

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



DO-203AB (DO-5)

### FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V  $V_{RRM}$
- RoHS compliant
- Designed and qualified for industrial level



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRODUCT SUMMARY

$I_{F(AV)}$	85 A
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### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	85HF(R)		UNITS
		10 TO 120	140/160	
$I_{F(AV)}$		85		A
	$T_C$	140	110	°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		
$V_{RRM}$	Range	100 to 1200	1400/1600	V
$T_J$		- 65 to 180	- 65 to 150	°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
85HF(R)	10	100	200	9
	20	200	300	
	40	400	500	
	60	600	700	
	80	800	900	
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	4.5
160	1600	1700		

# 85HF(R) Series



Vishay High Power Products Standard Recovery Diodes,  
(Stud Version), 85 A

FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			85HF(R)		UNITS
					10 to 120	140/160	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			85		A
					140	110	°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 reappplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	1700		A
		t = 8.3 ms			1800		
		t = 10 ms	100 % $V_{RRM}$ reappplied		1450		
		t = 8.3 ms			1500		
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied		14 500		A <sup>2</sup> s
		t = 8.3 ms			13 500		
		t = 10 ms	100 % $V_{RRM}$ reappplied		10 500		
		t = 8.3 ms			9400		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied			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		mΩ
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	1.4	V

THERMAL AND MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS			85HF(R)		UNITS
					10 to 120	140/160	
Maximum junction operating and storage temperature range	$T_J, T_{Stg}$				- 65 to 180	- 65 to 150	°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 <sup>(1)</sup>					1500		g
Maximum constant vibration <sup>(1)</sup>		50 Hz			20		
Maximum constant acceleration <sup>(1)</sup>		Stud outwards			5000		
Allowable mounting torque		Not lubricated threads			3.4 + 0 - 10 % (30)		N · m (lbf · in)
		Lubricated threads			2.3 + 0 - 10 % (20)		
Approximate weight		Unleaded device			17		g
					0.6		oz.
Case style		See dimensions - link at the end of datasheet			DO-203AB (DO-5)		

## Notes

<sup>(1)</sup> Available only for 88HF



$\Delta R_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.10	0.08	T <sub>J</sub> = T <sub>J</sub> 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

