

International
IR Rectifier

70HF(R) SERIES

STANDARD RECOVERY DIODES

Stud Version

Features

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600V V_{RRM}

Typical Applications

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

70 A

Major Ratings and Characteristics

Parameters	70HF(R)		Units
	10 to 120	140 to 160	
$I_{F(AV)}$	70	70	A
@ T_C	140	110	°C
$I_{F(RMS)}$	110		A
I_{FSM}	@ 50Hz	1200	A
	@ 60Hz	1250	A
I^2t	@ 50Hz	7100	A ² s
	@ 60Hz	6540	A ² s
V_{RRM}	range	100 to 1200 1400 to 1600	V
T_J	range	- 65 to 180 - 65 to 150	°C



case style
DO-203AB (DO-5)

70HF(R) Series

Bulletin I20202 rev. A 05/98

International
IR Rectifier**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 (1)	I_{RRM} max. @ $T_J = T_J \text{ max.}$ mA
70HF(R)	10	100	200	--	15
	20	200	300	--	
	40	400	500	500	
	60	600	720	725	
	80	800	960	950	9
	100	1000	1200	1150	
	120	1200	1440	1350	
	140	1400	1650	1550	
	160	1600	1900	1750	4.5

(1) Avalanche version only available from V_{RRM} 400V to 1600V.

Forward Conduction

Parameter		70HF(R)		Units	Conditions			
		10 to 120	140 to 160					
I _{F(AV)}	Max. average forward current @ Case temperature	70	70	A	180° conduction, half sine wave			
		140	110	°C				
I _{F(RMS)}	Max. RMS forward current	110		A	DC @ T _C = 25°C			
P _R	Maximum non-repetitive peak reverse power	20		K · W	10μs square pulse, T _J = T _J max. see note (2)			
I _{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	1200		A	t = 10ms	No voltage	Sinusoidal half wave, Initial T _J = T _J max.	
		1250			t = 8.3ms	reapplied		
		1000			t = 10ms	100% V _{RRM}		
		1050			t = 8.3ms	reapplied		
I ² t	Maximum I ² t for fusing	7100		A ² s	t = 10ms	No voltage		
		6450			t = 8.3ms	reapplied		
		5000			t = 10ms	100% V _{RRM}		
		4550			t = 8.3ms	reapplied		
I ² √t	Maximum I ² √t for fusing	71000		A ² √s	t = 0.1 to 10ms, no voltage reapplied			
V _{F(TO)1}	Low level value of threshold voltage	0.79		V	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.			
V _{F(TO)2}	High level value of threshold voltage	1.00			(I > π × I _{F(AV)}), T _J = T _J max.			
r _{f1}	Low level value of forward slope resistance	2.33		mΩ	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.			
r _{f2}	High level value of forward slope resistance	1.53			(I > π × I _{F(AV)}), T _J = T _J max.			
V _{FM}	Max. forward voltage drop	1.35		V	I _{pk} = 220A, T _J = 25°C, t _D = 10ms sinusoidal wave			

(2) Available only for Avalanche version, all other parameters the same as 70HF.

Thermal and Mechanical Specifications

Parameter		70HF(R)		Units	Conditions
		10to 120	140 to 160		
T _j	Max. junction operating temperature range	-65 to 180	-65 to 150	°C	
T _{stg}	Max. storage temperature range	-65 to 180	-65 to 150		
R _{thJC}	Max. thermal resistance, junction to case	0.45		K/W	DC operation
R _{thCS}	Max. thermal resistance, case to heatsink	0.25			Mounting surface, smooth, flat and greased
T	Max. allowed mounting torque ±10%	2.3 - 3.4		Nm	Not lubricated threads
		20 - 30		lbf·in	
wt	Approximate weight	17 (0.6)		g (oz)	
Case style		DO-203AB (DO5)			See Outline Table

ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.08	0.06	K/W	T _j = T _j max.
120°	0.10	0.11		
90°	0.13	0.14		
60°	0.19	0.20		
30°	0.30	0.30		

Ordering Information Table

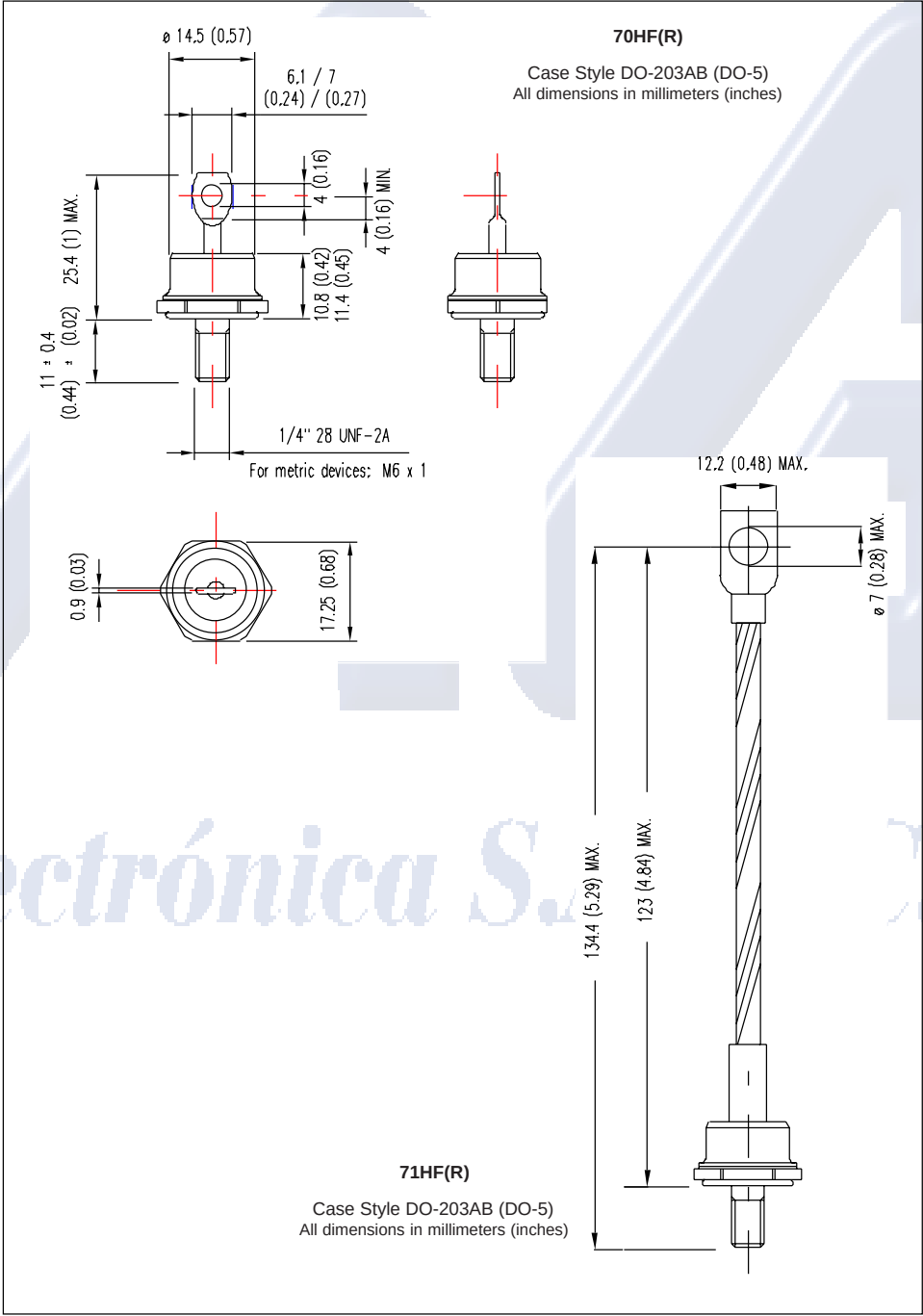
Device Code				
70	HF	R	160	M
1	2	3	4	5
1 - 70 = Standard device 71 = Not isolated lead 72 = Isolated lead with silicone sleeve (Red = Reverse polarity) (Blue = Normal polarity)				
2 - HF = Standard diode HA = Avalanche diode				
3 - None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)				
4 - Voltage code: 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 - (Not available for Avalanche diodes)				

