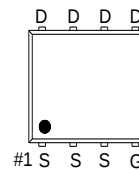
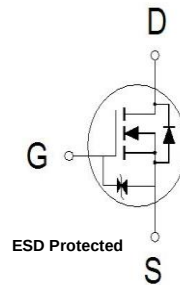


**PRODUCT SUMMARY**

|               |              |       |
|---------------|--------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
| 30V           | 18m $\Omega$ | 24A   |



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.
- Products Integrated ESD diode with ESD Protected up to 2KV.

**Applications**

- Protection Circuits Applications.
- Computer for DC to DC Converters Applications.

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

| PARAMETERS/TEST CONDITIONS                     |                                     | SYMBOL         | LIMITS     | UNITS              |
|------------------------------------------------|-------------------------------------|----------------|------------|--------------------|
| Drain-Source Voltage                           |                                     | $V_{DS}$       | 30         | V                  |
| Gate-Source Voltage                            |                                     | $V_{GS}$       | $\pm 20$   | V                  |
| Continuous Drain Current <sup>4</sup>          | $T_C = 25\text{ }^{\circ}\text{C}$  | $I_D$          | 24         | A                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 15         |                    |
| Pulsed Drain Current <sup>1</sup>              |                                     | $I_{DM}$       | 36         |                    |
| Continuous Drain Current                       | $T_A = 25\text{ }^{\circ}\text{C}$  | $I_D$          | 7.8        |                    |
|                                                | $T_A = 70\text{ }^{\circ}\text{C}$  |                | 6.2        |                    |
| Avalanche Current <sup>5</sup>                 |                                     | $I_{AS}$       | 21.4       |                    |
| Avalanche Energy <sup>5</sup>                  | $L = 0.02\text{mH}$                 | $E_{AS}$       | 4.6        | mJ                 |
| Power Dissipation                              | $T_C = 25\text{ }^{\circ}\text{C}$  | $P_D$          | 19         | W                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 7.7        |                    |
| Power Dissipation <sup>3</sup>                 | $T_A = 25\text{ }^{\circ}\text{C}$  | $P_D$          | 2          | W                  |
|                                                | $T_A = 70\text{ }^{\circ}\text{C}$  |                | 1.3        |                    |
| 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> | $t \leq 10s$ | $R_{\theta JA}$ |         | 62      | °C / W |
| Junction-to-Ambient <sup>2</sup> | Steady-State | $R_{\theta JA}$ |         | 96      |        |
| Junction-to-Case                 | Steady-State | $R_{\theta JC}$ |         | 6.5     |        |

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

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

<sup>5</sup> $V_{DD} = 50V$ ,  $V_{GS} = 10V$ , starting  $T_J = 25^\circ\text{C}$ .

**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                                                 | 30     |      |     | V    |
| Gate Threshold Voltage                        | V <sub>GS(th)</sub>  |                        | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                   | 1.3    | 1.75 | 2.2 |      |
| Gate-Body Leakage                             | I <sub>GSS</sub>     |                        | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±16V                                                 |        |      | ±10 | μA   |
| Zero Gate Voltage Drain Current               | I <sub>DSS</sub>     |                        | V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V                                                  |        |      | 1   | μA   |
|                                               |                      |                        | V <sub>DS</sub> = 20V, 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> = 4.5V, I <sub>D</sub> = 6A                                                  |        | 18   | 27  | mΩ   |
|                                               |                      |                        | V <sub>GS</sub> = 10V, I <sub>D</sub> = 7A                                                   |        | 13   | 18  |      |
| Forward Transconductance <sup>1</sup>         | g <sub>fs</sub>      |                        | V <sub>DS</sub> = 5V, I <sub>D</sub> = 7A                                                    |        | 37   |     | S    |
| DYNAMIC                                       |                      |                        |                                                                                              |        |      |     |      |
| Input Capacitance                             | C <sub>iss</sub>     |                        | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz                                        |        | 376  |     | pF   |
| Output Capacitance                            | C <sub>oss</sub>     |                        |                                                                                              |        | 76   |     |      |
| Reverse Transfer Capacitance                  | C <sub>rss</sub>     |                        |                                                                                              |        | 48   |     |      |
| Gate Resistance                               | R <sub>g</sub>       |                        | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz                                         |        | 3.1  |     | Ω    |
| Total Gate Charge <sup>2</sup>                | Q <sub>g</sub>       | V <sub>GS</sub> = 10V  | V <sub>DS</sub> = 15V , V <sub>GS</sub> = 10V,<br>I <sub>D</sub> = 7A                        |        | 7.6  |     | nC   |
|                                               |                      | V <sub>GS</sub> = 4.5V |                                                                                              |        | 4.2  |     |      |
| Gate-Source Charge <sup>2</sup>               | Q <sub>gs</sub>      |                        |                                                                                              |        | 1    |     |      |
| Gate-Drain Charge <sup>2</sup>                | Q <sub>gd</sub>      |                        |                                                                                              |        | 1.9  |     |      |
| Turn-On Delay Time <sup>2</sup>               | t <sub>d(on)</sub>   |                        | V <sub>DS</sub> = 15V ,<br>I <sub>D</sub> ≅ 7A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> =6 Ω |        | 5.5  |     | nS   |
| Rise Time <sup>2</sup>                        | t <sub>r</sub>       |                        |                                                                                              |        | 35   |     |      |
| Turn-Off Delay Time <sup>2</sup>              | t <sub>d(off)</sub>  |                        |                                                                                              |        | 15   |     |      |
| Fall Time <sup>2</sup>                        | t <sub>f</sub>       |                        |                                                                                              |        | 46   |     |      |

