

## Product Summary

| $V_{(BR)DS}$<br>S | $R_{DS(ON)}$ max                | Package | $I_D$ max<br>$T_A = +25^\circ C$ |
|-------------------|---------------------------------|---------|----------------------------------|
| -30V              | 72m $\Omega$ @ $V_{GS} = -10V$  | SOT-23  | -3.9A                            |
|                   | 85m $\Omega$ @ $V_{GS} = -4.5V$ |         | -3.6A                            |

## Description and Applications

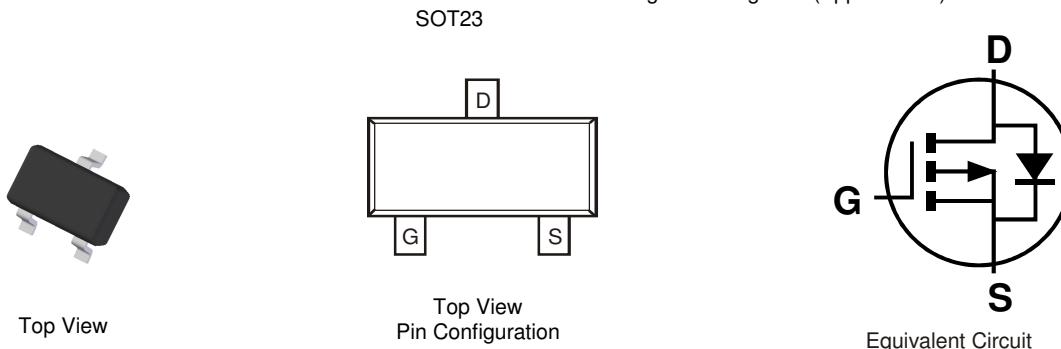
This new generation MOSFET is designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

## Features

- Low On-Resistance
- Low Gate Threshold Voltage
- 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)

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe).
- Terminals: Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



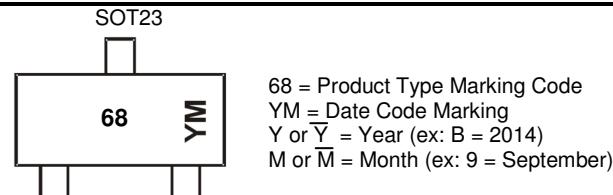
## Ordering Information (Note 4)

| Part Number | Case  | Packaging          |
|-------------|-------|--------------------|
| DMP3068L-7  | SOT23 | 3,000/Tape & Reel  |
| DMP3068L-13 | SOT23 | 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



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** (@ $T_A = +25^\circ\text{C}$  unless otherwise specified.)

| Characteristic   |              |                           | Symbol    | Value    | Units |
|--|--------------|---------------------------|-----------|----------|-------|
| Drain-Source Voltage   |              |                           | $V_{DSS}$ | -30      | V     |
| Gate-Source Voltage  |              |                           | $V_{GSS}$ | $\pm 12$ | V     |
| Drain Current (Note 6) $V_{GS} = -10\text{V}$                                    | Steady State | $T_A = +25^\circ\text{C}$ | $I_D$     | -3.3     | A     |
|  |              | $T_A = +70^\circ\text{C}$ |           | -2.6     |       |
| $t < 10\text{s}$   |              | $T_A = +25^\circ\text{C}$ | $I_D$     | -3.9     | A     |
|  |              | $T_A = +70^\circ\text{C}$ |           | -3.2     |       |
| Pulsed Drain Current (Pulse width $\leq 10\mu\text{s}$ , Duty Cycle $\leq 1\%$ ) |              |                           | $I_{DM}$  | -18      | A     |

**Thermal Characteristics**

| Characteristic                                   |                  | Symbol          | Value       | Unit               |
|--|------------------|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 5)                 |                  | $P_D$           | 0.7         | W                  |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State     | $R_{\theta JA}$ | 182         | $^\circ\text{C/W}$ |
|  | $t < 10\text{s}$ |                 | 133         |                    |
| Total Power Dissipation (Note 6)                 |                  | $P_D$           | 1.2         | W                  |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State     | $R_{\theta JA}$ | 103         | $^\circ\text{C/W}$ |
|  | $t < 10\text{s}$ |                 | 75          |                    |
| Operating and Storage Temperature Range          |                  | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$  unless otherwise specified.)

| Characteristic                                | Symbol              | Min  | Typ                   | Max                    | Unit             | Test Condition  |
|---|---------------------|------|-----------------------|------------------------|------------------|---|
| <b>OFF CHARACTERISTICS (Note 7)</b>           |                     |      |                       |                        |                  |   |
| Drain-Source Breakdown Voltage                | $BV_{DSS}$          | -30  | —                     | —                      | V                | $V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$   |
| Zero Gate Voltage Drain Current               | $I_{DSS}$           | —    | —                     | -1                     | $\mu\text{A}$    | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$  |
| Gate-Source Leakage                           | $I_{GSS}$           | —    | —                     | $\pm 100$              | nA               | $V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$   |
| <b>ON CHARACTERISTICS (Note 7)</b>            |                     |      |                       |                        |                  |   |
| Gate Threshold Voltage                        | $V_{GS(\text{th})}$ | -0.5 | —                     | -1.3                   | V                | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$  |
| Static Drain-Source On-Resistance             | $R_{DS(\text{ON})}$ | —    | 57<br>64<br>80<br>107 | 72<br>85<br>120<br>165 | $\text{m}\Omega$ | $V_{GS} = -10\text{V}, I_D = -4.2\text{A}$<br>$V_{GS} = -4.5\text{V}, I_D = -4.0\text{A}$<br>$V_{GS} = -2.5\text{V}, I_D = -2.0\text{A}$<br>$V_{GS} = -1.8\text{V}, I_D = -1.0\text{A}$ |
| Diode Forward Voltage                         | $V_{SD}$            | —    | —                     | -1.2                   | V                | $V_{GS} = 0\text{V}, I_S = -1.0\text{A}$  |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>       |                     |      |                       |                        |                  |   |
| Input Capacitance                             | $C_{iss}$           | —    | 708                   | —                      | pF               | $V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$   |
| Output Capacitance                            | $C_{oss}$           | —    | 57                    | —                      | pF               |   |
| Reverse Transfer Capacitance                  | $C_{rss}$           | —    | 47                    | —                      | pF               |   |
| Gate Resistance                               | $R_G$               | —    | 14                    | —                      | $\Omega$         | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$   |
| Total Gate Charge ( $V_{GS} = -4.5\text{V}$ ) | $Q_G$               | —    | 7.3                   | —                      | nC               | $V_{DS} = -15\text{V}, I_D = -4\text{A}$  |
| Total Gate Charge ( $V_{GS} = -10\text{V}$ )  | $Q_G$               | —    | 15.9                  | —                      | nC               | $V_{DS} = -15\text{V}, I_D = -4\text{A}$  |
| Gate-Source Charge                            | $Q_{GS}$            | —    | 1.2                   | —                      |                  |   |
| Gate-Drain Charge                             | $Q_{GD}$            | —    | 1.7                   | —                      |                  |   |
| Turn-On Delay Time                            | $t_{d(\text{on})}$  | —    | 3.5                   | —                      | ns               | $V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, I_D = -4\text{A}, R_G = 6.0\Omega$   |
| Rise Time                                     | $t_r$               | —    | 15.8                  | —                      |                  |   |
| Turn-Off Delay Time                           | $t_{d(\text{off})}$ | —    | 70.3                  | —                      |                  |   |
| Fall Time                                     | $t_f$               | —    | 33.9                  | —                      |                  |   |

Notes:

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

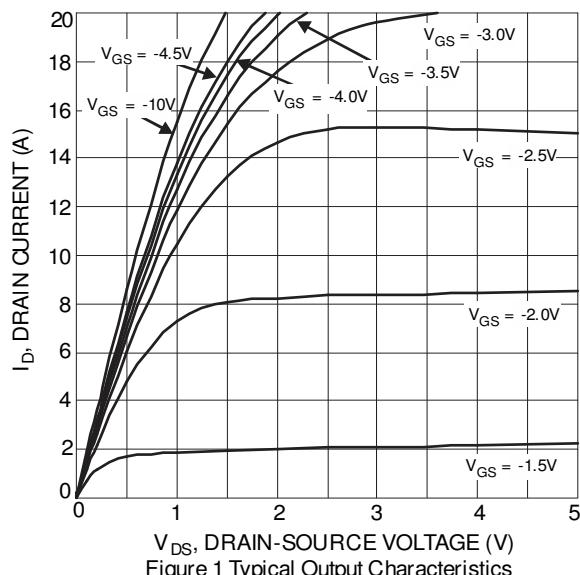


Figure 1 Typical Output Characteristics

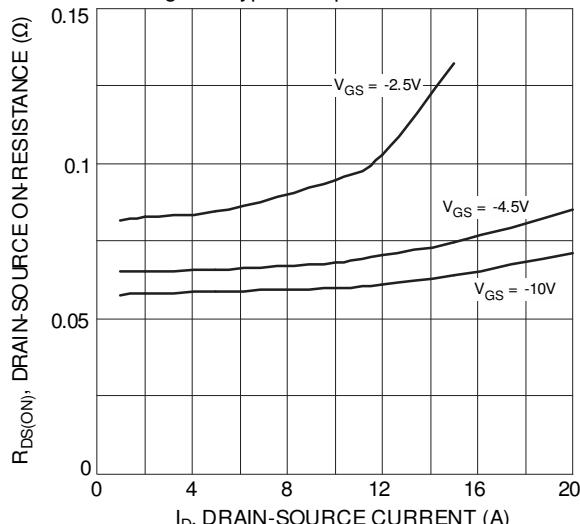


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

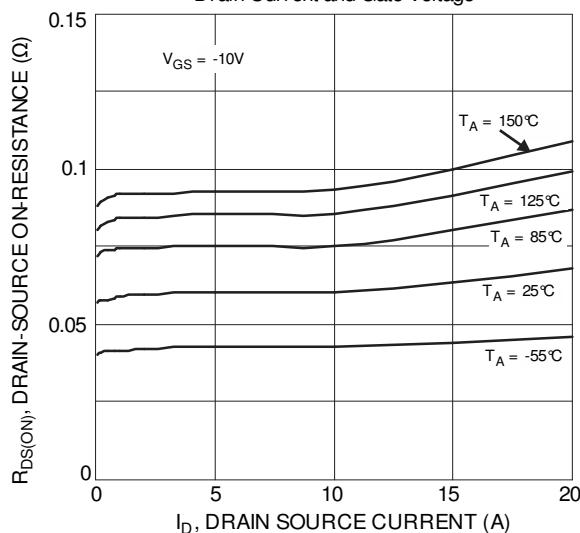


Figure 5 Typical On-Resistance vs.  
Drain Current and Temperature

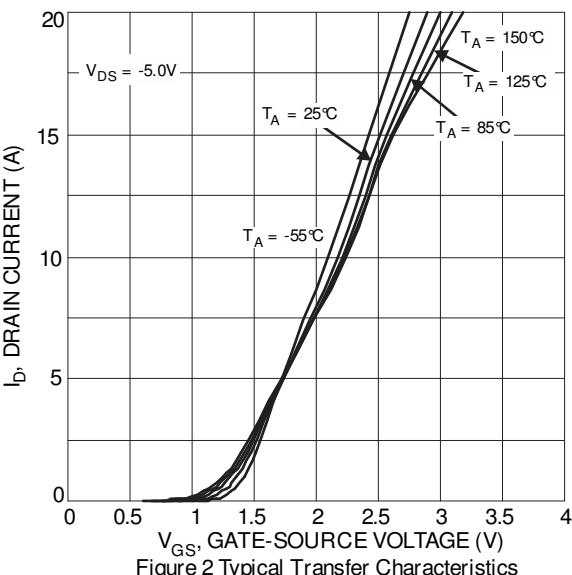


Figure 2 Typical Transfer Characteristics

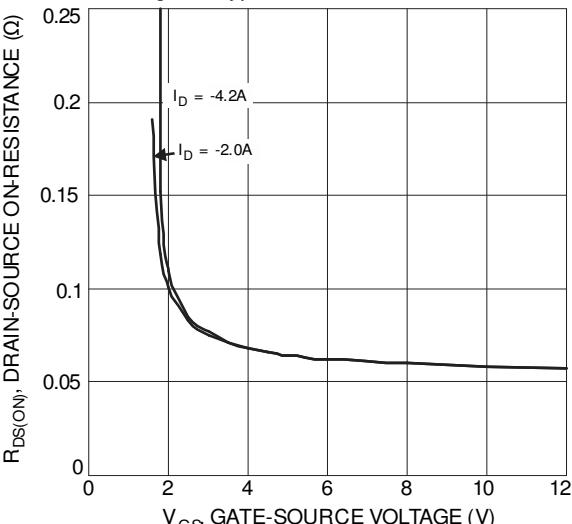


Figure 4 Typical Drain-Source On-Resistance  
vs. Gate-Source Voltage

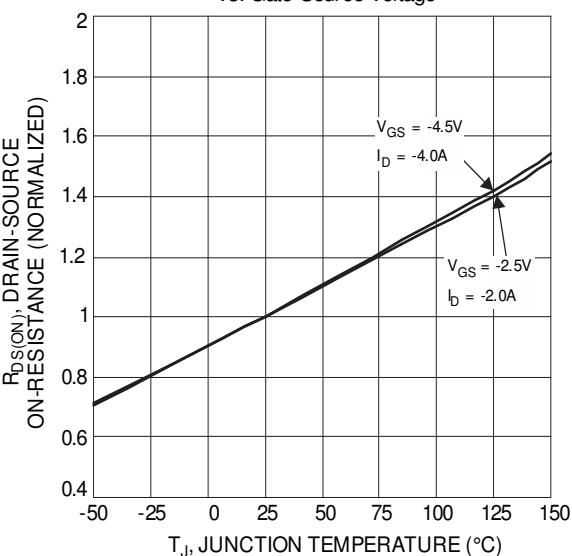
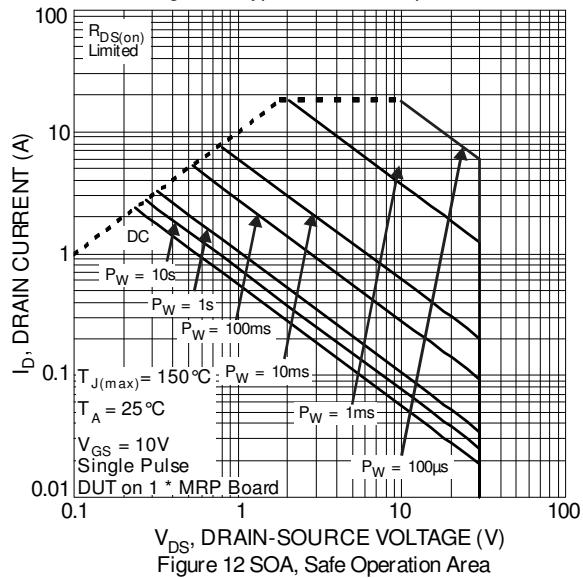
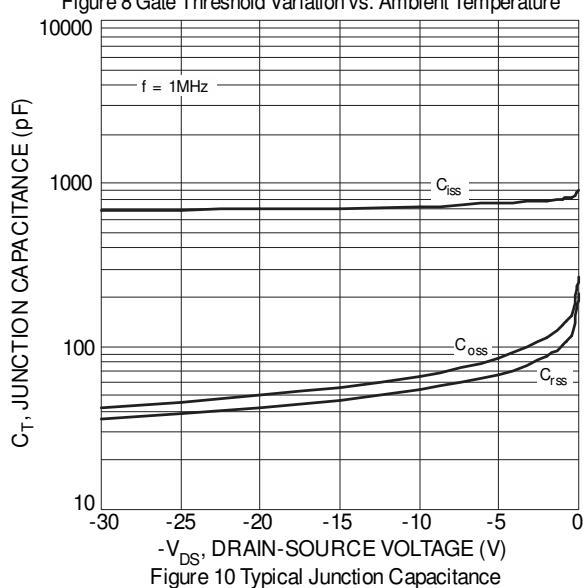
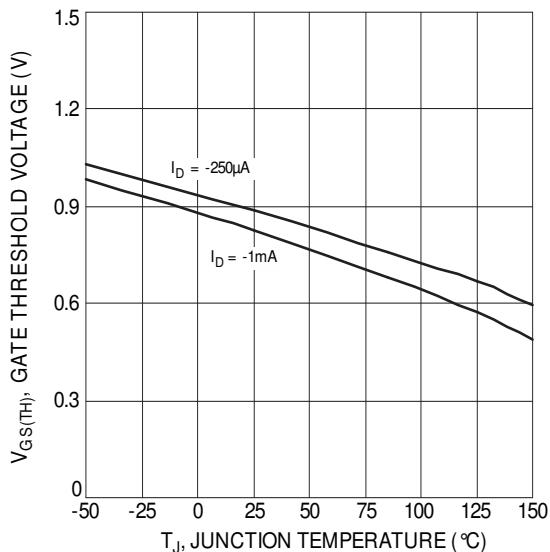
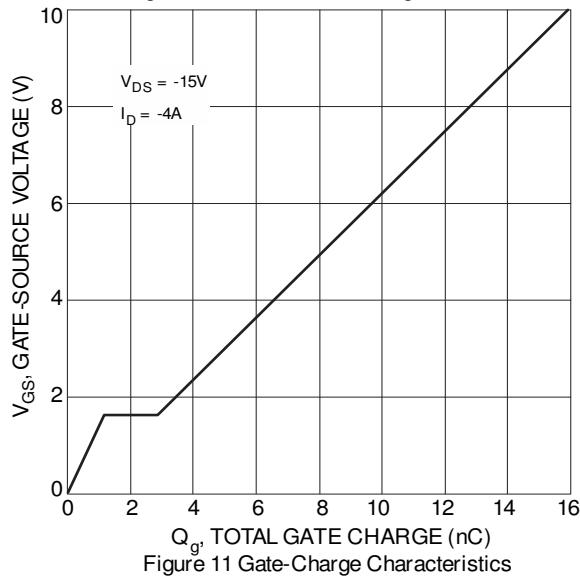
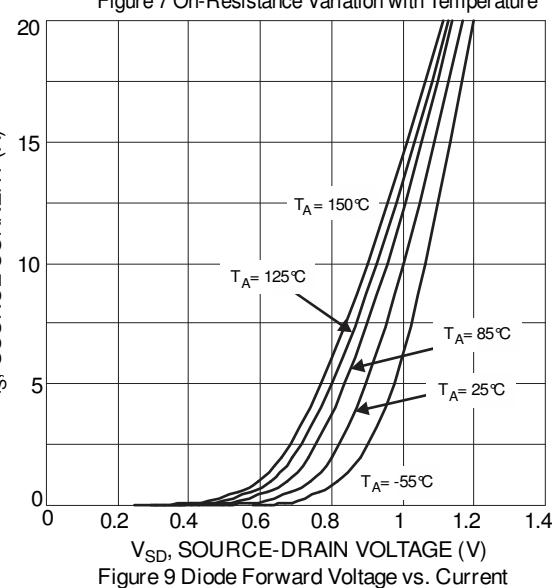
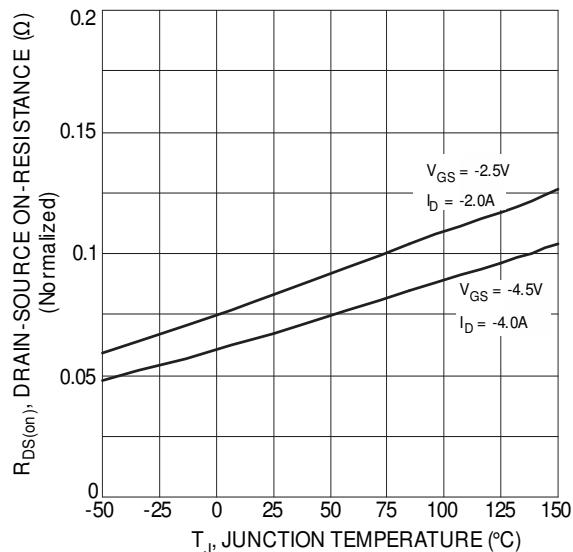
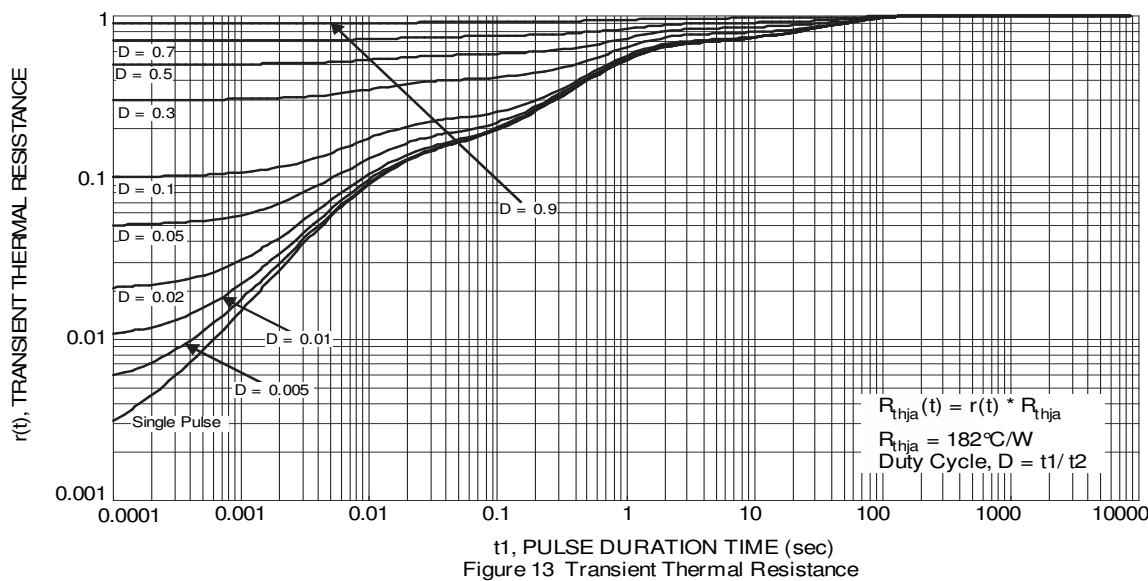


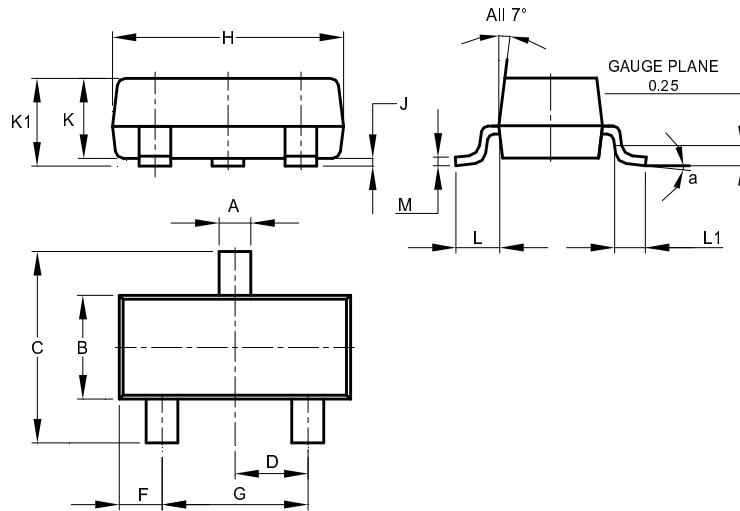
Figure 6 On-Resistance Variation with Temperature





## Package Outline Dimensions

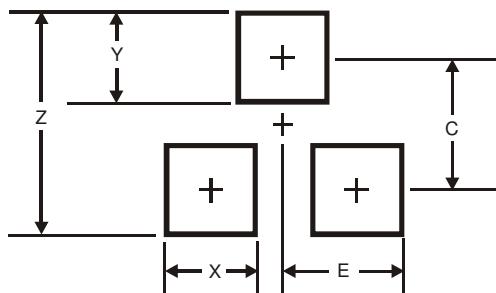
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest the version.



| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| a                    | 8°    |       |       |
| 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) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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