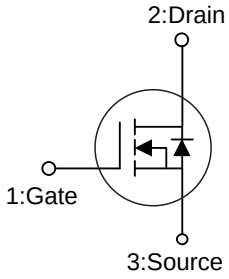
■ PRODUCT CHARACTERISTICS

| | |
|---|---|
| $V_{DSS}$ | 600V |
| $R_{DS(ON)}$ Typ(@$V_{GS}$=10V) | 1.8Ω |
| Qg@typ | 12.5nC |
| $I_D$ | 5A |

Symbol




■ APPLICATIONS

* Electronic lamp ballasts based on half bridge
* Load Switching,Quick/Wirelss Charge.
* Motor Driving


TO-220F

■ FEATURE

* Low Gate Charge
* Pb-Free Lead Plating

■ ORDER INFORMATION

| Order Codes | | Package | Packing |
|---|---|---|---|
| Halogen-Free | Halogen | | |
| N/A | MOT5N60F | TO-220F | 50 pieces/Tube |

■ ABSOLUTE MAXIMUM RATINGS($T_c$ =25°C,unless otherwise specified)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 250 | V |
| Gate-Source Voltage | $V_{GSS}$ | ±30 | V |
| Drain Current Continuous(@$V_{GS}$=10V ,$T_C$=25°C ) | $I_D$ | 5 | A |
| Drain Current Continuous(@$V_{GS}$=10V ,$T_C$=100°C) | $I_D$ | 3.1 | A |
| Drain Current Pulsed | $I_{DM}$ | 20 | A |
| Avalanche Energy * | $E_{AS}$ | 245 | mJ |
| Power Dissipation | $P_D$ | 30 | W |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -55~ +150 | °C |

■ THERMAL CHARACTERISTICS

| Parameter | Symbol | Typ | Unit |
|---|---|---|---|
| Junction to Case | $R_{thJC}$ | 4.17 | °C/W |

Note: * EAS condition: $T_J$=25°C ,$V_{DD}$=50V,$V_G$=10V ,L=10mH,$R_g$ =25Ω

■ ELECTRICAL CHARACTERISTICS ($T_C$=25°C, unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Off characteristics | | | | | | |
| Drain to Source Breakdown Voltage | $V_{DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 600 | - | - | V |
| Drain to Source Leakage Current | $I_{DSS}$ | $V_{DS}$=600V,$V_{GS}$=0V | - | - | 1 | μA |
| Gate to Source Forward Leakage | $I_{GSS(F)}$ | $V_{GS}$=+30V,$V_{DS}$=0V | - | - | 100 | nA |
| Gate to Source Reverse Leakage | $I_{GSS(R)}$ | $V_{GS}$=-30V ,$V_{DS}$=0V | - | - | -100 | nA |
| On characteristics | | | | | | |
| Drain to Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V,$I_D$=2.5A | - | 1.8 | 2.4 | Ω |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 2 | 3.1 | 4 | V |
| Dynamic characteristics | | | | | | |
| Gate capacitance | $R_g$ | $V_{GS}$=0V,$V_{DS}$=0V ,f=1.0MHz | - | 3 | - | Ω |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$=10V,$I_D$=2A | - | 4.2 | - | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V,$V_{GS}$=0V f=1.0MHz | - | 638 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 50 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 7.3 | - | pF |
| Resistive Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(ON)}$ | $V_{GS}$=10V, $V_{DS}$=300V, $I_D$=5A ,$R_G$=10Ω | - | 14 | - | ns |
| Rise Time | $t_r$ | | - | 15 | - | ns |
| Turn-off Delay Time | $t_{d(OFF)}$ | | - | 34 | - | ns |
| Fall Time | $t_f$ | | - | 13 | - | ns |
| Total Gate Charge | $Q_g$ | $I_D$=5A, $V_{DS}$=300V $V_{GS}$=10V | - | 12.5 | - | nC |
| Gate to Source Charge | $Q_{gs}$ | | - | 2.6 | - | nC |
| Gate to Drain("Miller") Charge | $Q_{gd}$ | | - | 5.5 | - | nC |
| Source-Drain Diode Characteristics | | | | | | |
| Continuous Source Current(Body Diode) | $I_S$ | | - | - | 5 | A |
| Maximum Pulsed Current(Body Diode) | $I_{SM}$ | | - | - | 20 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_{SD}$=1A, $V_{GS}$=0V | - | 0.74 | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{SD}$=10A, $T_J$=25°C dI/dt=100A/μs | - | 250 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 1000 | - | nC |

