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SEMICONDUCTOR



ESD



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MOV



GDT



PLED

STPS2170AF-MS

Product specification

Description

The STPS2170AF-MS is a 170 V Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in SMAF, the STPS2170AF-MS is ideal for use in low voltage, high frequency inverters, freewheeling and polarity protection. Also ideal for all LED lighting applications where efficiency and space constraint are required.

Device summary

Symbol	Value
$I_F(AV)$	2 A
V_{RRM}	170 V
$T_j(max.)$	175 °C
$V_F(typ.)$	0.62 V

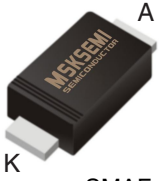
Features

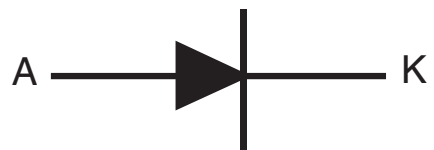
- Negligible switching losses
- High junction temperature capability
- Very small conduction losses
- Low leakage current
- Avalanche rated

Applications

- Switching diode
- SMPS
- DC / DC converter
- Telecom power

Reference News

STPS2170AF-MS	MARKING
	



Absolute ratings (limiting values, at 25 °C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			170	V
V _{RRM}	Repetitive peak reverse voltage, T _j = -40 °C			160	V
I _{F(RMS)}	Forward rms current			15	A
I _{F(AV)}	Average forward current, $\delta = 0.5$, square wave	SMAF	T _L = 145 °C	2	A
I _{FSM}	Surge non repetitive forward current	SMAF	t _p = 10 ms sinusoidal	70	A
P _{ARM}	Repetitive peak avalanche power		t _p = 10 μ s, T _j = 125 °C	165	W
T _{stg}	Storage temperature range			-65 to +175	°C
T _j	Maximum operating junction temperature ⁽¹⁾			+175	°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 parameter

Symbol	Parameter	Max. value	Unit
R _{th(j-l)}	Junction to lead	20	°C/W

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 °C	V _R = V _{RRM}	-		2.8	μ A
		T _j = 125 °C		-	0.5	2.8	mA
V _{F(2)}	Forward voltage drop	T _j = 25 °C	I _F = 2 A	-		0.82	V
		T _j = 125 °C		-	0.62	0.67	
		T _j = 25 °C	I _F = 4 A	-		0.89	
		T _j = 125 °C		-	0.70	0.75	

1. Pulse test: t_p = 5 ms, $\delta < 2\%$

2. Pulse test: t_p = 380 μ s, $\delta < 2\%$

To evaluate the conduction losses, use the following equation: $P = 0.59 \times$

$$I_{F(AV)} + 0.04 \times I_{F(RMS)}^2$$

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

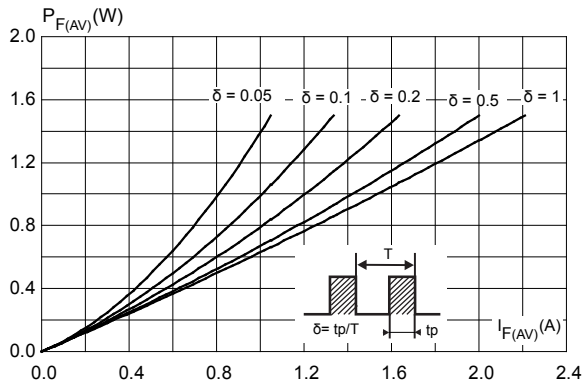


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, SMAF)

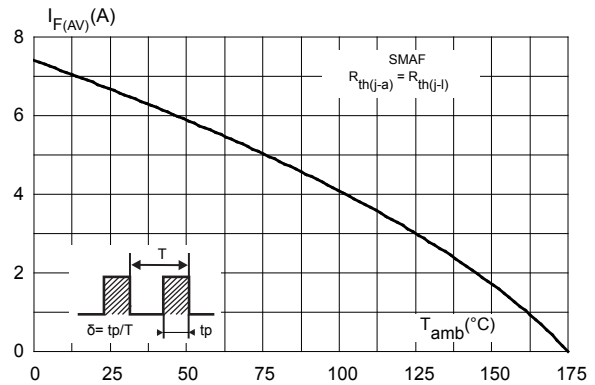


Figure 3. Normalized avalanche power derating versus pulse duration ($T_J = 125^\circ\text{C}$)

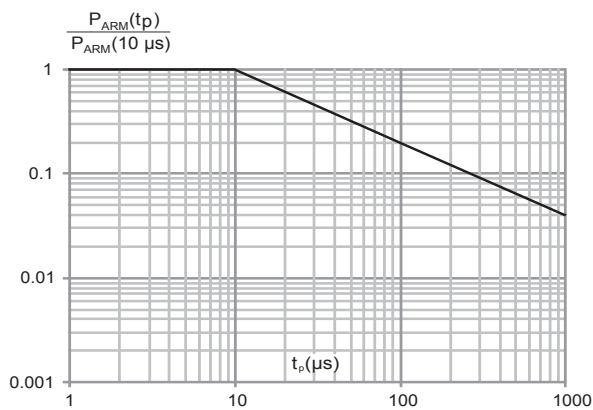


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration

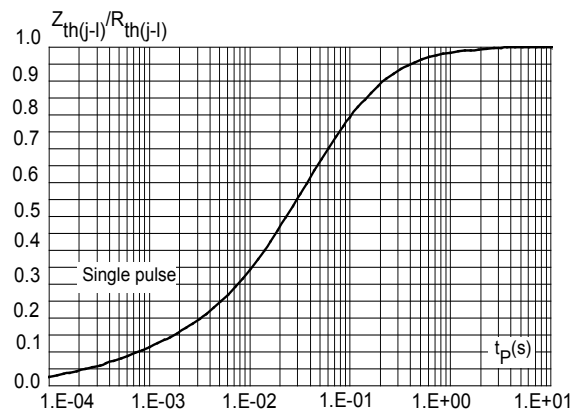


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

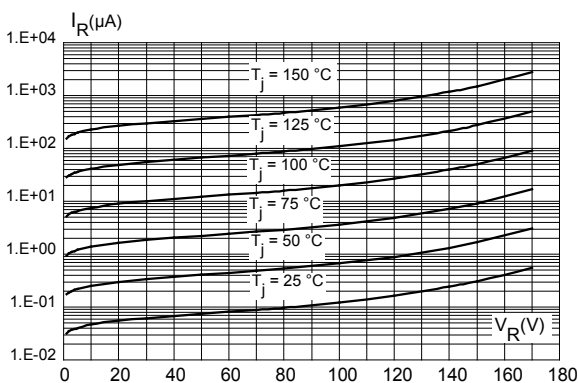


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

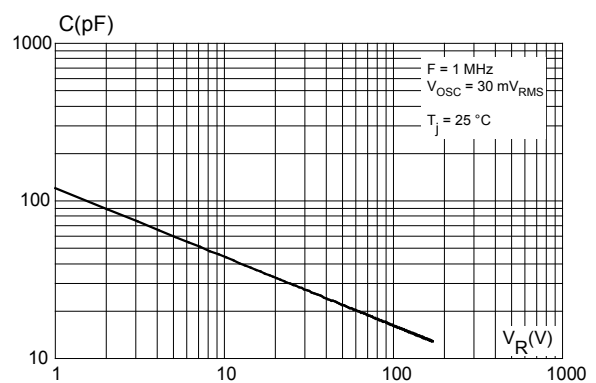


Figure 7. Forward voltage drop versus forward current (typical values)

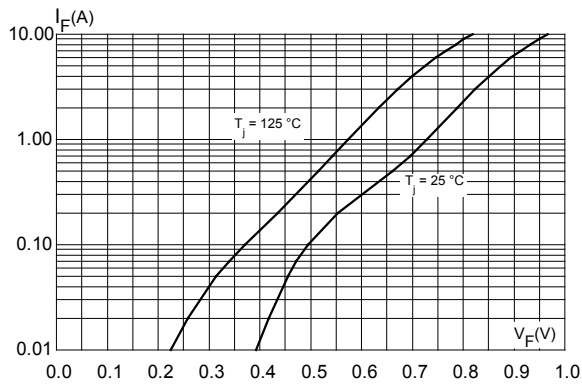


Figure 8. Forward voltage drop versus forward current (maximum values)

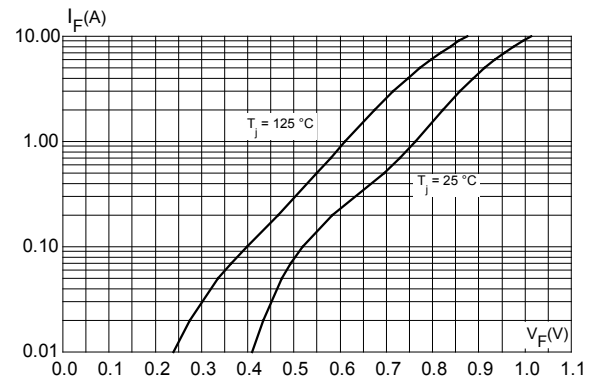
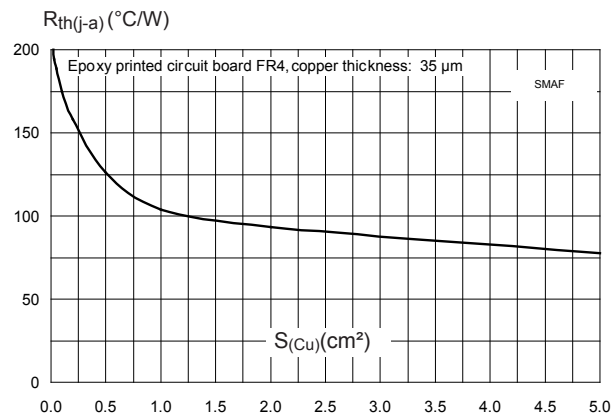
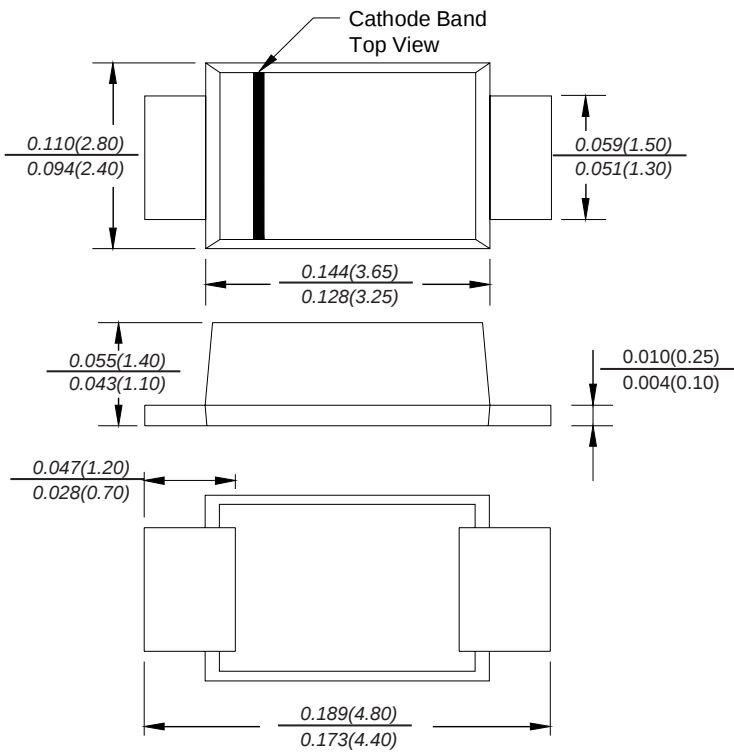


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (SMAF)



PACKAGE MECHANICAL DATA

SMAF



Dimensions in inches and (millimeters)

REEL SPECIFICATION

P/N	PKG	QTY
STPS2170AF-MS	SMAF	3000

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