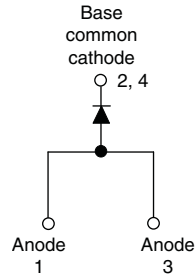


## Fast Soft Recovery Rectifier Diode, 80 A


**TO-247AC**

**FEATURES**

- 150 °C max. operating junction temperature
- Low forward voltage drop and short reverse recovery time
- Designed and qualified according to JEDEC-JESD47
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition (-M3 only)


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

PRODUCT SUMMARY	
Package	TO-247AC
$I_{F(AV)}$	80 A
$V_R$	1000 V, 1200 V
$V_F$ at $I_F$	1.35 V
$I_{FSM}$	1100 A
$t_{rr}$	90 ns
$T_J$ max.	150 °C
Diode variation	Single die
Snap factor	0.5

**APPLICATIONS**

These devices are intended for use in output rectification and freewheeling in inverters, choppers and converters as well as in input rectification where severe restrictions on conducted EMI should be met.

**DESCRIPTION**

The VS-80APF1... 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.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	TEST CONDITIONS	VALUES	UNITS
$V_{RRM}$		1000/1200	V
$I_{F(AV)}$	Sinusoidal waveform	80	A
$I_{FSM}$		1100	
$t_{rr}$	1 A, - 100 A/ $\mu$ s	90	ns
$V_F$	40 A, $T_J = 25$ °C	1.2	V
$T_J$		- 40 to 150	°C

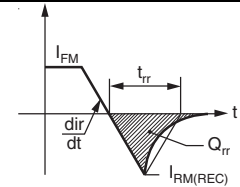
VOLTAGE RATINGS			
PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ AT 150 °C mA
VS-80APF10PbF, VS-80APF10-M3	1000	1100	12
VS-80APF12PbF, VS-80APF12-M3	1200	1300	



ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 92\text{ }^\circ\text{C}$ , 180° conduction half sine wave	80	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	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$ , no voltage reapplied	70 000	$A^2\sqrt{s}$

ELECTRICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	80 A, $T_J = 25\text{ }^\circ\text{C}$	1.35	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
		$T_J = 150\text{ }^\circ\text{C}$	12	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	$t_{rr}$	$I_F$ at 80 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
			0.21	oz.
Mounting torque	minimum		6 (5)	$\text{kgf} \cdot \text{cm}$ $(\text{lbf} \cdot \text{in})$
	maximum		12 (10)	
Marking device		Case style TO-247AC	80APF10	
			80APF12	

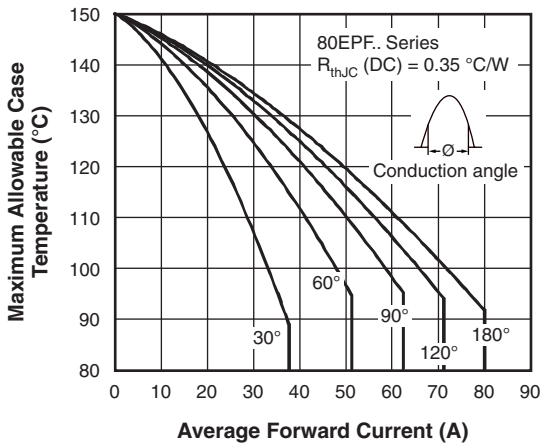


Fig. 1 - Current Rating Characteristics

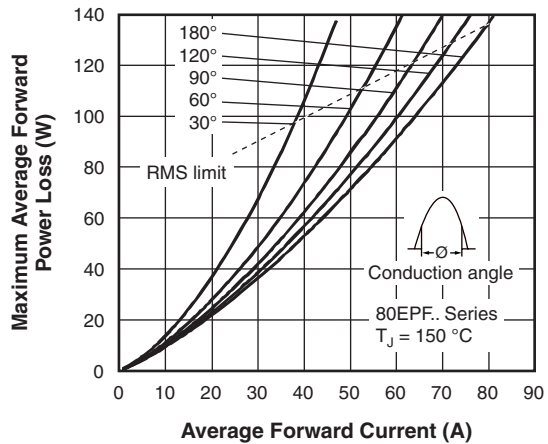


Fig. 4 - Forward Power Loss Characteristics

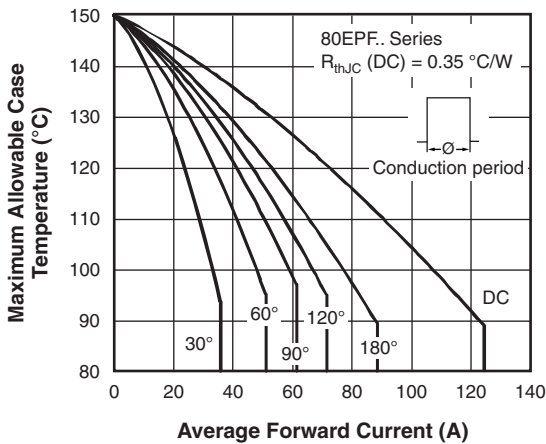


Fig. 2 - Current Rating Characteristics

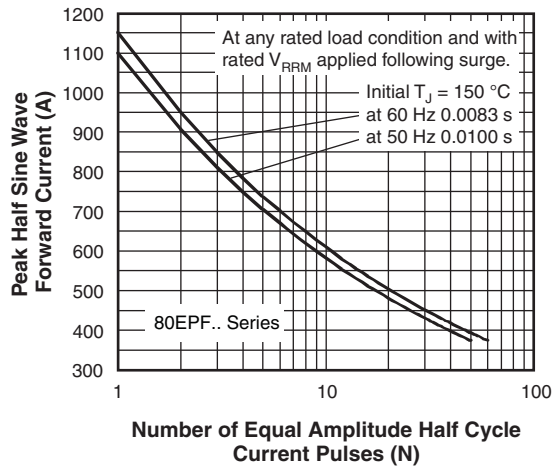


Fig. 5 - Maximum Non-Repetitive Surge Current

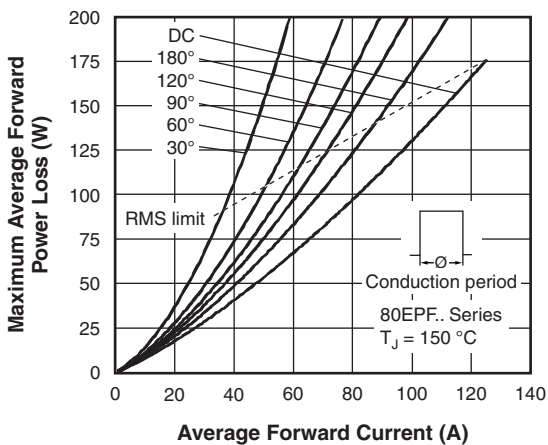


Fig. 3 - Forward Power Loss Characteristics

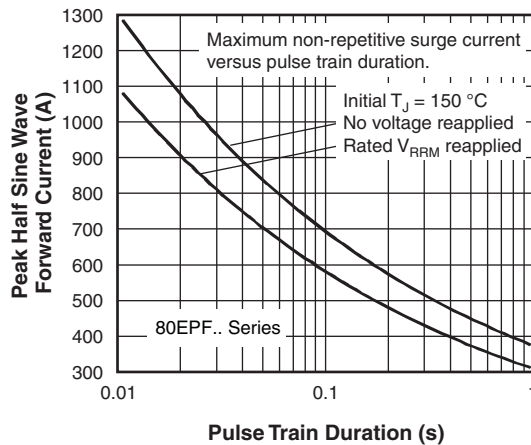


Fig. 6 - Maximum Non-Repetitive Surge Current

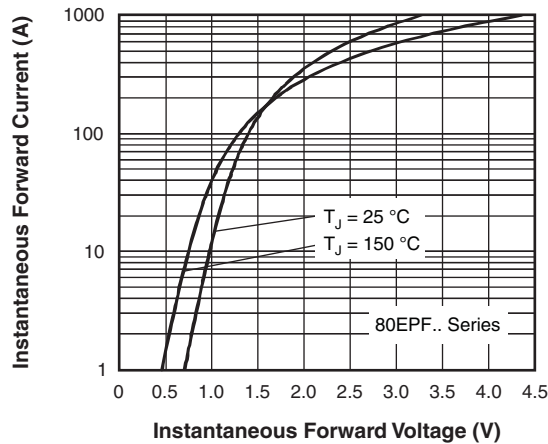


Fig. 7 - Forward Voltage Drop Characteristics

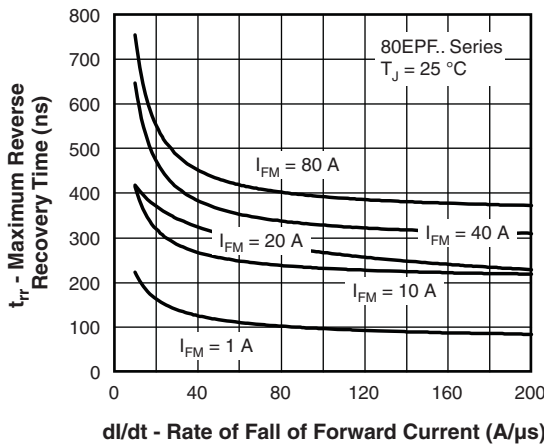


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

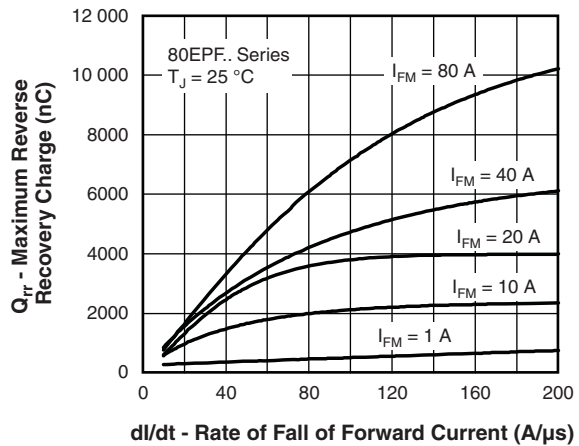


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

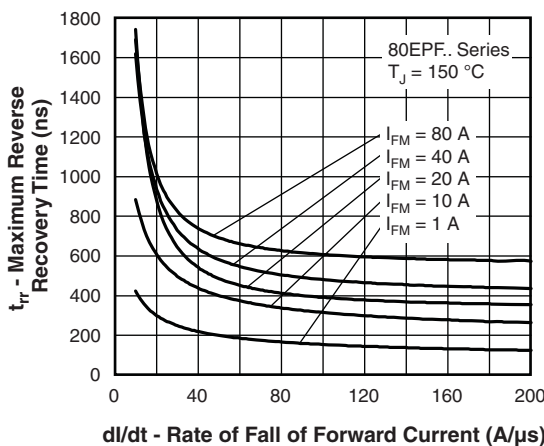


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

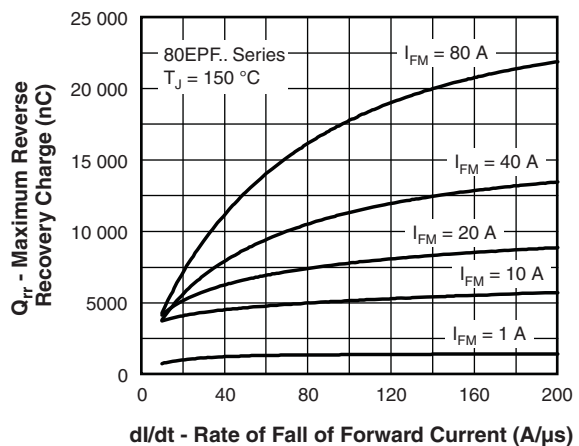


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

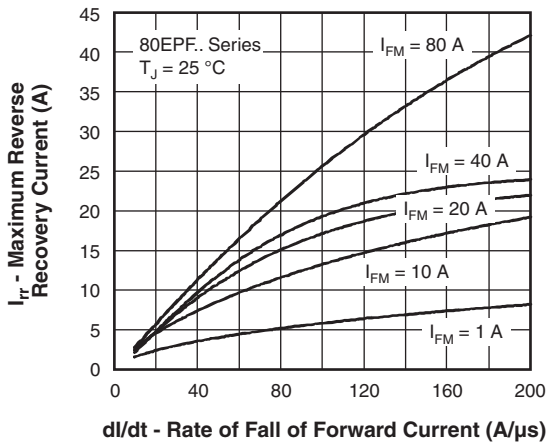


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

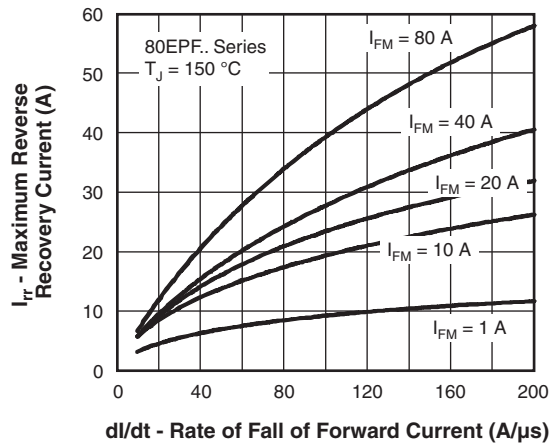


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

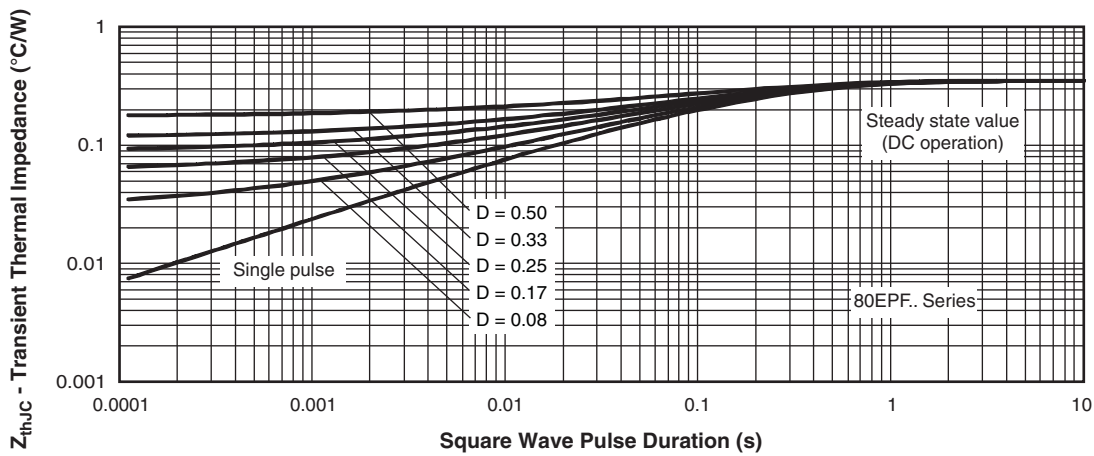
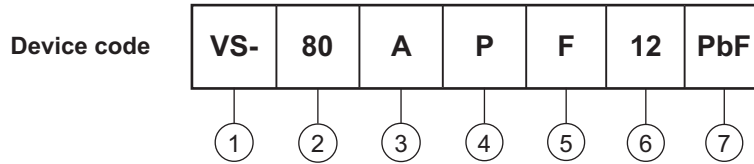


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (80 = 80 A)
- 3** - Circuit configuration:  
A = Single diode, 3 pins
- 4** - Package:  
P = TO-247AC
- 5** - Type of silicon:  
F = Fast recovery
- 6** - Voltage code x 100 =  $V_{RRM}$  10 = 1000 V  
12 = 1200 V
- 7** - Environmental digit:
  - PbF = Lead (Pb)-free and RoHS compliant
  - -M3 = Halogen-free, RoHS compliant and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-80APF10PbF	25	500	Antistatic plastic tubes
VS-80APF10-M3	25	500	Antistatic plastic tubes
VS-80APF12PbF	25	500	Antistatic plastic tubes
VS-80APF12-M3	25	500	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95223">www.vishay.com/doc?95223</a>
Part marking information	TO-247AC PbF <a href="http://www.vishay.com/doc?95226">www.vishay.com/doc?95226</a>
	TO-247AC -M3 <a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>



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