# VS-VSKDS201/045

**Vishay Semiconductors** 





AAP Gen 7 (TO-240AA)

PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub> 100 A				
V <sub>R</sub>	45 V			
Package	AAP Gen 7 (TO-240AA)			
Circuit configuration	Two diodes doubler circuit			

### **MECHANICAL DESCRIPTION**

The AAP Gen 7, 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

- 175 °C T<sub>J</sub> operation
- Low forward voltage drop
- High frequency operation
- Low thermal resistance
- UL approved file E78996
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

#### BENEFITS

- Excellent thermal performances obtained by the usage of exposed direct bonded copper substrate
- High surge capability
- Easy mounting on heatsink

#### **ELECTRICAL DESCRIPTION / APPLICATIONS**

The VS-VSKDS201.. Schottky rectifier doubler module has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °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	CHARACTERISTICS VALUES UNITS				
I <sub>F(AV)</sub>	Rectangular waveform	100	А			
V <sub>RRM</sub>		45	V			
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	8600	А			
V <sub>F</sub>	100 A <sub>pk</sub> , T <sub>J</sub> = 125 °C	0.69	V			
TJ	Range	-55 to +175	°C			

VOLTAGE RATINGS						
PARAMETER	SYMBOL	VS-VSKDS201/045	UNITS			
Maximum DC reverse voltage	V <sub>R</sub>	45	V			
Maximum working peak reverse voltage	V <sub>RWM</sub>	40	v			

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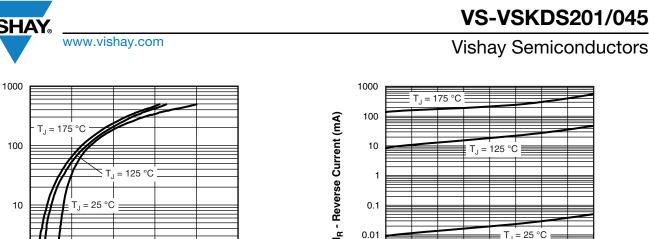


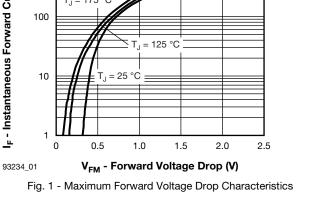
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ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current per leg	I <sub>F(AV)</sub>	50 % duty cycle at $T_C$ = 123 °C, rectangular waveform		100	
Maximum peak one cycle non-repetitive		5 µs sine or 3 µs rect. pulse	Following any rated load condition and with	8600	А
surge current	IFSM	10 ms sine or 6 ms rect. pulse	rated $V_{RRM}$ applied	1850	
Non-repetitive avalanche energy	E <sub>AS</sub>	$T_J = 25 \text{ °C}, I_{AS} = 24 \text{ A}, L = 1 \text{ mH}$ 270		mJ	
Repetitive avalanche current	I <sub>AR</sub>	Current decaying linearly to zero in 1 $\mu$ s Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical		20	А

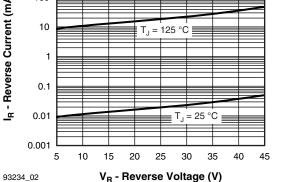
ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CO	VALUES	UNITS	
		100 A	T <sub>J</sub> = 25 °C	0.72	V
Maximum forward voltage drop	V <sub>FM</sub>	200 A	1j=25 C	1.04	
Maximum forward voltage drop		100 A	T 105 00	0.69	
		200 A	T <sub>J</sub> = 125 °C	0.98	
	I <sub>RM</sub>	T <sub>J</sub> = 25 °C	V Detect V	10	mA
Maximum reverse leakage current		T <sub>J</sub> = 125 °C	$V_R = Rated V_R$	90	
Maximum junction capacitance	CT	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C		5200	pF
Typical series inductance	L <sub>S</sub>	Measured lead to lead 5 mm from package body		7.0	nH
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub>			V/µs
Maximum RMS insulation voltage	V <sub>INS</sub>	50 Hz 3000 (1 min) 3600 (1 s)		V	

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	YMBOL TEST CONDITIONS		UNITS
Maximum junction and storage temperature range	9	T <sub>J</sub> , T <sub>Stg</sub>		-55 to +175	°C
Maximum thermal resistance, junction to case per leg		R <sub>thJC</sub>	DC operation	0.52	°C/W
Typical thermal resistance, case to heatsink per module		R <sub>thCS</sub>		0.1	C/W
Approximate weight				75	g
Approximate weight				2.7	oz.
Mounting torgue ± 10 %	to heatsink		A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for	4	Nm
	busbar		the spread of the compound.	3	
Case style			JEDEC®	TO-240AA co	mpatible

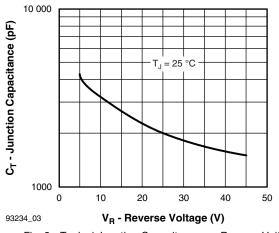




I<sub>F</sub> - Instantaneous Forward Current (A)









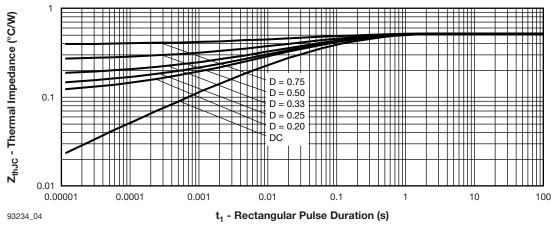
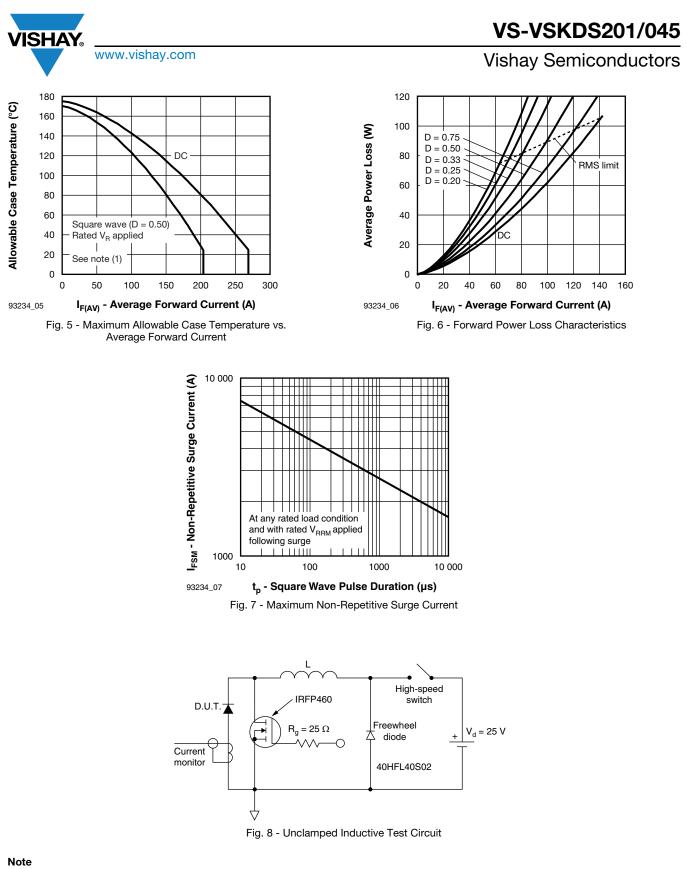


Fig. 4 - Maximum Thermal Impedance ZthJC Characteristics

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#### <sup>(1)</sup> Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$ ;

Pd = forward power loss =  $I_{F(AV)} \times V_{FM}$  at ( $I_{F(AV)}/D$ ) (see fig. 6); Pd<sub>REV</sub> = inverse power loss =  $V_{R1} \times I_R$  (1 - D);  $I_R$  at  $V_{R1}$  = 80 % rated  $V_R$ 

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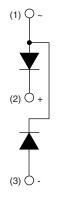
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### **ORDERING INFORMATION TABLE**

Device code	vs-vs	KD	S	20	1	1	045
		2	3	4	5		6
	1 - 2 - 3 -	Circ KD		iguratior A-PAK -	ו:	-	broduct ler circuit
	<ul> <li>S = Schottky diode</li> <li>Average current rating (20 = 200 A)</li> <li>Product silicon identification</li> <li>Voltage rating (045 = 45 V)</li> </ul>						

## **CIRCUIT CONFIGURATION**



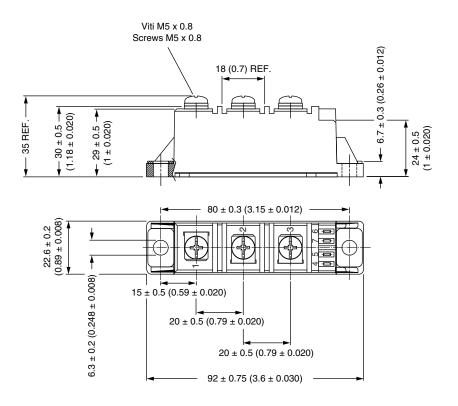
LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95369			

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## **ADD-A-PAK Generation VII - Diode**

### **DIMENSIONS** in millimeters (inches)





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Revision: 01-Jan-2024