

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


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 ² 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	

**FORWARD CONDUCTION**

PARAMETER	SYMBOL	TEST CONDITIONS			70HF(R)		UNITS	
					10 to 120	140/160		
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave			70		A	
					140	110	°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 reappplied	Sinusoidal half wave, initial T _J = T _J maximum	1200		A	
		t = 8.3 ms			1250			
		t = 10 ms	100 % V _{RRM} reappplied		1000			
		t = 8.3 ms			1050			
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reappplied		7100		A ² s	
		t = 8.3 ms			6450			
		t = 10 ms	100 % V _{RRM} reappplied		5000			
		t = 8.3 ms			4550			
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reappplied			71 000		A ² √s	
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum			0.79		V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum			1.00			
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum			2.33		mΩ	
High level value of forward slope resistance	r _{f2}	(I > π × 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	1.46	V	

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	70HF(R)		UNITS
			10 to 120	140/160	
Maximum junction 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	0.45		K/W
Thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth, flat and greased	0.25		
Maximum allowable mounting torque (+0 %, -10 %)		Not lubricated thread, tightening on nut ⁽¹⁾	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tightening on nut ⁽¹⁾	2.3 (20)		
		Not lubricated thread, tightening on hexagon ⁽²⁾	4.2 (37)		
		Lubricated thread, tightening on hexagon ⁽²⁾	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

ΔR_{thJC} CONDUCTION

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

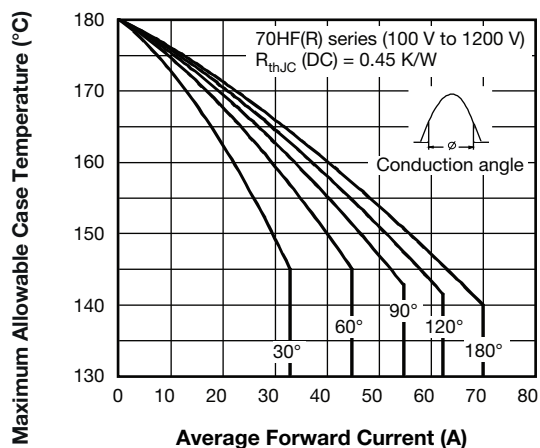


Fig. 1 - Current Ratings Characteristics

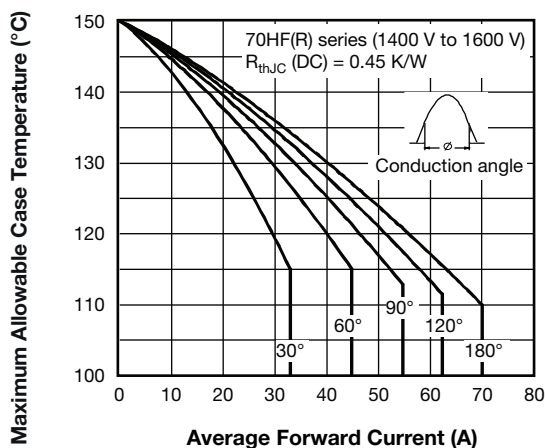


Fig. 3 - Current Ratings Characteristics

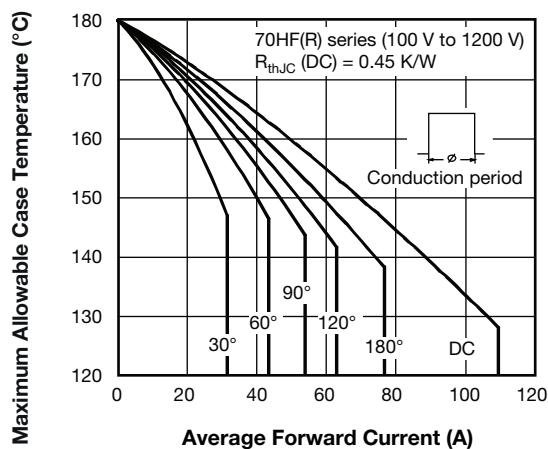


Fig. 2 - Current Ratings Characteristics

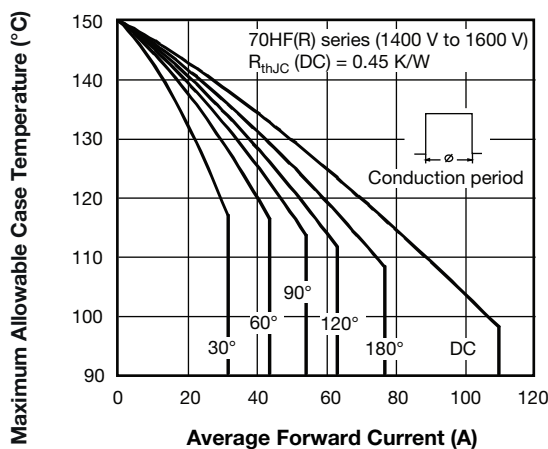


Fig. 4 - Current Ratings Characteristics

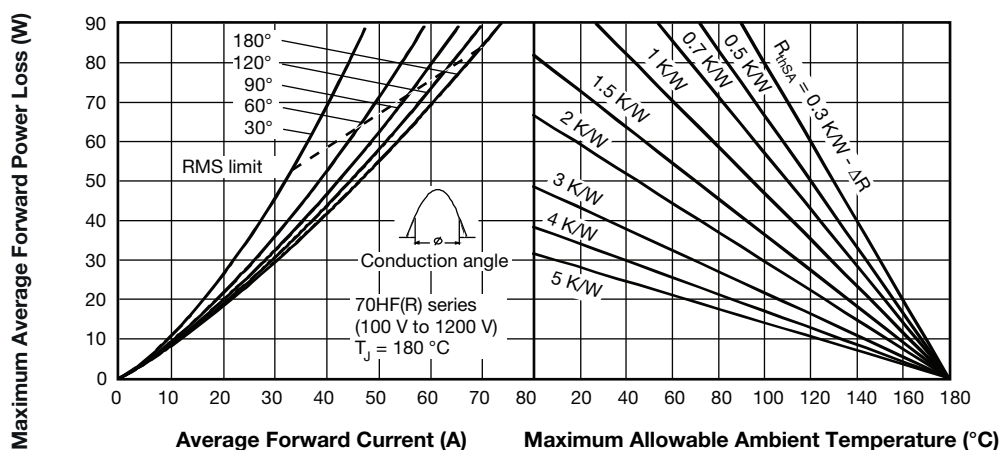


Fig. 5 - Forward Power Loss Characteristics

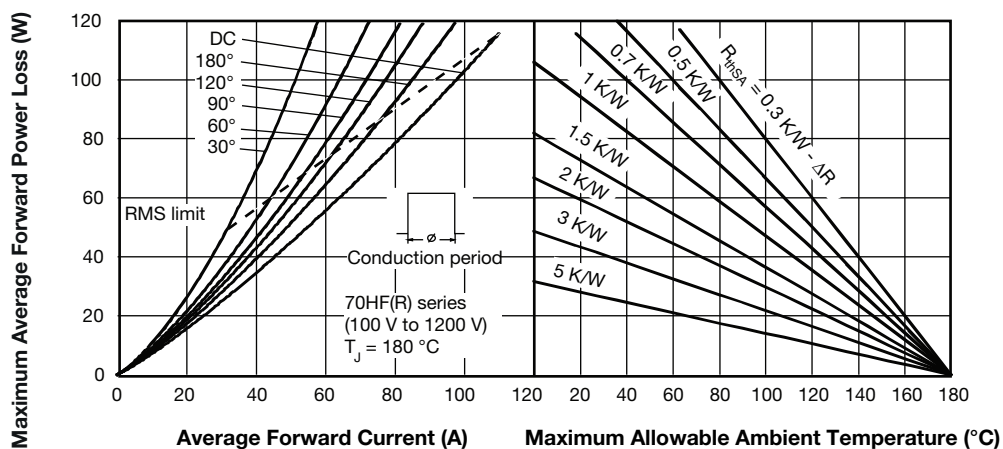


Fig. 6 - Forward Power Loss Characteristics

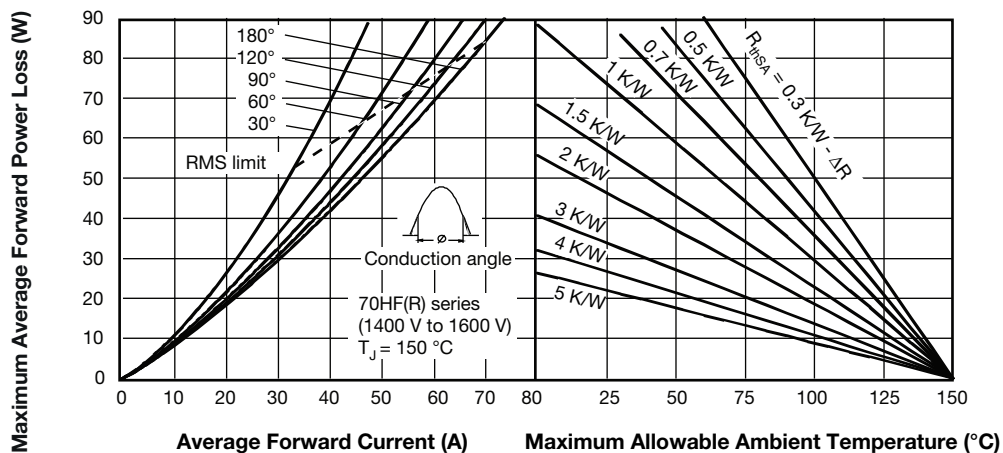


Fig. 7 - Forward Power Loss Characteristics

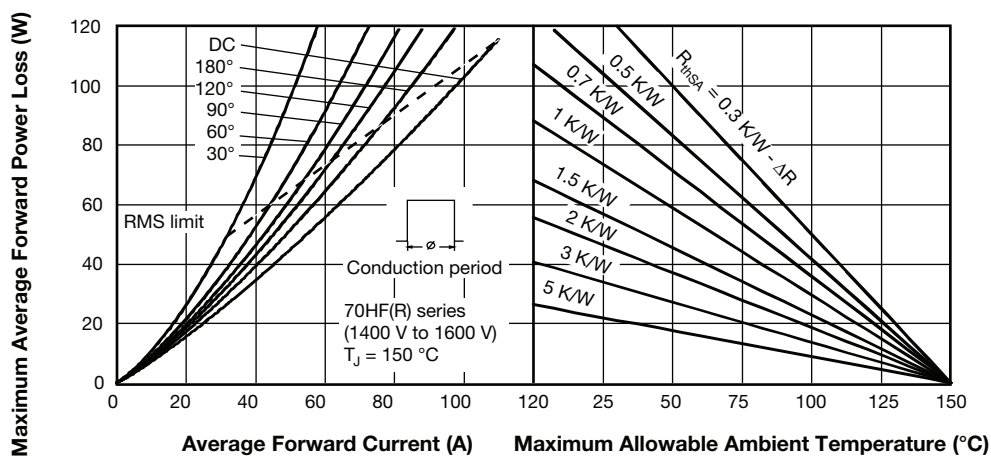


Fig. 8 - Forward Power Loss Characteristics

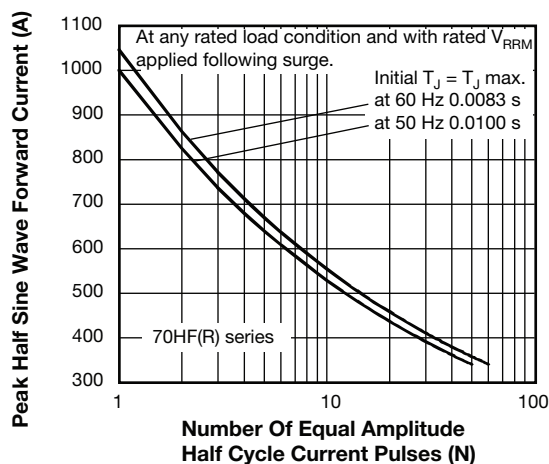


Fig. 9 - Maximum Non-Repetitive Surge Current

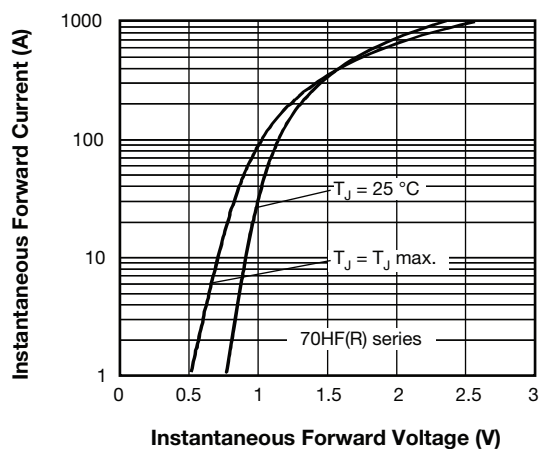


Fig. 11 - Forward Voltage Drop Characteristics

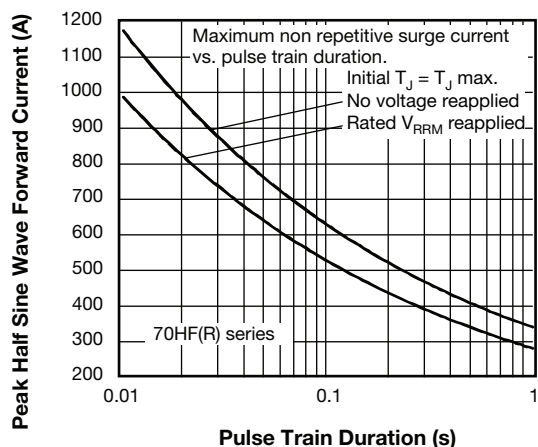


Fig. 10 - Maximum Non-Repetitive Surge Current

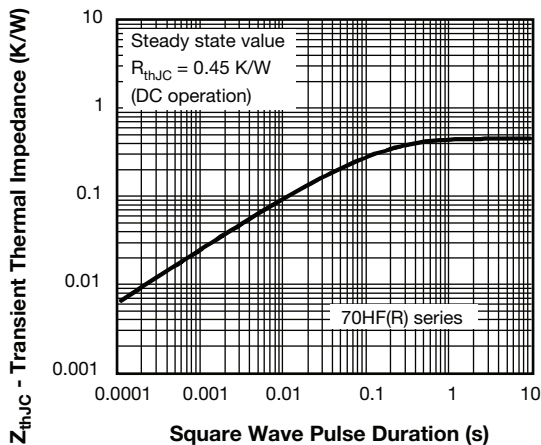


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

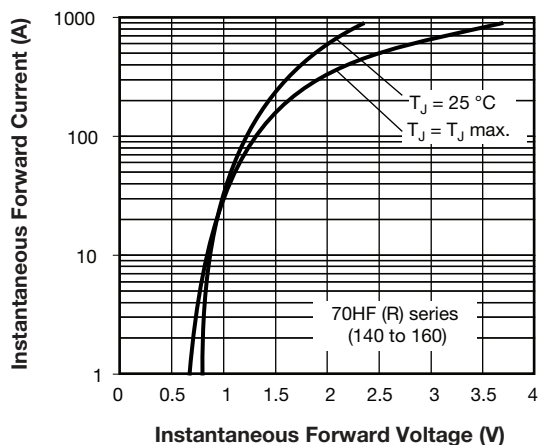


Fig. 13 - Forward Voltage Drop Characteristics



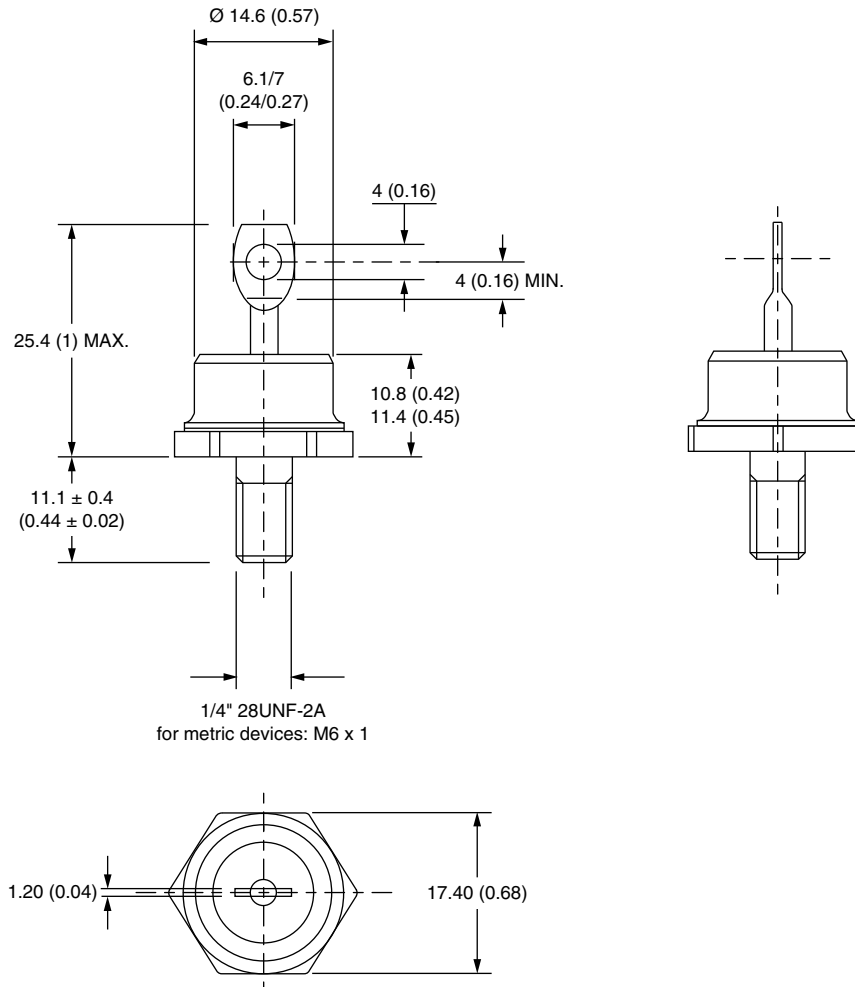
ORDERING INFORMATION TABLE

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	www.vishay.com/doc?95343

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

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



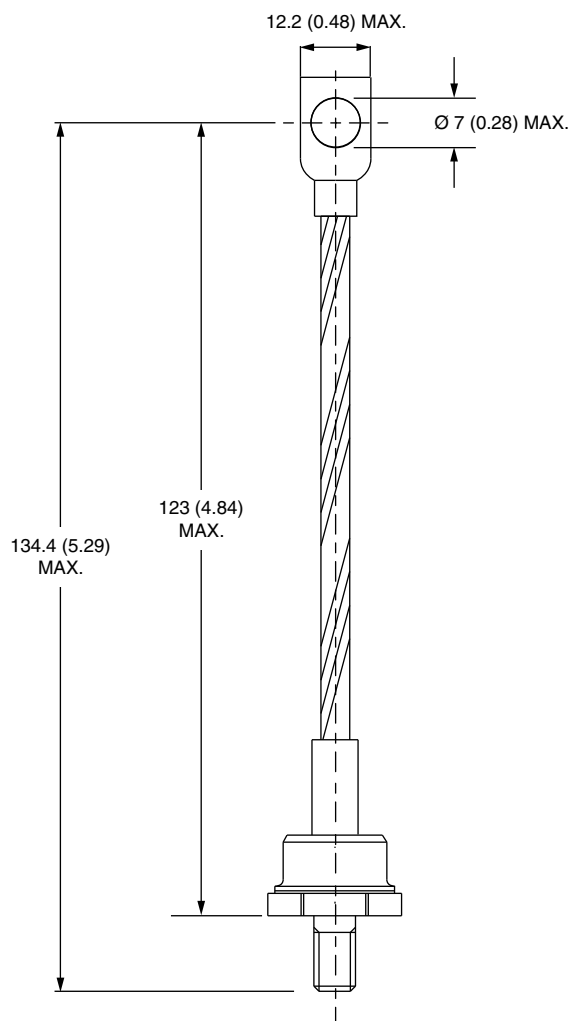
Outline Dimensions

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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