

**Maximum Ratings** (@  $T_A = +25^{\circ}\text{C}$ , unless otherwise specified.)

| Characteristic                                |              |                        | Symbol           | Value | Unit |
|---|--------------|------------------------|------------------|-------|------|
| Drain-Source Voltage                          |              |                        | V <sub>DSS</sub> | -30   | V    |
| Gate-Source Voltage                           |              |                        | V <sub>GSS</sub> | ±25   | V    |
| Drain Current (Note 5) V <sub>GS</sub> = -10V | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | -4.3  | A    |
|   |              | T <sub>A</sub> = +70°C |                  | -3.4  |      |
| Pulsed Drain Current (Note 6)                 |              |                        | I <sub>DM</sub>  | -20   | A    |

**Thermal Characteristics**

| Characteristic                                   | Symbol          | Value       | Unit                 |
|--|-----------------|-------------|----------------------|
| Total Power Dissipation (Note 5)                 | $P_D$           | 1.38        | W                    |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 91          | $^{\circ}\text{C/W}$ |
| Operating and Storage Temperature Range          | $T_J, T_{STG}$  | -55 to +150 | $^{\circ}\text{C}$   |

**Electrical Characteristics** (@  $T_A = +25^{\circ}\text{C}$ , unless otherwise specified.)

| Characteristic                                | Symbol       | Min | Typ  | Max                    | Unit             | Test Condition   |
|---|--------------|-----|------|------------------------|------------------|--|
| <b>OFF CHARACTERISTICS (Note 7)</b>           |              |     |      |                        |                  |  |
| Drain-Source Breakdown Voltage                | $BV_{DSS}$   | -30 | —    | —                      | V                | $V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$  |
| Zero Gate Voltage Drain Current               | $I_{DSS}$    | —   | —    | -1                     | $\mu\text{A}$    | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$   |
| Gate-Source Leakage                           | $I_{GSS}$    | —   | —    | $\pm 100$<br>$\pm 800$ | nA               | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$<br>$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$ |
| <b>ON CHARACTERISTICS (Note 7)</b>            |              |     |      |                        |                  |  |
| Gate Threshold Voltage                        | $V_{GS(TH)}$ | -1  | —    | -2.1                   | V                | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$   |
| Static Drain-Source On-Resistance             | $R_{DS(ON)}$ | —   | 35   | 50                     | $\text{m}\Omega$ | $V_{GS} = -10\text{V}, I_D = -6.0\text{A}$   |
|   |              | —   | 50   | 70                     |                  | $V_{GS} = -4.5\text{V}, I_D = -5.0\text{A}$  |
| Diode Forward Voltage                         | $V_{SD}$     | —   | —    | -1.2                   | V                | $V_{GS} = 0\text{V}, I_S = -1.7\text{A}$   |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>       |              |     |      |                        |                  |  |
| Input Capacitance                             | $C_{iss}$    | —   | 642  | —                      | pF               | $V_{DS} = -25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$                                  |
| Output Capacitance                            | $C_{oss}$    | —   | 65   | —                      | pF               |  |
| Reverse Transfer Capacitance                  | $C_{rss}$    | —   | 48   | —                      | pF               |  |
| Gate Resistance                               | $R_G$        | —   | 15   | —                      | $\Omega$         | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$                                    |
| Total Gate Charge ( $V_{GS} = -4.5\text{V}$ ) | $Q_G$        | —   | 5.8  | —                      | nC               | $V_{DS} = -15\text{V}, I_D = -6\text{A}$   |
| Total Gate Charge ( $V_{GS} = -10\text{V}$ )  | $Q_G$        | —   | 11.8 | —                      | nC               | $V_{DS} = -15\text{V}, I_D = -6\text{A}$   |
| Gate-Source Charge                            | $Q_{GS}$     | —   | 2.0  | —                      |                  |  |
| Gate-Drain Charge                             | $Q_{GD}$     | —   | 2.4  | —                      |                  |  |
| Turn-On Delay Time                            | $t_{D(ON)}$  | —   | 4.9  | —                      | ns               | $V_{DS} = -15\text{V}, V_{GS} = -10\text{V},$<br>$I_D = -1\text{A}, R_G = 6.0\Omega$           |
| Rise Time                                     | $t_R$        | —   | 4.7  | —                      |                  |  |
| Turn-Off Delay Time                           | $t_{D(OFF)}$ | —   | 35.2 | —                      |                  |  |
| Fall Time                                     | $t_F$        | —   | 18.2 | —                      |                  |  |

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
  - Pulse width  $\leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

