

# International IR Rectifier

## 85HF(R) SERIES

### STANDARD RECOVERY DIODES

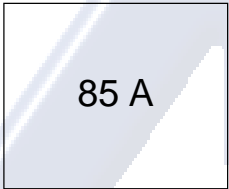
### Stud Version

#### 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



### 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 <sup>2</sup> s	
	@ 60Hz	13500	A <sup>2</sup> s	
$V_{RRM}$	range	100 to 1200	1400 to 1600	V
$T_J$	range	- 65 to 180	- 65 to 150	°C



**85HF(R) Series**

Bulletin I20203 rev. A 09/98

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**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	$I_{RRM}$ max. @ $T_J = T_J$ max. mA
85HF(R)	10	100	200	15
	20	200	300	
	40	400	500	
	60	600	720	
	80	800	960	9
	100	1000	1200	
	120	1200	1440	
	140	1400	1650	
	160	1600	1900	4.5

## Forward Conduction

Parameter	85HF(R)		Units	Conditions		
	10 to 120	140 to 160				
$I_{F(AV)}$ Max. average forward current @ Case temperature	85	85	A	180° conduction, half sine wave		
	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	Sinusoidal half wave, Initial $T_J = T_J$ max.
	1800			t = 8.3ms	reapplied	
	1450			t = 10ms	100% $V_{RRM}$	
	1500			t = 8.3ms	reapplied	
$I^2t$ Maximum $I^2t$ for fusing	14500		A <sup>2</sup> s	t = 10ms	No voltage	
	13500			t = 8.3ms	reapplied	
	10500			t = 10ms	100% $V_{RRM}$	
	9400			t = 8.3ms	reapplied	
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	16000		A <sup>2</sup> √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	$I_{pk} = 267A$ , $T_J = 25^\circ C$ , $t_p = 400\mu s$ rectangular wave		

Thermal and Mechanical Specifications

Parameter	85HF(R)		Units	Conditions
	10 to 120	140 to 160		
T <sub>J</sub> Max. junction operating temperature range	-65 to 180	-65 to 150	°C	
T <sub>stg</sub> Max. storage temperature range	-65 to 180	-65 to 150		
R <sub>thJC</sub> Max. thermal resistance, junction to case	0.35		K/W	DC operation
R <sub>thCS</sub> Max. thermal resistance, case to heatsink	0.25			Mounting surface, smooth, flat and greased
Maximum shock	1500g			<b>see note (1)</b>
Maximum constant vibration	20g			50Hz <b>see note (1)</b>
Maximum constant acceleration	5000g			Stud outwards <b>see note (1)</b>
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

$\Delta R_{thJC}$  Conduction

(The following table shows the increment of thermal resistance R<sub>thJC</sub> 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 <sub>J</sub> = T <sub>J</sub> max.
120°	0.11	0.11		
90°	0.13	0.13		
60°	0.17	0.17		
30°	0.26	0.26		

Ordering Information Table

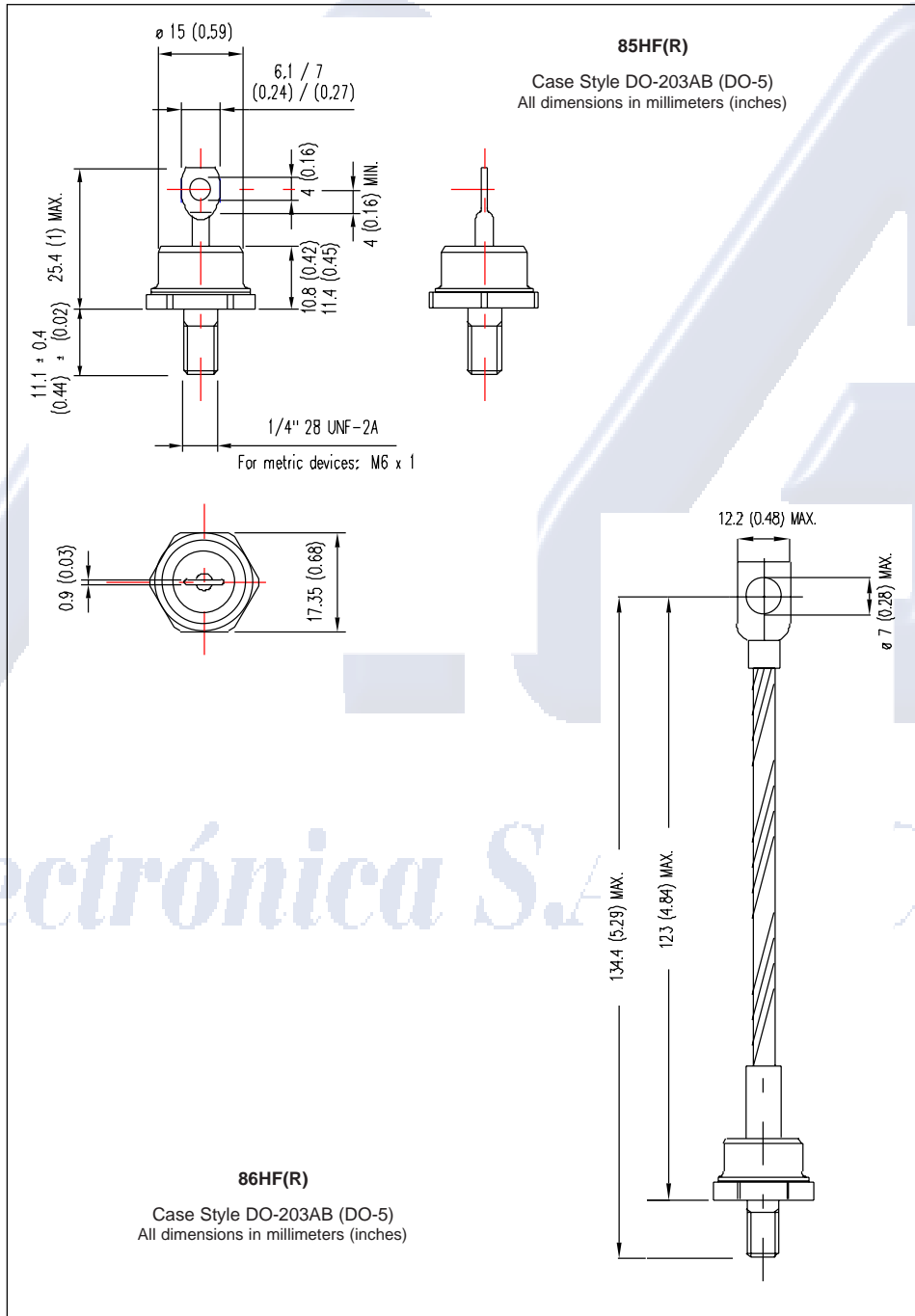
Device Code	
<b>85</b>	<b>HF R 160 M</b>
①	② ③ ④ ⑤
<b>1</b>	85 = Standard device 86 = Not isolated lead 87 = Isolated lead with silicone sleeve (Red = Reverse polarity) (Blue = Normal polarity) 88 = Type for rotating application
<b>2</b>	Standard diode
<b>3</b>	None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)
<b>4</b>	Voltage code: Code x 10 = V <sub>RRM</sub> (See Voltage Ratings table)
<b>5</b>	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)

### 85HF(R) Series

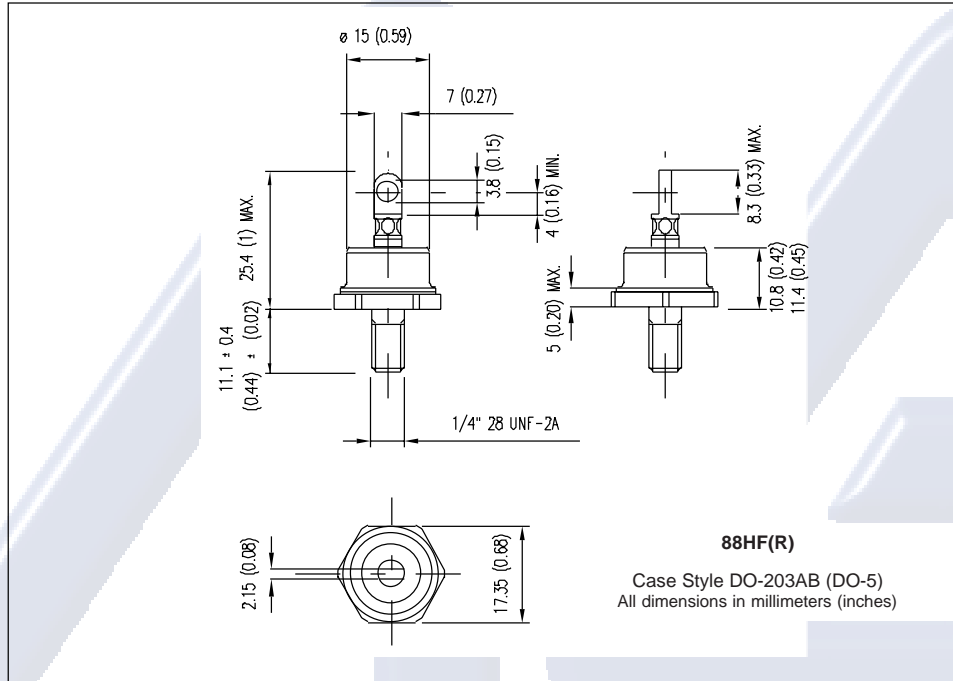
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#### Outlines Table



Outlines Table



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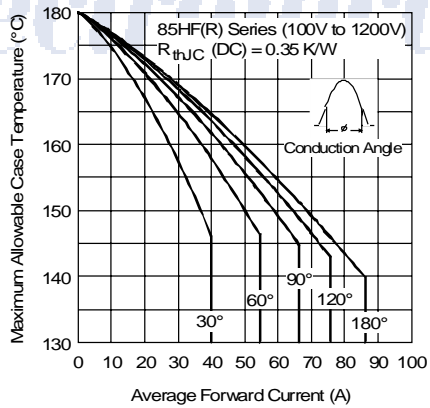


Fig. 1 - Current Ratings Characteristics

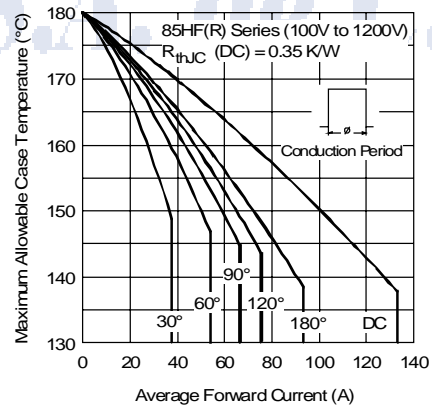


Fig. 2 - Current Ratings Characteristics

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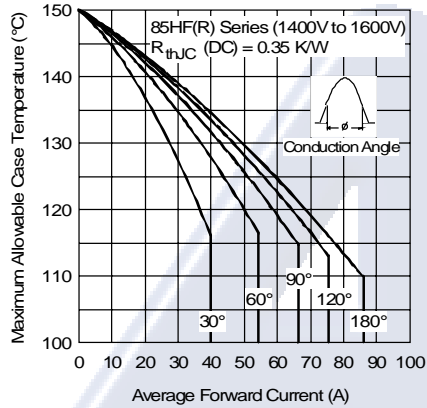


Fig. 3 - Current Ratings Characteristics

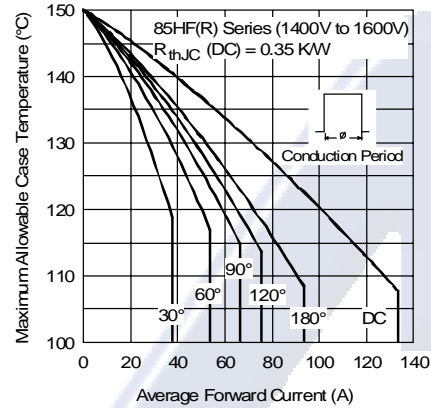


Fig. 4 - Current Ratings Characteristics

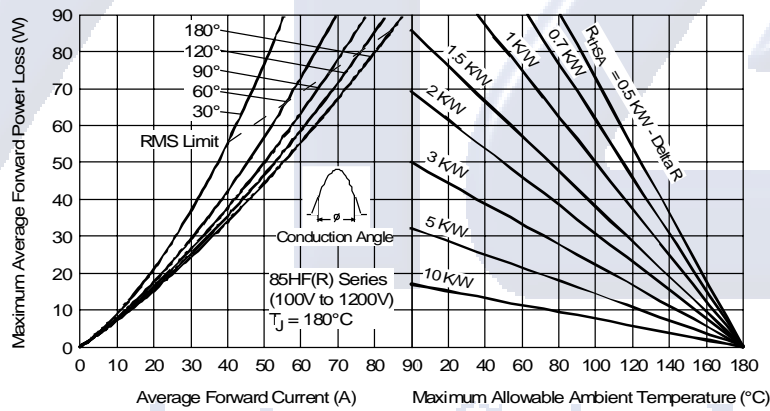


Fig. 5 - Forward Power Loss Characteristics

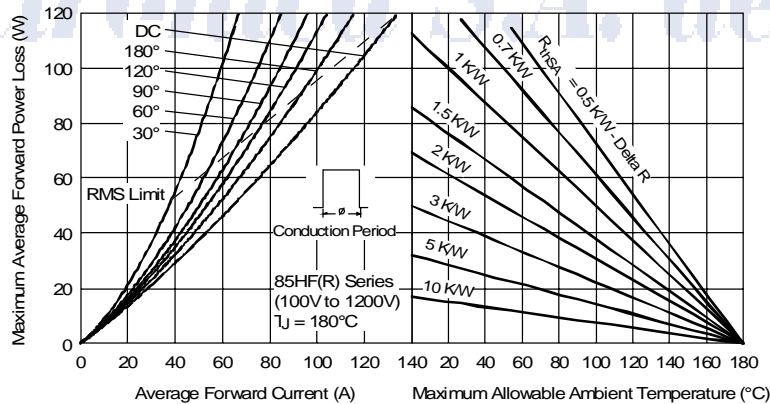


Fig. 6 - Forward Power Loss Characteristics

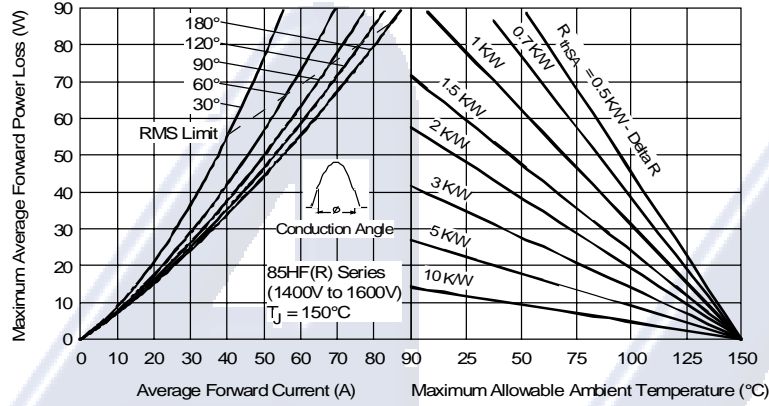


Fig. 7 - Forward Power Loss Characteristics

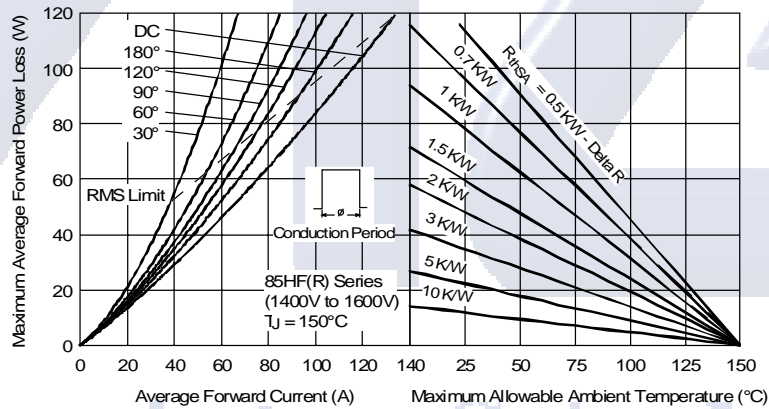


Fig. 8 - Forward Power Loss Characteristics

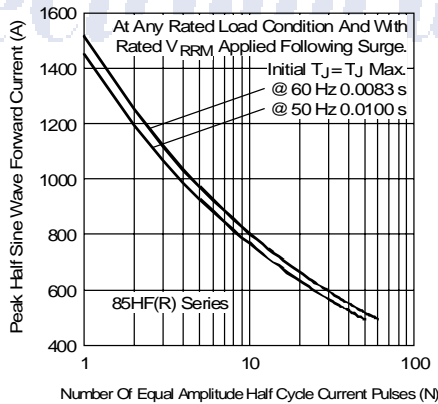


Fig. 9 - Maximum Non-Repetitive Surge Current

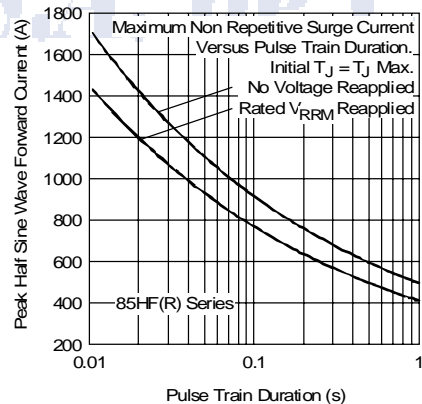


Fig. 10 - Maximum Non-Repetitive Surge Current

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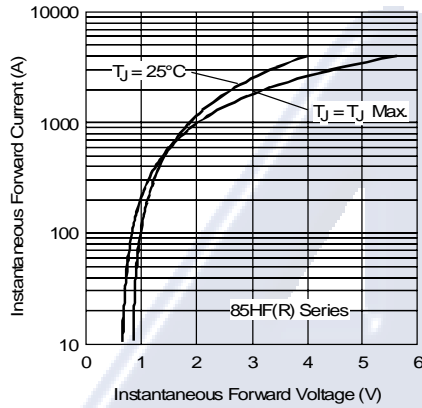


Fig. 11 - Forward Voltage Drop Characteristics

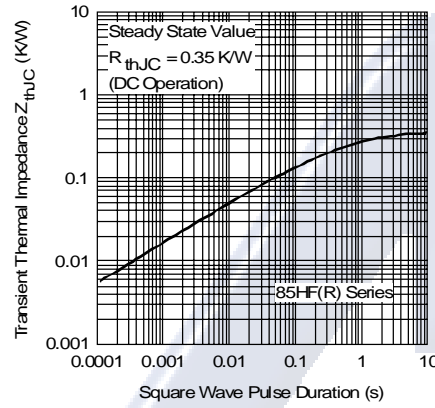


Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics

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Data and specifications subject to change without notice.