

## SDM100PL06SV

### -60V P-Channel MOSFETs

Rev A.0

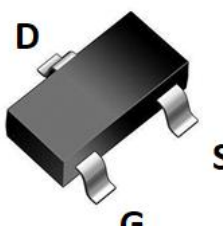
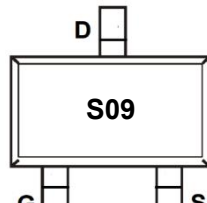
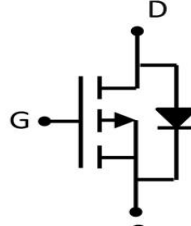
#### Feature

- ✧ Low  $R_{DS(ON)}$
- ✧ Low Gate Charge
- ✧ Green product (RoHS compliant) , lead free
- ✧ 100% UIS Tested, 100% Rg Tested
- ✧ AEC-Q101 qualified

#### Product Summary

|  |      |            |
|--|------|------------|
| $V_{DS}$                                   | -60  | V          |
| $V_{GS(th)_{Max}}$                         | -2.5 | V          |
| $R_{DS(ON)_{Tpy}}$ (at $V_{GS} = -10V$ )   | 75   | m $\Omega$ |
| $I_D$ (at $V_{GS} = -10V$ ) <sup>(1)</sup> | -3.4 | A          |

| Type         | Package | Marking | Outline | Media   | Quantity (pcs) |
|--------------|---------|---------|---------|---------|----------------|
| SDM100PL06SV | SOT-23  | S09     | Tape    | 7" Reel | 3000           |

|  |   |  |
|--|---|--|
|  <p><b>SOT-23 top view</b></p> |  <p><b>Marking and Pin Assignment</b></p> |  <p><b>Schematic Diagram</b></p> |
|--|---|--|

#### Absolute Maximum Ratings (Rating at $T_a=25^\circ C$ unless otherwise noted)

| Parameter                               | Symbol         | Maximum   | Unit       |
|---|----------------|-----------|------------|
| Drain-Source Voltage                    | $V_{DS}$       | -60       | V          |
| Gate-Source Voltage                     | $V_{GS}$       | $\pm 20$  | V          |
| Continuous Drain Current <sup>(1)</sup> | $I_D$          | -3.4      | A          |
| $T_C=25^\circ C$                        |                |           |            |
| Pulsed Drain Current <sup>(1)</sup>     | $I_{DM}$       | -12       | A          |
| Power Dissipation                       | $P_D$          | 1.25      | W          |
| $T_C=25^\circ C$                        |                |           |            |
| Junction and Storage Temperature Range  | $T_J, T_{stg}$ | -55 ~ 150 | $^\circ C$ |

**Electrical Characteristics** (Rating at  $T_a=25^\circ\text{C}$  unless otherwise noted)

| Symbol                      | Parameter                          | Conditions   | Min | Typ  | Max       | Unit          |
|-----------------------------|------------------------------------|--|-----|------|-----------|---------------|
| <b>STATIC PARAMETERS</b>    |                                    |  |     |      |           |               |
| $BV_{DSS}$                  | Drain-Source Breakdown Voltage     | $I_D=-250\mu\text{A}$ , $V_{GS}=0\text{V}$   | -60 | -    | -         | V             |
| $I_{DSS}$                   | Zero Gate Voltage Drain Current    | $V_{DS}=-48\text{V}$ , $V_{GS}=0\text{V}$  | -   | -    | -1        | $\mu\text{A}$ |
| $I_{GSS}$                   | Gate-Body Leakage Current          | $V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$   | -   | -    | $\pm 100$ | nA            |
| $V_{GS(th)}$                | Gate Threshold Voltage             | $V_{DS}=V_{GS}$ , $I_D=-250\mu\text{A}$  | -1  | -    | -2.5      | V             |
| $R_{DS(ON)}$                | Static Drain-Source On-Resistance  | $V_{GS}=-10\text{V}$ , $I_D=-4\text{A}$  | -   | 75   | 100       | m $\Omega$    |
|                             |                                    | $V_{GS}=-4.5\text{V}$ , $I_D=-4\text{A}$   | -   | 85   | 120       |               |
| $V_{SD}$                    | Diode Forward Voltage              | $I_S=-0.75\text{A}$ , $V_{GS}=0\text{V}$   | -   | -    | -1.3      | V             |
| <b>DYNAMIC PARAMETERS</b>   |                                    |  |     |      |           |               |
| $C_{iss}$                   | Input Capacitance                  | $V_{GS}=0\text{V}$ , $V_{DS}=-30\text{V}$ , $f=1\text{MHz}$  | -   | 835  | -         | pF            |
| $C_{oss}$                   | Output Capacitance                 |  | -   | 41   | -         | pF            |
| $C_{rss}$                   | Reverse Transfer Capacitance       |  | -   | 33   | -         | pF            |
| $R_g$                       | Gate Resistance                    | $V_{GS}=0\text{V}$ , $V_{DS}=0\text{V}$ , $f=1\text{MHz}$  | -   | 15.1 | -         | $\Omega$      |
| <b>SWITCHING PARAMETERS</b> |                                    |  |     |      |           |               |
| $Q_g$                       | Total Gate Charge                  | $V_{GS}=-10\text{V}$ , $V_{DS}=-30\text{V}$ , $I_D=-2\text{A}$                                       | -   | 17   | -         | nC            |
| $Q_{gs}$                    | Gate Source Charge                 | $V_{GS}=-10\text{V}$ , $V_{DS}=-15\text{V}$ , $I_D=-1.7\text{A}$                                     | -   | 3.3  | -         | nC            |
| $Q_{gd}$                    | Gate Drain Charge                  |  | -   | 1.7  | -         | nC            |
| $t_{D(on)}$                 | Turn-On Delay Time                 | $V_{GS}=-10\text{V}$ , $V_{DD}=-30\text{V}$ , $I_D=-2\text{A}$ ,<br>$R_G=4.5\Omega$ , $R_L=15\Omega$ | -   | 8.3  | -         | ns            |
| $t_r$                       | Turn-On Rise Time                  |  | -   | 23   | -         | ns            |
| $t_{D(off)}$                | Turn-Off Delay Time                |  | -   | 103  | -         | ns            |
| $t_f$                       | Turn-Off Fall Time                 |  | -   | 43   | -         | ns            |
| $t_{rr}$                    | Body Diode Reverse Recovery Time   | $I_{SD}=-2\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$  | -   | 17   | -         | ns            |
| $Q_{rr}$                    | Body Diode Reverse Recovery Charge | $I_{SD}=-2\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$  | -   | 15   | -         | nC            |

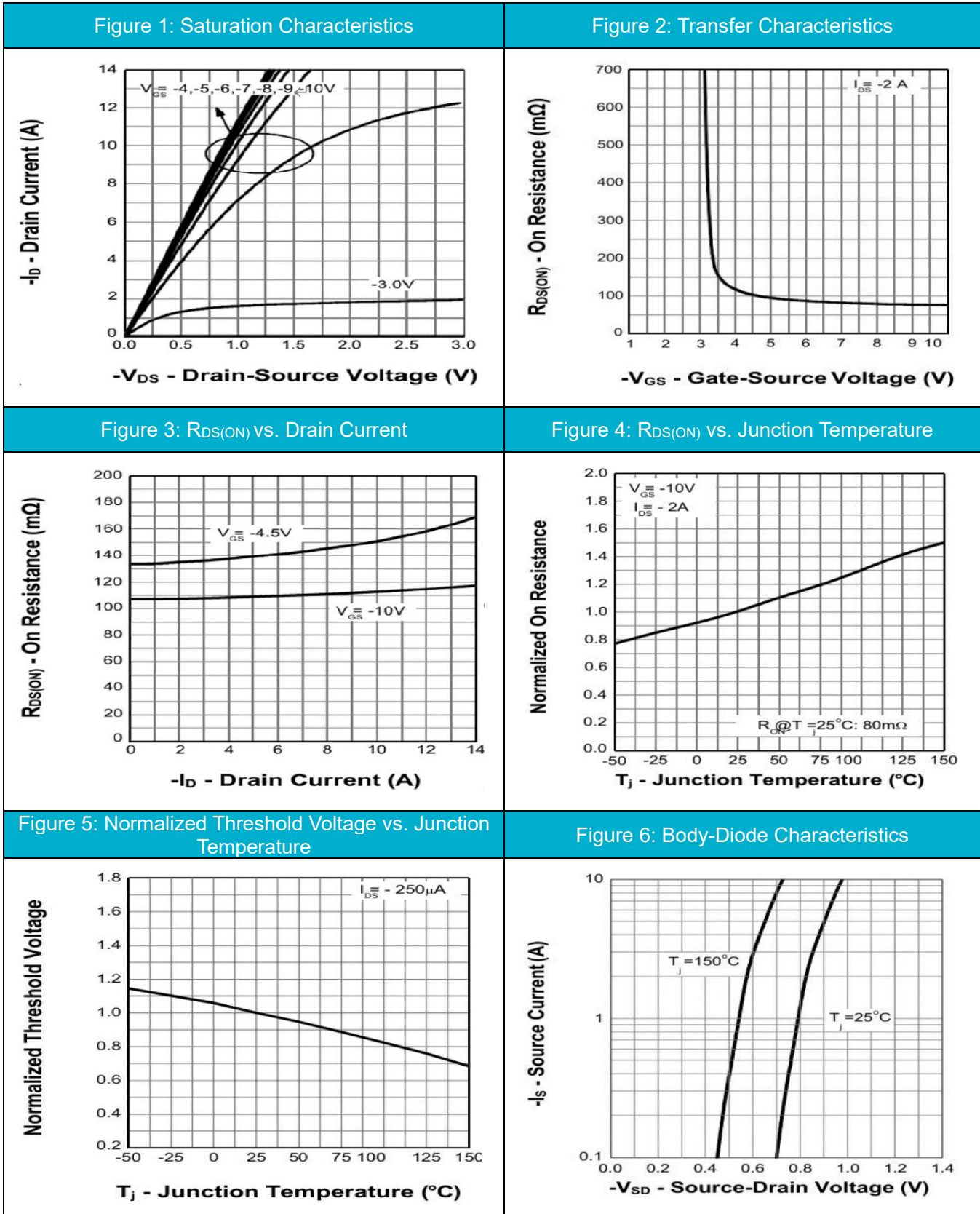
**Thermal Resistances**

| Symbol           | Parameter  | Typ | Max | Unit  |
|------------------|--|-----|-----|-------|
| R <sub>θJC</sub> | Thermal resistance from junction to Case                   | -   | 2.5 | °C /W |
| R <sub>θJA</sub> | Thermal Resistance from Junction to Ambient <sup>(2)</sup> | -   | 100 | °C /W |

