



# STPS6045CP/CPI/CW

## POWER SCHOTTKY RECTIFIERS

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	<b>2x30 A</b>
$V_{RRM}$	<b>45 V</b>
$V_F$	<b>0.63 V</b>

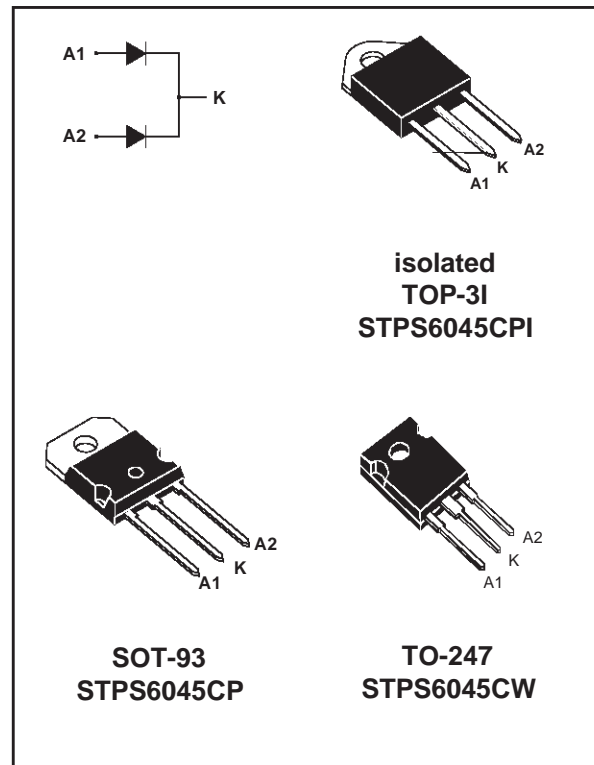
### FEATURES AND BENEFITS

- 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

### DESCRIPTION

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

Packaged 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)

Symbol	Parameter			Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage			45	V	
$I_{F(RMS)}$	RMS forward current		Per diode	60	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	SOT-93 TO-247	$T_c = 125^\circ\text{C}$	Per diode	30	A
		TOP-3I	$T_c = 105^\circ\text{C}$	Per device	60	
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ Sinusoidal	Per diode	400	A
$I_{RRM}$	Peak repetitive reverse current		$t_p = 2 \mu\text{s}$ $F = 1 \text{ kHz}$	Per diode	1	A
$T_{stg}$	Storage temperature range			- 65 to + 150	$^\circ\text{C}$	
$T_j$	Maximum junction temperature			150	$^\circ\text{C}$	
$dV/dt$	Critical rate of rise of reverse voltage			10000	V/ $\mu\text{s}$	

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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	
$R_{th(c)}$	Coupling	SOT-93/ TO-247		0.15	$^{\circ}\text{C/W}$
		TOP-3I		0.4	

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

### 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	$\mu\text{A}$
		$T_j = 125^{\circ}\text{C}$				80	$\text{mA}$
$V_F^{**}$	Forward voltage drop	$T_j = 125^{\circ}\text{C}$	$I_F = 60\text{ A}$			0.78	$\text{V}$
		$T_j = 125^{\circ}\text{C}$	$I_F = 30\text{ A}$			0.63	
		$T_j = 25^{\circ}\text{C}$	$I_F = 60\text{ A}$			0.84	

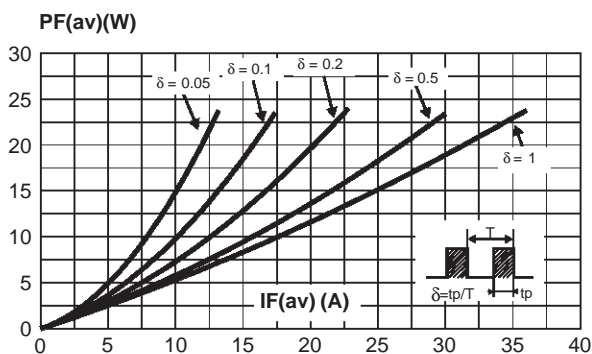
Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

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

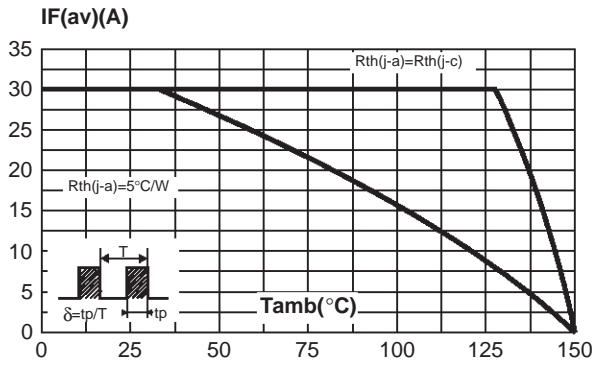
To evaluate the conduction losses use the following equation:

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

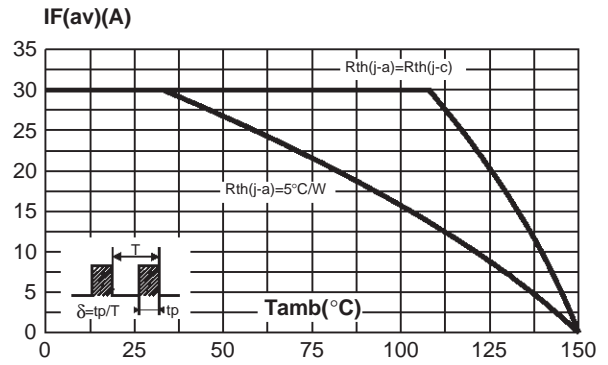
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



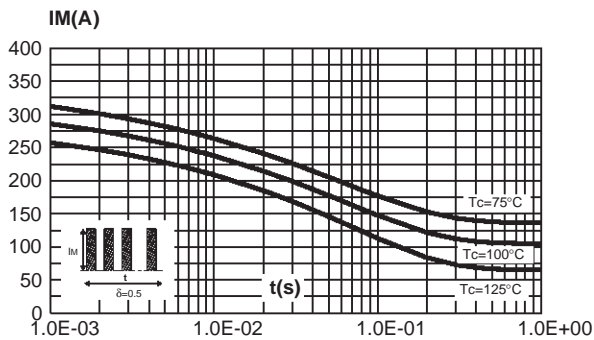
**Fig. 2:** Average current versus ambient temperature ( $\delta=0.5$ ) (per diode) (SOT-93 and TO-247).



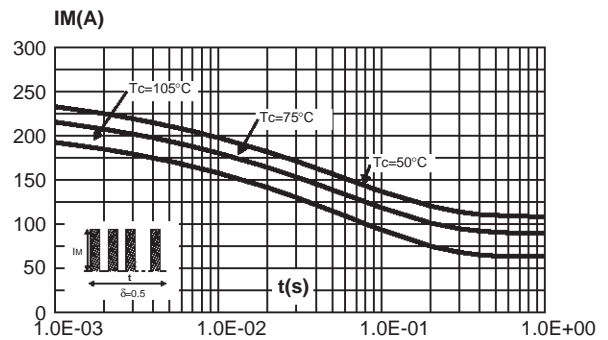
**Fig. 3:** Average current versus ambient temperature ( $\delta=0.5$ ) (per diode) (TOP-3I).



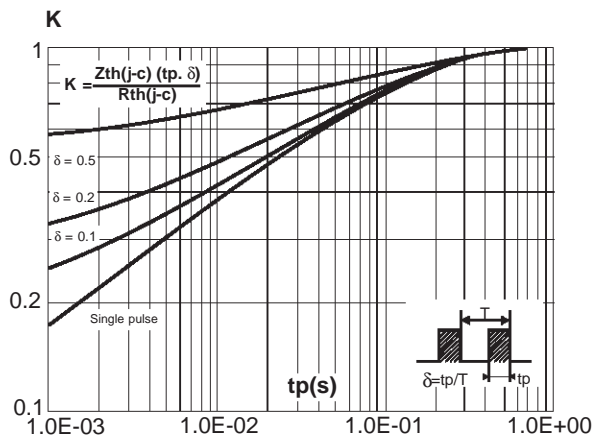
**Fig. 4:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode) (SOT-93 and TO-247).



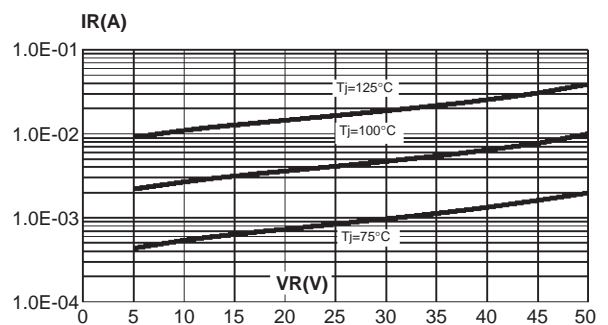
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode) (TOP-3I).



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

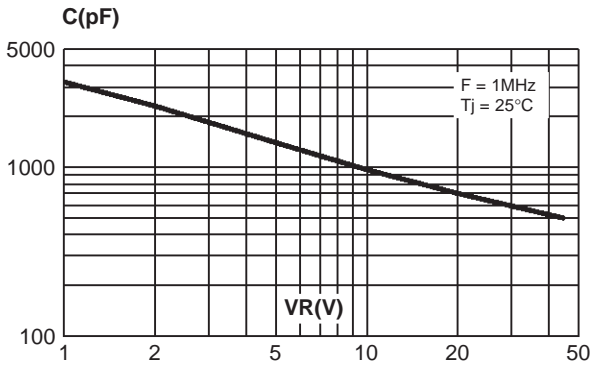


**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values) (per diode).

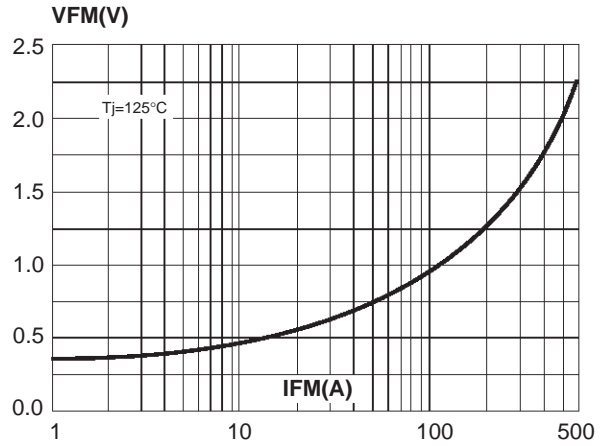


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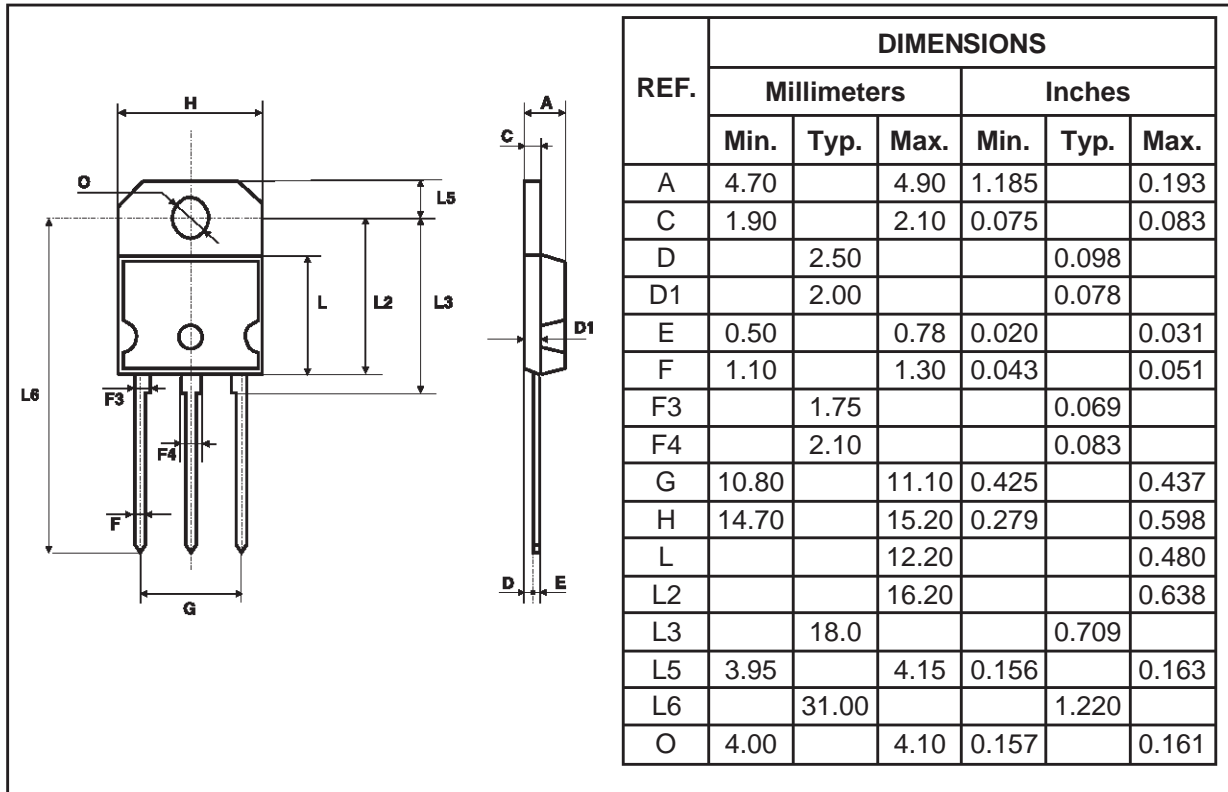
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values) (per diode).



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

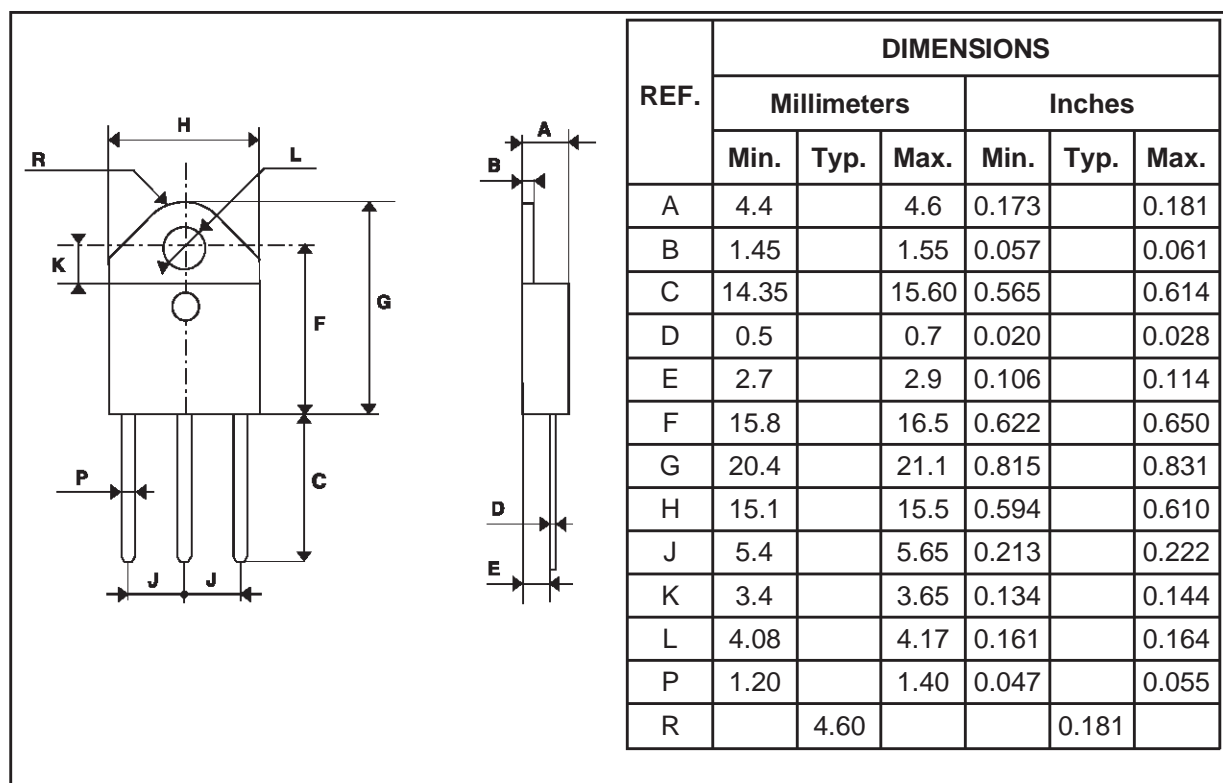


### PACKAGE MECHANICAL DATA SOT-93



- **Marking** : Type number
- **Cooling method** : C
- **Weight** : 5.3 g
- **Recommended torque value** : 0.8m.N
- **Maximum torque value** : 1.0m.N

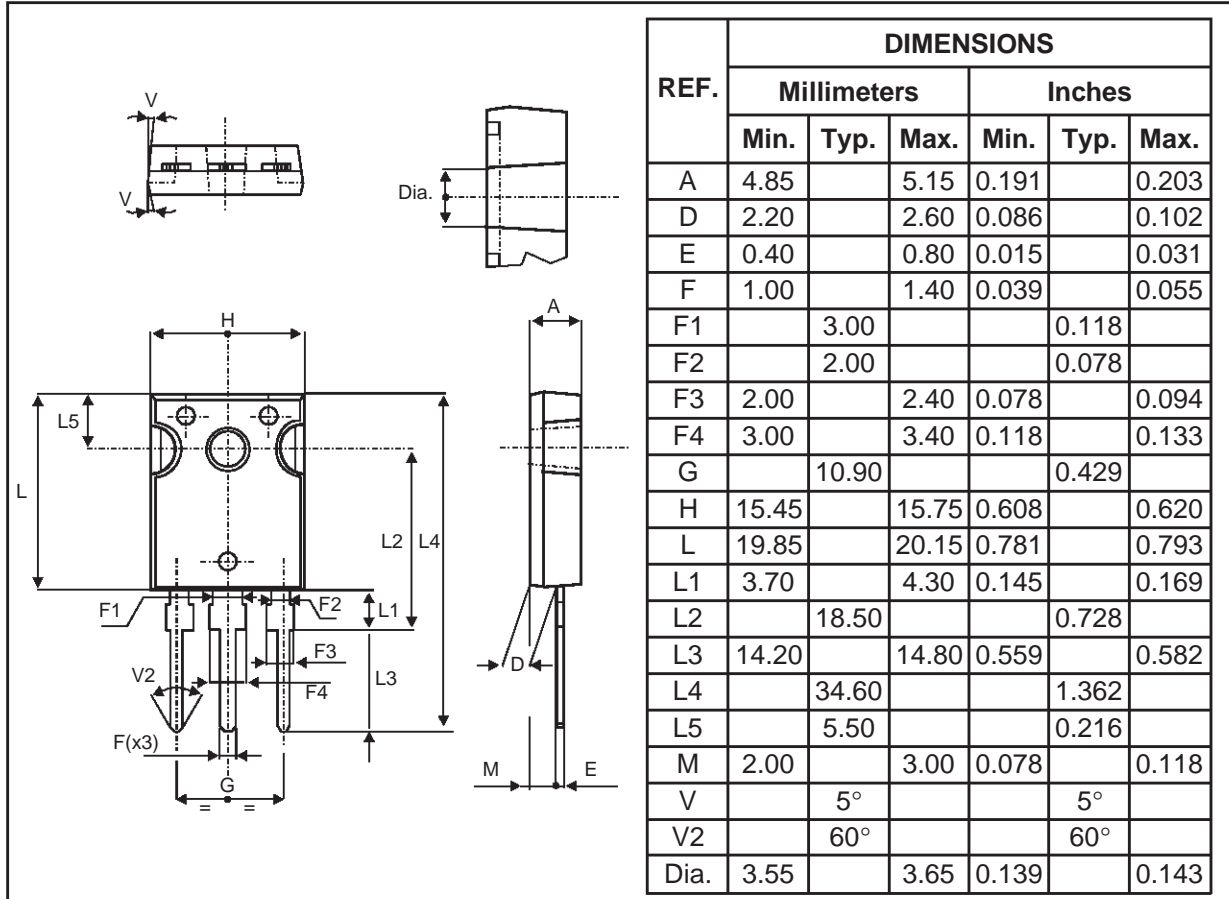
**PACKAGE MECHANICAL DATA**  
TOP-3l (isolated)



- **Marking** : Type number
- **Cooling method** : C
- **Weight** : 5.3 g
- **Recommended torque value** : 0.8m.N
- **Maximum torque value** : 1.0m.N

# STPS6045CP/CPI/CW

## PACKAGE MECHANICAL DATA TO-247



- **Marking** : Type number
- **Cooling method** : C
- **Weight** : 4.4 g
- **Recommended torque value** : 0.8m.N
- **Maximum torque value** : 1.0m.N

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