

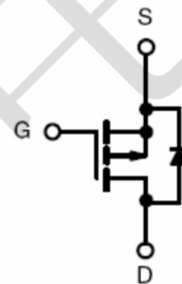
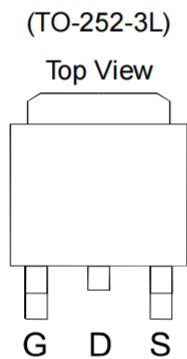
### FEATURES

- $V_{DS} = -100V$ ,  $I_D = -30A$
- $R_{DS(ON)} = 40m\Omega @ V_{GS} = -10V$

### Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- $150^{\circ}C$  operating temperature

### Package and Pin Configuration



P-Channel MOSFET

### Absolute Maximum Ratings ( $T_A = 25^{\circ}C$ unless otherwise noted)

| Symbol                    | Parameter                                        | Max.        | Units          |
|---------------------------|--------------------------------------------------|-------------|----------------|
| $I_D @ T_C = 25^{\circ}C$ | Continuous Drain Current, $V_{GS} @ -10V$ ①      | -30         | A              |
| $I_{DM}$                  | Pulsed Drain Current ②                           | -120        |                |
| $P_D @ T_C = 25^{\circ}C$ | Power Dissipation ③                              | 102         | W              |
|                           | Linear Derating Factor                           | 0.82        | W/ $^{\circ}C$ |
| $V_{DS}$                  | Drain-Source Voltage                             | -100        | V              |
| $V_{GS}$                  | Gate-to-Source Voltage                           | $\pm 30$    | V              |
| $E_{AS}$                  | Single Pulse Avalanche Energy @ $L=0.1mH$        | 106         | mJ             |
| $I_{AS}$                  | Avalanche Current @ $L=0.1mH$                    | 46          | A              |
| $T_J$ $T_{STG}$           | Operating Junction and Storage Temperature Range | -55 to +150 | $^{\circ}C$    |

### Thermal Resistance

| Symbol          | Characterizes                                     | Typ. | Max. | Units |
|-----------------|---------------------------------------------------|------|------|-------|
| $R_{\theta JC}$ | Junction-to-case <sup>③</sup>                     | —    | 1.22 | °C/W  |
| $R_{\theta JA}$ | Junction-to-ambient ( $t \leq 10s$ ) <sup>④</sup> | —    | 6.2  | °C/W  |

### Electrical Characterizes @ $T_A=25^\circ\text{C}$ unless otherwise specified

| Symbol        | Parameter                            | Min. | Typ. | Max. | Units | Conditions                                                     |
|---------------|--------------------------------------|------|------|------|-------|----------------------------------------------------------------|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage    | -100 | —    | —    | V     | $V_{GS} = 0V, I_D = -250\mu A$                                 |
| $R_{DS(on)}$  | Static Drain-to-Source on-resistance | —    | 40   | 53   | mΩ    | $V_{GS}=-10V, I_D=-15A$                                        |
|               |                                      | —    | 45   | 65   |       | $V_{GS}=-4.5V, I_D=-10A$                                       |
| $V_{GS(th)}$  | Gate threshold voltage               | -1   | —    | -3   | V     | $V_{DS} = V_{GS}, I_D = -250\mu A$                             |
| $I_{DSS}$     | Drain-to-Source leakage current      | —    | —    | -1   | μA    | $V_{DS} = -100V, V_{GS} = 0V$                                  |
| $I_{GSS}$     | Gate-to-Source forward leakage       | —    | —    | 100  | nA    | $V_{GS} = 30V$                                                 |
|               |                                      | —    | —    | -100 |       | $V_{GS} = -30V$                                                |
| $Q_g$         | Total gate charge                    | —    | 90   | —    | nC    | $I_D = -10A,$<br>$V_{DS}=-50V,$<br>$V_{GS} = -10V$             |
| $Q_{gs}$      | Gate-to-Source charge                | —    | 15   | —    |       |                                                                |
| $Q_{gd}$      | Gate-to-Drain("Miller") charge       | —    | 11   | —    |       |                                                                |
| $t_{d(on)}$   | Turn-on delay time                   | —    | 55   | —    | ns    | $V_{GS}=-10V, V_{DS}=-50V,$<br>$R_{GEN}=25\Omega$<br>$I_D=-5A$ |
| $t_r$         | Rise time                            | —    | 20   | —    |       |                                                                |
| $t_{d(off)}$  | Turn-Off delay time                  | —    | 210  | —    |       |                                                                |
| $t_f$         | Fall time                            | —    | 90   | —    |       |                                                                |
| $C_{iss}$     | Input capacitance                    | —    | 7800 | —    | pF    | $V_{GS} = 0V$<br>$V_{DS} = -25V$<br>$f = 1MHz$                 |
| $C_{oss}$     | Output capacitance                   | —    | 222  | —    |       |                                                                |
| $C_{rss}$     | Reverse transfer capacitance         | —    | 165  | —    |       |                                                                |

### Source-Drain Ratings and Characteristics

| Symbol   | Parameter                                 | Min. | Typ. | Max. | Units | Conditions                                                              |
|----------|-------------------------------------------|------|------|------|-------|-------------------------------------------------------------------------|
| $I_S$    | Continuous Source Current<br>(Body Diode) | —    | —    | -30  | A     | MOSFET symbol<br>showing the<br>integral reverse<br>p-n junction diode. |
| $I_{SM}$ | Pulsed Source Current<br>(Body Diode)     | —    | —    | -60  | A     |                                                                         |
| $V_{SD}$ | Diode Forward Voltage                     | —    | —    | -1.2 | V     | $I_S=-6A, V_{GS}=0V$                                                    |

### Typical Characteristics (T<sub>J</sub> = 25°C Noted)

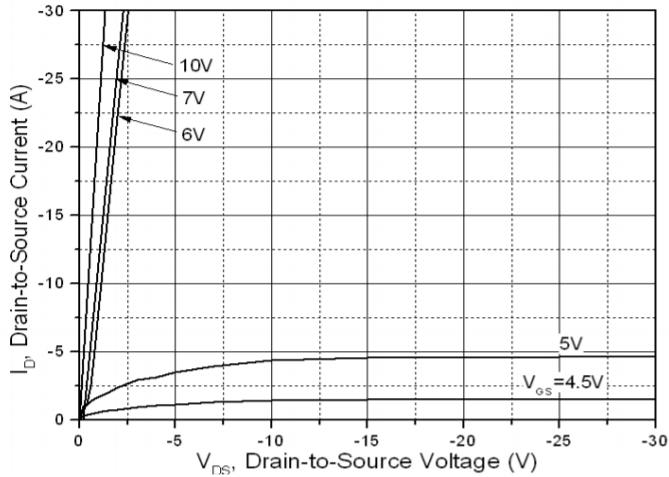


Figure 1: Typical Output Characteristics

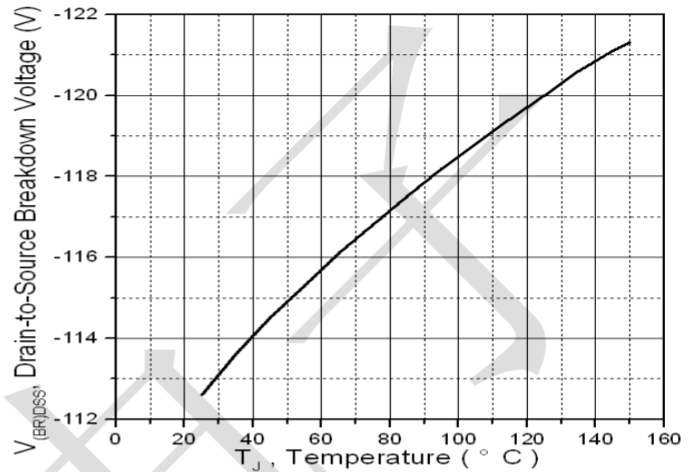


Figure 2: Drain-to-Source Breakdown Voltage vs. Temperature

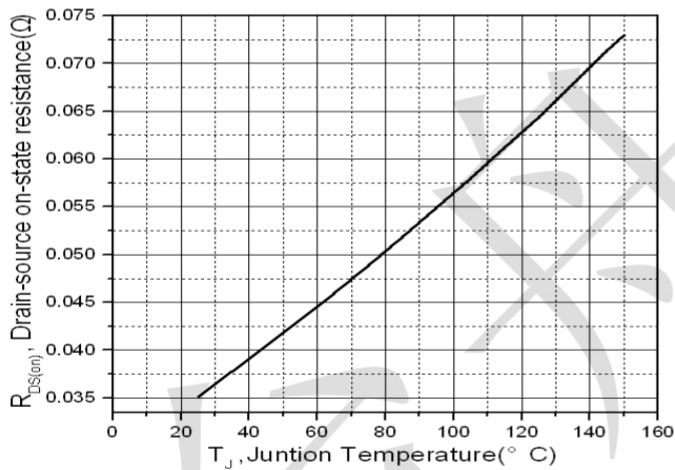


Figure 3: Normalized On-Resistance Vs. Case Temperature

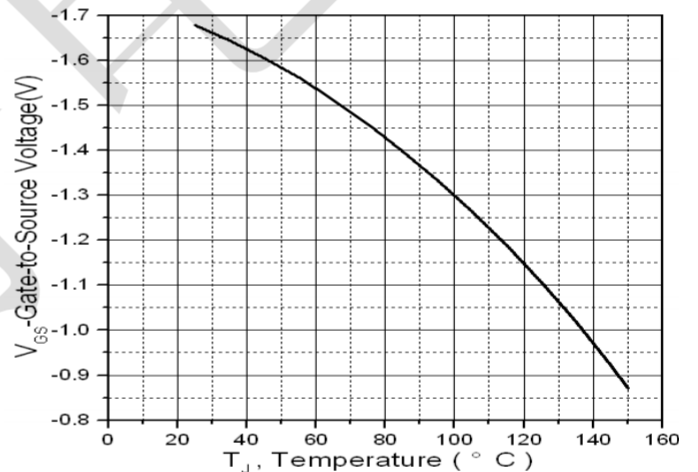


Figure 4: Gate to source cut-off voltage

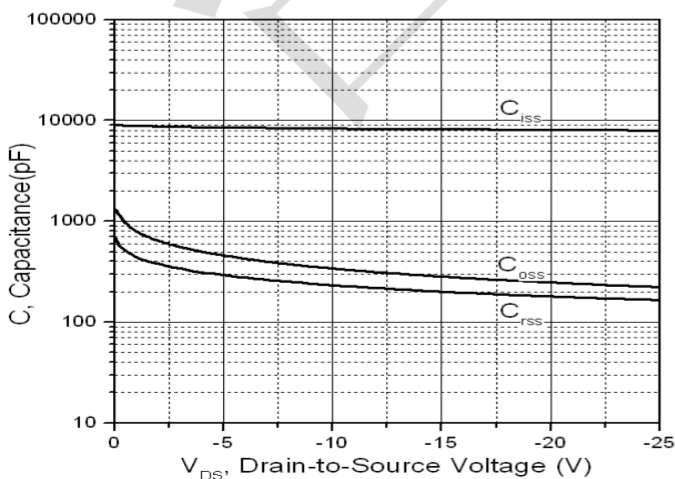


Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage

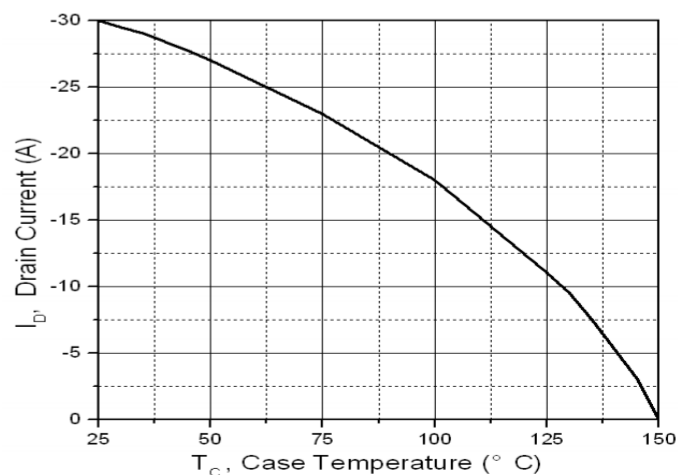
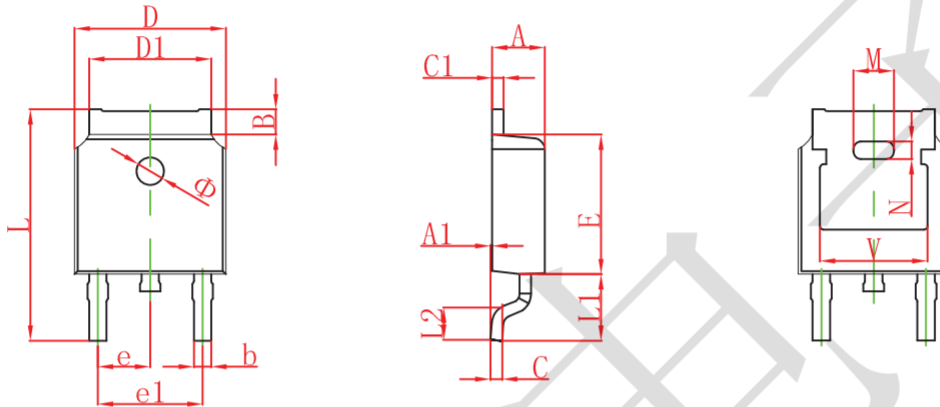


Figure 6: Maximum Drain Current Vs.

### TO252 Package Information



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.380  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.100  | 0.000                | 0.004 |
| B      | 0.800                     | 1.400  | 0.031                | 0.055 |
| b      | 0.710                     | 0.810  | 0.028                | 0.032 |
| c      | 0.460                     | 0.560  | 0.018                | 0.022 |
| c1     | 0.460                     | 0.560  | 0.018                | 0.022 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.130                     | 5.460  | 0.202                | 0.215 |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.286 TYP.                |        | 0.090 TYP.           |       |
| e1     | 4.327                     | 4.727  | 0.170                | 0.186 |
| M      | 1.778 REF.                |        | 0.070 REF.           |       |
| N      | 0.762 REF.                |        | 0.018 REF.           |       |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.9 REF.                  |        | 0.114 REF.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| V      | 4.830 REF.                |        | 0.190 REF.           |       |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |