

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ Max | I_D $T_A = +25^\circ\text{C}$ |
|---------------|---------------------------------------|------------------------------------|
| 20V | 24m Ω @ $V_{GS} = 4.5\text{V}$ | 6.2A |
| | 32m Ω @ $V_{GS} = 2.5\text{V}$ | |

Description and Applications

This new generation 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.

- DC-DC Converters
- Power Management Functions
- Backlighting

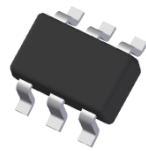
Features and Benefits

- 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)**

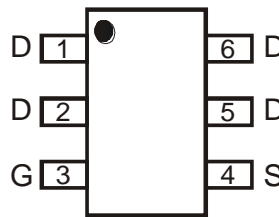
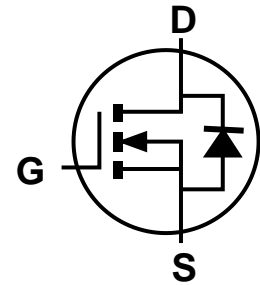
Mechanical Data

- 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


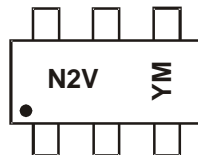
Equivalent Circuit

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------|--------------------|
| DMN2028UVT-7 | TSOT26 | 3,000/Tape & Reel |
| DMN2028UVT-13 | TSOT26 | 10,000/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 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



N2V = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: C = 2015)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | | | | | |
|-------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| Code | B | C | D | E | F | G | H | | | | | |
| 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} | 20 | V |
| Gate-Source Voltage | V _{GSS} | ±8 | V |
| Continuous Drain Current (Note 6) V _{GS} = 4.5V | I _D | 6.2 | A |
| Maximum Body Diode Forward Current (Note 6) | I _S | 1.5 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | 40 | A |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|--------------|------|
| Total Power Dissipation (Note 5) | P _D | 1.2 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | Steady state | 105 |
| | | t < 10s | 76 |
| Total Power Dissipation (Note 6) | P _D | 1.6 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | Steady state | 76 |
| | | t < 10s | 50 |
| Thermal Resistance, Junction to Case (Note 6) | R _{θJC} | 15 | °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} | 20 | — | — | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 16V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±8V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 0.4 | — | 1.5 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 20 | 24 | mΩ | V _{GS} = 4.5V, I _D = 6.2A |
| | | — | 24 | 32 | | V _{GS} = 2.5V, I _D = 5.2A |
| Diode Forward Voltage | V _{SD} | — | — | 1.2 | V | V _{GS} = 0V, I _S = 1.3A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{ISS} | — | 856 | — | pF | V _{DS} = 10V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{OSS} | — | 83 | — | | |
| Reverse Transfer Capacitance | C _{RSS} | — | 78 | — | | |
| Total Gate Charge | Q _g | — | 8.3 | — | nC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6.2A |
| Gate-Source Charge | Q _{gs} | — | 1.3 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 3.1 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 13.2 | — | ns | V _{DD} = 10V, V _{GS} = 4.5V, I _D = 1A, R _G = 6Ω |
| Turn-On Rise Time | t _r | — | 12.6 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 65 | — | | |
| Turn-Off Fall Time | t _f | — | 22 | — | | |

- 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.

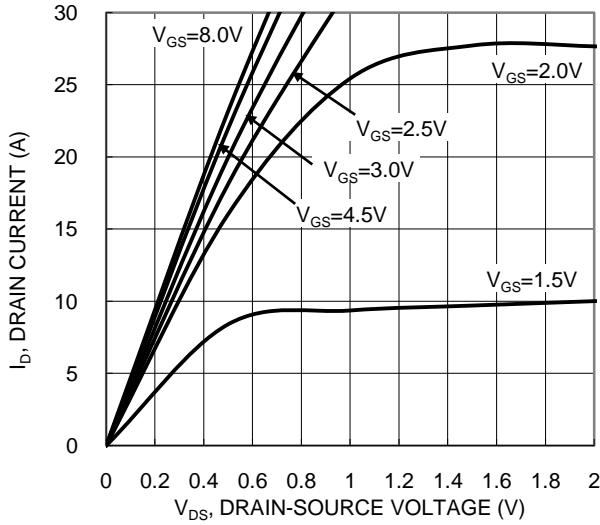


Figure 1. Typical Output Characteristic

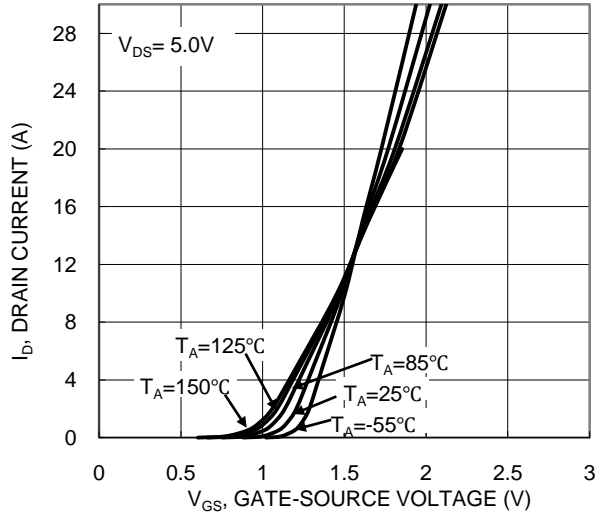


Figure 2. Typical Transfer Characteristic

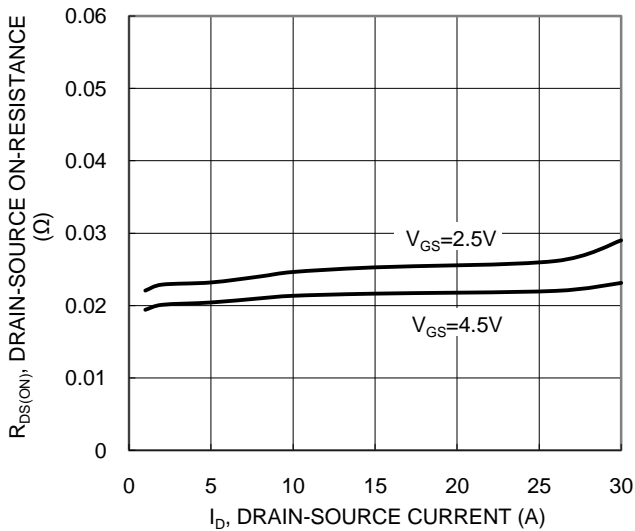


Figure 3. Typical On-Resistance vs. Drain Current

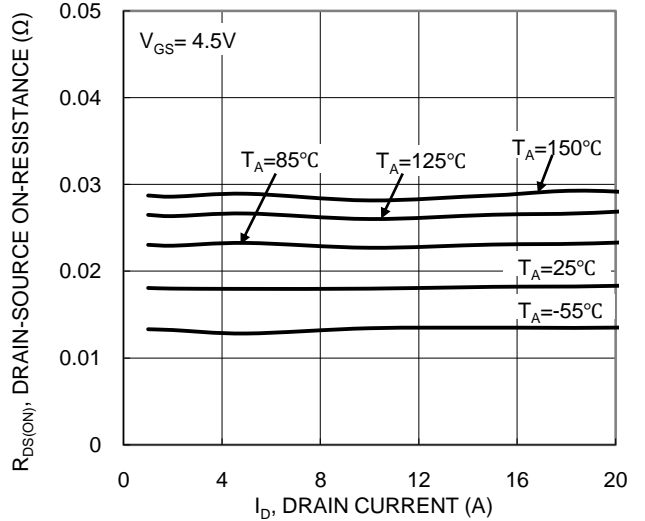


Figure 4. Typical On-Resistance vs. Drain Current and Temperature

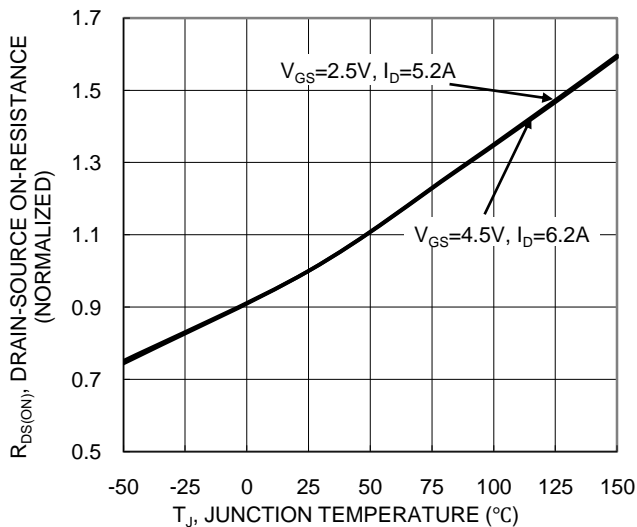


Figure 5. On-Resistance Variation with Temperature

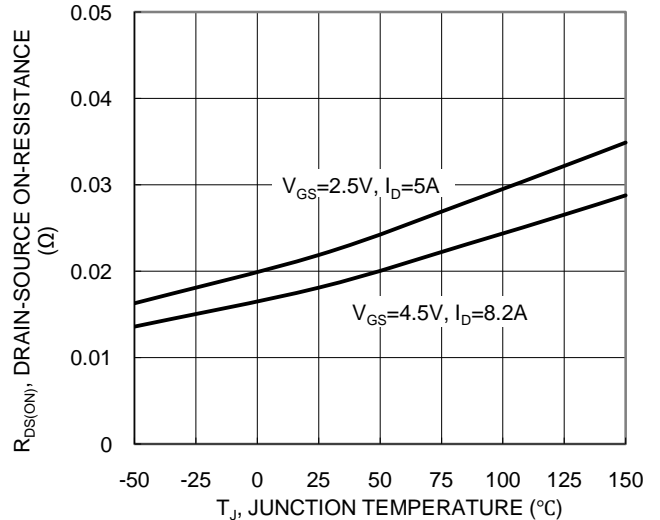


Figure 6. On-Resistance Variation with Temperature

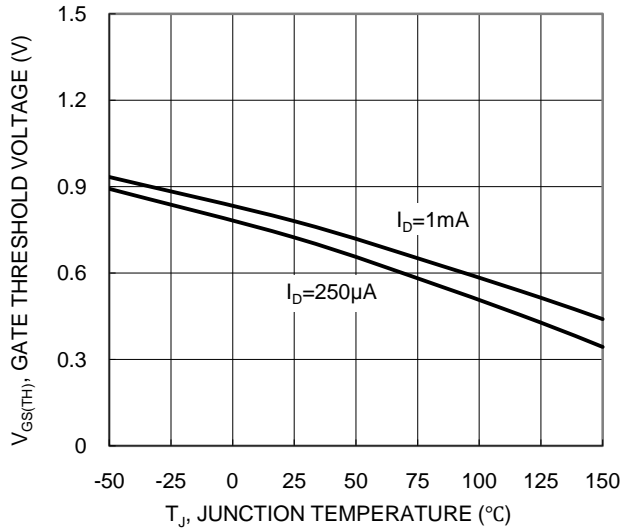


Figure 7. Gate Threshold Variation vs. Temperature

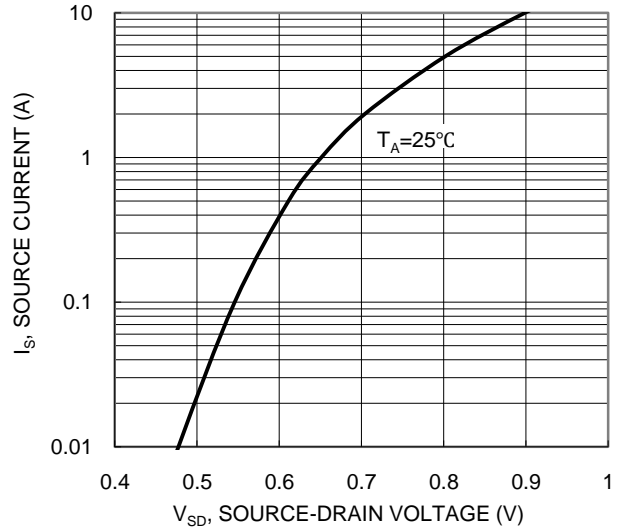


Figure 8. Diode Forward Voltage vs. Current

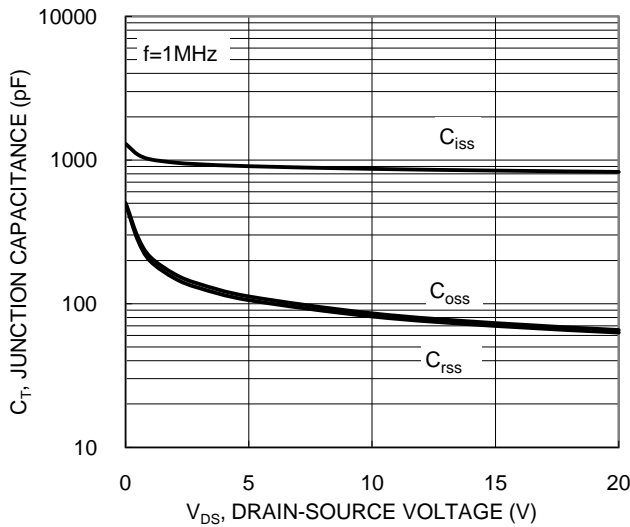


Figure 9. Typical Junction Capacitance

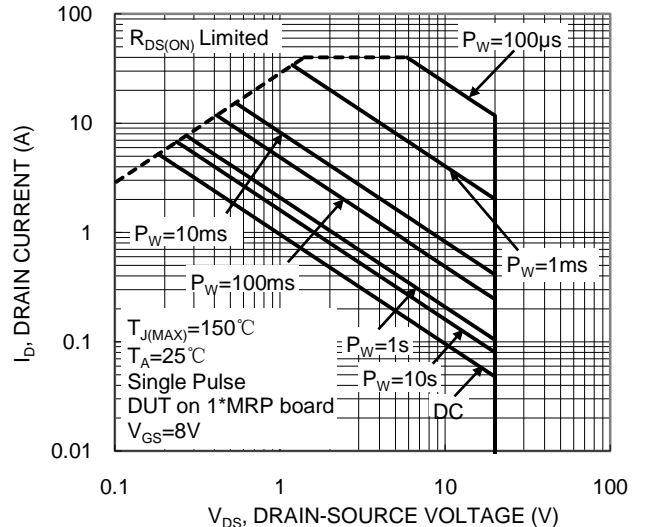


Figure 10. SOA, Safe Operation Area

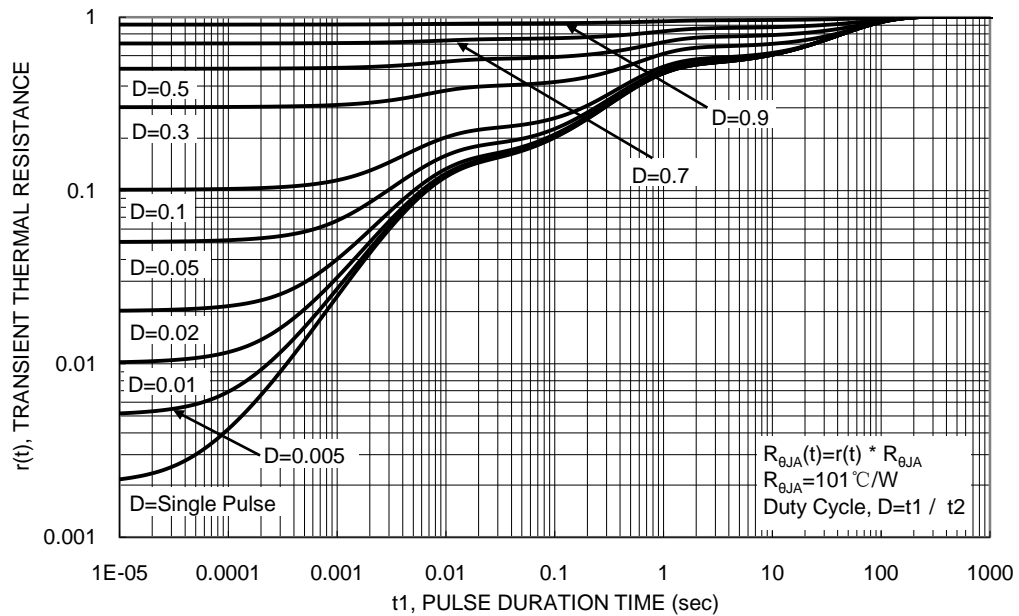
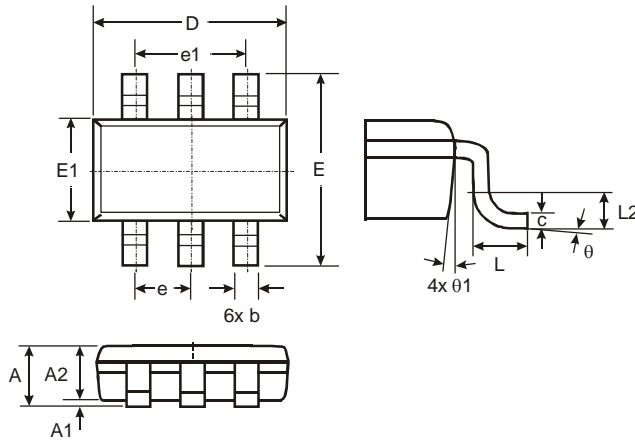


Figure 11. Transient Thermal Resistance

Package Outline Dimensions

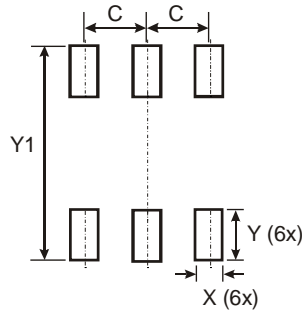
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| TSOT26 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | — | 1.00 | — |
| A1 | 0.01 | 0.10 | — |
| A2 | 0.84 | 0.90 | — |
| D | — | — | 2.90 |
| E | — | — | 2.80 |
| E1 | — | — | 1.60 |
| b | 0.30 | 0.45 | — |
| c | 0.12 | 0.20 | — |
| e | — | — | 0.95 |
| e1 | — | — | 1.90 |
| L | 0.30 | 0.50 | — |
| L2 | — | — | 0.25 |
| θ | 0° | 8° | 4° |
| θ1 | 4° | 12° | — |
| 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 | 0.950 |
| X | 0.700 |
| Y | 1.000 |
| Y1 | 3.199 |

NEW PRODUCT

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