

ADD-A-PAK Generation VII Power Modules Thyristor/Diode and Thyristor/Thyristor, 95 A



ADD-A-PAK

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

PRODUCT SUMMARY

I _{T(AV)} or I _{F(AV)}	95 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.

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 _{T(AV)} or I _{F(AV)}	85 °C	95	A
I _{O(RMS)}	As AC switch	210	
I _{TSM} , I _{FSM}	50 Hz	2000	
	60 Hz	2094	
I ² t	50 Hz	20	kA ² s
	60 Hz	18.26	
I ² √t		200	kA ² /s
V _{RRM}	Range	400 to 1600	V
T _{Stg}		- 40 to 125	°C
T _J			

VSK.91.. Series

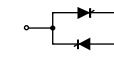
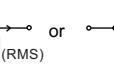
Vishay High Power Products

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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	V _{DRM} , MAXIMUM REPETITIVE PEAK OFF-STATE VOLTAGE, GATE OPEN CIRCUIT V	I _{RRM} , I _{DRM} AT 125 °C mA
VSK.91	04	400	500	400	15
	06	600	700	600	
	08	800	900	800	
	10	1000	1100	1000	
	12	1200	1300	1200	
	14	1400	1500	1400	
	16	1600	1700	1600	

ON-STATE CONDUCTION								
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS		
Maximum average on-state current (thyristors)	I _{T(AV)}	180° conduction, half sine wave, T _C = 85 °C			95	A		
Maximum average forward current (diodes)	I _{F(AV)}							
Maximum continuous RMS on-state current, as AC switch	I _{O(RMS)}	 or 			210			
Maximum peak, one-cycle non-repetitive on-state or forward current	I _{TSM} or I _{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T _J = T _J maximum	2000	kA ² s		
		t = 8.3 ms			2094			
		t = 10 ms	100 % V _{RRM} reapplied		1682			
		t = 8.3 ms			1760			
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied	Initial T _J = T _J maximum	20			
		t = 8.3 ms			18.26			
		t = 10 ms	100 % V _{RRM} reapplied		14.14			
		t = 8.3 ms			12.91			
Maximum I ² /t for fusing	I ² /t (1)	t = 0.1 ms to 10 ms, no voltage reapplied T _J = T _J maximum			200	kA ² /s		
Maximum value or threshold voltage	V _{T(TO)} (2)	Low level (3)	T _J = T _J maximum		0.97	V		
		High level (4)			1.1			
Maximum value of on-state slope resistance	r _t (2)	Low level (3)	T _J = T _J maximum		2.76	mΩ		
		High level (4)			2.38			
Maximum peak on-state or forward voltage	V _{TM}	I _{TM} = π x I _{T(AV)}	T _J = 25 °C		1.73	V		
	V _{FM}	I _{FM} = π x I _{F(AV)}						
Maximum non-repetitive rate of rise of turned on current	dI/dt	T _J = 25 °C, from 0.67 V _{DRM} , I _{TM} = π x I _{T(AV)} , I _g = 500 mA, t _r < 0.5 μs, t _p > 6 μs			150	A/μs		
Maximum holding current	I _H	T _J = 25 °C, anode supply = 6 V, resistive load, gate open circuit			250	mA		
Maximum latching current	I _L	T _J = 25 °C, anode supply = 6 V, resistive load			400			

Notes

(1) I²t for time t_x = I²/t x √t_x

(2) Average power = V_{T(TO)} x I_{T(AV)} + r_t x (I_{T(RMS)})²

(3) 16.7 % x π x I_{AV} < I < π x I_{AV}

(4) I > π x I_{AV}



TRIGGERING								
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS		
Maximum peak gate power	P _{GM}			12		W		
Maximum average gate power	P _{G(AV)}			3.0				
Maximum peak gate current	I _{GM}			3.0		A		
Maximum peak negative gate voltage	- V _{GM}			10		V		
Maximum gate voltage required to trigger	V _{GT}	T _J = - 40 °C		Anode supply = 6 V resistive load				
		T _J = 25 °C				4.0		
		T _J = 125 °C				2.5		
Maximum gate current required to trigger	I _{GT}	T _J = - 40 °C		Anode supply = 6 V resistive load		mA		
		T _J = 25 °C				1.7		
		T _J = 125 °C				270		
Maximum gate voltage that will not trigger	V _{GD}	T _J = 125 °C, rated V _{DRM} applied			150	V		
Maximum gate current that will not trigger	I _{GD}	T _J = 125 °C, rated V _{DRM} applied			80			
					0.25			
					6	mA		

BLOCKING						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum peak reverse and off-state leakage current at V _{RRM} , V _{DRM}	I _{RRM} , I _{DRM}	T _J = 125 °C, gate open circuit			15	mA
RMS insulation voltage	V _{INS}	50 Hz, 1 s			3500	V
Maximum critical rate of rise of off-state voltage	dV/dt	T _J = 125 °C, linear to 0.67 V _{DRM}			1000	V/μs

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Junction operating and storage temperature range	T _J , T _{Stg}				- 40 to 125	°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 ± 10 %	to heatsink	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
	busbar				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°		
VSK.91..	0.04	0.048	0.063	0.085	0.125	0.033	0.052	0.067	0.088	0.127	°C/W

Note

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

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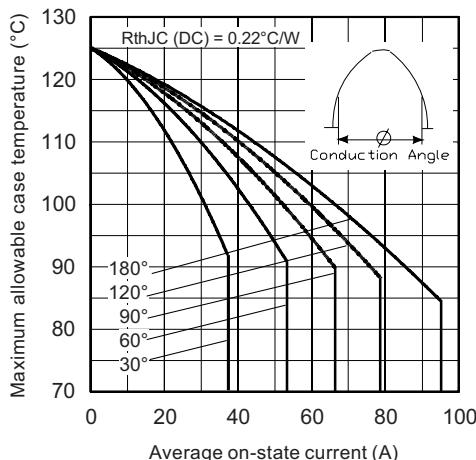


