

# MR2520L

## Overvoltage Transient Suppressor

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

- 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	$V_{RRM}$ $V_{RWM}$ $V_R$	23	V
Repetitive Peak Reverse Surge Current (Time Constant = 10 ms, Duty Cycle $\leq 1\%$ , $T_C = 25^\circ\text{C}$ )	$I_{RSM}$	58	A
Peak Reverse Power (Time Constant = 10 ms, Duty Cycle $\leq 1\%$ , $T_C = 25^\circ\text{C}$ )	$P_{RSM}$	2500	W
Average Rectified Forward Current, (Single Phase, Resistive Load, 60 Hz, $T_C = 125^\circ\text{C}$ ) (See Figure 4)	$I_O$	6.0	A
Non-Repetitive Peak Surge Current, Surge Supplied at Rated Load Conditions Halfwave, Single Phase	$I_{FSM}$	400	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.

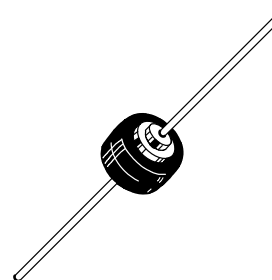
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

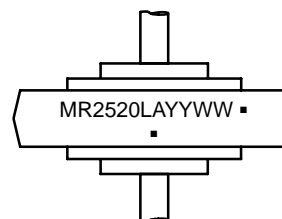
<http://onsemi.com>

## OVERVOLTAGE TRANSIENT SUPPRESSOR 24 – 32 VOLTS



MICRO 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

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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## THERMAL CHARACTERISTICS

Characteristic	Lead Length	Symbol	Max	Unit
Thermal Resistance, Junction-to-Lead, Both Leads to Heat Sink with Equal Length	6.25 mm 10 mm 15 mm	$R_{\theta JL}$	7.5 10 15	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Case	–	$R_{\theta JC}$	1.0	$^{\circ}\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Max	Unit
Instantaneous Forward Voltage (Note 1) ( $I_F = 100\text{ A}$ , $T_C = 25^{\circ}\text{C}$ )	$V_F$	–	1.25	V
Instantaneous Forward Voltage (Note 1) ( $I_F = 6.0\text{ A}$ , $T_C = 25^{\circ}\text{C}$ )	$V_F$	–	0.90	V
Reverse Current ( $V_R = 20\text{ Vdc}$ , $T_C = 25^{\circ}\text{C}$ )	$I_R$	–	10	nAdc
Reverse Current ( $V_R = 20\text{ Vdc}$ , $T_C = 25^{\circ}\text{C}$ )	$I_R$	–	300	nAdc
Breakdown Voltage (Note 1) ( $I_R = 100\text{ mAdc}$ , $T_C = 25^{\circ}\text{C}$ )	$V_{(BR)}$	24	32	V
Breakdown Voltage (Note 1) ( $I_R = 90\text{ A}$ , $T_C = 150^{\circ}\text{C}$ , $PW = 80\text{ }\mu\text{s}$ )	$V_{(BR)}$	–	40	V
Dynamic Resistance ( $I_R = 100\text{ mA}$ , $T_J = 25^{\circ}\text{C}$ , $f = 1.0\text{ kHz}$ )	$R_Z$	–	5.0	$\Omega$
Dynamic Resistance ( $I_R = 40\text{ mA}$ , $T_J = 25^{\circ}\text{C}$ )	$R_Z$	–	0.15	$\Omega$
Breakdown Voltage Temperature Coefficient	$V_{(BR)TC}$	–	0.09*	$\%/^{\circ}\text{C}$
Forward Voltage Temperature Coefficient @ $I_F = 10\text{ mA}$	$V_{FTC}$	–	-2*	$\text{mV}/^{\circ}\text{C}$

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

\*Typical

## ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
MR2520L	Microde Axial	1000 / Box
MR2520LG	Microde Axial (Pb-Free)	
MR2520LRL	Microde Axial	800 / Tape & Reel
MR2520LRLG	Microde Axial (Pb-Free)	

<sup>†</sup>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.

