

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

STPS3150xxx-MS

Product specification

Description

150 V power Schottky rectifier are suited for switch mode power supplies on up to 24V rails and high frequency converters.

Packaged in axial, SMB, SMA Flat Notch and SMB Flat, the STPS3150xxx-MS is ideal for use in consumer and computer applications like TV, STB, PC and DVD where low drop forward voltage is required to reduce power dissipation.

Features

- Negligible switching losses
- Low forward voltage drop for higher efficiency and extended battery life
- Surface mount miniature package
- Low thermal resistance

Applications

- LED Lighting
- Battery charger
- DC / DC converter
- Notebook adapter
- Switching diode

Reference News

STPS3150U-MS	MARKING
 DO-214AA(SMB)	

STPS3150UF-MS	MARKING
 SMBF	

STPS3150AFN-MS	MARKING
 SMAF	

Device summary

Symbol	Value
$I_F(AV)$	3 A
V_{RRM}	150 V
$T_{J(max.)}$	175 °C
$V_F(typ.)$	0.63 V



Characteristics

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

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			150	V
I _{F(AV)}	Average forward current, δ = 0.5, square wave	SMAF	T _L = 130 °C	3	A
		SMB	T _L = 130 °C		
		SMBF	T _L = 150 °C		
I _{FSM}	Surge non repetitive forward current	SMAF	t _p = 10 ms sinusoidal	75	A
		SMB		80	
		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
		SMB	20	
		SMBF	10	

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	$T_j = 25\text{ °C}$	$V_R = V_{RM}$	-	0.4	2.0	μA
		$T_j = 125\text{ °C}$		-	0.6	2.0	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$	-	0.78	0.82	V
		$T_j = 125\text{ °C}$		-	0.63	0.67	
		$T_j = 25\text{ °C}$	$I_F = 6\text{ A}$	-	0.85	0.89	
		$T_j = 125\text{ °C}$		-	0.70	0.75	

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:

$$P = 0.59 \times I_{F(AV)} + 0.027 \times I_F^2(RMS)$$

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

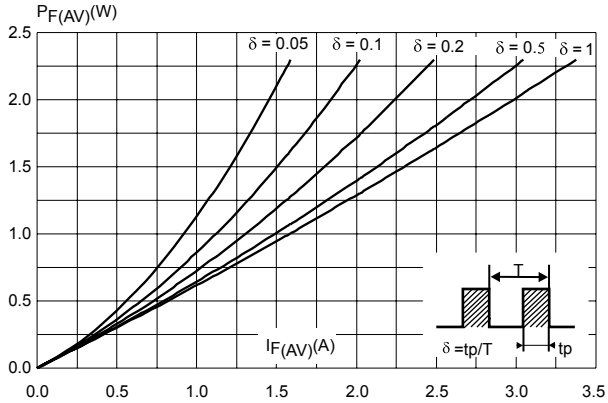


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

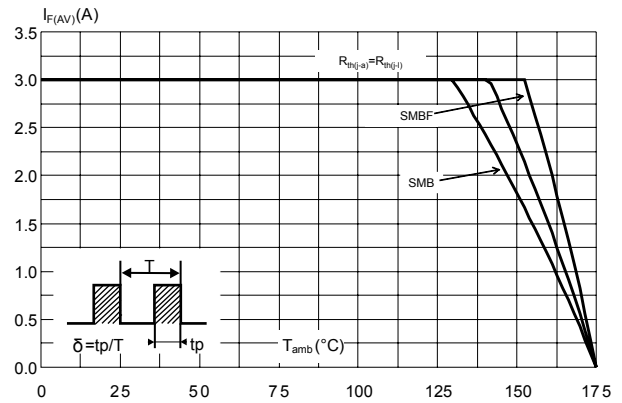


Figure 3. Normalized avalanche power derating versus pulse duration ($T_J = 125^\circ\text{C}$)

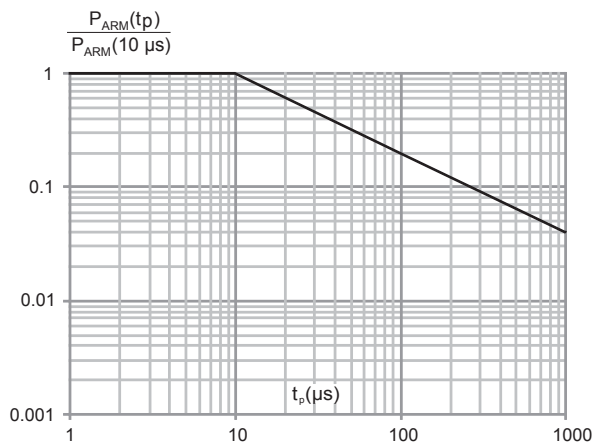


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

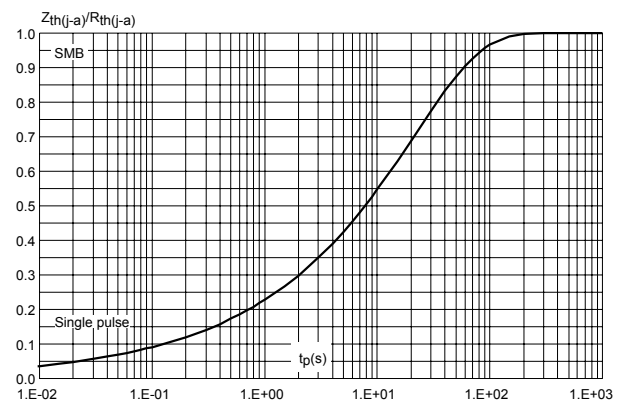


Figure 5. Relative variation of thermal impedance junction to lead versus pulse duration (SMBF)

