

ADD-A-PAK Generation VII Power Modules Schottky Rectifier, 200 A


ADD-A-PAK

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



BENEFITS

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

ELECTRICAL DESCRIPTION

The 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.

PRODUCT SUMMARY	
$I_{F(AV)}$	200 A
V_R	100 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.

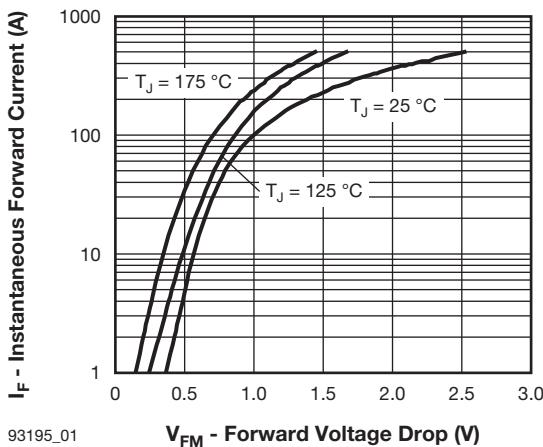
MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	200	A
V_{RRM}		100	V
I_{FSM}	$t_p = 5 \mu s$ sine	12 800	A
V_F	$100 A_{pk}$, $T_J = 125^\circ C$	0.87	V
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	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 $T_C = 121^\circ\text{C}$, rectangular waveform		200	A	
				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}	$T_J = 25^\circ\text{C}$, $I_{AS} = 5.5 \text{ A}$, $L = 1 \text{ mH}$		15	mJ	
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		1	A	

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	V_{FM}	100 A	$T_J = 25^\circ\text{C}$	0.99	V	
		200 A		1.34		
		100 A	$T_J = 125^\circ\text{C}$	0.87		
		200 A		1.09		
Maximum reverse leakage current	I_{RM}	$T_J = 25^\circ\text{C}$	$V_R = \text{Rated } V_R$	3	mA	
		$T_J = 125^\circ\text{C}$		65		
Maximum junction capacitance	C_T	$V_R = 5 \text{ V}_{\text{DC}}$ (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	$\text{V}/\mu\text{s}$	
Maximum RMS insulation voltage	V_{INS}	50 Hz		3000 (1 min) 3600 (1 s)	V	

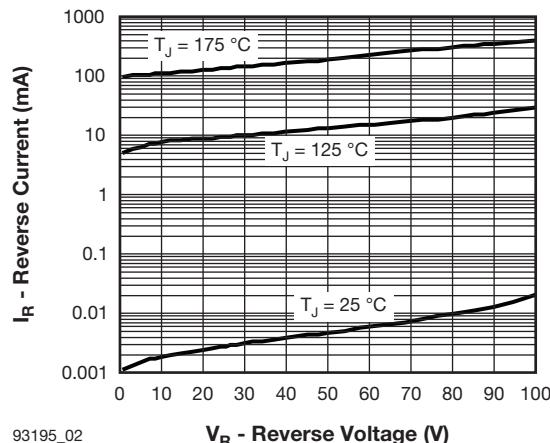
THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	T_J , T_{Stg}			- 55 to 175	$^\circ\text{C}$
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		0.52	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink per module	R_{thCS}			0.1	
Approximate weight				75	g
				2.7	oz.
Mounting torque $\pm 10\%$	to heatsink	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
	busbar			3	
Case style		JEDEC		TO-240AA compatible	



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 V_{FM} - Forward Voltage Drop (V)

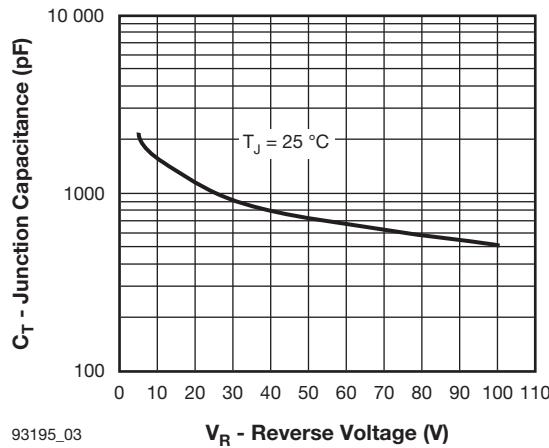
Fig. 1 - Maximum Forward Voltage Drop Characteristics



