



# STPS20120C

## POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics**

$I_{F(AV)}$	2 x 10 A
$V_{RRM}$	120 V
$T_j (max)$	175°C
$V_F (typ)$	0.54 V

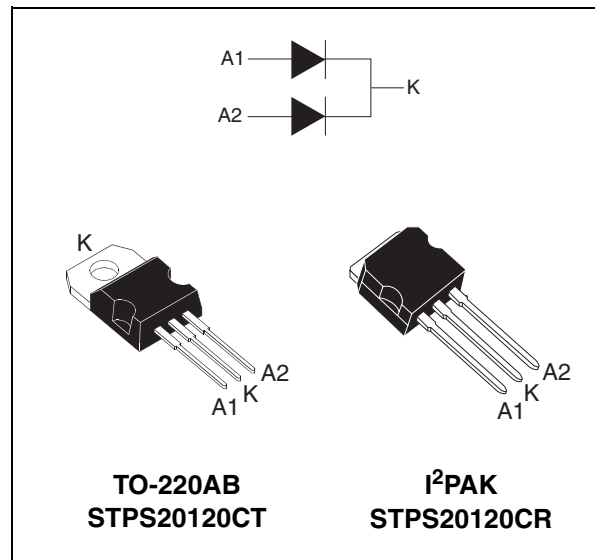
### FEATURES AND BENEFITS

- High junction temperature capability
- Avalanche rated
- Low leakage current
- Good trade-off between leakage current and forward voltage drop

### DESCRIPTION

Dual center tap Schottky rectifier suited for high frequency Switch Mode Power Supply.

Packaged in TO-220AB & I<sup>2</sup>PAK, this device is intended to be used in notebook & LCD adaptors, desktop SMPS, providing in these applications a margin between the remaining voltages applied on the diode and the voltage capability of the diode.



**Table 2: Order Codes**

Part Number	Marking
STPS20120CT	STPS20120CT
STPS20120CR	STPS20120CR

**Table 3: Absolute Ratings** (limiting values, per diode)

Symbol	Parameter			Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage			120	V
I <sub>F(RMS)</sub>	RMS forward voltage			30	A
I <sub>F(AV)</sub>	Average forward current	δ = 0.5 T <sub>c</sub> = 150°C	Per diode Per device	10 20	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10ms sinusoidal		150	A
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 1μs T <sub>j</sub> = 25°C		4600	W
T <sub>stg</sub>	Storage temperature range			-65 to + 175	°C
T <sub>j</sub>	Maximum operating junction temperature *			175	°C

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

Table 4: Thermal Parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	3	°C/W
		Total	1.8	
$R_{th(c)}$	Coupling	Total	0.6	°C/W

When the diodes 1 and 2 are used simultaneously:

$$T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

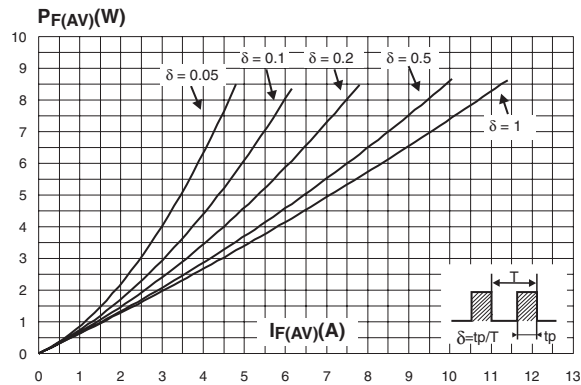
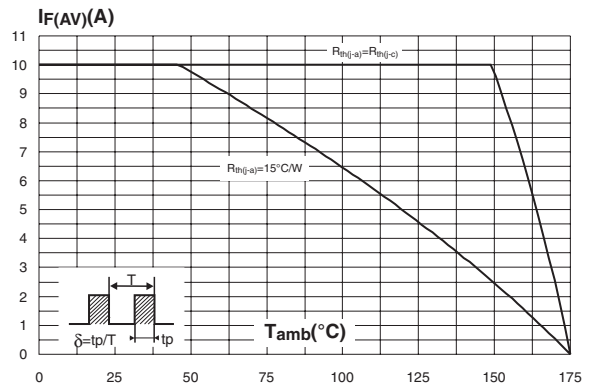
Table 5: Static Electrical Characteristics (per diode)

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$			10	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$		1.5	5	mA
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$			0.7	V
		$T_j = 125^\circ\text{C}$		0.54	0.58	
		$T_j = 25^\circ\text{C}$			0.92	
		$T_j = 125^\circ\text{C}$		0.7	0.74	
		$T_j = 25^\circ\text{C}$			1.02	
		$T_j = 125^\circ\text{C}$		0.81	0.86	

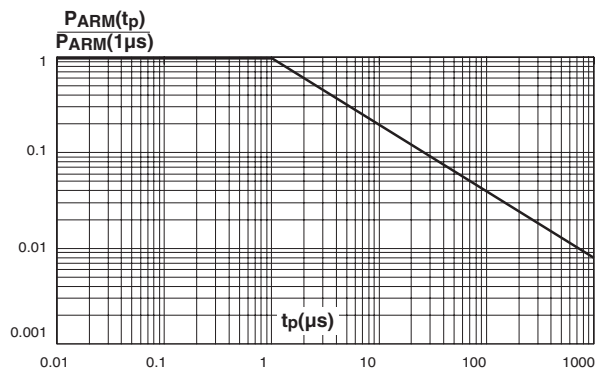
Pulse test: \*  $t_p = 5 \text{ ms}$ ,  $\delta < 2\%$   
\*\*  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  $P = 0.62 \times I_F(\text{AV}) + 0.012 I_F^2(\text{RMS})$

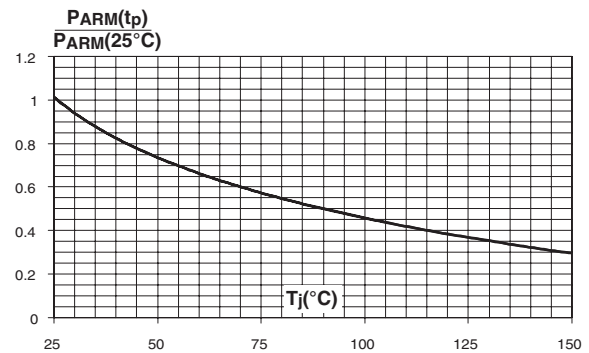
Figure 1: Average forward power dissipation versus average forward current (per diode)


Figure 2: Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)


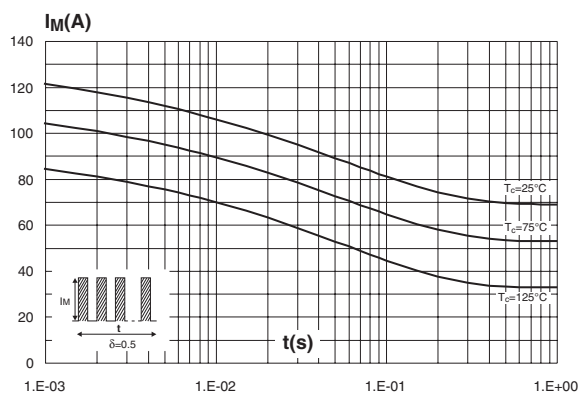
**Figure 3: Normalized avalanche power derating versus pulse duration**



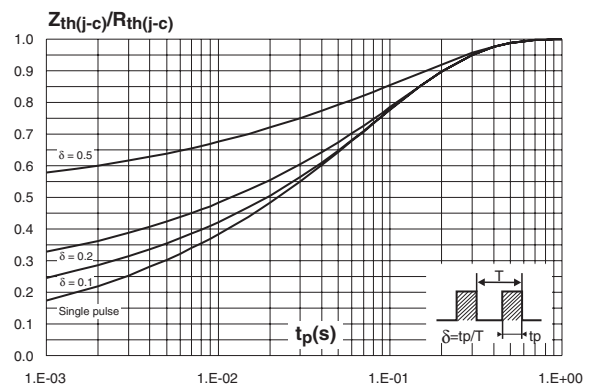
**Figure 4: Normalized avalanche power derating versus junction temperature**



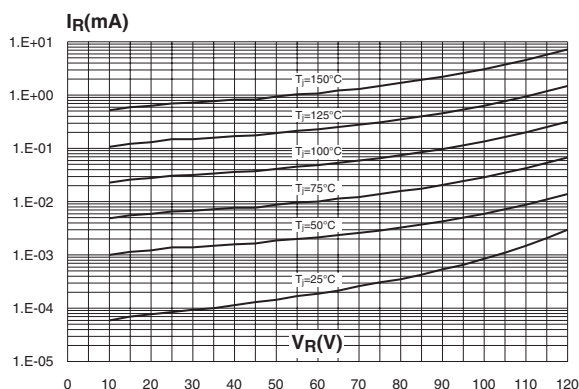
**Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**



**Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration**



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



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

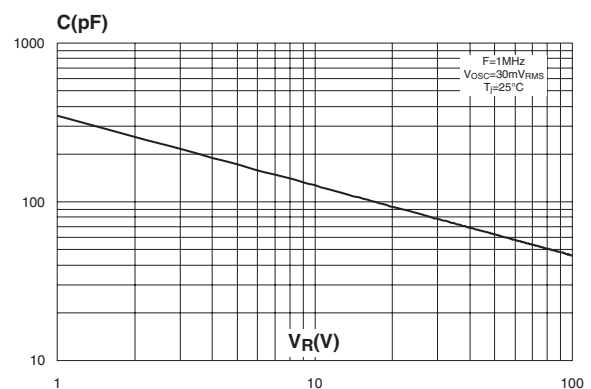


Figure 9: Forward voltage drop versus forward current (per diode)

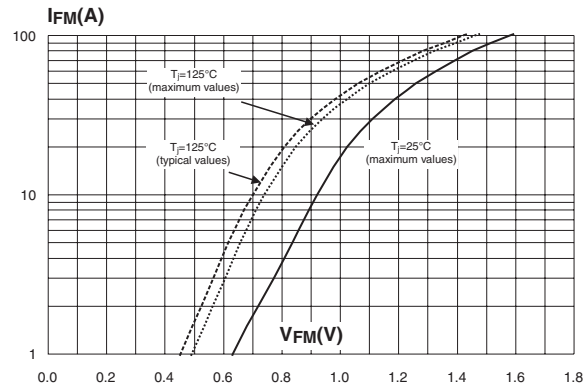


Figure 10: TO-220AB Package Mechanical Data

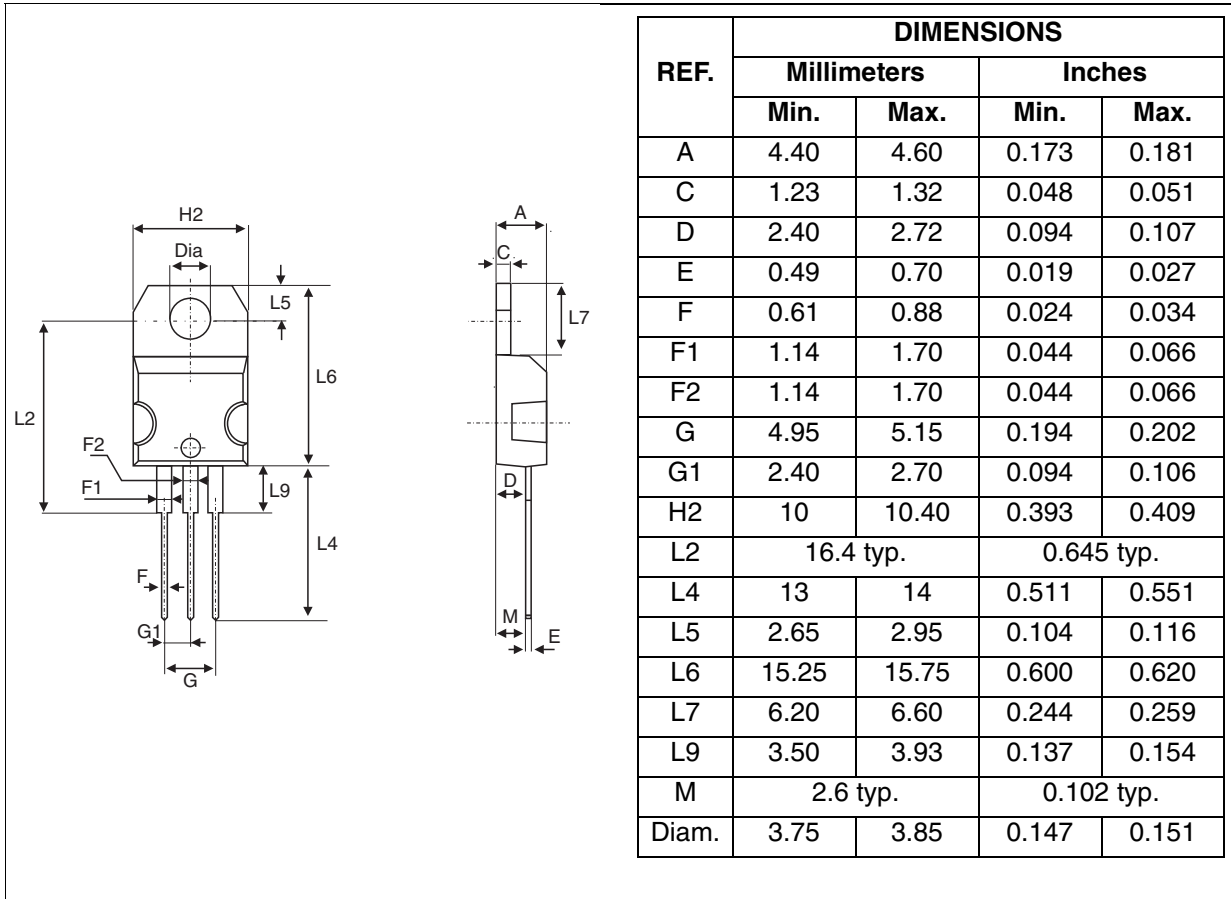


