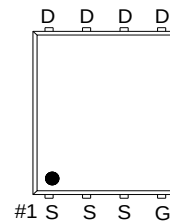
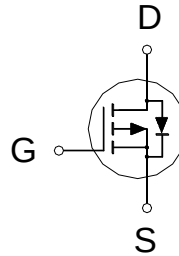


PRODUCT SUMMARY

|               |              |       |
|---------------|--------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
| -60V          | 35m $\Omega$ | -27A  |



G. GATE  
D. DRAIN  
S. SOURCE

100% UIS Tested  
100% Rg Tested

Features

- Pb-Free, Halogen Free and RoHS compliant.
- Low  $R_{DS(on)}$  to Minimize Conduction Losses.
- Ohmic Region Good  $R_{DS(on)}$  Ratio.
- Optimized Gate Charge to Minimize Switching Losses.

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^{\circ}\text{C}$  Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS                     |                                     | SYMBOL         | LIMITS     | UNITS              |
|------------------------------------------------|-------------------------------------|----------------|------------|--------------------|
| Drain-Source Voltage                           |                                     | $V_{DS}$       | -60        | V                  |
| Gate-Source Voltage                            |                                     | $V_{GS}$       | $\pm 25$   | V                  |
| Continuous Drain Current <sup>4</sup>          | $T_C = 25\text{ }^{\circ}\text{C}$  | $I_D$          | -27        | A                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | -17        |                    |
|                                                | $T_A = 25\text{ }^{\circ}\text{C}$  |                | -6.7       |                    |
|                                                | $T_A = 70\text{ }^{\circ}\text{C}$  |                | -5.4       |                    |
| Pulsed Drain Current <sup>1</sup>              |                                     | $I_{DM}$       | -71        |                    |
| Avalanche Current                              |                                     | $I_{AS}$       | -29        |                    |
| Avalanche Energy                               | $L = 0.1\text{mH}$                  | $E_{AS}$       | 42         | mJ                 |
| Power Dissipation <sup>3</sup>                 | $T_C = 25\text{ }^{\circ}\text{C}$  | $P_D$          | 48         | W                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 19         |                    |
|                                                | $T_A = 25\text{ }^{\circ}\text{C}$  |                | 3          |                    |
|                                                | $T_A = 70\text{ }^{\circ}\text{C}$  |                | 2          |                    |
| Operating Junction & Storage Temperature Range |                                     | $T_j, T_{stg}$ | -55 to 150 | $^{\circ}\text{C}$ |

**THERMAL RESISTANCE RATINGS**

| THERMAL RESISTANCE               |              | SYMBOL          | TYPICAL | MAXIMUM | UNITS  |
|----------------------------------|--------------|-----------------|---------|---------|--------|
| Junction-to-Ambient <sup>2</sup> | $t \leq 10s$ | $R_{\theta JA}$ |         | 41      | °C / W |
| Junction-to-Ambient <sup>2</sup> | Steady-State | $R_{\theta JA}$ |         | 77      |        |
| Junction-to-Case                 | Steady-State | $R_{\theta JC}$ |         | 2.6     |        |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ \text{C}$ . The value in any given application depends on the user's specific board design.

<sup>3</sup>The Power dissipation is based on  $R_{\theta JA}$   $t \leq 10s$  value.

<sup>4</sup>The maximum current rating is package limited.

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

| PARAMETER                                     | SYMBOL               | TEST CONDITIONS                                                                                | LIMITS |      |      | UNIT |
|-----------------------------------------------|----------------------|------------------------------------------------------------------------------------------------|--------|------|------|------|
|                                               |                      |                                                                                                | MIN    | TYP  | MAX  |      |
| STATIC                                        |                      |                                                                                                |        |      |      |      |
| Drain-Source Breakdown Voltage                | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                  | -60    |      |      | V    |
| Gate Threshold Voltage                        | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                    | -1.3   | -1.8 | -2.3 |      |
| Gate-Body Leakage                             | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±25V                                                   |        |      | ±100 | nA   |
| Zero Gate Voltage Drain Current               | I <sub>DSS</sub>     | V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0V                                                   |        |      | -1   | uA   |
|                                               |                      | V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C                           |        |      | -10  |      |
| Drain-Source On-State Resistance <sup>1</sup> | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A                                                  |        | 32   | 35   | mΩ   |
|                                               |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -15A                                                 |        | 43   | 55   |      |
| Forward Transconductance <sup>1</sup>         | g <sub>fs</sub>      | V <sub>DS</sub> = -5V, I <sub>D</sub> = -20A                                                   |        | 28   |      | S    |
| DYNAMIC                                       |                      |                                                                                                |        |      |      |      |
| Input Capacitance                             | C <sub>iss</sub>     | V <sub>GS</sub> = 0V, V <sub>DS</sub> = -30V, f = 1MHz                                         |        | 1440 |      | pF   |
| Output Capacitance                            | C <sub>oss</sub>     |                                                                                                |        | 138  |      |      |
| Reverse Transfer Capacitance                  | C <sub>rss</sub>     |                                                                                                |        | 92   |      |      |
| Gate Resistance                               | R <sub>g</sub>       | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz                                           |        | 3.6  |      | Ω    |
| Total Gate Charge <sup>2</sup>                | Q <sub>g</sub>       | V <sub>DS</sub> = -30V,<br>V <sub>GS</sub> = -10V , I <sub>D</sub> = -20A                      |        | 29   |      | nC   |
| Gate-Source Charge <sup>2</sup>               | Q <sub>gs</sub>      |                                                                                                |        | 4.5  |      |      |
| Gate-Drain Charge <sup>2</sup>                | Q <sub>gd</sub>      |                                                                                                |        | 7.7  |      |      |
| Turn-On Delay Time <sup>2</sup>               | t <sub>d(on)</sub>   | V <sub>DS</sub> = -30V,<br>I <sub>D</sub> ≐ -20A, V <sub>GS</sub> = -10V, R <sub>GS</sub> = 6Ω |        | 9.7  |      | nS   |
| Rise Time <sup>2</sup>                        | t <sub>r</sub>       |                                                                                                |        | 60   |      |      |
| Turn-Off Delay Time <sup>2</sup>              | t <sub>d(off)</sub>  |                                                                                                |        | 41   |      |      |
| Fall Time <sup>2</sup>                        | t <sub>f</sub>       |                                                                                                |        | 100  |      |      |

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

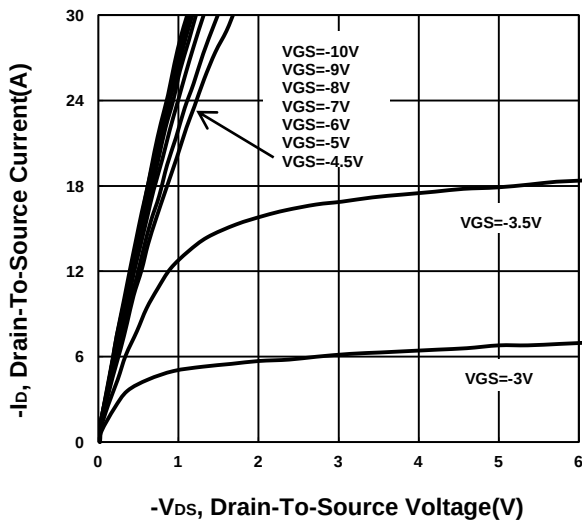
|                                 |                 |                                                          |  |     |      |    |
|---------------------------------|-----------------|----------------------------------------------------------|--|-----|------|----|
| Continuous Current <sup>3</sup> | I <sub>S</sub>  |                                                          |  |     | -21  | A  |
| Forward Voltage <sup>1</sup>    | V <sub>SD</sub> | I <sub>F</sub> = -20A, V <sub>GS</sub> = 0V              |  |     | -1.3 | V  |
| Reverse Recovery Time           | t <sub>rr</sub> | I <sub>F</sub> = -20A , di <sub>F</sub> /dt = 100 A / μS |  | 12  |      | nS |
| Reverse Recovery Charge         | Q <sub>rr</sub> |                                                          |  | 6.4 |      | nC |

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

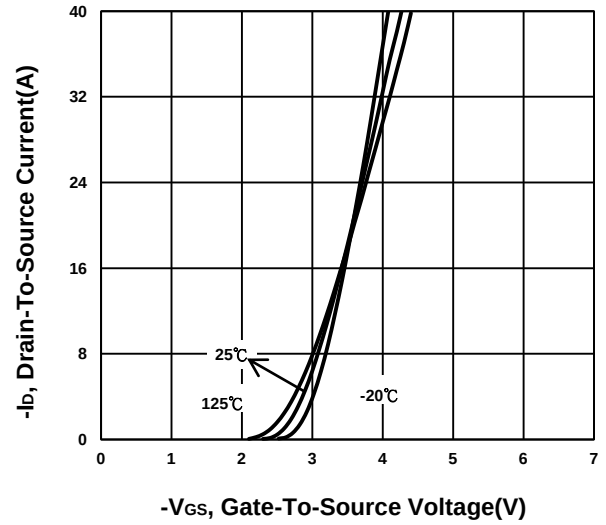
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>The maximum current rating is package limited.

