



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

### 1.3 Applications

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

### 1.4 Quick reference data

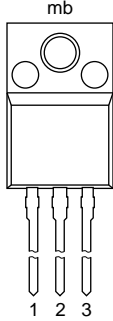
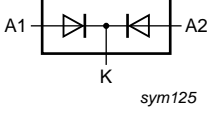
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	-	100	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$ ; $T_h \leq 147^\circ\text{C}$ ; per diode; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a> ; see <a href="#">Figure 3</a>	-	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$ ; $T_h \leq 128^\circ\text{C}$ ; both diodes conducting	-	-	20	A
$T_j$	junction temperature		-	-	175	$^\circ\text{C}$
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 10\text{ A}$ ; $T_j = 25^\circ\text{C}$ ; see <a href="#">Figure 6</a>	-	-	0.77	V
		$I_F = 10\text{ A}$ ; $T_j = 125^\circ\text{C}$ ; see <a href="#">Figure 6</a>	-	0.59	0.64	V
$I_R$	reverse current	$V_R = 100\text{ V}$ ; $T_j = 25^\circ\text{C}$ ; see <a href="#">Figure 7</a>	-	2	4.5	$\mu\text{A}$
		$V_R = 100\text{ V}$ ; $T_j = 125^\circ\text{C}$ ; see <a href="#">Figure 7</a>	-	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; $\delta = 0.5$ ; $T_h \leq 147\text{ }^{\circ}\text{C}$ ; per diode; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a> ; see <a href="#">Figure 3</a>	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$ ; $T_h \leq 128\text{ }^{\circ}\text{C}$ ; both diodes conducting	-	20	A
$I_{FSM}$	non-repetitive peak forward current	sine-wave pulse; $t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$ ; see <a href="#">Figure 4</a>	-	250	A
$T_{stg}$	storage temperature		-65	175	$^{\circ}\text{C}$
$T_j$	junction temperature		-	175	$^{\circ}\text{C}$

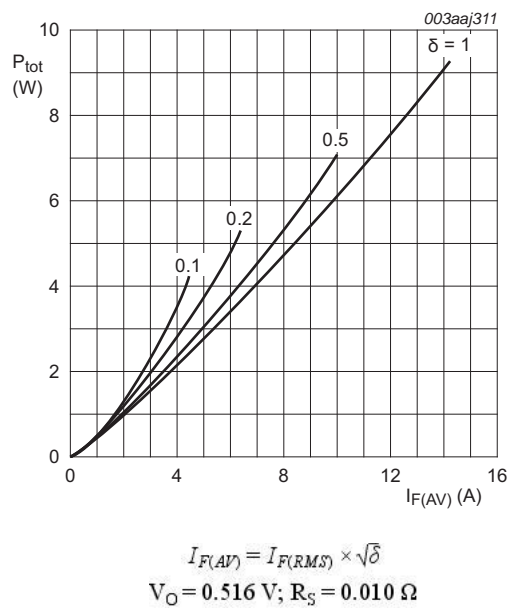


Fig 1. Forward power dissipation as a function of average forward current; square waveform; per diode; maximum values

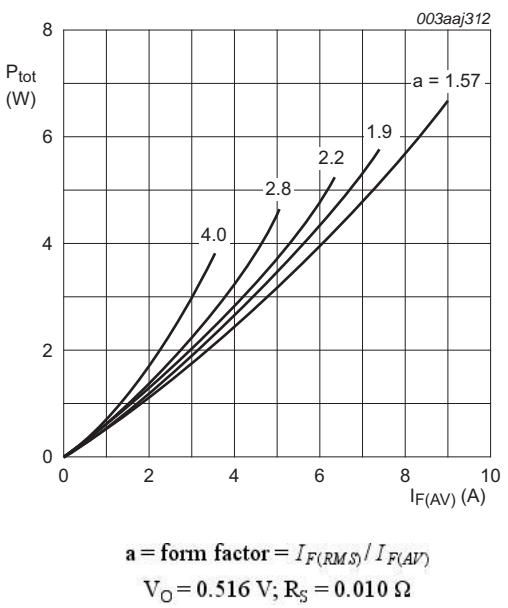


Fig 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; per diode; maximum values

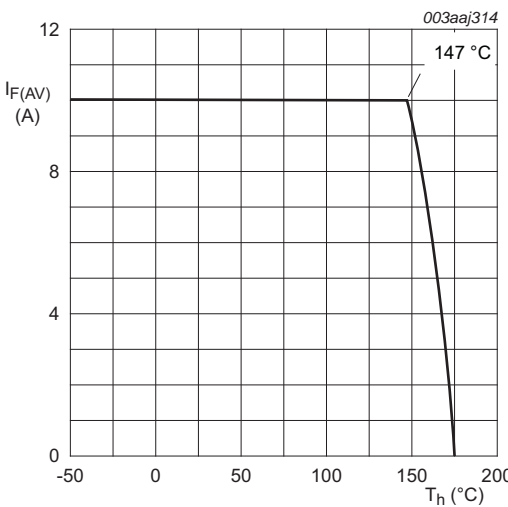


Fig 3. Average forward current as a function of heatsink temperature; per diode; maximum values

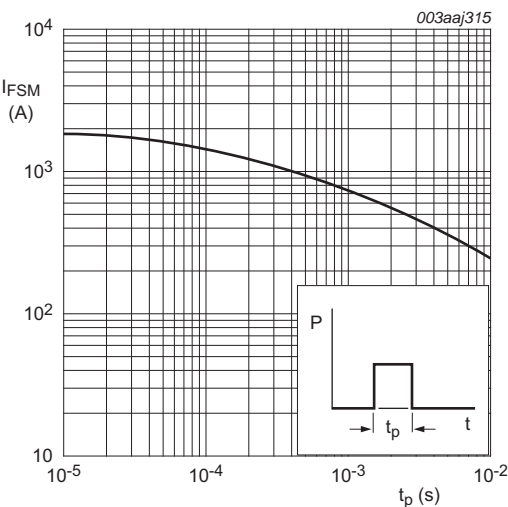


Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values

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 <a href="#">Figure 5</a>	-	-	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

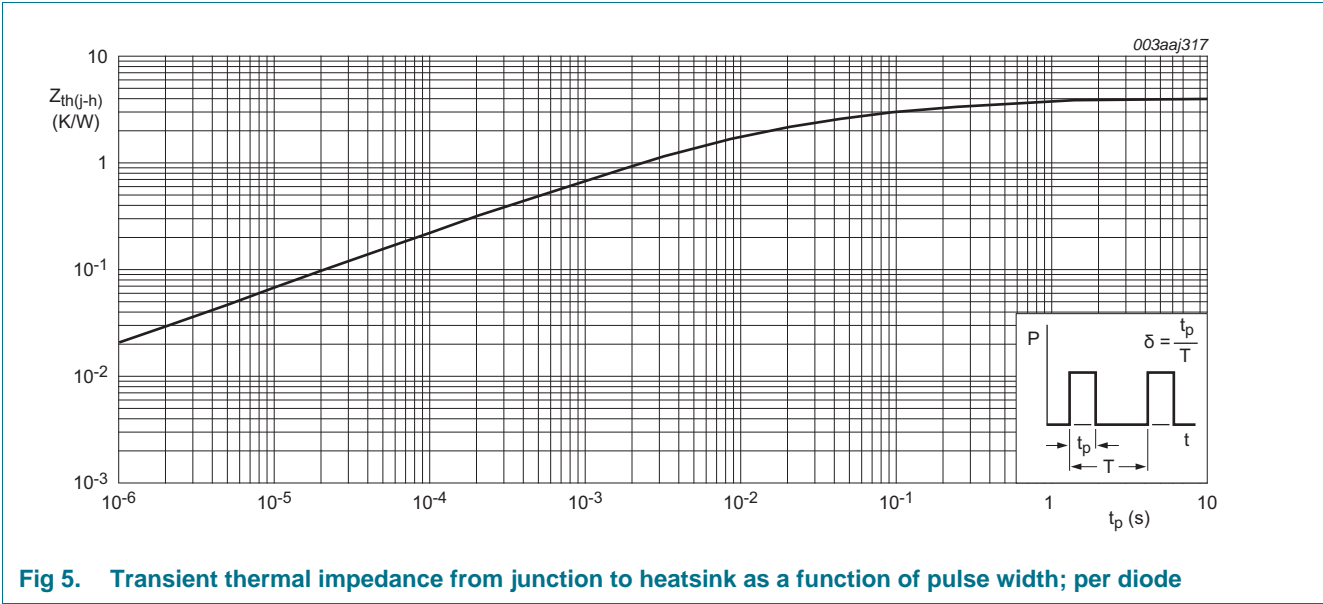


Fig 5. Transient thermal impedance from junction to heatsink as a function of pulse width; per diode

6. Isolation characteristics

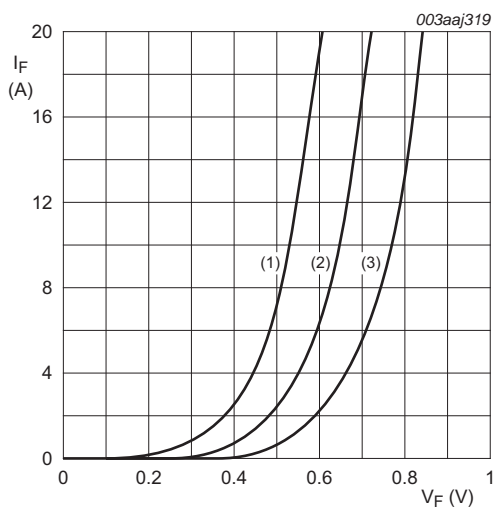
Table 6. Isolation characteristics

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

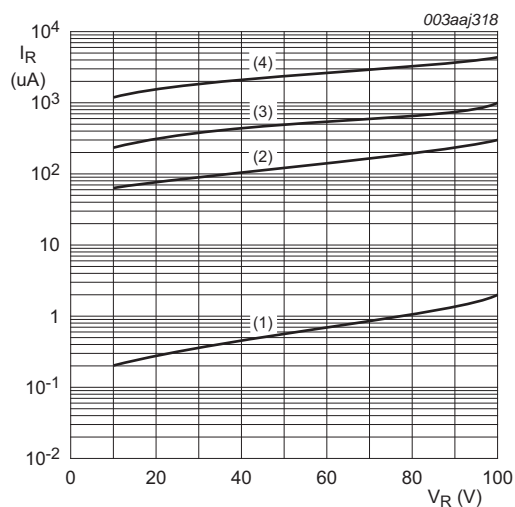
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 8 A; T <sub>j</sub> = 25 °C; see <a href="#">Figure 6</a>	-	-	0.71	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 25 °C; see <a href="#">Figure 6</a>	-	-	0.77	V
		I <sub>F</sub> = 16 A; T <sub>j</sub> = 25 °C; see <a href="#">Figure 6</a>	-	-	0.81	V
		I <sub>F</sub> = 20 A; T <sub>j</sub> = 25 °C; see <a href="#">Figure 6</a>	-	-	0.88	V
		I <sub>F</sub> = 8 A; T <sub>j</sub> = 125 °C; see <a href="#">Figure 6</a>	-	0.56	0.58	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 125 °C; see <a href="#">Figure 6</a>	-	0.59	0.64	V
		I <sub>F</sub> = 16 A; T <sub>j</sub> = 125 °C; see <a href="#">Figure 6</a>	-	0.65	0.68	V
		I <sub>F</sub> = 20 A; T <sub>j</sub> = 125 °C; see <a href="#">Figure 6</a>	-	0.67	0.73	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 100 V; T <sub>j</sub> = 25 °C; see <a href="#">Figure 7</a>	-	2	4.5	μA
		V <sub>R</sub> = 100 V; T <sub>j</sub> = 125 °C; see <a href="#">Figure 7</a>	-	1	6	mA
Dynamic characteristics						
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 10 V; T <sub>j</sub> = 25 °C; see <a href="#">Figure 8</a>	-	250	-	pF



(1) T<sub>j</sub> = 125 °C; typical values;  
(2) T<sub>j</sub> = 125 °C; maximum values;  
(3) T<sub>j</sub> = 25 °C; maximum values;  
V<sub>O</sub> = 0.516 V; R<sub>S</sub> = 0.010 Ω

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



(1) T<sub>j</sub> = 25 °C; typical values;  
(2) T<sub>j</sub> = 100 °C; typical values;  
(3) T<sub>j</sub> = 125 °C; typical values;  
(4) T<sub>j</sub> = 150 °C; typical values

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

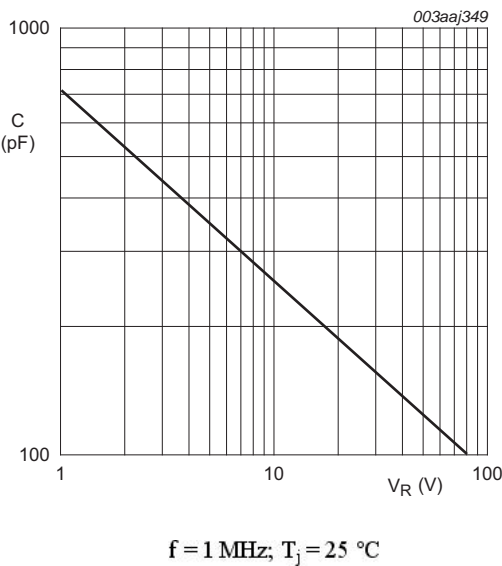


Fig 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

8. Package outline

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

SOT186A

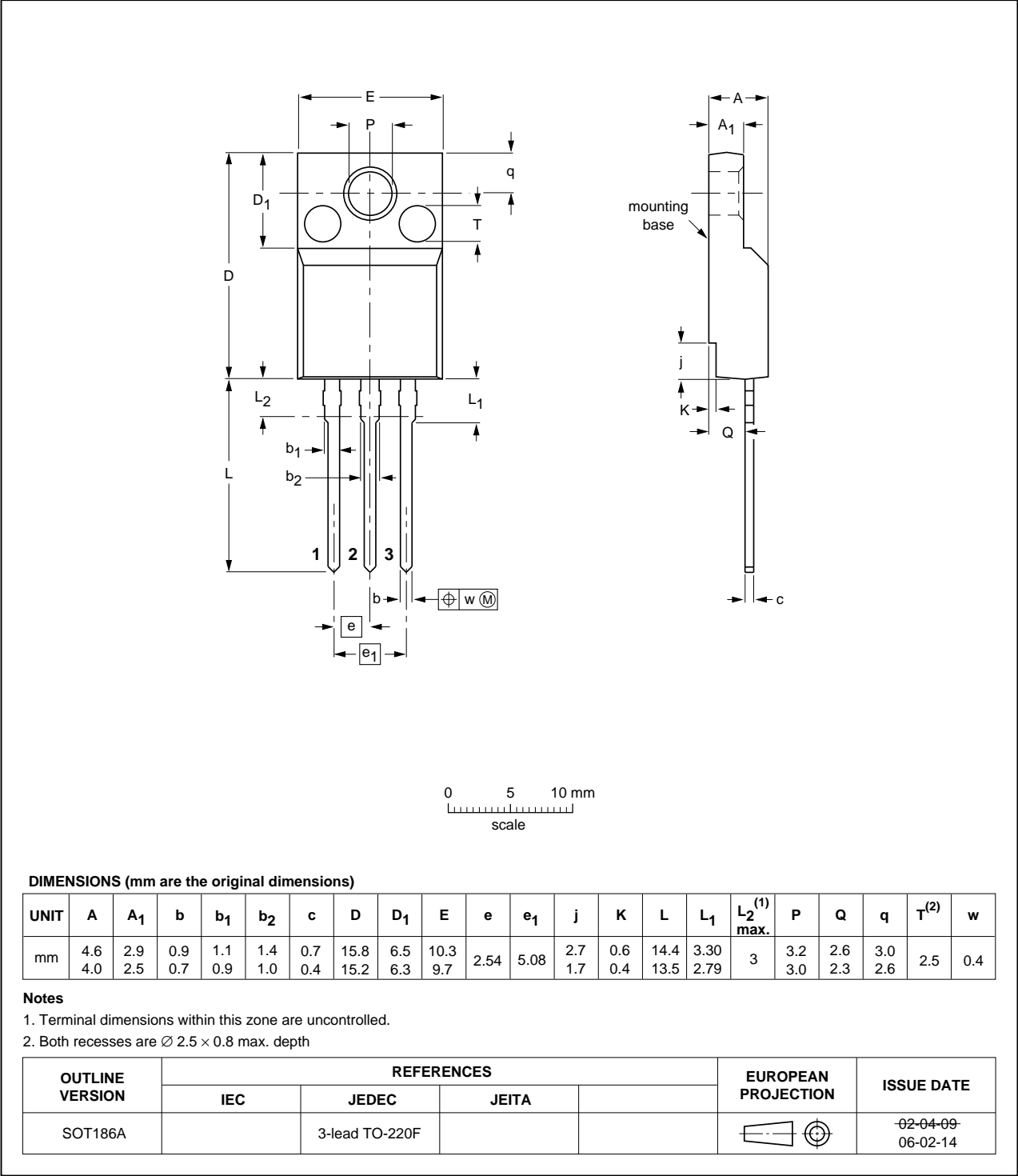


Fig 9. Package outline SOT186A (TO-220F)

## 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"><li>• Status changed from preliminary to product.</li><li>• Various changes to content.</li></ul>			
NXPS20H100CX v.1	20120420	Preliminary data sheet	-	-



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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.

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