

Dual Inverter Gate

General Description

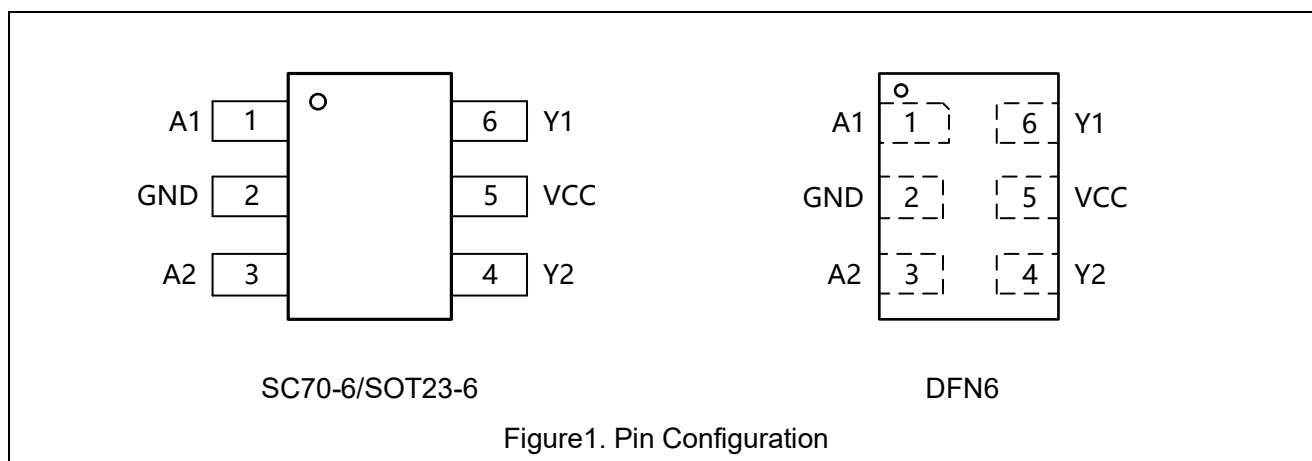
The ET74AHCT2G04 is a high-performance dual inverter operating from a 4.5V to 5.5V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

- Designed for 4.5V to 5.5V V_{CC} Operation
- Over-voltage Tolerant Inputs Accept Voltages to 5.5V
- $\pm 8\text{mA}$ 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: $\pm 4000\text{V}$ Pass (JEDEC JS-001)
 - CDM: $\pm 1000\text{V}$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 100\text{mA}$ per JEDEC JESD78F
- Device Information Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74AHCT2G04	SC70-6 (1.3mm × 2.1mm)	Tape and Reel, 3K/Reel	1
ET74AHCT2G04T	SOT23-6 (1.6mm × 2.9mm)	Tape and Reel, 3K/Reel	3
ET74AHCT2G04Y	DFN6 (1.0mm × 1.5mm)	Tape and Reel, 3K/Reel	1

