

Features

- Operate from 1.65V to 5.5V
- Inputs Accept Voltages to 5.5V
- I_{OFF} supports partial-power-down mode
- Low static power consumption; I_{CC}=10μA (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)

General Description

The TP74LVC1G332 device performs the Boolean function in $Y=A+B+C$ or $Y=\overline{A}\cdot\overline{B}\cdot\overline{C}$ positive logic. This device is fully specified for partial-power-down applications using I_{OFF}. The I_{OFF} circuitry disables the outputs, preventing damaging current backflow through the device 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
- Solid State Drive(SSD): Client and Enterprise
- Wireless Headset, Keyboard, and Mouse

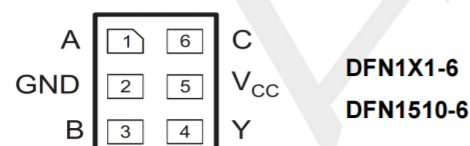
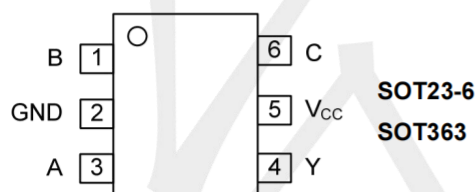
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74LVC1G332S6	SOT23-6	Tape and Reel, 3000
TP74LVC1G332C6	SOT363	Tape and Reel, 3000
TP74LVC1G332D6	DFN1X1-6	Tape and Reel, 5000
TP74LVC1G332N6	DFN1510-6	Tape and Reel, 5000

Pin Configuratio



Function Table

INPUT			OUTPUT
A	B	C	Y
H	X	X	H
X	H	X	H
X	X	H	H
L	L	L	L

Note: H: HIGH voltage level, L: LOW voltage level, X = Valid H or L

Absolute Maximum Ratings (Unless otherwise specified)

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 high or low state	-0.5 ~ VCC + 0.5	V
		Output in the power-off state	-0.5 ~ +6.5	V
VCC or GND Current	ICC		±100	mA
Continuous Output Current	IOUT	VOUT=0~VCC	±50	mA
Input Clamp Current	IiK	VIN<0	-50	mA
Output Clamp Current	IoK	VOUT>VCC or VOUT<0V	-50	mA
Storage Temperature Range	TSTG		-65 ~ +150	°C
Junction to Ambient	θ_{JA}	SOT-23-6	230	°C/W
		SOT363	280	°C/W
		DFN1X1-6	460	°C/W
		DFN1510-6	440	°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 (Unless otherwise specified)

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 Rate	$\Delta t/\Delta v$	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 (TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	V _{IH}	V _{CC} =1.8±0.15V	0.65× V _{CC}	--	--	V
		V _{CC} =2.5±0.2V	1.7	--	--	V
		V _{CC} =3.3±0.3V	2	--	--	V
		V _{CC} =5±0.5V	0.7× V _{CC}	--	--	V
Low-level Input Voltage	V _{IL}	V _{CC} =1.8±0.15V	--	--	0.35× V _{CC}	V
		V _{CC} =2.5±0.2V	--	--	0.7	V
		V _{CC} =3.3±0.3V	--	--	0.8	V
		V _{CC} =5±0.5V	--	--	0.3× V _{CC}	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 5.5V, I _{OH} =-100μA	V _{CC} - 0.1	--	--	V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	--	--	V
		V _{CC} =3.0V, I _{OH} =-16mA	2.4	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	--	--	V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65 ~ 5.5V, I _{OL} =100μA	--	--	0.1	V
		V _{CC} =1.65V, I _{OL} =4mA	--	--	0.45	V
		V _{CC} =2.3V, I _{OL} =8mA	--	--	0.3	V
		V _{CC} =3.0V, I _{OL} =16mA	--	--	0.4	V
		V _{CC} =3.0V, I _{OL} =24mA	--	--	0.55	V
		V _{CC} =4.5V, I _{OL} =32mA	--	--	0.55	V
Input Leakage Current (All Input)	I _{I(LEAK)}	V _{CC} =0V ~ 5.5V V _{IN} =5.5V or GND	--	--	±5	μA
Power Off Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V	--	--	±10	μA
Quiescent Supply Current	I _{CC}	V _{CC} =1.65 ~ 5.5V, V _{IN} =5.5V or GND, I _{OUT} =0	--	--	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI _{CC}	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, other inputs at V _{CC} or GND	--	--	500	μA

