

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> Max        | I <sub>D</sub> Max<br>T <sub>A</sub> = +25°C |
|-------------------|--------------------------------|--|
| 30V               | 60mΩ @ V <sub>GS</sub> = 10V   | 2.7A   |
|                   | 100mΩ @ V <sub>GS</sub> = 4.5V | 2.1A   |

## Description and Applications

This MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- General Purpose Interfacing Switch
- Power Management Functions
- DC-DC Converters
- Analog Switch

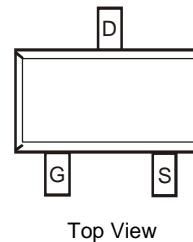
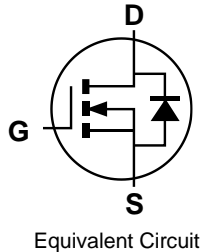
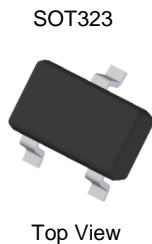
## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN3061SWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.027 grams (Approximate)

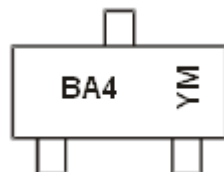


## Ordering Information (Note 4)

| Part Number   | Case   | Packaging          |
|---------------|--------|--------------------|
| DMN3061SWQ-7  | SOT323 | 3,000/Tape & Reel  |
| DMN3061SWQ-13 | SOT323 | 10,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



BA4 = Product Type Marking Code  
 YM or YM = Date Code Marking  
 Y or Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | G    | H    | 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic  |              |                        | Symbol           | Value | Unit |
|---|--------------|------------------------|------------------|-------|------|
| Drain-Source Voltage                                    |              |                        | V <sub>DSS</sub> | 30    | V    |
| Gate-Source Voltage                                     |              |                        | V <sub>GSS</sub> | ±20   | V    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 2.7   | A    |
|   |              | T <sub>A</sub> = +70°C |                  | 2.2   |      |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)      |              |                        | I <sub>DM</sub>  | 22    | A    |
| Maximum Body Diode Forward Current (Note 5)             |              |                        | I <sub>S</sub>   | 0.67  | A    |

