

## 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  $V_{RRM}$

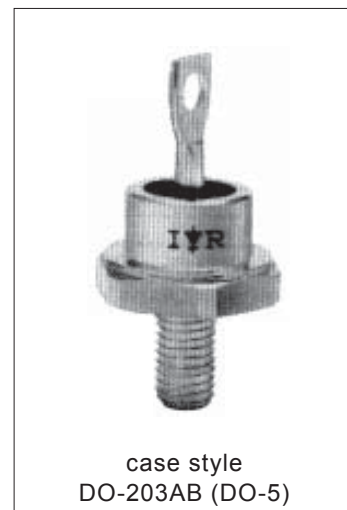
70 A

### 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 <sup>2</sup> s |    |
|              | @ 60Hz    | 6450        | A <sup>2</sup> 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. F 01/05

International  
IR Rectifier

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

| Type number | Voltage Code | $V_{RRM}$ , maximum repetitive peak reverse voltage<br>V | $V_{RSM}$ , maximum non-repetitive peak reverse voltage<br>V | $V_{R(BR)}$ , minimum avalanche voltage<br>V | $I_{RRM}$ max.<br>@ $T_J = T_{J \text{ max.}}$<br>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 <sup>2</sup> 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 <sup>2</sup> /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 <sub>J</sub> Max. junction operating temperature range    | -65 to 180            | -65 to 150 | °C     |  |
| T <sub>stg</sub> Max. storage temperature range             | -65 to 180            | -65 to 150 |        |  |
| R <sub>thJC</sub> Max. thermal resistance, junction to case | 0.45                  |            | K/W    | DC operation                               |
| R <sub>thCS</sub> Max. thermal resistance, case to heatsink | 0.25                  |            |        | Mounting surface, smooth, flat and greased |
| T Allowable mounting torque                                 | 3.4 <sup>+0-10%</sup> |            | Nm     | Not lubricated threads                     |
|   |                       |            | lbf·in |  |
|   | 2.3 <sup>+0-10%</sup> |            | Nm     | Lubricated threads                         |
|   |                       |            | lbf·in |  |
| wt Approximate weight                                       | 17 (0.6)              |            | g (oz) |  |
| Case style  | DO-203AB (DO5)        |            |        | See Outline Table                          |

$\Delta R_{thJC}$  Conduction

(The following table shows the increment of thermal resistance R<sub>thJC</sub> 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 <sub>J</sub> = T <sub>J</sub> 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<sub>RRM</sub> (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

# 70HF(R) Series

Bulletin I20202 rev. F 01/05

International  
**IRF** Rectifier

## Outlines Table

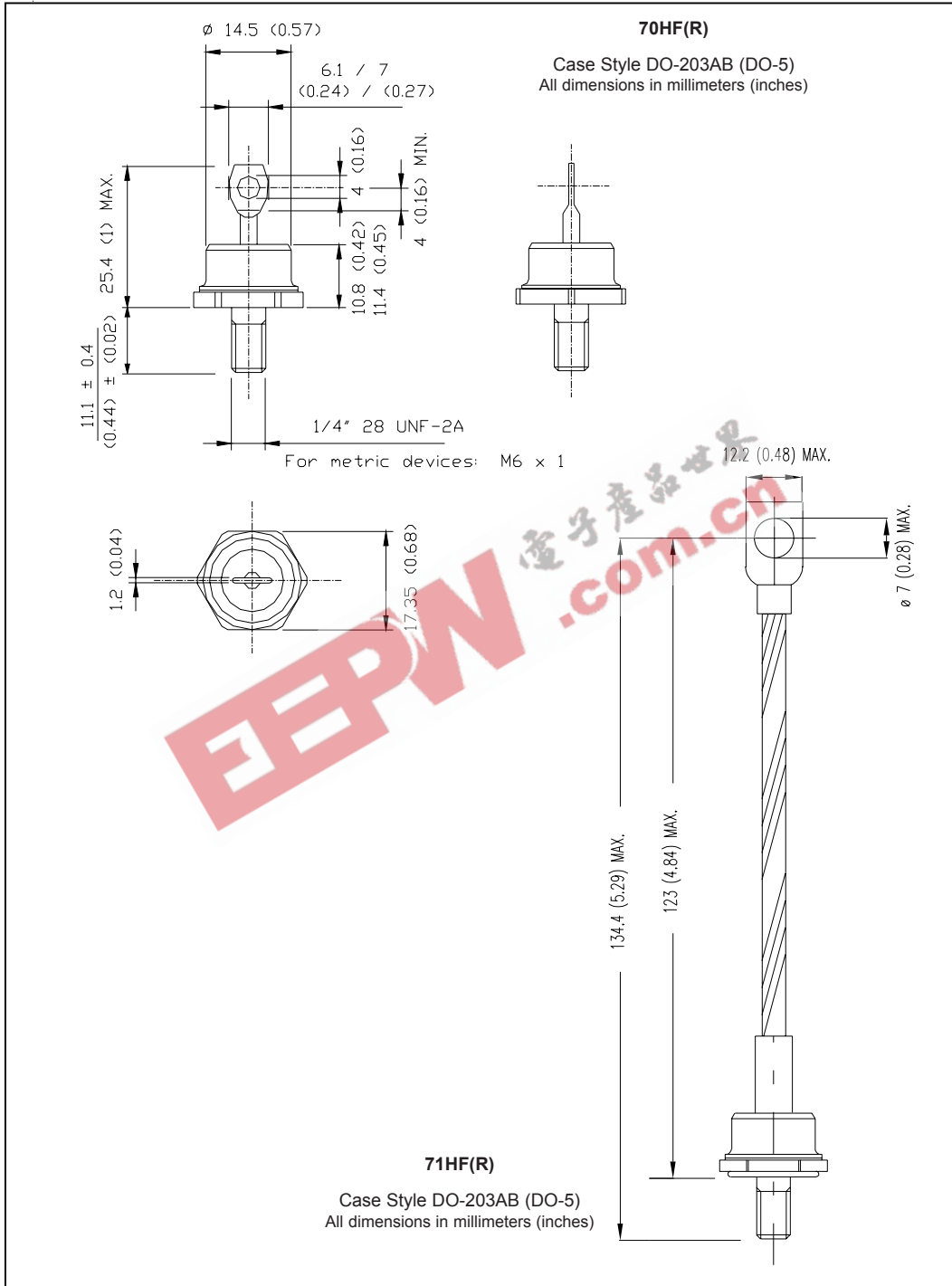




Fig. 1 - Current Ratings Characteristics



Fig. 2 - Current Ratings Characteristics



Fig. 3 - Current Ratings Characteristics



Fig. 4 - Current Ratings Characteristics



Fig. 5 - Forward Power Loss Characteristics

# 70HF(R) Series

Bulletin I20202 rev. F 01/05

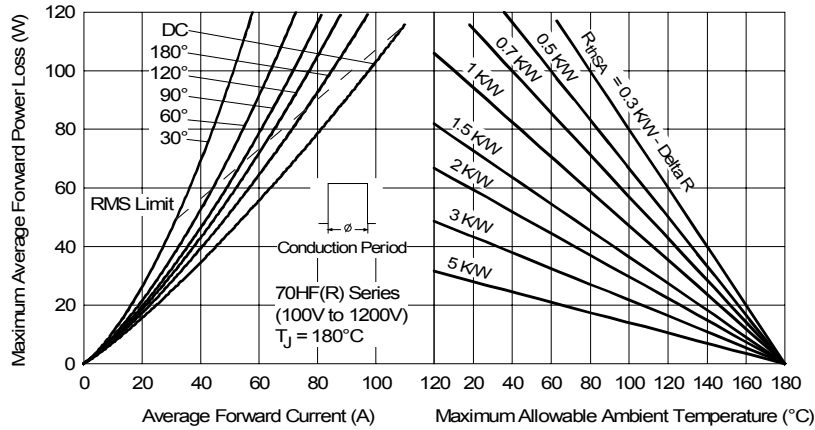


Fig. 6 - Forward Power Loss Characteristics

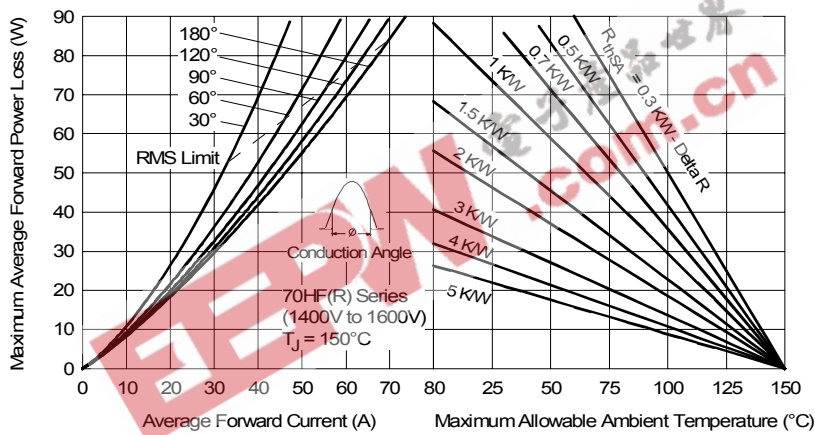


Fig. 7 - Forward Power Loss Characteristics

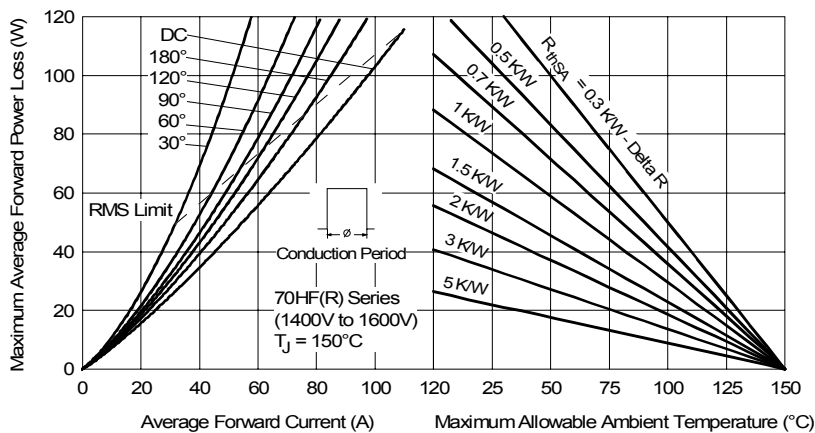


Fig. 8 - Forward Power Loss Characteristics



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

## 70HF(R) Series

Bulletin I20202 rev. F 01/05

International  
**IR** Rectifier

EEPW 电子产品世界  
.com.cn

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.

International  
**IR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 01/05