

# IMPORTANT NOTICE

10 December 2015

## 1. Global joint venture starts operations as WeEn Semiconductors

Dear customer,

As from November 9th, 2015 NXP Semiconductors N.V. and Beijing JianGuang Asset Management Co. Ltd established Bipolar Power joint venture (JV), **WeEn Semiconductors**, which will be used in future Bipolar Power documents together with new contact details.

In this document where the previous NXP references remain, please use the new links as shown below.

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Thank you for your cooperation and understanding,

WeEn Semiconductors



# BYV29F-600

## Enhanced ultrafast power diode

Rev. 02 — 7 March 2011

Product data sheet

## 1. Product profile

### 1.1 General description

Enhanced ultrafast power diode in a SOD59 (2-lead TO-220AC) plastic package.

### 1.2 Features and benefits

- High thermal cycling performance
- Low on-state losses
- Low thermal resistance
- Soft recovery characteristic

### 1.3 Applications

- Dual Mode (DCM and CCM) PFC
- Power Factor Correction (PFC) for Interleaved Topology

### 1.4 Quick reference data

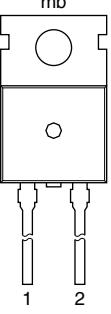
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	-	600	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 115$ °C; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a>	-	-	9	A
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8$ A; $T_j = 25$ °C; see <a href="#">Figure 5</a>	-	1.45	1.9	V
		$I_F = 8$ A; $T_j = 150$ °C; see <a href="#">Figure 5</a>	-	1.25	1.7	V
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $dI_F/dt = 100$ A/μs; $T_j = 25$ °C; see <a href="#">Figure 6</a>	-	17.5	35	ns



## 2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
mb	mb	mounting base; cathode		

SOD59 (TO-220AC)

## 3. Ordering information

Table 3. Ordering information

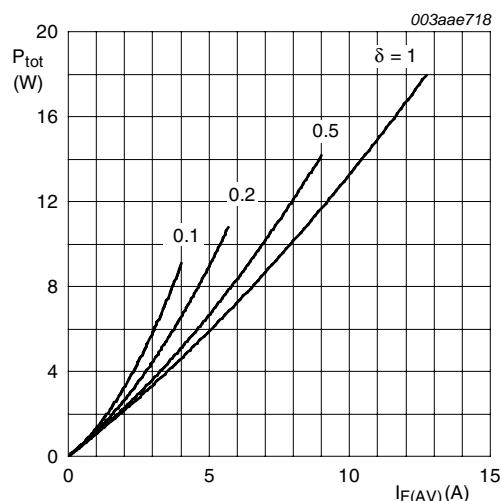
Type number	Package			Version
	Name	Description	Version	
BYV29F-600	TO-220AC	plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC		SOD59

