

## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ max                 | $I_D$ max<br>$T_A = +25^\circ C$ |
|------------|----------------------------------|----------------------------------|
| -30V       | 90m $\Omega$ @ $V_{GS} = -10V$   | -3.8A                            |
|            | 134m $\Omega$ @ $V_{GS} = -4.5V$ | -3.1A                            |

## 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.

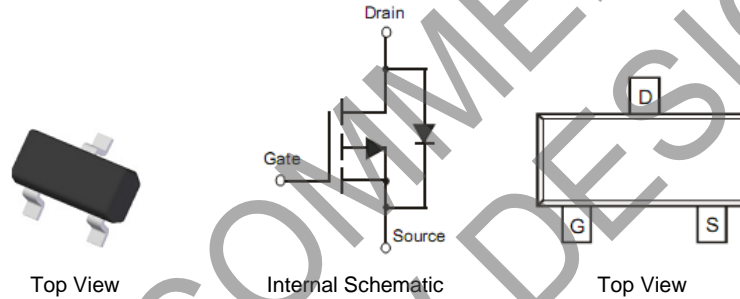
- General Purpose Interfacing Switch
- Power Management Functions
- Load Switch for Portable Devices

## Features and Benefits

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

## 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
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208e3
- Weight: 0.08 grams (Approximate)

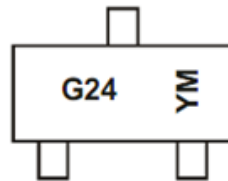


## Ordering Information (Note 4)

| Part Number | Case  | Packaging         |
|-------------|-------|-------------------|
| DMG2307L-7  | SOT23 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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



G24 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | F    | G    | H    | I    | J    | K    | L    | M    | N    | O    | P    |

| 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> | ±20          | V    |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = -10V  | Steady State | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | -2.5<br>-2.0 | A    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V  | Steady State | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | -3.8<br>-3.0 | A    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V  | t ≤ 10sec    | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | -4.6<br>-3.6 | A    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = -4.5V | Steady State | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | -3.1<br>-2.5 | A    |
| Pulsed Drain Current (Note 6)                             |              |  | I <sub>DM</sub>  | -20          | A    |

### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                           | P <sub>D</sub>                    | 0.76        | W    |
| Thermal Resistance, Junction to Ambient (Note 5)           | R <sub>θJA</sub>                  | 159         | °C/W |
| Total Power Dissipation (Note 6)                           | P <sub>D</sub>                    | 1.36        | W    |
| Thermal Resistance, Junction to Ambient (Note 6)           | R <sub>θJA</sub>                  | 94          | °C/W |
| Total Power Dissipation (Note 6) t ≤ 10sec                 | P <sub>D</sub>                    | 1.9         | W    |
| Thermal Resistance, Junction to Ambient (Note 6) t ≤ 10sec | R <sub>θJA</sub>                  | 65.8        | °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>    | —    | —     | -1.0 | μA   | @T <sub>C</sub> = +25°C<br>V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V   |
| Gate-Source Leakage                         | I <sub>GSS</sub>    | —    | —     | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 7)</b>          |                     |      |       |      |      |   |
| Gate Threshold Voltage                      | V <sub>GS(TH)</sub> | -1.0 | —     | -3.0 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA   |
| Static Drain-Source On-Resistance           | R <sub>DS(ON)</sub> | —    | 70    | 90   | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -2.5A  |
|   |                     | —    | 105   | 134  |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.5A   |
| Forward Transfer Admittance                 | Y <sub>fs</sub>     | —    | 4.8   | —    | S    | V <sub>DS</sub> = -10V, I <sub>D</sub> = -2.5A  |
| Diode Forward Voltage (Note 6)              | V <sub>SD</sub>     | —    | -0.75 | -1.0 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A  |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>     |                     |      |       |      |      |   |
| Input Capacitance                           | C <sub>iss</sub>    | —    | 371.3 | —    | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz   |
| Output Capacitance                          | C <sub>oss</sub>    | —    | 51.3  | —    | pF   |   |
| Reverse Transfer Capacitance                | C <sub>rss</sub>    | —    | 45.9  | —    | pF   |   |
| Gate Resistance                             | R <sub>g</sub>      | —    | 17    | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz  |
| Total Gate Charge (V <sub>GS</sub> = -4.5V) | Q <sub>g</sub>      | —    | 4.0   | —    | nC   | V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V,<br>I <sub>D</sub> = -3A   |
| Total Gate Charge (V <sub>GS</sub> = -10V)  | Q <sub>g</sub>      | —    | 8.2   | —    | nC   |   |
| Gate-Source Charge                          | Q <sub>gs</sub>     | —    | 0.9   | —    | nC   |   |
| Gate-Drain Charge                           | Q <sub>gd</sub>     | —    | 1.2   | —    | nC   |   |
| Turn-On Delay Time                          | t <sub>D(ON)</sub>  | —    | 4.8   | —    | ns   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V,<br>R <sub>L</sub> = 15Ω, R <sub>G</sub> = 6Ω,<br>I <sub>D</sub> = -1A |
| Turn-On Rise Time                           | t <sub>R</sub>      | —    | 7.3   | —    | ns   |   |
| Turn-Off Delay Time                         | t <sub>D(OFF)</sub> | —    | 22.4  | —    | ns   |   |
| Turn-Off Fall Time                          | t <sub>F</sub>      | —    | 13.4  | —    | ns   |   |

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias 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.

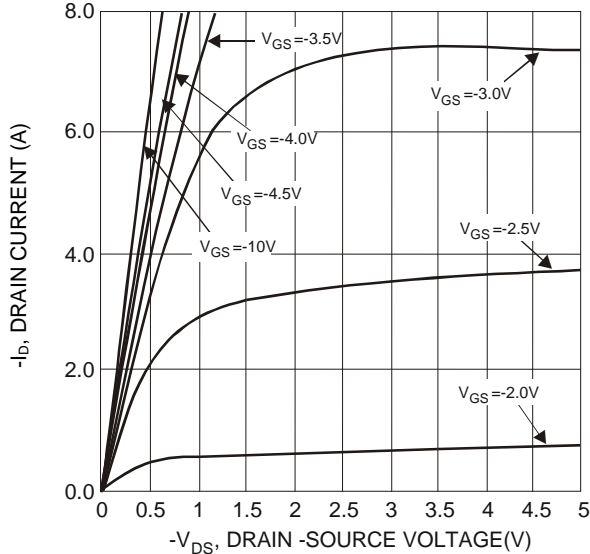


Fig. 1 Typical Output Characteristics

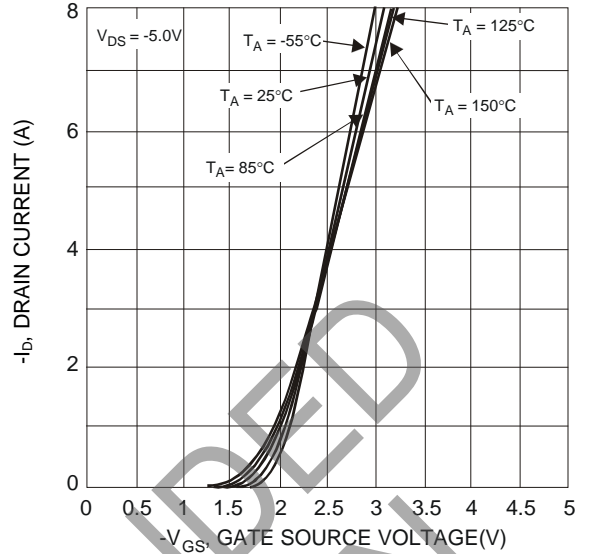


Fig. 2 Typical Transfer Characteristics

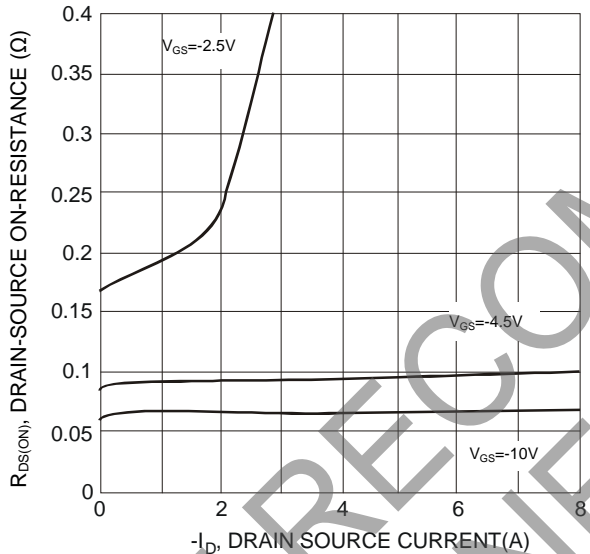


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

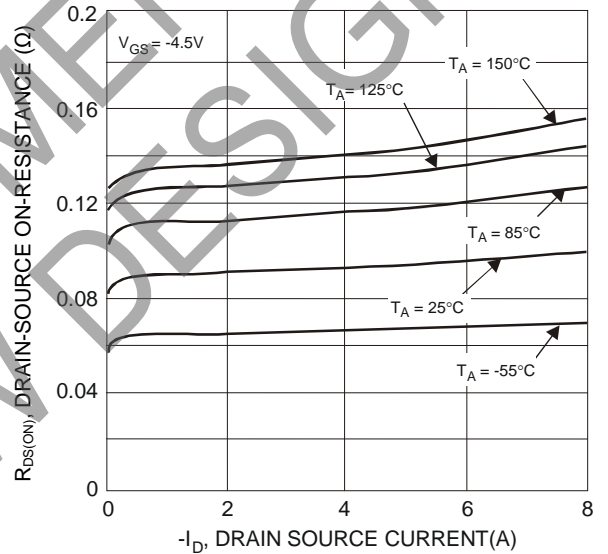


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

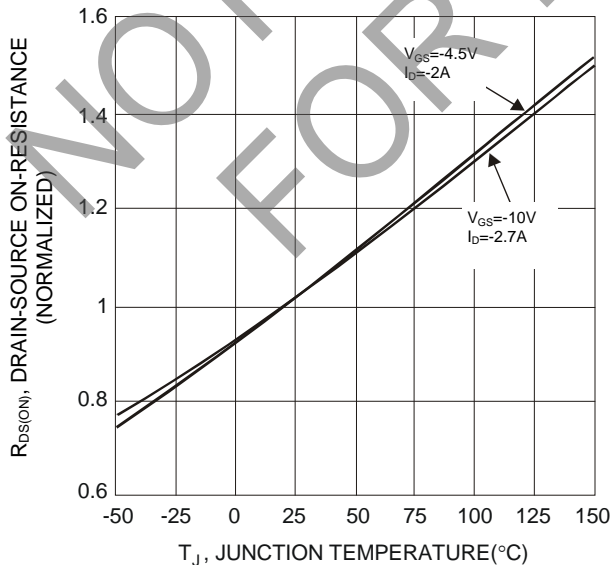


Fig. 5 On-Resistance Variation with Temperature

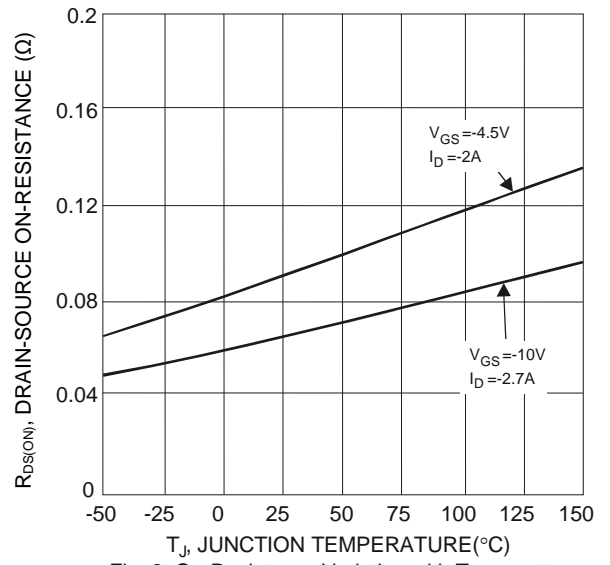


Fig. 6 On-Resistance Variation with Temperature

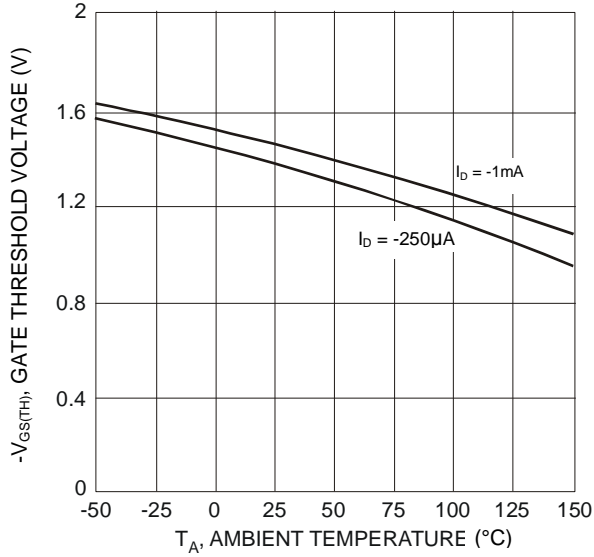


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

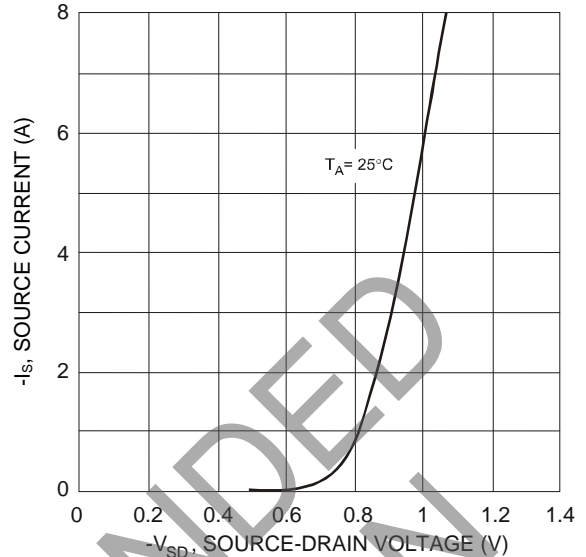


Fig. 8 Diode Forward Voltage vs. Current

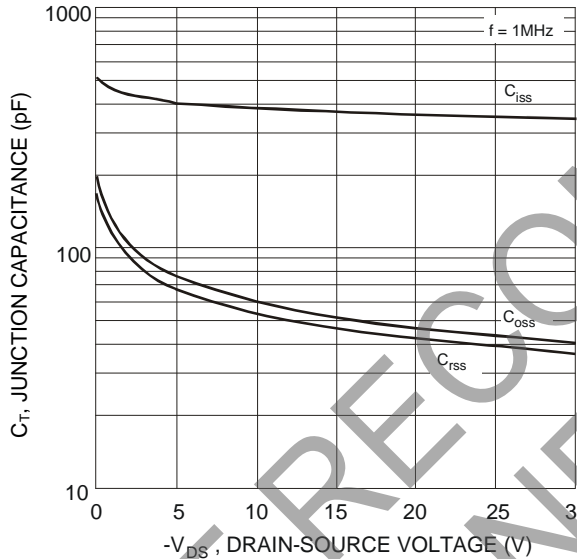


Fig. 9 Typical Junction Capacitance

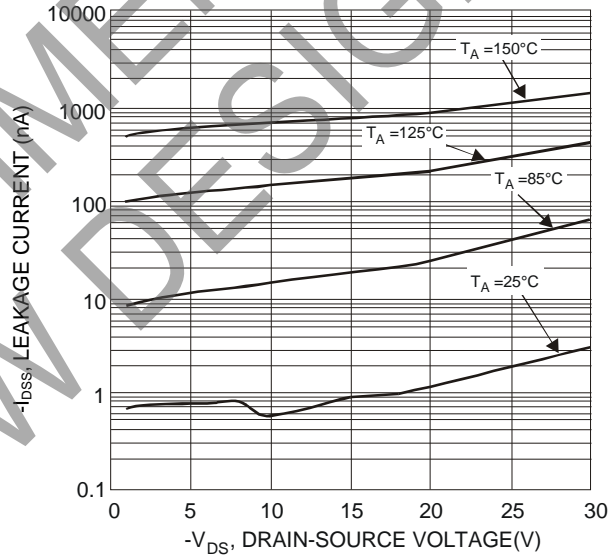


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

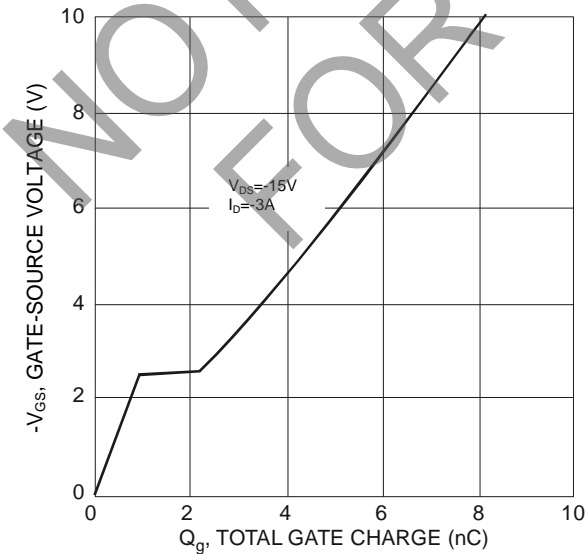


Fig. 11 Gate-Charge Characteristics

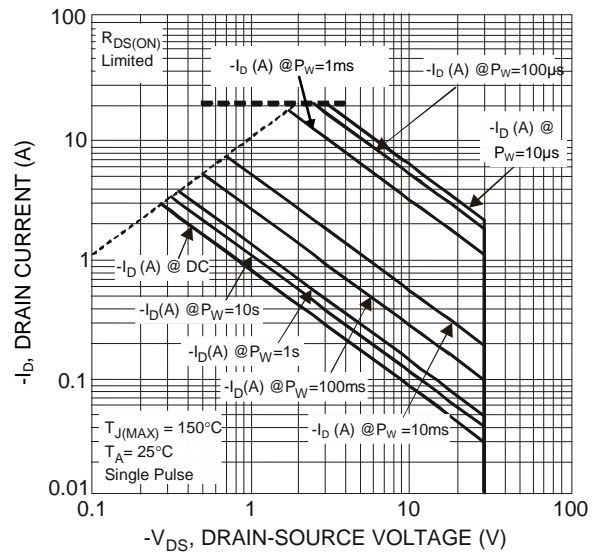
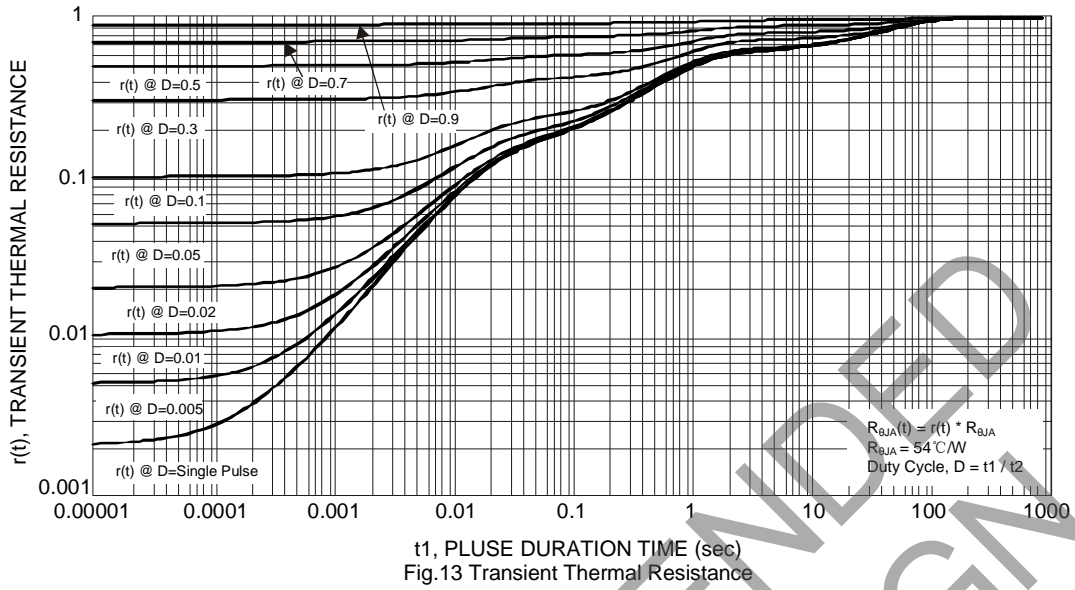


Fig. 12 SOA, Safe Operation Area

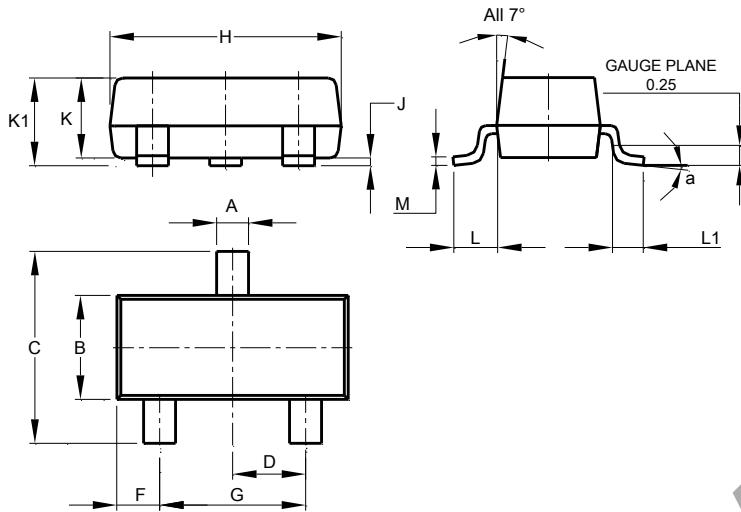


NOT RECOMMENDED FOR NEW DESIGN

**Package Outline Dimensions**

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

**SOT23**

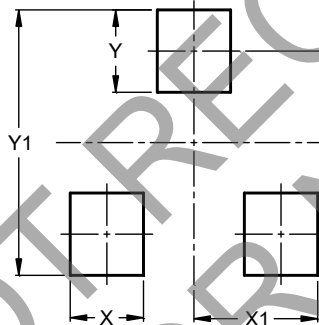


| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 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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