## Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

## Product Summary

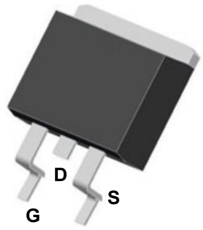
Green

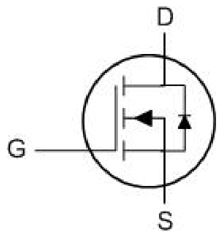
| BVDSS | RDSON | ID |
|---|---|---|
| 100V | 3.9mΩ | 120A |

## Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

## TO263 Pin Configuration




## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 100 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current, $V_{GS}$ @ -10V[1] | 120 | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current, $V_{GS}$ @ -10V[1] | 81 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | 512 | A |
| EAS | Single Pulse Avalanche Energy[3] | 486 | mJ |
| $I_{AS}$ | Avalanche Current | 120 | A |
| $P_D$@$T_C$=25℃ | Total Power Dissipation[4] | 178 | W |
| $P_D$@$T_A$=25℃ | Total Power Dissipation[4] | 71 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient [1] | --- | 56 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | 0.8 | ℃/W |

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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 100 | --- | --- | V |
| △$BV_{DSS}$/△$T_J$ | $BV_{DSS}$ Temperature Coefficient | Reference to 25℃ , $I_D$=1mA | --- | --- | --- | V/℃ |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=10V , $I_D$=20A | --- | 3.9 | 4.8 | mΩ |
| | | $V_{GS}$=4.5V , $I_D$=10A | --- | --- | --- | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 2.0 | 3.0 | 4.0 | V |
| △$V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | --- | --- | mV/℃ |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=80V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=80 , $V_{GS}$=0V , $T_J$=55℃ | --- | --- | 5 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=5V , $I_D$=15A | --- | 35 | --- | S |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 1.6 | --- | Ω |
| $Q_g$ | Total Gate Charge (6V) | $V_{DS}$=50V , $V_{GS}$=4.5V , $I_D$=20A | --- | 44 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 24 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 18.5 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=50V , $V_{GS}$=10V , $R_G$=3.3Ω, $I_D$=10A | --- | 18 | --- | ns |
| $T_r$ | Rise Time | | --- | 23 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 37 | --- | |
| $T_f$ | Fall Time | | --- | 15.7 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=50V , $V_{GS}$=0V , f=1MHz | --- | 4102 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 592 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 19.8 | --- | |

**Notes:**

1. Computed continuous current assumes the condition of $T_{J\_Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J\_Max}$ = 150°C.
3. $E_{AS}$ of 486 mJ is based on starting $T_J$ = 25°C, L = 3.0mH, $I_{AS}$ = 18A, $V_{GS}$ = 10V, $V_{DD}$ = 50V; 100% test at L = 0.1mH, $I_{AS}$ = 67A.
4. The power dissipation $P_D$ is based on $T_{J\_Max}$ = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.

### Typical Electrical & Thermal Characteristics

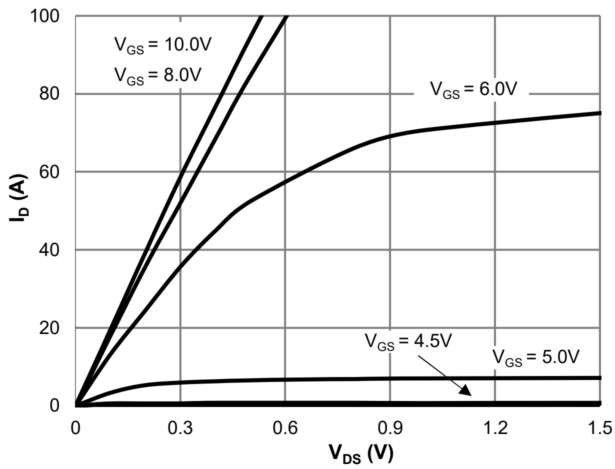



**Figure 1: Saturation Characteristics**

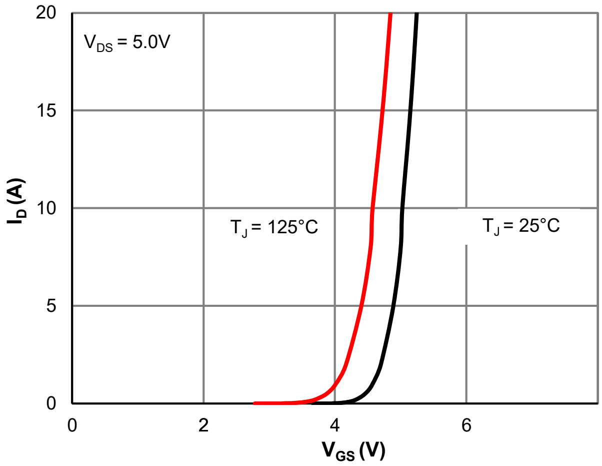



**Figure 2: Transfer Characteristics**

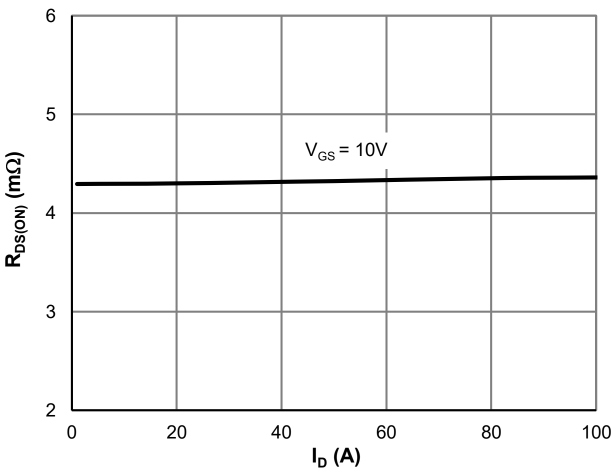



**Figure 3: $R_{DS(ON)}$ vs. Drain Current**

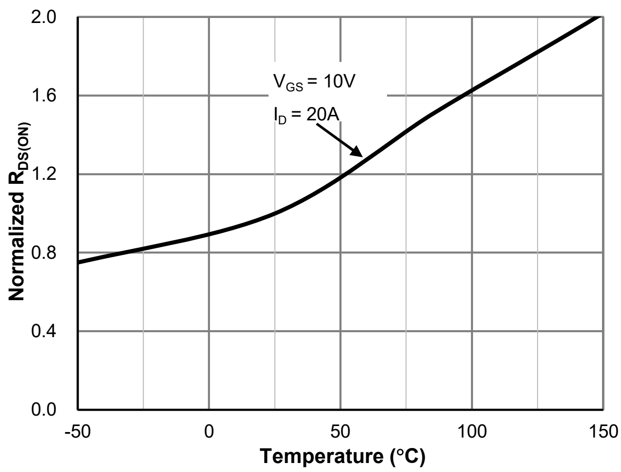



**Figure 4: $R_{DS(ON)}$ vs. Junction Temperature**

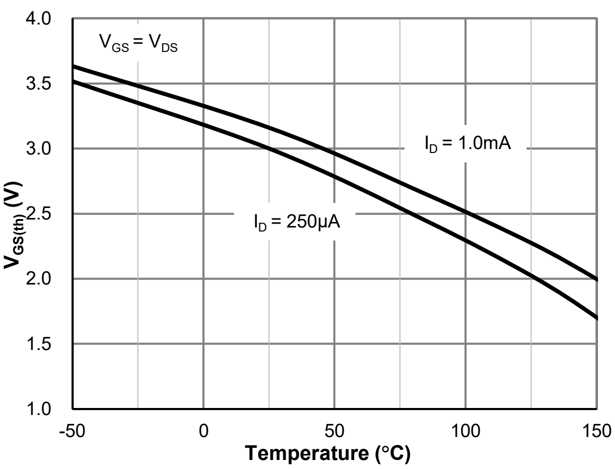



