


**PRODUCT SUMMARY**

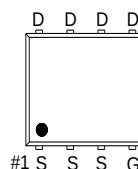
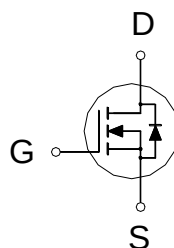
|               |              |       |
|---------------|--------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
| 30V           | 9m $\Omega$  | 32A   |

**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.



G. GATE  
D. DRAIN  
S. SOURCE

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

| PARAMETERS/TEST CONDITIONS                     |                                     | SYMBOL         | LIMITS     | UNITS              |
|------------------------------------------------|-------------------------------------|----------------|------------|--------------------|
| Drain-Source Voltage                           |                                     | $V_{DS}$       | 30         | V                  |
| Gate-Source Voltage                            |                                     | $V_{GS}$       | $\pm 25$   | V                  |
| Continuous Drain Current <sup>3</sup>          | $T_C = 25\text{ }^{\circ}\text{C}$  | $I_D$          | 32         | A                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 20         |                    |
| Pulsed Drain Current <sup>1</sup>              |                                     | $I_{DM}$       | 90         |                    |
| Continuous Drain Current                       | $T_A = 25\text{ }^{\circ}\text{C}$  | $I_D$          | 10         |                    |
|                                                | $T_A = 70\text{ }^{\circ}\text{C}$  |                | 8.2        |                    |
| Avalanche Current                              |                                     | $I_{AS}$       | 22         |                    |
| Avalanche Energy                               | $L = 0.1\text{mH}$                  | $E_{AS}$       | 24         | mJ                 |
| Power Dissipation                              | $T_C = 25\text{ }^{\circ}\text{C}$  | $P_D$          | 18         | W                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 7          |                    |
| Power Dissipation                              | $T_A = 25\text{ }^{\circ}\text{C}$  | $P_D$          | 1.8        | W                  |
|                                                | $T_A = 70\text{ }^{\circ}\text{C}$  |                | 1.1        |                    |
| 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> | Steady-State | $R_{\theta JA}$ |         | 68      | °C / W |
| Junction-to-Case                 | Steady-State | $R_{\theta JC}$ |         | 7       |        |

<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  $T_A = 25^\circ\text{C}$ .

<sup>3</sup>Package limitation current is 27A.

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                | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                  | 30     |      |           | V          |
| Gate Threshold Voltage                        | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                              | 1.3    | 1.7  | 2.3       |            |
| Gate-Body Leakage                             | $I_{GSS}$     | $V_{DS} = 0V, V_{GS} = \pm 25V$                                |        |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current               | $I_{DSS}$     | $V_{DS} = 24V, V_{GS} = 0V$                                    |        |      | 1         | $\mu A$    |
|                                               |               | $V_{DS} = 20V, V_{GS} = 0V, T_J = 55\text{ }^{\circ}C$         |        |      | 10        |            |
| Drain-Source On-State Resistance <sup>1</sup> | $R_{DS(ON)}$  | $V_{GS} = 4.5V, I_D = 8.8A$                                    |        | 11.5 | 16        | m $\Omega$ |
|                                               |               | $V_{GS} = 10V, I_D = 10A$                                      |        | 7.5  | 9         |            |
| Forward Transconductance <sup>1</sup>         | $g_{fs}$      | $V_{DS} = 5V, I_D = 10A$                                       |        | 28   |           | S          |
| DYNAMIC                                       |               |                                                                |        |      |           |            |
| Input Capacitance                             | $C_{iss}$     | $V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$                          |        | 530  |           | pF         |
| Output Capacitance                            | $C_{oss}$     |                                                                |        | 160  |           |            |
| Reverse Transfer Capacitance                  | $C_{rss}$     |                                                                |        | 90   |           |            |
| Gate Resistance                               | $R_g$         | $V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$                           |        | 2.7  |           | $\Omega$   |
| Total Gate Charge <sup>2</sup>                | $Q_g$         | $V_{GS} = 10V$                                                 |        | 12   |           | nC         |
|                                               |               | $V_{GS} = 4.5V$                                                |        | 6.7  |           |            |
| Gate-Source Charge <sup>2</sup>               | $Q_{gs}$      | $V_{DS} = 15V, V_{GS} = 10V, I_D = 10A$                        |        | 1.5  |           |            |
| Gate-Drain Charge <sup>2</sup>                | $Q_{gd}$      |                                                                |        | 4.3  |           |            |
| Turn-On Delay Time <sup>2</sup>               | $t_{d(on)}$   | $V_{DS} = 15V, I_D \cong 10A, V_{GS} = 10V, R_{GEN} = 6\Omega$ |        | 18   |           | nS         |
| Rise Time <sup>2</sup>                        | $t_r$         |                                                                |        | 16   |           |            |
| Turn-Off Delay Time <sup>2</sup>              | $t_{d(off)}$  |                                                                |        | 35   |           |            |
| Fall Time <sup>2</sup>                        | $t_f$         |                                                                |        | 17   |           |            |

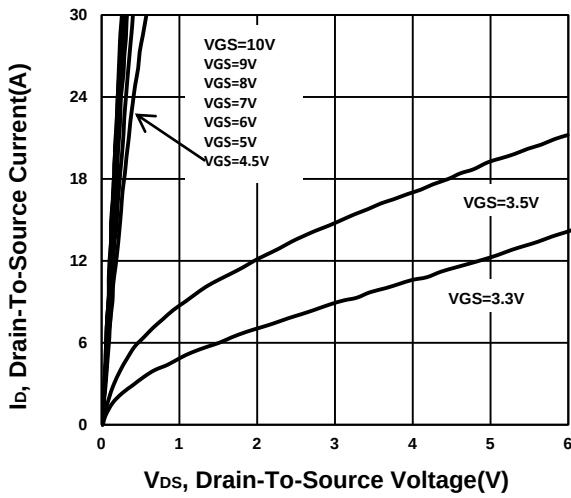
**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ( $T_J = 25\text{ }^{\circ}\text{C}$ )**

|                              |          |                                                         |  |     |    |
|------------------------------|----------|---------------------------------------------------------|--|-----|----|
| Continuous Current           | $I_S$    |                                                         |  | 15  | A  |
| Forward Voltage <sup>1</sup> | $V_{SD}$ | $I_F = 10\text{A}, V_{GS} = 0\text{V}$                  |  | 1.2 | V  |
| Reverse Recovery Time        | $t_{rr}$ | $I_F = 10\text{A}, di_F/dt = 100\text{A} / \mu\text{S}$ |  | 15  | nS |
| Reverse Recovery Charge      | $Q_{rr}$ |                                                         |  | 5   | nC |

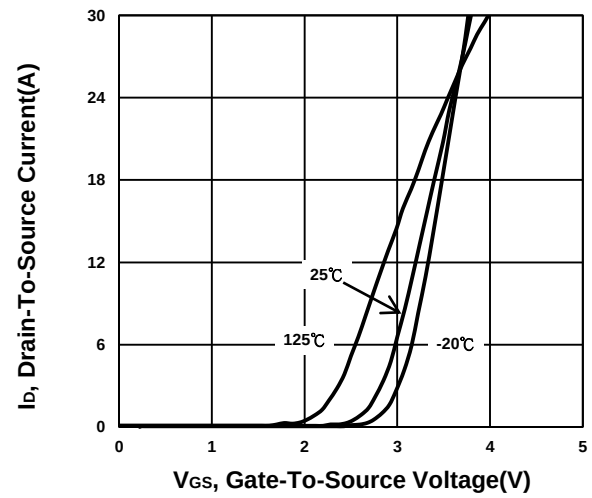
<sup>1</sup>Pulse test : Pulse Width  $\leq 300\text{ }\mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

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

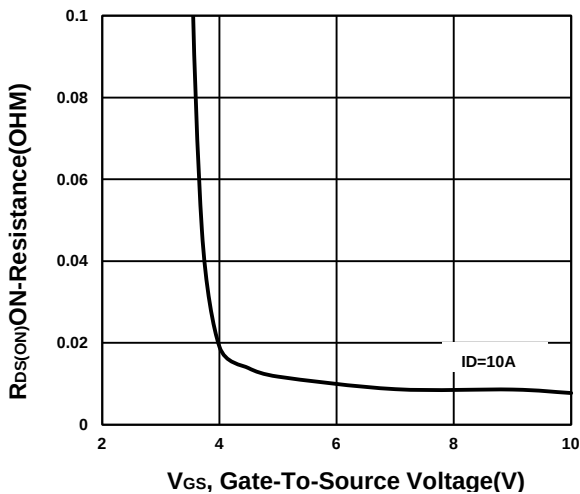
**Output Characteristics**



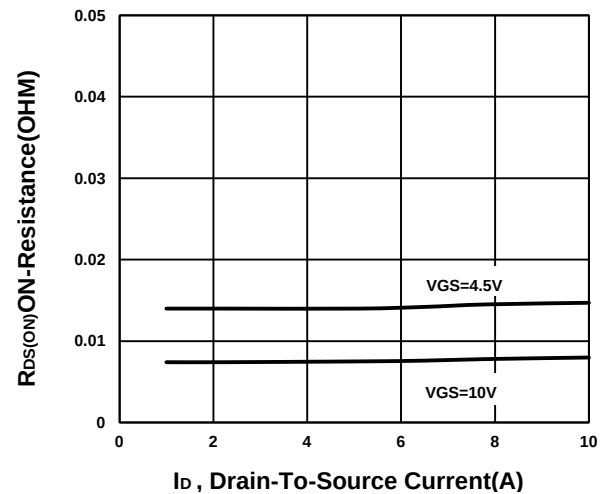
**Transfer Characteristics**



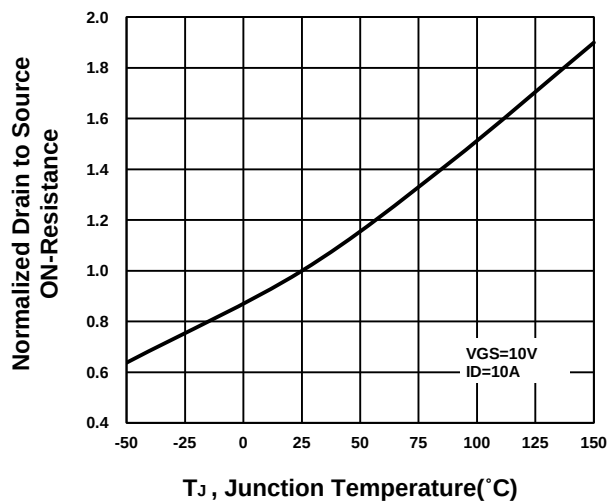
**On-Resistance VS Gate-To-Source**



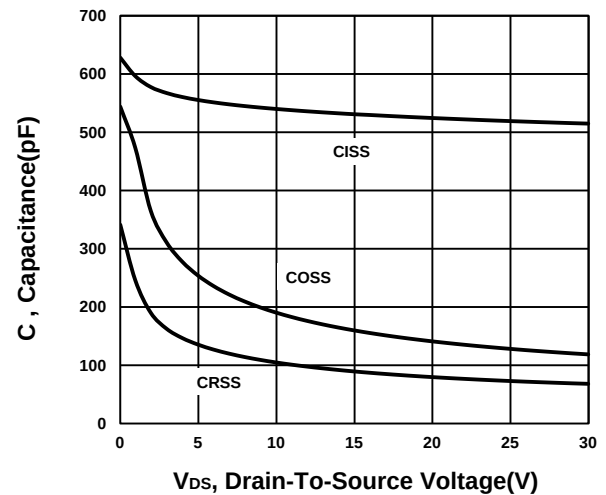
**On-Resistance VS Drain Current**



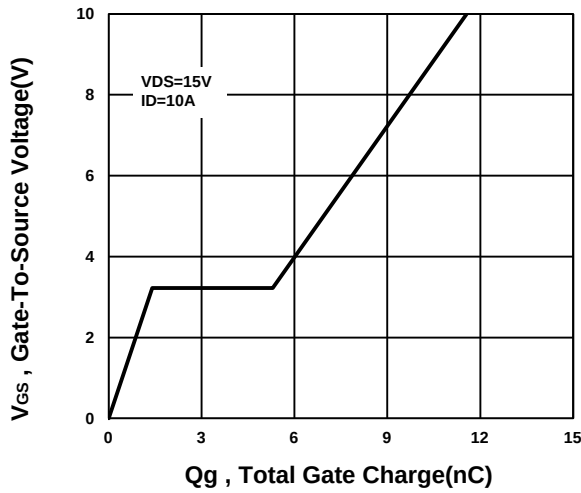
**On-Resistance VS Temperature**



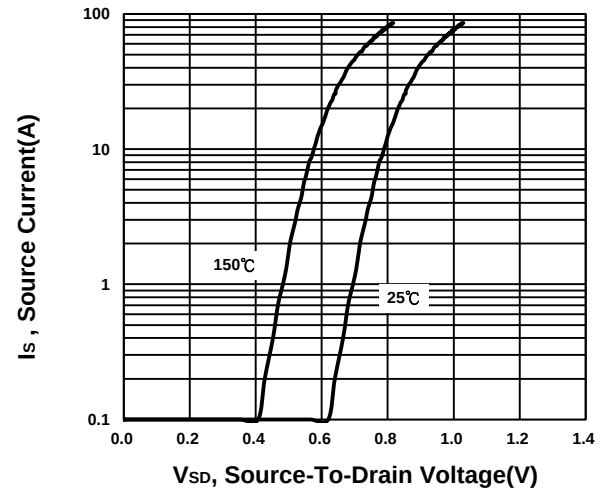
**Capacitance Characteristic**



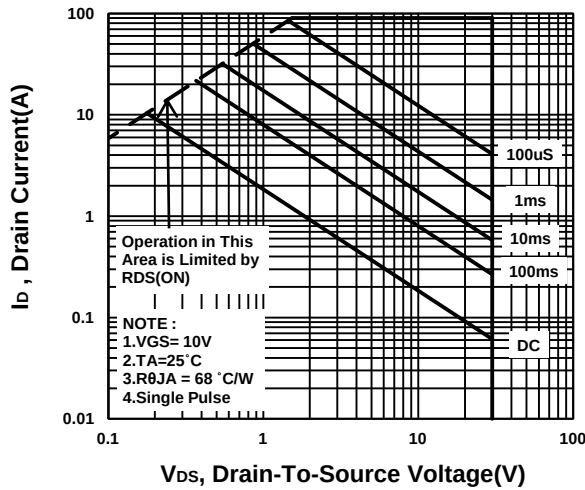
Gate charge Characteristics



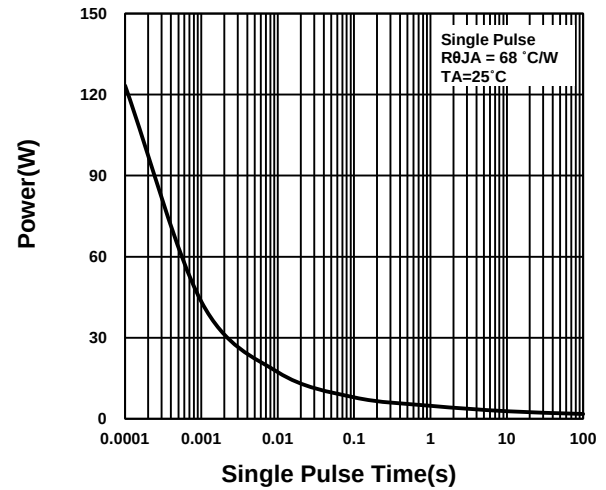
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