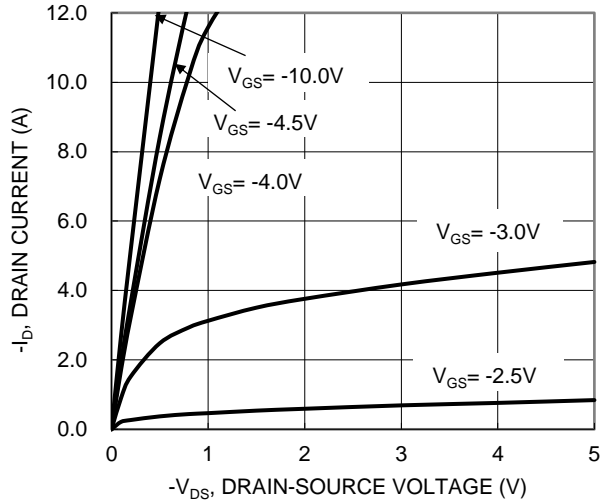


Figure 1. Typical Output Characteristic

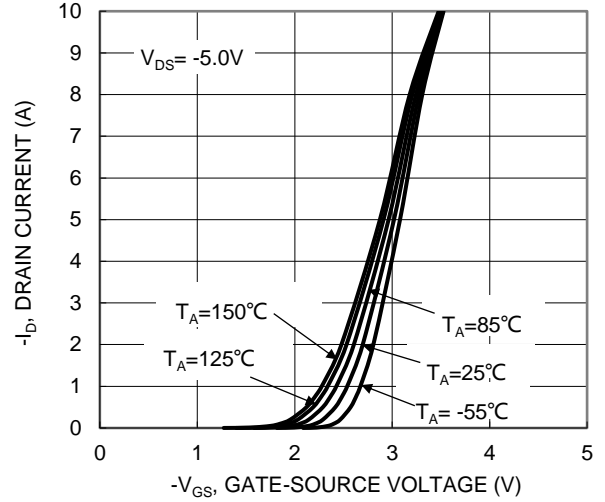


Figure 2. Typical Transfer Characteristic

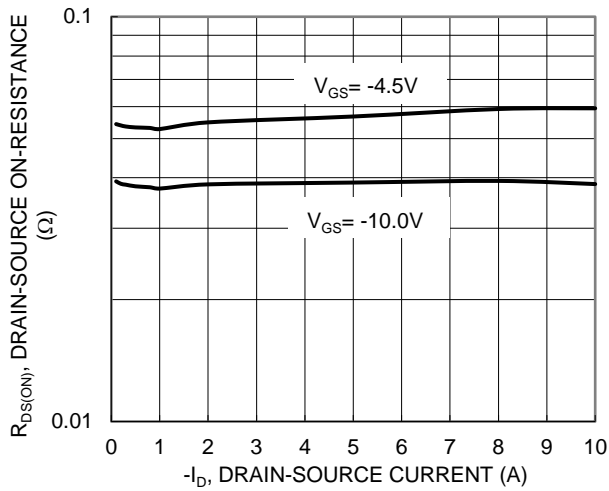


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

