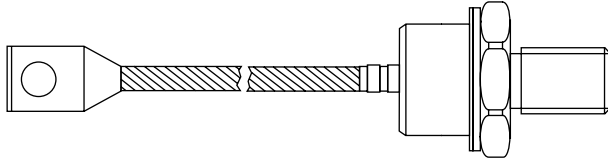**VISHAY.**

Standard Recovery Diodes
(Stud Version), 400 A

DO-205AB (DO-9)

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
- Lead (Pb)-free
- Designed and qualified for industrial level

RoHS COMPLIANT

Pb-free

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

PRODUCT SUMMARY

$I_{F(AV)}$	400 A

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		480	A
	T_C	120	°C
$I_{F(RMS)}$		630	A
I_{FSM}	50 Hz	8250	
	60 Hz	8640	
I^2t	50 Hz	340	kA^{2}s
	60 Hz	311	
V_{RRM}	Range	1600 to 2400	V
T_J		- 40 to 190	°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
SD400N/R	16	1600	1700	15
	20	2000	2100	
	24	2400	2500	

Vishay High Power Products | Standard Recovery Diodes
(Stud Version), 400 A

VISHAY.

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			400	A
					120	°C
					480	A
					100	°C
Maximum RMS forward current	$I_{F(RMS)}$	DC at 110 °C case temperature			630	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	8250	
		t = 8.3 ms			8640	
		t = 10 ms	100 % V_{RRM} reapplied		6940	
		t = 8.3 ms			7270	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		340	kA^2s
		t = 8.3 ms			311	
		t = 10 ms	100 % V_{RRM} reapplied		241	
		t = 8.3 ms			220	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			3400	$kA^2\sqrt{s}$
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			0.80	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.85	
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			0.55	$m\Omega$
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.51	
Maximum forward voltage drop	V_{FM}	I_{pk} = 1500 A, $T_J = T_J$ maximum, t_p = 10 ms sinusoidal wave			1.62	V

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating temperature range	T_J		- 40 to 190	°C
Maximum storage temperature range	T_{Stg}		- 55 to 200	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.11	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.04	
Maximum allowed mounting torque ± 10 %		Not-lubricated threads	27	Nm
Approximate weight			250	g
Case style		See dimensions (link at the end of datasheet)	DO-205AB (DO-9)	

For technical questions, contact: ind-modules@vishay.com

Standard Recovery Diodes
(Stud Version), 400 A

ΔR$_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.020	0.013	T$_J$ = T$_J$ maximum	K/W
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

Note

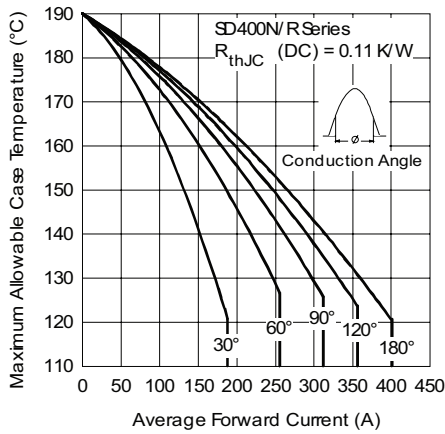• The table above shows the increment of thermal resistance R$_{thJC}$ when devices operate at different conduction angles than DC

Fig. 1 - Current Ratings Characteristics
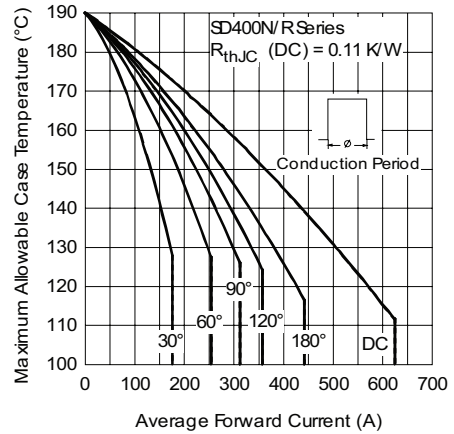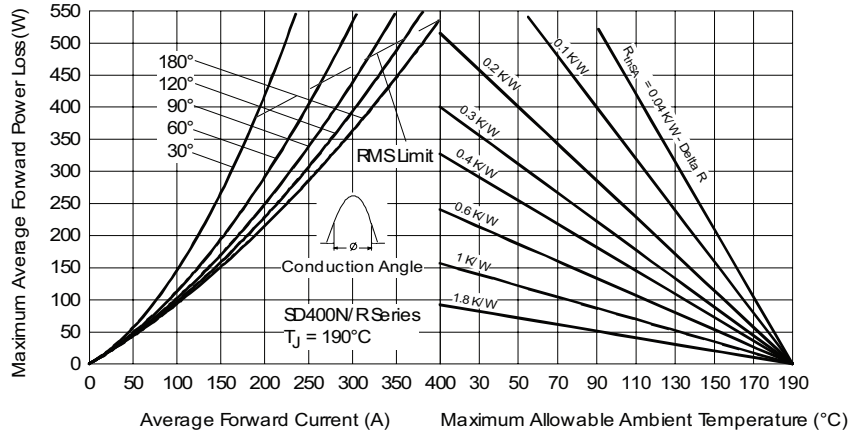