## 4. Limiting values

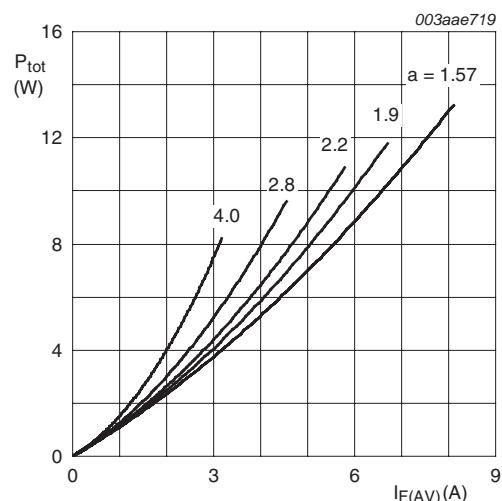
Table 4. Limiting values

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

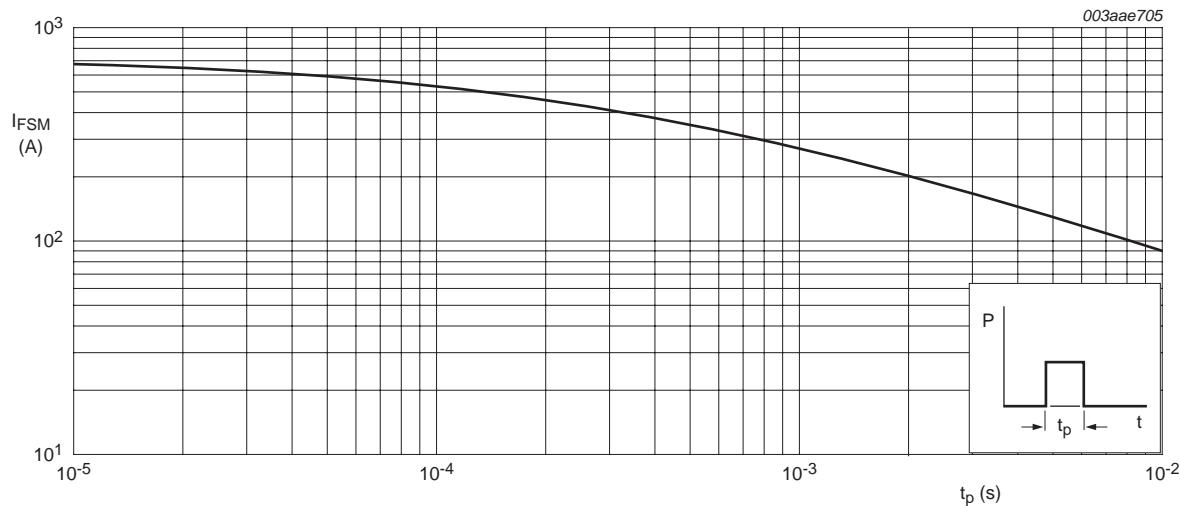
Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	600	V
$V_{RWM}$	crest working reverse voltage		-	600	V
$V_R$	reverse voltage	DC	-	600	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 115$ °C; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a>	-	9	A
$I_{FRM}$	repetitive peak forward current	square-wave pulse; $\delta = 0.5$ ; $t_p = 25$ $\mu$ s; $T_{mb} \leq 115$ °C	-	18	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; see <a href="#">Figure 3</a>	-	91	A
		$t_p = 8.3$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; see <a href="#">Figure 3</a>	-	100	A
$T_{stg}$	storage temperature		-40	150	°C
$T_j$	junction temperature		-	150	°C



**Fig 1. Forward power dissipation as a function of average forward current; square waveform; maximum values**



**Fig 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values**



**Fig 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values**

## 5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	see <a href="#">Figure 4</a>	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W

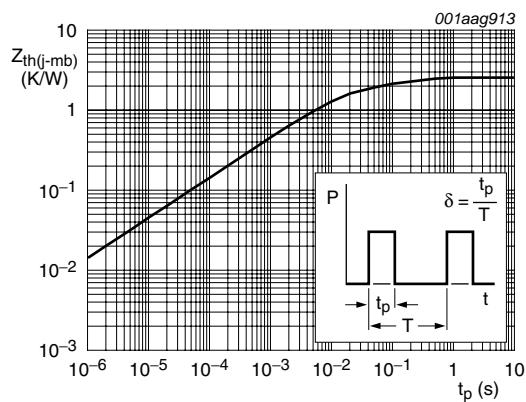
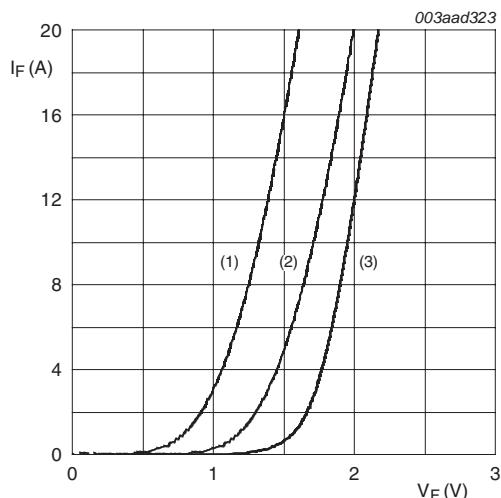


Fig 4. Transient thermal impedance from junction to mounting base as a function of pulse width

## 6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8 \text{ A}; T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 5</a>	-	1.45	1.9	V
		$I_F = 8 \text{ A}; T_j = 150 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 5</a>	-	1.25	1.7	V
$I_R$	reverse current	$V_R = 600 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$	-	-	1.5	mA
		$V_R = 600 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	50	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}$ ; see <a href="#">Figure 6</a>	-	13	-	nC
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 6</a>	-	17.5	35	ns
$I_{RM}$	peak reverse recovery current	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}$ ; see <a href="#">Figure 6</a>	-	1.5	-	A
$V_{FR}$	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 100 \text{ A}/\mu\text{s}$ ; see <a href="#">Figure 7</a>	-	3.2	-	V



- (1)  $T_j = 150 \text{ }^\circ\text{C}$ ; typical values
- (2)  $T_j = 150 \text{ }^\circ\text{C}$ ; maximum values
- (3)  $T_j = 25 \text{ }^\circ\text{C}$ ; maximum values

Fig 5. Forward current as a function of forward voltage

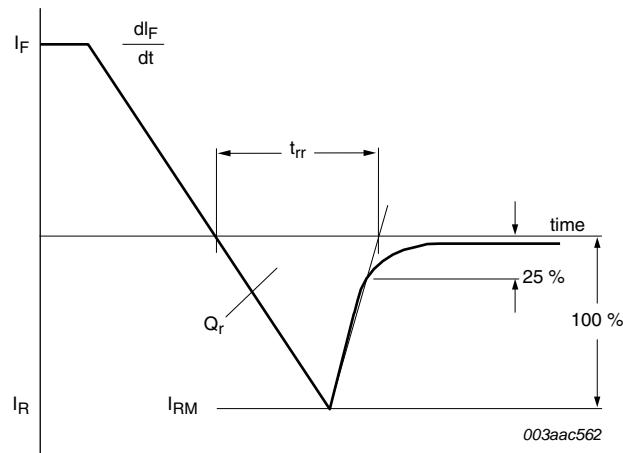


Fig 6. Reverse recovery definitions; ramp recovery

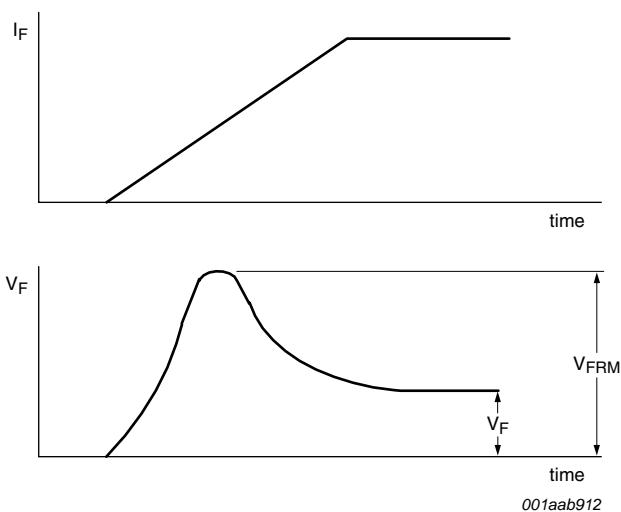


Fig 7. Forward recovery definitions

## 7. Package outline

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

SOD59

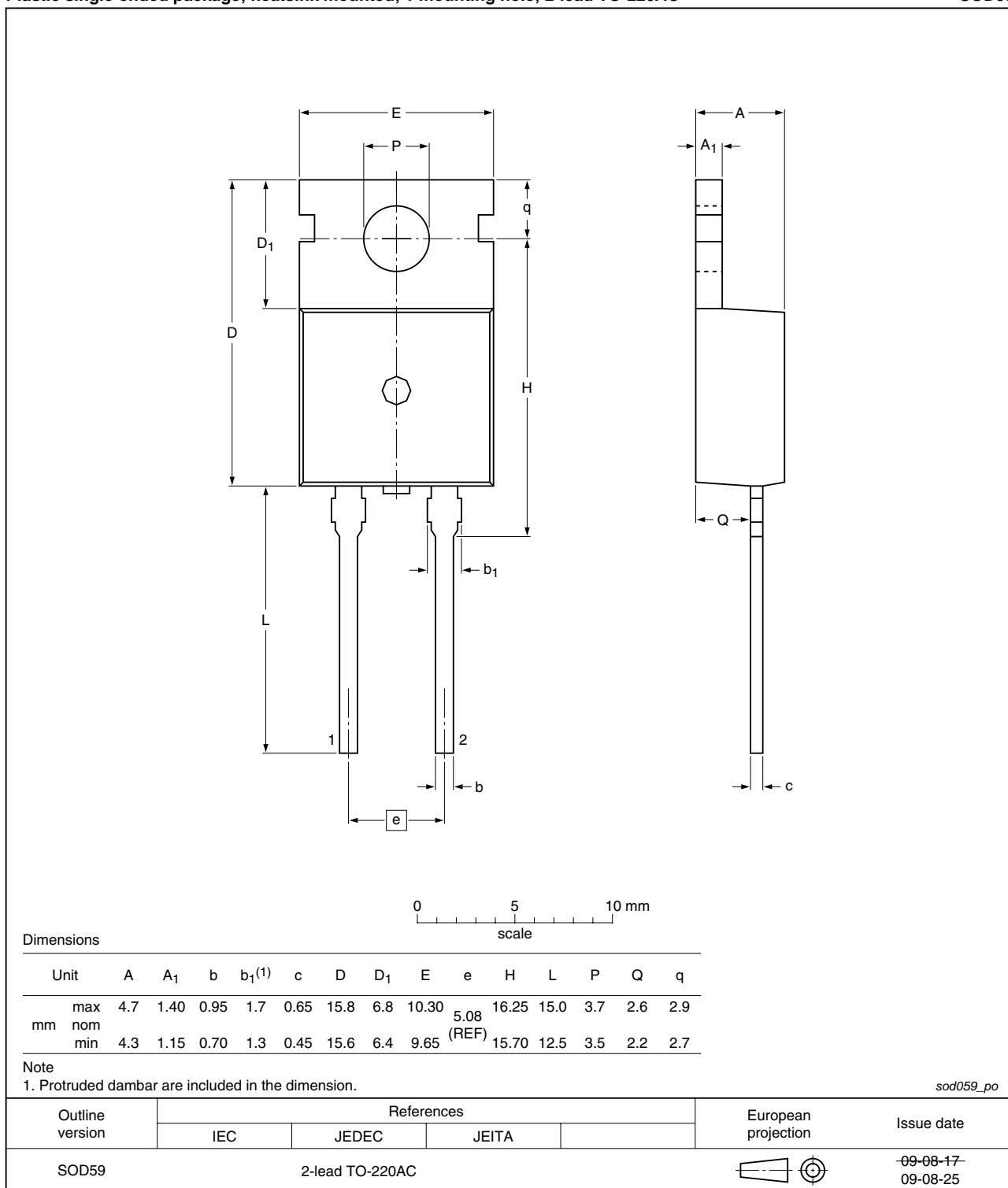


Fig 8. Package outline SOD59 (TO-220AC)

## 8. Revision history

**Table 7. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV29F-600 v.2	20110307	Product data sheet	-	BYV29F-600 v.1
Modifications:		• Various changes to content.		
BYV29F-600 v.1	20100907	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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Date of release: 7 March 2011

Document identifier: BYV29F-600