

**ELECTRICAL SPECIFICATIONS PER LEG** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	$V_{BR}$	$I_R = 100\ \mu\text{A}$	1200	-	-	V
Maximum forward voltage	$V_{FM}$	$I_F = 16\ \text{A}$	-	2.5	3.0	
		$I_F = 32\ \text{A}$	-	3.2	3.93	
		$I_F = 16\ \text{A}, T_J = 125^\circ\text{C}$	-	2.3	2.7	
Maximum reverse leakage current	$I_{RM}$	$V_R = V_R\ \text{rated}$	-	0.75	20	$\mu\text{A}$
		$T_J = 125^\circ\text{C}, V_R = 0.8 \times V_R\ \text{rated}$	-	375	2000	
Junction capacitance	$C_T$	$V_R = 200\ \text{V}$	-	27	40	pF
Series inductance	$L_S$	Measured lead to lead 5 mm from package body	-	8.0	-	nH

**DYNAMIC RECOVERY CHARACTERISTICS PER LEG** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time See fig. 5, 10	$t_{rr}$	$I_F = 1.0\ \text{A}, di_F/dt = 200\ \text{A}/\mu\text{s}, V_R = 30\ \text{V}$	-	30	-	ns
	$t_{rr1}$	$T_J = 25^\circ\text{C}$	-	90	135	
	$t_{rr2}$	$T_J = 125^\circ\text{C}$	-	164	245	
Peak recovery current See fig. 6	$I_{RRM1}$	$T_J = 25^\circ\text{C}$	-	5.8	10	A
	$I_{RRM2}$	$T_J = 125^\circ\text{C}$	-	8.3	15	
Reverse recovery charge See fig. 7	$Q_{rr1}$	$T_J = 25^\circ\text{C}$	-	260	675	nC
	$Q_{rr2}$	$T_J = 125^\circ\text{C}$	-	680	1838	
Peak rate of fall of recovery current during $t_b$ See fig. 8	$di_{(rec)M}/dt1$	$T_J = 25^\circ\text{C}$	-	120	-	$\text{A}/\mu\text{s}$
	$di_{(rec)M}/dt2$	$T_J = 125^\circ\text{C}$	-	76	-	

**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Lead temperature	$T_{\text{lead}}$	0.063" from case (1.6 mm) for 10 s	-	-	300	$^\circ\text{C}$
Thermal resistance, junction to case	$R_{thJC}$		-	-	0.83	K/W
Thermal resistance, junction to ambient	$R_{thJA}$	Typical socket mount	-	-	80	
Thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, flat, smooth and greased	-	0.50	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style TO-247AC (JEDEC)	HFA32PA120C			

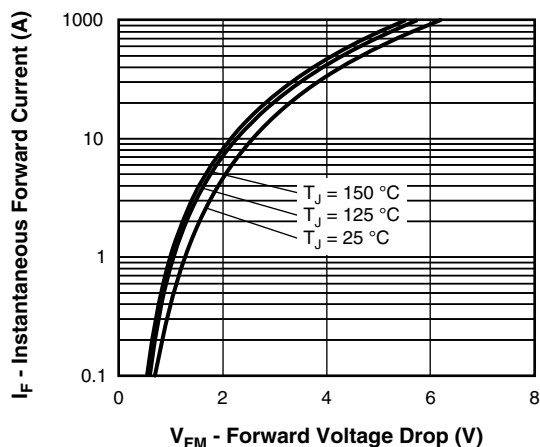


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

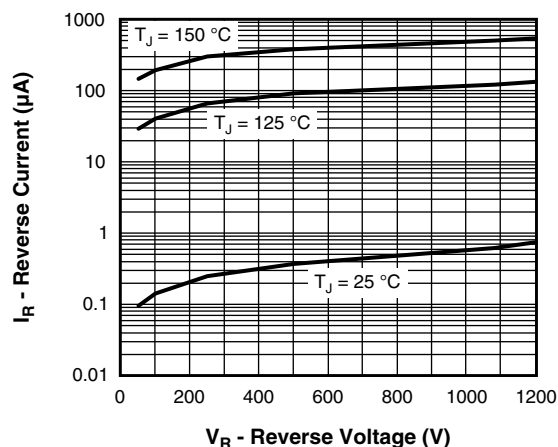


Fig. 2 - Typical Reverse Current vs. Reverse Voltage

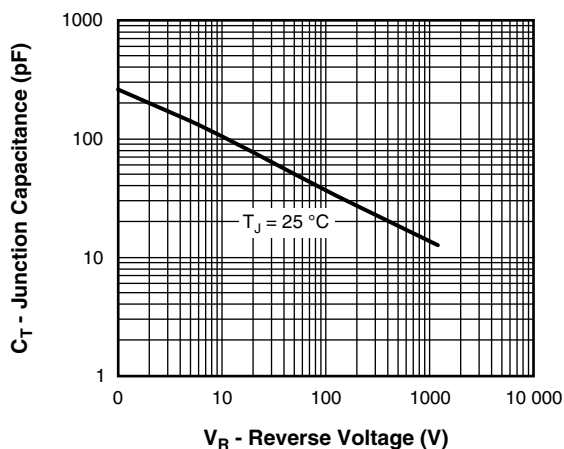


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

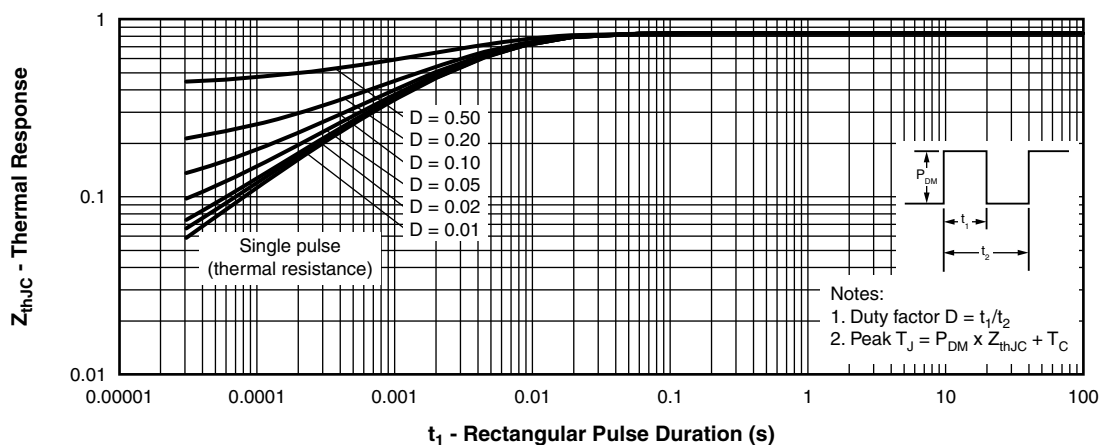


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

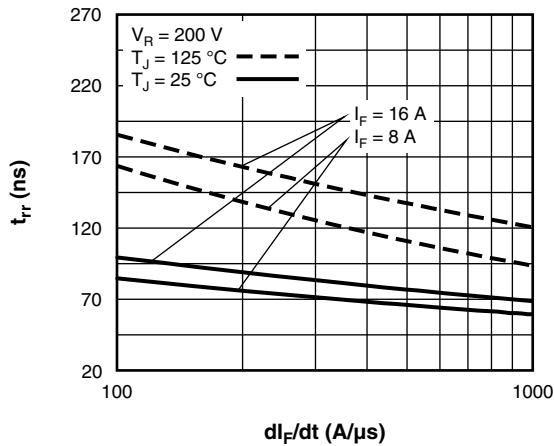
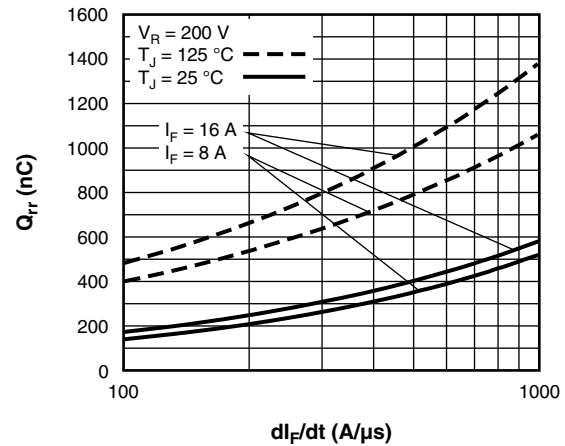
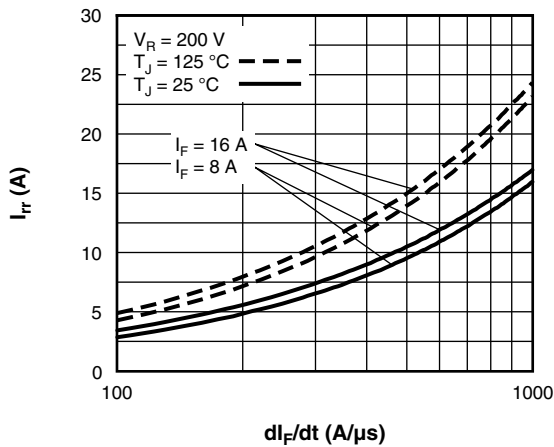
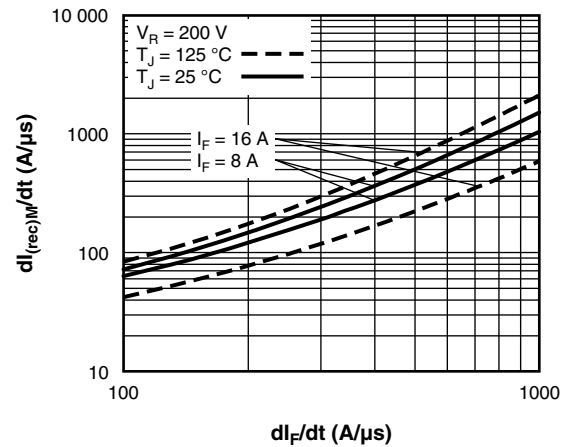
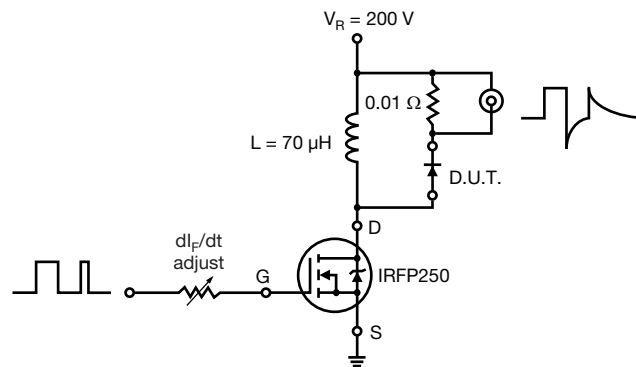

