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深圳市灵星芯微电子科技有限公司

Shenzhen Lingxing Microelectronics Technology Co., Ltd.

Tab: 835-12-B4

Number: SN74LVC1G157-AX-LJ-B021EN

# SN74LVC1G157 (LX) Single 2-input Multiplexer

## Product Specification

### Specification Revision History:

Version	Date	Description
2021-05-A1	2021-05	New
2023-04-B1	2023-04	Update the template



# Contents

<b>1、 General Description.....</b>	<b>3</b>
<b>2、 Block Diagram And Pin Description .....</b>	<b>4</b>
2.1、 Block Diagram .....	4
2.2、 Pin Configurations.....	4
2.3、 Pin Description .....	5
2.4、 Function Table.....	5
<b>3、 Electrical Parameter .....</b>	<b>5</b>
3.1、 Absolute Maximum Ratings.....	5
3.2、 Recommended Operating Conditions .....	6
3.3、 Electrical Characteristics .....	6
3.3.1、 DC Characteristics 1 .....	6
3.3.2、 DC Characteristics 2 .....	7
3.3.3、 AC Characteristics 1 .....	8
3.3.4、 AC Characteristics 2 .....	8
<b>4、 Testing Circuit .....</b>	<b>9</b>
4.1、 AC Testing Circuit .....	9
4.2、 AC Testing Waveforms.....	9
4.3、 Measurement Points .....	10
4.4、 Test Data .....	10
<b>5、 Package Information .....</b>	<b>11</b>
5.1、 SOT-23-6.....	11
5.2、 SOT-363 .....	12
<b>6、 Statements.....</b>	<b>13</b>
6.1、 The name and content of Hazardous substances or Elements in the product .....	13



## 1、 General Description

The SN74LVC1G157 is a single 2-input multiplexer which select data from two data inputs (I0 and I1) under control of a common data select input (S). The state of the common data select input determines the particular register from which the data comes. The output (Y) presents the selected data in the true (non-inverted) form.

Inputs can be driven from either 3.3V or 5V devices. This feature allows the use of these devices as translators in mixed 3.3V and 5V applications.

### Features:

- Wide supply voltage range from 1.65V to 5.5V
- $\pm 24\text{mA}$  output drive ( $V_{CC}=3.0\text{V}$ )
- CMOS low power consumption
- Latch-up performance exceeds 250mA
- Inputs accept voltages up to 5V
- Specified from  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Packaging information: SOT-23-6/SOT-363

### Ordering Information:

#### Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
SN74LVC1G157DB (LX)	SOT-23-6	ATXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
SN74LVC1G157DC (LX)	SOT-363	ATXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing: 0.65mm

Note 1: "XX" refers to variable content, meaning year and package batch serial number.

Note 2: If the physical information is inconsistent with the ordering information, please refer to the actual product.



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## 2、Block Diagram And Pin Description

### 2.1、Block Diagram

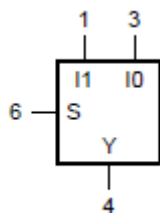


Figure 1. Logic symbol

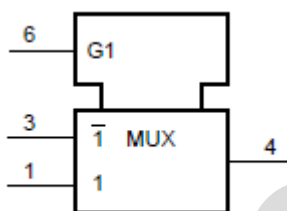


Figure 2. IEC logic symbol

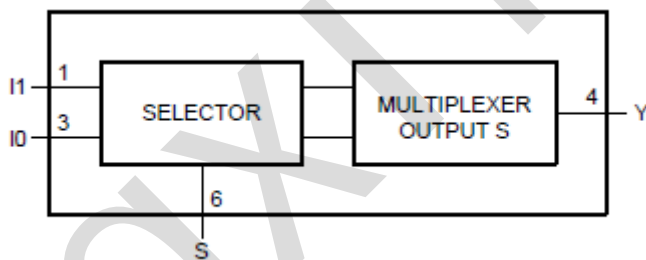
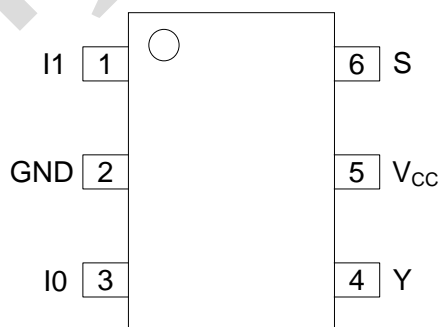


Figure 3. Logic diagram

### 2.2、Pin Configurations





### 2.3、Pin Description

Pin No.	Pin Name	Description
1	I1	data input from source 1
2	GND	ground (0V)
3	I0	data input from source 0
4	Y	multiplexer output
5	V <sub>CC</sub>	supply voltage
6	S	common data select input

### 2.4、Function Table

Input			Output
S	I1	I0	Y
L	X	L	L
L	X	H	H
H	L	X	L
H	H	X	H

Note: H=HIGH voltage level; L=LOW voltage level; X=don't care.

## 3、Electrical Parameter

### 3.1、Absolute Maximum Ratings

(Voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V <sub>CC</sub>	-	-0.5	+6.5	V
input clamping current	I <sub>IK</sub>	V <sub>I</sub> < 0V	-50	-	mA
input voltage	V <sub>I</sub>	-	-0.5	+6.5	V
output clamping current	I <sub>OK</sub>	V <sub>O</sub> > V <sub>CC</sub> or V <sub>O</sub> < 0V	-	±50	mA
output voltage	V <sub>O</sub>	Active mode	-0.5	V <sub>CC</sub> +0.5	V
		Power-down mode	-0.5	+6.5	V
output current	I <sub>O</sub>	V <sub>O</sub> =0V to V <sub>CC</sub>	-	±50	mA
supply current	I <sub>CC</sub>	-	-	100	mA
ground current	I <sub>GND</sub>	-	-100	-	mA
storage temperature	T <sub>stg</sub>	-	-65	+150	°C
total power dissipation	P <sub>tot</sub>	-	-	250	mW
soldering temperature	T <sub>L</sub>	10s	260		°C

Note: When V<sub>CC</sub>=0V (Power-down mode), the output voltage can be 5.5V in normal operation.



### 3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	$V_{CC}$	-	1.65	-	5.5	V
input voltage	$V_I$	-	0	-	5.5	V
output voltage	$V_O$	Active mode	0	-	$V_{CC}$	V
		Power-down mode; $V_{CC}=0V$	0	-	5.5	V
ambient temperature	$T_{amb}$	-	-40	-	+125	°C

### 3.3、Electrical Characteristics

#### 3.3.1、DC Characteristics 1

( $T_{amb}=-40^{\circ}C$  to  $+85^{\circ}C$ , voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
HIGH-level input voltage	$V_{IH}$	$V_{CC}=1.65V$ to $1.95V$	$0.65 \times V_{CC}$	-	-	V	
		$V_{CC}=2.3V$ to $2.7V$	1.7	-	-	V	
		$V_{CC}=2.7V$ to $3.6V$	2.0	-	-	V	
		$V_{CC}=4.5V$ to $5.5V$	$0.7 \times V_{CC}$	-	-	V	
LOW-level input voltage	$V_{IL}$	$V_{CC}=1.65V$ to $1.95V$	-	-	$0.35 \times V_{CC}$	V	
		$V_{CC}=2.3V$ to $2.7V$	-	-	0.7	V	
		$V_{CC}=2.7V$ to $3.6V$	-	-	0.8	V	
		$V_{CC}=4.5V$ to $5.5V$	-	-	$0.3 \times V_{CC}$	V	
HIGH-level output voltage	$V_{OH}$	$V_I = V_{IH}$ or $V_{IL}$	$I_O=-100\mu A$ ; $V_{CC}=1.65V$ to $5.5V$	$V_{CC} - 0.1$	-	-	V
			$I_O=-4mA$ ; $V_{CC}=1.65V$	1.2	1.54	-	V
			$I_O=-8mA$ ; $V_{CC}=2.3V$	1.9	2.15	-	V
			$I_O=-12mA$ ; $V_{CC}=2.7V$	2.2	2.50	-	V
			$I_O=-24mA$ ; $V_{CC}=3.0V$	2.3	2.62	-	V
			$I_O=-32mA$ ; $V_{CC}=4.5V$	3.8	4.11	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH}$ or $V_{IL}$	$I_O=100\mu A$ ; $V_{CC}=1.65V$ to $5.5V$	-	-	0.10	V
			$I_O=4mA$ ; $V_{CC}=1.65V$	-	0.07	0.45	V
			$I_O=8mA$ ; $V_{CC}=2.3V$	-	0.12	0.30	V
			$I_O=12mA$ ; $V_{CC}=2.7V$	-	0.17	0.40	V
			$I_O=24mA$ ; $V_{CC}=3.0V$	-	0.33	0.55	V
			$I_O=32mA$ ; $V_{CC}=4.5V$	-	0.39	0.55	V
input leakage current	$I_I$	$V_I=5.5V$ or GND; $V_{CC}=0V$ to $5.5V$	-	-	$\pm 1$	$\mu A$	
power-off leakage current	$I_{OFF}$	$V_I$ or $V_O=5.5V$ ; $V_{CC}=0V$	-	-	$\pm 2$	$\mu A$	
supply current	$I_{CC}$	$V_I=5.5V$ or GND; $I_O=0A$ ; $V_{CC}=1.65V$ to $5.5V$	-	-	4	$\mu A$	
additional supply current	$\Delta I_{CC}$	per pin; $V_I=V_{CC}-0.6V$ ; $I_O=0A$ ; $V_{CC}=2.3V$ to $5.5V$	-	-	500	$\mu A$	



input capacitance	$C_I$	$V_{CC}=3.3V; V_I=GND \text{ to } V_{CC}$	-	2.5	-	pF
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Note: All typical values are measured at  $T_{amb}=25^{\circ}C$ .

### 3.3.2、DC Characteristics 2

( $T_{amb}=-40^{\circ}C$  to  $+125^{\circ}C$ , voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
HIGH-level input voltage	$V_{IH}$	$V_{CC}=1.65V \text{ to } 1.95V$	$0.65 \times V_{CC}$	-	-	V	
		$V_{CC}=2.3V \text{ to } 2.7V$	1.7	-	-	V	
		$V_{CC}=2.7V \text{ to } 3.6V$	2.0	-	-	V	
		$V_{CC}=4.5V \text{ to } 5.5V$	$0.7 \times V_{CC}$	-	-	V	
LOW-level input voltage	$V_{IL}$	$V_{CC}=1.65V \text{ to } 1.95V$	-	-	$0.35 \times V_{CC}$	V	
		$V_{CC}=2.3V \text{ to } 2.7V$	-	-	0.7	V	
		$V_{CC}=2.7V \text{ to } 3.6V$	-	-	0.8	V	
		$V_{CC}=4.5V \text{ to } 5.5V$	-	-	$0.3 \times V_{CC}$	V	
HIGH-level output voltage	$V_{OH}$	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O=-100\mu A; V_{CC}=1.65V \text{ to } 5.5V$	$V_{CC} - 0.1$	-	-	V
			$I_O=-4mA; V_{CC}=1.65V$	0.95	-	-	V
			$I_O=-8mA; V_{CC}=2.3V$	1.7	-	-	V
			$I_O=-12mA; V_{CC}=2.7V$	1.9	-	-	V
			$I_O=-24mA; V_{CC}=3.0V$	2.0	-	-	V
			$I_O=-32mA; V_{CC}=4.5V$	3.4	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O=100\mu A; V_{CC}=1.65V \text{ to } 5.5V$	-	-	0.10	V
			$I_O=4mA; V_{CC}=1.65V$	-	-	0.70	V
			$I_O=8mA; V_{CC}=2.3V$	-	-	0.45	V
			$I_O=12mA; V_{CC}=2.7V$	-	-	0.60	V
			$I_O=24mA; V_{CC}=3.0V$	-	-	0.80	V
			$I_O=32mA; V_{CC}=4.5V$	-	-	0.80	V
input leakage current	$I_I$	$V_I=5.5V \text{ or } GND; V_{CC}=0V \text{ to } 5.5V$	-	-	$\pm 1$	$\mu A$	
power-off leakage current	$I_{OFF}$	$V_I \text{ or } V_O=5.5V; V_{CC}=0V$	-	-	$\pm 2$	$\mu A$	
supply current	$I_{CC}$	$V_I=5.5V \text{ or } GND; I_O=0A; V_{CC}=1.65V \text{ to } 5.5V$	-	-	4	$\mu A$	
additional supply current	$\Delta I_{CC}$	per pin; $V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.3V \text{ to } 5.5V$	-	-	500	$\mu A$	



### 3.3.3、AC Characteristics 1

( $T_{amb}=-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ. <sup>[1]</sup>	Max.	Unit	
propagation delay	$t_{PHL}$	I0, I1 to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	12.5	18.8	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	10.5	15.8	ns
			$V_{CC}=2.7\text{V}$	-	10	15	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	9.5	14.3	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	9	13.5	ns
		S to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	12.5	18.8	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	10.5	15.8	ns
			$V_{CC}=2.7\text{V}$	-	10	15	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	9.5	14.3	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	9	13.5	ns
propagation delay	$t_{PLH}$	I0, I1 to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	14	21	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	10	15	ns
			$V_{CC}=2.7\text{V}$	-	9.5	14.3	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	8.5	12.8	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	7.5	11.3	ns
		S to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	14	21	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	10	15	ns
			$V_{CC}=2.7\text{V}$	-	9.5	14.3	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	8.5	12.8	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	7.5	11.3	ns

Note:

[1] Typical values are measured at  $T_{amb}=25^{\circ}\text{C}$  and  $V_{CC}=1.8\text{V}$ ,  $2.5\text{V}$ ,  $2.7\text{V}$ ,  $3.3\text{V}$  and  $5.0\text{V}$  respectively.

### 3.3.4、AC Characteristics 2

( $T_{amb}=-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
propagation delay	$t_{PHL}$	I0, I1 to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	-	20.8	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	-	17.8	ns
			$V_{CC}=2.7\text{V}$	-	-	17	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	-	16.3	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	-	15.5	ns
		S to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	-	20.8	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	-	17.8	ns
			$V_{CC}=2.7\text{V}$	-	-	17	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	-	16.3	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	-	15.5	ns
propagation delay	$t_{PLH}$	I0, I1 to Y; see Figure 5	$V_{CC}=1.65\text{V}$ to $1.95\text{V}$	-	-	23	ns
			$V_{CC}=2.3\text{V}$ to $2.7\text{V}$	-	-	17	ns
			$V_{CC}=2.7\text{V}$	-	-	16.3	ns
			$V_{CC}=3.0\text{V}$ to $3.6\text{V}$	-	-	14.8	ns
			$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	-	13.3	ns





	S to Y; see Figure 5	$V_{CC}=1.65V$ to $1.95V$	-	-	23	ns
		$V_{CC}=2.3V$ to $2.7V$	-	-	17	ns
		$V_{CC}=2.7V$	-	-	16.3	ns
		$V_{CC}=3.0V$ to $3.6V$	-	-	14.8	ns
		$V_{CC}=4.5V$ to $5.5V$	-	-	13.3	ns

## 4、Testing Circuit

### 4.1、AC Testing Circuit

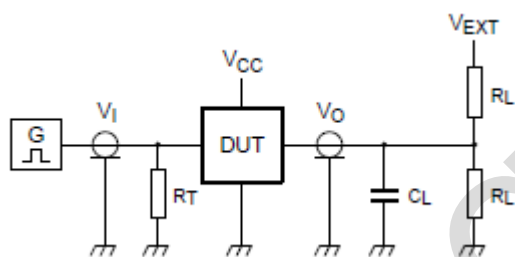


Figure 4. Test circuit for measuring switching times

Definitions for test circuit:

$R_L$ =Load resistance.

$C_L$ =Load capacitance including jig and probe capacitance.

$R_T$ =Termination resistance; should be equal to the output impedance  $Z_o$  of the pulse generator.

$V_{EXT}$ =External voltage for measuring switching times.

### 4.2、AC Testing Waveforms

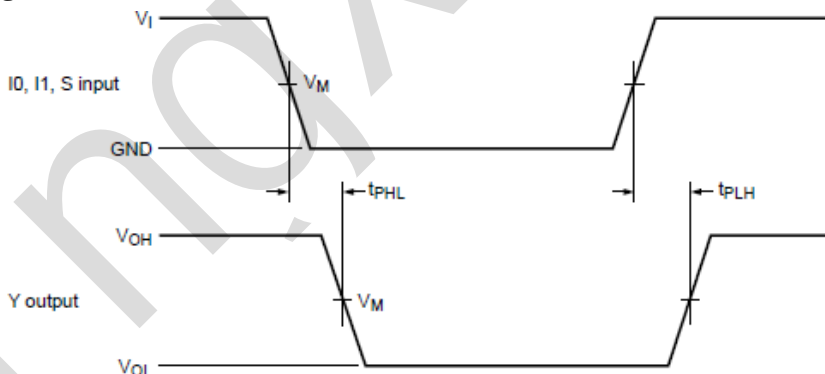


Figure 5. Data inputs (I0, I1) and common data select input (S) to output (Y) propagation delays



#### 4.3、Measurement Points

Supply voltage	Input	Output
$V_{CC}$	$V_M$	$V_M$
1.65V to 1.95V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2.3V to 2.7V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2.7V	1.5V	1.5V
3.0V to 3.6V	1.5V	1.5V
4.5V to 5.5V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$

#### 4.4、Test Data

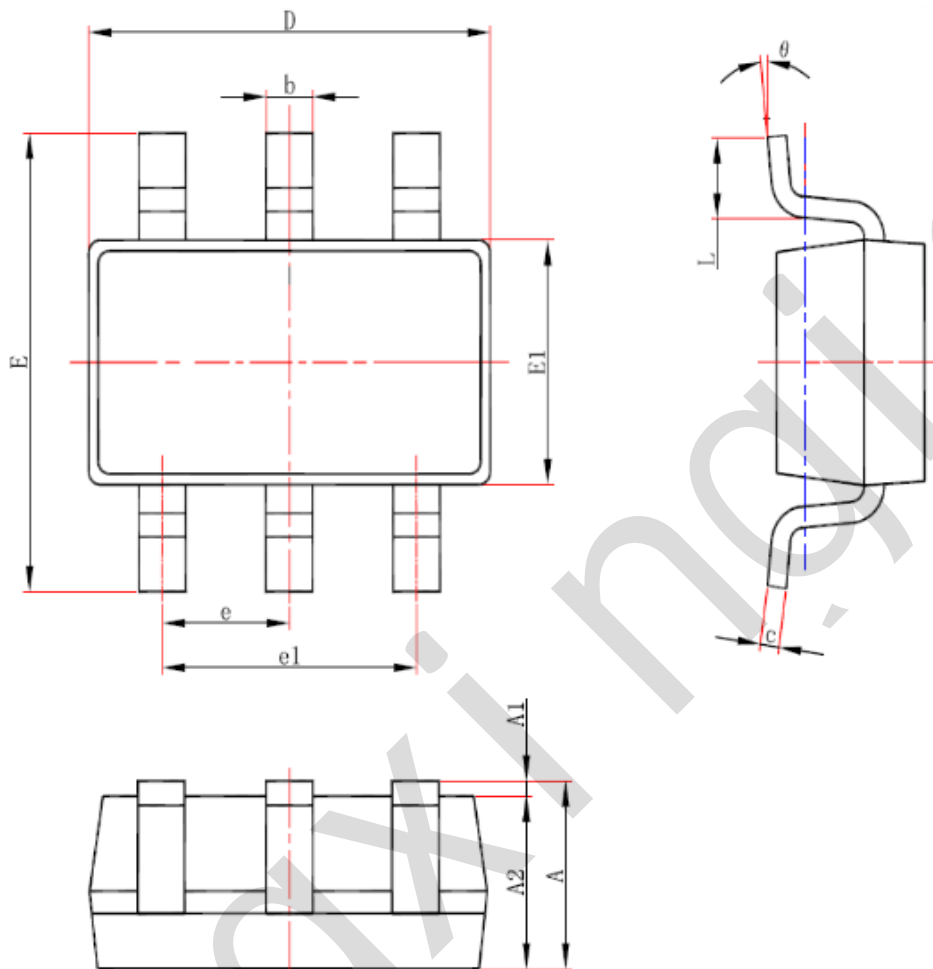
Supply voltage	Input		Load		$V_{EXT}$
	$V_I$	$t_r = t_f$	$C_L$	$R_L$	$t_{PLH}, t_{PHL}$
1.65V to 1.95V	$V_{CC}$	$\leq 3ns$	30pF	1k $\Omega$	open
2.3V to 2.7V	$V_{CC}$	$\leq 3ns$	30pF	500 $\Omega$	open
2.7V	2.7V	$\leq 3ns$	50pF	500 $\Omega$	open
3.0V to 3.6V	2.7V	$\leq 3ns$	50pF	500 $\Omega$	open
4.5V to 5.5V	$V_{CC}$	$\leq 3ns$	50pF	500 $\Omega$	open



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## 5、Package Information

### 5.1、SOT-23-6

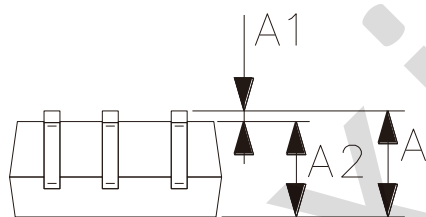
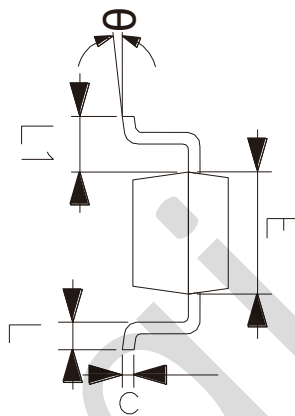
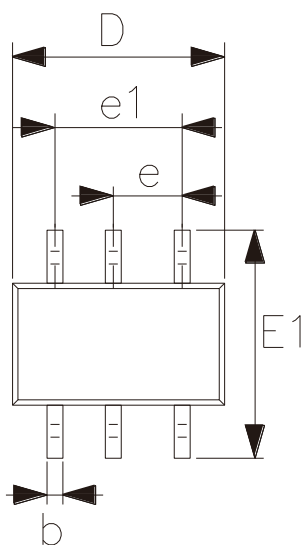


Symbol	Dimensions (mm)	
	Min.	Max.
A	-	1.25
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°



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5.2、SOT-363



Symbol	Dimensions (mm)	
	Min.	Max.
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.15	0.35
c	0.11	0.175
D	2.00	2.20
E1	2.15	2.45
E	1.15	1.35
e	0.65	
e1	1.20	1.40
L	0.26	0.46
L1	0.525	
$\theta$	0°	8°



## 6、Statements

### 6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	<p>○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard.</p> <p>×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.</p>									