

Schottky Rectifier, 200 A


ADD-A-PAK

FEATURES

- 175 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- UL pending
- Totally lead (Pb)-free, RoHS compliant
- Designed and qualified for industrial level


RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	200 A
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MECHANICAL DESCRIPTION

The Generation 5 of ADD-A-PAK module combine the excellent thermal performance obtained by the usage of direct bonded copper substrate with superior mechanical ruggedness, thanks to the insertion of a solid copper baseplate at the bottom side of the device.

The Cu baseplate allow an easier mounting on the majority of heatsink with increased tolerance of surface roughness and improved thermal spread.

The Generation 5 of ADD-A-PAK module is manufactured without hard mold, eliminating in this way any possible directstress on the leads.

The electrical terminals are secured against axial pull-out: they are fixed to the module housing via a click-stop feature already tested and proved as reliable on other Vishay HPP modules.

DESCRIPTION

The VSKCS201.. Schottky rectifier common cathode 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}		45	V
I_{FSM}	$t_p = 5 \mu s$ sine	8600	A
V_F	100 Apk, $T_J = 125^\circ C$	0.65	V
T_J	Range	- 55 to 175	$^\circ C$

VOLTAGE RATINGS

PARAMETER	SYMBOL	VSKCS201/045P	UNITS
Maximum DC reverse voltage	V_R	45	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS						
PARAMETER		SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	per module	I _{F(AV)}	50 % duty cycle at T _C = 120 °C, rectangular waveform		200	A
	per leg				100	
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	8600	
			10 ms sine or 6 ms rect. pulse		1850	
Non-repetitive avalanche energy		E _{AS}	T _J = 25 °C, I _{AS} = 24 A, L = 1 mH		270	mJ
Repetitive avalanche current per leg		I _{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T _J maximum V _A = 1.5 x V _R typical		20	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	100 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.7	V
		200 A		0.92	
		100 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.65	
		200 A		0.86	
Maximum reverse leakage curent	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	10	mA
		$T_J = 125\text{ }^{\circ}\text{C}$		90	
Maximum junction capacitance	C_T	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		5200	pF
Typical series inductance	L_S	From top of terminal hole to mounting plane		7.0	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/μs
RMS insulation voltage	V_{INS}	50 Hz, circuit to base, all terminals shorted (1 s)		3500	V

Note(1) Pulse width < 500 μs

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	0.6	°C/W
Maximum thermal resistance, case to heatsink	R _{thCS}	Mounting surface, flat, smooth and greased	0.1	
Approximate weight			110	g
			4	oz.
Mounting torque ± 10 %	to heatsink		5	Nm
	busbar		4	
Case style		JEDEC	TO-240AA	

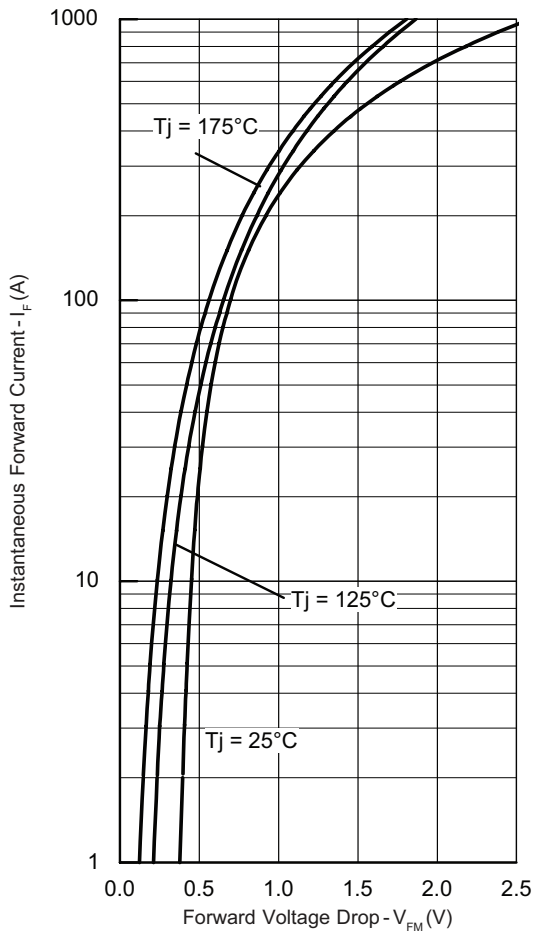


Fig. 1 - Maximum Forward Voltage Drop Characteristics

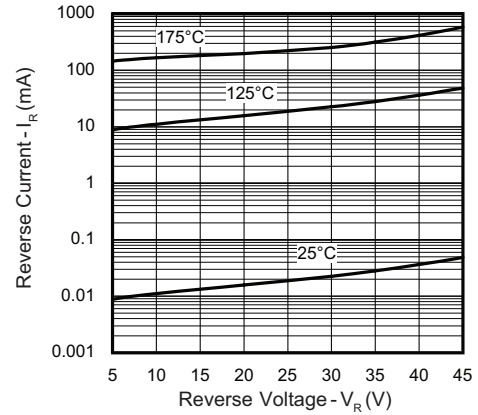


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

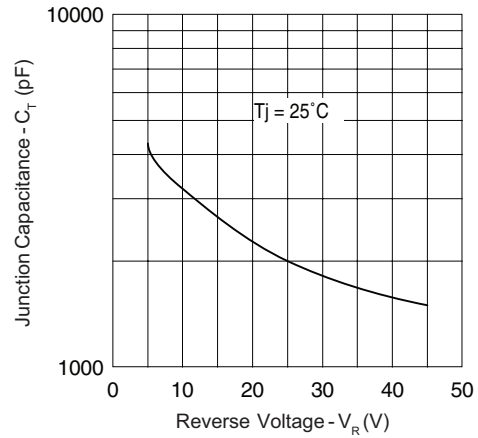
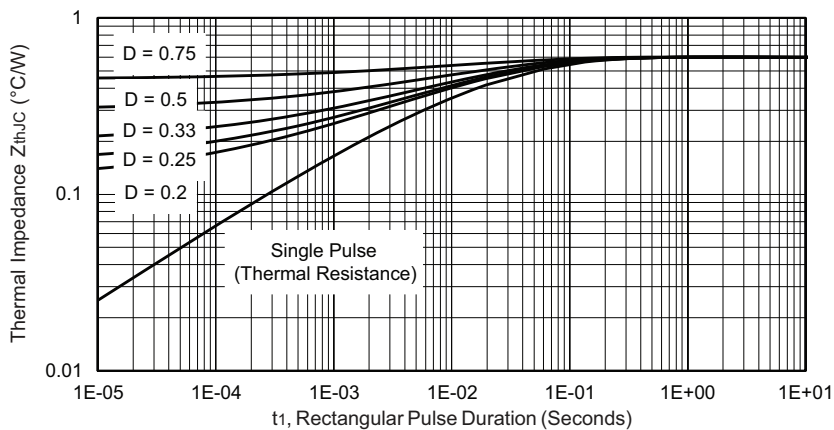


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

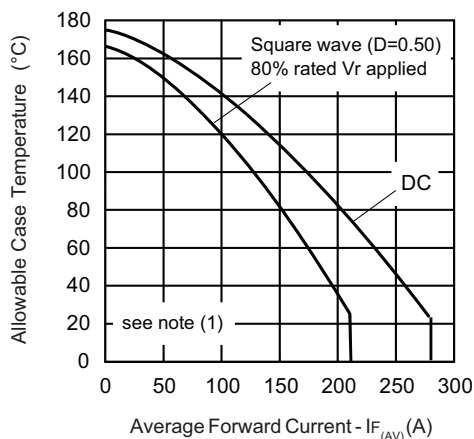


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

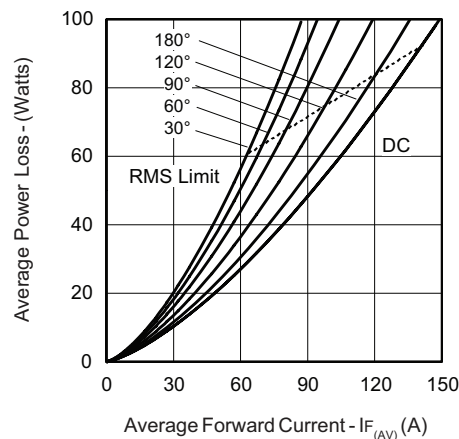


Fig. 6 - Forward Power Loss Characteristics

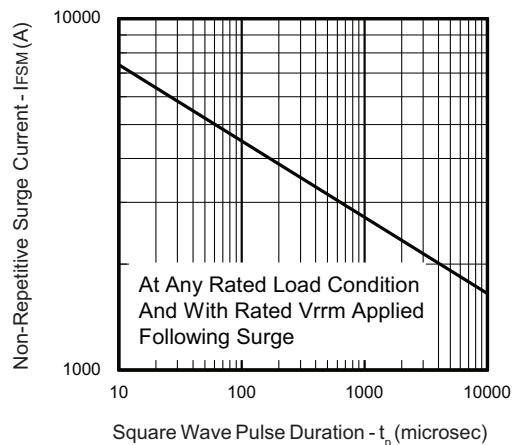


Fig. 7 - Maximum Non-Repetitive Surge Current

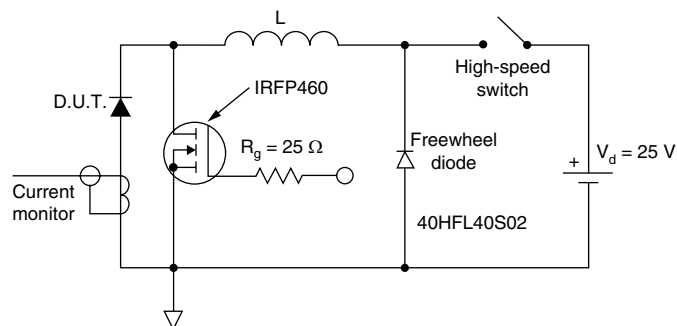


Fig. 8 - Unclamped Inductive Test Circuit

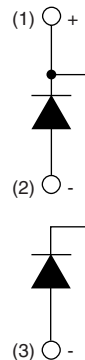
Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

**ORDERING INFORMATION TABLE**

Device code	VS	KC	S	20	1	/	045	P
	①	②	③	④	⑤		⑥	⑦

- 1** - Vishay HPP
- 2** - Circuit configuration:
KC = ADD-A-PAK - 2 diodes/common cathode
- 3** - S = Schottky diode
- 4** - Average rating (x 10)
- 5** - Product silicon identification
- 6** - Voltage rating (045 = 45 V)
- 7** - Lead (Pb)-free

CIRCUIT CONFIGURATION

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95174



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