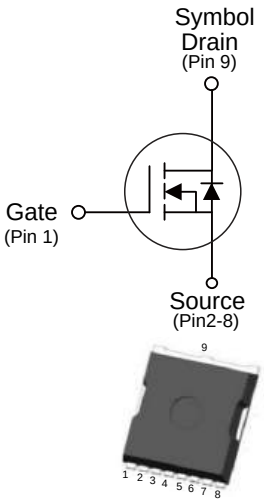
■ PRODUCT CHARACTERISTICS

| | |
|---|---|
| $V_{DSS}$ | 650V |
| $R_{DS(ON)}$Typ(@$V_{GS}$=10V) | 57mΩ |
| Qg@typ | 95.1nC |
| $I_D$ | 45A |




TOLL

■ APPLICATIONS

* High efficiency switch mode power supplies
* Electronic lamp ballasts based on half bridge
* LED power supplies

■ FEATURE

* High Switching Speed
* Improved dv/dt capability

■ ORDER INFORMATION

| Order Codes | | Package | Packing |
|---|---|---|---|
| Halogen-Free | Halogen | | |
| MOT65R070T | N/A | TOLL | 2000 pieces/Reel |

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

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 650 | V |
| Gate-Source Voltage | $V_{GSS}$ | ±30 | V |
| Drain Current Continuous(@$V_{GS}$=10V ,$T_A$=25°C ) | $I_D$ | 45 | A |
| Drain Current Pulsed | $I_{DM}$ | 180 | A |
| Avalanche Energy * | $E_{AS}$ | 956 | mJ |
| Power Dissipation | $P_D$ | 347 | W |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -55~ +150 | °C |

■ THERMAL CHARACTERISTICS

| Parameter | Symbol | Typ | Unit |
|---|---|---|---|
| Junction to Case | $R_{thJC}$ | 0.36 | °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 | 650 | - | - | V |
| Drain to Source Leakage Current | $I_{DSS}$ | $V_{DS}$=650V,$V_{GS}$=0V | - | - | 1 | μA |
| Gate to Source Forward Leakage | $I_{GSS(F)}$ | $V_{DS}$=0V, $V_{GS}$=+30V | - | - | 100 | nA |
| Gate to Source Reverse Leakage | $I_{GSS(R)}$ | $V_{DS}$=0V, $V_{GS}$=-30V | - | - | -100 | nA |
| On characteristics | | | | | | |
| Drain to Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V,$I_D$=22.5A | - | 57 | 70 | mΩ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 2 | 3.6 | 4 | V |
| Dynamic characteristics | | | | | | |
| Gate Resistance | $R_g$ | $V_{GS}$=0V,$V_{DS}$=0V ,f=1.0MHz | - | 0.81 | - | Ω |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$=10V,$I_D$=5A | - | 16 | - | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=40V,$V_{GS}$=0V<br>f=1.0MHz | - | 4000 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 440 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 68 | - | pF |
| Resistive Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(ON)}$ | $I_D$=22A, $V_{DS}$=325V<br>$R_G$=10Ω ,$V_{GS}$=10V | - | 158.9 | - | ns |
| Rise Time | $t_r$ | | - | 23 | - | ns |
| Turn-off Delay Time | $t_{d(OFF)}$ | | - | 109.5 | - | ns |
| Fall Time | $t_f$ | | - | 6.2 | - | ns |
| Total Gate Charge | $Q_g$ | $I_D$=22A, $V_{DS}$=325V<br>$V_{GS}$=10V | - | 95.1 | - | nC |
| Gate to Source Charge | $Q_{gs}$ | | - | 27.4 | - | nC |
| Gate to Drain("Miller") Charge | $Q_{gd}$ | | - | 35.1 | - | nC |
| Source-Drain Diode Characteristics | | | | | | |
| Continuous Source Current(Body Diode) | $I_S$ | | - | - | 45 | A |
| Maximum Pulsed Current(Body Diode) | $I_{SM}$ | | - | - | 180 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_{SD}$=1A, $V_{GS}$=0V | - | 0.74 | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{SD}$=22 A, $T_J$=25 °C<br>dI/dt=100A/μs | - | 180 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 1500 | - | nC |