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 V_R - Reverse Voltage (V)

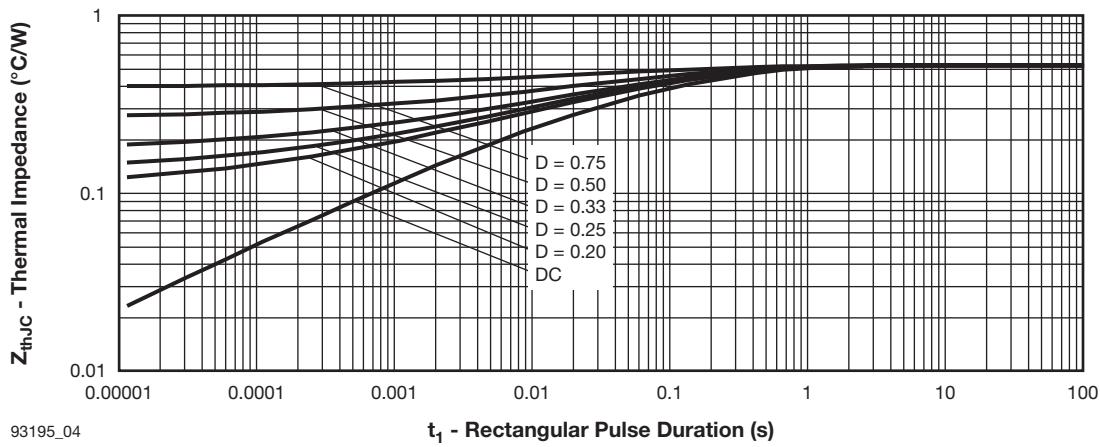
Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



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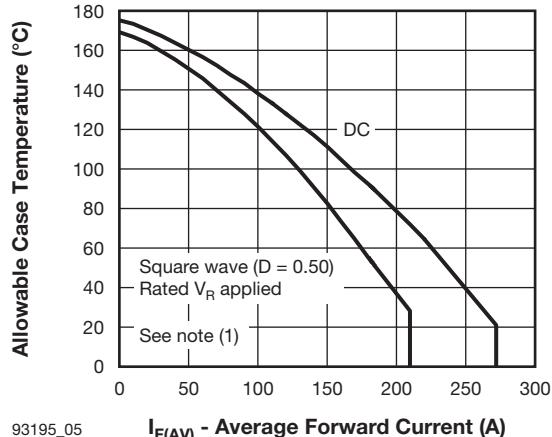
 V_R - Reverse Voltage (V)

Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



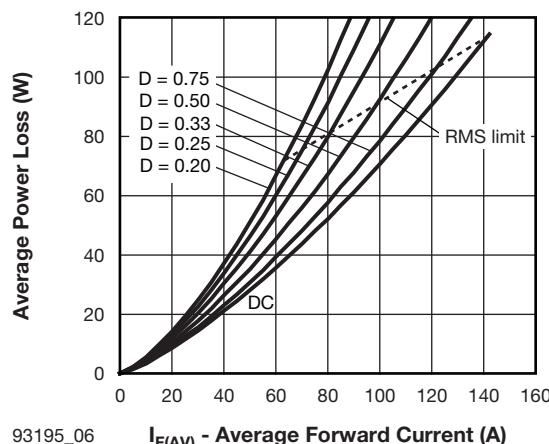
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Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



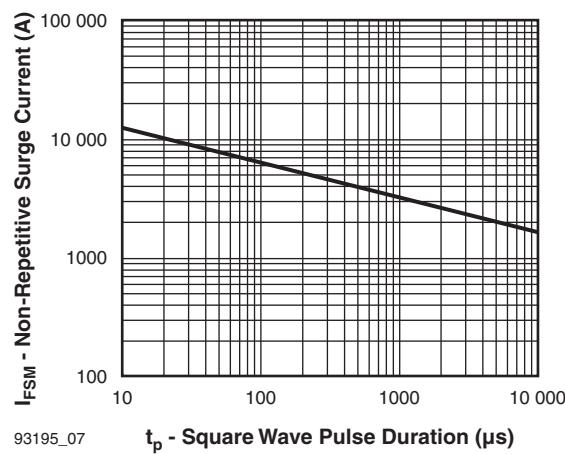
93195_05 **$I_{F(AV)}$ - Average Forward Current (A)**

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



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Fig. 7 - Maximum Non-Repetitive Surge Current

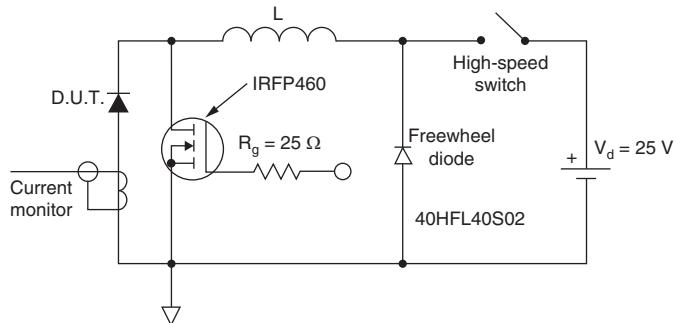


Fig. 8 - Unclamped Inductive Test Circuit

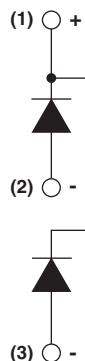
Note

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

ORDERING INFORMATION TABLE

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

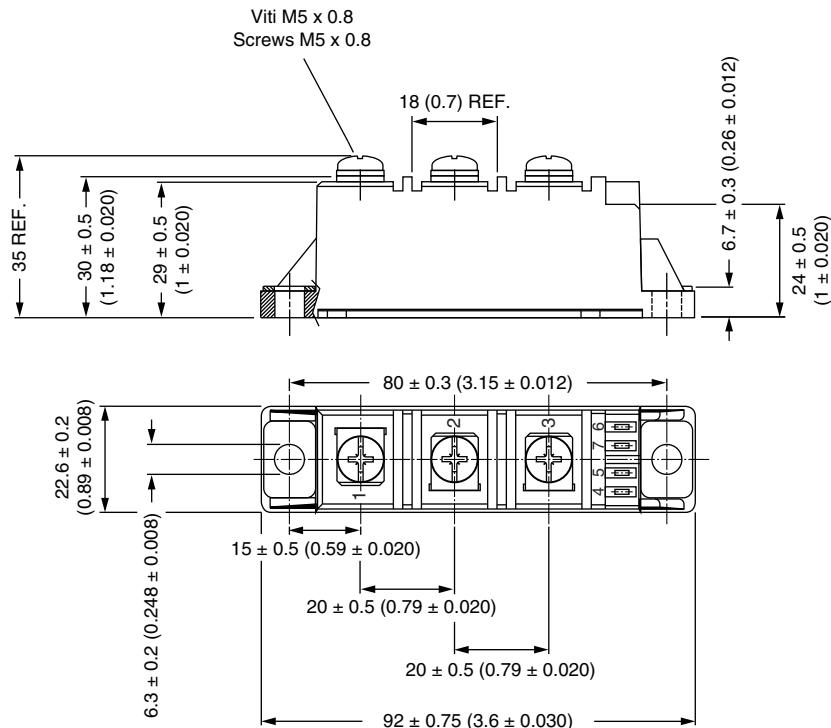
- 1** - Vishay Semiconductors product
- 2** - Circuit configuration:
KC = ADD-A-PAK - 2 diodes/common cathode
- 3** - S = Schottky diode
- 4** - Average current rating (20 = 200 A)
- 5** - Product silicon identification
- 6** - Voltage rating (100 = 100 V)

CIRCUIT CONFIGURATION


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

ADD-A-PAK Generation VII - Diode

DIMENSIONS in millimeters (inches)



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