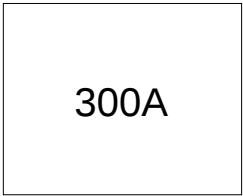


Features

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

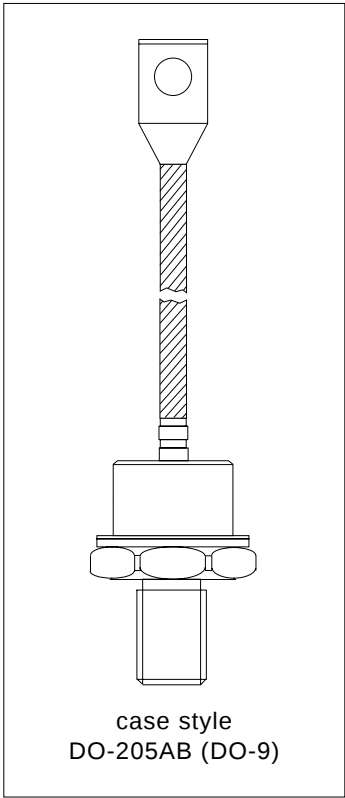


Typical Applications

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

Major Ratings and Characteristics

| Parameters       | 300U       | 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                |



## 300U(R) Series

Bulletin I2039 rev. C 03/03

International  
**IR** Rectifier

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

#### Forward Conduction

| Parameter                                                            | 300U  | Units              | Conditions                                          |
|----------------------------------------------------------------------|-------|--------------------|-----------------------------------------------------|
| $I_{F(AV)}$ Max. average forward current @ Case temperature          | 300   | A                  | 180° conduction, half sine wave                     |
|                                                                      | 130   | °C                 |                                                     |
| $I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current | 6550  | A                  | t = 10ms No voltage reappplied                      |
|                                                                      | 6850  |                    | t = 8.3ms                                           |
|                                                                      | 5500  |                    | t = 10ms 100% $V_{RRM}$                             |
|                                                                      | 5750  |                    | t = 8.3ms reappplied                                |
| $I^2t$ Maximum $I^2t$ for fusing                                     | 214   | KA <sup>2</sup> s  | t = 10ms No voltage reappplied                      |
|                                                                      | 195   |                    | t = 8.3ms                                           |
|                                                                      | 151   |                    | t = 10ms 100% $V_{RRM}$                             |
|                                                                      | 138   |                    | t = 8.3ms reappplied                                |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing                       | 2140  | KA <sup>2</sup> √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 | mΩ                 |                                                     |
| $V_{FM}$ Max. peak forward voltage                                   | 1.40  | V                  | $I_{peak} = 942\text{A}$ , $T_J = 25^\circ\text{C}$ |

#### Thermal and Mechanical Specifications

| Parameter                                            | 300U(R)           | Units | Conditions                                 |
|------------------------------------------------------|-------------------|-------|--------------------------------------------|
| $T_J$ Max. junction operating temperature range      | -65 to 200        | °C    |                                            |
| $T_{stg}$ Max. storage temperature range             | -65 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                | Nm    | Not lubricated threads                     |
|                                                      | 28                |       | Lubricated threads                         |
| wt Approximate weight                                | 250               | g     |                                            |
| Case style                                           | DO-205AB (DO-9)** |       | JEDEC (See Outline Table)                  |

\*\* 302U-A uses IR case style B-26

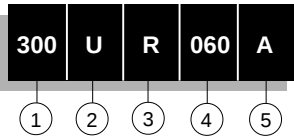
$\Delta R_{thJC}$  Conduction

(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 = Standard 300U device  
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

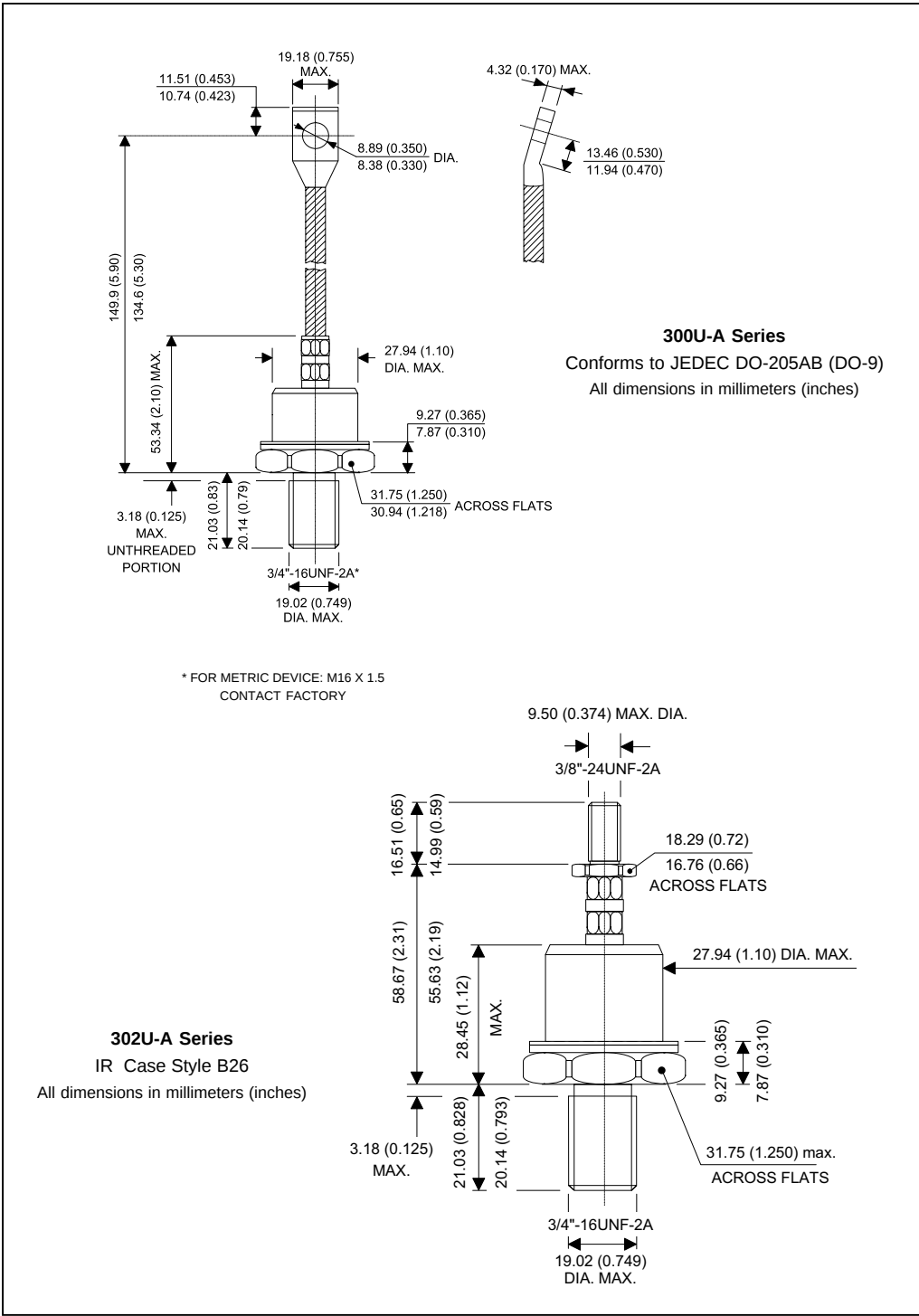
NOTE: For Metric Device M16 x 1.5 Contact Factory

**300U(R) Series**

Bulletin I2039 rev. C 03/03

International  
**IR** Rectifier

**Outline Table**



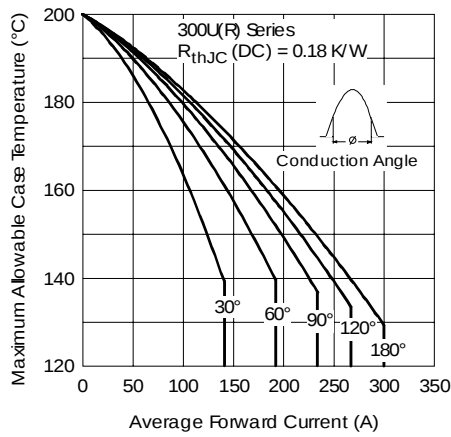


Fig. 1 - Current Ratings Characteristics

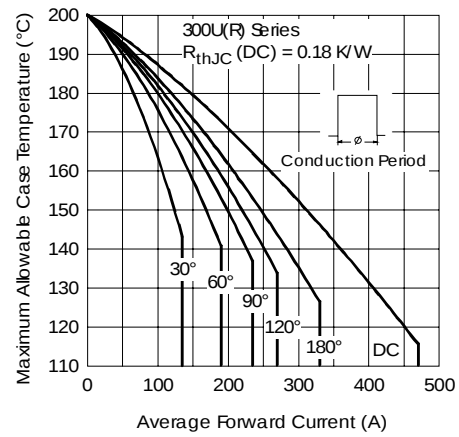


Fig. 2 - Current Ratings Characteristics

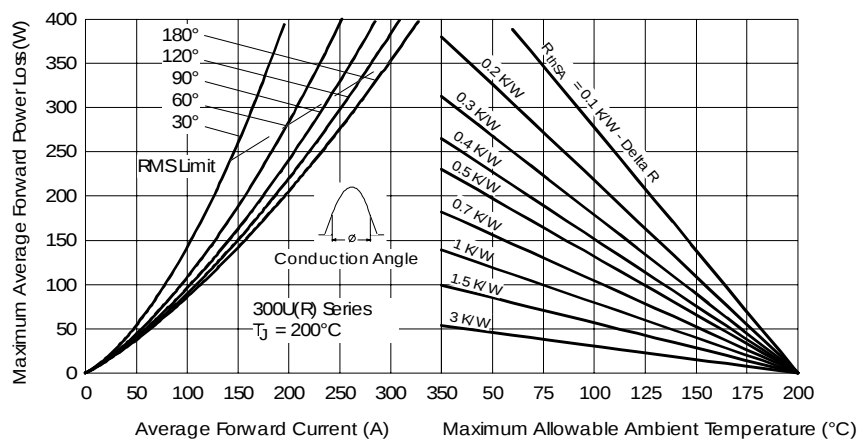


Fig. 3 - Forward Power Loss Characteristics

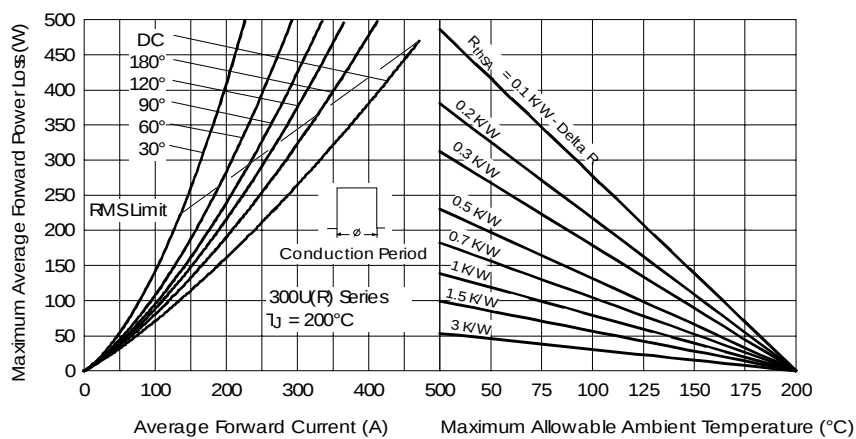


Fig. 4 - Forward Power Loss Characteristics

## 300U(R) Series

Bulletin I2039 rev. C 03/03

International  
**IR** Rectifier

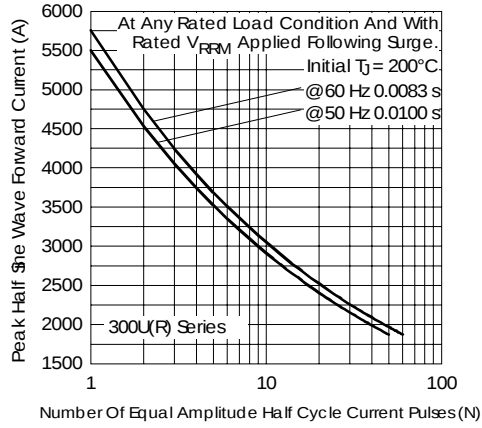


Fig. 5 - Maximum Non-Repetitive Surge Current

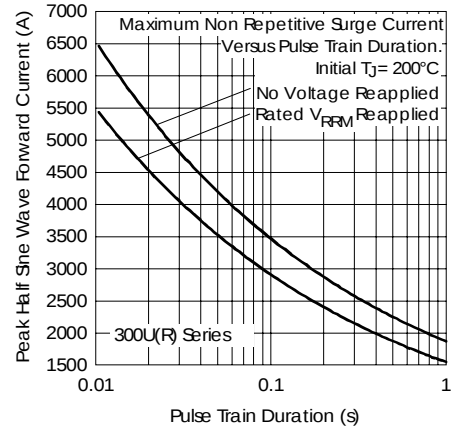


Fig. 6 - Maximum Non-Repetitive Surge Current

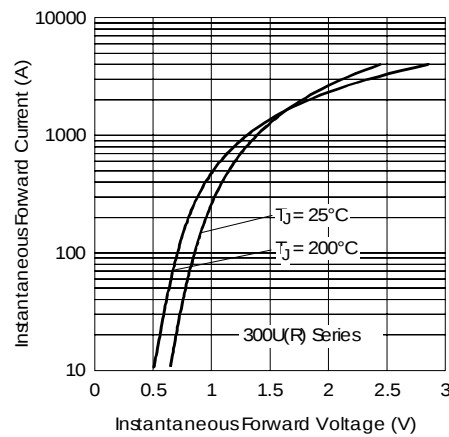


Fig. 7 - Forward Voltage Drop Characteristics

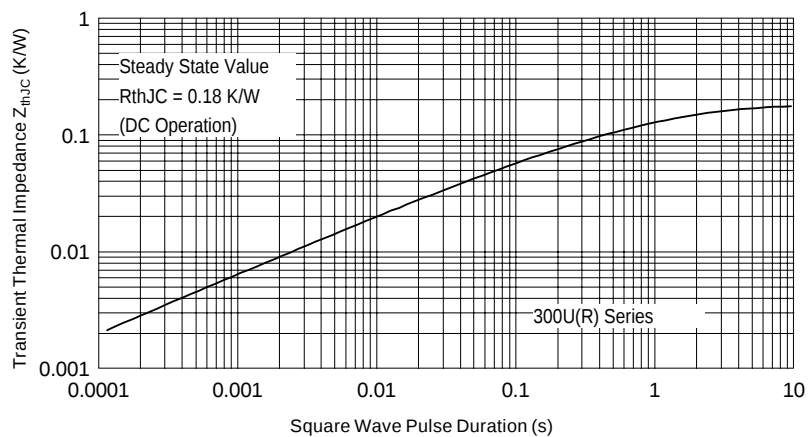


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

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

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 03/03