## ■ TYPICAL CHARACTERISTICS

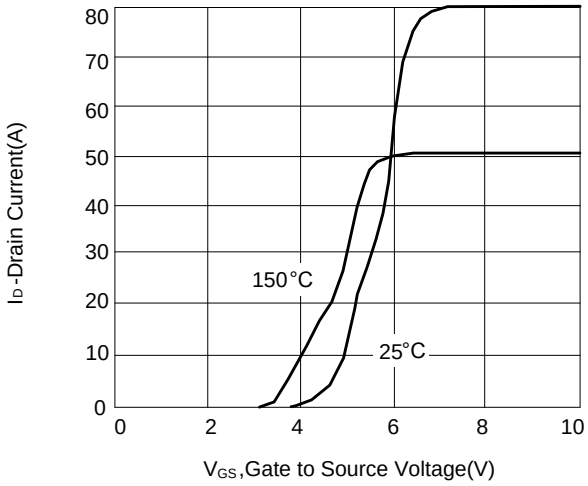



Figure 1: Transfer Characteristics

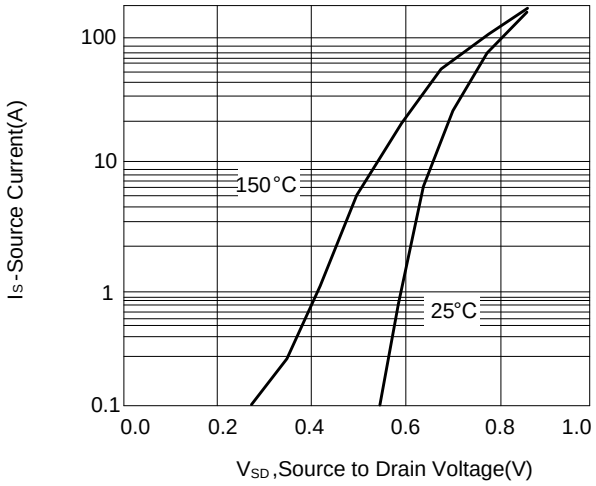



Figure 2: Body Diode Characteristics

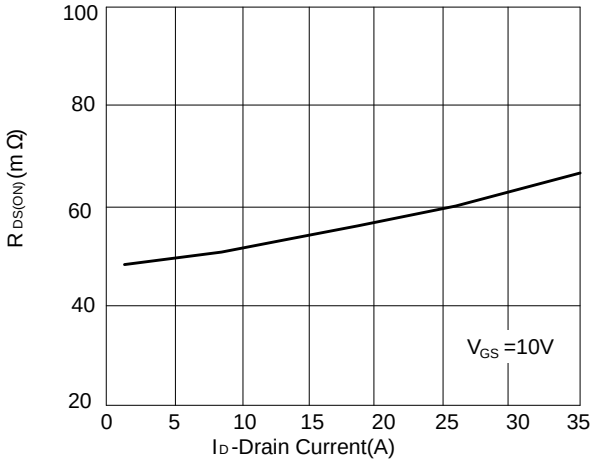



Figure 3: Drain to Source On-Resistance vs Drain Current

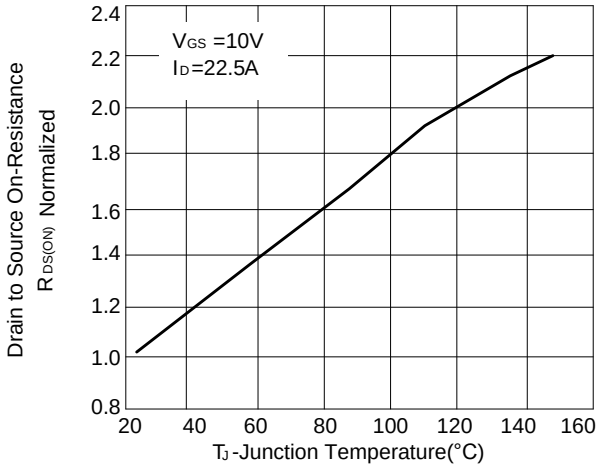



Figure 4: Drain to Source On-Resistance vs.Junction Temperature

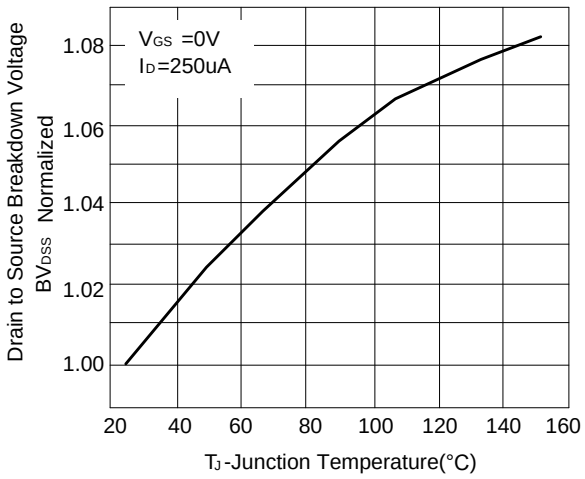



Figure 5: Breakdown Voltage vs Junction Temperature

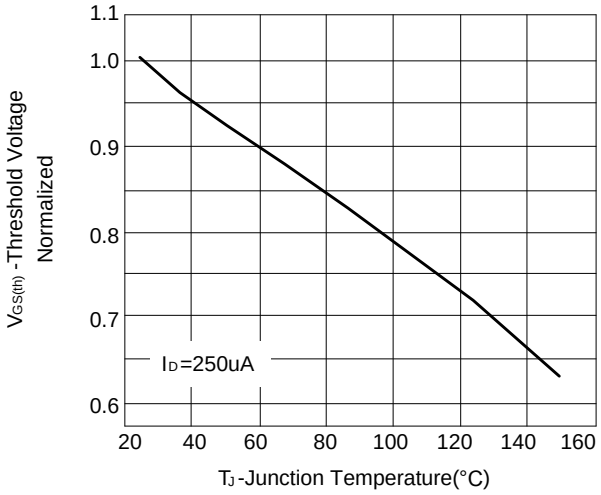



Figure 6: Threshold Voltage vs Junction Temperature

■ TYPICAL CHARACTERISTICS(Cont.)

