



**THE DATASHEET OF
NXPS20H110C,127**





NXPS20H110C

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 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

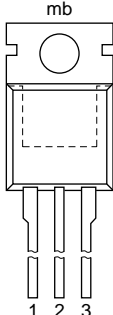
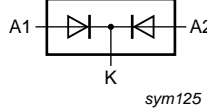
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	-	110	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_j \leq 163$ °C; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$; $T_{mb} \leq 161$ °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	$V_R = 110$ V; $T_j = 25$ °C; see Figure 7	-	2.5	6	μ A
		$V_R = 110$ V; $T_j = 125$ °C; see Figure 7	-	1.5	6.5	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

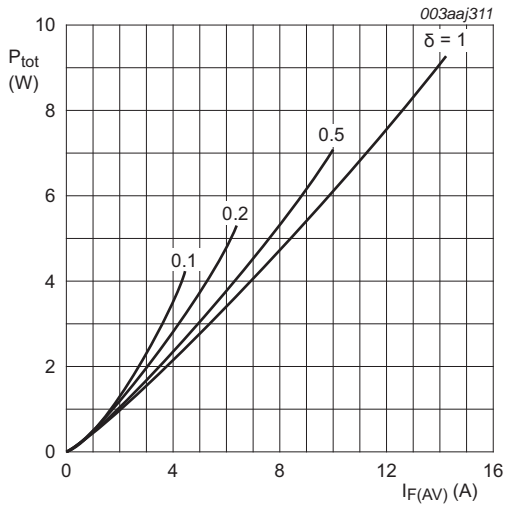
Type number	Package		
	Name	Description	Version
NXPS20H110C	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

4. Limiting values

Table 4. Limiting values

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

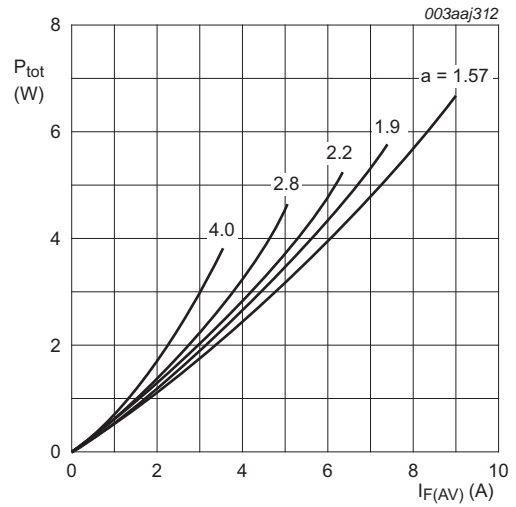
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	110	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_j \leq 163$ °C; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$; $T_{mb} \leq 161$ °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 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

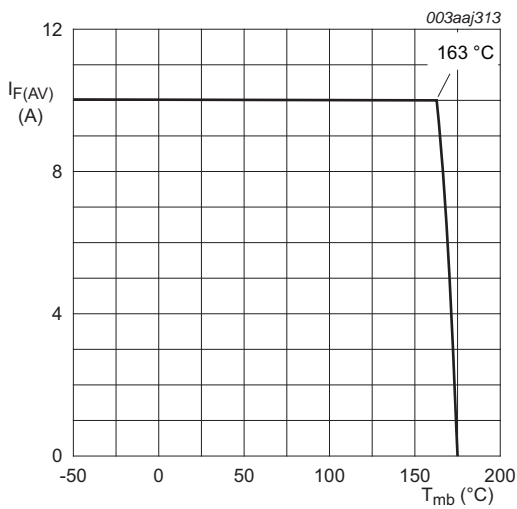


Fig 3. Average forward current as a function of mounting base temperature; per diode; maximum values

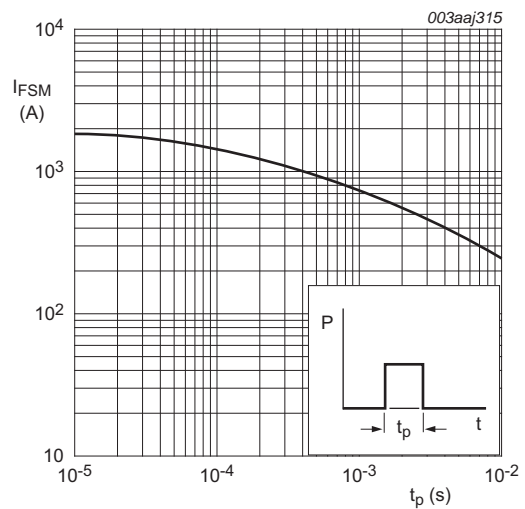
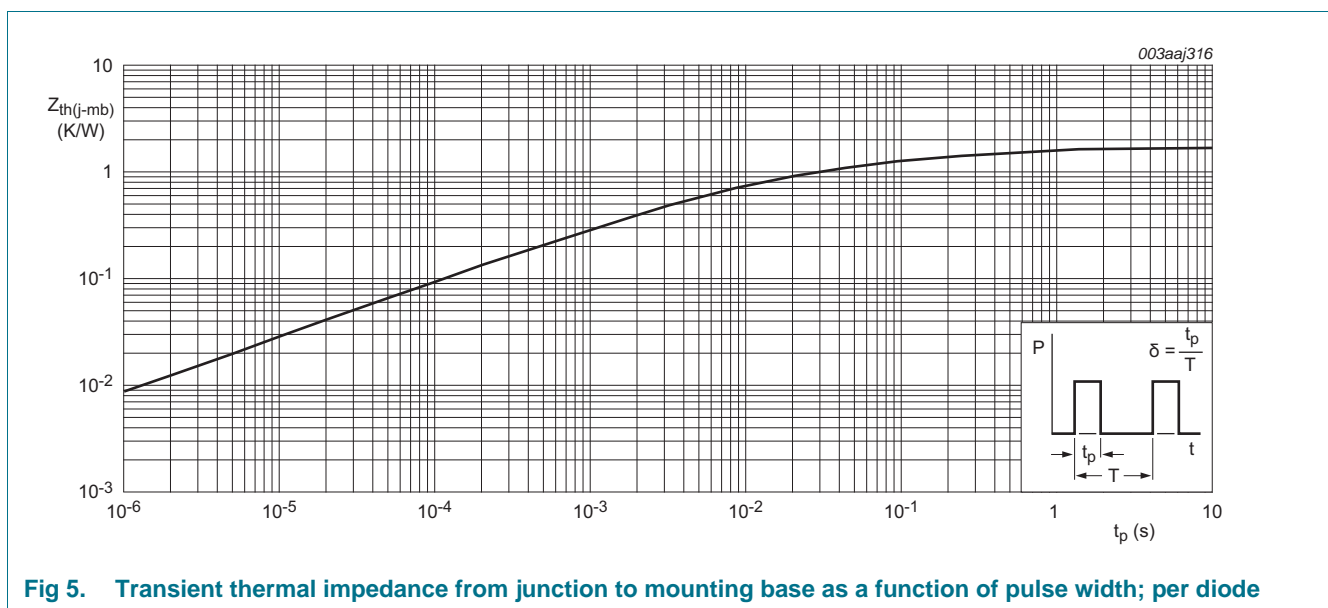


Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values

5. Thermal characteristics

Table 5. Thermal characteristics

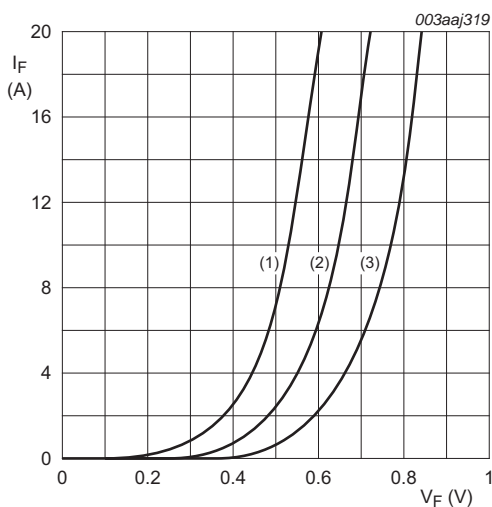
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	with heatsink compound; per diode; see Figure 5	-	-	1.6	K/W
		with heatsink compound; both diodes conducting	-	-	0.9	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air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



6. Characteristics

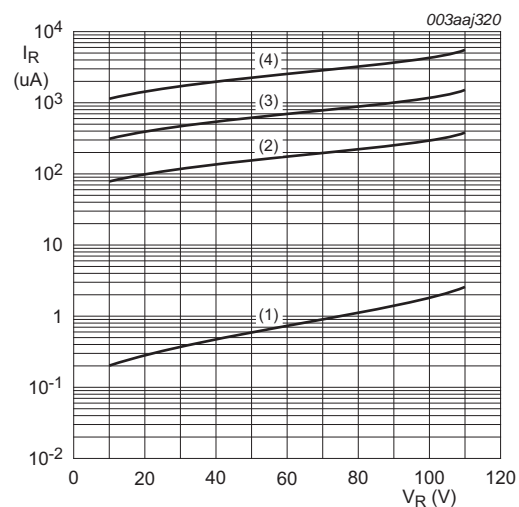
Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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	$V_R = 110 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$; see Figure 7	-	2.5	6	μA
		$V_R = 110 \text{ V}; T_j = 125 \text{ }^\circ\text{C}$; see Figure 7	-	1.5	6.5	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



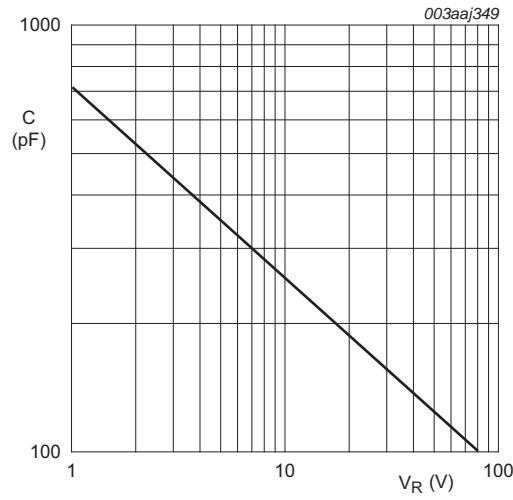
(1) $T_j = 125 \text{ }^\circ\text{C}$; typical values;
 (2) $T_j = 125 \text{ }^\circ\text{C}$; maximum values;
 (3) $T_j = 25 \text{ }^\circ\text{C}$; maximum values;
 $V_O = 0.516 \text{ V}; R_S = 0.010 \text{ } \Omega$

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 MHz; T_j = 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

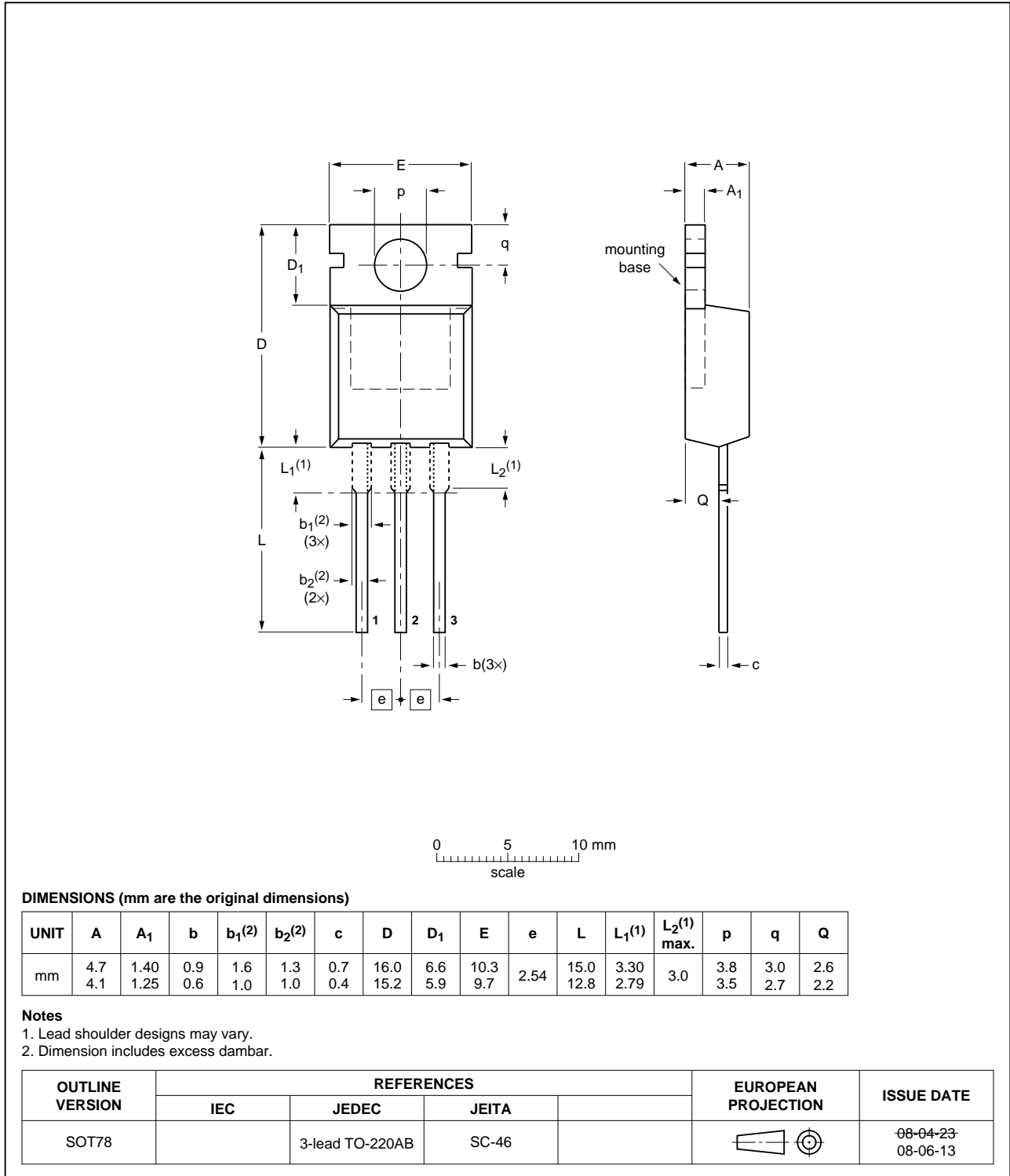


Fig 9. Package outline SOT78 (TO-220AB)

8. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NXPS20H110C v.2	20120524	Product data sheet	-	NXPS20H110C v.1
Modifications:	<ul style="list-style-type: none">• Status changed from preliminary to product.• Various changes to content.			
NXPS20H110C v.1	20120420	Preliminary data sheet	-	-

9. Legal information

9.1 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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11. 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	Characteristics	5
7	Package outline	7
8	Revision history	8
9	Legal information	9
9.1	Data sheet status	9
9.2	Definitions	9
9.3	Disclaimers	9
9.4	Trademarks	10
10	Contact information	10

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