

STANDARD RECOVERY DIODES

Stud Version

Features

- Alloy diode
- Popular series for rough service
- Stud cathode and stud anode version

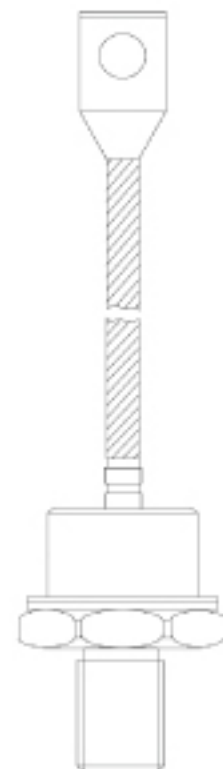
300A

Typical Applications

- Welders
- Power supplies
- Motor controls
- Battery chargers
- General industrial current rectification

Major Ratings and Characteristics

| Parameters       | D300U      | Units             |
|------------------|------------|-------------------|
| $I_{F(AV)}$      | 300        | A                 |
| @ $T_C$          | 150        | °C                |
| $I_{FSM}$ @ 50Hz | 6550       | A                 |
| @ 60Hz           | 6850       | A                 |
| $I^2t$ @ 50Hz    | 214        | KA <sup>2</sup> s |
| @ 60Hz           | 195        | KA <sup>2</sup> s |
| $V_{RRM}$ range  | 100 to 600 | V                 |
| $T_J$            | -65 to 200 | °C                |



case style  
DO-205AB (DO-9)

# D300U Series

## ELECTRICAL SPECIFICATIONS

### Voltage Ratings

AMERICAN SEMI



| 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 |
|-------------|--------------|--|---|---|
| D300U       | 10           | 100  | 200   | 40  |
|             | 20           | 200  | 300   |   |
|             | 30           | 300  | 400   |   |
|             | 40           | 400  | 500   |   |
|             | 60           | 600  | 700   |   |

### Forward Conduction

| Parameter  | D300U                        | Units  | Conditions   |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
|--|------------------------------|--|--|----------|-----------------------|--|-----------|------------|----------|----------------|-----------|------------|----------|-----------------------|-----------|------------|----------|----------------|-----------|------------|
| $I_{F(AV)}$ Max. average forward current @ Case temperature          | 300<br>130                   | A<br>$^\circ\text{C}$                                    | 180° conduction, half sine wave  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| $I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current | 6550<br>6850<br>5500<br>5750 | A  | <table border="1"> <tr> <td>t = 10ms</td> <td>No voltage reappplied</td> <td rowspan="8">Sinusoidal half wave, Initial <math>T_J = T_{J \text{ max.}}</math></td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> <tr> <td>t = 10ms</td> <td>100% <math>V_{RRM}</math></td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> <tr> <td>t = 10ms</td> <td>No voltage reappplied</td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> <tr> <td>t = 10ms</td> <td>100% <math>V_{RRM}</math></td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> </table> | t = 10ms | No voltage reappplied | Sinusoidal half wave, Initial $T_J = T_{J \text{ max.}}$ | t = 8.3ms | reappplied | t = 10ms | 100% $V_{RRM}$ | t = 8.3ms | reappplied | t = 10ms | No voltage reappplied | t = 8.3ms | reappplied | t = 10ms | 100% $V_{RRM}$ | t = 8.3ms | reappplied |
| t = 10ms   | No voltage reappplied        | Sinusoidal half wave, Initial $T_J = T_{J \text{ max.}}$ |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 10ms   | 100% $V_{RRM}$               |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
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| t = 10ms   | 100% $V_{RRM}$               |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| $I^2t$ Maximum $I^2t$ for fusing                                     | 214<br>195<br>151<br>138     | $\text{KA}^2\text{s}$                                    | <table border="1"> <tr> <td>t = 10ms</td> <td>No voltage reappplied</td> <td rowspan="8">Sinusoidal half wave, Initial <math>T_J = T_{J \text{ max.}}</math></td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> <tr> <td>t = 10ms</td> <td>100% <math>V_{RRM}</math></td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> <tr> <td>t = 10ms</td> <td>No voltage reappplied</td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> <tr> <td>t = 10ms</td> <td>100% <math>V_{RRM}</math></td> </tr> <tr> <td>t = 8.3ms</td> <td>reappplied</td> </tr> </table> | t = 10ms | No voltage reappplied | Sinusoidal half wave, Initial $T_J = T_{J \text{ max.}}$ | t = 8.3ms | reappplied | t = 10ms | 100% $V_{RRM}$ | t = 8.3ms | reappplied | t = 10ms | No voltage reappplied | t = 8.3ms | reappplied | t = 10ms | 100% $V_{RRM}$ | t = 8.3ms | reappplied |
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| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 10ms   | 100% $V_{RRM}$               |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 10ms   | No voltage reappplied        |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 10ms   | 100% $V_{RRM}$               |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| t = 8.3ms  | reappplied                   |  |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing                       | 2140                         | $\text{KA}^2\sqrt{\text{s}}$                             | t = 0.1 to 10ms, no voltage reappplied   |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| $V_{F(TO)}$ Max. value of threshold voltage                          | 0.610                        | V  | $T_J = 200^\circ\text{C}$  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| $r_f$ Max. value of forward slope resistance                         | 0.751                        | m $\Omega$   |  |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |
| $V_{FM}$ Max. peak forward voltage                                   | 1.40                         | V  | $I_{\text{peak}} = 942\text{A}$ , $T_J = 25^\circ\text{C}$   |          |                       |  |           |            |          |                |           |            |          |                       |           |            |          |                |           |            |

### Thermal and Mechanical Specifications

| Parameter   | D300U           | Units            | Conditions                                 |
|---|-----------------|------------------|--|
| $T_J$ Max. junction operating temperature range             | -65 to 200      | $^\circ\text{C}$ |  |
| $T_{\text{stg}}$ Max. storage temperature range             | -65 to 200      |                  |  |
| $R_{\text{thJC}}$ Max. thermal resistance, junction to case | 0.18            | K/W              | DC operation                               |
| $R_{\text{thCS}}$ Max. thermal resistance, case to heatsink | 0.08            |                  | Mounting surface, smooth, flat and greased |
| T Max. allowed mounting torque +0 -20%                      | 37<br>28        | Nm               | Not lubricated threads                     |
|   |                 |                  | Lubricated threads                         |
| wt Approximate weight                                       | 250             | g                |  |
| Case style  | DO-205AB (DO-9) |                  | JEDEC (See Outline Table)                  |



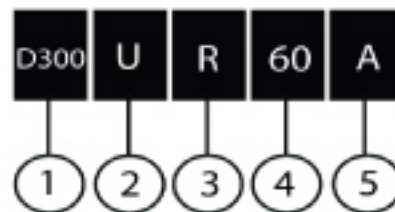
$\Delta R_{thJC}$  Conduction

(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°             | 0.020                 | 0.015                  | K/W   | $T_j = T_{j \text{ max.}}$ |
| 120°             | 0.024                 | 0.025                  |       |                            |
| 90°              | 0.031                 | 0.034                  |       |                            |
| 60°              | 0.045                 | 0.047                  |       |                            |
| 30°              | 0.077                 | 0.077                  |       |                            |

Ordering Information Table

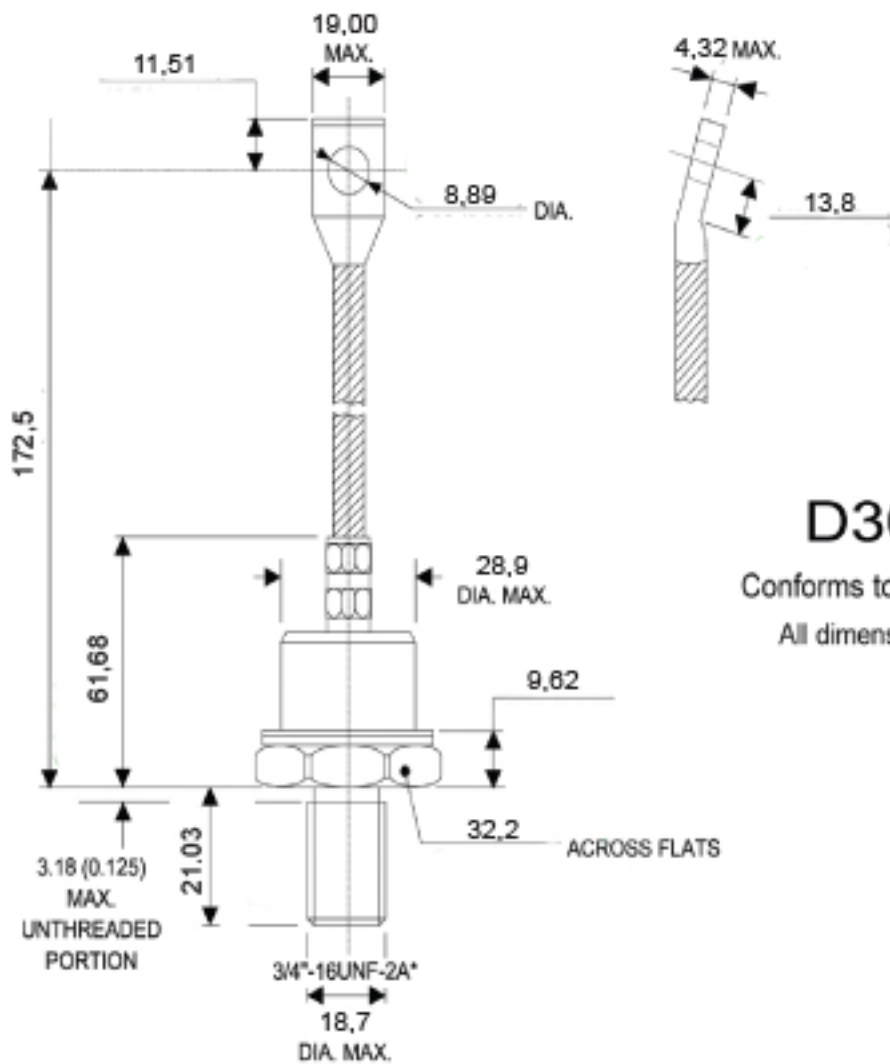
Device Code



- 1** - 300 = Device 300 Standard  
302 = 300U Top Threaded version
- 2** - U = 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)
- 5** - A = Essential Part Number

NOTE: For Metric Device M16 x 1.5 Contact Factory

# D300U Series



**D300U Series**  
Conforms to JEDEC DO-205AB (DO-9)  
All dimensions in millimeters (inches)

FOR METRIC DEVICE M18  
CONTACT FACTORY

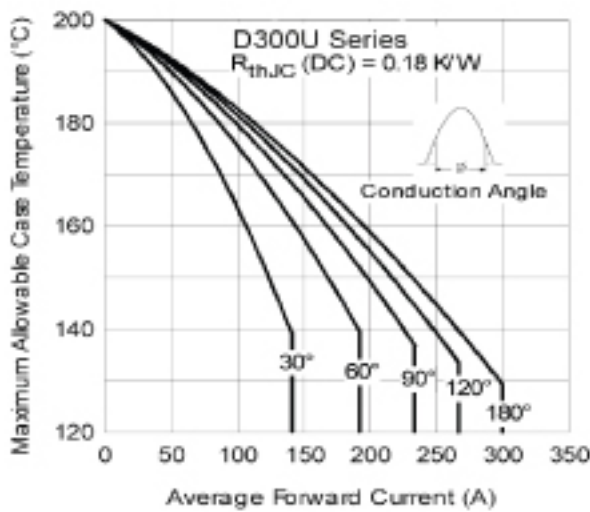


Fig. 1 - Current Ratings Characteristics

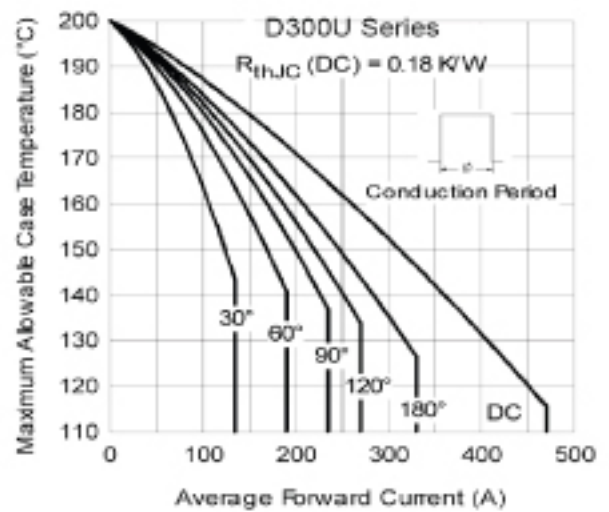


Fig. 2 - Current Ratings Characteristics

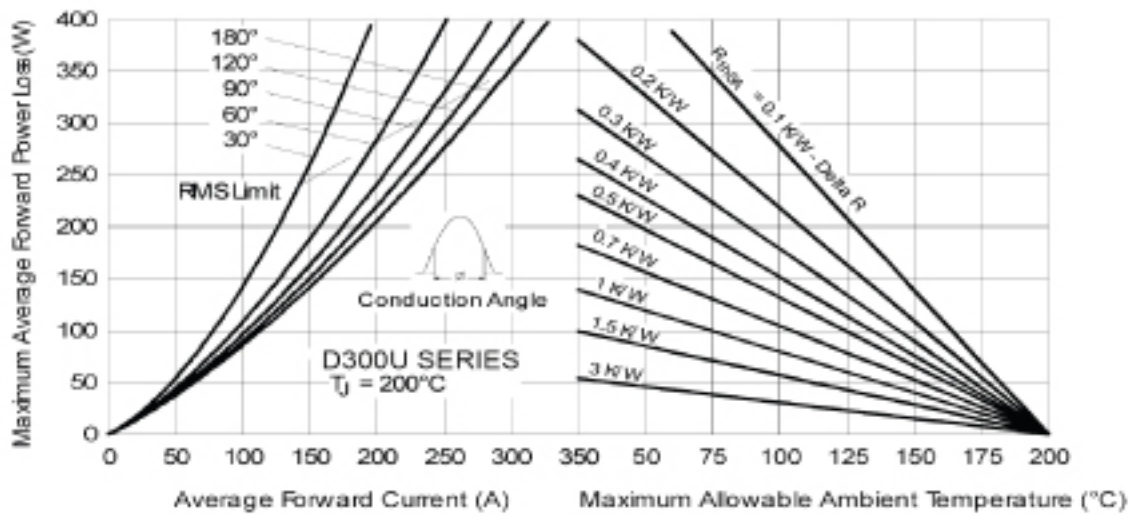


Fig. 3 - Forward Power Loss Characteristics

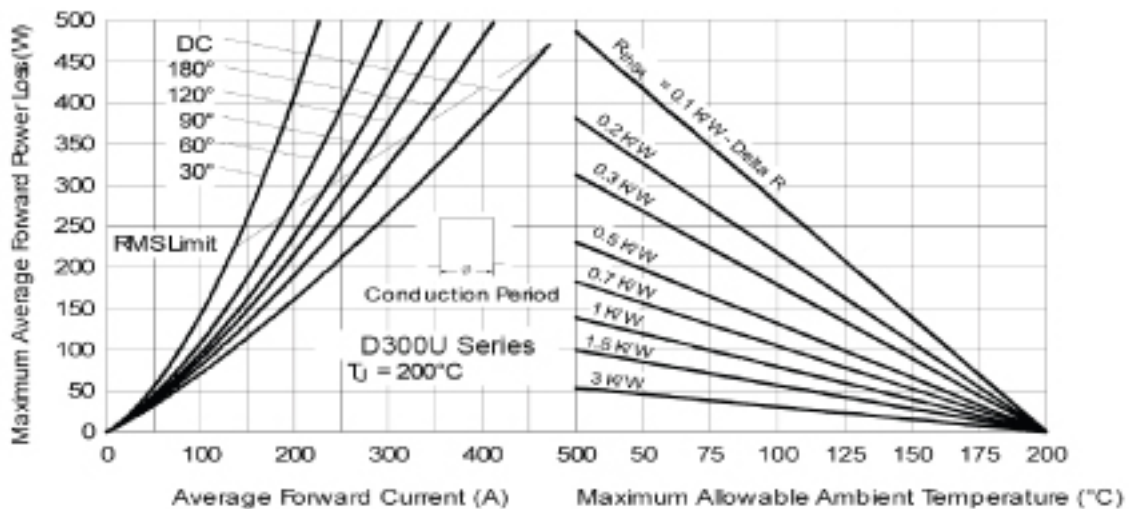


Fig. 4 - Forward Power Loss Characteristics

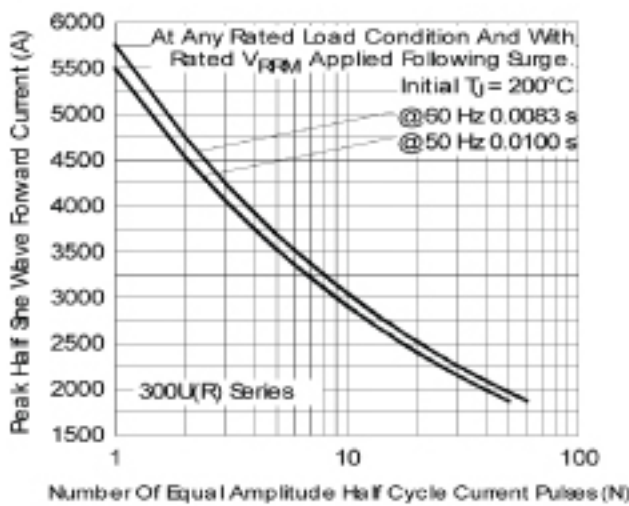


Fig. 5 - Maximum Non-Repetitive Surge Current

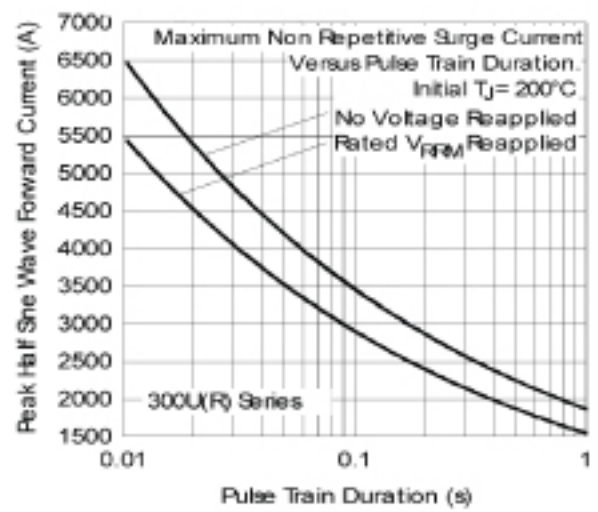


Fig. 6 - Maximum Non-Repetitive Surge Current

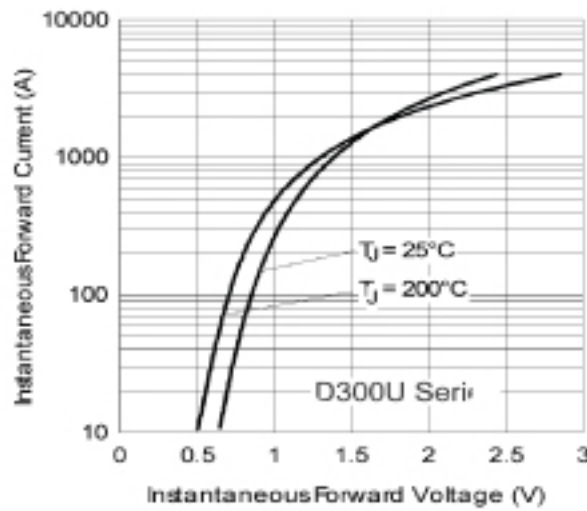


Fig. 7 - Forward Voltage Drop Characteristics

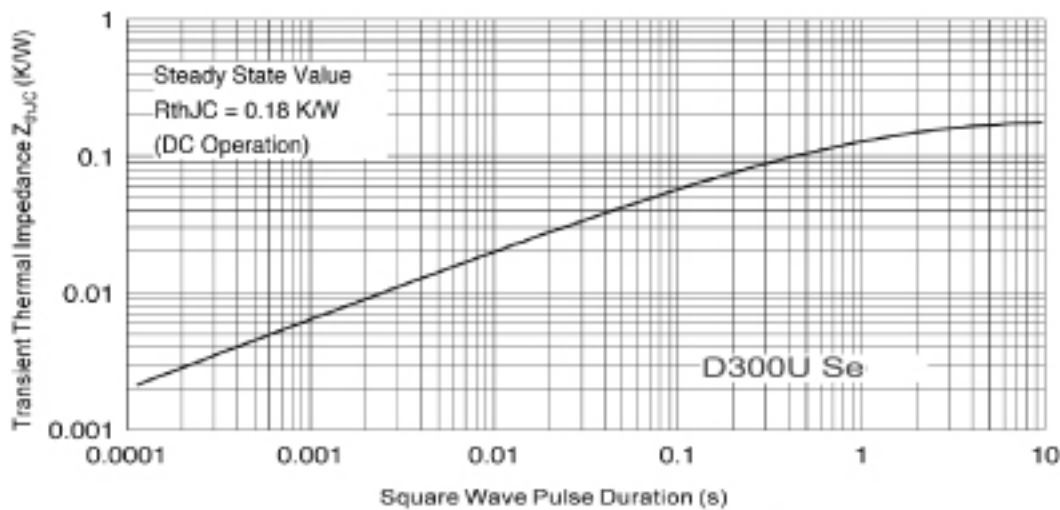


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic