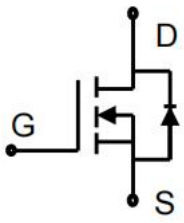
## N-Channel SGT MOSFET 150V/50A

| Parameter | Value | Unit |
|---|---|---|
| $V_{DS}$ | 150 | V |
| $R_{DS(on)}$ | 15.6 | mΩ |
| $I_D$ | 50 | A |




PDFN5x6

### FEATURES

- Ultra-Low RDS(ON)
- Low Gate Charge
- High Current Capability

### APPLICATIONS

- Power Management in Telecom, Industrial
- Motor Driving in Power Tool,E-vehicle,Robotics
- Current Switching in DC/DC&AC/DC(SR)

**MAXIMUM RATED VALUES**(at TC=25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 150 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continue Drain Current | $I_D$ | 50 | A |
| Pulsed Drain Current (Note1) | $I_{DM}$ | 200 | A |
| Power Dissipation | $P_D$ | 96 | W |
| Single Pulse Avalanche Energy (Note1) | $E_{AS}$ | 135 | mJ |
| Operating Temperature Range | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 50 | °C/W |

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

**ELECTRICAL CHARACTERISTICS** (TJ=25℃,unless otherwise noted)

| Parameter | Test Condition | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{GS}$=0V,$I_D$=250μA | $BV_{DSS}$ | 150 | - | - | V |
| Drain-Source Leakage Current | $V_{DS}$=150V, $V_{GS}$=0V | $I_{DSS}$ | - | - | 1 | μA |
| Gate Leakage Current | $V_{GS}$=± 20V, $V_{DS}$=0V | $I_{GSS}$ | - | - | ±100 | nA |
| Gate-Source Threshold Voltage | $V_{DS}$=VGS , $I_D$=250μA | $V_{GS(th)}$ | 2.2 | - | 4.2 | V |
| Drain-Source On-State Resistance | $V_{GS}$=10V, $I_D$=20A | $R_{DS(on)}$ | - | 15.6 | 18.8 | mΩ |
| Input Capacitance | $V_{GS}$=0V, $V_{DS}$=75V, | $C_{iss}$ | - | 2500 | - | pF |

| | | | | | | |
|---|---|---|---|---|---|---|
| Output Capacitance | f=1MHz | $C_{oss}$ | - | 210 | - | pF |
| Reverse Transfer Capacitance | | $C_{rss}$ | - | 20 | - | pF |
| Turn-on Delay Time(Note2) | $V_{GS}$=10V, $V_{DD}$ =75V, $R_G$=6 Ω,$I_D$=20A | $t_{d(ON)}$ | - | 7.1 | - | ns |
| Rise Time(Note2) | | $t_r$ | - | 8.4 | - | ns |
| Turn-Off Delay Time(Note2) | | $t_{d(OFF)}$ | - | 17 | - | ns |
| Fall Time(Note2) | | $t_f$ | - | 11 | - | ns |
| Total Gate Charge(Note2) | $I_D$=20A, $V_{DD}$=75V, $V_{GS}$=10V | $Q_G$ | - | 23 | - | nC |
| Gate to Source Charge(Note2) | | $Q_{GS}$ | - | 7.7 | - | nC |
| Gate to Drain Charge(Note2) | | $Q_{GD}$ | - | 4.7 | - | nC |

**SOURCE-DRAIN DIODE CHARACTERISTICS** (Ta=25°C unless otherwise specified)

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Maximun Body-Diode Continuous Current | | $I_S$ | - | - | 50 | A |
| Maximun Body-Diode Pulsed Current(Note2) | | $I_{SM}$ | - | - | 200 | A |
| Drain-Source Diode Forward Voltage | $I_{SD}$=20 A | $V_{SD}$ | - | - | 1.2 | V |
| Reverse Recovery Time(Note2) | $I_{SD}$=20 A, $V_{GS}$=0 V, $dI_F$ / dt=100 A/μs | $t_{rr}$ | - | 86 | - | ns |
| Reverse Recovery Charge(Note2) | | $Q_{rr}$ | - | 137 | - | nC |

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

## CHARACTERISTICS DIAGRAMS

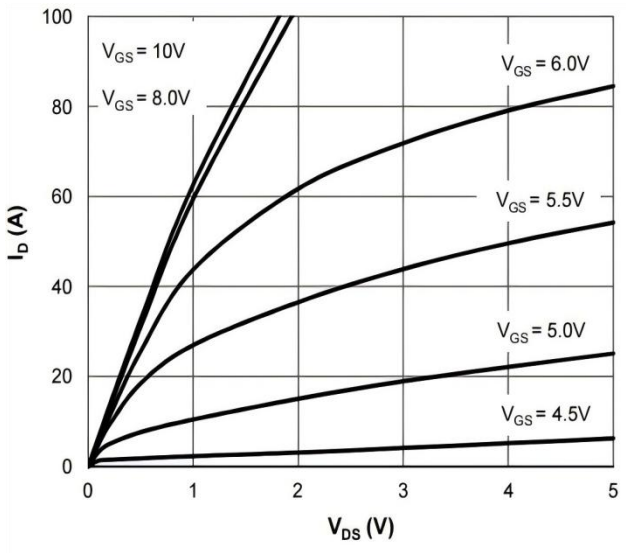



Figure 1: Saturation Characteristics

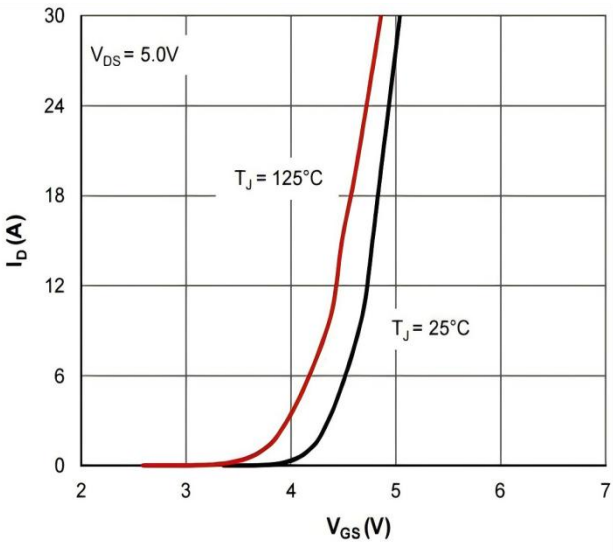



Figure 2: Transfer Characteristics

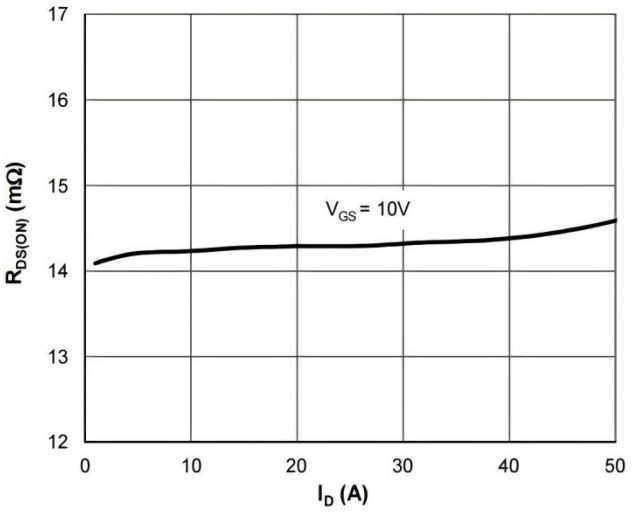



Figure 3: $R_{DS(ON)}$ vs. Drain Current

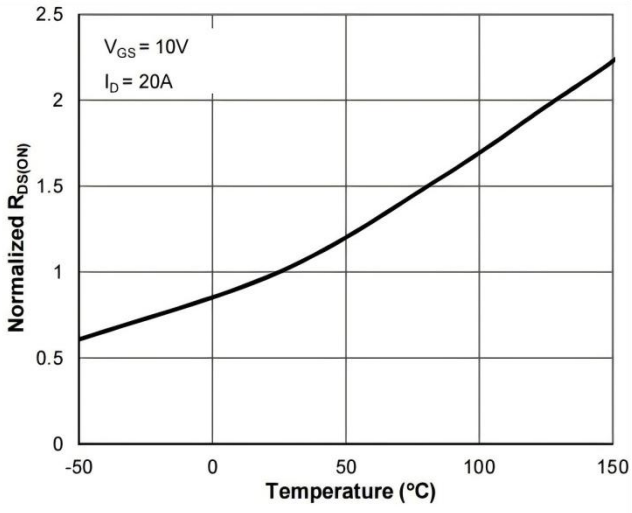



Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

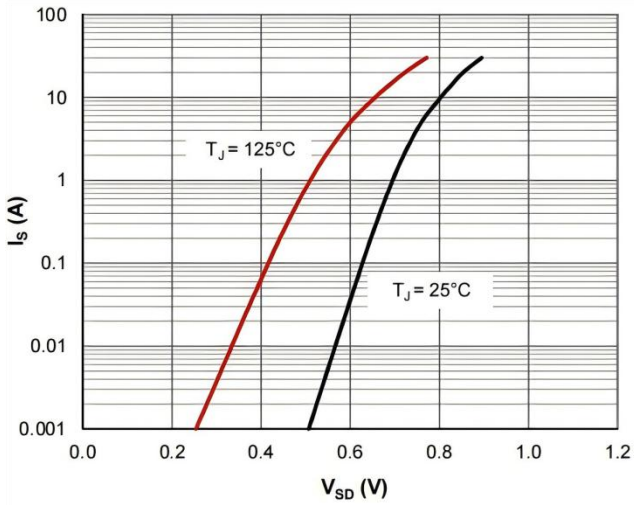



Figure 5: Body-Diode Characteristics

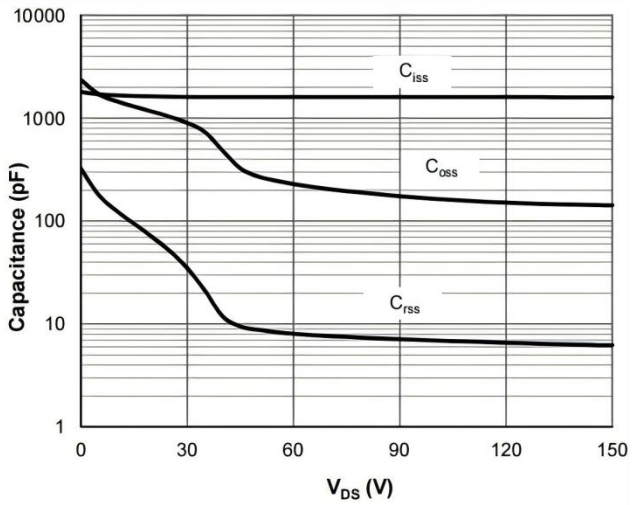



Figure 6: Capacitance Characteristics

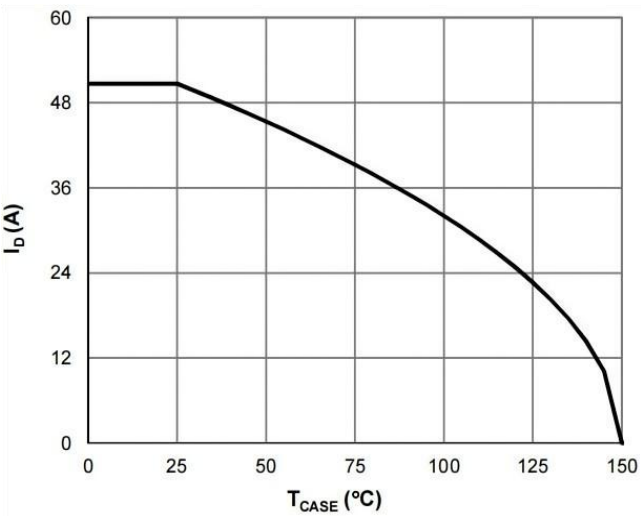



Figure 7: Current De-rating

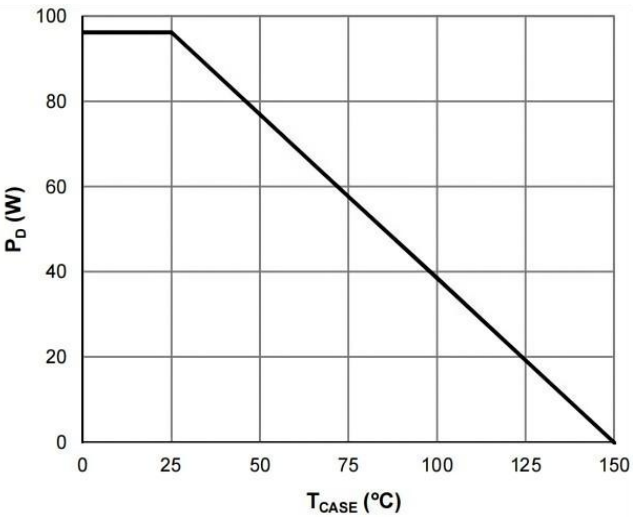



Figure 8: Power De-rating

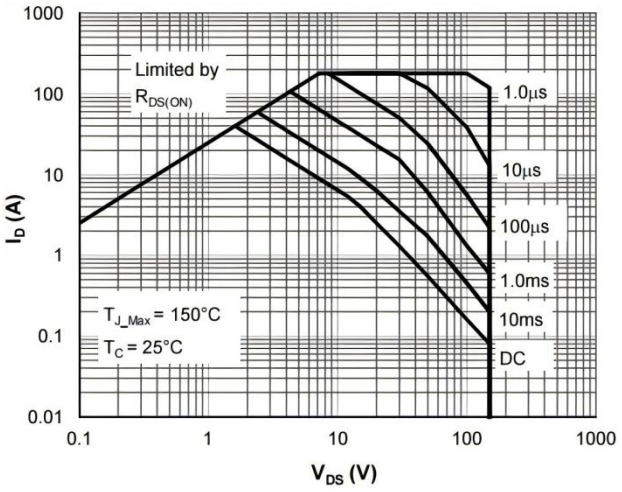



Figure 9: Maximum Safe Operating Area

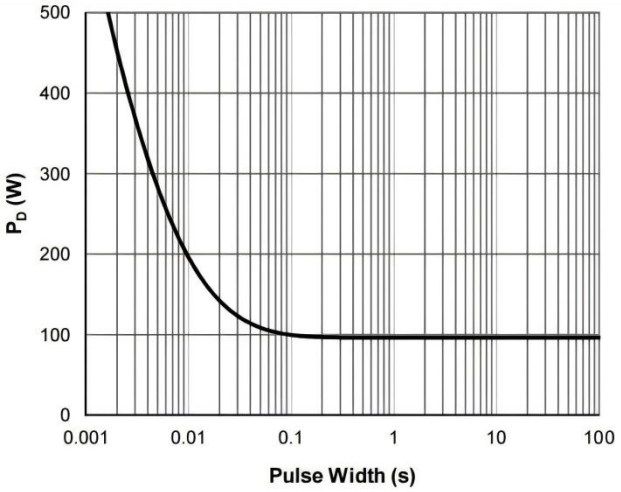



Figure 10: Single Pulse Power Rating, Junction-to-Case

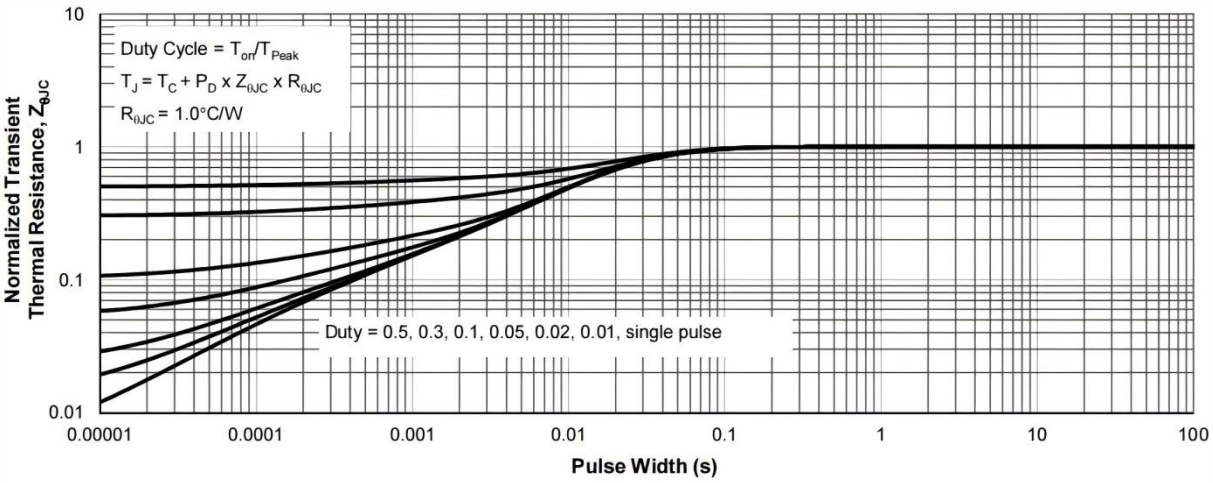
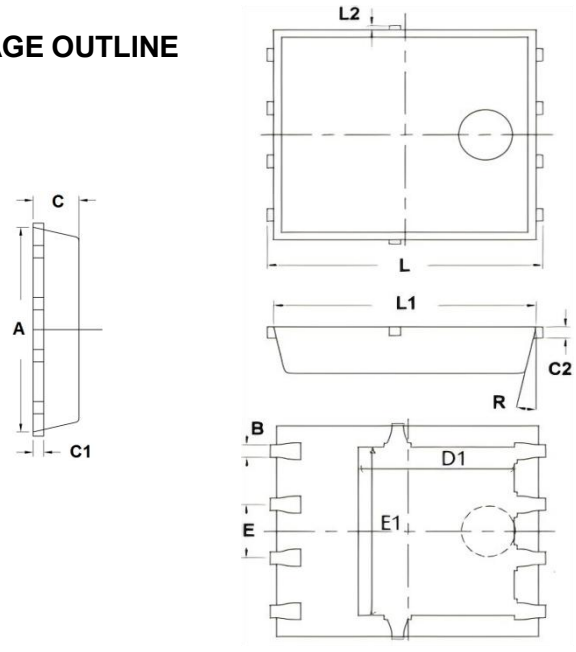



Figure 11: Normalized Maximum Transient Thermal Impedance

## PACKAGE OUTLINE




| Dim. | Min. | Max. |
|---|---|---|
| A | 4.8 | 5.2 |
| B | 0.25 | 0.35 |
| C | 1 | 1.2 |
| C1 | Typ0.254 | |
| C2 | Typ0.254 | |
| D1 | 3.35 | 3.81 |
| E | Typ1.27 | |
| E1 | 3.9 | 4.18 |
| L | 6 | 6.3 |
| L1 | 5.7 | 6 |
| L2 | MAX 0.2 | |
| R | Typ 13° | |
| All Dimensions in millimeter | | |

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