



AiP74LVC1G3157
2-channel Analog
Multiplexer/Demultiplexer

Product Specification

Specification Revision History:

| Version | Date | Description |
|----------------|-------------|--|
| 2020-05-A1 | 2020-05 | New |
| 2023-04-B1 | 2023-04 | Update the template |
| 2025-08-B2 | 2025-08 | Modify the marking code of XSON6; update the package information |
| | | |
| | | |



Contents

| | |
|--|-----------|
| 1、 General Description..... | 4 |
| 2、 Block Diagram And Pin Description | 5 |
| 2.1、 Block Diagram | 5 |
| 2.2、 Pin Configurations..... | 5 |
| 2.3、 Pin Description | 6 |
| 2.4、 Function Table..... | 6 |
| 3、 Electrical Parameter | 6 |
| 3.1、 Absolute Maximum Ratings..... | 6 |
| 3.2、 Recommended Operating Conditions..... | 7 |
| 3.3、 Electrical Characteristics | 7 |
| 3.3.1、 DC Characteristics 1 | 7 |
| 3.3.2、 DC Characteristics 2 | 8 |
| 3.3.3、 ON Resistance 1 | 9 |
| 3.3.4、 ON Resistance 2 | 10 |
| 3.3.5、 AC Characteristics 1 | 11 |
| 3.3.6、 AC Characteristics 2 | 12 |
| 3.3.7、 Additional AC Characteristics | 13 |
| 4、 Testing Circuit | 13 |
| 4.1、 DC Testing Circuit | 13 |
| 4.2、 ON Resistance Test Circuit And Graphs..... | 14 |
| 4.3、 AC Testing Waveforms..... | 16 |
| 4.4、 Measurement Points | 17 |
| 4.5、 AC Testing Circuit | 17 |
| 4.6、 Test Data | 18 |
| 4.7、 Additional AC Testing Circuit | 19 |
| 5、 Package Information | 21 |
| 5.1、 SOT23-6..... | 21 |
| 5.2、 SOT363 | 22 |
| 5.3、 XSON6..... | 23 |
| 6、 Statements And Notes | 24 |
| 6.1、 The name and content of Hazardous substances or Elements in the product | 24 |



6.2、Notes 24





1、General Description

The AiP74LVC1G3157 provides one analog multiplexer/demultiplexer with one digital select input (S), two independent inputs/outputs (Y0, Y1) and a common input/output (Z).

Schmitt trigger action at the select input makes the circuit tolerant of slower input rise and fall times across the entire V_{CC} range from 1.65V to 5.5V.

Features:

- Wide supply voltage range from 1.65V to 5.5V
- Very low ON resistance:
 - 7.5 Ω (typical) at $V_{CC}=2.7V$
 - 6.5 Ω (typical) at $V_{CC}=3.3V$
 - 6 Ω (typical) at $V_{CC}=5V$
- Switch current capability of 32mA
- Break-before-make switching
- CMOS low power consumption
- TTL interface compatibility at 3.3V
- Control input accepts voltages up to 5.5V
- Specified from -40 $^{\circ}C$ to +125 $^{\circ}C$
- Packaging information: SOT23-6/SOT363/XSON6

Ordering Information:

Reel packing specifications:

| Part number | Packaging form | Marking code | Reel quantity | Boxed reel quantity | Notes |
|------------------------|----------------|--------------|------------------|---------------------|--|
| AiP74LVC1G3157GB236.TR | SOT23-6 | CNXX | 3000 PCS/reel | 30000 PCS/box | Dimensions of plastic enclosure: 2.9mm \times 1.6mm Pin spacing: 0.95mm |
| AiP74LVC1G3157GC363.TR | SOT363 | CNXX | 3000 PCS/reel | 30000 PCS/box | Dimensions of plastic enclosure: 2.1mm \times 1.3mm Pin spacing: 0.65mm |
| AiP74LVC1G3157EA6.TR | XSON6 | CN XX | 5000 PCS/reel | 25000 PCS/box | Dimensions of plastic enclosure: 1.45mm \times 1.0mm Pin spacing: 0.5mm |

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

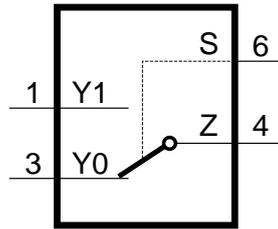


Figure 1. Logic symbol

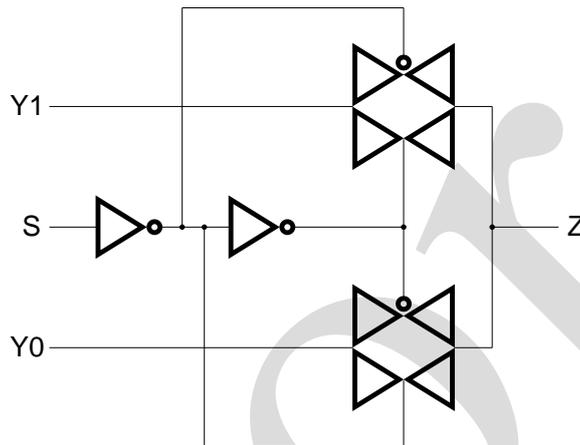
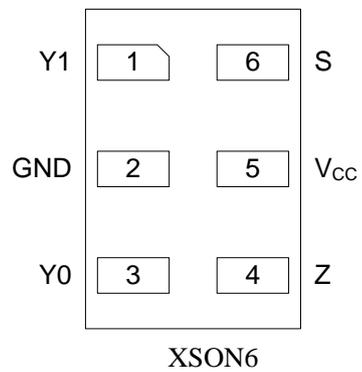
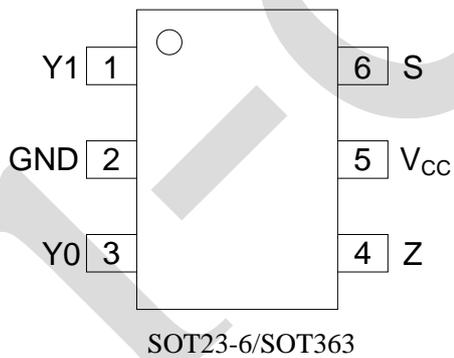


Figure 2. Logic diagram

2.2、Pin Configurations





2.3、Pin Description

| Pin No. | Pin Name | Description |
|---------|-----------------|-----------------------------|
| 1 | Y1 | independent input or output |
| 2 | GND | ground (0 V) |
| 3 | Y0 | independent input or output |
| 4 | Z | common output or input |
| 5 | V _{CC} | supply voltage |
| 6 | S | select input |

2.4、Function Table

| Input S | Channel on |
|---------|------------|
| L | Y0 |
| H | Y1 |

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

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25°C, All voltage referenced to GND, unless otherwise specified)

| Characteristic | Symbol | Conditions | Min. | Max. | Unit |
|-------------------------|------------------|--|------|----------------------|------|
| supply voltage | V _{CC} | - | -0.5 | +6.5 | V |
| input voltage | V _I | - ^[1] | -0.5 | +6.5 | V |
| input clamping current | I _{IK} | V _I <-0.5V or V _I >V _{CC} +0.5V | -50 | - | mA |
| switch clamping current | I _{SK} | V _I <-0.5V or V _I >V _{CC} +0.5V | - | ±50 | mA |
| switch voltage | V _{SW} | enable and disable mode ^[2] | -0.5 | V _{CC} +0.5 | V |
| switch current | I _{SW} | V _{SW} >-0.5V or V _{SW} <V _{CC} +0.5V | - | ±50 | mA |
| supply current | I _{CC} | - | - | 100 | mA |
| ground current | I _{GND} | - | -100 | - | mA |
| storage temperature | T _{stg} | - | -65 | +150 | °C |
| total power dissipation | P _{tot} | - | - | 250 | mW |
| soldering temperature | T _L | 10s | 260 | | °C |

Note:

[1] The minimum input voltage rating may be exceeded if the input current rating is observed.

[2] The minimum and maximum switch voltage ratings may be exceeded if the switch clamping current rating is observed.



3.2、Recommended Operating Conditions

| Characteristic | 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} | enable and disable mode ^[1] | 0 | - | V_{CC} | V |
| ambient temperature | T_{amb} | - | -40 | - | +125 | °C |
| input transition rise and fall rate | $\Delta t/\Delta V$ | $V_{CC}=1.65V$ to $2.7V$ ^[2] | - | - | 20 | ns/V |
| | | $V_{CC}=2.7V$ to $5.5V$ ^[2] | - | - | 10 | ns/V |

Note:

[1] To avoid sinking GND current from terminal Z when switch current flows in terminal Y_n , the voltage drop across the bidirectional switch must not exceed 0.4V. If the switch current flows into terminal Z, no GND current will flow from terminal Y_n . In this case, there is no limit for the voltage drop across the switch.

[2] Applies to control signal levels.

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. ^[1] | Max. | Unit |
|---------------------------|-----------------|---|--------------|---------------------|--------------|---------|
| HIGH-level input voltage | V_{IH} | $V_{CC}=1.65V$ to $1.95V$ | $0.65V_{CC}$ | - | - | V |
| | | $V_{CC}=2.3V$ to $2.7V$ | 1.7 | - | - | V |
| | | $V_{CC}=3V$ to $3.6V$ | 2.0 | - | - | V |
| | | $V_{CC}=4.5V$ to $5.5V$ | $0.7V_{CC}$ | - | - | V |
| LOW-level input voltage | V_{IL} | $V_{CC}=1.65V$ to $1.95V$ | - | - | $0.35V_{CC}$ | V |
| | | $V_{CC}=2.3V$ to $2.7V$ | - | - | 0.7 | V |
| | | $V_{CC}=3V$ to $3.6V$ | - | - | 0.8 | V |
| | | $V_{CC}=4.5V$ to $5.5V$ | - | - | $0.3V_{CC}$ | V |
| input leakage current | I_I | pin S; $V_I = 5.5V$ or GND; $V_{CC} = 0V$ to $5.5V$ ^[2] | - | ± 0.1 | ± 1 | μA |
| OFF-state | $I_{S(OFF)}$ | $V_{CC}=5.5V$; see Figure 3 ^[2] | - | ± 0.1 | ± 0.2 | μA |
| ON-state | $I_{S(ON)}$ | $V_{CC}=5.5V$; see Figure 4 ^[2] | - | ± 0.1 | ± 1 | μA |
| supply current | I_{CC} | $V_I=5.5V$ or GND; $V_{SW}=GND$ or V_{CC} ; $V_{CC}=1.65V$ to $5.5V$ ^[2] | - | 0.1 | 4 | μA |
| additional supply current | ΔI_{CC} | pin S; $V_I=V_{CC}-0.6V$; $V_{CC}=5.5V$; $V_{SW}=GND$ or V_{CC} ^[2] | - | 5 | 500 | μA |
| input capacitance | C_I | - | - | 2.5 | - | pF |
| OFF-state capacitance | $C_{S(OFF)}$ | - | - | 6.0 | - | pF |
| ON-state capacitance | $C_{S(ON)}$ | - | - | 18 | - | pF |

Note:

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



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

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} | $V_{CC}=1.65V$ to $1.95V$ | $0.65V_{CC}$ | - | - | V |
| | | $V_{CC}=2.3V$ to $2.7V$ | 1.7 | - | - | V |
| | | $V_{CC}=3V$ to $3.6V$ | 2.0 | - | - | V |
| | | $V_{CC}=4.5V$ to $5.5V$ | $0.7V_{CC}$ | - | - | V |
| LOW-level input voltage | V_{IL} | $V_{CC}=1.65V$ to $1.95V$ | - | - | $0.35V_{CC}$ | V |
| | | $V_{CC}=2.3V$ to $2.7V$ | - | - | 0.7 | V |
| | | $V_{CC}=3V$ to $3.6V$ | - | - | 0.8 | V |
| | | $V_{CC}=4.5V$ to $5.5V$ | - | - | $0.3V_{CC}$ | V |
| input leakage current | I_I | pin S; $V_I = 5.5V$ or GND; $V_{CC} = 0V$ to $5.5V$ ^[1] | - | - | ± 1 | μA |
| OFF-state | $I_{S(OFF)}$ | $V_{CC}=5.5V$; see Figure 3 ^[1] | - | - | ± 0.5 | μA |
| ON-state | $I_{S(ON)}$ | $V_{CC}=5.5V$; see Figure 4 ^[1] | - | - | ± 2 | μA |
| supply current | I_{CC} | $V_I=5.5V$ or GND; $V_{SW}=GND$ or V_{CC} ; $V_{CC}=1.65V$ to $5.5V$ ^[1] | - | - | 4 | μA |
| additional supply current | ΔI_{CC} | pin S; $V_I=V_{CC}-0.6V$; $V_{CC}=5.5V$; $V_{SW}=GND$ or V_{CC} ^[1] | - | - | 500 | μA |



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. ^[1] | Max. | Unit | |
|--------------------------|----------------|--------------------------------------|---|---------------------|------|------|----------|
| ON resistance (peak) | $R_{ON(peak)}$ | $V_I=GND$ to V_{CC} ; see Figure 5 | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | 34.0 | 130 | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | 12.0 | 30 | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | 10.4 | 25 | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | 7.8 | 20 | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | 6.2 | 15 | Ω |
| ON resistance (rail) | $R_{ON(rail)}$ | $V_I=GND$; see Figure 5 | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | 8.2 | 18 | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | 7.1 | 16 | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | 6.9 | 14 | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | 6.5 | 12 | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | 5.8 | 10 | Ω |
| | | $V_I=V_{CC}$; see Figure 5 | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | 10.4 | 30 | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | 7.6 | 20 | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | 7.0 | 18 | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | 6.1 | 15 | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | 4.9 | 10 | Ω |
| ON resistance (flatness) | $R_{ON(flat)}$ | $V_I=GND$ to V_{CC} ^[2] | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | 26.0 | - | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | 5.0 | - | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | 3.5 | - | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | 2.0 | - | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | 1.5 | - | Ω |

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) | $R_{ON(peak)}$ | $V_I=GND$ to V_{CC} ; see Figure 5 | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | - | 195 | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | - | 45 | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | - | 38 | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | - | 30 | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | - | 23 | Ω |
| ON resistance (rail) | $R_{ON(rail)}$ | $V_I=GND$; see Figure 5 | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | - | 27 | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | - | 24 | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | - | 21 | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | - | 18 | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | - | 15 | Ω |
| | | $V_I=V_{CC}$; see Figure 5 | $I_{sw} = 4\text{ mA}; V_{CC}=1.65\text{V to }1.95\text{V}$ | - | - | 45 | Ω |
| | | | $I_{sw}=8\text{mA}; V_{CC}=2.3\text{V to }2.7\text{V}$ | - | - | 30 | Ω |
| | | | $I_{sw}=12\text{mA}; V_{CC}=2.7\text{V}$ | - | - | 27 | Ω |
| | | | $I_{sw}=24\text{mA}; V_{CC}=3\text{V to }3.6\text{V}$ | - | - | 23 | Ω |
| | | | $I_{sw}=32\text{mA}; V_{CC}=4.5\text{V to }5.5\text{V}$ | - | - | 15 | Ω |



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. ^[1] | Max. | Unit | |
|-------------------------------|-----------|--|---------------------------------------|---------------------|------|------|----|
| propagation delay | t_{pd} | Z to Yn or Yn to Z; see Figure 12 ^{[2][3]} | $V_{CC}=1.65\text{V to }1.95\text{V}$ | - | - | 2 | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | - | - | 1.2 | ns |
| | | | $V_{CC}=2.7\text{V}$ | - | - | 1.0 | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | - | - | 0.8 | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | - | - | 0.6 | ns |
| enable time | t_{en} | S to Yn; see Figure 13 ^[4] | $V_{CC}=1.65\text{V to }1.95\text{V}$ | 3.1 | 8.7 | 20.8 | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | 2.2 | 5.3 | 11.5 | ns |
| | | | $V_{CC}=2.7\text{V}$ | 2.1 | 4.9 | 9.3 | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | 1.8 | 4.0 | 7.6 | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | 1.5 | 3.0 | 5.7 | ns |
| disable time | t_{dis} | S to Yn; see Figure 13 ^[5] | $V_{CC}=1.65\text{V to }1.95\text{V}$ | 3.0 | 6.0 | 11.4 | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | 2.1 | 4.4 | 7.3 | ns |
| | | | $V_{CC}=2.7\text{V}$ | 2.1 | 4.2 | 6.3 | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | 1.7 | 3.6 | 5.3 | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | 1.3 | 2.9 | 3.8 | ns |
| break-before emake time | t_{b-m} | see Figure 14 ^[6] | $V_{CC}=1.65\text{V to }1.95\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=2.7\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | 0.5 | - | - | ns |

Note:

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

[2] t_{pd} is the same as t_{PLH} and t_{PHL} .

[3] 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).

[4] t_{en} is the same as t_{PZH} and t_{PZL} .

[5] t_{dis} is the same as t_{PLZ} and t_{PHZ} .

[6] Break-before-make specified by design.



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. ^[1] | Max. | Unit | |
|------------------------|-----------|--|---------------------------------------|---------------------|------|------|----|
| propagation delay | t_{pd} | Z to Yn or Yn to Z; see Figure 12 ^{[2][3]} | $V_{CC}=1.65\text{V to }1.95\text{V}$ | - | - | 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 |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | - | - | 1.5 | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | - | - | 1.0 | ns |
| enable time | t_{en} | S to Yn; see Figure 13 ^[4] | $V_{CC}=1.65\text{V to }1.95\text{V}$ | 3.1 | - | 22.0 | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | 2.2 | - | 12.5 | ns |
| | | | $V_{CC}=2.7\text{V}$ | 2.1 | - | 10.5 | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | 1.8 | - | 9.0 | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | 1.5 | - | 6.1 | ns |
| disable time | t_{dis} | S to Yn; see Figure 13 ^[5] | $V_{CC}=1.65\text{V to }1.95\text{V}$ | 3.0 | - | 11.7 | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | 2.1 | - | 7.6 | ns |
| | | | $V_{CC}=2.7\text{V}$ | 2.1 | - | 6.6 | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | 1.7 | - | 5.9 | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | 1.3 | - | 4.3 | ns |
| break-before make time | t_{b-m} | see Figure 14 ^[6] | $V_{CC}=1.65\text{V to }1.95\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=2.3\text{V to }2.7\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=2.7\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=3\text{V to }3.6\text{V}$ | 0.5 | - | - | ns |
| | | | $V_{CC}=4.5\text{V to }5.5\text{V}$ | 0.5 | - | - | ns |

Note:

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

[2] t_{pd} is the same as t_{PLH} and t_{PHL} .

[3] 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).

[4] t_{en} is the same as t_{PZH} and t_{PZL} .

[5] t_{dis} is the same as t_{PLZ} and t_{PHZ} .

[6] Break-before-make specified by design.



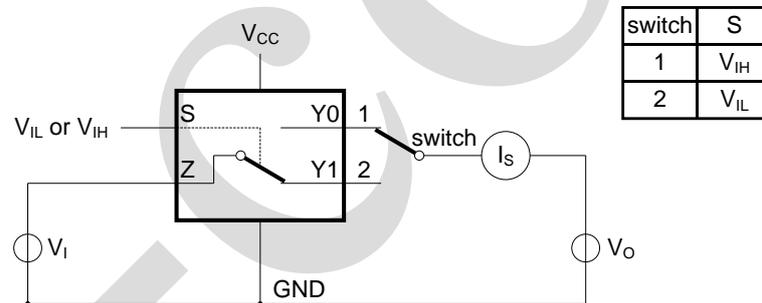
3.3.7. Additional AC Characteristics

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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|---------------------------|---------------------|--|-----------------------|------|-------|------|-----|
| total harmonic distortion | THD | $f_i=600\text{Hz to }20\text{kHz};$ $R_L=600\Omega;$ $C_L=50\text{pF}; V_i=0.5\text{V(p-p)};$ see Figure 16 | $V_{CC}=1.65\text{V}$ | - | 0.260 | - | % |
| | | | $V_{CC}=2.3\text{V}$ | - | 0.078 | - | % |
| | | | $V_{CC}=3.0\text{V}$ | - | 0.078 | - | % |
| | | | $V_{CC}=4.5\text{V}$ | - | 0.078 | - | % |
| -3 dB frequency response | $f_{(-3\text{dB})}$ | $R_L=50\Omega;$ see Figure 17 | $V_{CC}=1.65\text{V}$ | - | 200 | - | MHz |
| | | | $V_{CC}=2.3\text{V}$ | - | 300 | - | MHz |
| | | | $V_{CC}=3.0\text{V}$ | - | 300 | - | MHz |
| | | | $V_{CC}=4.5\text{V}$ | - | 300 | - | MHz |
| isolation (OFF-state) | α_{iso} | $R_L=50\Omega; C_L=5\text{pF};$ $f_i=10\text{MHz};$ see Figure 18 | $V_{CC}=1.65\text{V}$ | - | -42 | - | dB |
| | | | $V_{CC}=2.3\text{V}$ | - | -42 | - | dB |
| | | | $V_{CC}=3.0\text{V}$ | - | -40 | - | dB |
| | | | $V_{CC}=4.5\text{V}$ | - | -40 | - | dB |
| charge injection | Q_{inj} | $C_L=0.1\text{nF}; V_{gen}=0\text{V};$ $R_{gen}=0\Omega;$ $f_i=1\text{MHz}; R_L=1\text{M}\Omega;$ see Figure 19 | $V_{CC}=1.8\text{V}$ | - | 3.3 | - | pC |
| | | | $V_{CC}=2.5\text{V}$ | - | 4.1 | - | pC |
| | | | $V_{CC}=3.3\text{V}$ | - | 5.0 | - | pC |
| | | | $V_{CC}=4.5\text{V}$ | - | 6.4 | - | pC |
| | | | $V_{CC}=5.5\text{V}$ | - | 7.5 | - | pC |

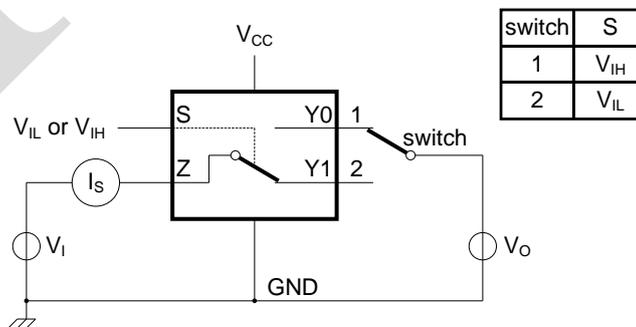
4. Testing Circuit

4.1. DC Testing Circuit



$V_I=V_{CC}$ or GND and $V_O=GND$ or V_{CC} .

Figure 3. Test circuit for measuring OFF-state leakage current



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

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



4.2、ON Resistance Test Circuit And Graphs

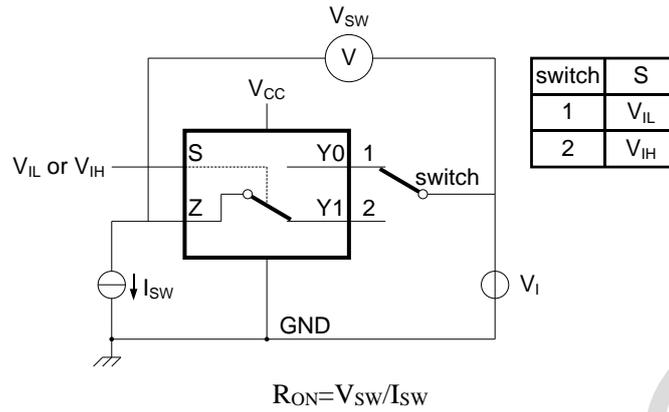
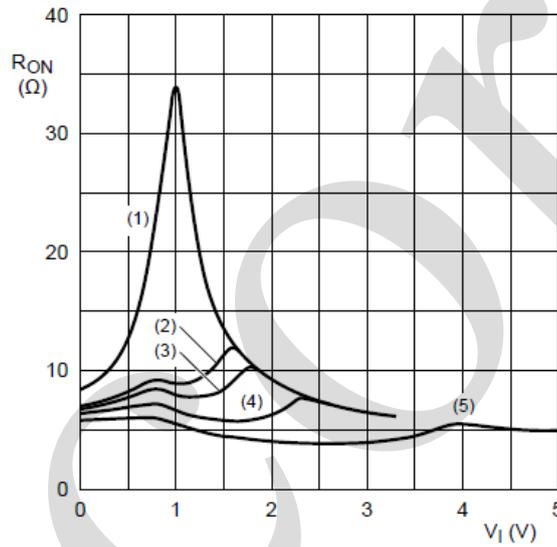
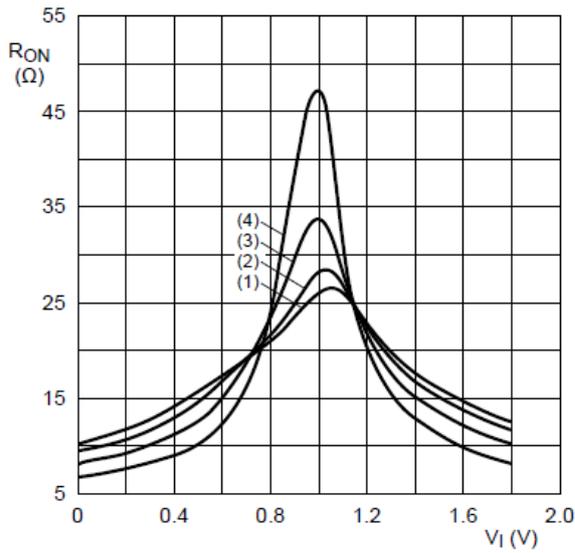


