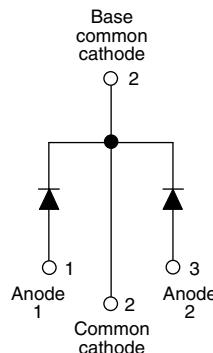
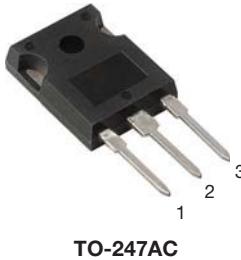


## Schottky Rectifier, 2 x 20 A



### 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
- Designed and qualified according to JEDEC-JESD47
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

### 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
$I_{FSM}$	$t_p = 5$ µs sine	700	A
$V_F$	19 A <sub>pk</sub> , $T_J = 125$ °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	$V_R$				
Maximum working peak reverse voltage	$V_{RWM}$	$T_J = 100$ °C	15	15	V

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per leg See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 86$ °C, rectangular waveform	20	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7			40	
Non-repetitive avalanche energy per leg	$E_{AS}$	5 µs sine or 3 µs rect. pulse	700	
		10 ms sine or 6 ms rect. pulse	330	
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 µs Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	2	A

ELECTRICAL SPECIFICATIONS							
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		$\text{m}\Omega$	
Maximum junction capacitance per leg	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		-	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		$\text{V}/\mu\text{s}$	

**Note**

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

THERMAL - MECHANICAL SPECIFICATIONS				
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	$^\circ\text{C}/\text{W}$
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
Mounting torque	minimum maximum		0.21	oz.
Marking device		Non-lubricated threads	6 (5) 12 (10)	kgf · cm (lbf · in)
		Case style TO-247AC (JEDEC)	STPS40L15CW	

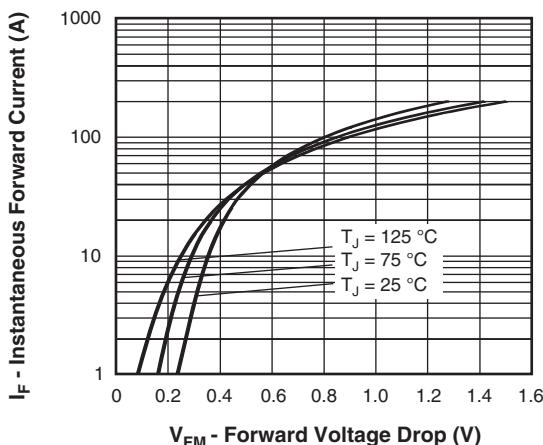


Fig. 1 - Maximum Forward Voltage Drop Characteristics

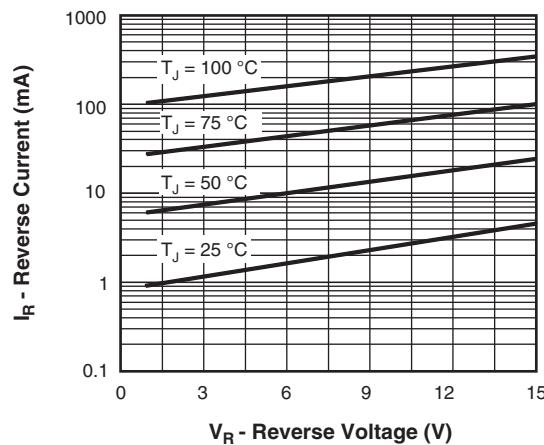


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

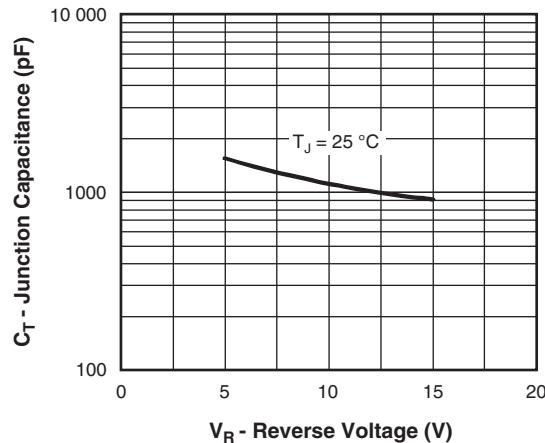


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

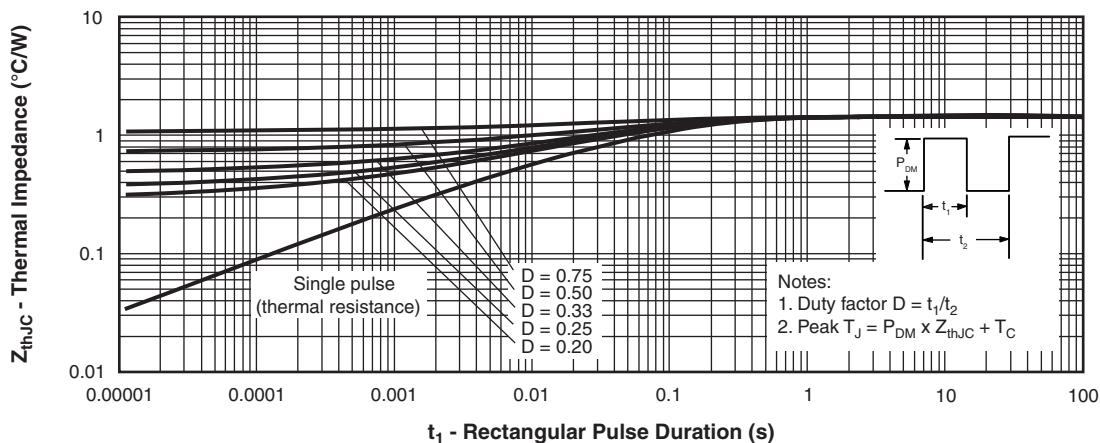


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

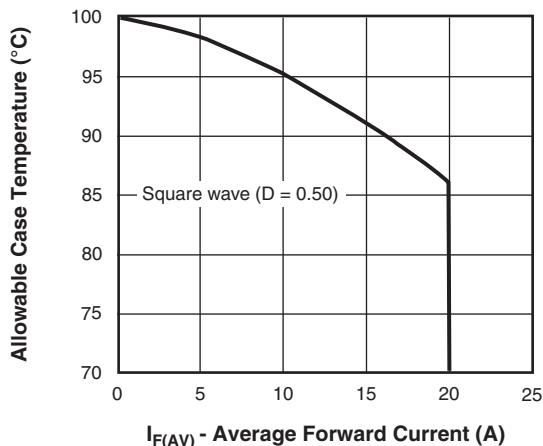


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

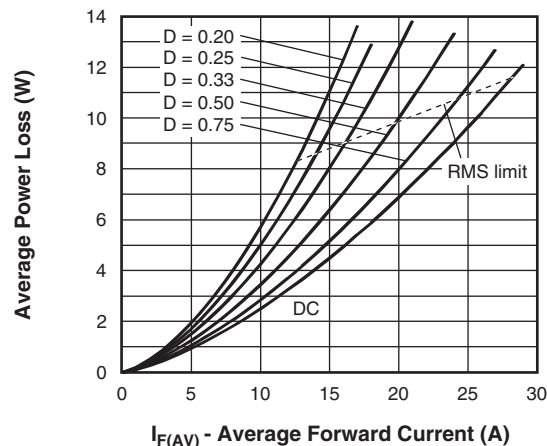


Fig. 6 - Forward Power Loss Characteristics

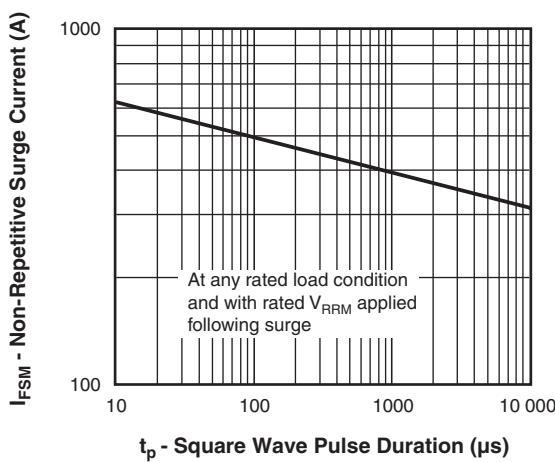


Fig. 7 - Maximum Non-Repetitive Surge Current

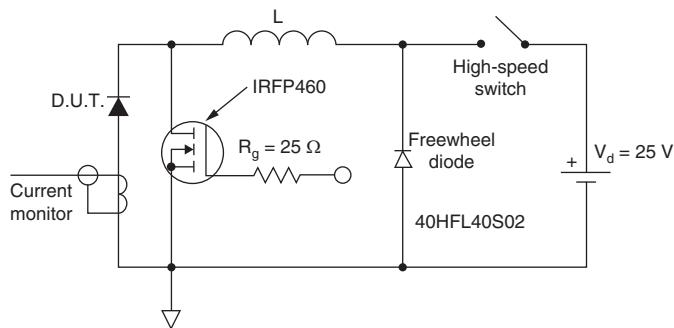
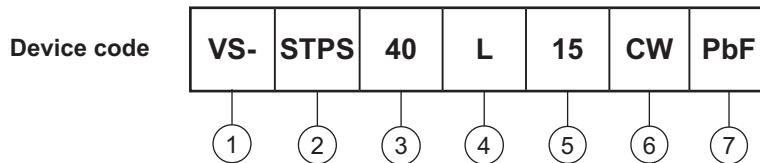


Fig. 8 - Unclamped Inductive Test Circuit

**ORDERING INFORMATION TABLE**


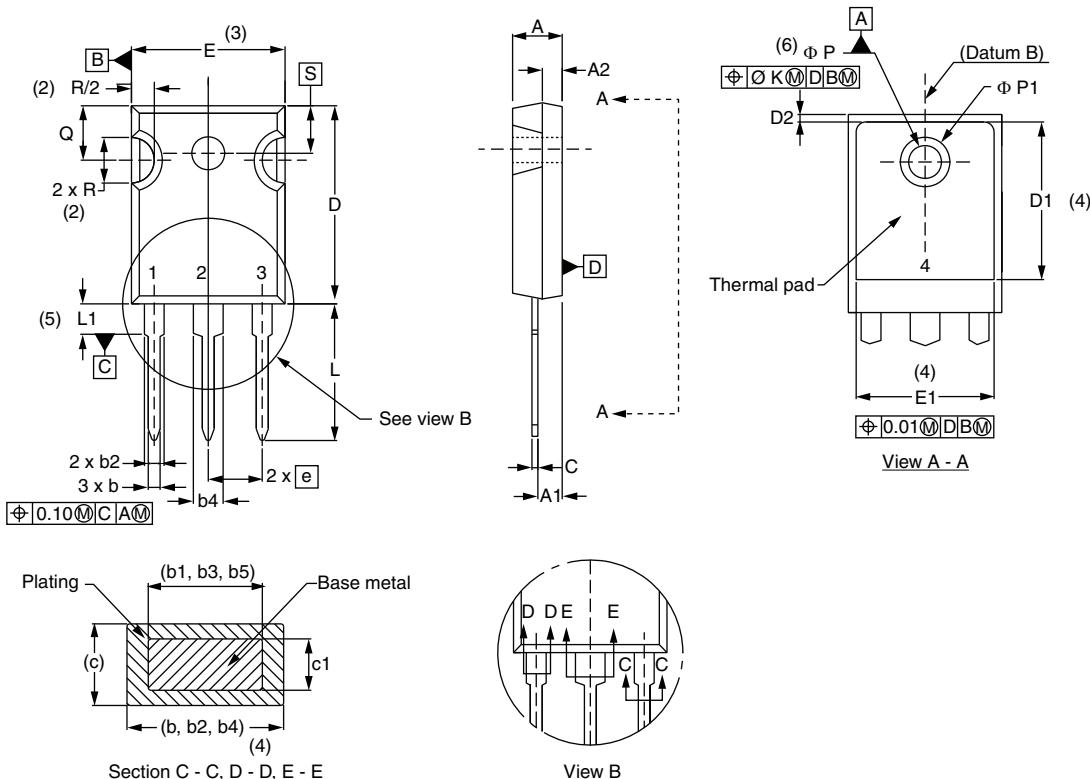
- 1** - Vishay Semiconductors product
- 2** - Schottky STPS series
- 3** - Current ratings (40 = 40 A)
- 4** - L = Low forward voltage
- 5** - Voltage code (15 = 15 V)
- 6** - Package:  
CW = TO-247
- 7** - Environmental digit
  - PbF = Lead (Pb)-free and RoHS compliant
  - -N3 = Halogen-free, RoHS compliant,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

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

<b>LINKS TO RELATED DOCUMENTS</b>		
Dimensions		<a href="http://www.vishay.com/doc?95542">www.vishay.com/doc?95542</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>

## TO-247AC - 50 mils L/F

**DIMENSIONS** in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES	View A - A	SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.				MIN.	MAX.	MIN.	MAX.	
A	4.65	5.31	0.183	0.209			D2	0.51	1.35	0.020	0.053	
A1	2.21	2.59	0.087	0.102			E	15.29	15.87	0.602	0.625	3
A2	1.17	1.37	0.046	0.054			E1	13.46	-	0.53	-	
b	0.99	1.40	0.039	0.055			e	5.46 BSC		0.215 BSC		
b1	0.99	1.35	0.039	0.053			Ø K	0.254		0.010		
b2	1.65	2.39	0.065	0.094			L	14.20	16.10	0.559	0.634	
b3	1.65	2.34	0.065	0.092			L1	3.71	4.29	0.146	0.169	
b4	2.59	3.43	0.102	0.135			Ø P	3.56	3.66	0.14	0.144	
b5	2.59	3.38	0.102	0.133			Ø P1	-	7.39	-	0.291	
c	0.38	0.89	0.015	0.035			Q	5.31	5.69	0.209	0.224	
c1	0.38	0.84	0.015	0.033			R	4.52	5.49	0.178	0.216	
D	19.71	20.70	0.776	0.815	3		S	5.51 BSC		0.217 BSC		
D1	13.08	-	0.515	-	4							

**Notes**

- (1) Dimensioning and tolerancing per ASME Y14.5M-1994
- (2) Contour of slot optional
- (3) 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 outermost extremes of the plastic body
- (4) Thermal pad contour optional with dimensions D1 and E1
- (5) Lead finish uncontrolled in L1
- (6) Ø P to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
- (7) Outline conforms to JEDEC® outline TO-247 with exception of dimension c and Q

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