

### STANDARD RECOVERY DIODES

### Stud Version

#### Features

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

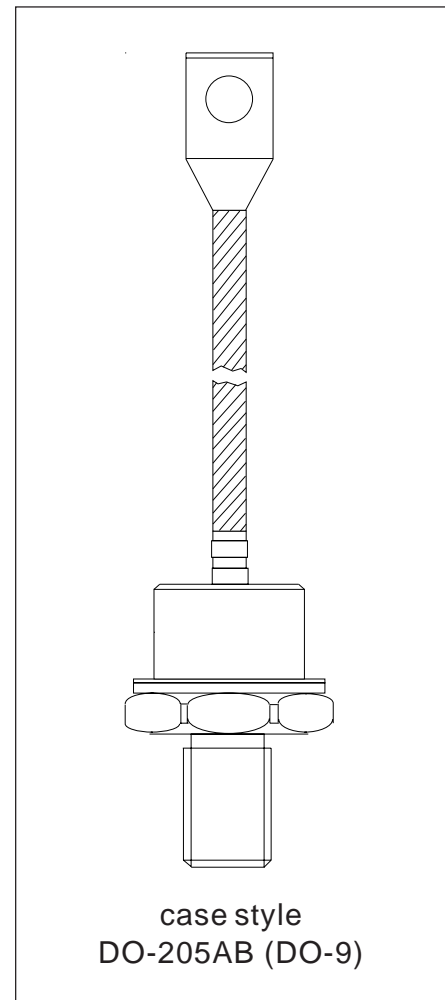
#### Typical Applications

- 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 <sup>2</sup> s
	@ 60Hz	195 KA <sup>2</sup> s
$V_{RRM}$ range	1200 to 1600	V
$T_J$	- 40 to 200	°C

250A



**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 @ Case temperature	250	A	180° conduction, half sine wave
	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
	6850		t = 8.3ms reappplied
	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
	195		t = 8.3ms reappplied
	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
$V_{F(TO)1}$ Low level value of threshold voltage	0.61	V	(16.7% x $\pi$ x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.
$V_{F(TO)2}$ High level value of threshold voltage	0.83		( $I > \pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	0.75	mΩ	(16.7% x $\pi$ x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f2}$ High level value of forward slope resistance	0.49		( $I > \pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.30	V	$I_{pk} = 785A$ , $T_J = 25^\circ C$ , $t_p = 10ms$ sinusoidal wave

**Thermal and Mechanical Specifications**

Parameter	70/300U(R)..D	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	0.18	K/W	DC operation
R <sub>thCS</sub> 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

**ΔR<sub>thJC</sub> Conduction**

(The following table shows the increment of thermal resistance R<sub>thJC</sub> 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 <sub>J</sub> = T <sub>J</sub> max.
120°	0.024	0.025		
90°	0.031	0.034		
60°	0.045	0.047		
30°	0.077	0.077		

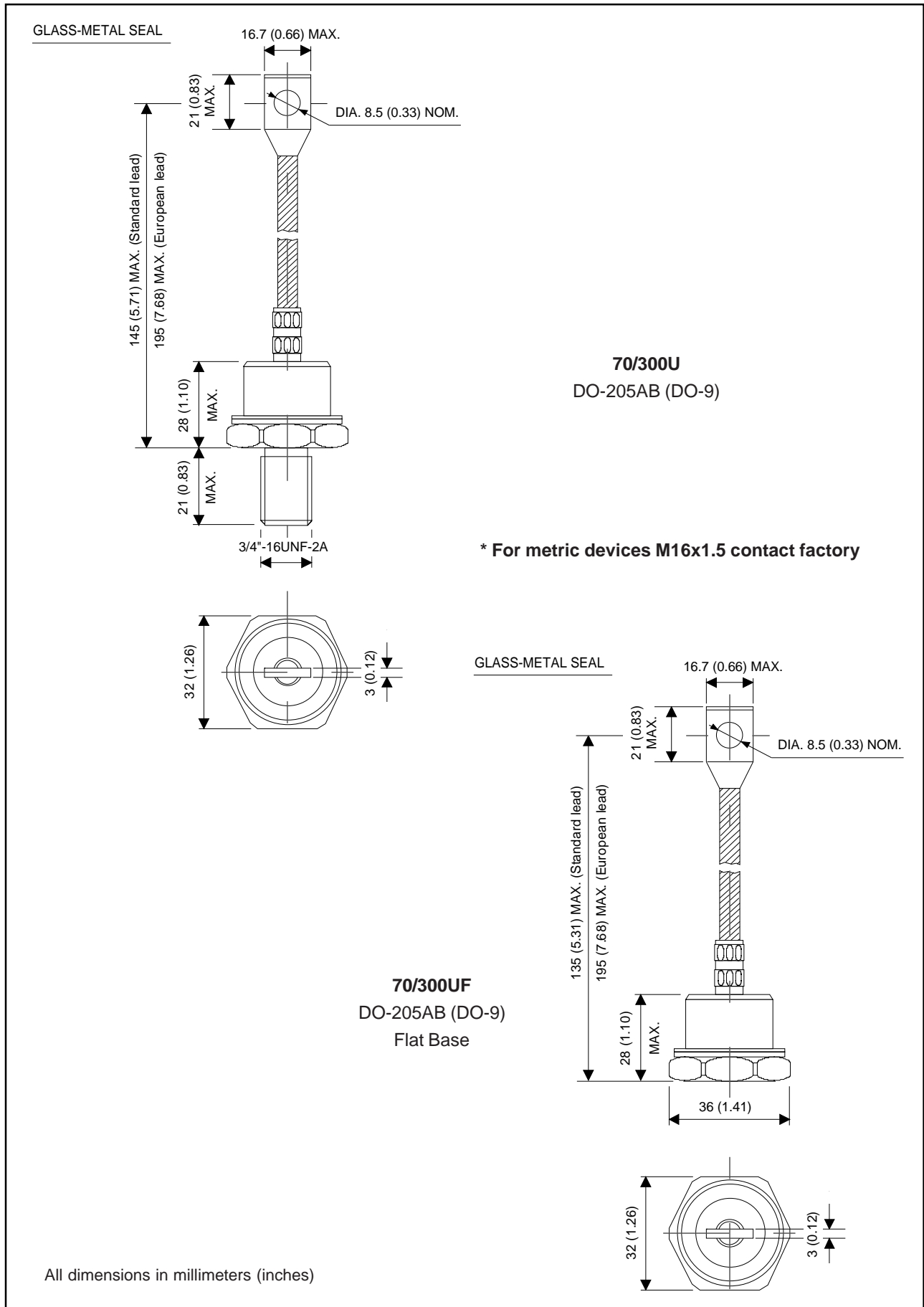
**Ordering Information Table**

**Device Code**

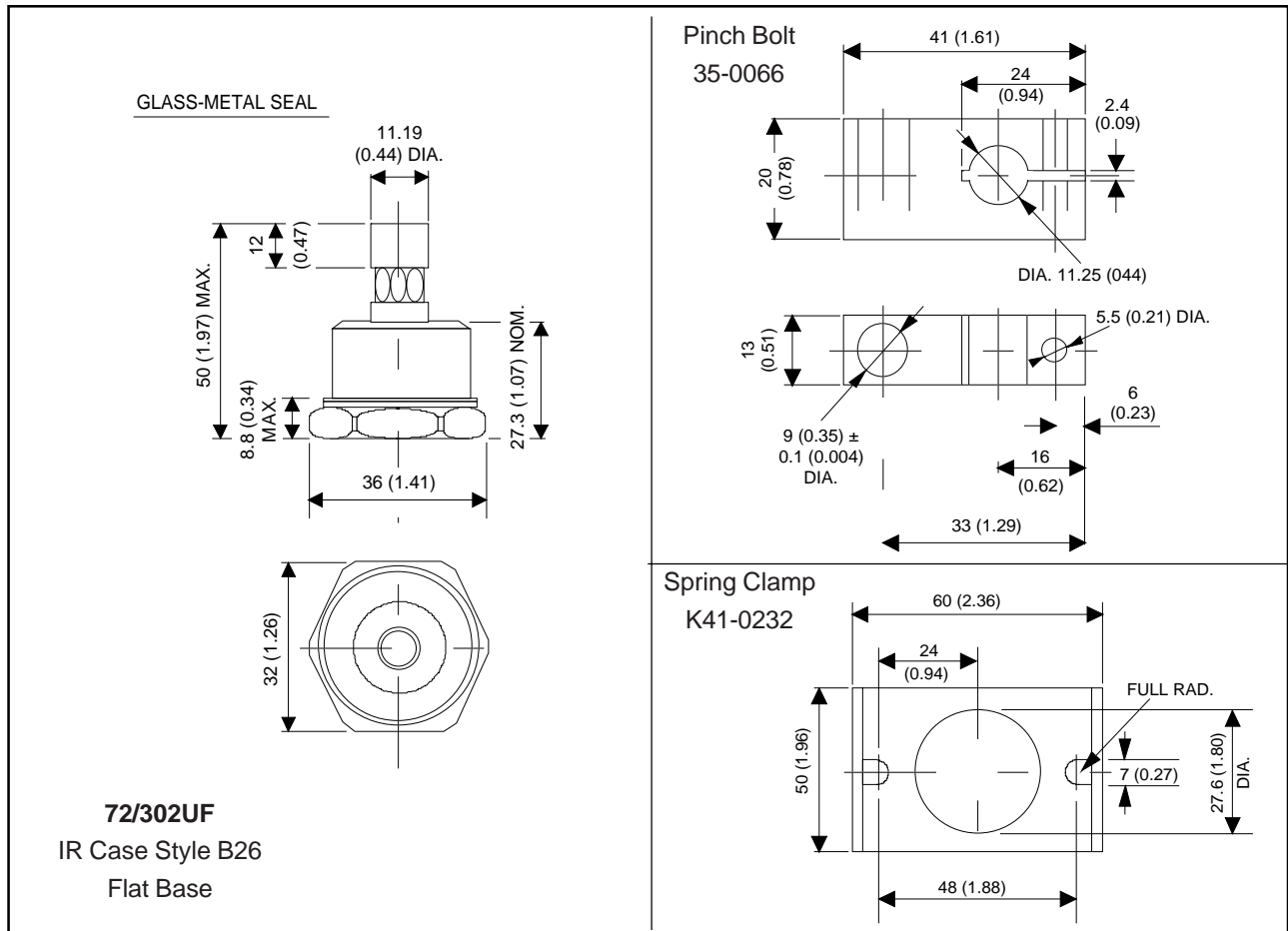
<b>300</b>	<b>U</b>	<b>F</b>	<b>R</b>	<b>160</b>	<b>A</b>	<b>Y</b>	<b>P</b>	<b>D</b>
①	②	③	④	⑤	⑥	⑦	⑧	⑨

- 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<sub>RRM</sub> (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<sub>FM</sub> < 1.125V, I<sub>FM</sub> = 470A, T<sub>J</sub> = 25°C)
- 9** - D = Diffused diode

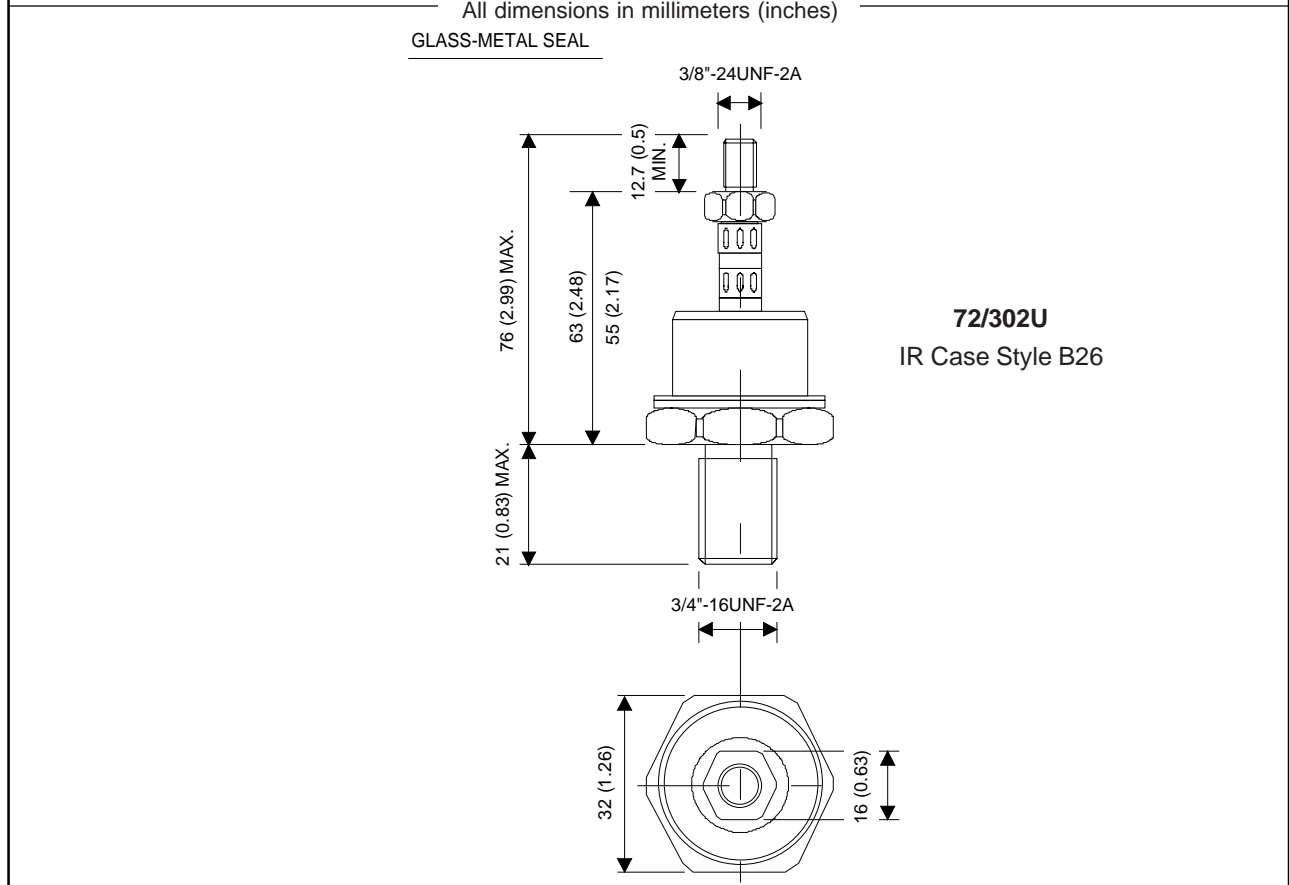
Outline Table



Outline Table



All dimensions in millimeters (inches)



