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)		UNITS
		10 to 120	140 to 160	
$I_{F(AV)}$		85	85	A
	T_C	140	110	°C
$I_{F(RMS)}$		133	133	A
I_{FSM}	50 Hz	1700	1700	A
	60 Hz	1800	1800	
I^2t	50 Hz	14 500	14 500	A^2s
	60 Hz	13 500	13 500	
V_{RRM}	Range	100 to 1200	1400 to 1600	V
T_J		-65 to +180	-65 to +150	°C

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	4.5
	160	1600	1700	

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FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			85HF(R) 10 to 120	85HF(R) 140/160	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			85		A
					140	110	°C
Maximum RMS forward current	$I_{F(RMS)}$				133		A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	1700		A
		t = 8.3 ms			1800		
		t = 10 ms	100 % V_{RRM} reapplied		1450		
		t = 8.3 ms			1500		
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		14 500		A^2s
		t = 8.3 ms			13 500		
		t = 10 ms	100 % V_{RRM} reapplied		10 500		
		t = 8.3 ms			9400		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			145 000		$A^2\sqrt{s}$
Value of threshold voltage (up to 1200 V)	$V_{F(TO)}$	$T_J = T_J$ 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) 10 to 20	85HF(R) 140 to 160	UNITS
Maximum junction operating and storage temperature range	T_J, T_{Stg}		-65 to +180	-65 to +150	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.35		K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.25		
Maximum shock (1)			1500		g
Maximum constant vibration (1)		50 Hz	20		
Maximum constant acceleration (1)		Stud outwards	5000		
Maximum allowable mounting torque + 0 %, - 10 %		Not lubricated thread, tighting on nut	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tighting on nut	2.3 (20)		
		Not lubricated thread, tighting on hexagon	4.2 (37)		
		Lubricated thread, tighting on hexagon	3.2 (28)		
Approximate weight		Unleaded device	17		g
			0.6		oz.
Case style		See dimensions - link at the end of datasheet	DO-5 (DO-203AB)		

Notes

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

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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	K/W
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

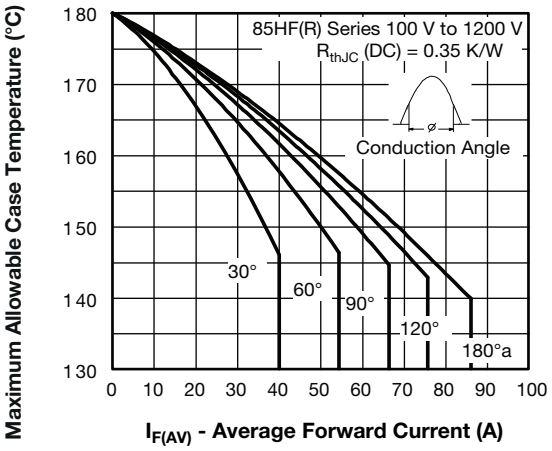


Fig. 1 - Current Ratings Characteristics

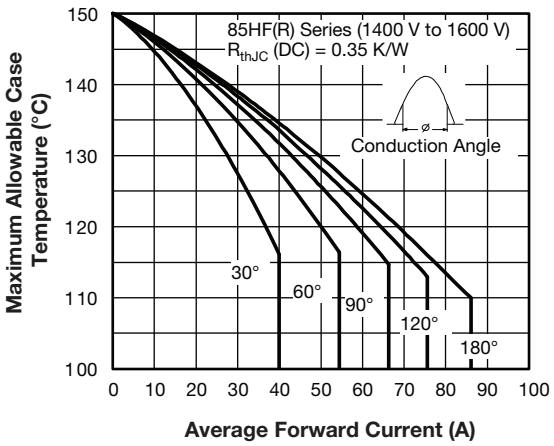


Fig. 3 - Current Ratings Characteristics

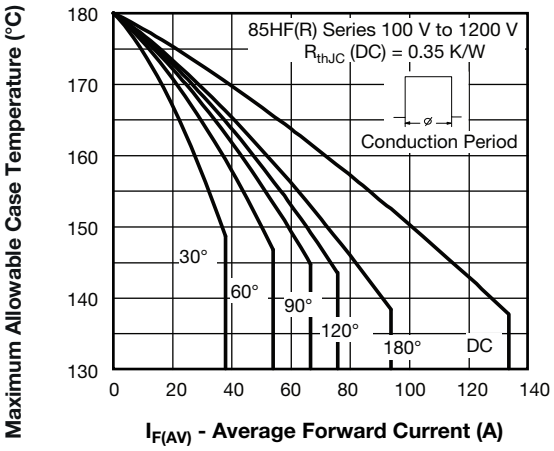


Fig. 2 - Current Ratings Characteristics

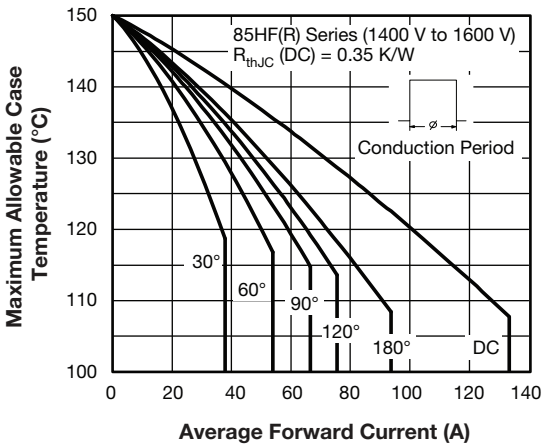


Fig. 4 - Current Ratings Characteristics

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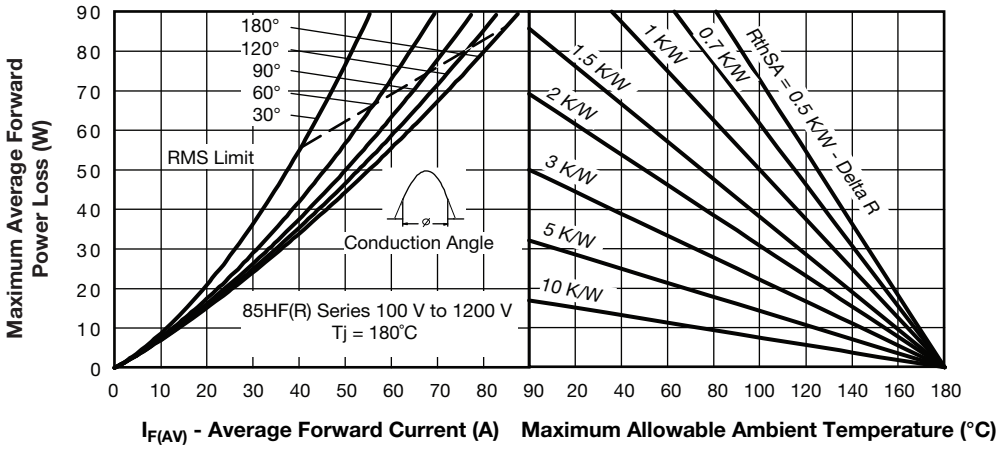


Fig. 5 - Forward Power Loss Characteristics

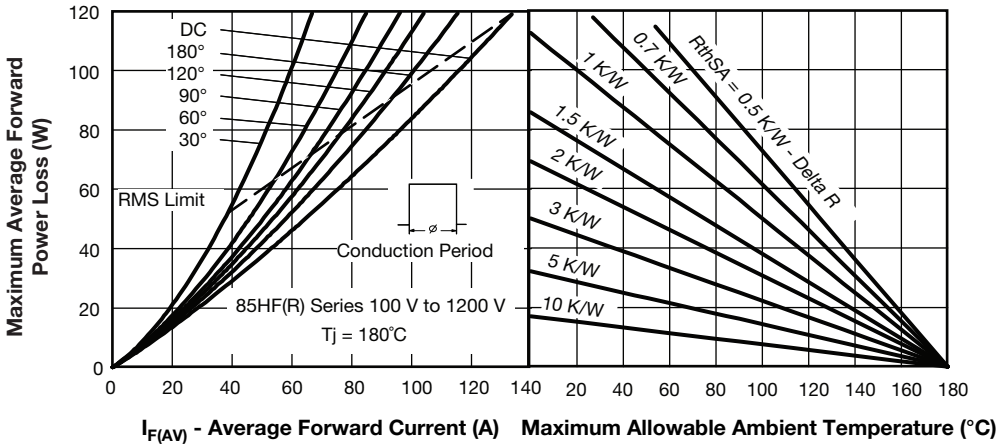


Fig. 6 - Forward Power Loss Characteristics

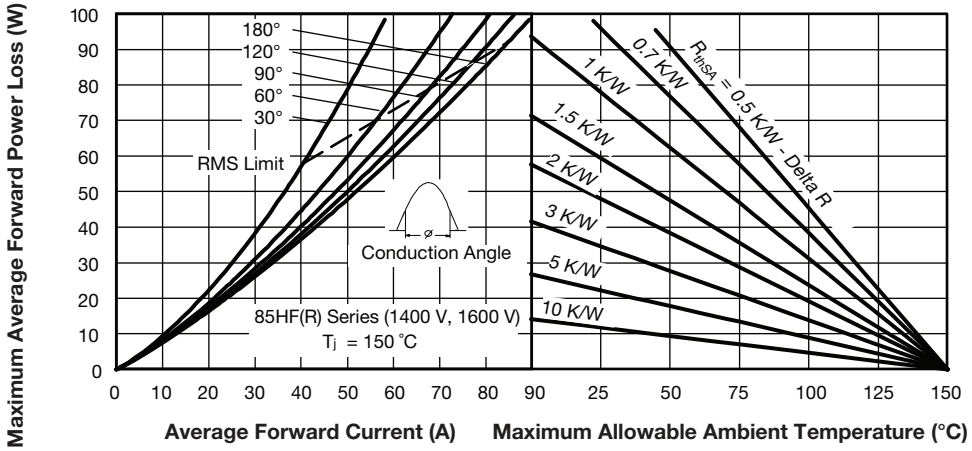


Fig. 7 - Forward Power Loss Characteristics

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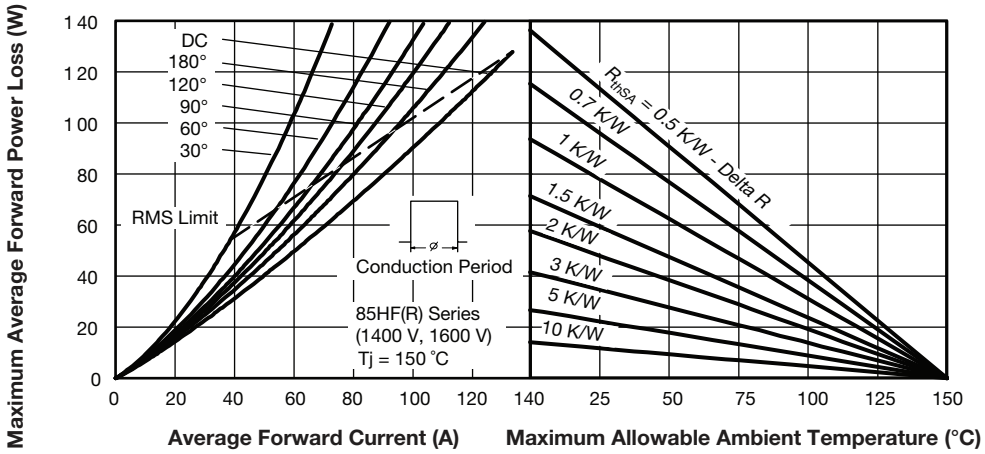


