

**PRODUCT SUMMARY**

|               |               |         |
|---------------|---------------|---------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$  | $I_D^4$ |
| 30V           | 1.2m $\Omega$ | 161A    |

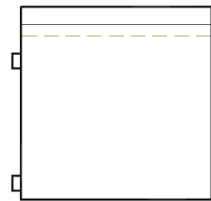
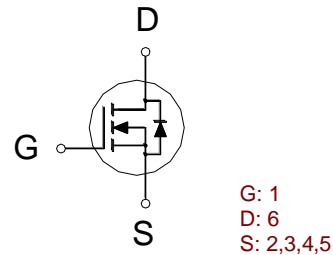


**Features**

- 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.
- 100% UIS Tested & 100% Rg Tested
- Patent No. US9,947,551.

**Applications**

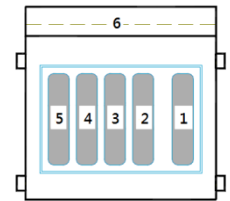
- Protection Circuits Applications.
- Computer for DC to DC Converters Applications.



Top view



Side view



Bottom view

**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>          | $T_C = 25\text{ }^\circ\text{C}$  | $I_D$          | 161        | A                |
|  | $T_C = 100\text{ }^\circ\text{C}$ |                | 102        |                  |
|  | $T_A = 25\text{ }^\circ\text{C}$  |                | 40         |                  |
|  | $T_A = 70\text{ }^\circ\text{C}$  |                | 32         |                  |
| Pulsed Drain Current <sup>1</sup>              |                                   | $I_{DM}$       | 306        |                  |
| Avalanche Current                              |                                   | $I_{AS}$       | 28         |                  |
| Avalanche Energy                               | L = 0.5mH                         | $E_{AS}$       | 196        | mJ               |
| Power Dissipation <sup>3</sup>                 | $T_C = 25\text{ }^\circ\text{C}$  | $P_D$          | 50         | W                |
|  | $T_C = 100\text{ }^\circ\text{C}$ |                | 20         |                  |
|  | $T_A = 25\text{ }^\circ\text{C}$  |                | 3.1        |                  |
|  | $T_A = 70\text{ }^\circ\text{C}$  |                | 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> | $t \leq 10s$ | $R_{\theta JA}$ |         | 40      | °C / W |
| Junction-to-Ambient <sup>2</sup> | Steady-State | $R_{\theta JA}$ |         | 60      |        |
| Junction-to-Case                 | Top          | $R_{\theta JC}$ |         | 2.5     |        |

<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  $T_A = 25^\circ C$ .

<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.

**ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)**

| PARAMETER                                     | SYMBOL        | TEST CONDITIONS  | LIMITS                                  |      |           | UNIT       |    |
|---|---------------|--|---|------|-----------|------------|----|
|   |               |  | MIN                                     | TYP  | MAX       |            |    |
| <b>STATIC</b>                                 |               |  |   |      |           |            |    |
| 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                                     | 1.6  | 2.3       |            |    |
| Gate-Body Leakage                             | $I_{GSS}$     | $V_{DS} = 0V, V_{GS} = \pm 20V$                                |   |      | $\pm 100$ | nA         |    |
| Zero Gate Voltage Drain Current               | $I_{DSS}$     | $V_{DS} = 24V, V_{GS} = 0V$                                    |   |      | 1         | $\mu A$    |    |
|   |               | $V_{DS} = 20V, V_{GS} = 0V, T_J = 55^\circ C$                  |   |      | 10        |            |    |
| Drain-Source On-State Resistance <sup>1</sup> | $R_{DS(on)}$  | $V_{GS} = 4.5V, I_D = 12A$                                     |   | 1.6  | 2.0       | m $\Omega$ |    |
|   |               | $V_{GS} = 10V, I_D = 14A$                                      |   | 0.9  | 1.2       |            |    |
| Forward Transconductance <sup>1</sup>         | $g_{fs}$      | $V_{DS} = 5V, I_D = 14A$                                       |   | 87   |           | S          |    |
| <b>DYNAMIC</b>                                |               |  |   |      |           |            |    |
| Input Capacitance                             | $C_{iss}$     | $V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$                          |   | 3368 |           | $\mu F$    |    |
| Output Capacitance                            | $C_{oss}$     |  |   | 1294 |           |            |    |
| Reverse Transfer Capacitance                  | $C_{rss}$     |  |   | 140  |           |            |    |
| Gate Resistance                               | $R_g$         | $V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$                           |   | 0.73 |           | $\Omega$   |    |
| Total Gate Charge <sup>2</sup>                | $Q_g$         | $V_{GS} = 10V$   | $V_{DS} = 15V, V_{GS} = 10V, I_D = 14A$ |      | 64        | nC         |    |
|   |               | $V_{GS} = 4.5V$  |   |      | 32.5      |            |    |
| Gate-Source Charge <sup>2</sup>               | $Q_{gs}$      |  |   | 8.6  |           |            |    |
| Gate-Drain Charge <sup>2</sup>                | $Q_{gd}$      |  |   | 13.8 |           |            |    |
| Turn-On Delay Time <sup>2</sup>               | $t_{d(on)}$   | $V_{DS} = 15V, I_D \cong 14A, V_{GS} = 10V, R_{GEN} = 6\Omega$ |   |      | 26        |            | nS |
| Rise Time <sup>2</sup>                        | $t_r$         |  |   |      | 130       |            |    |
| Turn-Off Delay Time <sup>2</sup>              | $t_{d(off)}$  |  |   |      | 95        |            |    |
| Fall Time <sup>2</sup>                        | $t_f$         |  |   | 148  |           |            |    |

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

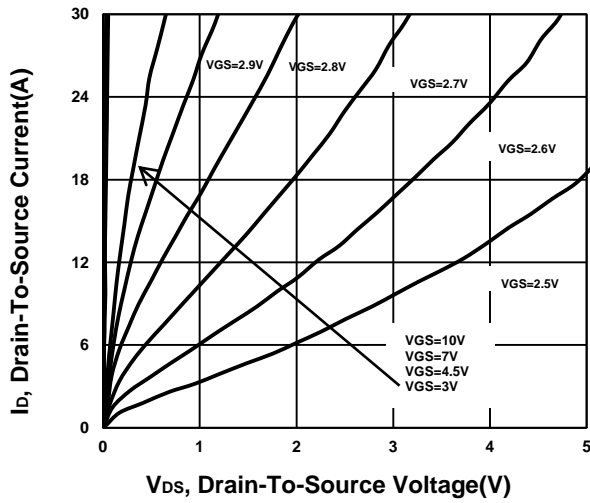
|                                 |                 |   |  |     |    |
|---------------------------------|-----------------|---|--|-----|----|
| Continuous Current <sup>3</sup> | I <sub>S</sub>  |   |  | 41  | A  |
| Forward Voltage <sup>1</sup>    | V <sub>SD</sub> | I <sub>F</sub> = 14A, V <sub>GS</sub> = 0V            |  | 1.2 | V  |
| Reverse Recovery Time           | t <sub>rr</sub> | I <sub>F</sub> = 14A, di <sub>F</sub> /dt = 100A / μS |  | 60  | nS |
| Reverse Recovery Charge         | Q <sub>rr</sub> |   |  | 66  | nC |

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

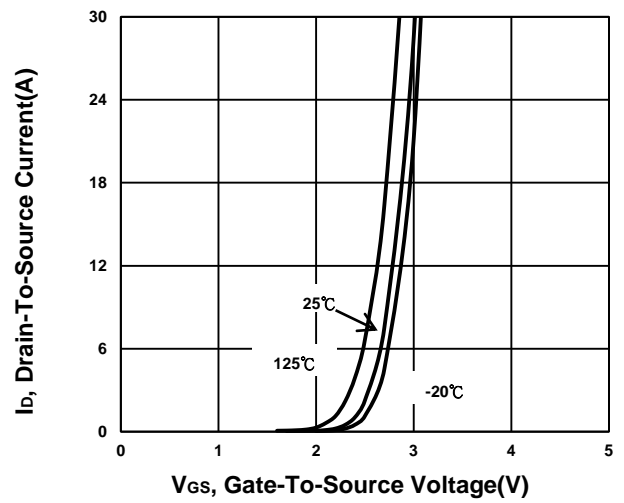
<sup>2</sup>Independent of operating temperature.

