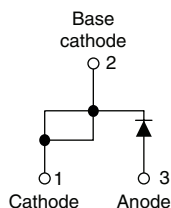


Fast Soft Recovery Rectifier Diode, 40 A



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/ μs	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° 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	A^2s
		10 ms sine pulse, no voltage reapplied	1131	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to } 10\text{ ms}$, 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 25 A/ μs 25 $^{\circ}\text{C}$	180	ns	
Reverse recovery current	I_{rr}		3.2	A	
Reverse recovery charge	Q_{rr}		0.5	μC	
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	°C
Maximum thermal resistance, junction to case	R _{thJC}	DC operation	0.6	°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)	40EPF06	

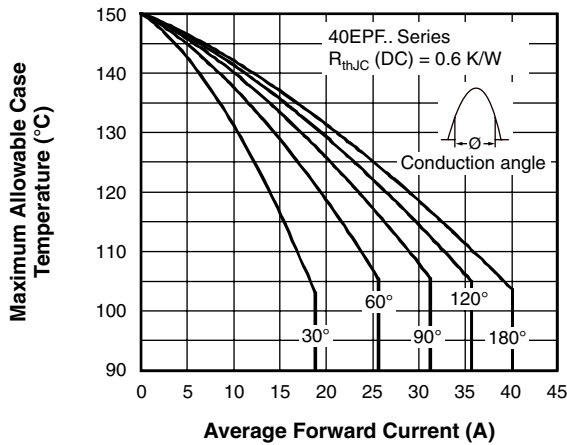


Fig. 1 - Current Rating Characteristics

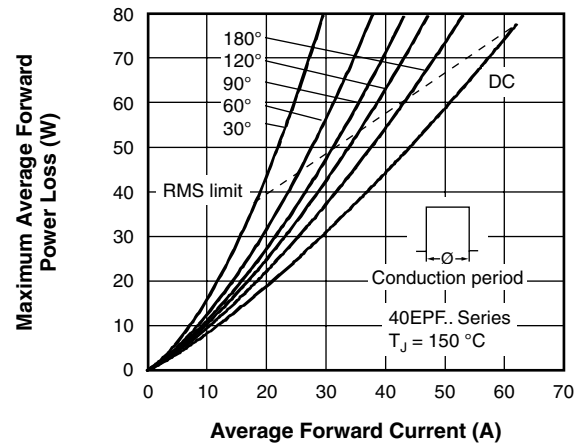


Fig. 4 - Forward Power Loss Characteristics

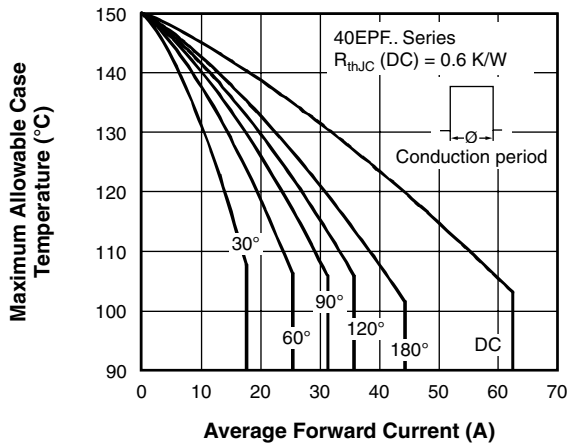


Fig. 2 - Current Rating Characteristics

