

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2x30 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>

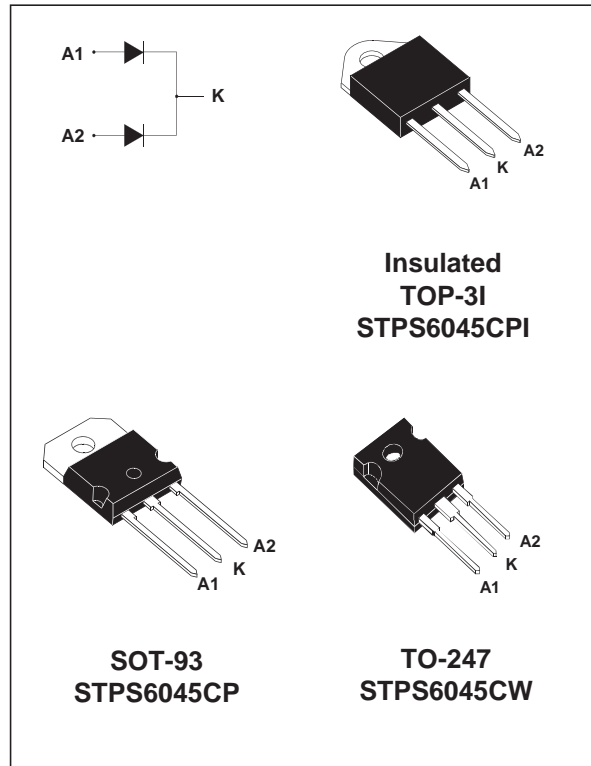
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREME FAST SWITCHING
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE: TOP-3I  
Insulating voltage = 2500V<sub>RMS</sub>  
Capacitance = 12pF
- 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, 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 <sub>RRM</sub>	Repetitive peak reverse voltage			45	V	
I <sub>F(RMS)</sub>	RMS forward current			60	A	
I <sub>F(AV)</sub>	Average forward current δ = 0.5	SOT-93 TO-247	T <sub>c</sub> = 150°C	Per diode	30	A
		TOP-3I	T <sub>c</sub> = 130°C	Per device	60	
I <sub>FSM</sub>	Surge non repetitive forward current		tp = 10 ms sinusoidal	400	A	
I <sub>RRM</sub>	Repetitive Peak reverse current		tp = 2 μs square F = 1kHz	1	A	
I <sub>RSM</sub>	Non repetitive peak reverse current		tp = 100 μs square	3	A	
P <sub>ARM</sub>	Repetitive peak avalanche power		tp = 1 μs T <sub>j</sub> = 25°C	10600	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

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	SOT-93 / TO-247	Per diode Total	0.95 0.55
		TOP-3I	Per diode Total	1.8 1.1
R <sub>th(c)</sub>		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 <sub>R</sub> *	Reverse leakage current	T <sub>J</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			500	μA
		T <sub>J</sub> = 125°C			20	80	mA
V <sub>F</sub> *	Forward voltage drop	T <sub>J</sub> = 125°C	I <sub>F</sub> = 30 A		0.53	0.63	V
		T <sub>J</sub> = 25°C	I <sub>F</sub> = 60 A			0.84	
		T <sub>J</sub> = 125°C	I <sub>F</sub> = 60 A		0.68	0.78	

Pulse test : \*\* tp = 380 μs, δ < 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).

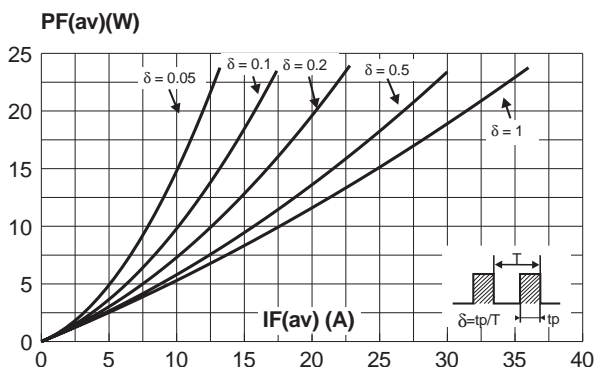


Fig. 3: Normalized avalanche power derating versus pulse duration.

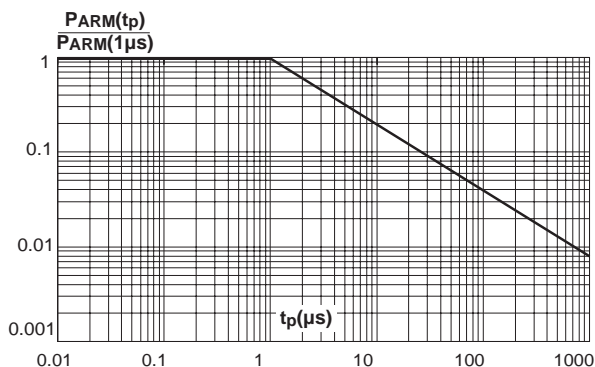


Fig. 2: Average current versus ambient temperature (δ=0.5, per diode).

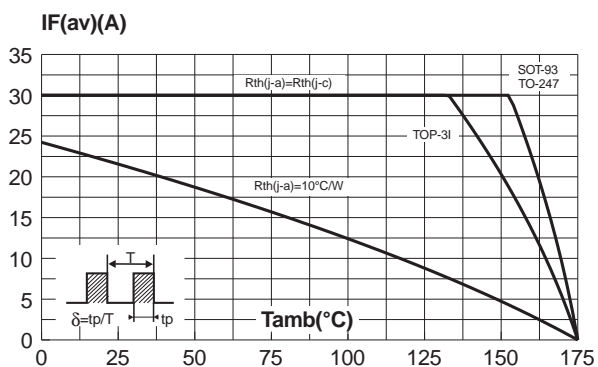
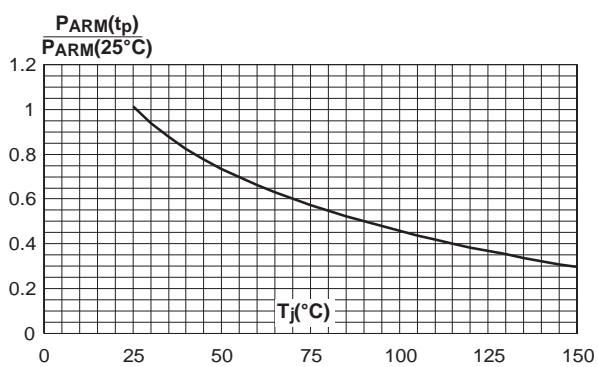
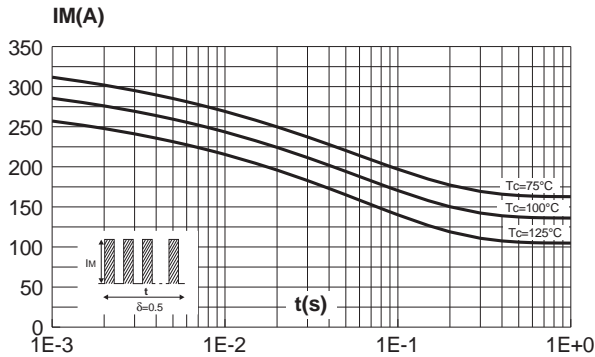


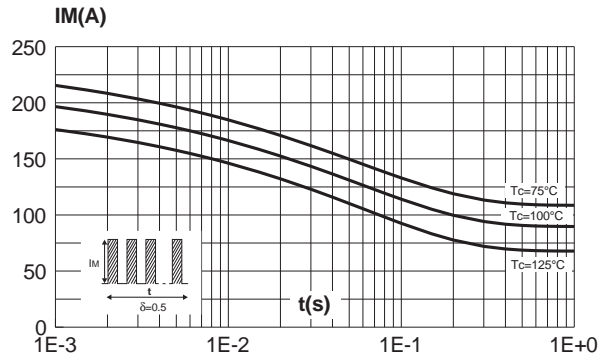
Fig. 4: Normalized avalanche power derating versus junction temperature.



