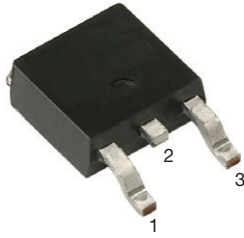
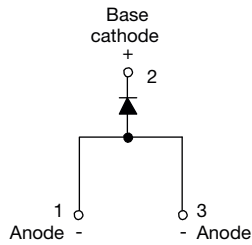


## Surface Mount Fast Soft Recovery Rectifier Diode, 8 A



TO-252AA (D-PAK)



### FEATURES

- Glass passivated pellet chip junction
- 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)


**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**

### 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	TO-252AA (D-PAK)
$I_{F(AV)}$	8 A
$V_R$	200 V, 400 V, 600 V
$V_F$ at $I_F$	1.2 V
$I_{FSM}$	150 A
$t_{rr}$	55 ns
$T_J$ max.	150 °C
Diode variation	Single die
Snap factor	0.5

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Sinusoidal waveform	8	A
$V_{RRM}$		200 to 600	V
$I_{FSM}$		150	A
$V_F$	8 A, $T_J = 25$ °C	1.2	V
$t_{rr}$	1 A, 100 A/ $\mu$ s	55	ns
$T_J$	Range	-40 to +150	°C

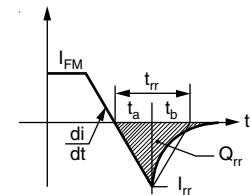
VOLTAGE RATINGS			
PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ AT 150 °C mA
VS-8EWF02S-M3	200	300	3
VS-8EWF04S-M3	400	500	
VS-8EWF06S-M3	600	700	

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 96$ °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	$I^2\sqrt{t}$	$t = 0.1$ ms to 10 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, $T_J = 25\text{ }^\circ\text{C}$		1.2	V
Forward slope resistance	$r_t$	$T_J = 150\text{ }^\circ\text{C}$		16	$m\Omega$
Threshold voltage	$V_{F(TO)}$			1.13	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		3	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	$t_{rr}$	$I_F$ at 1 A <sub>pk</sub> 100 A/ $\mu$ s $T_J = 25\text{ }^\circ\text{C}$	55	ns
		$I_F$ at 8 A <sub>pk</sub> 25 A/ $\mu$ s $T_J = 25\text{ }^\circ\text{C}$	200	
Reverse recovery current	$I_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	2.6	A
Reverse recovery charge	$Q_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	0.25	$\mu$ C
Snap factor	S		0.5	



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	
Approximate weight			1	g
			0.03	oz.
Marking device		Case style TO-252AA (D-PAK)	8EWF02S	
			8EWF04S	
			8EWF06S	

**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

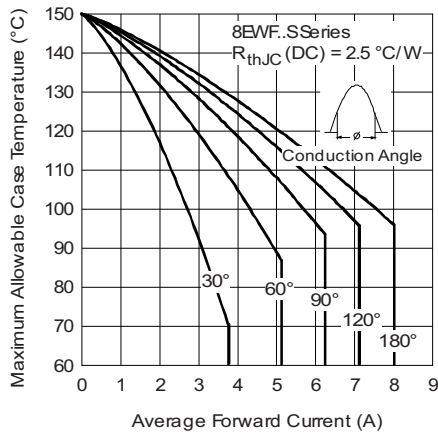


Fig. 1 - Current Rating Characteristics

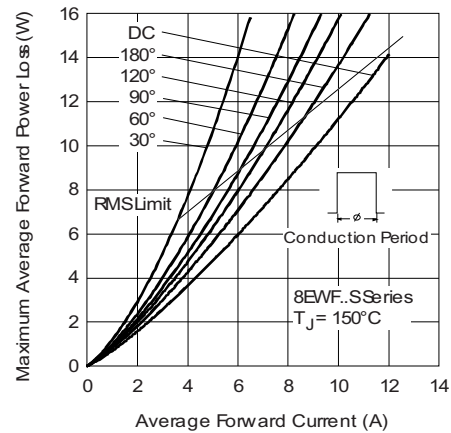


Fig. 4 - Forward Power Loss Characteristics

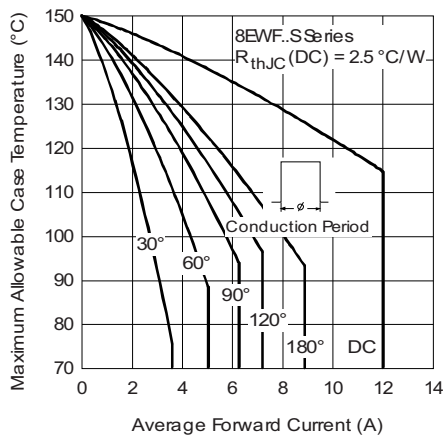


Fig. 2 - Current Rating Characteristics

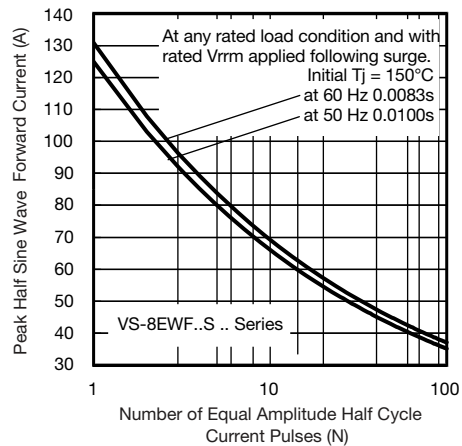


Fig. 5 - Maximum Non-Repetitive Surge Current

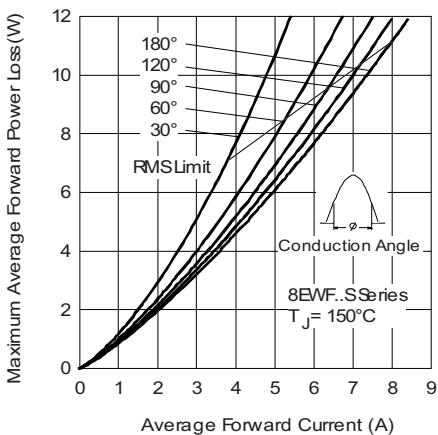


Fig. 3 - Forward Power Loss Characteristics

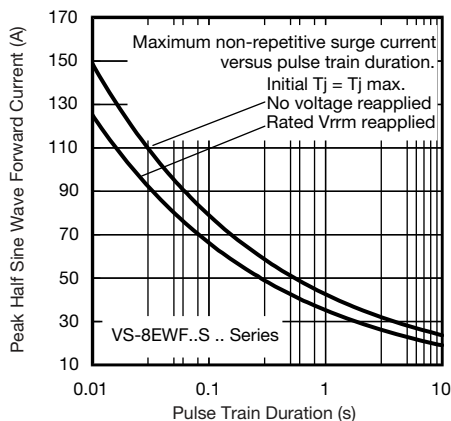


Fig. 6 - Maximum Non-Repetitive Surge Current

