

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on) \text{ max}}$              | $I_D$<br>$T_C = +25^\circ\text{C}$ |
|---------------|---------------------------------------|------------------------------------|
| -30V          | 20m $\Omega$ @ $V_{GS} = -10\text{V}$ | -18.0A                             |
|               | 29m $\Omega$ @ $V_{GS} = -5\text{V}$  | -15.0A                             |

## Description

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.

## Applications

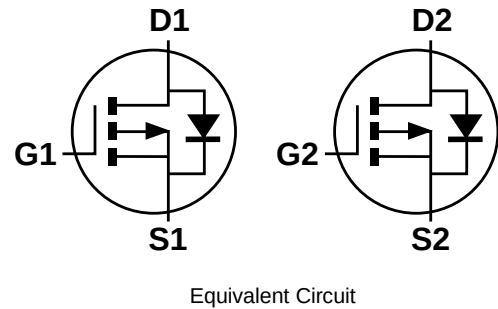
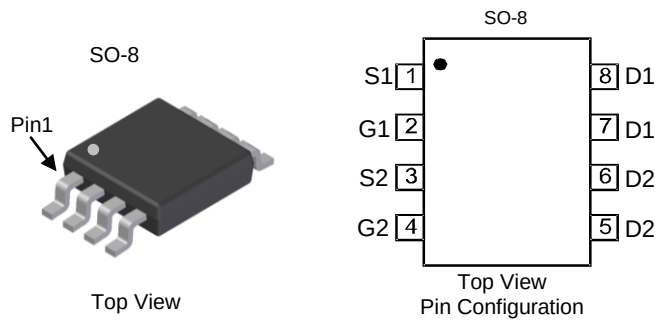
- DC-DC Converters
- Power Management Functions
- Backlighting

## Features

- 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: 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: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.074 grams (Approximate)

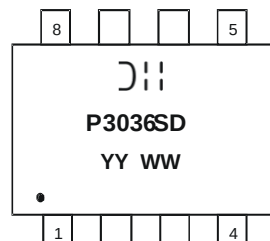


## Ordering Information (Note 4)

| Part Number   | Case | Packaging           |
|---------------|------|---------------------|
| DMP3036SSD-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) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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



D = Manufacturer's Marking  
 P3036SD = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 14 = 2014)  
 WW = Week (01 - 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 | T <sub>C</sub> = +25°C | I <sub>D</sub>   | -18.0 | A    |
|                                                          | T <sub>C</sub> = +70°C | I <sub>D</sub>   | -14.3 | A    |
|                                                          | T <sub>A</sub> = +25°C | I <sub>D</sub>   | -10.6 | A    |
|                                                          | T <sub>A</sub> = +70°C | I <sub>D</sub>   | -8.5  | A    |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%)       |                        | I <sub>DM</sub>  | -80   | A    |
| Maximum Continuous Body Diode Forward Current (Note 6)   |                        | I <sub>S</sub>   | -3.6  | A    |
| Avalanche Current (Note 7) L = 0.3mH                     |                        | I <sub>AS</sub>  | -17.5 | A    |
| Avalanche Energy (Note 7) L = 0.3mH                      |                        | E <sub>AS</sub>  | 64    | mJ   |