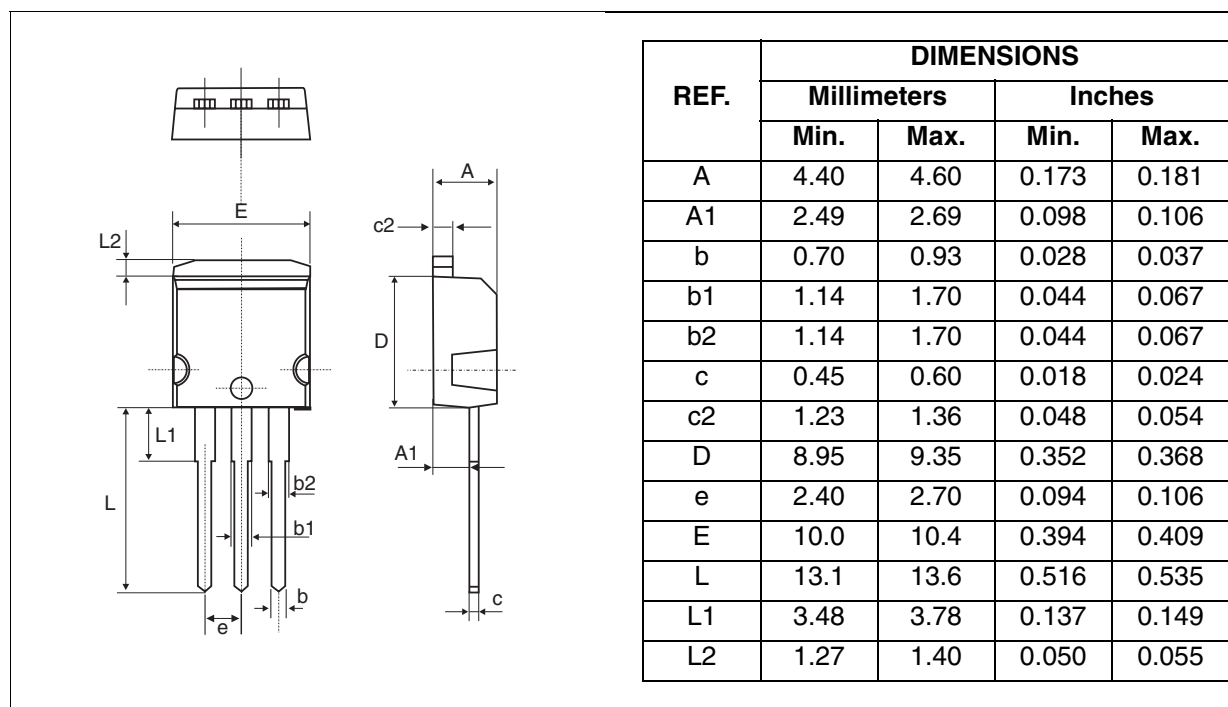
Figure 11: I<sup>2</sup>PAK Package Mechanical Data

Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS20120CT	STPS20120CT	TO-220AB	2.23 g	50	Tube
STPS20120CR	STPS20120CR	I <sup>2</sup> PAK	1.49 g	50	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1.0 m.N.

Table 7: Revision History

Date	Revision	Description of Changes
18-Feb-2005	1	First issue.

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