

Features

- Operation Voltage Range: 1.65V ~ 5.5V
- Power Down Protection
- $\pm 24\text{mA}$ Output Drive ($V_{CC}=3.0\text{V}$)
- Low Power Consumption, 10- μA Max ICC
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

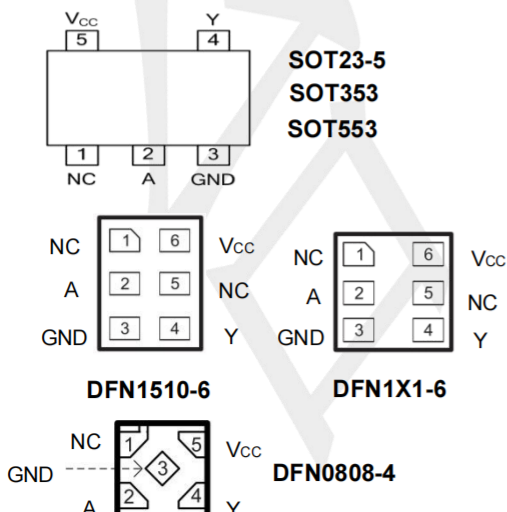
General Description

The TP74LVC1G14 is a single Schmitt-trigger inverter, it provides the function $Y=\overline{A}$. The device have different input threshold levels for positive going (V_{T+}) and negative-going (V_{T-}) signals because of the Schmitt-trigger action in the input.

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	Marking
TP74LVC1G14S5	SOT23-5	Tape and Reel,3000	S114
TP74LVC1G14C5	SOT353	Tape and Reel,3000	C114
TP74LVC1G14X5	SOT553	Tape and Reel,4000	CFJ
TP74LVC1G14D6	DFN1X1-6	Tape and Reel,5000	CF
TP74LVC1G14N6	DFN1510-6	Tape and Reel,5000	CF
TP74LVC1G14P6	DFN0808-4	Tape and Reel,3000	9H

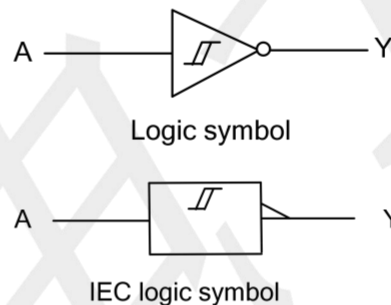
Pin Configuratio



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

Logic Diagram



Function Table

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	VCC		-0.5 ~ +6.5	V
Input Voltage	VIN		-0.5 ~ +6.5	V
Output Voltage	VOUT	Output in the Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ VCC+0.5	V
VCC or GND Current	ICC	Output in the Power-off state	±100	mA
Continuous Output Current	IOUT	VOUT=0~VCC	±50	mA
Input Clamp Current	IIK	VIN<0	-50	mA
Output Clamp Current	IOK	VOUT<0	-50	mA
Storage Temperature Range	TSTG		-65 ~ +150	°C
Junction to Ambient	θ_{JA}	SOT-23-5	230	°C/W
		SOT353	280	°C/W
		SOT553	250	°C/W
		DFN1X1-6	460	°C/W
		DFN1510-6	440	°C/W
		DFN0808-4	340	°C/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	VCC	Operating	1.65	--	5.5	V
		Data retention only	1.5	--	--	V
Input Voltage	VIN		0	--	5.5	V
Output Voltage	VOUT	High or low state	0	--	VCC	V
Operating Temperature	TA		-40	--	125	°C

Electrical Characteristics (unless otherwise specified)

PARAMETER	SYM BOL	TEST Conditions	TA =25°C			TA =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V _{T+}	V _{CC} =1.65V	0.79	--	1.16	0.76	--	1.16	V
		V _{CC} =2.3V	1.11	--	1.56	1.07	--	1.56	V
		V _{CC} =3V	1.5	--	1.87	1.47	--	1.87	V
		V _{CC} =4.5V	2.16	--	2.74	2.13	--	2.74	V
		V _{CC} =5.5V	2.61	--	3.33	2.58	--	3.33	V
Negative-Going Input Threshold Voltage	V _{T-}	V _{CC} =1.65V	0.39	--	0.62	0.39	--	0.65	V
		V _{CC} =2.3V	0.58	--	0.87	0.58	--	0.9	V
		V _{CC} =2.7V	0.84	--	1.14	0.84	--	1.17	V
		V _{CC} =4.5V	1.41	--	1.79	1.41	--	1.82	V
		V _{CC} =5.5V	1.87	--	2.29	1.87	--	2.31	V
Hysteresis Voltage (V _{T+} -V _{T-})	ΔV _T	V _{CC} =1.65V	0.37	--	0.62	0.3	--	0.62	V
		V _{CC} =2.3V	0.48	--	0.77	0.42	--	0.77	V
		V _{CC} =2.7V	0.56	--	0.87	0.5	--	0.87	V
		V _{CC} =4.5V	0.71	--	1.04	0.65	--	1.04	V
		V _{CC} =5.5V	0.71	--	1.11	0.65	--	1.11	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1	--	--	V _{CC} -0.1	--	--	V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2	1.54	--	0.95	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	2.15	--	1.7	--	--	V
		V _{CC} =2.7V, I _{OH} =-16mA	2.2	2.5	--	1.9	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	2.62	--	2.0	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	4.11	--	3.4	--	--	V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65 ~ 5.5V, I _{OL} =100μA	--	--	0.1	--	--	0.1	V
		V _{CC} =1.65V, I _{OL} =4mA	--	0.07	0.45	--	--	0.7	V
		V _{CC} =2.3V, I _{OL} =8mA	--	0.12	0.3	--	--	0.45	V
		V _{CC} =2.7V, I _{OL} =16mA	--	0.17	0.4	--	--	0.6	V
		V _{CC} =3.0V, I _{OL} =24mA	--	0.33	0.55	--	--	0.8	V
		V _{CC} =4.5V, I _{OL} =32mA	--	0.39	0.55	--	--	0.8	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0 ~ 5.5V, V _{IN} =5.5V or GND	--	±0.1	±5	--	--	±5	uA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V	--	±0.1	±10	--	--	±10	uA
Quiescent Supply Current	I _Q	V _{CC} =1.65 ~ 5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0A	--	0.1	10	--	--	10	uA
Additional Quiescent Supply ent Per Input Pin	ΔI _Q	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND	--	5	500	--	--	500	uA

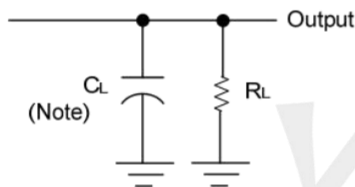
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND	--	5	--	pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =3.3V, V _{IN} =GND or V _{CC}	--	15.4	--	pF

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

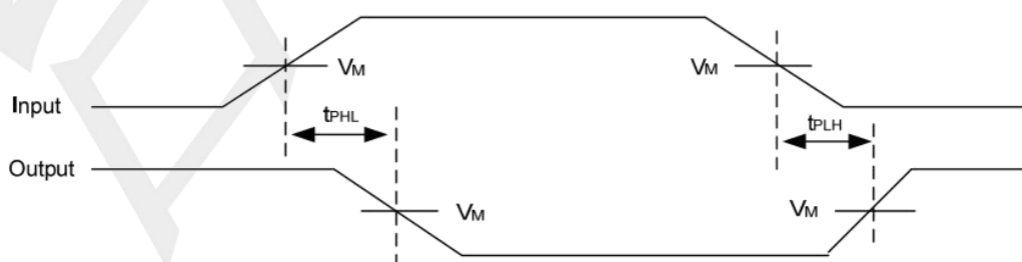
PARAMETER	SYMBOL	TEST Conditions	TA =25°C			TA =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output(Y)	t _{PLH} / t _{PHL}	V _{CC} =1.65~1.95V, C _L =30 pF, R _L =1K	1	8	13	--	--	15	nS
		V _{CC} =2.3~2.7V, C _L =30 pF, R _L =500 Ω	0.7	5	9	--	--	11	nS
		V _{CC} =2.7V, C _L =50pF, R _L =500Ω	0.7	5	8	--	--	10	nS
		V _{CC} =3.0~3.6V, C _L =50pF, R _L =500Ω	0.7	4.5	7	--	--	9	nS
		V _{CC} =4.5~5.5V, C _L =50pF, R _L =500Ω	0.7	4	6	--	--	8	nS

TEST CIRCUIT AND WAVEFORMS



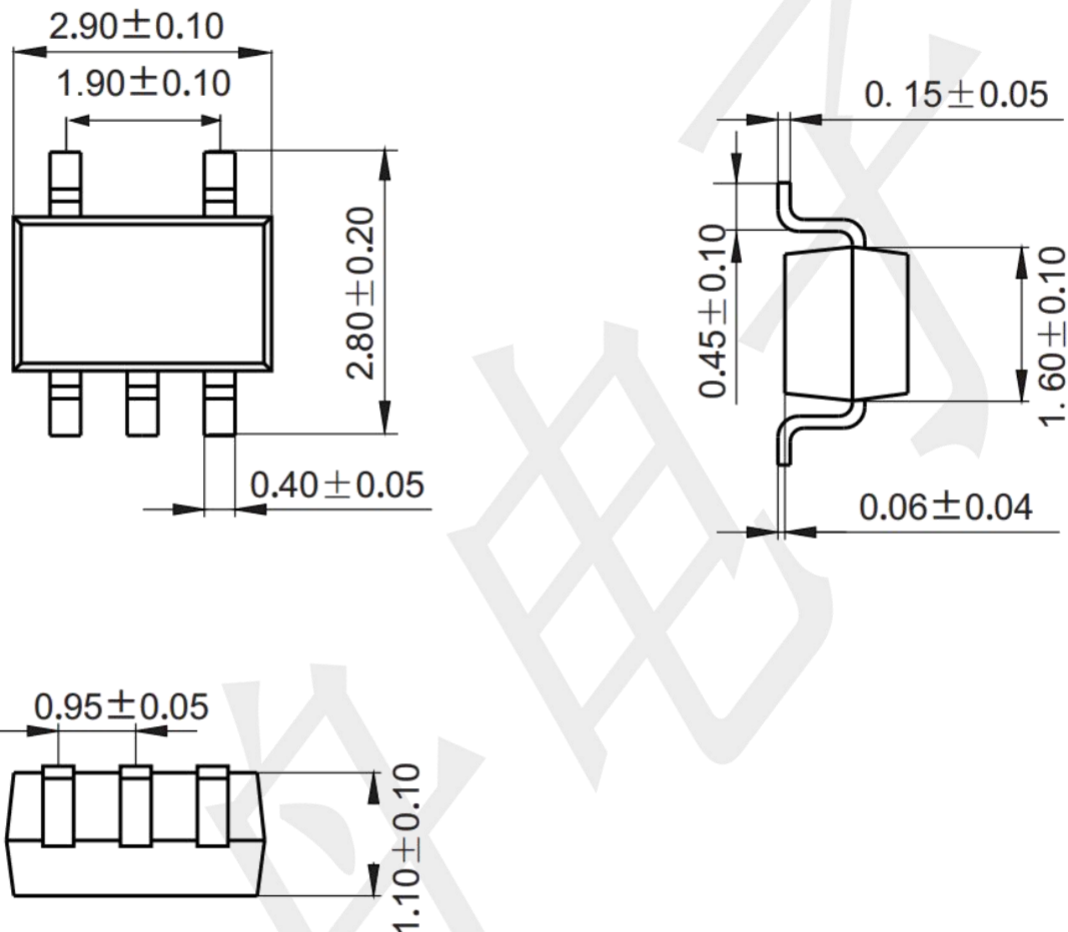
Note: C_L includes probe and jig capacitance.

V _{CC}	V _{IN}	t _R , t _F	V _M	C _L	R _L
1.65V~1.95V	V _{CC}	≤2ns	$\frac{V_{CC}}{2}$	30pF	1kΩ
2.3V~2.7V	V _{CC}	≤2ns	$\frac{V_{CC}}{2}$	30pF	500Ω
2.7V	2.7V	≤2.5ns	1.5V	50pF	500Ω
3.0V~3.6V	2.7V	≤2.5ns	1.5V	50pF	500Ω
4.5V~5.5V	V _{CC}	≤2.5ns	$\frac{V_{CC}}{2}$	50pF	500Ω

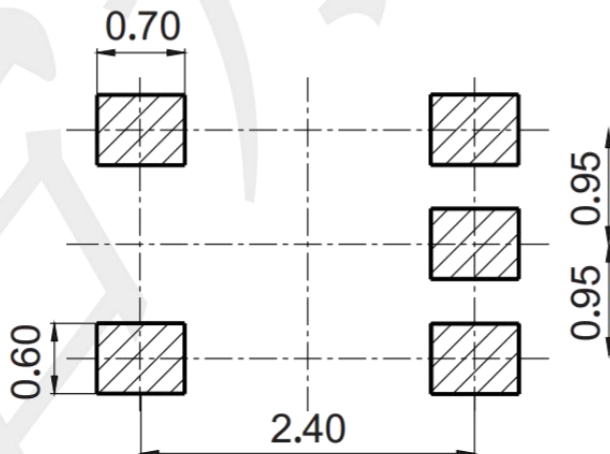


Package informantion

SOT23-5 (Unit: mm)

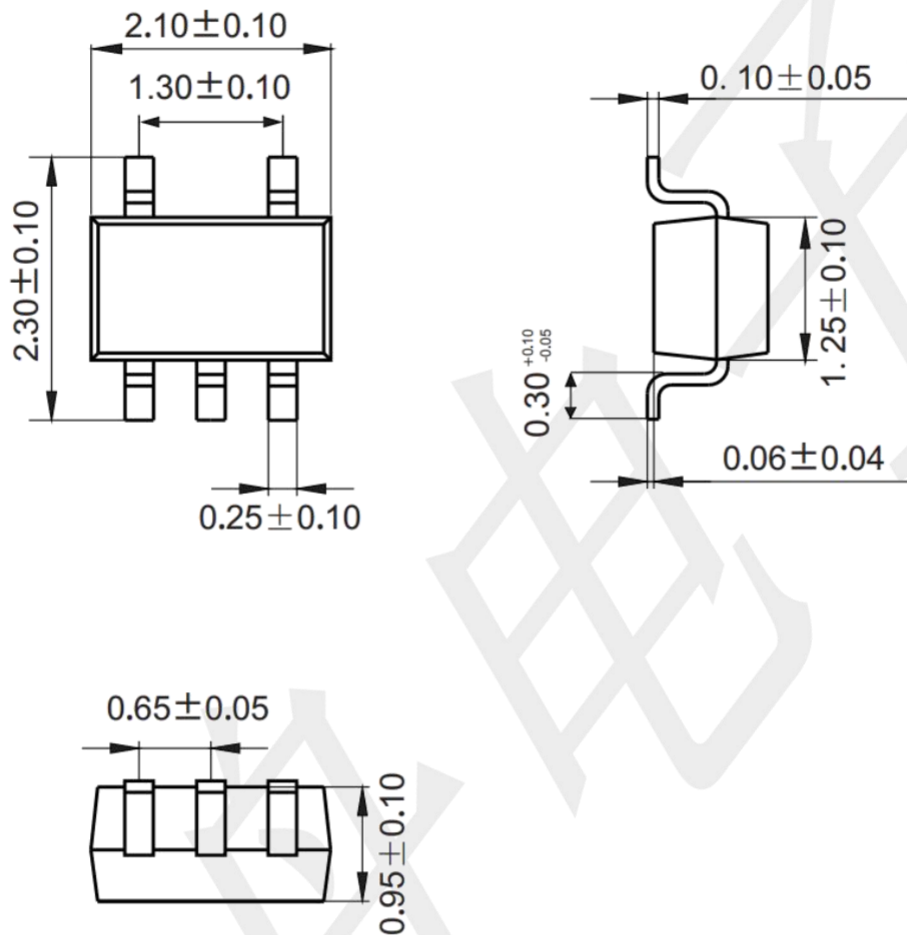


Mounting Pad Layout (unit: mm)

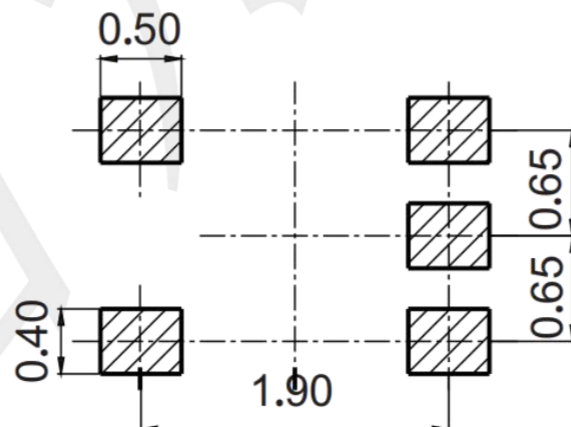


Package information

SOT353 (Unit: mm)

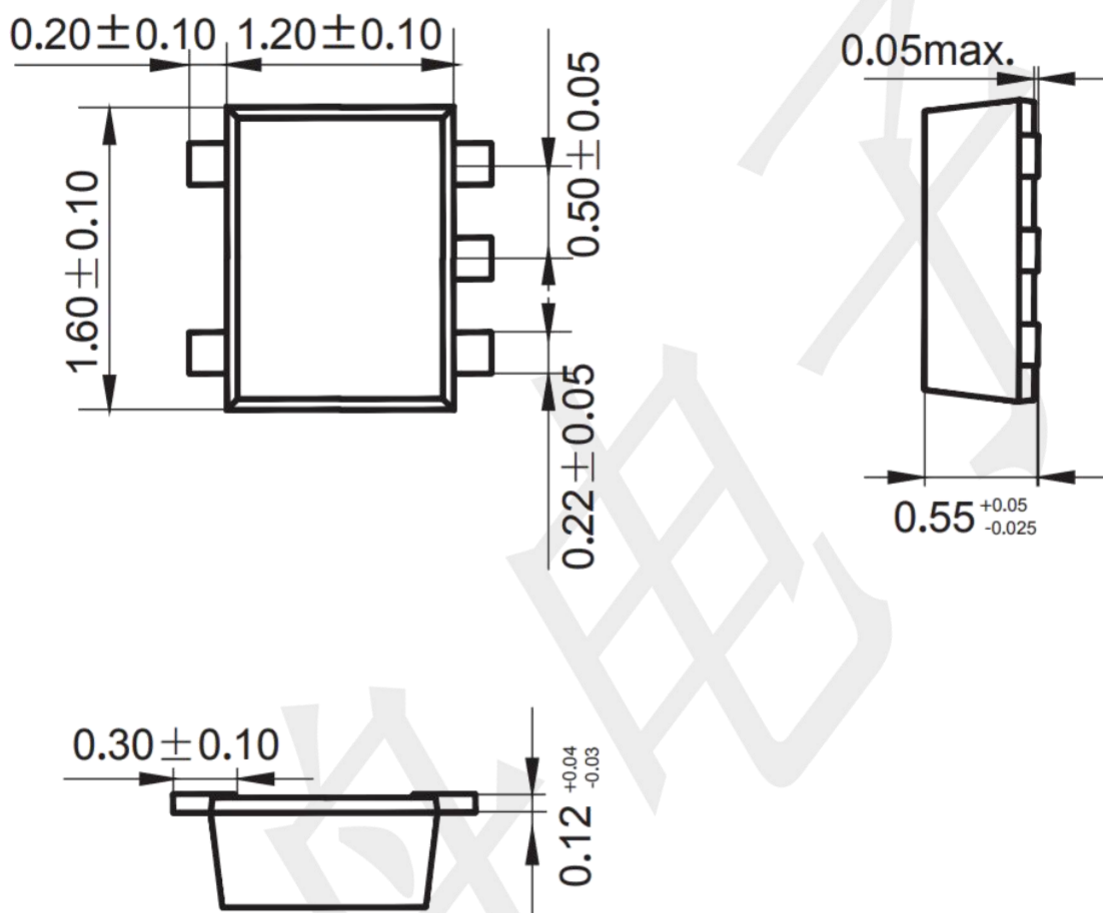


Mounting Pad Layout (unit: mm)

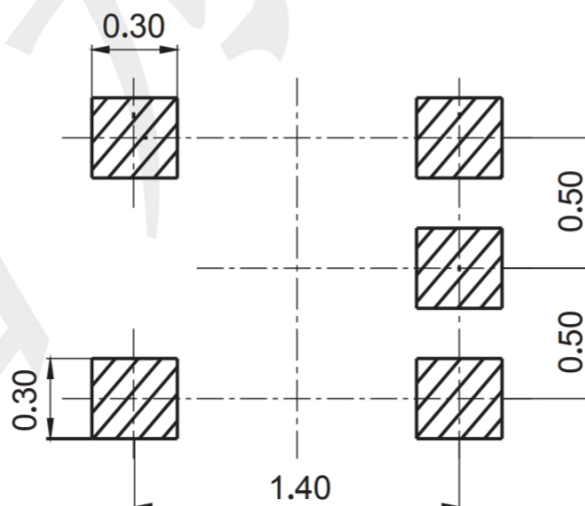


Package information

SOT553 (unit: mm)

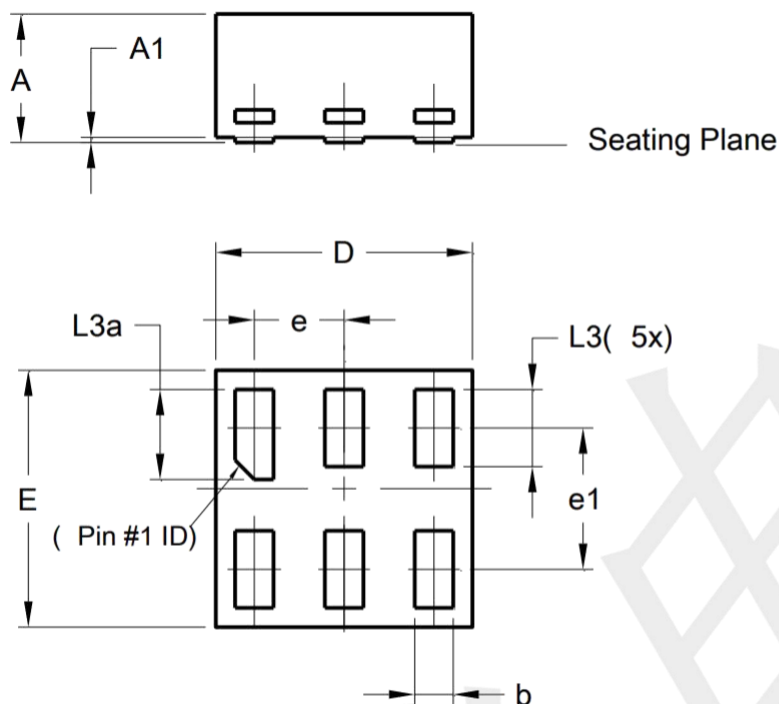


Mounting Pad Layout (unit: mm)



