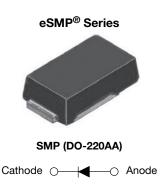


ROHS

HALOGEN

FREE

Ultrafast Rectifier, 2 A FRED Pt®



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS					
I _{F(AV)}	2 A				
V_{R}	100 V, 200 V				
V _F at I _F	0.79 V				
I _{FSM}	40 A				
t _{rr} (typ.)	23 ns				
T _J max.	175 °C				
Package	SMP (DO-220AA)				
Circuit configuration	Single				

FEATURES

- Very low profile typical height of 1.0 mm
- · Ideal for automated placement
- · Low forward voltage drop, low power losses
- · Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- For PFC, CRM snubber operation
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in high frequency, freewheeling, DC/DC converters, PFC, and in snubber industrial and automotive applications.

MECHANICAL DATA

Case: SMP (DO-220AA)

Molding compound meets UL 94 V-0 flammability rating

Terminals: matte tin plated leads, solderable per

J-STD-002, meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

ABSOLUTE MAXIMUM RATINGS						
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Peak repetitive reverse	VS-2ENH01-M3	W		100	V	
voltage	VS-2ENH02-M3	V_{RRM}		200	V	
Average rectified forward current		I _{F(AV)}	T _C = 158 °C	2	^	
Non-repetitive peak surge current		I _{FSM}	T _J = 25 °C, 10 ms sine pulse	40	А	
Operating junction and storage temperatures		T _J , T _{Stg}		-55 to +175	°C	

ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)								
PARAMETER		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Breakdown voltage,	VS-2ENH01-M3	V _{BR} ,	L = 100 · A	100	-	-	V	
blocking voltage	VS-2ENH02-M3	V_R	I _R = 100 μA	200	-	-		
Famusard voltage		V	I _F = 2 A	-	0.94	1.00	V	
Forward voltage		V _F	٧Ļ	I _F = 2 A, T _J = 150 °C	-	0.79	0.84	
Reverse leakage current		_	$V_R = V_R$ rated	-	-	2	μA	
		I _R	T _J = 150 °C, V _R = V _R rated	-	-	20		
Junction capacitance		C _T	V _R = 200 V	-	8	-	pF	



DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
		$I_F = 1.0 \text{ A}, dI_F/dt = 100 \text{ A/}\mu\text{s}, V_R = 30 \text{ V}$		ı	23	-	
Reverse recovery time	t _{rr}	$I_F = 0.5 \text{ A}, I_R = 1 \text{ A}, I_{rr} = 0.25 \text{ A}$		-	-	28	
		T _J = 25 °C	I _F = 2 A dI _F /dt = 200 A/μs V _R = 100 V	-	16	-	ns A nC
		T _J = 125 °C		-	25	-	
Peak recovery current	I _{RRM}	T _J = 25 °C		-	2.0	-	
		T _J = 125 °C		-	3.1	-	
Doverso vocaven charge	0	T _J = 25 °C		-	15	-	
Reverse recovery charge	Q _{rr}	T _J = 125 °C		-	37	-	110

THERMAL - MECHANICAL SPECIFICATIONS							
PARAMETER		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction a temperature range	nd storage	T _J , T _{Stg}		-55	-	175	°C
Thermal resistance, junction to mount		R _{thJM} ⁽¹⁾	Infinite heatsink	-	7	9	°C/W
Thermal resistance, junction to ambient R _t		R_{thJA}	PCB footprint 4.8 mm x 4.8 mm	-	107	=.	G/VV
Approximate weight					0.024		g
Marking daviso	VS-2ENH01-M3		Case style SMP (DO-220AA)	2H1			
Marking device	VS-2ENH02-M3		Case style Sivir (DO-220AA)	2H2			

Note

⁽¹⁾ Thermal resistance junction to mount follows JEDEC® 51-14 transient dual interface test method (TDIM)

