

## Hyperfast Rectifier, 3 A FRED Pt<sup>®</sup>

**eSMP<sup>®</sup> Series**


Top View

Bottom View

**SlimSMAW (DO-221AD)**
**LINKS TO ADDITIONAL RESOURCES**


3D Models

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

**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](http://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

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

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Peak repetitive reverse voltage	$V_{RRM}$		100	V	
			200		
Average rectified forward current	$I_{F(AV)}$ <sup>(1)</sup>	$T_C = 137$ °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	$V_{BR}, V_R$	$I_R = 100$ $\mu$ A	100	-	-	V			
			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	$\mu$ A			
		$T_J = 150$ °C, $V_R = V_R$ rated	-	-	20				
Junction capacitance	$C_T$	$V_R = 200$ V	-	16	-	pF			



DYNAMIC RECOVERY CHARACTERISTICS (T <sub>J</sub> = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> = 1.0 A, di <sub>F</sub> /dt = 50 A/μs, V <sub>R</sub> = 30 V	-	22	-	ns
		I <sub>F</sub> = 1.0 A, di <sub>F</sub> /dt = 100 A/μs, V <sub>R</sub> = 30 V	-	16	-	
		I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1A, I <sub>rr</sub> = 0.25 A	-	-	30	
		T <sub>J</sub> = 25 °C	-	18	-	
		T <sub>J</sub> = 125 °C	-	30	-	
Peak recovery current	I <sub>RRM</sub>	T <sub>J</sub> = 25 °C	-	2.5	-	A
		T <sub>J</sub> = 125 °C	-	4	-	
Reverse recovery charge	Q <sub>rr</sub>	T <sub>J</sub> = 25 °C	-	23	-	nC
		T <sub>J</sub> = 125 °C	-	60	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		-55	-	175	°C
Thermal resistance, junction to mount	R <sub>thJM</sub> <sup>(1)</sup>	Infinite heatsink	-	12	15	°C/W
Thermal resistance, junction to ambient	R <sub>thJA</sub>	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)

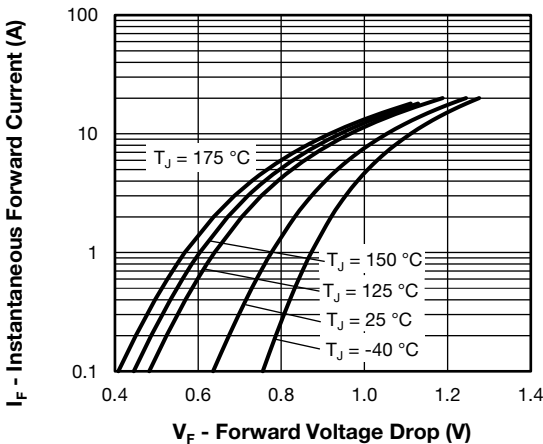


Fig. 1 - Typical Forward Voltage Drop Characteristics

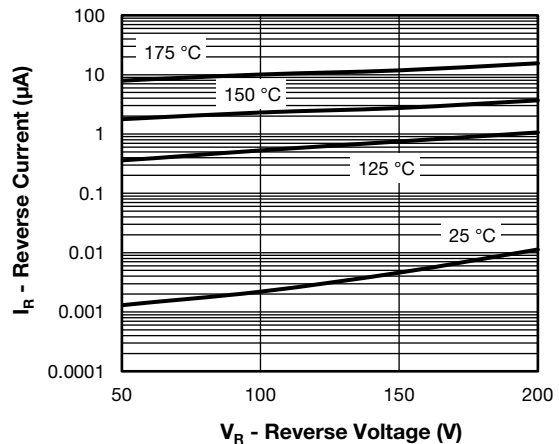


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

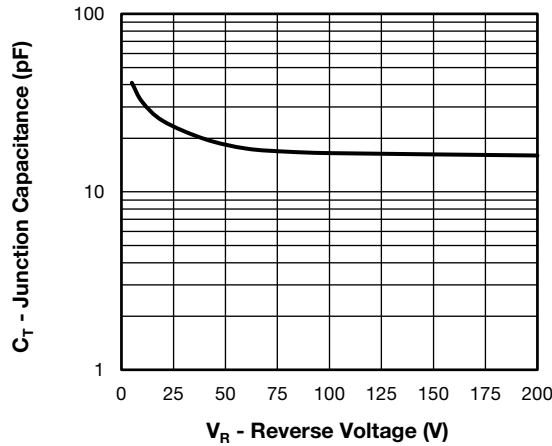


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

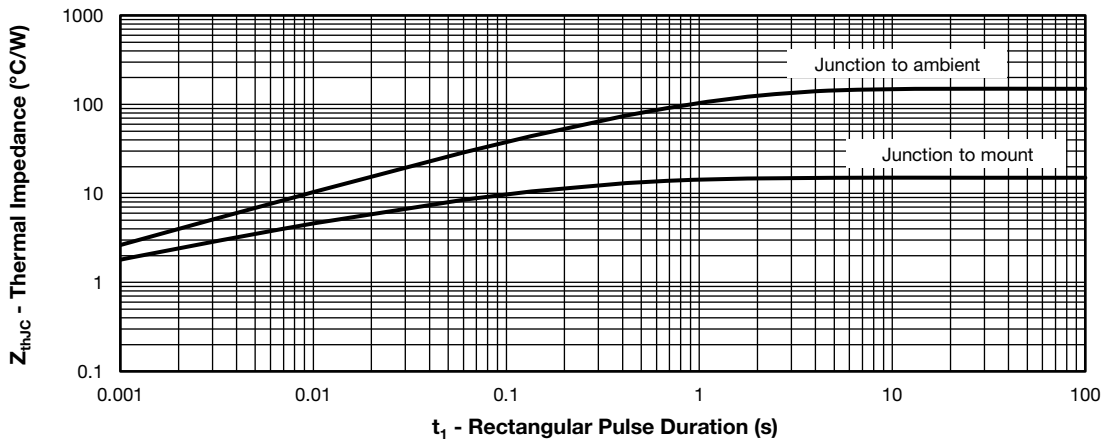


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

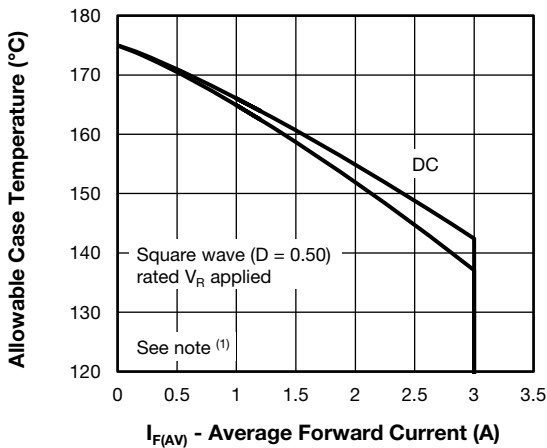


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

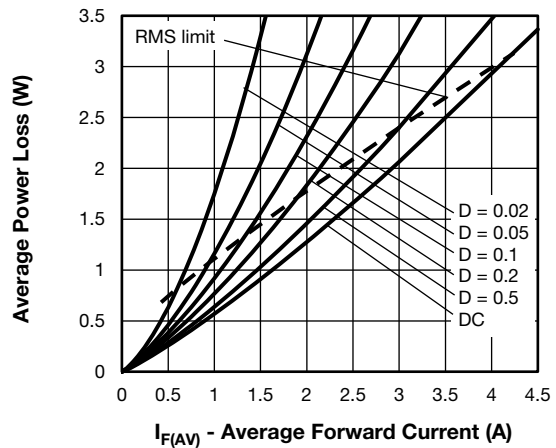


Fig. 6 - Forward Power Loss Characteristics

**Note**

- (1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;
- $P_d$  = 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  $V_R$

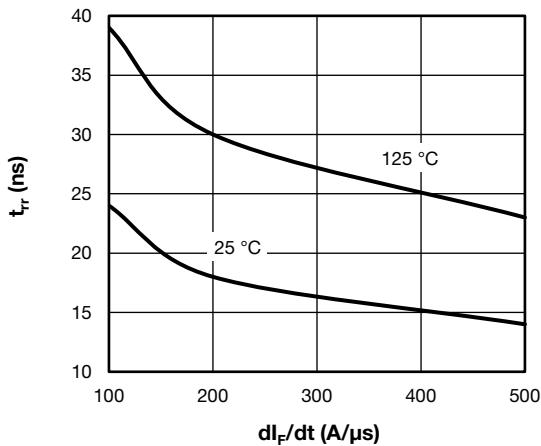


Fig. 7 - Typical Reverse Recovery Time vs. di/dt

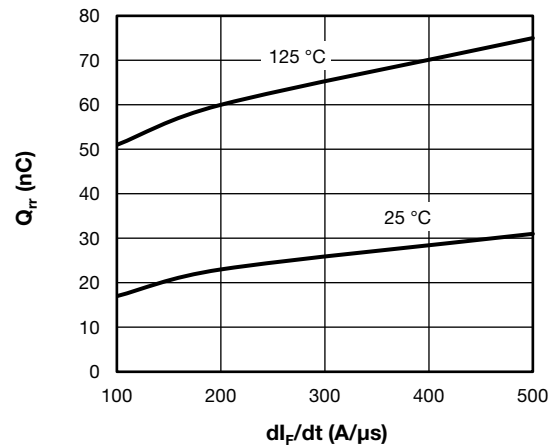


Fig. 8 - Typical Stored Charge vs. di/dt

**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>3</b>	<b>E</b>	<b>Y</b>	<b>H</b>	<b>02</b>	<b>-</b>	<b>M3</b>
	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

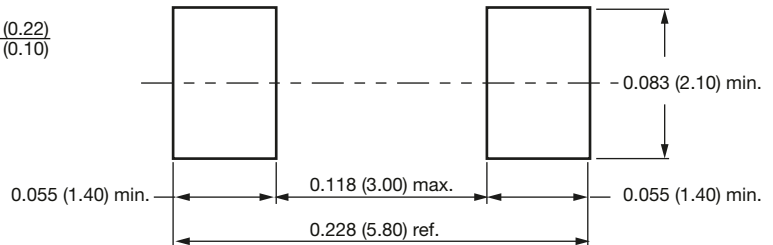
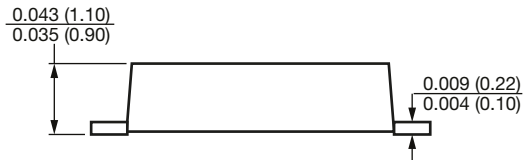
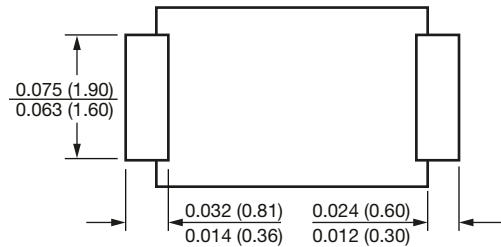
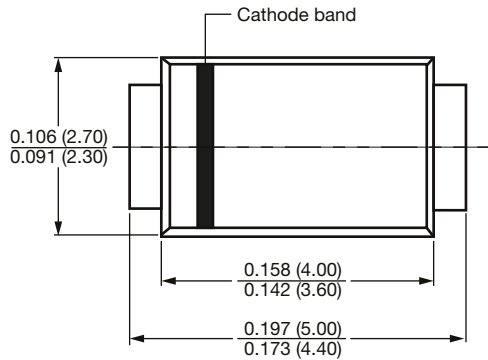
LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96582">www.vishay.com/doc?96582</a>
Part marking information	<a href="http://www.vishay.com/doc?95562">www.vishay.com/doc?95562</a>
Packaging information	<a href="http://www.vishay.com/doc?88869">www.vishay.com/doc?88869</a>
SPICE model	<a href="http://www.vishay.com/doc?96586">www.vishay.com/doc?96586</a>



## SlimSMAW (DO-221AD)

**DIMENSIONS** in inches (millimeters)

### SlimSMAW (DO-221AD)



**Mounting pad layout**



## Disclaimer

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