

ADD-A-PAK Generation VII Power Modules Schottky Rectifier, 100 A



ADD-A-PAK

PRODUCT SUMMARY				
I _{F(AV)} 100 A				
V _R	45 V			
Package	AAP GEN VII (TO-240AA)			
Circuit	Two diodes in series			

MECHANICAL DESCRIPTION

The ADD-A-PAK generation VII, 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.

FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Low thermal resistance
- UL pending
- · Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishav.com/doc?99912

BENEFITS

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

ELECTRICAL DESCRIPTION

The VS-VSKDS200/045 Schottky rectifier doubler module has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °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.

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	VALUES	UNITS		
I _{F(AV)}	Rectangular waveform	100	Α		
V _{RRM}		45	V		
I _{FSM}	t _p = 5 μs sine	12 800	Α		
V _F	100 A _{pk} , T _J = 125 °C	0.73	V		
TJ	Range	-55 to +150	°C		

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-VSKDS200/045	UNITS	
Maximum DC reverse voltage	V_{R}	45	V	
Maximum working peak reverse voltage	V_{RWM}	45	V	



ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current per leg	I _{F(AV)}	50 % duty cycle at T _C = 91 °C, rectangular waveform		100	
Maximum peak one cycle		5 µs sine or 3 µs rect. pulse	Following any rated	12 800	Α
non-repetitive surge current	IFSM	10 ms sine or 6 ms rect. pulse	rated V _{RRM} applied	1700	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 19 A, L = 1 mH		180	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		Α	

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Marine of the second selection of the selection of the second selection of the	V _{FM}	100 A	T _J = 25 °C	0.67	V
		200 A		0.92	
Maximum forward voltage drop		100 A	T _J = 125 °C	0.73	
		200 A		1.14	
Maximum reverse leakage current	I _{RM}	T _J = 25 °C	V _R = Rated V _R	10	mA
Maximum reverse leakage current		T _J = 125 °C		800	IIIA
Maximum junction capacitance	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C		5200	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) 3600 (1 s)	V

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range)	T _J , T _{Stg}		-55 to +150	°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
Approximate weight				2.7	oz.
Mounting torque ± 10 %	to heatsink		A mounting compound is recommended and the torque should be rechecked after a period of 3 h to allow for the	4	Nm
.	busbar		spread of the compound.	3	INIII
Case style	•		JEDEC®	TO-240AA co	mpatible

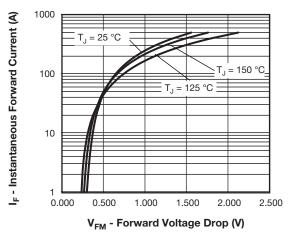


Fig. 1 - Maximum Forward Voltage Drop Characteristics

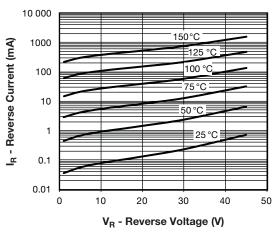


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

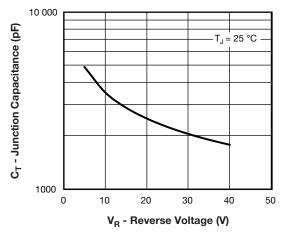


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

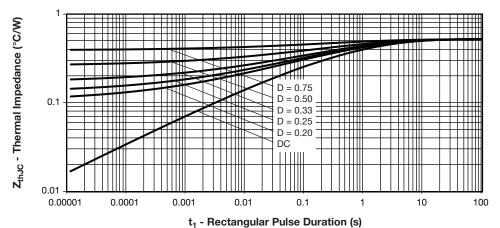


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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Vishay Semiconductors

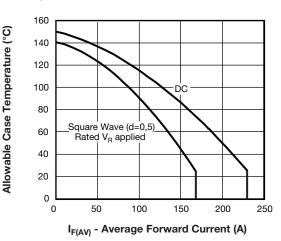
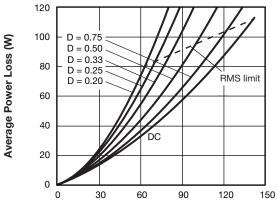


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current



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

Fig. 6 - Forward Power Loss Characteristics

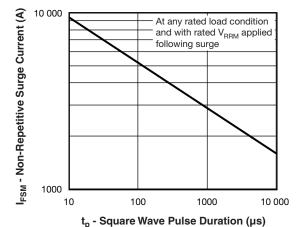


Fig. 7 - Maximum Non-Repetitive Surge Current

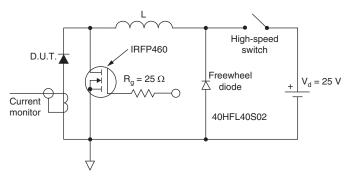
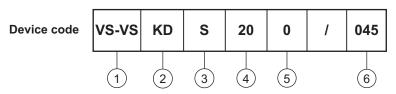


Fig. 8 - Unclamped Inductive Test Circuit

Note

Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$; $Pd = Forward power loss = I_{F(AV)} \times V_{FM} at (I_{F(AV)}/D)$ (see fig. 6); $Pd_{REV} = Inverse power loss = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80 \%$ rated V_R

ORDERING INFORMATION TABLE



1 - Vishay Semiconductors product

2 - Circuit configuration:

KD = ADD-A-PAK - 2 diodes in series

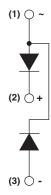
3 - S = Schottky diode

4 - Average current rating (20 = 200 A)

5 - Product silicon identification

6 - Voltage rating (045 = 45 V)

CIRCUIT CONFIGURATION

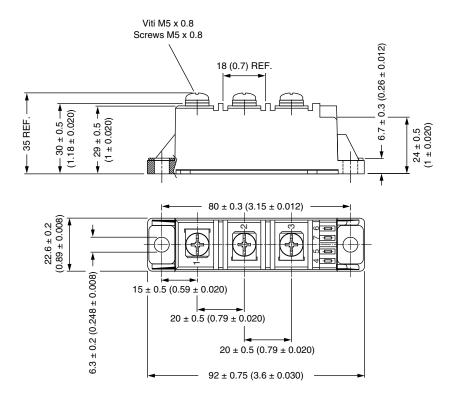


LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95369			



ADD-A-PAK Generation VII - Diode

DIMENSIONS in millimeters (inches)





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