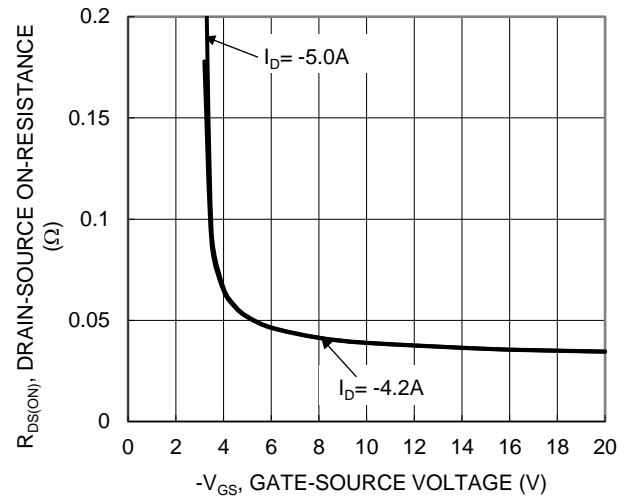


Figure 4. Typical Transfer Characteristic

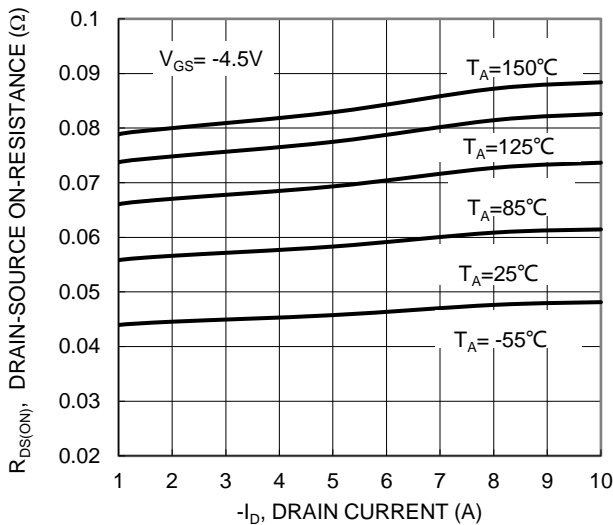


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

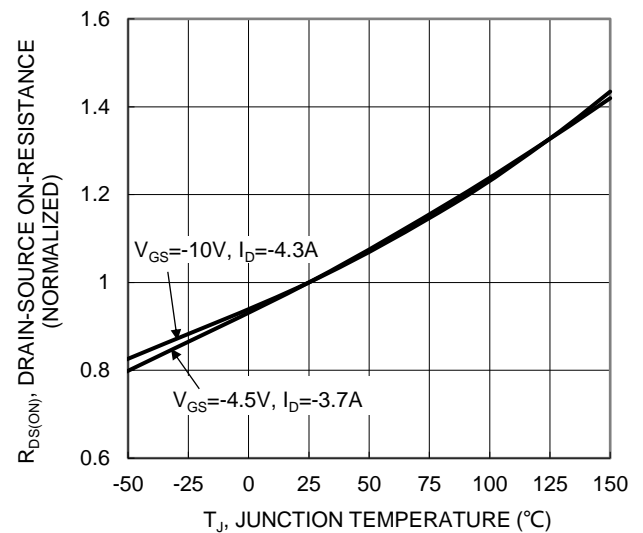
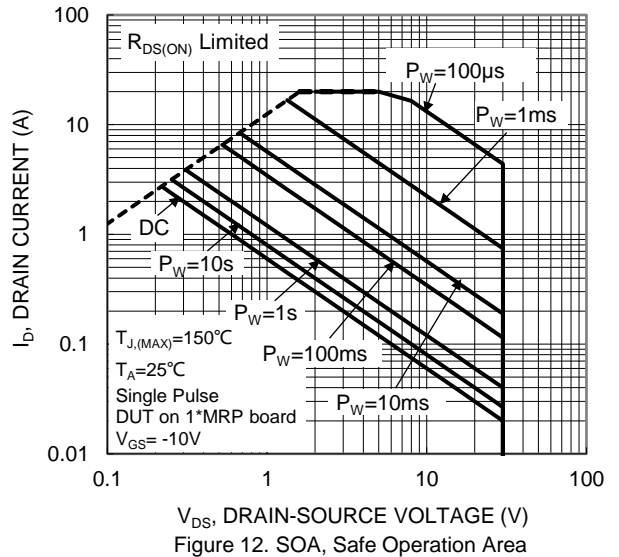
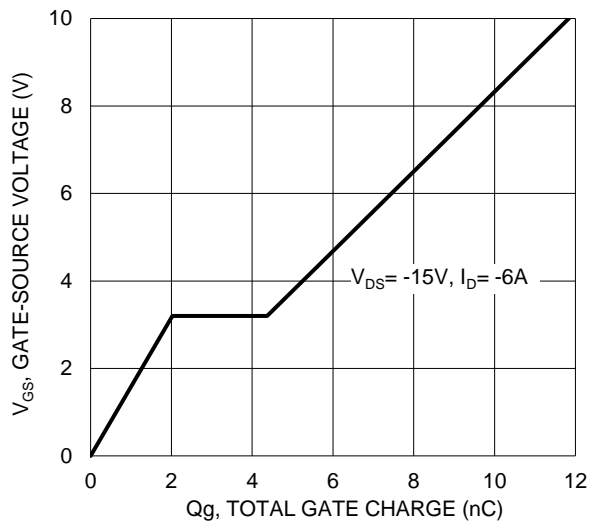
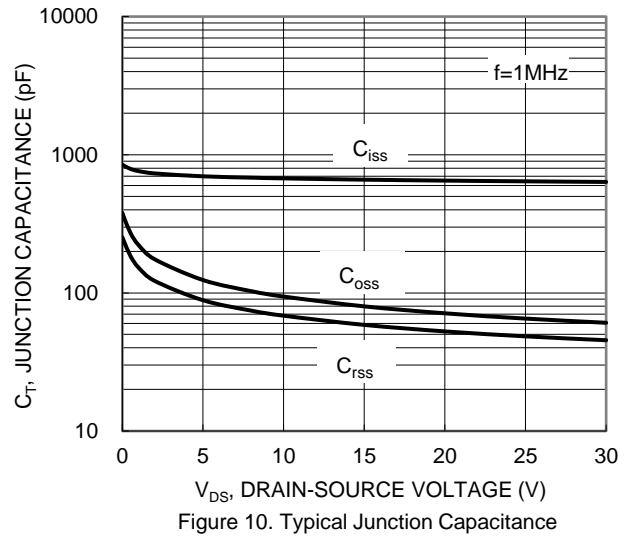
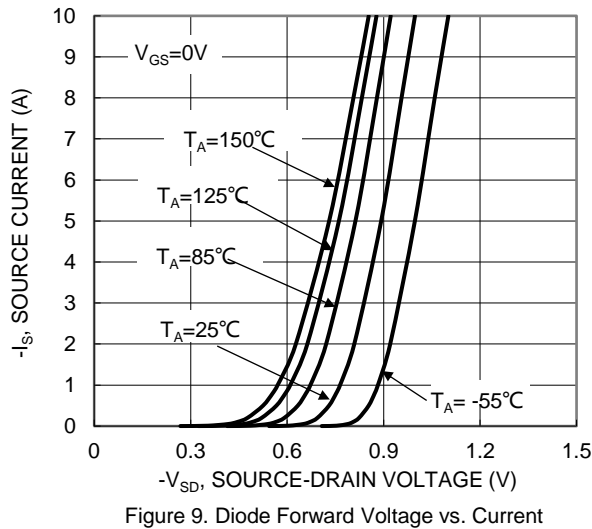
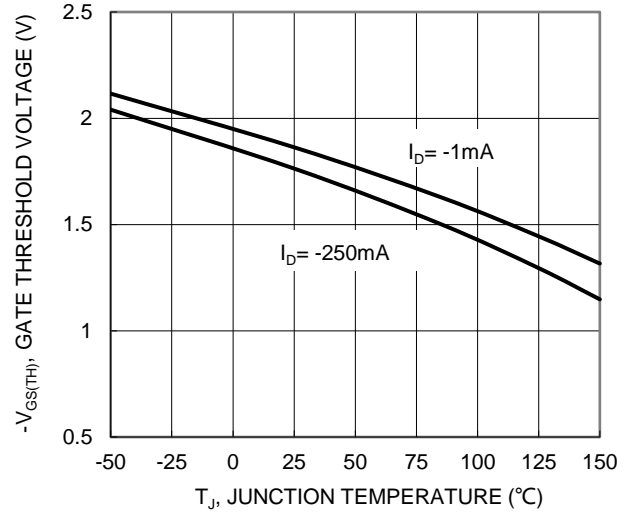
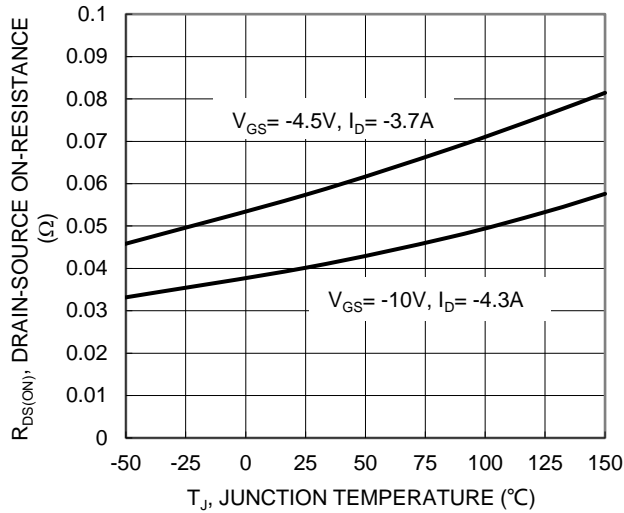


Figure 6. On-Resistance Variation with Temperature



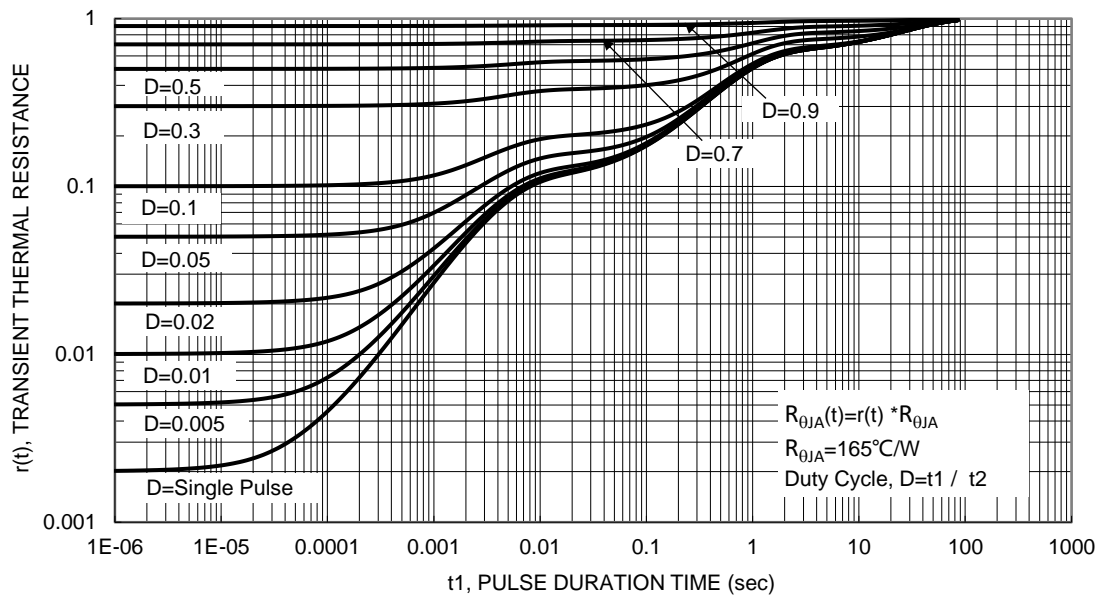
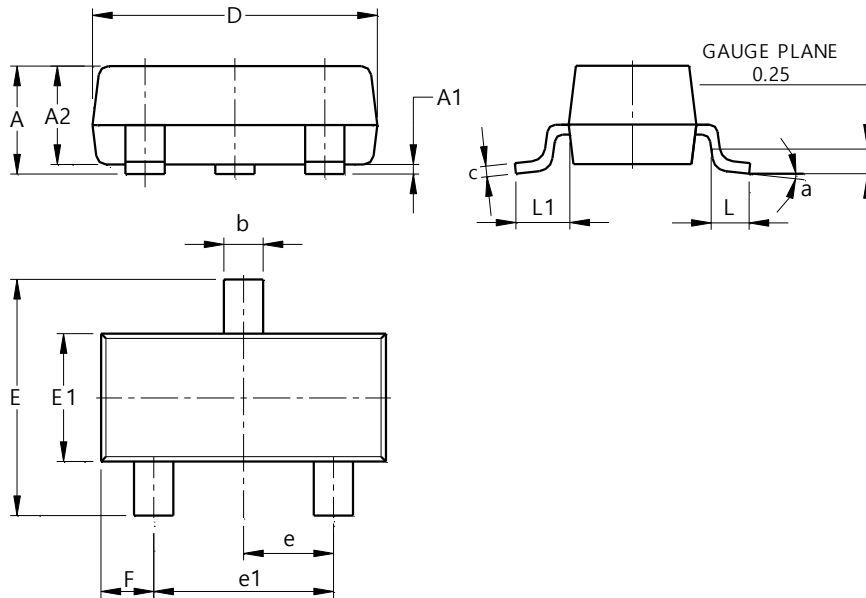


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SOT23 (Standard)

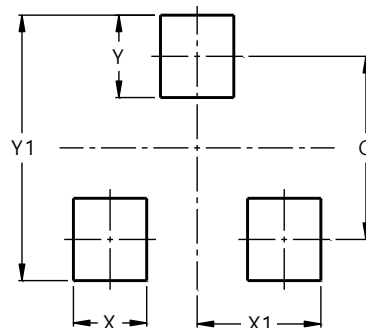


| SOT23 (Standard)     |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.90  | 1.15  | 1.025 |
| A1                   | 0.00  | 0.10  | 0.05  |
| A2                   | 0.85  | 1.10  | 0.975 |
| b                    | 0.30  | 0.51  | 0.40  |
| c                    | 0.080 | 0.202 | 0.11  |
| D                    | 2.80  | 3.00  | 2.90  |
| E                    | 2.25  | 2.55  | 2.40  |
| E1                   | 1.20  | 1.40  | 1.30  |
| e                    | 0.89  | 1.03  | 0.915 |
| e1                   | 1.78  | 2.05  | 1.83  |
| F                    | 0.40  | 0.60  | 0.535 |
| L1                   | 0.45  | 0.61  | 0.55  |
| L                    | 0.25  | 0.55  | 0.40  |
| a                    | 0°    | 8°    | --    |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SOT23 (Standard)



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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