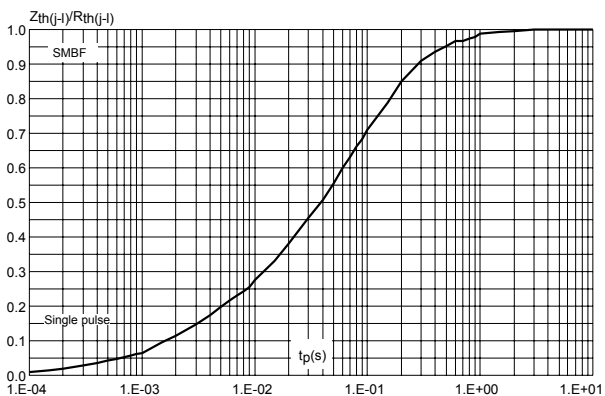


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

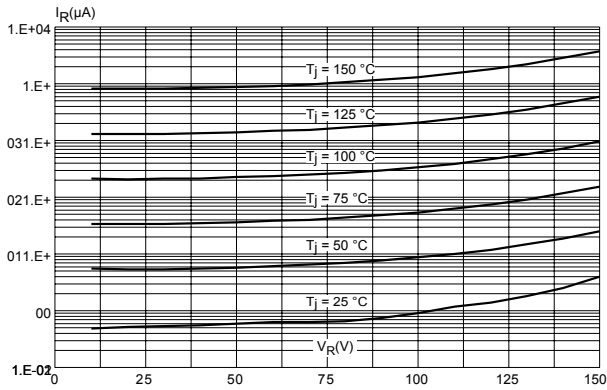


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

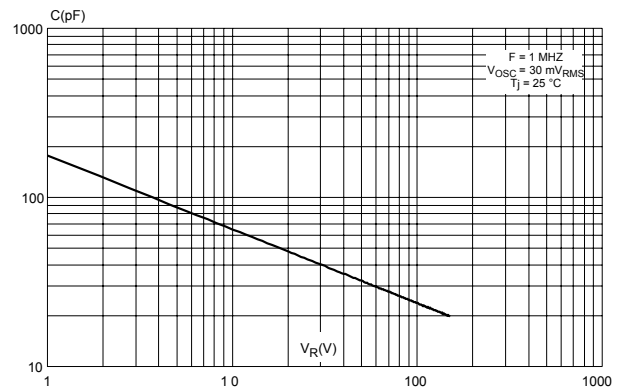


Figure 9. Forward voltage drop versus forward current

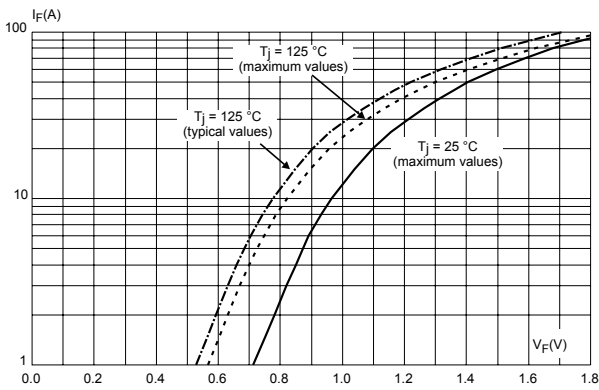


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

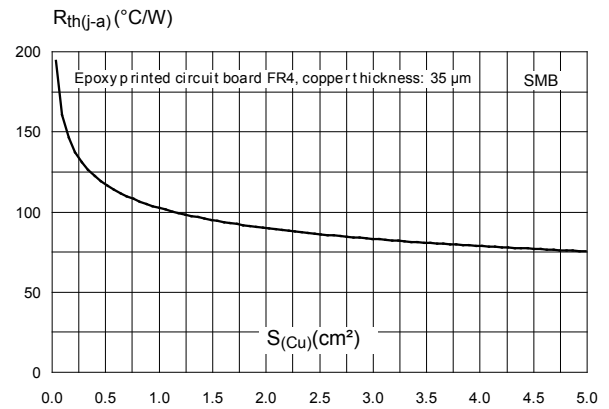
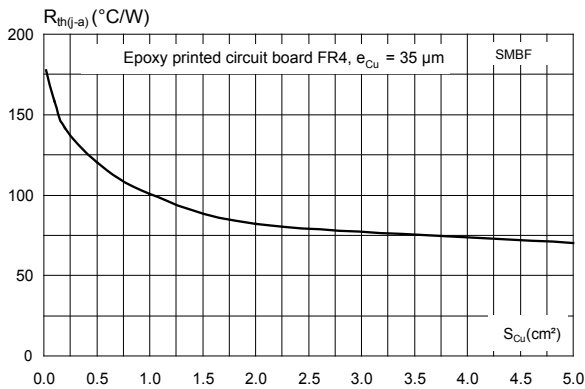
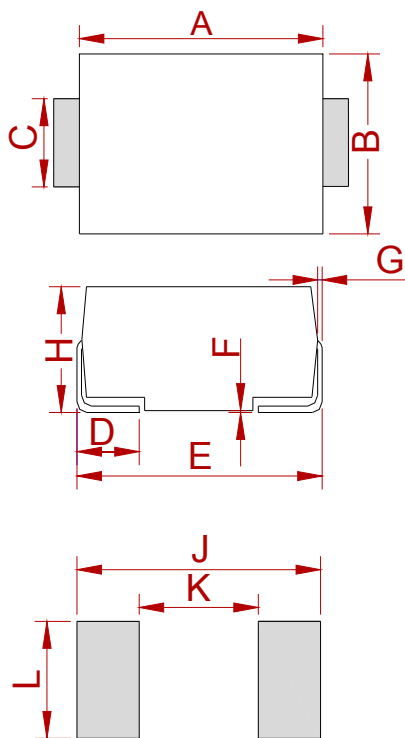


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead (SMBF)