SWITCHING CHARACTERISTICS

($T_A=25^{\circ}\text{C}$, unless otherwise specified)

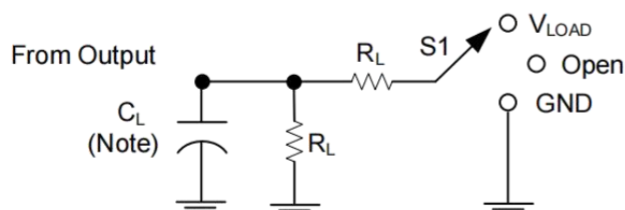
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (A, B or C) to output (Y)	t_{PD}	$V_{CC}=1.8\text{V}\pm 0.15\text{V}$	$C_L=15\text{pF}$	2.4	--	17	ns
		$V_{CC}=2.5\text{V}\pm 0.2\text{V}$		1.4	--	7	ns
		$V_{CC}=3.3\text{V}\pm 0.3\text{V}$		1.2	--	5.5	ns
		$V_{CC}=5\text{V}\pm 0.5\text{V}$		0.8	--	4	ns
		$V_{CC}=1.8\text{V}\pm 0.15\text{V}$	$C_L=30\text{pF}$ or 50pF	2.8	--	17.2	ns
		$V_{CC}=2.5\text{V}\pm 0.2\text{V}$		1.5	--	7.5	ns
		$V_{CC}=3.3\text{V}\pm 0.3\text{V}$		1.4	--	6	ns
		$V_{CC}=5\text{V}\pm 0.5\text{V}$		1	--	5	ns

OPERATING CHARACTERISTICS

($f=10\text{MHz}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC}=3.3\text{V}$, $V_{IN}=V_{CC}$ or GND	--	3.5	--	pF
Power Dissipation Capacitance	C_{PD}	$V_{CC}=1.8\text{V}$, $f=10\text{MHz}$	--	18	--	pF
		$V_{CC}=2.5\text{V}$, $f=10\text{MHz}$	--	19	--	pF
		$V_{CC}=3.3\text{V}$, $f=10\text{MHz}$	--	20	--	pF
		$V_{CC}=5\text{V}$, $f=10\text{MHz}$	--	23	--	pF

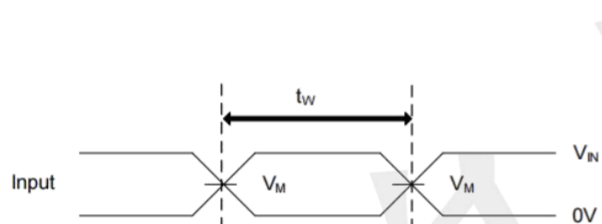
TEST CIRCUIT AND WAVEFORMS



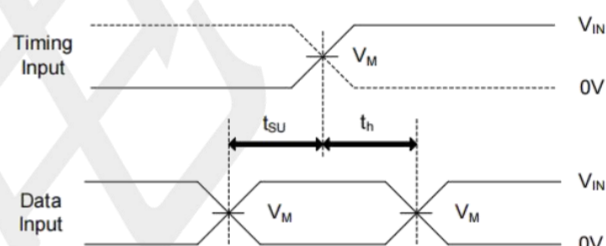
TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

Note: C_L includes probe and jig capacitance.

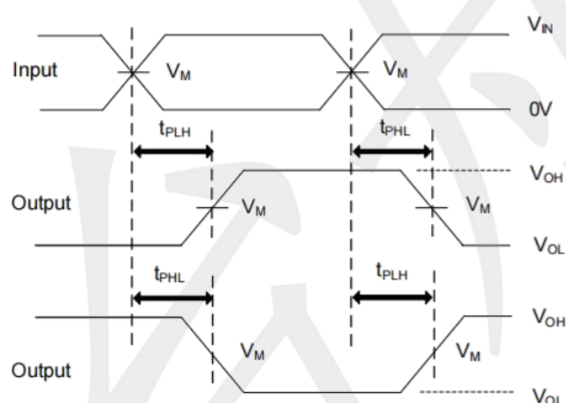
V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_{IN}	t_R / t_F					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	15pF	1M Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.3V



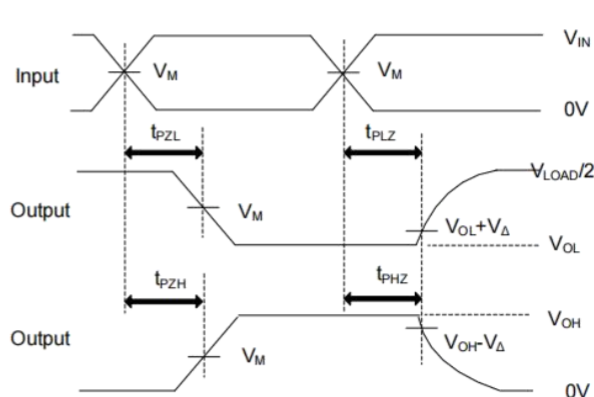
PULSE WIDTH



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



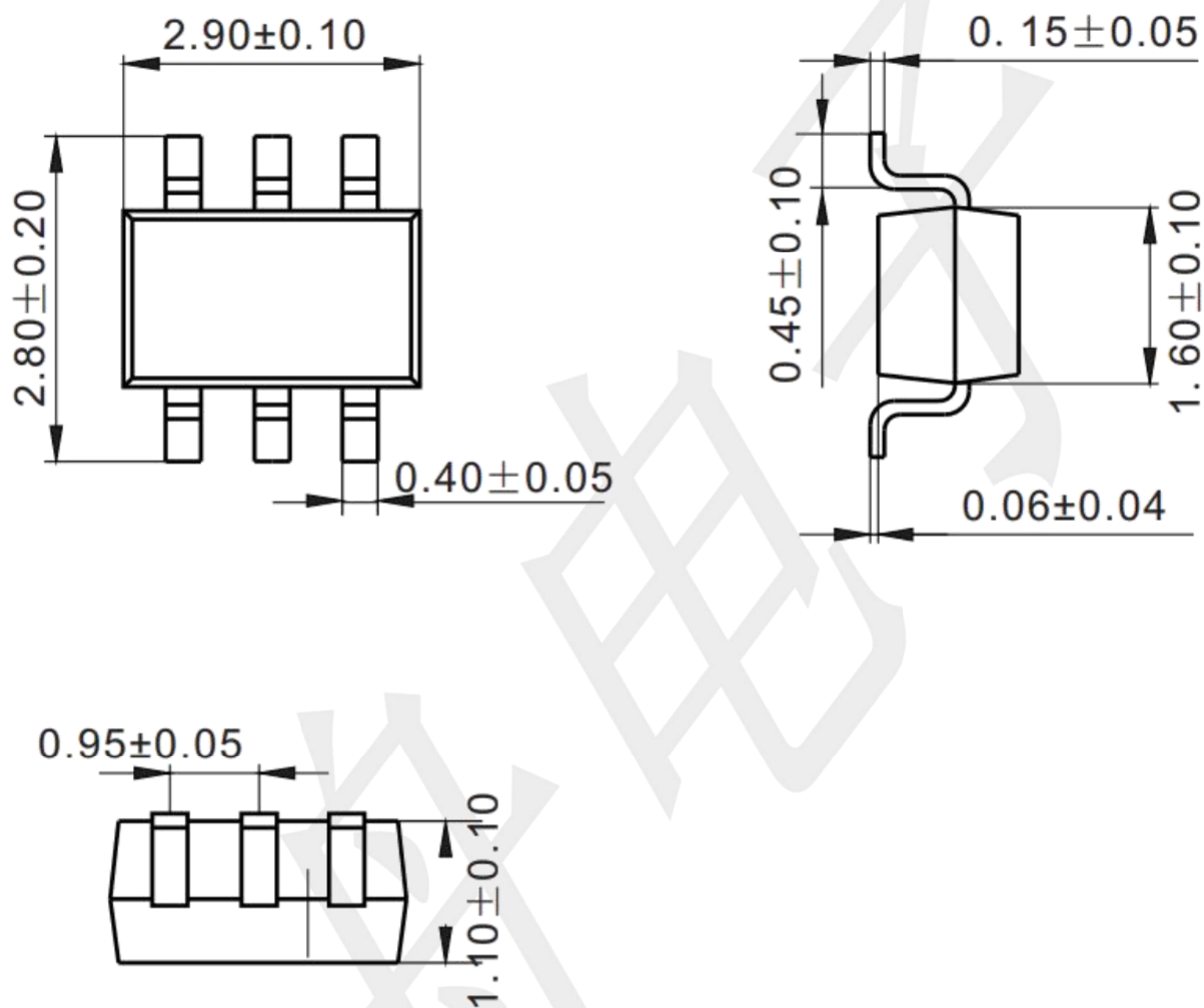
ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.

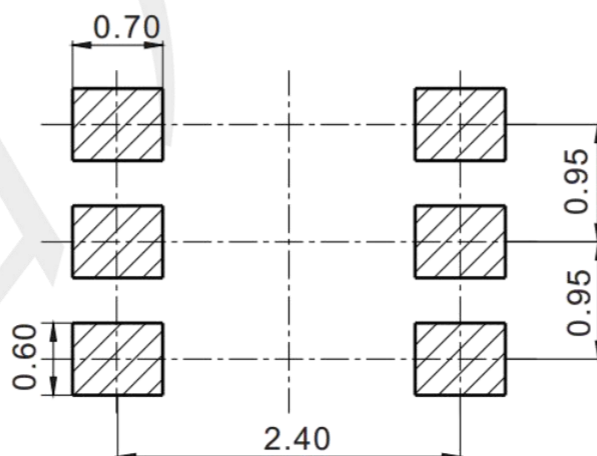
2. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_o = 50\Omega$.

Package information (Unit: mm)

SOT23-6

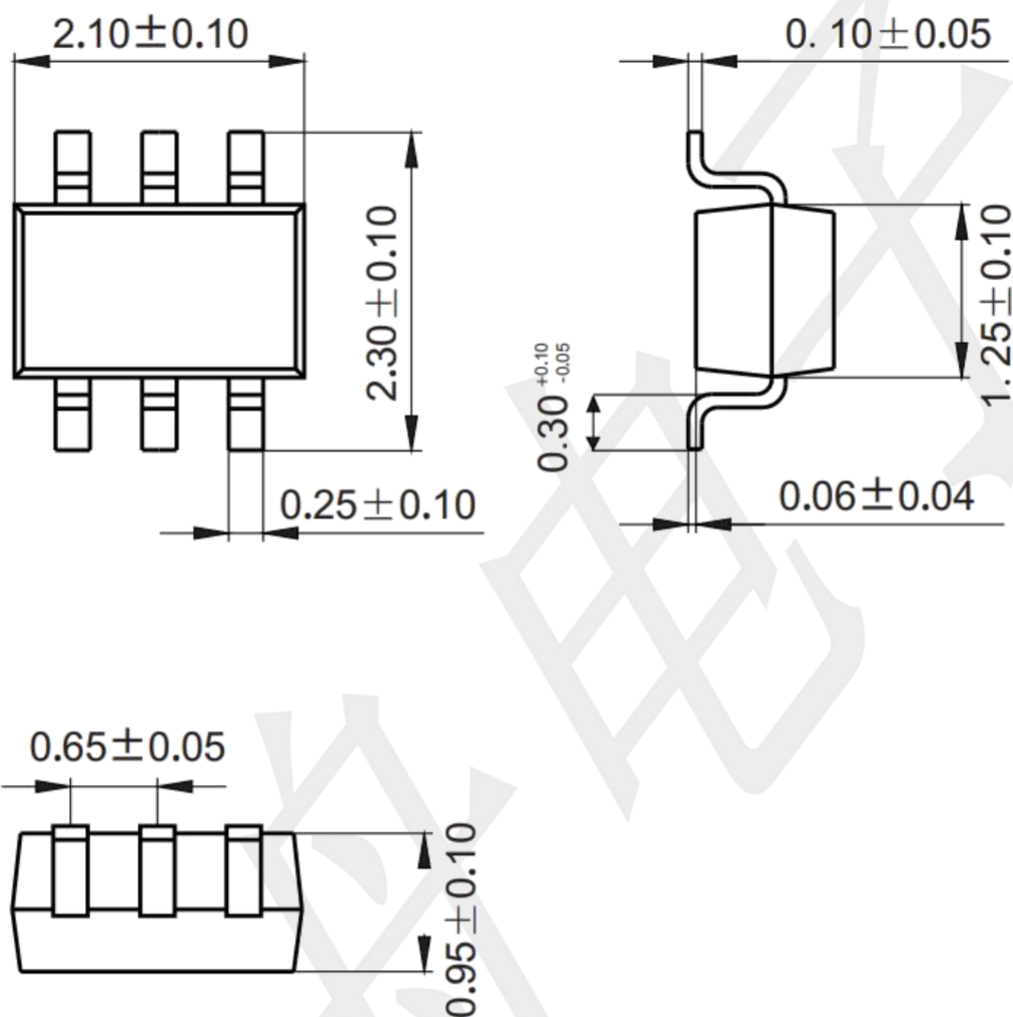


Mounting Pad Layout (unit: mm)

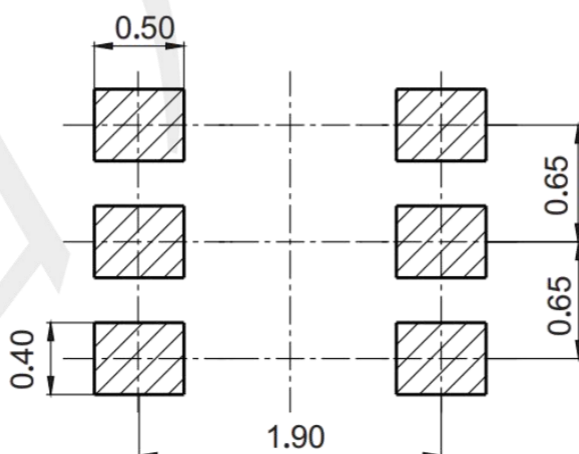


Package information (Unit: mm)

SOT363

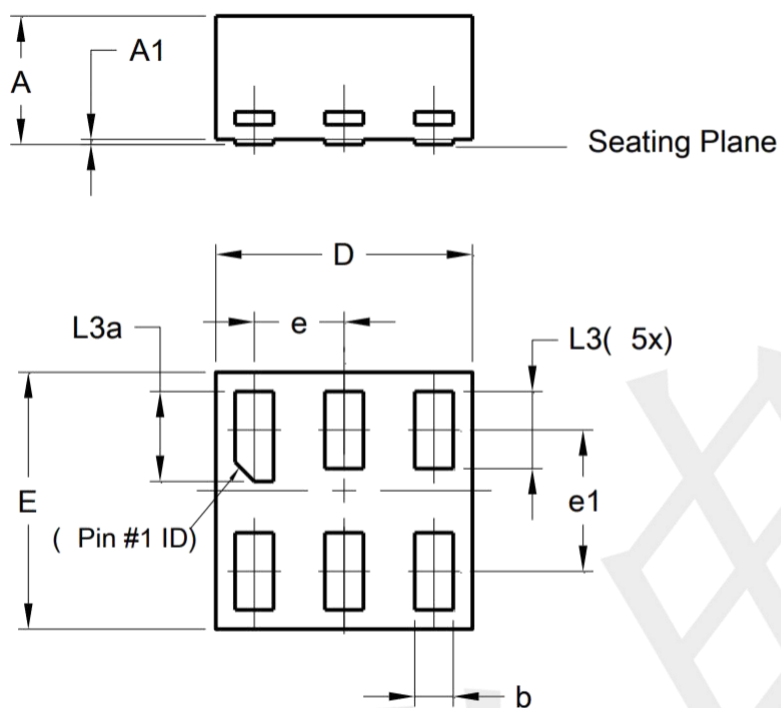


Mounting Pad Layout (unit: mm)



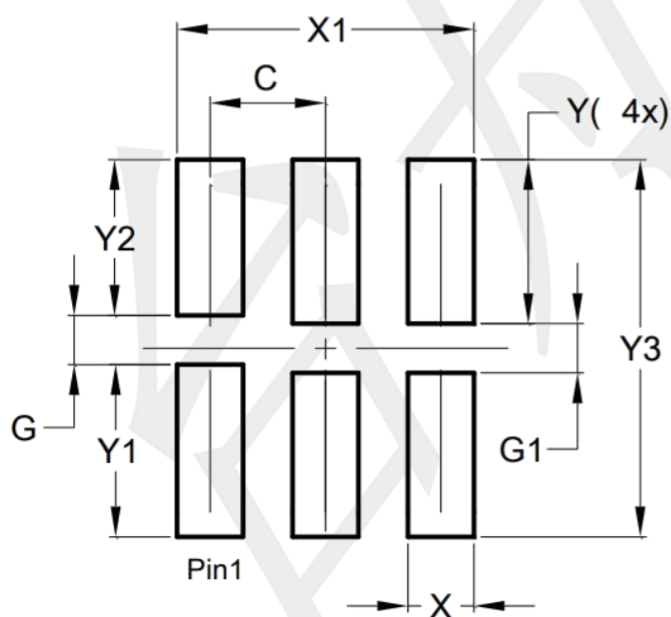
Package information (unit: mm)

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			

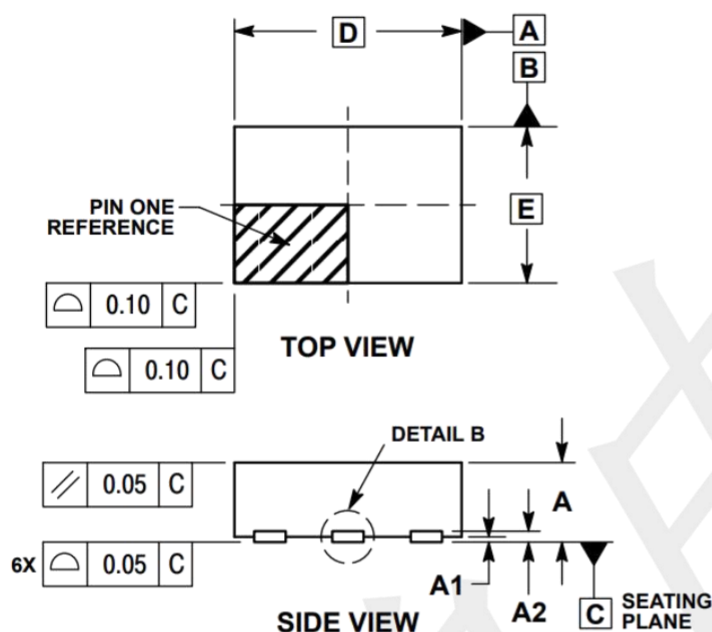
Mounting Pad Layout (unit: mm)



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

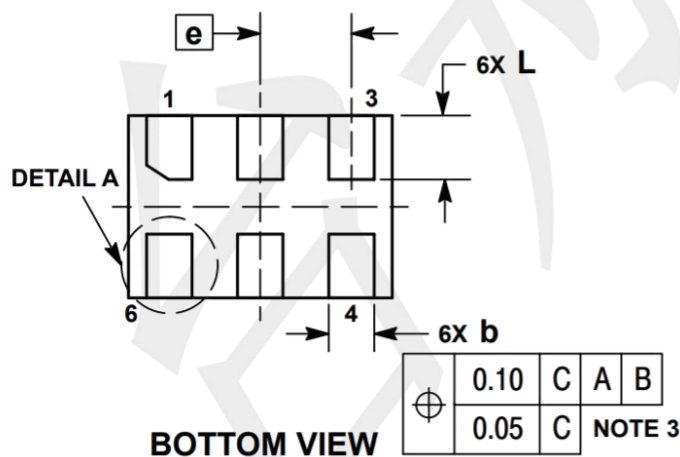
Package information (unit: mm)

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)



MOUNTING FOOTPRINT

