

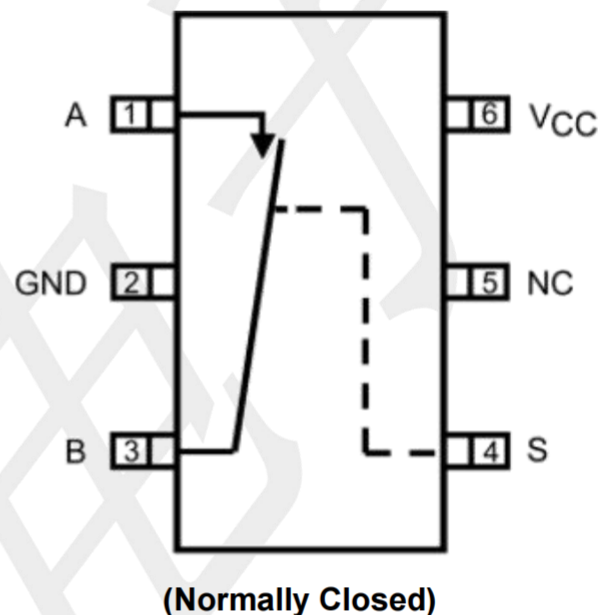
### Features

- Low On-resistance,  $R_{on}=1.5\Omega$  when  $A=5V$
- 1.8V Logic Compatible Control Pin
- A Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation:  $-100dB @ 100KHz$
- Low Channel-to-Channel Crosstalk:  $-97dB @ 100KHz$
- High Bandwidth ( $-3dB @ 350MHz$ ) Suitable For USB2.0 High-Speed Routing
- Low Quiescent Current ( $<2\mu A$ ) With Very Wide Supply Range ( $1.5V \sim 5.5V$ )

### Applications

- Cell phones and TWS headset
- Audio, Video, UART, USB2.0 Signal and Supply Routing

### Logic Diagram



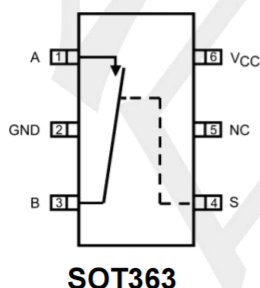
### General Description

The and are high-performance Single-Pole / Single-Throw (SPST) analog switches. The devices feature ultra-low and operate over a wide VCC range of 1.65 V to 5.5 V. The devices are fabricated with sub-micron CMOS technology to achieve fast switching speeds. The select input is TTL-level compatible.

### PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION                 |
|---------|----------|-----------------------------|
| 1       | A        | Common output or input      |
| 2       | GND      | Ground (0 V)                |
| 3       | B        | Independent input or output |
| 4       | S        | Select input                |
| 5       | NC       | No Connect                  |
| 6       | VCC      | Supply voltage              |

### Pin Configuratio



### Function Table

| INPUT(S) | OUTPUT(A to B) |
|----------|----------------|
| L        | ON             |
| H        | OFF            |

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

## Absolute Maximum Ratings

(Unless otherwise specified)

| PARAMETER                                                   | SYMBOL | RATINGS     | UNIT |
|-------------------------------------------------------------|--------|-------------|------|
| Supply Voltage                                              | VCC    | -0.3 ~ +6.5 | V    |
| Switch Voltage                                              | VS     | -0.3 ~ +6.5 | V    |
| Input Voltage                                               | VIN    | -0.3 ~ +6.5 | V    |
| Continuous Current Through A, B                             |        | ±128        | mA   |
| Peak Current Through A, B<br>(pulsed at 1ms 50% duty cycle) |        | ±200        | mA   |
| Storage Temperature Range                                   | TSTG   | -55 ~ +150  | °C   |
| Operating Junction Temperature                              | TJ     | 150         | °C   |
| Junction to Ambient                                         | RθJA   | 280         | °C/W |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## Recommend operating ratings

(Unless otherwise specified)

| PARAMETER                | SYMBOL | RATINGS    | UNIT |
|--------------------------|--------|------------|------|
| Supply Voltage Operating | VCC    | 1.5 ~ 5.5  | V    |
| Control Input Voltage    | VSEL   | -0.3 ~ 5.5 | V    |
| Input Signal Voltage     | VA     | -0.3 ~ 5.5 | V    |
| Operating Temperature    | TA     | -40 ~ +85  | °C   |

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

| PARAMETER                               | SYMBOL             | TEST Conditions                                                               | MIN | TYP | MAX  | UNIT |
|-----------------------------------------|--------------------|-------------------------------------------------------------------------------|-----|-----|------|------|
| High-Level Input Voltage                | V <sub>IH</sub>    | VCC=3.3V ~ 5.5V                                                               | 1.6 | --  | --   | V    |
|                                         |                    | VCC=1.5V ~ 3.3V                                                               | 1.4 | --  | --   | V    |
| Low-Level Input Voltage                 | V <sub>IL</sub>    | VCC=3.3V ~ 5.5V                                                               | --  | --  | 0.6  | V    |
|                                         |                    | VCC=1.5V ~ 3.3V                                                               | --  | --  | 0.4  | V    |
| Supply quiescent current                | I <sub>CC</sub>    | I <sub>A</sub> =0, V <sub>SEL</sub> =0 or V <sub>SEL</sub> =VCC               | --  | --  | 1.0  | uA   |
| Increase in ICC per input               | I <sub>CC</sub> T  | I <sub>A</sub> =0, VCC=4.5V<br>V <sub>SEL</sub> >1.8 or V <sub>SEL</sub> <0.5 | --  | --  | 1.0  | uA   |
| Off state leakage from A to B           | I <sub>A</sub>     | V <sub>A</sub> = 5.5V, V <sub>B0(or B1)</sub> = 0V                            | --  | --  | ±2.0 | uA   |
| On-Resistance                           | R <sub>ON1</sub>   | V <sub>A</sub> =0 ~ 0.5V, I <sub>A</sub> =30mA                                | --  | 3.6 | 3.9  | Ω    |
|                                         | R <sub>ON2</sub>   | V <sub>A</sub> =0.5 ~ 2.0V, I <sub>A</sub> =30mA                              | --  | 3.0 | 3.5  | Ω    |
|                                         | R <sub>ON3</sub>   | V <sub>A</sub> =2.0 ~ 4.0V, I <sub>A</sub> =30mA                              | --  | 2.5 | 3.5  | Ω    |
|                                         | R <sub>ON4</sub>   | V <sub>A</sub> =4.0 ~ 5.5V, I <sub>A</sub> =30mA                              | --  | 1.5 | 1.8  | Ω    |
| On-Resistance Flatness                  | R <sub>FLAT1</sub> | V <sub>A</sub> =0 ~ 0.5V, I <sub>A</sub> =30mA                                | --  | 1.6 | --   | Ω    |
|                                         | R <sub>FLAT2</sub> | V <sub>A</sub> =0.5 ~ 2.0V, I <sub>A</sub> =30mA                              | --  | 0.7 | --   | Ω    |
|                                         | R <sub>FLAT3</sub> | V <sub>A</sub> =2.0 ~ 4.0V, I <sub>A</sub> =30mA                              | --  | 0.5 | --   | Ω    |
|                                         | R <sub>FLAT4</sub> | V <sub>A</sub> =4.0 ~ 5.5V, I <sub>A</sub> =30mA                              | --  | 0.3 | --   | Ω    |
| On-Resistance Matching Between Channels | Δ R <sub>ON</sub>  | V <sub>A</sub> =0~5.5V, I <sub>A</sub> =30mA                                  | --  | 0.1 | 0.2  | Ω    |

