Hyperfast Rectifier, 3 A FRED Pt®

eSMP® Series



Top View Bottom View

SlimSMAW (DO-221AD)

FEATURES

- Low profile package
- 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
- Class 2 whisker test
- Compatible to SOD-128 package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models

DESCRIPTION / APPLICATIONS

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

MECHANICAL DATA

Case: SlimSMAW
Molding compound meets UL 94 V-0 flammability rating
Halogen-free, RoHS-compliant

Terminals: matte tin plated leads, solderable per J-STD-002

Polarity: color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3 A
V_R	100 V, 200 V
V_F at I_F	0.71 V
I_{FSM}	70 A
t_{rr} (typ.)	16 ns
T_J max.	175 °C
Package	SlimSMAW (DO-221AD)
Circuit configuration	Single

ABSOLUTE MAXIMUM RATINGS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	VS-3EYH01-M3	V_{RRM}		100	V
	VS-3EYH02-M3			200	
Average rectified forward current		$I_{F(AV)}$ (1)	T_C = 137 °C	3	A
Non-repetitive peak surge current		I_{FSM}	T_J = 25 °C, 10 ms sine pulse wave	70	
Operating junction and storage temperatures		T_J, T_{Stg}		-55 to +175	°C

Note

(1) Mounted on infinite heatsink

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)							
PARAMETER		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	VS-3EYH01-M3	V_{BR}, V_R	I_R = 100 µA	100	-	-	V
	VS-3EYH02-M3			200	-	-	
Forward voltage, per diode		V_F	I_F = 3 A	-	0.86	0.95	
			I_F = 3 A, T_J = 150 °C	-	0.71	0.79	
Reverse leakage current, per diode		I_R	V_R = V_R rated	-	-	2	µA
			T_J = 150 °C, V_R = V_R rated	-	-	20	
Junction capacitance		C_T	V_R = 200 V	-	16	-	pF

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

DYNAMIC RECOVERY CHARACTERISTICS (T_J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	I_F = 1.0 A, dI_F/dt = 50 A/µs, V_R = 30 V		-	22	-	ns
		I_F = 1.0 A, dI_F/dt = 100 A/µs, V_R = 30 V		-	16	-	
		I_F = 0.5 A, I_R = 1A, I_{rr} = 0.25 A		-	-	30	
		T_J = 25 °C	I_F = 3 A, dI_F/dt = 200 A/µs, V_R = 100 V	-	18	-	
		T_J = 125 °C		-	30	-	
Peak recovery current	I_{RRM}	T_J = 25 °C		-	2.5	-	A
		T_J = 125 °C		-	4	-	
Reverse recovery charge	Q_{rr}	T_J = 25 °C		-	23	-	nC
		T_J = 125 °C		-	60	-	

THERMAL - MECHANICAL SPECIFICATIONS							
PARAMETER		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range		T_J, T_{Stg}		-55	-	175	°C
Thermal resistance, junction to mount		R_{thJM} (1)	Infinite heatsink	-	12	15	°C/W
Thermal resistance, junction to ambient		R_{thJA}	Device mounted on FR4 PCB, 2 oz. standard footprint	-	120	150	
Marking device	VS-3EYH01-M3		Case style SlimSMAW (DO-221AD)	3H1			
	VS-3EYH02-M3			3H2			

Note

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

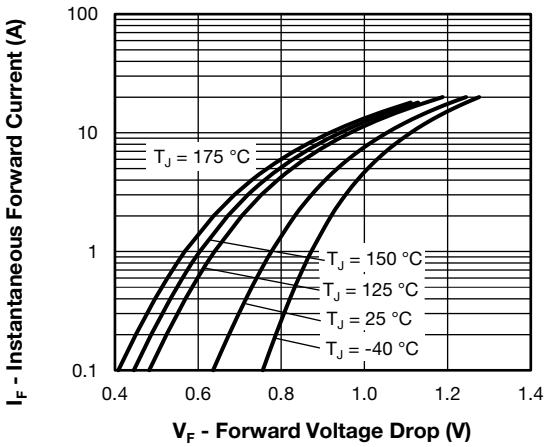


Fig. 1 - Typical Forward Voltage Drop Characteristics

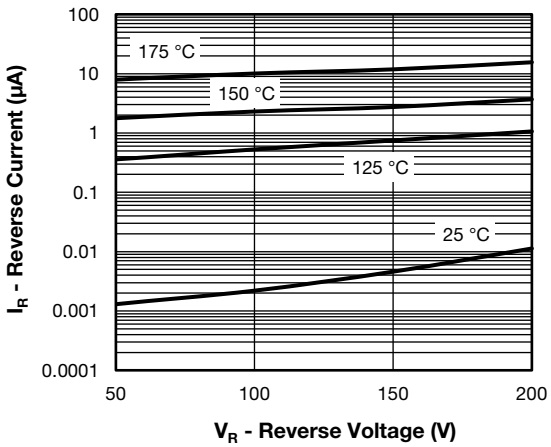


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

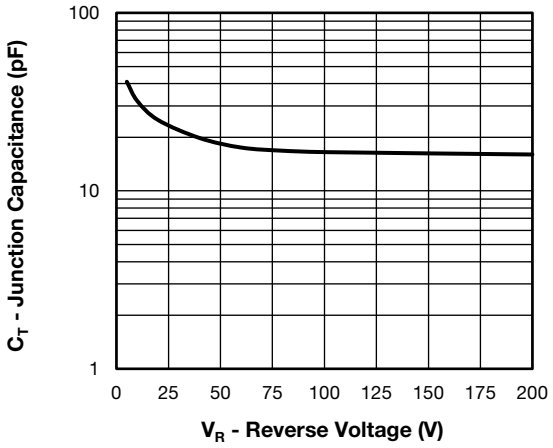


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

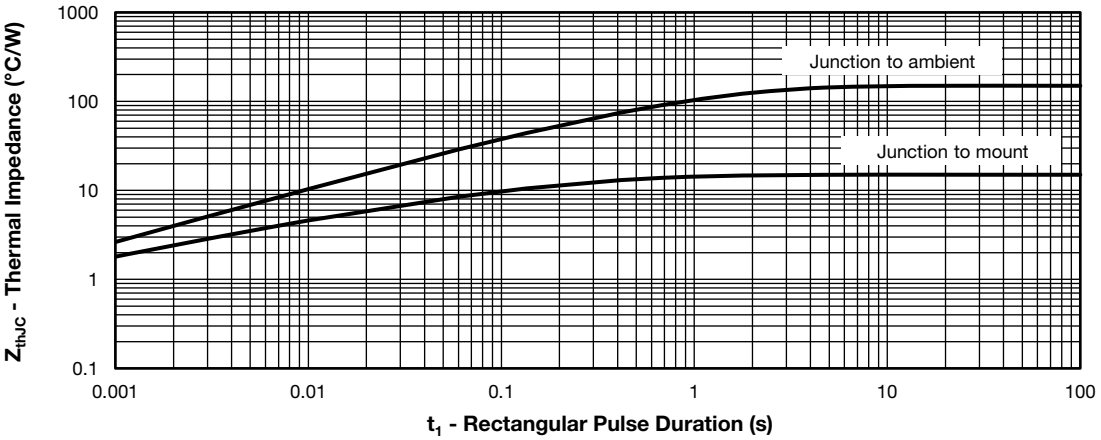


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

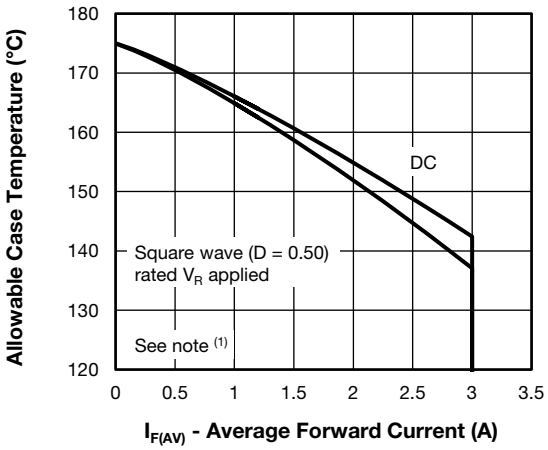


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

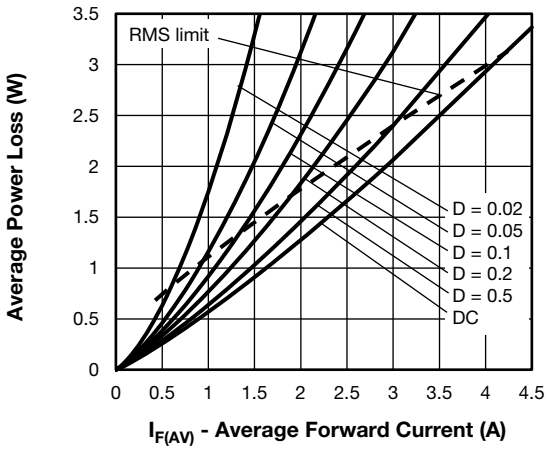


Fig. 6 - Forward Power Loss Characteristics

Note

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

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

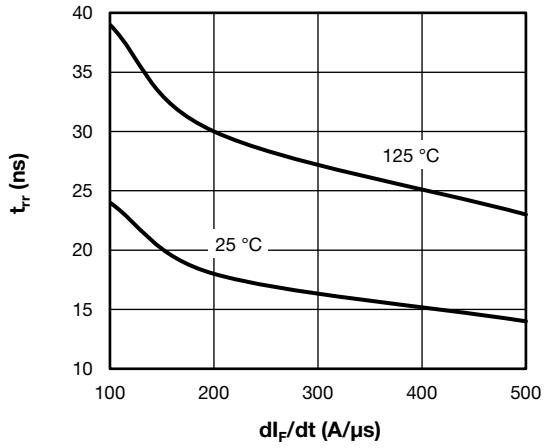


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

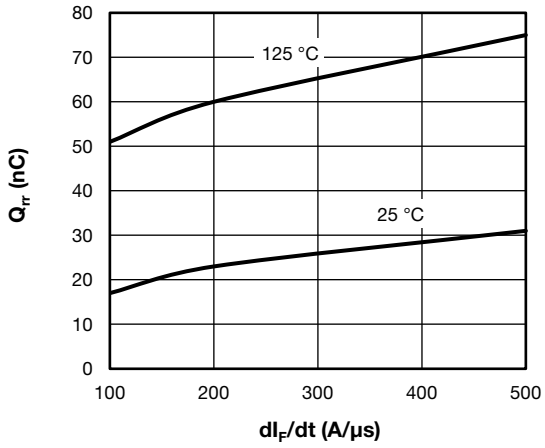


Fig. 8 - Typical Stored Charge vs. dI_F/dt

ORDERING INFORMATION TABLE

Device code	VS-	3	E	Y	H	02	-	M3
	1	2	3	4	5	6		7

1 - Vishay Semiconductors product

2 - Current rating (3 = 3 A)

3 - Circuit configuration:
E = single diode

4 - Y = SlimSMAW (DO-221AD)

5 - Process type,
H = hyperfast recovery

6 - Voltage code (02 = 200 V)

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

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**PACKAGING DESCRIPTION**
VS-3EYH01-M3/H	0.033	H	3500	7"diameter plastic tape and reel
VS-3EYH01-M3/I	0.033	I	14 000	13"diameter plastic tape and reel
VS-3EYH02-M3/H	0.033	H	3500	7"diameter plastic tape and reel
VS-3EYH02-M3/I	0.033	I	14 000	13"diameter plastic tape and reel

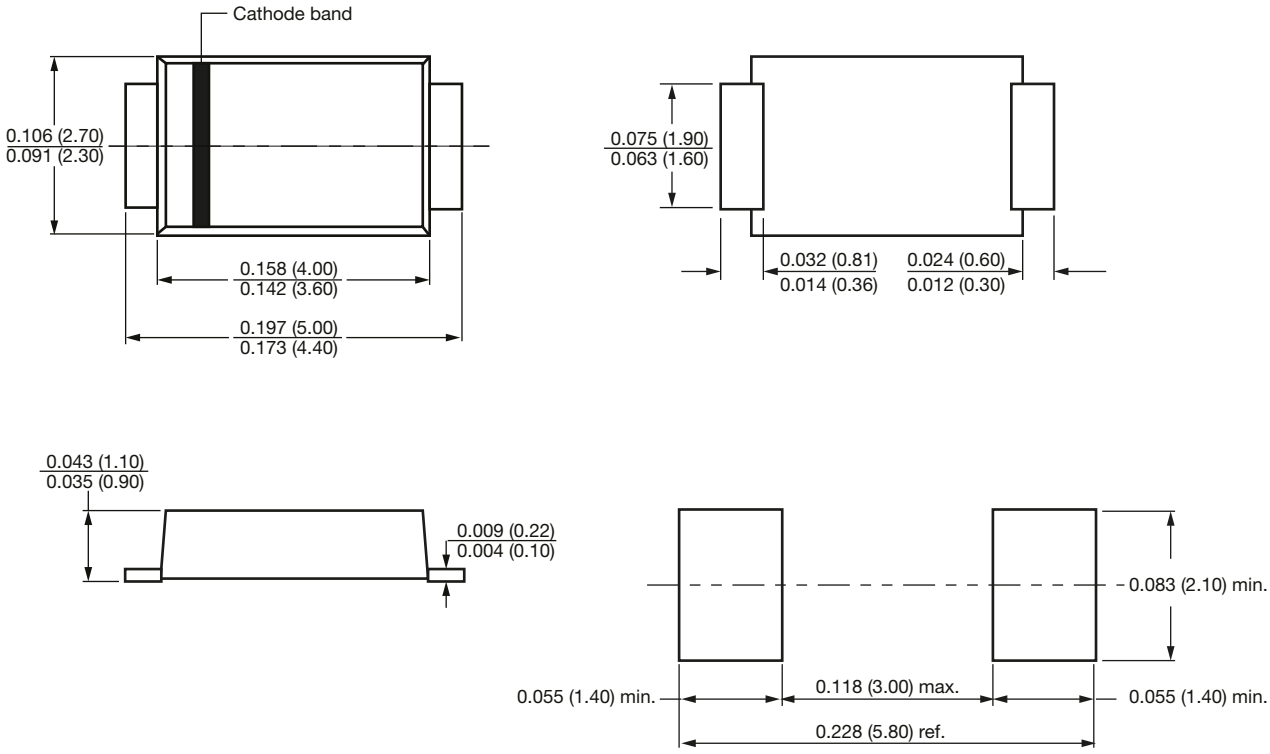
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96582
Part marking information	www.vishay.com/doc?95562
Packaging information	www.vishay.com/doc?88869
SPICE model	www.vishay.com/doc?96586

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

SlimSMAW (DO-221AD)

DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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.

© 2024 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED