## Features

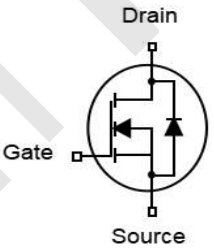
- N-Channel
- Low gate charge
- Low reverse transfer capacitance
- Fast switching speed
- 100% Avalanche test
- 100% EAS Tested

| | | |
|---|---|---|
| $V_{DS}$ | 30 | V |
| $R_{DS(on),TYP}$@ $V_{GS}$=10V | 1.1 | mΩ |
| $I_D$ | 160 | A |

DFN5x6


RoHS HF

| Part ID | Package Type | Marking | Packing |
|---|---|---|---|
| ZTG012N03GC | DFN5x6 | ZTG012N03GC | 5000pcs/Reel |




## Absolute Maximum Ratings $T_A$ =25°C, unless otherwise specified

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| **Common Ratings (Tc=25°C Unless Otherwise Noted)** | | | | |
| $V_{GS}$ | Gate-Source Voltage | | ±20 | V |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | | 30 | V |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $I_{DM}$ | Drain Current-Continuous@ Current-Pulsed (Note 2) | $T_C$ =25°C | 640 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_D$ | Drain Current-Continuous (Note 1) | $T_C$ =25°C | 160 | A |
| | | $T_C$ =100°C | 101 | A |
| $P_D$ | Maximum Power Dissipation (Note 3) | | 88 | W |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | | 1.42 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | | 50 | °C/W |
| **Drain-Source Avalanche Ratings** | | | | |
| EAS | Avalanche Energy, Single Pulsed (Note 6) | | 342 | mJ |

## Electrical Characteristics ($T_J$=25℃ unless otherwise noted)

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Electrical Characteristics @ $T_j$=25°C (unless otherwise stated)** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 30 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=30V,$V_{GS}$=0V | -- | -- | 1 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$=±20V,$V_{DS}$=0V | -- | -- | ±100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 1.2 | -- | 2.2 | V |
| $R_{DS(on)}$ | Drain-Source On-State Resistance | $V_{GS}$=10V, $I_D$=30A | -- | 1.1 | 1.4 | mΩ |
| **Dynamic Electrical Characteristics @ $T_j$ = 25°C (unless otherwise stated)** (Note 4.5) | | | | | | |
| Ciss | Input Capacitance | $V_{DS}$=15V,$V_{GS}$=0V, f=1MHz | -- | 3430 | -- | pF |
| Coss | Output Capacitance | | -- | 1296 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 77 | -- | pF |
| Rg | Gate Resistance | f=1MHz | -- | 1.9 | -- | Ω |
| Qg | Total Gate Charge | $V_{DD}$=15V,$I_D$=60A, $V_{GS}$=10V | -- | 48 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 11 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 6 | -- | nC |
| $V_{Plateau}$ | Gate Plateau Voltage | | -- | 3.3 | -- | V |
| **Switching Characteristics** (Note 4.5) | | | | | | |
| Td(on) | Turn-on Delay Time | $V_{DD}$=20V, $I_D$ =30A, $R_G$=4.7Ω, $V_{GS}$=10V | -- | 10 | -- | ns |
| Tr | Turn-on Rise Time | | -- | 30 | -- | ns |
| Td(off) | Turn-Off Delay Time | | -- | 54 | -- | ns |
| Tf | Turn-Off Fall Time | | -- | 15 | -- | ns |
| **Source- Drain Diode Characteristics@ $T_j$ = 25°C (unless otherwise stated)** | | | | | | |
| $I_S$ | Diode Forward Current | | -- | -- | 160 | A |
| $V_{SD}$ | Forward on voltage | $I_S$ =60A,$V_{GS}$=0V | -- | -- | 1.4 | V |
| Trr | Reverse Recovery Time (Note 4) | $T_j$=25℃,$I_S$ =60A di/dt=100A/μs | -- | 50 | -- | ns |
| Qrr | Reverse Recovery Charge | | -- | 59 | -- | nC |

