

Single Inverter

General Description

The ET74AHCT1G04 is an inverter operating from a 4.5V to 5.5V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

- $\pm 8\text{mA}$ Sink and Source Output Capability
- Over-Voltage Tolerant Inputs Accept Voltages to 5.5V
- Designed for 4.5V to 5.5V V_{CC} Operation
- 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
ET74AHCT1G04	SC70-5 (1.3mm $\times$ 2.1mm)	Tape and Reel, 3K/Reel	1
ET74AHCT1G04T	SOT23-5 (1.6mm $\times$ 2.9mm)	Tape and Reel, 3K/Reel	3
ET74AHCT1G04Y	DFN6 (1.0mm $\times$ 1.5mm)	Tape and Reel, 3K/Reel	1

Pin Configuration

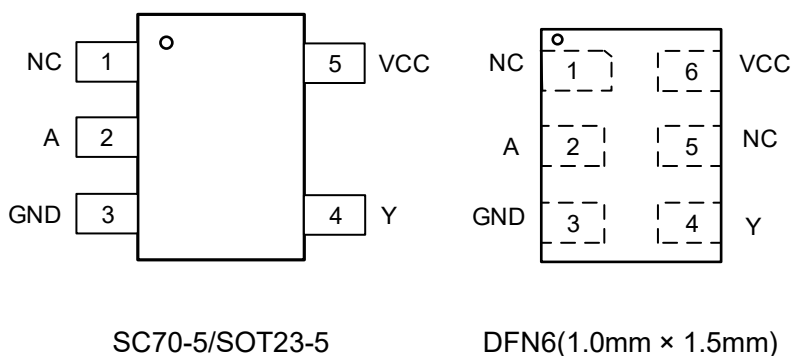


Figure1. Pin Configuration

ET74AHCT1G04

Pin Function

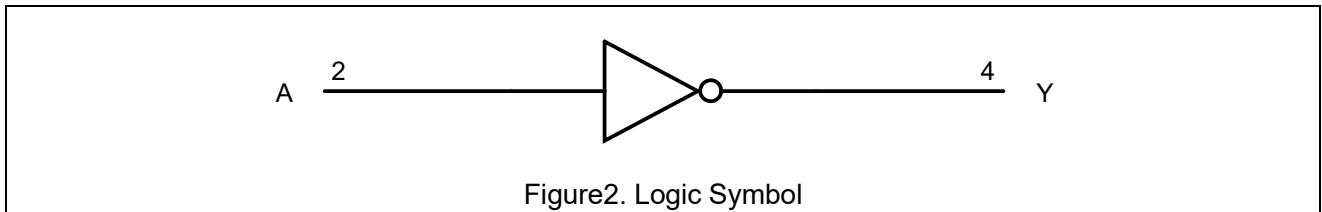
SC70-5/SOT23-5

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

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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⁾		$-0.5 \leq V_I \leq 7.0$	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 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
$R_{\theta JA}$	SC70-5	Thermal Characteristics, Thermal Resistance, Junction-to-Air	300	°C/W
	SOT23-5		250	
	DFN6 (1.0mm × 1.5mm)		440	
	DFN6 (1.0mm × 1.0mm)		440	
P_D	SC70-5	Power Dissipation in Still Air at 85°C	215	mW
	SOT23-5		260	
	DFN6 (1.0mm × 1.5mm)		150	
	DFN6 (1.0mm × 1.0mm)		150	

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Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage	4.5	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

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		4.5	2			2		V
			5.5	2			2		
V _{IL}	Low-Level Input Voltage		4.5			0.8		0.8	V
			5.5			0.8		0.8	
V _{OH}	High-Level Output Voltage	I _{OH} = -50uA	4.5	4.4	4.5		4.4		V
		I _{OH} = -8mA		3.94			3.8		
V _{OL}	Low-Level Output Voltage	I _{OL} = 50uA	4.5			0.1		0.1	V
		I _{OL} = 8mA				0.36		0.44	
I _I	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			1		10	uA

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AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$; Over recommended operating free-air temperature range, $V_{CC} = 5\text{V} \pm 0.5\text{V}$ (unless otherwise noted)

Symbol	Parameter	Condition	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		Unit
			Min	Typ	Max	Min	Max	
t_{PLH}	Propagation Delay	$C_L = 15\text{pF}$		5	8	1.0	10	ns
t_{PHL}		$C_L = 50\text{pF}$		6.5	10	1.0	12	ns

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C_{IN}	Input Capacitance	$V_{CC} = 5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	5	pF
C_{PD}	Power Dissipation Capacitance (5)	10MHz, $V_{CC} = 5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	28	pF

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

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

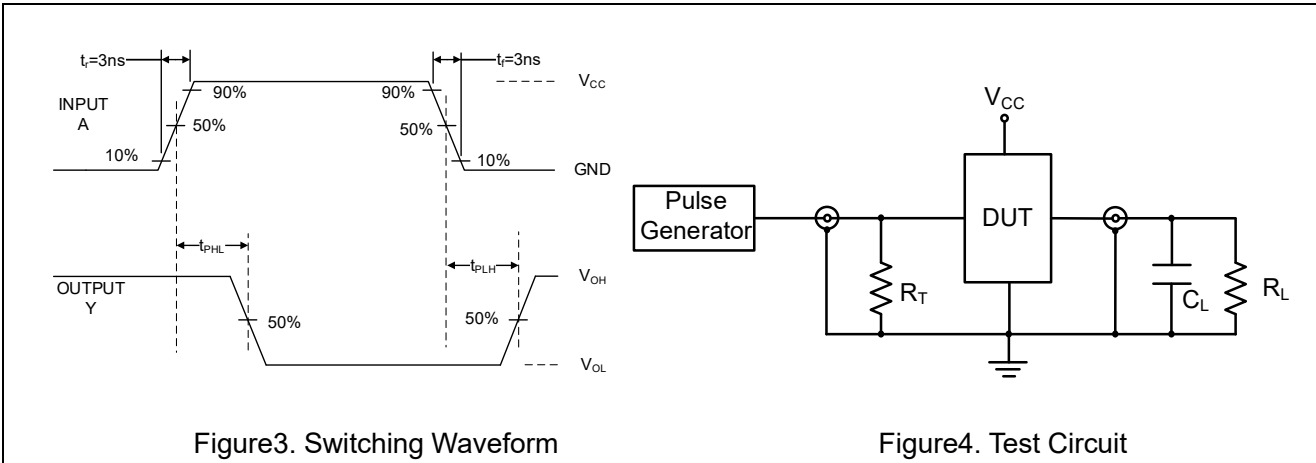
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

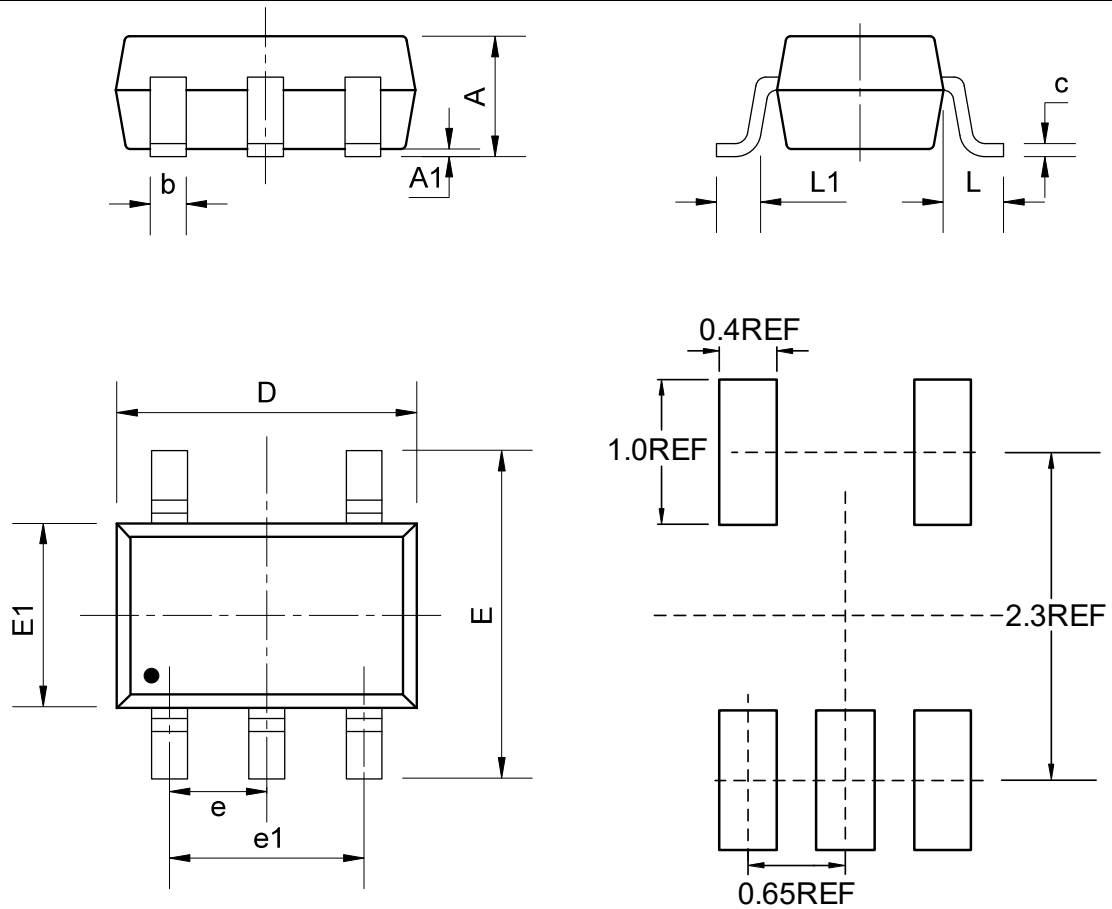
AC Test Circuit



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Package Dimension

SC70-5 (1.3mm × 2.1mm)



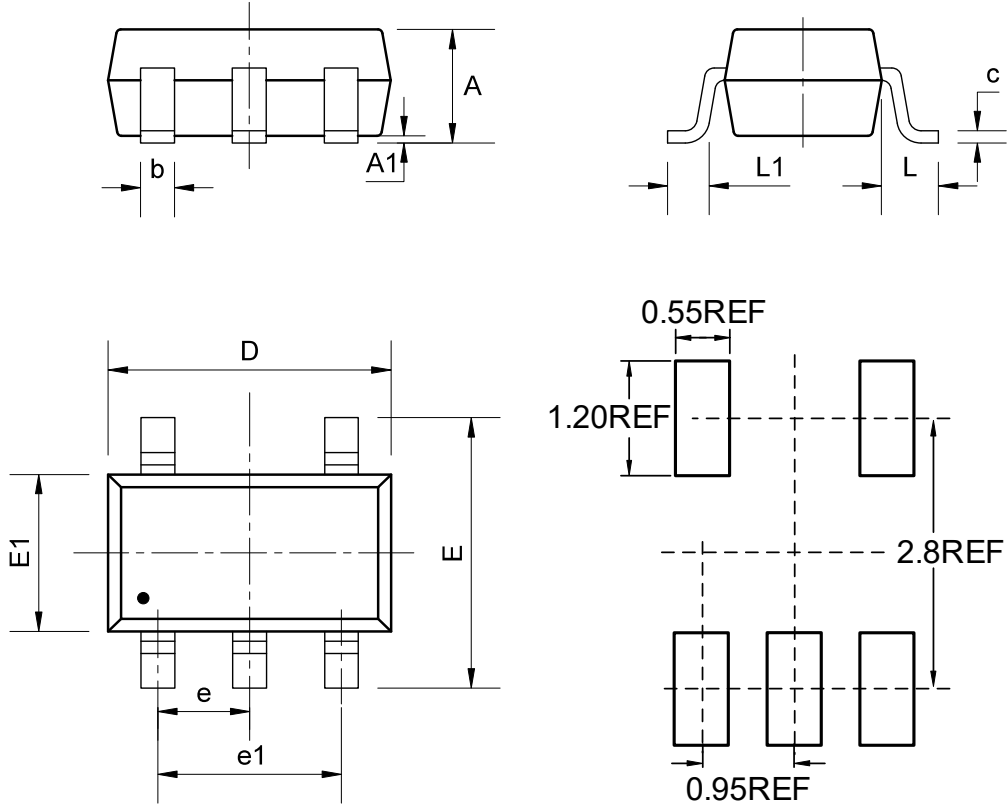
COMMON DIMENSIONS

(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)



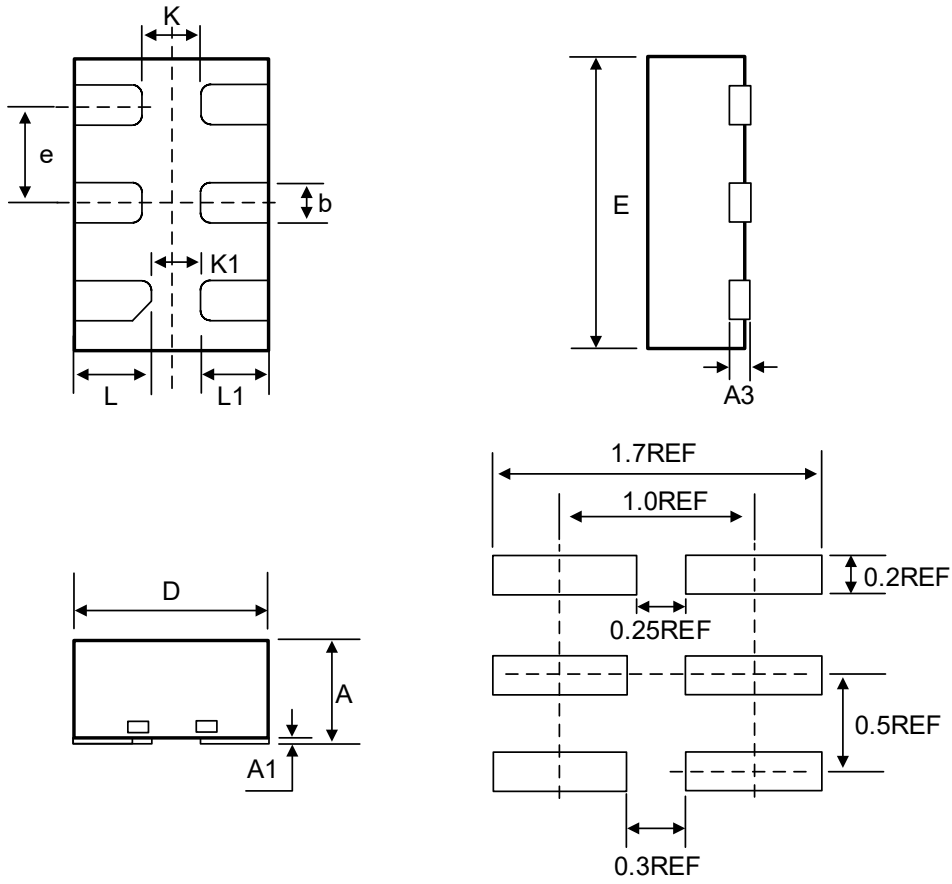
COMMON DIMENSIONS

(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

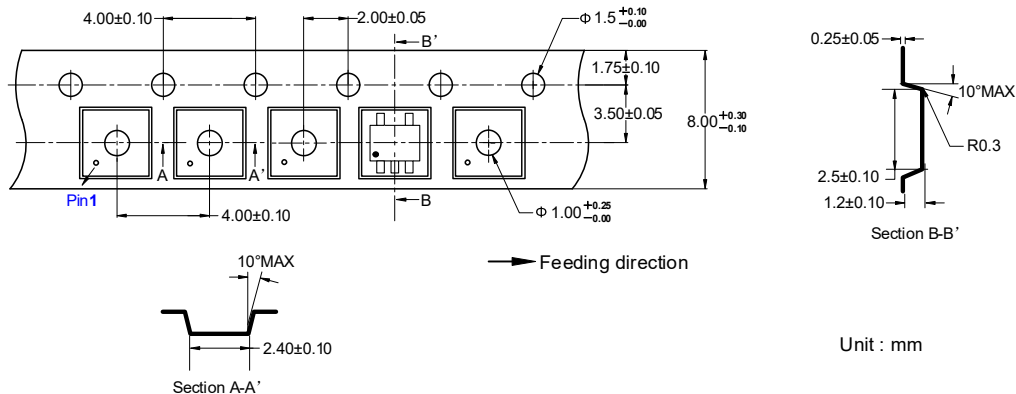
(Unit: mm)

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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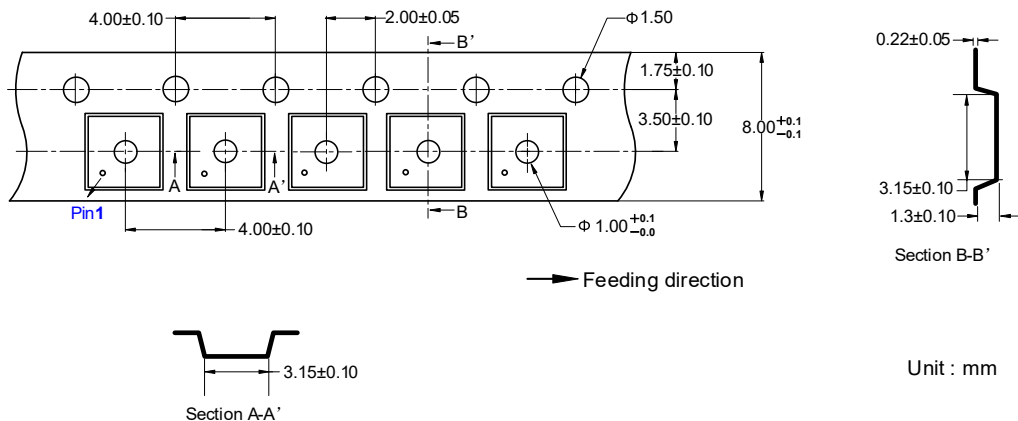
Tape Information

SC70-5 (1.3mm × 2.1mm)



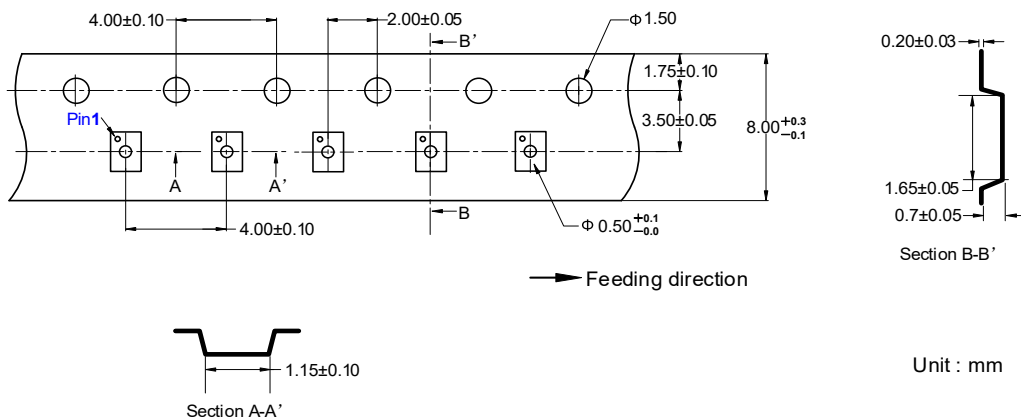
Unit : mm

SOT23-5 (1.6mm × 2.9mm)



Unit : mm

DFN6 (1.0mm × 1.5mm)



Unit : mm

ET74AHCT1G04

Marking Information

T104X ET74AHCT1G04 T104 = Part Number X = Tracking Number	T104 XXXXX ET74AHCT1G04T T104 = 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	2025-10-28	Official Version	Wang anran	Yang xiaoxu	Liu jiaying