

## POWER SCHOTTKY RECTIFIERS

### MAIN PRODUCTS CHARACTERISTICS

<b>I<sub>F(av)</sub></b>	<b>2 x 20 A</b>
<b>V<sub>RRM</sub></b>	<b>45 V</b>
<b>T<sub>j (max)</sub></b>	<b>175 °C</b>
<b>V<sub>F (max)</sub></b>	<b>0.63 V</b>

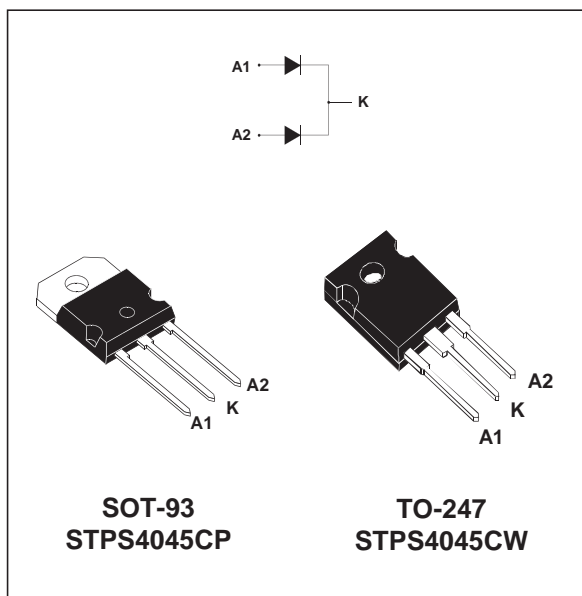
### FEATURES AND BENEFITS

- 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 <sub>RRM</sub>	Repetitive peak reverse voltage		45	V
I <sub>F(RMS)</sub>	RMS forward current		30	A
I <sub>F(AV)</sub>	Average forward current	T <sub>c</sub> = 150°C δ = 0.5	Per diode 20 Per device 40	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms sinusoidal	220	A
I <sub>R(RM)</sub>	Repetitive Peak reverse current	tp = 2 μs square F = 1kHz	1	A
I <sub>R(SM)</sub>	Non repetitive peak reverse current	tp = 100 μs square	3	A
P <sub>ARM</sub>	Repetitive peak avalanche power	tp = 1μs T <sub>j</sub> = 25°C	6000	W
T <sub>stg</sub>	Storage temperature range		- 65 to + 175	°C
T <sub>j</sub>	Maximum operating junction temperature *		175	°C
dV/dt	Critical rate of rise of reverse voltage		10000	V/μs

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

# STPS4045CP/CW

## THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	1.5	°C/W
		total	0.8	
R <sub>th(c)</sub>		Coupling	0.1	

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

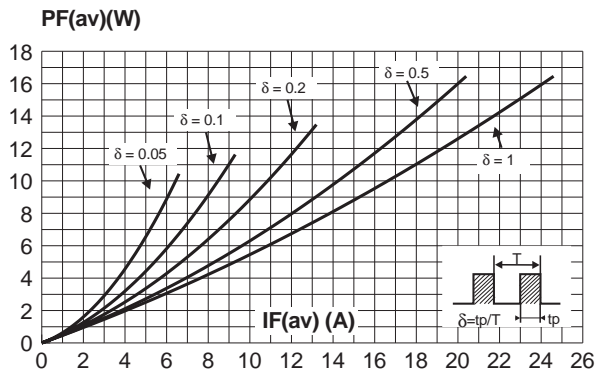
## STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			200	μA
		T <sub>j</sub> = 125°C			11	40	mA
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 125°C	I <sub>F</sub> = 20 A		0.56	0.63	V
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 40 A			0.94	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 40 A		0.7	0.83	

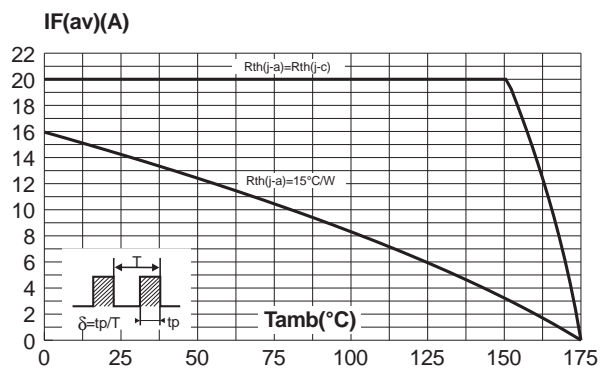
Pulse test : \* t<sub>p</sub> = 380 μs, δ < 2%

