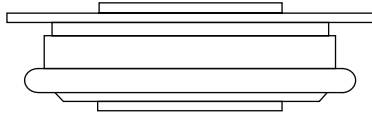


## Fast Recovery Diodes (Hockey PUK Version), 350 A



DO-200AA

### PRODUCT SUMMARY

$I_{F(AV)}$	350 A
-------------	-------

### FEATURES

- High power FAST recovery diode series
- 1.0 to 2.0  $\mu$ s recovery time
- High voltage ratings up to 2500 V
- High current capability
- Optimized turn-on and turn-off characteristics
- Low forward recovery
- Fast and soft reverse recovery
- Press PUK encapsulation
- Case style conform to JEDEC DO-200AA
- Maximum junction temperature 125 °C
- Lead (Pb)-free



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

- Snubber diode for GTO
- High voltage freewheeling diode
- Fast recovery rectifier applications

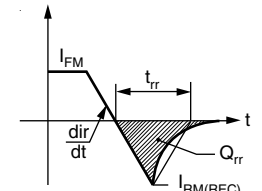
### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		350	A
	$T_{hs}$	55	°C
$I_{F(RMS)}$		550	A
	$T_{hs}$	25	°C
$I_{FSM}$	50 Hz	5770	A
	60 Hz	6040	
$I^2t$	50 Hz	166	kA <sup>2</sup> s
	60 Hz	152	
$V_{RRM}$	Range	400 to 2500	V
$t_{rr}$		1.0 to 2.0	$\mu$ s
	$T_J$	25	°C
$T_J$		- 40 to 125	

## ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I <sub>RRM</sub> MAXIMUM AT T <sub>J</sub> = 125 °C mA
SD303C..S10C	04	400	500	35
	08	800	900	
	10	1000	1100	
SD303C..S15C	12	1200	1300	
	14	1400	1500	
	16	1600	1700	
SD303C..S20C	20	2000	2100	
	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		350 (175)	A
		Double side (single side) cooled		55 (75)	°C
Maximum RMS current	I <sub>F(RMS)</sub>	25 °C heatsink temperature double side cooled		550	A
Maximum peak, one-cycle, non-repetitive forward current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	5770	
		t = 8.3 ms	No voltage reapplied	6040	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied	4850	
		t = 8.3 ms	100 % V <sub>RRM</sub> reapplied	5080	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied	166	kA <sup>2</sup> s
		t = 8.3 ms	No voltage reapplied	152	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied	117	
		t = 8.3 ms	100 % V <sub>RRM</sub> reapplied	107	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 to 10 ms, no voltage reapplied		1660	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		1.14	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		1.63	
Low level 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		1.14	mΩ
High level of forward slope resistance	r <sub>f2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum		0.77	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 1100 A, T <sub>J</sub> = 25 °C; t <sub>p</sub> = 10 ms sinusoidal wave		2.26	V

RECOVERY CHARACTERISTICS								
CODE	MAXIMUM VALUE AT T <sub>J</sub> = 25 °C	TEST CONDITIONS			TYPICAL VALUES AT T <sub>J</sub> = 125 °C			
	t <sub>rr</sub> AT 25 % I <sub>RRM</sub> (μs)	I <sub>pk</sub> SQUARE PULSE (A)	di/dt (A/μs)	V <sub>r</sub> (V)	t <sub>rr</sub> AT 25 % I <sub>RRM</sub> (μs)	Q <sub>rr</sub> (μC)	I <sub>rr</sub> (A)	
S10	1.0	750	25	- 30	2.4	52	33	
S15	1.5				2.9	90	44	
S20	2.0				3.2	107	46	



<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum operating temperature range	$T_J$		- 40 to 125	°C
Maximum storage temperature range	$T_{Stg}$		- 40 to 150	
Maximum thermal resistance, junction to heatsink	$R_{thJ-hs}$	DC operation single side cooled	0.16	K/W
		DC operation double side cooled	0.08	
Mounting force, $\pm 10\%$			4900 (500)	N (kg)
Approximate weight			70	g
Case style		See dimensions - link at the end of datasheet	DO-200AA	

<b><math>\Delta R_{thJ-hs}</math> CONDUCTION</b>						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.010	0.011	0.008	0.008	$T_J = T_J$ maximum	K/W
120°	0.012	0.013	0.013	0.013		
90°	0.016	0.016	0.018	0.018		
60°	0.024	0.024	0.025	0.025		
30°	0.042	0.042	0.042	0.042		

