

### General Description:

The LW3134AF uses trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications. The package form is SOT-523, which accords with the ROHS standard and Halogen Free standard.

### Features:

- Fast Switching
- Low Gate Charge and  $R_{DS(ON)}$
- Low Reverse transfer capacitances
- ESD Rating: HBM  $\geq 1000V$

### Applications:

- DC-DC Converter
- Portable Equipment
- Power Management

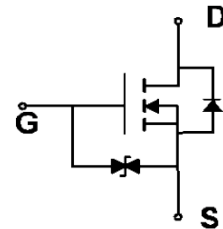


|                   |      |            |
|-------------------|------|------------|
| $V_{DSS}$         | 20   | V          |
| $I_D$             | 0.75 | A          |
| $P_D$             | 0.15 | W          |
| $R_{DS(ON)}$ TYPE | 150  | m $\Omega$ |

Marking and Pin Assignment



Inner Equivalent Principium Chart



### Package Marking and Ordering Information:

| Marking | Part Number | Package | Packing | Qty.     |
|---------|-------------|---------|---------|----------|
| 3134A   | LW3134AF    | SOT-523 | Reel    | 3000 Pcs |

### Absolute Maximum Ratings:

| Symbol         | Parameter                                        |                    | Value           | Units       |
|----------------|--------------------------------------------------|--------------------|-----------------|-------------|
| $V_{DSS}$      | Drain-to-Source Voltage                          |                    | 20              | V           |
| $I_D$          | Continuous Drain Current                         | $T_A=25^{\circ}C$  | 0.75            | A           |
|                | Continuous Drain Current                         | $T_A=100^{\circ}C$ | 0.47            | A           |
| $I_{DM}^{a1}$  | Pulsed Drain Current                             |                    | 3.0             | A           |
| $V_{GS}$       | Gate-to-Source Voltage                           |                    | $\pm 10$        | V           |
| $P_D$          | Power Dissipation                                |                    | 0.15            | W           |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature Range |                    | 150, -55 to 150 | $^{\circ}C$ |
| $T_L$          | Maximum Temperature for Soldering                |                    | 260             | $^{\circ}C$ |

### Thermal Characteristics:

| Symbol               | Parameter                               | Value | Units         |
|----------------------|-----------------------------------------|-------|---------------|
| $R_{\theta JA}^{a2}$ | Thermal Resistance, Junction-to-Ambient | 833   | $^{\circ}C/W$ |

**Electrical Characteristic** ( $T_J = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified):

| Static Characteristics |                                   |                               |       |      |      |           |
|------------------------|-----------------------------------|-------------------------------|-------|------|------|-----------|
| Symbol                 | Parameter                         | Test Conditions               | Value |      |      | Units     |
|                        |                                   |                               | Min.  | Typ. | Max. |           |
| $V_{DSS}$              | Drain to Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$     | 20    | --   | --   | V         |
| $I_{DSS}$              | Drain to Source Leakage Current   | $V_{DS}=20V, V_{GS}=0V$       | --    | --   | 1.0  | $\mu A$   |
| $I_{GSS(F)}$           | Gate to Source Forward Leakage    | $V_{GS}=+10V, V_{DS}=0V$      | --    | --   | 5.0  | $\mu A$   |
| $I_{GSS(R)}$           | Gate to Source Reverse Leakage    | $V_{GS}=-10V, V_{DS}=0V$      | --    | --   | -5.0 | $\mu A$   |
| $V_{GS(TH)}$           | Gate Threshold Voltage            | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.45  | 0.65 | 1.0  | V         |
| $R_{DS(ON)1}$          | Drain-to-Source On-Resistance     | $V_{GS}=4.5V, I_D=0.5A$       | --    | 150  | 200  | $m\Omega$ |
| $R_{DS(ON)2}$          | Drain-to-Source On-Resistance     | $V_{GS}=2.5V, I_D=0.3A$       | --    | 185  | 300  | $m\Omega$ |
| $R_{DS(ON)3}$          | Drain-to-Source On-Resistance     | $V_{GS}=1.8V, I_D=0.3A$       | --    | 310  | 500  | $m\Omega$ |

