



STPS200170TV1

High voltage power Schottky rectifier

Main product characteristics

$I_{F(AV)}$	2 x 100 A
V_{RRM}	170 V
T_j	150 °C
V_F (typ)	0.63 V

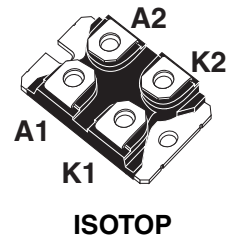
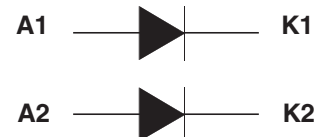
Features and benefits

- Negligible switching losses
- Avalanche rated
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Insulated package
 - ISOTOP
 - Electrical insulation = 2500 V_{RMS}
 - Capacitance = 45 pF

Description

High voltage Schottky rectifier suited for high frequency switch mode power supply.

Packaged in ISOTOP, this device is intended for use in the secondary rectification of the applications.



Order codes

Part Number	Marking
STPS200170TV1	STPS200170TV1

1 Characteristics

Table 1. Absolute ratings - limiting values per diode at $T_{amb} = 25\text{ °C}$, unless otherwise specified

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		170	V
$I_{F(RMS)}$	RMS forward current		200	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 105\text{ °C}$ per diode	100	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal	700	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$, $T_j = 25\text{ °C}$	100000	W
T_{stg}	Storage temperature range		-55 to + 150	°C
T_j	Maximum operating junction temperature ⁽¹⁾		150	°C

1. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

Table 2. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.52	°C/W
		Total	0.31	
$R_{th(c)}$	Coupling thermal resistance		0.1	

When the diodes are used simultaneously:

$$T_{j(\text{diode1})} = P_{(\text{diode1})} \times R_{th(j-c)} (\text{per diode}) + P_{(\text{diode2})} \times R_{th(c)}$$

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$			200	μA
		$T_j = 125\text{ °C}$			30	100	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 100\text{ A}$			0.83	V
		$T_j = 150\text{ °C}$			0.63	0.68	
		$T_j = 25\text{ °C}$	$I_F = 200\text{ A}$			0.975	
		$T_j = 150\text{ °C}$			0.78	0.86	

1. Pulse test: $t_p = 5\text{ ms}$, $\delta < 2\%$

2. Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.5 \times I_{F(AV)} + 0.0018 I_{F(RMS)}^2$

Figure 1. Conduction losses versus average current (per diode)

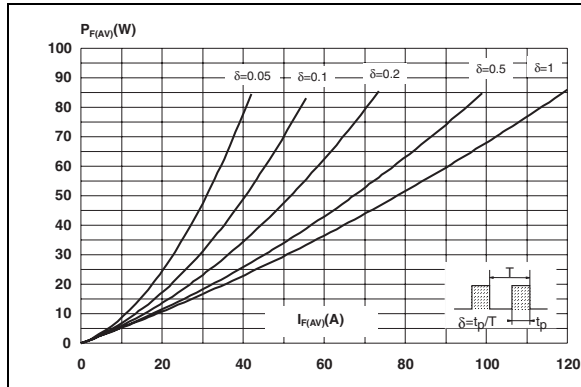


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

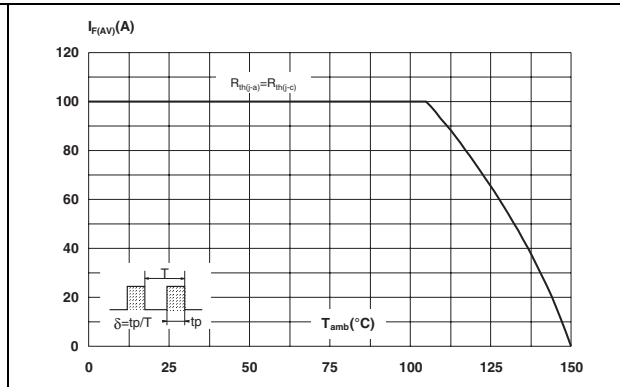


Figure 3. Non-repetitive surge peak forward current versus overload duration (maximum values per diode)

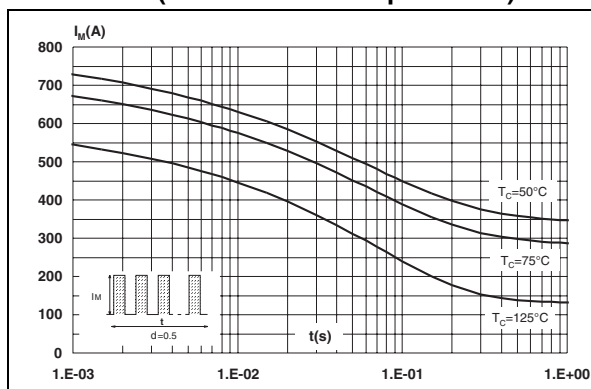


Figure 4. Relative variation of thermal impedance (junction to case) versus pulse duration

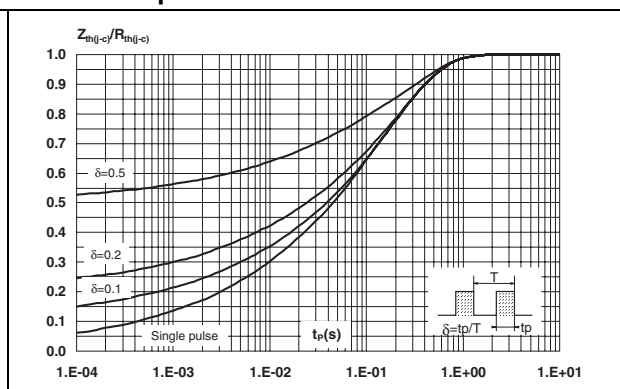


Figure 5. Reverse leakage current versus reverse voltage applied (typical values per diode)

