

## POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics**

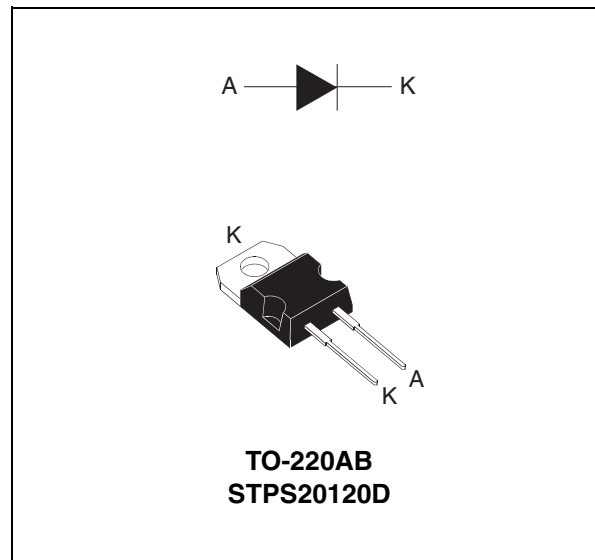
$I_{F(AV)}$	<b>20 A</b>
$V_{RRM}$	<b>120 V</b>
$T_j$ (max)	<b>175°C</b>
$V_F$ (typ)	<b>0.54 V</b>

**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 current	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	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			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:  $P = 0.56 \times I_{F(AV)} + 0.010 I_F^2(\text{RMS})$

Figure 1: Average forward power dissipation versus average forward current

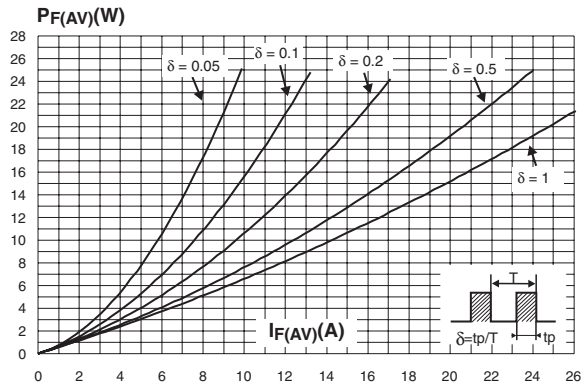


Figure 2: Average forward current versus ambient temperature ( $\delta = 0.5$ )

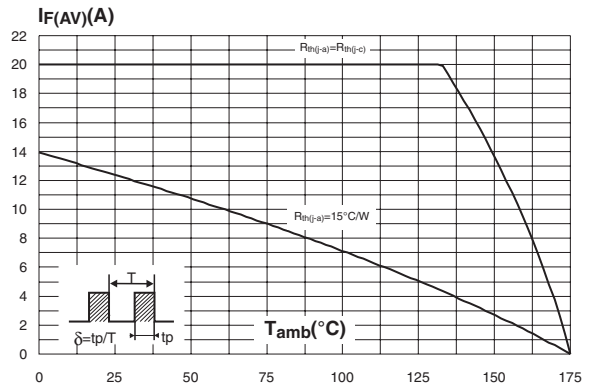


Figure 3: Normalized avalanche power derating versus pulse duration

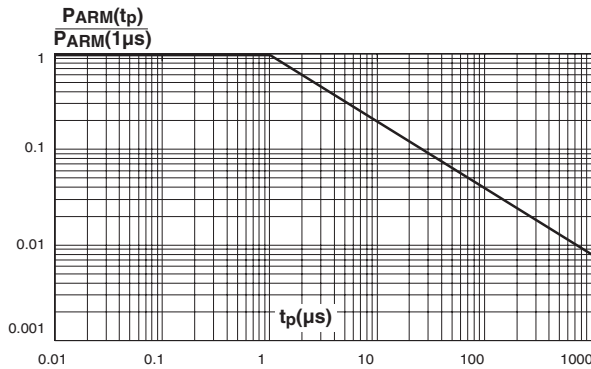


Figure 4: Normalized avalanche power derating versus junction temperature

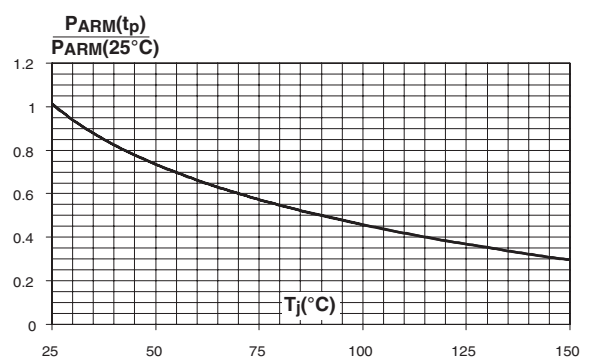


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

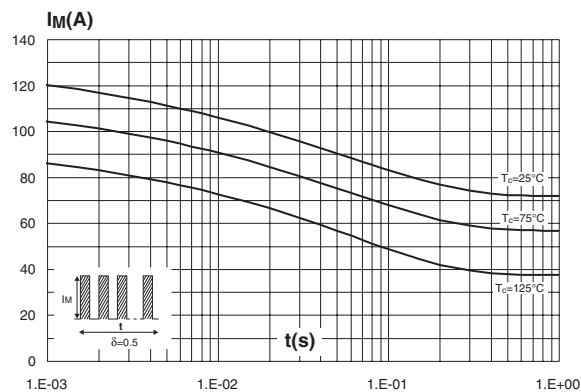
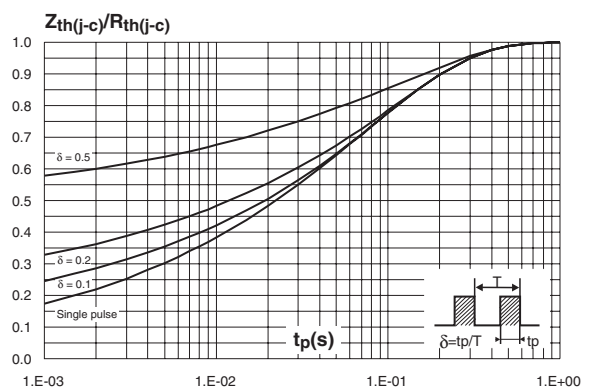
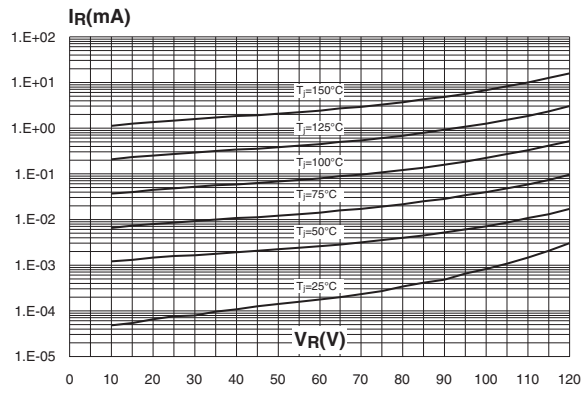


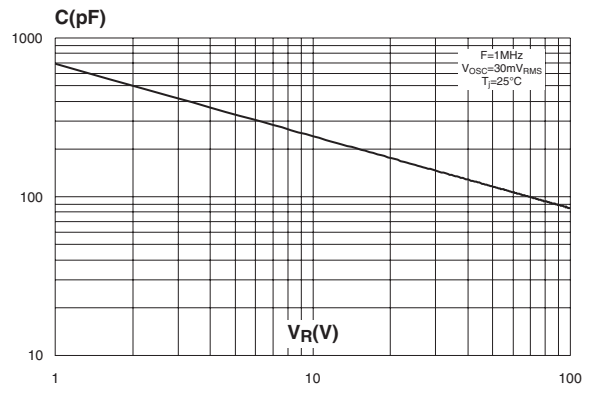
Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration



**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**

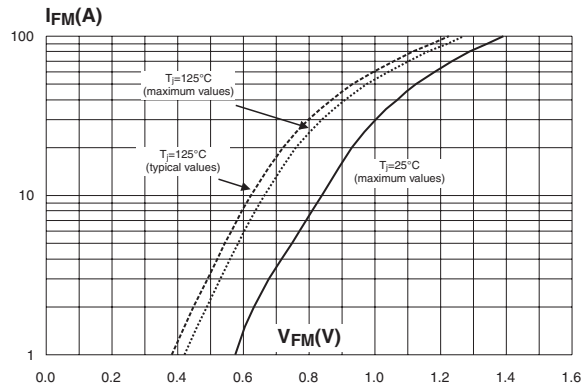


Figure 10: TO-220AC Package Mechanical Data

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam. I	3.75	3.85	0.147	0.151

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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