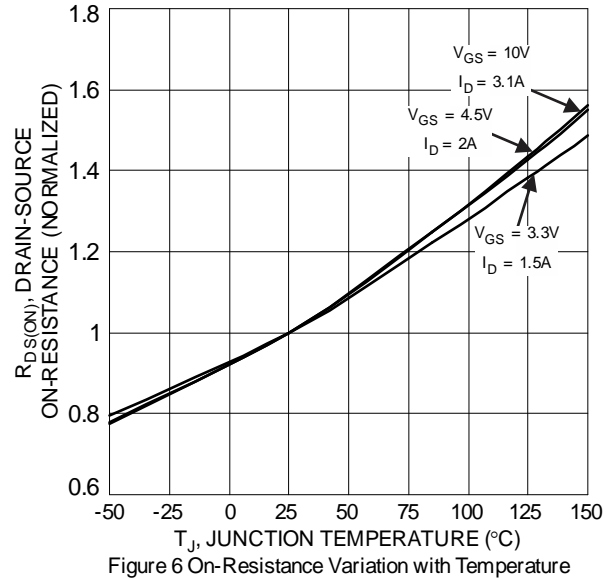
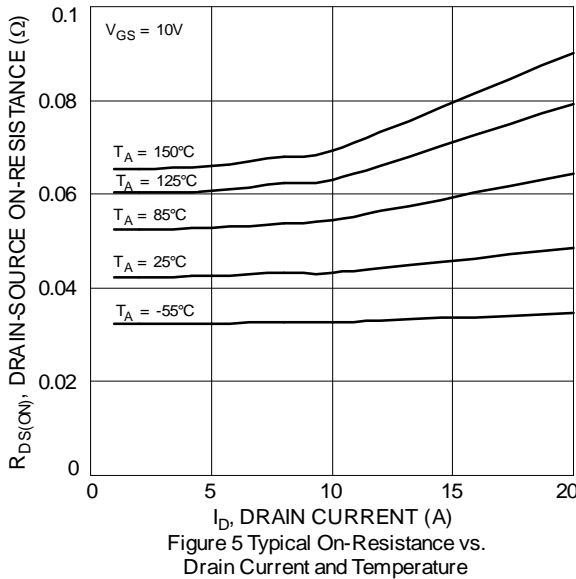
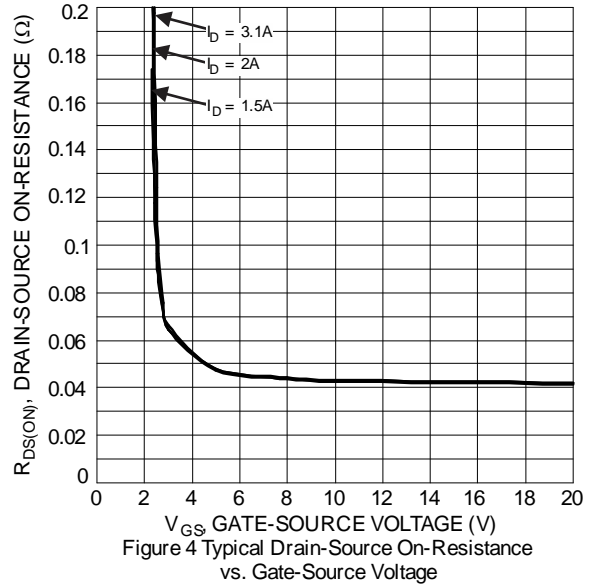
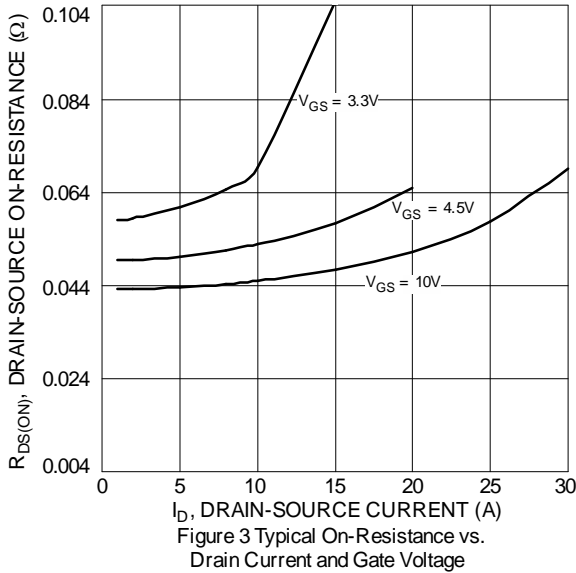
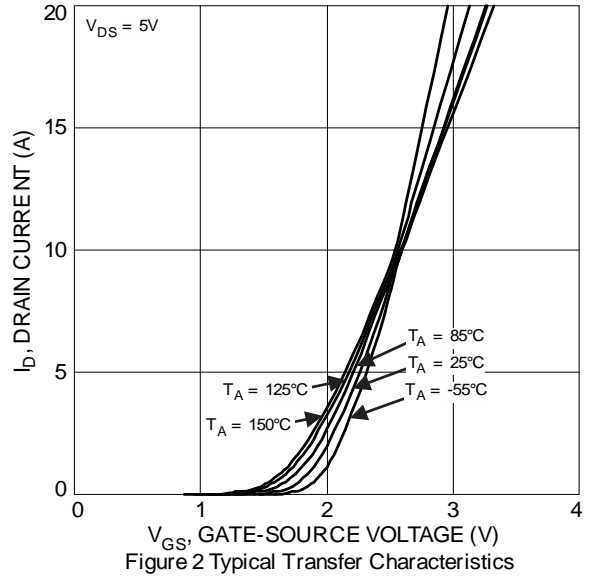
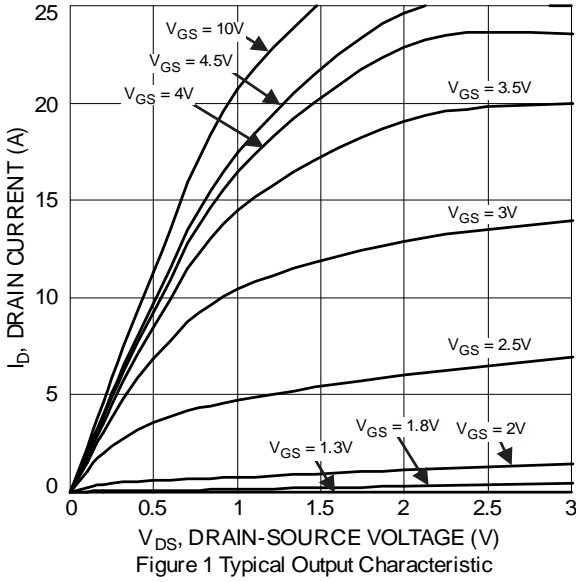
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                   |  |              | Symbol                            | Value       | Unit |
|--|--|--------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 |  |              | P <sub>D</sub>                    | 0.49        | W    |
| Thermal Resistance, Junction to Ambient (Note 5) |  | Steady State | R <sub>θJA</sub>                  | 254         | °C/W |
| Total Power Dissipation (Note 6)                 |  |              | P <sub>D</sub>                    | 0.65        | W    |
| Thermal Resistance, Junction to Ambient (Note 6) |  | Steady State | R <sub>θJA</sub>                  | 191         | °C/W |
| Operating and Storage Temperature Range          |  |              | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol              | Min | Typ  | Max  | Unit | Test Condition  |
|---|---------------------|-----|------|------|------|---|
| <b>OFF CHARACTERISTICS (Note 7)</b>     |                     |     |      |      |      |   |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | 30  | —    | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA  |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —   | —    | 1.0  | µA   | @T <sub>C</sub> = +25°C<br>V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V                      |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 7)</b>      |                     |     |      |      |      |   |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | 0.5 | —    | 1.8  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA                                  |
