STPS3150

Power Schottky rectifier

Main product characteristics

$I_{F(AV)}$	3 A
V_{RRM}	150 V
T_j (max)	175° C
V_F (max)	0.67 V

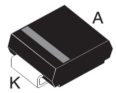
Features and benefits

- Negligible switching losses
- Low forward voltage drop for higher efficiency and extented battery life
- Low thermal resistance

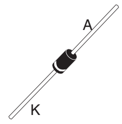
Description

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

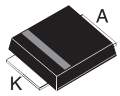
Packaged in Axial, SMB, and low-profile SMB, this device is intended for use in consumer and computer applications like TV, STB, PC and DVD where low drop forward voltage is required to reduce power dissipation.



SMB
STPS3150U



DO-201AD
STPS3150



SMB flat
STPS3150UF

Order Codes

Part Number	Marking
STPS3150U	G315
STPS3150	STPS3150
STPS3150RL	STPS3150
STPS3150UF	FG315

Table 1. Absolute Ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			150	V
$I_{F(AV)}$	Average forward current	SMB	T_L = 130° C δ = 0.5	3	A
		DO-201AD	T_L = 140° C δ = 0.5		
		SMB flat	T_L = 150° C δ = 0.5		
I_{FSM}	Surge non repetitive forward current	SMB	t_p = 10 ms sinusoidal	100	A
		DO-201AD		150	
		SMB flat		100	
T_{stg}	Storage temperature range			-65 to + 175	° C
T_j	Operating junction temperature(1)			175	° C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

1 Characteristics

Table 2. Thermal resistance

Symbol	Parameter			Value	Unit
$R_{th(j-l)}$	Junction to lead		SMB flat	10	° C/W
			SMB	20	
		Lead length = 10 mm	DO-201AD	15	

Table 3. Static electrical characteristics

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$		0.4	2.0	µA
		T_j = 125° C			0.6	2.0	mA
V_F (2)	Forward voltage drop	T_j = 25° C	I_F = 3 A		0.78	0.82	V
		T_j = 125° C			0.63	0.67	
		T_j = 25° C	I_F = 6 A		0.85	0.89	
		T_j = 125° C			0.70	0.75	

1. t_p = 5 ms, δ < 2%
2. t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.59 \times I_{F(AV)} + 0.023\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

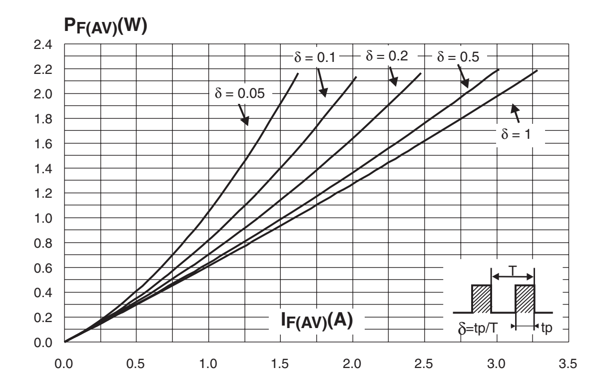


Figure 2. Average forward current versus ambient temperature (δ = 0.5) (DO-201AD / SMB)

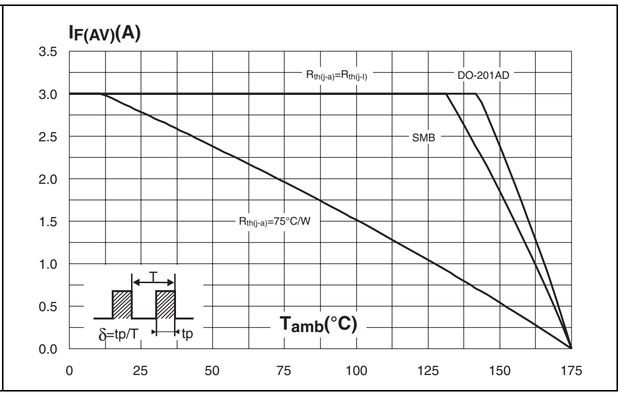


Figure 3. Average forward current versus ambient temperature (δ = 0.5) (SMB flat)

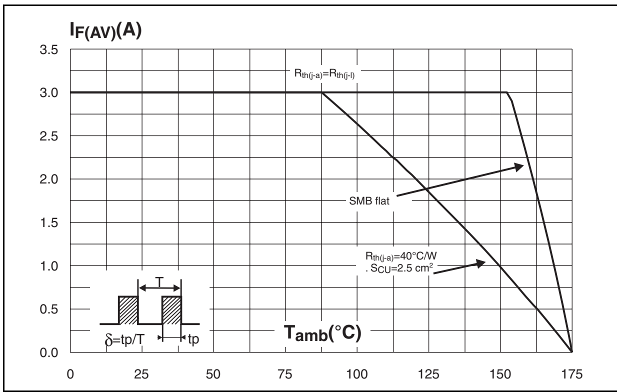


Figure 4. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

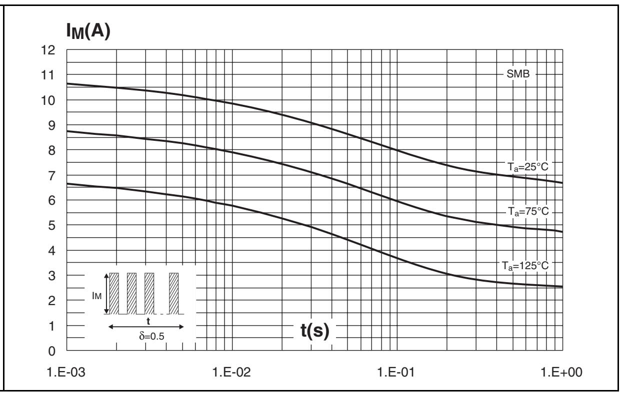


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) (DO-201AD)

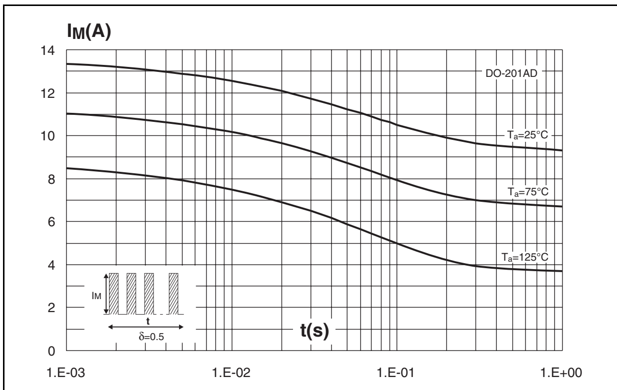


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values)

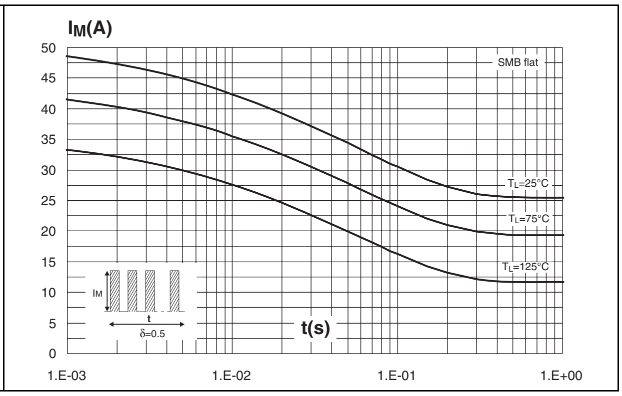


Figure 7. Normalized avalanche power derating versus pulse duration

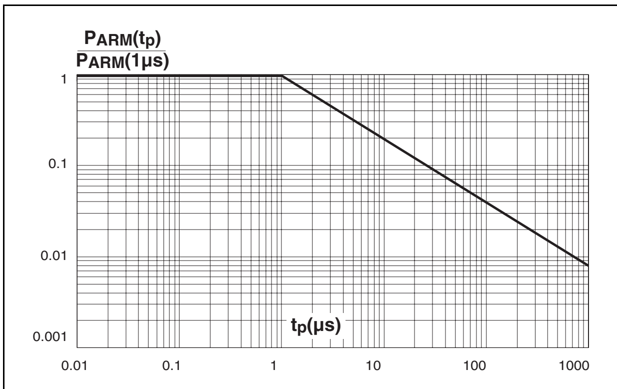


Figure 8. Normalized avalanche power derating versus junction temperature

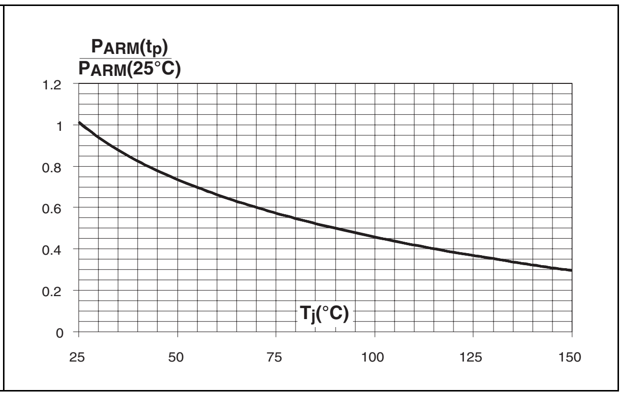


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

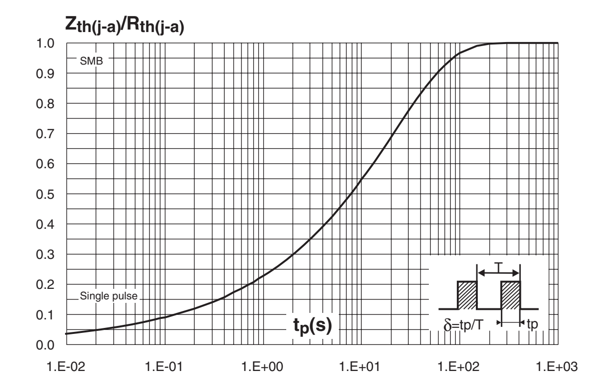


Figure 10. Relative variation of thermal impedance junction to ambient versus pulse duration (DO-2001AD)

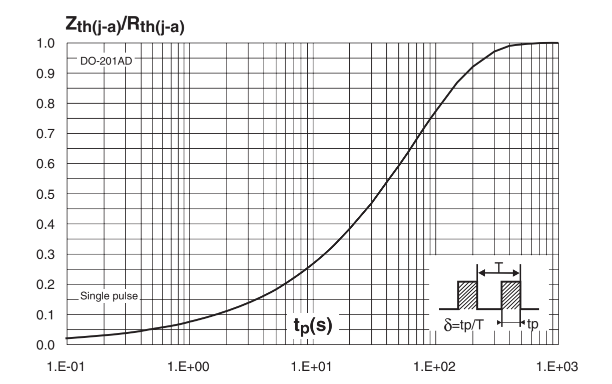


Figure 11. Relative variation of thermal impedance junction to lead versus pulse duration - SMB flat

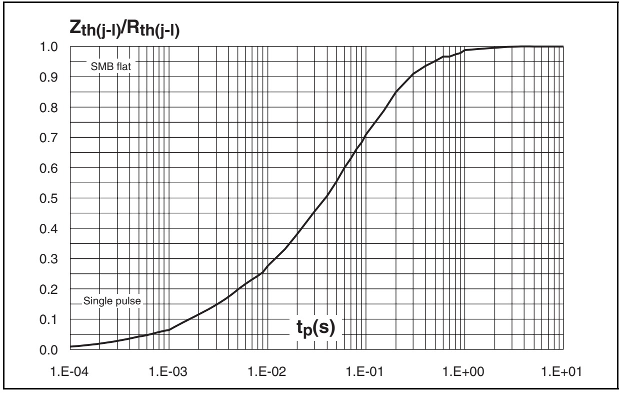


Figure 12. Reverse leakage current versus reverse voltage applied (typical values)

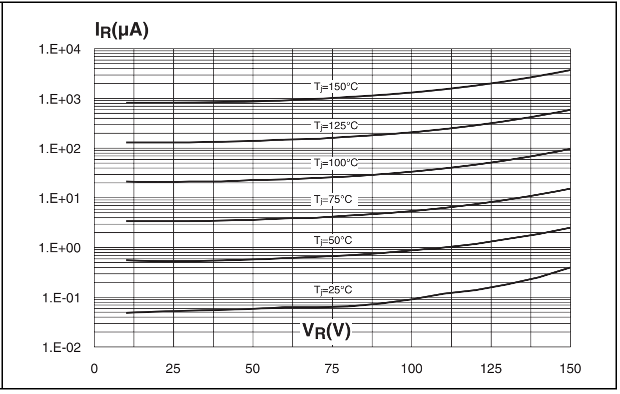


Figure 13. Junction capacitance versus reverse voltage applied (typical values)

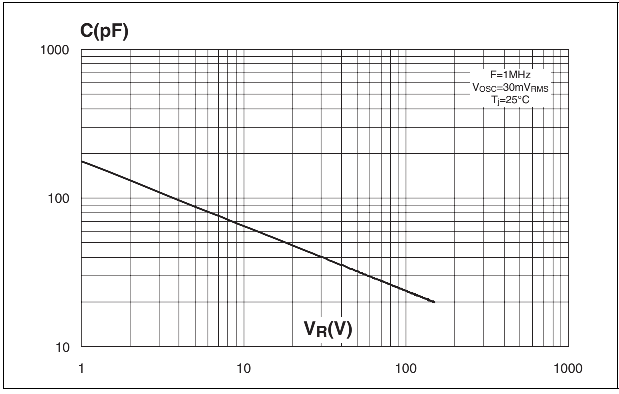


Figure 14. Forward voltage drop versus forward current

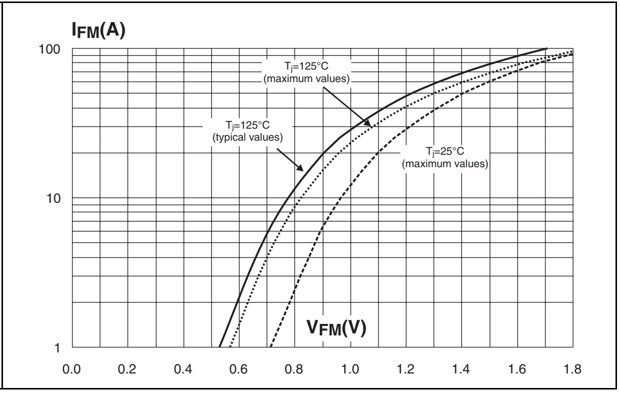


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU} = 35 µm) (SMB)

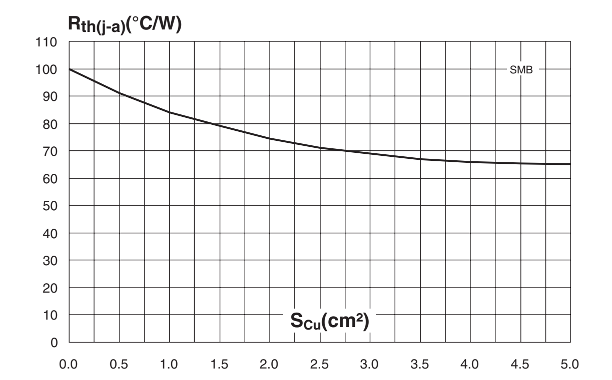


Figure 16. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU} = 35 µm) (DO-201AD)

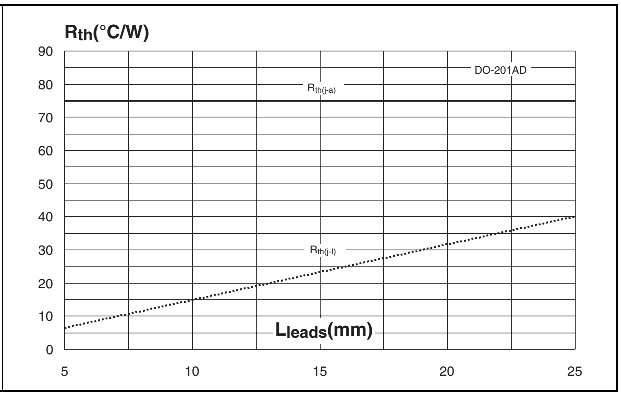
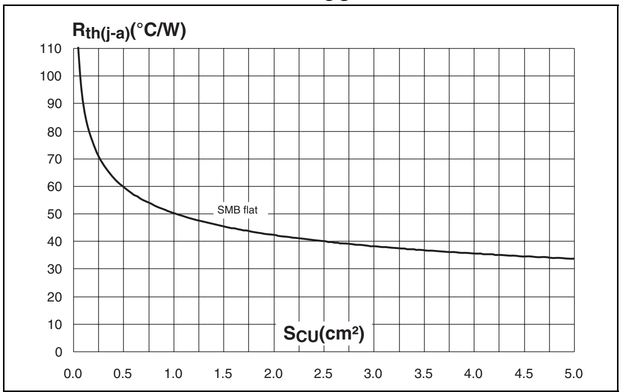


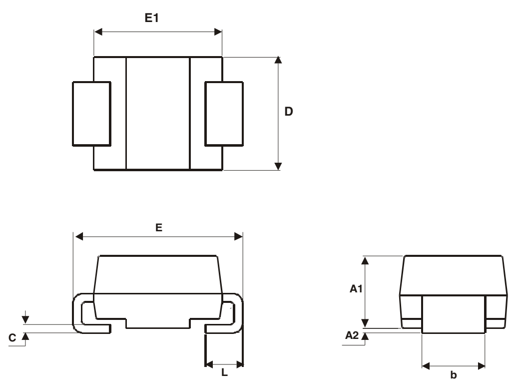
Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU} = 35 µm) (SMB flat)



2 Package information

- Epoxy meets UL94, V0.

Table 4. SMB dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

Figure 18. SMB footprint (dimensions in mm)

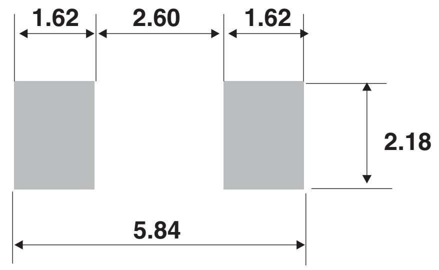
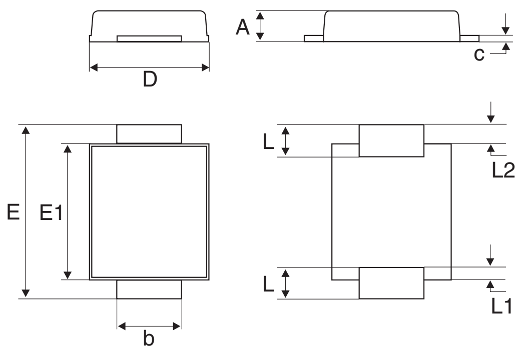


Table 5. SMB Flat dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b(1)	1.95		2.20	0.077		0.087
c(1)	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.200		0.220
E1	4.05		4.60	0.189		0.181
L	0.75		1.50	0.029		0.059
L1		0.40			0.016	
L2		0.60			0.024	

1. Applies to plated leads

Figure 19. SMB Flat footprint (dimensions in mm)

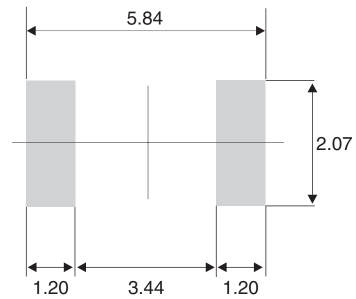
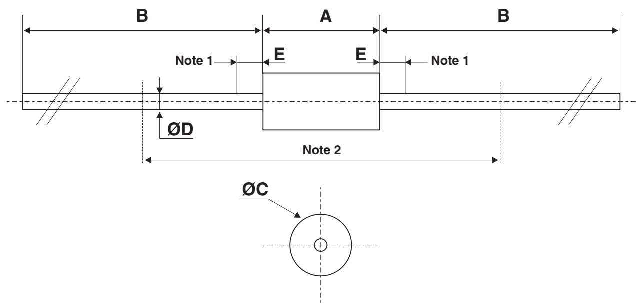


Table 6. DO-201AD Package dimensions



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		9.50		0.374
B	25.40		1.000	
C		5.30		0.209
D(1)		1.30		0.051
E		1.25		0.049
Note 2(2)	15		0.59	

1. The lead diameter D is not controlled over zone E
2. The minimum length, which must stay straight between the right angles after bending, is 15 mm (0.59")

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS3150U	G315	SMB	0.107 g	2500	Tape and reel
STPS3150UF	FG315	SMB flat	0.50 g	5000	Tape and reel
STPS3150	STPS3150	DO-201AD	1.12 g	600	Ammopack
STPS3150RL	STPS3150	DO-201AD	1.12 g	1900	Tape and reel

4 Revision history

Date	Revision	Description of Changes
May-2003	2A	Last update.
31-May-2006	3	Reformatted to current standard. Added ECOPACK statement. Updated SMB footprint in Figure 12. Changed nF to pF in Figure 8.
08-Feb-2007	4	Added SMB flat package.