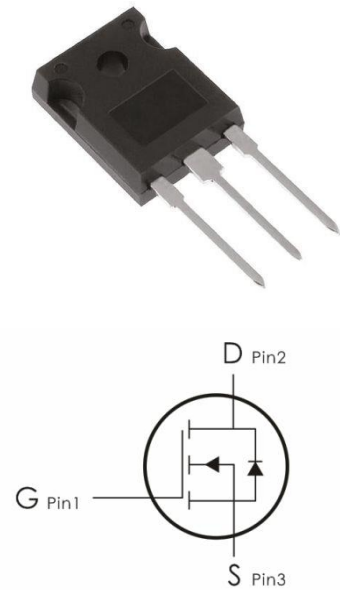


Description:

This N-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=300A, R_{DS(ON)} < 2.1m \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Ratings | Units |
|----------------|--|-------------|------------|
| V_{DS} | Drain-Source Voltage | 100 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Continuous Drain Current- $T_C=25^\circ C$ | 300 | A |
| | Continuous Drain Current- $T_C=100^\circ C$ | 240 | |
| I_{DM}^1 | Drain Current (Pulsed) | 1000 | A |
| E_{AS} | Single Pulse Avalanche Energy(note1) | 2900 | mJ |
| P_D | Power Dissipation | 500 | W |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to +175 | $^\circ C$ |

Thermal Characteristics:

| Symbol | Parameter | Max | Units |
|-------------------|---|------|--------------|
| $R_{\theta JC}^2$ | Thermal Resistance, Junction to Case | 0.25 | $^\circ C/W$ |
| $R_{\theta JA}^2$ | Thermal Resistance, Junction-to-Ambient | 40 | |

Electrical Characteristics: ($T_C=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|-----|-------|-----------|------------|
| Off Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250 \mu A$ | 100 | 110 | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{GS}=0V, V_{DS}=100V$ | --- | --- | 1 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0A$ | --- | --- | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}=V_{DS}, I_D=250 \mu A$ | 2 | --- | 4 | V |
| $R_{DS(ON)}$ | Drain-Source On Resistance ⁴ | $V_{GS}=10V, I_D=50A$ | --- | 1.8 | 2.1 | m Ω |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance ⁵ | $V_{DS}=50V, V_{GS}=0V, f=1MHz$ | --- | 11258 | --- | pF |
| C_{oss} | Output Capacitance ⁵ | | --- | 1714 | --- | |
| C_{rss} | Reverse Transfer Capacitance ⁵ | | --- | 327 | --- | |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time ⁵ | $V_{DD}=50V, I_D=50A, V_{GEN} = 10 V,$ $R_G=4.5 \Omega, R_L = 1 \Omega,$ | --- | 34 | --- | ns |
| t_r | Rise Time ⁵ | | --- | 26 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time ⁵ | | --- | 78 | --- | ns |
| t_f | Fall Time ⁵ | | --- | 29 | --- | ns |
| Q_g | Total Gate Charge ⁵ | $V_{GS}=10V, V_{DS}=50V,$ $I_D=50A$ | --- | 223 | --- | nC |
| Q_{gs} | Gate-Source Charge ⁵ | | --- | 175 | --- | nC |
| Q_{gd} | Gate-Drain "Miller" Charge ⁵ | | --- | 35 | --- | nC |
| Drain-Source Diode Characteristics | | | | | | |
| V_{SD} | Diode Forward Voltage ⁴ | $I_S=50A, V_{GS}=0V$ | --- | --- | 1.2 | V |
| I_S | Diode Forward Current | $V_G=V_D=0V$ | --- | --- | 300 | A |

| | | | | | | |
|-----------------------|-------------------------|---|-----|-----|------|-----|
| I_{SM} | Pulsed Source Current | V _G =V _D =0V | --- | --- | 1000 | A |
| T_{rr} | Reverse Recovery Time | I _S =50A; V _{GS} =0V, | --- | 100 | --- | NS |
| Q_{rr} | Reverse Recovery Charge | di/dt = 100 A/μs | --- | 280 | --- | μ C |

Notes:

1. Pulse width ≤ 300 μs, duty cycle ≤ 2 %
2. Surface Mounted on minimum footprint pad area.
3. Limited by bonding wire
4. Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%
5. Guaranteed by design, not subject to production testing

Typical Characteristics: (T_C=25°C unless otherwise noted)

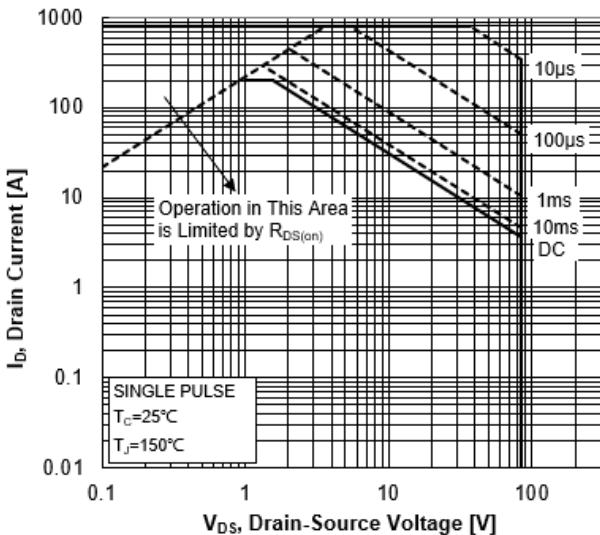


Fig1. Safe Operating Area

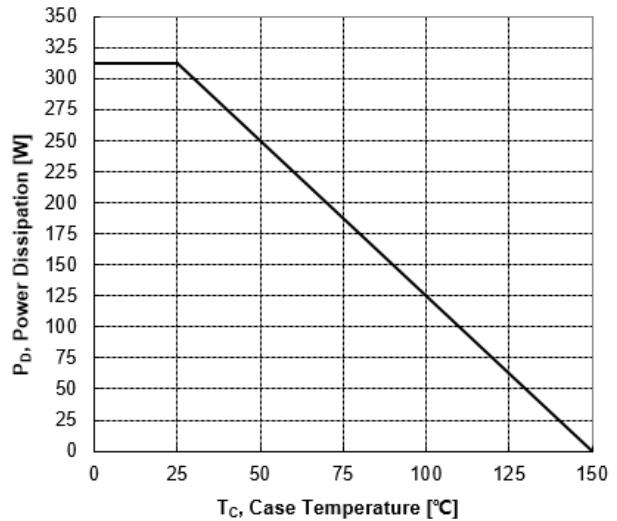


Fig2. Maximum Power Dissipation vs Case Temperature

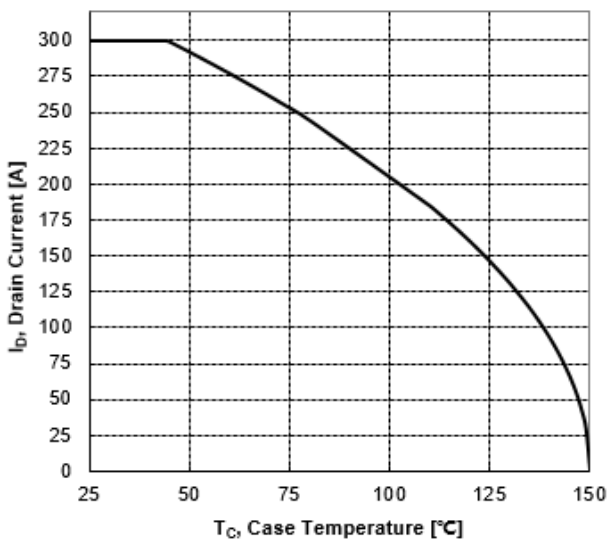


Fig3. Maximum Continuous Drain Current vs Case Temperature

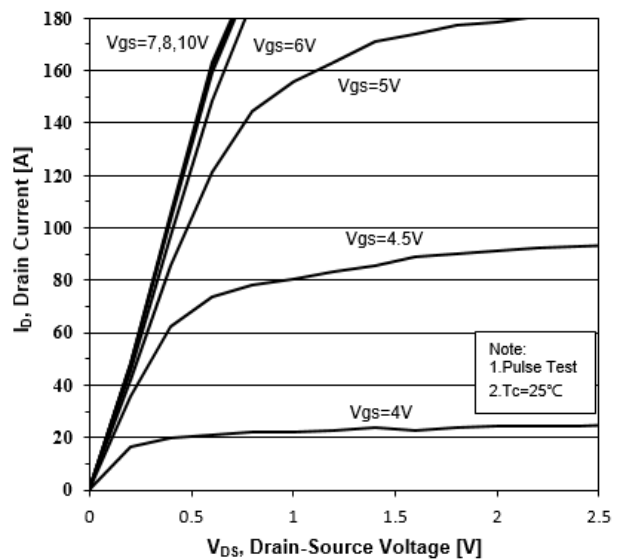


Fig4. Typical Output Characteristics

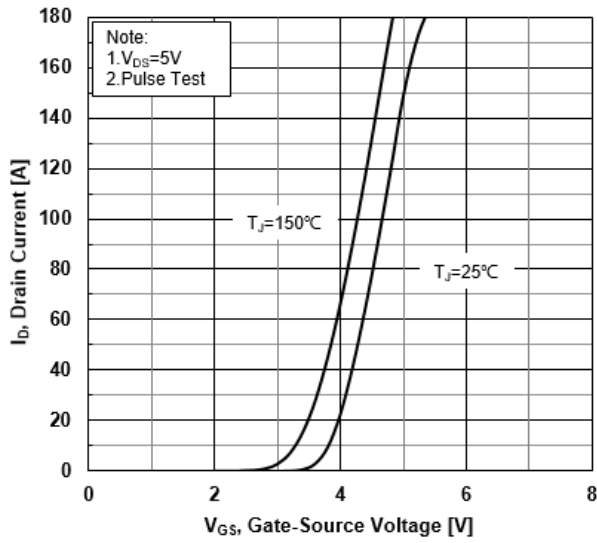


Fig5. Typical Transfer Characteristics

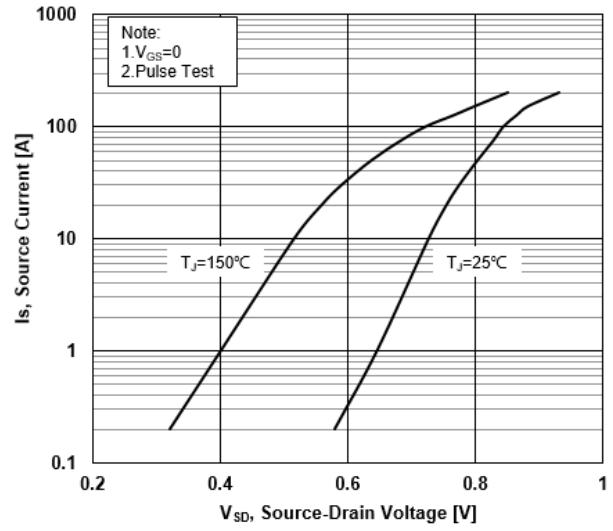


Fig6. Source-Drain Diode Forward Characteristics

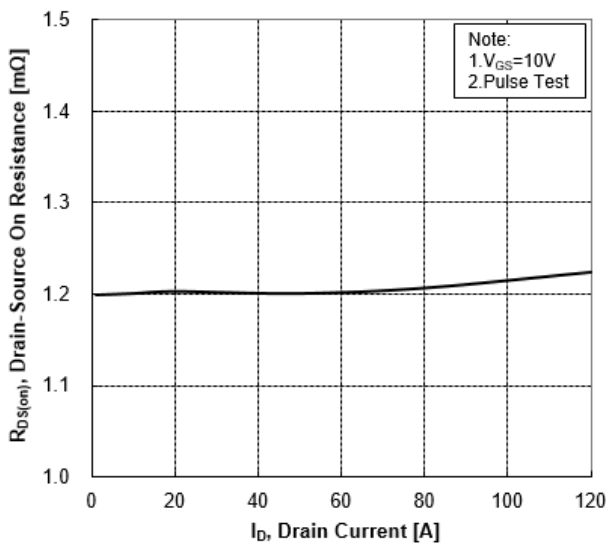


Fig7. Drain-Source On-Resistance vs Drain Current

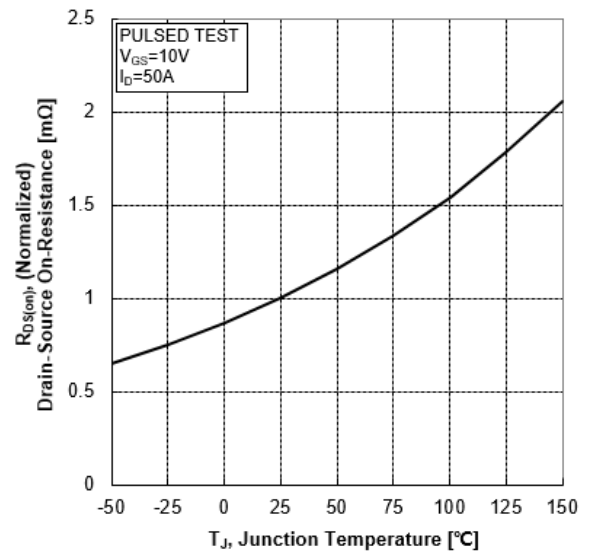


Fig8. Normalized On-Resistance vs Junction Temperature

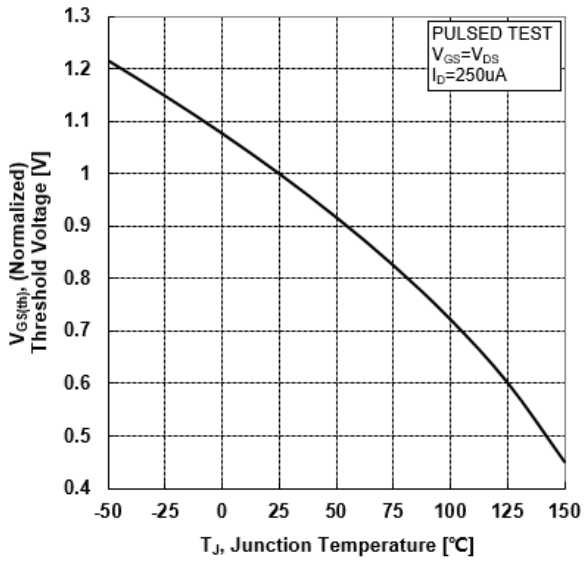


Fig9. Normalized Threshold Voltage vs Junction Temperature

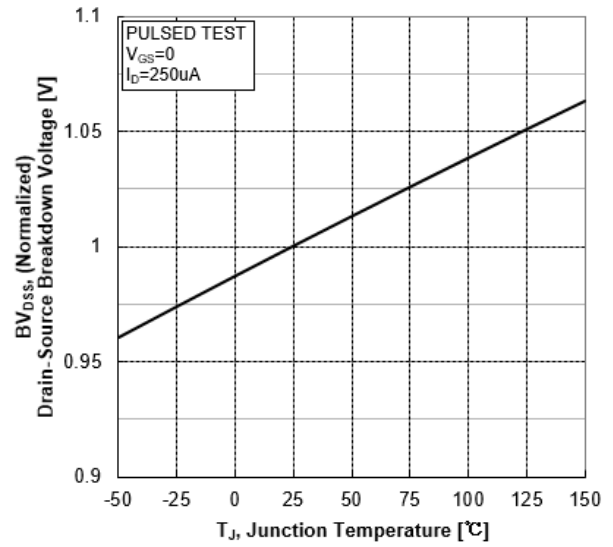


Fig10. Normalized Breakdown Voltage vs Junction Temperature

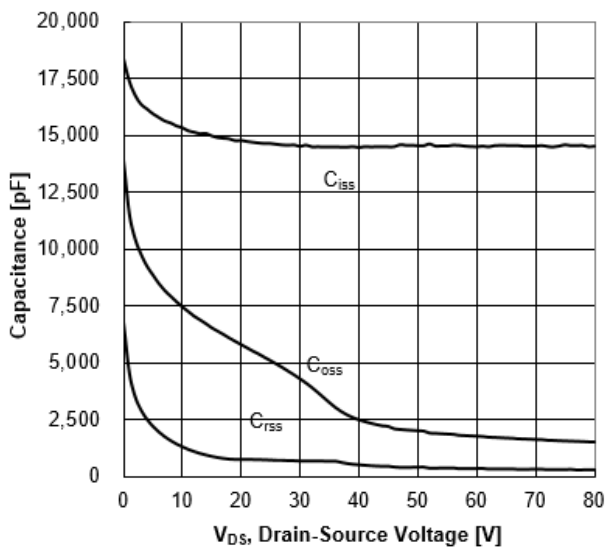


Fig11. Capacitance Characteristics

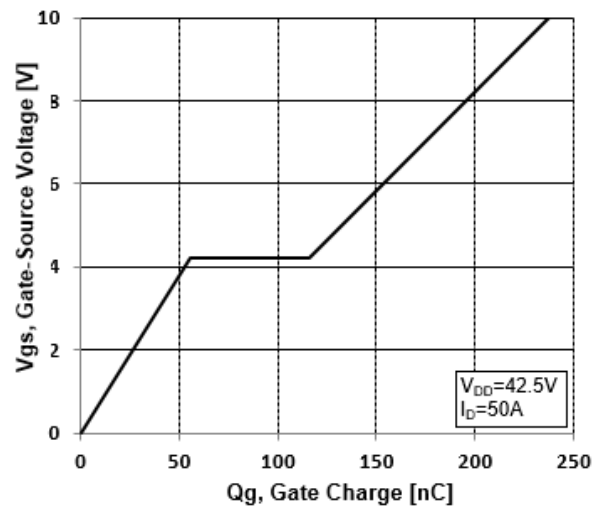


Fig12. Typical Gate Charge vs Gate-Source Voltage

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