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

| Characteristic | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | -20 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±8 | V |
| Continuous Drain Current (Note 6) $V_{GS}$ = -4.5V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | -4.3<br>-3.5 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | $I_S$ | -1.2 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | | | $I_{DM}$ | -25 | A |

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

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Total Power Dissipation (Note 5) | | $P_D$ | 0.8 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | $R_{\theta JA}$ | 154 | °C/W |
| Total Power Dissipation (Note 6) | | $P_D$ | 1.2 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | $R_{\theta JA}$ | 98 | °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 7)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | -20 | — | — | V | $V_{GS}$ = 0V, $I_D$ = -250µA |
| Zero Gate Voltage Drain Current $T_J$ = +25°C | $I_{DSS}$ | — | — | -1 | µA | $V_{DS}$ = -20V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ±8.0V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 7)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | -0.3 | — | -1.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 32 | 45 | mΩ | $V_{GS}$ = -4.5V, $I_D$ = -4.0A |
| | | — | 42 | 58 | | $V_{GS}$ = -2.5V, $I_D$ = -3.5A |
| | | — | 54 | 90 | | $V_{GS}$ = -1.8V, $I_D$ = -1.0A |
| Diode Forward Voltage | $V_{SD}$ | — | -0.7 | -1.2 | V | $V_{GS}$ = 0V, $I_S$ = -1.0A |
| **DYNAMIC CHARACTERISTICS (Note 8)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 634 | — | pF | $V_{DS}$ = -10V, $V_{GS}$ = 0V<br>f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | 81 | — | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 66 | — | pF | |
| Gate Resistance | $R_g$ | — | 20 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1.0MHz |
| Total Gate Charge | $Q_g$ | — | 6.8 | — | nC | $V_{GS}$ = -4.5V, $V_{DS}$ = -10V<br>$I_D$ = -4A |
| Gate-Source Charge | $Q_{gs}$ | — | 0.7 | — | nC | |
| Gate-Drain Charge | $Q_{gd}$ | — | 1.6 | — | nC | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 4.2 | — | ns | $V_{DD}$ = -10V, $V_{GS}$ = -4.5V,<br>$R_L$ = 3.3Ω, $R_G$ = 1Ω |
| Turn-On Rise Time | $t_R$ | — | 3.4 | — | ns | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 23 | — | ns | |
| Turn-Off Fall Time | $t_F$ | — | 9.6 | — | ns | |
| Reverse Recovery Time | $t_{RR}$ | — | 1.8 | — | ns | $I_F$ = -1.0A, di/dt = 100A/µs |
| Reverse Recovery Charge | $Q_{RR}$ | — | 9.4 | — | nC | $I_F$ = -1.0A, di/dt = 100A/µs |

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

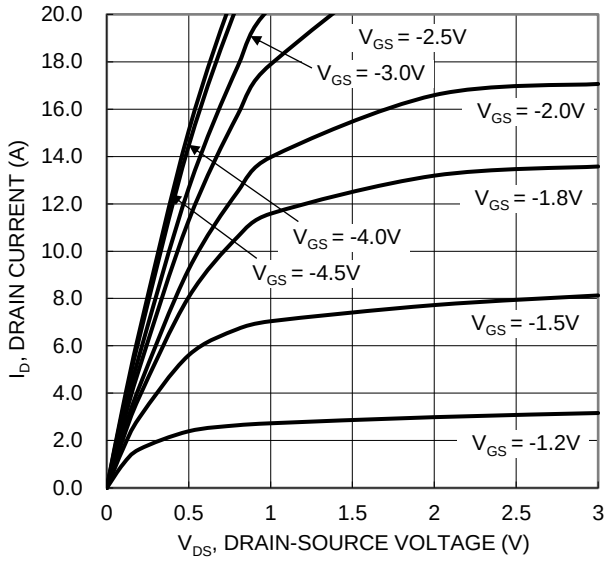



Figure 1. Typical Output Characteristic

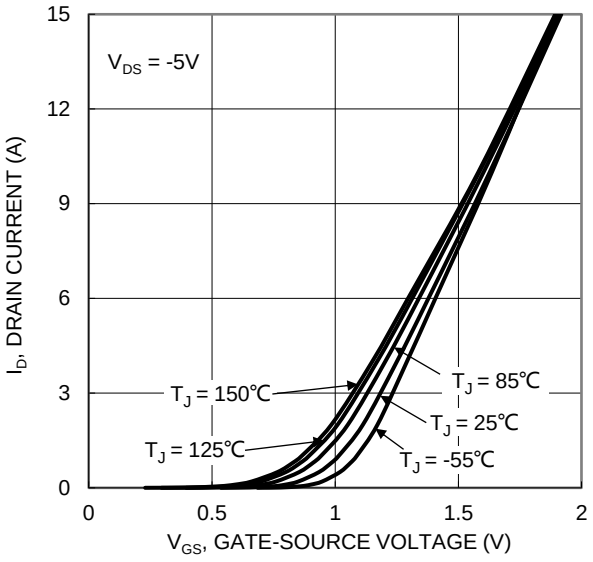



Figure 2. Typical Transfer Characteristic

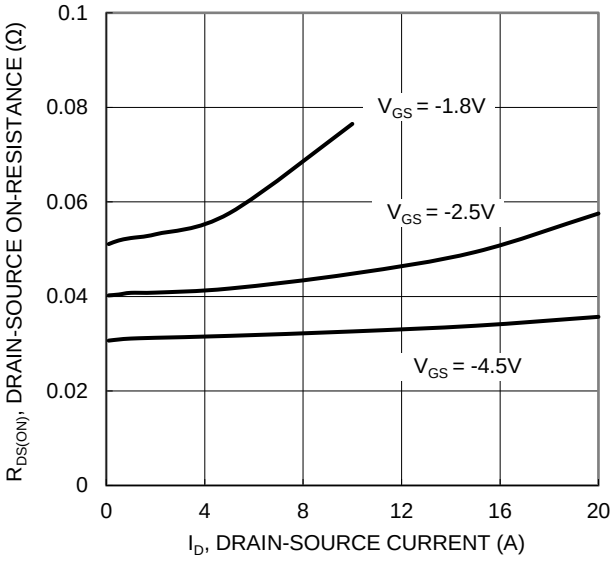



Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

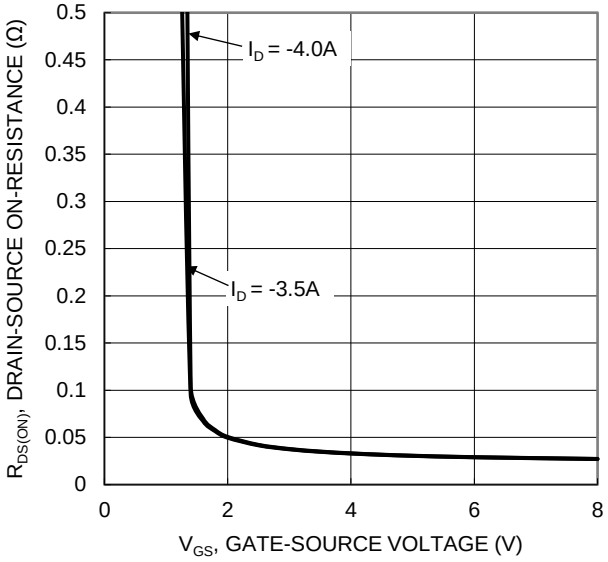



Figure 4. Typical Transfer Characteristic

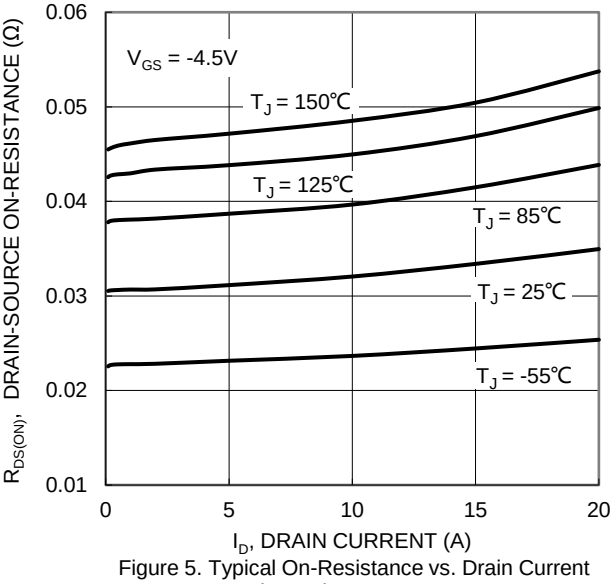



Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

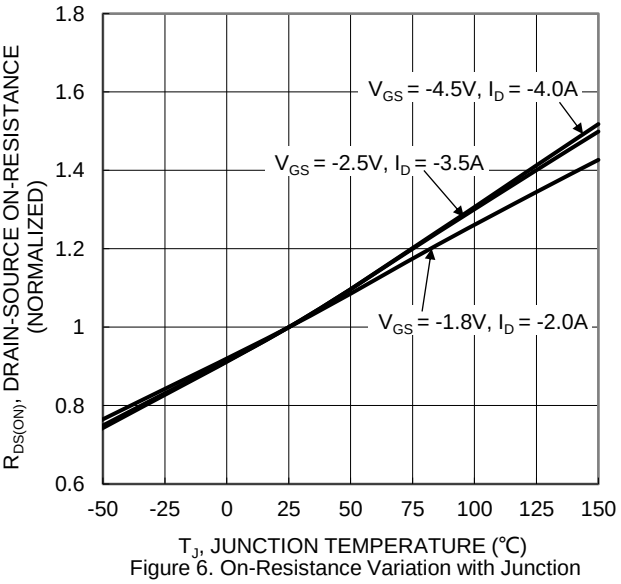



Figure 6. On-Resistance Variation with Junction Temperature

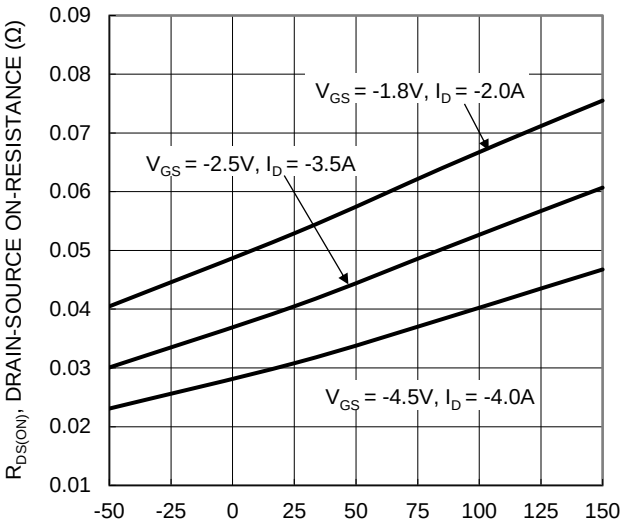


Figure 7. On-Resistance Variation with Junction Temperature

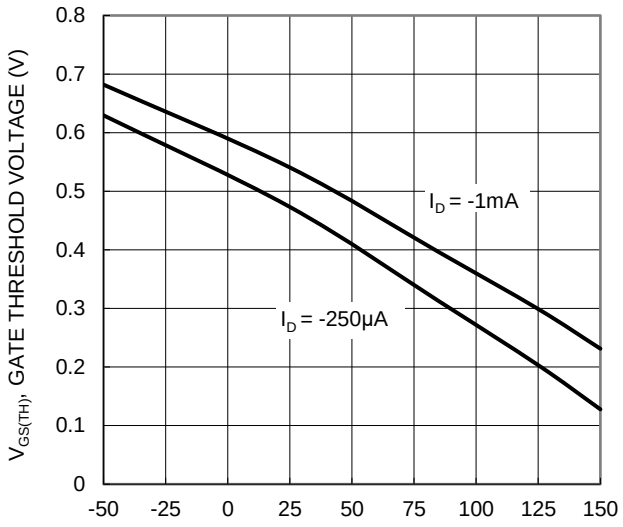


Figure 8. Gate Threshold Variation vs. Junction Temperature

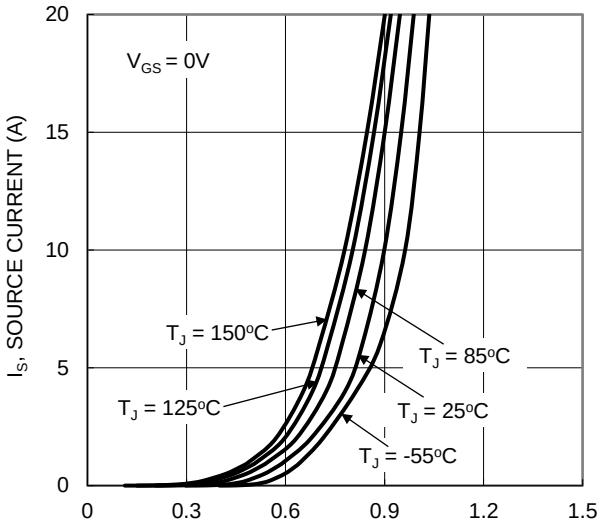


