

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.

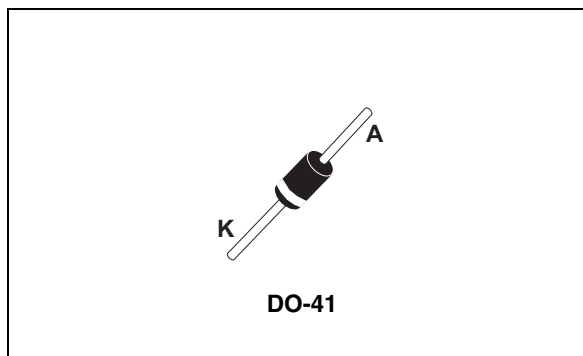


Table 1. Device summary

| 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 °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. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ 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 °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 :

$$P = 0.3 \times I_{F(AV)} + 0.090 I_{F2(RMS)}^2 \text{ for 1N5817 / 1N5818}$$

$$P = 0.3 \times I_{F(AV)} + 0.150 I_{F2(RMS)}^2 \text{ for 1N5819}$$

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

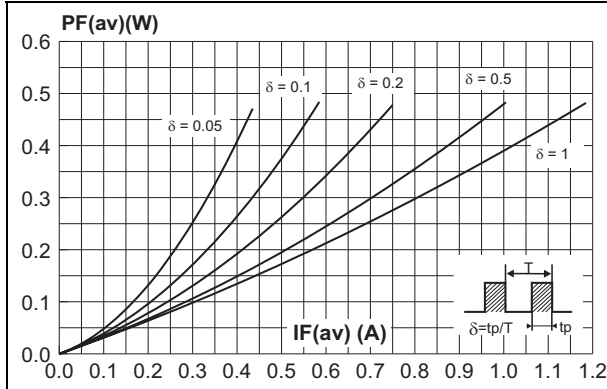


Figure 2. Average forward power dissipation versus average forward current (1N5819)

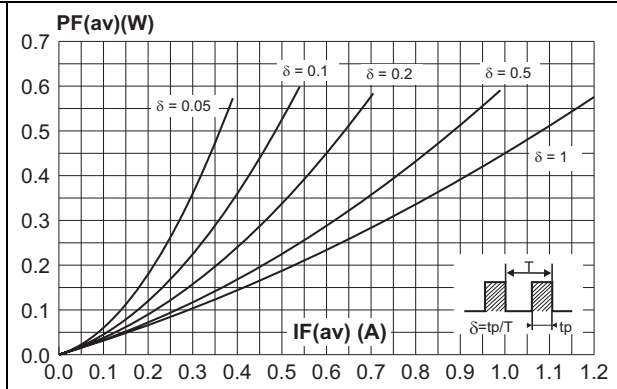


Figure 3. Average forward current versus ambient temperature (delta = 0.5) (1N5817/1N5818)

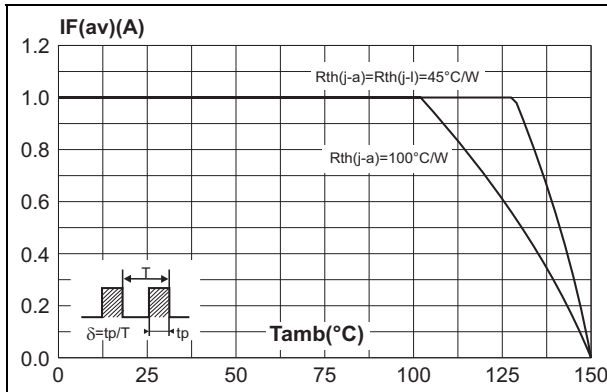


Figure 4. Average forward current versus ambient temperature (delta = 0.5) (1N5819)

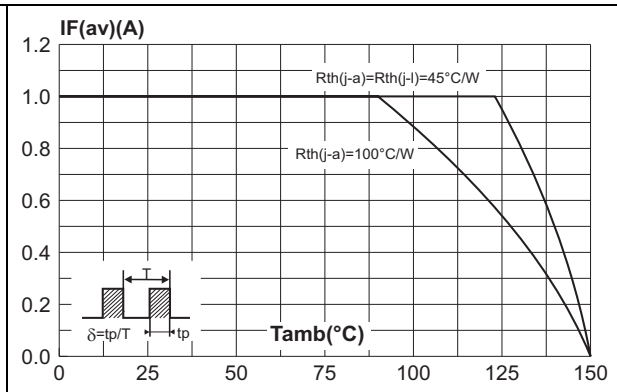


Figure 5. Normalized avalanche power derating versus pulse duration

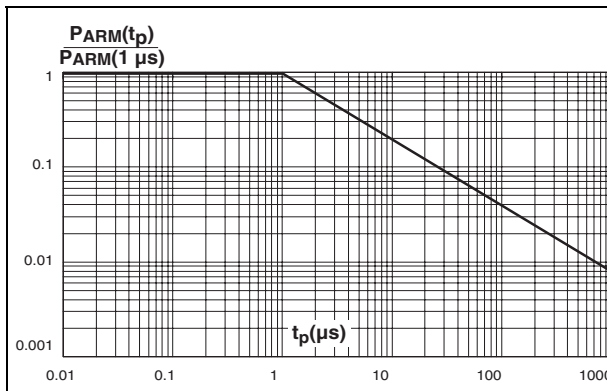


Figure 6. Normalized avalanche power derating versus junction temperature

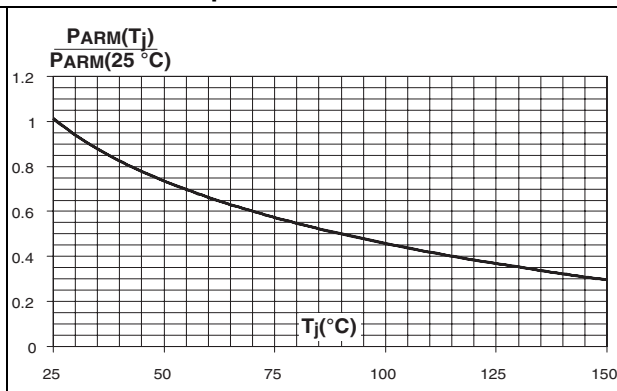


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) (1N5817/1N5818)

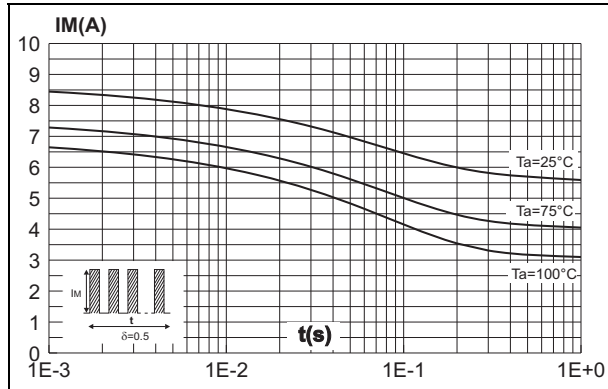


Figure 8. Non repetitive surge peak forward current versus overload duration (maximum values) (1N5819)

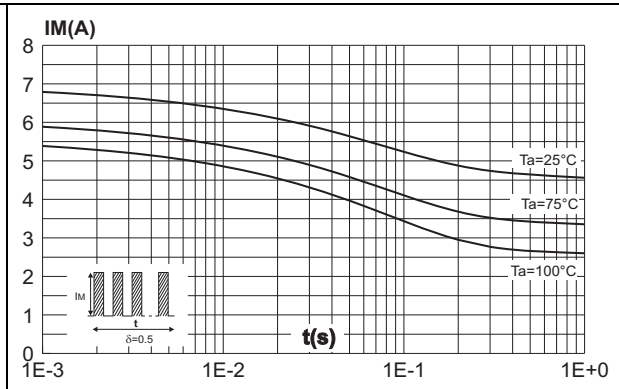


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration

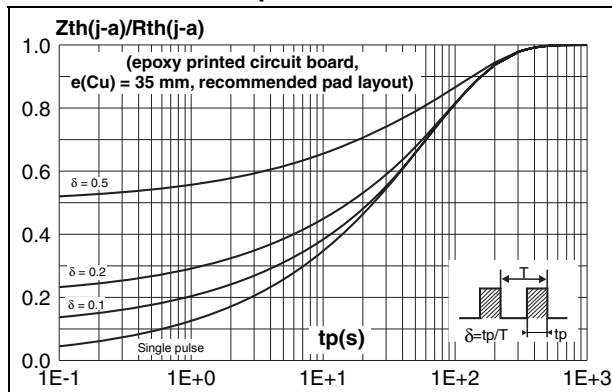


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

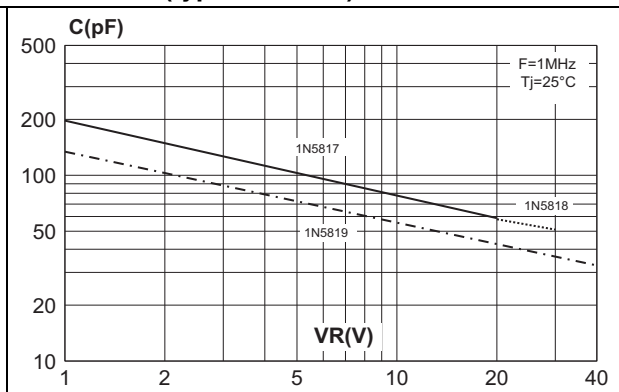


Figure 11. Reverse leakage current versus reverse voltage applied (typical values) (1N5817/1N5818)

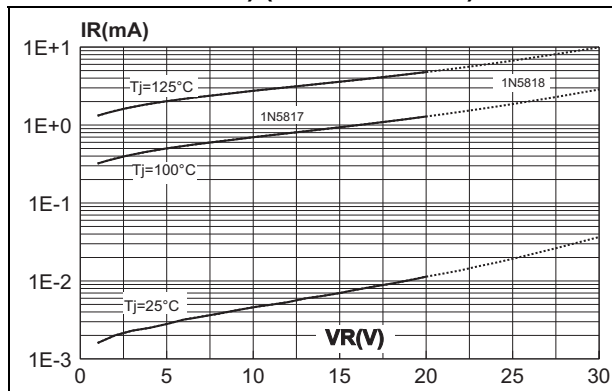


Figure 12. Reverse leakage current versus reverse voltage applied (typical values) (1N5819)

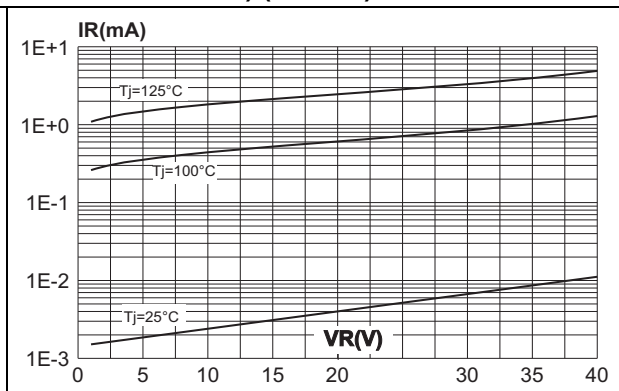


Figure 13. Forward voltage drop versus forward current (typical values) (1N5817/1N5818)

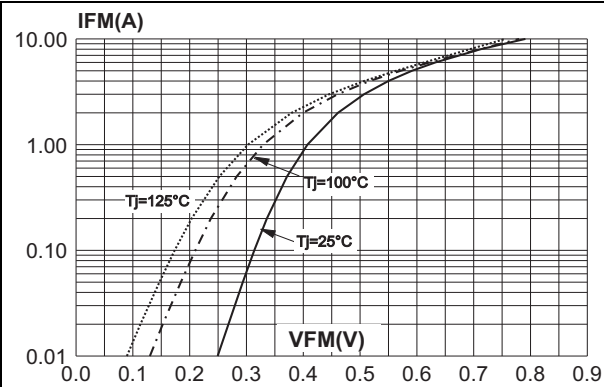


Figure 14. Forward voltage drop versus forward current (typical values) (1N5819)

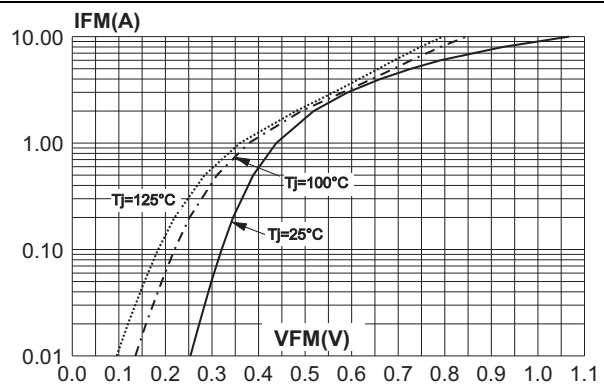
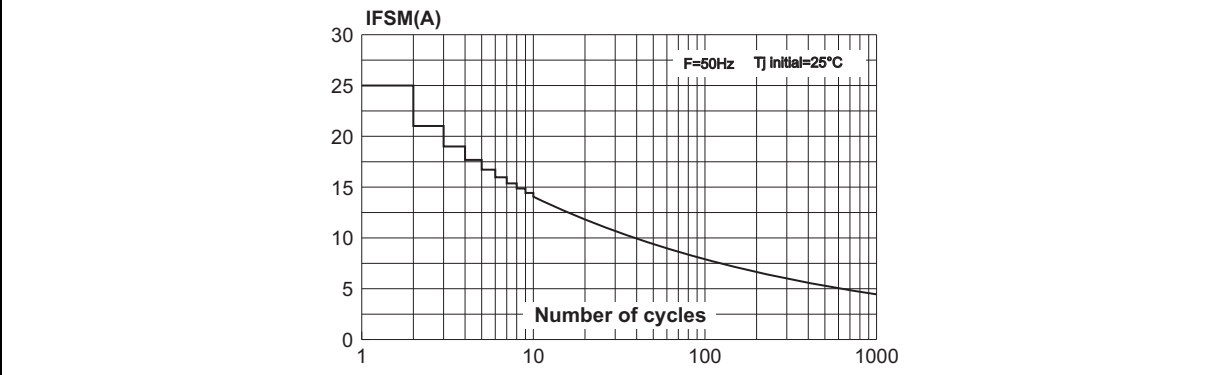


Figure 15. Non repetitive surge peak forward current versus number of cycles



2 Package Information

- Epoxy meets UL94, V0
- Band indicates cathode

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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. |

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