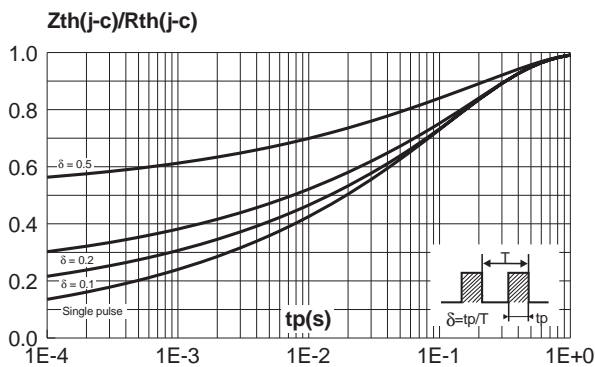
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (SOT-93 and TO-247).



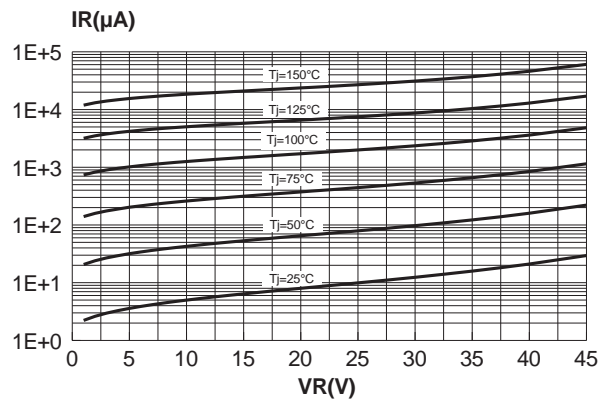
**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TOP-3I).



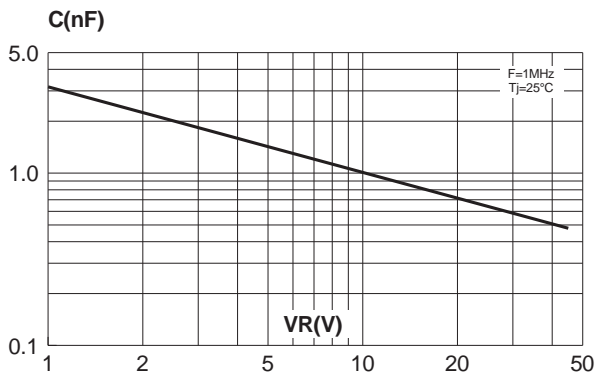
**Fig. 6:** Relative variation of thermal transient impedance junction to case versus pulse duration.



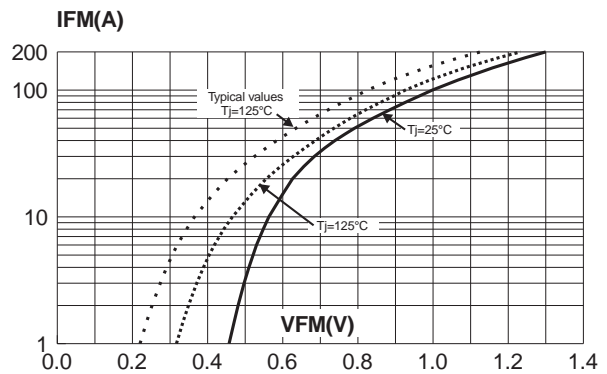
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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

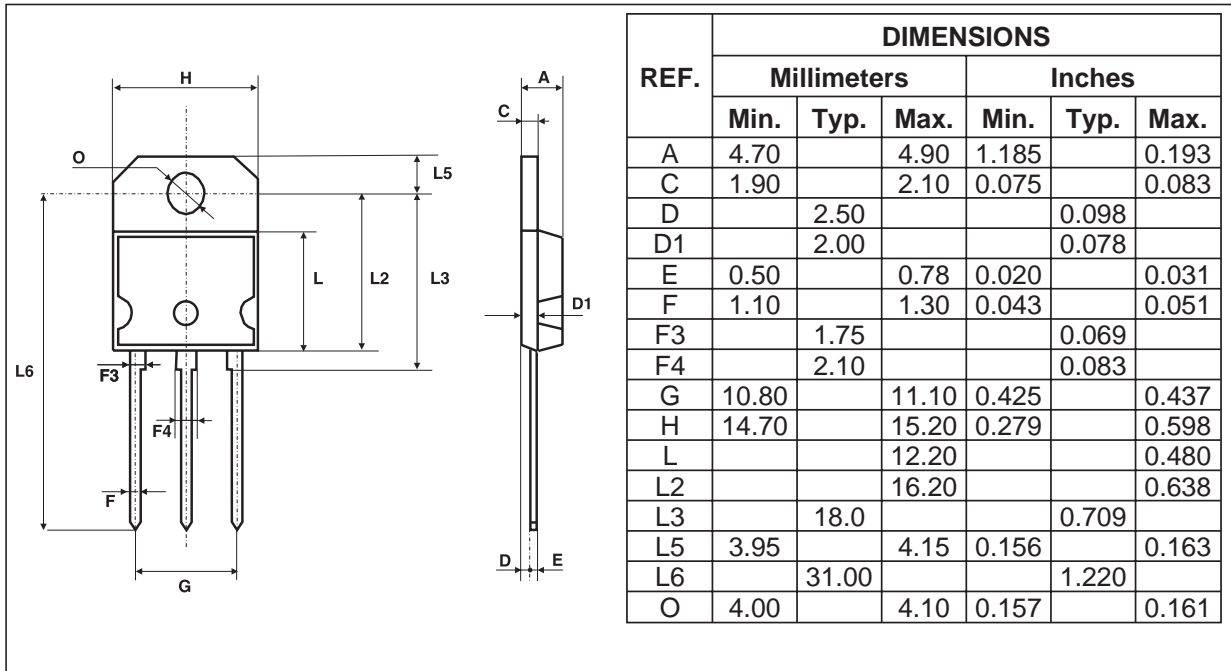


**Fig. 9:** Forward voltage drop versus forward current (maximum values, per diode).

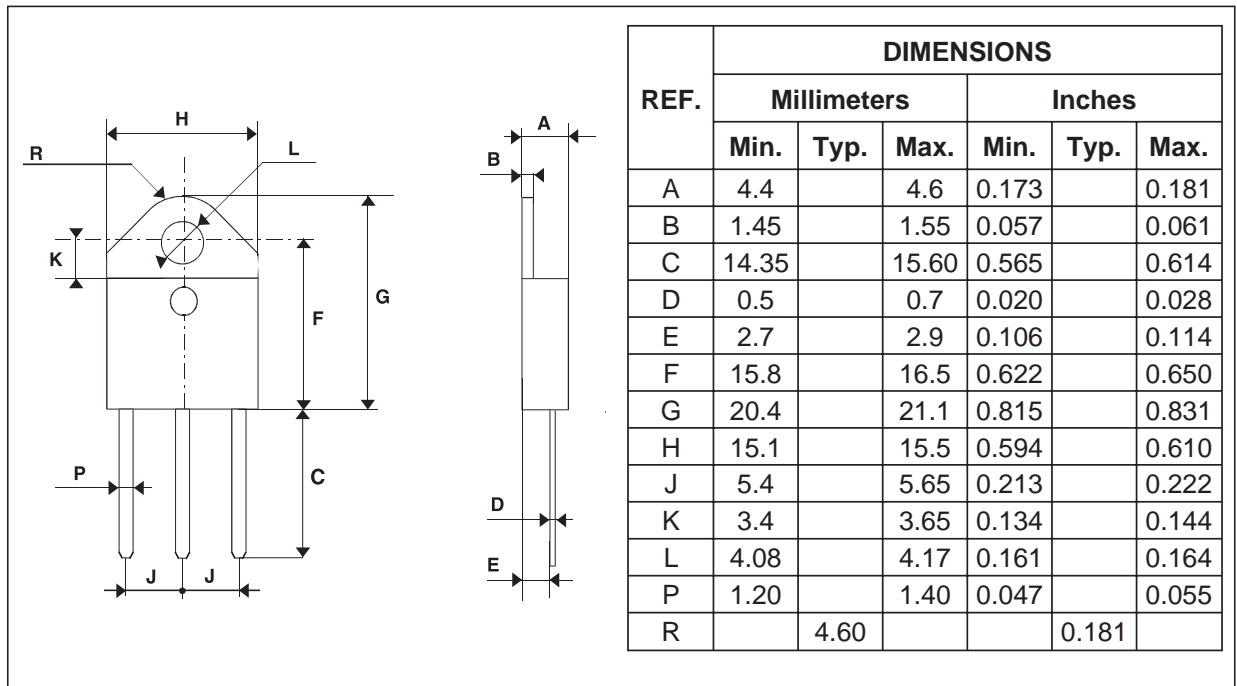


**STPS6045CP/CPI/CW**

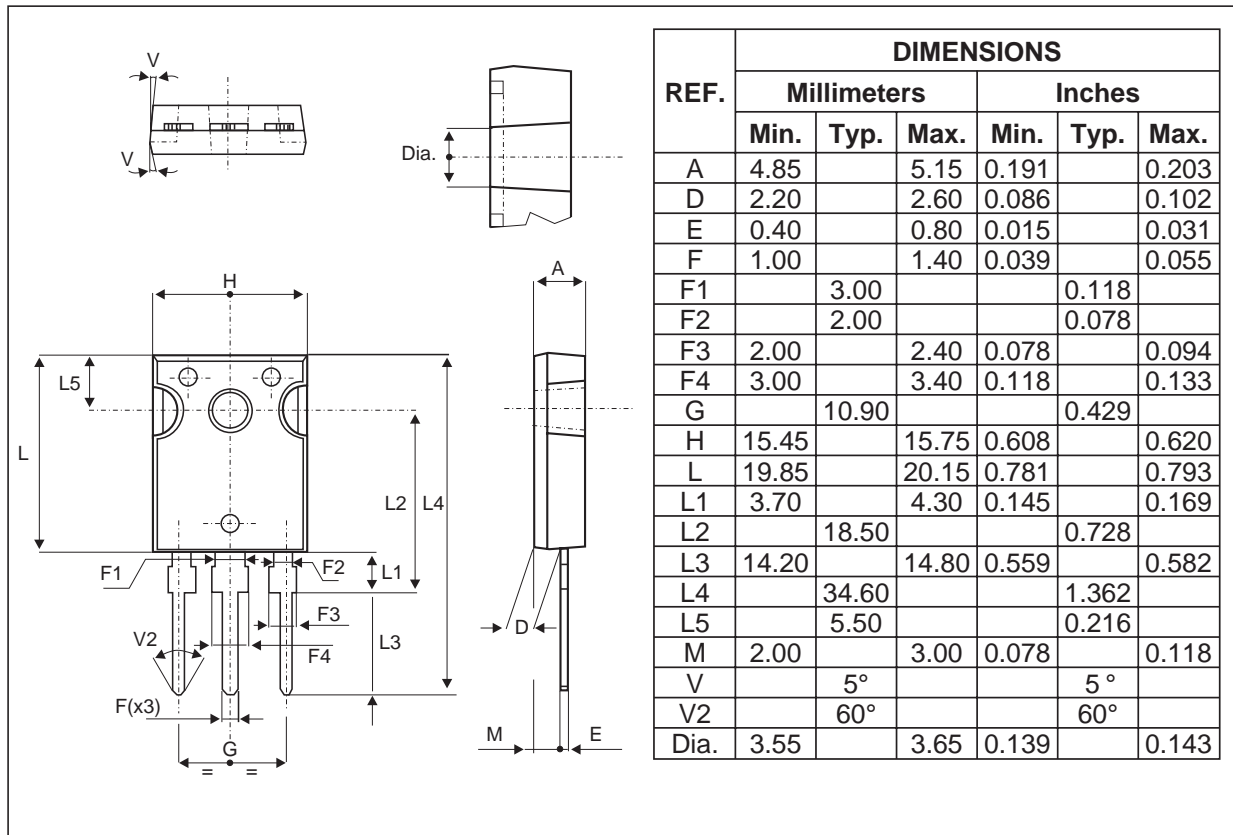
**PACKAGE MECHANICAL DATA**  
SOT-93



**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.	120	Bulk
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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