



# NXPS20H100C

## Dual power Schottky diode

Rev. 2 — 8 June 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 SOT78 (TO-220AB) plastic package.

### 1.2 Features and benefits

- High junction temperature capability
- 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

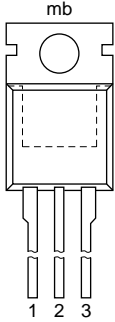
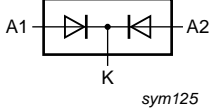
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	-	100	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 163$ °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; $\delta = 0.5$ ; $T_{mb} \leq 161$ °C; both diodes conducting	-	-	20	A
$T_j$	junction temperature		-	-	175	°C
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 10$ A; $T_j = 25$ °C; see <a href="#">Figure 6</a>	-	-	0.77	V
		$I_F = 10$ A; $T_j = 125$ °C; see <a href="#">Figure 6</a>	-	0.59	0.64	V
$I_R$	reverse current	$V_R = 100$ V; $T_j = 25$ °C; see <a href="#">Figure 7</a>	-	2	4.5	$\mu$ A
		$V_R = 100$ V; $T_j = 125$ °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	K	mounting base; cathode		

**SOT78 (TO-220AB)**

## 3. Ordering information

**Table 3. Ordering information**

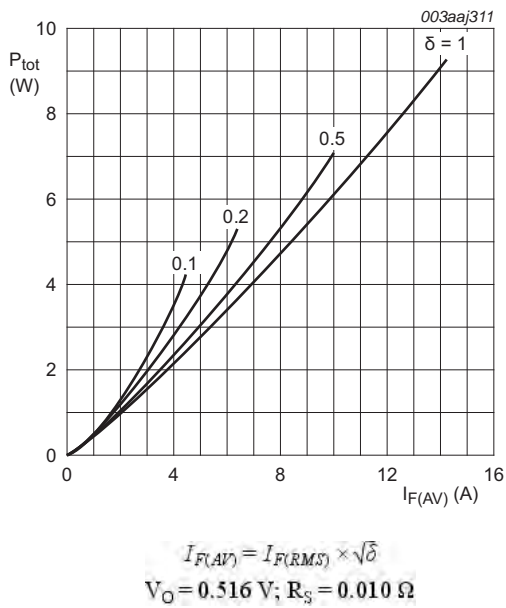
Type number	Package		Version
	Name	Description	
NXPS20H100C	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

