Fast Soft Recovery Rectifier Diode, 85 A

PowerTab®

FEATURES

- 150 °C max. operating junction temperature
- Output rectification and freewheeling in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met
- Screw mounting only
- Designed and qualified according to JEDEC-JESD47
- PowerTab® package
- Compliant to RoHS Directive 2002/95/EC

Pb-free

e4

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 sturdeness connectivity for use in high current environments.

PRODUCT SUMMARY	
Package	PowerTab®
$I_{F(AV)}$	85 A
V_R	1200 V
V_F at I_F	1.36 V
I_{FSM}	110 A
t_{rr}	95 ns
T_J max.	150 °C
Diode variation	Single die
Snap factor	0.5

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

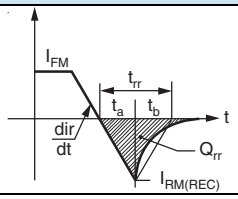
ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	T_C = 85 °C, 180° conduction half sine wave	85	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	10 ms sine pulse, rated V_{RRM} applied	1100	
		10 ms sine pulse, no voltage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

ELECTRICAL SPECIFICATIONS

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

RECOVERY CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	t_{rr}	I_F at 85 A_{pk} 25 A/µs 25 °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	°C
Maximum thermal resistance, junction to case		R_{thJC}	DC operation	0.35	°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	

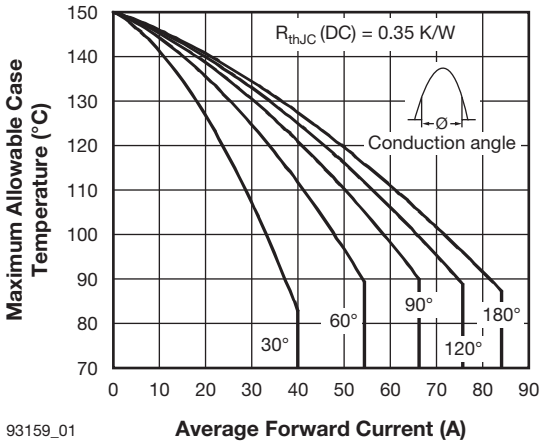


Fig. 1 - Current Rating Characteristics

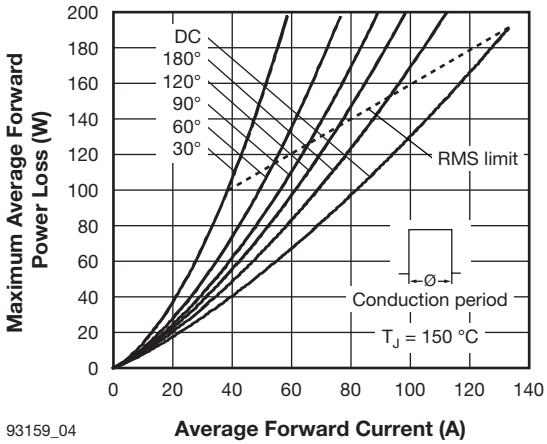


Fig. 4 - Forward Power Loss Characteristics

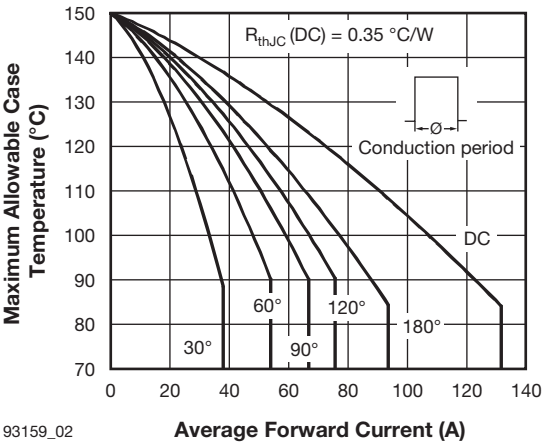


Fig. 2 - Current Rating Characteristics

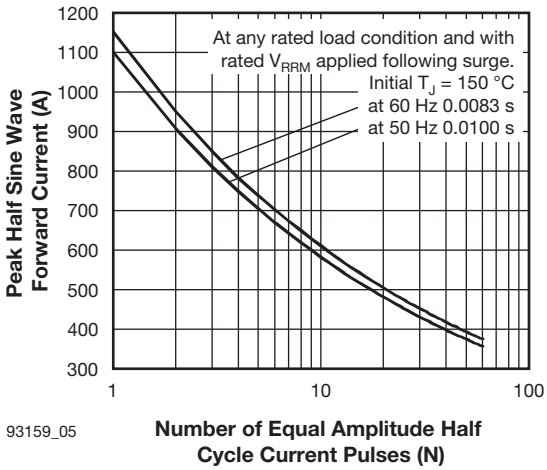


Fig. 5 - Maximum Non-Repetitive Surge Current

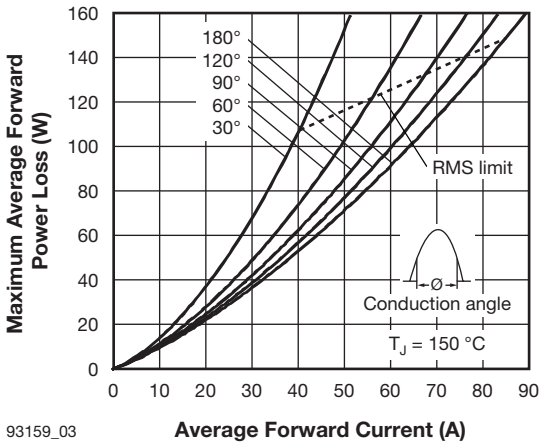


Fig. 3 - Forward Power Loss Characteristics

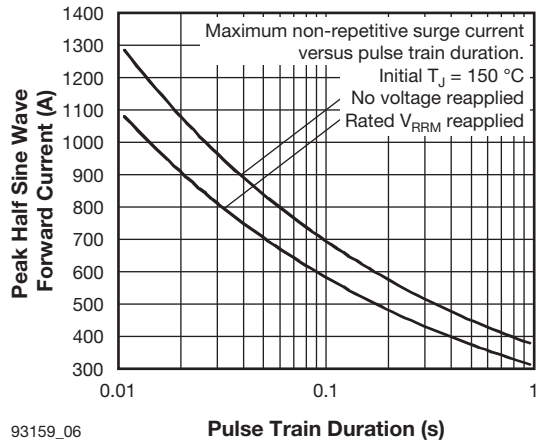


Fig. 6 - Maximum Non-Repetitive Surge Current

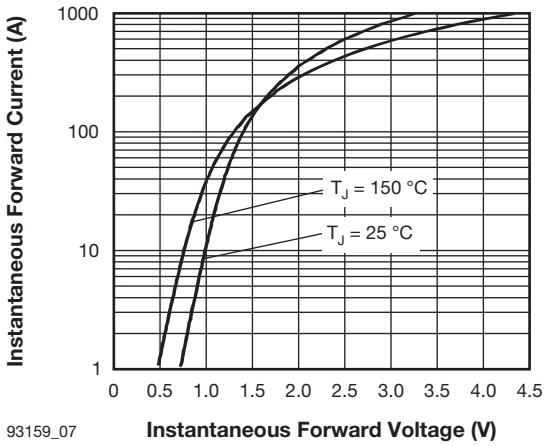


Fig. 7 - Forward Voltage Drop Characteristics

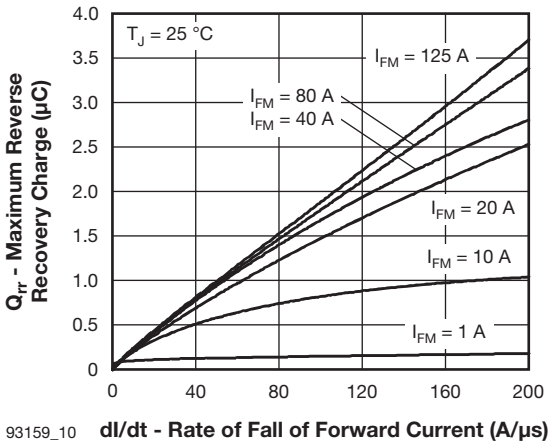


Fig. 10 - Recovery Charge Characteristics, T_J = 25 °C

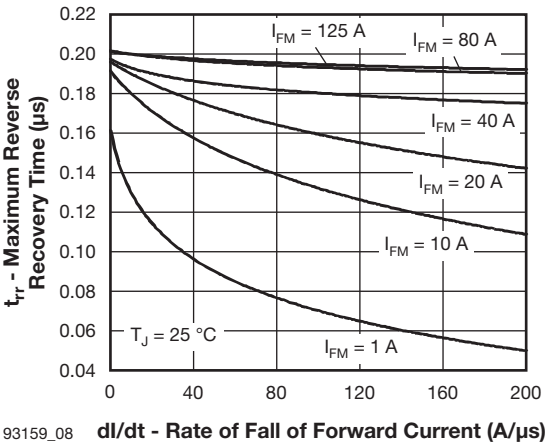


Fig. 8 - Recovery Time Characteristics, T_J = 25 °C

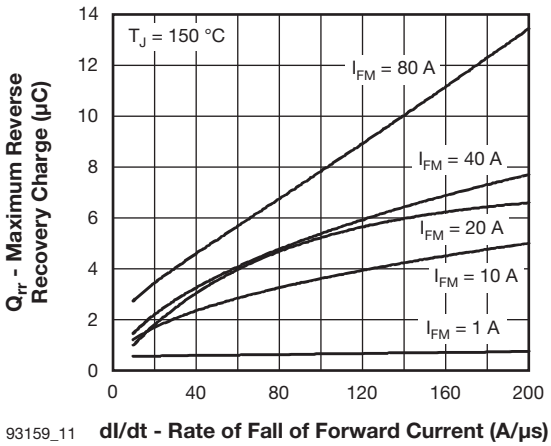


Fig. 11 - Recovery Charge Characteristics, T_J = 150 °C

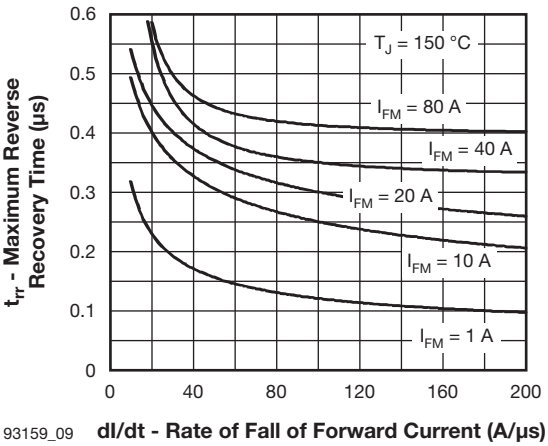


Fig. 9 - Recovery Time Characteristics, T_J = 150 °C

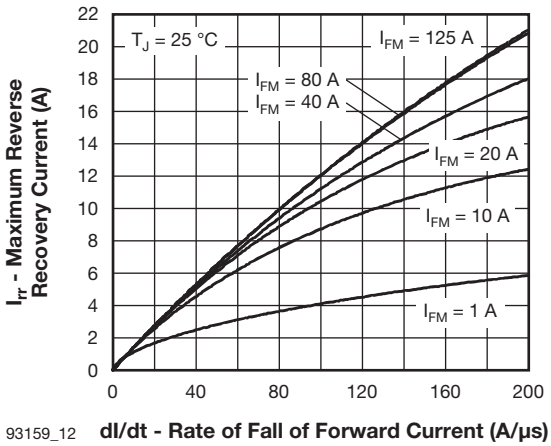


Fig. 12 - Recovery Current Characteristics, T_J = 25 °C

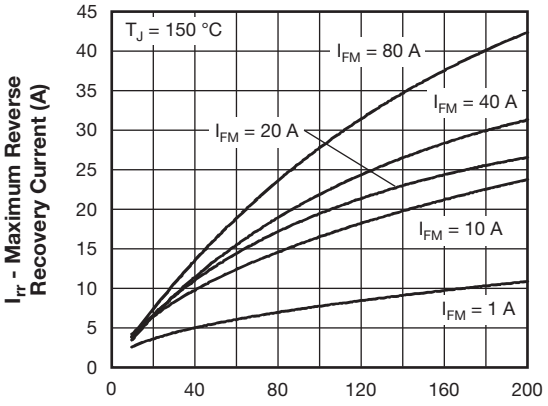


Fig. 13 - Recovery Current Characteristics, T_J = 150 °C

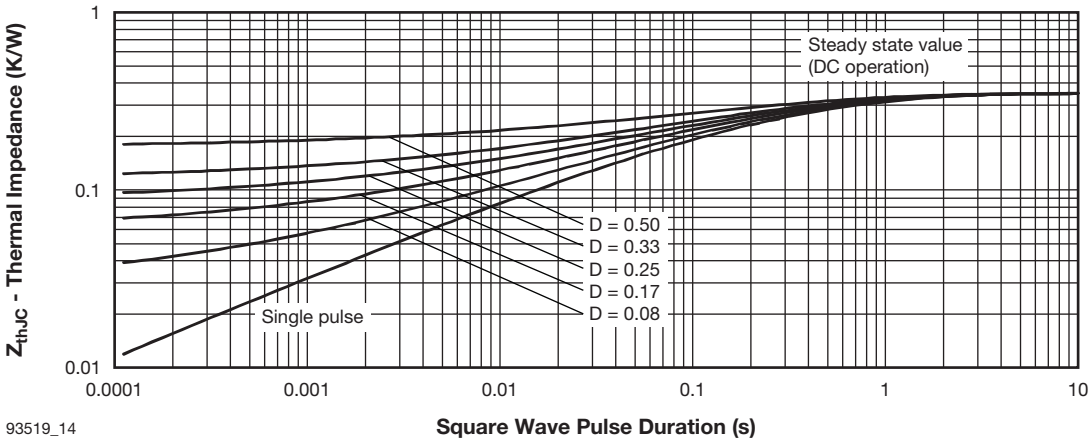
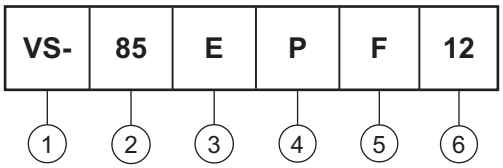


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating

3 - Circuit configuration:

E = Single diode

4 - Package:

P = TO-247AC

5 - Type of silicon:

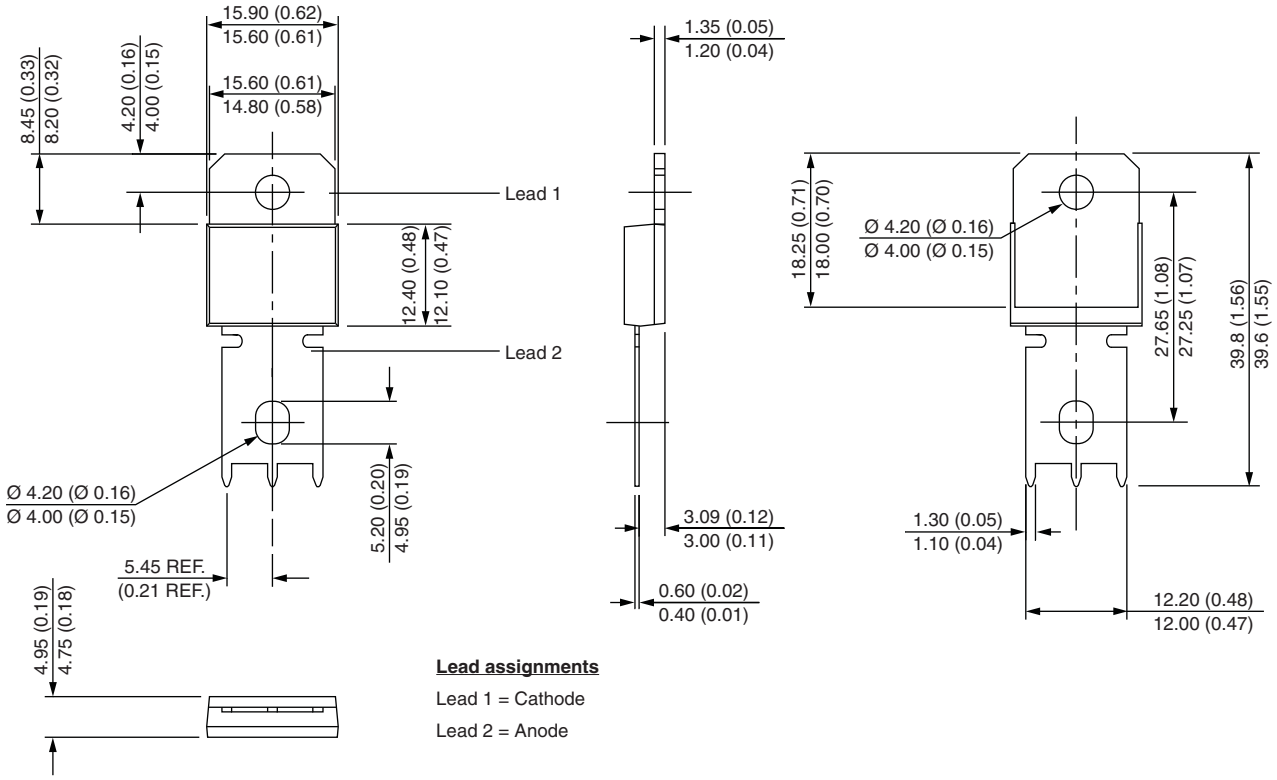
F = Fast recovery

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

PowerTab®

DIMENSIONS in millimeters (inches)



Lead assignments

Lead 1 = Cathode

Lead 2 = Anode

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