

AAP Gen 7 (TO-240AA) Power Modules Schottky Rectifier, 200 A



AAP Gen 7 (TO-240AA)

FEATURES

- 175 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Low thermal resistance
- UL approved file E78996 
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

BENEFITS

- Excellent thermal performances obtained by the usage of exposed direct bonded copper substrate
- High surge capability
- Easy mounting on heatsink

ELECTRICAL DESCRIPTION / APPLICATIONS

The VS-VSKCS203.. Schottky rectifier common cathode has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in high current switching power supplies, plating power supplies, UPS systems, converters, freewheeling diodes, welding, and reverse battery protection.

PRIMARY CHARACTERISTICS	
I _{F(AV)}	200 A
V _R	100 V
Package	AAP Gen 7 (TO-240AA)
Circuit configuration	Two diodes common cathode

MECHANICAL DESCRIPTION

The AAP Gen 7, new generation of ADD-A-PAK module, combines the excellent thermal performances obtained by the usage of exposed direct bonded copper substrate, with advanced compact simple package solution and simplified internal structure with minimized number of interfaces.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}	Rectangular waveform	200	A
V _{RRM}		100	V
I _{FSM}	t _p = 5 μs sine	12 800	A
V _F	100 A _{pk} , T _J = 125 °C	0.87	V
T _J	Range	-55 to +175	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-VSKCS203/100	UNITS
Maximum DC reverse voltage	V _R	100	V
Maximum working peak reverse voltage	V _{RWM}		

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	I _{F(AV)}	50 % duty cycle at T _C = 121 °C, rectangular waveform		200	A
per module per leg				100	
Maximum peak one cycle non-repetitive surge current	I _{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V _{RRM} applied	12 800	
		10 ms sine or 6 ms rect. pulse		1700	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 5.5 A, L = 1 mH		15	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T _J maximum V _A = 1.5 x V _R typical		1	A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V _{FM}	100 A	T _J = 25 °C	0.99	V
		200 A		1.34	
		100 A	T _J = 125 °C	0.87	
		200 A		1.09	
Maximum reverse leakage current	I _{RM}	T _J = 25 °C	V _R = Rated V _R	3	mA
		T _J = 125 °C		65	
Maximum junction capacitance	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz), 25 °C		2750	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body		7.0	nH
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/μs
Maximum RMS insulation voltage	V _{INS}	50 Hz		3000 (1 min)	V
				3600 (1 s)	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T _J , T _{Stg}		-55 to +175	°C
Maximum thermal resistance, junction to case per leg	R _{thJC}	DC operation	0.52	°C/W
Typical thermal resistance, case to heatsink per module	R _{thCS}		0.1	
Approximate weight			75	g
			2.7	oz.
Mounting torque ± 10 % to heatsink busbar		A mounting compound is recommended and the torque should be rechecked after a period of 3 h to allow for the spread of the compound.	4	Nm
			3	
Case style		JEDEC®	TO-240AA compatible	

