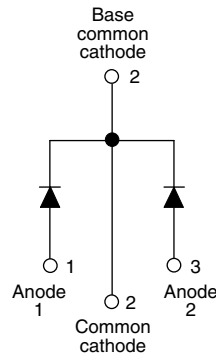


## Schottky Rectifier, 2 x 20 A



TO-247AC



### FEATURES

- 125 °C  $T_J$  operation ( $V_R < 5$  V)
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified according to JEDEC-JESD47
- Halogen-free according to IEC 61249-2-21 definition (-N3 only)



PRODUCT SUMMARY	
Package	TO-247AC
$I_{F(AV)}$	2 x 20 A
$V_R$	15 V
$V_F$ at $I_F$	See Electrical table
$I_{RM}$ max.	600 mA at 100 °C
$T_J$ max.	125 °C
Diode variation	Common cathode
$E_{AS}$	10 mJ

### DESCRIPTION

The VS-STPS40L15CW... center tap 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	40	A
$V_{RRM}$		15	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	700	A
$V_F$	19 Apk, $T_J = 125$ °C (per leg, typical)	0.25	V
$T_J$		- 55 to 125	°C

VOLTAGE RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	VS-STPS40L15CWPBF	VS-STPS40L15CW-N3	UNITS
Maximum DC reverse voltage	$V_R$	$T_J = 100$ °C	15	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 $T_C = 86$ °C, rectangular waveform		20	A
				40	
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	700	A
		10 ms sine or 6 ms rect. pulse		330	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 2$ A, $L = 5$ mH		10	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical		2	A



<b>ELECTRICAL SPECIFICATIONS</b>						
PARAMETER	SYMBOL	TEST CONDITIONS	TYP.	MAX.	UNITS	
Maximum forward voltage drop per leg 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 per leg 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		m $\Omega$	
Maximum junction capacitance per leg	$C_T$	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$	-	2000	pF	
Typical series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body	8	-	nH	
Maximum voltage rate of change	dV/dt	Rated $V_R$	10 000		V/ $\mu\text{s}$	

**Note**

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

<b>THERMAL - MECHANICAL SPECIFICATIONS</b>				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	$T_J$		- 55 to 125	$^\circ\text{C}$
Maximum storage temperature range	$T_{Stg}$		- 55 to 150	
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation See fig. 4	1.4	$^\circ\text{C/W}$
Maximum thermal resistance, junction to case per package		DC operation	0.7	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased	0.24	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum maximum	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
			12 (10)	
Marking device		Case style TO-247AC (JEDEC)	STPS40L15CW	

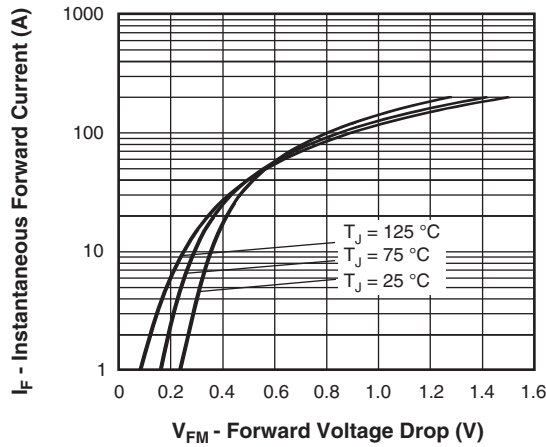


Fig. 1 - Maximum Forward Voltage Drop Characteristics

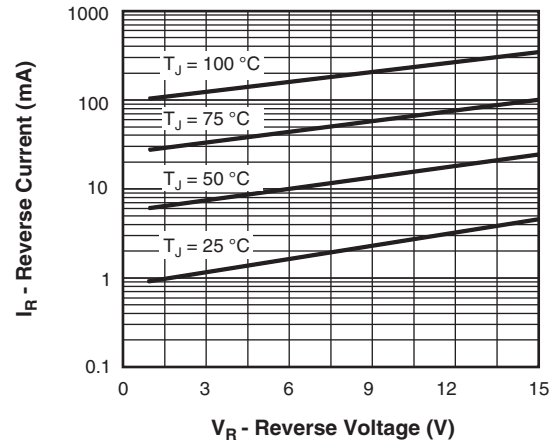


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

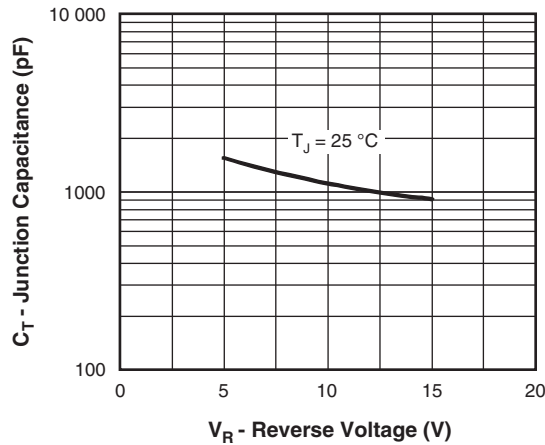


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

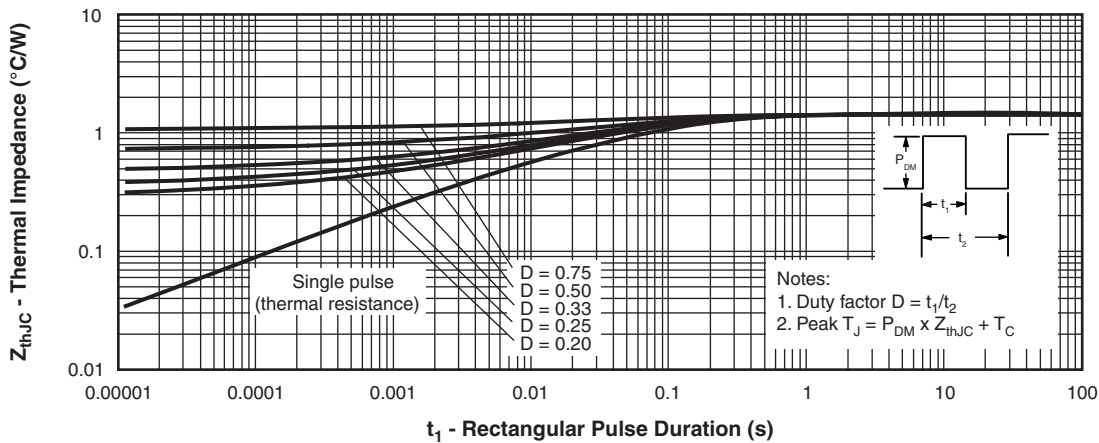


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

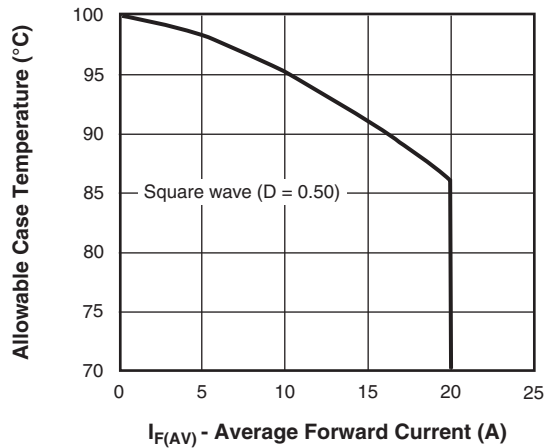


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

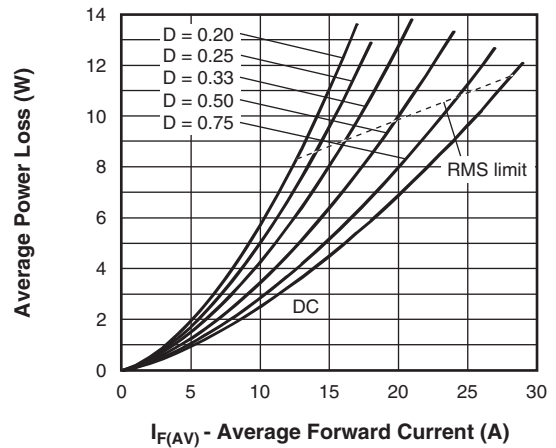


Fig. 6 - Forward Power Loss Characteristics

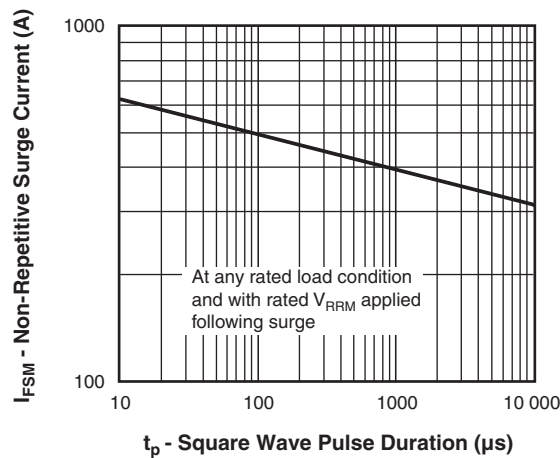


Fig. 7 - Maximum Non-Repetitive Surge Current

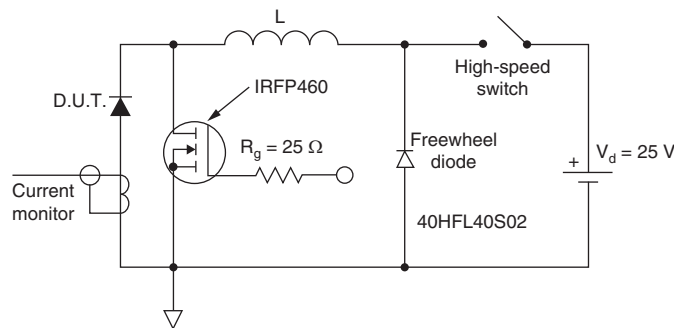
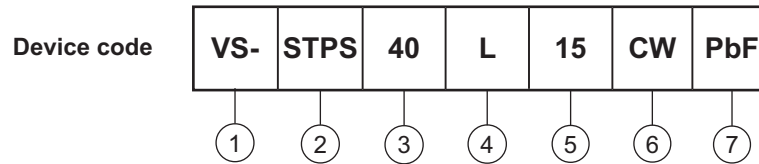


Fig. 8 - Unclamped Inductive Test Circuit



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Schottky STPS series
- 3** - Current ratings (40 = 40 A)
- 4** - L = Low forward voltage
- 5** - Voltage code (15 = 15 V)
- 6** - Package:  
CW = TO-247
- 7** - Environmental digit
  - PbF = Lead (Pb)-free and RoHS compliant
  - -N3 = Halogen-free, RoHS compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-STPS40L15CWPbF	25	500	Antistatic plastic tube
VS-STPS40L15CW-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95223">www.vishay.com/doc?95223</a>
Part marking information	TO-247AC PbF <a href="http://www.vishay.com/doc?95226">www.vishay.com/doc?95226</a>
	TO-247AC -N3 <a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**