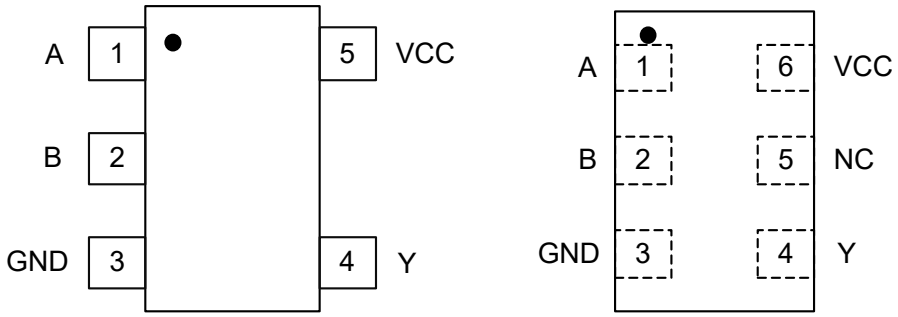
1.Description

The SN74AHCT1G08 device is a single 2-input positive AND gate. The device performs the Boolean function Y =A • B or Y = $\overline{A + B}$ in positive logic. Low ICC current allows this device to be used in power- sensitive or battery-powered applications.

2.Features

- Operating Range: 4.5 V to 5.5 V
- Maximum tpd of 7.1 ns at 5 V
- Low Power Consumption: Maximum I_{CC} of 10 μA
- ±8 mA Output Drive at 5 V
- Inputs are TTL-Voltage Compatible
- Packages are SC70-5,SOT23-5 or small DFN6
- MSL3(SC70-5,SOT23-5，DFN6(1*1.5)

3.Pinning information



SOT23-5/SC70-5 **DFN6(1*1.5)**

Figure1. Top View

4.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

DFN6

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

5.Block Diagram

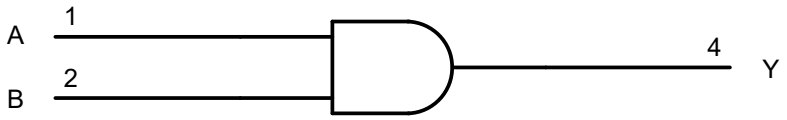


Figure2. Logic Symbol

Function Table

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

6.Absolute Maximum Ratings

Parameter		Symbol	Value	Units
DC Supply Voltage		V_{CC}	−0.5 to 7.0	V
DC Input Voltage (1)		V_I	$-0.5 \le V_I \le +7.0$	V
DC Output Voltage Output in Higher or Low State		V_O	−0.5 to V_{CC}+0.5	V
DC Input Diode Current V_I<GND		I_{IK}	-20	mA
DC Output Diode Current V_O<GND, V_O>V_{CC}		I_{OK}	±20	mA
DC Output Sink Current		I_O	±25	mA
DC Supply Current per Supply Pin		I_{CC}	±50	mA
DC Ground Current per Supply Pin		I_{GND}	±50	mA
Storage Temperature Range		T_{STG}	-65 to 150	°C
Lead Temperature, 1 mm from Case for 10 Seconds		T_L	260	°C
Junction Temperature Under Bias		T_J	150	°C
ESD Classification	Human Body Model (2)	V_{ESD}	±4000	V
	Charged Device Model (3)		±1000	V
Latch-up Current Above V_{CC} and GND at 125°C (4)		I_{LU}	±100	mA

7.Thermal Characteristics

Ratings	Package	Symbol	Value	Units
Thermal Characteristics, Thermal Resistance, Junction-to-Air	SC70-5	$R_{\theta JA}$	300	°C/W
	SOT23-5		250	
	DFN6(1.0x1.5)		440	
Thermal Characteristics, Thermal Resistance, Junction-to-board	SC70-5	$R_{\theta JB}$	75	°C/W
	SOT23-5		65	
	DFN6(1.0x1.5)		270	
Power Dissipation in Still Air at 85°C	SC70-5	P_D	215	mW
	SOT23-5		260	
	DFN6(1.0x1.5)		150	

8.Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	4.5	5.5	V
High-level input Voltage	V_{IH}	2		V
Low-level input Voltage	V_{IL}		0.8	V
Input Voltage	V_I	0	5.5	V
Output Voltage	V_O	0	V_{CC}	V
High-level Output Current	I_{OH}		-8	mA
Low-level Output Current	I_{OL}		8	mA
Input Transition Rise and Fall Rate	Δt/Δv		20	ns/V
Operating Temperature Range	T_A	-40	125	°C

Notes:

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

9.Electrical Characteristics

DC Electrical Characteristics

Parameter	Condition	Symbol	V_{CC}(V)	T_A=25°C			−40°C≤T_A≤125°C		Units
				Min	Typ	Max	Min	Max	
High−Level Output Voltage	I_{OH}=−50μA	V_{OH}	4.5	4.4	4.5		4.4		V
	I_{OH}=−8mA		4.5	3.94			3.8		V
Low−Level Output Voltage	I_{OL}=50μA	V_{OL}	4.5			0.1		0.1	V
	I_{OL}=8mA		4.5			0.36		0.44	V
Input Current	V_{IN}=5.5V or GND	I_I	0 to 5.5			±0.1		±1	μA
Supply Current	V_{IN}=V_{CC} or GND, I_O=0	I_{CC}	5.5			1		10	μA
Change in Supply Current	One input at 3.4 V, Other Inputs at V_{CC} or GND	ΔI_{CC}(5)	5.5			1.35		1.5	mA
Input Capacitance	V_{IN}=V_{CC} or GND	C_I	5		3	10			pF

Notes:

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

10.Switching Characteristics

Over recommended operating free-air temperature range, V_{CC}=5V±0.5V (unless otherwise noted) (see Figure 3)

Parameter	Condition	Symbol	T_A=25°C			−40°C≤T_A≤85°C		−40°C≤T_A≤125°C		Units
			Min	Typ	Max	Min	Max	Min	Max	
Propagation Delay	C_L=15pF	t_{PLH}		2.5	6.2	1	7.1	1	7.5	ns
	C_L=15pF	t_{PHL}		4.5	6.8	1	7.1	1	7.5	ns
	C_L=50pF	t_{PLH}		3	7.9	1	9	1	10	ns
	C_L=50pF	t_{PHL}		5.5	8.3	1	9	1	10	ns

11.Operating Characteristics

V_{CC}=5 V, T_A=25°C

Parameter	Symbol	Condition	Typ	Units
Power Dissipation Capacitance (6)	C_{PD}	No load, f=1MH	12	pF

Notes:

(6) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $I_{CC(OPR)}=C_{PD}\times V_{CC}\times f_{in}+I_{CC}\times C_{PD}$ is used to determine the no−load dynamic power consumption; $P_D=C_{PD}\times V_{CC}^2\times f_{in}+I_{CC}\times V_{CC}\times$Fig.

12.Waveform and Test Circuit

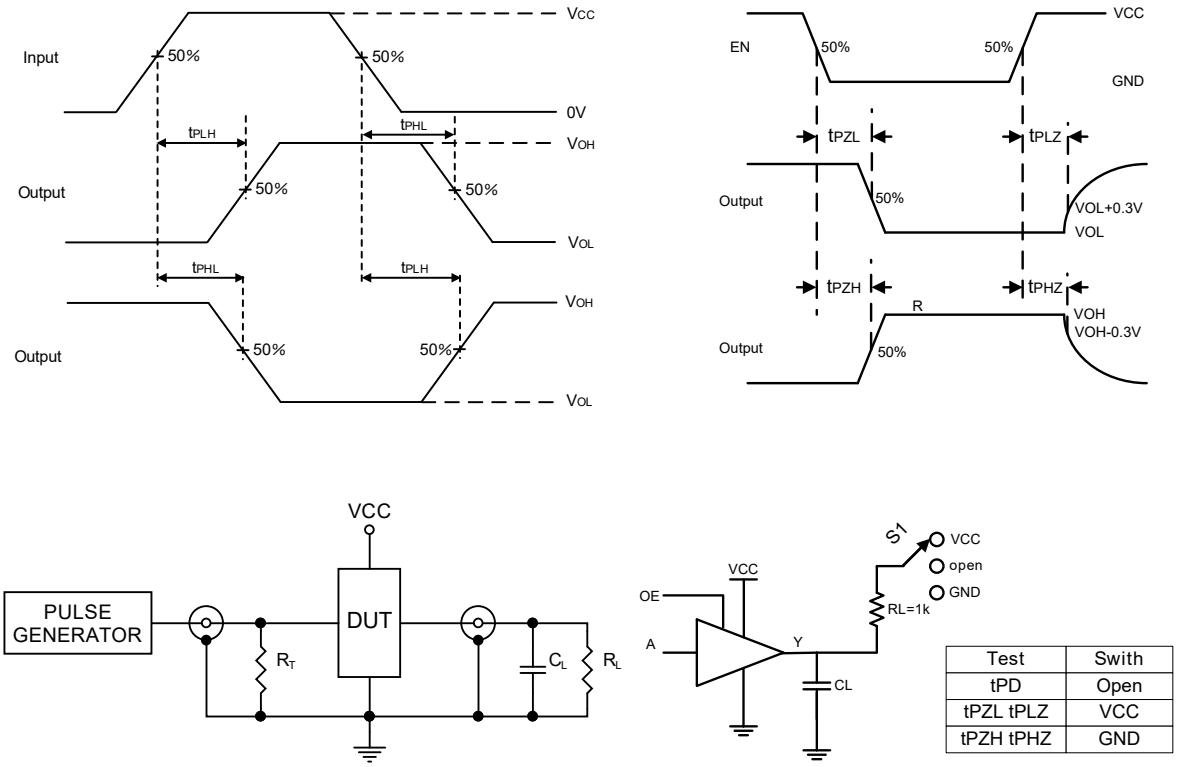


Figure3. Load Circuit and Voltage Waveforms

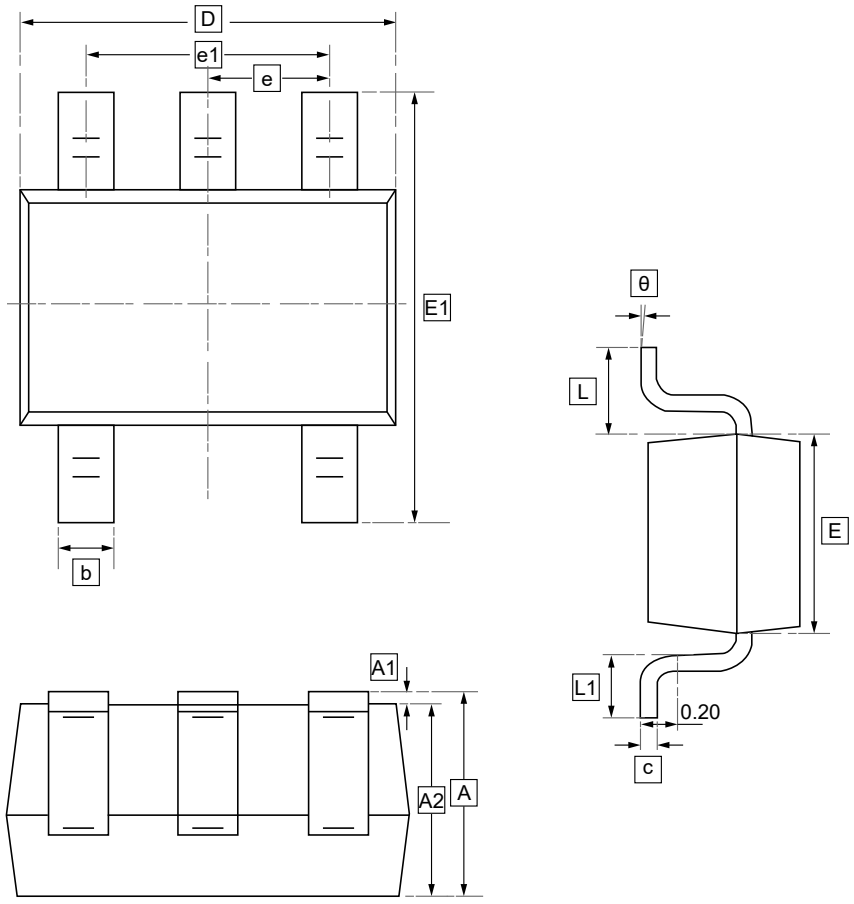
C_L includes probe and jig capacitance

All input pulses are supplied by generators having the following characteristics:PRR≤1MHz, Z_O=50Ω, t_r≤ 3ns, t_f≤3ns.

The outputs are measured one at a time with one input transition per measurement.

All parameters and waveforms are not applicable to all devices.

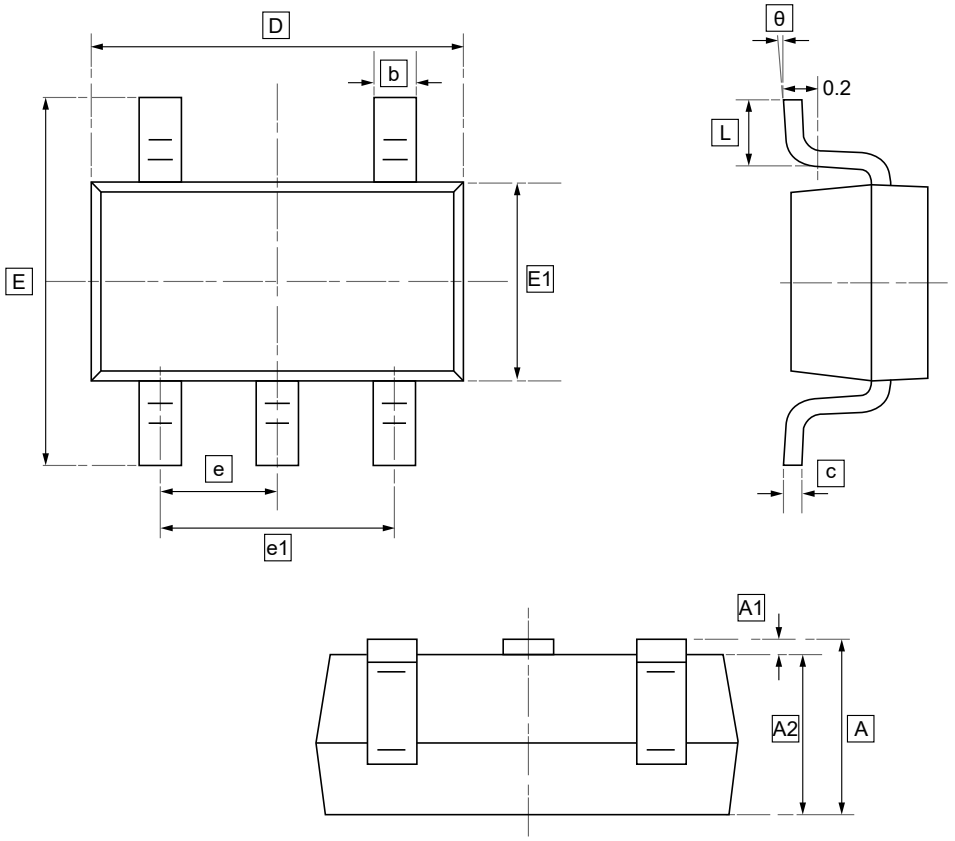
13.1 SC70-5 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	e1	L	θ
Min	0.90	0.00	0.90	0.15	0.08	1.80	1.15	2.15	0.65	1.20	0.26	7°
Max	1.10	0.10	1.00	0.35	0.15	2.25	1.35	2.45	TYP	1.40	0.46	REF.

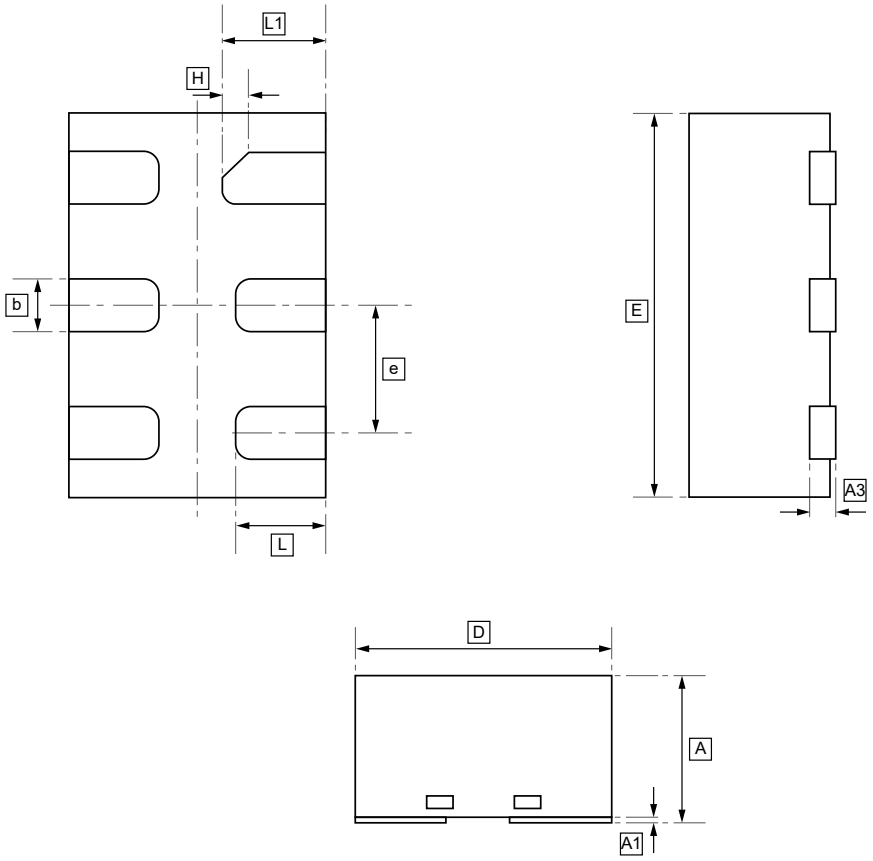
13.2 SOT-23-5 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E1	E	e	e1	L	θ
Min	1.050	0.000	1.050	0.300	0.100	2.820	1.500	2.650	0.950	1.800	0.300	0°
Max	1.250	0.100	1.150	0.500	0.200	3.020	1.700	2.950	BSC	2.000	0.600	8°

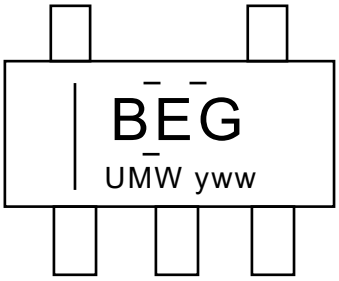
13.3 DFN6(1*1.5) Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A3	b	D	E	e	H	L	L1
Min	0.50	0	0.10	0.15	0.90	1.40	0.40	0.10	0.30	0.35
Max	0.60	0.05	REF	0.25	1.10	1.60	0.60	REF	0.40	0.45

14.Ordering Information



yww: Batch Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW SN74AHCT1G08DBVR	B08S	SOT23-5	3000	Tape and reel
UMW SN74AHCT1G08DCKR	BEG	SC70-5	3000	Tape and reel
UMW SN74AHCT1G08DRYR	BES	DFN6(1*1.5)	5000	Tape and reel

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