



# 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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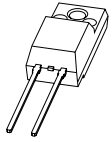
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Thank you for your cooperation and understanding,

WeEn Semiconductors





# BYV25X-600

Rectifier diode, ultrafast

Rev. 01 — 12 August 2008

Product data sheet

## 1. Product profile

### 1.1 General description

Ultrafast epitaxial rectifier diode in a SOD113 (TO-220F) plastic package.

### 1.2 Features

- Fast switching
- Soft recovery characteristic
- Low forward voltage drop
- Low thermal resistance
- Isolated package

### 1.3 Applications

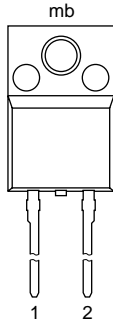

- High frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

### 1.4 Quick reference data

- $V_{RRM} \leq 600$  V
- $V_F \leq 1.11$  V
- $I_{F(AV)} \leq 5$  A
- $t_{rr} \leq 60$  ns

## 2. Pinning information

Table 1. Pinning

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

SOD113 (2-lead TO-220F)

### 3. Ordering information

**Table 2. Ordering information**

Type number	Package		Version
	Name	Description	
BYV25X-600	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 2-lead TO-220 'full pack'	SOD113

### 4. Limiting values

**Table 3. Limiting values**

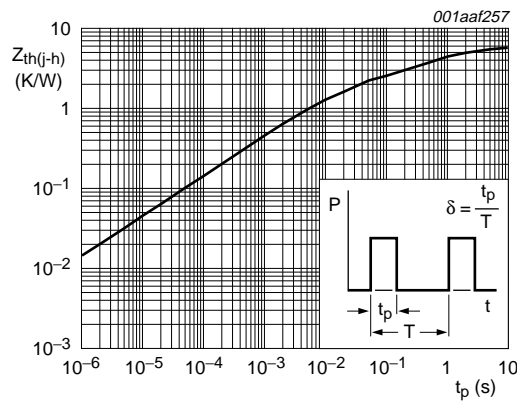
*In accordance with the Absolute Maximum Rating System (IEC 60134).*

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; $\delta = 1.0$ ; $T_h \leq 100$ °C	-	600	V
$I_{F(AV)}$	average forward current	square waveform; $\delta = 0.5$ ; $T_h \leq 115$ °C	-	5	A
$I_{FRM}$	repetitive peak forward current	square waveform; $\delta = 0.5$ ; $T_h \leq 115$ °C	-	10	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10$ ms; sinusoidal waveform	-	60	A
		$t = 8.3$ ms; sinusoidal waveform	-	66	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
$R_{th(j-h)}$	thermal resistance from junction to heatsink	with heatsink compound; see <a href="#">Figure 1</a>	-	-	5.5	K/W
		without heatsink compound	-	-	5.9	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 heatsink as a function of pulse width**

## 6. Isolation characteristics

**Table 5. Isolation limiting values and characteristics**

$T_h = 25^\circ\text{C}$  unless otherwise specified.

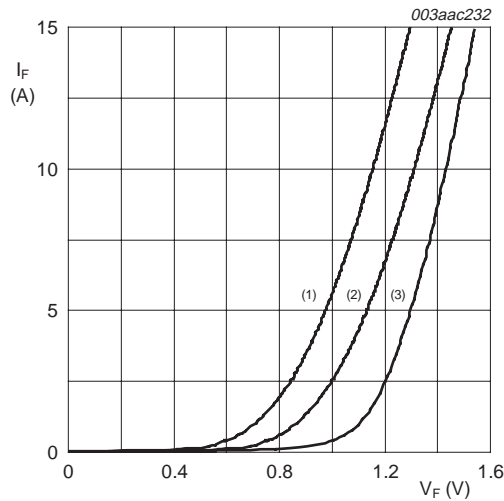
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	from all terminals to external heatsink; $f = 50 \text{ Hz to } 60 \text{ Hz}$ ; sinusoidal waveform; relative humidity $\leq 65 \%$ ; clean and dust free	-	-	2500	V
$C_{isol}$	isolation capacitance	from cathode to external heatsink; $f = 1 \text{ MHz}$	-	10	-	pF

## 7. Characteristics

**Table 6. Characteristics**

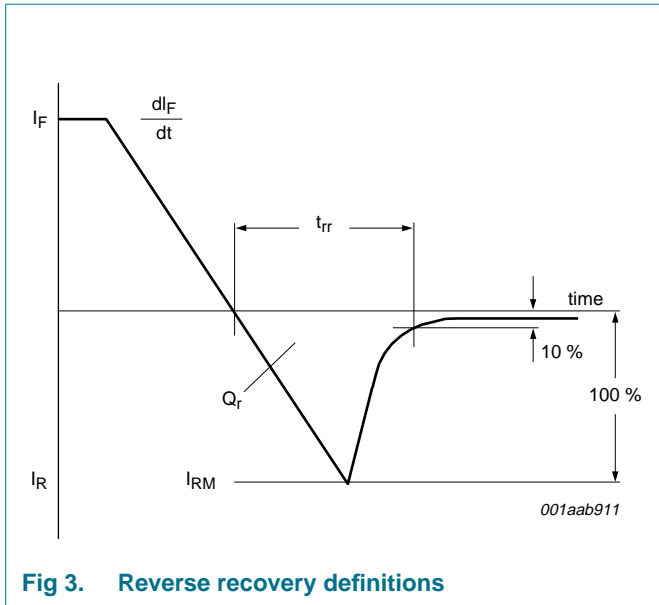
$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 5\text{ A}$ ; $T_j = 150\text{ }^\circ\text{C}$ ; see <a href="#">Figure 2</a>	-	0.97	1.11	V
		$I_F = 5\text{ A}$	-	1.12	1.30	V
$I_R$	reverse current	$V_R = 600\text{ V}$	-	2	50	$\mu\text{A}$
		$V_R = 600\text{ V}$ ; $T_j = 100\text{ }^\circ\text{C}$	-	0.1	0.35	mA
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 2\text{ A}$ to $V_R \geq 30\text{ V}$ ; $di_F/dt = 20\text{ A}/\mu\text{s}$ ; see <a href="#">Figure 3</a>	-	40	70	nC
$t_{rr}$	reverse recovery time	$I_F = 1\text{ A}$ to $V_R \geq 30\text{ V}$ ; $di_F/dt = 100\text{ A}/\mu\text{s}$ ; see <a href="#">Figure 3</a>	-	50	60	ns
$I_{RM}$	peak reverse recovery current	$I_F = 10\text{ A}$ to $V_R \geq 30\text{ V}$ ; $di_F/dt = 50\text{ A}/\mu\text{s}$ ; $T_j = 100\text{ }^\circ\text{C}$ ; see <a href="#">Figure 3</a>	-	3	5.5	A
$V_{FR}$	forward recovery voltage	$I_F = 10\text{ A}$ ; $di_F/dt = 10\text{ A}/\mu\text{s}$ ; see <a href="#">Figure 4</a>	-	3.2	-	V

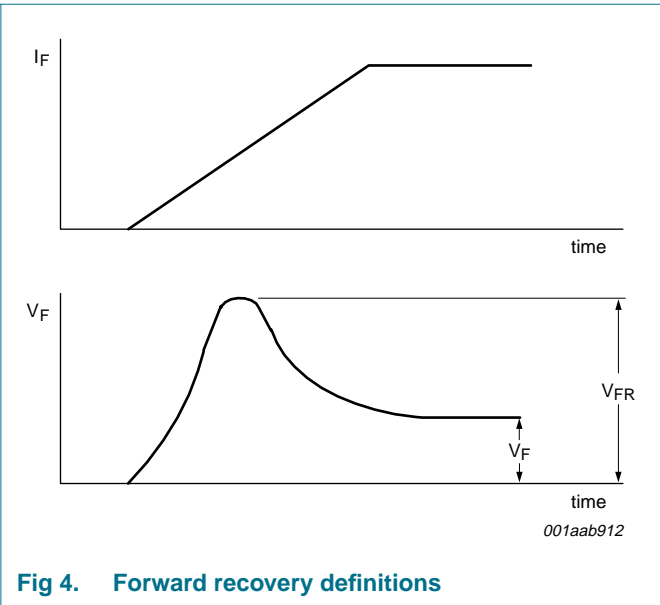


- (1)  $T_j = 150\text{ }^\circ\text{C}$ ; typical values
- (2)  $T_j = 150\text{ }^\circ\text{C}$ ; maximum values
- (3)  $T_j = 25\text{ }^\circ\text{C}$ ; maximum values

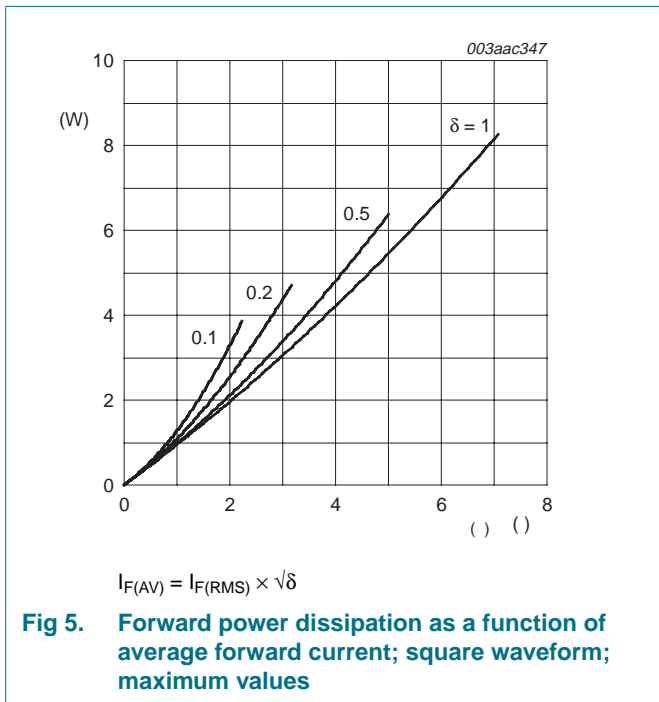
**Fig 2. Forward current as a function of forward voltage**



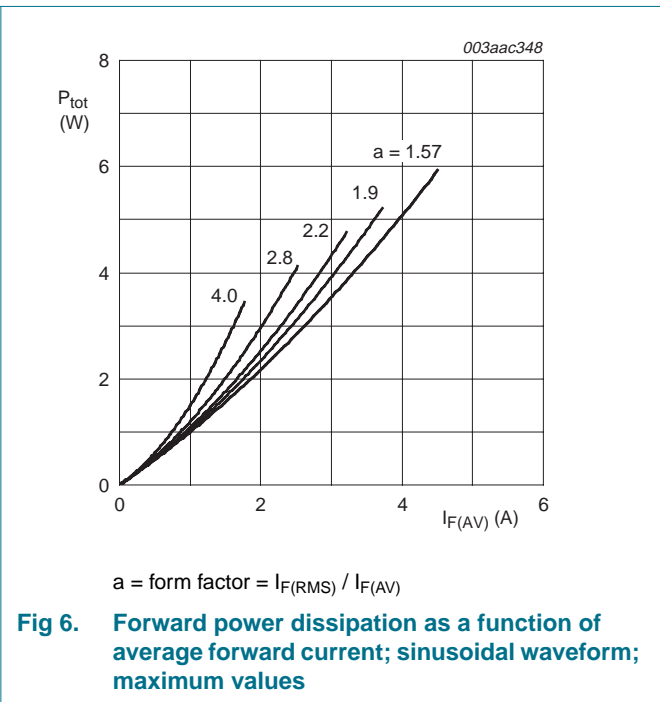
**Fig 3. Reverse recovery definitions**



**Fig 4. Forward recovery definitions**



**Fig 5. Forward power dissipation as a function of average forward current; square waveform; maximum values**



**Fig 6. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values**

8. Package outline

Plastic single-ended package; isolated heatsink mounted;  
1 mounting hole; 2-lead TO-220 'full pack'

