Bulletin I20203 rev. A 09/98

International
IOR Rectifier

85HF(R) SERIES

STANDARD RECOVERY DIODES **Stud Version**

85 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		85HF(R)		Units
		10 to 120	140 to 160	
$I_{F(AV)}$		85	85	A
	@ T_C	140	110	°C
$I_{F(RMS)}$		133		A
I_{FSM}	@ 50Hz	1700		A
	@ 60Hz	1800		A
I^2t	@ 50Hz	14500		A^2s
	@ 60Hz	13500		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	I_{RRM} max. @ $T_J = T_J$ max. mA
85HF(R)	10	100	200	15
	20	200	300	
	40	400	500	
	60	600	720	9
	80	800	960	
	100	1000	1200	
	120	1200	1440	
	140	1400	1650	4.5
	160	1600	1900	

Forward Conduction

Parameter		85HF(R) 10 to 120	85HF(R) 140 to 160	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	85	85	A	180° conduction, half sine wave		
	@ Case temperature	140	110	°C			
$I_{F(RMS)}$	Max. RMS forward current	133		A			
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	1700		A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		1800			t = 8.3ms		
		1450			t = 10ms	100% V_{RRM} reapplied	
		1500			t = 8.3ms		
I^2t	Maximum I^2t for fusing	14500		A^2s	t = 10ms	No voltage reapplied	
		13500			t = 8.3ms		
		10500			t = 10ms	100% V_{RRM} reapplied	
		9400			t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	16000		$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.68		V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.80			$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	1.62		mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ max.		
r_{f2}	High level value of forward slope resistance	1.25			$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.20		V	I_{pk}= 267A, T_J = 25°C, t_p = 400µs rectangular wave		

Thermal and Mechanical Specifications

Parameter		85HF(R) 10 to 120	85HF(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	0.35		K/W	DC operation
R_{thCS}	Max. thermal resistance, case to heatsink	0.25			Mounting surface, smooth, flat and greased
	Maximum shock	1500g			**see note (1)**
	Maximum constant vibration	20g			50Hz **see note (1)**
	Maximum constant acceleration	5000g			Stud outwards **see note (1)**
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

(1) Available only for 88HF

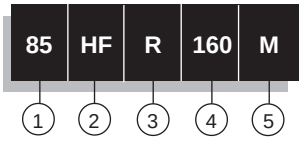
ΔR_{thJC} Conduction

(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°	0.10	0.08	K/W	$T_J = T_J$ max.
120°	0.11	0.11		
90°	0.13	0.13		
60°	0.17	0.17		
30°	0.26	0.26		

Ordering Information Table

Device Code



1 - 85 = Standard device
86 = Not isolated lead
87 = Isolated lead with silicone sleeve
(Red = Reverse polarity)
(Blue = Normal polarity)
88 = Type for rotating application

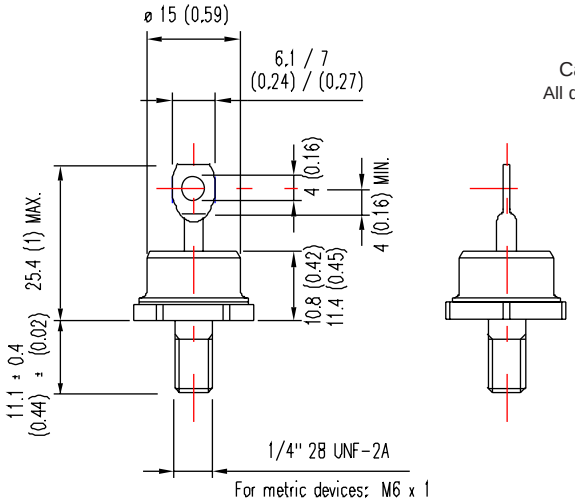
2 - Standard diode

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)

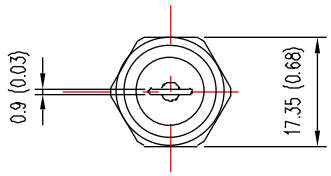
5 - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A
M = Stud base DO-203AB (DO-5) M6 X 1 - (Not available for 88HF)

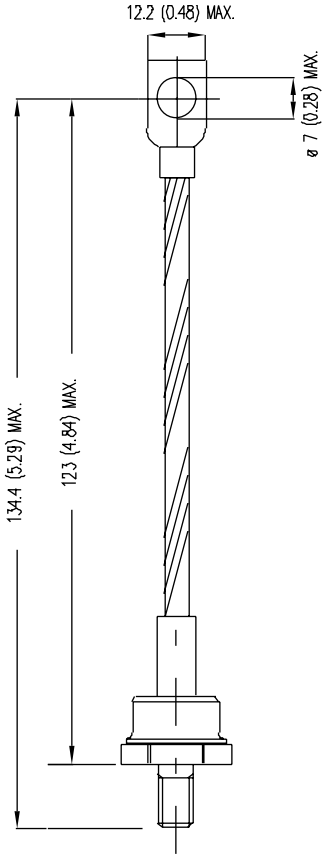
Outlines Table



85HF(R)

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

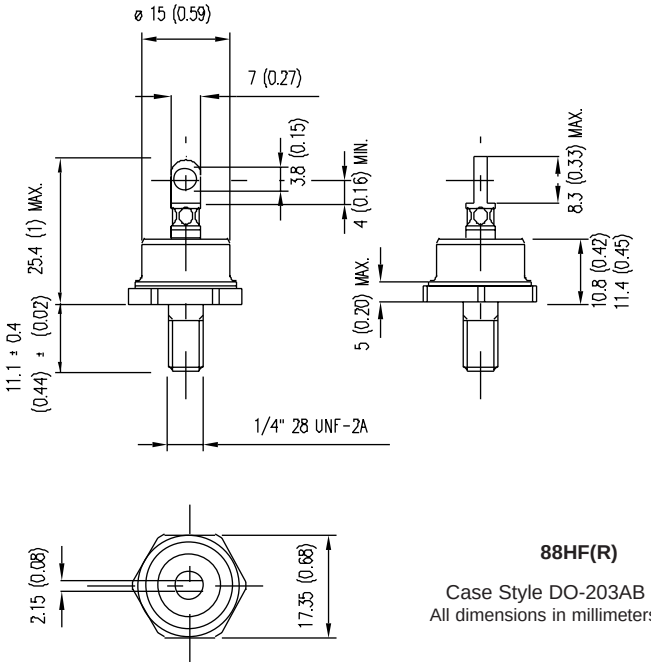




86HF(R)

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

Outlines Table



88HF(R)

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

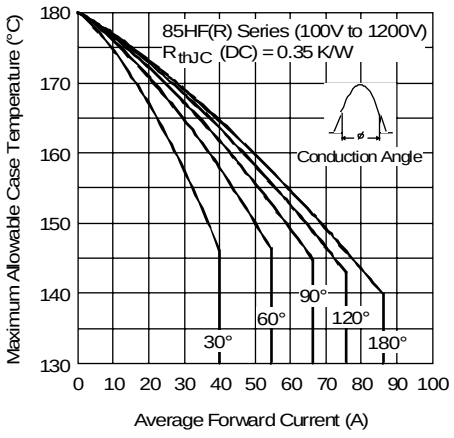


Fig. 1 - Current Ratings Characteristics

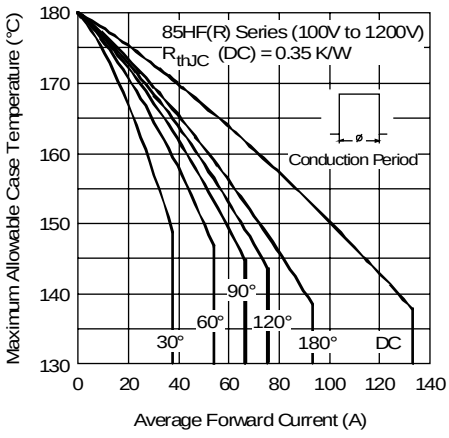


Fig. 2 - Current Ratings Characteristics

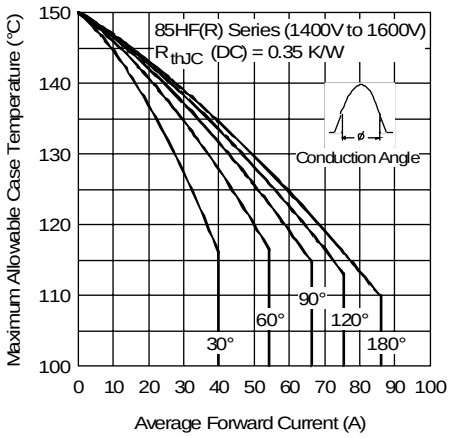


Fig. 3 - Current Ratings Characteristics

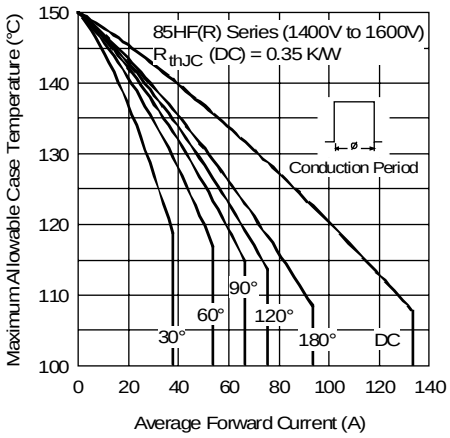


Fig. 4 - Current Ratings Characteristics

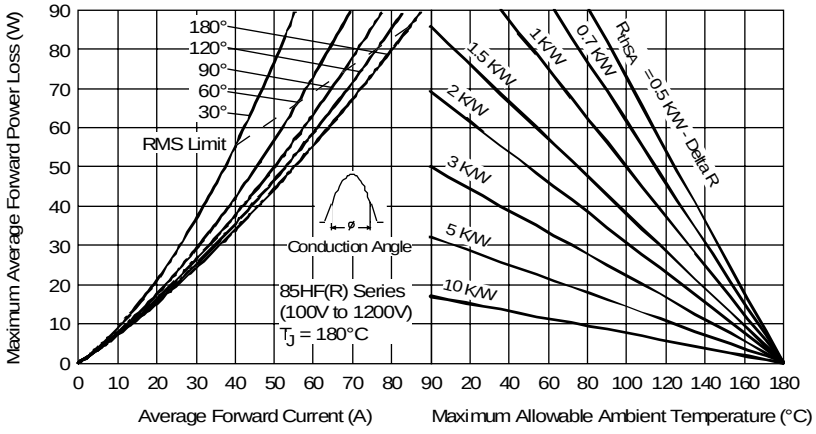


Fig. 5 - Forward Power Loss Characteristics

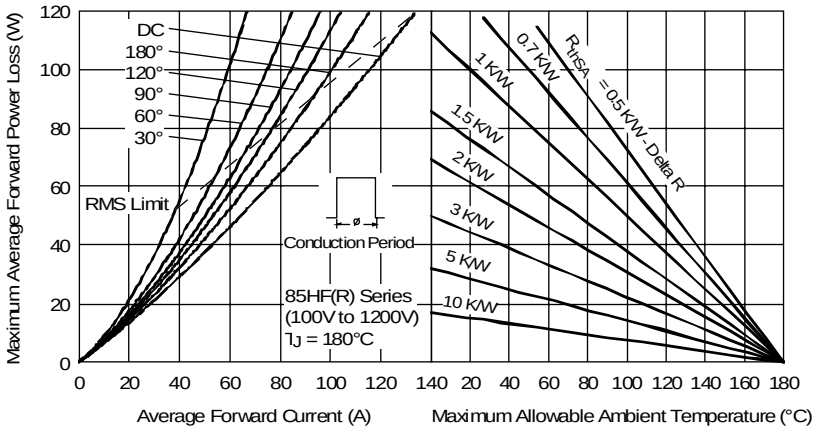


Fig. 6 - Forward Power Loss Characteristics

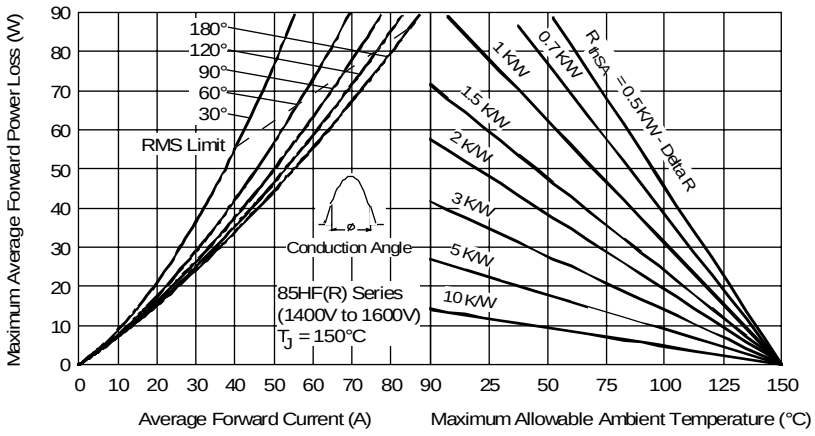


Fig. 7 - Forward Power Loss Characteristics

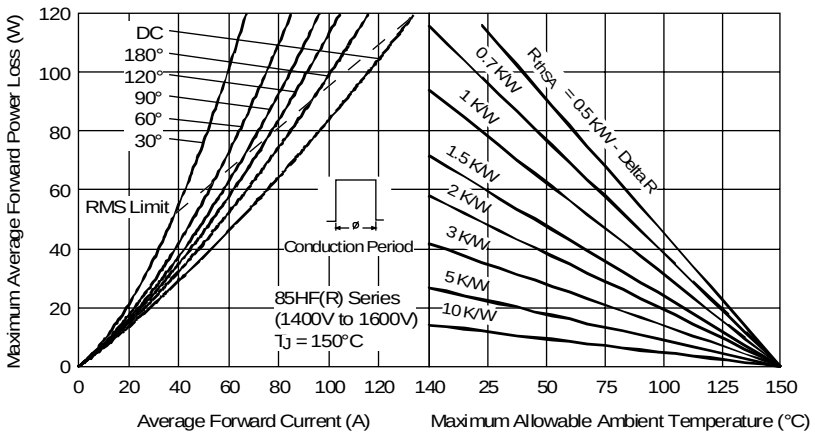


Fig. 8 - Forward Power Loss Characteristics

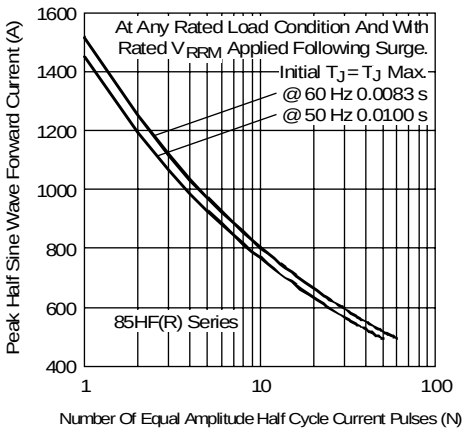


Fig. 9 - Maximum Non-Repetitive Surge Current

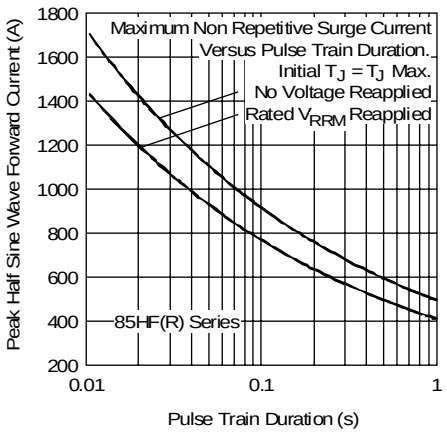


Fig. 10 - Maximum Non-Repetitive Surge Current

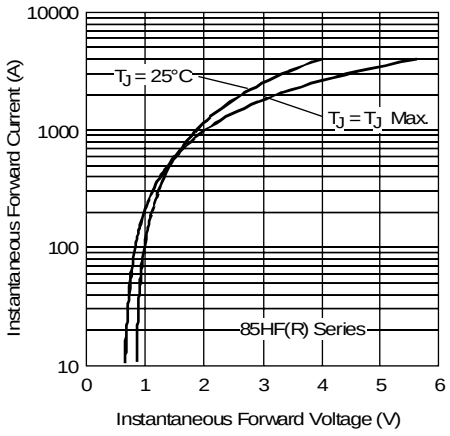


Fig. 11 - Forward Voltage Drop Characteristics

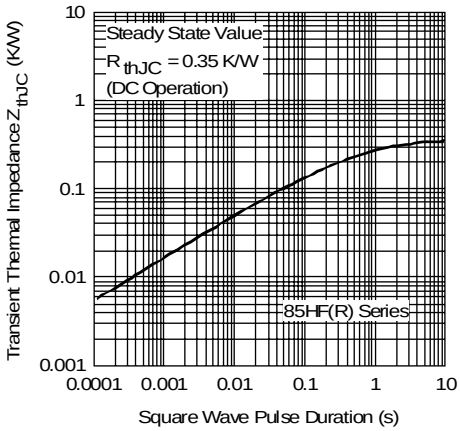


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

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Data and specifications subject to change without notice.