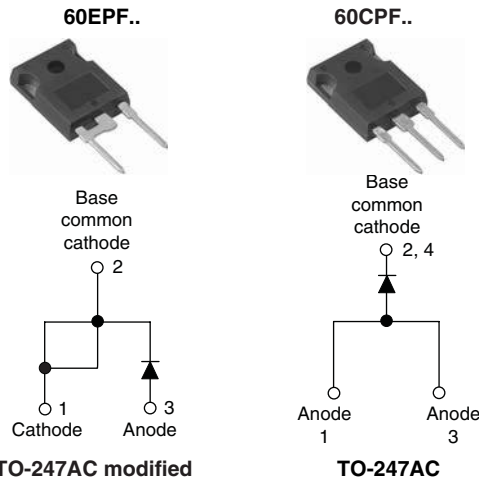




# THE DATASHEET OF 60CPF12



## Fast Soft Recovery Rectifier Diode, 60 A



### FEATURES/DESCRIPTION

The 60EPF..PbF and 60CPF..PbF fast soft recovery rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.



RoHS\*  
COMPLIANT

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 and lead (Pb)-free.

### 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	< 1.2 V
$t_{rr}$	95 ns
$V_{RRM}$	1000/1200 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$V_{RRM}$		1000/1200	V
$I_{F(AV)}$	Sinusoidal waveform	60	A
$I_{FSM}$		700	
$t_{rr}$	1 A, - 100 A/ $\mu$ s	95	ns
$V_F$	30 A, $T_J = 25^\circ\text{C}$	1.2	V
$T_J$	Range	- 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
60EPF10PbF, 60CPF10PbF	1000	1100	8
60EPF12PbF, 60CPF12PbF	1200	1300	

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 103^\circ\text{C}$ , 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	$\text{A}^2\sqrt{\text{s}}$

\* Pb containing terminations are not RoHS compliant, exemptions may apply

# 60EPF..PbF, 60CPF..PbF Soft Recovery Series

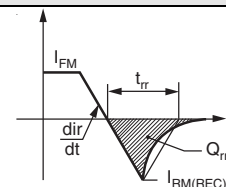


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Fast Soft Recovery  
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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	60 A, $T_J = 25\text{ }^\circ\text{C}$		1.4	V
Forward slope resistance	$r_t$	$T_J = 125\text{ }^\circ\text{C}$		4.6	$\text{m}\Omega$
Threshold voltage	$V_{F(TO)}$			0.9	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		8	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	$t_{rr}$	$I_F$ at 60 Apk 25 A/ $\mu\text{s}$ 25 $^\circ\text{C}$	480	ns
Reverse recovery current	$I_{rr}$		8	A
Reverse recovery charge	$Q_{rr}$		2.7	$\mu\text{C}$
Snap factor	S		0.6	



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)	60EPF10	
			60EPF12	
		Case style TO-247AC	60CPF10	
			60CPF12	



# 60EPF..PbF, 60CPF..PbF Soft Recovery Series

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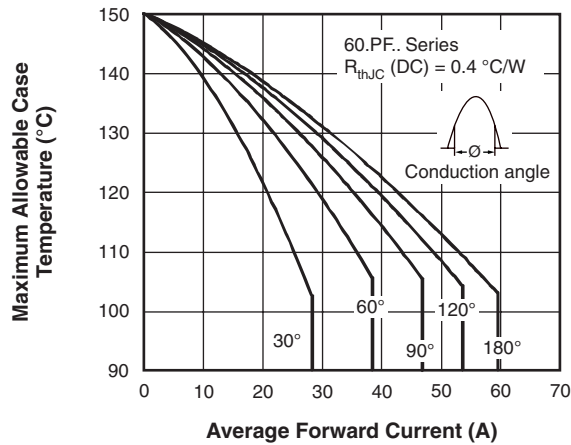


Fig. 1 - Current Rating Characteristics

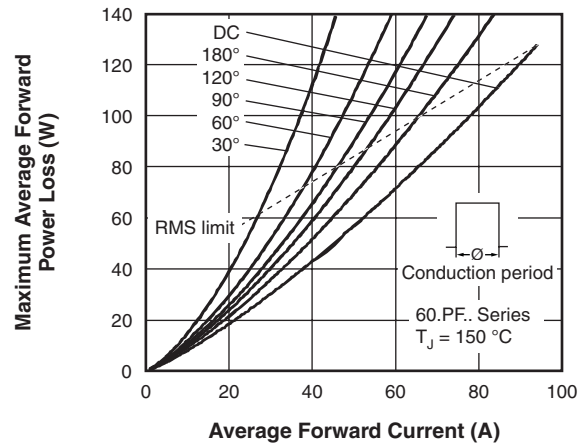


Fig. 4 - Forward Power Loss Characteristics

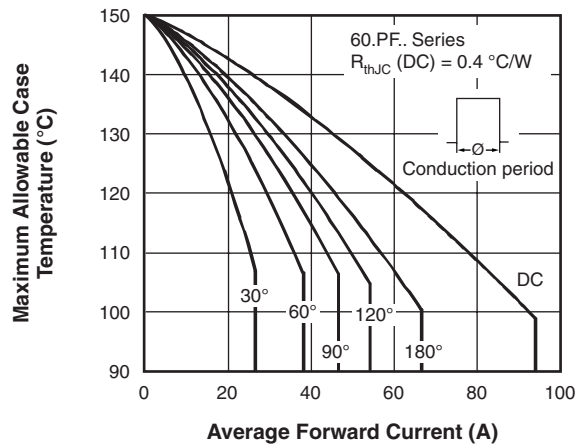


Fig. 2 - Current Rating Characteristics

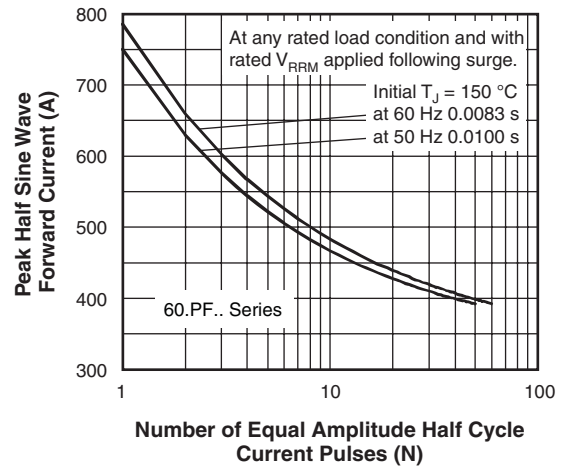


Fig. 5 - Maximum Non-Repetitive Surge Current

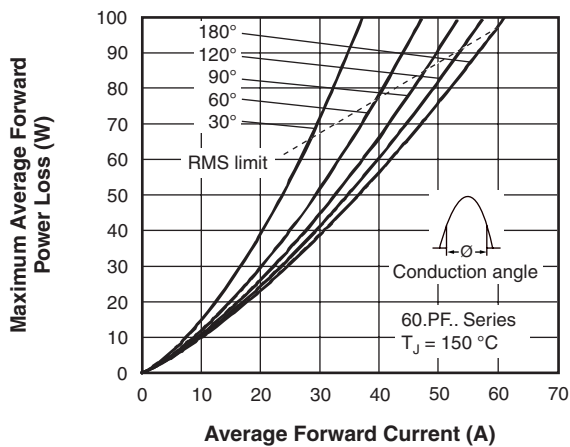


Fig. 3 - Forward Power Loss Characteristics

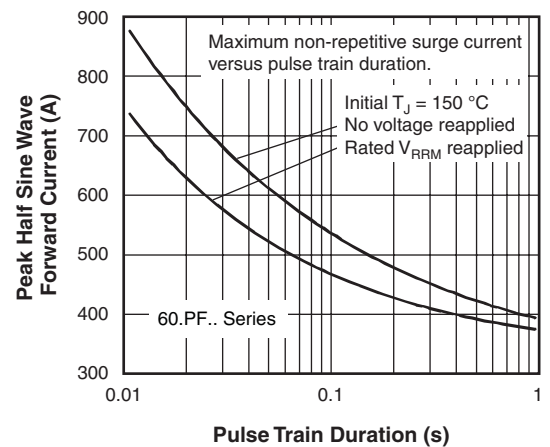


Fig. 6 - Maximum Non-Repetitive Surge Current

# 60EPF..PbF, 60CPF..PbF Soft Recovery Series



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Fast Soft Recovery Rectifier Diode, 60 A

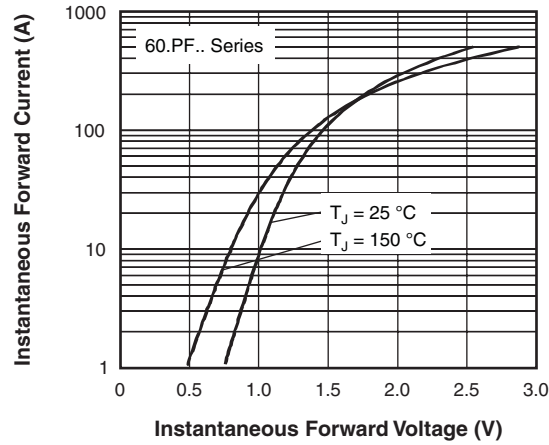


Fig. 7 - Forward Voltage Drop Characteristics

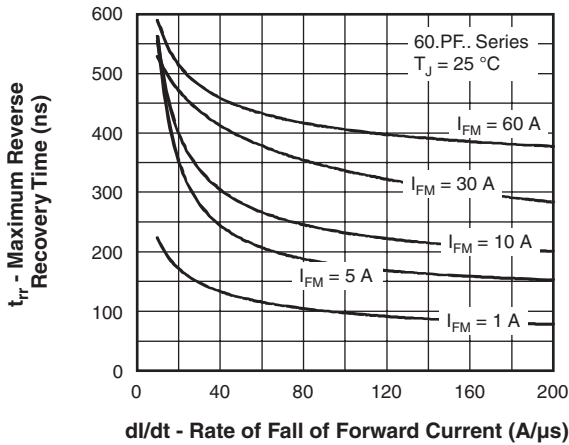


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ °C}$

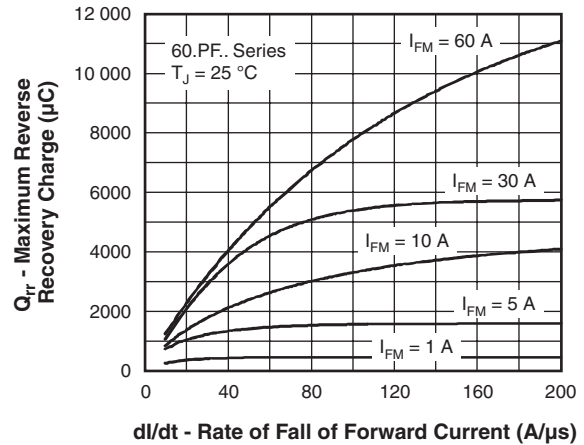


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ °C}$

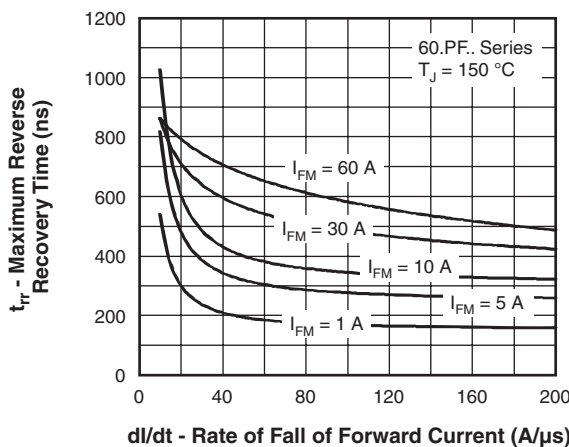


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ °C}$

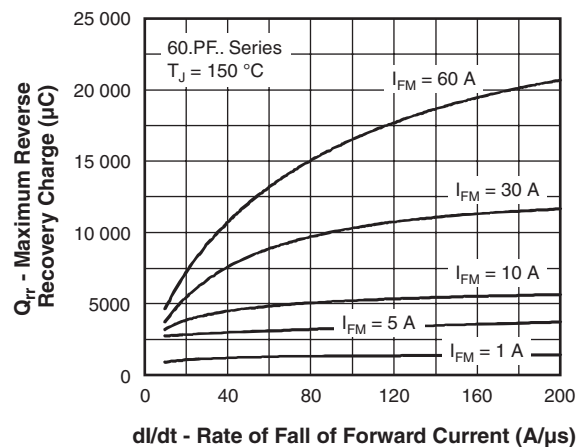


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ °C}$



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Fast Soft Recovery  
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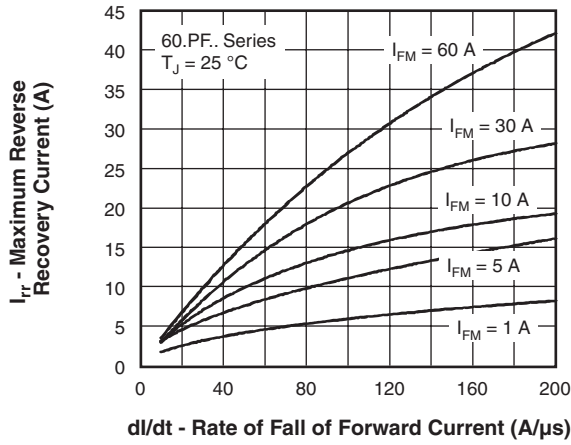


