



# STPS6045CP/CPI/CW

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2x30 A
$V_{RRM}$	45 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	0.63 V

### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREME FAST SWITCHING
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE: TOP-3I  
Insulating voltage = 2500V<sub>RMS</sub>  
Capacitance = 12pF

### DESCRIPTION

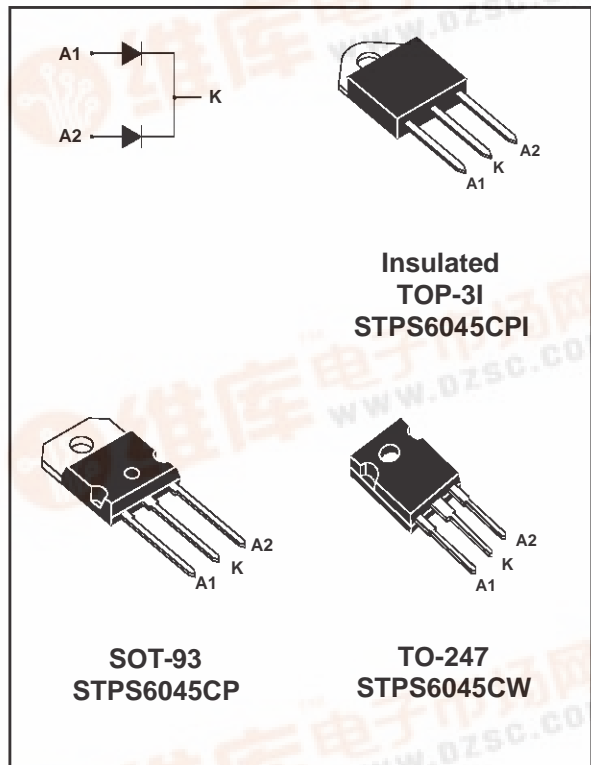
Dual center tap Schottky rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged either in SOT-93, TOP-3I 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			60	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	SOT-93 TO-247	$T_c = 150^\circ\text{C}$ Per diode	30	A
		TOP-3I	$T_c = 130^\circ\text{C}$ Per device	60	A
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms sinusoidal}$	400	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
$T_{stg}$	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



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### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit	
$R_{th(j-c)}$	Junction to case	SOT-93/ TO-247	Per diode Total	0.95 0.55	$^{\circ}\text{C/W}$
		TOP-3I	Per diode Total	1.8 1.1	
$R_{th(c)}$		SOT-93/ TO-247	Coupling	0.15	
		TOP-3I		0.4	

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)

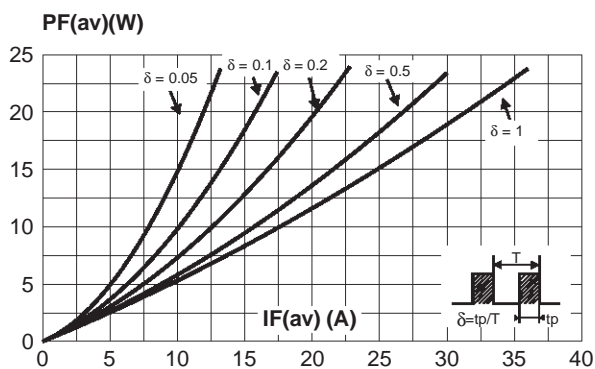
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			500	$\mu\text{A}$
		$T_j = 125^{\circ}\text{C}$			20	80	mA
$V_F^*$	Forward voltage drop	$T_j = 125^{\circ}\text{C}$	$I_F = 30\text{ A}$		0.53	0.63	V
		$T_j = 25^{\circ}\text{C}$	$I_F = 60\text{ A}$			0.84	
		$T_j = 125^{\circ}\text{C}$	$I_F = 60\text{ A}$		0.68	0.78	

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

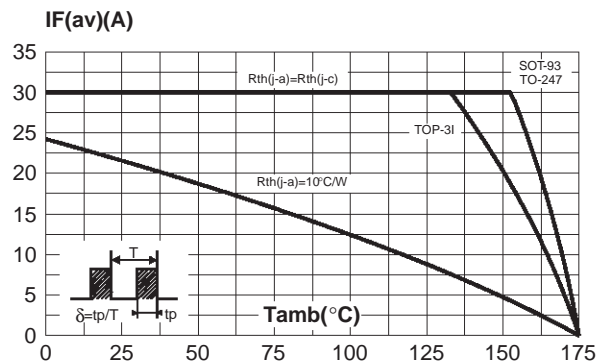
To evaluate the conduction losses use the following equation:

$$P = 0.48 \times I_{F(AV)} + 0.005 I_{F(RMS)}^2$$

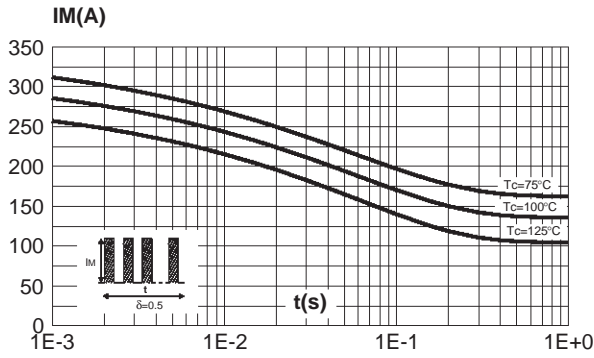
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



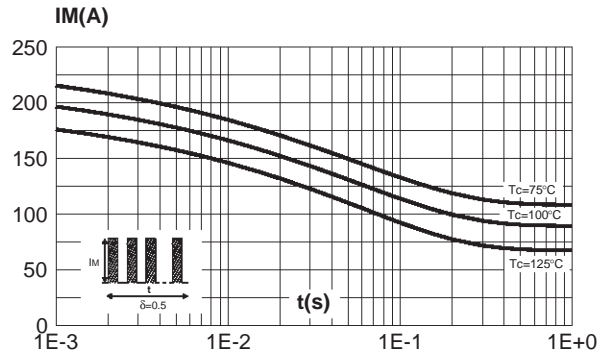
**Fig. 2:** Average current versus ambient temperature ( $\delta=0.5$ , per diode).



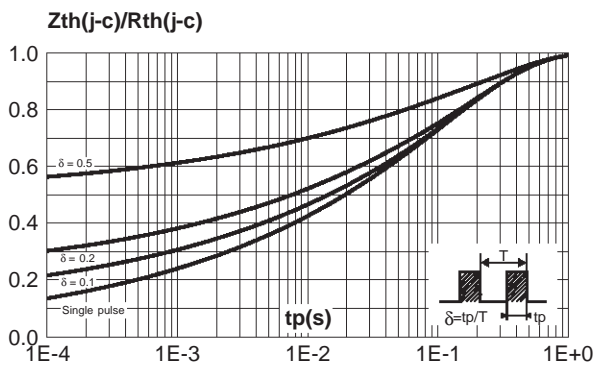
**Fig. 3-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (SOT-93 and TO-247).



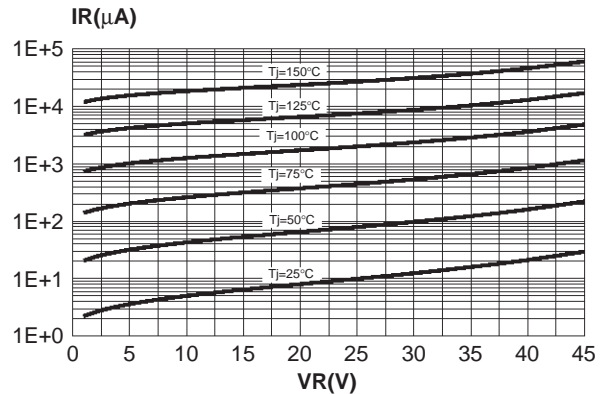
**Fig. 3-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TOP-31).



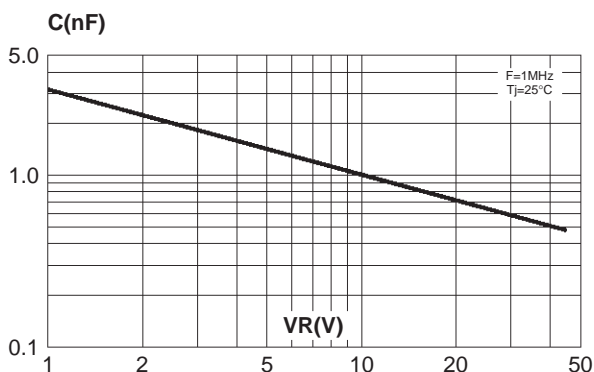
**Fig. 4:** Relative variation of thermal transient impedance junction to case versus pulse duration.



