

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

STPS130x-MS

Product specification

Description

Single Schottky rectifiers designed for high frequency miniature switched mode power supplies such as adaptors and on board DC/DC converters.

Packaged in SMA, SMAF or SMB, the STPS130x-MS is ideal for use in parallel with MOSFETs in synchronous and low voltage secondary rectification.

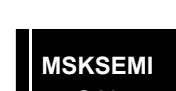
Features

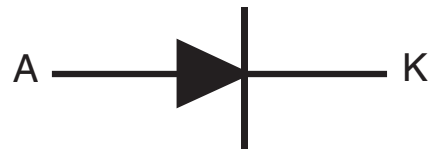
- Very low forward voltage drop for less power dissipation
- Optimized conduction/reverse losses trade-off which means the highest yield in the applications
- Surface mount miniature packages
- Avalanche rated

Applications

- Cordless appliance
- SSD
- Battery charger
- Telecom power
- DC / DC converter

Reference News

STPS130A-MS	MARKING
 DO-214AC(SMA)	
STPS130U-MS	MARKING
 DO-214AA(SMB)	



Device summary

Symbol	Value
$I_F(AV)$	1 A
V_{RRM}	30 V
$T_J(max.)$	150 °C
$V_F(typ.)$	0.37 V

Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			30	V
I _{F(RMS)}	Forward rms current			7	A
I _{F(AV)}	Average forward current, δ = 0.5, square wave	SMA	T _L = 130 °C	1	A
		SMAF, SMB	T _L = 135 °C		
I _{FSM}	Surge non repetitive forward current	SMA, SMB	t _p = 10 ms sinusoidal	45	A
		SMAF		60	
P _{ARM}	Repetitive peak avalanche power		t _p = 10 μs, T _j = 125 °C	86	W
T _{stg}	Storage temperature range			-65 to +150	°C
T _j	Maximum operating junction temperature ⁽¹⁾			+150	°C

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

Thermal resistance

Symbol	Parameter		Max. value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	$^{\circ}\text{C/W}$
		SMAF	20	
		SMB	23	

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

Static electrical characteristics

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

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:

$$P = 0.37 \times I_{F(AV)} + 0.090 \times I_F^2(RMS)$$

For more information, please refer to the following application notes related to the power losses :

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

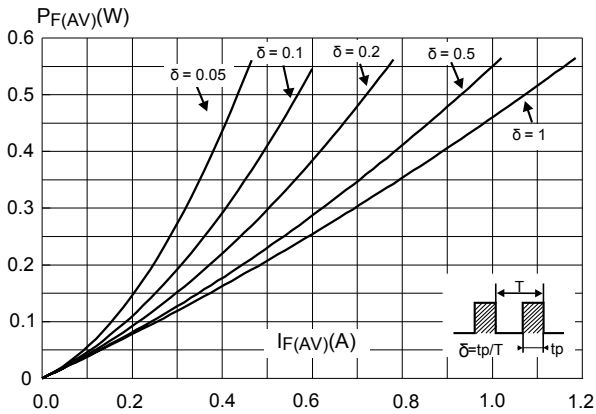


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, SMB)

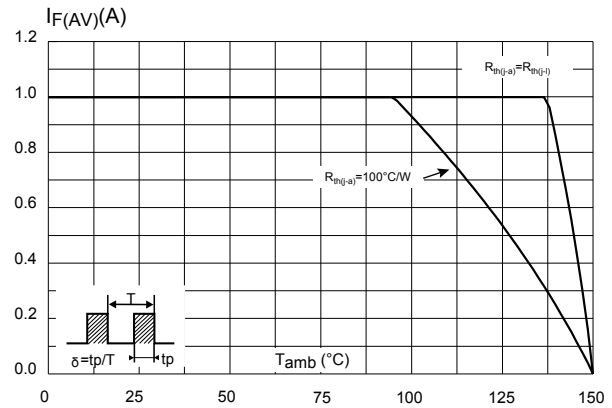


Figure 3. Normalized avalanche power derating versus pulse duration ($T_j = 125^\circ\text{C}$)

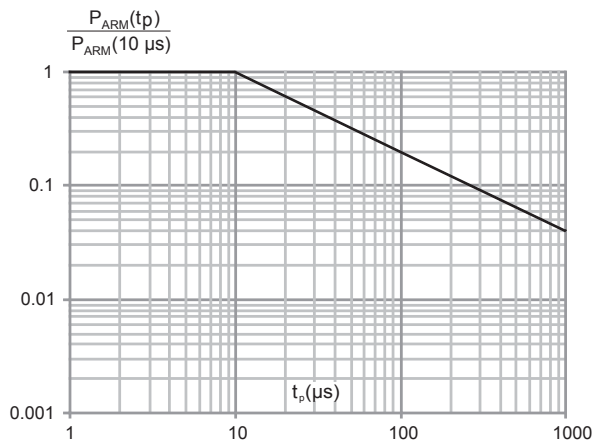


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

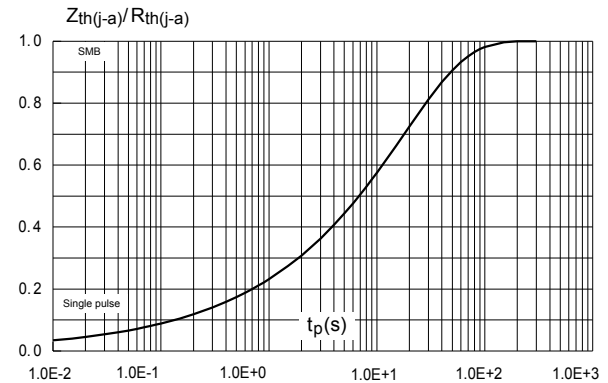


Figure 5. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA)

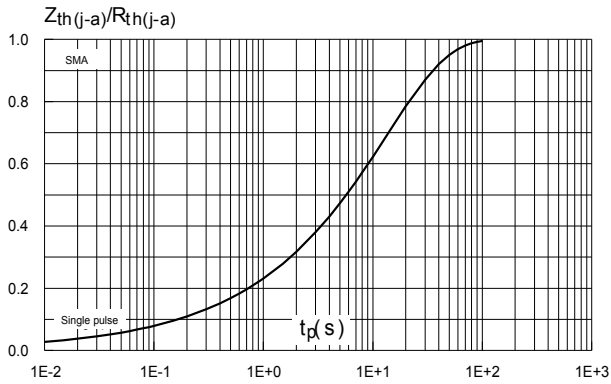


Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

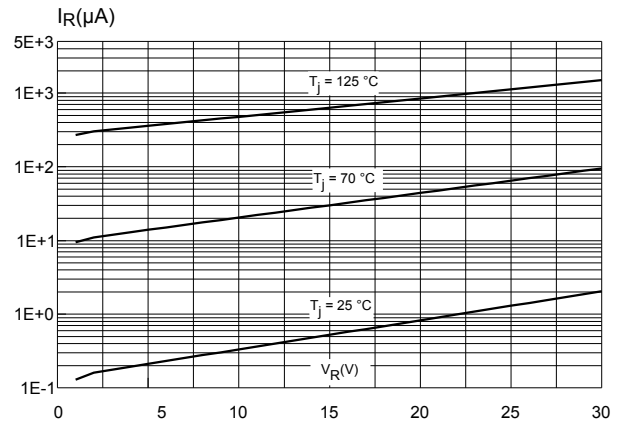


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

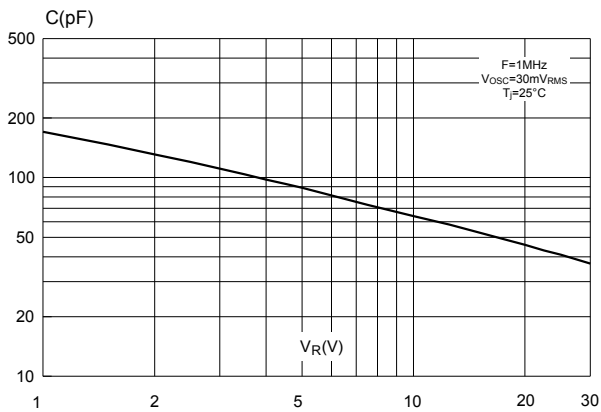


Figure 8. Forward voltage drop versus forward current (maximum values)

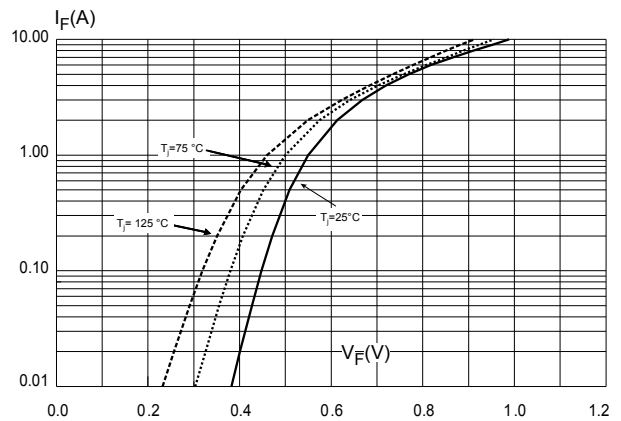


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

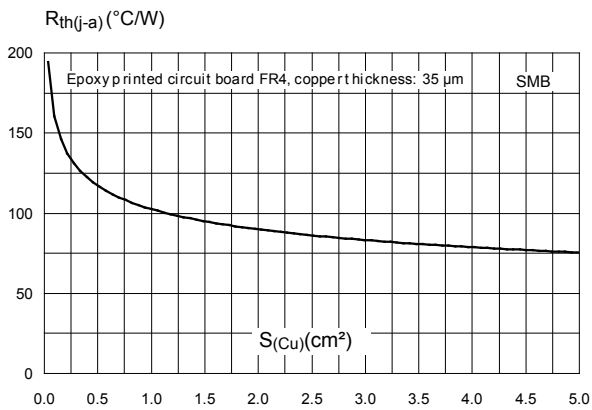


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMA)

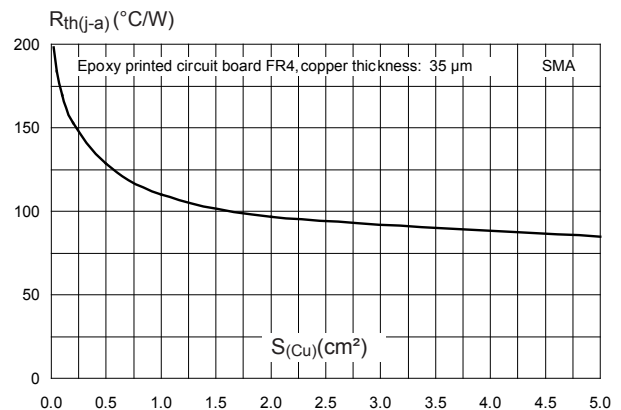
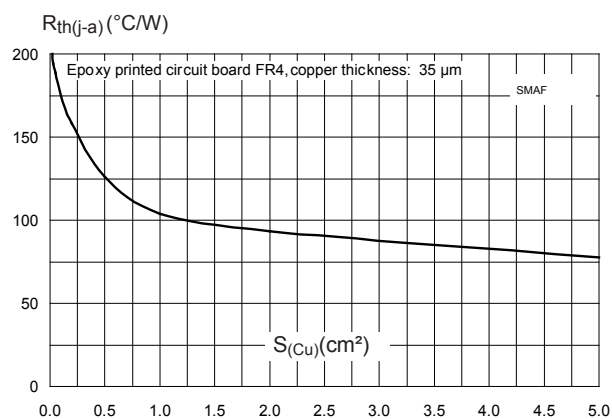
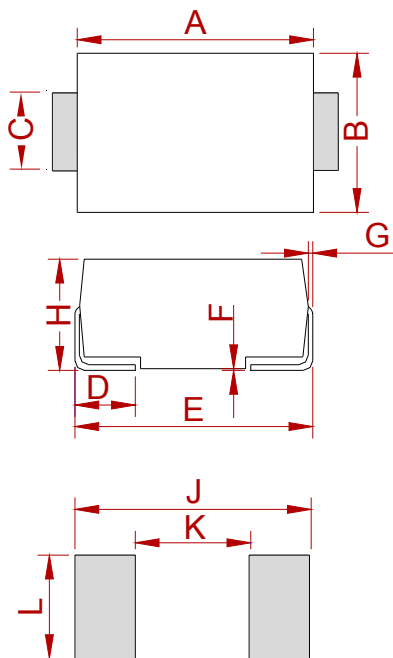


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead (SMAF Notch)



PACKAGE MECHANICAL DATA



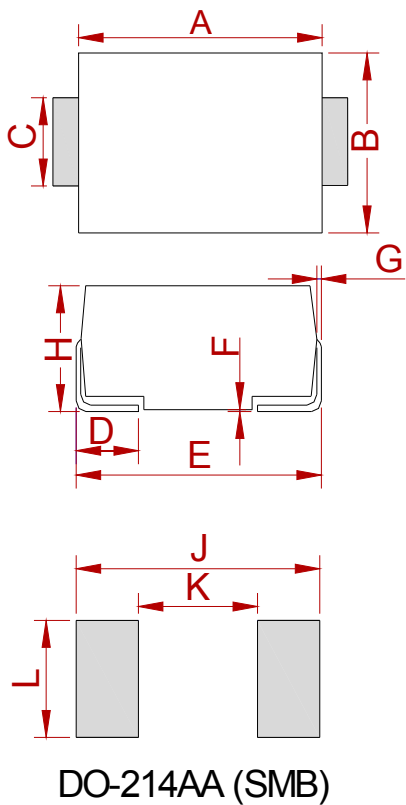
DO-214AC (SMA)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.65	0.167	0.183
B	2.50	2.90	0.098	0.114
C	1.35	1.65	0.053	0.065
D	0.76	1.52	0.030	0.060
E	4.93	5.28	0.194	0.208
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	1.98	2.41	0.078	0.095
J	6.50		0.256	
K		2.30		0.090
L	1.70		0.067	

REEL SPECIFICATION

P/N	PKG	QTY
STPS130A-MS	DO-214AC (SMA)	5000

PACKAGE MECHANICAL DATA



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.75	0.167	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.11	2.44	0.083	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	

REELS SPECIFICATION

P/N	PKG	QTY
STPS130U-MS	DO-214AA (SMB)	2500

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