

## Standard Recovery Diodes (Stud Version), 70 A



DO-203AB (DO-5)

### FEATURES

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V  $V_{RRM}$
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- Battery charges

### PRODUCT SUMMARY

$I_{F(AV)}$	70 A
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### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	70HF(R)		UNITS
		10 TO 120	140/160	
I <sub>F(AV)</sub>		70	70	A
	T <sub>C</sub>	140	110	°C
I <sub>F(RMS)</sub>		110		A
I <sub>FSM</sub>	50 Hz	1200		A
	60 Hz	1250		
I <sup>2</sup> <sub>t</sub>	50 Hz	7100		A <sup>2</sup> s
	60 Hz	6450		
V <sub>RRM</sub>	Range	100 to 1200	1400/1600	V
T <sub>J</sub>		- 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	$V_{R(BR)}$ , MINIMUM AVALANCHE VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM mA
70HF(R)	10	100	200	200	15
	20	200	300	300	
	40	400	500	500	
	60	600	720	725	9
	80	800	960	950	
	100	1000	1200	1150	
	120	1200	1440	1350	4.5
	140	1400	1650	1550	
	160	1600	1900	1750	

FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			70HF(R)		UNITS
					10 TO 120	140/160	
Maximum average forward current at case temperature	I <sub>F(AV)</sub>	180° conduction, half sine wave			70		A
					140	110	°C
Maximum RMS forward current	I <sub>F(RMS)</sub>				110		A
Maximum peak, one cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reappplied	Sinusoidal half wave, initial T <sub>J</sub> = T <sub>J</sub> maximum	1200		A
		t = 8.3 ms			1250		
		t = 10 ms	100 % V <sub>RRM</sub> reappplied		1000		
		t = 8.3 ms			1050		
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reappplied		7100		A <sup>2</sup> s
		t = 8.3 ms			6450		
		t = 10 ms	100 % V <sub>RRM</sub> reappplied		5000		
		t = 8.3 ms			4550		
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reappplied			71 000		A <sup>2</sup> √s
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % x π x I <sub>F(AV)</sub> ) < I < π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.79		V
High level value of threshold voltage	V <sub>F(TO)2</sub>	(I > π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			1.00		
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % x π x I <sub>F(AV)</sub> ) < I < π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			2.33		mΩ
High level value of forward slope resistance	r <sub>f2</sub>	(I > π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			1.53		
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 220 A, T <sub>J</sub> = 25 °C, t <sub>p</sub> = 400 μs rectangular wave			1.35	1.46	V

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS			UNITS
			70HF(R)		
			10 TO 120	140/160	
Maximum junction 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	0.45		K/W
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 <sup>(1)</sup>	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tightening on nut <sup>(1)</sup>	2.3 (20)		
		Not lubricated thread, tightening on hexagon <sup>(2)</sup>	4.2 (37)		
		Lubricated thread, tightening on hexagon <sup>(2)</sup>	3.2 (28)		
Approximate weight			17		g
			0.6		oz.
Case style		See dimensions - link at the end of datasheet	DO-203AB (DO-5)		

**Notes**

(1) Recommended for pass-through holes

(2) Recommended for holed threaded heatsinks

$\Delta R_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.08	0.06	$T_J = T_J \text{ maximum}$	K/W
120°	0.10	0.11		
90°	0.13	0.14		
60°	0.19	0.20		
30°	0.30	0.30		