Fig. 8 - Forward Power Loss Characteristics

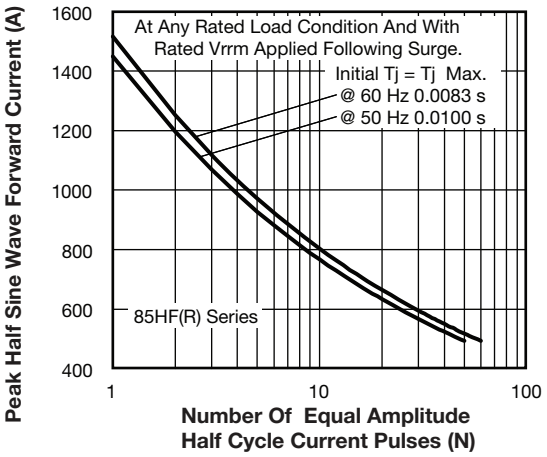


Fig. 9 - Maximum Non-Repetitive Surge Current

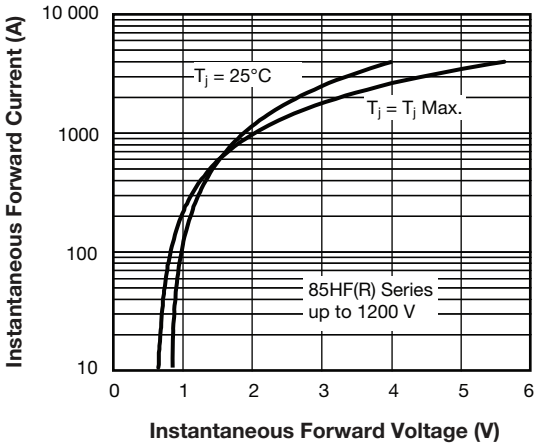


Fig. 11 - Forward Voltage Drop Characteristics

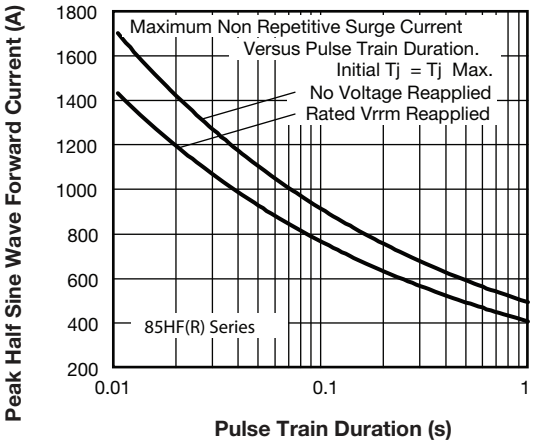


Fig. 10 - Maximum Non-Repetitive Surge Current

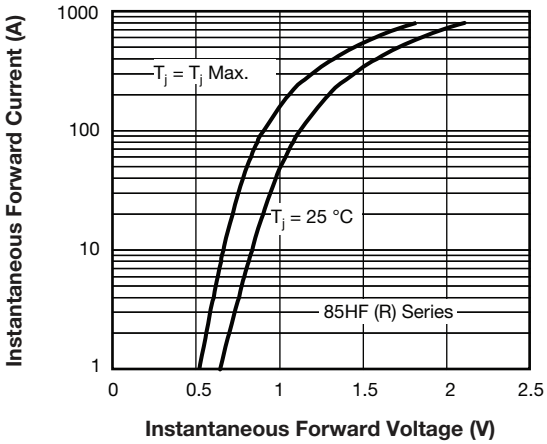


Fig. 12 - Forward Voltage Drop Characteristics
(for 1400 V, 1600 V)

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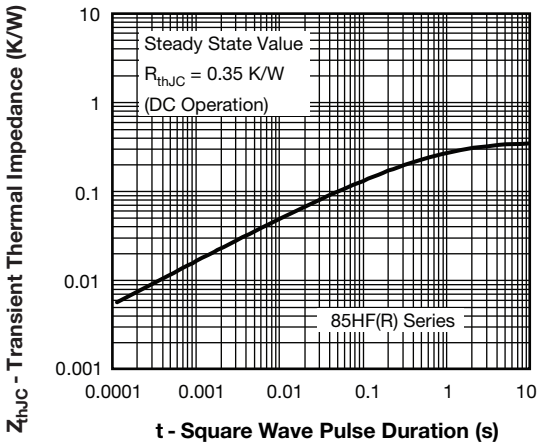


