

Standard Recovery Diodes,
(Stud Version), 85 A



DO-5 (DO-203AB)

FEATURES

- High surge current capability
- 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

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

PRIMARY CHARACTERISTICS		
$I_{F(AV)}$	85 A	
Package	DO-5 (DO-203AB)	
Circuit configuration	Single	

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	85HF(R)	
		10 to 120	140 to 160
$I_{F(AV)}$	T_C	85	85
		140	110
		133	133
$I_{F(RMS)}$	50 Hz	1700	1700
		1800	1800
		14 500	14 500
I^2t	60 Hz	13 500	13 500
		100 to 1200	1400 to 1600
V_{RRM}	Range	-65 to +180	-65 to +150
T_J			

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} MAXIMUM AT $T_J = T_J$ MAXIMUM mA
VS-85HF(R) VS-86HF(R) VS-87HF(R) VS-88HF(R)	10	100	200	9
	20	200	300	
	40	400	500	
	60	600	700	
	80	800	900	
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	
				4.5

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		85HF(R)		UNITS
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave		10 to 120	140/160	A
				85		
Maximum RMS forward current	I _{F(RMS)}			140	110	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I _{FSM}		Sinusoidal half wave, initial T _J = T _J maximum	t = 10 ms	133	A
				No voltage reapplied	1700	
				t = 8.3 ms	1800	
				t = 10 ms	1450	
				100 % V _{FRM} reapplied	1500	
Maximum i ² t for fusing	i ² t			t = 10 ms	14 500	A ² s
				No voltage reapplied	13 500	
				t = 8.3 ms	10 500	
				t = 10 ms	9400	
				100 % V _{FRM} reapplied	16 000	
Maximum i ² ·t for fusing	i ² ·t	t = 0.1 ms to 10 ms, no voltage reapplied		16 000		A ² ·s
Value of threshold voltage (up to 1200 V)	V _{FT(O)}	T _J = T _J maximum		0.68	V	
Value of threshold voltage (for 1400 V, 1600 V)				0.69		
Value of forward slope resistance (up to 1200 V)	r _f	T _J = T _J maximum		1.62	mW	
Value of forward slope resistance (for 1400 V, 1600 V)				1.75		
Maximum forward voltage drop	V _{FM}	I _{pk} = 267 A, T _J = 25 °C, t _p = 400 μs rectangular wave		1.2	1.4	V

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS	85HF(R)		UNITS
Maximum junction operating and storage temperature range	T _J , T _{Stg}		10 to 20	140 to 160	°C
Maximum thermal resistance, junction to case	R _{thJC}	DC operation		-65 to +180 -65 to +150	
Maximum thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth, flat and greased	0.35		K/W
Maximum shock ⁽¹⁾			0.25		
Maximum constant vibration ⁽¹⁾		50 Hz	1500		g
Maximum constant acceleration ⁽¹⁾		Stud outwards	20		
Maximum allowable mounting torque + 0 %, - 10 %		Not lubricated thread, tightening on nut	5000		N · m (lbf · in)
		Lubricated thread, tightening on nut	3.4 (30)		
		Not lubricated thread, tightening on hexagon	2.3 (20)		
		Lubricated thread, tightening on hexagon	4.2 (37)		
Approximate weight		Unleaded device	3.2 (28)		g
			17		
Case style		See dimensions - link at the end of datasheet	0.6		oz.
			DO-5 (DO-203AB)		

Notes

- ⁽¹⁾ Available only for 88HF
- ⁽²⁾ Recommended for pass-through holes
- ⁽³⁾ Recommended for holed threaded heatsinks



VS-85HF(R), VS-86HF(R), VS-87HF(R), VS-88HF(R) Series

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ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.10	0.08	$T_J = T_J$ maximum	KW
120°	0.11	0.11		
90°	0.13	0.13		
60°	0.17	0.17		
30°	0.26	0.26		

Note

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

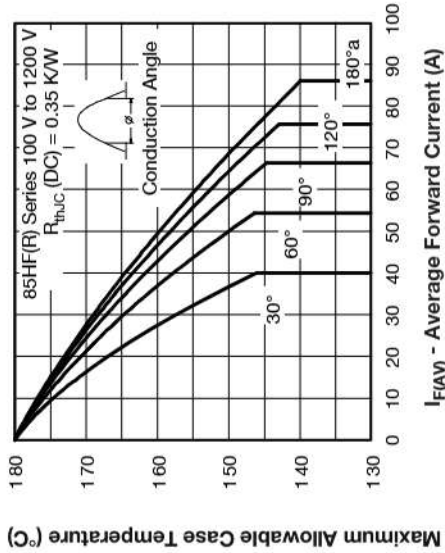


Fig. 1 - Average Ratings Characteristics

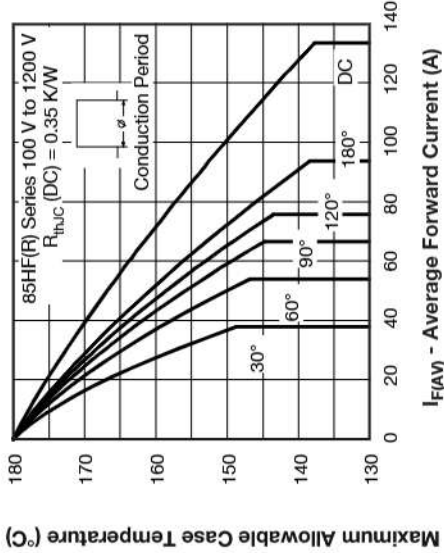


Fig. 2 - Current Ratings Characteristics

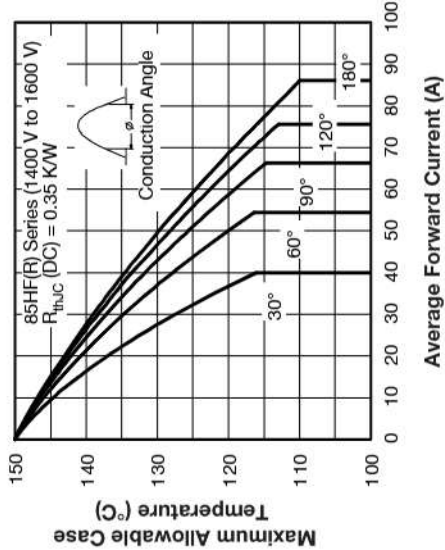


Fig. 3 - Current Ratings Characteristics

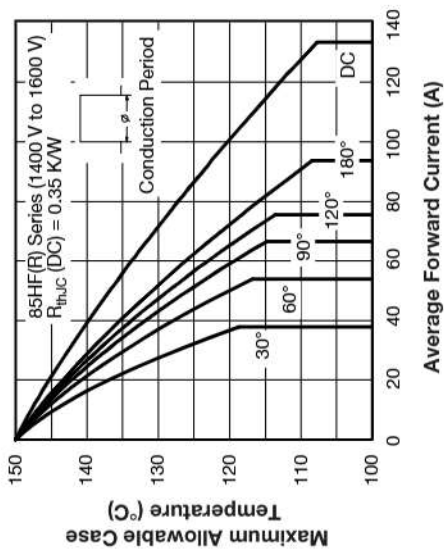


Fig. 4 - Current Ratings Characteristics



VS-85HF(R), VS-86HF(R), VS-87HF(R), VS-88HF(R) Series

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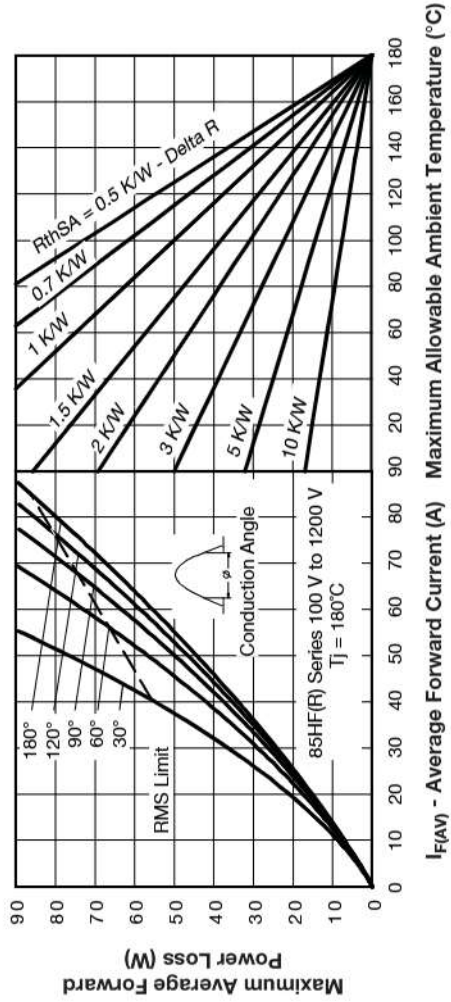


Fig. 5 - Forward Power Loss Characteristics

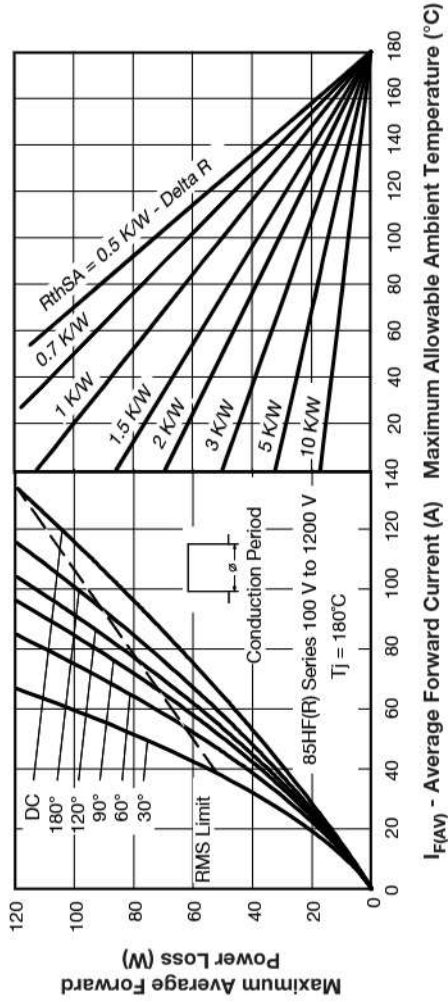


Fig. 6 - Forward Power Loss Characteristics

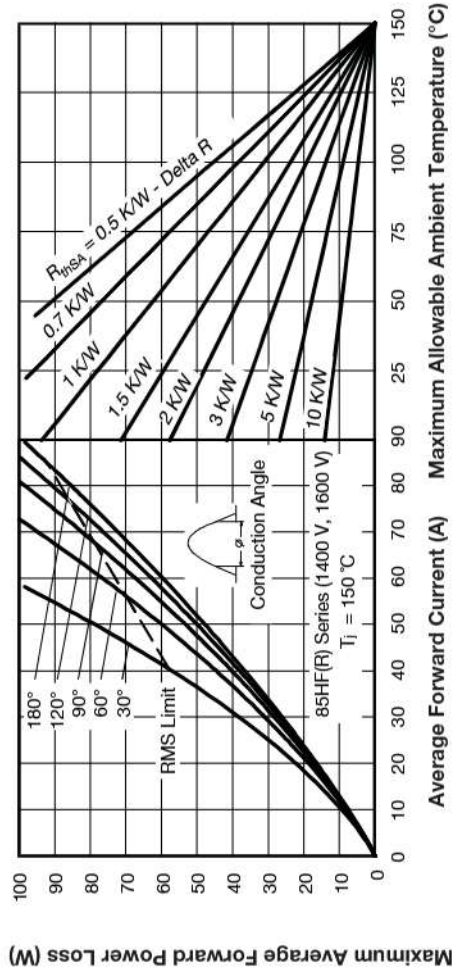


Fig. 7 - Forward Power Loss Characteristics



VS-85HF(R), VS-86HF(R), VS-87HF(R), VS-88HF(R) Series

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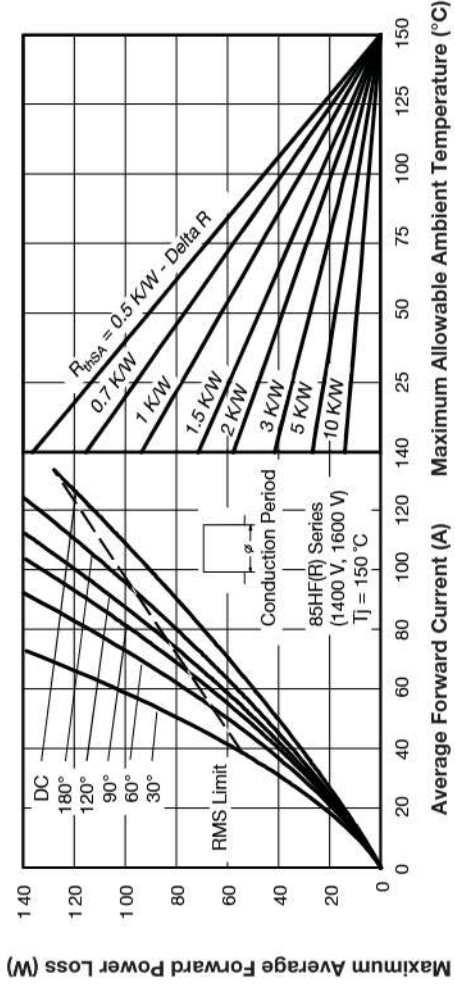


Fig. 8 - Forward Power Loss Characteristics

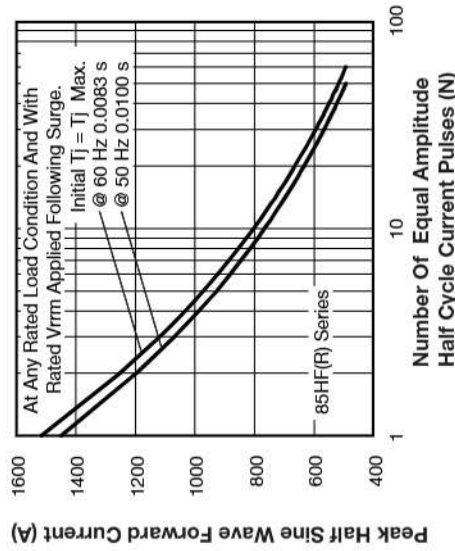


Fig. 9 - Maximum Non-Repetitive Surge Current

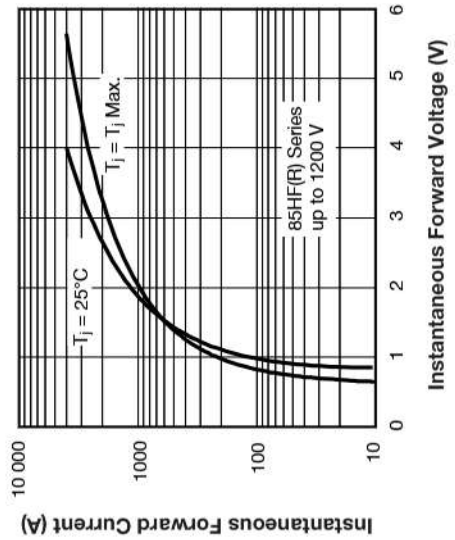


Fig. 11 - Forward Voltage Drop Characteristics

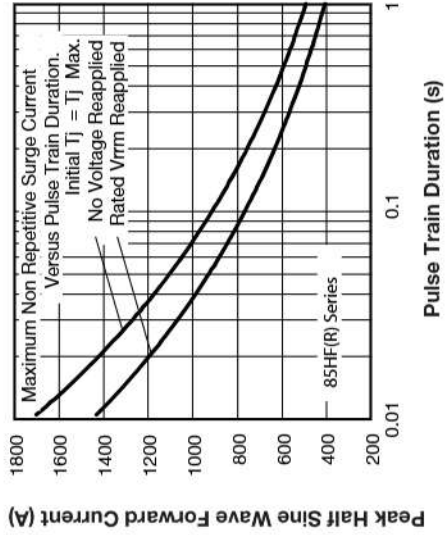


Fig. 10 - Maximum Non-Repetitive Surge Current

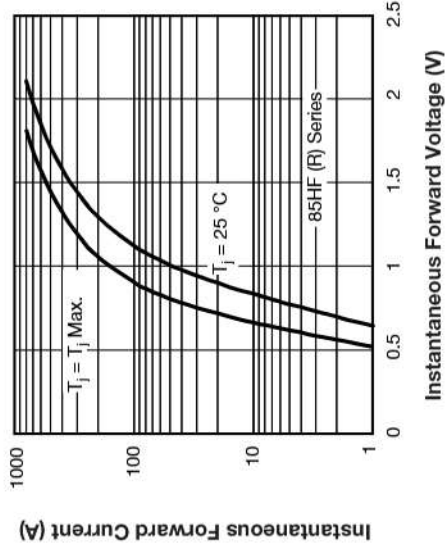


Fig. 12 - Forward Voltage Drop Characteristics (for 1400 V, 1600 V)

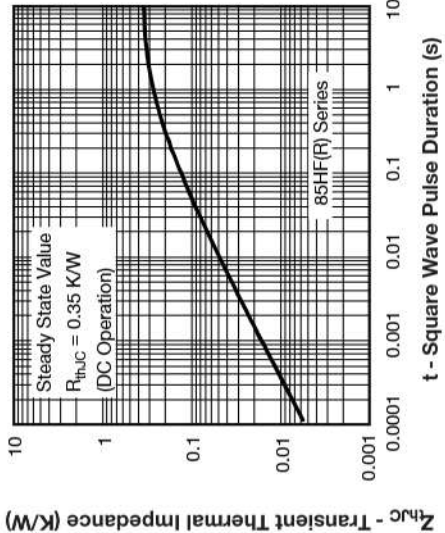


Fig. 13 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code					
VS-	85	HF	R	160	M
	①	②	③	④	⑤
⑥					
1	- Vishay Semiconductors product				
2	- 85 = standard device 86 = not isolated lead 87 = isolated lead with silicone sleeve (red = Reverse polarity) (blue = Normal polarity) 88 = type for rotating application HF = standard diode				
3	- None = stud normal polarity (cathode to stud)				
4	- R = stud reverse polarity (anode to stud)				
5	- Voltage code x 10 = V_{RRM} (see Voltage Ratings table)				
6	- None = stud base DO-5 (DO-203AB) 1/4" 28UNF-2A M = stud base DO-5 (DO-203AB) M6 x 1 (not available for 88HF) M8 = stud base DO-5 (DO-203AB) M8 x 1.25 (not available for 88HF)				

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95342



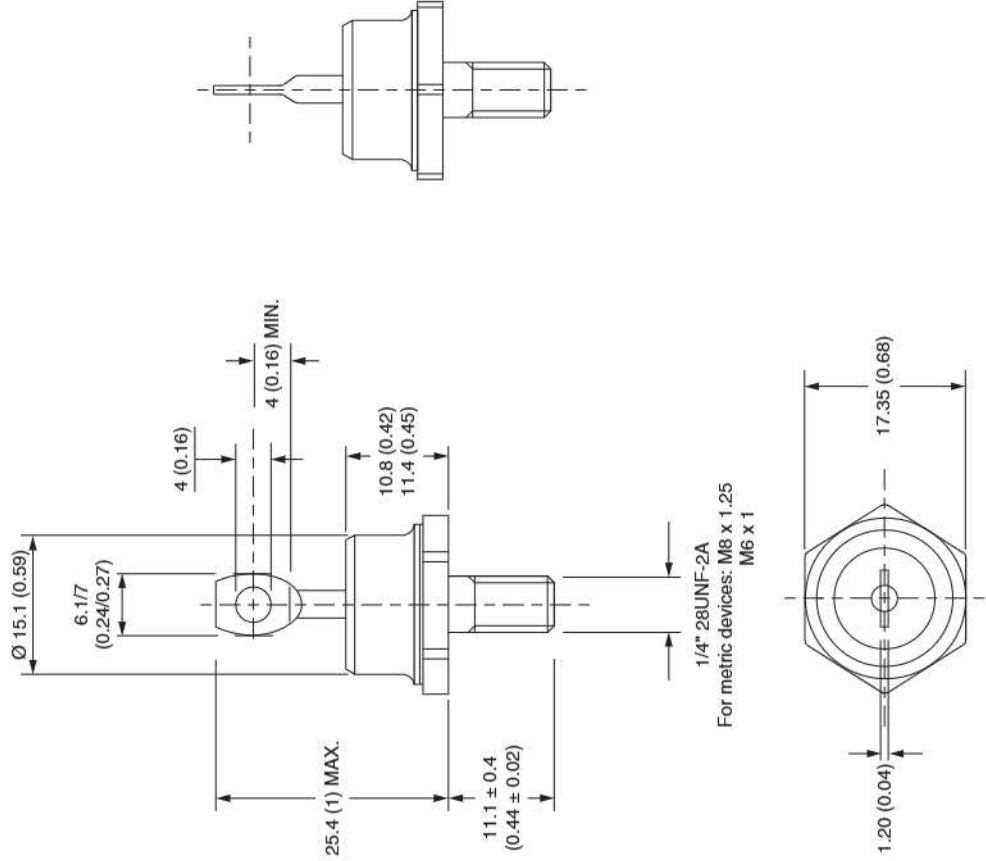
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Outline Dimensions

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DO-5 (DO-203AB) for 85HF(R), 86HF(R) and 88HF(R) Series

DIMENSIONS FOR 85HF(R) SERIES in millimeters (inches)



Revision: 20-Nov-2018

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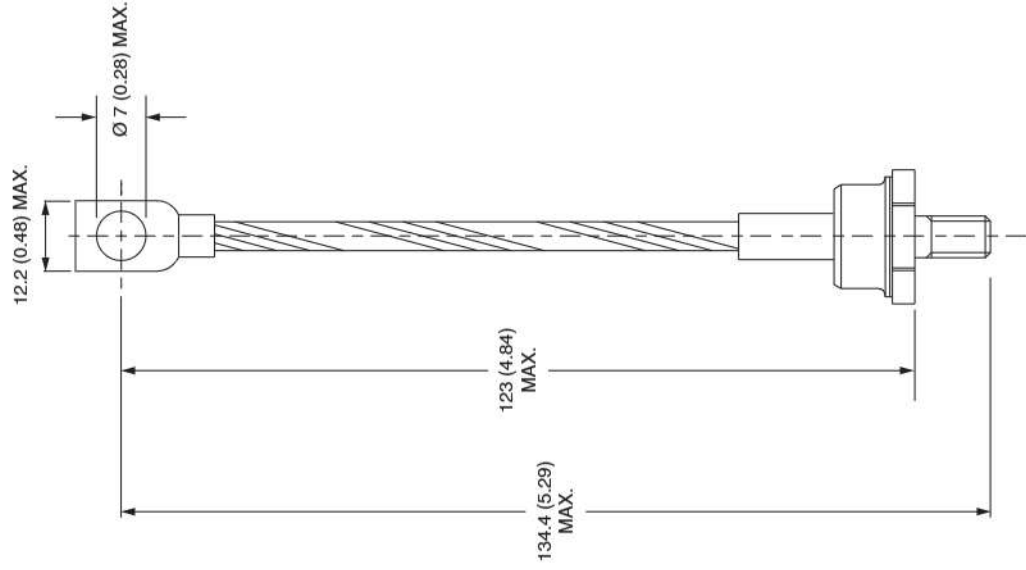


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Outline Dimensions

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DIMENSIONS FOR 86HF(R) SERIES in millimeters (inches)



Revision: 20-Nov-2018

Document Number: 95342

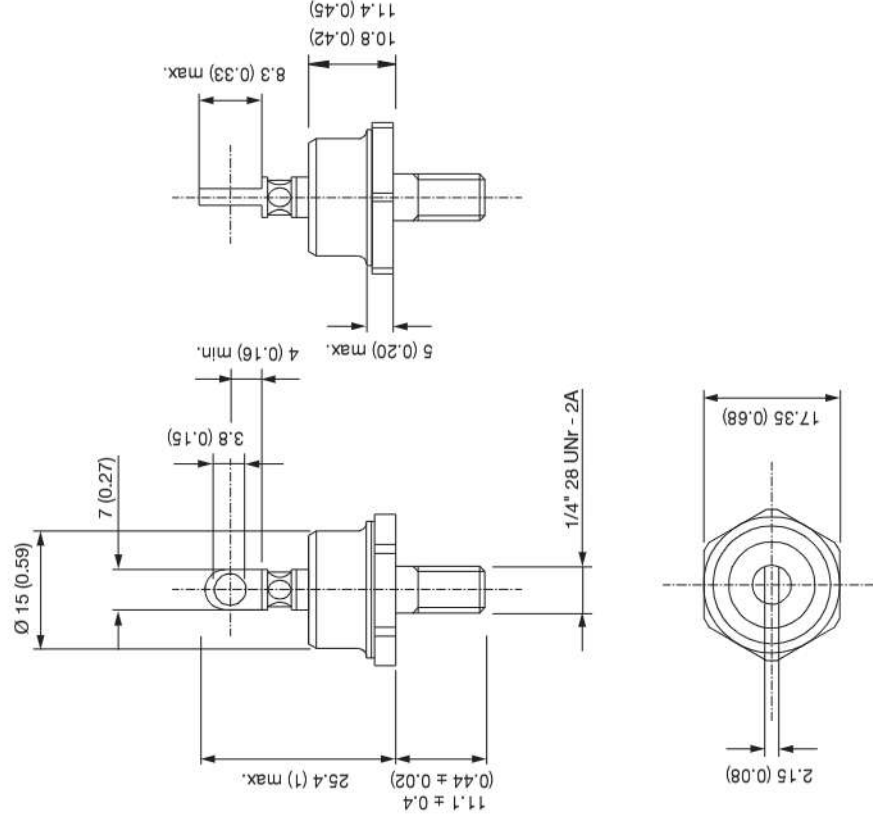
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DIMENSIONS 88HF(R) SERIES in millimeters (inches)





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