

Fast Soft Recovery Rectifier Diode, 85 A



PowerTab™



FEATURES

- Output rectification and freewheeling in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified for industrial level



RoHS
COMPLIANT

DESCRIPTION

The VS-85EPF12 fast soft recovery rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.

The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions. Available in the new PowerTab™ package, this new series is suitable for a large range of applications combining excellent die to footprint ratio and sturdiness connectivity for use in high current environments.

PRODUCT SUMMARY	
$I_{F(RMS)}$	160 A
V_F at 100 A	< 1.4 V
t_{rr}	95 ns
V_{RRM}	1200 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rect. conduction 50 % duty cycle at $T_C = 85^\circ\text{C}$	85	A
$I_{F(RMS)}$		160	
V_{RRM}	Range	1200	V
I_{FSM}		110	A
V_F	100 A, $T_J = 25^\circ\text{C}$	1.4	V
t_{rr}	1 A, - 100 A/ μs	95	ns
T_J	Range	- 40 to 150	$^\circ\text{C}$

VOLTAGE RATINGS			
TYPE NUMBER	V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} AT 150°C mA
VS-85EPF12	1200	1300	15

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 85^\circ\text{C}$, 180° conduction half sine wave	85	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	10 ms sine pulse, rated V_{RRM} applied	1100	
		10 ms sine pulse, no voltage reapplied	1250	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	5000	A^2s
		10 ms sine pulse, no voltage reapplied	7000	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ ms to 10 ms, no voltage reapplied	70 000	$\text{A}^2\sqrt{\text{s}}$

VS-85EPF12 Soft Recovery Series



Vishay Semiconductors Fast Soft Recovery Rectifier Diode, 85 A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V_{FM}	85 A, $T_J = 25\text{ }^\circ\text{C}$		1.36	V
Forward slope resistance	r_t	$T_J = 150\text{ }^\circ\text{C}$		4.03	m Ω
Threshold voltage	$V_{F(TO)}$			0.87	V
Maximum reverse leakage current	I_{RM}	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		15	

RECOVERY CHARACTERISTICS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Reverse recovery time	t_{rr}	I_F at 85 A _{pk} 25 A/ μ s 25 $^\circ\text{C}$	480	ns	
Reverse recovery current	I_{rr}		7.1	A	
Reverse recovery charge	Q_{rr}		2.1	μC	
Snap factor	S		0.5		

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 40 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.35	$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	R_{thJA}		40	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.2	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style PowerTab™	85EPF12	

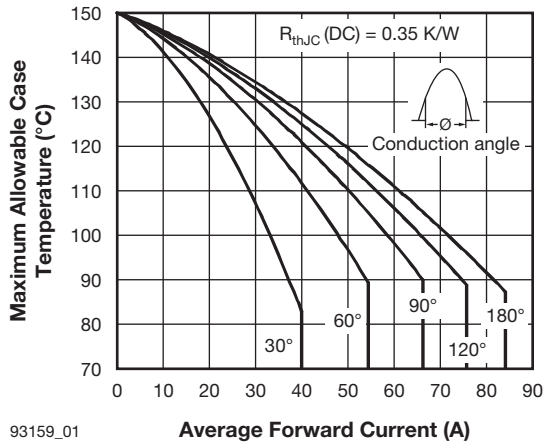


Fig. 1 - Current Rating Characteristics

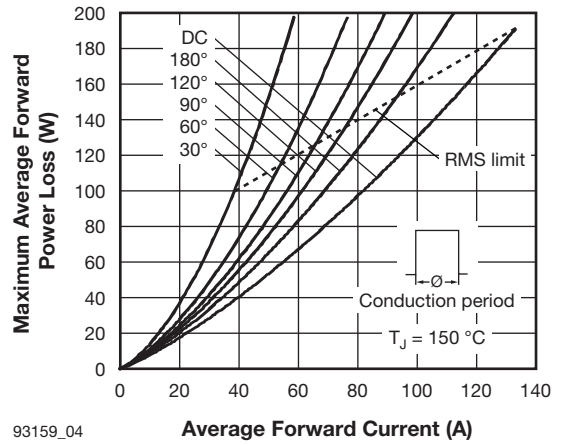


Fig. 4 - Forward Power Loss Characteristics

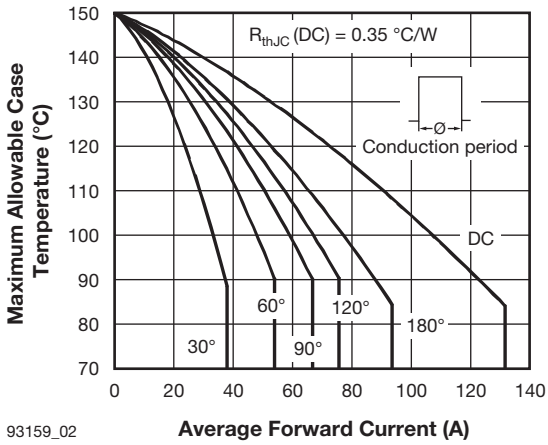


Fig. 2 - Current Rating Characteristics

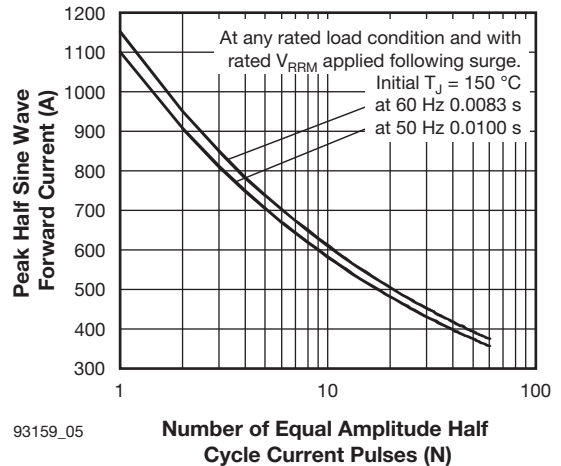


Fig. 5 - Maximum Non-Repetitive Surge Current

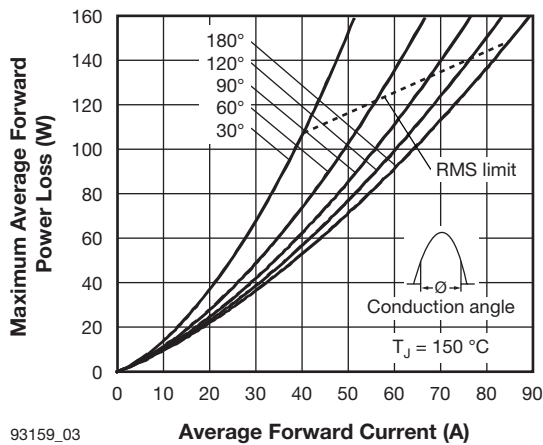


Fig. 3 - Forward Power Loss Characteristics

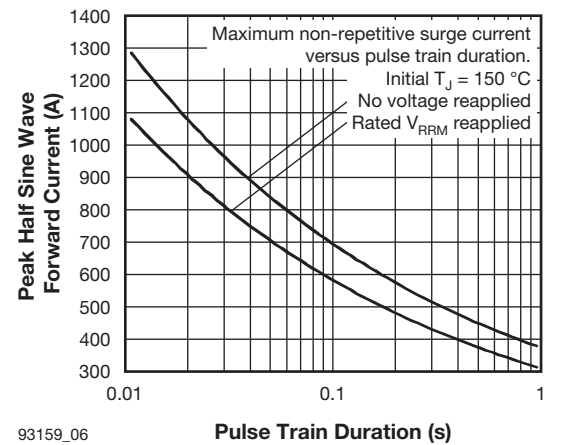
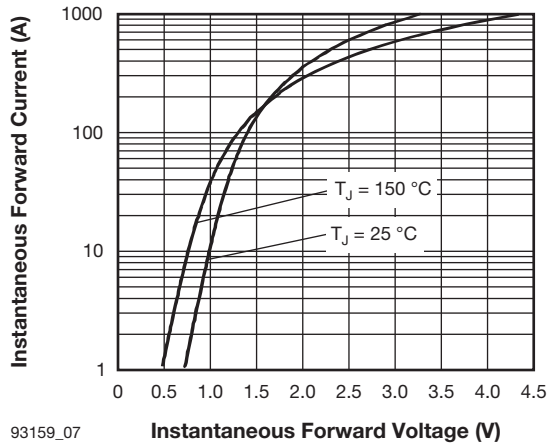


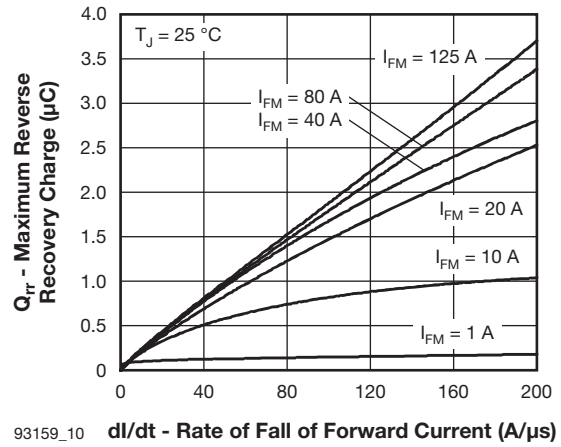
Fig. 6 - Maximum Non-Repetitive Surge Current

VS-85EPF12 Soft Recovery Series

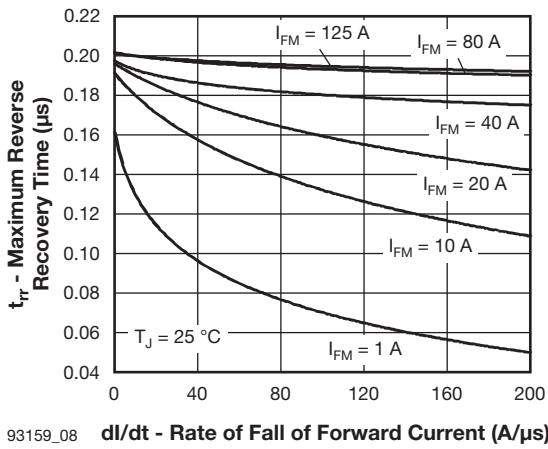
Vishay Semiconductors Fast Soft Recovery Rectifier Diode, 85 A



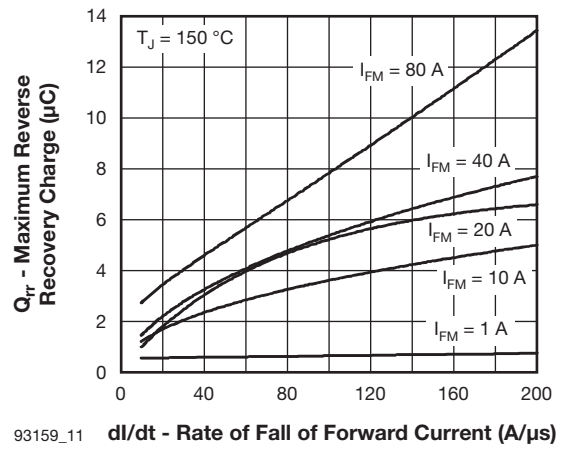
93159_07
Fig. 7 - Forward Voltage Drop Characteristics



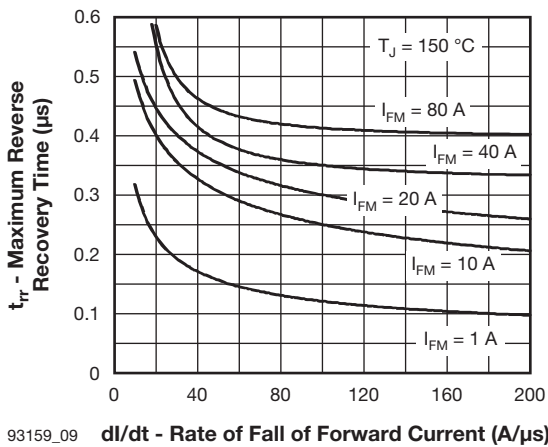
93159_10
Fig. 10 - Recovery Charge Characteristics, $T_J = 25\text{ }^\circ\text{C}$



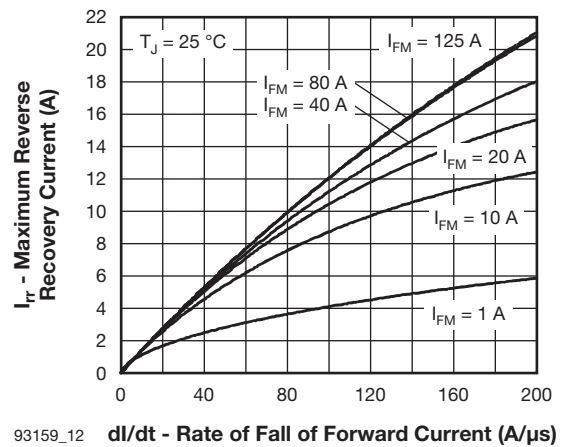
93159_08
Fig. 8 - Recovery Time Characteristics, $T_J = 25\text{ }^\circ\text{C}$



93159_11
Fig. 11 - Recovery Charge Characteristics, $T_J = 150\text{ }^\circ\text{C}$



93159_09
Fig. 9 - Recovery Time Characteristics, $T_J = 150\text{ }^\circ\text{C}$



93159_12
Fig. 12 - Recovery Current Characteristics, $T_J = 25\text{ }^\circ\text{C}$



VS-85EPF12 Soft Recovery Series

Fast Soft Recovery Rectifier Diode, 85 A Vishay Semiconductors

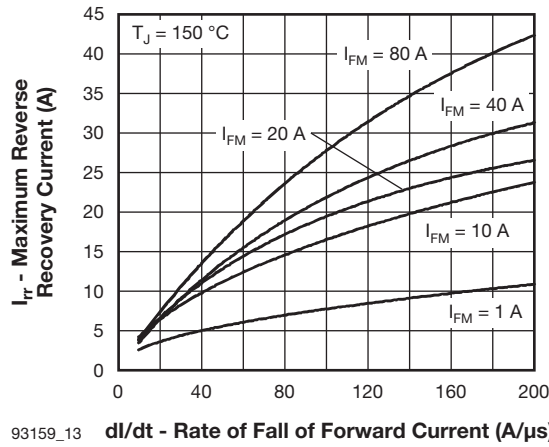


Fig. 13 - Recovery Current Characteristics, $T_J = 150\text{ °C}$

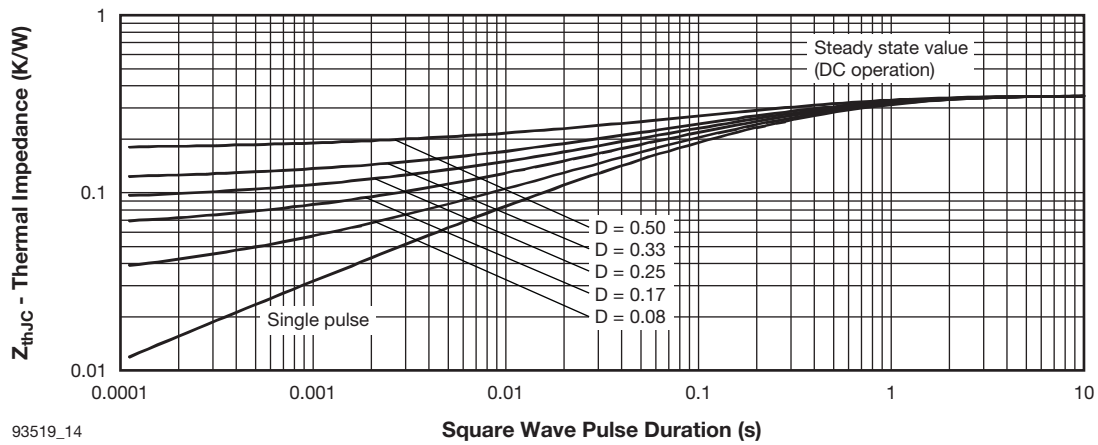


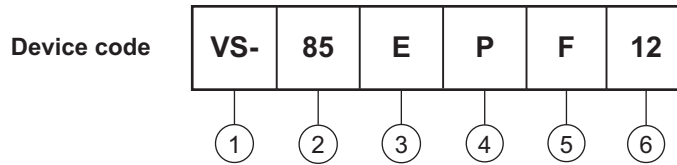
Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

VS-85EPF12 Soft Recovery Series

Vishay Semiconductors Fast Soft Recovery Rectifier Diode, 85 A



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating
- 3** - Circuit configuration:
E = Single diode
- 4** - Package:
P = TO-247AC
- 5** - Type of silicon:
F = Fast recovery
- 6** - Voltage code x 100 = V_{RRM} (12 = 1200 V)

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95240
Part marking information	www.vishay.com/doc?95370
Application note	www.vishay.com/doc?95179



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 and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.