

# PRODUCT CHARACTERISTICS

|                                   |               |
|-----------------------------------|---------------|
| $V_{DSS}$                         | 600V          |
| $R_{DS(ON)}$ Typ(@ $V_{GS}=10V$ ) | 0.24 $\Omega$ |
| Qg@typ                            | 83nC          |
| $I_D$                             | 28A           |

# 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    |         |                |
| N/A          | MOT28N60HF | TO-220F | 50 pieces/Tube |

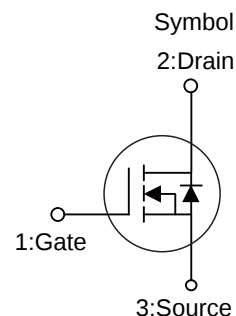
# ABSOLUTE MAXIMUM RATINGS( $T_A=25^{\circ}C$ , unless otherwise specified)

| Parameter                                                     | Symbol    | Ratings   | Unit        |
|---------------------------------------------------------------|-----------|-----------|-------------|
| Drain-Source Voltage                                          | $V_{DSS}$ | 600       | V           |
| Gate-Source Voltage                                           | $V_{GSS}$ | $\pm 30$  | V           |
| Drain Current Continuous(@ $V_{GS}=10V$ , $T_A=25^{\circ}C$ ) | $I_D$     | 28        | A           |
| Drain Current Pulsed                                          | $I_{DM}$  | 112       | A           |
| Avalanche Energy *                                            | $E_{AS}$  | 2380      | mJ          |
| Peak Diode Recovery dv/dt                                     | dv/dt     | 5.0       | V/ns        |
| Power Dissipation                                             | $P_D$     | 50        | W           |
| Junction Temperature                                          | $T_J$     | +150      | $^{\circ}C$ |
| Storage Temperature                                           | $T_{STG}$ | -55~ +150 | $^{\circ}C$ |

# THERMAL CHARACTERISTICS

| Parameter           | Symbol     | Typ  | Unit          |
|---------------------|------------|------|---------------|
| Junction to Ambient | $R_{thJA}$ | 62.5 | $^{\circ}C/W$ |
| Junction to Case    | $R_{thJC}$ | 2.5  | $^{\circ}C/W$ |

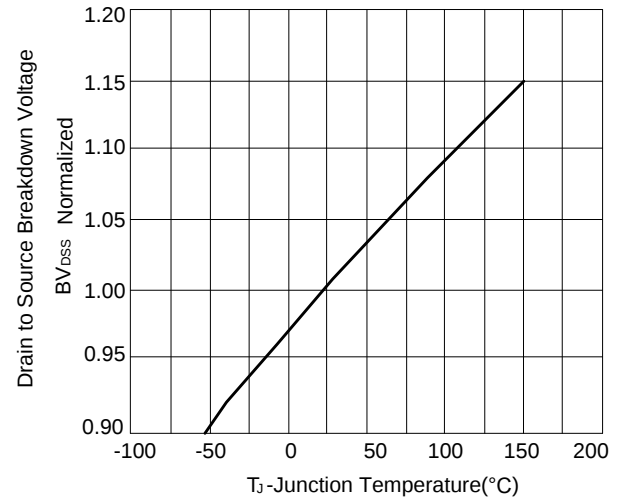
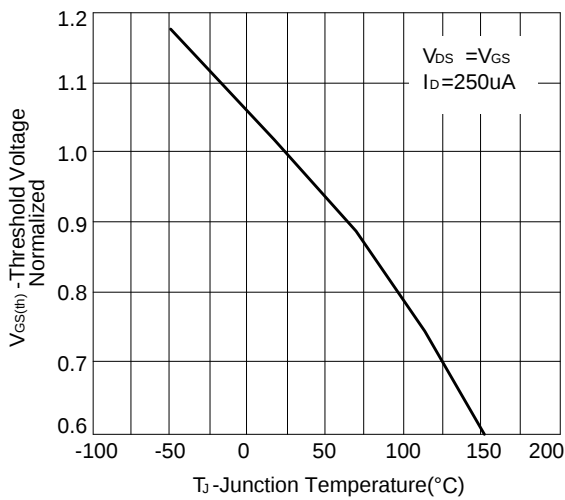
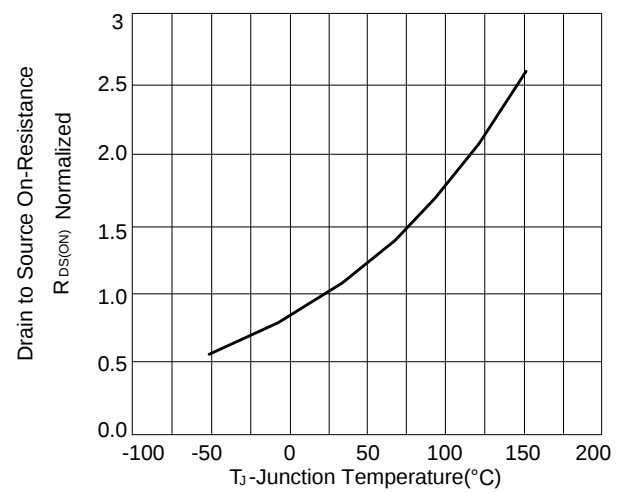
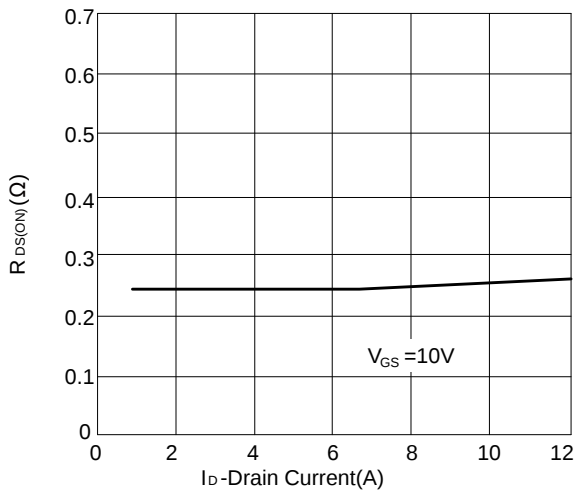
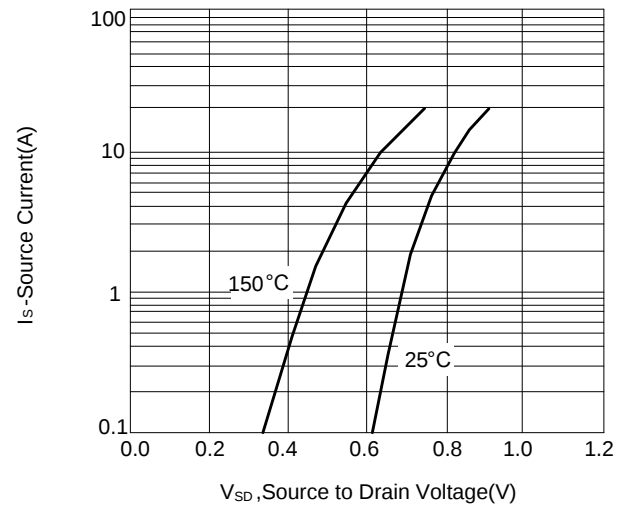
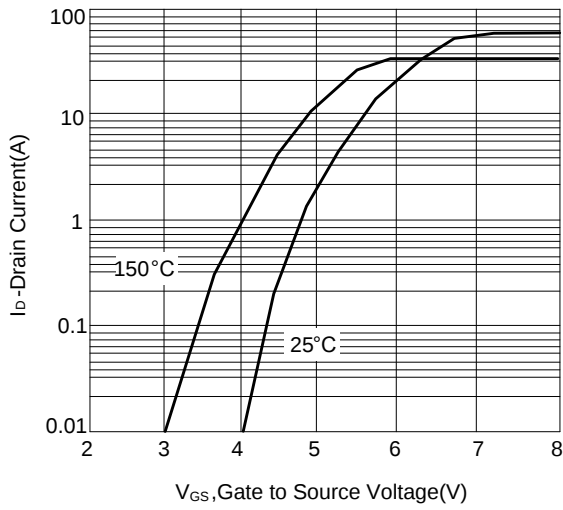
Note: \* EAS condition:  $T_J=25^{\circ}C$ ,  $V_{DD}=50V$ ,  $V_G=10V$ ,  $L=10mH$ ,  $R_g=25\Omega$



**■ ELECTRICAL CHARACTERISTICS** ( $T_C=25^{\circ}\text{C}$ , unless otherwise noted)

| Parameter                             | Symbol              | Test Conditions                                                                              | Min | Typ  | Max  | Unit |
|---------------------------------------|---------------------|----------------------------------------------------------------------------------------------|-----|------|------|------|
| Off characteristics                   |                     |                                                                                              |     |      |      |      |
| Drain to Source Breakdown Voltage     | V <sub>DSS</sub>    | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                   | 600 | -    | -    | V    |
| Drain to Source Leakage Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =600V, V <sub>GS</sub> =0V                                                   | -   | -    | 1    | μA   |
| Gate to Source Forward Leakage        | I <sub>GSS(F)</sub> | V <sub>DS</sub> =0V, V <sub>GS</sub> =+30V                                                   | -   | -    | 100  | nA   |
| Gate to Source Reverse Leakage        | I <sub>GSS(R)</sub> | V <sub>DS</sub> =0V, V <sub>GS</sub> =-30V                                                   | -   | -    | -100 | nA   |
| On characteristics                    |                     |                                                                                              |     |      |      |      |
| Drain to Source On-Resistance         | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =14A                                                    | -   | 0.24 | 0.29 | Ω    |
| Gate Threshold Voltage                | V <sub>GS(TH)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                     | 2   | -    | 4    | V    |
| Dynamic characteristics               |                     |                                                                                              |     |      |      |      |
| Gate capacitance                      | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V ,f=1.0MHz                                           | -   | 1.6  | -    | Ω    |
| Forward Transconductance              | g <sub>fs</sub>     | V <sub>DS</sub> =10V, I <sub>D</sub> =3A                                                     | -   | 11   | -    | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V<br>f=1.0MHz                                        | -   | 4600 | -    | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                              | -   | 292  | -    | pF   |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                              | -   | 2.7  | -    | pF   |
| Resistive Switching Characteristics   |                     |                                                                                              |     |      |      |      |
| Turn-on Delay Time                    | t <sub>d(ON)</sub>  | I <sub>D</sub> =28 A, V <sub>DS</sub> =300V<br><br>R <sub>G</sub> =10Ω ,V <sub>GS</sub> =10V | -   | 56   | -    | ns   |
| Rise Time                             | t <sub>r</sub>      |                                                                                              | -   | 83   | -    | ns   |
| Turn-off Delay Time                   | t <sub>d(OFF)</sub> |                                                                                              | -   | 107  | -    | ns   |
| Fall Time                             | t <sub>f</sub>      |                                                                                              | -   | 59   | -    | ns   |
| Total Gate Charge                     | Q <sub>g</sub>      | I <sub>D</sub> =28 A, V <sub>DS</sub> =300V<br>V <sub>GS</sub> =10V                          | -   | 83   | -    | nC   |
| Gate to Source Charge                 | Q <sub>gs</sub>     |                                                                                              | -   | 26.4 | -    | nC   |
| Gate to Drain("Miller") Charge        | Q <sub>gd</sub>     |                                                                                              | -   | 27.3 | -    | nC   |
| Source-Drain Diode Characteristics    |                     |                                                                                              |     |      |      |      |
| Continuous Source Current(Body Diode) | I <sub>s</sub>      |                                                                                              | -   | -    | 28   | A    |
| Maximum Pulsed Current(Body Diode)    | I <sub>SM</sub>     |                                                                                              | -   | -    | 112  | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>SD</sub> =1A, V <sub>GS</sub> =0V                                                     | -   | 0.7  | 1.2  | V    |
| Reverse Recovery Time                 | t <sub>rr</sub>     | I <sub>SD</sub> =28 A, T <sub>J</sub> =25 °C                                                 | -   | 514  | -    | ns   |
| Reverse Recovery Charge               | Q <sub>rr</sub>     | dI /dt=100A/μs                                                                               | -   | 8.57 | -    | uC   |

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)