Pin Configuration



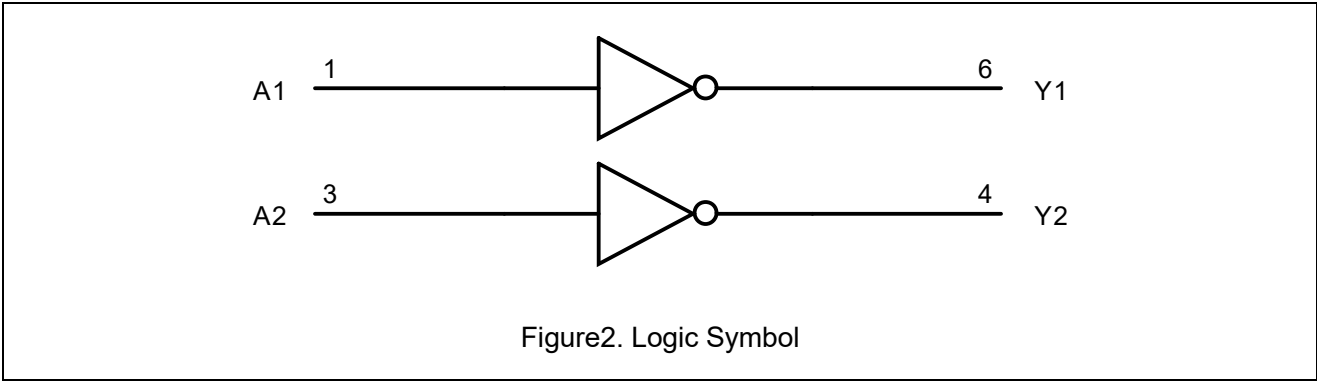
ET74AHCT2G04

Pin Function

SC70-6/ SOT23-6/ DFN6

Pin No.	Pin Name	Function
1	A1	Input CH1
2	GND	Ground
3	A2	Input CH2
4	Y2	Output CH2
5	VCC	Supply Voltage
6	Y1	Output CH1

Block Diagram



Function Table

Input A	Output Y
L	H
H	L

ET74AHCT2G04

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 _{θJA}	SC70-6	Thermal Characteristics, Thermal Resistance, Junction-to-Air	280	°C/W
	SOT23-6		180	
	DFN6		440	
P _D	SC70-6	Power Dissipation in Still Air at 85°C	230	mW
	SOT23-6		360	
	DFN6		150	

ET74AHCT2G04

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	$V_{CC}(V)$	$T_A = 25^{\circ}C$			$-40^{\circ}C \leq T_A \leq 125^{\circ}C$		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	$I_{OH} = -50\mu A$	4.5	4.4	4.5		4.4		V
		$I_{OH} = -8mA$		3.94			3.8		
V_{OL}	Low-Level Output Voltage	$I_{OL} = 50\mu A$	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	μA
I_{OFF}	Power Off Leakage Current	$V_I = 5.5V$ or $V_O = 5.5V$	0			1		10	μA
I_{CC}	Quiescent Supply Current	$V_I = 5.5V$ or GND	5.5			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.

ET74AHCT2G04

AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$; $R_L = 500\Omega$

Over recommended operating free-air temperature range, $V_{CC} = 5V \pm 0.5V$ (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	$C_L = 15\text{pF}$		6	9	1.0	11	ns
t_{PHL}		$C_L = 50\text{pF}$		7.5	11	1.0	13	ns

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C_{IN}	Input Capacitance	$V_{CC} = 5V$, $V_I = 0V$ or V_{CC}	3.5	pF
C_{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, $V_{CC} = 5V$, $V_I = 0V$ or V_{CC}	28	pF

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

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

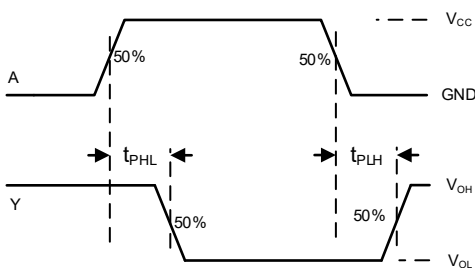


Figure3. Switching Waveform

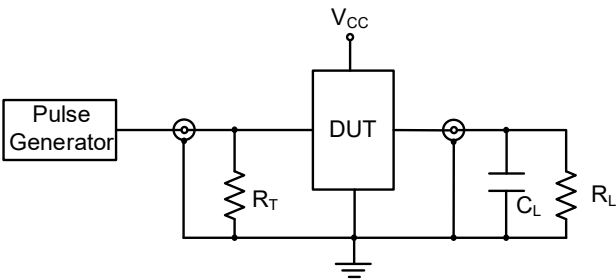
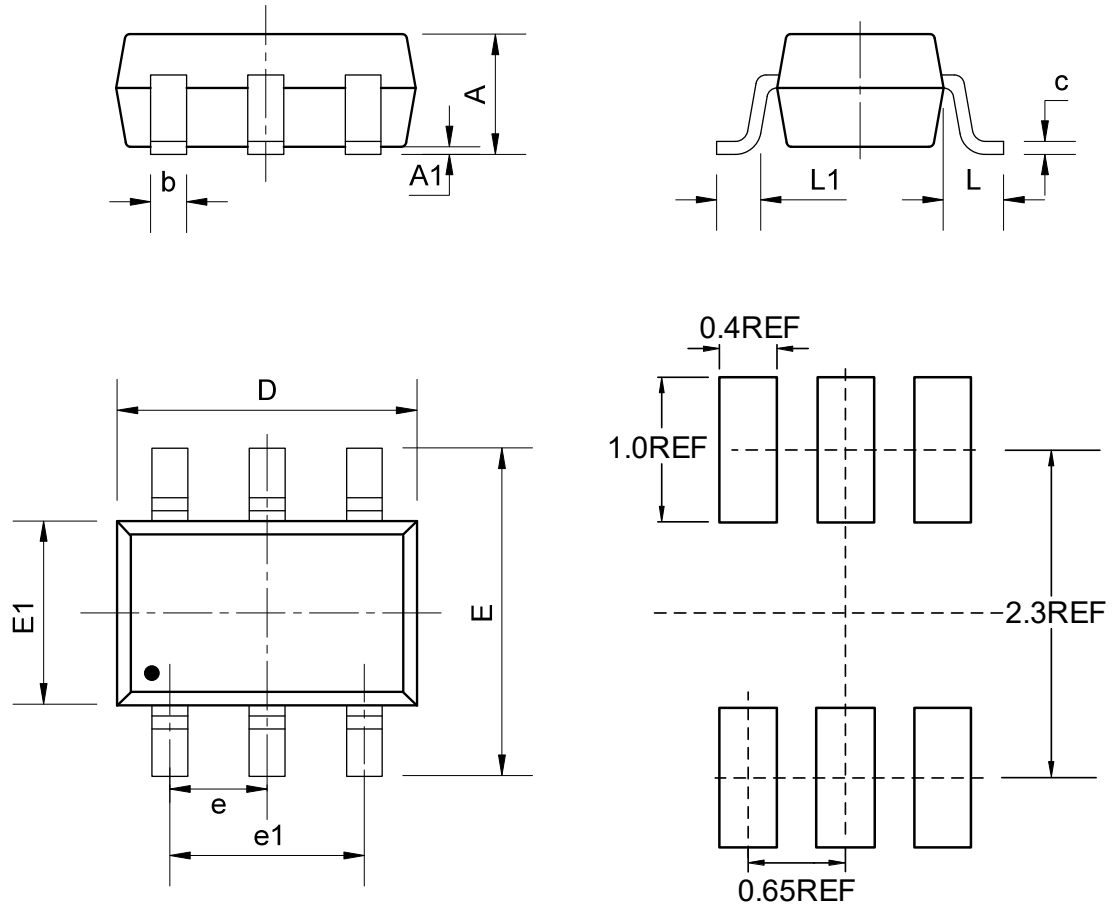


Figure4. Test Circuit

ET74AHCT2G04

Package Dimension

SC70-6 (1.3mm × 2.1mm)



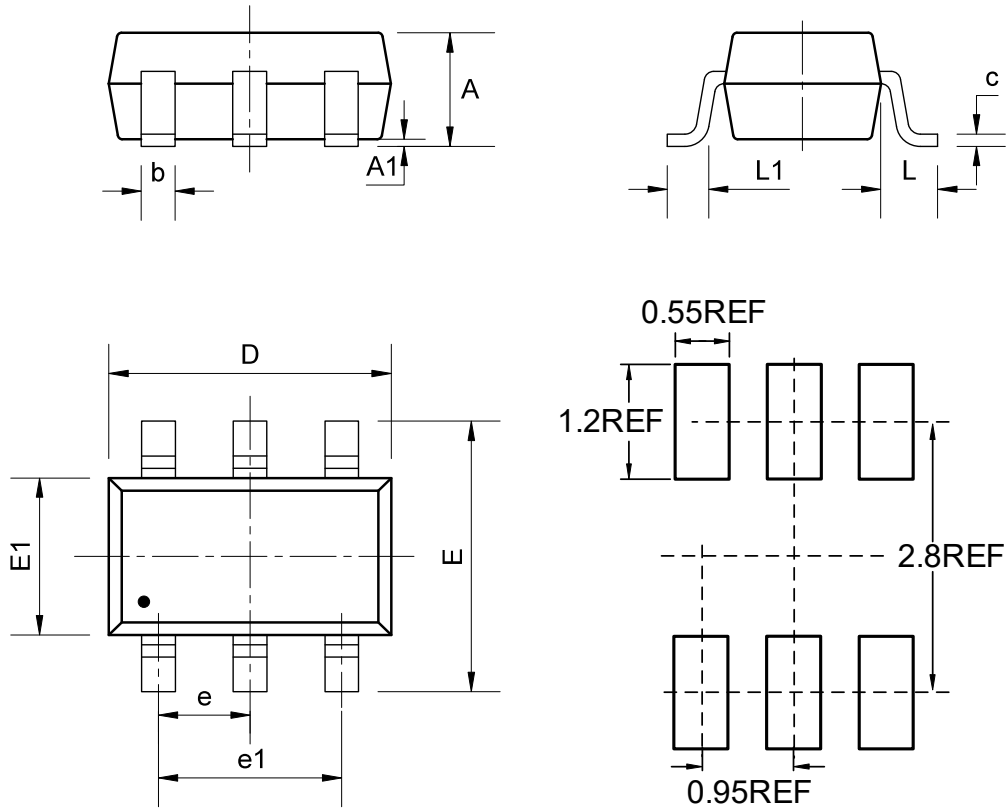
COMMON DIMENSIONS

(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		

ET74AHCT2G04

SOT23-6 (1.6mm × 2.9mm)



