


Standard Diodes, 600 A (SUPER MAGN-A-PAK™ Power Modules)



SUPER MAGN-A-PAK™

FEATURES

- High current capability
- High surge capability
- High voltage ratings up to 2000 V
- 3000 V_{RMS} isolating voltage with non-toxic substrate
- Industrial standard package
- UL E78996 approved 
- Lead (Pb)-free



RoHS
COMPLIANT

TYPICAL APPLICATIONS

- Rectifying bridge for large motor drives
- Rectifying bridge for large UPS

PRODUCT SUMMARY

$I_{F(AV)}$	600 A
-------------	-------

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$		600	A
	T_C	100	°C
$I_{F(RMS)}$		942	A
	T_C	100	°C
I_{FSM}	50 Hz	19 000	A
	60 Hz	20 100	
I^2t	50 Hz	1805	kA ² s
	60 Hz	1683	
$I^2\sqrt{t}$		18 050	kA ² √s
V_{RRM}	Range	800 to 2000	V
T_{Stg}, T_J	Range	- 40 to 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 MAXIMUM mA
VSKD600..	08	800	900	50
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	

FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		600	A
				100	°C
Maximum RMS forward current	$I_{F(RMS)}$	180° conduction, half sine wave at $T_C = 100\text{ °C}$		942	A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	19.0	kA
		t = 8.3 ms		100 % V_{RRM} reapplied	
		t = 10 ms	Sinusoidal half wave, initial $T_J = T_J$ maximum		
		t = 8.3 ms		17.2	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied	1805	kA ² s
		t = 8.3 ms		100 % V_{RRM} reapplied	
		t = 10 ms	Sinusoidal half wave, initial $T_J = T_J$ maximum		
		t = 8.3 ms		1230	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied		18 050	kA ² √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		0.70	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > $\pi \times I_{F(AV)}$), $T_J = T_J$ maximum		0.77	
Low level value 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		0.28	mΩ
High level value of forward slope resistance	r_{f2}	(I > $\pi \times I_{F(AV)}$), $T_J = T_J$ maximum		0.25	
Maximum forward voltage drop	V_{FM}	$I_{pk} = 1800\text{ A}$, $T_J = 25\text{ °C}$, $t_p = 10\text{ ms}$ sine pulse		1.45	V

BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
RMS insulation voltage	V_{INS}	t = 1 s		3000	V
Maximum peak reverse and off-state leakage current	I_{RRM}	$T_J = T_J$ maximum, rated V_{RRM} applied		50	mA

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction operating and storage temperature range	T_J, T_{Stg}			- 40 to 150	°C
Maximum thermal resistance, junction to case per junction	R_{thJC}	DC operation		0.065	K/W
Maximum thermal resistance, case to heatsink	R_{thC-hs}			0.02	
Mounting torque ± 10 %	SMAP to heatsink	A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound.		6 to 8	Nm
	busbar to SMAP			12 to 15	
Approximate weight				1500	g
Case style		See dimensions - link at the end of datasheet		SUPER MAGN-A-PAK	



ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.009	0.006	$T_J = T_{J \text{ maximum}}$	K/W
120°	0.011	0.011		
90°	0.014	0.015		
60°	0.021	0.022		
30°	0.037	0.038		

