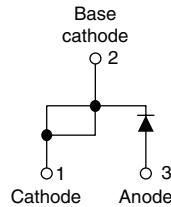


## Fast Soft Recovery Rectifier Diode, 40 A



TO-247AC modified



### FEATURES/DESCRIPTION

The 40EPF..PbF 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.

Compliant to RoHS directive 2002/95/EC.



**RoHS\***  
COMPLIANT

### PRODUCT SUMMARY

$V_F$ at 10 A	< 1 V
$t_{rr}$	60 ns
$V_{RRM}$	200 V to 600 V

### APPLICATIONS

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

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Sinusoidal waveform	40	A
$V_{RRM}$		200 to 600	V
$I_{FSM}$		475	A
$V_F$	10 A, $T_J = 25^\circ\text{C}$	1	V
$t_{rr}$	1 A, - 100 A/ $\mu\text{s}$	60	ns
$T_J$		- 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
40EPF02PbF	200	300	7
40EPF04PbF	400	500	
40EPF06PbF	600	700	

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 105^\circ\text{C}$ , 180 $^\circ$ conduction half sine wave	40	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	400	
		10 ms sine pulse, no voltage reapplied	475	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied	800	$\text{A}^2\text{s}$
		10 ms sine pulse, no voltage reapplied	1131	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ ms to 10 ms, no voltage reapplied	11 310	$\text{A}^2\sqrt{\text{s}}$

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

# 40EPF..PbF Soft Recovery Series



Vishay High Power Products

Fast Soft Recovery  
Rectifier Diode, 40 A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	40 A, $T_J = 25\text{ }^\circ\text{C}$		1.25	V
Forward slope resistance	$r_t$	$T_J = 125\text{ }^\circ\text{C}$		4.4	$\text{m}\Omega$
Threshold voltage	$V_{F(TO)}$			1.1	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		7.0	

RECOVERY CHARACTERISTICS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Reverse recovery time	$t_{rr}$	$I_F$ at 40 Apk	180	ns	
Reverse recovery current	$I_{rr}$	25 A/ $\mu\text{s}$	3.2	A	
Reverse recovery charge	$Q_{rr}$	25 $^\circ\text{C}$	0.5	$\mu\text{C}$	
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	0.6	$^\circ\text{C}/\text{W}$
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)	40EPF06	

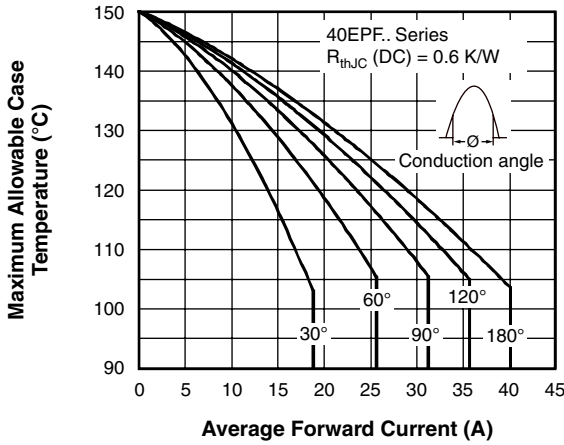


Fig. 1 - Current Rating Characteristics

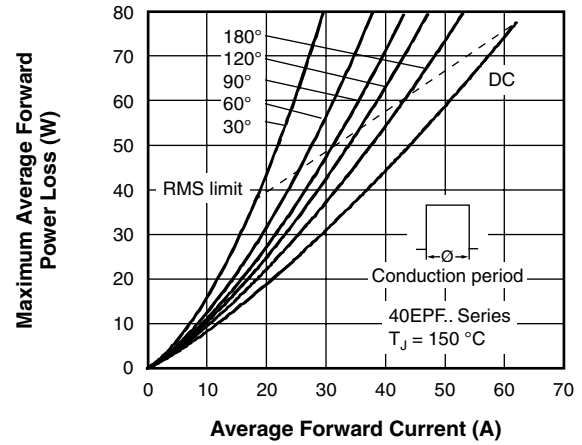


Fig. 4 - Forward Power Loss Characteristics

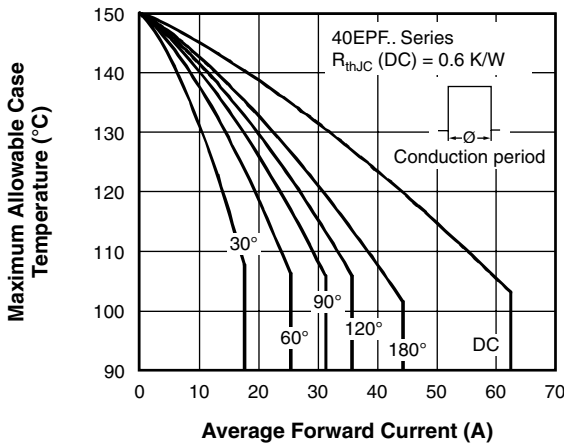


Fig. 2 - Current Rating Characteristics

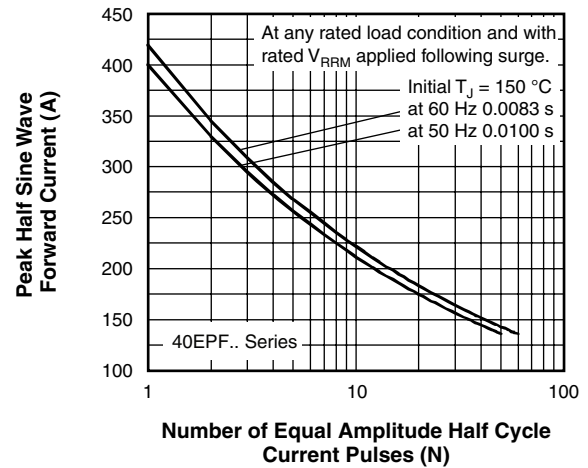


Fig. 5 - Maximum Non-Repetitive Surge Current

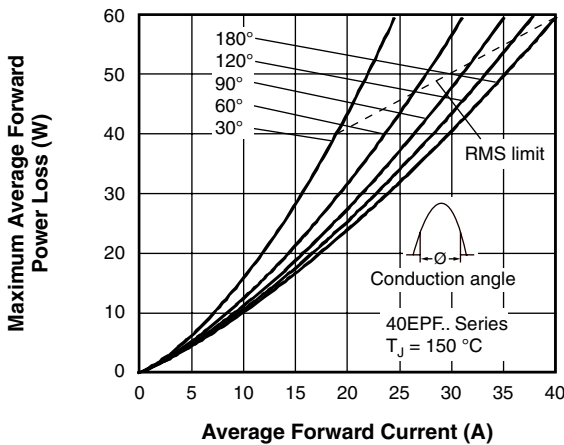


Fig. 3 - Forward Power Loss Characteristics

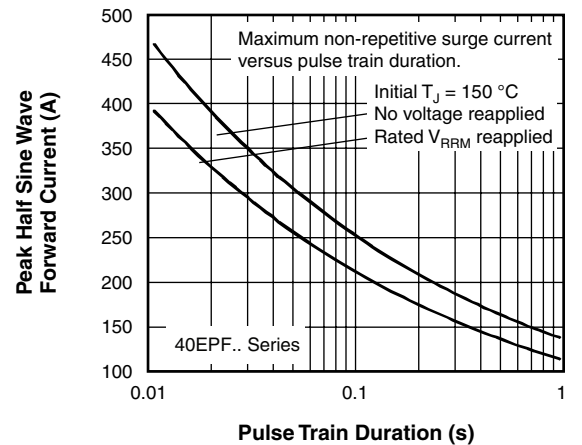


Fig. 6 - Maximum Non-Repetitive Surge Current

# 40EPF..PbF Soft Recovery Series



Vishay High Power Products

Fast Soft Recovery Rectifier Diode, 40 A

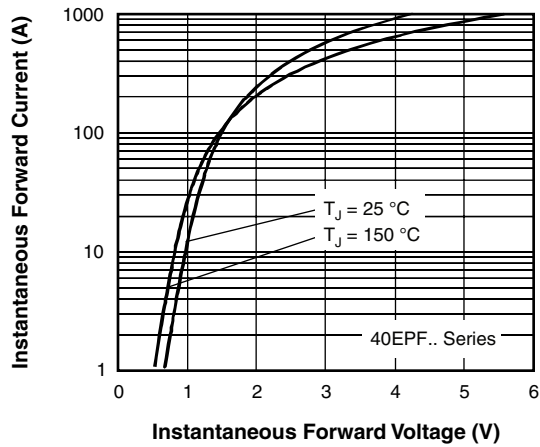


Fig. 7 - Forward Voltage Drop Characteristics

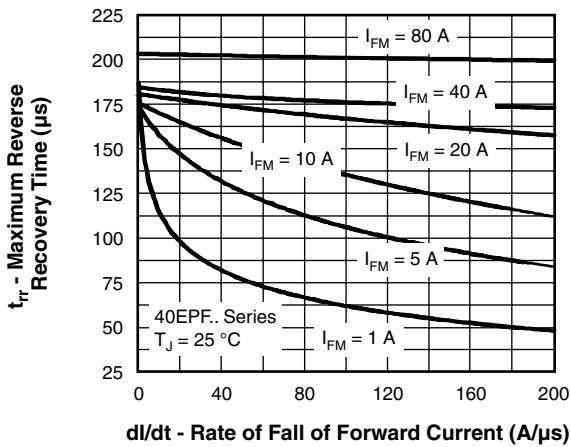


Fig. 8 - Recovery Time Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

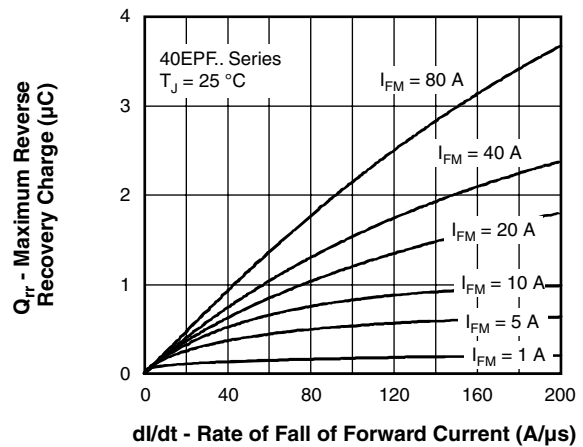


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

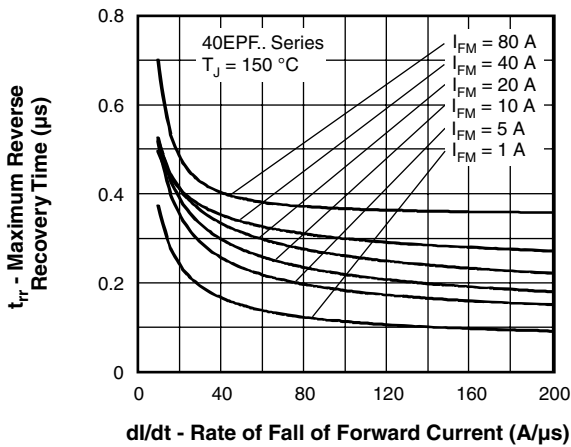


Fig. 9 - Recovery Time Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

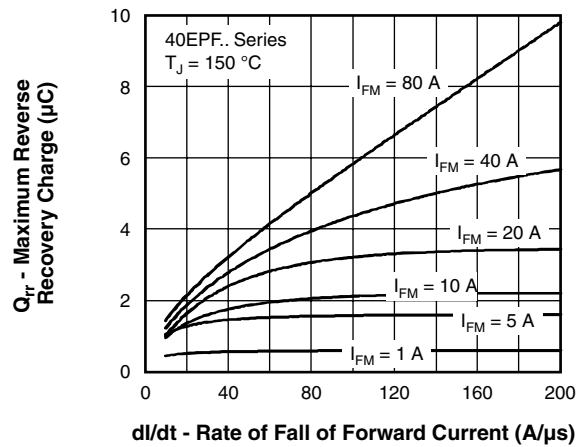


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150\text{ }^\circ\text{C}$



# 40EPF..PbF Soft Recovery Series

Fast Soft Recovery  
Rectifier Diode, 40 A

Vishay High Power Products

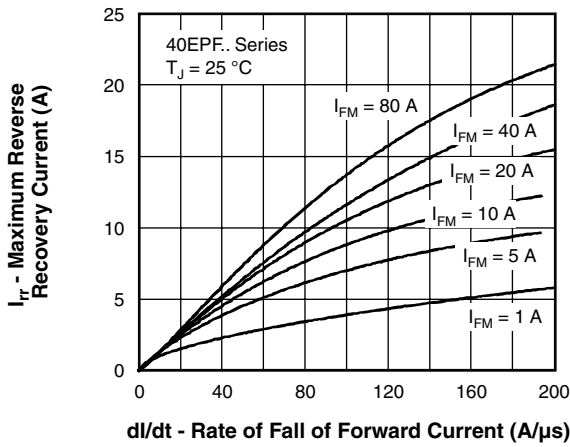


Fig. 12 - Recovery Current Characteristics,  $T_J = 25\text{ }^\circ\text{C}$

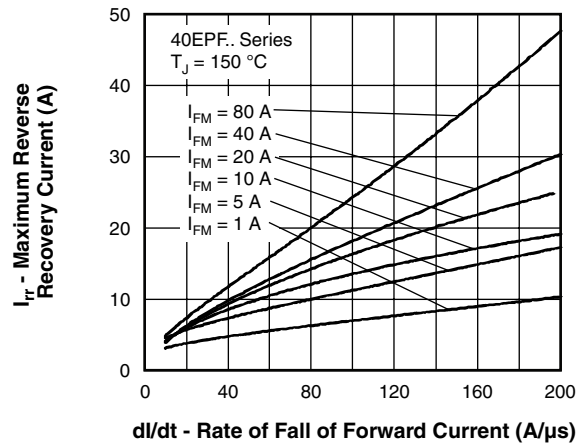


Fig. 13 - Recovery Current Characteristics,  $T_J = 150\text{ }^\circ\text{C}$

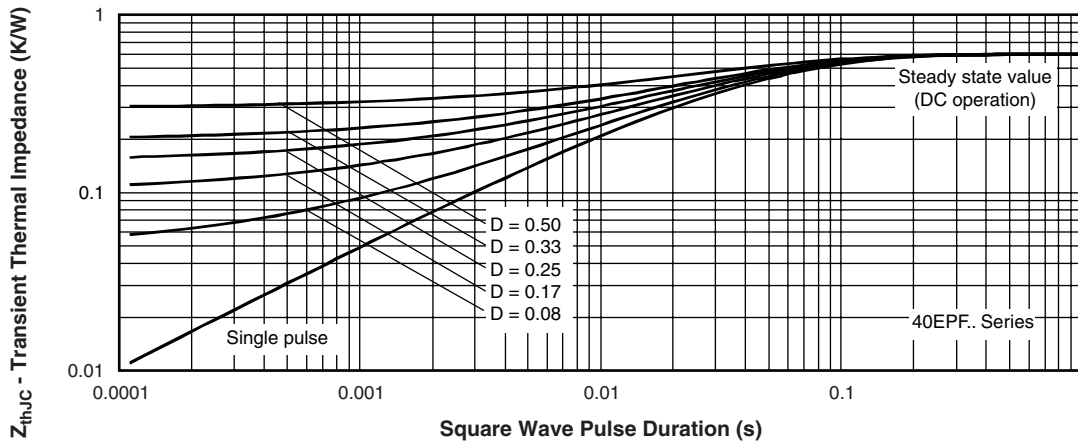


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

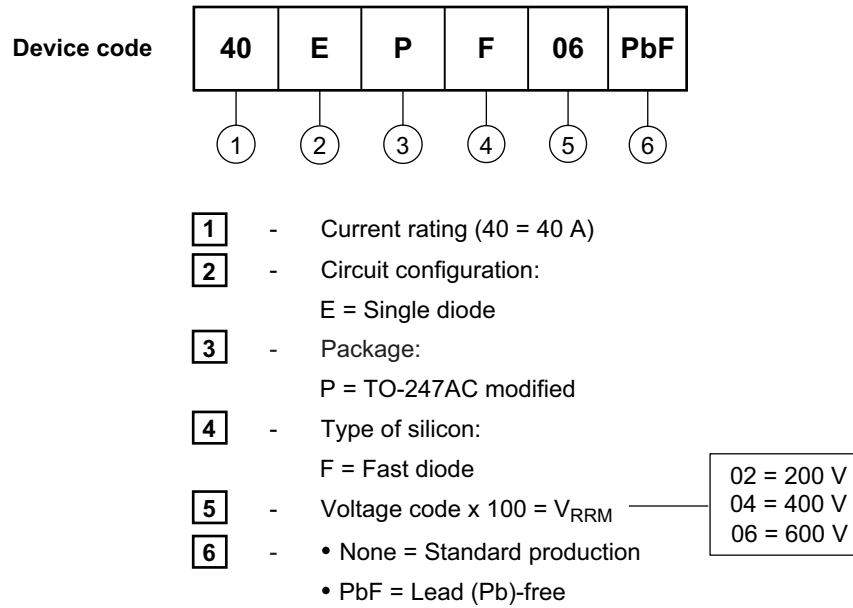
# 40EPF..PbF Soft Recovery Series



Vishay High Power Products

Fast Soft Recovery  
Rectifier Diode, 40 A

## ORDERING INFORMATION TABLE



### LINKS TO RELATED DOCUMENTS

Dimensions	<a href="http://www.vishay.com/doc?95253">www.vishay.com/doc?95253</a>
Part marking information	<a href="http://www.vishay.com/doc?95255">www.vishay.com/doc?95255</a>
SPICE model	<a href="http://www.vishay.com/doc?95274">www.vishay.com/doc?95274</a>



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