

### General Description:

The LW4407AS 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 SOP-8, which accords with the ROHS standard and Halogen Free standard.

### Features:

- Fast Switching
- Low Gate Charge and  $R_{DS(ON)}$
- Low Reverse transfer capacitances

### Applications:

- Power switching application
- Hard switched and high frequency circuits
- Power Management

**100% DVDS Tested**

**100% Avalanche Tested**



### Package Marking and Ordering Information:

| Marking         | Part Number | Package | Packing | Qty.     |
|-----------------|-------------|---------|---------|----------|
| 4407/LW AS/D.C. | LW4407AS    | SOP-8   | Reel    | 4000 Pcs |

### Absolute Maximum Ratings:

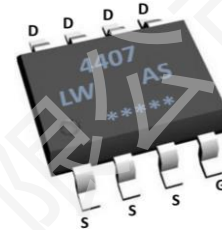
| Symbol         | Parameter                                        |                           | Value           | Units              |
|----------------|--------------------------------------------------|---------------------------|-----------------|--------------------|
| $V_{DSS}$      | Drain-to-Source Voltage                          |                           | -30             | V                  |
| $I_D$          | Continuous Drain Current                         | $T_A=25^{\circ}\text{C}$  | -12             | A                  |
|                | Continuous Drain Current                         | $T_A=100^{\circ}\text{C}$ | -7.6            | A                  |
| $I_{DM}^{a1}$  | Pulsed Drain Current                             |                           | -48             | A                  |
| $E_{AS}^{a2}$  | Single pulse avalanche energy                    |                           | 80              | mJ                 |
| $V_{GS}$       | Gate-to-Source Voltage                           |                           | $\pm 20$        | V                  |
| $P_D$          | Power Dissipation                                |                           | 3.1             | W                  |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature Range |                           | 150, -55 to 150 | $^{\circ}\text{C}$ |
| $T_L$          | Maximum Temperature for Soldering                |                           | 260             | $^{\circ}\text{C}$ |

### Thermal Characteristics:

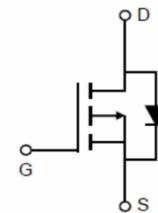
| Symbol               | Parameter                               | Value | Units                |
|----------------------|-----------------------------------------|-------|----------------------|
| $R_{\theta JA}^{a3}$ | Thermal Resistance, Junction-to-Ambient | 40    | $^{\circ}\text{C/W}$ |

|                           |     |                  |
|---------------------------|-----|------------------|
| $V_{DSS}$                 | -30 | V                |
| $I_D$                     | -12 | A                |
| $P_D$                     | 3.1 | W                |
| $R_{DS(ON) \text{ TYPE}}$ | 10  | $\text{m}\Omega$ |

Marking and Pin Assignment



Inner Equivalent Principium Chart



**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 | $V_{GS}=0V, I_D=-250\mu A$     | -30   | --   | --   | V          |
| $I_{DSS}$              | Drain to Source Leakage Current   | $V_{DS}=-30V, V_{GS}=0V$       | --    | --   | -1.0 | $\mu A$    |
| $I_{GSS(F)}$           | Gate to Source Forward Leakage    | $V_{GS}=-20V, V_{DS}=0V$       | --    | --   | -100 | nA         |
| $I_{GSS(R)}$           | Gate to Source Reverse Leakage    | $V_{GS}=+20V, V_{DS}=0V$       | --    | --   | 100  | nA         |
| $V_{GS(TH)}$           | Gate Threshold Voltage            | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1.0  | -1.5 | -2.0 | V          |
| $R_{DS(ON)1}$          | Drain-to-Source On-Resistance     | $V_{GS}=-10V, I_D=-12A$        | --    | 10   | 13   | m $\Omega$ |
| $R_{DS(ON)2}$          | Drain-to-Source On-Resistance     | $V_{GS}=-4.5V, I_D=-8.0A$      | --    | 15   | 20   | m $\Omega$ |

| Dynamic Characteristics |                              |                                |       |      |      |          |
|-------------------------|------------------------------|--------------------------------|-------|------|------|----------|
| Symbol                  | Parameter                    | Test Conditions                | Value |      |      | Units    |
|                         |                              |                                | Min.  | Typ. | Max. |          |
| $C_{iss}$               | Input Capacitance            | $V_{GS}=0V$                    | --    | 1382 | --   | pF       |
| $C_{oss}$               | Output Capacitance           | $V_{DS}=-15V$                  | --    | 242  | --   |          |
| $C_{rss}$               | Reverse Transfer Capacitance | $f=1.0MHz$                     | --    | 202  | --   |          |
| $R_G$                   | Gate resistance              | $V_{GS}=0V, V_{DS}=0V, f=1MHz$ | --    | 6.6  | --   | $\Omega$ |

