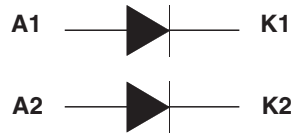
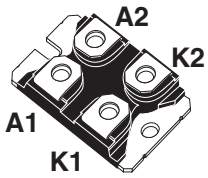
STPS200170TV1

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





ISOTOP

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 °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, δ = 0.5		T_c = 105 °C per diode	100	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal		700	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs, T_j = 25 °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:
$T_{j(diode1)} = P_{(diode1)} X R_{th(j-c)}$ (per diode) + $P_{(diode2)} X R_{th(c)}$

Table 3. Static electrical characteristics

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

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: $P = 0.5 \times I_{F(AV)} + 0.0018 I_{F^2(RMS)}$

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

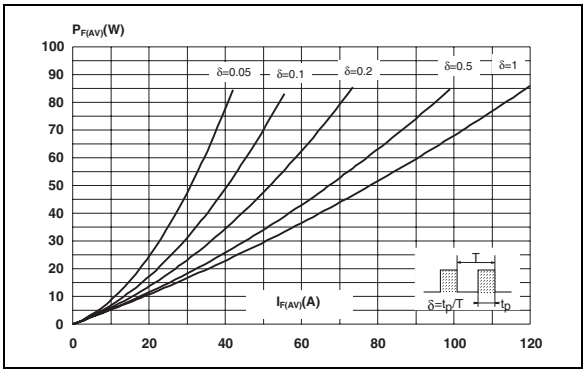


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

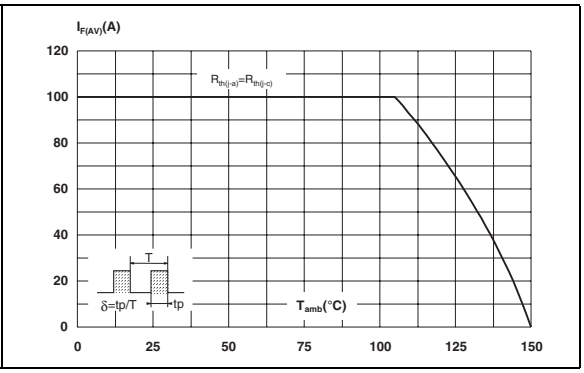


Figure 3. Non-repetitive surge peak forward current vesus overload duration (maximum values per diode)

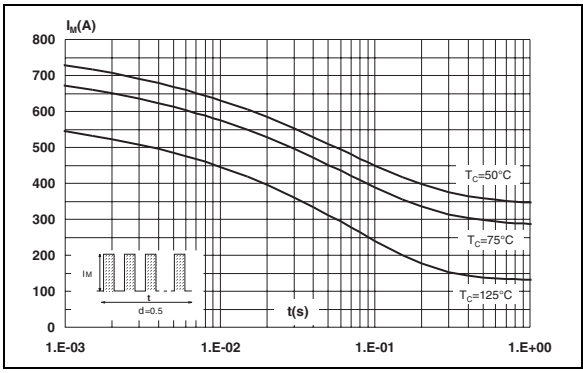


Figure 4. Relative variation of thermal impedance (junction to case) versus pulse duration

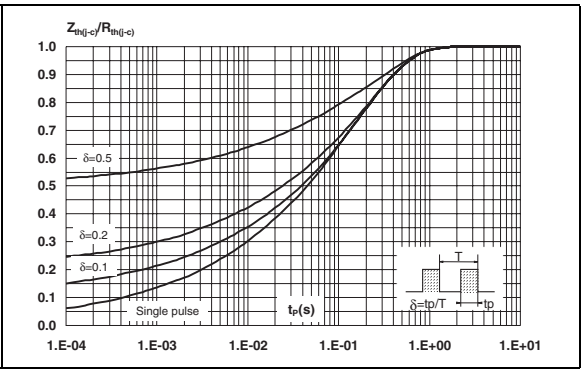


Figure 5. Reverse leakage current versus reverse voltage applied (typical values per diode)

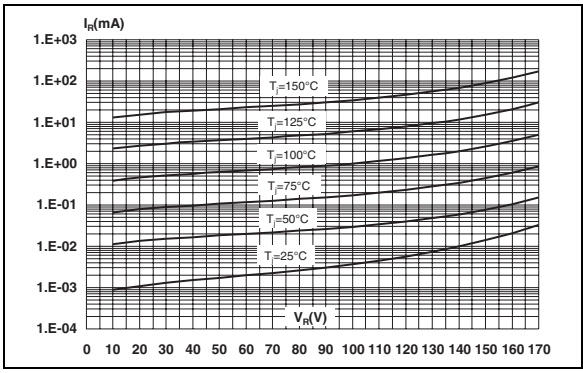


Figure 6. Junction capacitances versus reverse voltage applied (typical values per diode)

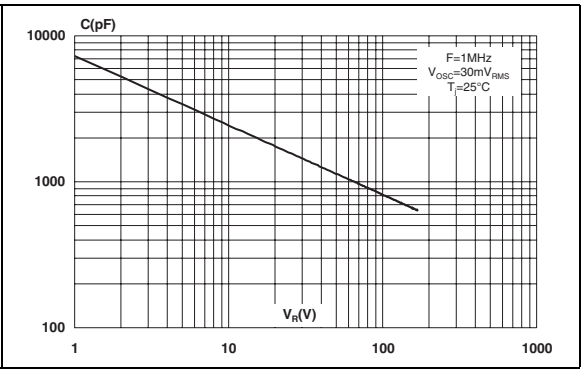


Figure 7. Forward voltage drop versus forward current (per diode, low level)

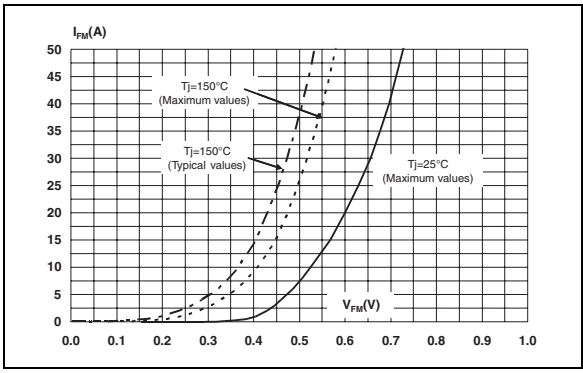


Figure 8. Forward voltage drop versus forward current (per diode, high level)

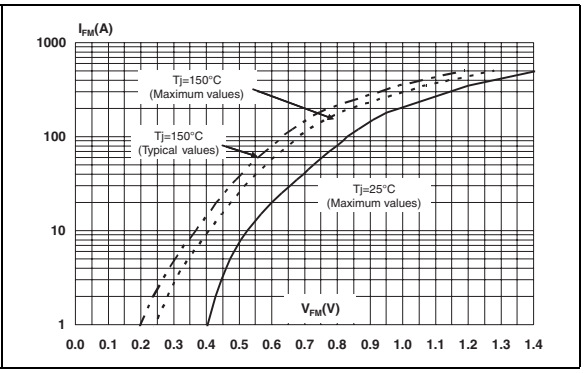


Figure 9. Normalized avalanche power derating versus pulse duration

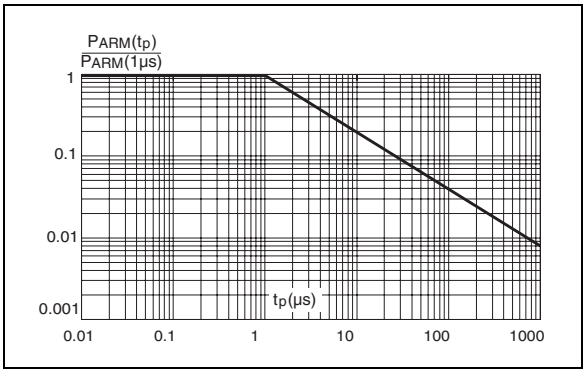
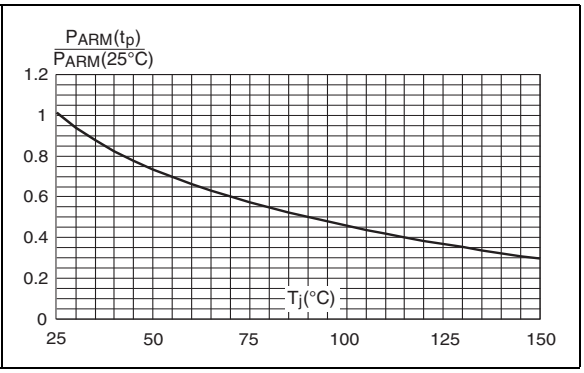


Figure 10. Normalized avalanche power derating versus junction temperature

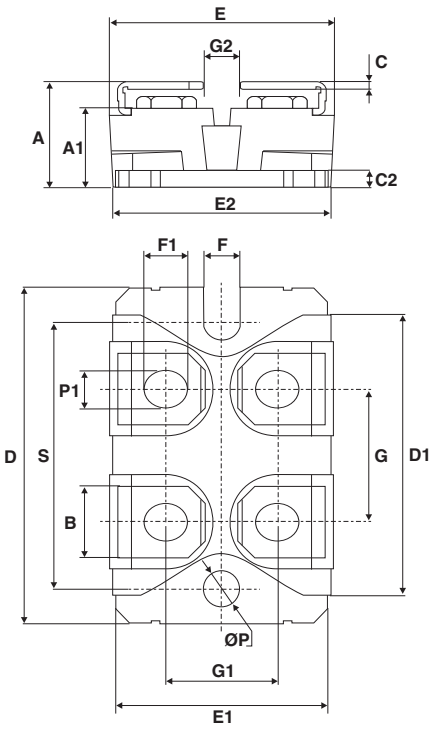


2 Package mechanical data

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.