# DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

## Product Summary

| $BV_{DSS}$ | $R_{DS(on)}$ | $I_D$ $T_A$ = +25°C |
|---|---|---|
| 30V | 60mΩ @ $V_{GS}$= 10V | 3.4A |
| | 100mΩ @ $V_{GS}$= 4.5V | 2.7A |

## Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and is ideal for use in:

- Backlighting
- DC-DC converters
- Power management functions

## Features and Benefits

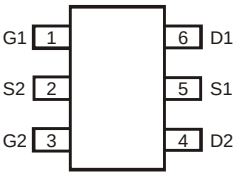
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DIODES™ DMN3061SVTQ is suitable for automotive applications requiring specific change 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

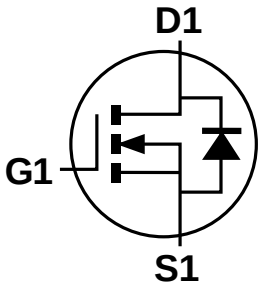
- Package: TSOT26
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (Approximate)

TSOT26

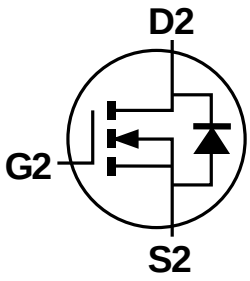
Top View




Top View




Q1 N-Channel MOSFET



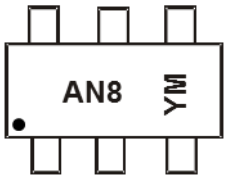

Q2 N-Channel MOSFET

## Ordering Information (Note 4)

| Part Number | Package | Packing | |
|---|---|---|---|
| | | Qty. | Carrier |
| DMN3061SVTQ-7 | TSOT26 | 3000 | Tape & Reel |
| DMN3061SVTQ-13 | TSOT26 | 10000 | 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




AN8 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: J = 2022)
M = Month (ex: 4 = April)

Date Code Key

| Year | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | I | J | K | L | M | N | O | P | R | S | T | U |

| 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 | | | $V_{DSS}$ | 30 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current (Note 5) $V_{GS}$ = 4.5V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | 3.4<br>2.7 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | $I_S$ | 1.4 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | | | $I_{DM}$ | 20 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 5) | $P_D$ | 0.88 | W |
| Thermal Resistance, Junction to Ambient @$T_A$ = +25°C (Note 5) | $R_{\theta JA}$ | 142 | °C/W |
| Power Dissipation (Note 6) | $P_D$ | 1.08 | W |
| Thermal Resistance, Junction to Ambient @$T_A$ = +25°C (Note 6) | $R_{\theta JA}$ | 116 | °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 7)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 30 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | 1.0 | µA | $V_{DS}$ = 24V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 7)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 0.5 | 1.3 | 1.8 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250µA |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | — | 35<br>41 | 60<br>100 | mΩ | $V_{GS}$ = 10V, $I_D$ = 3.1A<br>$V_{GS}$ = 4.5V, $I_D$ = 2A |
| Diode Forward Voltage | $V_{SD}$ | — | 0.7 | 1.0 | V | $V_{GS}$ = 0V, $I_S$ = 1A |
| **DYNAMIC CHARACTERISTICS (Note 8)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 278 | — | pF | $V_{DS}$ = 15V, $V_{GS}$ = 0V, f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | 44 | — | | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 29 | — | | |
| Gate Resistance | $R_g$ | — | 4.2 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz |
| Total Gate Charge ($V_{GS}$ = 4.5V) | $Q_g$ | — | 3.5 | — | nC | $V_{DS}$ = 15V, $V_{GS}$ = 4.5V, $I_D$ = 3A |
| Total Gate Charge ($V_{GS}$ = 10V) | $Q_g$ | — | 6.6 | — | | $V_{DS}$ = 15V, $V_{GS}$ = 10V, $I_D$ = 3A |
| Gate-Source Charge | $Q_{gs}$ | — | 0.1 | — | | |
| Gate-Drain Charge | $Q_{gd}$ | — | 1.3 | — | | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 5.7 | — | ns | $V_{GS}$ = 10V, $V_{DS}$ = 15V, $R_G$ = 3Ω, $R_L$ = 1.7Ω |
| Turn-On Rise Time | $t_R$ | — | 97 | — | | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 12.6 | — | | |
| Turn-Off Fall Time | $t_F$ | — | 51 | — | | |

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

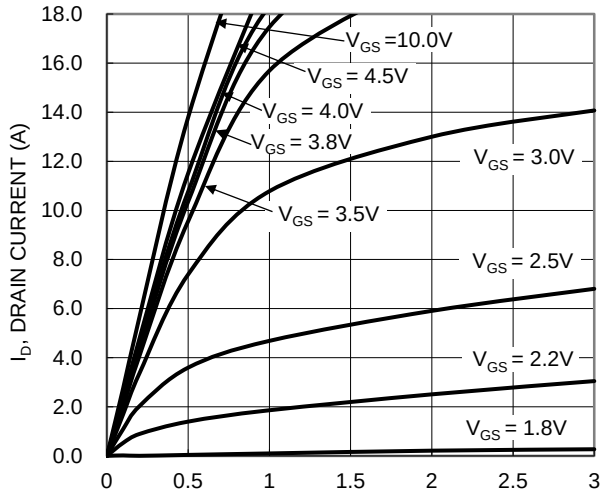



Figure 1.Typical Output Characteristic

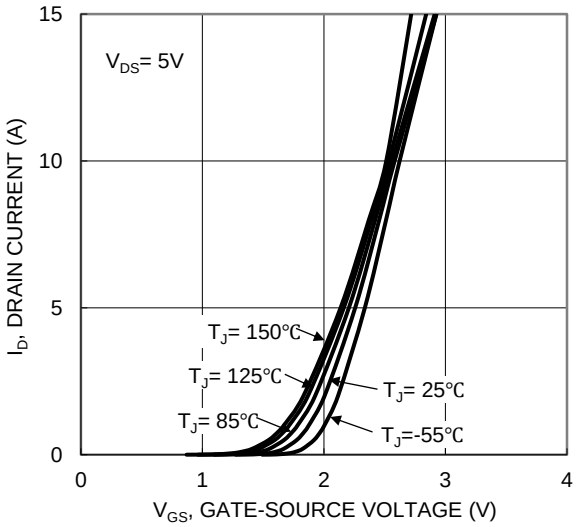



Figure 2. Typical Transfer Characteristic

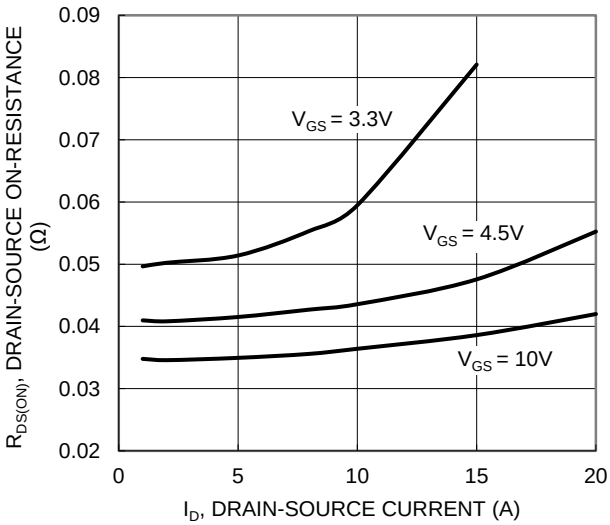



Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

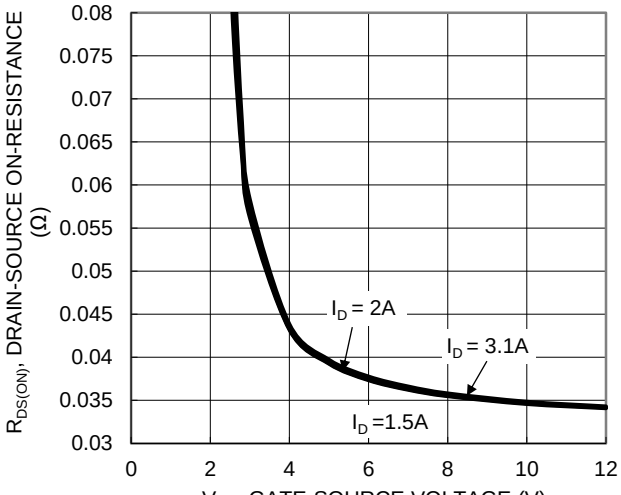



Figure 4. Typical Transfer Characteristic

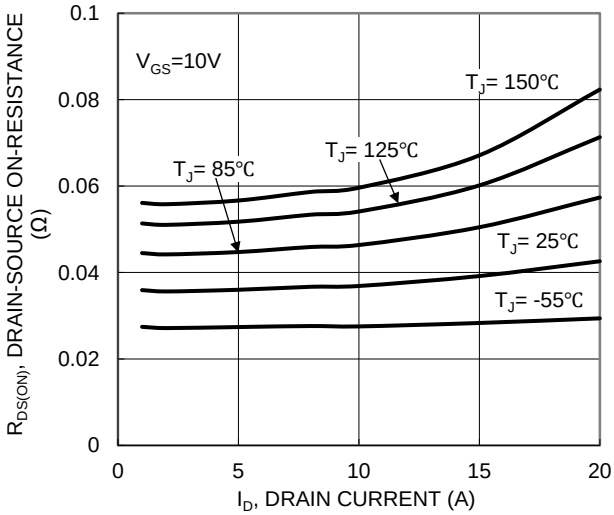



