

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ max             | $I_D$ max<br>$T_A = +25^\circ\text{C}$ |
|---------------|------------------------------|----------------------------------------|
| 30V           | 2.8Ω @ $V_{GS} = 10\text{V}$ | 380mA                                  |
|               | 3.8Ω @ $V_{GS} = 5\text{V}$  | 330mA                                  |

## Description

This MOSFET is designed to minimize the on-state resistance ( $R_{DS(ON)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

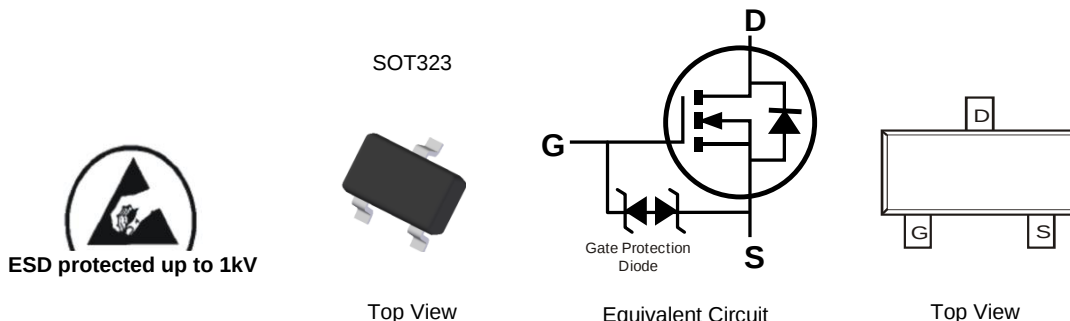
- Motor Control
- Power Management Functions
- Backlighting

## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Up To 1kV
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

## 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
- Terminals: Finish — Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.006 grams (Approximate)

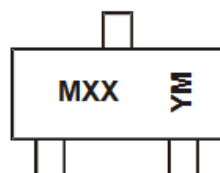


## Ordering Information (Note 4)

| Part Number  | Case   | Packaging         |
|--------------|--------|-------------------|
| DMN63D8LW-7  | SOT323 | 3000/Tape & Reel  |
| DMN63D8LW-13 | SOT323 | 10000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

## Marking Information



MXX= Product Type Marking Code  
 YM = Date Code Marking  
 Y or Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year  | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    |
| 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>   | 380   | mA   |
|                                                             |              | T <sub>A</sub> = +70°C |                  | 300   |      |
|                                                             | t<5s         | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 430   | mA   |
|                                                             |              | T <sub>A</sub> = +70°C |                  | 340   |      |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%) (Note 6) |              |                        | I <sub>DM</sub>  | 1.2   | 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>                    | 300         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | R <sub>θJA</sub>                  | 426         | °C/W |
| Total Power Dissipation (Note 6)                 |              | P <sub>D</sub>                    | 420         | mW   |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | R <sub>θJA</sub>                  | 301         | °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   | V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V                                                    |
| Gate-Source Leakage                      | I <sub>GSS</sub>    | —   | —    | ±10.0 | μA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                   |
| <b>ON CHARACTERISTICS (Note 7)</b>       |                     |     |      |       |      |                                                                                                |
| Gate Threshold Voltage                   | V <sub>GS(TH)</sub> | 0.8 | —    | 1.5   | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                     |
| Static Drain-Source On-Resistance        | R <sub>DS(ON)</sub> | —   | —    | 2.8   | Ω    | V <sub>GS</sub> = 10.0V, I <sub>D</sub> = 250mA                                                |
|                                          |                     | —   | —    | 3.8   |      | V <sub>GS</sub> = 5.0V, I <sub>D</sub> = 250mA                                                 |
|                                          |                     | —   | —    | 4.2   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 250mA                                                 |
|                                          |                     | —   | —    | 4.5   |      | V <sub>GS</sub> = 4.0V, I <sub>D</sub> = 250mA                                                 |
|                                          |                     | —   | —    | 13    |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 10mA                                                  |
| Forward Transconductance                 | g <sub>FS</sub>     | 80  | —    | —     | mS   | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.115A                                                 |
| Diode Forward Voltage                    | V <sub>SD</sub>     | —   | 0.8  | 1.2   | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA                                                   |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>  |                     |     |      |       |      |                                                                                                |
| Input Capacitance                        | C <sub>iss</sub>    | —   | 23.2 | —     | pF   | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz                                        |
| Output Capacitance                       | C <sub>oss</sub>    | —   | 3.0  | —     |      |                                                                                                |
| Reverse Transfer Capacitance             | C <sub>rss</sub>    | —   | 2.2  | —     |      |                                                                                                |
| Gate Resistance                          | R <sub>G</sub>      | —   | 79.9 | —     | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz                                         |
| Total Gate Charge V <sub>GS</sub> = 10V  | Q <sub>g</sub>      | —   | 0.9  | —     | nC   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 30V, I <sub>D</sub> = 150mA                           |
| Total Gate Charge V <sub>GS</sub> = 4.5V | Q <sub>g</sub>      | —   | 0.4  | —     |      |                                                                                                |
| Gate-Source Charge                       | Q <sub>gs</sub>     | —   | 0.1  | —     |      |                                                                                                |
| Gate-Drain Charge                        | Q <sub>gd</sub>     | —   | 0.2  | —     |      |                                                                                                |
| Turn-On Delay Time                       | t <sub>D(ON)</sub>  | —   | 2.3  | —     | ns   | V <sub>DD</sub> = 30V, I <sub>D</sub> = 0.115A, V <sub>GEN</sub> = 10V, R <sub>GEN</sub> = 25Ω |
| Turn-On Rise Time                        | t <sub>R</sub>      | —   | 3.9  | —     |      |                                                                                                |
| Turn-Off Delay Time                      | t <sub>D(OFF)</sub> | —   | 11.4 | —     |      |                                                                                                |
| Turn-Off Fall Time                       | t <sub>F</sub>      | —   | 16.7 | —     |      |                                                                                                |

- Notes:
5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
  6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to product testing.

