



STPS4045CP/CW

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

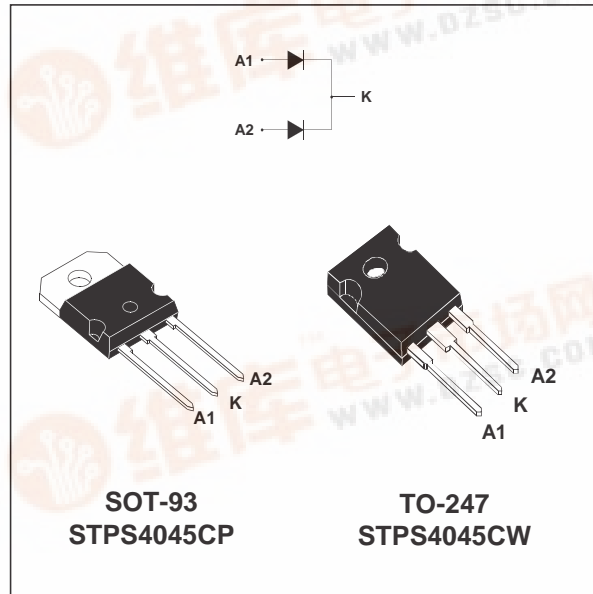
FEATURES AND BENEFITS

- 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	$t_p = 10\text{ ms}$ sinusoidal	220	A
I_{RRM}	Repetitive Peak reverse current	$t_p = 2\ \mu\text{s}$ square $F = 1\text{ kHz}$	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/ μs

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

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.5	$^{\circ}C/W$
		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	$T_j = 25^{\circ}C$	$V_R = V_{RRM}$			200	μA
		$T_j = 125^{\circ}C$			11	40	mA
V_F^*	Forward voltage drop	$T_j = 125^{\circ}C$	$I_F = 20 A$		0.56	0.63	V
		$T_j = 25^{\circ}C$	$I_F = 40 A$			0.94	
		$T_j = 125^{\circ}C$	$I_F = 40 A$		0.7	0.83	

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

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).

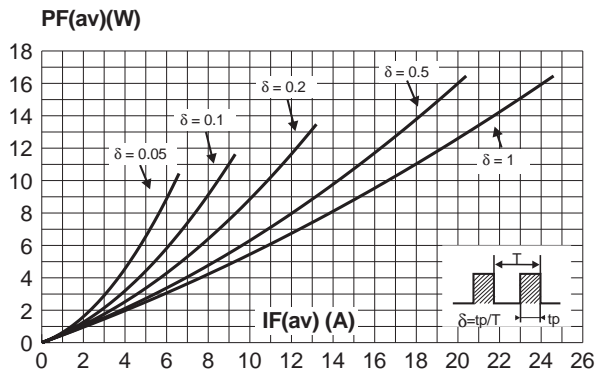


Fig. 2: Average current versus ambient temperature (per diode).

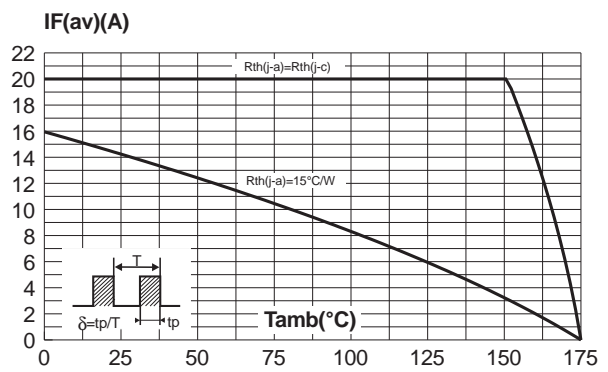


Fig. 3: Normalized avalanche power derating versus pulse duration.

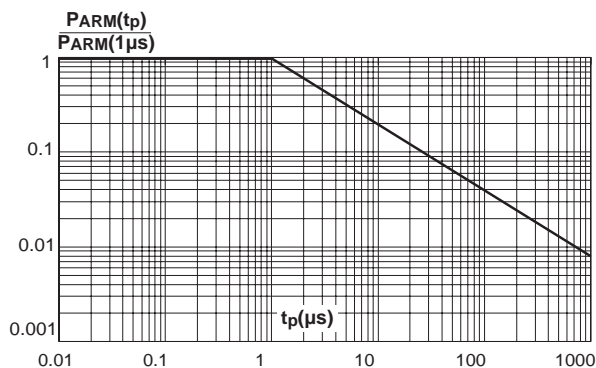


Fig. 4: Normalized avalanche power derating versus junction temperature.

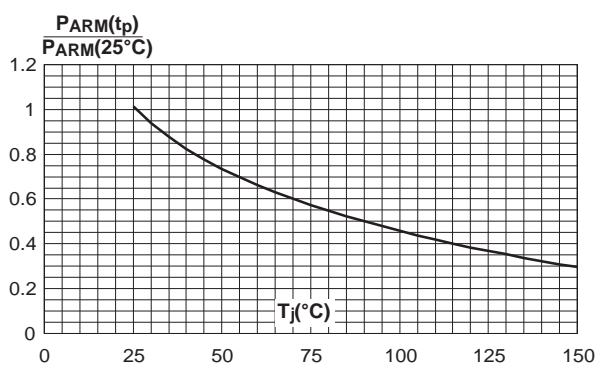


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).

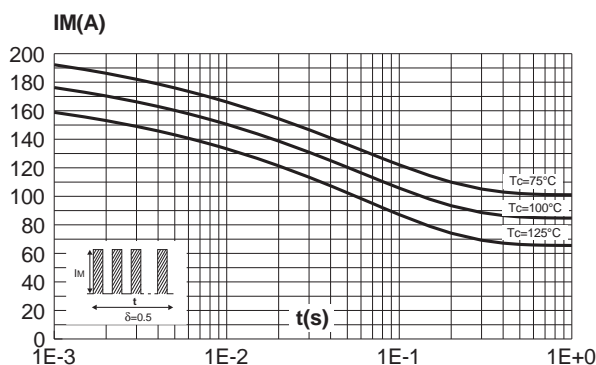


Fig. 6: Relative variation of thermal transient impedance junction to case versus pulse duration.

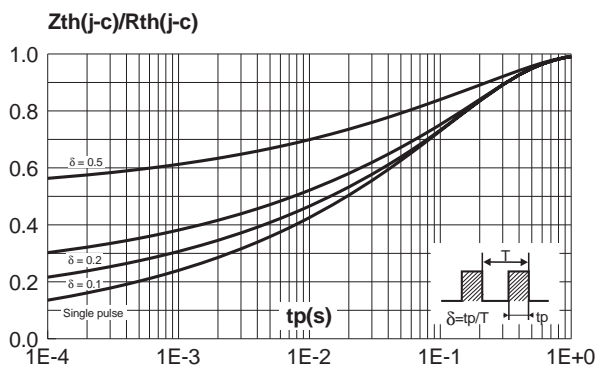


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values) (per diode).