70HF(R) Series

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Outlines Table



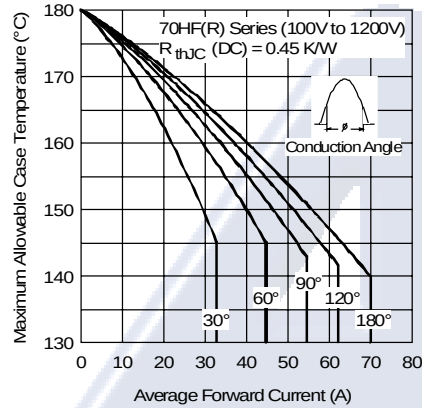


Fig. 1 - Current Ratings Characteristics

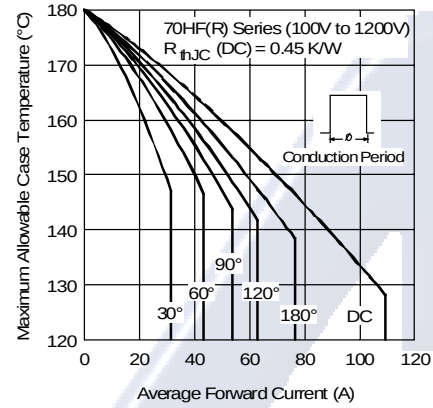


Fig. 2 - Current Ratings Characteristics

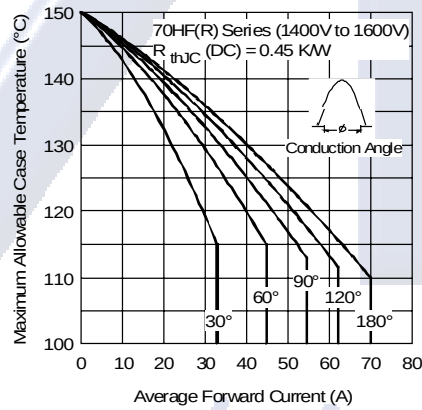


Fig. 3 - Current Ratings Characteristics

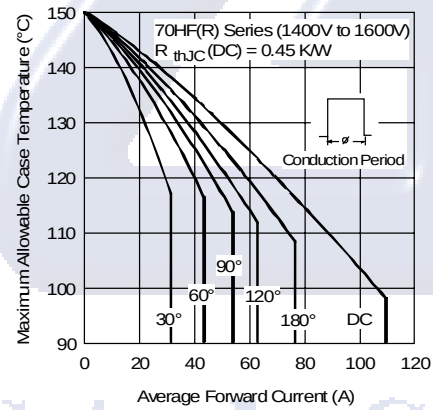


Fig. 4 - Current Ratings Characteristics

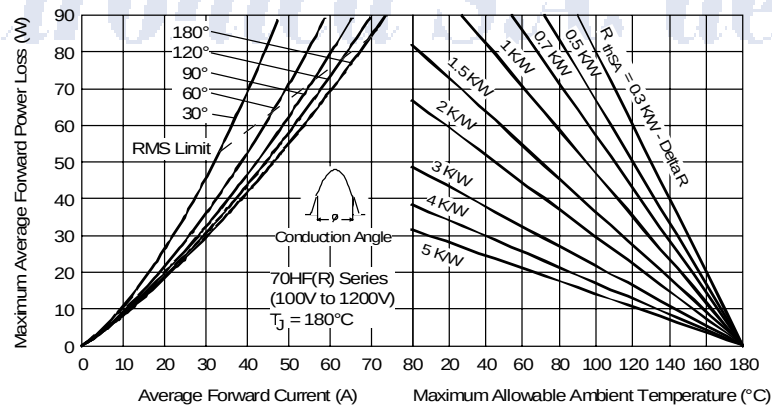


Fig. 5 - Forward Power Loss Characteristics

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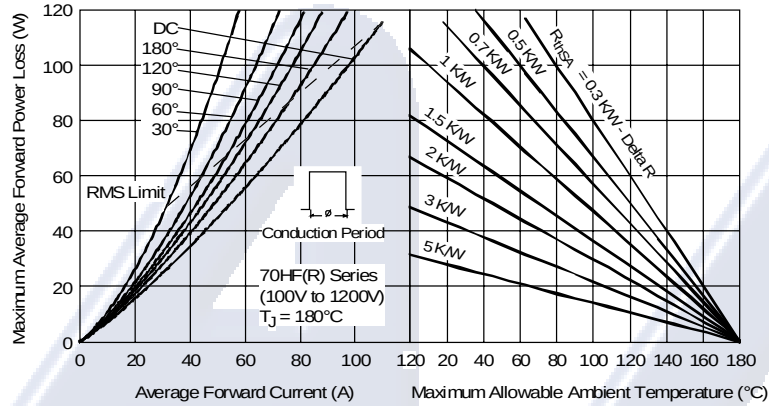
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Fig. 6 - Forward Power Loss Characteristics

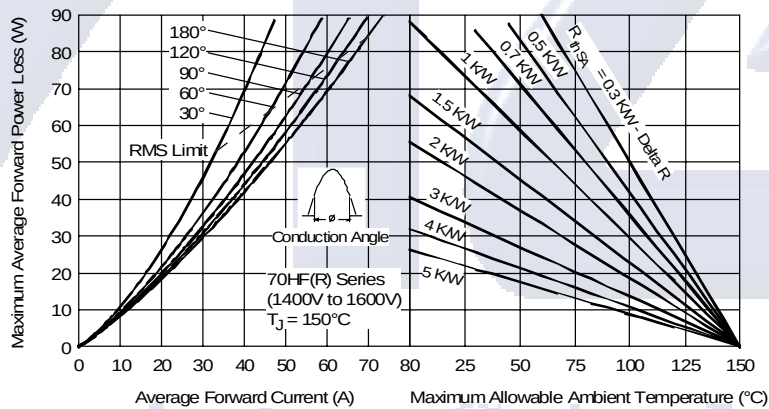


Fig. 7 - Forward Power Loss Characteristics

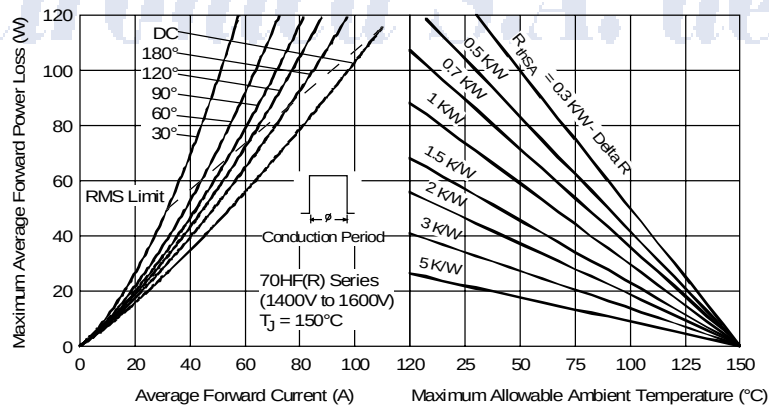


Fig. 8 - Forward Power Loss Characteristics

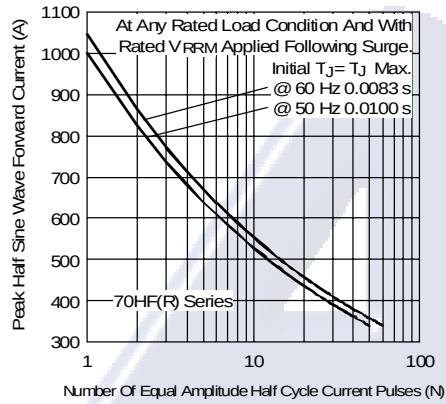


Fig. 9 - Maximum Non-Repetitive Surge Current

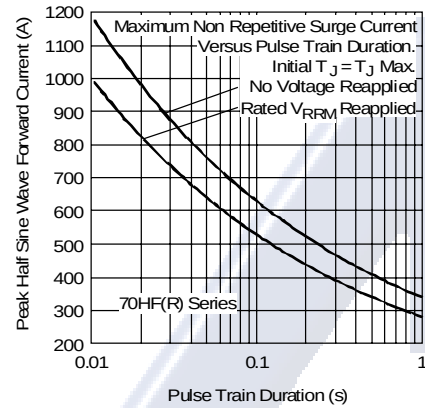


Fig. 10 - Maximum Non-Repetitive Surge Current

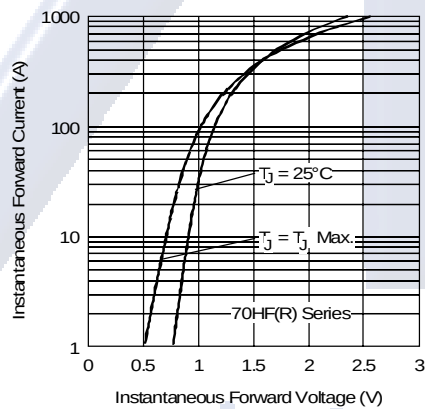


Fig. 11 - Forward Voltage Drop Characteristics

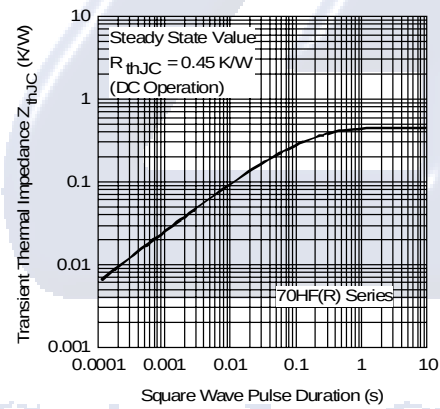


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics