

## 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

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	70HF(R)		UNITS
		10 TO 120	140/160	
$I_{F(AV)}$		70	70	A
	$T_C$	140	110	°C
$I_{F(RMS)}$		110		A
$I_{FSM}$	50 Hz	1200		A
	60 Hz	1250		
$I^2t$	50 Hz	7100		A <sup>2</sup> s
	60 Hz	6450		
$V_{RRM}$	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	$V_{R(BR)}$ , 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	
	140	1400	1650	1550	4.5
160	1600	1900	1750		

# 70HF(R) Series



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

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		70HF(R)		UNITS
				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

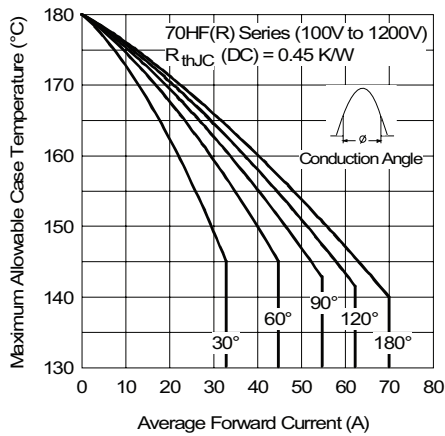


Fig. 1 - Current Ratings Characteristics

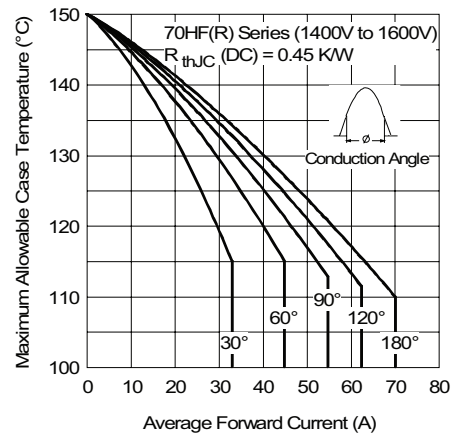


Fig. 3 - Current Ratings Characteristics

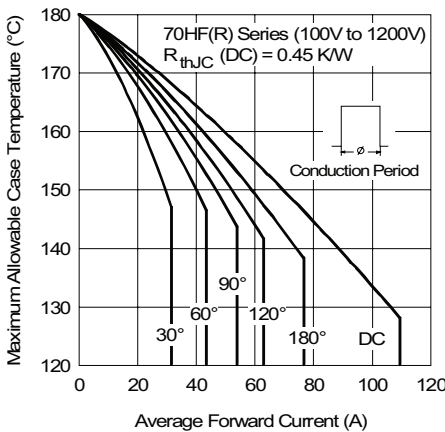


Fig. 2 - Current Ratings Characteristics

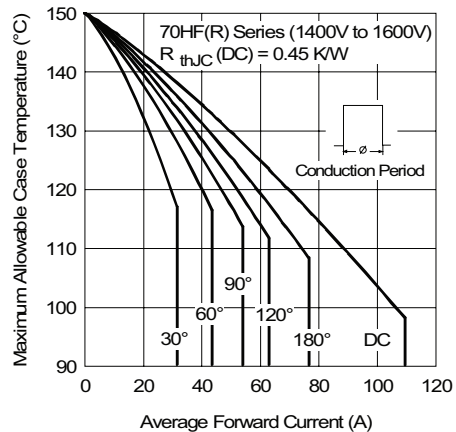


Fig. 4 - Current Ratings Characteristics

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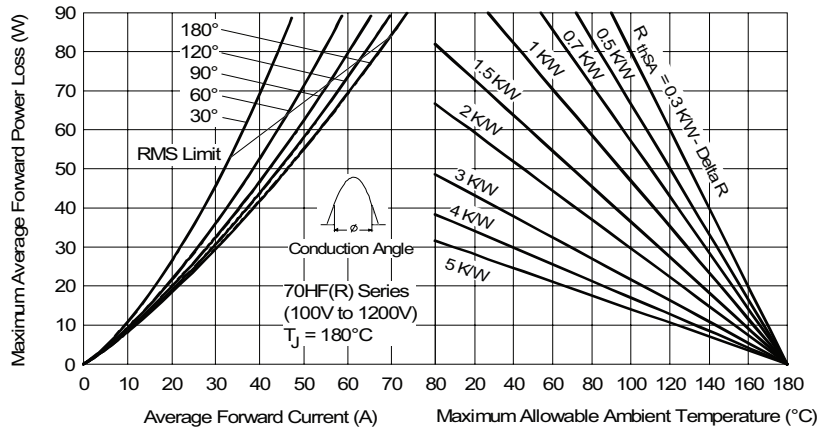


