## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Source-Source Voltage | | | $V_{SSS}$ | 12 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±8 | V |
| Continuous Source Current (Note 5) $V_{GS}$ = 4.5V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_S$ | 24.4<br>19.6 | A |
| Continuous Source Current (Note 5) $V_{GS}$ = 2.5V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_S$ | 16.4<br>13.1 | A |
| Pulsed Source Current (Note 6) | | | $I_{SM}$ | 100 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 7) | $P_D$ | 1.10 | W |
| Thermal Resistance, Junction to Ambient @$T_A$ = +25°C (Note 7) | $R_{\theta JA}$ | 114.1 | °C/W |
| Power Dissipation (Note 5) | $P_D$ | 2.47 | W |
| Thermal Resistance, Junction to Ambient @$T_A$ = +25°C (Note 5) | $R_{\theta JA}$ | 50.7 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 8)** | | | | | | |
| Source-Source Breakdown Voltage | $BV_{SSS}$ | 12 | — | — | V | $V_{GS}$ = 0V, $I_S$ = 1mA |
| Zero Gate Voltage Drain Current $T_J$ = +25°C | $I_{SSS}$ | — | — | 1 | μA | $V_{SS}$ = 9.6V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±10 | μA | $V_{GS}$ = ±8V, $V_{SS}$ = 0V |
| | | — | — | ±1.0 | μA | $V_{GS}$ = ±5V, $V_{SS}$ = 0V |
| **ON CHARACTERISTICS (Note 8)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 0.35 | 0.8 | 1.4 | V | $V_{SS}$ = 10V, $I_S$ = 1.41mA |
| Static Source-Source On-Resistance | $R_{SS(ON)}$ | 1.5 | 2.27 | 2.75 | mΩ | $V_{GS}$ = 4.5V, $I_S$ = 6A |
| | | 1.6 | 2.36 | 2.85 | | $V_{GS}$ = 3.8V, $I_S$ = 6A |
| | | 1.7 | 2.54 | 3.95 | | $V_{GS}$ = 3.1V, $I_S$ = 6A |
| | | 1.9 | 2.9 | 6.1 | | $V_{GS}$ = 2.5V, $I_S$ = 6A |
| Diode Forward Voltage | $V_{SS}$ | — | 0.69 | 1.2 | V | $V_{GS}$ = 0V, $I_S$ = 6A |
| **DYNAMIC CHARACTERISTICS (Note 9)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 3062 | 4593 | pF | $V_{SS}$ = 10V, $V_{GS}$ = 0V, f = 1kHz |
| Output Capacitance | $C_{oss}$ | — | 758 | 1137 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 198 | 297 | | |
| Total Gate Charge | $Q_g$ | — | 45.7 | 68.6 | nC | $V_{SS}$ = 8V, $V_{GS}$ = 4V, $I_S$ = 6A |
| Gate-Source Charge | $Q_{gs}$ | — | 8.3 | 12.5 | | |
| Gate-Drain Charge | $Q_{gd}$ | — | 16.0 | 24.0 | | |
| Gate Charge at $V_{TH}$ | $Q_{g(th)}$ | — | 4.5 | 6.8 | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 1005 | 1508 | ns | $V_{SS}$ = 8V, $V_{GS}$ = 4V, $I_S$ = 6A |
| Turn-On Rise Time | $t_R$ | — | 2186 | 3279 | | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 2643 | 3965 | | |
| Turn-Off Fall Time | $t_F$ | — | 4193 | 6290 | | |

Notes:
5. Device mounted on FR-4 material with 1-inch$^2$ (6.45-cm$^2$), 2-oz. (0.071-mm thick) Cu.
6. Repetitive rating, pulse width limited by junction temperature.
7. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

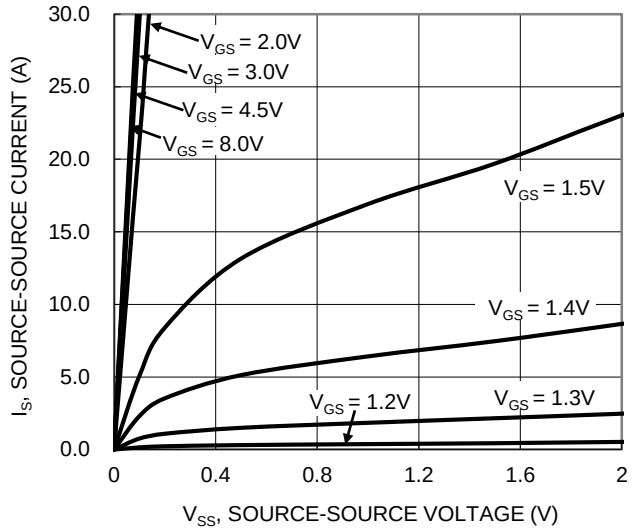



Figure 1. Typical Output Characteristic

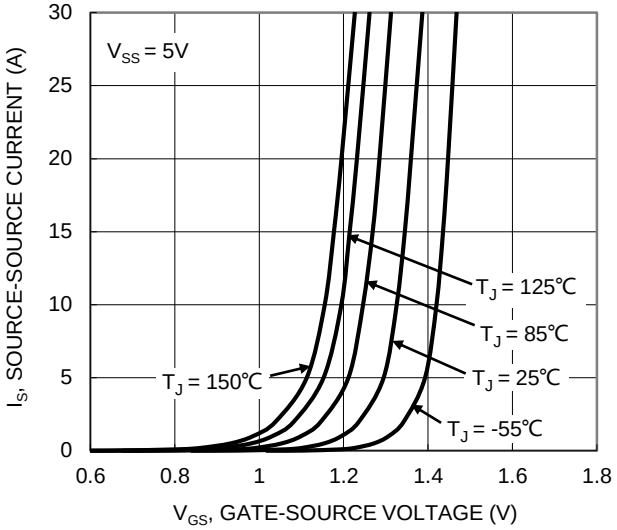



Figure 2. Typical Transfer Characteristic

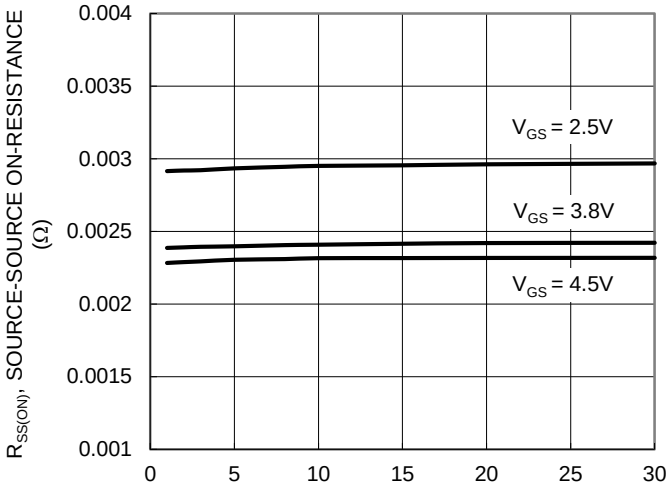



Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

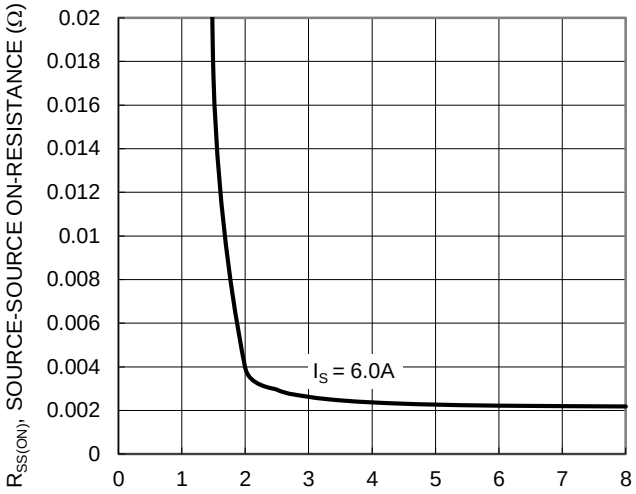



Figure 4. Typical Transfer Characteristic

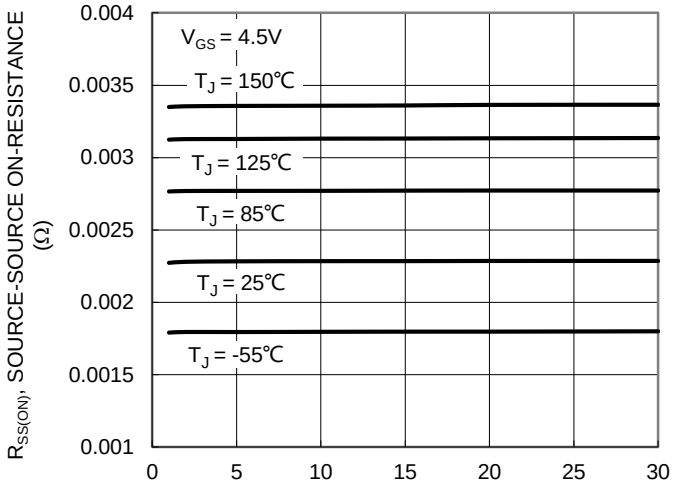



Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

