

Product Summary

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

Features

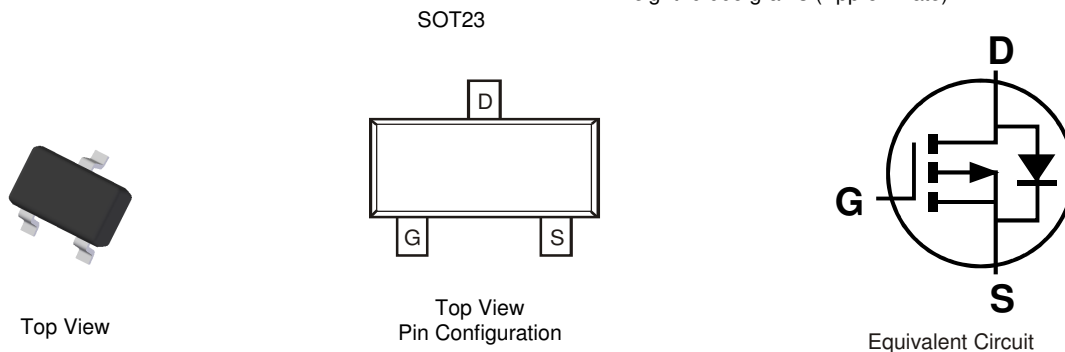
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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.

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 [Ⓔ]
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

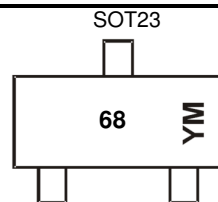


Ordering Information (Note 4)

| 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 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



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

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 °C unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|---|--------------|--|------------------|--------------|-------|
| Drain-Source Voltage | | | V _{DSS} | -30 | V |
| Gate-Source Voltage | | | V _{GSS} | ±12 | V |
| Drain Current (Note 6) V _{GS} = -10V | Steady State | T _A = +25 °C T _A = +70 °C | I _D | -3.3 -2.6 | A |
| | t < 10s | T _A = +25 °C T _A = +70 °C | I _D | -3.9 -3.2 | A |
| Pulsed Drain Current (Pulse width ≤ 10 μs, Duty Cycle ≤ 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 _{θJA} | 182 | °C/W |
| | t < 10s | | | 133 | |
| Total Power Dissipation (Note 6) | | | P _D | 1.2 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | | R _{θJA} | 103 | °C/W |
| | t < 10s | | | 75 | |
| Operating and Storage Temperature Range | | | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25 °C unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---------------------|------|------|------|------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -30 | — | — | V | V _{GS} = 0V, I _D = -250 μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | μA | V _{DS} = -30V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±12V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | -0.5 | — | -1.3 | V | V _{DS} = V _{GS} , I _D = -250 μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | 57 | 72 | mΩ | V _{GS} = -10V, I _D = -4.2A V _{GS} = -4.5V, I _D = -4.0A V _{GS} = -2.5V, I _D = -2.0A V _{GS} = -1.8V, I _D = -1.0A |
| | | | 64 | 85 | | |
| | | | 80 | 120 | | |
| | | | 107 | 165 | | |
| Diode Forward Voltage | V _{SD} | — | — | -1.2 | V | V _{GS} = 0V, I _S = -1.0A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 708 | — | pF | V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 57 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 47 | — | pF | |
| Gate Resistance | R _G | — | 14 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge (V _{GS} = -4.5V) | Q _G | — | 7.3 | — | nC | V _{DS} = -15V, I _D = -4A |
| Total Gate Charge (V _{GS} = -10V) | Q _G | — | 15.9 | — | nC | |
| Gate-Source Charge | Q _{GS} | — | 1.2 | — | nC | V _{DS} = -15V, I _D = -4A |
| Gate-Drain Charge | Q _{GD} | — | 1.7 | — | | |
| Turn-On Delay Time | t _{d(on)} | — | 3.5 | — | ns | V _{DS} = -15V, V _{GS} = -10V, I _D = -4A, R _G = 6.0Ω |
| Rise Time | t _r | — | 15.8 | — | | |
| Turn-Off Delay Time | t _{d(off)} | — | 70.3 | — | | |
| Fall Time | t _f | — | 33.9 | — | | |