Fig. 5 - Typical Reverse Recovery Time vs.  $dI_F/dt$  (Per Leg)

Fig. 7 - Typical Stored Charge vs.  $dI_F/dt$  (Per Leg)

Fig. 6 - Typical Recovery Current vs.  $dI_F/dt$  (Per Leg)

Fig. 8 - Typical  $dI_{(rec)M}/dt$  vs.  $dI_F/dt$  (Per Leg)


Fig. 9 - Reverse Recovery Parameter Test Circuit

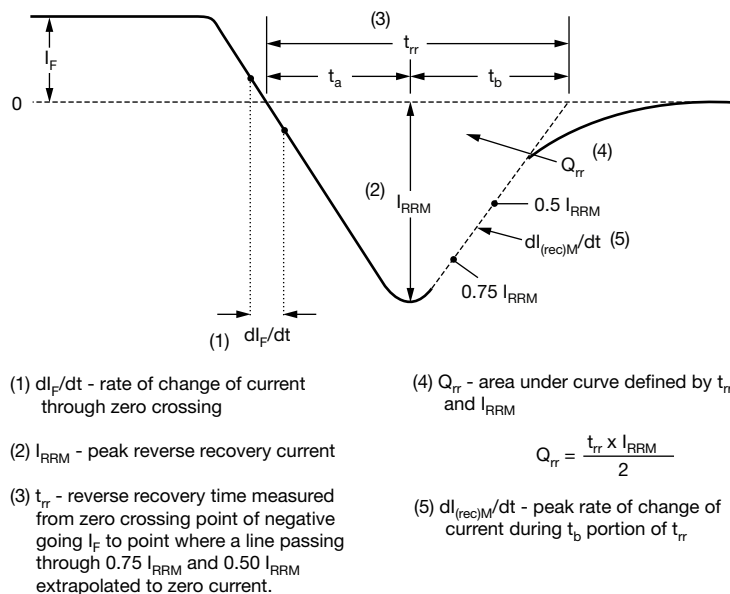


Fig. 10 - Reverse Recovery Waveform and Definitions

## ORDERING INFORMATION TABLE

Device code	VS-	HF	A	32	PA	120	C	PbF
	1	2	3	4	5	6	7	8
1	Vishay Semiconductors product							
2	HEXFRED® family							
3	Electron irradiated							
4	Current rating (32 = 32 A)							
5	PA = TO-247AC							
6	Voltage rating: (120 = 1200 V)							
7	Circuit configuration C = common cathode							
8	Environmental digit: PbF = lead (Pb)-free and RoHS-compliant -N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free							

