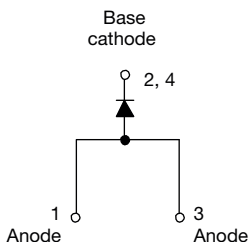


High Voltage Surface Mount Input Rectifier Diode, 8 A



DPAK (TO-252AA)



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-8EWS16S-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.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	8 A
V_R	1600 V
V_F at I_F	1.1 V
I_{FSM}	150 A
T_J max.	150 °C
Package	DPAK (TO-252AA)
Circuit configuration	Single

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}		1600	V
I_{FSM}		150	A
V_F	8 A, $T_J = 25$ °C	1.10	V
T_J		-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-8EWS16S-M3	1600	1700	0.5

**ABSOLUTE MAXIMUM RATINGS**

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

ELECTRICAL SPECIFICATIONS

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

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)	$R_{thJA}^{(1)}$		62	
Approximate weight			1	g
			0.03	oz.
Marking device		Case style DPAK (TO-252AA)	8EWS16S	

Note

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

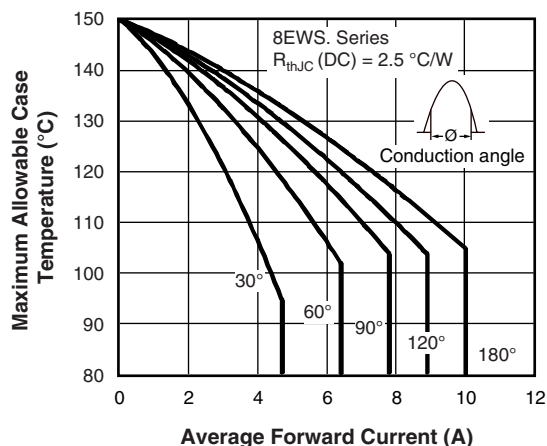


Fig. 1 - Current Rating Characteristics

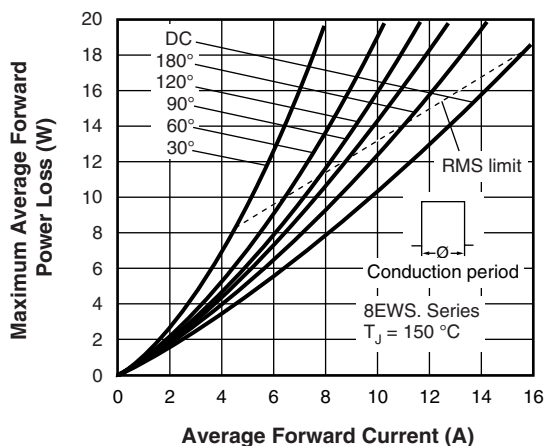


Fig. 4 - Forward Power Loss Characteristics

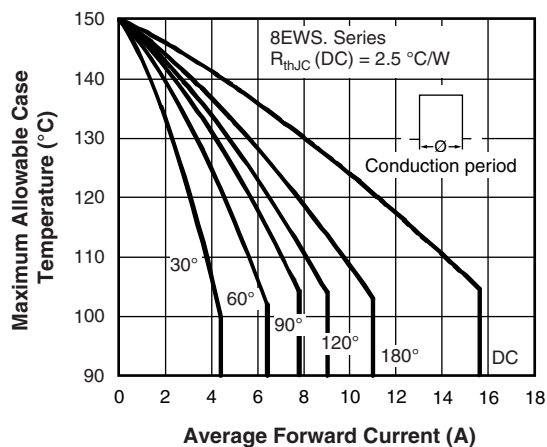


Fig. 2 - Current Rating Characteristics

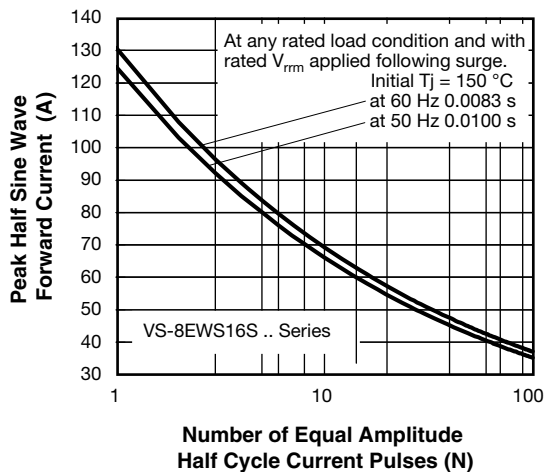


Fig. 5 - Maximum Non-Repetitive Surge Current

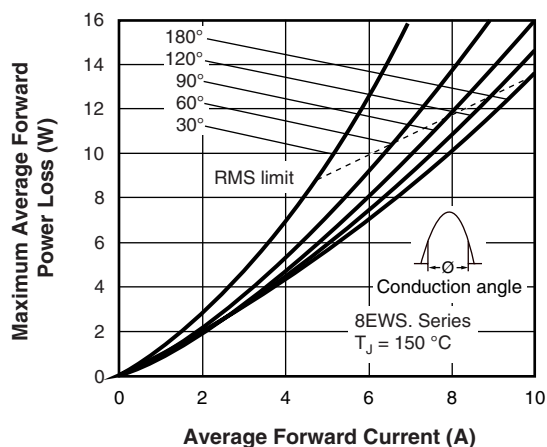


Fig. 3 - Forward Power Loss Characteristics

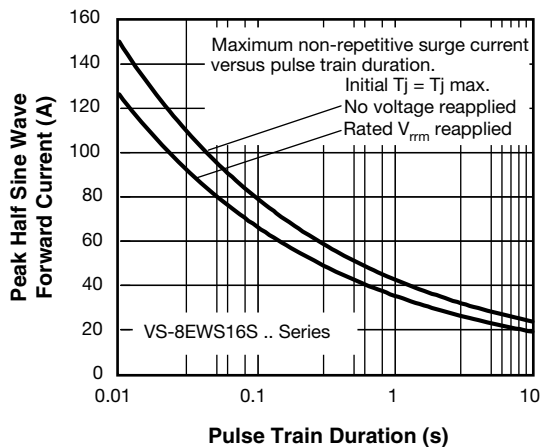


Fig. 6 - Maximum Non-Repetitive Surge Current

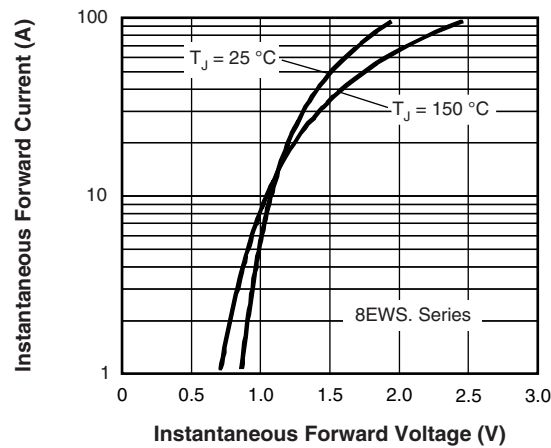
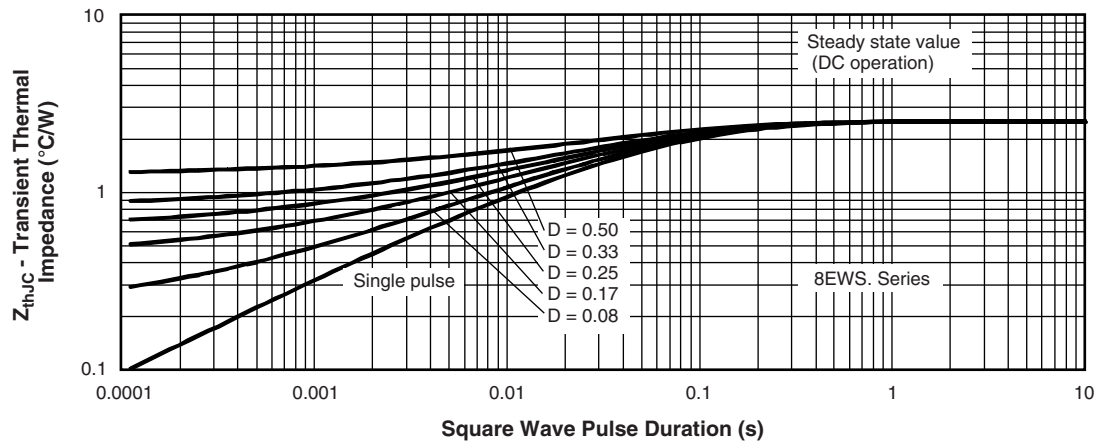


Fig. 7 - Forward Voltage Drop Characteristics


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

**ORDERING INFORMATION TABLE**

Device code	VS-	8	E	W	S	16	S	TR	-M3
	1	2	3	4	5	6	7	8	9

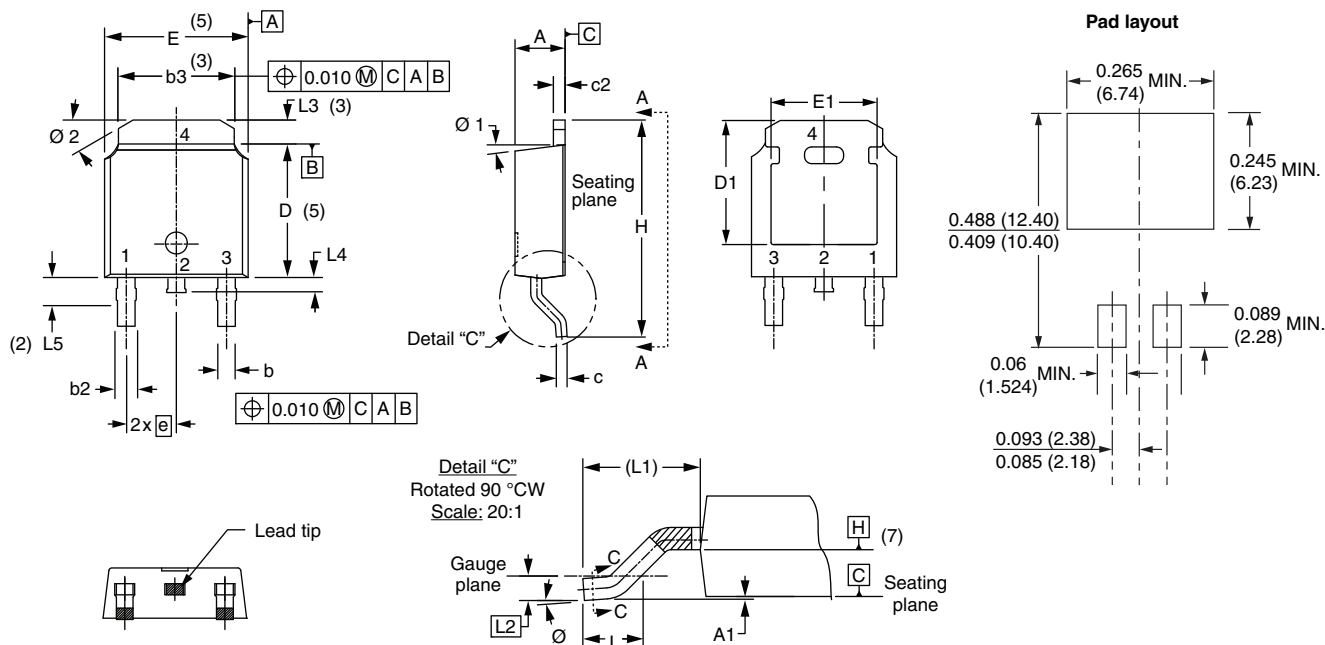
- | | | |
|----------|---|---|
| 1 | - | Vishay Semiconductors product |
| 2 | - | Current rating (8 = 8 A) |
| 3 | - | Circuit configuration:
E = single diode |
| 4 | - | Package:
W = D-PAK |
| 5 | - | Type of silicon:
S = standard recovery rectifier |
| 6 | - | Voltage code x 100 = V_{RRM} (16 = 1600 V) |
| 7 | - | S = surface mountable |
| 8 | - | <ul style="list-style-type: none">• 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-8EWS16S-M3	75	3000	Antistatic plastic tubes
VS-8EWS16STR-M3	2000	2000	13" diameter reel
VS-8EWS16STRL-M3	3000	3000	13" diameter reel
VS-8EWS16STRR-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
SPICE model	www.vishay.com/doc?96960

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

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	0.086	0.094	
A1	-	0.13	-	0.005	
b	0.64	0.89	0.025	0.035	
b2	0.76	1.14	0.030	0.045	
b3	4.95	5.46	0.195	0.215	3
c	0.46	0.61	0.018	0.024	
c2	0.46	0.89	0.018	0.035	
D	5.97	6.22	0.235	0.245	5
D1	5.21	-	0.205	-	3
E	6.35	6.73	0.250	0.265	5
E1	4.32	-	0.170	-	3

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
e	2.29 BSC		0.090 BSC		
H	9.40	10.41	0.370	0.410	
L	1.40	1.78	0.055	0.070	
L1	2.74 BSC		0.108 REF.		
L2	0.51 BSC		0.020 BSC		
L3	0.89	1.27	0.035	0.050	3
L4	-	1.02	-	0.040	
L5	1.14	1.52	0.045	0.060	2
Ø	0°	10°	0°	10°	
Ø1	0°	15°	0°	15°	
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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