

POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	20 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

Single Schottky rectifier suited for high frequency Switch Mode Power Supply.

Packaged in TO-220AC, 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.

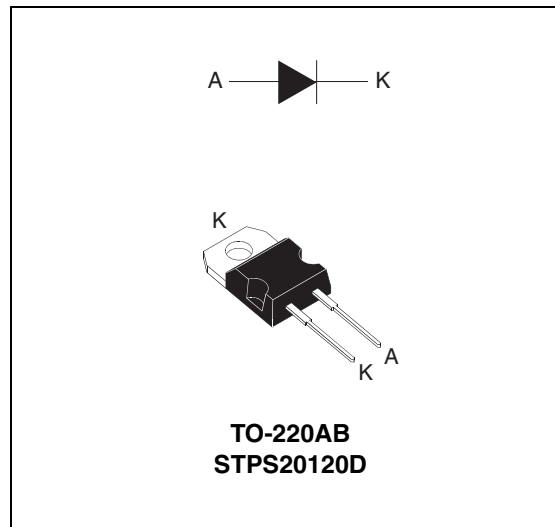


Table 2: Order Code

Part Number	Marking
STPS20120D	STPS20120D

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	120	V
$I_{F(RMS)}$	RMS forward voltage	30	A
$I_{F(AV)}$	Average forward current	$\delta = 0.5 \quad T_c = 130^\circ\text{C}$	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms sinusoidal}$	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s} \quad T_j = 25^\circ\text{C}$	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

STPS20120D

Table 4: Thermal Parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	2.2	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit	
I_R^*	Reverse leakage current	$T_J = 25^\circ\text{C}$	$V_R = V_{RRM}$			20	μA
		$T_J = 125^\circ\text{C}$			3	10	mA
V_F^{**}	Forward voltage drop	$T_J = 25^\circ\text{C}$	$I_F = 5\text{A}$			0.7	V
		$T_J = 125^\circ\text{C}$			0.54	0.58	
		$T_J = 25^\circ\text{C}$	$I_F = 10\text{A}$			0.8	
		$T_J = 125^\circ\text{C}$			0.62	0.66	
		$T_J = 25^\circ\text{C}$	$I_F = 20\text{A}$			0.93	
		$T_J = 125^\circ\text{C}$			0.72	0.76	

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: $P = 0.56 \times I_{F(AV)} + 0.010 I_{F(RMS)}^2$

Figure 1: Average forward power dissipation versus average forward current

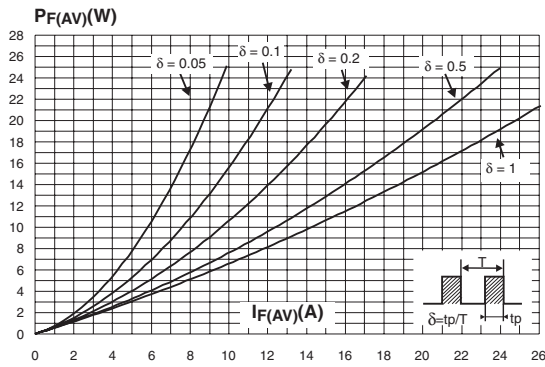


Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$)

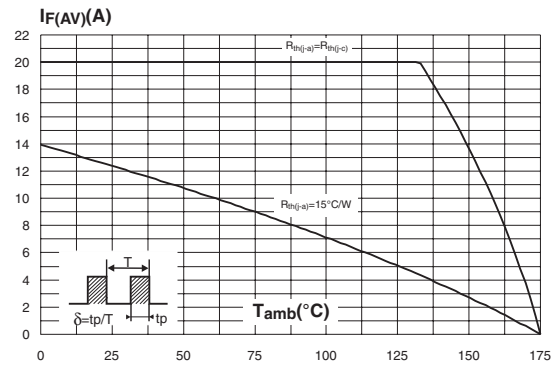


Figure 3: Normalized avalanche power derating versus pulse duration

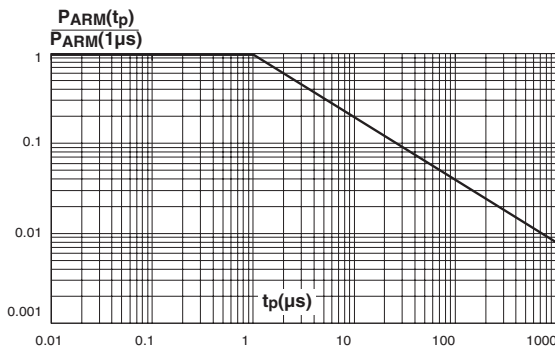


Figure 4: Normalized avalanche power derating versus junction temperature

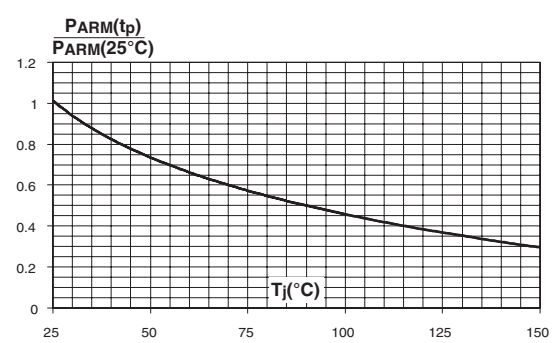


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

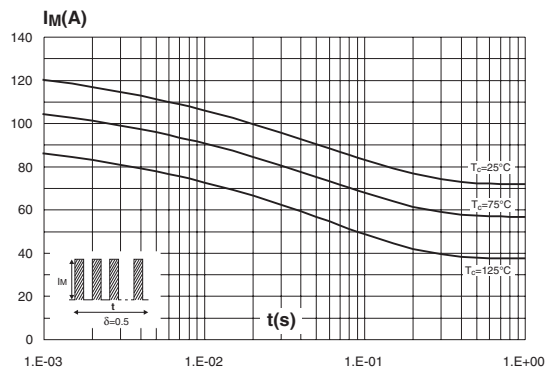


Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration

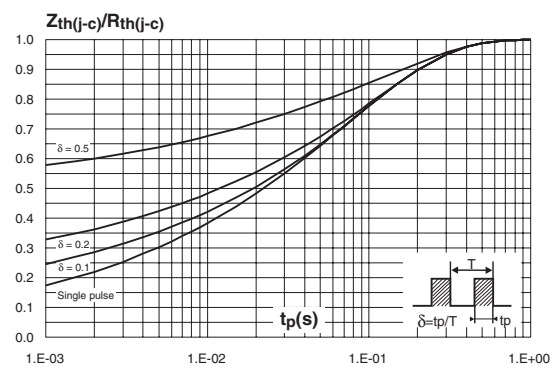


Figure 7: Reverse leakage current versus reverse voltage applied (typical values)

