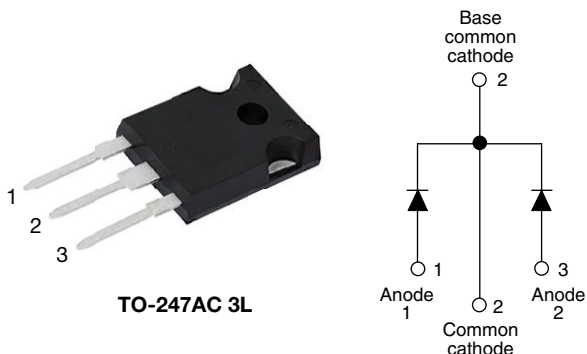


## High Performance Schottky Rectifier, 2 x 20 A



### 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®-JESD 47
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	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
$E_{AS}$	10 mJ
Package	TO-247AC 3L
Circuit configuration	Common cathode

### 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 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-STPS40L15CW-N3	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 $T_C = 86$ °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	700	
		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

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	TYP.	MAX.	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	19 A	-	0.41	V
		40 A		0.52	
		19 A	0.25	0.33	
		40 A		0.50	
Reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	-	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	$C_T$	$V_R = 5\text{ V}_{DC}$ (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		V/ $\mu$ s

**Note**

<sup>(1)</sup> Pulse width < 300  $\mu$ s, duty cycle < 2 %

**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T <sub>J</sub>		- 55 to 125	°C
Maximum storage temperature range	T <sub>Stg</sub>		- 55 to 150	
Maximum thermal resistance, junction to case per leg	R <sub>thJC</sub>	DC operation See fig. 4	1.4	°C/W
Maximum thermal resistance, junction to case per package		DC operation	0.7	
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth and greased	0.24	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC 3L	STPS40L15CW	

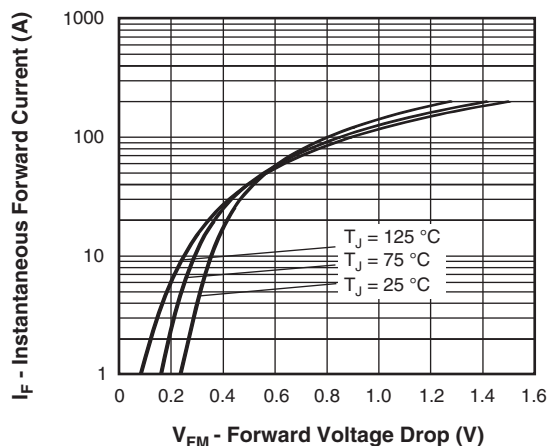


Fig. 1 - Maximum Forward Voltage Drop Characteristics

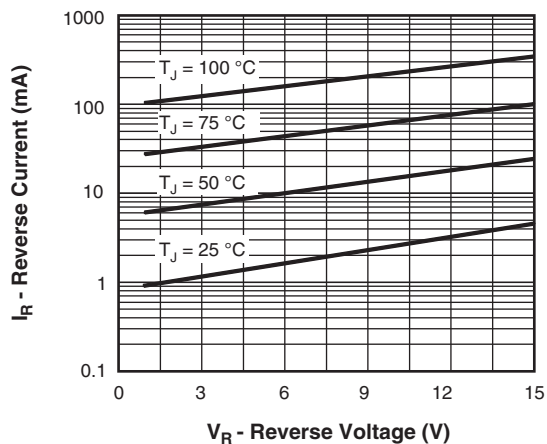


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

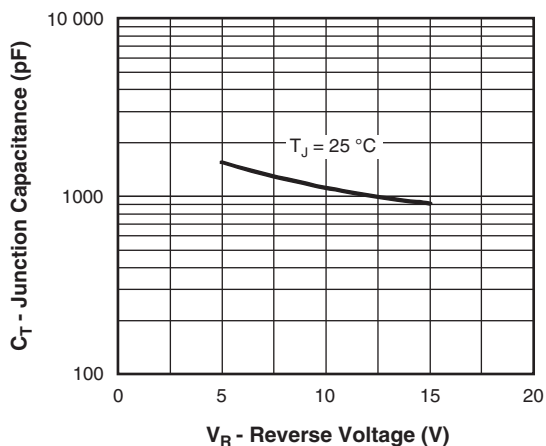
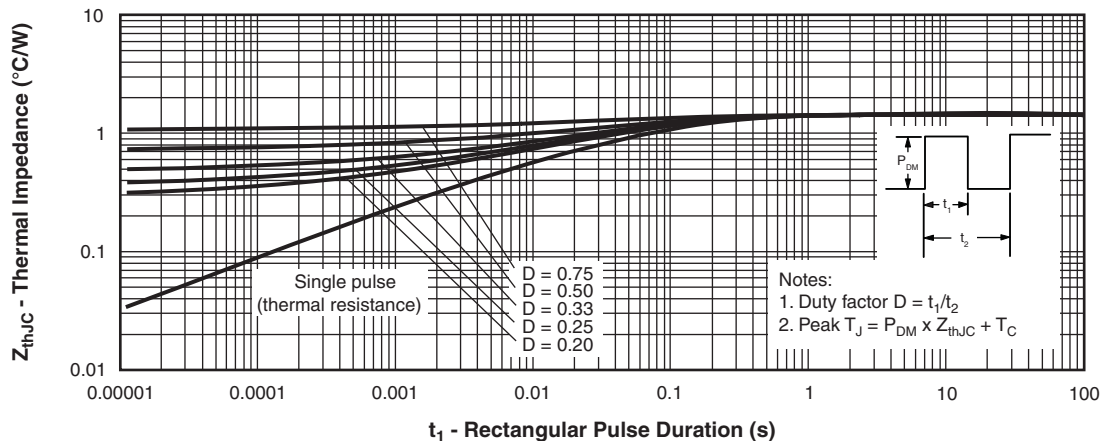


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

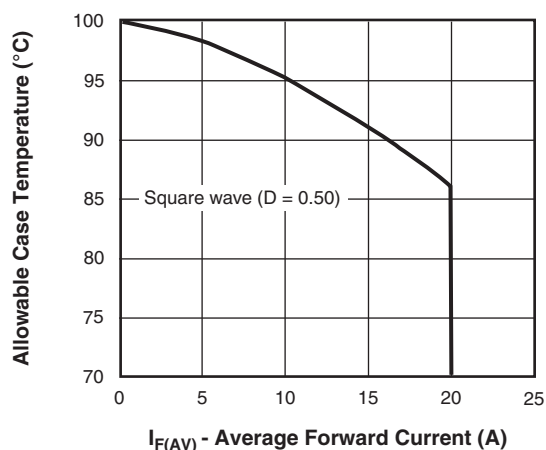


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

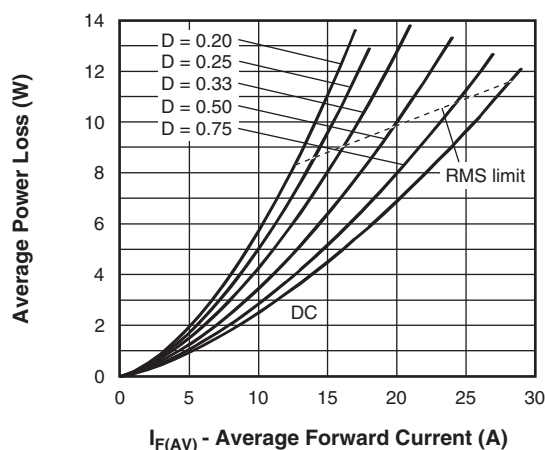


Fig. 6 - Forward Power Loss Characteristics

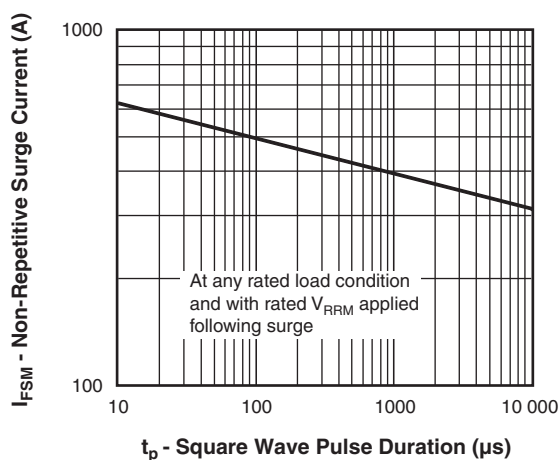


Fig. 7 - Maximum Non-Repetitive Surge Current

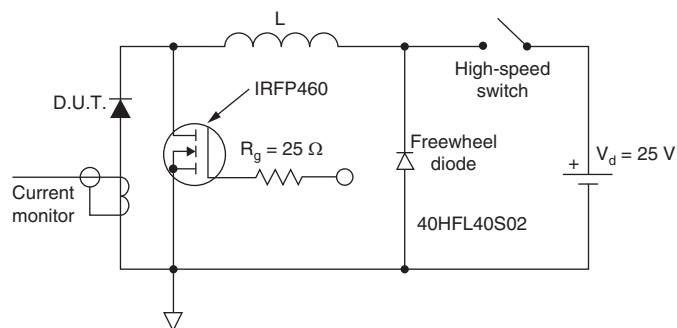


Fig. 8 - Unclamped Inductive Test Circuit



## ORDERING INFORMATION TABLE

Device code	VS-	STPS	40	L	15	CW	-N3
	1	2	3	4	5	6	7

- 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  
-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-STPS40L15CW-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96138">www.vishay.com/doc?96138</a>
Part marking information	<a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>





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