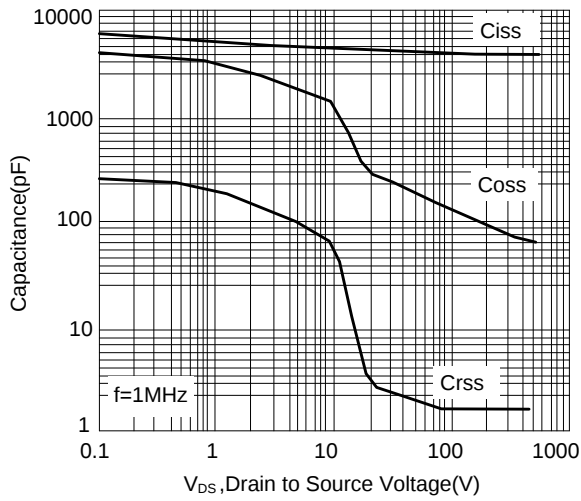


Figure 7: Capacitance vs Drain to Source Voltage

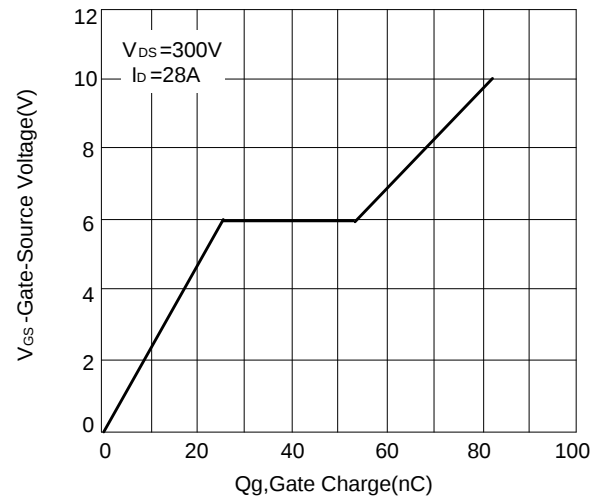


Figure 8: Gate Charge vs Gate to Source Voltage

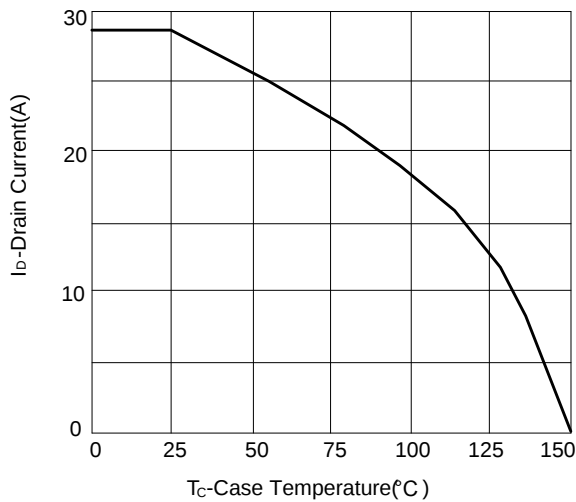


Figure 9: Continuous Drain vs Case Temperature

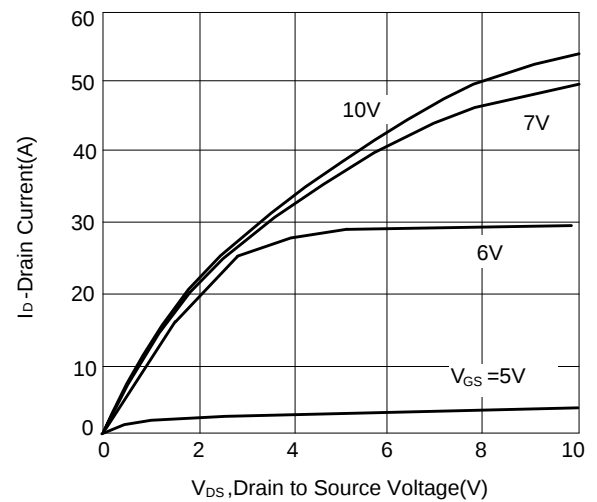


Figure 10: Output Characteristics

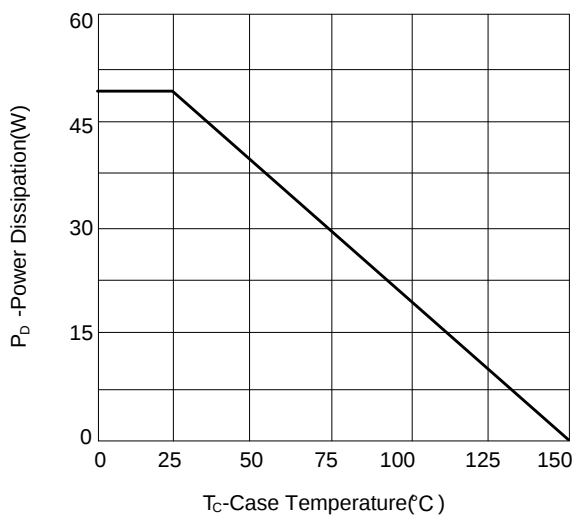


Figure 11: Power Dissipation vs Case Temperature

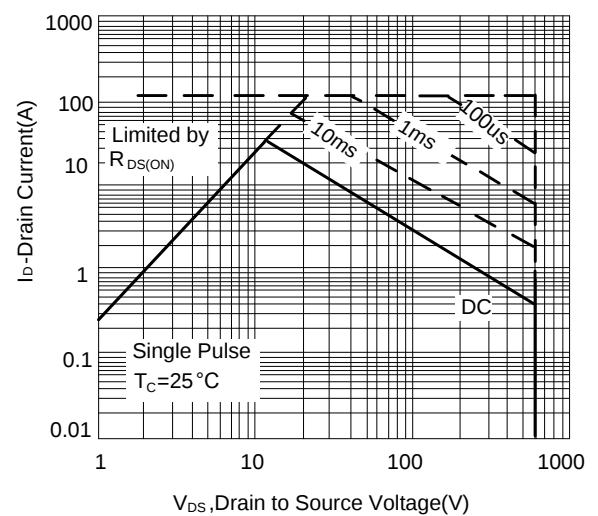


Figure 12: Safe operating Area

Technical drawing of a mechanical part, showing front, top, and side views with dimensions.

**Front View Dimensions:**

- Overall width:  $10.06 \pm 0.15$
- Overall height:  $15.87 \pm 0.15$
- Top flange width:  $7.00 \pm 0.15$
- Top flange thickness:  $3.30$
- Central hole diameter:  $3 - \phi 1.50$
- Central hole position from top edge:  $1.80$
- Central hole position from side edge:  $1.80 \pm 0.1$
- Bottom flange width:  $8.0$
- Bottom flange thickness:  $4.90$
- Bottom flange radius:  $R0.5$
- Bottom flange position from top edge:  $6.10 \pm 0.1$
- Bottom flange position from side edge:  $1.80 \pm 0.1$
- Bottom flange position from bottom edge:  $(6.47)$
- Bottom flange position from top edge:  $12.93 \pm 0.3$
- Bottom flange position from side edge:  $3 - 1.38 \pm 0.1$
- Bottom flange position from bottom edge:  $(9.75)$
- Bottom flange position from top edge:  $(3.18)$
- Bottom flange position from side edge:  $0.80$
- Bottom flange position from bottom edge:  $2.54$
- Bottom flange position from top edge:  $2.54$

**Top View Dimensions:**

- Overall width:  $10.06 \pm 0.15$
- Overall height:  $15.87 \pm 0.15$
- Top flange width:  $7.00 \pm 0.15$
- Top flange thickness:  $3.30$
- Central hole diameter:  $3 - \phi 1.50$
- Central hole position from top edge:  $1.80$
- Central hole position from side edge:  $1.80 \pm 0.1$
- Bottom flange width:  $8.0$
- Bottom flange thickness:  $4.90$
- Bottom flange radius:  $R0.5$
- Bottom flange position from top edge:  $6.10 \pm 0.1$
- Bottom flange position from side edge:  $1.80 \pm 0.1$
- Bottom flange position from bottom edge:  $(6.47)$
- Bottom flange position from top edge:  $12.93 \pm 0.3$
- Bottom flange position from side edge:  $3 - 1.38 \pm 0.1$
- Bottom flange position from bottom edge:  $(9.75)$
- Bottom flange position from top edge:  $(3.18)$
- Bottom flange position from side edge:  $0.80$
- Bottom flange position from bottom edge:  $2.54$
- Bottom flange position from top edge:  $2.54$

**Side View Dimensions:**

- Overall width:  $10.06 \pm 0.15$
- Overall height:  $15.87 \pm 0.15$
- Top flange width:  $7.00 \pm 0.15$
- Top flange thickness:  $3.30$
- Central hole diameter:  $3 - \phi 1.50$
- Central hole position from top edge:  $1.80$
- Central hole position from side edge:  $1.80 \pm 0.1$
- Bottom flange width:  $8.0$
- Bottom flange thickness:  $4.90$
- Bottom flange radius:  $R0.5$
- Bottom flange position from top edge:  $6.10 \pm 0.1$
- Bottom flange position from side edge:  $1.80 \pm 0.1$
- Bottom flange position from bottom edge:  $(6.47)$
- Bottom flange position from top edge:  $12.93 \pm 0.3$
- Bottom flange position from side edge:  $3 - 1.38 \pm 0.1$
- Bottom flange position from bottom edge:  $(9.75)$
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- Bottom flange position from side edge:  $0.80$
- Bottom flange position from bottom edge:  $2.54$
- Bottom flange position from top edge:  $2.54$