

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> max       | I <sub>D</sub> max<br>T <sub>A</sub> = +25°C |
|-------------------|-------------------------------|----------------------------------------------|
| 60V               | 2Ω @ V <sub>GS</sub> = 4.5V   | 380mA                                        |
|                   | 2.5Ω @ V <sub>GS</sub> = 2.5V | 340mA                                        |

## Description

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

## Applications

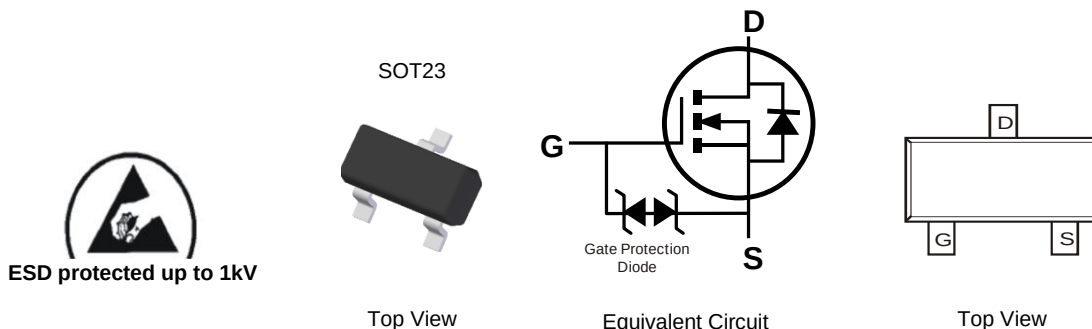
- Motor Control
- Power Management Functions
- Backlighting

## 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: SOT23
- 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 Ⓔ3
- Weight: 0.008 grams (Approximate)



## Ordering Information (Note 4)

| Part Number | Case  | Packaging         |
|-------------|-------|-------------------|
| DMN62D0U-7  | SOT23 | 3000/Tape & Reel  |
| DMN62D0U-13 | SOT23 | 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



3D2 = Product Type Marking Code  
 YM or YM = Date Code Marking  
 Y or Y = Year (ex: D = 2016)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year  | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    | N    | O    |
| 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> | 60         | V    |
| Gate-Source Voltage                                         |              |                                                  | V <sub>GSS</sub> | ±20        | V    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V    | Steady State | T <sub>A</sub> = +25°C                           | I <sub>D</sub>   | 380        | mA   |
|                                                             |              | T <sub>A</sub> = +70°C                           | I <sub>D</sub>   | 300        | mA   |
|                                                             | t < 5s       | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 430<br>340 | mA   |
| Maximum Continuous Body Diode Forward Current (Note 6)      |              |                                                  | I <sub>S</sub>   | 0.4        | A    |
| 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>                    | 380         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State |  | R <sub>θJA</sub>                  | 338         | °C/W |
|                                                  | t < 5s       |  | R <sub>θJA</sub>                  | 292         | °C/W |
| Total Power Dissipation (Note 6)                 |              |  | P <sub>D</sub>                    | 590         | mW   |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State |  | R <sub>θJA</sub>                  | 216         | °C/W |
|                                                  | t < 5s       |  | R <sub>θJA</sub>                  | 177         | °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>   | 60  | —    | —   | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 10µA                                                   |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —   | —    | 1.0 | µA   | V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V                                                   |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | —   | —    | ±10 | 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> | 0.5 | —    | 1.0 | V    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 250µA                                                 |
| Static Drain-Source On-Resistance       | R <sub>DS(ON)</sub> | —   | 1.2  | 2.0 | Ω    | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.1A                                                 |
|                                         |                     |     | 1.4  | 2.5 |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.05A                                                |
|                                         |                     |     | 1.8  | 3.0 |      | V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 0.05A                                                |
| Forward Transconductance                | Y <sub>fs</sub>     | —   | 1.8  | —   | S    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.2A                                                  |
| Diode Forward Voltage                   | V <sub>SD</sub>     | —   | 0.8  | 1.3 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA                                                  |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b> |                     |     |      |     |      |                                                                                               |
| Input Capacitance                       | C <sub>iss</sub>    | —   | 32   | —   | pF   | V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                     |
| Output Capacitance                      | C <sub>oss</sub>    | —   | 3.9  | —   | pF   |                                                                                               |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    | —   | 2.4  | —   | pF   |                                                                                               |
| Gate Resistance                         | R <sub>g</sub>      | —   | 101  | —   | Ω    | f = 1MHz, V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V                                          |
| Total Gate Charge                       | Q <sub>g</sub>      | —   | 0.5  | —   | nC   | V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V,<br>I <sub>D</sub> = 250mA                      |
| Gate-Source Charge                      | Q <sub>gs</sub>     | —   | 0.09 | —   | nC   |                                                                                               |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | —   | 0.09 | —   | nC   |                                                                                               |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —   | 2.4  | —   | ns   | V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V,<br>R <sub>G</sub> = 25Ω, I <sub>D</sub> = 200mA |
| Turn-On Rise Time                       | t <sub>R</sub>      | —   | 2.5  | —   | ns   |                                                                                               |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —   | 22.6 | —   | ns   |                                                                                               |
| Turn-Off Fall Time                      | t <sub>F</sub>      | —   | 12.5 | —   | ns   |                                                                                               |

- 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.

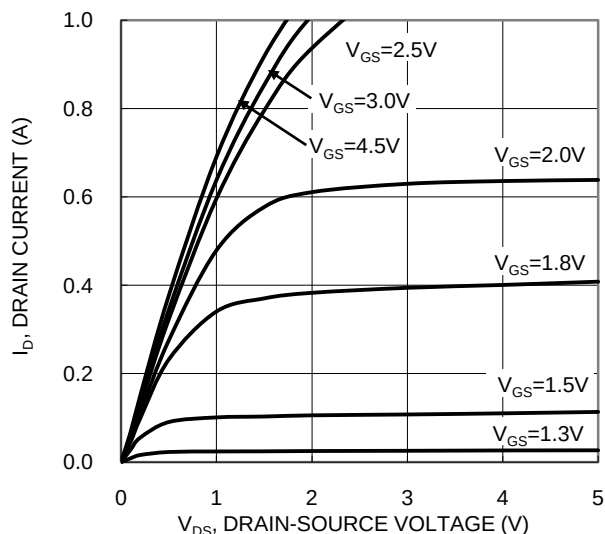


Figure 1. Typical Output Characteristic

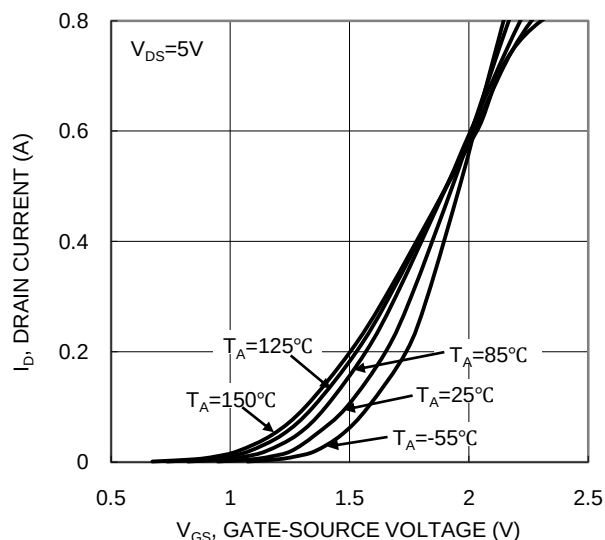


Figure 2. Typical Transfer Characteristic

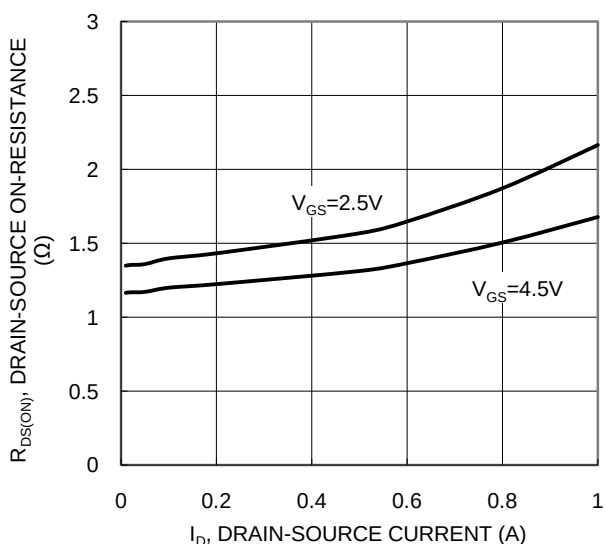


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

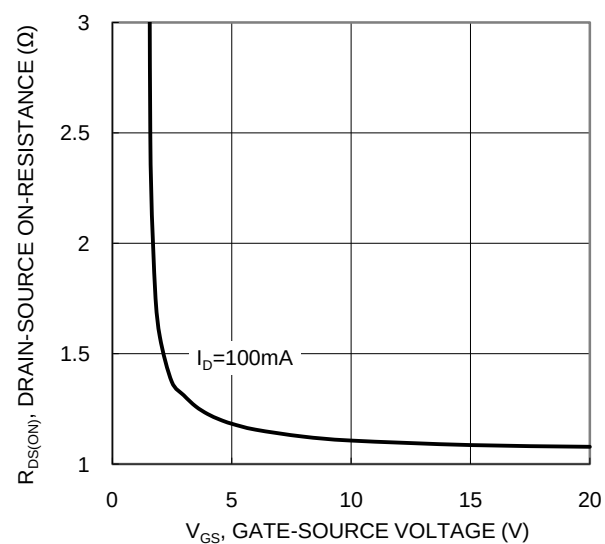


Figure 4. Typical Transfer Characteristic

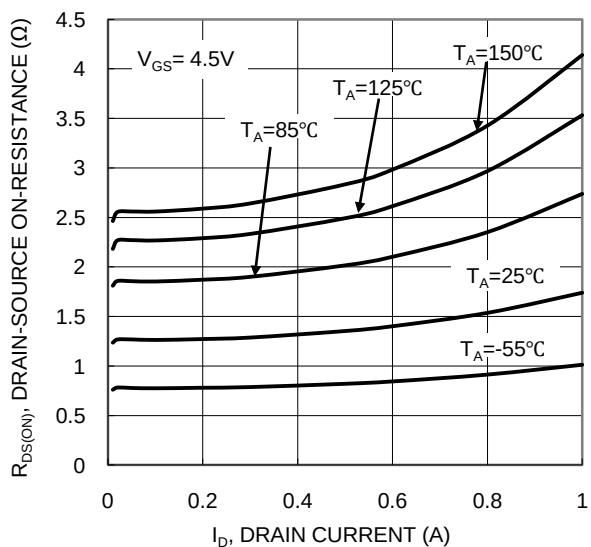


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

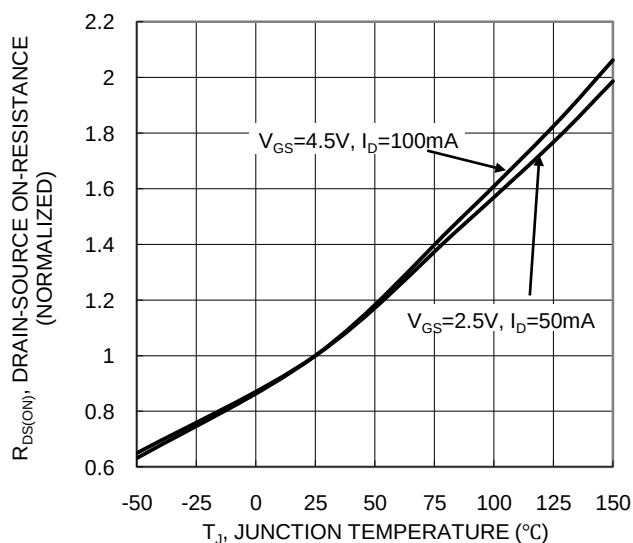
