



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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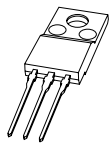
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Thank you for your cooperation and understanding,

WeEn Semiconductors



BYV34X-600

Dual rectifier diode ultrafast

Rev. 01 — 13 September 2007

Product data sheet

1. Product profile

1.1 General description

Ultrafast, dual common cathode, epitaxial rectifier diode in a SOT186A (TO-220F)) plastic package.

1.2 Features

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

- $V_{RRM} \leq 600 \text{ V}$
- $V_F \leq 1.16 \text{ V}$
- $I_{O(AV)} \leq 20 \text{ A}$
- $t_{rr} \leq 60 \text{ ns}$

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	anode 1		 sym084
2	cathode		
3	anode 2		
mb	mounting base; isolated		
		SOT186A (3-lead TO-220F)	

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BYV34X-600	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 'full pack'	SOT186A

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; $\delta = 1.0$; $T_h \leq 100\text{ }^{\circ}\text{C}$	-	600	V
$I_{O(AV)}$	average output current	square waveform; $\delta = 0.5$; $T_h \leq 44\text{ }^{\circ}\text{C}$; both diodes conducting	-	20	A
I_{FRM}	repetitive peak forward current	$t = 25\text{ }\mu\text{s}$; square waveform; $\delta = 0.5$; $T_h \leq 44\text{ }^{\circ}\text{C}$; per diode	-	20	A
I_{FSM}	non-repetitive peak forward current	$t = 10\text{ ms}$; sinusoidal waveform; per diode	-	120	A
		$t = 8.3\text{ ms}$; sinusoidal waveform; per diode	-	132	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-h)}	thermal resistance from junction to heatsink	with heatsink compound; per diode; see Figure 1	-	-	5.0	K/W
		with heatsink compound; both diodes conducting	-	-	4.0	K/W
		without heatsink compound; per diode	-	-	7.0	K/W
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	-	55	-	K/W

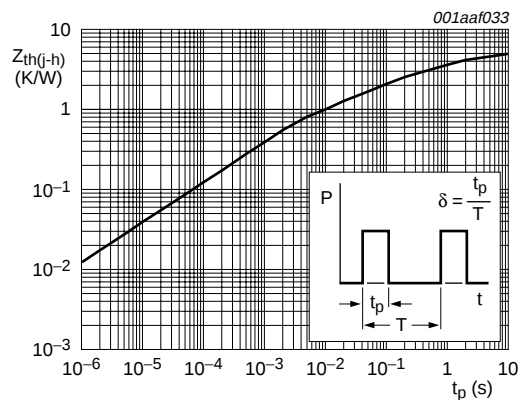


Fig 1. Transient thermal impedance from junction to heatsink as a function of pulse width

6. Isolation characteristics

Table 5. Isolation limiting values and characteristics

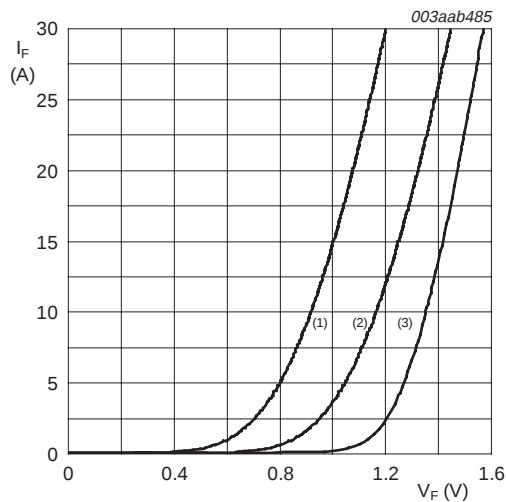
T_h = 25 °C unless otherwise specified.

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

7. Characteristics

Table 6. Characteristics
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V _F	forward voltage	I _F = 10 A; T _J = 150 °C; see Figure 2	-	0.92	1.16	V
		I _F = 10 A; see Figure 2	-	1.07	1.36	V
I _R	reverse current	V _R = 600 V	-	10	50	μA
		V _R = 600 V; T _J = 100 °C	-	0.2	0.6	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	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

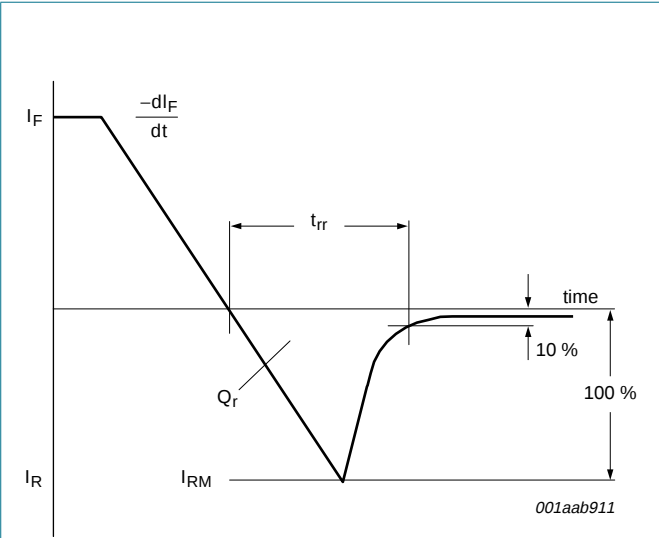


Fig 3. Reverse recovery definitions

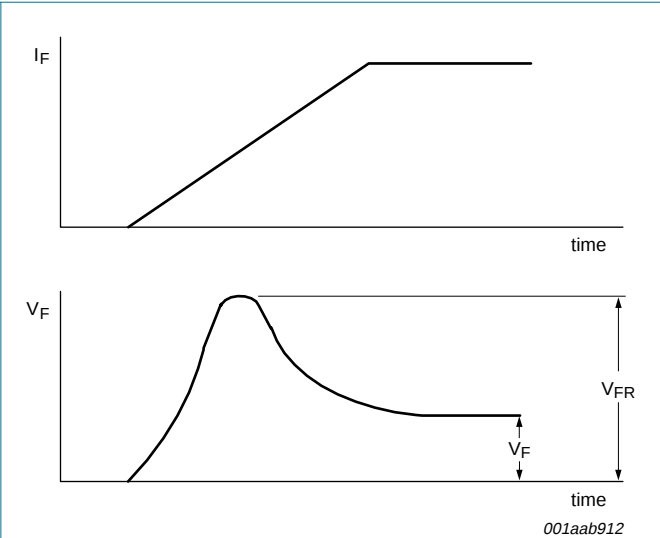
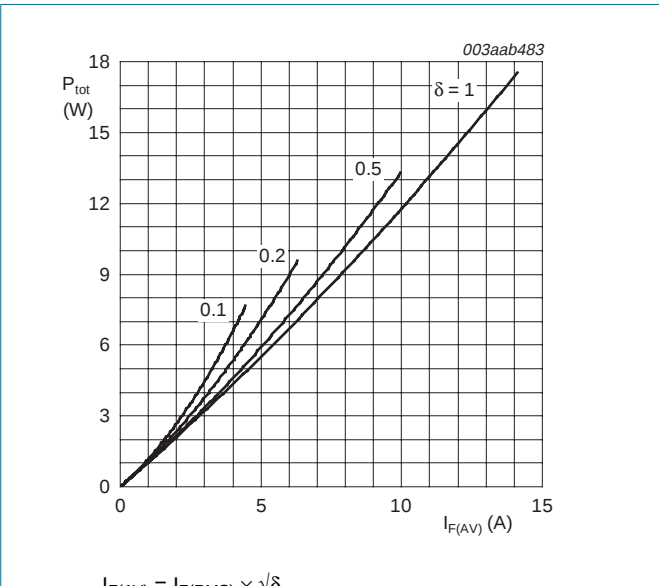
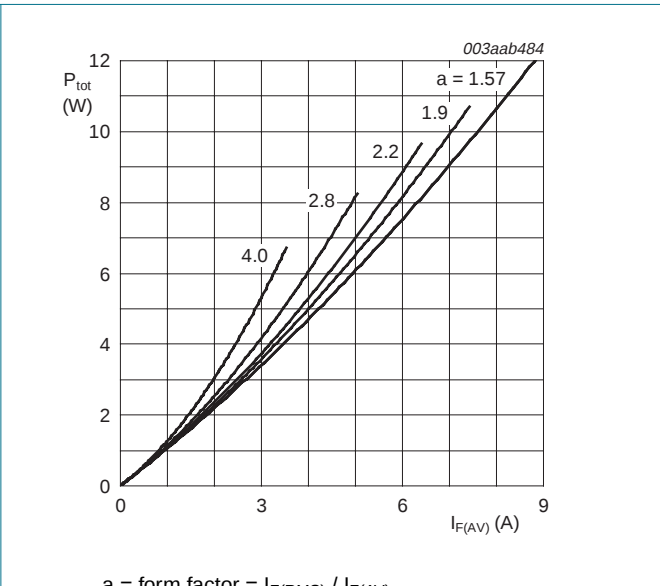


Fig 4. Forward recovery definitions



$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$

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



$$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$$

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; 3-lead TO-220 'full pack'

SOT186A

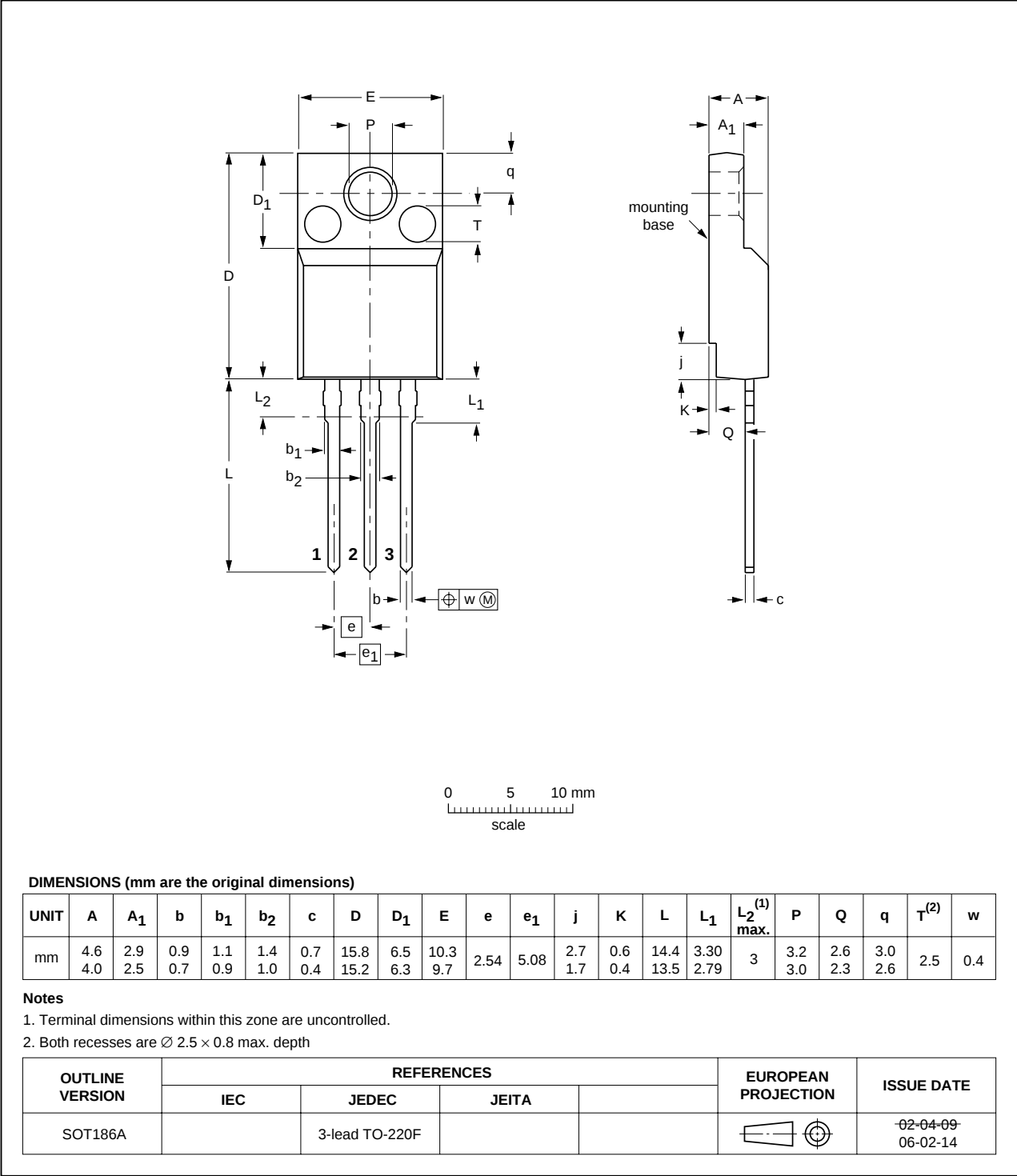


Fig 7. Package outline SOT186A (3-lead TO-220F)

9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV34X-600_1	20070913	Product data sheet	-	-

10. Legal information

10.1 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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