

ADD-A-PAK Generation VII Power Modules Standard Diodes, 100 A



ADD-A-PAK

PRODUCT SUMMARY

$I_{F(AV)}$	100 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
- 3500 V_{RMS} isolating voltage
- Low thermal resistance
- Totally lead (Pb)-free
- 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
$I_{F(AV)}$	112 °C	100	A
$I_{F(RMS)}$		157	
I_{FSM}	50 Hz	2020	
	60 Hz	2115	
I^2t	50 Hz	20.41	kA ² s
	60 Hz	18.63	
$I^2\sqrt{t}$		204.1	kA ² √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 $T_J = 150\text{ }^{\circ}\text{C}$ mA
VSK.91	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	100	A
Maximum RMS forward current	$I_{F(RMS)}$	DC at 90 °C case temperature	112	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms t = 8.3 ms No voltage reappplied 100 % V_{RRM} reappplied	2000 2115 1700 1780	A
Maximum I^2t for fusing	I^2t	t = 10 ms t = 8.3 ms No voltage reappplied 100 % V_{RRM} reappplied	20.41 18.63 14.44 13.18	kA ² s
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reappplied	204.1	kA ² √s
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J$ maximum	0.76	V
High level value of threshold voltage	$V_{F(TO)2}$	($I > \pi \times I_{F(AV)}$), $T_J = T_J$ maximum	0.89	
Low level value of forward slope resistance	r_{f1}	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J$ maximum	2.4	mΩ
High level value of forward slope resistance	r_{f2}	($I > \pi \times I_{F(AV)}$), $T_J = T_J$ maximum	2.05	
Maximum forward voltage drop	V_{FM}	$I_{FM} = \pi \times I_{F(AV)}$, $T_J = 25\text{ }^{\circ}\text{C}$, $t_p = 400\text{ }\mu\text{s}$ square wave	1.55	V

BLOCKING				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum peak reverse leakage current	I_{RRM}	$T_J = 150\text{ }^{\circ}\text{C}$	10	mA
RMS insulation voltage	V_{INS}	50 Hz, 1 s	3500	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	0.22	°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	TO-240AA compatible	

ΔR CONDUCTION PER JUNCTION											
DEVICES	SINE HALF WAVE CONDUCTION					RECTANGULAR WAVE CONDUCTION					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
VSK.91	0.057	0.068	0.087	0.12	0.177	0.045	0.073	0.093	0.123	0.178	°C/W

