



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

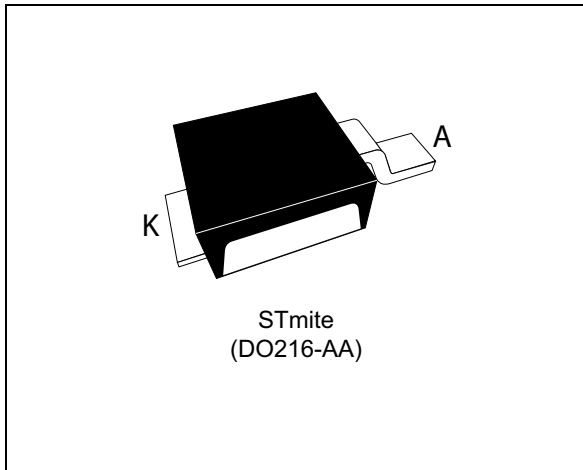
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Power Schottky rectifier

Datasheet - production data



Description

Single Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in STmite, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications. Due to the small size of the package this device fits battery powered equipment (cellular, notebook, PDA's, printers) as well chargers and PCMCIA cards.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	1 A
V_{RRM}	20 V
T_j (max)	150 °C
V_F (typ)	0.36 V

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop for higher efficiency and extended battery life
- Low thermal resistance
- Avalanche capability specified

1 Characteristics

Table 2. Absolute ratings (limiting values at T_{amb} = 25 °C, unless otherwise specified)

Symbol	Parameter	Value	Unit
V _{RRM}	Repetitive peak reverse voltage	20	V
I _{F(RMS)}	Forward rms current	2	A
I _{F(AV)}	Average forward current, δ = 0.5, square wave	T _c = 140 °C	A
I _{FSM}	Surge non repetitive forward current	t _p = 8.3 ms sinusoidal	A
P _{ARM} ⁽¹⁾	Repetitive peak avalanche power	T _j = 125 °C, t _p = 10 μs	W
T _{stg}	Storage temperature range	-65 to +150	°C
T _j	Maximum operating junction temperature ⁽²⁾	150	°C

- For pulse time duration deratings, please refer to [Figure 3](#). More details regarding the avalanche energy measurements and diode validation in the avalanche are provided in the STMicroelectronics Application notes AN1768, "Admissible avalanche power of Schottky diodes" and AN2025, "Converter improvement using Schottky rectifier avalanche specification".
- $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case	20	°C/W
R _{th(j-a)} ⁽¹⁾	Junction to ambient	250	°C/W

- Mounted with minimum recommended pad size, PC board FR4.

Table 4. 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}	-	1.3	3.9	μA
		T _j = 100 °C		-	275	850	
		T _j = 25 °C	V _R = 10 V	-	0.6	2.0	
		T _j = 100 °C		-	145	450	
		T _j = 25 °C	V _R = 5 V	-	0.4	1.0	
		T _j = 100 °C		-	105	300	
V _F ⁽¹⁾	Forward voltage drop	T _j = 25 °C	I _F = 1 A	-	0.44	0.49	V
		T _j = 100 °C		-	0.36	0.41	
		T _j = 25 °C	I _F = 2 A	-	0.48	0.54	
		T _j = 100 °C		-	0.42	0.48	

- Pulse test: t_p = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.34 \times I_{F(AV)} + 0.07 \times I_{F(RMS)}^2$$

Figure 1. Average forward power dissipation versus average forward current

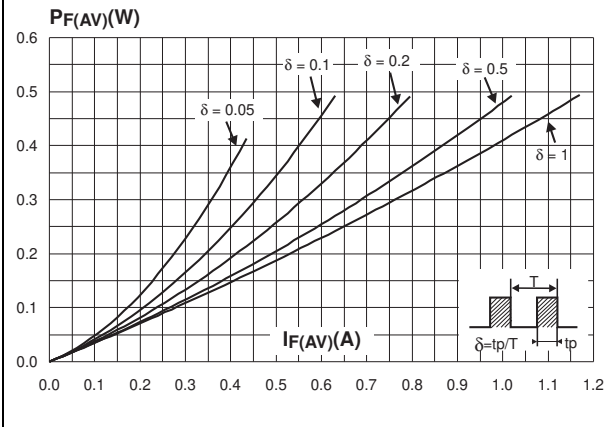


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

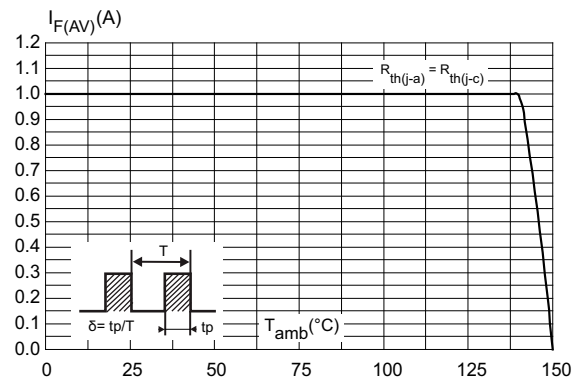


Figure 3. Normalized avalanche power derating versus pulse duration ($T_j = 125^\circ\text{C}$)

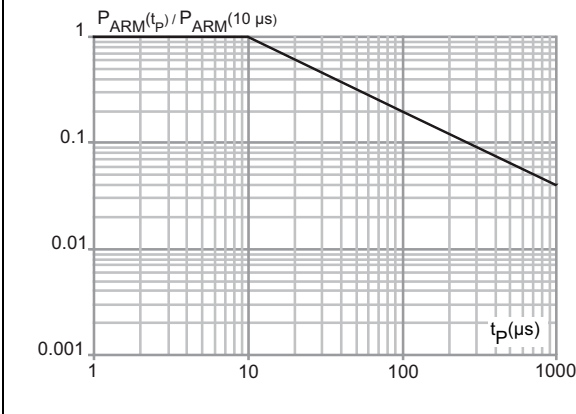


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

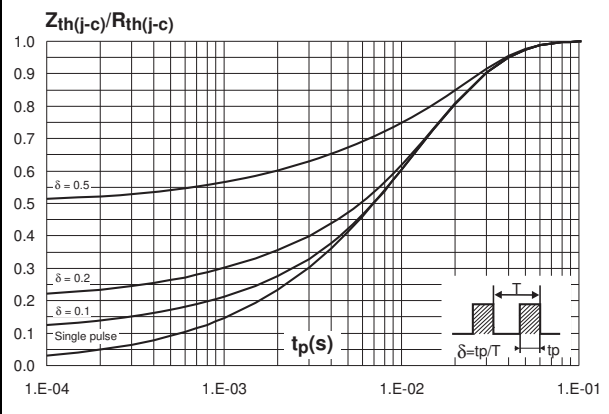


Figure 5. Reverse leakage current versus reverse reverse voltage applied (typical values)

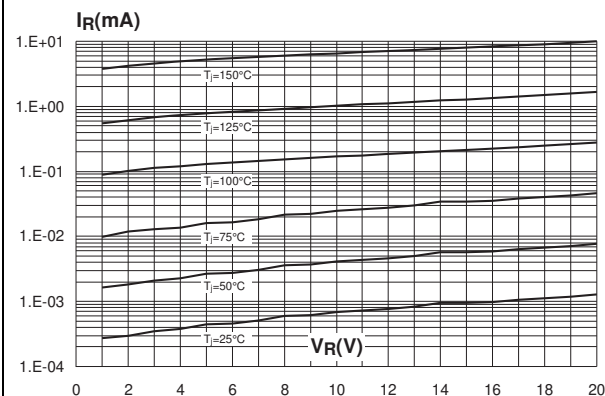


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

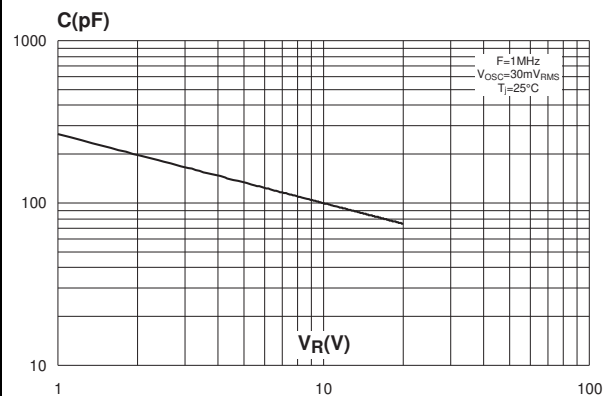


Figure 7. Forward voltage drop versus forward current (low level)

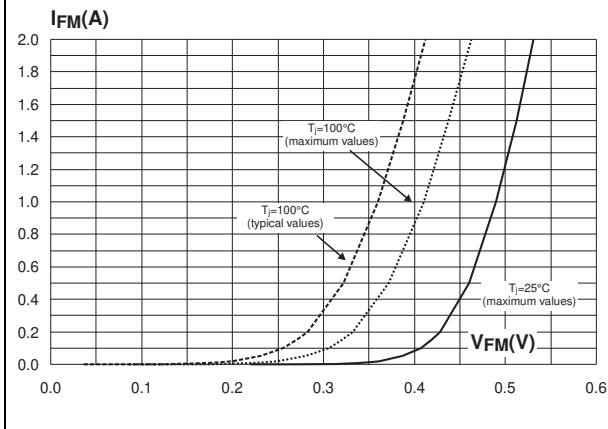


Figure 8. Forward voltage drop versus forward current (high level)

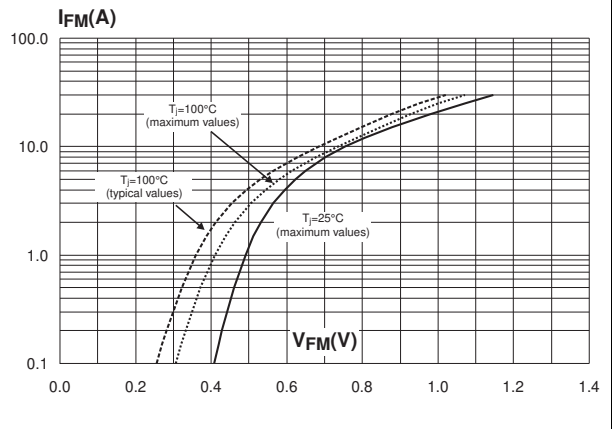
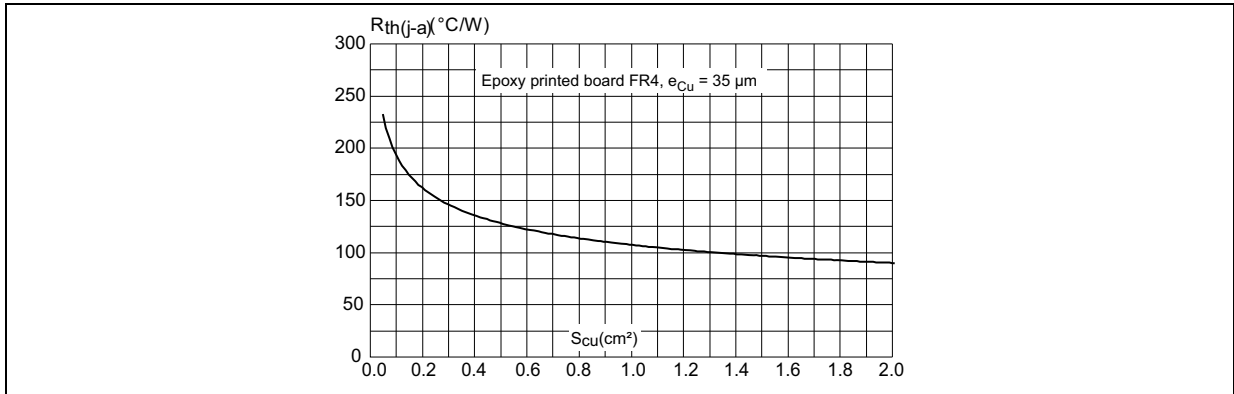


Figure 9. Thermal resistance junction to ambient versus copper surface under tab (typical values)



2 Package information

- Epoxy meets UL94, V0

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. ECOPACK[®] is an ST trademark.

