

ADD-A-PAK Generation VII Power Modules Schottky Rectifier, 400 A



PRODUCT SUMMARY				
I _{F(AV)}	400 A			
V_{R}	45 V			
Package	ADD-A-PAK			
Circuit	Two diodes common cathodes			

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 approved file E78996
- · Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see www.vishay.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-VSKCS400/045 Schottky rectifier common cathode 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	400	А			
V _{RRM}		45	V			
I _{FSM}	t _p = 5 μs sine	29 000	А			
V _F	200 A _{pk} , T _J = 125 °C	0.73	V			
TJ	Range	-55 to 150	°C			

VOLTAGE RATINGS					
PARAMETER	SYMBOL	VS-VSKCS400/045	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	per module	L CO % distriction of the Company of			400	
forward current	per leg	I _{F(AV)}	(AV) 50 % duty cycle at T _C = 91 °C, rectangular waveform		200	
Maximum peak one cycle		5 μs sine or 3 μs rect. pulse	Following any rated load condition and with	29 000	Α	
non-repetitive surge current		I _{FSM}	10 ms sine or 6 ms rect. pulse	rated V _{RRM} applied	3400	
Non-repetitive avalanche energ	у	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		40	А

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
	V _{FM}	200 A	T _J = 25 °C	0.67	V
Maximum forward voltage drop		400 A		0.92	
Waximum forward voltage drop		200 A	T _J = 125 °C	0.73	
		400 A		1.14	
Marin and an Indiana and	I _{RM}	T _J = 25 °C	V _R = Rated V _R	20	mA
Maximum reverse leakage current		T _J = 125 °C		1.2	Α
Maximum junction capacitance	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C		10 300	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body		5.0	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	0.26	°C/W
Typical thermal resistance, case to heatsink per module		R _{thCS}		0.1	C/VV
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

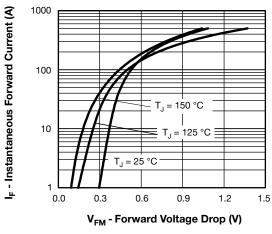


Fig. 1 - Maximum Forward Voltage Drop Characteristics

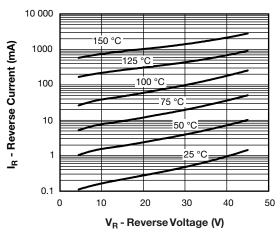


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

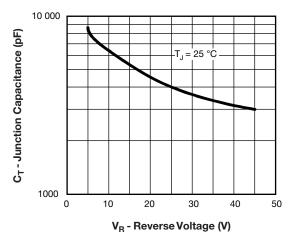


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

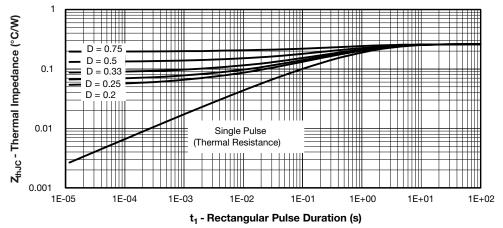


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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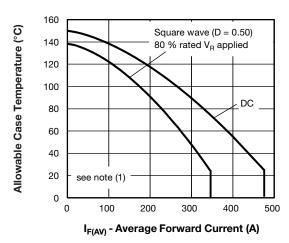


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

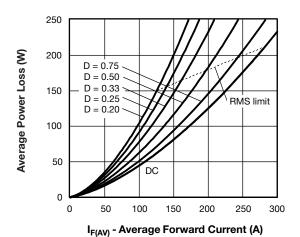
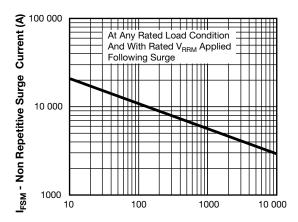


Fig. 6 - Forward Power Loss Characteristics



 $t_{\textrm{p}}$ - Square Wave Pulse Duration (µs)

Fig. 7 - Maximum Non-Repetitive Surge Current

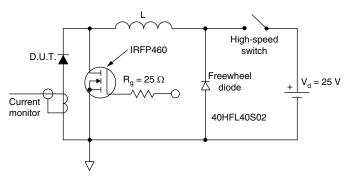


Fig. 8 - Unclamped Inductive Test Circuit

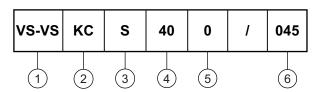
Note

 $\begin{array}{l} \text{(1)} \ \ \text{Formula used: } T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}; \\ Pd = \text{Forward power loss} = I_{F(AV)} \times V_{FM} \ \text{at } (I_{F(AV)}/D) \ \text{(see fig. 6)}; \\ Pd_{REV} = \text{Inverse power loss} = V_{R1} \times I_R \ \text{(1 - D)}; \ I_R \ \text{at } V_{R1} = 80 \ \% \ \text{rated } V_R \ \text{(1 - D)}; \\ Pd_{REV} = I_{R1} \times I_R \ \text{(1 - D)}; \ I_R \ \text{(2 - D)}; \\ Pd_{REV} = I_{R1} \times I_R \ \text{(2 - D)}; \\ Pd_{REV} =$



ORDERING INFORMATION TABLE

Device code



1 - VS-VS = Vishay Semiconductors product

2 - Circuit configuration:

KC = ADD-A-PAK - 2 diodes/common cathode

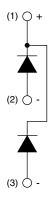
3 - S = Schottky diode

4 - Average rating (x 10)

Product silicon identification

6 - Voltage rating (045 = 45 V)

CIRCUIT CONFIGURATION

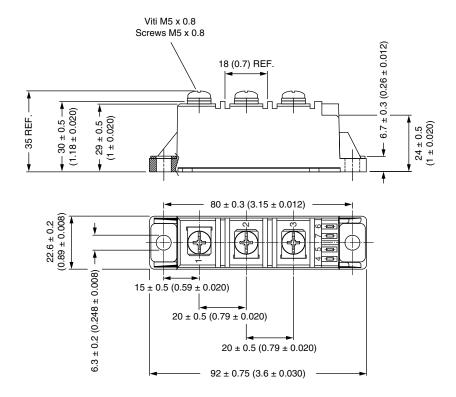


LINKS TO RELATED DOCUMENTS			
Dimensions	www.vishay.com/doc?95369		



ADD-A-PAK Generation VII - Diode

DIMENSIONS in millimeters (inches)





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