

Bulletin I2039 11/94

International
IOR Rectifier

70/300U(R) SERIES

STANDARD RECOVERY DIODES

Stud Version

Features

- Alloy diode
- Peak reverse voltage up to 1000V
- Popular series for rough service
- Standard JEDEC types
- Stud cathode and stud anode version

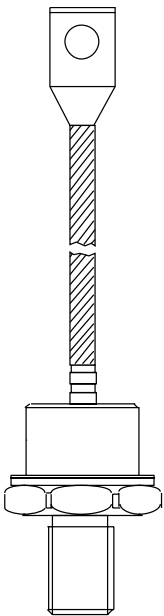
Typical Applications

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

Major Ratings and Characteristics

Parameters	70U	300U	Units
$I_{F(AV)}$	250	300	A
@ T_C	150	130	°C
I_{FSM} @ 50Hz	6550		A
@ 60Hz	6850		A
I^2t @ 50Hz	214		KA ² s
@ 60Hz	195		KA ² s
V_{RRM} range	100 to 1000	50 to 1000	V
T_J	-65 to 200		°C

250A
300A



case style
DO-205AB (DO-9)

70/300U(R) Series

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International
IOR Rectifier**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. $T_J = 200^\circ\text{C}$ mA
70U	10	100	200	60
	20	200	300	
	40	400	500	
	60	600	720	
	80	800	960	
	100	1000	1200	
Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} max. $T_J = 175^\circ\text{C}$ mA
300U	5	50	100	40
	10	100	200	40
	20	200	300	40
	30	300	400	40
	40	400	500	40
	60	600	720	40
	80	800	960	35
	100	1000	1200	30

* Also available as JEDEC series: 1N3735 through 1N3743; 1N2054 through 1N2068; 1N4044 through 1N4056.

Forward Conduction

Parameter	70U	300U	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	250 150	300 130	A $^\circ\text{C}$	180° conduction, half sine wave
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	6550 6850 5500 5750	A	A	t = 10ms No voltage t = 8.3ms reapplied t = 10ms 100% V_{RRM} t = 8.3ms reapplied Sinusoidal half wave, Initial $T_J = T_J \text{ max.}$
I^2t Maximum I^2t for fusing	214 195 151 138			t = 10ms No voltage t = 8.3ms reapplied t = 10ms 100% V_{RRM} t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	2140		$\text{KA}^2\sqrt{\text{s}}$	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)}$ Max. value of threshold voltage	0.610		V	$T_J = 200^\circ\text{C}$
r_f Max. value of forward slope resistance	0.751		$\text{m}\Omega$	
V_{FM} Max. peak forward voltage	1.30 --	-- 1.40	V V	
				$(I_{FM} \times \pi \times I_{F(AV)} (785\text{A peak}), T_J = 25^\circ\text{C})$ $(I_{FM} \times \pi \times I_{F(AV)} (942\text{A peak}), T_J = 25^\circ\text{C})$

Thermal and Mechanical Specifications

Parameter	70/300U(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

ΔR_{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 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

300	U		R	100	A
①	②	③	④	⑤	⑥

1 - 300 = Standard 300U device
70 = Standard 70U device
302 = 300U Top Threaded version
72 = 70U with Pinch Bolt

2 - U = Essential Part Number

3 - F = Flat Base, available only on 72UF Series
None = Normal Stud

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

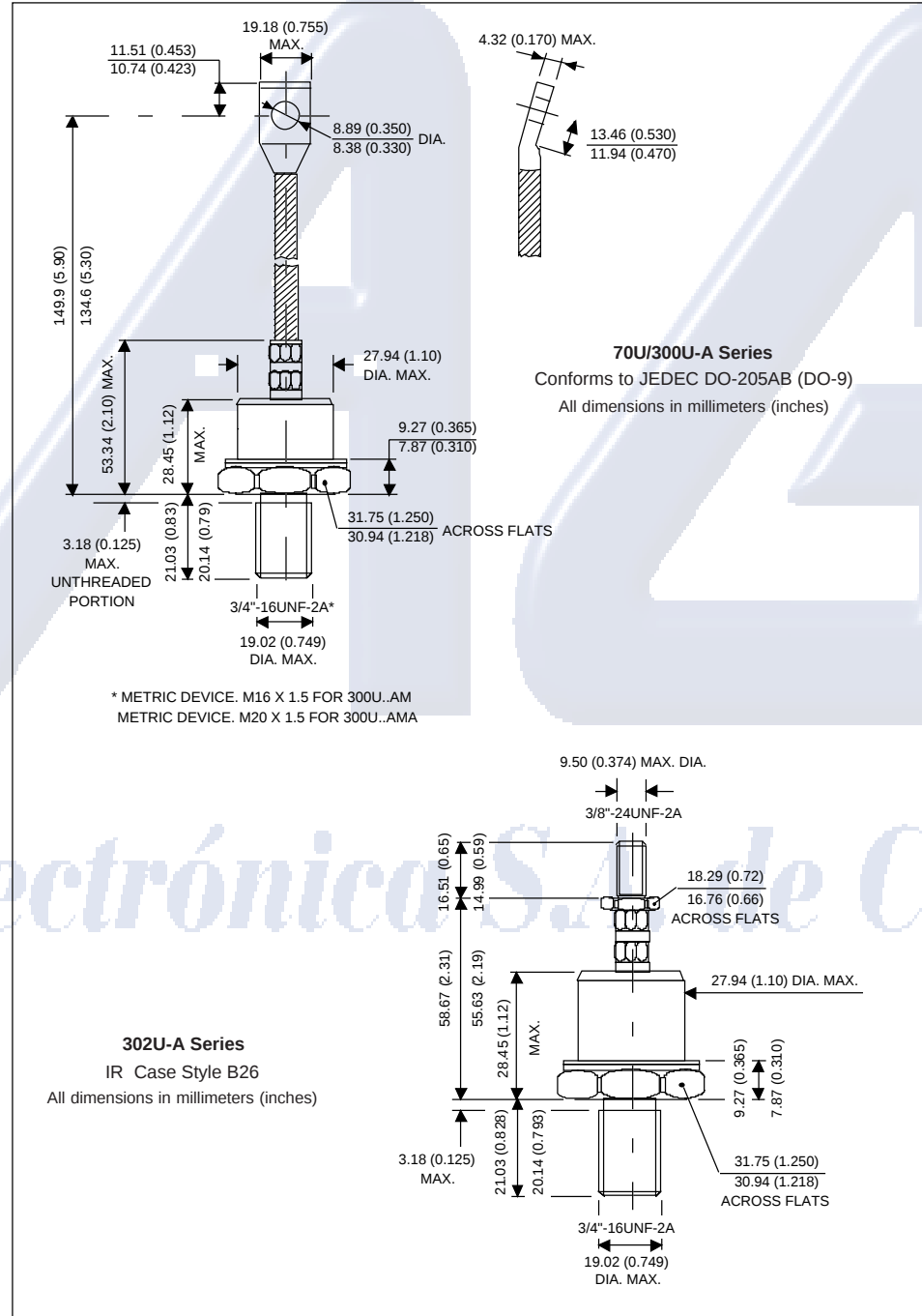
NOTE: For longer lead Contact Factory

70/300U(R) Series

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International
IR Rectifier

Outline Table



Outline Table

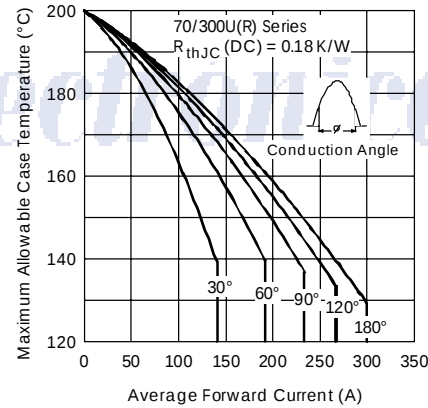
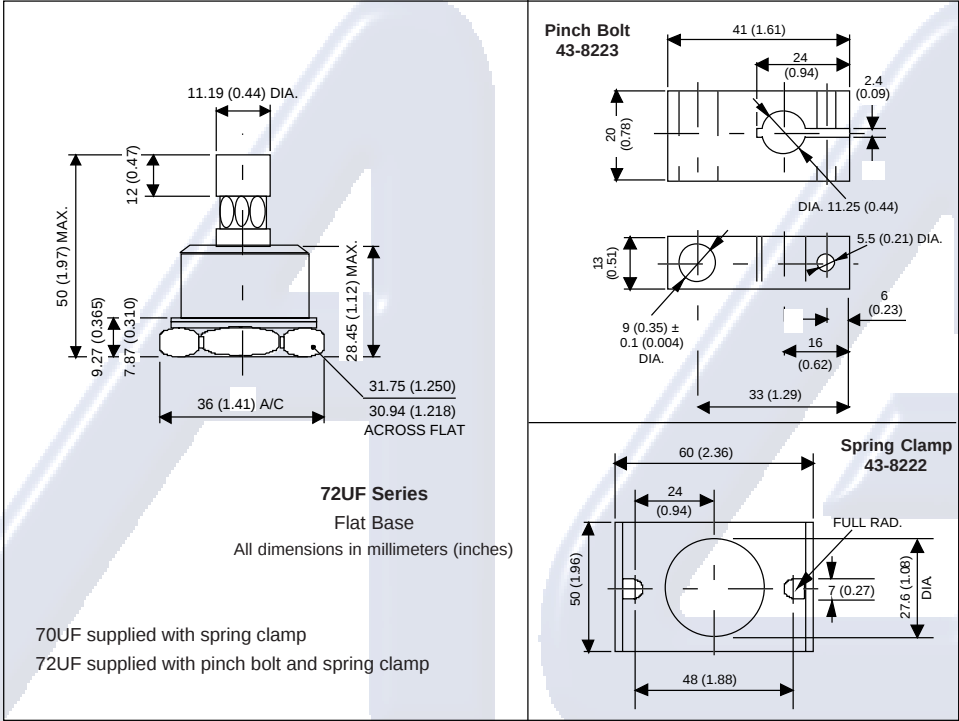


Fig. 1 - Current Ratings Characteristics

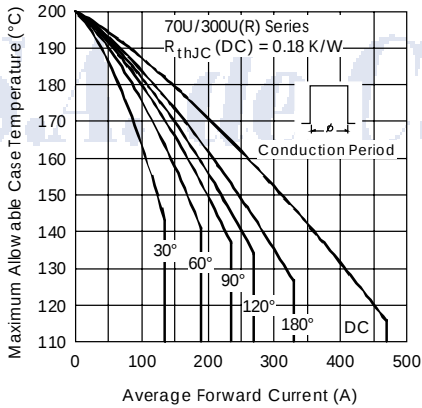


Fig. 2 - Current Ratings Characteristics

70/300U(R) Series

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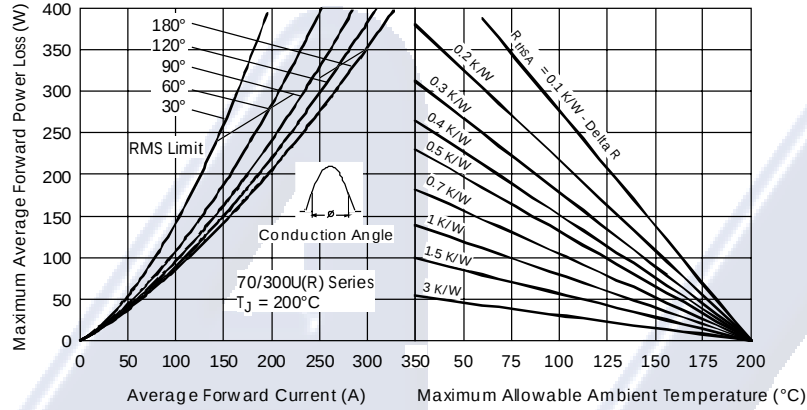


Fig. 3 - Forward Power Loss Characteristics

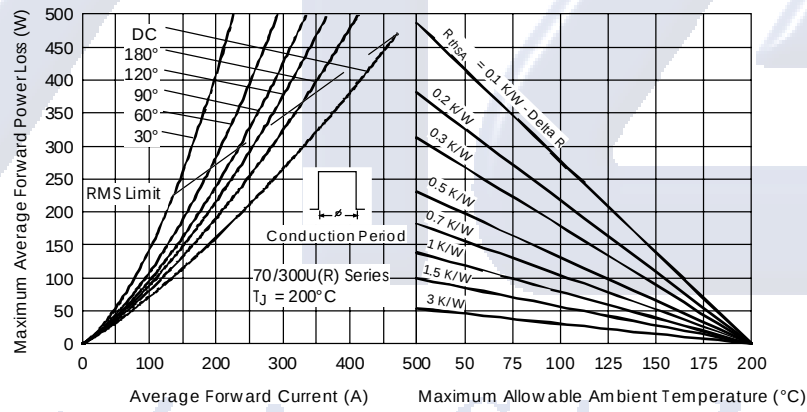


Fig. 4 - Forward Power Loss Characteristics

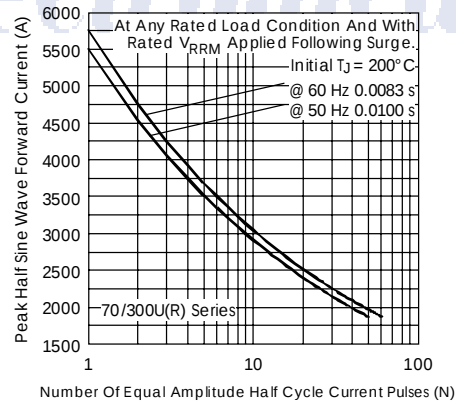


Fig. 5 - Maximum Non-Repetitive Surge Current

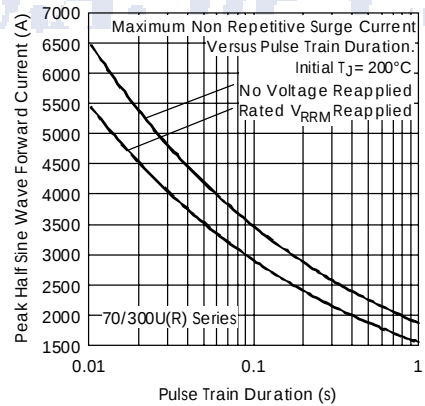


Fig. 6 - Maximum Non-Repetitive Surge Current

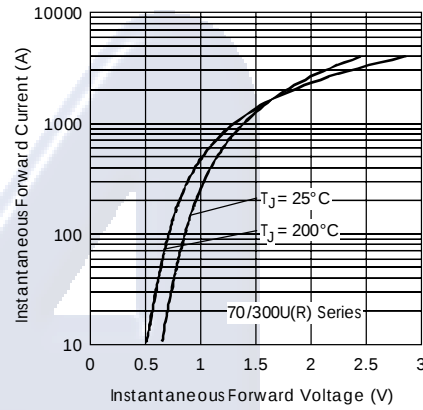
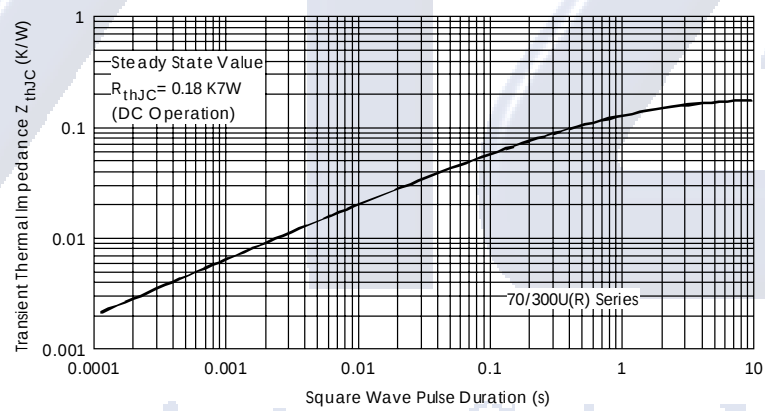


Fig. 7 - Forward Voltage Drop Characteristics

Fig. 8 - Thermal Impedance Z_{thJC} Characteristic