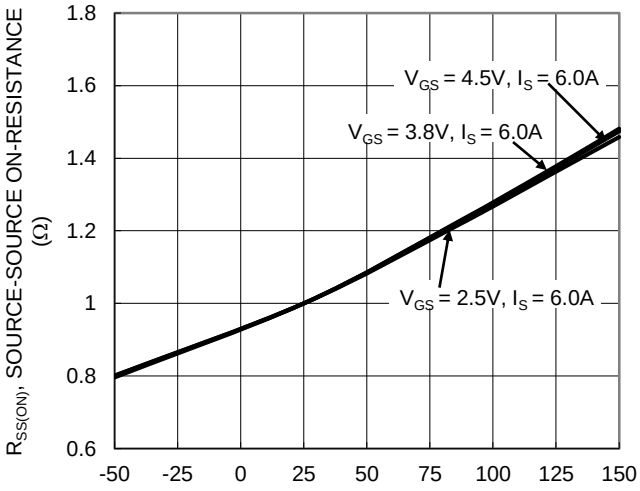



Figure 6. On-Resistance Variation with Junction Temperature

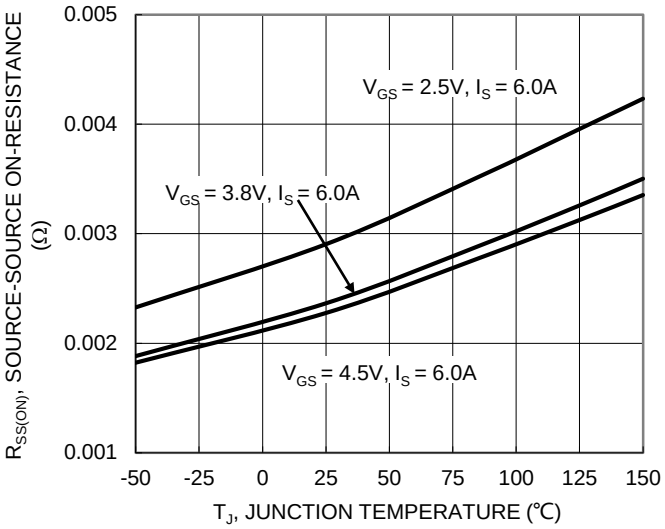



Figure 7. On-Resistance Variation with Junction Temperature

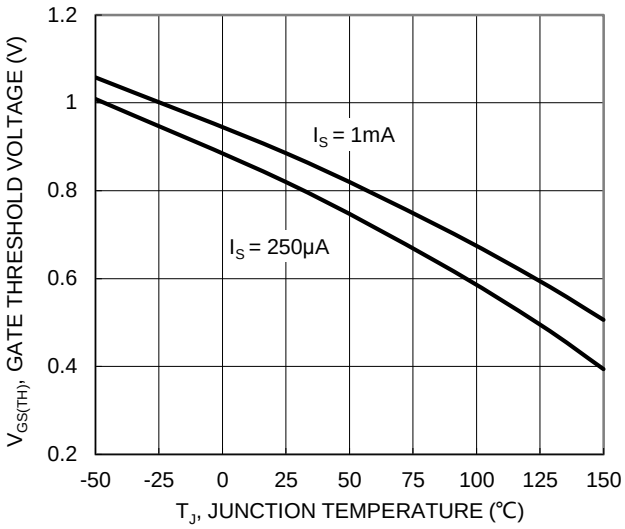



Figure 8. Gate Threshold Variation vs. Junction Temperature

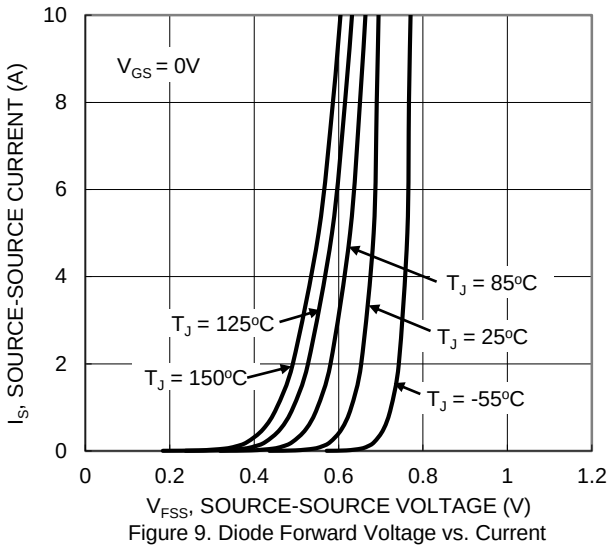



Figure 9. Diode Forward Voltage vs. Current

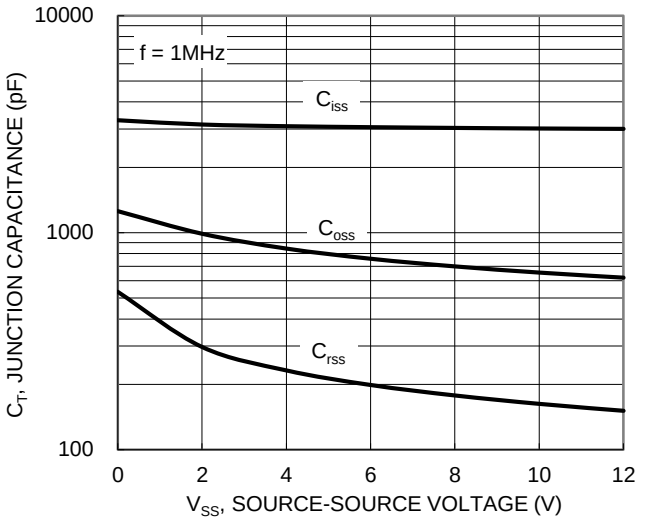



Figure 10. Typical Junction Capacitance