PACKAGE MECHANICAL DATA



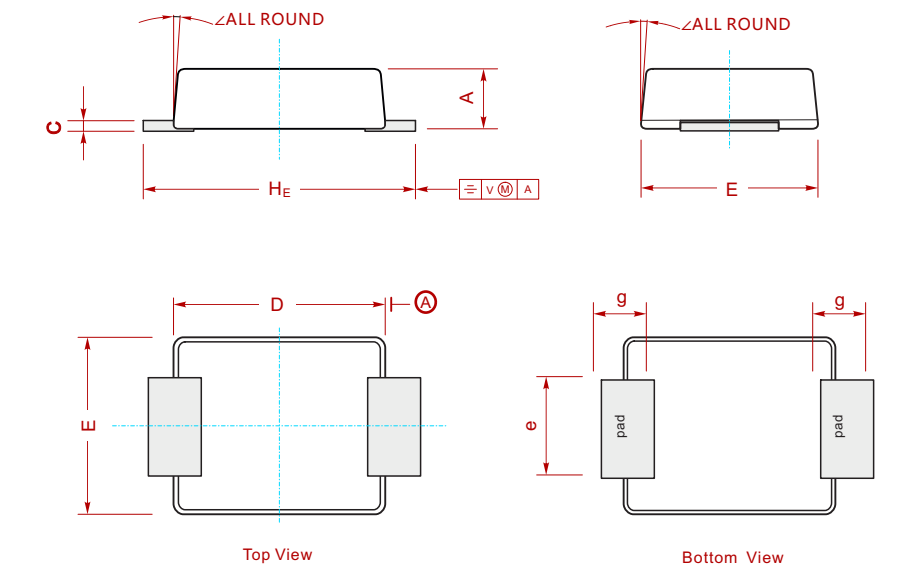
DO-214AA (SMB)

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	

REEL SPECIFICATION

P/N	PKG	QTY
STPS3150U-MS	DO-214AA (SMB)	2500

PACKAGEECHANICALDATA



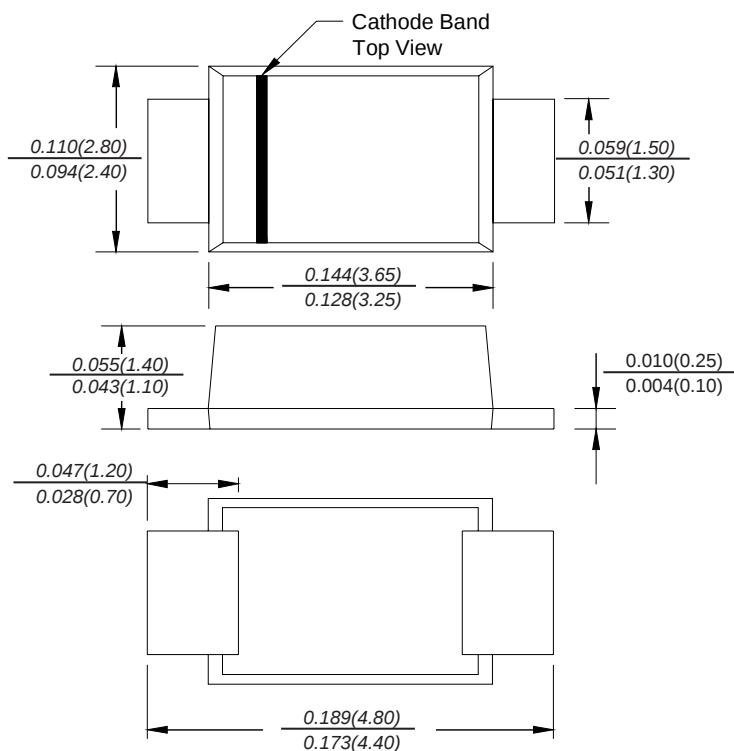
UNIT		A	C	D	E	H _E	e	g	∠
mm	max	1.3	0.26	4.4	3.7	5.5	2.2	1.0	9°
	min	1.1	0.18	4.2	3.5	5.1	1.9		
mil	max	51	10	173	146	216	86	40	
	min	43	7	165	138	200	75		

Order information

P/N	PKG	QTY
STPS3150UF-MS	SMBF	5000

PACKAGE MECHANICAL DATA

SMAF



Dimensions in inches and (millimeters)

REEL SPECIFICATION

P/N	PKG	QTY
STPS3150AFN-MS	SMAF	3000

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