

## ADD-A-PAK Generation VII Power Modules Standard Diodes, 80 A



ADD-A-PAK

### PRODUCT SUMMARY

$I_{F(AV)}$	80 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

- High voltage
- Industrial standard package
- UL pending
- Low thermal resistance
- 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
- Up to 1600 V
- High surge capability
- Easy mounting on heatsink

### ELECTRICAL DESCRIPTION

These modules are intended for general purpose high voltage applications such as high voltage regulated power supplies, lighting circuits, temperature and motor speed control circuits, UPS and battery charger.

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	110 °C	80	A
$I_{F(RMS)}$		126	
$I_{FSM}$	50 Hz	1500	
	60 Hz	1570	
$I^2t$	50 Hz	11.25	kA <sup>2</sup> s
	60 Hz	10.26	
$I^2\sqrt{t}$		112.5	kA <sup>2</sup> √s
$V_{RRM}$	Range	400 to 1600	V
$T_J$		- 40 to 150	°C
$T_{Stg}$			



## ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I <sub>RRM</sub> MAXIMUM AT T <sub>J</sub> = 150 °C mA
VSK.71	04	400	500	10
	06	600	700	
	08	800	900	
	10	1000	1100	
	12	1200	1300	
	14	1400	1500	
	16	1600	1700	

FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current at case temperature	I <sub>F(AV)</sub>	180° conduction, half sine wave		80	A
				110	°C
Maximum RMS forward current	I <sub>F(RMS)</sub>	DC at 90 °C case temperature		126	
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reappplied	Sinusoidal half wave, initial T <sub>J</sub> = T <sub>J</sub> maximum	A
		t = 8.3 ms			
		t = 10 ms	100 % V <sub>RRM</sub> reappplied		
		t = 8.3 ms			
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reappplied	11.25	kA <sup>2</sup> s
		t = 8.3 ms			
		t = 10 ms	100 % V <sub>RRM</sub> reappplied	7.95	
		t = 8.3 ms		7.23	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reappplied		112.5	kA <sup>2</sup> √s
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum		0.73	V
High level value of threshold voltage	V <sub>F(TO)2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum		0.83	
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum		3.22	mΩ
High level value of forward slope resistance	r <sub>f2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum		2.89	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>FM</sub> = π × I <sub>F(AV)</sub> , T <sub>J</sub> = 25 °C, t <sub>p</sub> = 400 μs square wave		1.6	V

BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak reverse leakage current	I <sub>RRM</sub>	T <sub>J</sub> = 150 °C		10	mA
Maximum RMS insulation voltage	V <sub>INS</sub>	50 Hz		3000 (1 min)	V
				3600 (1 s)	



<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Junction and storage temperature range	$T_J, T_{Stg}$		- 40 to 150	°C
Maximum internal thermal resistance, junction to case per leg	$R_{thJC}$	DC operation	0.28	°C/W
Typical thermal resistance, case to heatsink per module	$R_{thCS}$	Mounting surface flat, smooth and greased	0.1	
Mounting torque $\pm 10\%$ 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	
Approximate weight			75	g
			2.7	oz.
Case style		JEDEC	TO-240AA compatible	

<b><math>\Delta R</math> CONDUCTION PER JUNCTION</b>											
DEVICES	SINE HALF WAVE CONDUCTION					RECTANGULAR WAVE CONDUCTION					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
VSK.71	0.075	0.088	0.113	0.155	0.228	0.06	0.094	0.12	0.158	0.23	°C/W

**Note**

- Table shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

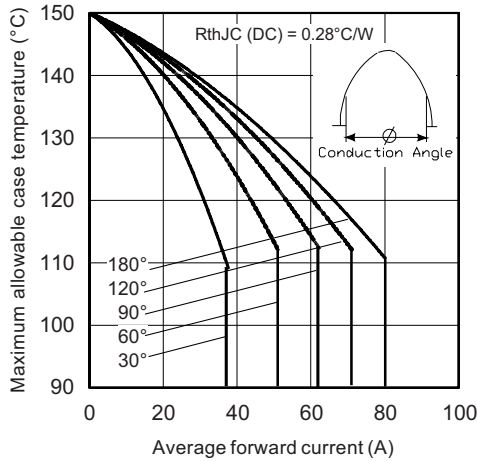


Fig. 1 - Current Ratings Characteristics

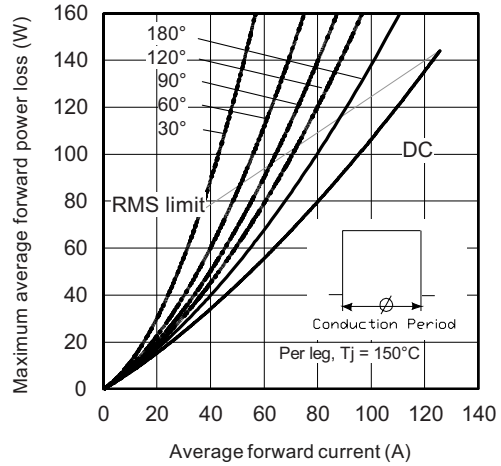


Fig. 4 - Forward Power Loss Characteristics

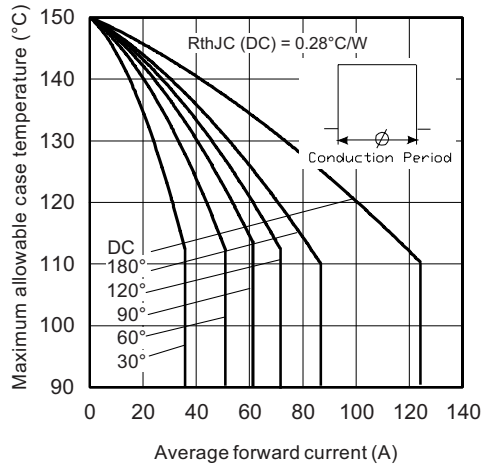


Fig. 2 - Current Ratings Characteristics

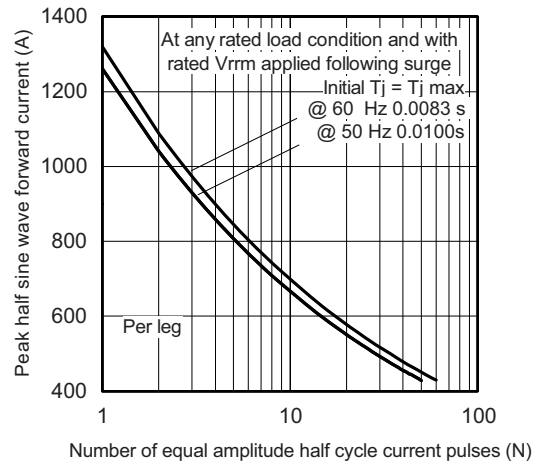


Fig. 5 - Maximum Non-Repetitive Surge Current

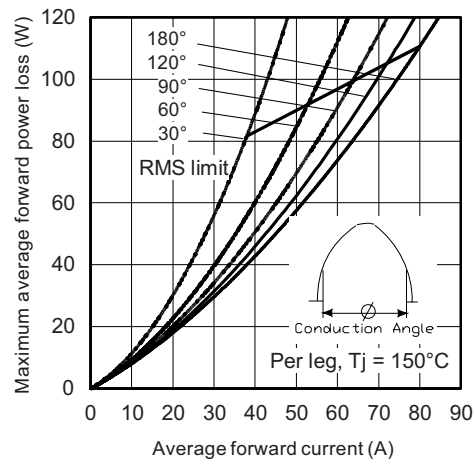


Fig. 3 - Forward Power Loss Characteristics

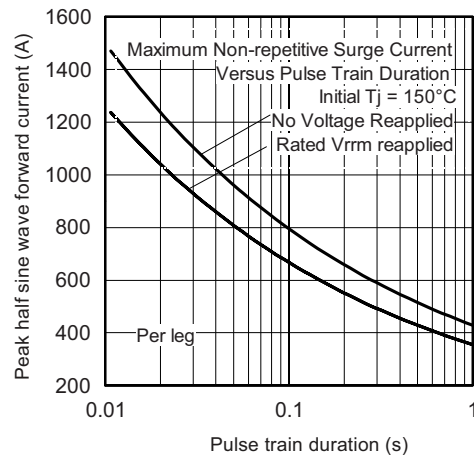


Fig. 6 - Maximum Non-Repetitive Surge Current

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Vishay High Power Products

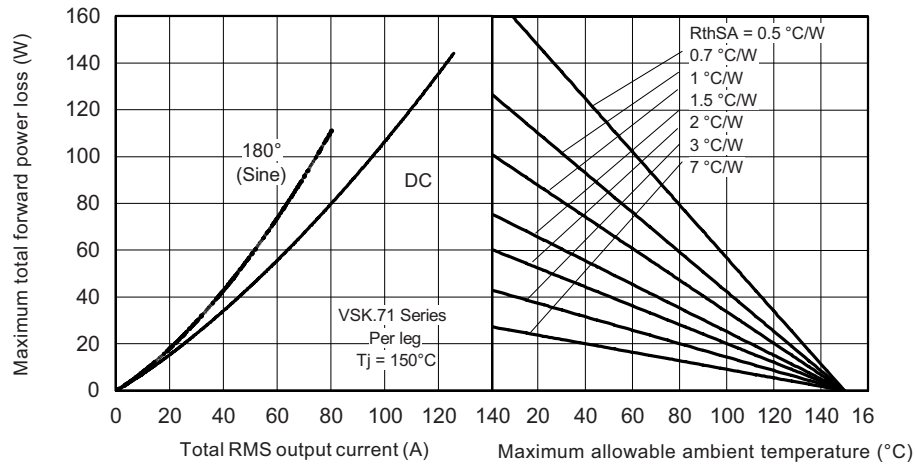


Fig. 7 - Forward Power Loss Characteristics

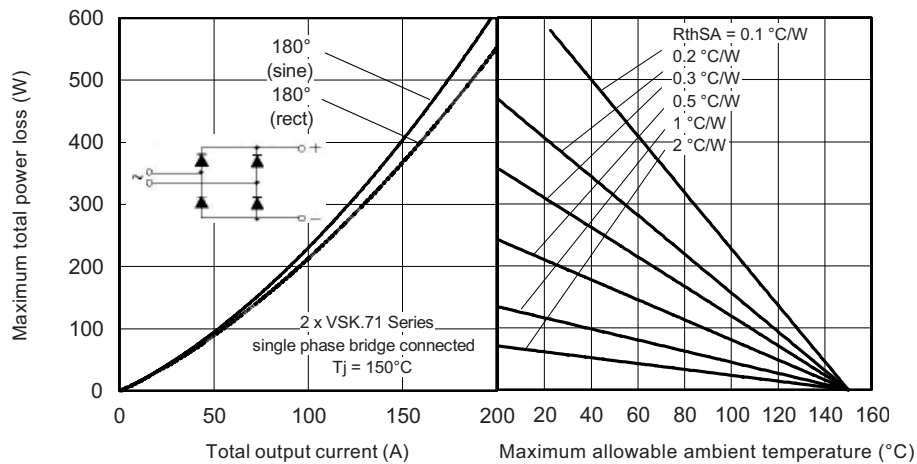


Fig. 8 - Forward Power Loss Characteristics

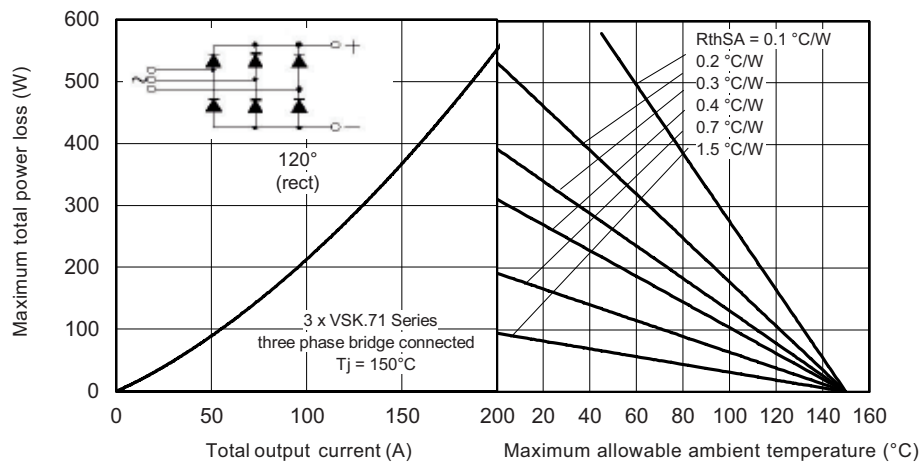


Fig. 9 - Forward Power Loss Characteristics

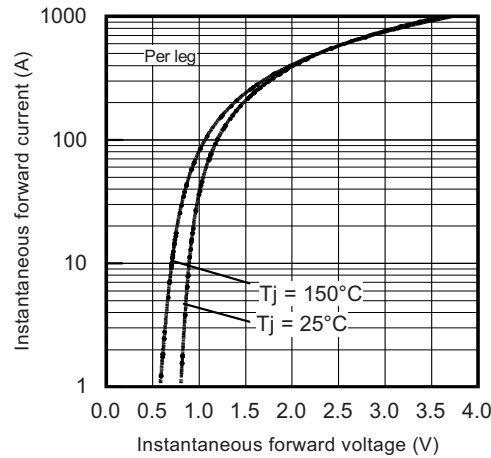


Fig. 10 - Forward Voltage Characteristics

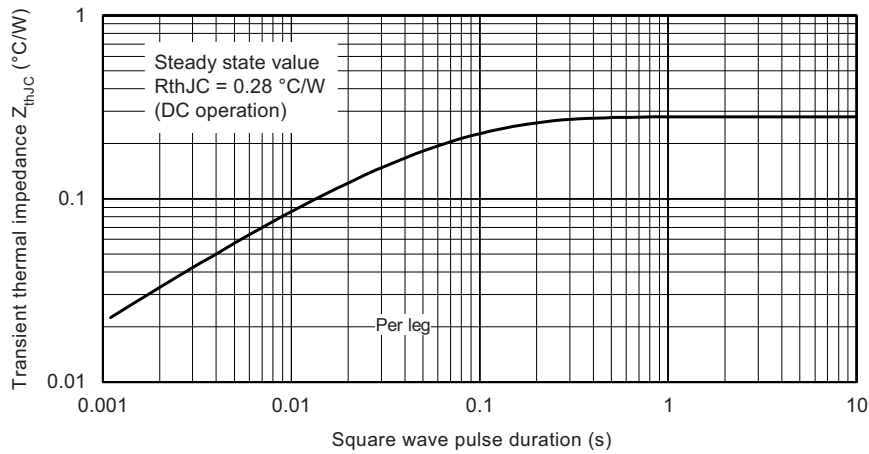


Fig. 11 - Thermal Impedance  $Z_{thJC}$  Characteristics

**ORDERING INFORMATION TABLE**

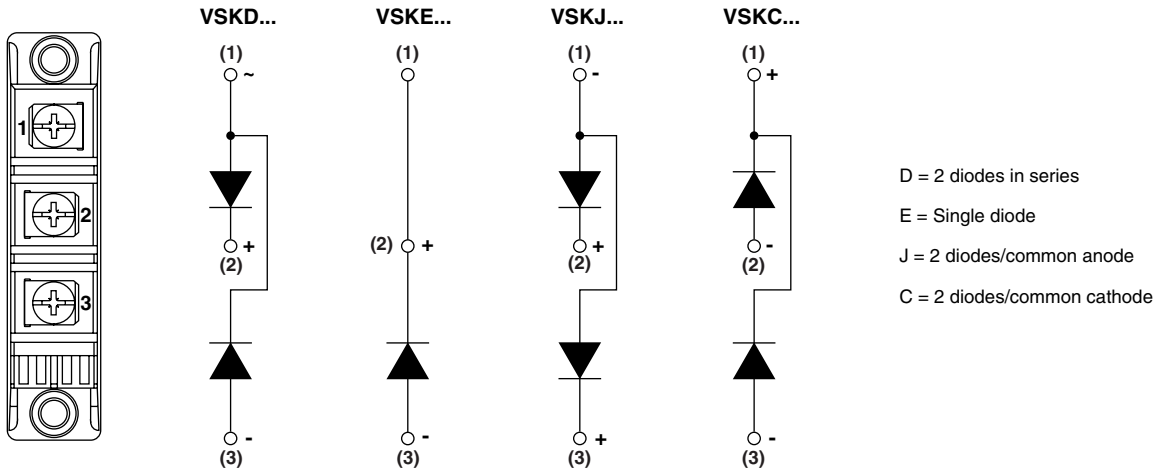
Device code	<b>VSK</b>	<b>D</b>	<b>71</b>	<b>/</b>	<b>16</b>
	①	②	③		④
	<b>1</b>	-	Module type		
	<b>2</b>	-	Circuit configuration (see end of datasheet)		
	<b>3</b>	-	Current code (80 A)		
	<b>4</b>	-	Voltage code (see Voltage Ratings table)		

**Note**

- To order the optional hardware go to [www.vishay.com/doc?95172](http://www.vishay.com/doc?95172)



## CIRCUIT CONFIGURATION



### LINKS TO RELATED DOCUMENTS

Dimensions

[www.vishay.com/doc?95369](http://www.vishay.com/doc?95369)



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