

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> Max       | I <sub>D</sub> Max<br>T <sub>A</sub> = +25°C |
|-------------------|-------------------------------|----------------------------------------------|
| 20V               | 24mΩ @ V <sub>GS</sub> = 4.5V | 6.8A                                         |
|                   | 32mΩ @ V <sub>GS</sub> = 2.5V | 5.9A                                         |

## Description and Applications

This new generation 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.

- DC-DC Converters
- Power Management Functions
- Backlighting

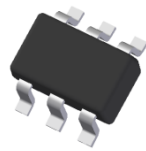
## Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

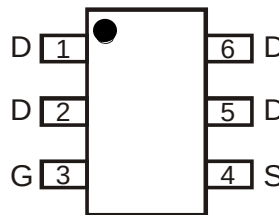
## Mechanical Data

- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.013 grams (Approximate)

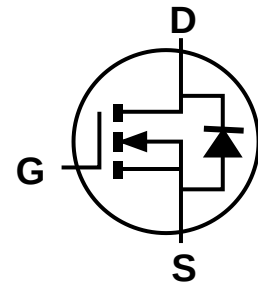
TSOT26



Top View



Top View  
Pin Configuration



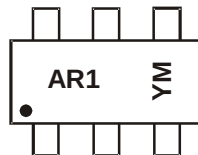
Equivalent Circuit

## Ordering Information (Note 4)

| Part Number   | Case   | Packaging          |
|---------------|--------|--------------------|
| DMN2029UVT-7  | TSOT26 | 3,000/Tape & Reel  |
| DMN2029UVT-13 | TSOT26 | 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



AR1 = Product Type Marking Code  
YM = Date Code Marking  
Y or Y = Year (ex: F = 2018)  
M = Month (ex: 9 = September)

### Date Code Key

Date Code Key

| Year | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|------|------|------|------|------|------|------|------|------|------|
| Code | F    | G    | H    | I    | J    | K    | L    | M    | N    |

| 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> | 20    | V    |
| Gate-Source Voltage                                      |              |                        | V <sub>GSS</sub> | ±10   | V    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 6.8   | A    |
|                                                          |              | T <sub>A</sub> = +70°C |                  | 5.5   | A    |
| Maximum Body Diode Forward Current (Note 6)              |              |                        | I <sub>S</sub>   | 2     | A    |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)       |              |                        | I <sub>DM</sub>  | 40    | A    |

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

| Characteristic                                   |                        | Symbol                            | Value       | Unit |
|--------------------------------------------------|------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.7         | W    |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State           | R <sub>θJA</sub>                  | 109         | °C/W |
| Total Power Dissipation (Note 6)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 0.7         | W    |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State           | R <sub>θJA</sub>                  | 74          | °C/W |
| Thermal Resistance, Junction to Case (Note 6)    |                        | R <sub>θJC</sub>                  | 15          |      |
| 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>   | 20  | —    | —   | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA                                               |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —   | —    | 1   | µA   | V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V                                                |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | —   | —    | ±10 | µA   | V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V                                                |
| <b>ON CHARACTERISTICS (Note 7)</b>      |                     |     |      |     |      |                                                                                            |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | 0.4 | 0.7  | 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> | —   | 18   | 24  | mΩ   | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.2A                                              |
|                                         |                     | —   | 21   | 32  |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 5.2A                                              |
| Diode Forward Voltage                   | V <sub>SD</sub>     | —   | 0.65 | 1.2 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1.3A                                                |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b> |                     |     |      |     |      |                                                                                            |
| Input Capacitance                       | C <sub>ISS</sub>    | —   | 646  | —   | pF   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                  |
| Output Capacitance                      | C <sub>OSS</sub>    | —   | 78   | —   |      |                                                                                            |
| Reverse Transfer Capacitance            | C <sub>rSS</sub>    | —   | 38   | —   |      |                                                                                            |
| Gate Resistance                         | R <sub>g</sub>      | —   | 628  | —   | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                       |
| Total Gate Charge                       | Q <sub>g</sub>      | —   | 7.1  | —   | nC   | V <sub>DS</sub> = 10V, I <sub>D</sub> = 6.2A, V <sub>GS</sub> = 4.5 V                      |
| Gate-Source Charge                      | Q <sub>gs</sub>     | —   | 0.9  | —   |      |                                                                                            |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | —   | 0.7  | —   |      |                                                                                            |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —   | 98   | —   | ns   | V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V,<br>I <sub>D</sub> = 1A, R <sub>g</sub> = 6Ω |
| Turn-On Rise Time                       | t <sub>r</sub>      | —   | 139  | —   |      |                                                                                            |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —   | 1023 | —   |      |                                                                                            |
| Turn-Off Fall Time                      | t <sub>f</sub>      | —   | 433  | —   |      |                                                                                            |
| Reverse Recovery Time                   | t <sub>RR</sub>     | —   | 245  | —   | ns   | I <sub>F</sub> = 1.0A, di/dt = 100A/µs                                                     |
| Reverse Recovery Charge                 | Q <sub>RR</sub>     | —   | 148  | —   | nC   | I <sub>F</sub> = 1.0A, di/dt = 100A/µs                                                     |

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

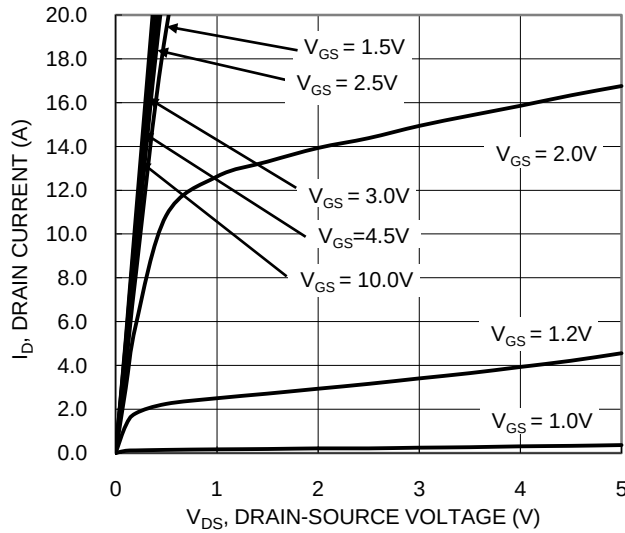


Figure 1. Typical Output Characteristic

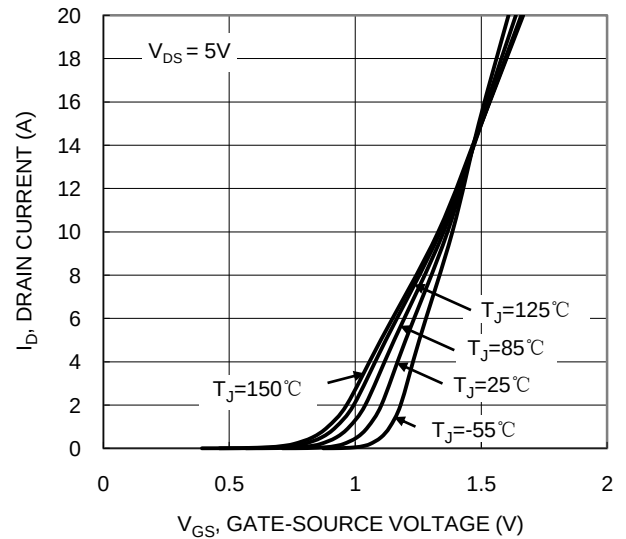


Figure 2. Typical Transfer Characteristic

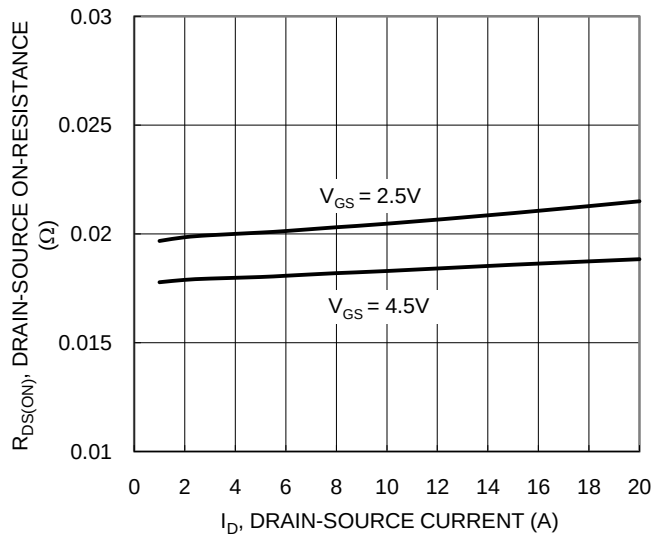


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

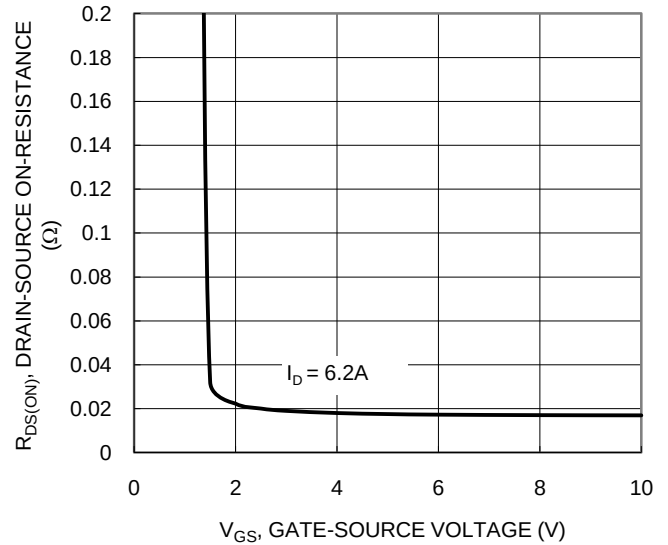


Figure 4. Typical Transfer Characteristic

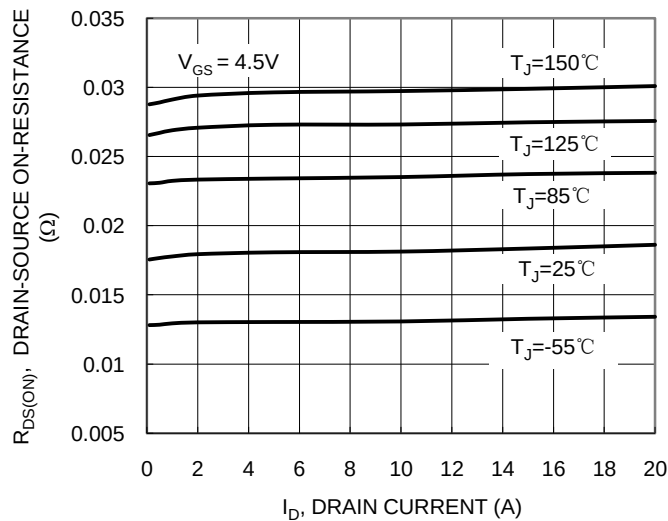


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

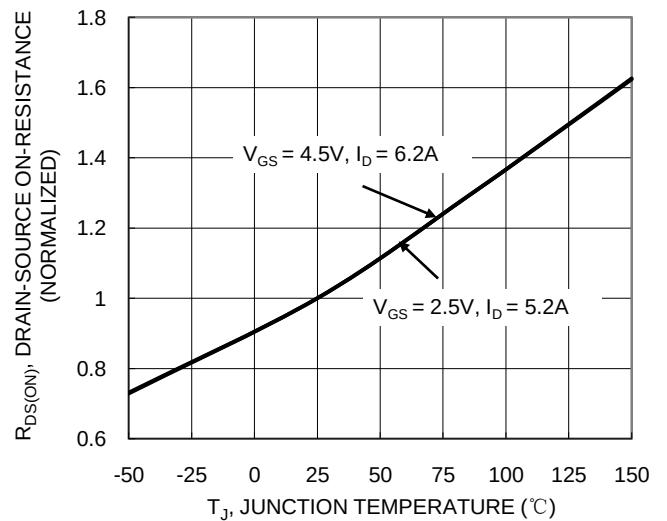
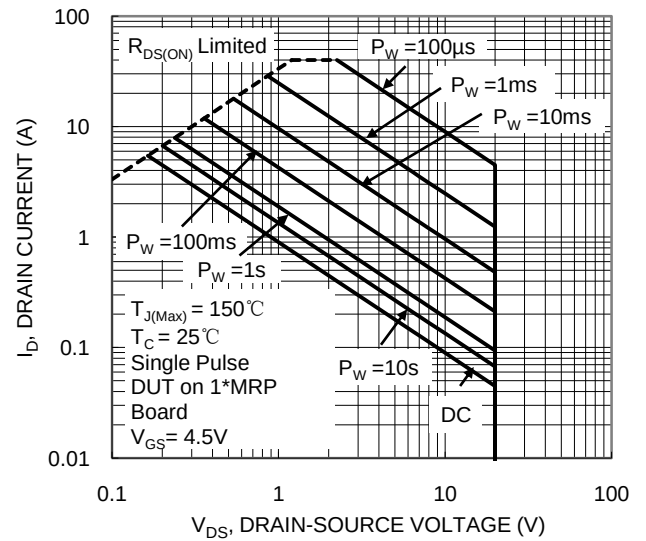
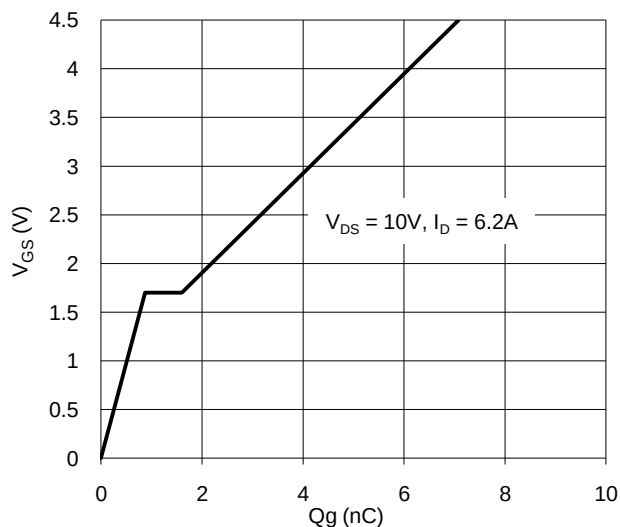
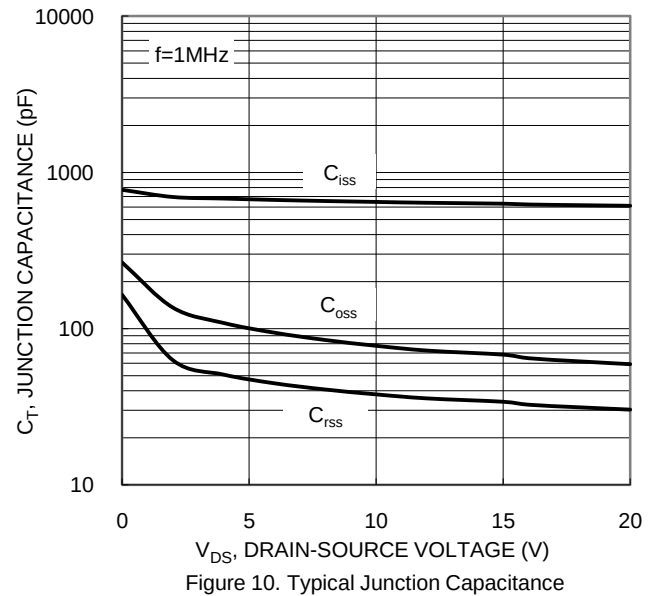
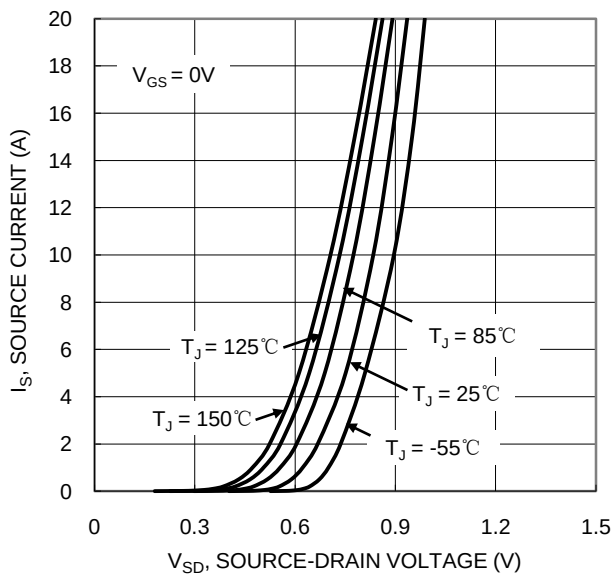
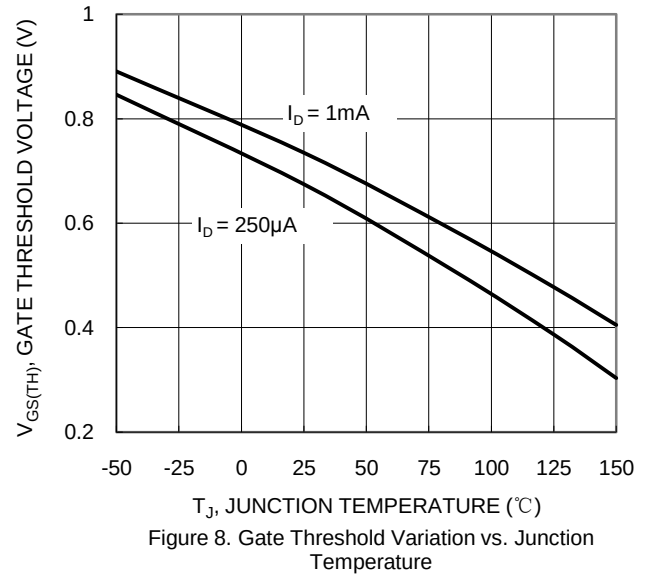
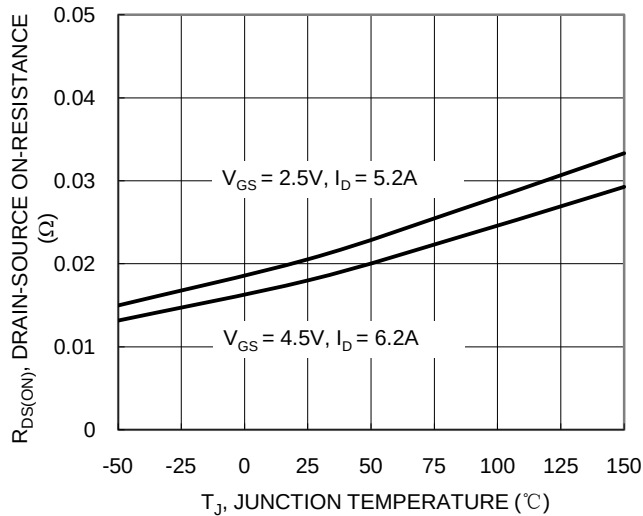


Figure 6. On-Resistance Variation with Junction Temperature



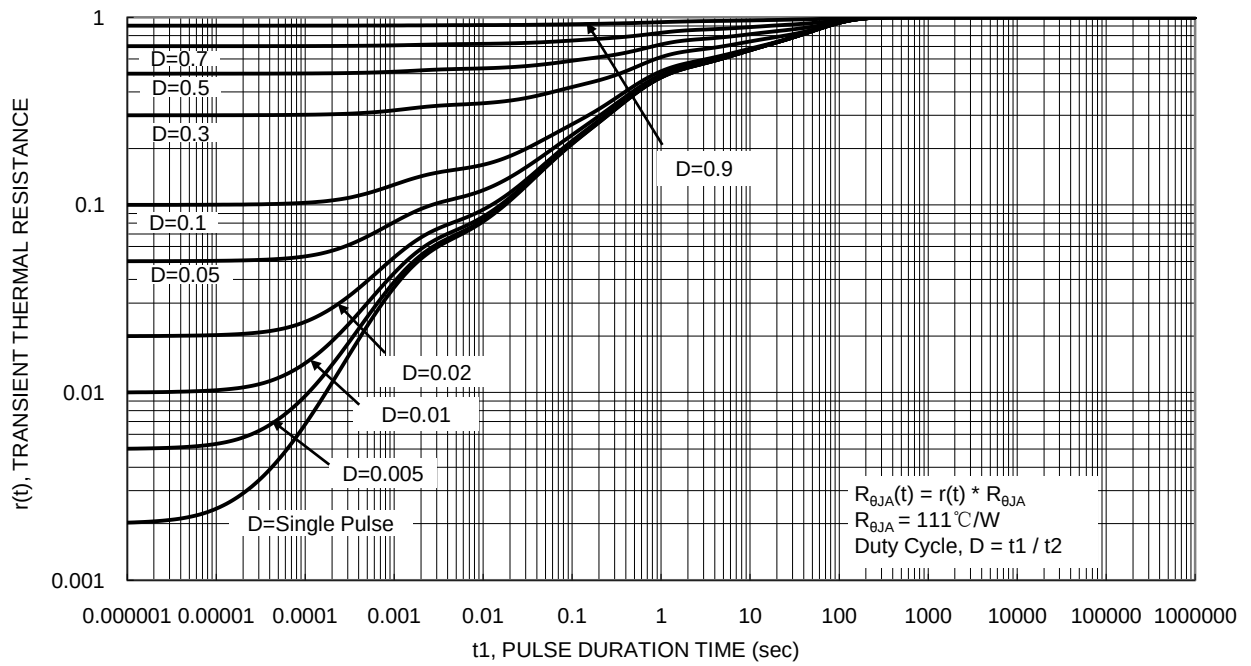
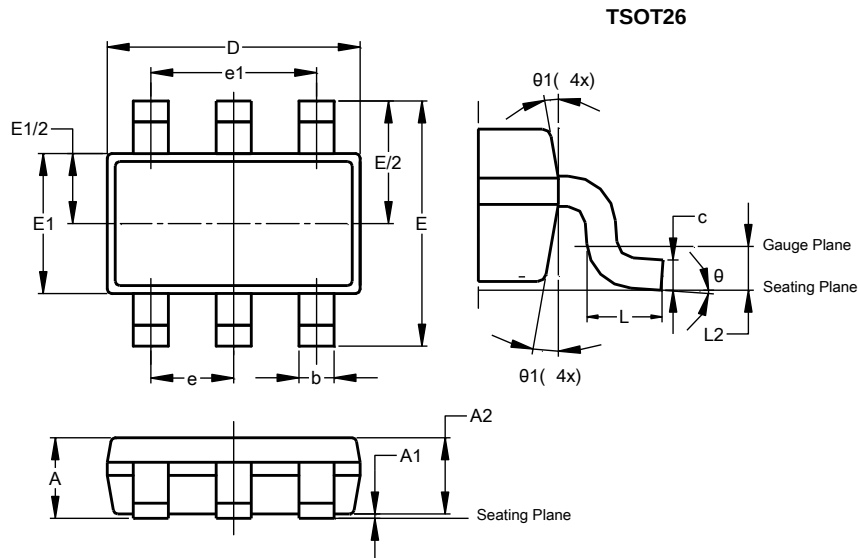


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

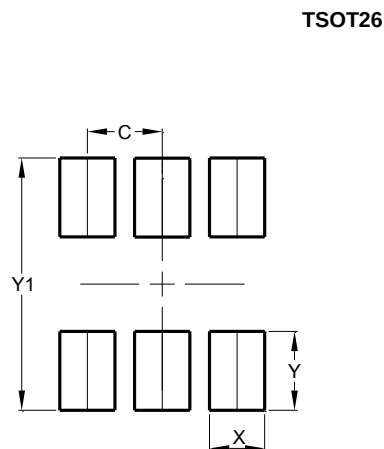
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



| TSOT26               |           |       |       |
|----------------------|-----------|-------|-------|
| Dim                  | Min       | Max   | Typ   |
| A                    | —         | 1.00  | —     |
| A1                   | 0.010     | 0.100 | —     |
| A2                   | 0.840     | 0.900 | —     |
| D                    | 2.800     | 3.000 | 2.900 |
| E                    | 2.800 BSC |       |       |
| E1                   | 1.500     | 1.700 | 1.600 |
| b                    | 0.300     | 0.450 | —     |
| c                    | 0.120     | 0.200 | —     |
| e                    | 0.950 BSC |       |       |
| e1                   | 1.900 BSC |       |       |
| L                    | 0.30      | 0.50  | —     |
| L2                   | 0.250 BSC |       |       |
| θ                    | 0°        | 8°    | 4°    |
| θ1                   | 4°        | 12°   | —     |
| All Dimensions in mm |           |       |       |

## Suggested Pad Layout

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



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.950         |
| X          | 0.700         |
| Y          | 1.000         |
| Y1         | 3.199         |

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