Figure 5. Typical On-Resistance vs. Drain Current and Temperature

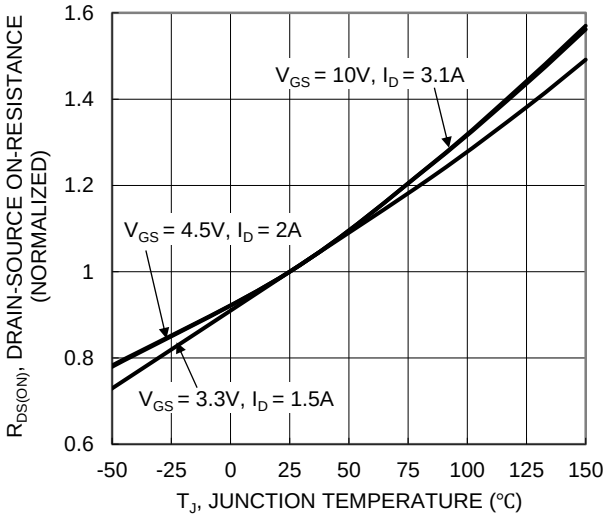



Figure 6. On-Resistance Variation with Temperature

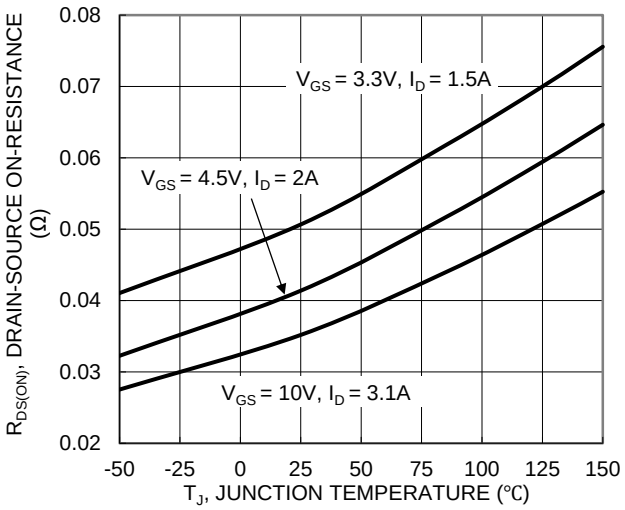



Figure 7. On-Resistance Variation with Temperature

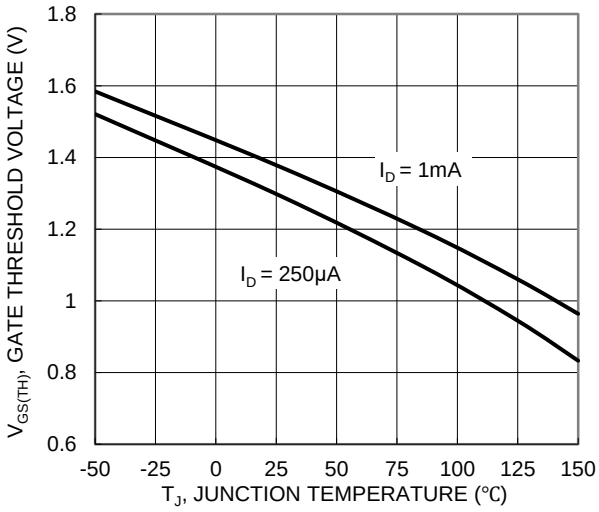



Figure 8. Gate Threshold Variation vs. JunctionTemperature

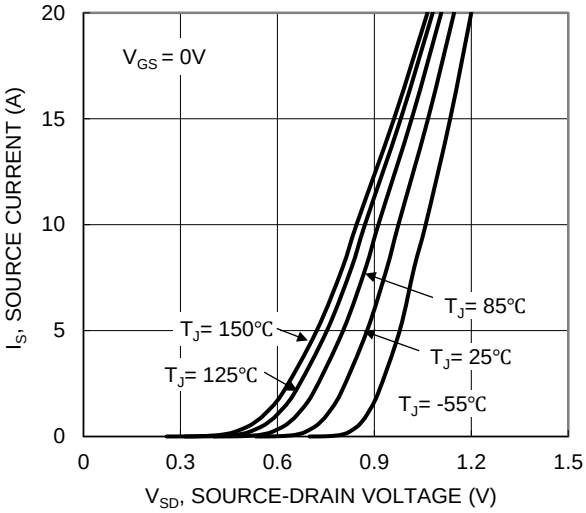



Figure 9. Diode Forward Voltage vs. Current

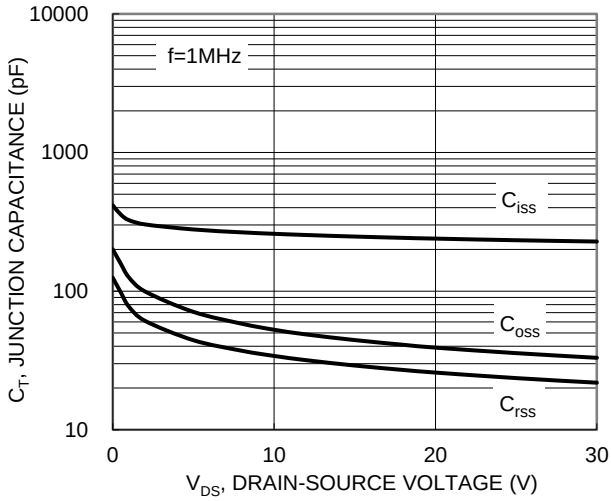



Figure 10. Typical Junction Capacitance

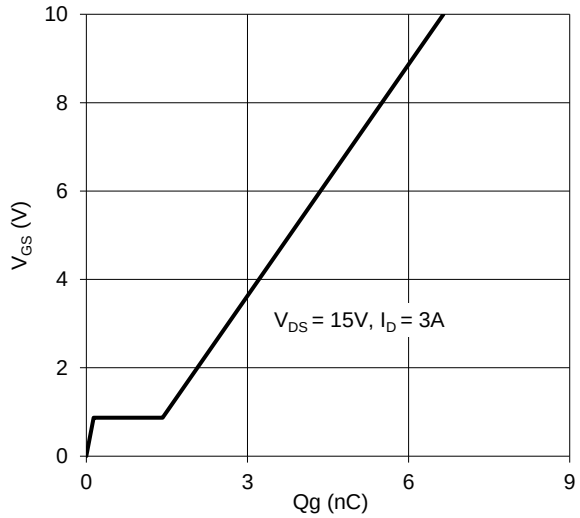



Figure 11. Gate Charge

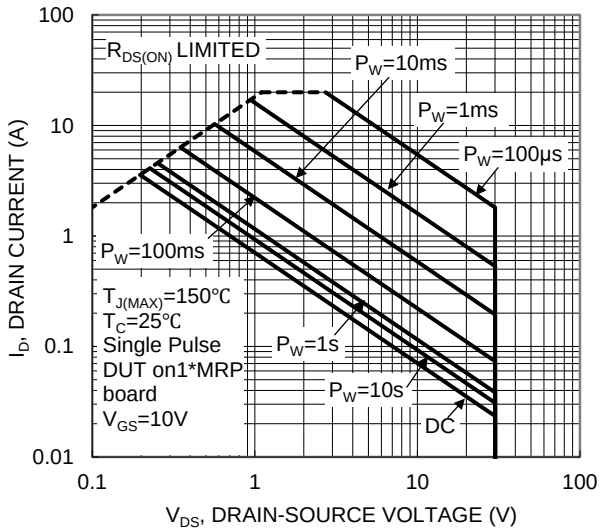



Figure 12. SOA, Safe Operation Area

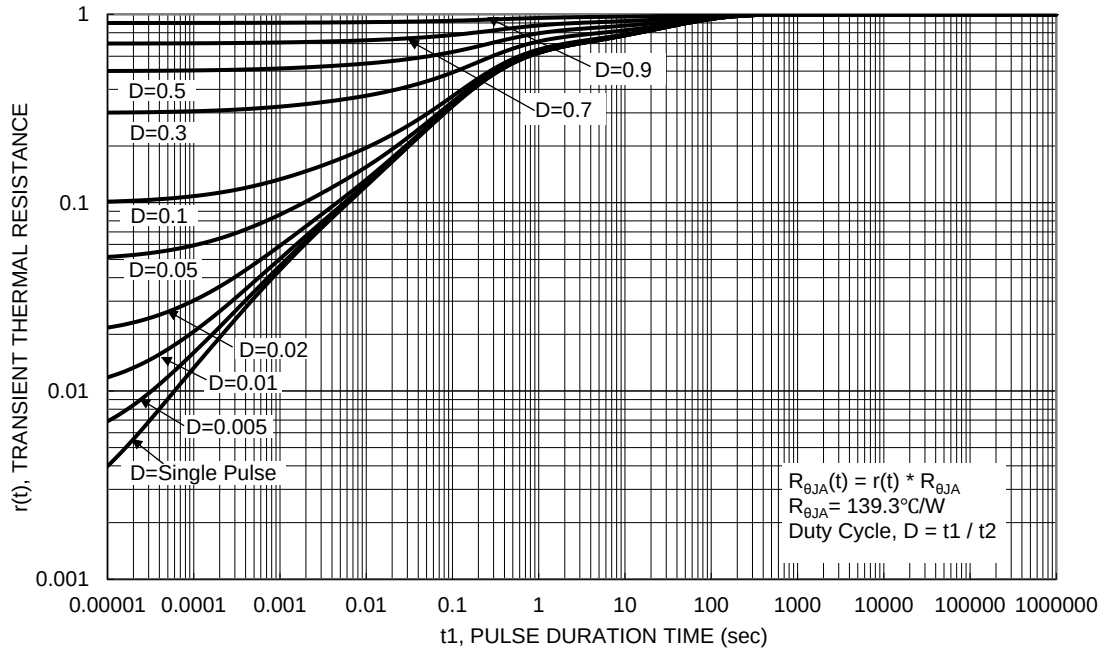
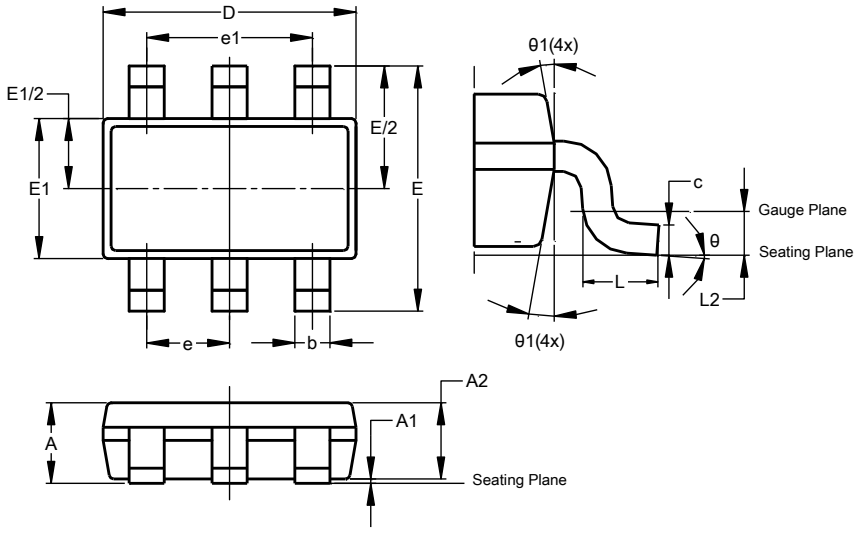



Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

**TSOT26**

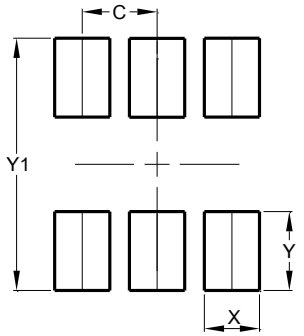



| TSOT26 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | – | 1.00 | – |
| **A1** | 0.010 | 0.100 | – |
| **A2** | 0.840 | 0.900 | – |
| **D** | 2.800 | 3.000 | 2.900 |
| **E** | 2.800 BSC | | |
| **E1** | 1.500 | 1.700 | 1.600 |
| **b** | 0.300 | 0.450 | – |
| **c** | 0.120 | 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.

**TSOT26**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 0.950 |
| **X** | 0.700 |
| **Y** | 1.000 |
| **Y1** | 3.200 |

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