## ■ TYPICAL CHARACTERISTICS

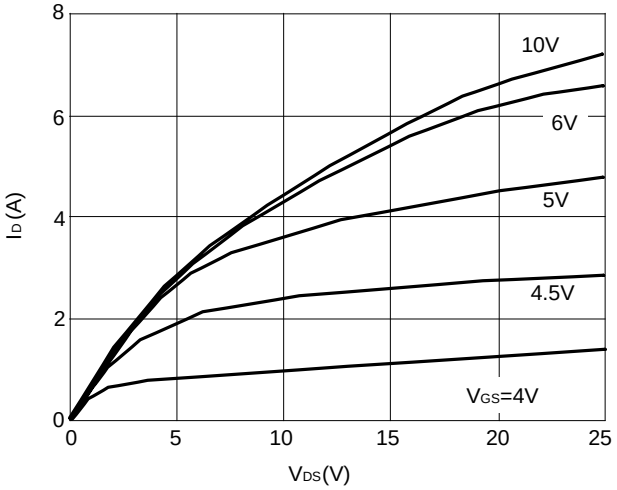



Figure 1: Output Characteristics

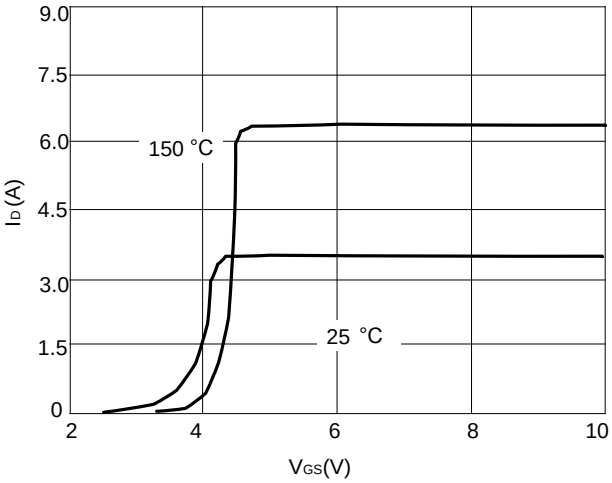



Figure 2: Typical Transfer Characteristics

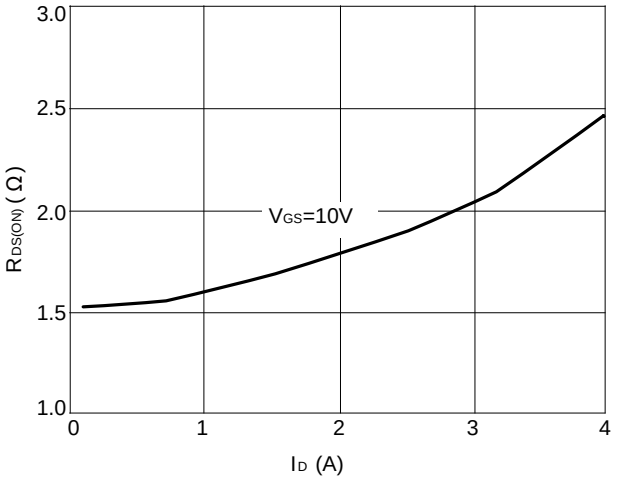



Figure 3: On-Resistance vs. Drain Current

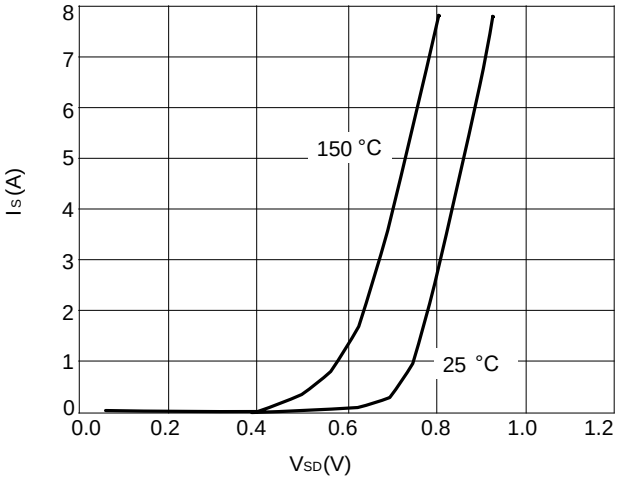



Figure 4: Body Diode Characteristics

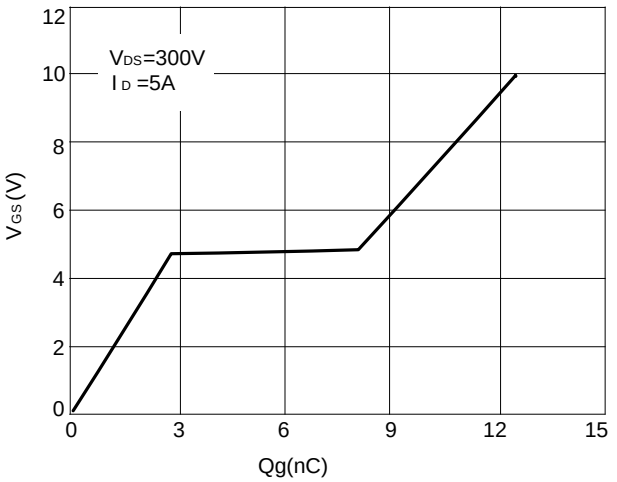



Figure 5: Gate Charge Characteristics

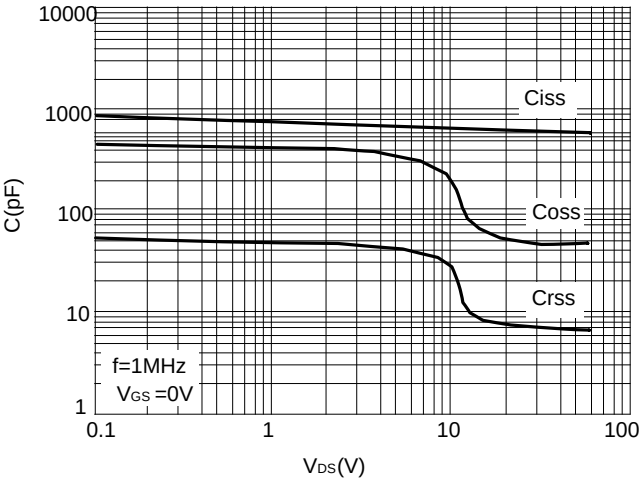



Figure 6: Cpacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

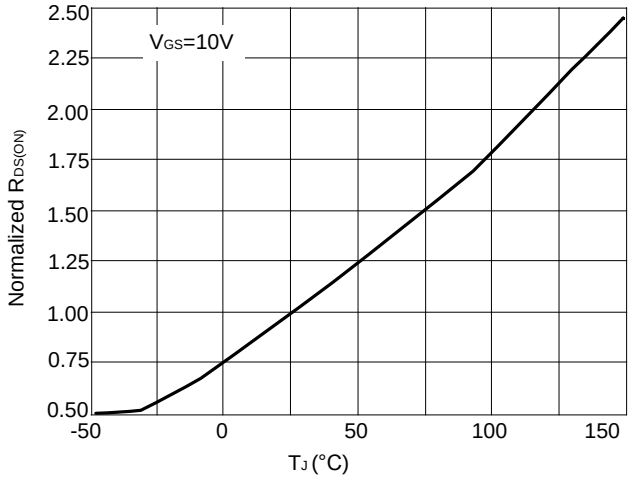



