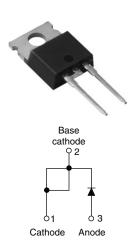


Vishay High Power Products

HEXFRED® Ultrafast Soft Recovery Diode, 8 A



TO-220AC

PRODUCT SUMMARY				
V_{R}	1200 V			
V _F at 8 A at 25 °C	3.3 V			
I _{F(AV)}	8 A			
t _{rr} (typical)	28 ns			
T _J (maximum)	150 °C			
Q _{rr} (typical)	140 nC			
dI _{(rec)M} /dt (typical) at 125 °C	85 A/μs			
I _{RRM} (typical)	4.5 A			

FEATURES

- · Ultrafast recovery
- Ultrasoft recovery
- Very low I_{RRM}
- Very low Q_{rr}
- · Specified at operating conditions
- · Designed and qualified for industrial level

BENEFITS

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

DESCRIPTION

HFA08TB120 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 8 A continuous current, the HFA08TB120 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 th 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 HFA08TB120 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.

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Cathode to anode voltage	V_R		1200	V	
Maximum continuous forward current	I _F	T _C = 100 °C	8.0		
Single pulse forward current	I _{FSM}		130	Α	
Maximum repetitive forward current	I _{FRM}		32		
Maximum namer dissination	P _D	T _C = 25 °C	73.5	W	
Maximum power dissipation		T _C = 100 °C	29]	
Operating junction and storage temperature range	T _J , T _{Stg}		- 55 to + 150	°C	

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ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Cathode to anode breakdown voltage	V _{BR}	Ι _R = 100 μΑ	1200	-	-		
		I _F = 8.0 A	-	2.6	3.3	V	
Maximum forward voltage V _{FM}	I _F = 16 A	-	3.4	4.3			
		I _F = 8.0 A, T _J = 125 °C	-	2.4	3.1		
Maximum reverse		$V_R = V_R$ rated	-	0.31	10		
leakage current		T _J = 125 °C, V _R = 0.8 x V _R rated	-	135	1000	μΑ	
Junction capacitance	C _T	V _R = 200 V	-	11	20	pF	
Series inductance	L _S	Measured lead to lead 5 mm from package body	-	8.0	-	nΗ	

DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
	t _{rr}	$I_F = 1.0 \text{ A}, dI_F/dt = 200 \text{ A/}\mu\text{s}, V_R = 30 \text{ V}$		-	28	-	
Reverse recovery time	t _{rr1}	T _J = 25 °C	I _F = 8.0 A dI _F /dt = 200 A/μs V _R = 200 V	-	63	95	ns
	t _{rr2}	T _J = 125 °C		-	106	160	
Peak recovery current	I _{RRM1}	T _J = 25 °C		-	4.5	8.0	Α
	I _{RRM2}	T _J = 125 °C		-	6.2	11	
Povorco rocovoru oborgo	Q _{rr1}	T _J = 25 °C		-	140	380	nC
Reverse recovery charge	Q _{rr2}	T _J = 125 °C		-	335	880	
Peak rate of recovery current	dI _{(rec)M} /dt1	T _J = 25 °C		-	133	-	A/μs
during t _b	$dI_{(rec)M}/dt2$ $T_J = 125 ^{\circ}C$	-	85	-	Α/μδ		

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	°C
Thermal resistance, junction to case	R _{thJC}		-	-	1.7	
Thermal resistance, junction to ambient	R _{thJA}	Typical socket mount	-	-	40	K/W
Thermal resistance, case to heatsink	R _{thCS}	Mounting surface, flat, smooth and greased	-	0.25	-	
Weight			-	6.0	-	g
vveignt			-	0.21	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style TO-220AC		HFA08	3TB120	



HEXFRED® Vishay High Power Products Ultrafast Soft Recovery Diode, 8 A

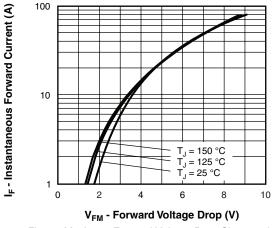


Fig. 1 - Maximum Forward Voltage Drop Characteristics

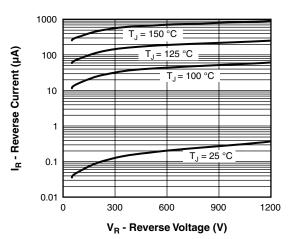


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

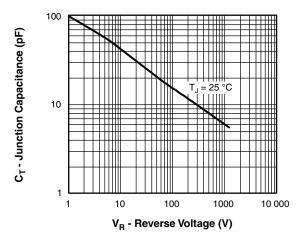


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

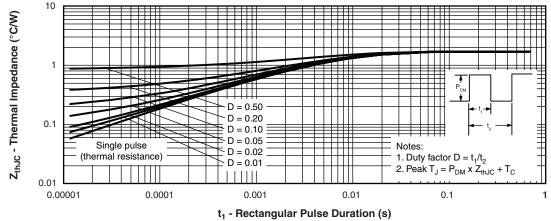


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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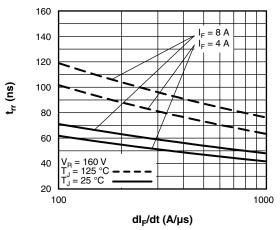


Fig. 5 - Typical Reverse Recovery Time vs. dI_F/dt

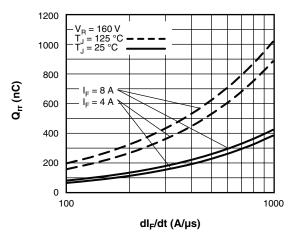


Fig. 7 - Typical Stored Charge vs. dl_F/dt

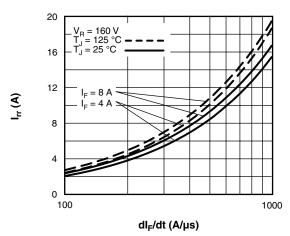


Fig. 6 - Typical Recovery Current vs. dl_F/dt

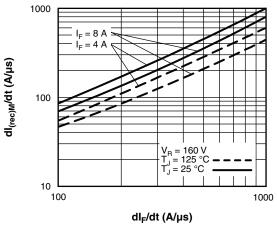


Fig. 8 - Typical $dI_{(rec)M}/dt$ vs. dI_F/dt



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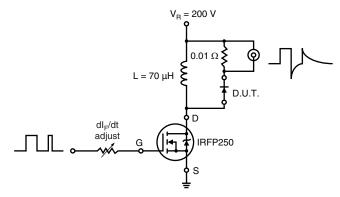
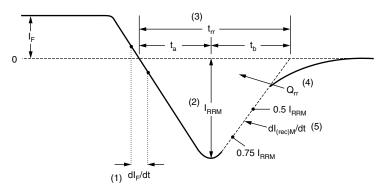


Fig. 9 - Reverse Recovery Parameter Test Circuit



- (1) dl_F/dt rate of change of current through zero crossing
- (2) I_{RRM} peak reverse recovery current
- (3) $\rm t_{rr}$ reverse recovery time measured from zero crossing point of negative going $\rm I_F$ to point where a line passing through 0.75 $\rm I_{RRM}$ and 0.50 $\rm I_{RRM}$ extrapolated to zero current.
- (4) $\mathbf{Q}_{\rm rr}$ area under curve defined by $\mathbf{t}_{\rm rr}$ and $\mathbf{I}_{\rm RRM}$

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

(5) $dI_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions

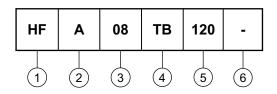
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ORDERING INFORMATION TABLE

Device code



- 1 HEXFRED® family
- 2 Process designator A = subs. elec. irrad.

B = subs. platinum

- 3 Current rating (08 = 8 A)
- 4 Package outline (TB = TO-220, 2 leads)
- 5 Voltage rating (120 = 1200 V)
- 6 • None = Standard production
 - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS					
Dimensions http://www.vishay.com/doc?95221					
Part marking information	http://www.vishay.com/doc?95224				



Vishay

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