Bulletin I2031 rev. B 06/06

International
IOR Rectifier

# 70/300U(R)..D SERIES

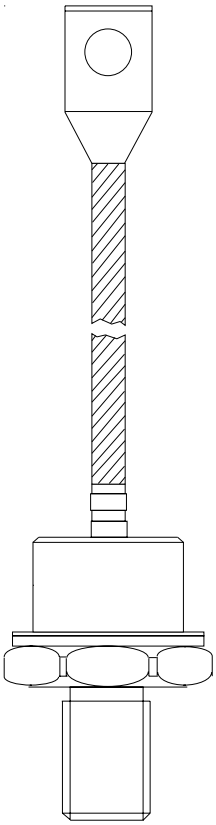
## STANDARD RECOVERY DIODES

**Stud Version**

250A

### Features

- Diffused diode
- Wide current range
- High voltage ratings up to 1600V
- High surge current capabilities
- Stud cathode and stud anode version
- RoHS Compliant



case style
DO-205AB (DO-9)

### Typical Applications

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

### Major Ratings and Characteristics

| Parameters | | 70/300U(R)..D | Units |
|---|---|---|---|
| $I_{F(AV)}$ | | 250 | A |
| | @ $T_C$ | 145 | °C |
| $I_{F(RMS)}$ | | 390 | A |
| $I_{FSM}$ | @50Hz | 6550 | A |
| | @ 60Hz | 6850 | A |
| $I^2t$ | @50Hz | 214 | $KA^2s$ |
| | @ 60Hz | 195 | $KA^2s$ |
| $V_{RRM}$ range | | 1200 to 1600 | V |
| $T_J$ | | - 40 to 200 | °C |

## ELECTRICAL SPECIFICATIONS

### Voltage Ratings

| Type number | Voltage Code | $V_{RRM}$ , maximum repetitive peak reverse voltage V | $V_{RSM}$ , maximum non-repetitive peak rev. voltage V | $I_{RRM}$ max. @ $T_J = T_J$ max. mA |
|---|---|---|---|---|
| 70/300U(R)..D | 120 | 1200 | 1300 | 60 |
| | 160 | 1600 | 1700 | |

### Forward Conduction

| | Parameter | 70/300U(R)..D | Units | Conditions | | |
|---|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. average forward current | 250 | A | 180° conduction, half sine wave | | |
| | @ Case temperature | 145 | °C | | | |
| $I_{F(RMS)}$ | Max. RMS forward current | 390 | A | DC @ 134°C case temperature | | |
| $I_{FSM}$ | Max. peak, one-cycle forward, non-repetitive surge current | 6550 | A | t = 10ms | No voltage reapplied | Sinusoidal half wave, Initial $T_J = T_J$ max. |
| | | 6850 | | t = 8.3ms | | |
| | | 5500 | | t = 10ms | 100% $V_{RRM}$ reapplied | |
| | | 5750 | | t = 8.3ms | | |
| $I^2t$ | Maximum $I^2t$ for fusing | 214 | $KA^2s$ | t = 10ms | No voltage reapplied | |
| | | 195 | | t = 8.3ms | | |
| | | 151 | | t = 10ms | 100% $V_{RRM}$ reapplied | |
| | | 138 | | t = 8.3ms | | |
| $I^2\sqrt{t}$ | Maximum $I^2\sqrt{t}$ for fusing | 2140 | $KA^2\sqrt{s}$ | t = 0.1 to 10ms, no voltage reapplied | | |
| $V_{F(TO)1}$ | Low level value of threshold voltage | 0.61 | V | (16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $V_{F(TO)2}$ | High level value of threshold voltage | 0.83 | | (I > π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $r_{f1}$ | Low level value of forward slope resistance | 0.75 | mΩ | (16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $r_{f2}$ | High level value of forward slope resistance | 0.49 | | (I > π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $V_{FM}$ | Max. forward voltage drop | 1.30 | V | $I_{pk}$= 785A, $T_J$ = 25°C, $t_p$ = 10ms sinusoidal wave | | |

## Thermal and Mechanical Specifications

| | Parameter | 70/300U(R)..D | Units | Conditions |
|---|---|---|---|---|
| $T_J$ | Max. junction operating temperature range | -40 to 200 | °C | |
| $T_{stg}$ | Max. storage temperature range | -40 to 200 | | |
| $R_{thJC}$ | Max. thermal resistance, junction to case | 0.18 | K/W | DC operation |
| $R_{thCS}$ | Max. thermal resistance, case to heatsink | 0.08 | | Mounting surface, smooth, flat and greased |
| T | Max. allowed mounting torque +0 -20% | 37 | N m | Not lubricated threads |
| | | 28 | | Lubricated threads |
| wt | Approximate weight | 250 | g | |
| | Case style | DO-205AB (DO-9) | | See Outline Table |

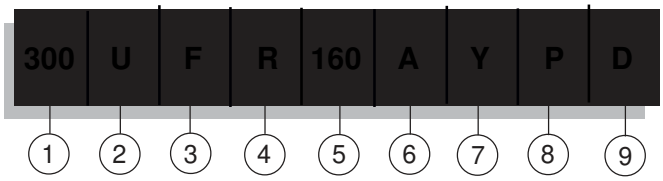
## $\Delta R_{thJC}$ Conduction

(The following table shows the increment of thermal resistence $R_{thJC}$ when devices operate at different conduction angles than DC)

| Conduction angle | Sinusoidal conduction | Rectangular conduction | Units | Conditions |
|---|---|---|---|---|
| 180° | 0.020 | 0.015 | K/W | $T_J = T_J$ 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 = Standard 300U device
70 = Standard 70U device
302 = 300U Top Threaded version
72 = 70U Top Threaded version

2 - U = Essential Part Number

3 - F = Flat Base (with Pinch Bolt)
None = Normal Stud Base 3/4"-16UNF-2A

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)

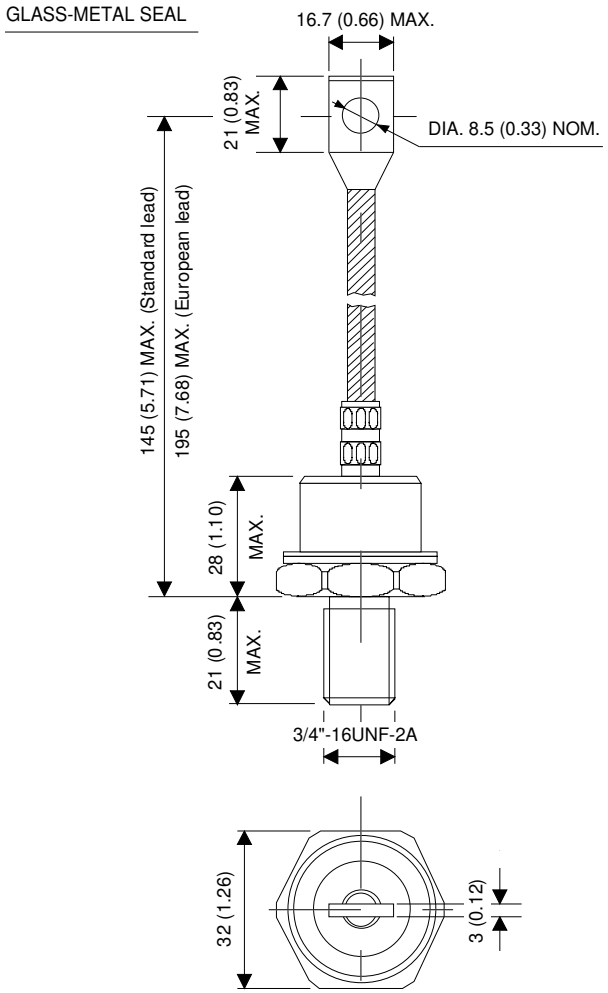
6 - A = Essential Part Number only for 300U Series
None = 70U Series

7 - Y = European Lead
None = Standard Lead

8 - P = Forward Selection (1.045V < $V_{FM}$ < 1.125V, $I_{FM}$ = 470A, $T_J$ = 25°C)

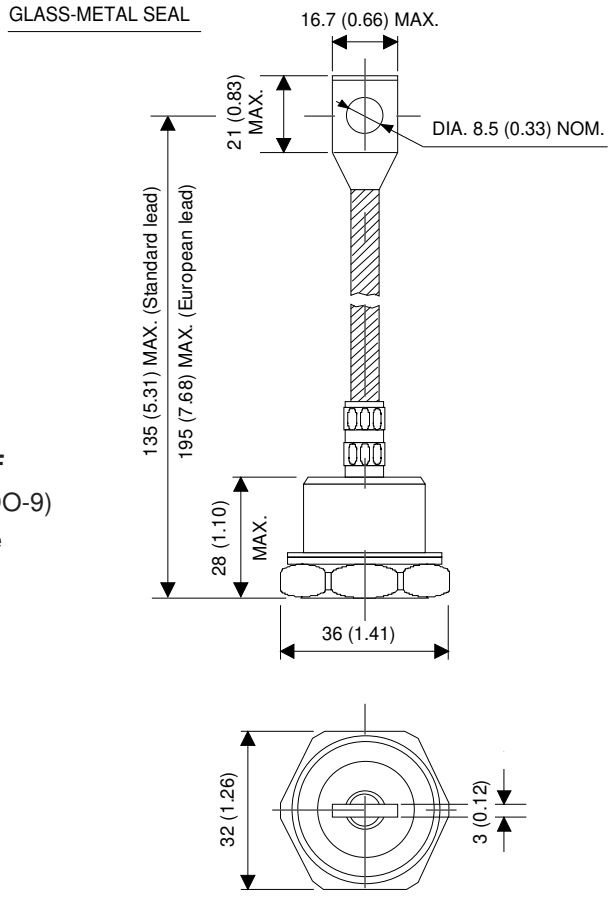
9 - D = Diffused diode

## Outline Table




**70/300U**
DO-205AB (DO-9)

*** For metric devices M16x1.5 contact factory**

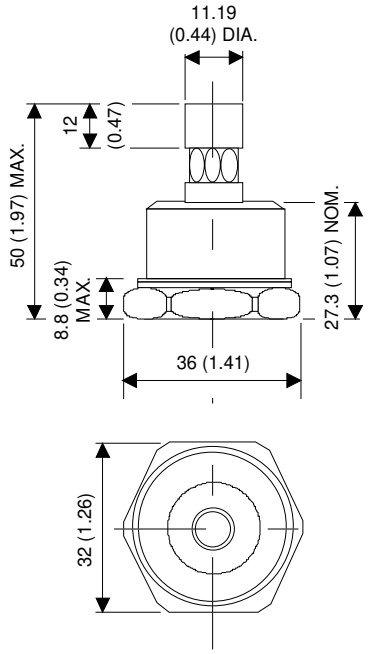



**70/300UF**
DO-205AB (DO-9)
Flat Base

All dimensions in millimeters (inches)

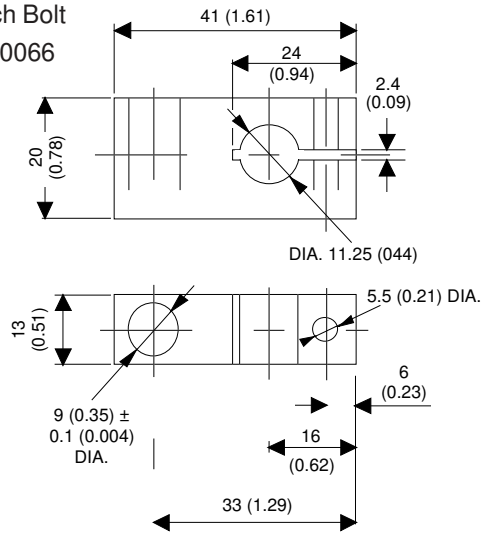
## Outline Table

GLASS-METAL SEAL

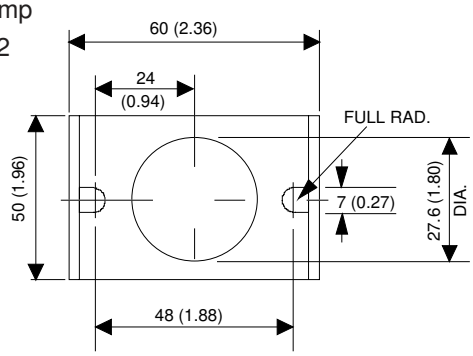



**72/302UF**
IR Case Style B26
Flat Base

Pinch Bolt
35-0066

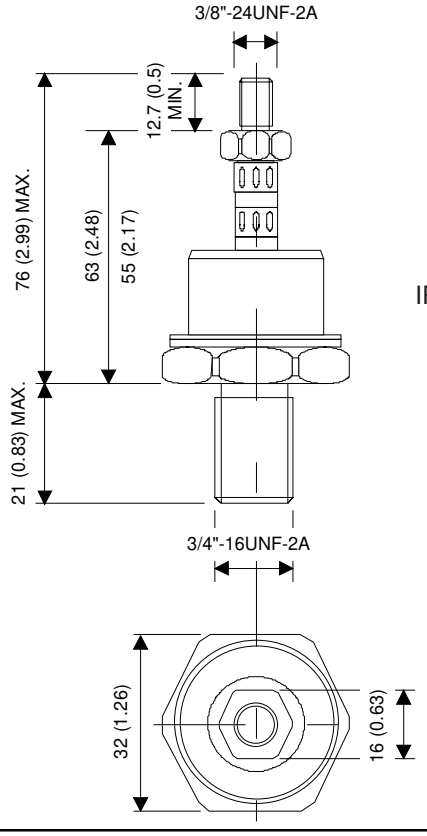



Spring Clamp
K41-0232




All dimensions in millimeters (inches)

