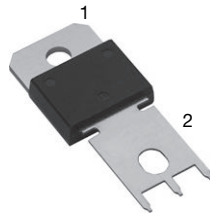
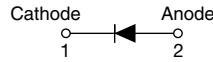


## Fast Soft Recovery Rectifier Diode, 85 A


**PowerTab®**

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**

### FEATURES

- Glass passivated pellet chip junction
- 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
- AEC-Q101 qualified
- PowerTab® package
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	85 A
$V_R$	1200 V
$V_F$ at $I_F$	1.36 V
$I_{FSM}$	1190 A
$t_{rr}$	95 ns
$T_J$ max.	150 °C
Snap factor	0.5
Package	PowerTab®
Circuit configuration	Single

### 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.

### MECHANICAL DATA

**Case:** PowerTab®

Molding compound meets UL 94 V-0 flammability rating

**Terminal:** nickel plated, screwable

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	
$V_{RRM}$		1200	V
$I_{FSM}$		1190	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-M4	1200	1300	18



ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 85\text{ }^\circ\text{C}$ , 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	1000	
		10 ms sine pulse, no voltage reapplied	1190	
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	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$ , 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, $T_J = 25\text{ }^\circ\text{C}$	1.36	V
Forward slope resistance	$r_t$	$T_J = 150\text{ }^\circ\text{C}$	4.03	$m\Omega$
Threshold voltage	$V_{F(TO)}$		0.87	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$	18	

RECOVERY CHARACTERISTICS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Reverse recovery time	$t_{rr}$	$I_F$ at 85 A <sub>pk</sub> 25 A/ $\mu$ s 25 °C	480	ns	
Reverse recovery current	$I_{rr}$		7.1	A	
Reverse recovery charge	$Q_{rr}$		2.1	$\mu$ C	
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
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style PowerTab®	85EPF12H	

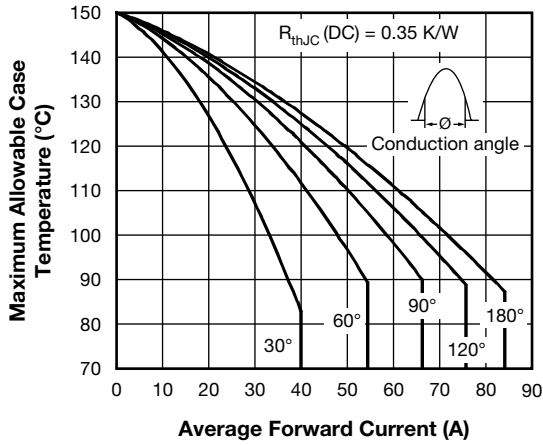


Fig. 1 - Current Rating Characteristics

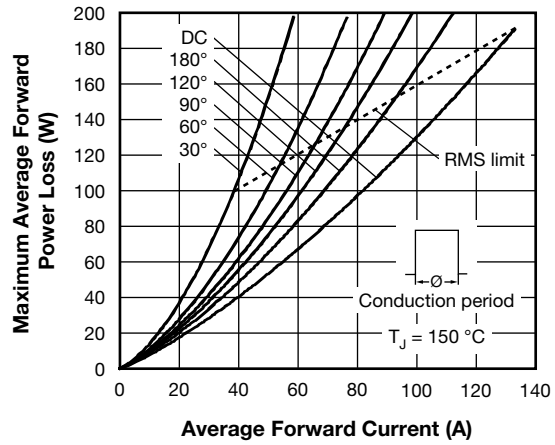


Fig. 4 - Forward Power Loss Characteristics

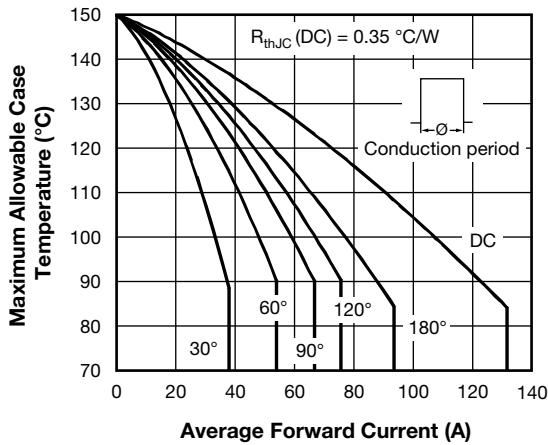


Fig. 2 - Current Rating Characteristics

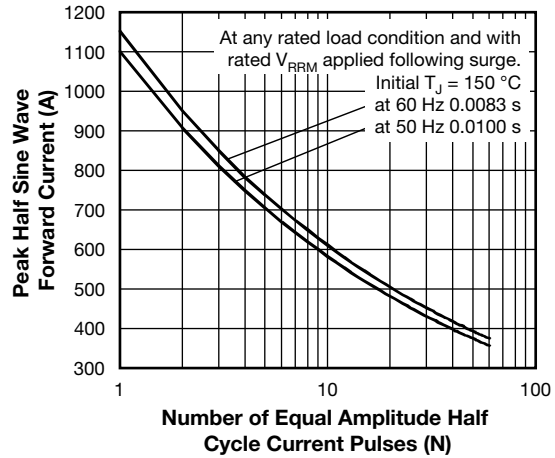


Fig. 5 - Maximum Non-Repetitive Surge Current

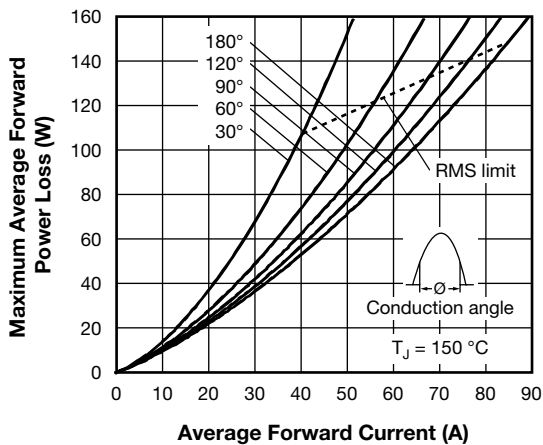


Fig. 3 - Forward Power Loss Characteristics

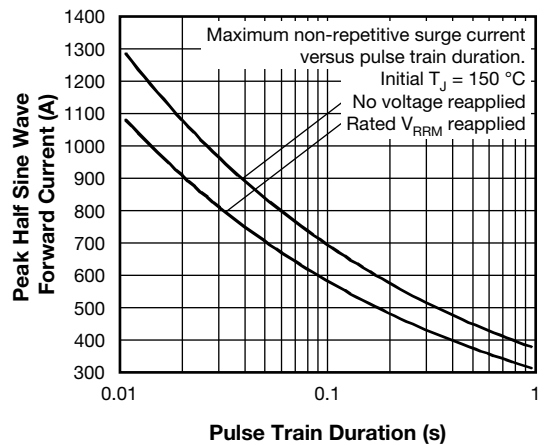


Fig. 6 - Maximum Non-Repetitive Surge Current

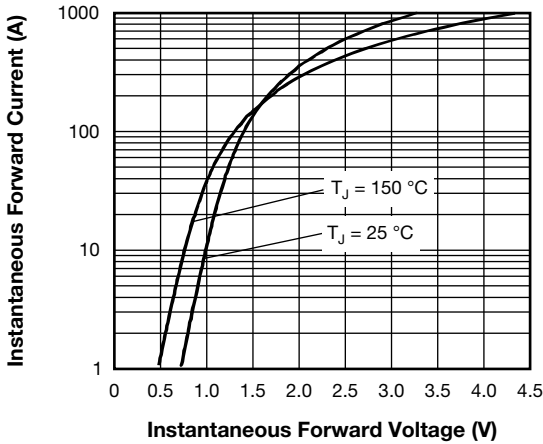


Fig. 7 - Forward Voltage Drop Characteristics

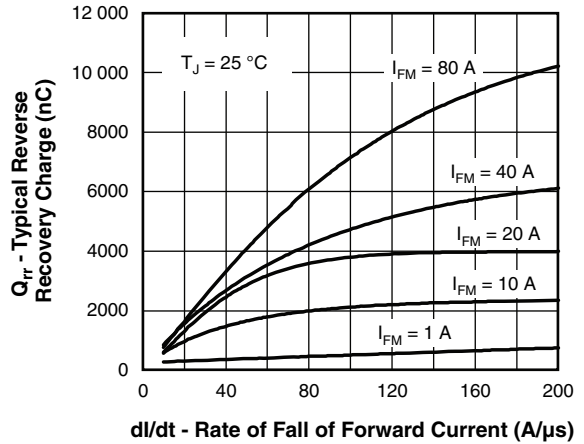


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

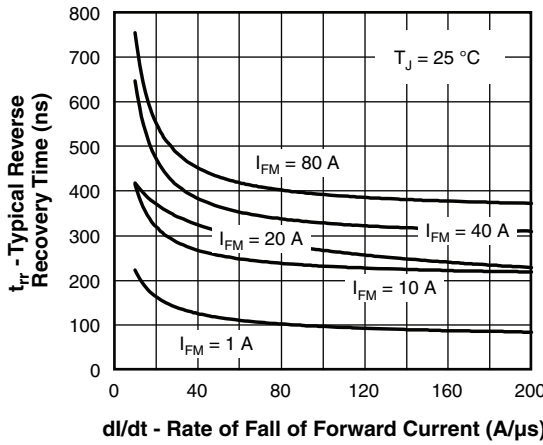


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

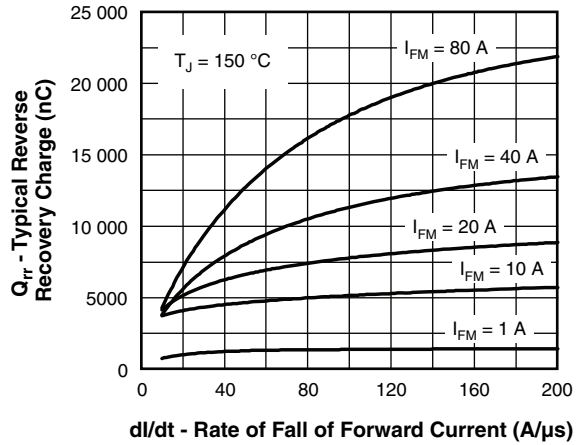


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

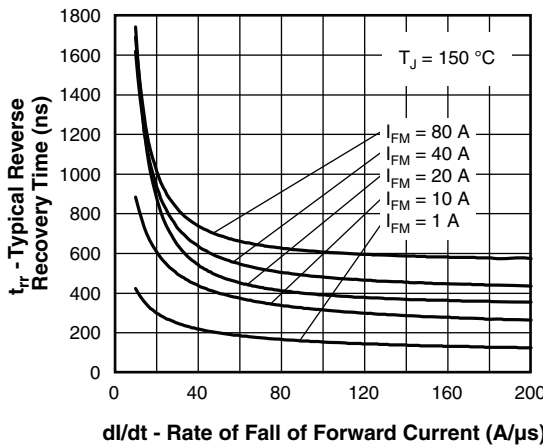


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

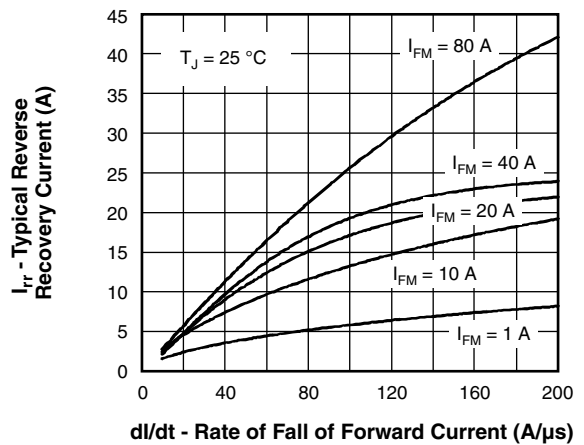


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

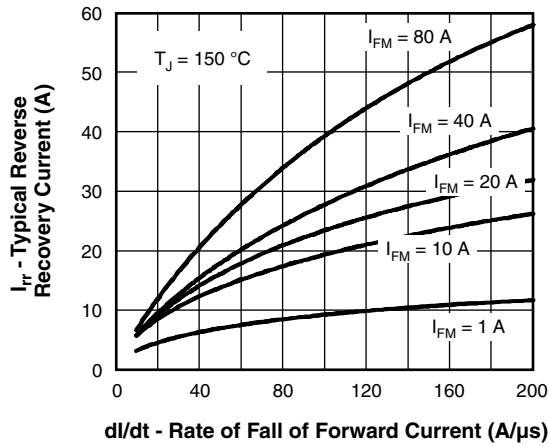


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ °C}$

