

1.Description

The SN74AUP1G126 is a single non-inverting buffer with 3-State output from ultra low power series, which can operate from a 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 V_{CC} Operation
- Low static power consumption; $I_{CC}=0.7\mu A$ (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

3.Pinning information

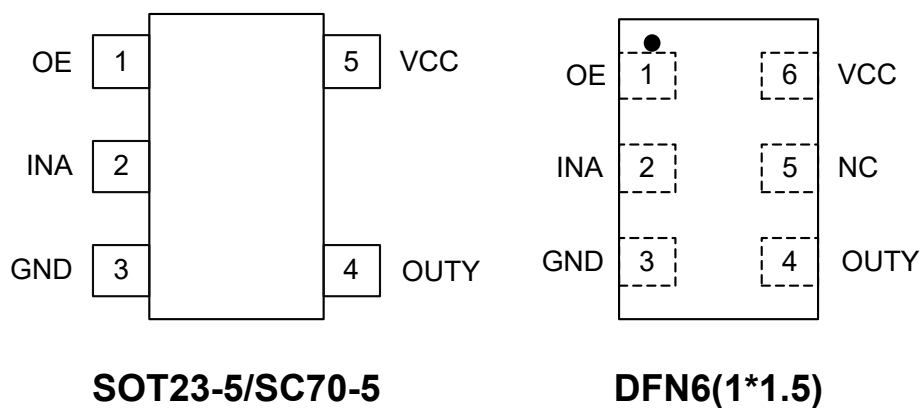


Figure1. Top View



4.Pin Function

Pin No.		Function
SC70-5/SOT23-5	DFN6	
1	1	OE
2	2	INA
3	3	GND
4	4	OUTY
/	5	NC
5	6	VCC



5.Block Diagram

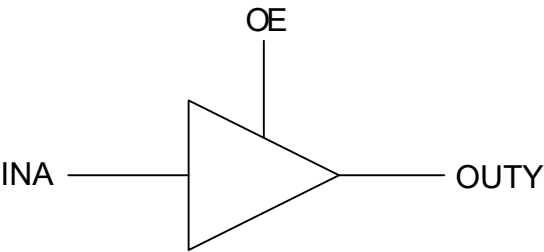


Figure2.

Function Table

Input		Output
OE	INA	OUTY
H	L	L
H	H	H
L	X	Z



6. Absolute Maximum Ratings

Parameter		Symbol	Value	Units
DC Supply Voltage		V_{CC}	-0.5 to 4.6	V
DC Input Voltage		V_I	$-0.5 \leq V_I \leq +4.6$	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
Power Dissipation in Still Air at 85°C		P_D	200	mW
ESD Classification	Human Body Model ⁽²⁾	V_{ESD}	4000	V
	Machine Model ⁽³⁾		200	V
	Charged Device Model ⁽⁴⁾		1000	V
Latchup Current Above V_{CC} and GND at 125°C ⁽⁵⁾		I_{LU}	± 100	mA

Stresses exceeding those listed in the Maximum Ratings 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.

Notes:

1. IO absolute maximum rating must be observed.
2. Tested to EIA/JESD22-A114-A, rated to EIA/JESD22-A114-B.
3. Tested to EIA/JESD22-A115-A, rated to EIA/JESD22-A115-A.
4. Tested to JESD22-C101-A.
5. Tested to EIA/JESD78.



7. 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.



8. Electrical Characteristics

DC Electrical Characteristics

Parameter	Condition	Symbol	$V_{CC}(V)$	$T_A=25^{\circ}C$			$-40^{\circ}C \leq T_A \leq 85^{\circ}C$		Units
				Min	Typ	Max	Min	Max	
High-Level Input Voltage		V_{IH}	0.8	$0.75V_{CC}$			$0.75V_{CC}$		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	$I_{OH}=-20\mu A$	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		
	$I_{OH}=-1.7\mu A$		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	$I_{OL}=20\mu A$	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	$V_I=GND$ or (V_{CC} to 3.6V) $OE=GND, I_O=0$	I_{CC}	3.6			0.2		0.7	μA

Notes:

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.



