

## 300HF(R) SERIES

### STANDARD RECOVERY DIODES

### Stud Version

#### Features

- High current carrying capability
- High surge current capability
- Types up to 1200V  $V_{RRM}$
- Stud cathode and stud anode version
- Standard JEDEC types
- Diffused junction

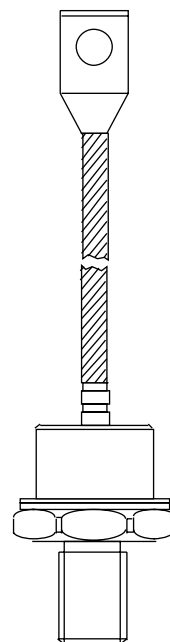
#### Typical Applications

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

#### Major Ratings and Characteristics

| Parameters       | 300HF(R)    | Units             |
|------------------|-------------|-------------------|
| $I_{F(AV)}$      | 300         | A                 |
| @ $T_C$          | 125         | °C                |
| $I_{F(RMS)}$     | 470         | A                 |
| $I_{FSM}$ @ 50Hz | 5000        | A                 |
| @ 60Hz           | 5200        | A                 |
| $I^2t$ @ 50Hz    | 125         | KA <sup>2</sup> s |
| @ 60Hz           | 113         | KA <sup>2</sup> s |
| $V_{RRM}$ range  | 400 to 1200 | V                 |
| $T_J$            | -40 to 180  | °C                |

300A



case style  
DO-205AB (DO-9)

## 300HF(R) Series

Bulletin I2021 rev. A 07/94

International  
**IOR** Rectifier

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

| Type number | Voltage Code | $V_{RRM}$ , maximum repetitive peak voltage<br>V | $V_{RSM}$ , maximum non-repetitive peak voltage<br>V | $I_{RRM}$ max.<br>@ 180°C<br>mA |
|-------------|--------------|--------------------------------------------------|------------------------------------------------------|---------------------------------|
| 300HF(R)    | 40           | 400                                              | 500                                                  | 20                              |
|             | 80           | 800                                              | 900                                                  |                                 |
|             | 120          | 1200                                             | 1300                                                 |                                 |

#### Forward Conduction

| Parameter                                                            | 300HF(R)   | Units              | Conditions                                                                                       |
|----------------------------------------------------------------------|------------|--------------------|--------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. average forward current @ Case temperature          | 300<br>125 | A<br>°C            | 180° conduction, half sine wave                                                                  |
| $I_{F(RMS)}$ Max. RMS forward current                                | 470        | A                  | DC @ 118°C case temperature                                                                      |
| $I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current | 5000       | A                  | t = 10ms No voltage                                                                              |
|                                                                      | 5200       |                    | t = 8.3ms reapplied                                                                              |
|                                                                      | 3800       |                    | t = 10ms 100% $V_{RRM}$                                                                          |
|                                                                      | 4000       |                    | t = 8.3ms reapplied                                                                              |
| $I^2t$ Maximum $I^2t$ for fusing                                     | 125        | KA <sup>2</sup> s  | t = 10ms No voltage                                                                              |
|                                                                      | 113        |                    | t = 8.3ms reapplied                                                                              |
|                                                                      | 72         |                    | t = 10ms 100% $V_{RRM}$                                                                          |
|                                                                      | 66         |                    | t = 8.3ms reapplied                                                                              |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing                       | 1250       | KA <sup>2</sup> /s | t = 0.1 to 10ms, no voltage reapplied                                                            |
| $V_{F(TO)1}$ Low level value of threshold voltage                    | 0.86       | 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                   | 0.89       |                    | $(I > \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$                                          |
| $r_{f1}$ Low level value of forward slope resistance                 | 0.48       | 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                | 0.46       |                    | $(I > \pi \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$                                          |
| $V_{FM}$ Max. forward voltage drop                                   | 1.38       | V                  | $I_{FM} = \pi \times I_{F(AV)}$ , $T_J = 25^\circ\text{C}$ , $t_p = 10\text{ms}$ sinusoidal wave |

