



IMPORTANT NOTICE

10 December 2015

1. Global joint venture starts operations as WeEn Semiconductors

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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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WeEn Semiconductors





NXPS20H100CX

Dual power Schottky diode

Rev. 2 — 24 May 2012

Product data sheet

1. Product profile

1.1 General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a SOT186A (TO-220F) "full pack" plastic package.

1.2 Features and benefits

- High junction temperature capability
- Isolated package
- Low leakage current
- Negligible switching losses
- Optimised design to give low V_F and high $T_{j(max)}$

1.3 Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode
- Switched mode power supply rectifier

1.4 Quick reference data

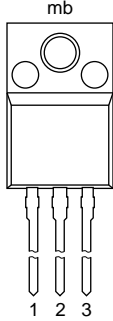
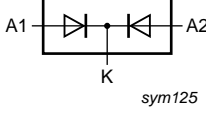
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	-	100	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_h \leq 147$ °C; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$; $T_h \leq 128$ °C; both diodes conducting	-	-	20	A
T_j	junction temperature		-	-	175	°C
Static characteristics						
V_F	forward voltage	$I_F = 10$ A; $T_j = 25$ °C; see Figure 6	-	-	0.77	V
		$I_F = 10$ A; $T_j = 125$ °C; see Figure 6	-	0.59	0.64	V
I_R	reverse current	$V_R = 100$ V; $T_j = 25$ °C; see Figure 7	-	2	4.5	μ A
		$V_R = 100$ V; $T_j = 125$ °C; see Figure 7	-	1	6	mA



2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		
2	K	cathode		
3	A2	anode 2		
mb	n.c.	mb; isolated		

SOT186A (TO-220F)

3. Ordering information

Table 3. Ordering information

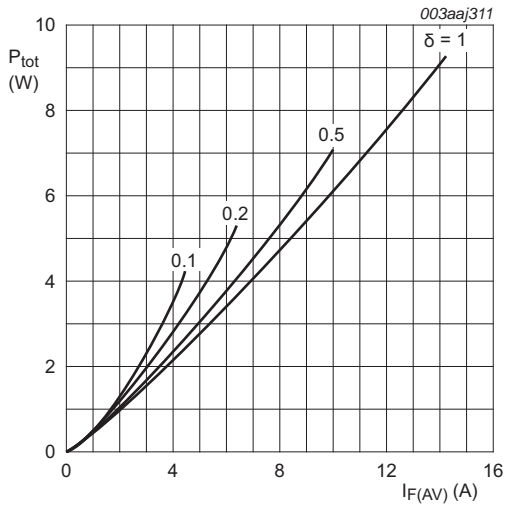
Type number	Package		
	Name	Description	Version
NXPS20H100CX	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 "full pack"	SOT186A

4. Limiting values

Table 4. Limiting values

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

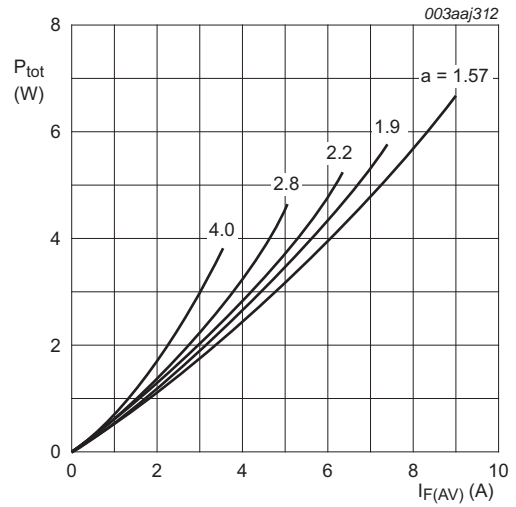
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	100	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_h \leq 147$ °C; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$; $T_h \leq 128$ °C; both diodes conducting	-	20	A
I_{FSM}	non-repetitive peak forward current	sine-wave pulse; $t_p = 10$ ms; $T_{j(init)} = 25$ °C; see Figure 4	-	250	A
T_{stg}	storage temperature		-65	175	°C
T_j	junction temperature		-	175	°C



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

$V_O = 0.516 \text{ V}; R_S = 0.010 \Omega$

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



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

$V_O = 0.516 \text{ V}; R_S = 0.010 \Omega$

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

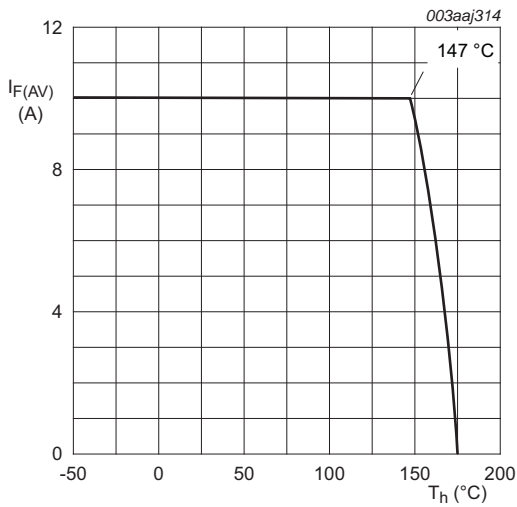


Fig 3. Average forward current as a function of heatsink temperature; per diode; maximum values

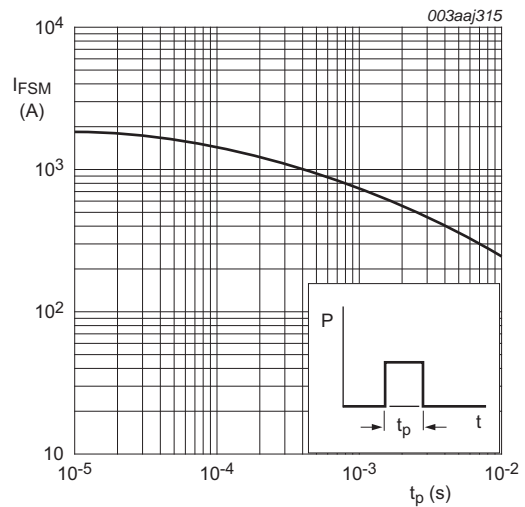


Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values

5. Thermal characteristics

Table 5. 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 5	-	-	4	K/W
		with heatsink compound; both diodes conducting	-	-	3.2	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	55	-	K/W

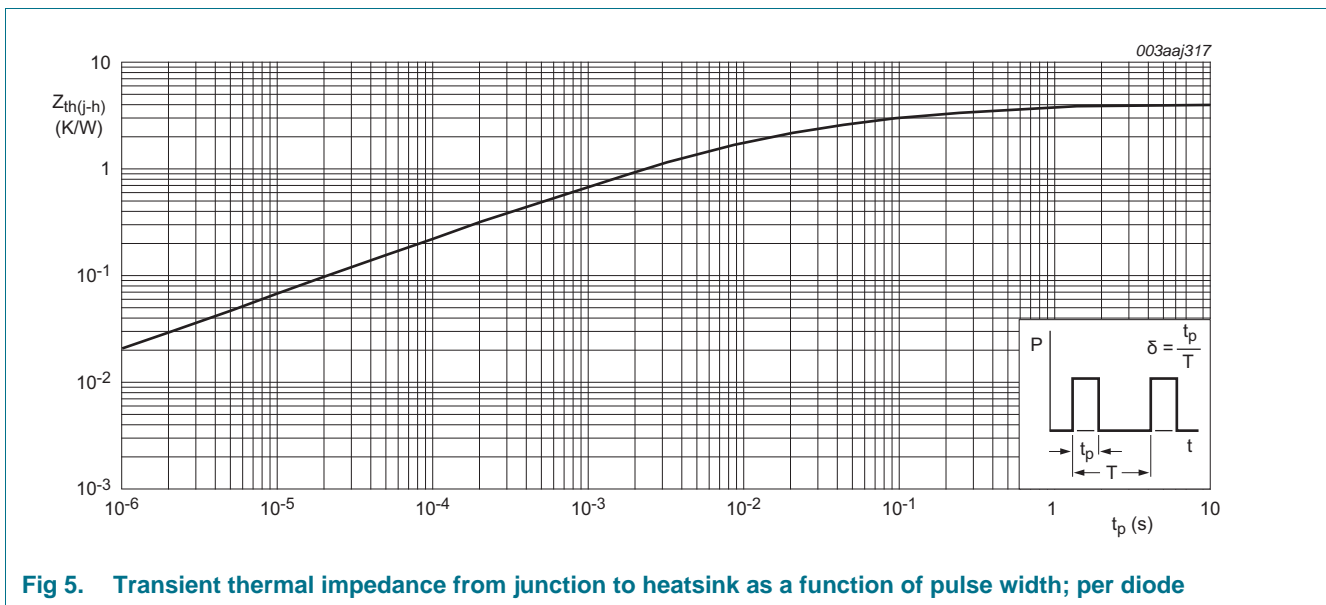


Fig 5. Transient thermal impedance from junction to heatsink as a function of pulse width; per diode

6. Isolation characteristics

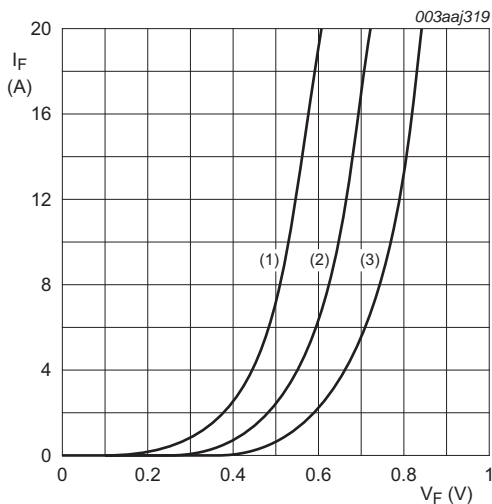
Table 6. Isolation characteristics

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

7. Characteristics

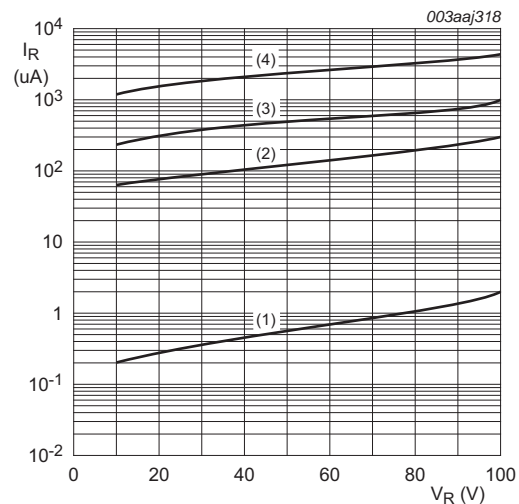
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 8 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 6	-	-	0.71	V
		$I_F = 10 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 6	-	-	0.77	V
		$I_F = 16 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 6	-	-	0.81	V
		$I_F = 20 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 6	-	-	0.88	V
		$I_F = 8 \text{ A}; T_j = 125 \text{ }^\circ\text{C};$ see Figure 6	-	0.56	0.58	V
		$I_F = 10 \text{ A}; T_j = 125 \text{ }^\circ\text{C};$ see Figure 6	-	0.59	0.64	V
		$I_F = 16 \text{ A}; T_j = 125 \text{ }^\circ\text{C};$ see Figure 6	-	0.65	0.68	V
I_R	reverse current	$V_R = 100 \text{ V}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 7	-	2	4.5	μA
		$V_R = 100 \text{ V}; T_j = 125 \text{ }^\circ\text{C};$ see Figure 7	-	1	6	mA
Dynamic characteristics						
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 10 \text{ V}; T_j = 25 \text{ }^\circ\text{C};$ see Figure 8	-	250	-	pF



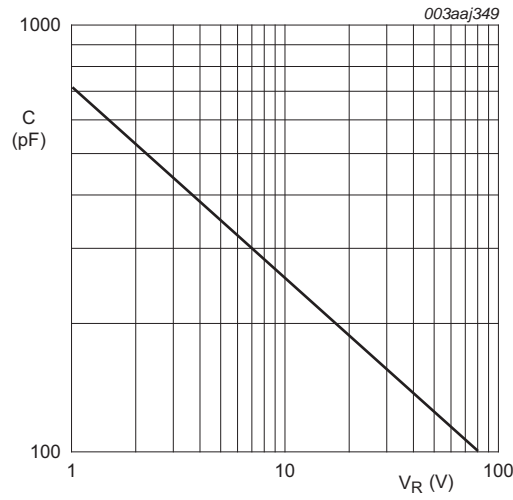
(1) $T_j = 125 \text{ }^\circ\text{C};$ typical values;
 (2) $T_j = 125 \text{ }^\circ\text{C};$ maximum values;
 (3) $T_j = 25 \text{ }^\circ\text{C};$ maximum values;
 $V_O = 0.516 \text{ V}; R_S = 0.010 \text{ } \Omega$

Fig 6. Forward current as a function of forward voltage; per diode



(1) $T_j = 25 \text{ }^\circ\text{C};$ typical values;
 (2) $T_j = 100 \text{ }^\circ\text{C};$ typical values;
 (3) $T_j = 125 \text{ }^\circ\text{C};$ typical values;
 (4) $T_j = 150 \text{ }^\circ\text{C};$ typical values

Fig 7. Reverse leakage current as a function of reverse voltage; per diode; typical values



$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}$

Fig 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

8. Package outline

Plastic single-ended package; isolated heatsink mounted;
1 mounting hole; 3-lead TO-220 'full pack'