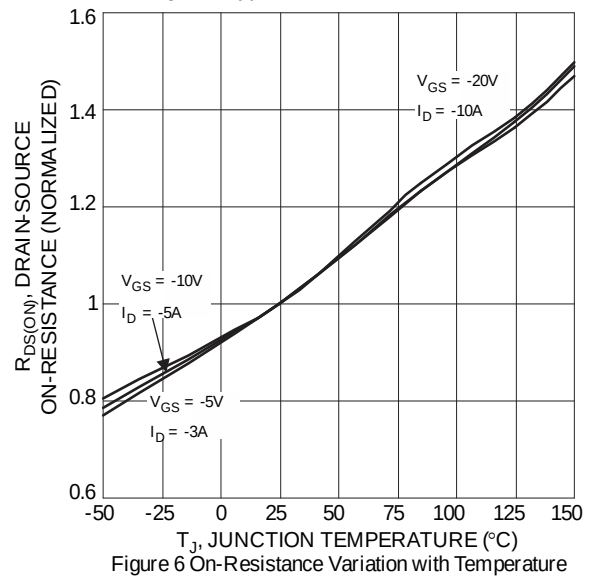
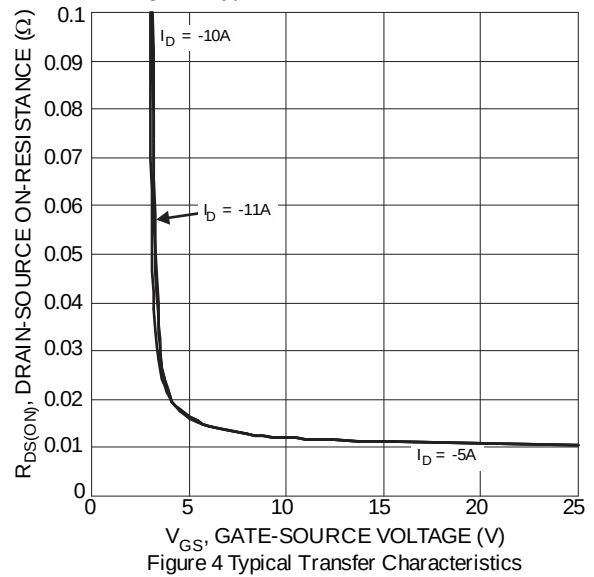
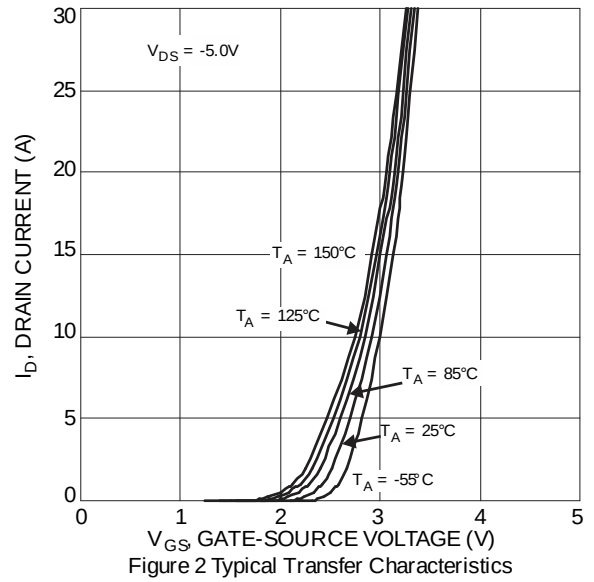
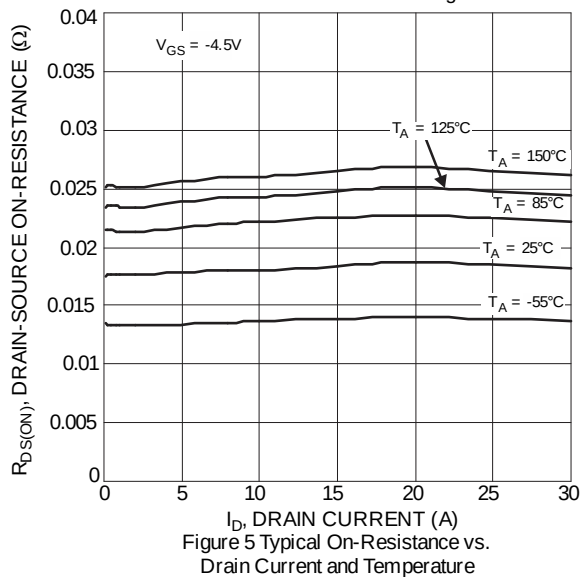
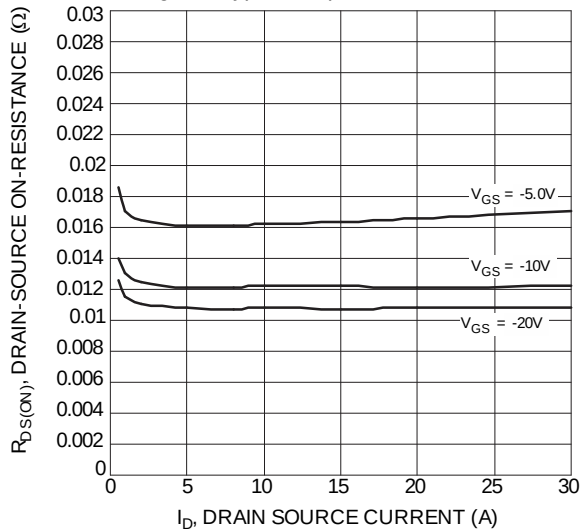
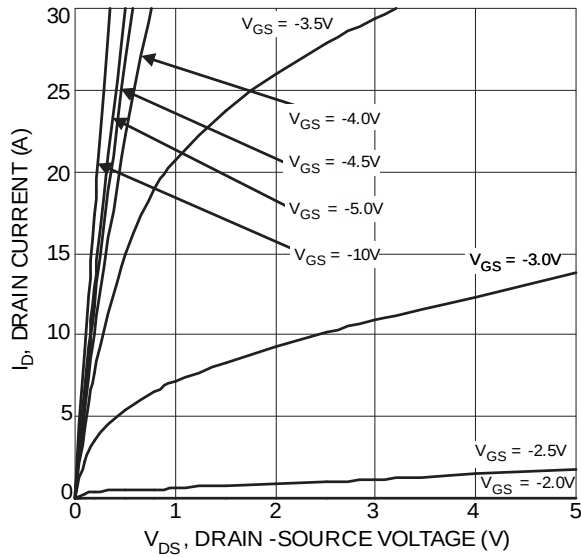
## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