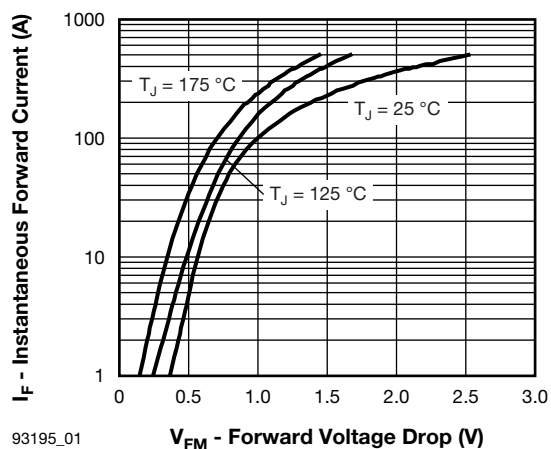


Fig. 1 - Maximum Forward Voltage Drop Characteristics

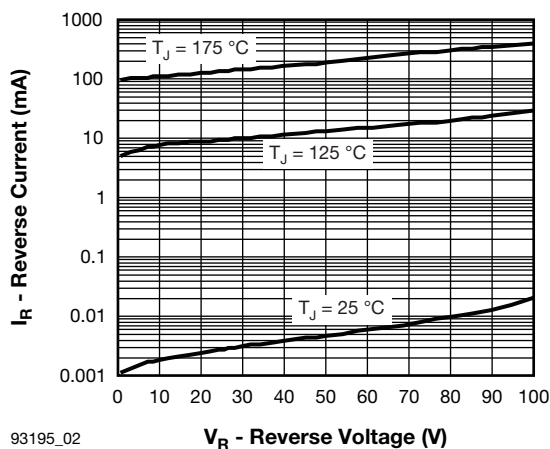


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

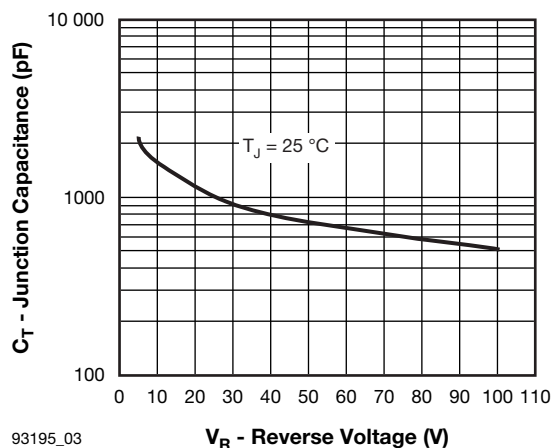
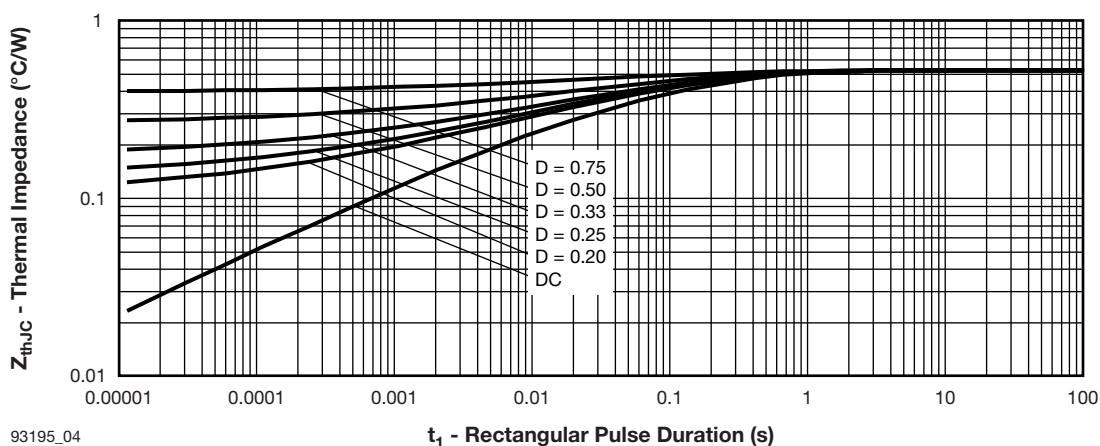
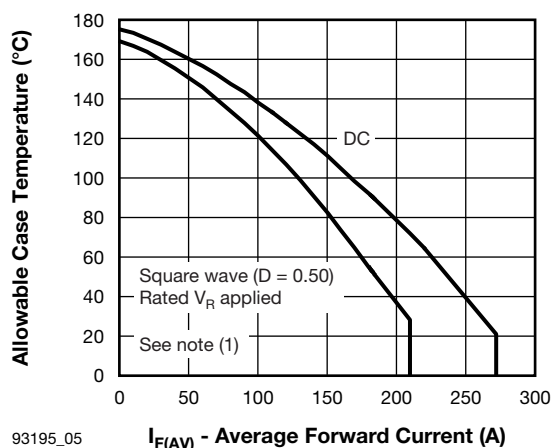


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

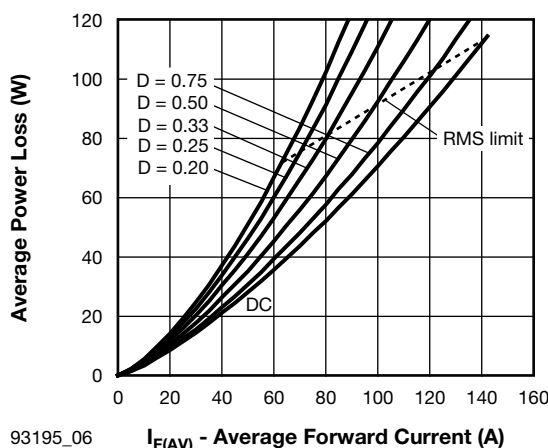

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



93195_05

 $I_{F(AV)}$ - Average Forward Current (A)

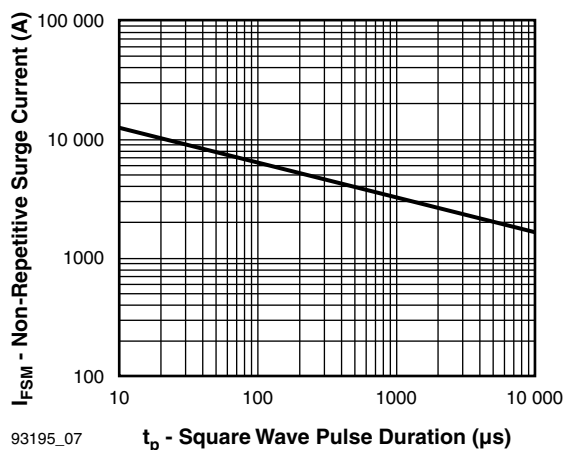
Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current



93195_06

 $I_{F(AV)}$ - Average Forward Current (A)

Fig. 6 - Forward Power Loss Characteristics



93195_07

 t_p - Square Wave Pulse Duration (μ s)

Fig. 7 - Maximum Non-Repetitive Surge Current

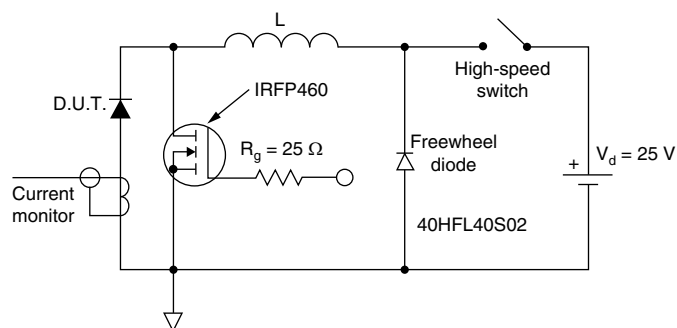


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

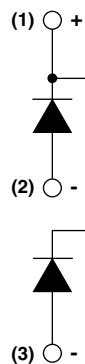


ORDERING INFORMATION TABLE

Device code	VS-VS	KC	S	20	3	/	100
	1	2	3	4	5		6

- 1** - VS-VS = Vishay Semiconductors product
- 2** - Circuit configuration:
KC = ADD-A-PAK - 2 diodes / common cathode
- 3** - S = Schottky diode
- 4** - Average current rating (20 = 200 A)
- 5** - Product silicon identification
- 6** - Voltage rating (100 = 100 V)

CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95369

ADD-A-PAK Generation VII - Diode

DIMENSIONS in millimeters (inches)





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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.