

Features

- Operation voltage range: 1.65~5.5V
- Inputs Accept Voltages up to 5.5 V Allowing Down Translation to VCC
- $\pm 24\text{mA}$ output drive ($V_{CC}=3.3\text{V}$)
- 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

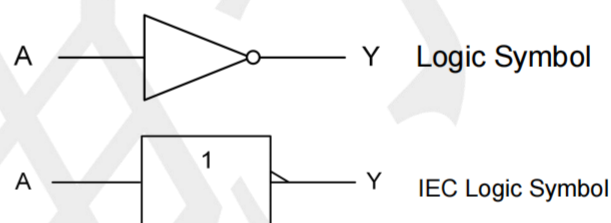
The TP74LVC1G04 is a single inverter gate, it provides the function $Y = \overline{A}$.

This device has power-down protective circuit, preventing device destruction when it is powered down.

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

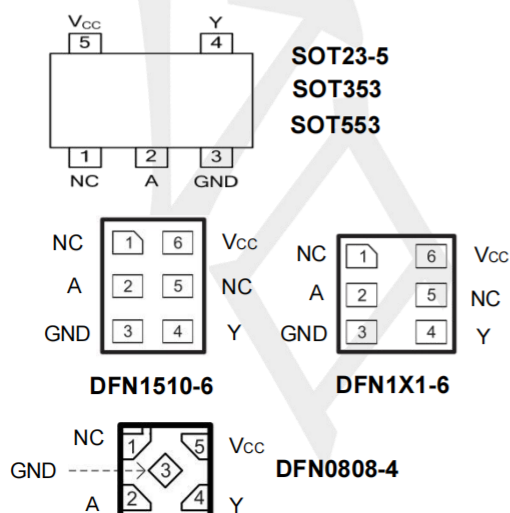
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	Marking
TP74LVC1G04S5	SOT23-5	Tape and Reel,3000	S104
TP74LVC1G04C5	SOT353	Tape and Reel,3000	C104
TP74LVC1G04X5	SOT553	Tape and Reel,4000	CC7
TP74LVC1G04D6	DFN1X1-6	Tape and Reel,5000	CC
TP74LVC1G04N6	DFN1510-6	Tape and Reel,5000	CC
TP74LVC1G04P6	DFN0808-4	Tape and Reel,3000	K4

Pin Configuration



Function Table

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

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
Input Transition Rise or Fall ate	$\Delta t/\Delta v$	VCC=1.8V±0.15V, 2.5V±0.2V	--	--	20	ns/V
		VCC=3.3V±0.3V	--	--	10	ns/V
		VCC=5V±0.5V	--	--	5	ns/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	
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V ~ 1.95V	0.65×V _{CC}	--	--	0.65×V _{CC}	--	--	V
		V _{CC} =2.3V ~ 2.7V	1.7	--	--	1.7	--	--	V
		V _{CC} =3V ~ 3.6V	2	--	--	2	--	--	V
		V _{CC} =4.5V ~ 5.5V	0.7×V _{CC}	--	--	0.7×V _{CC}	--	--	V
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V ~ 1.95V	--	--	0.35×V _{CC}	--	--	0.35×V _{CC}	V
		V _{CC} =2.3V ~ 2.7V	--	--	0.7	--	--	0.7	V
		V _{CC} =2.7V ~ 3.6V	--	--	0.8	--	--	0.8	V
		V _{CC} =4.5V ~ 5.5V	--	--	0.35×V _{CC}	--	--	0.35×V _{CC}	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	--	--	0.95	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	--	--	1.7	--	--	V
		V _{CC} =3.0V, I _{OH} =-16mA	2.2	--	--	1.9	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	--	--	2.0	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	--	--	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	--	--	0.45	--	--	0.7	V
		V _{CC} =2.3V, I _{OL} =8mA	--	--	0.3	--	--	0.45	V
		V _{CC} =3.0V, I _{OL} =16mA	--	--	0.4	--	--	0.6	V
		V _{CC} =3.0V, I _{OL} =24mA	--	--	0.55	--	--	0.8	V
		V _{CC} =4.5V, I _{OL} =32mA	--	--	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 Current 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

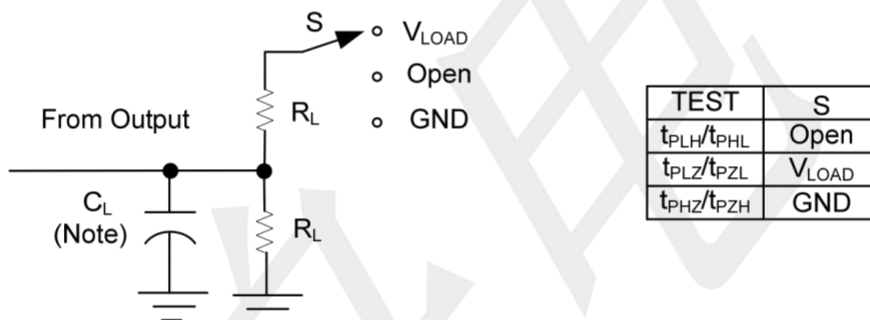
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND	--	3.5	--	pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V	--	16	--	pF
		V _{CC} =2.5V	--	18	--	pF
		V _{CC} =3.3V	--	18	--	pF
		V _{CC} =5.0V	--	20	--	pF

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

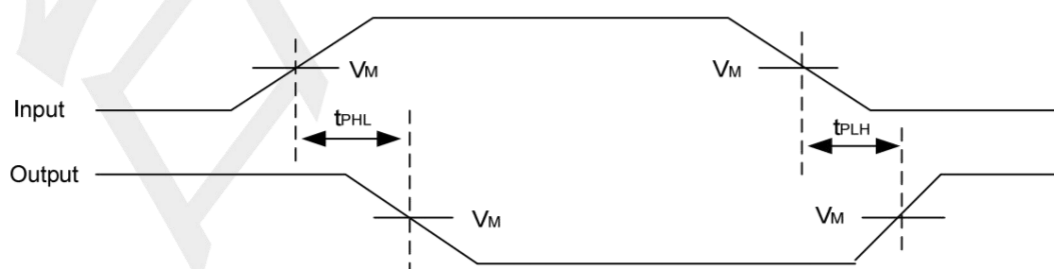
PARAMETER	SYMBOL	TEST Conditions	TA = 25°C			TA = -40°C ~ +125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output(Y)	t _{PLH} / t _{PHL}	CL = 15pF RL = 1MΩ	V _{CC} = 1.8 ± 0.15V, CL = 15 pF			1.0			11 nS
			V _{CC} = 2.5 ± 0.2V, CL = 15 pF			0.5			8 nS
			V _{CC} = 3.3 ± 0.3V, CL = 15 pF			0.5			6 nS
			V _{CC} = 5 ± 0.5V, CL = 15 pF			0.5			5 nS
	t _{PLH} / t _{PHL}	CL = 30pF	V _{CC} = 1.8 ± 0.15V, CL = 30 pF			1.0			12 nS
			V _{CC} = 2.5 ± 0.2V, CL = 30 pF			0.5			9 nS
			V _{CC} = 3.3 ± 0.3V, CL = 50 pF			0.5			7 nS
			V _{CC} = 5 ± 0.5V, CL = 50 pF			0.5			6 nS

TEST CIRCUIT AND WAVEFORMS



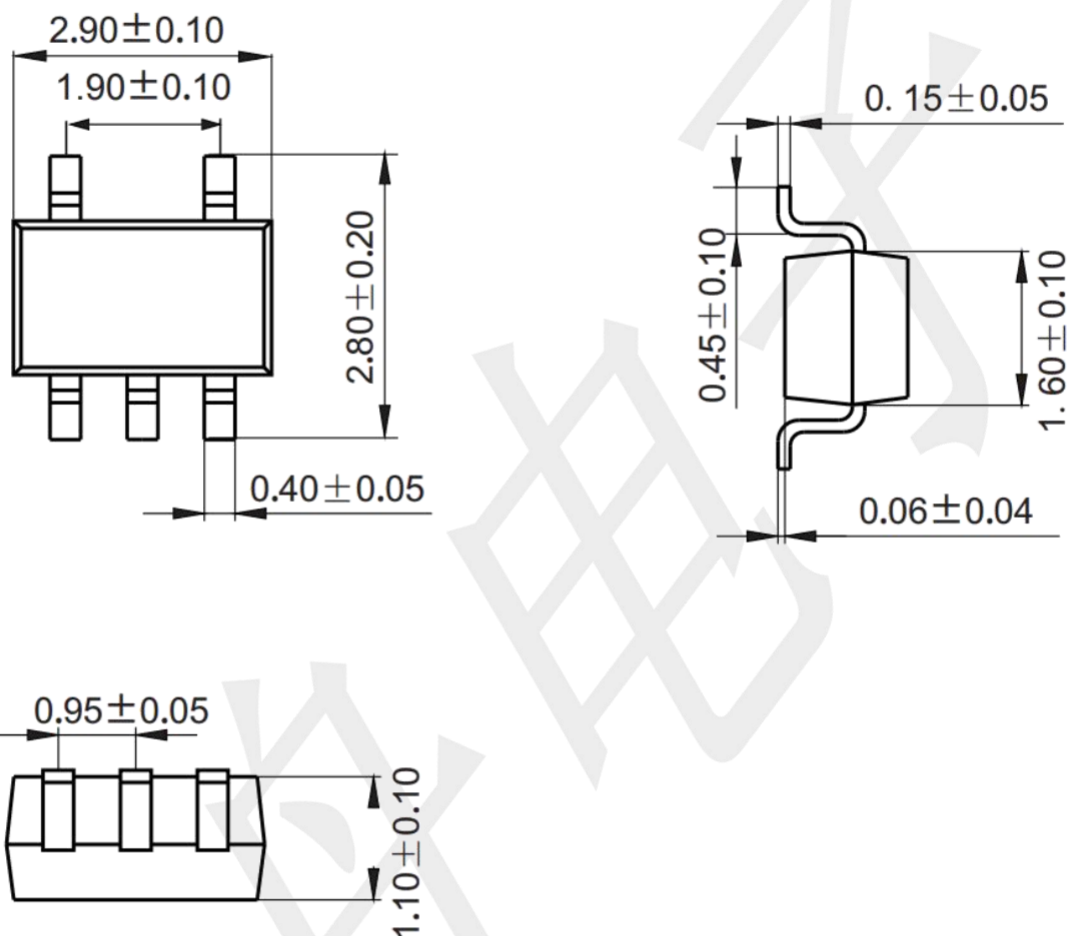
Note: CL includes probe and jig capacitance.

V _{CC}	V _{IN}	t _R , t _F	V _M	V _{LOAD}	C _L	R _L	V _Δ
1.8V ± 0.15V	V _{CC}	≤ 2ns	V _{CC} /2	2 × V _{CC}	15pF	1MΩ	0.15V
2.5V ± 0.2V	V _{CC}	≤ 2ns	V _{CC} /2	2 × V _{CC}	15pF	1MΩ	0.15V
3.3V ± 0.3V	3 V	≤ 2.5ns	1.5V	6V	15pF	1MΩ	0.3V
5V ± 0.5V	V _{CC}	≤ 2.5ns	V _{CC} /2	2 × V _{CC}	15pF	1MΩ	0.3V
1.8V ± 0.15V	V _{CC}	≤ 2ns	V _{CC} /2	2 × V _{CC}	30pF	1kΩ	0.15V
2.5V ± 0.2V	V _{CC}	≤ 2ns	V _{CC} /2	2 × V _{CC}	30pF	500Ω	0.15V
3.3V ± 0.3V	3 V	≤ 2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V ± 0.5V	V _{CC}	≤ 2.5ns	V _{CC} /2	2 × V _{CC}	50pF	500Ω	0.3V

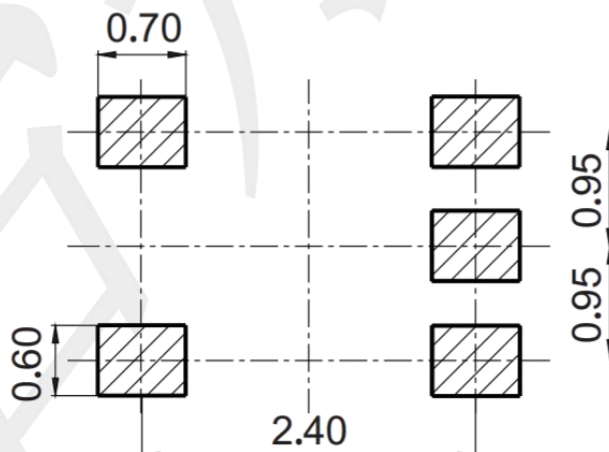


Package information

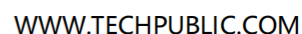
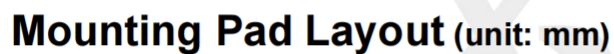
SOT23-5 (Unit: mm)



Mounting Pad Layout (unit: mm)

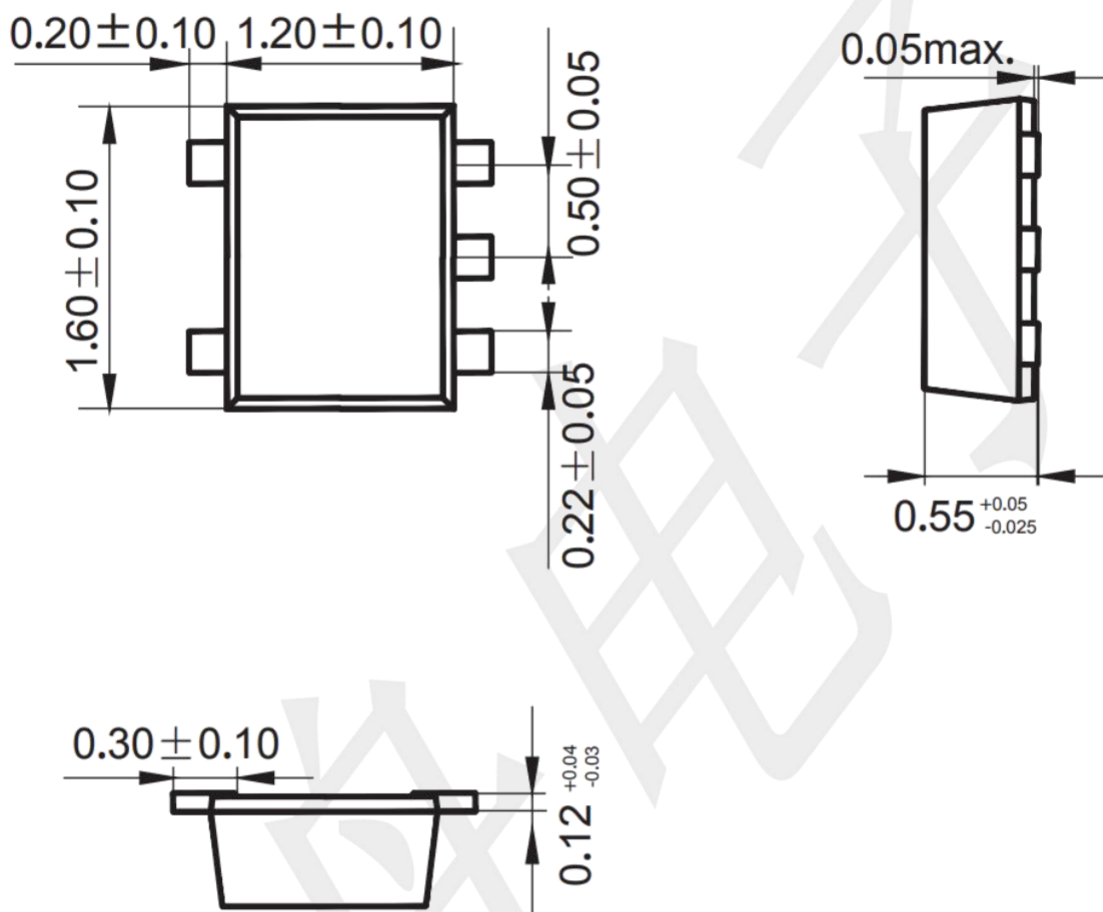


SOT353 (Unit: mm)

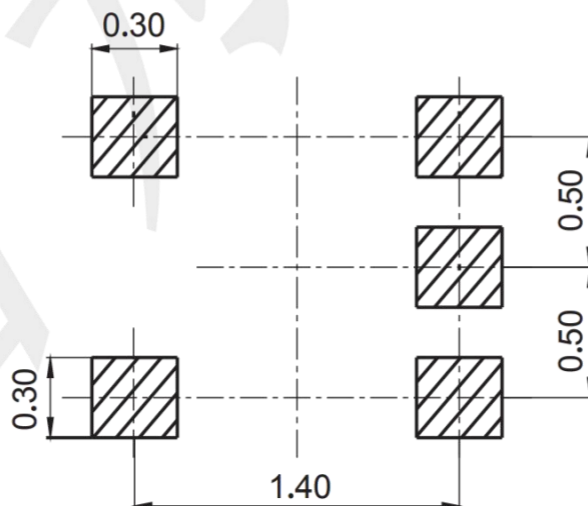


Package information

SOT553 (unit: mm)

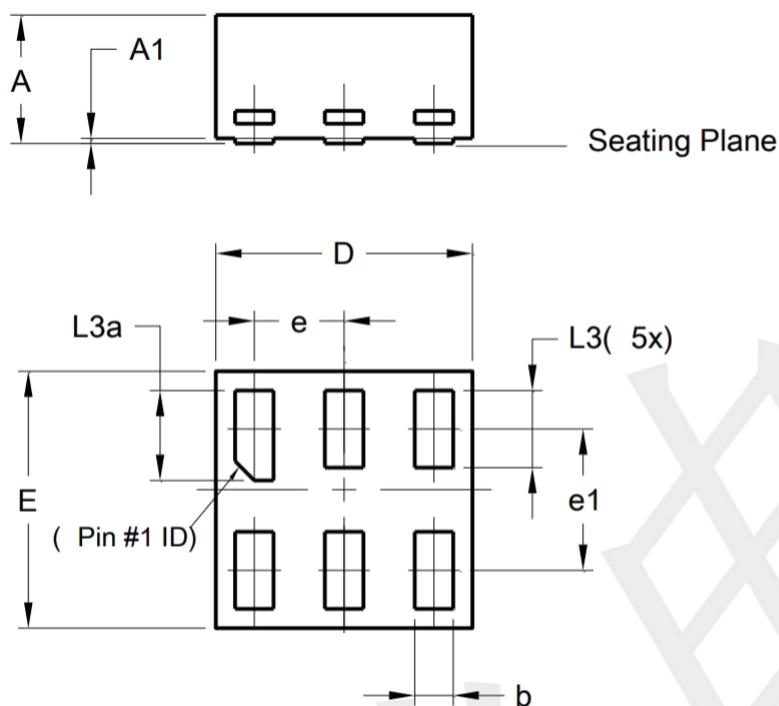


Mounting Pad Layout (unit: mm)



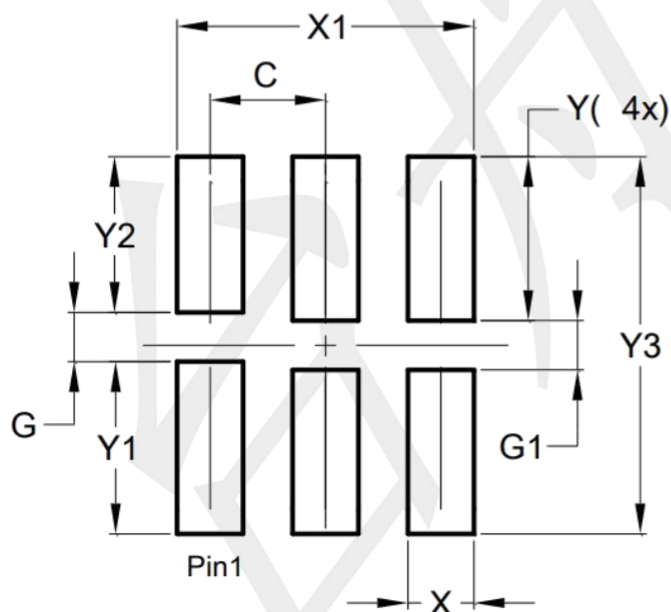
Package information

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			

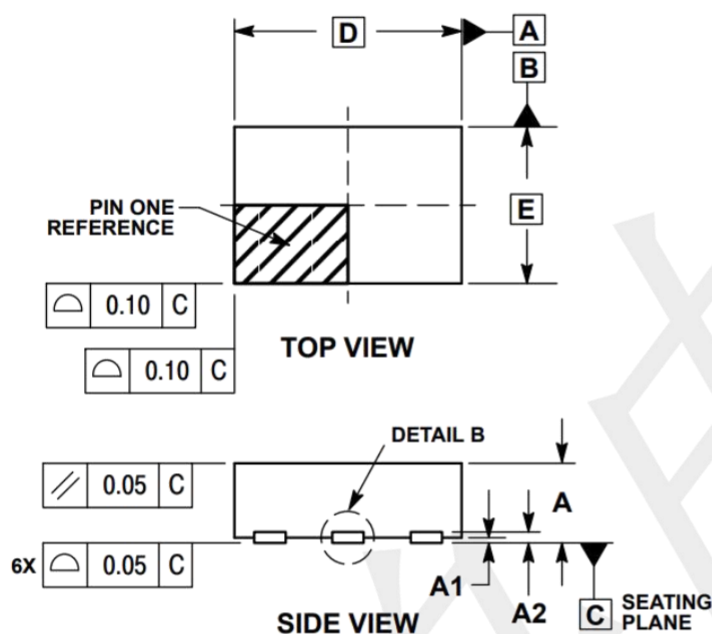
Mounting Pad Layout (unit: mm)



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

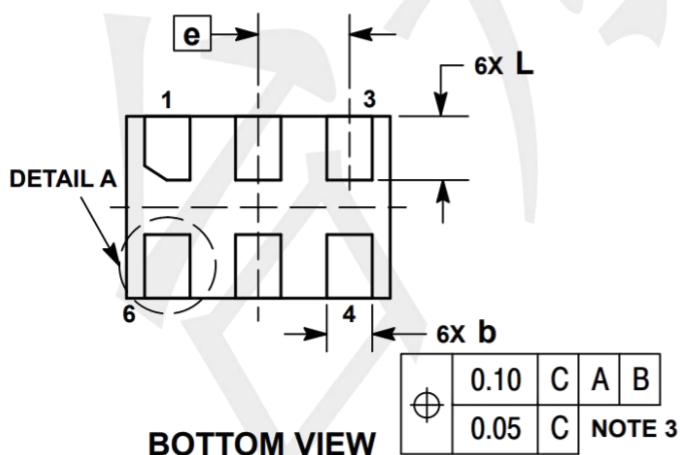
Package information

DFN1510-6 (unit: mm)

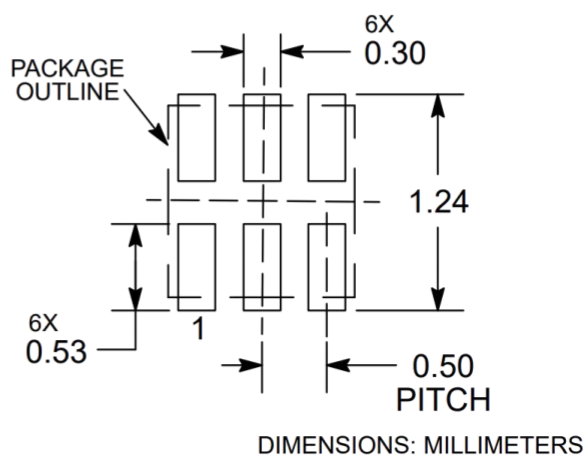


DIM	MILLIMETERS	
	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A2	0.07 REF	
b	0.20	0.30
D	1.45 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.30	0.40
L1	---	0.15

Mounting Pad Layout (unit: mm)

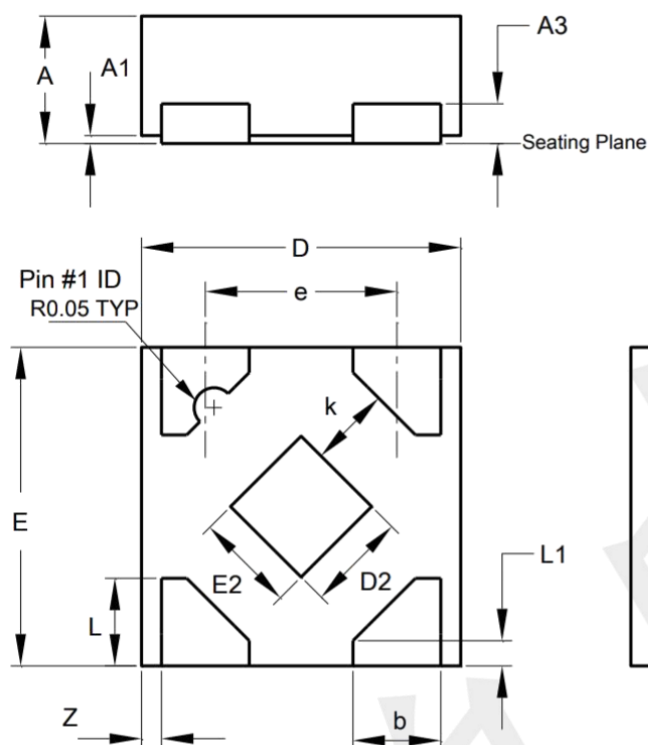


MOUNTING FOOTPRINT



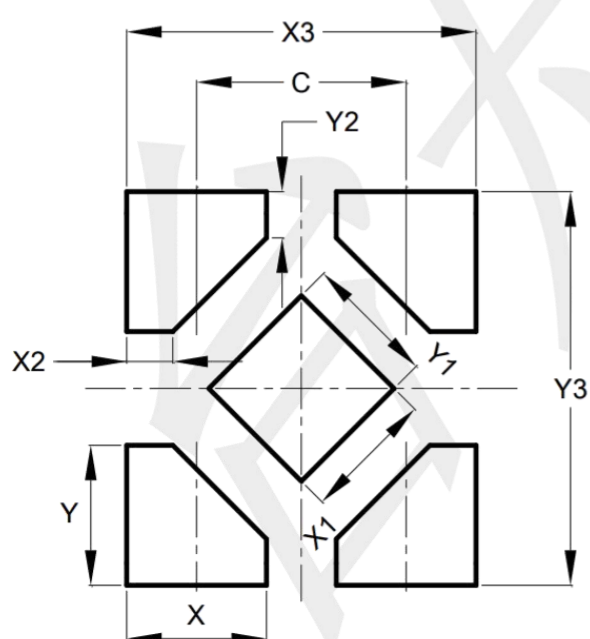
Package information

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