## Notes:

1. The rating only refers to the maximum absolute value of 25 °C in the specification. If the shell temperature is higher than 25 °C,it needs to be derated according to the actual environmental conditions.
2. Pulse time 5us,pulse width is limited by the maximum junction temperature.
3. The dissipated power value will change with the change of temperature, when greater than 25 ° C, the dissipated power value will decrease by 0.7 W/ °C with the increase of 1 °C of temperature.
4. Pulse test: pulse width ≤ 300μs, Duty Cycle ≤ 2%.
5. Basically unaffected by operating temperature.
6. EAS condition : $T_j$=25℃,$V_{DD}$=24V, L=0.5mH,$R_g$=25Ω

## Typical Electrical and Thermal Characteristics

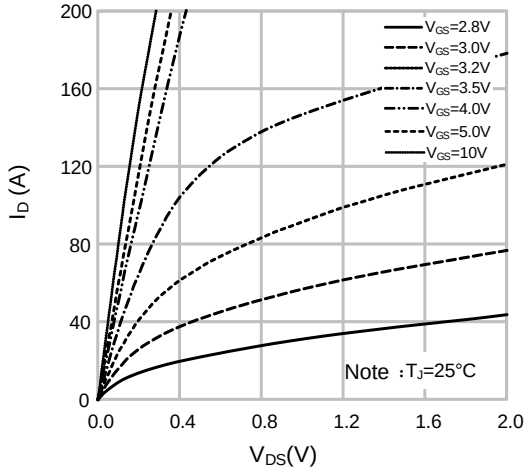



**Figure 1 Output Characteristics**

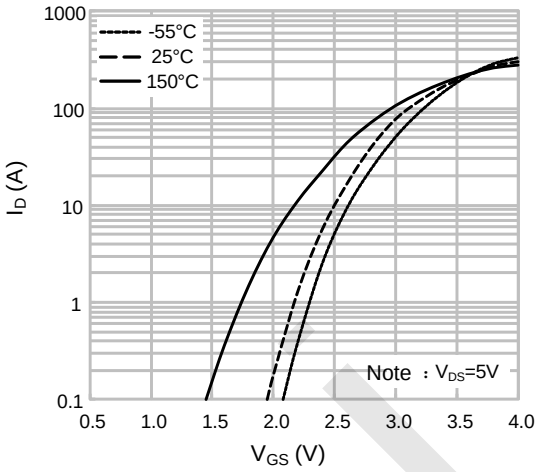



**Figure 4 Transfer Characteristics**

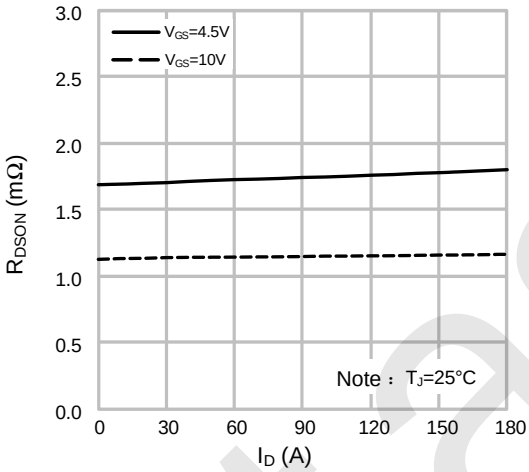



**Figure 2 Rdson- Drain Current**

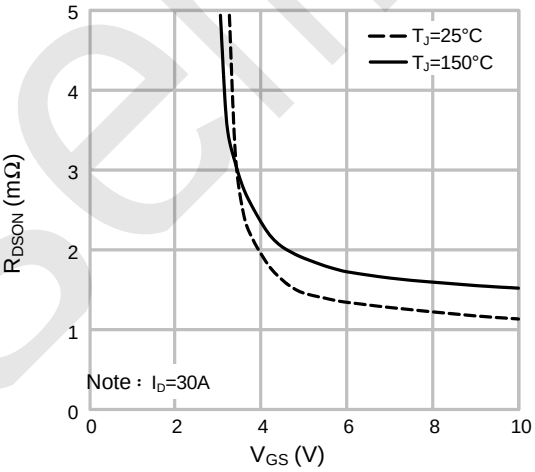



**Figure 5 Rds(on) VS $V_{GS}$**

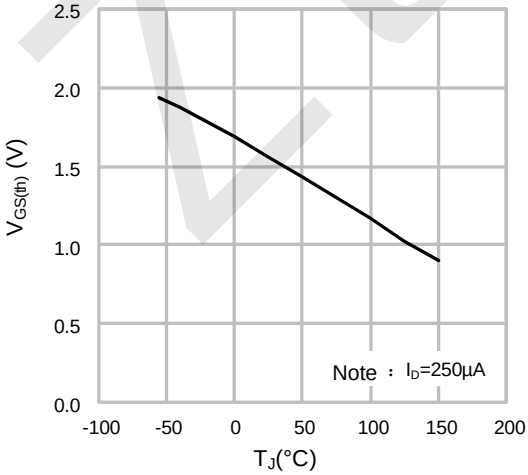



**Figure 3 $V_{GS(th)}$ VS Temperature Characteristic**

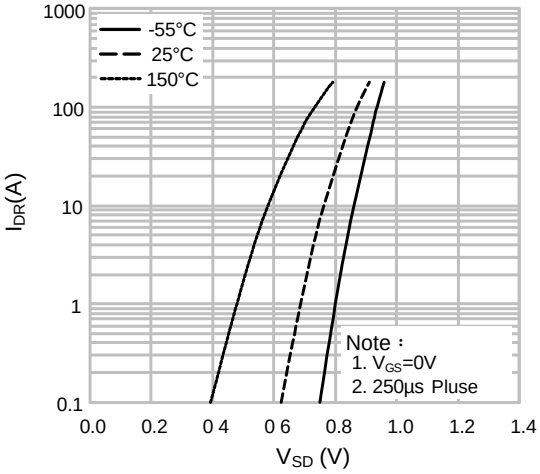



**Figure 6 Body Diode Forward Voltage Drop VS Source Current and Temperature**

## Typical Electrical and Thermal Characteristics

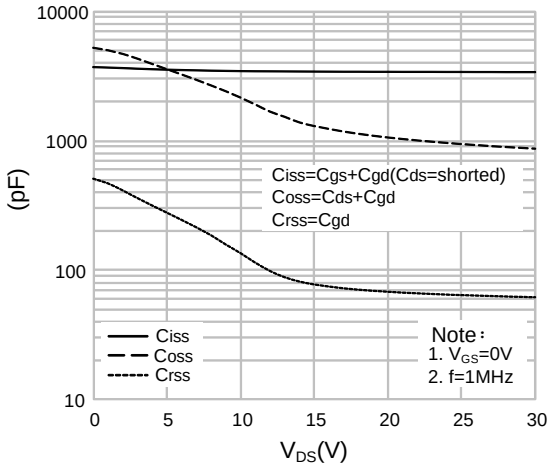



Figure 7 Capacitance Charateristics

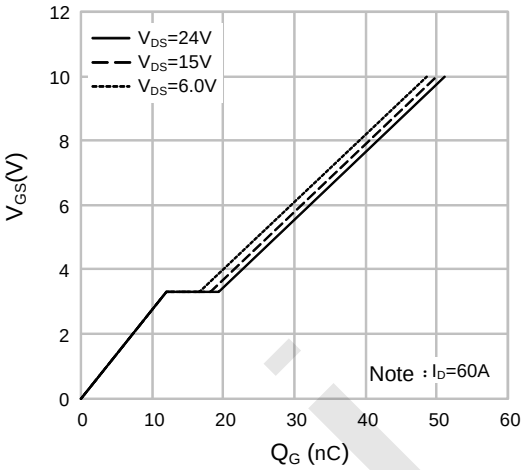



Figure 10 Gate Charge

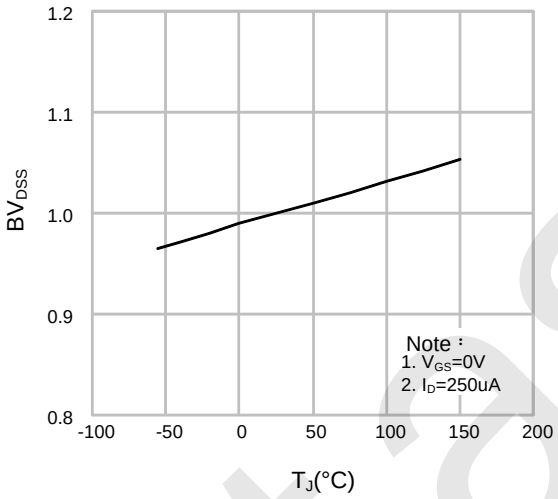



Figure 8 Breakdown Voltage VS Temperature Characteristic

