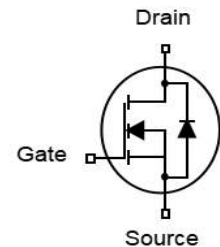


Features

- N-Channel
- Low $R_{DS(on)}$ & FOM
- Easy to use/drive
- 100% Avalanche Tested
- RoHS compliant
- 100% EAS Tested

| | | |
|-------------------------------|-----|------------|
| V_{DS} | 30 | V |
| $R_{DS(on),TYP@ V_{GS}=10V}$ | 2.5 | m Ω |
| $R_{DS(on),TYP@ V_{GS}=4.5V}$ | 3.7 | m Ω |
| I_D | 100 | A |

TO-252



| Part ID | Package Type | Marking | Packing |
|-----------|--------------|-----------|--------------|
| ZT025N03D | TO-252 | ZT025N03D | 2500pcs/reel |

Absolute Maximum Ratings $T_A = 25^\circ\text{C}$, unless otherwise specified

| Symbol | Parameter | Rating | Unit | |
|--|---|---------------------------------|--------------------|---|
| Common Ratings ($T_C = 25^\circ\text{C}$ 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 | $^\circ\text{C}$ | |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| I_{DM} | Drain Current-Continuous@ Current-Pulsed (Note 3) | $T_C = 25^\circ\text{C}$ 400 | A | |
| Mounted on Large Heat Sink | | | | |
| I_D | Drain Current-Continuous (Note 2) | $T_C = 25^\circ\text{C}$ | 100 | A |
| | | $T_C = 100^\circ\text{C}$ | 65 | A |
| P_D | Maximum Power Dissipation | 41.6 | W | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 3 | $^\circ\text{C/W}$ | |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | 35 | $^\circ\text{C/W}$ | |
| Drain-Source Avalanche Ratings | | | | |
| EAS | Avalanche Energy, Single Pulsed (Note 1) | 178 | mJ | |

Electrical Characteristics (T_J=25°C 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 |
| IDSS | Zero Gate Voltage Drain Current | V _{DS} =30V, V _{GS} =0V | -- | -- | 1 | μA |
| IGSS | Gate-Body Leakage Current | V _{GS} =±20V, V _{DS} =0V | -- | -- | ±100 | nA |
| VGS(th) | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250μA | 1.4 | 1.8 | 2.2 | V |
| RDS(on) | Drain-Source On-State Resistance | V _{GS} =10V, I _D =20A | -- | 2.5 | 3.0 | mΩ |
| RDS(on) | Drain-Source On-State Resistance | V _{GS} =4.5V, I _D =20A | -- | 3.7 | 4.4 | mΩ |
| Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| Ciss | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | -- | 3660 | -- | pF |
| Coss | Output Capacitance | | -- | 518 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 416 | -- | pF |
| Rg | Gate Resistance | f=1MHz | -- | 1.7 | -- | Ω |
| Qg | Total Gate Charge | V _{DS} =15V, I _D =20A, V _{GS} =10V | -- | 70 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 11.5 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 11.7 | -- | nC |
| Switching Characteristics | | | | | | |
| Td(on) | Turn-on Delay Time | V _{DS} =15V, I _D =20A, R _G =3.0Ω, V _{GS} =10V | -- | 21 | -- | ns |
| Tr | Turn-on Rise Time | | -- | 18 | -- | ns |
| Td(off) | Turn-Off Delay Time | | -- | 43 | -- | ns |
| Tf | Turn-Off Fall Time | | -- | 14 | -- | ns |
| Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| IS | Diode Forward Current | | -- | -- | 100 | A |
| VSD | Forward on voltage | I _S =20A, V _{GS} =0V | -- | -- | 1.2 | V |
| Trr | Reverse Recovery Time | T _J =25°C, I _F =20A | -- | 22 | -- | ns |
| Qrr | Reverse Recovery Charge | di/dt=100A/μs | -- | 47 | -- | nC |

Notes

1. L=0.1mH, V_{DD}=20V, Start T_J=25°C.
2. Limited by maximum junction temperature.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

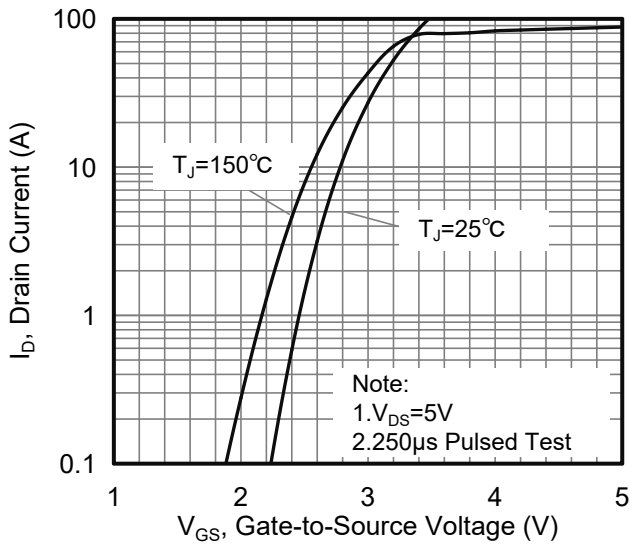


Figure 1. Typical Transfer Characteristics

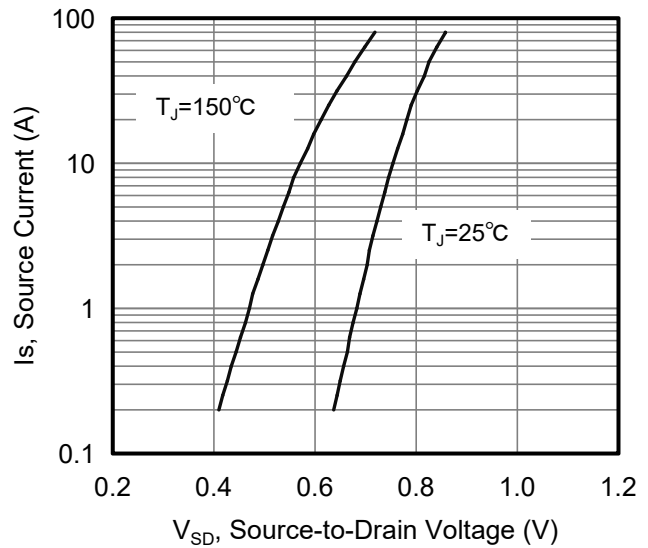


Figure 4. Typical Body Diode Transfer Characteristics

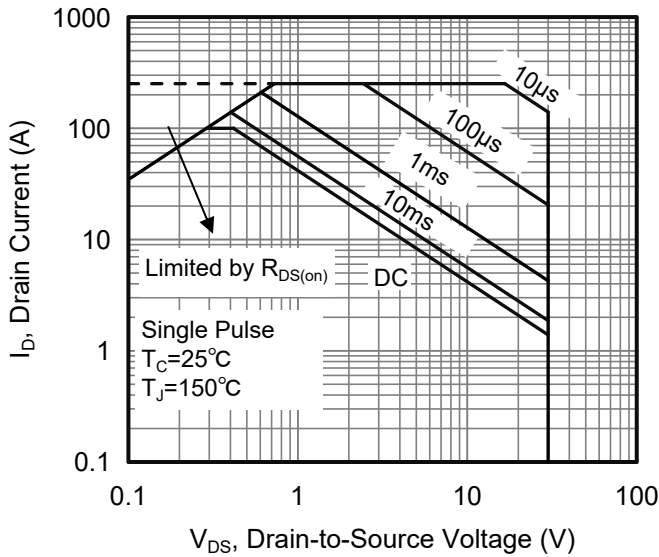


Figure 2. Maximum Safe Operating Area

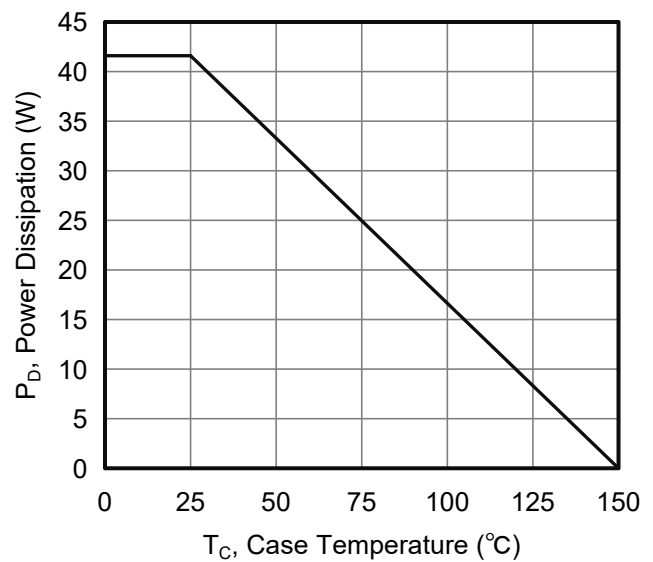


Figure 5. Maximum Power Dissipation vs Case Temperature

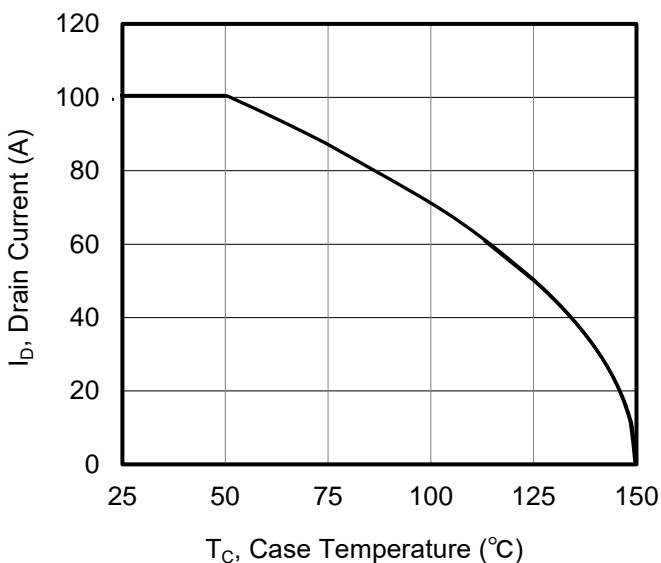


Figure 3. Maximum Continuous Drain Current vs Case Temperature

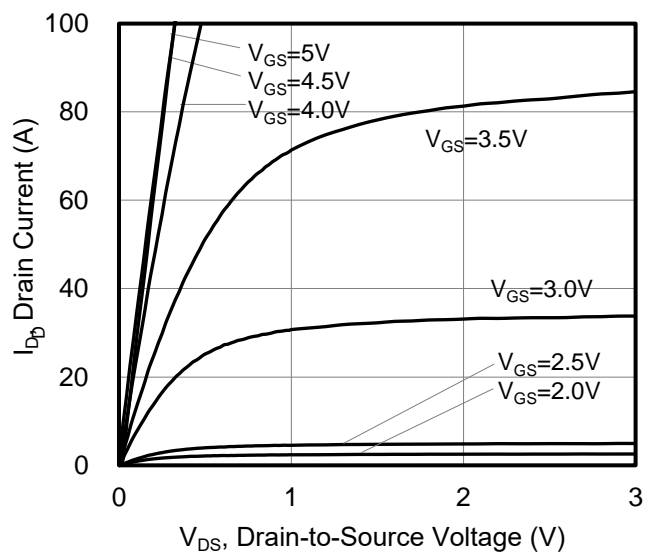


Figure 6. Typical output Characteristics

