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SEMICONDUCTOR



ESD



TVS



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MOV



GDT



PLED

STPS3170xx-MS

Product specification

Description

The STPS3170xx-MS is a 170 V Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in SMA Flat, SMA Flat Notch and SMB Flat, the STPS3170xx-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.

Features

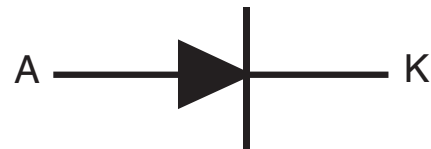
- Negligible switching losses
- High junction temperature capability
- Very small conduction losses
- Low leakage current
- Avalanche rated

Applications

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

Reference News

STPS3170AF-MS	MARKING
	
STPS3170UF-MS	MARKING
	



Device summary

Symbol	Value
$I_F(AV)$	3 A
V_{RRM}	170 V
$T_{J(max.)}$	175 °C
$V_F(typ.)$	0.63 V

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, δ = 0.5, square wave	SMAF	T _L = 130 °C	3	A
		SMBF	T _L = 140 °C		
I _{FSM}	Surge non repetitive forward current	SMAF	t _p = 10 ms sinusoidal	75	A
		SMBF		80	
P _{ARM}	Repetitive peak avalanche power		t _p = 10 μs, T _j = 125 °C	210	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

Symbol	Parameter		Max. value	Unit
R _{th(j-l)}	Junction to lead	SMAF	20	°C/W
		SMBF	15	

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}	-		4.0	μA
		T _j = 125 °C		-	0.73	4.0	mA
V _F (2)	Forward voltage drop	T _j = 25 °C	I _F = 3 A	-		0.82	V
		T _j = 125 °C		-	0.63	0.67	
		T _j = 25 °C	I _F = 6 A	-		0.89	
		T _j = 125 °C		-	0.70	0.75	

1. Pulse test: t_p = 5 ms, δ < 2%

2. Pulse test: t_p = 380 μs, δ < 2%

To evaluate the conduction losses, use the following equation: $P = 0.59 \times I_{F(AV)} + 0.027 \times I_{F(RMS)}^2$

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

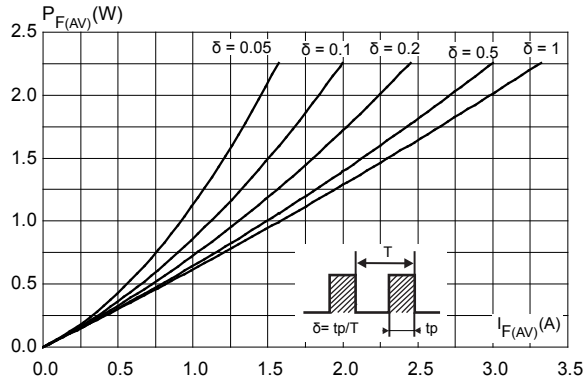


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

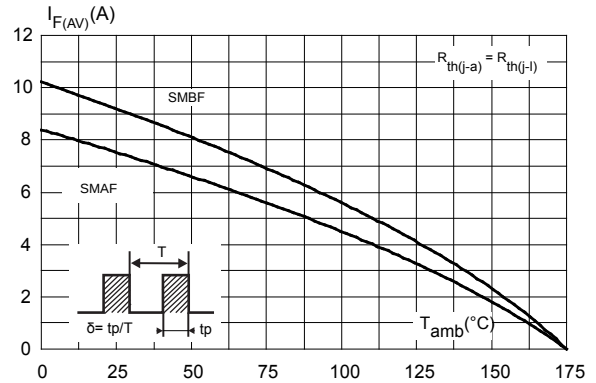


Figure 3. Relative variation of thermal impedance junction to lead versus pulse duration

