

## High voltage power Schottky rectifier

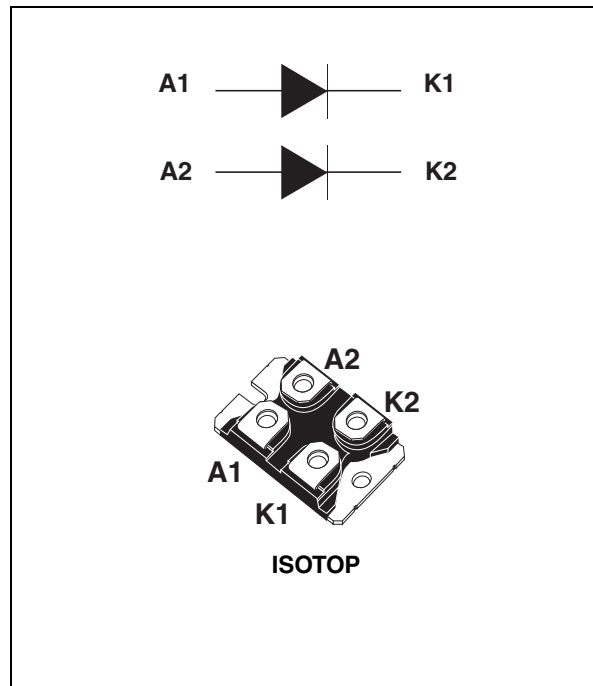
### Features

- 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

This high voltage Schottky rectifier is suited for high frequency switch mode power supplies.

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



**Table 1. Device summary**

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

# 1 Characteristics

**Table 2. 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
$I_{F(RMS)}$	Forward rms current	200	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 105\text{ °C}$ per diode	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$ , $T_j = 25\text{ °C}$	W
$T_{stg}$	Storage temperature range	-55 to + 150	°C
$T_j$	Maximum operating junction temperature <sup>(1)</sup>	150	°C

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

**Table 3. Thermal parameters**

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

When the diodes are used simultaneously:

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

**Table 4. Static electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	-	-	200	$\mu\text{A}$
		$T_j = 125\text{ °C}$	-	30	100	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	-	-	0.85	V
		$T_j = 150\text{ °C}$	-	0.63	0.68	
		$T_j = 25\text{ °C}$	-	-	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)

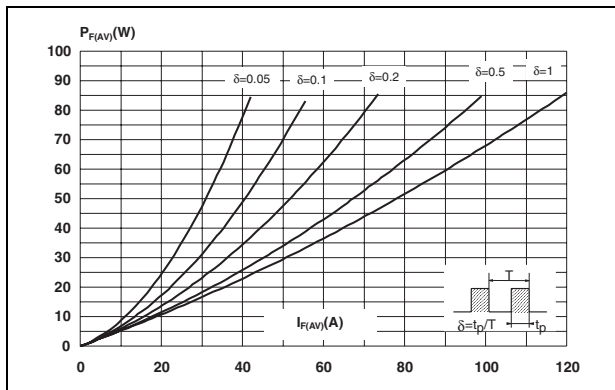


Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)

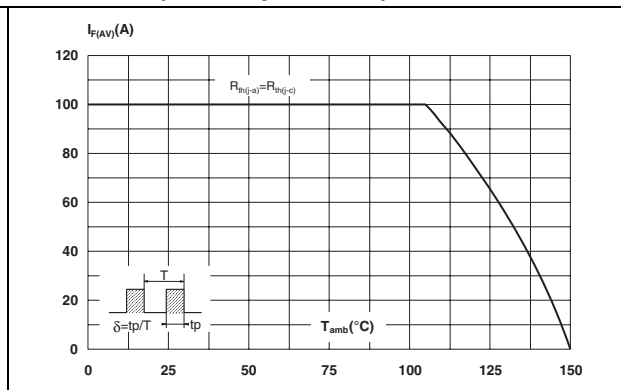


Figure 3. Non-repetitive surge peak forward current versus overload duration (maximum values per diode)

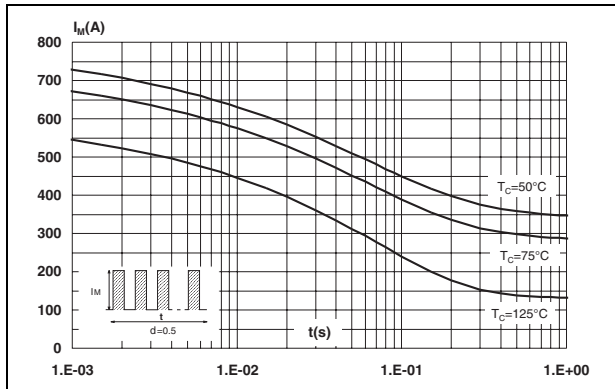


Figure 4. Relative variation of thermal impedance (junction to case) versus pulse duration

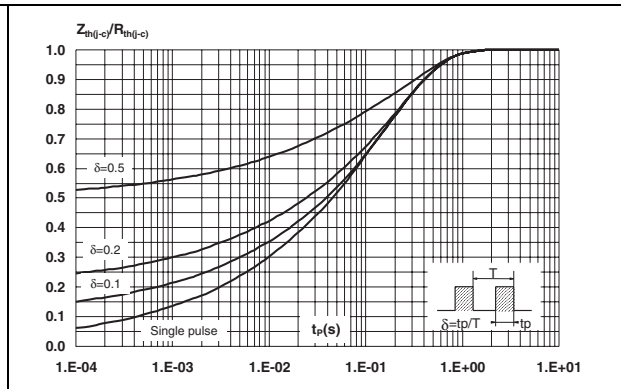


Figure 5. Reverse leakage current versus reverse voltage applied (typical values per diode)

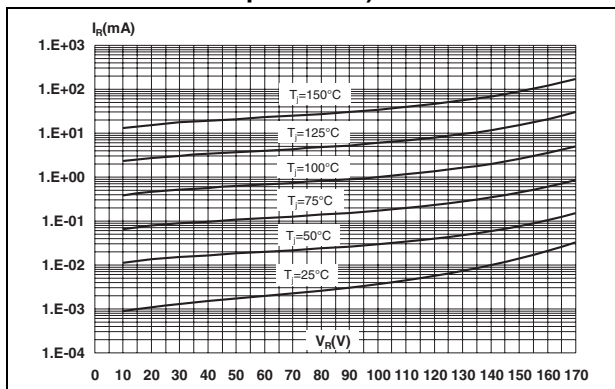
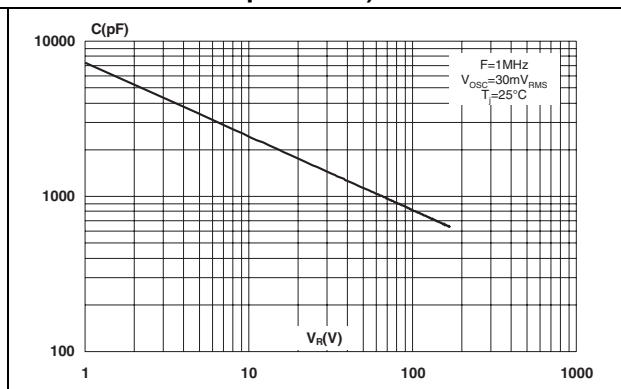
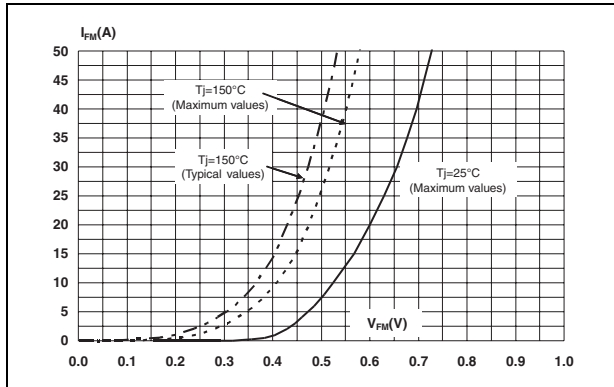


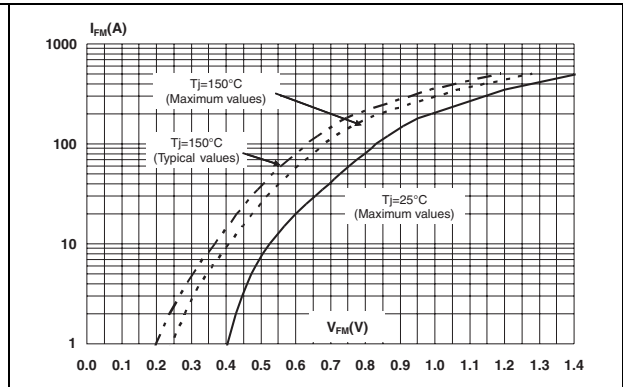
Figure 6. Junction capacitances versus reverse voltage applied (typical values per diode)



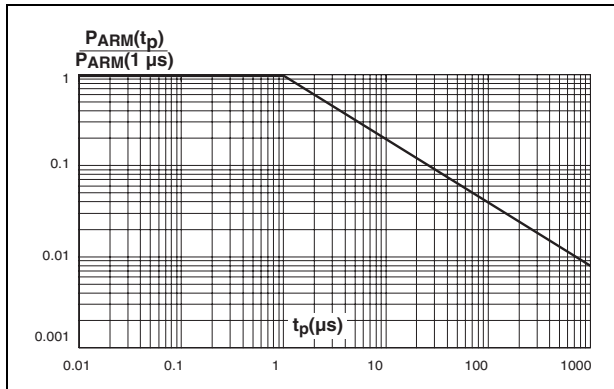
**Figure 7. Forward voltage drop versus forward current (per diode, low level)**



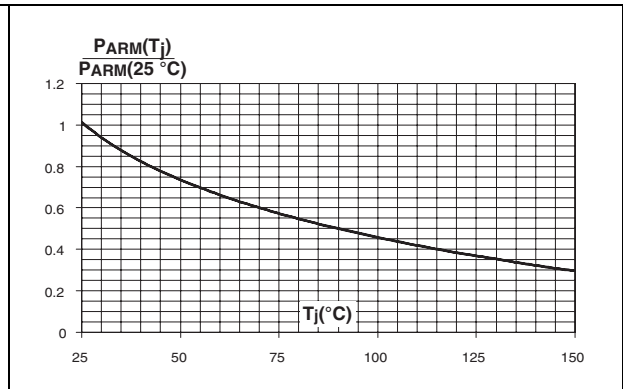
**Figure 8. Forward voltage drop versus forward current (per diode, high level)**



**Figure 9. Normalized avalanche power derating versus pulse duration**



**Figure 10. Normalized avalanche power derating versus junction temperature**



## 2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

**Table 5. 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

### 3 Ordering information

**Table 6. 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

**Table 7. Document revision history**

Date	Revision	Changes
14-Nov-2005	1	First issue.
09-Sep-2011	2	Updated $V_{F \max}$ at $T_j = 25 \text{ }^\circ\text{C}$ and $I_F = 100 \text{ A}$ to 0.85 V.

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY TWO AUTHORIZED ST REPRESENTATIVES, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2011 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STPS200170TV1](#)