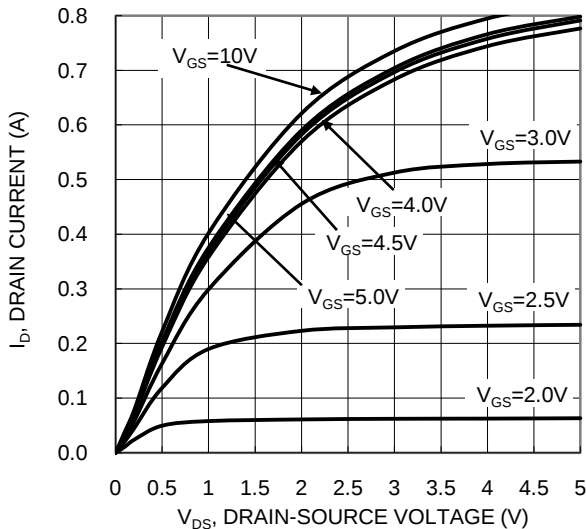


Figure 1. Typical Output Characteristic

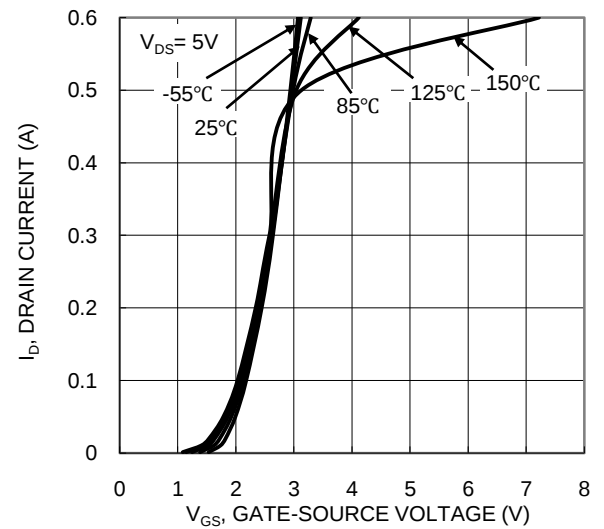


Figure 2. Typical Transfer Characteristic

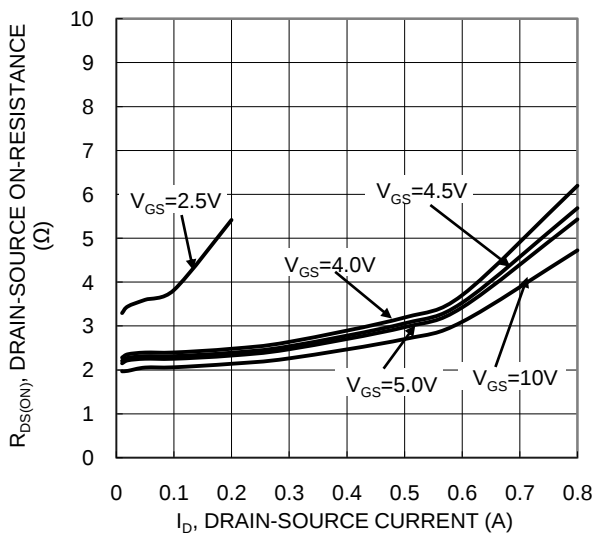


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

