

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



ADD-A-PAK

PRODUCT SUMMARY

$I_{F(AV)}$	400 A
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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 
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified for industrial level


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

The VSKCS408/060 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	A
V_{RRM}		60	V
I_{FSM}	$t_p = 5 \mu s$ sine	25 500	A
V_F	200 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.71	V
T_J	Range	- 55 to 150	$^\circ\text{C}$

VOLTAGE RATINGS

PARAMETER	SYMBOL	VSKCS408/060	UNITS
Maximum DC reverse voltage	V_R	60	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 $T_C = 102\text{ }^\circ\text{C}$, rectangular waveform		400	A
				200	
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	25 500	
		10 ms sine or 6 ms rect. pulse		3300	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25\text{ }^\circ\text{C}$, $I_{AS} = 5.5\text{ A}$, $L = 1\text{ mH}$		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}	200 A	$T_J = 25\text{ }^\circ\text{C}$	0.74	V
		400 A		1.09	
		200 A	$T_J = 125\text{ }^\circ\text{C}$	0.71	
		400 A		1.02	
Maximum reverse leakage current	I_{RM}	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	2.2	mA
		$T_J = 125\text{ }^\circ\text{C}$		650	
Maximum junction capacitance	C_T	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		11 000	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)	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 150	$^\circ\text{C}$
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		0.26	$^\circ\text{C/W}$
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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Vishay Semiconductors