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

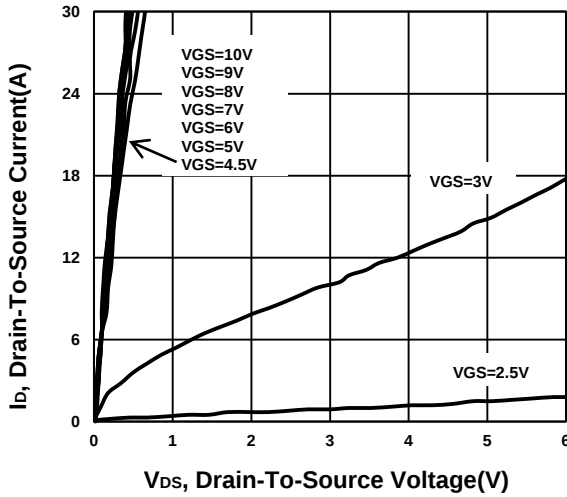
|                                 |          |                                                        |  |     |    |
|---------------------------------|----------|--------------------------------------------------------|--|-----|----|
| Continuous Current <sup>3</sup> | $I_S$    |                                                        |  | 17  | A  |
| Forward Voltage <sup>1</sup>    | $V_{SD}$ | $I_F = 7\text{A}, V_{GS} = 0\text{V}$                  |  | 1.1 | V  |
| Reverse Recovery Time           | $t_{rr}$ | $I_F = 7\text{A}, dI_F/dt = 100\text{A} / \mu\text{S}$ |  | 4.7 | nS |
| Reverse Recovery Charge         | $Q_{rr}$ |                                                        |  | 0.9 | nC |

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

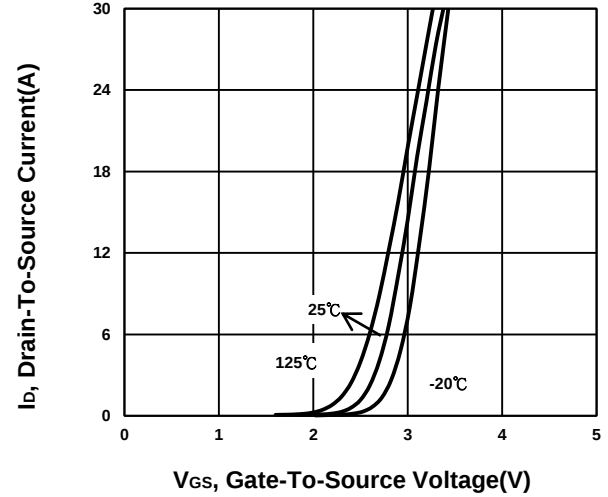
<sup>2</sup>Independent of operating temperature.