Fig. 1 - Current Ratings Characteristics

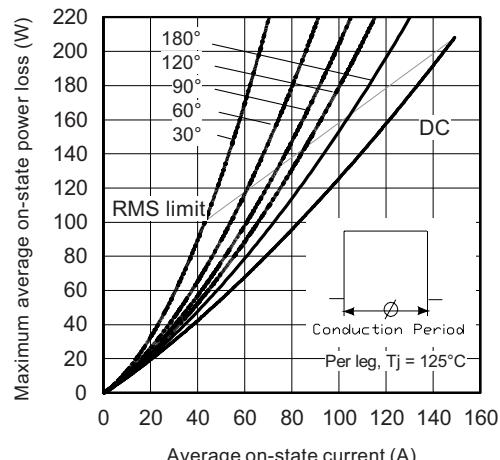


Fig. 4 - On-State Power Loss Characteristics

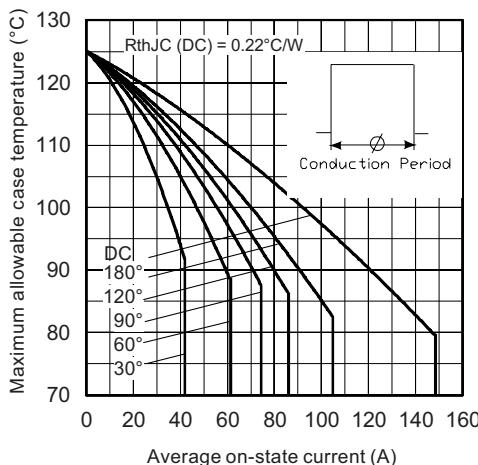


Fig. 2 - Current Ratings Characteristics

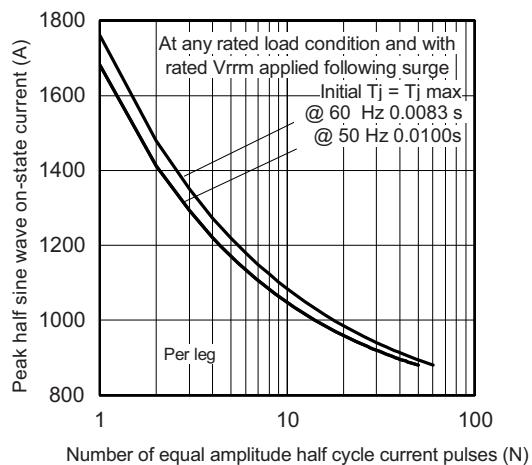


Fig. 5 - Maximum Non-Repetitive Surge Current

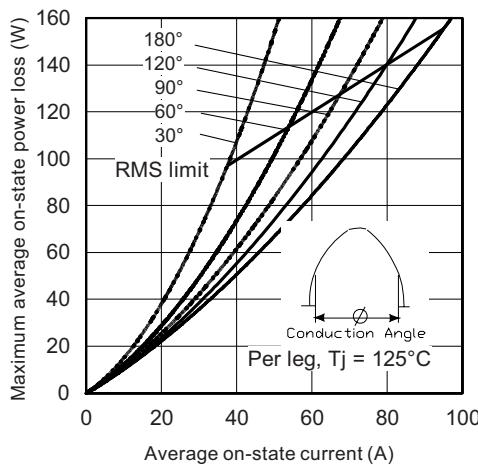


Fig. 3 - On-State Power Loss Characteristics

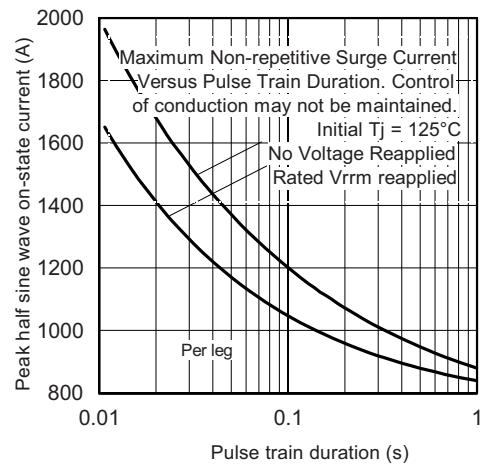


Fig. 6 - Maximum Non-Repetitive Surge Current

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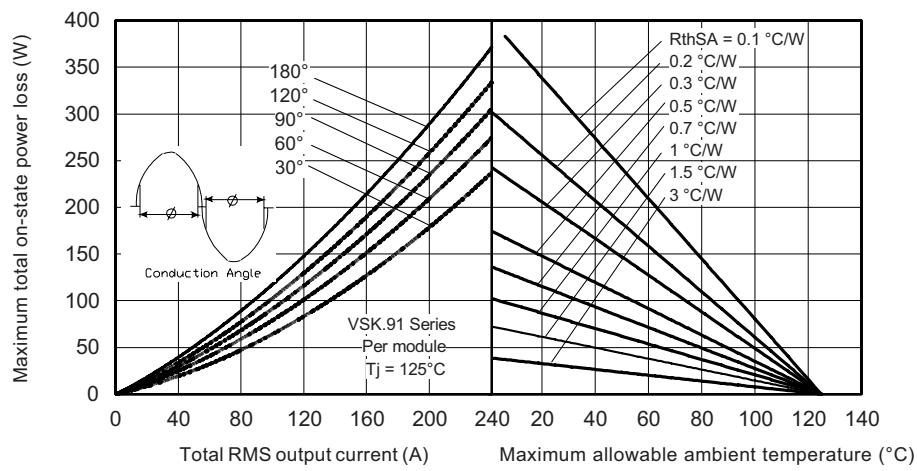


Fig. 7 - On-State Power Loss Characteristics

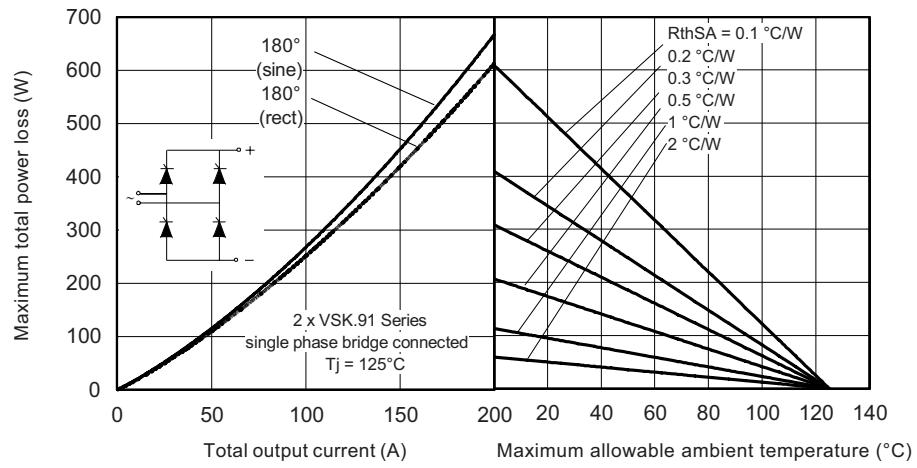


Fig. 8 - On-State Power Loss Characteristics

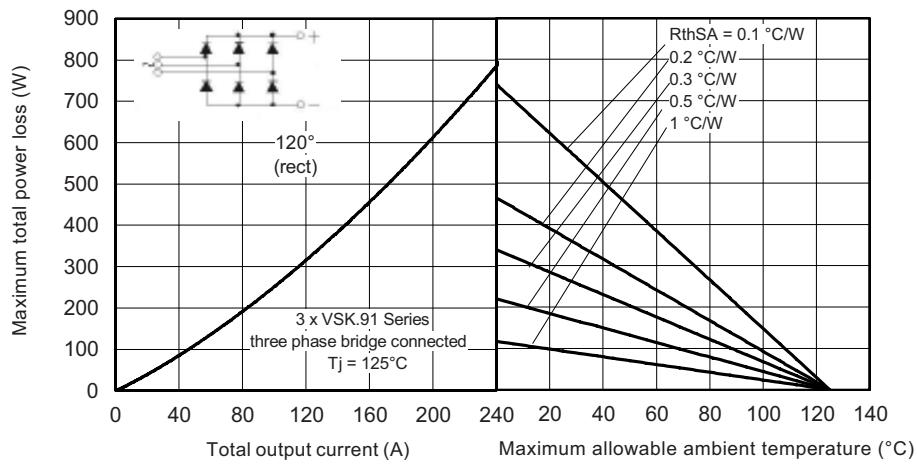


Fig. 9 - On-State Power Loss Characteristics

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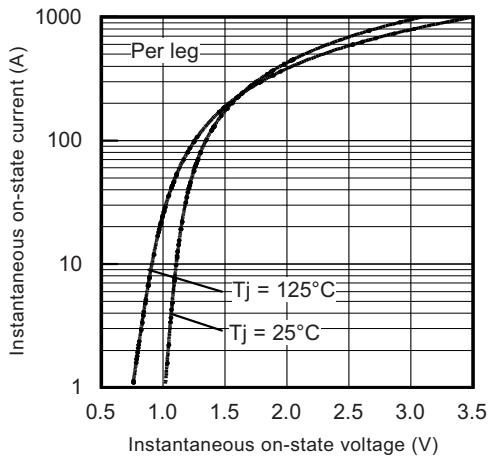


Fig. 10 - On-State Voltage Drop Characteristics

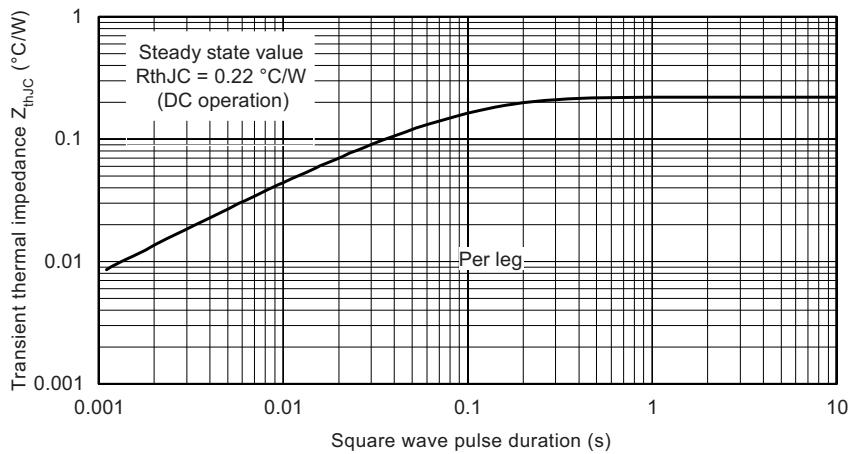


Fig. 11 - Thermal Impedance Z_{thJC} Characteristics

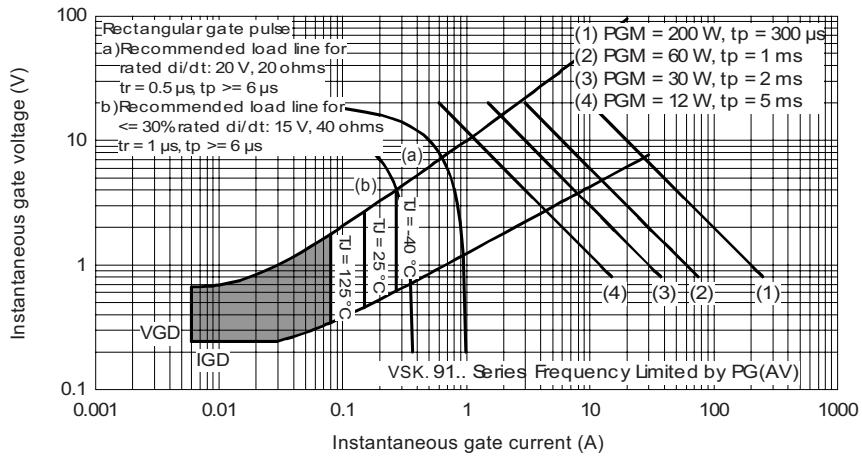


Fig. 12 - Gate Characteristics

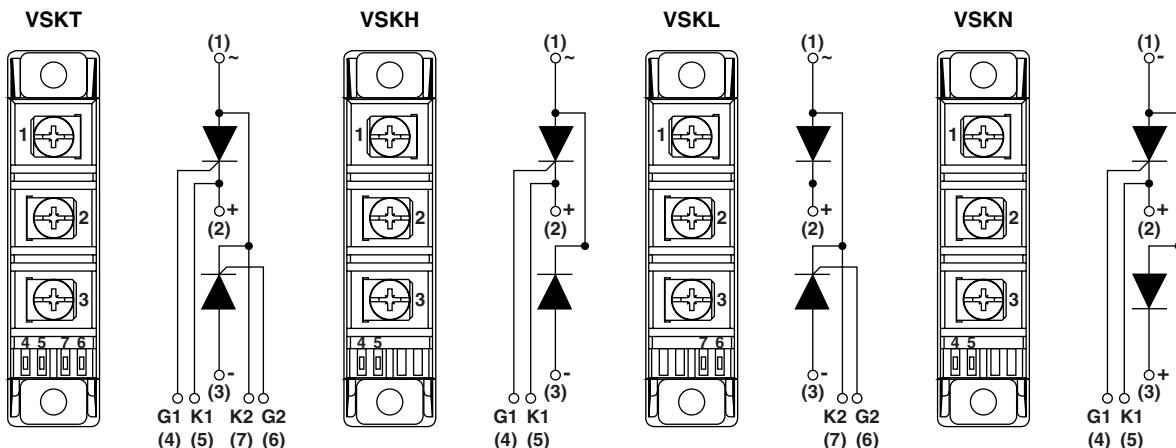
ORDERING INFORMATION TABLE

Device code	VSK	T	91	/	16
	(1)	(2)	(3)	(4)	

- [1]** - Module type
- [2]** - Circuit configuration (see end of datasheet)
- [3]** - Current code (95 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?95368



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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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