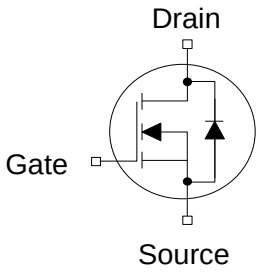
## Description

N-Channel SGT Power MOSFET designed by WL-Micro Semiconductor Company, according to the advanced Trench Technology. This devices provide an excellent gate charge and $R_{DS(on)}$, which leads to extremely communication and conduction losses. So it is very suitable for DC/DC converter, ideal for high-frequency switching and synchronous rectification.



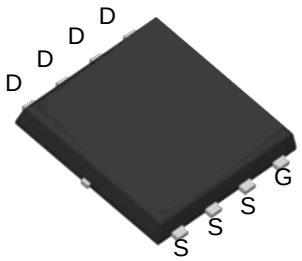

## Features

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Pb-free lead plating

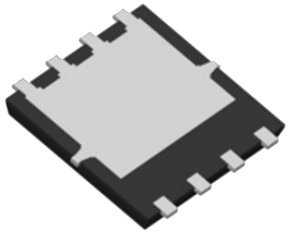
## Applications

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

**DFN5x6_8L**




Top View



Bottom View

| Key Performance Parameters | | |
|---|---|---|
| **Parameter** | **Value** | **Unit** |
| $V_{DS@Tc=25℃}$ | 100 | V |
| $R_{DS(on),max@10V}$ | 7.2 | mΩ |
| $Q_{g,typ}$ | 47 | nC |
| $I_{D@Tc=25℃}$ | 85 | A |
| $I_{D,pulse}$ | 340 | A |
| $E_{AS}$ [1)] | 330 | mJ |
| **Device Marking and Package Information** | | |
| **Device** | **Package** | **Marking** |
| WLQ072R10 | DFN5x6_8L | WLQ072R10 |

| **Absolute Maximum Ratings** $T_A$ = 25ºC, unless otherwise noted | | | | |
|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Values** | **Unit** |
| Drain-Source Voltage($V_{GS}$=0V) | | $V_{DS}$ | 100 | V |
| Continuous Drain Current[2)] | $T_C$ = 25ºC | $I_D$ | 85 | A |
| | $T_C$ = 100ºC | | 58 | |
| Pulsed Drain Current[3)] | | $I_{D,pulse}$ | 340 | A |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Single Pulse Avalanche Energy | | $E_{AS}$ | 330 | mJ |
| Power Dissipation | | $P_D$ | 104 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | -55~+150 | ºC |

| **Thermal Resistance** | | | |
|---|---|---|---|
| **Parameter** | **Symbol** | **Max.** | **Unit** |
| Thermal Resistance, Junction-to-Case | $R_{thJC}$ | 1.2 | ºC/W |
| Thermal Resistance, Junction-to-Ambient | $R_{thJA}$ | 55 | ºC/W |

**Notes**

1) L=0.5mH, $V_{DD}$=50V, Start $T_J$=25℃.

2) Limited by maximum junction temperature.

3) Repetitive Rating: Pulse width limited by maximum junction temperature.

| **Electrical Characteristics** $T_J$ = 25ºC, unless otherwise noted | | | | | | |
|---|---|---|---|---|---|---|
| **Parameter** | **Symbol** | **Test Conditions** | **Value** | | | **Unit** |
| | | | **Min.** | **Typ.** | **Max.** | |
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 100 | -- | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 100V<br>$V_{GS}$ = 0V, $T_J$ = 25ºC | -- | -- | 1 | μA |
| | | $V_{DS}$ = 100V<br>$V_{GS}$ = 0V, $T_J$ = 125ºC | -- | -- | 100 | |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20V | -- | -- | ±100 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1 | 1.7 | 2.4 | V |
| Drain-Source On-State-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 40A | -- | 6.3 | 7.2 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 40A | -- | 7.5 | 9 | |
| Gate Resistance | $R_G$ | f = 1.0MHz open drain | -- | 2.5 | -- | Ω |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 50V<br>f = 1.0MHz | -- | 3106 | -- | pF |
| Output Capacitance | $C_{oss}$ | | -- | 238 | -- | |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 8.9 | -- | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 50V, $I_D$ = 40A<br>$V_{GS}$ = 10V | -- | 47 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 11.1 | -- | |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 5.4 | -- | |
| Gate Plateau Voltage | $V_{Plateau}$ | | -- | 3.3 | -- | V |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}$ = 50V, $V_{GS}$ = 10V<br>$I_D$=40A, $R_G$ = 6Ω | -- | 10 | -- | ns |
| Turn-on Rise Time | $t_r$ | | -- | 6 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 51 | -- | |
| Turn-off Fall Time | $t_f$ | | -- | 9 | -- | |
| **Drain-Source Body Diode Characteristics** | | | | | | |
| Body Diode Forward Voltage | $V_{SD}$ | $T_J$ = 25ºC, $I_{SD}$ = 40A<br>$V_{GS}$ = 0V | -- | -- | 1.2 | V |
| Continuous Diode Forward Current | $I_S$ | | -- | -- | 85 | A |
| Reverse Recovery Time | $t_{rr}$ | $I_F$ = 40A, $di_F/dt$ = 100A/μs | -- | 55 | -- | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | -- | 135 | -- | nC |

**Typical Characteristics** $T_J$ = 25ºC, unless otherwise noted

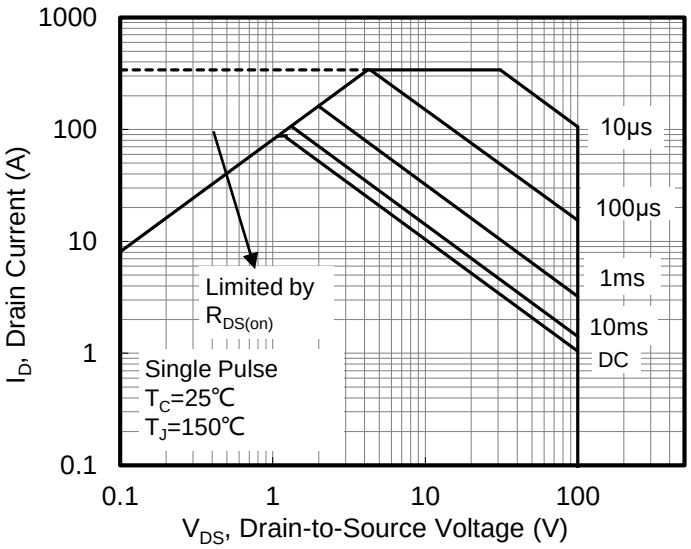



**Figure 1. Maximum Safe Operating Area**

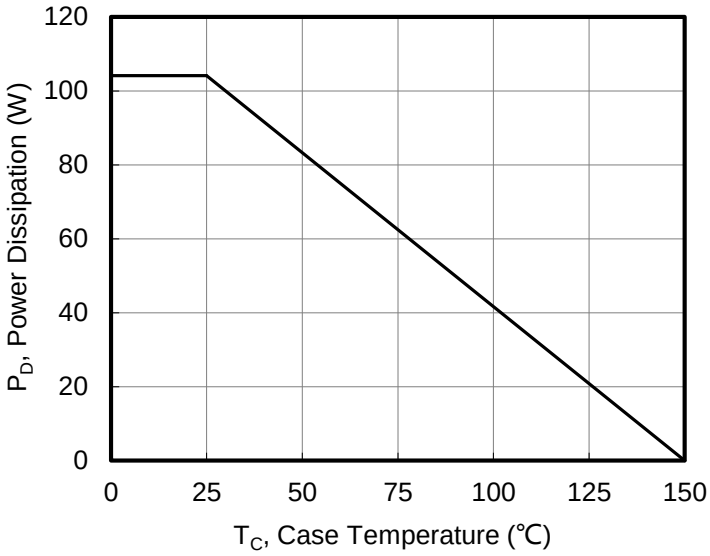



**Figure 2. Maximum Power Dissipation vs Case Temperature**

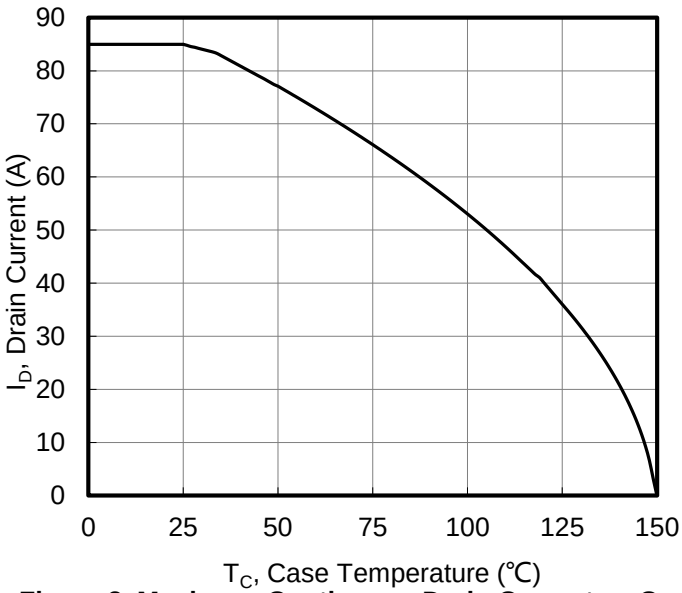



**Figure 3. Maximum Continuous Drain Current vs Case Temperature**

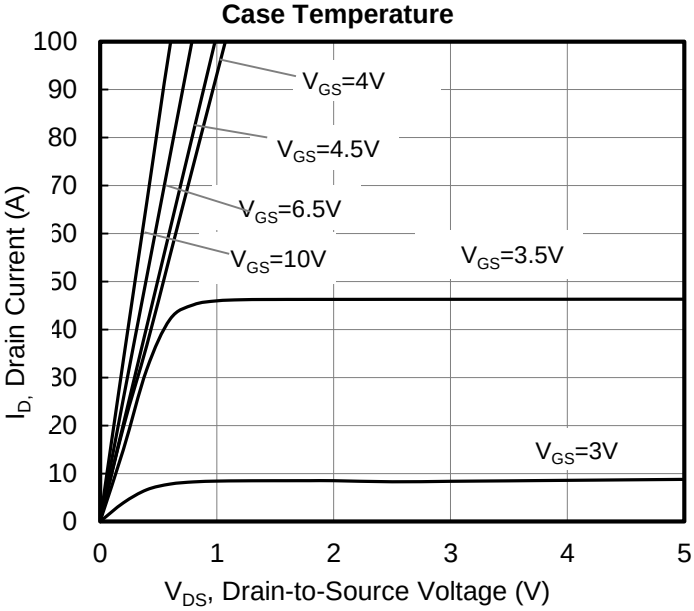



**Figure 4. Typical output Characteristics**

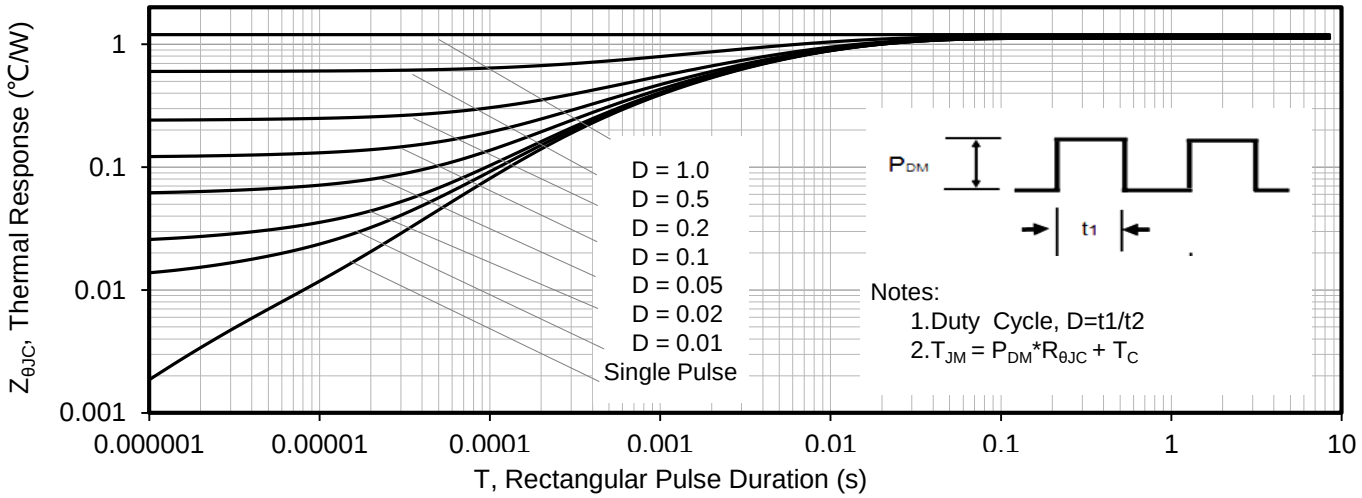



**Figure 5. Maximum Effective Thermal Impedance , Junction to Case**

**Typical Characteristics** $T_J$ = 25ºC, unless otherwise noted

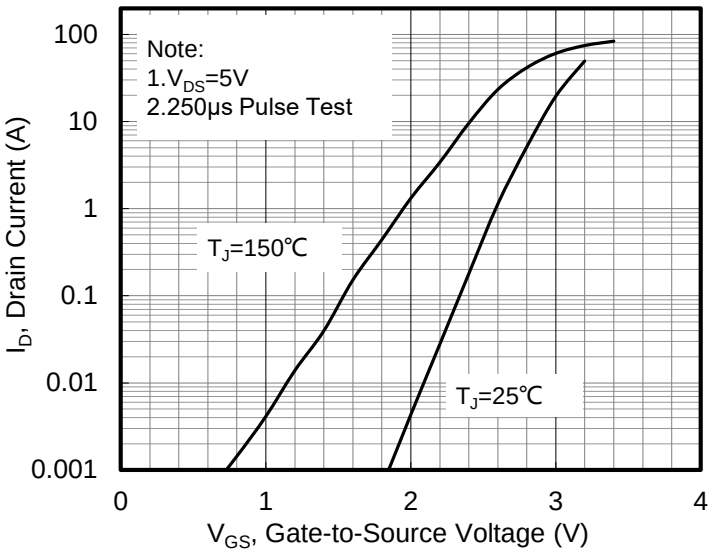



**Figure 6. Typical Transfer Characteristics**

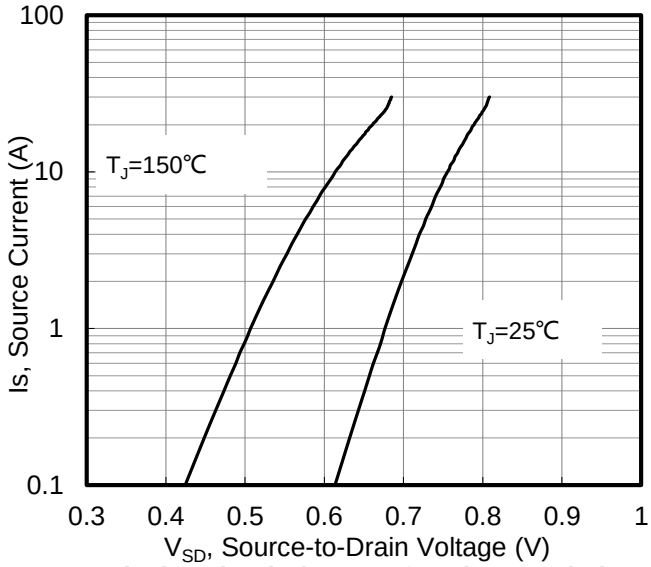



**Figure 7. Typical Body Diode Transfer Characteristics**

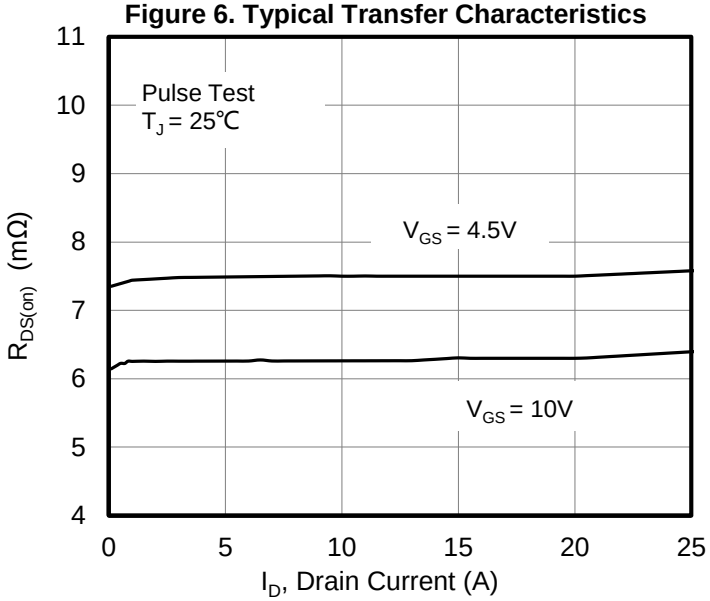



**Figure 8. Drain-to-Source On Resistance vs Drain Current**

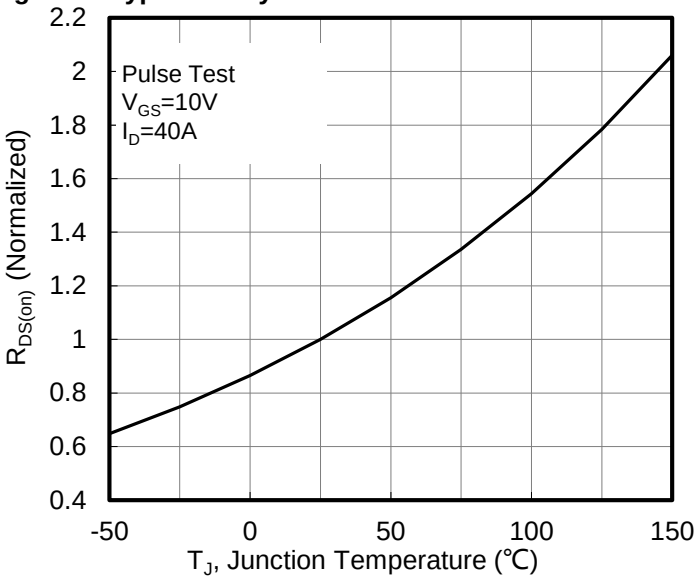



**Figure 9. Normalized On Resistance vs Junction Temperature**

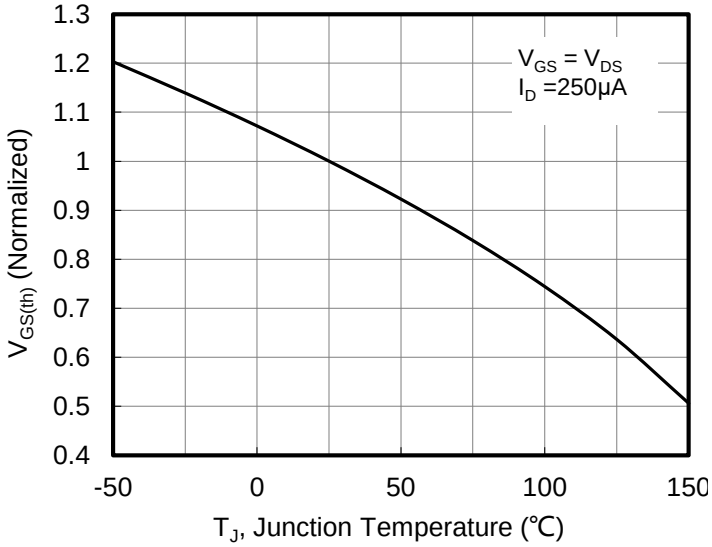



**Figure 10. Normalized Threshold Voltage vs Junction Temperature**

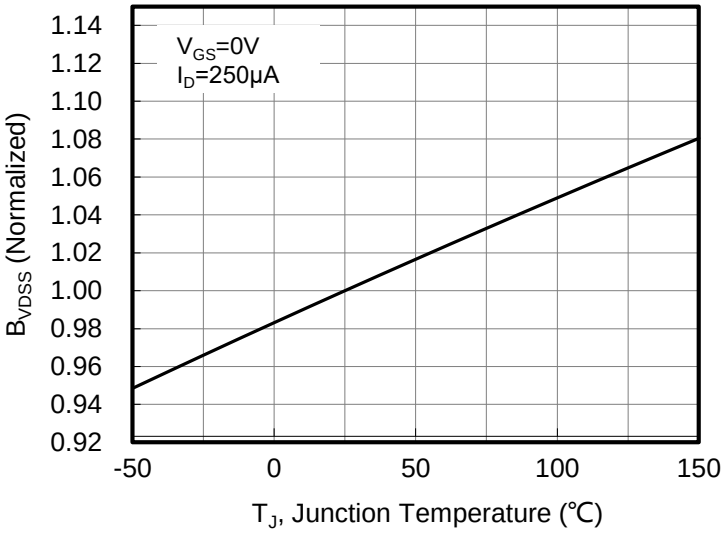



**Figure 11. Normalized Breakdown Voltage vs Junction Temperature**

**Typical Characteristics** $T_J$ = 25ºC, unless otherwise noted

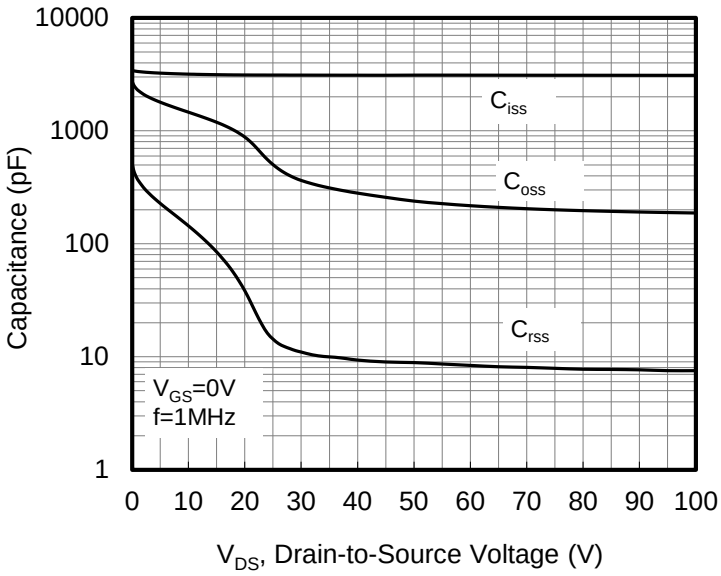



**Figure 12. Capacitance Characteristics**

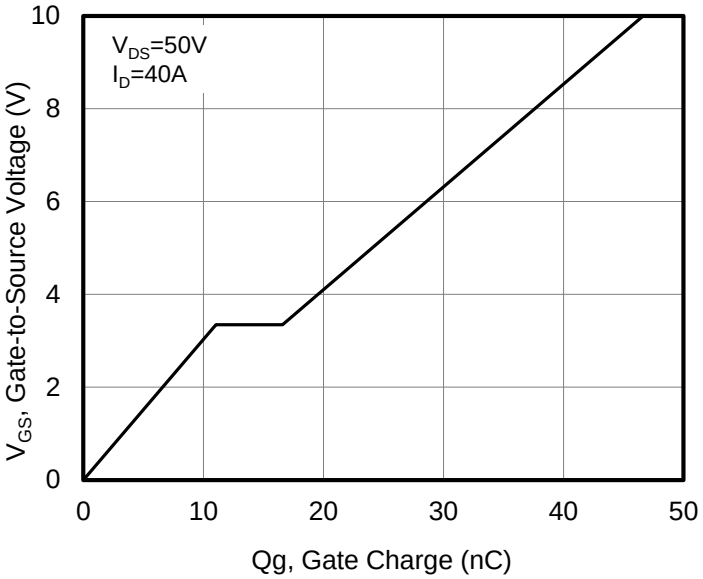



**Figure 13. Typical Gate Charge vs Gate to Source Voltage**

**Figure A：Gate Charge Test Circuit and Waveform**

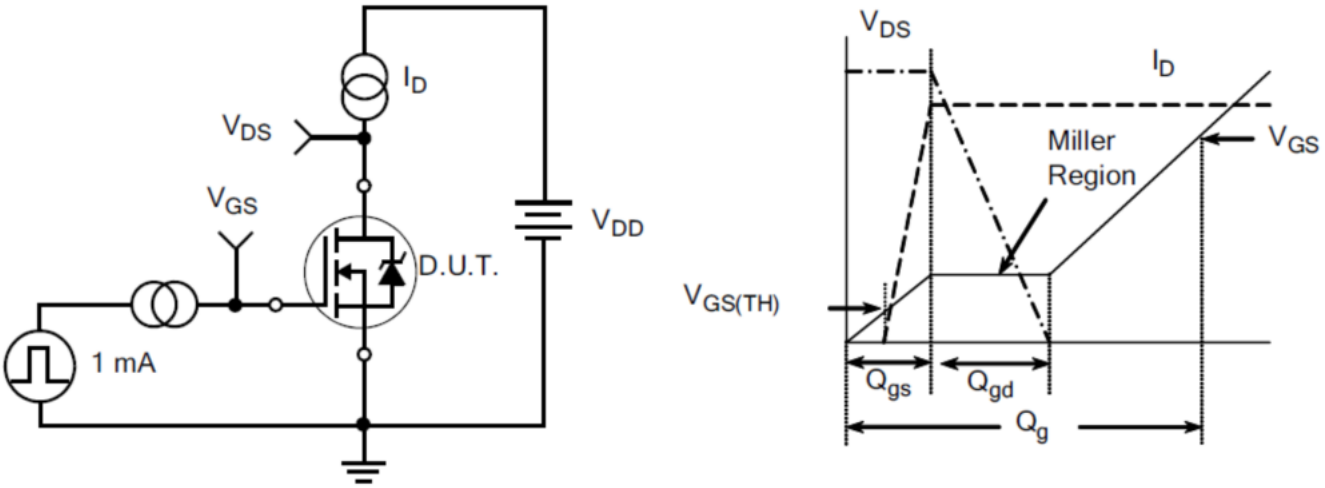



**Figure B：Resistive Switching Test Circuit and Waveform**

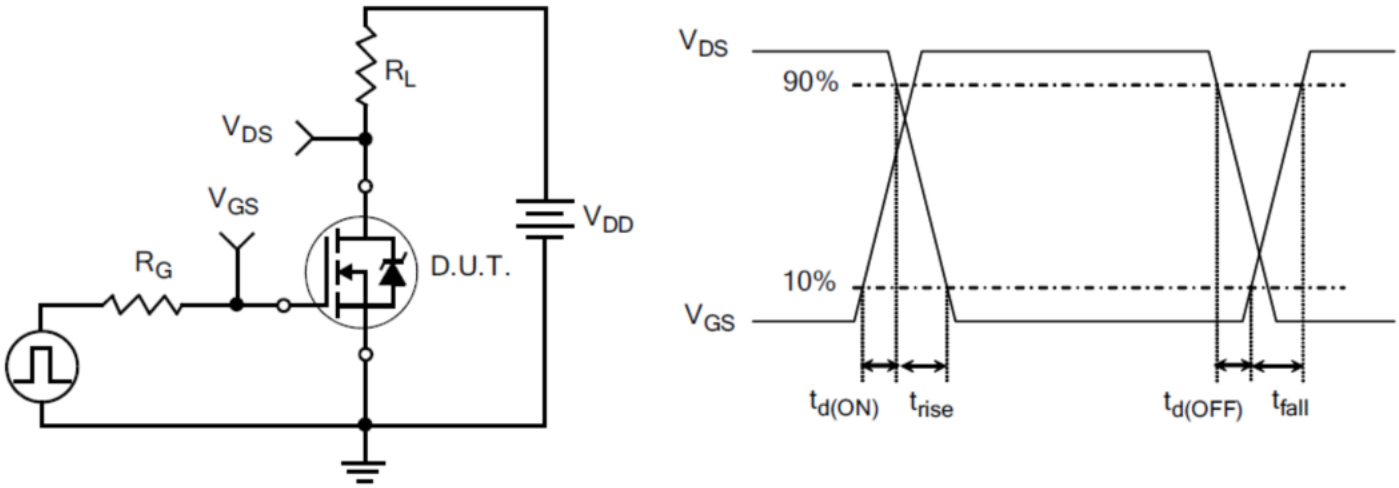
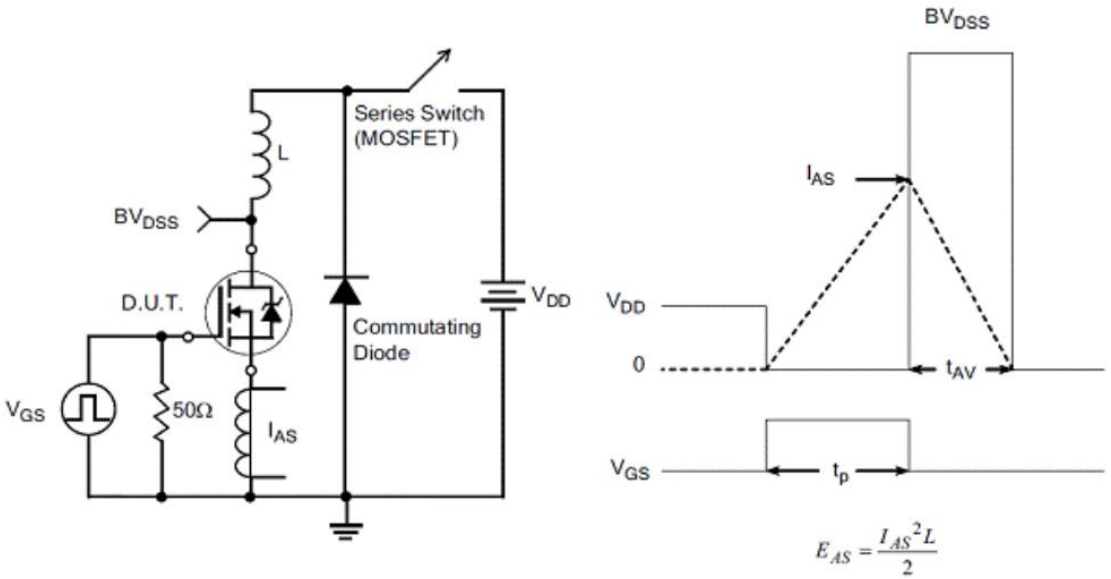
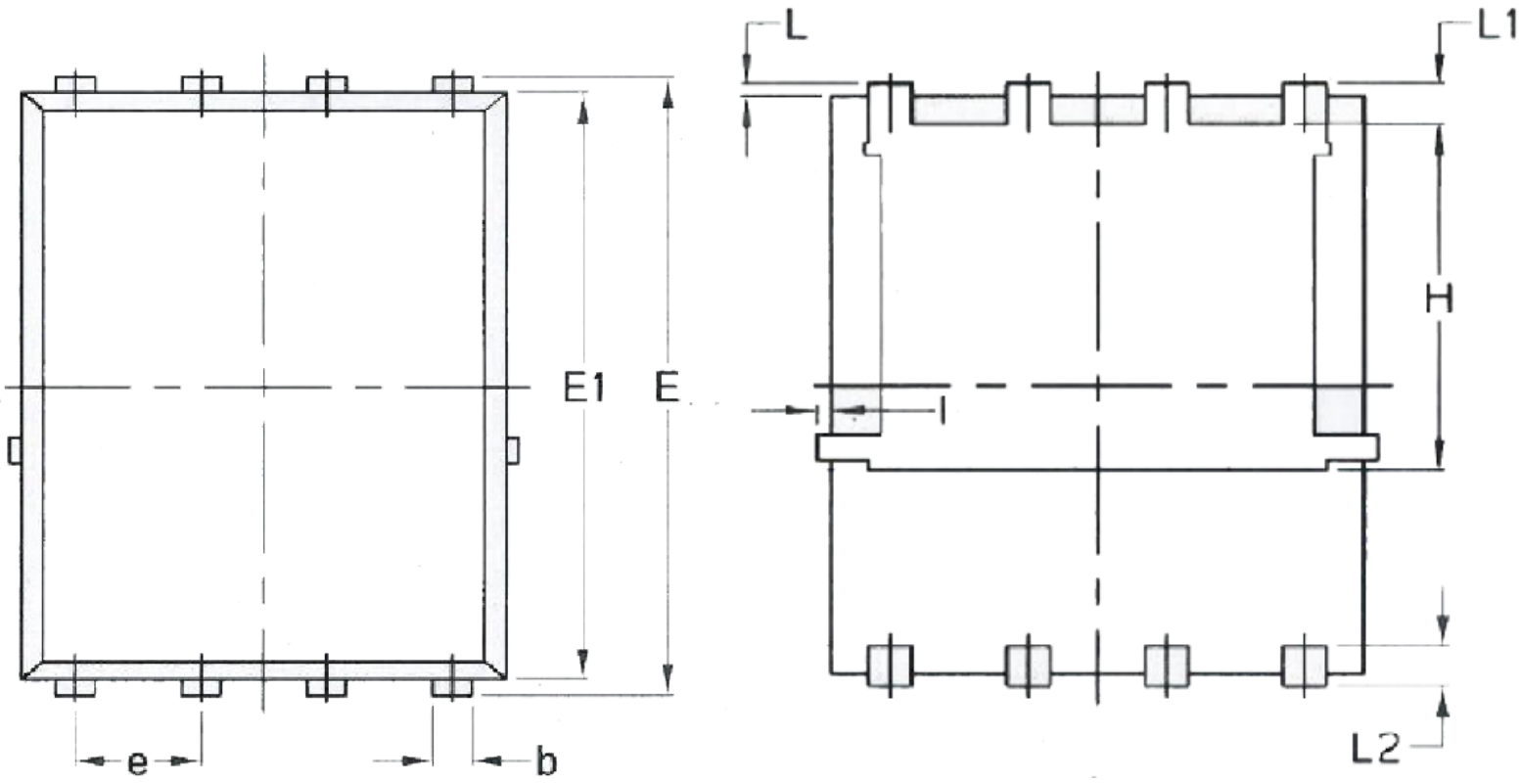
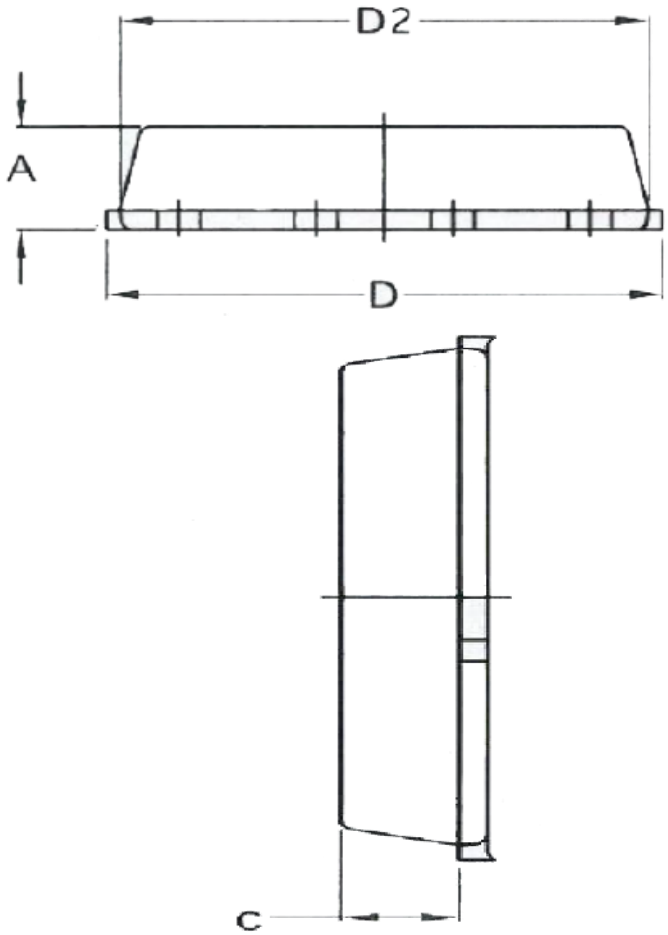



**Figure C：Unclamped Inductive Switching Test Circuit and Waveform**



# Outlines DFN5x6_8L Package




| SYMBOL | DIMENSIONAL REQMTS | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 0.9 | 1.055 | 1.17 |
| b | 0.33 | 0.415 | 0.51 |
| c | 0.78 | --- | 0.97 |
| D | 4.7 | 5.04 | 5.4 |
| D2 | 4.7 | 4.9 | 5.1 |
| E | 5.75 | 6.025 | 6.25 |
| E1 | 5.6 | 5.775 | 6 |
| e | 1.27 BSC | | |
| L | 0.05 | 0.14 | 0.25 |
| L1 | 0.35 | 0.485 | 0.71 |
| L2 | 0.35 | 0.485 | 0.71 |
| H | 3.18 | 3.41 | 3.66 |
| I | --- | --- | 0.18 |

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