

### 30V Dual P-Channel Enhancement Mode MOSFET

#### Description

The PECN4953CSR uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.

#### General Features

- ◆  $V_{DS} = -30V$ ,  $I_D = -5.5A$   
 $R_{DS(ON)}(Typ.) = 55m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)}(Typ.) = 45m\Omega$  @  $V_{GS} = -10V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

#### Application

- ◆ PWM applications
- ◆ Load switch

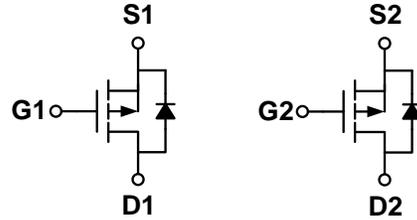
*100% UIS TESTED!*  
*100%  $\Delta V_{ds}$  TESTED!*

#### Package

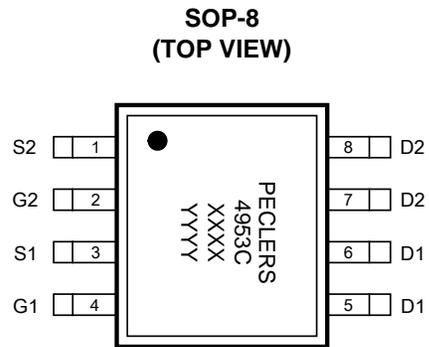
- ◆ SOP-8



#### Schematic diagram



#### Marking and pin assignment



Note: XXXX is the date code, YYYY is the Quality Code

#### Ordering Information

| Part Number | Storage Temperature | Package | Devices Per Reel |
|-------------|---------------------|---------|------------------|
| PECN4953CSR | -55°C to +150°C     | SOP-8   | 4000             |

#### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| parameter                                  | symbol   | limit              | unit |   |
|--|----------|--------------------|------|---|
| Drain-source voltage                       | $V_{DS}$ | -30                | V    |   |
| Gate-source voltage                        | $V_{GS}$ | ±20                | V    |   |
| Drain Current-Continuous (Silicon Limited) | $I_D$    | $T_A = 25^\circ C$ | -5.5 | A |
|  |          | $T_A = 75^\circ C$ | -4   | A |
| Pulsed Drain Current (Package Limited)     | $I_{DM}$ | -22                | A    |   |
| Maximum power dissipation                  | $P_D$    | $T_A = 25^\circ C$ | 3.0  | W |
|  |          | $T_A = 75^\circ C$ | 2.1  | W |
| Operating junction Temperature range       | $T_j$    | -55—150            | °C   |   |

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

| Parameter                        | Symbol       | Condition  | Min  | Typ  | Max       | Unit       |
|----------------------------------|--------------|--|------|------|-----------|------------|
| <b>OFF Characteristics</b>       |              |  |      |      |           |            |
| Drain-source breakdown voltage   | $BV_{DSS}$   | $V_{GS}=0V, I_D=-250\mu A$   | -30  | -    | -         | V          |
| Zero gate voltage drain current  | $I_{DSS}$    | $V_{DS}=-30V, V_{GS}=0V$   | -    | -    | 1         | $\mu A$    |
| Gate-body leakage                | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 20V$  | -    | -    | $\pm 100$ | nA         |
| <b>ON Characteristics</b>        |              |  |      |      |           |            |
| Gate threshold voltage           | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$   | -0.7 | -1.3 | -2.0      | V          |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-5.5A$   | -    | 45   | 65        | m $\Omega$ |
|                                  |              | $V_{GS}=-4.5V, I_D=-4.5A$  | -    | 55   | 90        |            |
| Forward transconductance         | gfs          | $V_{GS}=-5V, I_D=-5A$  | -    | 5    | -         | S          |
| <b>Dynamic Characteristics</b>   |              |  |      |      |           |            |
| Input capacitance                | $C_{ISS}$    | $V_{DS}=-15V, V_{GS}=0V$<br>$f=1.0MHz$   | -    | 700  | -         | pF         |
| Output capacitance               | $C_{OSS}$    |  | -    | 120  | -         |            |
| Reverse transfer capacitance     | $C_{RSS}$    |  | -    | 70   | -         |            |
| <b>Switching Characteristics</b> |              |  |      |      |           |            |
| Turn-on delay time               | $t_{D(on)}$  | $V_{DD}=-15V$<br>$I_D=-5.5A$<br>$V_{GEN}=-10V$<br>$R_L=10ohm$<br>$R_{GEN}=-6ohm$ | -    | 9    | -         | ns         |
| Rise time                        | $t_r$        |  | -    | 5    | -         |            |
| Turn-off delay time              | $t_{D(off)}$ |  | -    | 28   | -         |            |
| Fall time                        | $t_f$        |  | -    | 12.5 | -         |            |
| Total gate charge                | Qg           | $V_{DS}=-15V, I_D=-5.5A$<br>$V_{GS}=-10V$  | -    | 14   | -         | nC         |
| Gate-source charge               | Qgs          |  | -    | 3.1  | -         |            |
| Gate-drain charge                | Qgd          |  | -    | 3    | -         |            |

### Thermal Characteristics

| Parameter                                |              | Symbol          | Typ | Max | Unit          |
|--|--------------|-----------------|-----|-----|---------------|
| Maximum Junction-to-Ambient <sup>A</sup> | $\leq 10s$   | $R_{\theta JA}$ | 33  | 40  | $^{\circ}C/W$ |
| Maximum Junction-to-Ambient <sup>A</sup> | Steady-State |                 | 59  | 75  |               |
| Maximum Junction-to-Lead <sup>B</sup>    | Steady-State | $R_{\theta JC}$ | 16  | 24  |               |

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^{\circ}C$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10s$  thermal resistance rating.

B: The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to lead  $R_{\theta JC}$  and lead to ambient.

### Typical Performance Characteristics

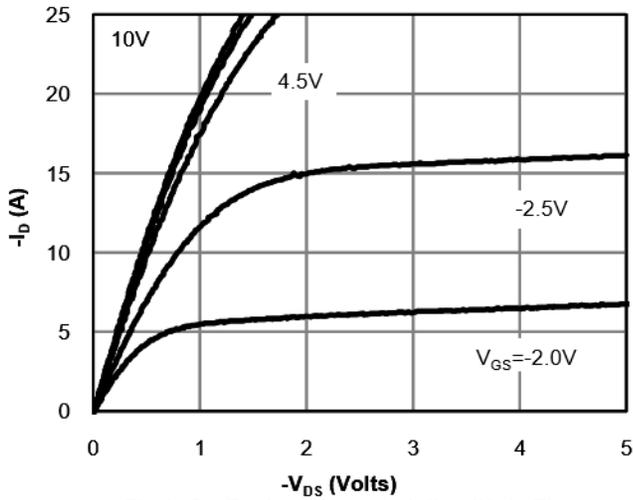


Fig 1: On-Region Characteristics (Note E)

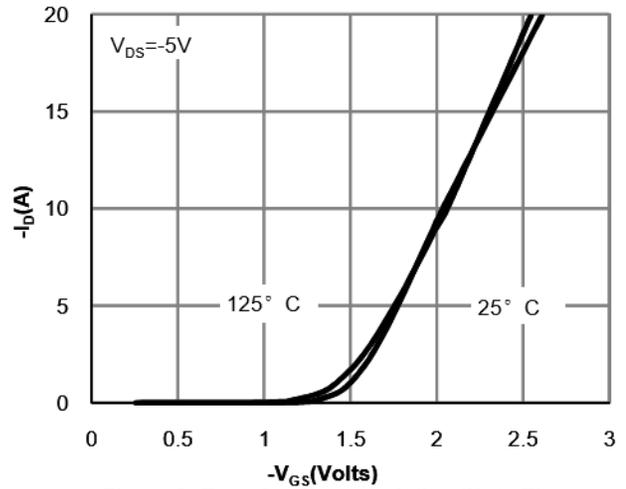


Figure 2: Transfer Characteristics (Note E)

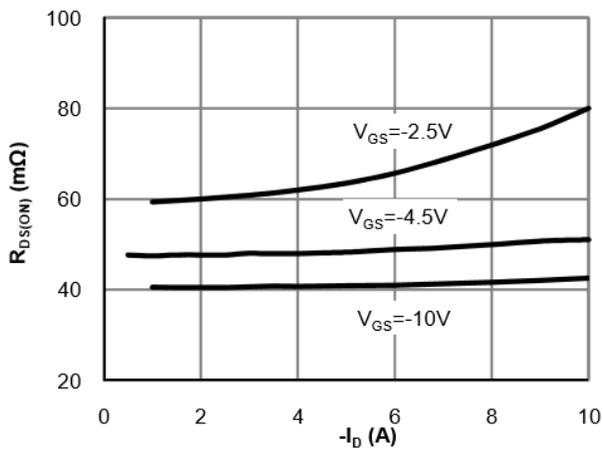


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

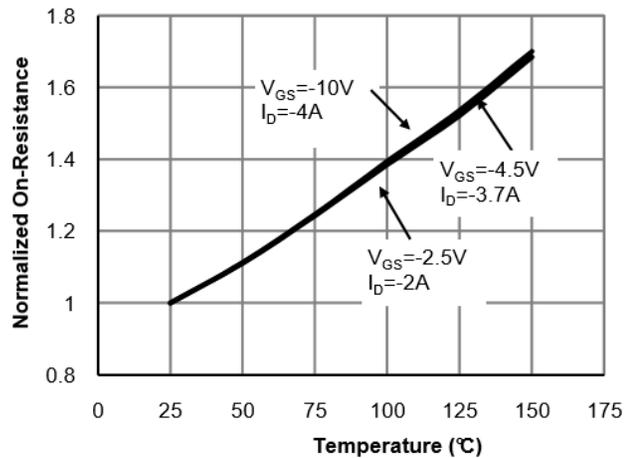


Figure 4: On-Resistance vs. Junction Temperature (Note E)

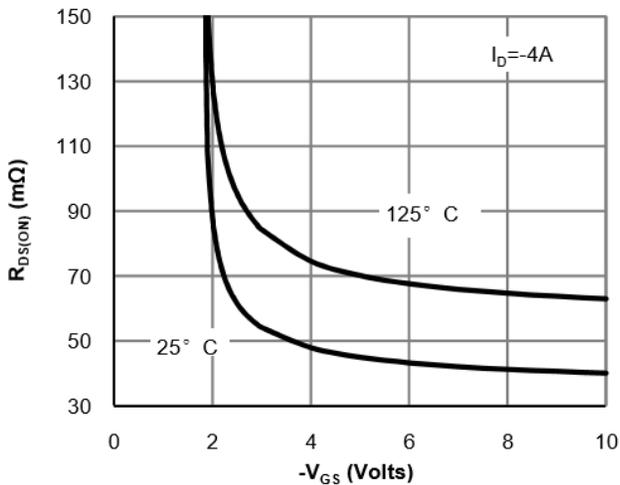


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

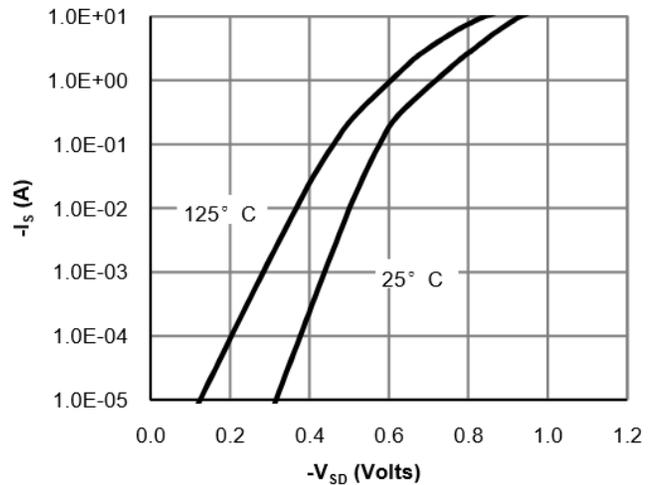


Figure 6: Body-Diode Characteristics (Note E)

