

## 1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO220 plastic package.



## 2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- High efficiency
- Low forward voltage drop, negligible switching losses

## 3. Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode

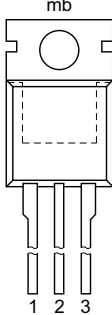
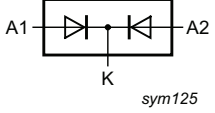
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values				Unit
Absolute maximum rating							
V <sub>RRM</sub>	repetitive peak reverse voltage		100				V
I <sub>F(AV)</sub>	average forward current	δ = 0.5 ; square-wave pulse; T <sub>mb</sub> ≤ 134 °C; per diode; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	20				A
I <sub>O(AV)</sub>	average output current	δ = 0.5 ; square-wave pulse; T <sub>mb</sub> ≤ 131 °C; both diodes conducting	40				A
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 10 A; T <sub>j</sub> = 25 °C; prediode; <a href="#">Fig. 6</a>		-	0.54	0.59	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 125 °C; prediode; <a href="#">Fig. 6</a>		-	0.5	0.56	V
		I <sub>F</sub> = 20 A; T <sub>j</sub> = 25 °C; prediode; <a href="#">Fig. 6</a>		-	0.67	0.71	V
		I <sub>F</sub> = 20 A; T <sub>j</sub> = 125 °C; prediode; <a href="#">Fig. 6</a>		-	0.63	0.68	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 100 V; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	-	50	μA
		V <sub>R</sub> = 100 V; T <sub>j</sub> = 125 °C; <a href="#">Fig. 7</a>		-	-	30	mA

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode 1		
2	K	cathode		
3	A	anode 2		
mb	mb	mounting base; connected to cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WN3S40H100C	TO220	WN3S40H100CQ	Tube	50	SOT78	13-Jun-2008

## 7. Marking

Table 4. Marking codes

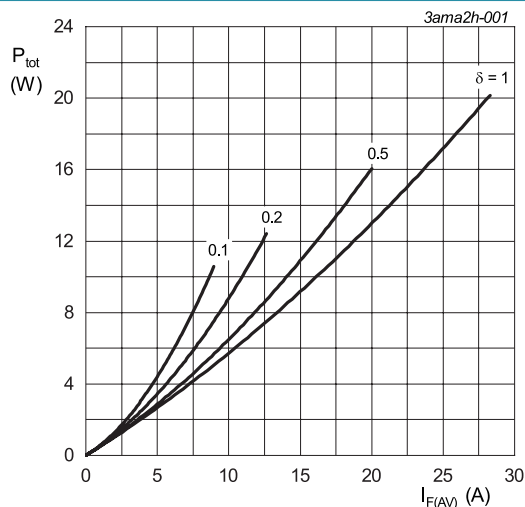
Type number	Marking codes
WN3S40H100C	WN3S 40H100C

## 8. Limiting values

**Table 5. Limiting values**

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

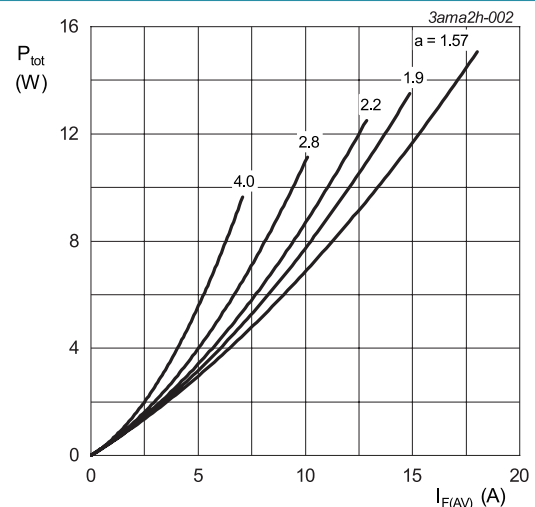
Symbol	Parameter	Conditions	Values	Unit
$V_{RRM}$	repetitive peak reverse voltage		100	V
$V_{RWM}$	crest working reverse voltage		100	V
$V_R$	reverse voltage	DC	100	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 134^\circ\text{C}$ ; per diode; Fig. 1; Fig. 2; Fig. 3	20	A
$I_{O(AV)}$	average output current	$\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 131^\circ\text{C}$ ; both diodes conducting	40	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25^\circ\text{C}$ ; sine-wave pulse; per diode; Fig. 4	380	A
		$t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25^\circ\text{C}$ ; sine-wave pulse; per diode	418	A
$T_{stg}$	storage temperature		-40 to 150	$^\circ\text{C}$
$T_j$	junction temperature		150	$^\circ\text{C}$