Note

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

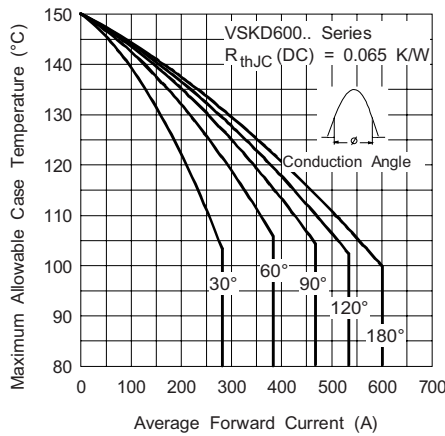


Fig. 1 - Current Ratings Characteristics

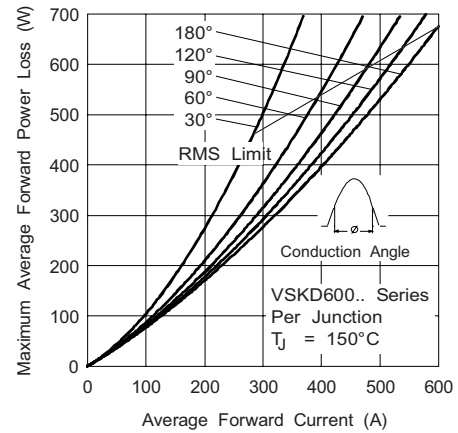


Fig. 3 - Forward Power Loss Characteristics

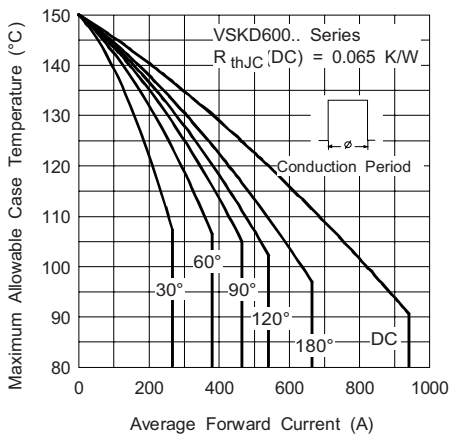


Fig. 2 - Current Ratings Characteristics

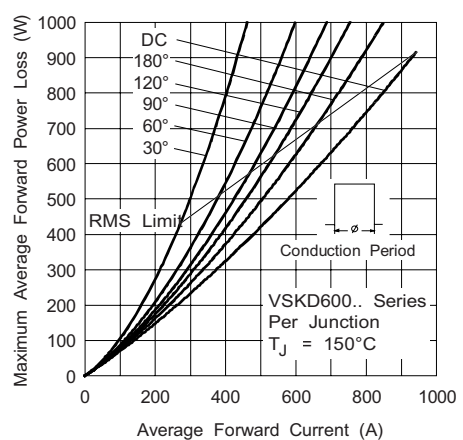


Fig. 4 - Forward Power Loss Characteristics

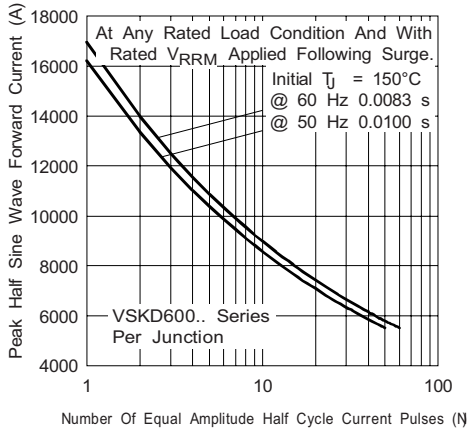


Fig. 5 - Maximum Non-Repetitive Surge Current

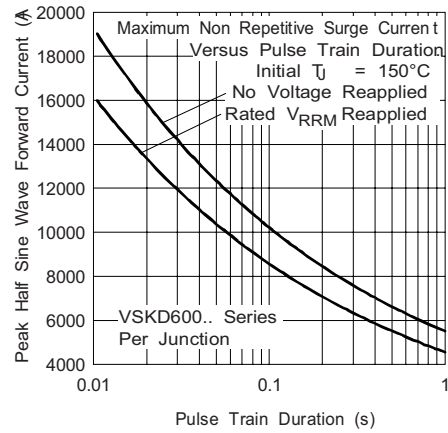


Fig. 6 - Maximum Non-Repetitive Surge Current

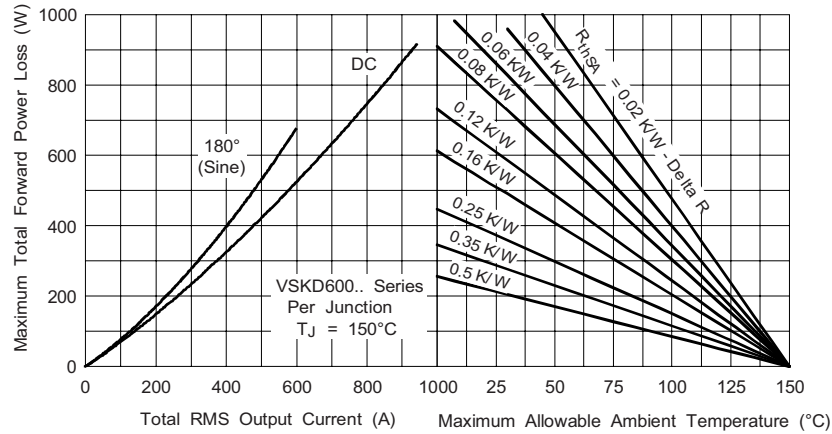


Fig. 7 - Forward Power Loss Characteristics

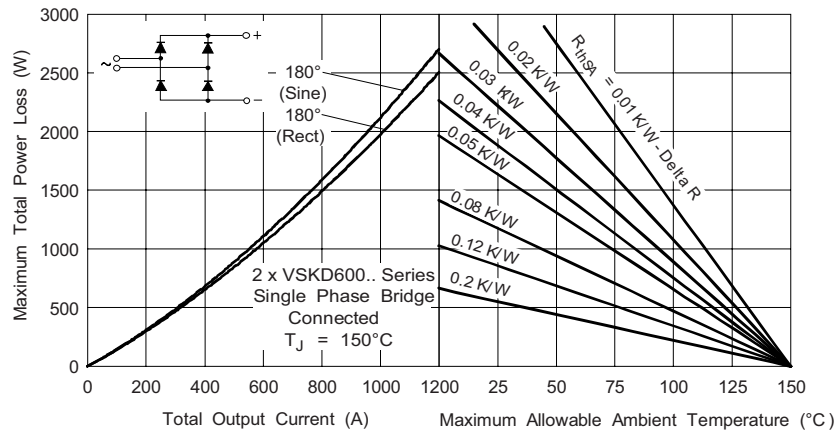


