

## 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	$I_{F(AV)}$	180° conduction, half sine wave		85	A
				140	°C
Maximum RMS forward current	$I_{F(RMS)}$			133	A
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reapplied	1700	A
		t = 8.3 ms		1800	
		t = 10 ms	100 % $V_{RRM}$ reapplied	1450	
		t = 8.3 ms		1500	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied	14 500	A <sup>2</sup> s
		t = 8.3 ms		13 500	
		t = 10 ms	100 % $V_{RRM}$ reapplied	10 500	
		t = 8.3 ms		9400	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	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)	$V_{F(TO)}$	$T_J = T_J$ maximum		0.68	V
Value of threshold voltage (for 1400 V, 1600 V)				0.69	
Value of forward slope resistance (up to 1200 V)	$r_f$	$T_J = T_J$ maximum		1.62	mW
Value of forward slope resistance (for 1400 V, 1600 V)				1.75	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 267$ A, $T_J = 25$ °C, $t_p = 400$ 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

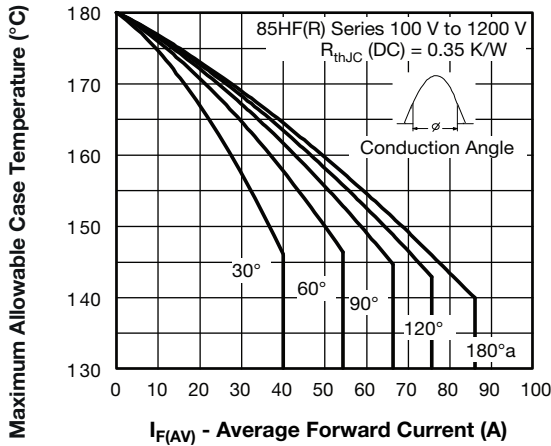


Fig. 1 - Current Ratings Characteristics

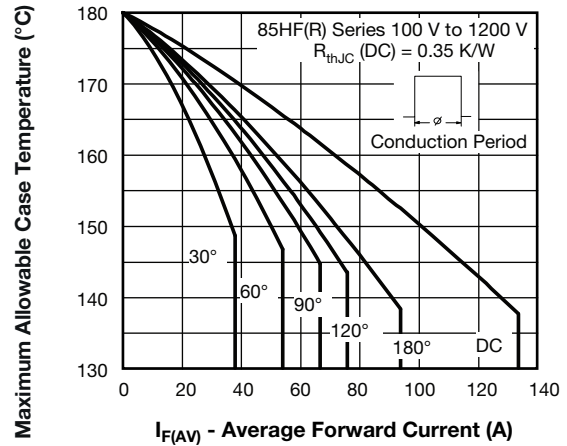


Fig. 2 - Current Ratings Characteristics

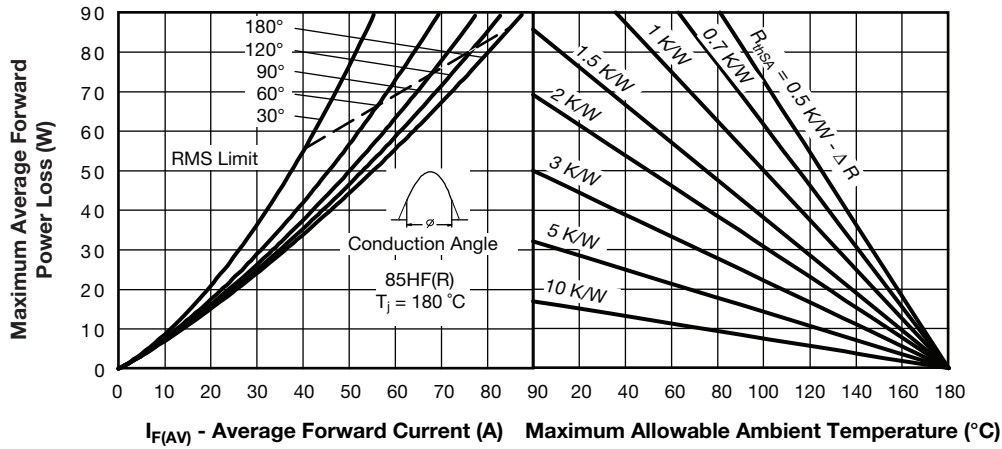


Fig. 3 - Forward Power Loss Characteristics

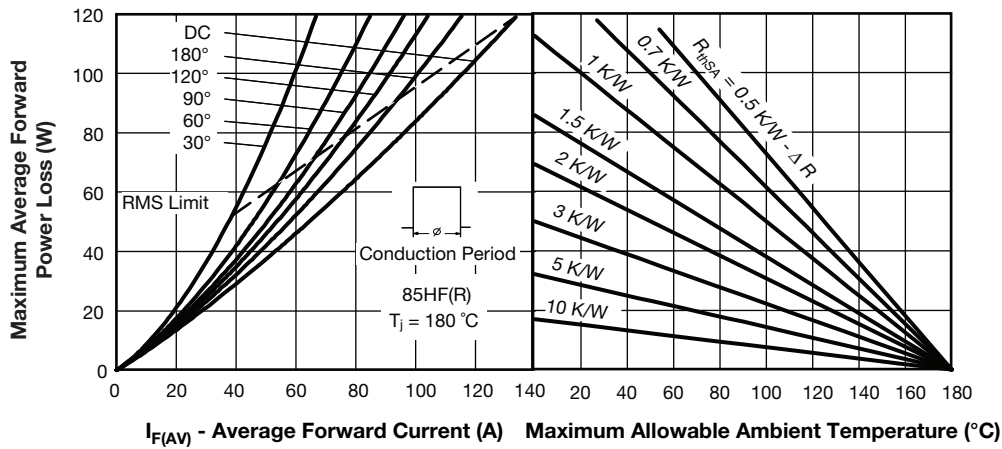


Fig. 4 - Forward Power Loss Characteristics

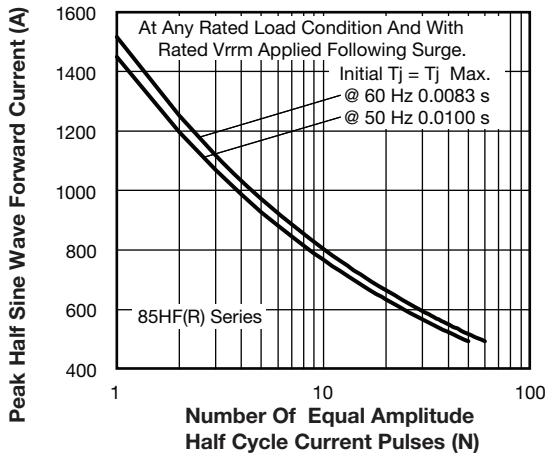


Fig. 5 - Maximum Non-Repetitive Surge Current

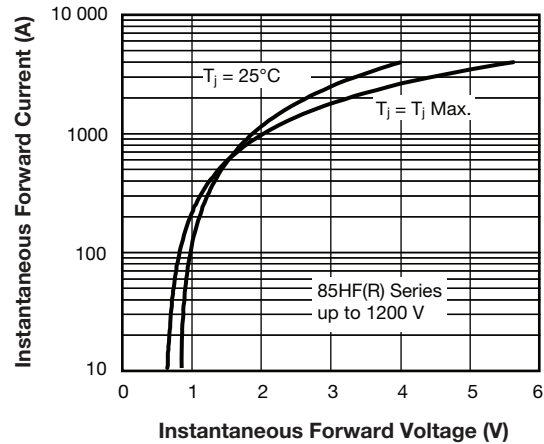


Fig. 7 - Forward Voltage Drop Characteristics

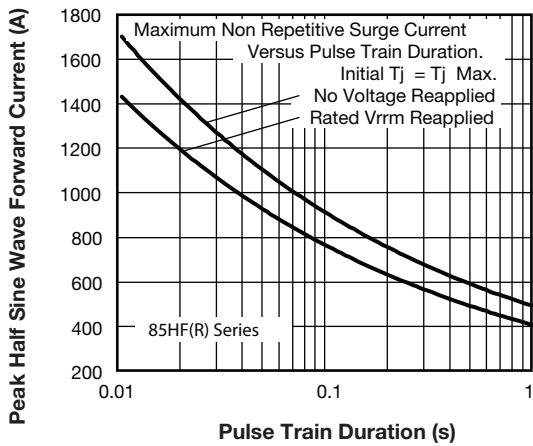


Fig. 6 - Maximum Non-Repetitive Surge Current

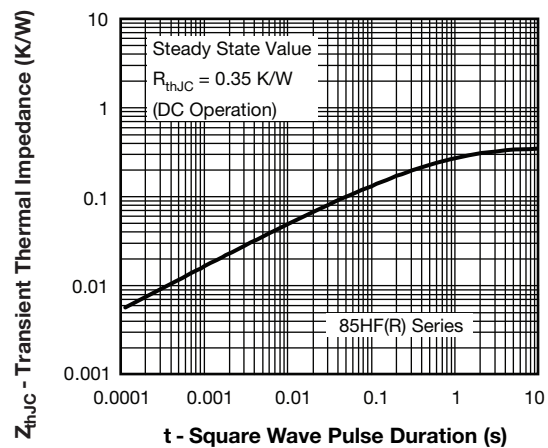


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

**ORDERING INFORMATION TABLE**

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

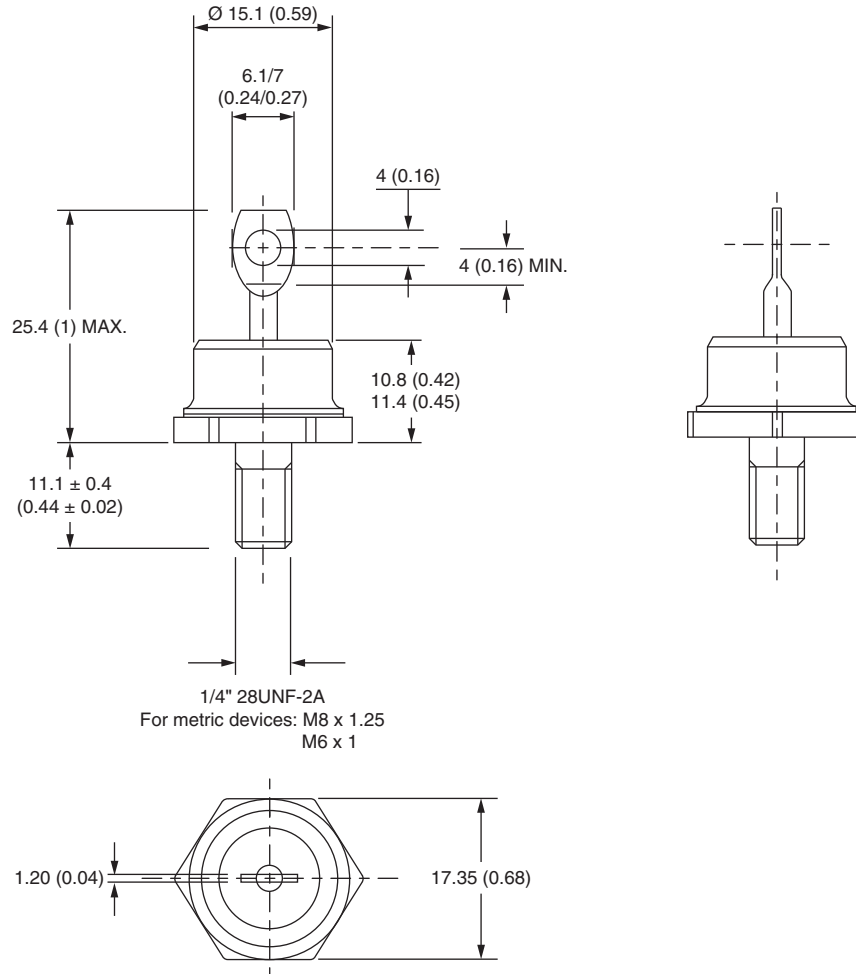
**LINKS TO RELATED DOCUMENTS**

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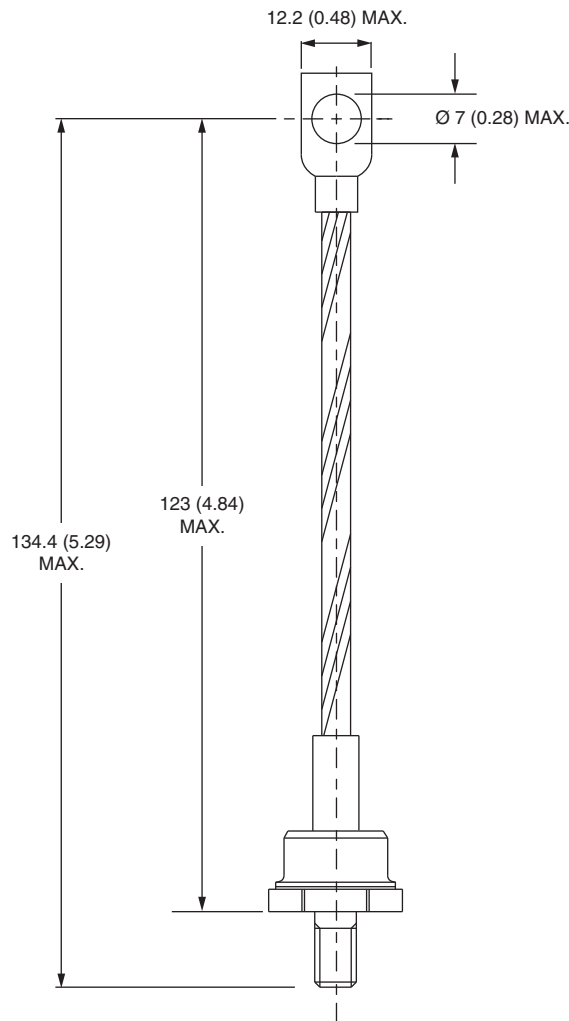
## DO-5 (DO-203AB) for 85HF(R), 86HF(R) and 88HF(R) Series

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



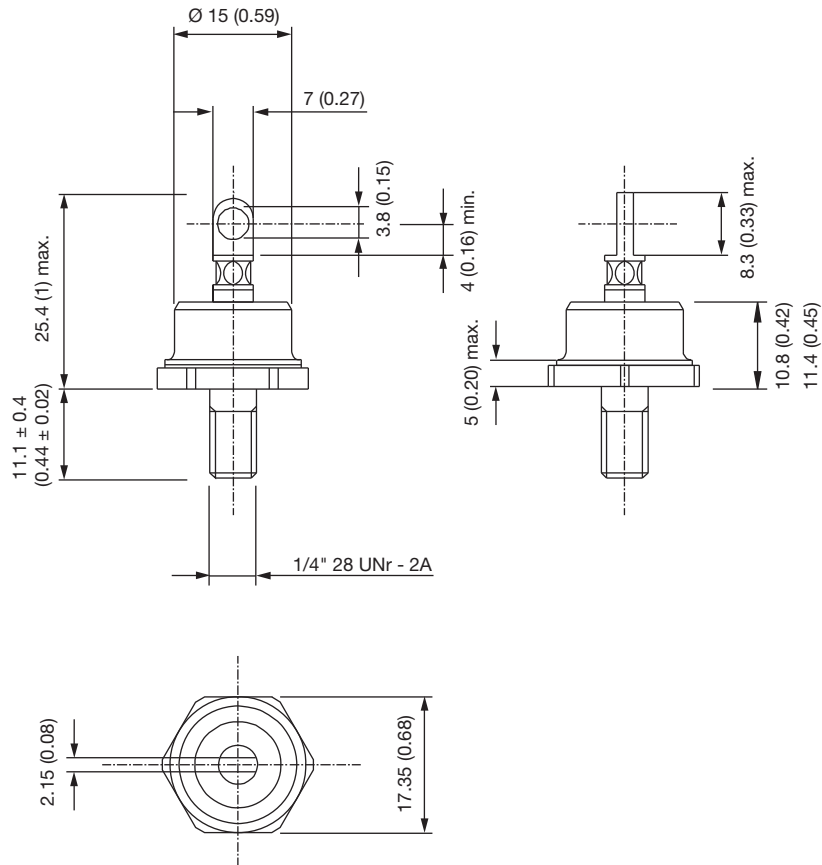


## DIMENSIONS FOR 86HF(R) SERIES in millimeters (inches)





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





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