

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> Max        | I <sub>D</sub> Max<br>T <sub>A</sub> = +25°C |
|-------------------|--------------------------------|----------------------------------------------|
| -30V              | 12mΩ @ V <sub>GS</sub> = -10V  | -10.5A                                       |
|                   | 21mΩ @ V <sub>GS</sub> = -4.5V | -8.0A                                        |

## Description and Applications

This MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

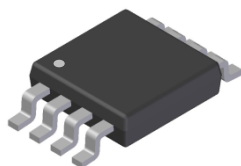
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

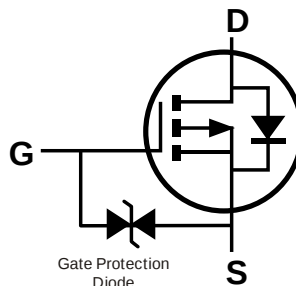
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

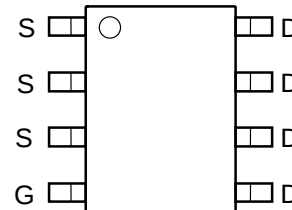
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram Below
- Terminals: Finish — Matte Tin Annealed Over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 
- Weight: 0.074 grams (Approximate)



Top View



Internal Schematic



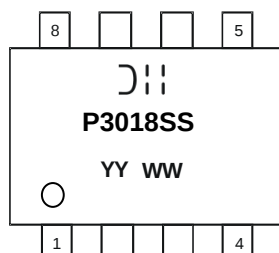
Top View  
Pin Configuration

## Ordering Information (Note 4)

| Part Number   | Case | Packaging         |
|---------------|------|-------------------|
| DMP3018SSS-13 | SO-8 | 2,500/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



⌋⌋⌋ = Manufacturer's Marking  
 P3018SS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 18 = 2018)  
 WW = Week (01 to 53)

**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> | ±25           | V    |
| 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>   | -10.5<br>-8.5 | A    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V | Steady State | T <sub>C</sub> = +25°C<br>T <sub>C</sub> = +70°C | I <sub>D</sub>   | -25<br>-20    | A    |
| Maximum Continuous Body Diode Forward Current (Note 6)   |              |                                                  | I <sub>S</sub>   | -20           | A    |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)       |              |                                                  | I <sub>DM</sub>  | -90           | A    |
| Avalanche Current (Note 7) L = 1mH                       |              |                                                  | I <sub>AS</sub>  | -14           | A    |
| Avalanche Energy (Note 7) L = 1mH                        |              |                                                  | E <sub>AS</sub>  | 104           | mJ   |

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

| Characteristic                                   |                        | Symbol                            | Value       | Unit |
|--------------------------------------------------|------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.2         | W    |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State           | R <sub>θJA</sub>                  | 101         | °C/W |
| Total Power Dissipation (Note 6)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.7         | W    |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State           | R <sub>θJA</sub>                  | 73          | °C/W |
| Total Power Dissipation (Note 6)                 |                        | P <sub>D</sub>                    | 10          | W    |
| Thermal Resistance, Junction to Case (Note 6)    |                        | R <sub>θJC</sub>                  | 12.5        | °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 8)</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> = -24V, V <sub>GS</sub> = 0V                                                 |
| Gate-Source Leakage                        | I <sub>GSS</sub>    | —    | —    | ±10  | μA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                 |
| <b>ON CHARACTERISTICS (Note 8)</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> | —    | 8.7  | 12   | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -11.5A                                              |
|                                            |                     | —    | 14.5 | 21   |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -8.5A                                              |
| Diode Forward Voltage                      | V <sub>SD</sub>     | —    | -0.7 | -1.2 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A                                                   |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>    |                     |      |      |      |      |                                                                                              |
| Input Capacitance                          | C <sub>iss</sub>    | —    | 2714 | —    | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz                                     |
| Output Capacitance                         | C <sub>oss</sub>    | —    | 727  | —    | pF   |                                                                                              |
| Reverse Transfer Capacitance               | C <sub>rss</sub>    | —    | 342  | —    | pF   |                                                                                              |
| Gate Resistance                            | R <sub>g</sub>      | —    | 14.2 | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz                                       |
| Total Gate Charge (V <sub>GS</sub> = -5V)  | Q <sub>g</sub>      | —    | 31   | —    | nC   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -11.5A                                              |
| Total Gate Charge (V <sub>GS</sub> = -10V) | Q <sub>g</sub>      | —    | 57   | —    | nC   |                                                                                              |
| Gate-Source Charge                         | Q <sub>gs</sub>     | —    | 7    | —    | nC   |                                                                                              |
| Gate-Drain Charge                          | Q <sub>gd</sub>     | —    | 15.5 | —    | nC   |                                                                                              |
| Turn-On Delay Time                         | t <sub>D(ON)</sub>  | —    | 7.8  | —    | ns   | V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = -11.5A |
| Turn-On Rise Time                          | t <sub>R</sub>      | —    | 17.8 | —    | ns   |                                                                                              |
| Turn-Off Delay Time                        | t <sub>D(OFF)</sub> | —    | 62.2 | —    | ns   |                                                                                              |
| Turn-Off Fall Time                         | t <sub>F</sub>      | —    | 40.9 | —    | ns   |                                                                                              |
| Reverse Recovery Time                      | t <sub>RR</sub>     | —    | 21   | —    | ns   | I <sub>S</sub> = -11.5A, dI/dt = 100A/μs                                                     |
| Reverse Recovery Charge                    | Q <sub>RR</sub>     | —    | 10.5 | —    | nC   |                                                                                              |

- 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 1-inch square copper plate.
  - I<sub>AS</sub> and E<sub>AS</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

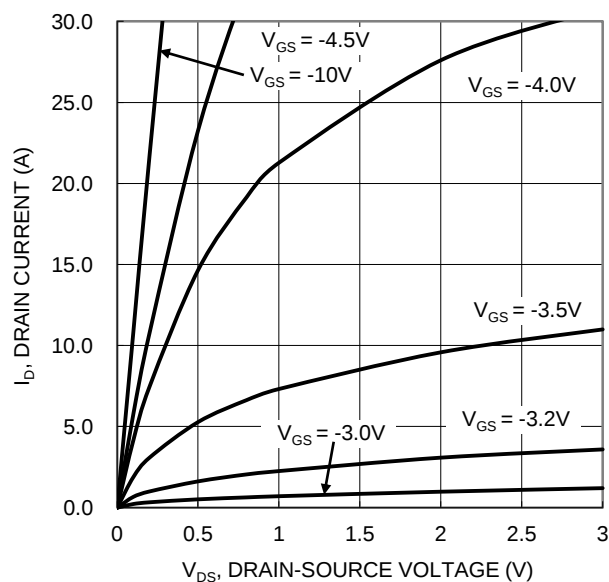


Figure 1. Typical Output Characteristic

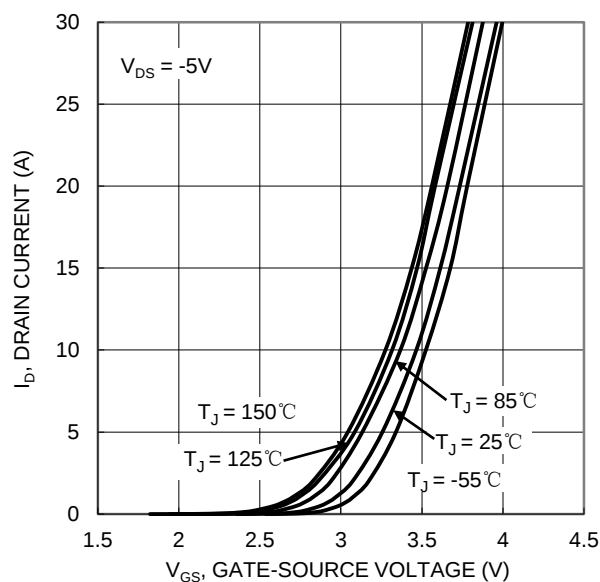


Figure 2. Typical Transfer Characteristic

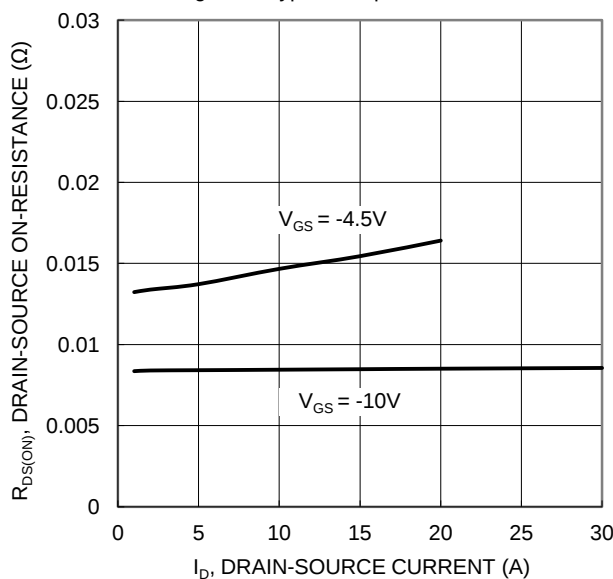


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

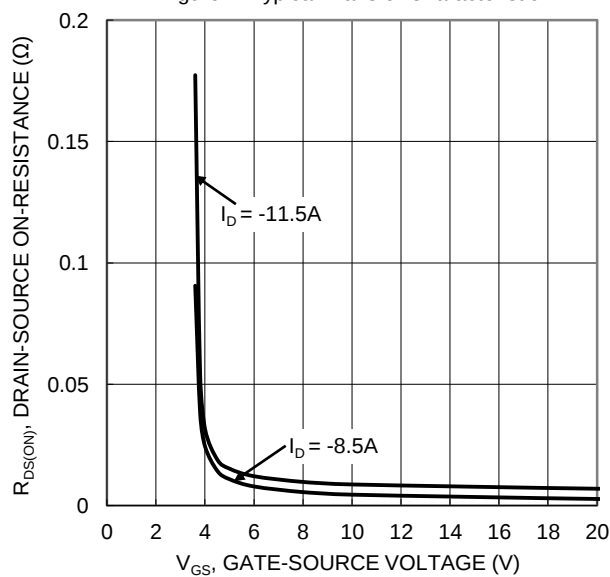


Figure 4. Typical Transfer Characteristic

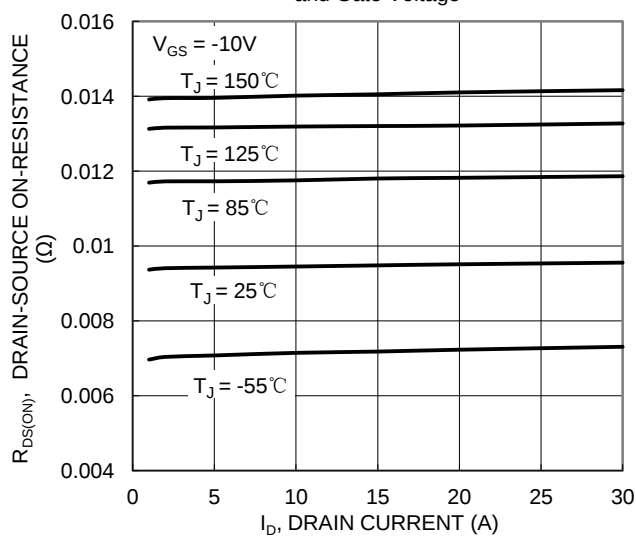


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

