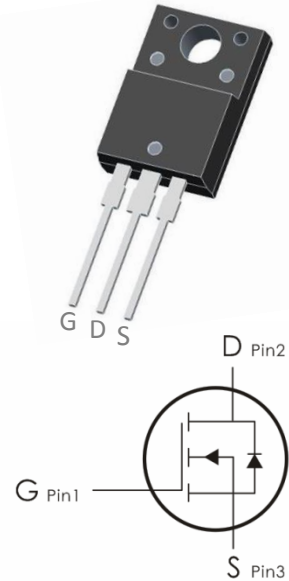


Description:

This N-Channel MOSFET uses advanced trench 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) $V_{DS}=500V, I_D=5A, R_{DS(ON)} < 1.4 \Omega @ V_{GS}=10V$
- 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 | 500 | V |
| V_{GS} | Gate-Source Voltage | ± 30 | V |
| I_D | Continuous Drain Current- $T_C=25^\circ C$ | 5 | A |
| | Continuous Drain Current- $T_C=100^\circ C$ | 2.2 | |
| E_{AS} | Single Pulse Avalanche Energy ¹ | 270 | mJ |
| P_D | Power Dissipation | 35 | W |
| I_{AR} | avalanche Current ² | 5 | A |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ C$ |

Thermal Characteristics:

| Symbol | Parameter | Max | Units |
|-----------------|---|------|--------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 3.45 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 110 | |

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 | $V_{GS}=0V, I_D=250\ \mu\text{A}$ | 500 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{GS}=0V, V_{DS}=500V$ | --- | --- | 1 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 30V, V_{DS}=0A$ | --- | --- | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$ | 2 | --- | 4 | V |
| $R_{DS(ON)}$ | Drain-Source On Resistance | $V_{GS}=10V, I_D=2.5A$ | --- | --- | 1.4 | Ω |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$ | --- | 800 | 1000 | pF |
| C_{oss} | Output Capacitance | | --- | 75 | 95 | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 8.5 | 11 | |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}=250V, I_D=5A$ $R_{GEN}=25\ \Omega$. (Note3,4) | --- | 13 | 35 | ns |
| t_r | Rise Time | | --- | 55 | 120 | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | --- | 25 | 60 | ns |
| t_f | Fall Time | | --- | 35 | 80 | ns |
| Q_g | Total Gate Charge | $V_{GS}=10V, V_{DS}=400V$ $I_D=5A$. (Note3,4) | --- | 13 | 17 | nC |
| Q_{gs} | Gate-Source Charge | | --- | 3.4 | --- | nC |
| Q_{gd} | Gate-Drain "Miller" Charge | | --- | 6.4 | --- | nC |
| Drain-Source Diode Characteristics | | | | | | |
| V_{SD} | Source-Drain Diode Forward Voltage | $V_{GS}=0V, I_D=5A$ | --- | --- | 1.5 | V |
| I_S | Max. Diode Forward Current | --- | --- | --- | 5 | A |
| I_{sm} | Max. Pulsed Forward Current | | --- | --- | 20 | A |

| | | | | | | |
|------------|-------------------------|---|-----|------|-----|----|
| Trr | Reverse Recovery Time | $I_S=5A, V_{GS}=0V$ $diF/dt=100A/\mu s$ (Note3) | --- | 215 | --- | Ns |
| qrr | Reverse Recovery Charge | | --- | 1.26 | --- | nc |

- Notes : 1, L=27mH, IAS=5A, VDD=50V, RG=25Ω, Starting T_J=25°C
 2, Repetitive Rating : Pulse width limited by maximum junction temperature
 3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
 4, Essentially Independent of Operating Temperature

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

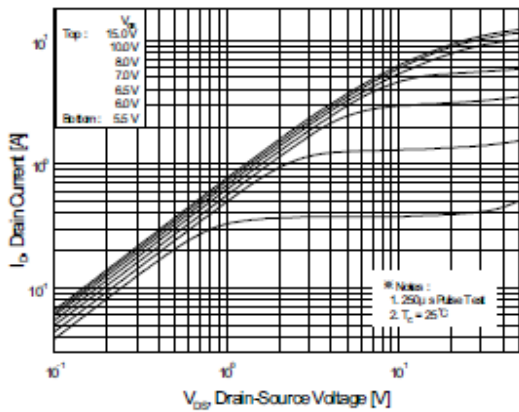


Figure 1. On-Region Characteristics

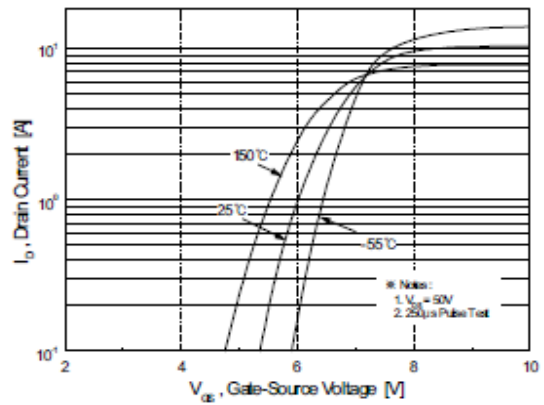


Figure 2. Transfer Characteristics

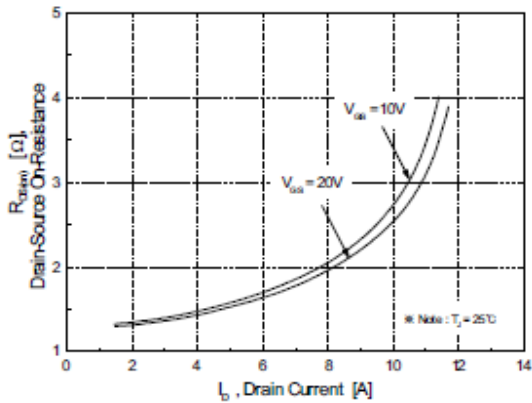


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

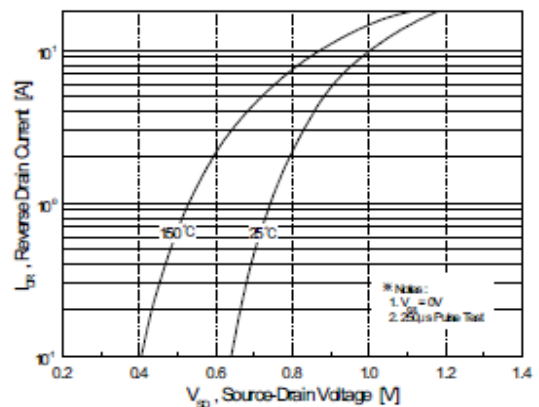


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

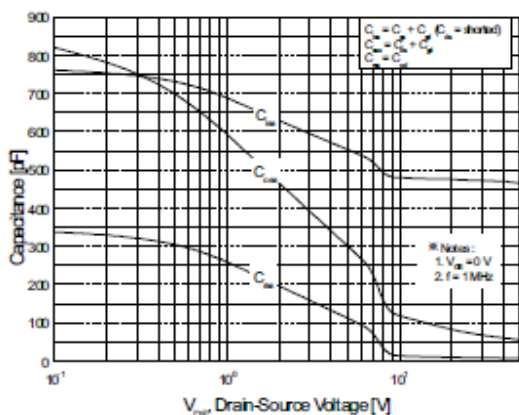


Figure 5. Capacitance Characteristics

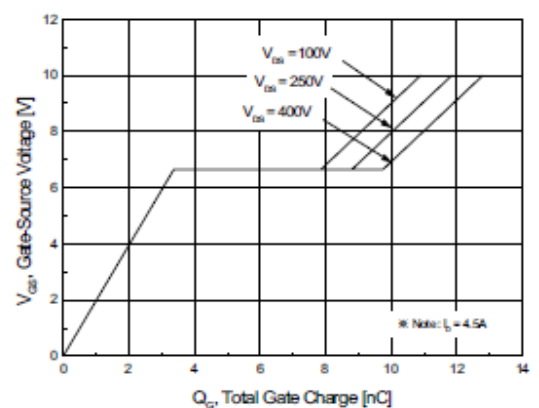


Figure 6. Gate Charge Characteristics

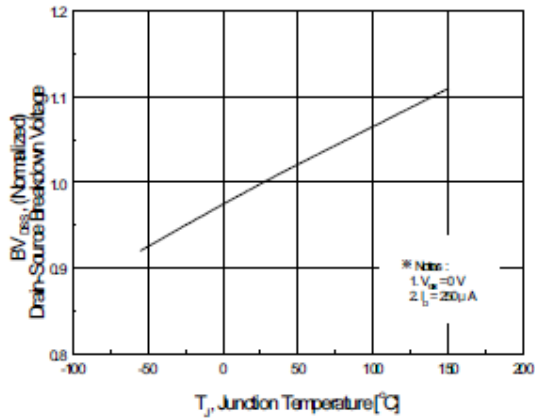


Figure 7. Breakdown Voltage Variation vs. Temperature

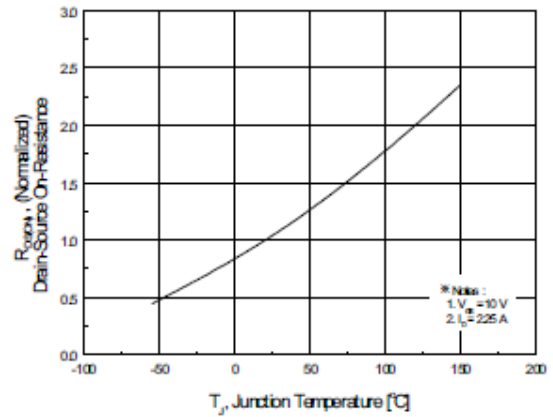


Figure 8. On-Resistance Variation vs. Temperature

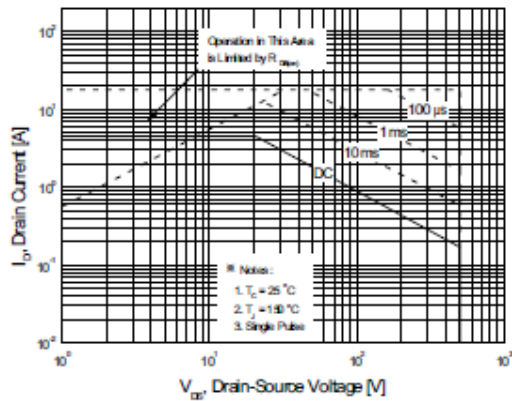


Figure 9. Maximum Safe Operating Area

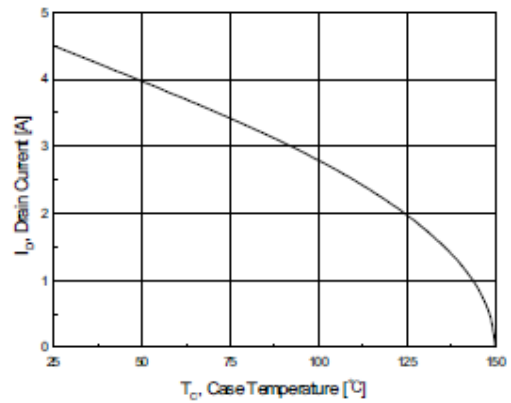


Figure 10. Maximum Drain Current vs. Case Temperature

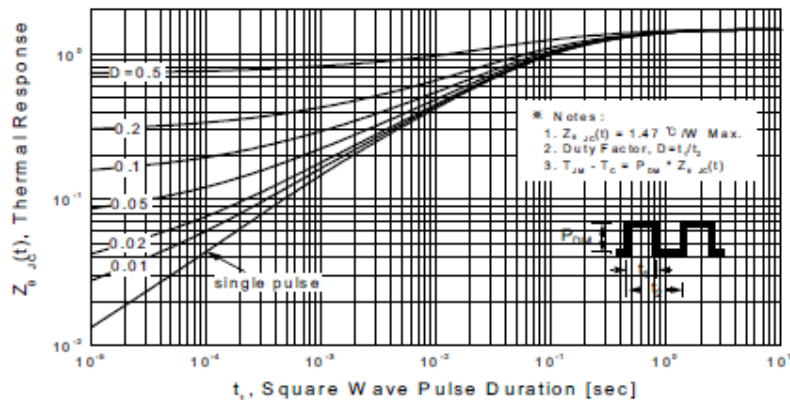


Figure 11. Transient Thermal Response Curve



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