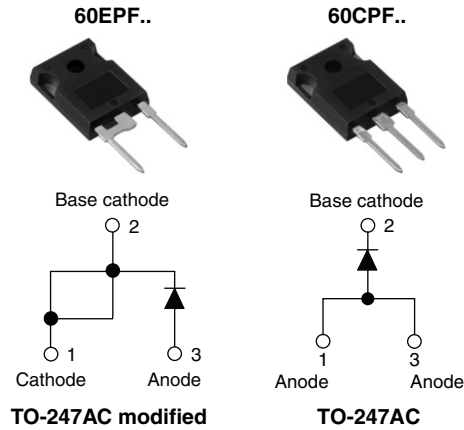


## Fast Soft Recovery Rectifier Diode, 60 A



### FEATURES/DESCRIPTION

The 60EPF.. and 60CPF.. 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.

This product series has been designed and qualified for industrial level.

### APPLICATIONS

- Output rectification and freewheeling in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met

### PRODUCT SUMMARY

$V_F$ at 30 A	< 1.1 V
$t_{rr}$	70 ns
$V_{RRM}$	200 to 600 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$V_{RRM}$		200 to 600	V
$I_{F(AV)}$	Sinusoidal waveform	60	A
$I_{FSM}$		830	
$t_{rr}$	1 A, 100 A/ $\mu$ s	70	ns
$V_F$	30 A, $T_J = 25^\circ\text{C}$	1.1	V
$T_J$		- 40 to 150	$^\circ\text{C}$

### VOLTAGE RATINGS

PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ AT 150 $^\circ\text{C}$ mA
60EPF02, 60CPF02	200	300	5
60EPF04, 60CPF04	400	500	
60EPF06, 60CPF06	600	700	

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 106^\circ\text{C}$ , 180 $^\circ$ conduction half sine wave	60	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	700	
		10 ms sine pulse, no voltage reapplied	830	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied	2450	$\text{A}^2\text{s}$
		10 ms sine pulse, no voltage reapplied	3460	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied	34 600	$\text{A}^2\sqrt{\text{s}}$

# 60EPF../60CPF.. Soft Recovery Series



Vishay High Power Products

Fast Soft Recovery  
Rectifier Diode, 60 A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	60 A, $T_J = 25\text{ }^\circ\text{C}$		1.3	V
Forward slope resistance	$r_t$	$T_J = 150\text{ }^\circ\text{C}$		5.0	$\text{m}\Omega$
Threshold voltage	$V_{F(TO)}$			0.88	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		5.0	

RECOVERY CHARACTERISTICS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Reverse recovery time	$t_{rr}$	$I_F$ at 60 Apk	180	ns	
Reverse recovery current	$I_{rr}$	25 A/ $\mu\text{s}$	3.4	A	
Reverse recovery charge	$Q_{rr}$	25 $^\circ\text{C}$	0.5	$\mu\text{C}$	
Snap factor	S	Typical	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	0.4	$^\circ\text{C/W}$
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 modified (JEDEC)	60EPF02, 60CPF02	
			60EPF04, 60CPF04	
			60EPF06, 60CPF06	



# 60EPF../60CPF.. Soft Recovery Series

Fast Soft Recovery Rectifier Diode, 60 A

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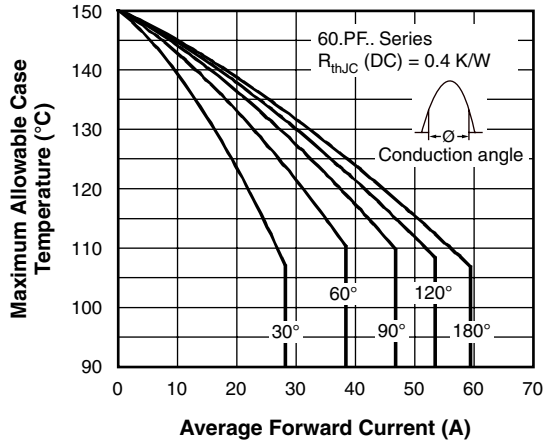


Fig. 1 - Current Rating Characteristics

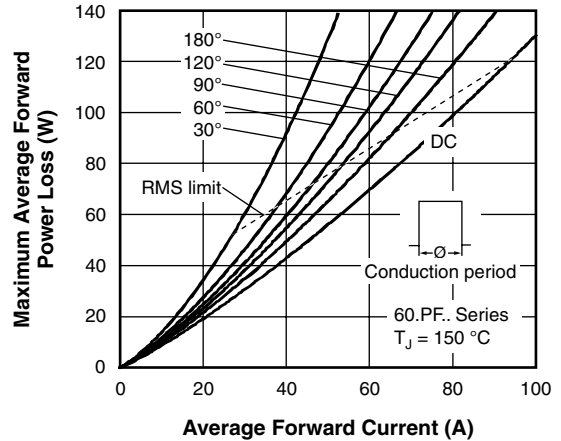


Fig. 4 - Forward Power Loss Characteristics

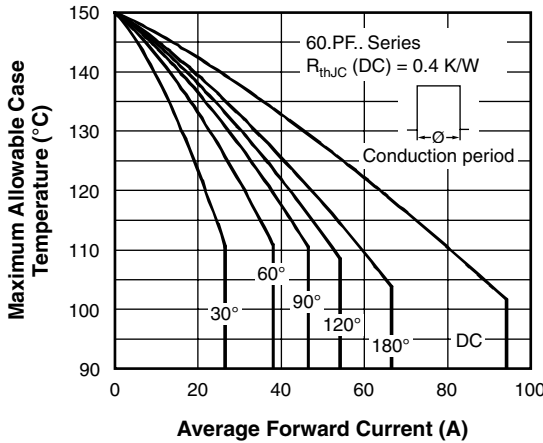


Fig. 2 - Current Rating Characteristics

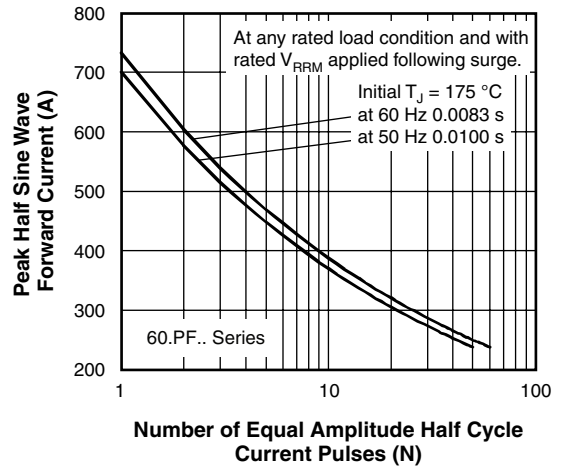


Fig. 5 - Maximum Non-Repetitive Surge Current

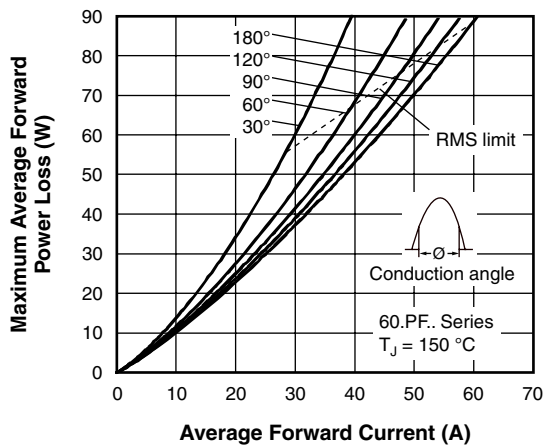


Fig. 3 - Forward Power Loss Characteristics

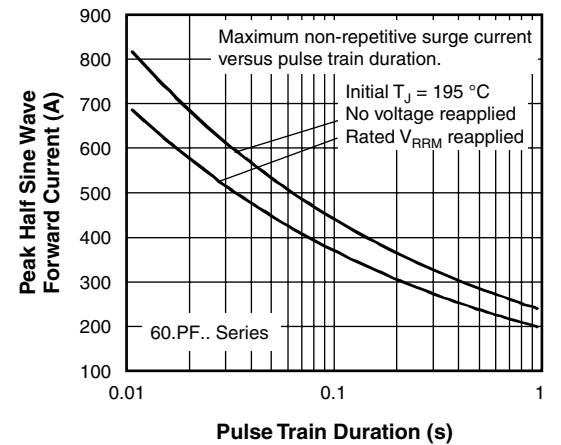


Fig. 6 - Maximum Non-Repetitive Surge Current

# 60EPF../60CPF.. Soft Recovery Series



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Fast Soft Recovery Rectifier Diode, 60 A

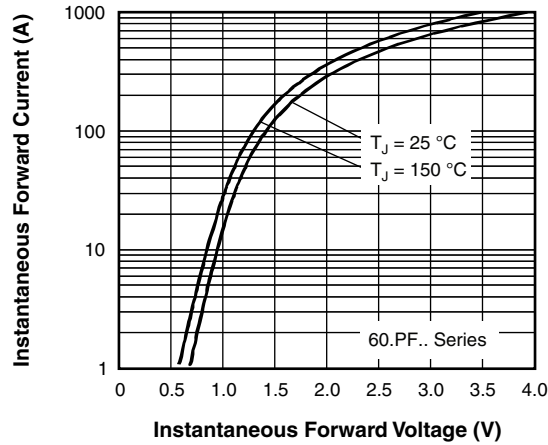


Fig. 7 - Forward Voltage Drop Characteristics

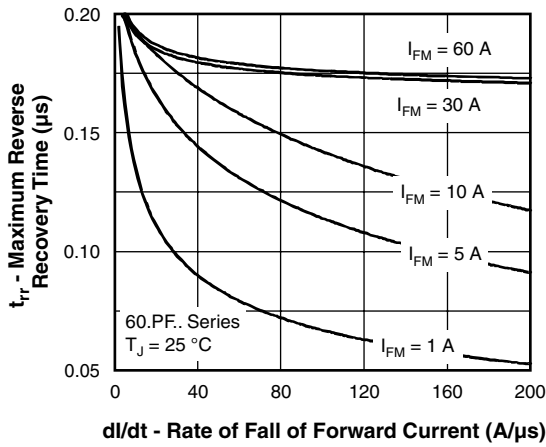


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

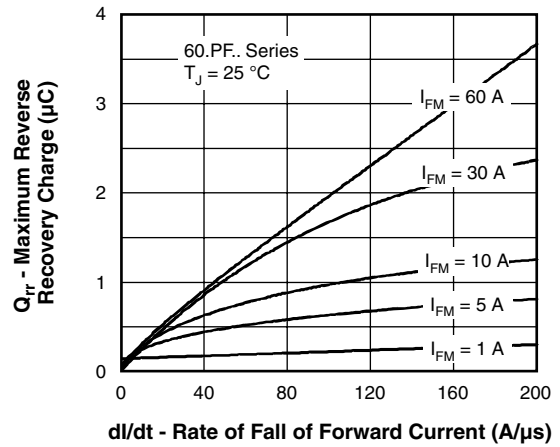


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

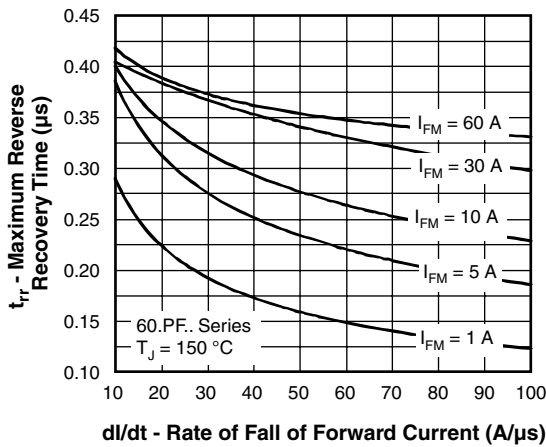


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

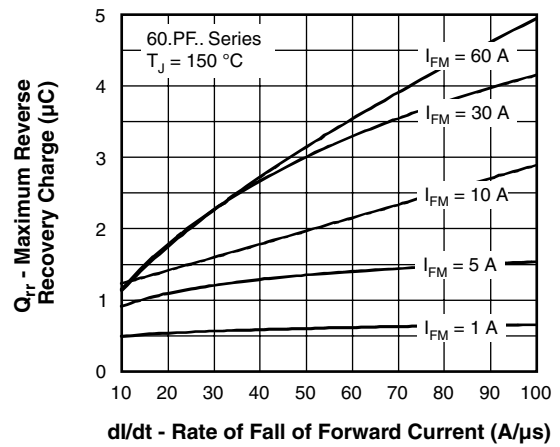


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ }^\circ\text{C}$



# 60EPF../60CPF.. Soft Recovery Series

Fast Soft Recovery  
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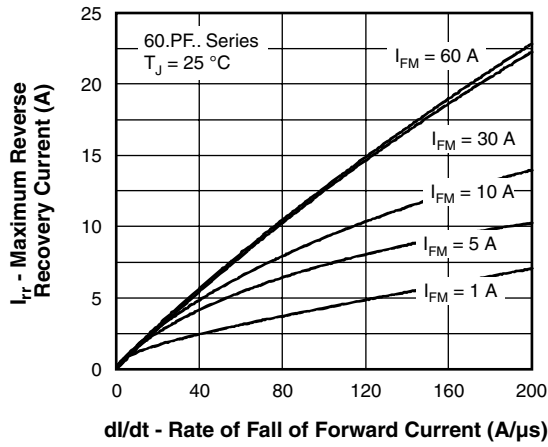


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

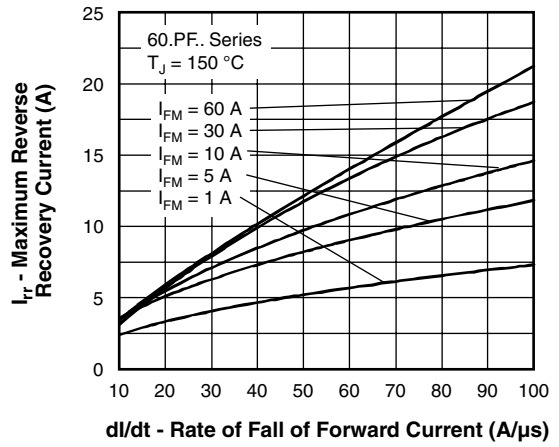


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

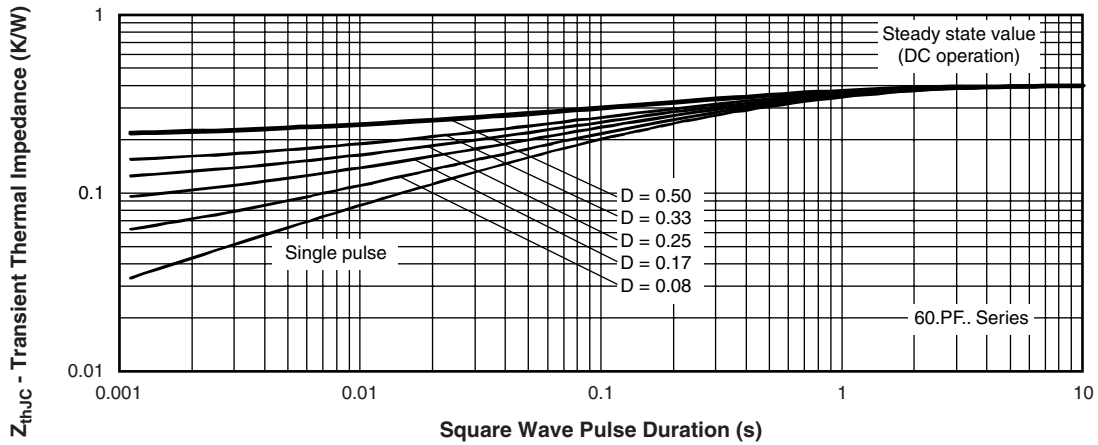


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

# 60EPF../60CPF.. Soft Recovery Series

Vishay High Power Products

Fast Soft Recovery  
Rectifier Diode, 60 A



## ORDERING INFORMATION TABLE

Device code	60	E	P	F	06	-
	①	②	③	④	⑤	⑥
<b>1</b>	- Current rating (60 = 60 A)					
<b>2</b>	- Circuit configuration: E = Single diode C = Single diode, 3 pins					
<b>3</b>	- Package: P = TO-247AC modified					
<b>4</b>	- Type of silicon: F = Fast recovery					
<b>5</b>	- Voltage code x 100 = $V_{RRM}$					
<b>6</b>	- • None = Standard production • PbF = Lead (Pb)-free					

02 = 200 V  
 04 = 400 V  
 06 = 600 V

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95001">http://www.vishay.com/doc?95001</a>
Part marking information	<a href="http://www.vishay.com/doc?95006">http://www.vishay.com/doc?95006</a>
SPIICE model	<a href="http://www.vishay.com/doc?95275">http://www.vishay.com/doc?95275</a>



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