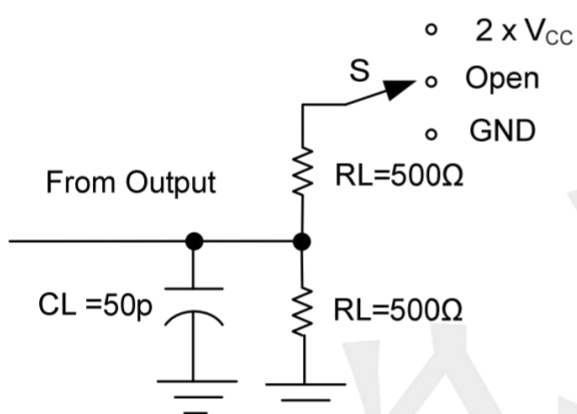
### AC Electronics Characteristics (Ta=25oC, VCC=3.3V, unless otherwise noted)

| PARAMETER                 | SYMBOL           | TEST Conditions                                                  | MIN | TYP | MAX | UNIT |
|---------------------------|------------------|------------------------------------------------------------------|-----|-----|-----|------|
| Turn-On Time              | T <sub>ON</sub>  | V <sub>A</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω  | --  | 200 | --  | ns   |
| Turn-Off Time             | T <sub>OFF</sub> | V <sub>A</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω  | --  | 200 | --  | ns   |
| Break-Before-Make time    | T <sub>BBM</sub> | V <sub>A</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω  | --  | 500 | --  | ns   |
| -3dB Bandwidth            | BW               | R <sub>L</sub> =50Ω, C <sub>L</sub> =0pF                         | --  | 350 | --  | MHz  |
| Off isolation             | OIRR             | F=1KHz, R <sub>L</sub> =50Ω                                      | --  | -81 | --  | dB   |
|                           |                  | F=10KHz, R <sub>L</sub> =50Ω                                     | --  | -80 | --  | dB   |
| Crosstalk                 | Xtalk            | F=1KHz, R <sub>L</sub> =50Ω                                      | --  | -83 | --  | dB   |
|                           |                  | F=10KHz, R <sub>L</sub> =50Ω                                     | --  | -82 | --  | dB   |
| Total Harmonic Distortion | THD              | F=20Hz to 20KHz<br>V <sub>A</sub> =600mVp-p @R <sub>L</sub> =32Ω | --  | -80 | --  | dB   |

**Capacitance** ( $T_a=25^\circ\text{C}$  unless otherwise noted)

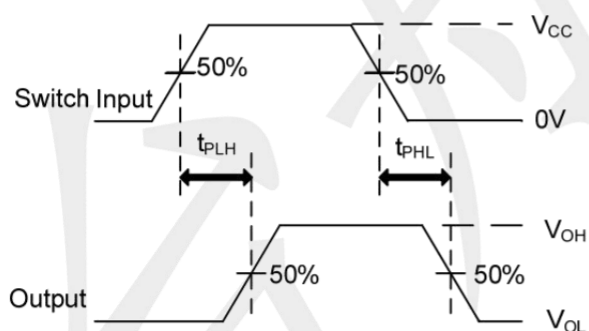
| PARAMETER       | SYMBOL    | TEST Conditions                  | MIN | TYP | MAX | UNIT |
|-----------------|-----------|----------------------------------|-----|-----|-----|------|
| Off capacitance | $C_{OFF}$ | $F=100\text{KHz}$ , $V_{CC}=3.3$ | --  | 5.0 | --  | pF   |
| On capacitance  | $C_{ON}$  | $F=100\text{KHz}$ , $V_{CC}=3.3$ | --  | 7.0 | --  | pF   |

## TEST CIRCUIT AND WAVEFORMS



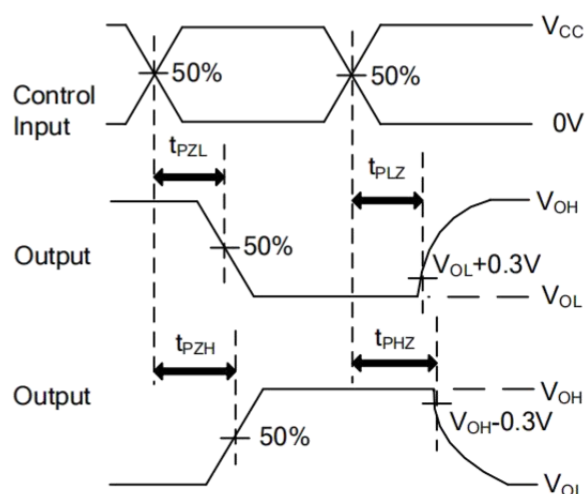
TEST CIRCUIT

| TEST              | S                 |
|-------------------|-------------------|
| $t_{PLH}/t_{PHL}$ | Open              |
| $t_{PHZ}/t_{PZH}$ | GND               |
| $t_{PLZ}/t_{PZL}$ | $2 \times V_{CC}$ |



