AAP Gen 7 (TO-240AA)
Power Modules Schottky Rectifier, 200 A



AAP Gen 7 (TO-240AA)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	200 A
V_R	150 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_J operation
- Low forward voltage drop
- High frequency operation
- UL approved file E78996
- Low thermal resistance
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

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-VSKDS409/150 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	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	200	A
V_{RRM}		150	V
I_{FSM}	t_p = 5 µs sine	20 000	A
V_F	200 A_{pk}, T_J = 125 °C	0.85	V
T_J	Range	-55 to +175	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-VSKDS409/150	UNITS
Maximum DC reverse voltage	V_R	150	V
Maximum static peak reverse voltage	V_{RRM}		

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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at T_C = 105 °C, rectangular waveform		200	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	20 000	
		10 ms sine or 6 ms rect. pulse		2300	
Non-repetitive avalanche energy	E_{AS}	T_J = 25 °C, I_{AS} = 1.8 A, L = 10 mH		15	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A = 1.5 x V_R typical		1	A
Maximum dynamic peak reverse voltage	V_{AV}	T_J = 25 °C, I_{AS} = 1.8 A, L = 10 mH		170	V

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V_{FM}	200 A	T_J = 25 °C	1.03	V
		400 A		1.33	
		200 A	T_J = 125 °C	0.85	
		400 A		1.13	
Maximum reverse leakage current	I_{RM}	T_J = 25 °C	V_R = Rated V_R	6	mA
		T_J = 125 °C		85	
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz), 25 °C		6000	pF
Typical series inductance	L_S	Measured lead to lead 5 mm from package body		5.0	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/µs
Maximum RMS insulation voltage	V_{INS}	50 Hz		3000 (1 min) 3600 (1 s)	V

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		-55 to +175	°C
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation	0.32	°C/W
Typical thermal resistance, case to heatsink per module	R_{thCS}		0.1	
Approximate weight			75	g
			2.7	oz.
Mounting torque ± 10 % to heatsink		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
Mounting torque ± 10 % busbar			3	
Case style		JEDEC®	TO-240AA compatible	

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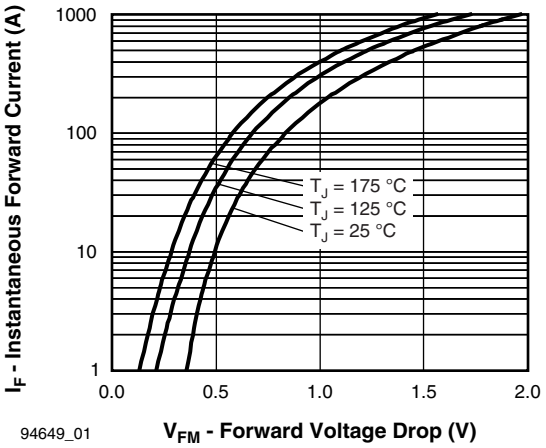


