

## 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 400 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

### PRODUCT SUMMARY

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

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	85HF(R)	UNITS
		400	
$I_{F(AV)}$		85	A
	$T_C$	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	
$V_{RRM}$	Range	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



<b>FORWARD CONDUCTION</b>					
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	Sinusoidal half wave, initial $T_J = T_J$ maximum	A
		t = 8.3 ms			
		t = 10 ms	100 % $V_{RRM}$ reapplied		
		t = 8.3 ms			
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied		A <sup>2</sup> s
		t = 8.3 ms			
		t = 10 ms	100 % $V_{RRM}$ reapplied		
		t = 8.3 ms			
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

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>				
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 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-203AB (DO-5)	

<b><math>\Delta R_{thJC}</math> CONDUCTION</b>				
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

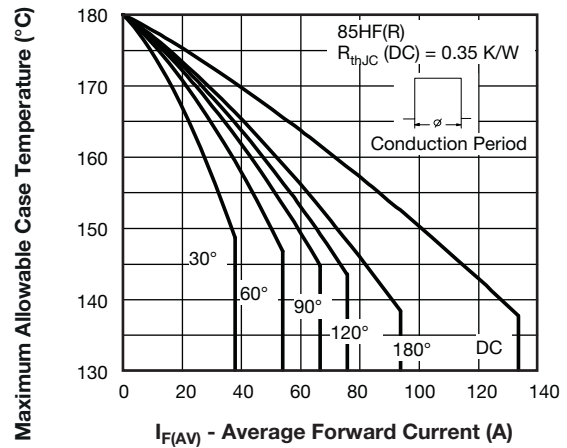


Fig. 2 - Current Ratings Characteristics



Fig. 3 - Forward Power Loss Characteristics

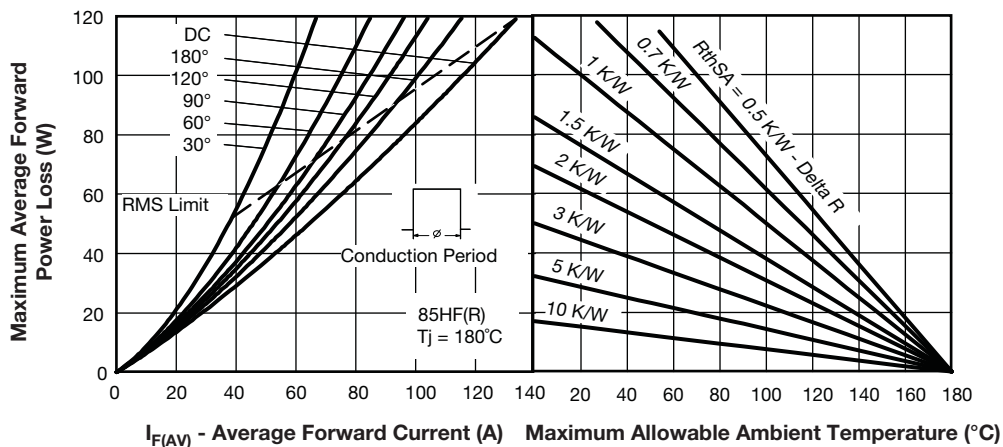


Fig. 4 - Forward Power Loss Characteristics



Fig. 5 - Maximum Non-Repetitive Surge Current



Fig. 7 - Forward Voltage Drop Characteristics

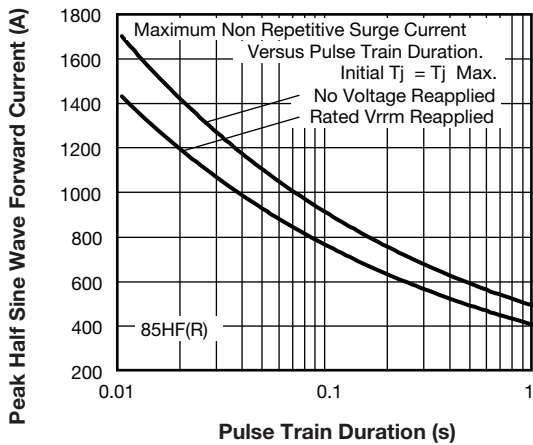


Fig. 6 - Maximum Non-Repetitive Surge Current



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

- 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 x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** - M8 = Stud base DO-203AB (DO-5) 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-203AB (DO-5) for 85HF(R) Series

**DIMENSIONS** in millimeters (inches)





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