



1N5817, 1N5818, 1N5819

Low drop power Schottky rectifier

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Avalanche capability specified

Description

Axial Power Schottky rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters. Packaged in DO-41 these devices are intended for use in low voltage, high frequency inverters, free wheeling, polarity protection and small battery chargers.

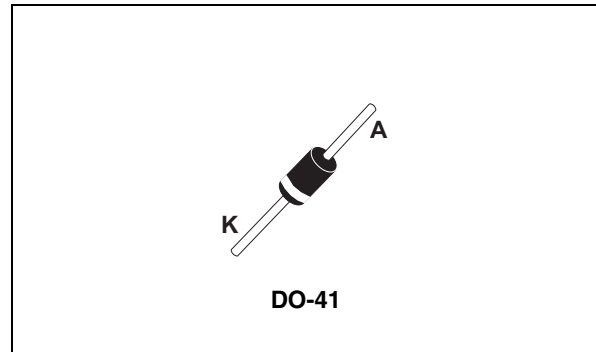


Table 1. Device summary

Symbol	Value	Unit
$I_{F(AV)}$	1	A
V_{RRM}	40	V
T_j	150	°C
V_F (max)	0.45	V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value			Unit
			1N5817	1N5818	1N5819	
V_{RRM}	Repetitive peak reverse voltage		20	30	40	V
$I_{F(RMS)}$	Forward rms current		10			A
$I_{F(AV)}$	Average forward current	$T_L = 125\text{ °C}, \delta = 0.5$	1			A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal	25			A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}, T_j = 25\text{ °C}$	1200	1200	900	W
T_{stg}	Storage temperature range		-65 to + 150			°C
T_j	Maximum operating junction temperature ⁽¹⁾		150			°C
dV/dt	Critical rate of rise of reverse voltage		10000			V/ μs

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

Table 3. Thermal resistances

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient	Lead length = 10 mm	100	°C/W
$R_{th(j-l)}$	Junction to lead	Lead length = 10 mm	45	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Tests conditions		1N5817	1N5818	1N5819	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	0.5	0.5	0.5	mA
		$T_j = 100\text{ °C}$		10	10	10	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$	0.45	0.50	0.55	V
		$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$	0.75	0.80	0.85	V

1. Pulse test : $t_p = 380\text{ }\mu\text{s}, \delta < 2\%$

To evaluate the conduction losses use the following equations :

$$P = 0.3 \times I_{F(AV)} + 0.090 I_{F_2(RMS)}^2 \text{ for 1N5817 / 1N5818}$$

$$P = 0.3 \times I_{F(AV)} + 0.150 I_{F_2(RMS)}^2 \text{ for 1N5819}$$

Figure 1. Average forward power dissipation versus average forward current (1N5817/1N5818)

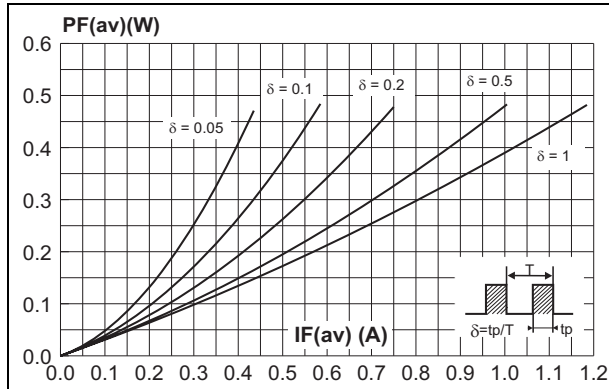


Figure 2. Average forward power dissipation versus average forward current (1N5819)

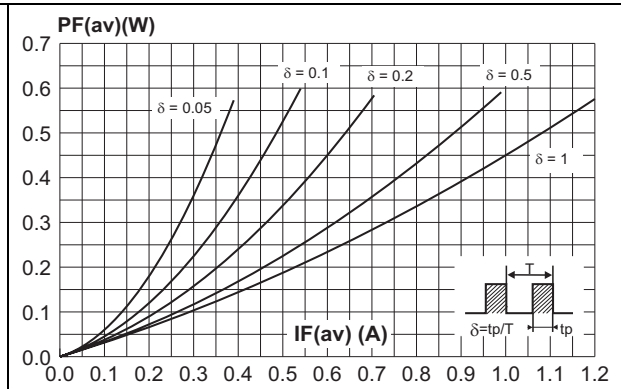


Figure 3. Average forward current versus ambient temperature (delta = 0.5) (1N5817/1N5818)