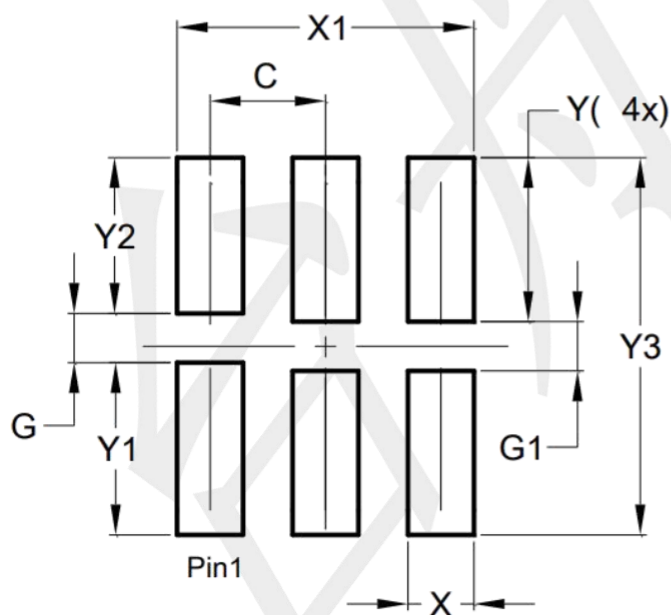
Package information

DFN1X1-6 (unit: mm)



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			

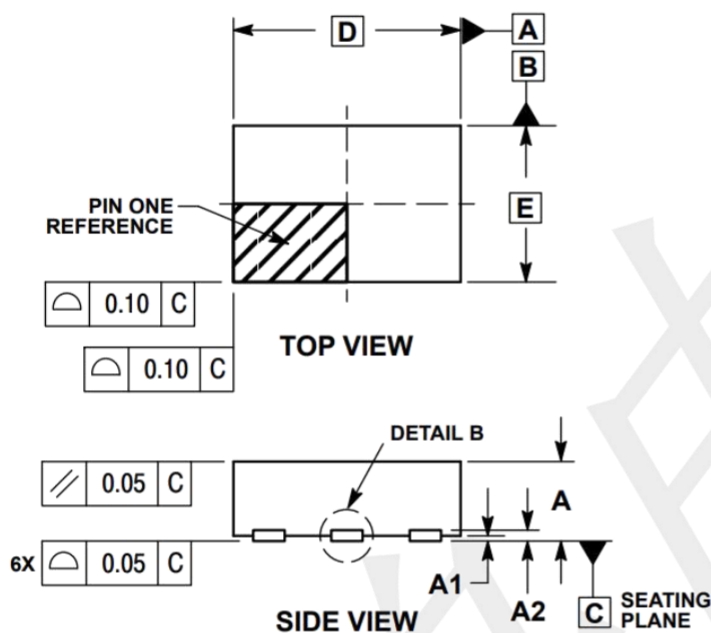
Mounting Pad Layout (unit: mm)



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

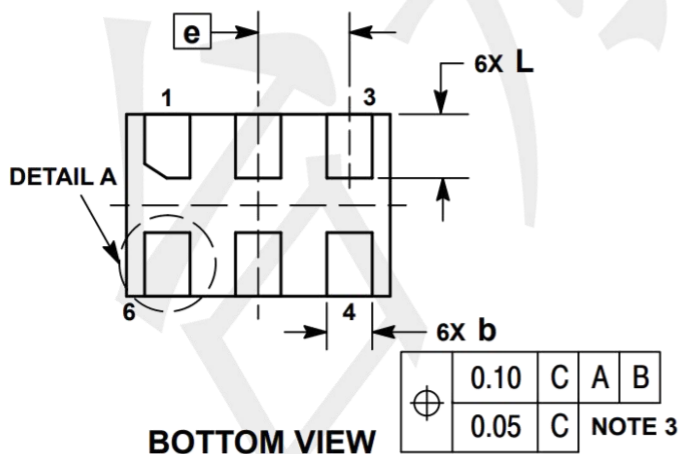
Package information

DFN1510-6 (unit: mm)

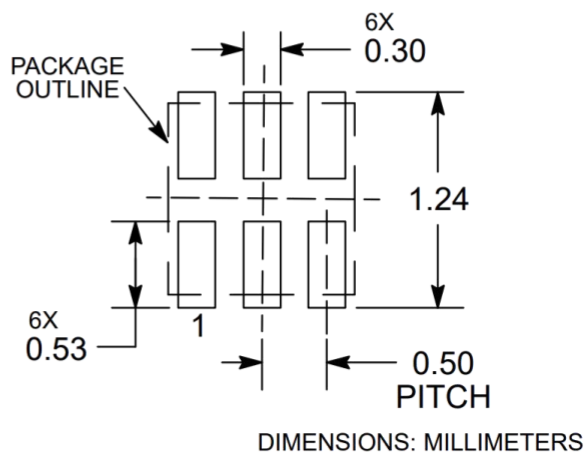


DIM	MILLIMETERS	
	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A2	0.07 REF	
b	0.20	0.30
D	1.45 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.30	0.40
L1	---	0.15

Mounting Pad Layout (unit: mm)

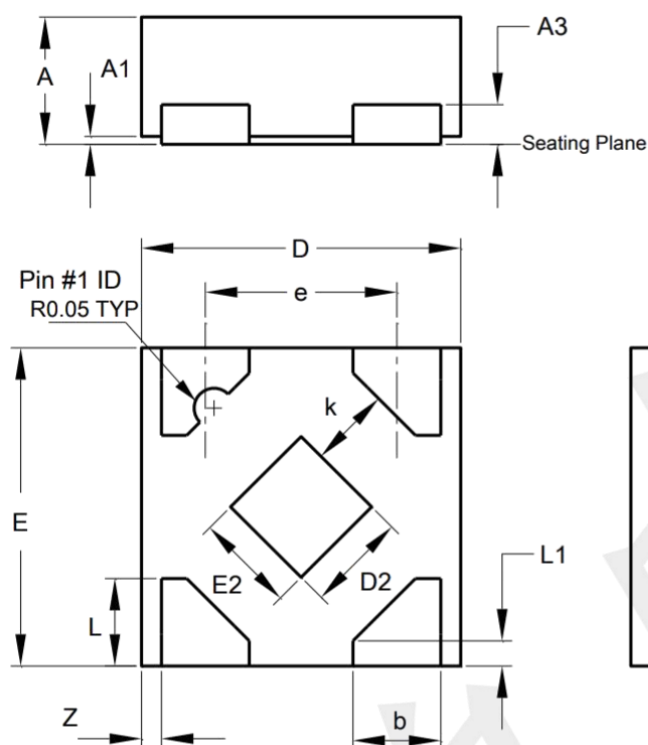


MOUNTING FOOTPRINT



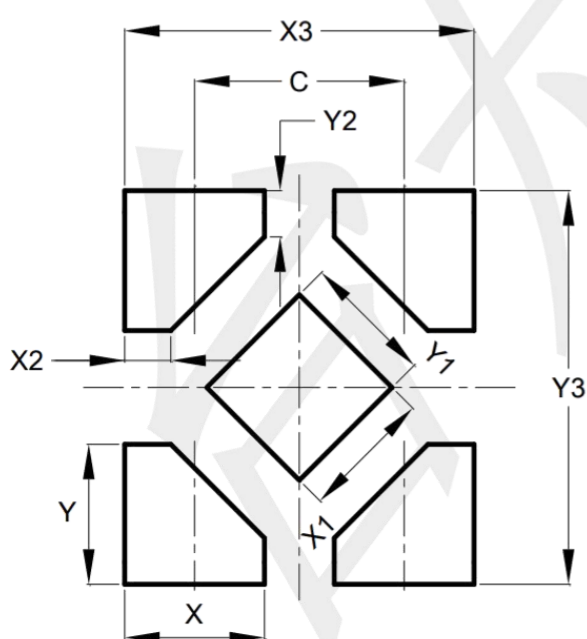
Package information

DFN0808-4 (unit: mm)



DFN0808-4			
Dim	Min	Max	Typ
A	0.25	0.35	0.30
A1	0	0.04	0.02
A3	-	-	0.13
b	0.17	0.27	0.22
D	0.75	0.85	0.80
D2	0.15	0.35	0.25
E	0.75	0.85	0.80
E2	0.15	0.35	0.25
e	-	-	0.48
k	0.20	-	-
L	0.17	0.27	0.22
L1	0.02	0.12	0.07
z	-	-	0.05
All Dimensions in mm			

Mounting Pad Layout (unit: mm)



Dimensions	Value
C	0.480
X	0.320
X1	0.300
X2	0.106
X3	0.800
Y	0.320
Y1	0.300
Y2	0.106
Y3	0.900