

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ Max                 | $I_D$ Max<br>$T_C = +25^\circ C$ |
|---------------|----------------------------------|----------------------------------|
| -60V          | 105m $\Omega$ @ $V_{GS} = -10V$  | -7.3A                            |
|               | 130m $\Omega$ @ $V_{GS} = -4.5V$ | -6.5A                            |

## Description and Applications

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.

- Backlighting
- Power Management Functions
- DC-DC Converters

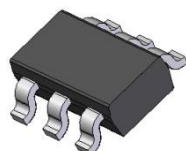
## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **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**

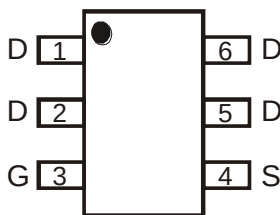
## Mechanical Data

- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.008 grams (Approximate)

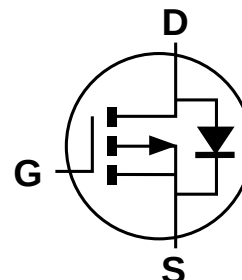
TSOT26



Top View



Device Schematic



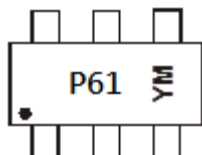
Equivalent Circuit

## Ordering Information (Note 4)

| Part Number   | Case   | Packaging          |
|---------------|--------|--------------------|
| DMP6110SVT-7  | TSOT26 | 3,000/Tape & Reel  |
| DMP6110SVT-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](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



P61 = Product Type Marking Code  
 YM or YM = Date Code Marking  
 Y or Y = Year (ex: C = 2015)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------|------|------|------|------|------|------|------|
| Code | C    | D    | E    | F    | G    | H    | I    |

| 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> = -10V | I <sub>D</sub>   | T <sub>C</sub> = +25°C<br>-7.3 | A    |
|                                                          |                  | T <sub>C</sub> = +70°C<br>-5.8 |      |
| Maximum Body Diode Forward Current (Note 6)              | I <sub>S</sub>   | -1.8                           | A    |
| Pulsed Drain Current (380µs Pulse, 1% Duty Cycle)        | I <sub>DM</sub>  | -24                            | A    |
| Avalanche Current (Note 7) L = 0.1mH                     | I <sub>AS</sub>  | -19                            | A    |
| Repetitive Avalanche Energy (Note 7) L = 0.1mH           | E <sub>AS</sub>  | 18                             | mJ   |

