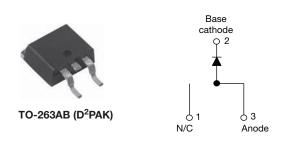
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# High Performance Schottky Rectifier, 20 A



PRODUCT SUMMARY								
I <sub>F(AV)</sub>	20 A							
V <sub>R</sub>	15 V							
V <sub>F</sub> at I <sub>F</sub>	0.33 V							
I <sub>RM</sub> max.	600 mA at 100 °C							
T <sub>J</sub> max.	125 °C							
E <sub>AS</sub>	10 mJ							
Package	TO-263AB (D <sup>2</sup> PAK)							
Diode variation	Single die							

### FEATURES

- 125 °C T<sub>J</sub> operation ( $V_R < 5 V$ )
- Center tap module
- Optimized for OR-ing applications
- Ultralow forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long
   **FREE** 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
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

### DESCRIPTION

The Schottky rectifier module has been optimized for ultralow 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 <sub>F(AV)</sub>	Rectangular waveform	20	А						
V <sub>RRM</sub>		15	V						
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	700	А						
V <sub>F</sub>	19 A <sub>pk</sub> , T <sub>J</sub> = 125 °C (typical)	0.25	V						
TJ	Range	-55 to +125	°C						

VOLTAGE RATINGS								
PARAMETER	SYMBOL	TEST CONDITIONS	VS-STPS20L15GPbF	UNITS				
Maximum DC reverse voltage	V <sub>R</sub>	T.I = 100 °C	15	V				
Maximum working peak reverse voltage	V <sub>RWM</sub>	1j = 100 C	15	v				

ABSOLUTE MAXIMUM RATINGS									
PARAMETER	SYMBOL	TEST COND	VALUES	UNITS					
Maximum average forward current See fig. 5	I <sub>F(AV)</sub>	50 % duty cycle at $T_C$ = 85 °C,	20						
Maximum peak one cycle		5 µs sine or 3 µs rect. pulse	Following any rated load	700	A				
non-repetitive surge current See fig. 7	IFSM	10 ms sine or 6 ms rect. pulse	condition and with rated V <sub>RRM</sub> applied	330					
Non-repetitive avalanche energy	E <sub>AS</sub>	$T_J = 25 \ ^{\circ}C, \ I_{AS} = 2 \ A, \ L = 6 \ mH$	10	mJ					
Repetitive avalanche current	I <sub>AR</sub>	Current decaying linearly to zero Frequency limited by T <sub>J</sub> maximu	2	А					

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ELECTRICAL SPECIFICATIONS									
PARAMETER	SYMBOL	TEST CO	TEST CONDITIONS						
		19 A	T.I = 25 °C	-	0.41				
Forward voltage drop See fig. 1	V <sub>FM</sub> <sup>(1)</sup>	40 A	1j=25 C	-	0.52	v			
	V FM \.,	19 A	T.I = 125 °C	0.25	0.33				
		40 A	1j = 125 0	0.37	0.50				
Reverse leakage current	I <sub>BM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	$V_{\rm B}$ = Rated $V_{\rm B}$	-	10	mA			
See fig. 2	IRM (")	T <sub>J</sub> = 100 °C	V <sub>R</sub> = naleu V <sub>R</sub>	-	600	ШA			
Threshold voltage	V <sub>F (TO)</sub>	V <sub>F(TO)</sub> T T movimum 0.182		182	V				
Forward slope resistance	r <sub>t</sub>	$T_J = T_J$ maximum	7.6		mW				
Maximum junction capacitance	CT	$V_R = 5 V_{DC}$ (test signal range	-	2000	pF				
Typical series inductance	L <sub>S</sub>	Measured lead to lead 5 r	8	-	nH				
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub>	Rated V <sub>R</sub> 10 000 V/µ						

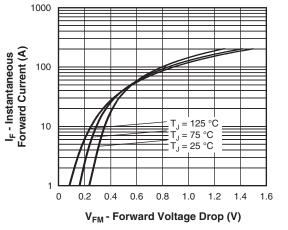
#### Note

 $^{(1)}\,$  Pulse width < 300  $\mu s,$  duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS				
Maximum junction temperature r	ange T <sub>J</sub>		-55 to +125	°C				
Maximum storage temperature r	ange T <sub>Stg</sub>		-55 to +150	C				
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation See fig. 4	1.5					
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth and greased (for TO-220)	0.50	°C/W				
Maximum thermal resistance, junction to ambient	R <sub>thJA</sub>	DC operation (for D <sup>2</sup> PAK)	40					
Approximate weight			2	g				
Approximate weight			0.07	oz.				
Mounting torque	nimum	Non-lubricated threads	6 (5)	kgf ⋅ cm				
Mounting torque ma	ximum			(lĎf · in)				
Marking device		Case style D <sup>2</sup> PAK	STPS2	0L15G				

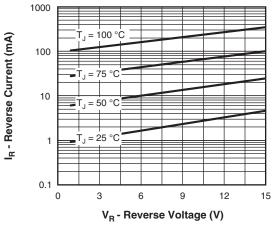
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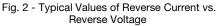
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Fig. 1 - Maximum Forward Voltage Drop Characteristics





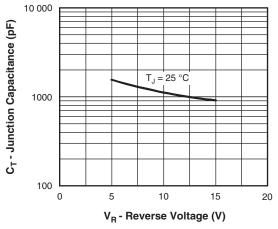


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

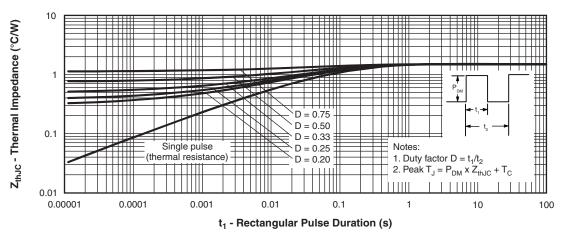
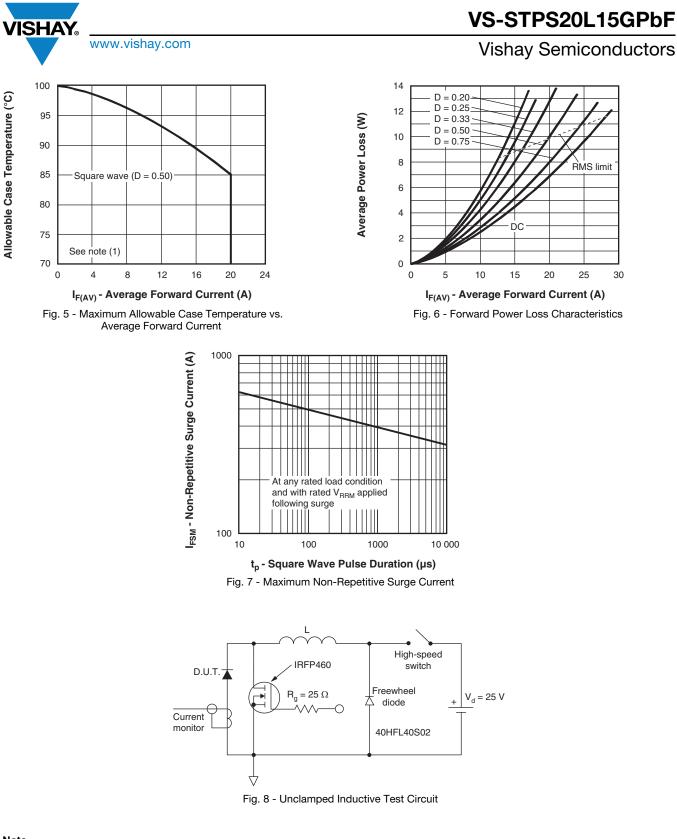


Fig. 4 - Maximum Thermal Impedance Z<sub>thJC</sub> Characteristics

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#### Note

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### **ORDERING INFORMATION TABLE**

Device code	VS-	STPS	20	L	15	G	TRL	PbF
		2	3	4	5	6	7	8
	<ol> <li>Vishay Semiconductors product</li> <li>Essential part number</li> <li>Current rating (20 = 20 A)</li> <li>Low voltage</li> <li>Voltage rating (15 = 15 V)</li> </ol>							
	<ul> <li>G = D<sup>2</sup>PAK package</li> <li>7 - • None = tube</li> </ul>							
				e and re	`		,	
	8	- • Pk	oF = lea	be and ro d (Pb)-fr Pb)-free	ee (for l	D <sup>2</sup> PAK	tube)	(RL)

ORDERING INFORMATION (Example)								
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION					
VS-STPS20L15GPbF	50	1000	Antistatic plastic tubes					
VS-STPS20L15GTRLP	800	800	13" diameter reel					
VS-STPS20L15GTRRP	800	800	13" diameter reel					

LINKS TO RELATED DOCUMENTS						
Dimensions	www.vishay.com/doc?95046					
Part marking information	www.vishay.com/doc?95054					
Packaging information	www.vishay.com/doc?95032					

# **Outline Dimensions**



D<sup>2</sup>PAK

### **DIMENSIONS** in millimeters and inches

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SYMBOL	MILLIMETERS		INC	HES	NOTES	NOTES	SYMBOL	MILLIM	IETERS	INC	HES	NOTES
STMBOL	MIN.	MAX.	MIN.	MAX.	NOTES	STWDUL	MIN.	MAX.	MIN.	MAX.	NOTES	
А	4.06	4.83	0.160	0.190			D1	6.86	8.00	0.270	0.315	3
A1	0.00	0.254	0.000	0.010			E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039			E1	7.90	8.80	0.311	0.346	3
b1	0.51	0.89	0.020	0.035	4		е	2.54	BSC	0.100	BSC	
b2	1.14	1.78	0.045	0.070			Н	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4		L	1.78	2.79	0.070	0.110	
С	0.38	0.74	0.015	0.029			L1	-	1.65	-	0.066	3
c1	0.38	0.58	0.015	0.023	4		L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065			L3	0.25	BSC	0.010	BSC	
D	8.51	9.65	0.335	0.380	2		L4	4.78	5.28	0.188	0.208	

#### Notes

<sup>(1)</sup> Dimensioning and tolerancing per ASME Y14.5 M-1994

<sup>(2)</sup> Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body

<sup>(3)</sup> Thermal pad contour optional within dimension E, L1, D1 and E1

<sup>(4)</sup> Dimension b1 and c1 apply to base metal only

<sup>(5)</sup> Datum A and B to be determined at datum plane H

<sup>(6)</sup> Controlling dimension: inch

<sup>(7)</sup> Outline conforms to JEDEC<sup>®</sup> outline TO-263AB

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