

BYV29-600

Rectifier diode ultrafast

Rev. 02 — 24 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 forward voltage drop
- Low thermal resistance
- High thermal cycling performance

1.3 Applications

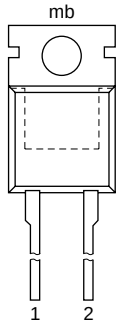
- High frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

1.4 Quick reference data

- $V_{RRM} \leq 600 \text{ V}$
- $V_F \leq 1.11 \text{ V}$
- $I_{F(AV)} \leq 9 \text{ A}$
- $t_{rr} \leq 60 \text{ ns}$

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode (k)		 001aaa020
2	anode (a)		
mb	mounting base; cathode		

SOD59 (2-lead TO-220AC)

3. Ordering information

Table 2. Ordering information

Type number	Package			Version
	Name	Description		
BYV29-600	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; $\delta = 1.0$; $T_{mb} \leq 100\text{ }^{\circ}\text{C}$	-	600	V
I _{F(AV)}	average forward current	square waveform; $\delta = 0.5$; $T_{mb} \leq 120\text{ }^{\circ}\text{C}$	-	9	A
I _{FRM}	repetitive peak forward current	square waveform; $\delta = 0.5$; $T_{mb} \leq 120\text{ }^{\circ}\text{C}$	-	18	A
I _{FSM}	non-repetitive peak forward current	t = 10 ms; sinusoidal waveform	-	70	A
		t = 8.3 ms; sinusoidal waveform	-	77	A
T _{stg}	storage temperature		-40	+150	°C
T _j	junction temperature		-	150	°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	-	-	2.5	K/W
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	-	60	-	K/W

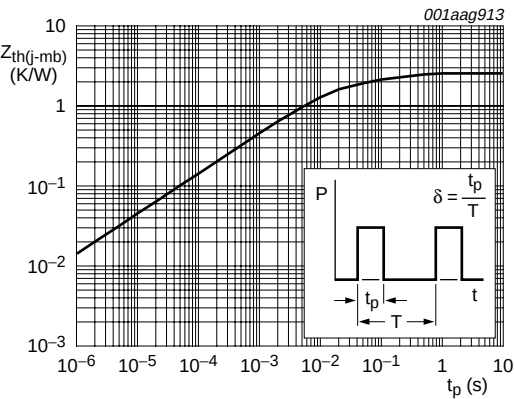
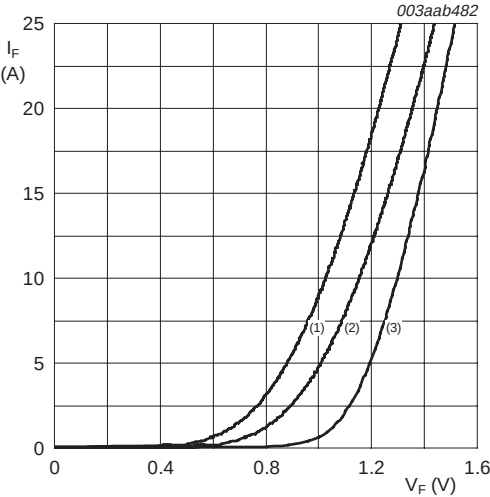


Fig 1. Transient thermal impedance from junction to mounting base as a function of pulse width

6. Characteristics

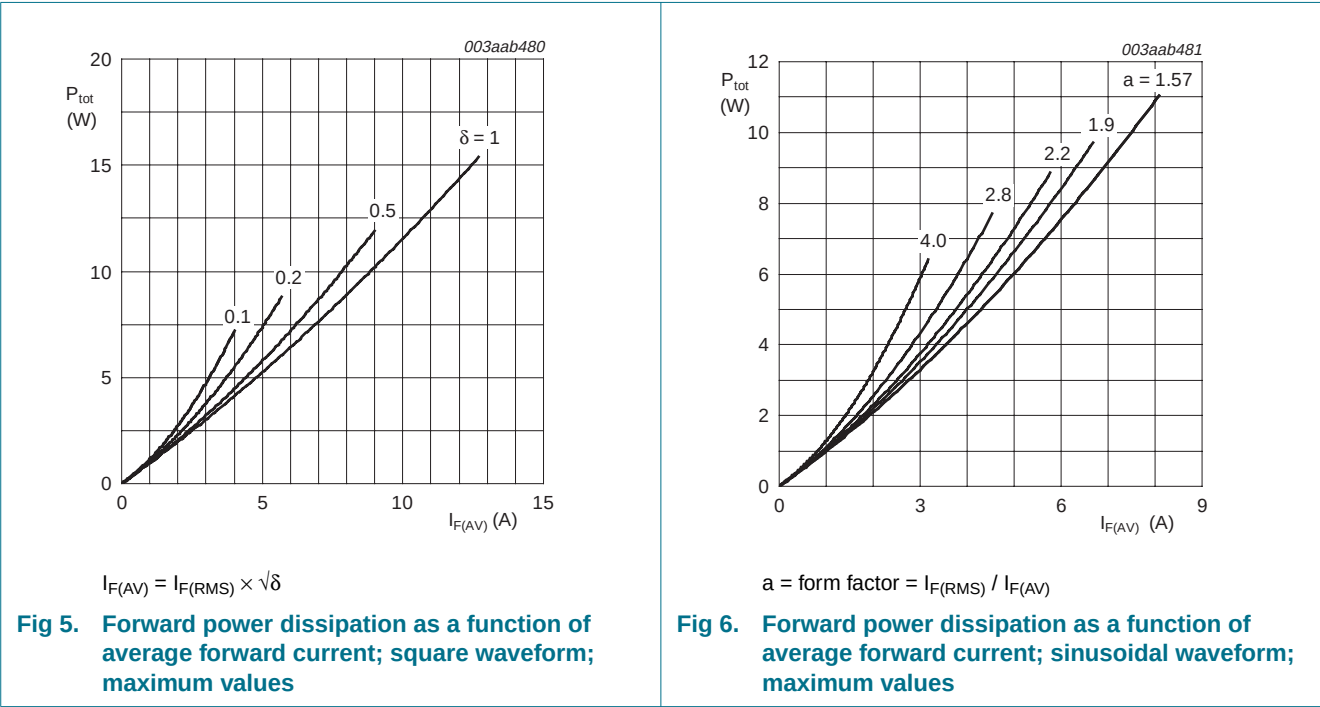
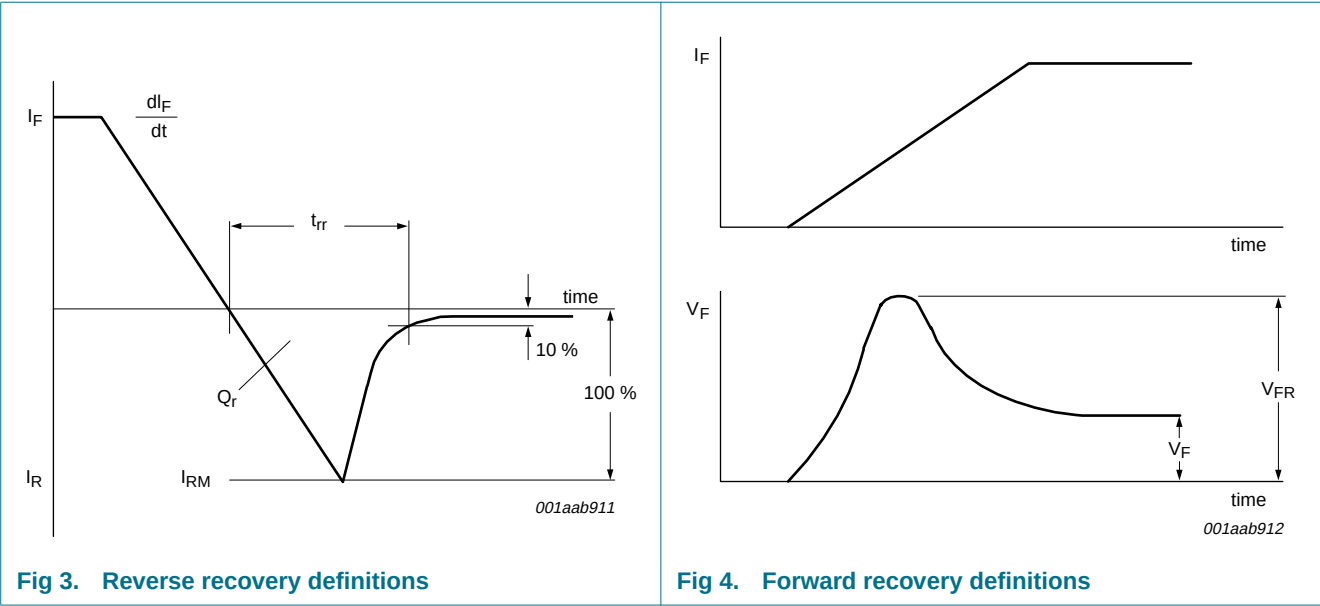
Table 5. Characteristics
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V _F	forward voltage	I _F = 8 A; T _j = 150 °C; see Figure 2	-	0.97	1.11	V
		I _F = 8 A	-	1.12	1.25	V
		I _F = 20 A; see Figure 2	-	1.31	1.45	V
I _R	reverse current	V _R = 600 V	-	2	50	μA
		V _R = 600 V; T _j = 100 °C	-	0.1	0.35	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	5.5	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

