



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

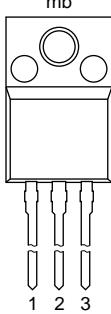
Table 1. Quick reference data

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	µA
		$V_R = 100$ 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

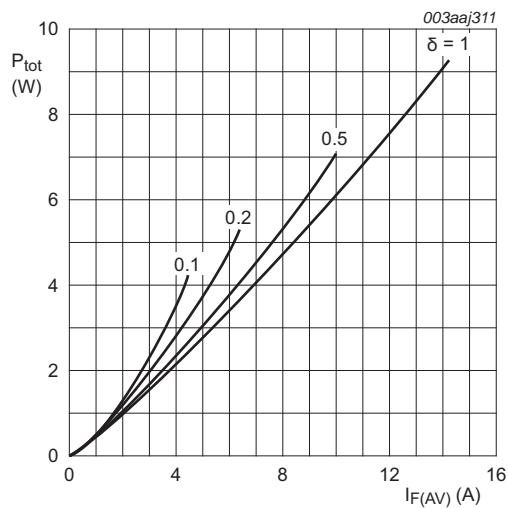
Type number	Package		Version
	Name	Description	
NXPS20H100CX	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 "full pack"	SOT186A

4. Limiting values

Table 4. Limiting values

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

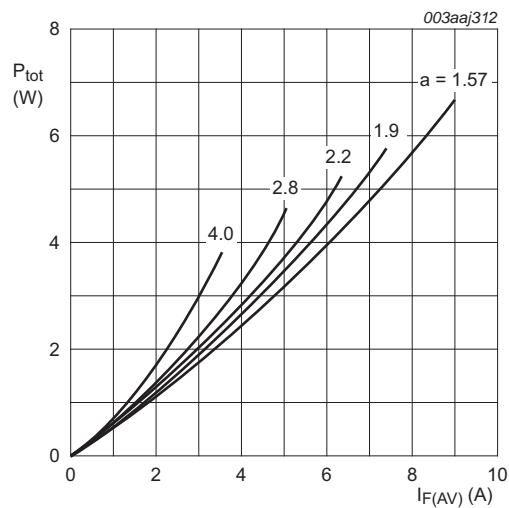
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	100	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_h \leq 147$ °C; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta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

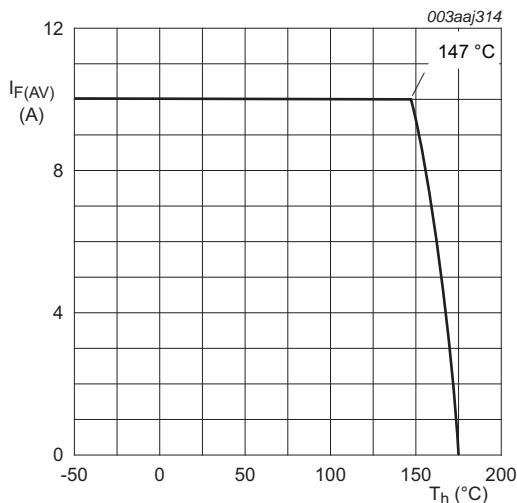


Fig 3. Average forward current as a function of heatsink temperature; per diode; maximum values

