

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


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 ² 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		100 % V_{RRM} reapplied	
		t = 10 ms	Sinusoidal half wave, initial $T_J = T_J$ maximum		
		t = 8.3 ms		1500	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied	14 500	A ² s
		t = 8.3 ms		100 % V_{RRM} reapplied	
		t = 10 ms	Sinusoidal half wave, initial $T_J = T_J$ maximum		
		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 ² √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)	

ΔR_{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

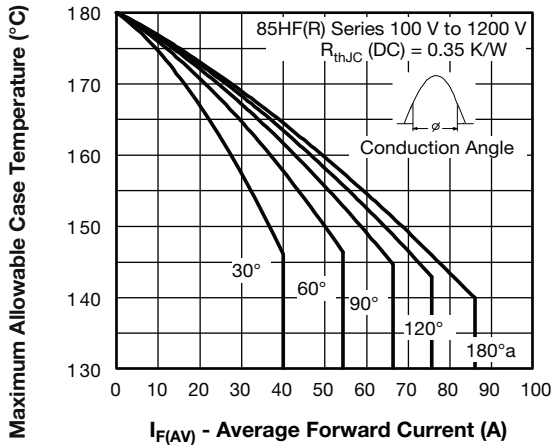


Fig. 1 - Current Ratings Characteristics

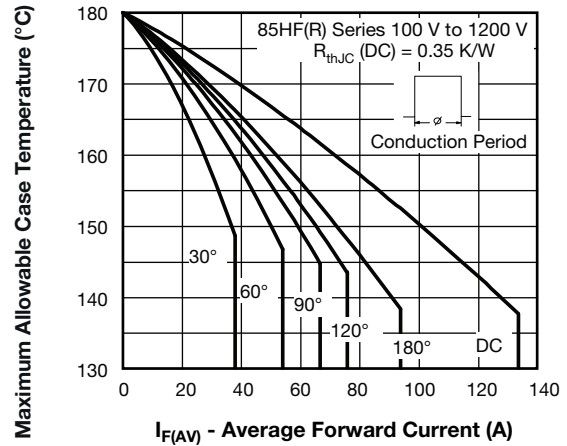


Fig. 2 - Current Ratings Characteristics

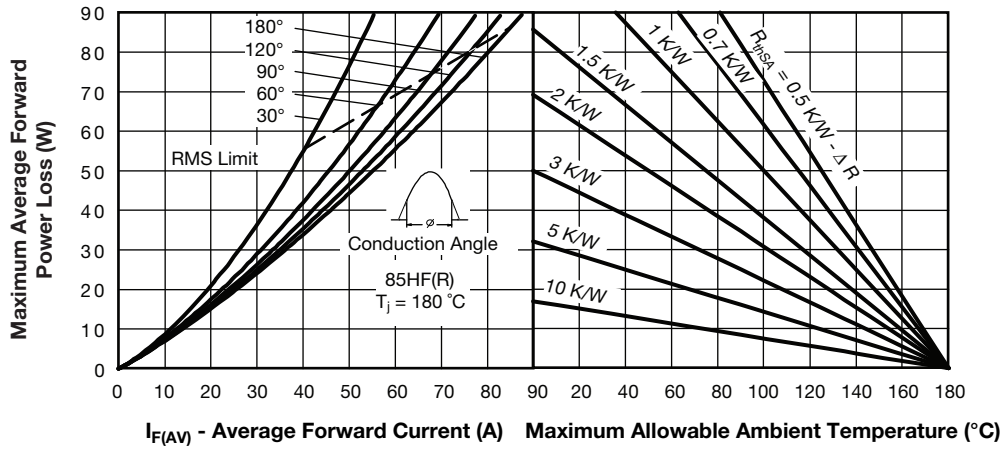


Fig. 3 - Forward Power Loss Characteristics

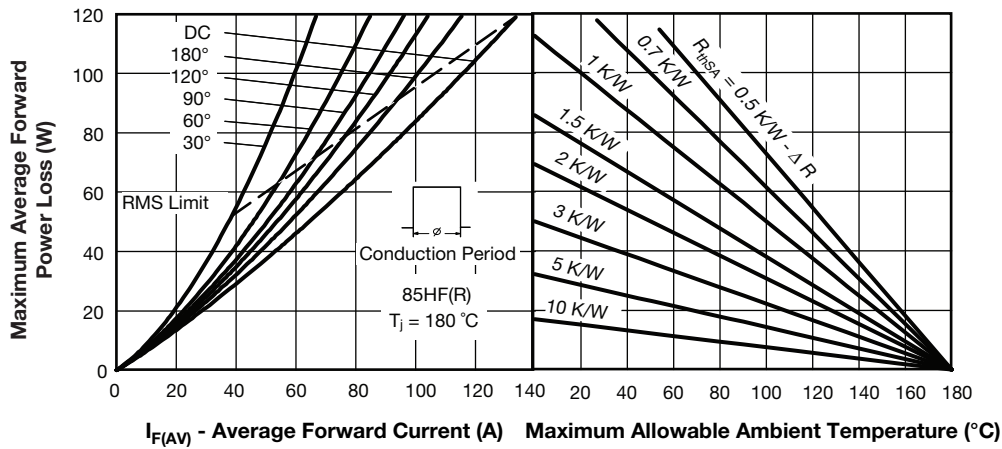


Fig. 4 - Forward Power Loss Characteristics

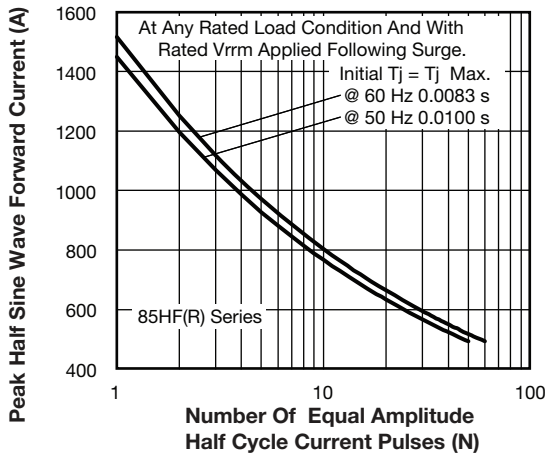


Fig. 5 - Maximum Non-Repetitive Surge Current

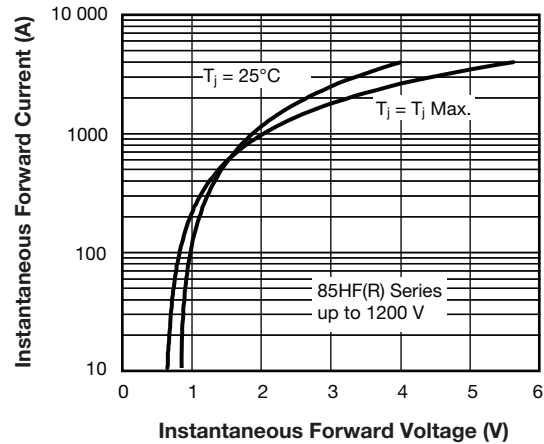


Fig. 7 - Forward Voltage Drop Characteristics

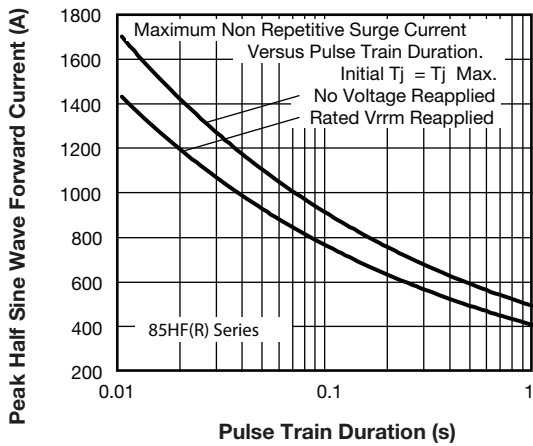


Fig. 6 - Maximum Non-Repetitive Surge Current

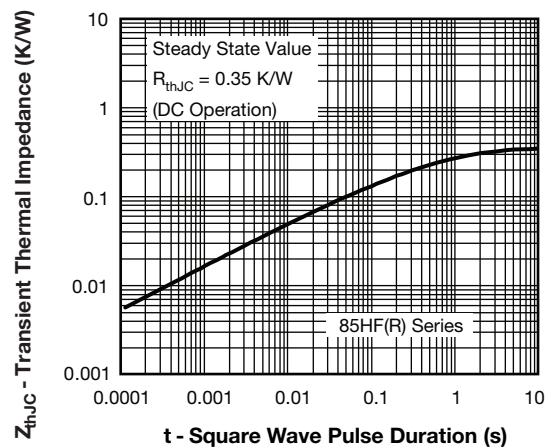


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	85	HF	R	40	M8
	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-5 (DO-203AB) M8 x 1.25			

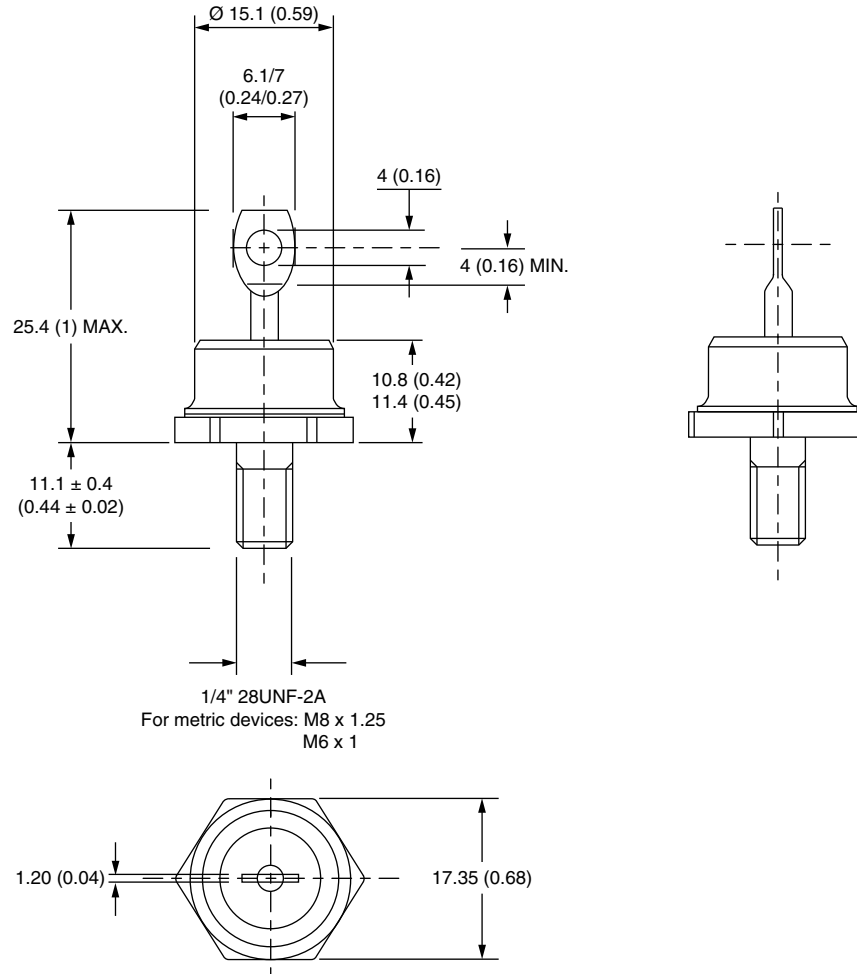
LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95342
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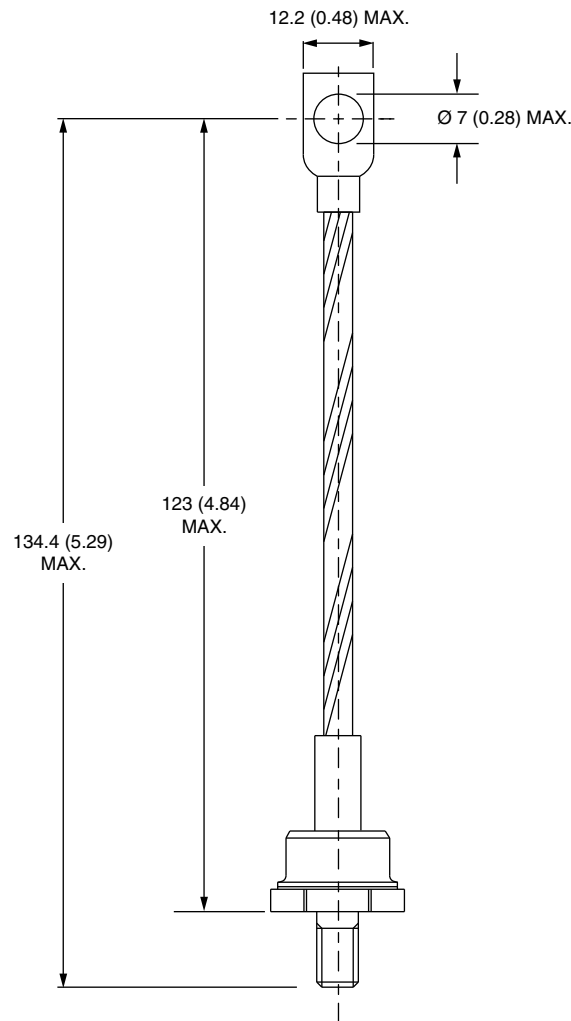
DO-203AB (DO-5) for 85HF(R) and 86HF(R) Series

DIMENSIONS in millimeters (inches)





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





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