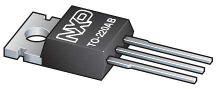


NXPS20H110C

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

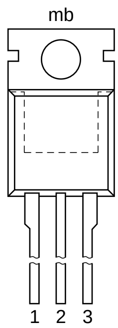
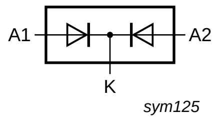
1.4 Quick reference data

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; δ = 0.5 ; T_j ≤ 163 °C; per diode; see Figure 1; see Figure 2; see Figure 3	-	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; δ = 0.5 ; T_{mb} ≤ 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	µA
		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

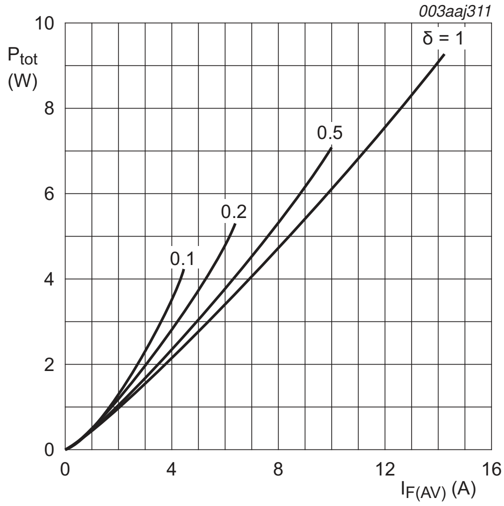
Type number	Package		
	Name	Description	Version
NXPS20H110C	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

4. Limiting values

Table 4. Limiting values

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

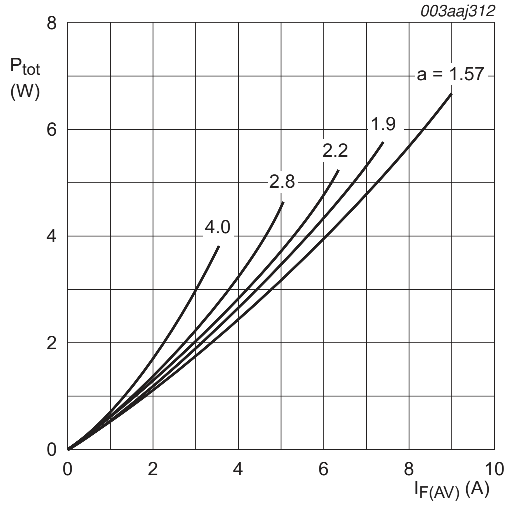
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	110	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $T_j \leq 163$ °C; per diode; see Figure 1; see Figure 2; see Figure 3	-	10	A
$I_{O(AV)}$	average output current	square-wave pulse; $\delta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



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

$V_O = 0.516$ 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 = form factor = $I_{F(RMS)} / I_{F(AV)}$

$V_O = 0.516$ V; $R_S = 0.010\ \Omega$

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

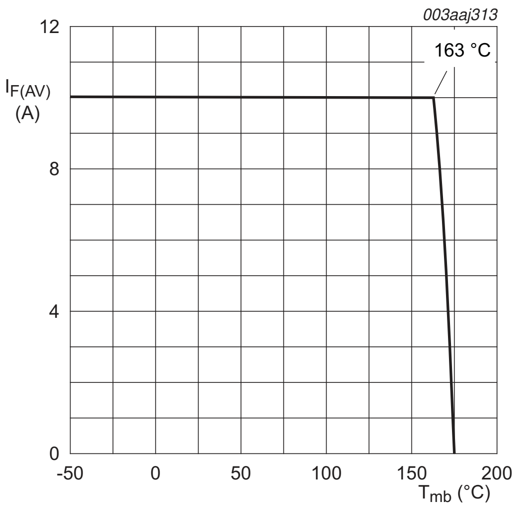


Fig 3. Average forward current as a function of mounting base temperature; per diode; maximum values

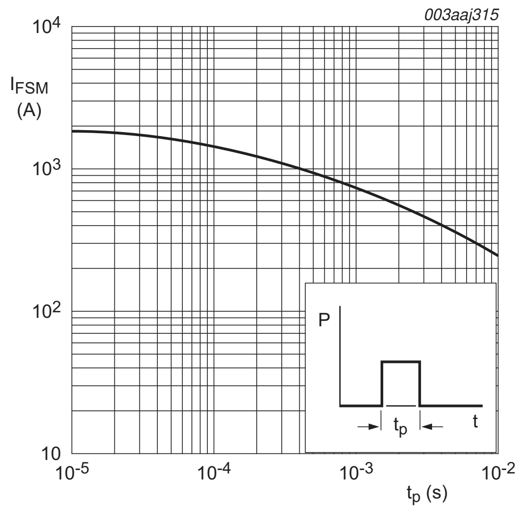


Fig 4. Non-repetitive peak forward current as a function of pulse width; square waveform; per diode; maximum values

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

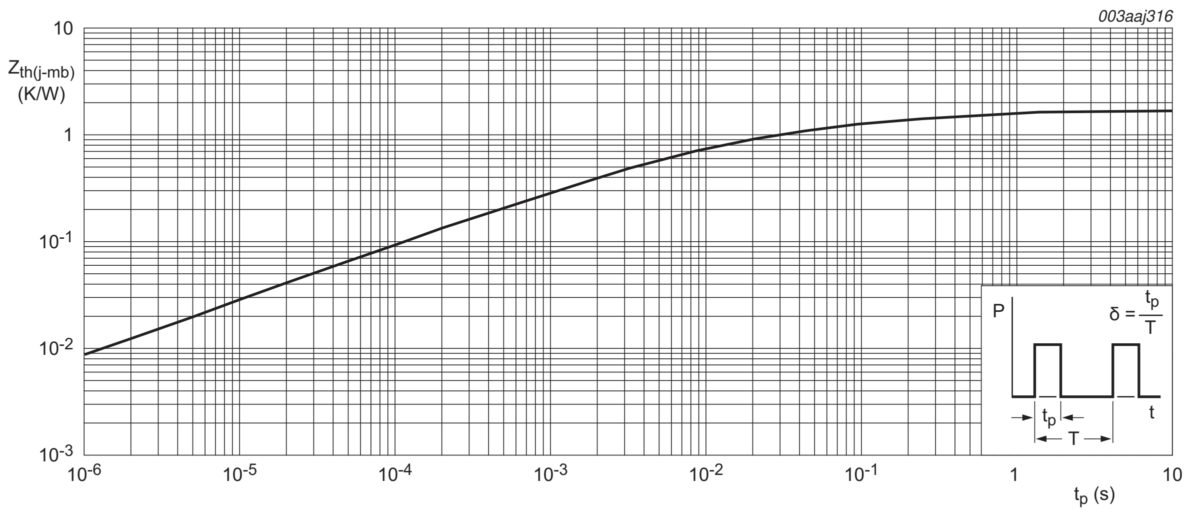
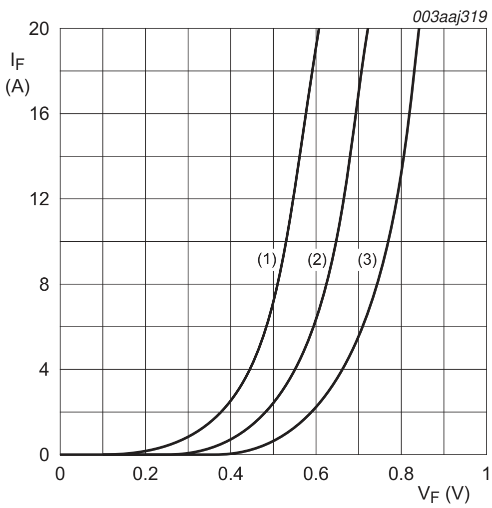


Fig 5. Transient thermal impedance from junction to mounting base as a function of pulse width; per diode

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



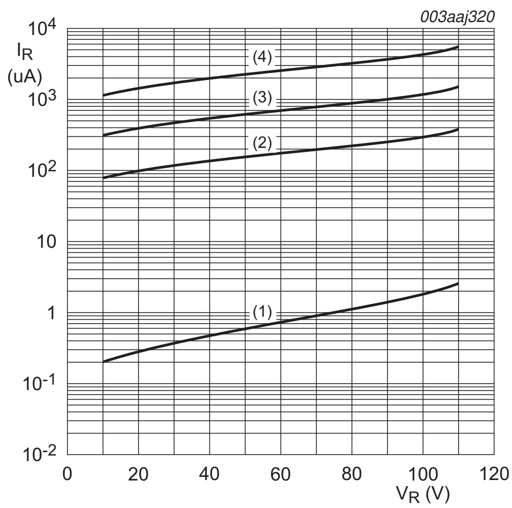
(1) T_j = 125 °C; typical values;

(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



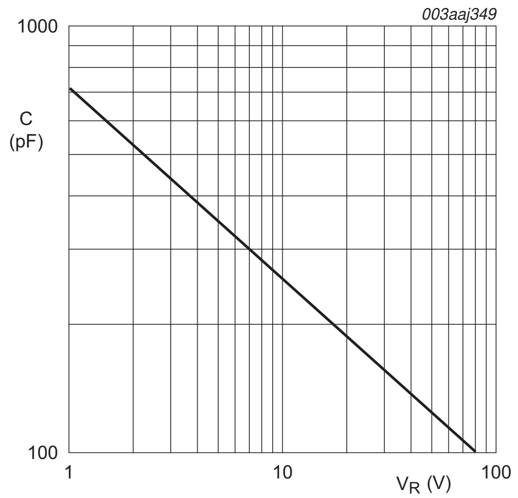
(1) T_j = 25 °C; typical values;

(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

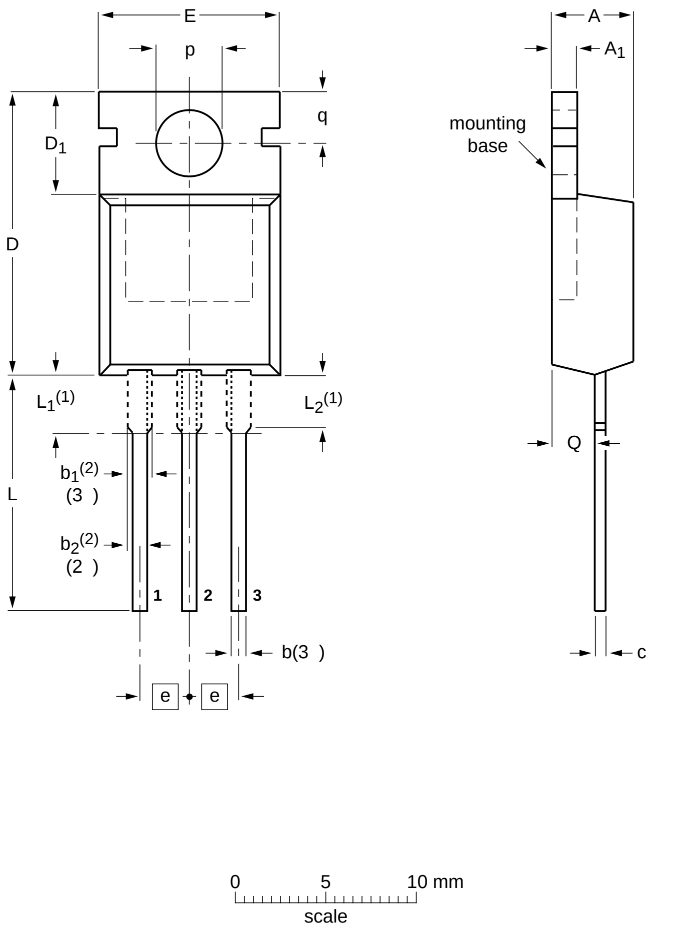


f = 1 MHz; T_j = 25 °C

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**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	$b_1^{(2)}$	$b_2^{(2)}$	c	D	D_1	E	e	L	$L_1^{(1)}$	$L_2^{(1)}$ max.	p	q	Q
mm	4.7 4.1	1.40 1.25	0.9 0.6	1.6 1.0	1.3 1.0	0.7 0.4	16.0 15.2	6.6 5.9	10.3 9.7	2.54	15.0 12.8	3.30 2.79	3.0	3.8 3.5	3.0 2.7	2.6 2.2

Notes

1. Lead shoulder designs may vary.
2. Dimension includes excess dambar.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT78		3-lead TO-220AB	SC-46			~~08-04-23~~ 08-06-13

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:	• 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

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