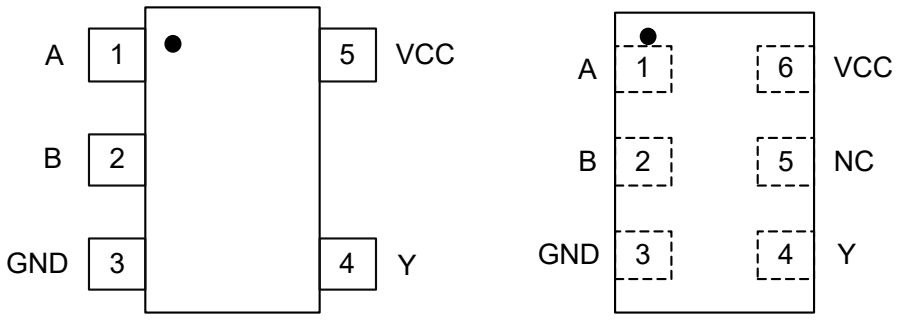
1.Description

The 74AUP1G00 is a high performance single 2−input NAND Gate operating from 0.8V to 3.6V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

2.Features

- Designed for 0.8V to 3.6V VCC Operation
- Low static power consumption; I_{CC}=0.7μA (maximum)
- 4mA Balanced Output Sink and Source Capability
- Near Zero Static Supply Current Substantially
- Reduces System Power Requirements
- These Devices are Pb−Free and are RoHS Compliant
- Tiny SC70-5, SOT23-5 and DFN6(1.0×1.5) Packages

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	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

5.Block Diagram

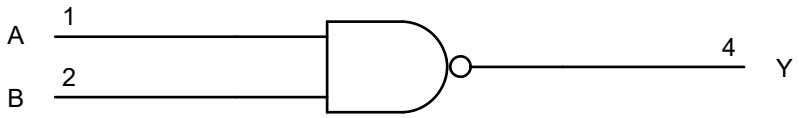


Figure2. Logic Symbol

Function Table

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

6.Absolute Maximum Ratings

Parameter		Symbol	Value	Units
DC Supply Voltage		V_{CC}	−0.5 to 4.6	V
DC Input Voltage (1)		V_I	$-0.5 \le V_I \le +4.6$	V
DC Output Voltage Output in Higher or Low State (1)		V_O	−0.5 to 4.6	V
DC Input Diode Current V_I<GND		I_{IK}	-50	mA
DC Output Diode Current V_O<GND, V_O>V_{CC}		I_{OK}	±50	mA
DC Output Sink Current		I_O	±20	mA
DC Supply Current per Supply Pin		I_{CC}	±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	
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
DC Supply Voltage Operating		V_{CC}	0.8	3.6	V
DC input Voltage		V_{IN}	0	3.6	V
DC Output Voltage (High or Low State)		V_{OUT}	0	3.6	V
Operating Temperature Range		T_A	-40	85	°C
Input Rise and Fall Time	V_{CC}=0.8V to 3.6V	t_r, t_f	0	20	ns/V

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≤85°C		Units
				Min	Typ	Max	Min	Max	
High−Level Input Voltage		V_{IH}	0.8V	0.75V_{CC}			0.75V_{CC}		V
			0.9 to 1.95	0.7V_{CC}			0.7V_{CC}		
			2.3 to 2.7	1.6			1.6		
			3 to 3.6	2			2		
Low−Level Input Voltage		V_{IL}	0.8			0.25V_{CC}		0.25V_{CC}	V
			0.9 to 1.95			0.3V_{CC}		0.3V_{CC}	
			2.3 to 2.7			0.7		0.7	
			3.0 to 3.6			0.9		0.9	
High−Level Output Voltage	I_{OH}=−20μA	V_{OH}	0.8 to 3.6	V_{CC}-0.1			V_{CC}-0.1		V
	I_{OH}=−1.1mA		1.1	0.82	1.02		0.77		
	I_{OH}=−1.7μA		1.4	1.11	1.32		1.03		
	I_{OH}=−1.9mA		1.65	1.32	1.58		1.30		
	I_{OH}=−2.3mA		2.3	2.05	2.24		1.97		
	I_{OH}=−3.1mA			1.9	2.22		1.85		
	I_{OH}=−2.7mA		3	2.72	2.95		2.67		
	I_{OH}=−4.0mA			2.6	2.92		2.55		
Low−Level Output Voltage	I_{OL}=20μA	V_{OL}	0.8 to 3.6			0.1		0.1	V
	I_{OL}=1.1mA		1.1		0.11	0.33		0.33	
	I_{OL}=1.7mA		1.4		0.12	0.31		0.37	
	I_{OL}=1.9mA		1.65		0.11	0.31		0.35	
	I_{OL}=2.3mA		2.3		0.14	0.31		0.33	
	I_{OL}=3.1mA				0.19	0.44		0.45	
	I_{OL}=2.7mA		3		0.11	0.31		0.33	
	I_{OL}=4.0mA				0.16	0.44		0.45	

