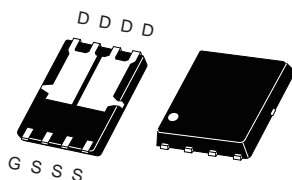


N-Channel Enhancement Mode Field Effect Transistor

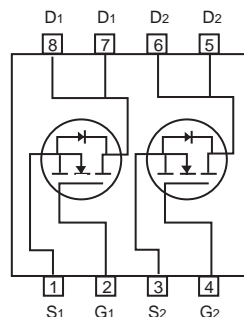
PRELIMINARY

FEATURES

- 60V, 42A, $R_{DS(ON)} = 9\text{ m}\Omega @ V_{GS} = 10\text{V}$.
 $R_{DS(ON)} = 13\text{ m}\Omega @ V_{GS} = 4.5\text{V}$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead-free plating ; RoHS compliant.
- Surface mount Package.



PR-PACK (5*6)



ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$ unless otherwise noted

| Parameter | Symbol | Limit | Units |
|--|--------------------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | $I_D @ R_{\theta JA}$ | 42 | A |
| | $I_D @ R_{\theta JC}$ | 48 | A |
| Drain Current-Pulsed ^a | $I_{DM} @ R_{\theta JA}$ | 52 | A |
| | $I_{DM} @ R_{\theta JC}$ | 168 | A |
| Maximum Power Dissipation | P_D | 32.8 | W |
| Single Pulsed Avalanche Energy ^e | E_{AS} | 60 | mJ |
| Single Pulsed Avalanche Current ^e | I_{AS} | 20 | A |
| Operating and Store Temperature Range | T_J, T_{stg} | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Limit | Units |
|--|-----------------|-------|---------------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 3.8 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient ^b | $R_{\theta JA}$ | 40 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|--|--------------|---|-----|------|------|-----------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0V, I_D = 250\mu A$ | 60 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 60V, V_{GS} = 0V$ | | | 1 | μA |
| Gate Body Leakage Current, Forward | I_{GSSF} | $V_{GS} = 20V, V_{DS} = 0V$ | | | 100 | nA |
| Gate Body Leakage Current, Reverse | I_{GSSR} | $V_{GS} = -20V, V_{DS} = 0V$ | | | -100 | nA |
| On Characteristics ^c | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$ | 1 | | 3 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 13A$ | | 7 | 9 | $m\Omega$ |
| | | $V_{GS} = 4.5V, I_D = 10A$ | | 10 | 13 | $m\Omega$ |
| Dynamic Characteristics ^d | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 30V, V_{GS} = 0V, f = 1.0\text{ MHz}$ | | 1170 | | pF |
| Output Capacitance | C_{oss} | | | 430 | | pF |
| Reverse Transfer Capacitance | C_{rss} | | | 10 | | pF |
| Switching Characteristics ^d | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 30V, I_D = 13A, V_{GS} = 10V, R_{GEN} = 10\Omega$ | | 20 | | ns |
| Turn-On Rise Time | t_r | | | 4 | | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 47 | | ns |
| Turn-Off Fall Time | t_f | | | 8 | | ns |
| Total Gate Charge | Q_g | $V_{DS} = 30V, I_D = 13A, V_{GS} = 4.5V$ | | 9 | | nC |
| Gate-Source Charge | Q_{gs} | | | 3 | | nC |
| Gate-Drain Charge | Q_{gd} | | | 4 | | nC |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Drain-Source Diode Forward Current ^b | I_S | | | | 34 | A |
| Drain-Source Diode Forward Voltage ^c | V_{SD} | $V_{GS} = 0V, I_S = 13A$ | | | 1.2 | V |
| Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature. b.Surface Mounted on FR4 Board, $t < 10$ sec. c.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. d.Guaranteed by design, not subject to production testing. e.L = 0.5mH, $I_{AS} = 23A, V_{DD} = 25V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$ | | | | | | |

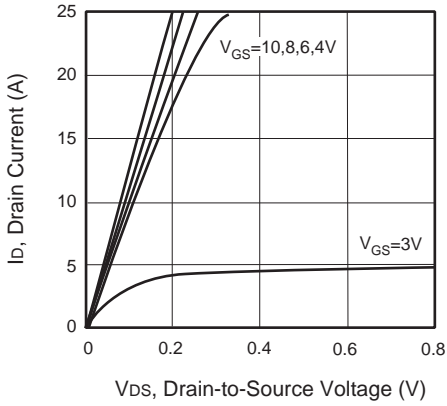


Figure 1. Output Characteristics

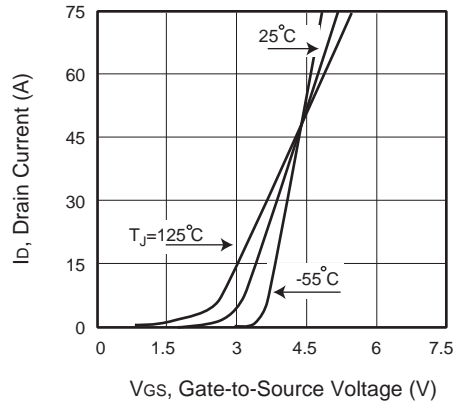


Figure 2. Transfer Characteristics

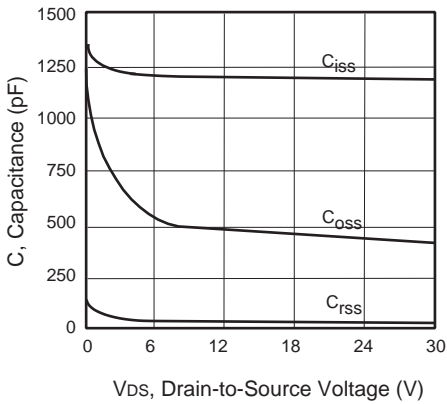


Figure 3. Capacitance

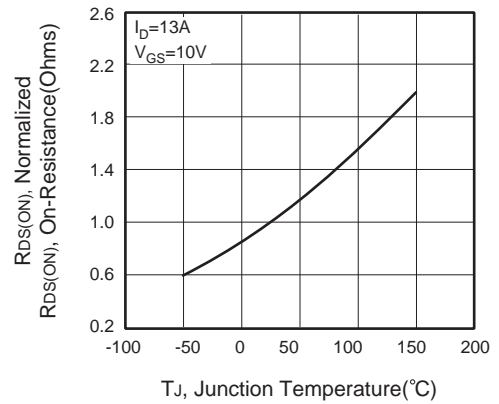


Figure 4. On-Resistance Variation with Temperature

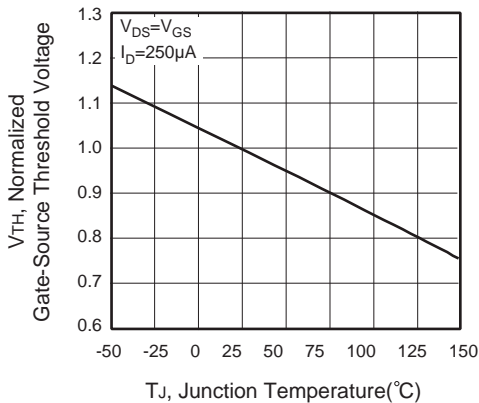


Figure 5. Gate Threshold Variation with Temperature

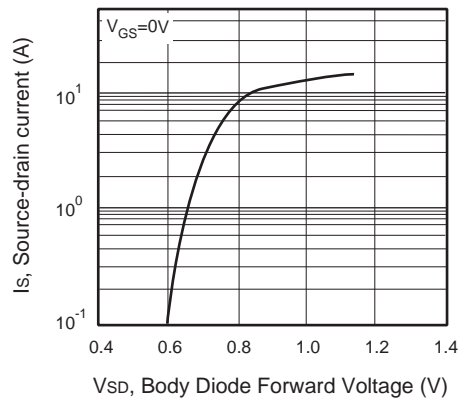


Figure 6. Body Diode Forward Voltage Variation with Source Current

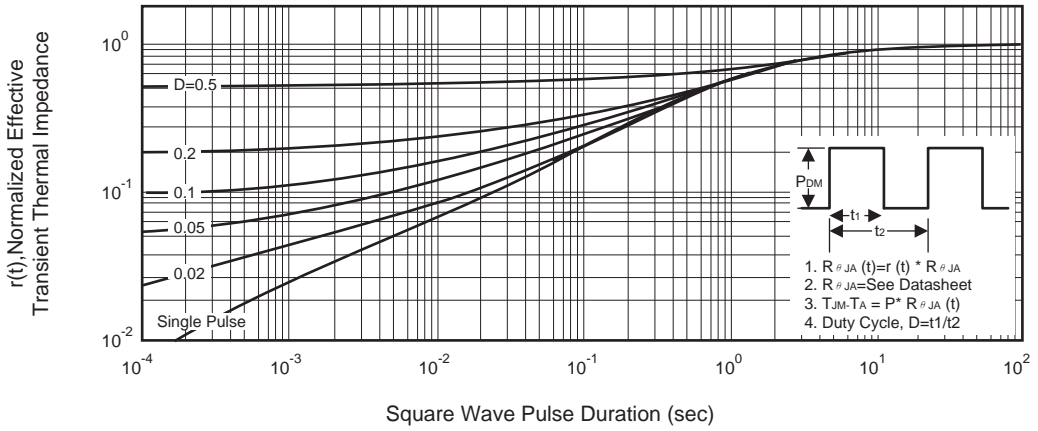


Figure 12. Normalized Thermal Transient Impedance Curve