Standard Recovery Diodes, (Hockey PUK Version), 650 A

A-PUK (DO-200AA)

FEATURES

- Wide current range
- High voltage ratings up to 3200 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style A-PUK (DO-200AA)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
RoHS COMPLIANT

TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	650 A
Package	A-PUK (DO-200AA)
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS				
PARAMETER	TEST CONDITIONS	SD300C..C		UNITS
		04 to 20	25 to 32	
$I_{F(AV)}$		650	540	A
	T_{hs}	55	55	°C
$I_{F(RMS)}$		1150	995	A
	T_{hs}	25	25	°C
I_{FSM}	50 Hz	6050	6050	A
	60 Hz	6335	6335	
I^2t	50 Hz	183	183	kA^2s
	60 Hz	167	167	
V_{RRM}	Range	400 to 2000	2500 to 3200	V
T_J		-40 to +180	-40 to +150	°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
VS-SD300C..C	04	400	500	15
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	
	28	2800	2900	
	32	3200	3300	

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FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			SD300C..C 04 to 20	SD300C..C 25 to 32	UNITS
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave Double side (single side) cooled			650 (380)	540 (250)	A
					55 (85)	55 (85)	°C
Maximum RMS forward current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled			1150	995	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	6050	6050	
		t = 8.3 ms			6335	6335	
		t = 10 ms	100 % V_{RRM} reapplied		5090	5090	
		t = 8.3 ms			5330	5330	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		183	183	kA^2s
		t = 8.3 ms			167	167	
		t = 10 ms	100 % V_{RRM} reapplied		129	129	
		t = 8.3 ms			118	118	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			1830	1830	$kA^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			0.95	0.95	V
High level value of threshold voltage	$V_{F(TO)2}$	($I > \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			1.00	1.00	
Low level values of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			0.75	0.75	mW
High level values of forward slope resistance	r_{f2}	($I > \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			0.72	0.72	
Maximum forward voltage drop	V_{FM}	I_{pk} = 1500 A, $T_J = T_J$ maximum; t_p = 10 ms sinusoidal wave			2.08	2.08	V

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	SD300C..C 04 to 20	SD300C..C 25 to 32	UNITS
Maximum operating temperature range	T_J		-40 to 180	-40 to 150	°C
Maximum storage temperature range	T_{Stg}		-55 to 200		
Maximum thermal resistance, junction to heatsink	R_{thJ-hs}	DC operation single side cooled	0.163		K/W
		DC operation double side cooled	0.073		
Mounting force, ± 10 %			4900 (500)		N (kg)
Approximate weight			70		g
Case style		See dimensions - link at the end of datasheet	A-PUK (DO-200AA)		

ΔR_{thJ-hs} CONDUCTION

CONDUCTION ANGLE	SINUSOIDAL CONDUCTION SINGLE SIDE	SINUSOIDAL CONDUCTION DOUBLE SIDE	RECTANGULAR CONDUCTION SINGLE SIDE	RECTANGULAR CONDUCTION DOUBLE SIDE	TEST CONDITIONS	UNITS
180°	0.017	0.017	0.011	0.012	$T_J = T_J$ maximum	K/W
120°	0.020	0.020	0.020	0.020		
90°	0.025	0.025	0.027	0.027		
60°	0.036	0.036	0.038	0.038		
30°	0.064	0.062	0.065	0.062		

Note

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

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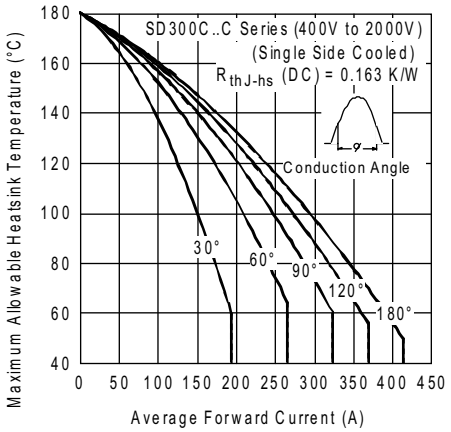