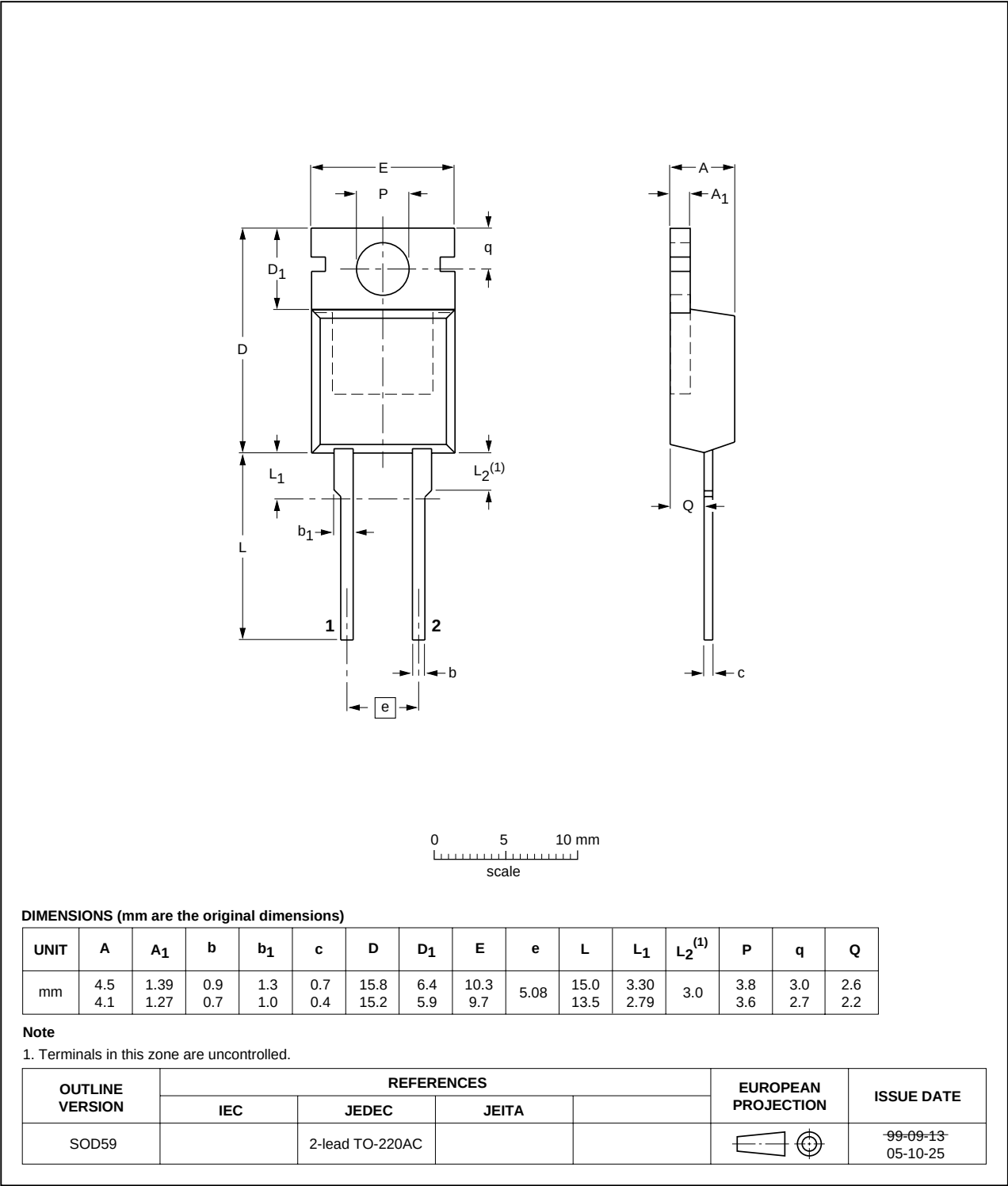


Fig 7. Package outline SOD59 (2-lead TO-220AC)

8. Revision history

Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV29-600_2	20071024	Product data sheet	-	BYV29-600_1
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Table 5 "Characteristics" on page 3: V_F values updated.			
BYV29-600_1	20000201	Product specification	-	-

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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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11. Contents

1 Product profile 1

1.1 General description..... 1

1.2 Features 1

1.3 Applications 1

1.4 Quick reference data..... 1

2 Pinning information..... 1

3 Ordering information..... 2

4 Limiting values..... 2

5 Thermal characteristics..... 2

6 Characteristics..... 3

7 Package outline 5

8 Revision history..... 6

9 Legal information..... 7

9.1 Data sheet status 7

9.2 Definitions..... 7

9.3 Disclaimers..... 7

9.4 Trademarks..... 7

10 Contact information..... 7

11 Contents 8



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