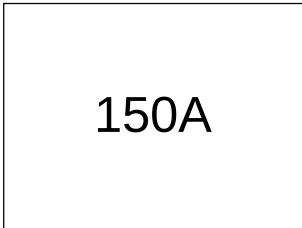


**STANDARD RECOVERY DIODES**

**Stud Version**

**Features**

- Alloy diode
- High current carrying capability
- High surge current capabilities
- Stud cathode and stud anode version
- RoHS Compliant

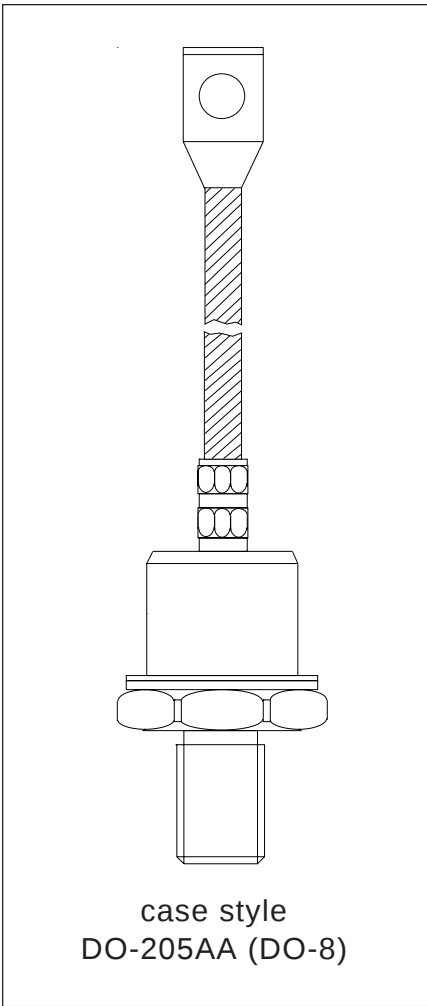


**Typical Applications**

- Battery charges
- Welders
- Machine tool controls
- High power drives
- Medium traction applications
- Freewheeling diodes

**Major Ratings and Characteristics**

| Parameters       | 45L /150K   | Units             |
|------------------|-------------|-------------------|
| $I_{F(AV)}$      | 150         | A                 |
| $@ T_C$          | 150         | °C                |
| $I_{F(RMS)}$     | 235         | A                 |
| $I_{FSM}$ @ 50Hz | 3570        | A                 |
| @ 60Hz           | 3740        | A                 |
| $I^2t$ @ 50Hz    | 64          | KA <sup>2</sup> s |
| @ 60Hz           | 58          | KA <sup>2</sup> s |
| $V_{RRM}$ range  | 100 to 600  | V                 |
| $T_J$            | - 40 to 200 | °C                |



**ELECTRICAL SPECIFICATIONS**
**Voltage Ratings**

| Type number                   | Voltage Code | $V_{RRM}$ , maximum repetitive peak reverse voltage<br>V | $V_{RSM}$ , maximum non-repetitive peak rev. voltage<br>V | $I_{RRM}$ max.<br>@ $T_J = 175^\circ\text{C}$<br>mA |
|-------------------------------|--------------|----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------|
| 45L(R)<br>150K(R)<br>150KS(R) | 10           | 100                                                      | 200                                                       | 35                                                  |
|                               | 20           | 200                                                      | 300                                                       |                                                     |
|                               | 30           | 300                                                      | 400                                                       |                                                     |
|                               | 40           | 400                                                      | 500                                                       |                                                     |
|                               | 60           | 600                                                      | 720                                                       |                                                     |

**Forward Conduction**

| Parameter           |                                                               | 45L /150K | Units              | Conditions                                                                                           |                       |                                                                           |  |
|---------------------|---------------------------------------------------------------|-----------|--------------------|------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------|--|
| I <sub>F(AV)</sub>  | Max. average forward current<br>@ Case temperature            | 150       | A                  | 180° conduction, half sine wave                                                                      |                       |                                                                           |  |
|                     |                                                               | 150       | °C                 |                                                                                                      |                       |                                                                           |  |
| I <sub>F(RMS)</sub> | Max. RMS forward current                                      | 235       | A                  | DC @ 142°C case temperature                                                                          |                       |                                                                           |  |
| I <sub>FSM</sub>    | Max. peak, one-cycle forward,<br>non-repetitive surge current | 3570      | A                  | t = 10ms                                                                                             | No voltage            | Sinusoidal half wave,<br><br>Initial T <sub>J</sub> = T <sub>J</sub> max. |  |
|                     |                                                               | 3740      |                    | t = 8.3ms                                                                                            | reapplied             |                                                                           |  |
|                     |                                                               | 3000      |                    | t = 10ms                                                                                             | 100% V <sub>RRM</sub> |                                                                           |  |
|                     |                                                               | 3140      |                    | t = 8.3ms                                                                                            | reapplied             |                                                                           |  |
| I <sup>2</sup> t    | Maximum I <sup>2</sup> t for fusing                           | 64        | KA <sup>2</sup> s  | t = 10ms                                                                                             | No voltage            |                                                                           |  |
|                     |                                                               | 58        |                    | t = 8.3ms                                                                                            | reapplied             |                                                                           |  |
|                     |                                                               | 45        |                    | t = 10ms                                                                                             | 100% V <sub>RRM</sub> |                                                                           |  |
|                     |                                                               | 41        |                    | t = 8.3ms                                                                                            | reapplied             |                                                                           |  |
| I <sup>2</sup> √t   | Maximum I <sup>2</sup> √t for fusing                          | 640       | KA <sup>2</sup> √s | t = 0.1 to 10ms, no voltage reapplied                                                                |                       |                                                                           |  |
| V <sub>F(TO)1</sub> | Low level value of threshold voltage                          | 0.67      | V                  | (16.7% × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max. |                       |                                                                           |  |
| V <sub>F(TO)2</sub> | High level value of threshold voltage                         | 0.83      |                    | (I > x π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max.                                |                       |                                                                           |  |
| r <sub>f1</sub>     | Low level value of forward slope resistance                   | 1.42      | mΩ                 | (16.7% × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max. |                       |                                                                           |  |
| r <sub>f2</sub>     | High level value of forward slope resistance                  | 0.91      |                    | (I > x π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max.                                |                       |                                                                           |  |
| V <sub>FM</sub>     | Max. forward voltage drop                                     | 1.33      | V                  | I <sub>pk</sub> = 471A, T <sub>J</sub> = 25°C, t <sub>p</sub> = 10ms sinusoidal wave                 |                       |                                                                           |  |

## Thermal and Mechanical Specifications

| Parameter         |                                           |        | 45L /150K        | Units          | Conditions                                 |
|-------------------|-------------------------------------------|--------|------------------|----------------|--------------------------------------------|
| T <sub>j</sub>    | Max. junction operating temperature range |        | -40 to 200       | °C             |                                            |
| T <sub>stg</sub>  | Max. storage temperature range            |        | -40 to 200       |                |                                            |
| R <sub>thJC</sub> | Max. thermal resistance, junction to case |        | 0.25             | K/W            | DC operation                               |
| R <sub>thCS</sub> | Max. thermal resistance, case to heatsink |        | 0.10             |                | Mounting surface, smooth, flat and greased |
| T                 | Mounting torque<br>45L                    | Min.   | 14.1 (125)       | Nm<br>(lbf-in) | Not lubricated threads                     |
|                   |                                           | Max.   | 17.0 (150)       |                |                                            |
|                   |                                           | Min.   | 12.2 (108)       |                | Lubricated threads                         |
|                   |                                           | Max.   | 15.0 (132)       |                |                                            |
|                   | 150K<br>150KS                             | Min.   | 11.3 (100)       | Nm<br>(lbf-in) | Not lubricated threads                     |
|                   |                                           | Max.   | 14.1 (125)       |                |                                            |
|                   |                                           | Min.   | 9.5 (85)         |                | Lubricated threads                         |
|                   |                                           | Max.   | 12.5 (110)       |                |                                            |
| wt                | Approximate weight                        |        | 100 (3.5)        | g (oz)         |                                            |
| Case style        |                                           | 45L    | DO-205AC (DO-30) |                | See Outline Table                          |
|                   |                                           | 150K-A | DO-205AA (DO-8)  |                |                                            |
|                   |                                           | 150KS  | B-42             |                |                                            |

## $\Delta R_{thJC}$ 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°             | 0.031                 | 0.023                  | K/W   | $T_J = T_J \text{ max.}$ |
| 120°             | 0.038                 | 0.040                  |       |                          |
| 90°              | 0.048                 | 0.053                  |       |                          |
| 60°              | 0.071                 | 0.075                  |       |                          |
| 30°              | 0.120                 | 0.121                  |       |                          |

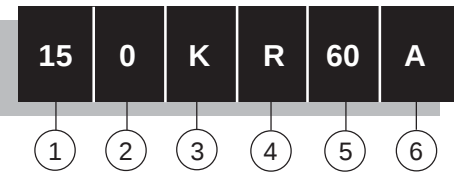
## Ordering Information Table

### Device Code

- 1** - 45 = Standard version
- 2** - L = Essential Part Number
- 3** - R = Stud Reverse Polarity (Anode to Stud)  
None = Stud Normal Polarity (Cathode to Stud)
- 4** - Voltage code: Code x 10 =  $V_{RRM}$  (See Voltage Ratings table)

Ordering Information Table

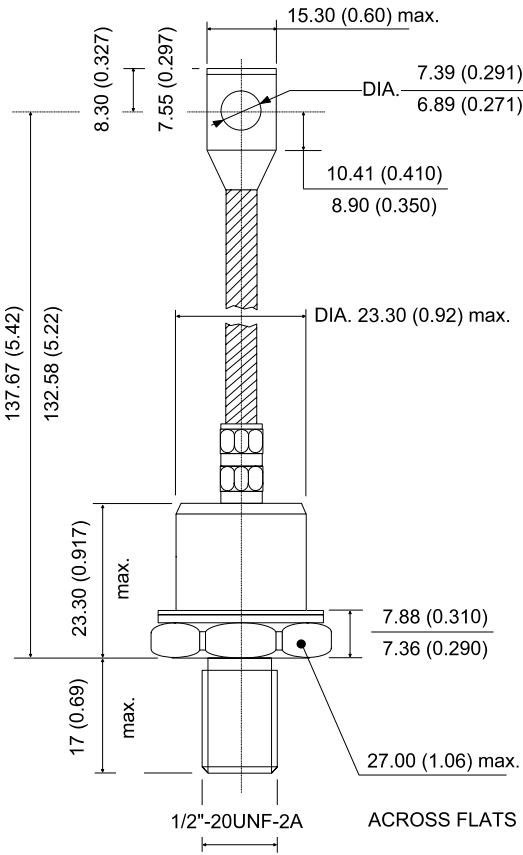
Device Code



- 1** - 15 = Essential Part Number
- 2** - 0 = Standard Device
- 3** - Case Style  
K = DO205AA (DO-8)  
KS = B-42
- 4** - R = Stud Reverse Polarity (Anode to Stud)  
None = Stud Normal Polarity (Cathode to Stud)
- 5** - Voltage code: Code x 10 =  $V_{RRM}$  (See Voltage Ratings table)
- 6** - A = Essential Part Number for 150K (Omitted for 150KS)

NOTE: For Metric Device M12 x 1.75 Contact Factory

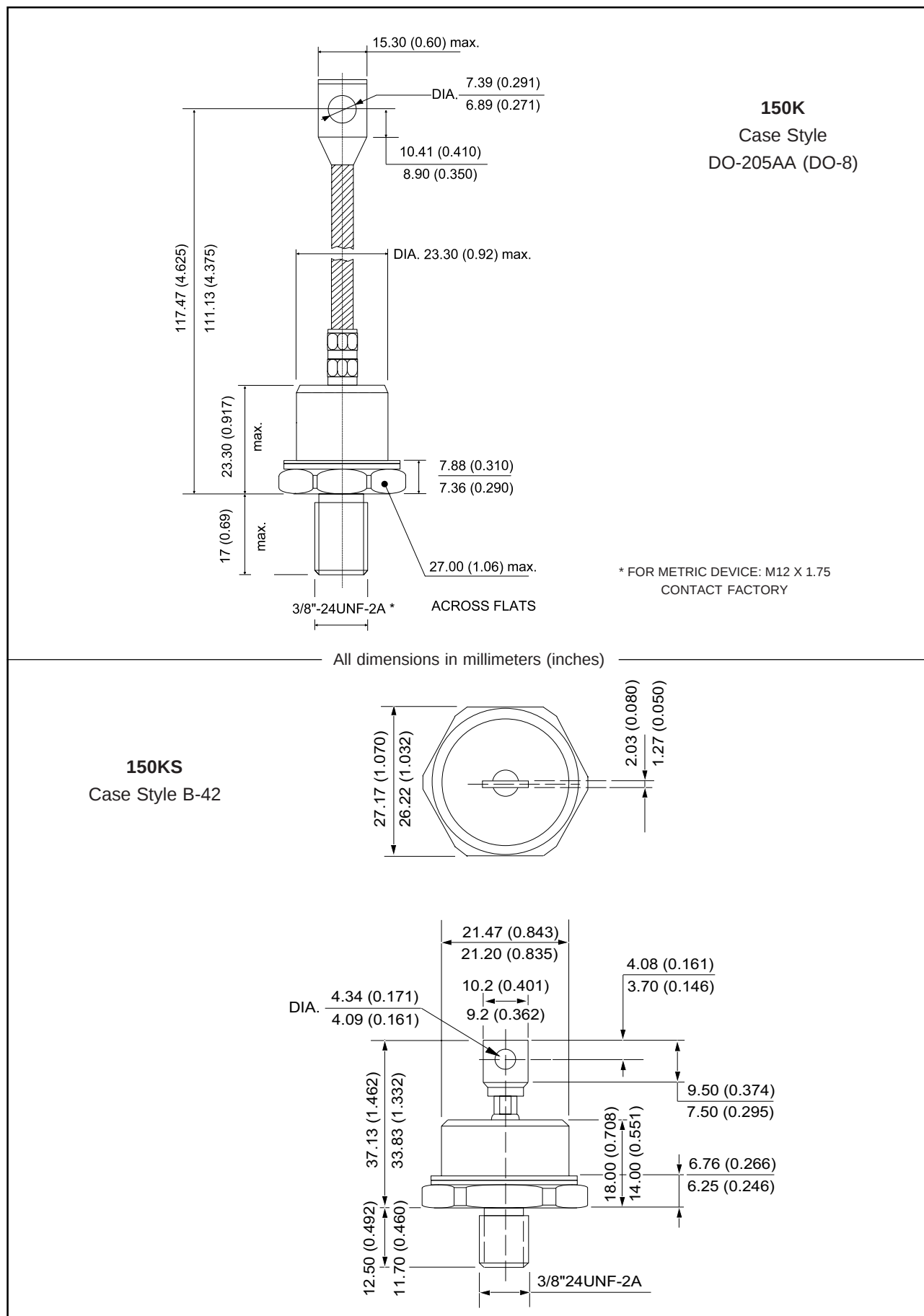
Outline Table



**45L**  
Case Style  
DO-205AC (DO-30)

All dimensions in millimeters (inches)

Outline Table



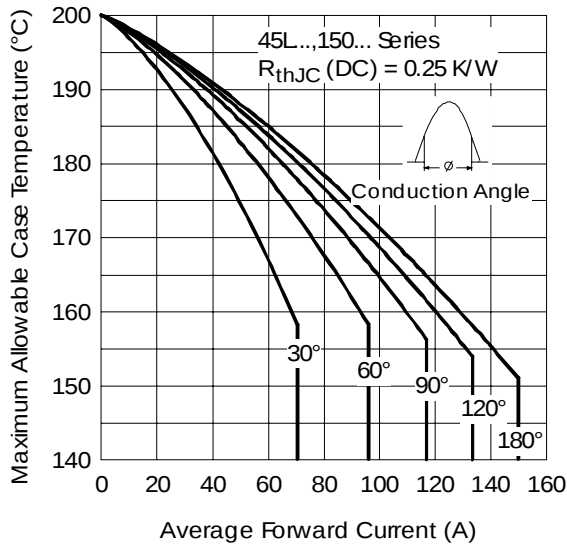


Fig. 1 - Current Ratings Characteristics

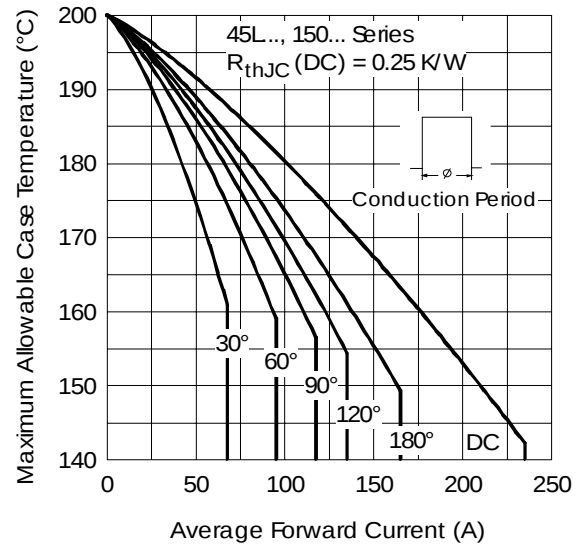


Fig. 2 - Current Ratings Characteristics

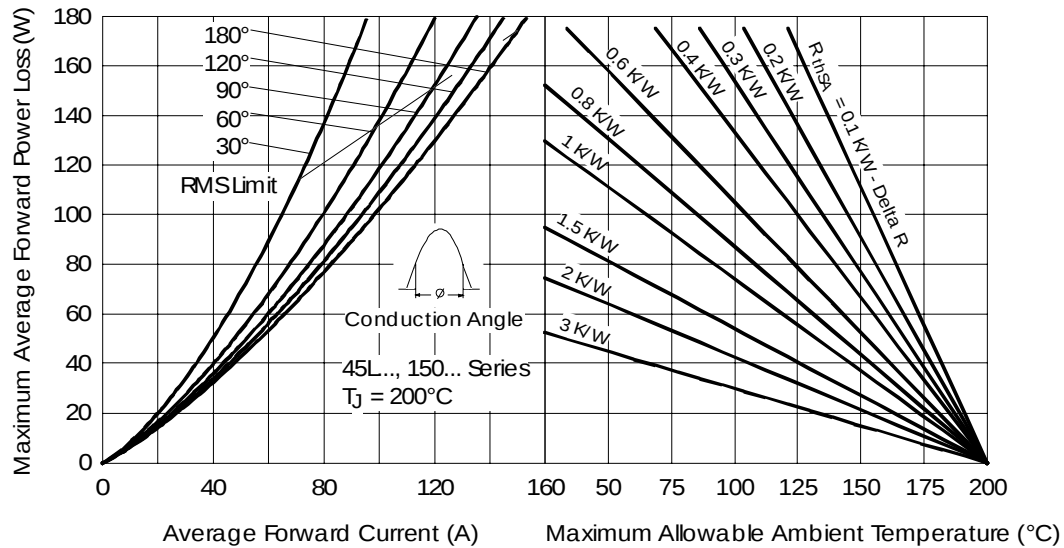


Fig. 3 - Forward Power Loss Characteristics

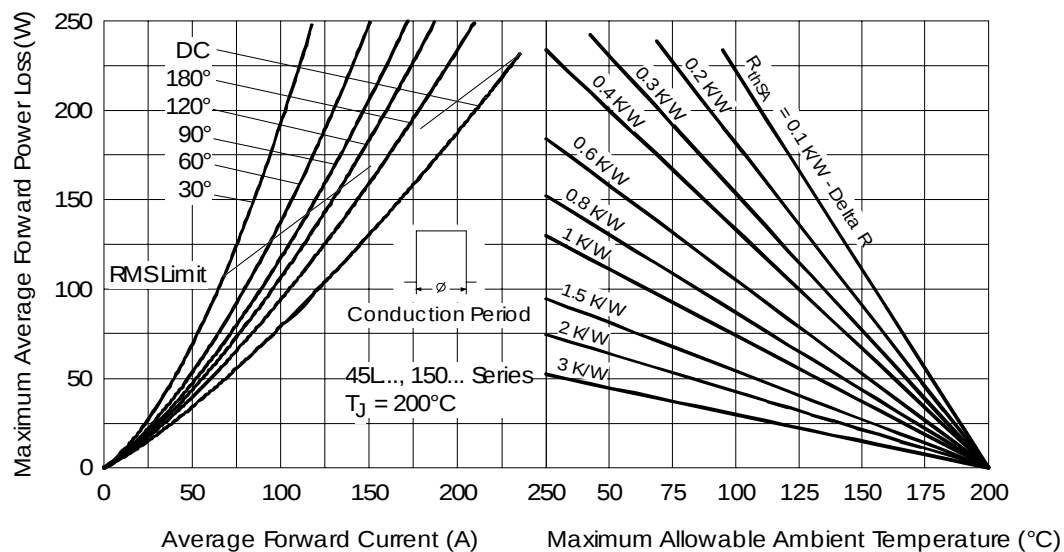


Fig. 4 - Forward Power Loss Characteristics

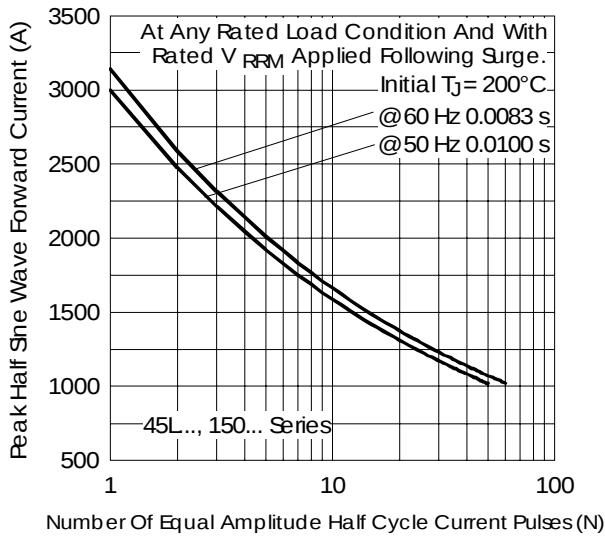


Fig. 5 - Maximum Non-Repetitive Surge Current

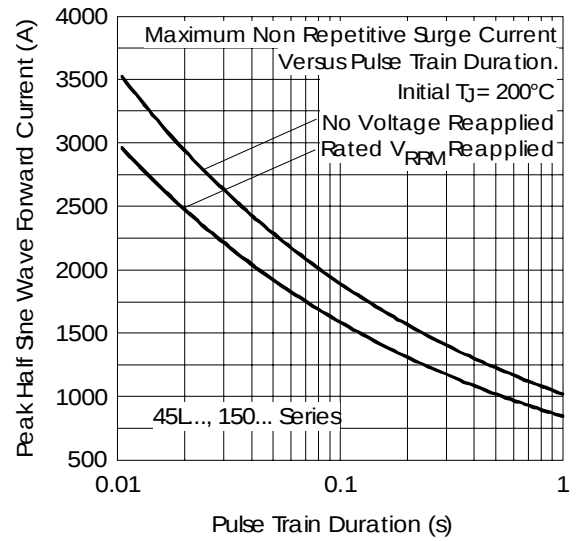


Fig. 6 - Maximum Non-Repetitive Surge Current

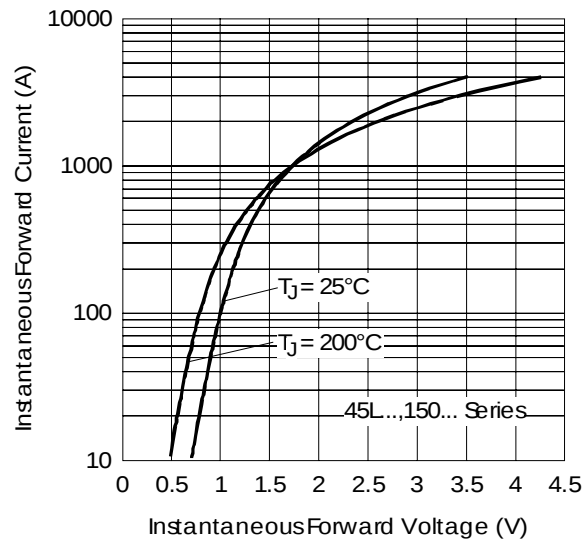


Fig. 7 - Forward Voltage Drop Characteristics

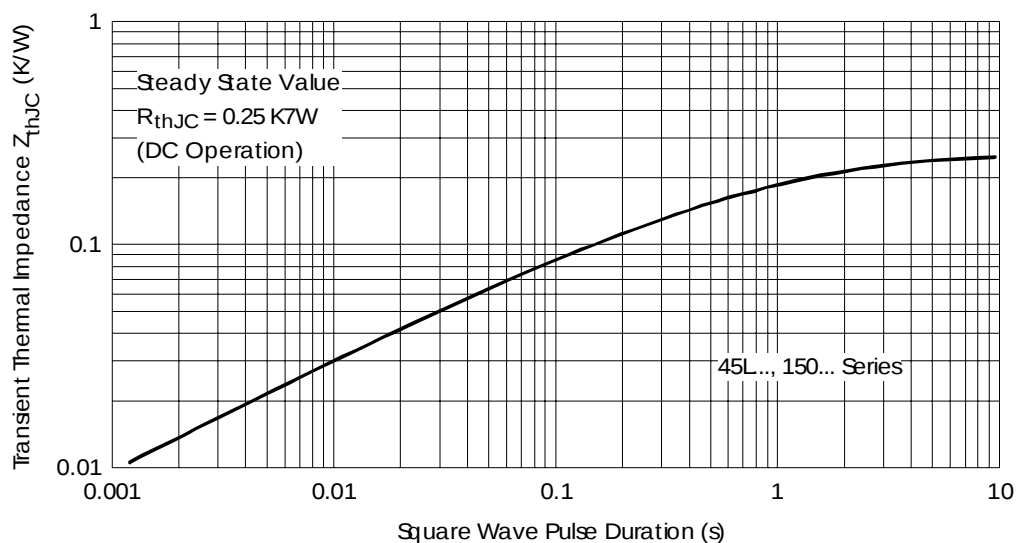


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

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  
**IOR** Rectifier

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