

Features

- Operate from 1.65V to 5.5V
- $\pm 24\text{mA}$ Output Drive ($V_{CC}=3.0\text{V}$)
- 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.

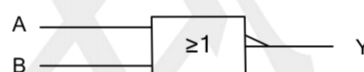
Applications

- 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

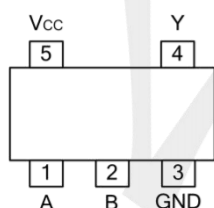


IEC Logic Symbol

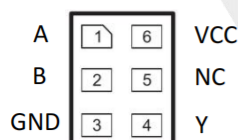
Ordering Information

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	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
		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

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} =1.65V ~ 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 _{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	I _{I(LEAK)}	V _{CC} =0 ~ 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 _Q	V _{CC} =1.65 ~ 5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0A	--	--	10	μA
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	μA
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND	--	4	--	pF

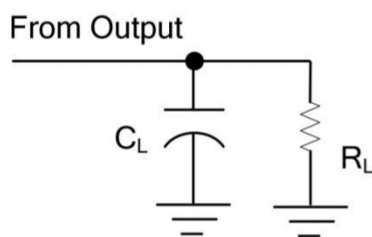
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

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)

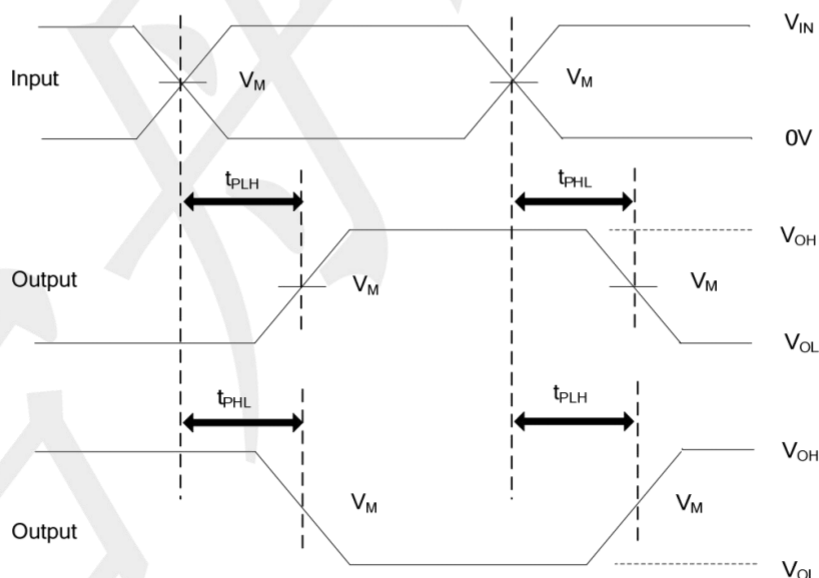
PARAMETER	SYMBOL	TEST Conditions		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t _{PLH} / t _{PHL}	CL=15pF RL=1MΩ	V _{CC} =1.8±0.15V	1.9	--	7.2	nS
			V _{CC} =2.5±0.2V	0.8	--	4.4	nS
			V _{CC} =3.3±0.3V	0.8	--	3.6	nS
			V _{CC} =5±0.5V	0.8	--	3.4	nS
	t _{PLH} / t _{PHL}	CL=30pF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



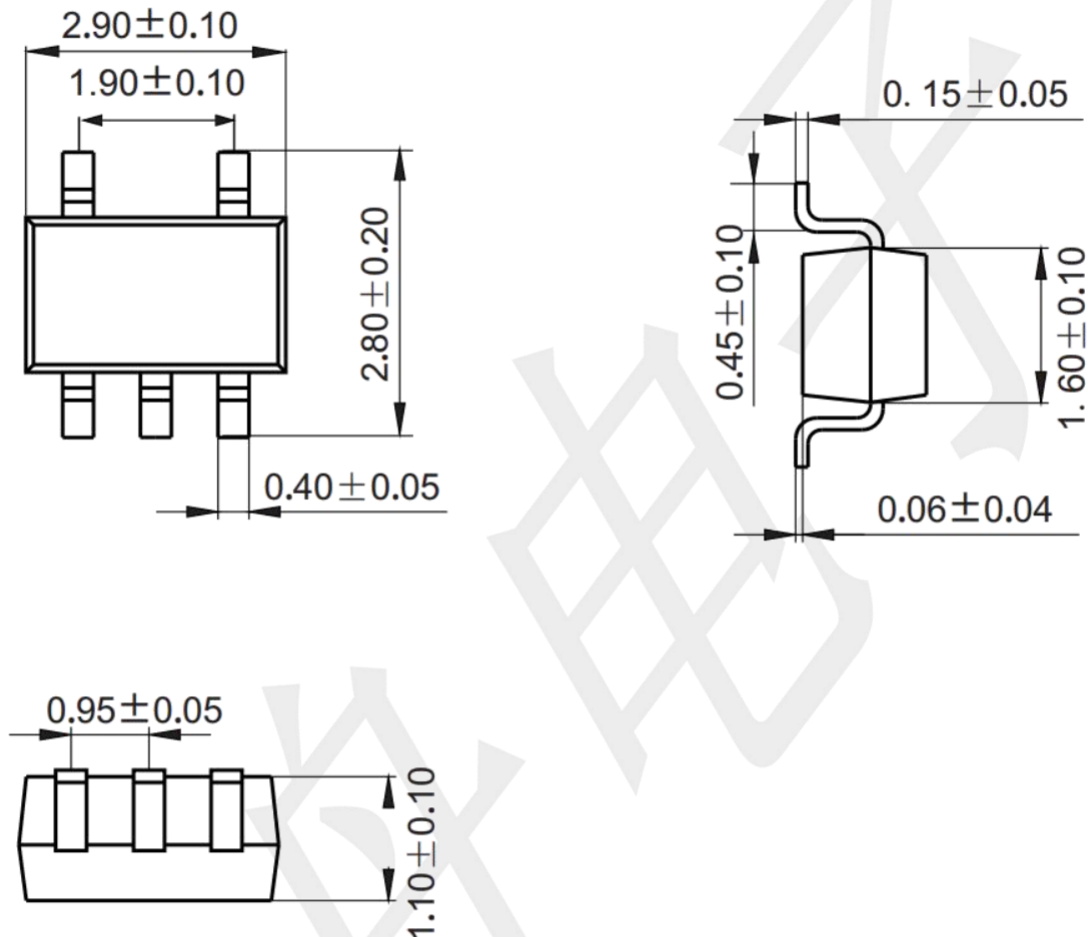
PROPAGATION DELAY TIMES

Note: CL includes probe and jig capacitance.

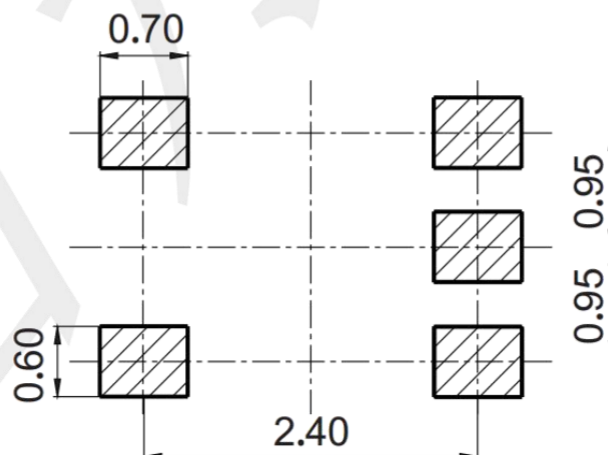
All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, ZO = 50Ω.

Package informantion

SOT23-5 (Unit: mm)

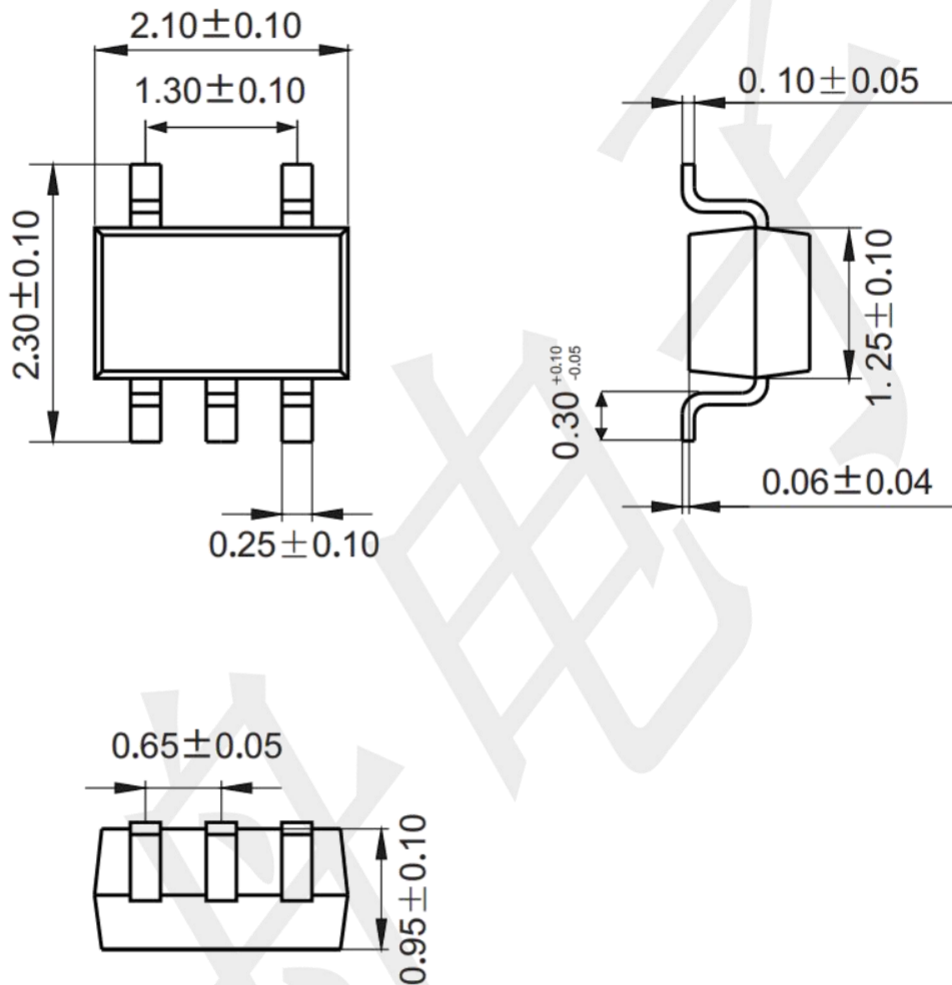


Mounting Pad Layout (Unit: mm)

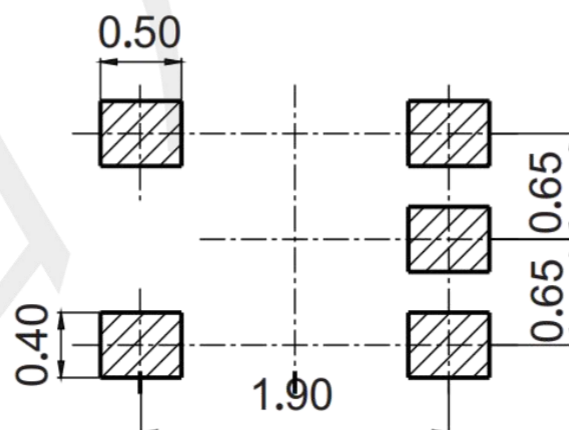


Package information

SOT353 (Unit: mm)

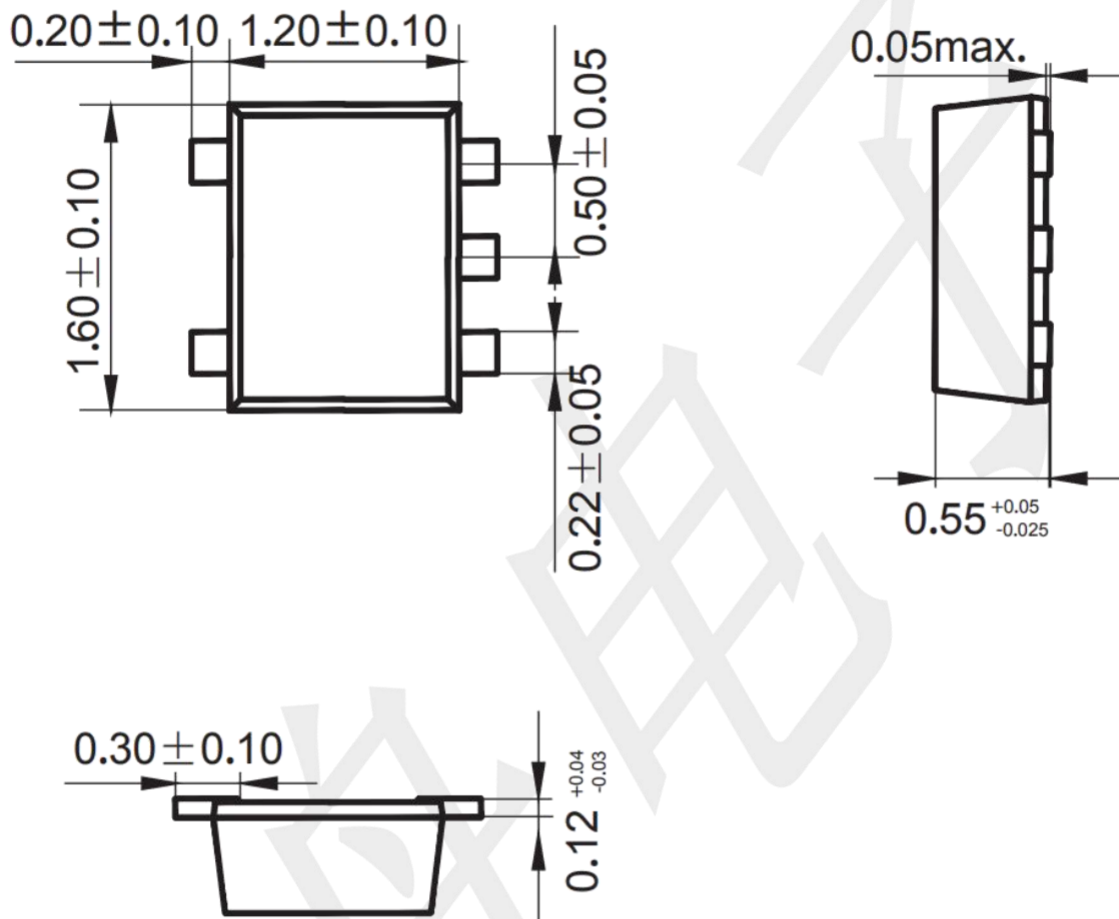


Mounting Pad Layout (Unit: mm)

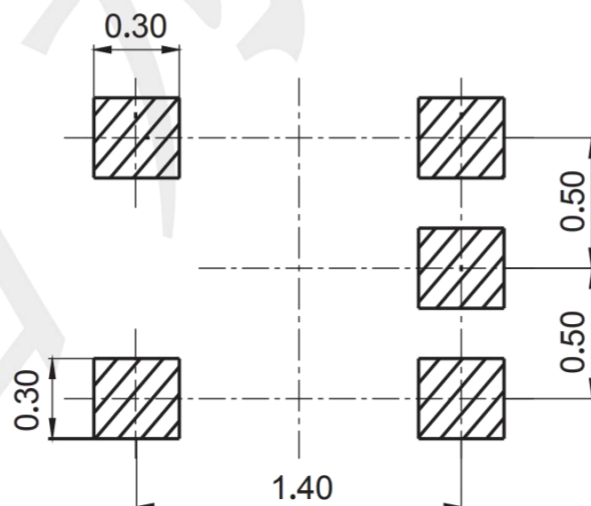


Package information

SOT553 (Unit: mm)

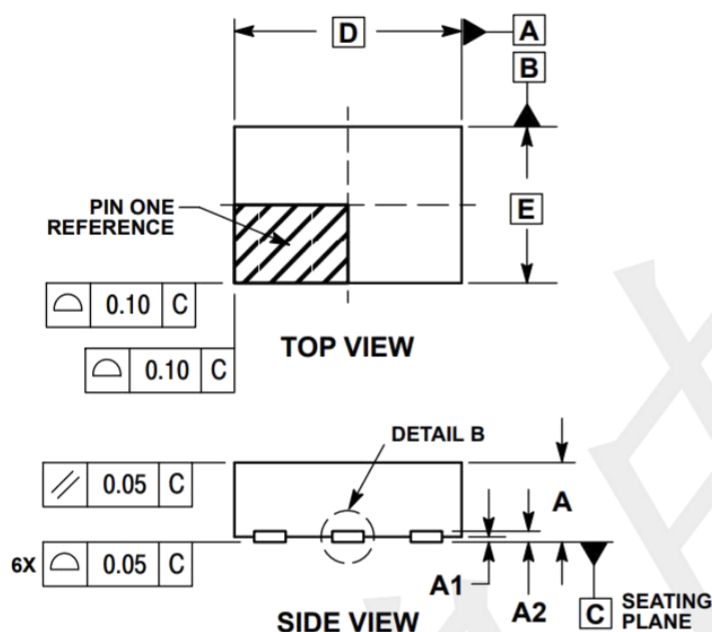


Mounting Pad Layout (Unit: mm)



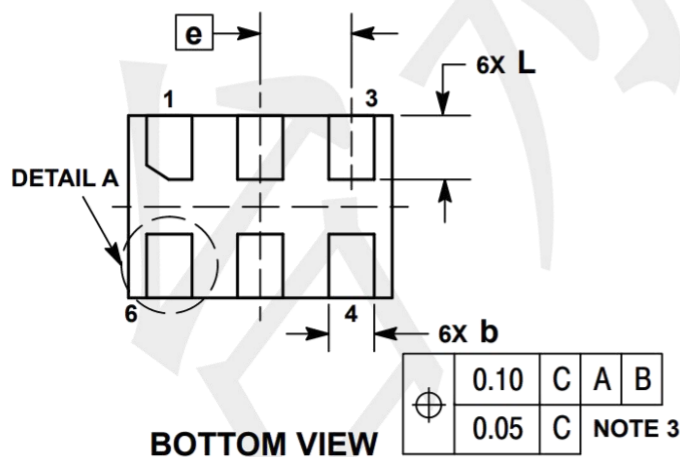
Package information

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)



MOUNTING FOOTPRINT

