

## Fast Recovery Diodes (Hockey PUK Version), 430 A



DO-200AA

### FEATURES

- High power FAST recovery diode series
- 1.0  $\mu$ s to 1.5  $\mu$ s recovery time
- High voltage ratings up to 1600 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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS  
COMPLIANT**

### PRODUCT SUMMARY

$I_{F(AV)}$	430 A
Package	DO-200AA
Circuit configuration	Single diode

### TYPICAL APPLICATIONS

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

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		430	A
	$T_{hs}$	55	°C
$I_{F(RMS)}$		675	A
	$T_{hs}$	25	°C
$I_{FSM}$	50 Hz	6180	A
	60 Hz	6470	
$I^2t$	50 Hz	191	kA <sup>2</sup> s
	60 Hz	175	
$V_{RRM}$	Range	400 to 1600	V
$t_{rr}$		1.0 to 1.5	$\mu$ s
	$T_J$	25	°C
$T_J$		- 40 to 125	

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	$V_{RRM}$ , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J = 125$ °C mA
VS-SD403C..S10C	04	400	500	35
	08	800	900	
	10	1000	1100	
VS-SD403C..S15C	12	1200	1300	
	14	1400	1500	
	16	1600	1700	



FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave		430 (210)	A
		Double side (single side) cooled		55 (75)	°C
Maximum RMS current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled		675	A
Maximum peak, one-cycle, non-repetitive forward current	$I_{FSM}$	t = 10 ms	No voltage reappplied	6180	
		t = 8.3 ms	No voltage reappplied	6470	
		t = 10 ms	100 % $V_{RRM}$ reappplied	5200	
		t = 8.3 ms	100 % $V_{RRM}$ reappplied	5445	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied	191	kA <sup>2</sup> s
		t = 8.3 ms	No voltage reappplied	175	
		t = 10 ms	100 % $V_{RRM}$ reappplied	135	
		t = 8.3 ms	100 % $V_{RRM}$ reappplied	123	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		1910	kA <sup>2</sup> √s
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.00	V
High level value of threshold voltage	$V_{F(TO)2}$	(I $> \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.20	
Low level of forward slope resistance	$r_{f1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.56	mΩ
High level of forward slope resistance	$r_{f2}$	(I $> \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.70	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1350$ A, $T_J = 25$ °C; $t_p = 10$ ms sinusoidal wave		1.83	V

RECOVERY CHARACTERISTICS								
CODE	MAXIMUM VALUE AT $T_J = 25$ °C	TEST CONDITIONS			TYPICAL VALUES AT $T_J = 125$ °C			
	$t_{rr}$ AT 25 % $I_{RRM}$ (μs)	$I_{pk}$ SQUARE PULSE (A)	dI/dt (A/μs)	$V_r$ (V)	$t_{rr}$ AT 25 % $I_{RRM}$ (μs)	$Q_{rr}$ (μC)	$I_{rr}$ (A)	
S10	1.0	750	25	- 30	2.4	52	33	
S15	1.5				2.9	90	44	

THERMAL AND MECHANICAL SPECIFICATIONS					
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, ± 10 %				4900 (500)	N (kg)
Approximate weight				70	g
Case style		See dimensions - link at the end of datasheet		DO-200AA	

$\Delta R_{thJ-hs}$ CONDUCTION						
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

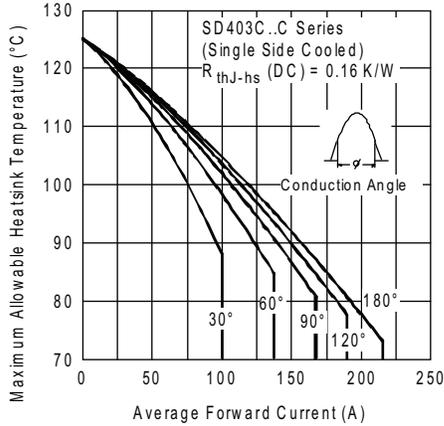


Fig. 1 - Current Ratings Characteristics

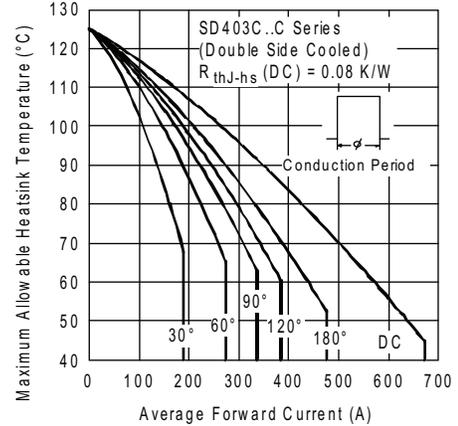


Fig. 4 - Current Ratings Characteristics

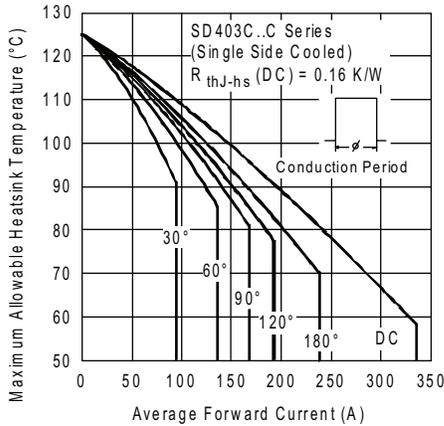


Fig. 2 - Current Ratings Characteristics

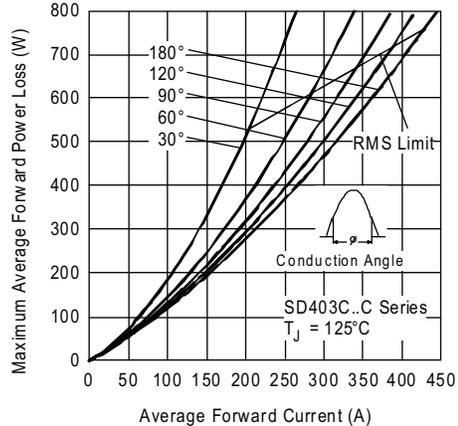


Fig. 5 - Forward Power Loss Characteristics

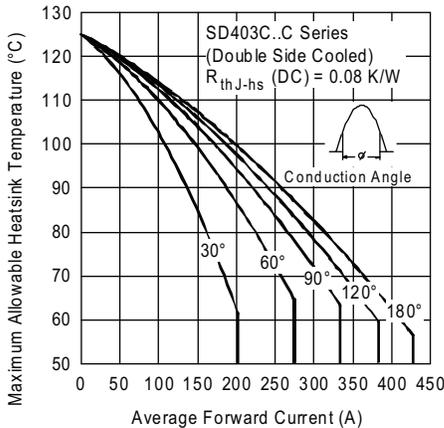


Fig. 3 - Current Ratings Characteristics

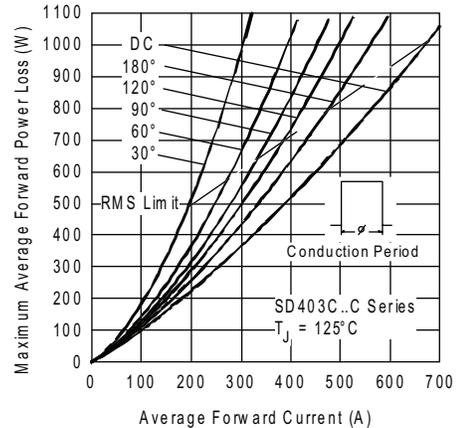


Fig. 6 - Forward Power Loss Characteristics

