

## Standard Recovery Diodes, (Hockey PUK Version), 3000 A



K-PUK (DO-200AC)

### FEATURES

- Wide current range
- High voltage ratings up to 2500 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style K-PUK (DO-200AC)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	3000 A
Package	K-PUK (DO-200AC)
Circuit configuration	Single

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		3000	A
	$T_{hs}$	55	°C
$I_{F(RMS)}$		5000	A
	$T_{hs}$	25	°C
$I_{FSM}$	50 Hz	31 000	A
	60 Hz	32 460	
$I^2t$	50 Hz	4810	kA <sup>2</sup> s
	60 Hz	4390	
$V_{RRM}$	Range	1200 to 2500	V
$T_J$		-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 $T_J = 180$ °C mA
VS-SD2500C..K	12	1200	1300	75
	16	1600	1700	
	20	2000	2100	
	24	2400	2500	
	25	2500	2600	



FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS	
Maximum average forward current at heatsink temperature	I <sub>F(AV)</sub>	180° conduction, half sine wave Double side (single side) cooled			3000 (1550)	A	
					55 (85)	°C	
Maximum RMS forward current	I <sub>F(RMS)</sub>	25 °C heatsink temperature double side cooled			5000		
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T <sub>J</sub> = T <sub>J</sub> maximum	31 000	A	
		t = 8.3 ms			32 460		
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		26 050		
		t = 8.3 ms			27 300		
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied			4810	kA <sup>2</sup> s
		t = 8.3 ms				4390	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied			3400	
		t = 8.3 ms				3100	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 to 10 ms, no voltage reapplied			48 100	kA <sup>2</sup> √s	
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.76	V	
High level value of threshold voltage	V <sub>F(TO)2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.97		
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.16	mW	
High level value of forward slope resistance	r <sub>f2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.13		
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 4000 A, T <sub>J</sub> = T <sub>J</sub> maximum t <sub>p</sub> = 10 ms sinusoidal wave			1.41	V	

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating temperature range	T <sub>J</sub>		-40 to +180	°C
Maximum storage temperature range	T <sub>Stg</sub>		-55 to +200	
Maximum thermal resistance, junction to heatsink	R <sub>thJ-hs</sub>	DC operation single side cooled	0.042	K/W
		DC operation double side cooled	0.020	
Mounting force, ± 10 %			22 250 (2250)	N (kg)
Approximate weight			425	g
Case style		See dimensions - link at the end of datasheet	K-PUK (DO-200AC)	

$\Delta R_{thJ-hs}$ CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.002	0.002	0.001	0.001	T <sub>J</sub> = T <sub>J</sub> maximum	K/W
120°	0.002	0.002	0.002	0.002		
90°	0.003	0.003	0.003	0.003		
60°	0.004	0.004	0.004	0.004		
30°	0.007	0.007	0.007	0.007		

