

Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D T _A = +25°C |
|-------------------|---------------------------------|------------------------------------------|
| -30V | 77mΩ @ V _{GS} = -10V | -3.5A |
| | 95mΩ @ V _{GS} = -4.5V | -3.0A |
| | 150mΩ @ V _{GS} = -2.5V | -2.4A |

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.

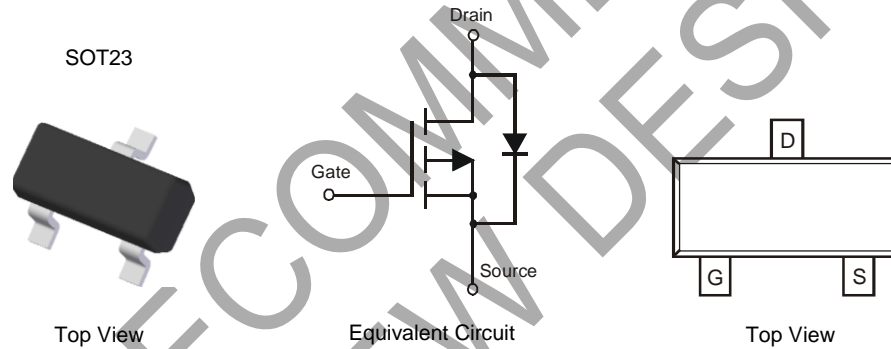
- DC-DC Converters
- Power Management Functions
- Analog Switch

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)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMP3130LQ](#))**

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 [Ⓜ]
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

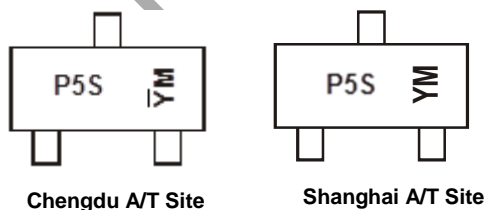


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|-------|------------------|
| DMP3130L-7 | SOT23 | 3000/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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



P5S = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test Site)
 ȲM = Date Code Marking for CAT (Chengdu Assembly/ Test Site)
 Y or Ȳ = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | V | W | X | Y | 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_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|-----------------------------------------------------------|------------------------------------------------------------------|--------------|------|
| Drain-Source Voltage | V _{DSS} | -30 | V |
| Gate-Source Voltage | V _{GSS} | ±12 | V |
| Continuous Drain Current (Note 5) V _{GS} = -4.5V | Steady State T _A = +25°C T _A = +70°C | -3.0 -2.6 | A |
| | t < 10s T _A = +25°C T _A = +70°C | -4.1 -3.2 | A |
| Maximum Continuous Body Diode Forward Current (Note 5) | I _S | -1.6 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | -20 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--------------------------------------------------|-----------------------------------|------------------------|------|
| Total Power Dissipation (Note 5) | P _D | T _A = +25°C | 0.7 |
| | | T _A = +70°C | 0.4 |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | Steady State | 184 |
| | | t < 10s | 115 |
| Total Power Dissipation (Note 6) | P _D | T _A = +25°C | 1.3 |
| | | T _A = +70°C | 0.8 |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | Steady State | 94 |
| | | t < 10s | 61 |
| Thermal Resistance, Junction to Case | R _{θJC} | 25 | |
| 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 = -250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | µA | V _{DS} = -30V, V _{GS} = 0V |
| Gate-Body Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±12V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -0.6 | — | -1.3 | V | V _{DS} = V _{GS} , I _D = -250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 59 | 77 | mΩ | V _{GS} = -10V, I _D = -4.2A |
| | | — | 73 | 95 | | V _{GS} = -4.5V, I _D = -4A |
| | | — | 115 | 150 | | V _{GS} = -2.5V, I _D = -3A |
| Forward Transconductance | g _{fs} | — | 8 | — | S | V _{DS} = -5V, I _D = -4A |
| Source-Drain Diode Forward Voltage | V _{SD} | — | -0.8 | -1.25 | V | V _{GS} = 0V, I _S = -3.0A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 432 | 864 | pF | V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 87 | 174 | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 62 | 124 | pF | |
| Gate Resistance | R _G | — | 4.04 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| SWITCHING CHARACTERISTICS (Note 8) | | | | | | |
| Total Gate Charge | Q _G | — | 5.9 | 11.8 | nC | V _{DS} = -15V, V _{GS} = -4.5V, I _D = -4.0A |
| | | — | 12 | 24 | | V _{DS} = -15V, V _{GS} = -10V, I _D = -4.0A |
| Gate-Source Charge | Q _{GS} | — | 1.0 | 2.0 | ns | V _{DS} = -15V, V _{GS} = -4.5V, I _D = -4.0A |
| Gate-Drain Charge | Q _{GD} | — | 3.1 | 6.2 | | |
| Turn-On Delay Time | t _{D(ON)} | — | 4.6 | 9.2 | ns | V _{DS} = -15V, V _{GS} = -10V, I _D = -1A, R _G = 6.0Ω |
| Rise Time | t _r | — | 6.5 | 13.0 | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 27.8 | 55.6 | | |
| Fall Time | t _f | — | 15.0 | 30.0 | | |

- 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 vias to bottom layer 1inch square copper plate.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.

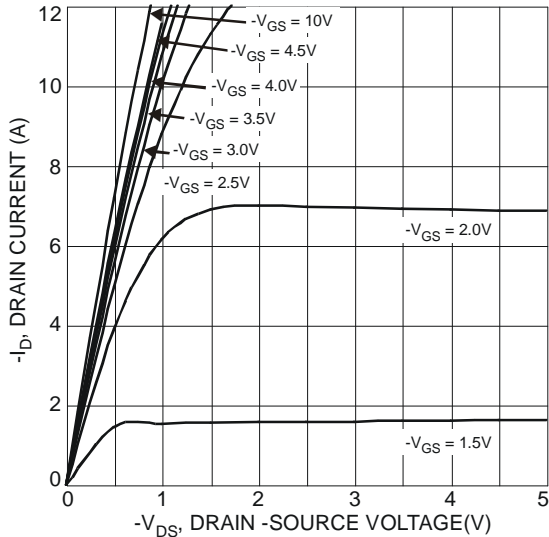


Fig. 1 Typical Output Characteristics

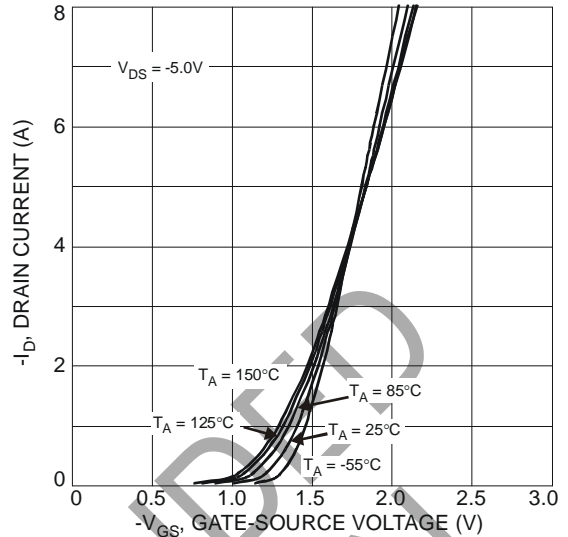


Fig. 2 Typical Transfer Characteristics

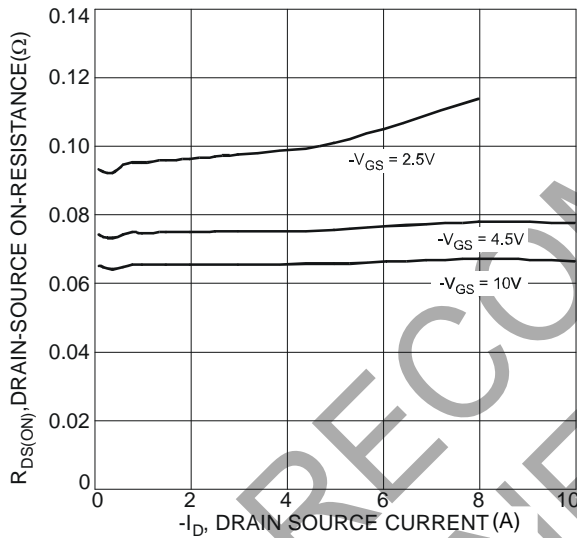


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

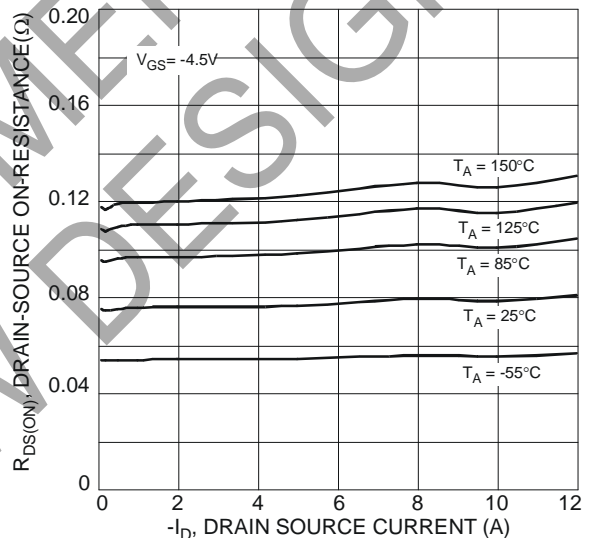


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

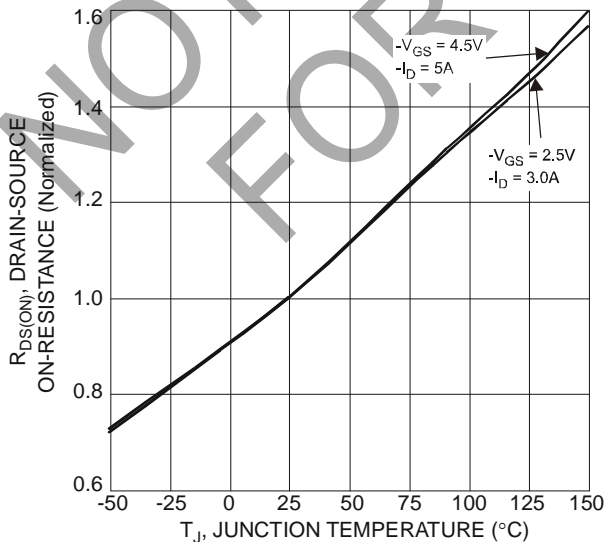


Fig. 5 On-Resistance Variation with Temperature

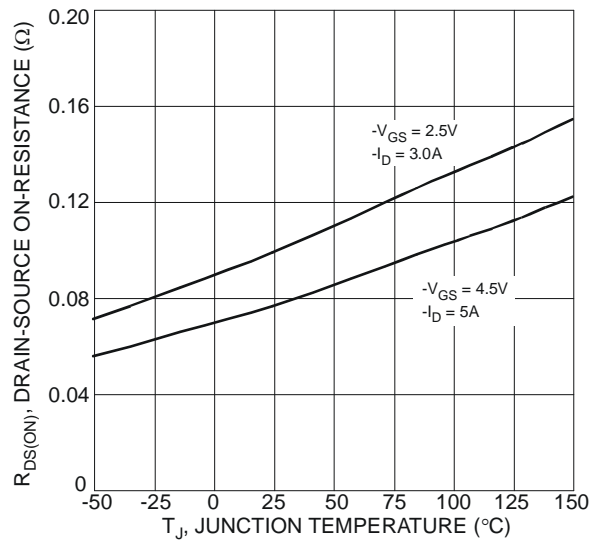


Fig. 6 On-Resistance Variation with Temperature

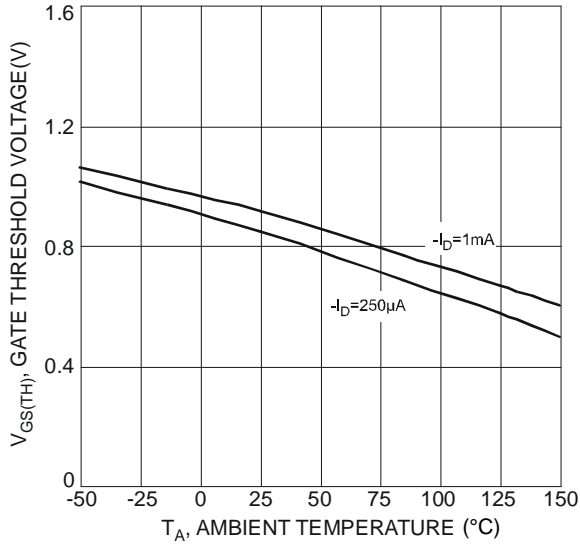


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

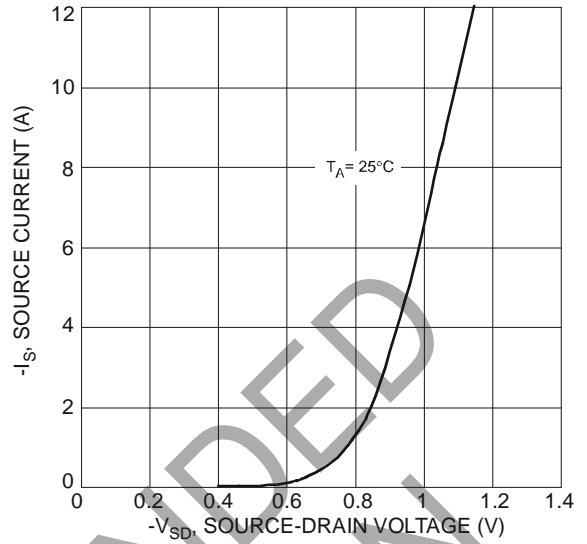


Fig. 8 Diode Forward Voltage vs. Current

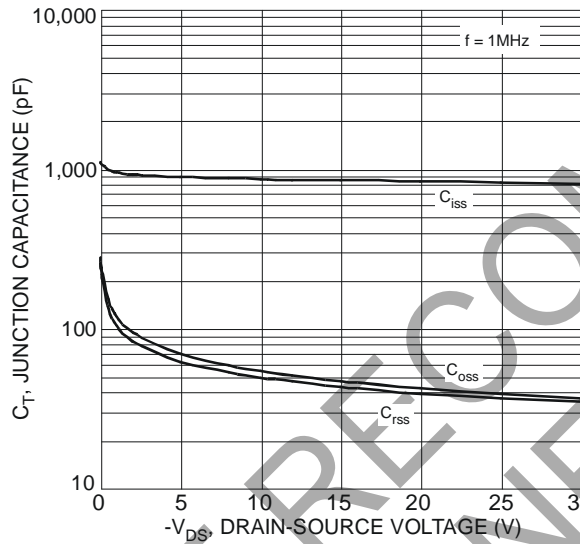


Fig. 9 Typical Junction Capacitance

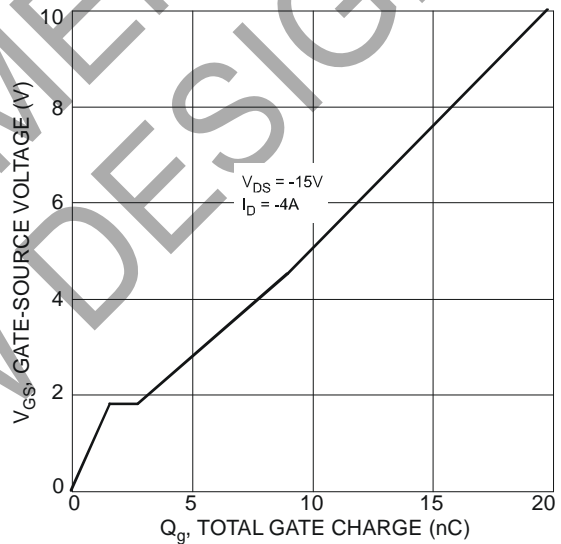


Fig. 10 Gate-Charge Characteristics

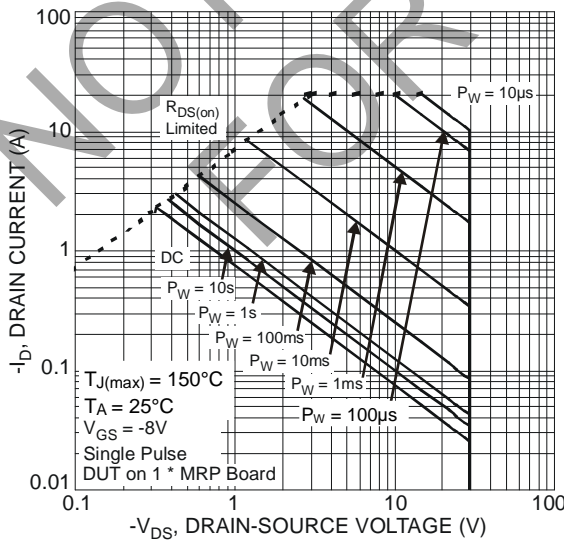
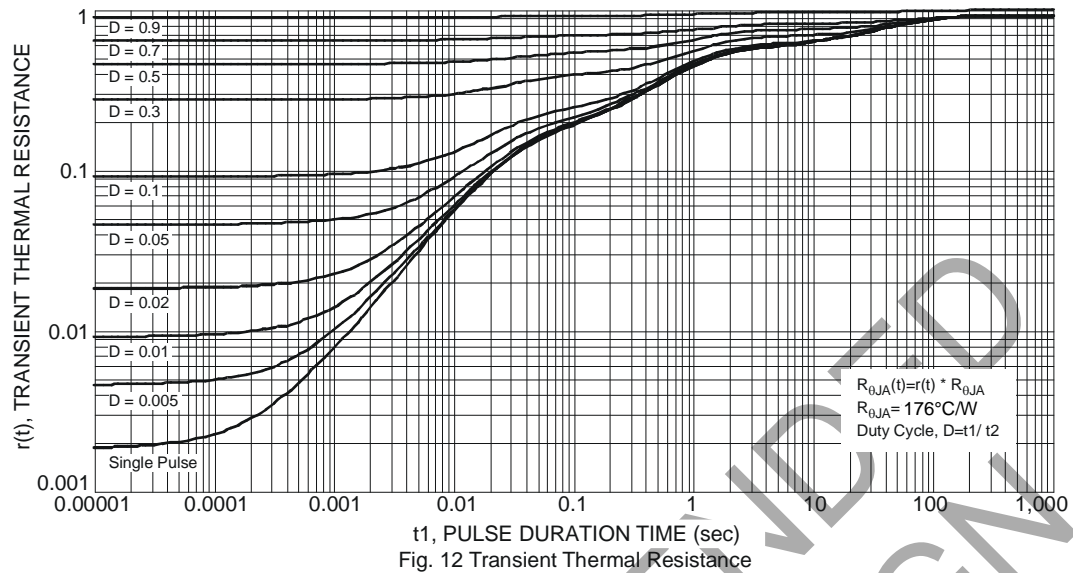


Fig. 11 SOA, Safe Operation Area

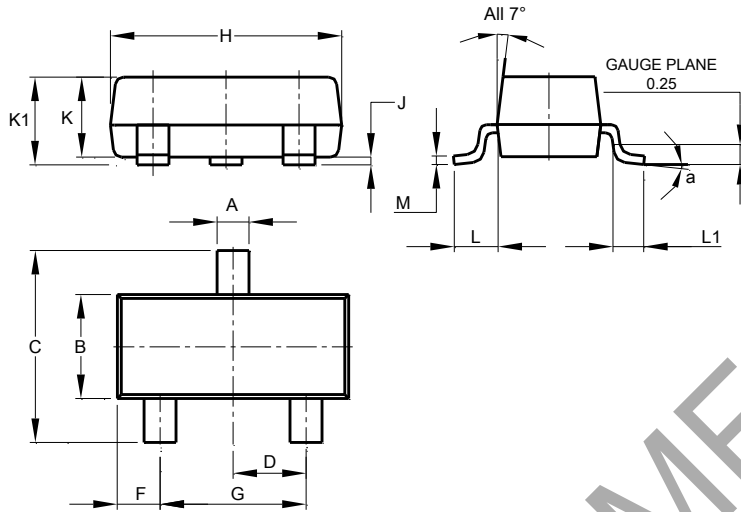


NOT RECOMMENDED FOR NEW DESIGN

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23

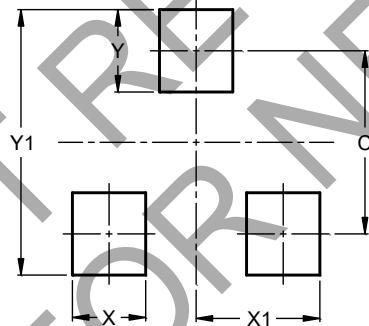


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 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 | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 2.0 |
| X | 0.8 |
| X1 | 1.35 |
| Y | 0.9 |
| Y1 | 2.9 |

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