SN74LVC1G02 Series

SINGLE 2-INPUT NOR GATE

Features

- Operate from 1.65V to 5.5V
- ±24mA Output Drive (VCC=3.0V)
- High Noise Immunity
- Power Down Protection
- 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 SN74LVC1G02 is a 2-input NOR gate Device which provides the Function $Y=\overline{A+B}$ in positive logic.

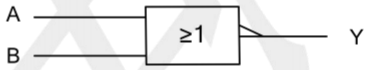
This device has power-down protective circuit preventing device from destruction when it is powered down.

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
- Solid State Drive(SSD):Client and Enterprise
- Wireless Headset,Keyboard,and Mouse

Logic Diagram

Logic Symbol

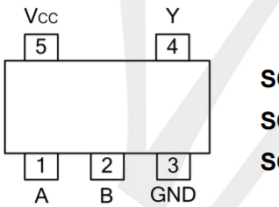


IEC Logic Symbol

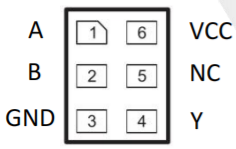
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	Marking
SN74LVC1G02DBVR-TP	SOT23-5	Tape and Reel,3000	C02F
SN74LVC1G02DCKR-TP	SOT353	Tape and Reel,3000	CB5
SN74LVC1G02DRLR-TP	SOT553	Tape and Reel,4000	CB7
SN74LVC1G02DRYR-TP	DFN1510-6	Tape and Reel,5000	CB

Pin Configuratio



SOT23-5
SOT353
SOT553



DFN1510-6

Function Table

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

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

Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +6.5	V
Input Voltage	V_{IN}		-0.5 ~ +6.5	V
Output Voltage	V_{OUT}	Output in the Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ $V_{CC+0.5}$	V
VCC or GND Current	I_{CC}	Output in the Power-off state	±100	mA
Continuous Output Current	I_{OUT}	V_{OUT}=0~V_{CC}	±50	mA
Input Clamp Current	I_{IK}	V_{IN}<0	-50	mA
Output Clamp Current	I_{OK}	V_{OUT}<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
		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	1.65	--	5.5	V
		Data retention only	1.5	--	--	V
Input Voltage	V_{IN}		0	--	5.5	V
Output Voltage	V_{OUT}	High or low state	0	--	VCC	V
Input Transition Rise or Fall ate	Δt/Δv	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	T_A		-40	--	125	℃

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

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}=1.65V ~ 1.95V	0.65×V_{CC}	--	--	V
		V_{CC}=2.3V ~ 2.7V	1.7	--	--	V
		V_{CC}=3V ~ 3.6V	2	--	--	V
		V_{CC}=4.5V ~ 5.5V	0.7×V_{CC}	--	--	V
Low-Level Input Voltage	V_{IL}	V_{CC}=1.65V ~ 1.95V	--	--	0.35×V_{CC}	V
		V_{CC}=2.3V ~ 2.7V	--	--	0.7	V
		V_{CC}=3V ~ 3.6V	--	--	0.8	V
		V_{CC}=4.5V ~ 5.5V	--	--	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
		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_{OH}=16mA	--	--	0.4	V
		V_{CC}=3.0V,I_{OH}=24mA	--	--	0.55	V
		V_{CC}=4.5V, I_{OH}=32mA	--	--	0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 5.5V, V_{IN}=5.5V or GND	--	--	±5	uA
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V	--	--	±10	uA
Quiescent Supply Current	I_Q	V_{CC}=1.65 ~ 5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0A	--	--	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	--	--	500	uA
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=V_{CC} or GND	--	4	--	pF

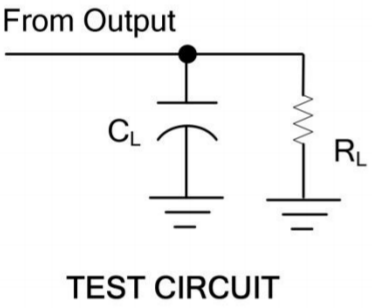
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V	--	23	--	pF
		V_{CC}=2.5V	--	23	--	pF
		V_{CC}=3.3V	--	23	--	pF
		V_{CC}=5.0V	--	25	--	pF

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

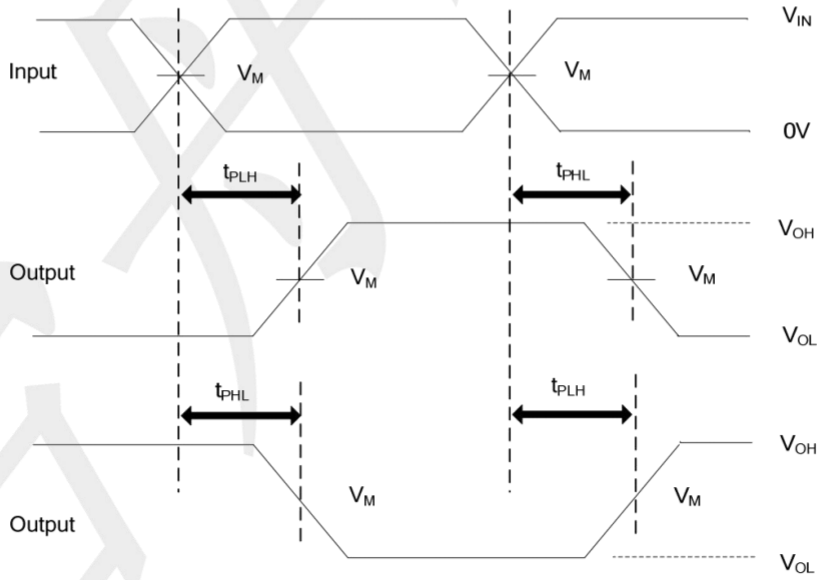
PARAMETER	SYMBOL	TEST Conditions		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH} / t_{PHL}	C_L=15pF R_L=1MΩ	V_{CC}=1.8±0.15V	1.9	--	7.2	nS
			V_{CC}=2.5±0.2V	0.8	--	4.4	nS
			V_{CC}=3.3±0.3V	0.8	--	3.6	nS
			V_{CC}=5±0.5V	0.8	--	3.4	nS
	t_{PLH} / t_{PHL}	C_L=30pF	V_{CC}=1.8±0.15V, R_L=1KΩ	2.8	--	8	nS
			V_{CC}=2.5±0.2V, R_L=500Ω	1.2	--	5.5	nS
		C_L=50pF R_L=500Ω	V_{CC}=3.3±0.3V	1	--	4.5	nS
			V_{CC}=5±0.5V	1	--	4	nS

TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	Inputs		V_M	C_L	R_L
	V_{IN}	t_R, t_F			
1.8V±0.15V	V_{CC}	≤2ns	V_{CC}/2	15pF	1MΩ
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	15pF	1MΩ
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
5V±0.5V	V_{CC}	≤2.5ns	V_{CC}/2	15pF	1MΩ
1.8V±0.15V	V_{CC}	≤2ns	V_{CC}/2	30pF	1KΩ
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0.5V	V_{CC}	≤2.5ns	V_{CC}/2	50pF	500Ω



