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STPS20120D

POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

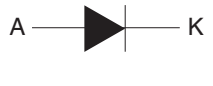
$I_{F(AV)}$	20 A
V_{RRM}	120 V
T_j (max)	175°C
V_F (typ)	0.54 V

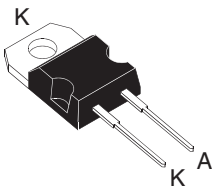
FEATURES AND BENEFITS

- 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.





TO-220AB
STPS20120D

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	$\delta = 0.5$ $T_c = 130°C$	20	A
I_{FSM}	Surge non repetitive forward current	t_p = 10ms sinusoidal	200	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1µs $T_j = 25°C$	8600	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature *		175	°C

* : $\frac{dPtot}{dTj} > \frac{1}{Rth(j-a)}$ 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	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°C	$V_R = V_{RRM}$			20	µA
		T_j = 125°C			3	10	mA
V_F **	Forward voltage drop	T_j = 25°C	I_F = 5A			0.7	V
		T_j = 125°C			0.54	0.58	
		T_j = 25°C	I_F = 10A			0.8	
		T_j = 125°C			0.62	0.66	
		T_j = 25°C	I_F = 20A			0.93	
		T_j = 125°C			0.72	0.76	

Pulse test: * tp = 5 ms, $\delta < 2\%$

** tp = 380 µs, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.56 \times I_{F(AV)} + 0.010\ I_F^2{}_{(RMS)}$

Figure 1: Average forward power dissipation versus average forward current

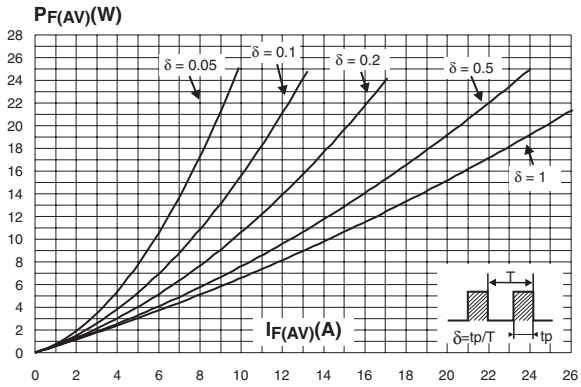


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

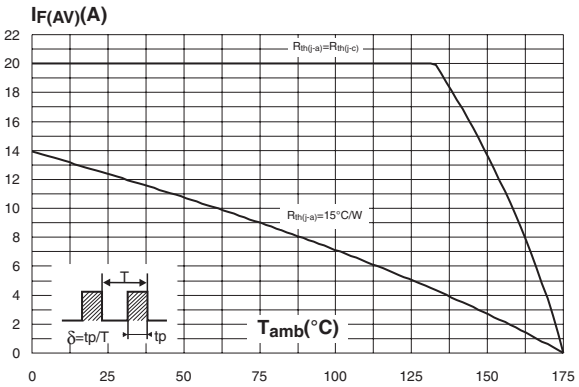


Figure 3: Normalized avalanche power derating versus pulse duration

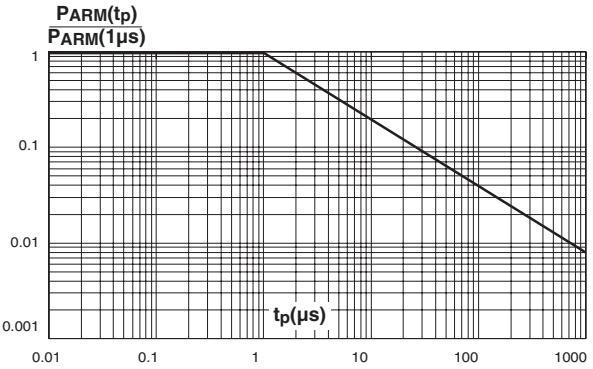


Figure 4: Normalized avalanche power derating versus junction temperature

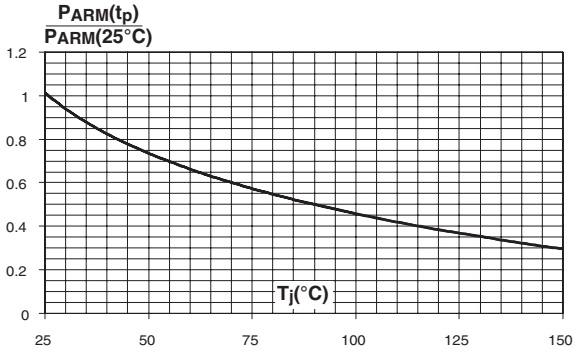


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

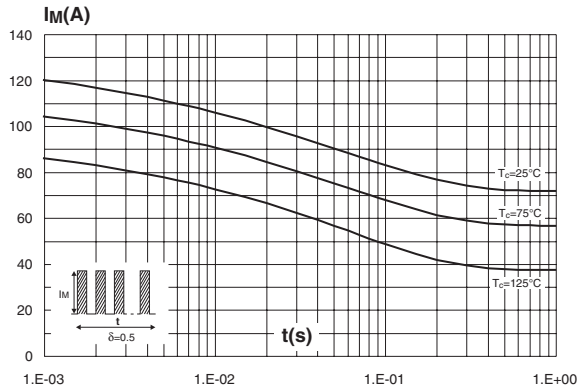


Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration

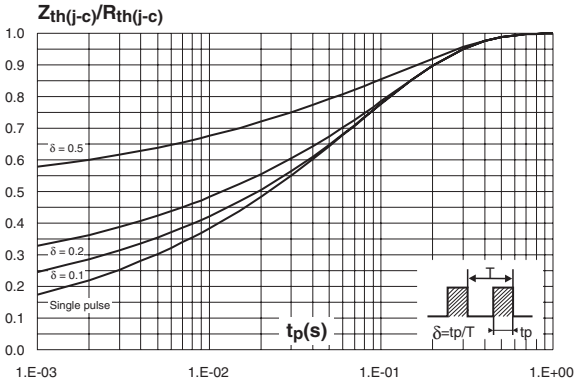


Figure 7: Reverse leakage current versus reverse voltage applied (typical values)

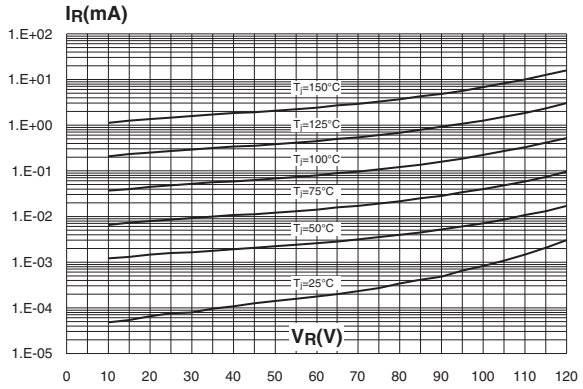


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

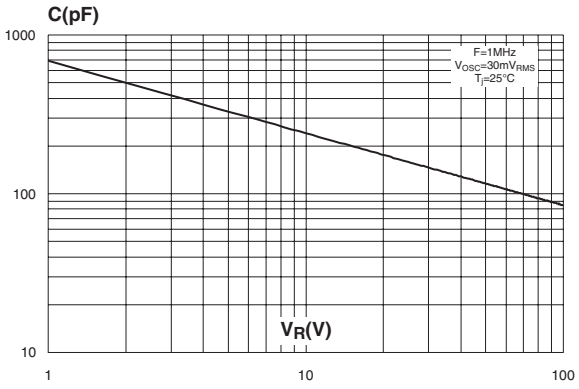


Figure 9: Forward voltage drop versus forward current

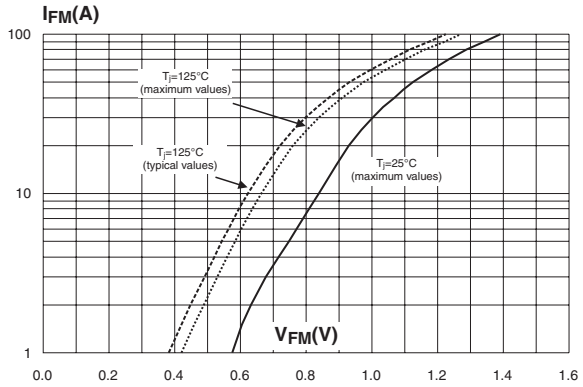
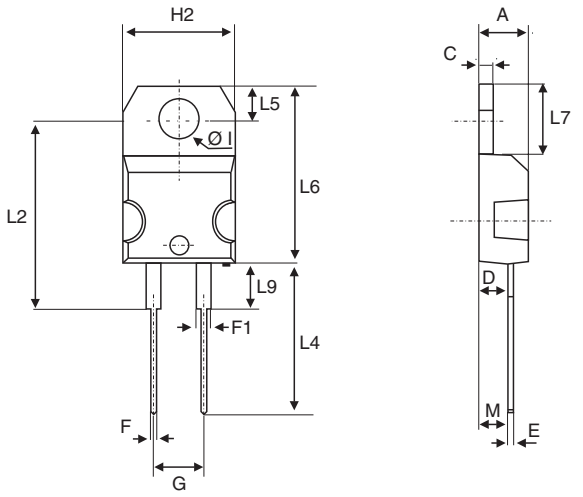


Figure 10: TO-220AC Package Mechanical Data



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.