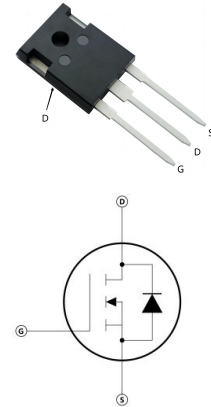


### Features

- Fast Intrinsic Diode
- Gate charge minimized
- Very low intrinsic capacitances
- High speed switching



### Applications

- High Voltage Power Supplies
- Capacitor Discharge Applications
- Pulse circuits
- Laser and X-Ray Generation Systems

### Electrical ratings

| Absolute maximum ratings                                                                                                                    |           |           |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|--------------------|
| Parameter                                                                                                                                   | Symbol    | Value     | Unit               |
| Drain-source voltage ( $V_{GS} = 0$ )                                                                                                       | $V_{DS}$  | 3500      | V                  |
| Gate- source voltage                                                                                                                        | $V_{GS}$  | $\pm 30$  |                    |
| Drain current (continuous) at $T_C = 25\text{ }^{\circ}\text{C}$                                                                            | $I_D$     | 2         | A                  |
| Drain current (continuous) at $T_C = 100\text{ }^{\circ}\text{C}$                                                                           |           | 1.6       |                    |
| Drain current (pulsed)                                                                                                                      | $I_{DM}$  | 6         |                    |
| Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$                                                                                     | $P_D$     | 463       | W                  |
| Avalanche Current                                                                                                                           | $I_{AR}$  | 1.3       | A                  |
| Single pulse avalanche energy<br>(starting $T_J = 25\text{ }^{\circ}\text{C}$ , $I_D = I_{AR}$ , $V_{DD} = 50\text{ V}$ , $L=20\text{mH}$ ) | $E_{AS}$  | 16.9      | mJ                 |
| Operating junction temperature                                                                                                              | $T_J$     | -55 ~ 150 | $^{\circ}\text{C}$ |
| Storage temperature                                                                                                                         | $T_{stg}$ |           |                    |
| Maximum lead temperature for soldering<br>purpose                                                                                           | $T_L$     | 300       | $^{\circ}\text{C}$ |
| Mounting Torque                                                                                                                             | $M_d$     | 1.13      | N • m              |
| Weight                                                                                                                                      | G         | 6         | g                  |

### Electrical Characteristics ( $T_{vj} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

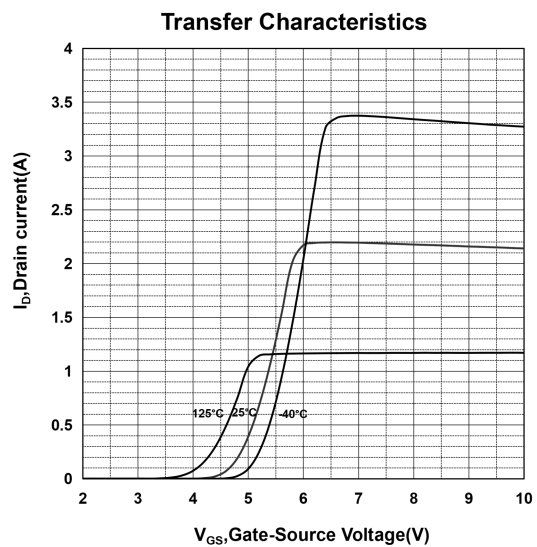
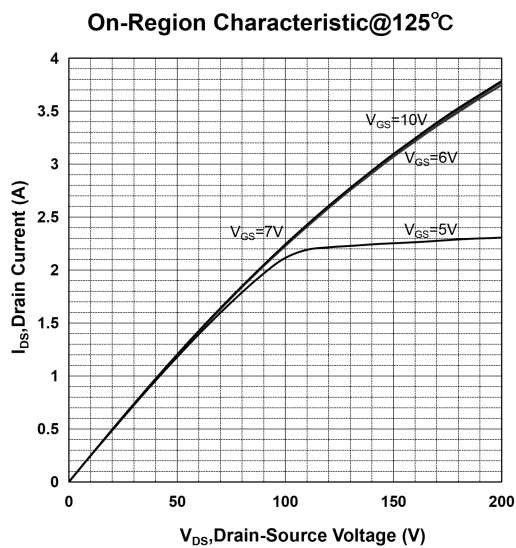
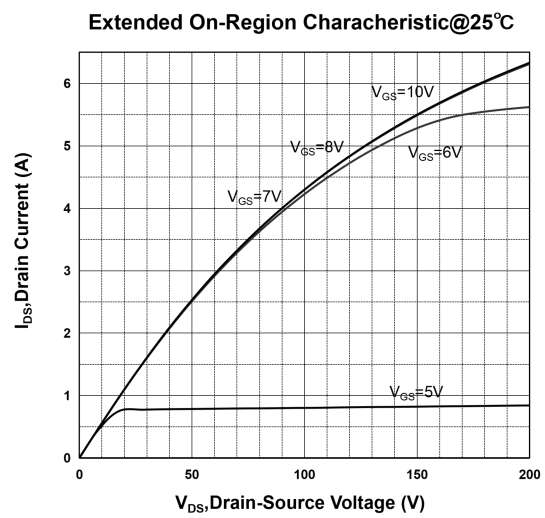
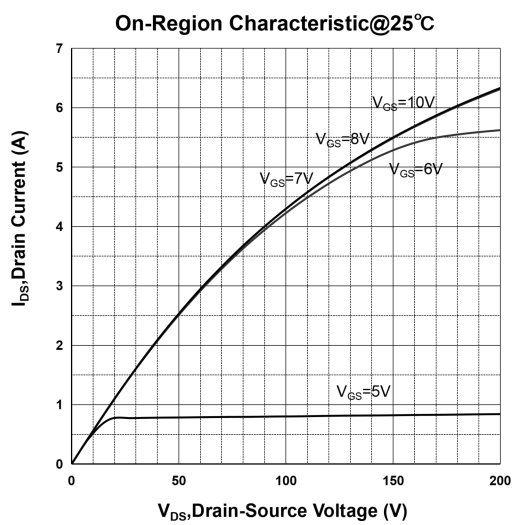
| On /off states                                      |               |                                                                                                    |      |     |             |               |
|-----------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------|------|-----|-------------|---------------|
| Parameter                                           | Symbol        | Test conditions                                                                                    | Min  | Typ | Max         | Unit          |
| Drain-source<br>breakdown voltage                   | $V_{(BR)DSS}$ | $I_D = 250\text{ }\mu\text{A}$ , $V_{GS} = 0$                                                      | 3500 |     |             | V             |
| Zero gate voltage<br>drain current ( $V_{GS} = 0$ ) | $I_{DSS}$     | $V_{DS} = \text{Max rating}$<br>$V_{DS} = \text{Max rating}$ , $T_C = 125\text{ }^{\circ}\text{C}$ |      |     | 100<br>1000 | $\mu\text{A}$ |

|                                            |              |                                          |     |    |           |          |
|--------------------------------------------|--------------|------------------------------------------|-----|----|-----------|----------|
| Gate-body leakage current ( $V_{DS} = 0$ ) | $I_{GSS}$    | $V_{GS} = \pm 30 \text{ V}$              |     |    | $\pm 200$ | nA       |
| Gate threshold voltage                     | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$ | 3.5 | -  | 5.5       | V        |
| Static drain-source on resistance          | $R_{DS(on)}$ | $V_{GS} = 10\text{V}, I_D = 2\text{A}$   | -   | 19 | 25        | $\Omega$ |

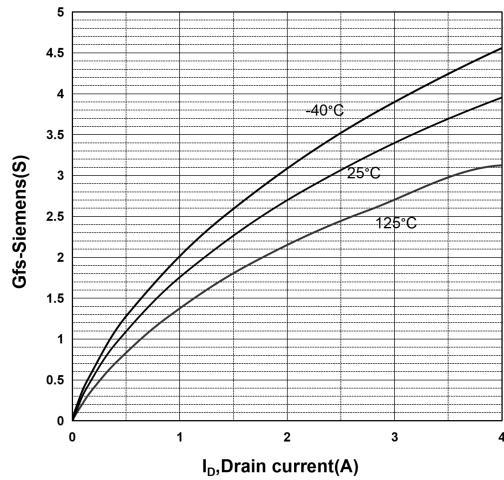
| Dynamic                       |              |                                                                                                                                      |     |      |     |      |
|-------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|------|-----|------|
| Parameter                     | Symbol       | Test conditions                                                                                                                      | Min | Typ  | Max | Unit |
| Forward transconductance      | $g_{fs}$     | $V_{DS} = 50 \text{ V}, I_D = 2 \text{ A}$                                                                                           | 1.2 | 2.7  |     | S    |
| Input capacitance             | $C_{iss}$    | $V_{DS}=25\text{V}, f=1\text{MHz}, V_{GS}=0$                                                                                         |     | 3540 |     | pF   |
| Output capacitance            | $C_{oss}$    |                                                                                                                                      |     | 210  |     |      |
| Reverse transfer capacitance  | $C_{rss}$    |                                                                                                                                      |     | 68   |     |      |
| Total gate charge             | $Q_g$        | $V_{DD}=1750\text{V}, I_D=2\text{A}$<br>$V_{GS}=10\text{V}$                                                                          |     | 94   |     | nC   |
| Gate-source charge            | $Q_{gs}$     |                                                                                                                                      |     | 14   |     |      |
| Gate-drain charge             | $Q_{gd}$     |                                                                                                                                      |     | 50   |     |      |
| Switching times               |              |                                                                                                                                      |     |      |     |      |
| Parameter                     | Symbol       | Test conditions                                                                                                                      | Min | Typ  | Max | Unit |
| Turn-on delay time            | $t_{d(on)}$  | <b>Resistive load</b><br>$V_{DD} = 1750 \text{ V}, I_D = 2\text{A},$<br>$V_{GS} = 10 \text{ V},$<br>$R_G = 5\Omega(\text{External})$ |     | 19   |     | ns   |
| Rise time                     | $t_r$        |                                                                                                                                      |     | 23   |     |      |
| Turn-off-delay time           | $t_{d(off)}$ |                                                                                                                                      |     | 52   |     |      |
| Fall time                     | $t_f$        |                                                                                                                                      |     | 53   |     |      |
| Source drain diode            |              |                                                                                                                                      |     |      |     |      |
| Parameter                     | Symbol       | Test conditions                                                                                                                      | Min | Typ  | Max | Unit |
| Source-drain current          | $I_{SD}$     |                                                                                                                                      |     |      | 4   | A    |
| Source-drain current (pulsed) | $I_{SDM}$    |                                                                                                                                      |     |      | 12  |      |
| Forward on voltage            | $V_{SD}$     | $I_{SD}= 1\text{A}, V_{GS}= 0$                                                                                                       |     | 0.9  | 1.5 | V    |
| Reverse recovery time         | $t_{rr}$     | $I_{SD}=2\text{A}, -di/dt=100\text{A}/\mu\text{s}$<br>$V_{DD}= 1750\text{V}$                                                         |     | 620  |     | ns   |
| Reverse recovery charge       | $Q_{rr}$     |                                                                                                                                      |     | 570  |     | nC   |
| Reverse recovery current      | $I_{RRM}$    |                                                                                                                                      |     | 1.1  |     | A    |
| Reverse recovery time         | $t_{rr}$     | $I_{SD}=2\text{A}, di/dt=100\text{A}/\mu\text{s}$<br>$V_{DD}= 1750 \text{ V } T_J=125^\circ\text{C}$                                 |     | 880  |     | ns   |
| Reverse recovery charge       | $Q_{rr}$     |                                                                                                                                      |     | 460  |     | nC   |

|                                         |                |       |      |   |
|-----------------------------------------|----------------|-------|------|---|
| Reverse recovery current                | $I_{RRM}$      |       | 1.3  | A |
| Thermal data                            |                |       |      |   |
| Parameter                               | Symbol         | Value | Unit |   |
| Thermal resistance junction-case max    | $R_{thj-case}$ | 0.27  | W/°C |   |
| Thermal resistance junction-ambient max | $R_{thj-amb}$  | 50    |      |   |

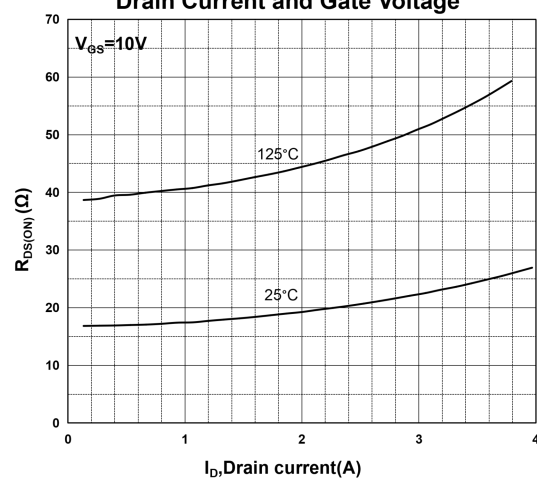
### Electrical characteristics



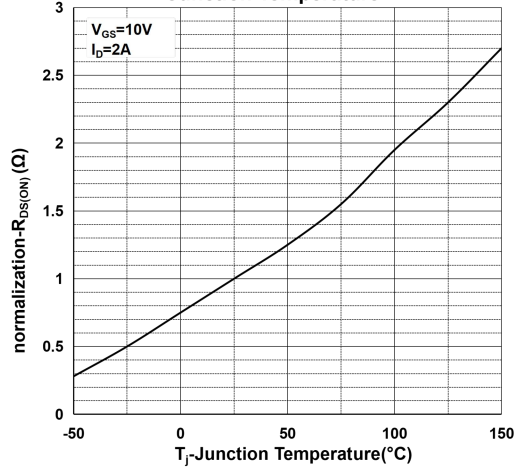
**Transconductance**



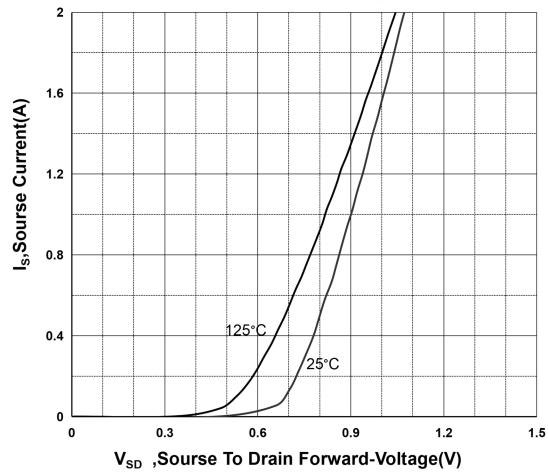
**On-Resistance Variation vs Drain Current and Gate Voltage**



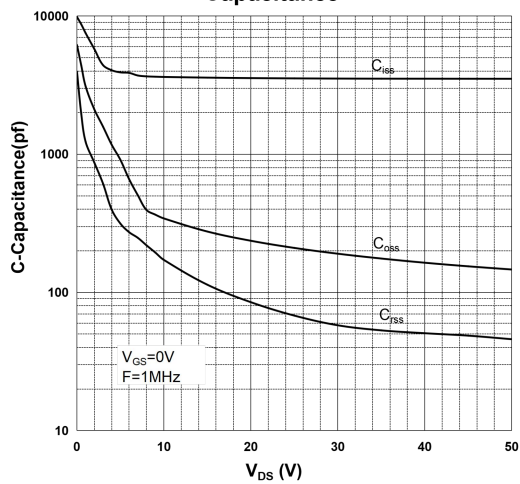
**Normalization On-Resistance Variation vs Junction Temperature**



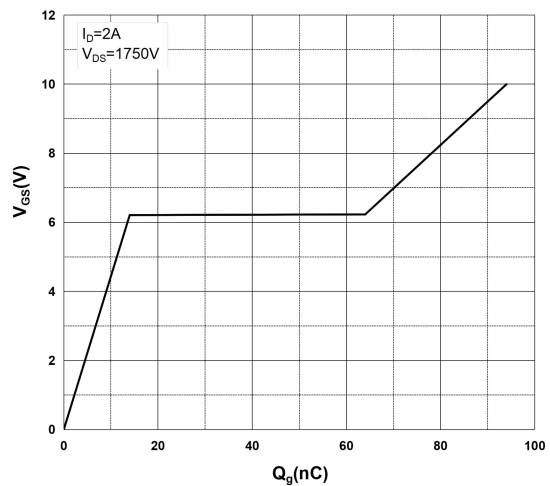
**Body Diode Forward Voltage Variation with Source Current and Temperature**



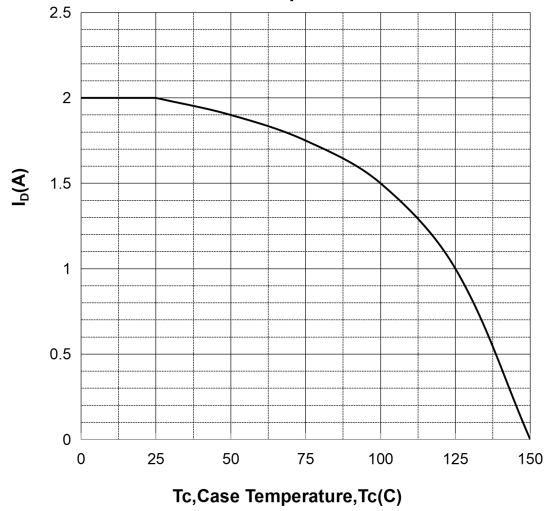
**Capacitance**



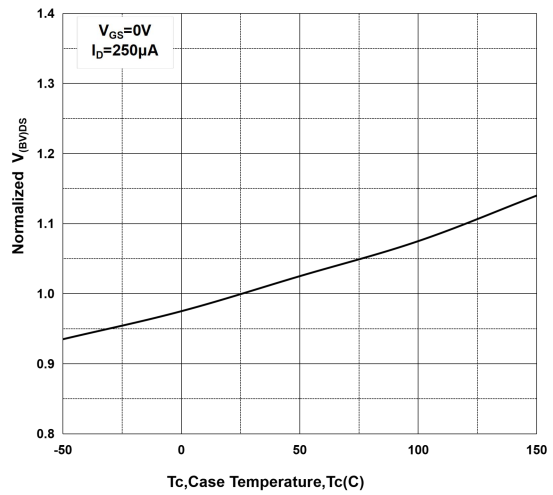
**Gate Charge**



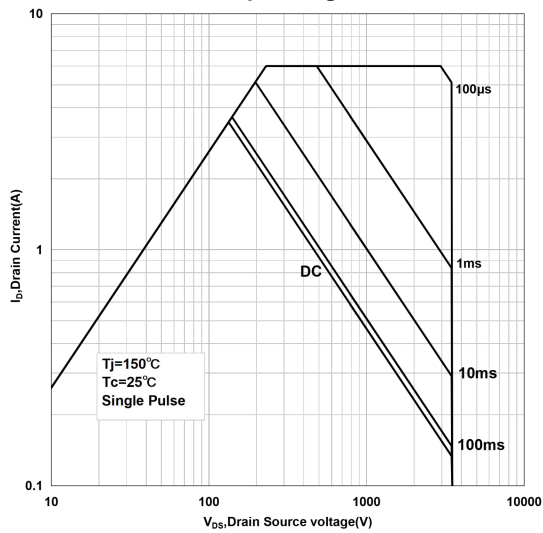
**Maximum Drain Current vs Case Temperature**



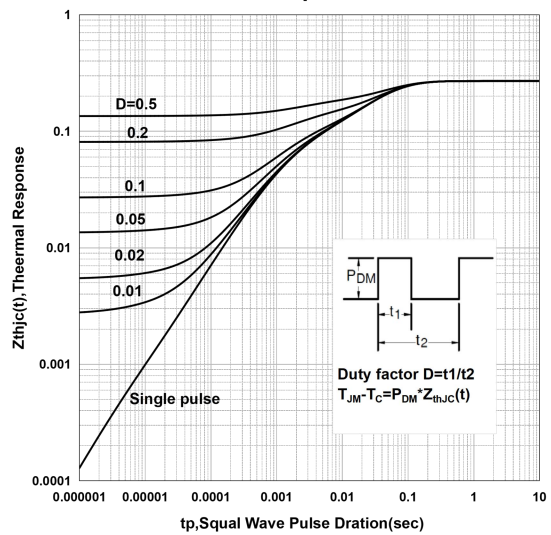
**Normalized  $V_{(BV)DS}$  vs temperature**



**Safe Operating Area**



**Transient response Curve**



## Package outline dimension