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

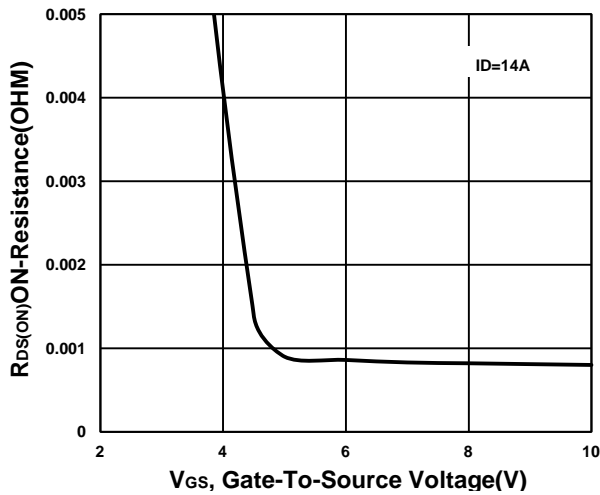
**Output Characteristics**



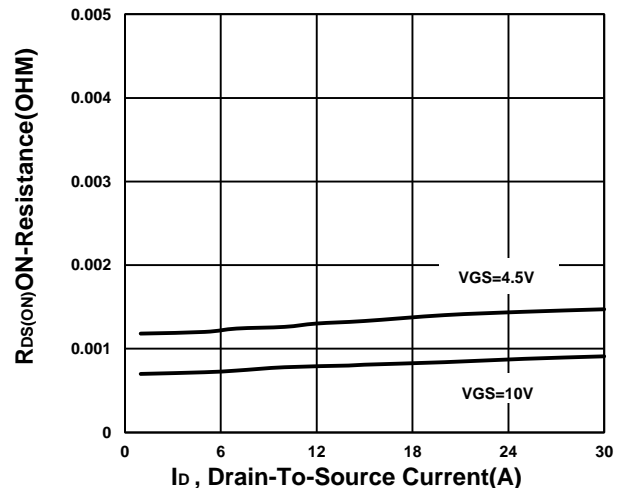
**Transfer Characteristics**



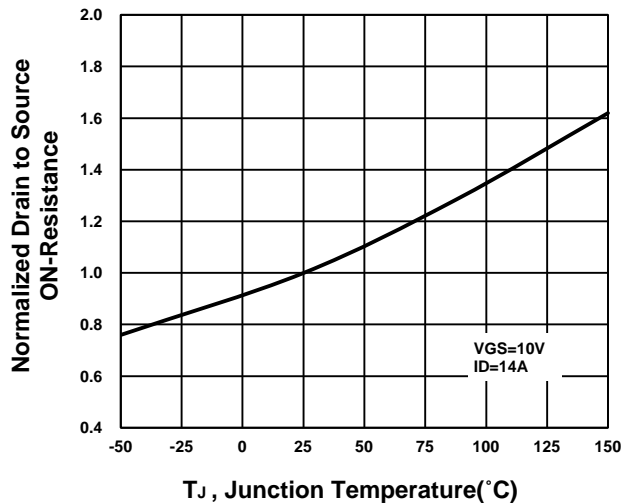
**On-Resistance VS Gate-To-Source Voltage**



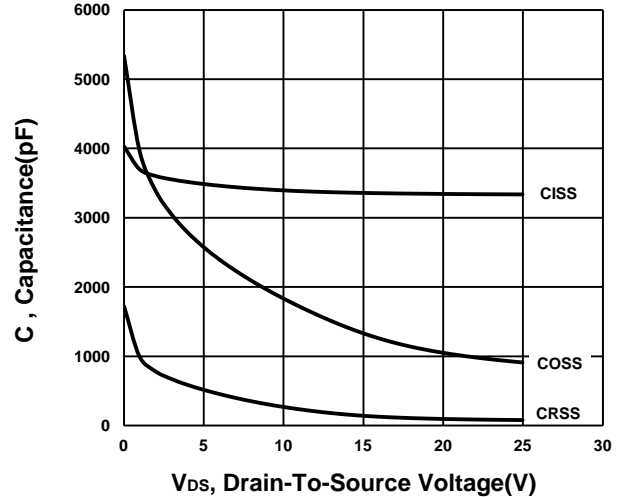
**On-Resistance VS Drain Current**



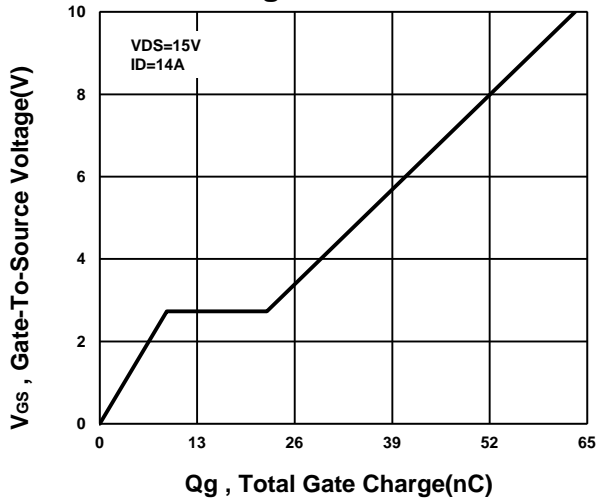
**On-Resistance VS Temperature**



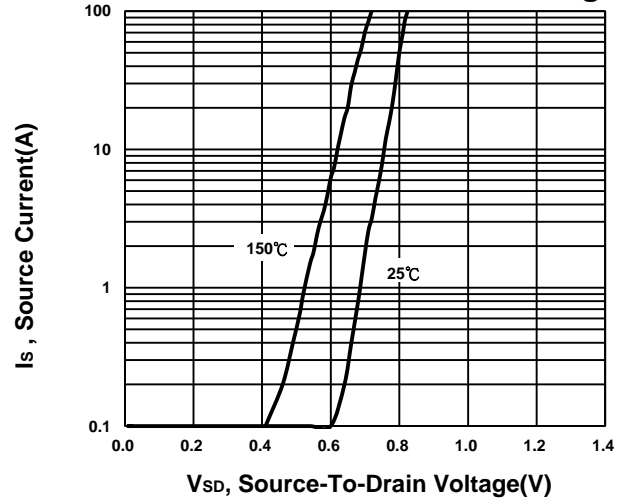
**Capacitance Characteristic**



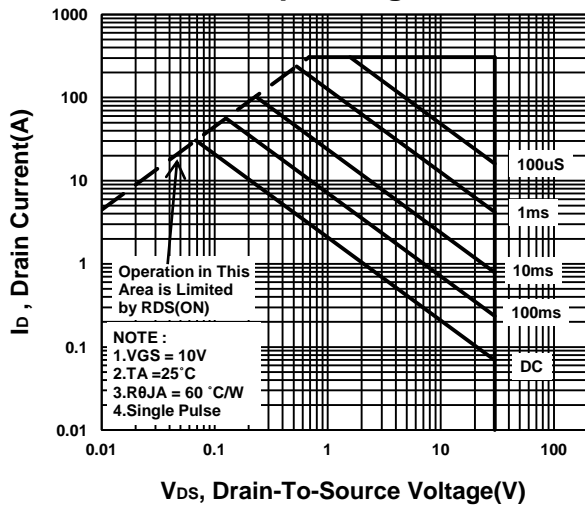
**Gate charge Characteristics**



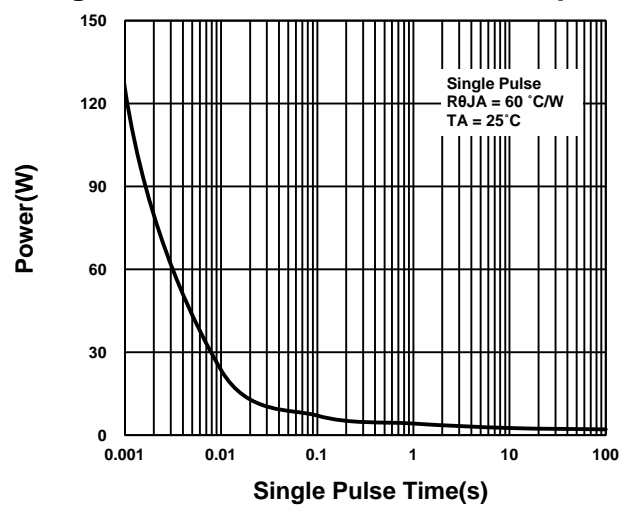
**Source-Drain Diode Forward Voltage**



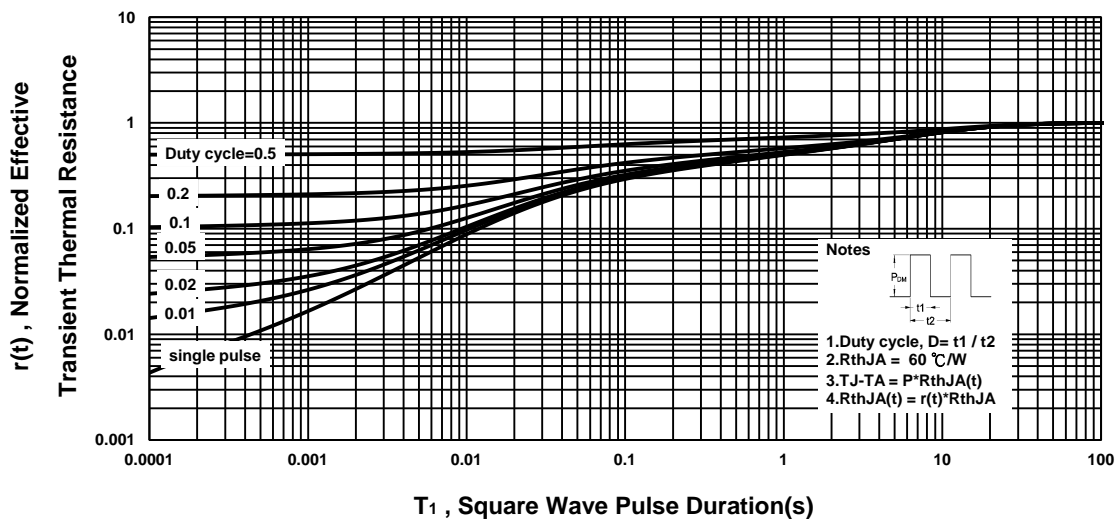
**Safe Operating Area**



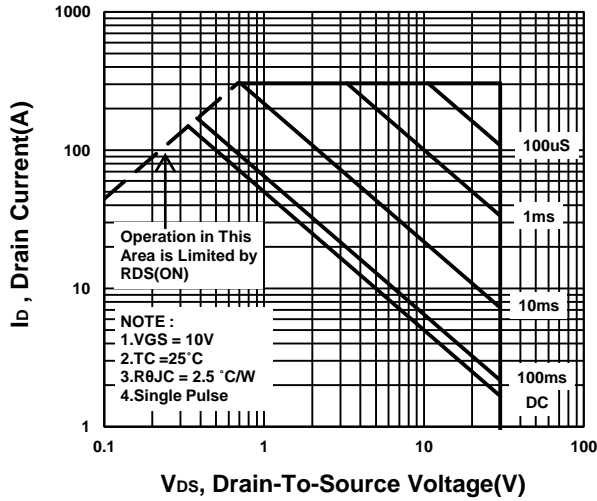
**Single Pulse Maximum Power Dissipation**



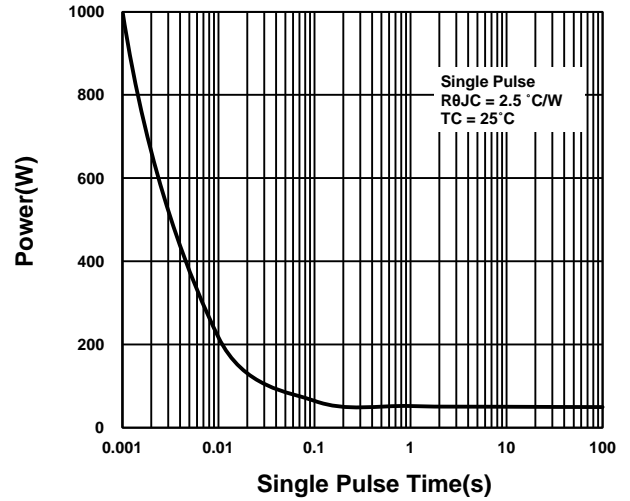
**Transient Thermal Response Curve**



**Safe Operating Area, (Top)**



**Single Pulse Maximum Power Dissipation, (Top)**



**Transient Thermal Response Curve, (Top)**