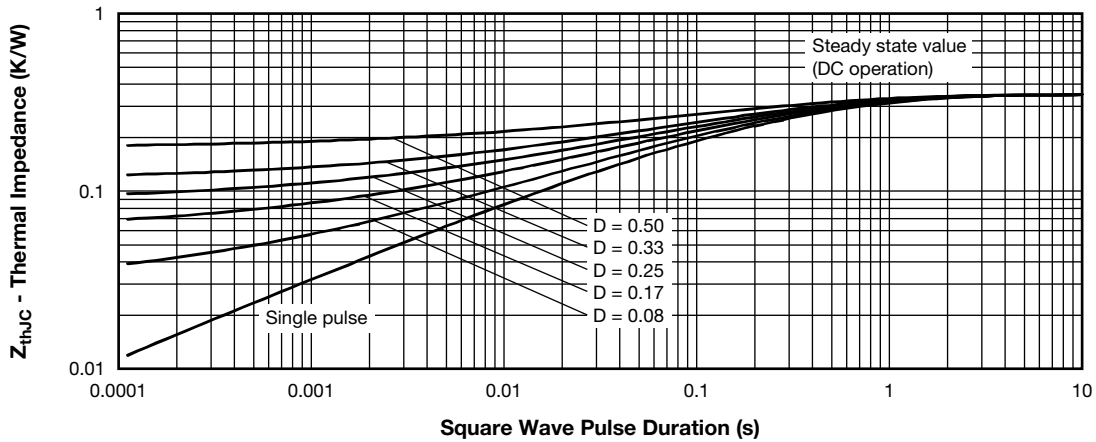
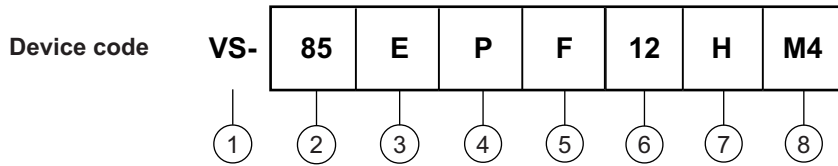


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics



**ORDERING INFORMATION TABLE**



- 1** - Vishay Semiconductors product
- 2** - Current rating (85 = 85 A)
- 3** - Circuit configuration:  
E = single diode
- 4** - Package:  
P = PowerTab®
- 5** - Type of silicon:  
F = fast recovery
- 6** - Voltage code x 100 =  $V_{RRM}$  (12 = 1200 V)
- 7** - AEC-Q101 qualified
- 8** - Environmental digit:  
M4 = Halogen-free, RoHS-compliant and terminations lead (Pb)-free

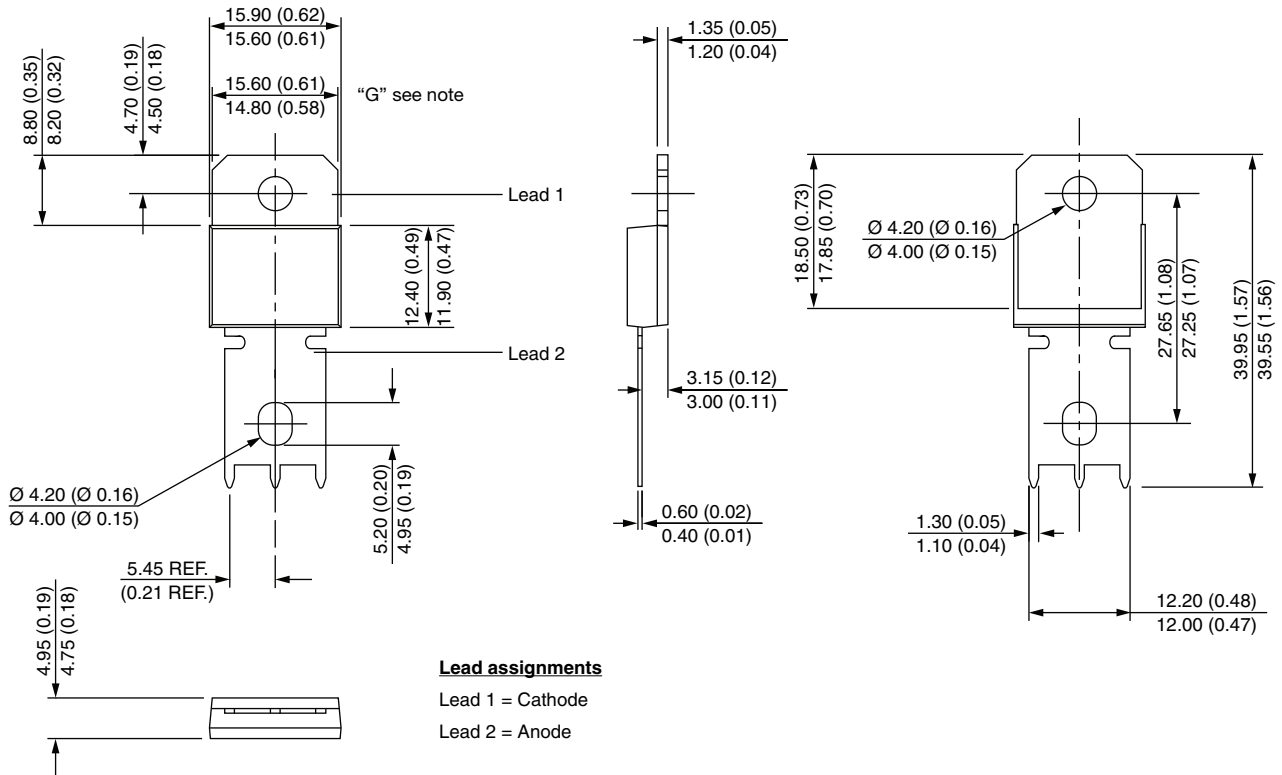
<b>ORDERING INFORMATION</b> (Example)		
<b>PREFERRED P/N</b>	<b>BASE QUANTITY</b>	<b>PACKAGING DESCRIPTION</b>
VS-85EPF12HM4	25/tube	Antistatic plastic tube

<b>LINKS TO RELATED DOCUMENTS</b>	
Dimensions	<a href="http://www.vishay.com/doc?95240">www.vishay.com/doc?95240</a>
Part marking information	<a href="http://www.vishay.com/doc?95467">www.vishay.com/doc?95467</a>
SPIICE model	<a href="http://www.vishay.com/doc?97277">www.vishay.com/doc?97277</a>
Application note	<a href="http://www.vishay.com/doc?95179">www.vishay.com/doc?95179</a>



### PowerTab®

#### DIMENSIONS in millimeters (inches)



**Note:**  
Outline conform to JEDEC® TO-275, except for dimension "G" only



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