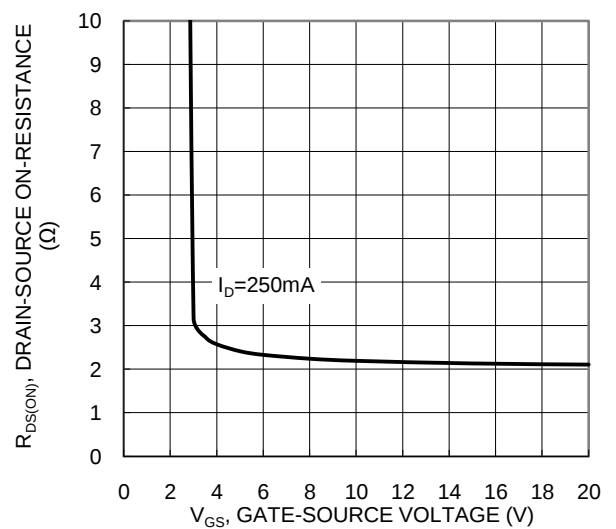


Figure 4. Typical Transfer Characteristic

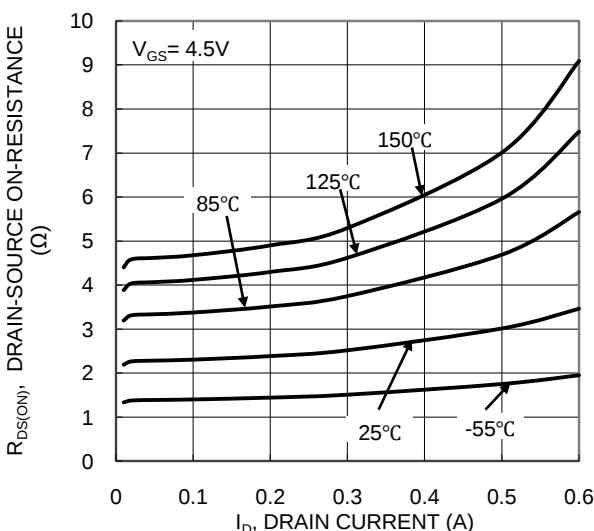


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

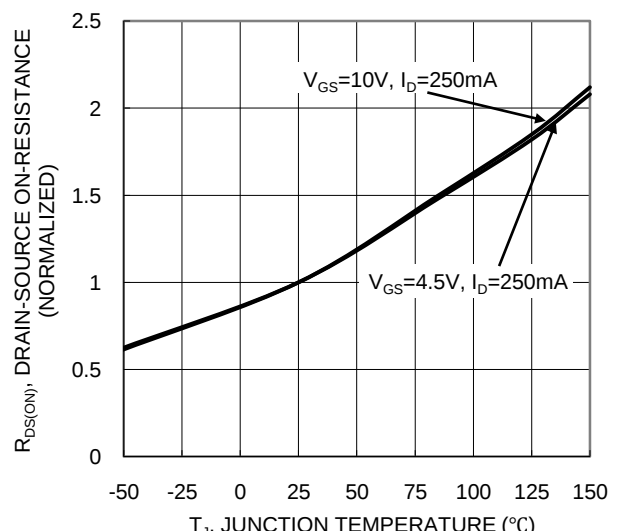
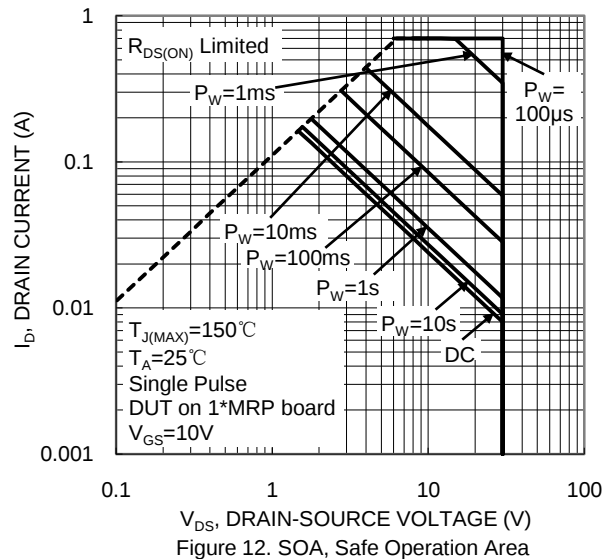
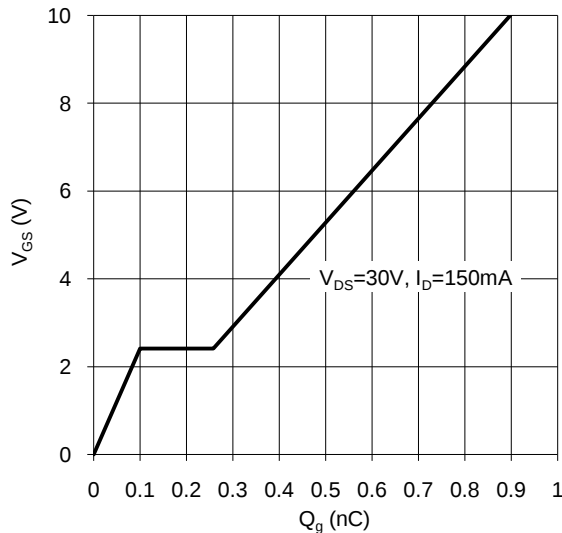
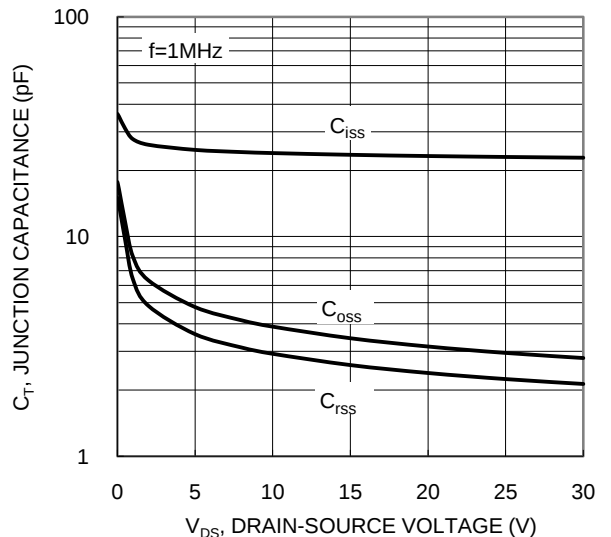
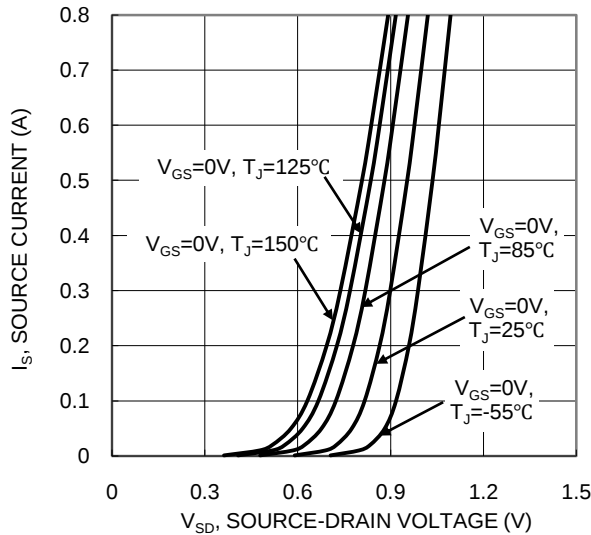
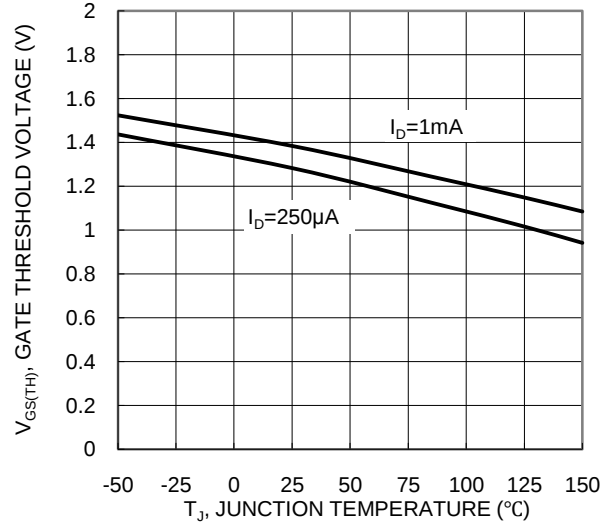
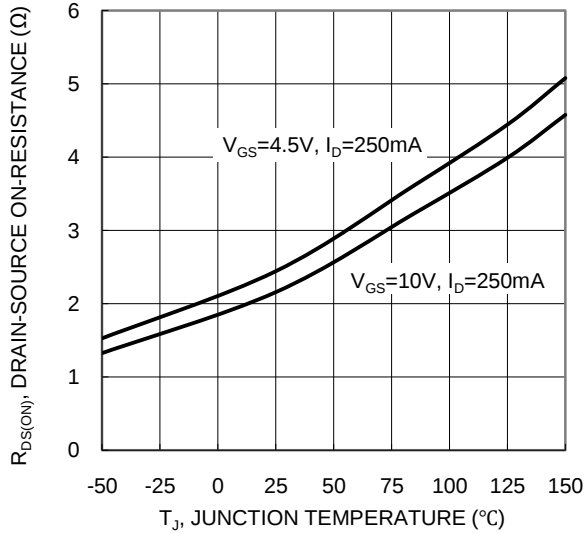
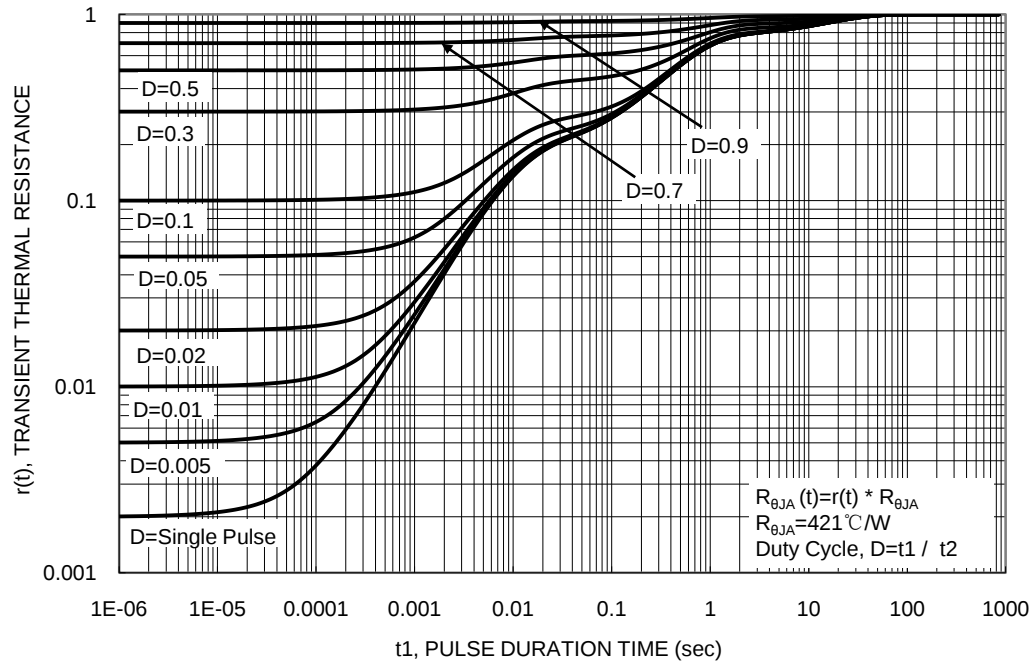


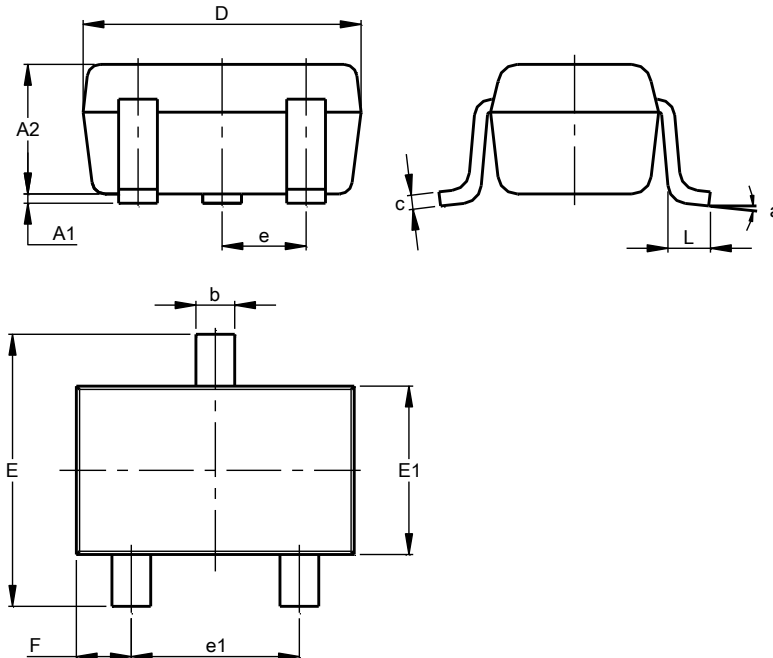
Figure 6. On-Resistance Variation with Junction Temperature





## Package Outline Dimensions

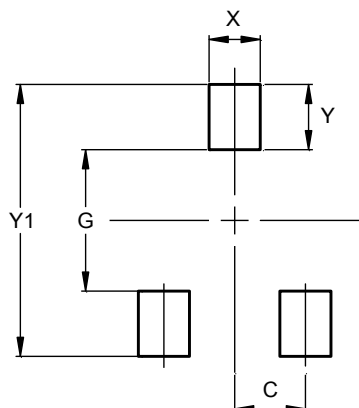
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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                    | 8°        |       |       |
| All Dimensions in mm |           |       |       |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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

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