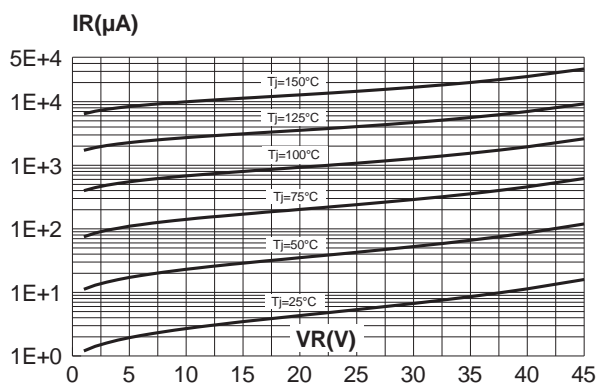
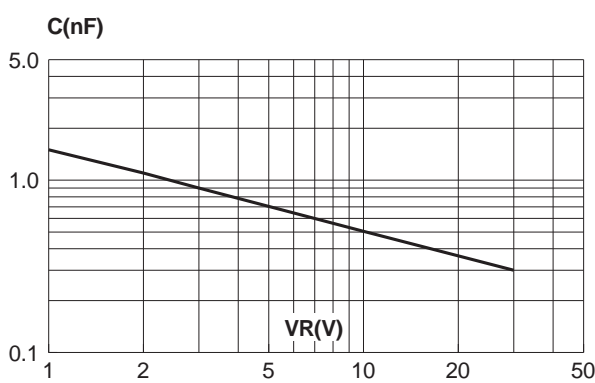
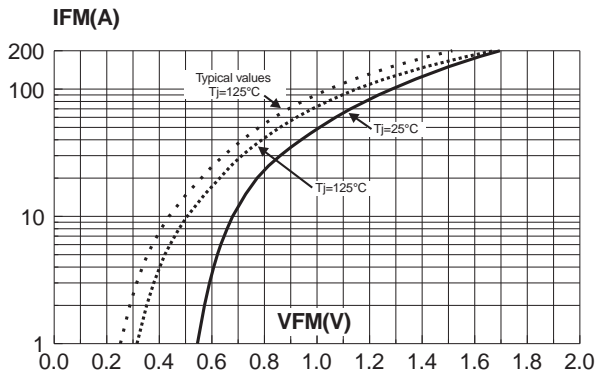


Fig. 8: Junction capacitance versus reverse voltage applied (typical values) (per diode).

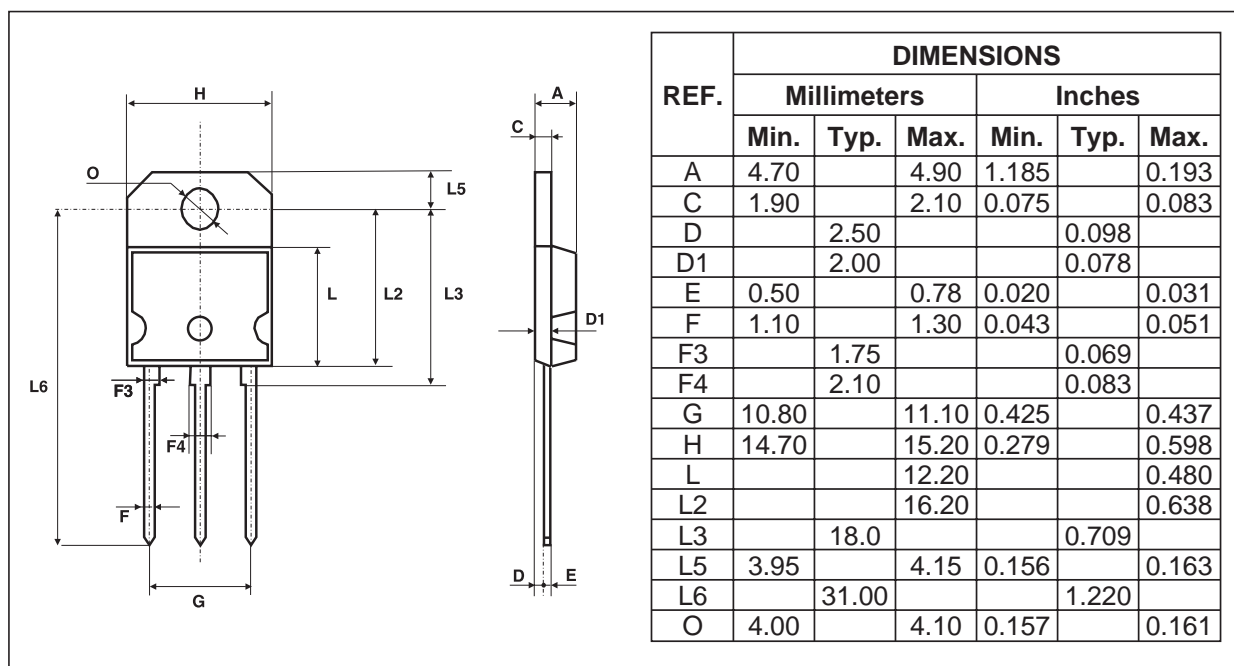


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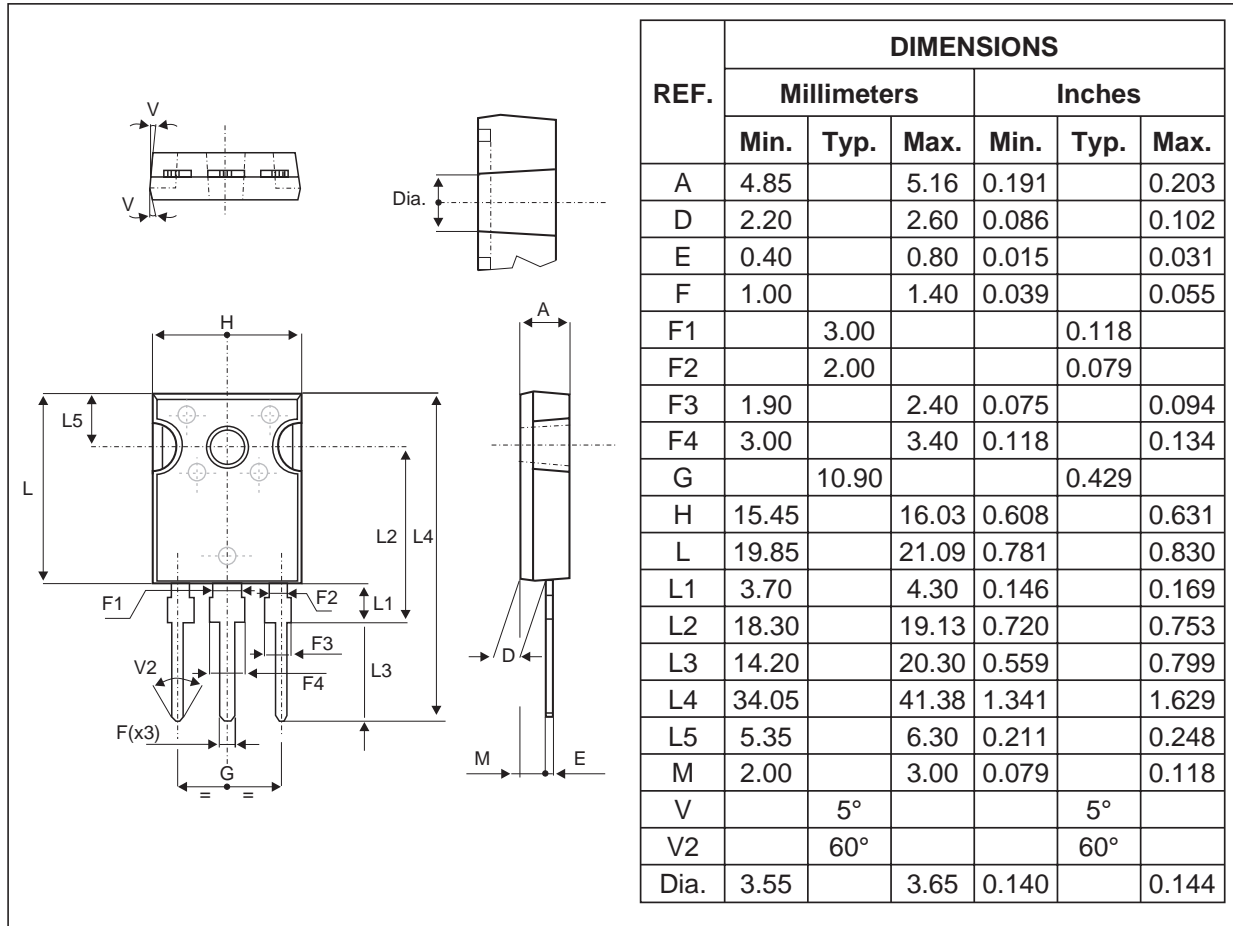
Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).



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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