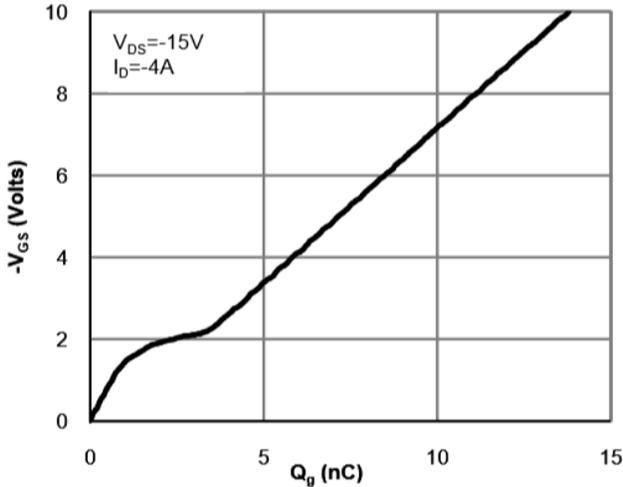


Figure 7: Gate-Charge Characteristics

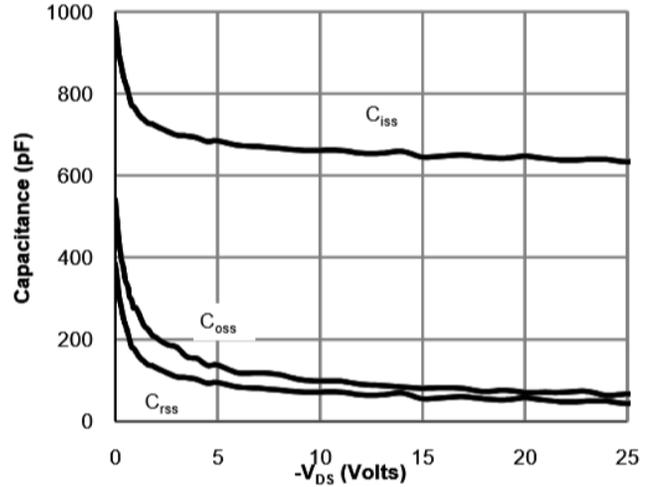


Figure 8: Capacitance Characteristics

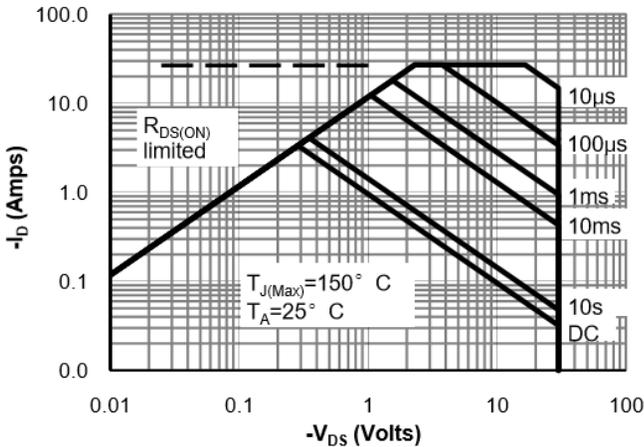


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

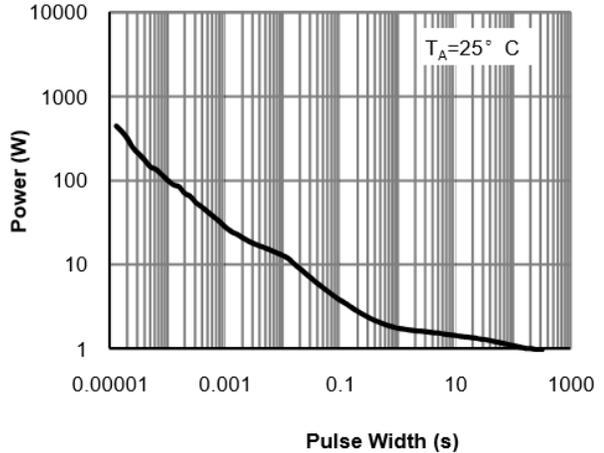


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

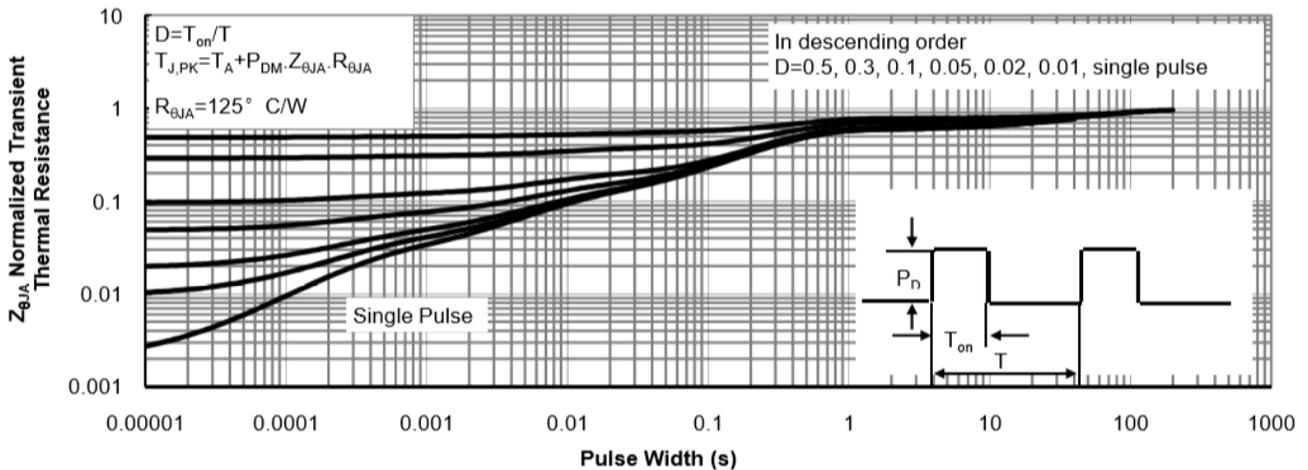
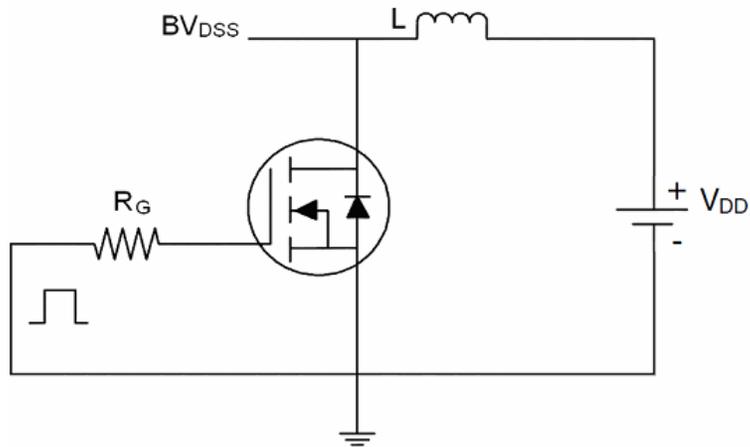


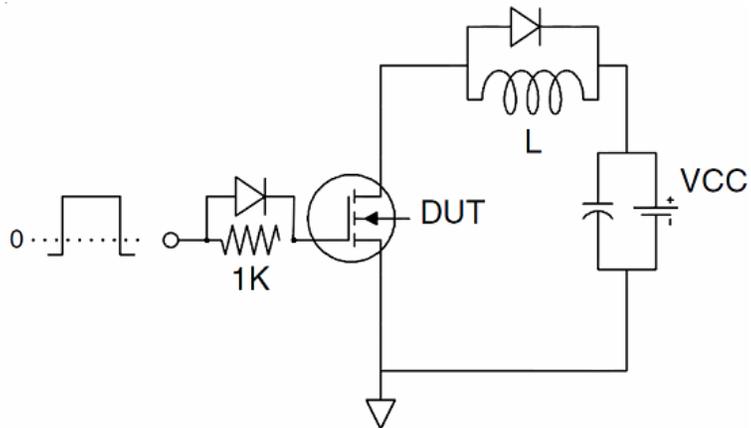
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

### Test Circuit:

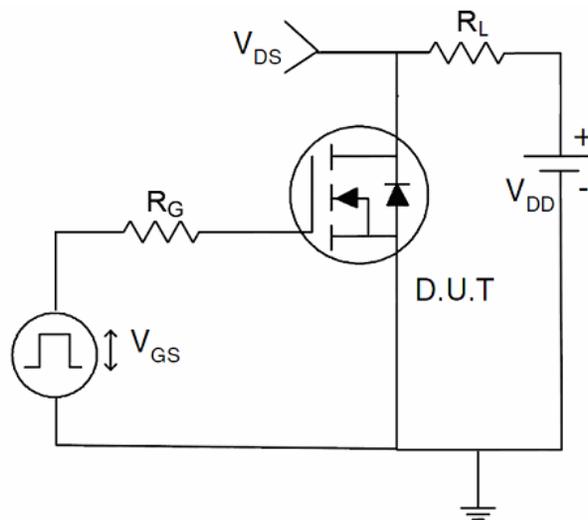
(1)、EAS Test Circuit



(2)、Gate Charge Test Circuit

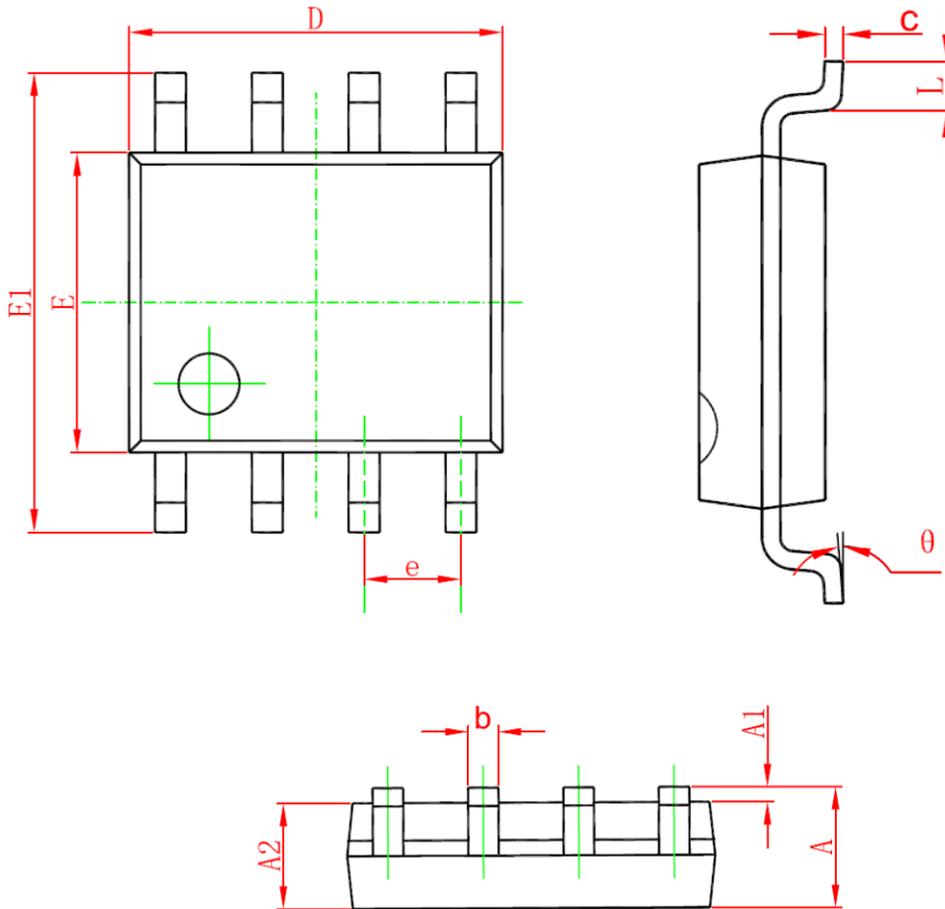


(3)、Switch Time Test Circuit



### Package Information

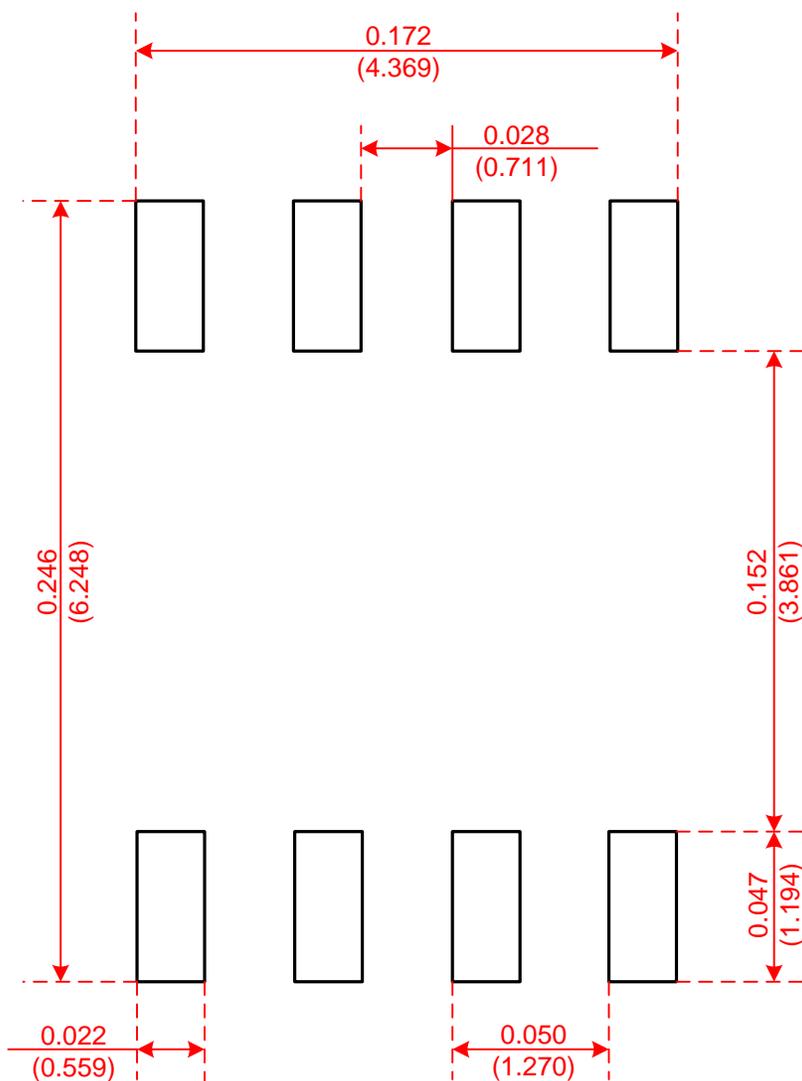
- SOP-8



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.350                     | 1.750 | 0.053                | 0.069 |
| A1     | 0.100                     | 0.250 | 0.004                | 0.010 |
| A2     | 1.350                     | 1.550 | 0.053                | 0.061 |
| b      | 0.330                     | 0.510 | 0.013                | 0.020 |
| c      | 0.170                     | 0.250 | 0.006                | 0.010 |
| D      | 4.700                     | 5.100 | 0.185                | 0.200 |
| E      | 3.800                     | 4.000 | 0.150                | 0.157 |
| E1     | 5.800                     | 6.200 | 0.228                | 0.244 |
| e      | 1.270 (BSC)               |       | 0.050 (BSC)          |       |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

### Recommended Minimum Pads

- SOP-8



**Recommended Minimum Pads  
Dimensions in Inches/(mm)**

