Schottky Rectifier, 100 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

Pb-free
RoHS COMPLIANT

PRODUCT SUMMARY	
$I_{F(AV)}$	100 A
V_R	45 V

MECHANICAL DESCRIPTION

The Gene ration 5 of ADD-A-PAK modul e combi ne the excellent th ermal performance obtai ned by the usage of direct bond ed co pper substrate with supe rior mechanical ruggedness, than ks to th e insertion of a soli d coppe r baseplate at the bottom side of the device.
The Cu baseplate allow an easier mounting on the majority of heatsin k with in creased tole rance of su rface rou ghness and improved thermal spread.
The Generation 5 of ADD-A-PAK mo dule is manufactured without hard mold, eliminating in this way any possible direct stress on the leads.
The ele ctrical terminals are secured against axi al pul l-out: they are fixed to the module housing via a click-stop feature already tested and proved as reliable on other Vi shay HPP modules.

DESCRIPTION

The 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 app lications are in high curren t switching pow er supplies, plating power supplies, UPS systems, converters, freewheeling d iodes, we lding, and re verse battery protection.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS VAL	UES	UNITS
$I_{F(AV)}$	Rectangular waveform	100	A
V_{RRM}		45	V
I_{FSM}	t_p = 5 µs sine	8600	A
V_F	100 Apk, T_J = 125 °C	0.65	V
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS			
PARAMETER SYMBOL		VSKDS201/045P	UNITS
Maximum DC reverse voltage	V_R	45	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER SYMBO		L	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 Amps, 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 °C	0.7	V
		200 A		0.92	
		100 A	T_J = 125 °C	0.65	
		200 A		0.86	
Maximum reverse leakage current	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	10	mA
		T_J = 125 °C		90	
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °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} D	C operation	0.6	°C/W
Maximum thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	0.1	
Approximate weight				110	g
				4o	z.
Mounting torque ± 10 %	to heatsink			5	Nm
	busbar			4	
Case style			JEDEC	TO-240AA	

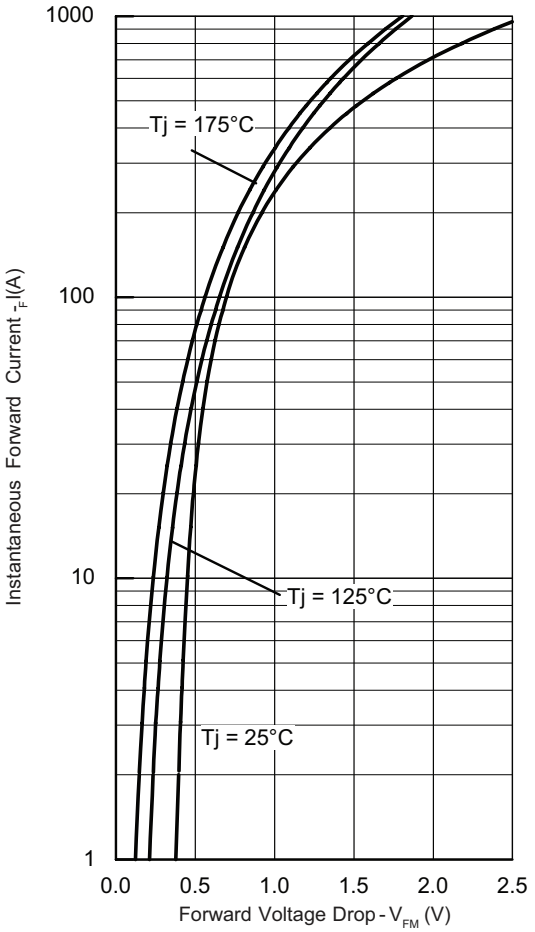


Fig. 1 - Maximum Forward Voltage Drop Characteristics

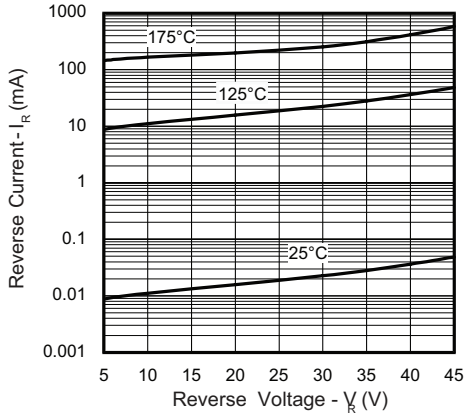


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

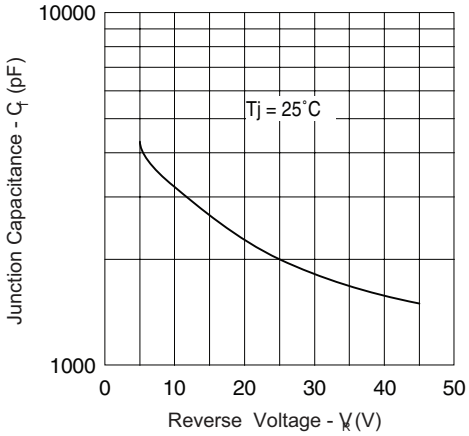


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

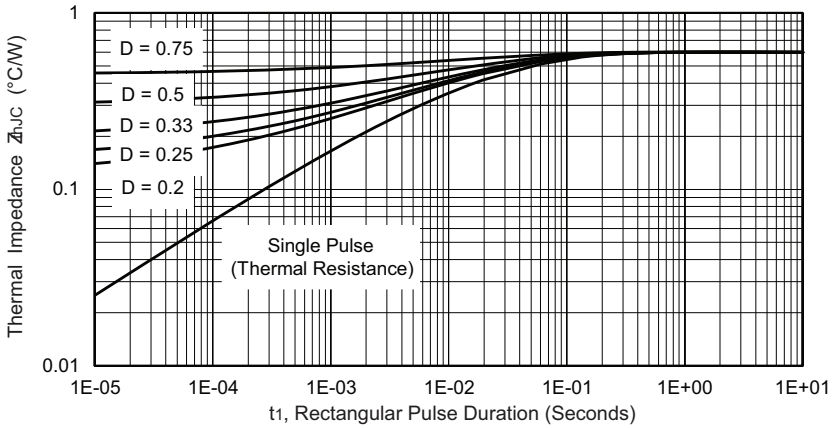


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

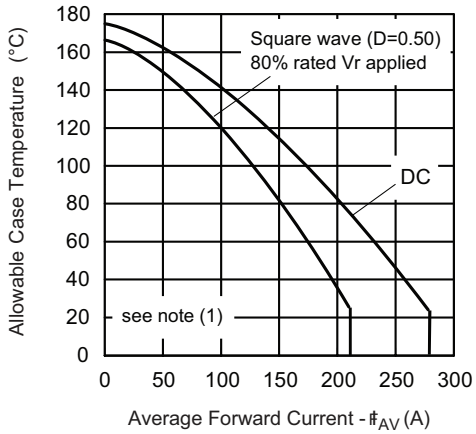


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

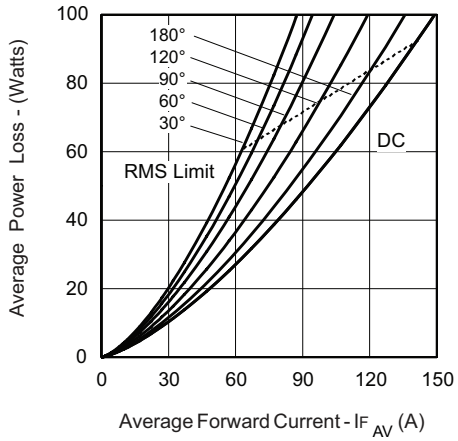


Fig. 6 - Forward Power Loss Characteristics

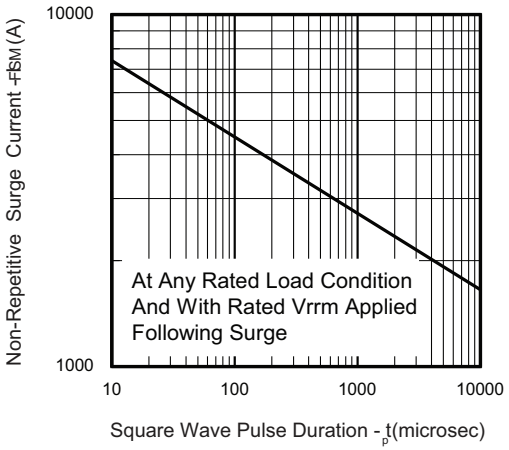


Fig. 7 - Maximum Non-Repetitive Surge Current

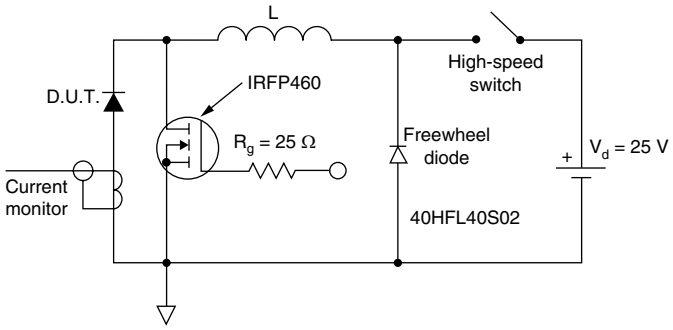


Fig. 8 - Unclamped Inductive Test Circuit

Note

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

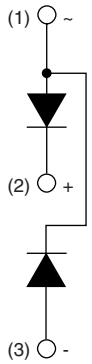
ORDERING INFORMATION TABLE

Device code

VS	KD	S	20	1	/	045	P
1	2	3	4	5		6	7

- 1 - Vishay HPP
- 2 - Circuit configuration:
  KC = ADD-A-PAK - 2 diodes in series
- 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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