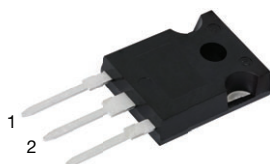
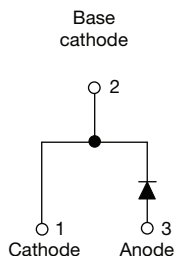
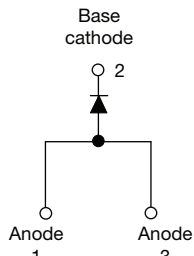


Fast Soft Recovery Rectifier Diode, 60 A


TO-247AC 2L

TO-247AC 3L

VS-60EPF1...

VS-60APF1...

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 www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
Available

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-65EPF12-M3 and VS-65APF12-M3 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.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	60 A
V_R	1000 V, 1200 V
V_F at I_F	1.4 V
I_{FSM}	830 A
t_{rr}	95 ns
T_J max.	150 °C
Package	TO-247AC 2L, TO-247AC 3L
Circuit configuration	Single
Snap factor	0.6

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}		1000 to 1200	V
$I_{F(AV)}$	Sinusoidal waveform	60	A
I_{FSM}		830	
t_{rr}	1 A, - 100 A/μs	95	ns
V_F	30 A, $T_J = 25$ °C	1.2	V
T_J	Range	-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-60EPF10-M3, VS-60APF10-M3	1000	1100	12
VS-60EPF12-M3, VS-60APF12-M3	1200	1300	

**ABSOLUTE MAXIMUM RATINGS**

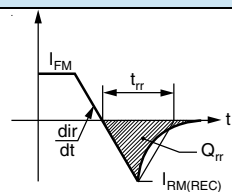
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 103\text{ }^{\circ}\text{C}$, 180° conduction half sine wave	60	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	10 ms sine pulse, rated V_{RRM} applied	700	
		10 ms sine pulse, no voltage reapplied	830	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	2450	A^2s
		10 ms sine pulse, no voltage reapplied	3460	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$, no voltage reapplied	34 600	$\text{A}^2\sqrt{\text{s}}$

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	$T_J = 150\text{ }^{\circ}\text{C}$	4.6	$\text{m}\Omega$
Threshold voltage	$V_{F(TO)}$		0.9	V
Maximum reverse leakage current	I_{RM}	$T_J = 25\text{ }^{\circ}\text{C}$	0.1	mA
		$T_J = 150\text{ }^{\circ}\text{C}$	12	

RECOVERY CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	t_{rr}	I_F at 60 A _{pk} 25 A/ μs 25 $^{\circ}\text{C}$	480	ns
Reverse recovery current	I_{rr}		8	A
Reverse recovery charge	Q_{rr}		2.7	μC
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)	$\text{kgf} \cdot \text{cm}$ ($\text{lbf} \cdot \text{in}$)
	maximum		12 (10)	
Marking device		Case style TO-247AC 2L	60EPF10	
			60EPF12	
		Case style TO-247AC 3L	60APF10	
			60APF12	

