

## POWER SCHOTTKY RECTIFIERS

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(av)}$	2 x 20 A
$V_{RRM}$	45 V
$T_j(max)$	175 °C
$V_F(max)$	0.63 V

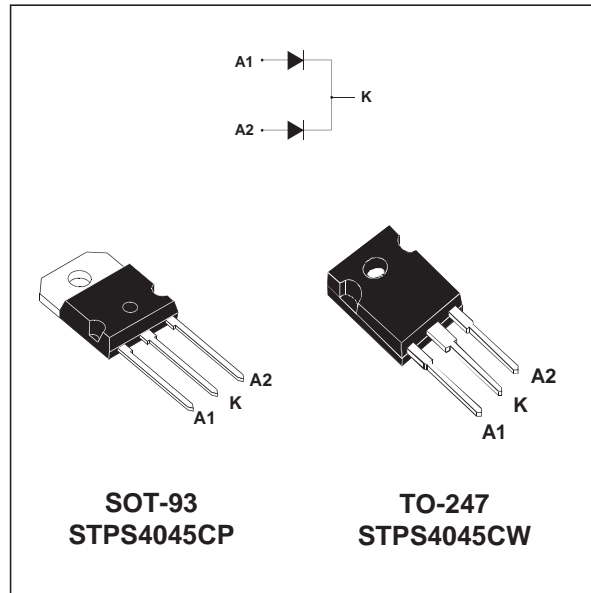
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

Dual center tap Schottky rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged either in SOT-93 or TO-247 this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		45	V
$I_{F(RMS)}$	RMS forward current		30	A
$I_{F(AV)}$	Average forward current	$T_c = 150^\circ\text{C}$ $\delta = 0.5$	Per diode 20 Per device 40	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	220	A
$I_{RRM}$	Repetitive Peak reverse current	$t_p = 2$ $\mu\text{s}$ square $F = 1$ kHz	1	A
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100$ $\mu\text{s}$ square	3	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1$ $\mu\text{s}$ $T_j = 25^\circ\text{C}$	6000	W
$T_{stg}$	Storage temperature range		- 65 to + 175	°C
$T_j$	Maximum operating junction temperature *		175	°C
$dV/dt$	Critical rate of rise of reverse voltage		10000	V/ $\mu\text{s}$

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  thermal runaway condition for a diode on its own heatsink

# STPS4045CP/CW

## THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.5	$^{\circ}\text{C}/\text{W}$
		total	0.8	
$R_{th(c)}$		Coupling	0.1	

When the diodes 1 and 2 are used simultaneously :  
 $\Delta T_J(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$

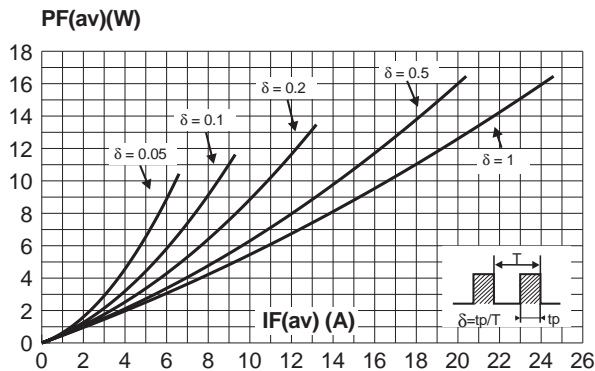
## STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			200	$\mu\text{A}$
		$T_j = 125^{\circ}\text{C}$			11	40	$\text{mA}$
$V_F^*$	Forward voltage drop	$T_j = 125^{\circ}\text{C}$	$I_F = 20 \text{ A}$		0.56	0.63	$\text{V}$
		$T_j = 25^{\circ}\text{C}$	$I_F = 40 \text{ A}$			0.94	
		$T_j = 125^{\circ}\text{C}$	$I_F = 40 \text{ A}$		0.7	0.83	

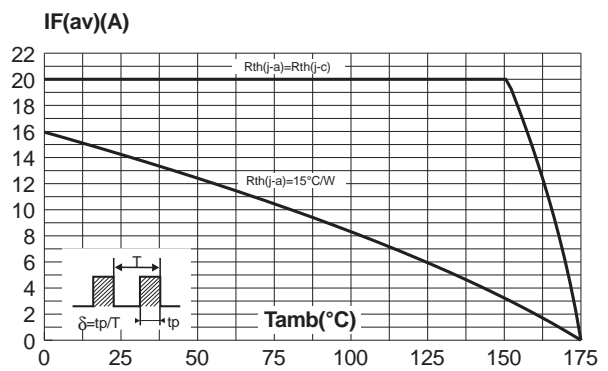
Pulse test : \*  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation :  
 $P = 0.46 \times I_{F(AV)} + 0.0085 I_{F(RMS)}^2$

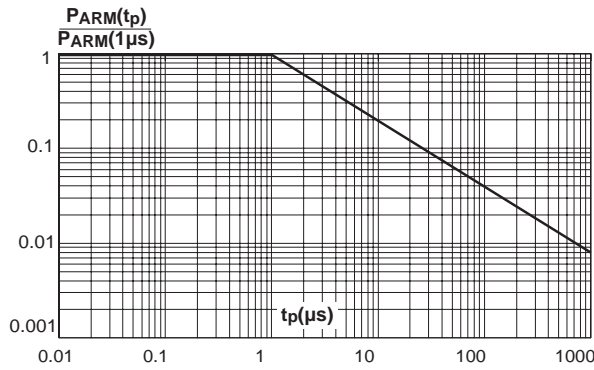
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



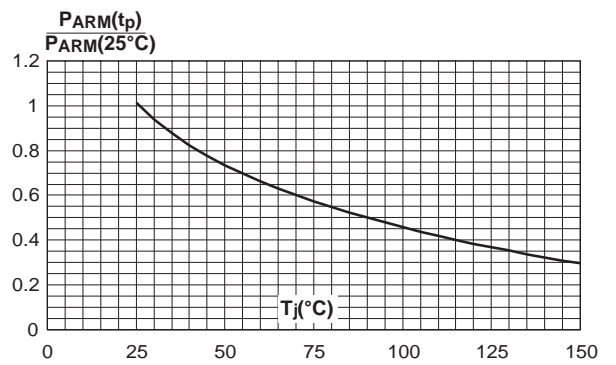
**Fig. 2:** Average current versus ambient temperature (per diode).



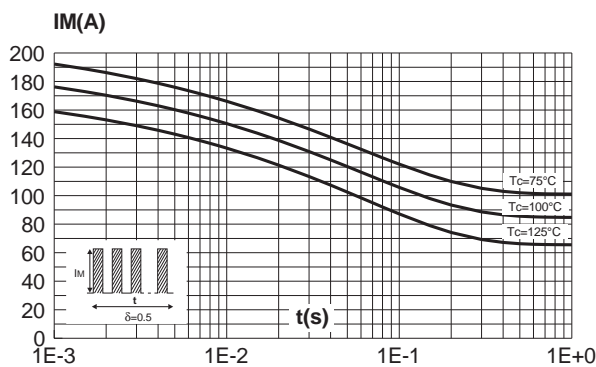
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



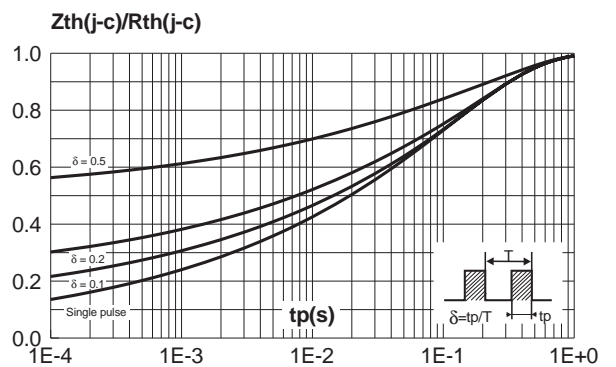
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



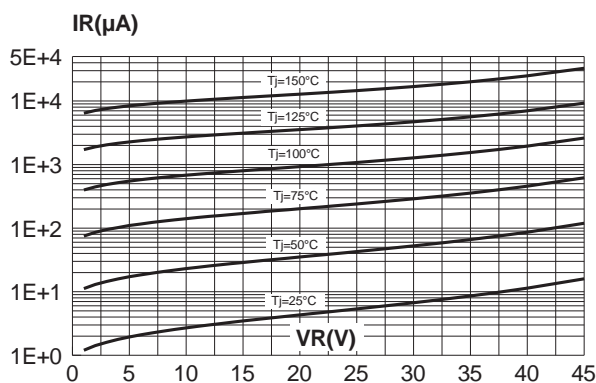
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).



**Fig. 6:** Relative variation of thermal transient impedance junction to case versus pulse duration.



**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values) (per diode).



**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values) (per diode).

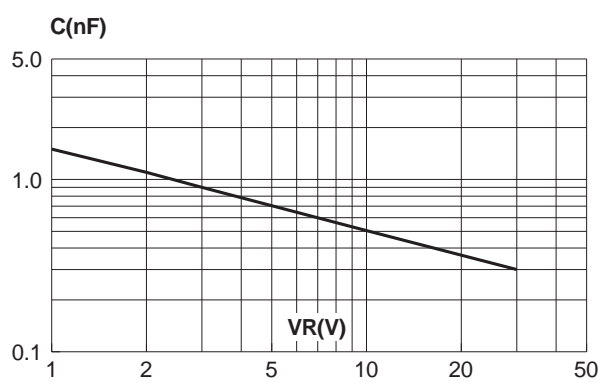
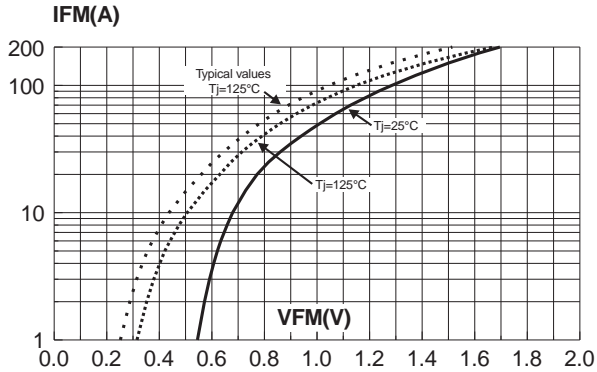
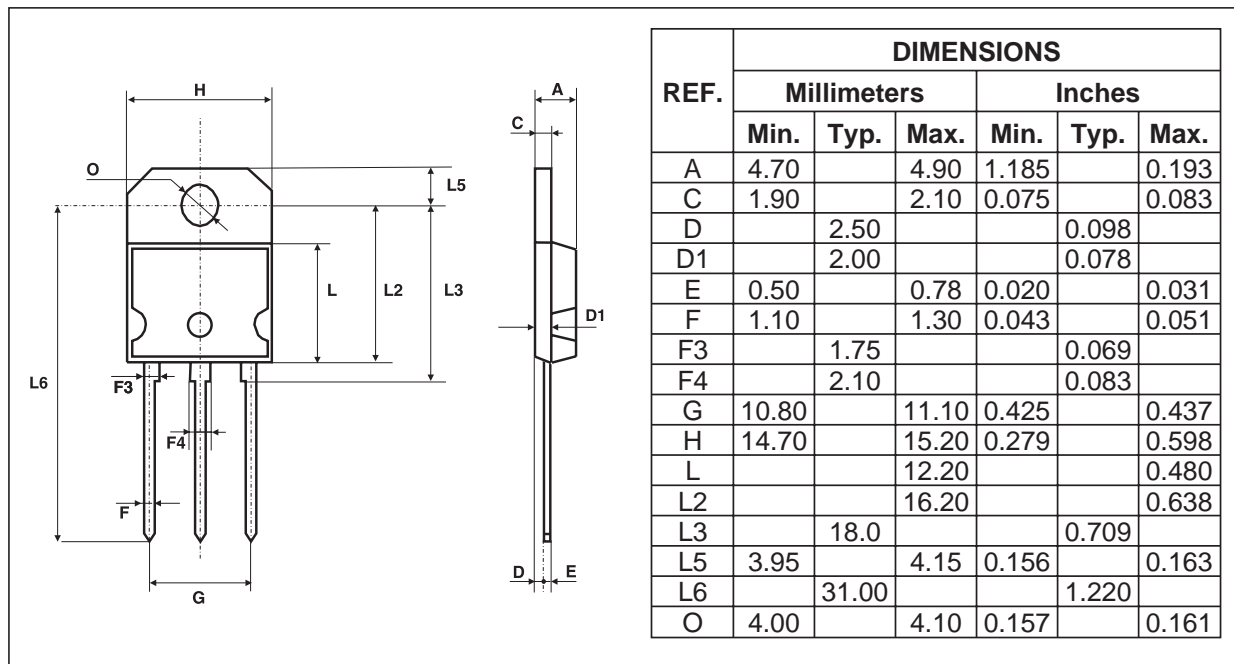


Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).



PACKAGE MECHANICAL DATA  
SOT-93



**PACKAGE MECHANICAL DATA**  
 TO-247

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.16	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.079	
F3	1.90		2.40	0.075		0.094
F4	3.00		3.40	0.118		0.134
G		10.90			0.429	
H	15.45		16.03	0.608		0.631
L	19.85		21.09	0.781		0.830
L1	3.70		4.30	0.146		0.169
L2	18.30		19.13	0.720		0.753
L3	14.20		20.30	0.559		0.799
L4	34.05		41.38	1.341		1.629
L5	5.35		6.30	0.211		0.248
M	2.00		3.00	0.079		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.140		0.144

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS4045CP	STPS4045CP	SOT-93	3.97 g.	30	Tube
STPS4045CW	STPS4045CW	TO-247	4.46 g.	30	Tube

- COOLING METHOD: BY CONDUCTION (C)
- RECOMMENDED TORQUE VALUE: 0.8 N.M
- MAXIMUM TORQUE VALUE: 1.0 N.M.
- EPOXY MEETS UL94,V0

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