

Product Summary

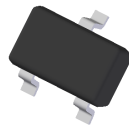
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | I_D $T_A = +25^\circ\text{C}$ |
|---------------|-----------------------------|------------------------------------|
| 300V | 4Ω @ $V_{GS} = 10\text{V}$ | 0.25A |
| | 4Ω @ $V_{GS} = 4.5\text{V}$ | 0.25A |

Description and Applications

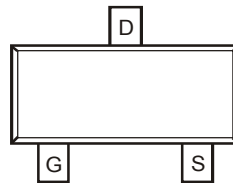
This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Description and Applications

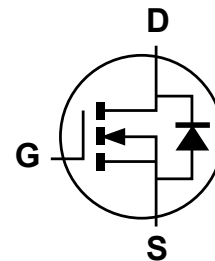
- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc



Top View



Top View
Pin Configuration



Equivalent Circuit

Features and Benefits

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- **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**

Mechanical Data

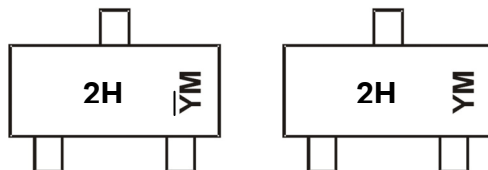
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 (3)
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|-------|--------------------|
| DMN30H4D0L-7 | SOT23 | 3,000/Tape & Reel |
| DMN30H4D0L-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



2H = Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or Y̅ = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|
| Code | A | B | C | D | E | F | G |

| 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} | 300 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 20 | V |
| Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$ | Steady State | $T_A = +25^\circ\text{C}$ | I_D | 0.25 | A |
| | | $T_A = +70^\circ\text{C}$ | | 0.20 | |
| Pulsed Drain Current (10 μs pulse, duty cycle $\leq 1\%$) | | | I_{DM} | 2 | A |
| Maximum Body Diode Continuous Current (Note 6) | | | I_S | 0.8 | A |

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

| Characteristic | | Symbol | Value | Units |
|---|----------|-----------------|------------|--------------------|
| Total Power Dissipation | (Note 5) | P_D | 0.31 | W |
| | (Note 6) | | 0.47 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 377 | $^\circ\text{C/W}$ |
| | (Note 6) | | 255 | |
| Thermal Resistance, Junction to Case | (Note 6) | $R_{\theta JC}$ | 81 | |
| 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 |
|---|--------------|-----|-------|-----------|---------------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 300 | — | — | V | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | 1.0 | μA | $V_{DS} = 240\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Body Leakage | I_{GSS} | — | — | ± 100 | nA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 1 | — | 3 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | — | 2.1 | 4 | Ω | $V_{GS} = 10\text{V}, I_D = 0.3\text{A}$ |
| | | — | 2.1 | 4 | | $V_{GS} = 4.5\text{V}, I_D = 0.2\text{A}$ |
| | | — | 3.8 | 6 | | $V_{GS} = 2.7\text{V}, I_D = 0.1\text{A}$ |
| | | — | — | — | | $V_{GS} = 2.7\text{V}, I_D = 0.1\text{A}$ |
| Diode Forward Voltage | V_{SD} | — | 0.7 | 1.2 | V | $V_{GS} = 0\text{V}, I_S = 0.3\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{ISS} | — | 187.3 | — | pF | $V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{OSS} | — | 11.7 | — | | |
| Reverse Transfer Capacitance | C_{RSS} | — | 8.7 | — | | |
| Total Gate Charge | Q_g | — | 7.6 | — | nC | $V_{DS} = 192\text{V}, V_{GS} = 10\text{V}, I_D = 0.5\text{A}$ |
| Gate-Source Charge | Q_{gs} | — | 0.5 | — | | |
| Gate-Drain Charge | Q_{gd} | — | 3.3 | — | | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 4.9 | — | nS | $V_{DS} = 60\text{V}, R_L = 200\Omega, V_{GS} = 10\text{V}, R_G = 25\Omega$ |
| Turn-On Rise Time | t_r | — | 4.7 | — | | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 25.8 | — | | |
| Turn-Off Fall Time | t_f | — | 17.5 | — | | |

- 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 1inch square copper pad layout
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

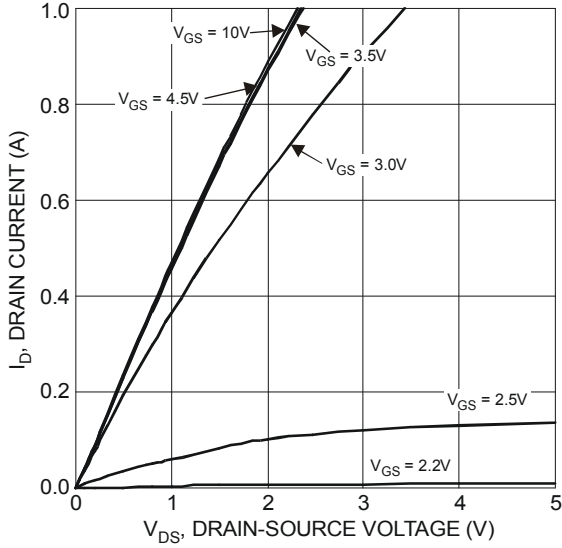


Figure 1 Typical Output Characteristics

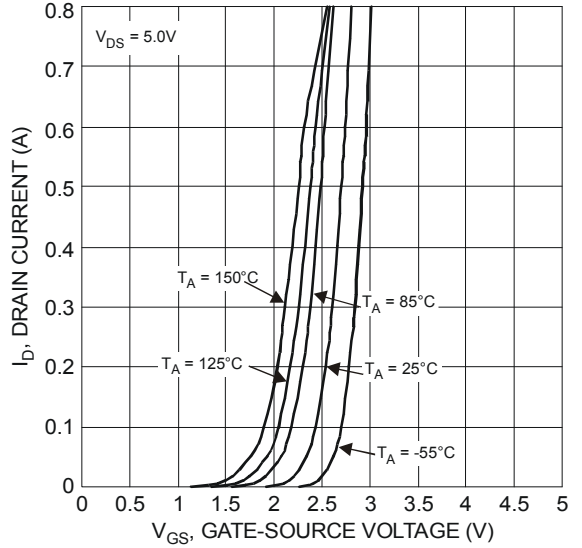


Figure 2 Typical Transfer Characteristics

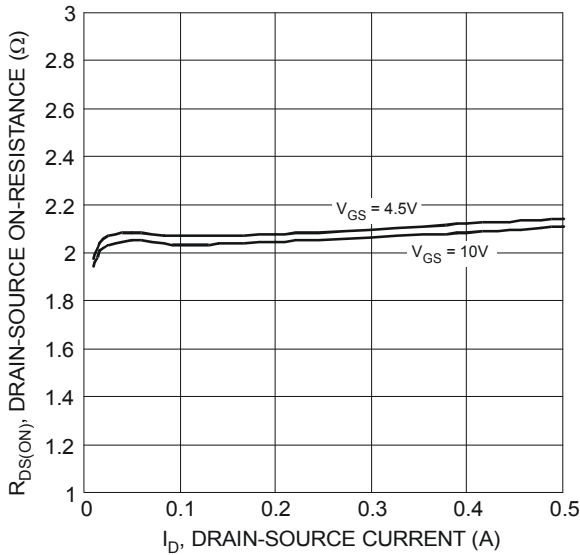


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

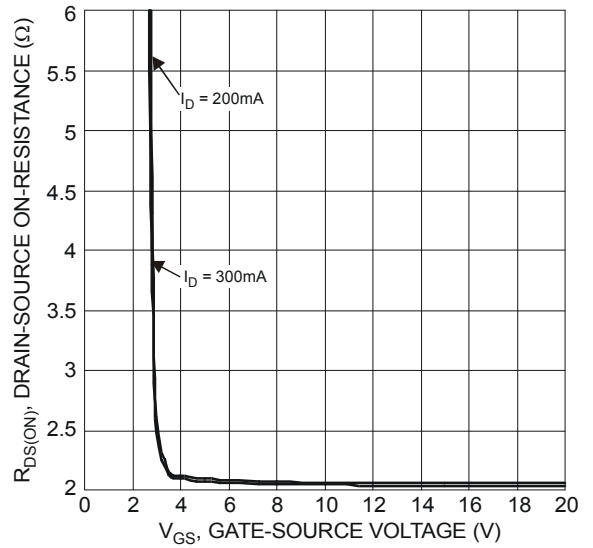


Figure 4 Typical Transfer Characteristics

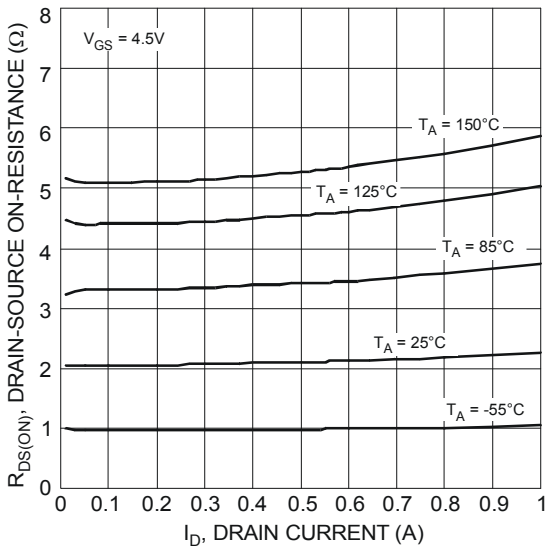


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

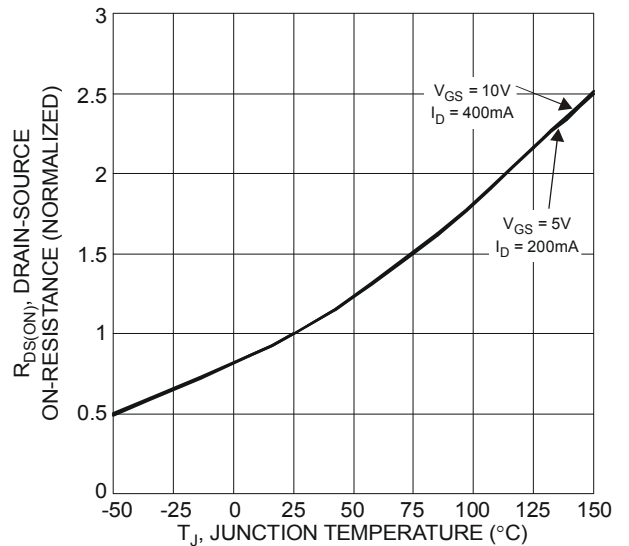


Figure 6 On-Resistance Variation with Temperature

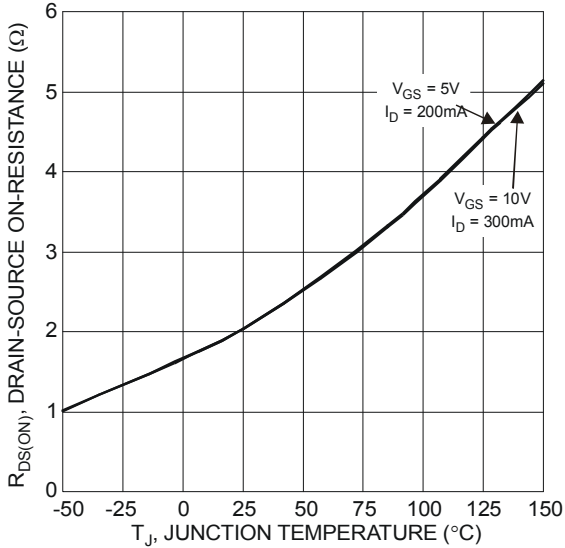


Figure 7 On-Resistance Variation with Temperature

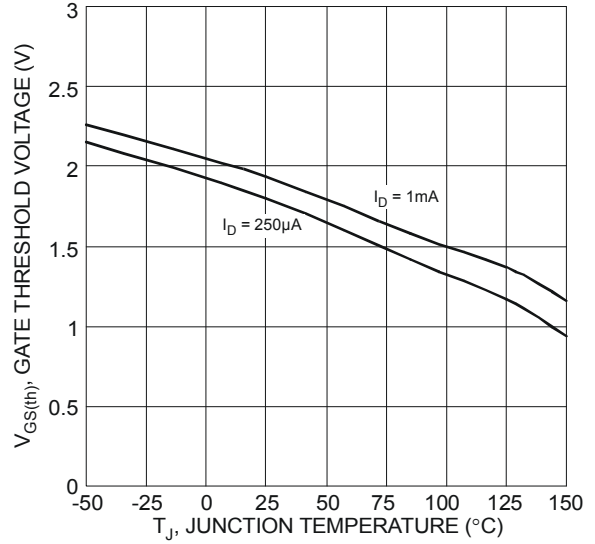


Figure 8 Gate Threshold Variation vs. Ambient Temperature

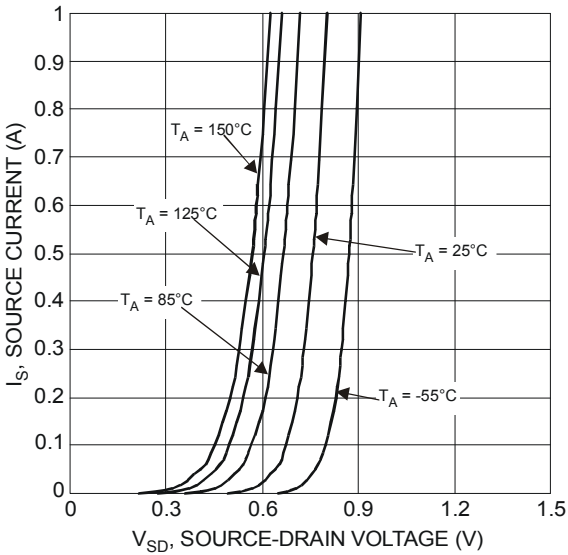


Figure 9 Diode Forward Voltage vs. Current

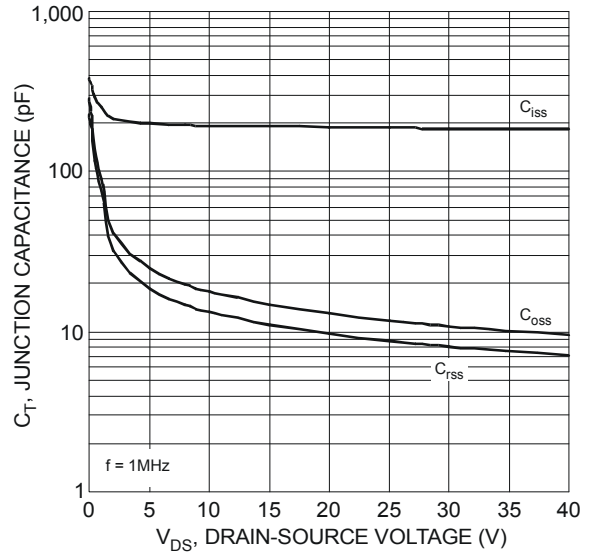


Figure 10 Typical Junction Capacitance

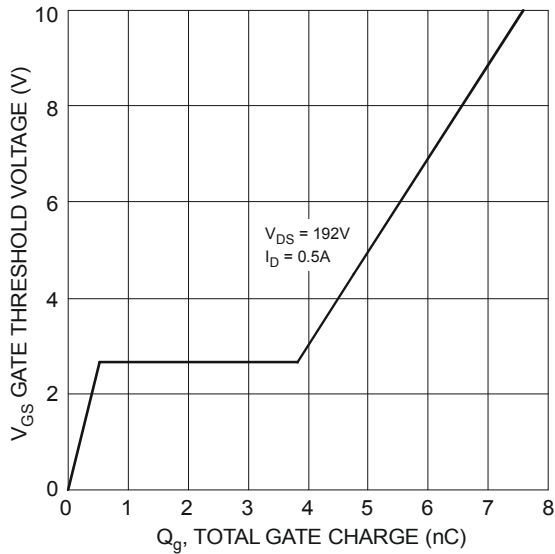


Figure 11 Gate Charge

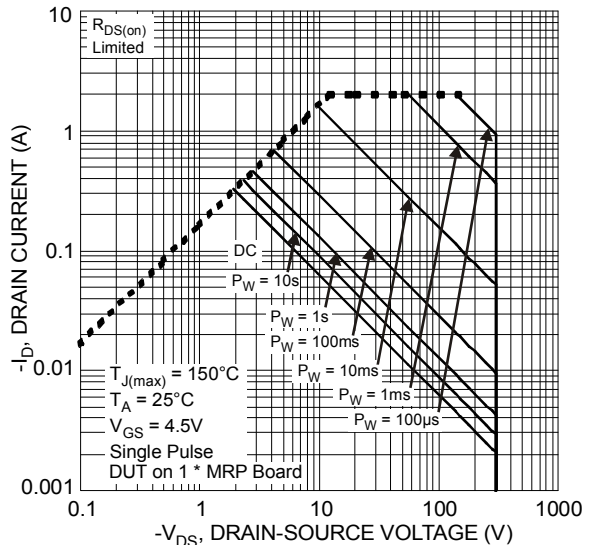


Figure 12 SOA, Safe Operation Area

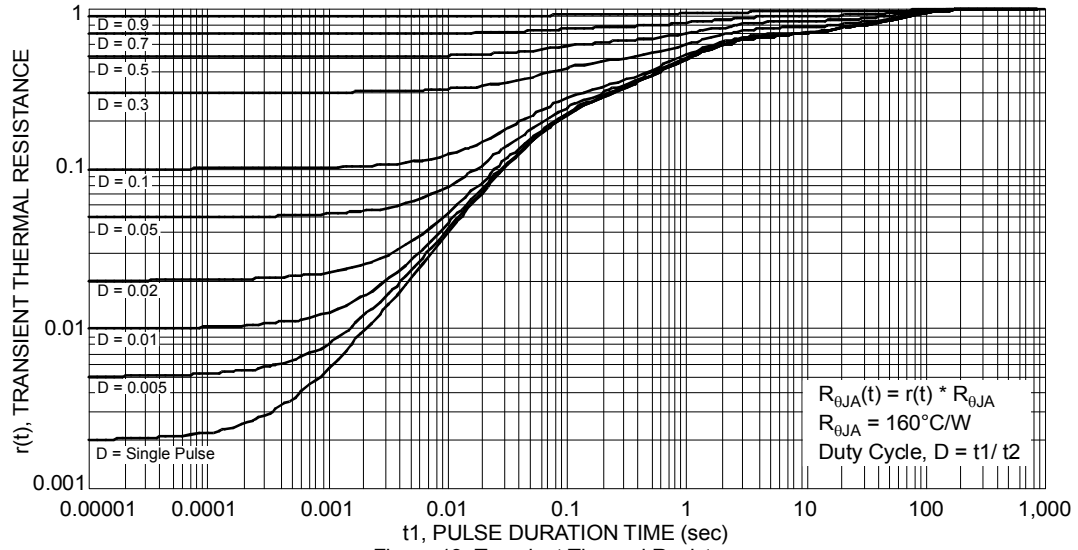
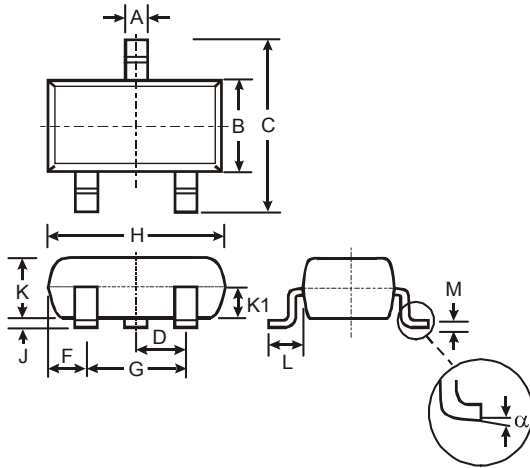


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

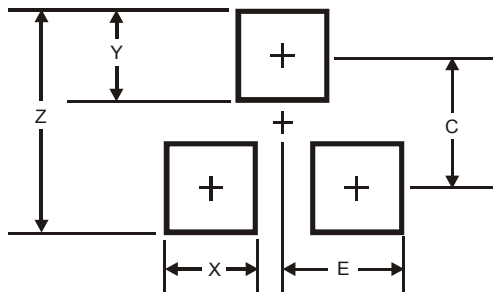
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 | 0.903 | 1.10 | 1.00 |
| K1 | - | - | 0.400 |
| L | 0.45 | 0.61 | 0.55 |
| M | 0.085 | 0.18 | 0.11 |
| α | 0° | 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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