

## POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics**

$I_{F(AV)}$	1 A
$V_{RRM}$	30 V
$T_j(\text{max})$	150°C
$V_F(\text{max})$	0.46 V

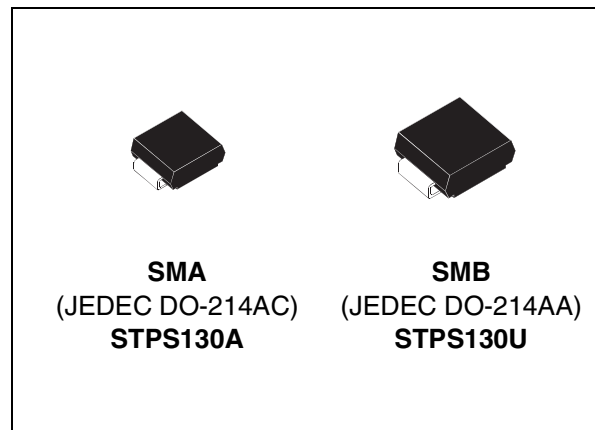
### FEATURES AND BENEFITS

- Very low forward voltage drop for less power dissipation
- Optimized conduction/reverse losses trade-off which means the highest yield in the applications
- Surface mount miniature packages
- Avalanche capability specified

### DESCRIPTION

Single Schottky rectifier suited to Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in SMA and SMB, this device is especially intended for use in parallel with MOSFETs in synchronous rectification and low voltage secondary rectification.



**Table 2: Order Codes**

Part Number	Marking
STPS130A	S130
STPS130U	G12

**Table 3: Absolute Ratings** (limiting values)

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	30	V
$I_{F(RMS)}$	RMS forward current	7	A
$I_{F(AV)}$	Average forward current	$T_L = 130^\circ\text{C} \quad \delta = 0.5$	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	A
$I_{RRM}$	Repetitive peak reverse current	$t_p = 2\mu\text{s} \quad F = 1\text{kHz}$ square	A
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100\mu\text{s}$ square	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\mu\text{s} \quad T_j = 25^\circ\text{C}$	W
$T_{stg}$	Storage temperature range	-65 to + 150	°C
$T_j$	Maximum operating junction temperature *	150	°C
dV/dt	Critical rate of rise of reverse voltage	10000	V/ $\mu\text{s}$

\*:  $\frac{dP_{tot}}{dT_j} > \frac{1}{R_{th(j-a)}}$  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	$^{\circ}\text{C}/\text{W}$
		SMB	23	

Table 5: Static Electrical Characteristics

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			10	$\mu\text{A}$
		$T_j = 125^{\circ}\text{C}$		1.5	10	mA	
$V_F^{**}$	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{A}$			0.55	V
		$T_j = 125^{\circ}\text{C}$		0.37	0.46		
		$T_j = 25^{\circ}\text{C}$	$I_F = 2\text{A}$			0.63	
		$T_j = 125^{\circ}\text{C}$		0.45	0.55		

Pulse test: \*  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 5 \text{ms}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  $P = 0.37 \times I_{F(AV)} + 0.090 I_{F(RMS)}^2$

Figure 1: Average forward power dissipation versus average forward current

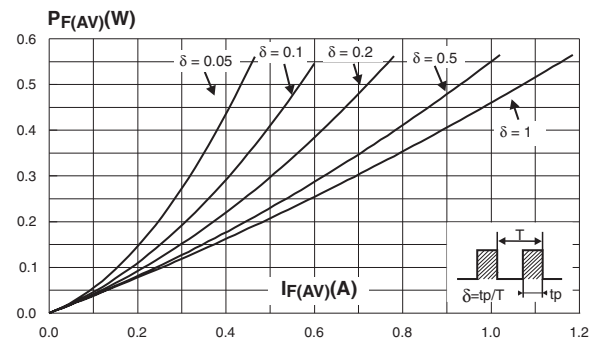


Figure 2: Average forward current versus ambient temperature (delta = 0.5)