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

$$V_o = 0.496\text{ V}; R_s = 0.0077\ \Omega$$

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



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

$$V_o = 0.496\text{ V}; R_s = 0.0077\ \Omega$$

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

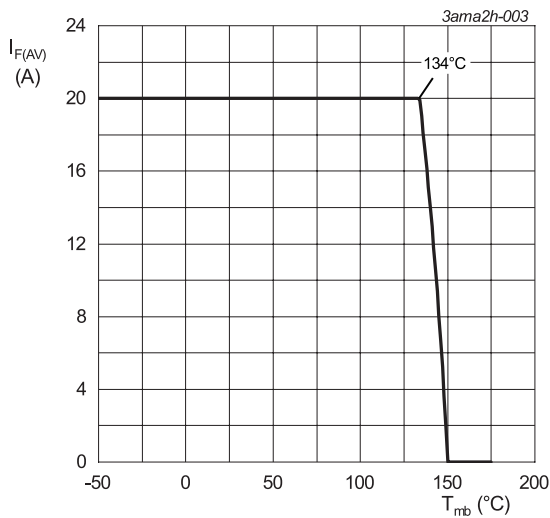


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

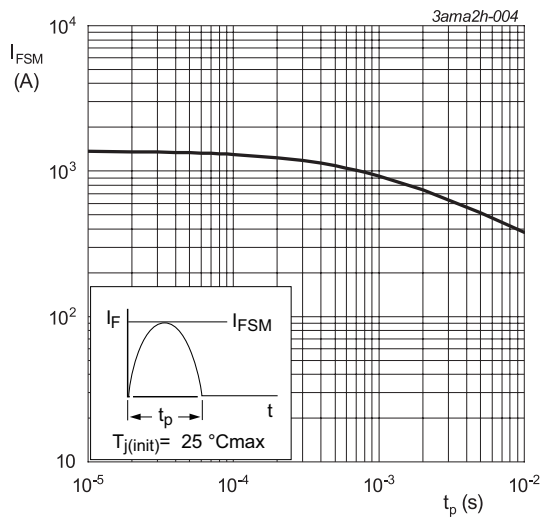


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; Fig. 5		-	-	1	K/W
		both diodes conducting		-	-	0.6	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	60	-	K/W

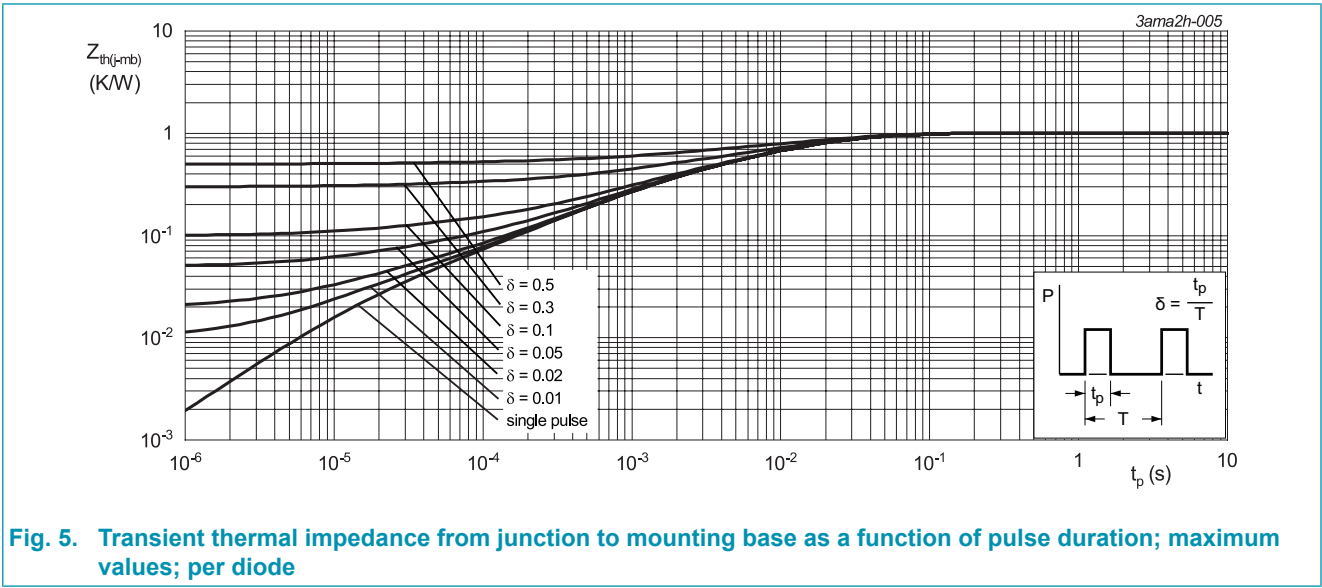
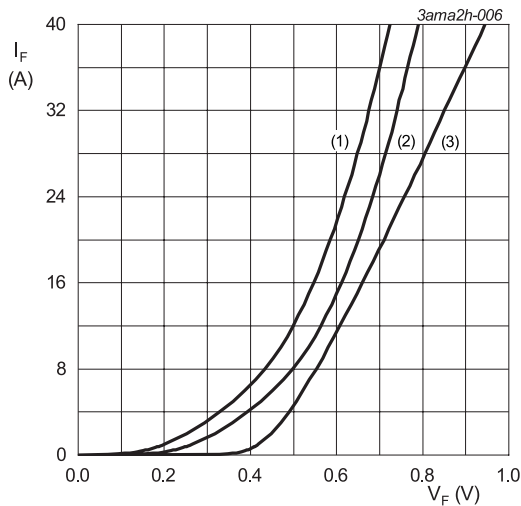


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values; per diode

10. Characteristics

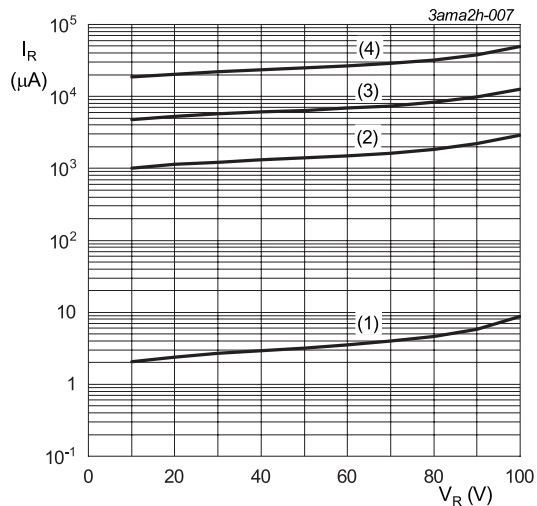
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 10 A; T <sub>j</sub> = 25 °C; prediode; Fig. 6		-	0.54	0.59	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 125 °C; prediode; Fig. 6		-	0.5	0.56	V
		I <sub>F</sub> = 20 A; T <sub>j</sub> = 25 °C; prediode; Fig. 6		-	0.67	0.71	V
		I <sub>F</sub> = 20 A; T <sub>j</sub> = 125 °C; prediode; Fig. 6		-	0.63	0.68	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 100 V; T <sub>j</sub> = 25 °C; prediode; Fig. 7; Fig. 8		-	-	50	μA
		V <sub>R</sub> = 100 V; T <sub>j</sub> = 125 °C; prediode; Fig. 7; Fig. 8		-	-	30	mA