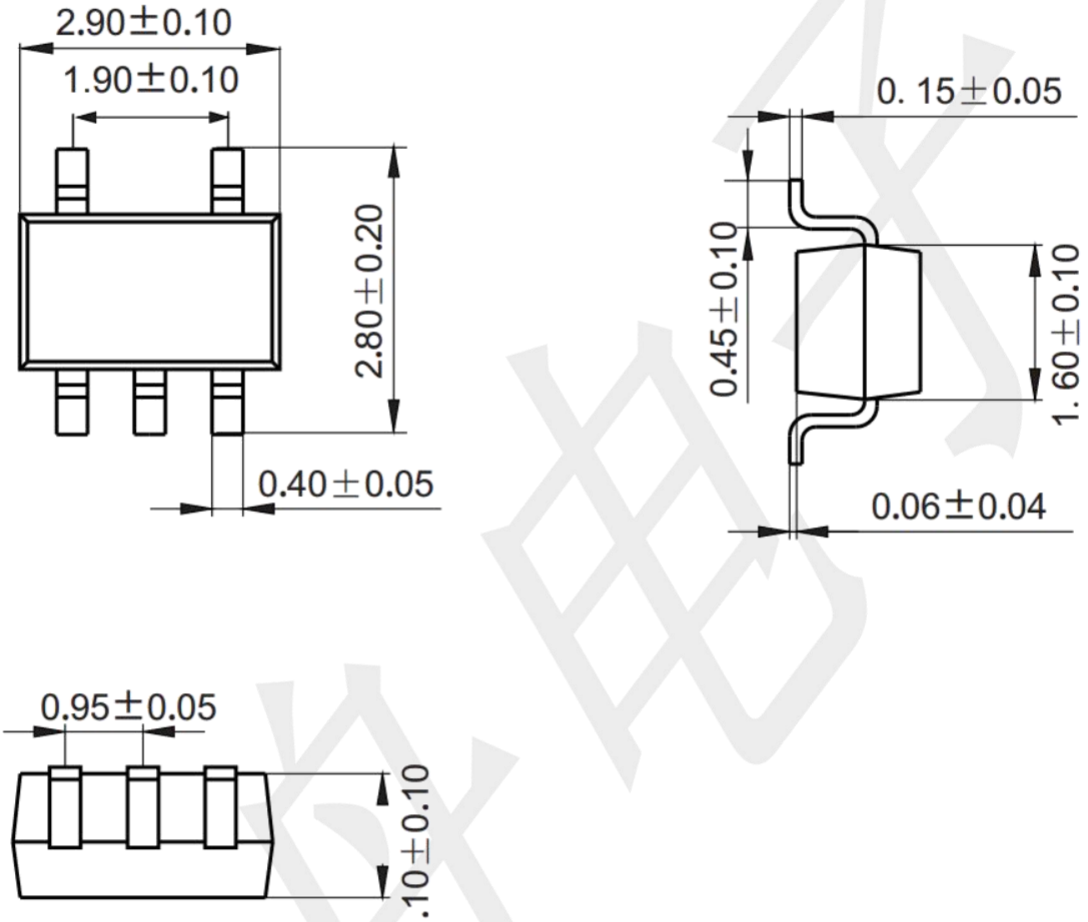
PROPAGATION DELAY TIMES

Note: CL includes probe and jig capacitance.

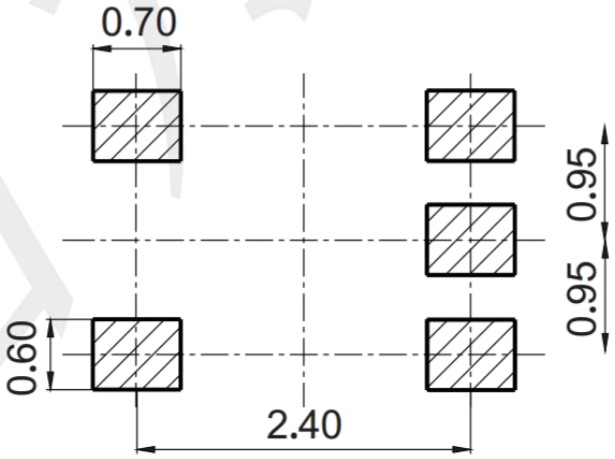
All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, ZO = 50Ω.

Package informantion

SOT23-5 (Unit: mm)

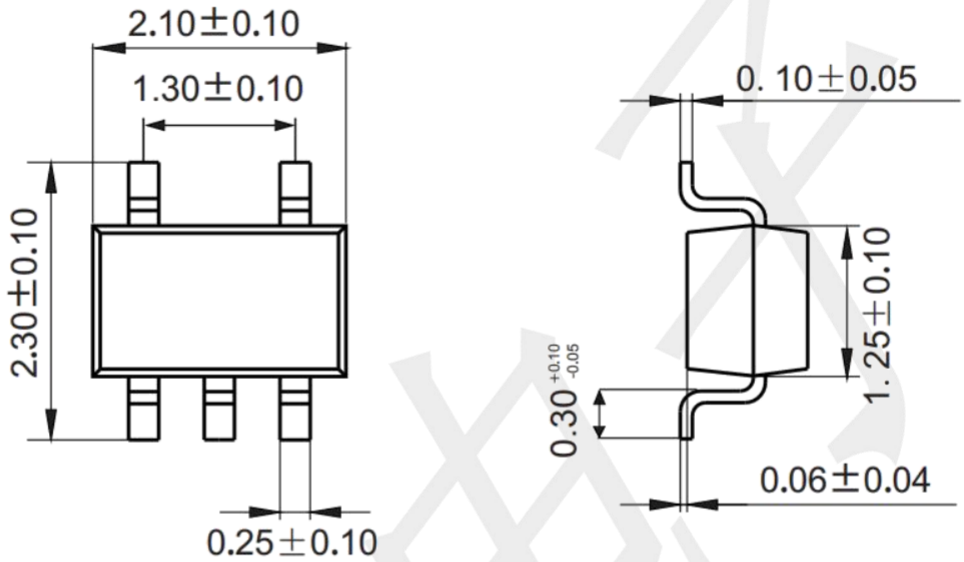


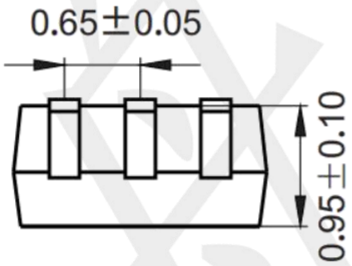
Mounting Pad Layout (Unit: mm)



