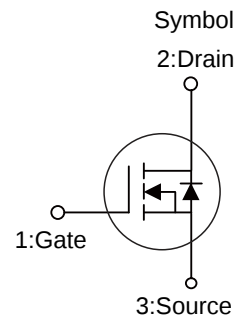


# PRODUCT CHARACTERISTICS

|                                   |               |
|-----------------------------------|---------------|
| $V_{DSS}$                         | 650V          |
| $R_{DS(ON)}$ Typ(@ $V_{GS}=10V$ ) | 1.12 $\Omega$ |
| $Q_g$ @typ                        | 24nC          |
| $I_D$                             | 7A            |



# 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          | MOT7N65A | TO-220  | 50 pieces/Tube |



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

| Parameter                                                     | Symbol    | Ratings   | Unit        |
|---------------------------------------------------------------|-----------|-----------|-------------|
| Drain-Source Voltage                                          | $V_{DSS}$ | 650       | V           |
| Gate-Source Voltage                                           | $V_{GSS}$ | $\pm 30$  | V           |
| Drain Current Continuous(@ $V_{GS}=10V$ , $T_A=25^{\circ}C$ ) | $I_D$     | 7         | A           |
| Drain Current Pulsed                                          | $I_{DM}$  | 28        | A           |
| Avalanche Energy *                                            | $E_{AS}$  | 760       | mJ          |
| Peak Diode Recovery dv/dt                                     | dv/dt     | 5.0       | V/ns        |
| Power Dissipation                                             | $P_D$     | 100       | 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    | $R_{thJC}$ | 1.52 | $^{\circ}C/W$ |

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                                             | 650 | -    | -    | V    |
| Drain to Source Leakage Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =650V, 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> =3.5A                                             | -   | 1.12 | 1.5  | 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 Resistance                       | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V ,f=1.0MHz                                     | -   | 2.2  | -    | Ω    |
| Forward Transconductance              | g <sub>fs</sub>     | V <sub>DS</sub> =10V, I <sub>D</sub> =3A                                               | -   | 6    | -    | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V<br>f=1.0MHz                                  | -   | 1200 | -    | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                        | -   | 81   | -    | pF   |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                        | -   | 1.9  | -    | pF   |
| Resistive Switching Characteristics   |                     |                                                                                        |     |      |      |      |
| Turn-on Delay Time                    | t <sub>d(ON)</sub>  | I <sub>D</sub> =7A, V <sub>DS</sub> =325V<br>R <sub>G</sub> =10Ω ,V <sub>GS</sub> =10V | -   | 18   | -    | ns   |
| Rise Time                             | t <sub>r</sub>      |                                                                                        | -   | 15   | -    | ns   |
| Turn-off Delay Time                   | t <sub>d(OFF)</sub> |                                                                                        | -   | 34   | -    | ns   |
| Fall Time                             | t <sub>f</sub>      |                                                                                        | -   | 15   | -    | ns   |
| Total Gate Charge                     | Q <sub>g</sub>      | I <sub>D</sub> =7A, V <sub>DS</sub> =325V<br>V <sub>GS</sub> =10V                      | -   | 24   | -    | nC   |
| Gate to Source Charge                 | Q <sub>gs</sub>     |                                                                                        | -   | 5.2  | -    | nC   |
| Gate to Drain("Miller") Charge        | Q <sub>gd</sub>     |                                                                                        | -   | 11   | -    | nC   |
| Source-Drain Diode Characteristics    |                     |                                                                                        |     |      |      |      |
| Continuous Source Current(Body Diode) | I <sub>S</sub>      |                                                                                        | -   | -    | 7    | A    |
| Maximum Pulsed Current(Body Diode)    | I <sub>SM</sub>     |                                                                                        | -   | -    | 28   | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>SD</sub> =1A, V <sub>GS</sub> =0V                                               | -   | 0.72 | 1.2  | V    |
| Reverse Recovery Time                 | t <sub>rr</sub>     | I <sub>SD</sub> =7A, T <sub>J</sub> =25°C                                              | -   | 750  | -    | ns   |
| Reverse Recovery Charge               | Q <sub>rr</sub>     | di/dt=100A/μs                                                                          | -   | 4640 | -    | nC   |

## ■ TYPICAL CHARACTERISTICS

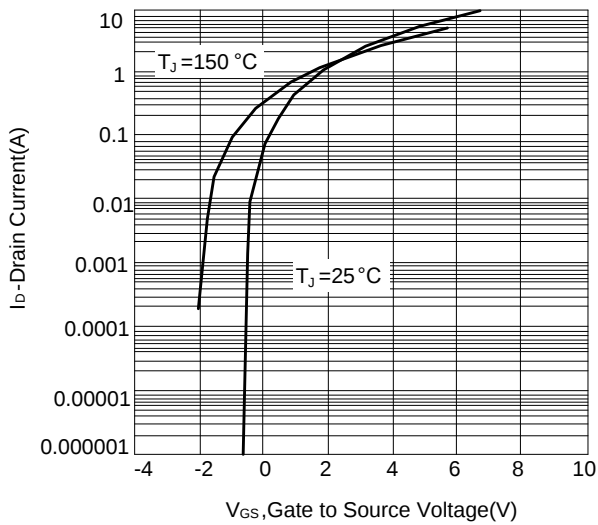


Figure 1: Transfer Characteristics

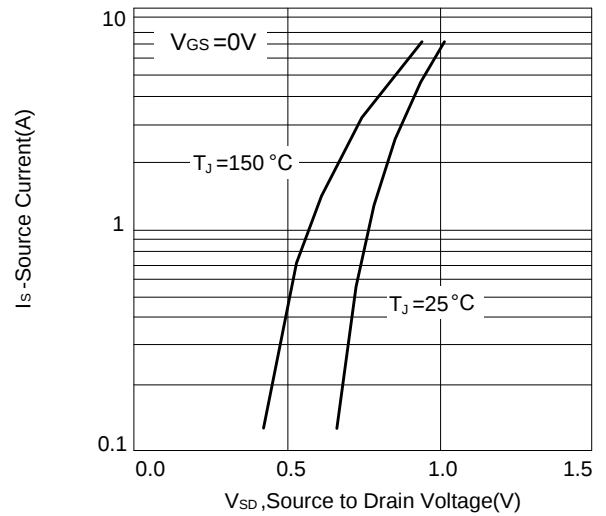


Figure 2: Body Diode Characteristics

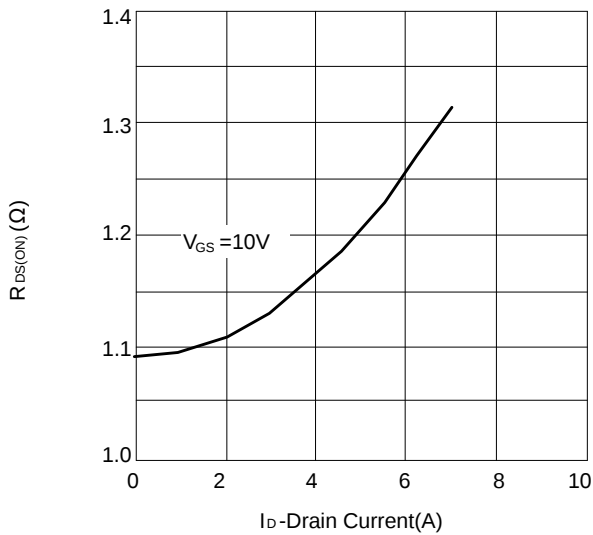


Figure 3: Drain to Source On-Resistance vs. Drain Current

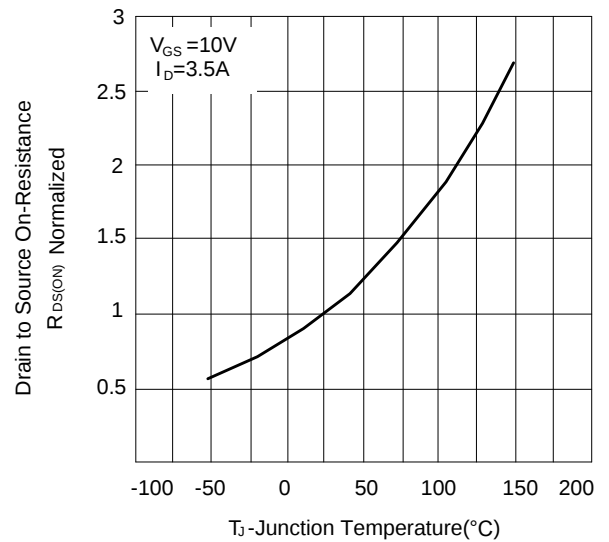


Figure 4: Drain to Source On-Resistance vs. Junction Temperature

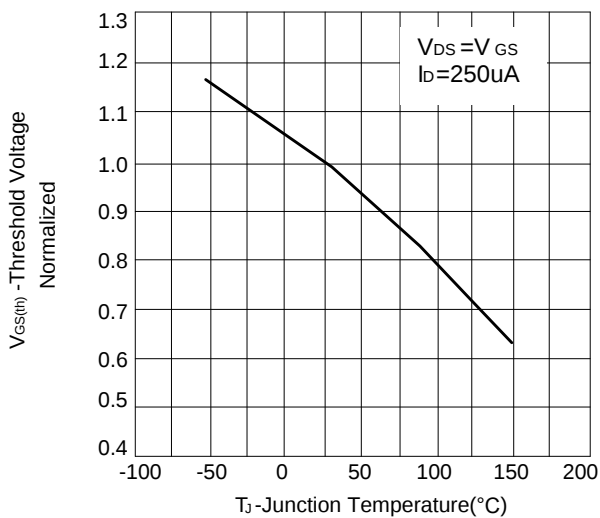


Figure 5: Threshold Voltage vs. Junction Temperature

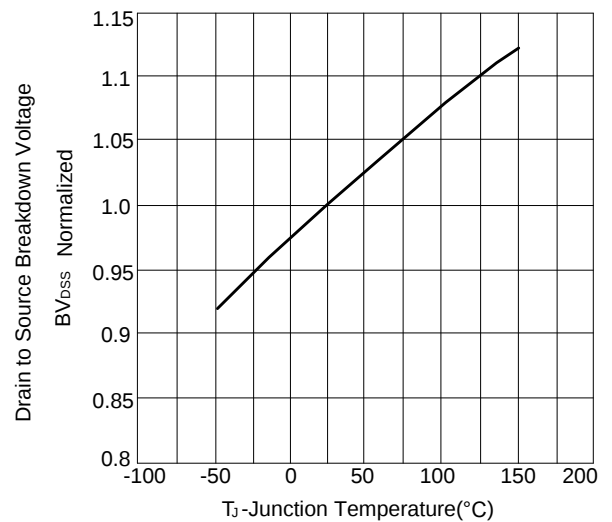


Figure 6: Breakdown Voltage vs. Junction Temperature

■ TYPICAL CHARACTERISTICS(Cont.)

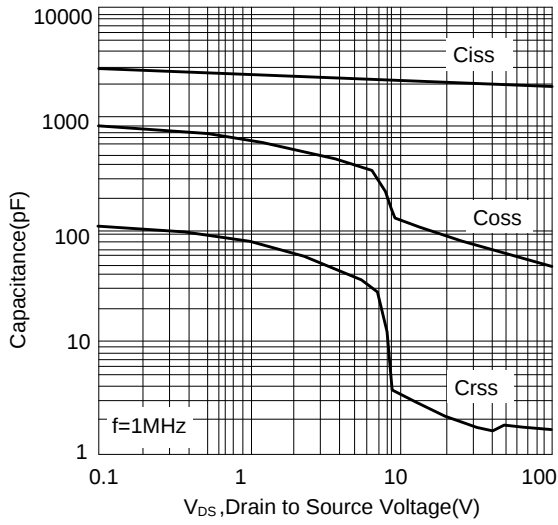


Figure 7: Capacitance vs Drain to Source Voltage

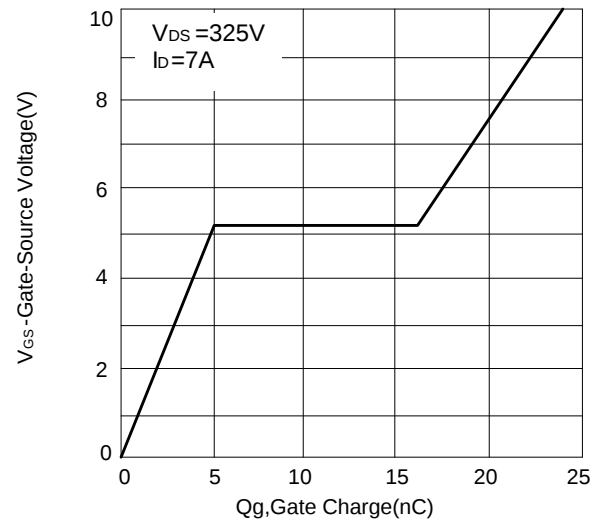


Figure 8: Gate Charge vs Gate to Source Voltage

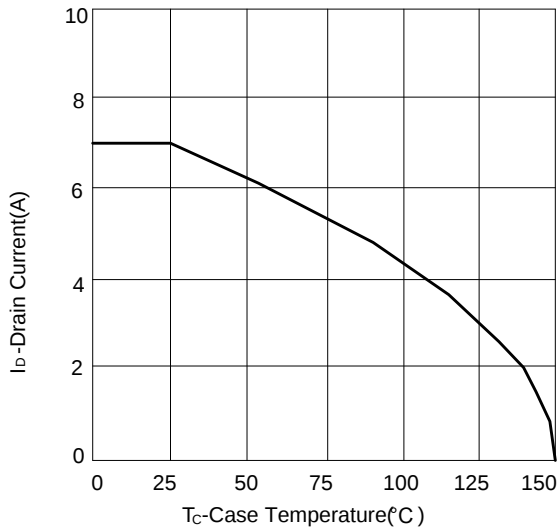


Figure 9: Continuous Drain vs Case Temperature

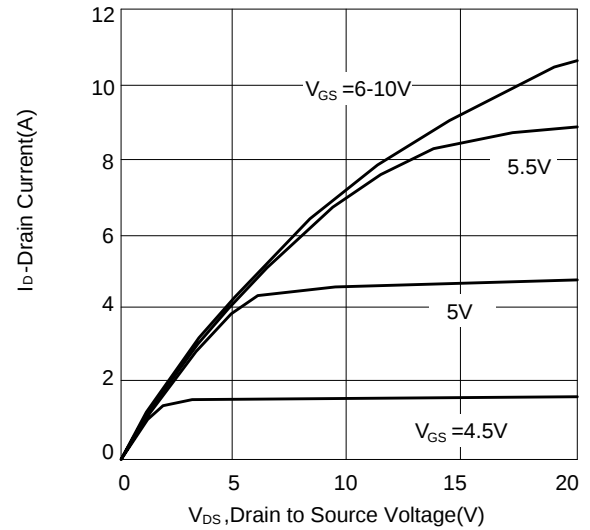


Figure 10: Output Characteristics

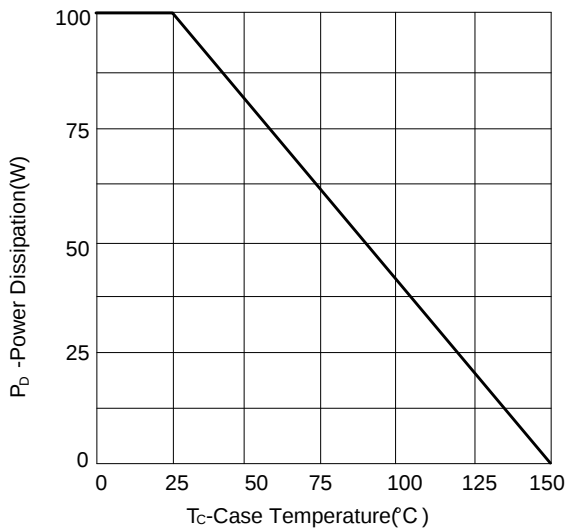


Figure 11: Power Dissipation vs Case Temperature

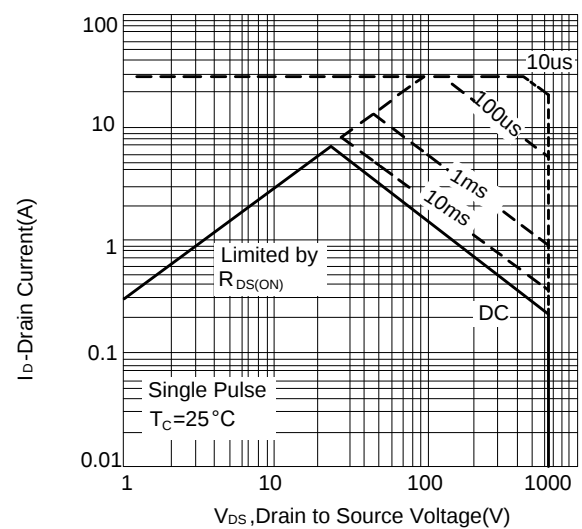


Figure 12: Safe operating Area

■ TO-220 PACKAGE OUTLINE DIMENSIONS