Fig. 8 - Forward Power Loss Characteristics

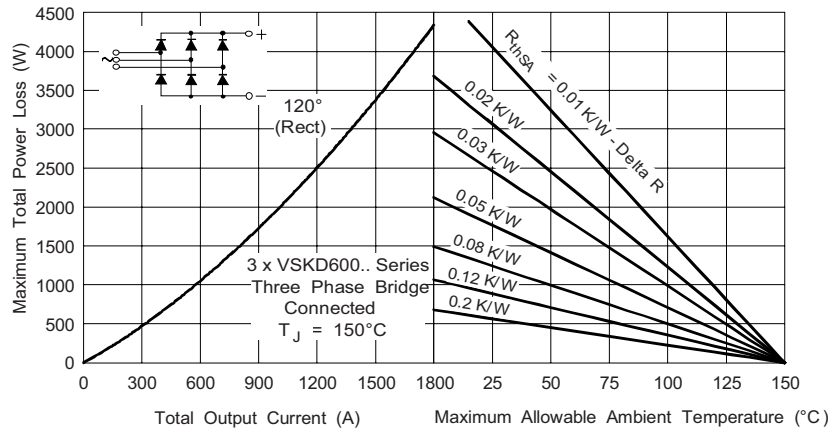


Fig. 9 - Forward Power Loss Characteristics

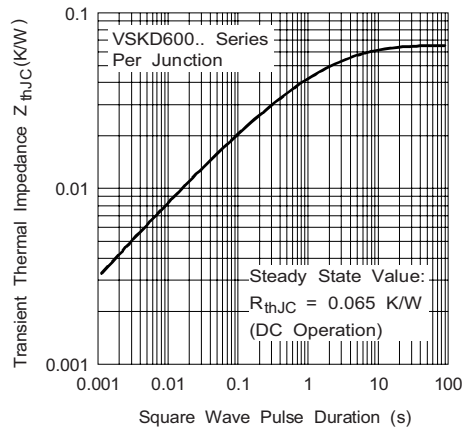


Fig. 10 - Thermal Impedance $Z_{\theta JC}$ Characteristic

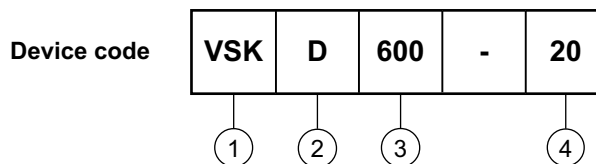
VSKD600.. Series

Vishay High Power Products

Standard Diodes, 600 A
(SUPER MAGN-A-PAK™ Power Modules)

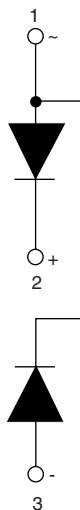


ORDERING INFORMATION TABLE



- 1** - Module type
- 2** - Circuit configuration D = 2 diodes in series
- 3** - Current rating
- 4** - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)

CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95088



Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.