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

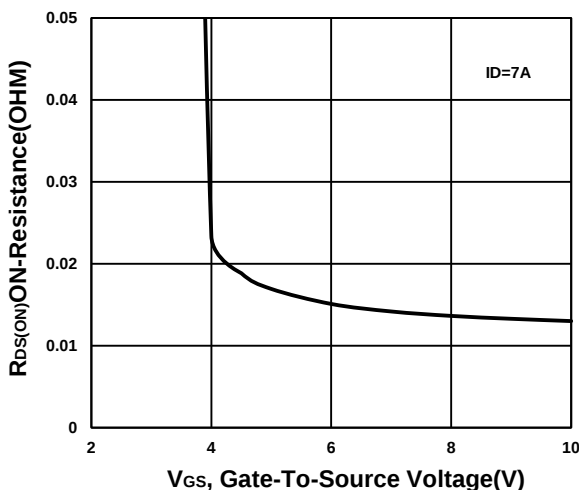
Output Characteristics



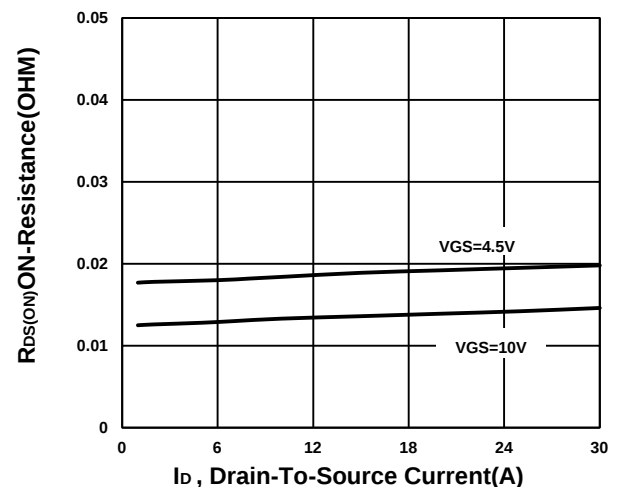
Transfer Characteristics



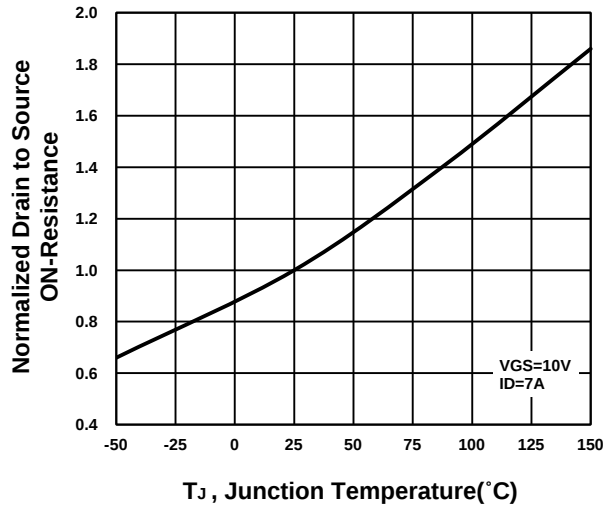
On-Resistance VS Gate-To-Source Voltage



