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**VS-85HF(R)40M8**

Vishay Semiconductors

## 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


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# VS-85HF(R)40M8

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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
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)
		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)

$\Delta R_{thJC}$ 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



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## VS-85HF(R)40M8

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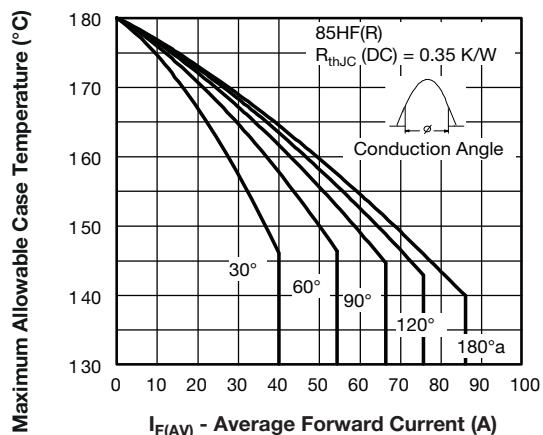


Fig. 1 - Current Ratings Characteristics

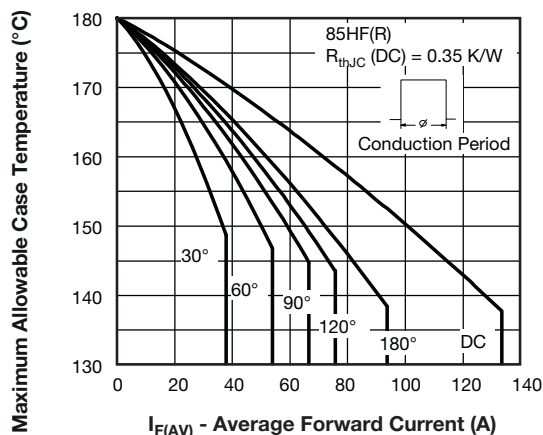


Fig. 2 - Current Ratings Characteristics

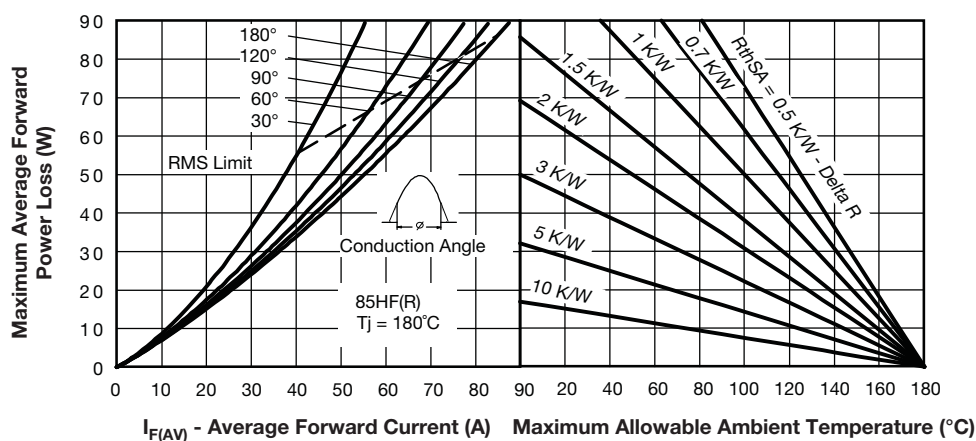


Fig. 3 - Forward Power Loss Characteristics

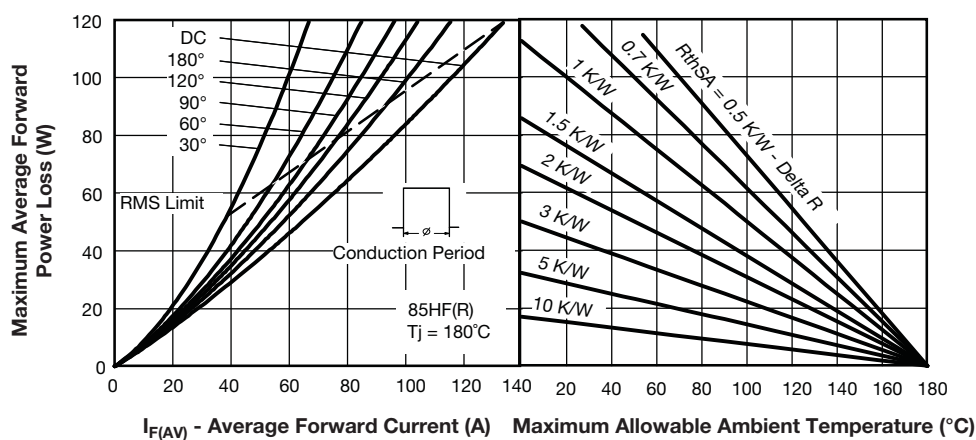


Fig. 4 - Forward Power Loss Characteristics



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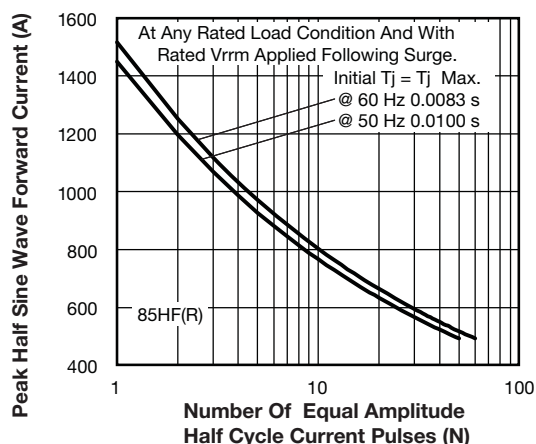


Fig. 5 - Maximum Non-Repetitive Surge Current

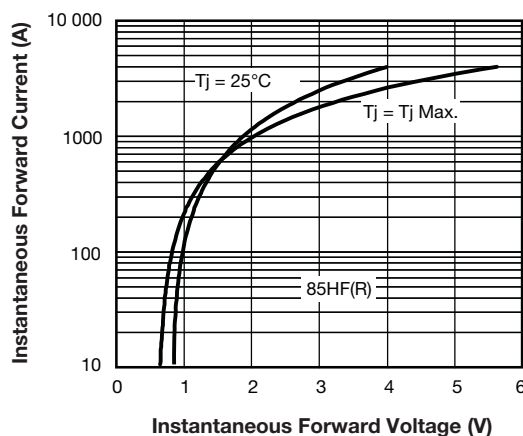


Fig. 7 - Forward Voltage Drop Characteristics

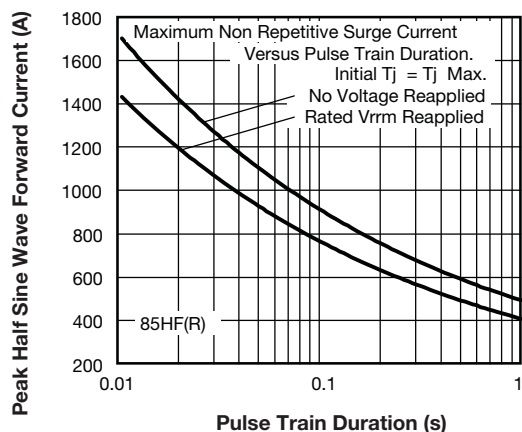


Fig. 6 - Maximum Non-Repetitive Surge Current

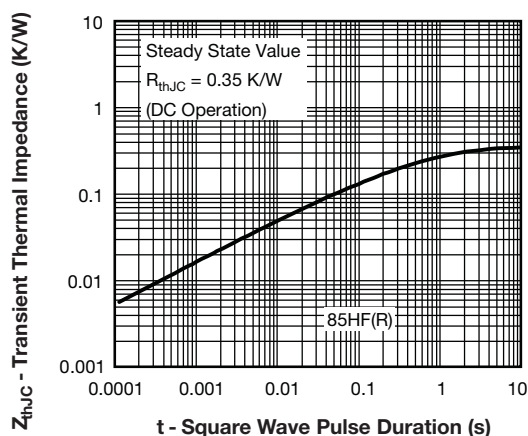


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

### ORDERING INFORMATION TABLE

Device code

VS-	85	HF	R	40	M8
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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  $\times 10 = V_{RRM}$  (see Voltage Ratings table)
- 6** - M8 = Stud base DO-203AB (DO-5) 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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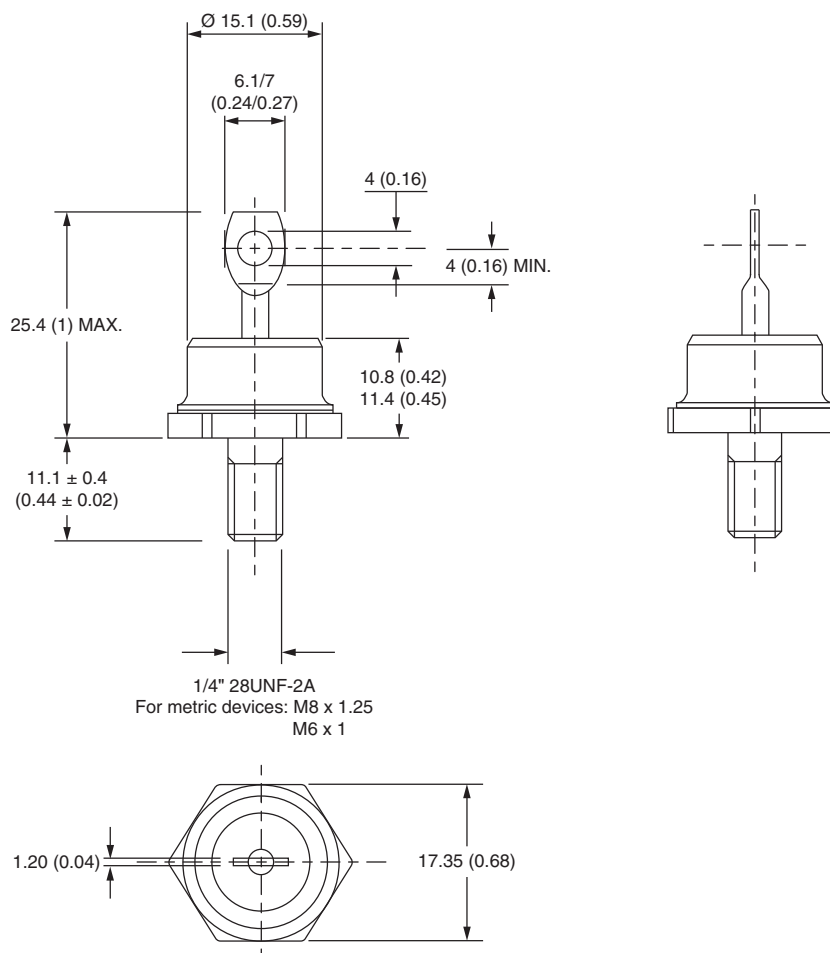
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## Outline Dimensions

Vishay Semiconductors

### DO-203AB (DO-5) for 85HF(R) Series

**DIMENSIONS** in millimeters (inches)





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