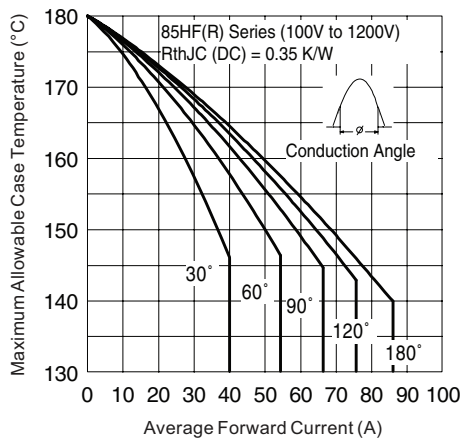


Fig. 1 - Current Ratings Characteristics

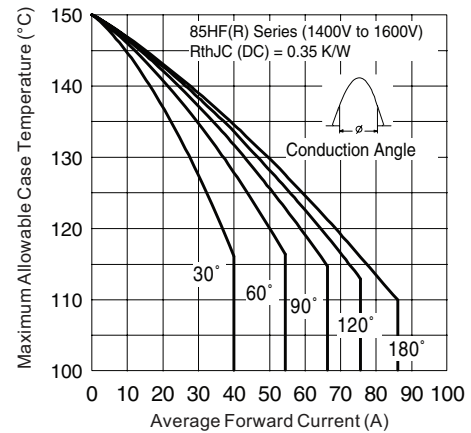


Fig. 3 - Current Ratings Characteristics

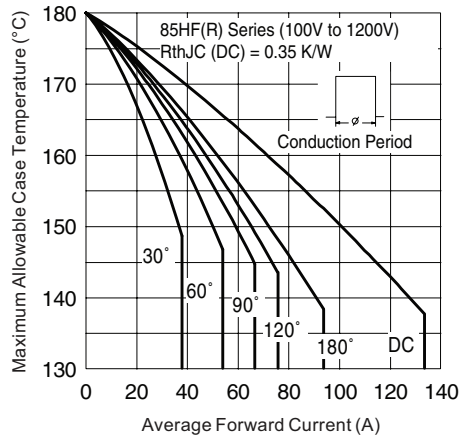


Fig. 2 - Current Ratings Characteristics

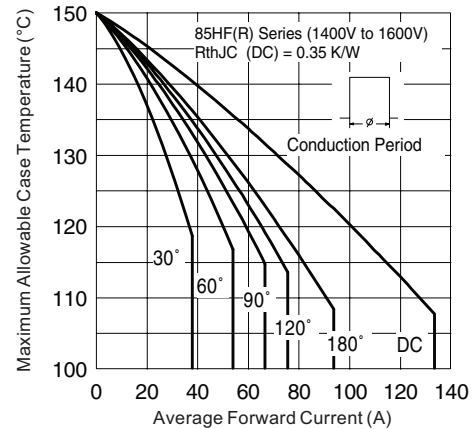


Fig. 4 - Current Ratings Characteristics

# 85HF(R) Series



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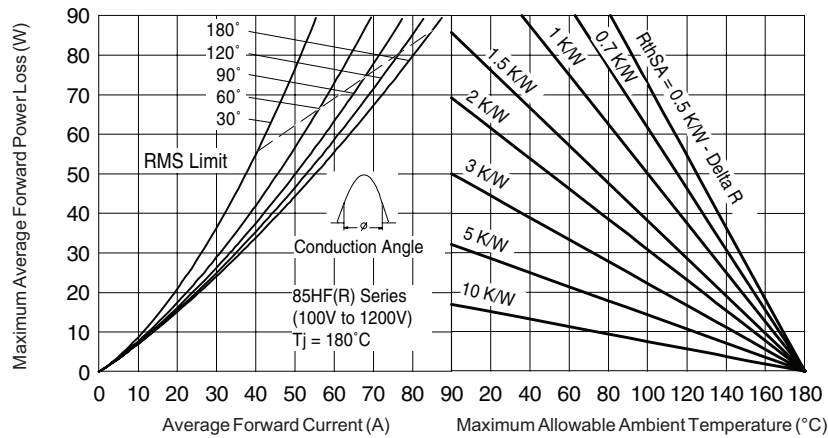