**Note**

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

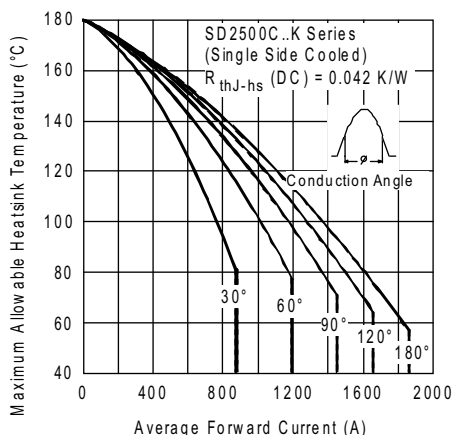


Fig. 1 - Current Ratings Characteristics

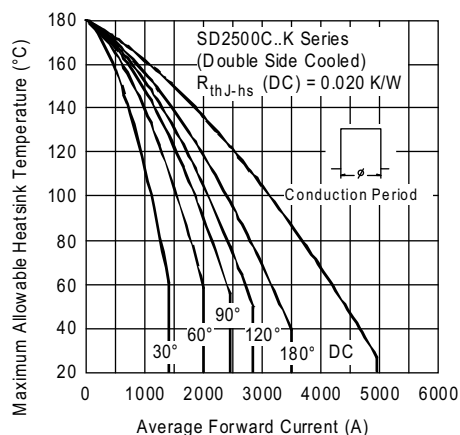


Fig. 4 - Current Ratings Characteristics

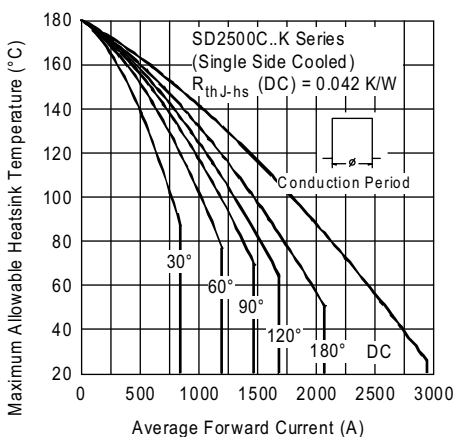


Fig. 2 - Current Ratings Characteristics

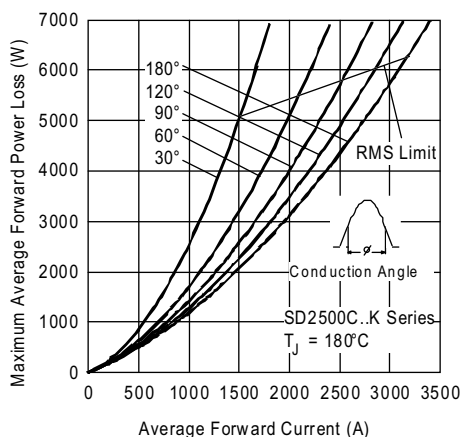


Fig. 5 - Forward Power Loss Characteristics

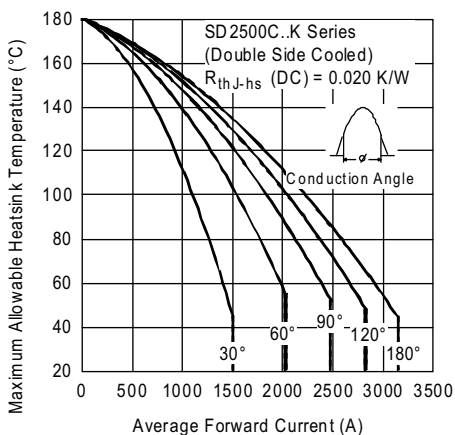


Fig. 3 - Current Ratings Characteristics

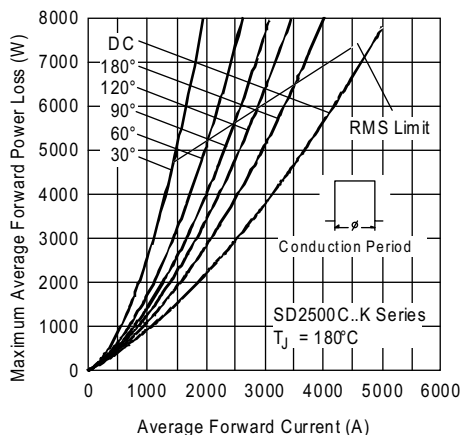


Fig. 6 - Forward Power Loss Characteristics

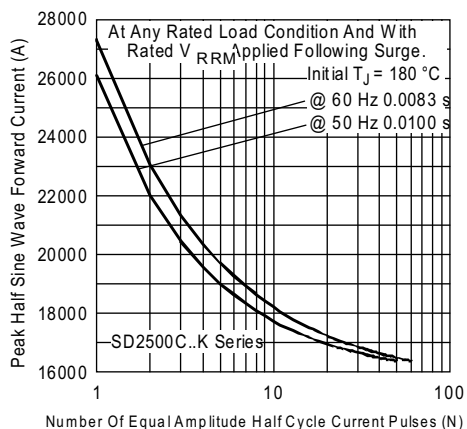


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

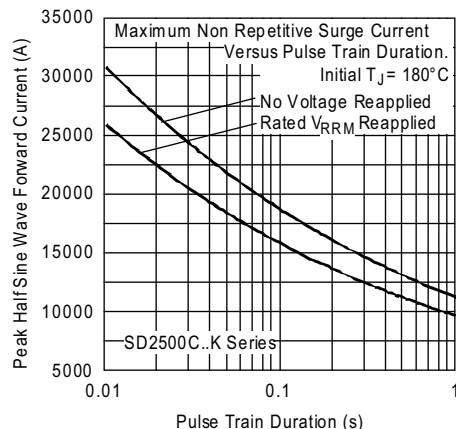


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

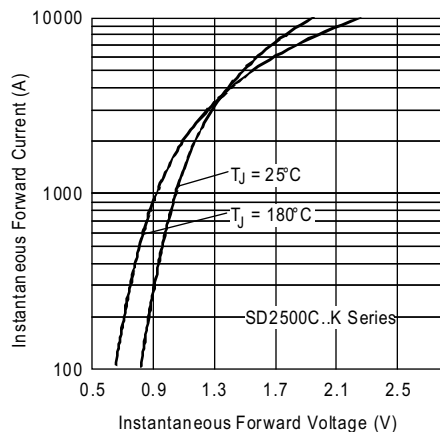


Fig. 9 - Forward Voltage Drop Characteristics

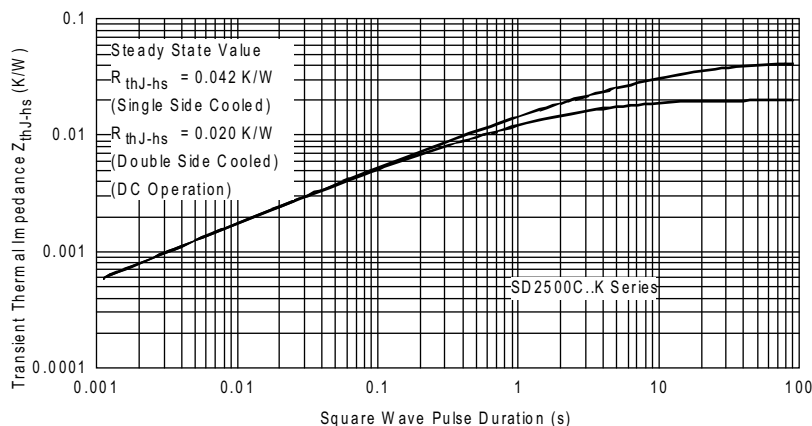


Fig. 10 - Thermal Impedance  $Z_{thJ-hs}$  Characteristics



## ORDERING INFORMATION TABLE

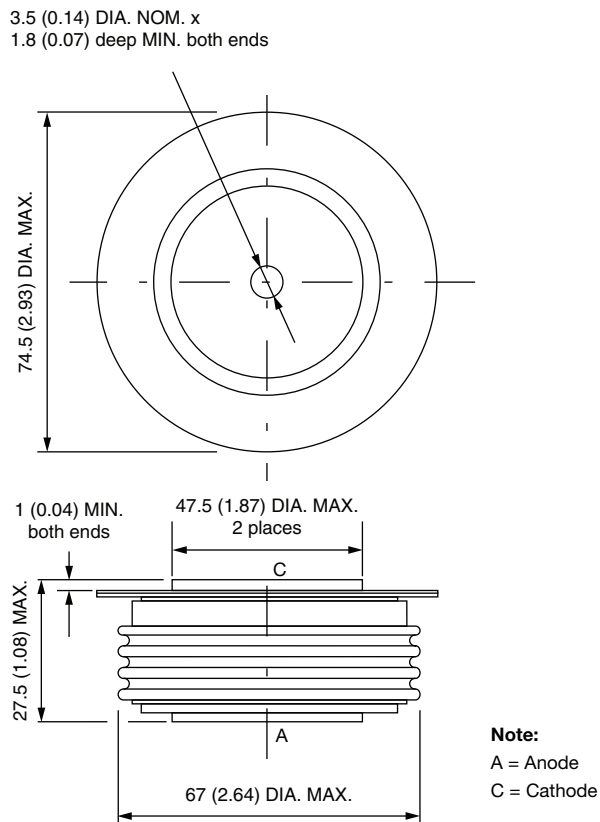
Device code	VS-	SD	250	0	C	25	K
	1	2	3	4	5	6	7

- |   |   |  |
|---|---|--|
| 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 | - | K = PUK case K-PUK (DO-200AC)                              |

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95247">www.vishay.com/doc?95247</a>

## K-PUK (DO-200AC)

**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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