



**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

| Symbol                                    | Parameter                         | Conditions  | Min | Typ  | Max  | Unit |
|---|-----------------------------------|---|-----|------|------|------|
| <b>On/Off States</b>                      |                                   |   |     |      |      |      |
| B <sub>V</sub> DSS                        | Drain-Source Breakdown Voltage    | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA   | -60 |      |      | V    |
| I <sub>DSS</sub>                          | Zero Gate Voltage Drain Current   | V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V  |     |      | -1   | μA   |
| I <sub>GSS</sub>                          | Gate-Body Leakage Current         | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V  |     |      | ±100 | nA   |
| V <sub>GS(th)</sub>                       | Gate Threshold Voltage            | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                   | -1  | -1.6 | -2.5 | V    |
| g <sub>FS</sub>                           | Forward Transconductance          | V <sub>DS</sub> =-5V, I <sub>D</sub> =-15A  |     | 35   |      | S    |
| R <sub>DS(ON)</sub>                       | Drain-Source On-State Resistance  | V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A   |     | 24   | 29   | mΩ   |
|   |                                   | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A  |     | 30   | 39   | mΩ   |
| <b>Dynamic Characteristics</b>            |                                   |   |     |      |      |      |
| C <sub>iss</sub>                          | Input Capacitance                 | V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                     |     | 2026 |      | pF   |
| C <sub>oss</sub>                          | Output Capacitance                |   |     | 134  |      | pF   |
| C <sub>rss</sub>                          | Reverse Transfer Capacitance      |   |     | 98   |      | pF   |
| <b>Switching Parameters</b>               |                                   |   |     |      |      |      |
| t <sub>d(on)</sub>                        | Turn-on Delay Time                | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V,<br>R <sub>L</sub> =1.5Ω, R <sub>GEN</sub> =3Ω |     | 12.2 |      | nS   |
| t <sub>r</sub>                            | Turn-on Rise Time                 |   |     | 10   |      | nS   |
| t <sub>d(off)</sub>                       | Turn-Off Delay Time               |   |     | 64   |      | nS   |
| t <sub>f</sub>                            | Turn-Off Fall Time                |   |     | 14   |      | nS   |
| Q <sub>g</sub>                            | Total Gate Charge                 | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-20A                          |     | 68   |      | nC   |
| Q <sub>gs</sub>                           | Gate-Source Charge                |   |     | 10.5 |      | nC   |
| Q <sub>gd</sub>                           | Gate-Drain Charge                 |   |     | 13   |      | nC   |
| <b>Source-Drain Diode Characteristics</b> |                                   |   |     |      |      |      |
| I <sub>SD</sub>                           | Source-Drain Current (Body Diode) |   |     |      | -30  | A    |
| V <sub>SD</sub>                           | Forward on Voltage (Note 3)       | V <sub>GS</sub> =0V, I <sub>S</sub> =-15A   |     |      | -1.2 | V    |
| t <sub>rr</sub>                           | Reverse Recovery Time             | I <sub>F</sub> =-20A, di/dt=100A/μs   |     | 26   |      | ns   |
| Q <sub>rr</sub>                           | Reverse Recovery Charge           | I <sub>F</sub> =-20A, di/dt=100A/μs   |     | 29   |      | nC   |

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

 Notes 2.E<sub>AS</sub> Condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=40V, V<sub>G</sub>=-10V, R<sub>g</sub>=25Ω, L=0.5mH.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

