

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ max              | $I_D$<br>$T_C = +25^\circ C$ |
|---------------|-------------------------------|------------------------------|
| 100V          | 80m $\Omega$ @ $V_{GS} = 10V$ | 17A                          |
|               | 99m $\Omega$ @ $V_{GS} = 6V$  | 15A                          |

## Description

This new generation complementary MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

## Applications

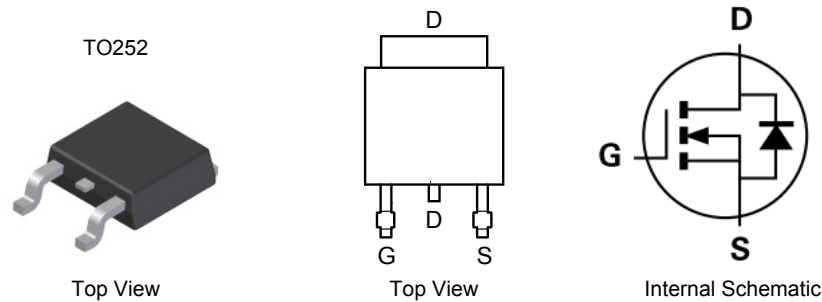
- Power Management Functions
- DC-DC Converters

## Features

- Low  $R_{DS(ON)}$  – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: TO252 (DPAK)
- 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 – Matte Tin annealed over Copper leadframe  
Solderable per MIL-STD-202, Method 208 
- Weight: 0.33 grams (approximate)

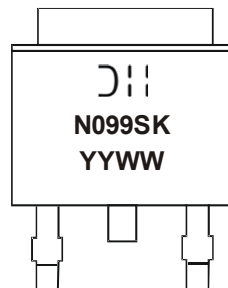


## Ordering Information (Note 4)

| Part Number     | Case  | Packaging         |
|-----------------|-------|-------------------|
| DMN10H099SK3-13 | TO252 | 2,500/Tape & Reel |

- Notes:
- EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DII = Manufacturer's Marking  
 N099SK = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Digit of Year (ex: 14 = 2014)  
 WW = Week Code (01 to 53)

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

| Characteristic                                          | Symbol           | Value | Units |
|---------------------------------------------------------|------------------|-------|-------|
| Drain-Source Voltage                                    | V <sub>DSS</sub> | 100   | V     |
| Gate-Source Voltage                                     | V <sub>GSS</sub> | ±20   | V     |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V | I <sub>D</sub>   | 17    | A     |
|                                                         |                  | 13    |       |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%)      | I <sub>DM</sub>  | 20    | A     |
| Avalanche Current, L = 1mH                              | I <sub>AS</sub>  | 7.5   | A     |
| Avalanche Energy, L = 1mH                               | E <sub>AS</sub>  | 28.5  | mJ    |

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

| Characteristic                                   | Symbol                            | Value       | Units |
|--------------------------------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | 34          | W     |
|                                                  |                                   | 22          |       |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 51          | °C/W  |
| Thermal Resistance, Junction to Case (Note 5)    | R <sub>θJC</sub>                  | 3.6         |       |
| 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>   | 100 | —    | —    | 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> = 80V, V <sub>GS</sub> = 0V                         |
| Gate-Source Leakage                        | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                        |
| <b>ON CHARACTERISTICS (Note 7)</b>         |                     |     |      |      |      |                                                                     |
| Gate Threshold Voltage                     | V <sub>GS(th)</sub> | 1.5 | 2    | 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> | —   | 67   | 80   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.3A                        |
|                                            |                     | —   | 69   | 99   |      | V <sub>GS</sub> = 6V, I <sub>D</sub> = 3A                           |
| Diode Forward Voltage                      | V <sub>SD</sub>     | —   | 0.77 | —    | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 3.2A                         |
| <b>DYNAMIC CHARACTERISTICS (Note 6)</b>    |                     |     |      |      |      |                                                                     |
| Input Capacitance                          | C <sub>iss</sub>    | —   | 1172 | —    | pF   | V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz               |
| Output Capacitance                         | C <sub>oss</sub>    | —   | 40.8 | —    |      |                                                                     |
| Reverse Transfer Capacitance               | C <sub>rss</sub>    | —   | 31.3 | —    |      |                                                                     |
| Gate Resistance                            | R <sub>G</sub>      | —   | 1.6  | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                |
| Total Gate Charge (V <sub>GS</sub> = 10V)  | Q <sub>g</sub>      | —   | 25.2 | —    | nC   | V <sub>DS</sub> = 50V, I <sub>D</sub> = 3.3A                        |
| Total Gate Charge (V <sub>GS</sub> = 4.5V) | Q <sub>g</sub>      | —   | 12.2 | —    |      |                                                                     |
| Gate-Source Charge                         | Q <sub>gs</sub>     | —   | 5.3  | —    |      |                                                                     |
| Gate-Drain Charge                          | Q <sub>gd</sub>     | —   | 5.9  | —    |      |                                                                     |
| Turn-On Delay Time                         | t <sub>D(on)</sub>  | —   | 5.4  | —    | ns   | V <sub>DD</sub> = 50V, R <sub>G</sub> = 6.0Ω, I <sub>D</sub> = 3.3A |
| Turn-On Rise Time                          | t <sub>r</sub>      | —   | 5.9  | —    |      |                                                                     |
| Turn-Off Delay Time                        | t <sub>D(off)</sub> | —   | 20   | —    |      |                                                                     |
| Turn-Off Fall Time                         | t <sub>f</sub>      | —   | 7.3  | —    |      |                                                                     |
| Body Diode Reverse Recovery Time           | t <sub>rr</sub>     | —   | 19.7 | —    | ns   | I <sub>F</sub> = 3.3A, dI/dt = 100A/µs                              |
| Body Diode Reverse Recovery Charge         | Q <sub>rr</sub>     | —   | 15.9 | —    | nC   |                                                                     |

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

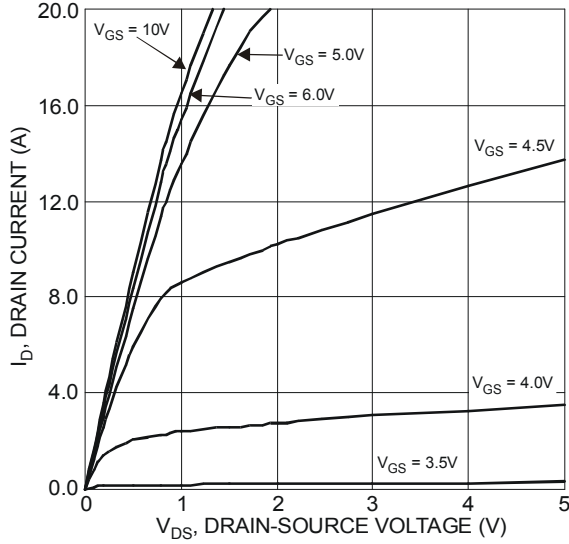


Figure 1 Typical Output Characteristics

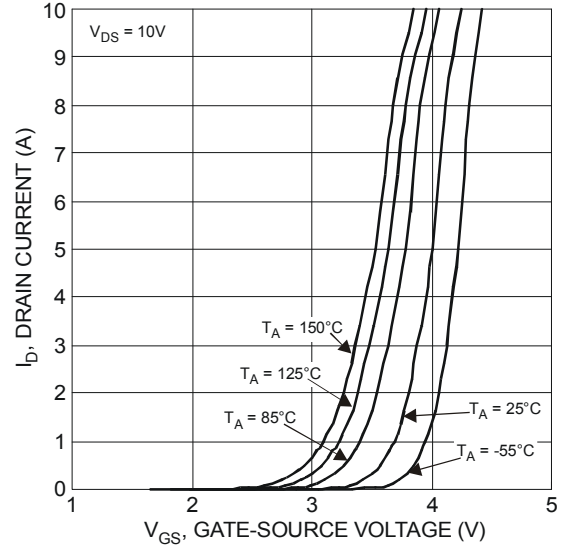


Figure 2 Typical Transfer Characteristics

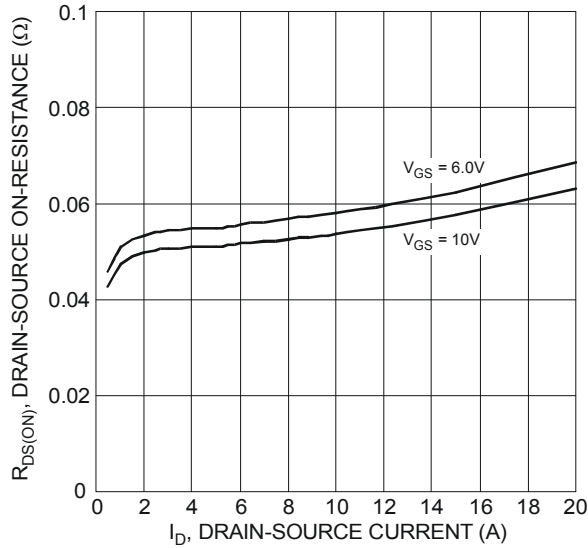


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

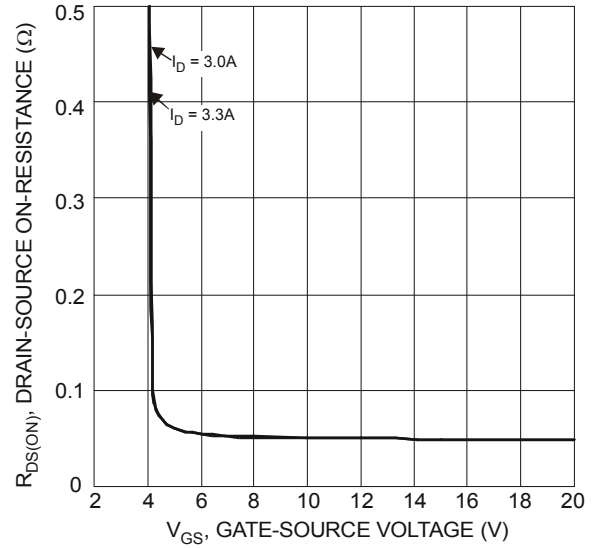


Figure 4 Typical Transfer Characteristics

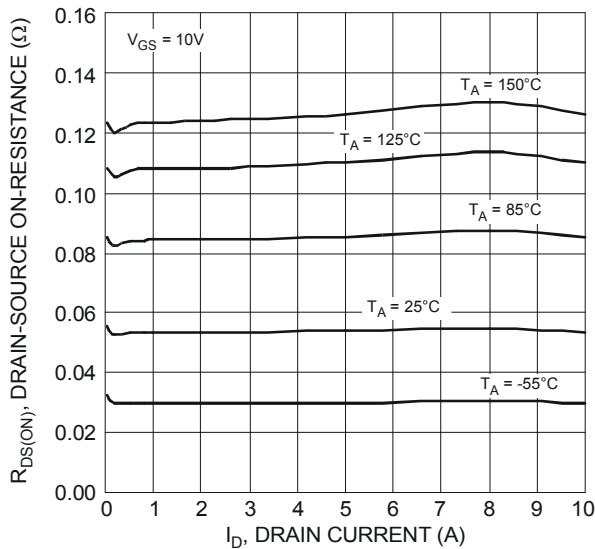


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

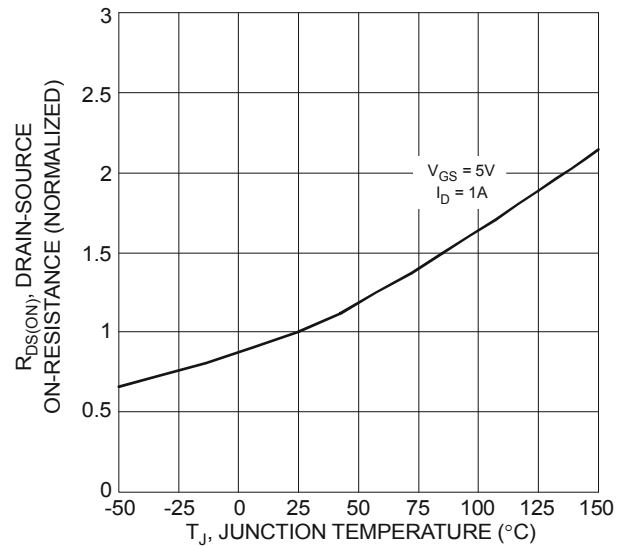
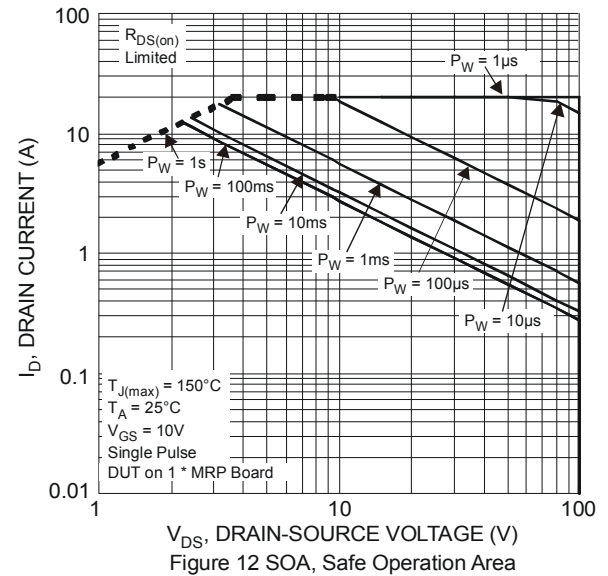
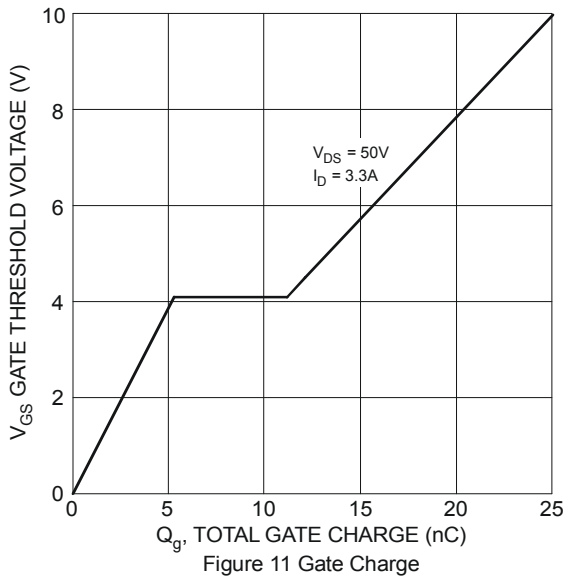
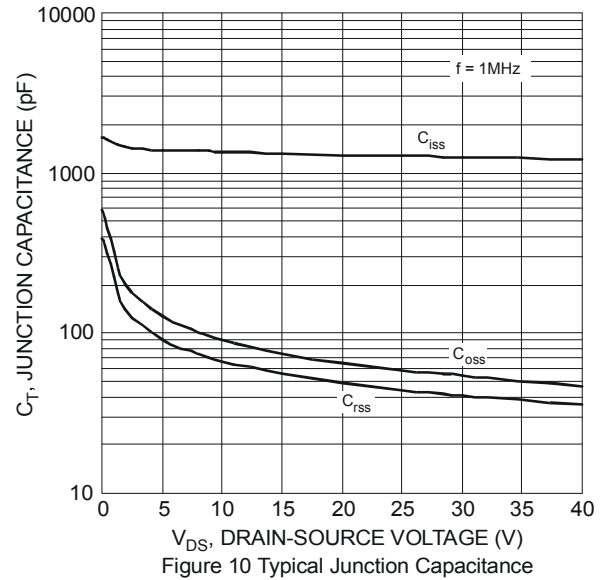
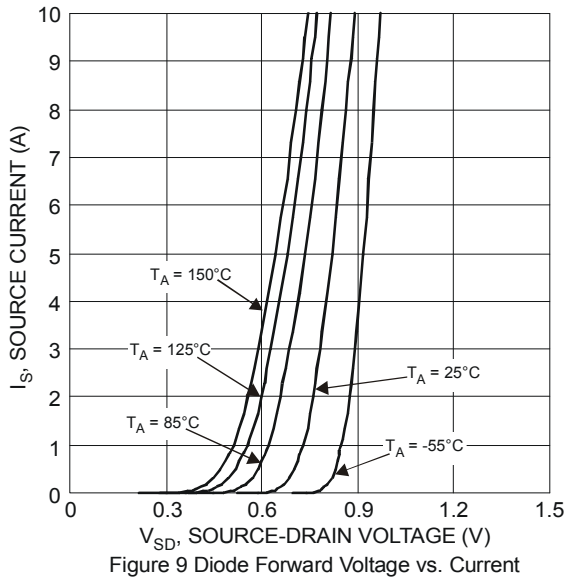
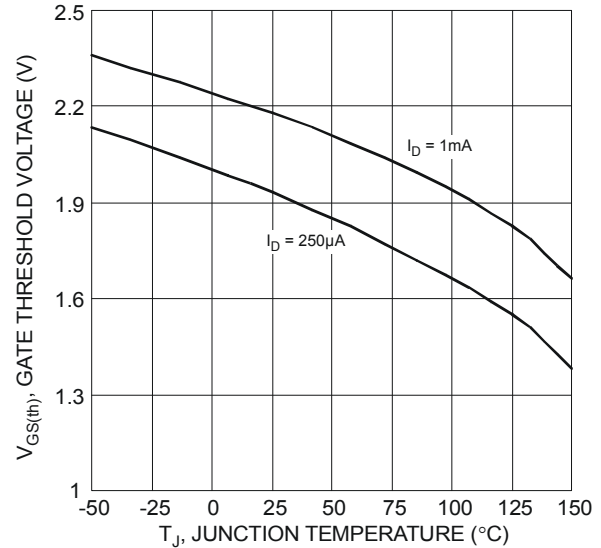
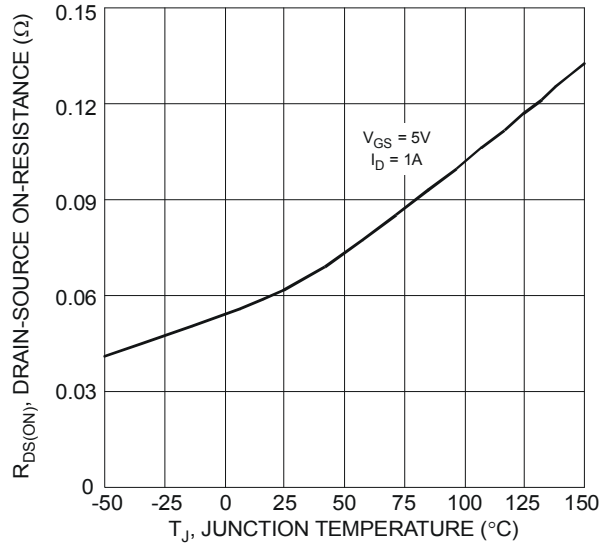
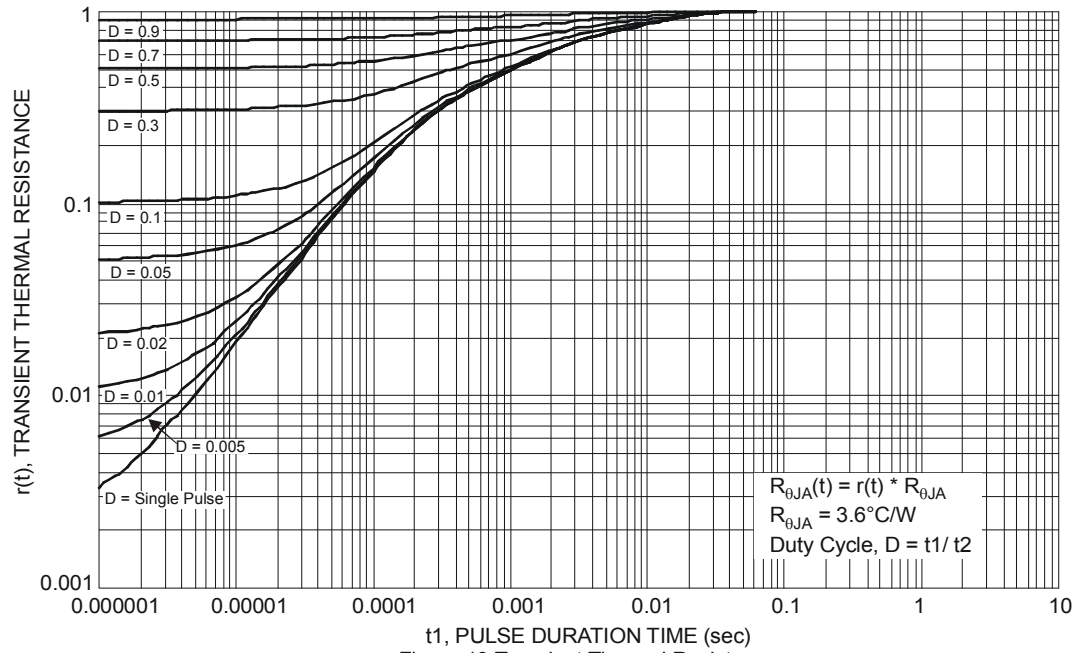


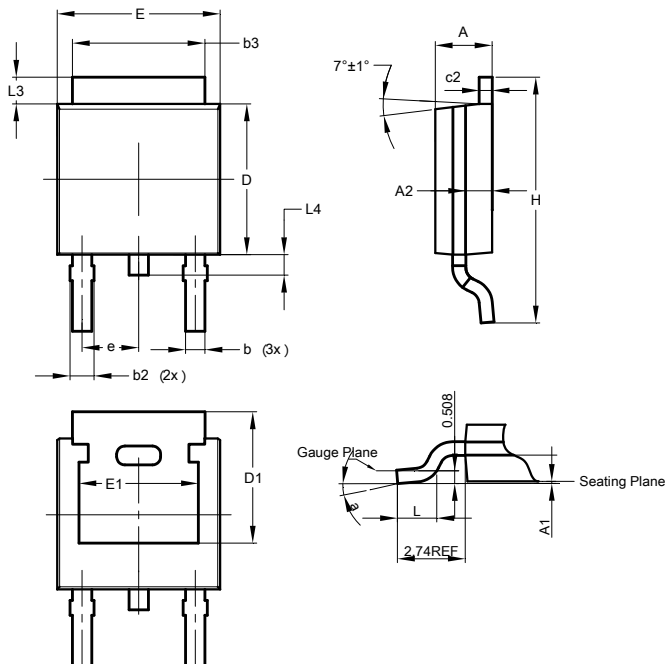
Figure 6 On-Resistance Variation with Temperature