| Static Drain-Source On-Resistance       | R <sub>DS(ON)</sub> | —   | 41   | 60   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.1A  |
|   |                     | —   | 48   | 100  |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2A   |
|   |                     | —   | 56   | 200  |      | V <sub>GS</sub> = 3.3V, I <sub>D</sub> = 1.5A   |
| Diode Forward Voltage                   | V <sub>SD</sub>     | —   | 0.7  | 1    | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A   |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b> |                     |     |      |      |      |   |
| Input Capacitance                       | C <sub>iss</sub>    | —   | 278  | —    | pF   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                  |
| Output Capacitance                      | C <sub>oss</sub>    | —   | 44   | —    | pF   |   |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    | —   | 29   | —    | pF   |   |
| Gate Resistance                         | R <sub>g</sub>      | —   | 4.2  | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz  |
| Total Gate Charge                       | Q <sub>g</sub>      | —   | 3.5  | —    | nC   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A                          |
| Gate-Source Charge                      | Q <sub>gs</sub>     | —   | 0.1  | —    | nC   |   |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | —   | 1.3  | —    | nC   |   |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —   | 5.7  | —    | ns   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V,<br>R <sub>G</sub> = 3Ω, R <sub>L</sub> = 1.7Ω |
| Turn-On Rise Time                       | t <sub>R</sub>      | —   | 97   | —    | ns   |   |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —   | 12.6 | —    | ns   |   |
| Turn-Off Fall Time                      | t <sub>F</sub>      | —   | 51   | —    | ns   |   |