SOT186A

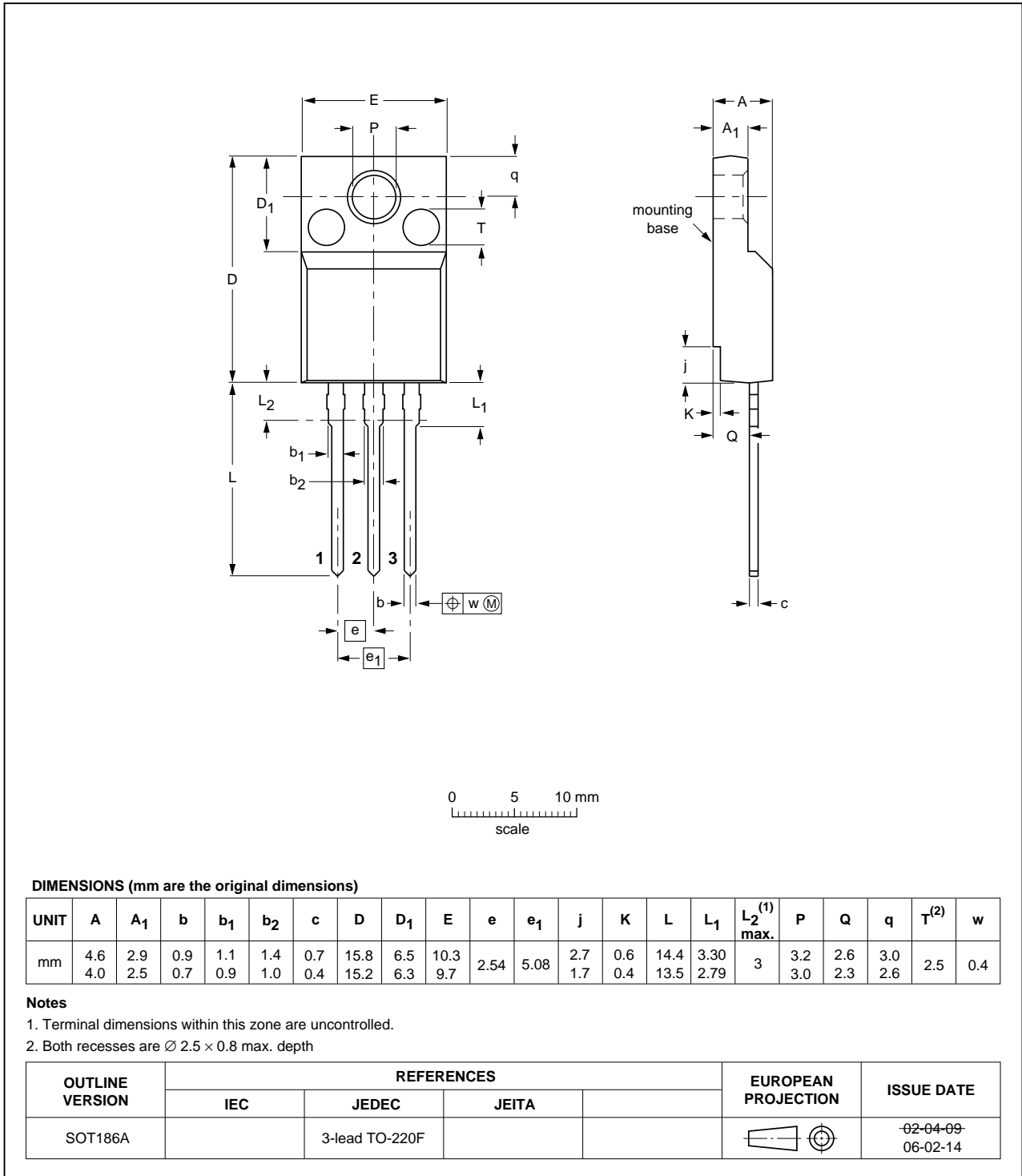


Fig 9. Package outline SOT186A (TO-220F)

9. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NXPS20H100CX v.2	20120524	Product data sheet	-	NXPS20H100CX v.1
Modifications:	<ul style="list-style-type: none">• Status changed from preliminary to product.• Various changes to content.			
NXPS20H100CX v.1	20120420	Preliminary 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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12. Contents

1 Product profile1

1.1 General description1

1.2 Features and benefits1

1.3 Applications1

1.4 Quick reference data1

2 Pinning information2

3 Ordering information2

4 Limiting values2

5 Thermal characteristics4

6 Isolation characteristics4

7 Characteristics5

8 Package outline7

9 Revision history8

10 Legal information9

10.1 Data sheet status9

10.2 Definitions9

10.3 Disclaimers9

10.4 Trademarks10

11 Contact information10

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

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