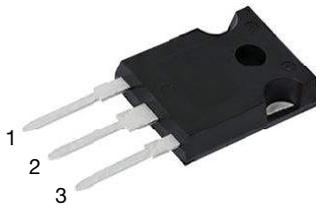
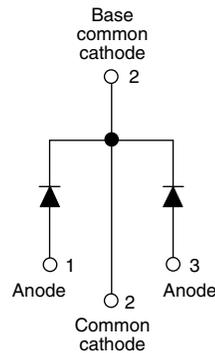


High Performance Schottky Rectifier, 2 x 20 A


TO-247AC 3L


FEATURES

- 150 °C T_J operation
- Very 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


RoHS
 COMPLIANT
HALOGEN
FREE

DESCRIPTION

The VS-STPS40L45CW... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_R	45 V
V_F at I_F	0.49 V
I_{RM} max.	80 mA at 100 °C
T_J max.	150 °C
E_{AS}	20 mJ
Package	TO-247AC 3L
Circuit configuration	Common cathode

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	40	A
V_{RRM}		45	V
I_{FSM}	$t_p = 5 \mu s$ sine	1240	A
V_F	20 A _{pk} , $T_J = 125$ °C (per leg, typical)	0.42	V
T_J		-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-STPS40L45CW-N3	UNITS
Maximum DC reverse voltage	V_R	45	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 $T_C = 122$ °C, rectangular waveform	40	A
			per device	
Maximum peak one cycle non-repetitive surge current per leg, see fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	1240	
		10 ms sine or 6 ms rect. pulse	350	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °C, $I_{AS} = 3$ A, $L = 4.4$ mH	20	mJ
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	3	A



ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	TYP.	MAX.	UNITS	
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	20 A	$T_J = 25\text{ °C}$	0.48	0.53	V
		40 A		0.61	0.69	
		20 A	$T_J = 125\text{ °C}$	0.42	0.49	
		40 A		0.60	0.70	
Reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ °C}$	$V_R = \text{Rated } V_R$	-	1.5	mA
		$T_J = 100\text{ °C}$		20	80	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$	0.27		V	
Forward slope resistance	r_t		8.72		$m\Omega$	
Maximum junction capacitance per leg	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C	-	1500	pF	
Typical series inductance per leg	L_S	Measured lead to lead 5 mm from package body	7.5	-	nH	
Maximum voltage rate of change	dV/dt	Rated V_R	10 000		V/ μ s	

Note

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

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		-55 to 150	°C
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation See fig. 4	1.6	°C/W
Maximum thermal resistance, junction to case per package		DC operation	0.8	
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	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC 3L	STPS40L45CW	

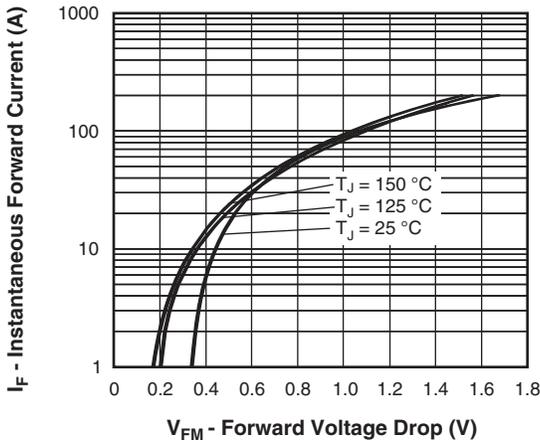


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

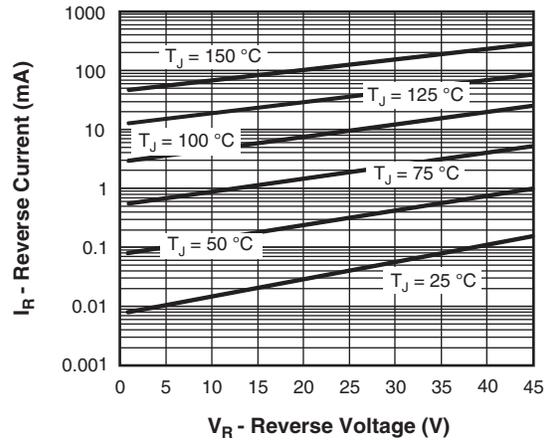


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

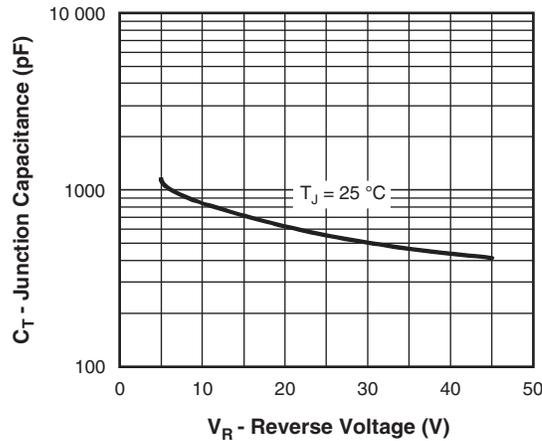


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

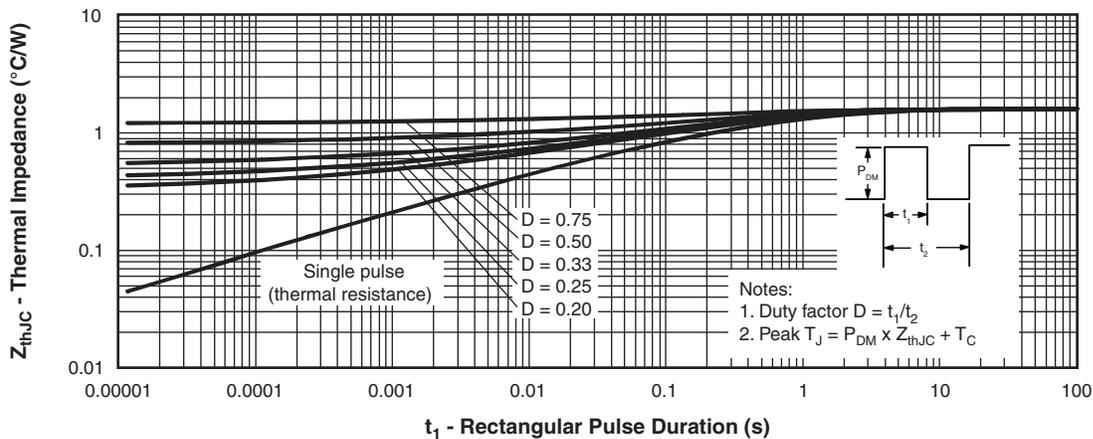


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

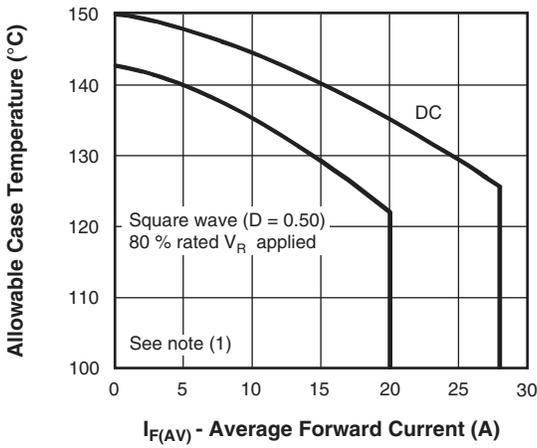


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

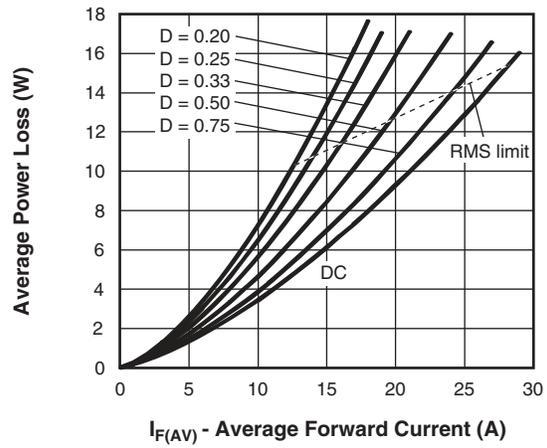


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

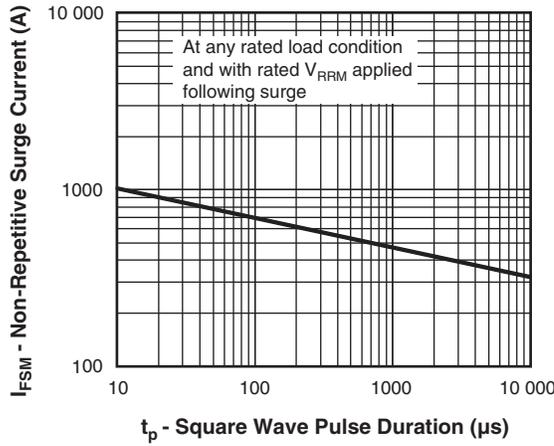


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

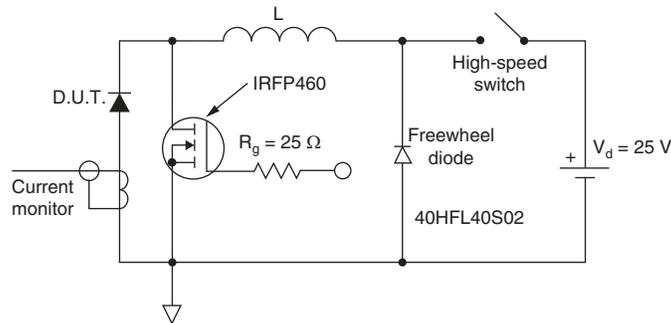


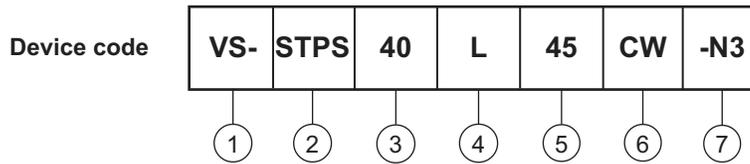
Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
- P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
- P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R



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 (45 = 45 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-STPS40L45CW-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96138
Part marking information	www.vishay.com/doc?95007



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