



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

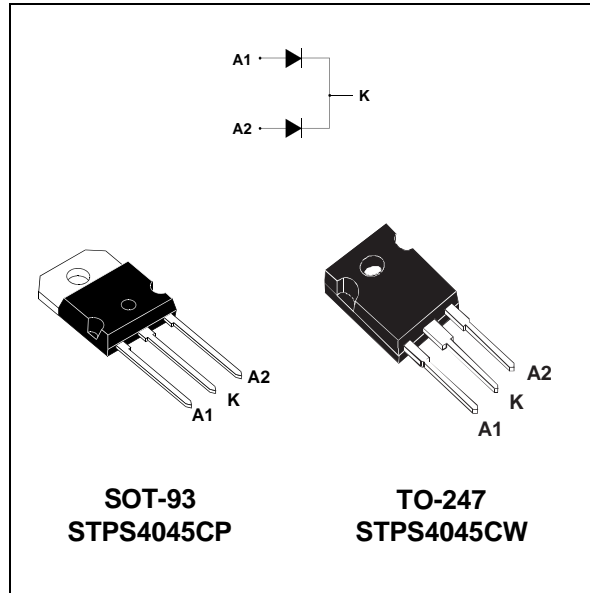
FEATURES AND BENEFITS

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

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°C δ = 0.5	Per diode 20 Per device 40	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal	220	A
I _{R(RM)}	Repetitive Peak reverse current	tp = 2 μs square F = 1kHz	1	A
I _{R(SM)}	Non repetitive peak reverse current	tp = 100 μs square	3	A
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

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ 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	$^{\circ}\text{C}/\text{W}$
		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	μA
		$T_j = 125^{\circ}\text{C}$			11	40	mA
V_F^*	Forward voltage drop	$T_j = 125^{\circ}\text{C}$	$I_F = 20\text{ A}$		0.56	0.63	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).

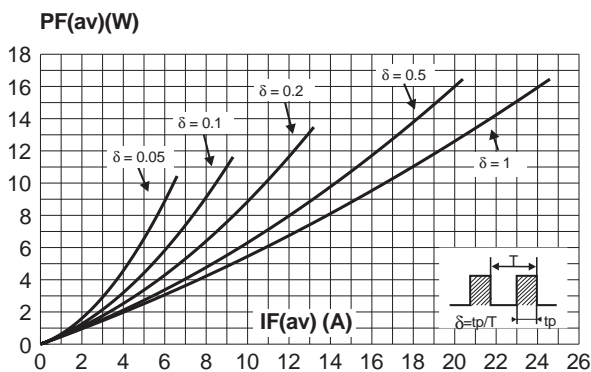


Fig. 2: Average current versus ambient temperature (per diode).

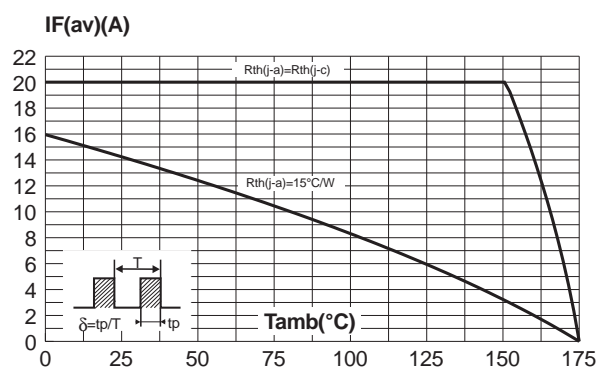


Fig. 3: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).

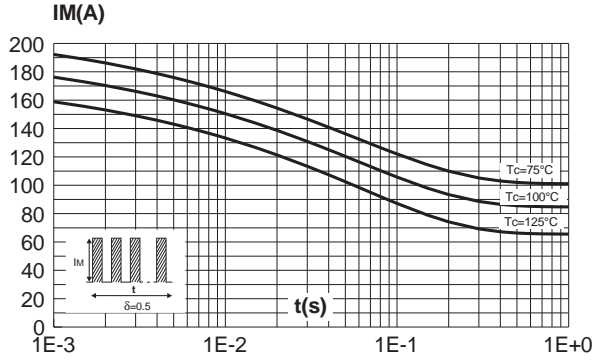


Fig. 4: Relative variation of thermal transient impedance junction to case versus pulse duration.

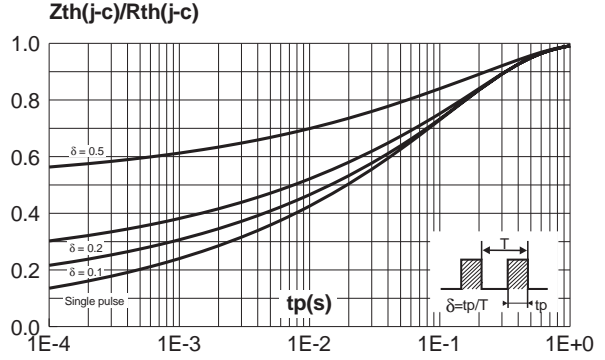


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values) (per diode).

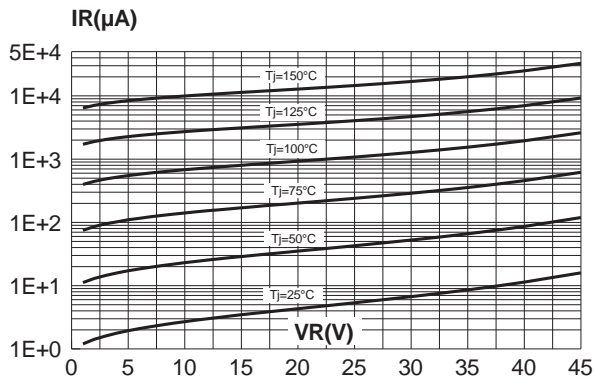


Fig. 6: Junction capacitance versus reverse voltage applied (typical values) (per diode).

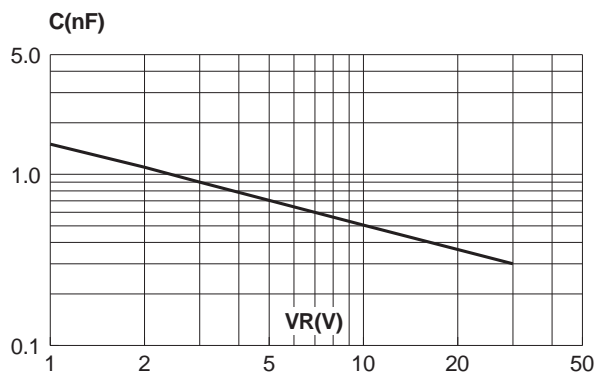
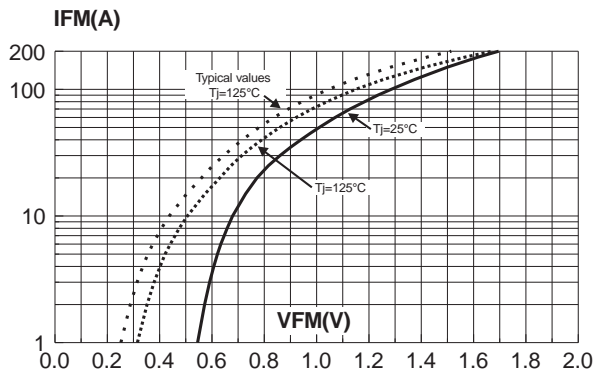
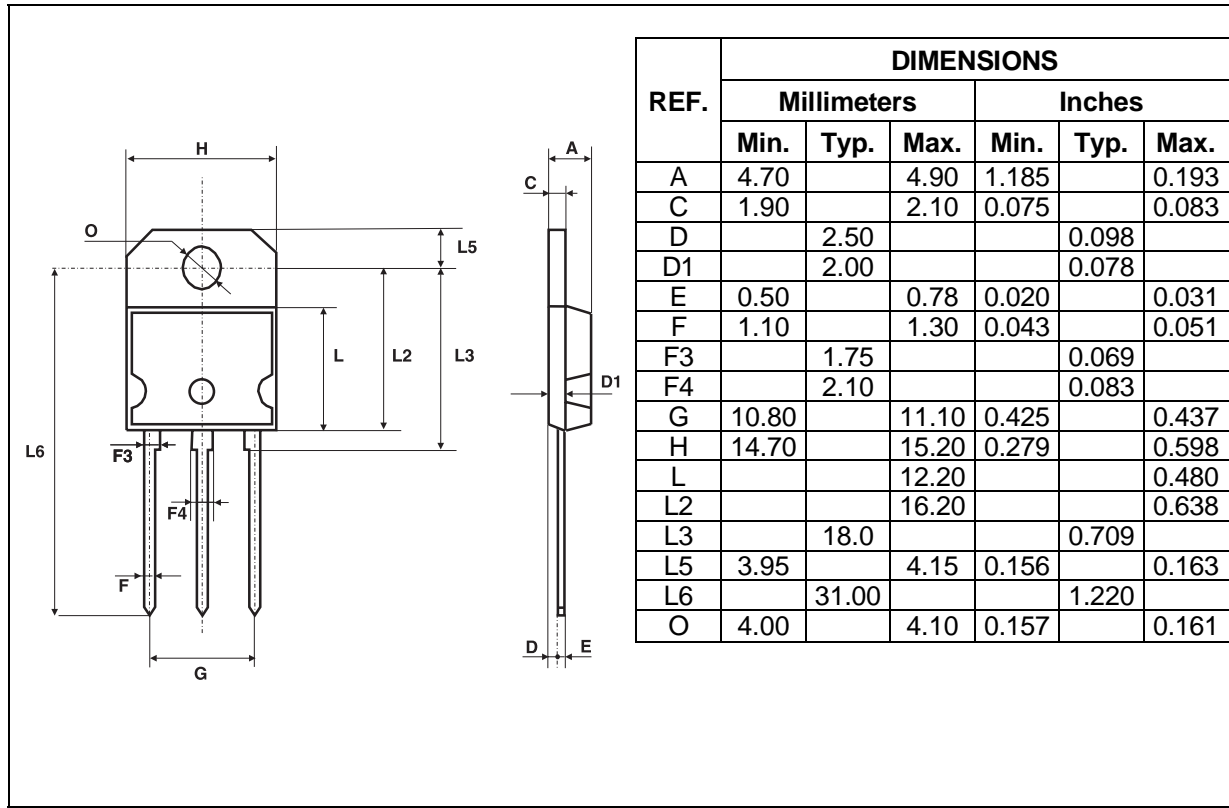


Fig. 7: Forward voltage drop versus forward current (maximum values) (per diode).

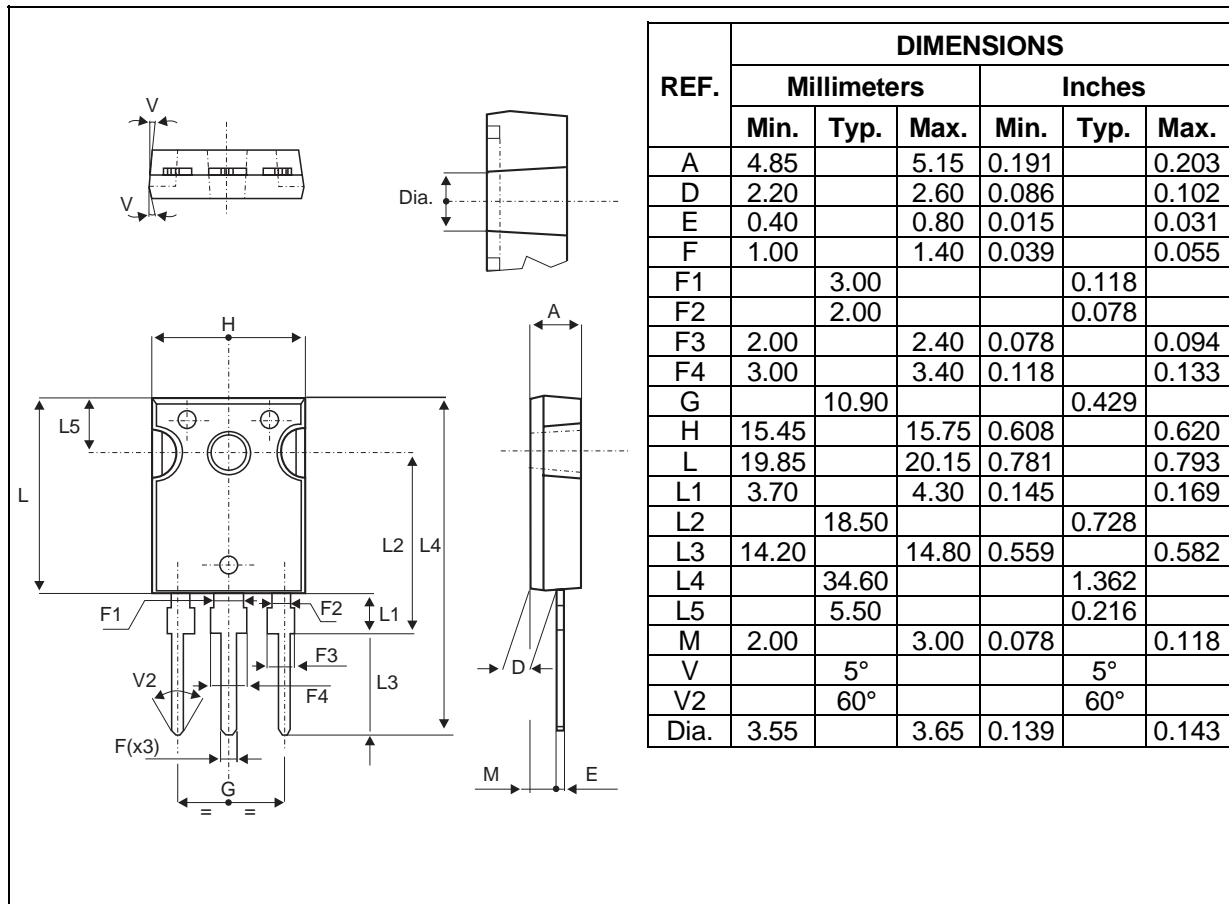


STPS4045CP/CW

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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