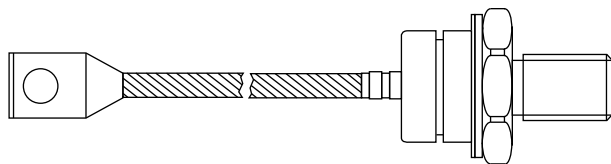


## Standard Recovery Diodes, (Stud Version), 200 A



DO-30 (DO-205AC)

### FEATURES

- Wide current range
- High voltage ratings up to 2400 V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC® types
- Compression bonded encapsulations
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	200 A
Package	DO-30 (DO-205AC)
Circuit configuration	Single

### TYPICAL APPLICATIONS

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

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VS-SD200N/R		UNITS
		1600 to 2000	2400	
$I_{F(AV)}$		200	200	A
	$T_C$	110	110	°C
$I_{F(RMS)}$		314	314	
$I_{FSM}$	50 Hz	4700	4700	A
	60 Hz	4920	4920	
$I^2t$	50 Hz	110	110	kA <sup>2</sup> s
	60 Hz	101	101	
$V_{RRM}$	Range	1600 to 2000	2400	V
$T_J$		-40 to +180	+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-SD200N/R	16	1600	1700	15
	20	2000	2100	
	24	2400	2500	



FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS	
Maximum average forward current at case temperature	I <sub>F(AV)</sub>	180° conduction, half sine wave			200	A	
Maximum average forward current at case temperature					110	°C	
					220	A	
					100	°C	
Maximum RMS forward current	I <sub>F(RMS)</sub>	DC at 95 °C case temperature			314		
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	4700	A	
		t = 8.3 ms			4920		
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		3950		
		t = 8.3 ms			4140		
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied			110	kA <sup>2</sup> s
		t = 8.3 ms				101	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied			78	
		t = 8.3 ms				71	
Maximum I <sup>2</sup> Öt for fusing	I <sup>2</sup> Öt	t = 0.1 to 10 ms, no voltage reapplied			1100	kA <sup>2</sup> Ös	
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % x π x I <sub>F(AV)</sub> ) < I < π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.90	V	
High level value of threshold voltage	V <sub>F(TO)2</sub>	(I > π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			1.00		
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % x π x I <sub>F(AV)</sub> ) < I < π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.79	mW	
High level value of forward slope resistance	r <sub>f2</sub>	(I > π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.64		
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 630 A, T <sub>J</sub> = T <sub>J</sub> maximum, t <sub>p</sub> = 10 ms sinusoidal wave			1.40	V	

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS	SD200N/R		UNITS
			1600 to 2000	2400	
Maximum junction operating temperature range	T <sub>J</sub>		-40 to 180	-40 to 150	°C
Maximum storage temperature range	T <sub>Stg</sub>		-55 to 200		
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.23		K/W
Maximum thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth, flat and greased	0.08		
Maximum allowed mounting torque ± 10 %		Not-lubricated threads	14		Nm
Approximate weight			120		g
Case style		See dimensions (link at the end of datasheet)	DO-30 (DO-205AC)		

$\Delta R_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.041	0.030	$T_J = T_J$ maximum	K/W
120°	0.049	0.051		
90°	0.063	0.068		
60°	0.093	0.096		
30°	0.156	0.157		

**Note**

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

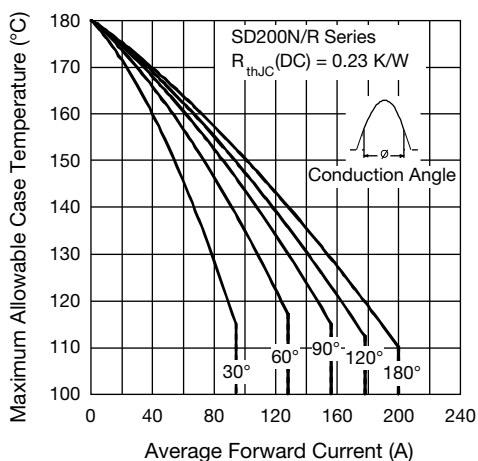


Fig. 1 - Current Ratings Characteristics

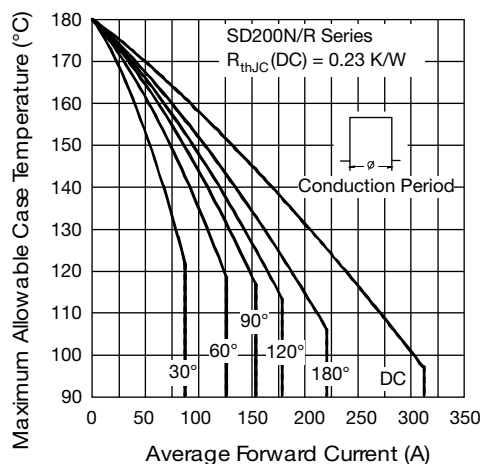


Fig. 2 - Current Ratings Characteristics

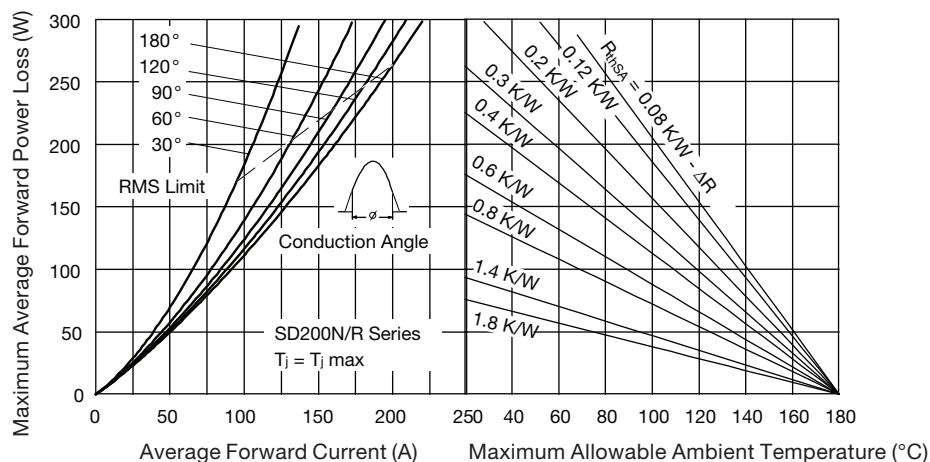


Fig. 3 - Forward Power Loss Characteristics

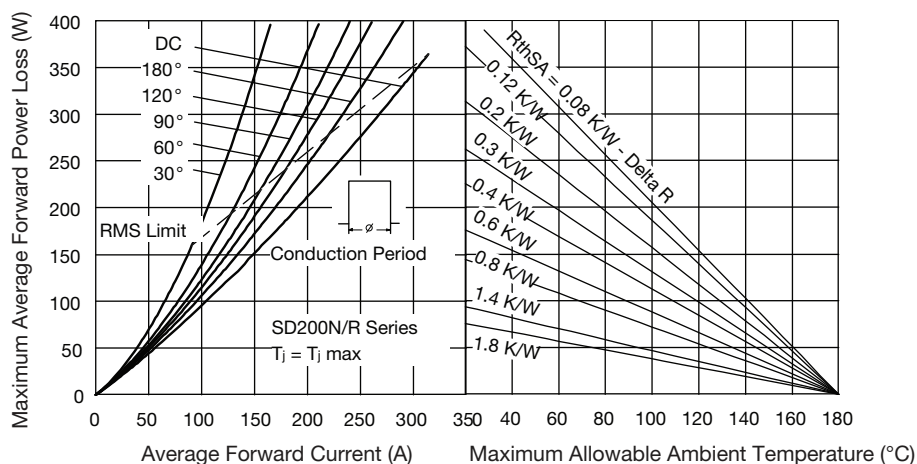


Fig. 4 - Forward Power Loss Characteristics

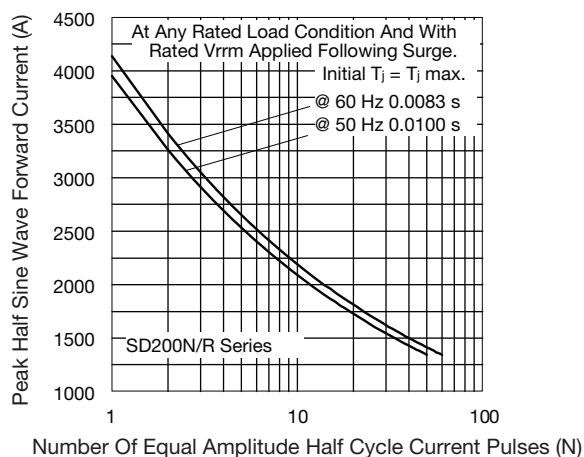


Fig. 5 - Maximum Non-Repetitive Surge Current

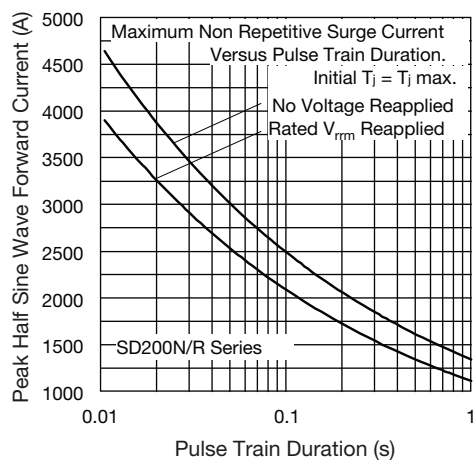


Fig. 6 - Maximum Non-Repetitive Surge Current

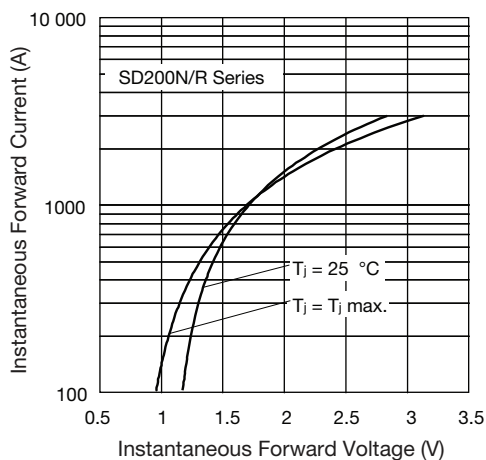
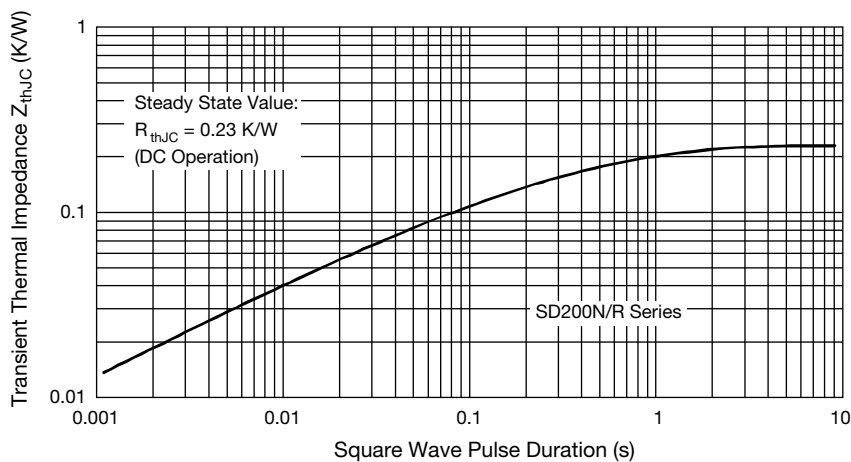


Fig. 7 - Forward Voltage Drop Characteristics


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic



## ORDERING INFORMATION TABLE

Device code	<b>VS-</b>	<b>SD</b>	<b>20</b>	<b>0</b>	<b>N</b>	<b>24</b>	<b>P</b>	<b>C</b>
	①	②	③	④	⑤	⑥	⑦	⑧

- 1** - Vishay Semiconductors product
- 2** - Diode
- 3** - Essential part number
- 4** - 0 = standard recovery
- 5** -
  - N = stud normal polarity (cathode to stud)
  - R = stud reverse polarity (anode to stud)
- 6** - Voltage code x 100 =  $V_{RRM}$  (see Voltage Ratings table)
- 7** -
  - P = stud base DO-30 (DO-205AC) 1/2" 20UNF-2A
  - M = stud base DO-30 (DO-205AC) M12 x 1.75
- 8** - C = ceramic housing

For metric device M12 x 1.75 contact factory

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95302">www.vishay.com/doc?95302</a>

**DIMENSIONS** in millimeters (inches)





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