

# 1N4933, 1N4934, 1N4935, 1N4936, 1N4937

## Axial-Lead Glass Passivated Fast Recovery Rectifiers

Axial-lead, fast-recovery rectifiers are designed for special applications such as DC power supplies, inverters, converters, ultrasonic systems, choppers, low RF interference and free wheeling diodes. A complete line of fast recovery rectifiers having typical recovery time of 150 nanoseconds providing high efficiency at frequencies to 250 kHz.

### Features

- Shipped in Plastic Bags; 1,000 per Bag
- Available Tape and Reeled; 5,000 per Reel, by Adding a “RL” Suffix to the Part Number
- These are Pb-Free Devices\*

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Max. for 10 Seconds
- Polarity: Cathode Indicated by Polarity Band

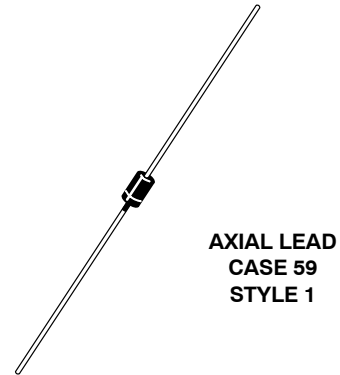
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



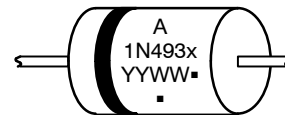
**ON Semiconductor®**

[www.onsemi.com](http://www.onsemi.com)

## FAST RECOVERY RECTIFIERS 1.0 AMPERE, 50–600 VOLTS



### MARKING DIAGRAM



A = Assembly Location  
1N493x = Device Number  
x = 3, 4, 5, 6 or 7  
YY = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

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## MAXIMUM RATINGS (Note 1)

| Rating   | Symbol                          | 1N4933       | 1N4934    | 1N4935     | 1N4936     | 1N4937     | Unit             |
|--|---------------------------------|--------------|-----------|------------|------------|------------|------------------|
| †Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                  | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 50           | 100       | 200        | 400        | 600        | V                |
| †Non-Repetitive Peak Reverse Voltage<br>RMS Reverse Voltage  | $V_{RSM}$<br>$V_{R(RMS)}$       | 75<br>35     | 150<br>70 | 250<br>140 | 450<br>280 | 650<br>420 | V                |
| †Average Rectified Forward Current<br>(Single phase, resistive load, $T_A = 75^\circ\text{C}$ ) (Note 2) | $I_O$                           | 1.0          |           |            |            |            | A                |
| †Non-Repetitive Peak Surge Current<br>(Surge applied at rated load conditions)                           | $I_{FSM}$                       | 30           |           |            |            |            | A                |
| Operating Junction Temperature Range<br>Storage Temperature Range  | $T_J, T_{stg}$                  | - 65 to +150 |           |            |            |            | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Ratings at  $25^\circ\text{C}$  ambient temperature unless otherwise specified.
2. Derate by 20% for capacitive loads.

## THERMAL CHARACTERISTICS

| Characteristic   | Symbol          | Max | Unit                      |
|--|-----------------|-----|---------------------------|
| Thermal Resistance, Junction-to-Ambient (Typical Printed Circuit Board Mounting) | $R_{\theta JA}$ | 65  | $^\circ\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic   | Symbol | Min | Typ       | Max        | Unit          |
|--|--------|-----|-----------|------------|---------------|
| Instantaneous Forward Voltage<br>( $I_F = 3.14$ Amp, $T_J = 150^\circ\text{C}$ )             | $V_F$  | -   | 1.0       | 1.2        | V             |
| Forward Voltage<br>( $I_F = 1.0$ Amp, $T_A = 25^\circ\text{C}$ )                             | $V_F$  | -   | 1.05      | 1.2        | V             |
| †Reverse Current (Rated DC Voltage)<br>$T_A = 25^\circ\text{C}$<br>$T_A = 100^\circ\text{C}$ | $I_R$  | -   | 1.0<br>50 | 5.0<br>100 | $\mu\text{A}$ |

## REVERSE RECOVERY CHARACTERISTICS†

|   |               |   |            |            |    |
|---|---------------|---|------------|------------|----|
| Reverse Recovery Time<br>( $I_F = 1.0$ Amp to $V_R = 30$ Vdc)<br>( $I_{FM} = 15$ Amp, $di/dt = 10$ A/ $\mu\text{s}$ ) | $t_{rr}$      | - | 150<br>175 | 200<br>300 | ns |
| Reverse Recovery Current<br>( $I_F = 1.0$ Amp to $V_R = 30$ Vdc)  | $I_{RM(REC)}$ | - | 1.0        | 2.0        | A  |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

†Indicates JEDEC Registered Data for 1N4933 Series.

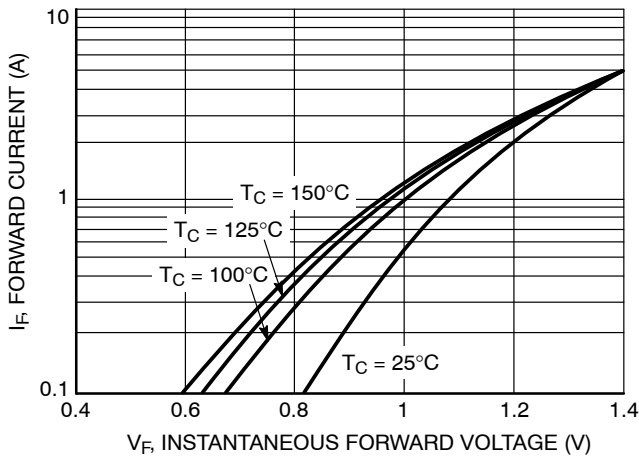


Figure 1. Typical Forward Voltage

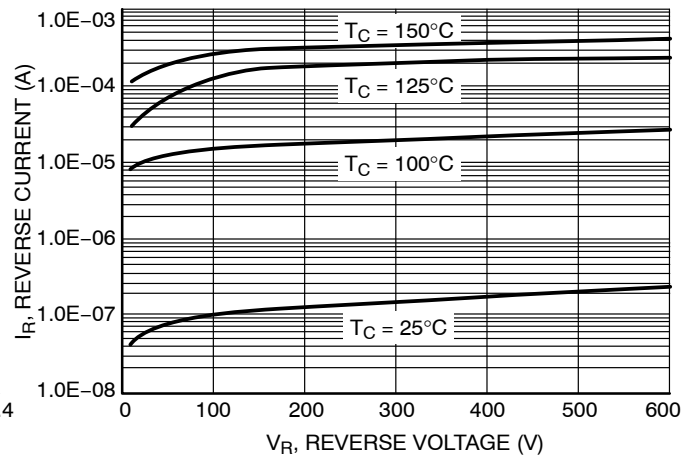


Figure 2. Typical Reverse Current

# 1N4933, 1N4934, 1N4935, 1N4936, 1N4937

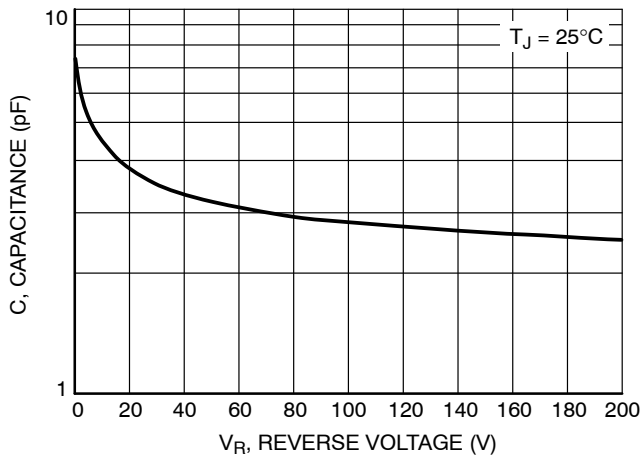


Figure 3. Typical Capacitance

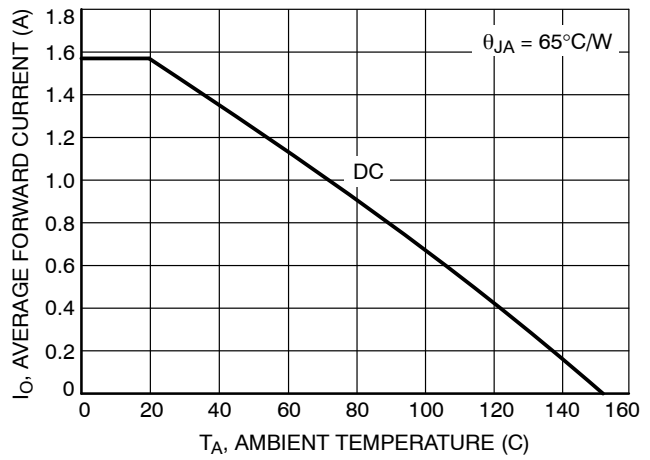


Figure 4. Current Derating

## ORDERING INFORMATION

| Device    | Package     | Shipping†          |
|-----------|-------------|--------------------|
| 1N4933    | Axial Lead* | 1000 Units / Bag   |
| 1N4933G   | Axial Lead* | 1000 Units / Bag   |
| 1N4933RL  | Axial Lead* | 5000 / Tape & Reel |
| 1N4933RLG | Axial Lead* | 5000 / Tape & Reel |
| 1N4934    | Axial Lead* | 1000 Units / Bag   |
| 1N4934G   | Axial Lead* | 1000 Units / Bag   |
| 1N4934RL  | Axial Lead* | 5000 / Tape & Reel |
| 1N4934RLG | Axial Lead* | 5000 / Tape & Reel |
| 1N4935    | Axial Lead* | 1000 Units / Bag   |
| 1N4935G   | Axial Lead* | 1000 Units / Bag   |
| 1N4935RL  | Axial Lead* | 5000 / Tape & Reel |
| 1N4935RLG | Axial Lead* | 5000 / Tape & Reel |
| 1N4936    | Axial Lead* | 1000 Units / Bag   |
| 1N4936G   | Axial Lead* | 1000 Units / Bag   |
| 1N4936RL  | Axial Lead* | 5000 / Tape & Reel |
| 1N4936RLG | Axial Lead* | 5000 / Tape & Reel |
| 1N4937    | Axial Lead* | 1000 Units / Bag   |
| 1N4937G   | Axial Lead* | 1000 Units / Bag   |
| 1N4937RL  | Axial Lead* | 5000 / Tape & Reel |
| 1N4937RLG | Axial Lead* | 5000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*This package is inherently Pb-Free.

# MECHANICAL CASE OUTLINE

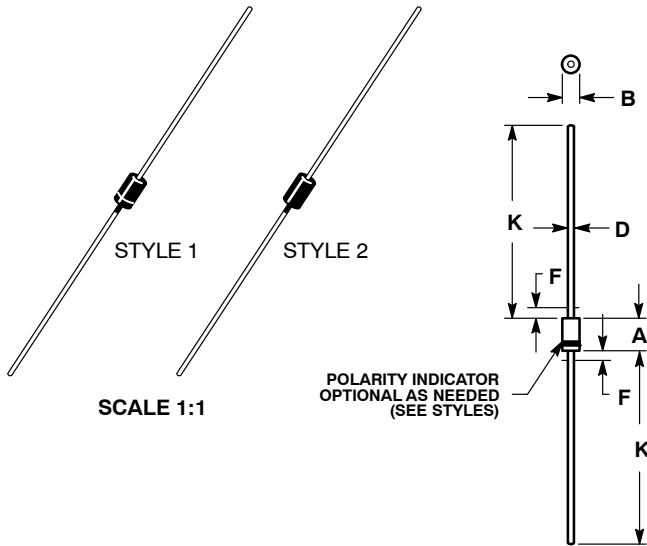
## PACKAGE DIMENSIONS

ON Semiconductor®



### AXIAL LEAD CASE 59-10 ISSUE U

DATE 15 FEB 2005



STYLE 1

STYLE 2

SCALE 1:1

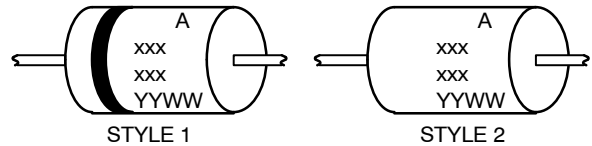
POLARITY INDICATOR  
OPTIONAL AS NEEDED  
(SEE STYLES)

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY.
4. POLARITY DENOTED BY CATHODE BAND.
5. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.161  | 0.205 | 4.10        | 5.20 |
| B   | 0.079  | 0.106 | 2.00        | 2.70 |
| D   | 0.028  | 0.034 | 0.71        | 0.86 |
| F   | ---    | 0.050 | ---         | 1.27 |
| K   | 1.000  | ---   | 25.40       | ---  |

### GENERIC MARKING DIAGRAM\*



STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

- xxx = Specific Device Code
- A = Assembly Location
- YY = Year
- WW = Work Week

\*This information is generic. Please refer to device data sheet for actual part marking.  
Pb-Free indicator, "G" or microdot "▪", may or may not be present.

|                         |                    |   |
|-------------------------|--------------------|---|
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| <b>DESCRIPTION:</b>     | <b>AXIAL LEAD</b>  | <b>PAGE 1 OF 1</b>  |

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