SOD113

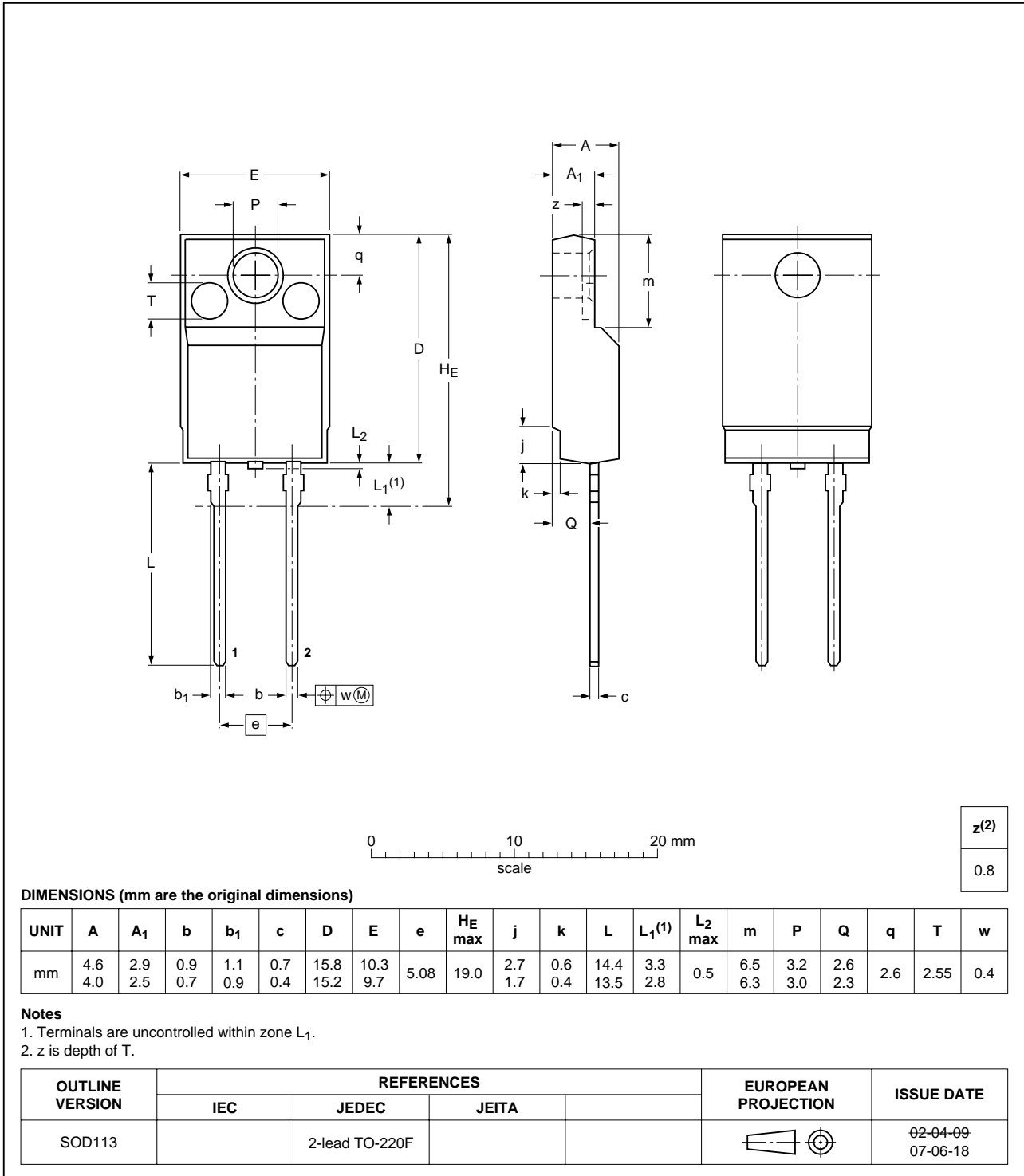


Fig 7. Package outline SOD113 (2-lead TO-220F)

## 9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV25X-600_1	20080812	Product data sheet	-	-



## 10. Legal information

### 10.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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