

### Features

- Low On-resistance,  $R_{on}=1.0\Omega$
- 1.8V Logic Compatible Control Pin
- High Off-Isolation:  $-100\text{dB}$  @  $100\text{KHz}$
- COMx Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- Low Channel-to-Channel Crosstalk:  $-97\text{dB}$  @  $100\text{KHz}$
- High Bandwidth ( $-3\text{dB}$  @  $500\text{MHz}$ ) Suitable For USB2.0 High-Speed Routing
- Low Quiescent Current ( $<2\mu\text{A}$ ) With Very Wide Supply Range ( $1.5\text{V} \sim 5.5\text{V}$ )
- Small Packaging: MSOP-10L

### Applications

- Mobile Phones, Tablets and Notebooks
- USB Type-C Mic/Gnd Switch
- Audio, Video, UART, USB2.0 Signal and Supply Routing
- Telecom Signal Switching
- Sample and Hold Systems
- Signal Gating, Multiplexer / Demultiplexer

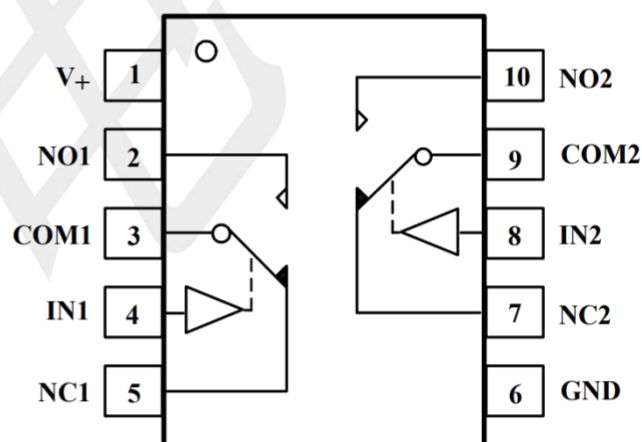
### General Description

The is a dual SPDT low on-resistance analog switch. It can operate from a single 1.5V to 5.5V power supply.

The device offers low ON-state resistance and excellent ON-state resistance matching with break-before-make feature, to prevent signal distortion during the transferring of a signal from one channel to another.

The device is capable of true isolation. Even when COMx overrides VCC, very little current will flow back to the supply.

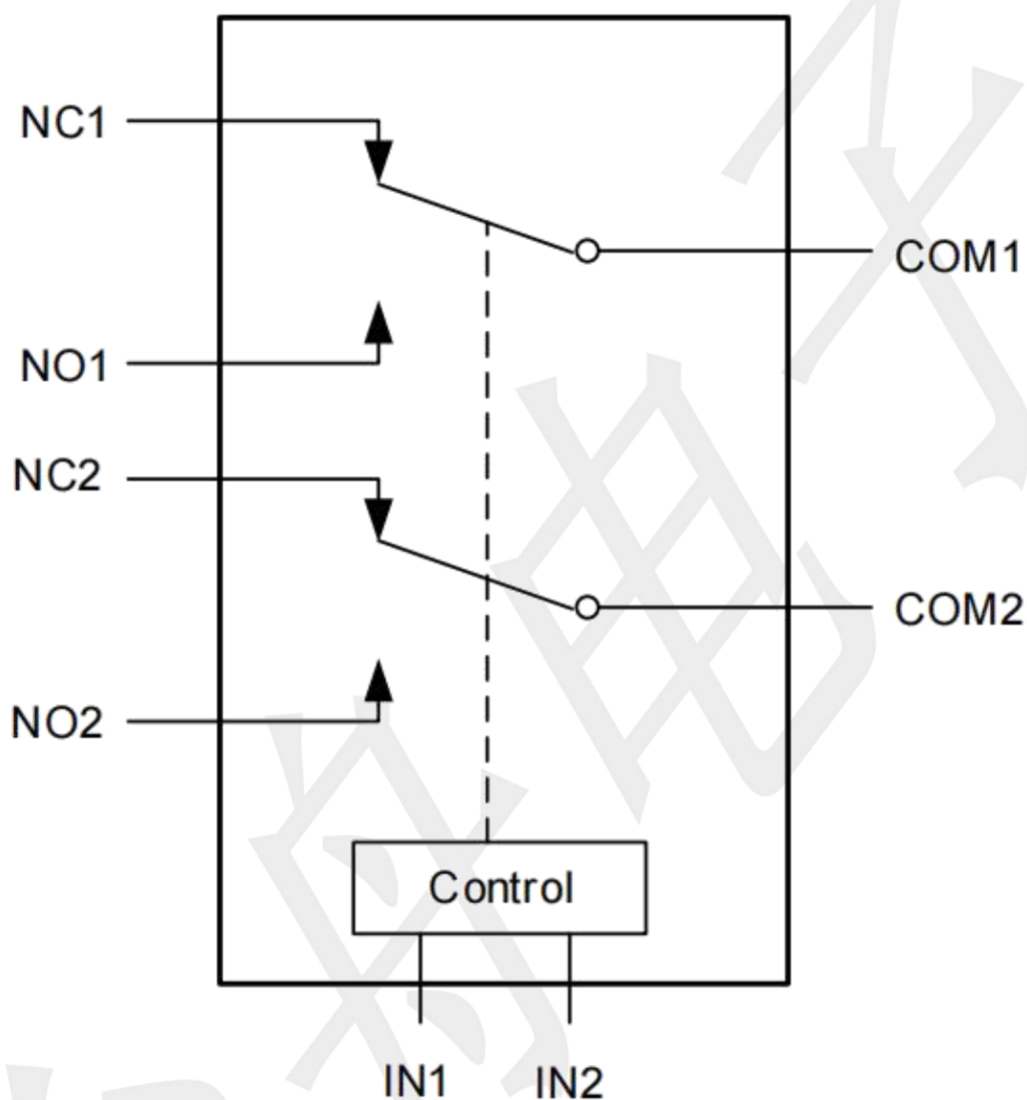
### PIN CONFIGURATIONS (Top View)



### PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION                                                               |
|---------|----------|---------------------------------------------------------------------------|
| 1       | V+       | Supply voltage VCC                                                        |
| 2       | NO 1     | Analog/Digital Signal Ports (Normally open)                               |
| 3       | COM1     | Port 1 common data terminal, Connect to NC1 or NO1 according to SEL logic |
| 4       | IN1      | Digital control to connect COM to NO or NC                                |
| 5       | NC 1     | Analog/Digital Signal Ports (Normally closed)                             |
| 6       | GND      | Ground                                                                    |
| 7       | NC 2     | Analog/Digital Signal Ports (Normally closed)                             |
| 8       | IN2      | Digital control to connect COM to NO or NC                                |
| 9       | COM2     | Port 2 common data terminal, Connect to NC2 or NO2 according to SEL logic |
| 10      | NO 2     | Analog/Digital Signal Ports (Normally open)                               |

## BLOCK DIAGRAM



## Function Table

| Logic Input(IN <sub>x</sub> ) | Function              |
|-------------------------------|-----------------------|
| 0                             | NC1=COM1 and NC2=COM2 |
| 1                             | NO1=COM1 and NO2=COM2 |

Note: X= 1 or 2

### Absolute Maximum Ratings

(Unless otherwise specified)

| PARAMETER                                                          | SYMBOL           | RATINGS     | UNIT |
|--------------------------------------------------------------------|------------------|-------------|------|
| Supply Voltage                                                     | V <sub>CC</sub>  | -0.3 ~ +6.5 | V    |
| Input Voltage                                                      | V <sub>IN</sub>  | -0.3 ~ +6.5 | V    |
| Continuous Current Through NO, NC, COM                             |                  | ±100        | mA   |
| Peak Current Through NO, NC, COM<br>(pulsed at 1ms 50% duty cycle) |                  | ±200        | mA   |
| Storage Temperature Range                                          | T <sub>STG</sub> | -55 ~ +150  | °C   |
| Operating Junction Temperature                                     | T <sub>J</sub>   | 150         | °C   |
| Lead Temperature (Soldering, 10 seconds)                           | T <sub>L</sub>   | 260         | °C   |
| Power Dissipation                                                  | P <sub>D</sub>   | 250         | mW   |

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 | V <sub>CC</sub>  | 1.5 ~ 5.5  | V    |
| Control Input Voltage    | V <sub>IN</sub>  | -0.3 ~ 5.5 | V    |
| Input Signal Voltage     | V <sub>COM</sub> | -0.3 ~ 5.5 | V    |
| Operating Temperature    | T <sub>A</sub>   | -40 ~ +85  | °C   |
| Junction to Ambient      | R <sub>θJA</sub> | 360        | °C/W |

### DC Electrical Characteristics (TA = 25°C, VC = +3.3V, unless otherwise specified)

| PARAMETER                                   | SYMBOL | TEST Conditions                        | MIN | TYP | MAX  | UNIT |
|---------------------------------------------|--------|----------------------------------------|-----|-----|------|------|
| High-Level Input Voltage                    | VIH    | VCC=3.3V ~ 5.5V                        | 1.6 | --  | --   | V    |
|                                             |        | VCC=1.5V ~ 3.3V                        | 1.4 | --  | --   | V    |
| Low-Level Input Voltage                     | VIL    | VCC=3.3V ~ 5.5V                        | --  | --  | 0.6  | V    |
|                                             |        | VCC=1.5V ~ 3.3V                        | --  | --  | 0.4  | V    |
| Supply quiescent current                    | ICC    | IA=0, VSEL=0 or VSEL=VCC               | --  | --  | 1.0  | uA   |
| Increase in ICC per input                   | ICCT   | IA=0, VCC=4.5V<br>VSEL>1.8 or VSEL<0.5 | --  | --  | 1.0  | uA   |
| Off state leakage from COMx to NCx (or NOx) | ICOMx  | VCOM = 5.5V, VNC(or NO) = 0V           | --  | --  | ±2.0 | uA   |
| On-Resistance                               | RON1   | VA=0 ~ 0.5V, IA=30mA                   | --  | 3.6 | 3.9  | Ω    |
|                                             | RON2   | VA=0.5 ~ 2.0V, IA=30mA                 | --  | 3.0 | 3.5  | Ω    |
|                                             | RON3   | VA=2.0 ~ 4.0V, IA=30mA                 | --  | 2.5 | 3.5  | Ω    |
|                                             | RON4   | VA=4.0 ~ 5.5V, IA=30mA                 | --  | 1.0 | 1.8  | Ω    |
| On-Resistance Flatness                      | RFLAT1 | VA=0 ~ 0.5V, IA=30mA                   | --  | 1.6 | --   | Ω    |
|                                             | RFLAT2 | VA=0.5 ~ 2.0V, IA=30mA                 | --  | 0.7 | --   | Ω    |
|                                             | RFLAT3 | VA=2.0 ~ 4.0V, IA=30mA                 | --  | 0.5 | --   | Ω    |
|                                             | RFLAT4 | VA=4.0 ~ 5.5V, IA=30mA                 | --  | 0.3 | --   | Ω    |
| On-Resistance Matching Between Channels     | Δ RON  | VA=0~5.5V, IA=30mA                     | --  | 0.1 | 0.2  | Ω    |

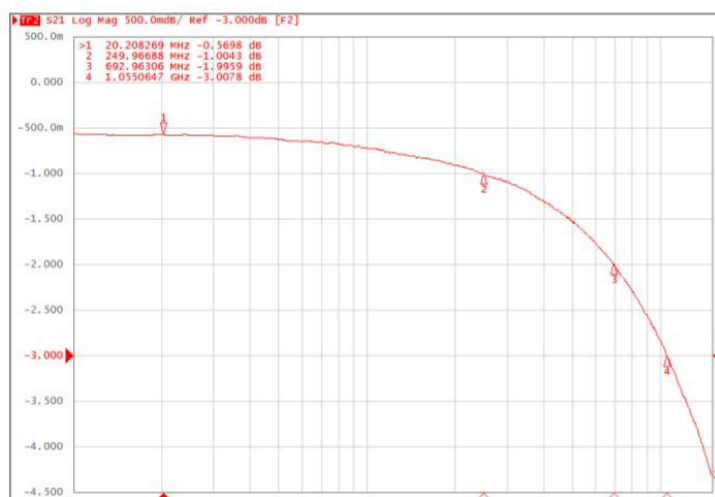
### AC Electronics Characteristics (Ta=25°C, VCC=+3.3V, unless otherwise noted)

| PARAMETER                 | SYMBOL | TEST Conditions                        | MIN | TYP | MAX | UNIT |
|---------------------------|--------|----------------------------------------|-----|-----|-----|------|
| Turn-On Time              | TON    | VA=1.5V, CL=35pF, RL=50Ω               | --  | 200 | --  | ns   |
| Turn-Off Time             | TOFF   | VA=1.5V, CL=35pF, RL=50Ω               | --  | 200 | --  | ns   |
| Break-Before-Make time    | TBBM   | VA=1.5V, CL=35pF, RL=50Ω               | --  | 500 | --  | ns   |
| -3dB Bandwidth            | BW     | RL=50Ω, CL=5pF                         | --  | 500 | --  | MHz  |
|                           |        | RL=50Ω, CL=0pF                         | --  | 700 | --  | MHz  |
| Off isolation             | OIRR   | F=1KHz, RL=50Ω                         | --  | -81 | --  | dB   |
|                           |        | F=10KHz, RL=50Ω                        | --  | -80 | --  | dB   |
| Crosstalk                 | Xtalk  | F=1KHz, RL=50Ω                         | --  | -83 | --  | dB   |
|                           |        | F=10KHz, RL=50Ω                        | --  | -82 | --  | dB   |
| Total Harmonic Distortion | THD    | F=20Hz to 20KHz<br>VA=600mVp-p @RL=32Ω | --  | -80 | --  | dB   |

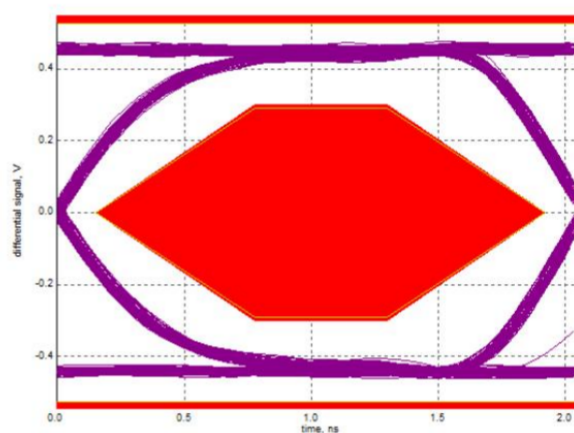
**Capacitance** ( $T_a=25^\circ\text{C}$ ,  $V_{CC}=+3.3\text{V}$ , unless otherwise noted)

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

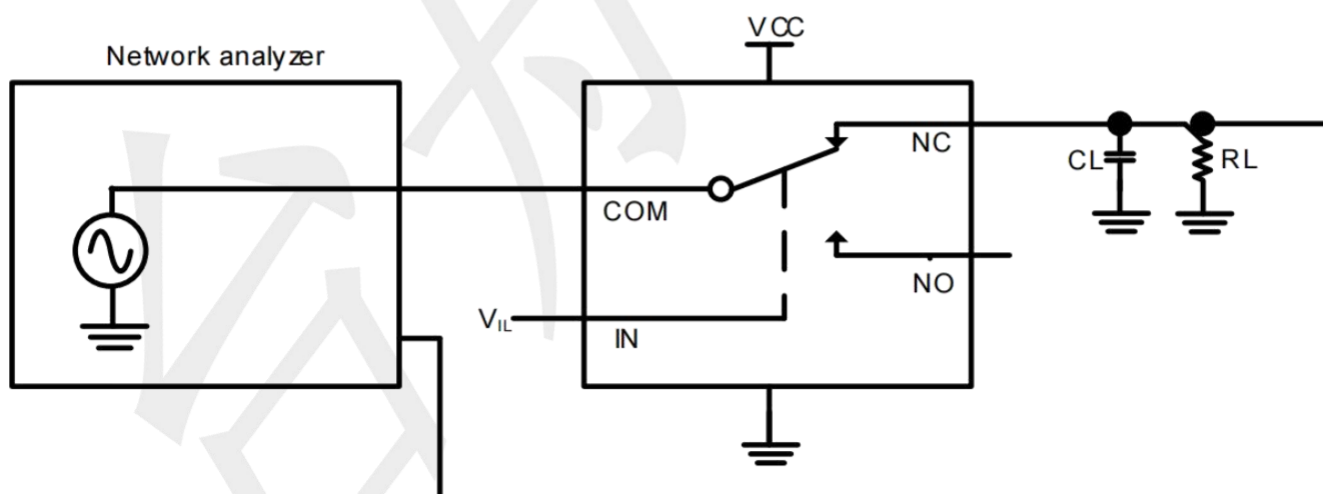
**Typical Characteristics** ( $T_a=25^\circ\text{C}$ ,  $V_{CC}=3.3\text{V}$ , unless otherwise noted)



