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}
- RoHS compliant
- 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^2s
	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	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			70HF(R) 10 TO 120	70HF(R) 140/160	UNITS
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 reapplied	Sinusoidal half wave, initial T_J = T_J maximum	1200		A
		t = 8.3 ms			1250		
		t = 10 ms	100 % V_{RRM} reapplied		1000		
		t = 8.3 ms			1050		
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		7100		A^2s
		t = 8.3 ms			6450		
		t = 10 ms	100 % V_{RRM} reapplied		5000		
		t = 8.3 ms			4550		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			71 000		$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J maximum			0.79		V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), T_J = T_J maximum			1.00		
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J maximum			2.33		mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), 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) 10 TO 120	70HF(R) 140/160	UNITS
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		
Allowable mounting torque		Not lubricated threads	$3.4^{+0-10\ \%}$ (30)		N · m (lbf · in)
		Lubricated threads	$2.3^{+0-10\ \%}$ (20)		
Approximate weight			17		g
			0.6		oz.
Case style		See dimensions - link at the end of datasheet	DO-203AB (DO-5)		

ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.08	0.06	$T_J = T_J$ 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

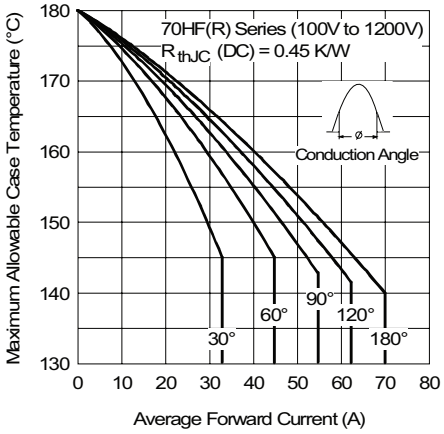

Fig. 1 - Current Ratings Characteristics

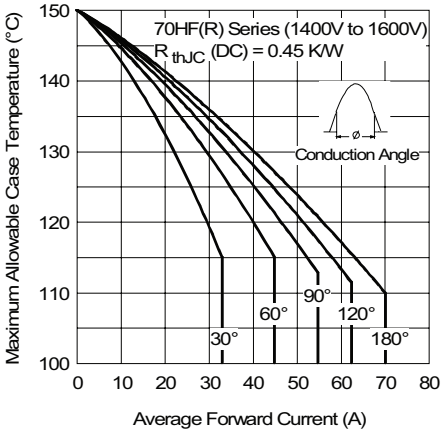

Fig. 3 - Current Ratings Characteristics

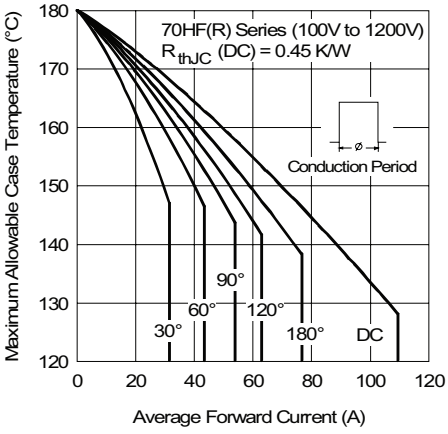

Fig. 2 - Current Ratings Characteristics

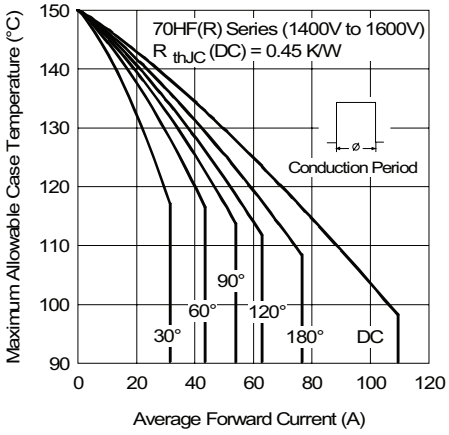

Fig. 4 - Current Ratings Characteristics

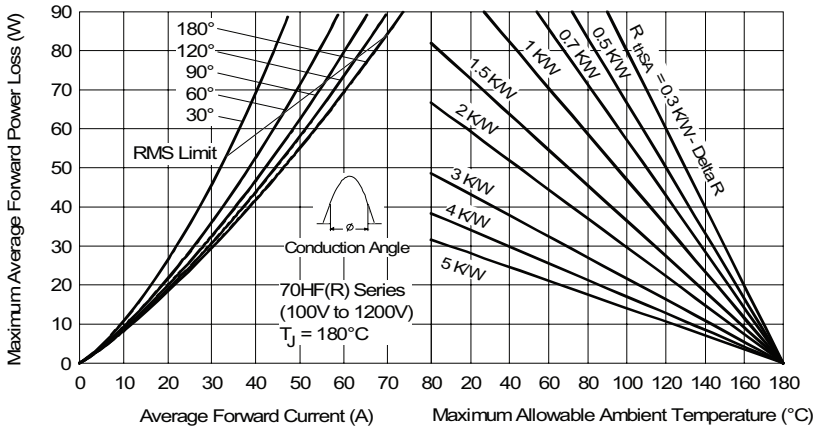

Fig. 5 - Forward Power Loss Characteristics

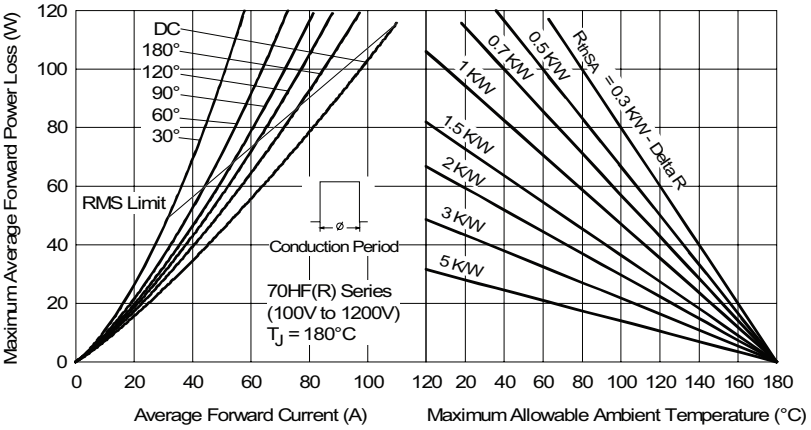

Fig. 6 - Forward Power Loss Characteristics

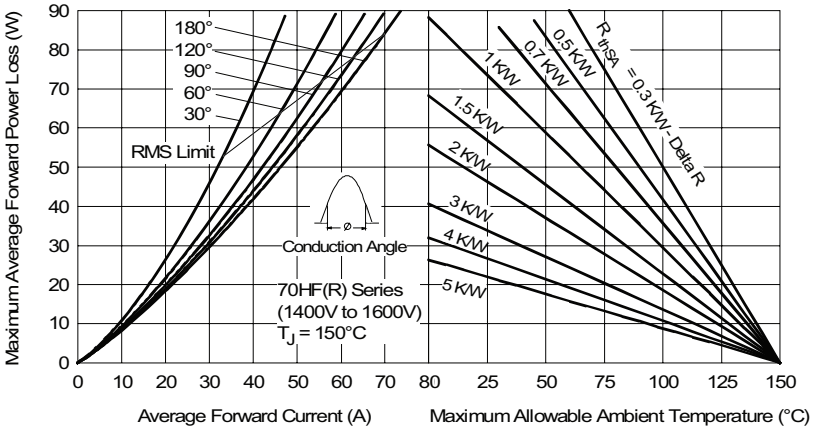

Fig. 7 - Forward Power Loss Characteristics

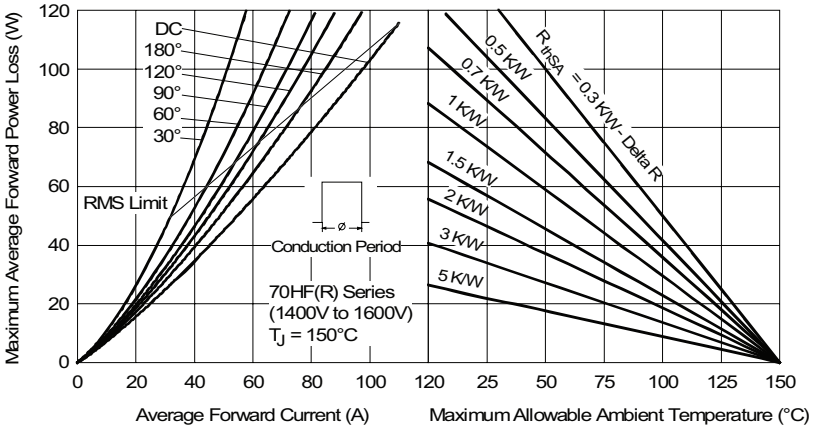

Fig. 8 - Forward Power Loss Characteristics

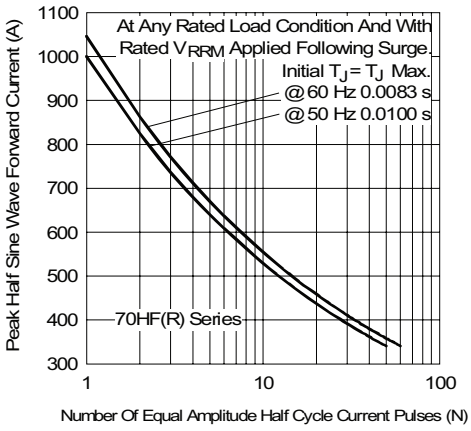

Fig. 9 - Maximum Non-Repetitive Surge Current

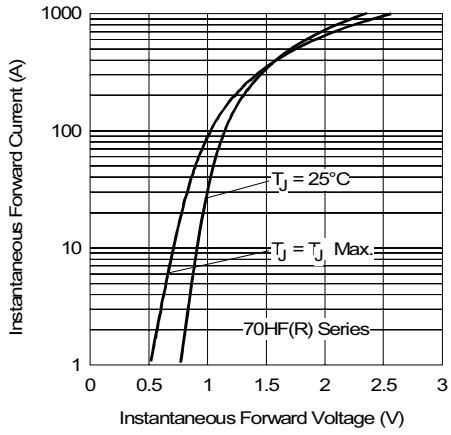

Fig. 11 - Forward Voltage Drop Characteristics

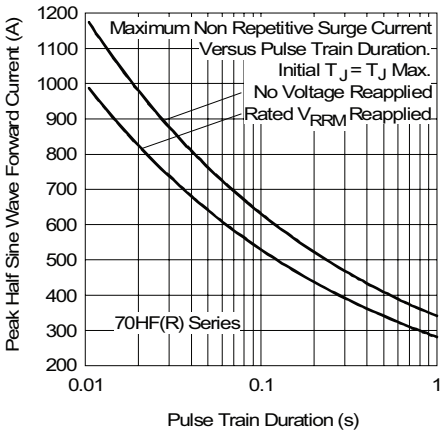

Fig. 10 - Maximum Non-Repetitive Surge Current

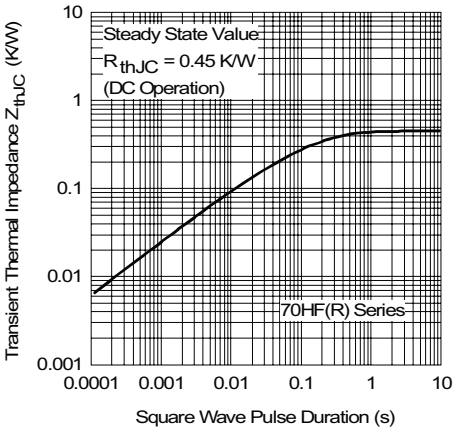

Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

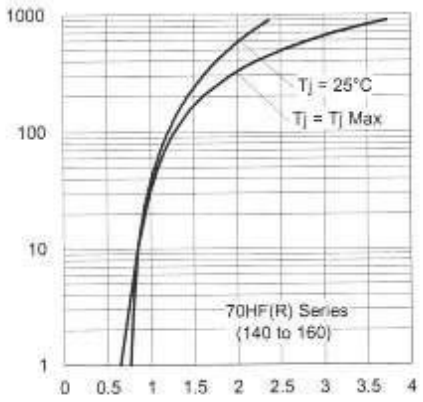

Fig. 13 - Forward Voltage Drop Characteristics

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	http://www.vishay.com/doc?95343

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