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

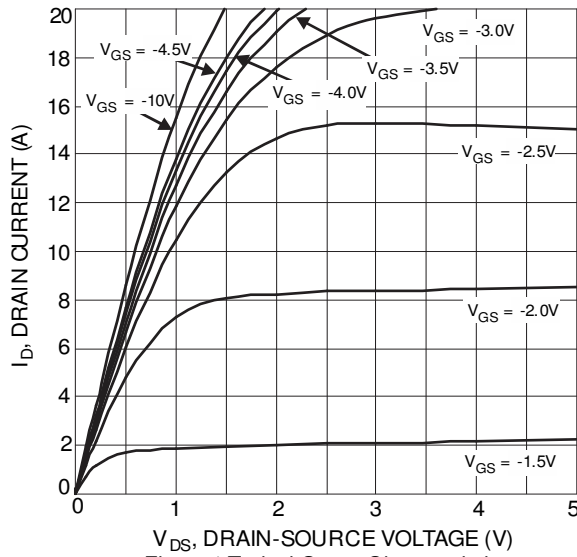


Figure 1 Typical Output Characteristics

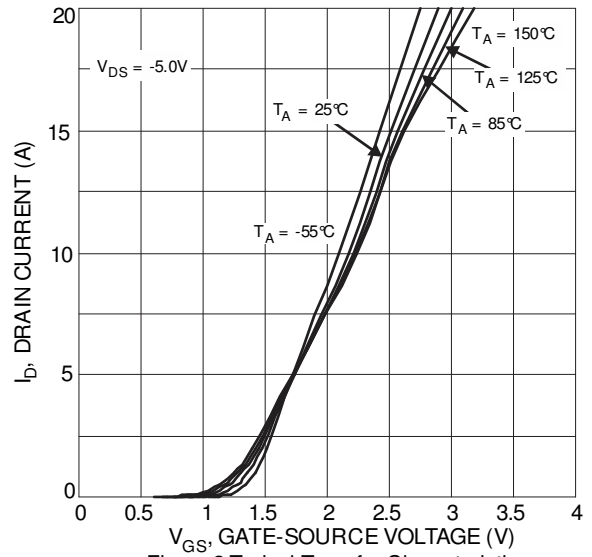


Figure 2 Typical Transfer Characteristics

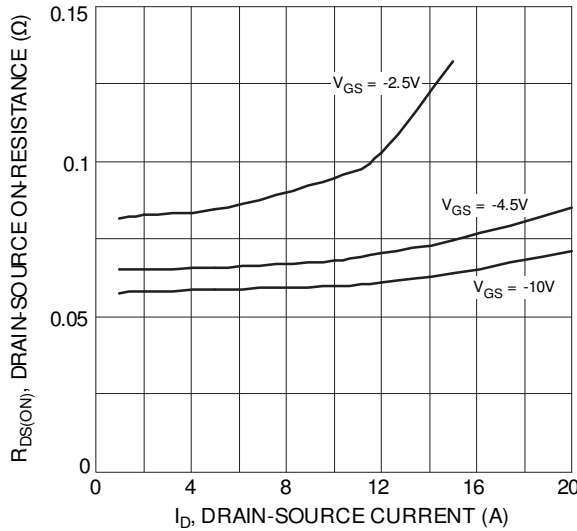


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

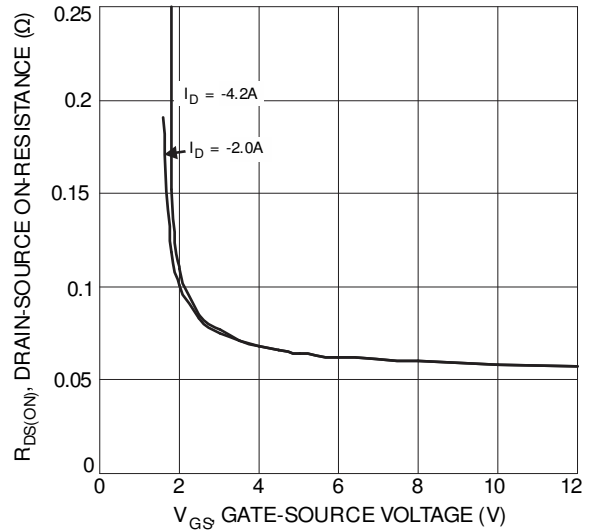