## Package Outline Dimensions

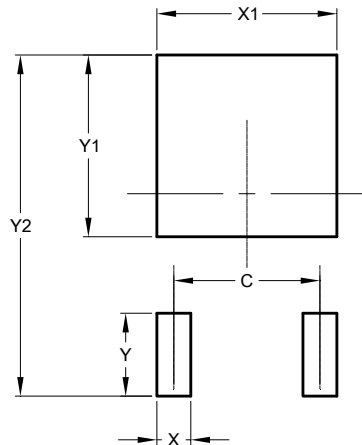
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



| TO252 (DPAK)         |      |       |       |
|----------------------|------|-------|-------|
| Dim                  | Min  | Max   | Typ   |
| A                    | 2.19 | 2.39  | 2.29  |
| A1                   | 0.00 | 0.13  | 0.08  |
| A2                   | 0.97 | 1.17  | 1.07  |
| b                    | 0.64 | 0.88  | 0.783 |
| b2                   | 0.76 | 1.14  | 0.95  |
| b3                   | 5.21 | 5.46  | 5.33  |
| c2                   | 0.45 | 0.58  | 0.531 |
| D                    | 6.00 | 6.20  | 6.10  |
| D1                   | 5.21 | -     | -     |
| e                    | -    | -     | 2.286 |
| E                    | 6.45 | 6.70  | 6.58  |
| E1                   | 4.32 | -     | -     |
| H                    | 9.40 | 10.41 | 9.91  |
| L                    | 1.40 | 1.78  | 1.59  |
| L3                   | 0.88 | 1.27  | 1.08  |
| L4                   | 0.64 | 1.02  | 0.83  |
| a                    | 0°   | 10°   | -     |
| 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          | 4.572         |
| X          | 1.060         |
| X1         | 5.632         |
| Y          | 2.600         |
| Y1         | 5.700         |
| Y2         | 10.700        |

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