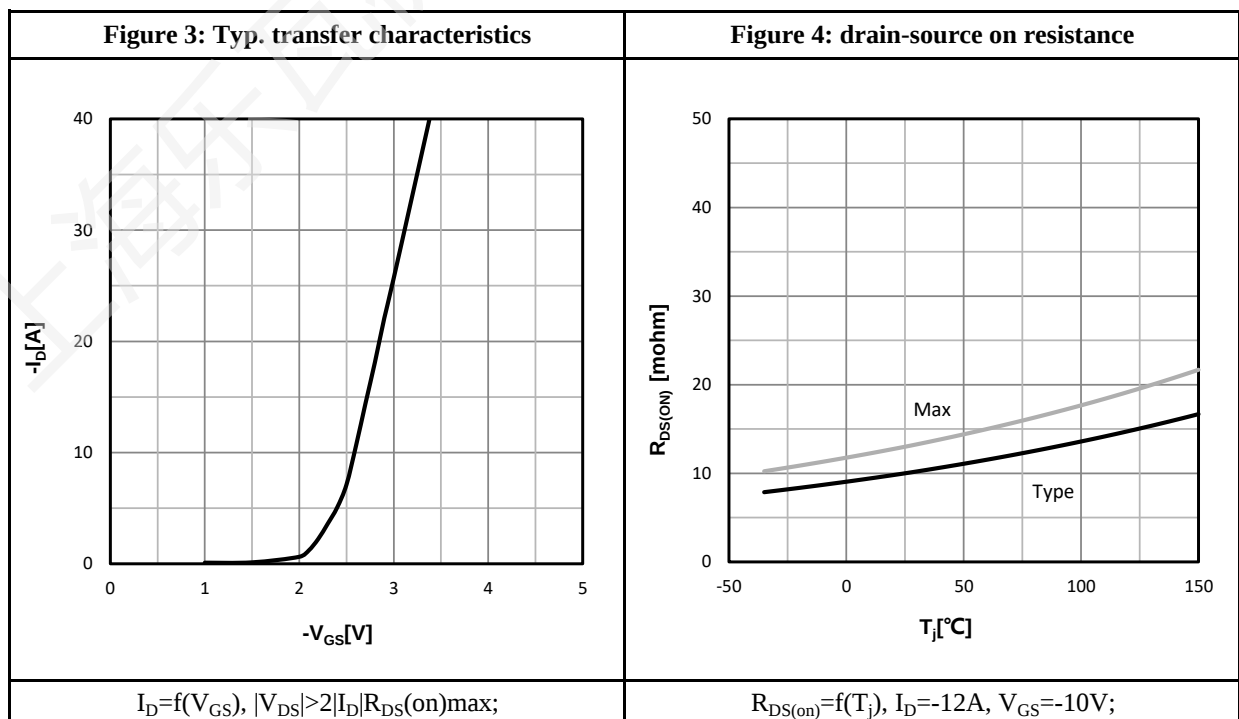
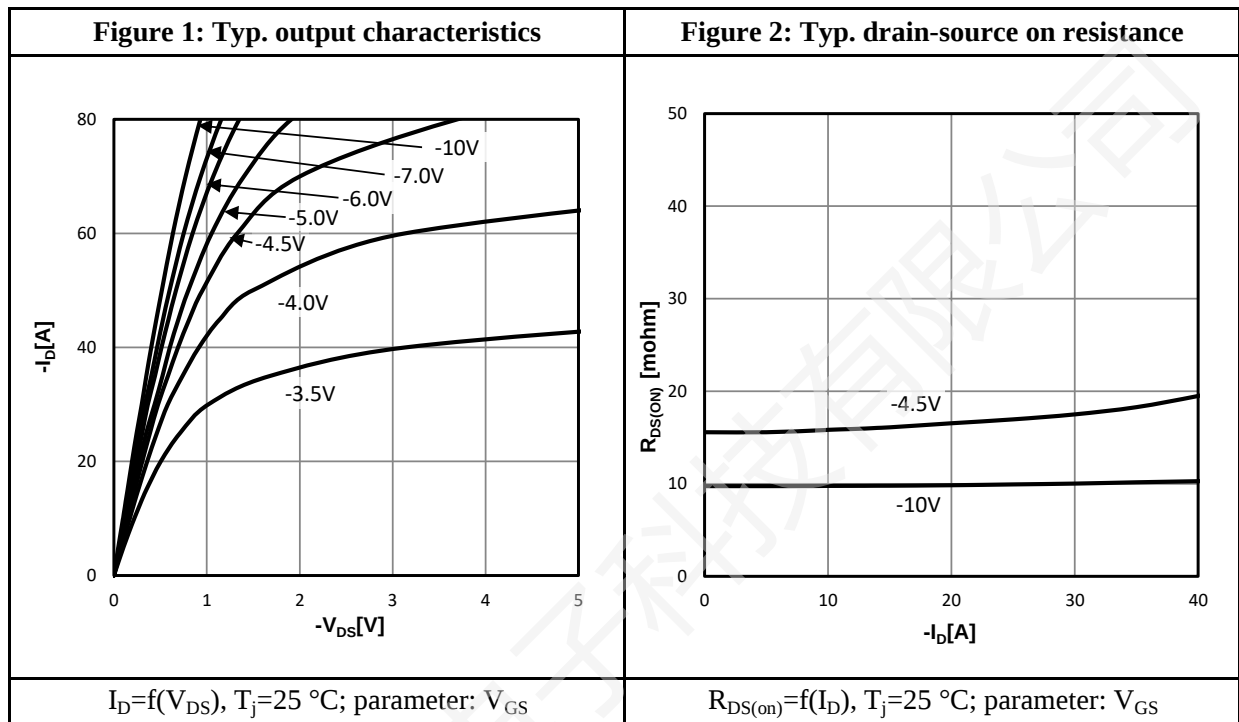
| Resistive Switching Characteristics |                       |                 |       |      |      |       |
|-------------------------------------|-----------------------|-----------------|-------|------|------|-------|
| Symbol                              | Parameter             | Test Conditions | Value |      |      | Units |
|                                     |                       |                 | Min.  | Typ. | Max. |       |
| $t_{d(ON)}$                         | Turn-on Delay Time    | $I_D=-12A$      | --    | 8.0  | --   | ns    |
| $t_r$                               | Rise Time             | $V_{DS}=-15V$   | --    | 12.5 | --   |       |
| $t_{d(OFF)}$                        | Turn-Off Delay Time   | $V_{GS}=-10V$   | --    | 69   | --   |       |
| $t_f$                               | Fall Time             | $R_G=3.0\Omega$ | --    | 40.5 | --   |       |
| $Q_g$                               | Total Gate Charge     | $V_{GS}=-10V$   | --    | 31   | --   | nC    |
| $Q_{gs}$                            | Gate to Source Charge | $V_{DS}=-15V$   | --    | 3.9  | --   |       |
| $Q_{gd}$                            | Gate to Drain Charge  | $I_D=-12A$      | --    | 6.8  | --   |       |

