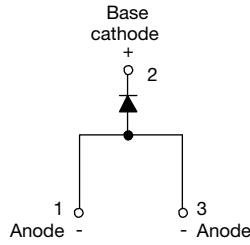




## Surface Mount Fast Soft Recovery Rectifier Diode, 8 A



### FEATURES

- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- Output rectification and freewheeling diode in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met

### DESCRIPTION

The VS-8EWF..S-M3 fast soft recovery rectifier series has been optimized for combined short reverse recovery time, low forward voltage drop and low leakage current.

The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

PRODUCT SUMMARY	
Package	D-PAK (TO-252AA)
$I_{F(AV)}$	8 A
$V_R$	1000 V, 1200 V
$V_F$ at $I_F$	1.3 V
$I_{FSM}$	150 A
$t_{rr}$	80 ns
$T_J$ max.	150 °C
Diode variation	Single die
Snap factor	0.6

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Sinusoidal waveform	8	A
$V_{RRM}$		1000/1200	V
$I_{FSM}$		150	A
$V_F$	8 A, $T_J = 25\text{ °C}$	1.3	V
$t_{rr}$	1 A, 100 A/ $\mu$ s	80	ns
$T_J$	Range	-40 to 150	°C

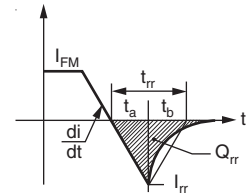
VOLTAGE RATINGS			
PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ AT 150 °C mA
VS-8EWF10S-M3	1000	1100	4
VS-8EWF12S-M3	1200	1300	

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 96\text{ °C}$ , 180° conduction half sine wave	8	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	125	
		10 ms sine pulse, no voltage reapplied	150	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied	78	A <sup>2</sup> s
		10 ms sine pulse, no voltage reapplied	110	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$ , no voltage reapplied	1100	A <sup>2</sup> $\sqrt{s}$



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	8 A, $T_J = 25\text{ }^\circ\text{C}$		1.3	V
Forward slope resistance	$r_t$	$T_J = 150\text{ }^\circ\text{C}$		25.6	m $\Omega$
Threshold voltage	$V_{F(TO)}$			0.93	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		4	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	$t_{rr}$	$I_F$ at 8 A <sub>pk</sub> 25 A/ $\mu$ s $T_J = 25\text{ }^\circ\text{C}$	270	ns
Reverse recovery current	$I_{rr}$		4.2	A
Reverse recovery charge	$Q_{rr}$		1	$\mu$ C
Snap factor	S		0.6	



THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		-40 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	2.5	$^\circ\text{C/W}$
Typical thermal resistance, junction to ambient (PCB mount)	$R_{thJA}^{(1)}$		50	
Soldering temperature	$T_S$	For 10 s	260	$^\circ\text{C}$
Approximate weight			1	g
			0.03	oz.
Marking device		Case style D-PAK (TO-252AA)	8EWF10S	
			8EWF12S	

**Note**

<sup>(1)</sup> When mounted on 1" square (650 mm<sup>2</sup>) PCB of FR-4 or G-10 material 4 oz. (140  $\mu$ m) copper 40  $^\circ\text{C/W}$   
For recommended footprint and soldering techniques refer to application note #AN-994