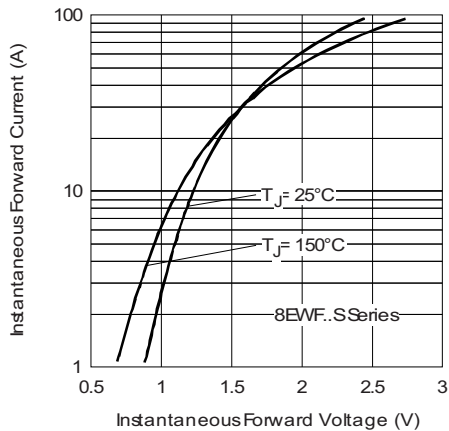


Fig. 7 - Forward Voltage Drop Characteristics

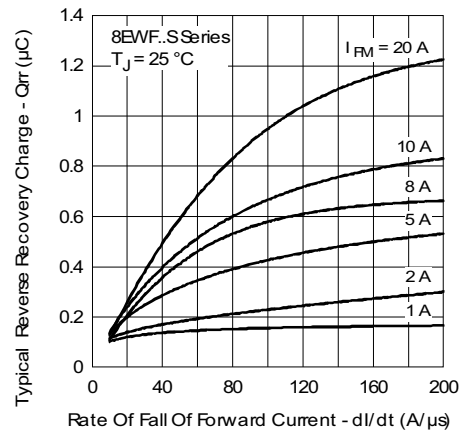


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

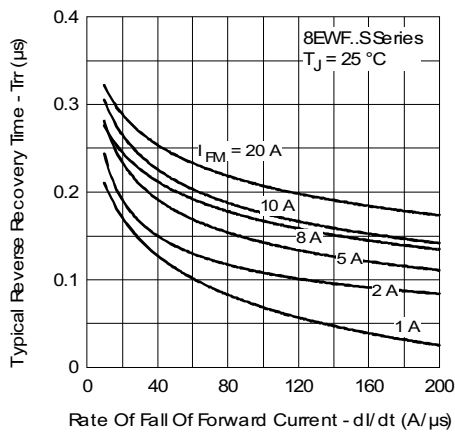


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

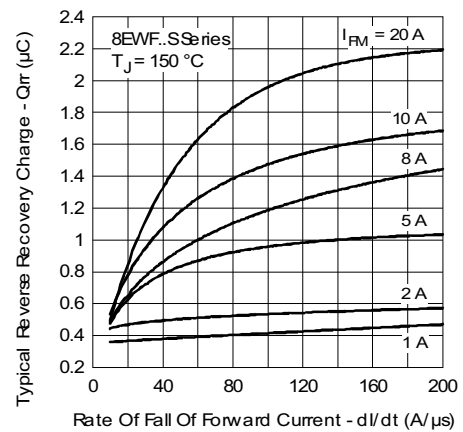


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

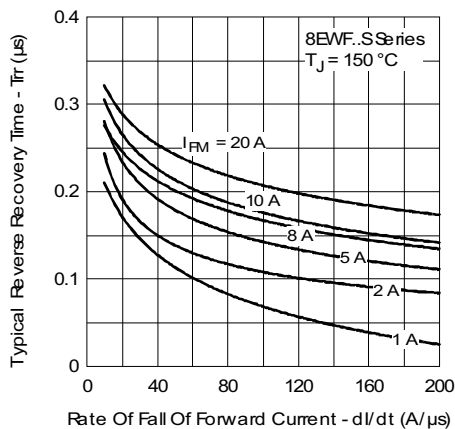


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

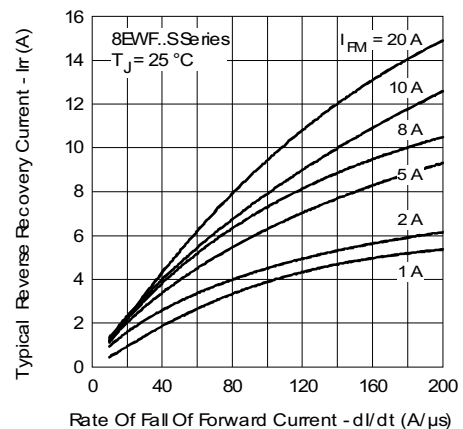


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

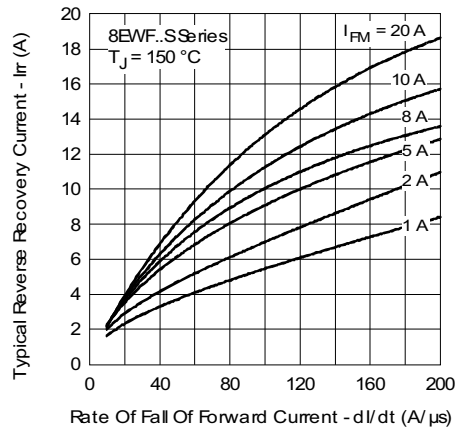