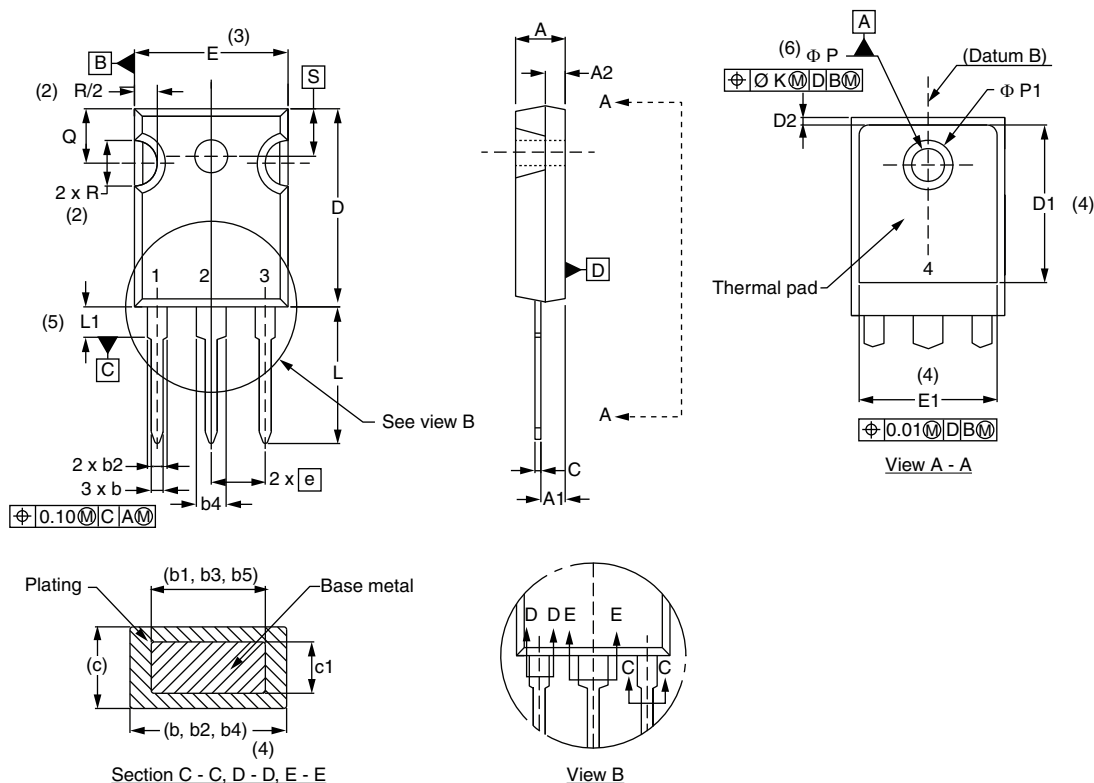
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-HFA32PA120CPbF	25	500	Antistatic plastic tube
VS-HFA32PA120C-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95542">www.vishay.com/doc?95542</a>
Part marking information	<a href="http://www.vishay.com/doc?95226">www.vishay.com/doc?95226</a>
	<a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>



## TO-247AC - 50 mils L/F

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.65	5.31	0.183	0.209	
A1	2.21	2.59	0.087	0.102	
A2	1.17	1.37	0.046	0.054	
b	0.99	1.40	0.039	0.055	
b1	0.99	1.35	0.039	0.053	
b2	1.65	2.39	0.065	0.094	
b3	1.65	2.34	0.065	0.092	
b4	2.59	3.43	0.102	0.135	
b5	2.59	3.38	0.102	0.133	
c	0.38	0.89	0.015	0.035	
c1	0.38	0.84	0.015	0.033	
D	19.71	20.70	0.776	0.815	3
D1	13.08	-	0.515	-	4

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D2	0.51	1.35	0.020	0.053	
E	15.29	15.87	0.602	0.625	3
E1	13.46	-	0.53	-	
e	5.46 BSC		0.215 BSC		
$\Phi K$	0.254		0.010		
L	14.20	16.10	0.559	0.634	
L1	3.71	4.29	0.146	0.169	
$\Phi P$	3.56	3.66	0.14	0.144	
$\Phi P1$	-	7.39	-	0.291	
Q	5.31	5.69	0.209	0.224	
R	4.52	5.49	0.178	0.216	
S	5.51 BSC		0.217 BSC		

## Notes

- (1) Dimensioning and tolerancing per ASME Y14.5M-1994
- (2) Contour of slot optional
- (3) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Thermal pad contour optional with dimensions D1 and E1
- (5) Lead finish uncontrolled in L1
- (6)  $\Phi P$  to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
- (7) Outline conforms to JEDEC® outline TO-247 with exception of dimension c and Q



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