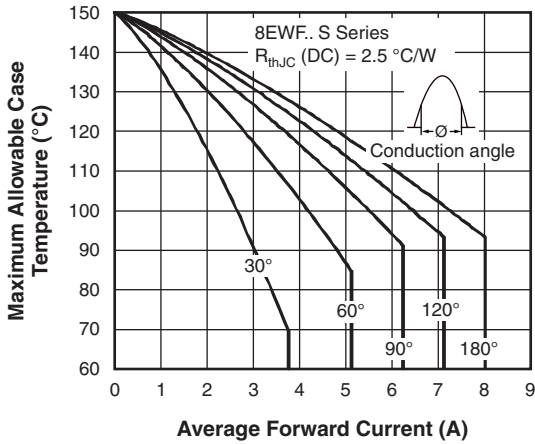


Fig. 1 - Current Rating Characteristics

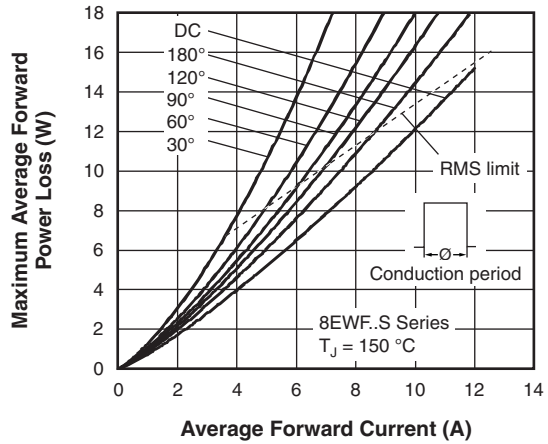


Fig. 4 - Forward Power Loss Characteristics

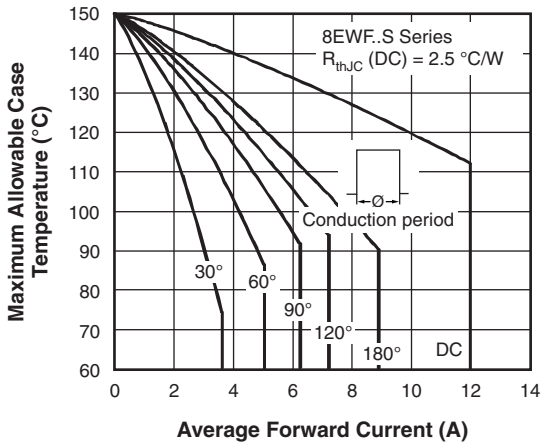


Fig. 2 - Current Rating Characteristics

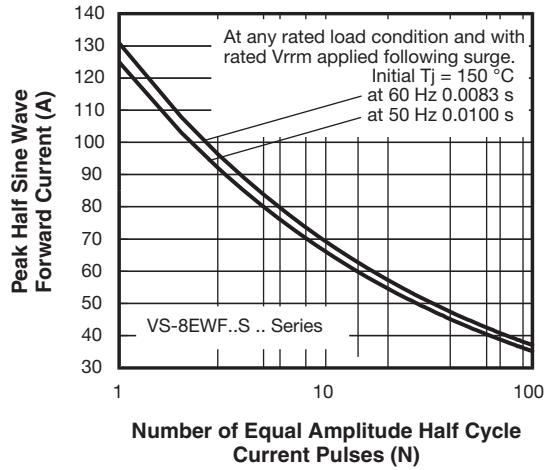


Fig. 5 - Maximum Non-Repetitive Surge Current

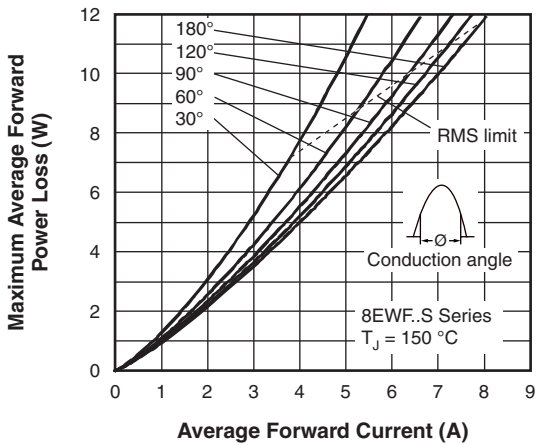


Fig. 3 - Forward Power Loss Characteristics

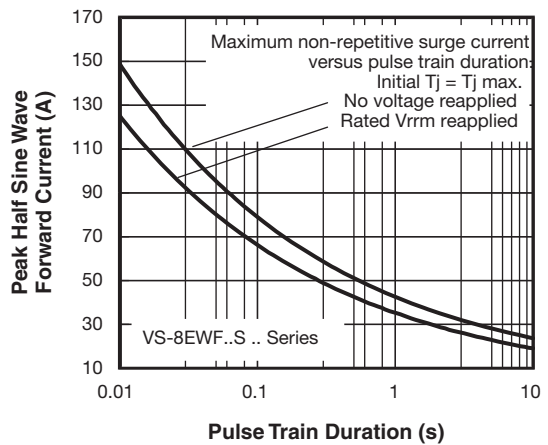


Fig. 6 - Maximum Non-Repetitive Surge Current

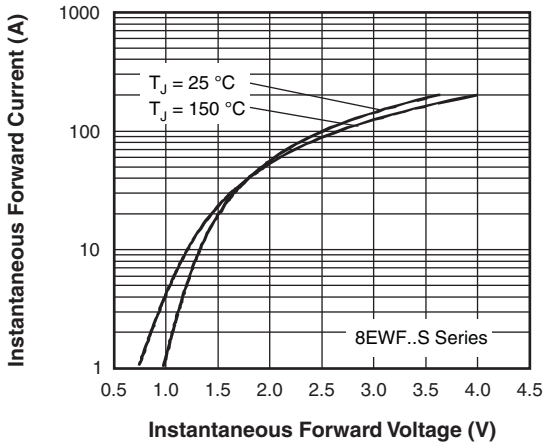


Fig. 7 - Forward Voltage Drop Characteristics

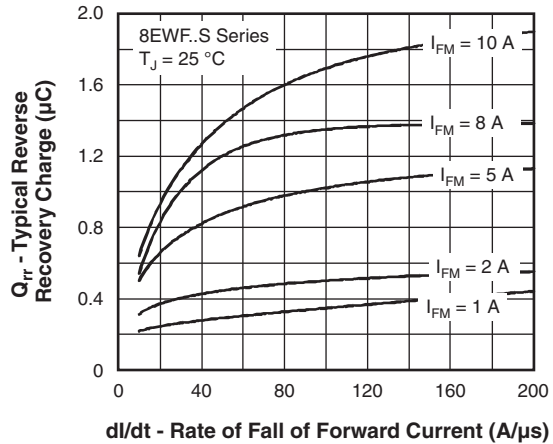


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ °C}$

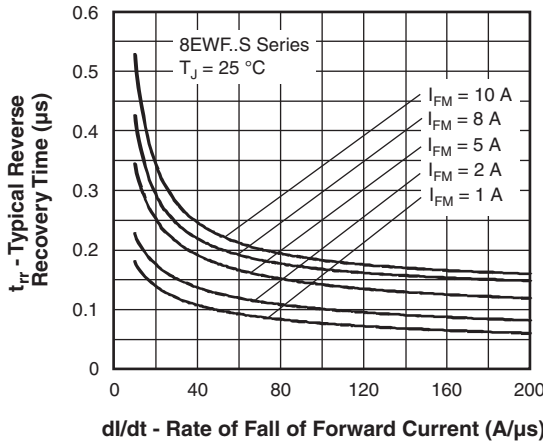


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ °C}$

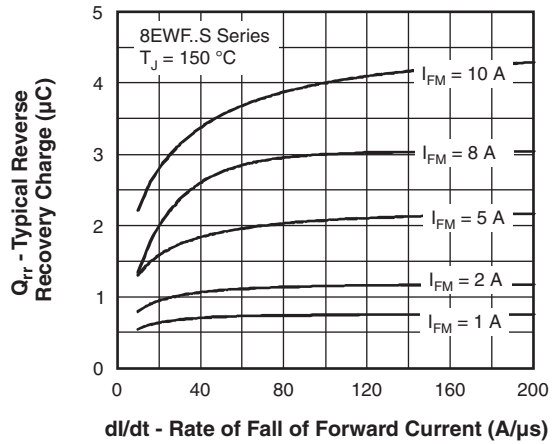


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ °C}$

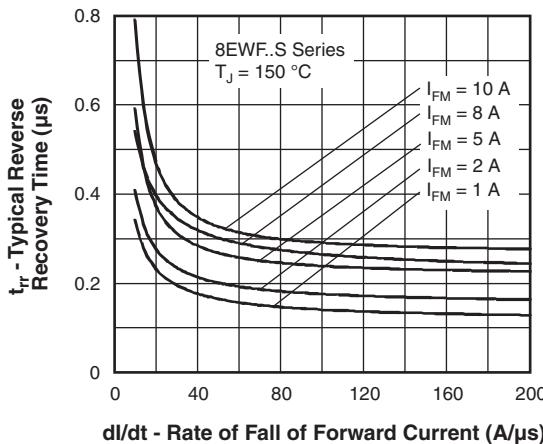


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ °C}$

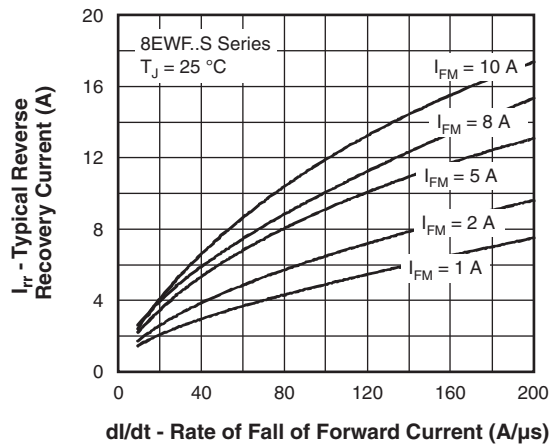


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ °C}$

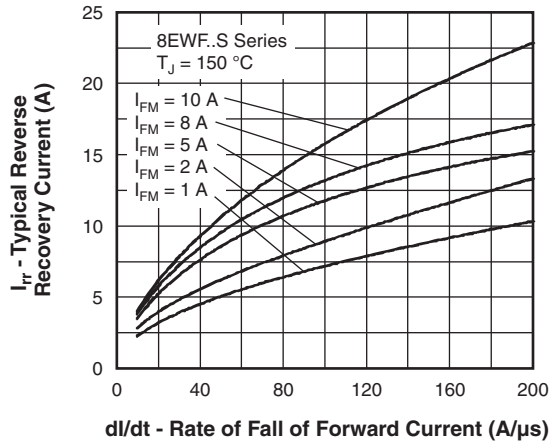


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

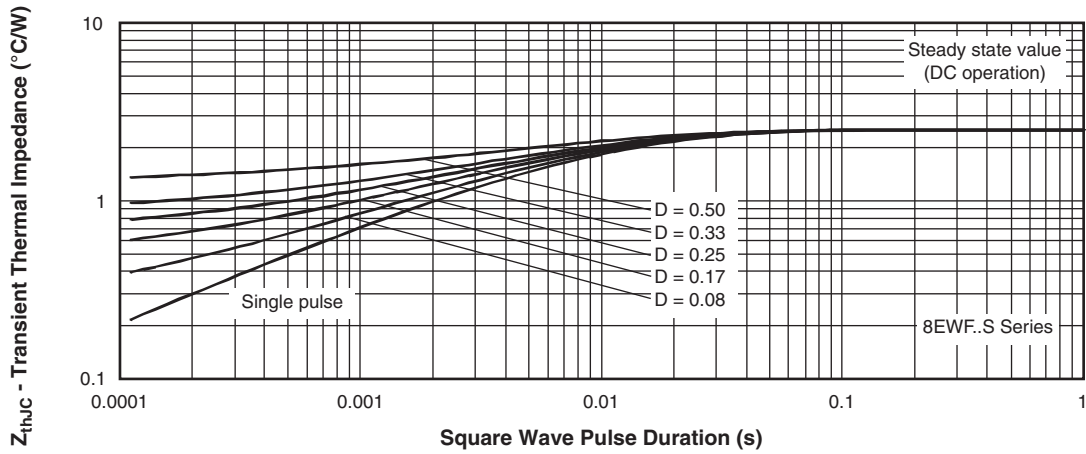
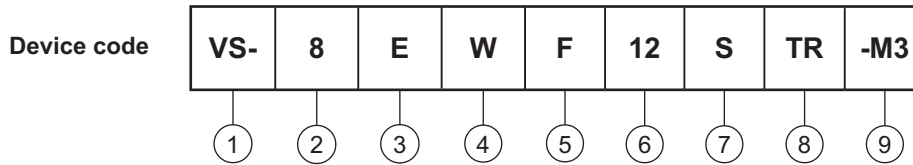


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (8 = 8 A)
- 3** - Circuit configuration:  
E = Single diode
- 4** - Package:  
W = D-PAK
- 5** - Type of silicon:  
F = Fast soft recovery rectifier
- 6** - Voltage code x 100 =  $V_{RRM}$ 

10 = 1000 V
12 = 1200 V
- 7** - S = Surface mountable
- 8** -
  - TR = Tape and reel
  - TRR = Tape and reel (right oriented)
  - TRL = Tape and reel (left oriented)
- 9** - Environmental digit:  
-M3 = Halogen-free, RoHS compliant and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-8EWF10S-M3	75	3000	Antistatic plastic tubes
VS-8EWF10STR-M3	2000	2000	13" diameter reel
VS-8EWF10STRL-M3	3000	3000	13" diameter reel
VS-8EWF10STRR-M3	3000	3000	13" diameter reel
VS-8EWF12S-M3	75	3000	Antistatic plastic tubes
VS-8EWF12STR-M3	2000	2000	13" diameter reel
VS-8EWF12STRL-M3	3000	3000	13" diameter reel
VS-8EWF12STRR-M3	3000	3000	13" diameter reel

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95016">www.vishay.com/doc?95016</a>
Part marking information	<a href="http://www.vishay.com/doc?95176">www.vishay.com/doc?95176</a>
Packaging information	<a href="http://www.vishay.com/doc?95033">www.vishay.com/doc?95033</a>
SPICE model	<a href="http://www.vishay.com/doc?95552">www.vishay.com/doc?95552</a>



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