**VOLTAGE WAVEFORMS**  
**PROPAGATION DELAY TIMES**

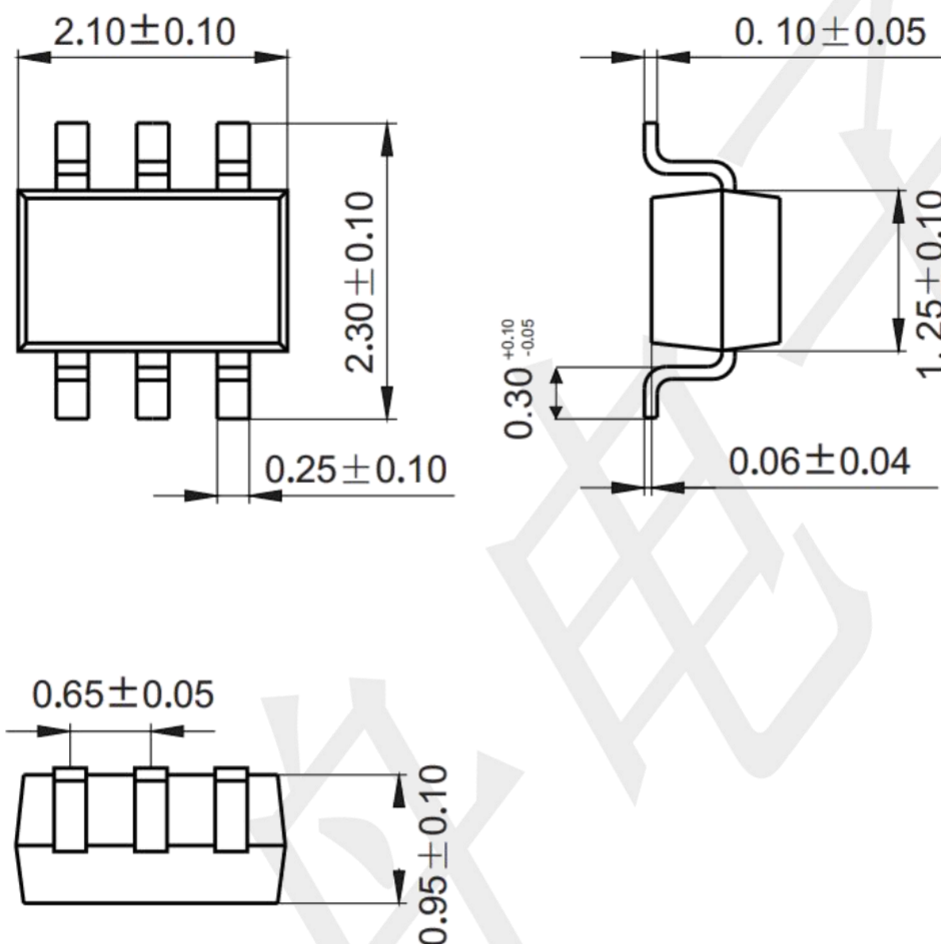
Note:  $C_L$  includes probe and jig capacitance.  
 $PRR \leq 1\text{MHz}$ ,  $Z_O = 50\Omega$ ,  $t_r \leq 2.5\text{ns}$ ,  $t_f \leq 2.5\text{ns}$ .



**VOLTAGE WAVEFORMS**  
**ENABLE AND DISABLE TIMES**

**Package information (Unit: mm)**

SOT363



**Mounting Pad Layout (unit: mm)**