**Typical Electrical And Thermal Characteristics (Curves)**

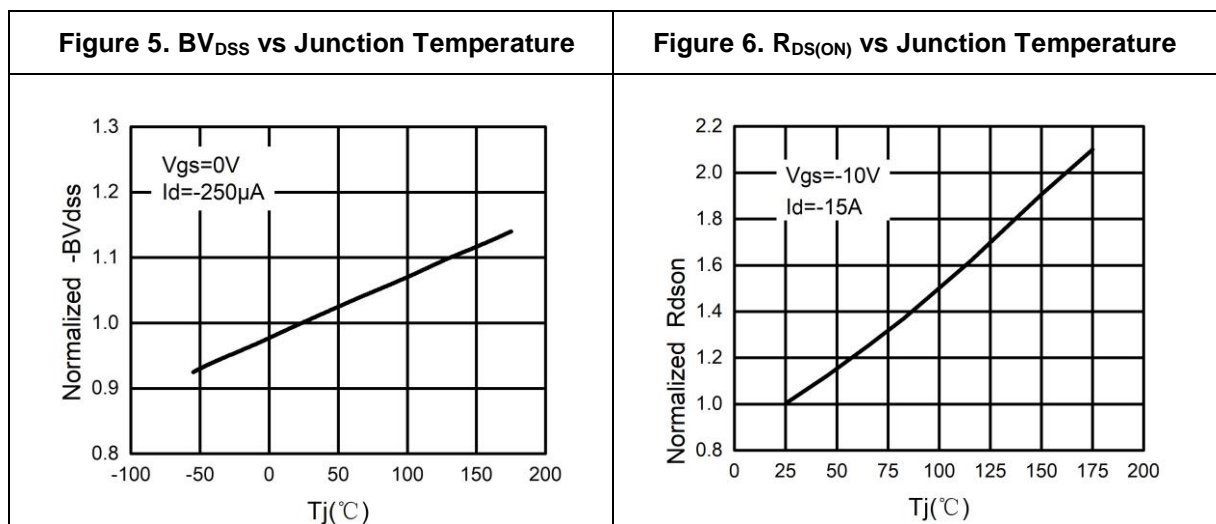
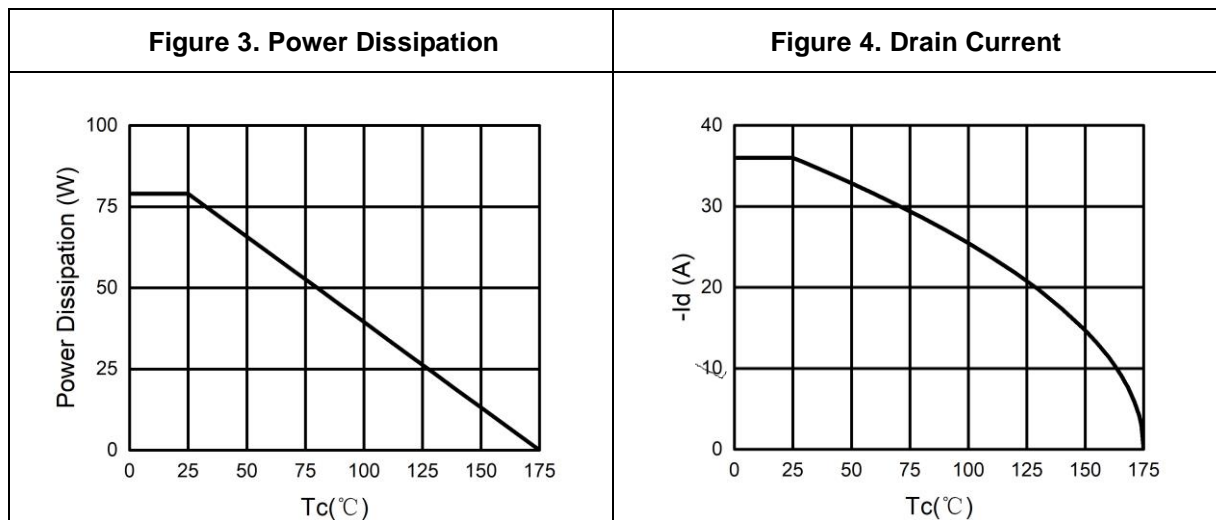
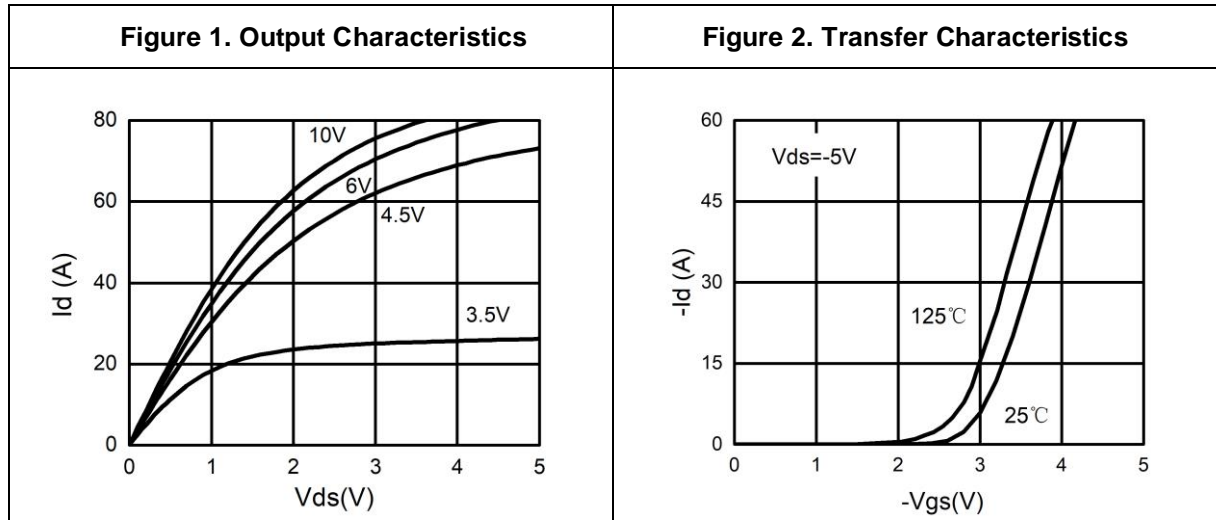