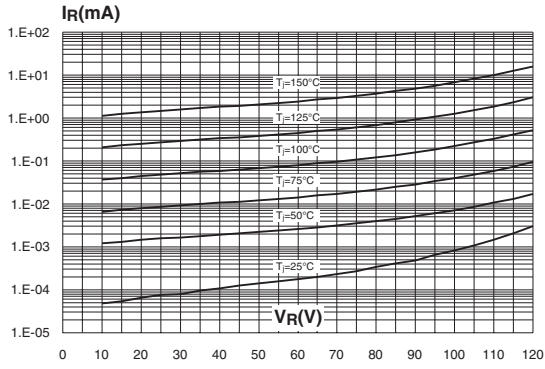


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

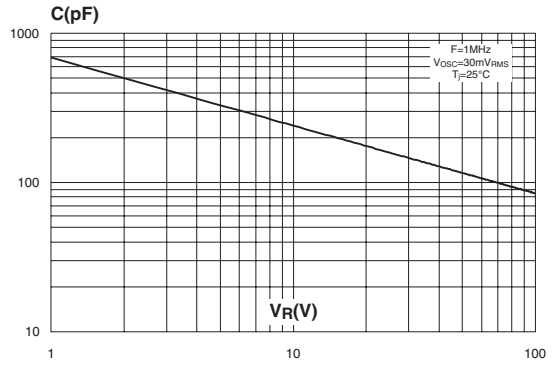


Figure 9: Forward voltage drop versus forward current

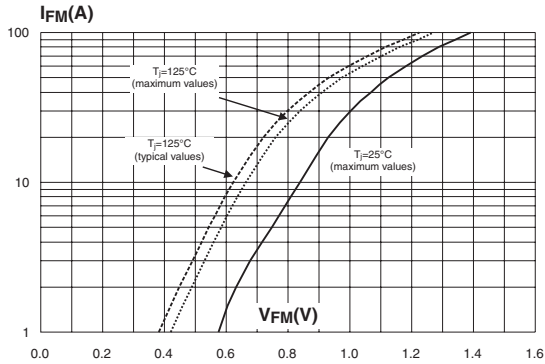


Figure 10: TO-220AC Package Mechanical Data

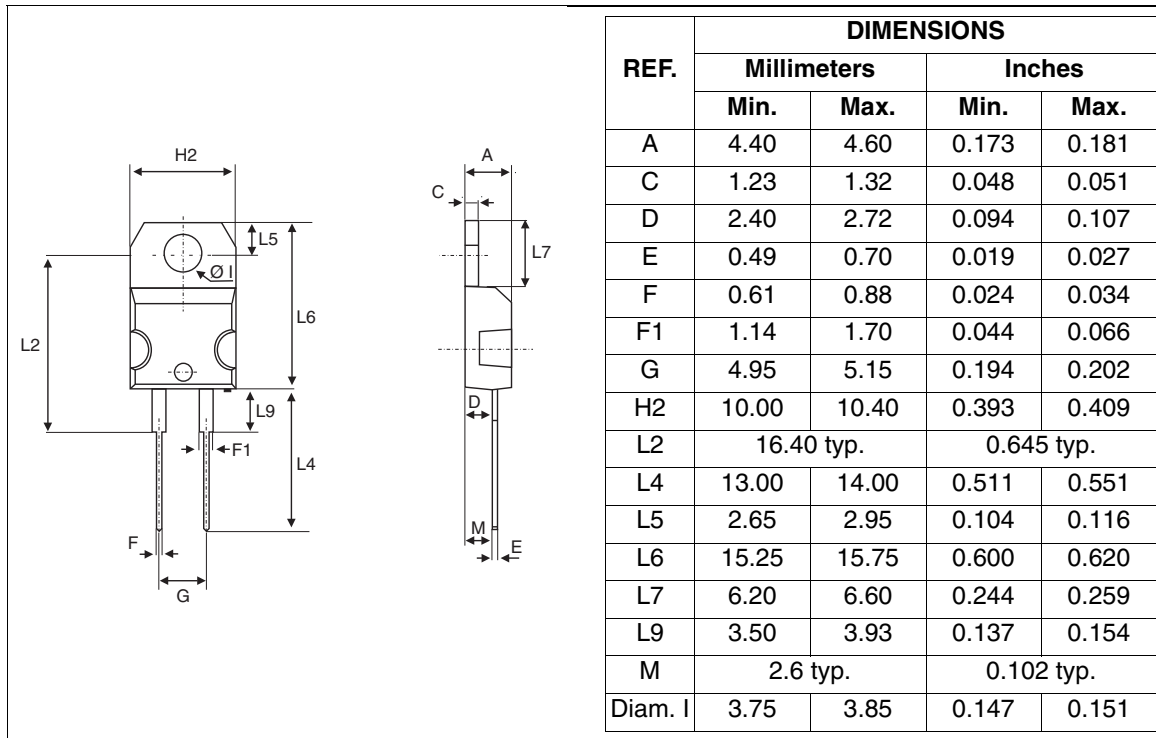


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS20120D	STPS20120D	TO-220AC	1.90 g	50	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 m.N.
- Maximum torque value: 0.70 m.N.

Table 7: Revision History

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

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