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}
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY	
$I_{F(AV)}$	70 A
Package	DO-203AB (DO-5)
Circuit configuration	Single diode

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	110	A
I_{FSM}	50 Hz	1200	1200	A
	60 Hz	1250	1250	
I^2t	50 Hz	7100	7100	A^2s
	60 Hz	6450	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
VS-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	

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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 ms 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		
Maximum allowable mounting torque (+0 %, -10 %)		Not lubricated thread, tighting on nut (1)	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tighting on nut (1)	2.3 (20)		
		Not lubricated thread, tighting on hexagon (2)	4.2 (37)		
		Lubricated thread, tighting on hexagon (2)	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

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

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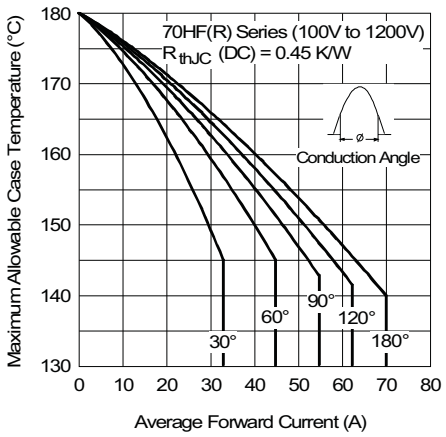

Fig. 1 - Current Ratings Characteristics

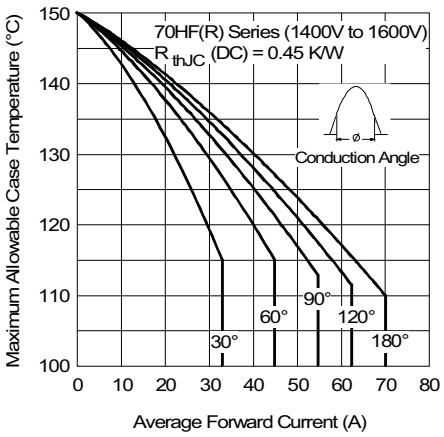

Fig. 3 - Current Ratings Characteristics

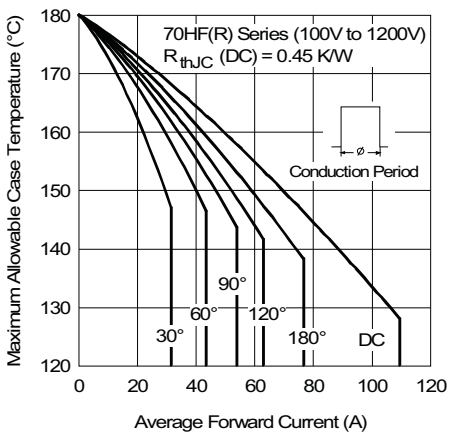

Fig. 2 - Current Ratings Characteristics

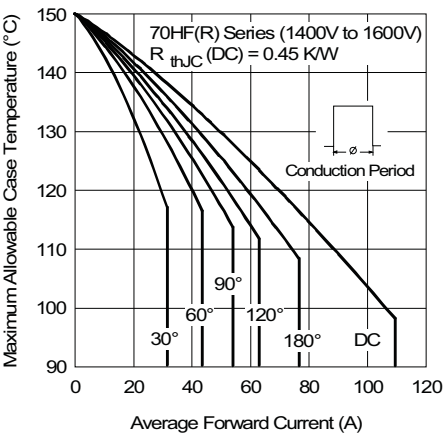

Fig. 4 - Current Ratings Characteristics

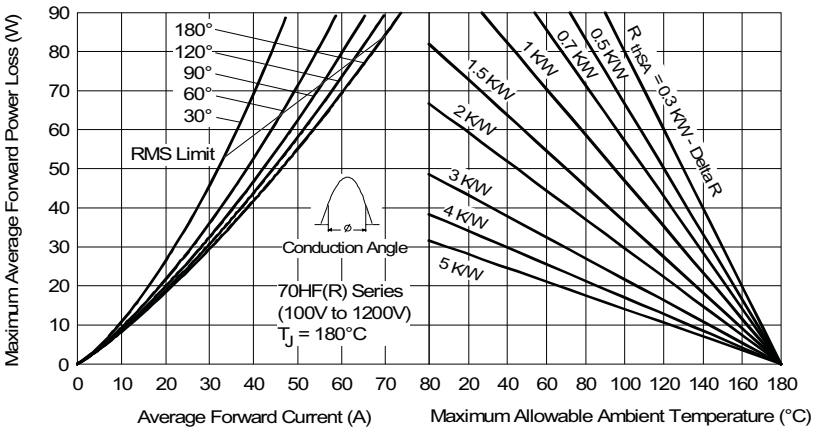

Fig. 5 - Forward Power Loss Characteristics

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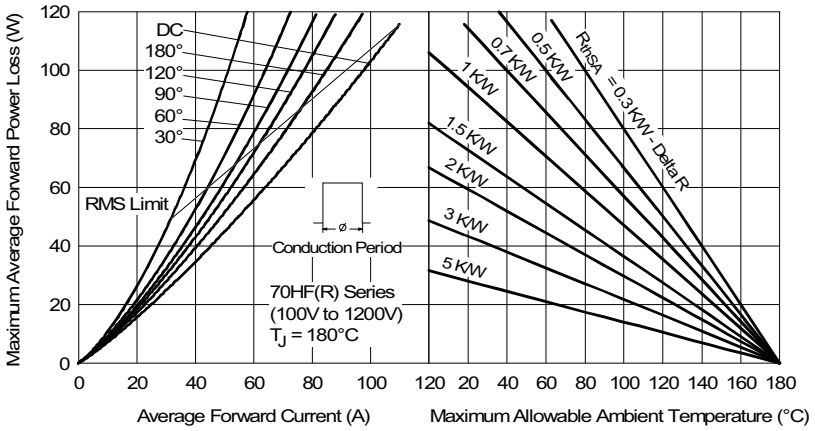

Fig. 6 - Forward Power Loss Characteristics

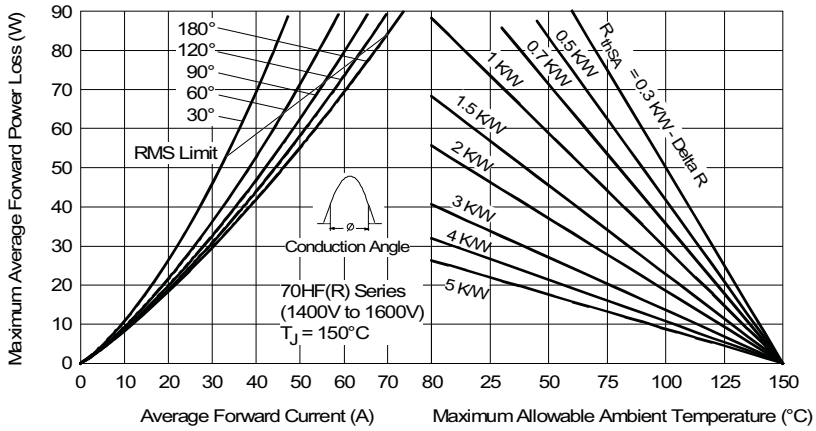

Fig. 7 - Forward Power Loss Characteristics

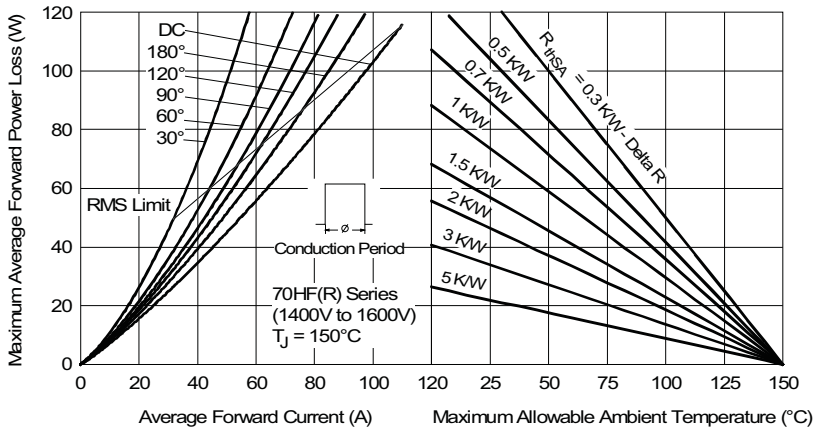

Fig. 8 - Forward Power Loss Characteristics

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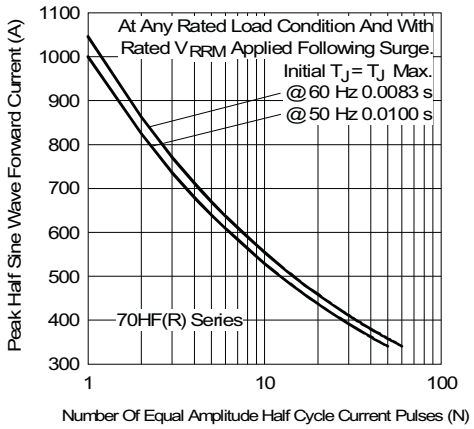

Fig. 9 - Maximum Non-Repetitive Surge Current

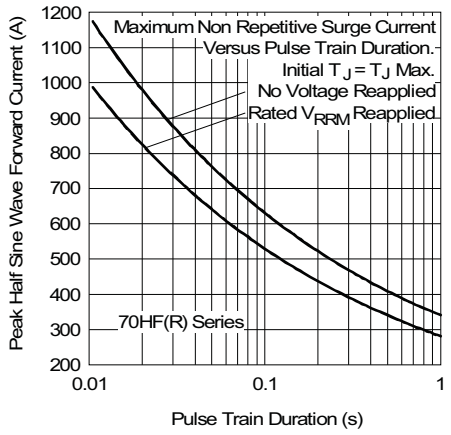

Fig. 10 - Maximum Non-Repetitive Surge Current

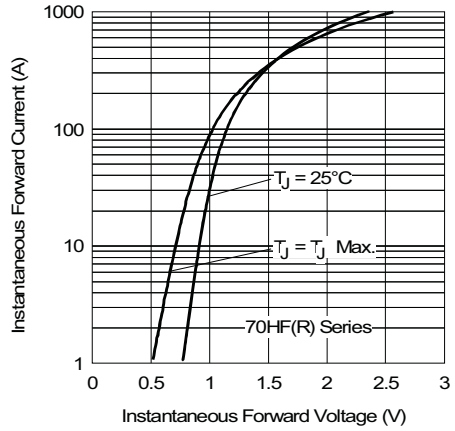

Fig. 11 - Forward Voltage Drop Characteristics

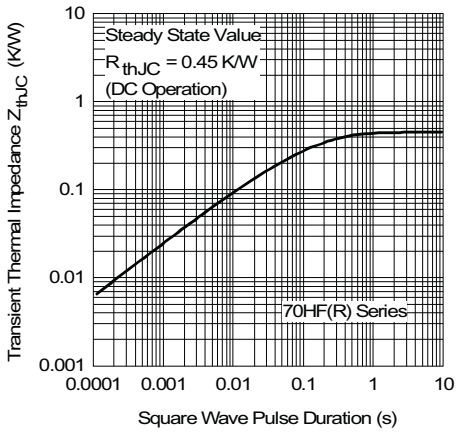

Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

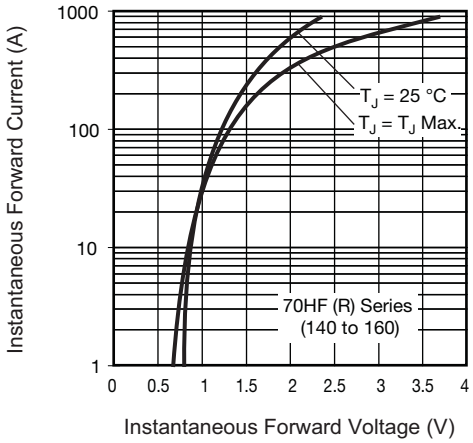

Fig. 13 - Forward Voltage Drop Characteristics

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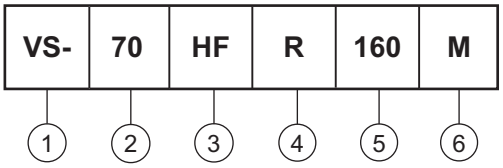
ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - 70 = Standard device

71 = Not isolated lead

72 = Isolated lead with silicone sleeve

(red = Reverse polarity)

(blue = Normal polarity)

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 - • 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	www.vishay.com/doc?95343

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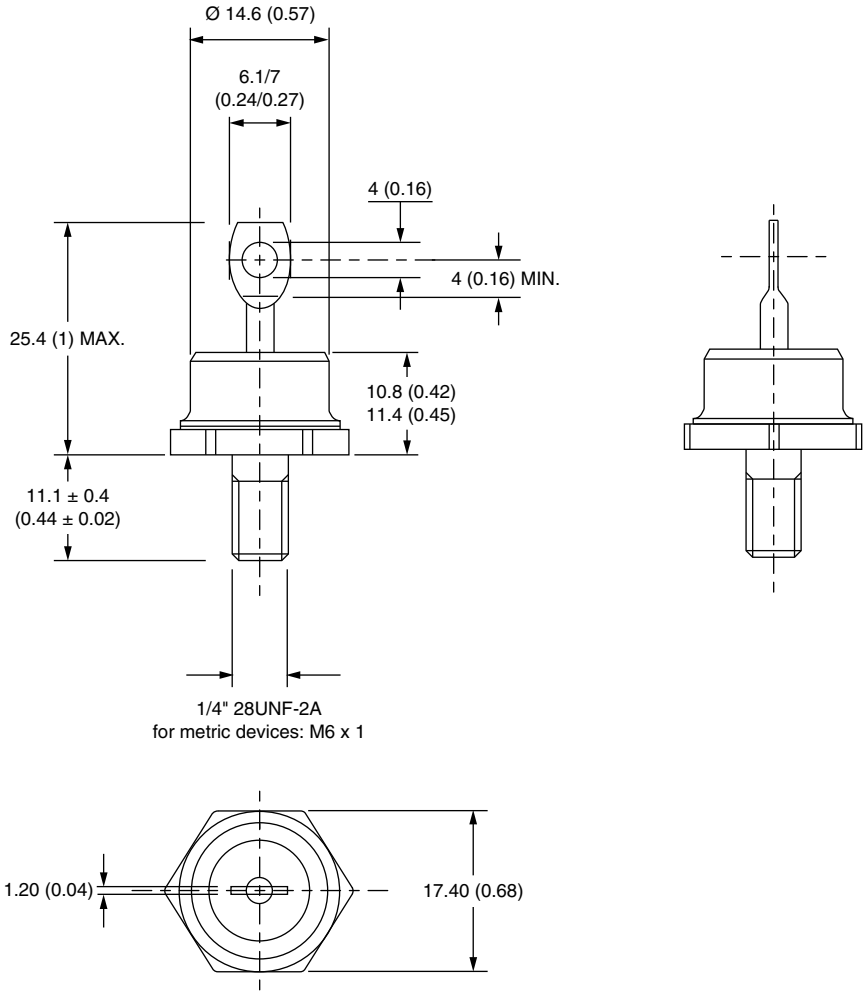
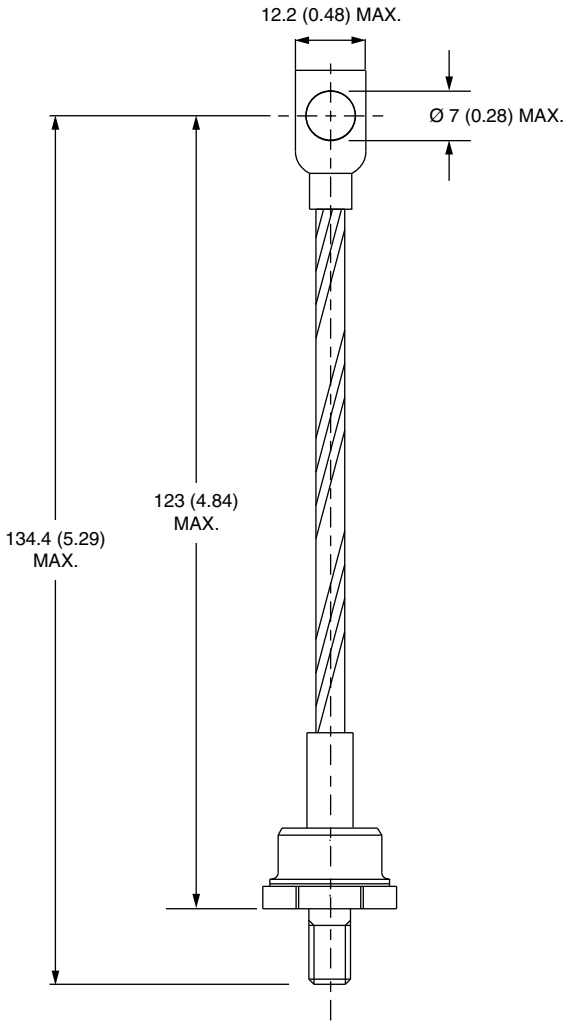
DO-203AB (DO-5) for 70HF(R) and 71HF(R) Series

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



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



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