## 4. Limiting values

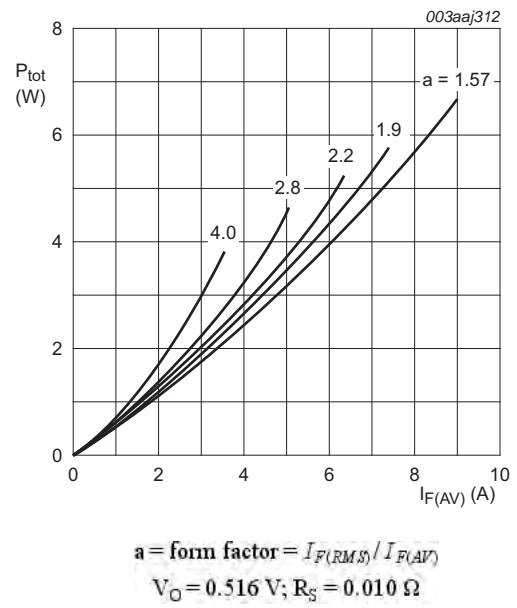
**Table 4. Limiting values**

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

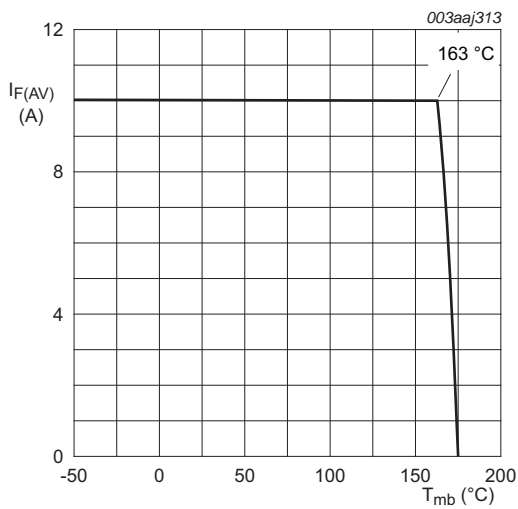
Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	100	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 163$ °C; per diode; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a> ; see <a href="#">Figure 3</a>	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 161$ °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 <a href="#">Figure 4</a>	-	250	A
$T_{stg}$	storage temperature		-65	175	°C
$T_j$	junction temperature		-	175	°C



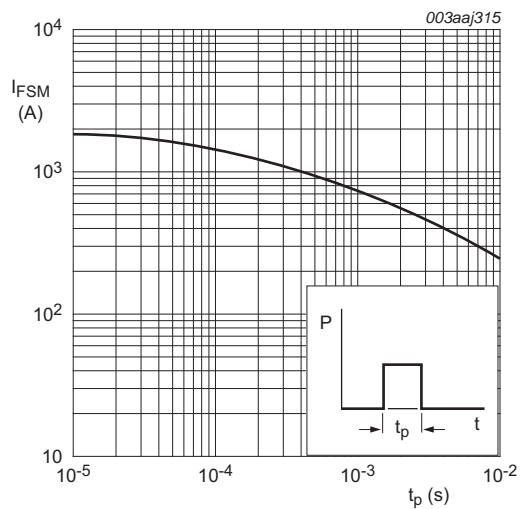
**Fig 1. Forward power dissipation as a function of average forward current; square waveform; per diode; maximum values**



**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 mounting base temperature; per diode; maximum values**

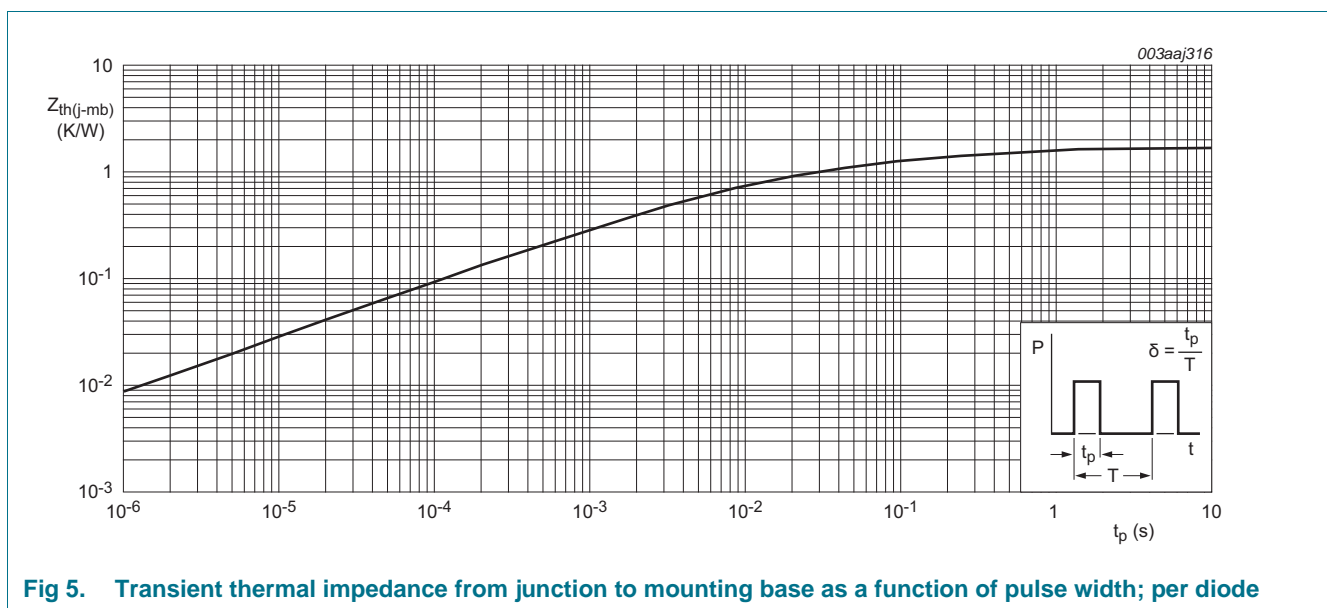


**Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values**

## 5. Thermal characteristics

**Table 5. Thermal characteristics**

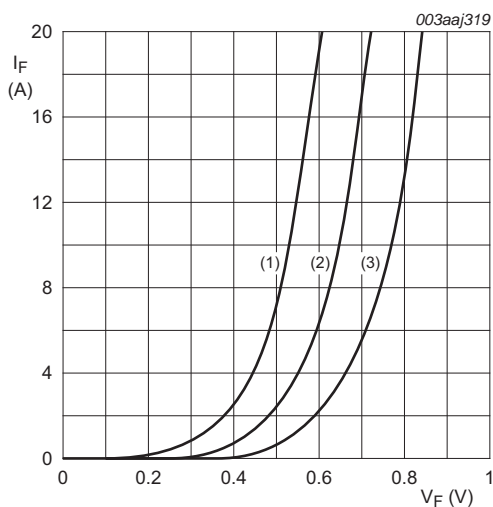
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	with heatsink compound; per diode; see <a href="#">Figure 5</a>	-	-	1.6	K/W
		with heatsink compound; both diodes conducting	-	-	0.9	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W



## 6. Characteristics

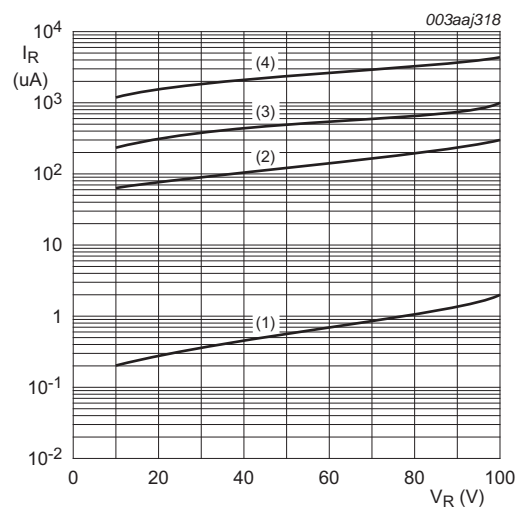
Table 6. Characteristics

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



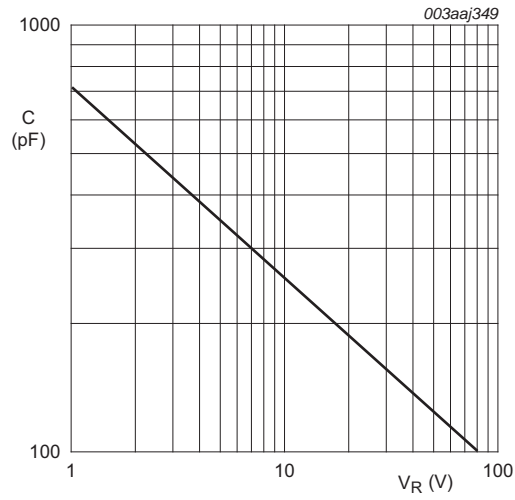
(1)  $T_j = 125 \text{ }^\circ\text{C}$ ; typical values;  
 (2)  $T_j = 125 \text{ }^\circ\text{C}$ ; maximum values;  
 (3)  $T_j = 25 \text{ }^\circ\text{C}$ ; maximum values;  
 $V_O = 0.516 \text{ V}; R_S = 0.010 \text{ } \Omega$

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



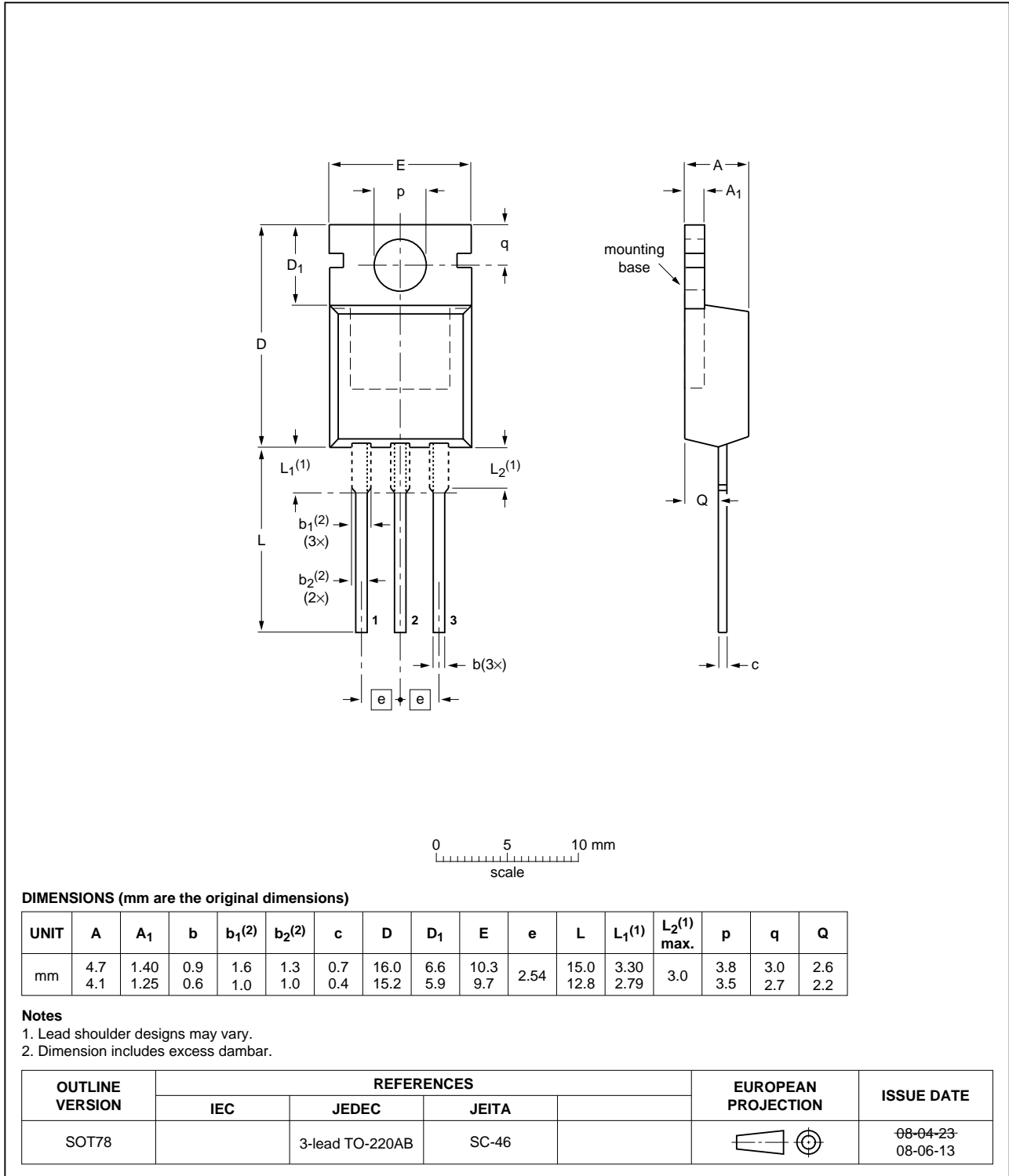
f = 1 MHz; T<sub>j</sub> = 25 °C

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

**7. Package outline**

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB

SOT78



**Fig 9. Package outline SOT78 (TO-220AB)**

## 8. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NXPS20H100C v.2	20120608	Product data sheet	-	NXPS20H100C v.1
Modifications:	<ul style="list-style-type: none"><li>• Status changed from preliminary to product.</li><li>• Various changes to content.</li></ul>			
NXPS20H100C v.1	20120420	Preliminary data sheet	-	-



## 9. Legal information

### 9.1 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.

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[2] The term 'short data sheet' is explained in section "Definitions".

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