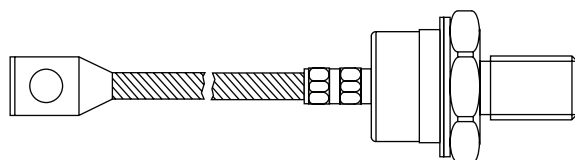


Standard Recovery Diodes (Stud Version), 300 A



DO-205AB (DO-9)

FEATURES

- Wide current range
- High voltage rating up to 2500 V
- High surge current capabilities
- Stud cathode and stud anode version
- High resistance to acceleration
- RoHS compliant
- Designed and qualified for industrial level



PRODUCT SUMMARY

$I_{F(AV)}$	300 A
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TYPICAL APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	301U(R)		UNITS
		160 TO 200	250	
$I_{F(AV)}$		330	300	A
	T_C	120	120	°C
$I_{F(RMS)}$		520	470	A
I_{FSM}	50 Hz	8250	6050	A
	60 Hz	8640	6335	
I^2t	50 Hz	340	183	kA ² s
	60 Hz	311	167	
V_{RRM}	Range	1600 to 2000	2500	V
T_J		- 40 to 180	- 40 to 180	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT $T_J = T_J$ MAXIMUM mA
301U(R)	160	1600	1700	15
	200	2000	2100	
	250	2500	2600	

FORWARD CONDUCTION								
PARAMETER	SYMBOL	TEST CONDITIONS			301U(R)		UNITS	
					160 TO 200	250		
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave			330	300	A	
					120	120	°C	
Maximum RMS forward current	I _{F(RMS)}	DC at T _C = 115 °C (up to 2000 V), T _C = 102 °C (2500 V)			520	470	A	
Maximum peak, one cycle forward, non-repetitive surge current	I _{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T _J = T _J maximum	8250	6050	A	
		t = 8.3 ms			8640	6335		
		t = 10 ms	100 % V _{RRM} reapplied		6940	5090		
		t = 8.3 ms			7270	5330		
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied			340	183	kA ² s
		t = 8.3 ms				311	167	
		t = 10 ms	100 % V _{RRM} reapplied			241	129	
		t = 8.3 ms				220	118	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			3400	1830	kA ² √s	
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J = T _J maximum			0.77	0.90	V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.84	0.97		
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J = T _J maximum			0.49	0.59	mΩ	
High level value of forward slope resistance	r _{f2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.49	0.55		
Maximum forward voltage drop	V _{FM}	I _{pk} = 942 A, T _J = T _J maximum, t _p = 10 ms sinusoidal wave			1.22	1.46	V	

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating temperature range	T_J		- 40 to 180	°C
Maximum storage temperature range	T_{Stg}		- 40 to 200	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.14	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.08	
Maximum allowed mounting torque + 0 - 20 %		Not lubricated threads	37	N · m
		Lubricated threads	28	
Weight	301U		250 ± 5	g
	303U		152 ± 5	
	305U		177 ± 5	
	307U		197 ± 5	
	309U		160 ± 5	
Case style		See dimensions - link at the end of datasheet		DO-205AB (DO-9)



ΔR_{thJC} CONDUCTION					
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS
	80 TO 200	250	80 TO 200	250	
180°	0.015	0.015	0.011	0.011	$T_J = T_J \text{ maximum}$
120°	0.018	0.018	0.019	0.019	
90°	0.023	0.023	0.025	0.025	
60°	0.034	0.034	0.035	0.035	
30°	0.056	0.056	0.057	0.057	
					K/W

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

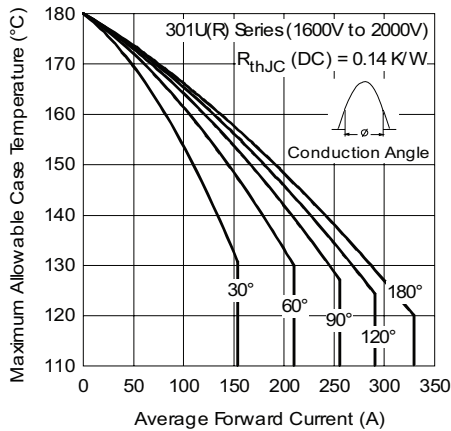


Fig. 1 - Current Ratings Characteristics

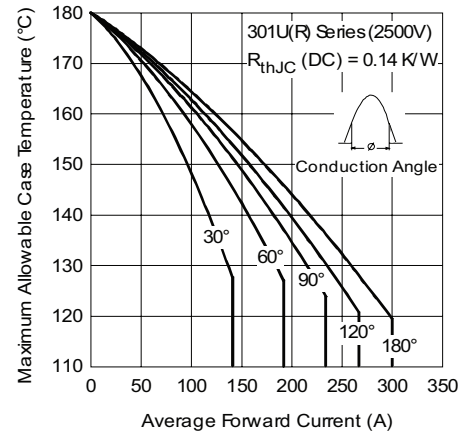


Fig. 3 - Current Ratings Characteristics

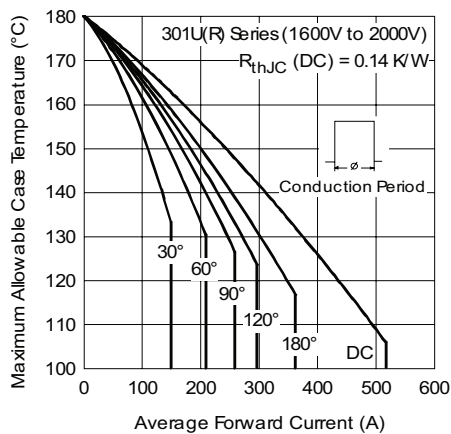


Fig. 2 - Current Ratings Characteristics

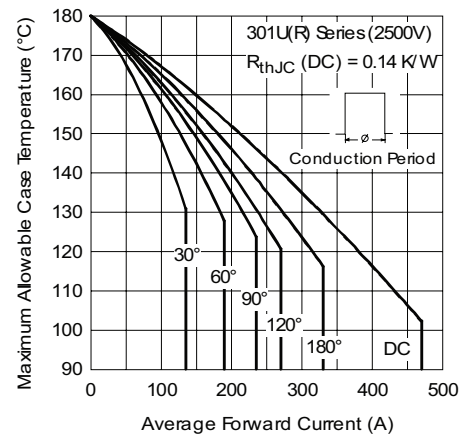


Fig. 4 - Current Ratings Characteristics

301U(R) Series

Vishay High Power Products Standard Recovery Diodes
(Stud Version), 300 A

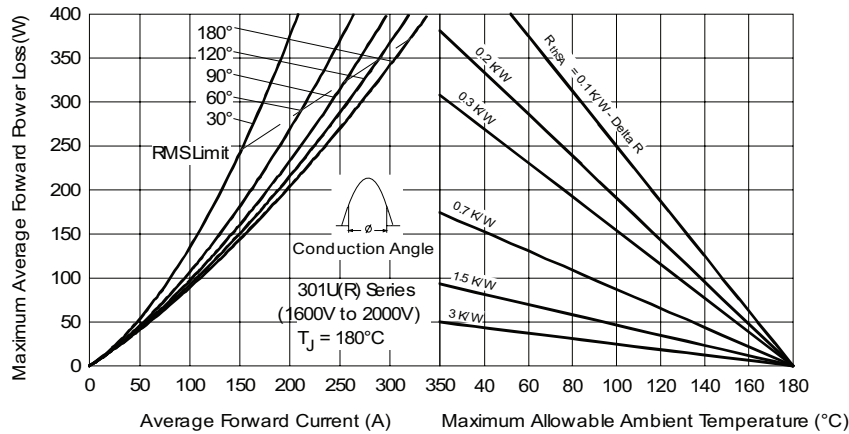


Fig. 5 - Forward Power Loss Characteristics

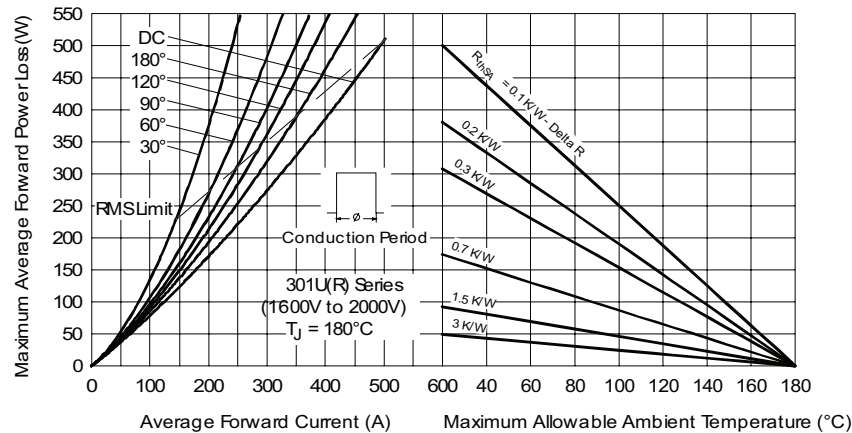


Fig. 6 - Forward Power Loss Characteristics

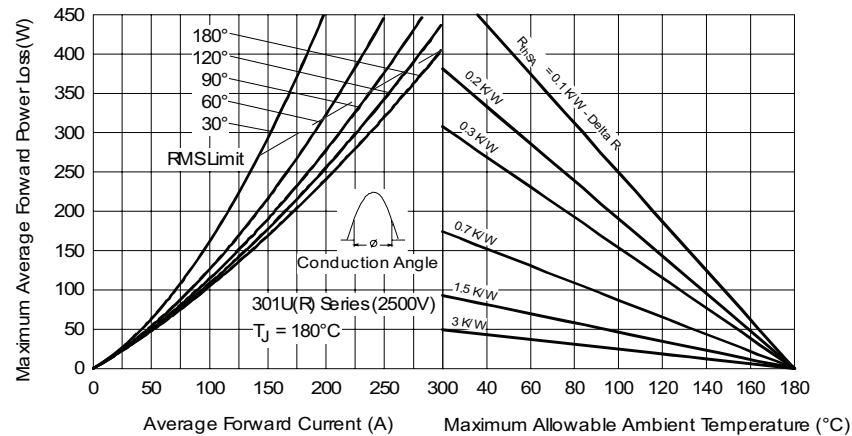


Fig. 7 - Forward Power Loss Characteristics

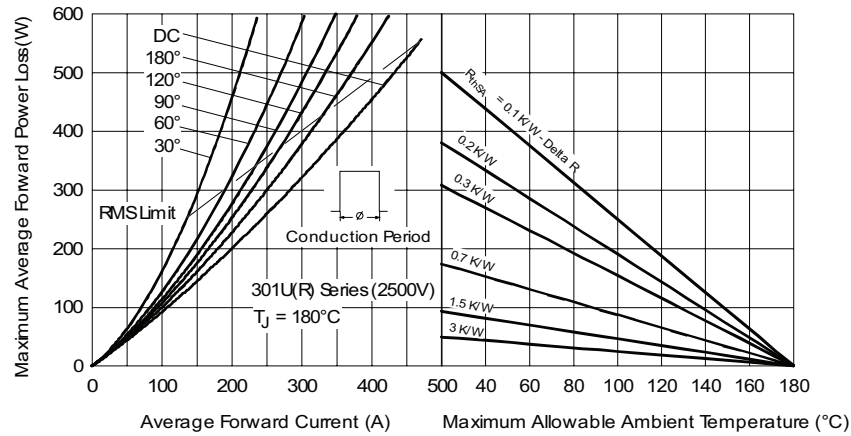


Fig. 8 - Forward Power Loss Characteristics

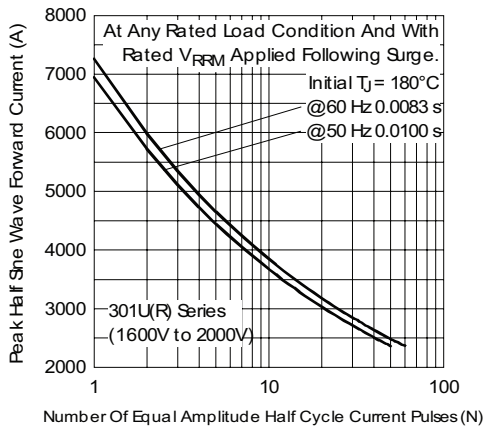


Fig. 9 - Maximum Non-Repetitive Surge Current

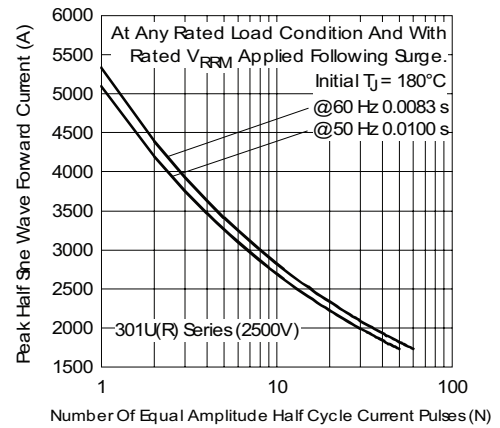


Fig. 11 - Maximum Non-Repetitive Surge Current

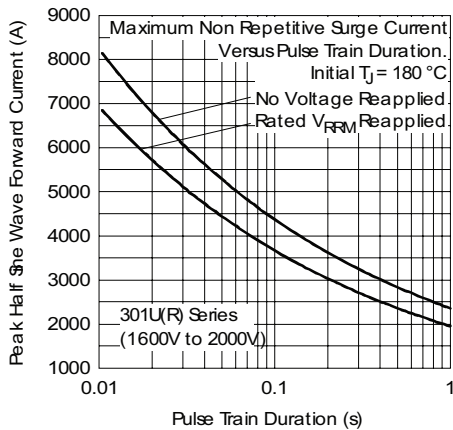


Fig. 10 - Maximum Non-Repetitive Surge Current

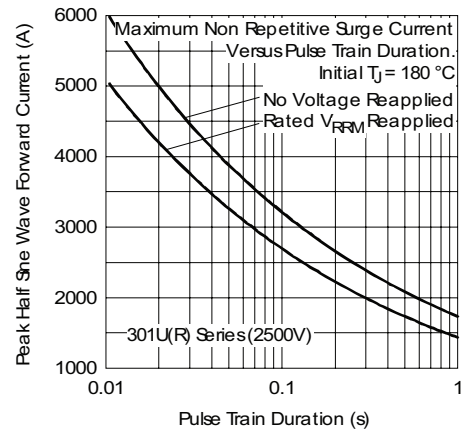


Fig. 12 - Maximum Non-Repetitive Surge Current

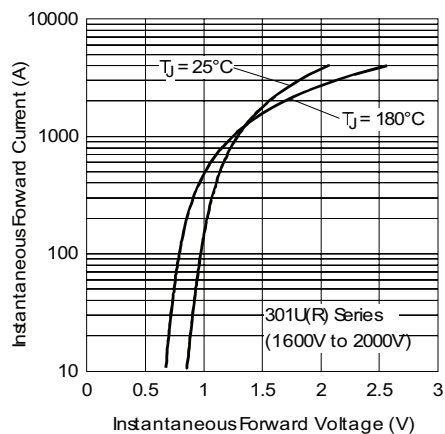


Fig. 13 - Forward Voltage Drop Characteristics

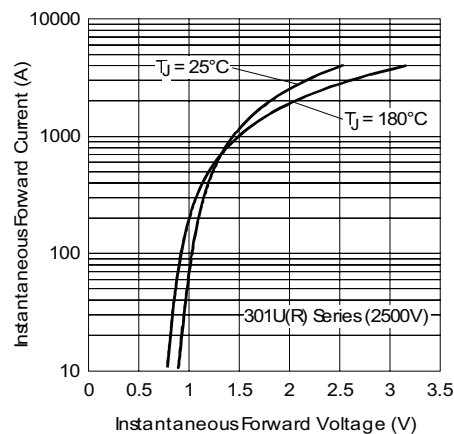


Fig. 14 - Forward Voltage Drop Characteristics

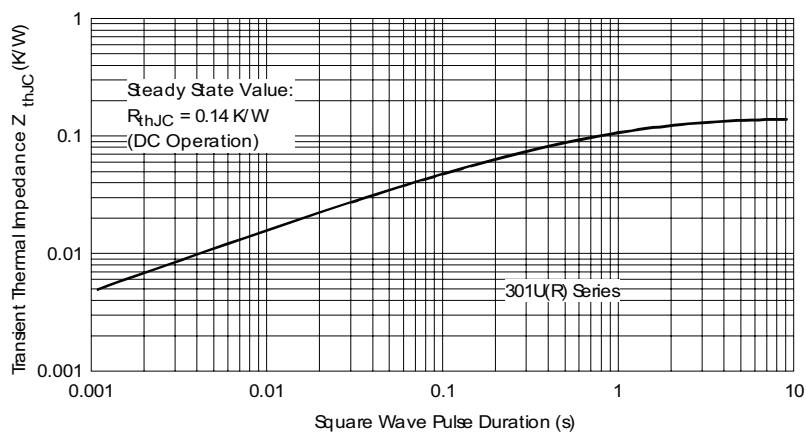


Fig. 15 - Thermal Impedance Z_{thJC} Characteristic



ORDERING INFORMATION TABLE

Device code	30	1	U	A	250
	1	2	3	4	5
1	- 30 = Essential part number				
2	- 1 = Standard device 3 = Top threaded version 5 = Type for rotating application with top threaded version 3/8 16UNC-2A 7 = Type for rotating application with flexible lead 9 = Type for rotating application with top threaded version 3/8 24UNF				
3	- - U = Stud normal polarity (cathode to stud) - UR = Stud reverse polarity (anode to stud)				
4	- A = Maximum leakage selection $I_{RRM} = 2 \text{ mA}$ $T_J = 25 \text{ }^{\circ}\text{C}$				
5	- Voltage code x 10 = V_{RRM} (see Voltage Ratings table)				

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95337



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