

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



DO-5 (DO-203AB)

### FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V  $V_{RRM}$
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	85 A
Package	DO-5 (DO-203AB)
Circuit configuration	Single

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	85HF(R)	UNITS
		400	
$I_{F(AV)}$	$T_C$	85	A
		140	°C
$I_{F(RMS)}$		133	A
$I_{FSM}$	50 Hz	1700	A
	60 Hz	1800	
$I^2t$	50 Hz	14 500	A <sup>2</sup> s
	60 Hz	13 500	
$V_{RRM}$		400	V
$T_J$		-65 to +180	°C

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	$V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM mA
VS-85HF(R)	40	400	500	9



FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			85HF(R)	UNITS
Maximum average forward current at case temperature	I <sub>F(AV)</sub>	180° conduction, half sine wave			85	A
					140	°C
Maximum RMS forward current	I <sub>F(RMS)</sub>				133	A
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T <sub>J</sub> = T <sub>J</sub> maximum	1700	A
		t = 8.3 ms			1800	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		1450	
		t = 8.3 ms			1500	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied		14 500	A <sup>2</sup> s
		t = 8.3 ms			13 500	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		10 500	
		t = 8.3 ms			9400	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied			16 000	A <sup>2</sup> √s
Value of threshold voltage (up to 1200 V)	V <sub>F(TO)</sub>	T <sub>J</sub> = T <sub>J</sub> maximum			0.68	V
Value of threshold voltage (for 1400 V, 1600 V)					0.69	
Value of forward slope resistance (up to 1200 V)	r <sub>f</sub>	T <sub>J</sub> = T <sub>J</sub> maximum			1.62	mW
Value of forward slope resistance (for 1400 V, 1600 V)					1.75	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 267 A, T <sub>J</sub> = 25 °C, t <sub>p</sub> = 400 μs rectangular wave			1.2	V

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	85HF(R)	UNITS
Maximum junction operating and storage temperature range	$T_J, T_{Stg}$		-65 to +180	°C
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.35	K/W
Maximum thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth, flat and greased	0.25	
Maximum shock			1500	g
Maximum constant vibration		50 Hz	20	
Maximum constant acceleration		Stud outwards	5000	
Maximum allowable mounting torque +0 %, -10 %		Not lubricated thread, tightening on nut	3.4 (30)	N · m (lbf · in)
		Lubricated thread, tightening on nut	2.3 (20)	
		Not lubricated thread, tightening on hexagon	4.2 (37)	
		Lubricated thread, tightening on hexagon	3.2 (28)	
Approximate weight		Unleaded device	17	g
			0.6	oz.
Case style		See dimensions - link at the end of datasheet	DO-5 (DO-203AB)	

$\Delta R_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.10	0.08	$T_J = T_J$ maximum	K/W
120°	0.11	0.11		
90°	0.13	0.13		
60°	0.17	0.17		
30°	0.26	0.26		

**Note**

- The table above shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

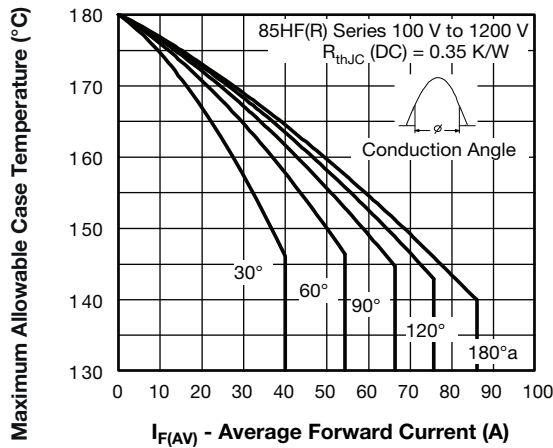


Fig. 1 - Current Ratings Characteristics

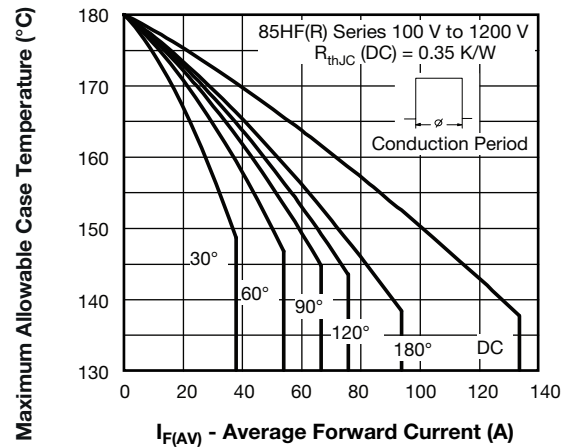


Fig. 2 - Current Ratings Characteristics

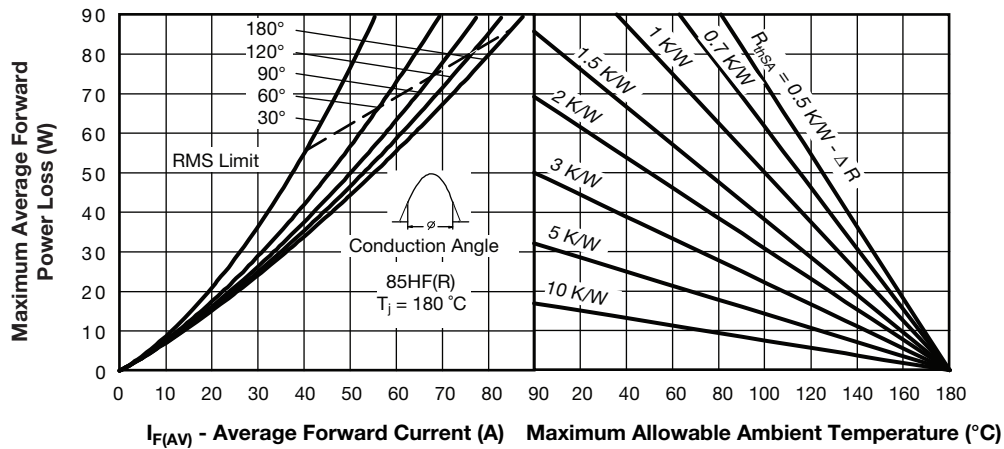


Fig. 3 - Forward Power Loss Characteristics

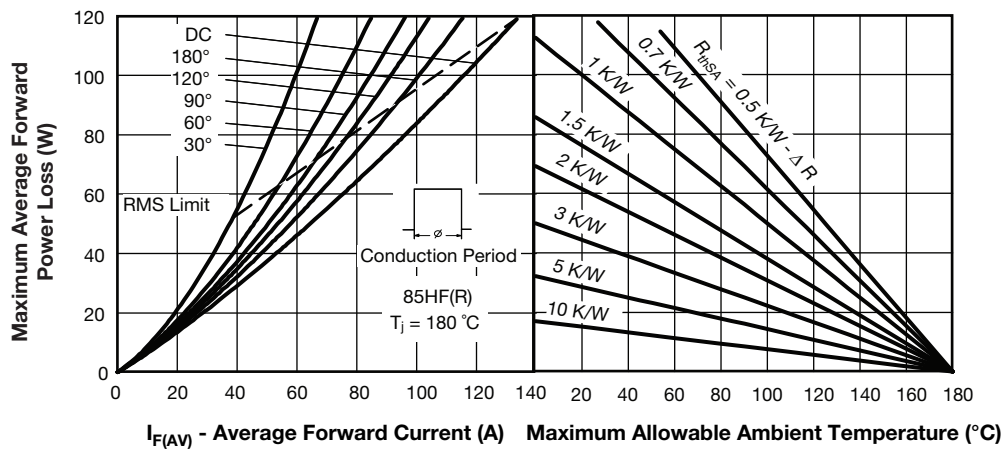


Fig. 4 - Forward Power Loss Characteristics

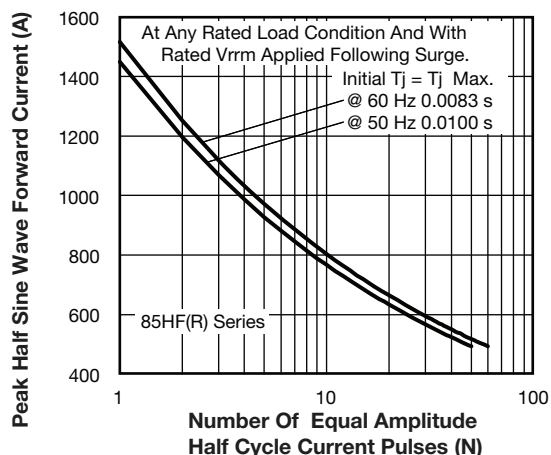


Fig. 5 - Maximum Non-Repetitive Surge Current

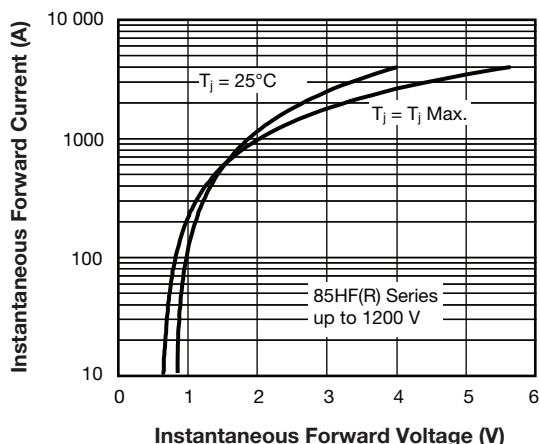


Fig. 7 - Forward Voltage Drop Characteristics

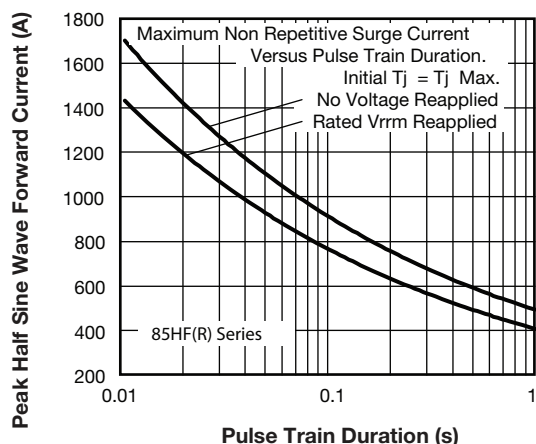
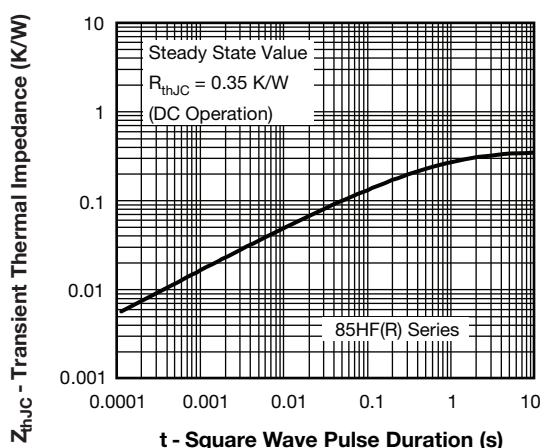


Fig. 6 - Maximum Non-Repetitive Surge Current


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

Device code

<b>VS-</b>	<b>85</b>	<b>HF</b>	<b>R</b>	<b>40</b>	<b>M8</b>
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①	②	③	④	⑤	⑥
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- 1** - Vishay Semiconductors product
- 2** - 85 = standard device
- 3** - HF = standard diode
- 4** - None = stud normal polarity (cathode to stud)  
R = stud reverse polarity (anode to stud)
- 5** - Voltage code  $\times 10 = V_{RRM}$  (see Voltage Ratings table)
- 6** - M8 = stud base DO-5 (DO-203AB) M8  $\times 1.25$

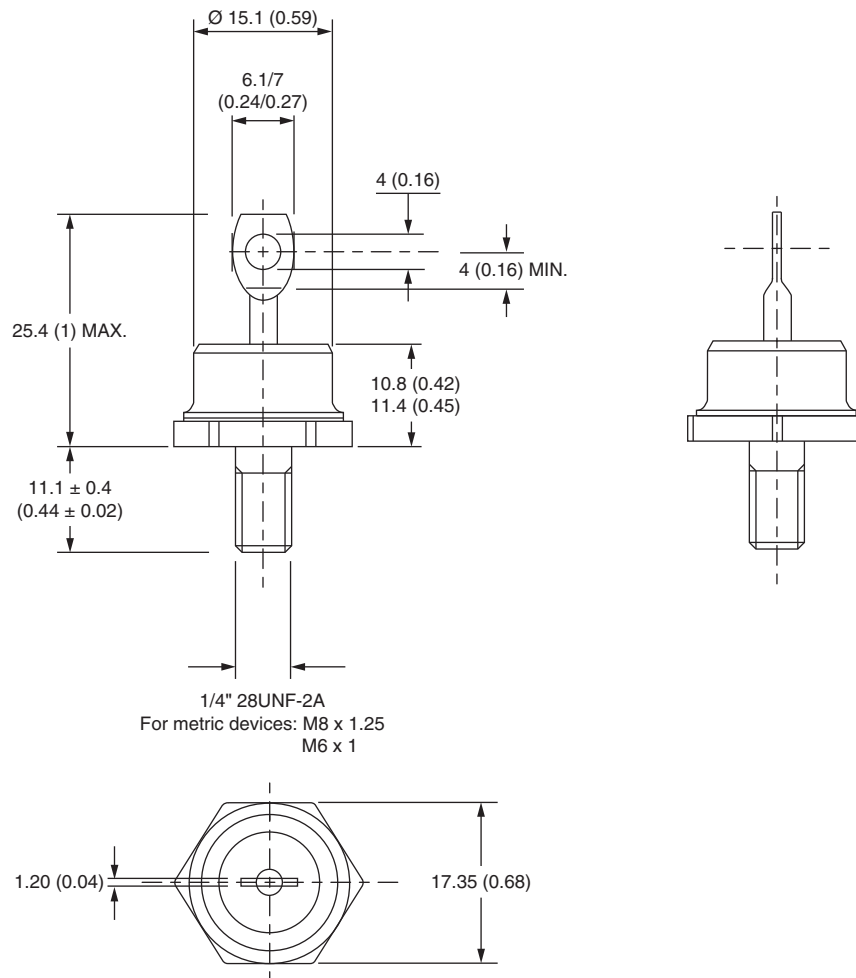
## LINKS TO RELATED DOCUMENTS

Dimensions	<a href="http://www.vishay.com/doc?95342">www.vishay.com/doc?95342</a>
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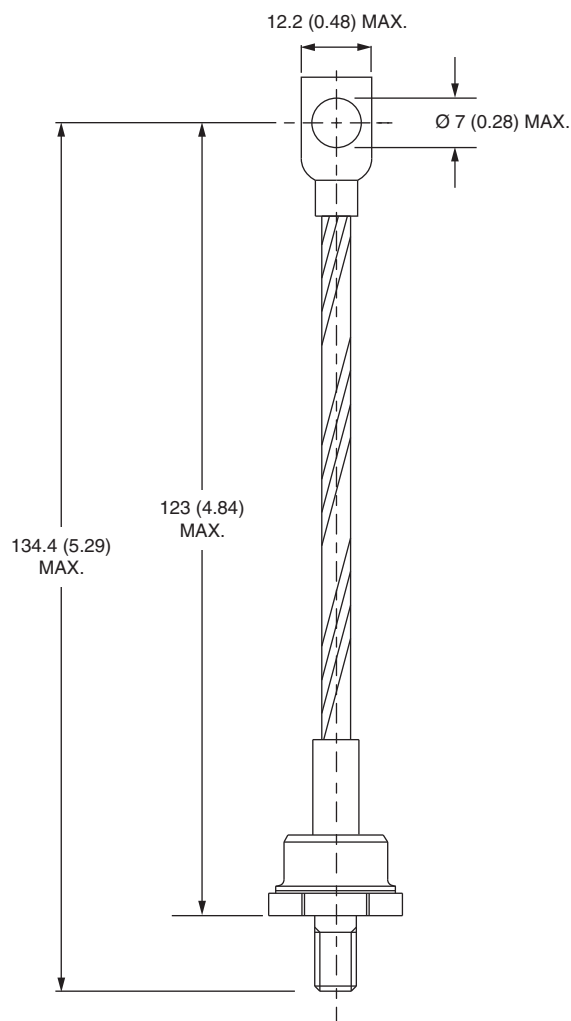
## DO-5 (DO-203AB) for 85HF(R), 86HF(R) and 88HF(R) Series

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

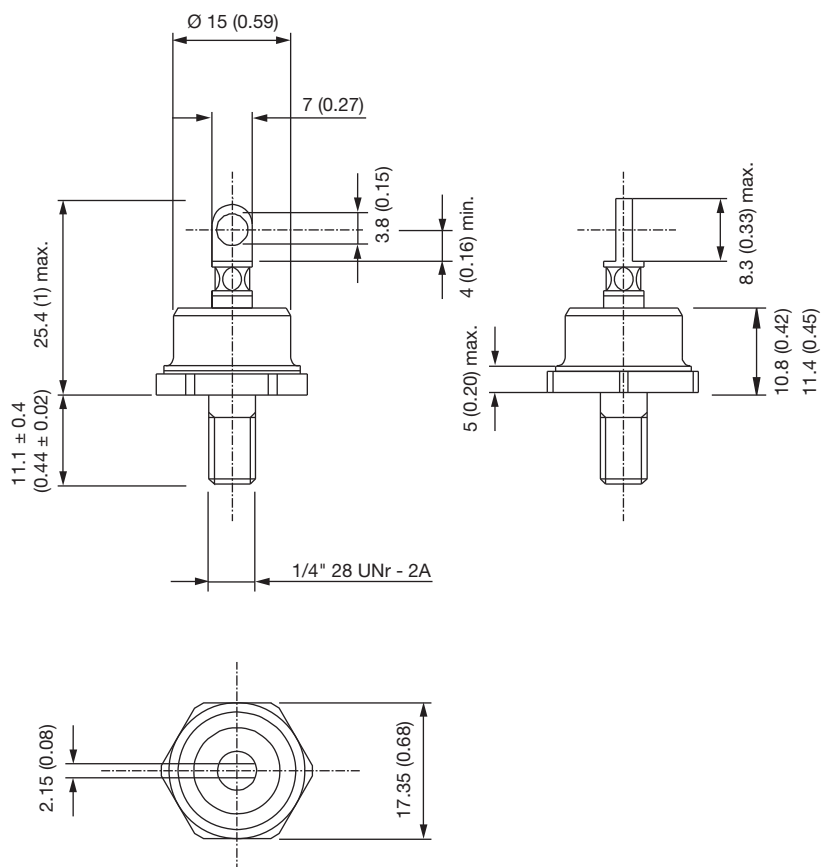




## DIMENSIONS FOR 86HF(R) SERIES in millimeters (inches)



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





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