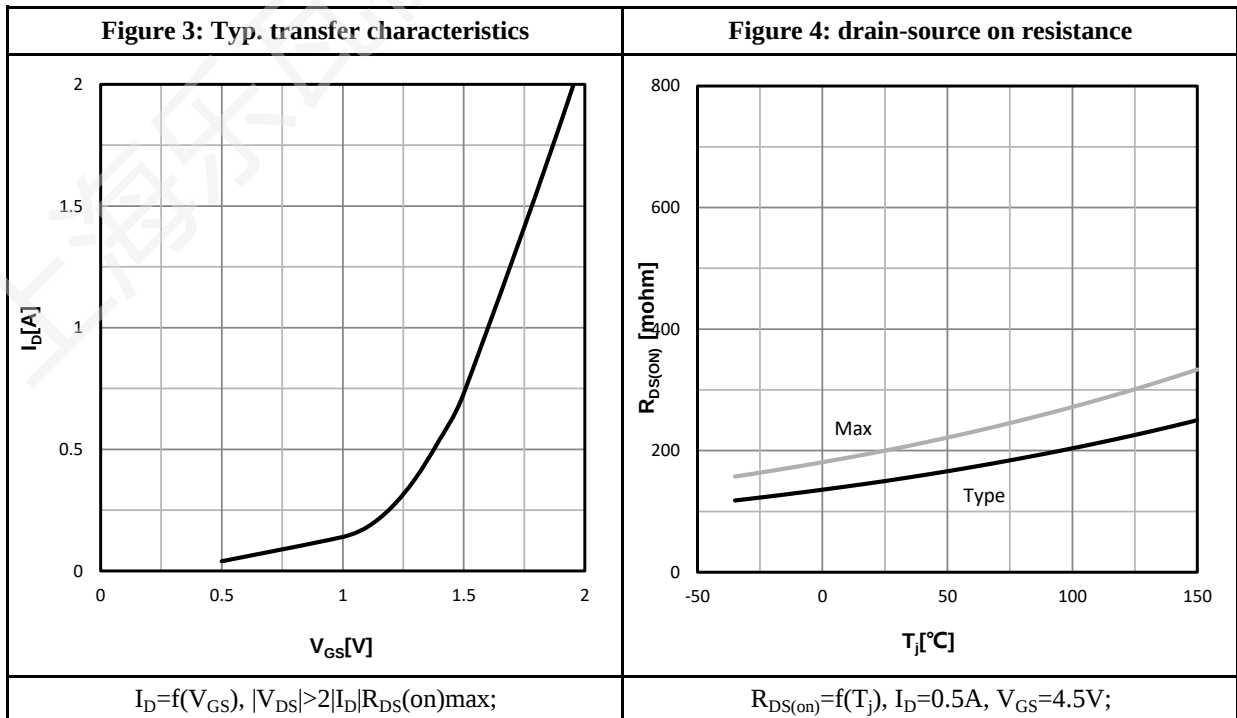
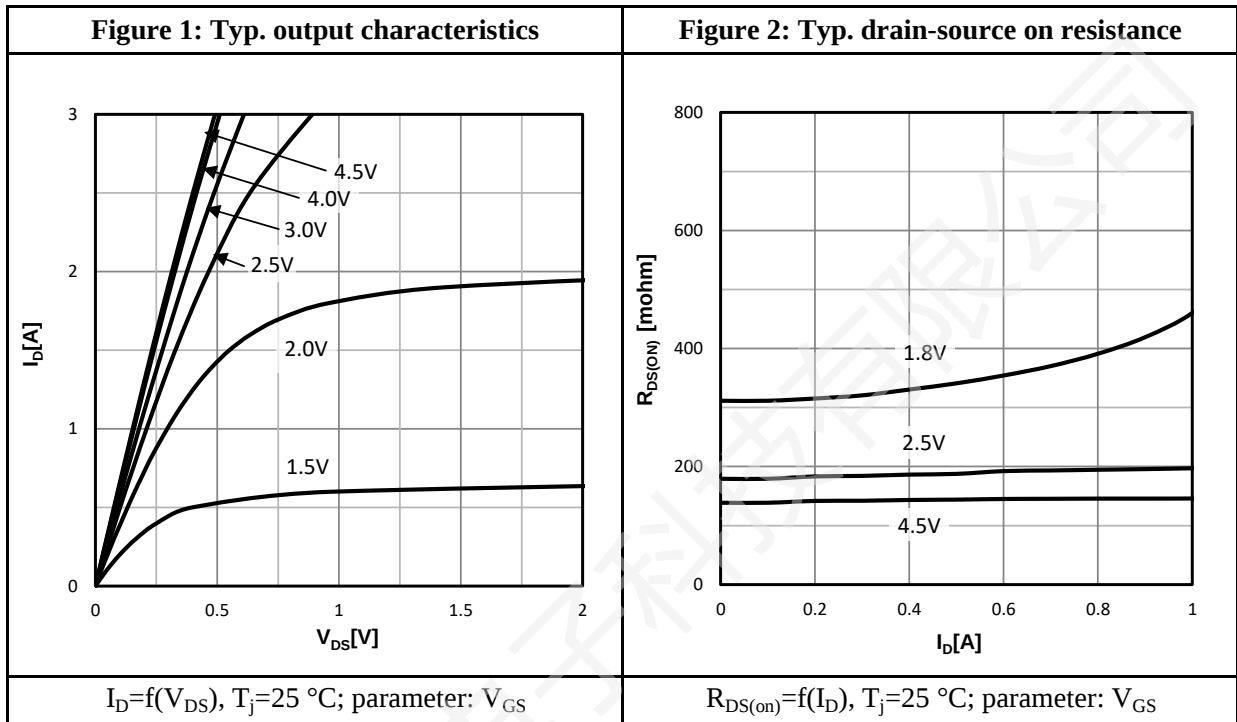
| Dynamic Characteristics |                              |                                |       |      |      |          |
|-------------------------|------------------------------|--------------------------------|-------|------|------|----------|
| Symbol                  | Parameter                    | Test Conditions                | Value |      |      | Units    |
|                         |                              |                                | Min.  | Typ. | Max. |          |
| $C_{iss}$               | Input Capacitance            | $V_{GS}=0V$                    | --    | 44   | --   | pF       |
| $C_{oss}$               | Output Capacitance           | $V_{DS}=10V$                   | --    | 11   | --   |          |
| $C_{rss}$               | Reverse Transfer Capacitance | $f=1.0MHz$                     | --    | 8.1  | --   |          |
| $R_G$                   | Gate resistance              | $V_{GS}=0V, V_{DS}=0V, f=1MHz$ | --    | 19   | --   | $\Omega$ |

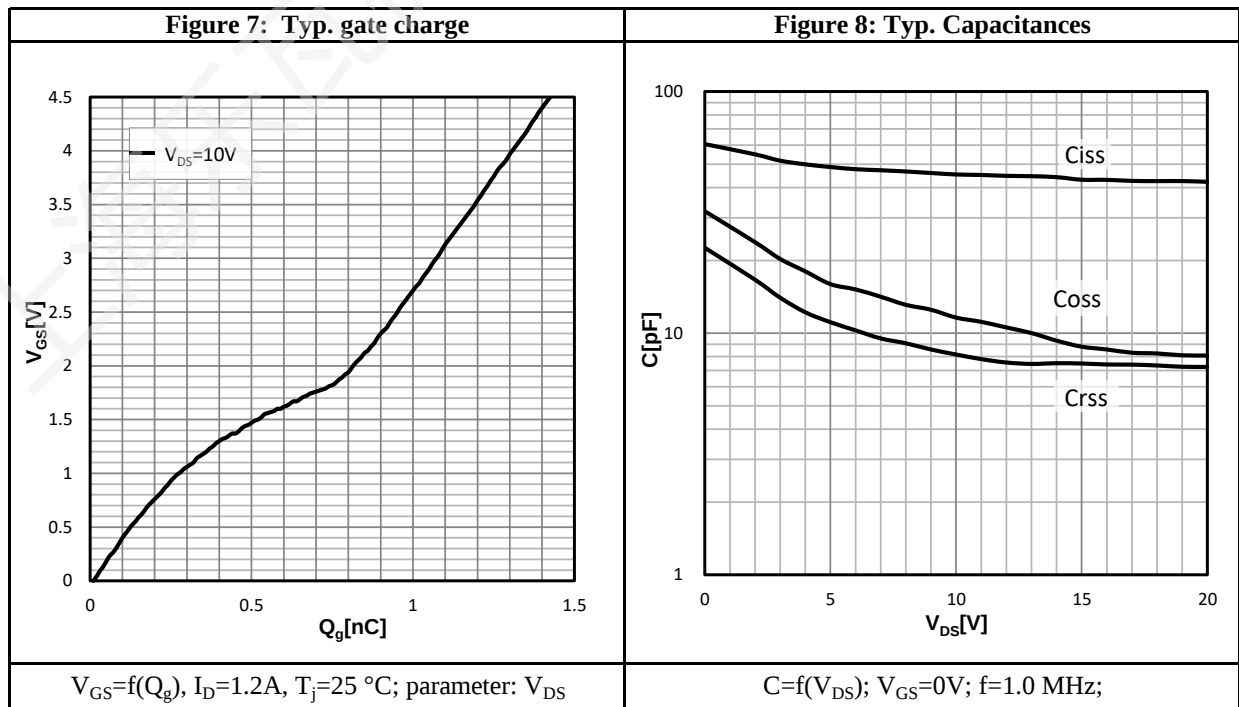
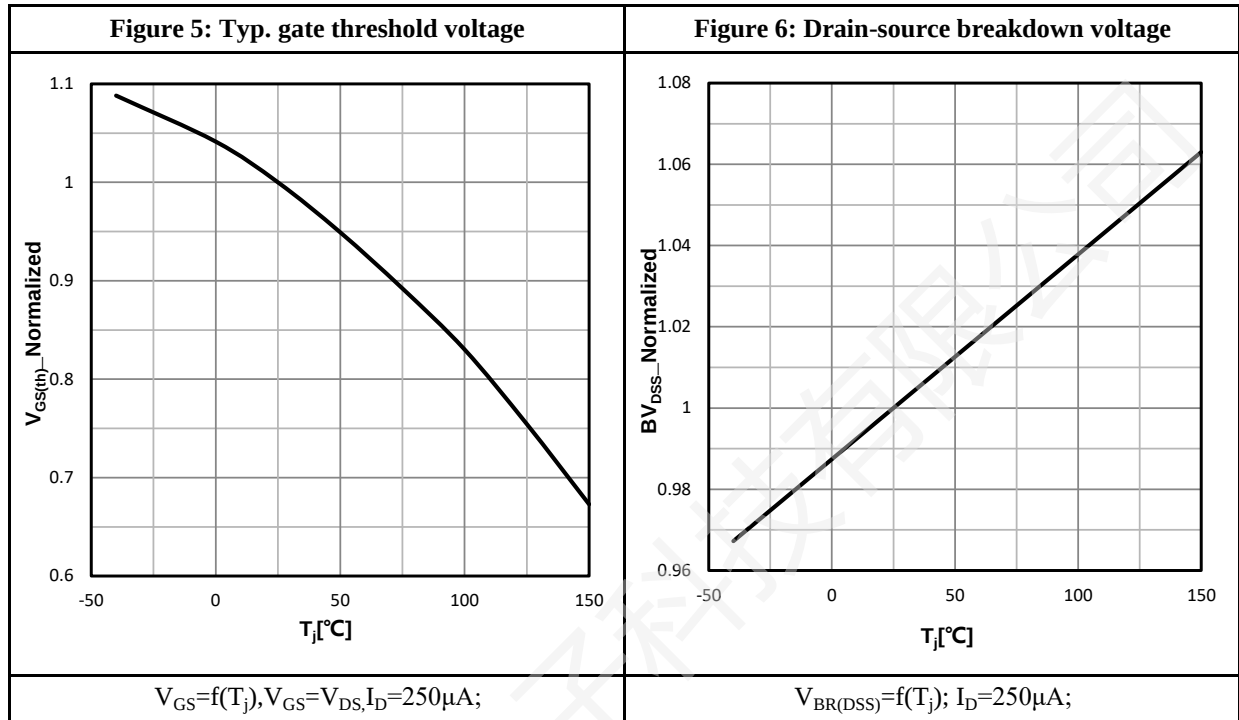
| Resistive Switching Characteristics |                       |                 |       |      |      |       |
|-------------------------------------|-----------------------|-----------------|-------|------|------|-------|
| Symbol                              | Parameter             | Test Conditions | Value |      |      | Units |
|                                     |                       |                 | Min.  | Typ. | Max. |       |
| $t_{d(ON)}$                         | Turn-on Delay Time    | $I_D=0.5A$      | --    | 6.7  | --   | ns    |
| $t_r$                               | Rise Time             | $V_{DS}=10V$    | --    | 4.8  | --   |       |
| $t_{d(OFF)}$                        | Turn-Off Delay Time   | $V_{GS}=4.5V$   | --    | 17   | --   |       |
| $t_f$                               | Fall Time             | $R_G=10\Omega$  | --    | 7.4  | --   |       |
| $Q_g$                               | Total Gate Charge     | $V_{GS}=4.5V$   | --    | 1.4  | --   | nC    |
| $Q_{gs}$                            | Gate to Source Charge | $V_{DS}=10V$    | --    | 0.28 | --   |       |
| $Q_{gd}$                            | Gate to Drain Charge  | $I_D=1.2A$      | --    | 0.46 | --   |       |

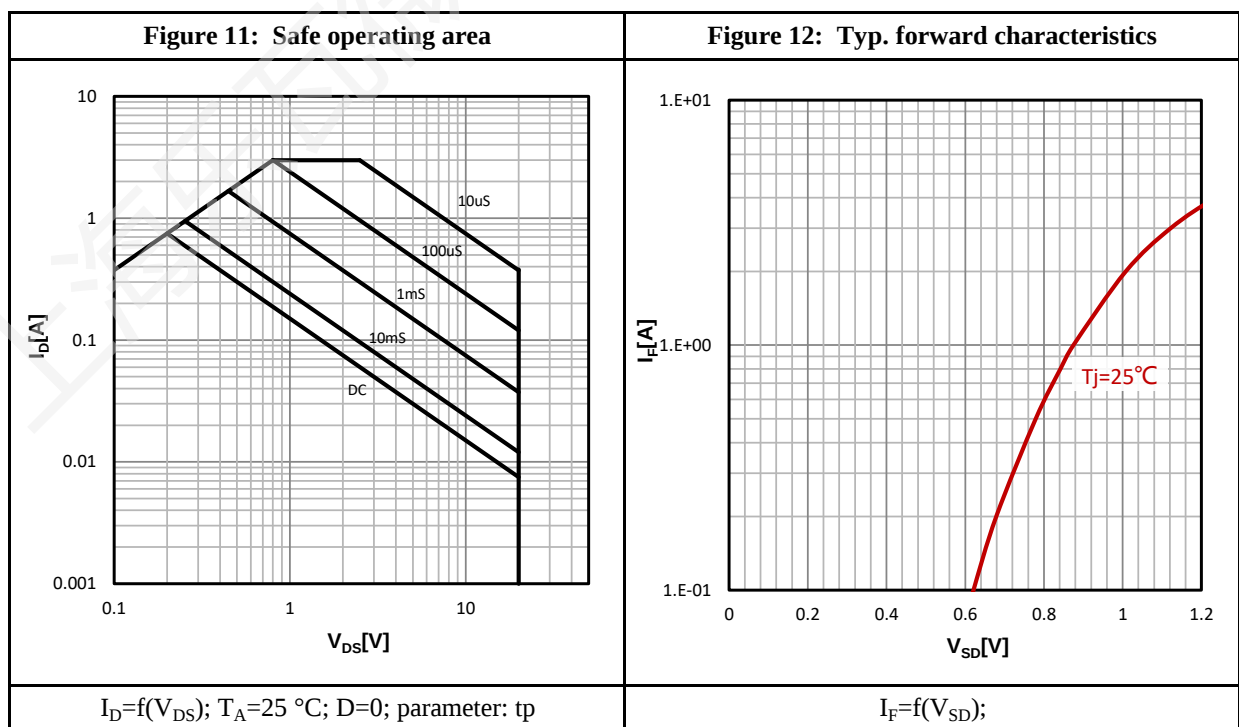
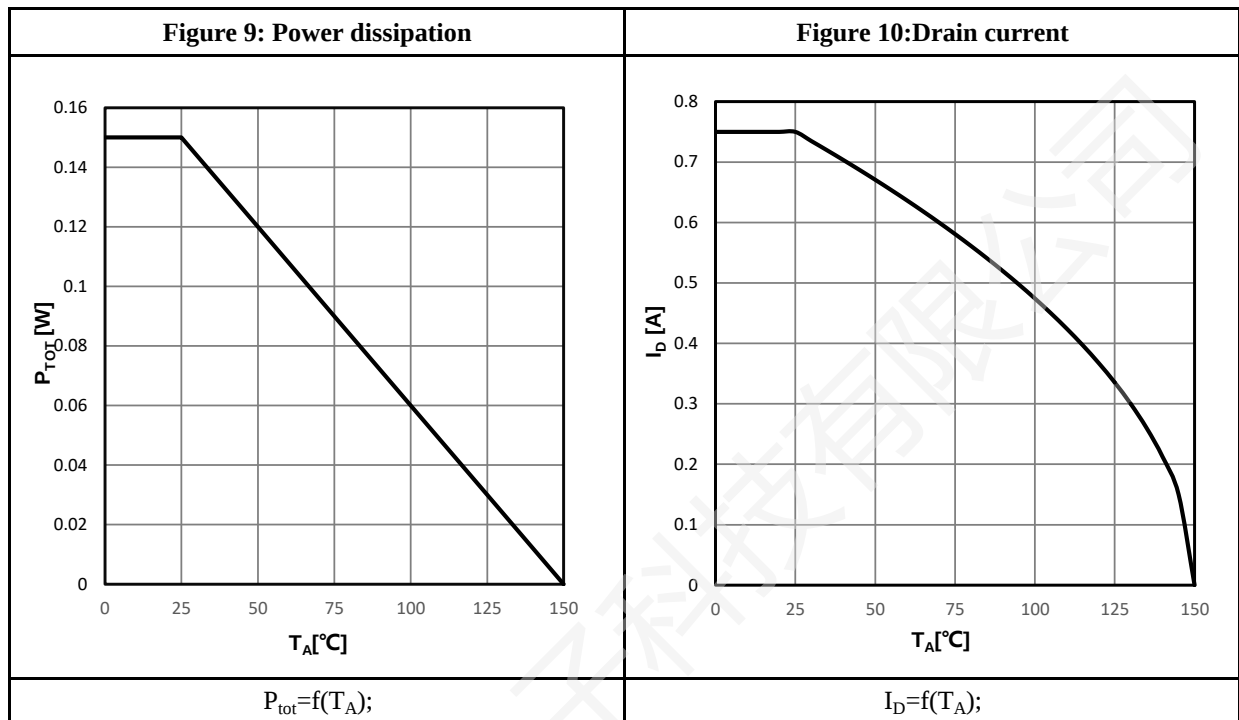
| Source-Drain Diode Characteristics |                       |                                  |       |      |      |       |
|------------------------------------|-----------------------|----------------------------------|-------|------|------|-------|
| Symbol                             | Parameter             | Test Conditions                  | Value |      |      | Units |
|                                    |                       |                                  | Min.  | Typ. | Max. |       |
| $I_S$                              | Diode Forward Current | $T_A=25\text{ }^{\circ}\text{C}$ | --    | --   | 0.75 | A     |
| $V_{SD}$                           | Diode Forward Voltage | $I_S=0.5A, V_{GS}=0V$            | --    | --   | 1.2  | V     |

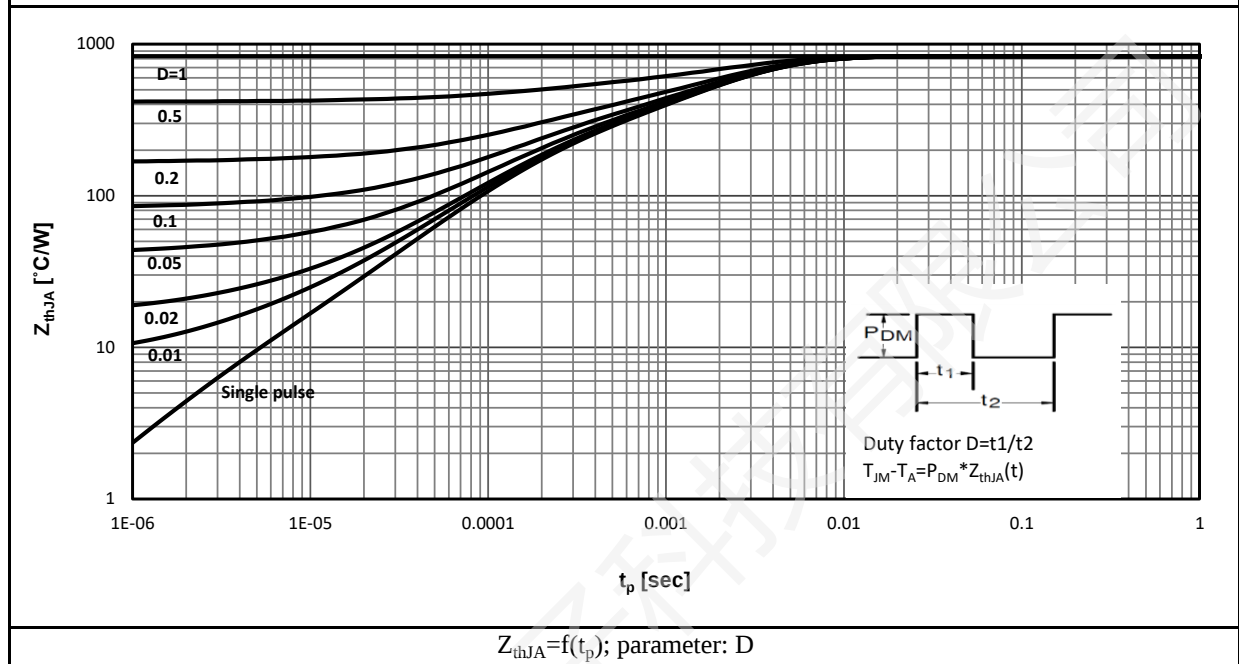
a1: Repetitive rating; pulse width limited by maximum junction temperature

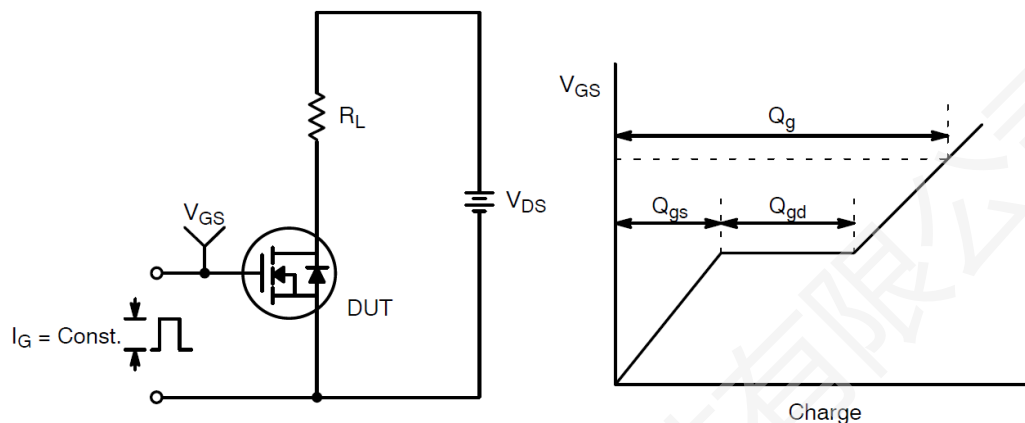
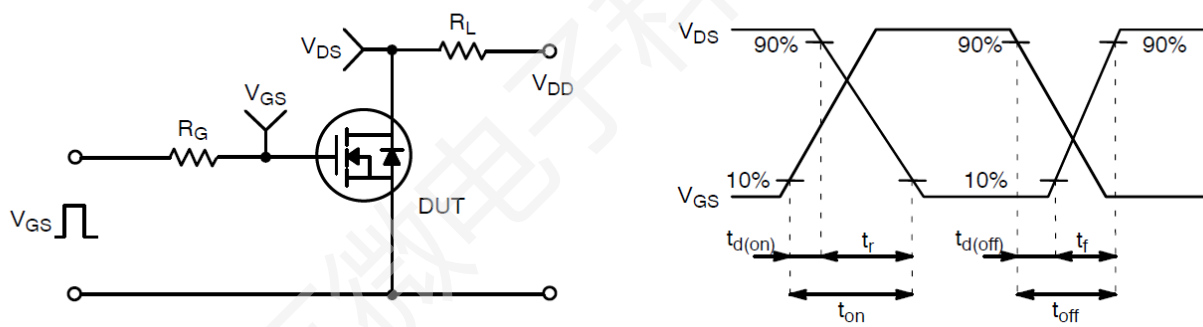
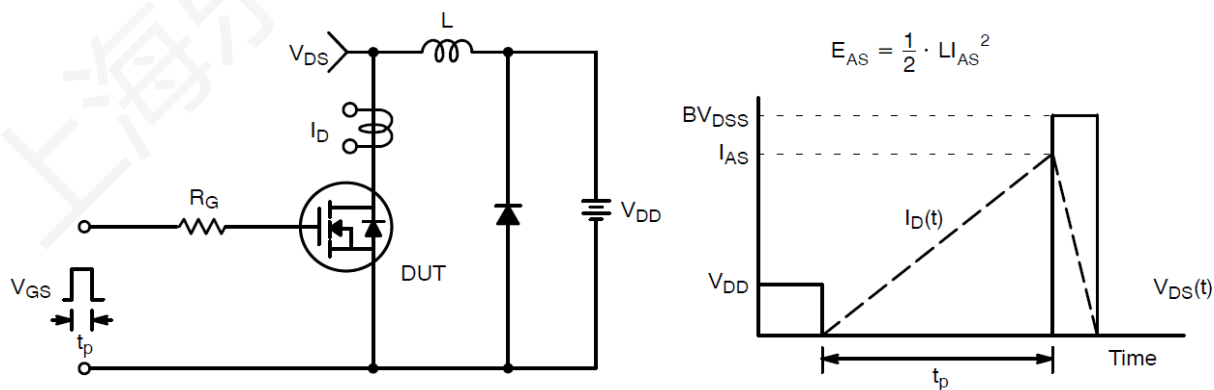
a2: Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection.

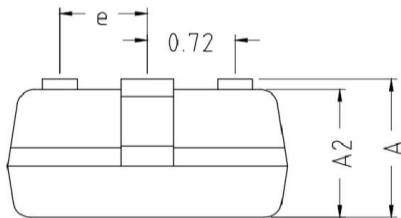
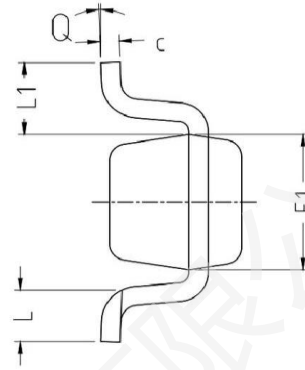
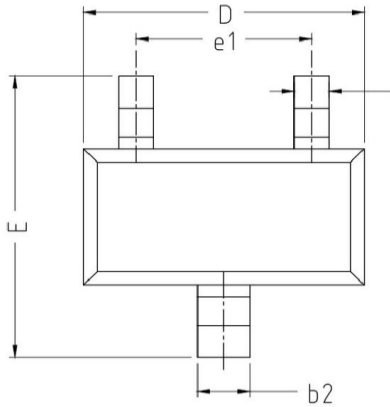
**Characteristics Curve:**






**Figure 13: Max. Transient Thermal Impedance**


**Test Circuit & Waveform:**

**Figure 14: Gate Charge Test Circuit & Waveform**

**Figure 15: Resistive Switching Test Circuit & Waveforms**

**Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms**

**Package Outline:**


| COMMON IN DIMENSION (MM) |           |       |       |
|--------------------------|-----------|-------|-------|
| PKG                      | SOT-523   |       |       |
| Symbol                   | Min       | Nom   | Max   |
| A                        | 0.700     | 0.800 | 0.890 |
| A1                       | 0.000     | 0.050 | 0.100 |
| A2                       | 0.700     | 0.750 | 0.800 |
| b1                       | 0.150     | 0.200 | 0.250 |
| b2                       | 0.250     | 0.300 | 0.350 |
| C                        | 0.100     | 0.130 | 0.200 |
| D                        | 1.550     | 1.600 | 1.700 |
| E                        | 1.450     | 1.600 | 1.750 |
| E1                       | 0.700     | 0.800 | 0.900 |
| e                        | 0.500 TYP |       |       |
| e1                       | 0.900     | 1.000 | 1.100 |
| L                        | 0.260     | 0.360 | 0.460 |
| L1                       | 0.400 REF |       |       |
| Q                        | 0°        | 4°    | 8°    |

**Revision History:**

| Revison | Date     | Descriptions    |
|---------|----------|-----------------|
| Rev 1.0 | Dec.2024 | Initial Version |

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