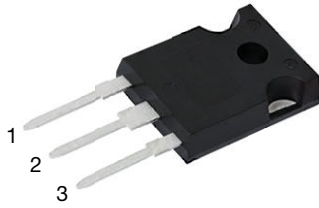
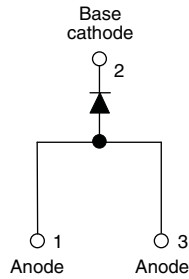


## Fast Soft Recovery Rectifier Diode, 80 A


**TO-247AC 3L**

**FEATURES**

- Glass passivated pellet chip junction
- 150 °C max. operating junction temperature
- Low forward voltage drop and short reverse recovery time
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


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

**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-90APF006L-M3 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.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	80 A
$V_R$	200 V, 400 V, 600 V
$V_F$ at $I_F$	1.25 V
$I_{FSM}$	1000 A
$t_{rr}$	70 ns
$T_J$ max.	150 °C
Package	TO-247AC 3L
Circuit configuration	Single
Snap factor	0.5

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$V_{RRM}$		200 to 600	V
$I_{F(AV)}$	Sinusoidal waveform	80	A
$I_{FSM}$		1000	
$t_{rr}$	1 A, - 100 A/ $\mu$ s	70	ns
$V_F$	40 A, $T_J = 25$ °C	1.1	V
$T_J$	Range	-40 to +150	°C

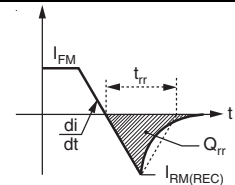
VOLTAGE RATINGS			
PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ AT 150 °C mA
VS-80APF02-M3	200	300	17
VS-80APF04-M3	400	500	
VS-80APF06-M3	600	700	



ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 95\text{ }^\circ\text{C}$ , 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	850	
		10 ms sine pulse, no voltage reapplied	1000	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied	3610	$A^2s$
		10 ms sine pulse, no voltage reapplied	5100	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$ , no voltage reapplied	51 000	$A^2\sqrt{s}$

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum forward voltage drop	$V_{FM}$	80 A, $T_J = 25\text{ }^\circ\text{C}$	1.25	V	
Forward slope resistance	$r_t$	$T_J = 150\text{ }^\circ\text{C}$	3.5	$m\Omega$	
Threshold voltage	$V_{F(TO)}$		0.85	V	
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		17	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	$t_{rr}$	$I_F$ at 40 A <sub>pk</sub> 25 A/ $\mu s$ 25 °C	190	ns
Reverse recovery current	$I_{rr}$		3.4	A
Reverse recovery charge	$Q_{rr}$		0.5	$\mu C$
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)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC 3L	80APF02	
			80APF04	
			80APF06	

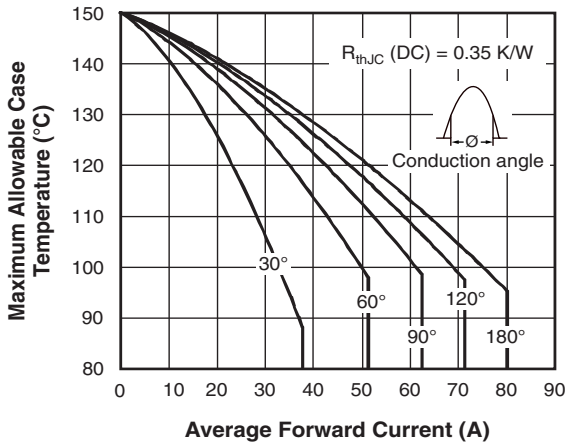


Fig. 1 - Current Rating Characteristics

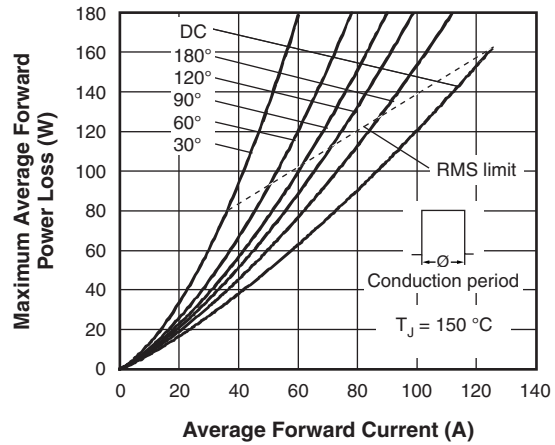


Fig. 4 - Forward Power Loss Characteristics

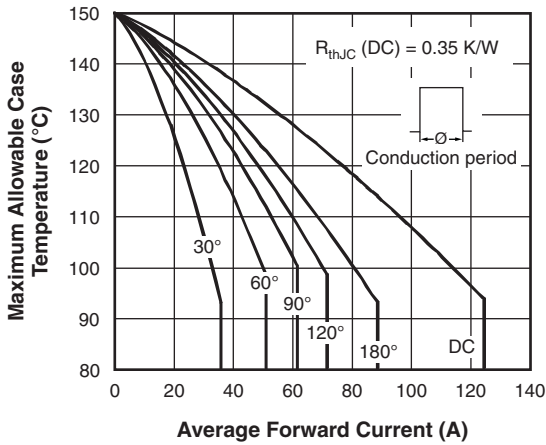


Fig. 2 - Current Rating Characteristics

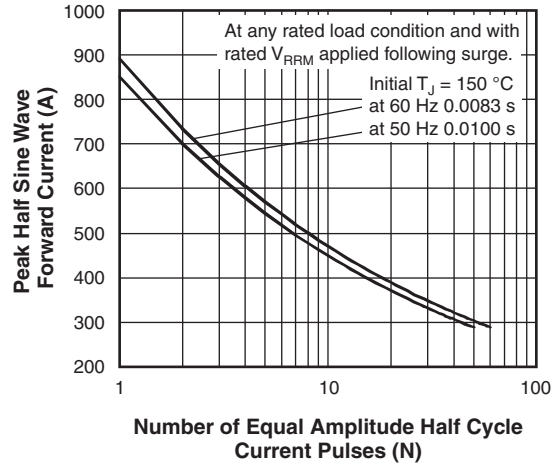


Fig. 5 - Maximum Non-Repetitive Surge Current

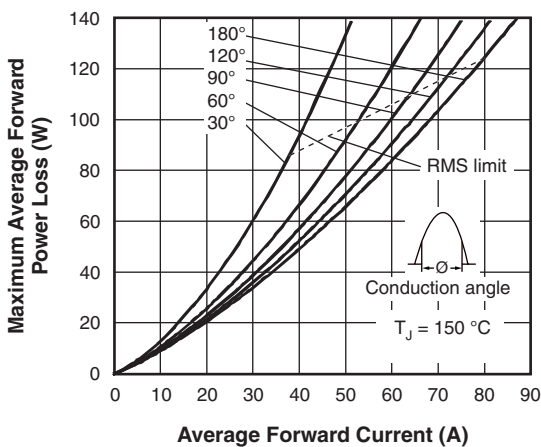


Fig. 3 - Forward Power Loss Characteristics

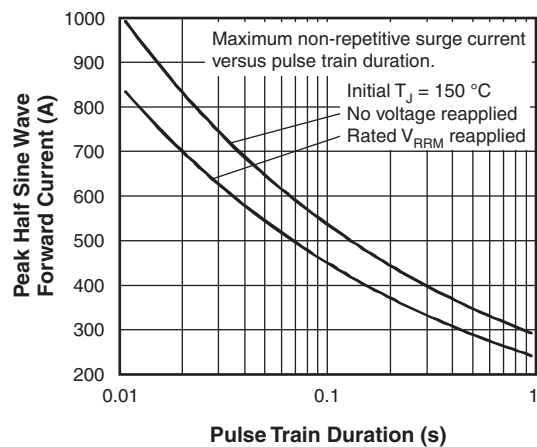


Fig. 6 - Maximum Non-Repetitive Surge Current

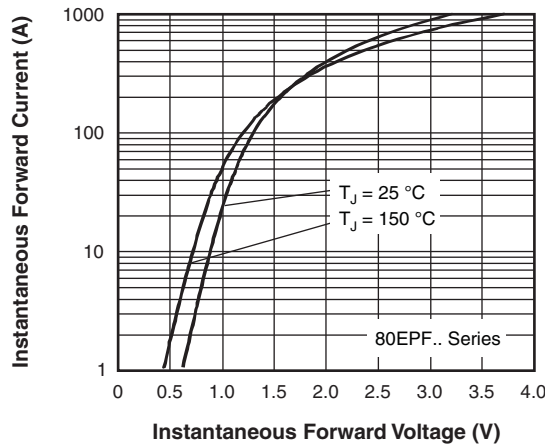


Fig. 7 - Forward Voltage Drop Characteristics

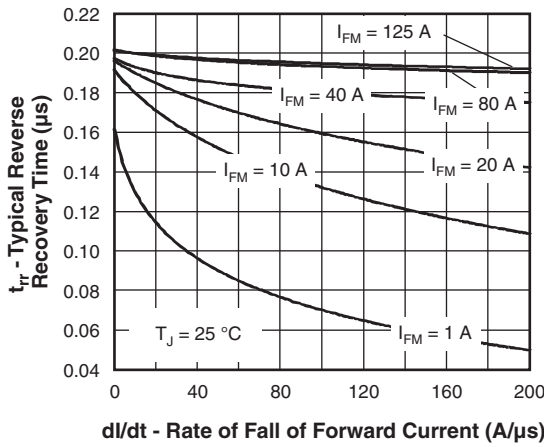


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

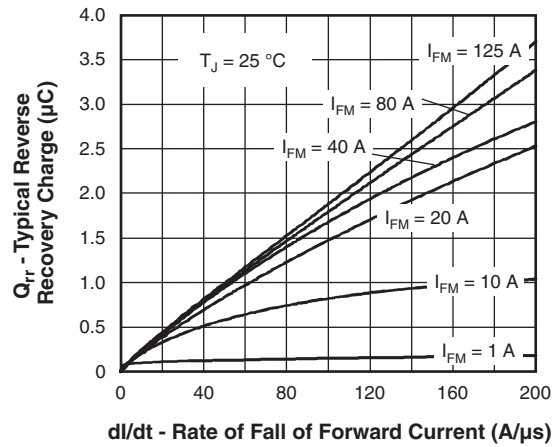


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

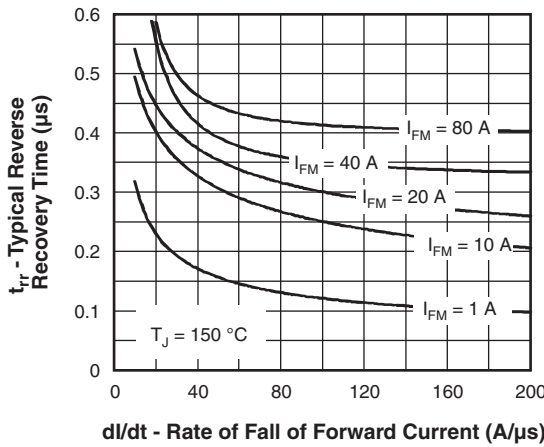


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

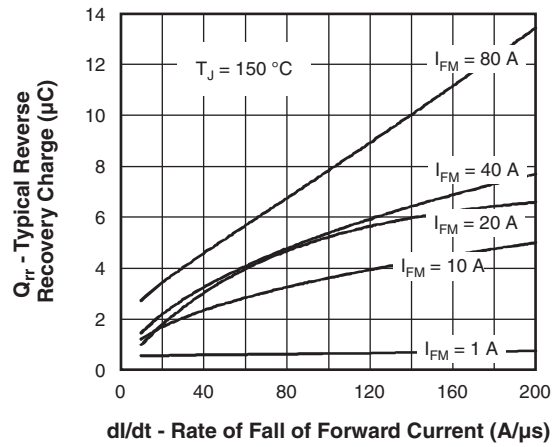


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

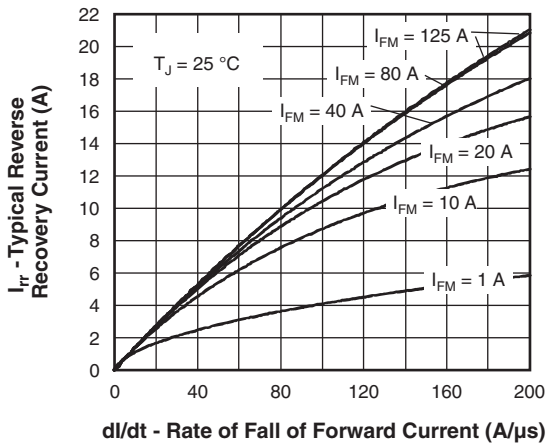


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

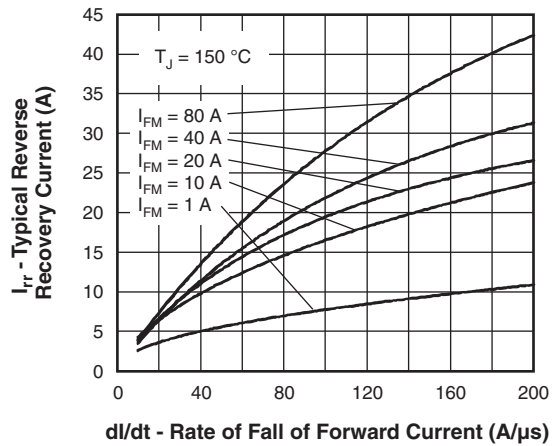


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

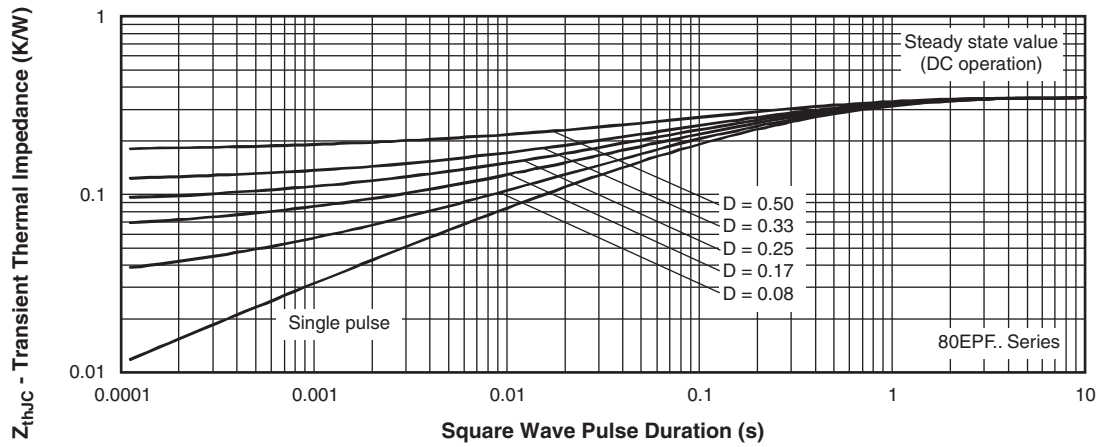
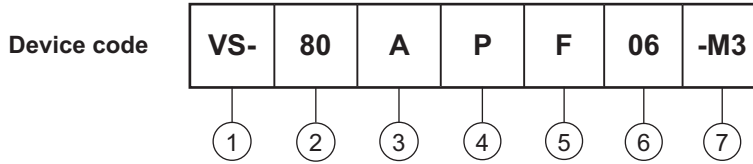


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics



## 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 3L
- 5** - Type of silicon:  
F = fast recovery
- 6** - Voltage code x 100 =  $V_{RRM}$ 

02 = 200 V
04 = 400 V
06 = 600 V
- 7** - Environmental digit:  
-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-80APF02-M3	25	500	Antistatic plastic tubes
VS-80APF04-M3	25	500	Antistatic plastic tubes
VS-80APF06-M3	25	500	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96138">www.vishay.com/doc?96138</a>
Part marking information	<a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>





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