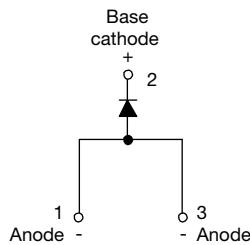


High Voltage Surface Mountable Input Rectifier Diode, 8 A



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



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Input rectification
- Vishay Semiconductors switches and output rectifiers which are available in identical package outlines

DESCRIPTION

The VS-8EWS..S-M3 rectifier high voltage series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150 °C junction temperature.

The **high reverse voltage** range available allows design of input stage primary rectification with **outstanding voltage surge** capability.

PRODUCT SUMMARY	
Package	TO-252AA (D-PAK)
$I_{F(AV)}$	8 A
V_R	800 V, 1200 V
V_F at I_F	1.1 V
I_{FSM}	150 A
T_J max.	150 °C
Diode variation	Single die

OUTPUT CURRENT IN TYPICAL APPLICATIONS			
APPLICATIONS	SINGLE-PHASE BRIDGE	THREE-PHASE BRIDGE	UNITS
NEMA FR-4 or G10 glass fabric-based epoxy with 4 oz. (140 µm) copper	1.2	1.6	A
Aluminum IMS, $R_{thCA} = 15$ °C/W	2.5	2.8	
Aluminum IMS with heatsink, $R_{thCA} = 5$ °C/W	5.5	6.5	

Note

- $T_A = 55$ °C, $T_J = 125$ °C, footprint 300 mm²

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Sinusoidal waveform	8	A
V_{RRM}		800/1200	V
I_{FSM}		150	A
V_F	8 A, $T_J = 25$ °C	1.10	V
T_J		-55 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-8EWS08S-M3	800	900	0.5
VS-8EWS12S-M3	1200	1300	

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 105^\circ C$, 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^2s
		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	$A^2\sqrt{s}$

ELECTRICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum forward voltage drop	V_{FM}	8 A, $T_J = 25^\circ C$	1.1	V
Forward slope resistance	r_t	$T_J = 150^\circ C$	20	$m\Omega$
Threshold voltage	$V_{F(TO)}$		0.82	V
Maximum reverse leakage current	I_{RM}	$T_J = 25^\circ C$	0.05	mA
		$T_J = 150^\circ C$	0.50	
		$V_R = \text{Rated } V_{RRM}$		

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		-55 to +150	$^\circ C$
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	2.5	$^\circ C/W$
Typical thermal resistance, junction to ambient (PCB mount)	$R_{thJA}^{(1)}$		62	
Approximate weight		Case style TO-252AA (D-PAK)	1	g
			0.03	oz.
Marking device		Case style TO-252AA (D-PAK)	8EWS08S	
			8EWS12S	

Note

⁽¹⁾ When mounted on 1" square (650 mm²) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 $^\circ C/W$
For recommended footprint and soldering techniques refer to application note #AN-994

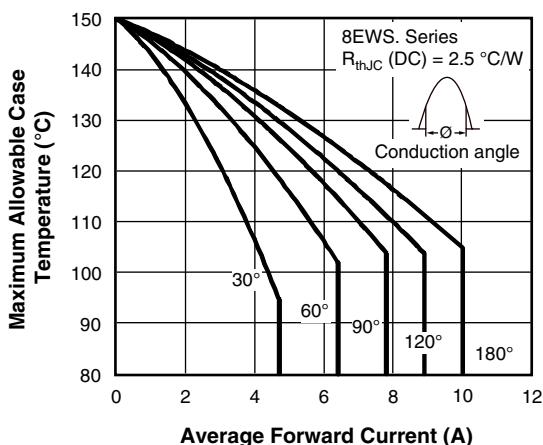


Fig. 1 - Current Rating Characteristics

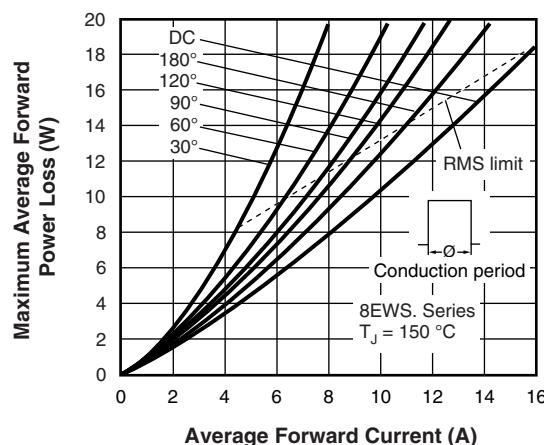


Fig. 4 - Forward Power Loss Characteristics

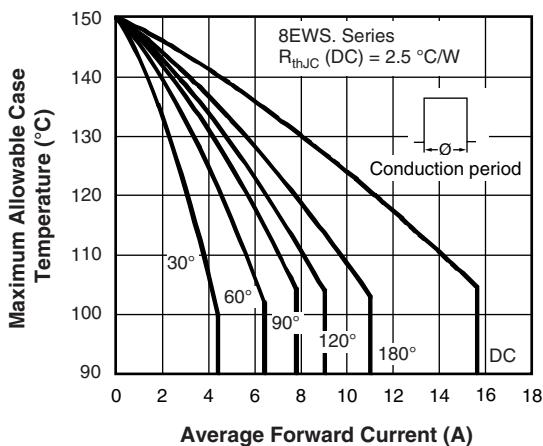


Fig. 2 - Current Rating Characteristics

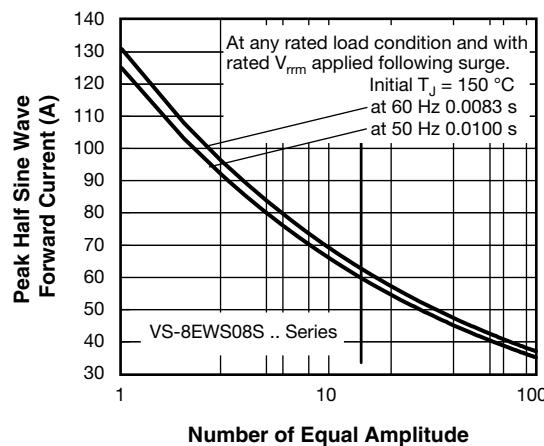


Fig. 5 - Maximum Non-Repetitive Surge Current

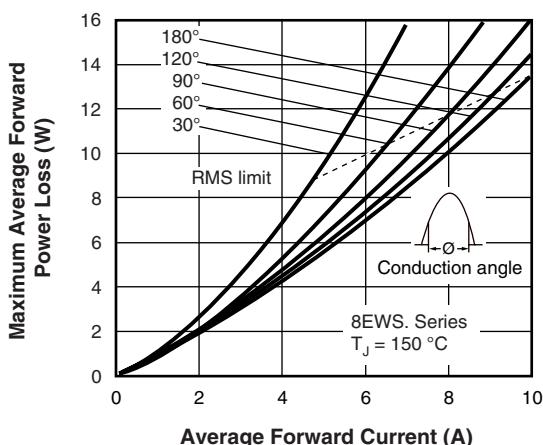


Fig. 3 - Forward Power Loss Characteristics

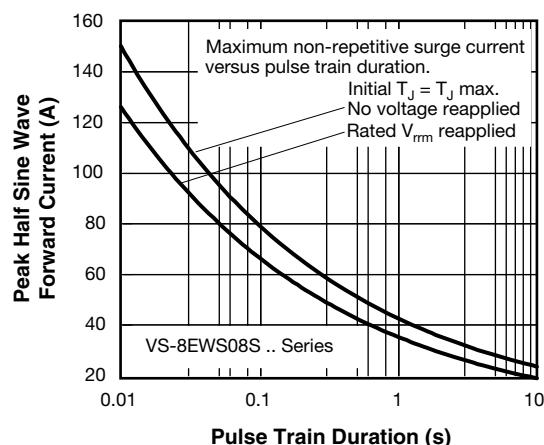


Fig. 6 - Maximum Non-Repetitive Surge Current

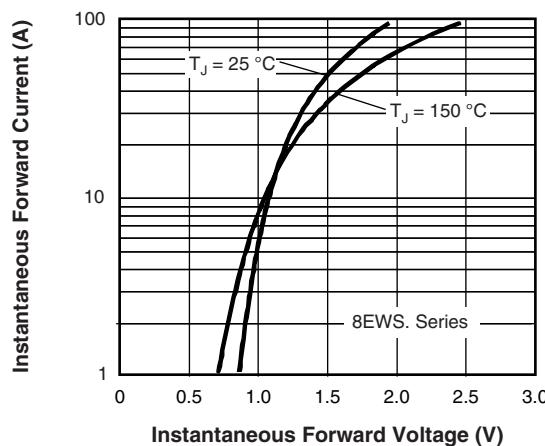


Fig. 7 - Forward Voltage Drop Characteristics

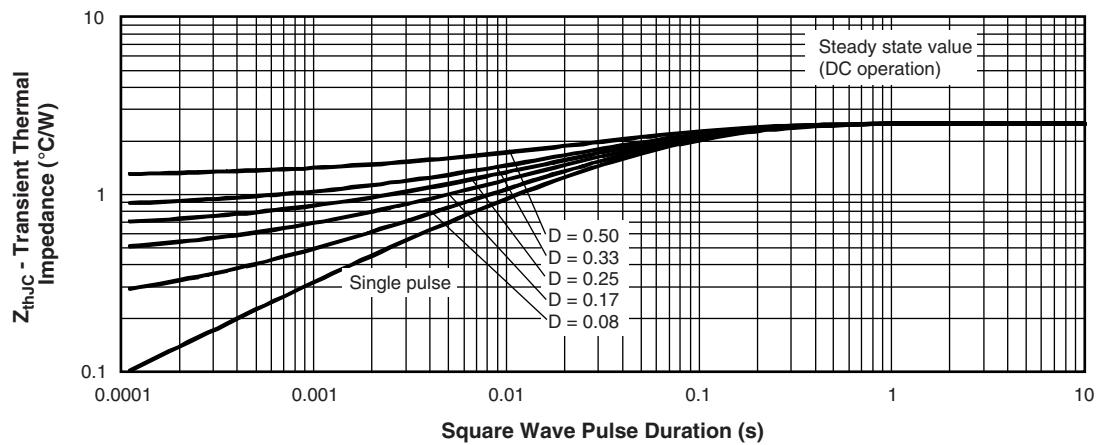


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	8	E	W	S	12	S	TR	-M3
	1	2	3	4	5	6	7	8	9

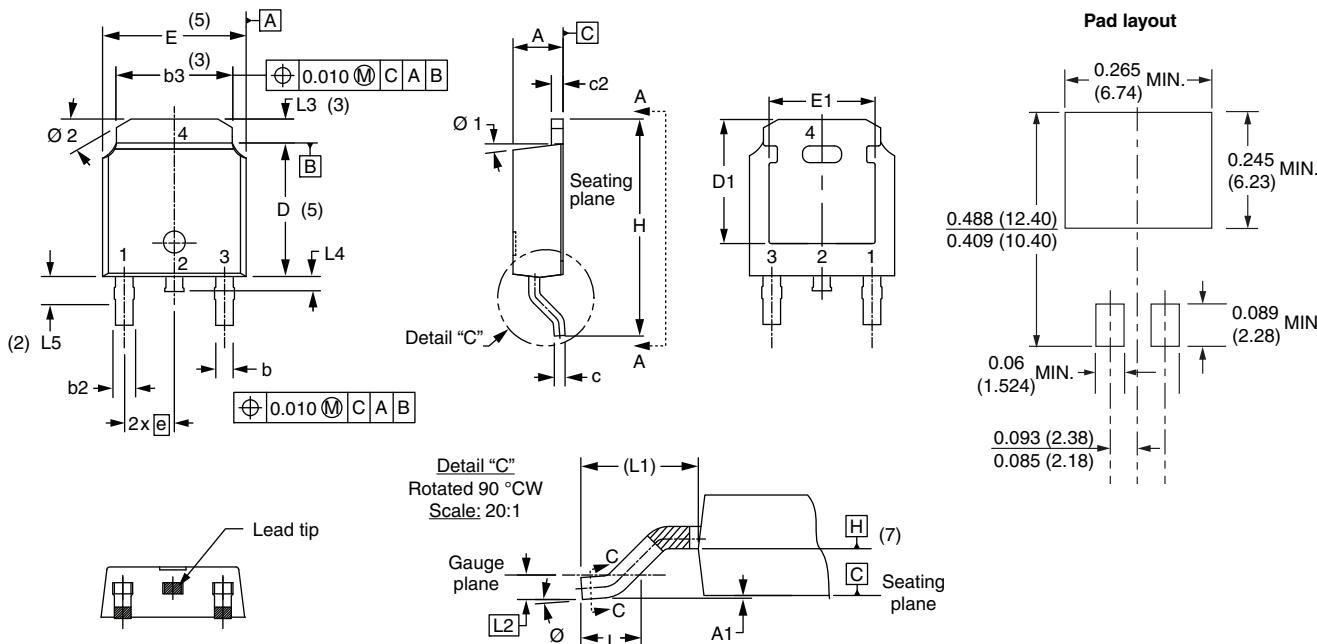
- [1]** - Vishay Semiconductors product
- [2]** - Current rating (8 = 8 A)
- [3]** - Circuit configuration:
E = single diode
- [4]** - Package:
W = D-PAK
- [5]** - Type of silicon:
S = standard recovery rectifier
- [6]** - Voltage code x 100 = V_{RRM} → 08 = 800 V
12 = 1200 V
- [7]** - S = surface mountable
- [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-8EWS08S-M3	75	3000	Antistatic plastic tubes	
VS-8EWS08STR-M3	2000	2000	13" diameter reel	
VS-8EWS08STRL-M3	3000	3000	13" diameter reel	
VS-8EWS08STRR-M3	3000	3000	13" diameter reel	
VS-8EWS12S-M3	75	3000	Antistatic plastic tubes	
VS-8EWS12STR-M3	2000	2000	13" diameter reel	
VS-8EWS12STRL-M3	3000	3000	13" diameter reel	
VS-8EWS12STRR-M3	3000	3000	13" diameter reel	

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95627
Part marking information	www.vishay.com/doc?95176
Packaging information	www.vishay.com/doc?95033

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			2.29	BSC	0.090	BSC	
A1	-	0.13	-	0.005			9.40	10.41	0.370	0.410	
b	0.64	0.89	0.025	0.035			1.40	1.78	0.055	0.070	
b2	0.76	1.14	0.030	0.045			2.74	BSC	0.108	REF.	
b3	4.95	5.46	0.195	0.215	3		0.51	BSC	0.020	BSC	
c	0.46	0.61	0.018	0.024			0.89	1.27	0.035	0.050	3
c2	0.46	0.89	0.018	0.035			-	1.02	-	0.040	
D	5.97	6.22	0.235	0.245	5		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 0.010") 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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