9.1 Switching Characteristics: $C_L=5\text{pF}$

Over recommended operating free-air temperature range, $C_L=5\text{pF}$ (unless otherwise noted)

Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t_{pd}	A	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		18.1		ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	4.3	7.4	12.6	
				$T_A=-40$ to 85°C	2.7		15.3	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	3.3	5.2	8.5	
				$T_A=-40$ to 85°C	1		10.2	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	2.6	4.1	6.8	
				$T_A=-40$ to 85°C	1.3		8.3	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	2	2.9	4.7	
				$T_A=-40$ to 85°C	1.1		5.8	
t_{en}	OE	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		19.1		ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	5.1	9.3	15.9	
				$T_A=-40$ to 85°C	3.6		19.2	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	4.1	6.6	10.5	
				$T_A=-40$ to 85°C	2.5		12.7	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	3.2	5.3	8.7	
				$T_A=-40$ to 85°C	2.1		10.3	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	2.5	3.8	6	
				$T_A=-40$ to 85°C	1.6		7.2	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	2.1	3.2	4.9	
				$T_A=-40$ to 85°C	1.4		5.9	



Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t _{dis}	OE	Y	V _{CC} =0.8V	T _A =25°C		12.1		ns
			V _{CC} =1.2±0.1V	T _A =25°C	2.4	4.1	6.9	
				T _A =-40 to 85°C	2.2		7.7	
			V _{CC} =1.5±0.1V	T _A =25°C	1.8	2.9	4.5	
				T _A =-40 to 85°C	1.7		5.1	
			V _{CC} =1.8±0.15V	T _A =25°C	1	2.9	4.3	
				T _A =-40 to 85°C	1.5		4.7	
			V _{CC} =2.5±0.2V	T _A =25°C	1	1.8	2.7	
				T _A =-40 to 85°C	1		3.3	
			V _{CC} =3.3±0.3V	T _A =25°C	1.2	2.2	3.2	
				T _A =-40 to 85°C	1.1		4	



9.2 Switching Characteristics: $C_L=10\text{pF}$

Over recommended operating free-air temperature range, $C_L=10\text{pF}$ (unless otherwise noted)

Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t_{pd}	A	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		20.5	13.7	ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	4.6	8.4	9.3	
				$T_A=-40$ to 85°C	3.6		16.6	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	3.5	5.9	7.5	
				$T_A=-40$ to 85°C	2.4		11.1	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	3.9	4.7	5.3	
				$T_A=-40$ to 85°C	1.3		9.1	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	2.3	3.4	4.3	
				$T_A=-40$ to 85°C	1.6		6.4	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	2.1	2.8		
				$T_A=-40$ to 85°C	1.4		5.2	
t_{en}	OE	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		21.8	16.8	ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	4.9	10.2	11.2	
				$T_A=-40$ to 85°C	4.4		20.2	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	3.9	7.3	9.2	
				$T_A=-40$ to 85°C	3.3		13.5	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	3.4	5.8	6.4	
				$T_A=-40$ to 85°C	2.7		11	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	2.5	4.3	5.4	
				$T_A=-40$ to 85°C	2.1		7.8	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	2.1	3.7		
				$T_A=-40$ to 85°C	1.9		6.4	



Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t _{dis}	OE	Y	V _{CC} =0.8V	T _A =25°C		13		ns
			V _{CC} =1.2±0.1V	T _A =25°C	3.8	6.6	11.7	
				T _A =-40 to 85°C	1.2		14	
			V _{CC} =1.5±0.1V	T _A =25°C	2.2	4.7	7.9	
				T _A =-40 to 85°C	1.3		9.3	
			V _{CC} =1.8±0.15V	T _A =25°C	2.4	4.4	6.4	
				T _A =-40 to 85°C	2.2		7.5	
			V _{CC} =2.5±0.2V	T _A =25°C	1.3	3.1	4.9	
				T _A =-40 to 85°C	1.2		5.4	
			V _{CC} =3.3±0.3V	T _A =25°C	1.9	3.4	5	
				T _A =-40 to 85°C	1.9		5.6	



9.3 Switching Characteristics: $C_L=15\text{pF}$

Over recommended operating free-air temperature range, $C_L=15\text{pF}$ (unless otherwise noted)

Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t_{pd}	A	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		22.5		ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	5.8	9.3	15.1	
				$T_A=-40$ to 85°C	4.3		17.9	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	4.4	6.6	10.2	
				$T_A=-40$ to 85°C	3		12.1	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	3.5	5.3	8.3	
				$T_A=-40$ to 85°C	2.3		9.9	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	2.7	3.9	5.8	
				$T_A=-40$ to 85°C	1.9		7	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	2.4	3.2	4.7	
				$T_A=-40$ to 85°C	1.8		5.7	
t_{en}	OE	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		25.2		ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	7	11.3	18.1	
				$T_A=-40$ to 85°C	5.4		21.4	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	5.5	8.1	12.2	
				$T_A=-40$ to 85°C	4.1		14.5	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	4.3	6.5	10.1	
				$T_A=-40$ to 85°C	3.3		12	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	3.4	4.8	7.1	
				$T_A=-40$ to 85°C	2.6		8.4	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	2.9	4.1	5.9	
				$T_A=-40$ to 85°C	2.3		6.9	



Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t _{dis}	OE	Y	V _{CC} =0.8V	T _A =25°C		14		ns
			V _{CC} =1.2±0.1V	T _A =25°C	3.7	5.8	8.2	
				T _A =-40 to 85°C	3.3		11	
			V _{CC} =1.5±0.1V	T _A =25°C	5.5	3.9	5.9	
				T _A =-40 to 85°C	2.1		8	
			V _{CC} =1.8±0.15V	T _A =25°C	3.3	4.5	6.6	
				T _A =-40 to 85°C	2.9		7.4	
			V _{CC} =2.5±0.2V	T _A =25°C	2.3	3.2	4.3	
				T _A =-40 to 85°C	1.8		5.1	
			V _{CC} =3.3±0.3V	T _A =25°C	2.4	4.8	6.2	
				T _A =-40 to 85°C	3.1		6.7	



9.4 Switching Characteristics: $C_L=30\text{pF}$

Over recommended operating free-air temperature range, $C_L=30\text{pF}$ (unless otherwise noted)

Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t_{pd}	A	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		29		ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	7.4	12	18.7	
				$T_A=-40\text{ to }85^\circ\text{C}$	6.6		21.4	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	5.7	8.6	12.5	
				$T_A=-40\text{ to }85^\circ\text{C}$	4.9		14.7	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	4.8	6.9	10.1	
				$T_A=-40\text{ to }85^\circ\text{C}$	3.1		12	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	3.9	5.1	7.2	
				$T_A=-40\text{ to }85^\circ\text{C}$	3.3		8.7	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	3.5	4.8	6	
				$T_A=-40\text{ to }85^\circ\text{C}$	3		7	
t_{en}	OE	Y	$V_{CC}=0.8\text{V}$	$T_A=25^\circ\text{C}$		33.4		ns
			$V_{CC}=1.2\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	8.8	14.1	21.8	
				$T_A=-40\text{ to }85^\circ\text{C}$	7.4		25.5	
			$V_{CC}=1.5\pm 0.1\text{V}$	$T_A=25^\circ\text{C}$	6.9	10.1	14.6	
				$T_A=-40\text{ to }85^\circ\text{C}$	5.6		17.4	
			$V_{CC}=1.8\pm 0.15\text{V}$	$T_A=25^\circ\text{C}$	5.6	8.1	12	
				$T_A=-40\text{ to }85^\circ\text{C}$	4.7		14.1	
			$V_{CC}=2.5\pm 0.2\text{V}$	$T_A=25^\circ\text{C}$	4.3	6.1	8.5	
				$T_A=-40\text{ to }85^\circ\text{C}$	3.8		10	
			$V_{CC}=3.3\pm 0.3\text{V}$	$T_A=25^\circ\text{C}$	3.7	5.2	7.1	
				$T_A=-40\text{ to }85^\circ\text{C}$	3.4		8.3	



Parameter	From(Input)	To(Output)	Conditions		Min	Typ	Max	Units
t_{dis}	OE	Y	$V_{CC}=0.8V$	$T_A=25^{\circ}C$		17.7		ns
			$V_{CC}=1.2\pm0.1V$	$T_A=25^{\circ}C$	5.8	10	16	
				$T_A=-40\text{ to }85^{\circ}C$	3.7		16	
			$V_{CC}=1.5\pm0.1V$	$T_A=25^{\circ}C$	5.7	7.7	10.9	
				$T_A=-40\text{ to }85^{\circ}C$	1		10.7	
			$V_{CC}=1.8\pm0.15V$	$T_A=25^{\circ}C$	4.5	7.7	9.8	
				$T_A=-40\text{ to }85^{\circ}C$	4.4		12.5	
			$V_{CC}=2.5\pm0.2V$	$T_A=25^{\circ}C$	3.9	5.6	7.4	
				$T_A=-40\text{ to }85^{\circ}C$	3.2		9	
			$V_{CC}=3.3\pm0.3V$	$T_A=25^{\circ}C$	3.3	8.4	10.7	
				$T_A=-40\text{ to }85^{\circ}C$	6.6		10.8	

9.5 Operating Characteristics

$T_A=25^{\circ}C$

Parameter		Conditions		V_{CC}	Typ	Units
C_{pd}	Power dissipation capacitance	Output enabled	$f=10MHz$	0.8V	3.8	pF
				1.2V $\pm$ 0.1V	3.7	
				1.5V $\pm$ 0.1V	3.7	
				1.8V $\pm$ 0.15V	3.7	
				2.5V $\pm$ 0.2V	3.9	
				3.3V $\pm$ 0.3V	4	
		Output disabled	$f=10MHz$	0.8V	0	
				1.2V $\pm$ 0.1V	0	
				1.5V $\pm$ 0.1V	0	
				1.8V $\pm$ 0.15V	0	
				2.5V $\pm$ 0.2V	0	
				3.3V $\pm$ 0.3V	0	



11.AC Test Circuit

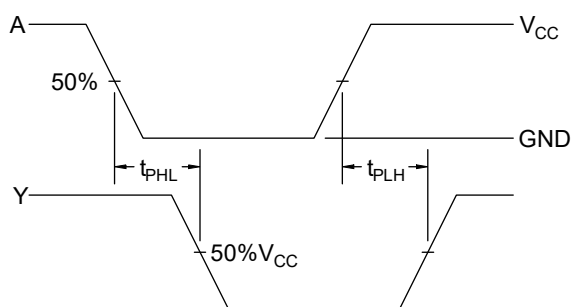


Figure 3. Switching Waveforms

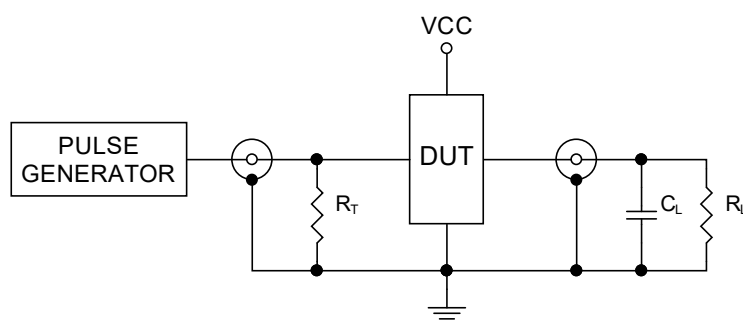
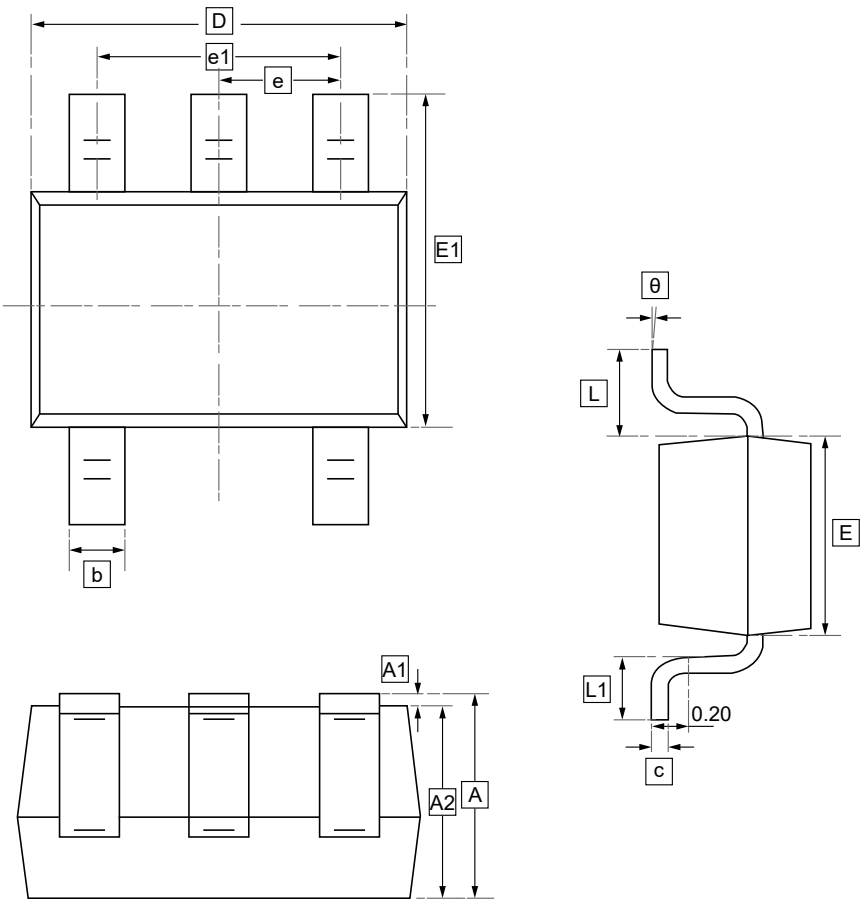


Figure 4. Test Circuit



12.1SC70-5 Package Outline Dimensions

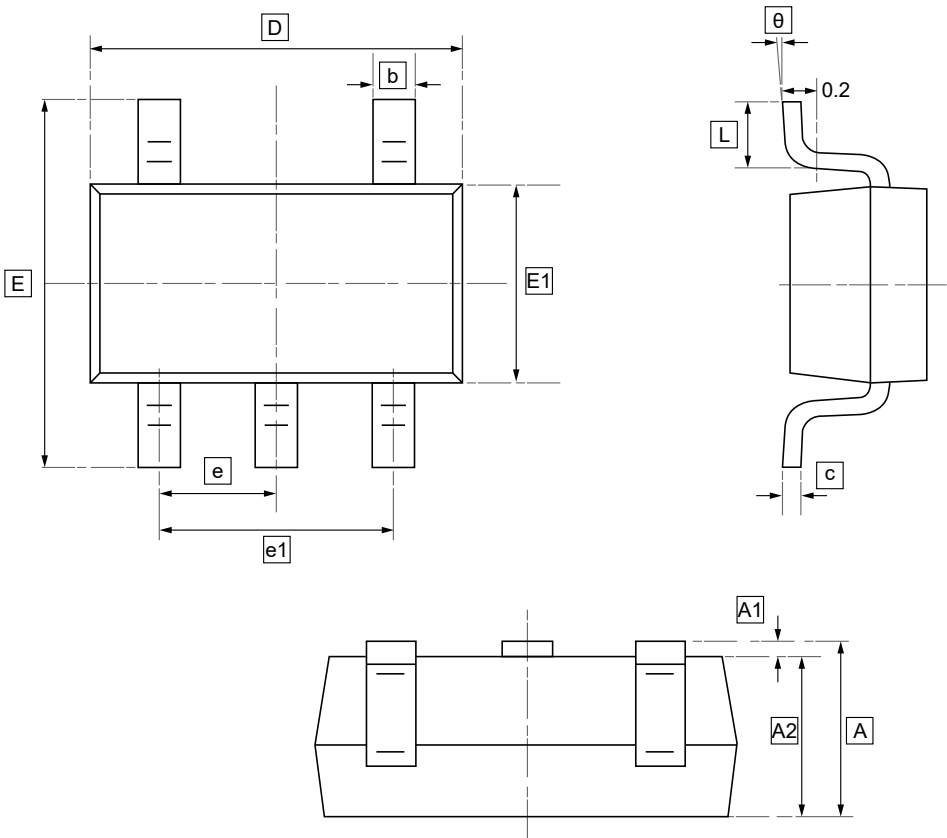


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	e1	L	θ
Min	0.90	0.00	0.90	0.15	0.08	2.05	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.



12.2SOT-23-5 Package Outline Dimensions

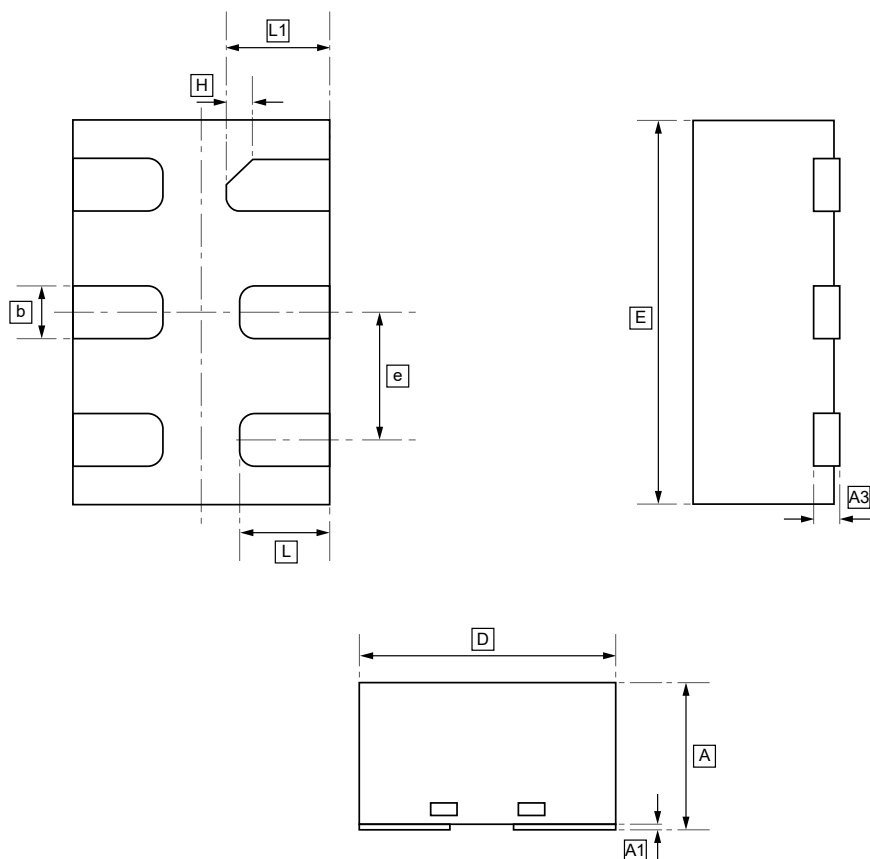


DIMENSIONS (mm are the original dimensions)

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°



12.3DFN6(1*1.5) Package Outline Dimensions

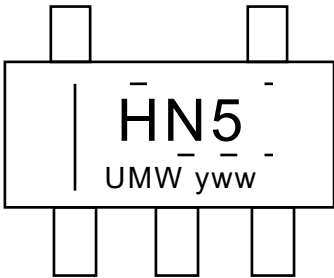


DIMENSIONS (mm are the original dimensions)

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



13.Ordering information



yww: Batch Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW SN74AUP1G126DCKR	HN5	SC70-5	3000	Tape and reel
UMW SN74AUP1G126DBVR	H26R	SOT23-5	3000	Tape and reel
UMW SN74AUP1G126DSFR	HN	DFN6(1*1.5)	5000	Tape and reel



14.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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