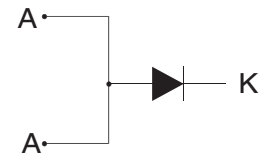
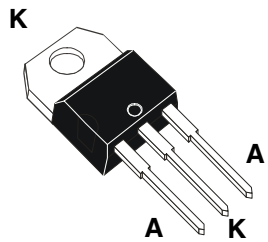
STPS30100ST

Power Schottky rectifier

Main product characteristics

$I_{F(AV)}$	30 A
V_{RRM}	100 V
T_j (max)	150° C
V_F(typ)	0.385 V





TO-220AB
STPS30100ST

Features and Benefits

- Avalanche rated
- Low V_F
- Good trade off between leakage current and forward voltage drop
- High frequency operation
- Avalanche capability specified

Description

Single Schottky rectifier, suited for high frequency switch mode power supply.

Packaged in TO-220AB, this device is intended to be used in notebook and game station adaptors, providing in these applications a good efficiency at both low and high load.

Table 1. Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
$I_{F(RMS)}$	RMS forward current		60	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	T_c = 125° C	30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	300	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25° C	26400	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature (1)		150	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

1 Characteristics

Table 2. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	1	°C/W

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			175	µA
		T_j = 125° C			20	50	mA
		T_j = 25° C	V_R = 70 V			60	µA
		T_j = 125° C			10	20	mA
V_F(2)	Forward voltage drop	T_j = 25° C	I_F = 5 A		0.475		V
		T_j = 125° C			0.385		
		T_j = 25° C	I_F = 10 A		0.555		
		T_j = 125° C			0.475		
		T_j = 25° C	I_F = 15 A		0.620	0.660	
		T_j = 125° C			0.525	0.565	
		T_j = 25° C	I_F = 30 A		0.740	0.800	
		T_j = 125° C			0.605	0.655	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.475 \times I_{F(AV)} + 0.006 \times I_F{}^2{}_{(RMS)}$

Figure 1. Conduction losses versus average current

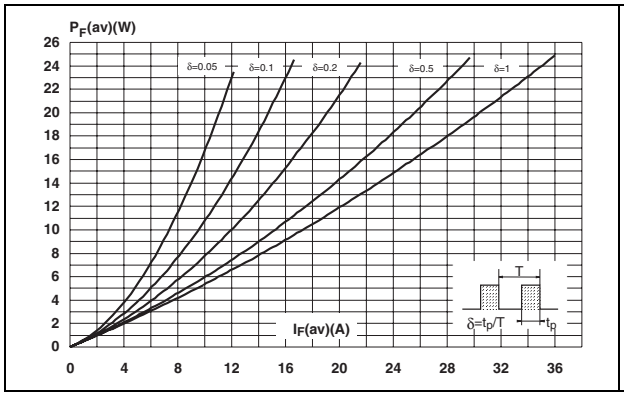


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

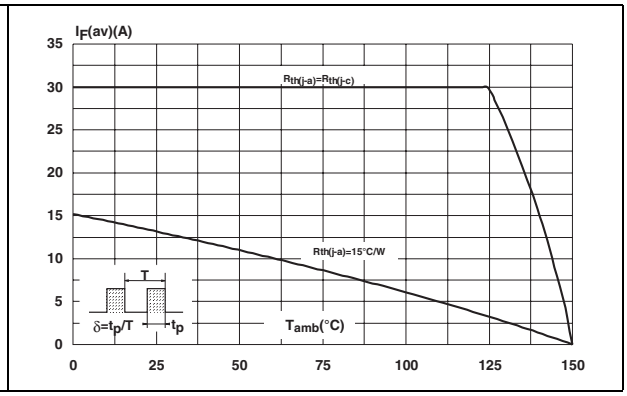


Figure 3. Normalized avalanche power derating versus pulse duration

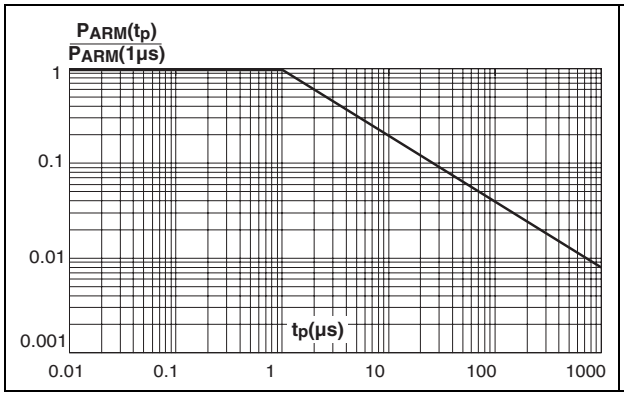


Figure 4. Normalized avalanche power derating versus junction temperature

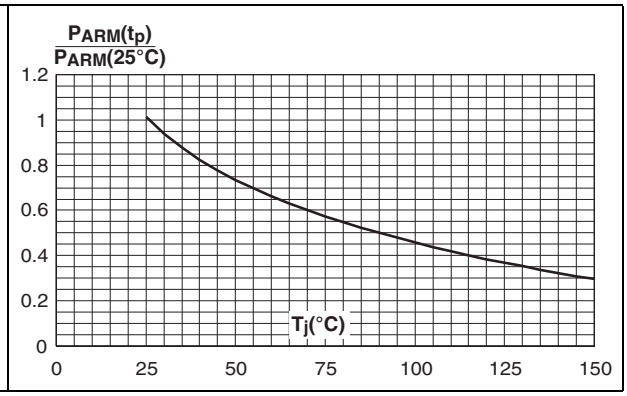


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

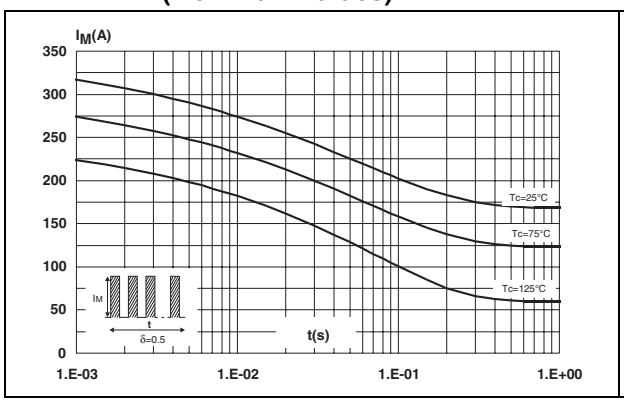


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

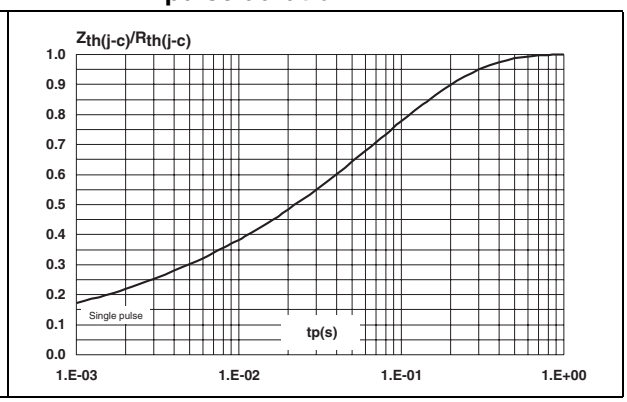


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

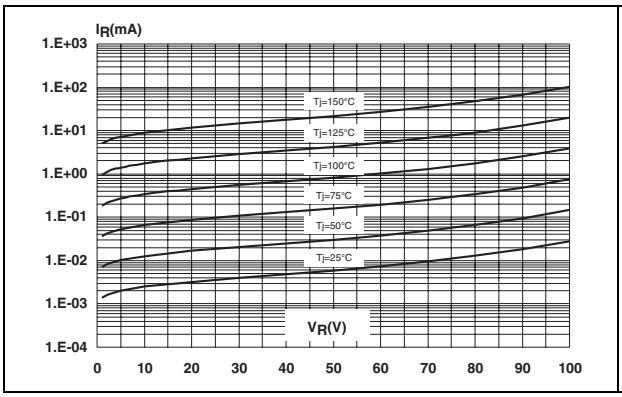


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

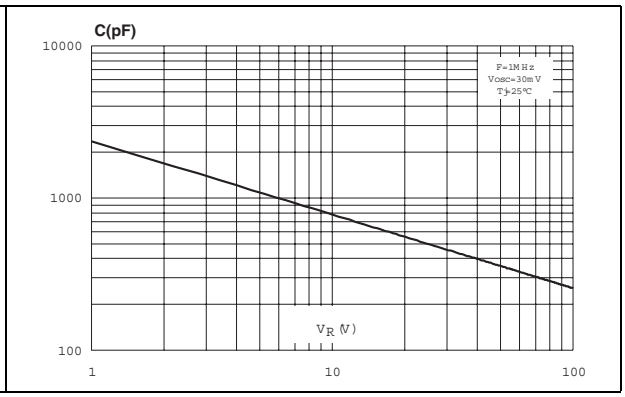


Figure 9. Forward voltage drop versus forward current (high level)

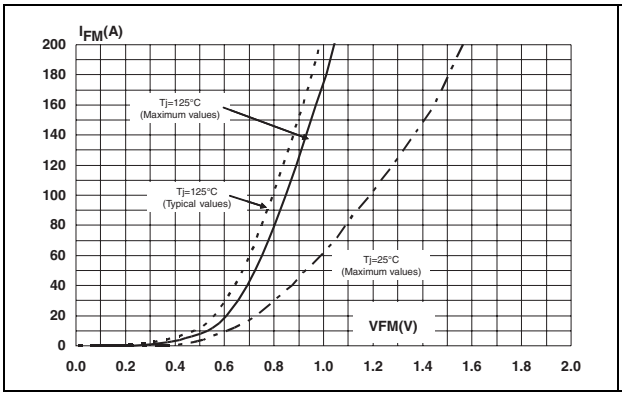
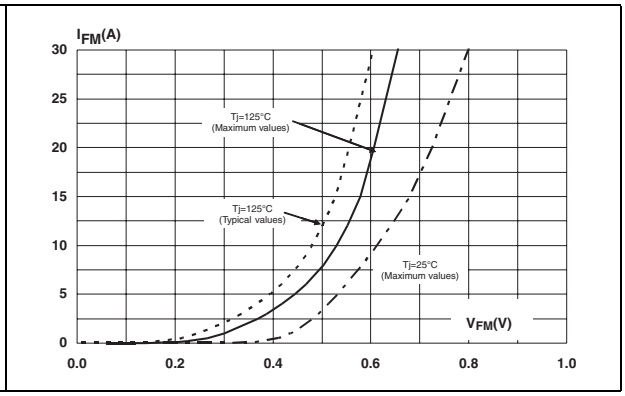


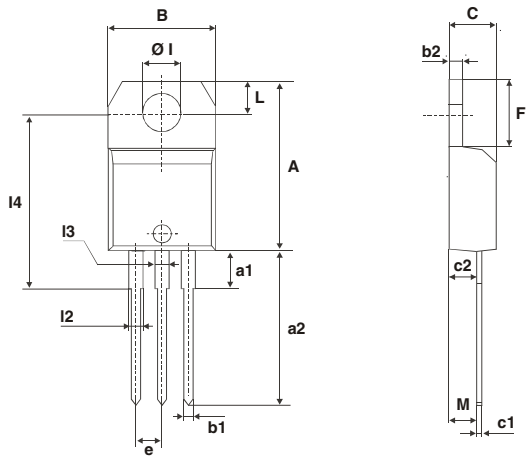
Figure 10. Forward voltage drop versus forward current (low level)



2 Package Information

Epoxy meets UL94,V0

Table 4. TO-220AB dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS30100ST	STPS30100ST	TO-220AB	2.23 g	50	Tube

4 Revision History

Date	Revision	Changes
24-Oct-2006	1	First issue

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