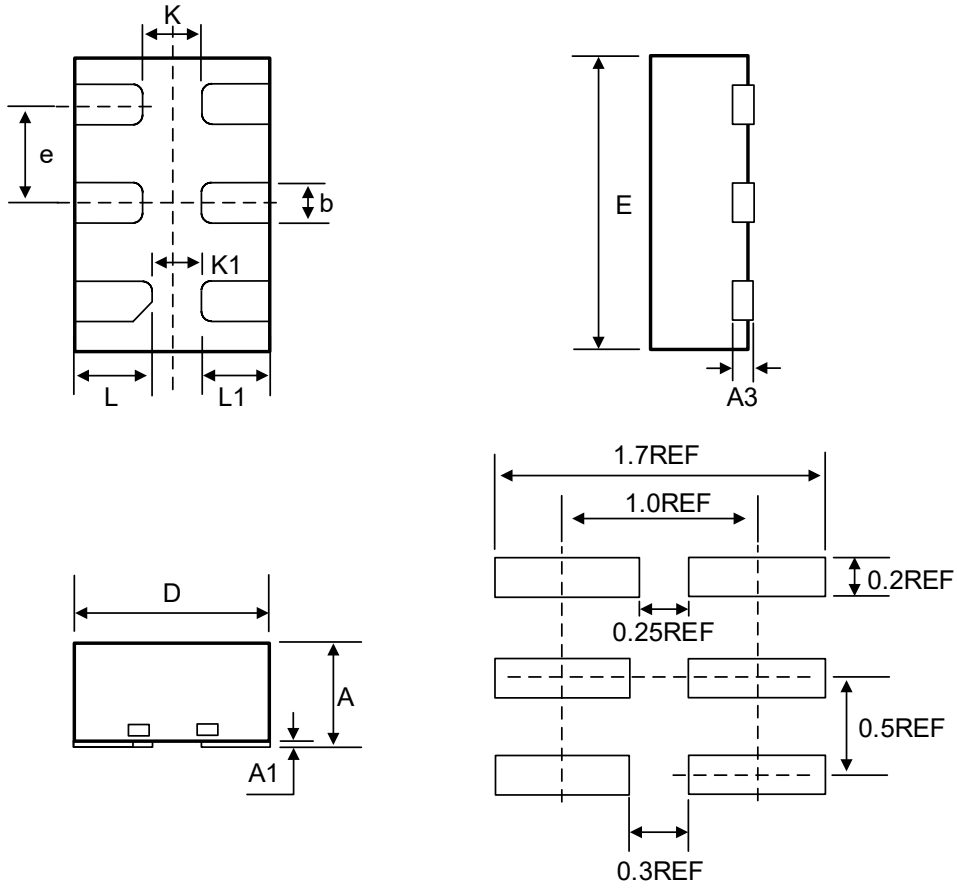
COMMON DIMENSIONS

(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

ET74AHCT2G04

DFN6 (1.0mm × 1.5mm)



COMMON DIMENSIONS

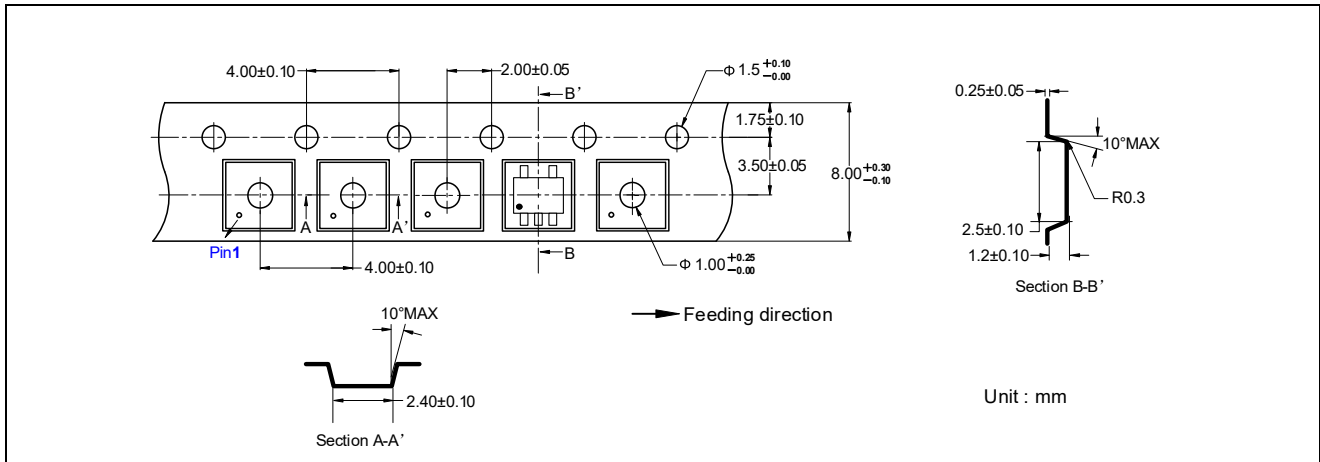
(Unit: mm)

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

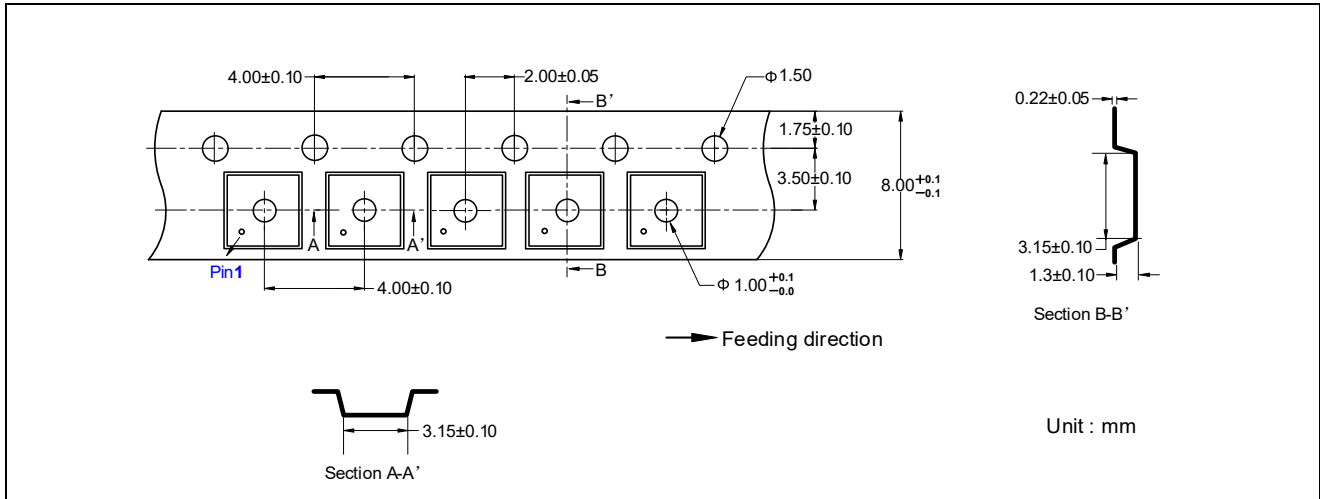
ET74AHCT2G04

Tape Information

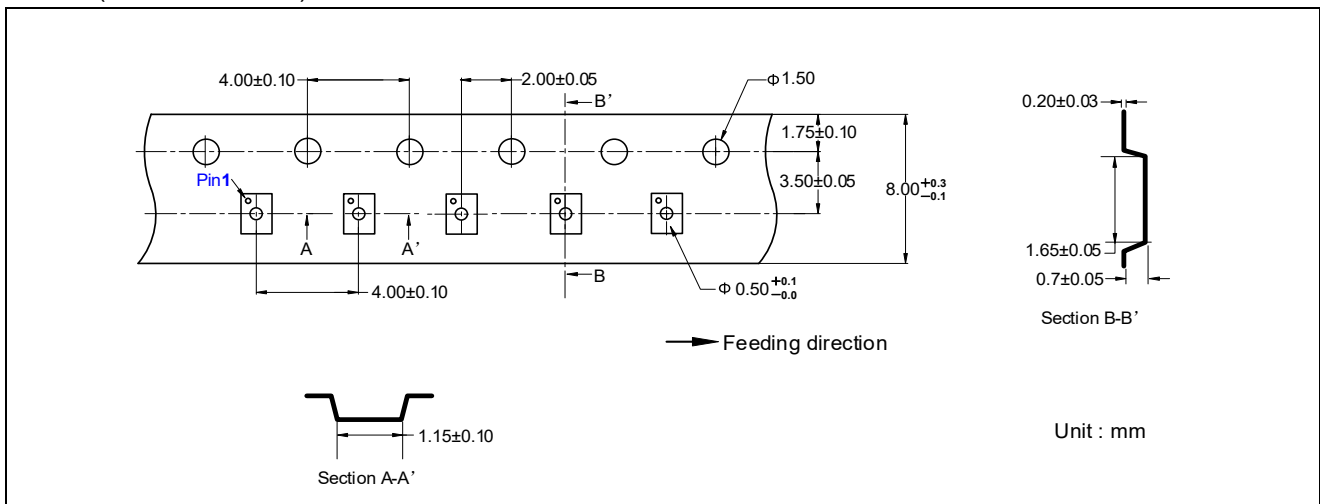
SC70-6 (1.3mm × 2.1mm)



SOT23-6 (1.6mm × 2.9mm)



DFN6 (1.0mm × 1.5mm)



ET74AHCT2G04

Marking Information

T204X ● ET74AHCT2G04 T204 = Part Number X = Tracking Number	T204 XXXXX ● ET74AHCT2G04T T204 = Part 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	2026-01-05	Update Format, Add Tape and Marking	Xu tao	Yang xiaoxu	Liu jiaying