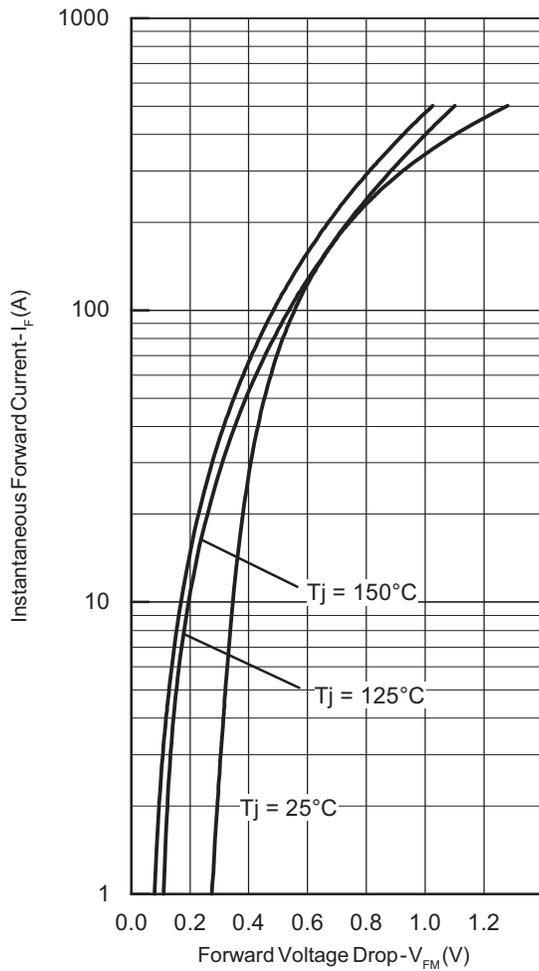


Fig. 1 - Maximum Forward Voltage Drop Characteristics

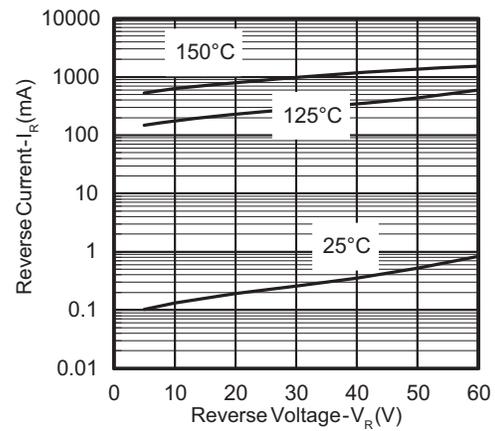


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

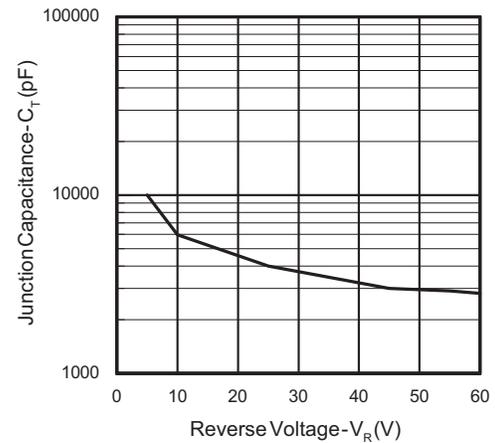


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

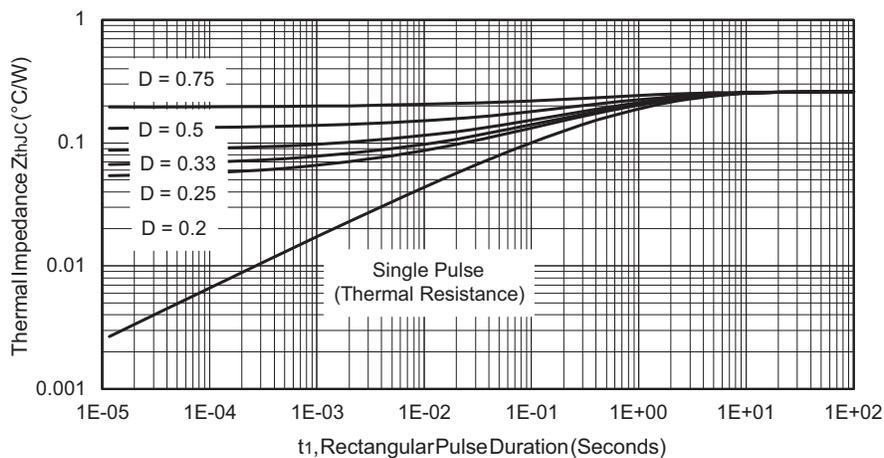


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

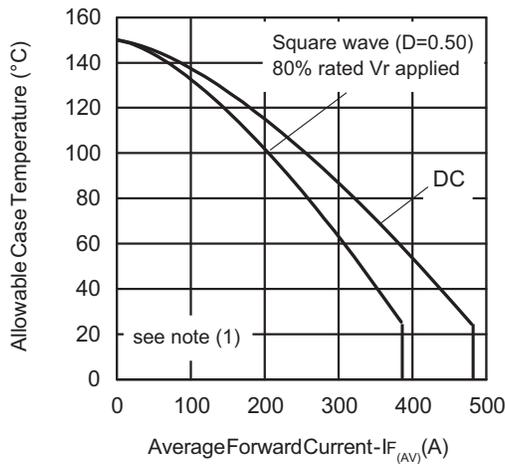


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

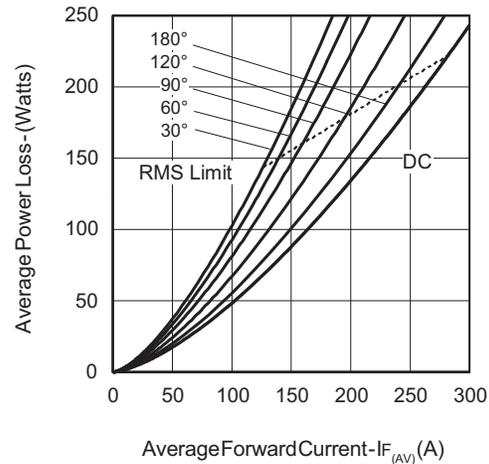


Fig. 6 - Forward Power Loss Characteristics

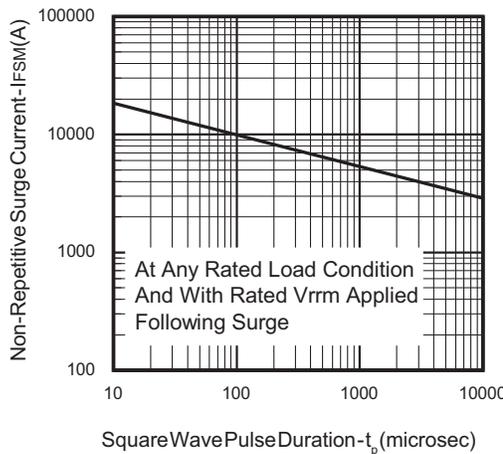


Fig. 7 - Maximum Non-Repetitive Surge Current

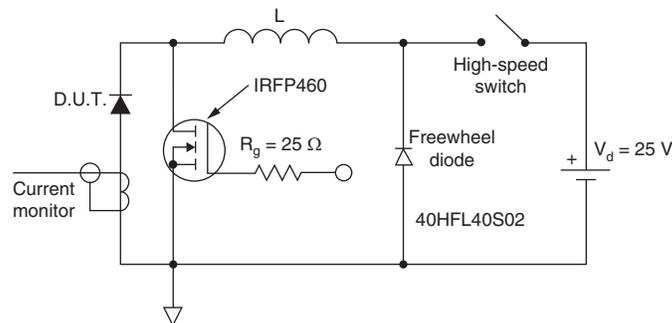
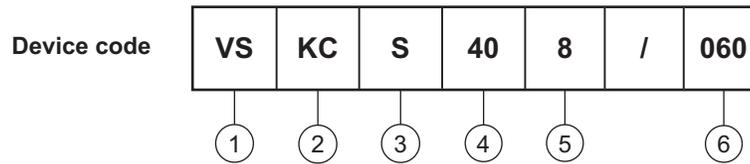


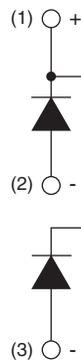
Fig. 8 - Unclamped Inductive Test Circuit

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


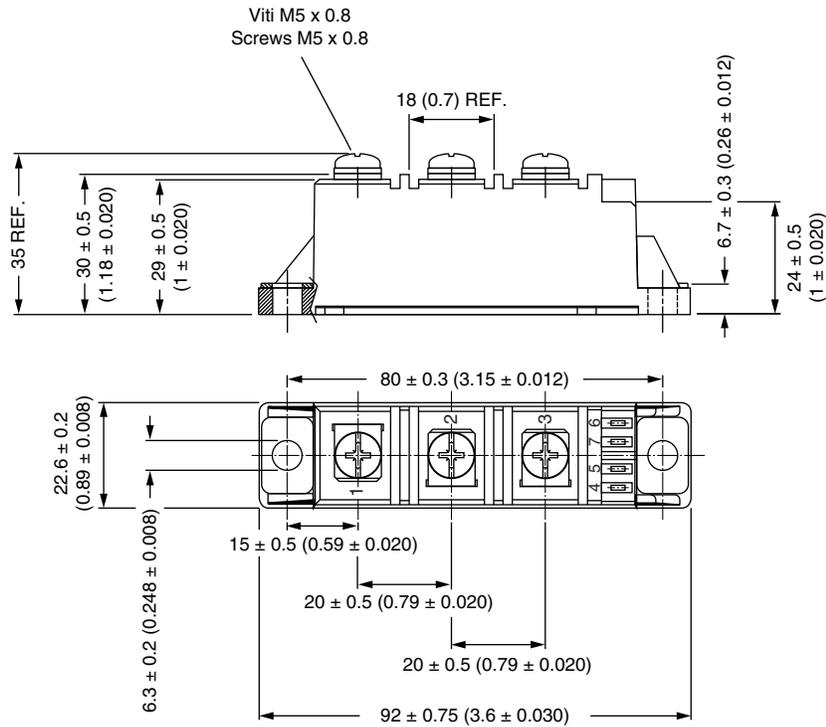
- 1** - Vishay Semiconductors product
- 2** - Circuit configuration:
KC = ADD-A-PAK - 2 diodes/common cathode
- 3** - S = Schottky diode
- 4** - Average rating (x 10)
- 5** - Product silicon identification
- 6** - Voltage rating (060 = 60 V)

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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