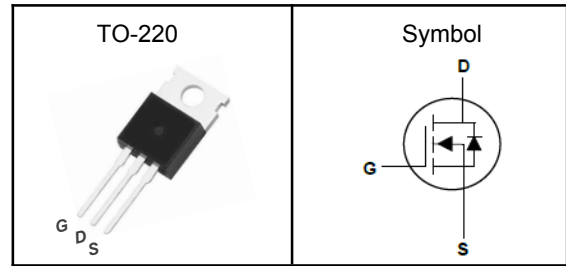


**N-Channel Enhancement Mode MOSFET**
**Features**

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

**Applications**

- Power Management in Desktop Computer
- DC/DC Converters

**Pin Description**


|                  |      |            |
|------------------|------|------------|
| $V_{DSS}$        | 900  | V          |
| $R_{DS(ON)-Typ}$ | 1700 | m $\Omega$ |
| $I_D$            | 6    | A          |

**Absolute Maximum Ratings**( $T_J=25^\circ\text{C}$ , Unless Otherwise Noted)

| Symbol       | Parameter                                  | Rating                 | Unit             |
|--------------|--|------------------------|------------------|
| $V_{DSS}$    | Drain-Source Voltage                       | 900                    | V                |
| $V_{GSS}$    | Gate-Source Voltage                        | $\pm 30$               | V                |
| $T_J$        | Maximum Junction Temperature               | -55 to 150             | $^\circ\text{C}$ |
| $T_{STG}$    | Storage Temperature Range                  | -55 to 150             | $^\circ\text{C}$ |
| $E_{AS}$     | Single Pulse Avalanche Energy <sup>③</sup> | 180                    | mJ               |
| $I_{DM}^{①}$ | Pulse Drain Current Tested                 | 24                     | A                |
| $I_D$        | Continuous Drain Current                   | $T_c=25^\circ\text{C}$ | A                |
| $P_D$        | Maximum Power Dissipation                  | $T_c=25^\circ\text{C}$ | W                |

**Thermal Characteristics**

| Symbol          | Parameter  | Rating | Unit               |
|-----------------|--|--------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient <sup>①</sup> | 62.5   | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case <sup>①</sup>    | 0.78   | $^\circ\text{C/W}$ |

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$ .

Note ③ : Surface Mounted on 1in<sup>2</sup> FR-4 board with 1oz.



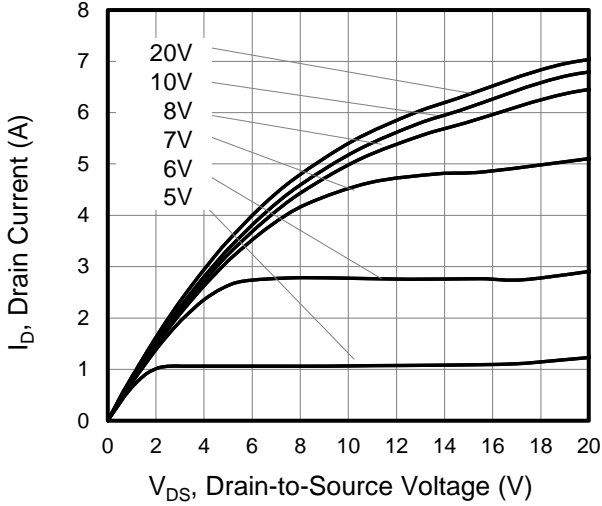
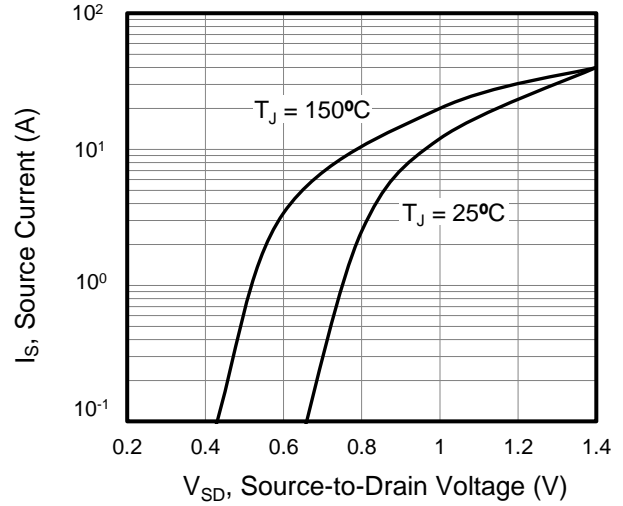
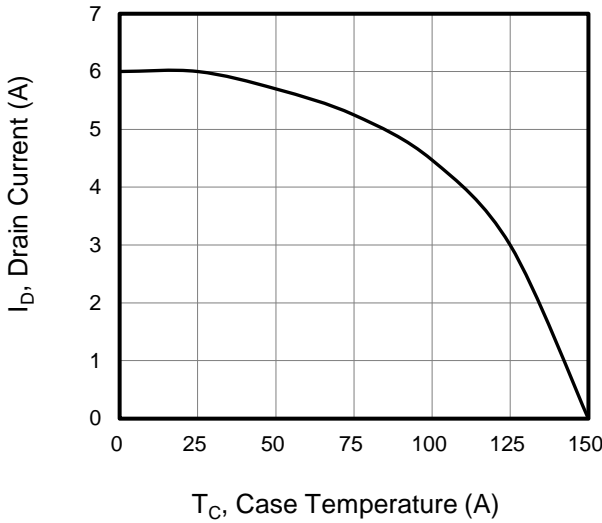
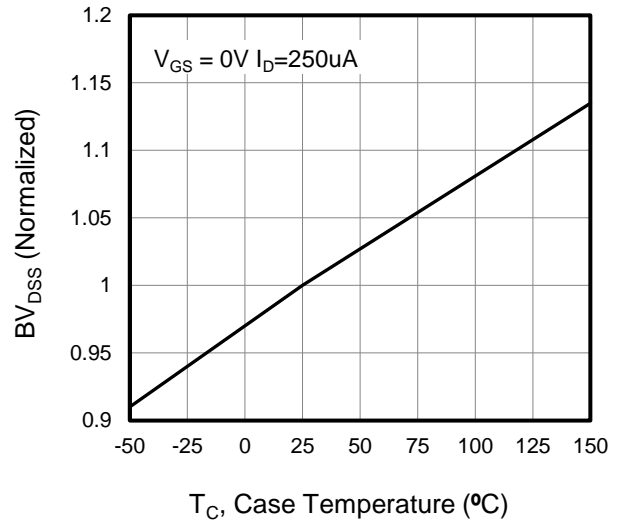
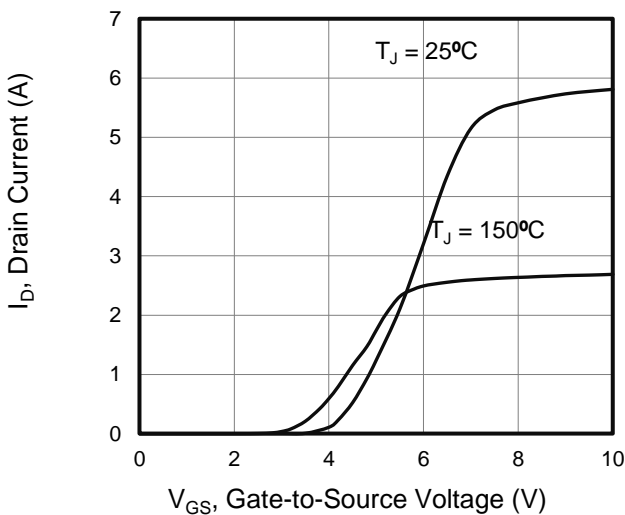
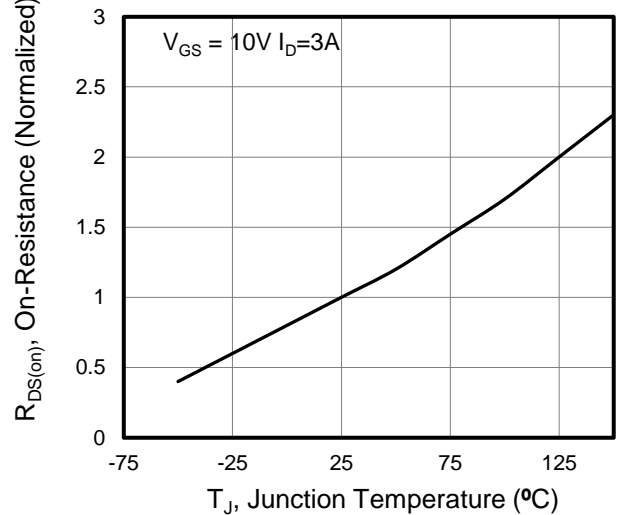
**N-Channel Enhancement Mode MOSFET**

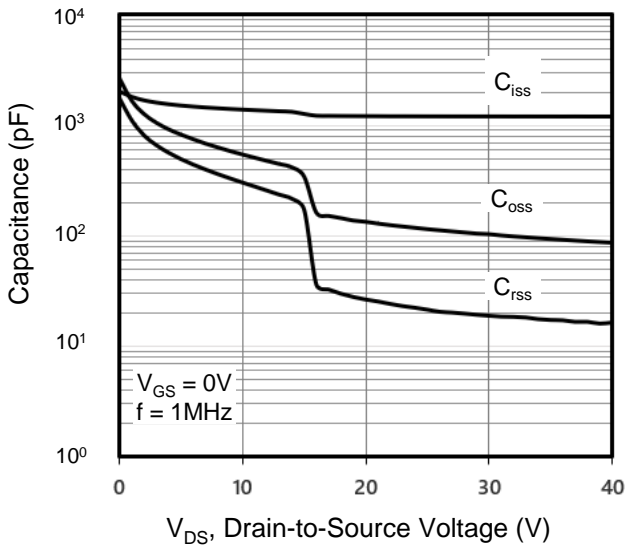
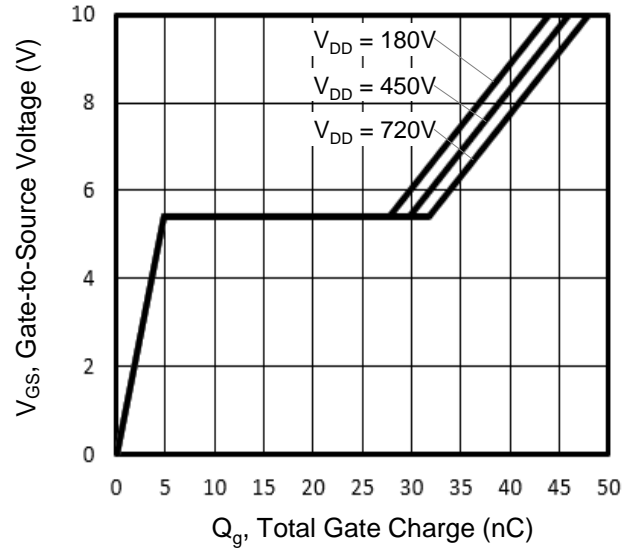
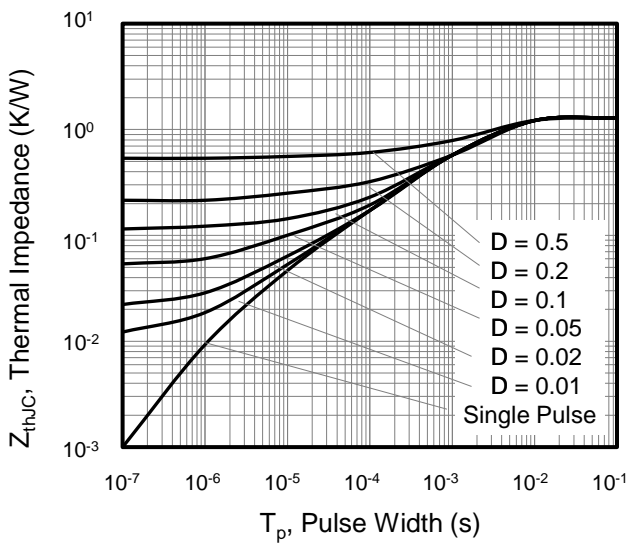
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

| Symbol   | Parameter                          | Test Conditions   | Min | Typ  | Max       | Unit      |
|--|------------------------------------|---|-----|------|-----------|-----------|
| <b>Static Electrical Characteristics</b>                         |                                    |   |     |      |           |           |
| $BV_{DSS}$   | Drain-Source Breakdown Voltage     | $V_{GS}=0V, I_D=250\mu A$                                 | 900 | ---  | ---       | V         |
| $I_{DSS}$  | Zero Gate Voltage Drain Current    | $V_{DS}=900V, V_{GS}=0V$                                  | --- | ---  | 1         | $\mu A$   |
| $V_{GS(th)}$   | Gate Threshold Voltage             | $V_{DS}=V_{GS}, I_D=250\mu A$                             | 2.5 | ---  | 4.5       | V         |
| $I_{GSS}$  | Gate Leakage Current               | $V_{GS}=\pm 30V, V_{DS}=0V$                               | --- | ---  | $\pm 100$ | nA        |
| $R_{DS(ON)}$   | Drain-Source On-state Resistance   | $V_{GS}=10V, I_D=3A$                                      | --- | 1700 | 2000      | $m\Omega$ |
| <b>Dynamic Characteristics</b> <sup>⑤</sup>                      |                                    |   |     |      |           |           |
| $C_{iss}$  | Input Capacitance                  | $V_{GS}=0V,$<br>$V_{DS}=25V,$<br>$Freq.=1MHz$             | --- | 1255 | ---       | pF        |
| $C_{oss}$  | Output Capacitance                 |   | --- | 110  | ---       |           |
| $C_{rss}$  | Reverse Transfer Capacitance       |   | --- | 20   | ---       |           |
| $T_{d(on)}$  | Turn-on Delay Time                 | $V_{DD}=450V,$<br>$V_{GS}=10V, R_G=25\Omega,$<br>$I_D=6A$ | --- | 42   | ---       | nS        |
| $T_r$  | Turn-on Rise Time                  |   | --- | 25   | ---       |           |
| $T_{d(off)}$   | Turn-off Delay Time                |   | --- | 203  | ---       |           |
| $T_f$  | Turn-off Fall Time                 |   | --- | 42   | ---       |           |
| $Q_g$  | Total Gate Charge                  | $V_{DD}=720V,$<br>$V_{GS}=10V, I_D=6A$                    | --- | 47   | ---       | nC        |
| $Q_{gs}$   | Gate-Source Charge                 |   | --- | 8    | ---       |           |
| $Q_{gd}$   | Gate-Drain Charge                  |   | --- | 24   | ---       |           |
| <b>Source-Drain Characteristics</b> ( $T_J=25^{\circ}\text{C}$ ) |                                    |   |     |      |           |           |
| $V_{SD}$   | Diode Forward Voltage <sup>2</sup> | $V_{GS}=0V, I_S=3A, T_J=25^{\circ}\text{C}$               | --- | ---  | 1.4       | V         |
| $t_{rr}$   | Reverse Recovery Time              | $I_F=6A,$<br>$di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$   | --- | 520  | ---       | nS        |
| $Q_{rr}$   | Reverse Recovery Charge            |   | --- | 1.5  | ---       | nC        |

Note ④ : Pulse test (pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ ).

Note ⑤ : Guaranteed by design, not subject to production testing.

**N-Channel Enhancement Mode MOSFET**
**Typical Characteristics**
**Figure 1. Output Characteristics ( $T_J = 25^\circ\text{C}$ )**

**Figure 2. Body Diode Forward Voltage**

**Figure 3. Drain Current vs. Temperature**

**Figure 4.  $BV_{DSS}$  Variation vs. Temperature**

**Figure 5. Transfer Characteristics**

**Figure 6. On-Resistance vs. Temperature**


**N-Channel Enhancement Mode MOSFET**
**Figure 7. Capacitance**

**Figure 8. Gate Charge**

**Figure 9. Transient Thermal Impedance**


**N-Channel Enhancement Mode MOSFET**
**TO-220 Package Outline Data**


| Symbol | Dimensions In Millimeters |        |
|--------|---------------------------|--------|
|        | Min.                      | Max.   |
| A      | 4.350                     | 4.650  |
| A1     | 2.250                     | 2.550  |
| b      | 0.710                     | 0.910  |
| b1     | 1.170                     | 1.400  |
| c      | 0.330                     | 0.650  |
| c1     | 1.200                     | 1.400  |
| D      | 9.910                     | 10.250 |
| E      | 8.9500                    | 9.750  |
| E1     | 12.650                    | 12.950 |
| e      | 2.540 TYP.                |        |
| e1     | 4.980                     | 5.180  |
| F      | 2.650                     | 2.950  |
| H      | 7.900                     | 8.100  |
| h      | 0.000                     | 0.300  |
| L      | 12.700                    | 13.500 |
| L1     | 2.850                     | 3.250  |
| V      | 7.500 REF.                |        |
| Φ      | 3.400                     | 3.800  |