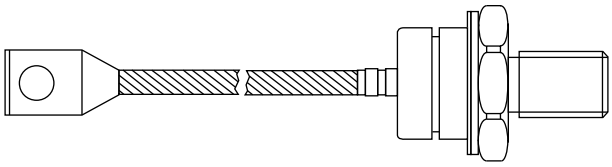
Standard Recovery Diodes, (Stud Version), 200 A



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

Pb-free

RoHS COMPLIANT

TYPICAL APPLICATIONS

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

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

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	A
I_{FSM}	50 Hz	4700	4700	
	60 Hz	4920	4920	
I^2t	50 Hz	110	110	kA^2s
	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	$I_{F(AV)}$	180° conduction, half sine wave			200	A
					110	°C
Maximum average forward current at case temperature					220	A
					100	°C
Maximum RMS forward current	$I_{F(RMS)}$	DC at 95 °C case temperature			314	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	4700	
		t = 8.3 ms			4920	
		t = 10 ms	100 % V_{RRM} reapplied		3950	
		t = 8.3 ms			4140	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		110	kA^2s
		t = 8.3 ms			101	
		t = 10 ms	100 % V_{RRM} reapplied		78	
		t = 8.3 ms			71	
Maximum $I^2Öt$ for fusing	$I^2Öt$	t = 0.1 to 10 ms, no voltage reapplied			1100	$kA^2Ös$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.90	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.00	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.79	mW
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.64	
Maximum forward voltage drop	V_{FM}	I_{pk} = 630 A, $T_J = T_J$ maximum, t_p = 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_J		-40 to 180	-40 to 150	°C
Maximum storage temperature range	T_{Stg}		-55 to 200		
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.23		K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	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)		

ΔR_{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

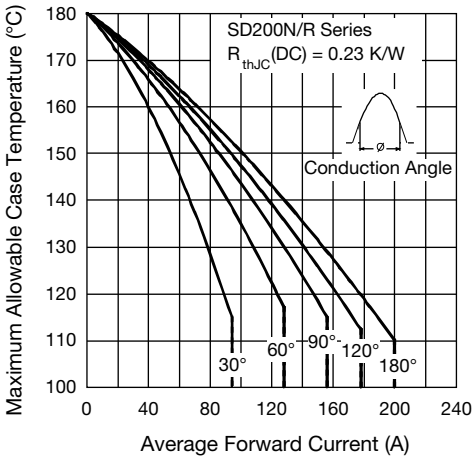


Fig. 1 - Current Ratings Characteristics

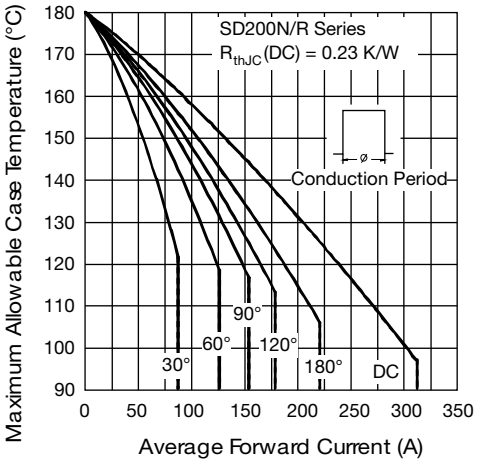


Fig. 2 - Current Ratings Characteristics

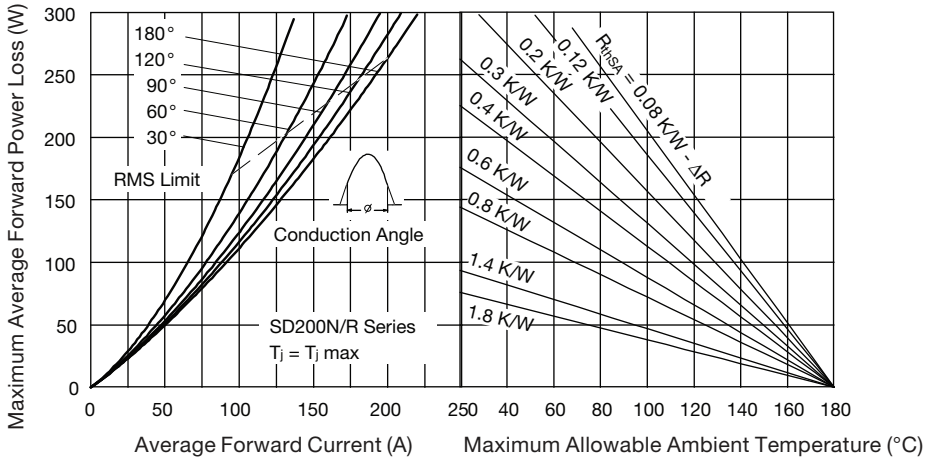


Fig. 3 - Forward Power Loss Characteristics

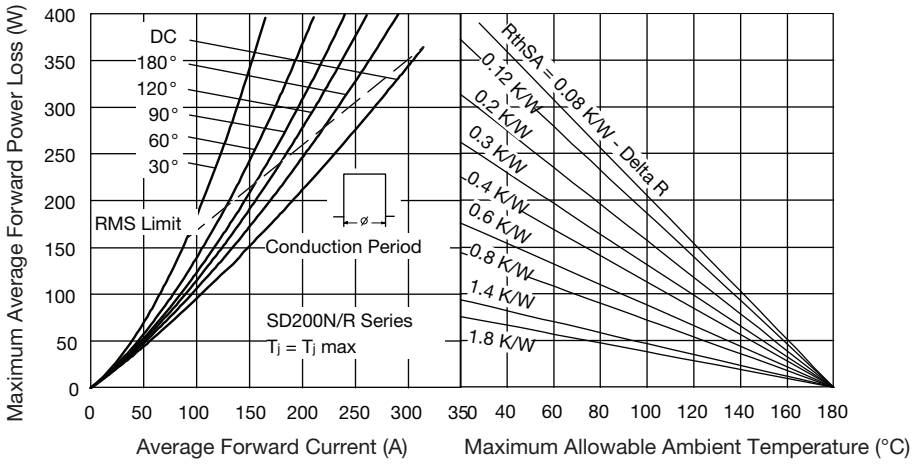


Fig. 4 - Forward Power Loss Characteristics

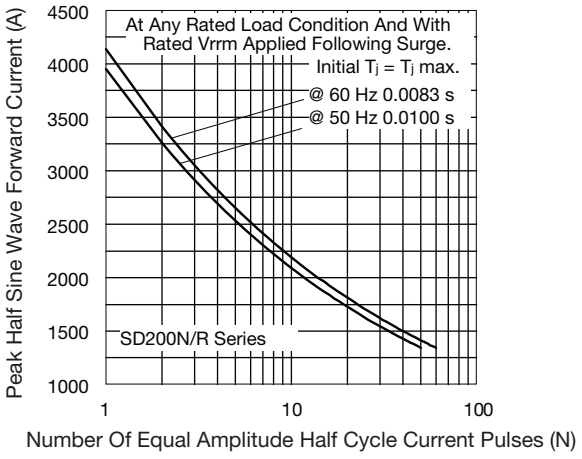


Fig. 5 - Maximum Non-Repetitive Surge Current

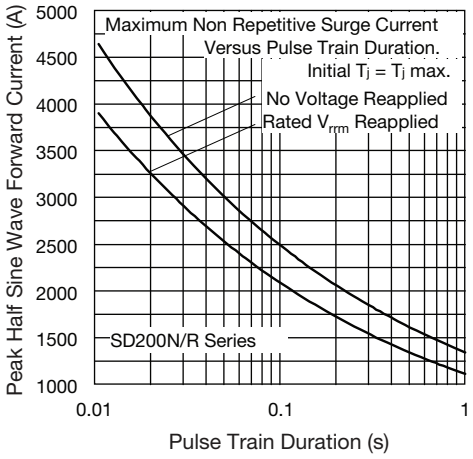


Fig. 6 - Maximum Non-Repetitive Surge Current

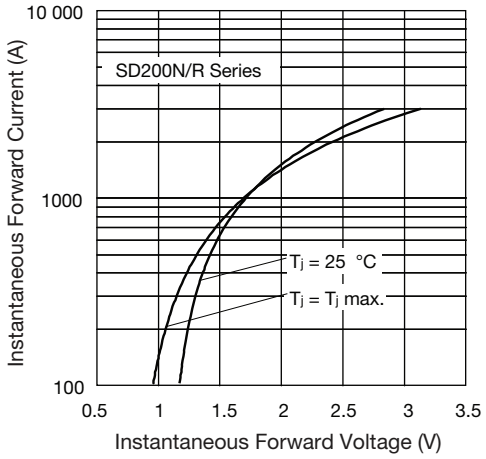


Fig. 7 - Forward Voltage Drop Characteristics

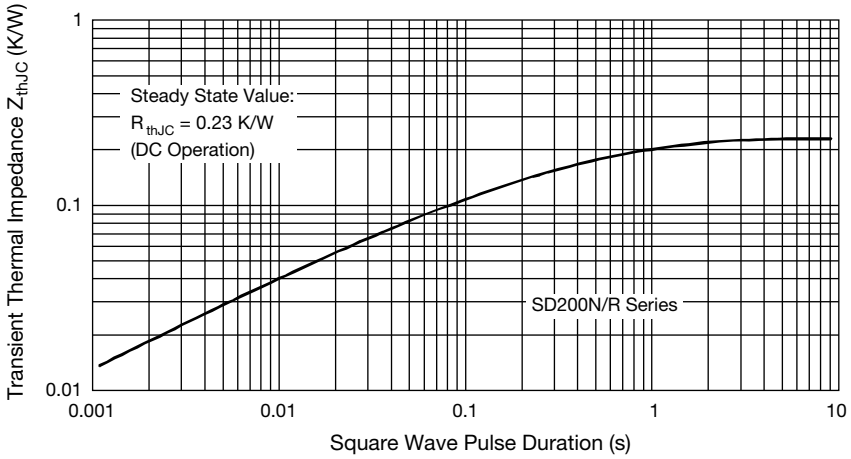
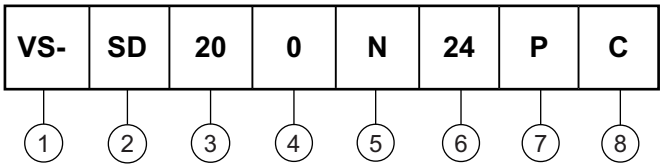


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

Device code



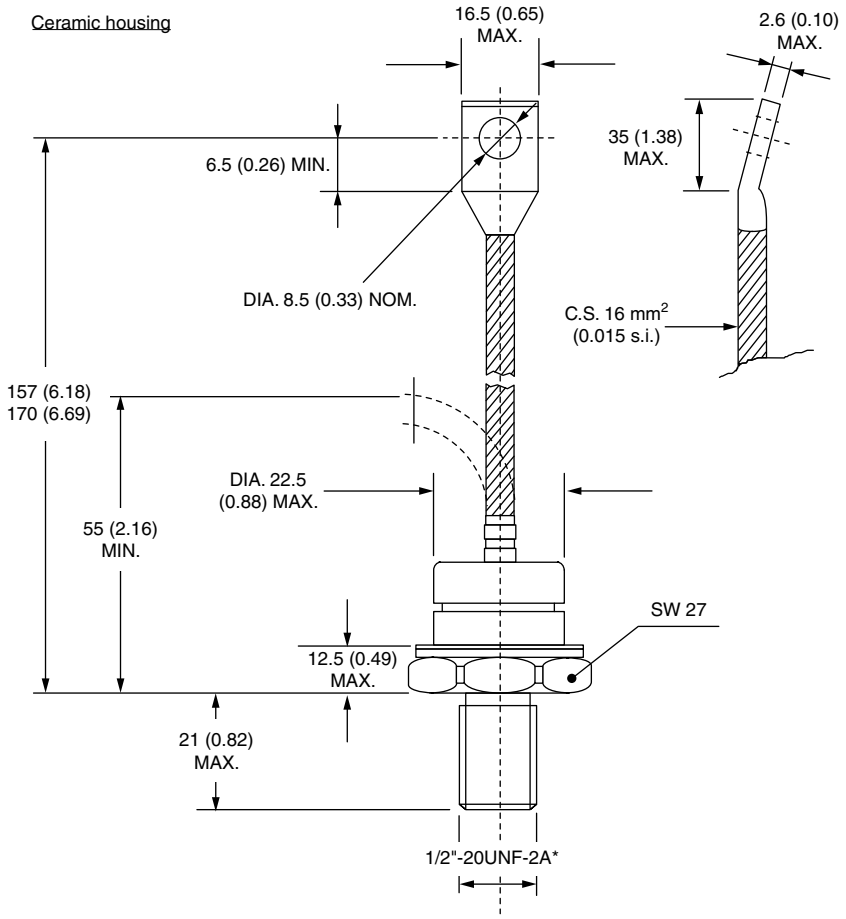
1 - Vishay Semiconductors product
2 - Diode
3 - Essential part number
4 - 0 = standard recovery
5 - • N = stud normal polarity (cathode to stud)
• R = stud reverse polarity (anode to stud)
6 - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)
7 - • P = stud base DO-30 (DO-205AC) 1/2" 20UNF-2A
• 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	www.vishay.com/doc?95302

DO-205AC (DO-30)

DIMENSIONS in millimeters (inches)



*For metric device: M12 x 1.75
contact factory

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