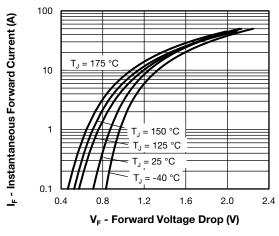


Fig. 1 - Typical Forward Voltage Drop Characteristics

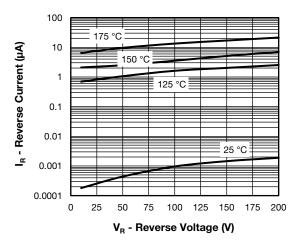


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

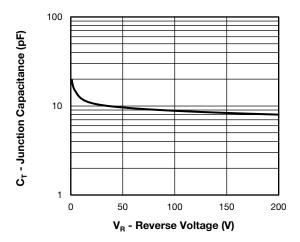


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

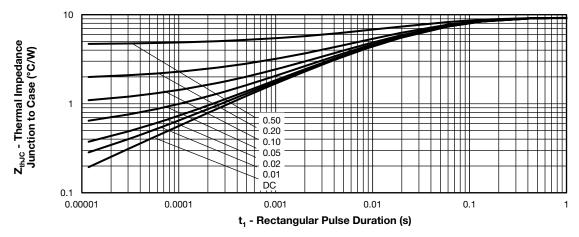


Fig. 4 - Transient Thermal Impedance, Junction to Case

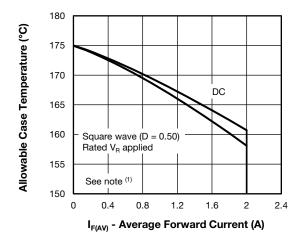


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

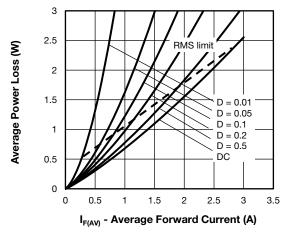


Fig. 6 - Forward Power Loss Characteristics

www.vishay.com

Vishay Semiconductors

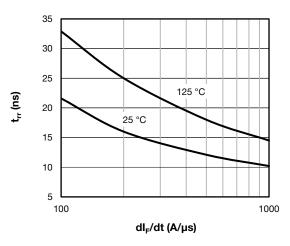


Fig. 7 - Typical Reverse Recovery Time vs. dl_F/dt

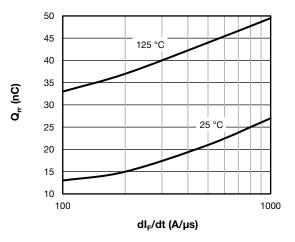
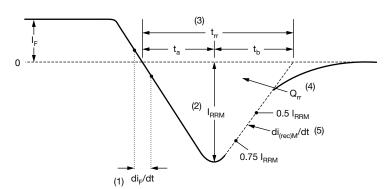


Fig. 8 - Typical Stored Charge vs. dl_F/dt

Note

 $^{(1)}$ Formula used: T_C = T_J - (Pd + Pd_{REV}) x R_{thJC}; Pd = forward power loss = I_{F(AV)} x V_{FM} at (I_{F(AV)}/D) (see fig. 5); Pd_{REV} = inverse power loss = V_{R1} x I_R (1 - D); I_R at V_{R1} = rated V_R



- (1) di_F/dt rate of change of current through zero crossing
- (2) I_{RRM} peak reverse recovery current
- (3) t_{rr} reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through 0.75 I_{RRM} and 0.50 I_{RRM} extrapolated to zero current.
- (4) \mathbf{Q}_{rr} area under curve defined by \mathbf{t}_{rr} and \mathbf{I}_{RRM}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

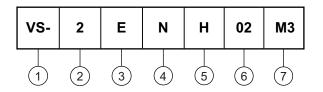
(5) $di_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

Fig. 9 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating (2 = 2 A)

Circuit configuration:

E = single diode

4 - N = SMP package

5 - Process type,

H = ultrafast recovery

6 - Voltage code (02 = 200 V)

7 - M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

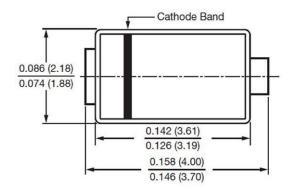
ORDERING INFORMATION (Example)						
PREFERRED P/N	PREFERRED PACKAGE CODE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION			
VS-2ENH01-M3/84A	84A	3000	7" diameter plastic tape and reel			
VS-2ENH01-M3/85A	85A	10 000	13" diameter plastic tape and reel			
VS-2ENH02-M3/84A	84A	3000	7" diameter plastic tape and reel			
VS-2ENH02-M3/85A	85A	10 000	13" diameter plastic tape and reel			

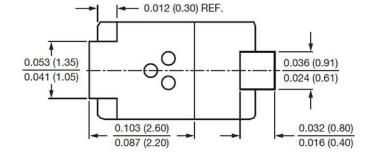
LINKS TO RELATED DOCUMENTS					
Dimensions <u>www.vishay.com/doc?96547</u>					
Part marking information	www.vishay.com/doc?96574				
Packaging information	www.vishay.com/doc?88869				
SPICE model	www.vishay.com/doc?96551				

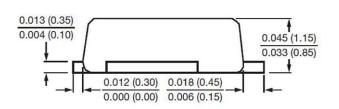


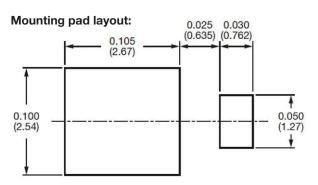
SMP (DO-220AA)

DIMENSIONS in inches (millimeters)











Legal Disclaimer Notice

Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.