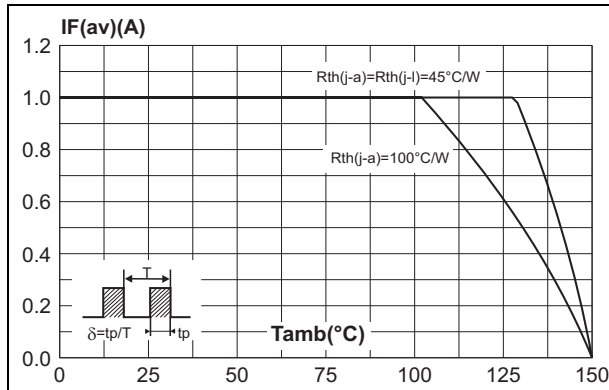


Figure 4. Average forward current versus ambient temperature (delta = 0.5) (1N5819)

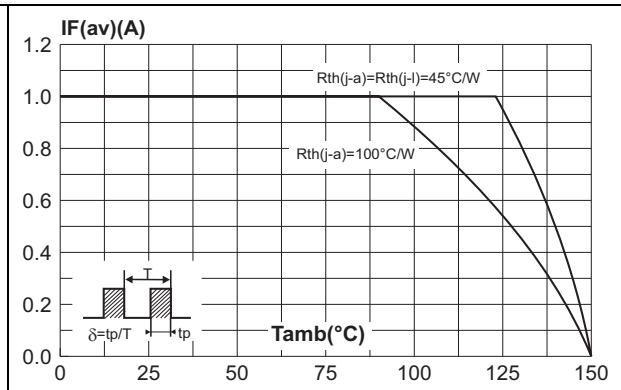


Figure 5. Normalized avalanche power derating versus pulse duration

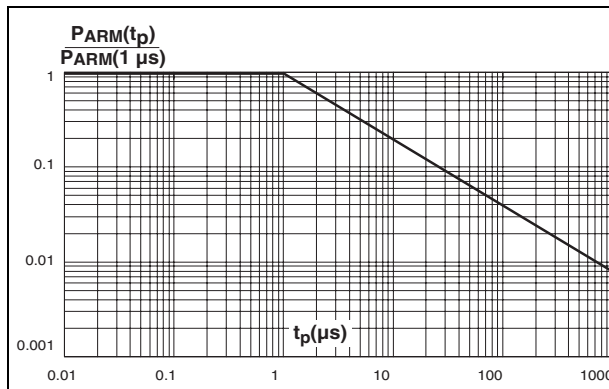


Figure 6. Normalized avalanche power derating versus junction temperature

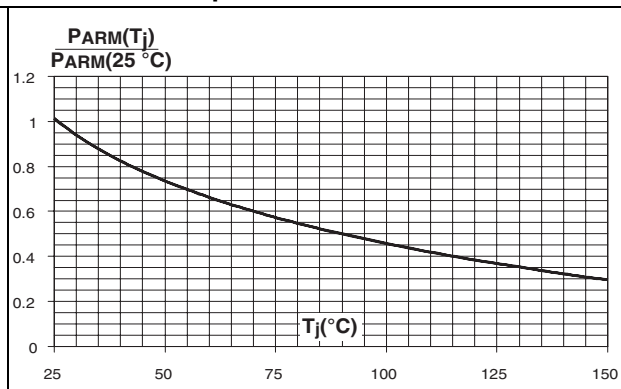


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) (1N5817/1N5818)

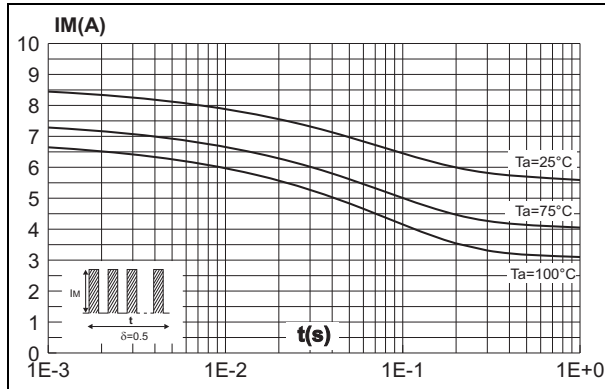


Figure 8. Non repetitive surge peak forward current versus overload duration (maximum values) (1N5819)

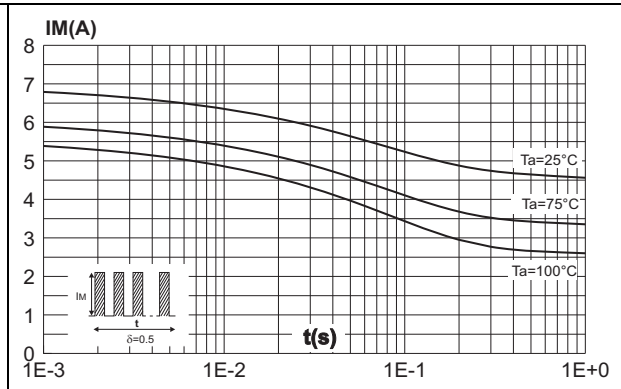


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration

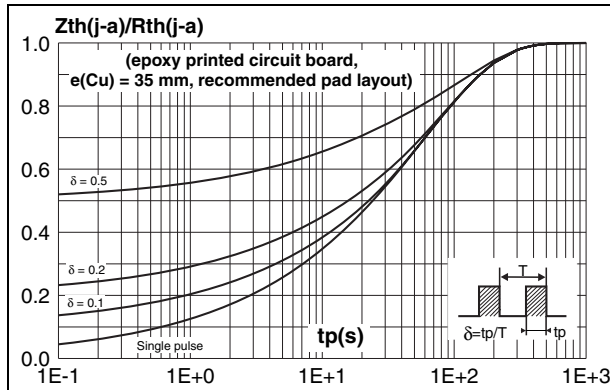


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

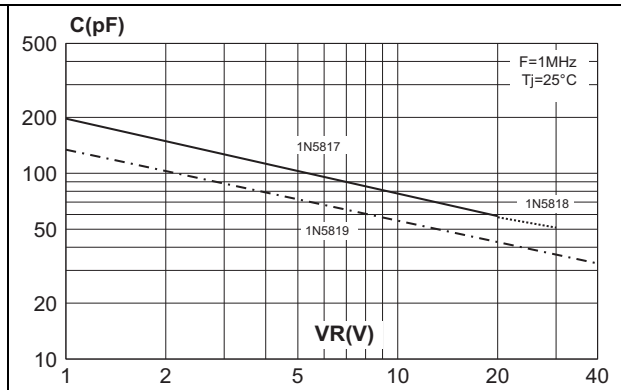


Figure 11. Reverse leakage current versus reverse voltage applied (typical values) (1N5817/1N5818)

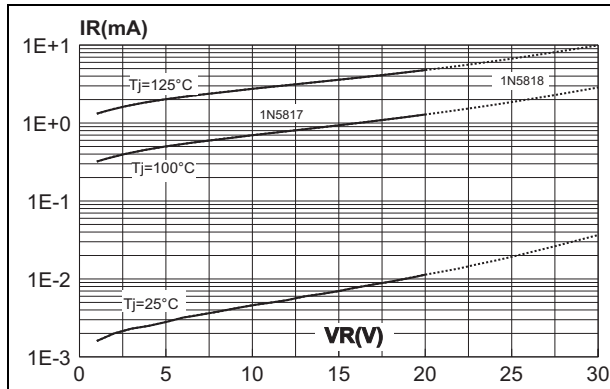


Figure 12. Reverse leakage current versus reverse voltage applied (typical values) (1N5819)

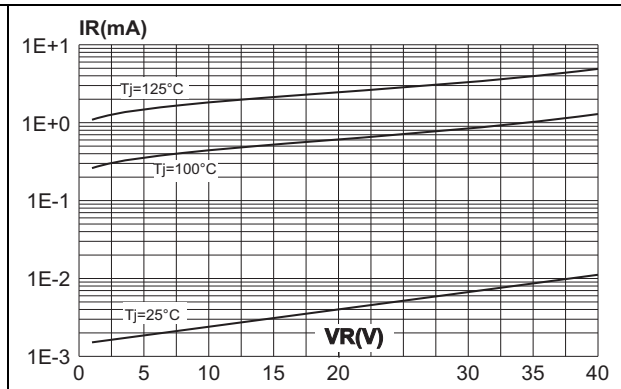


Figure 13. Forward voltage drop versus forward current (typical values) (1N5817/1N5818)