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

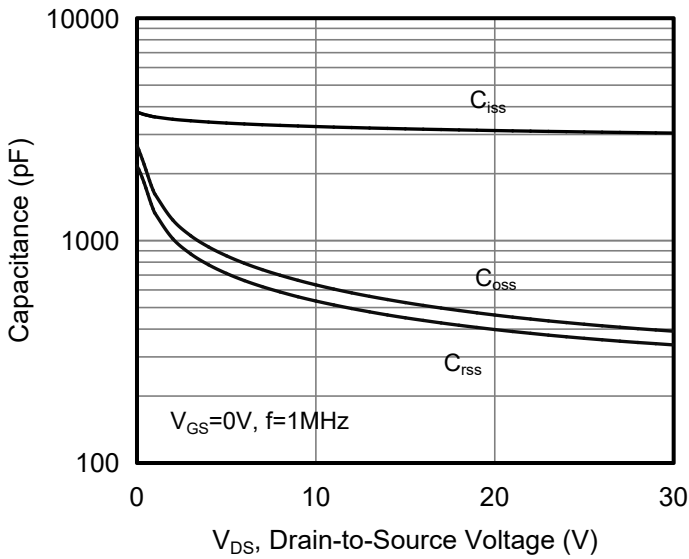


Figure 7 . Capacitance Characteristics

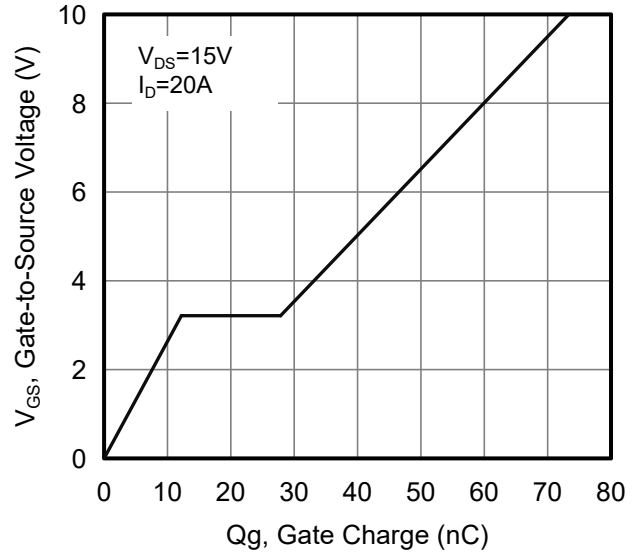


Figure 10. Typical Gate Charge vs Gate to Source Voltage

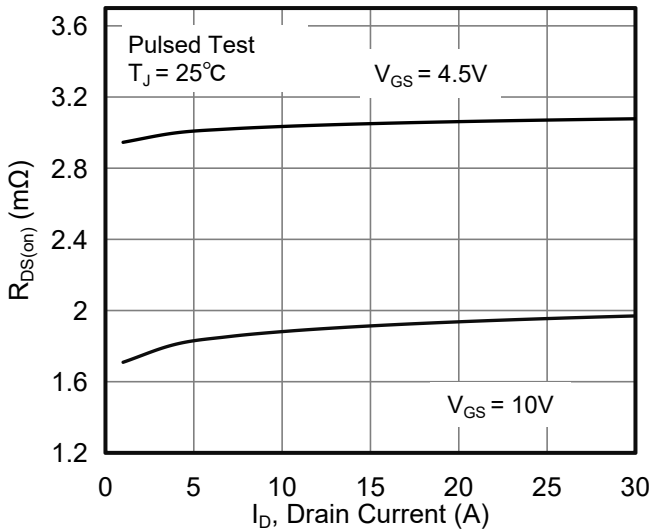


