1N5817, 1N5818, 1N5819

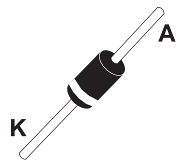
Low drop power Schottky rectifier

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.



DO-41

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 1N5817	Value 1N5818	Value 1N5819	Unit
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 °C, δ = 0.5	1			A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal	25			A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs, T_j = 25 °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. $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ 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 °C	$V_R = V_{RRM}$	0.5	0.5	0.5	mA
		T_j = 100 °C		10	10	10	mA
V_F [1]	Forward voltage drop	T_j = 25 °C	I_F = 1 A	0.45	0.50	0.55	V
		T_j = 25 °C	I_F = 3 A	0.75	0.80	0.85	V

1. Pulse test : t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equations :
$P = 0.3 \times I_{F(AV)} + 0.090\ I_F{}^2{}_{(RMS)}$ for 1N5817 / 1N5818
$P = 0.3 \times I_{F(AV)} + 0.150\ I_F{}^2{}_{(RMS)}$ for 1N5819

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

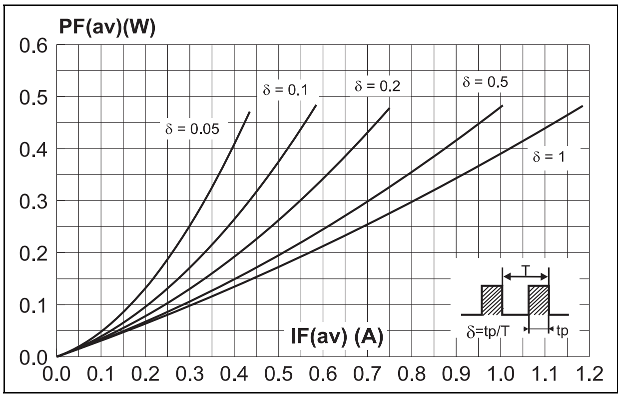


Figure 2. Average forward power dissipation versus average forward current (1N5819)

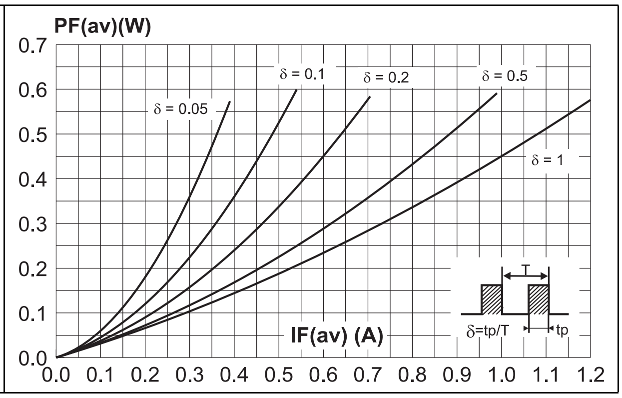


Figure 3. Average forward current versus ambient temperature (δ = 0.5) (1N5817/1N5818)

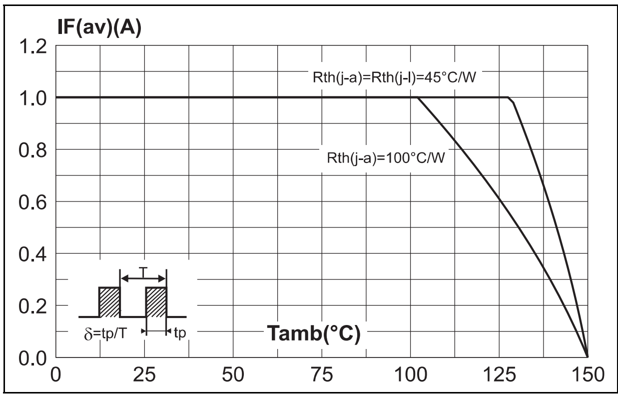


Figure 4. Average forward current versus ambient temperature (δ = 0.5) (1N5819)

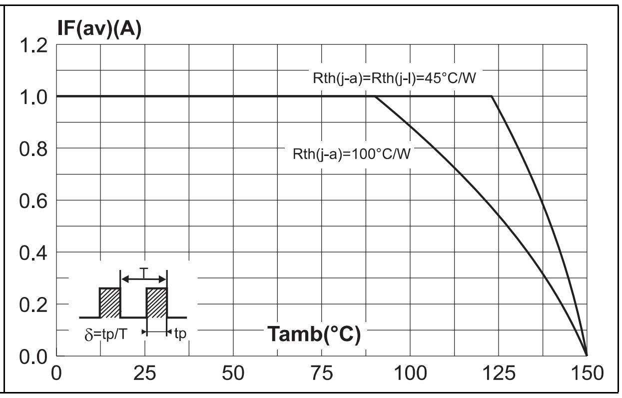


Figure 5. Normalized avalanche power derating versus pulse duration

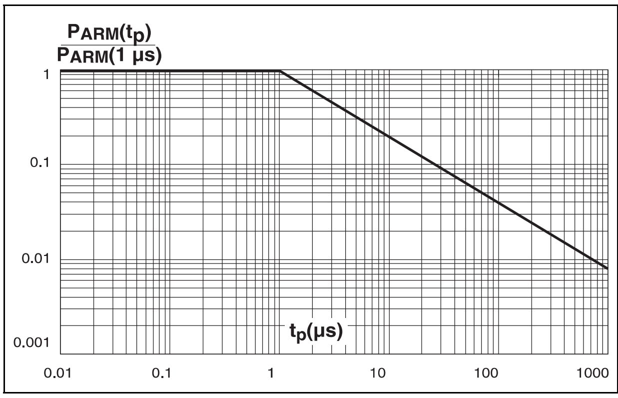


Figure 6. Normalized avalanche power derating versus junction temperature

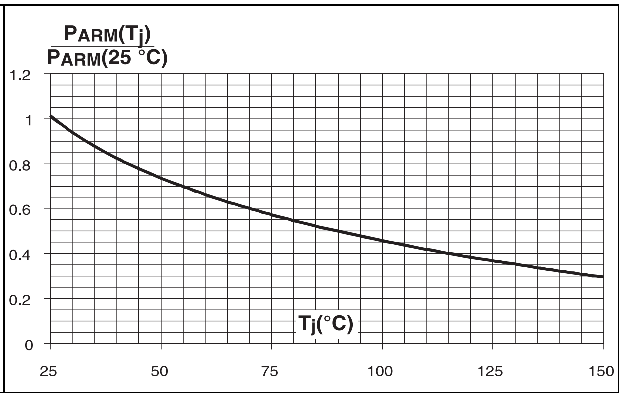


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) (1N5817/1N5818)

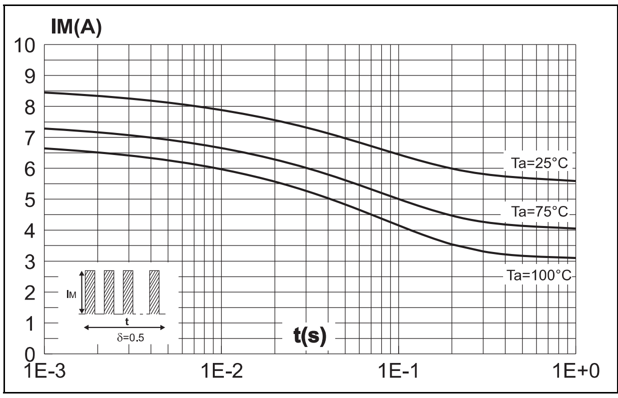


Figure 8. Non repetitive surge peak forward current versus overload duration (maximum values) (1N5819)

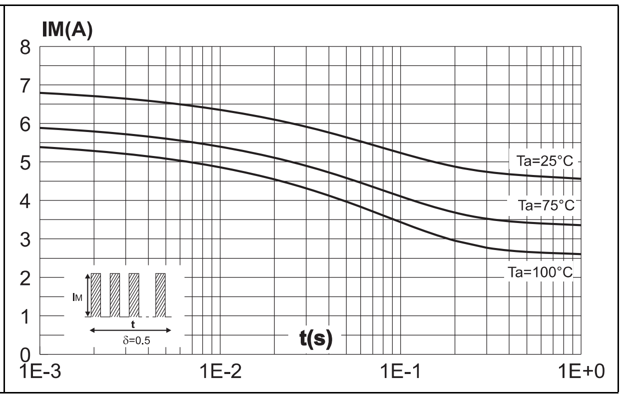


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration

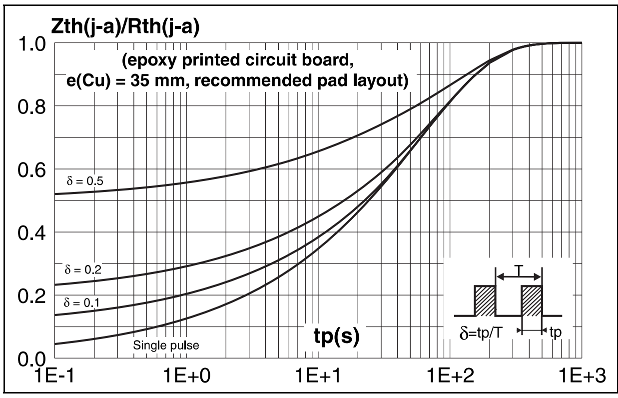


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

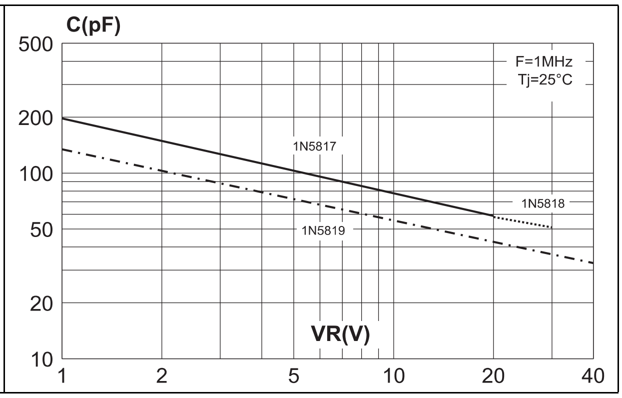


Figure 11. Reverse leakage current versus reverse voltage applied (typical values) (1N5817/1N5818)

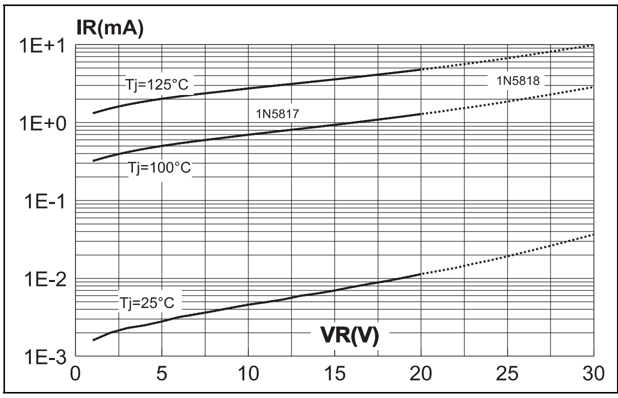


Figure 12. Reverse leakage current versus reverse voltage applied (typical values) (1N5819)

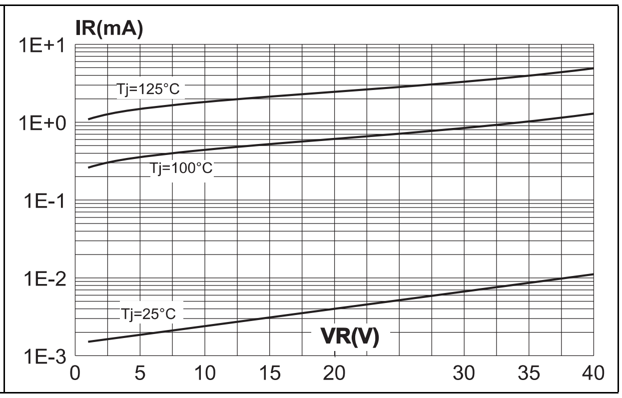


Figure 13. Forward voltage drop versus forward current (typical values) (1N5817/1N5818)

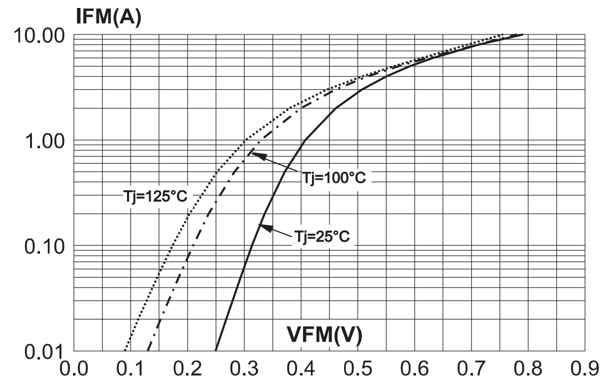


Figure 14. Forward voltage drop versus forward current (typical values) (1N5819)

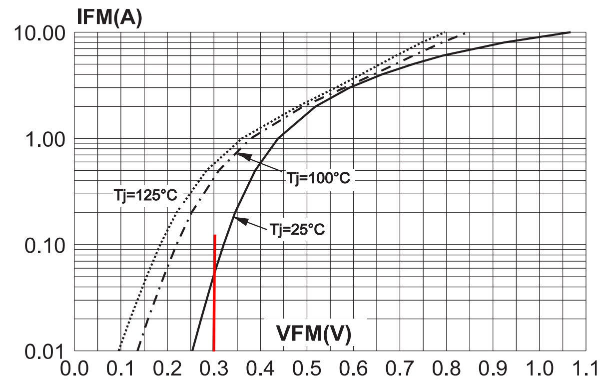


Figure 15. Non repetitive surge peak forward current versus number of cycles