**Note**

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

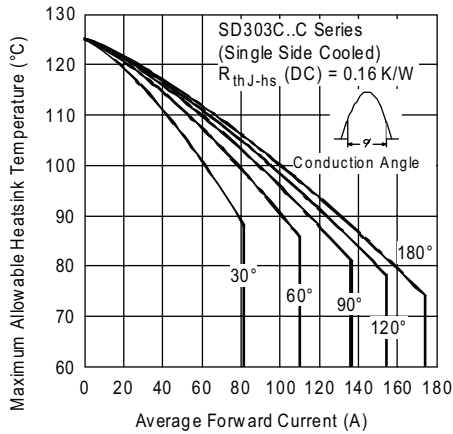


Fig. 1 - Current Ratings Characteristics

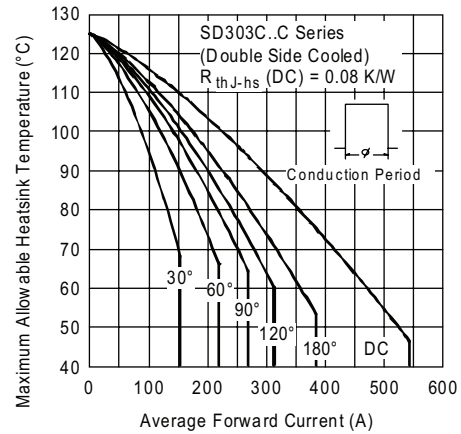


Fig. 4 - Current Ratings Characteristics

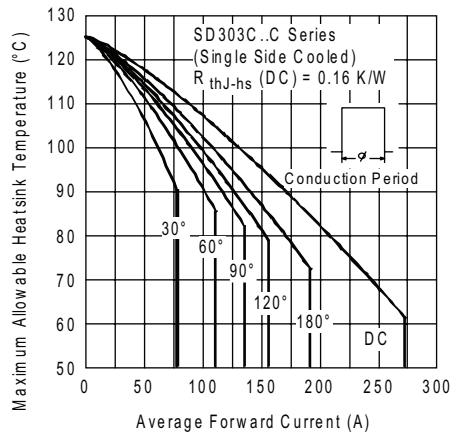


Fig. 2 - Current Ratings Characteristics

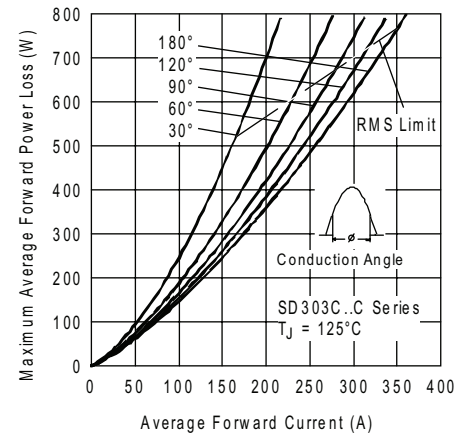


Fig. 5 - Forward Power Loss Characteristics

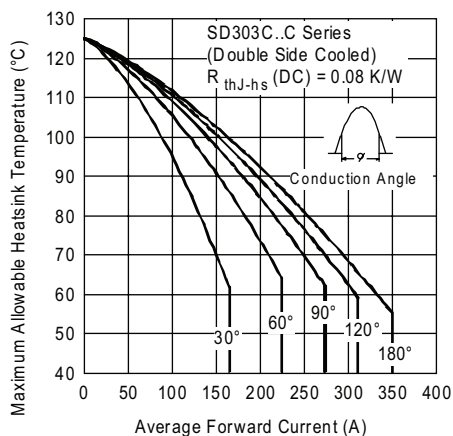


Fig. 3 - Current Ratings Characteristics

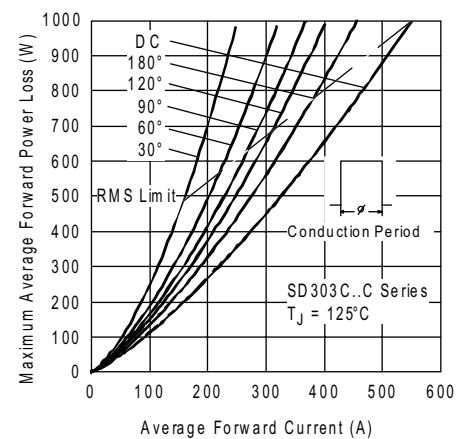