GLASS-METAL SEAL




**72/302U**
IR Case Style B26

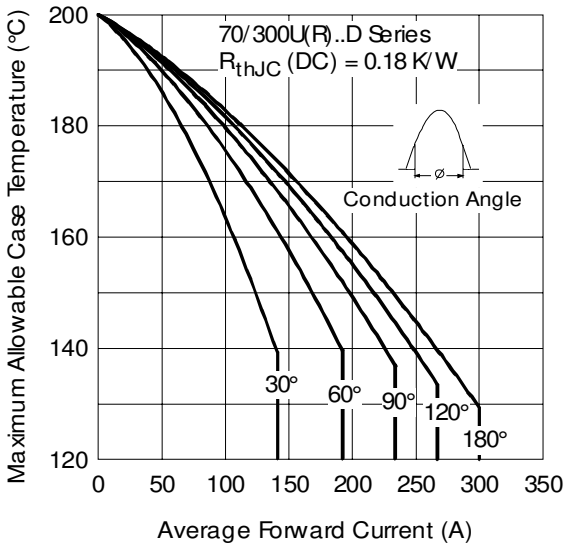



Fig. 1 - Current Ratings Characteristics

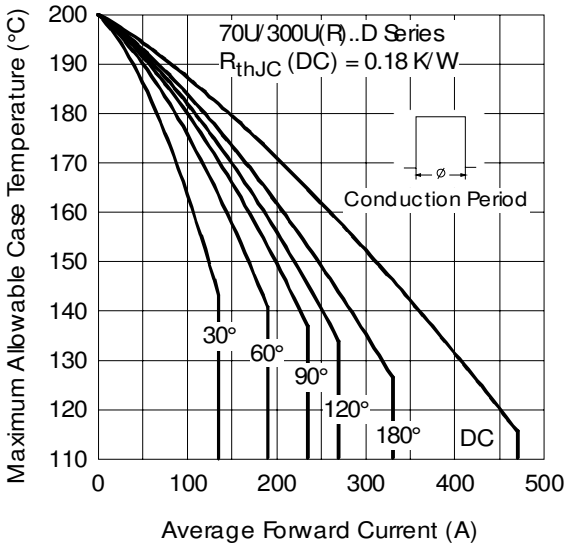



Fig. 2 - Current Ratings Characteristics

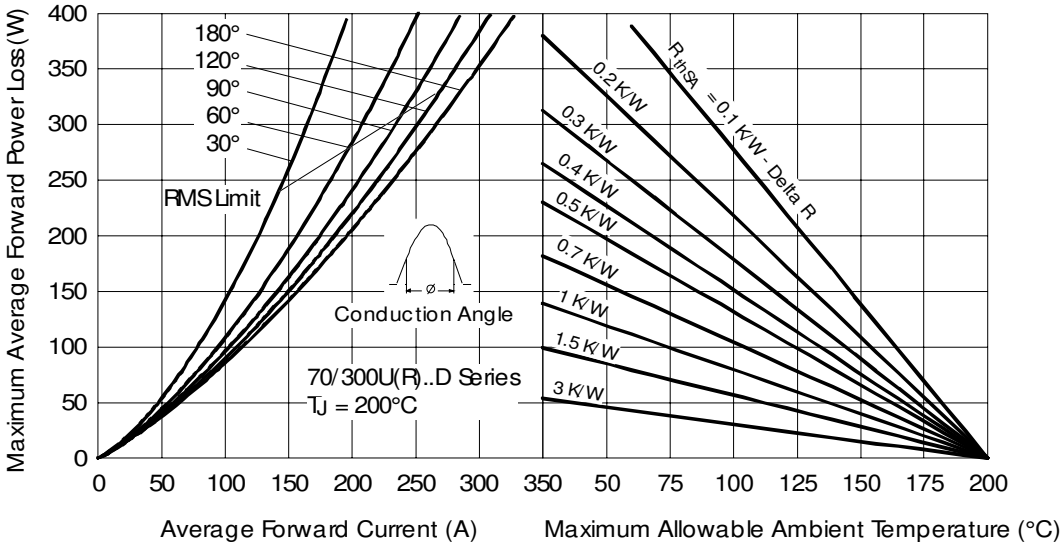



Fig. 3 - Forward Power Loss Characteristics

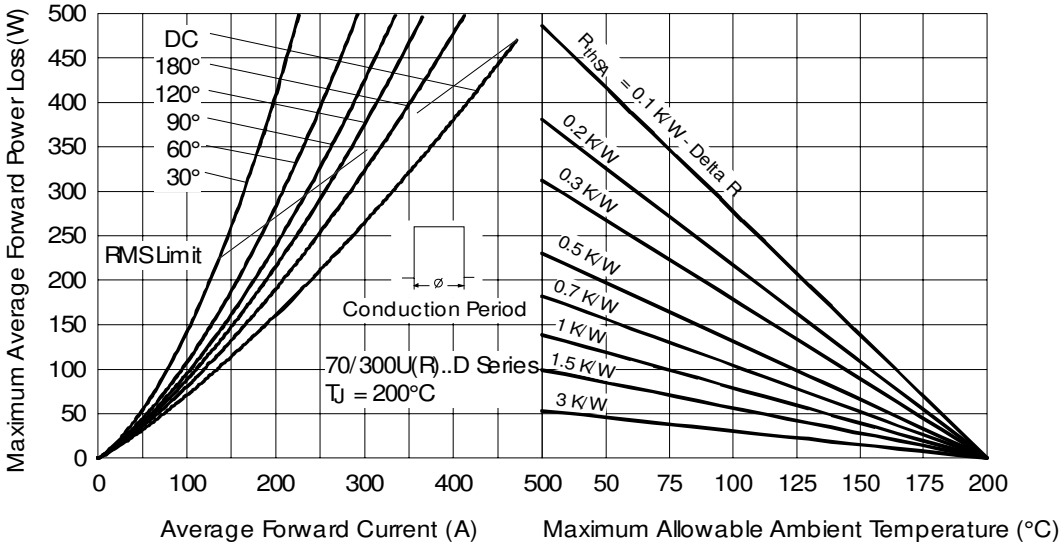



Fig. 4 - Forward Power Loss Characteristics

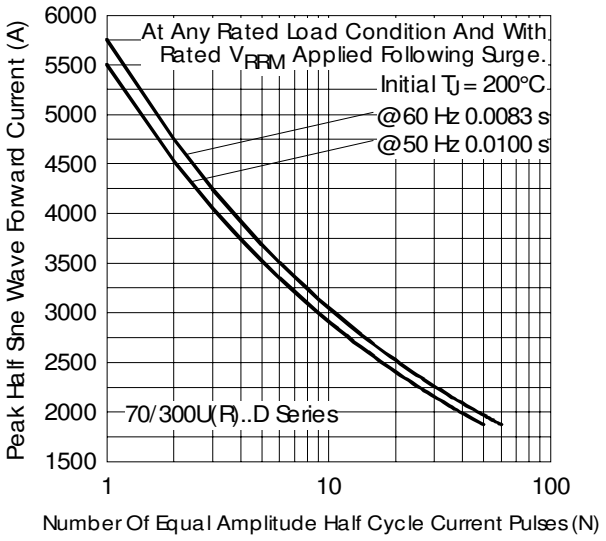



Fig. 5 - Maximum Non-Repetitive Surge Current

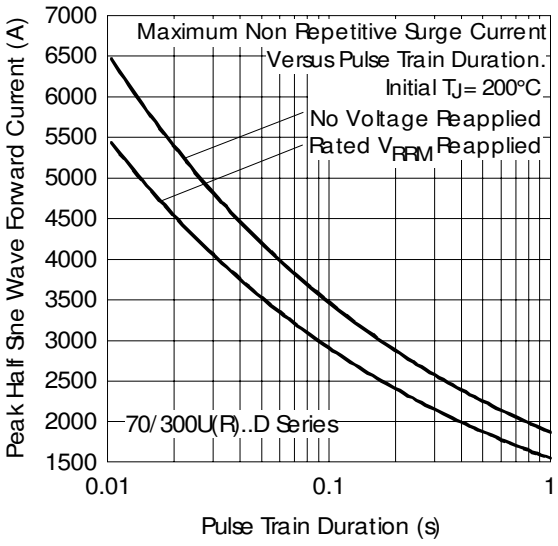



Fig. 6 - Maximum Non-Repetitive Surge Current

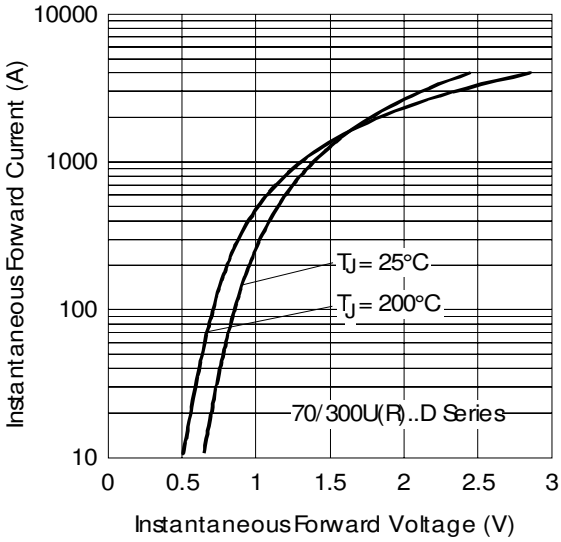



Fig. 7 - Forward Voltage Drop Characteristics

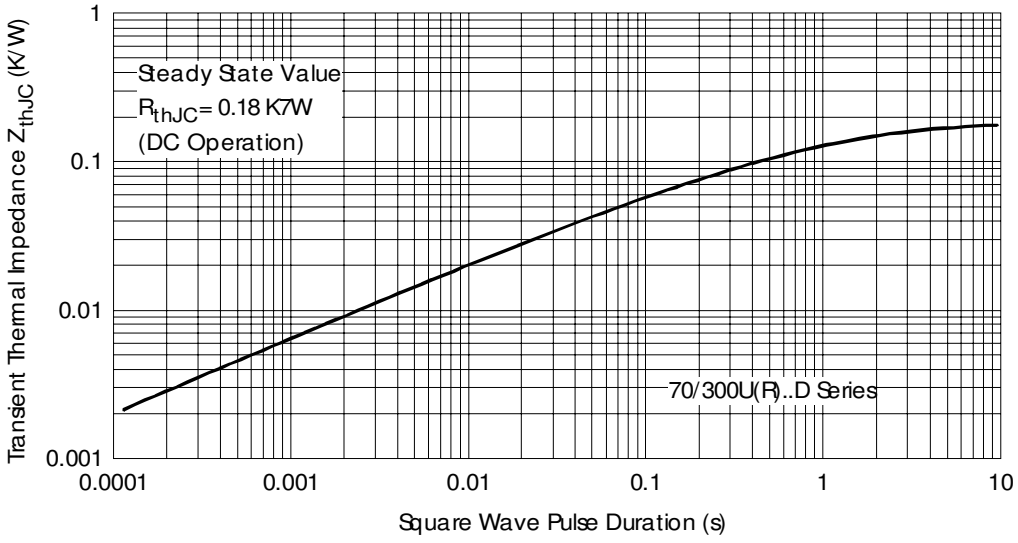



Fig. 8 - Thermal Impedance $Z_{thJC}$ Characteristic

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.

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