



# AiP74LVC1G66 Bilateral Switch

## Product Specification

### Specification Revision History:

| Version    | Date    | Description                               |
|------------|---------|-------------------------------------------|
| 2022-10-A1 | 2022-10 | New                                       |
| 2023-11-A2 | 2023-11 | Internal structure block diagram modified |
|            |         |                                           |
|            |         |                                           |



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## 1、General Description

The AiP74LVC1G66 provides one single pole, single-throw analog switch function. It has two input/output terminals (Y and Z) and an active HIGH enable input pin (E). When E is LOW, the analog switch is turned off.

### Features:

- Wide supply voltage range from 1.65 V to 5.5 V
- Very low ON resistance:
- Switch current capability of 32 mA
- CMOS low power consumption
- Specified from -40°C to +125°C
- Packaging information: SOT-23-5/SOT-353

### Ordering Information:

#### Reel packing specifications:

| Part number          | Packaging form | Marking code | Reel quantity | Boxed reel quantity | Notes                                                              |
|----------------------|----------------|--------------|---------------|---------------------|--------------------------------------------------------------------|
| AiP74LVC1G66GB235.TR | SOT-23-5       | DRXX         | 3000 PCS/reel | 30000 PCS/box       | Dimensions of plastic enclosure: 2.9mm×1.6mm<br>Pin spacing:0.95mm |
| AiP74LVC1G66GC353.TR | SOT-353        | DRXX         | 3000 PCS/reel | 30000 PCS/box       | Dimensions of plastic enclosure: 2.1mm×1.3mm<br>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.



## 2、Block Diagram And Pin Description

### 2.1、Block Diagram

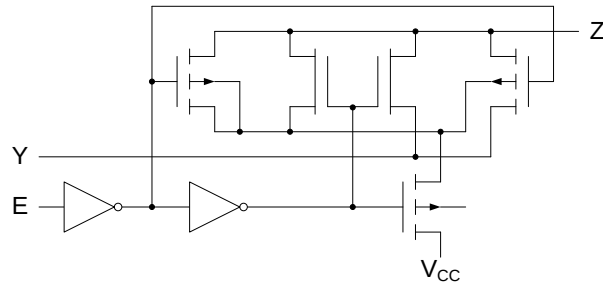
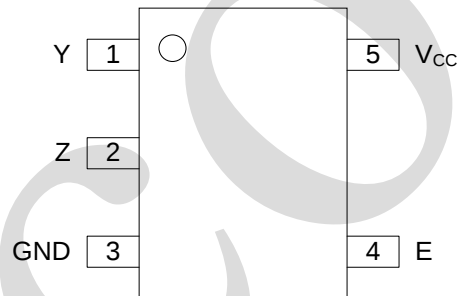


Figure 3. Logic diagram

### 2.2、Pin Configurations



### 2.3、Pin Description

| Pin No. | Pin Name        | Description                 |
|---------|-----------------|-----------------------------|
| 1       | Y               | independent input or output |
| 2       | Z               | independent output or input |
| 3       | GND             | ground (0V)                 |
| 4       | E               | enable input (active HIGH)  |
| 5       | V <sub>CC</sub> | supply voltage              |



## 2.4、Function Table

| Input E | Switch    |
|---------|-----------|
| L       | OFF-state |
| H       | ON-state  |

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

## 3、Electrical Parameter

### 3.1、Absolute Maximum Ratings

( $T_{amb}=25^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified)

| Parameter               | Symbol    | Conditions                                                 | Min. | Max.           | Unit               |
|-------------------------|-----------|------------------------------------------------------------|------|----------------|--------------------|
| supply voltage          | $V_{CC}$  | -                                                          | -0.5 | +6.5           | V                  |
| input clamping current  | $I_{IK}$  | $V_I < -0.5\text{V}$ or $V_I > V_{CC} + 0.5\text{V}$       | -50  | -              | mA                 |
| input voltage           | $V_I$     | -                                                          | -0.5 | +6.5           | V                  |
| switch clamping current | $I_{SK}$  | $V_I < -0.5\text{V}$ or $V_I > V_{CC} + 0.5\text{V}$       | -50  | -              | mA                 |
| switch voltage          | $V_{SW}$  | enable and disable mode                                    | -0.5 | $V_{CC} + 0.5$ | V                  |
| switch current          | $I_{SW}$  | $V_{SW} > -0.5\text{V}$ or $V_{SW} < V_{CC} + 0.5\text{V}$ | -    | $\pm 50$       | mA                 |
| supply current          | $I_{CC}$  | -                                                          | -    | 100            | mA                 |
| ground current          | $I_{GND}$ | -                                                          | -100 | -              | mA                 |
| storage temperature     | $T_{stg}$ | -                                                          | -65  | +150           | $^{\circ}\text{C}$ |
| total power dissipation | $P_{tot}$ | -                                                          | -    | 250            | mW                 |
| soldering temperature   | $T_L$     | 10s                                                        | 260  |                | $^{\circ}\text{C}$ |

### 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                  |
| switch voltage      | $V_{SW}$  | -          | 0    | -    | $V_{CC}$ | V                  |
| ambient temperature | $T_{amb}$ | -          | -40  | -    | +125     | $^{\circ}\text{C}$ |



## 3.3、Electrical Characteristics

### 3.3.1、DC 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          |
|---------------------------|-----------------|----------------------------------------------------------------------------------------------------------------|----------------------|---------------------|----------------------|---------------|
| HIGH-level input voltage  | $V_{IH}$        | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$                                                                        | $0.65 \times V_{CC}$ | -                   | -                    | V             |
|                           |                 | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$                                                                          | 1.7                  | -                   | -                    | V             |
|                           |                 | $V_{CC}=2.7\text{V}$ to $3.6\text{V}$                                                                          | 2.0                  | -                   | -                    | V             |
|                           |                 | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$                                                                          | $0.7 \times V_{CC}$  | -                   | -                    | V             |
| LOW-level input voltage   | $V_{IL}$        | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$                                                                        | -                    | -                   | $0.35 \times V_{CC}$ | V             |
|                           |                 | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$                                                                          | -                    | -                   | 0.7                  | V             |
|                           |                 | $V_{CC}=2.7\text{V}$ to $3.6\text{V}$                                                                          | -                    | -                   | 0.8                  | V             |
|                           |                 | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$                                                                          | -                    | -                   | $0.3 \times V_{CC}$  | V             |
| input leakage current     | $I_I$           | pin E; $V_I=5.5\text{V}$ or GND;<br>$V_{CC}=0\text{V}$ to $5.5\text{V}^{[2]}$                                  | -                    | $\pm 0.1$           | $\pm 1$              | $\mu\text{A}$ |
| OFF-state leakage current | $I_{(S)OFF}$    | $V_{CC}=5.5\text{V}$ ; see Figure 4 <sup>[2]</sup>                                                             | -                    | $\pm 0.1$           | $\pm 0.2$            | $\mu\text{A}$ |
| ON-state leakage current  | $I_{(S)ON}$     | $V_{CC}=5.5\text{V}$ ; see Figure 5 <sup>[2]</sup>                                                             | -                    | $\pm 0.1$           | $\pm 1$              | $\mu\text{A}$ |
| supply current            | $I_{CC}$        | $V_I=5.5\text{V}$ or GND;<br>$V_{SW}=\text{GND}$ or $V_{CC}$ ;<br>$V_{CC}=1.65\text{V}$ to $5.5\text{V}^{[2]}$ | -                    | 0.1                 | 4                    | $\mu\text{A}$ |
| additional supply current | $\Delta I_{CC}$ | pin E; $V_I=V_{CC}-0.6\text{V}$ ;<br>$V_{SW}=\text{GND}$ or $V_{CC}$ ; $V_{CC}=5.5\text{V}^{[2]}$              | -                    | 5                   | 500                  | $\mu\text{A}$ |
| input capacitance         | $C_I$           | -                                                                                                              | -                    | 2.0                 | -                    | pF            |
| OFF-state capacitance     | $C_{S(OFF)}$    | -                                                                                                              | -                    | 6.5                 | -                    | pF            |
| ON-state capacitance      | $C_{S(ON)}$     | -                                                                                                              | -                    | 11                  | -                    | pF            |

Note:

[1] All typical values are measured at  $T_{amb}=25^{\circ}\text{C}$ .

[2] These typical values are measured at  $V_{CC}=3.3\text{V}$ .



## 3.3.2、DC 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          |
|---------------------------|-----------------|----------------------------------------------------------------------------------------------------------------|----------------------|------|----------------------|---------------|
| HIGH-level input voltage  | $V_{IH}$        | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$                                                                        | $0.65 \times V_{CC}$ | -    | -                    | V             |
|                           |                 | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$                                                                          | 1.7                  | -    | -                    | V             |
|                           |                 | $V_{CC}=2.7\text{V}$ to $3.6\text{V}$                                                                          | 2.0                  | -    | -                    | V             |
|                           |                 | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$                                                                          | $0.7 \times V_{CC}$  | -    | -                    | V             |
| LOW-level input voltage   | $V_{IL}$        | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$                                                                        | -                    | -    | $0.35 \times V_{CC}$ | V             |
|                           |                 | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$                                                                          | -                    | -    | 0.7                  | V             |
|                           |                 | $V_{CC}=2.7\text{V}$ to $3.6\text{V}$                                                                          | -                    | -    | 0.8                  | V             |
|                           |                 | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$                                                                          | -                    | -    | $0.3 \times V_{CC}$  | V             |
| input leakage current     | $I_I$           | pin E; $V_I=5.5\text{V}$ or GND;<br>$V_{CC}=0\text{V}$ to $5.5\text{V}^{[1]}$                                  | -                    | -    | $\pm 1$              | $\mu\text{A}$ |
| OFF-state leakage current | $I_{(S)OFF}$    | $V_{CC}=5.5\text{V}$ ; see Figure 4 <sup>[1]</sup>                                                             | -                    | -    | $\pm 0.5$            | $\mu\text{A}$ |
| ON-state leakage current  | $I_{(S)ON}$     | $V_{CC}=5.5\text{V}$ ; see Figure 5 <sup>[1]</sup>                                                             | -                    | -    | $\pm 2$              | $\mu\text{A}$ |
| supply current            | $I_{CC}$        | $V_I=5.5\text{V}$ or GND;<br>$V_{SW}=\text{GND}$ or $V_{CC}$ ;<br>$V_{CC}=1.65\text{V}$ to $5.5\text{V}^{[1]}$ | -                    | -    | 4                    | $\mu\text{A}$ |
| additional supply current | $\Delta I_{CC}$ | pin E; $V_I=V_{CC}-0.6\text{V}$ ;<br>$V_{SW}=\text{GND}$ or $V_{CC}$ ; $V_{CC}=5.5\text{V}^{[1]}$              | -                    | -    | 500                  | $\mu\text{A}$ |

Note:

[1] These typical values are measured at  $V_{CC}=3.3\text{V}$ .



## 3.3.3、ON Resistance 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         |
|--------------------------|--------------------|----------------------------------------------|-------------------------------------------------------------------|---------------------|------|--------------|
| ON resistance (peak)     | $R_{ON(peak)}$     | $V_I=\text{GND to } V_{CC};$<br>see Figure 6 | $I_{SW} = 4\text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -                   | 34.0 | 130 $\Omega$ |
|                          |                    |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$      | -                   | 12.0 | 30 $\Omega$  |
|                          |                    |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                     | -                   | 10.4 | 25 $\Omega$  |
|                          |                    |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$       | -                   | 7.8  | 20 $\Omega$  |
|                          |                    |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$     | -                   | 6.2  | 15 $\Omega$  |
| ON resistance (rail)     | $R_{ON(rail)}$     | $V_I=\text{GND};$<br>see Figure 6            | $I_{SW} = 4\text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -                   | 8.2  | 18 $\Omega$  |
|                          |                    |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$      | -                   | 7.1  | 16 $\Omega$  |
|                          |                    |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                     | -                   | 6.9  | 14 $\Omega$  |
|                          |                    |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$       | -                   | 6.5  | 12 $\Omega$  |
|                          |                    |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$     | -                   | 5.8  | 10 $\Omega$  |
|                          |                    | $V_I=V_{CC};$<br>see Figure 6                | $I_{SW} = 4\text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -                   | 10.4 | 30 $\Omega$  |
|                          |                    |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$      | -                   | 7.6  | 20 $\Omega$  |
|                          |                    |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                     | -                   | 7.0  | 18 $\Omega$  |
|                          |                    |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$       | -                   | 6.1  | 15 $\Omega$  |
|                          |                    |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$     | -                   | 4.9  | 10 $\Omega$  |
| ON resistance (flatness) | $R_{ON(flatness)}$ | $V_I=\text{GND to } V_{CC}^{[2]}$            | $I_{SW} = 4\text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -                   | 26.0 | - $\Omega$   |
|                          |                    |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$      | -                   | 5.0  | - $\Omega$   |
|                          |                    |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                     | -                   | 3.5  | - $\Omega$   |
|                          |                    |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$       | -                   | 2.0  | - $\Omega$   |
|                          |                    |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$     | -                   | 1.5  | - $\Omega$   |

Note:

[1] Typical values are measured at  $T_{amb}=25^{\circ}\text{C}$  and nominal  $V_{CC}$ .

[2] Flatness is defined as the difference between the maximum and minimum value of ON resistance



measured at identical  $V_{CC}$  and temperature.

### 3.3.4、ON Resistance 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     |
|----------------------|----------------|----------------------------------------------|--------------------------------------------------------------------|------|------|------|----------|
| ON resistance (peak) | $R_{ON(peak)}$ | $V_I=\text{GND to } V_{CC};$<br>see Figure 6 | $I_{SW} = 4 \text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -    | -    | 195  | $\Omega$ |
|                      |                |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$       | -    | -    | 45   | $\Omega$ |
|                      |                |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                      | -    | -    | 38   | $\Omega$ |
|                      |                |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$        | -    | -    | 30   | $\Omega$ |
|                      |                |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$      | -    | -    | 23   | $\Omega$ |
| ON resistance (rail) | $R_{ON(rail)}$ | $V_I=\text{GND};$<br>see Figure 6            | $I_{SW} = 4 \text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -    | -    | 27   | $\Omega$ |
|                      |                |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$       | -    | -    | 24   | $\Omega$ |
|                      |                |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                      | -    | -    | 21   | $\Omega$ |
|                      |                |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$        | -    | -    | 18   | $\Omega$ |
|                      |                |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$      | -    | -    | 15   | $\Omega$ |
|                      |                | $V_I=V_{CC};$<br>see Figure 6                | $I_{SW} = 4 \text{ mA};$<br>$V_{CC}=1.65\text{V to } 1.95\text{V}$ | -    | -    | 45   | $\Omega$ |
|                      |                |                                              | $I_{SW}=8\text{mA};$<br>$V_{CC}=2.3\text{V to } 2.7\text{V}$       | -    | -    | 30   | $\Omega$ |
|                      |                |                                              | $I_{SW}=12\text{mA};$<br>$V_{CC}=2.7\text{V}$                      | -    | -    | 27   | $\Omega$ |
|                      |                |                                              | $I_{SW}=24\text{mA};$<br>$V_{CC}=3\text{V to } 3.6\text{V}$        | -    | -    | 23   | $\Omega$ |
|                      |                |                                              | $I_{SW}=32\text{mA};$<br>$V_{CC}=4.5\text{V to } 5.5\text{V}$      | -    | -    | 15   | $\Omega$ |



## 3.3.5、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 | $t_{PHL}, t_{PLH}$ | Y to Z or Z to Y; see Figure 13 <sup>[2]</sup> |      |                     |      |      |
|                   |                    | $V_{CC} = 1.65\text{V to } 1.95\text{V}$       | -    | 0.8                 | 2.0  | ns   |
|                   |                    | $V_{CC} = 2.3\text{V to } 2.7\text{V}$         | -    | 0.4                 | 1.2  | ns   |
|                   |                    | $V_{CC} = 2.7\text{V}$                         | -    | 0.4                 | 1.0  | ns   |
|                   |                    | $V_{CC} = 3.0\text{V to } 3.6\text{V}$         | -    | 0.3                 | 0.8  | ns   |
|                   |                    | $V_{CC} = 4.5\text{V to } 5.5\text{V}$         | -    | 0.2                 | 0.6  | ns   |
| enable time       | $t_{PZH}, t_{PZL}$ | E to Y or Z; see Figure 14                     |      |                     |      |      |
|                   |                    | $V_{CC} = 1.65\text{V to } 1.95\text{V}$       | 1.0  | 5.3                 | 12   | ns   |
|                   |                    | $V_{CC} = 2.3\text{V to } 2.7\text{V}$         | 1.0  | 3.0                 | 6.5  | ns   |
|                   |                    | $V_{CC} = 2.7\text{V}$                         | 1.0  | 2.6                 | 6.0  | ns   |
|                   |                    | $V_{CC} = 3.0\text{V to } 3.6\text{V}$         | 1.0  | 2.5                 | 5.0  | ns   |
|                   |                    | $V_{CC} = 4.5\text{V to } 5.5\text{V}$         | 1.0  | 1.9                 | 4.2  | ns   |
| disable time      | $t_{PLZ}, t_{PHZ}$ | E to Y or Z; see Figure 14                     |      |                     |      |      |
|                   |                    | $V_{CC} = 1.65\text{V to } 1.95\text{V}$       | 1.0  | 4.2                 | 10   | ns   |
|                   |                    | $V_{CC} = 2.3\text{V to } 2.7\text{V}$         | 1.0  | 2.4                 | 6.9  | ns   |
|                   |                    | $V_{CC} = 2.7\text{V}$                         | 1.0  | 3.6                 | 7.5  | ns   |
|                   |                    | $V_{CC} = 3.0\text{V to } 3.6\text{V}$         | 1.0  | 3.4                 | 6.5  | ns   |
|                   |                    | $V_{CC} = 4.5\text{V to } 5.5\text{V}$         | 1.0  | 2.5                 | 5.0  | ns   |

### Note:

[1] Typical values are measured at  $T_{amb} = 25^{\circ}\text{C}$  and nominal  $V_{CC}$ .

[2] Propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the specified capacitance when driven by an ideal voltage source (zero output impedance).



## 3.3.6、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 | $t_{PHL}, t_{PLH}$ | Y to Z or Z to Y; see Figure 13 <sup>[1]</sup> |      |      |      |      |
|                   |                    | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$        | -    | -    | 3.0  | ns   |
|                   |                    | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$          | -    | -    | 2.0  | ns   |
|                   |                    | $V_{CC}=2.7\text{V}$                           | -    | -    | 1.5  | ns   |
|                   |                    | $V_{CC}=3.0\text{V}$ to $3.6\text{V}$          | -    | -    | 1.5  | ns   |
|                   |                    | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$          | -    | -    | 1.0  | ns   |
| enable time       | $t_{PZH}, t_{PZL}$ | E to Y or Z; see Figure 14                     |      |      |      |      |
|                   |                    | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$        | 1.0  | -    | 15.5 | ns   |
|                   |                    | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$          | 1.0  | -    | 8.5  | ns   |
|                   |                    | $V_{CC}=2.7\text{V}$                           | 1.0  | -    | 8.0  | ns   |
|                   |                    | $V_{CC}=3.0\text{V}$ to $3.6\text{V}$          | 1.0  | -    | 6.5  | ns   |
|                   |                    | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$          | 1.0  | -    | 5.5  | ns   |
| disable time      | $t_{PLZ}, t_{PHZ}$ | E to Y or Z; see Figure 14                     |      |      |      |      |
|                   |                    | $V_{CC}=1.65\text{V}$ to $1.95\text{V}$        | 1.0  | -    | 13   | ns   |
|                   |                    | $V_{CC}=2.3\text{V}$ to $2.7\text{V}$          | 1.0  | -    | 9.0  | ns   |
|                   |                    | $V_{CC}=2.7\text{V}$                           | 1.0  | -    | 9.5  | ns   |
|                   |                    | $V_{CC}=3.0\text{V}$ to $3.6\text{V}$          | 1.0  | -    | 8.5  | ns   |
|                   |                    | $V_{CC}=4.5\text{V}$ to $5.5\text{V}$          | 1.0  | -    | 6.5  | ns   |

### Note:

[1] Propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the specified capacitance when driven by an ideal voltage source (zero output impedance).

## 3.3.7、Additional AC Characteristics

( $T_{amb}=25^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified)

| Parameter                 | Symbol              | Conditions                                                                        | Min.                  | Typ. | Max.  | Unit |
|---------------------------|---------------------|-----------------------------------------------------------------------------------|-----------------------|------|-------|------|
| total harmonic distortion | THD                 | $R_L=10\text{k}\Omega$ ; $C_L=50\text{pF}$ ;<br>$f_i=1\text{kHz}$ ; see Figure 7  | $V_{CC}=1.65\text{V}$ | -    | 0.032 | %    |
|                           |                     |                                                                                   | $V_{CC}=2.3\text{V}$  | -    | 0.008 | %    |
|                           |                     |                                                                                   | $V_{CC}=3.0\text{V}$  | -    | 0.006 | %    |
|                           |                     |                                                                                   | $V_{CC}=4.5\text{V}$  | -    | 0.001 | %    |
|                           |                     | $R_L=10\text{k}\Omega$ ; $C_L=50\text{pF}$ ;<br>$f_i=10\text{kHz}$ ; see Figure 7 | $V_{CC}=1.65\text{V}$ | -    | 0.068 | %    |
|                           |                     |                                                                                   | $V_{CC}=2.3\text{V}$  | -    | 0.009 | %    |
|                           |                     |                                                                                   | $V_{CC}=3.0\text{V}$  | -    | 0.008 | %    |
|                           |                     |                                                                                   | $V_{CC}=4.5\text{V}$  | -    | 0.006 | %    |
| -3dB frequency response   | $f_{(-3\text{dB})}$ | $R_L=600\Omega$ ; $C_L=50\text{pF}$ ;<br>see Figure 8                             | $V_{CC}=1.65\text{V}$ | -    | 135   | MHz  |
|                           |                     |                                                                                   | $V_{CC}=2.3\text{V}$  | -    | 145   | MHz  |
|                           |                     |                                                                                   | $V_{CC}=3.0\text{V}$  | -    | 150   | MHz  |
|                           |                     |                                                                                   | $V_{CC}=4.5\text{V}$  | -    | 155   | MHz  |
|                           |                     | $R_L=50\Omega$ ; $C_L=5\text{pF}$ ;<br>see Figure 8                               | $V_{CC}=1.65\text{V}$ | -    | >500  | MHz  |
|                           |                     |                                                                                   | $V_{CC}=2.3\text{V}$  | -    | >500  | MHz  |
|                           |                     |                                                                                   | $V_{CC}=3.0\text{V}$  | -    | >500  | MHz  |
|                           |                     |                                                                                   | $V_{CC}=4.5\text{V}$  | -    | >500  | MHz  |
|                           |                     | $R_L=50\Omega$ ; $C_L=10\text{pF}$ ;<br>see Figure 8                              | $V_{CC}=1.65\text{V}$ | -    | 200   | MHz  |
|                           |                     |                                                                                   | $V_{CC}=2.3\text{V}$  | -    | 350   | MHz  |



#### 4.1、 DC Testing Circuit

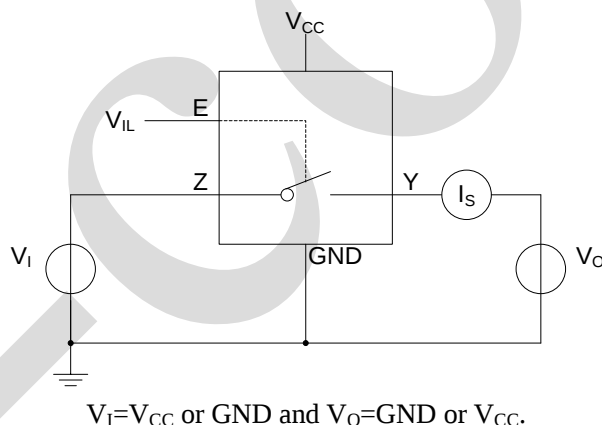
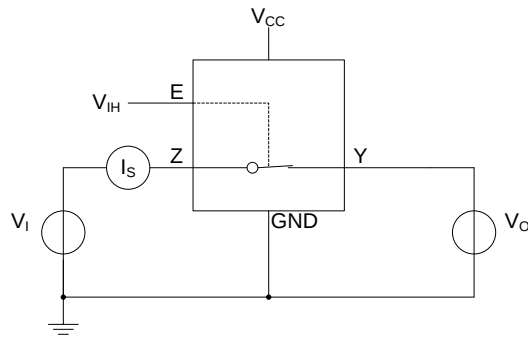


Figure 4. Test circuit for measuring OFF-state leakage current



$V_I = V_{CC}$  or GND and  $V_O = \text{open circuit}$ .

Figure 5. Test circuit for measuring ON-state leakage current

## 4.2、ON Resistance Test Circuit

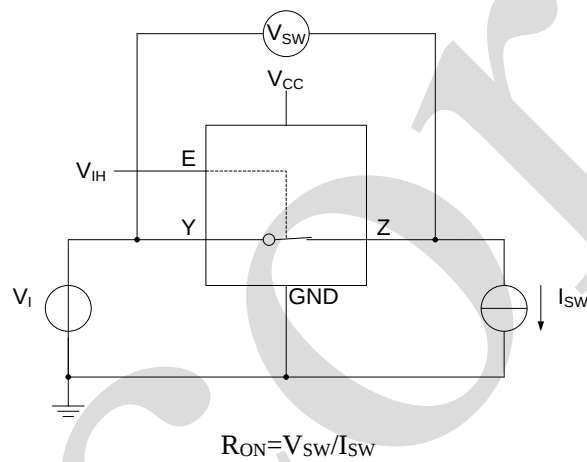
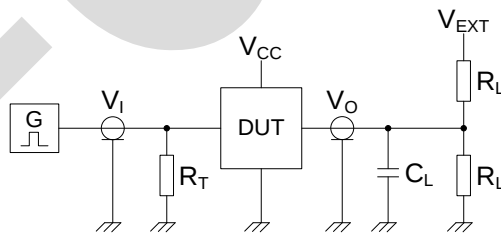


Figure 6. Test circuit for measuring ON resistance

## 4.3、AC Testing Circuit



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.

Figure 7. Test circuit for measuring switching times



## 4.4、AC Testing Circuit

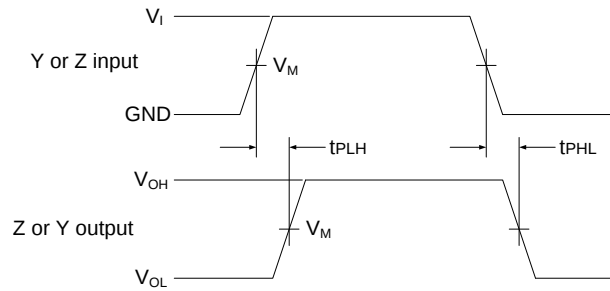


Figure 8. Input (Y or Z) to output (Z or Y) propagation delays

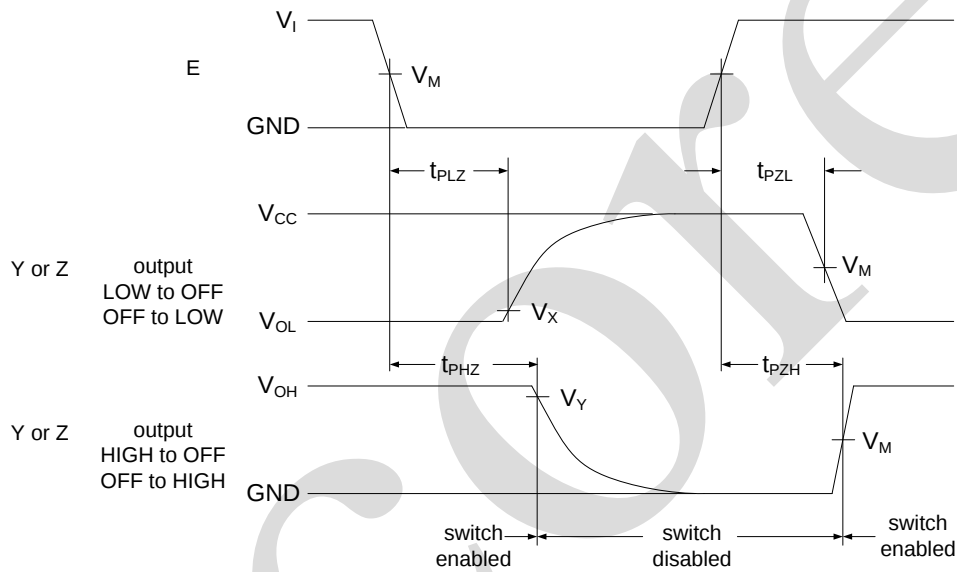
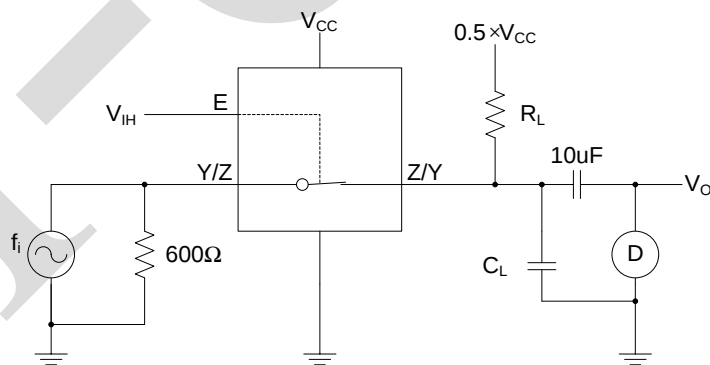


Figure 9. Enable and disable times

## 4.5、Additional AC Testing Circuit



Test conditions:

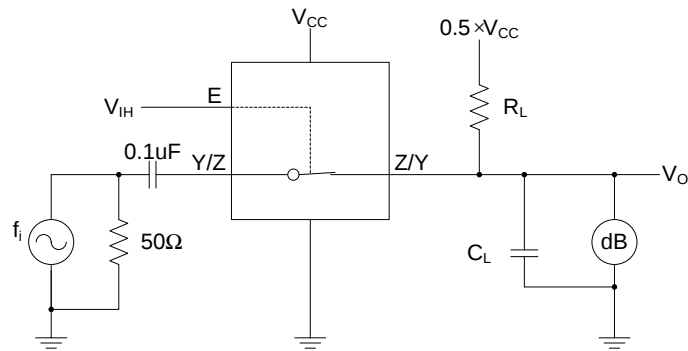
$V_{CC}=1.65V$ :  $V_i=1.4V$  (p-p).

$V_{CC}=2.3V$ :  $V_i=2V$  (p-p).

$V_{CC}=3V$ :  $V_i=2.5V$  (p-p).

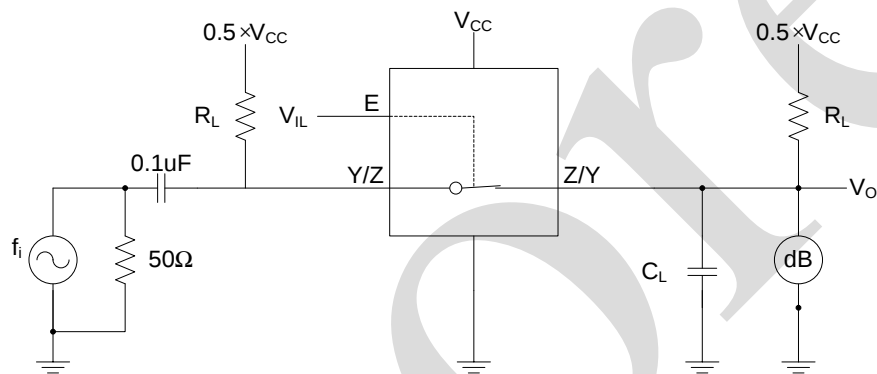
$V_{CC}=4.5V$ :  $V_i=4V$  (p-p).

Figure 10. Test circuit for measuring total harmonic distortion



Adjust  $f_i$  voltage to obtain 0dBm level at output. Increase  $f_i$  frequency until dB meter reads -3dB.

Figure 11. Test circuit for measuring the frequency response when switch is in ON-state



Adjust  $f_i$  voltage to obtain 0dBm level at input.

Figure 12. Test circuit for measuring isolation (OFF-state)

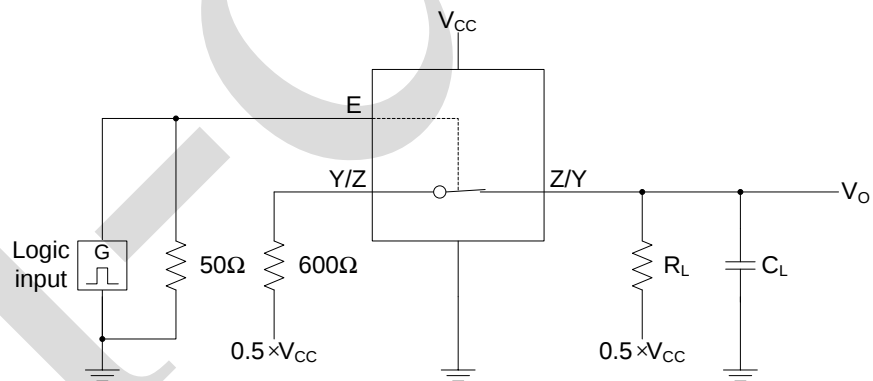
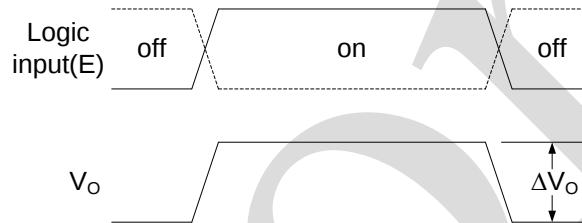
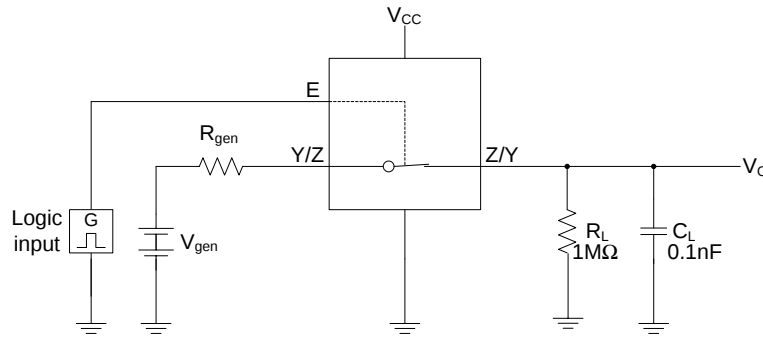


Figure 13. Test circuit for measuring crosstalk between digital input and switch



$$Q_{inj} = \Delta V_O \times C_L.$$

$\Delta V_O$  = output voltage variation.

$R_{gen}$  = generator resistance.

$V_{gen}$  = generator voltage.

Figure 14. Test circuit for measuring charge injection

#### 4.6、Measurement Points

| Supply voltage | Input               | Output              |                  |                  |
|----------------|---------------------|---------------------|------------------|------------------|
| $V_{CC}$       | $V_M$               | $V_M$               | $V_X$            | $V_Y$            |
| 1.65V to 1.95V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15V$ | $V_{OH} - 0.15V$ |
| 2.3V to 2.7V   | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15V$ | $V_{OH} - 0.15V$ |
| 2.7V           | 1.5V                | 1.5V                | $V_{OL} + 0.3V$  | $V_{OH} - 0.3V$  |
| 3V to 3.6V     | 1.5V                | 1.5V                | $V_{OL} + 0.3V$  | $V_{OH} - 0.3V$  |
| 4.5V to 5.5V   | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3V$  | $V_{OH} - 0.3V$  |

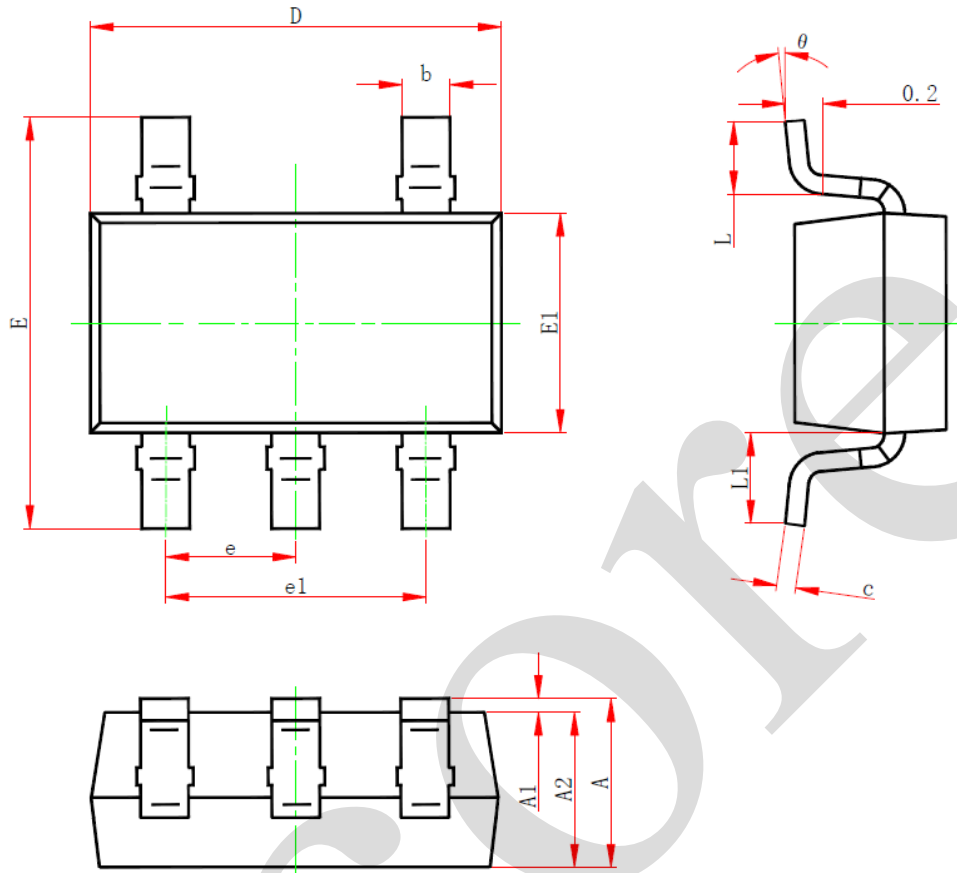
#### 4.7、Test Data

| Supply voltage | Input    |              | Load  |       | $V_{EXT}$          |                    |                    |
|----------------|----------|--------------|-------|-------|--------------------|--------------------|--------------------|
| $V_{CC}$       | $V_I$    | $t_r, t_f$   | $C_L$ | $R_L$ | $t_{PLH}, t_{PHL}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 1.65V to 1.95V | $V_{CC}$ | $\leq 2.0ns$ | 30pF  | 1kΩ   | open               | GND                | $2 \times V_{CC}$  |
| 2.3V to 2.7V   | $V_{CC}$ | $\leq 2.0ns$ | 30pF  | 500Ω  | open               | GND                | $2 \times V_{CC}$  |
| 2.7V           | 2.7V     | $\leq 2.5ns$ | 50pF  | 500Ω  | open               | GND                | $2 \times V_{CC}$  |
| 3V to 3.6V     | 2.7V     | $\leq 2.5ns$ | 50pF  | 500Ω  | open               | GND                | $2 \times V_{CC}$  |
| 4.5V to 5.5V   | $V_{CC}$ | $\leq 2.5ns$ | 50pF  | 500Ω  | open               | GND                | $2 \times V_{CC}$  |



## 5、Package Information

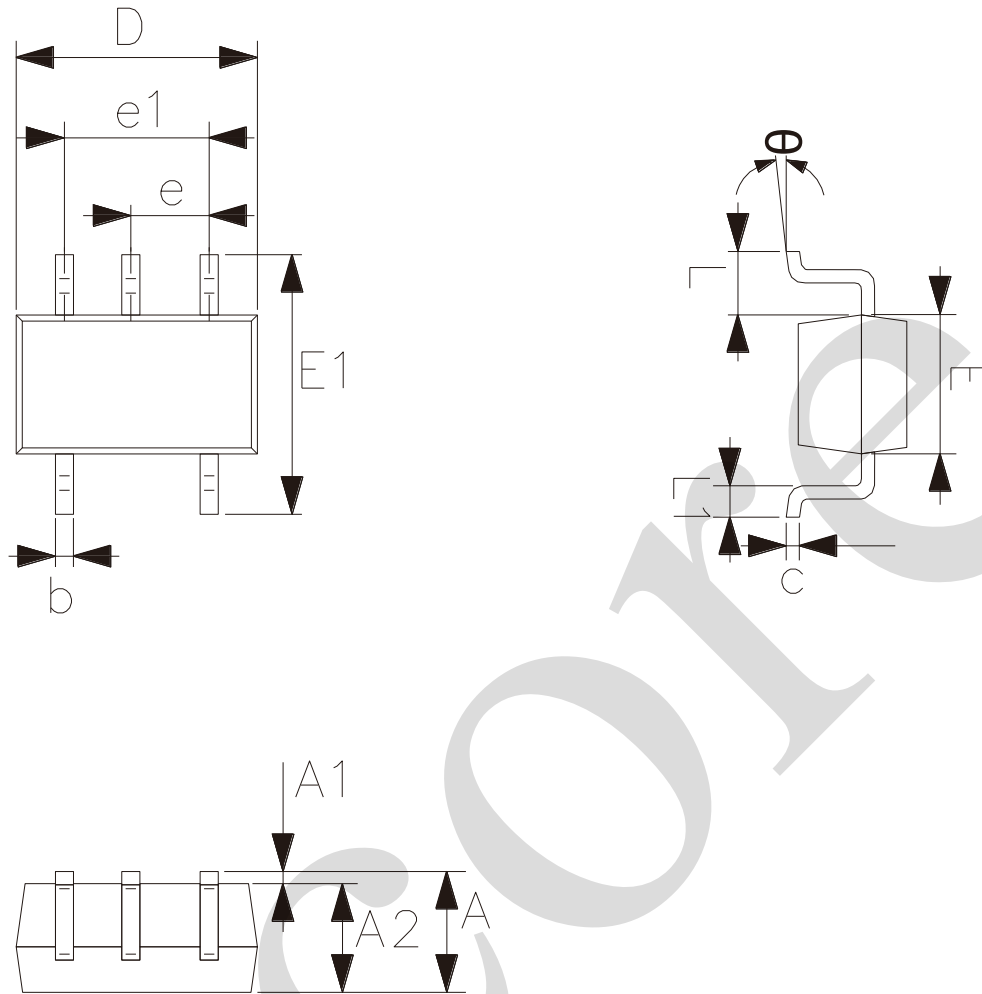
### 5.1、SOT23-5



| Symbol   | Dimensions (mm) |      |
|----------|-----------------|------|
|          | Min.            | Max. |
| A        | -               | 1.26 |
| 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 |
| $\theta$ | 0°              | 8°   |



## 5.2、SOT353



| 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  |
| E      | 1.15            | 1.35  |
| E1     | 2.15            | 2.45  |
| e      | 0.65            |       |
| e1     | 1.20            | 1.40  |
| L      | 0.525           |       |
| L1     | 0.26            | 0.46  |
| θ      | 0°              | 8°    |



## 6、Statements And Notes

### 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> |                               |                               |                               |                          |                                |                   |                       |                           |                      |

### 6.2、Notes

Recommended carefully reading this information before the use of this product;

The information in this document are subject to change without notice;

This information is using to the reference only, the company is not responsible for any loss;

The company is not responsible for the any infringement of the third party patents or other rights of the responsibility.