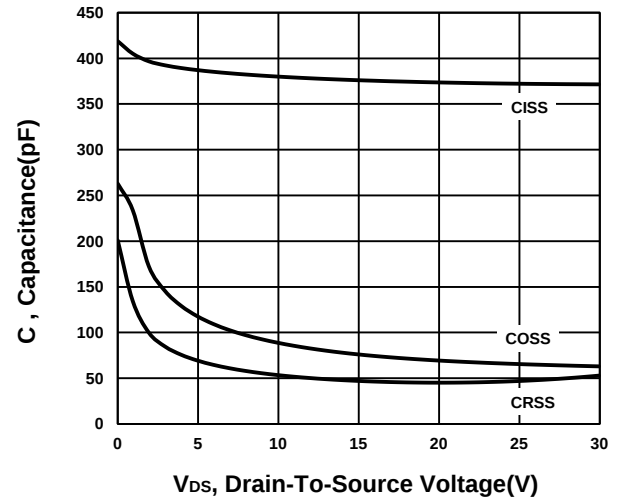
On-Resistance VS Drain Current

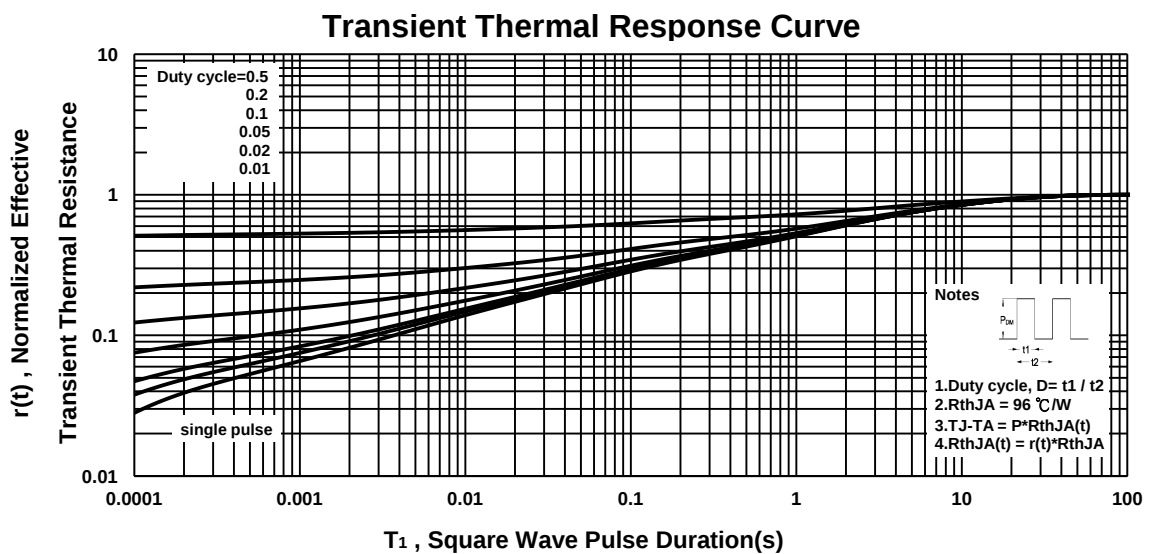
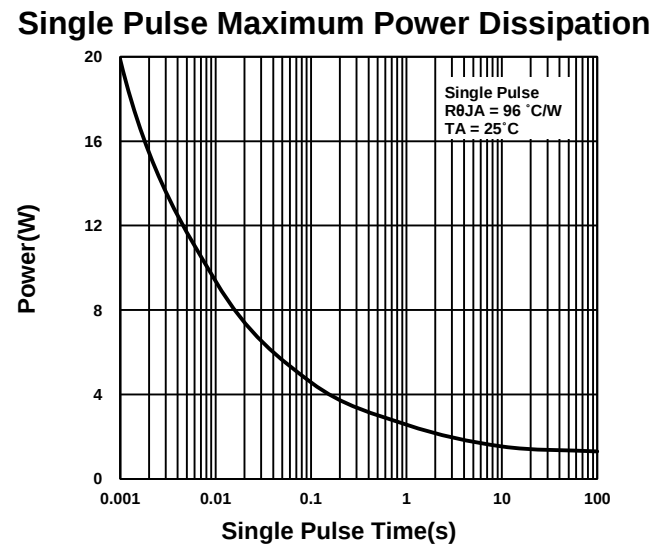
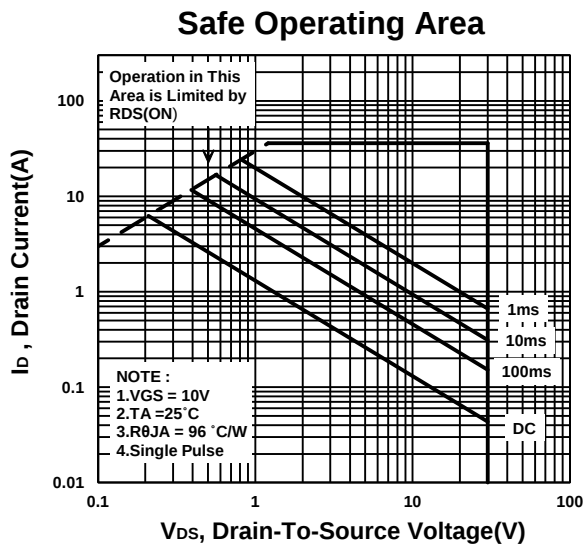
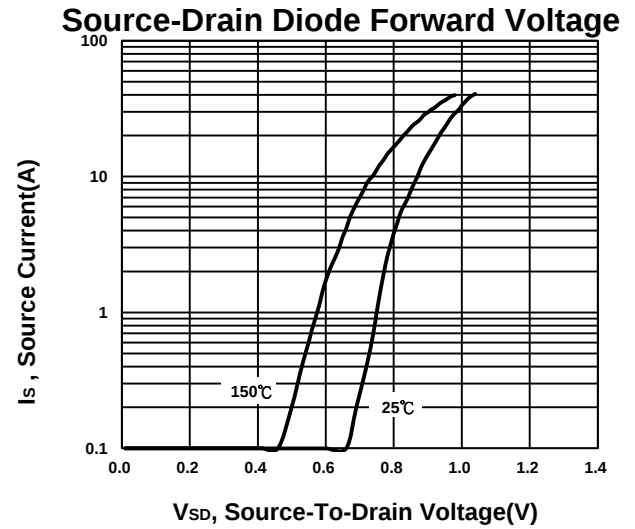
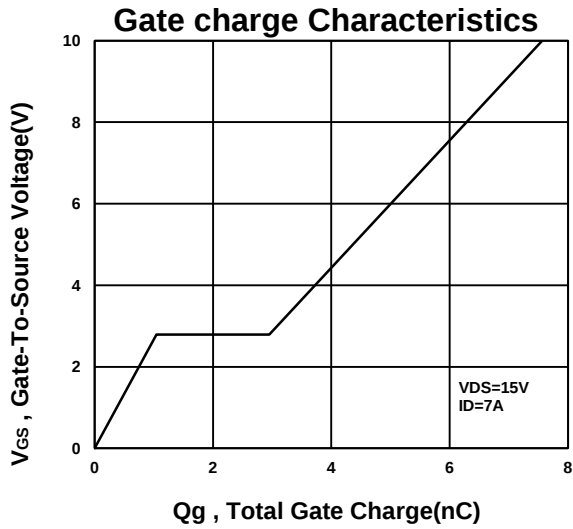


On-Resistance VS Temperature

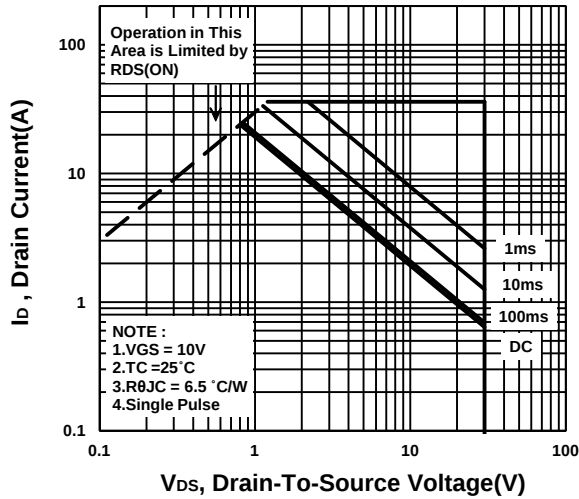


Capacitance Characteristic

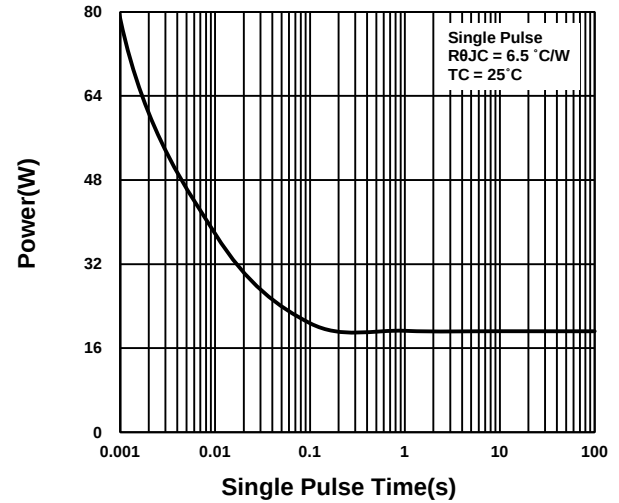




**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