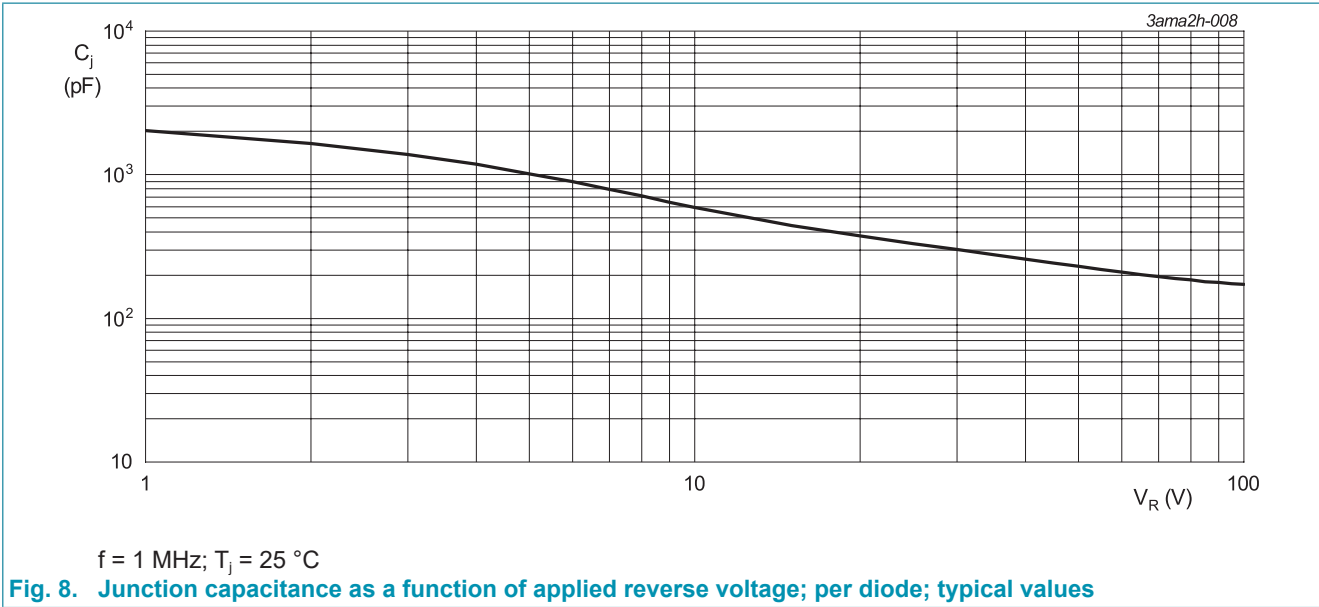
V<sub>o</sub> = 0.496 V; R<sub>s</sub> = 0.0077 Ω  
(1) T<sub>j</sub> = 150 °C; typical values  
(2) T<sub>j</sub> = 150 °C; maximum values  
(3) T<sub>j</sub> = 25 °C; maximum values

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



(1) T<sub>j</sub> = 25 °C; typical values  
(2) T<sub>j</sub> = 100 °C; typical values  
(3) T<sub>j</sub> = 125 °C; typical values  
(4) T<sub>j</sub> = 150 °C; typical values

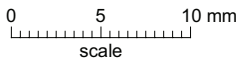
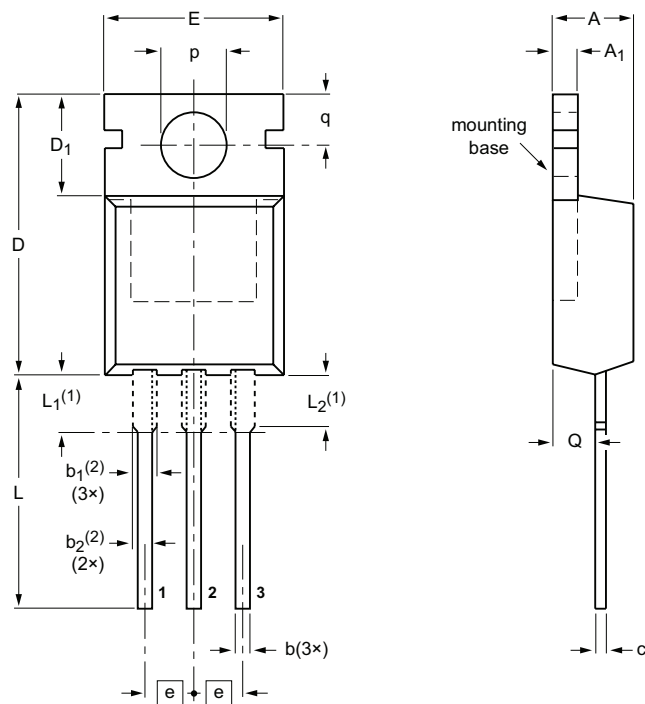
Fig. 7. Reverse leakage current as a function of reverse voltage; per diode; typical value



11. 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 <sub>1</sub>	b	b <sub>1</sub> (2)	b <sub>2</sub> (2)	c	D	D <sub>1</sub>	E	e	L	L <sub>1</sub> (1)	L <sub>2</sub> (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



## 12. Legal information

### 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.
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