

Ultrafast Soft Recovery Diode, 150 A FRED Pt®



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	150 A			
V _R	600 V			
V _F at I _F	1.08 V			
I _{FSM}	1200 A			
t _{rr} (typ.)	50 ns			
T _J max.	175 °C			
Snap factor	0.5			
Package	PowerTab [®]			
Circuit configuration	Single			

FEATURES

- · Ultrafast recovery time
- 175 °C max. operating junction temperature
- · Screw mounting only
- AEC-Q101 qualified
- PowerTab[®] package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free RoHS COMPLIANT HALOGEN FREE

BENEFITS

- · Reduced RFI and EMI
- Higher frequency operation
- · Reduced snubbing
- Reduced parts count

DESCRIPTION/APPLICATIONS

These diodes are optimized to reduce losses and EMI/RFI in high frequency power conditioning systems. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for HF welding, power converters and other applications where switching losses are not significant portion of the total losses.

MECHANICAL DATA

Case: PowerTab®

Molding compound meets UL 94 V-0 flammability rating

Terminal: nickel plated, screwable

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Cathode to anode voltage	V _R		600	V
Continuous forward current	I _{F(AV)}	T _C = 89 °C	150	^
Single pulse forward current	I _{FSM}	T _C = 25 °C	1200	A
Operating junction and storage temperatures	T _J , T _{Stg}		-55 to +175	°C

ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR} , V_{R}	Ι _R = 200 μΑ	600	-	-	
		I _F = 150 A	-	1.27	1.63	V
Forward voltage V _F	I _F = 150 A, T _J = 125 °C	-	1.15	1.43		
		I _F = 150 A, T _J = 175 °C	-	1.08	1.32	
Devenue leekene euwent		$V_R = V_R$ rated	-	=.	8	μΑ
Reverse leakage current I _R		$T_J = 150 ^{\circ}\text{C}, V_R = V_R \text{rated}$	-	-	0.5	mA
Junction capacitance	C _T	V _R = 600 V - 70 - p		pF		
Series inductance	L _S	Measured lead to lead 5 mm from package body - 3.5 - nH				



DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
D	$I_F = 1.0 \text{ A}, dI_F/dt = 100 \text{ A/}\mu\text{s}, V_R = 30 \text{ V}$		-	50	1		
	$I_F = 1.0 \text{ A}, dI_F/dt = 200 \text{ A/}\mu\text{s}, V_R = 30 \text{ V}$		-	40	-		
neverse recovery time	Reverse recovery time t _{rr}	T _J = 25 °C	I _F = 50 A V _R = 200 V	-	100	-	ns
		T _J = 125 °C		-	210	-	
Peak recovery current I _{RRM}	1	T _J = 25 °C		-	10.5	-	Α
	T _J = 125 °C	v _R = 200 v dI _F /dt = 200 A/μs	-	22	-	^	
Reverse recovery charge Q _{rr}	0	T _J = 25 °C	•	-	550	1	nC
	Q _{rr}	T _J = 125 °C		-	2350	-	110

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	R _{thJC}		-	-	0.35	K/W
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, flat, smooth and greased	-	0.2	-	IV/VV
Weight			-	-	5.02	g
Mounting torque			1.2 (10)	-	2.4 (20)	N ⋅ m (lbf ⋅ in)
Marking device		Case style PowerTab®		EBU1	5006H	•