**Note**

- The table above shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

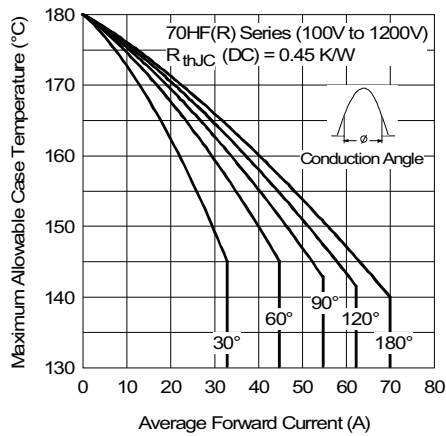


Fig. 1 - Current Ratings Characteristics

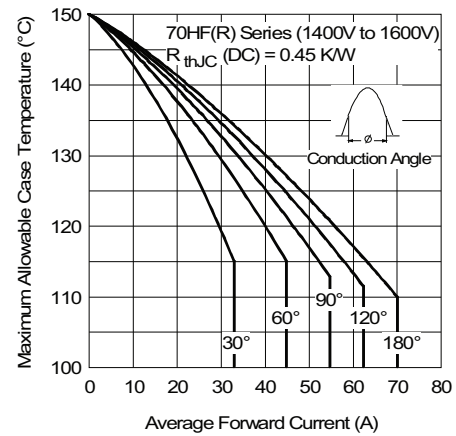


Fig. 3 - Current Ratings Characteristics

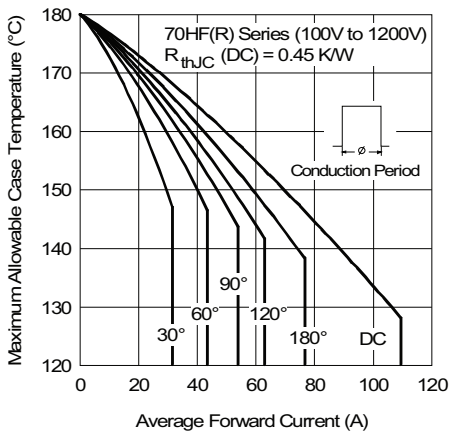


Fig. 2 - Current Ratings Characteristics

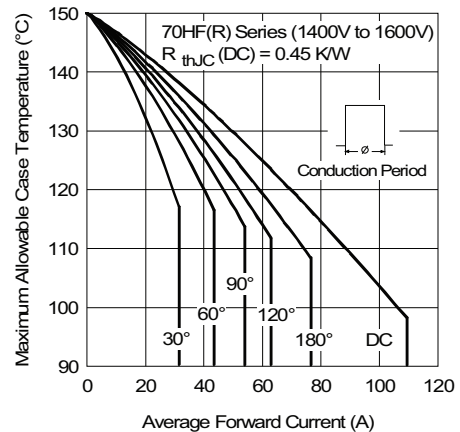


Fig. 4 - Current Ratings Characteristics

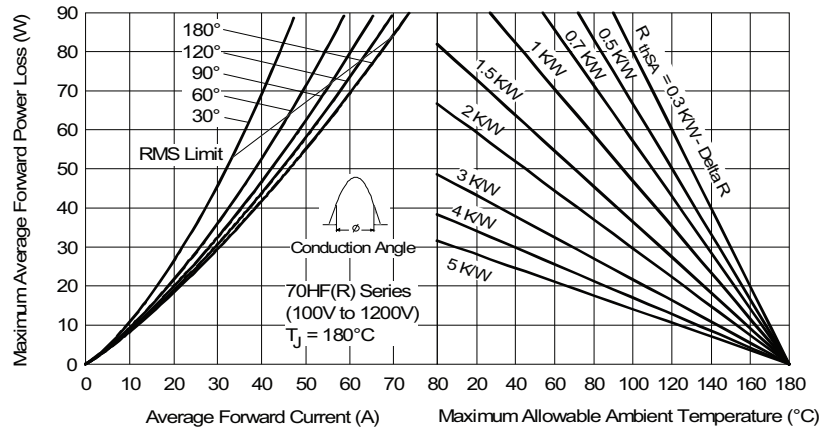


Fig. 5 - Forward Power Loss Characteristics

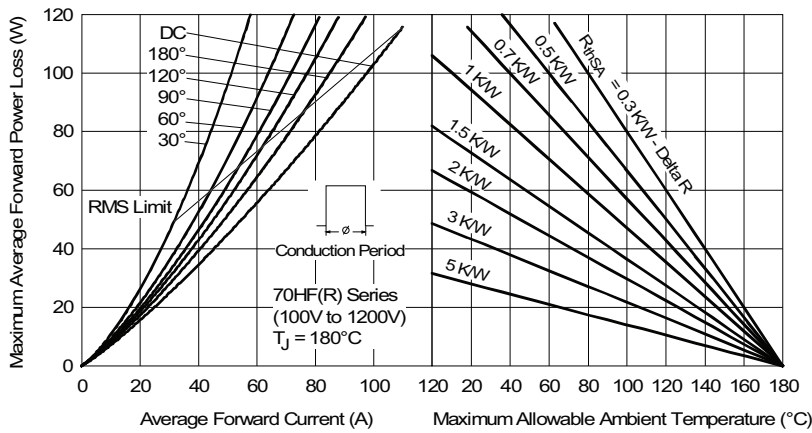


Fig. 6 - Forward Power Loss Characteristics

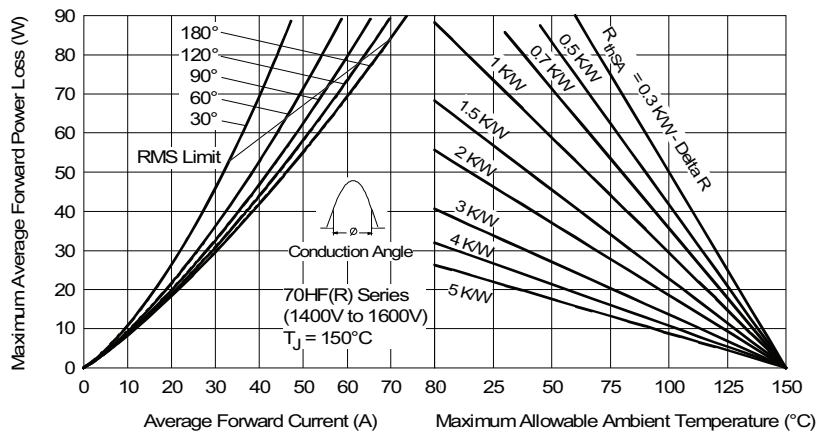


Fig. 7 - Forward Power Loss Characteristics

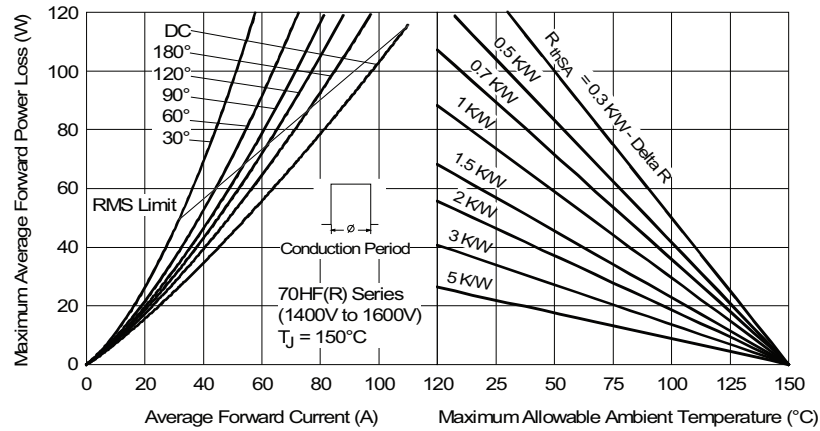


Fig. 8 - Forward Power Loss Characteristics

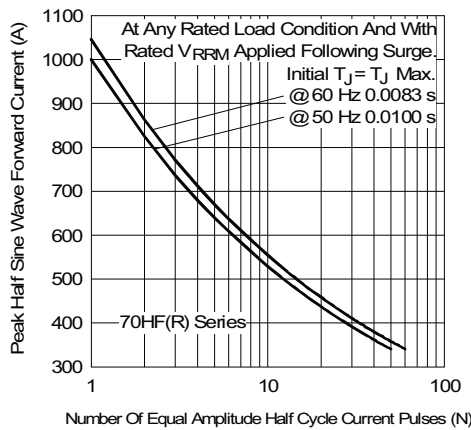


Fig. 9 - Maximum Non-Repetitive Surge Current

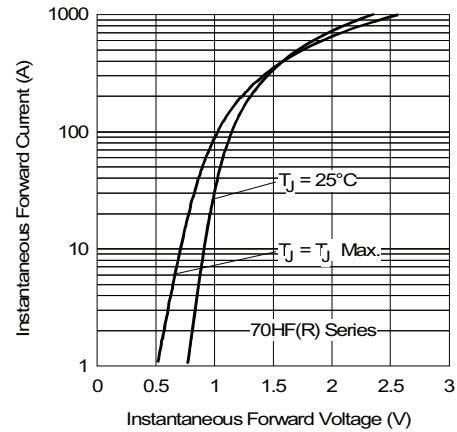


Fig. 11 - Forward Voltage Drop Characteristics

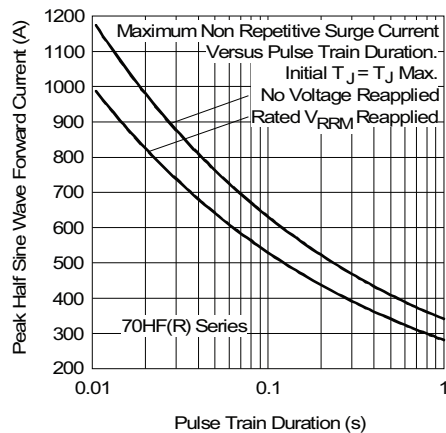


Fig. 10 - Maximum Non-Repetitive Surge Current

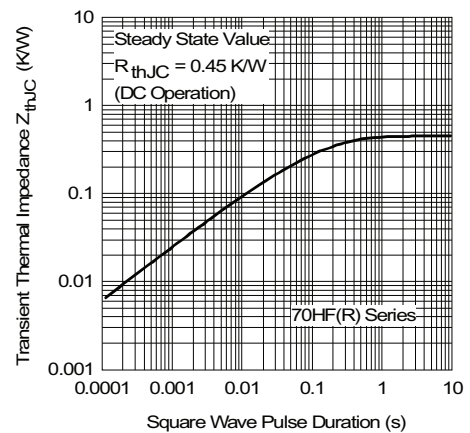


Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics

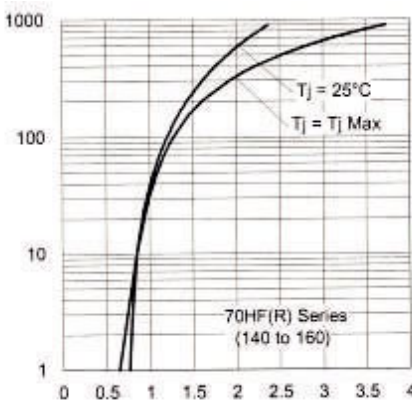


Fig. 13 - Forward Voltage Drop Characteristics

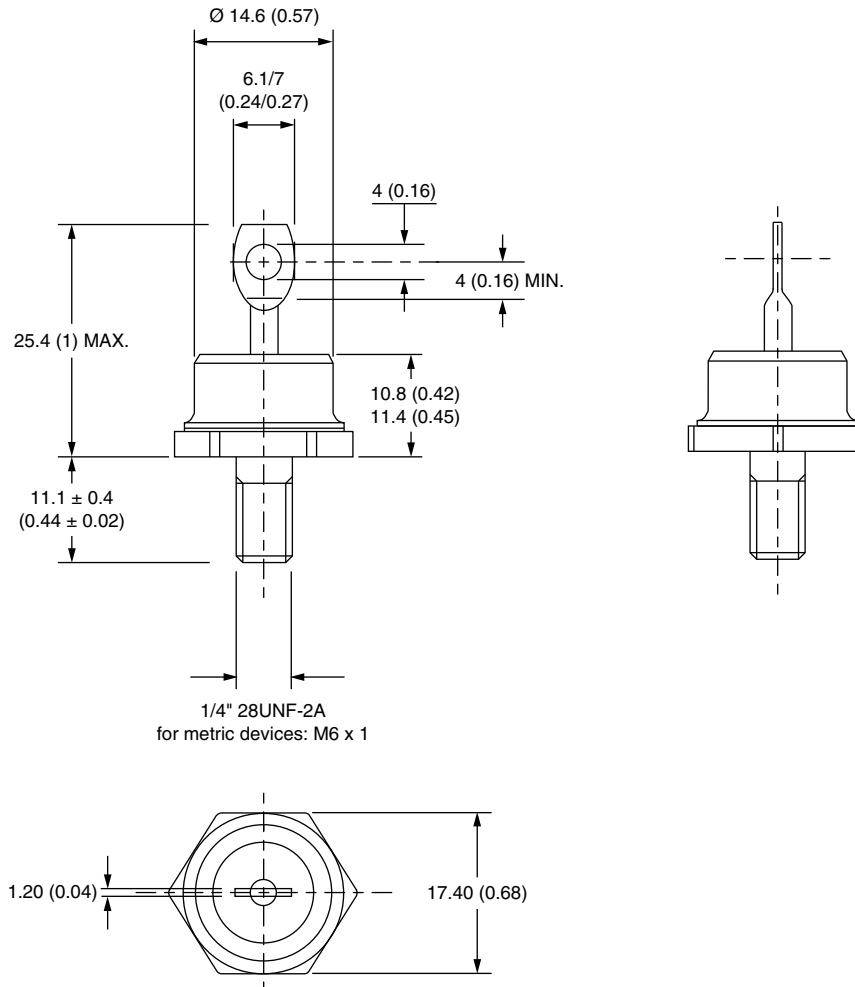
ORDERING INFORMATION TABLE

Device code	70	HF	R	160	M
	①	②	③	④	⑤
①	- 70 = Standard device 71 = Not isolated lead 72 = Isolated lead with silicone sleeve (red = Reverse polarity) (blue = Normal polarity)				
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				

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95343">www.vishay.com/doc?95343</a>

## DO-203AB (DO-5) for 70HF(R) and 71HF(R) Series

### DIMENSIONS FOR 70HF(R) SERIES in millimeters (inches)



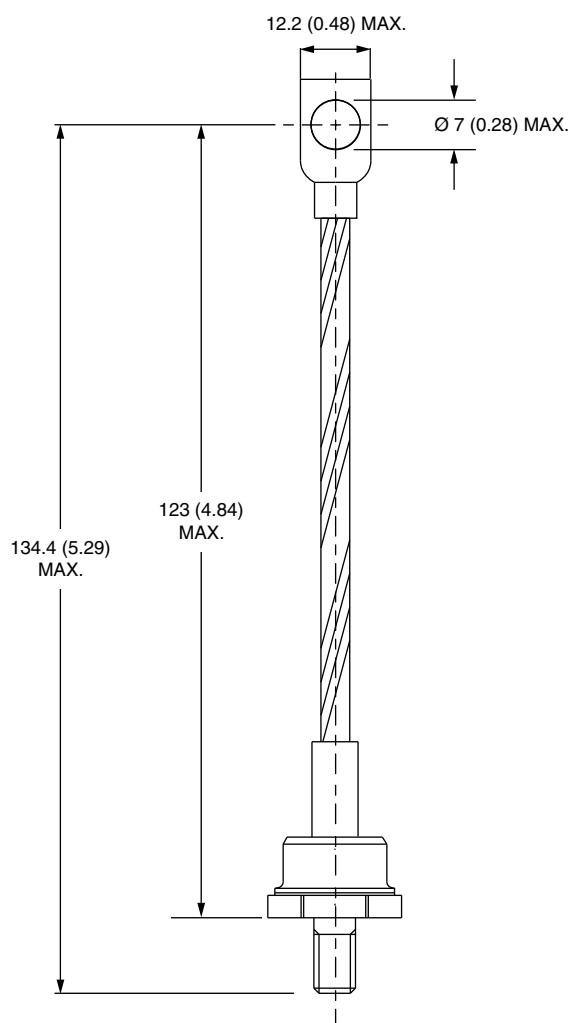
# Outline Dimensions

Vishay Semiconductors

DO-203AB (DO-5) for 70HF(R)  
and 71HF(R) Series



## **DIMENSIONS FOR 71HF(R) SERIES** in millimeters (inches)







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