Fig. 1 - Current Ratings Characteristics

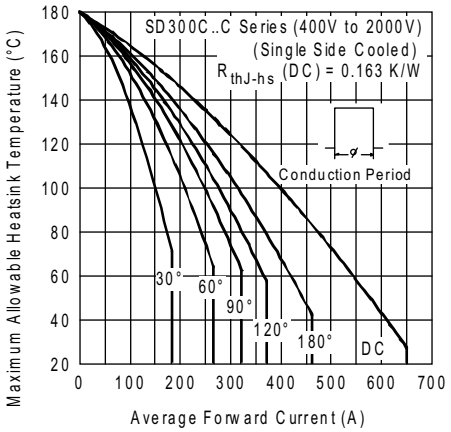

Fig. 2 - Current Ratings Characteristics

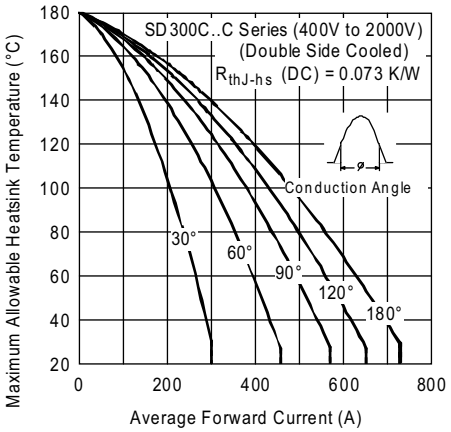

Fig. 3 - Current Ratings Characteristics

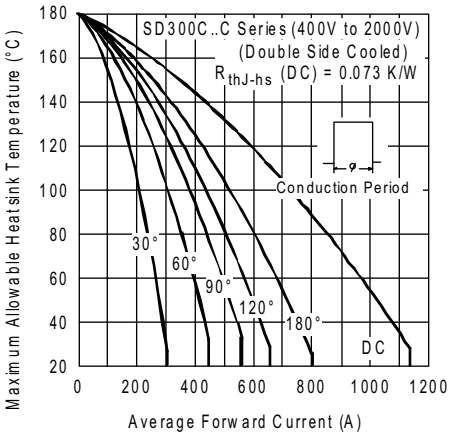

Fig. 4 - Current Ratings Characteristics

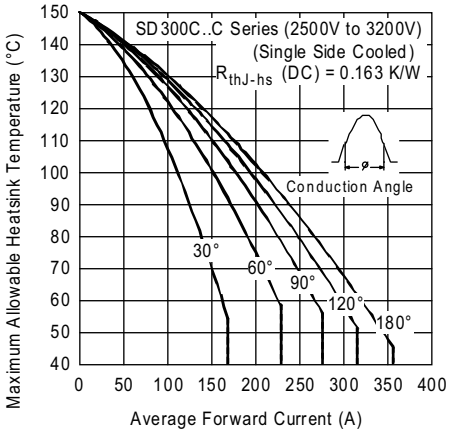

Fig. 5 - Current Ratings Characteristics

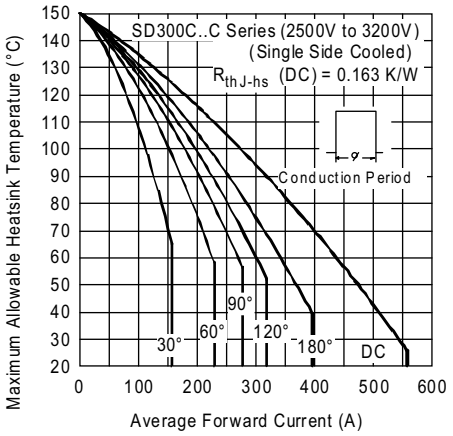

Fig. 6 - Current Ratings Characteristics

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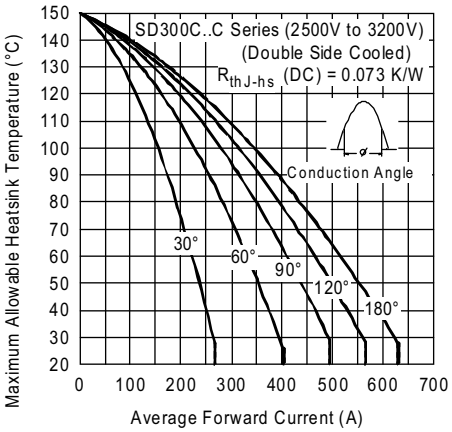