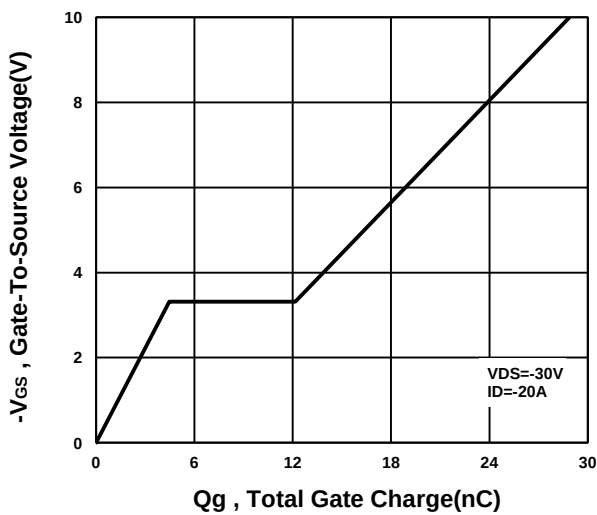
Output Characteristics



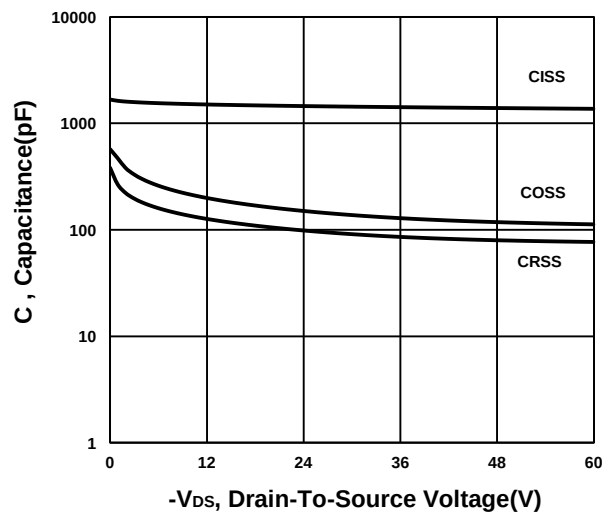
Transfer Characteristics



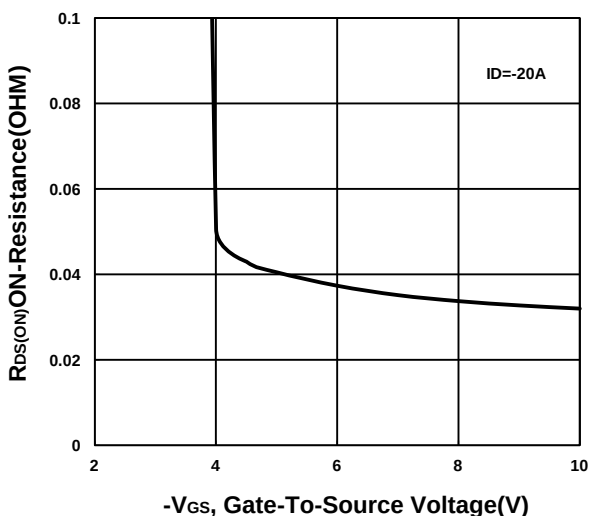
Gate charge Characteristics



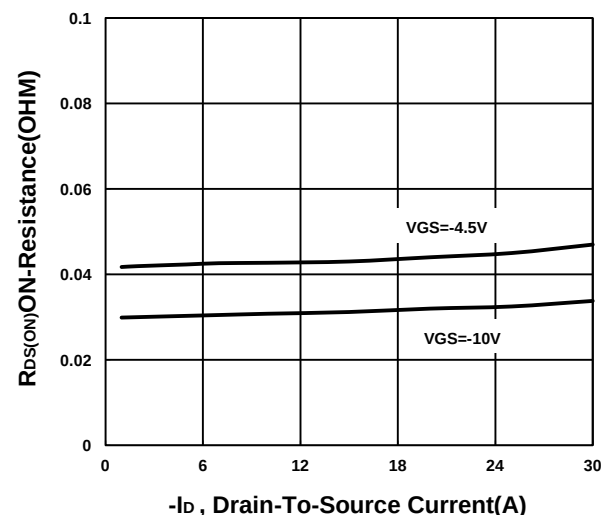
Capacitance Characteristic