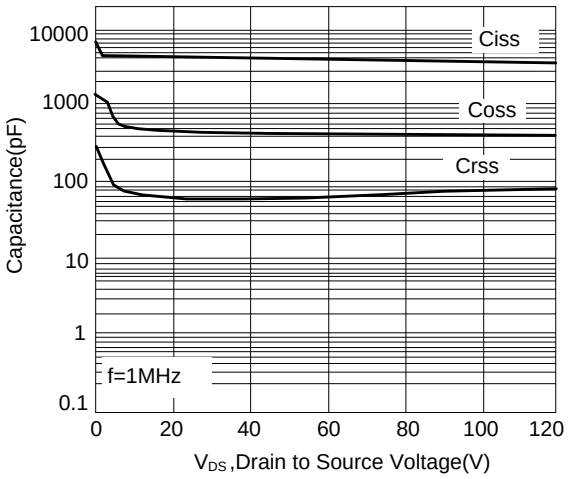



Figure 7: Capacitance vs Drain to Source Voltagfe

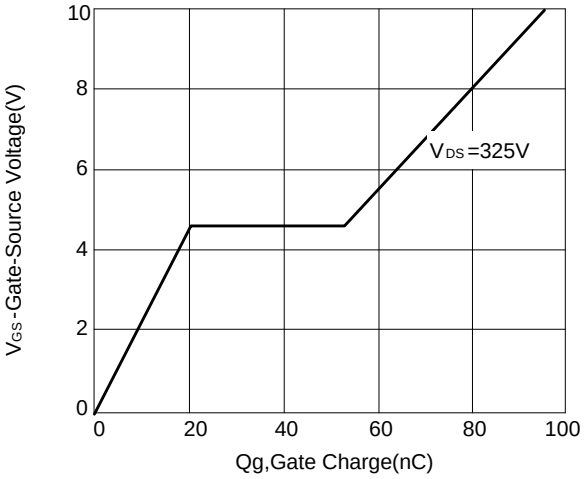



Figure 8: Gate Charge vs Gate to Source Voltage

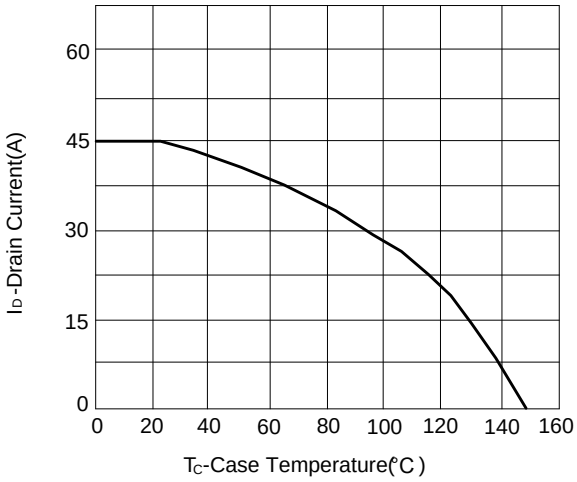



Figure 9: Continuous Drain vs Case Temperature

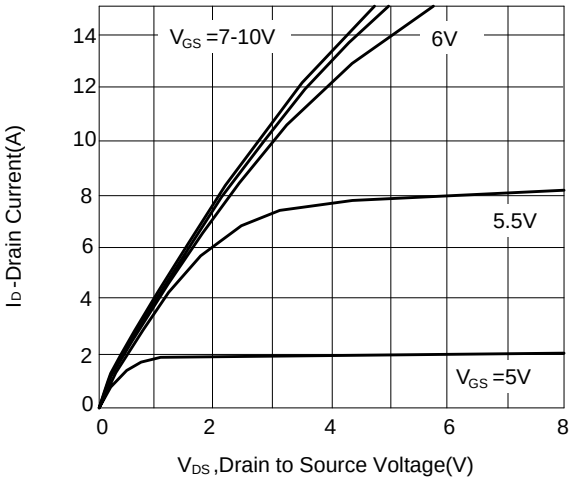



Figure 10: Output Characteristics

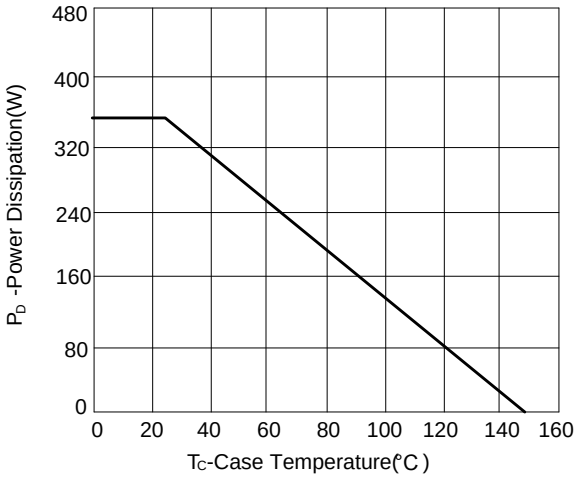



Figure 11: Power Dissipation vs Case Temperature

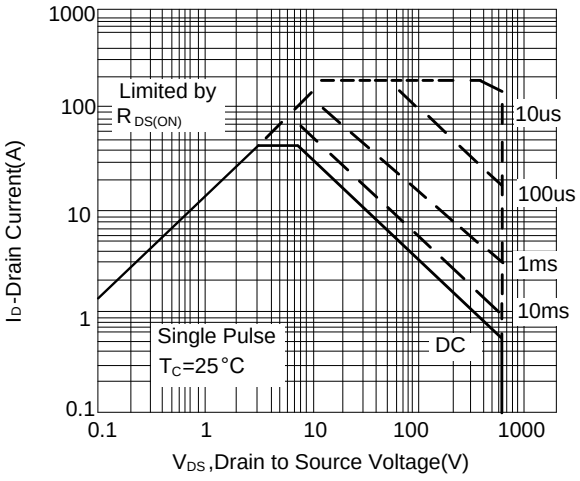
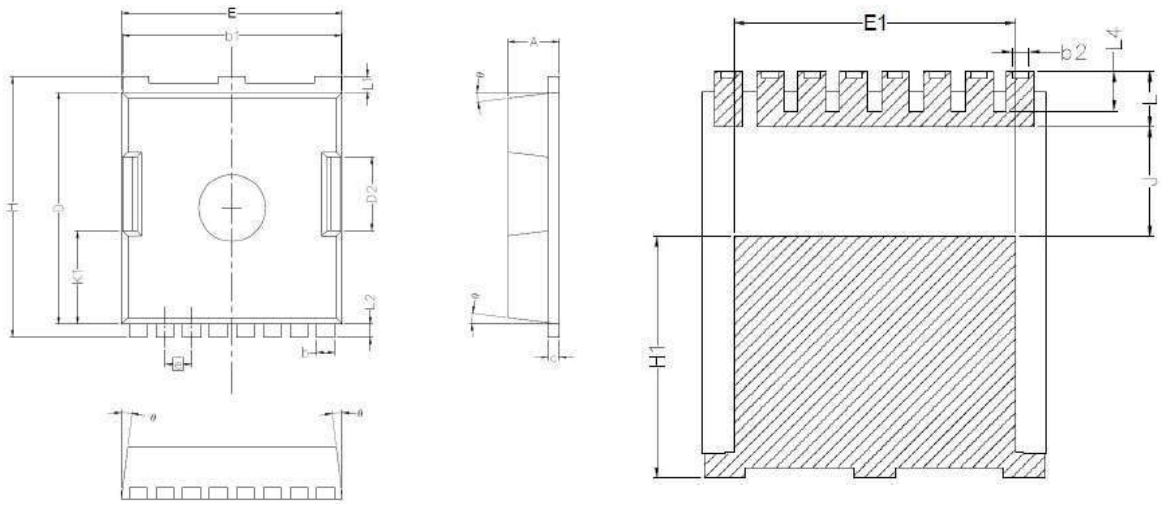



Figure 12: Safe operating Area

■ TOLL PACKAGE OUTLINE DIMENSIONS




| Symbol | Dimesions In Millimeters | |
|---|---|---|
| | Min. | Max. |
| A | 2.20 | 2.40 |
| b | 0.70 | 0.90 |
| b1 | 9.70 | 9.90 |
| b2 | 0.42 | 0.50 |
| c | 0.40 | 0.60 |
| D | 10.28 | 10.58 |
| D2 | 3.10 | 3.50 |
| E | 9.70 | 10.10 |
| E1 | 7.90 | 8.30 |
| e | 1.20BSC | |
| H | 11.48 | 11.88 |
| H1 | 6.75 | 7.15 |
| N | 8 | |
| J | 3.00 | 3.30 |
| K1 | 3.98 | 4.38 |
| L | 1.40 | 1.80 |
| L1 | 0.60 | 0.80 |
| L2 | 0.50 | 0.70 |
| L4 | 1.00 | 1.30 |
| $\theta$ | 4° | 10° |