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

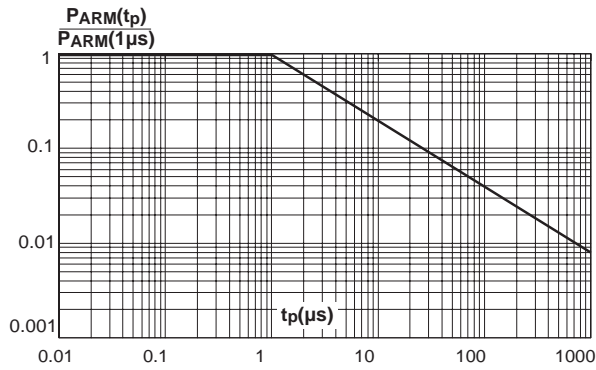
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



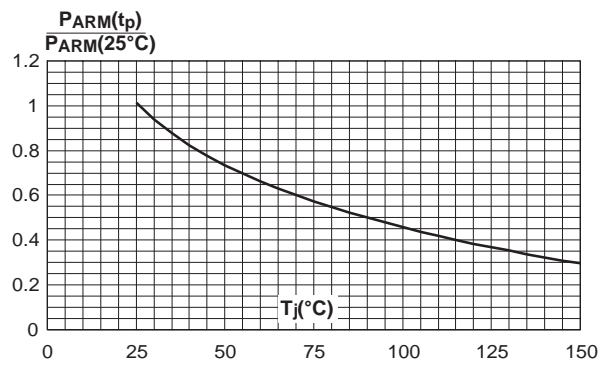
**Fig. 2:** Average current versus ambient temperature (per diode).



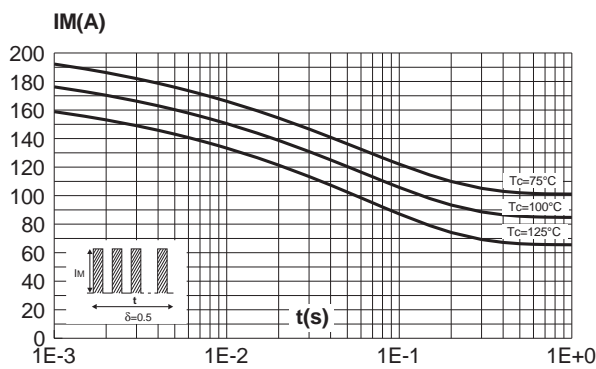
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



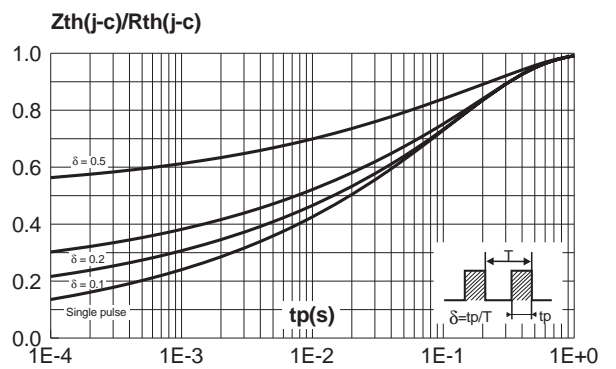
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



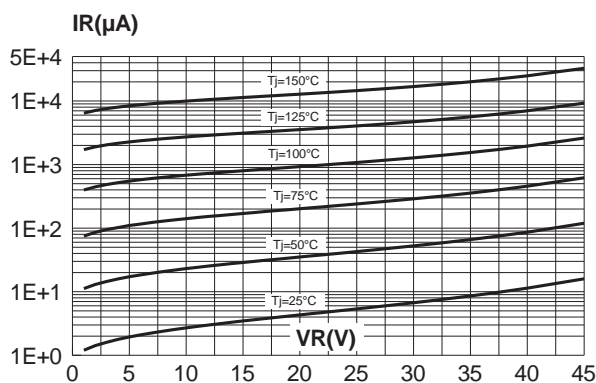
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).



**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).

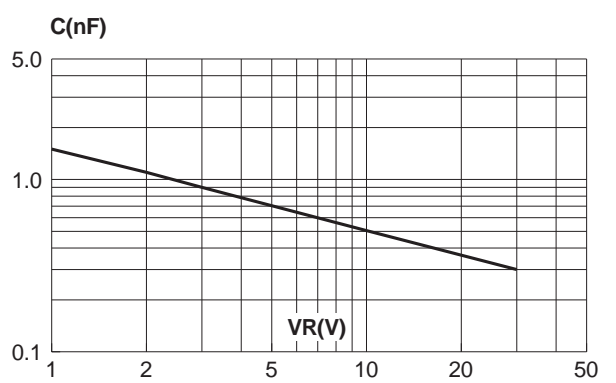
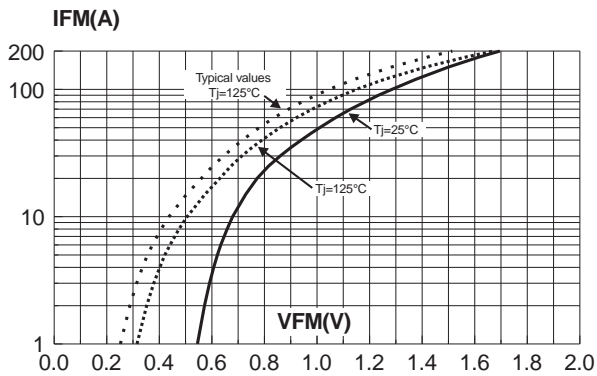
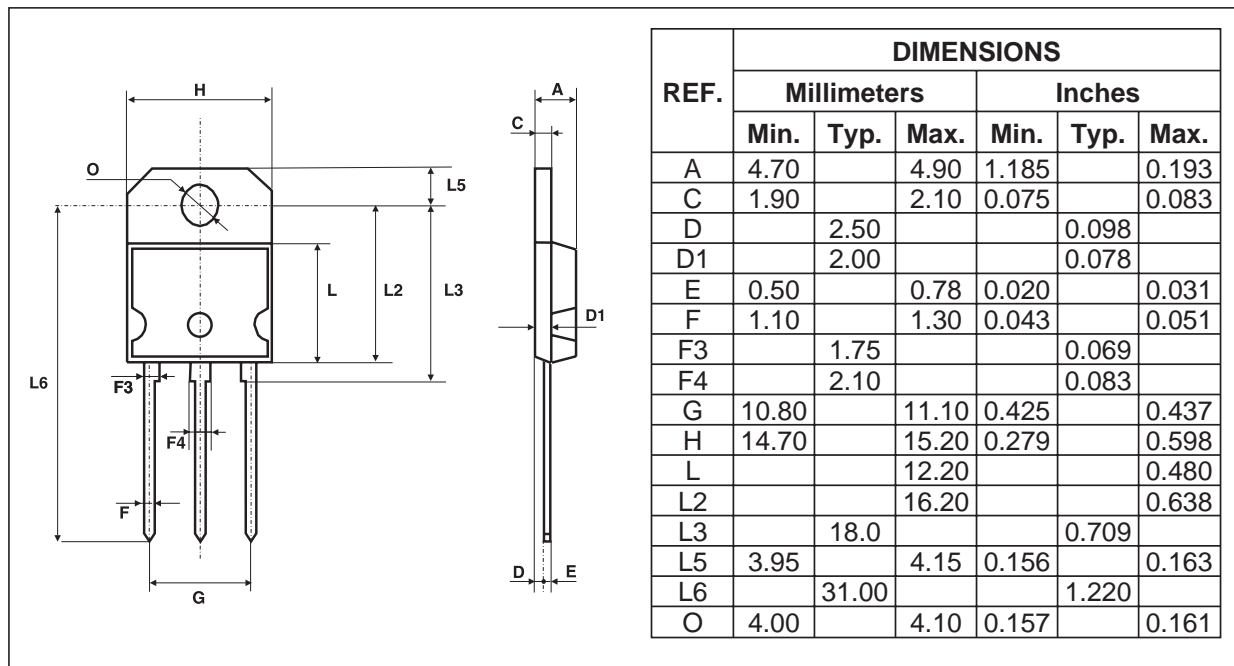


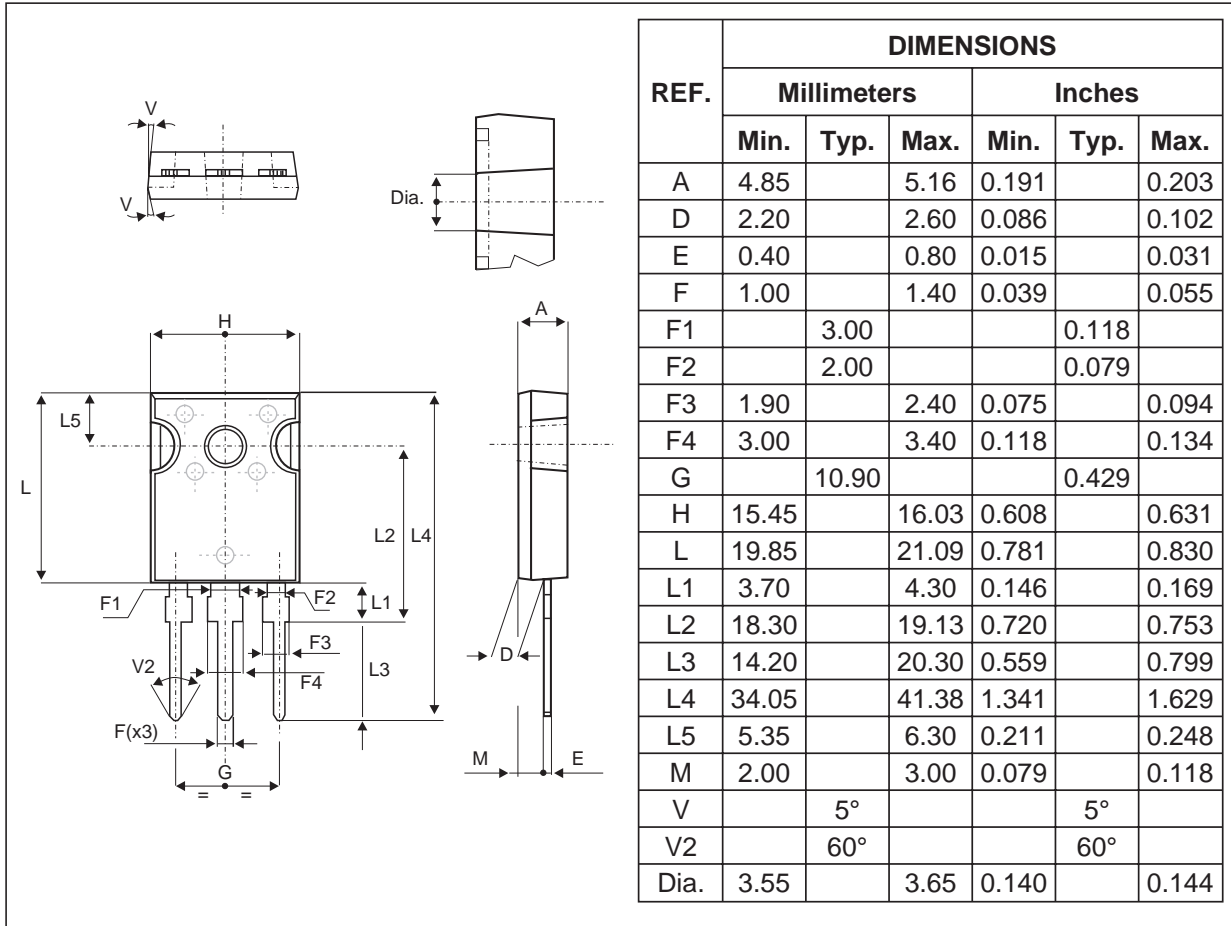
Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).



PACKAGE MECHANICAL DATA  
SOT-93



**PACKAGE MECHANICAL DATA**  
TO-247



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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