

STANDARD RECOVERY DIODES

Stud Version

Features

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600V V_{RRM}

70 A

Typical Applications

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

Major Ratings and Characteristics

| Parameters | 70HF(R) | | Units |
|------------------|-------------|--------------|------------------|
| | 10 to 120 | 140 to 160 | |
| $I_{F(AV)}$ | 70 | 70 | A |
| @ T_C | 140 | 110 | °C |
| $I_{F(RMS)}$ | 110 | | A |
| I_{FSM} @ 50Hz | 1200 | | A |
| @ 60Hz | 1250 | | A |
| I^2t @ 50Hz | 7100 | | A ² s |
| @ 60Hz | 6450 | | A ² s |
| V_{RRM} range | 100 to 1200 | 1400 to 1600 | V |
| T_J range | - 65 to 180 | - 65 to 150 | °C |



70HF(R) Series

Bulletin I20202 rev. E 03/04

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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} max. @ $T_J = T_{J \text{ max.}}$ 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 | 70HF(R) | | Units | Conditions | |
|--|---|------------|---|--|--|
| | 10 to 120 | 140 to 160 | | | |
| $I_{F(AV)}$ Max. average forward current @ Case temperature | 70 | 70 | A | 180° conduction, half sine wave | |
| | 140 | 110 | °C | | |
| $I_{F(RMS)}$ Max. RMS forward current | 110 | | A | | |
| I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current | 1200 | | A | t = 10ms | No voltage reappplied |
| | 1250 | | | t = 8.3ms | |
| | 1000 | | | t = 10ms | 100% V_{RRM} reappplied |
| | 1050 | | | t = 8.3ms | |
| I^2t Maximum I^2t for fusing | 7100 | | A ² s | t = 10ms | No voltage reappplied |
| | 6450 | | | t = 8.3ms | |
| | 5000 | | | t = 10ms | 100% V_{RRM} reappplied |
| | 4550 | | | t = 8.3ms | |
| I^2/t Maximum I^2/t for fusing | 71000 | | A ² /s | t = 0.1 to 10ms, no voltage reappplied | |
| | $V_{F(TO)1}$ Low level value of threshold voltage | 0.79 | | V | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_{J \text{ max.}}$ |
| $V_{F(TO)2}$ High level value of threshold voltage | 1.00 | | $(I > \pi \times I_{F(AV)})$, $T_J = T_{J \text{ max.}}$ | | |
| r_{f1} Low level value of forward slope resistance | 2.33 | | mΩ | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_{J \text{ max.}}$ | |
| r_{f2} High level value of forward slope resistance | 1.53 | | | $(I > \pi \times I_{F(AV)})$, $T_J = T_{J \text{ max.}}$ | |
| V_{FM} Max. forward voltage drop | 1.35 | 1.46 | V | $I_{pk} = 220A$, $T_J = 25^\circ C$, $t_p = 400\mu s$ rectangular wave | |

Thermal and Mechanical Specifications

| Parameter | 70HF(R) | | Units | Conditions |
|---|----------------|------------|--------|--|
| | 10 to 120 | 140 to 160 | | |
| T _J Max. junction operating temperature range | -65 to 180 | -65 to 150 | °C | |
| T _{stg} Max. storage temperature range | -65 to 180 | -65 to 150 | | |
| R _{thJC} Max. thermal resistance, junction to case | 0.45 | | K/W | DC operation |
| R _{thCS} Max. thermal resistance, case to heatsink | 0.25 | | | Mounting surface, smooth, flat and greased |
| T Max. allowed mounting torque ±10% | 2.3 - 3.4 | | Nm | Not lubricated threads |
| | 20 - 30 | | lbf·in | |
| wt Approximate weight | 17 (0.6) | | g (oz) | |
| Case style | DO-203AB (DO5) | | | See Outline Table |

ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

| Conduction angle | Sinusoidal conduction | Rectangular conduction | Units | Conditions |
|------------------|-----------------------|------------------------|-------|--------------------------------------|
| 180° | 0.08 | 0.06 | K/W | T _J = T _J max. |
| 120° | 0.10 | 0.11 | | |
| 90° | 0.13 | 0.14 | | |
| 60° | 0.19 | 0.20 | | |
| 30° | 0.30 | 0.30 | | |

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: 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

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Outlines Table

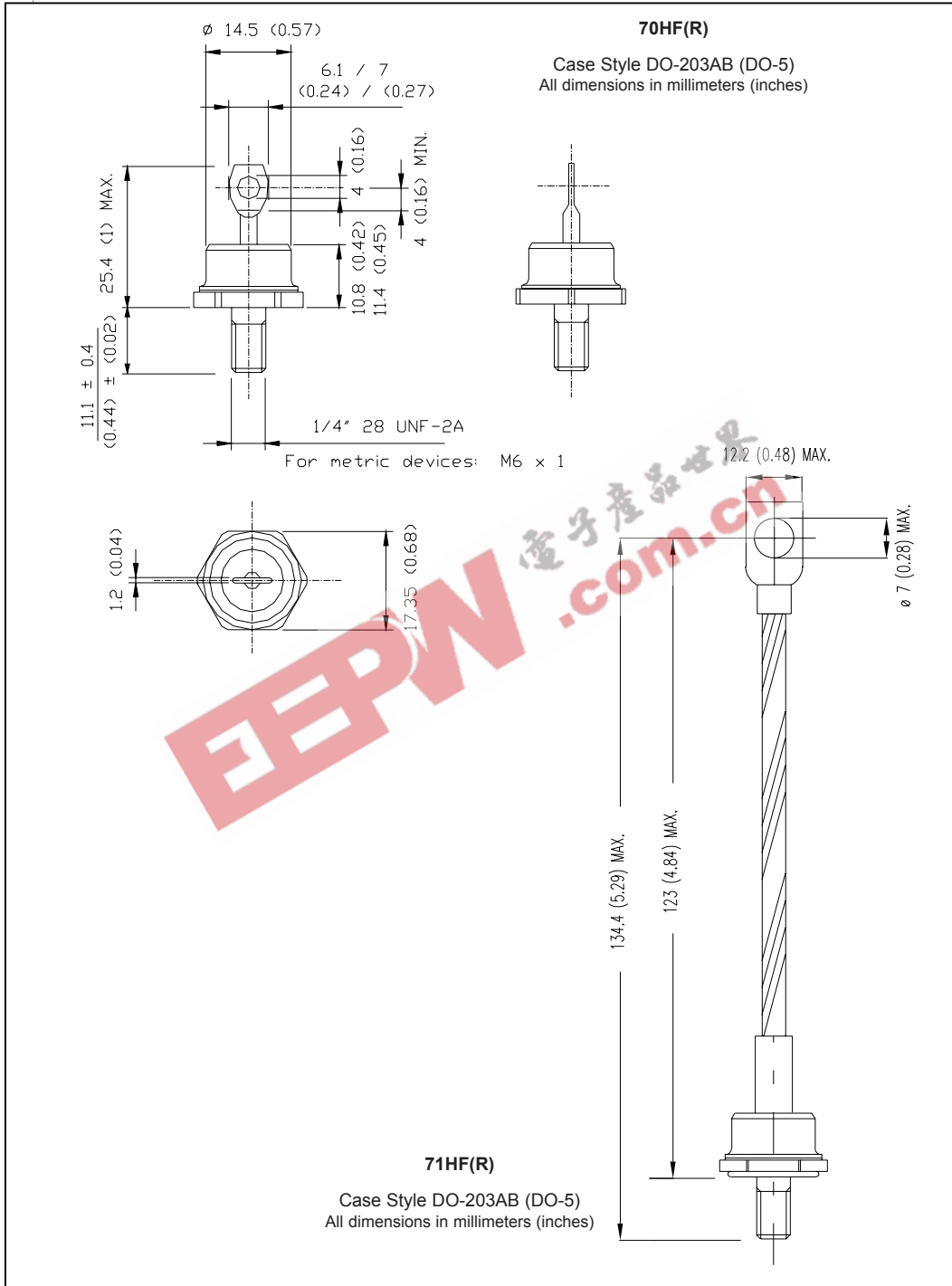




Fig. 1 - Current Ratings Characteristics



Fig. 2 - Current Ratings Characteristics



Fig. 3 - Current Ratings Characteristics



Fig. 4 - Current Ratings Characteristics



Fig. 5 - Forward Power Loss Characteristics

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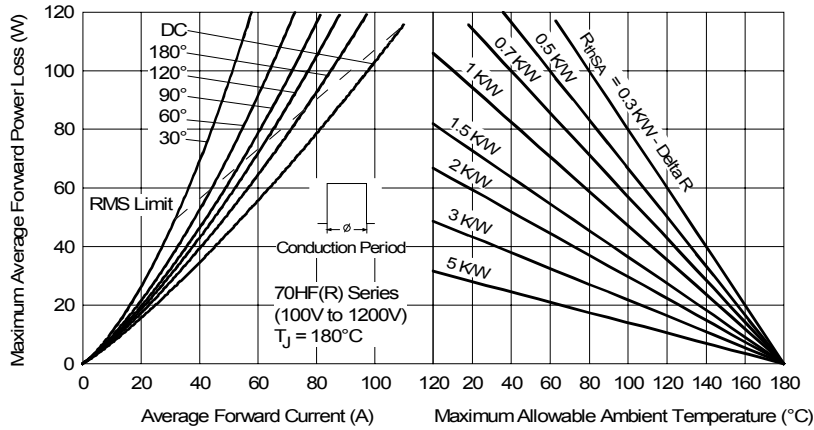


Fig. 6 - Forward Power Loss Characteristics



Fig. 7 - Forward Power Loss Characteristics



Fig. 8 - Forward Power Loss Characteristics



Fig. 9 - Maximum Non-Repetitive Surge Current



Fig. 10 - Maximum Non-Repetitive Surge Current



Fig. 11 - Forward Voltage Drop Characteristics



Fig. 12 - Thermal Impedance Z_{thjC} Characteristics



Fig. 13 - Forward Voltage Drop Characteristics

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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