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



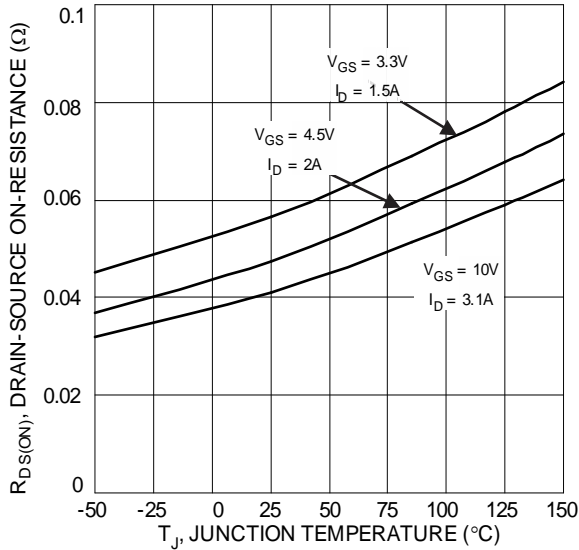


Figure 7 On-Resistance Variation with Temperature

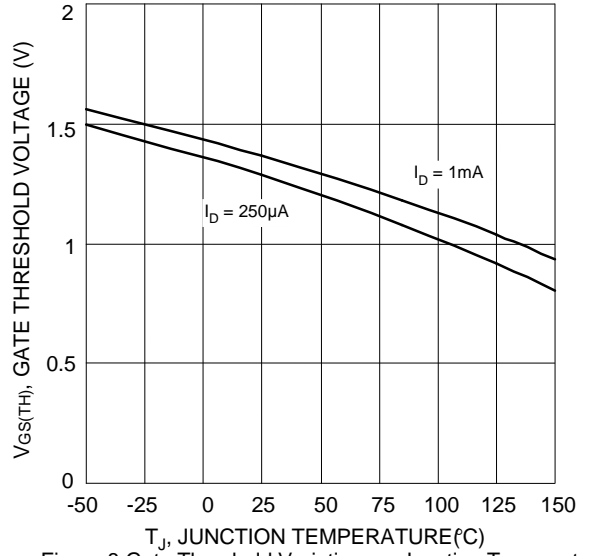


Figure 8 Gate Threshold Variation vs. Junction Temperature

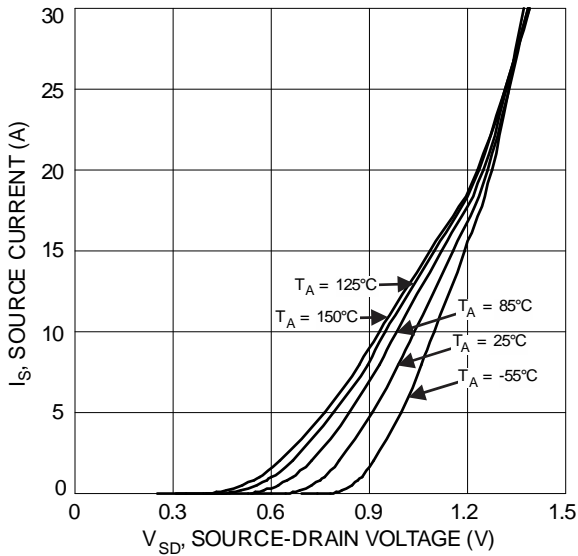


Figure 9 Diode Forward Voltage vs. Current

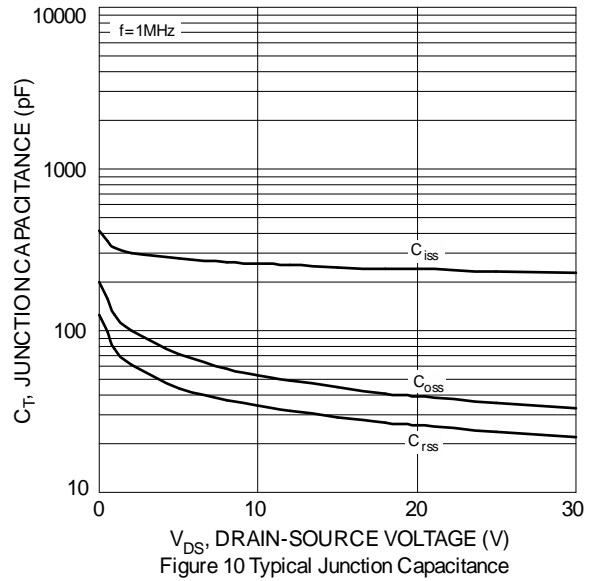


Figure 10 Typical Junction Capacitance

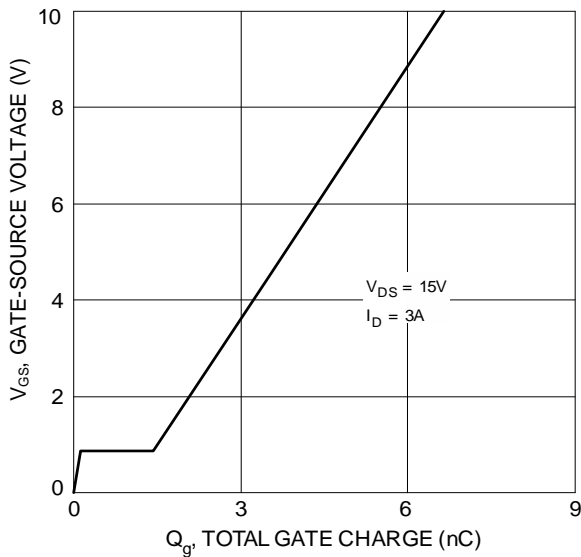


Figure 11 Gate Charge

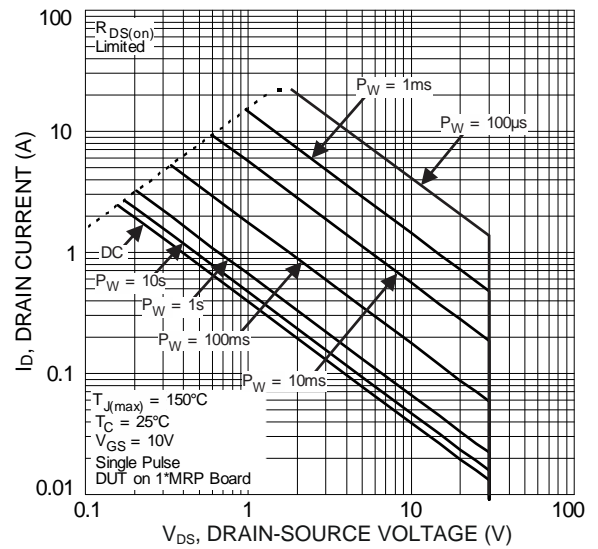
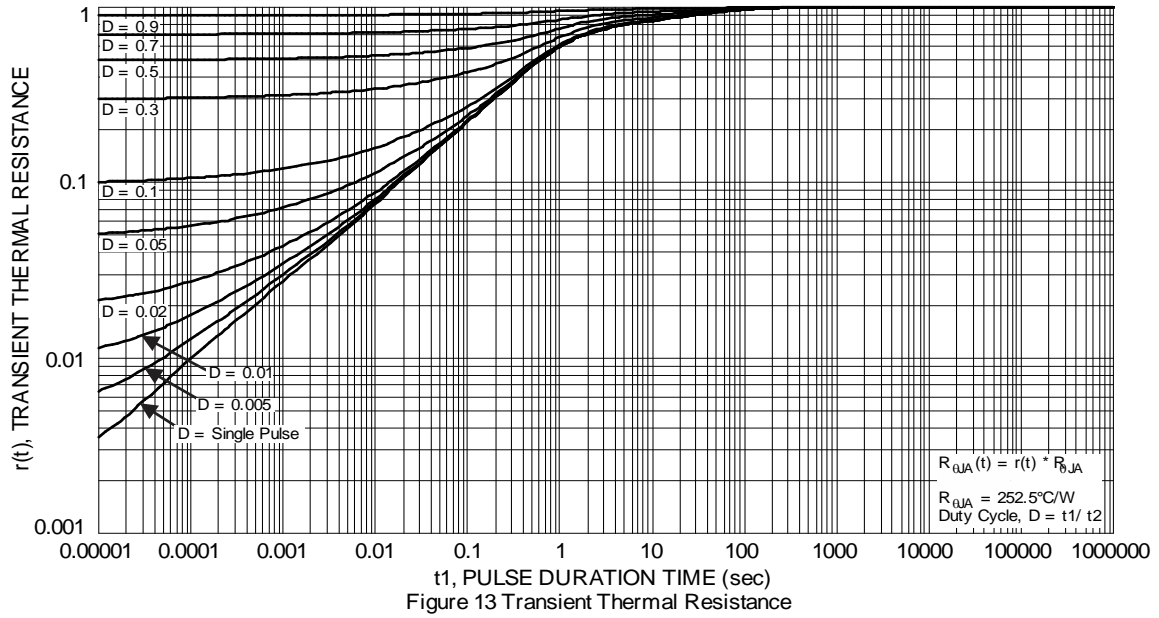


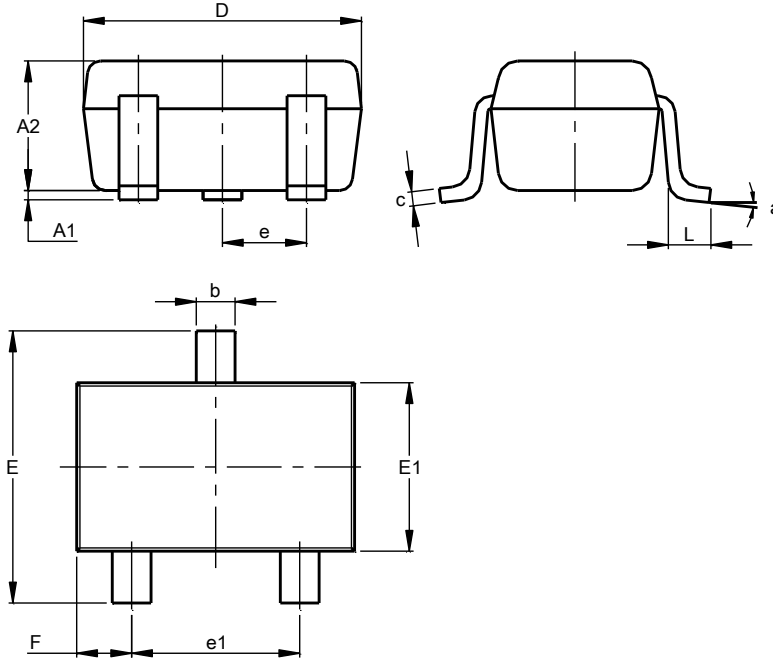
Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

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

**SOT323**

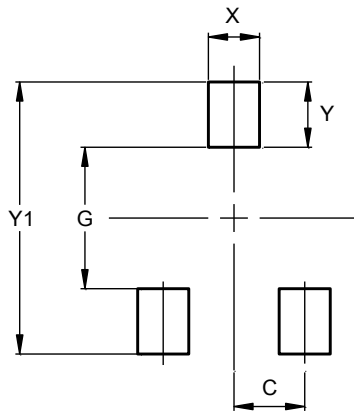


| SOT323               |           |       |       |
|----------------------|-----------|-------|-------|
| Dim                  | Min       | Max   | Typ   |
| A1                   | 0.00      | 0.10  | 0.05  |
| A2                   | 0.90      | 1.00  | 0.95  |
| b                    | 0.25      | 0.40  | 0.30  |
| c                    | 0.10      | 0.18  | 0.11  |
| D                    | 1.80      | 2.20  | 2.15  |
| E                    | 2.00      | 2.20  | 2.10  |
| E1                   | 1.15      | 1.35  | 1.30  |
| e                    | 0.650 BSC |       |       |
| e1                   | 1.20      | 1.40  | 1.30  |
| F                    | 0.375     | 0.475 | 0.425 |
| L                    | 0.25      | 0.40  | 0.30  |
| a                    | 0°        | 8°    | --    |
| All Dimensions in mm |           |       |       |

**Suggested Pad Layout**

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

**SOT323**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.650         |
| G          | 1.300         |
| X          | 0.470         |
| Y          | 0.600         |
| Y1         | 2.500         |

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