

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

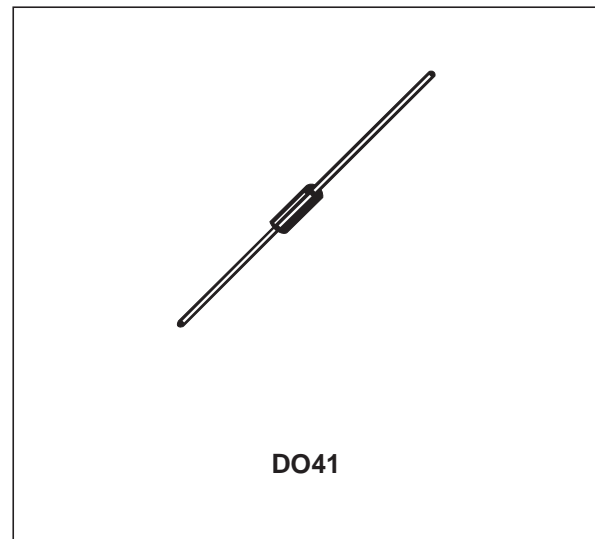
<b>I<sub>F(AV)</sub></b>	<b>1 A</b>
<b>V<sub>RRM</sub></b>	<b>40 V</b>
<b>T<sub>j</sub></b>	<b>150°C</b>
<b>V<sub>F(max)</sub></b>	<b>0.45 V</b>

### FEATURES AND BENEFITS

- 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 DO41 these devices are intended for use in low voltage, high frequency inverters, free wheeling, polarity protection and small battery chargers.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value			Unit
		1N5817	1N5818	1N5819	
V <sub>RRM</sub>	Repetitive peak reverse voltage	20	30	40	V
I <sub>F(RMS)</sub>	RMS forward current	10			A
I <sub>F(AV)</sub>	Average forward current T <sub>L</sub> = 125°C δ = 0.5	1			A
I <sub>FSM</sub>	Surge non repetitive forward current tp = 10 ms Sinusoidal	25			A
P <sub>ARM</sub>	Repetitive peak avalanche power tp = 1μs T <sub>j</sub> = 25°C	1200	1200	900	W
T <sub>stg</sub>	Storage temperature range	- 65 to + 150			°C
T <sub>j</sub>	Maximum operating junction temperature *	150			°C
dV/dt	Critical rate of rise of reverse voltage	10000			V/μs

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

# 1N581x

## THERMAL RESISTANCES

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

## STATIC ELECTRICAL CHARACTERISTICS

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

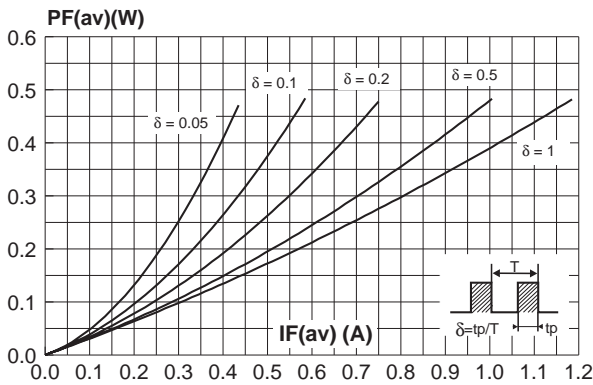
Pulse test : \*  $t_p = 380 \mu s$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equations :

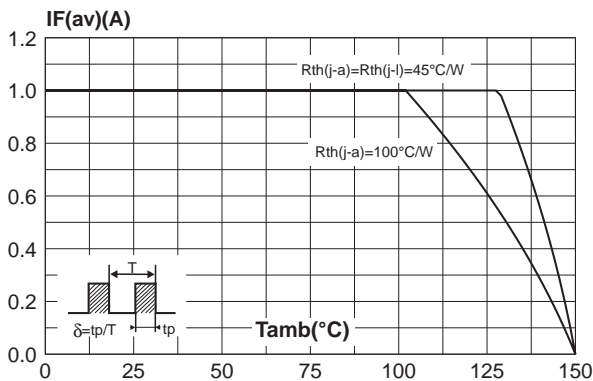
$$P = 0.3 \times I_{F(AV)} + 0.090 I_{F(RMS)}^2 \text{ for } 1N5817 / 1N5818$$

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

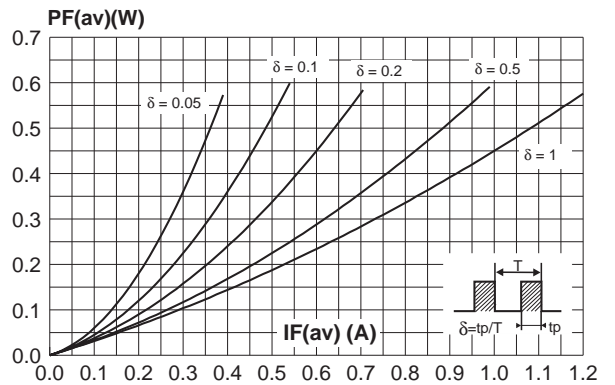
**Fig. 1:** Average forward power dissipation versus average forward current (1N5817/1N5818).



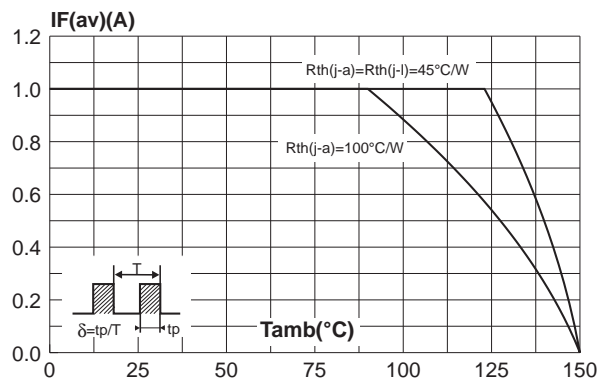
**Fig. 2-1:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5817/1N5818).



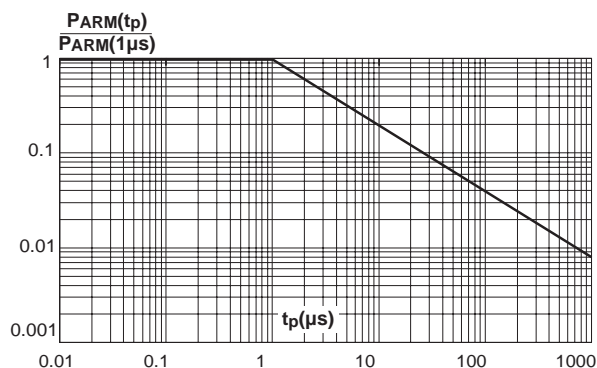
**Fig. 2:** Average forward power dissipation versus average forward current (1N5819).



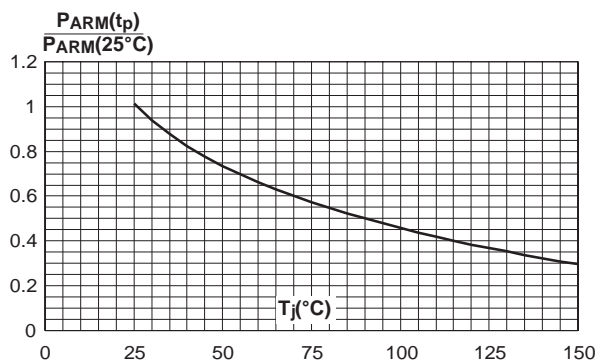
**Fig. 2-2:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5819).



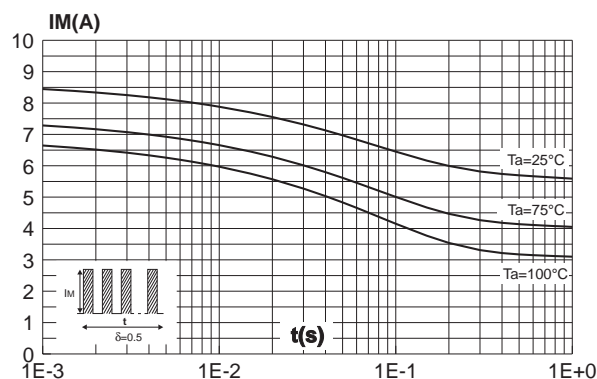
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



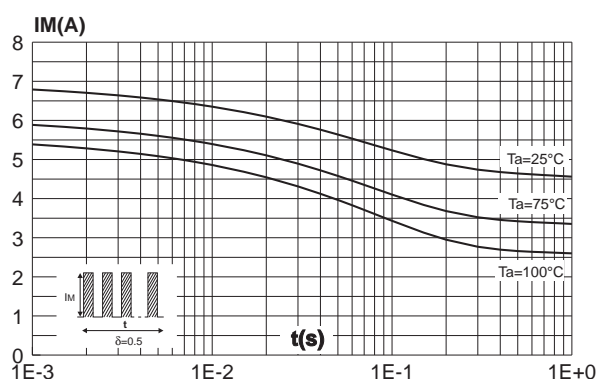
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



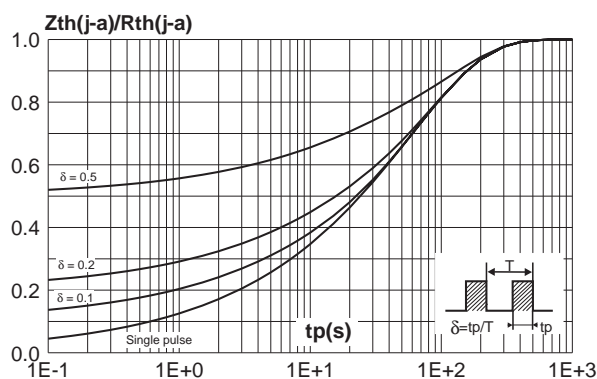
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5817/1N5818).



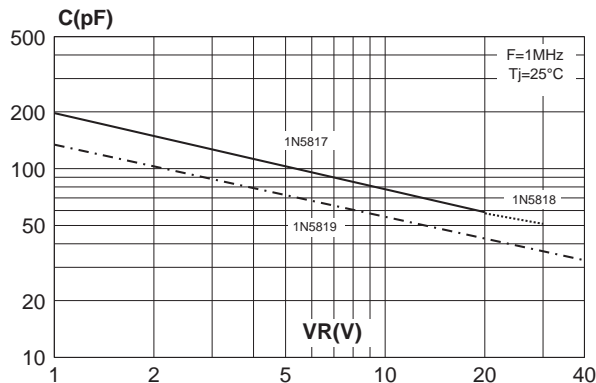
**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5819).



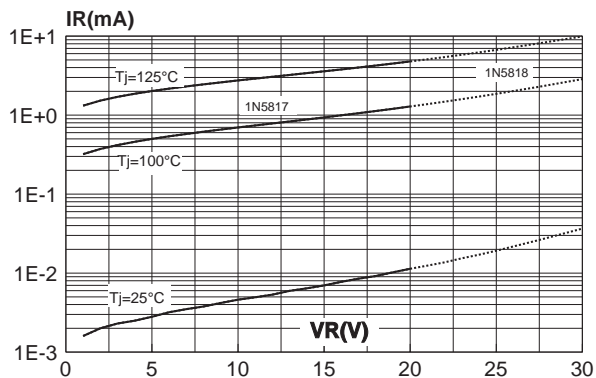
**Fig. 6:** Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35mm, recommended pad layout).



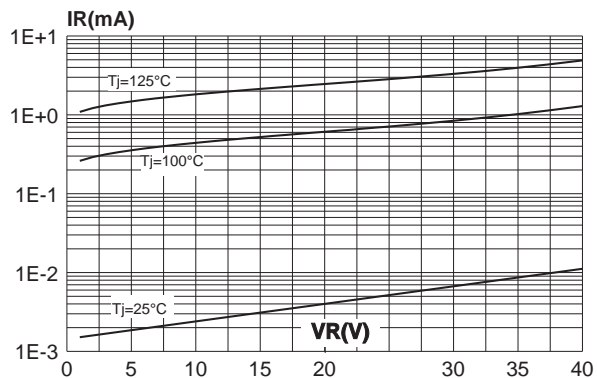
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values).



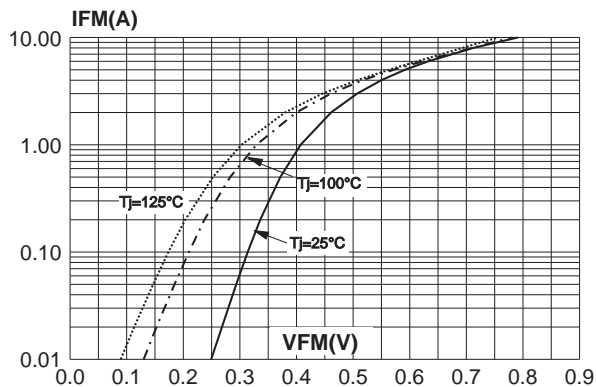
**Fig. 8-1:** Reverse leakage current versus reverse voltage applied (typical values) (1N5817/1N5818).



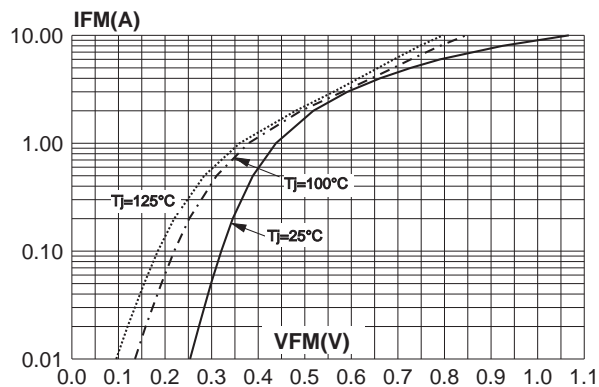
**Fig. 8-2:** Reverse leakage current versus reverse voltage applied (typical values) (1N5819).



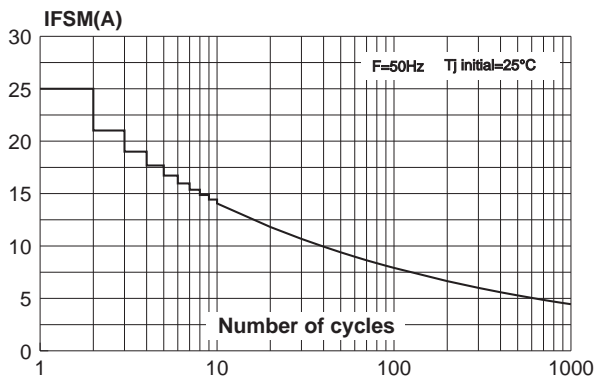
**Fig. 9-1:** Forward voltage drop versus forward current (typical values) (1N5817/1N5818).



**Fig. 9-2:** Forward voltage drop versus forward current (typical values) (1N5819).

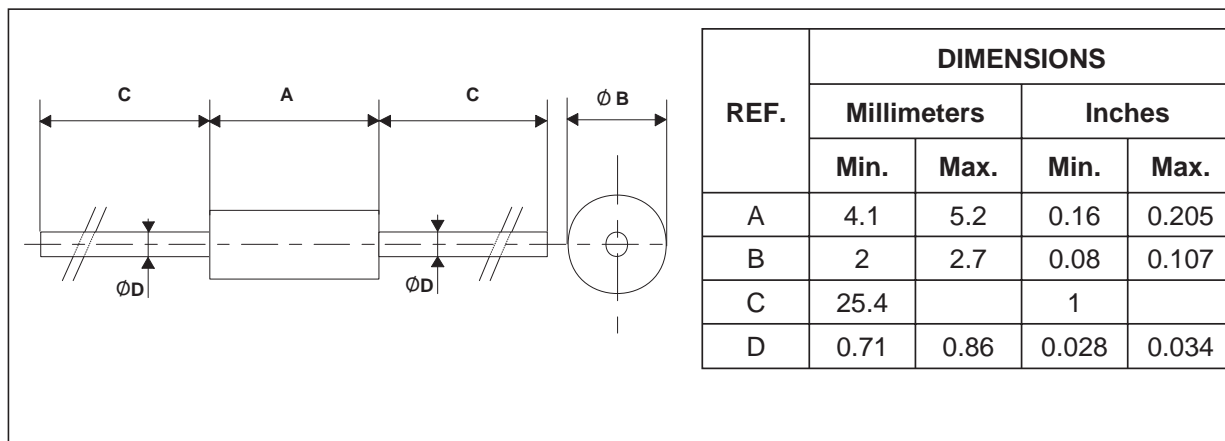


**Fig. 10:** Non repetitive surge peak forward current versus number of cycles.



## PACKAGE MECHANICAL DATA

DO41 plastic



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
1N581x	Part number cathode ring	DO41	0.34g	2000	Ammopack
1N581xRL	Part number cathode ring	DO41	0.34g	5000	Tape & reel

- Epoxy meets UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2003 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany  
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore  
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>