Fig. 7 - Current Ratings Characteristics

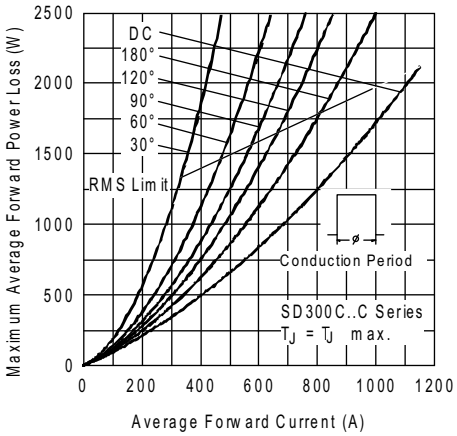

Fig. 10 - Forward Power Loss Characteristics

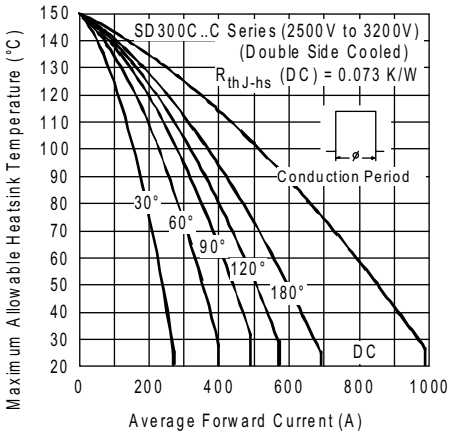

Fig. 8 - Current Ratings Characteristics

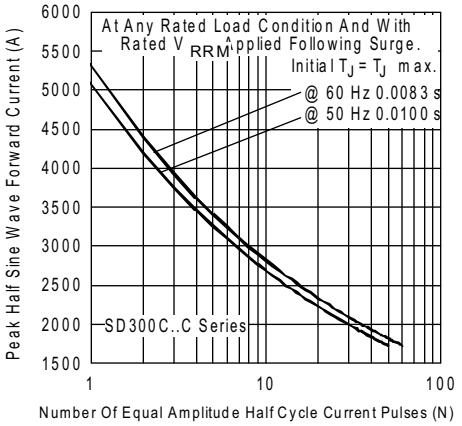

Fig. 11 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

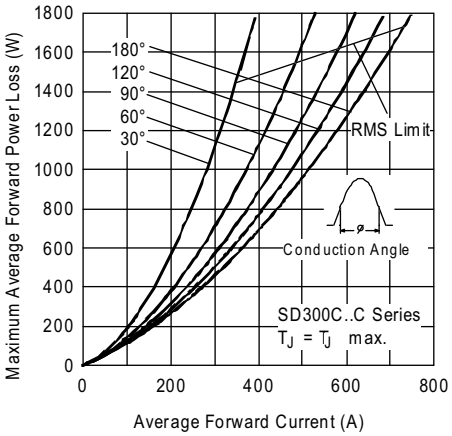

Fig. 9 - Forward Power Loss Characteristics

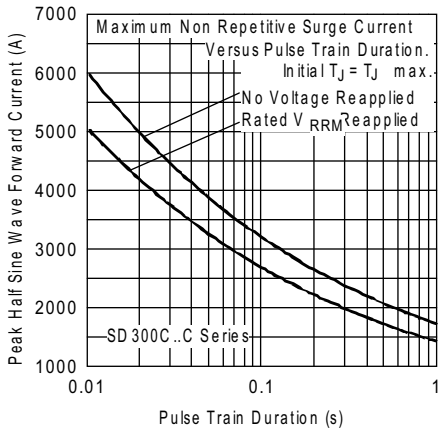

Fig. 12 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

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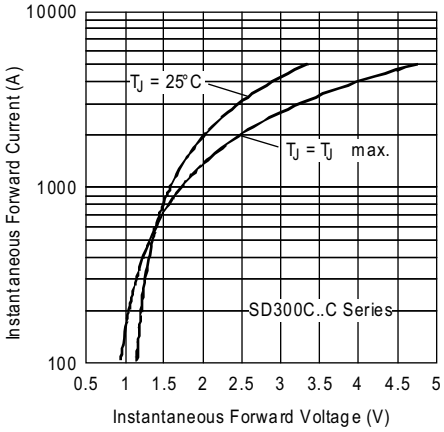

Fig. 13 - Forward Voltage Drop Characteristics

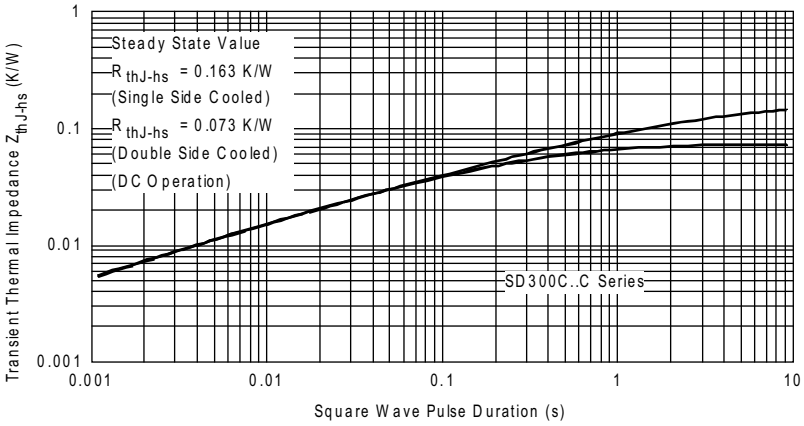

Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

VS-	SD	30	0	C	32	C
1	2	3	4	5	6	7

1 - Vishay Semiconductors product
2 - Diode
3 - Essential part number
4 - 0 = standard recovery
5 - C = ceramic PUK
6 - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)
7 - C = PUK case A-PUK (DO-200AA)

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95248

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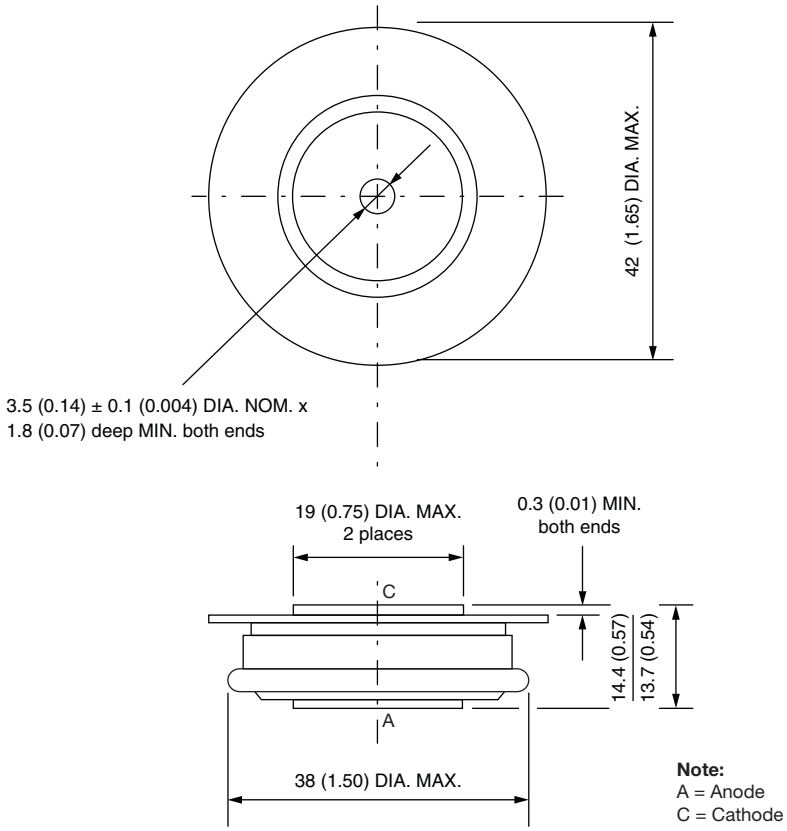
DO-200AA

DIMENSIONS in millimeters (inches)



Quote between upper and lower pole pieces has to be considered after application of mounting force (see Thermal and Mechanical Specifications)

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