

150V N-Channel Mosfet

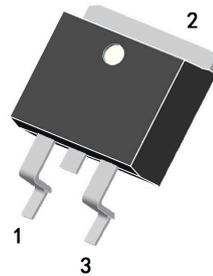
FEATURES

- $R_{DS(ON)} \leq 14m\Omega$ (11m Ω Typ.)
@ $V_{GS}=10V$
- $R_{DS(ON)} \leq 18m\Omega$ (13m Ω Typ.)
@ $V_{GS}=6V$

APPLICATIONS

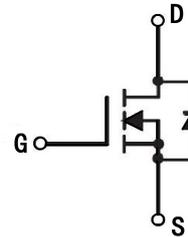
- Portable appliances
- High speed switch
- Battery management
- Low power DC to DC converter

TO-263



1. GATE
2. DRAIN
3. SOURCE

N-CHANNEL MOSFET



MAXIMUM RATINGS ($T_C=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Max. | Units |
|-----------------|---|-------------|--------------|
| V_{DSS} | Drain-Source Voltage | 150 | V |
| V_{GSS} | Gate-Source Voltage | ± 25 | V |
| I_D | Continuous Drain Current | 70 | A |
| I_{DM} | Pulsed Drain Current <small>note1</small> | 280 | A |
| P_D | Power Dissipation | 100 | W |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 1.25 | $^\circ C/W$ |
| T_J | Junction Temperature | 150 | $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to +150 | $^\circ C$ |

MOSFET ELECTRICAL CHARACTERISTICS $T_C=25\text{ }^\circ\text{C}$ unless otherwise specified

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|--|---|------|------|-----------|------------|
| Off Characteristic | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | 150 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 120V,$ $V_{GS} = 0V, T_J = 25^\circ C$ | - | - | 1 | μA |
| I_{GSS} | Gate to Body Leakage Current | $V_{GS} = \pm 25V, V_{DS} = 0V$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 2 | - | 4 | V |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance ^{note2} | $V_{GS} = 10V, I_D = 20A$ | - | 11 | 14 | m Ω |
| | | $V_{GS} = 6V, I_D = 10A$ | - | 13 | 18 | |
| Dynamic Characteristics ^{note3} | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0MHz$ | - | 2800 | - | pF |
| C_{oss} | Output Capacitance | | - | 300 | - | pF |
| C_{riss} | Reverse Transfer Capacitance | | - | 182 | - | pF |
| Q_g | Total Gate Charge | $V_{DS} = 50V, I_D = 25A,$ $V_{GS} = 10V$ | - | 45 | - | nC |
| Q_{gs} | Gate-Source Charge | | - | 8 | - | nC |
| Q_{gd} | Gate-Drain("Miller") Charge | | - | 15 | - | nC |
| Switching Characteristics ^{note3} | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{GS} = 10V, V_{DS} = 50V,$ $R_G = 2\Omega, I_D = 25A$ | - | 13.2 | - | ns |
| t_r | Turn-On Rise Time | | - | 20.5 | - | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | - | 43.1 | - | ns |
| t_f | Turn-Off Fall Time | | - | 13.5 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I_S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 70 | A |
| I_{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 280 | A |
| V_{SD} | Drain to Source Diode Forward Voltage | $V_{GS} = 0V, I_{SD} = 1A,$ $T_J = 25^\circ C$ | - | 0.7 | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $V_{GS} = 0V, I_S = 20A,$ $di/dt = 100A/\mu s$ | - | 20 | - | ns |
| Q_{rr} | Reverse Recovery Charge | | - | 45 | - | nC |

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

3. Guaranteed by design, not subject to production

Typical Performance Characteristics

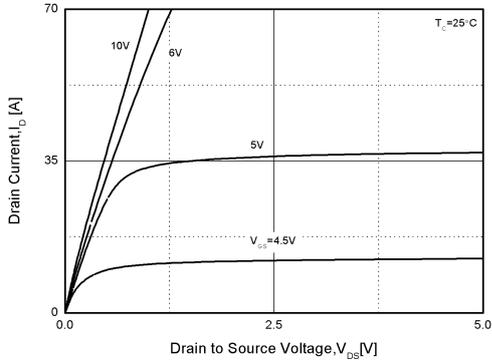


Figure1. Output Characteristics

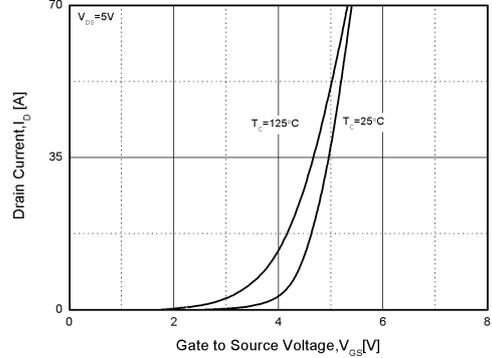


Figure2. Transfer Characteristics

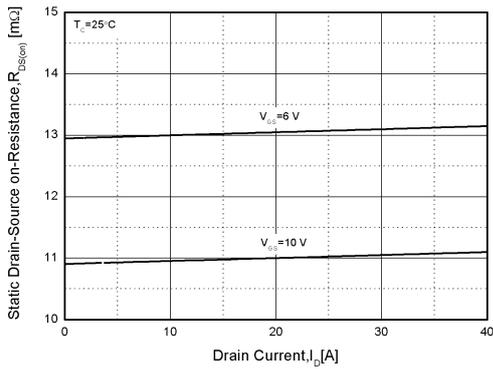


Figure3. Rdson-Drain Current

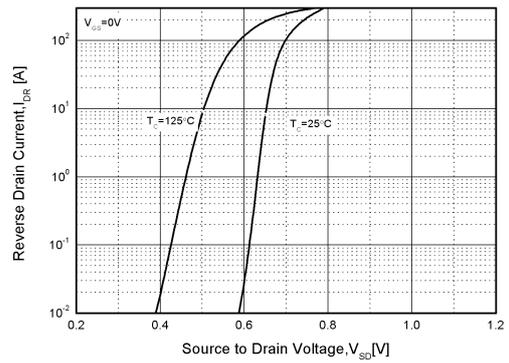


Figure4. Typical Source-Drain Diode Forward Voltage

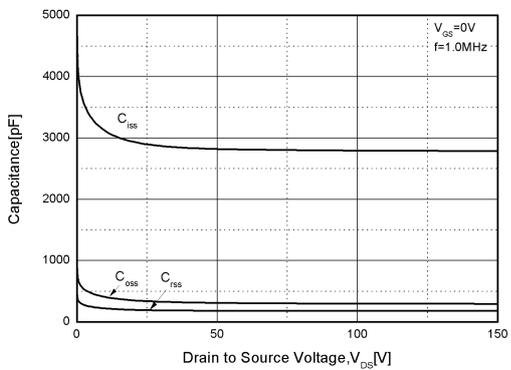


Figure5. Capacitance Characteristics

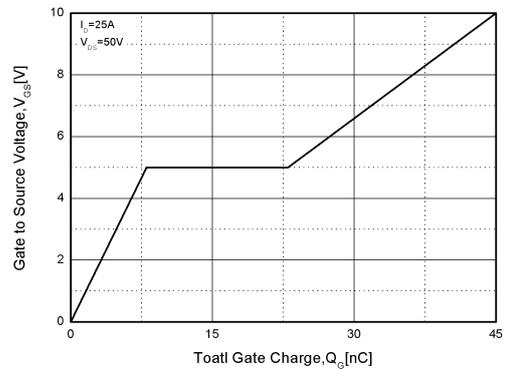


Figure6. Gate Charge

Typical Performance Characteristics (cont.)

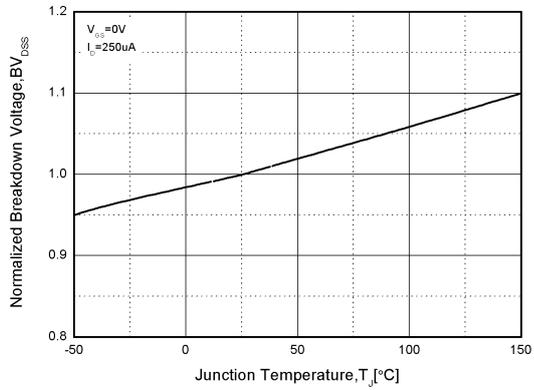


Figure7. Normalized Breakdown Voltage vs. Temperature

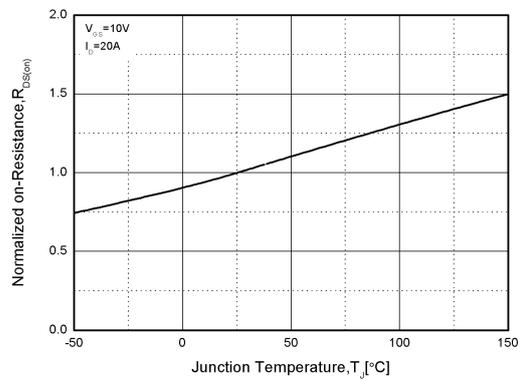


Figure8. Normalized on Resistance vs. Temperature

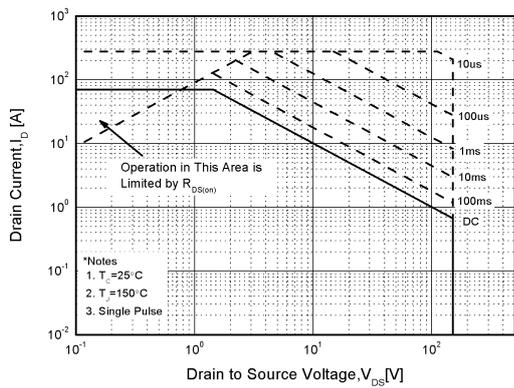


Figure9. Safe Operation Area

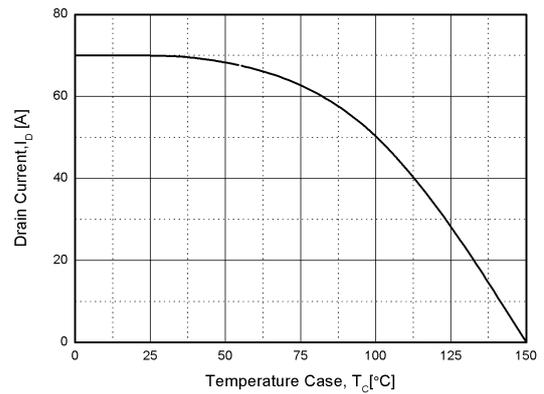


Figure10. Drain Current vs. Case Temperature

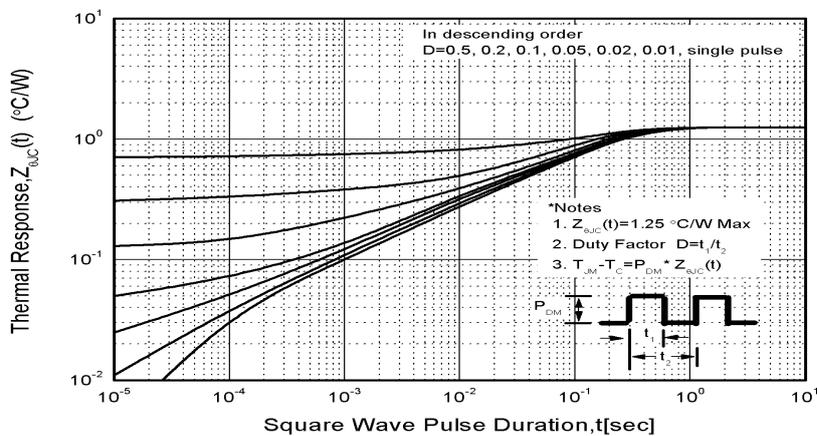
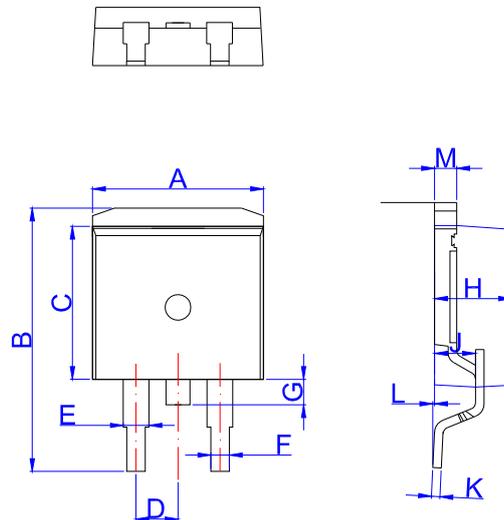


Figure11. Transient Thermal Response Curve

TO-263 PACKAGE OUTLINE DRAWING



| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 9.90 | | 10.20 | 0.390 | | 0.402 |
| B | 14.70 | | 15.80 | 0.579 | | 0.622 |
| C | 9.4 | | 9.6 | 0.37 | | 0.378 |
| D | | 2.54 | | | 0.100 | |
| E | 1.20 | | 1.40 | 0.047 | | 0.055 |
| F | 0.75 | | 0.85 | 0.029 | | 0.033 |
| G | | | 1.75 | | | 0.069 |
| H | 4.40 | | 4.70 | 0.173 | | 0.185 |
| J | 2.30 | | 2.70 | 0.091 | | 0.106 |
| K | 0.38 | | 0.55 | 0.015 | | 0.022 |
| L | 0 | 0.10 | 0.25 | 0 | 0.004 | 0.010 |
| M | 1.25 | | 1.35 | 0.049 | | 0.053 |