**Figure 5: $V_{GS(th)}$ vs. Junction Temperature**

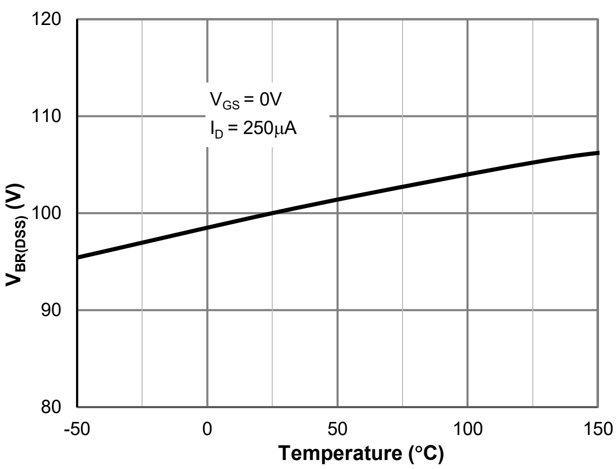



**Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature**

## Typical Electrical & Thermal Characteristics

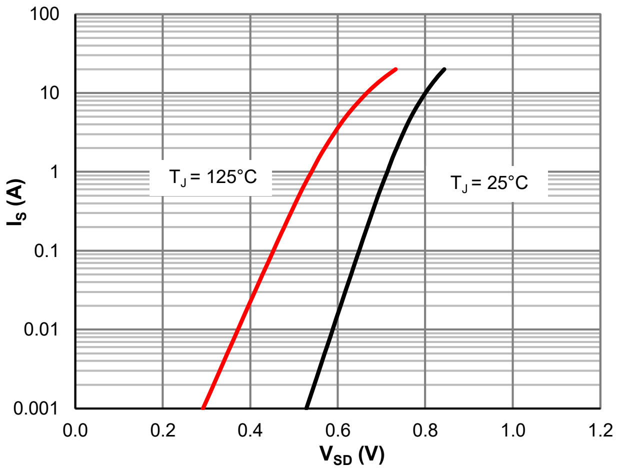



**Figure 7: Body-Diode Characteristics**

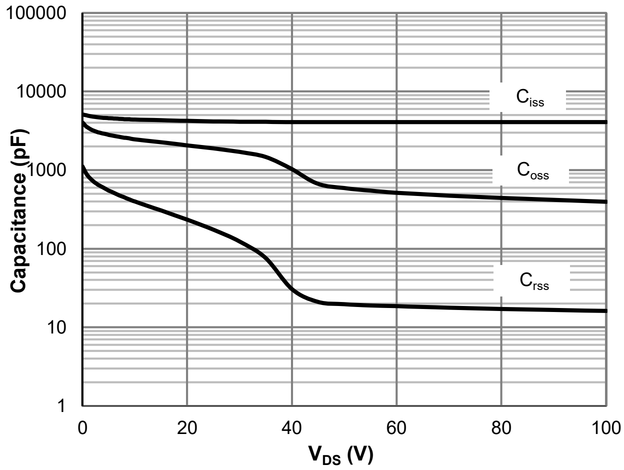



**Figure 8: Capacitance Characteristics**

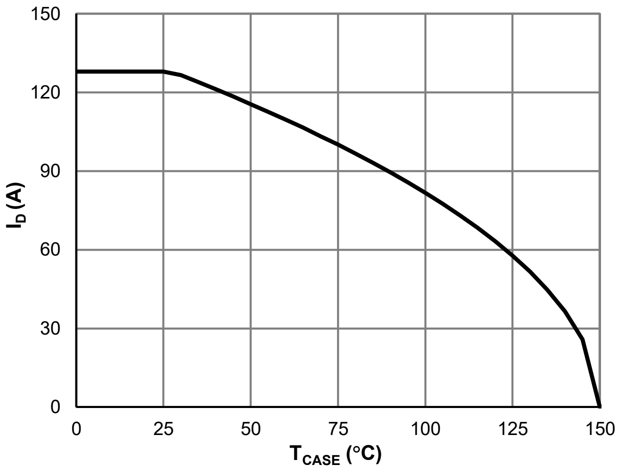



**Figure 9: Current De-rating**

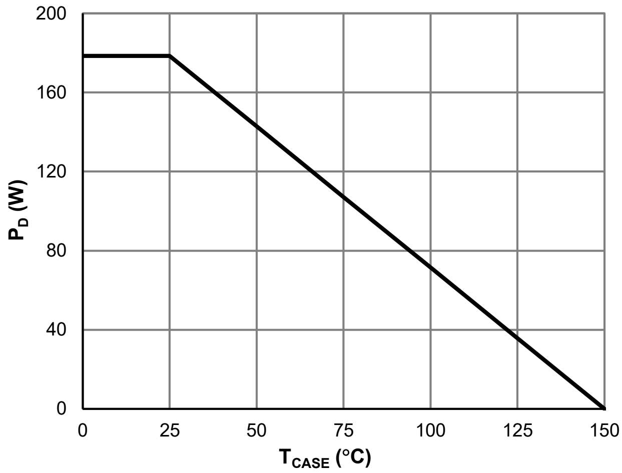



**Figure 10: Power De-rating**

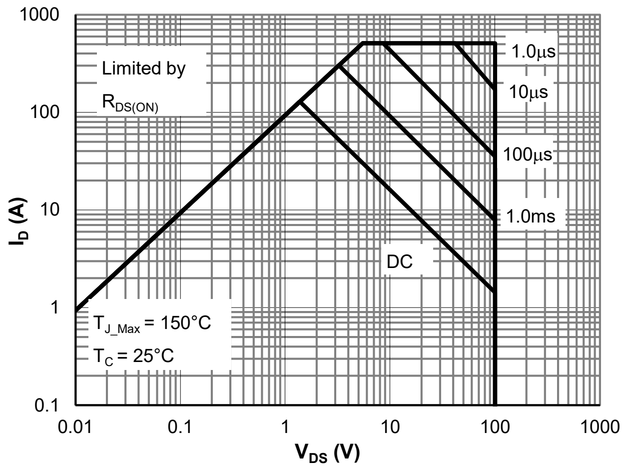



**Figure 11: Maximum Safe Operating Area**

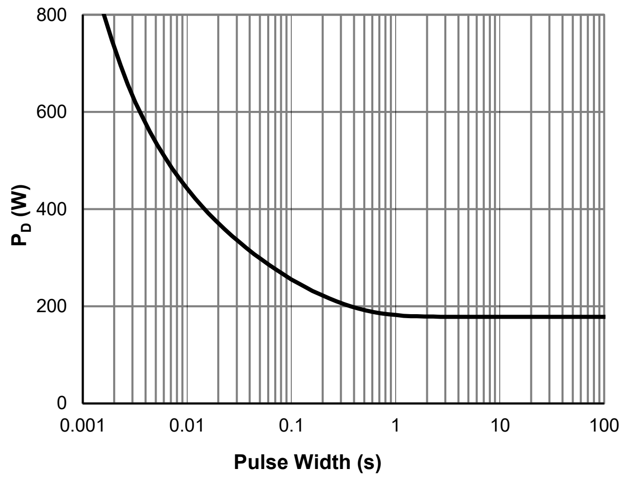



**Figure 12: Single Pulse Power Rating, Junction-to-Case**

## Typical Electrical & Thermal Characteristics

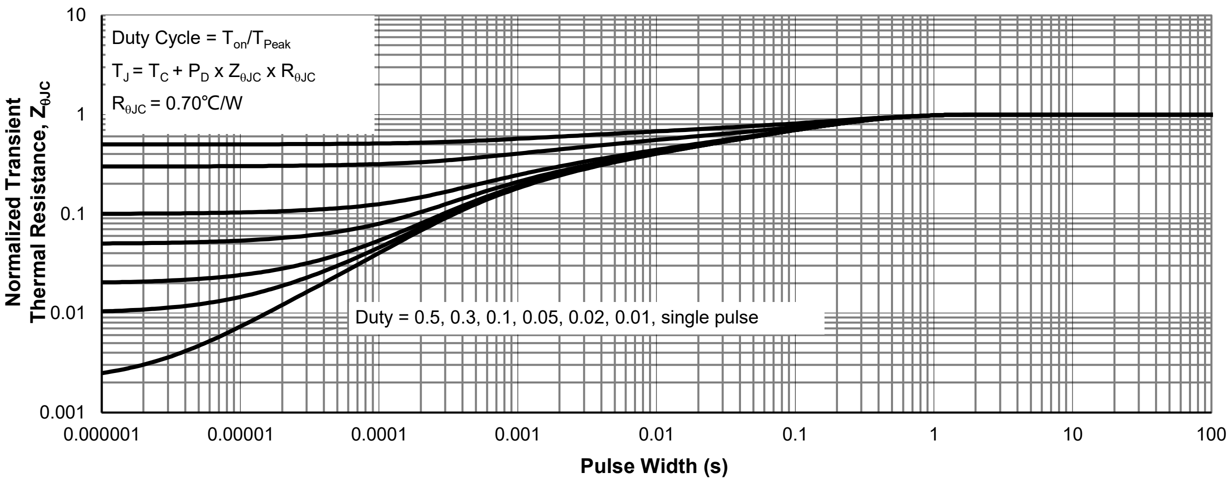
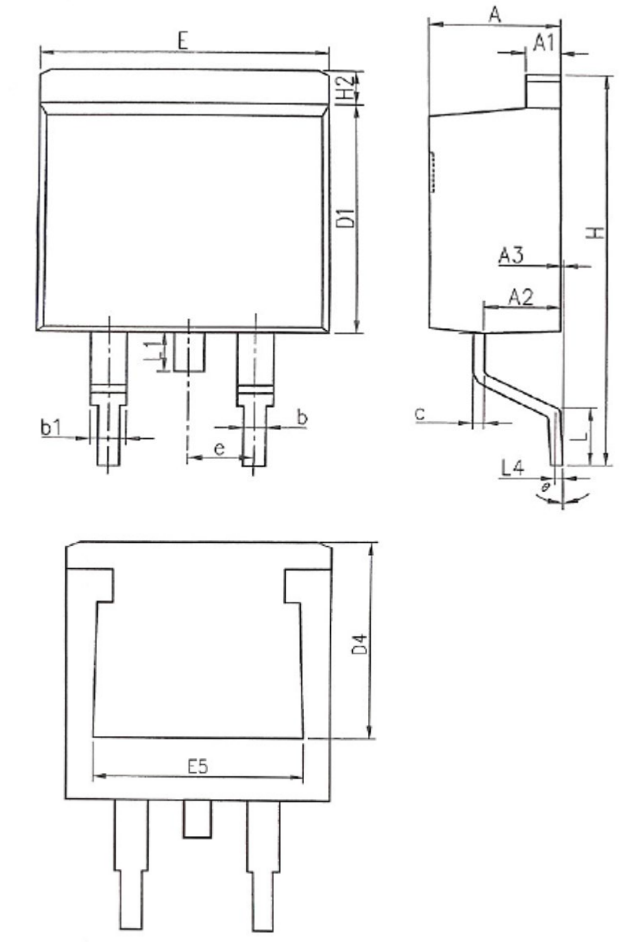



**Figure 13: Normalized Maximum Transient Thermal Impedance**

**Mechanical Dimensions for TO-263**




COMMON DIMENSIONS

| SYMBOL | MM | |
|---|---|---|
| | MIN | MAX |
| A | 4.37 | 4.89 |
| A1 | 1.17 | 1.42 |
| A2 | 2.20 | 2.90 |
| A3 | 0.00 | 0.25 |
| b | 0.70 | 0.96 |
| b1 | 1.17 | 1.47 |
| c | 0.28 | 0.60 |
| D1 | 8.45 | 9.30 |
| D4 | 6.60 | - |
| E | 9.80 | 10.40 |
| E5 | 7.06 | - |
| e | 2.54BSC | |
| H | 14.70 | 15.70 |
| H2 | 1.07 | 1.47 |
| L | 2.00 | 2.80 |
| L1 | - | 1.75 |
| L4 | 0.254BSC | |
| θ | 0° | 9° |