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

| Characteristic                                   | Symbol                            | Value                          | Unit |
|--------------------------------------------------|-----------------------------------|--------------------------------|------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | T <sub>A</sub> = +25°C<br>1.2  | W    |
|                                                  |                                   | T <sub>A</sub> = +70°C<br>0.75 |      |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | Steady state<br>105            | °C/W |
|                                                  |                                   | t < 10s<br>60                  |      |
| Total Power Dissipation (Note 6)                 | P <sub>D</sub>                    | T <sub>A</sub> = +25°C<br>1.8  | W    |
|                                                  |                                   | T <sub>A</sub> = +70°C<br>1.1  |      |
| Thermal Resistance, Junction to Ambient (Note 6) | R <sub>θJA</sub>                  | Steady state<br>69             | °C/W |
|                                                  |                                   | t < 10s<br>39                  |      |
| Thermal Resistance, Junction to Case (Note 6)    | R <sub>θJC</sub>                  | 15                             | °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 8)</b>         |                     |     |      |      |      |                                                                                              |
| Drain-Source Breakdown Voltage              | BV <sub>DSS</sub>   | -60 | —    | —    | 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> = -48V, V <sub>GS</sub> = 0V                                                 |
| Gate-Source Leakage                         | I <sub>GSS</sub>    | —   | —    | 100  | nA   | V <sub>GS</sub> = ±16V, V <sub>DS</sub> = 0V                                                 |
| <b>ON CHARACTERISTICS (Note 8)</b>          |                     |     |      |      |      |                                                                                              |
| Gate Threshold Voltage                      | V <sub>GS(TH)</sub> | -1  | —    | -3   | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA                                  |
| Static Drain-Source On-Resistance           | R <sub>DS(ON)</sub> | —   | —    | 105  | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.5A                                               |
|                                             |                     | —   | —    | 130  |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.5A                                              |
| Diode Forward Voltage                       | V <sub>SD</sub>     | —   | -0.7 | -1.2 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A                                                   |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>     |                     |     |      |      |      |                                                                                              |
| Input Capacitance                           | C <sub>iss</sub>    | —   | 969  | —    | pF   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V, f = 1.0MHz                                     |
| Output Capacitance                          | C <sub>oss</sub>    | —   | 57   | —    |      |                                                                                              |
| Reverse Transfer Capacitance                | C <sub>rss</sub>    | —   | 44   | —    |      |                                                                                              |
| Gate Resistance                             | R <sub>G</sub>      | —   | 13.7 | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz                                       |
| Total Gate Charge (V <sub>GS</sub> = -4.5V) | Q <sub>g</sub>      | —   | 8.2  | —    | nC   | V <sub>DS</sub> = -30V, I <sub>D</sub> = -12A                                                |
| Total Gate Charge (V <sub>GS</sub> = -10V)  | Q <sub>g</sub>      | —   | 17.2 | —    |      |                                                                                              |
| Gate-Source Charge                          | Q <sub>gs</sub>     | —   | 3.0  | —    |      |                                                                                              |
| Gate-Drain Charge                           | Q <sub>gd</sub>     | —   | 3.1  | —    |      |                                                                                              |
| Turn-On Delay Time                          | t <sub>D(ON)</sub>  | —   | 4.4  | —    | ns   | V <sub>GS</sub> = -10V, V <sub>DS</sub> = -30V, R <sub>GEN</sub> = 3Ω, I <sub>D</sub> = -12A |
| Turn-On Rise Time                           | t <sub>r</sub>      | —   | 23   | —    |      |                                                                                              |
| Turn-Off Delay Time                         | t <sub>D(OFF)</sub> | —   | 34   | —    |      |                                                                                              |
| Turn-Off Fall Time                          | t <sub>f</sub>      | —   | 42   | —    |      |                                                                                              |
| Body Diode Reverse Recovery Time            | t <sub>RR</sub>     | —   | 13.2 | —    | ns   | I <sub>S</sub> = -12A, dI/dt = 100A/µs                                                       |
| Body Diode Reverse Recovery Charge          | Q <sub>RR</sub>     | —   | 6.18 | —    | nC   |                                                                                              |

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - I<sub>AS</sub> and E<sub>AS</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

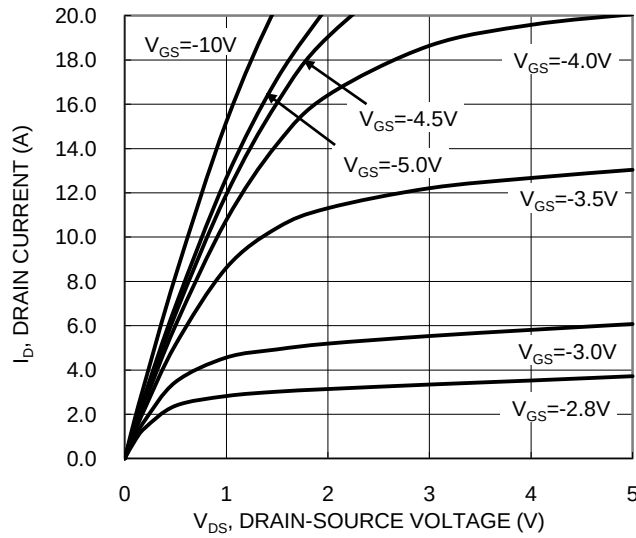


Figure 1. Typical Output Characteristic

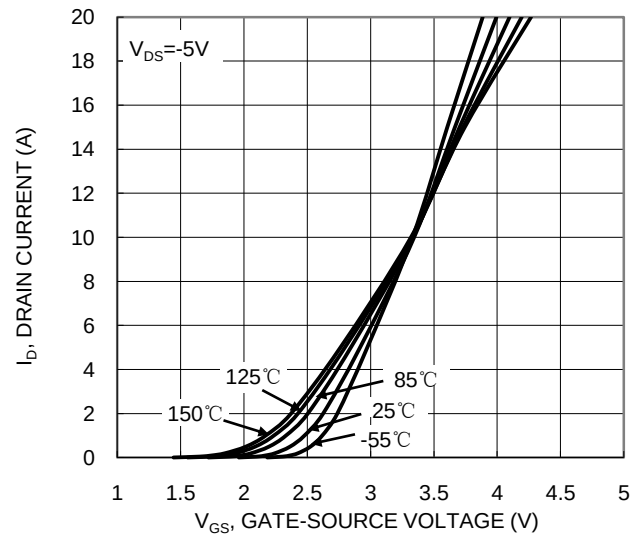


Figure 2. Typical Transfer Characteristic

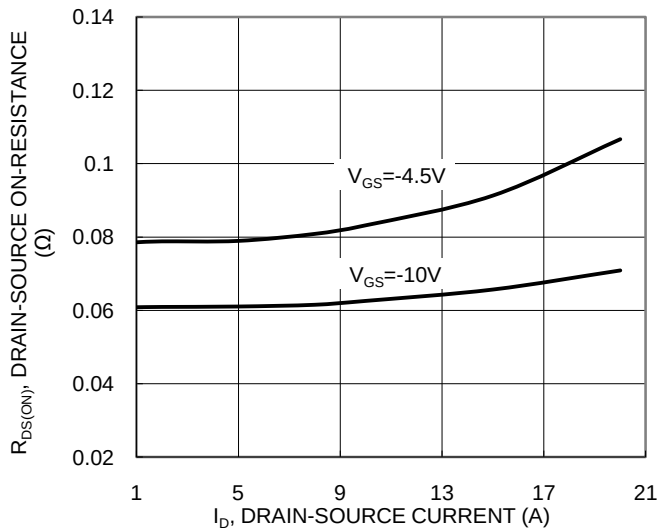


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

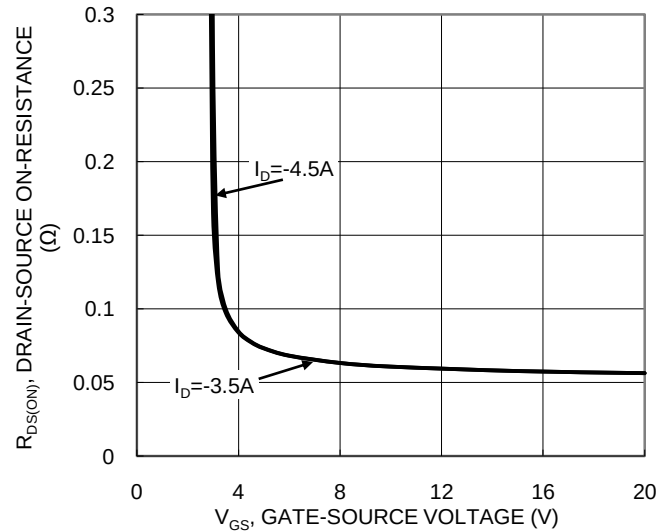


Figure 4. Typical Transfer Characteristic

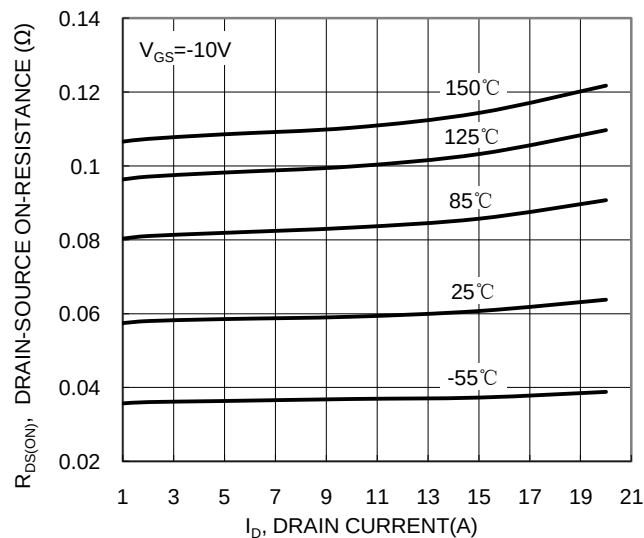


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

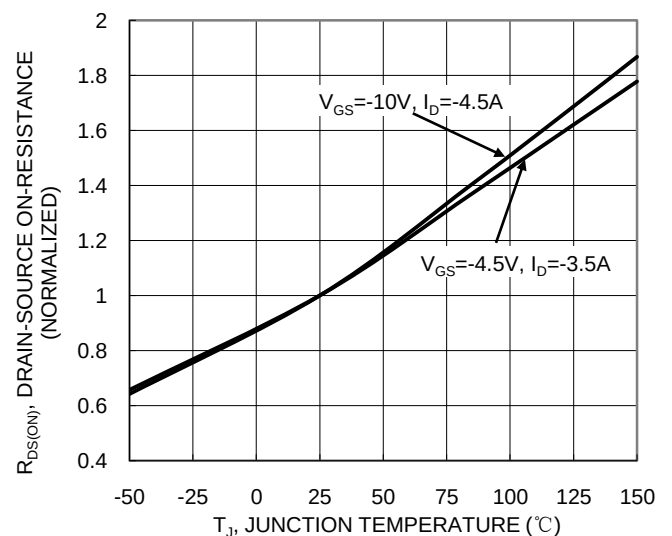
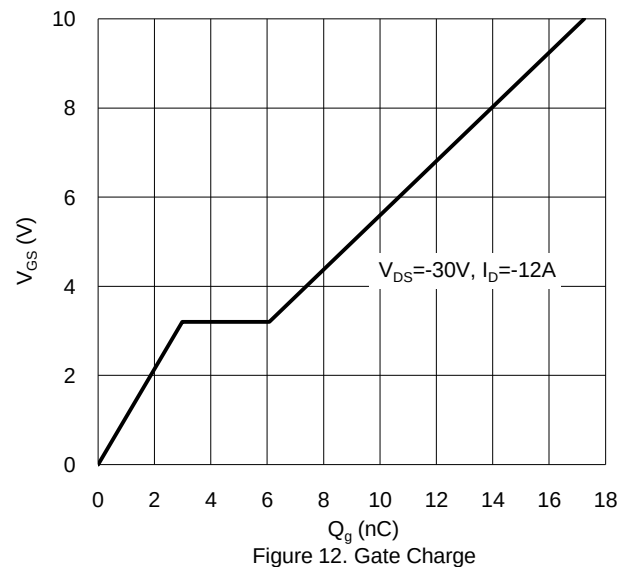
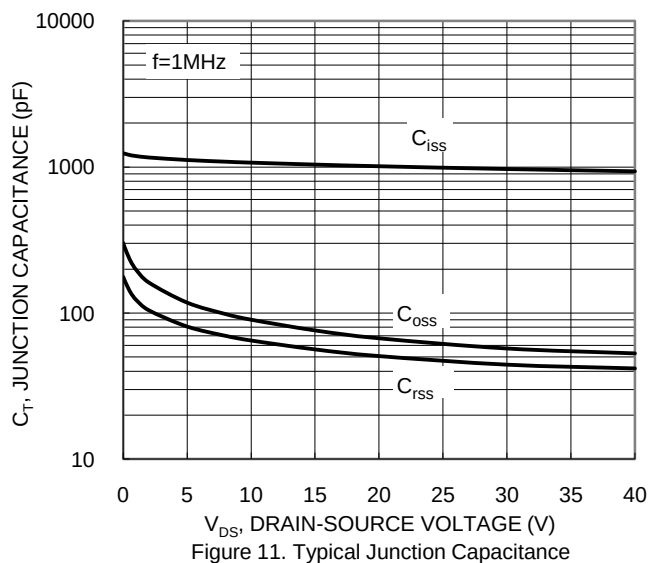
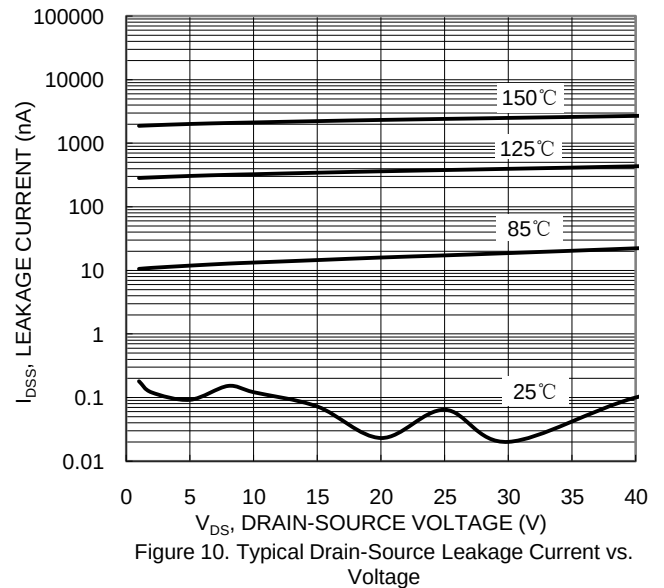
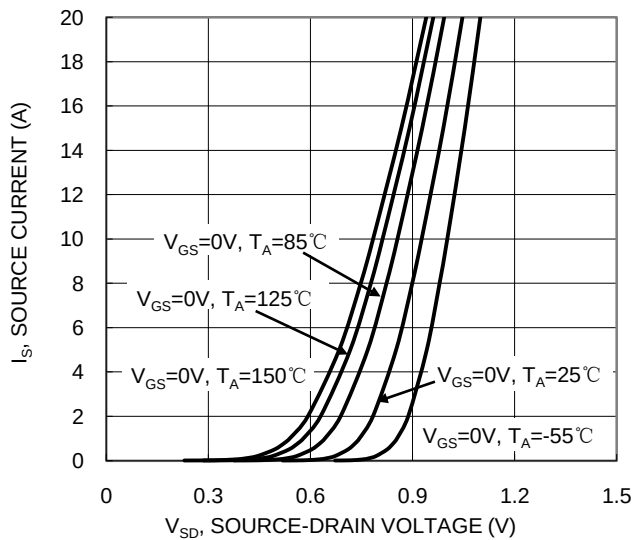
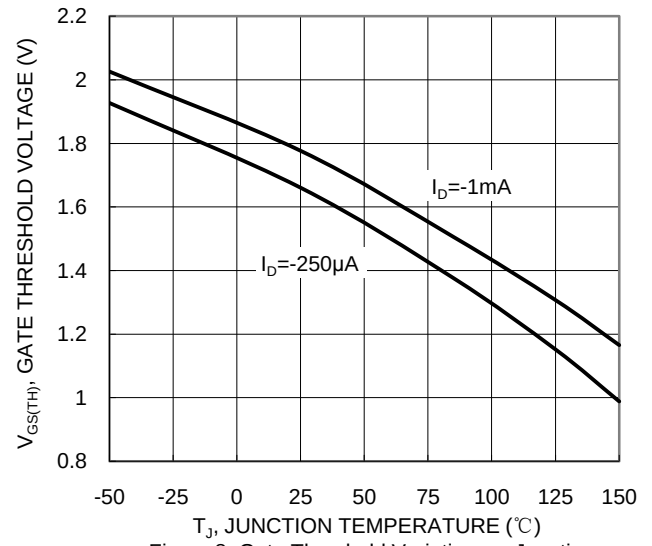
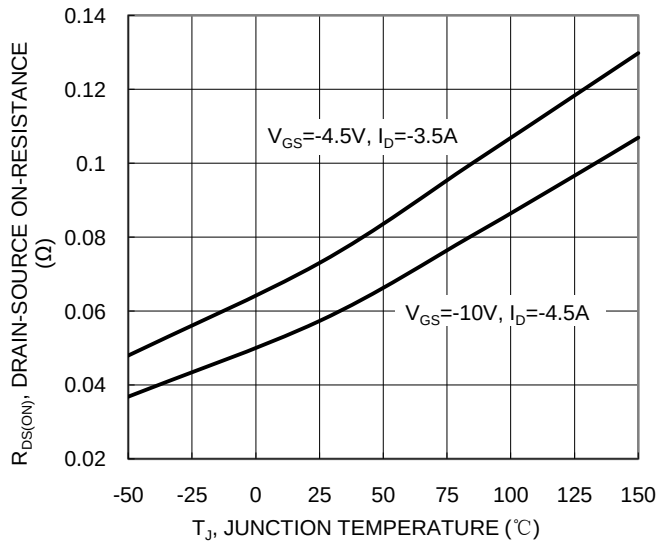
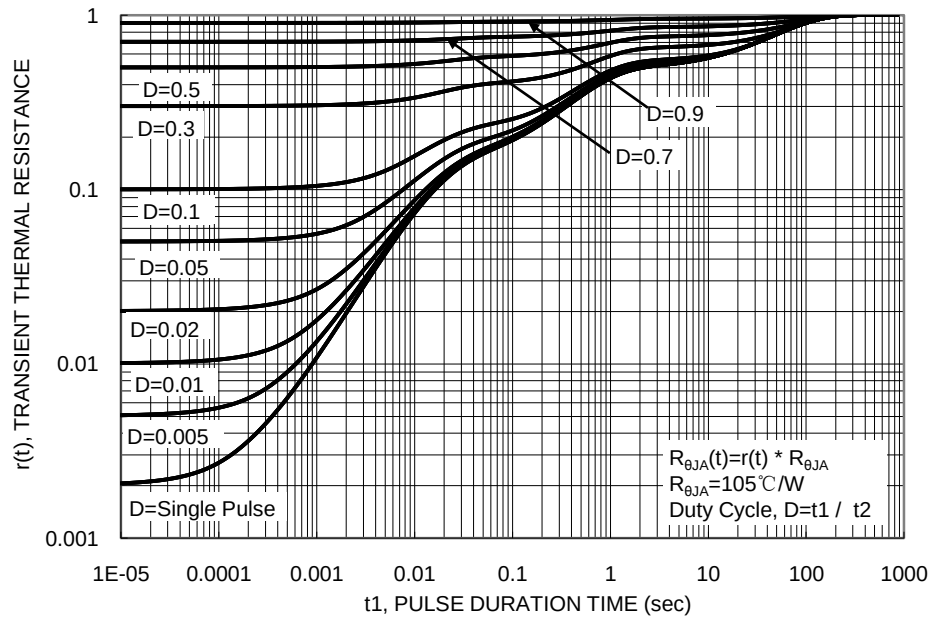
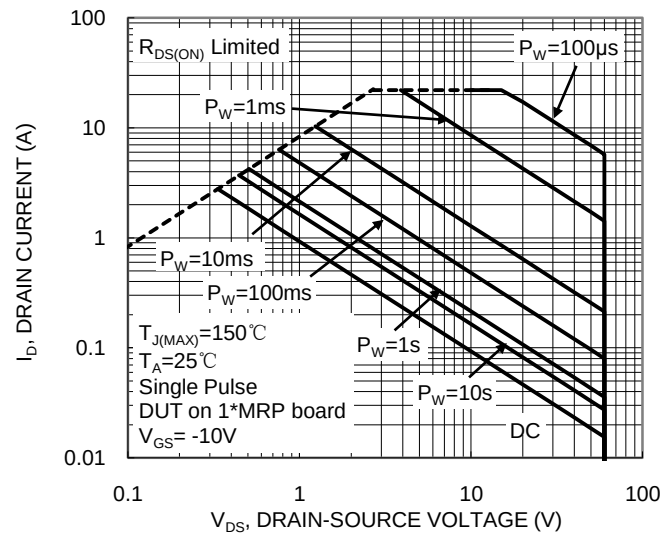


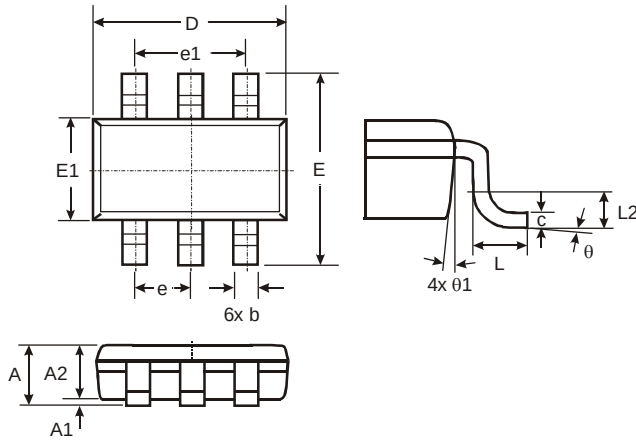
Figure 6. On-Resistance Variation with Temperature





## Package Outline Dimensions

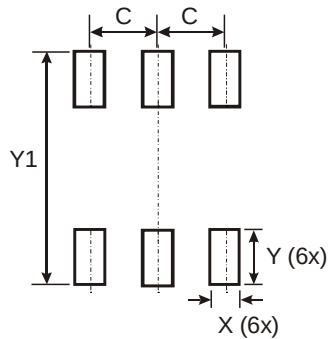
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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         |

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