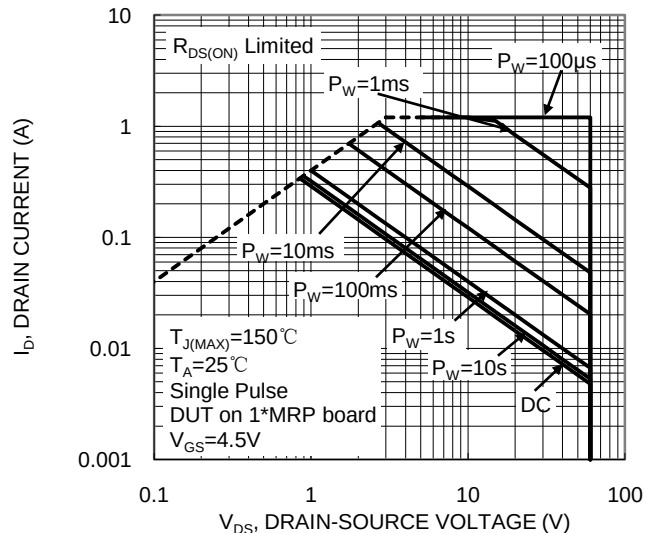
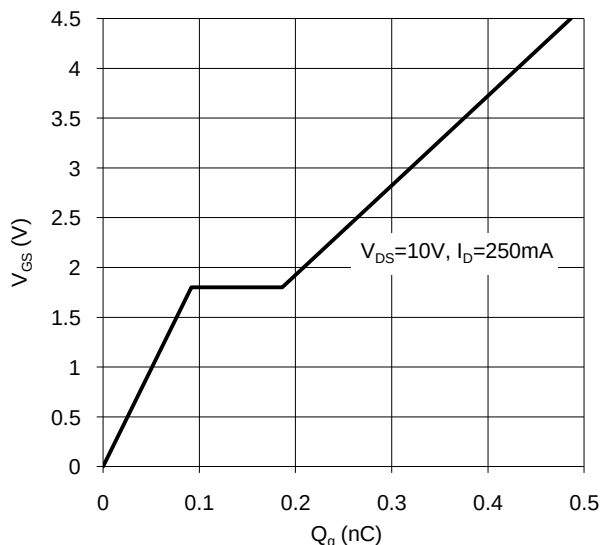
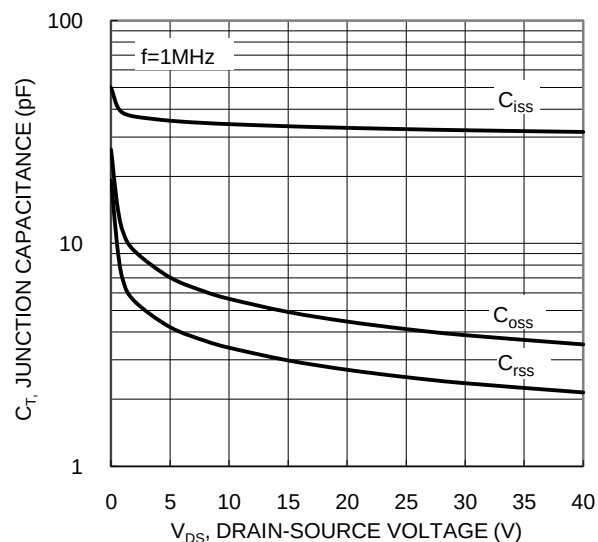
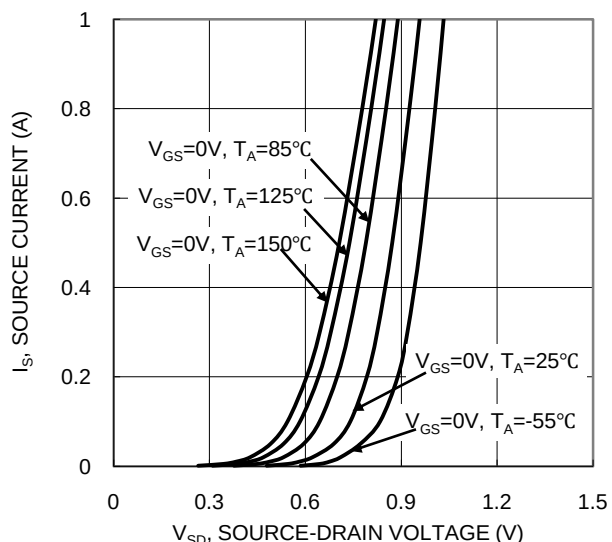
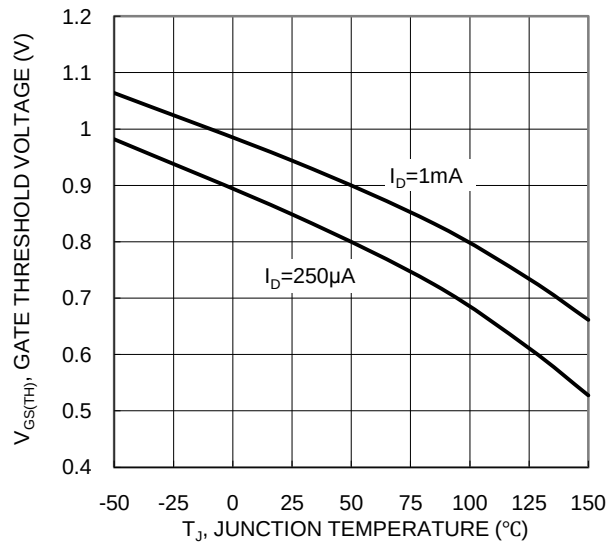
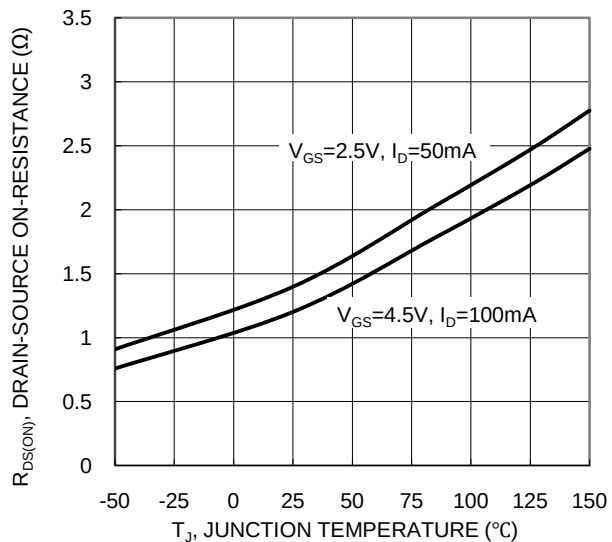


Figure 6. On-Resistance Variation with Junction Temperature



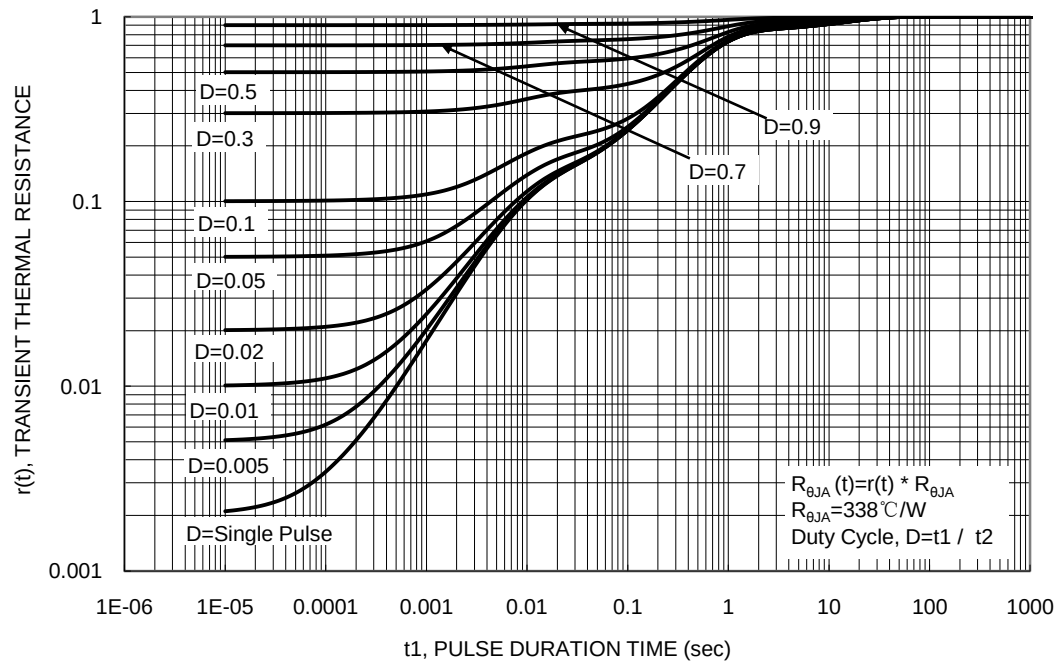
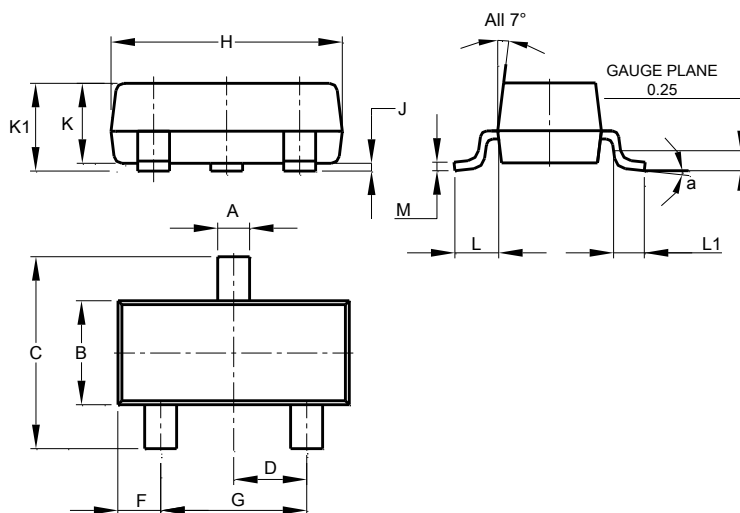


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

### SOT23

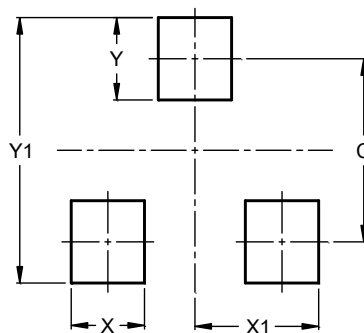


| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| a                    | 0°    | 8°    | --    |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout

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

### SOT23



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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