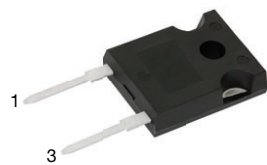
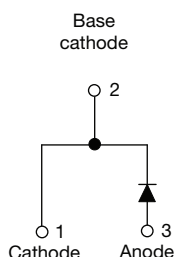
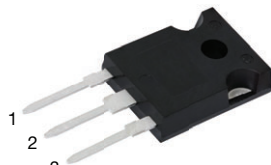
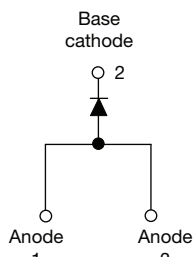


# Fast Soft Recovery Rectifier Diode, 30 A


**TO-247AC 2L**

**VS-30EPF1...**

**TO-247AC 3L**

**VS-30APF1...**

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	30 A
$V_R$	1000 V, 1200 V
$V_F$ at $I_F$	1.41 V
$I_{FSM}$	350 A
$t_{rr}$	95 ns
$T_J$ max.	150 °C
Package	TO-247AC 2L, TO-247AC 3L
Circuit configuration	Single
Snap factor	0.6

## 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](http://www.vishay.com/doc?99912)



## 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-35EPF12LHM3 and VS-35APF12LHM3 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	30	A
$V_{RRM}$		1000 to 1200	V
$I_{FSM}$		350	A
$V_F$	30 A, $T_J = 25\text{ °C}$	1.41	V
$t_{rr}$	1 A, 100 A/ $\mu$ s	95	ns
$T_J$		-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-30EPF10-M3, VS-30APF10-M3	1000	1100	6
VS-30EPF12-M3, VS-30APF12-M3	1200	1300	

**ABSOLUTE MAXIMUM RATINGS**

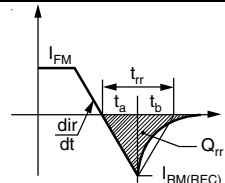
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 95\text{ }^{\circ}\text{C}$ , 180° conduction half sine wave	30	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	300	
		10 ms sine pulse, no voltage reapplied	350	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied	450	$\text{A}^2\text{s}$
		10 ms sine pulse, no voltage reapplied	636	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$ , no voltage reapplied	6360	$\text{A}^2\sqrt{\text{s}}$

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	30 A, $T_J = 25\text{ }^{\circ}\text{C}$		1.41	V
Forward slope resistance	$r_t$	$T_J = 150\text{ }^{\circ}\text{C}$		10.09	$\text{m}\Omega$
Threshold voltage	$V_{F(TO)}$			0.992	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^{\circ}\text{C}$		6	

**RECOVERY CHARACTERISTICS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	$t_{rr}$	$I_F$ at 30 A <sub>pk</sub> 25 A/ $\mu\text{s}$ 25 °C	450	ns
Reverse recovery current	$I_{rr}$		6.1	A
Reverse recovery charge	$Q_{rr}$		2.16	$\mu\text{C}$
Snap factor	S	Typical	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	0.8	$^{\circ}\text{C/W}$
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	30EPF10	
			30EPF12	
		Case style TO-247AC 3L	30APF10	
			30APF12	

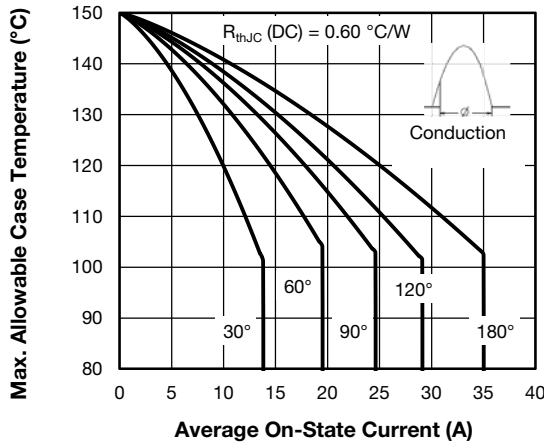


Fig. 1 - Current Rating Characteristics

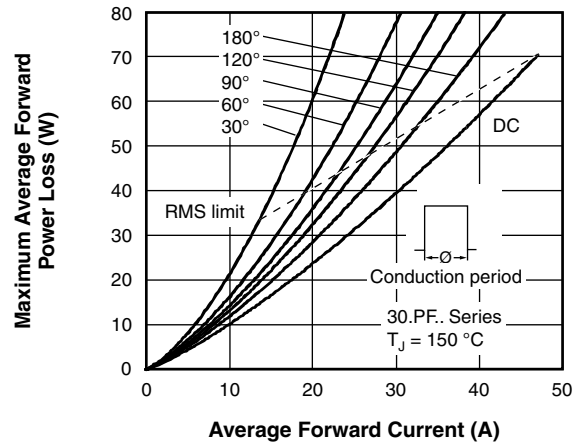


Fig. 4 - Forward Power Loss Characteristics

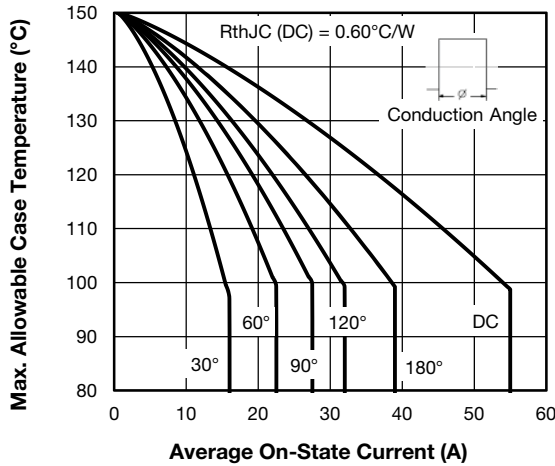


Fig. 2 - Current Rating Characteristics

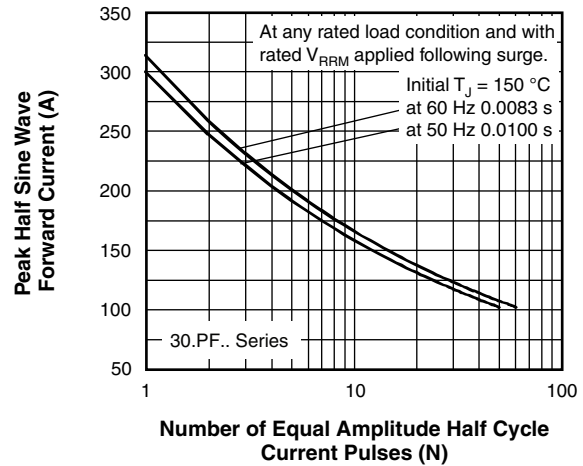


Fig. 5 - Maximum Non-Repetitive Surge Current

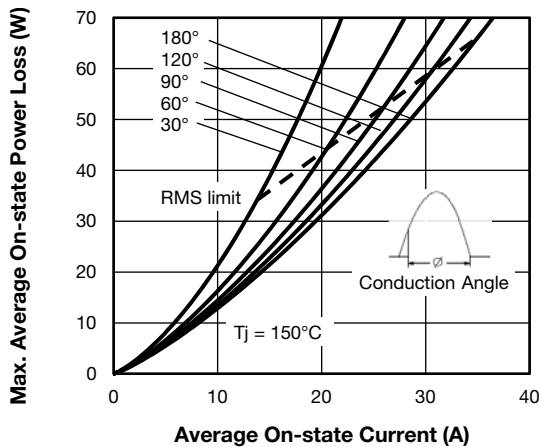


Fig. 3 - Forward Power Loss Characteristics

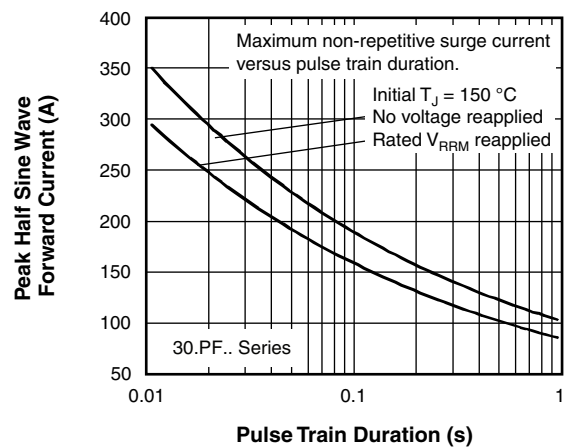


Fig. 6 - Maximum Non-Repetitive Surge Current

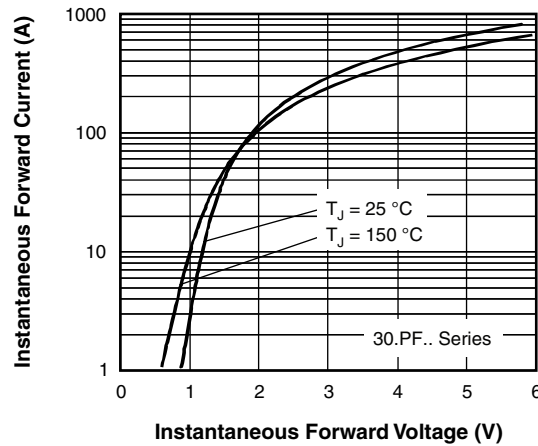
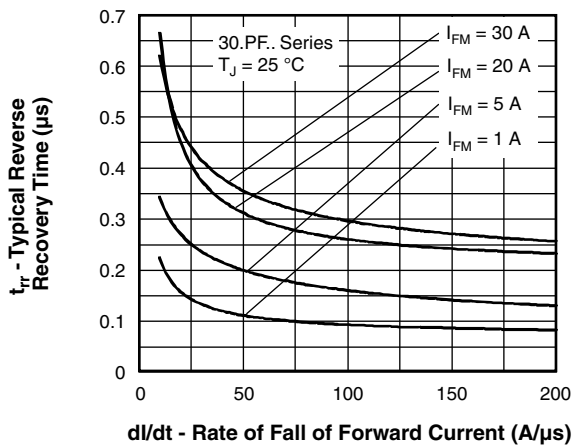
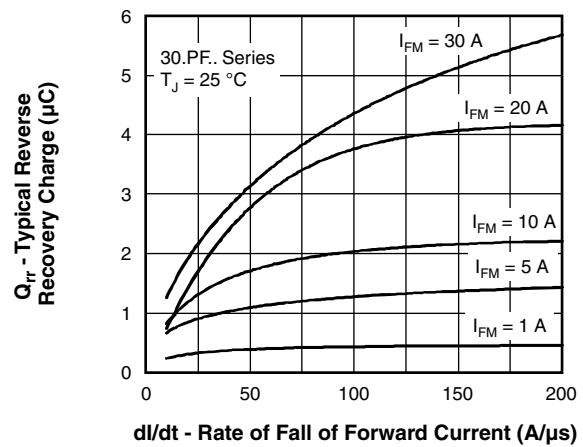
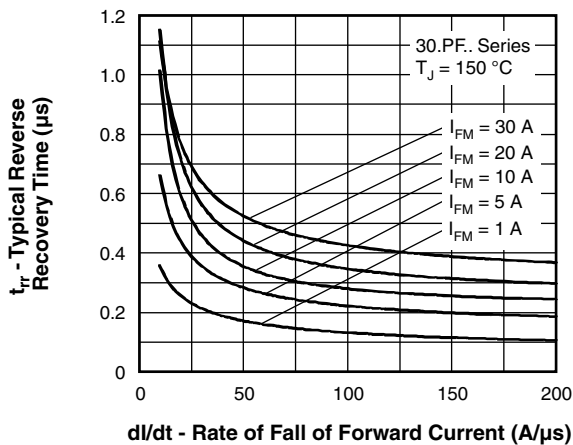
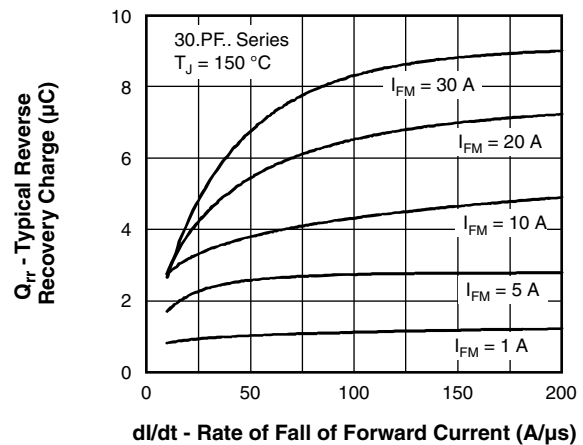
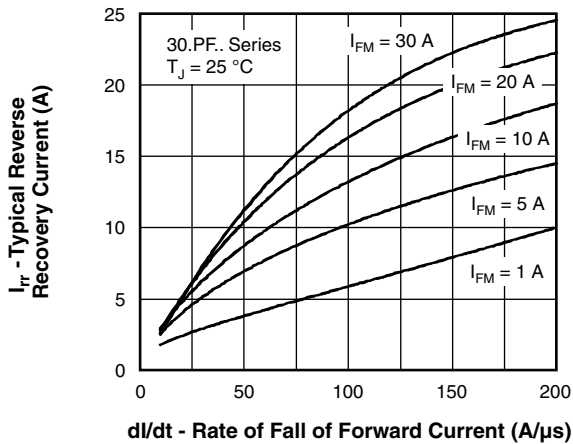
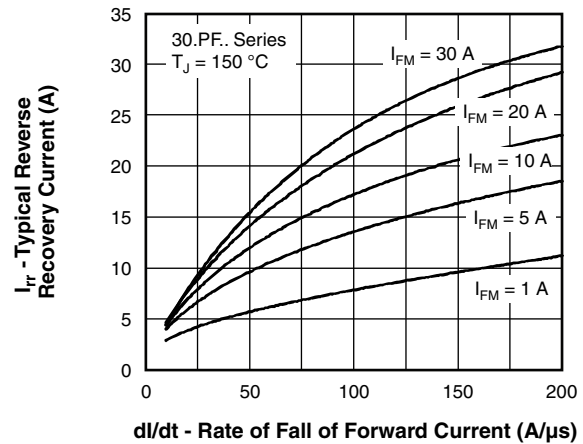
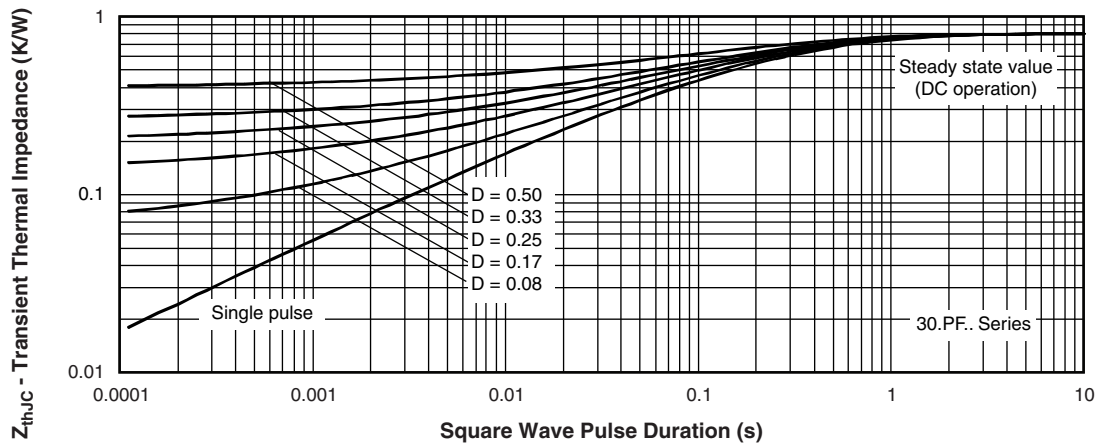


Fig. 7 - Forward Voltage Drop Characteristics


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,  $T_J = 25^\circ C$ 

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

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



## ORDERING INFORMATION TABLE

Device code	VS-	30	E	P	F	12	-M3
	1	2	3	4	5	6	7
1	- Vishay Semiconductors product						
2	- Current rating (30 = 30 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-30EPF10-M3	25	500	Antistatic plastic tubes
VS-30APF10-M3	25	500	Antistatic plastic tubes
VS-30EPF12-M3	25	500	Antistatic plastic tubes
VS-30APF12-M3	25	500	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS		
Dimensions	TO-247AC 2L	<a href="http://www.vishay.com/doc?96144">www.vishay.com/doc?96144</a>
	TO-247AC 3L	<a href="http://www.vishay.com/doc?96138">www.vishay.com/doc?96138</a>
Part marking information	TO-247AC 2L	<a href="http://www.vishay.com/doc?95648">www.vishay.com/doc?95648</a>
	TO-247AC 3L	<a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>
SPICE model		<a href="http://www.vishay.com/doc?95184">www.vishay.com/doc?95184</a>



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