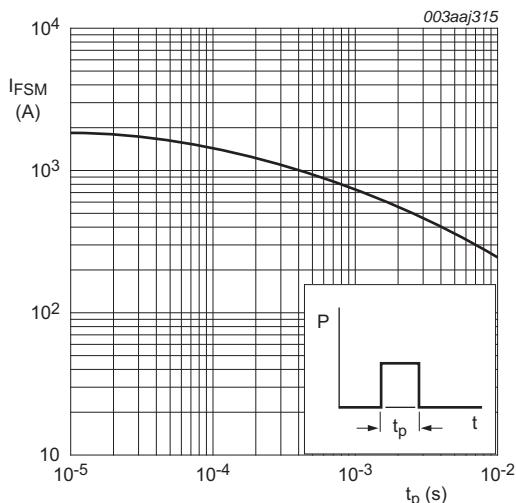


Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values

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

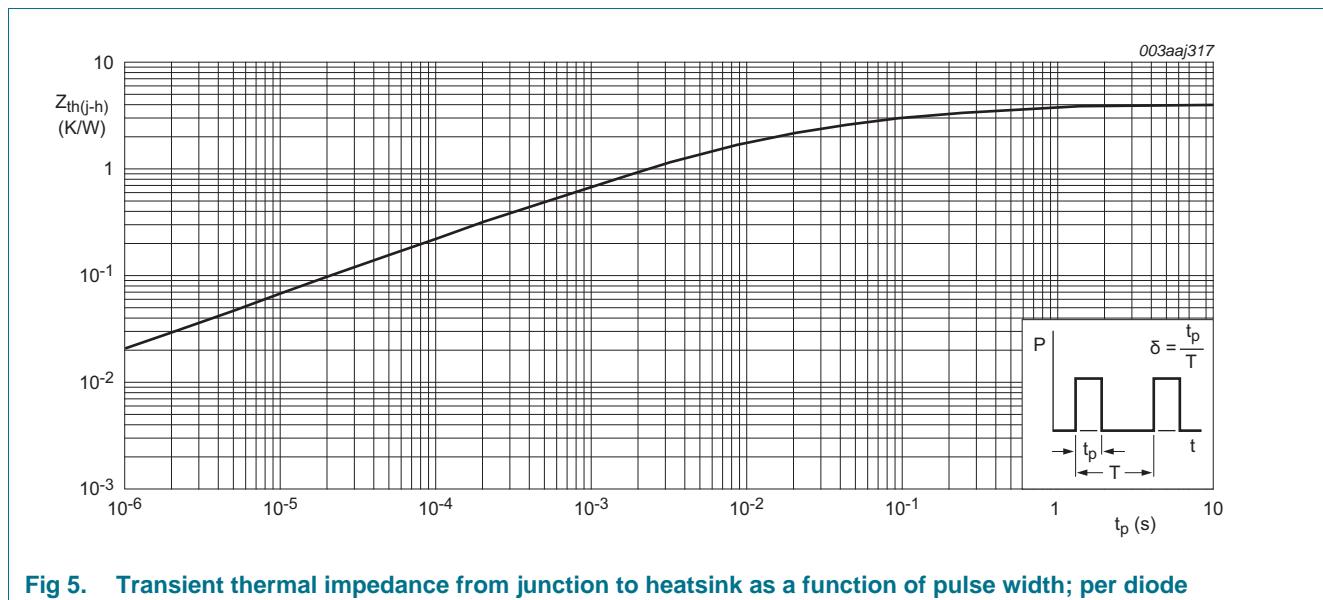


Fig 5. Transient thermal impedance from junction to heatsink as a function of pulse width; per diode

6. Isolation characteristics

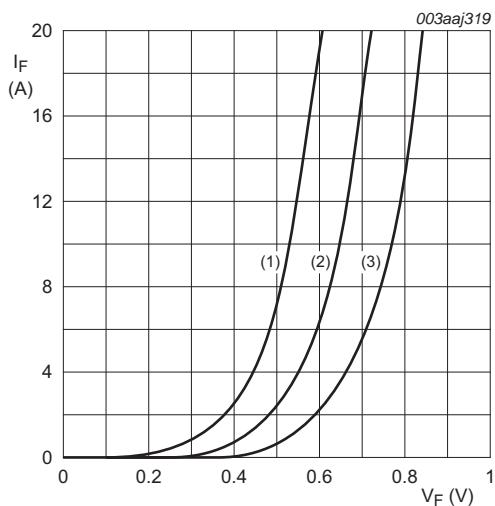
Table 6. Isolation characteristics

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

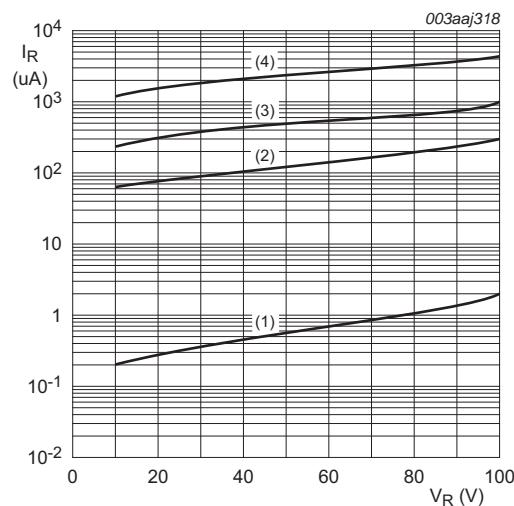
Table 7. Characteristics

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
		$I_F = 20 \text{ A}; T_j = 125 \text{ }^\circ\text{C}$; see Figure 6	-	0.67	0.73	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



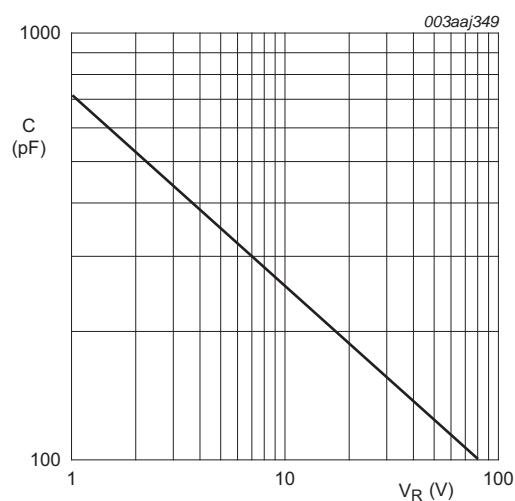
(1) $T_j = 125 \text{ }^\circ\text{C}$; typical values;
 (2) $T_j = 125 \text{ }^\circ\text{C}$; maximum values;
 (3) $T_j = 25 \text{ }^\circ\text{C}$; maximum values;
 $V_O = 0.516 \text{ V}; R_S = 0.010 \Omega$

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

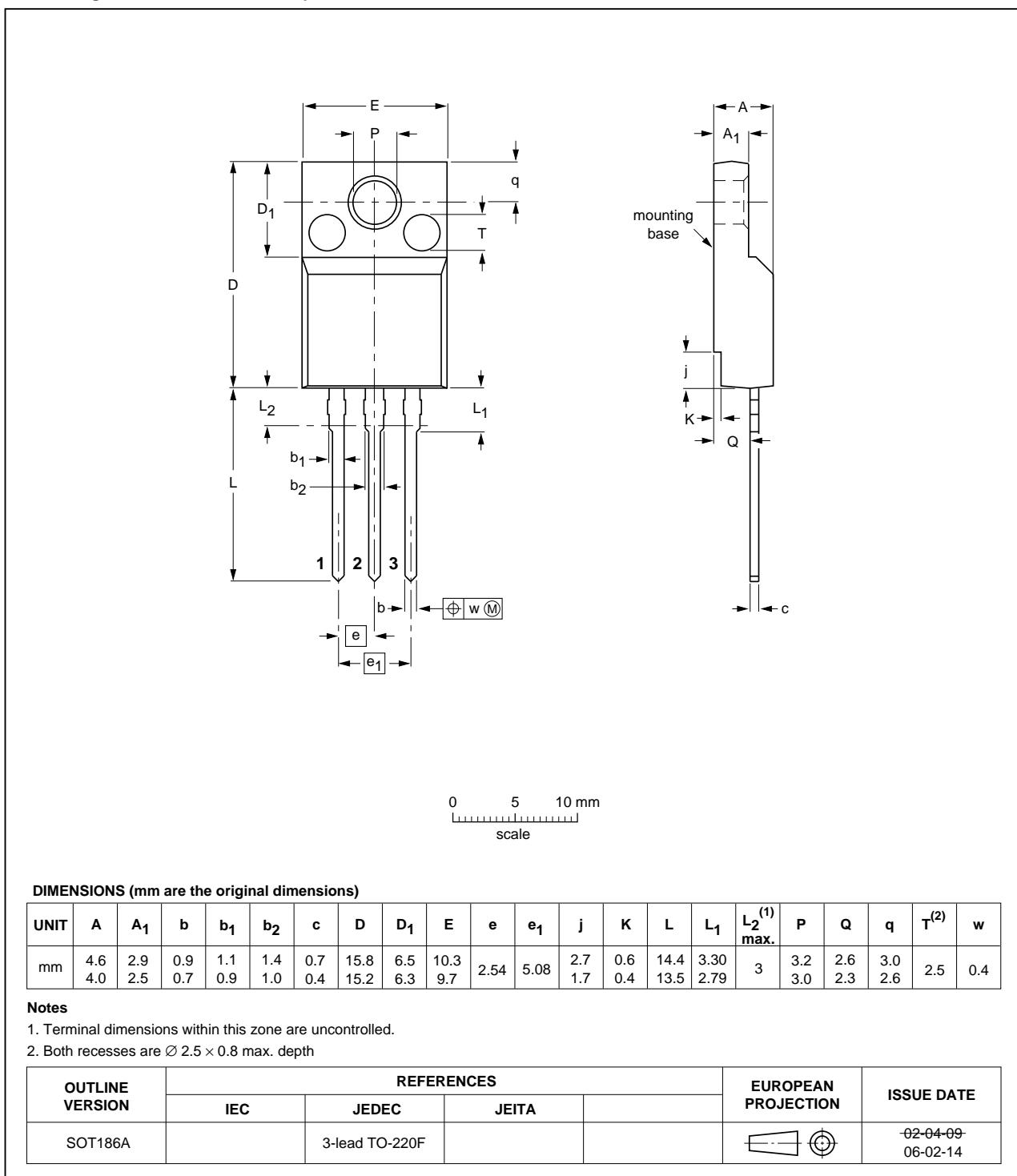


Fig 9. Package outline SOT186A (TO-220F)

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	-	-

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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.

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12. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	1
1.3	Applications	1
1.4	Quick reference data	1
2	Pinning information	2
3	Ordering information	2
4	Limiting values	2
5	Thermal characteristics	4
6	Isolation characteristics	4
7	Characteristics	5
8	Package outline	7
9	Revision history	8
10	Legal information	9
10.1	Data sheet status	9
10.2	Definitions	9
10.3	Disclaimers	9
10.4	Trademarks	10
11	Contact information	10

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