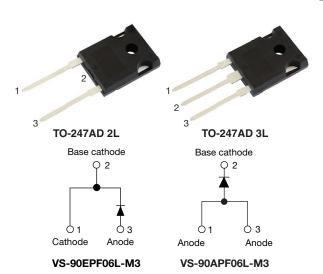


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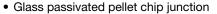
Vishay Semiconductors

## Fast Soft Recovery Rectifier Diode, 90 A



PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	90 A				
$V_R$	600 V				
V <sub>F</sub> at I <sub>F</sub>	1.3 V				
I <sub>FSM</sub>	1000 A				
t <sub>rr</sub>	70 ns				
T <sub>J</sub> max.	150 °C				
Package	TO-247AD 2L, TO-247AD 3L				
Circuit configuration	Single				
Snap factor	0.5				

#### **FEATURES**





- Low forward voltage drop and short reverse RoHS recovery time

  Designed to the state of the state of
- Designed and qualified according to FREE JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **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-90EPF006L-M3, 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.

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	VALUES	UNITS		
V <sub>RRM</sub>		600	V		
I <sub>F(AV)</sub>	Sinusoidal waveform	90			
I <sub>FSM</sub>		1000	Α		
t <sub>rr</sub>	1 A, -100 A/μs	70	ns		
V <sub>F</sub>	40 A, T <sub>J</sub> = 25 °C	1.12	V		
T <sub>J</sub>	Range	-40 to +150	°C		

VOLTAGE RATINGS					
PART NUMBER	V <sub>RRM</sub> , MAXIMUM PEAK REVERSE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I <sub>RRM</sub> AT 150 °C mA		
VS-90EPF06L-M3	600	700	17		
VS-90APF06L-M3	600	700	17		

# **VS-90EPF06L-M3, VS-90APF06L-M3**

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ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum average forward current	I <sub>F(AV)</sub>	T <sub>C</sub> = 108 °C, 180° conduction half sine wave	90		
Maximum peak one cycle		10 ms sine pulse, rated V <sub>RRM</sub> applied 850		Α	
non-repetitive surge current	I <sub>FSM</sub>	10 ms sine pulse, no voltage reapplied 1000			
Maximum I <sup>2</sup> t for fusing	l <sup>2</sup> t	10 ms sine pulse, rated V <sub>RRM</sub> applied	3610	A <sup>2</sup> s	
	1-1	10 ms sine pulse, no voltage reapplied	5100	A-5	
Maximum I <sup>2</sup> √t for fusing	$l^2\sqrt{t}$ $t = 0.1$ ms to 10 ms, no voltage reapplied		51 000	A <sup>2</sup> √s	

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	90 A, T <sub>J</sub> = 25 °C		1.3	V
Forward slope resistance	r <sub>t</sub>	T <sub>J</sub> = 150 °C		3.5	$m\Omega$
Threshold voltage	V <sub>F(TO)</sub>			0.85	V
Maximum reverse leakage current	1	$T_J = 25  ^{\circ}\text{C}$ $V_R = \text{rated } V_{BRM}$		0.1	mA
iviaximum reverse leakage current	I <sub>RM</sub>	T <sub>J</sub> = 150 °C	VR = rated VRRM	17	IIIA

RECOVERY CHARACTERISTICS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	•
Reverse recovery time	t <sub>rr</sub>	In at 40 And	190	ns	I <sub>FM</sub> t
Reverse recovery current	I <sub>rr</sub>	I <sub>F</sub> at 40 A <sub>pk</sub> 25 A/µs	3.4	Α	
Reverse recovery charge	Q <sub>rr</sub>	25 °C	0.5	μC	di / Q <sub>rr</sub>
Snap factor	S		0.5		I <sub>RM(REC)</sub>

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and temperature range	l storage	T <sub>J</sub> , T <sub>Stg</sub>		-40 to +150	°C
Maximum thermal resignation to case	stance,	$R_{thJC}$	DC operation	0.2	
Maximum thermal resi junction to ambient	stance,	R <sub>thJA</sub>		40	°C/W
Typical thermal resista case to heatsink	nce,	R <sub>thCS</sub>	Mounting surface, smooth, and greased	0.25	
Approximate weight				6	g
Approximate weight				0.21	oz.
Mauratia a taurana minimum				6 (5)	kgf · cm
Mounting torque -	maximum			12 (10)	(lbf ⋅ in)
Marking device			Case style TO-247AD 2L	90EP	F06L
			Case style TO-247AD 3L	90AP	F06L

### Vishay Semiconductors

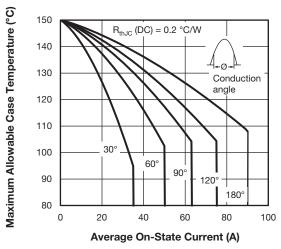


Fig. 1 - Current Rating Characteristics

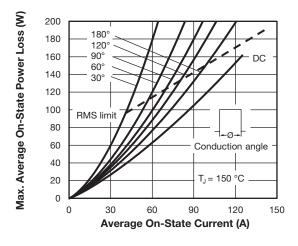


Fig. 4 - Forward Power Loss Characteristics

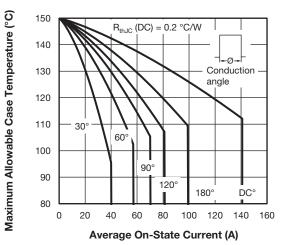


Fig. 2 - Current Rating Characteristics

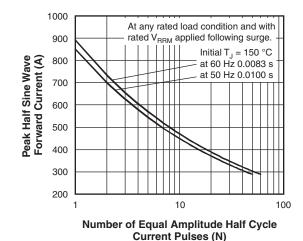


Fig. 5 - Maximum Non-Repetitive Surge Current

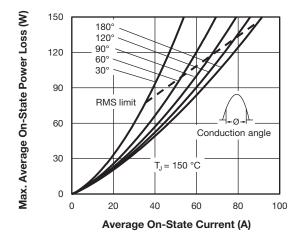


Fig. 3 - Forward Power Loss Characteristics

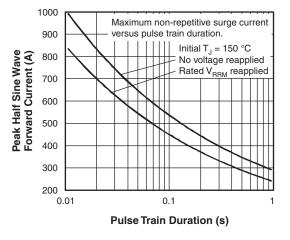


Fig. 6 - Maximum Non-Repetitive Surge Current



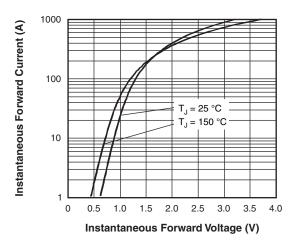


Fig. 7 - Forward Voltage Drop Characteristics

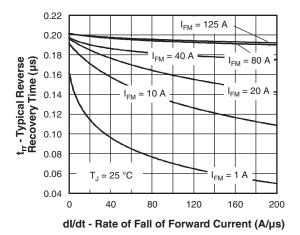


Fig. 8 - Recovery Time Characteristics, T<sub>J</sub> = 25 °C

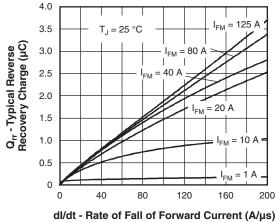


Fig. 10 - Recovery Charge Characteristics, T<sub>J</sub> = 25 °C

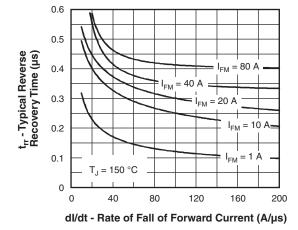
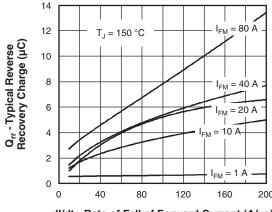


Fig. 9 - Recovery Time Characteristics, T<sub>J</sub> = 150 °C



dl/dt - Rate of Fall of Forward Current (A/µs)

Fig. 11 - Recovery Charge Characteristics, T<sub>J</sub> = 150 °C



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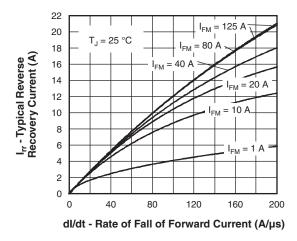


Fig. 12 - Recovery Current Characteristics, T<sub>J</sub> = 25 °C

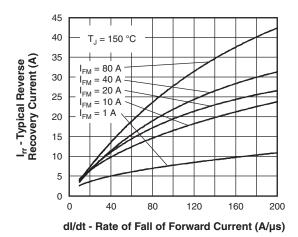


Fig. 13 - Recovery Current Characteristics,  $T_J = 150 \, ^{\circ}\text{C}$ 

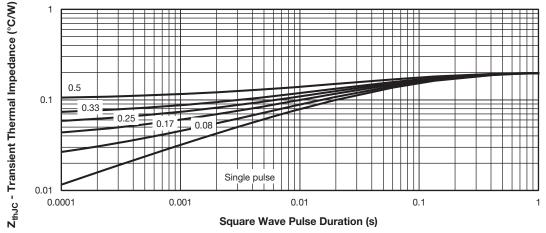


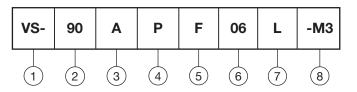
Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

## **VS-90EPF06L-M3, VS-90APF06L-M3**

Vishay Semiconductors

#### **ORDERING INFORMATION TABLE**

Device code



- Vishay Semiconductors product
- Current rating (90 = 90 A)
- Circuit configuration: E = single, 2 pins
  - A = single, 3 pins
- 4 Package:

P = TO-247AD

- 5 Type of silicon:
  - F = fast recovery
- 6 Voltage code x 100 = V<sub>RRM</sub> 06 = 600 V
- 7 L = long lead
- 8 Environmental digit:
  - -M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)					
PREFERRED P/N	QUANTITY PER TUBES	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION		
VS-90EPF06L-M3	25	500	Antistatic plastic tubes		
VS-90APF06L-M3	25	500	Antistatic plastic tubes		

LINKS TO RELATED DOCUMENTS				
Dimensions	TO-247AD 2L	www.vishay.com/doc?95536		
Dimensions	TO-247AD 3L	www.vishay.com/doc?95626		
Dark manding information	TO-247AD 2L	www.vishay.com/doc?95648		
Part marking information	TO-247AD 3L	www.vishay.com/doc?95007		



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