Bandwidth

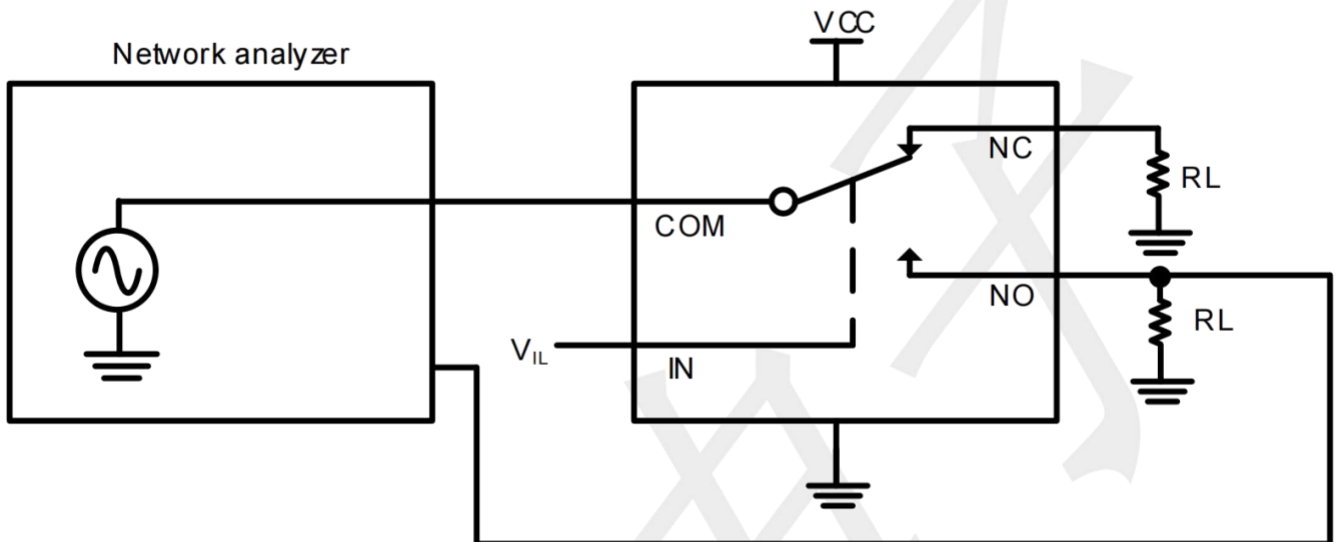


Eye Diagram (480Mbps)

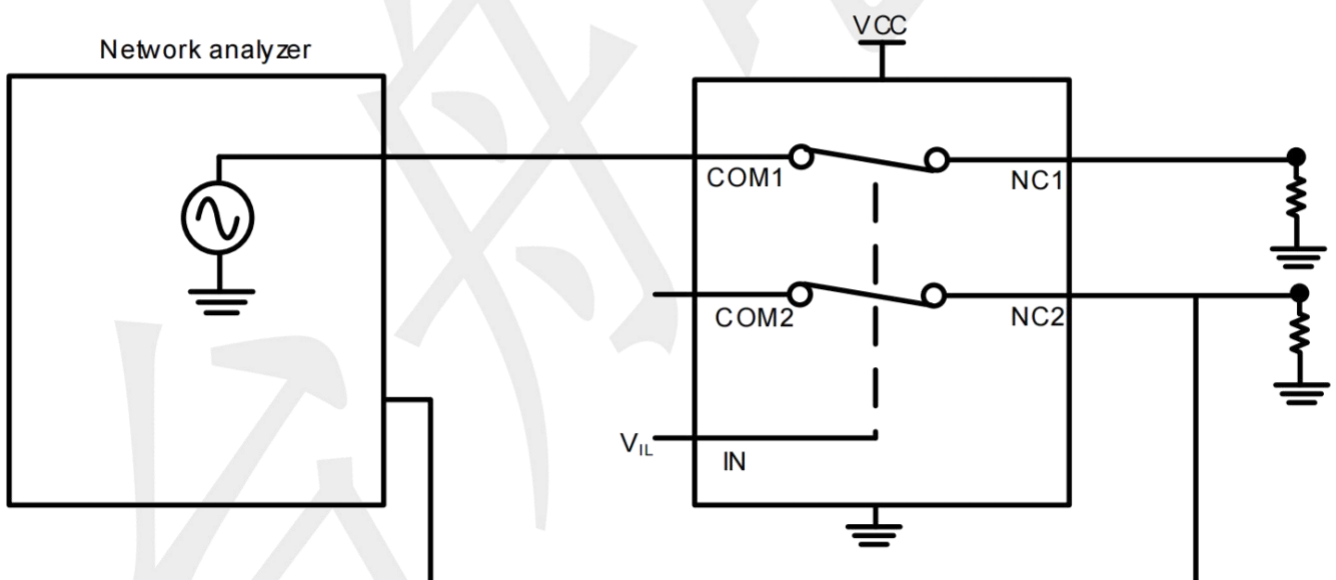


Bandwidth

## Typical Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)



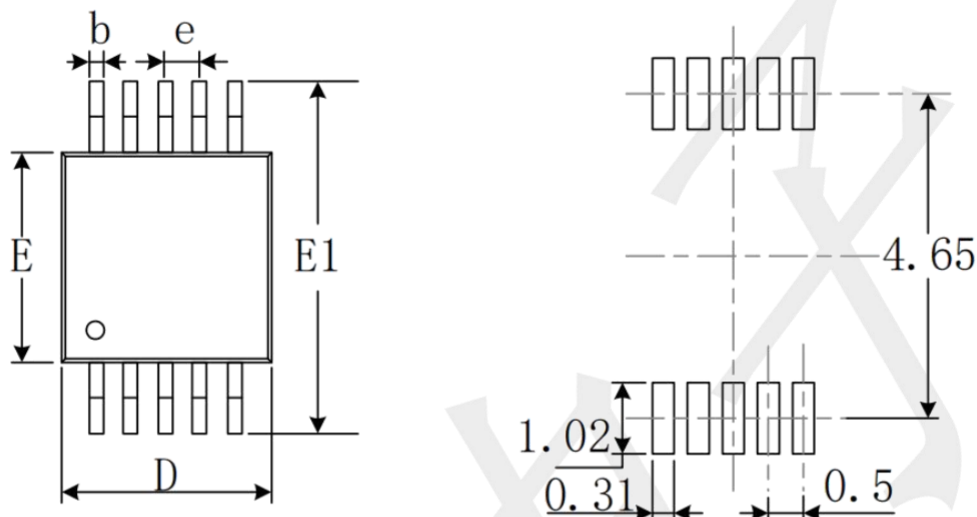
**Off isolation**



**Crosstalk**

## Package information

### MSOP-10L



RECOMMENDED LAND PATTERN (Unit: mm)



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.820                     | 1.100 | 0.032                | 0.043 |
| A1     | 0.020                     | 0.150 | 0.001                | 0.006 |
| A2     | 0.750                     | 0.950 | 0.030                | 0.037 |
| b      | 0.180                     | 0.280 | 0.007                | 0.011 |
| c      | 0.090                     | 0.230 | 0.004                | 0.009 |
| D      | 2.900                     | 3.100 | 0.114                | 0.122 |
| e      | 0.50(BSC)                 |       | 0.020(BSC)           |       |
| E      | 2.900                     | 3.100 | 0.114                | 0.122 |
| E1     | 4.750                     | 5.050 | 0.187                | 0.199 |
| L      | 0.400                     | 0.800 | 0.016                | 0.031 |
| θ      | 0°                        | 6°    | 0°                   | 6°    |