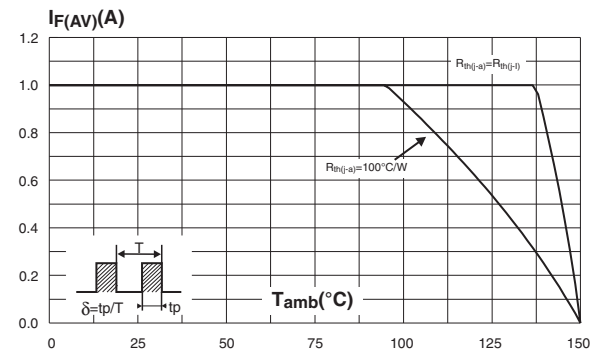


Figure 3: Normalized avalanche power derating versus pulse duration

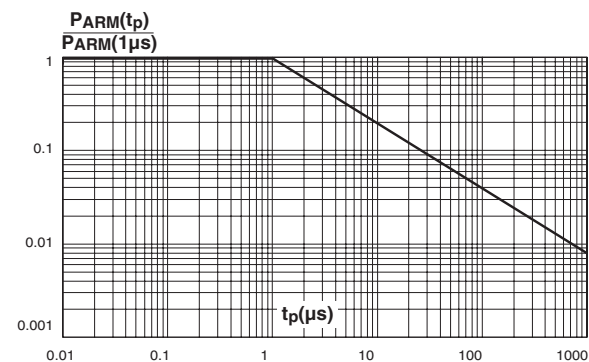
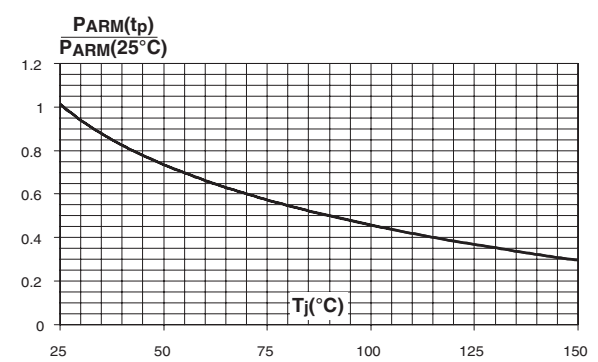
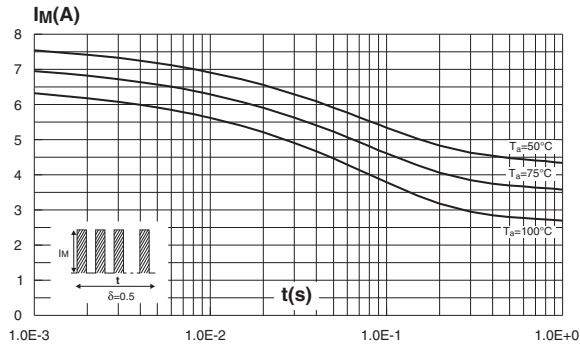


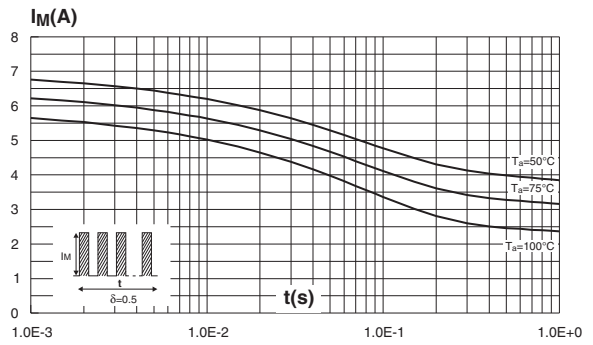
Figure 4: Normalized avalanche power derating versus junction temperature



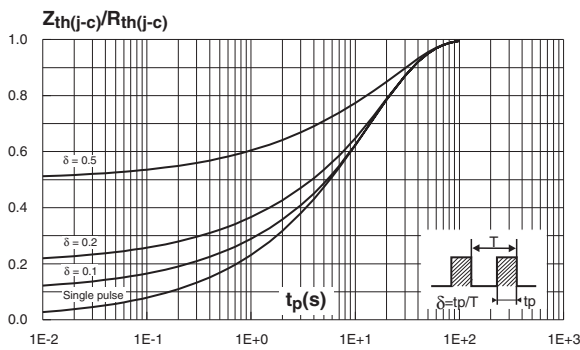
**Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)**



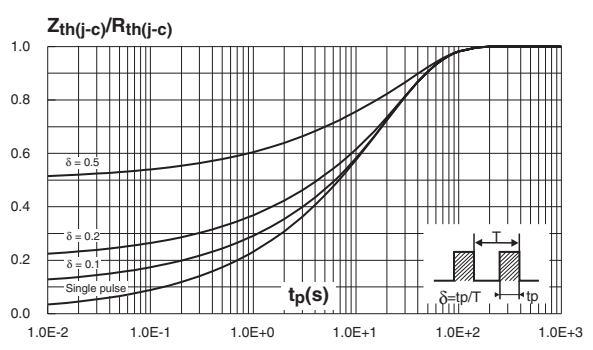
**Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)**



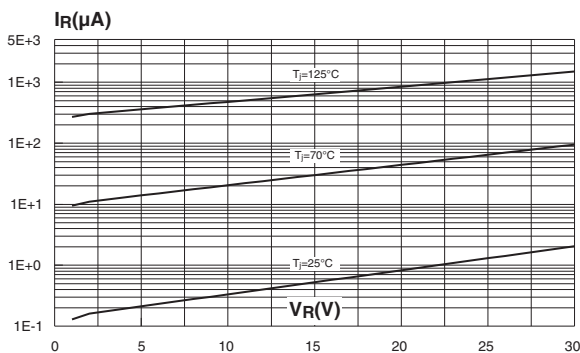
**Figure 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA)**



**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)**

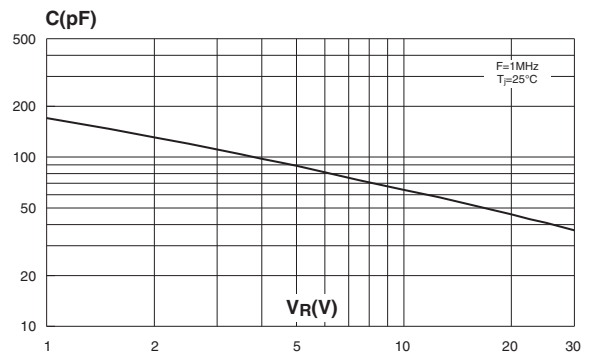


Figure 11: Forward voltage drop versus forward current (maximum values)

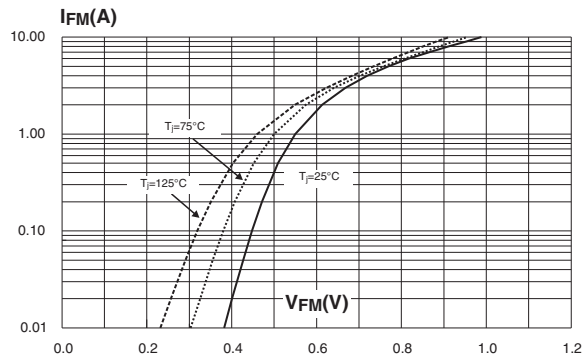


Figure 12: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)

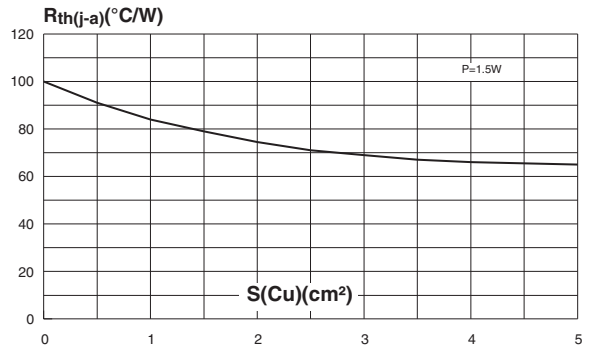


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMB)

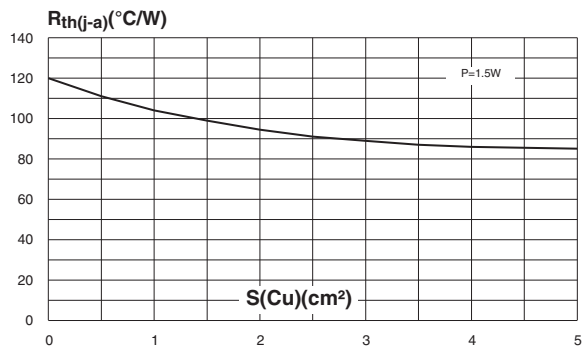


Figure 14: SMA Package Mechanical Data

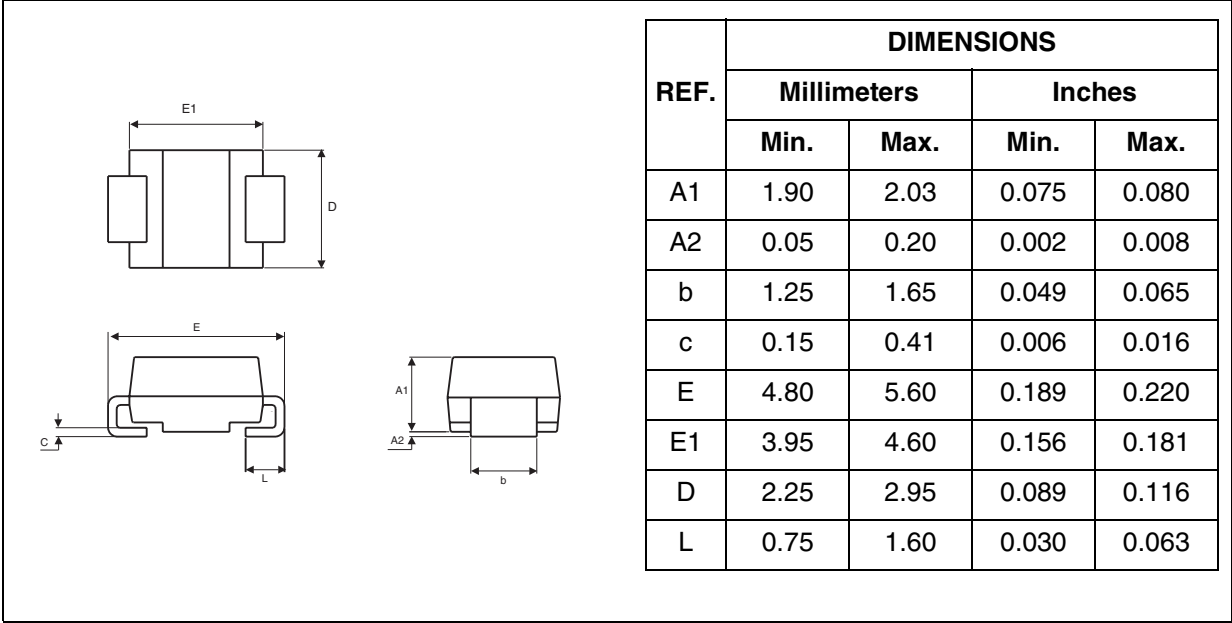


Figure 15: SMA Foot Print Dimensions (in millimeters)

