

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


ADD-A-PAK

RoHS
COMPLIANT

FEATURES

- High voltage
- Industrial standard package
- 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
- 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.

PRODUCT SUMMARY	
$I_{F(AV)}$	80 A
Type	Modules - Diode, High Voltage

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

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT T_J = 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 _{F(AV)}	180° conduction, half sine wave			80	A	
					110	°C	
Maximum RMS forward current	I _{F(RMS)}	DC at 90 °C case temperature			126		
Maximum peak, one-cycle forward, non-repetitive surge current	I _{FSM}	t = 10 ms t = 8.3 ms t = 10 ms t = 8.3 ms	No voltage reapplied 100 % V _{RRM} reapplied	Sinusoidal half wave, initial T _J = T _J maximum	1500 1570 1260 1320	A	
Maximum I ² t for fusing	I ² t	t = 10 ms t = 8.3 ms t = 10 ms t = 8.3 ms	No voltage reapplied 100 % V _{RRM} reapplied		11.25 10.26 7.95 7.23		
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			112.5	kA ² √s	
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)} , T _J = T _J maximum)			0.73	V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)} , T _J = T _J maximum)			0.83		
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)} , T _J = T _J maximum)			3.22	mΩ	
High level value of forward slope resistance	r _{f2}	(I > π × I _{F(AV)} , T _J = T _J maximum)			2.89		
Maximum forward voltage drop	V _{FM}	I _{FM} = π × I _{F(AV)} , T _J = 25 °C, t _p = 400 μs square wave			1.6	V	

BLOCKING						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum peak reverse leakage current	I _{RRM}	T _J = 150 °C			10	mA
Maximum RMS insulation voltage	V _{INS}	50 Hz			3000 (1 min) 3600 (1 s)	V

THERMAL AND MECHANICAL SPECIFICATIONS				
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 hours to allow for the spread of the compound.	4	Nm
			3	
Approximate weight			75	g
			2.7	oz.
Case style		JEDEC	ADD-A-PAK Gen. VII (TO-240AA)	

ΔR CONDUCTION PER JUNCTION											
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