Fig. 13 - Thermal Impedance Z_{thJC} Characteristics

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

3 - HF = standard diode

4 - None = stud normal polarity (cathode to stud)
R = stud reverse polarity (anode to stud)

5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

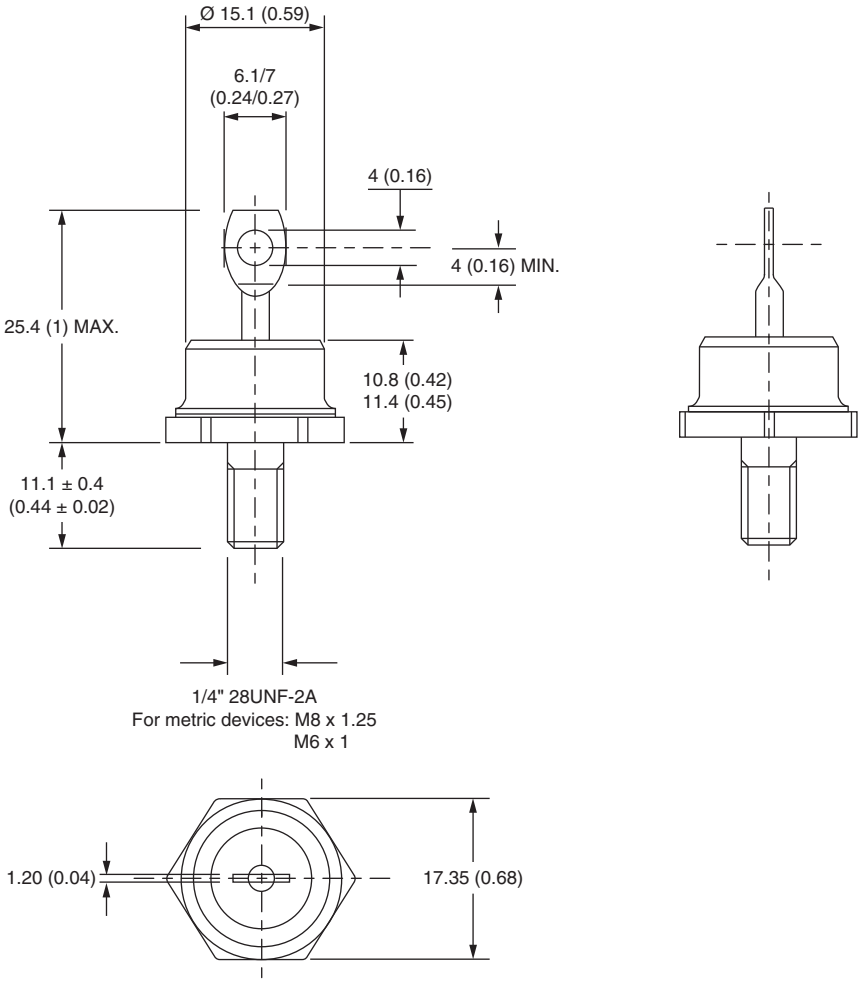
6 - None = stud base DO-5 (DO-203AB) 1/4" 28UNF-2A
M = stud base DO-5 (DO-203AB) M6 x 1 (not available for 88HF)
M8 = stud base DO-5 (DO-203AB) M8 x 1.25 (not available for 88HF)

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

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

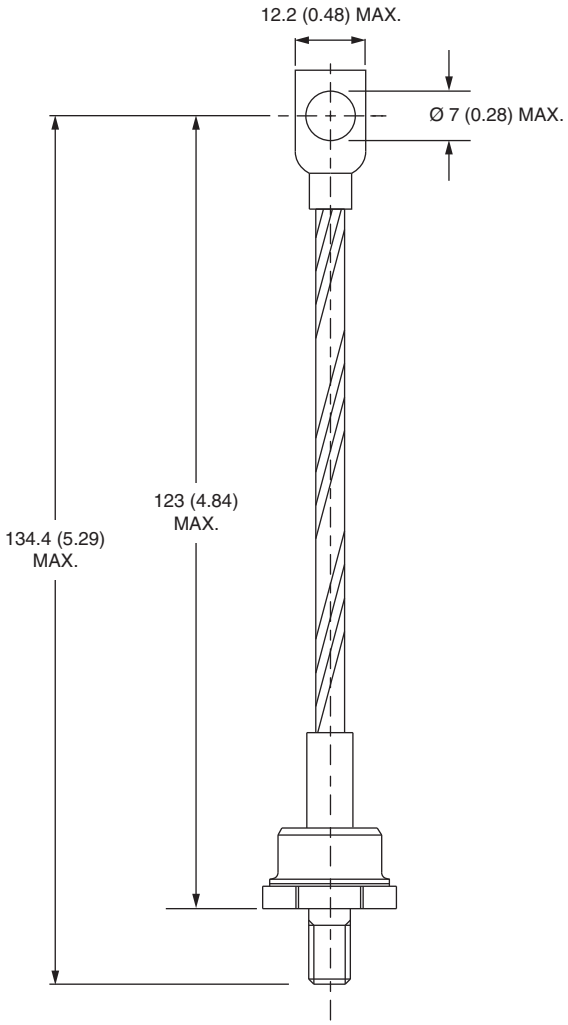
DIMENSIONS FOR 85HF(R) SERIES in millimeters (inches)



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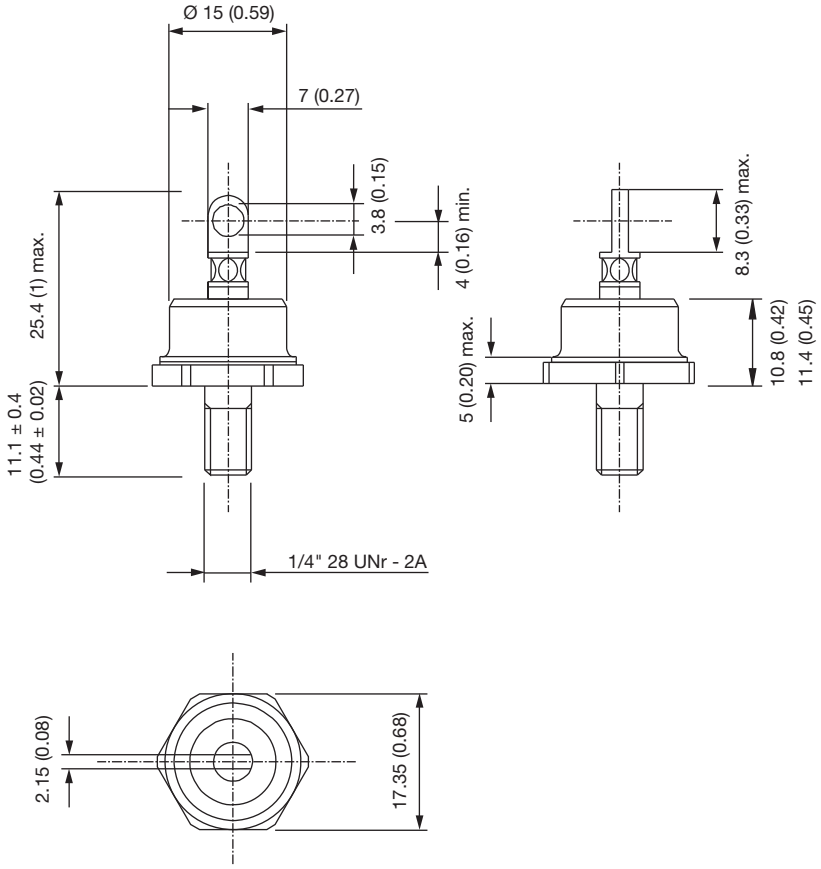
DIMENSIONS FOR 86HF(R) SERIES in millimeters (inches)



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



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