



STPS30120C

POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

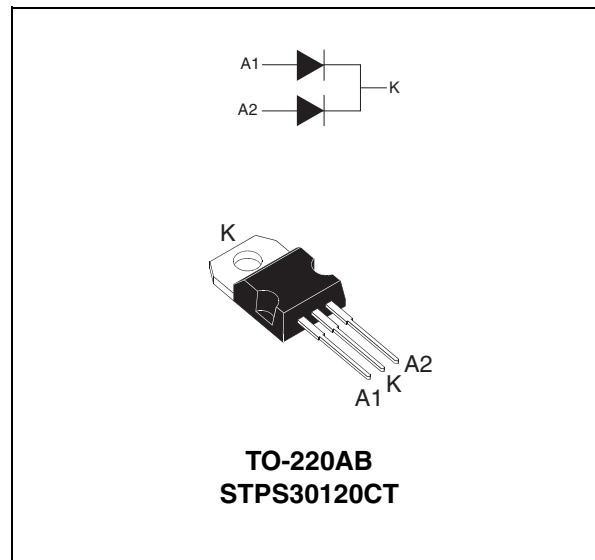
$I_{F(AV)}$	2 x 15 A
V_{RRM}	120 V
T_j (max)	175°C
V_F (typ)	0.57 V

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, 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 Code

Part Number	Marking
STPS30120CT	STPS30120CT

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		120	V
$I_{F(RMS)}$	RMS forward current		30	A
$I_{F(AV)}$	Average forward current	$\delta = 0.5$ $T_c = 145^\circ\text{C}$	Per diode 15 Per device 30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	180	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s}$ $T_j = 25^\circ\text{C}$	6700	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	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	2.2	°C/W
		Total	1.3	
$R_{th(c)}$	Coupling	Total	0.3	°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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		15	μA
		$T_j = 125^\circ\text{C}$		2.5	7.5	mA
V_F **	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{A}$		0.74	V
		$T_j = 125^\circ\text{C}$		0.57	0.61	
		$T_j = 25^\circ\text{C}$	$I_F = 15\text{A}$		0.92	
		$T_j = 125^\circ\text{C}$		0.7	0.74	
		$T_j = 25^\circ\text{C}$	$I_F = 30\text{A}$		1.02	
		$T_j = 125^\circ\text{C}$		0.83	0.89	

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: $P = 0.59 \times I_{F(AV)} + 0.01 I_{F(RMS)}^2$

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

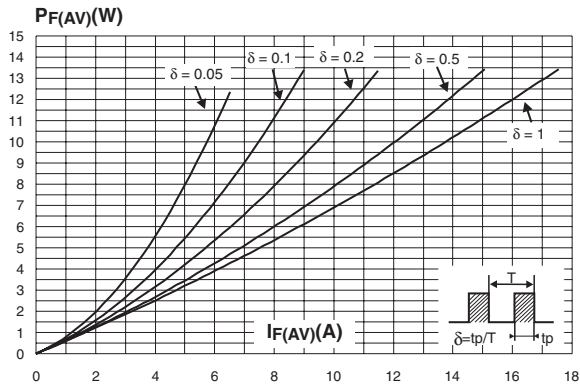


Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

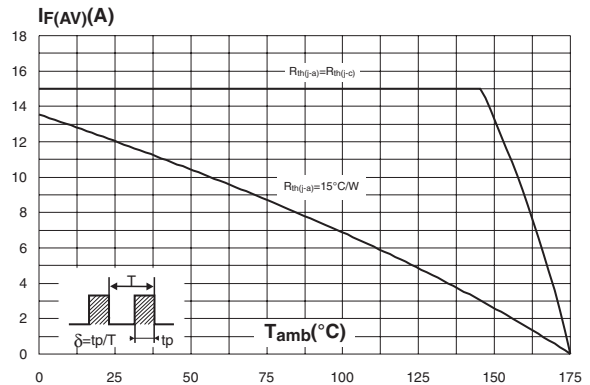


Figure 3: Normalized avalanche power derating versus pulse duration

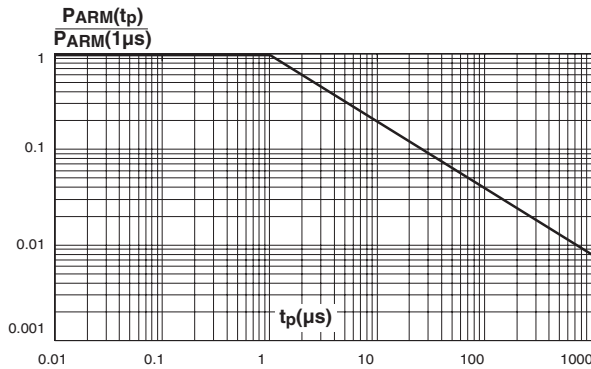


Figure 4: Normalized avalanche power derating versus junction temperature

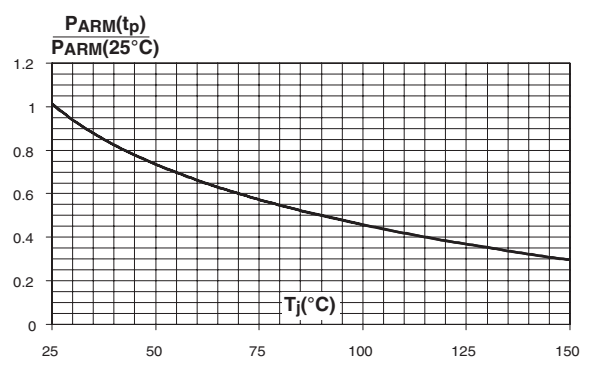


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

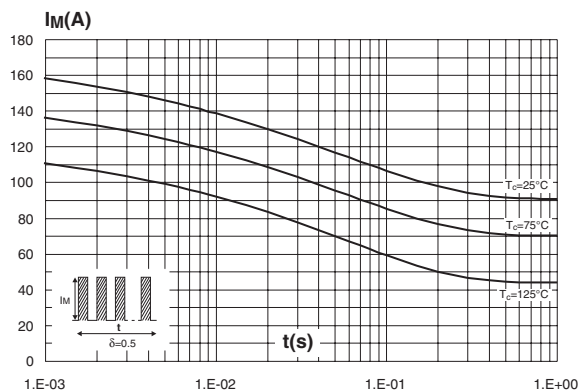


Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration

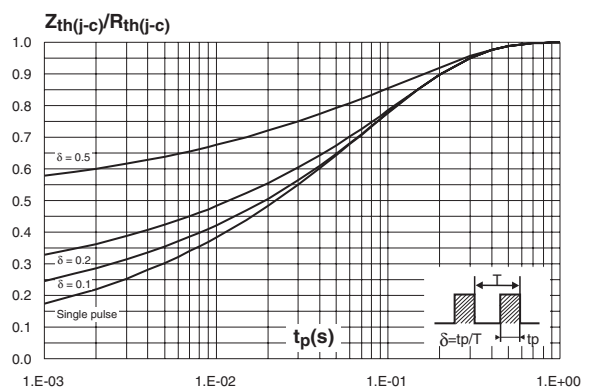


Figure 7: Reverse leakage current versus reverse voltage applied (typical values, per diode)

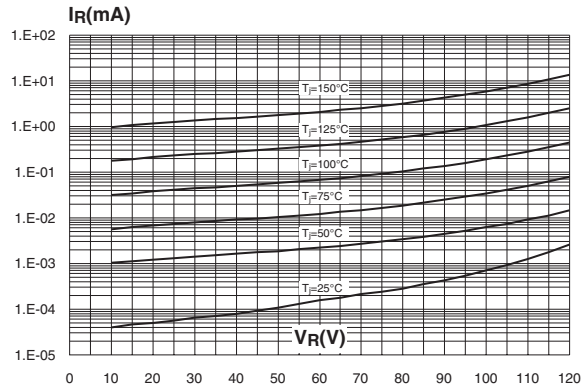


Figure 8: Junction capacitance versus reverse voltage applied (typical values, per diode)

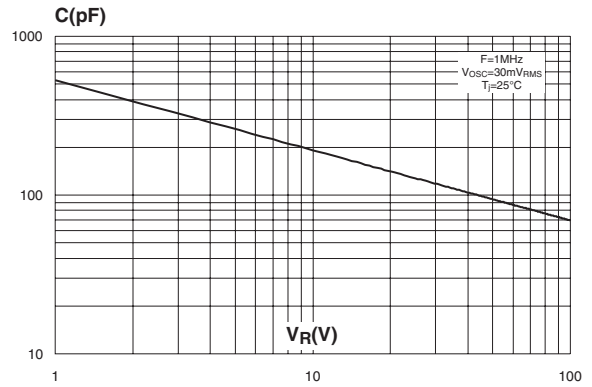


Figure 9: Forward voltage drop versus forward current (per diode)