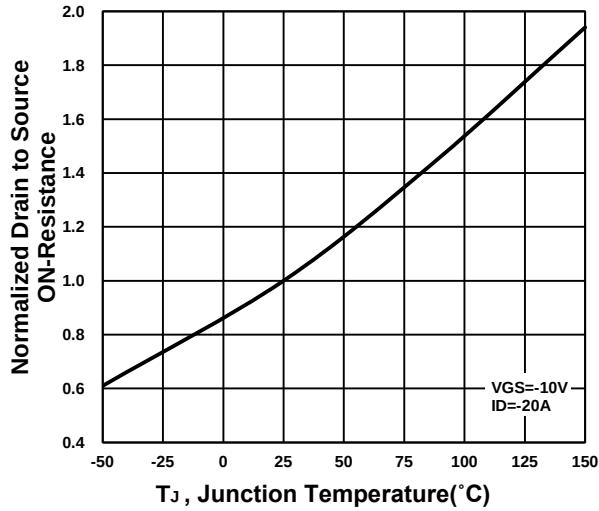
On-Resistance VS Gate-To-Source Voltage



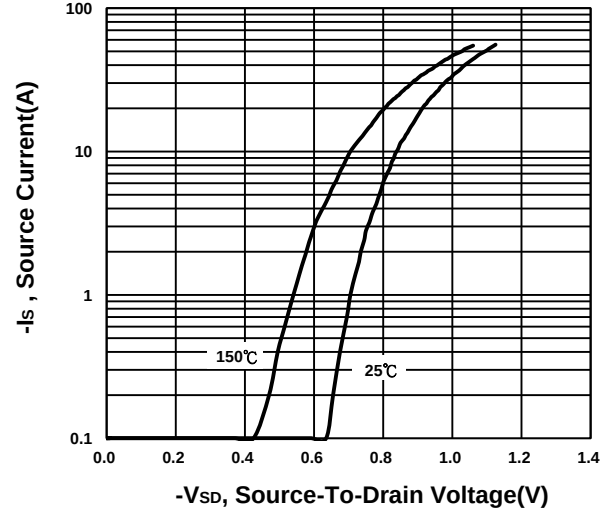
On-Resistance VS Drain Current



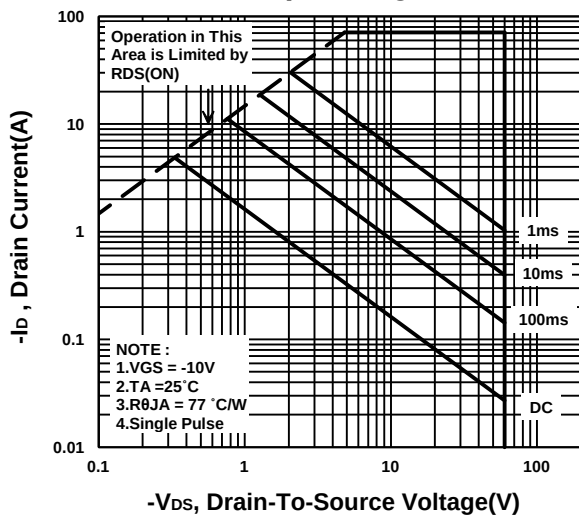
On-Resistance VS Temperature



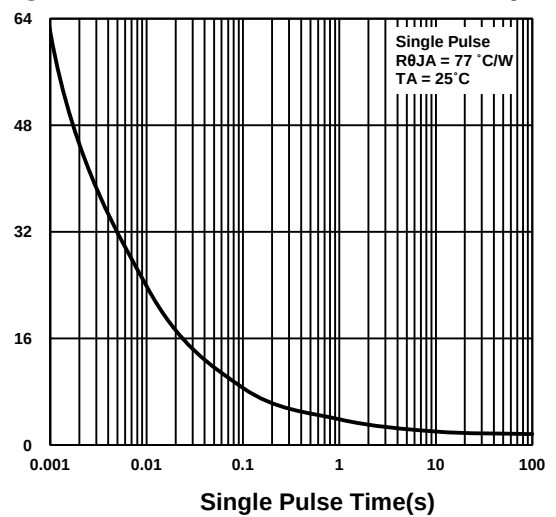
Source-Drain Diode Forward Voltage



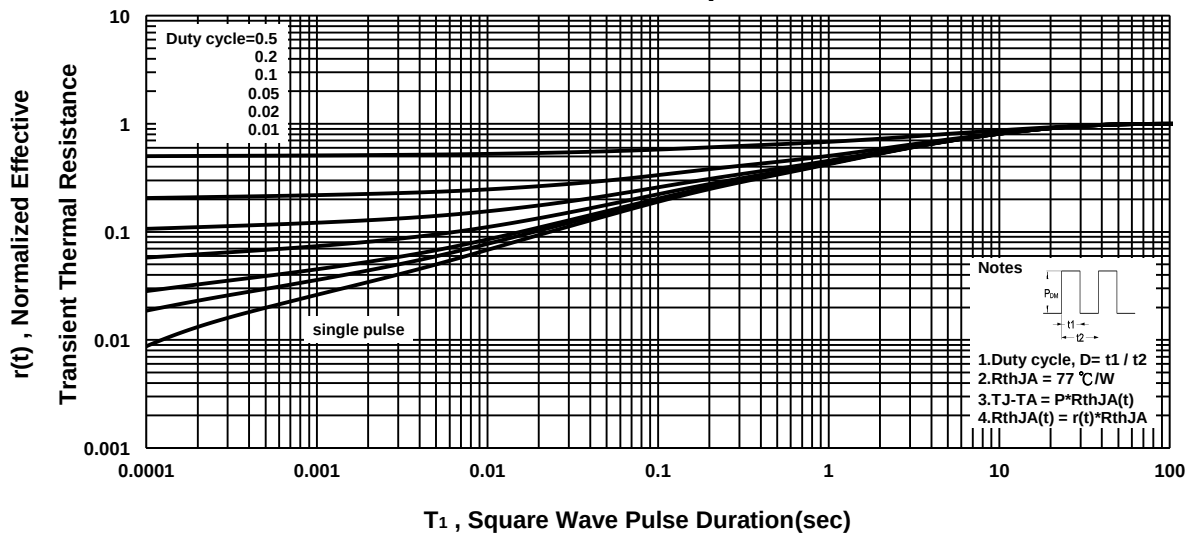
Safe Operating Area



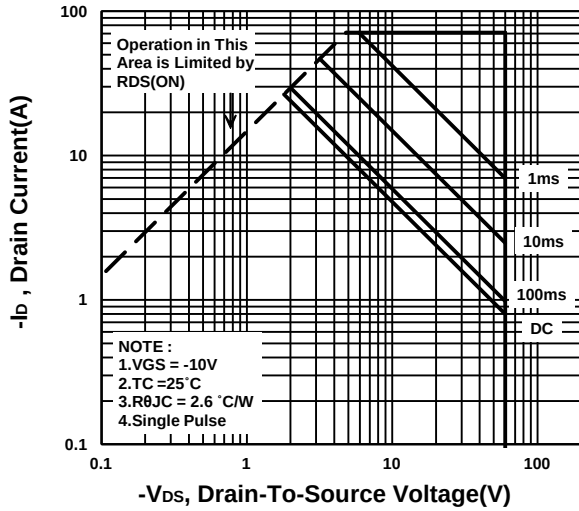
Single Pulse Maximum Power Dissipation



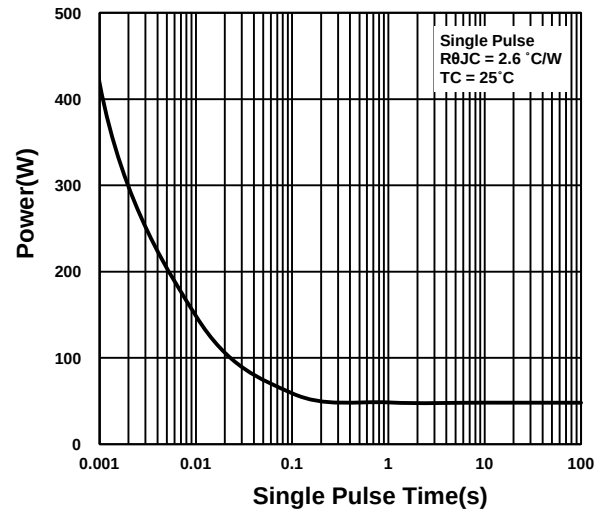
Transient Thermal Response Curve



**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