Figure 7: Normalized on-Resistance vs. Junction Temperature

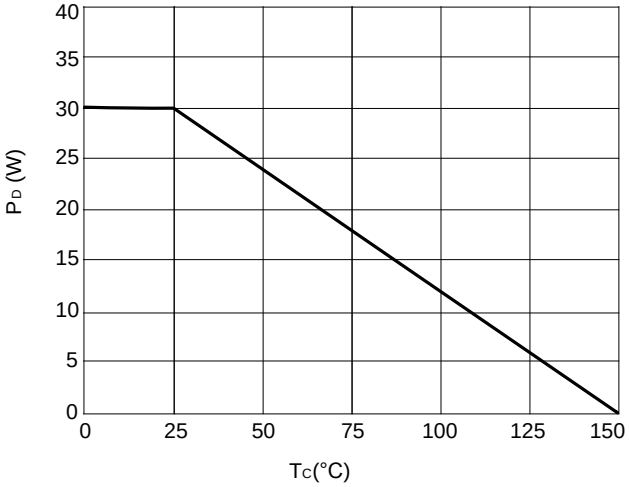



Figure 8: Power De-rating

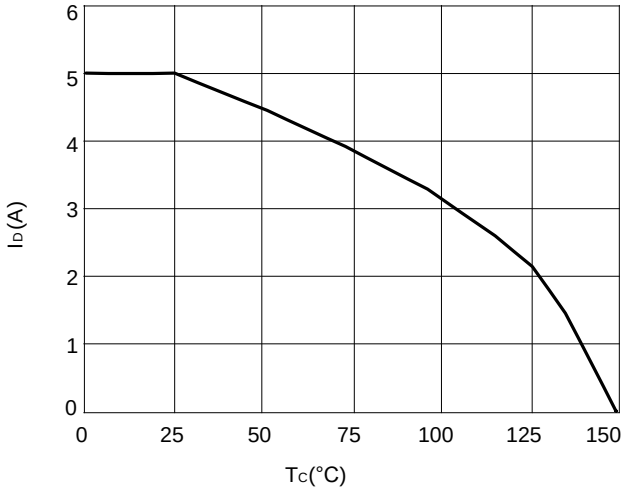



Figure 9: Current De-rating

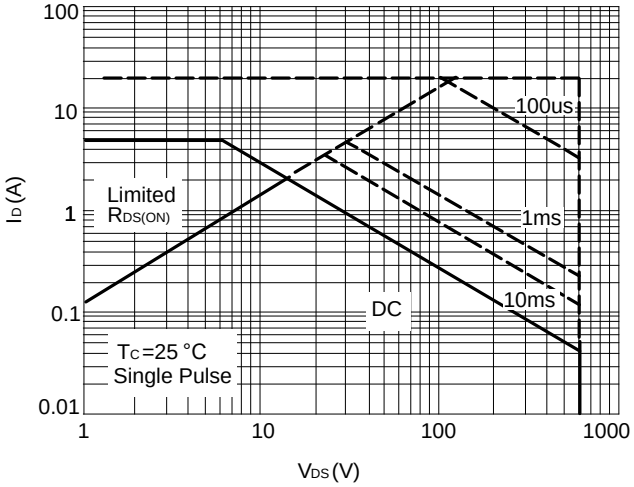



Figure 10: Maximum Safe Operating Area

■ TO-220F PACKAGE OUTLINE DIMENSIONS