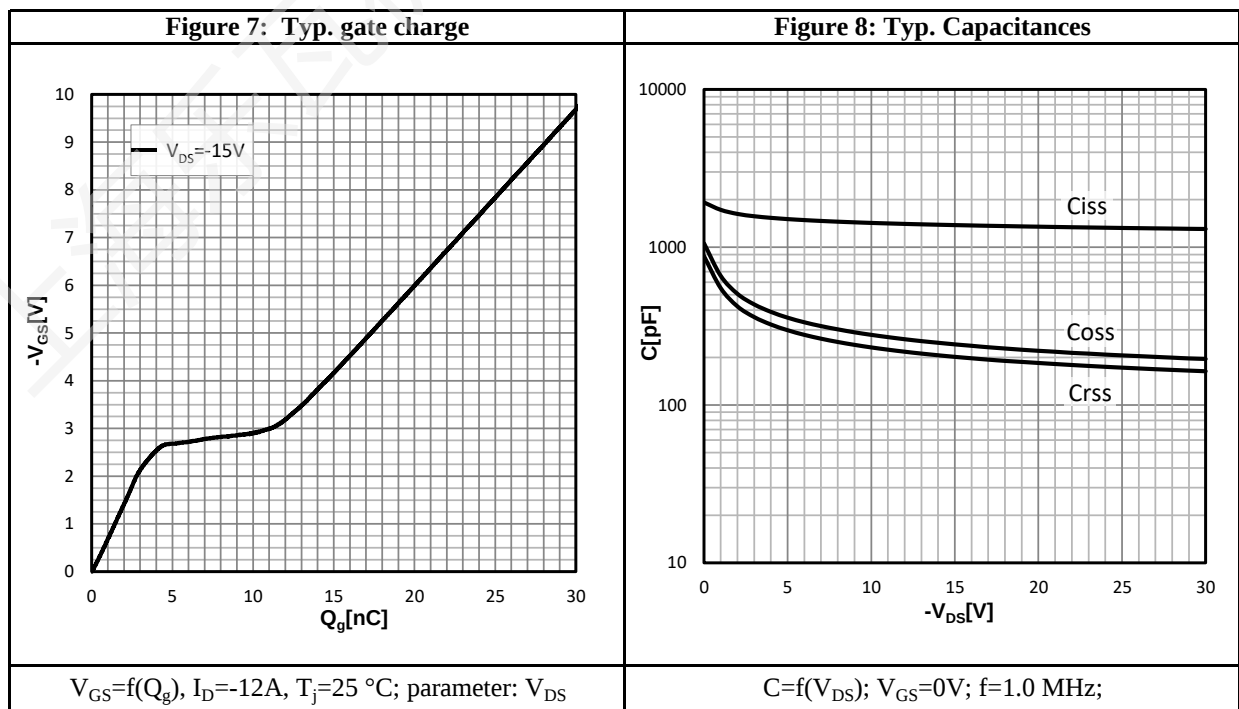
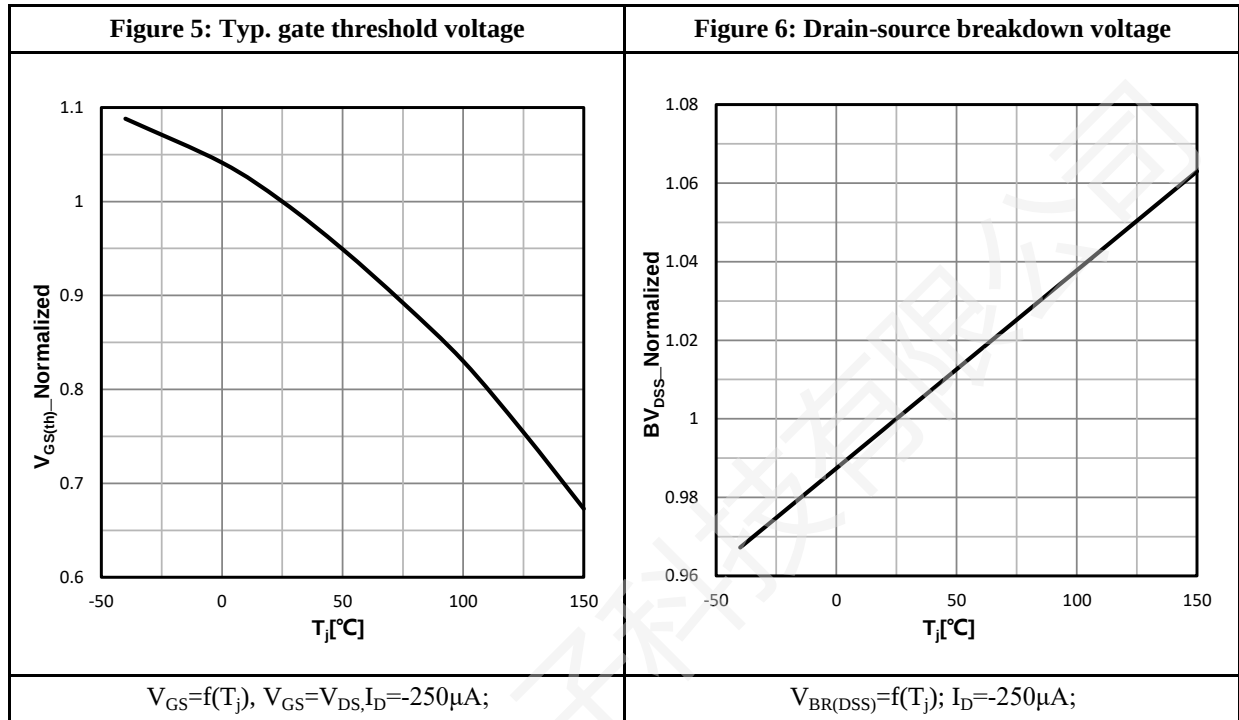
| Source-Drain Diode Characteristics |                       |                                  |       |      |      |       |
|------------------------------------|-----------------------|----------------------------------|-------|------|------|-------|
| Symbol                             | Parameter             | Test Conditions                  | Value |      |      | Units |
|                                    |                       |                                  | Min.  | Typ. | Max. |       |
| $I_S$                              | Diode Forward Current | $T_A=25\text{ }^{\circ}\text{C}$ | --    | --   | -12  | A     |
| $V_{SD}$                           | Diode Forward Voltage | $I_S=-12A, V_{GS}=0V$            | --    | --   | -1.2 | V     |

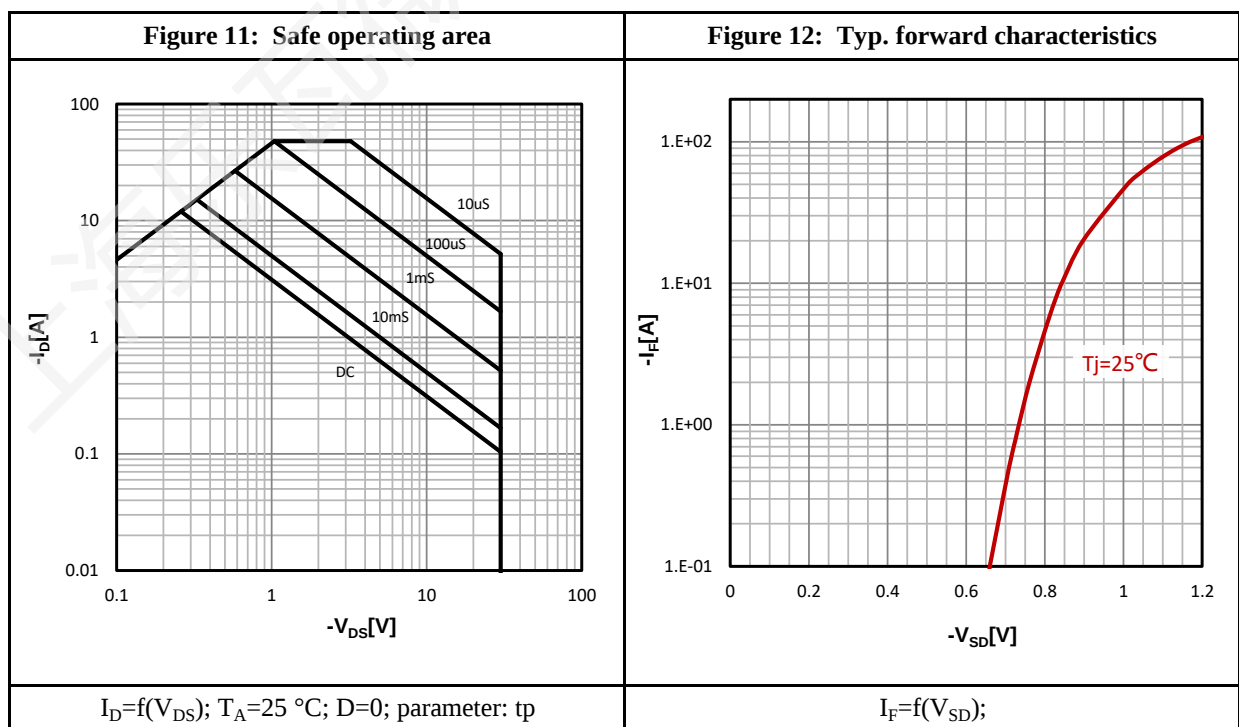
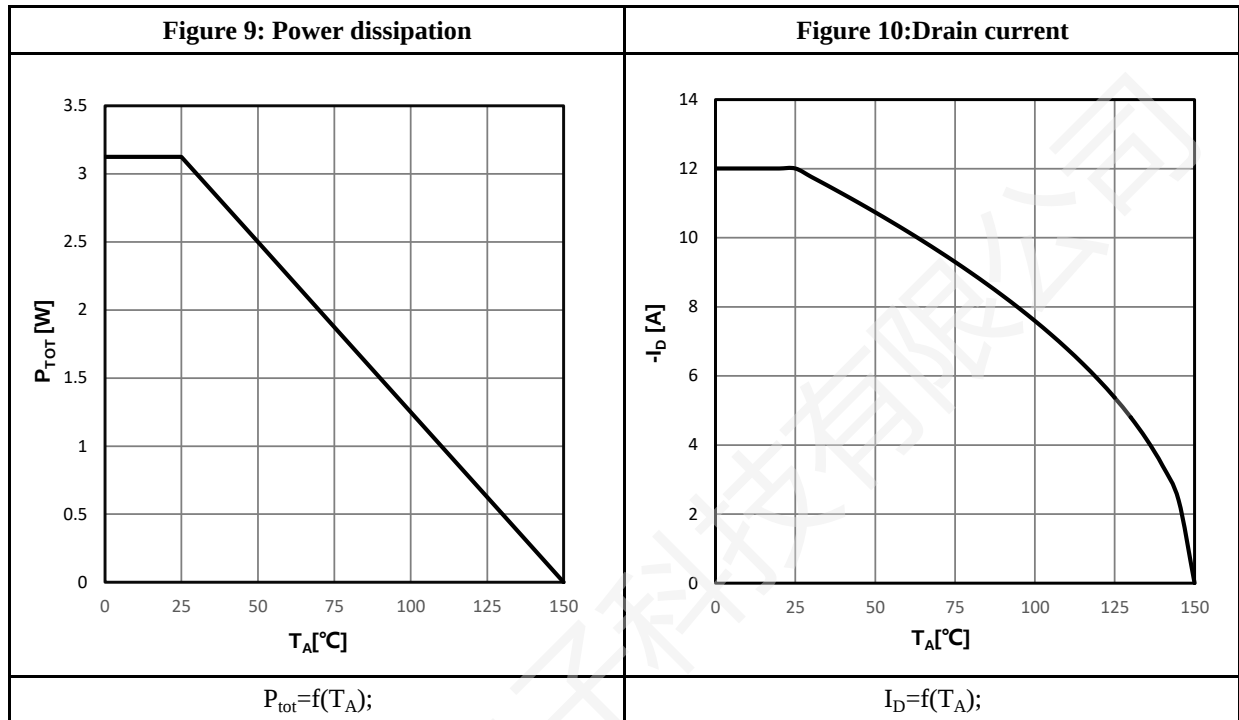
a1: Repetitive rating; pulse width limited by maximum junction temperature

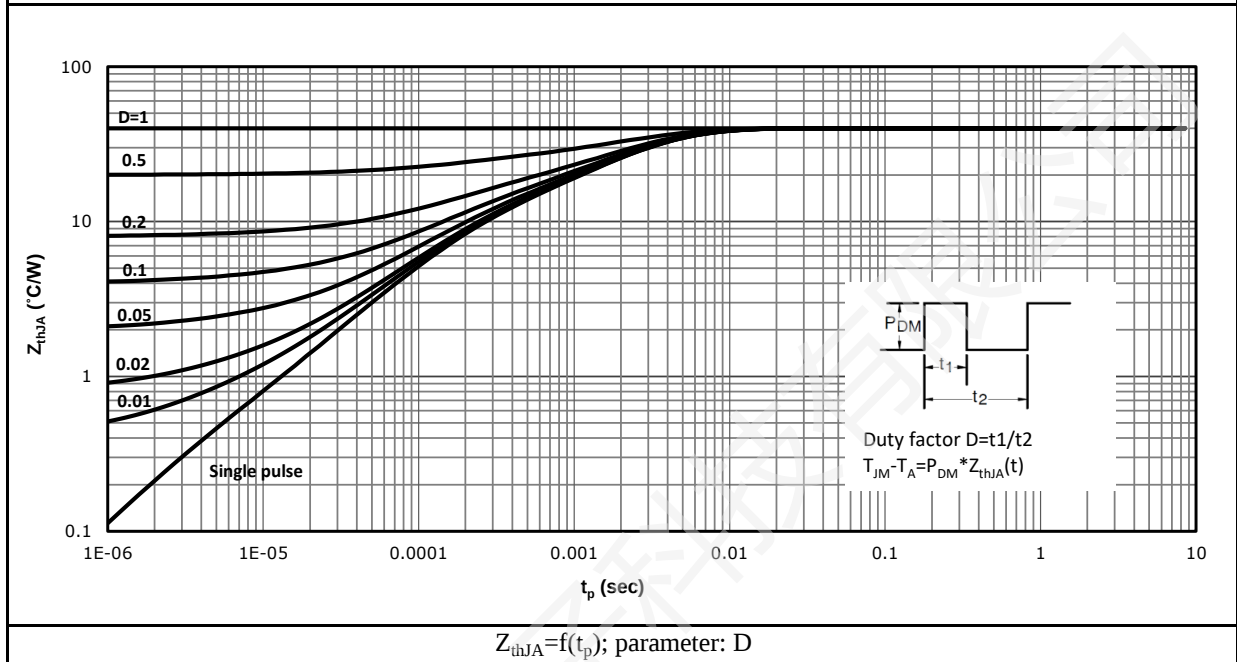
a2:  $V_{DD}=-15V, L=0.1mH, R_G=25\Omega$ , Starting  $T_J=25\text{ }^{\circ}\text{C}$

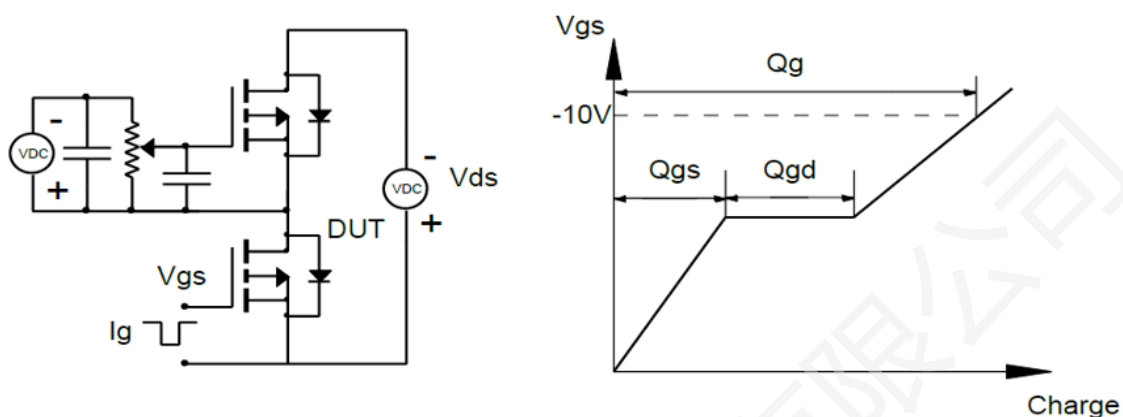
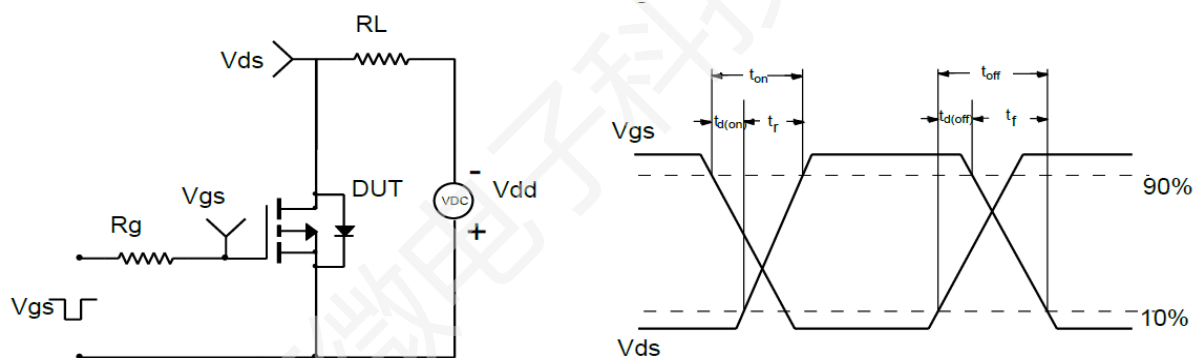
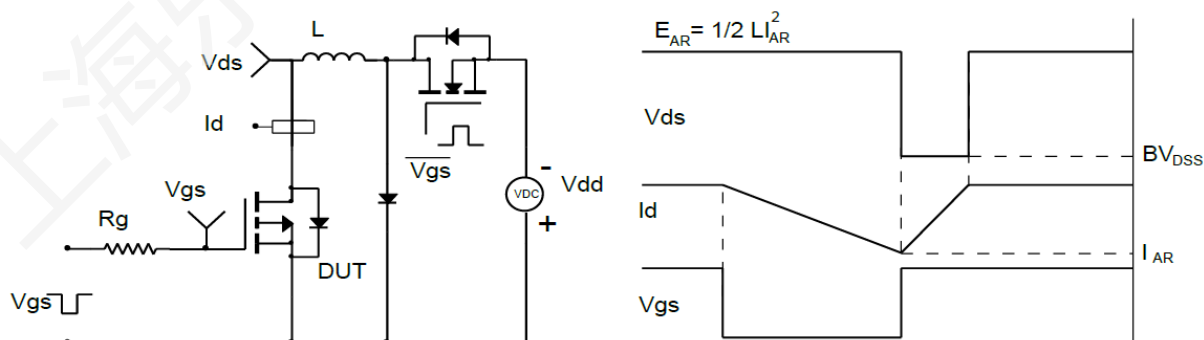
a3: Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70  $\mu m$  thick) copper area for drain connection.

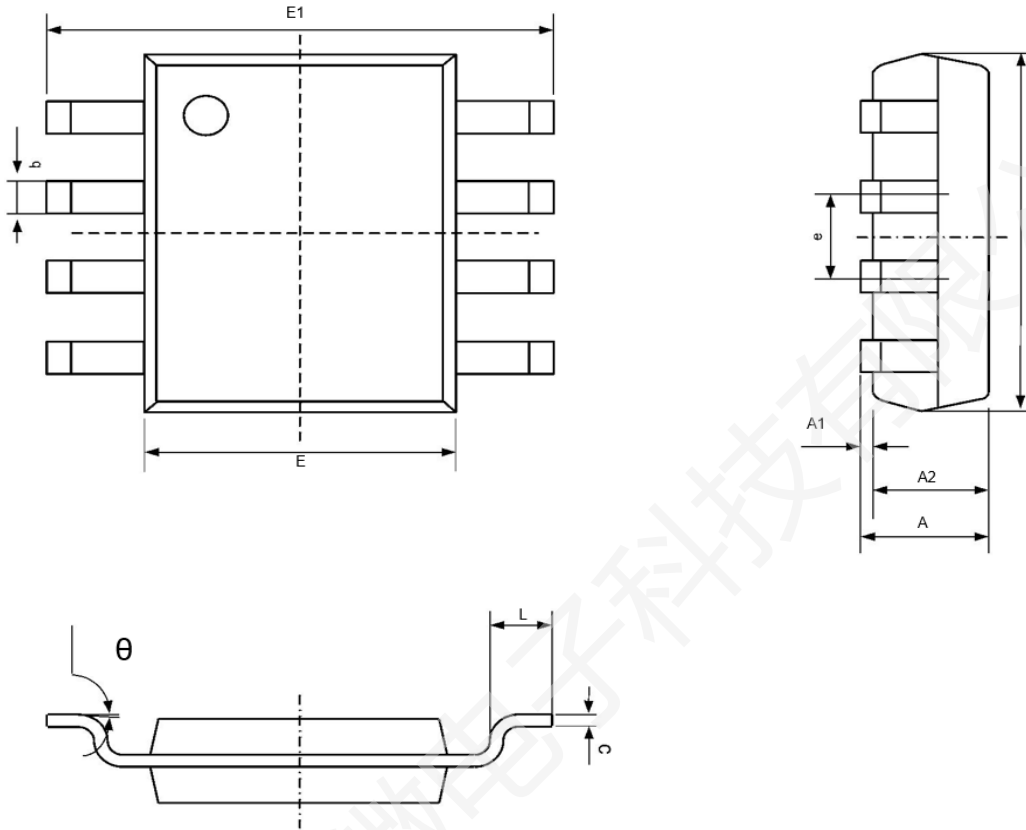
**Characteristics Curve:**






**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:**


| Symbol   | Dimensions In Millimeters |       |       |
|----------|---------------------------|-------|-------|
|          | Min                       | Ref   | Max   |
| A        | 1.350                     | 1.550 | 1.750 |
| A1       | 0.030                     | 0.140 | 0.250 |
| A2       | 1.350                     | 1.450 | 1.550 |
| b        | 0.330                     | 0.430 | 0.530 |
| c        | 0.160                     | 0.205 | 0.250 |
| D        | 4.700                     | 5.000 | 5.300 |
| E        | 3.800                     | 3.900 | 4.000 |
| E1       | 5.800                     | 6.000 | 6.200 |
| e        | 1.270(BSC)                |       |       |
| L        | 0.400                     | 0.835 | 1.270 |
| $\theta$ | 0°                        | 4°    | 8°    |

**Revision History:**

| Revison | Date      | Descriptions   |
|---------|-----------|----------------|
| Rev 1.1 | July.2025 | Formal Version |

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