

## Product Summary

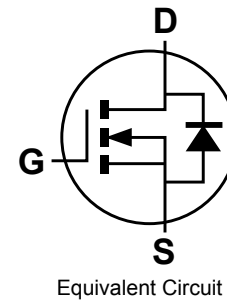
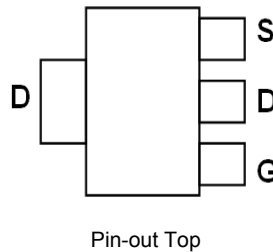
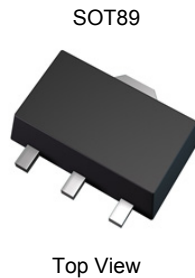
| $V_{(BR)DSS}$ | $R_{DS(ON)}$                 | $I_D$<br>$T_A = +25^\circ\text{C}$ |
|---------------|------------------------------|------------------------------------|
| 300V          | 14Ω @ $V_{GS} = 10\text{V}$  | 0.21A                              |
|               | 20Ω @ $V_{GS} = 4.5\text{V}$ | 0.17A                              |

## Description

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.

## Applications

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



## Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **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

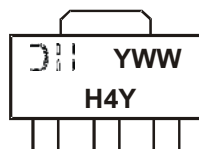
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208③
- Weight: 0.052 grams (approximate)

## Ordering Information (Note 4)

| Part Number    | Compliance | Case  | Quantity per reel |
|----------------|------------|-------|-------------------|
| DMN30H14DLY-13 | Standard   | SOT89 | 2,500             |

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_grade\\_definitions/](http://www.diodes.com/quality/product_grade_definitions/).

## Marking Information



= Manufacturer's Marking  
 H4Y = Marking Code  
 YWW = Date Code Marking  
 Y= Year (ex: 4 = 2014)  
 WW = Week (01 - 53)

**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   |              |                           | $V_{GSS}$ | $\pm 20$ | V     |
| Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$               | Steady State | $T_A = +25^\circ\text{C}$ | $I_D$     | 0.21     | A     |
|   |              | $T_A = +70^\circ\text{C}$ |           | 0.16     |       |
| Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle $\leq 1\%$ ) |              |                           | $I_{DM}$  | 1        | A     |
| Maximum Body Diode Continuous Current (Note 6)                        |              |                           | $I_S$     | 2        | A     |

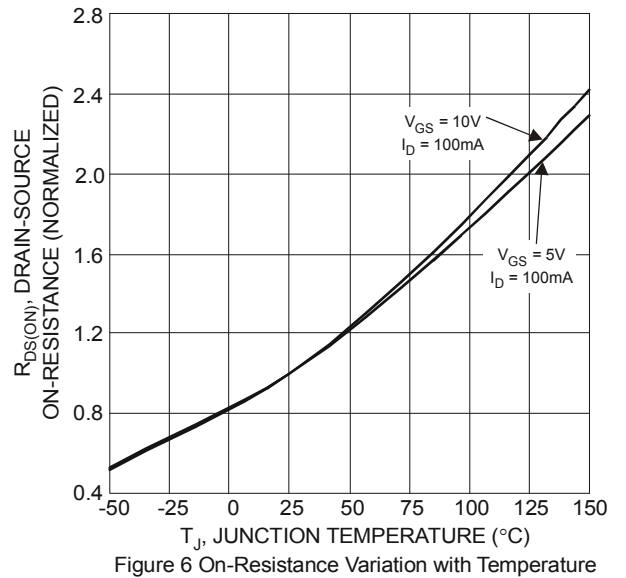
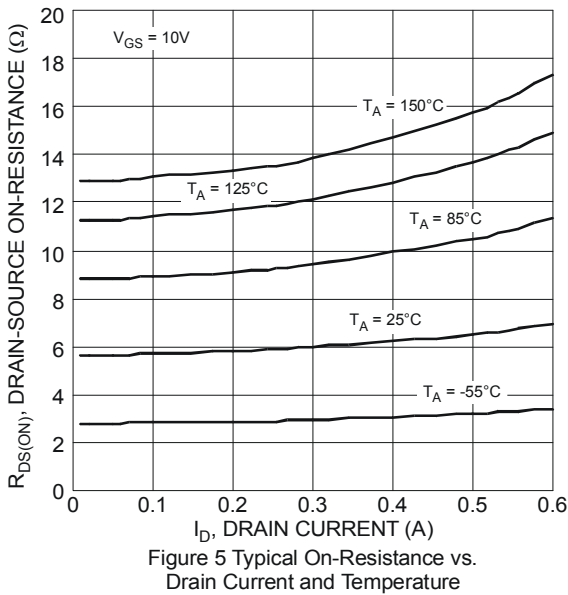
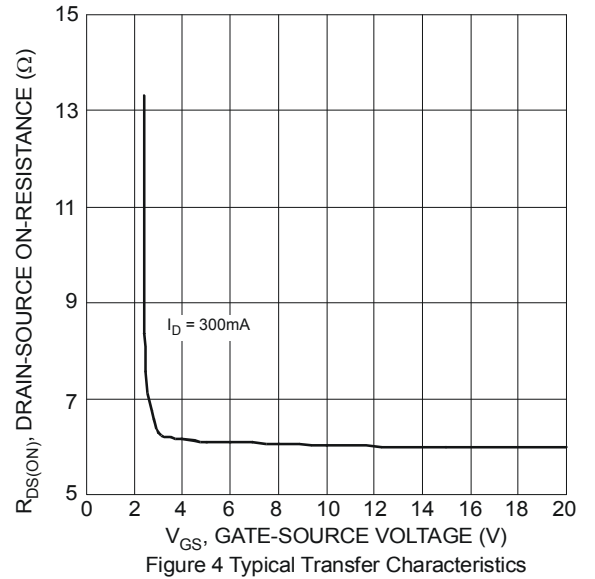
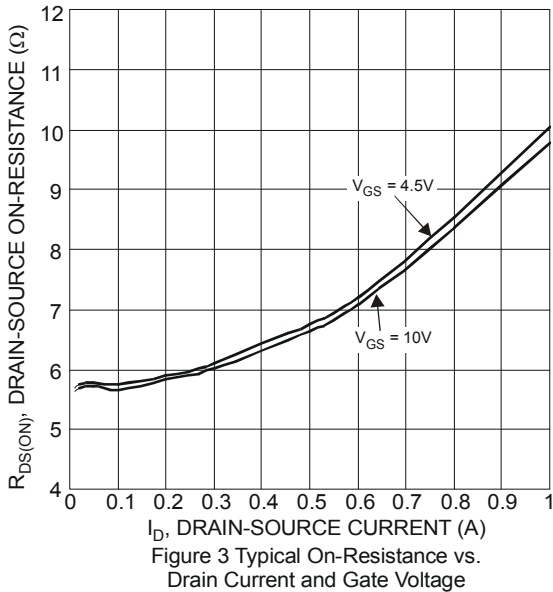
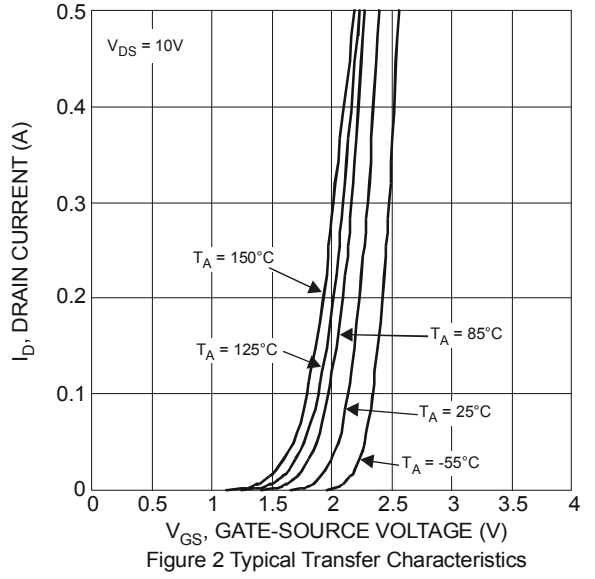
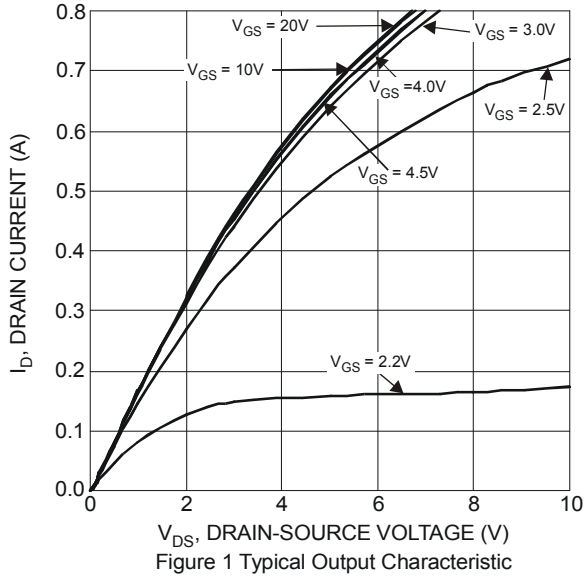
**Thermal Characteristics**

| Characteristic                          |          | Symbol          | Value       | Units              |
|---|----------|-----------------|-------------|--------------------|
| Total Power Dissipation                 | (Note 5) | $P_D$           | 0.9         | W                  |
|   | (Note 6) |                 | 2.2         |                    |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 132         | $^\circ\text{C/W}$ |
|   | (Note 6) |                 | 55          |                    |
| Thermal Resistance, Junction to Case    | (Note 6) | $R_{\theta JC}$ | 9.6         | $^\circ\text{C/W}$ |
| 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  |
|---|--------------|-----|-----|-----------|---------------|---|
| <b>OFF CHARACTERISTICS (Note 7)</b>     |              |     |     |           |               |   |
| 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         | $\mu\text{A}$ | $V_{DS} = 240\text{V}, V_{GS} = 0\text{V}$                                  |
| Gate-Body Leakage                       | $I_{GSS}$    | —   | —   | $\pm 100$ | nA            | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$                               |
| <b>ON CHARACTERISTICS (Note 7)</b>      |              |     |     |           |               |   |
| Gate Threshold Voltage                  | $V_{GS(th)}$ | 1   | —   | 3         | V             | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$                                     |
| Static Drain-Source On-Resistance       | $R_{DS(on)}$ | —   | 6   | 14        | $\Omega$      | $V_{GS} = 10\text{V}, I_D = 0.3\text{A}$                                    |
|   |              | —   | 6   | 20        |               | $V_{GS} = 4.5\text{V}, I_D = 0.2\text{A}$                                   |
| Diode Forward Voltage                   | $V_{SD}$     | —   | 0.7 | 1.2       | V             | $V_{GS} = 0\text{V}, I_S = 0.3\text{A}$                                     |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b> |              |     |     |           |               |   |
| Input Capacitance                       | $C_{iss}$    | —   | 96  | —         | pF            | $V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$                  |
| Output Capacitance                      | $C_{oss}$    | —   | 5.8 | —         |               |   |
| Reverse Transfer Capacitance            | $C_{rss}$    | —   | 3.2 | —         |               |   |
| Gate Resistance                         | $R_G$        | —   | 12  | —         | $\Omega$      | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$                 |
| Total Gate Charge                       | $Q_g$        | —   | 4   | —         | nC            | $V_{DS} = 192\text{V}, V_{GS} = 10\text{V}, I_D = 0.5\text{A}$              |
| Gate-Source Charge                      | $Q_{gs}$     | —   | 0.3 | —         |               |   |
| Gate-Drain Charge                       | $Q_{gd}$     | —   | 1.9 | —         |               |   |
| Turn-On Delay Time                      | $t_{D(on)}$  | —   | 3.3 | —         | nS            | $V_{DS} = 60\text{V}, R_L = 200\Omega, V_{GS} = 10\text{V}, R_G = 25\Omega$ |
| Turn-On Rise Time                       | $t_r$        | —   | 8.6 | —         |               |   |
| Turn-Off Delay Time                     | $t_{D(off)}$ | —   | 22  | —         |               |   |
| Turn-Off Fall Time                      | $t_f$        | —   | 12  | —         |               |   |
| Reverse Recovery Time                   | $t_{rr}$     | —   | 43  | —         | nS            | $V_R = 100\text{V}, I_F = 1.0\text{A}, di/dt = 100\text{A}/\mu\text{s}$     |
| Reverse Recovery Charge                 | $Q_{rr}$     | —   | 47  | —         | 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 1inch square copper plate
  - Short duration pulse test used to minimize self-heating effect
  - Guaranteed by design. Not subject to production testing



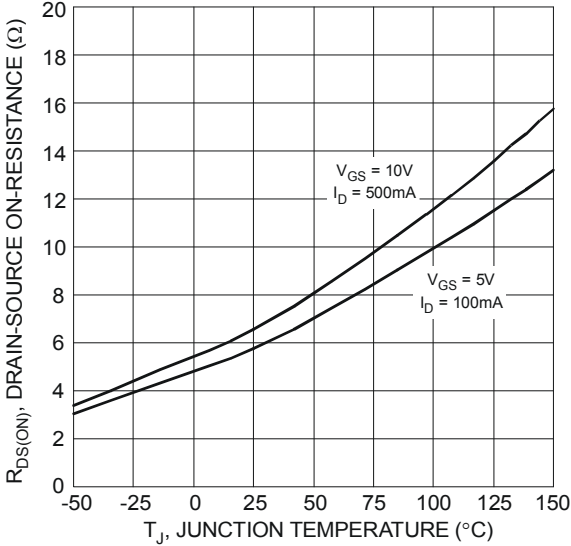


Figure 7 On-Resistance Variation with Temperature

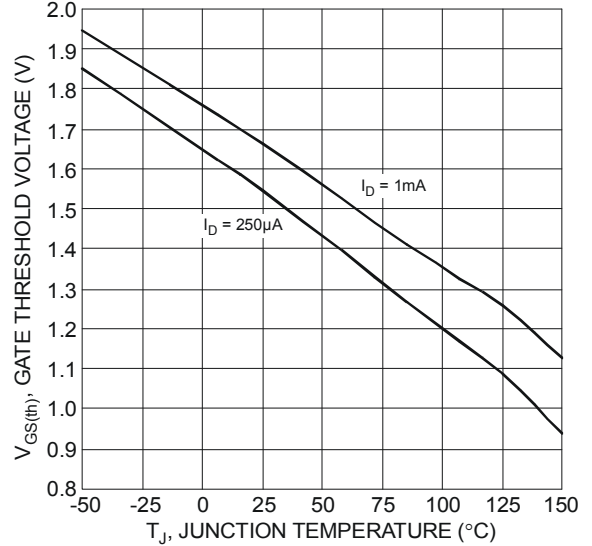


Figure 8 Gate Threshold Variation vs. Ambient Temperature

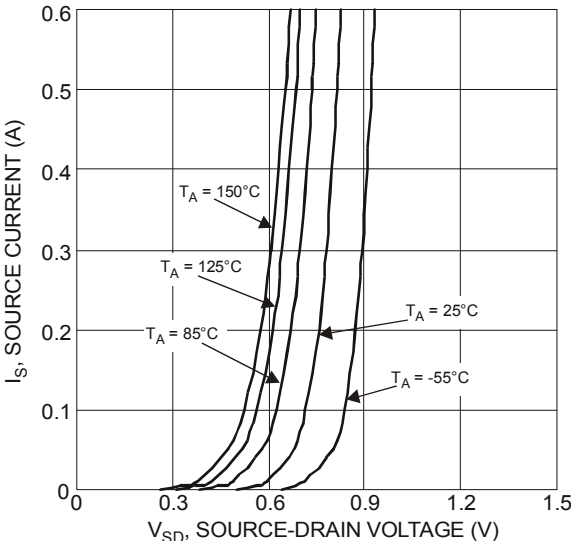


Figure 9 Diode Forward Voltage vs. Current

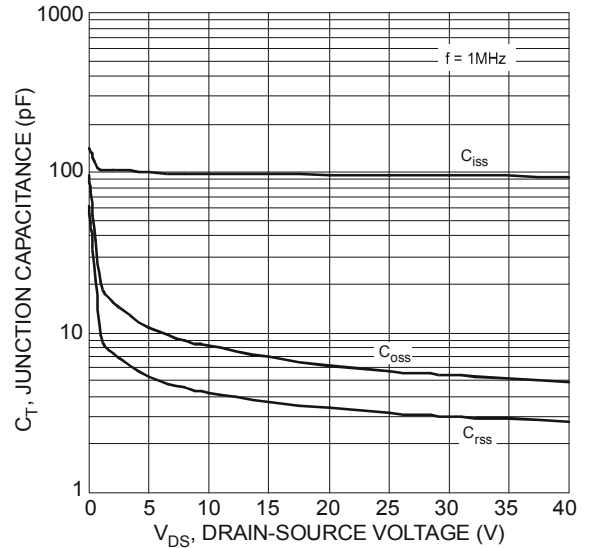


Figure 10 Typical Junction Capacitance

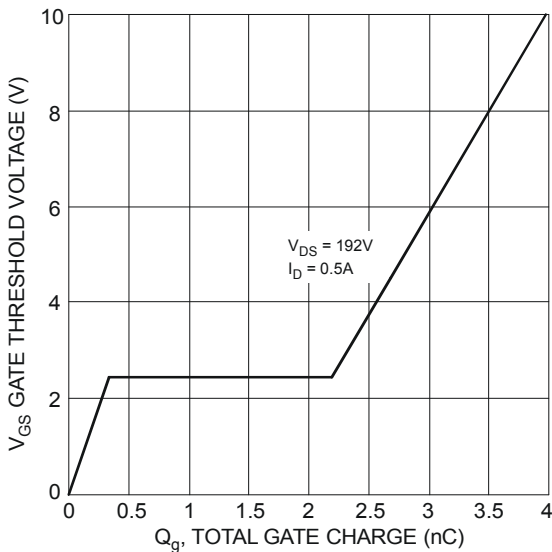


Figure 11 Gate Charge

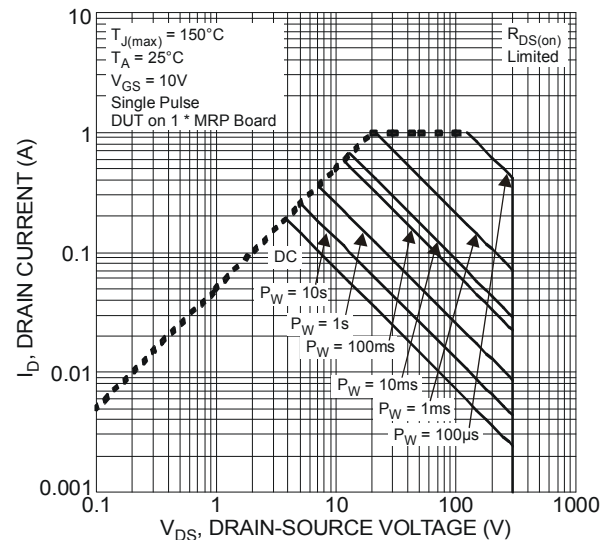
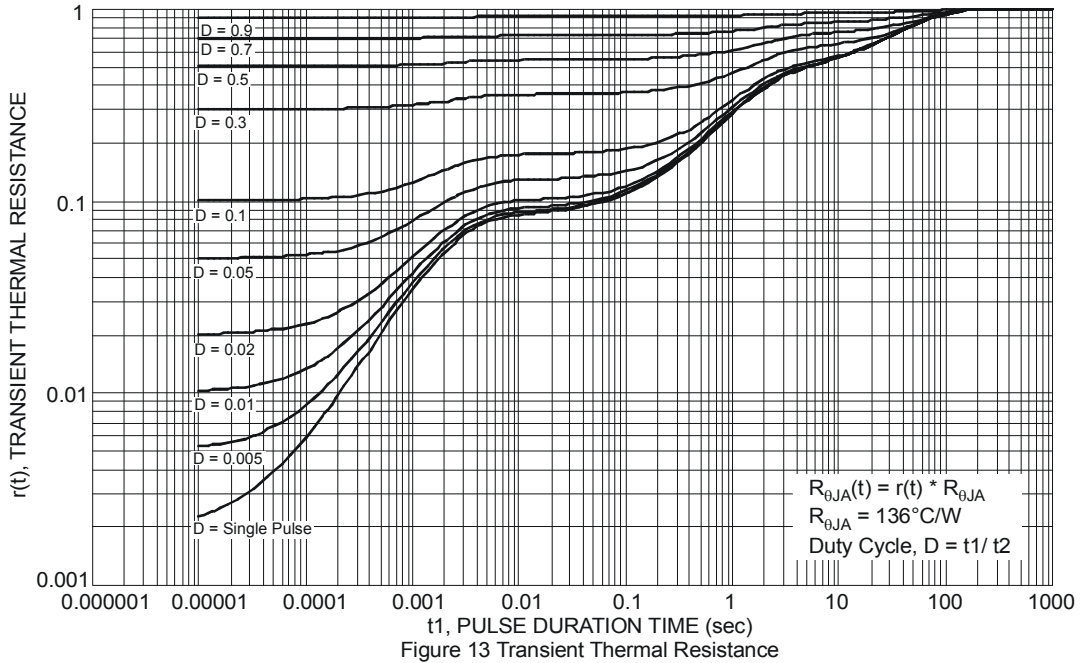
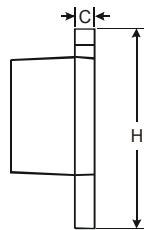
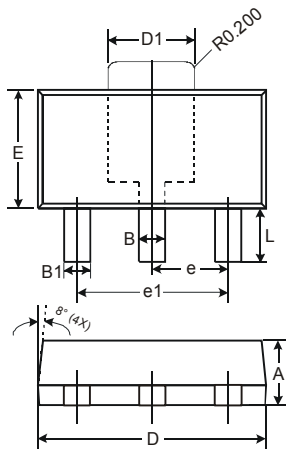


Figure 12 SOA, Safe Operation Area



### Package Outline Dimensions

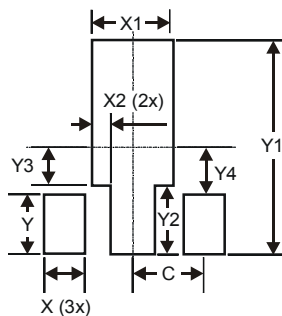
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT89                       |          |      |
|-----------------------------|----------|------|
| Dim                         | Min      | Max  |
| A                           | 1.40     | 1.60 |
| B                           | 0.44     | 0.62 |
| B1                          | 0.35     | 0.54 |
| C                           | 0.35     | 0.43 |
| D                           | 4.40     | 4.60 |
| D1                          | 1.52     | 1.83 |
| E                           | 2.29     | 2.60 |
| e                           | 1.50 Typ |      |
| e1                          | 3.00 Typ |      |
| H                           | 3.94     | 4.25 |
| L                           | 0.89     | 1.20 |
| <b>All Dimensions in mm</b> |          |      |

### Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.900         |
| X1         | 1.733         |
| X2         | 0.416         |
| Y          | 1.300         |
| Y1         | 4.600         |
| Y2         | 1.475         |
| Y3         | 0.950         |
| Y4         | 1.125         |
| C          | 1.500         |

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