

# MR2535L

## Overvoltage Transient Suppressors

### Medium Current

Designed for applications requiring a low voltage rectifier with reverse avalanche characteristics for use as reverse power transient suppressors. Developed to suppress transients in the automotive system, these devices operate in the forward mode as standard rectifiers or reverse mode as power avalanche rectifier and will protect electronic equipment from overvoltage conditions.

#### Features

- Avalanche Voltage 24 to 32 V
- High Power Capability
- Economical
- Increased Capacity by Parallel Operation
- Pb-Free Packages are Available\*

#### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 2.5 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Maximum Lead Temperature for Soldering Purposes: 350°C 3/8" from Case for 10 Seconds at 5 lbs. Tension
- Polarity: Indicated by Diode Symbol or Cathode Band

#### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
DC Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	20	V
Repetitive Peak Reverse Surge Current (Time Constant = 10 ms, Duty Cycle $\leq$ 1%, $T_C = 25^\circ\text{C}$ )	$I_{RSM}$	62	A
Average Rectified Forward Current (Single Phase, Resistive Load, 60 Hz, $T_C = 125^\circ\text{C}$ ) (Figure 4)	$I_O$	6.0	A
Non-Repetitive Peak Surge Current Surge Supplied at Rated Load Conditions Halfwave, Single Phase	$I_{FSM}$	600	A
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +175	$^\circ\text{C}$

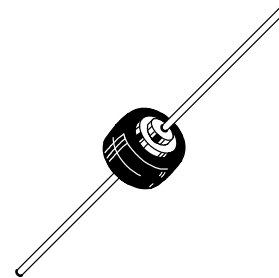
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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



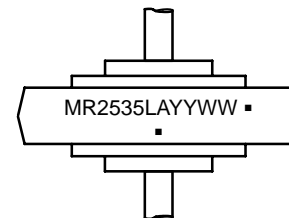
ON Semiconductor®

<http://onsemi.com>



MICRODE AXIAL  
CASE 194  
STYLE 1

#### MARKING DIAGRAM



A = Assembly Location  
YY = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
MR2535L	Microde Axial	1000 Units/Box
MR2535LG	Microde Axial (Pb-Free)	1000 Units/Box
MR2535LRL	Microde Axial	800/Tape & Reel
MR2535LRLG	Microde Axial (Pb-Free)	800/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.

# MR2535L

## THERMAL CHARACTERISTICS

Characteristic	Lead Length	Symbol	Max	Unit
Thermal Resistance, Junction-to-Lead @ Both Leads to Heatsink, Equal Length	1/4" 3/8" 1/2"	$R_{\theta JL}$	7.5 10 13	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	0.8 (Note 1)	$^{\circ}\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS ( $T_J = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
Instantaneous Forward Voltage (Note 2) ( $I_F = 100 \text{ A}$ , $T_C = 25^{\circ}\text{C}$ )	$V_F$	-	1.1	V
Reverse Current ( $V_R = 20 \text{ Vdc}$ , $T_C = 25^{\circ}\text{C}$ )	$I_R$	-	200	nAdc
Breakdown Voltage (Note 2) ( $I_R = 100 \text{ mAdc}$ , $T_C = 25^{\circ}\text{C}$ )	$V_{(BR)}$	24	32	V
Breakdown Voltage (Note 2) ( $I_R = 90 \text{ A}$ , $T_C = 150^{\circ}\text{C}$ , $\text{PW} = 80 \mu\text{s}$ )	$V_{(BR)}$	-	40	V
Breakdown Voltage Temperature Coefficient	$V_{(BR)TC}$	-	0.096 (Note 1)	$\%/^{\circ}\text{C}$
Forward Voltage Temperature Coefficient @ $I_F = 10 \text{ mA}$	$V_{FTC}$	-	2 (Note 1)	$\text{mV}/^{\circ}\text{C}$

- Typical.
- Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

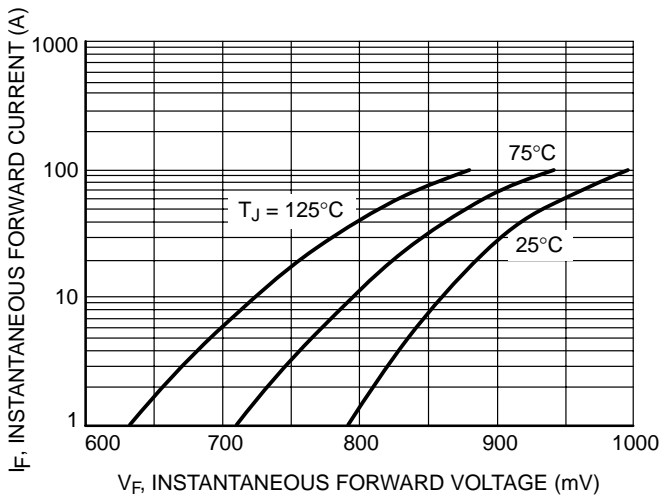


Figure 1. Typical Forward Voltage

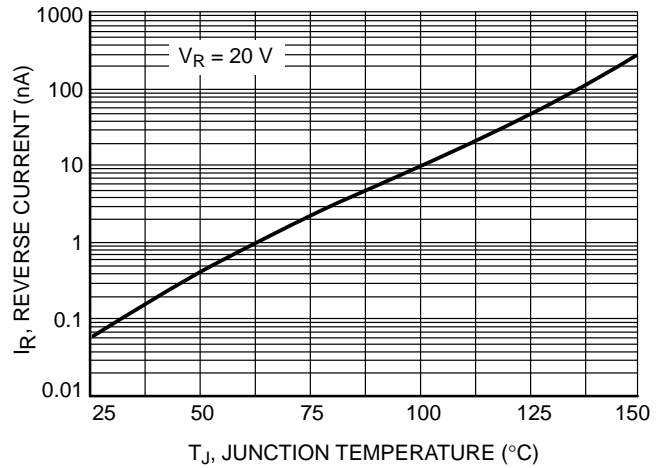


Figure 2. Typical Reverse Current versus Junction Temperature

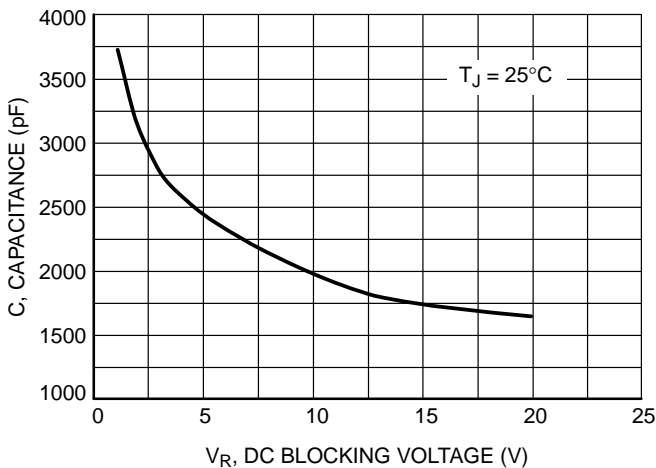


Figure 3. Typical Capacitance

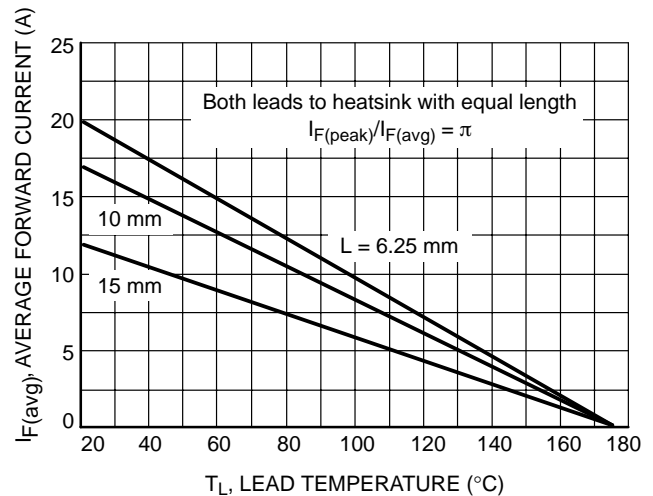


Figure 4. Maximum Current Ratings

# MR2535L

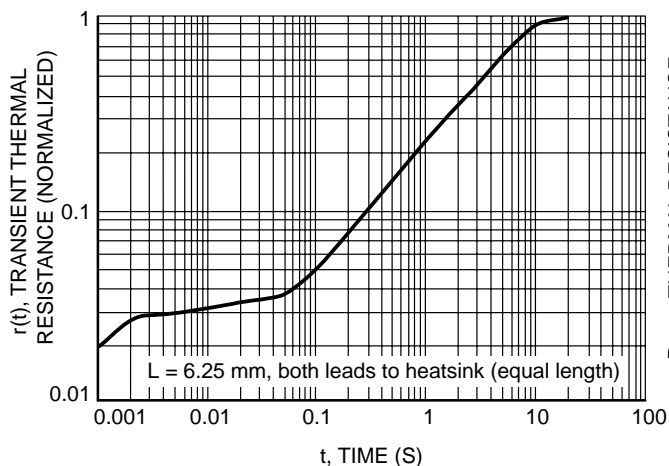


Figure 5. Thermal Response

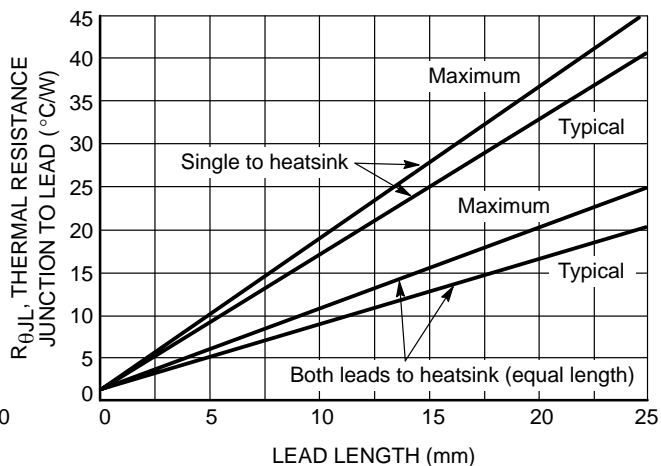


Figure 6. Steady State Thermal Resistance

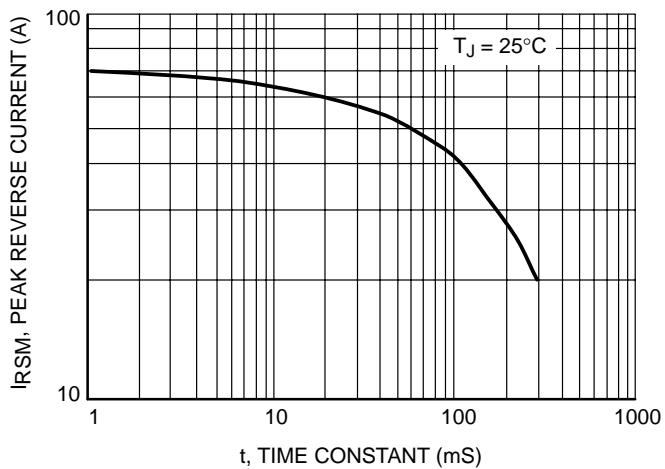


Figure 7. Maximum Peak Reverse Current

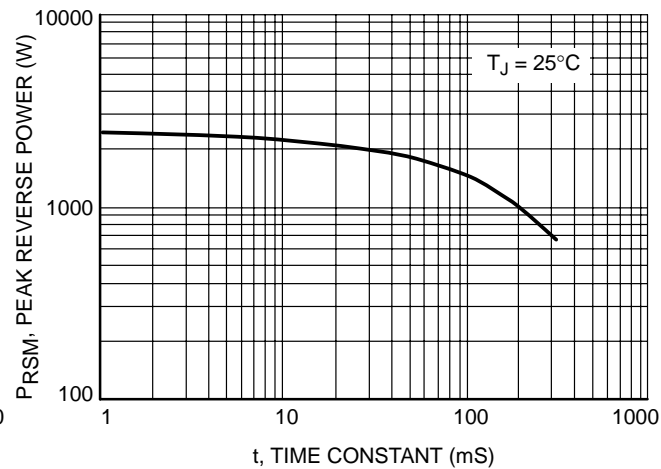


Figure 8. Maximum Peak Reverse Power

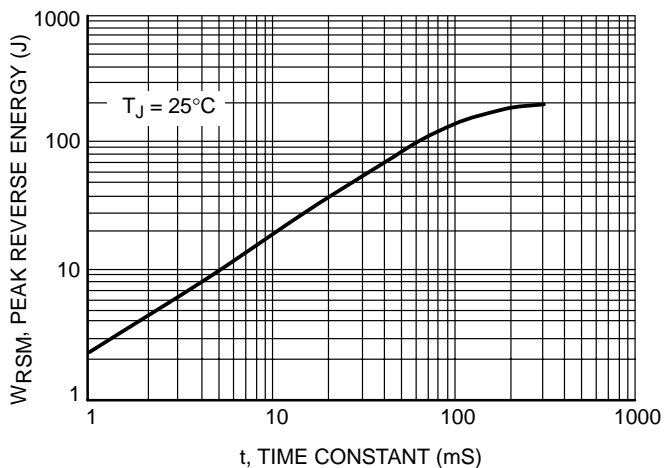


Figure 9. Maximum Reverse Energy

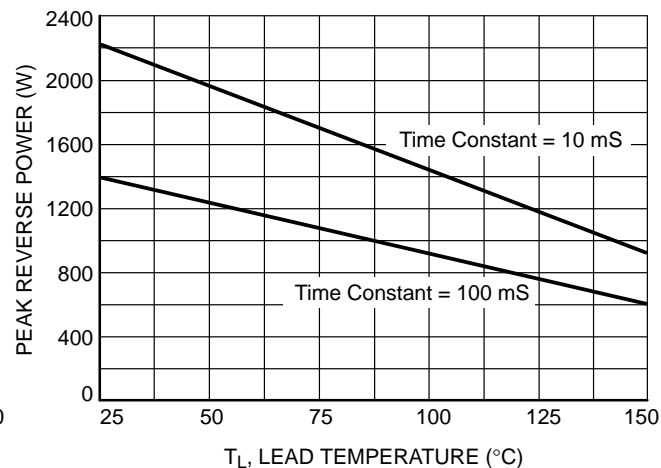
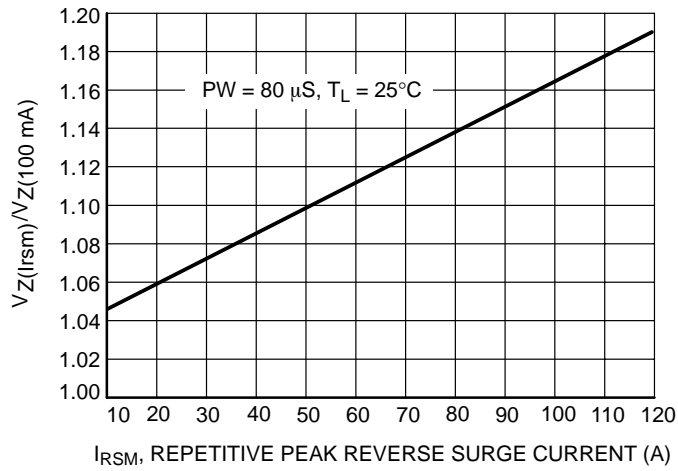
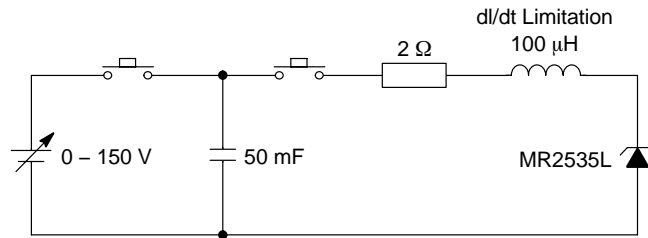


Figure 10. Reverse Power Derating

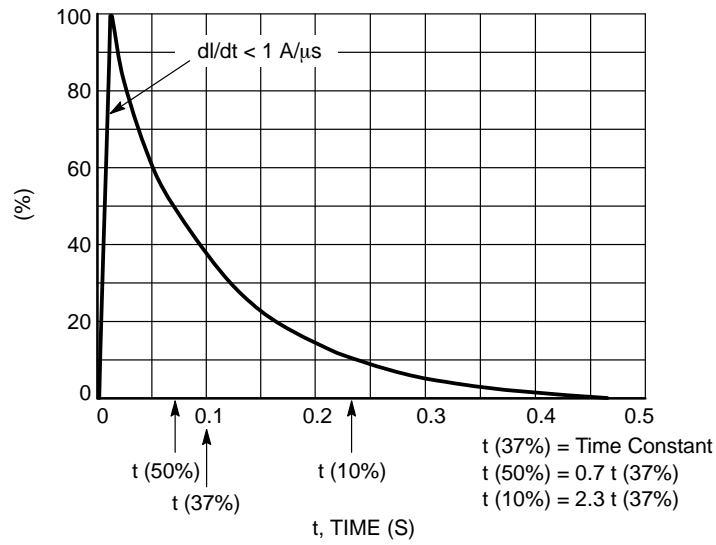
# MR2535L



**Figure 11. Typical Clamping Factor**



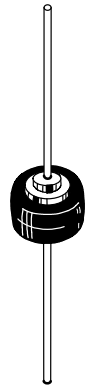
**Figure 12. Load Dump Test Circuit**



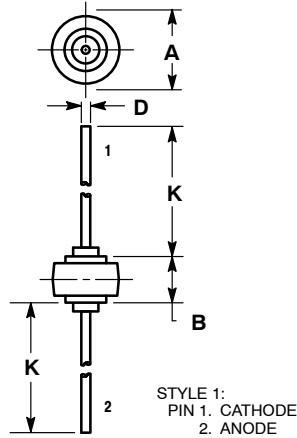
**Figure 13. Load Dump Pulse Current**

**MICRODE AXIAL  
CASE 194-04  
ISSUE H**

**DATE 09 SEP 2003**



SCALE 1:1

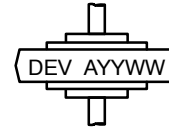


NOTES:

1. CATHODE SYMBOL ON PACKAGE.
2. 194-01 OBSOLETE, 194-04 NEW STANDARD.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.43	8.69	0.332	0.342
B	5.94	6.25	0.234	0.246
D	1.27	1.35	0.050	0.053
K	25.15	25.65	0.990	1.010

**GENERIC  
MARKING DIAGRAM\***



- DEV = 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.

<b>DOCUMENT NUMBER:</b>	<b>98ASB42126B</b>	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
<b>DESCRIPTION:</b>	<b>MICRODE AXIAL</b>	<b>PAGE 1 OF 1</b>

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)