#### Thermal and Mechanical Specification

| Parameter                                            | 300HF(R)       | Units | Conditions                                 |
|------------------------------------------------------|----------------|-------|--------------------------------------------|
| $T_J$ Max. operating temperature range               | -40 to 180     | °C    |                                            |
| $T_{stg}$ Max. storage temperature range             | -55 to 180     |       |                                            |
| $R_{thJC}$ Max. thermal resistance, junction to case | 0.12           | K/W   | DC operation                               |
| $R_{thCS}$ Max. thermal resistance, case to heatsink | 0.05           |       | Mounting surface, smooth, flat and greased |
| $T$ Max. allowed mounting torque +0 -20%             | 28             | Nm    | Not lubricated threads                     |
|                                                      | 22             |       | Lubricated threads                         |
| wt Approximate weight                                | 250            | g     |                                            |
| Case style                                           | DO-205AB(DO-9) |       | 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°             | 0.030                 | 0.022                  | K/W   | $T_J = T_J \text{ max.}$ |
| 120°             | 0.035                 | 0.037                  |       |                          |
| 90°              | 0.045                 | 0.048                  |       |                          |
| 60°              | 0.064                 | 0.066                  |       |                          |
| 30°              | 0.104                 | 0.105                  |       |                          |

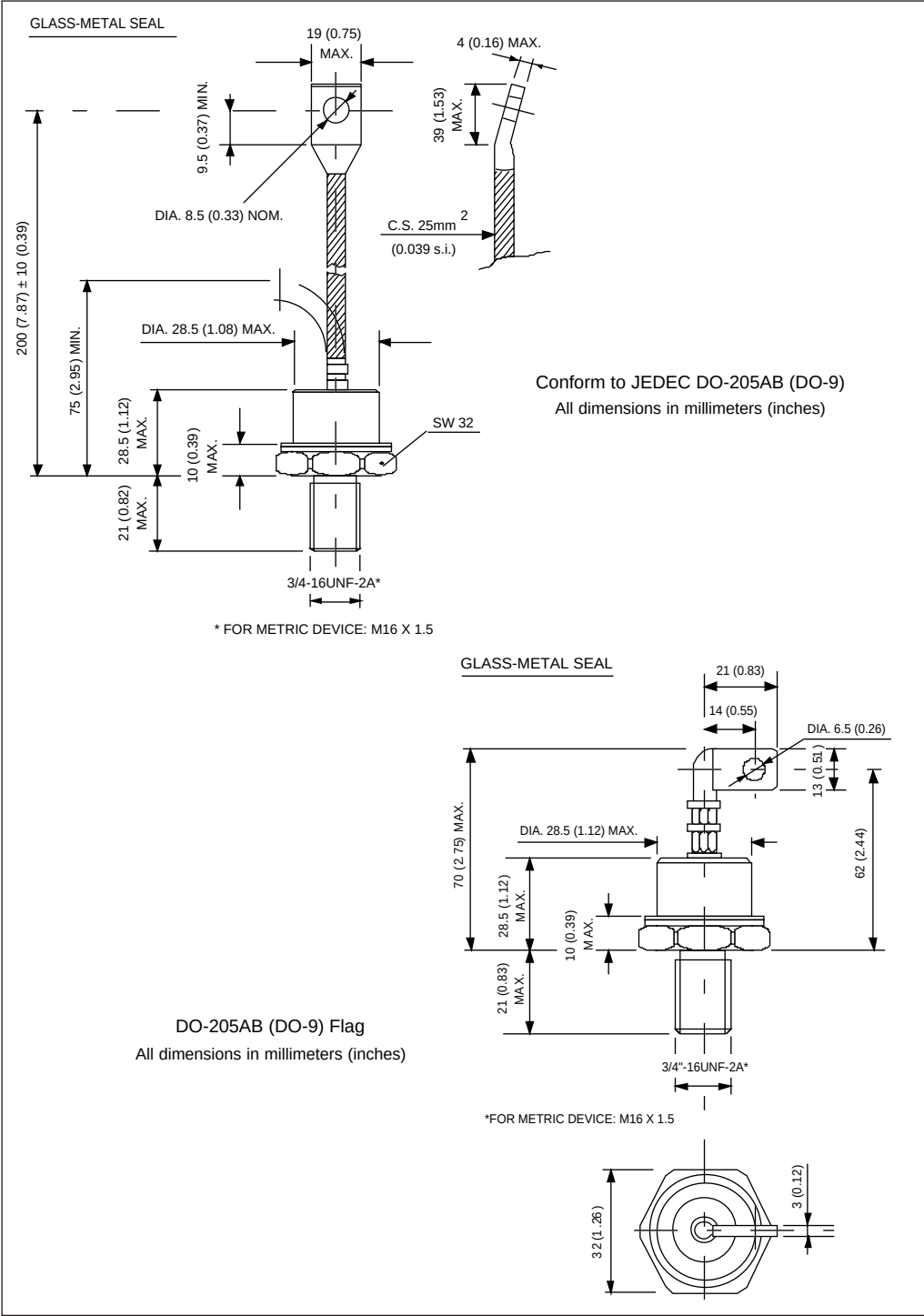
#### Ordering Information Table

| Device Code |                                                                                                                                                                               |           |          |            |            |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|------------|------------|
|             | <b>300</b>                                                                                                                                                                    | <b>HF</b> | <b>R</b> | <b>120</b> | <b>P B</b> |
|             | ①                                                                                                                                                                             | ②         | ③        | ④          | ⑤ ⑥        |
| <b>1</b>    | - Essential Part Number                                                                                                                                                       |           |          |            |            |
| <b>2</b>    | - Diode                                                                                                                                                                       |           |          |            |            |
| <b>3</b>    | - None = Stud Normal Polarity (Cathode to Stud)<br>R = Stud Reverse Polarity (Anode to Stud)                                                                                  |           |          |            |            |
| <b>4</b>    | - Voltage code: Code x 10 = $V_{RRM}$ (See Voltage Ratings table)                                                                                                             |           |          |            |            |
| <b>5</b>    | - P = Stud base DO-205AB(DO-9) 3/4" 16UNF-2A<br>M = Stud base DO-205AB(DO-9) M16 x 1.5                                                                                        |           |          |            |            |
| <b>6</b>    | - B = Flag top terminals (for Cathode/ Anode Leads)<br>S = Isolated lead with silicone sleeve<br>(Red = Reverse Polarity; Blue = Normal Polarity)<br>None = Not isolated lead |           |          |            |            |

**300HF(R) Series**

Bulletin I2021 rev. A 07/94

**Outline Table**



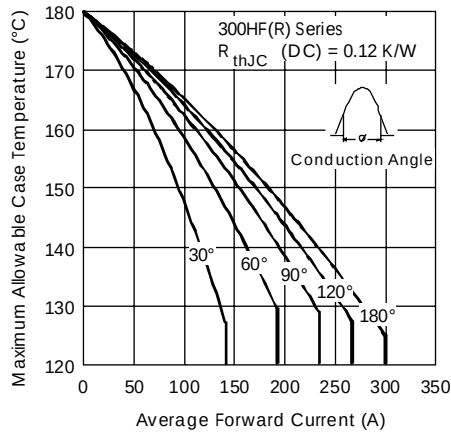


Fig. 1 - Current Ratings Characteristics

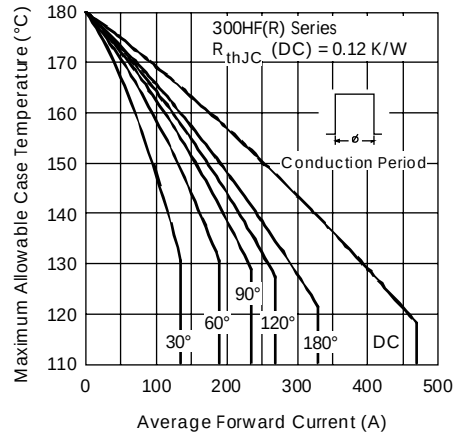


Fig. 2 - Current Ratings Characteristics

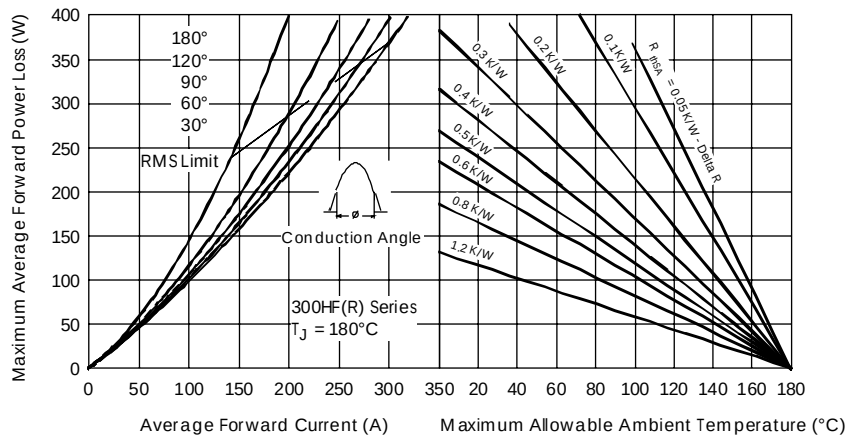


Fig. 3 - Forward Power Loss Characteristics

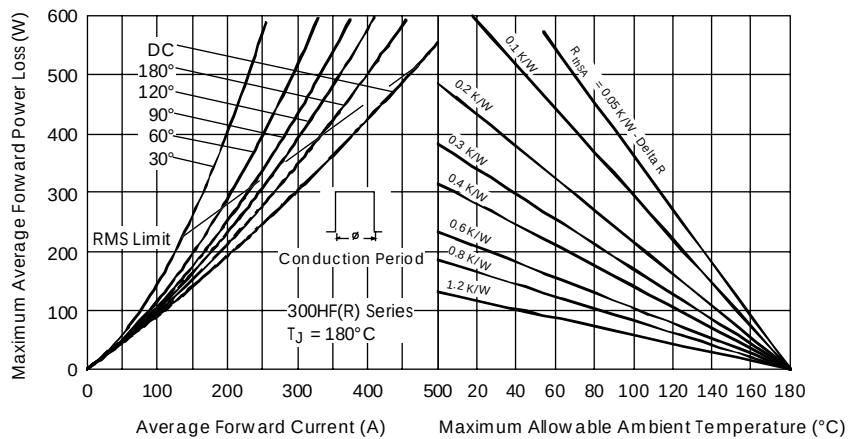


Fig. 4 - Forward Power Loss Characteristics

## 300HF(R) Series

Bulletin I2021 rev. A 07/94

International  
**IOR** Rectifier

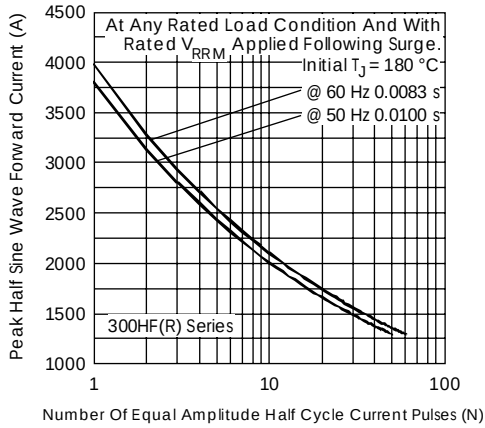


Fig. 5 - Maximum Non-Repetitive Surge Current

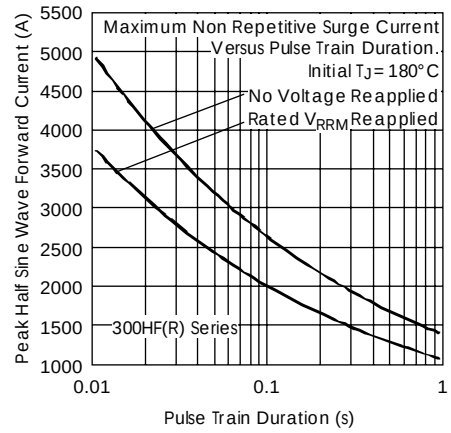


Fig. 6 - Maximum Non-Repetitive Surge Current

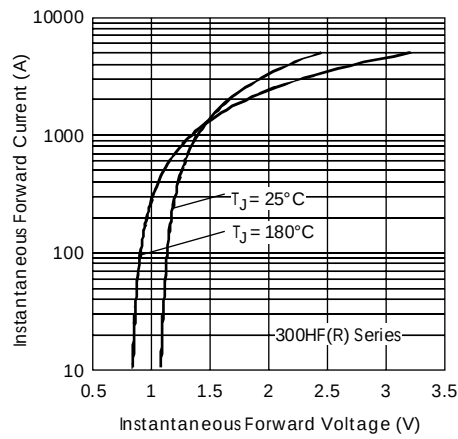


Fig. 7 - Forward Voltage Drop Characteristics

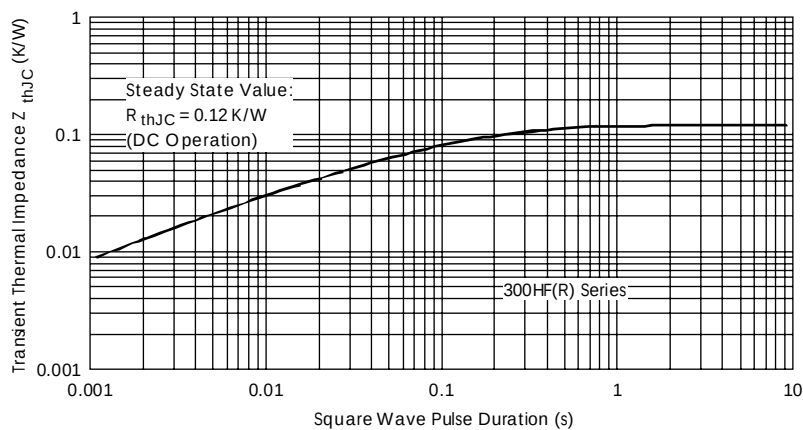


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic