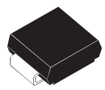
STPS1H100

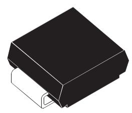
HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	**1 A**
V_{RRM}	**100 V**
T_j (max)	**175°C**
V_F(max)	**0.62 V**



SMA
(JEDEC DO-214AC)
STPS1H100A



SMB
(JEDEC DO-214AA)
STPS1H100U

FEATURES AND BENEFITS

- Negligible switching losses
- High junction temperature capability
- Low leakage cuurent
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified

DESCRIPTION

Schottky rectifiers designed for high frequency miniature Switched Mode Power Supplies such as adaptators and on board DC/DC converters.
Packaged in SMA or SMB.

Table 2: Order Codes

Part Number	Marking
STPS1H100A	S11
STPS1H100U	G11

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
$I_{F(RMS)}$	RMS forward voltage		10	A
$I_{F(AV)}$	Average forward current	T_L = 160°C δ = 0.5	1	A
I_{FSM}	Surge non repetitive forward current	tp = 10ms sinusoidal	50	A
I_{RRM}	Repetitive peak reverse current	tp = 2µs F = 1kHz square	1	A
I_{RSM}	Non repetitive peak reverse current	tp = 100µs square	1	A
P_{ARM}	Repetitive peak avalanche power	tp = 1µs Tj = 25°C	1500	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature *		175	°C
dV/dt	Critical rate of rise of reverse voltage		10000	V/µs

* : $\frac{dPtot}{dTj} > \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

Table 4: Thermal Resistance

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	°C/W
		SMB	25	

Table 5: Static Electrical Characteristics

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			4	µA
		T_j = 125°C			0.2	0.5	mA
V_F **	Forward voltage drop	T_j = 25°C	I_F = 1A			0.77	V
		T_j = 125°C			0.58	0.62	
		T_j = 25°C	I_F = 2A			0.86	
		T_j = 125°C			0.65	0.7	

Pulse test: * tp = 5 ms, δ < 2%
** tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation: $P = 0.54 \times I_{F(AV)} + 0.08\ I_F^2{}_{(RMS)}$

Figure 1: Average forward power dissipation versus average forward current

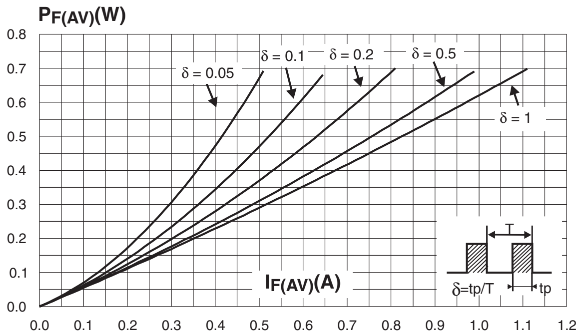


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

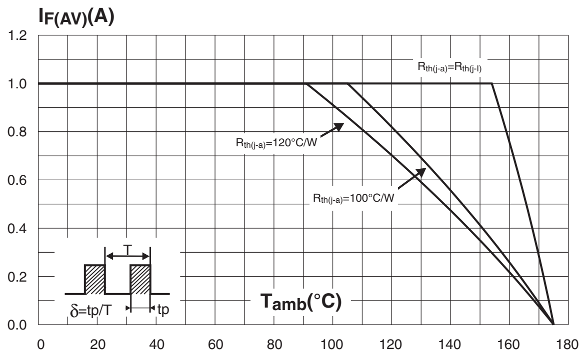


Figure 3: Normalized avalanche power derating versus pulse duration

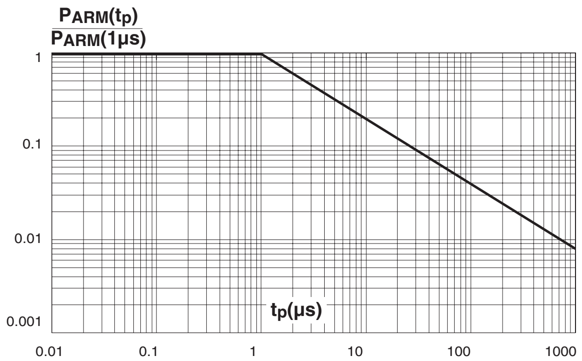


Figure 4: Normalized avalanche power derating versus junction temperature

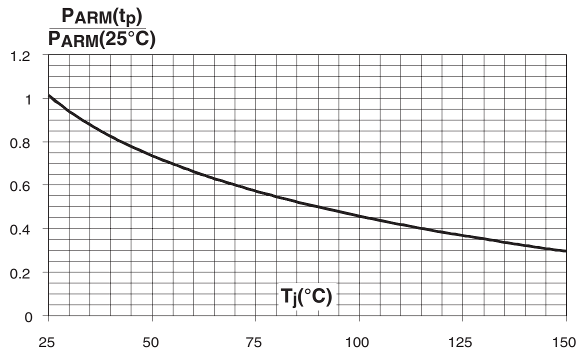


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

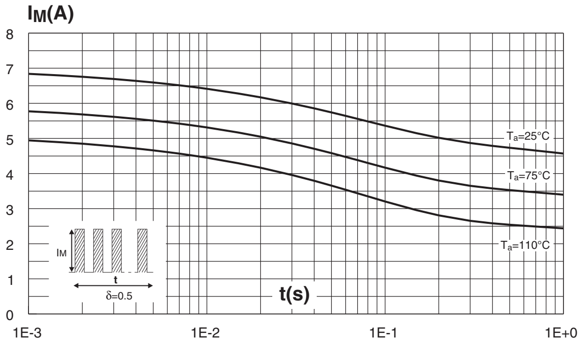


Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

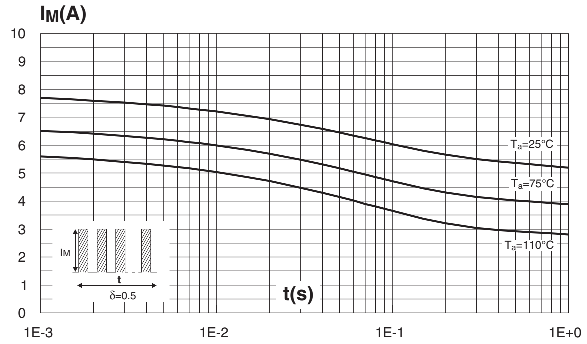


Figure 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA)

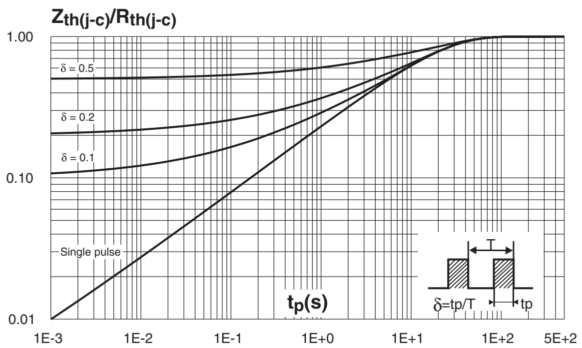


Figure 8: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMB)

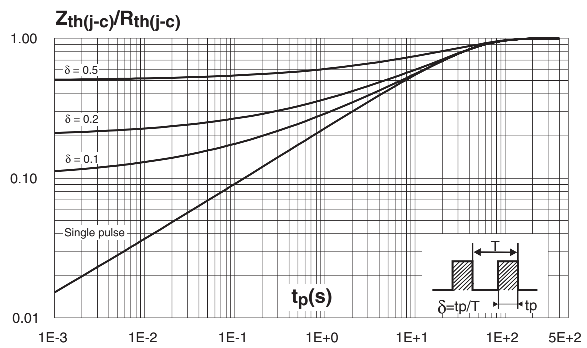


Figure 9: Reverse leakage current versus reverse voltage applied (typical values)

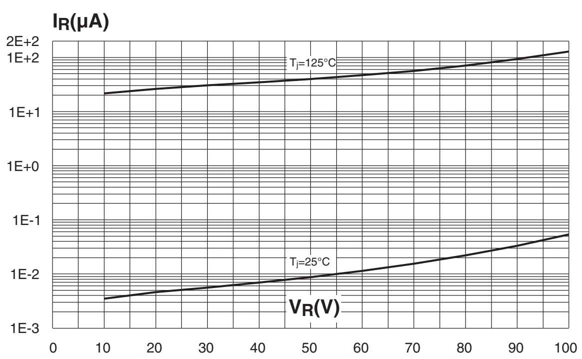


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

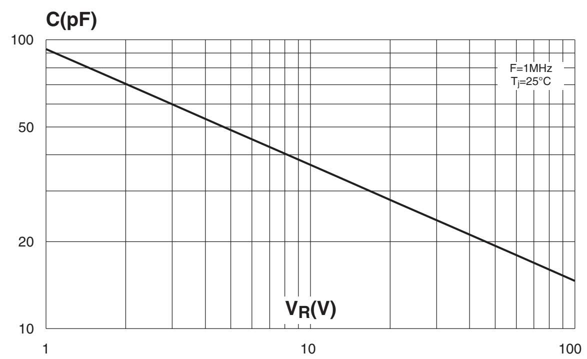


Figure 11: Forward voltage drop versus forward current (maximum values)

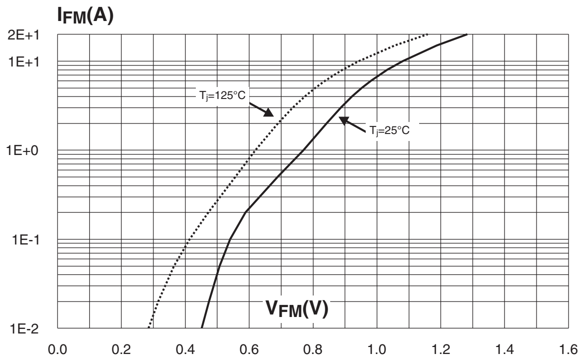


Figure 12: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)

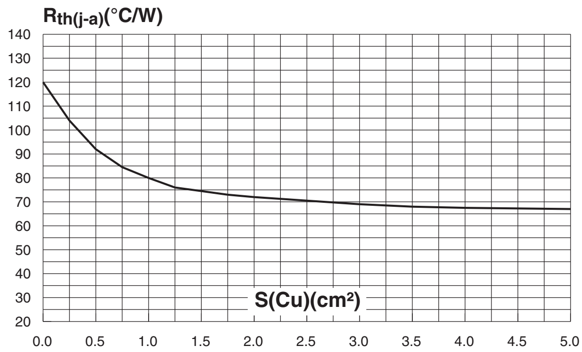


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMB)

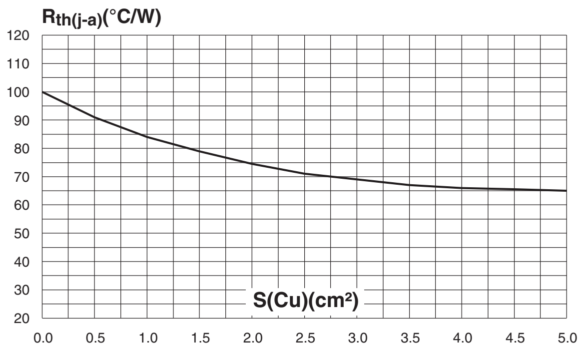
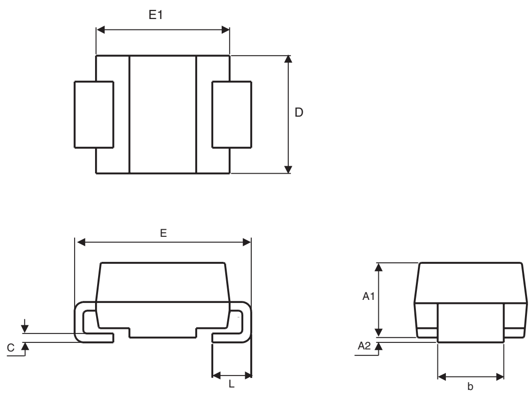


Figure 14: SMA Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.03	0.075	0.080
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

Figure 15: SMA Foot Print Dimensions
(in millimeters)

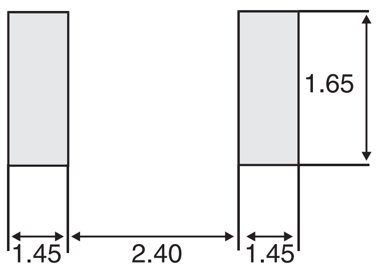
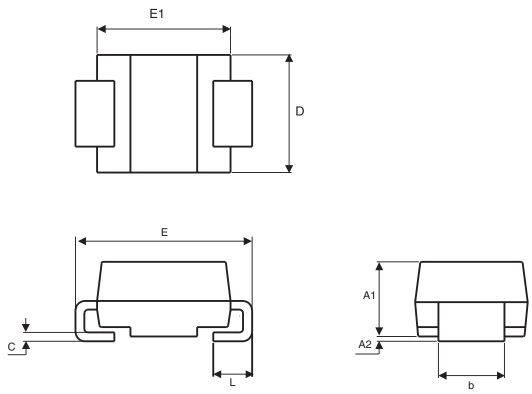


Figure 16: SMB Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

Figure 17: SMB Foot Print Dimensions
(in millimeters)

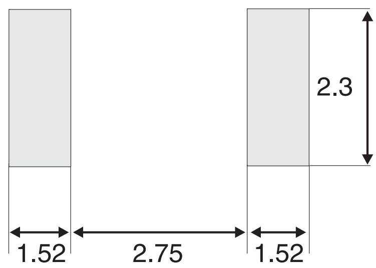


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS1H100A	S11	SMA	0.068 g	5000	Tape & reel
STPS1H100U	G11	SMB	0.107 g	2500	Tape & reel

- Band indicates cathode
- Epoxy meets UL94, V0

Table 7: Revision History

Date	Revision	Description of Changes
Jul-2003	4A	Last update.
Aug-2004	5	SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106inc.) to 2.03mm (0.080).

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