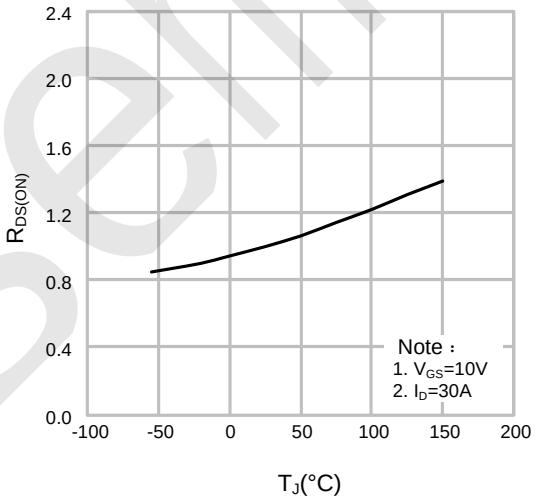



Figure 11 Rds(on) VS Temperature Characteristic

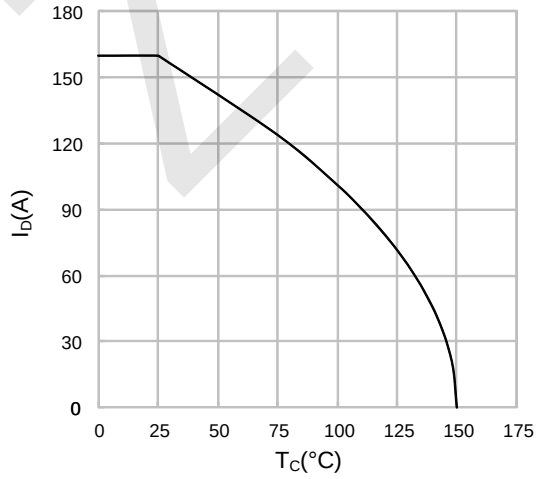



Figure 9 Drain Current VS Case Temperature

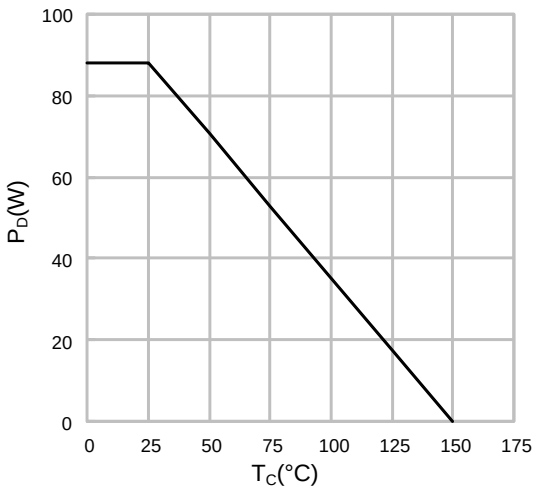



Figure 12 Power Dissipation VS Temperature

## Typical Electrical and Thermal Characteristics

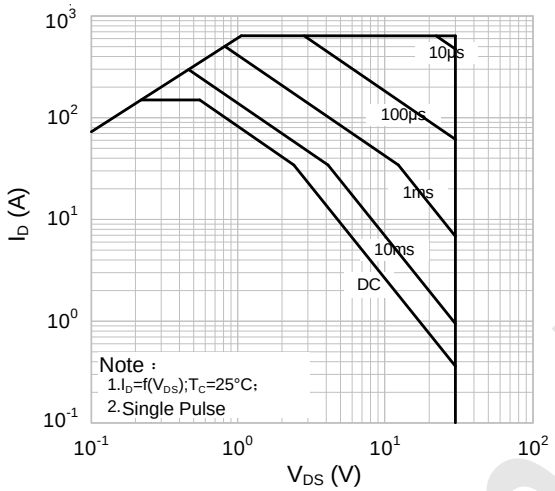



**Figure 13 Safe Operation Area**

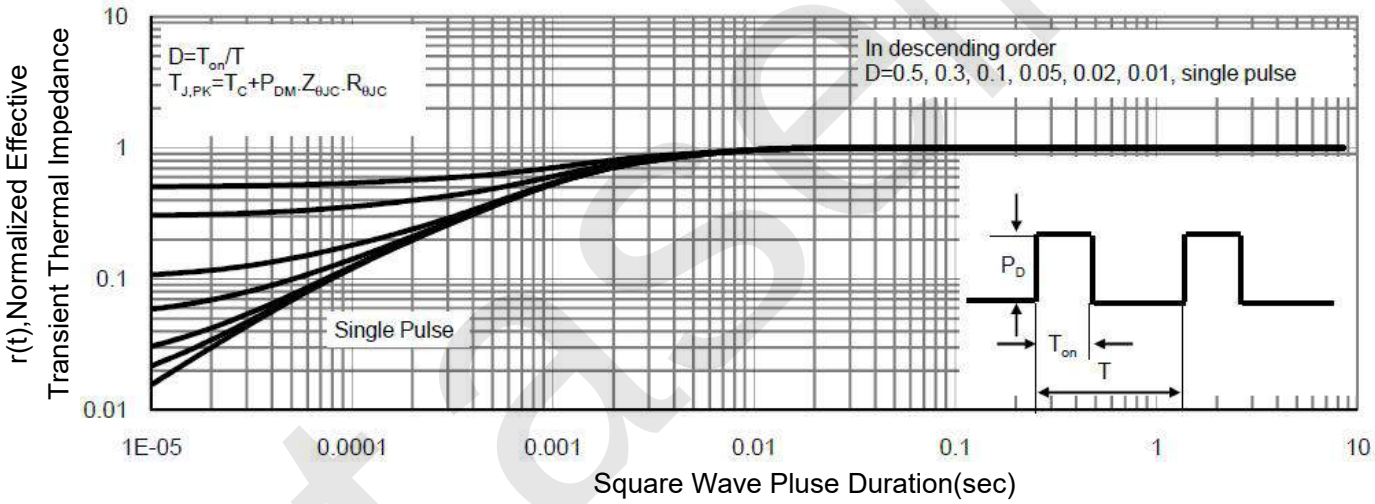
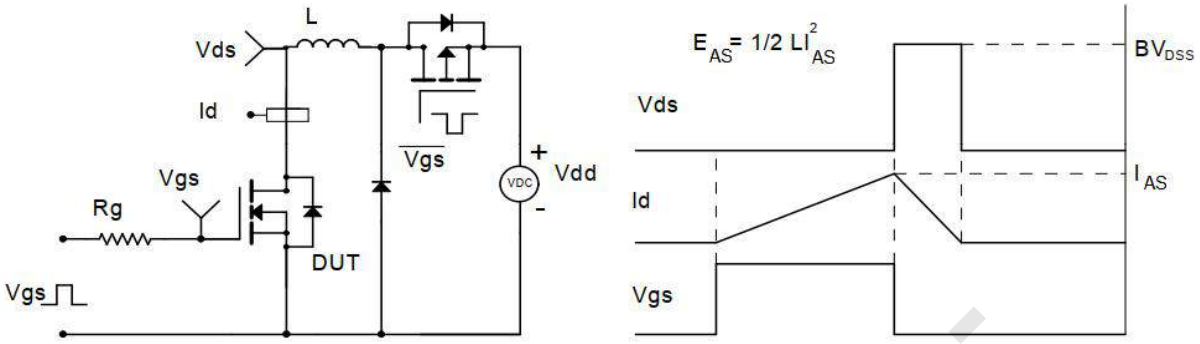


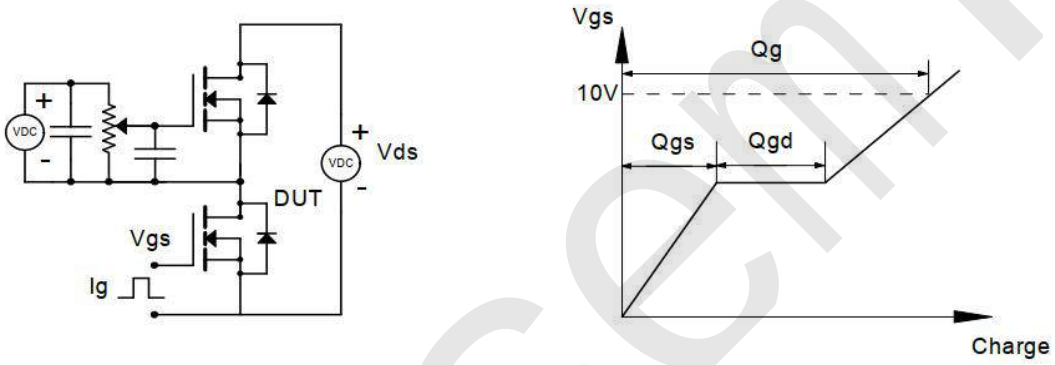

**Figure 14 Normalized Maximum Transient Thermal Impedance**

## Test circuit&Waveform

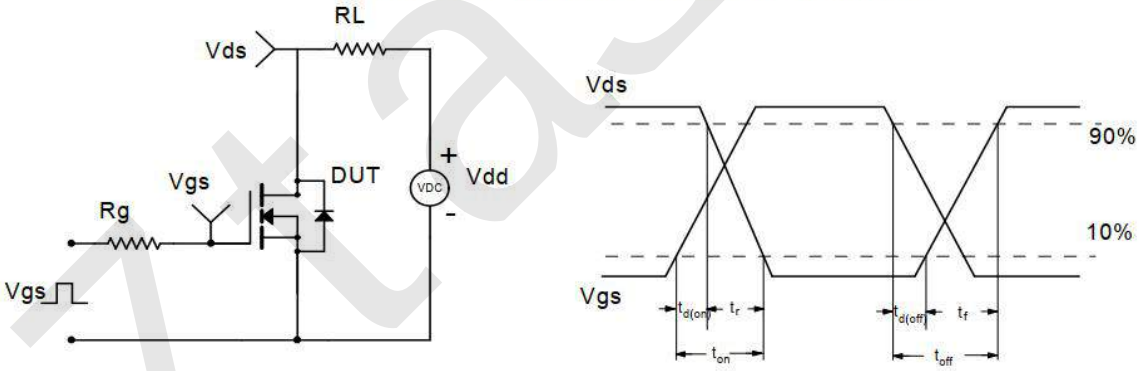
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



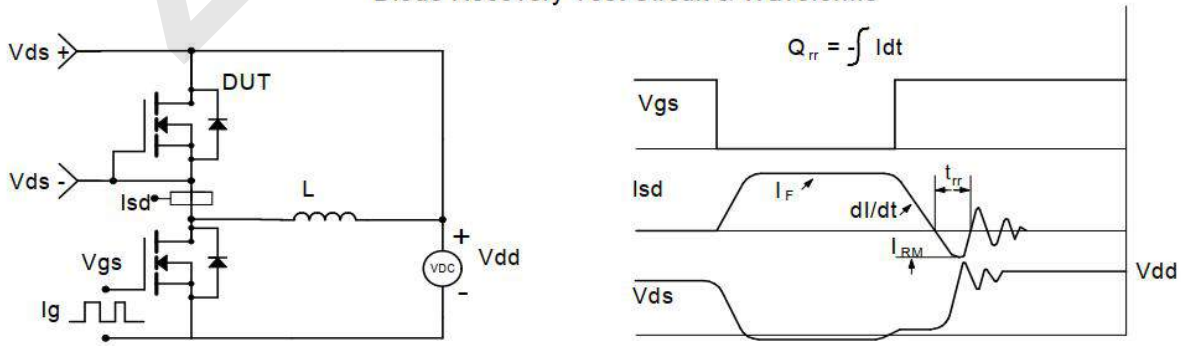

Gate Charge Test Circuit & Waveform



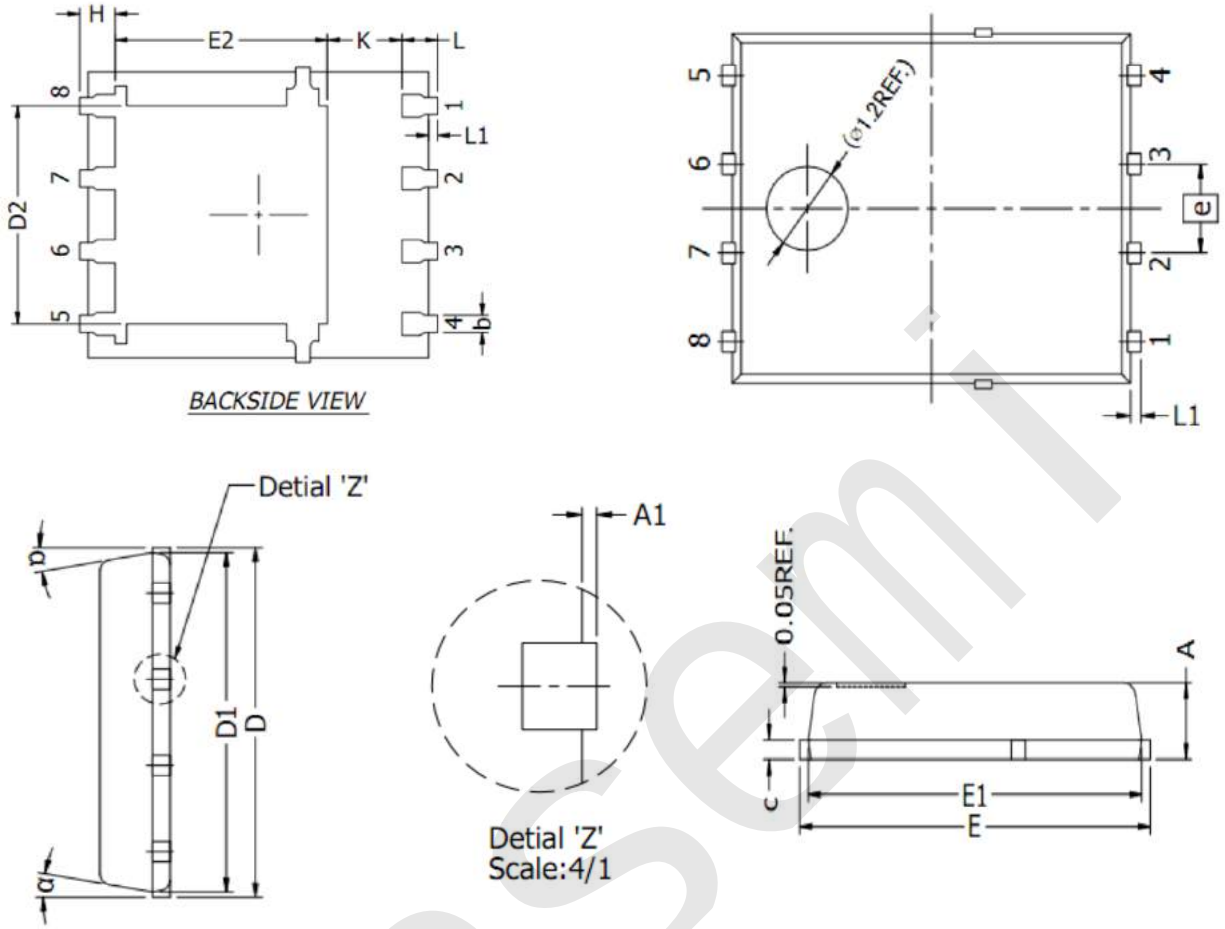

Resistive Switching Test Circuit & Waveforms




Diode Recovery Test Circuit & Waveforms



# DFN5x6-8L Package Information




| DIM. | MILLIMETERS | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.90 | 1.00 | 1.10 |
| A1 | 0 | - | 0.05 |
| b | 0.30 | 0.40 | 0.50 |
| c | 0.20 | 0.25 | 0.30 |
| D | 5.15 BSC | | |
| D1 | 5.00 BSC | | |
| D2 | 3.76 | 3.81 | 3.86 |
| E | 6.15 BSC | | |
| E1 | 5.80 | 5.85 | 5.90 |
| E2 | 3.45 | 3.65 | 3.85 |
| e | 1.27 BSC | | |
| H | 0.51 | 0.61 | 0.71 |
| K | 1.10 | - | - |
| L | 0.51 | 0.61 | 0.71 |
| L1 | 0.08 | 0.15 | 0.23 |
| α | 10° | 11° | 12° |

## Customer Service

**Sales and Service:**

zj@ztasemi.com