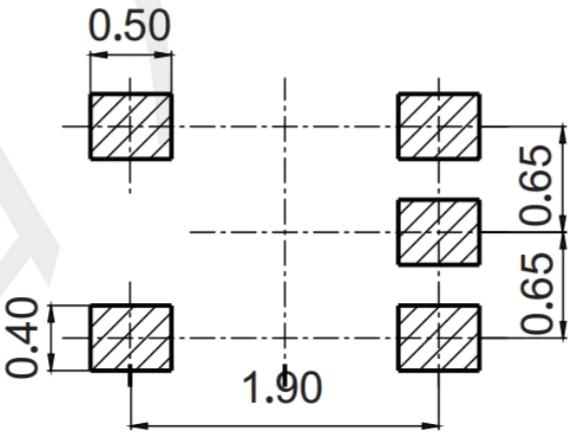
Package informantion

SOT353 (Unit: mm)



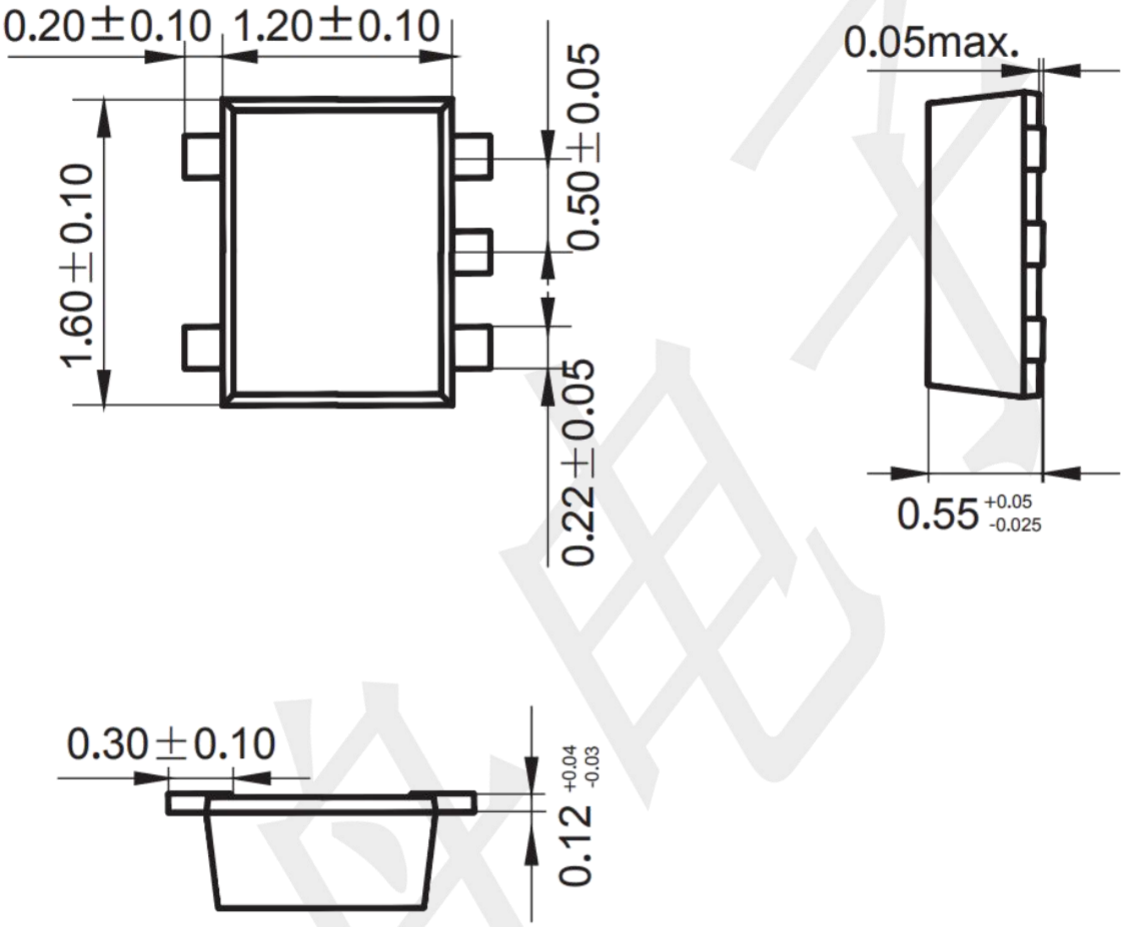


Mounting Pad Layout (Unit: mm)

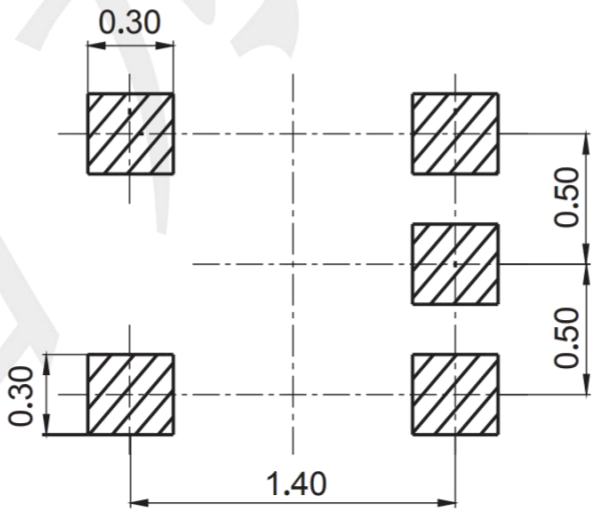


Package informantion

SOT553 (Unit: mm)

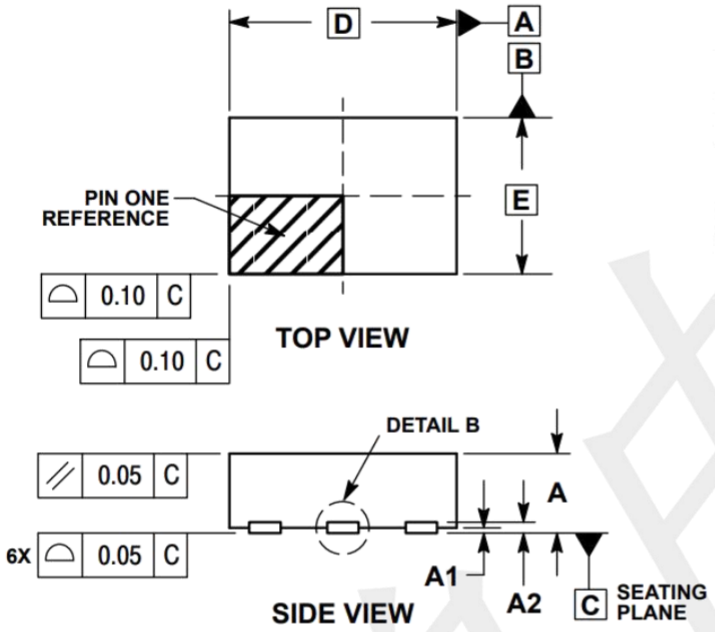


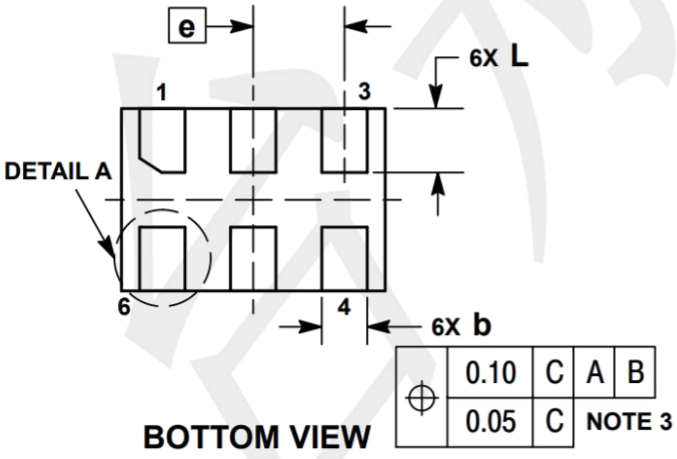
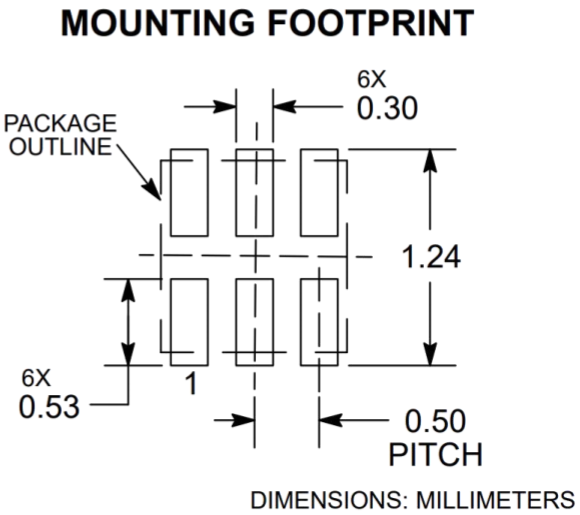
Mounting Pad Layout (Unit: mm)



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)