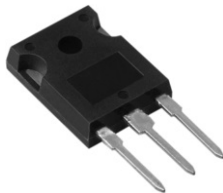
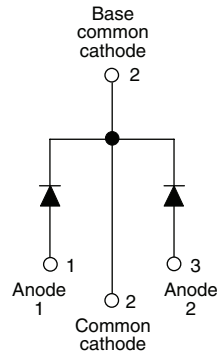


HEXFRED® Ultrafast Soft Recovery Diode, 2 x 16 A


TO-247AC

FEATURES

- Ultrafast recovery
- Ultrasoft recovery
- Very low I_{RRM}
- Very low Q_{rr}
- Specified at operating conditions
- Lead (Pb)-free
- Designed and qualified for industrial level


RoHS*
COMPLIANT

BENEFITS

- Reduced RFI and EMI
- Reduced power loss in diode and switching transistor
- Higher frequency operation
- Reduced snubbing
- Reduced parts count

DESCRIPTION

HFA32PA120C is a state of the art ultrafast recovery diode. Employing the latest in epitaxial construction and advanced processing techniques it features a superb combination of characteristics which result in performance which is unsurpassed by any rectifier previously available. With basic ratings of 1200 V and 16 A per leg continuous current, the HFA32PA120C is especially well suited for use as the companion diode for IGBTs and MOSFETs. In addition to ultrafast recovery time, the HEXFRED® product line features extremely low values of peak recovery current (I_{RRM}) and does not exhibit any tendency to “snap-off” during the t_b portion of recovery. The HEXFRED features combine to offer designers a rectifier with lower noise and significantly lower switching losses in both the diode and the switching transistor. These HEXFRED advantages can help to significantly reduce snubbing, component count and heatsink sizes. The HEXFRED HFA32PA120C is ideally suited for applications in power supplies and power conversion systems (such as inverters), motor drives, and many other similar applications where high speed, high efficiency is needed.

PRODUCT SUMMARY

V_R per leg	1200 V
V_F at 16 A at 25 °C	3.0 V
$I_{F(AV)}$	2 x 16 A
t_{rr} (typical) per leg	30 ns
T_J (maximum)	150 °C
Q_{rr} (typical) per leg	260 nC
I_{RRM} (typical) per leg	5.8 A

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	V_R		1200	V
Maximum continuous forward current per leg per device	I_F	$T_C = 100\text{ °C}$	16 32	A
Single pulse forward current	I_{FSM}		190	
Maximum repetitive forward current	I_{FRM}		64	
Maximum power dissipation	P_D	$T_C = 25\text{ °C}$	151	°C
		$T_C = 100\text{ °C}$	60	
Operating junction and storage temperature range	T_J, T_{Stg}		- 55 to + 150	W

* Pb containing terminations are not RoHS compliant, exemptions may apply

ELECTRICAL SPECIFICATIONS PER LEG ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V_{BR}	$I_R = 100\text{ }\mu\text{A}$	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	
		$I_F = 16\text{ A}, T_J = 125\text{ }^\circ\text{C}$	-	2.3	2.7	
Maximum reverse leakage current	I_{RM}	$V_R = V_R\text{ rated}$	-	0.75	20	μA
		$T_J = 125\text{ }^\circ\text{C}, V_R = 0.8 \times V_R\text{ rated}$	-	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 ($T_J = 25\text{ }^\circ\text{C}$ 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}	$T_J = 25\text{ }^\circ\text{C}$	-	90	135	
	t_{rr2}	$T_J = 125\text{ }^\circ\text{C}$	-	164	245	
Peak recovery current See fig. 6	I_{RRM1}	$T_J = 25\text{ }^\circ\text{C}$	-	5.8	10	A
	I_{RRM2}	$T_J = 125\text{ }^\circ\text{C}$	-	8.3	15	
Reverse recovery charge See fig. 7	Q_{rr1}	$T_J = 25\text{ }^\circ\text{C}$	-	260	675	nC
	Q_{rr2}	$T_J = 125\text{ }^\circ\text{C}$	-	680	1838	
Peak rate of fall of recovery current during t_b See fig. 8	$dI_{(rec)M}/dt1$	$T_J = 25\text{ }^\circ\text{C}$	-	120	-	$\text{A}/\mu\text{s}$
	$dI_{(rec)M}/dt2$	$T_J = 125\text{ }^\circ\text{C}$	-	76	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Lead temperature	T_{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			

HFA32PA120CPbF

Vishay High Power Products

HEXFRED®
Ultrafast Soft Recovery Diode, 2 x 16 A



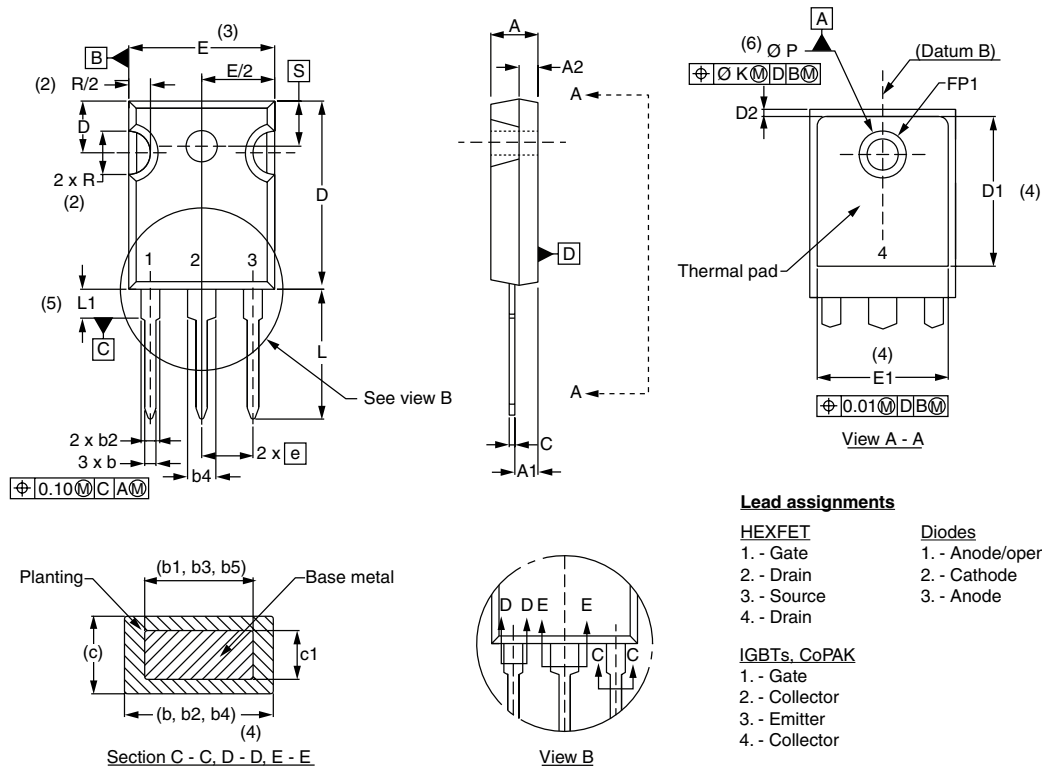
ORDERING INFORMATION TABLE

Device code	HF	A	32	PA	120	C	PbF
	①	②	③	④	⑤	⑥	⑦

- 1** - HEXFRED® family
- 2** - Process designator: A = Subs. electron irradiated
B = Subs. platinum
- 3** - Current rating (32 = 32 A)
- 4** - Package outline (PA = TO-247, 3 pins)
- 5** - Voltage rating (120 = 1200 V)
- 6** - Configuration (C = Center tap common cathode)
- 7** -
 - None = Standard production
 - PbF = Lead (Pb)-free

TO-247

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	1.50	2.49	0.059	0.098	
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	2.37	0.065	0.094	
b4	2.59	3.43	0.102	0.135	
b5	2.59	3.38	0.102	0.133	
c	0.38	0.86	0.015	0.034	
c1	0.38	0.76	0.015	0.030	
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	1.30	0.020	0.051	
E	15.29	15.87	0.602	0.625	3
E1	13.72	-	0.540	-	
e	5.46 BSC		0.215 BSC		
FK	2.54		0.010		
L	14.20	16.10	0.559	0.634	
L1	3.71	4.29	0.146	0.169	
N	7.62 BSC		3		
FP	3.56	3.66	0.14	0.144	
FP1	-	6.98	-	0.275	
Q	5.31	5.69	0.209	0.224	
R	0.452	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) Ø 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