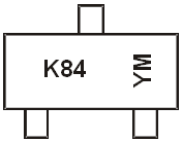
## Marking Information




K84 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: I = 2021)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

| Year | 1998 | ..... | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | J | ..... | I | J | K | L | M | N | O | P | R | S |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

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

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | -50 | V |
| Drain-Gate Voltage $R_{GS} \leq 20k\Omega$ | | $V_{DGR}$ | -50 | V |
| Gate-Source Voltage | Continuous | $V_{GSS}$ | ±20 | V |
| Drain Current (Note 5) | Continuous | $I_D$ | -130 | mA |
| Pulsed Drain Current | | $I_{DM}$ | -1.2 | A |

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

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Total Power Dissipation (Note 5) | $P_D$ | 300 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 417 | °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 6)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | -50 | — | — | V | $V_{GS}$ = 0V, $I_D$ = -250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | —<br>—<br>— | —<br>—<br>— | -1<br>-2<br>-100 | µA<br>µA<br>nA | $V_{DS}$ = -50V, $V_{GS}$ = 0V, $T_J$ = +25°C<br>$V_{DS}$ = -50V, $V_{GS}$ = 0V, $T_J$ = +125°C<br>$V_{DS}$ = -25V, $V_{GS}$ = 0V, $T_J$ = +25°C |
| Gate-Body Leakage | $I_{GSS}$ | — | — | ±10 | nA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 6)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -0.8 | — | -2.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -1mA |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | — | 3.2 | 10 | Ω | $V_{GS}$ = -5V, $I_D$ = -0.100A |
| Forward Transconductance | $g_{FS}$ | 0.05 | — | — | S | $V_{DS}$ = -25V, $I_D$ = -0.1A |
| **DYNAMIC CHARACTERISTICS (Note 7)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 24.6 | 45 | pF | $V_{DS}$ = -25V, $V_{GS}$ = 0V, f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | 4.7 | 25 | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 2.8 | 12 | pF | |
| Gate Resistance | $R_g$ | — | 916 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz |
| Total Gate Charge ($V_{GS}$ = -4.5V) | $Q_g$ | — | 0.28 | — | nC | $V_{DS}$ = -10V, $I_D$ = -0.1A |
| Total Gate Charge ($V_{GS}$ = -10V) | $Q_g$ | — | 0.59 | — | nC | |
| Gate-Source Charge | $Q_{gs}$ | — | 0.09 | — | nC | |
| Gate-Drain Charge | $Q_{gd}$ | — | 0.08 | — | nC | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 10 | — | ns | $V_{DD}$ = -30V, $I_D$ = -0.27A, |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 18 | — | ns | $R_{GEN}$ = 50Ω, $V_{GS}$ = -10V |

Notes:
5. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown in Diodes Incorporated's package outline PDFs, which can be found on our website at http://www.diodes.com/package-outlines.html.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to production testing.