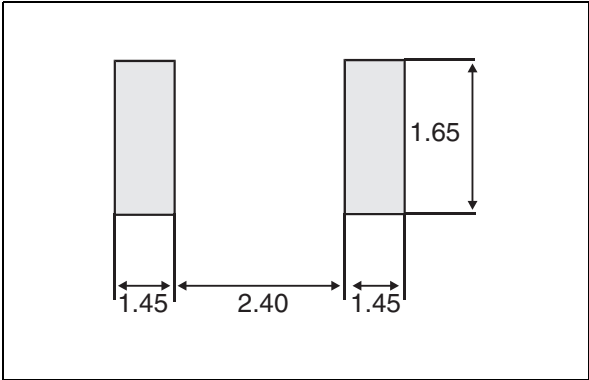


Figure 16: SMB Package Mechanical Data

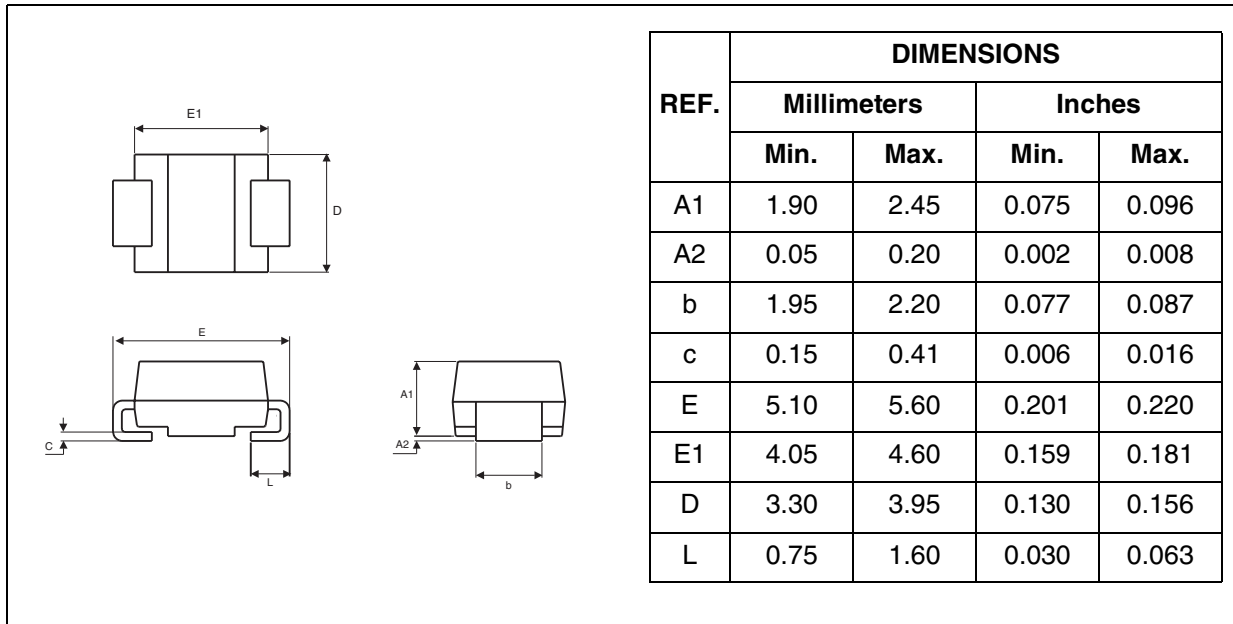
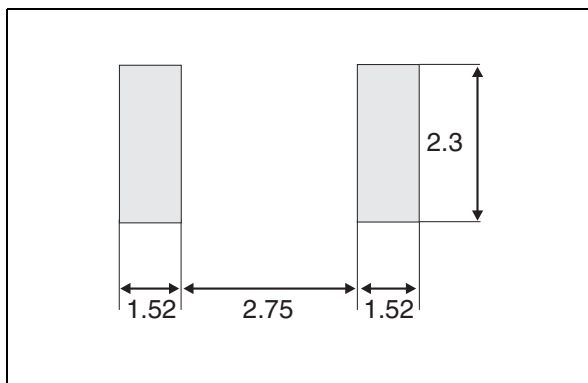


Figure 17: SMB Foot Print Dimensions (in millimeters)



**Table 6: Ordering Information**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS130A	S130	SMA	0.068 g	5000	Tape & reel
STPS130U	G12	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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