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

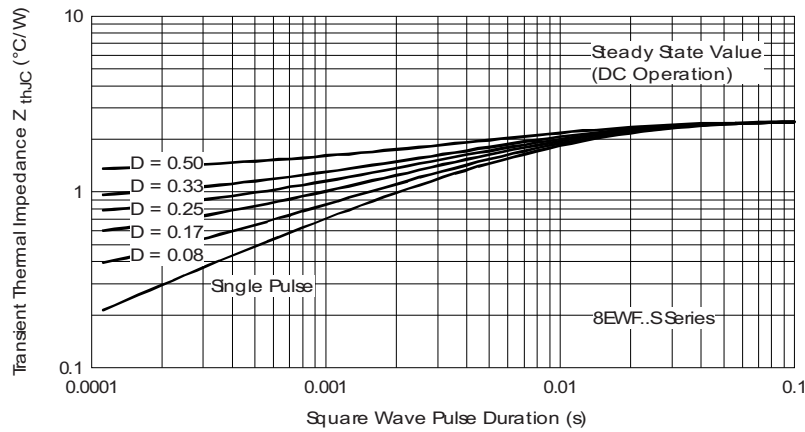
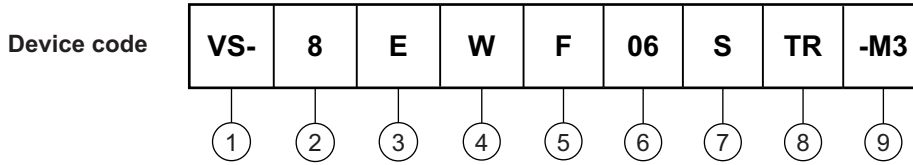


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics



**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 =  $V_{RRM}$ 

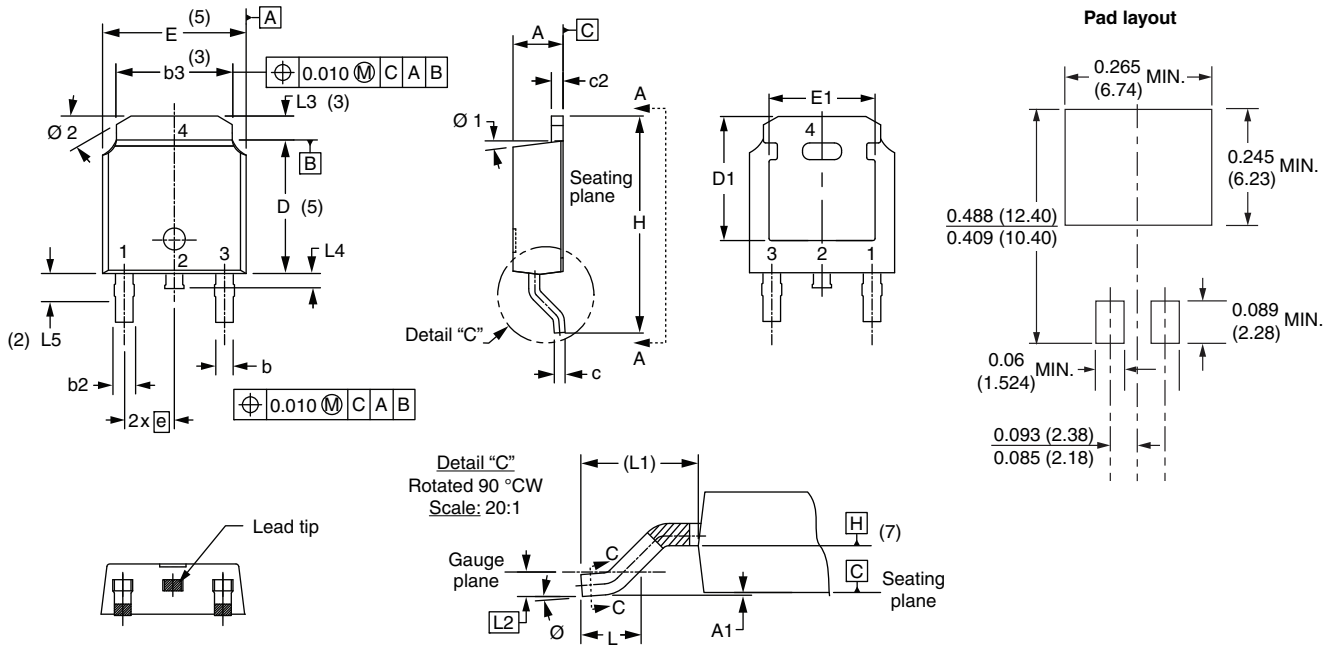
02 = 200 V
04 = 400 V
06 = 600 V
- 7** - S = surface mountable
- 8** -
  - TR = tape and reel
  - TRR = tape and reel (right oriented)
  - TRL = tape and reel (left oriented)
- 9** - Environmental digit:  
-M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

<b>ORDERING INFORMATION (Example)</b>			
<b>PREFERRED P/N</b>	<b>QUANTITY PER T/R</b>	<b>MINIMUM ORDER QUANTITY</b>	<b>PACKAGING DESCRIPTION</b>
VS-8EWF02S-M3	75	3000	Antistatic plastic tubes
VS-8EWF02STR-M3	2000	2000	13" diameter reel
VS-8EWF02STRL-M3	3000	3000	13" diameter reel
VS-8EWF02STRR-M3	3000	3000	13" diameter reel
VS-8EWF04S-M3	75	3000	Antistatic plastic tubes
VS-8EWF04STR-M3	2000	2000	13" diameter reel
VS-8EWF04STRL-M3	3000	3000	13" diameter reel
VS-8EWF04STRR-M3	3000	3000	13" diameter reel
VS-8EWF06S-M3	75	3000	Antistatic plastic tubes
VS-8EWF06STR-M3	2000	2000	13" diameter reel
VS-8EWF06STRL-M3	3000	3000	13" diameter reel
VS-8EWF06STRR-M3	3000	3000	13" diameter reel

<b>LINKS TO RELATED DOCUMENTS</b>	
Dimensions	<a href="http://www.vishay.com/doc?95627">www.vishay.com/doc?95627</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>
SPIICE model	<a href="http://www.vishay.com/doc?95551">www.vishay.com/doc?95551</a>

### D-PAK (TO-252AA) "M"

**DIMENSIONS** in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES	SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.			MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	0.086	0.094		e	2.29 BSC		0.090 BSC		
A1	-	0.13	-	0.005		H	9.40	10.41	0.370	0.410	
b	0.64	0.89	0.025	0.035		L	1.40	1.78	0.055	0.070	
b2	0.76	1.14	0.030	0.045		L1	2.74 BSC		0.108 REF.		
b3	4.95	5.46	0.195	0.215	3	L2	0.51 BSC		0.020 BSC		
c	0.46	0.61	0.018	0.024		L3	0.89	1.27	0.035	0.050	3
c2	0.46	0.89	0.018	0.035		L4	-	1.02	-	0.040	
D	5.97	6.22	0.235	0.245	5	L5	1.14	1.52	0.045	0.060	2
D1	5.21	-	0.205	-	3	Ø	0°	10°	0°	10°	
E	6.35	6.73	0.250	0.265	5	Ø1	0°	15°	0°	15°	
E1	4.32	-	0.170	-	3	Ø2	25°	35°	25°	35°	

**Notes**

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension uncontrolled in L5
- (3) Dimension D1, E1, L3 and b3 establish a minimum mounting surface for thermal pad
- (4) Section C - C dimension apply to the flat section of the lead between 0.13 and 0.25 mm (0.005 and 0.10") from the lead tip
- (5) Dimension D, and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (6) Dimension b1 and c1 applied to base metal only
- (7) Datum A and B to be determined at datum plane H
- (8) Outline conforms to JEDEC® outline TO-252AA



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