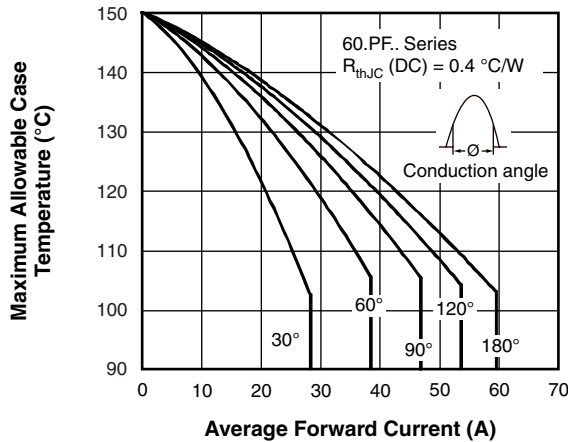


Fig. 1 - Current Rating Characteristics

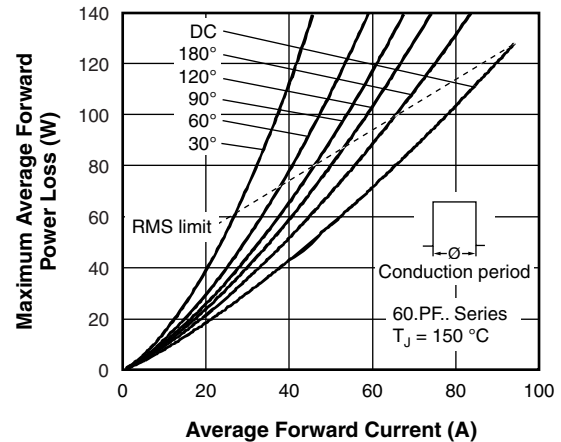


Fig. 4 - Forward Power Loss Characteristics

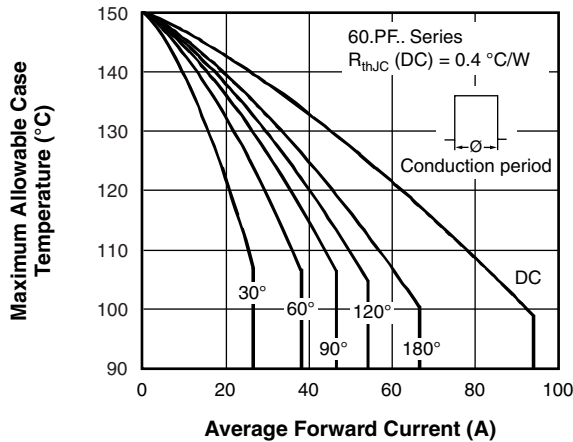


Fig. 2 - Current Rating Characteristics

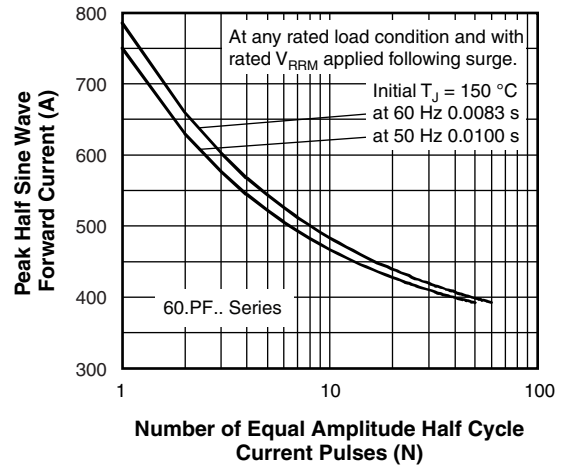


Fig. 5 - Maximum Non-Repetitive Surge Current

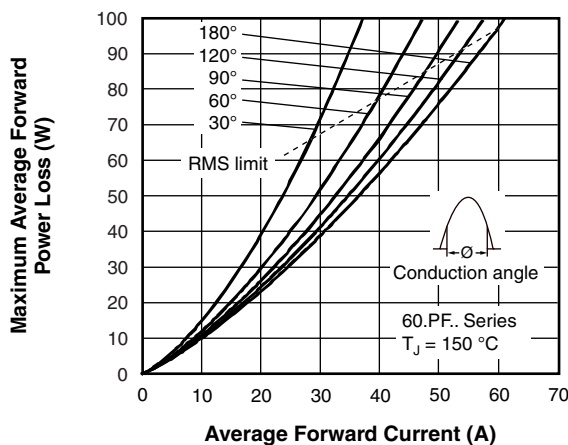


Fig. 3 - Forward Power Loss Characteristics

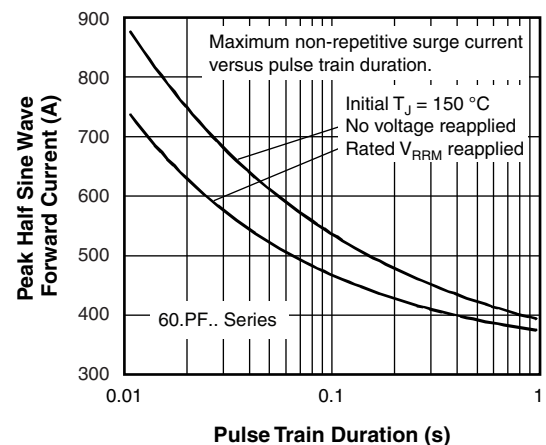


Fig. 6 - Maximum Non-Repetitive Surge Current

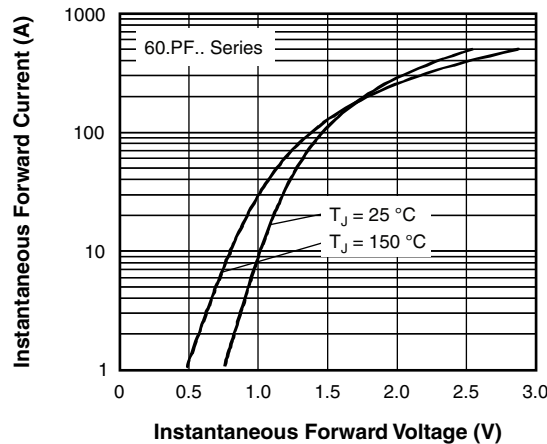
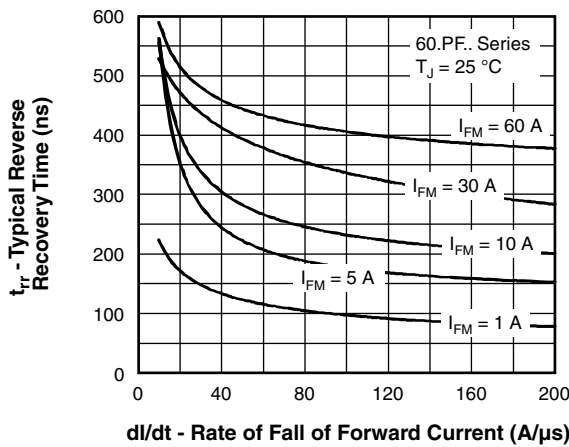
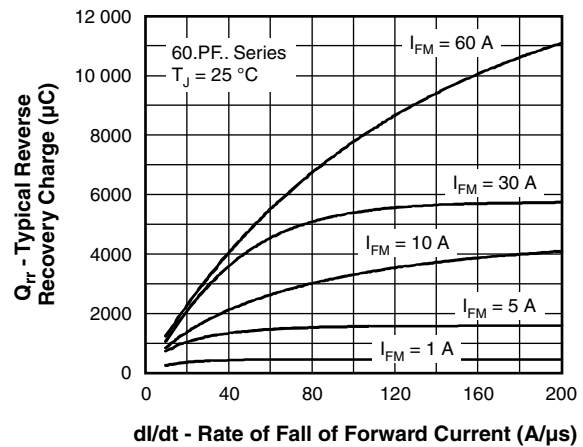
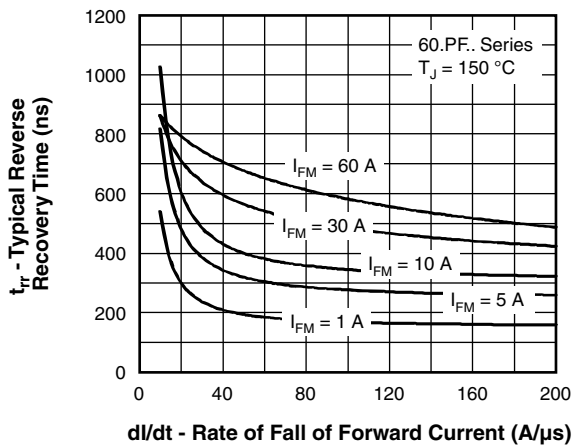
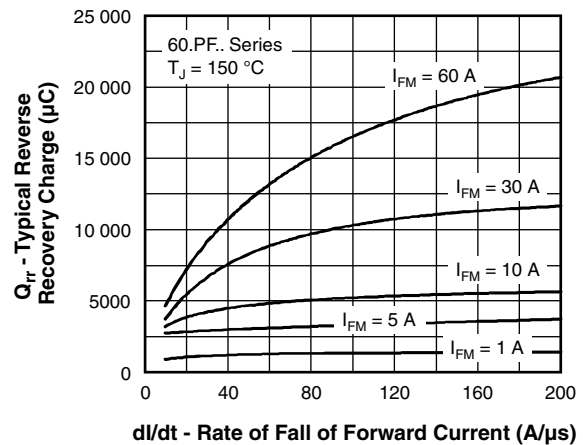
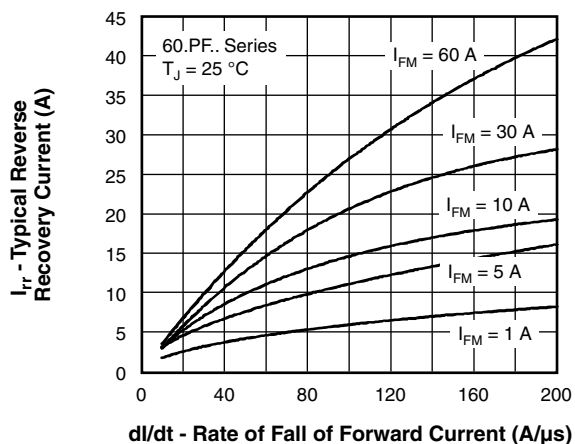
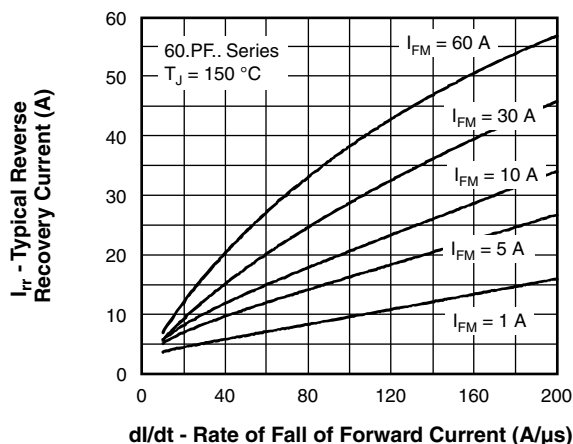
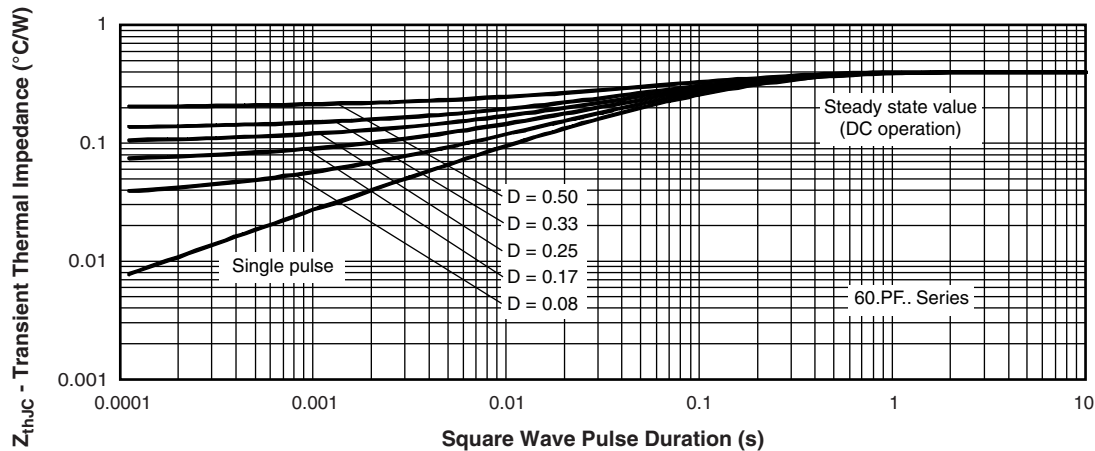


Fig. 7 - Forward Voltage Drop Characteristics


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, $T_J = 25\text{ }^{\circ}\text{C}$

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

Fig. 14 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

Device code	VS-	60	E	P	F	12	-M3
	1	2	3	4	5	6	7
1	- Vishay Semiconductors product						
2	- Current rating (60 = 60 A)						
3	- Circuit configuration: E = single diode, 2 pins A = single diode, 3 pins						
4	- Package: P = TO-247AC 3L /TO-247AC 2L						
5	- Type of silicon: F = fast recovery						
6	- Voltage code x 100 = V_{RRM} ——— 10 = 1000 V 12 = 1200 V						
7	- Environmental digit: -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-60EPF10-M3	25	500	Antistatic plastic tubes
VS-60APF10-M3	25	500	Antistatic plastic tubes
VS-60EPF12-M3	25	500	Antistatic plastic tubes
VS-60APF12-M3	25	500	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS

Dimensions	TO-247AC 2L	www.vishay.com/doc?96144
	TO-247AC 3L	www.vishay.com/doc?96138
Part marking information	TO-247AC 2L	www.vishay.com/doc?95648
	TO-247AC 3L	www.vishay.com/doc?95007



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