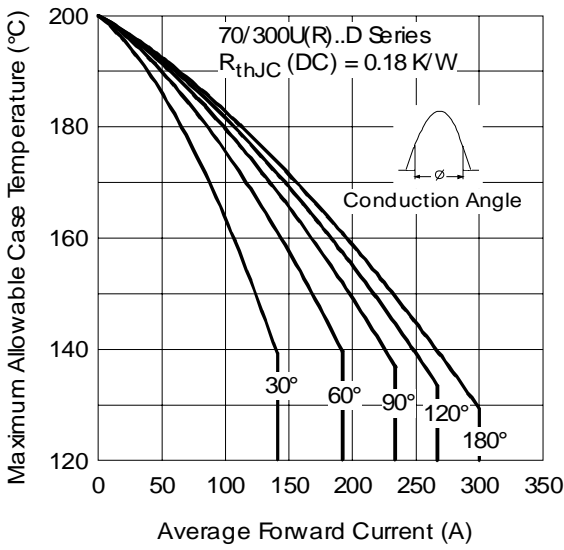


Fig. 1 - Current Ratings Characteristics

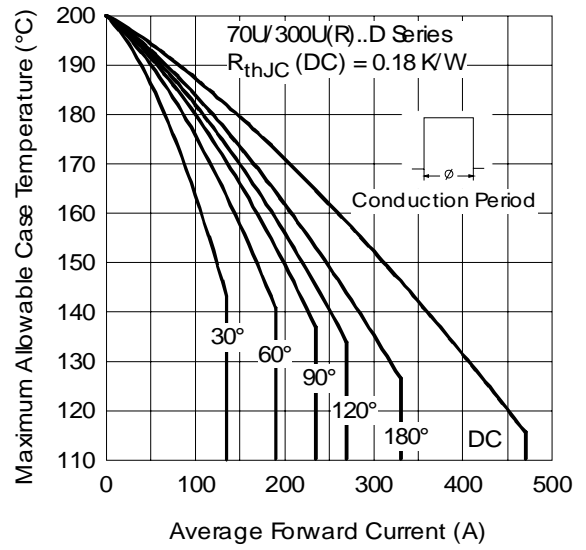


Fig. 2 - Current Ratings Characteristics

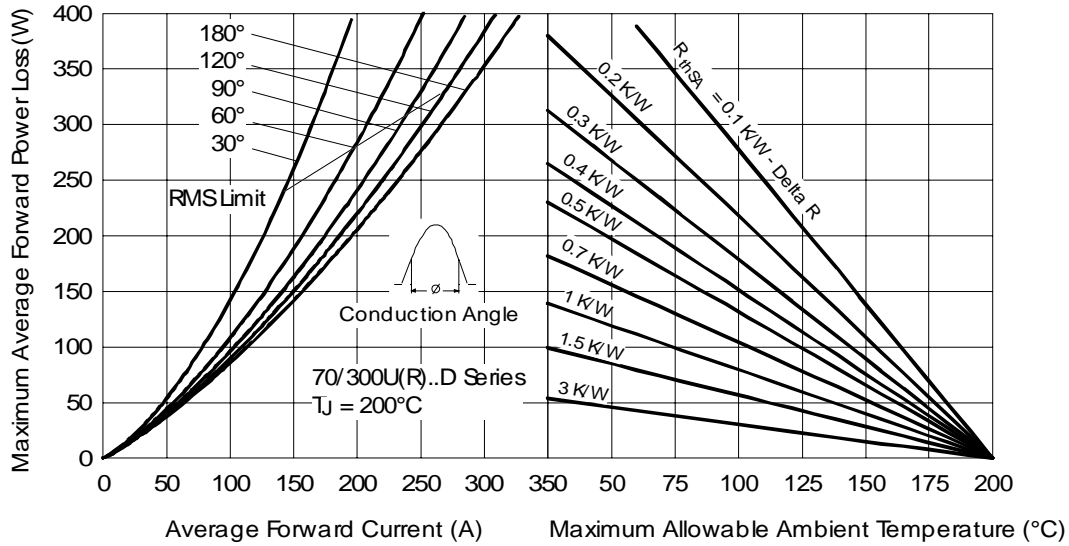


Fig. 3 - Forward Power Loss Characteristics

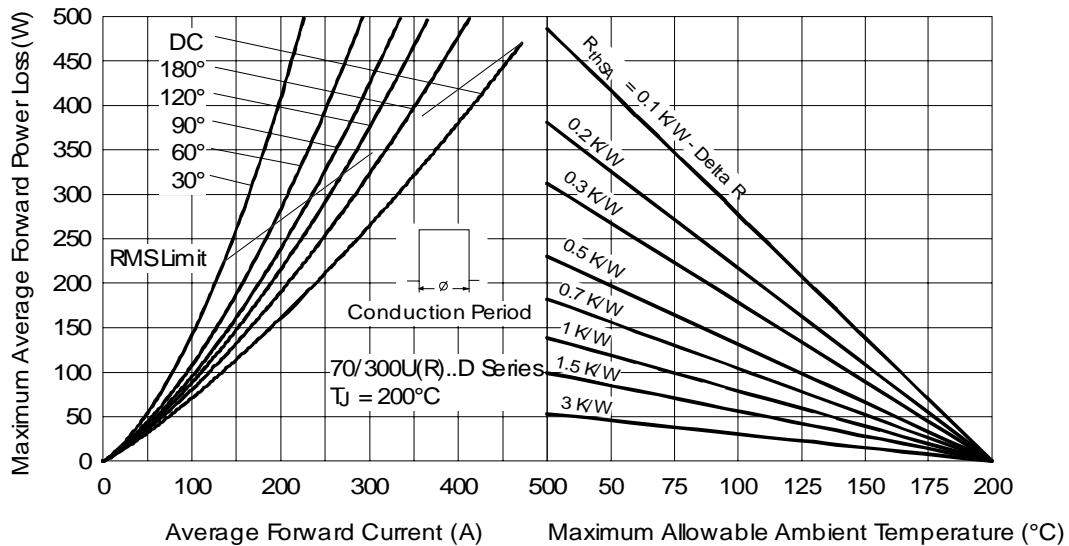


Fig. 4 - Forward Power Loss Characteristics

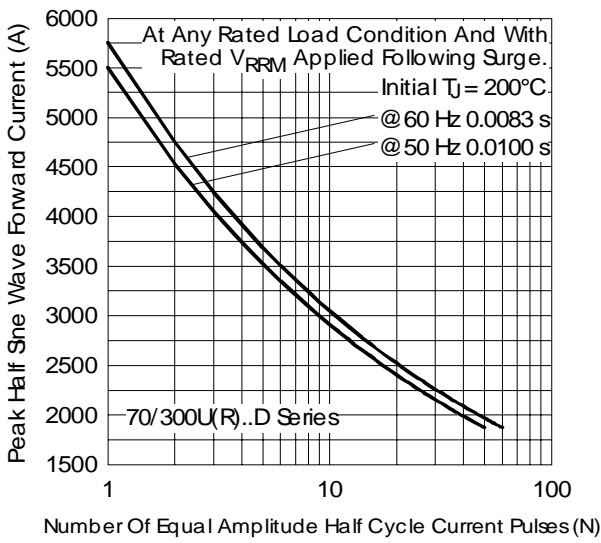


Fig. 5 - Maximum Non-Repetitive Surge Current

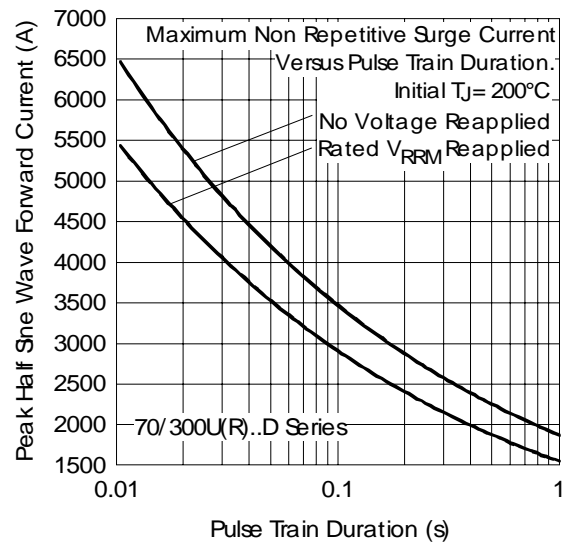


Fig. 6 - Maximum Non-Repetitive Surge Current

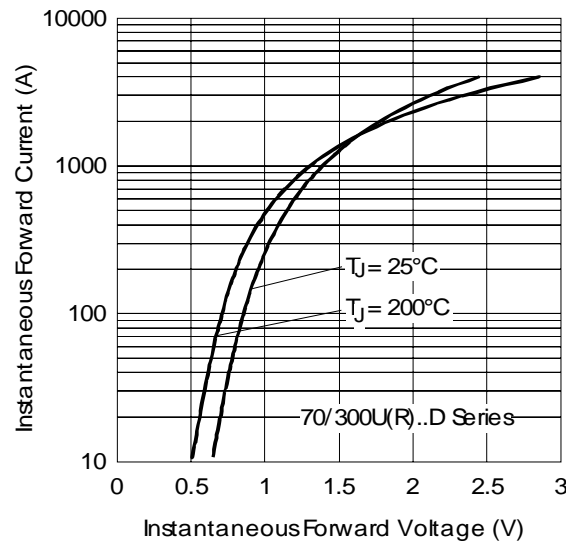


Fig. 7 - Forward Voltage Drop Characteristics

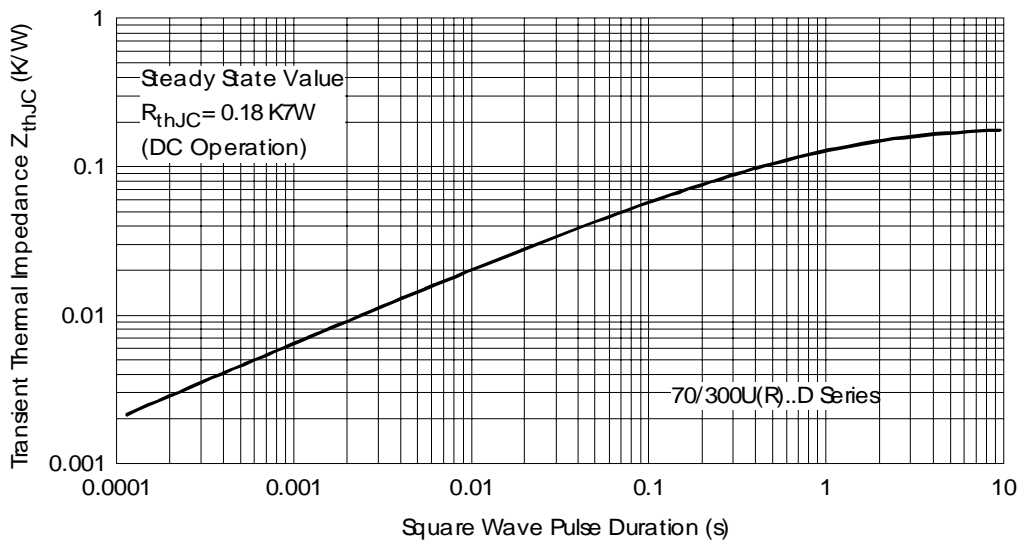


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

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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**IOR** Rectifier

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