Figure 7. Gate Charge Waveforms

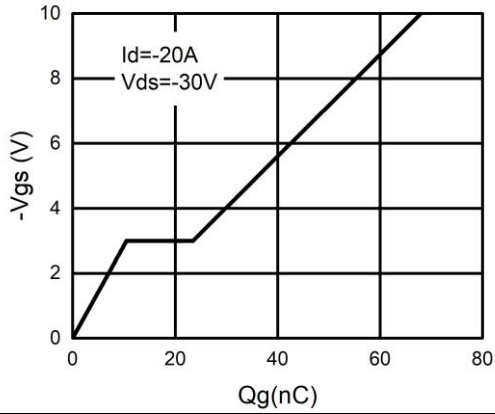


Figure 8. Capacitance

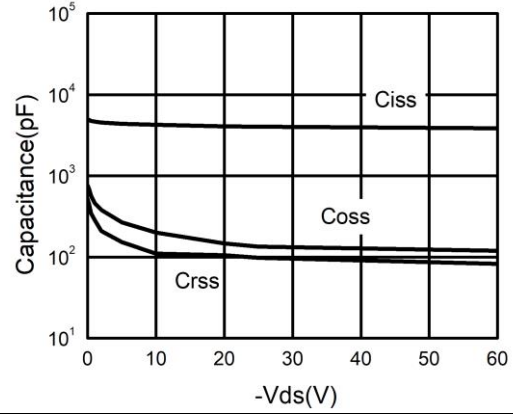


Figure 9. Body-Diode Characteristics

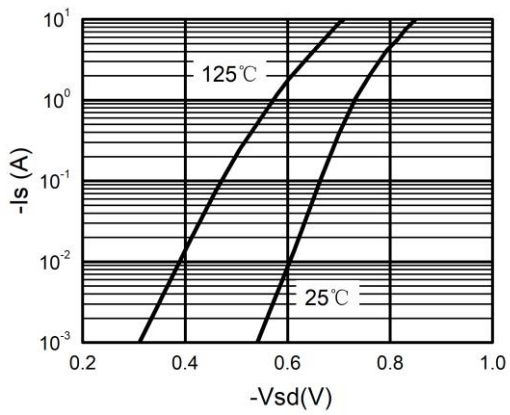
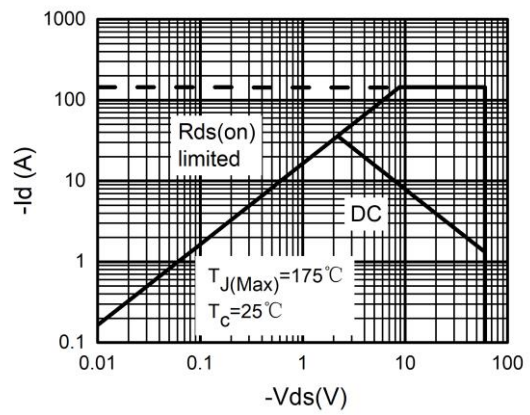


Figure 10. Maximum Safe Operating Area



Package Information:TO-252-3L

| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 4.830 TYP.                |        | 0.190 TYP.           |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 TYP.                |        | 0.114 TYP.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 TYP.                |        | 0.063 TYP.           |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| -      | 1.100                     | 1.300  | 0.043                | 0.051 |
|        | e                         | e      | e                    | e     |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.350 TYP.                |        | 0.211 TYP.           |       |