Fig. 6 - Forward Power Loss Characteristics

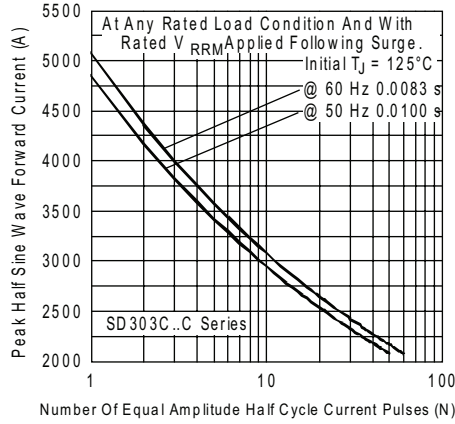


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

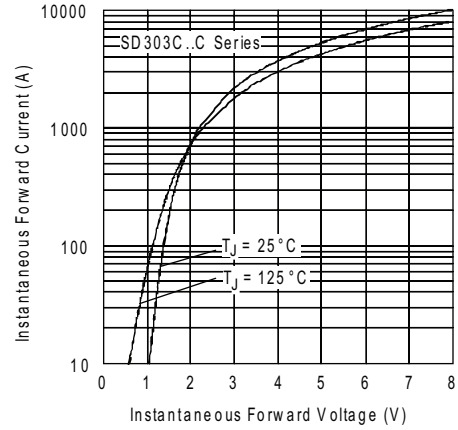


Fig. 9 - Forward Voltage Drop Characteristics

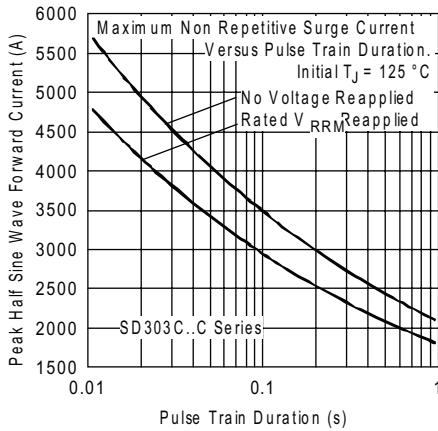


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

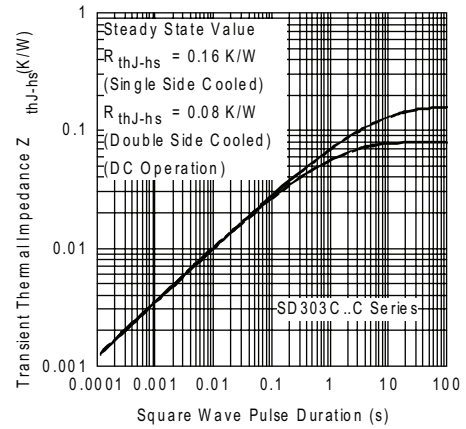


Fig. 10 - Thermal Impedance  $Z_{thJ-hs}$  Characteristic

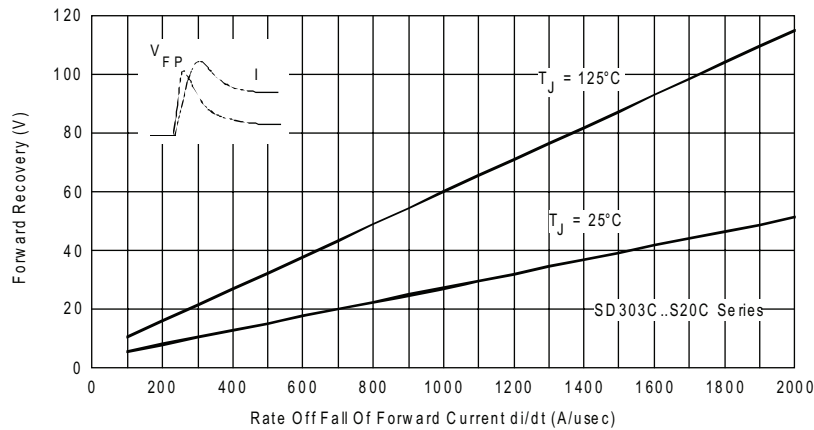


Fig. 11 - Typical Forward Recovery Characteristics

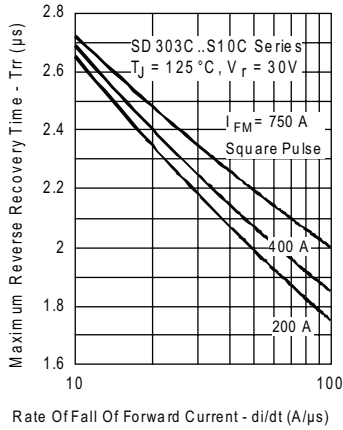


Fig. 12 - Recovery Time Characteristics

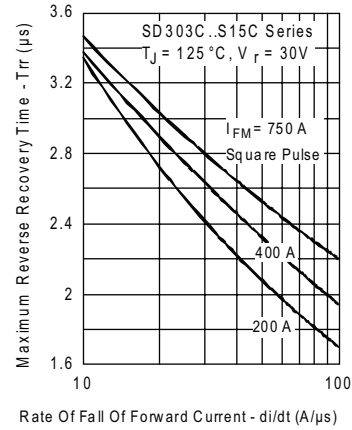


Fig. 15 - Recovery Time Characteristics

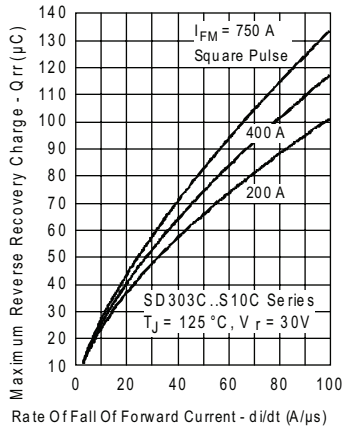


Fig. 13 - Recovery Charge Characteristics

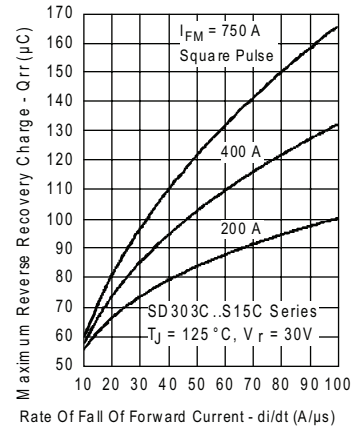


Fig. 16 - Recovery Charge Characteristics

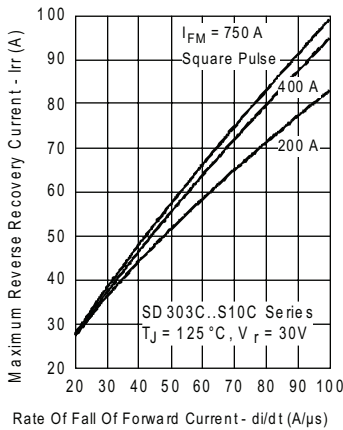


Fig. 14 - Recovery Current Characteristics

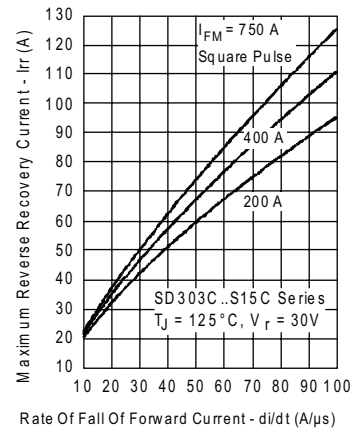


Fig. 17 - Recovery Current Characteristics

## Fast Recovery Diodes (Hockey PUK Version), 350 A

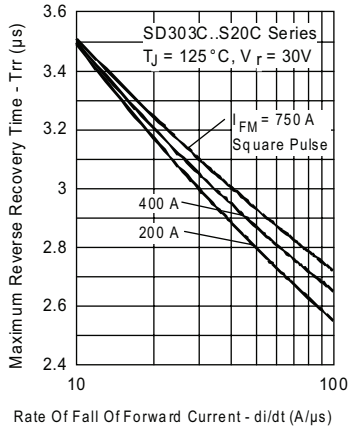


Fig. 18 - Recovery Time Characteristics

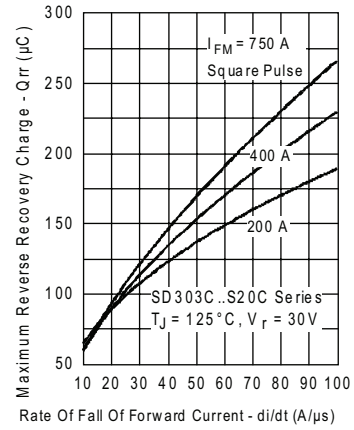


Fig. 19 - Recovery Charge Characteristics

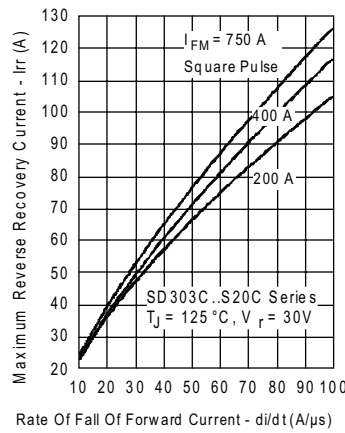


Fig. 20 - Recovery Current Characteristics

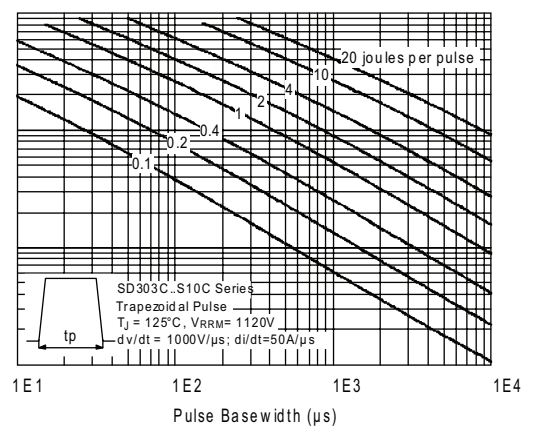
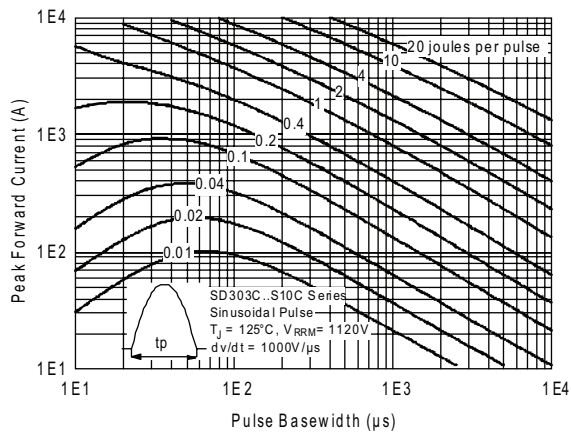


Fig. 21 - Maximum Total Energy Loss Per Pulse Characteristics

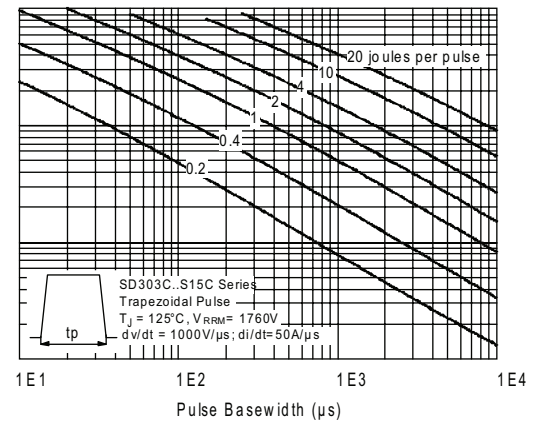
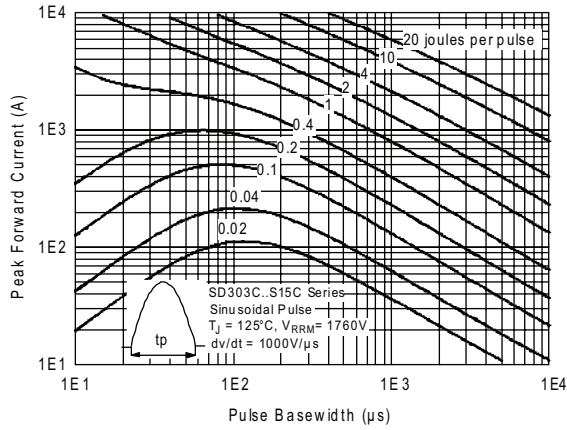


Fig. 22 - Maximum Total Energy Loss Per Pulse Characteristics

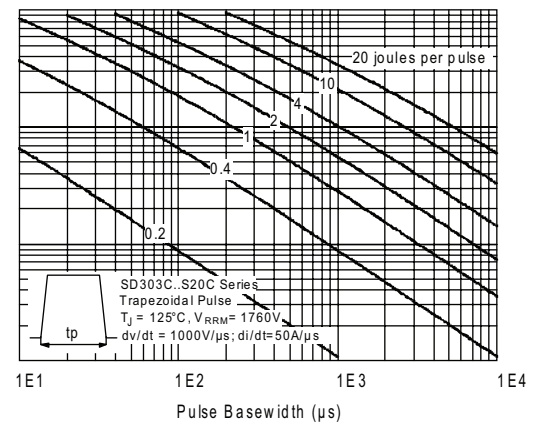
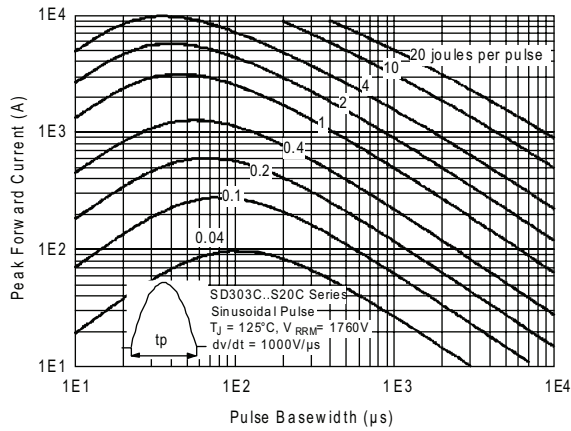


Fig. 23 - Maximum Total Energy Loss Per Pulse Characteristics





## ORDERING INFORMATION TABLE

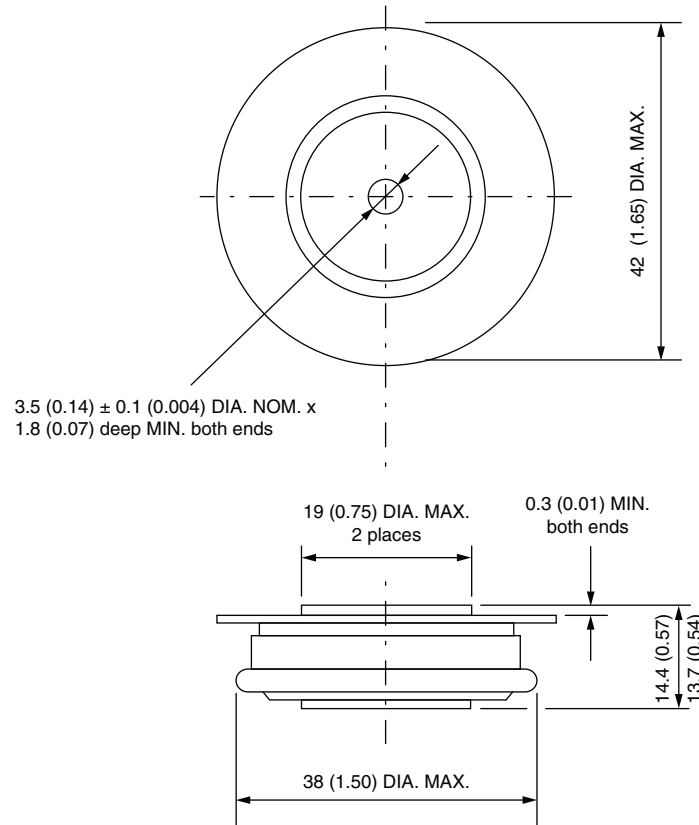
Device code	<b>SD</b>	<b>30</b>	<b>3</b>	<b>C</b>	<b>25</b>	<b>S20</b>	<b>C</b>
	①	②	③	④	⑤	⑥	⑦

- 1** - Diode
- 2** - Essential part number
- 3** - 3 = Fast recovery
- 4** - C = Ceramic PUK
- 5** - Voltage code x 100 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** -  $t_{rr}$  code (see Recovery Characteristics table)
- 7** - C = PUK case DO-200AA

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95248">http://www.vishay.com/doc?95248</a>

## 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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