# Standard Recovery Diodes (Stud Version), 70 A



DO-203AB (DO-5)

## 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 $V_{RRM}$
- RoHS compliant
- Designed and qualified for industrial level

RoHS COMPLIANT

## TYPICAL APPLICATIONS

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

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 70 A |

| 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 | | A |
| $I_{FSM}$ | 50 Hz | 1200 | | A |
| | 60 Hz | 1250 | | |
| $I^2t$ | 50 Hz | 7100 | | $A^2s$ |
| | 60 Hz | 6450 | | |
| $V_{RRM}$ | Range | 100 to 1200 | 1400/1600 | 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 |
| 70HF(R) | 10 | 100 | 200 | 200 | 15 |
| | 20 | 200 | 300 | 300 | |
| | 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) 10 TO 120 | 70HF(R) 140/160 | UNITS |
|---|---|---|---|---|---|---|---|
| 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 reapplied | Sinusoidal half wave, initial $T_J$ = $T_J$ maximum | 1200 | | A |
| | | t = 8.3 ms | | | 1250 | | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 1000 | | |
| | | t = 8.3 ms | | | 1050 | | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | No voltage reapplied | | 7100 | | $A^2s$ |
| | | t = 8.3 ms | | | 6450 | | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 5000 | | |
| | | t = 8.3 ms | | | 4550 | | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied | | | 71 000 | | $A^2\sqrt{s}$ |
| Low level value of threshold voltage | $V_{F(TO)1}$ | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$), $T_J$ = $T_J$ maximum | | | 0.79 | | V |
| High level value of threshold voltage | $V_{F(TO)2}$ | (I > $\pi$ x $I_{F(AV)}$), $T_J$ = $T_J$ maximum | | | 1.00 | | |
| Low level value of forward slope resistance | $r_{f1}$ | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$), $T_J$ = $T_J$ maximum | | | 2.33 | | mΩ |
| High level value of forward slope resistance | $r_{f2}$ | (I > $\pi$ x $I_{F(AV)}$), $T_J$ = $T_J$ 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) 10 TO 120 | 70HF(R) 140/160 | UNITS |
|---|---|---|---|---|---|
| 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 | | |
| Allowable mounting torque | | Not lubricated threads | $3.4^{+0-10\ \%}$ (30) | | N · m (lbf · in) |
| | | Lubricated threads | $2.3^{+0-10\ \%}$ (20) | | |
| Approximate weight | | | 17 | | g |
| | | | 0.6 | | oz. |
| Case style | | See dimensions - link at the end of datasheet | DO-203AB (DO-5) | | |

| $\Delta R_{thJC}$ 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

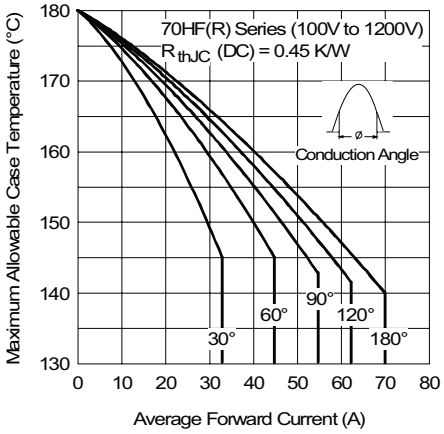



Fig. 1 - Current Ratings Characteristics

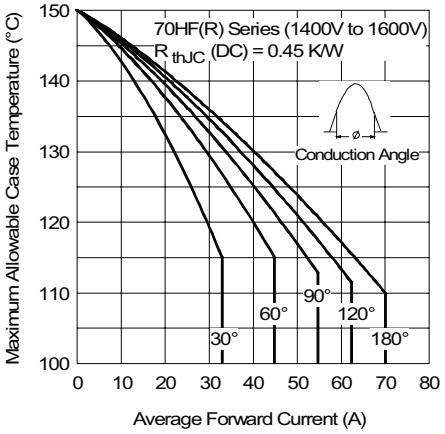



Fig. 3 - Current Ratings Characteristics

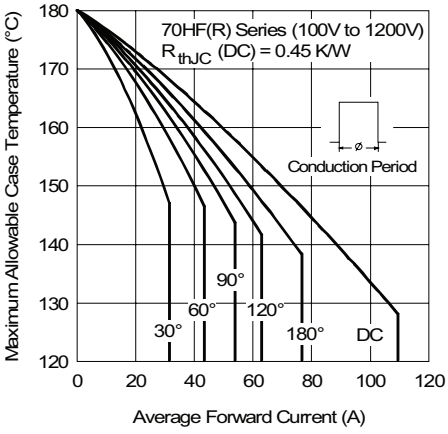



Fig. 2 - Current Ratings Characteristics

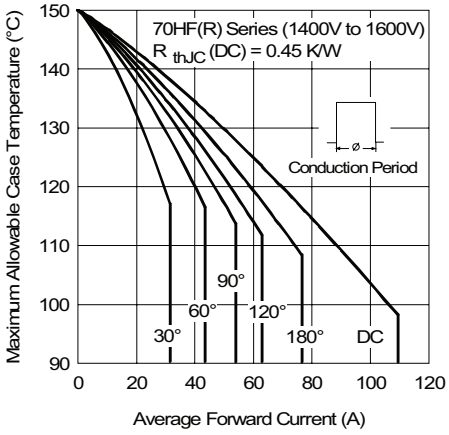



Fig. 4 - Current Ratings Characteristics

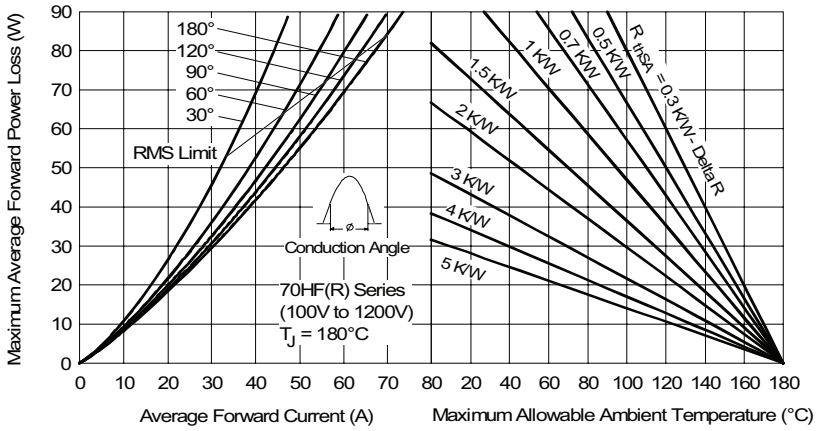



Fig. 5 - Forward Power Loss Characteristics

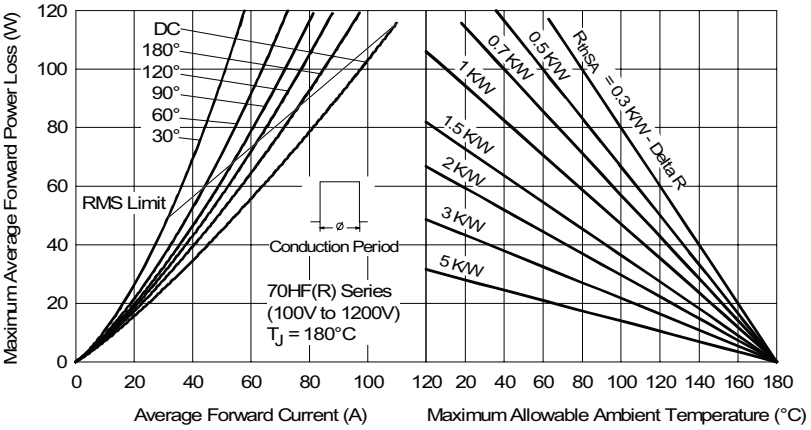



Fig. 6 - Forward Power Loss Characteristics

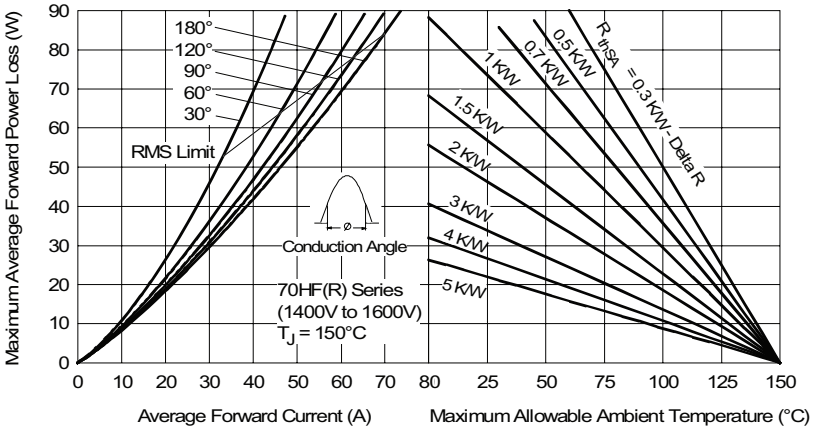



Fig. 7 - Forward Power Loss Characteristics

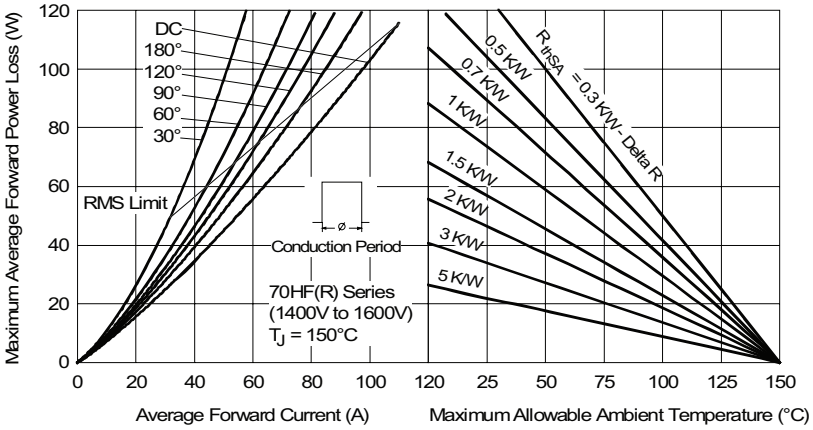



Fig. 8 - Forward Power Loss Characteristics

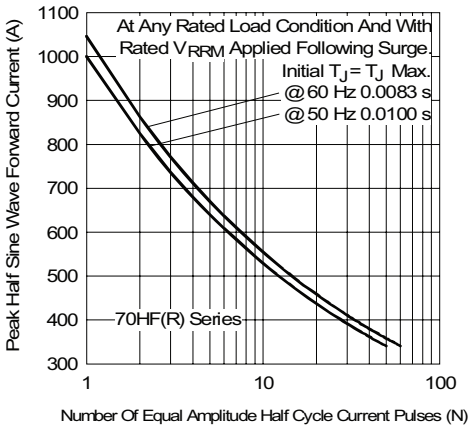



Fig. 9 - Maximum Non-Repetitive Surge Current

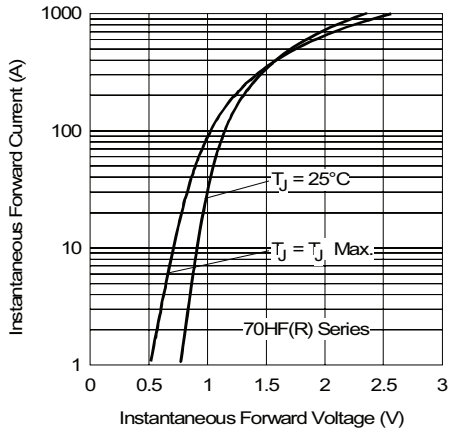



Fig. 11 - Forward Voltage Drop Characteristics

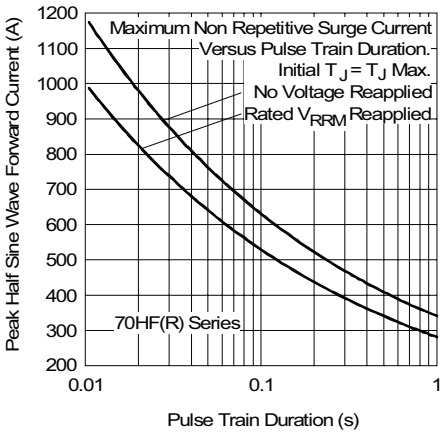



Fig. 10 - Maximum Non-Repetitive Surge Current

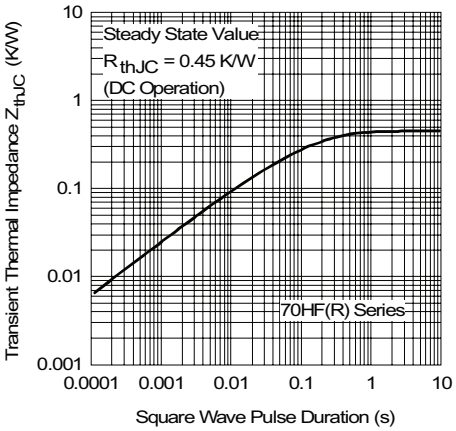



Fig. 12 - Thermal Impedance $Z_{thJC}$ Characteristics

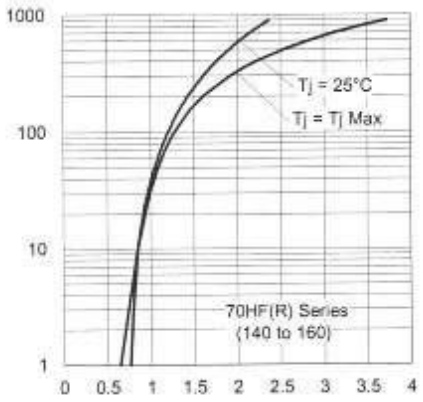



Fig. 13 - Forward Voltage Drop Characteristics

## ORDERING INFORMATION TABLE

**Device code**

| 70 | HF | R | 160 | M |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

- **1** - 70 = Standard device
  71 = Not isolated lead
  72 = Isolated lead with silicone sleeve
  (red = Reverse polarity)
  (blue = Normal polarity)
- **2** - HF = Standard diode
- **3** - • None = Stud normal polarity (cathode to stud)
  • R = Stud reverse polarity (anode to stud)
- **4** - Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)
- **5** - • None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A
  • M = Stud base DO-203AB (DO-5) M6 x 1

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | http://www.vishay.com/doc?95343 |

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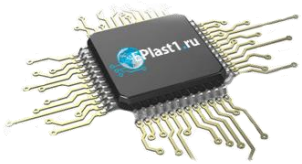
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




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