

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$                          | $I_D$<br>$T_A = +25^\circ\text{C}$ |
|---------------|---------------------------------------|------------------------------------|
| 30V           | 52m $\Omega$ @ $V_{GS} = 10\text{V}$  | 4A                                 |
|               | 65m $\Omega$ @ $V_{GS} = 4.5\text{V}$ | 3A                                 |
|               | 85m $\Omega$ @ $V_{GS} = 2.5\text{V}$ | 2A                                 |

## Features

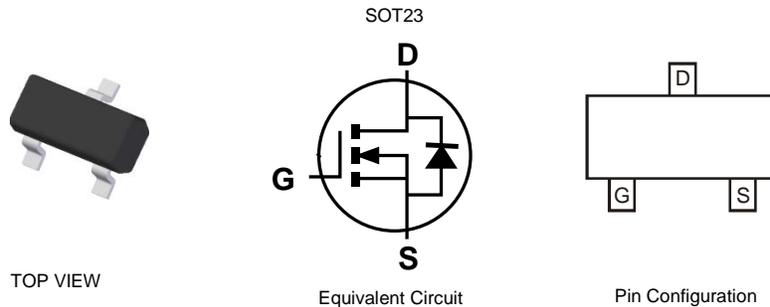
- Low On-Resistance:
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Applications

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays

## 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**
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

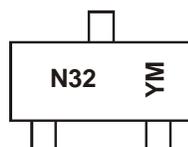


## Ordering Information (Note 4)

| Part Number | Case  | Packaging         |
|-------------|-------|-------------------|
| DMG3402L-7  | SOT23 | 3000/Tape & Reel  |
| DMG3402L-13 | SOT23 | 10000/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



N32 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------|------|------|------|------|------|------|------|
| Code | Z    | A    | B    | C    | D    | E    | F    |

| 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> | 30    | V    |
| Gate-Source Voltage                    | V <sub>GSS</sub> | ±12   | V    |
| Drain Current (Note 5)                 | I <sub>D</sub>   | 4.0   | A    |
| Body-Diode Continuous Current (Note 5) | I <sub>S</sub>   | 1.5   | A    |

**Thermal Characteristics**

| Characteristic   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)   | P <sub>D</sub>                    | 1.4         | W    |
| Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5) | R <sub>θJA</sub>                  | 90          | °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 6)</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-Body Leakage                       | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V   |
| <b>ON CHARACTERISTICS (Note 6)</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> | —   | —    | 52   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 4A   |
|   |                     | —   | —    | 65   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A  |
|   |                     | —   | —    | 85   |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 2A  |
| Forward Transconductance                | Y <sub>fs</sub>     | —   | 6.6  | —    | S    | V <sub>DS</sub> = 5V, I <sub>D</sub> = 3.1A  |
| Source-Drain Diode Forward Voltage      | V <sub>SD</sub>     | —   | —    | 1.16 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.0A  |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b> |                     |     |      |      |      |  |
| Gate Resistance                         | R <sub>g</sub>      | —   | 2.2  | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz   |
| Total Gate Charge (10V)                 | Q <sub>g</sub>      | —   | 11.7 | —    | nC   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 4A                            |
| Total Gate Charge (4.5V)                | Q <sub>g</sub>      | —   | 5.5  | —    | nC   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 4A                            |
| Gate-Source Charge                      | Q <sub>gs</sub>     | —   | 1.1  | —    | nC   |  |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | —   | 1.8  | —    | nC   |  |
| Turn-On Delay Time                      | t <sub>D(on)</sub>  | —   | 1.9  | —    | ns   | V <sub>DD</sub> = 15V, V <sub>GEN</sub> = 10V, R <sub>GEN</sub> = 3Ω, R <sub>L</sub> = 3.75Ω |
| Turn-On Rise Time                       | t <sub>r</sub>      | —   | 1.6  | —    | ns   |  |
| Turn-Off Delay Time                     | t <sub>D(off)</sub> | —   | 10.3 | —    | ns   |  |
| Turn-Off Fall Time                      | t <sub>f</sub>      | —   | 2.0  | —    | ns   |  |
| Input Capacitance                       | C <sub>iss</sub>    | —   | 464  | —    | pF   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz                                      |
| Output Capacitance                      | C <sub>oss</sub>    | —   | 49.5 | —    | pF   |  |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    | —   | 43.8 | —    | pF   |  |

- Notes:
5. Device mounted on FR-4 PCB. t ≤ 5 sec.
  6. Short duration pulse test used to minimize self-heating effect.
  7. Guaranteed by design. Not subject to production testing.

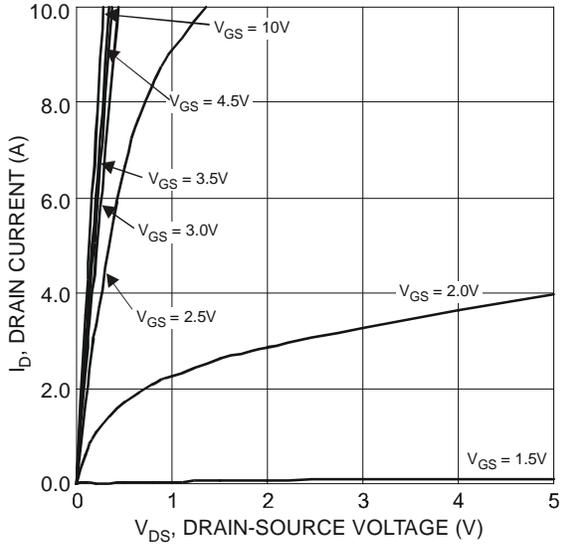


Figure 1 Typical Output Characteristics

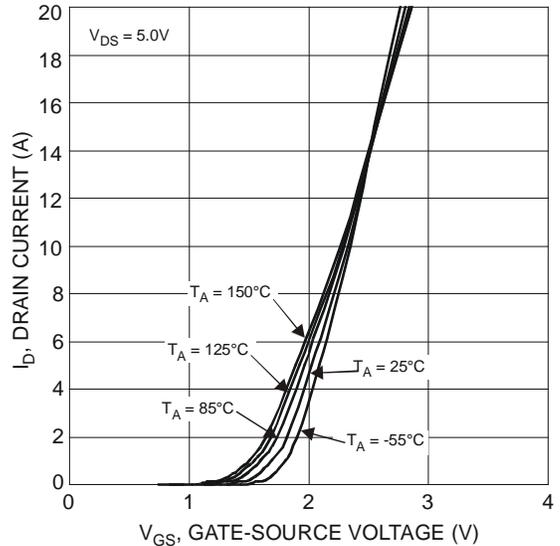


Figure 2 Typical Transfer Characteristics

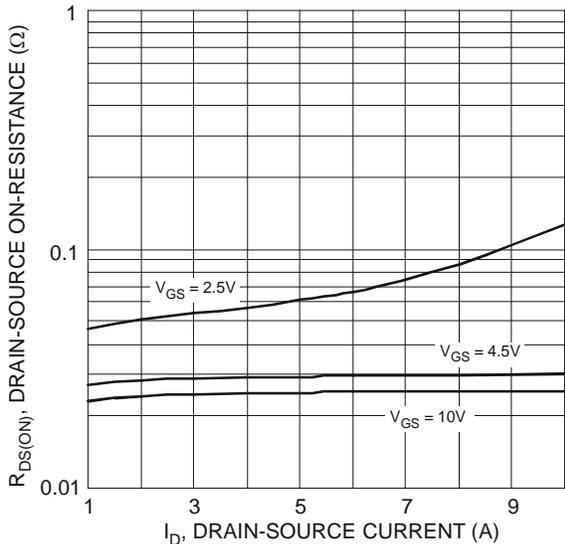


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

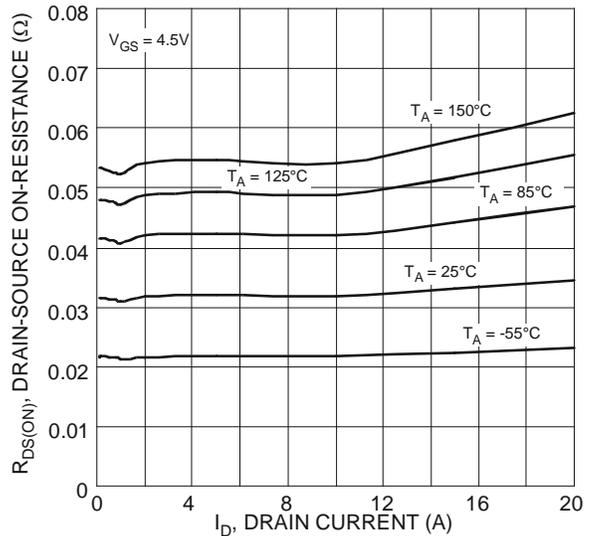


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

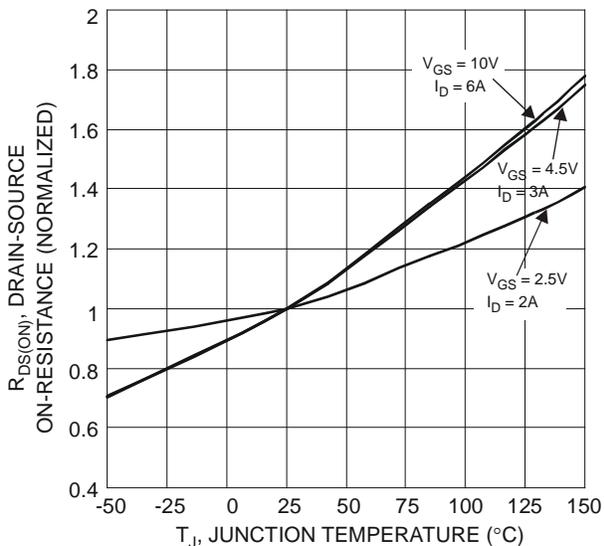


Figure 5 On-Resistance Variation with Temperature

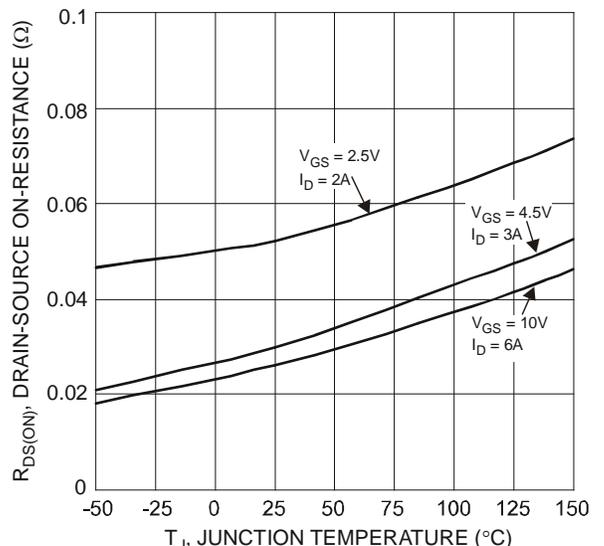


Figure 6 On-Resistance Variation with Temperature

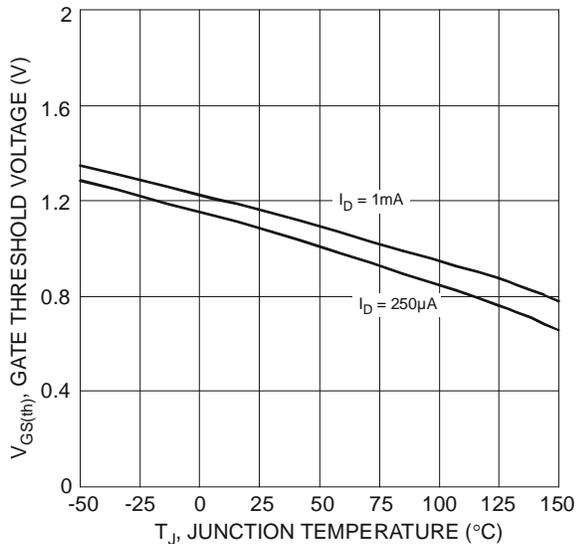


Figure 7 Gate Threshold Variation vs. Ambient Temperature

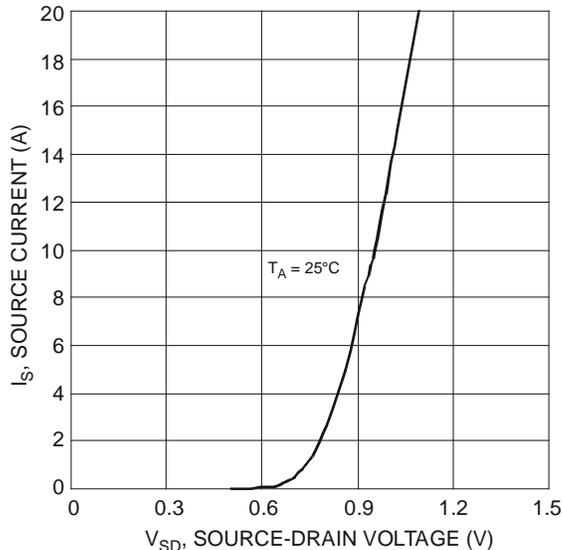


Figure 8 Diode Forward Voltage vs. Current

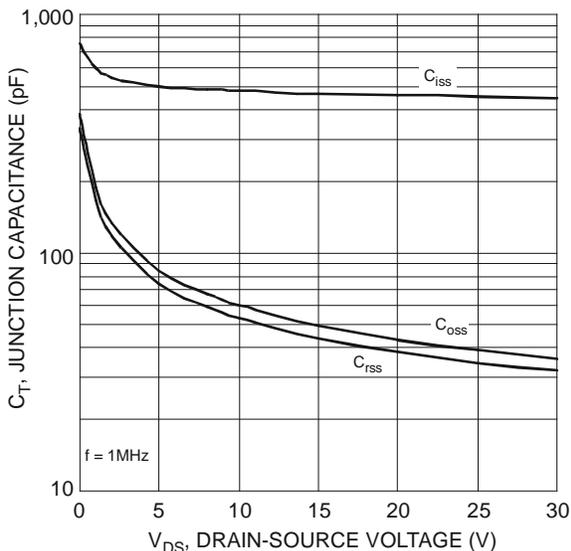


Figure 9 Typical Junction Capacitance

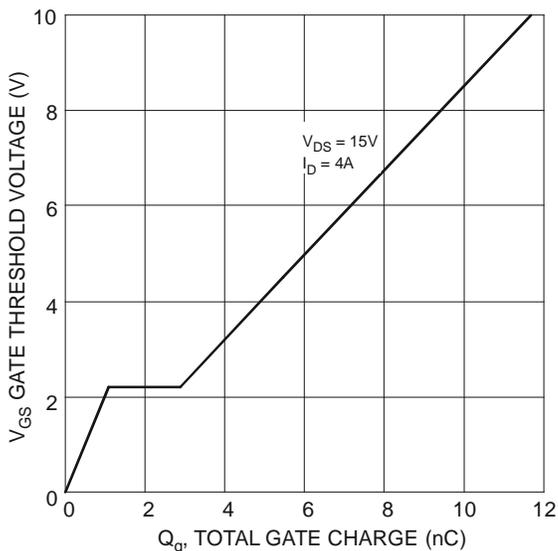


Figure 10 Gate Charge

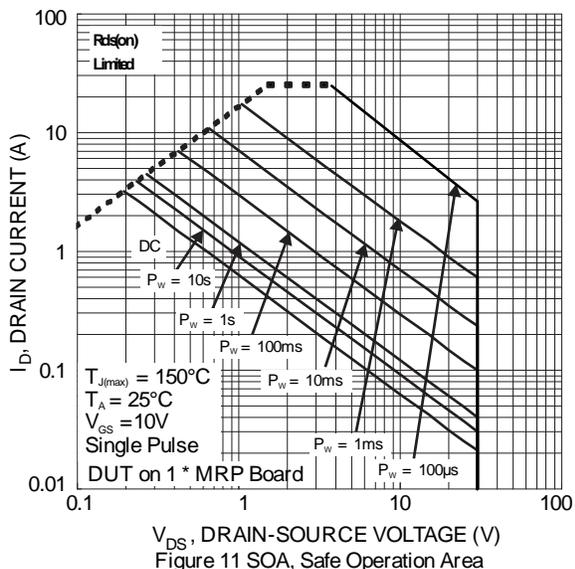
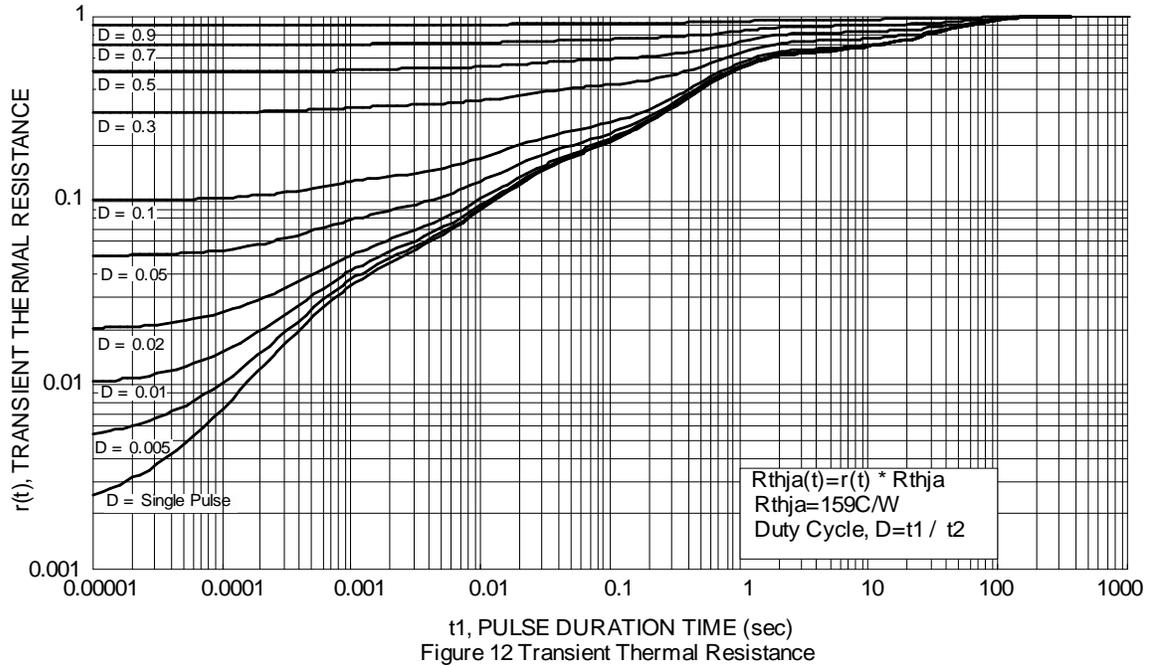
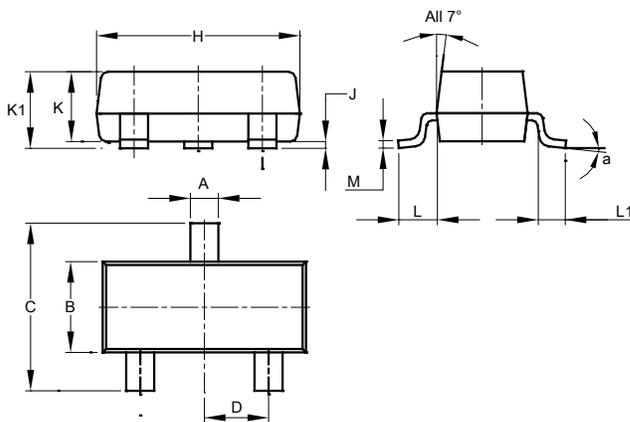


Figure 11 SOA, Safe Operation Area



**Package Outline Dimensions**

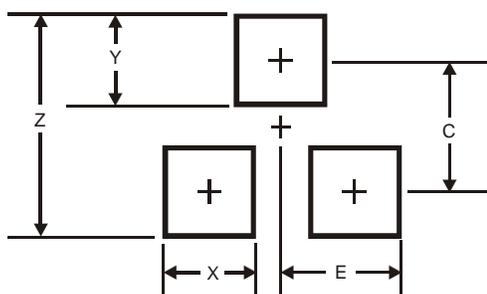
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 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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