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

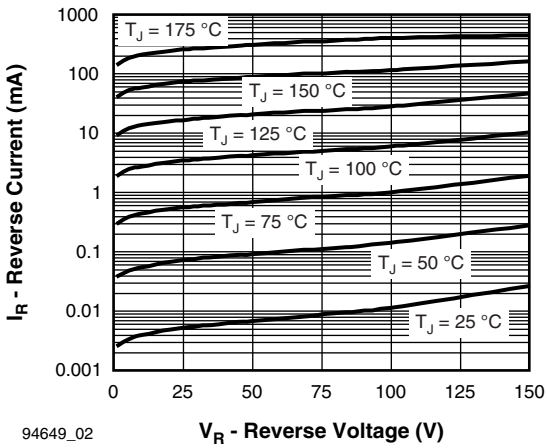


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

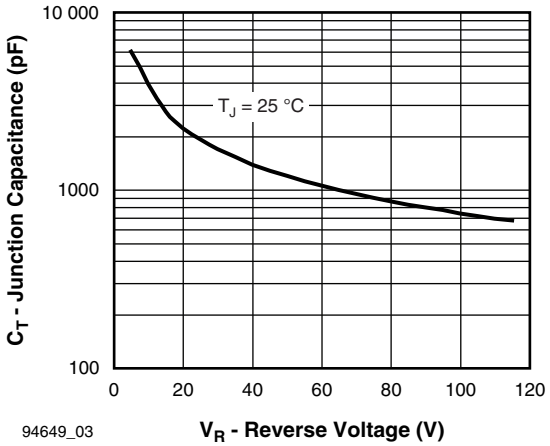


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

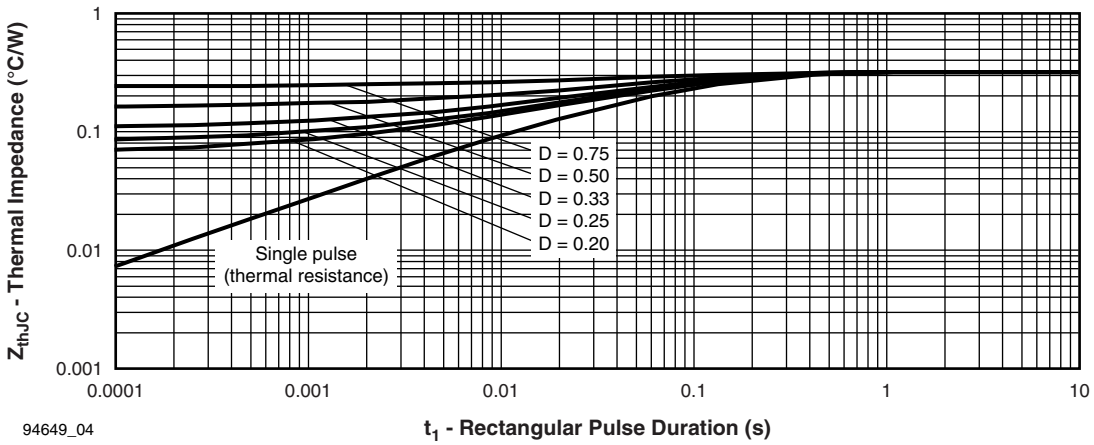


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Diode)

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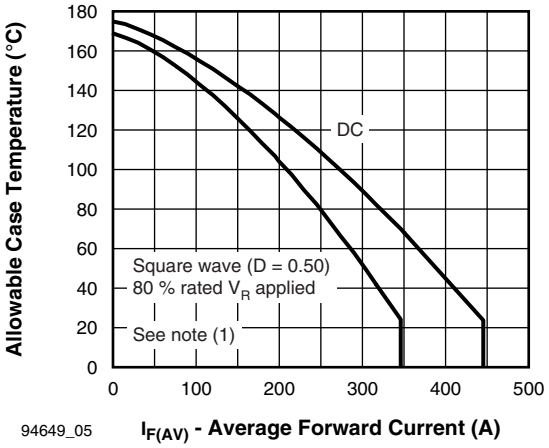


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

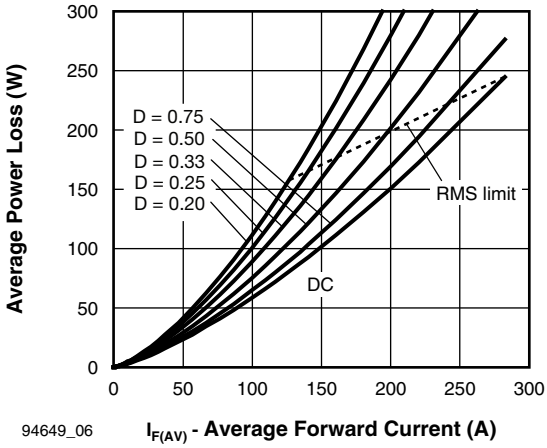


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

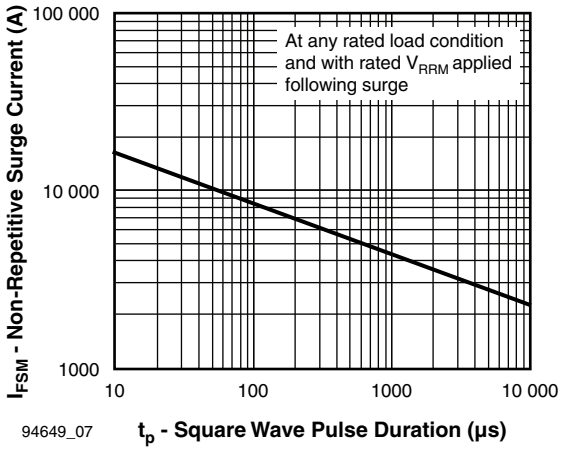


Fig. 7 - Maximum Non-Repetitive Surge Current

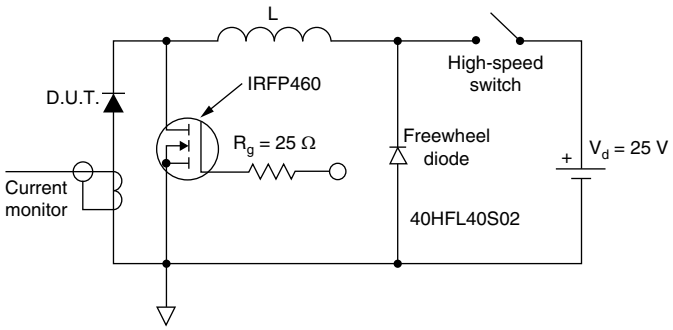


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) 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_{REV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = 80 % rated V_R

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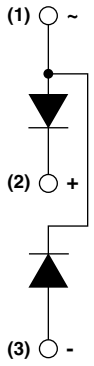
Device code	VS-VS	KD	S	40	9	/	150
	1	2	3	4	5		6

- 1 - Vishay Semiconductors product
- 2 - Circuit configuration:
  KD = ADD-A-PAK - 2 diodes doubler circuit
- 3 - S = Schottky diode
- 4 - Average current rating (40 = 400 A) (1)
- 5 - Product silicon identification
- 6 - Voltage rating (150 = 150 V)

Note

(1) For KD configuration average current rating per module is 200 A

CIRCUIT CONFIGURATION

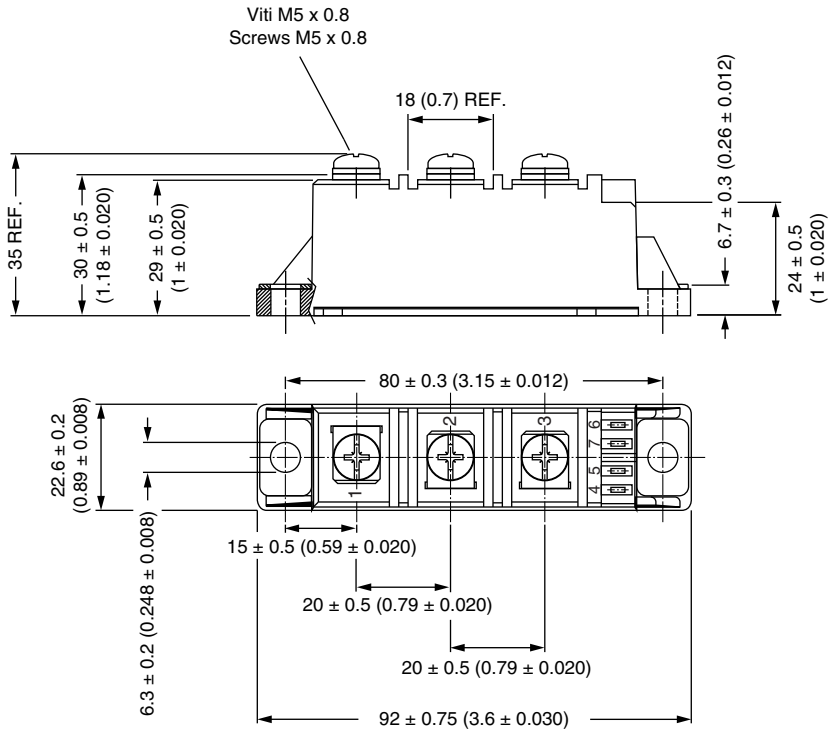


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Dimensions	www.vishay.com/doc?95369

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ADD-A-PAK Generation VII - Diode

DIMENSIONS in millimeters (inches)



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