

BYT79-600

Rectifier diode ultrafast

Rev. 01 — 16 October 2007

Product data sheet

1. Product profile

1.1 General description

Ultrafast, epitaxial rectifier diode in a SOD59 (TO-220AC) plastic package.

1.2 Features

- Fast switching
- Soft recovery characteristic
- Low switching loss
- Low thermal resistance
- Low forward voltage drop
- High thermal cycling performance

1.3 Applications

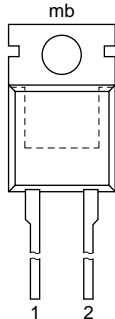

- Output rectifiers in high frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

1.4 Quick reference data

- $V_{RRM} \leq 600 \text{ V}$
- $V_F \leq 1.2 \text{ V}$
- $I_{F(AV)} \leq 15 \text{ A}$
- $t_{rr} \leq 60 \text{ ns}$

2. Pinning information

Table 1. Pinning

| Pin | Description | Simplified outline | Symbol |
|-----|------------------------|--|---|
| 1 | cathode (k) |  |  |
| 2 | anode (a) | | |
| mb | mounting base; cathode | | |

SOD59 (2-lead TO-220AC)

3. Ordering information

Table 2. Ordering information

| Type number | Package | | |
|-------------|----------|--|---------|
| | Name | Description | Version |
| BYT79-600 | TO-220AC | plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC | SOD59 |

4. Limiting values

Table 3. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-------------|-------------------------------------|--|-----|------|--------------------|
| V_{RRM} | repetitive peak reverse voltage | | - | 600 | V |
| V_{RWM} | crest working reverse voltage | | - | 600 | V |
| V_R | reverse voltage | square waveform; $\delta = 1.0$; $T_{mb} \leq 147\text{ }^{\circ}\text{C}$ | - | 600 | V |
| $I_{F(AV)}$ | average forward current | square waveform; $\delta = 0.5$; $T_{mb} \leq 108\text{ }^{\circ}\text{C}$ | - | 15 | A |
| I_{FRM} | repetitive peak forward current | $t = 25\text{ }\mu\text{s}$; square waveform; $\delta = 0.5$; $T_{mb} \leq 108\text{ }^{\circ}\text{C}$ | - | 30 | A |
| I_{FSM} | non-repetitive peak forward current | $t = 10\text{ ms}$; sinusoidal waveform | - | 130 | A |
| | | $t = 8.3\text{ ms}$; sinusoidal waveform | - | 143 | A |
| T_{stg} | storage temperature | | -40 | +150 | $^{\circ}\text{C}$ |
| T_j | junction temperature | | - | 150 | $^{\circ}\text{C}$ |

5. Thermal characteristics

Table 4. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|---|--|-----|-----|-----|------|
| $R_{th(j-mb)}$ | thermal resistance from junction to mounting base | with heatsink compound; see Figure 1 | - | - | 2.0 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | - | 60 | - | K/W |