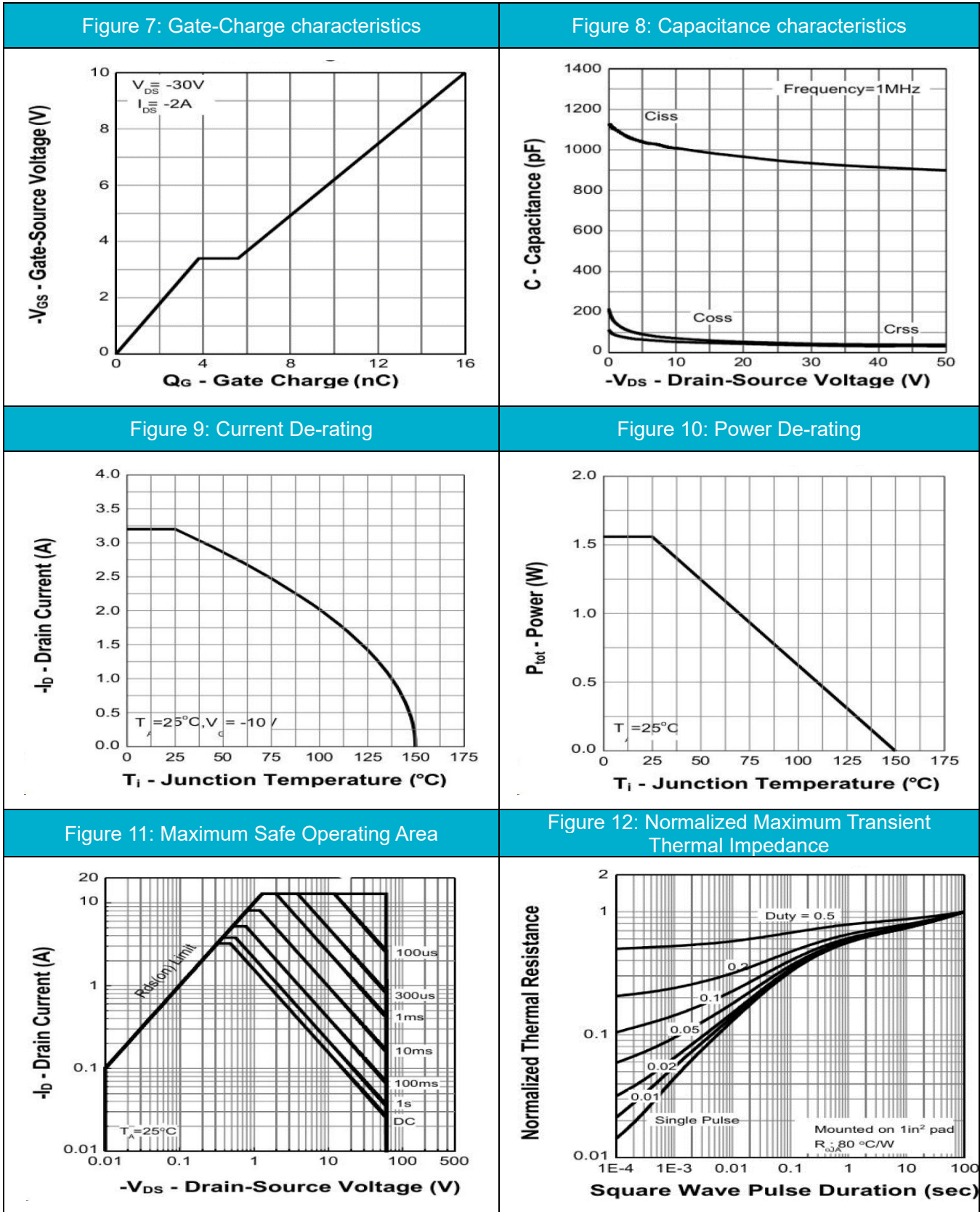
**Notes:**

1. Pulse width  $\leq 100\mu\text{s}$ , duty cycle  $\leq 1\%$ , limited by T<sub>jmax</sub>.
2. Device mounted on FR-4 substrate PC board, 2ozcopper, with 1-inch square copper plate in still air

Typical Electrical and Thermal Characteristics



Typical Electrical and Thermal Characteristics



Test Circuit

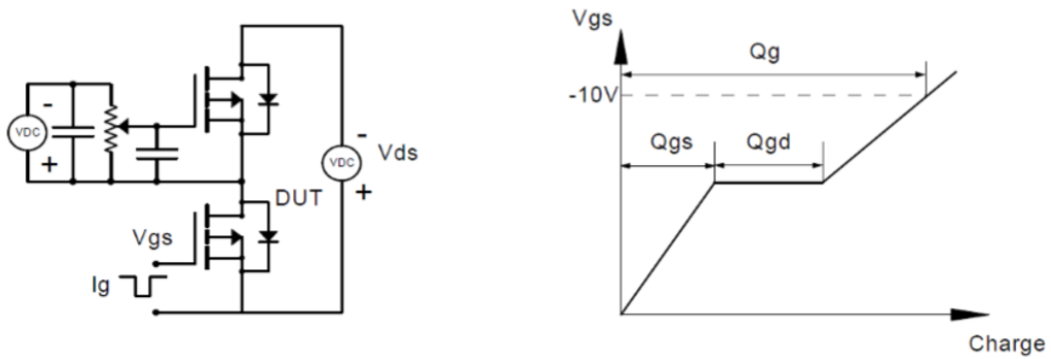


Figure1: Gate Charge Test Circuit & Waveforms

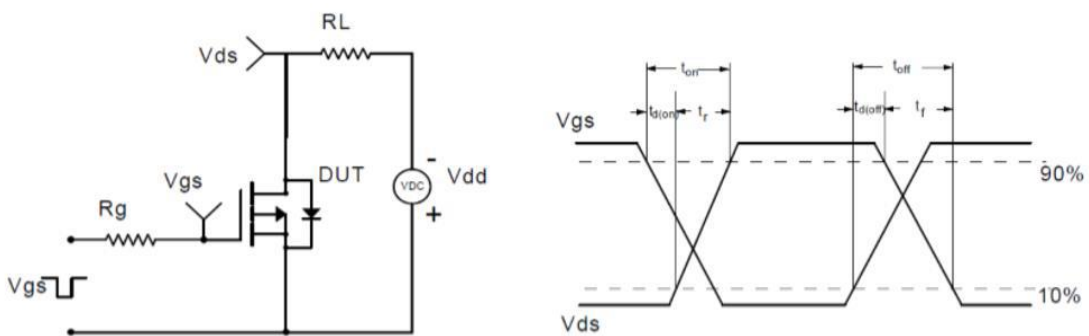


Figure2: Resistive Switching Test Circuit & Waveforms

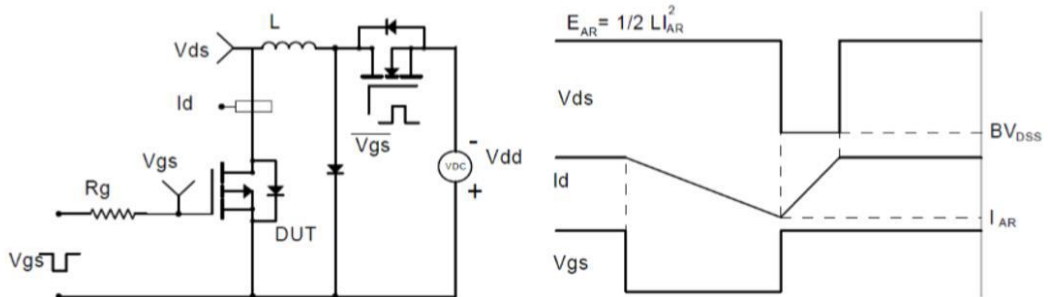


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

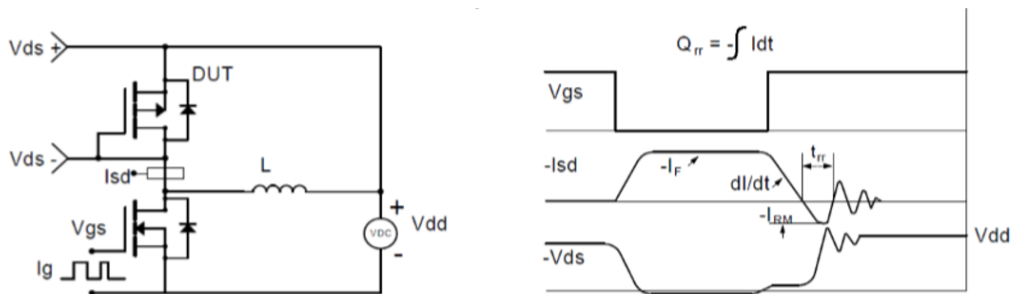
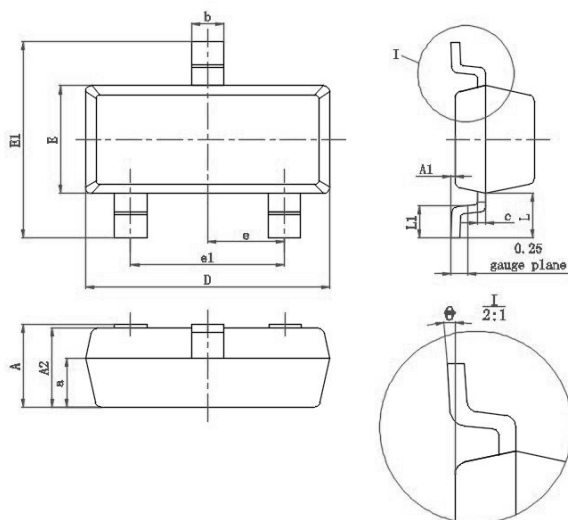


Figure4: Diode Recovery Test Circuit & Waveforms

## SOT-23 Package Information

## Package Outline Dimensions (Units: mm)



| 符号 | 尺寸    |      | 符号 | 尺寸     |      | 符号       | 尺寸     |      |
|----|-------|------|----|--------|------|----------|--------|------|
|    | Min   | Max  |    | Min    | Max  |          | Min    | Max  |
| A  | 0.9   | 1.15 | E  | 1.2    | 1.4  | c        | 0.08   | 0.15 |
| A1 | 0     | 0.1  | E1 | 2.25   | 2.55 | L        | (0.55) |      |
| A2 | 0.9   | 1.05 | e  | (0.95) |      | L1       | 0.3    | 0.5  |
| a  | (0.6) |      | e1 | 1.8    | 2.0  | $\theta$ | 0°     | 8°   |
| D  | 2.8   | 3.0  | b  | 0.3    | 0.5  |          |        |      |

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