Bulletin I20202 rev. A 05/98

International
IOR Rectifier

70HF(R) SERIES

STANDARD RECOVERY DIODES **Stud Version**

70 A

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}

TypicalApplications

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

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^2s
	@ 60Hz	6540		A^2s
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)

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. @ $T_J = T_J$ max. mA
70HF(R)	10	100	200	--	15
	20	200	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	

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

Forward Conduction

Parameter		70HF(R) 10 to 120	70HF(R) 140 to 160	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	70	70	A	180° conduction, half sine wave		
	@ Case temperature	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 reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		1250			t = 8.3ms		
		1000			t = 10ms	100% V_{RRM} reapplied	
		1050			t = 8.3ms		
I^2t	Maximum I^2t for fusing	7100		A^2s	t = 10ms	No voltage reapplied	
		6450			t = 8.3ms		
		5000			t = 10ms	100% V_{RRM} reapplied	
		4550			t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	71000		$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.79		V	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	1.00			(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	2.33		mΩ	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f2}	High level value of forward slope resistance	1.53			(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.35		V	I_{pk}= 220A, T_J = 25°C, t_p = 10ms sinusoidal wave		

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

Thermal and Mechanical Specifications

Parameter		70HF(R) 10 to 120	70HF(R) 140 to 160	Units	Conditions
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

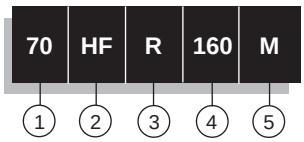
ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistence 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



1 - 70 = Standard device
71 = Not isolated lead
72 = Isolated lead with silicone sleeve
(Red = Reverse polarity)
(Blue = Normal polarity)

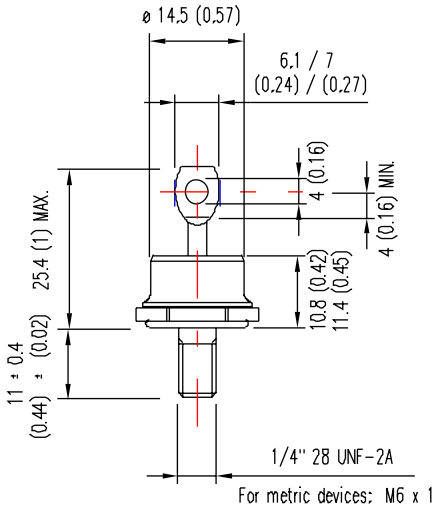
2 - HF = Standard diode
HA = Avalanche diode

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)

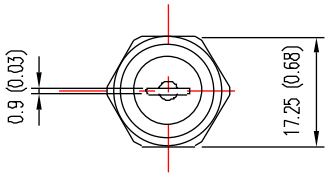
5 - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A
M = Stud base DO-203AB (DO-5) M6 X 1 - (Not available for Avalanche diodes)

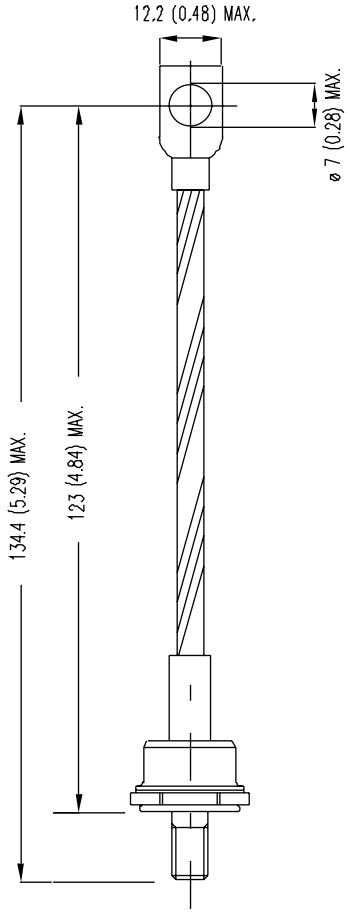
Outlines Table



70HF(R)

Case Style DO-203AB (DO-5)
All dimensions in millimeters (inches)





71HF(R)

Case Style DO-203AB (DO-5)
All dimensions in millimeters (inches)

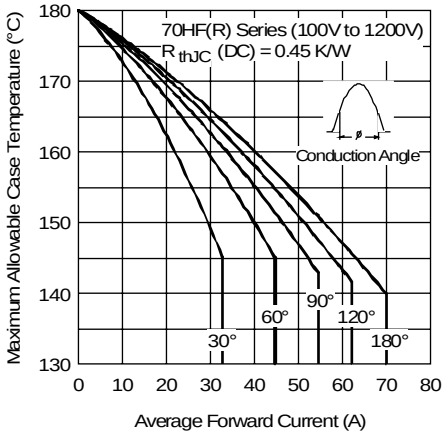


Fig. 1 - Current Ratings Characteristics

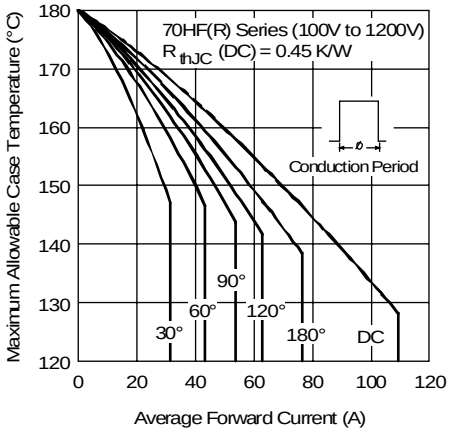


Fig. 2 - Current Ratings Characteristics

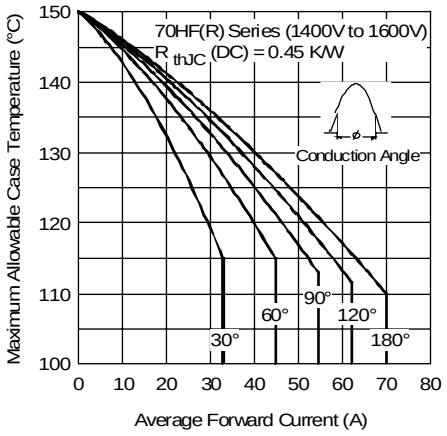


Fig. 3 - Current Ratings Characteristics

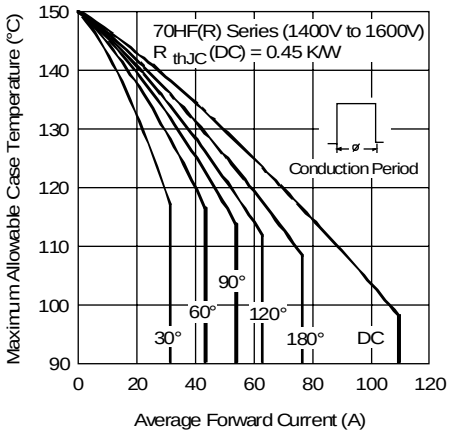


Fig. 4 - Current Ratings Characteristics

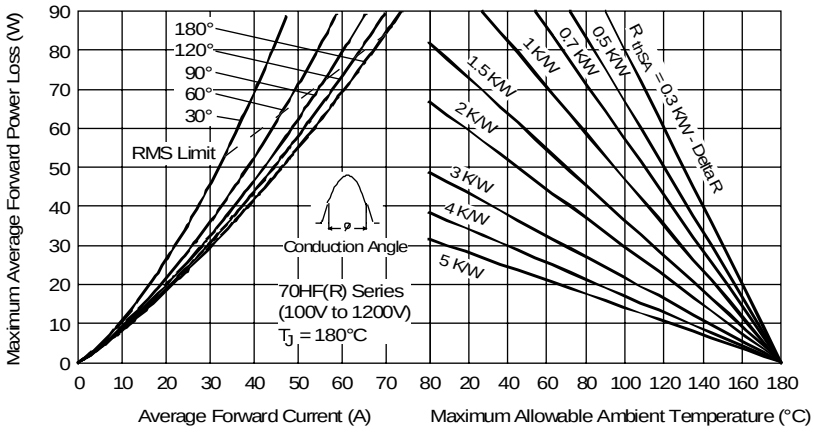


Fig. 5 - Forward Power Loss Characteristics

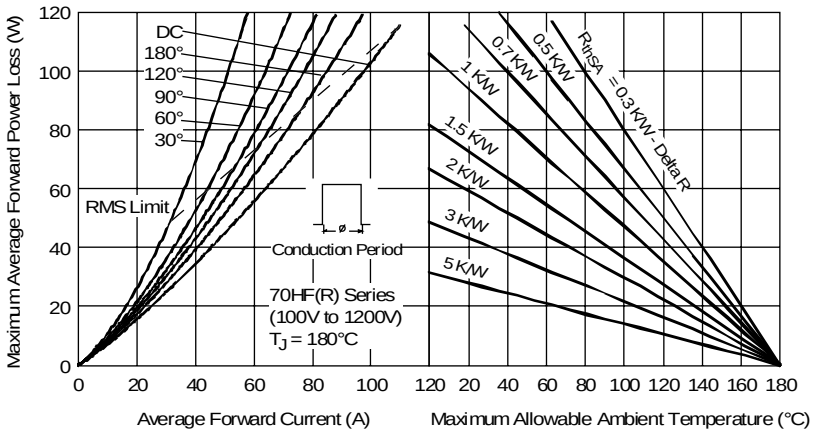


Fig. 6 - Forward Power Loss Characteristics

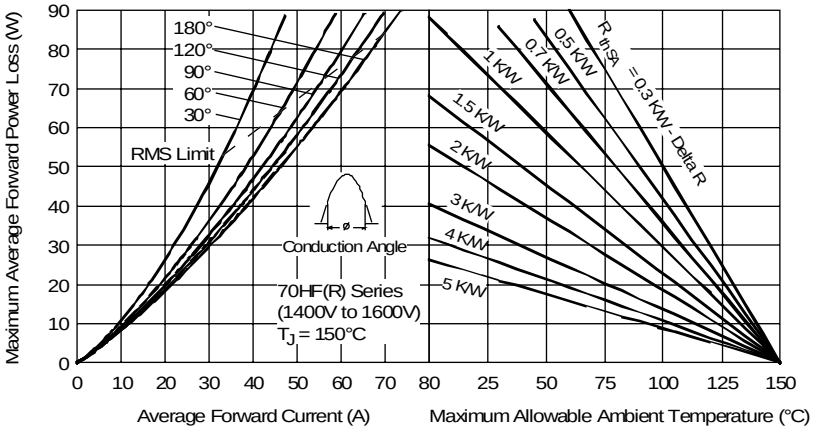


Fig. 7 - Forward Power Loss Characteristics

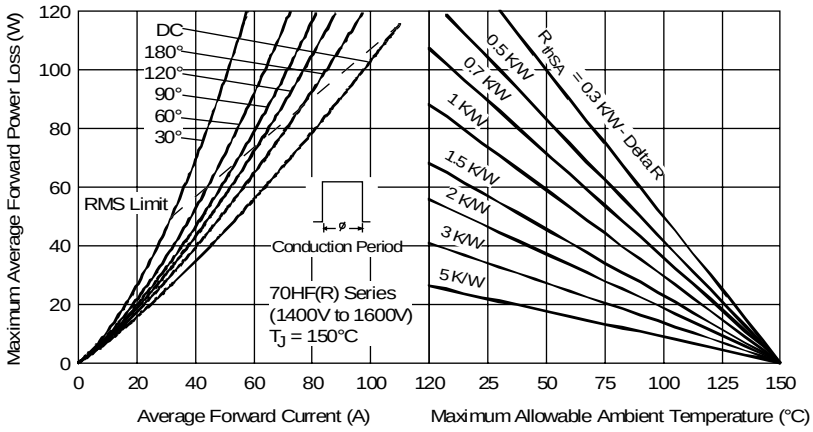


Fig. 8 - Forward Power Loss Characteristics

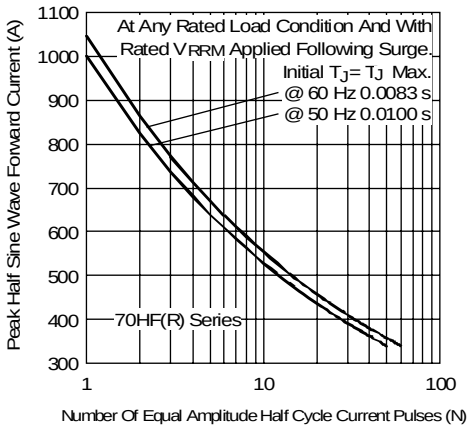


Fig. 9 - Maximum Non-Repetitive Surge Current

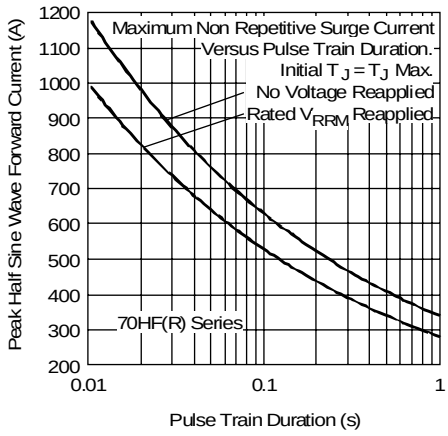


Fig. 10 - Maximum Non-Repetitive Surge Current

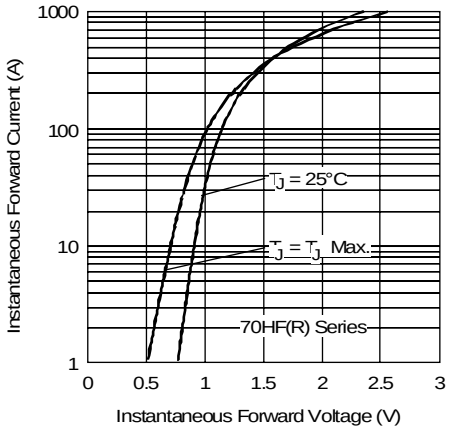


Fig. 11 - Forward Voltage Drop Characteristics

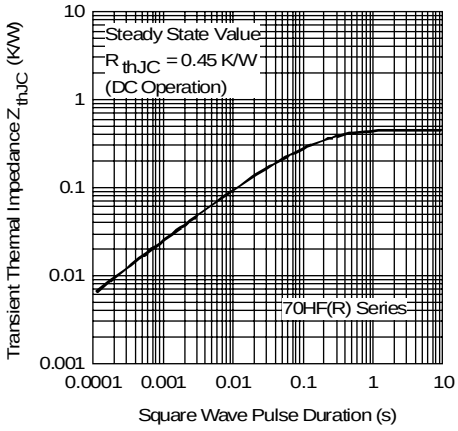


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics