

### 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               |



case style  
DO-203AB (DO-5)

## 70HF(R) Series

Bulletin I20202

International  
IOR 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>@ $T_J = T_J$ 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<br>@ 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,<br>non-repetitive surge current | 1200      | A          | t = 10ms      | No voltage<br>reapplied                                                           | Sinusoidal half wave,<br><br>Initial $T_J = T_J$ max. |  |  |
|               |                                                               | 1250      |            | t = 8.3ms     |                                                                                   |                                                       |  |  |
|               |                                                               | 1000      |            | t = 10ms      | 100% $V_{RRM}$                                                                    |                                                       |  |  |
|               |                                                               | 1050      |            | t = 8.3ms     | reapplied                                                                         |                                                       |  |  |
| $I^2t$        | Maximum $I^2t$ for fusing                                     | 7100      | $A^2s$     | t = 10ms      | No voltage<br>reapplied                                                           |                                                       |  |  |
|               |                                                               | 6450      |            | t = 8.3ms     |                                                                                   |                                                       |  |  |
|               |                                                               | 5000      |            | t = 10ms      | 100% $V_{RRM}$                                                                    |                                                       |  |  |
|               |                                                               | 4550      |            | t = 8.3ms     | reapplied                                                                         |                                                       |  |  |
| $I^2\sqrt{t}$ | Maximum $I^2\sqrt{t}$ for fusing                              | 71000     |            | $A^2\sqrt{s}$ | t = 0.1 to 10ms, no voltage reapplied                                             |                                                       |  |  |
| $V_{F(TO)1}$  | Low level value of threshold<br>voltage                       | 0.79      |            | V             | $(16.7\% \times \pi \times I_{F(AV)}) < I < \pi \times I_{F(AV)}, T_J = T_J$ max. |                                                       |  |  |
| $V_{F(TO)2}$  | High level value of threshold<br>voltage                      | 1.00      |            |               | $(I > \pi \times I_{F(AV)}), T_J = T_J$ max.                                      |                                                       |  |  |
| $r_{f1}$      | Low level value of forward<br>slope resistance                | 2.33      |            | mΩ            | $(16.7\% \times \pi \times I_{F(AV)}) < I < \pi \times I_{F(AV)}, T_J = T_J$ max. |                                                       |  |  |
| $r_{f2}$      | High level value of forward<br>slope resistance               | 1.53      |            |               | $(I > \pi \times I_{F(AV)}), T_J = T_J$ 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                     |
|                   |                                           | 30                    |            | lbf•in |                                            |
|                   |                                           | 2.3 <sup>+0-10%</sup> |            | Nm     | Lubricated threads                         |
|                   |                                           | 20                    |            | 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  $R_{thJC}$  when devices operate at different conduction angles than DC)

| Conduction angle | Sinusoidal conduction | Rectangular conduction | Units | Conditions                 |
|------------------|-----------------------|------------------------|-------|----------------------------|
| 180°             | 0.08                  | 0.06                   | K/W   | $T_j = T_{j \text{ max.}}$ |
| 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 |
| <p><b>1</b> - 70 = Standard device<br/> 71 = Not isolated lead<br/> 72 = Isolated lead with silicone sleeve<br/> (Red = Reverse polarity)<br/> (Blue = Normal polarity)</p> <p><b>2</b> - HF = Standard diode</p> <p><b>3</b> - None = Stud Normal Polarity (Cathode to Stud)<br/> R = Stud Reverse Polarity (Anode to Stud)</p> <p><b>4</b> - Voltage code: Code x 10 = <math>V_{RRM}</math> (See Voltage Ratings table)</p> <p><b>5</b> - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A<br/> M = Stud base DO-203AB (DO-5) M6 X 1</p> |    |   |     |   |

Outlines Table