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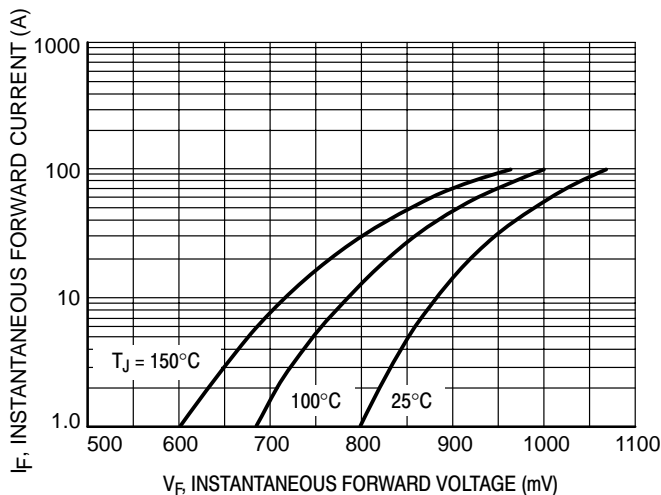


Figure 1. Forward Voltage

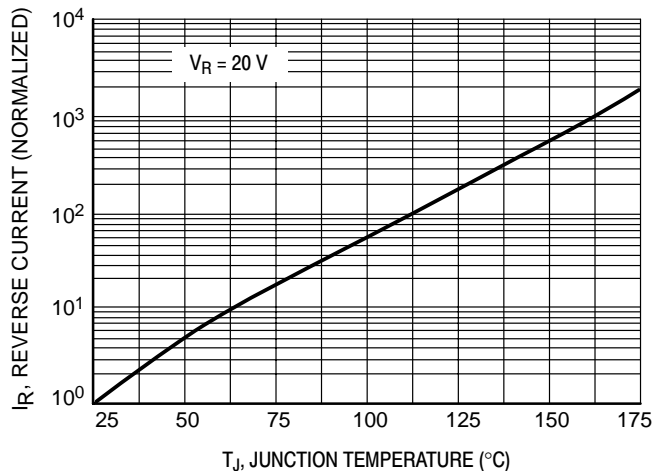


Figure 2. Normalized Reverse Current

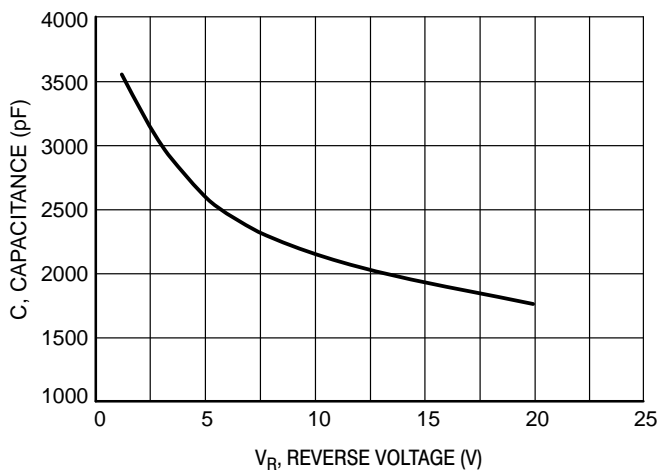


Figure 3. Typical Capacitance

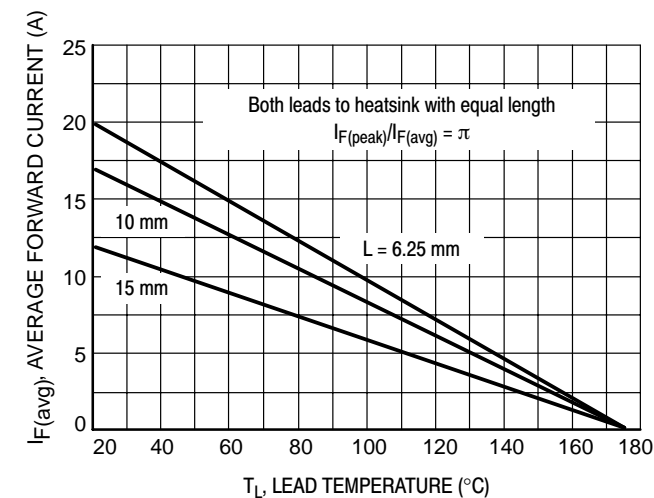


Figure 4. Maximum Current Ratings

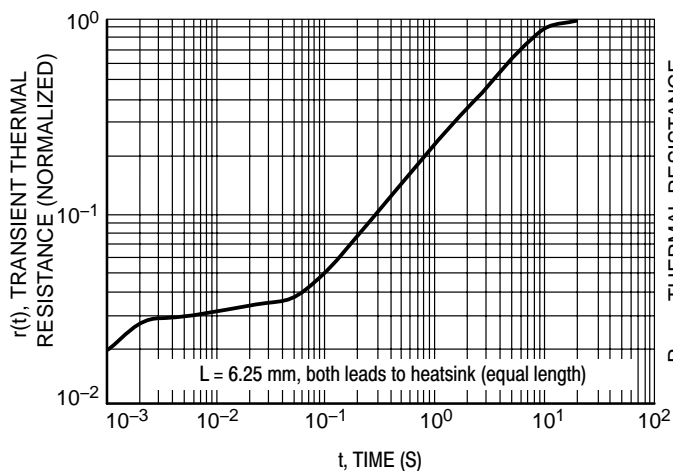


Figure 5. Thermal Response

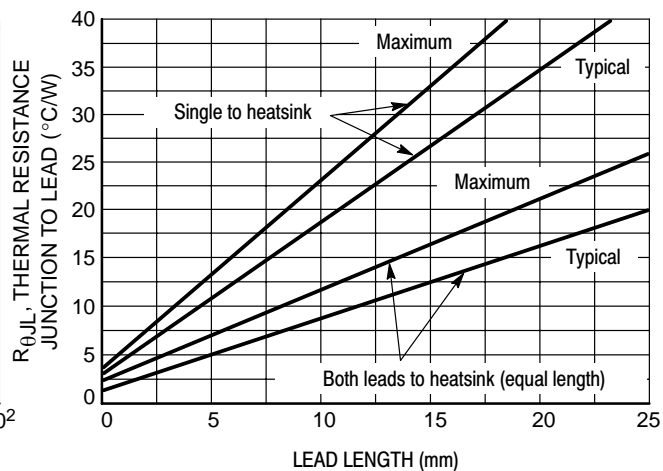


Figure 6. Steady State Thermal Resistance

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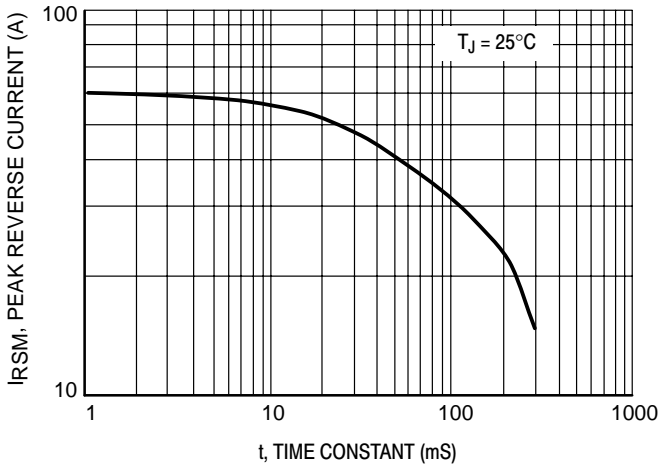


Figure 7. Maximum Peak Reverse Current

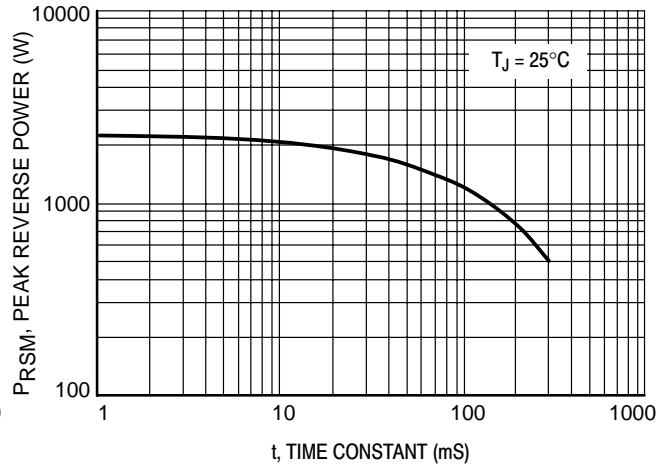


Figure 8. Maximum Peak Reverse Power

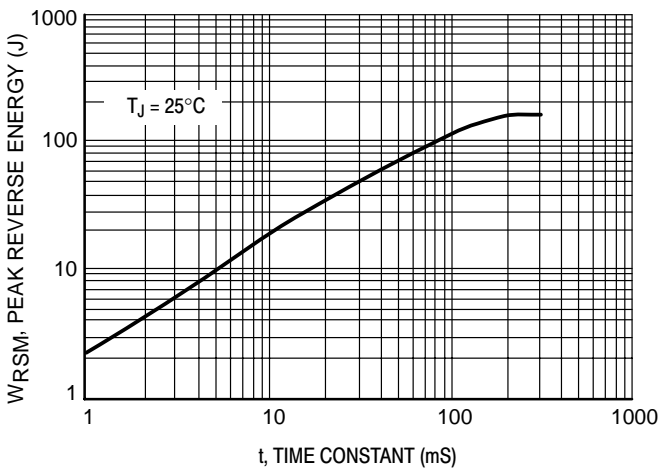


Figure 9. Maximum Reverse Energy

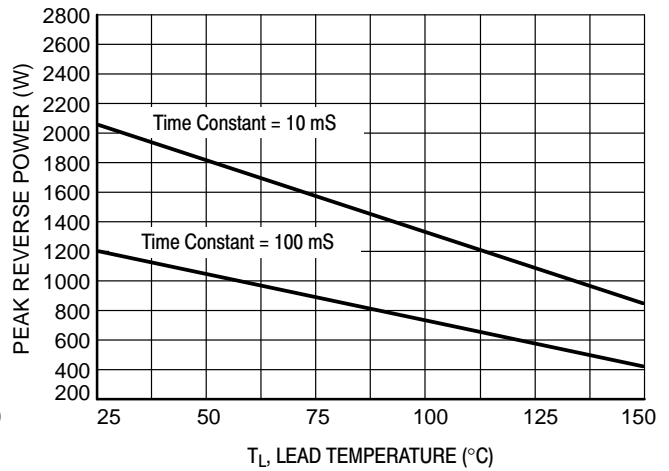


Figure 10. Reverse Power Derating

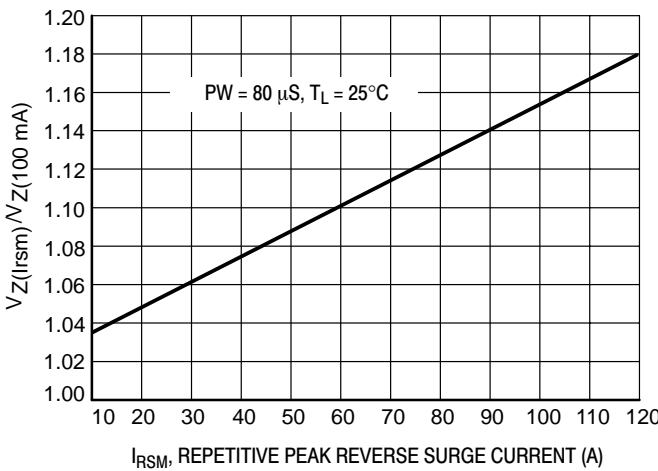


Figure 11. Typical Clamping Factor

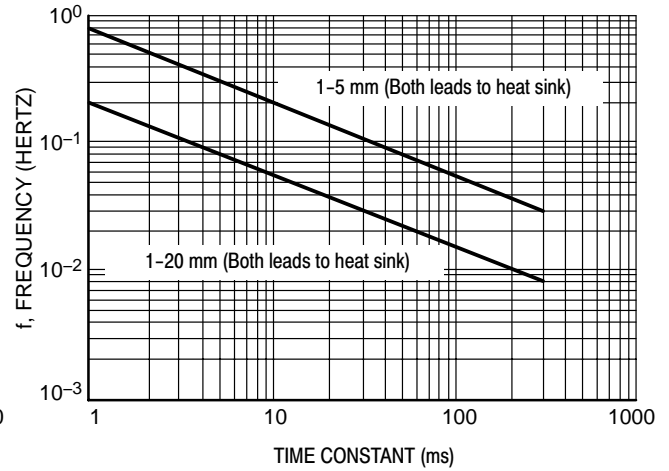
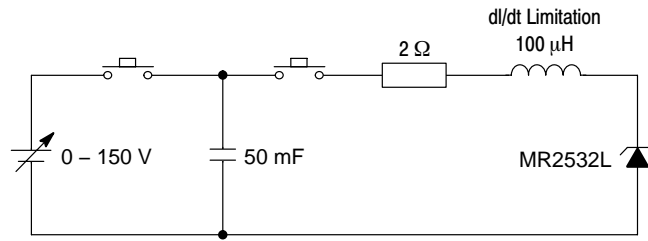
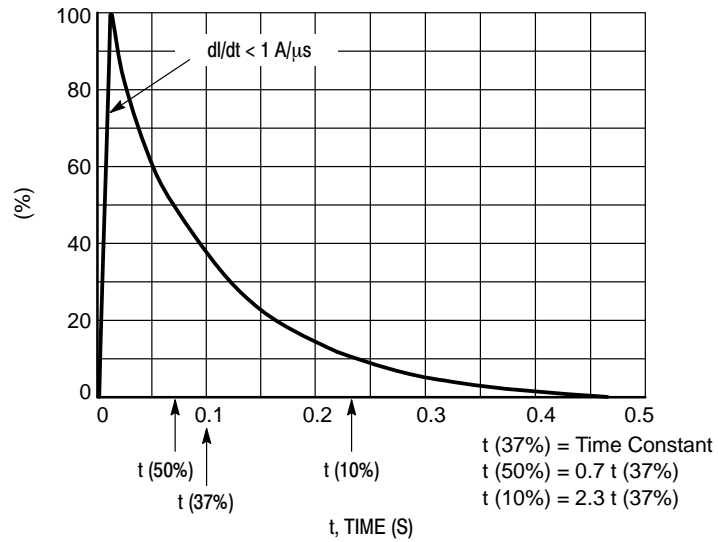


Figure 12. Maximum Load Dump Frequency

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**Figure 13. Load Dump Test Circuit**

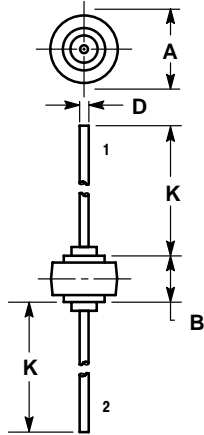


**Figure 14. Load Dump Pulse Current**

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## PACKAGE DIMENSIONS


### MICRODE AXIAL CASE 194-04 ISSUE H



- 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

- STYLE 1:  
PIN 1. CATHODE  
2. ANODE

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