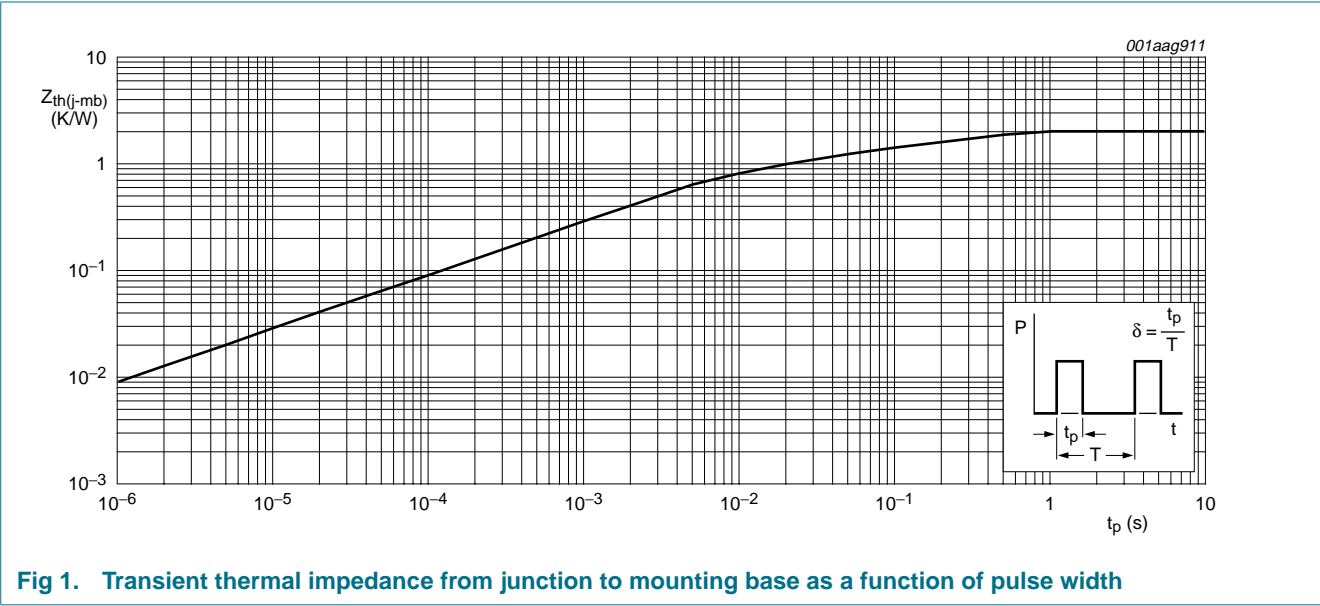
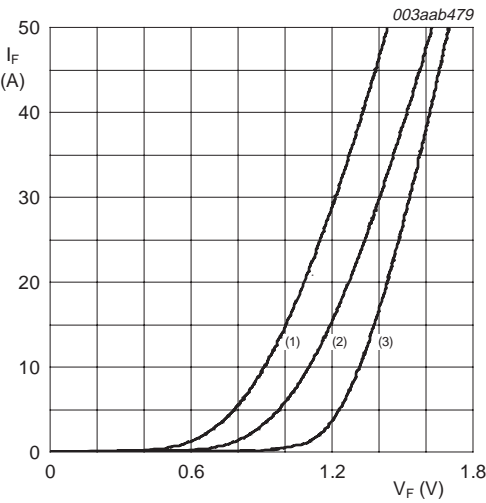


Fig 1. Transient thermal impedance from junction to mounting base as a function of pulse width

6. Characteristics

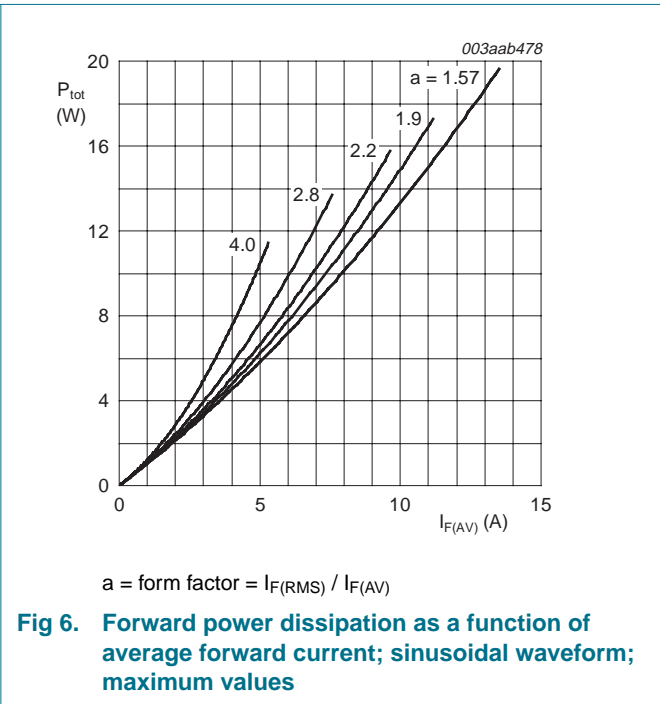
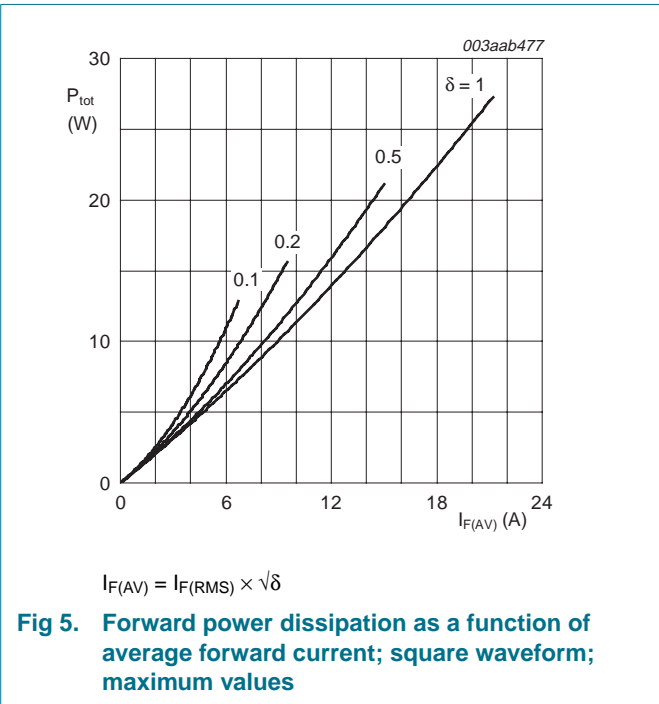
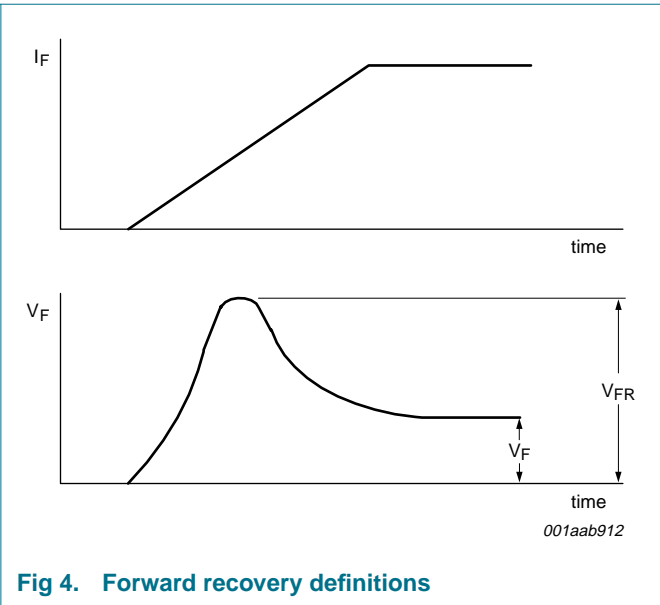
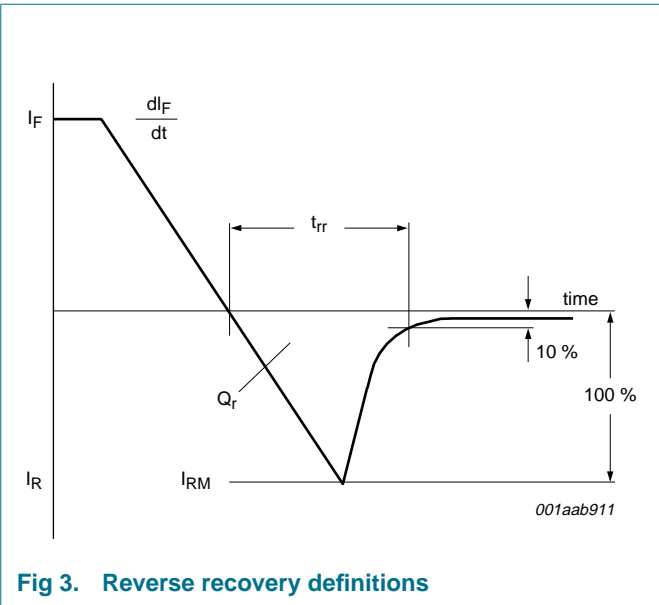
Table 5. Characteristics
T_j = 25 °C unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------------|-------------------------------|--|-----|------|------|------|
| Static characteristics | | | | | | |
| V _F | forward voltage | I _F = 15 A; T _j = 150 °C; see Figure 2 | - | 1.0 | 1.2 | V |
| | | I _F = 15 A; see Figure 2 | - | 1.17 | 1.38 | V |
| I _R | reverse current | V _R = 600 V | - | 5 | 50 | μA |
| | | V _R = 600 V; T _j = 100 °C | - | 0.2 | 0.8 | mA |
| Dynamic characteristics | | | | | | |
| Q _r | recovered charge | I _F = 2 A to V _R ≥ 30 V; dI _F /dt = 20 A/μs; see Figure 3 | - | 40 | 70 | nC |
| t _{rr} | reverse recovery time | I _F = 1 A to V _R ≥ 30 V; dI _F /dt = 100 A/μs; see Figure 3 | - | 50 | 60 | ns |
| I _{RM} | peak reverse recovery current | I _F = 10 A to V _R ≥ 30 V; dI _F /dt = 50 A/μs; T _j = 100 °C; see Figure 3 | - | 3.0 | 5.2 | A |
| V _{FR} | forward recovery voltage | I _F = 10 A; dI _F /dt = 10 A/μs; see Figure 4 | - | 3.2 | - | V |



- (1) T_j = 150 °C; typical values
- (2) T_j = 150 °C; maximum values
- (3) T_j = 25 °C; maximum values

Fig 2. Forward current as a function of forward voltage



7. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC

SOD59

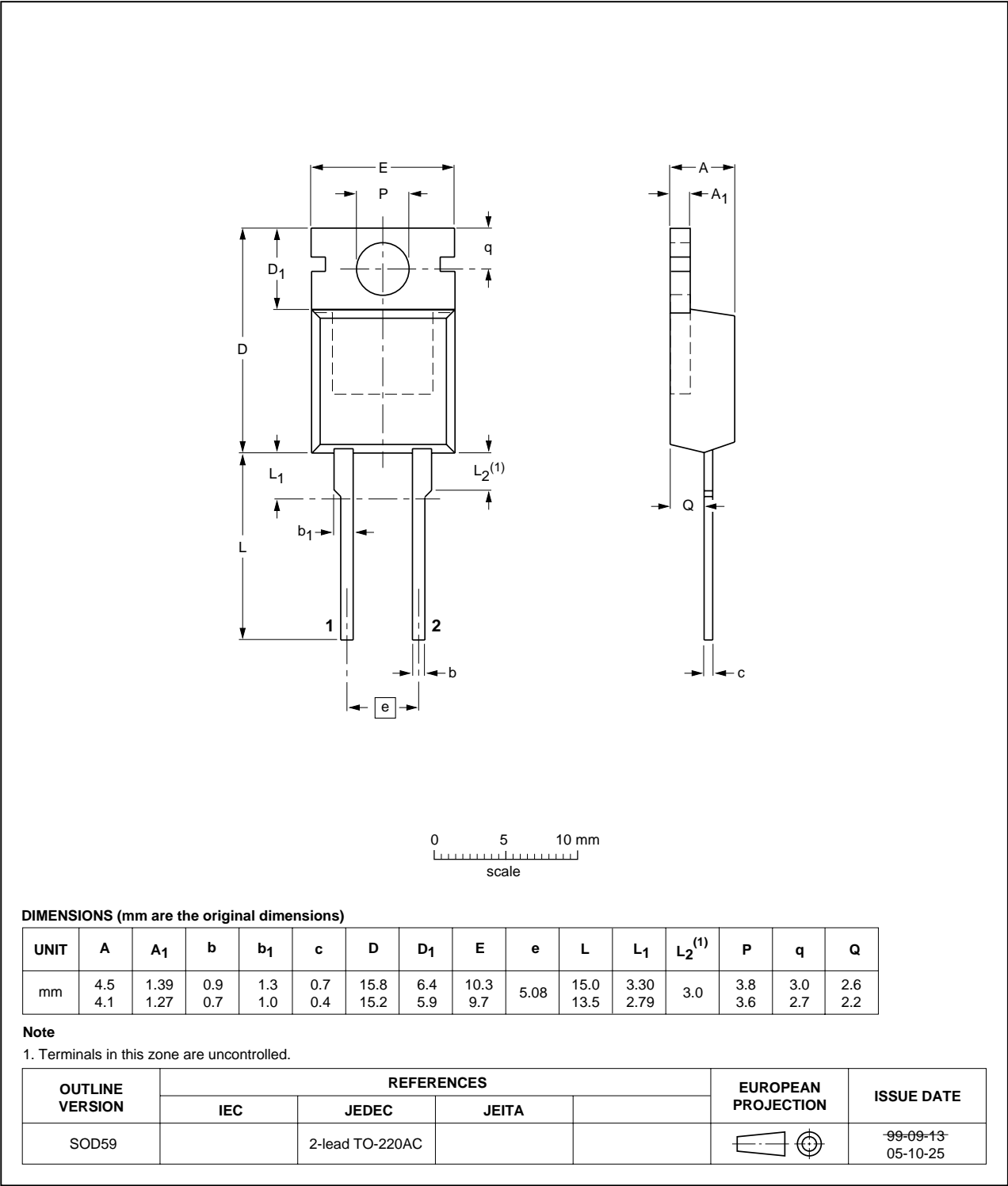


Fig 7. Package outline SOD59 (2-lead TO-220AC)

8. Revision history

Table 6. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-------------|--------------|--------------------|---------------|------------|
| BYT79-600_1 | 20071016 | Product data sheet | - | - |

9. Legal information

9.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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