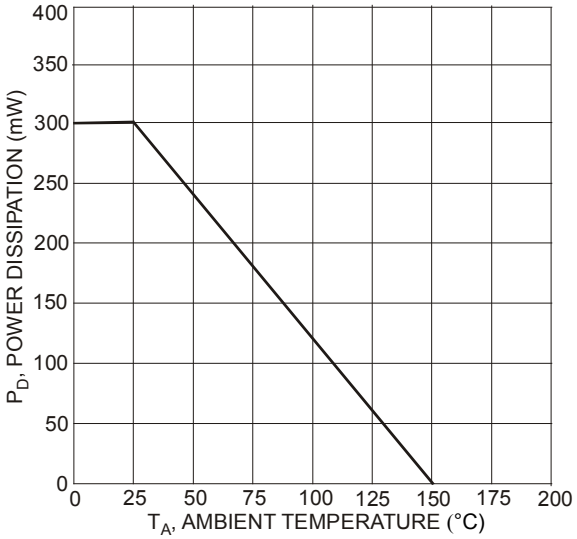



Fig. 1 Max Power Dissipation vs. Ambient Temperature

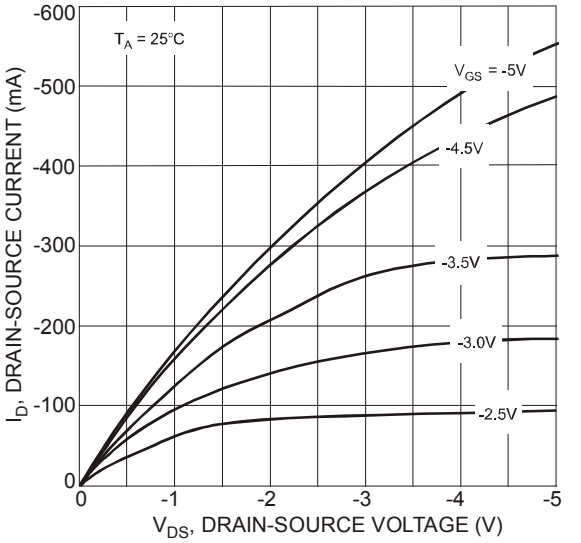



Fig. 2 Drain-Source Current vs. Drain-Source Voltage

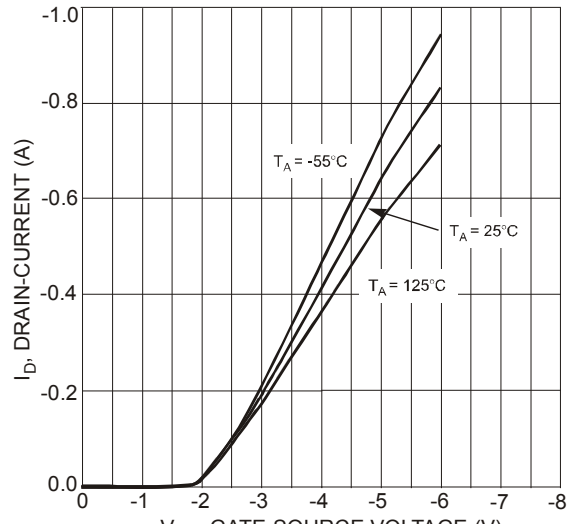



Fig. 3 Drain-Current vs. Gate-Source Voltage

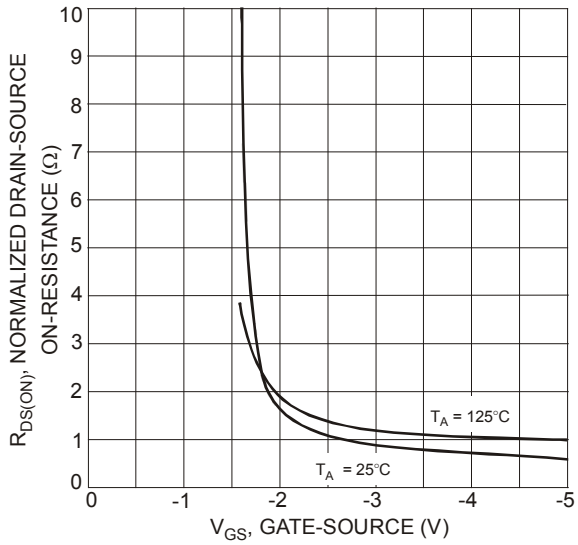



Fig. 4 On-Resistance vs. Gate-Source Voltage

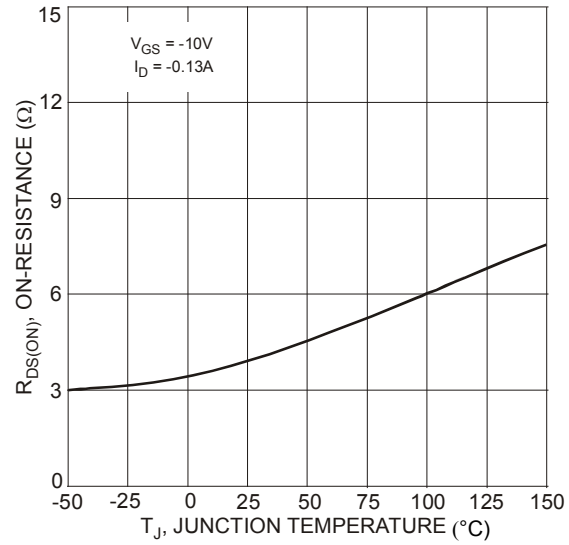