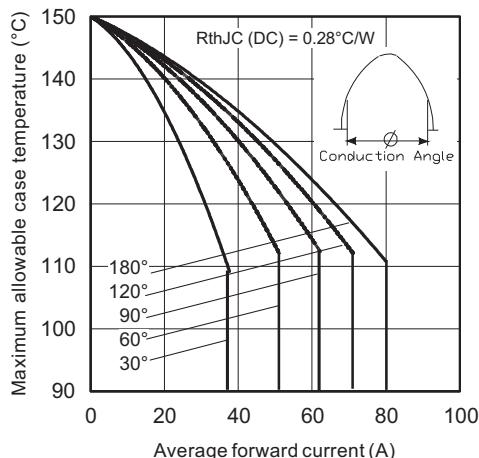


Fig. 1 - Current Ratings Characteristics

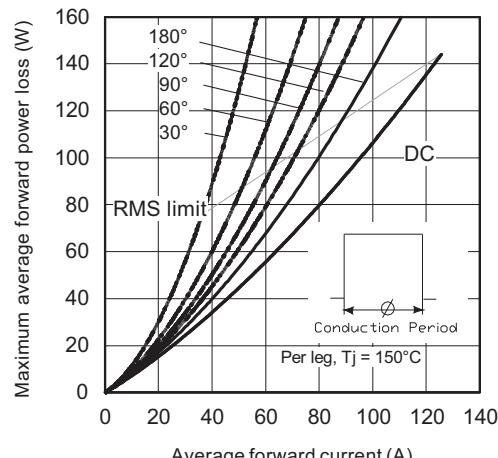


Fig. 4 - Forward Power Loss Characteristics

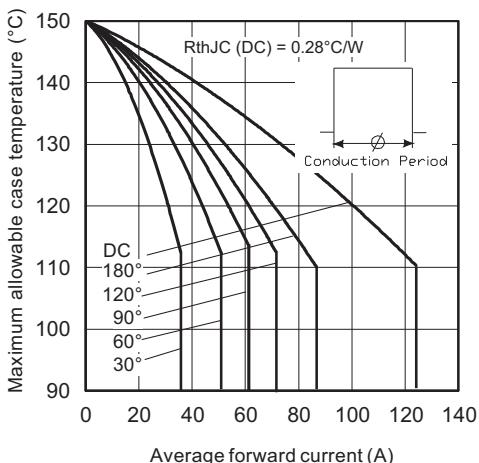


Fig. 2 - Current Ratings Characteristics

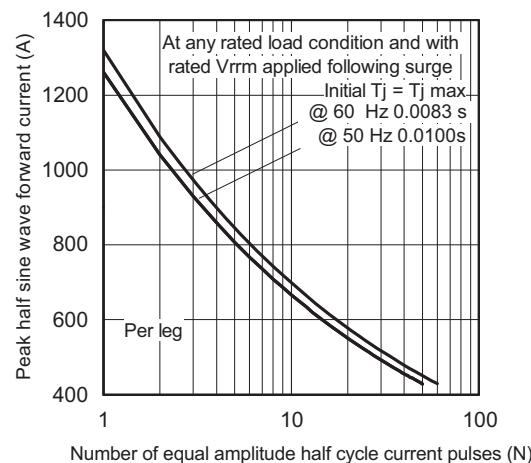


Fig. 5 - Maximum Non-Repetitive Surge Current

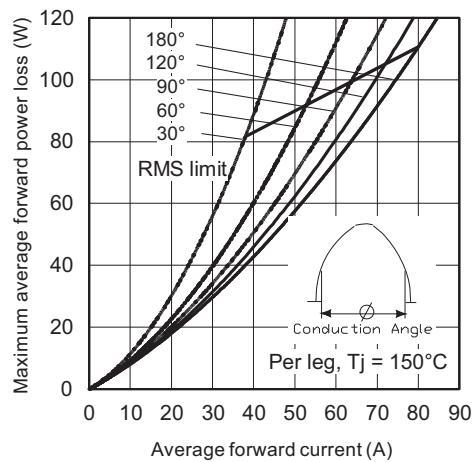


Fig. 3 - Forward Power Loss Characteristics

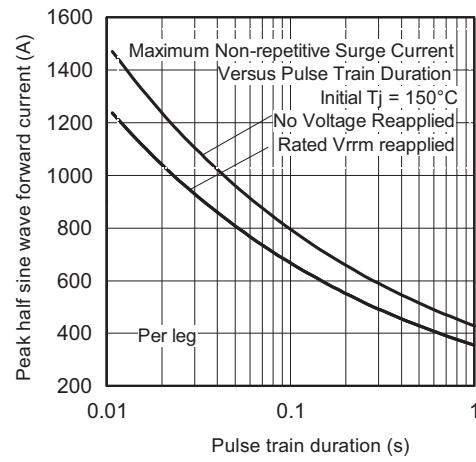


Fig. 6 - Maximum Non-Repetitive Surge Current

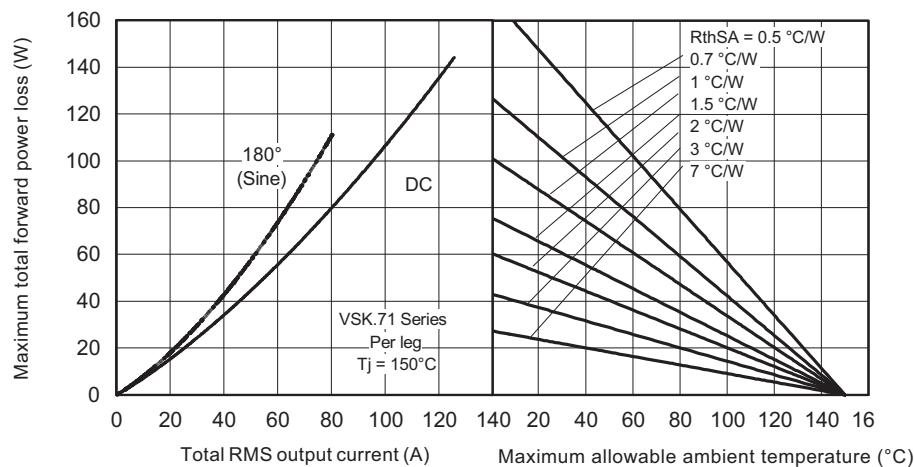


Fig. 7 - Forward Power Loss Characteristics

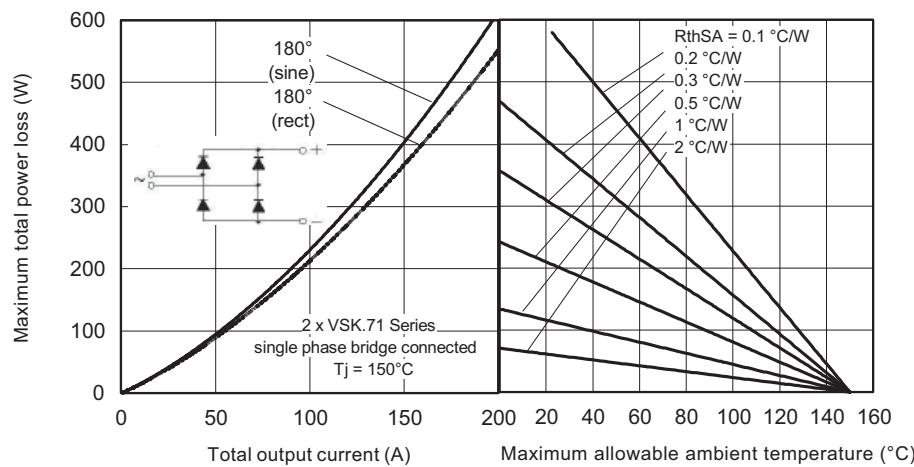


Fig. 8 - Forward Power Loss Characteristics

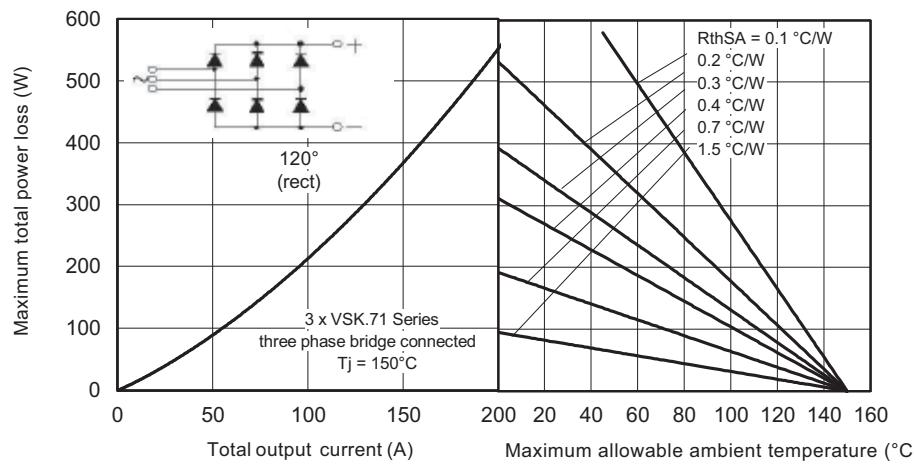


Fig. 9 - Forward Power Loss Characteristics

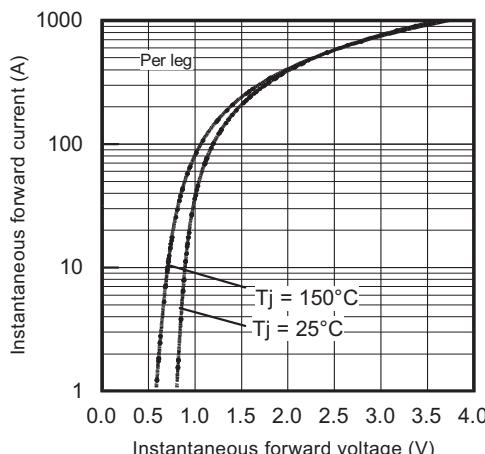


Fig. 10 - Forward Voltage Characteristics

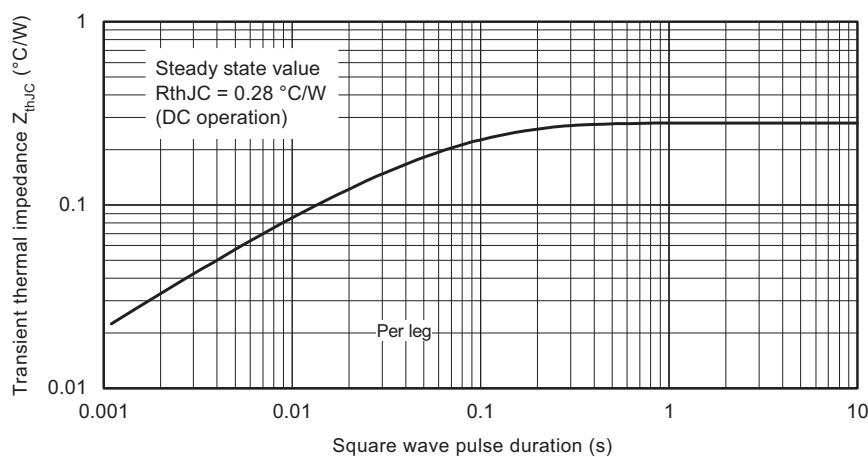


Fig. 11 - Thermal Impedance Z_{thJC} Characteristics

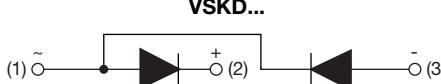
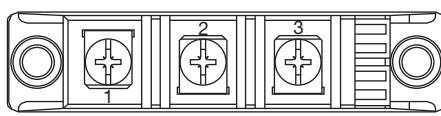
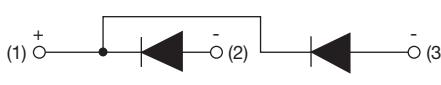
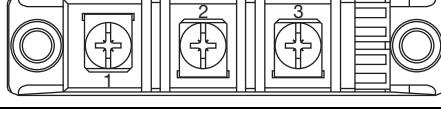
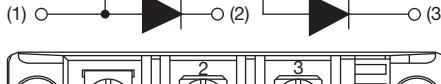
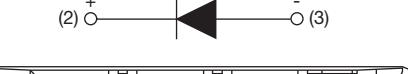
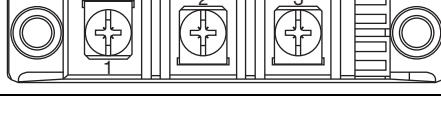
ORDERING INFORMATION TABLE

Device code	VSK	D	71	/	16
	(1)	(2)	(3)	(4)	

1	- Module type
2	- Circuit configuration (see Circuit Configuration table)
3	- Current code (80 A)
4	- Voltage code (see Voltage Ratings table)

Note

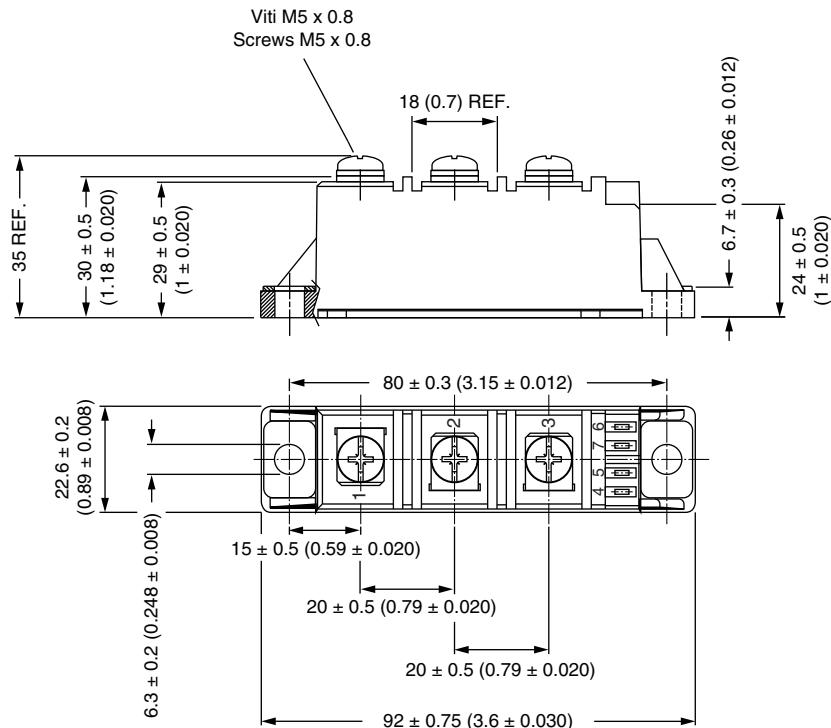
- To order the optional hardware go to www.vishay.com/doc?95172

CIRCUIT CONFIGURATION		
CIRCUIT DESCRIPTION	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Two diodes doubler circuit	D	<p>VSKD...</p>  
Two diodes common cathodes	C	<p>VSKE...</p>  
Two diodes common anodes	J	<p>VSKJ...</p>  
Single diode	E	<p>VSKE...</p>  

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

ADD-A-PAK Generation VII - Diode

DIMENSIONS in millimeters (inches)



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