Note

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

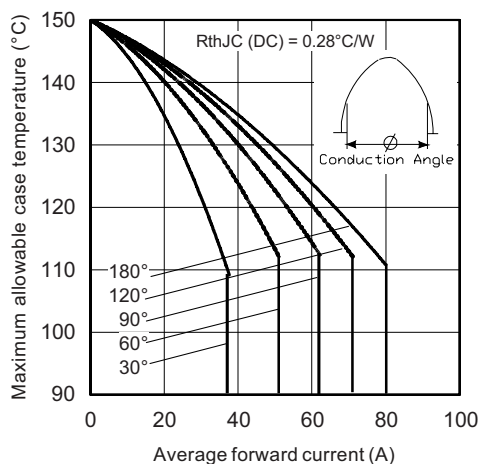


Fig. 1 - Current Ratings Characteristics

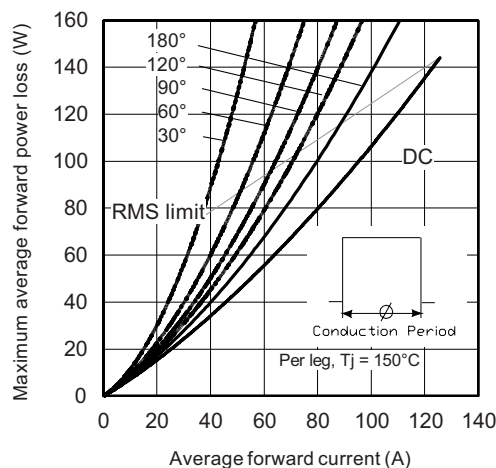


Fig. 4 - Forward Power Loss Characteristics

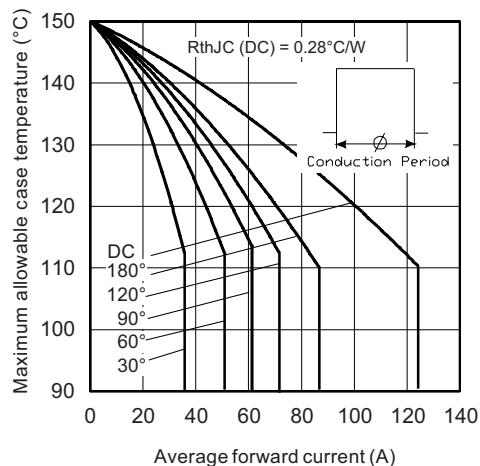


Fig. 2 - Current Ratings Characteristics

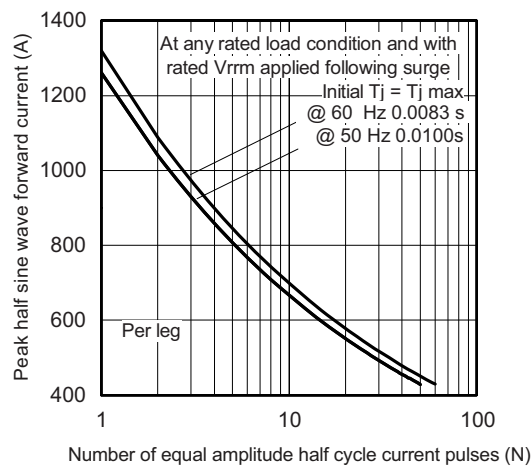


Fig. 5 - Maximum Non-Repetitive Surge Current

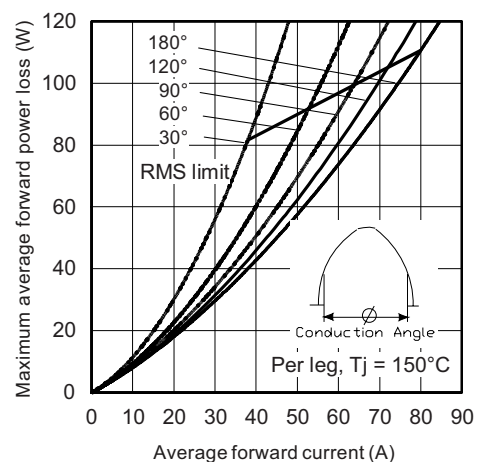


Fig. 3 - Forward Power Loss Characteristics

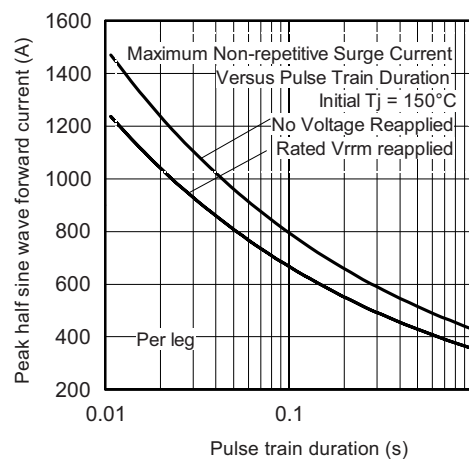


Fig. 6 - Maximum Non-Repetitive Surge Current



ADD-A-PAK Generation VII Power Modules Vishay High Power Products Standard Diodes, 100 A

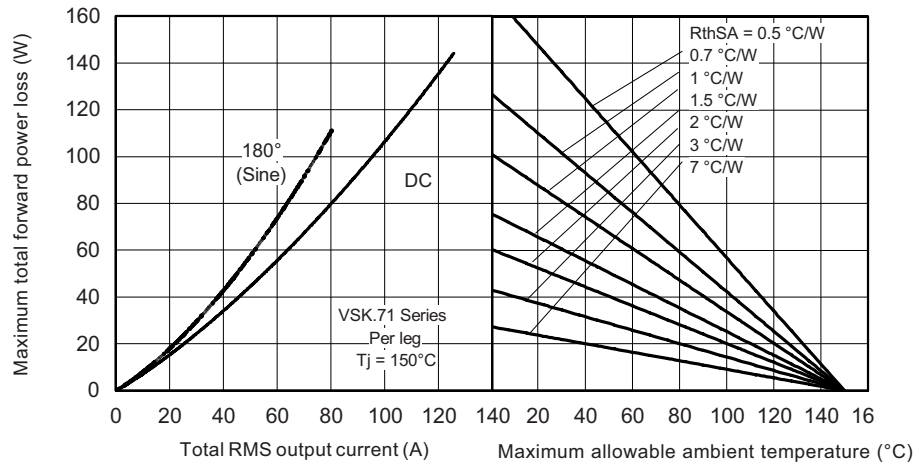


Fig. 7 - Forward Power Loss Characteristics

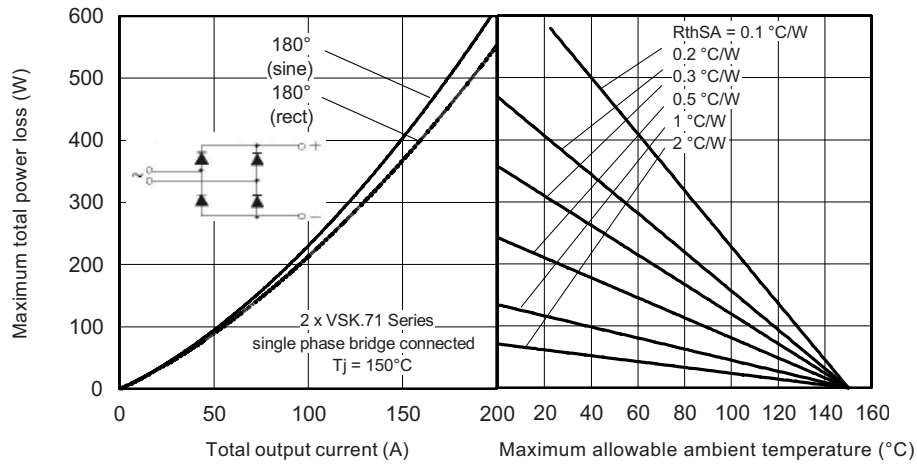


Fig. 8 - Forward Power Loss Characteristics

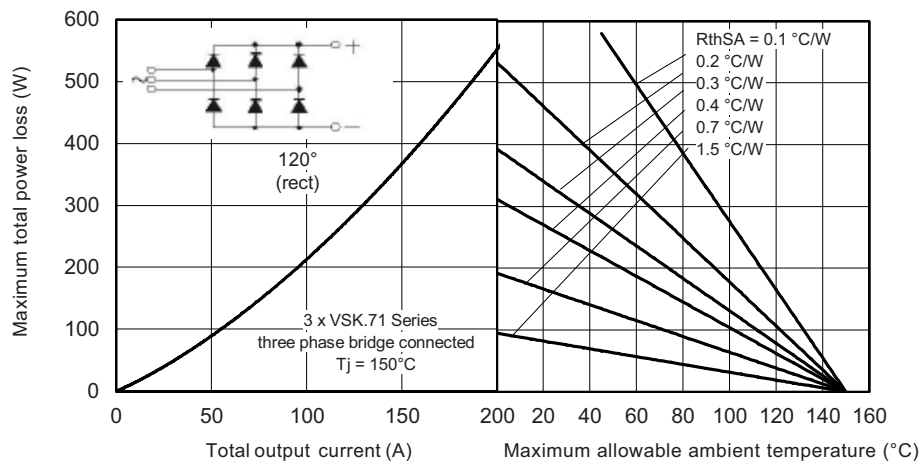


Fig. 9 - Forward Power Loss Characteristics

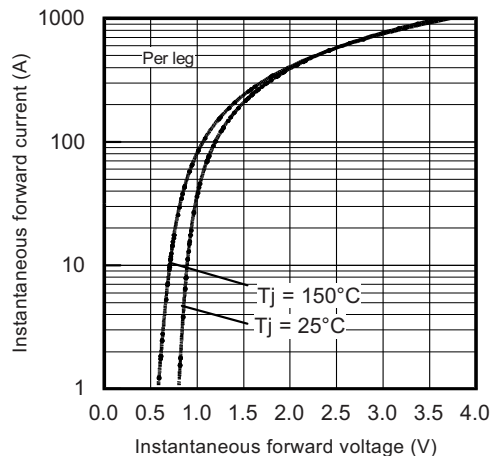


Fig. 10 - Forward Voltage Characteristics

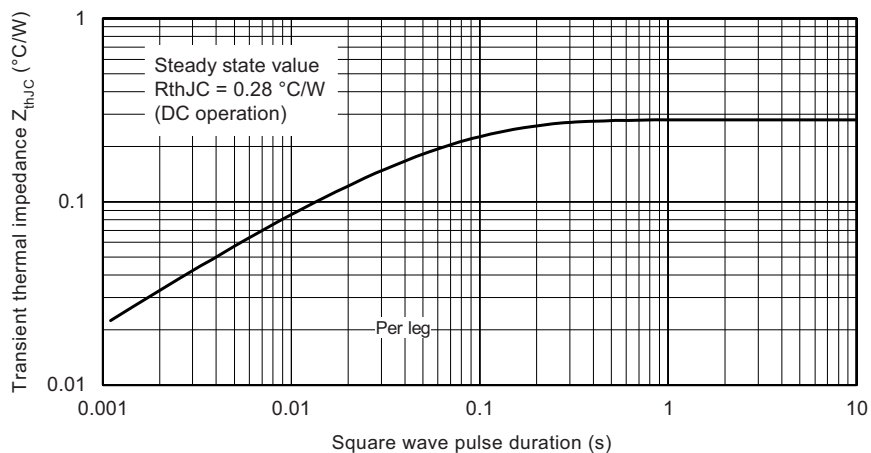


Fig. 11 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

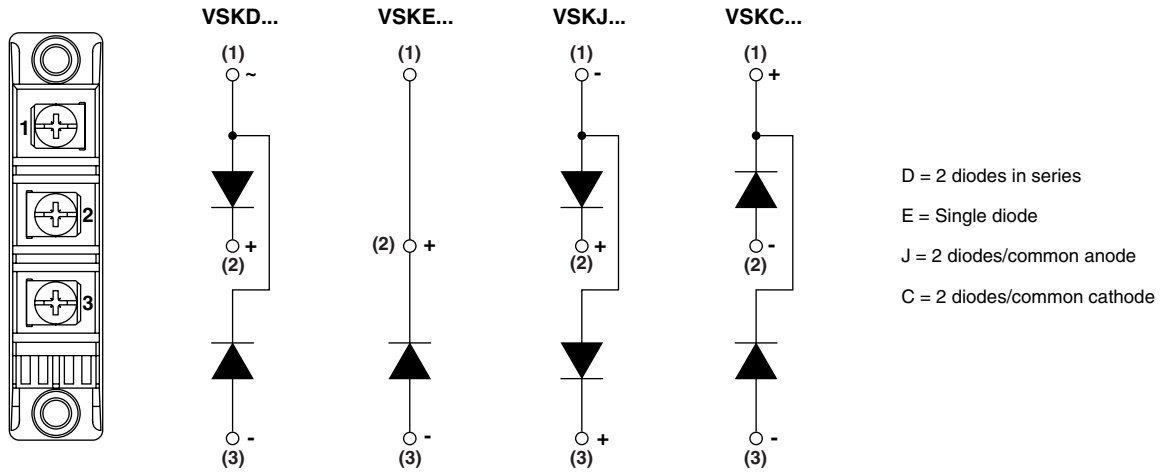
Device code	VSK	D	91	/	16
	①	②	③		④
①	-	Module type			
②	-	Circuit configuration (see end of datasheet)			
③	-	Current code (100 A)			
④	-	Voltage code (see Voltage Ratings table)			

Note

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



CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS

Dimensions

<http://www.vishay.com/doc?95369>



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