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Vishay Semiconductors

# Standard Recovery Diodes, (Stud Version), 85 A



DO-5 (DO-203AB)

PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub> 85 A				
Package	DO-5 (DO-203AB)			
Circuit configuration	Single			

#### **FEATURES**

- High surge current capability
- Stud cathode and stud anode version



- · Leaded version available
- Types up to 1600 V V<sub>RRM</sub>
- · Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **TYPICAL APPLICATIONS**

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

MAJOR RATINGS AND CHARACTERISTICS					
	TEST COMPLETIONS	85H	LINUTO		
PARAMETER	TEST CONDITIONS	10 to 120	140 to 160	UNITS	
1		85	85	Α	
I <sub>F(AV)</sub>	T <sub>C</sub>	140	110	°C	
I <sub>F(RMS)</sub>		133	133	Α	
1	50 Hz	1700	1700	٨	
IFSM	60 Hz	1800	1800	Α	
121	50 Hz	14 500	14 500	A 2 -	
I <sup>2</sup> t	60 Hz	13 500	13 500	A <sup>2</sup> s	
$V_{RRM}$	Range	100 to 1200	1400 to 1600	V	
T <sub>J</sub>		-65 to +180	-65 to +150	°C	

#### **ELECTRICAL SPECIFICATIONS**

VOLTAGE RATINGS					
TYPE NUMBER	VOLTAGE CODE	V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I <sub>RRM</sub> MAXIMUM AT T <sub>J</sub> = T <sub>J</sub> MAXIMUM mA	
	10	100	200		
	20	200	300		
	40	400	500		
VS-85HF(R)	60	600	700	9	
VS-86HF(R) VS-87HF(R)	80	800	900		
VS-88HF(R)	100	1000	1100		
	120	1200	1300		
	140	1400	1500	4.5	
	160	1600	1700	4.5	



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FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			85HF(R)		LINUTO
PARAMETER	STIVIBUL		TEST CONDITIONS		10 to 120	140/160	UNITS
Maximum average forward current at case temperature	I <sub>F(AV)</sub>	180° condu	180° conduction, half sine wave			5	A
					140	110	°C
Maximum RMS forward current	I <sub>F(RMS)</sub>				133		Α
		t = 10 ms	No voltage		17	1700	
Maximum peak, one-cycle forward,	1	t = 8.3  ms	reapplied		1800		A
non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	100 % V <sub>RRM</sub>		1450		
		t = 8.3 ms	reapplied	Sinusoidal half wave,	wave, 1500		
	l <sup>2</sup> t	t = 10 ms	No voltage	initial $T_J = T_J$ maximum	14 500		- A <sup>2</sup> s
		t = 8.3 ms	reapplied		13 500		
Maximum I <sup>2</sup> t for fusing		t = 10 ms	100 % V <sub>RRM</sub>		10 500		
	t = 8.3 ms reapplied			94	00	7	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied		145	000	A²√s	
Value of threshold voltage (up to 1200 V)	V	$T_J = T_J$ maximum		0.0	68	V	
Value of threshold voltage (for 1400 V, 1600 V)	V <sub>F(TO)</sub>			0.0	69		
Value of forward slope resistance (up to 1200 V)	_		T. T. avanimum		1.62		mW
Value of forward slope resistance (for 1400 V, 1600 V)	- r <sub>f</sub>	$T_J = T_J$ maximum			1.	75	11100
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 267 \text{ A}, T_J = 25 \text{ °C}, t_p = 400 \mu \text{s} \text{ rectangular wave}$ 1.2			1.2	1.4	V

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	CVMDOL	TEGT COMPLETIONS	85H			
PARAMETER	SYMBOL	TEST CONDITIONS	10 to 20	140 to 160	UNITS	
Maximum junction operating and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		-65 to +180	-65 to +150	°C	
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.	0.35		
Maximum thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth, flat and greased	0.	0.25		
Maximum shock (1)			1500			
Maximum constant vibration (1)		50 Hz	2	20 g		
Maximum constant acceleration (1)		Stud outwards	50	00		
		Not lubricated thread, tighting on nut	3.4	(30)		
Maximum allowable mounting torque		Lubricated thread, tighting on nut	2.3 (20) 4.2 (37)		N ⋅ m (lbf ⋅ in)	
+ 0 %, - 10 %		Not lubricated thread, tighting on hexagon				
		Lubricated thread, tighting on hexagon	3.2	(28)		
Approximate weight		Unleaded device	1	7	g	
Approximate weight		Officaucu device	0	0.6		
Case style		See dimensions - link at the end of datasheet DO-5 (DO-203AB)		)		

#### Notes

- (1) Available only for 88HF
- (2) Recommended for pass-through holes
- (3) Recommended for holed threaded heatsinks

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△R <sub>thJC</sub> CONDUCTION					
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS	
180°	0.10	0.08			
120°	0.11	0.11			
90°	0.13	0.13	$T_J = T_J$ maximum	K/W	
60°	0.17	0.17			
30°	0.26	0.26			

#### Note

The table above shows the increment of thermal resistance RthJC when devices operate at different conduction angles than DC

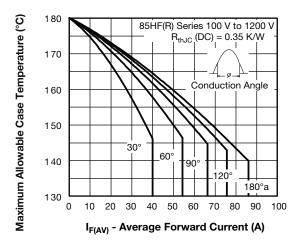


Fig. 1 - Current Ratings Characteristics

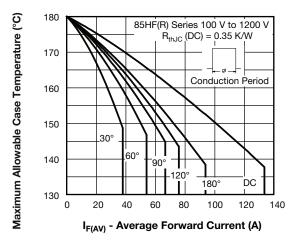


Fig. 2 - Current Ratings Characteristics

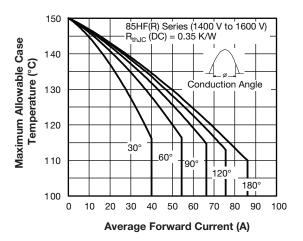


Fig. 3 - Current Ratings Characteristics

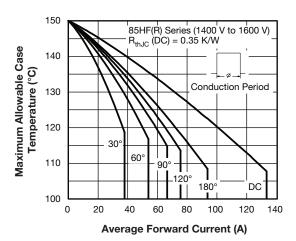


Fig. 4 - Current Ratings Characteristics

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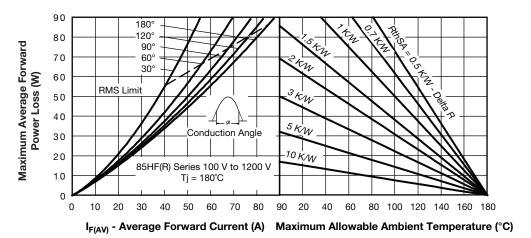
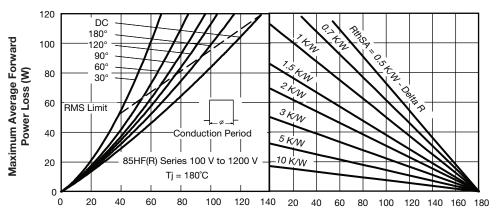


Fig. 5 - Forward Power Loss Characteristics



I<sub>F(AV)</sub> - Average Forward Current (A) Maximum Allowable Ambient Temperature (°C)

Fig. 6 - Forward Power Loss Characteristics

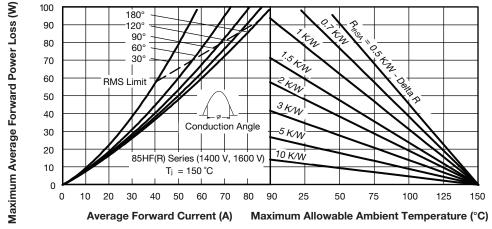


Fig. 7 - Forward Power Loss Characteristics

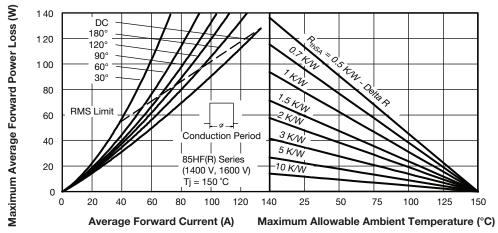


Fig. 8 - Forward Power Loss Characteristics

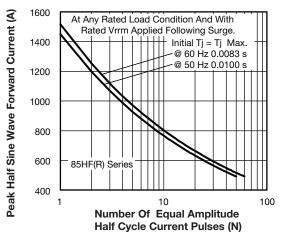


Fig. 9 - Maximum Non-Repetitive Surge Current

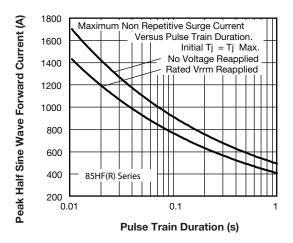


Fig. 10 - Maximum Non-Repetitive Surge Current

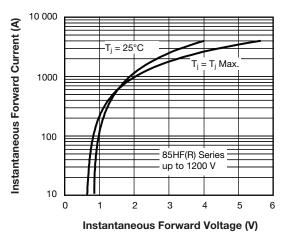


Fig. 11 - Forward Voltage Drop Characteristics

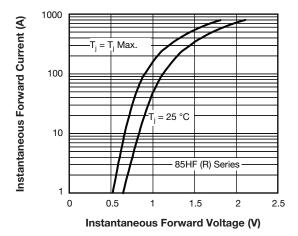


Fig. 12 - Forward Voltage Drop Characteristics (for 1400 V, 1600 V)

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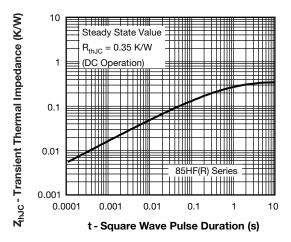
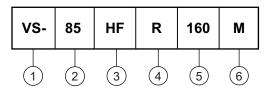


Fig. 13 - Thermal Impedance Z<sub>thJC</sub> Characteristics

#### **ORDERING INFORMATION TABLE**





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2 - 85 = standard device

86 = not isolated lead

87 = isolated lead with silicone sleeve

(red = Reverse polarity)

(blue = Normal polarity)

88 = type for rotating application

3 - HF = standard diode

4 - None = stud normal polarity (cathode to stud)

R = stud reverse polarity (anode to stud)

5 - Voltage code x 10 = V<sub>RRM</sub> (see Voltage Ratings table)

None = stud base DO-5 (DO-203AB) 1/4" 28UNF-2A

M = stud base DO-5 (DO-203AB) M6 x 1 (not available for 88HF)

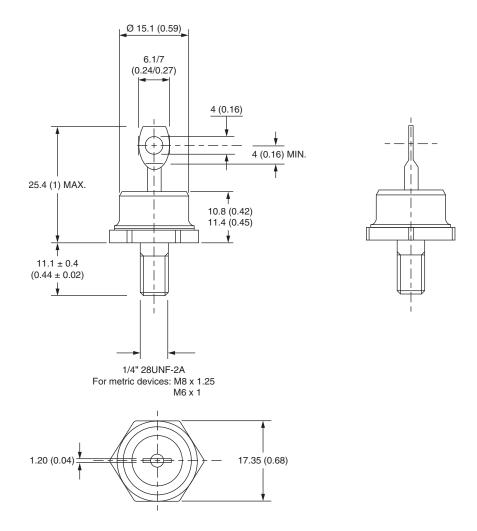
M8 = stud base DO-5 (DO-203AB) M8 x 1.25 (not available for 88HF)

LINKS TO RELATED DOCUMENTS			
Dimensions	www.vishay.com/doc?95342		

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# DO-5 (DO-203AB) for 85HF(R), 86HF(R) and 88HF(R)Series

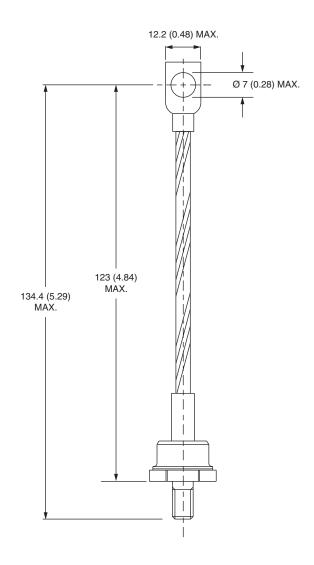
### **DIMENSIONS FOR 85HF(R) SERIES** in millimeters (inches)





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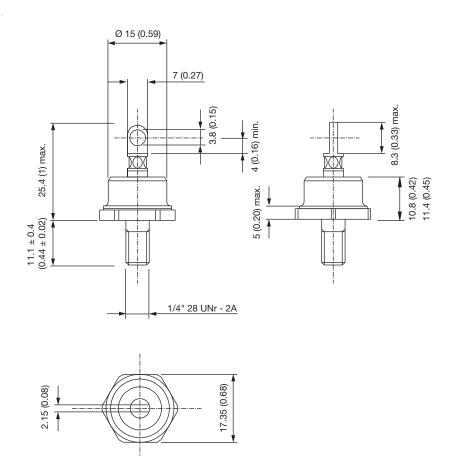
#### **DIMENSIONS FOR 86HF(R) SERIES** in millimeters (inches)





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#### **DIMENSIONS 88HF(R) SERIES** in millimeters (inches)





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