Fast Soft Recovery Rectifier Diode, 40 A



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PRIMARY CHARACTERISTICS				
I _{F(AV)}	40 A			
V _R	200 V, 400 V, 600 V			
V _F at I _F	1.25 V			
I _{FSM}	475 A			
t _{rr}	60 ns			
T _J max.	150 °C			
Package	TO-247AC 2L			
Circuit configuration	Single			
Snap factor	0.5			

FEATURES

- Glass passivated pellet chip junction
- 150 °C max. operating junction temperature
- Low forward voltage drop and short reverse recovery time
- Designed and qualified according to JEDEC[®]-JESD 47



 Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

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-40EPF006-M3 and VS-40APF006-M3 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.

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 °C	1	V			
t _{rr}	1 A, - 100 A/µs	60	ns			
TJ		-40 to +150	°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 °C mA
VS-40EPF02-M3	200	300	
VS-40EPF04-M3	400	500	8
VS-40EPF06-M3	600	700	

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS		
Maximum average forward current	I _{F(AV)}	$T_C = 105 \ ^{\circ}C$, 180° conduction half sine wave	40			
Maximum peak one cycle	1	10 ms sine pulse, rated V _{RRM} applied	400	А		
non-repetitive surge current		10 ms sine pulse, no voltage reapplied	475			
Maximum I ² t for fusing I ² t		10 ms sine pulse, rated V _{RRM} applied	800	- A ² s		
		10 ms sine pulse, no voltage reapplied	1131			
Maximum I ² \sqrt{t} for fusing	l²√t	t = 0.1 ms to 10 ms, no voltage reapplied	11 310	A²√s		

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VS-40EPF0.-M3 Series



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ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	V _{FM}	40 A, T _J = 25 °C		1.25	V	
Forward slope resistance	r _t	T.I = 150 °C		4.4	mΩ	
Threshold voltage	V _{F(TO)}	1j = 150 C		1.1	V	
Maximum reverse leakage current	1	T _J = 25 °C	$V_{B} = Rated V_{BBM}$	0.1	mA	
Maximum reverse leakage current	IRM	T _J = 150 °C	VR - naieu VRRM	8.0	IIIA	

RECOVERY CHARACTERISTICS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	· •	
Reverse recovery time	t _{rr}	I _F at 40 A _{pk}	180	ns	I _{FM} t	
Reverse recovery current	I _{rr}	25 A/µs	3.2	А		
Reverse recovery charge	Q _{rr}	25 °C	0.5	μC		
Snap factor	S		0.5			

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum junction and temperature range	storage	T _J , T _{Stg}		-40 to +150	°C	
Maximum thermal resis junction to case	tance,	R _{thJC}	R _{thJC} DC operation			
Maximum thermal resistance, junction to ambient		R _{thJA}		40	°C/W	
Typical thermal resistar case to heatsink	ice,	R _{thCS}	Mounting surface, smooth and greased	0.2		
Approximate weight				6	g	
Approximate weight				0.21	oz.	
	minimum			6 (5)	kgf · cm	
Mounting torque maximum				12 (10)	(lbf · in)	
Marking device				40EPF02		
			Case style TO-247AC 2L	40EPF04		
				40EP	F06	



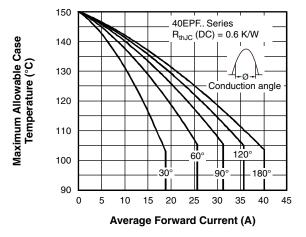


Fig. 1 - Current Rating Characteristics

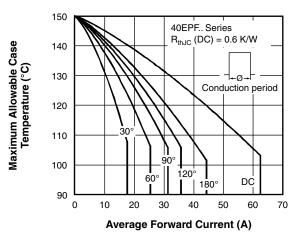


Fig. 2 - Current Rating Characteristics

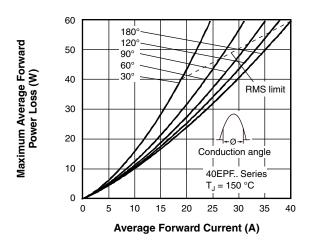


Fig. 3 - Forward Power Loss Characteristics

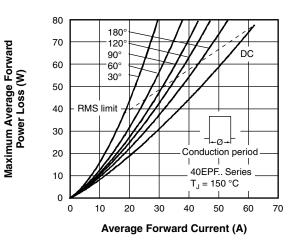


Fig. 4 - Forward Power Loss Characteristics

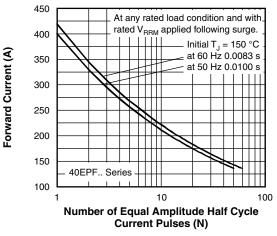


Fig. 5 - Maximum Non-Repetitive Surge Current

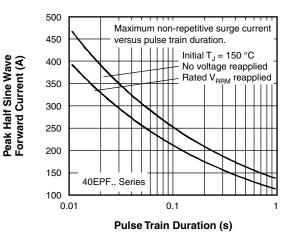


Fig. 6 - Maximum Non-Repetitive Surge Current

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Peak Half Sine Wave

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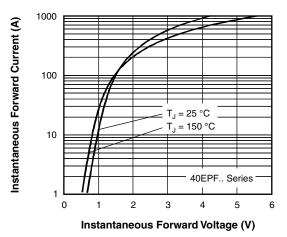


Fig. 7 - Forward Voltage Drop Characteristics

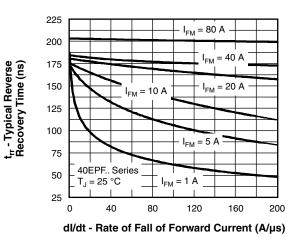


Fig. 8 - Recovery Time Characteristics, $T_J = 25 \ ^\circ C$

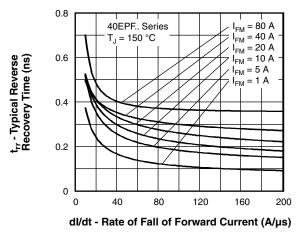


Fig. 9 - Recovery Time Characteristics, $T_J = 150 \ ^\circ C$

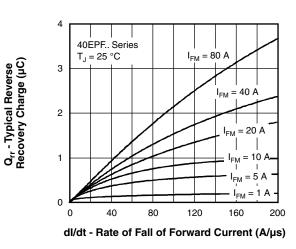


Fig. 10 - Recovery Charge Characteristics, $T_J = 25$ °C

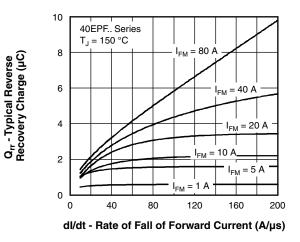


Fig. 11 - Recovery Charge Characteristics, $T_J = 150$ °C

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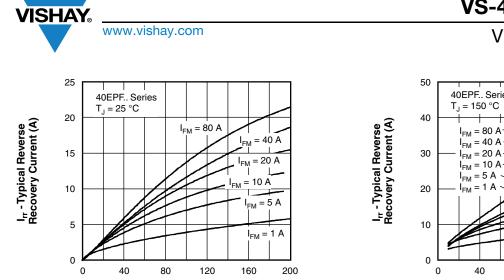
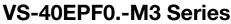




Fig. 12 - Recovery Current Characteristics, T_J = 25 °C



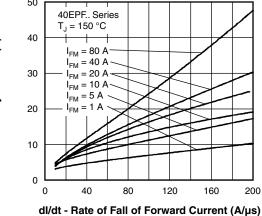


Fig. 13 - Recovery Current Characteristics, $T_J = 150$ °C

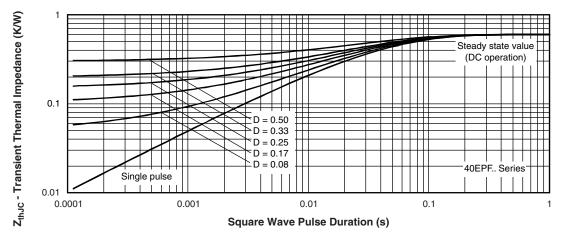
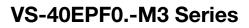


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics





ORDERING INFORMATION TABLE

Device code	VS-	40	Е	Р	F	06	-M3
		(2)	(3)	(4)	(5)	(6)	(7)
			\bigcirc	9	\bigcirc	\bigcirc	\mathbf{U}
	1.	- Visl	nay Sem	niconduc	ctors pro	duct	
	2		rent rati		•		
	3	- Circ	cuit conf	iguratior	n:		
		E =	single d	liode			
	4	- Pac	kage:				
		P =	TO-247	AC 2L			
	5 -	- Тур	e of silio	con:			
		F =	fast dio	de			02 =
	6	- Volt	tage coo	le x 100	= V _{RRM}		- 04 =
	7.	- Env	vironmer	ntal digit	:		06 =
		-M3	s = haloo	en-free	RoHS-	complia	ant and

-M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)						
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION			
VS-40EPF02-M3	25	500	Antistatic plastic tubes			
VS-40EPF04-M3	25	500	Antistatic plastic tubes			
VS-40EPF06-M3	25	500	Antistatic plastic tubes			

LINKS TO RELATED DOCUMENTS					
Dimensions	www.vishay.com/doc?96144				
Part marking information	www.vishay.com/doc?95648				
SPICE model	www.vishay.com/doc?95274				



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