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

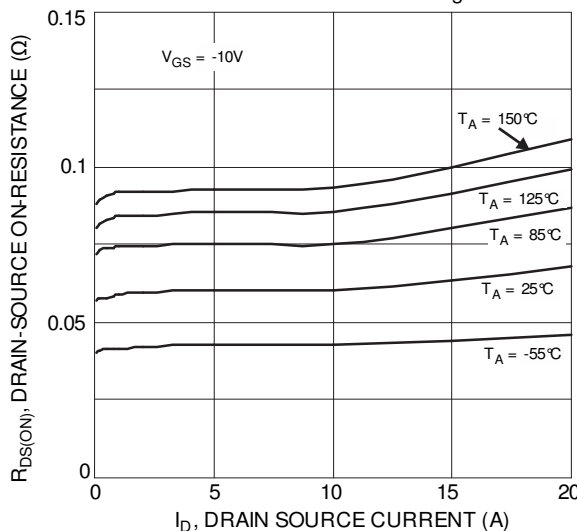


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

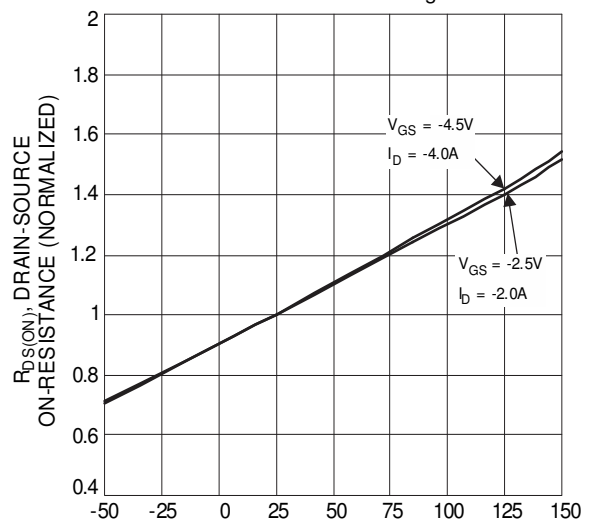


Figure 6 On-Resistance Variation with Temperature

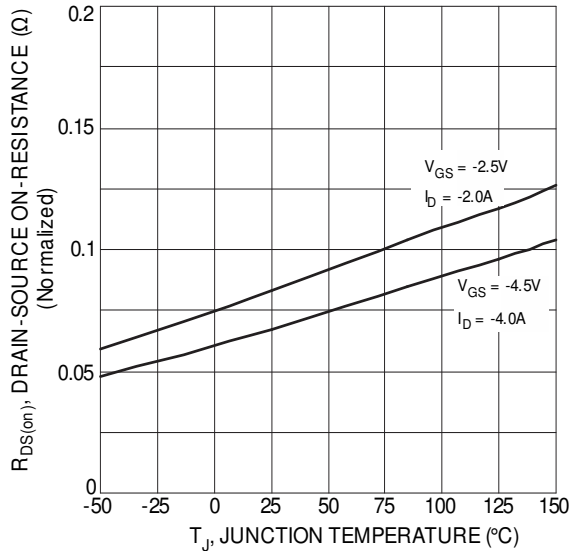


Figure 7 On-Resistance Variation with Temperature

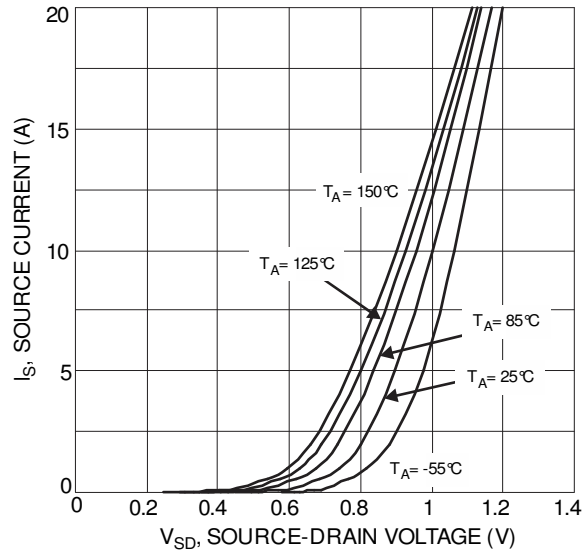


Figure 9 Diode Forward Voltage vs. Current

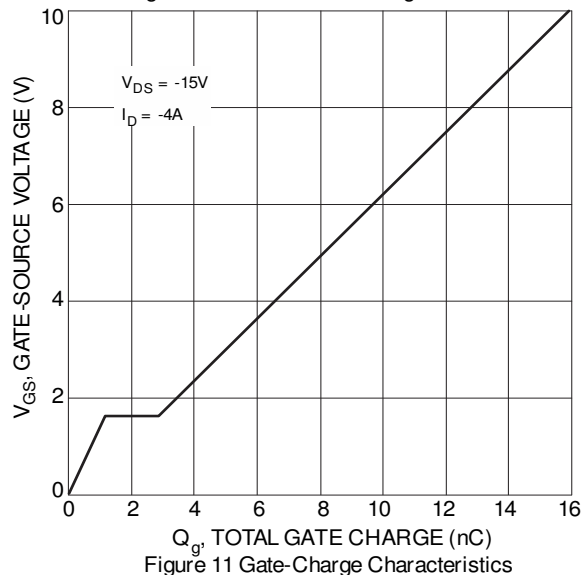


Figure 11 Gate-Charge Characteristics

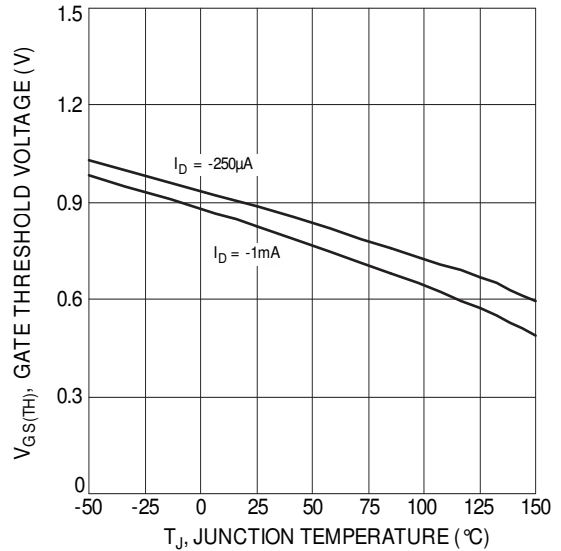


Figure 8 Gate Threshold Variation vs. Ambient Temperature

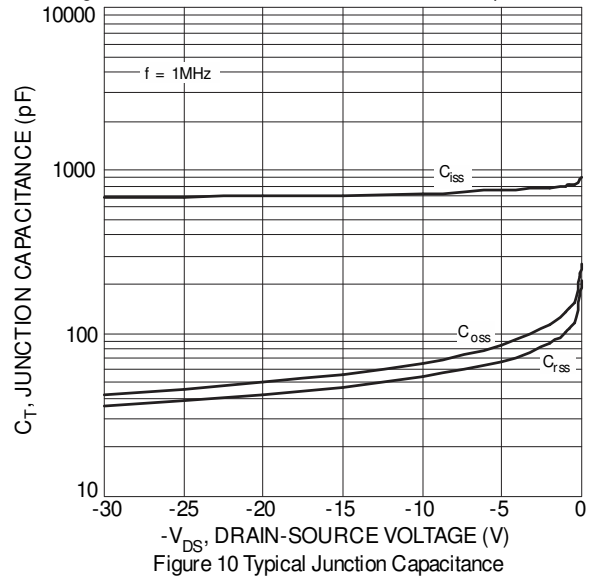


Figure 10 Typical Junction Capacitance

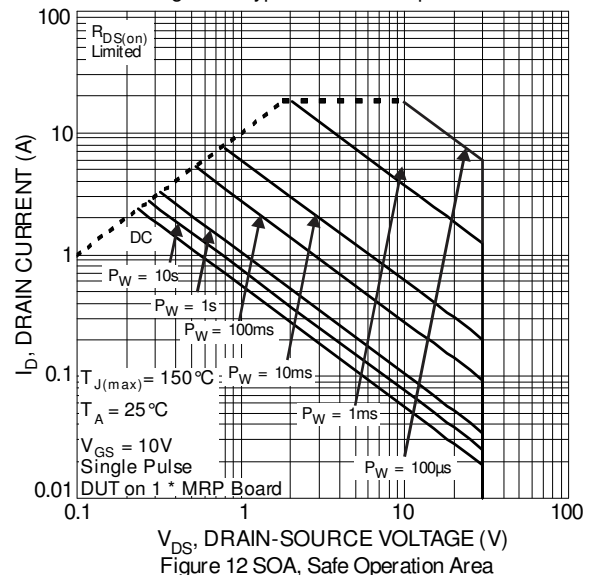
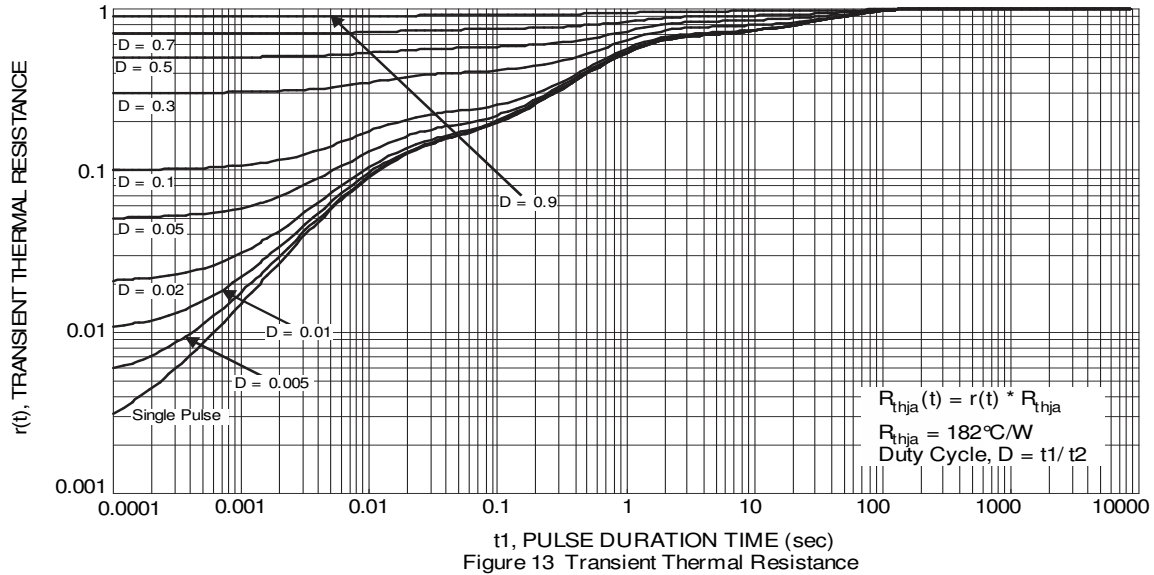
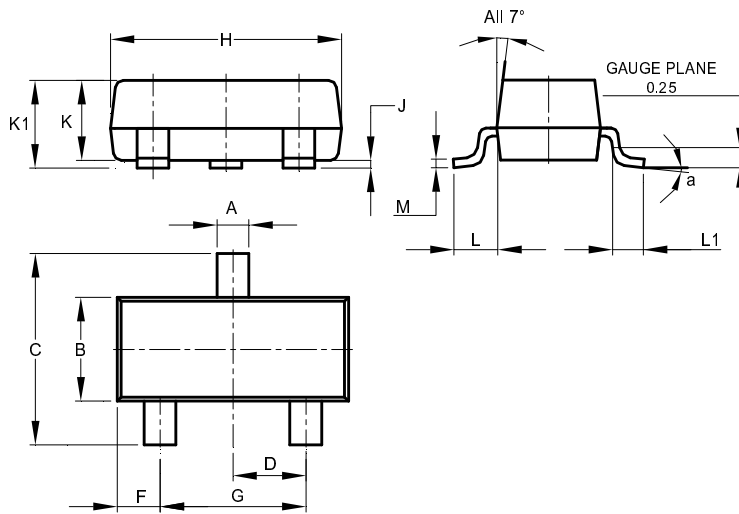


Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

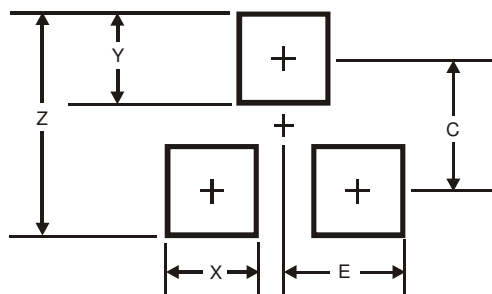
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest the version.



| 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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