2.1 STmite package information

Figure 10. STmite package outline

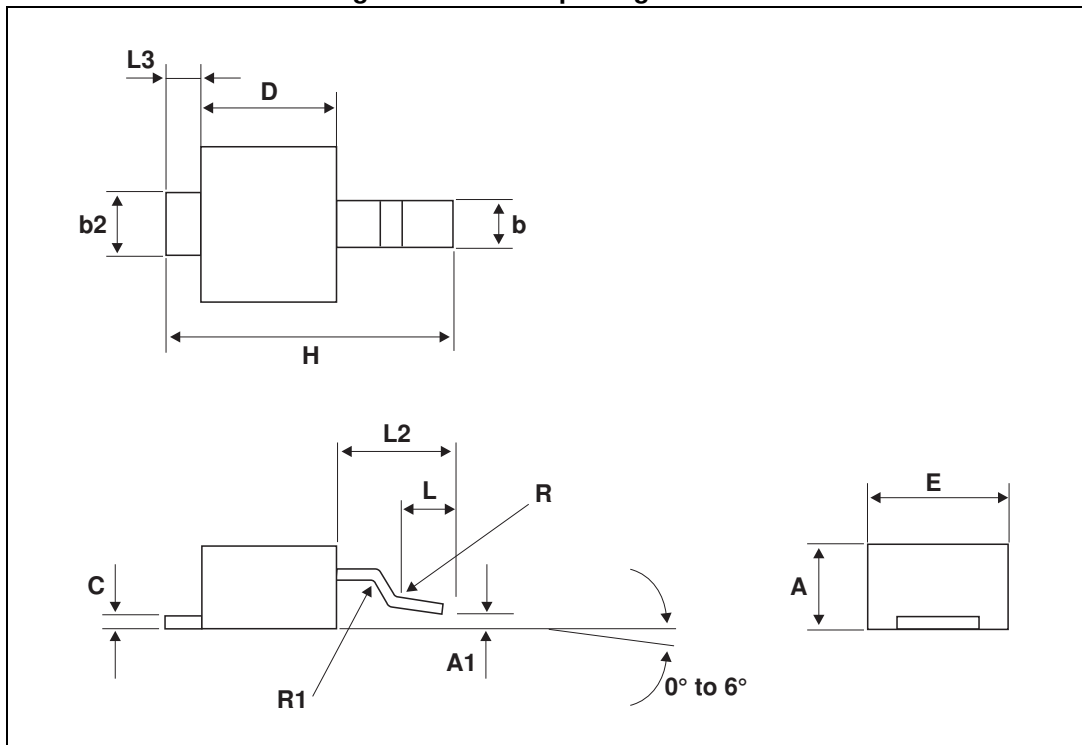
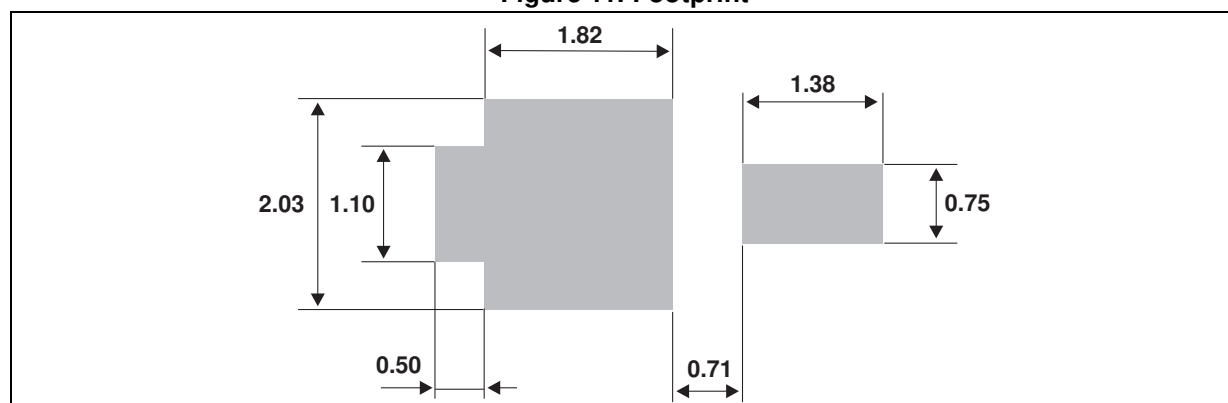


Table 5. STmite package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.85	1.00	1.15	0.033	0.039	0.045
A1	-0.05		0.05	-0.002		0.002
b	0.40		0.65	0.016		0.025
b2	0.70		1.00	0.027		0.039
c	0.10		0.25	0.004		0.010
D	1.75	1.90	2.05	0.069	0.007	0.081
E	1.75	1.90	2.05	0.069	0.007	0.081
H	3.60	3.75	3.90	0.142	0.148	0.154
L	0.50	0.63	0.80	0.020	0.025	0.031
L2	1.20	1.35	1.50	0.047	0.053	0.059
L3		0.50			0.019	
R	0.07			0.003		
R1	0.07			0.03		

Figure 11. Footprint



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS120M	120	STmite	15.5 mg	12000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Jul-2003	2A	Last update.
13-Sep-2004	3	STmite package dimensions reference A1 change: from blank (min) to -0.05mm and from 0.10 (max) to 0.05mm.
16-Feb-2011	4	Migrated from EDOCS.
20-Jul-2015	5	Updated Table 4 and reformatted to current standard.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2015 STMicroelectronics – All rights reserved