



**THE DATASHEET OF
VS-70HFR120**





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 | |
| 160 | 1600 | 1900 | 1750 | 4.5 | |



| 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^2t for fusing | I^2t | 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 $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | 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 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$, $T_J = T_J$ 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 | 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

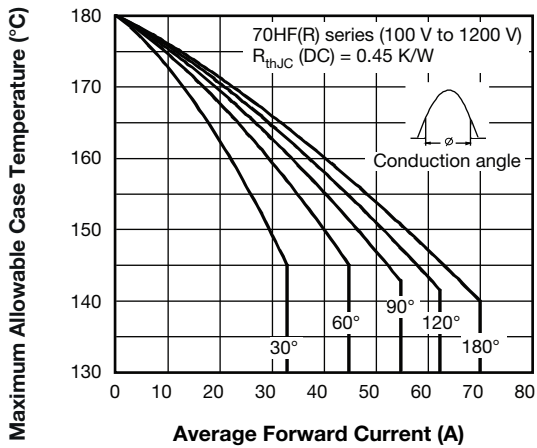


Fig. 1 - Current Ratings Characteristics

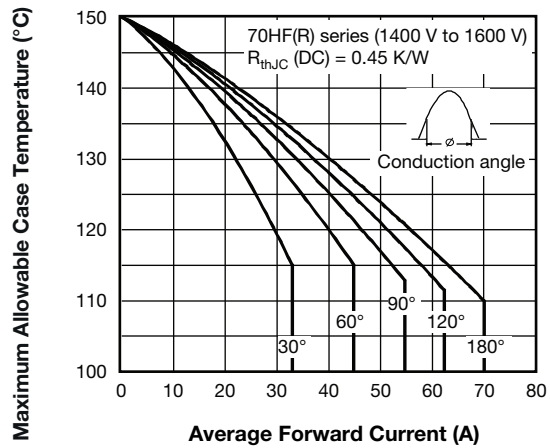


Fig. 3 - Current Ratings Characteristics

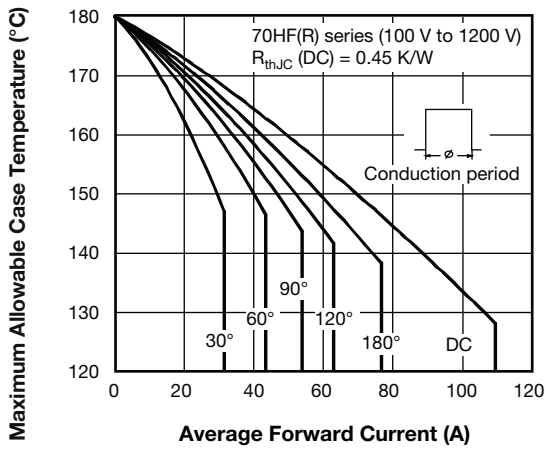


Fig. 2 - Current Ratings Characteristics

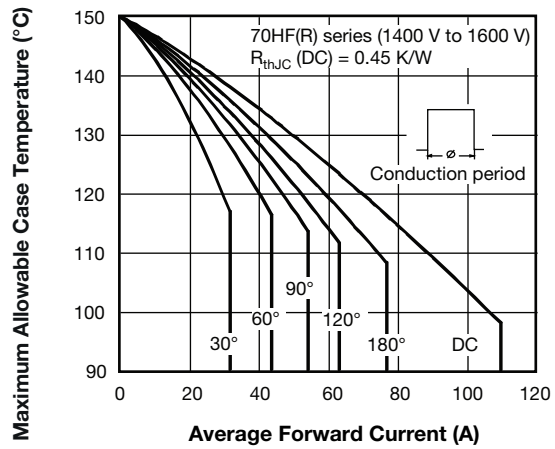


Fig. 4 - Current Ratings Characteristics

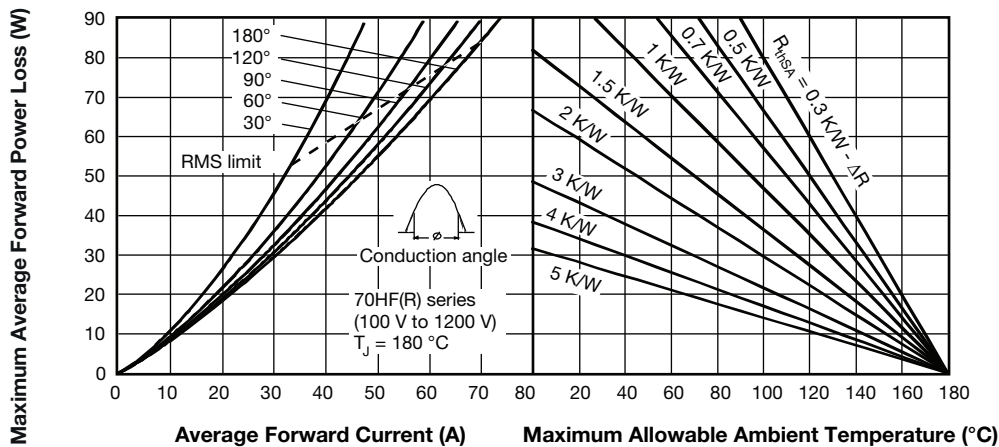


Fig. 5 - Forward Power Loss Characteristics

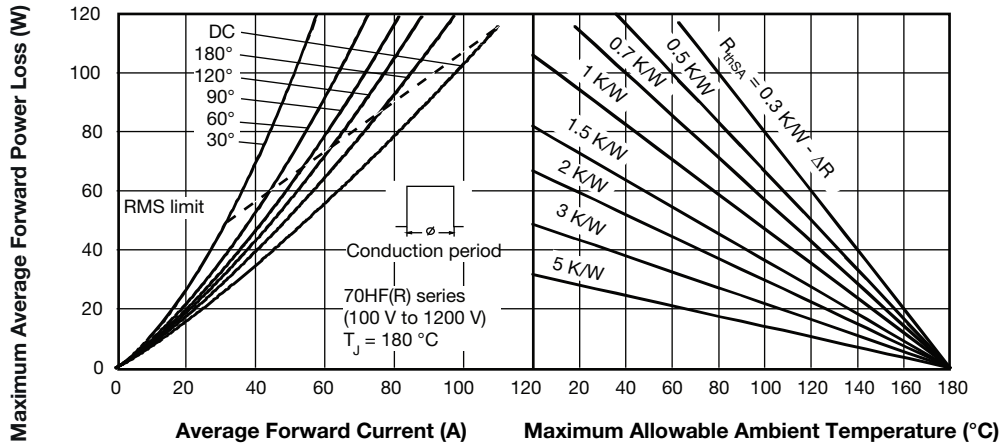


Fig. 6 - Forward Power Loss Characteristics

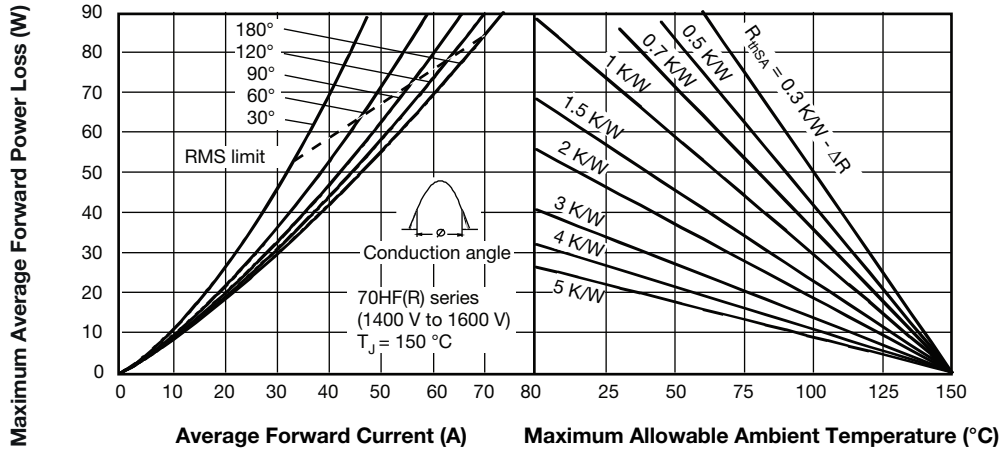


Fig. 7 - Forward Power Loss Characteristics

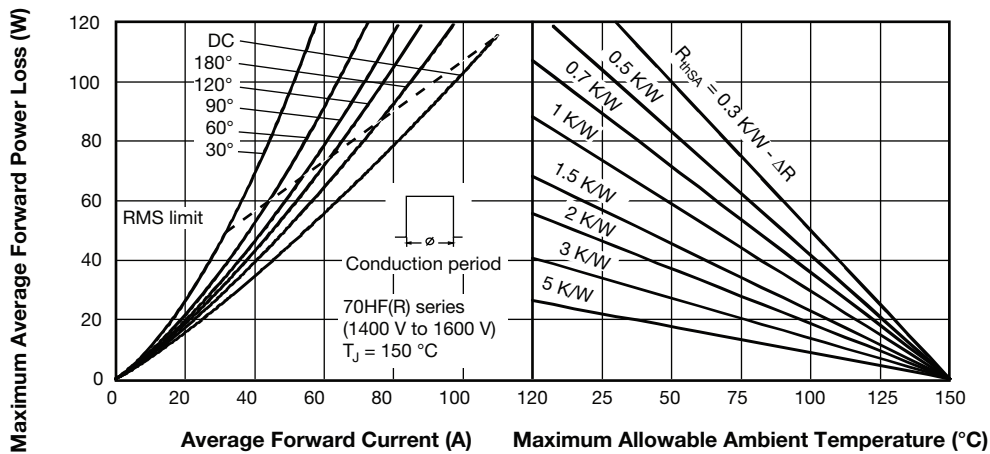


Fig. 8 - Forward Power Loss Characteristics

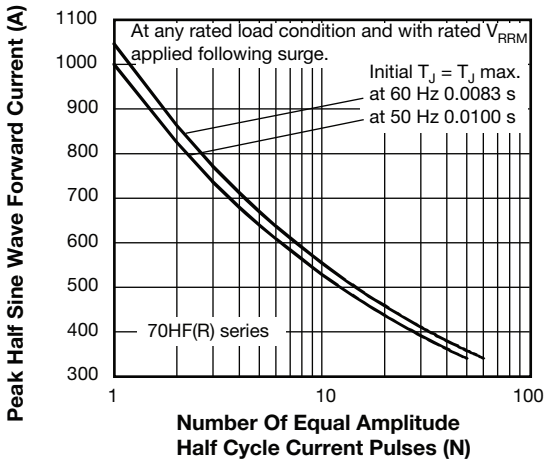


Fig. 9 - Maximum Non-Repetitive Surge Current

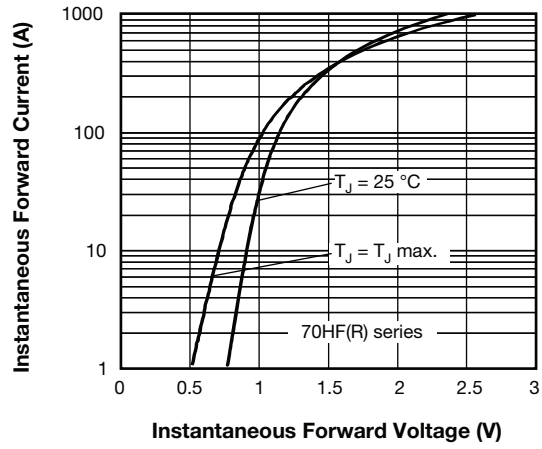


Fig. 11 - Forward Voltage Drop Characteristics

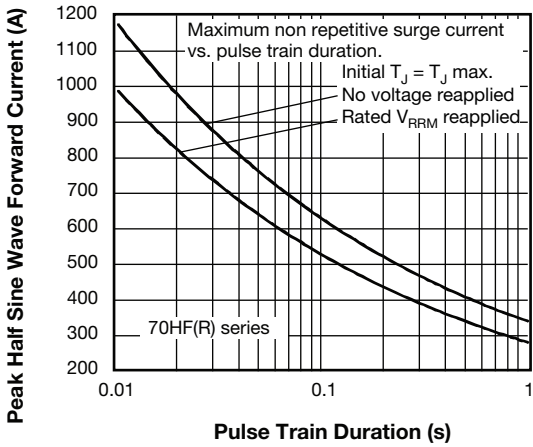


Fig. 10 - Maximum Non-Repetitive Surge Current

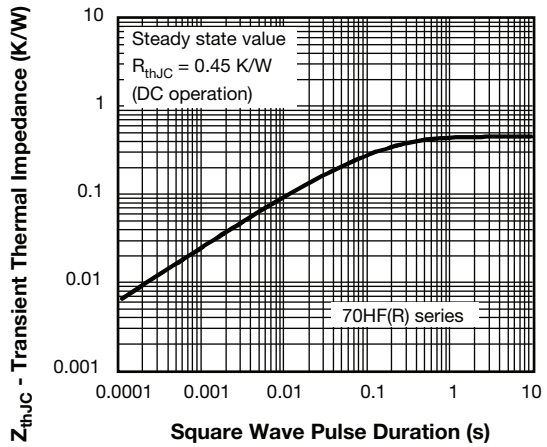


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

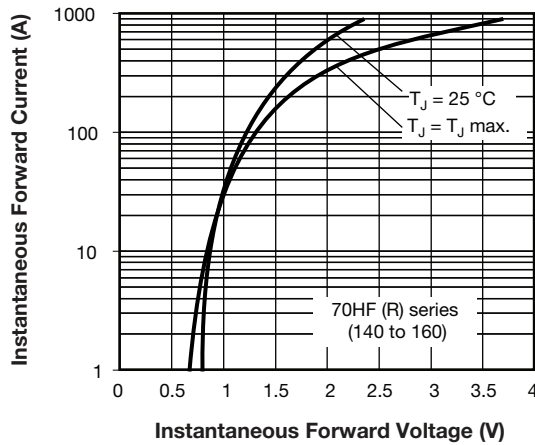
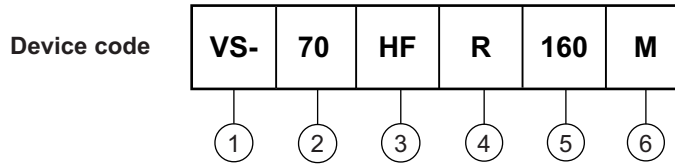


Fig. 13 - Forward Voltage Drop Characteristics



ORDERING INFORMATION TABLE

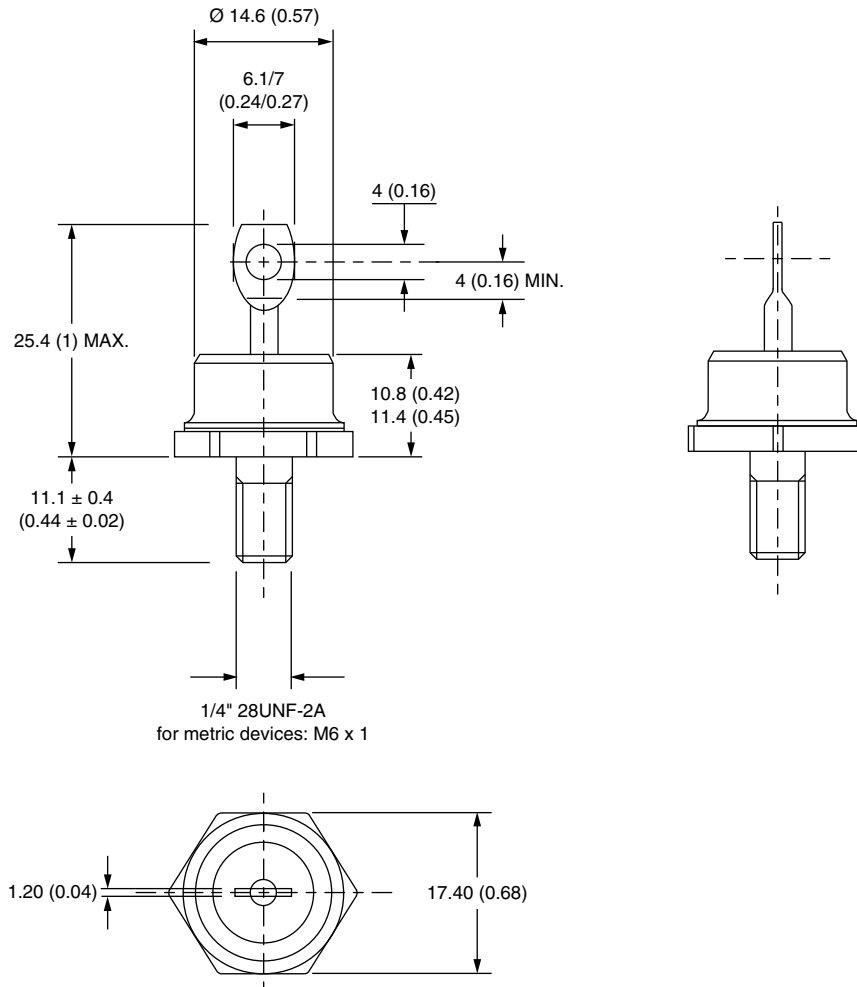


- 1** - Vishay Semiconductors product
- 2** - 70 = standard device
71 = not isolated lead
72 = isolated lead with silicone sleeve
(red = reverse polarity)
(blue = normal polarity)
- 3** - HF = standard diode
- 4** -
 - None = stud normal polarity (cathode to stud)
 - R = stud reverse polarity (anode 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)



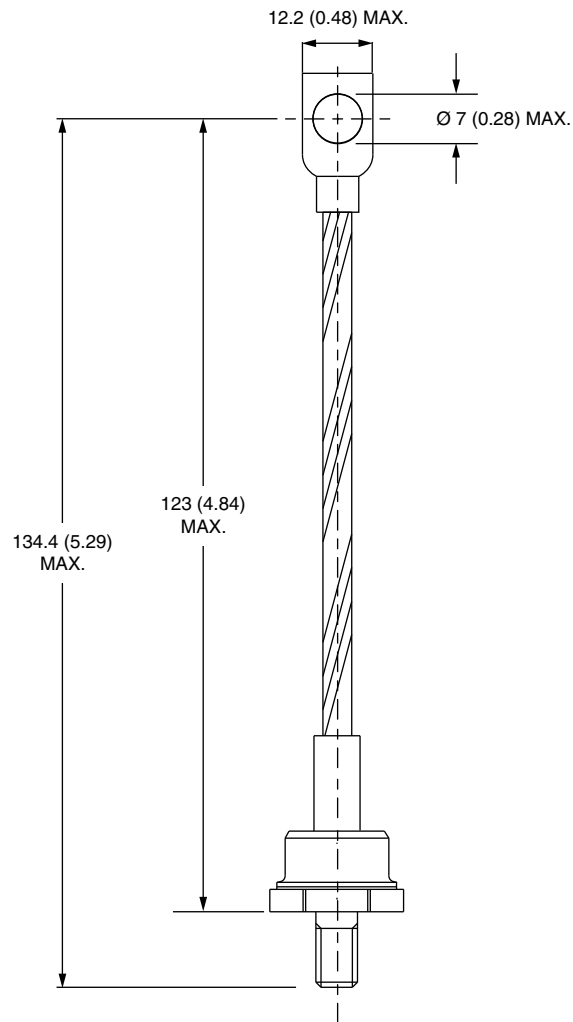
Outline Dimensions

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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