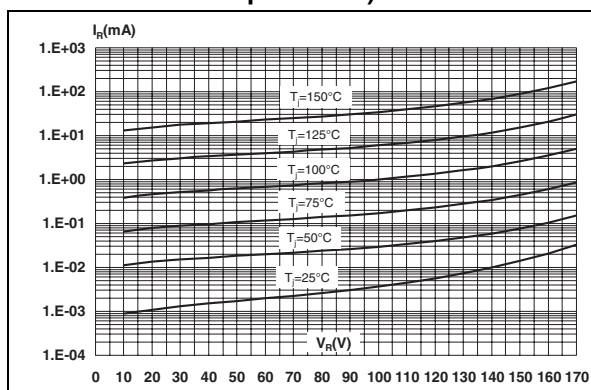


Figure 6. Junction capacitances versus reverse voltage applied (typical values per diode)

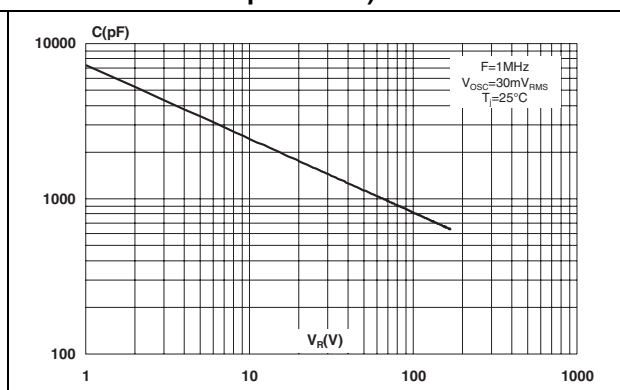


Figure 7. Forward voltage drop versus forward current (per diode, low level)

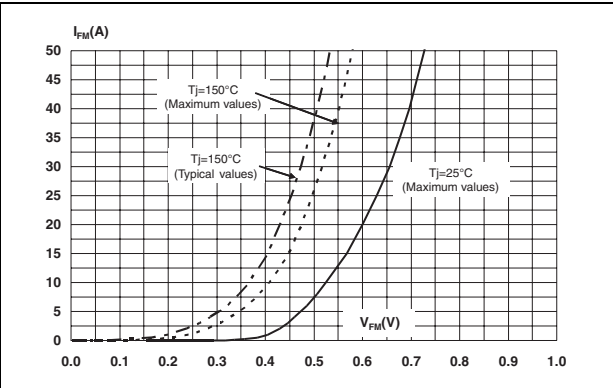


Figure 8. Forward voltage drop versus forward current (per diode, high level)

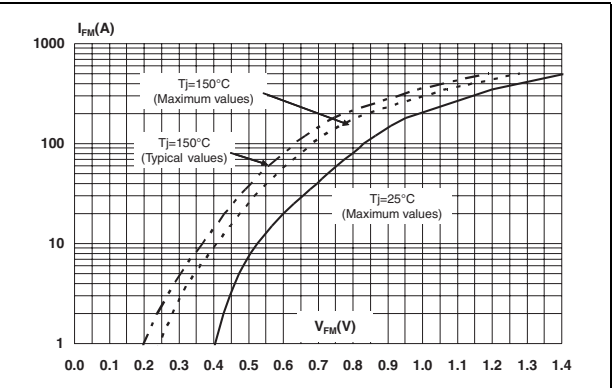


Figure 9. Normalized avalanche power derating versus pulse duration

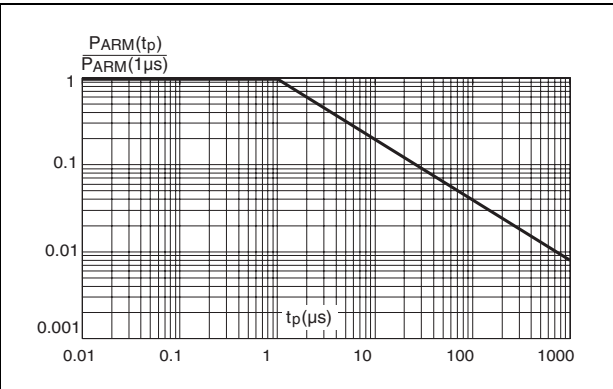
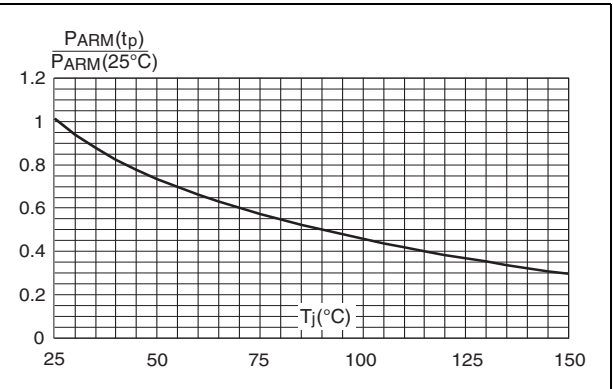


Figure 10. Normalized avalanche power derating versus junction temperature



2 Package mechanical data

Epoxy meets UL94, V0

Cooling method: by conduction (C)

Table 4. ISOTOP dimensions

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

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

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STPS200170TV1	STPS200170TV1	ISOTOP	27 g without screws	10 with screws	Tube

4 Revision history

Date	Revision	Description of Changes
14-Nov-2005	1	First issue.

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