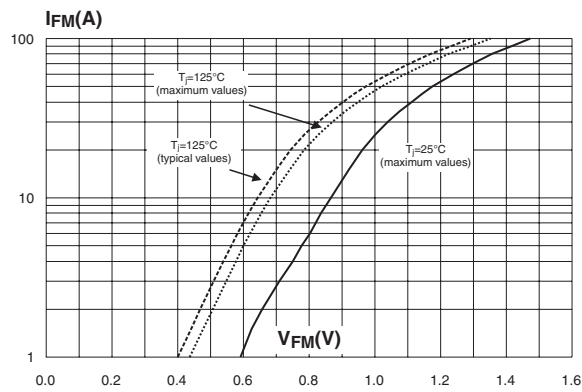


Figure 10: TO-220AB Package Mechanical Data

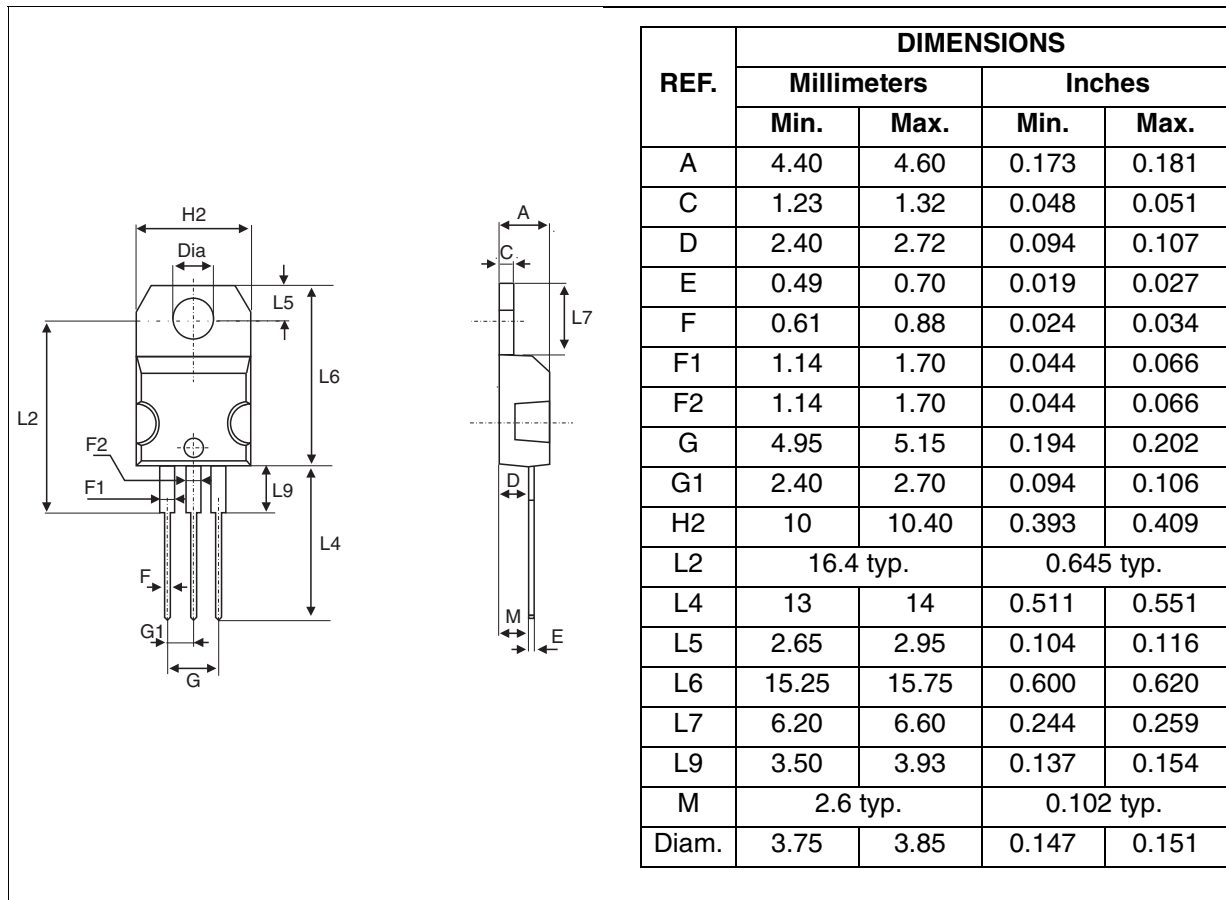


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS30120CT	STPS30120CT	TO-220AB	2.23 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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