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

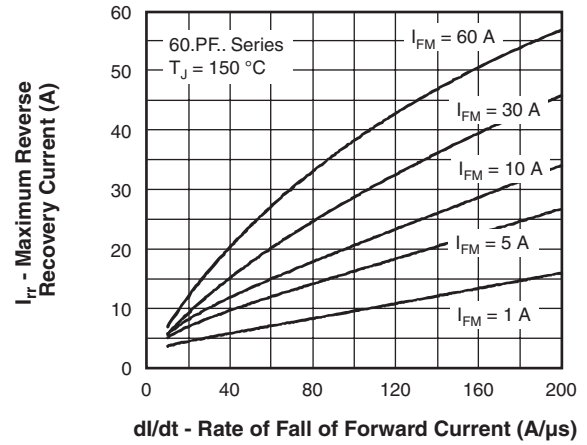


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

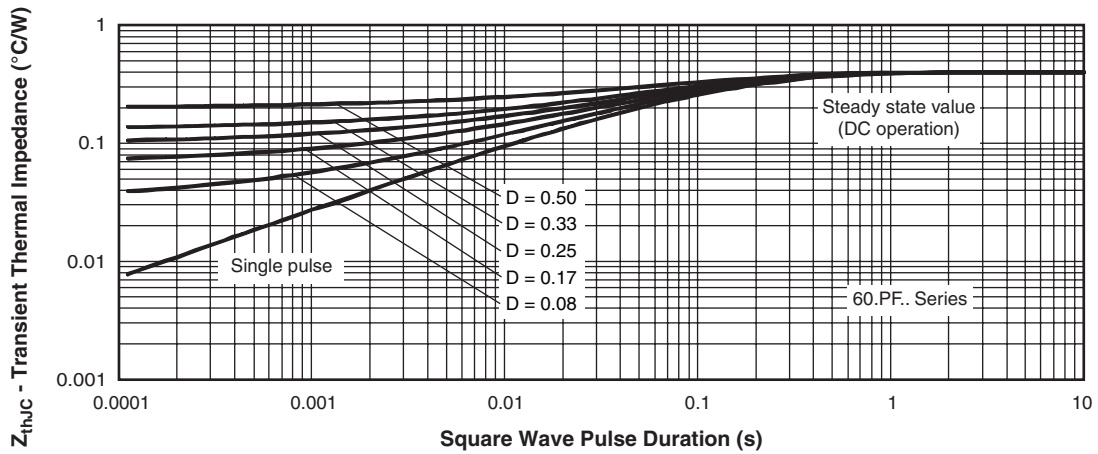


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

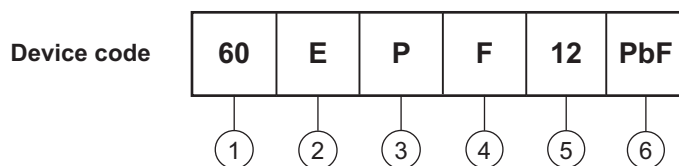
# 60EPF..PbF, 60CPF..PbF Soft Recovery Series



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Fast Soft Recovery  
Rectifier Diode, 60 A

## ORDERING INFORMATION TABLE



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

10 = 1000 V 12 = 1200 V
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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>



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