SN74AUP1G14 Series
SCHMITT-TRIGGER INVERTER

Features

- Wide supply voltage range from 0.8V to 3.6V
- Inputs accept voltages up to 3.6V
- I_{OFF} supports partial-power-down mode
- Low static power consumption; I_{CC}=0.5μA (Max.)
- ESD Protection Exceeds JESD 22
  -2000-V Human-Body Model (A114-A)
  -200-V Machine Model (A115-A)
  -1000-V Charged-Device Model (C101)

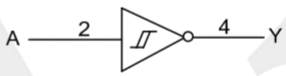
Applications

- AV Receiver
- Audio Dock:Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant(PDA)
- Power:Telecom/Server AC/DC Supply:Single Controller:Analog and Digital
- Solid State Drive(SSD):Client and Enterprise
- Wireless Headset,Keyboard,and Mouse

General Description

This SN74AUP1G14 functions as an independent gate with Schmitt-trigger inputs, which allows for slow input transition and better switching-noise immunity at the input. This device ensures a very low static and dynamic power consumption across the entire VCC range from 0.8V to 3.6V.

Logic Diagram



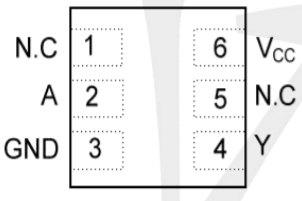
Logic symbol

IEC logic symbol

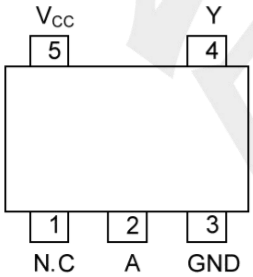
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74AUP1G14DBVR-TP	SOT23-5	Tape and Reel,3000
SN74AUP1G14DCKR-TP	SOT353	Tape and Reel,3000
SN74AUP1G14DRLR-TP	SOT553	Tape and Reel,4000
SN74AUP1G14DSFR-TP	DFN1X1-6	Tape and Reel,5000
SN74AUP1G14DRYR-TP	DFN1510-6	Tape and Reel,5000

Pin Configuratio (TOP VIEW)



DFN1X1-6
DFN1510-6



SOT23-5
SOT353
SOT553

Function Table (each gate)

INPUT (A)	OUTPUT (Y)
L	H
H	L

Note:H: HIGH voltage level;L: LOW voltage level.

Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +4.6	V
Input Voltage	V_{IN}		-0.5 ~ +4.6	V
Output Voltage	V_{OUT}	Output in the high or low state	-0.5 ~ +V_{CC}+0.5V	V
		Output in the power-off state	-0.5 ~ +4.6	V
VCC or GND Current	I_{CC}		±50	mA
Continuous Output Current	I_{OUT}	VOUT=0~VCC	±20	mA
Input Clamp Current	I_{IK}	VIN<0	-50	mA
Output Clamp Current	I_{OK}	VOUT<0	-50	mA
Storage Temperature Range	T_{STG}		-65 ~ +150	℃
Junction to Ambient	θ_{JA}	SOT-23-5	230	℃/W
		SOT353	280	℃/W
		SOT553	250	℃/W
		DFN1X1-6	460	℃/W
		DFN1510-6	440	℃/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	0.8	--	3.6	V
Input Voltage	V_{IN}		0	--	3.6	V
Output Voltage	V_{OUT}	High or low state	0	--	V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	V_{CC}=0.8V ~ 3.6V	--	--	200	ns/V
Operating Temperature	T_A		-40	--	+125	°C

Electrical Characteristics (T_A=25°C ,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Positive-Going Input Threshold Voltage	V_{T+}	V_{CC} =0.8V		0.3	--	0.6	V
		V_{CC} =1.1V		0.53	--	0.9	V
		V_{CC} =1.4V		0.74	--	1.11	V
		V_{CC} =1.65V		0.91	--	1.29	V
		V_{CC} =2.3V		1.37	--	1.77	V
		V_{CC} =3V		1.88	--	2.29	V
Negative-Going Input Threshold Voltage	V_{T-}	V_{CC} =0.8V		0.1	--	0.6	V
		V_{CC} =1.1V		0.26	--	0.65	V
		V_{CC} =1.4V		0.39	--	0.75	V
		V_{CC} =1.65V		0.47	--	0.84	V
		V_{CC} =2.3V		0.69	--	1.04	V
		V_{CC} =3V		0.88	--	1.24	V
Hysteresis Voltage (V_{T+}-V_{T-})	$\triangle V_T$	V_{CC} =0.8V		0.07	--	0.5	V
		V_{CC} =1.1V		0.08	--	0.46	V
		V_{CC} =1.4V		0.18	--	0.56	V
		V_{CC} =1.65V		0.27	--	0.66	V
		V_{CC} =2.3V		0.53	--	0.92	V
		V_{CC} =3V		0.79	--	1.31	V
High-Level Output Voltage	V_{OH}	V_{CC} =0.8V ~ 3.6V, I_{OH}=-20μA		V_{CC}-0.1	--	--	V
		V_{CC} =1.1V, I_{OH}=-1.1mA		0.75×V_{CC}	--	--	V
		V_{CC} =1.4V, I_{OH}=-1.7mA		1.11	--	--	V
		V_{CC} =1.65V, I_{OH}=-1.9mA		1.32	--	--	V
		V_{CC} =2.3V	I_{OH}=-2.3mA	2.05	--	--	V
			I_{OH}=-3.1mA	1.9	--	--	V
		V_{CC} =3V	I_{OH}=-2.7mA	2.72	--	--	V
			I_{OH}=-4mA	2.6	--	--	V

Electrical Characteristics (T_A=25°C ,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Low-Level Output Voltage	V_{OL}	V_{CC}=0.8V ~ 3.6V, I_{OL}=20μA		--	--	0.1	V
		V_{CC}=1.1V, I_{OL}=1.1mA		--	--	0.3×V_{CC}	V
		V_{CC}=1.4V, I_{OL}=1.7mA		--	--	0.31	V
		V_{CC}=1.65V, I_{OL}=1.9mA		--	--	0.31	V
		V_{CC}=2.3V	I_{OL}=2.3mA	--	--	0.31	V
			I_{OL}=3.1mA	--	--	0.44	V
		V_{CC}=3V	I_{OL}=2.7mA	--	--	0.31	V
			I_{OL}=4mA	--	--	0.44	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0V ~ 3.6V, V_{IN}=V_{CC} or GND		--	--	±0.1	μA
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{CC}=3.6V		--	--	±0.2	μA
Additional Power OFF Leakage Current	ΔI_{OFF}	V_{CC}=0V~0.2V, V_{IN} or V_{OUT}=0V~3.6V		--	--	±0.2	μA
Quiescent Supply Current	I_{CC}	V_{CC}=0.8V ~3.6V, I_{OUT}=0 V_{IN}=V_{CC} or GND		--	--	0.5	μA
Additional Quiescent Supply Current	ΔI_{CC}	V_{CC}=3.3V, One input at V_{CC}-0.6V, other inputs at V_{CC} or GND		--	--	40	μA
Input Capacitance	C_I	V_{CC}=0V, V_{IN}=V_{CC} or GND		--	1.5	--	pF
		V_{CC}=3.6V, V_{IN}=V_{CC} or GND		--	1.5	--	pF
Output Capacitance	C_{OUT}	V_{CC} =0V, V_{OUT}=GND		--	2.5	--	pF

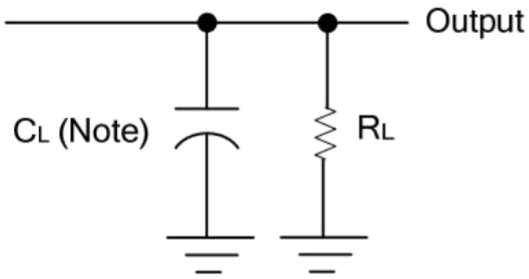
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=0.8V	--	4.0	--	pF
		V_{CC}=1.2±0.1V	--	4.0	--	pF
		V_{CC}=1.5±0.1V	--	4.1	--	pF
		V_{CC}=1.8±0.15V	--	4.1	--	pF
		V_{CC}=2.5±0.2V	--	4.3	--	pF
		V_{CC}=3.3±0.3V	--	4.4	--	pF

SWITCHING CHARACTERISTICS (TA =25°C，unless otherwise specified)

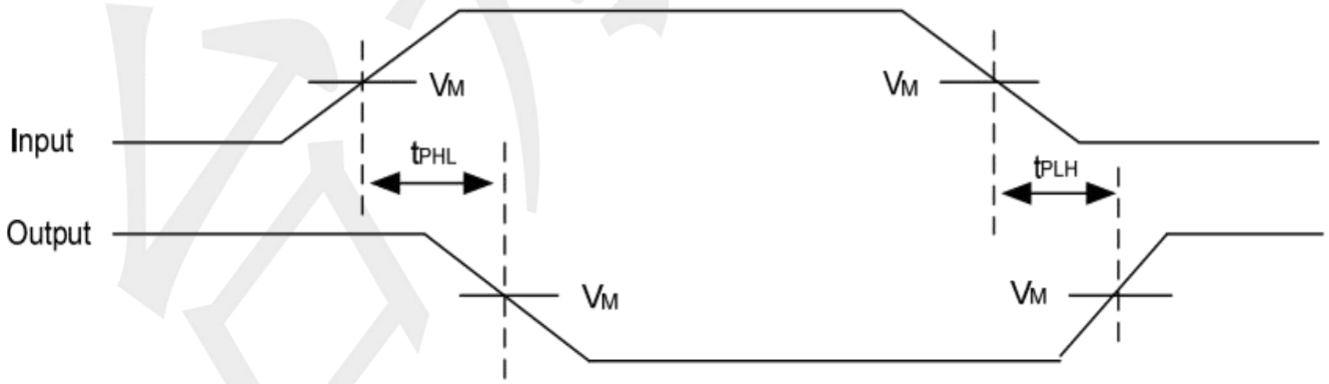
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from inputs (A) to output(Y)	t_{PD}	CL=5pF, RL=1MΩ	V_{CC}=0.8V	--	20.3	--	ns
			V_{CC}=1.2±0.1V	3.0	6.9	--	ns
			V_{CC}=1.5±0.1V	2.6	5.2	--	ns
			V_{CC}=1.8±0.15V	2.2	4.4	--	ns
			V_{CC}=2.5±0.2V	2.0	3.5	--	ns
			V_{CC}=3.3±0.3V	1.9	3	--	ns
		CL=10pF, RL=1MΩ	V_{CC}=0.8V	--	23.9	--	ns
			V_{CC}=1.2±0.1V	3.5	7.9	--	ns
			V_{CC}=1.5±0.1V	3.0	6	--	ns
			V_{CC}=1.8±0.15V	2.7	5	--	ns
			V_{CC}=2.5±0.2V	2.4	4	--	ns
			V_{CC}=3.3±0.3V	2.4	3.5	--	ns
		CL=15pF, RL=1MΩ	V_{CC}=0.8V	--	27.3	--	ns
			V_{CC}=1.2±0.1V	3.9	8.7	--	ns
			V_{CC}=1.5±0.1V	3.3	6.7	--	ns
			V_{CC}=1.8±0.15V	3.0	5.6	--	ns
			V_{CC}=2.5±0.2V	2.8	4.5	--	ns
			V_{CC}=3.3±0.3V	2.7	3.9	--	ns
		CL=30pF, RL=1MΩ	V_{CC}=0.8V	--	25.7	--	ns
			V_{CC}=1.2±0.1V	5.1	11.2	--	ns
			V_{CC}=1.5±0.1V	4.3	8.5	--	ns
			V_{CC}=1.8±0.15V	3.9	7.2	--	ns
			V_{CC}=2.5±0.2V	3.6	5.7	--	ns
			V_{CC}=3.3±0.3V	3.5	5	--	ns

TEST CIRCUIT AND WAVEFORMS



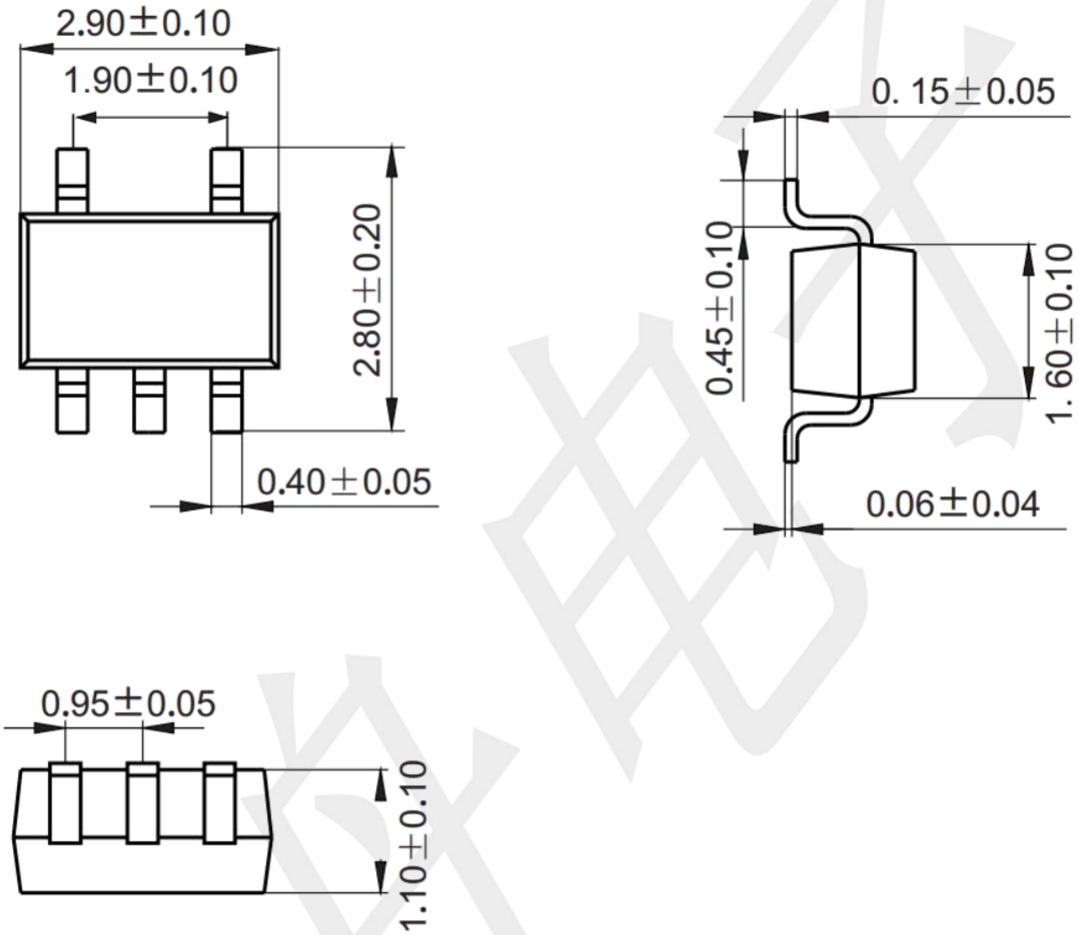
Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R / t_F	V_M	C_L	R_L
0.8V	V_{CC}	≤3ns	$V_{CC}/2$	5,10,15,30pF	1MΩ
1.2V±0.1V	V_{CC}	≤3ns	$V_{CC}/2$	5,10,15,30pF	1MΩ
1.5V±0.1V	V_{CC}	≤3ns	$V_{CC}/2$	5,10,15,30pF	1MΩ
1.8V±0.15V	V_{CC}	≤3ns	$V_{CC}/2$	5,10,15,30pF	1MΩ
2.5V±0.2V	V_{CC}	≤3ns	$V_{CC}/2$	5,10,15,30pF	1MΩ
3.3V±0.3V	V_{CC}	≤3ns	$V_{CC}/2$	5,10,15,30pF	1MΩ

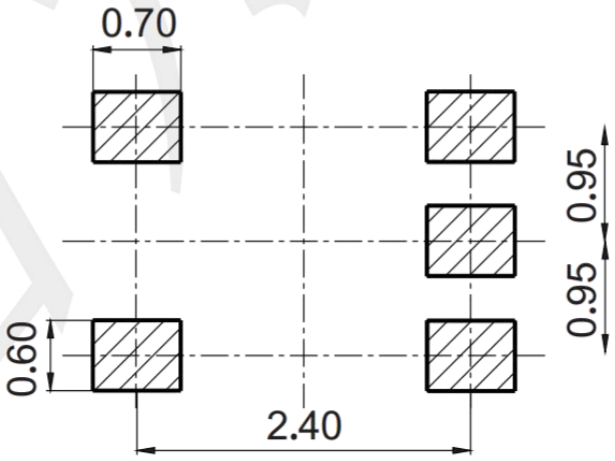


Package information (Unit: mm)

SOT23-5

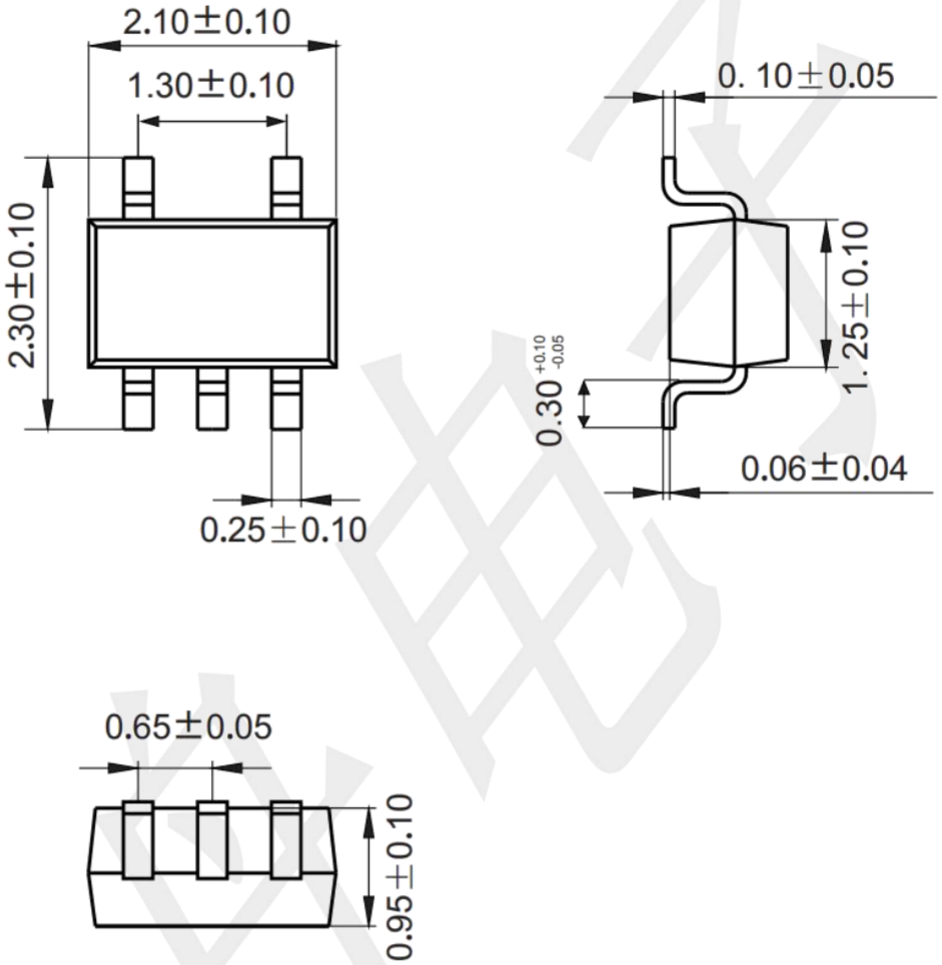


Mounting Pad Layout (unit: mm)

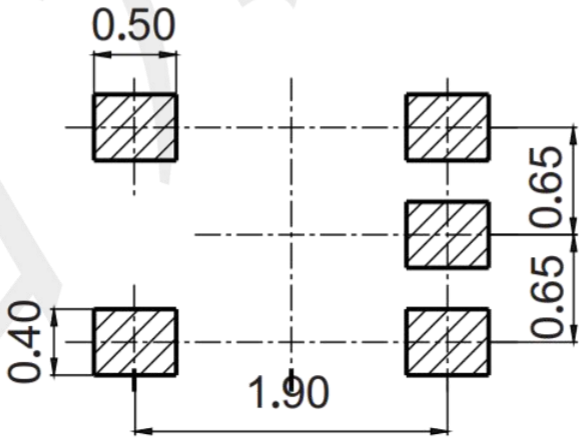


Package information (Unit: mm)

SOT353

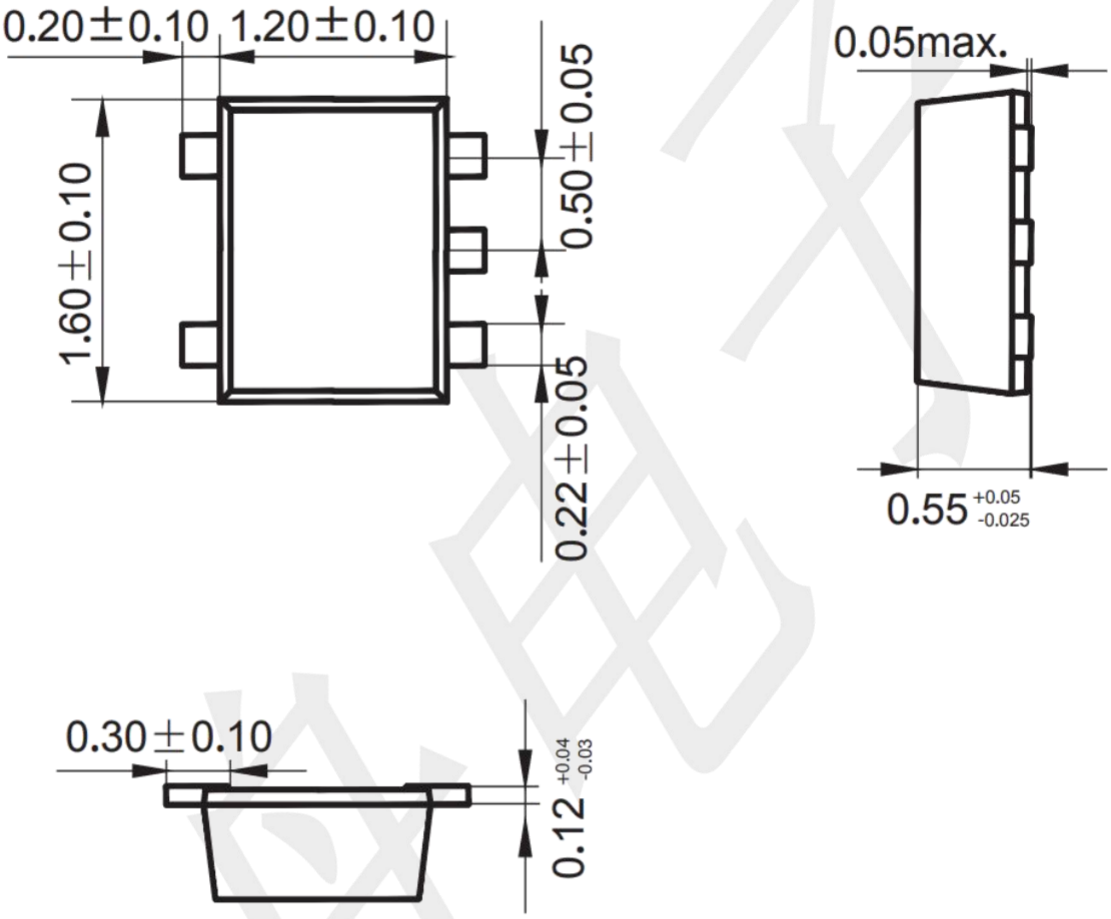


Mounting Pad Layout (unit: mm)

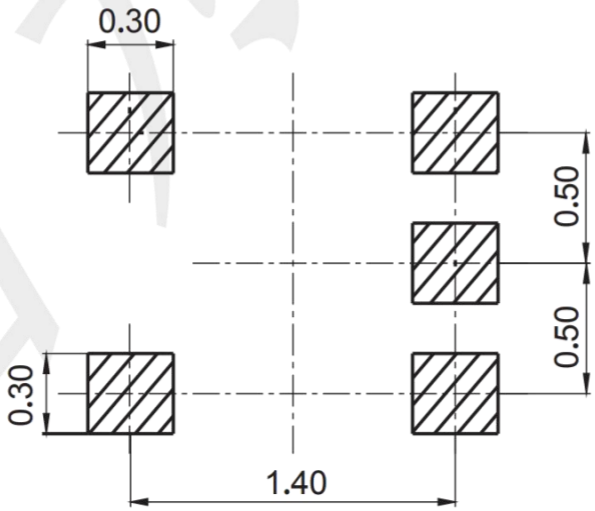


Package information (unit: mm)

SOT553

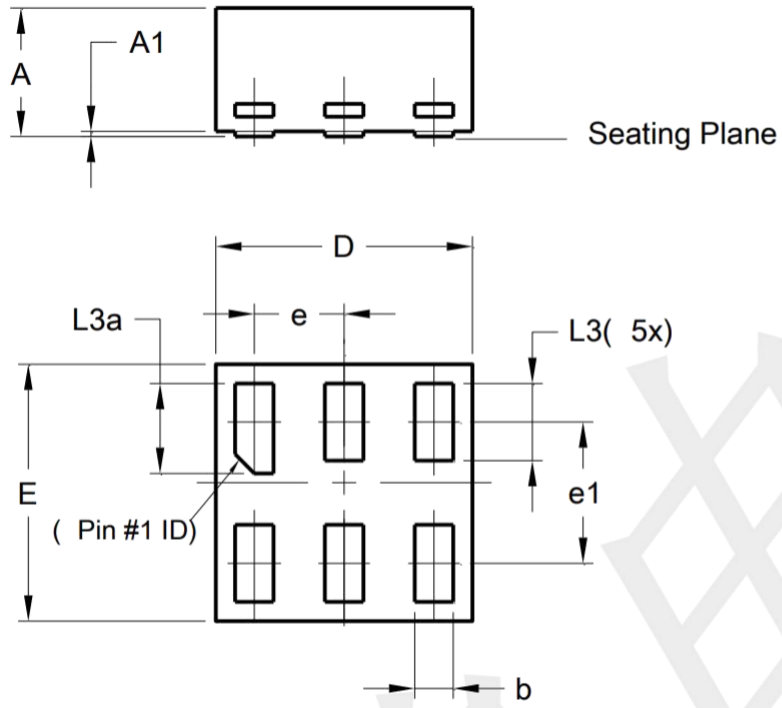


Mounting Pad Layout (unit: mm)



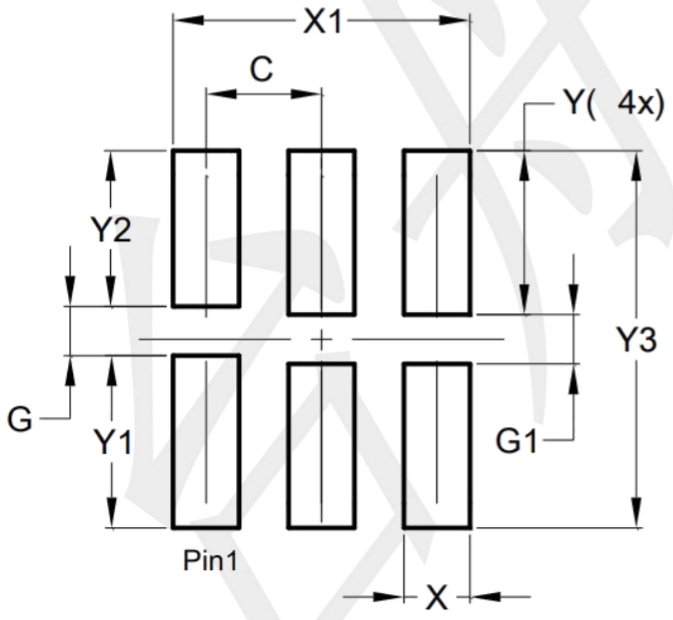
Package information (unit: mm)

DFN1X1-6



DFN1010-6 (Type B)			
Dim	Min	Max	Typ
A	-	0.50	0.39
A1	-	0.04	-
b	0.12	0.20	0.15
D	0.95	1.050	1.00
E	0.95	1.050	1.00
e	0.35 BSC		
e1	0.55 BSC		
L3	0.27	0.30	0.30
L3a	0.32	0.40	0.35
All Dimensions in mm			

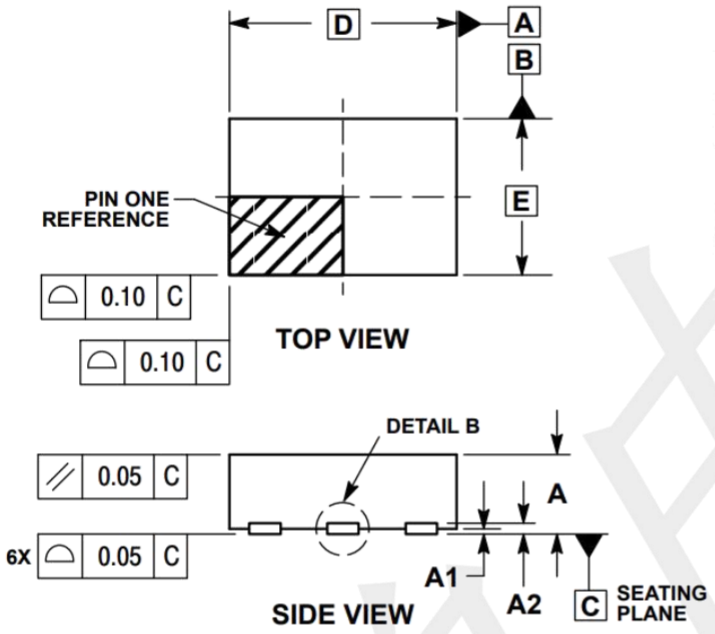
Mounting Pad Layout (unit: mm)



Dimensions	Value (in mm)
C	0.350
G	0.150
G1	0.150
X	0.200
X1	0.900
Y	0.500
Y1	0.525
Y2	0.475
Y3	1.150

Package information (unit: mm)

DFN1510-6



DIM	MILLIMETERS	
	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A2	0.07 REF	
b	0.20	0.30
D	1.45 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.30	0.40
L1	---	0.15

Mounting Pad Layout (unit: mm)