

**N-CHANNEL ENHANCEMENT MODE MOSFET**
**Product Summary**

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ max        | $I_D$ max |
|---------------|-------------------------|-----------|
| 30V           | 26.5mΩ @ $V_{GS} = 10V$ | 5.8A      |
|               | 32mΩ @ $V_{GS} = 4.5V$  | 5.0A      |

**Features and Benefits**

- 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)**

**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.

- Battery Charging
- Power Management Functions
- DC-DC Converters
- Portable Power Adaptors

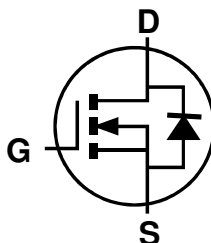
**Mechanical Data**

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208 **(E3)**
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)

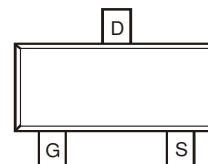
SOT23



Top View



Internal Schematic



Top View

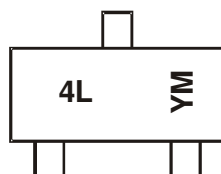
**Ordering Information** (Note 4)

| Part Number | Case  | Packaging          |
|-------------|-------|--------------------|
| DMN3042L-7  | SOT23 | 3,000/Tape & Reel  |
| DMN3042L-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**

SOT23



4L = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

**Date Code Key**

Date Code Key

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|
| Code | W    | X    | Y    | Z    | A    | B    | C    |

| 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 | Units |
|---------------------------------------------------------|--------------|-------------------------|------------------|-------|-------|
| Drain-Source Voltage                                    |              |                         | V <sub>DSS</sub> | 30    | V     |
| Gate-Source Voltage                                     |              |                         | V <sub>GSS</sub> | ±12   | V     |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V | Steady State | T <sub>A</sub> = +25 °C | I <sub>D</sub>   | 5.8   | A     |
|                                                         |              | T <sub>A</sub> = +70 °C |                  | 4.0   |       |
| Maximum Body Diode Forward Current (Note 6)             |              |                         | I <sub>S</sub>   | 1.5   | A     |
| Pulsed Drain Current (10μs pulse, duty cycle = 1%)      |              |                         | I <sub>DM</sub>  | 30    | A     |

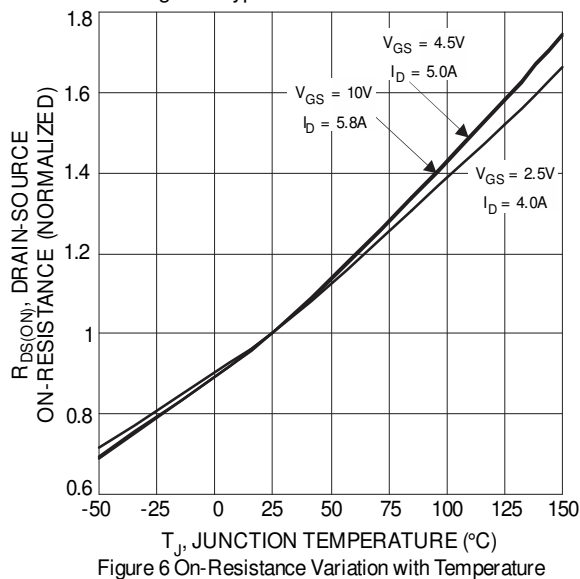
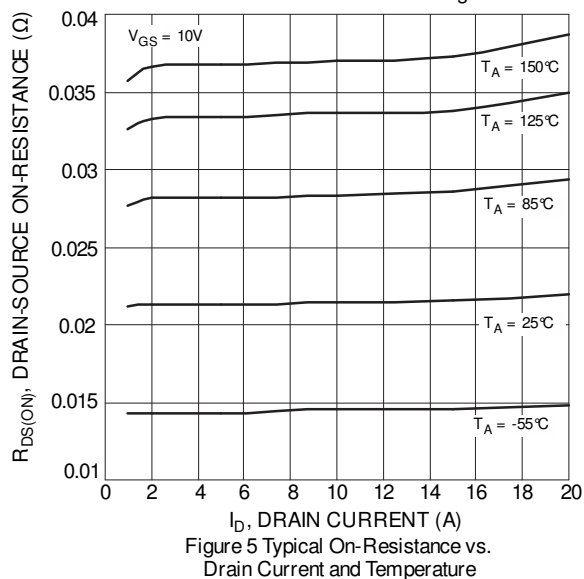
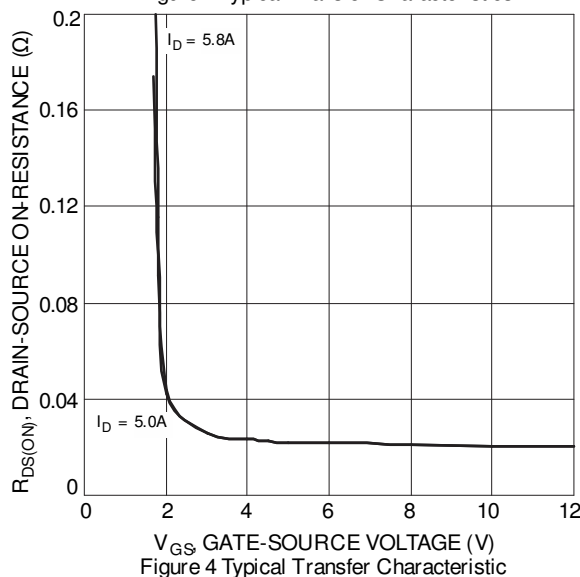
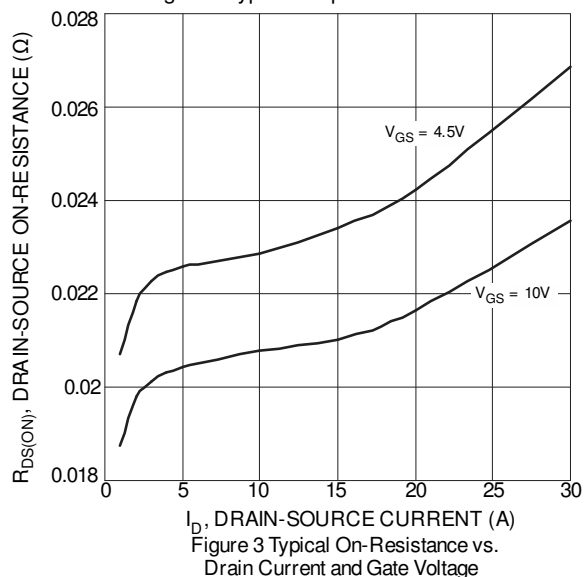
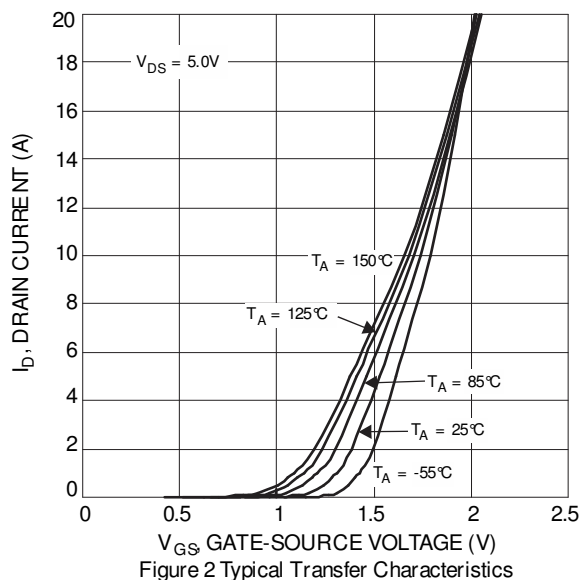
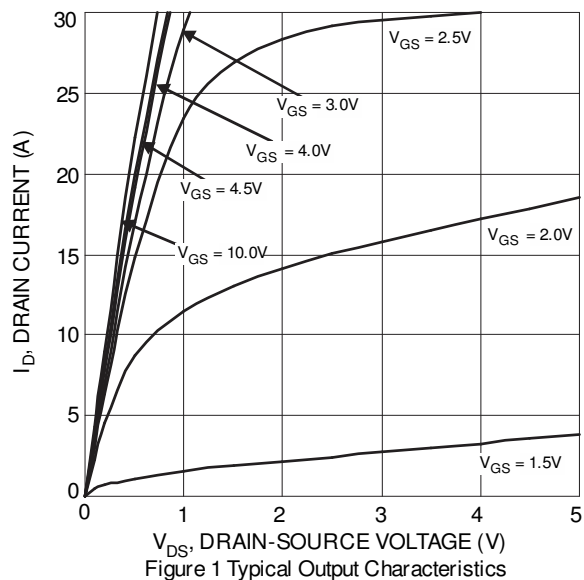
**Thermal Characteristics**

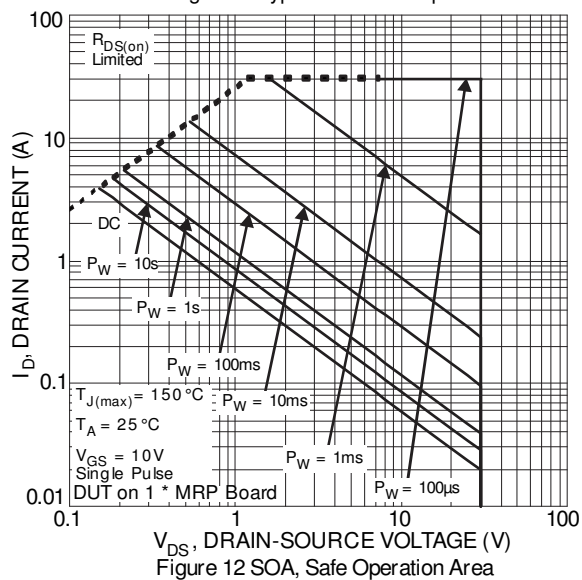
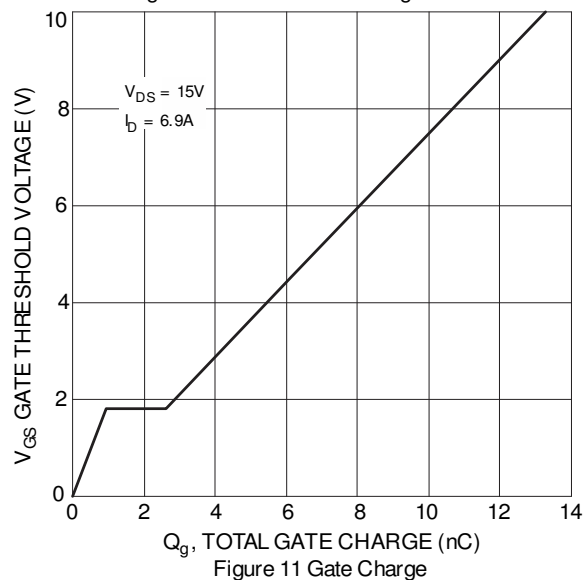
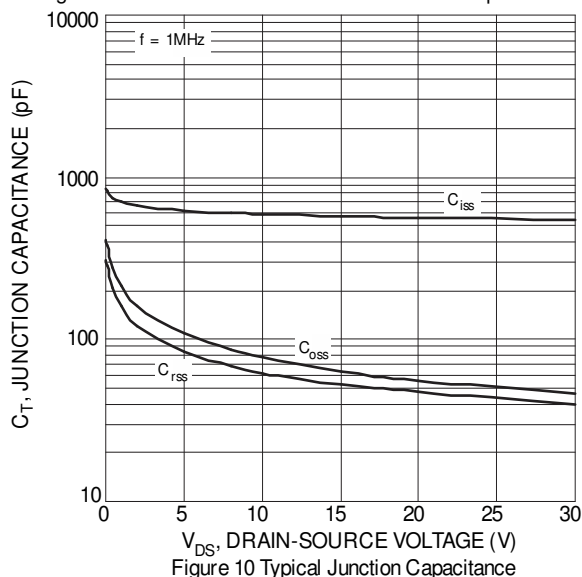
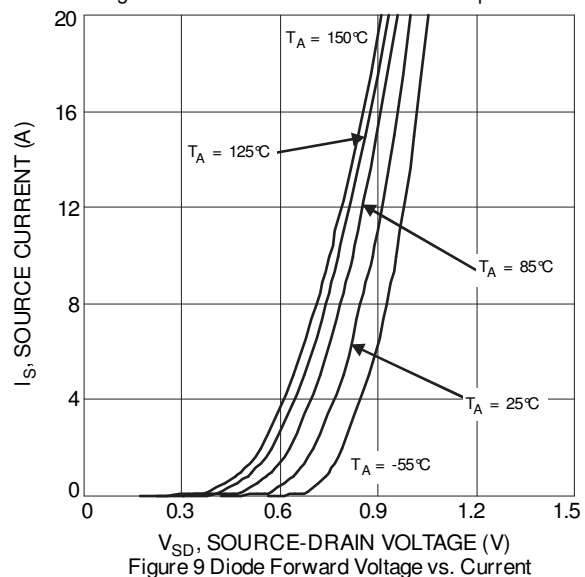
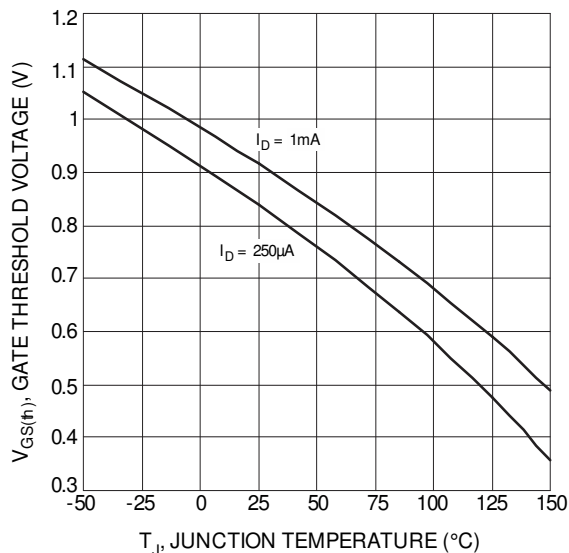
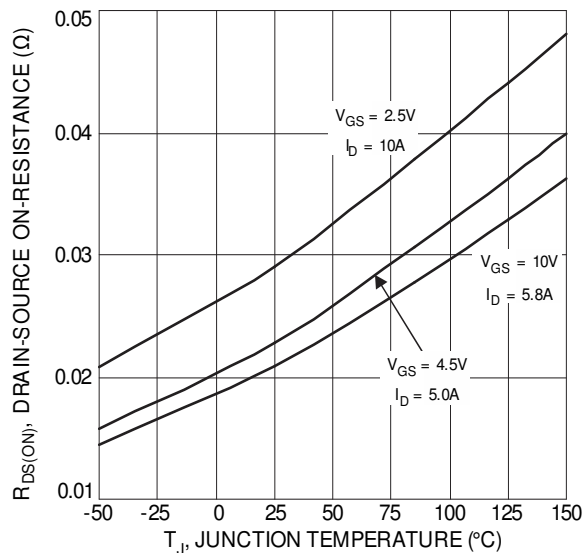
| Characteristic                                   |              | Symbol                            | Value       | Unit |
|--------------------------------------------------|--------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                       |              | P <sub>D</sub>                    | 0.72        | W    |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | R <sub>θJA</sub>                  | 171         | °C/W |
| Power Dissipation (Note 6)                       |              | P <sub>D</sub>                    | 1.4         | W    |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | R <sub>θJA</sub>                  | 93          | °C/W |
| Operating and Storage Temperature Range          |              | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

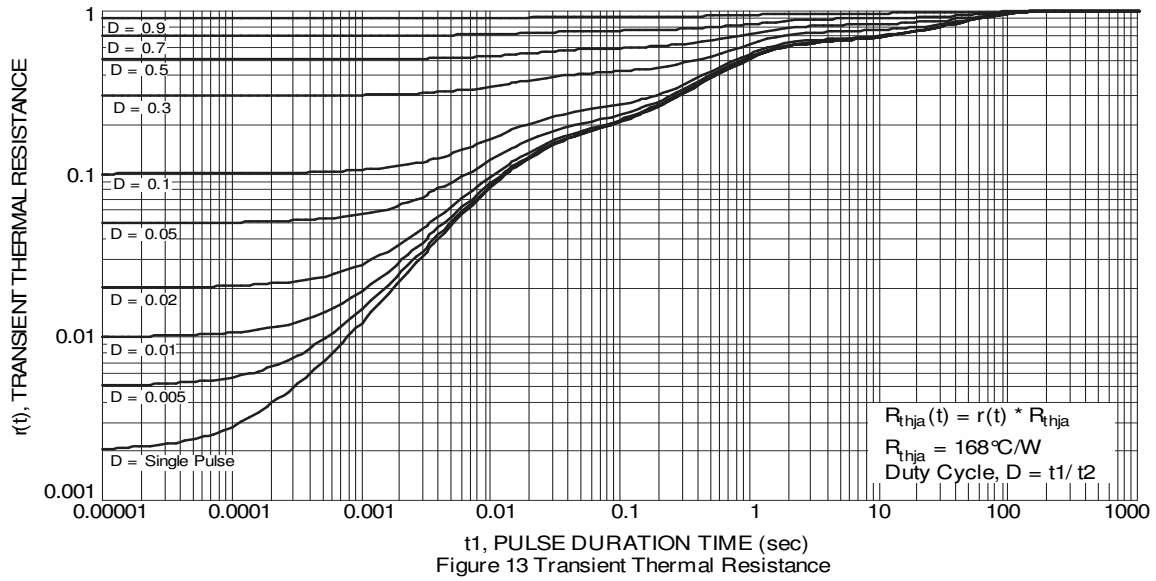
**Electrical Characteristics** (@T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic                             | Symbol              | Min | Typ  | Max  | Unit | Test Condition                                                                              |
|--------------------------------------------|---------------------|-----|------|------|------|---------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 7)</b>        |                     |     |      |      |      |                                                                                             |
| Drain-Source Breakdown Voltage             | BV <sub>DSS</sub>   | 30  | —    | —    | 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> = 30V, V <sub>GS</sub> = 0V                                                 |
| Gate-Source Leakage                        | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V                                                |
| <b>ON CHARACTERISTICS (Note 7)</b>         |                     |     |      |      |      |                                                                                             |
| Gate Threshold Voltage                     | V <sub>GS(th)</sub> | 0.6 | —    | 1.4  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                  |
| Static Drain-Source On-Resistance          | R <sub>DS(on)</sub> | —   | 21   | 26.5 | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 5.8A                                                |
|                                            |                     | —   | 23   | 32   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A                                               |
|                                            |                     | —   | 29   | 48   |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 4.0A                                               |
| 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 8)</b>    |                     |     |      |      |      |                                                                                             |
| Input Capacitance                          | C <sub>iss</sub>    | —   | 570  | 860  | pF   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                   |
| Output Capacitance                         | C <sub>oss</sub>    | —   | 63   | 95   |      |                                                                                             |
| Reverse Transfer Capacitance               | C <sub>rss</sub>    | —   | 53   | 80   |      |                                                                                             |
| Gate Resistance                            | R <sub>G</sub>      | —   | 3.2  | 4.5  | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz                                      |
| Total Gate Charge (V <sub>GS</sub> = 10V)  | Q <sub>g</sub>      | —   | 13.3 | 20   | nC   | V <sub>DS</sub> = 15V, I <sub>D</sub> = 6.9A                                                |
| Total Gate Charge (V <sub>GS</sub> = 4.5V) | Q <sub>g</sub>      | —   | 6.1  | 8    |      |                                                                                             |
| Gate-Source Charge                         | Q <sub>gs</sub>     | —   | 1.0  | 1.5  |      |                                                                                             |
| Gate-Drain Charge                          | Q <sub>gd</sub>     | —   | 1.6  | 2.5  |      |                                                                                             |
| Turn-On Delay Time                         | t <sub>D(on)</sub>  | —   | 1.5  | 2.4  | nS   | V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V, R <sub>G</sub> = 3Ω,<br>I <sub>D</sub> = 6.9A |
| Turn-On Rise Time                          | t <sub>r</sub>      | —   | 3.3  | 5    |      |                                                                                             |
| Turn-Off Delay Time                        | t <sub>D(off)</sub> | —   | 13.9 | 22   |      |                                                                                             |
| Turn-Off Fall Time                         | t <sub>f</sub>      | —   | 4.9  | 7    |      |                                                                                             |
| Body Diode Reverse Recovery Time           | t <sub>rr</sub>     | —   | 7.8  | 12   | nS   | I <sub>S</sub> = 5A, dI/dt = 100A/μs                                                        |
| Body Diode Reverse Recovery Charge         | Q <sub>rr</sub>     | —   | 1.9  | 3    | nC   | I <sub>S</sub> = 5A, dI/dt = 100A/μs                                                        |

- 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 thermal bias to bottom layer 1inch square copper plate.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

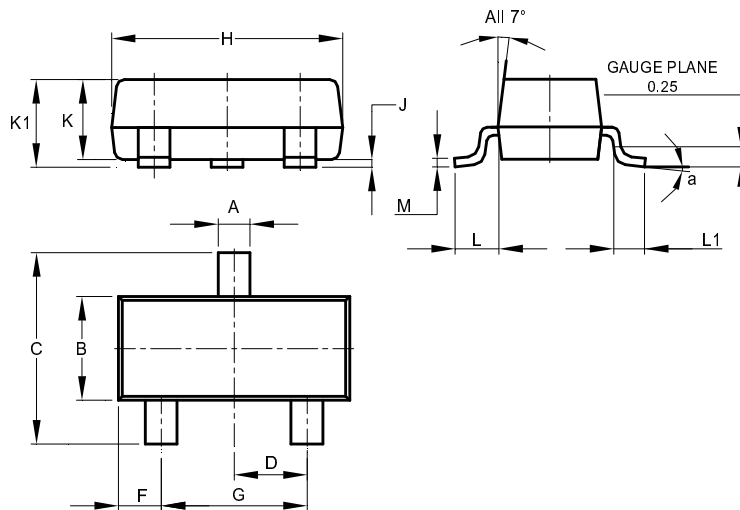






## Package Outline Dimensions

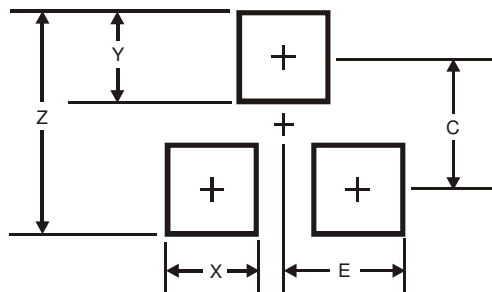
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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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