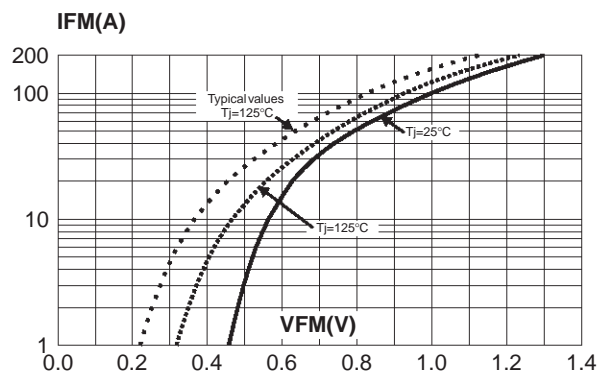
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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

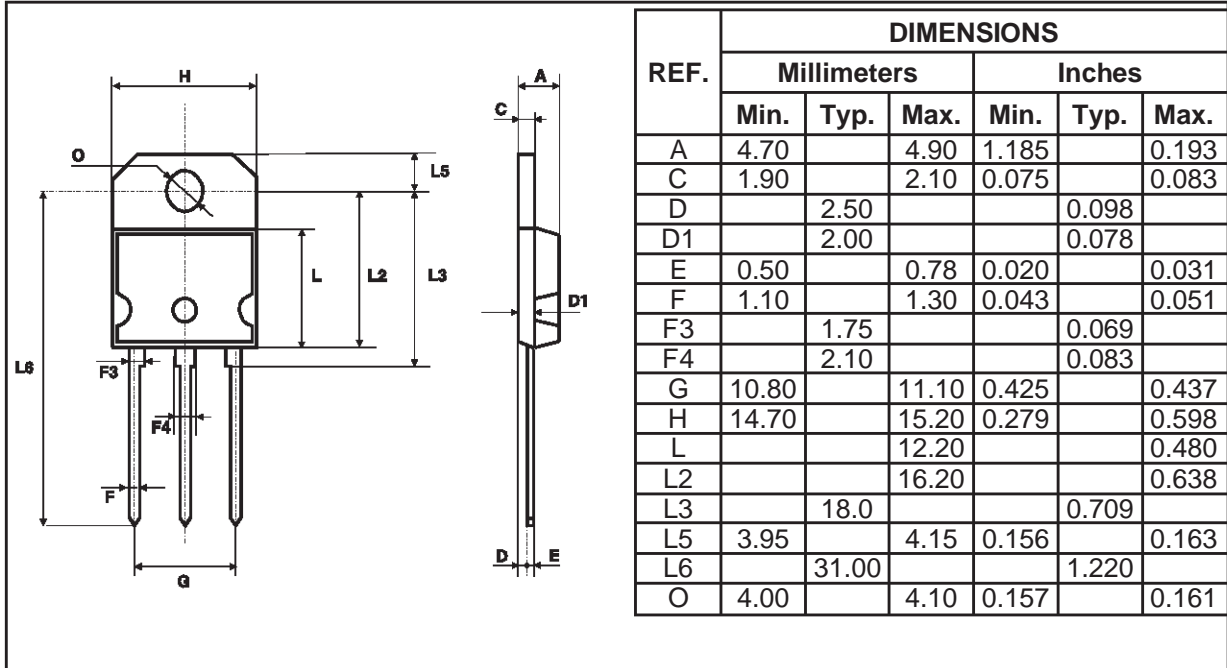


**Fig. 7:** Forward voltage drop versus forward current (maximum values, per diode).

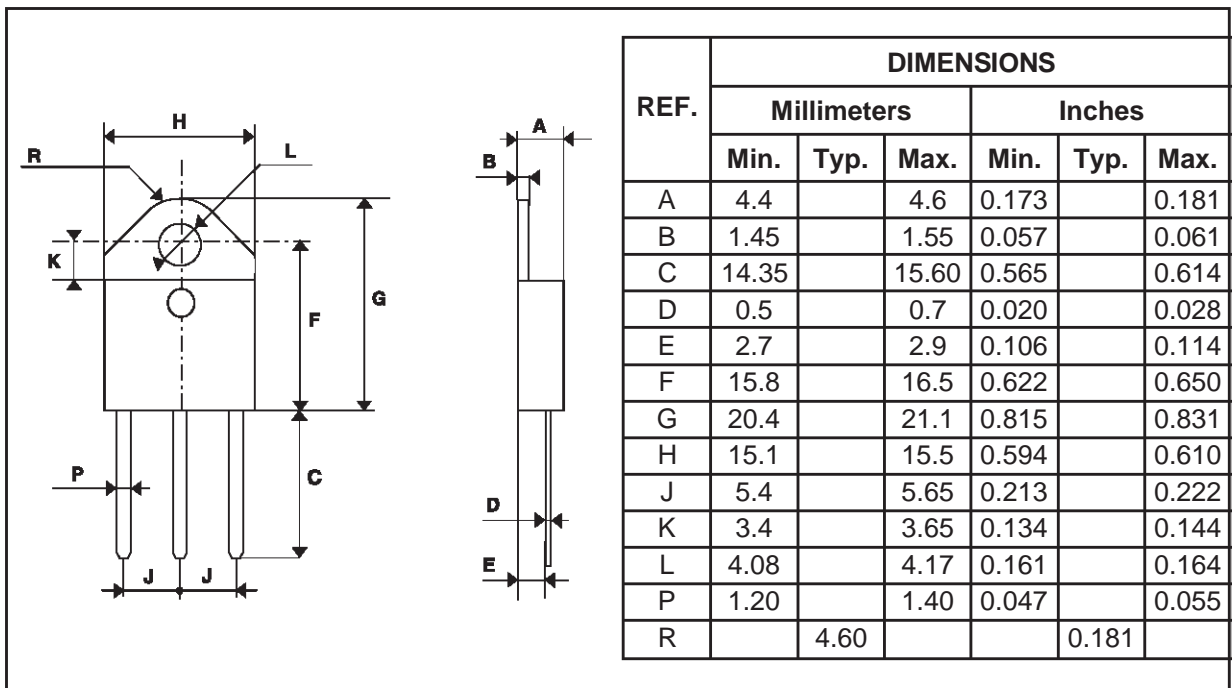


## STPS6045CP/CPI/CW

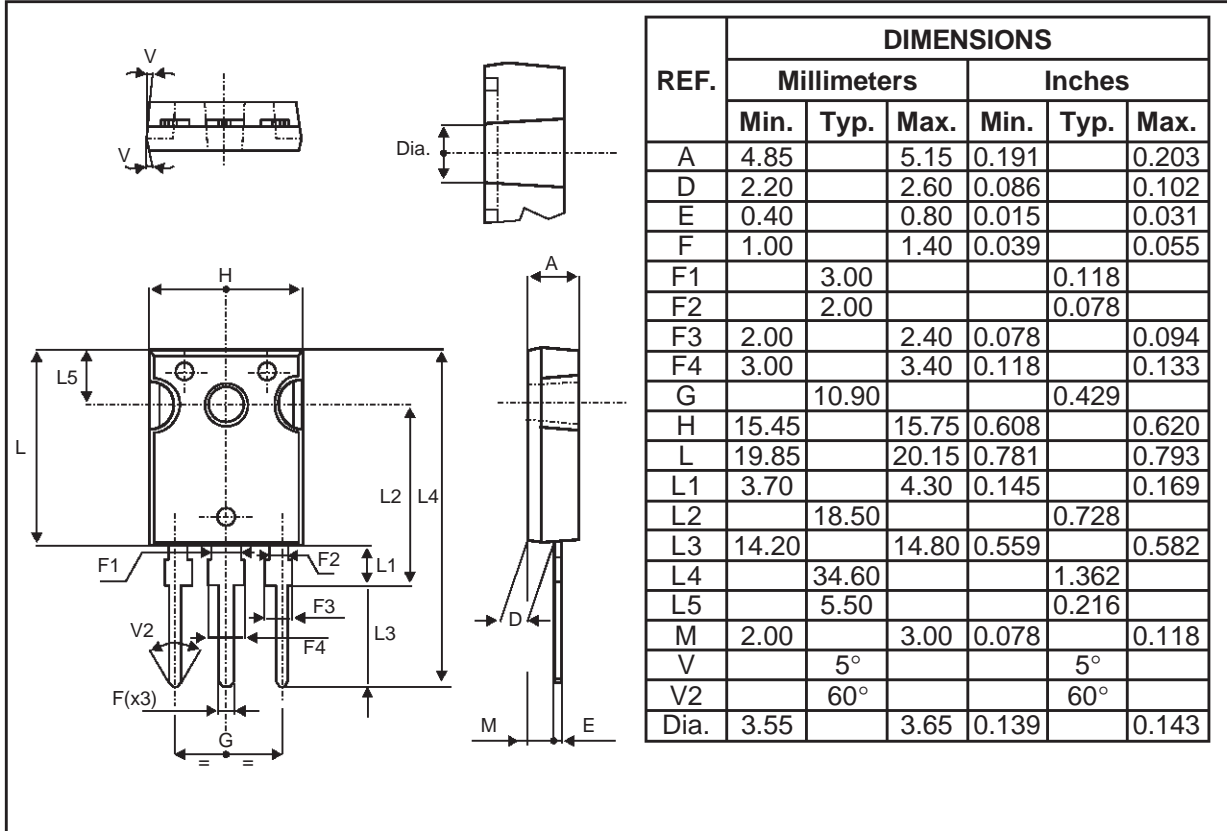
### PACKAGE MECHANICAL DATA SOT-93



### PACKAGE MECHANICAL DATA TOP-3I (isolated)



**PACKAGE MECHANICAL DATA**  
TO-247



Type	Marking	Package	Weight	Base qty	Delivery mode
STPS6045CP	STPS6045CP	SOT-93	3.97 g.	30	Tube
STPS6045CPI	STPS6045CPI	TOP-3I	4.46 g.	30	Tube
STPS6045CW	STPS6045CW	TO-247	4.36 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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