

Hyperfast Rectifier, 2 A FRED Pt[®]

eSMP[®] Series



Top View

Bottom View

SlimSAW (DO-221AD)



DESIGN SUPPORT TOOLS

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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



DESCRIPTION / APPLICATIONS

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

MECHANICAL DATA

Case: SlimSAW (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-B102

Polarity: color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 A
V_R	100 V, 200 V
V_F at I_F	0.69 V
I_{FSM}	60 A
t_{rr} (typ.)	15 ns
T_J max.	175 °C
Package	SlimSAW (DO-221AD)
Circuit configuration	Single

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	V_{RRM}		100	V
			200	
Average rectified forward current	$I_{F(AV)}$ ⁽¹⁾	$T_C = 151\text{ °C}$	2	A
Non-repetitive peak surge current	I_{FSM}	$T_J = 25\text{ °C}$, 10 ms sine pulse wave	60	
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	-	-	V
			200	-	-	
Forward voltage, per diode	V_F	$I_F = 2\text{ A}$	-	0.86	0.93	
		$I_F = 2\text{ A}, T_J = 150\text{ °C}$	-	0.69	0.75	
Reverse leakage current, per diode	I_R	$V_R = V_R$ rated	-	-	2	μA
		$T_J = 150\text{ °C}, V_R = V_R$ rated	-	-	20	
Junction capacitance	C_T	$V_R = 200\text{ V}$	-	12	-	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}	$I_F = 1.0\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	22	-	ns
		$I_F = 0.5\text{ A}$, $I_R = 1\text{ A}$, $I_{rr} = 0.25\text{ A}$	-	-	28	
		$T_J = 25\text{ }^\circ\text{C}$	-	16	-	
		$T_J = 125\text{ }^\circ\text{C}$	-	26	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^\circ\text{C}$	-	2.7	-	A
		$T_J = 125\text{ }^\circ\text{C}$	-	3.4	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^\circ\text{C}$	-	20	-	nC
		$T_J = 125\text{ }^\circ\text{C}$	-	43	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J , T_{Stg}		-55	-	175	$^\circ\text{C}$
Thermal resistance, junction to mount	$R_{thJM}^{(1)}$	Infinite heatsink	-	12	15	$^\circ\text{C}/\text{W}$
Thermal resistance, junction to ambient	R_{thJA}	Device mounted on FR4 PCB, 2 oz. standard footprint	-	120	150	
Marking device	VS-2EYH01HM3	Case style SlimSMAW (DO-221AD)	2H1			
	VS-2EYH02HM3		2H2			

Note

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

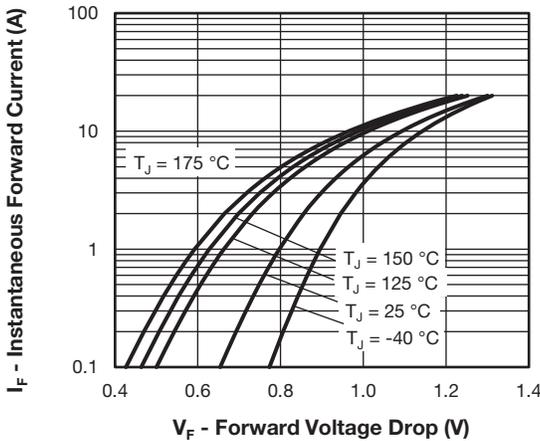


Fig. 1 - Typical Forward Voltage Drop Characteristics

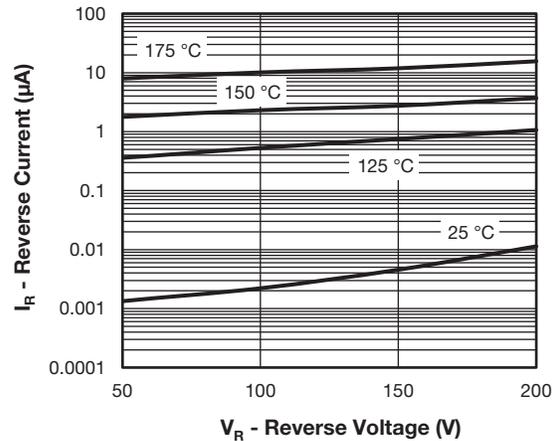


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

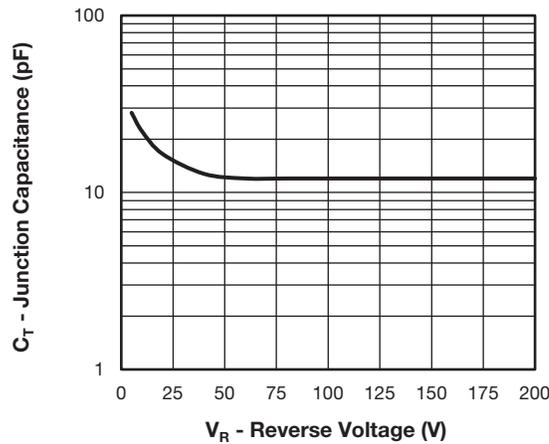


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

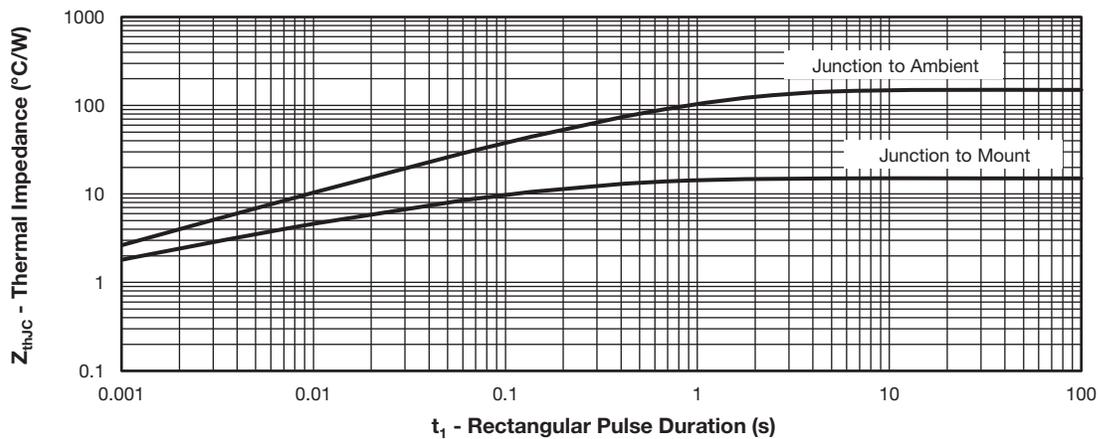


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

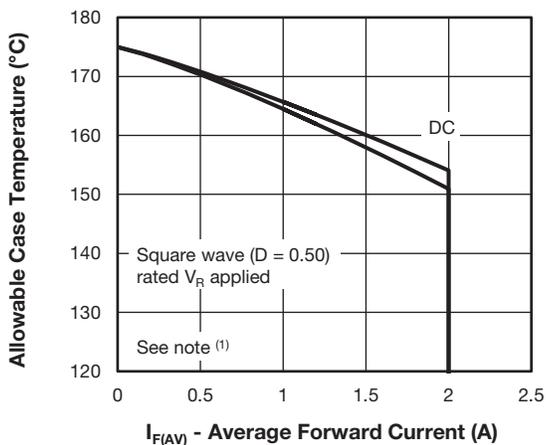


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

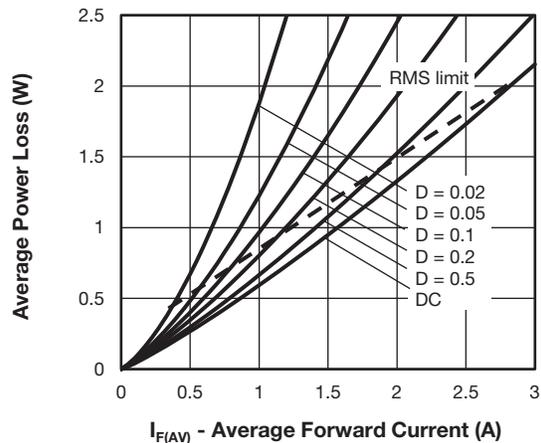


Fig. 6 - Forward Power Loss Characteristics

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

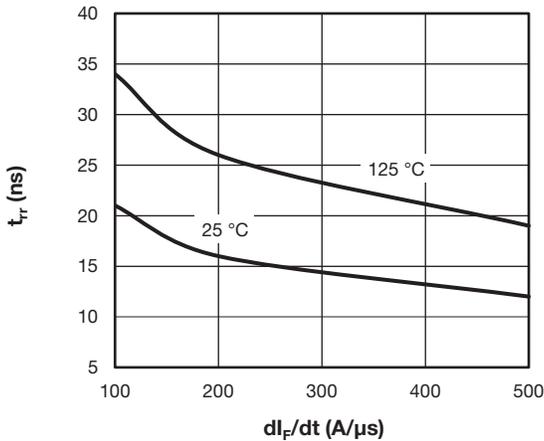


Fig. 7 - Typical Reverse Recovery Time vs. di_F/dt

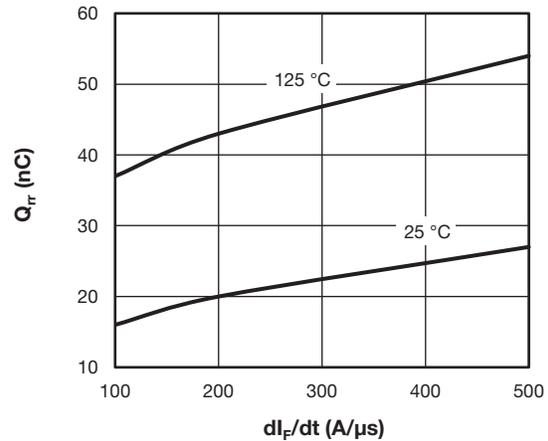


Fig. 8 - Typical Stored Charge vs. di_F/dt

ORDERING INFORMATION TABLE

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

- 1** - Vishay Semiconductors product
- 2** - Current rating (2 = 2 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-2EYH01HM3/H	0.033	H	3500	7" diameter plastic tape and reel
VS-2EYH01HM3/I	0.033	I	14 000	13" diameter plastic tape and reel
VS-2EYH02HM3/H	0.033	H	3500	7" diameter plastic tape and reel
VS-2EYH02HM3/I	0.033	I	14 000	13" diameter plastic tape and reel

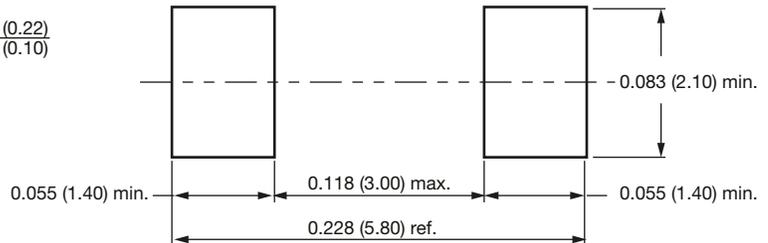
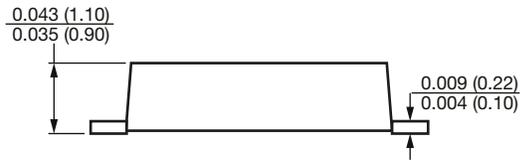
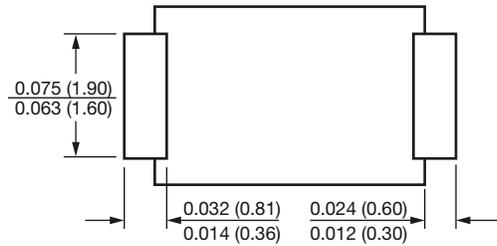
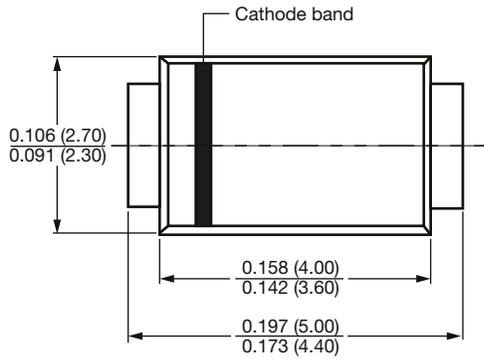
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96582
Part marking information	www.vishay.com/doc?95562
Packaging information	www.vishay.com/doc?88869
SPICE model	www.vishay.com/doc?96585



SlimSMAW (DO-221AD)

DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout



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