

Single 2-Input AND Gate

General Description

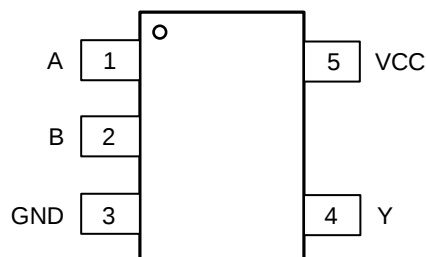
The ET74AHCT1G08 device is a single 2-input positive-AND gate. The device performs the Boolean function $Y = A \cdot B$ or $Y = \overline{A + B}$ in positive logic. Low I_{CC} current allows this device to be used in power-sensitive or battery-powered applications.

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
- 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
ET74AHCT1G08	SC70-5 (1.3mm $\times$ 2.1mm)	Tape and Reel, 3K/Reel	3
ET74AHCT1G08T	SOT23-5 (1.6mm $\times$ 2.9mm)	Tape and Reel, 3K/Reel	3

Pin Configuration



SC70-5/SOT23-5

Figure1. Pin Configuration

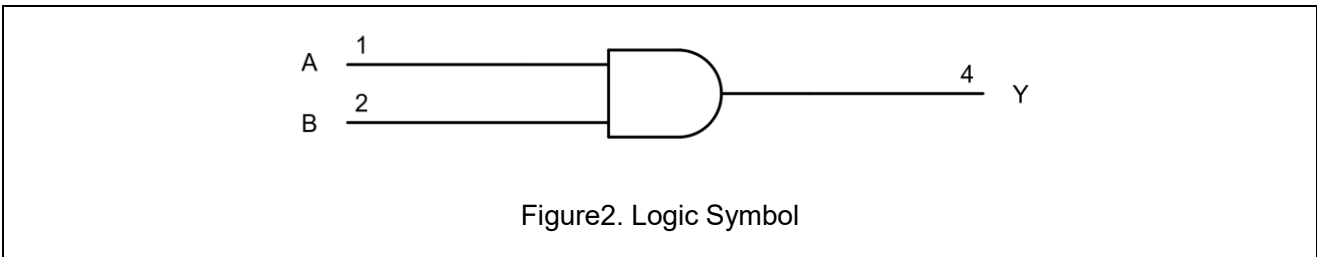
ET74AHCT1G08

Pin Function

SC70-5/ SOT23-5

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

Block Diagram



Function Table

Input		Output
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

ET74AHCT1G08

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 ≤ V _I ≤ 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}	SC70-5	Thermal Characteristics, Thermal Resistance, Junction-to-Air	300	°C/W
	SOT23-5		250	
P _D	SC70-5	Power Dissipation in Still Air at 85°C	215	
	SOT23-5		260	

ET74AHCT1G08

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	4.5	5.5	V
V_I	Input Voltage	0	V_{CC}	V
V_O	Output Voltage	0	V_{CC}	V
I_{OH}	High-level Output Current		-8	mA
I_{OL}	Low-level Output Current		8	mA
$\Delta t/\Delta V$	Input Transition Rise and Fall Rate		20	ns/V
T_A	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_{CC} (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	
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	$I_{OH} = -50\mu\text{A}$	4.5	4.4	4.5		4.4		V
		$I_{OH} = -8\text{mA}$	4.5	3.94			3.8		
V_{OL}	Low-Level Output Voltage	$I_{OL} = 50\mu\text{A}$	4.5			0.1		0.1	V
		$I_{OL} = 8\text{mA}$	4.5			0.36		0.44	
I_I	Input Current	$V_I = 5.5\text{V}$ or GND	0~5.5			± 0.1		± 1	μA
I_{CC}	Supply Current	$V_I = V_{CC}$ or GND, $I_O = 0\text{mA}$	5.5			1.0		10	μA
$\Delta I_{CC}^{(5)}$	Change In Supply Current	One Input at 3.4V, Other Inputs at V_{CC} or GND	5.5			1.35		1.5	mA
C_{IN}	Input Capacitance	$V_I = V_{CC}$ or GND	5		4	10			pF

Note5: This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0V or V_{CC} .

ET74AHCT1G08

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) (see [Figure3](#))

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	$C_L = 15\text{pF}$		7	10	1.0	12	ns
t_{PHL}		$C_L = 50\text{pF}$		8.5	12	1.0	14	ns

Capacitance Characteristics

$V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$

Symbol	Parameter	Condition	Typ	Unit
C_{PD}	Power Dissipation Capacitance ⁽⁶⁾	No Load, $f = 1\text{MHz}$	18	pF

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

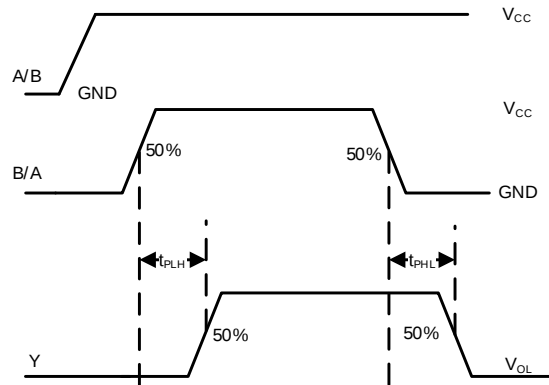


Figure3. Switching Waveform

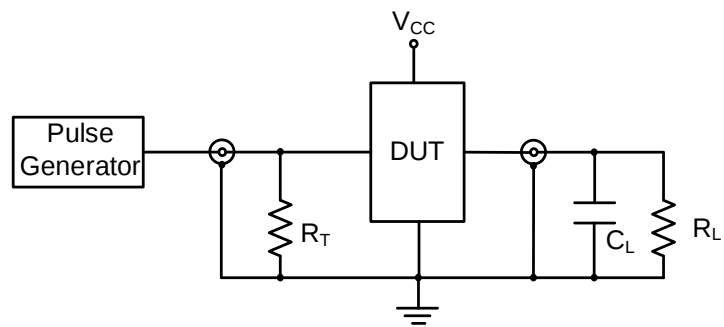
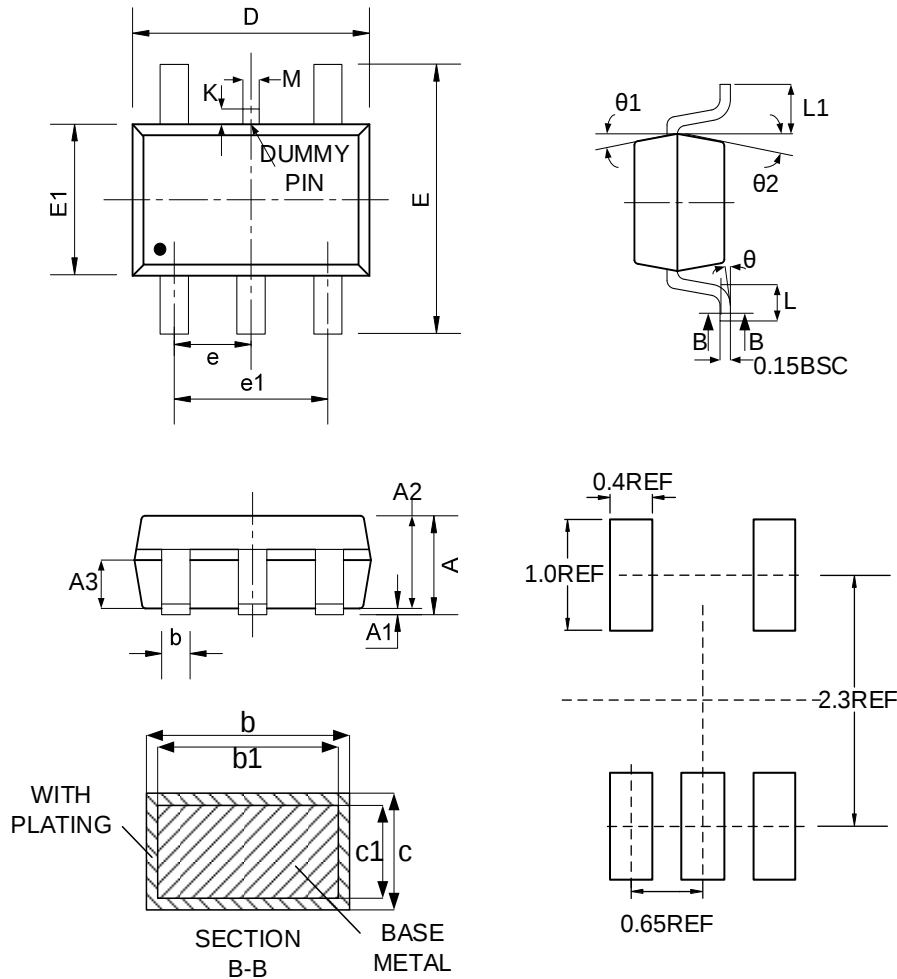


Figure4. Test Circuit

ET74AHCT1G08

Package Dimension

SC70-5 (1.3mm × 2.1mm)



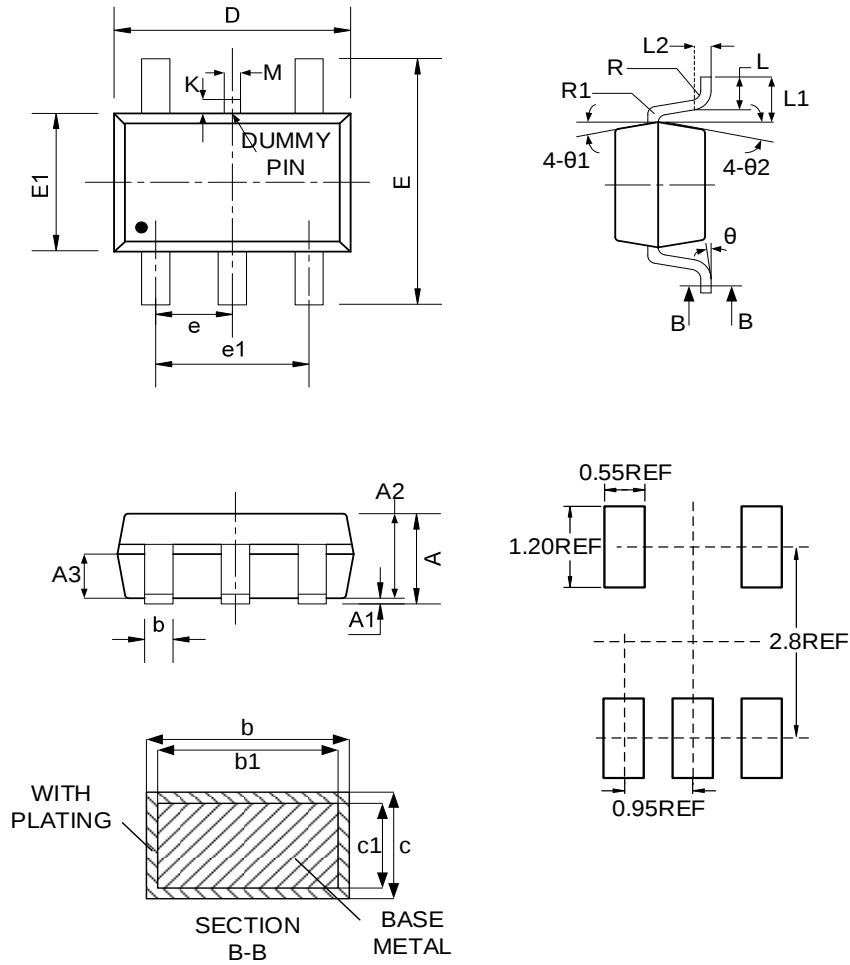
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	0.80	-	1.10	e	0.60	0.65	0.70
A1	0.00	-	0.10	e1	1.20	1.30	1.40
A2	0.80	0.90	1.00	L	0.26	0.33	0.46
A3	0.40	0.50	0.60	E1	1.21	1.26	1.31
b	0.17	-	0.30	L1	0.52REF		
b1	0.17	0.22	0.25	M	0.10	0.15	0.20
c	0.12	-	0.20	K	0.00	-	0.20
c1	0.12	0.15	0.16	θ	0°	-	8°
D	2.02	2.07	2.12	θ_1	10°	12°	14°
E	2.20	2.30	2.40	θ_2	10°	12°	14°

ET74AHCT1G08

SOT23-5 (1.6mm × 2.9mm)



COMMON DIMENSIONS

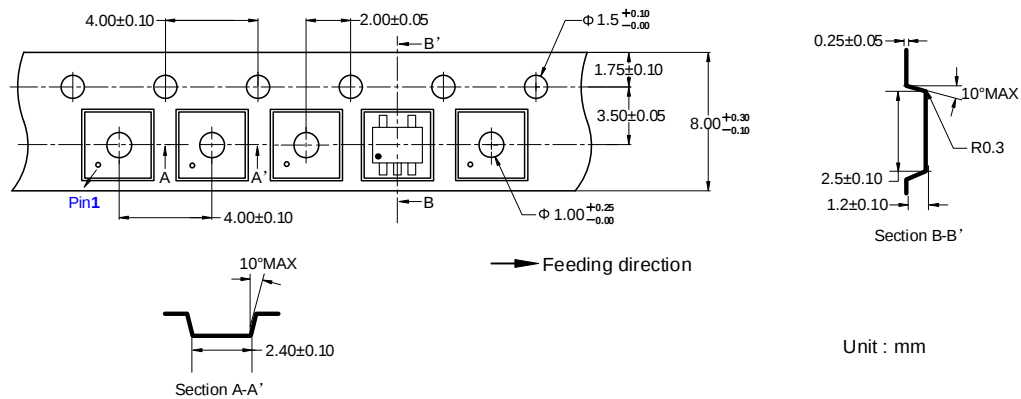
(Unit: mm)

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	-	-	1.25	K	0	-	0.20
A1	0.00	-	0.15	M	0.10	0.15	0.20
A2	1.00	1.10	1.20	L	0.30	0.40	0.60
A3	0.60	0.65	0.70	L1	0.59REF		
b	0.34	-	0.45	L2	0.25BSC		
b1	0.34	0.38	0.41	R	0.05	-	0.20
c	0.12	-	0.20	R1	0.05	-	0.20
c1	0.12	0.15	0.16	θ	0°	-	8°
D	2.826	2.926	3.026	θ1	8°	10°	12°
E	2.60	2.80	3.00	θ2	10°	12°	14°
E1	1.526	1.626	1.70				
e	0.90	0.95	1.00				
e1	1.80	1.90	2.00				

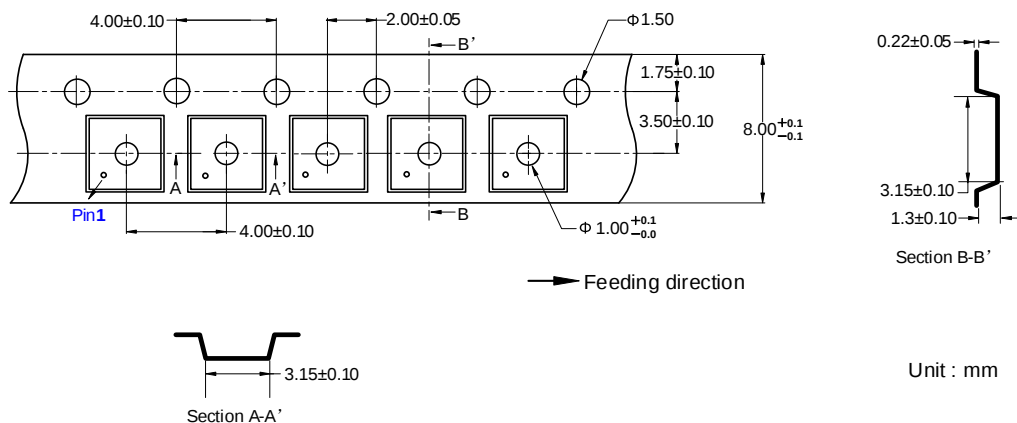
ET74AHCT1G08

Tape Information

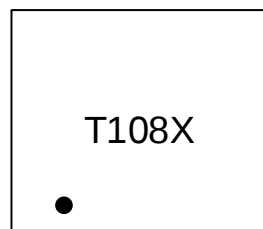
SC70-5 (1.3mm × 2.1mm)



SOT23-5 (1.6mm × 2.9mm)



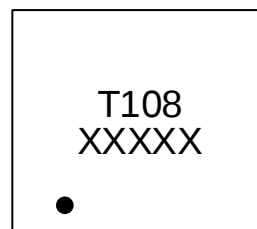
Marking Information



ET74AHC1G08

T108 = Part Number

X = Tracking Number



ET74AHC1G08T

T108 = Part Number

XXXXX = Tracking Number

ET74AHCT1G08

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2025-06-18	Preliminary Version	Yang xiaoxu	Yang xiaoxu	Liu jiaying
1.0	2025-09-02	Original Version	Peng junjie	Yang xiaoxu	Liu jiaying
1.1	2025-10-28	Add Tape Information	Wang anran	Yang xiaoxu	Liu jiaying
1.1.a	2025-12-25	Update Format, Add Marking	Xu tao	Yang xiaoxu	Liu jiaying
1.2	2026-7-31	Update Package	Lu Shao jie	Yang Xiao xu	Liu Jiaying