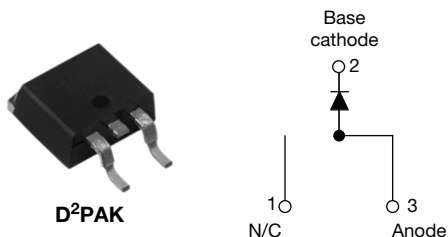


Schottky Rectifier, 20 A



FEATURES

- 125 °C T_J operation ($V_R < 5$ V)
- Single diode configuration
- Optimized for OR-ing applications
- Ultralow forward voltage drop
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Halogen-free according to IEC 61249-2-21 definition
- Compliant to RoHS directive 2002/95/EC
- AEC-Q101 qualified



RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY

$I_{F(AV)}$	20 A
V_R	15 V
I_{RM}	600 mA at 100 °C

DESCRIPTION

The Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	20	A
V_{RRM}		15	V
I_{FSM}	$t_p = 5 \mu s$ sine	700	A
V_F	19 Apk, $T_J = 125$ °C (typical)	0.25	V
T_J	Range	- 55 to 125	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VS-20L15TSPbF	UNITS
Maximum DC reverse voltage	V_R	$T_J = 100$ °C	15	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current See fig. 5	I _{F(AV)}	50 % duty cycle at T _C = 85 °C, rectangular waveform		20	A
Maximum peak one cycle non-repetitive surge current See fig. 7	I _{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V _{RRM} applied	700	
		10 ms sine or 6 ms rect. pulse		330	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 2 A, L = 6 mH		10	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		2	A

ELECTRICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS	
Forward voltage drop See fig. 1	$V_{FM}^{(1)}$	19 A	$T_J = 25\text{ }^{\circ}\text{C}$	-	0.41	V	
		40 A		-	0.52		
		19 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.25	0.33		
		40 A		0.37	0.50		
Reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	-	10	mA	
		$T_J = 100\text{ }^{\circ}\text{C}$		-	600		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.182		V	
Forward slope resistance	r_t			7.6		mΩ	
Maximum junction capacitance	C_T	$V_R = 5\text{ }V_{DC}$, (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$		-	2000	pF	
Typical series inductance	L_S	Measured lead to lead 5 mm from package body		8	-	nH	
Maximum voltage rate of change	dV/dt	Rated V_R		10 000		V/μs	

Note

(1) Pulse width < 300 μs, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T _J		- 55 to 125	°C
Maximum storage temperature range	T _{Stg}		- 55 to 150	
Maximum thermal resistance, junction to case	R _{thJC}	DC operation See fig. 4	1.5	°C/W
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased (For TO-220)	0.50	
Maximum thermal resistance, junction to ambient	R _{thJA}	DC operation	40	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style D ² PAK	20L15TS	

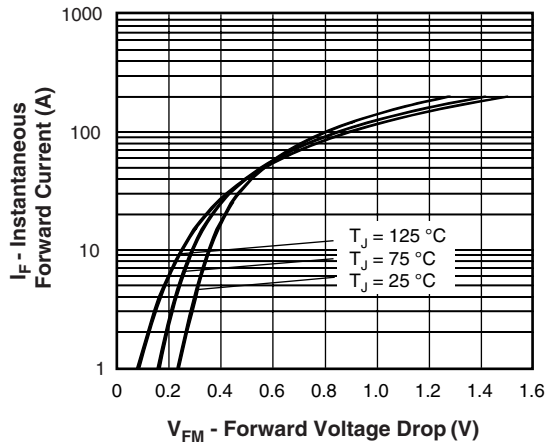


Fig. 1 - Maximum Forward Voltage Drop Characteristics

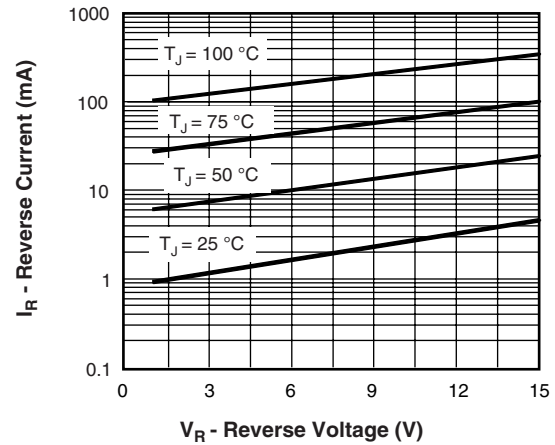


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

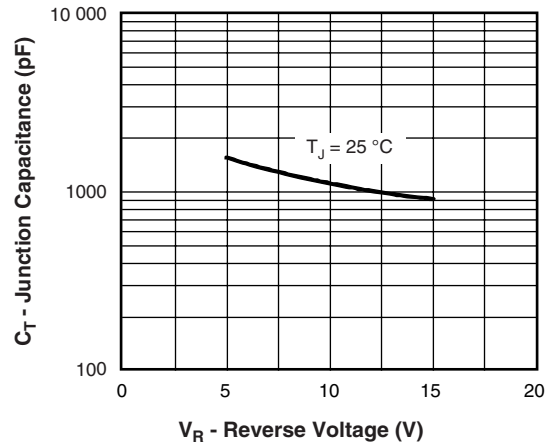
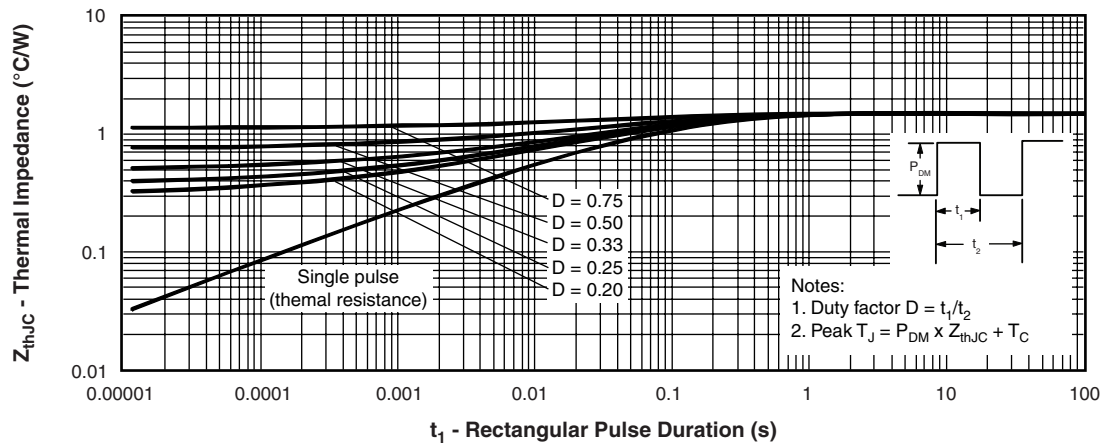


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

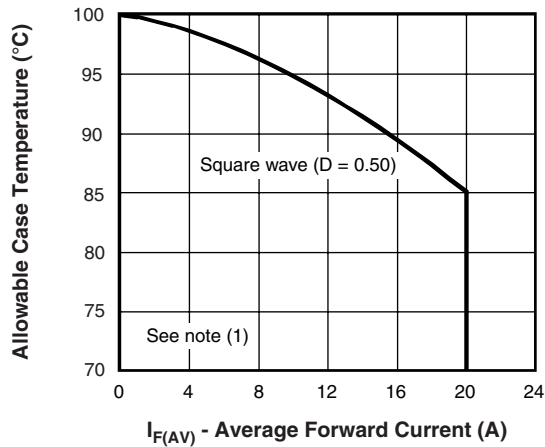


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

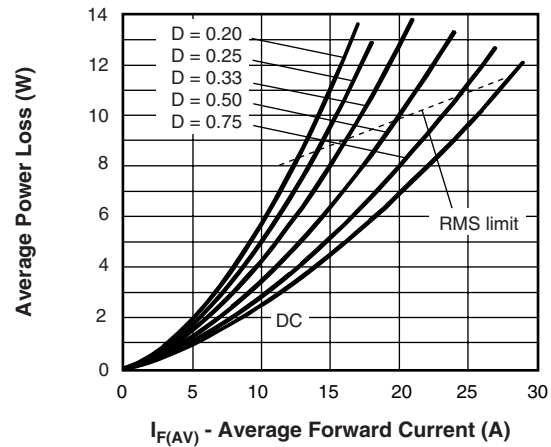


Fig. 6 - Forward Power Loss Characteristics

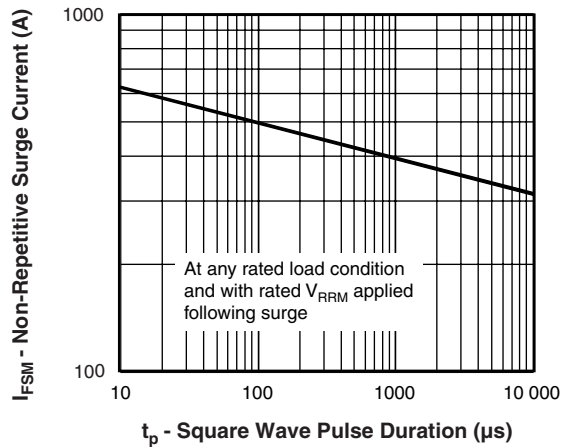


Fig. 7 - Maximum Non-Repetitive Surge Current

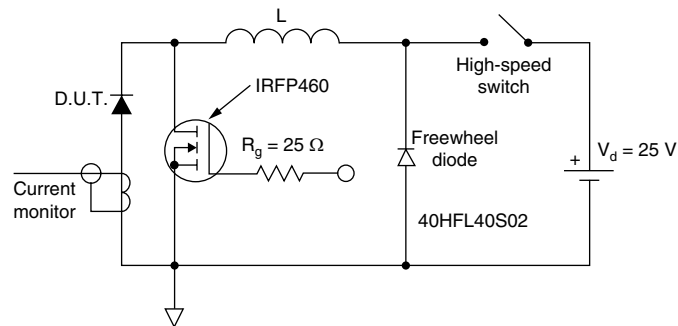


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = 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-	20	L	15	T	S	TRL	PbF
	1	2	3	4	5	6	7	8

- | | | |
|---|---|--|
| 1 | - | HPP product suffix |
| 2 | - | Current rating (20 A) |
| 3 | - | L = Low V_F |
| 4 | - | Voltage rating (15 = 15 V) |
| 5 | - | T = Schottky series |
| 6 | - | S = D ² PAK |
| 7 | - | <ul style="list-style-type: none">• None = Tube (50 pieces)• TRL = Tape and reel (left oriented)• TRR = Tape and reel (right oriented) |
| 8 | - | PbF = Lead (Pb)-free |

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95014
Part marking information	www.vishay.com/doc?95008
Packaging information	www.vishay.com/doc?95032



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.