Fig. 5 - Forward Power Loss Characteristics

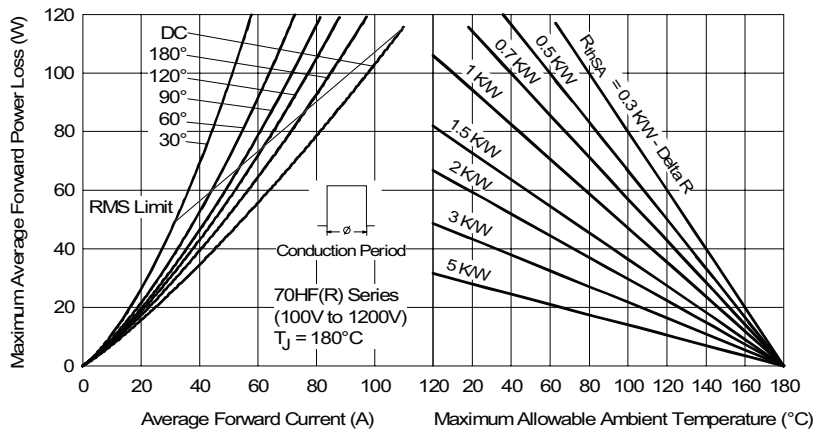


Fig. 6 - Forward Power Loss Characteristics

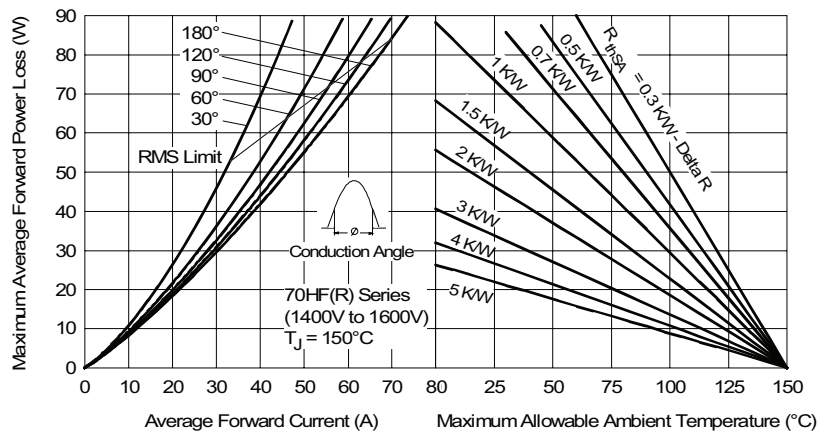


Fig. 7 - Forward Power Loss Characteristics

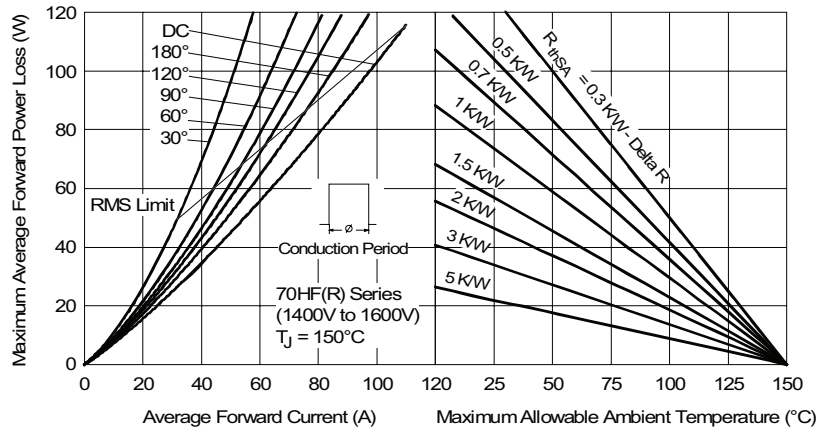


Fig. 8 - Forward Power Loss Characteristics

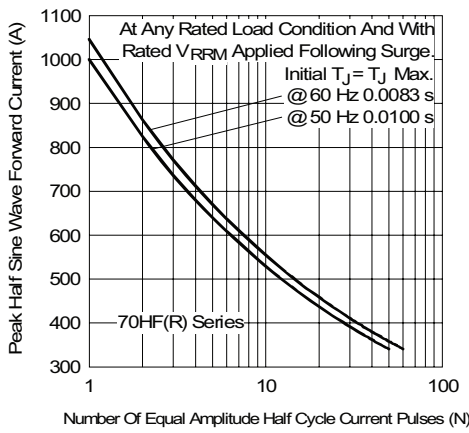


Fig. 9 - Maximum Non-Repetitive Surge Current

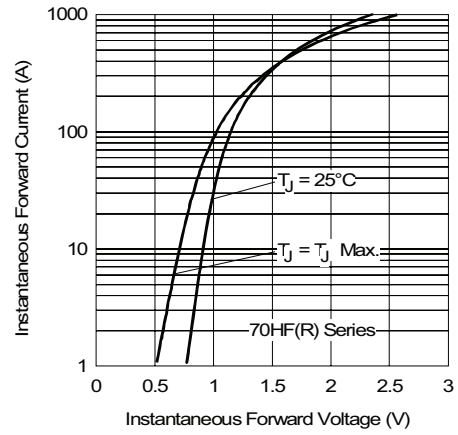


Fig. 11 - Forward Voltage Drop Characteristics

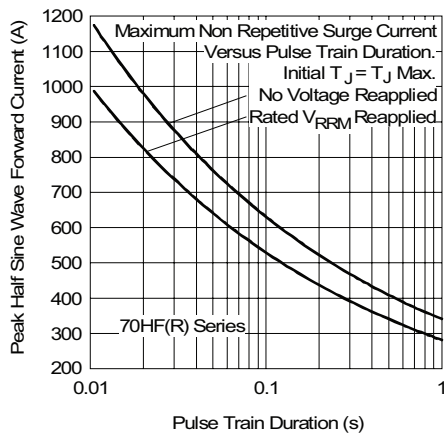


Fig. 10 - Maximum Non-Repetitive Surge Current

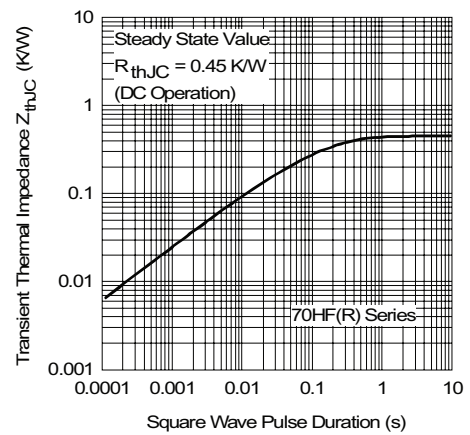


Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics

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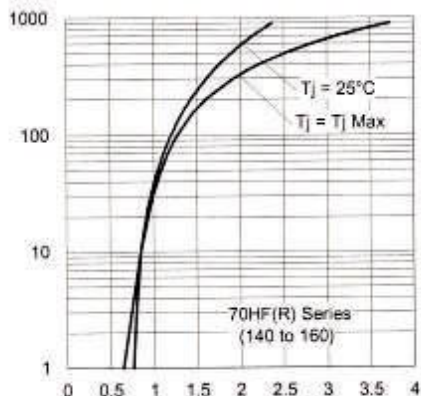


Fig. 13 - Forward Voltage Drop Characteristics

## ORDERING INFORMATION TABLE

Device code	<b>70</b>	<b>HF</b>	<b>R</b>	<b>160</b>	<b>M</b>
	①	②	③	④	⑤
<b>1</b>	- 70 = Standard device 71 = Not isolated lead 72 = Isolated lead with silicone sleeve (red = Reverse polarity) (blue = Normal polarity)				
<b>2</b>	- HF = Standard diode				
<b>3</b>	- • None = Stud normal polarity (cathode to stud) • R = Stud reverse polarity (anode to stud)				
<b>4</b>	- Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)				
<b>5</b>	- • 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>
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