Figure 5. Test circuit for measuring ON resistance



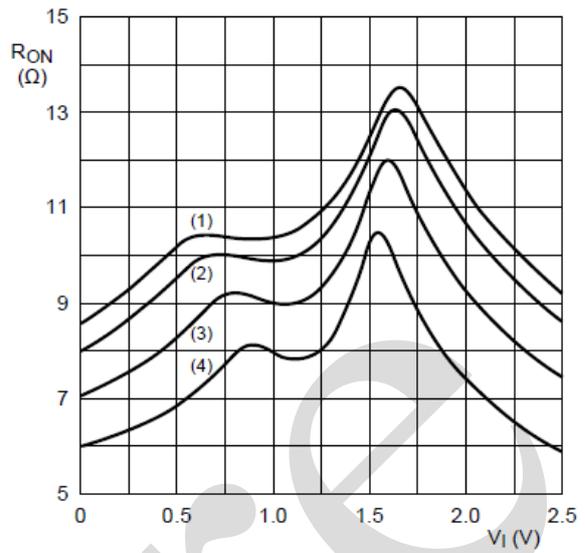
- (1) V_{CC}=1.8V.
- (2) V_{CC}=2.5V.
- (3) V_{CC}=2.7V.
- (4) V_{CC}=3.3V.
- (5) V_{CC}=5.0V.

Figure 6. Typical ON resistance as a function of input voltage; T_{amb}=25°C



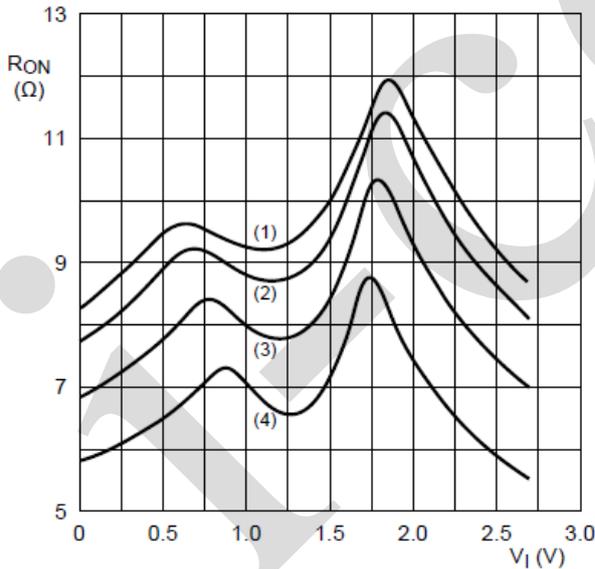
- (1) $T_{amb}=125^{\circ}\text{C}$.
- (2) $T_{amb}=85^{\circ}\text{C}$.
- (3) $T_{amb}=25^{\circ}\text{C}$.
- (4) $T_{amb}=-40^{\circ}\text{C}$.

Figure 7. ON resistance as a function of input voltage; $V_{CC}=1.8\text{V}$



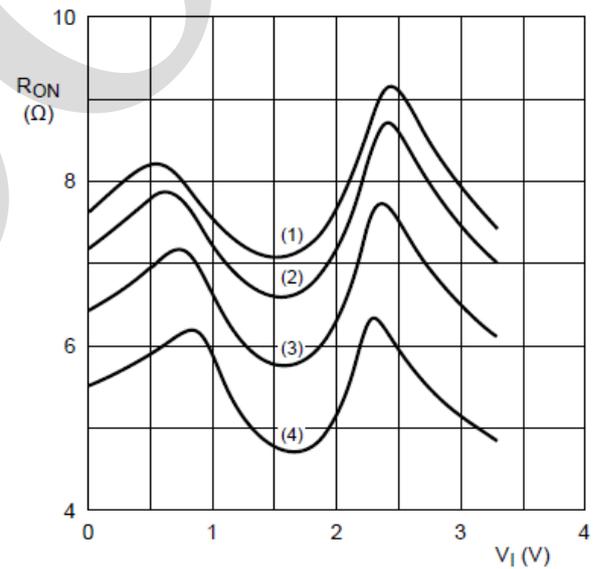
- (1) $T_{amb}=125^{\circ}\text{C}$.
- (2) $T_{amb}=85^{\circ}\text{C}$.
- (3) $T_{amb}=25^{\circ}\text{C}$.
- (4) $T_{amb}=-40^{\circ}\text{C}$.

Figure 8. ON resistance as a function of input voltage; $V_{CC}=2.5\text{V}$



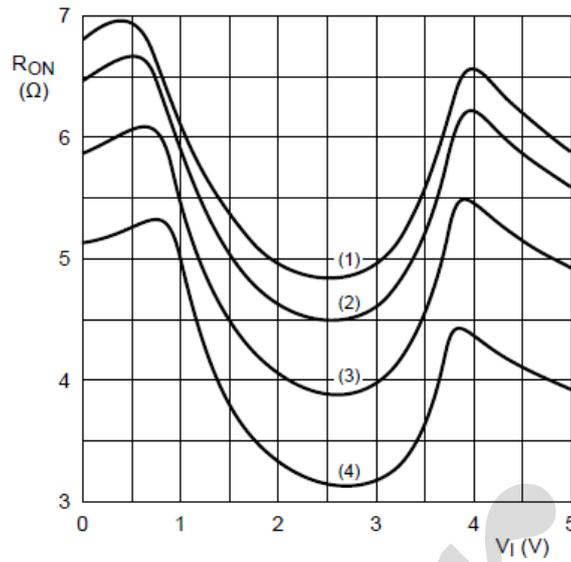
- (1) $T_{amb}=125^{\circ}\text{C}$.
- (2) $T_{amb}=85^{\circ}\text{C}$.
- (3) $T_{amb}=25^{\circ}\text{C}$.
- (4) $T_{amb}=-40^{\circ}\text{C}$.

Figure 9. ON resistance as a function of input voltage; $V_{CC}=2.7\text{V}$



- (1) $T_{amb}=125^{\circ}\text{C}$.
- (2) $T_{amb}=85^{\circ}\text{C}$.
- (3) $T_{amb}=25^{\circ}\text{C}$.
- (4) $T_{amb}=-40^{\circ}\text{C}$.

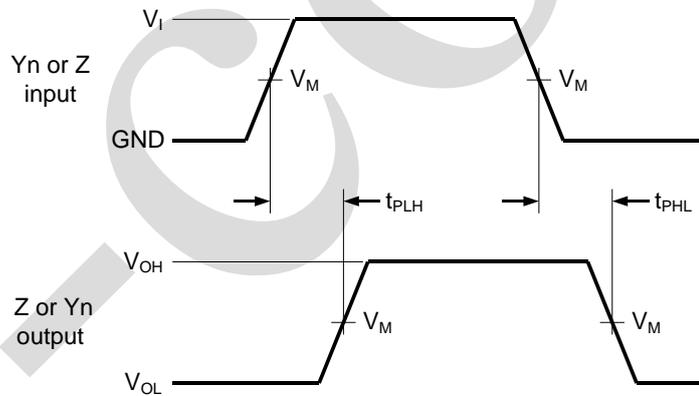
Figure 10. ON resistance as a function of input voltage; $V_{CC}=3.3\text{V}$



- (1) $T_{amb}=125^{\circ}C.$
- (2) $T_{amb}=85^{\circ}C.$
- (3) $T_{amb}=25^{\circ}C.$
- (4) $T_{amb}=-40^{\circ}C.$

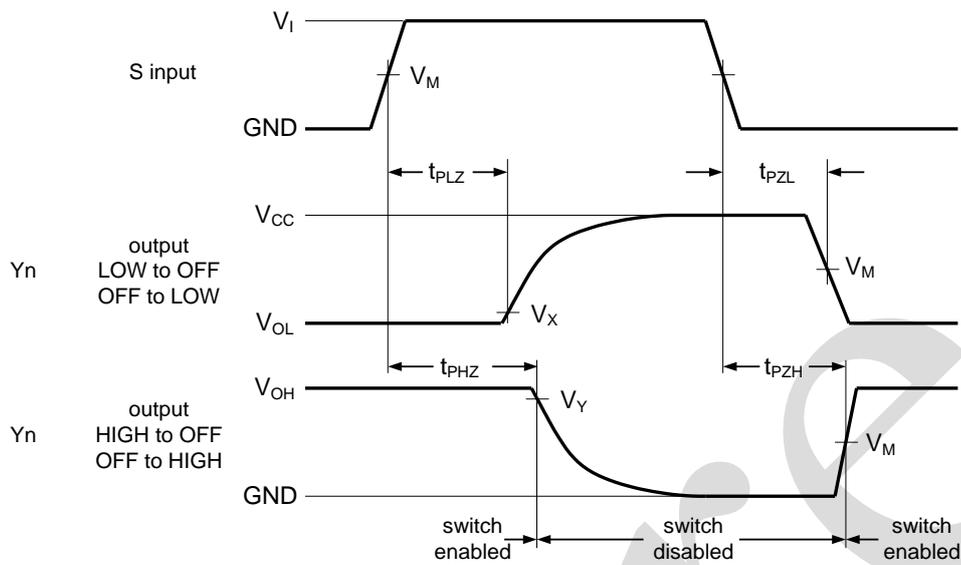
Figure 11. ON resistance as a function of input voltage; $V_{CC}=5.0V$

4.3. AC Testing Waveforms



Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 12. Input (Yn or Zn) to output (Z or Yn) propagation delays



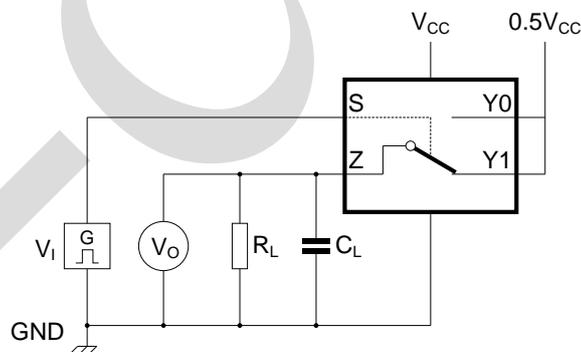
Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 13. Enable and disable times

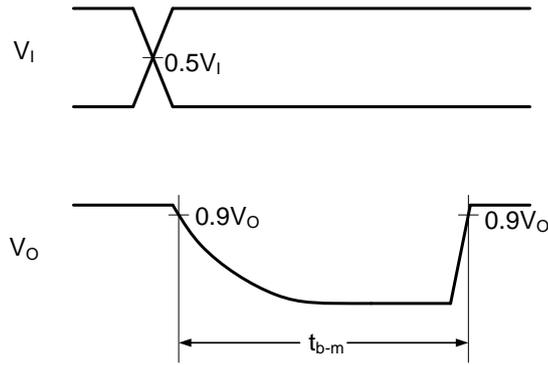
4.4. Measurement Points

| Supply voltage | Input | Output | | |
|----------------|---------------------|---------------------|-----------------|-----------------|
| V_{CC} | V_M | V_M | V_X | V_Y |
| 1.65V to 5.5V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3V$ | $V_{OH} - 0.3V$ |

4.5. AC Testing Circuit

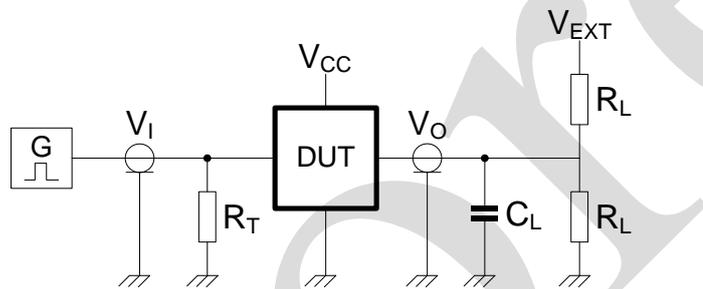


a. Test circuit



b. Input and output measurement points

Figure 14. Test circuit for measuring break-before-make timing



Definitions test circuit:

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

C_L =Load capacitance including jig and probe capacitance.

R_L =Load resistance.

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

Figure 15. Test circuit for measuring switching times

4.6. Test Data

| Supply voltage | Input | | Load | | V_{EXT} | | |
|----------------|----------|--------------|-------|-------|--------------------|--------------------|--------------------|
| | 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} | $\leq 2.0ns$ | 50pF | 500Ω | open | GND | $2 \times V_{CC}$ |
| 2.3V to 2.7V | V_{CC} | $\leq 2.0ns$ | 50pF | 500Ω | open | GND | $2 \times V_{CC}$ |
| 2.7V | V_{CC} | $\leq 2.5ns$ | 50pF | 500Ω | open | GND | $2 \times V_{CC}$ |
| 3V to 3.6V | V_{CC} | $\leq 2.5ns$ | 50pF | 500Ω | open | GND | $2 \times V_{CC}$ |
| 4.5V to 5.5V | V_{CC} | $\leq 2.5ns$ | 50pF | 500Ω | open | GND | $2 \times V_{CC}$ |



4.7. Additional AC Testing Circuit

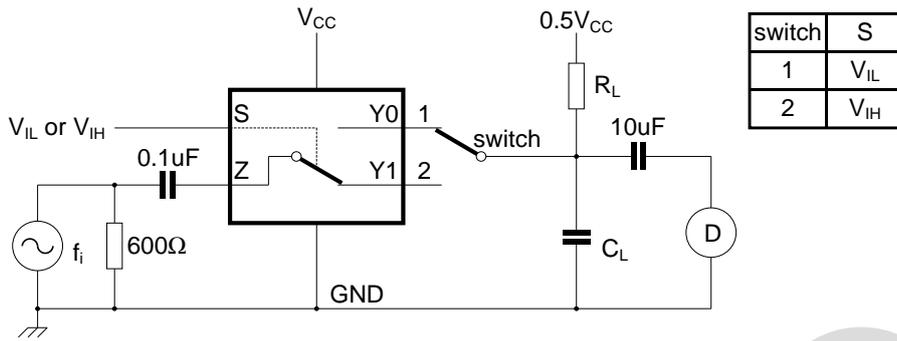
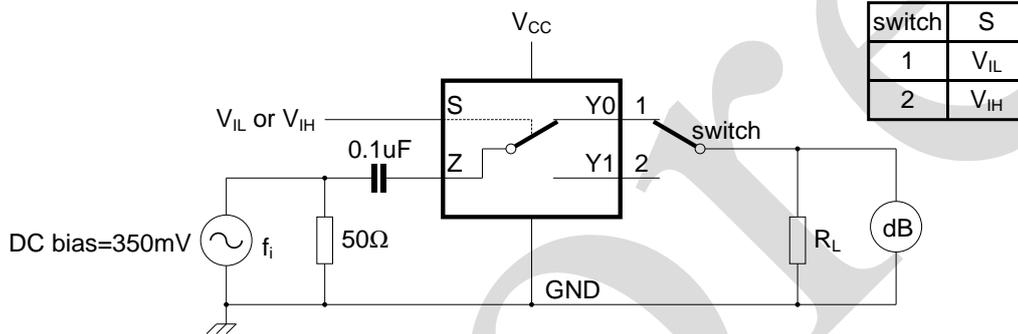
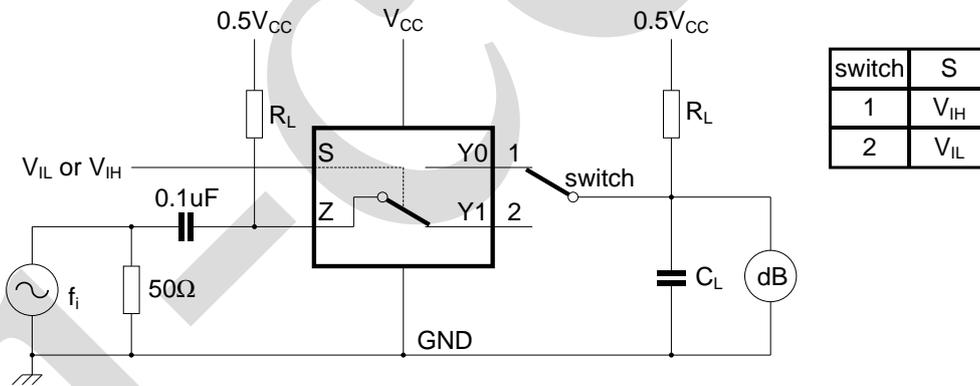


Figure 16. Test circuit for measuring total harmonic distortion



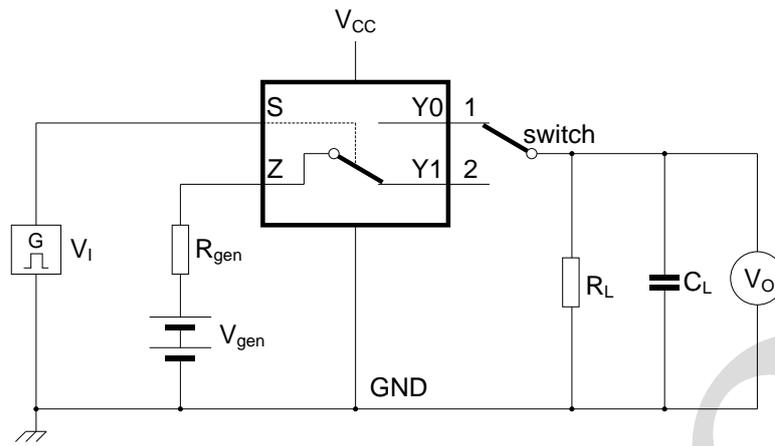
Adjust f_i voltage to obtain 0dBm level at output. Increase f_i frequency until dB meter reads -3dB.

Figure 17. Test circuit for measuring the frequency response when switch is in ON-state

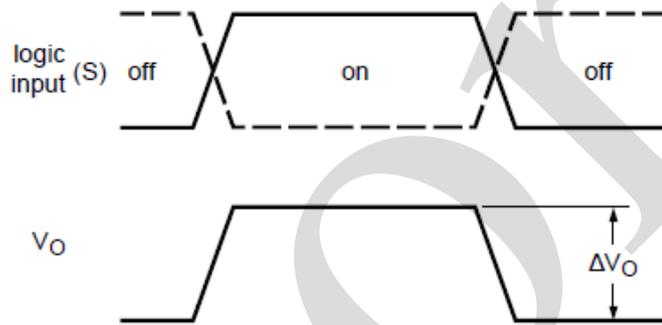


Adjust f_i voltage to obtain 0dBm level at input.

Figure 18. Test circuit for measuring isolation (OFF-state)



a. Test circuit



b. Input and output pulse definitions

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

ΔV_o = output voltage variation.

R_{gen} = generator resistance.

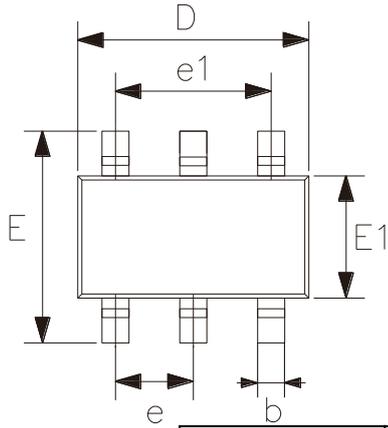
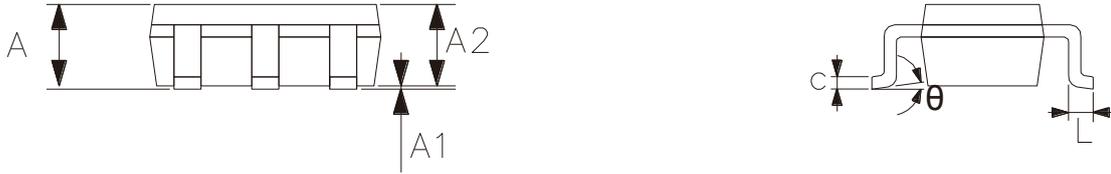
V_{gen} = generator voltage.

Figure 19. Test circuit for measuring charge injection



5、Package Information

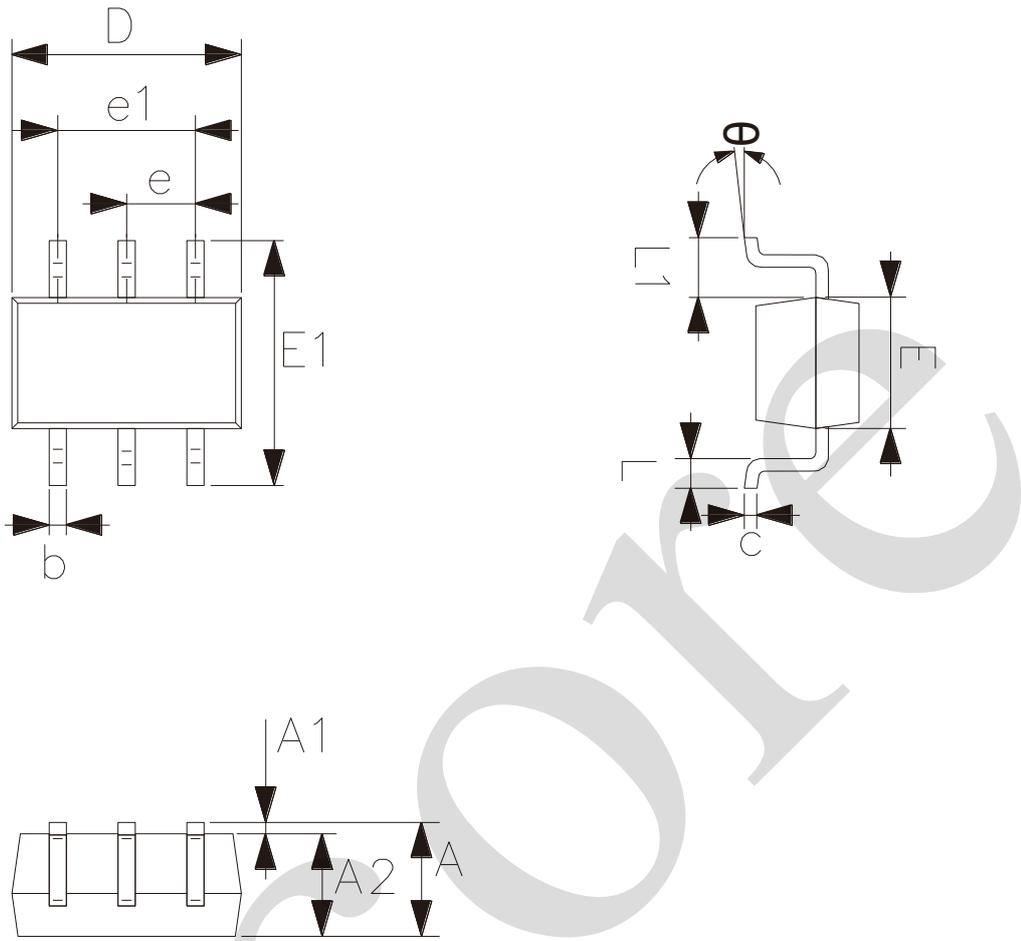
5.1、SOT23-6



| 2023/12/A Symbol | Dimensions In Millimeters | |
|---------------------|---------------------------|------|
| | 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° |



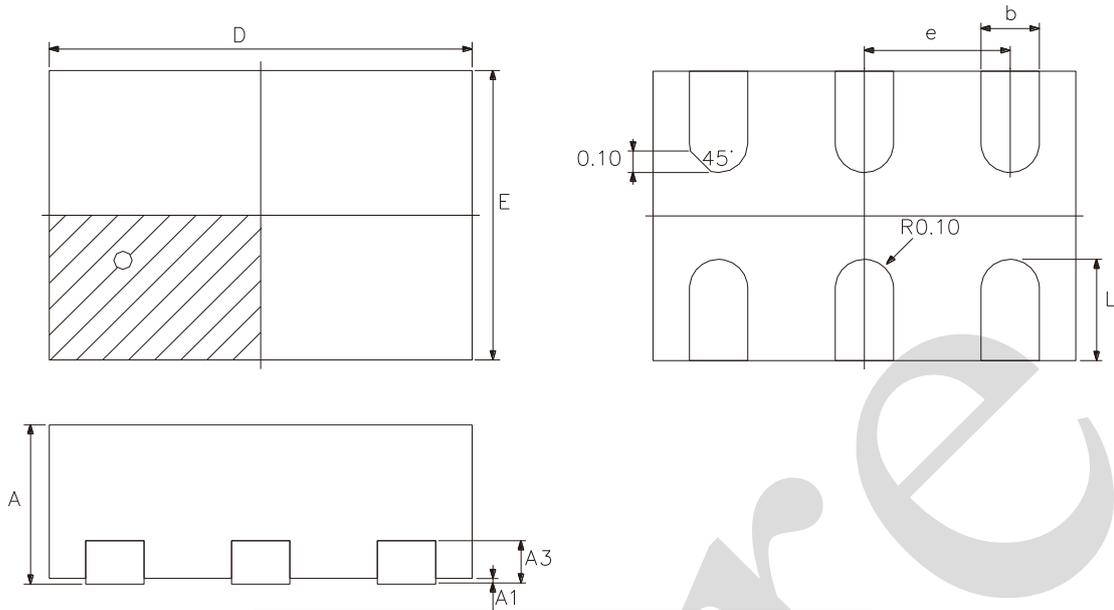
5.2、SOT363



| 2023/12/A | Dimensions In Millimeters | |
|-----------|---------------------------|-------|
| Symbol | 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 | |
| θ | 0° | 8° |



5.3、XSON6



| 2023/12/A | Dimensions In Millimeters | | |
|-----------|---------------------------|------|------|
| | Symbol | Min | Max |
| A | | 0.51 | 0.60 |
| A1 | | 0.00 | 0.05 |
| A3 | | 0.15 | |
| b | | 0.15 | 0.25 |
| D | | 1.45 | |
| E | | 1.00 | |
| e | | 0.50 | |
| L | | 0.25 | 0.45 |



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 | ○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements. | | | | | | | | | |

6.2、 Notes

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