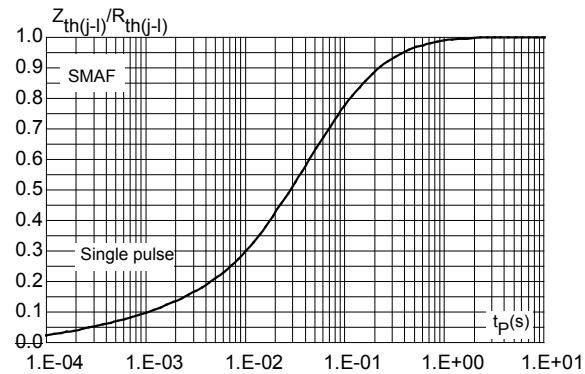


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration

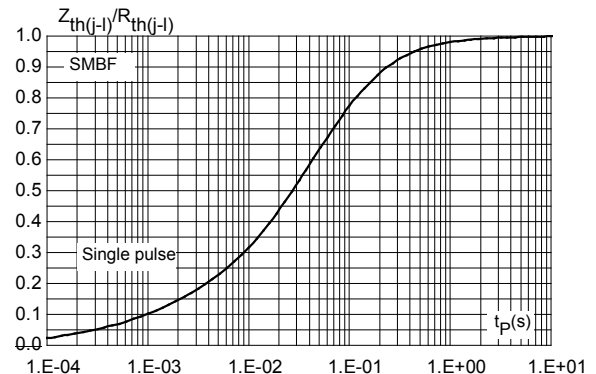


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

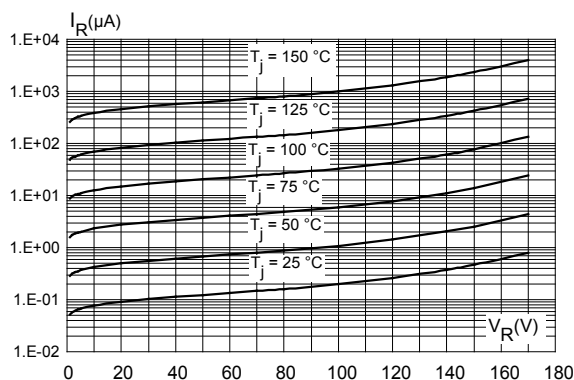


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

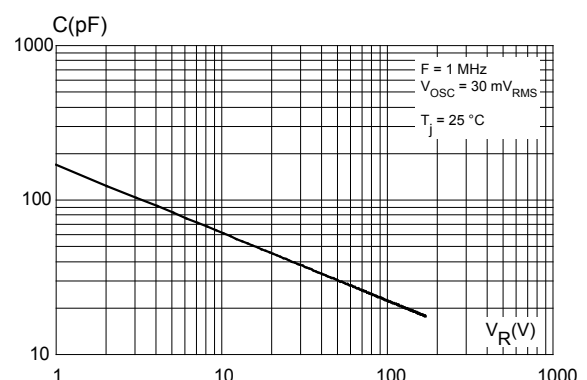


Figure 7. Forward voltage drop versus forward current (typical values)

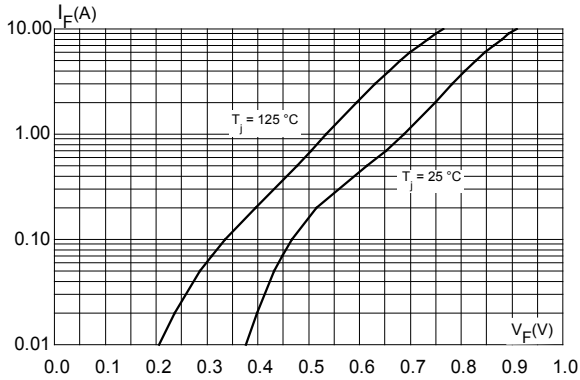


Figure 8. Forward voltage drop versus forward current (maximum values)

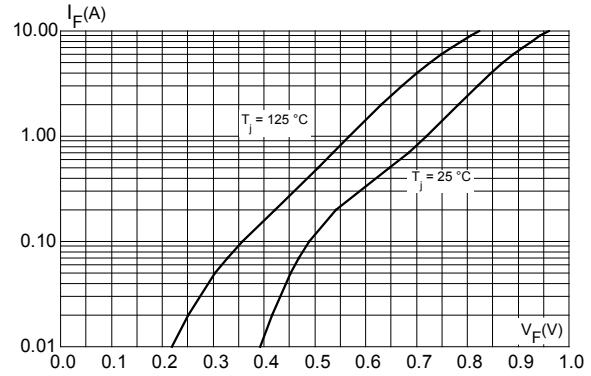


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (SMBF)

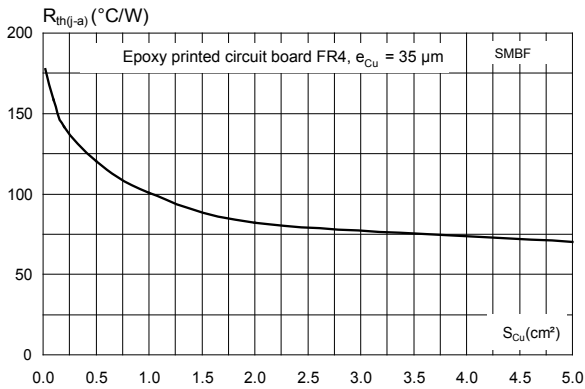


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMAF)

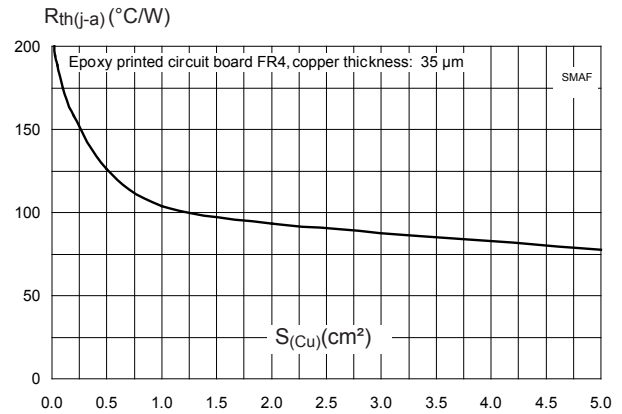
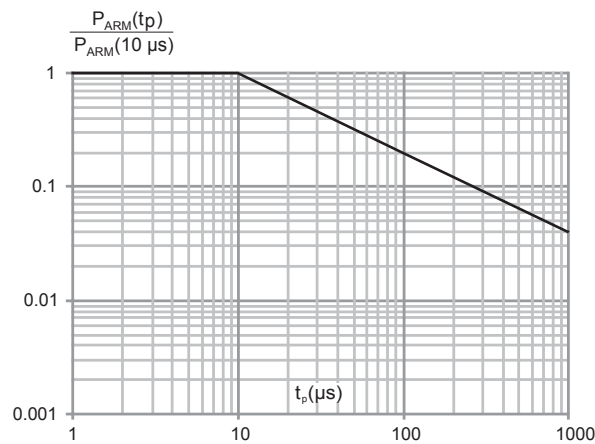
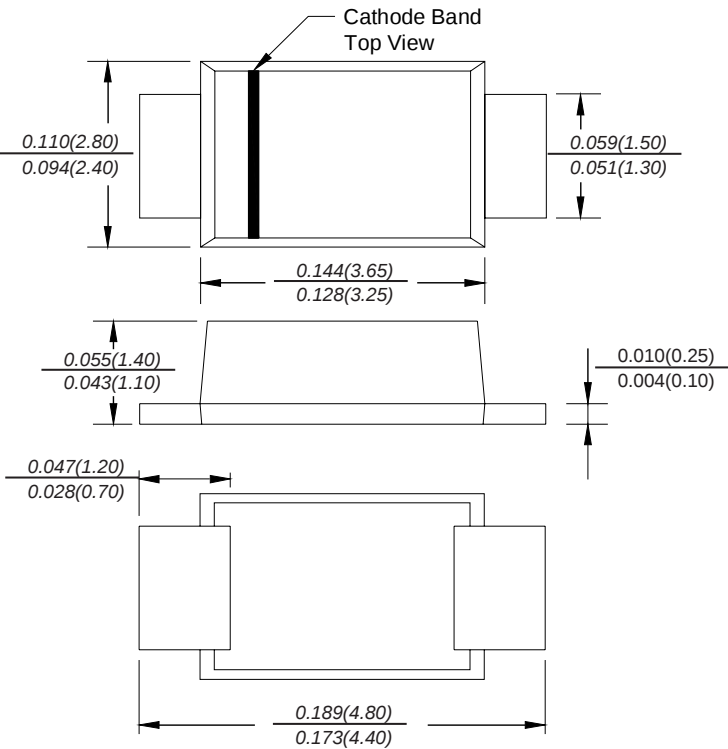


Figure 11. Normalized avalanche power derating versus pulse duration ($T_J = 125\text{ °C}$)



PACKAGE MECHANICAL DATA

SMAF

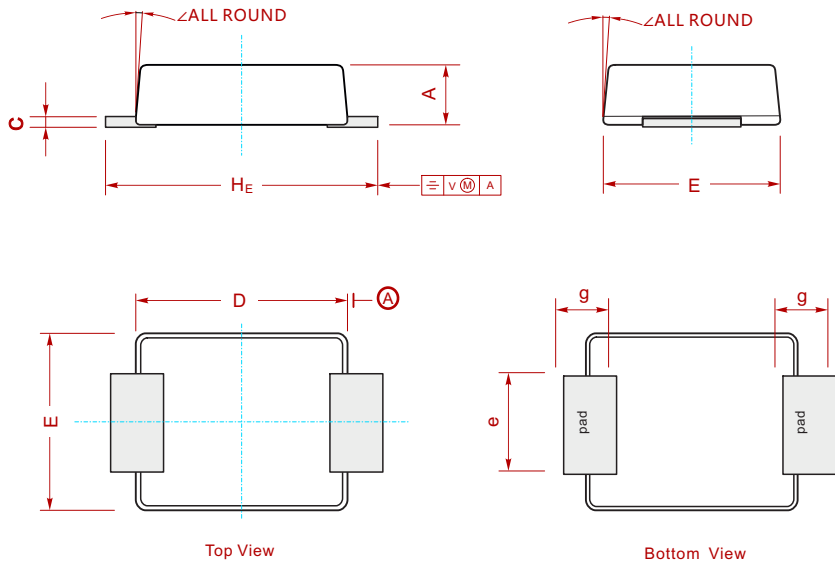


Dimensions in inches and (millimeters)

REEL SPECIFICATION

P/N	PKG	QTY
STPS3170AF-MS	SMAF	3000

PACKAGEECHANICALDATA



UNIT		A	C	D	E	H _E	e	g	∠
mm	max	1.3	0.26	4.4	3.7	5.5	2.2	1.0	9°
	min	1.1	0.18	4.2	3.5	5.1	1.9		
mil	max	51	10	173	146	216	86	40	
	min	43	7	165	138	200	75		

Order information

P/N	PKG	QTY
STPS3170UF-MS	SMBF	5000

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