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

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)

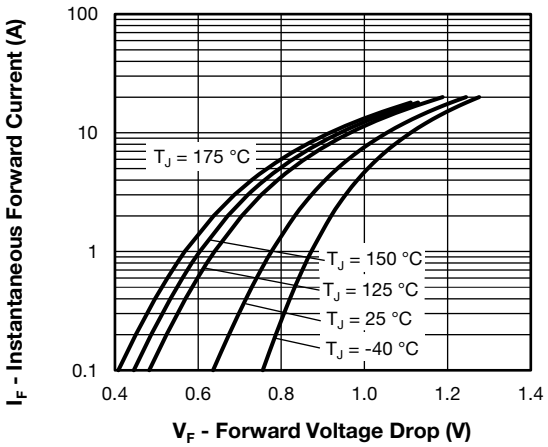


Fig. 1 - Typical Forward Voltage Drop Characteristics

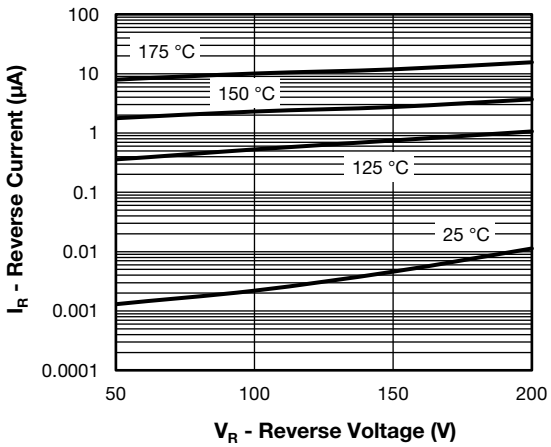


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

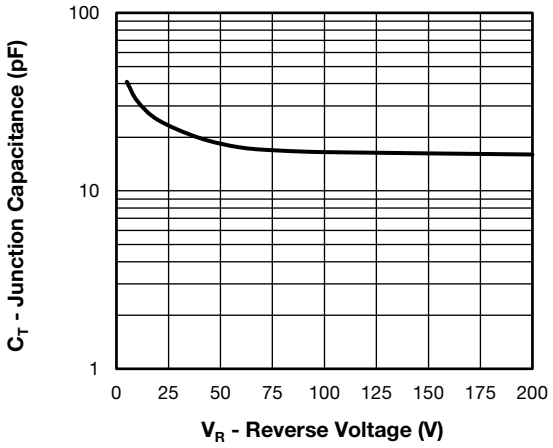


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

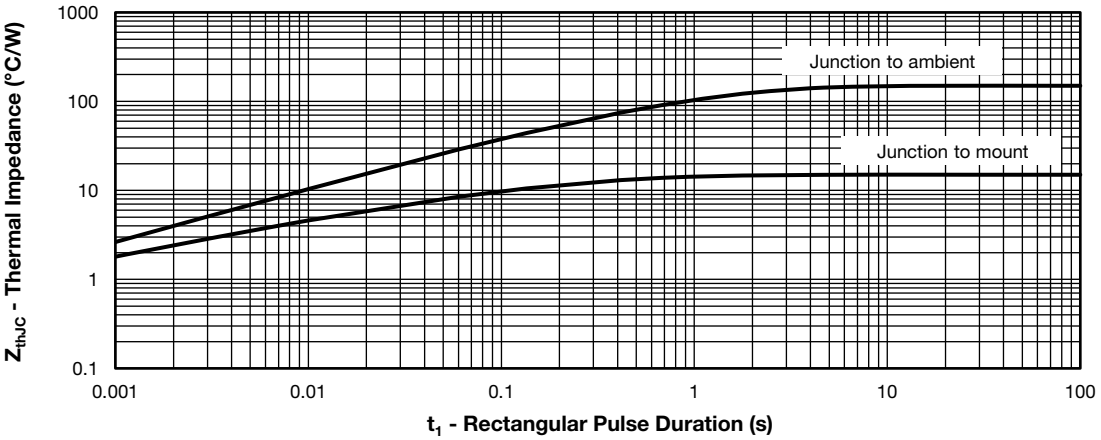


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

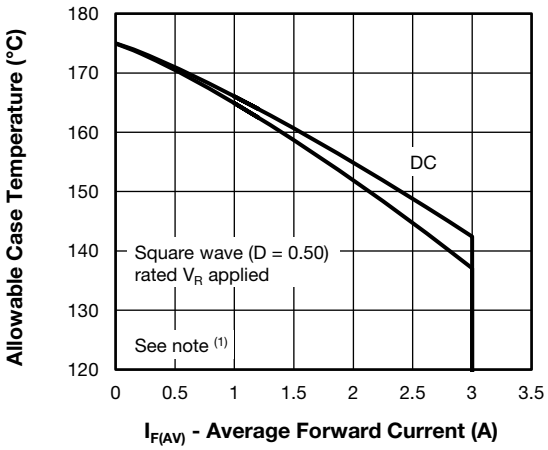


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

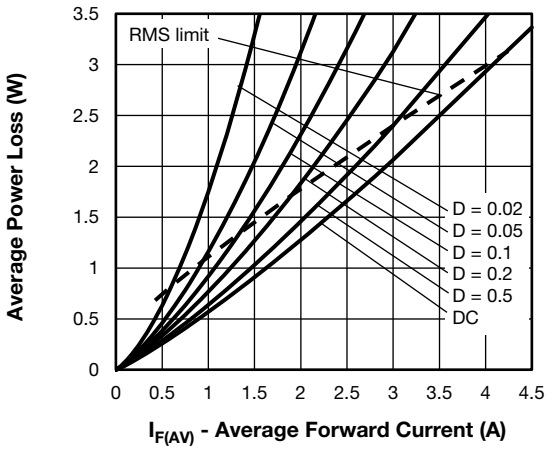


Fig. 6 - Forward Power Loss Characteristics

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

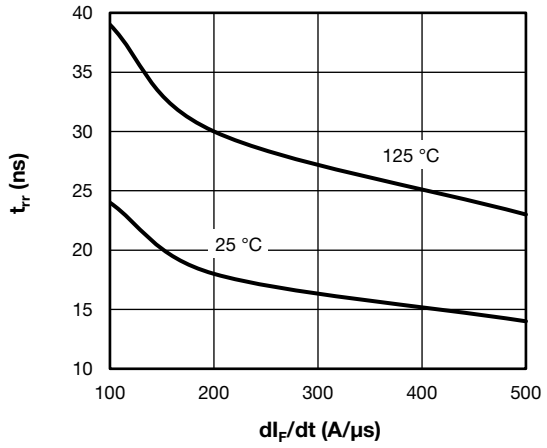


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

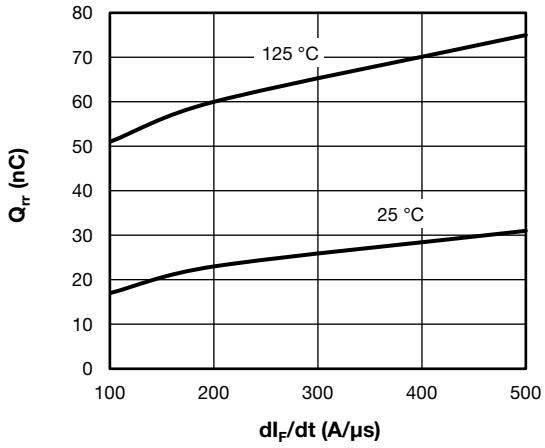


Fig. 8 - Typical Stored Charge vs. dI_F/dt

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

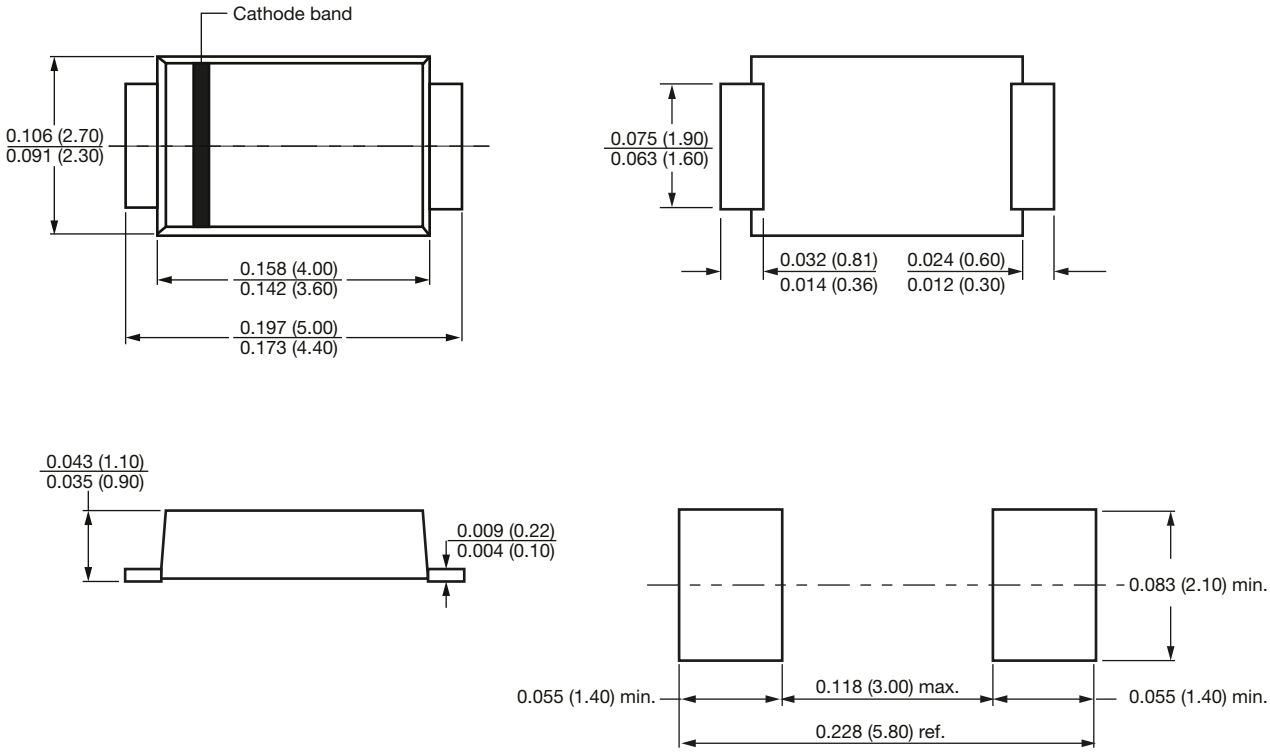
ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**PACKAGING DESCRIPTION**
VS-3EYH01-M3/H	0.033	H	3500	7"diameter plastic tape and reel
VS-3EYH01-M3/I	0.033	I	14 000	13"diameter plastic tape and reel
VS-3EYH02-M3/H	0.033	H	3500	7"diameter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

SlimSMAW (DO-221AD)

DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout

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