Figure 9. Diode Forward Voltage vs. Current

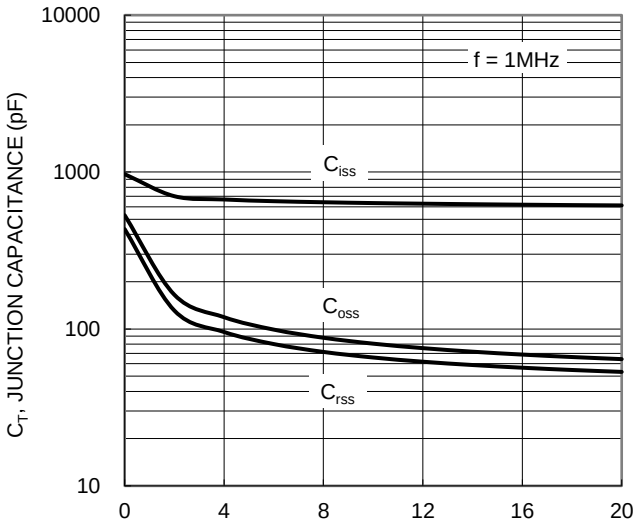


Figure 10. Typical Junction Capacitance

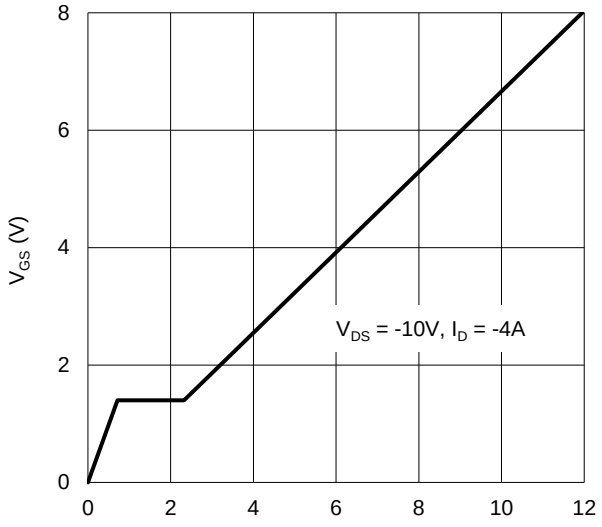


Figure 11. Gate Charge

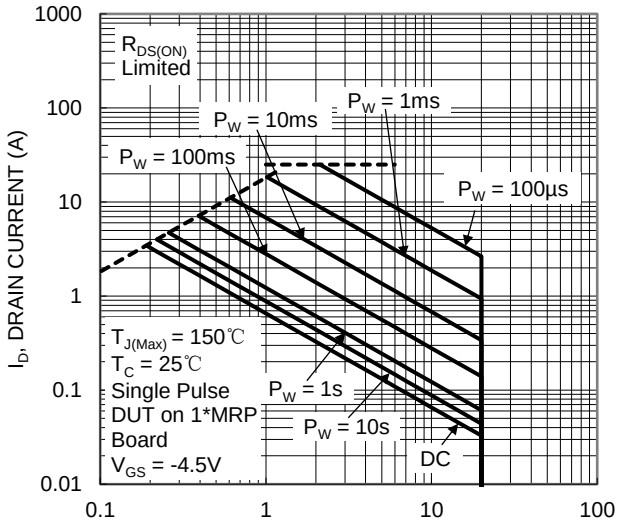


Figure 12. SOA, Safe Operation Area

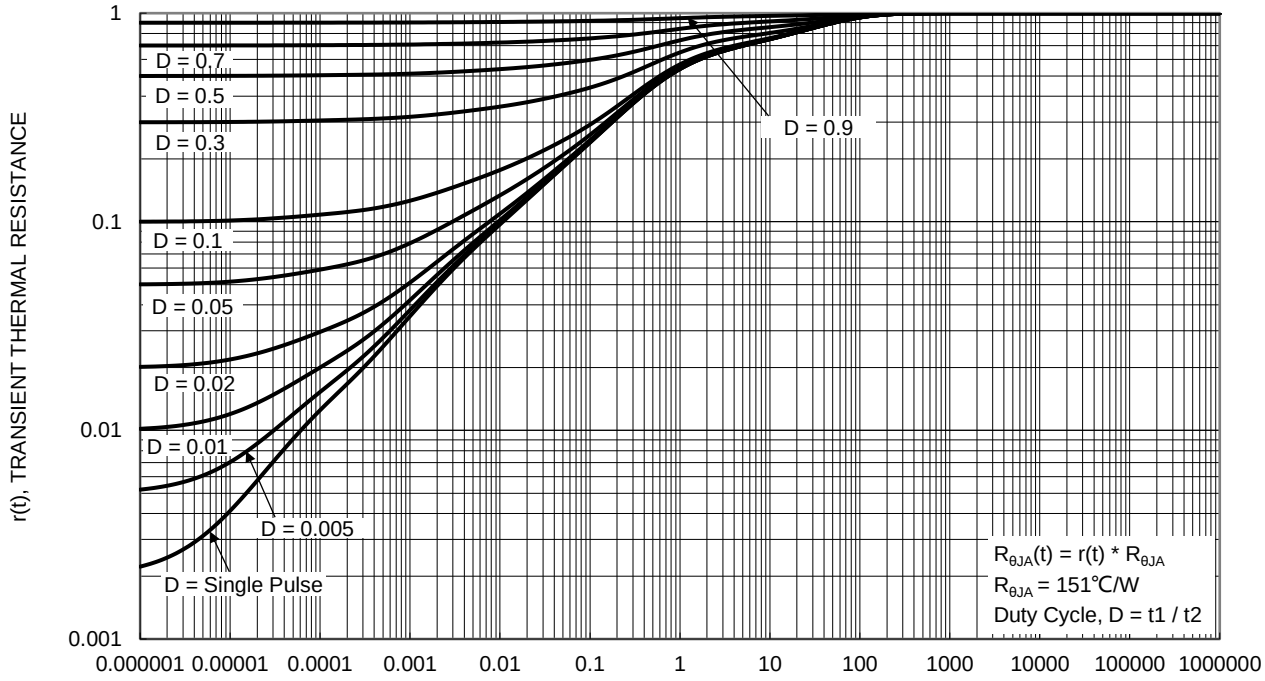
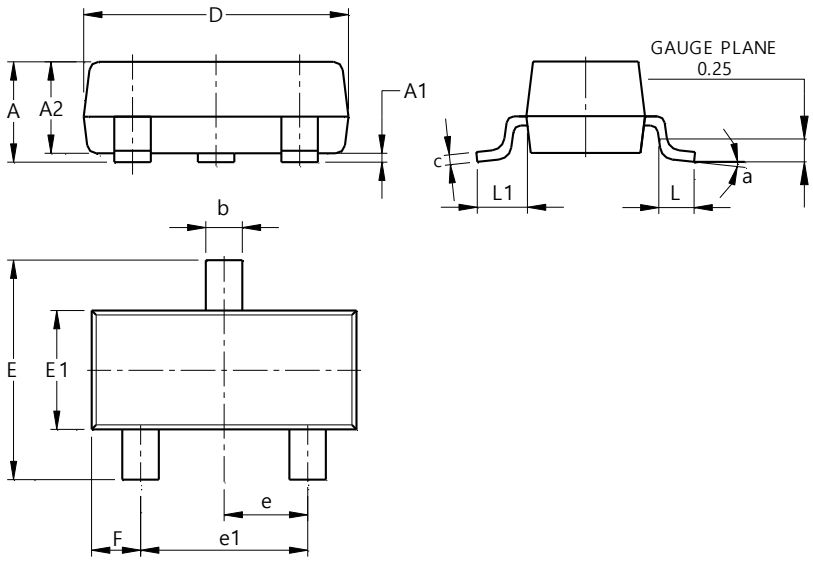



Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

**SOT23 (Standard)**

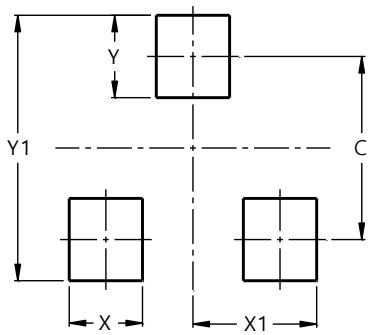



| SOT23 (Standard) | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.90 | 1.15 | 1.025 |
| **A1** | 0.00 | 0.10 | 0.05 |
| **A2** | 0.85 | 1.10 | 0.975 |
| **b** | 0.30 | 0.51 | 0.40 |
| **c** | 0.080 | 0.202 | 0.11 |
| **D** | 2.80 | 3.00 | 2.90 |
| **E** | 2.25 | 2.55 | 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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