THE DMN30H14DLY IS NOT RECOMMENDED FOR NEW DESIGNS.
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# DMN30H14DLY

## N-CHANNEL ENHANCEMENT MODE MOSFET

Lead-free Green

## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ | $I_D$ $T_A$ = +25°C |
|---|---|---|
| 300V | 14Ω @ $V_{GS}$ = 10V | 0.21A |
| | 20Ω @ $V_{GS}$ = 4.5V | 0.17A |

## Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) 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

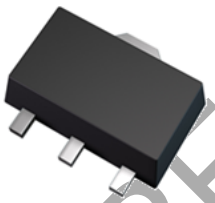
## Features

- 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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

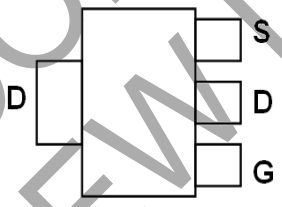
## Mechanical Data

- Package: SOT89
- Package 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 208 e3
- Weight: 0.052 grams (Approximate)

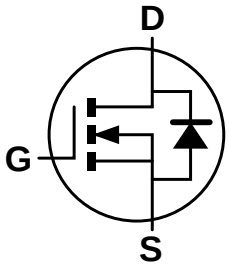
**SOT89**



Top View




Pin-out Top



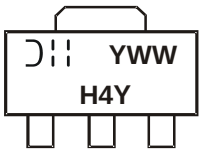

Equivalent Circuit

## Ordering Information (Note 4)

| Part Number | Package | Packing | |
|---|---|---|---|
| | | Qty. | Carrier |
| DMN30H14DLY-13 | SOT89 | 2,500 | 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
H4Y = Product Type Marking Code
YWW = Date Code Marking
Y = Year (ex: 4 = 2014)
WW = Week (01 to 53)

## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | 300 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current (Note 6) $V_{GS}$ = 10V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | 0.21<br>0.16 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle ≦ 1%) | | | $I_{DM}$ | 1 | A |
| Maximum Body Diode Continuous Current (Note 6) | | | $I_S$ | 2 | A |

## Thermal Characteristics

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| 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 | °C/W |
| | (Note 6) | | 55 | |
| Thermal Resistance, Junction to Case | (Note 6) | $R_{\theta JC}$ | 9.6 | |
| 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 | $BV_{DSS}$ | 300 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | 1 | µA | $V_{DS}$ = 240V, $V_{GS}$ = 0V |
| Gate-Body Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 7)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 1 | — | 3 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250µA |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 6 | 14 | Ω | $V_{GS}$ = 10V, $I_D$ = 0.3A |
| | | — | 6 | 20 | | $V_{GS}$ = 4.5V, $I_D$ = 0.2A |
| Diode Forward Voltage | $V_{SD}$ | — | 0.7 | 1.2 | V | $V_{GS}$ = 0V, $I_S$ = 0.3A |
| **DYNAMIC CHARACTERISTICS (Note 8)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 96 | — | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0V, f = 1MHz |
| Output Capacitance | $C_{oss}$ | — | 5.8 | — | | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 3.2 | — | | |
| Gate Resistance | $R_G$ | — | 12 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1.0MHz |
| Total Gate Charge | $Q_g$ | — | 4 | — | nC | $V_{DS}$ = 192V, $V_{GS}$ = 10V, $I_D$ = 0.5A |
| Gate-Source Charge | $Q_{gs}$ | — | 0.3 | — | | |
| Gate-Drain Charge | $Q_{gd}$ | — | 1.9 | — | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 3.3 | — | ns | $V_{DS}$ = 60V, $R_L$ = 200Ω, $V_{GS}$ = 10V, $R_G$ = 25Ω |
| 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 | $V_R$ = 100V, $I_F$ = 1.0A, di/dt = 100A/µs |
| Reverse Recovery Charge | $Q_{RR}$ | — | 47 | — | nC | |

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 bias 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.

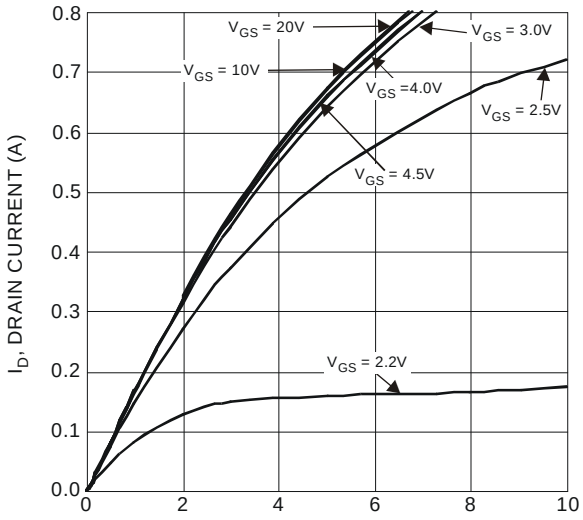



Figure 1 Typical Output Characteristic

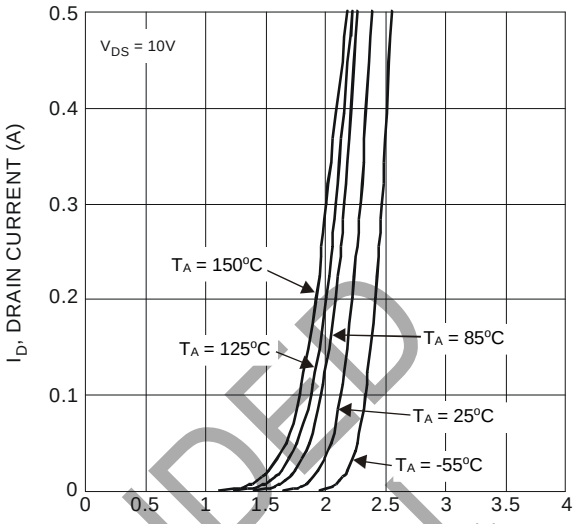



Figure 2 Typical Transfer Characteristics

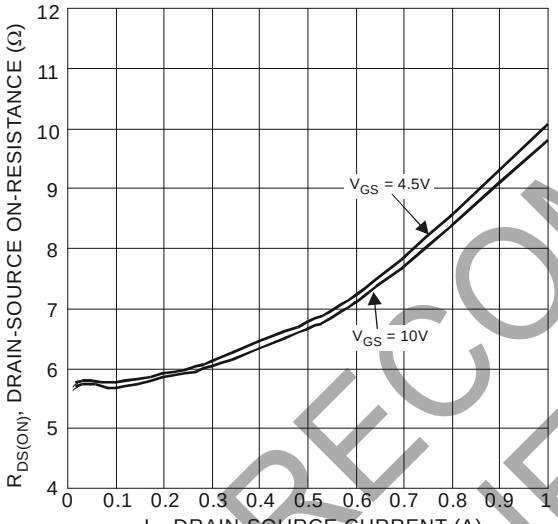



Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

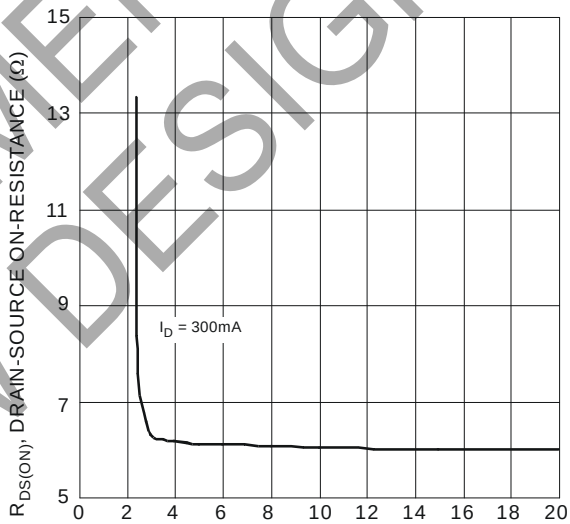



Figure 4 Typical Transfer Characteristics

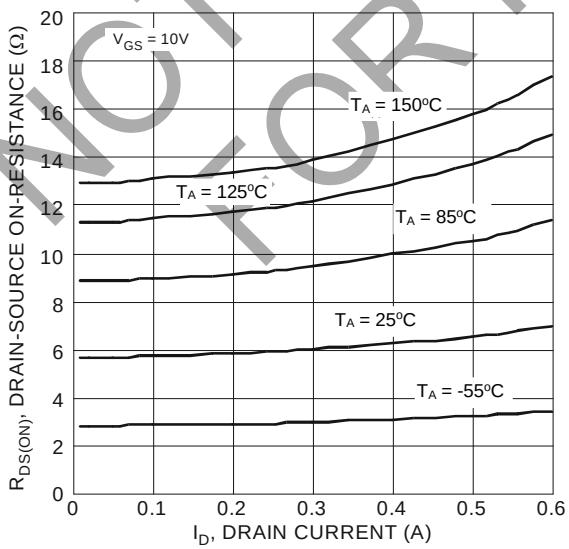



Figure 5 Typical On-Resistance vs. Drain Current and Temperature

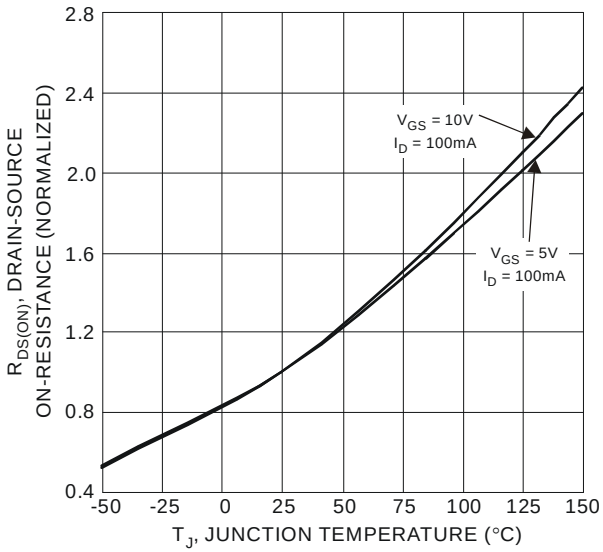



Figure 6 On-Resistance Variation with Temperature

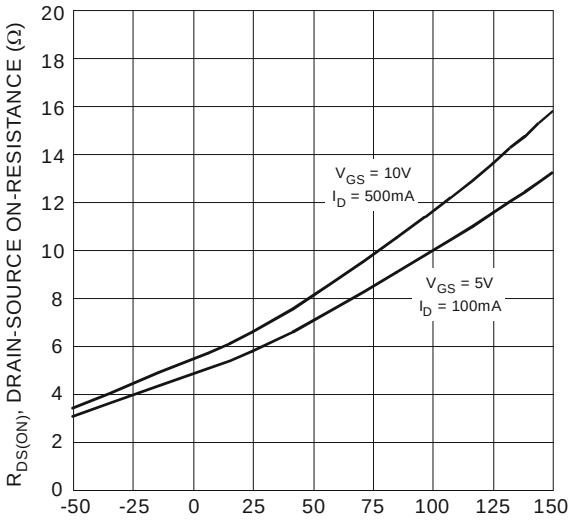



Figure 7 On-Resistance Variation with Temperature

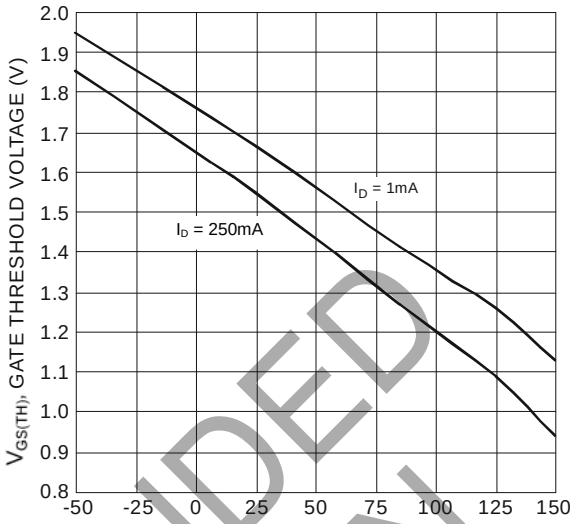



Figure 8 Gate Threshold Variation vs. Ambient Temperature

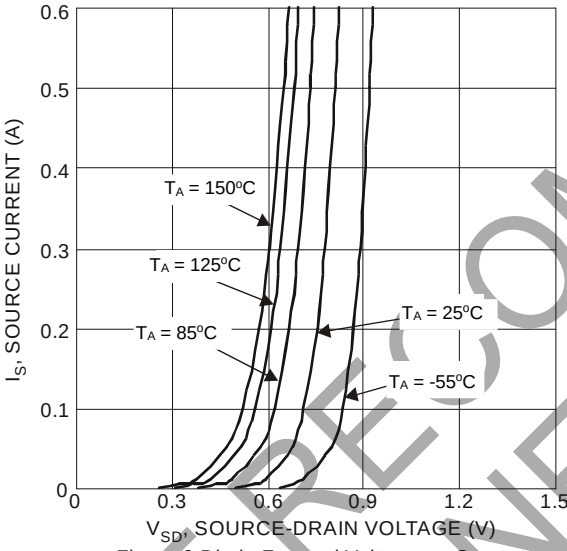



Figure 9 Diode Forward Voltage vs. Current

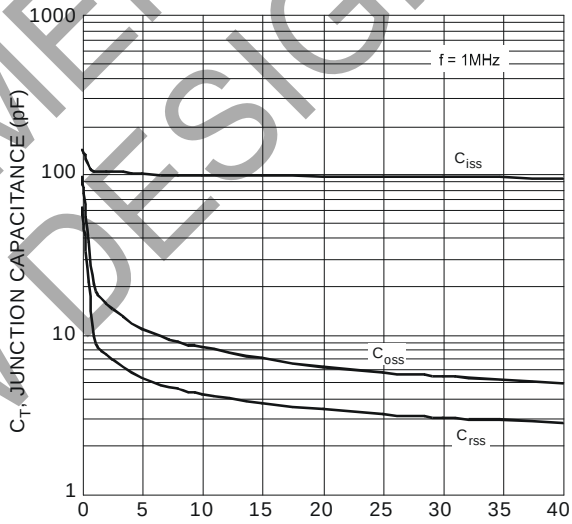



Figure 10 Typical Junction Capacitance

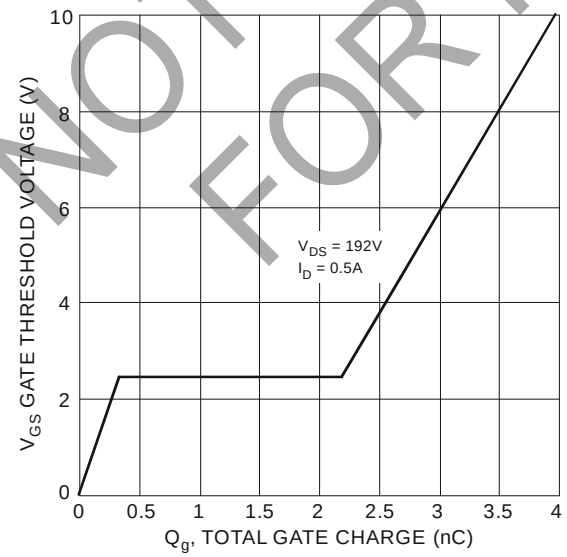



Figure 11 Gate Charge

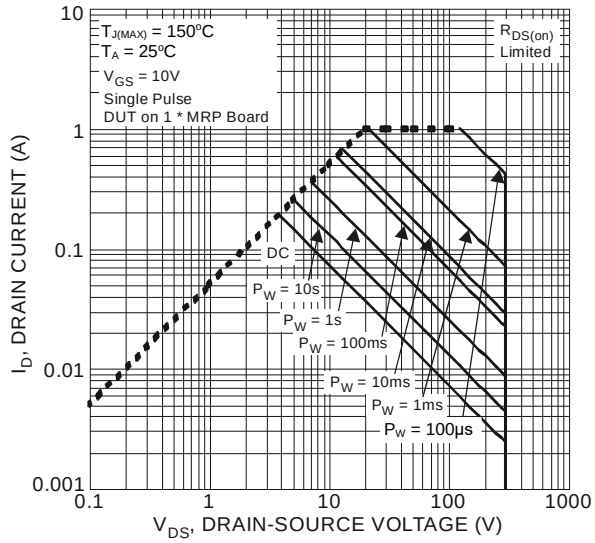



Figure 12 SOA, Safe Operation Area

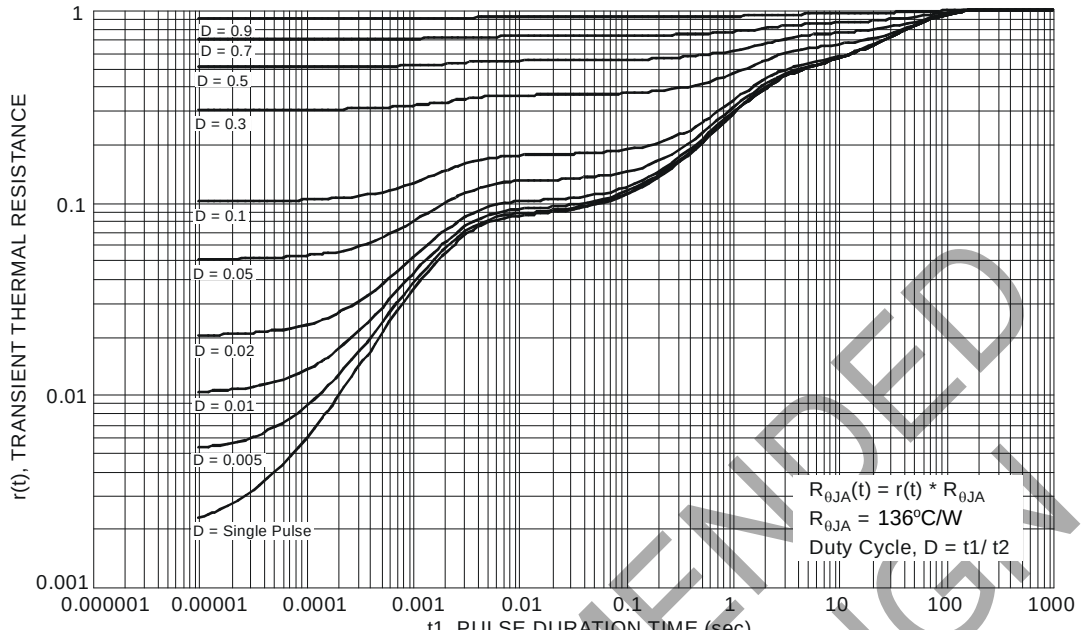
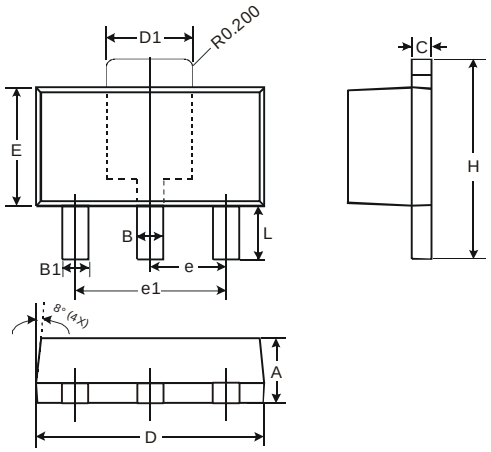



Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

**SOT89**

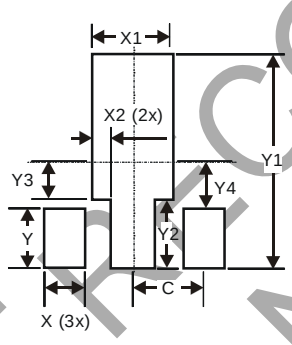



| SOT89 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 1.40 | 1.60 |
| **B** | 0.44 | 0.62 |
| **B1** | 0.35 | 0.54 |
| **C** | 0.35 | 0.43 |
| **D** | 4.40 | 4.60 |
| **D1** | 1.52 | 1.83 |
| **E** | 2.29 | 2.60 |
| **e** | 1.50 Typ | |
| **e1** | 3.00 Typ | |
| **H** | 3.94 | 4.25 |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

## Suggested Pad Layout

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

**SOT89**




| 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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