Fig. 2 - Current Ratings Characteristics

Fig. 3 - Forward Power Loss Characteristics

Document Number: 93548
Revision: 17-Apr-08

For technical questions, contact: ind-modules@vishay.com
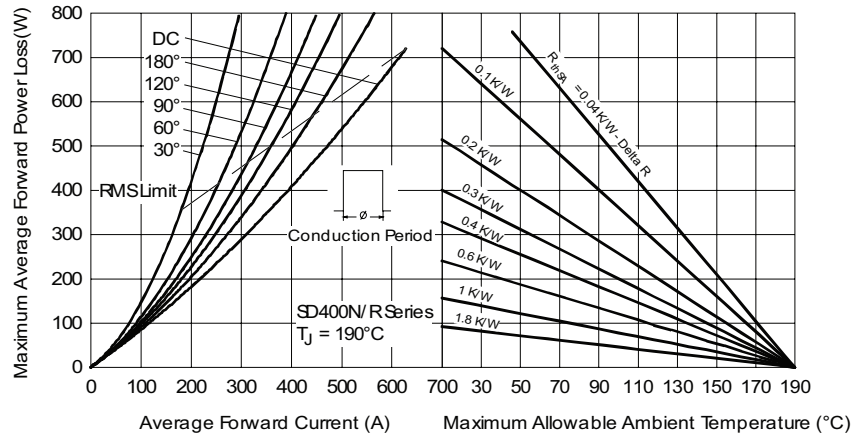
www.vishay.com
3
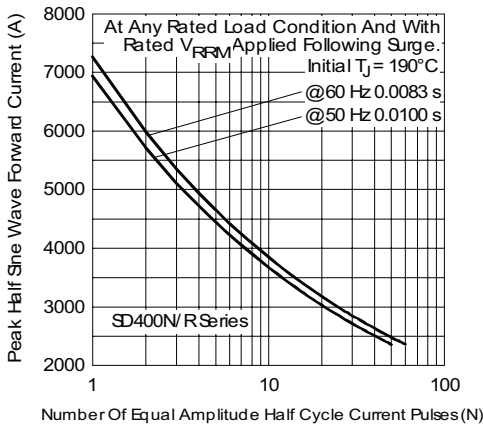
Fig. 4 - Forward Power Loss Characteristics

Fig. 5 - Maximum Non-Repetitive Surge Current
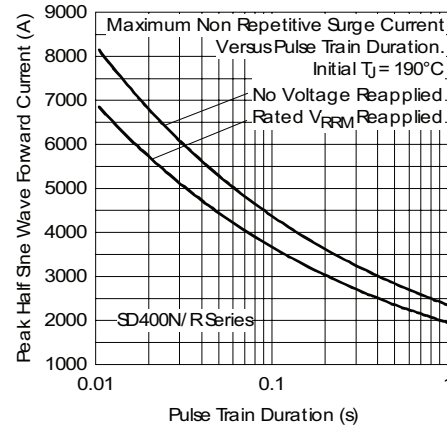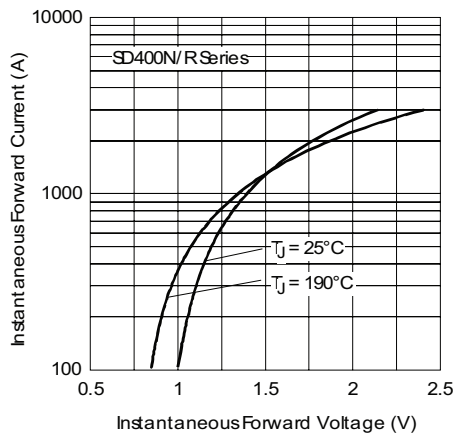

Fig. 6 - Maximum Non-Repetitive Surge Current

Fig. 7 - Forward Voltage Drop Characteristics

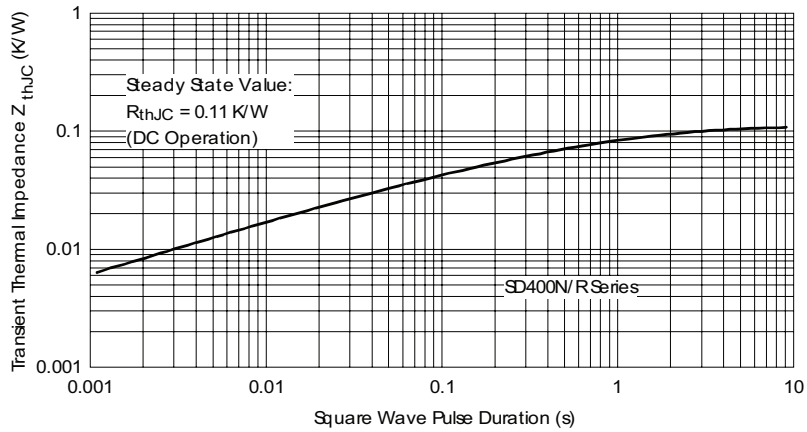Standard Recovery Diodes
(Stud Version), 400 A

Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

Device code | SD | 40 | 0 | N | 24 | P | C

① ② ③ ④ ⑤ ⑥ ⑦

1 - Diode

2 - Essential part number

3 - 0 = Standard recovery

4 - • N = Stud normal polarity (cathode to stud)

• R = Stud reverse polarity (anode to stud)

5 - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)

6 - P = Stud base DO-205AB (DO-9) 3/4" 16UNF-2A

7 - C = Ceramic housing

For metric device M16 x 1.5 contact factory

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95301

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.