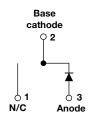


HEXFRED® Ultrafast Soft Recovery Diode, 8 A





LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS								
I _{F(AV)}	8 A							
V _R	600 V							
V _F at I _F	1.4 V							
t _{rr} (typ.)	18 ns							
T _J max.	150 °C							
Package	D ² PAK (TO-263AB)							
Circuit configuration	Single							

MECHANICAL DATA

Case: D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating **Terminals:** matte tin plated leads, solderable per

J-STD-002

FEATURES

- Ultrafast and ultrasoft recovery
- Very low I_{RRM} and Q_{rr}
- Specified at operating conditions
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



COMPLIANT HALOGEN FREE

BENEFITS

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

DESCRIPTION

VS-HFA08TB60S 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 600 V and 8 A continuous current, the VS-HFA08TB60S 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 HFA08TB60S is ideally suited for applications in power supplies (PFC boost diode) 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		600	V					
Maximum continuous forward current	I _F	T _C = 100 °C	8						
Single pulse forward current	I _{FSM}		60	Α					
Maximum repetitive forward current	I _{FRM}		24						
Maximum power dissination	В	T _C = 25 °C	36	W					
Maximum power dissipation	P_{D}	T _C = 100 °C	14	VV					
Operating junction and storage temperature range	T _J , T _{Stg}		-55 to +150	°C					



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	600	-	-				
Maximum forward voltage	V_{FM}	I _F = 8.0 A		-	1.4	1.7	V		
		I _F = 16 A	See fig. 1	-	1.7	2.1			
		I _F = 8.0 A, T _J = 125 °C		-	1.4	1.7			
Maximum reverse	,	$V_B = V_B$ rated		-	0.3	5.0			
leakage current	I _{RM}	$T_J = 125 ^{\circ}\text{C}, V_R = 0.8 \text{x} V_R \text{rated}$	See fig. 2	-	100	500	μΑ		
Junction capacitance	C _T	V _R = 200 V See fig. 3		=	10	25	pF		
Series inductance	L _S	Measured lead to lead 5 mm from pa	=	8.0	=	nΗ			

DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)									
PARAMETER	SYMBOL	TEST CON	MIN.	TYP.	MAX.	UNITS			
	t _{rr}	$I_F = 1.0 \text{ A}, dI_F/dt = 200$	I _F = 1.0 A, dI _F /dt = 200 A/μs, V _R = 30 V			-			
Reverse recovery time See fig. 5, 6	t _{rr1}	T _J = 25 °C		-	37	55	ns		
000 ligit 0, 0	t _{rr2}	T _J = 125 °C		-	55	90			
Peak recovery current	I _{RRM1}	T _J = 25 °C		-	3.5	5.0	A		
	I _{RRM2}	T _J = 125 °C	I _F = 8.0 A	-	4.5	8.0			
Reverse recovery charge	Q _{rr1}	T _J = 25 °C	$dI_F/dt = 200 \text{ A/}\mu\text{s}$ $V_B = 200 \text{ V}$	-	65	138	nC - A/µs		
See fig. 7	Q _{rr2}	T _J = 125 °C	VR = 200 V	-	124	360			
Peak rate of fall of recovery current during t _b See fig. 8	dI _{(rec)M} /dt1	T _J = 25 °C		-	240	-			
	dI _{(rec)M} /dt2	T _J = 125 °C		-	210	-			

THERMAL AND 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}		-	-	3.5	K/W				
Thermal resistance, junction to ambient	R _{thJA}	Typical socket mount	-	-	80	N/VV				
Weight			-	2.0	-	g				
Marking device		Case style D ² PAK (TO-263AB)		HFA08TB60S						



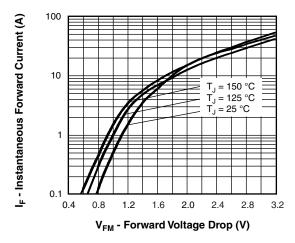


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

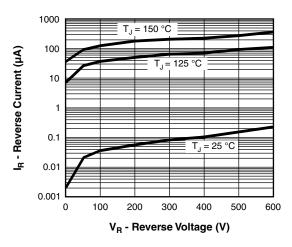


Fig. 2 - Typical Reverse Current vs. Reverse Voltage

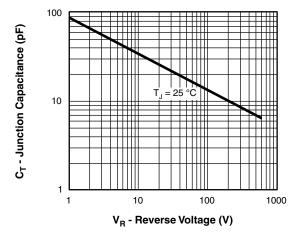


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

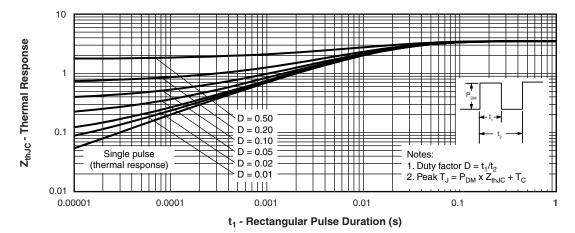


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

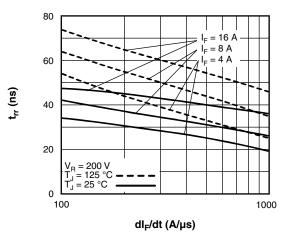


Fig. 5 - Typical Reverse Recovery Time vs. dl_E/dt

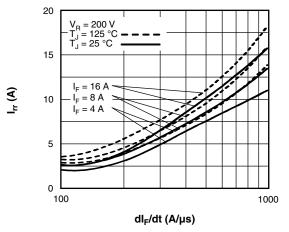


Fig. 6 - Typical Recovery Current vs. dl_F/dt

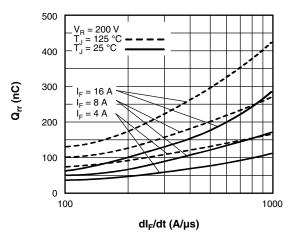


Fig. 7 - Typical Stored Charge vs. dl_F/dt

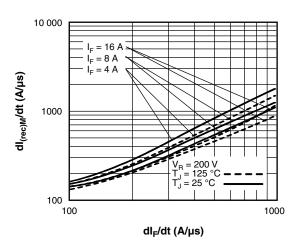
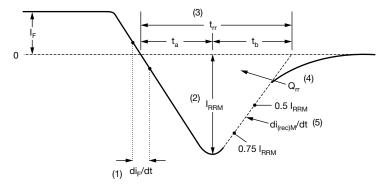


Fig. 8 - Typical dI_{(rec)M}/dt vs. dI_F/dt



- (1) di_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 $\mathbf{I}_{\rm RRM}$

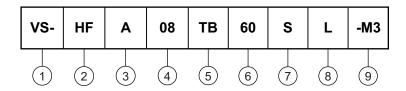
$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

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

Fig. 9 - Reverse Recovery Waveform and Definitions

ORDERING INFORMATION TABLE

Device code



- 1 Vishay Semiconductors product
- 2 HEXFRED® family
- Process designator: A = electron irradiated
- Current rating (08 = 8 A)
- 5 Package outline (TB = TO-220, 2 leads)
- 6 Voltage rating (60 = 600 V)
- 7 $S = D^2PAK (TO-263AB)$
- None = tube (50 pieces)
 - L = tape and reel (left oriented)
 - R = tape and reel (right oriented)
- 9 Environmental digit:
 - -M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)									
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION							
VS-HFA08TB60S-M3	50	Antistatic plastic tube							
VS-HFA08TB60SR-M3	800	13" diameter reel							
VS-HFA08TB60SL-M3	800	13" diameter reel							

LINKS TO RELATED DOCUMENTS						
Dimensions	www.vishay.com/doc?96164					
Part marking information	www.vishay.com/doc?95444					
Packaging information	www.vishay.com/doc?96424					
SPICE model	www.vishay.com/doc?96596					



D²PAK

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INC	INCHES		NOTES	SYMBOL	MILLIM	ETERS	INC	HES	NOTES
STIVIBUL	MIN.	MAX.	MIN.	MAX.	NOIES		STINIBUL	MIN.	MAX.	MIN.	MAX.	NOTES
Α	4.06	4.83	0.160	0.190			D1	6.86	8.00	0.270	0.315	3
A1	0.00	0.254	0.000	0.010			E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039			E1	7.90	8.80	0.311	0.346	3
b1	0.51	0.89	0.020	0.035	4		e 2.54 BSC		0.100 BSC			
b2	1.14	1.78	0.045	0.070			Н	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4		L	1.78	2.79	0.070	0.110	
С	0.38	0.74	0.015	0.029			L1	-	1.65	-	0.066	3
c1	0.38	0.58	0.015	0.023	4		L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065			L3 0.25 BSC 0.010 B		BSC			
D	8.51	9.65	0.335	0.380	2		L4	4.78	5.28	0.188	0.208	

Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) 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 outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inches
- (7) Outline conforms to JEDEC® outline TO-263AB

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