

### 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

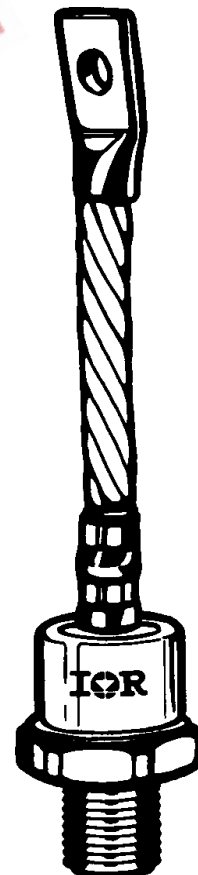
300A

#### 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                |



case style  
DO-205AB (DO-9)

# 300HF(R) Series

## 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      | A                  | 180° conduction, half sine wave   |
|  | 125      | °C                 |   |
| $I_{F(RMS)}$ 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 reappplied  |
|  | 3800     |                    | t = 10ms 100% $V_{RRM}$   |
|  | 4000     |                    | t = 8.3ms reappplied  |
| $I^2t$ Maximum $I^2t$ for fusing                                     | 125      | KA <sup>2</sup> s  | t = 10ms No voltage   |
|  | 113      |                    | t = 8.3ms reappplied  |
|  | 72       |                    | t = 10ms 100% $V_{RRM}$   |
|  | 66       |                    | t = 8.3ms reappplied  |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing                       | 1250     | KA <sup>2</sup> √s | t = 0.1 to 10ms, no voltage reappplied  |
| $V_{F(TO)1}$ 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                  | $I_{FM} = \pi \times I_{F(AV)}$ , $T_J = 25 \text{ °C}$ , $t_p = 10\text{ms}$ sinusoidal wave |

## Thermal and Mechanical Specification

| Parameter   | 300HF(R)       | Units | Conditions                                 |
|---|----------------|-------|--|
| T <sub>J</sub> Max. operating temperature range             | -40 to 180     | °C    |  |
| T <sub>stg</sub> Max. storage temperature range             | -55 to 180     |       |  |
| R <sub>thJC</sub> Max. thermal resistance, junction to case | 0.12           | K/W   | DC operation                               |
| R <sub>thCS</sub> 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 <sub>J</sub> = T <sub>J</sub> 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

300

HF

R

120

P

B

①

②

③

④

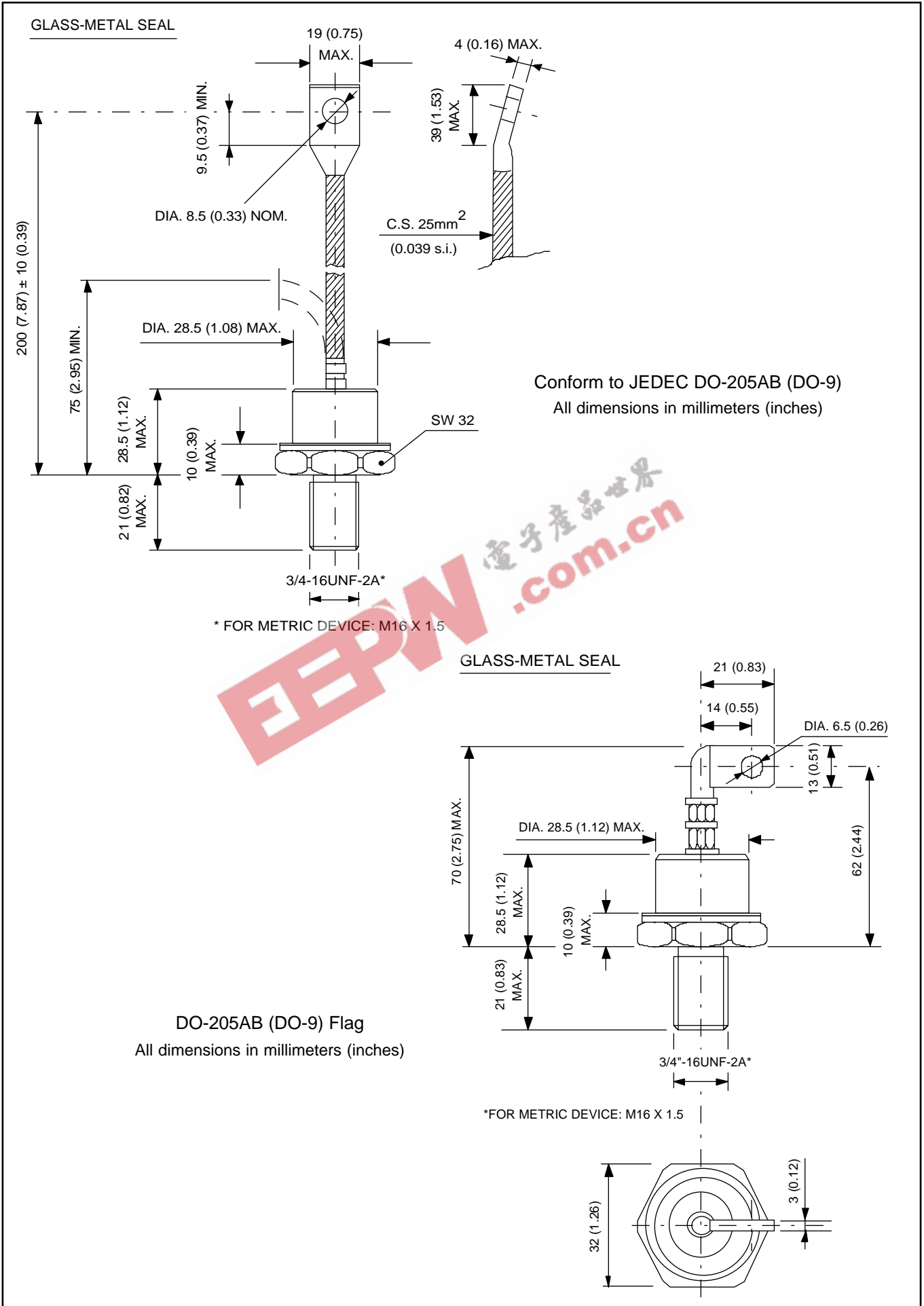
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⑥

- 1** - Essential Part Number
- 2** - 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** - P = Stud base DO-205AB(DO-9) 3/4" 16UNF-2A  
M = Stud base DO-205AB(DO-9) M16 x 1.5
- 6** - B = Flag top terminals (for Cathode/ Anode Leads)  
S = Isolated lead with silicone sleeve  
(Red = Reverse Polarity; Blue = Normal Polarity)  
None = Not isolated lead

# 300HF(R) Series

## Outline Table



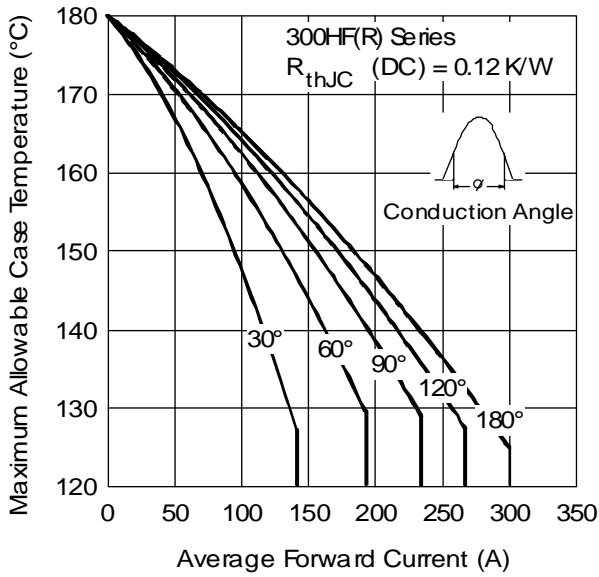


Fig. 1 - Current Ratings Characteristics

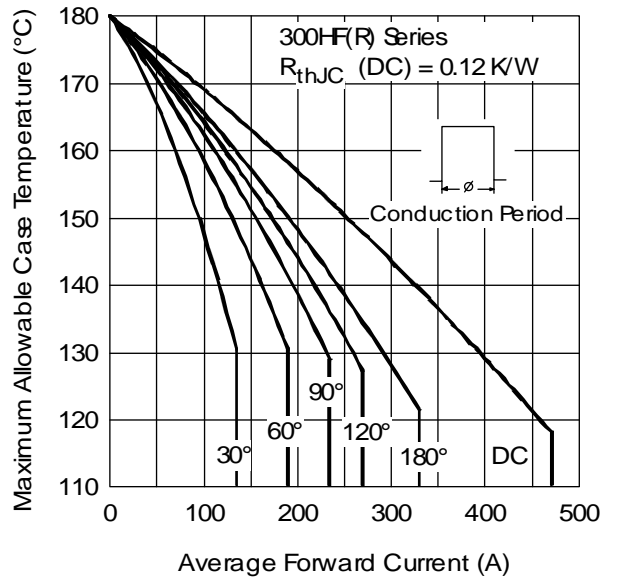


Fig. 2 - Current Ratings Characteristics

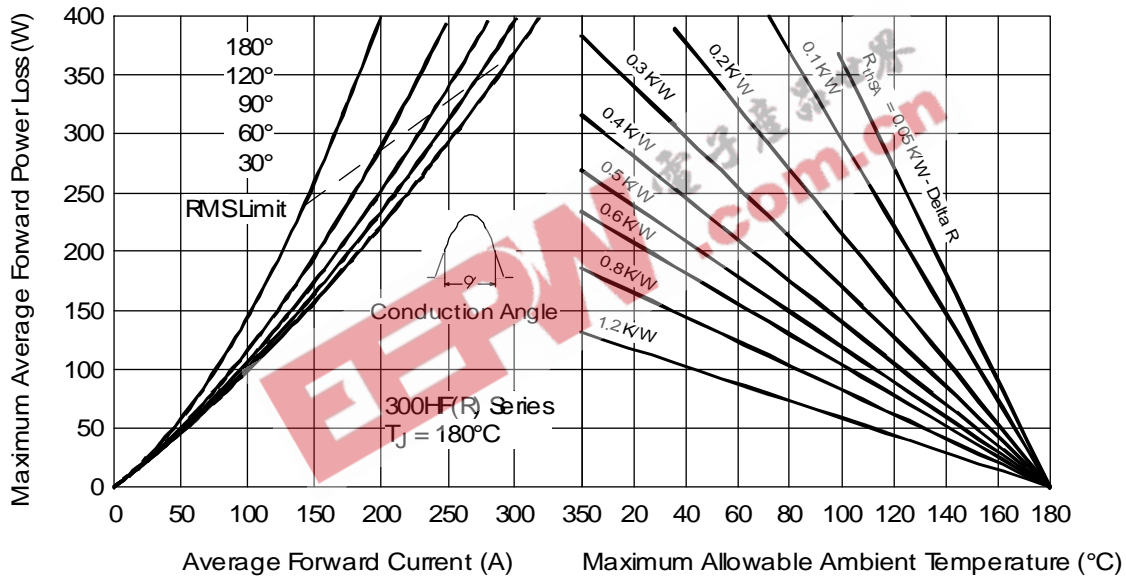


Fig. 3 - Forward Power Loss Characteristics

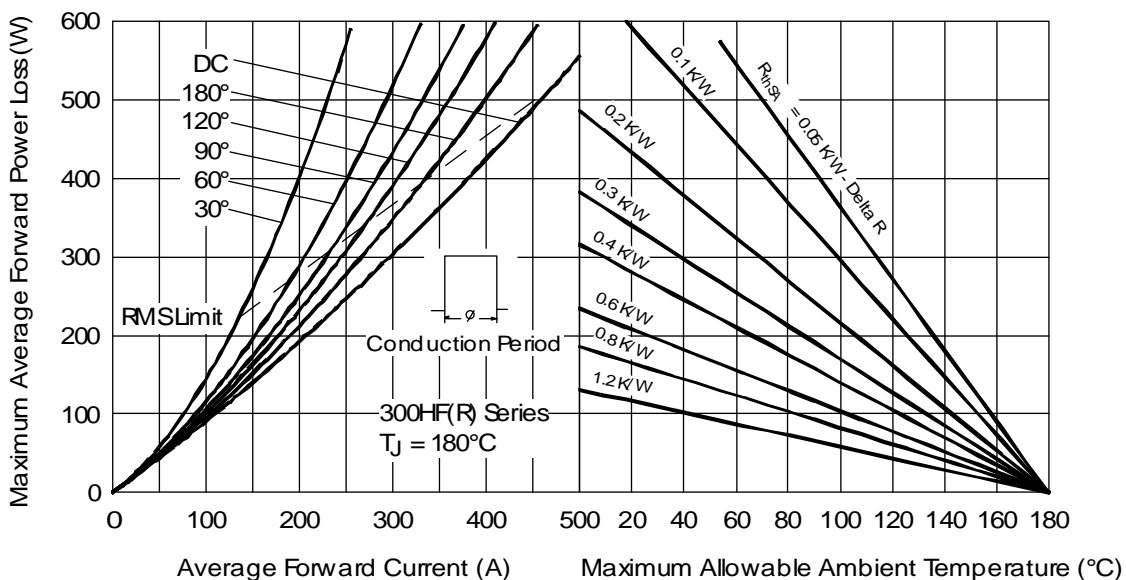


Fig. 4 - Forward Power Loss Characteristics

# 300HF(R) Series

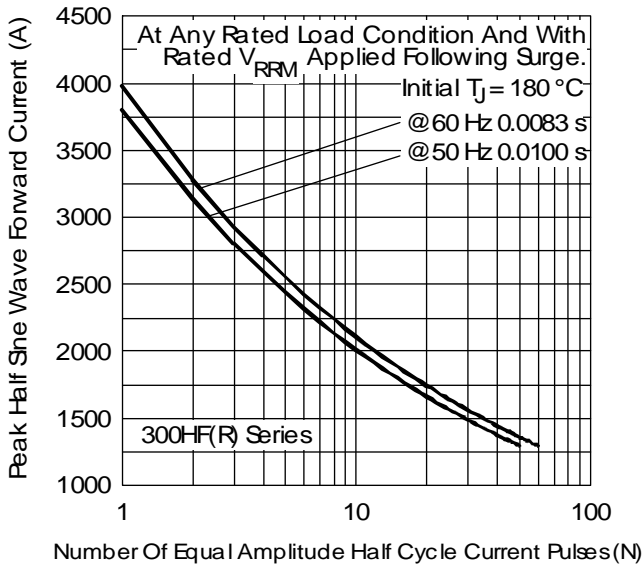


Fig. 5 - Maximum Non-Repetitive Surge Current

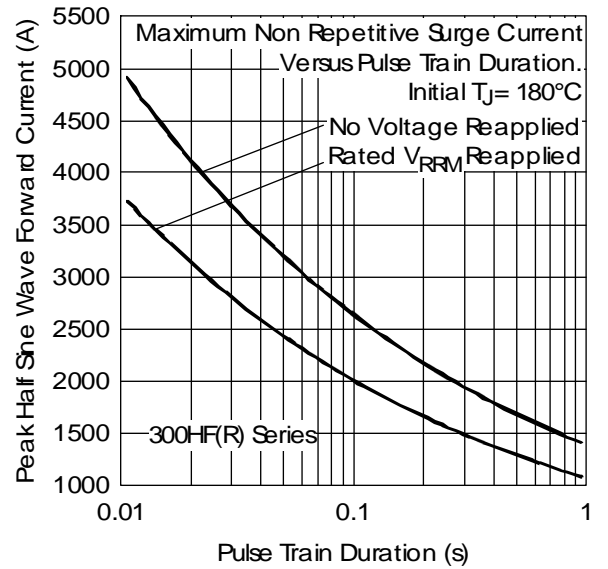


Fig. 6 - Maximum Non-Repetitive Surge Current

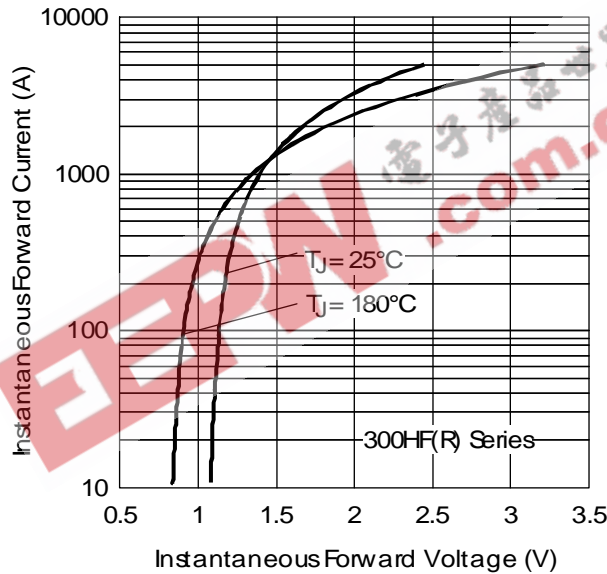


Fig. 7 - Forward Voltage Drop Characteristics

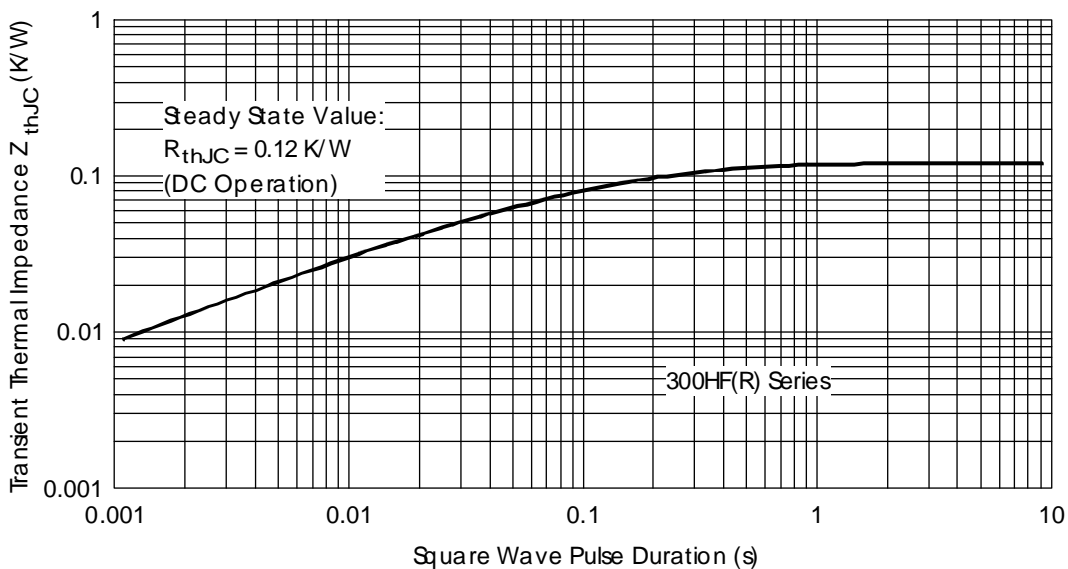


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic