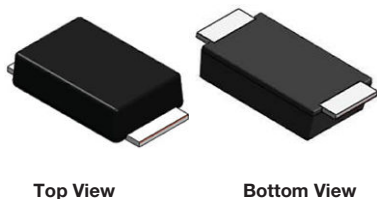


Hyperfast Rectifier, 3 A FRED Pt®

eSMP® Series



SlimSMAW (DO-221AD)



DESIGN SUPPORT TOOLS

[click logo to get started](#)


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
- AEC-Q101 qualified, 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

DESCRIPTION / APPLICATIONS

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

MECHANICAL DATA

Case: SlimSMAW (DO-221AD)

Molding compound meets UL 94 V-0 flammability rating halogen-free, RoHS-compliant

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B1022

Polarity: color band denotes the 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	V_{RRM}		100 200	V
Average rectified forward current	$I_{F(AV)}^{(1)}$	$T_C = 137\text{ °C}$	3	A
Non-repetitive peak surge current	I_{FSM}	$T_J = 25\text{ °C}$, 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 ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\text{ }\mu\text{A}$	100 200	- -	- -	V
Forward voltage, per diode	V_F	$I_F = 3\text{ A}$ $I_F = 3\text{ A}, T_J = 150\text{ °C}$	- -	0.86 0.71	0.95 0.79	
Reverse leakage current, per diode	I_R	$V_R = V_R$ rated $T_J = 150\text{ °C}, V_R = V_R$ rated	- -	- -	2 20	μA
Junction capacitance	C_T	$V_R = 200\text{ V}$	-	16	-	pF



DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$I_F = 1.0\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	16	-	ns
		$I_F = 0.5\text{ A}$, $I_R = 1\text{ A}$, $I_{rr} = 0.25\text{ A}$	-	-	30	
		$T_J = 25\text{ }^{\circ}\text{C}$	-	18	-	
		$T_J = 125\text{ }^{\circ}\text{C}$	-	30	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	2.5	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	4	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	23	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	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-3EYH01HM3	Case style SlimSMAW (DO-221AD)	3H1			
	VS-3EYH02HM3		3H2			

Note

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

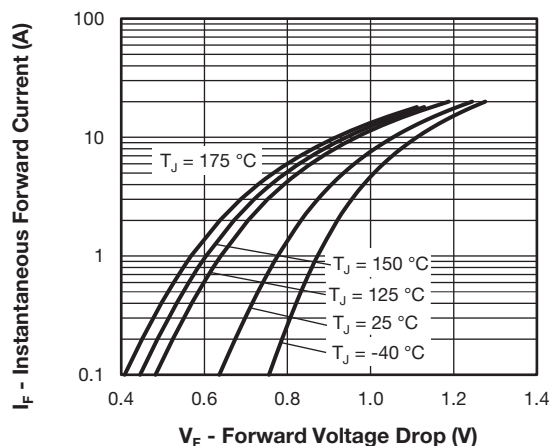


Fig. 1 - Typical Forward Voltage Drop Characteristics

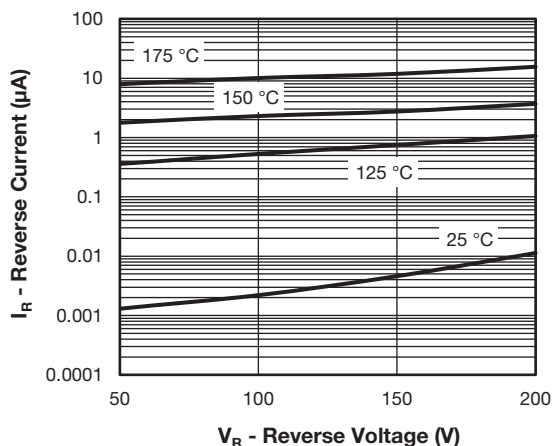


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

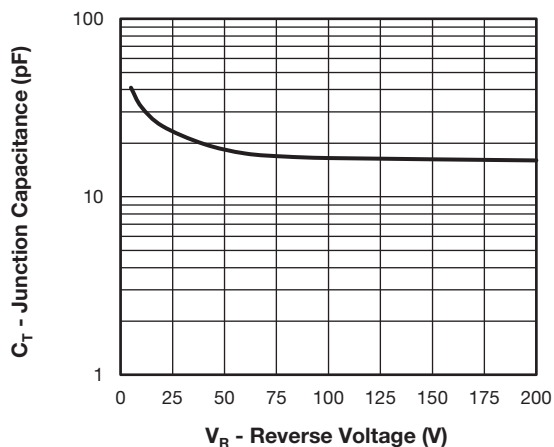
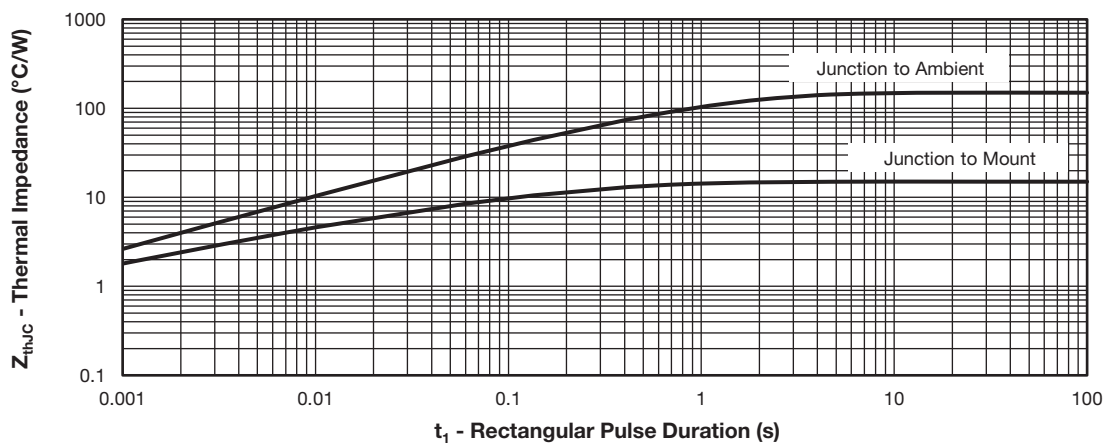


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

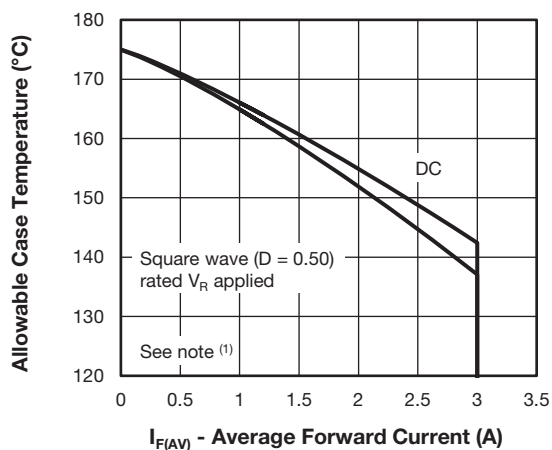


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

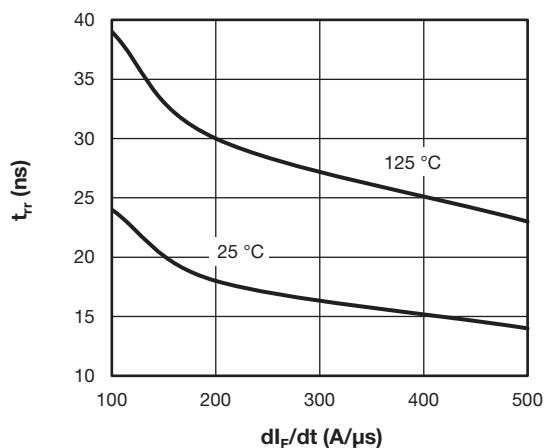


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

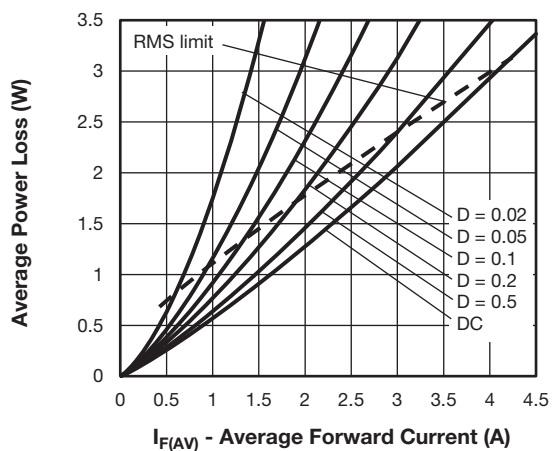


Fig. 6 - Forward Power Loss Characteristics

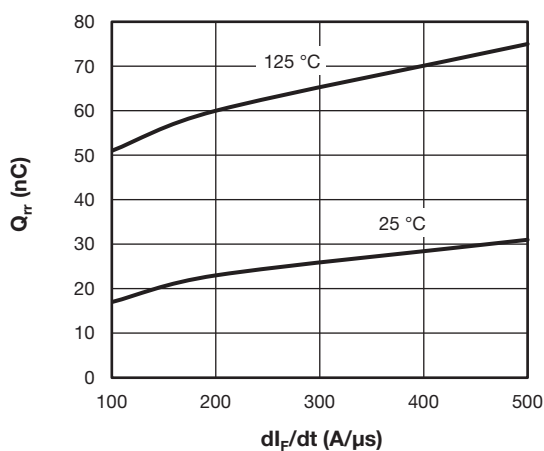


Fig. 8 - Typical Stored Charge vs. dI_F/dt

Note

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

**ORDERING INFORMATION TABLE**

Device code	VS-	3	E	Y	H	02	H	M3
	1	2	3	4	5	6	7	8

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	-	H = AEC-Q101 qualified
8	-	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-3EYH01HM3/H	0.033	H	3500	7" diameter plastic tape and reel
VS-3EYH01HM3/I	0.033	I	14 000	13" diameter plastic tape and reel
VS-3EYH02HM3/H	0.033	H	3500	7" diameter plastic tape and reel
VS-3EYH02HM3/I	0.033	I	14 000	13" diameter plastic tape and reel

LINKS TO RELATED DOCUMENTS

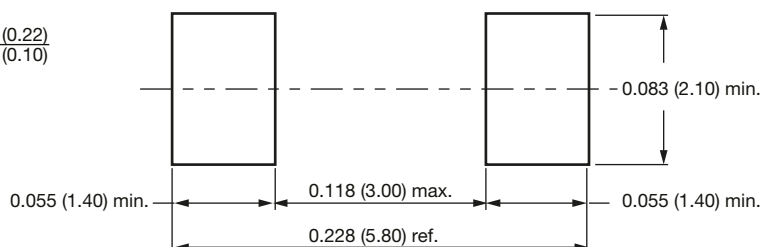
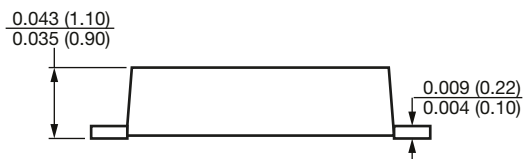
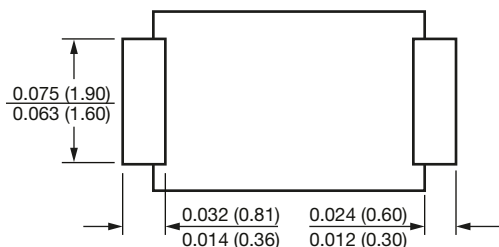
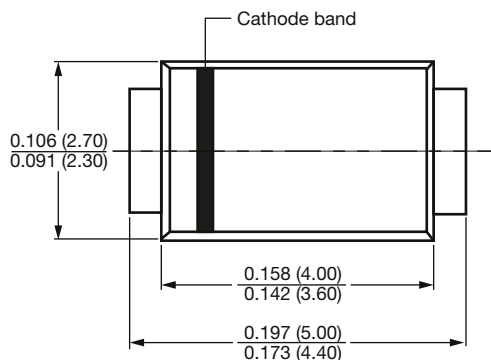
Dimensions	www.vishay.com/doc?96582
Part marking information	www.vishay.com/doc?95562
Packaging information	www.vishay.com/doc?88869
SPICE model	www.vishay.com/doc?96586



SlimSMAW (DO-221AD)

DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout



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.

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.