



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

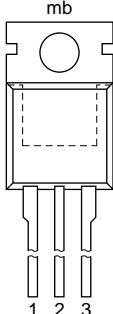
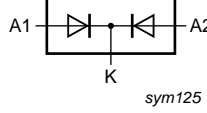
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	-	110	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_j \leq 163\text{ }^{\circ}\text{C}$; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$; $T_{mb} \leq 161\text{ }^{\circ}\text{C}$; both diodes conducting	-	-	20	A
T_j	junction temperature		-	-	175	$^{\circ}\text{C}$
Static characteristics						
V_F	forward voltage	$I_F = 10\text{ A}$; $T_j = 25\text{ }^{\circ}\text{C}$; see Figure 6	-	-	0.77	V
		$I_F = 10\text{ A}$; $T_j = 125\text{ }^{\circ}\text{C}$; see Figure 6	-	0.59	0.64	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



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

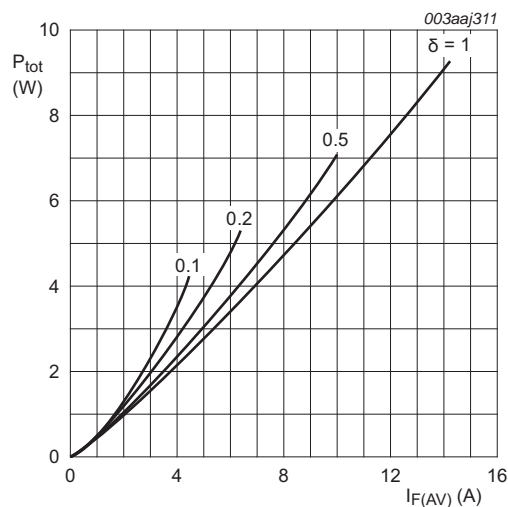
Type number	Package		
	Name	Description	Version
NXPS20H110C	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

4. Limiting values

Table 4. Limiting values

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

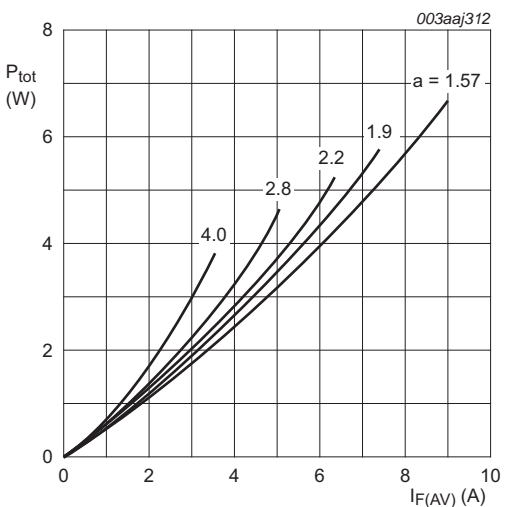
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	110	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_j \leq 163\text{ }^{\circ}\text{C}$; per diode; see Figure 1 ; see Figure 2 ; see Figure 3	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$; $T_{mb} \leq 161\text{ }^{\circ}\text{C}$; both diodes conducting	-	20	A
I_{FSM}	non-repetitive peak forward current	sine-wave pulse; $t_p = 10\text{ ms}$; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; see Figure 4	-	250	A
T_{stg}	storage temperature		-65	175	$^{\circ}\text{C}$
T_j	junction temperature		-	175	$^{\circ}\text{C}$



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

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

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



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

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

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

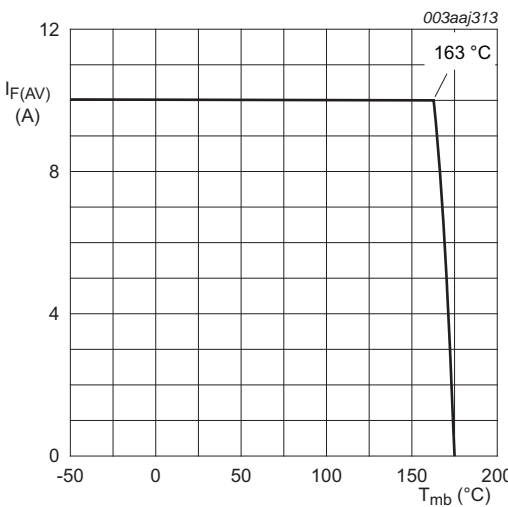


Fig 3. Average forward current as a function of mounting base temperature; per diode; maximum values

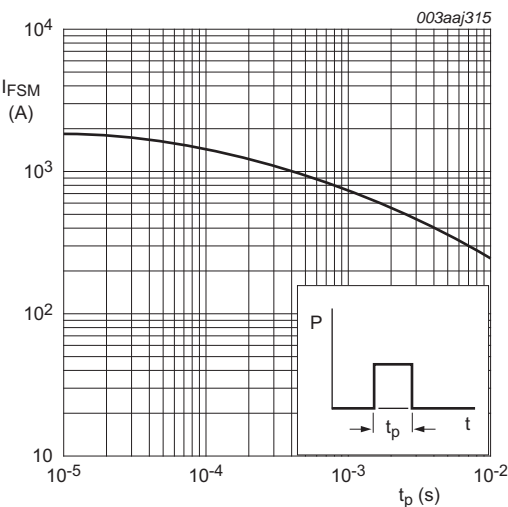
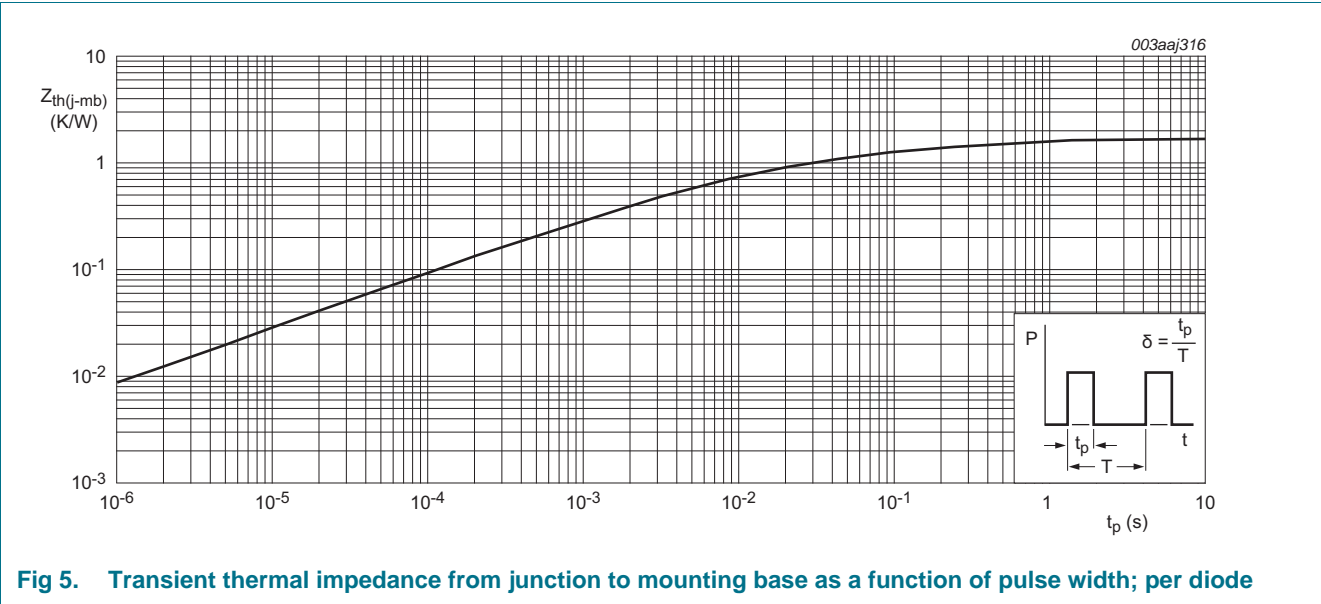


Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values

5. Thermal characteristics

Table 5. Thermal characteristics

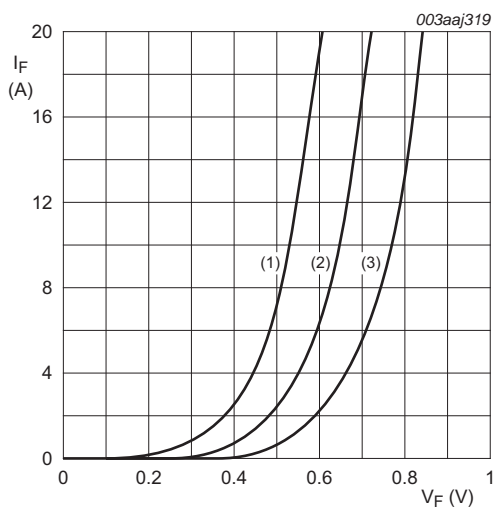
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	with heatsink compound; per diode; see Figure 5	-	-	1.6	K/W
		with heatsink compound; both diodes conducting	-	-	0.9	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air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



6. Characteristics

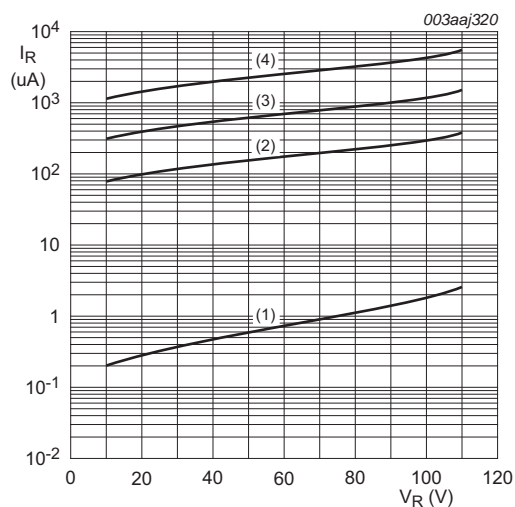
Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V _F	forward voltage	I _F = 8 A; T _j = 25 °C; see Figure 6	-	-	0.71	V
		I _F = 10 A; T _j = 25 °C; see Figure 6	-	-	0.77	V
		I _F = 16 A; T _j = 25 °C; see Figure 6	-	-	0.81	V
		I _F = 20 A; T _j = 25 °C; see Figure 6	-	-	0.88	V
		I _F = 8 A; T _j = 125 °C; see Figure 6	-	0.56	0.58	V
		I _F = 10 A; T _j = 125 °C; see Figure 6	-	0.59	0.64	V
		I _F = 16 A; T _j = 125 °C; see Figure 6	-	0.65	0.68	V
		I _F = 20 A; T _j = 125 °C; see Figure 6	-	0.67	0.73	V
I _R	reverse current	V _R = 110 V; T _j = 25 °C; see Figure 7	-	2.5	6	μA
		V _R = 110 V; T _j = 125 °C; see Figure 7	-	1.5	6.5	mA
Dynamic characteristics						
C _d	diode capacitance	f = 1 MHz; V _R = 10 V; T _j = 25 °C; see Figure 8	-	250	-	pF



(1) T_j = 125 °C; typical values;
(2) T_j = 125 °C; maximum values;
(3) T_j = 25 °C; maximum values;
V_O = 0.516 V; R_S = 0.010 Ω

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



(1) T_j = 25 °C; typical values;
(2) T_j = 100 °C; typical values;
(3) T_j = 125 °C; typical values;
(4) T_j = 150 °C; typical values

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

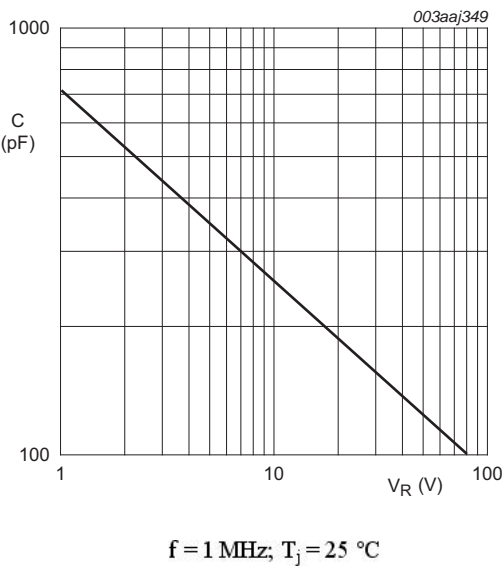


Fig 8. Junction capacitance as a function of applied reverse voltage;per diode; typical values

7. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB SOT78

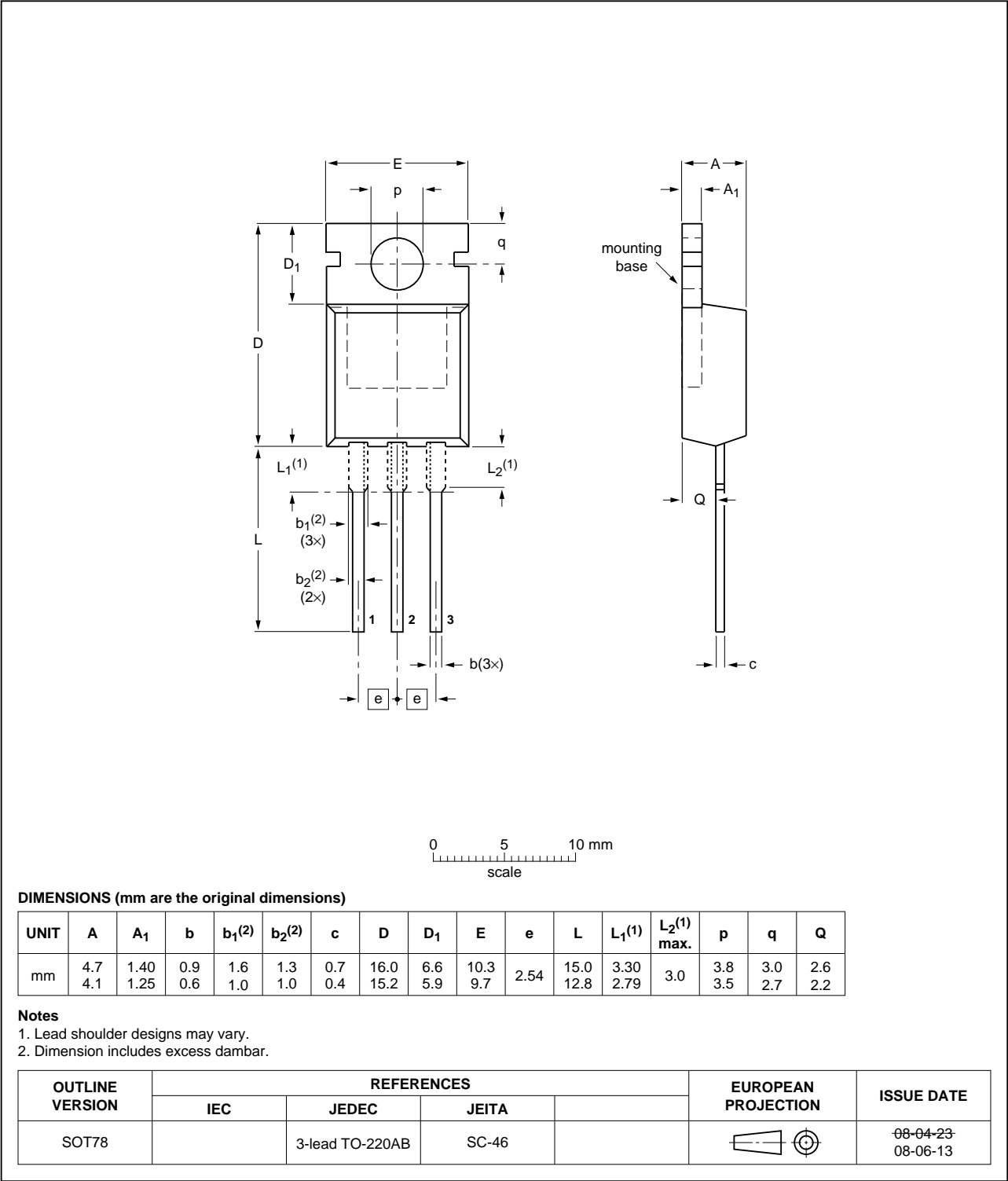


Fig 9. Package outline SOT78 (TO-220AB)

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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