

**DESCRIPTION**

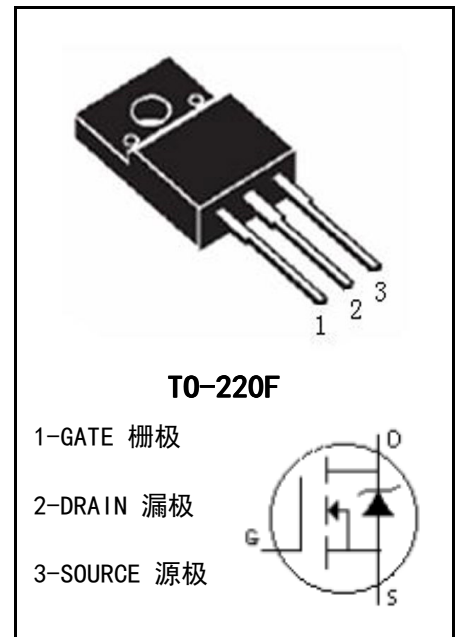
- ELECTRONIC BALLAST
- ELECTRONIC TRANSFORMER
- SWITCH MODE POWER SUPPLY

**FEATURES:**

- LOW THERMAL RESISTANCE
- HIGH INPUT RESISTANCE
- FAST SWITCHING
- ROHS COMPLIANT

**MAXIMUM RATINGS (T<sub>c</sub>=25°C)**

| PARAMETER                                       | SYMBOL           | VALUE   | UNIT |
|---|------------------|---------|------|
| Drain-source Voltage                            | VDS              | 200     | V    |
| gate-source Voltage                             | VGS              | ±20     | V    |
| Continuous Drain Current (T <sub>C</sub> =25°C) | ID               | 10      | A    |
| Drain Current-Pulsed                            | IDM              | 25      | A    |
| Total Dissipation                               | PD               | 25      | W    |
| Junction Temperature                            | T <sub>j</sub>   | 150     | °C   |
| Storage Temperature                             | T <sub>stg</sub> | -55-150 | °C   |
| Single Pulse Avalanche Energy<br>(L=0.4mH)      | EAS              | 5       | mJ   |

**MECHANICAL**

**ELECTRONIC CHARACTERISTICS (T<sub>c</sub>=25°C)**

| CHARACTERISTICS                     | SYMBOL   | TEST CONDITION     | MIN | MAX  | UNIT |
|-------------------------------------|----------|--------------------|-----|------|------|
| Drain-source Breakdown Voltage      | BVDSS    | VGS=0V, ID=250 μA  | 200 |      | V    |
| Gate Threshold Voltage              | VGS (TH) | VGS=VDS, ID=250 μA | 1.3 | 3    | V    |
| Drain-source Leakage Current        | IDSS     | VDS=200V, VGS=0V   |     | 1    | uA   |
| Drain-Source Diode Forward Voltage  | VSD      | VGS=0V, IS=10A     |     | 1.2  | V    |
| Gate-body Leakage Current (VDS = 0) | IGSS     | VGS=±20V           |     | ±100 | nA   |
| Static Drain-source On Resistance   | RDS (ON) | VGS=4.5V, ID=3A    |     | 140  | mΩ   |
|                                     |          | VGS=10V, ID=5A     |     | 120  | mΩ   |
| Thermal Resistance Junction-case    | RthJ-c   |                    |     | 5    | °C/W |

**■ DYNAMIC CHARACTERISTICS (T<sub>c</sub>=25°C)**

| CHARACTERISTICS              | SYMBOL           | TEST CONDITION  | MIN | TYP | MAX | UNIT |
|------------------------------|------------------|---|-----|-----|-----|------|
| Input Capacitance            | C <sub>iss</sub> | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V,<br>f=1.0 MHz | -   | 495 | -   | pF   |
| output Capacitance           | C <sub>oss</sub> |   | -   | 60  | -   | pF   |
| Reverse Transfer Capacitance | C <sub>rss</sub> |   | -   | 8   | -   | pF   |
| Gate resistance              | R <sub>G</sub>   | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V,<br>f=1.0MHz   | -   | 5.5 | -   | Ω    |

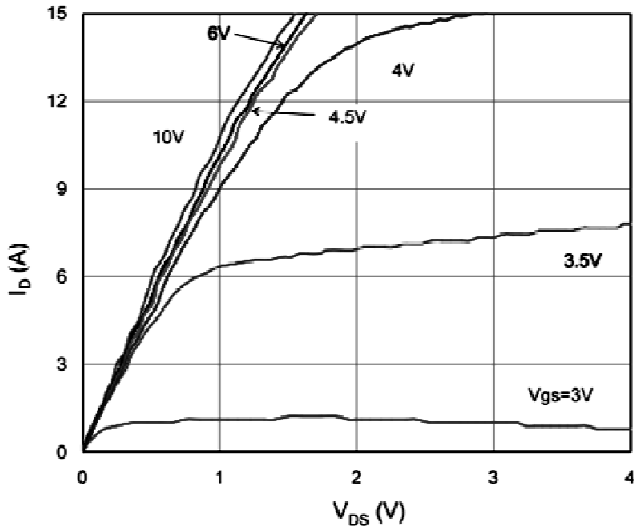
**■ SWITCHING CHARACTERISTICS (T<sub>c</sub>=25°C)**

| CHARACTERISTICS     | SYMBOL                | TEST CONDITION  | MIN | TYP | MAX | UNIT |
|---------------------|-----------------------|---|-----|-----|-----|------|
| Turn-On Delay Time  | t <sub>d(on)</sub>    | V <sub>DS</sub> =100V, I <sub>D</sub> =5A,<br>V <sub>GS</sub> =10V, R <sub>G</sub> =10Ω | -   | 9   | -   | ns   |
| Turn-On Rise Time   | t <sub>r</sub>        |   | -   | 5   | -   | ns   |
| Turn-Off Delay Time | t <sub>d(off)</sub>   |   | -   | 13  | -   | ns   |
| Turn-Off Rise Time  | t <sub>f</sub>        |   | -   | 4   | -   | ns   |
| Total Gate Charge   | Q <sub>g</sub> (4.5V) | V <sub>DS</sub> =100V, I <sub>D</sub> =5A,<br>V <sub>GS</sub> =10V                      | -   | 5.8 | -   | nC   |
| Total Gate Charge   | Q <sub>g</sub>        |   | -   | 10  | -   | nC   |
| Gate-Source Charge  | Q <sub>gs</sub>       |   | -   | 1.6 | -   | nC   |
| Gate-Drain Charge   | Q <sub>gd</sub>       |   | -   | 3.2 | -   | nC   |

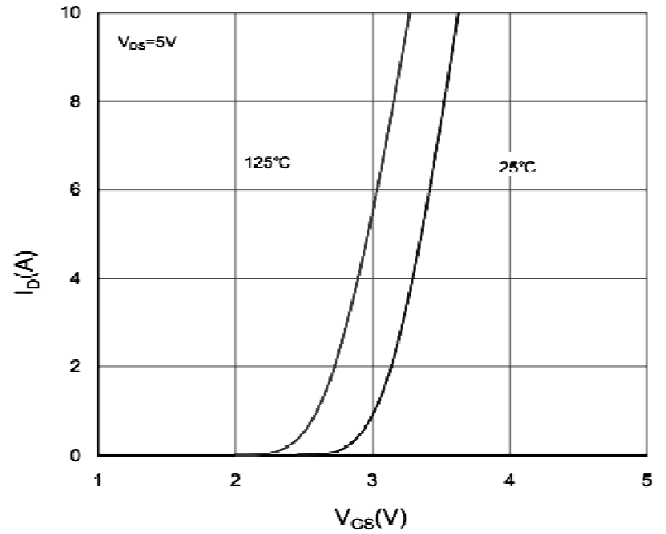
**■ DRAIN-SOURCE DIODE MAXIMUM RATINGS AND CHARACTERISTICS (T<sub>c</sub>=25°C)**

| CHARACTERISTICS         | SYMBOL          | TEST CONDITION   | MIN | TYP | MAX | UNIT |
|-------------------------|-----------------|--|-----|-----|-----|------|
| Diode Forward Voltage   | V <sub>SD</sub> | V <sub>GS</sub> =0V, I <sub>S</sub> =10A                                 | -   | -   | 1.2 | V    |
| Reverse Recovery Time   | t <sub>rr</sub> | V <sub>R</sub> =100V, I <sub>S</sub> =5A,<br>dI <sub>F</sub> /dt=100A/μs | -   | 60  | -   | ns   |
| Reverse Recovery Charge | Q <sub>rr</sub> |  | -   | 126 | -   | μC   |

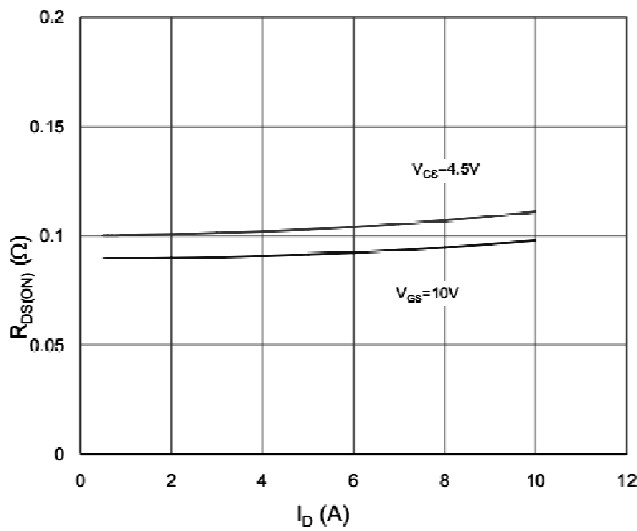
**CHARACTERISTICS CURVE**



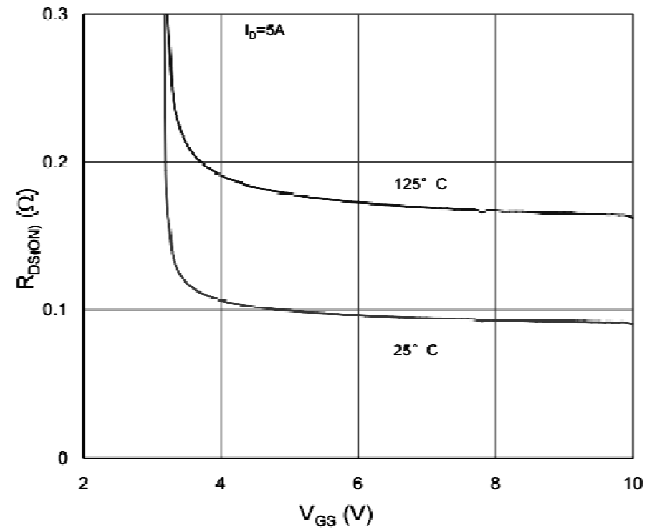
**Output Characteristics**



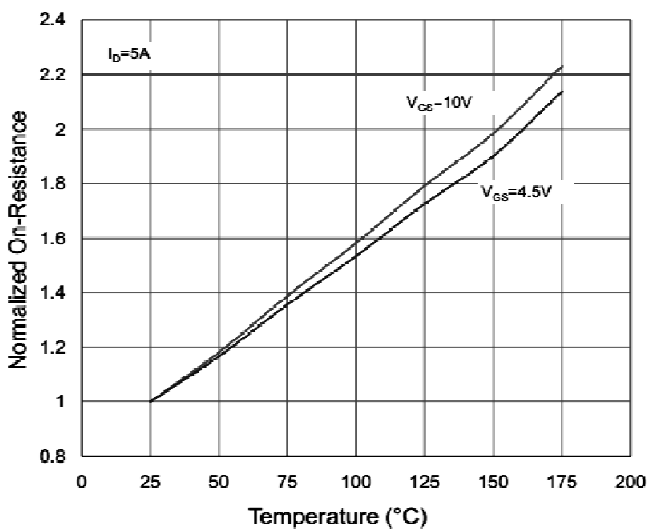
**Transfer Characteristics**



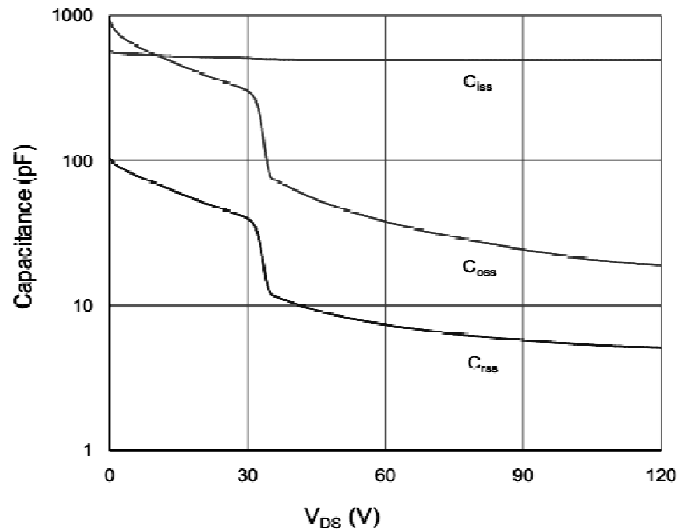
**On Resistance Vs Drain Current**



**On-Resistance vs. Gate-Source Voltage**

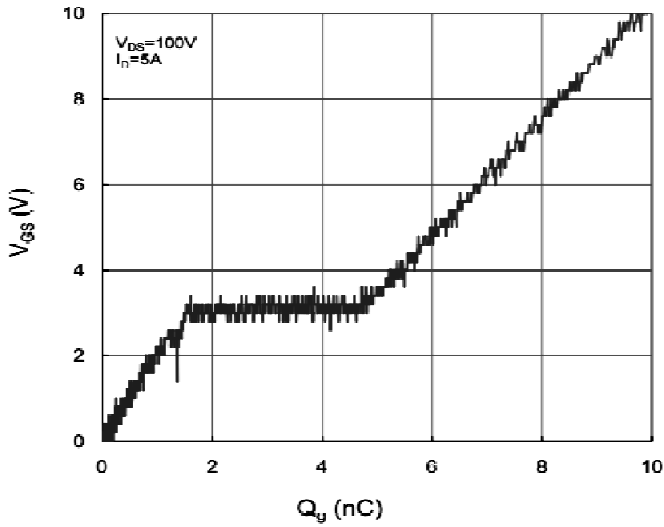


**Rdson-Junction Temperature**

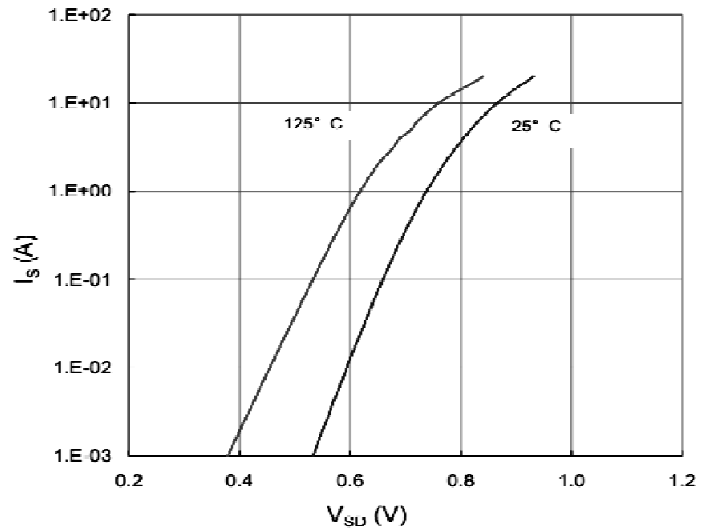


**Capacitance**

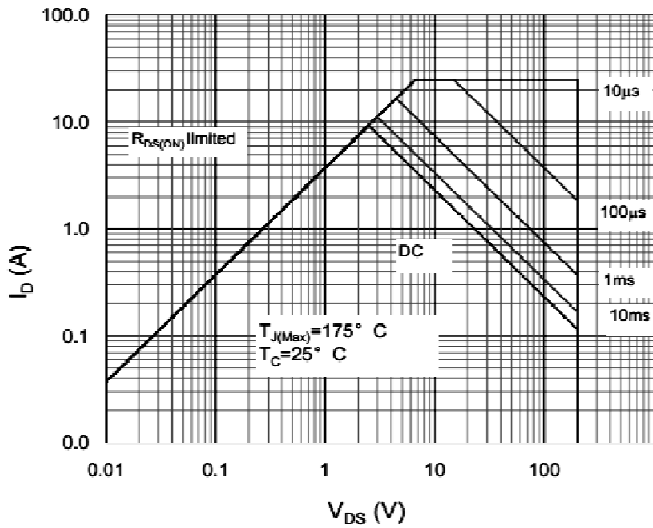
**CHARACTERISTICS CURVE**



**Gate Charge Waveform**



**Source-Drain Diode Forward Voltage**



**Safe Operating Area**

**TO-220F MECHANICAL DATA**

UNIT: mm

| SYMBOL | MIN  | NOM | MAX  | SYMBOL | MIN  | NOM  | MAX   |
|--------|------|-----|------|--------|------|------|-------|
| A      | 4.5  |     | 4.9  | E1     | 6.5  | 7    | 7.5   |
| A1     | 2.3  |     | 2.9  | e      | 2.44 | 2.54 | 2.64  |
| b      | 0.65 |     | 0.9  | L      | 12.5 |      | 14.3  |
| b1     | 1.1  |     | 1.7  | L1     | 9.45 |      | 10.05 |
| b2     | 1.2  |     | 1.4  | L2     | 15   |      | 16    |
| c      | 0.35 |     | 0.65 | L3     | 3.2  |      | 4.4   |
| D      | 14.5 |     | 16.5 | ΦP     | 3    |      | 3.3   |
| D1     | 6.1  |     | 6.9  | Q      | 2.5  |      | 2.9   |
| E      | 9.6  |     | 10.3 |        |      |      |       |