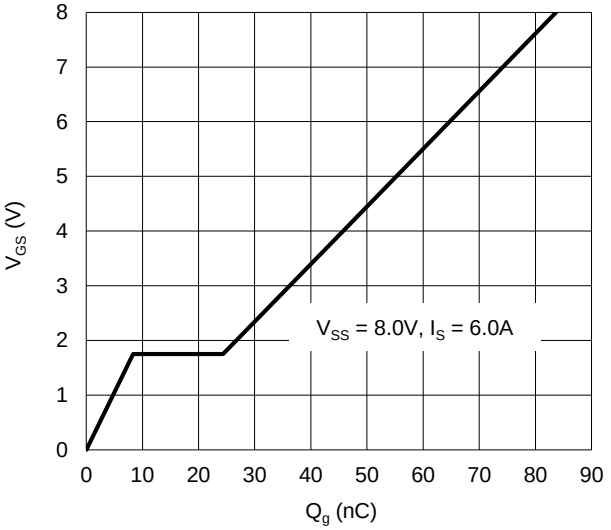



Figure 11. Gate Charge

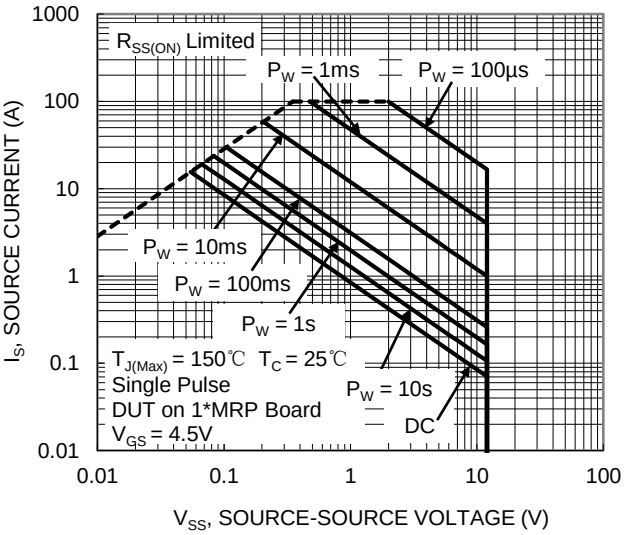



Figure 12. SOA, Safe Operation Area

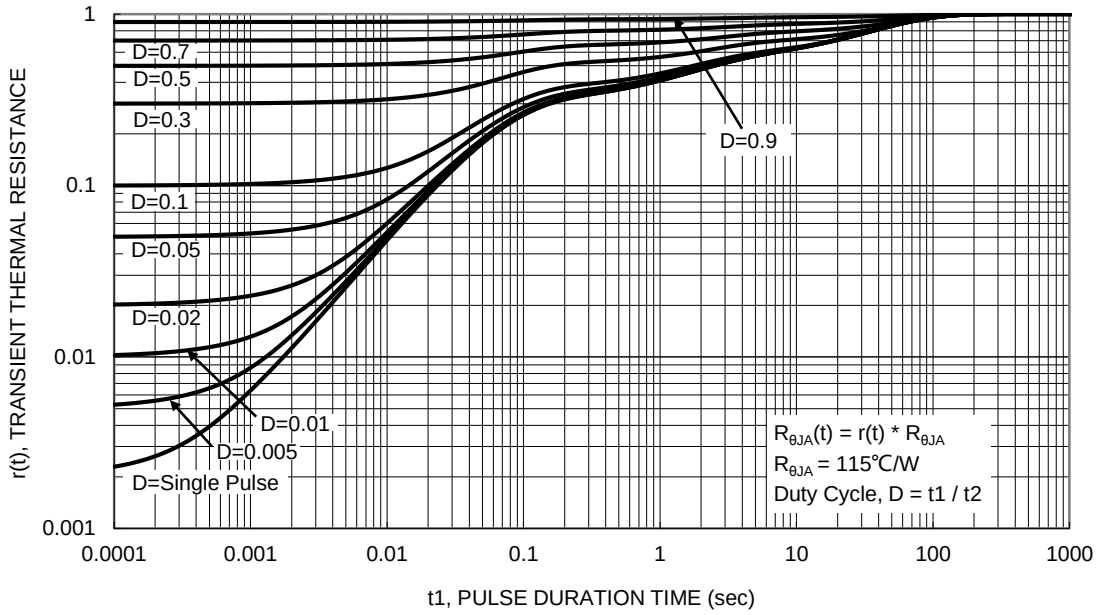
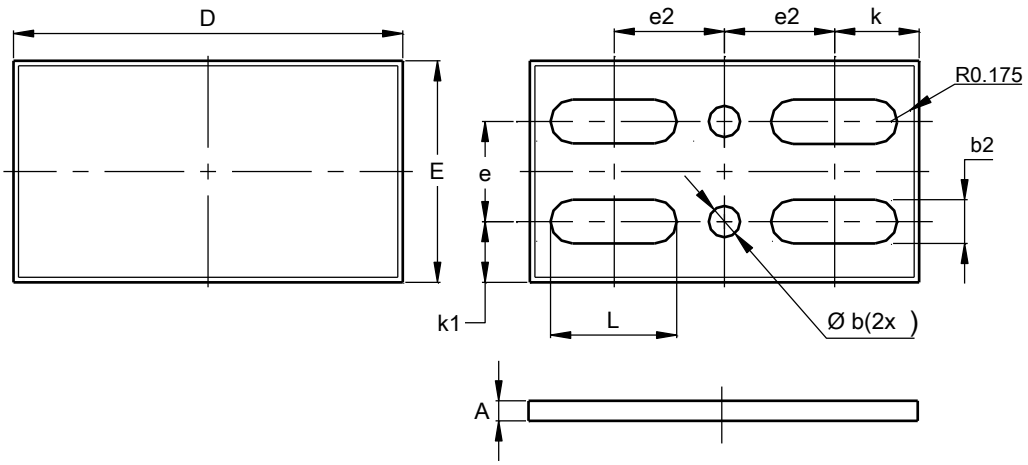



Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

**X4-DSN3118-6**

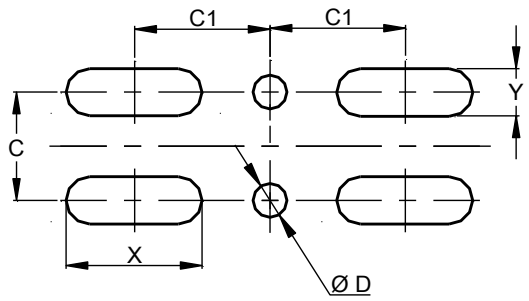



| X4-DSN3118-6 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.09 | 0.16 | 0.11 |
| **b** | -- | -- | 0.25 |
| **b2** | 0.32 | 0.38 | 0.35 |
| **D** | 3.00 | 3.10 | 3.05 |
| **E** | 1.72 | 1.82 | 1.77 |
| **e** | -- | -- | 0.800 |
| **e2** | -- | -- | 0.878 |
| **k** | -- | -- | 0.648 |
| **k1** | -- | -- | 0.485 |
| **L** | 0.975 | 1.035 | 1.005 |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**X4-DSN3118-6**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 0.800 |
| **C1** | 0.878 |
| **D** | 0.250 |
| **X** | 1.005 |
| **Y** | 0.350 |

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