Fig. 5 On-Resistance vs. Junction Temperature

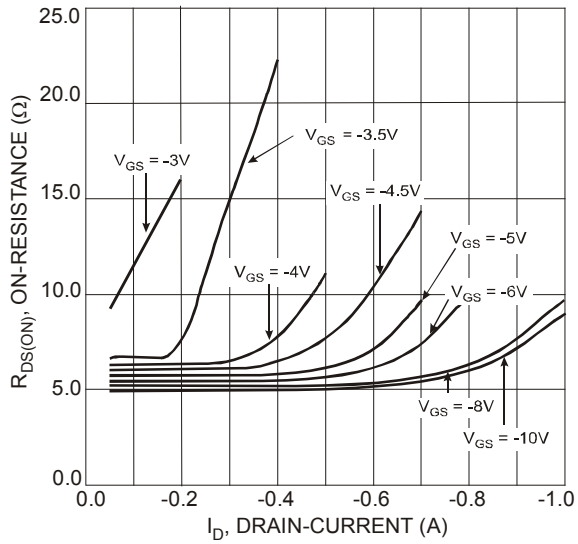



Fig. 6 On-Resistance vs. Drain-Current

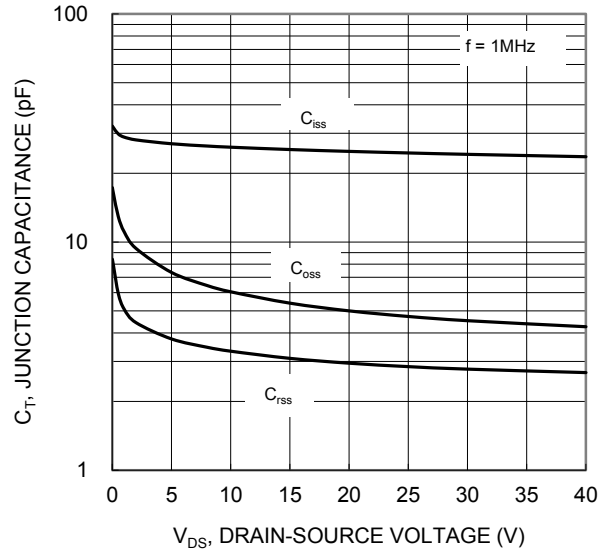



Fig. 7 Typical Junction Capacitance

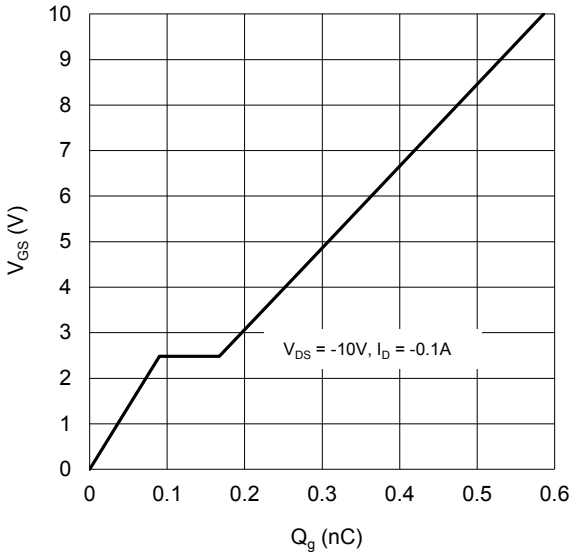



Fig. 8 Gate Charge

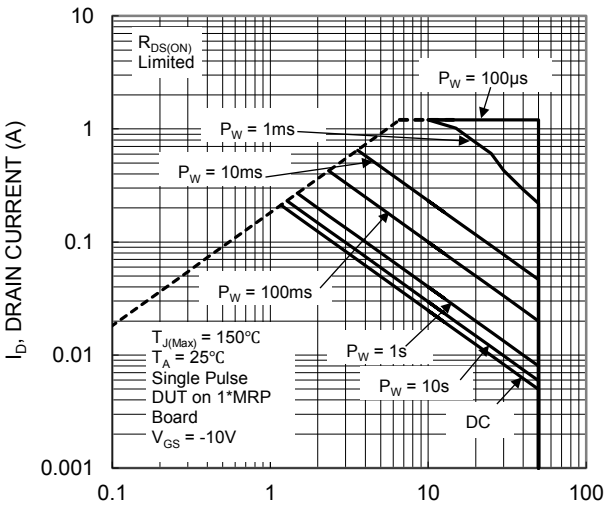
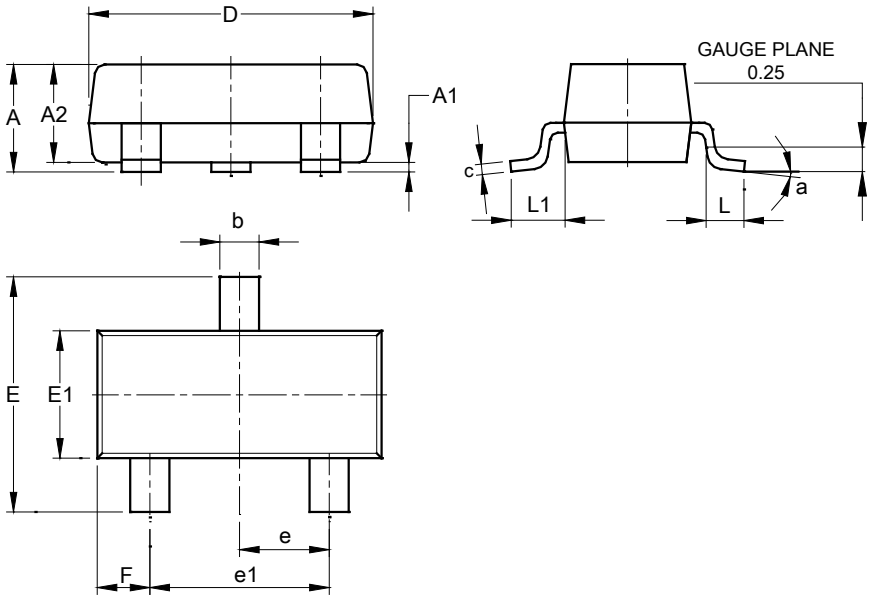



Fig. 9 SOA, Safe Operation Area

## Package Outline Dimensions

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

**SOT23 (Standard)**

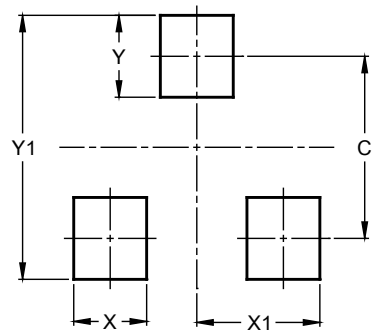



| SOT23 (Standard) | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.90 | 1.15 | 1.025 |
| **A1** | 0.00 | 0.10 | 0.05 |
| **A2** | 0.85 | 1.10 | 0.975 |
| **b** | 0.30 | 0.51 | 0.40 |
| **c** | 0.080 | 0.202 | 0.11 |
| **D** | 2.80 | 3.00 | 2.90 |
| **E** | 2.25 | 2.55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