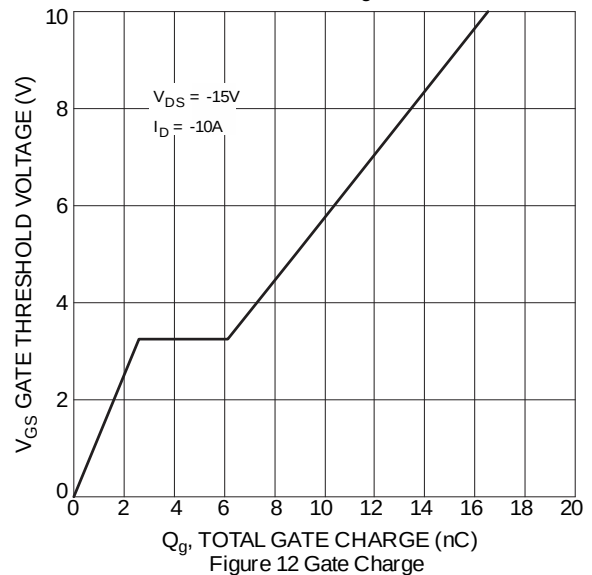
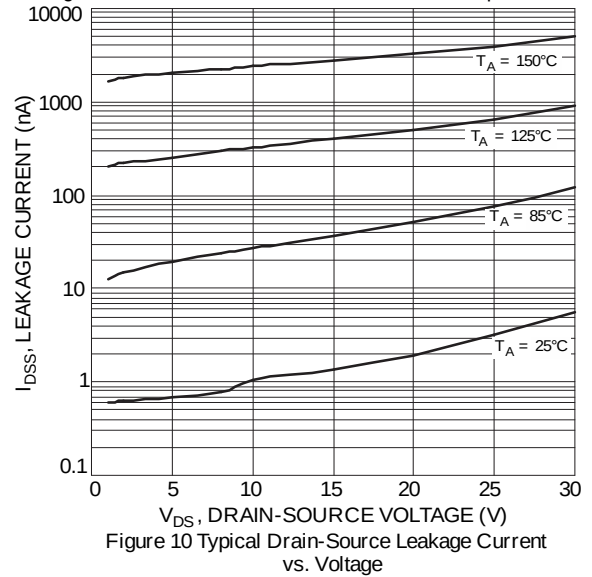
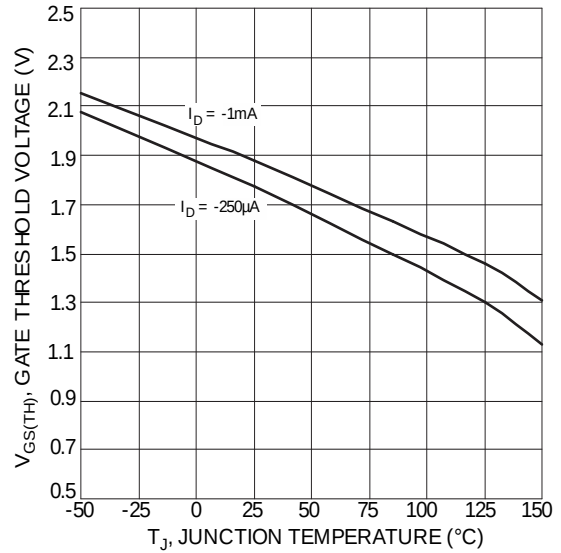
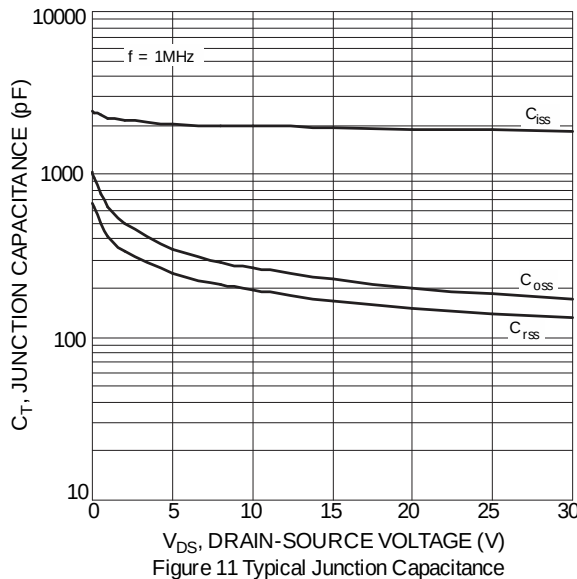
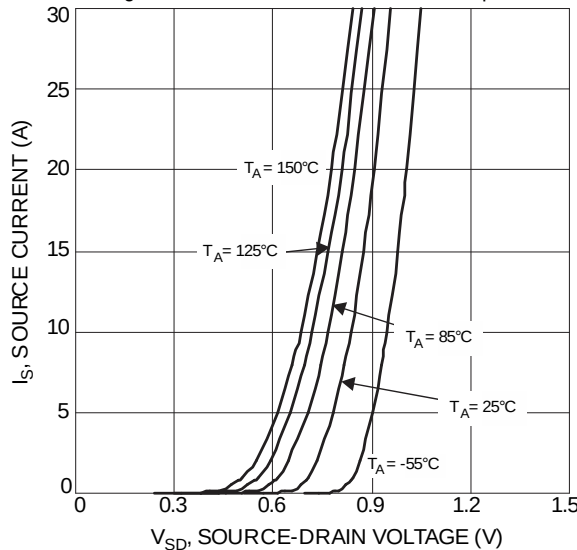
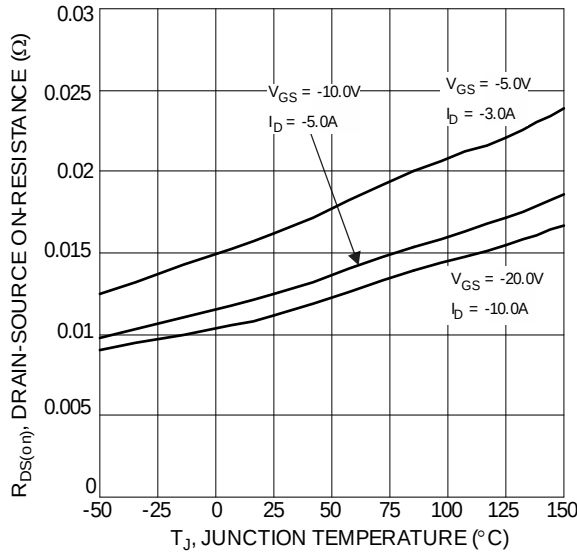
| Characteristic                                   |                        | Symbol                            | Value       | Units |
|--------------------------------------------------|------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.2         | W     |
|                                                  | T <sub>A</sub> = +70°C |                                   | 0.9         |       |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State           | R <sub>θJA</sub>                  | 104         | °C/W  |
|                                                  | t < 10s                |                                   | 45          |       |
| Total Power Dissipation (Note 6)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.7         | W     |
|                                                  | T <sub>A</sub> = +70°C |                                   | 1.1         |       |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State           | R <sub>θJA</sub>                  | 72          | °C/W  |
|                                                  | t < 10s                |                                   | 37          |       |
| Thermal Resistance, Junction to Case (Note 6)    |                        | R <sub>θJC</sub>                  | 13          |       |
| Operating and Storage Temperature Range          |                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

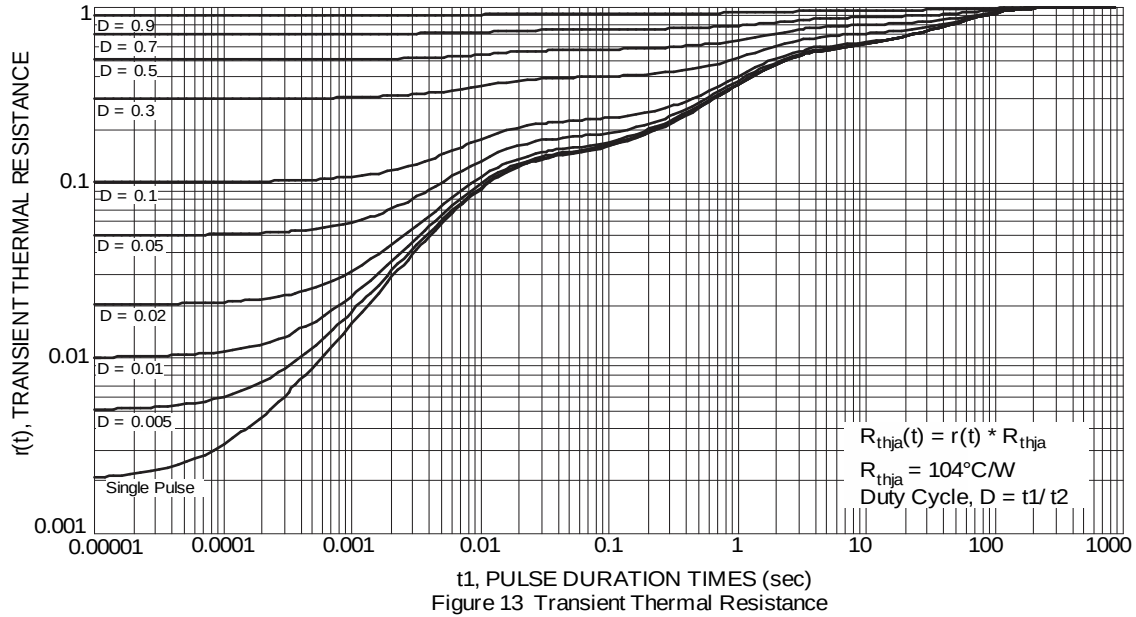
## Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| 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> = -1mA                                                   |
| Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C | I <sub>DSS</sub>    | -    | -    | -1.0 | µA   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V                                                  |
| Gate-Source Leakage                                    | I <sub>GSS</sub>    | -    | -    | ±100 | nA   | V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V                                                  |
| <b>ON CHARACTERISTICS (Note 8)</b>                     |                     |      |      |      |      |                                                                                               |
| Gate Threshold Voltage                                 | V <sub>GS(th)</sub> | -1.0 | -1.7 | -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> | -    | 16   | 20   | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -9A                                                  |
|                                                        |                     | -    | 22   | 29   |      | V <sub>GS</sub> = -5V, I <sub>D</sub> = -7A                                                   |
| Diode Forward Voltage                                  | V <sub>SD</sub>     | -    | -0.7 | -1.0 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A                                                    |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>                |                     |      |      |      |      |                                                                                               |
| Input Capacitance                                      | C <sub>iss</sub>    | -    | 1931 | -    | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz                                      |
| Output Capacitance                                     | C <sub>oss</sub>    | -    | 226  | -    | pF   |                                                                                               |
| Reverse Transfer Capacitance                           | C <sub>rss</sub>    | -    | 168  | -    | pF   |                                                                                               |
| Gate Resistance                                        | R <sub>g</sub>      | -    | 10.9 | -    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                          |
| Total Gate Charge at V <sub>GS</sub> = -5V             | Q <sub>g</sub>      | -    | 8.8  | -    | nC   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -10A                                                 |
| Total Gate Charge at V <sub>GS</sub> = -10V            | Q <sub>g</sub>      | -    | 16.5 | -    | nC   |                                                                                               |
| Gate-Source Charge                                     | Q <sub>gs</sub>     | -    | 2.6  | -    | nC   |                                                                                               |
| Gate-Drain Charge                                      | Q <sub>gd</sub>     | -    | 3.6  | -    | nC   |                                                                                               |
| Turn-On Delay Time                                     | t <sub>D(on)</sub>  | -    | 8.2  | -    | ns   | V <sub>GEN</sub> = -10V, V <sub>DD</sub> = -15V, R <sub>GEN</sub> = 3Ω, I <sub>D</sub> = -10A |
| Turn-On Rise Time                                      | t <sub>r</sub>      | -    | 14   | -    | ns   |                                                                                               |
| Turn-Off Delay Time                                    | t <sub>D(off)</sub> | -    | 65   | -    | ns   |                                                                                               |
| Turn-Off Fall Time                                     | t <sub>f</sub>      | -    | 31.6 | -    | ns   |                                                                                               |

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - I<sub>AS</sub> and E<sub>AS</sub> rating 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.

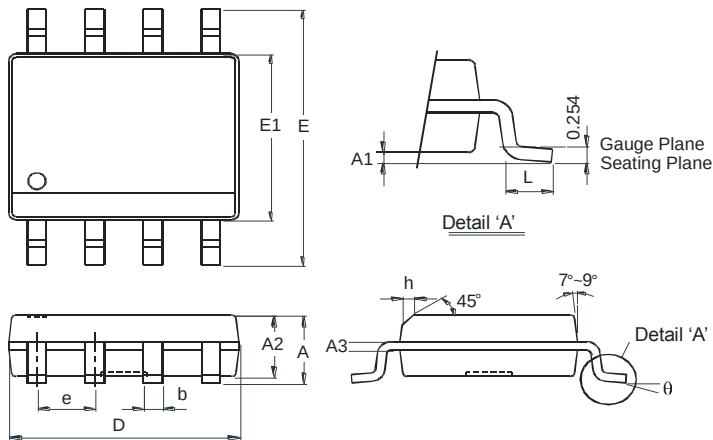






## Package Outline Dimensions

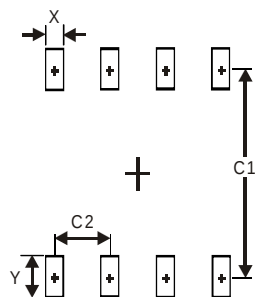
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SO-8                 |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | -        | 1.75 |
| A1                   | 0.10     | 0.20 |
| A2                   | 1.30     | 1.50 |
| A3                   | 0.15     | 0.25 |
| b                    | 0.3      | 0.5  |
| D                    | 4.85     | 4.95 |
| E                    | 5.90     | 6.10 |
| E1                   | 3.85     | 3.95 |
| e                    | 1.27 Typ |      |
| h                    | -        | 0.35 |
| L                    | 0.62     | 0.82 |
| θ                    | 0°       | 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) |
|------------|---------------|
| X          | 0.60          |
| Y          | 1.55          |
| C1         | 5.4           |
| C2         | 1.27          |

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