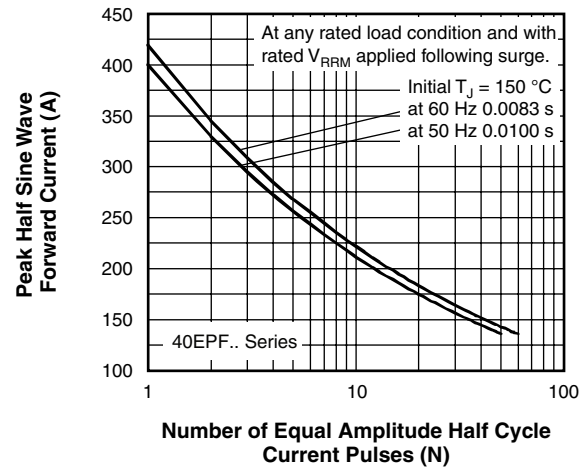


Fig. 5 - Maximum Non-Repetitive Surge Current

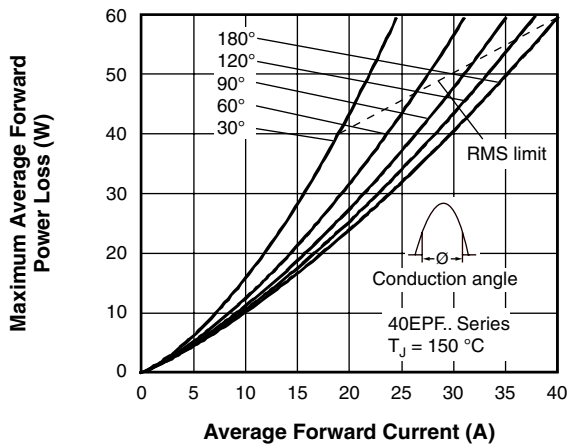


Fig. 3 - Forward Power Loss Characteristics

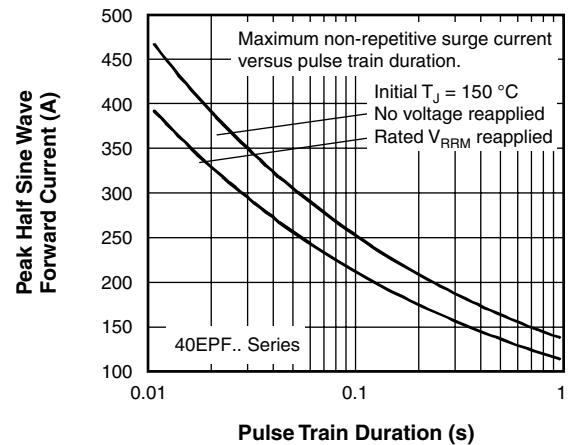


Fig. 6 - Maximum Non-Repetitive Surge Current

40EPF..PbF Soft Recovery Series

Vishay High Power Products

Fast Soft Recovery
Rectifier Diode, 40 A

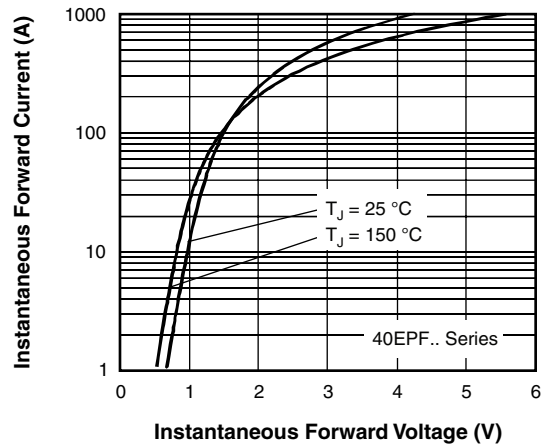


Fig. 7 - Forward Voltage Drop Characteristics

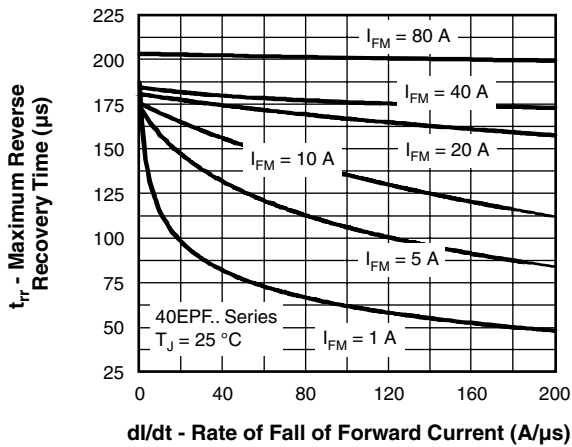


Fig. 8 - Recovery Time Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

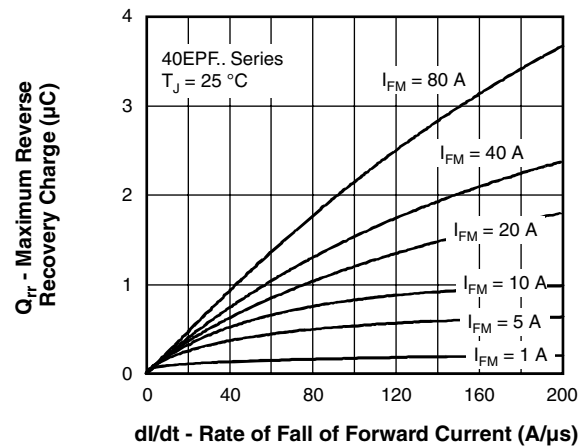


Fig. 10 - Recovery Charge Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

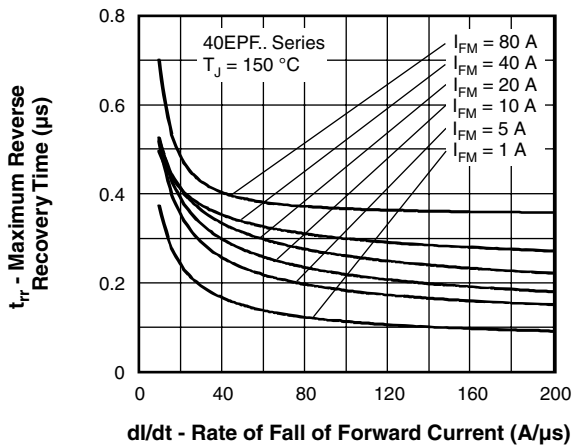


Fig. 9 - Recovery Time Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

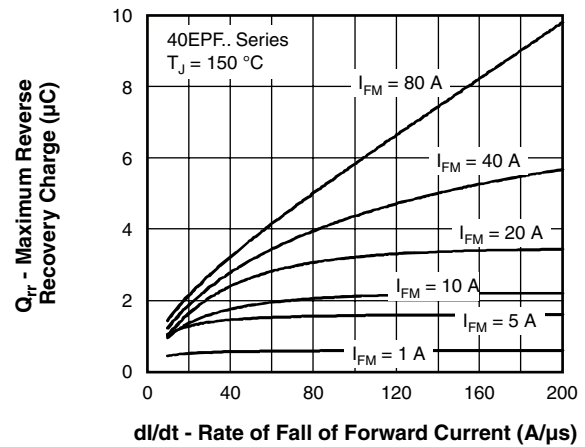


Fig. 11 - Recovery Charge Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

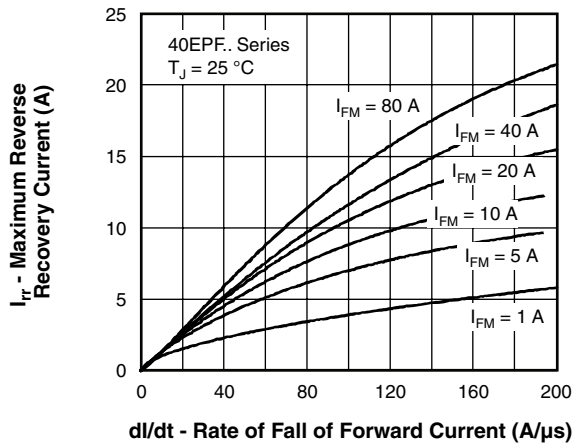


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ C$

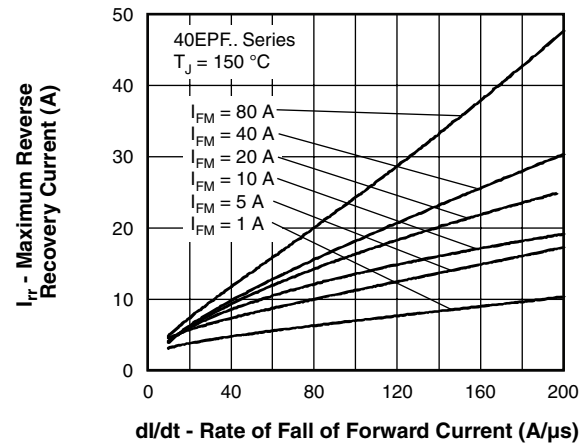


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ C$

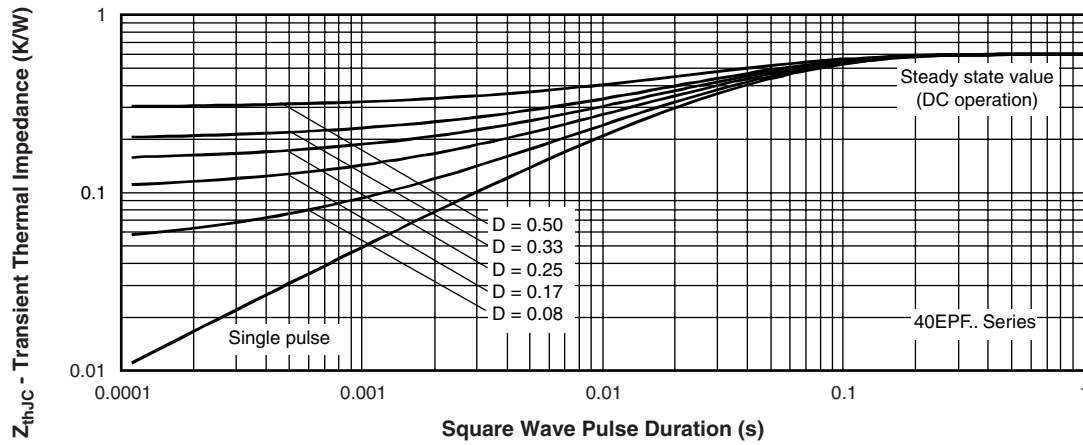


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

40EPF..PbF Soft Recovery Series



Vishay High Power Products

Fast Soft Recovery
Rectifier Diode, 40 A

ORDERING INFORMATION TABLE

Device code	40	E	P	F	06	PbF
	1	2	3	4	5	6
1	- Current rating (40 = 40 A)					
2	- Circuit configuration: E = Single diode					
3	- Package: P = TO-247AC modified					
4	- Type of silicon: F = Fast diode					
5	- Voltage code x 100 = V_{RRM}					
6	- • None = Standard production • PbF = Lead (Pb)-free					

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

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95253
Part marking information	www.vishay.com/doc?95255
SPICE model	www.vishay.com/doc?95274



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