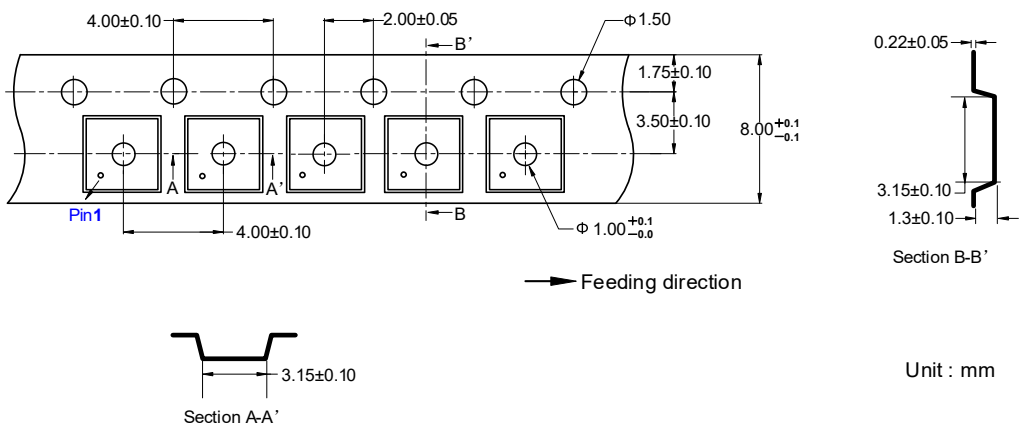
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Tape Information

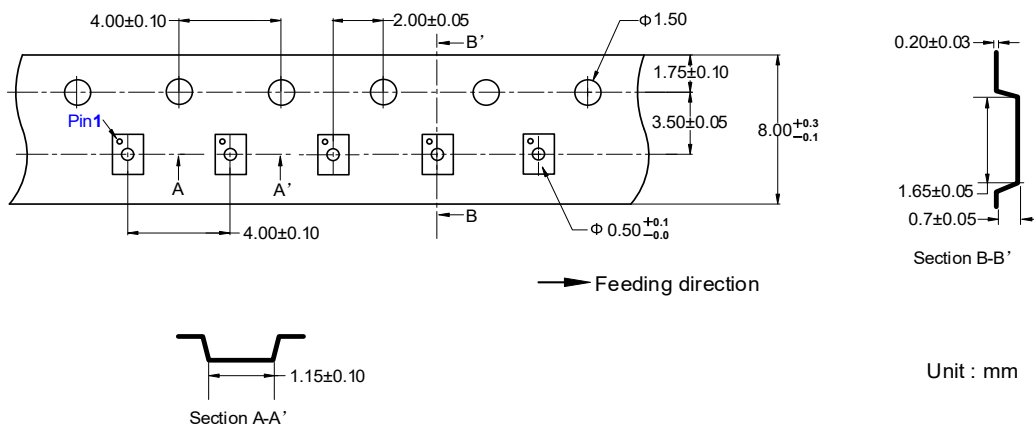
SC70-5 (1.3mm × 2.1mm)



SOT23-5 (1.6mm × 2.9mm)



DFN6 (1.0mm × 1.5mm)



ET74HC1G07

Marking Information

07XXX ● ET74HC1G07 07 = Part Number XXX = Tracking Number	C17 XXXXX ● ET74HC1G07T C17 = Part Number XXXXX = Tracking Number
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Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2025-11-14	Official Version	Xu tao	Yang xiaoxu	Liu jiaying