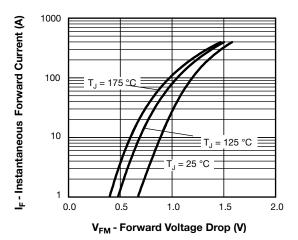


Fig. 1 - Maximum Forward Voltage Drop Characteristics

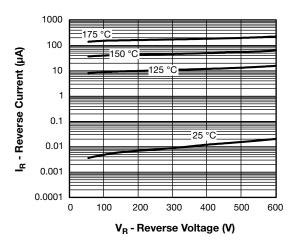


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



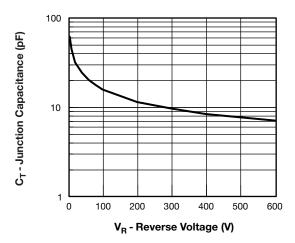


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

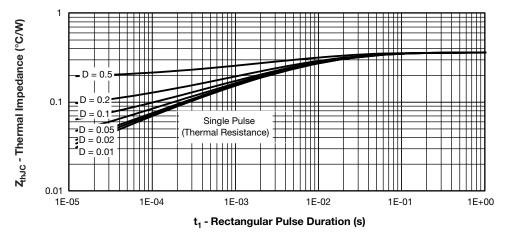


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

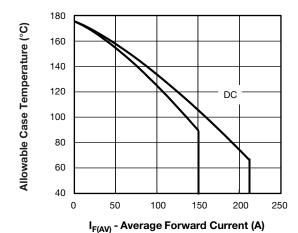


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

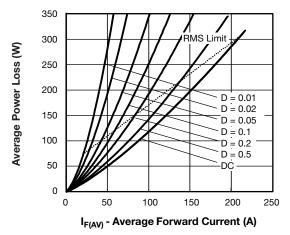


Fig. 6 - Forward Power Loss Characteristics

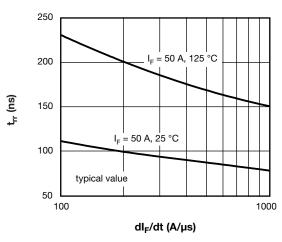


Fig. 7 - Typical Reverse Recovery Time vs. dl_F/dt

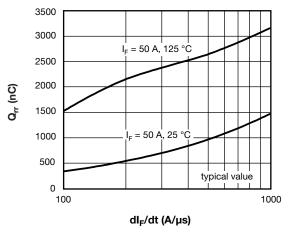
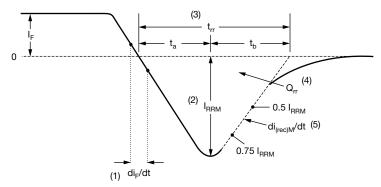


Fig. 8 - Typical Stored Charge vs. dl_F/dt



- (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) $\rm Q_{rr}$ area under curve defined by $\rm t_{rr}$ and $\rm I_{RBM}$

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

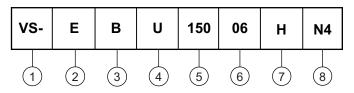
(5) di_{(rec)M}/dt - peak rate of change of current during t_b portion of t_{rr}

Fig. 9 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Single diode

3 - PowerTab[®]

Ultrafast recovery

5 - Current rating (150 = 150 A)

6 - Voltage rating (06 = 600 V)

- H = AEC-Q101 qualified

8 - Environmental digit:

N4 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

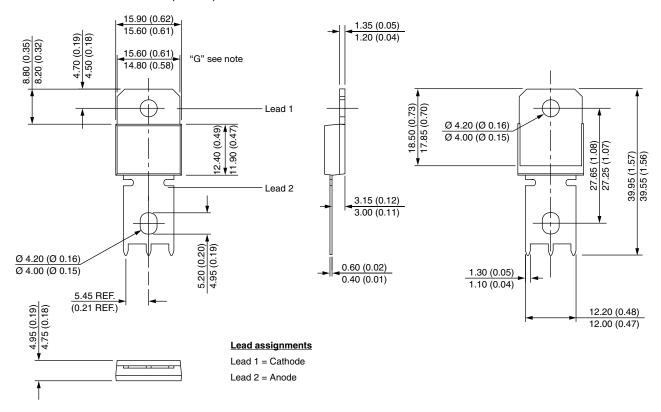
ORDERING INFORMATION (Example)				
PREFERRED P/N BASE QUANTITY PACKAGING DESCRIPTION				
VS-EBU15006HN4	25/tube	Antistatic plastic tube		

LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95240			
Part marking information	www.vishay.com/doc?95467			
Application note	www.vishay.com/doc?95179			
SPICE model	www.vishay.com/doc?97099			



PowerTab®

DIMENSIONS in millimeters (inches)



Note:

Outline conform to JEDEC® TO-275, except for dimension "G" only



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Vishay

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