Fig. 5 - Forward Power Loss Characteristics

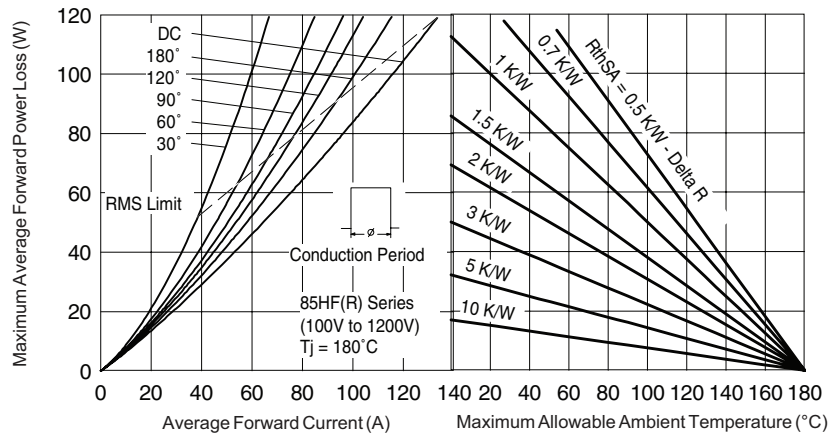


Fig. 6 - Forward Power Loss Characteristics

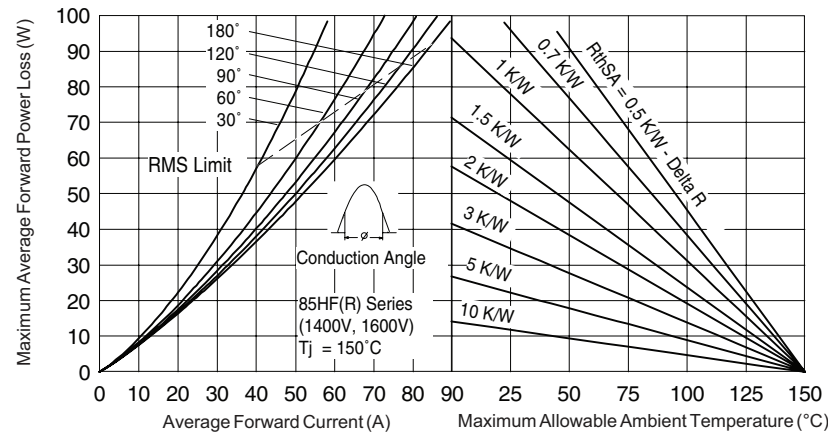


Fig. 7 - Forward Power Loss Characteristics

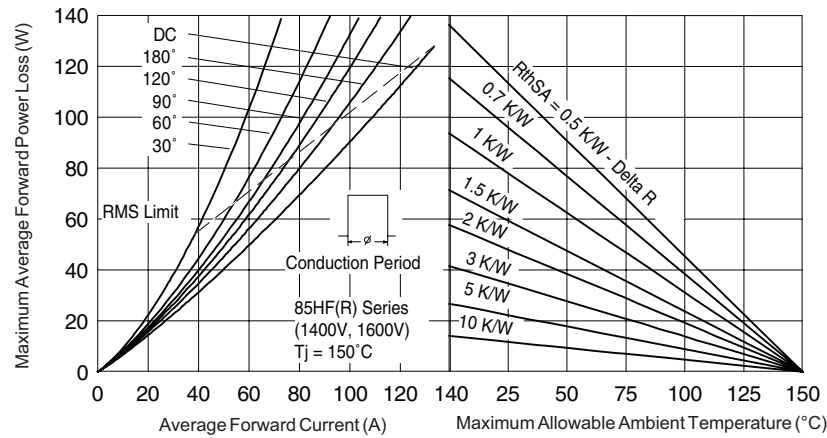


Fig. 8 - Forward Power Loss Characteristics

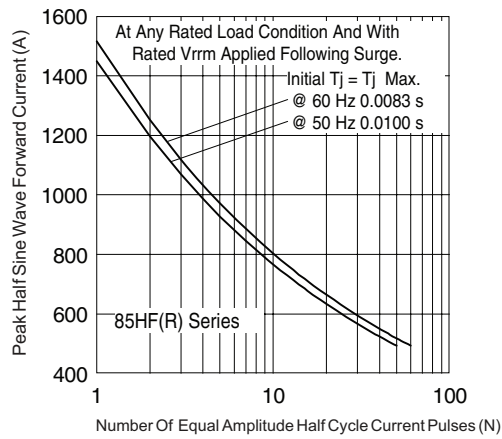


Fig. 9 - Maximum Non-Repetitive Surge Current

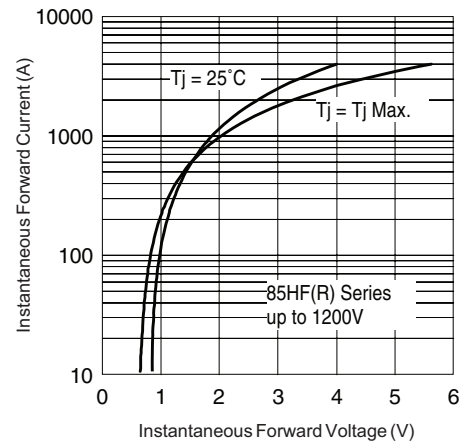


Fig. 11 - Forward Voltage Drop Characteristics (up to 1200 V)

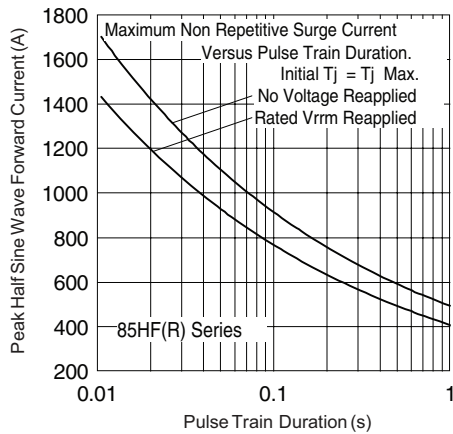


Fig. 10 - Maximum Non-Repetitive Surge Current

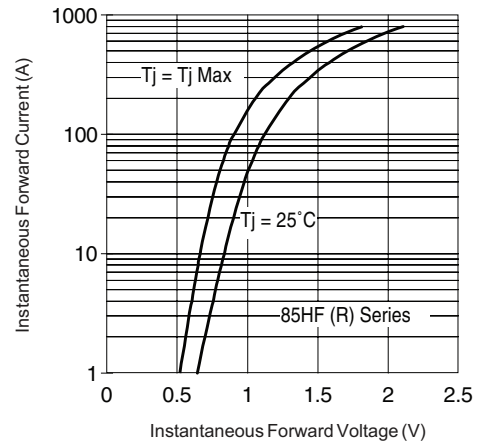


Fig. 12 - Forward Voltage Drop Characteristics (for 1400 V, 1600 V)

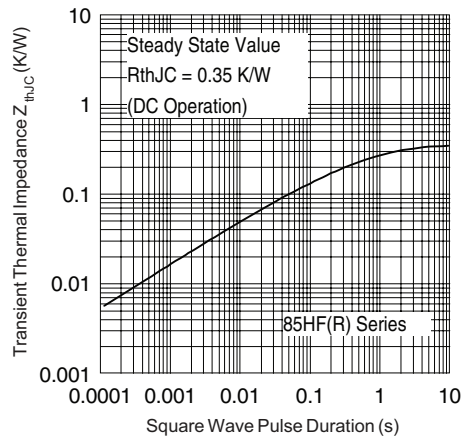


Fig. 13 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

Device code	<b>85</b>	<b>HF</b>	<b>R</b>	<b>160</b>	<b>M</b>
	①	②	③	④	⑤

- 1** - 85 = Standard device  
86 = Not isolated lead  
87 = Isolated lead with silicone sleeve  
(red = Reverse polarity)  
(blue = Normal polarity)  
88 = Type for rotating application
- 2** - HF = Standard diode
- 3** - None = Stud normal polarity (cathode to stud)  
R = Stud reverse polarity (anode to stud)
- 4** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 5** - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A  
M = Stud base DO-203AB (DO-5) M6 x 1 (not available for 88HF)

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95342">http://www.vishay.com/doc?95342</a>



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