Figure 8. Drain-to-Source On Resistance vs Drain Current

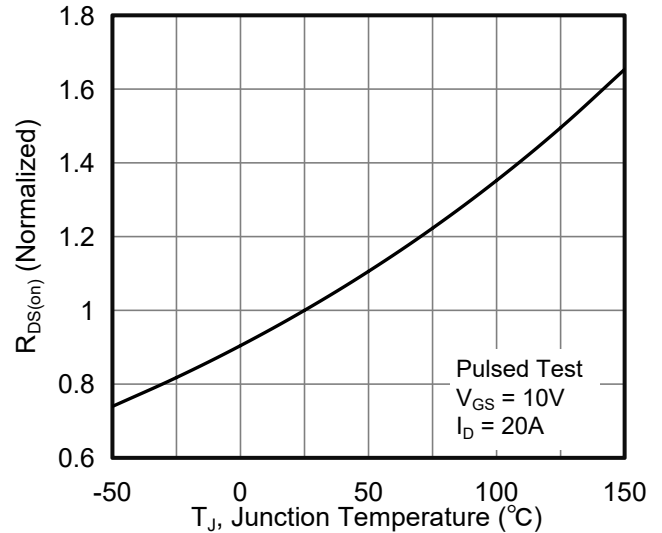


Figure 11. Normalized On Resistance vs Junction Temperature

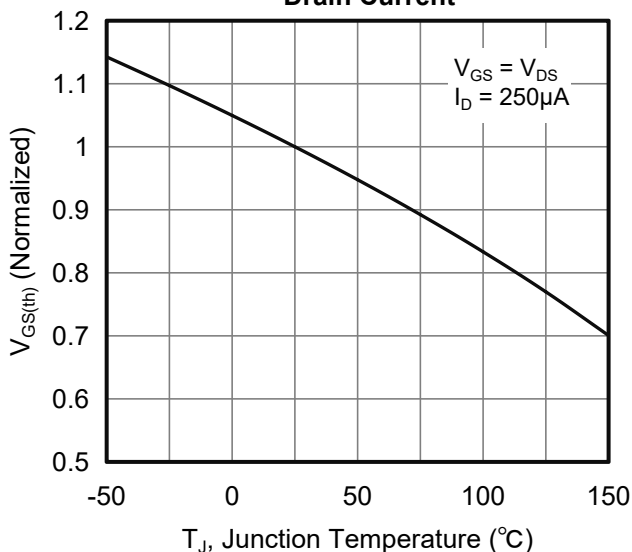


Figure 9 . Normalized Threshold Voltage vs Junction Temperature

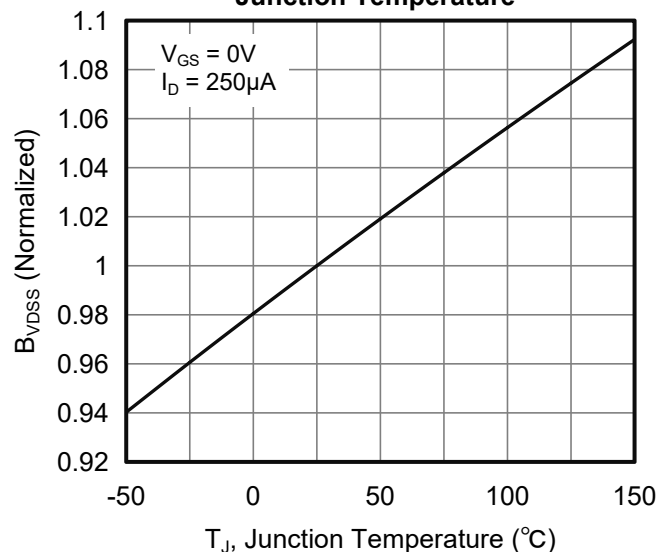


Figure 12. Normalized Breakdown Voltage vs Junction Temperature

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

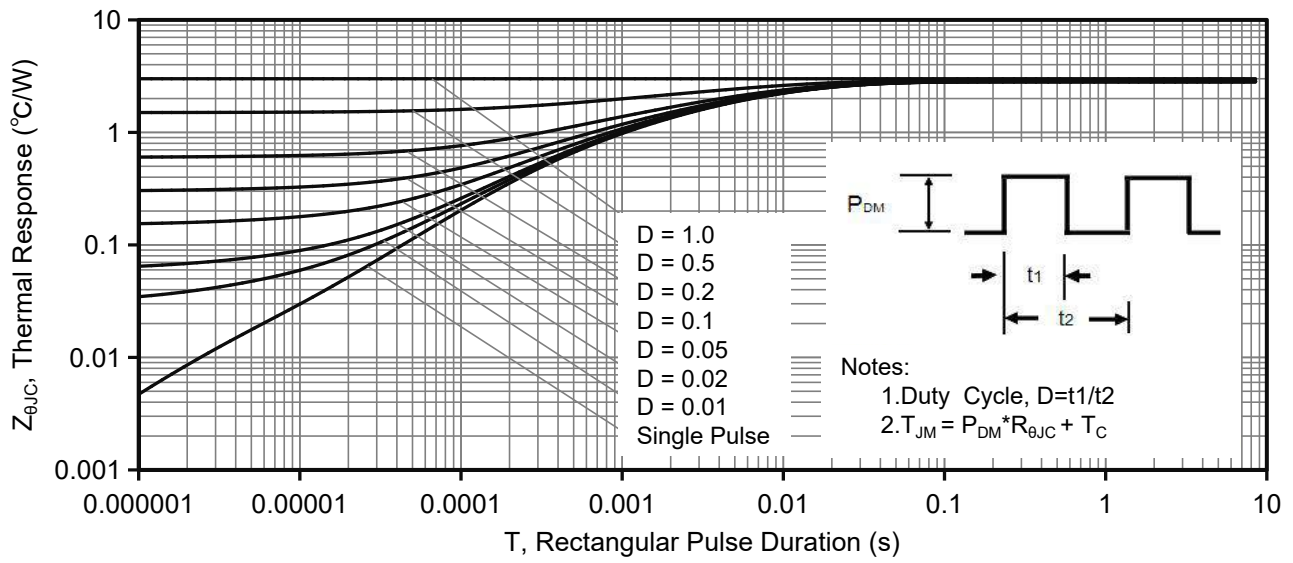


Figure 13. Maximum Effective Thermal Impedance, Junction to Case

Figure A: Gate Charge Test Circuit and Waveform

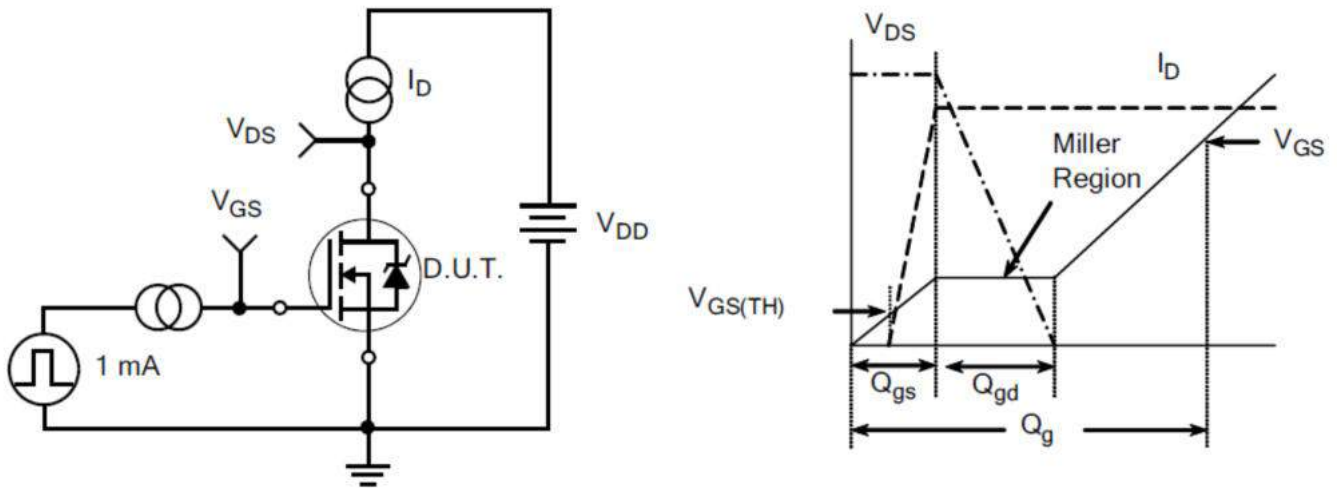


Figure B: Resistive Switching Test Circuit and Waveform

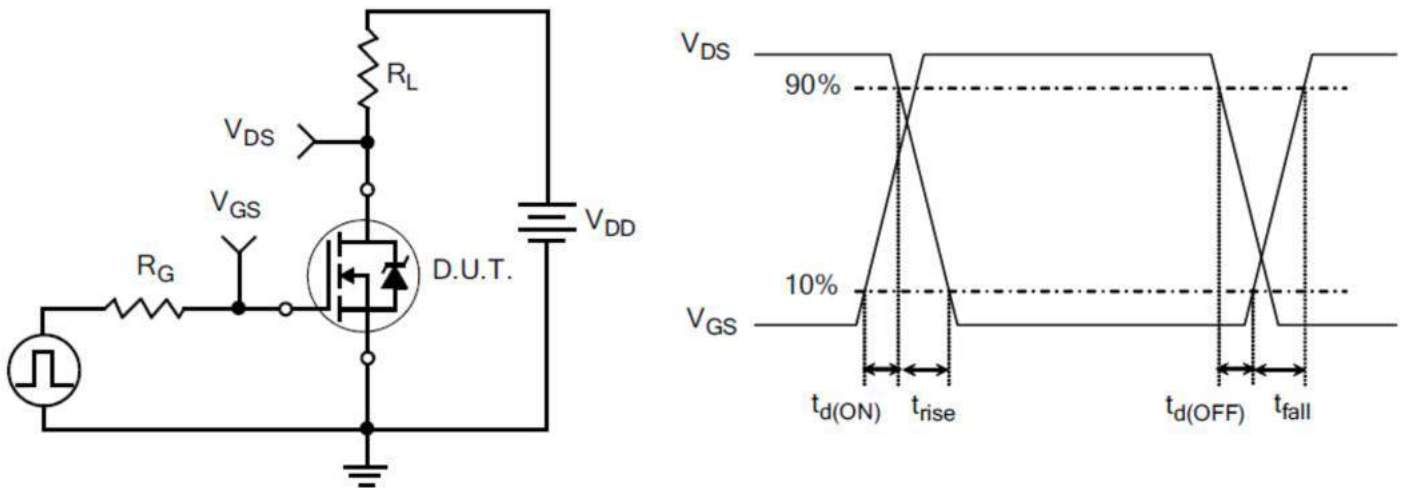
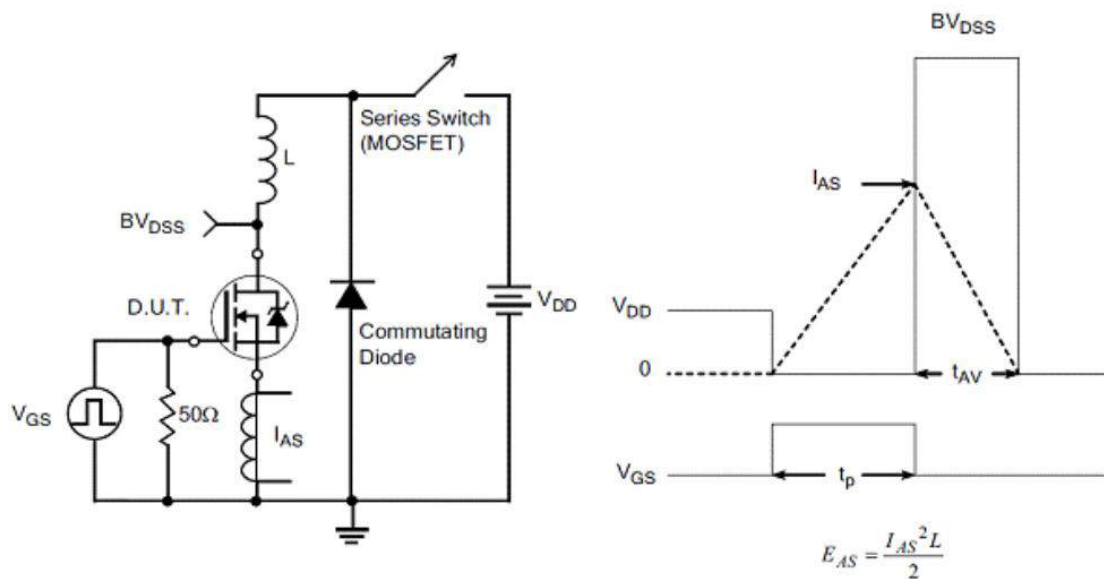
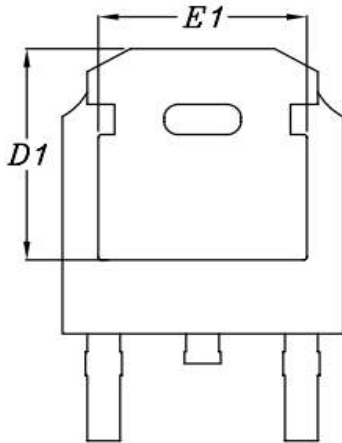
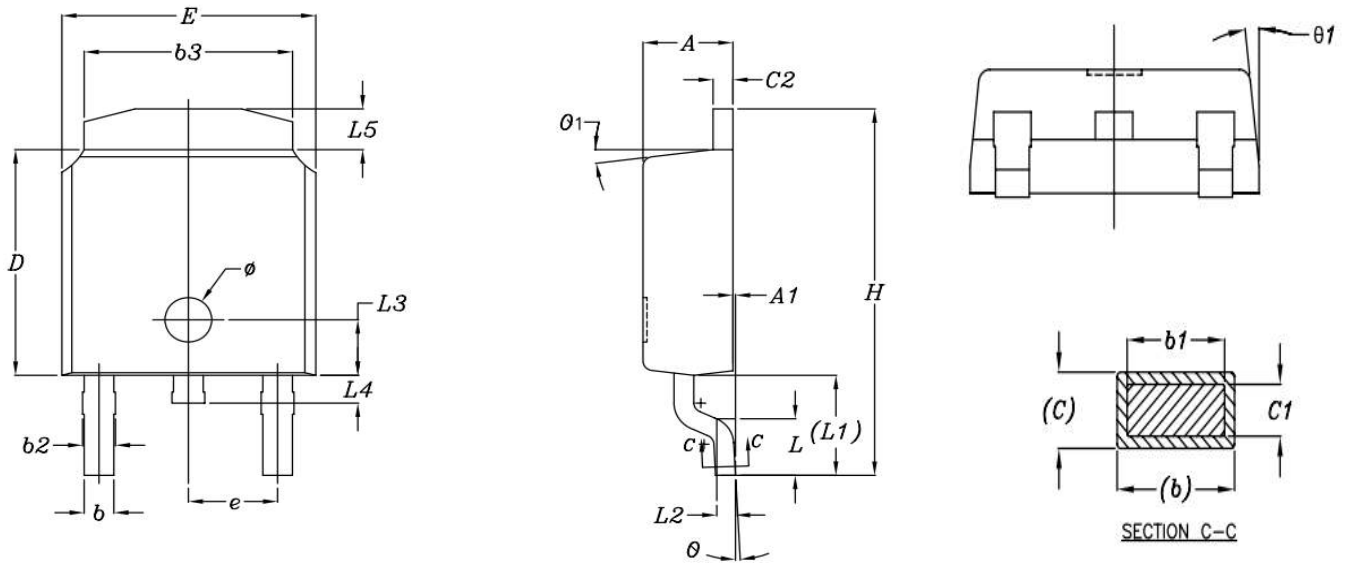


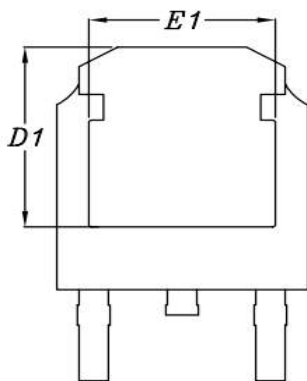
Figure C: Unclamped Inductive Switching Test Circuit and Waveform



TO-252 Package Information



Option(1)
Standard PAD



Option(2)
Large PAD

| I T E M | DIMENSIONS | | | |
|------------------|-------------|-------|-----------|-------|
| | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 2.18 | 2.39 | 0.086 | 0.094 |
| A1 | — | 0.13 | — | 0.005 |
| b | 0.70 | 0.89 | 0.028 | 0.035 |
| b1 | 0.70 | 0.86 | 0.028 | 0.034 |
| b2 | 0.76 | 1.14 | 0.030 | 0.045 |
| b3 | 4.95 | 5.46 | 0.195 | 0.215 |
| c | 0.46 | 0.61 | 0.018 | 0.024 |
| c1 | 0.41 | 0.56 | 0.016 | 0.022 |
| c2 | 0.46 | 0.89 | 0.018 | 0.035 |
| D | 5.97 | 6.22 | 0.235 | 0.245 |
| D1 | 5.21 | — | 0.205 | — |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 4.32 | — | 0.170 | — |
| e | 2.29 BSC | | 0.090 BSC | |
| H | 9.40 | 10.41 | 0.370 | 0.410 |
| L | 1.40 | 1.78 | 0.055 | 0.070 |
| L1 | 2.60 | 2.90 | 0.102 | 0.114 |
| L2 | 0.51 BSC | | 0.020 BSC | |
| L3 | 1.65 | 1.95 | 0.065 | 0.077 |
| L4 | 0.60 | 0.90 | 0.024 | 0.035 |
| L5 | 0.89 | 1.27 | 0.035 | 0.050 |
| ∅ | 1* | 5* | 1* | 5* |
| ∅1 | 7* REF | | 7* REF | |
| ∅ | 1.20 REF | | 1.20 REF | |

Customer Service

Sales and Service:

zj@ztasemi.com