Bulletin I2059 rev. C 03/03

International
IOR Rectifier

400U(R) SERIES

STANDARD RECOVERY DIODES **Stud Version**

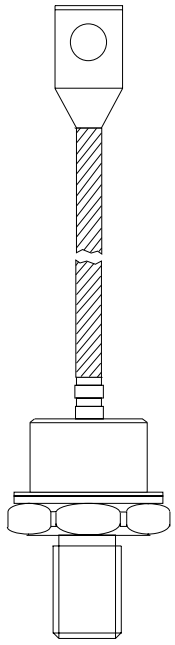
Features

- Wide current range
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC types

400A

Typical Applications

- Converters
- Power supplies
- Machine tool controls
- High power drives



case style
DO-205AB (DO-9)

Major Ratings and Characteristics

Parameters		400U/R	Units
$I_{F(AV)}$		400	A
	@ T_C	120	°C
$I_{F(RMS)}$		630	A
I_{FSM}	@ 50Hz	8250	A
	@ 60Hz	8640	A
I^2t	@ 50Hz	340	KA^2s
	@ 60Hz	311	KA^2s
V_{RRM} range		800 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
400U(R)	80	800	900	15
	120	1200	1300	
	160	1600	1700	

Forward Conduction

	Parameter	400U(R)	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	400	A	180° conduction, half sine wave		
	@ Case temperature	120	°C			
$I_{F(RMS)}$	Max. RMS forward current	630	A	DC @ 110°C case temperature		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	8250	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		8640		t = 8.3ms		
		6940		t = 10ms	100% V_{RRM} reapplied	
		7270		t = 8.3ms		
I^2t	Maximum I^2t for fusing	340	KA^2s	t = 10ms	No voltage reapplied	
		311		t = 8.3ms		
		241		t = 10ms	100% V_{RRM} reapplied	
		220		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	3400	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.77	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	0.85		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	0.49	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	1.62	V	I_{pk}= 1500A, $T_J = T_J$ max, t_p = 10ms sinusoidal wave		

Thermal and Mechanical Specifications

	Parameter	400U(R)	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	0.15	K/W	DC operation
R_{thCS}	Max. thermal resistance, case to heatsink	0.04		Mounting surface, smooth, flat and greased
T	Max. allowed mounting torque ±10%	27	Nm	Not lubricated threads
wt	Approximate weight	250	g	
	Case style	DO-205AB (DO-9)		See Outline Table

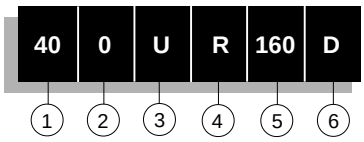
ΔR_{thJC} Conduction

(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	0.013	K/W	$T_J = T_J$ max.
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

Ordering Information Table

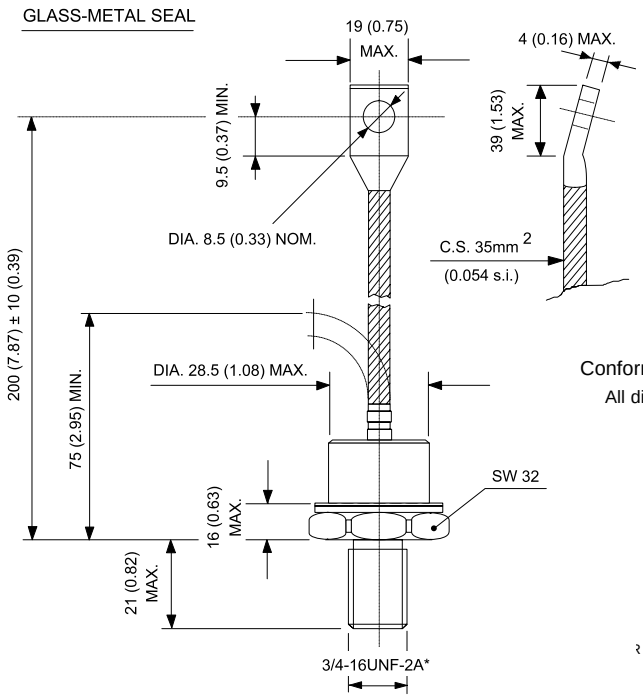
Device Code



1 - 40 = Essential Part Number
2 - 0 = Standard Recovery Device
3 - U = Stud Normal Polarity (Cathode to Stud)
4 - None = Stud Normal Polarity (Cathode to Stud)
R = Stud Reverse Polarity (Anode to Stud)
5 - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)
6 - Diffused diode

NOTE: For Metric device M16 x 1.5 Contact Factory

Outline Table



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

* METRIC DEVICE: M16 X 1.5
CONTACT FACTORY

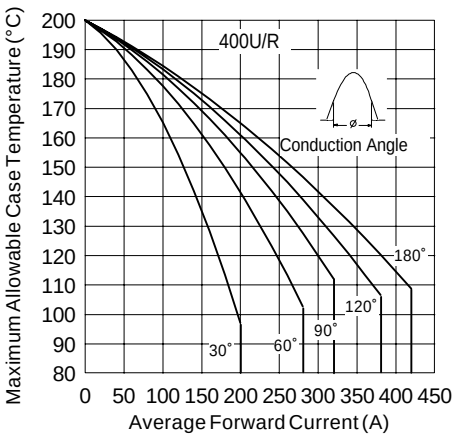


Fig. 1 - Current Ratings Characteristics

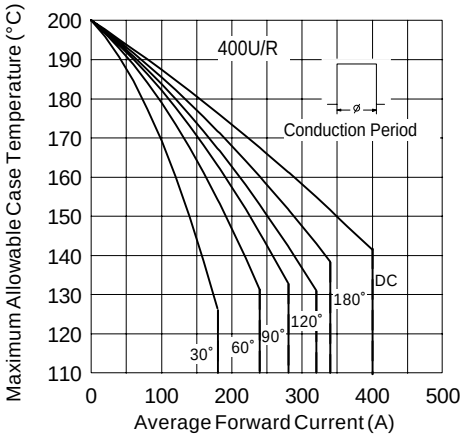


Fig. 2 - Current Ratings Characteristics

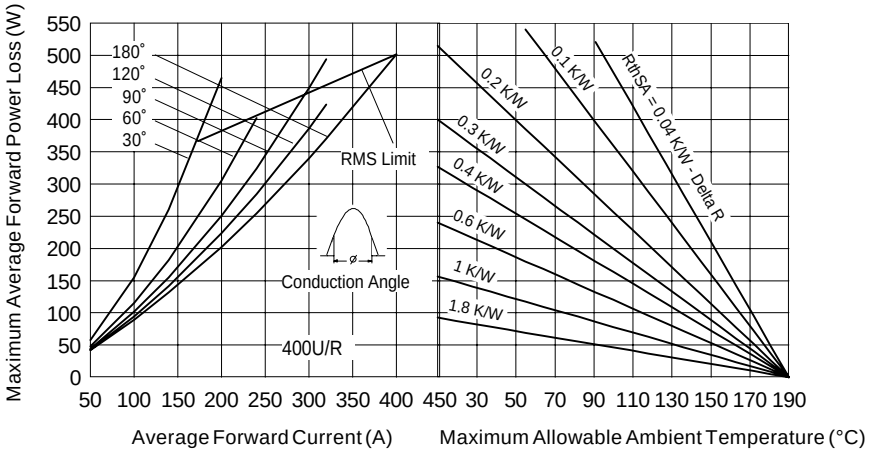


Fig. 3 - Forward Power Loss Characteristics

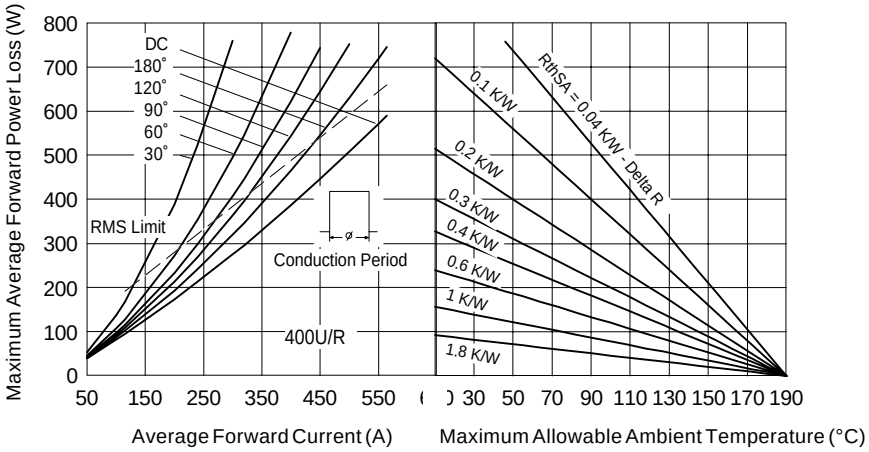


Fig. 4 - Forward Power Loss Characteristics

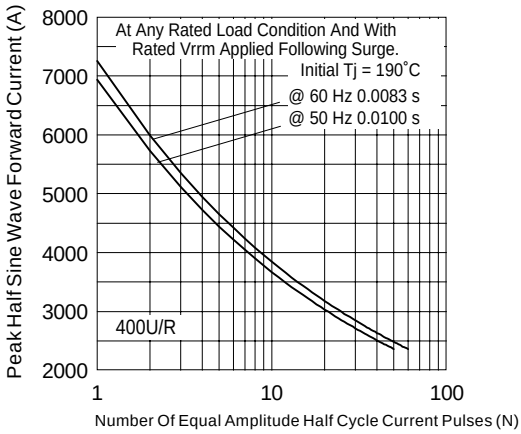


Fig. 5 - Maximum Non-Repetitive Surge Current

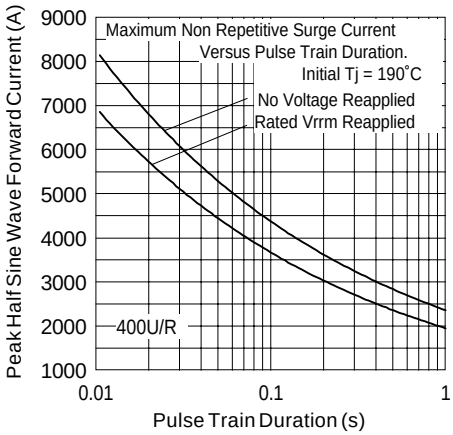


Fig. 6 - Maximum Non-Repetitive Surge Current

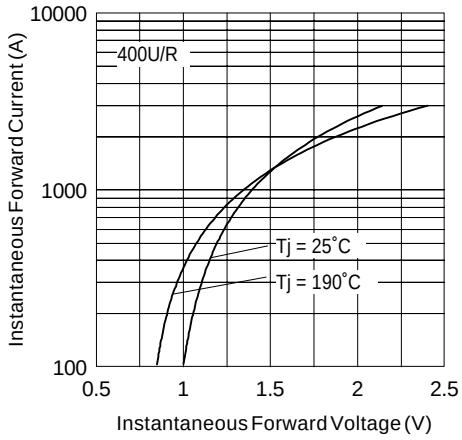


Fig. 7 - Forward Voltage Drop Characteristics

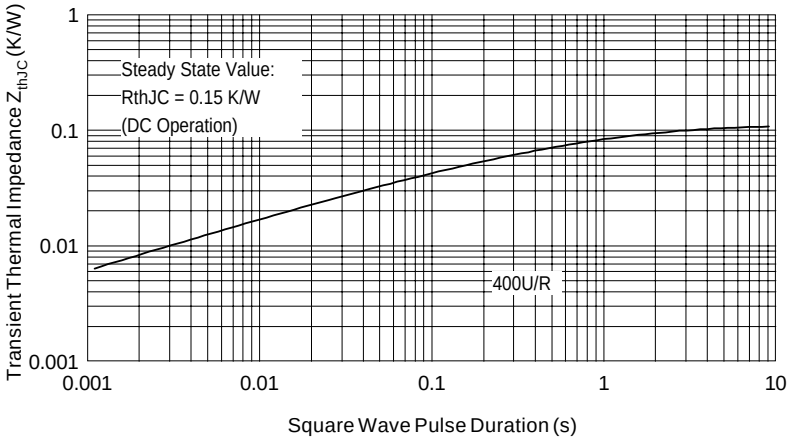


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

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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