Input Leakage Current	V_{IN}=V_{CC} or GND	I_{IN}	0 to 3.6			0.1		0.2	μA
Power Off Leakage Current	V_{IN}=3.6V or V_{OUT}=3.6V	I_{OFF}	0			0.2		0.5	μA
Quiescent Supply Current	V_{IN}=3.6V or GND	I_{CC}	3.6			0.2		0.7	μA

10.AC Electrical Characteristics

$t_r = t_f$ = 2.5ns

Parameter	Condition	Symbol	V_{CC}(V)	T_A=25°C			−40°C≤T_A≤85°C		Units
				Min	Typ	Max	Min	Max	
Propagation Delay (Figure3 And 4)	C_L=5pF (5)	t_{PHL} t_{PLH}	0.8		16.6				ns
			1 2	2.6	7	13.8	2.1	17.1	
			1.5	2.9	5	9.2	2.9	11.1	
			1.8	2	4	7.1	2	9	
			2.5	1.3	2.9	4.9	1.3	6.2	
			3.3	1	2.4	3.8	1	4.8	
	C_L=10pF (5)		0.8		18.9				ns
			1.2	3.2	8	15.7	3.1	18.8	
			1.5	2.9	5.8	10.5	2.9	12.1	
			1.8	2	4.7	8.2	2	9.8	
			2.5	1.3	3.4	5.7	1.3	6.8	
			3.3	1	2.9	4.5	1	5.2	
	C_L=15pF (5)		0.8		21.3				ns
			1.2	3.6	9	17.3	3.1	21.5	
			1.5	2.9	6.5	11.6	2.9	14	
			1.8	2	5.3	9.2	2	11.4	
			2.5	1.3	3.9	6.4	1.3	8	
			3.3	1	3.3	5.1	1	6.4	
	C_L=30pF (5)		0.8		28.4				ns
			1.2	4.9	11.9	21.9	4.4	27.1	
			1.5	2.9	8.6	14.7	2.9	17.7	
			1.8	2	7.1	11.5	2	14.2	
			2.5	1.3	5.3	8.1	1.3	10	
			3.3	1	4.5	6.5	1	8	

Notes: (5) C_L includes probe and jig capacitance.

11.Capacitance Characteristics

Parameter	Symbol	Condition		Typ	Units
Input Capacitance	C_{IN}	V_{CC}=3.6V, V_I= 0 V or V_{CC}		2	pF
output capacitance	C_O	V_{CC}= 0V, V_{OUT}=GND		3	pF
Power Dissipation Capacitance (6)	C_{PD}	1MHz, V_I=0 V to V_{CC}	V_{CC}=0.8V	7.6	pF
			V_{CC}=1.2V	8.1	
			V_{CC}=1.5V	8.5	
			V_{CC}=1.8V	8.6	
			V_{CC}=2.5V	9	
			V_{CC}=3.3V	9.6	

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

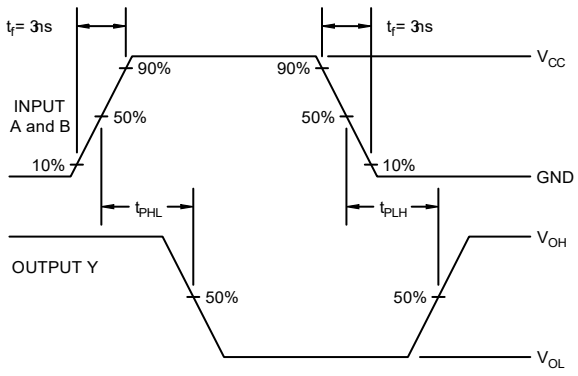


Figure3. Switching Waveform

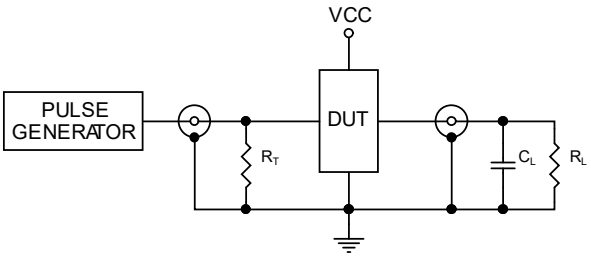
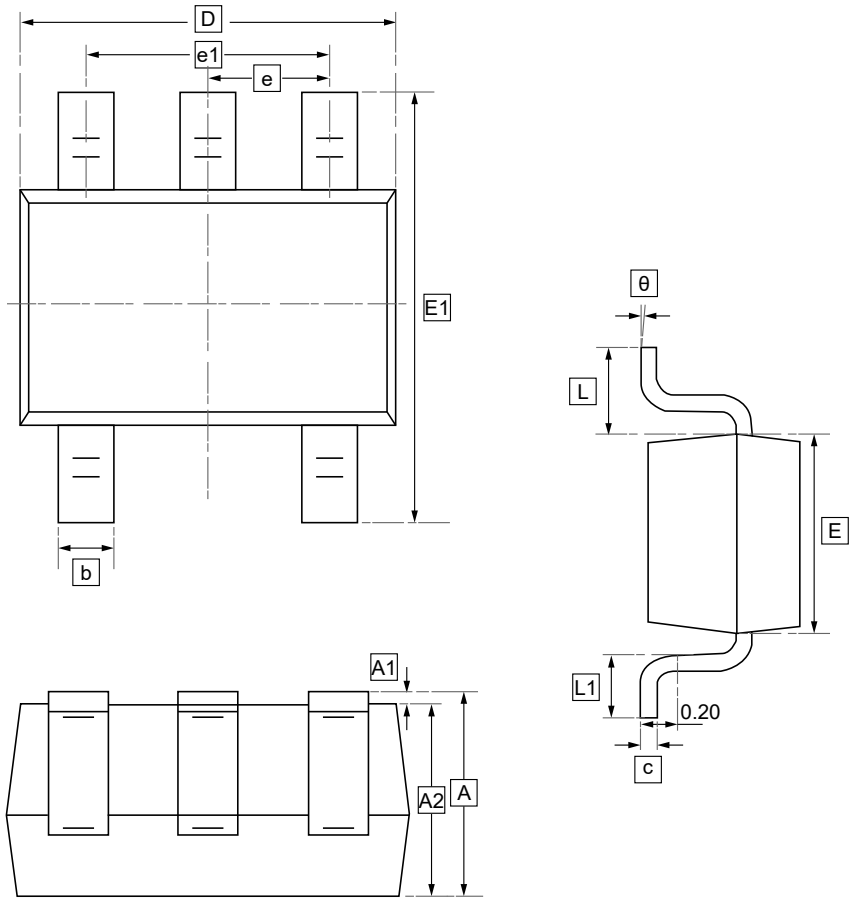


Figure4. Test Circuit

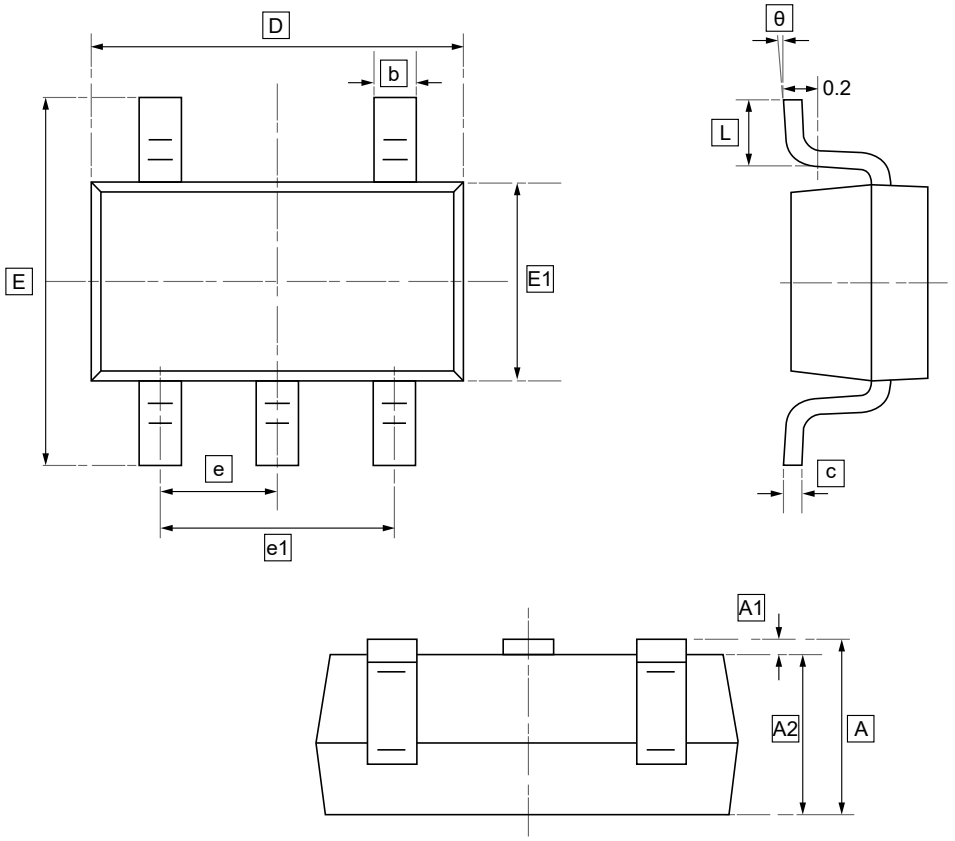
13.1 SC70-5 Package Outline Dimensions



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.

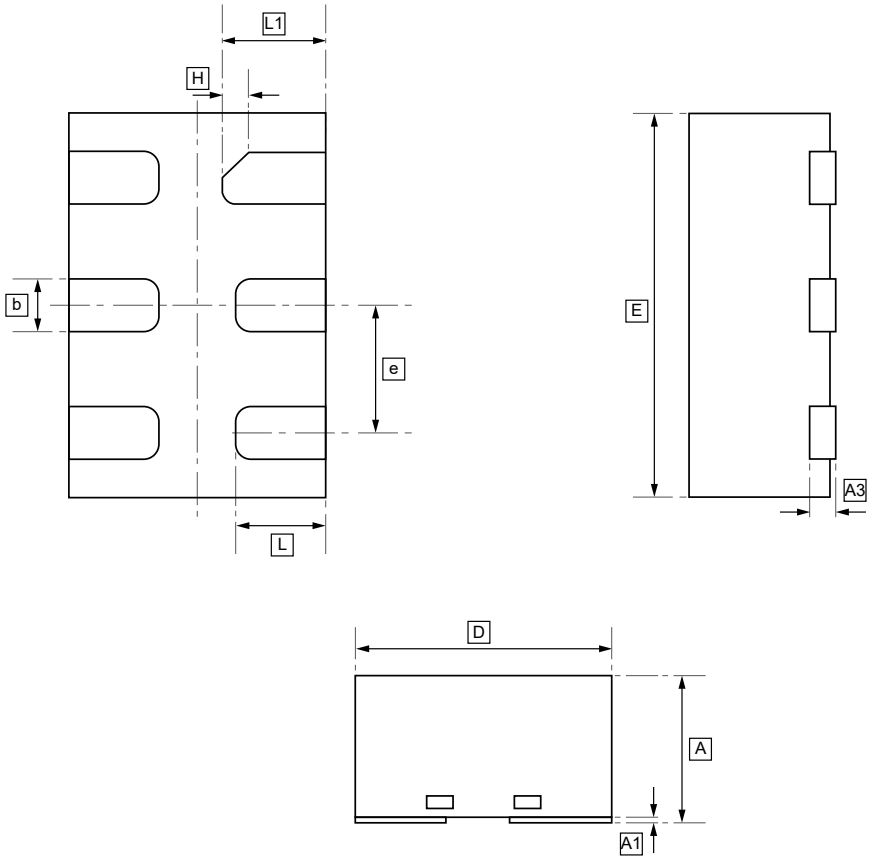
13.2 SOT-23-5 Package Outline Dimensions



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°

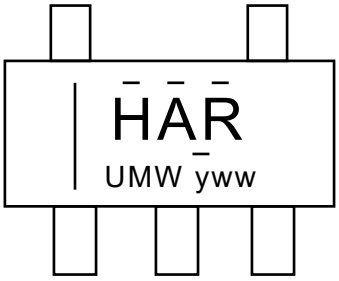
13.3 DFN6(1*1.5) Package Outline Dimensions



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 SN74AUP1G00DCKR	HAR	SC70-5	3000	Tape and reel
UMW SN74AUP1G00DBVR	H00R	SOT23-5	3000	Tape and reel
UMW SN74AUP1G00DRYR	HA	DFN6(1*1.5)	5000	Tape and reel

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