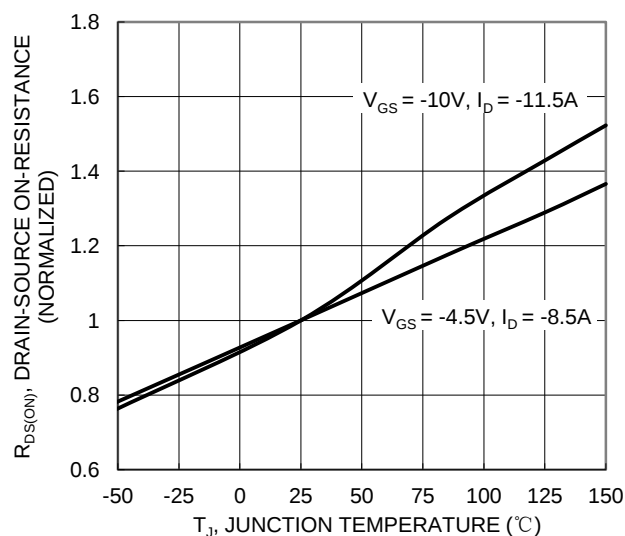
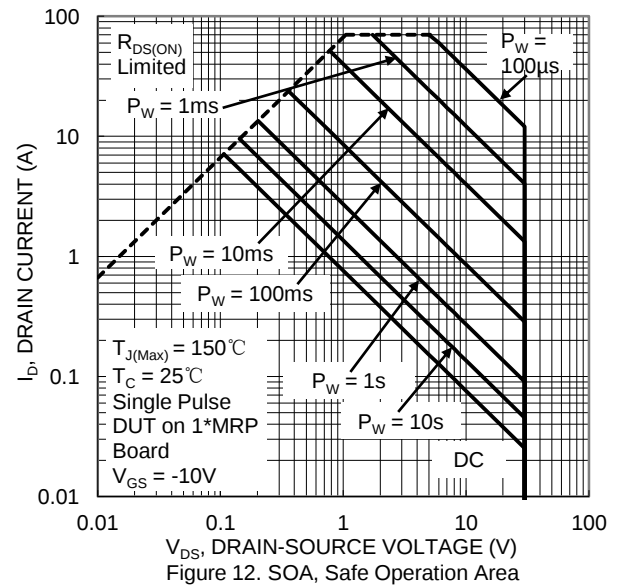
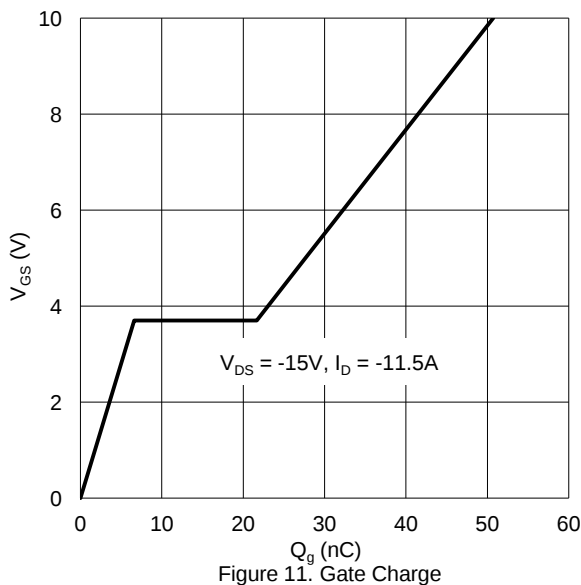
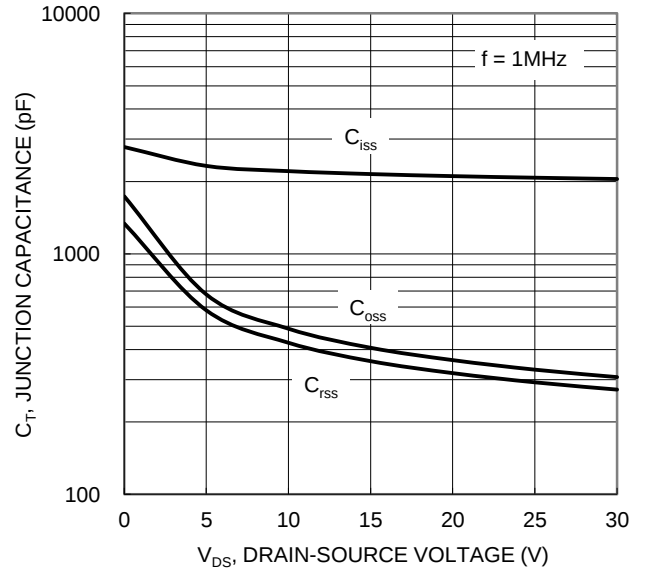
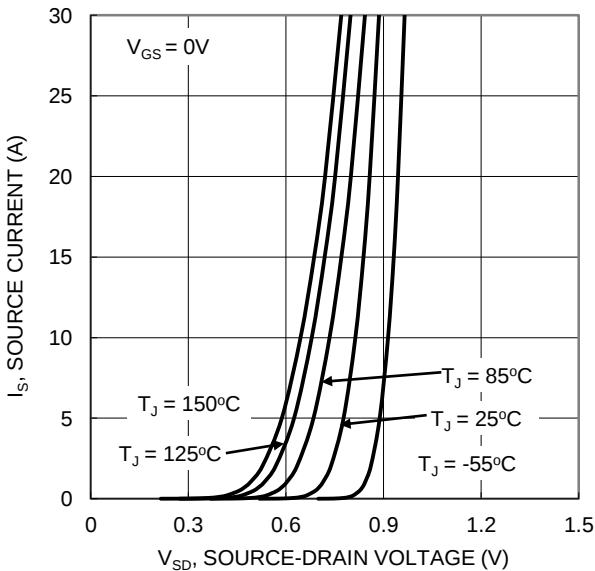
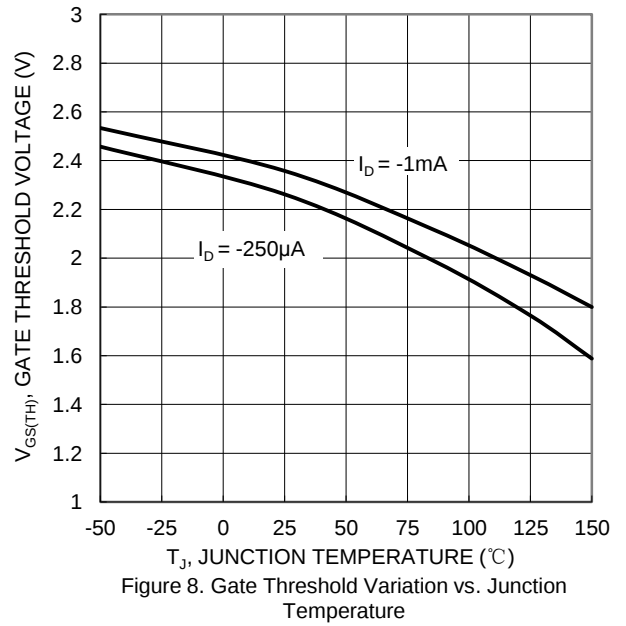
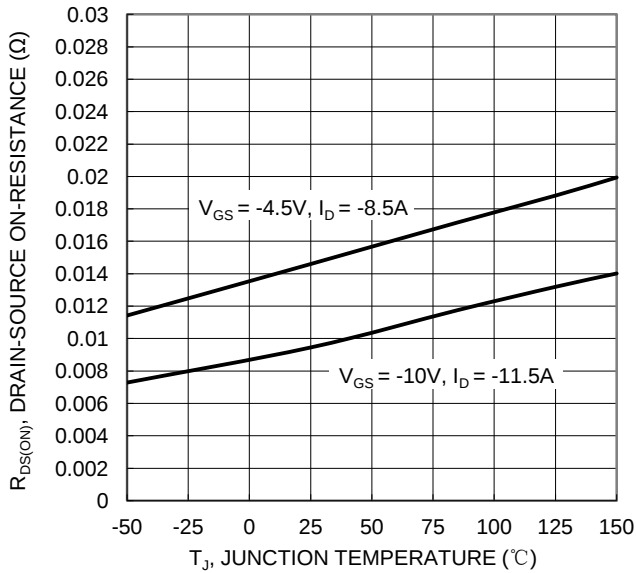


Figure 6. On-Resistance Variation with Junction Temperature



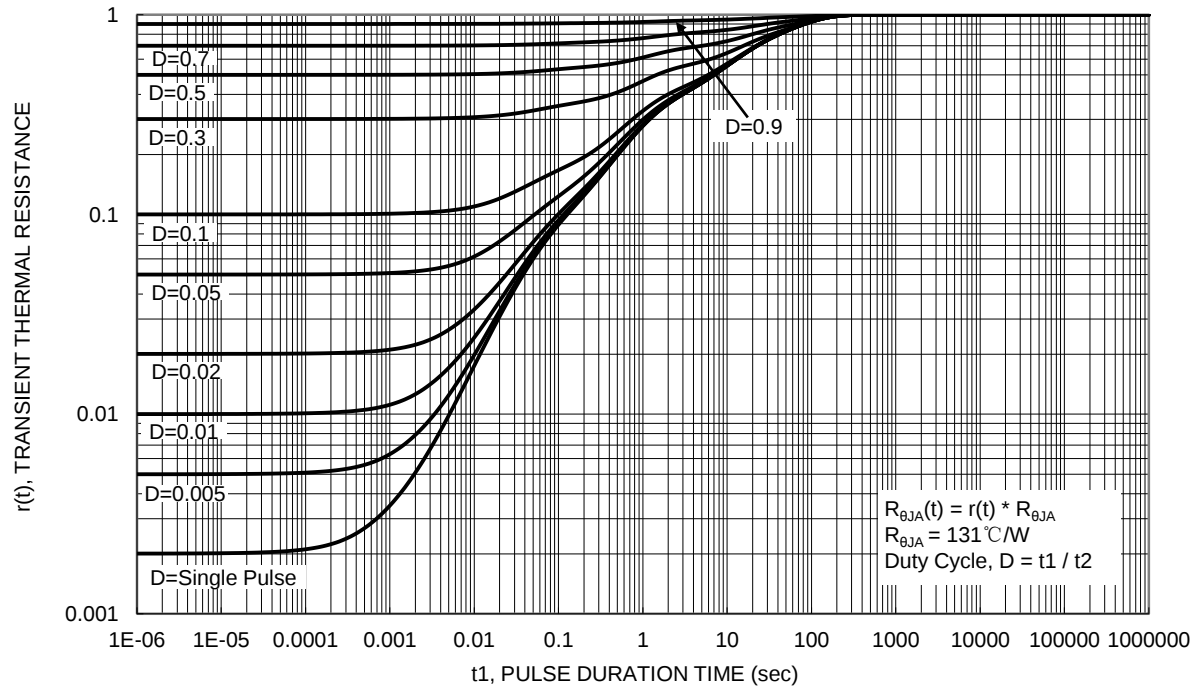
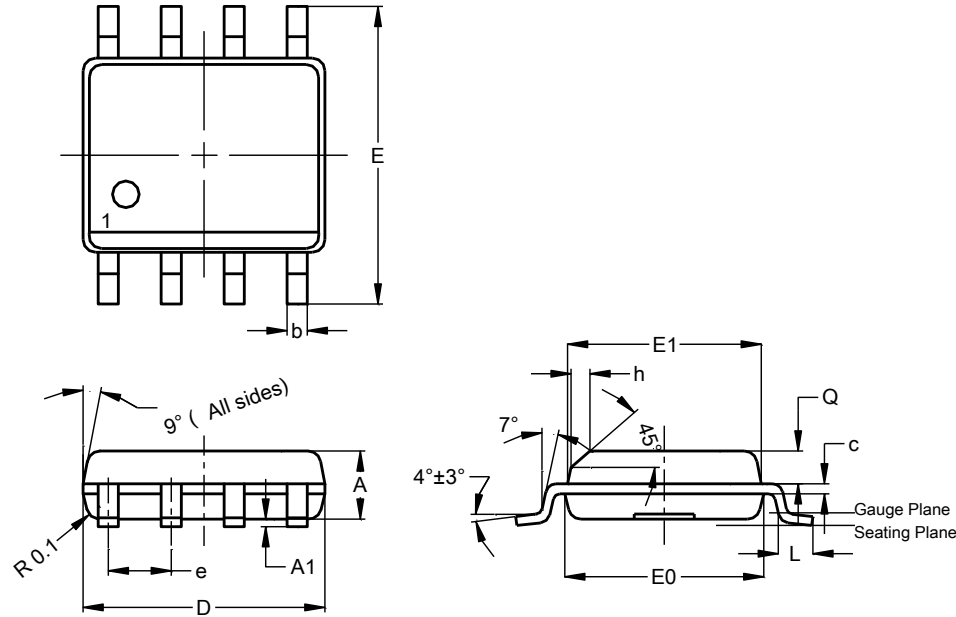


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

## SO-8

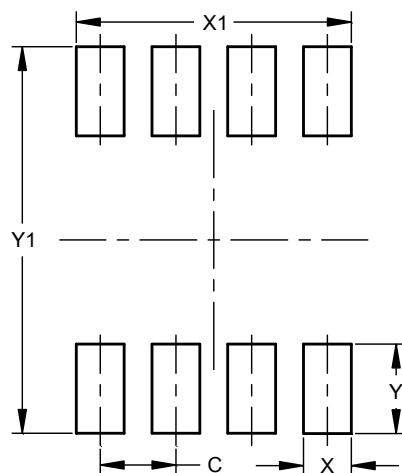


| SO-8                 |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 1.40 | 1.50 | 1.45 |
| A1                   | 0.10 | 0.20 | 0.15 |
| b                    | 0.30 | 0.50 | 0.40 |
| c                    | 0.15 | 0.25 | 0.20 |
| D                    | 4.85 | 4.95 | 4.90 |
| E                    | 5.90 | 6.10 | 6.00 |
| E1                   | 3.80 | 3.90 | 3.85 |
| E0                   | 3.85 | 3.95 | 3.90 |
| e                    | --   | --   | 1.27 |
| h                    | -    | --   | 0.35 |
| L                    | 0.62 | 0.82 | 0.72 |
| Q                    | 0.60 | 0.70 | 0.65 |
| All Dimensions in mm |      |      |      |

### Suggested Pad Layout

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

## SO-8



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.27          |
| X          | 0.802         |
| X1         | 4.612         |
| Y          | 1.505         |
| Y1         | 6.50          |

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