

## Standard Recovery Diodes, (Stud Version), 70 A



DO-5 (DO-203AB)

### FEATURES

- High surge current capability
- Designed for a wide range of applications
- 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	70 A
Package	DO-5 (DO-203AB)
Circuit configuration	Single

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	70HF(R)		UNITS
		10 TO 120	140/160	
$I_{F(AV)}$		70	70	A
	$T_C$	140	110	°C
$I_{F(RMS)}$		110	110	A
$I_{FSM}$	50 Hz	1200	1200	A
	60 Hz	1250	1250	
$I^2t$	50 Hz	7100	7100	A <sup>2</sup> s
	60 Hz	6450	6450	
$V_{RRM}$	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	$V_{R(BR)}$ , MINIMUM AVALANCHE VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM mA
VS-70HF(R)	10	100	200	200	15
	20	200	300	300	
	30	300	400	400	
	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	



<b>FORWARD CONDUCTION</b>					
PARAMETER	SYMBOL	TEST CONDITIONS		70HF(R)	UNITS
				10 to 120	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		70	A
				140	°C
Maximum RMS forward current	$I_{F(RMS)}$			110	A
Maximum peak, one cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reapplied	1200	A
		t = 8.3 ms	No voltage reapplied	1250	
		t = 10 ms	100 % $V_{RRM}$ reapplied	1000	
		t = 8.3 ms	100 % $V_{RRM}$ reapplied	1050	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied	7100	A <sup>2</sup> s
		t = 8.3 ms	No voltage reapplied	6450	
		t = 10 ms	100 % $V_{RRM}$ reapplied	5000	
		t = 8.3 ms	100 % $V_{RRM}$ reapplied	4550	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied		71 000	A <sup>2</sup> √s
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.79	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.00	
Low level value of forward slope resistance	$r_{f1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		2.33	mΩ
High level value of forward slope resistance	$r_{f2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.53	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 220$ A, $T_J = 25$ °C, $t_p = 400$ μs rectangular wave		1.35	V
				1.46	

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS	70HF(R)		UNITS
			10 to 120	140/160	
Maximum junction and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		-65 to +180	-65 to +150	°C
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.45		K/W
Thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth, flat and greased	0.25		
Maximum allowable mounting torque (+0 %, -10 %)		Not lubricated thread, tightening on nut <sup>(1)</sup>	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tightening on nut <sup>(1)</sup>	2.3 (20)		
		Not lubricated thread, tightening on hexagon <sup>(2)</sup>	4.2 (37)		
		Lubricated thread, tightening on hexagon <sup>(2)</sup>	3.2 (28)		
Approximate weight			17		g
			0.6		oz.
Case style		See dimensions - link at the end of datasheet	DO-5 (DO-203AB)		

**Notes**

- (1) Recommended for pass-through holes  
 (2) Recommended for holed threaded heatsinks

<b><math>\Delta R_{thJC}</math> CONDUCTION</b>				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.08	0.06	$T_J = T_J$ maximum	K/W
120°	0.10	0.11		
90°	0.13	0.14		
60°	0.19	0.20		
30°	0.30	0.30		

**Note**

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

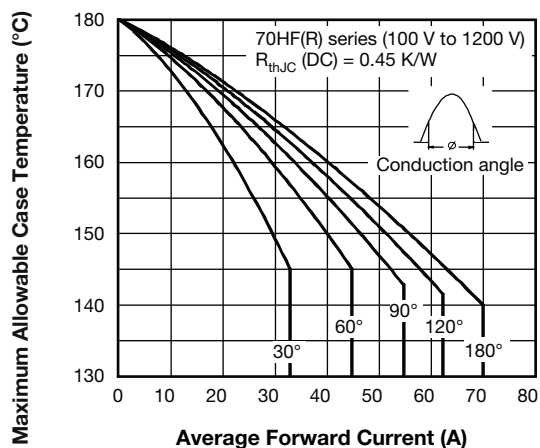


Fig. 1 - Current Ratings Characteristics

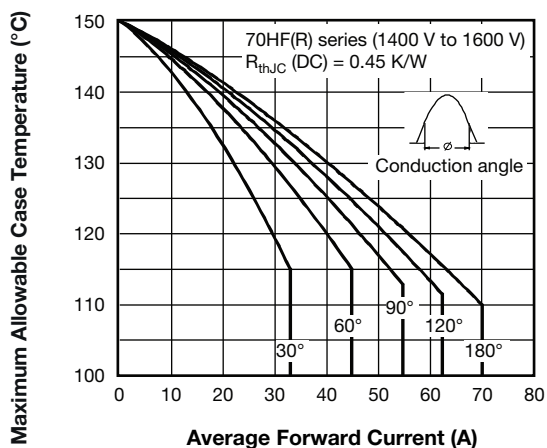


Fig. 3 - Current Ratings Characteristics

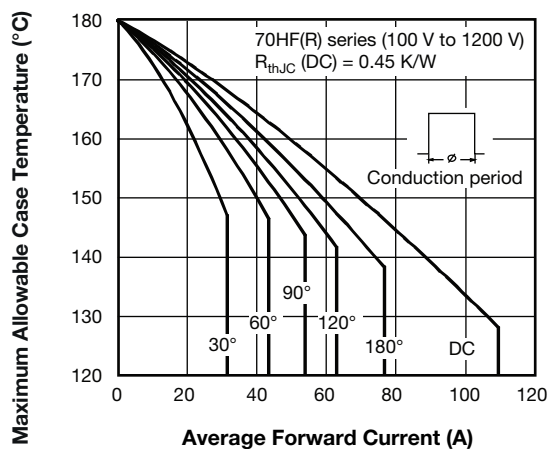


Fig. 2 - Current Ratings Characteristics

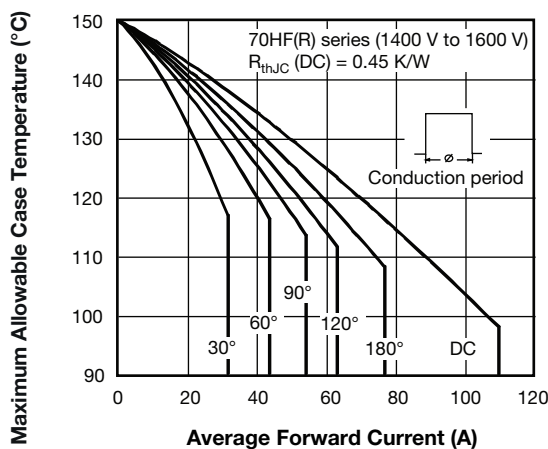


Fig. 4 - Current Ratings Characteristics

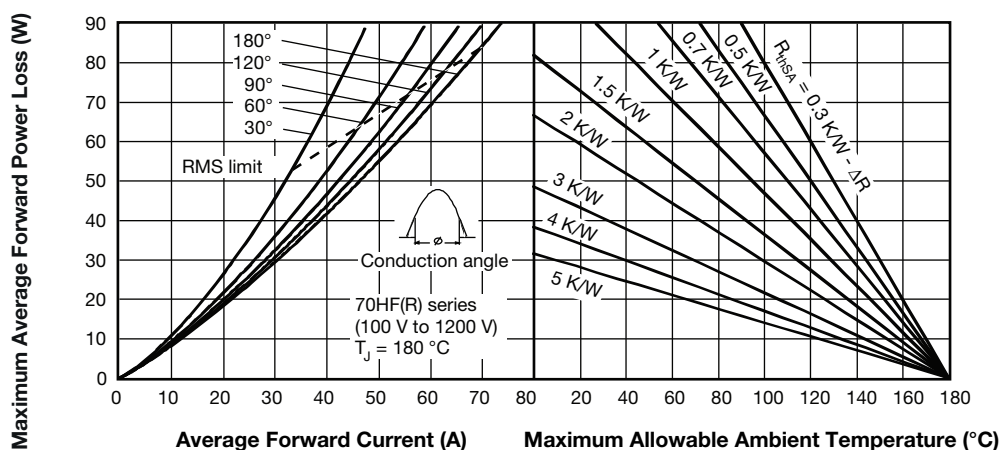


Fig. 5 - Forward Power Loss Characteristics

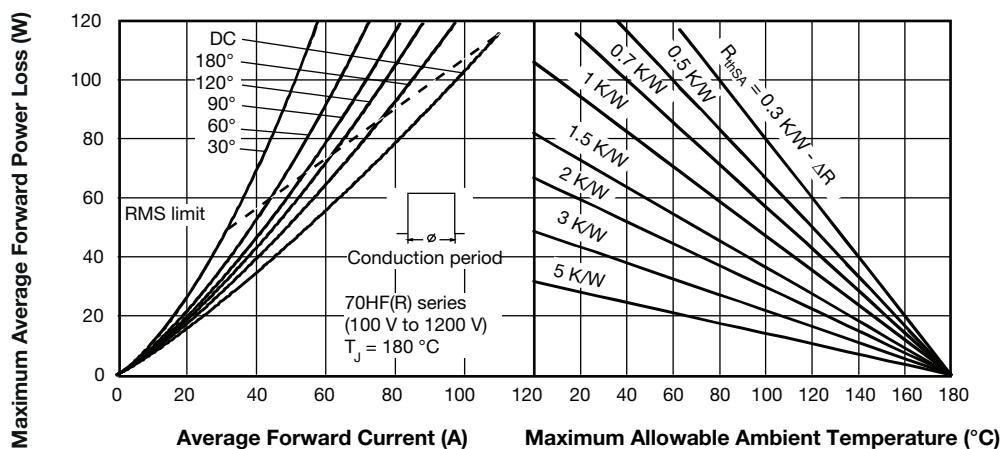


Fig. 6 - Forward Power Loss Characteristics

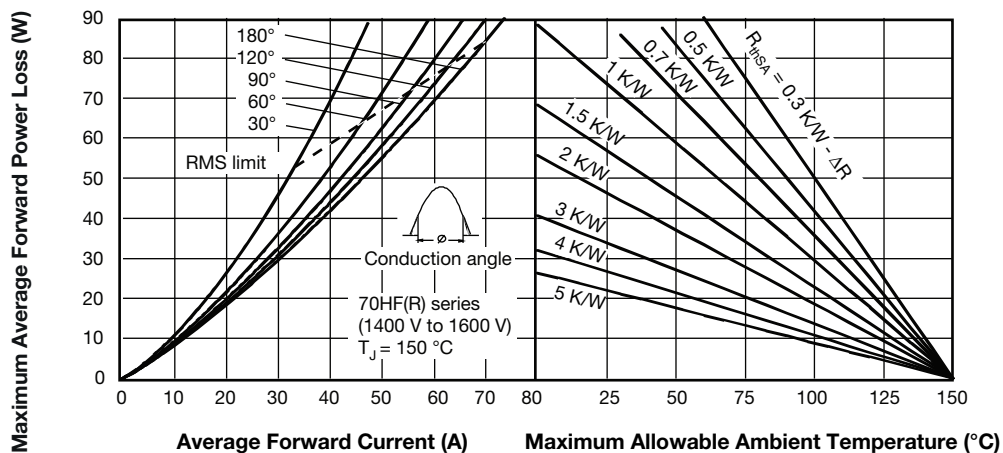


Fig. 7 - Forward Power Loss Characteristics

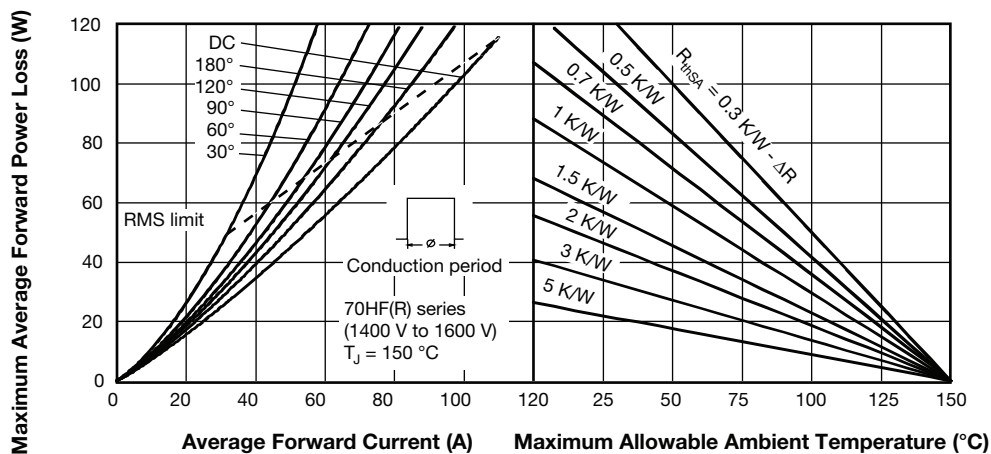


Fig. 8 - Forward Power Loss Characteristics

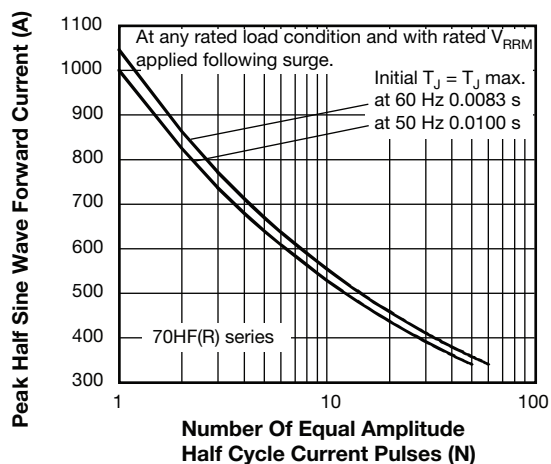


Fig. 9 - Maximum Non-Repetitive Surge Current

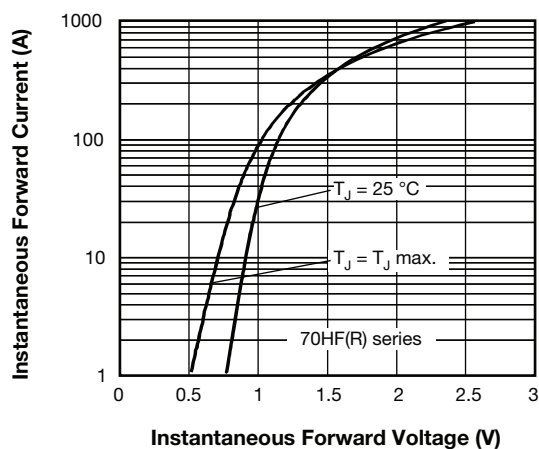


Fig. 11 - Forward Voltage Drop Characteristics

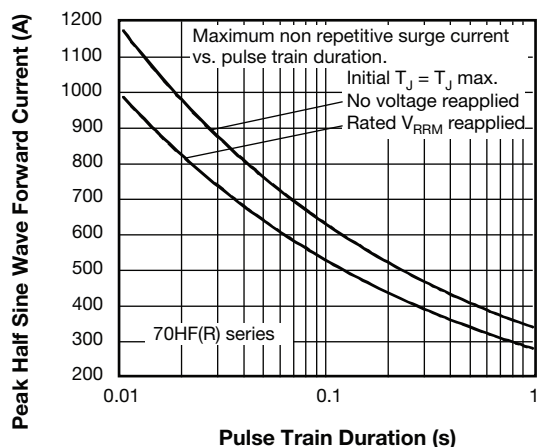


Fig. 10 - Maximum Non-Repetitive Surge Current

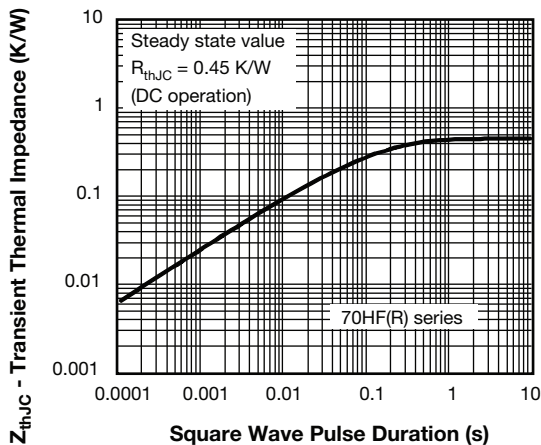


Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics

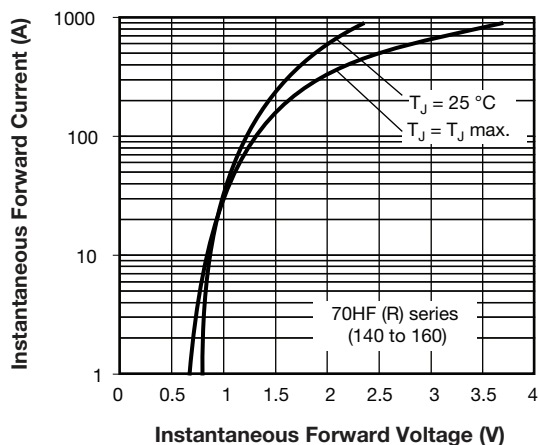


Fig. 13 - Forward Voltage Drop Characteristics



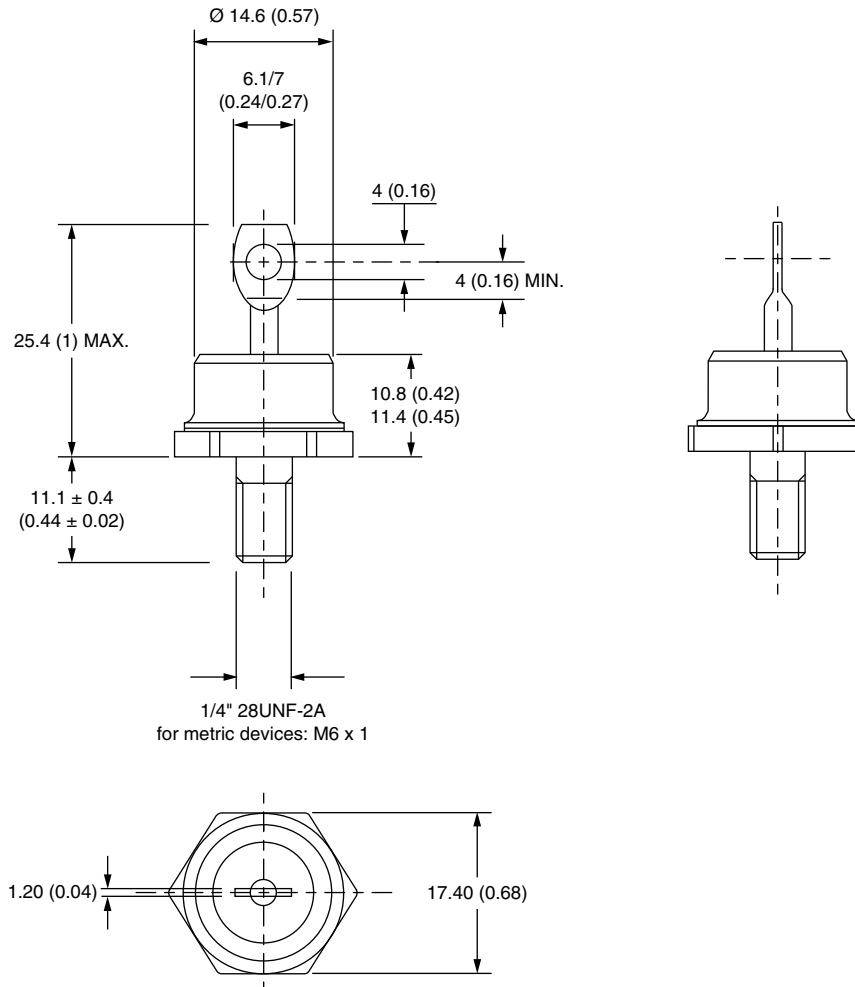
## ORDERING INFORMATION TABLE

Device code	VS-	70	HF	R	160	M
	1	2	3	4	5	6
1	- Vishay Semiconductors product					
2	- 70 = standard device					
	71 = not isolated lead					
	72 = isolated lead with silicone sleeve					
	(red = reverse polarity)					
	(blue = normal polarity)					
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					

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95343">www.vishay.com/doc?95343</a>

## DO-203AB (DO-5) for 70HF(R) and 71HF(R) Series

### DIMENSIONS FOR 70HF(R) SERIES in millimeters (inches)



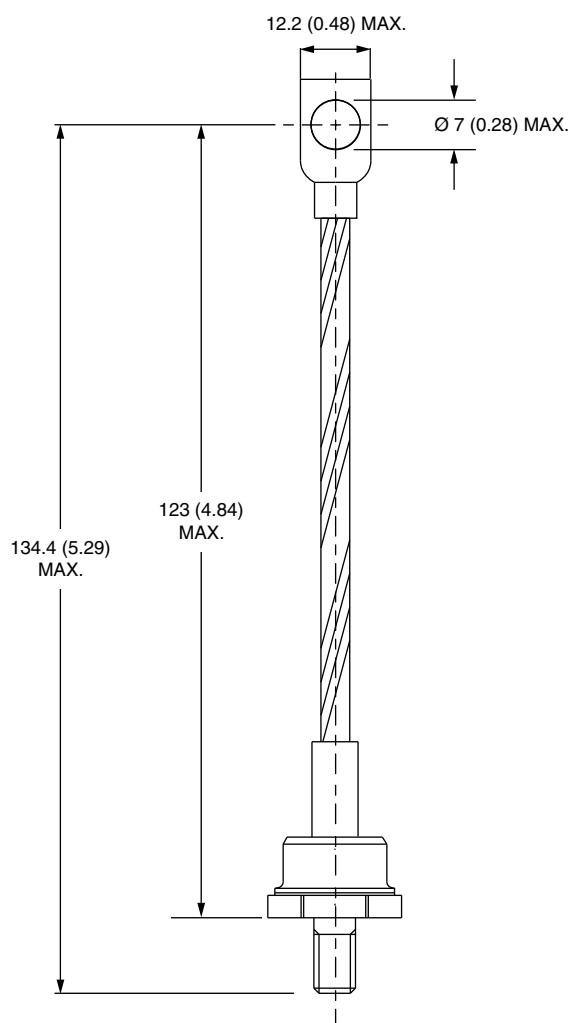
# Outline Dimensions

Vishay Semiconductors

DO-203AB (DO-5) for 70HF(R)  
and 71HF(R) Series



## **DIMENSIONS FOR 71HF(R) SERIES** in millimeters (inches)







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