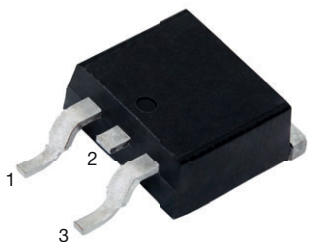
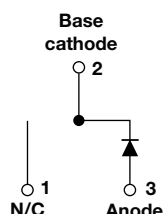


HEXFRED® Ultrafast Soft Recovery Diode, 8 A


D²PAK (TO-263AB)


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



RoHS
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 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 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.

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	V_R		600	V
Maximum continuous forward current	I_F	$T_C = 100\text{ °C}$	8	A
Single pulse forward current	I_{FSM}		60	
Maximum repetitive forward current	I_{FRM}		24	
Maximum power dissipation	P_D	$T_C = 25\text{ °C}$	36	W
		$T_C = 100\text{ °C}$	14	
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}	I _R = 100 μA		600	-	- V
Maximum forward voltage	V _{FM}	I _F = 8.0 A	See fig. 1	-	1.4	1.7
		I _F = 16 A		-	1.7	2.1
		I _F = 8.0 A, T _J = 125 °C		-	1.4	1.7
Maximum reverse leakage current	I _{RM}	V _R = V _R rated T _J = 125 °C, V _R = 0.8 x V _R rated	See fig. 2	-	0.3	5.0 μA
				-	100	500
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 package body		-	8.0	- nH

DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX. UNITS
Reverse recovery time See fig. 5, 6	t _{rr}	I _F = 1.0 A, dI _F /dt = 200 A/μs, V _R = 30 V		-	18	- ns
	t _{rr1}	T _J = 25 °C	I _F = 8.0 A dI _F /dt = 200 A/μs V _R = 200 V	-	37	55
	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		-	4.5	8.0
Reverse recovery charge See fig. 7	Q _{rr1}	T _J = 25 °C		-	65	138 nC
	Q _{rr2}	T _J = 125 °C		-	124	360
Peak rate of fall of recovery current during t _b See fig. 8	dI _{(rec)M} /dt1	T _J = 25 °C		-	240	- A/μs
	dI _{(rec)M} /dt2	T _J = 125 °C		-	210	-

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

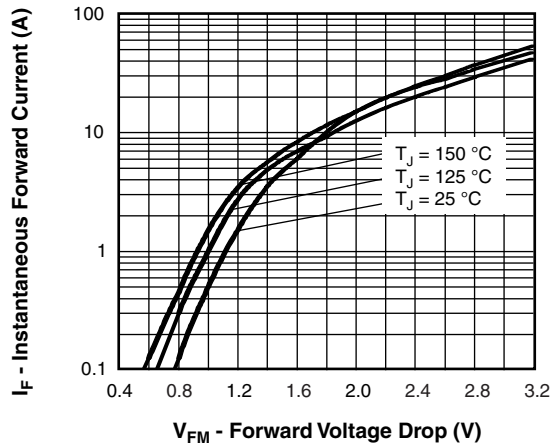


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

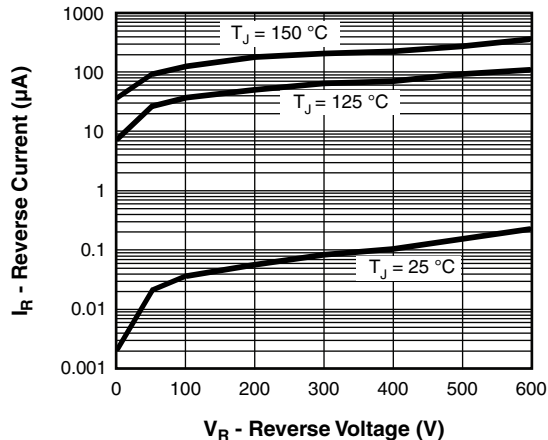


Fig. 2 - Typical Reverse Current vs. Reverse Voltage

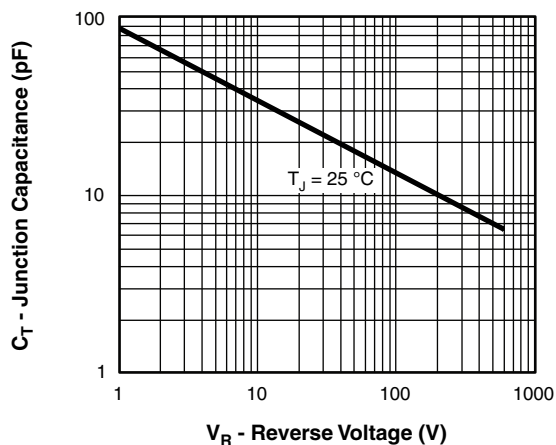


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

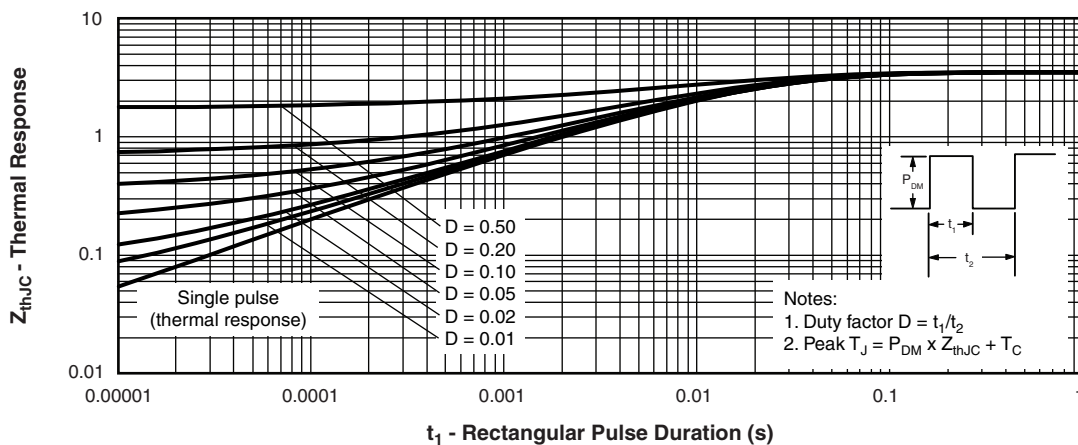


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

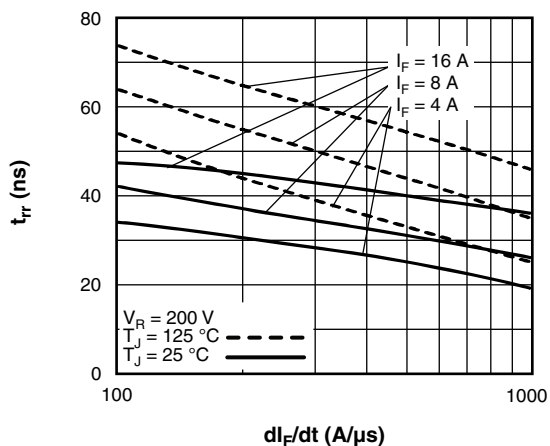
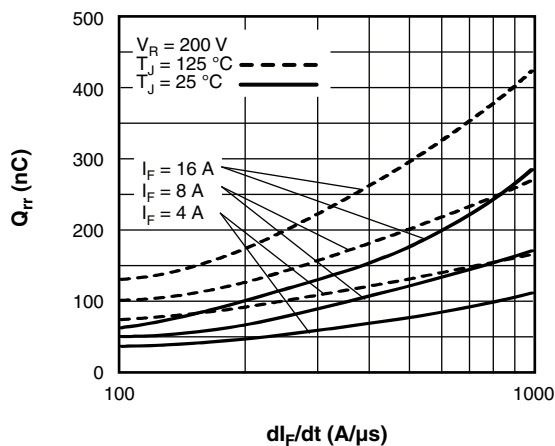
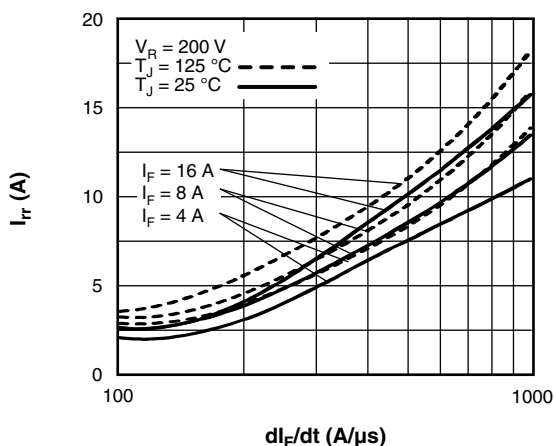
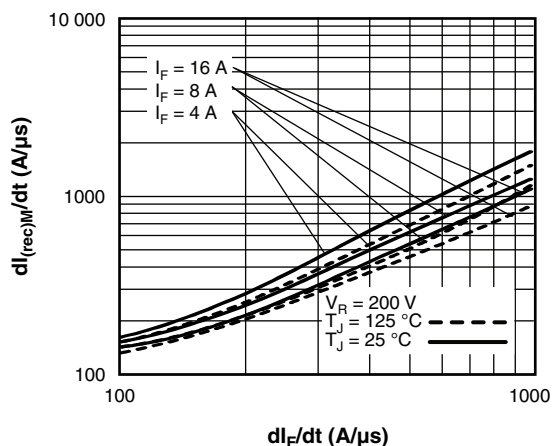
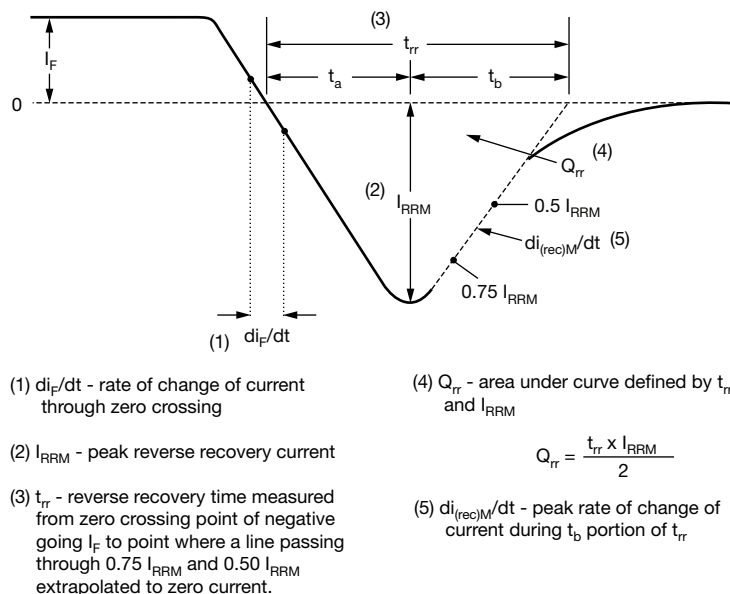

Fig. 5 - Typical Reverse Recovery Time vs. di_F/dt

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

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

Fig. 8 - Typical $di_{(rec)M}/dt$ vs. di_F/dt


Fig. 9 - Reverse Recovery Waveform and Definitions

**ORDERING INFORMATION TABLE**

Device code	VS-	HF	A	08	TB	60	S	L	-M3
	1	2	3	4	5	6	7	8	9

- | | | |
|----------|---|--|
| 1 | - | Vishay Semiconductors product |
| 2 | - | HEXFRED® family |
| 3 | - | Process designator: A = electron irradiated |
| 4 | - | Current rating (08 = 8 A) |
| 5 | - | Package outline (TB = TO-220, 2 leads) |
| 6 | - | Voltage rating (60 = 600 V) |
| 7 | - | S = D ² PAK (TO-263AB) |
| 8 | - | <ul style="list-style-type: none">• 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	QUANTITY PER TUBE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-HFA08TB60S-M3	50	1000	Antistatic plastic tube
VS-HFA08TB60SR-M3	800	800	13" diameter reel
VS-HFA08TB60SL-M3	800	800	13" diameter reel

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95164
Part marking information	www.vishay.com/doc?95444
Packaging information	www.vishay.com/doc?96424

D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	0.00	0.254	0.000	0.010	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
H	14.61	15.88	0.575	0.625	
L	1.78	2.79	0.070	0.110	
L1	-	1.65	-	0.066	3
L2	1.27	1.78	0.050	0.070	
L3	0.25 BSC		0.010 BSC		
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



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.