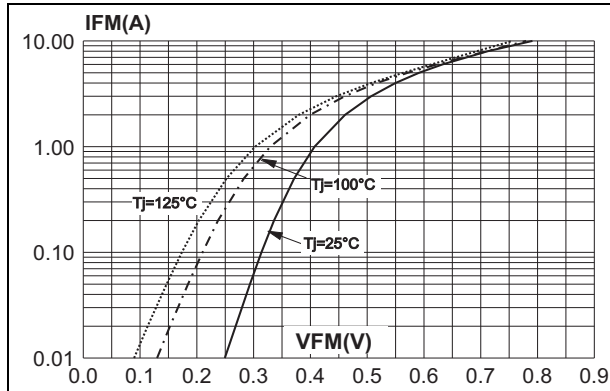


Figure 14. Forward voltage drop versus forward current (typical values) (1N5819)

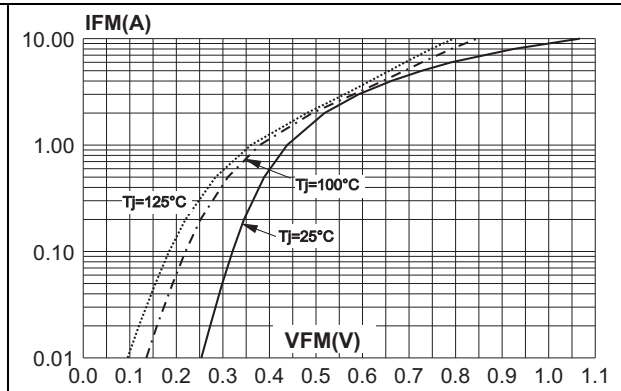
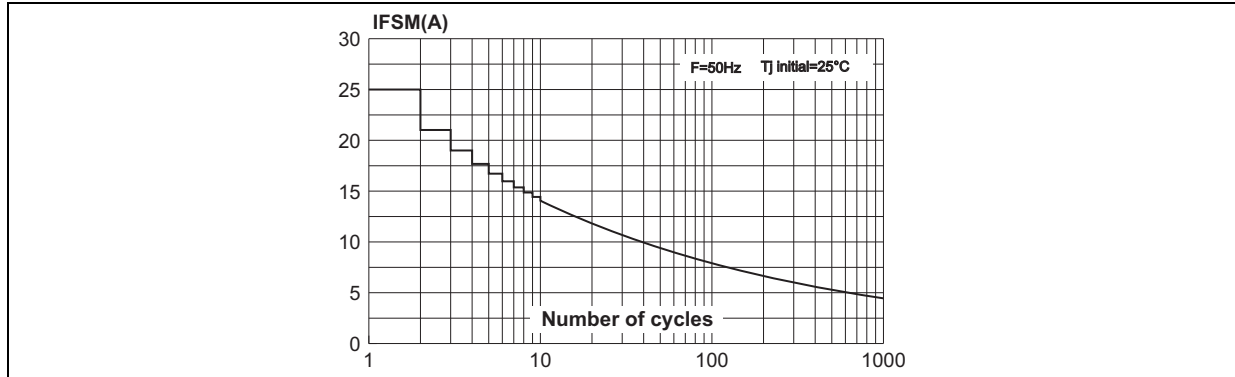


Figure 15. Non repetitive surge peak forward current versus number of cycles



2 Package Information

- Epoxy meets UL94, V0
- Band indicates cathode

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. DO-41 (Plastic) dimensions

	Ref.	Dimensions			
		Millimeters		Inches	
		Min.	Max.	Min.	Max.
	A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107	
C	25.4		1		
D	0.71	0.86	0.028	0.034	

3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
1N581x	Part number cathode ring	DO-41	0.34 g	2000	Ammopack
1N581xRL	Part number cathode ring	DO-41	0.34 g	5000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Jul-2003	4A	Last update.
04-Jul-2011	5	Updated Table 5.: DO-41 (Plastic) dimensions.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2011 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