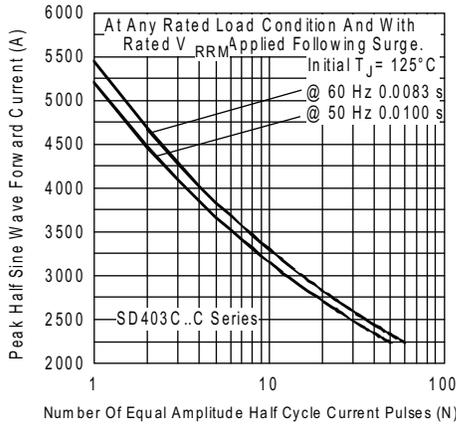


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

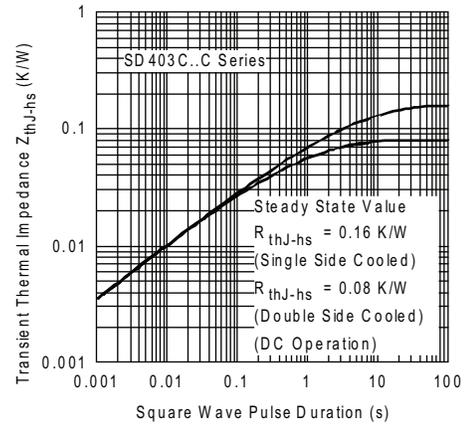


Fig. 1 - Thermal Impedance  $Z_{thJ-hs}$  Characteristics

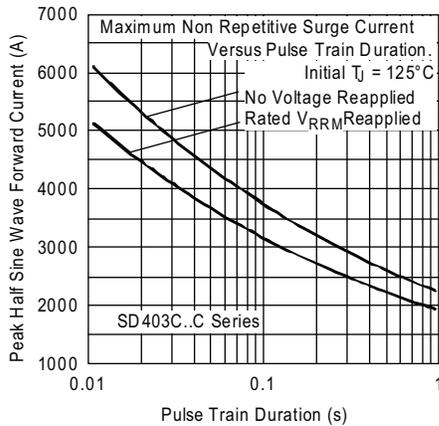


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

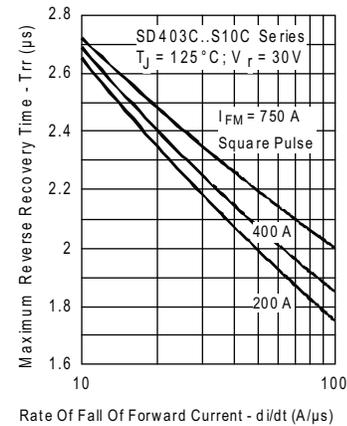


Fig. 10 - Recovery Time Characteristics

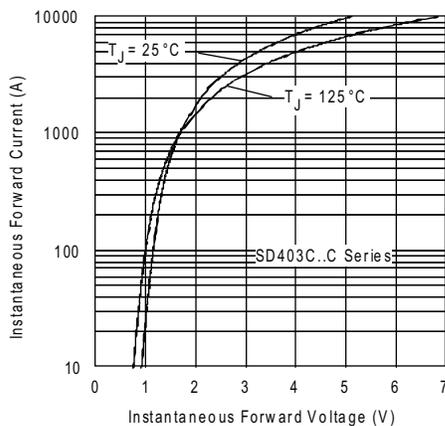


Fig. 9 - Forward Voltage Drop Characteristics

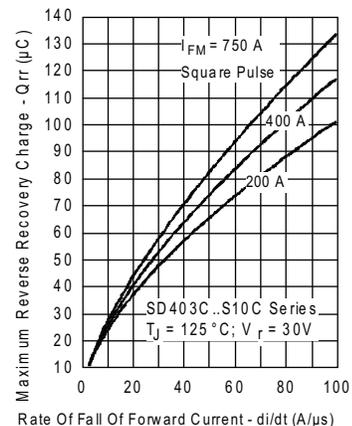


Fig. 11 - Recovery Charge Characteristics

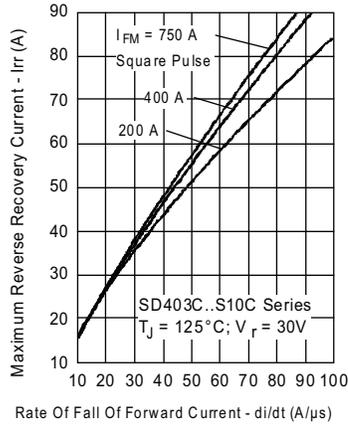


Fig. 12 - Recovery Current Characteristics

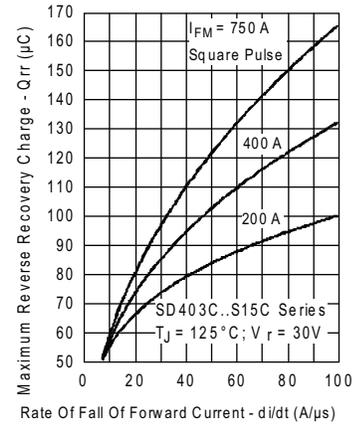


Fig. 14 - Recovery Charge Characteristics

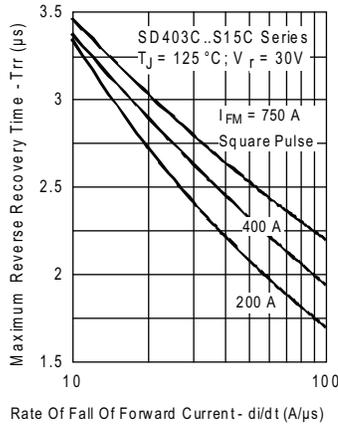


Fig. 13 - Recovery Time Characteristics

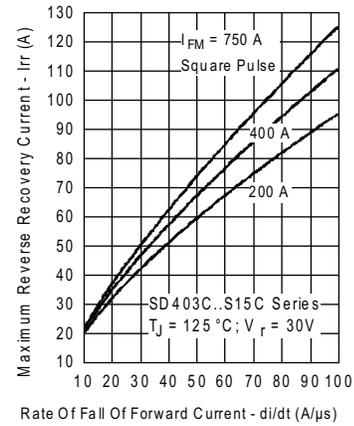


Fig. 15 - Recovery Current Characteristics

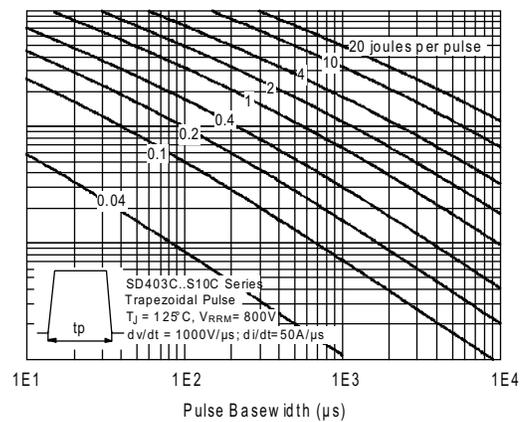
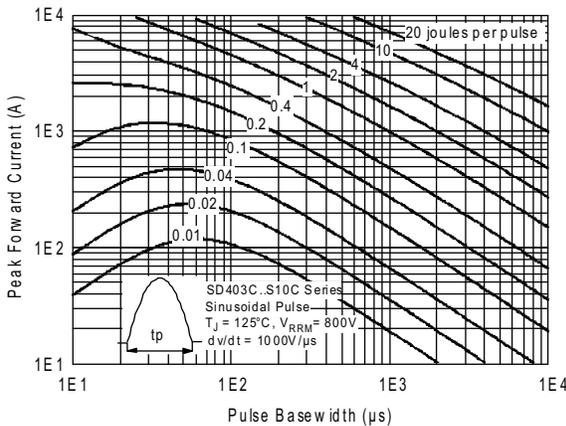


Fig. 16 - Maximum Total Energy Loss Per Pulse Characteristics

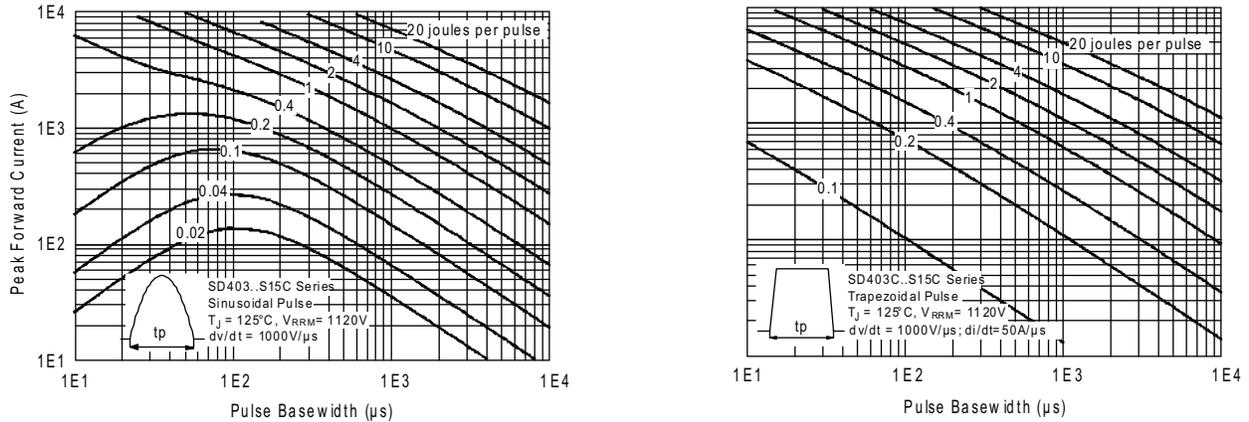


Fig. 17 - Maximum Total Energy Per Pulse Characteristics

**ORDERING INFORMATION TABLE**

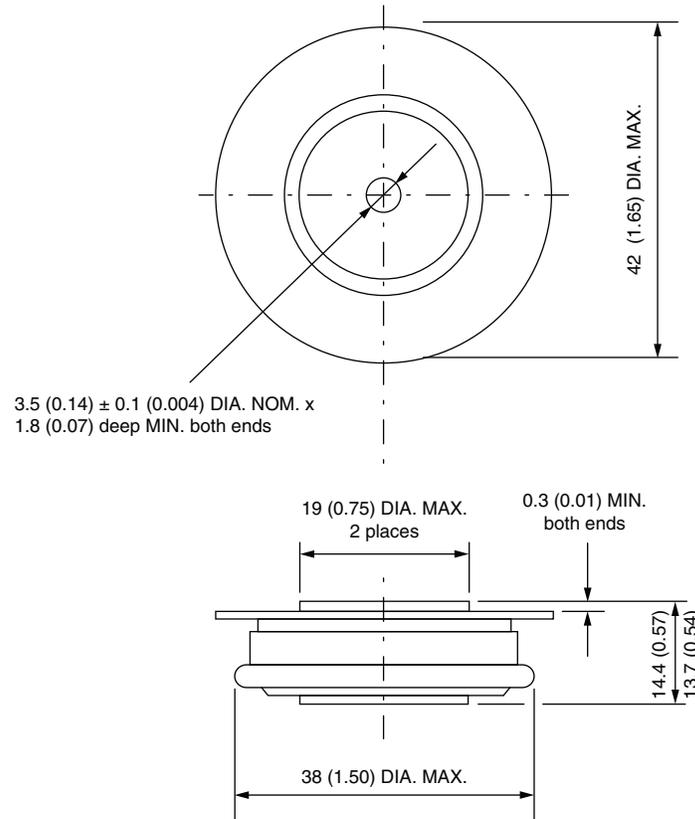
Device code	<b>VS-</b>	<b>SD</b>	<b>40</b>	<b>3</b>	<b>C</b>	<b>16</b>	<b>S15</b>	<b>C</b>
	1	2	3	4	5	6	7	8

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

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



## 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. 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.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Vishay:](#)

[VS-SD403C04S10C](#) [VS-SD403C08S10C](#) [VS-SD403C16S15C](#) [VS-SD403C12S15C](#) [VS-SD403C14S15C](#)