



**THE DATASHEET OF
WNS40100CQ**



1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO-220 plastic package.

2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- Low forward conduction voltage
- Negligible switching losses
- High efficiency

3. Applications

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

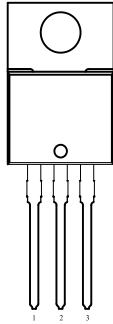
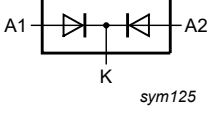
4. Quick reference data

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	$\delta = 0.5$; $T_{mb} \leq 128$ °C; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3	-	-	20	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 126$ °C; square-wave pulse; both diodes conducting	-	-	40	A
Static characteristics						
V_F	forward voltage	$I_F = 5$ A; $T_j = 25$ °C; Fig. 6 ; per diode	-	0.48	-	V
		$I_F = 5$ A; $T_j = 125$ °C; Fig. 6 ; per diode	-	0.41	-	V
		$I_F = 20$ A; $T_j = 25$ °C; Fig. 6 ; per diode	-	0.71	0.78	V
		$I_F = 20$ A; $T_j = 125$ °C; Fig. 6 ; per diode	-	0.64	0.71	V
I_R	reverse current	$V_R = 100$ V; $T_j = 25$ °C; Fig. 7 ; Fig. 8 ; per diode	-	-	50	μ A
		$V_R = 100$ V; $T_j = 125$ °C; Fig. 7 ; Fig. 8 ; per diode	-	-	30	mA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 <p>TO-220E</p>	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

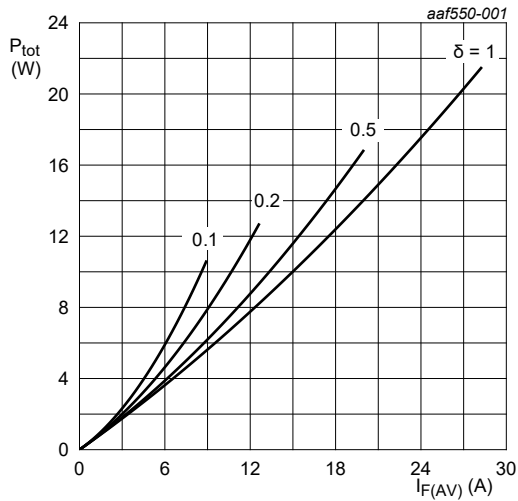
Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WNS40100C	TO220	WNS40100CQ	Tube	50	TO220E	26-April-2019

7. Limiting values

Table 4. Limiting values

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

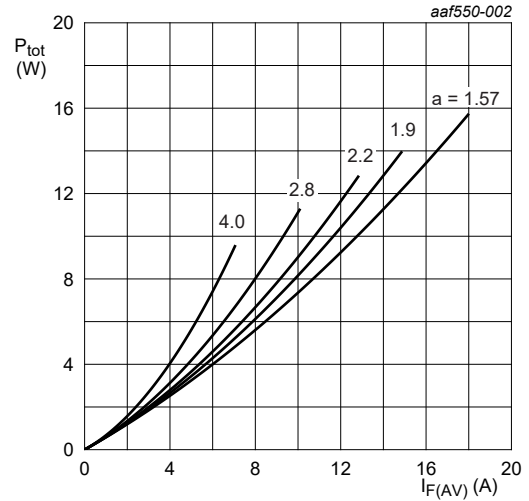
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	100	V
V_{RWM}	limiting crest working reverse voltage		-	100	V
V_R	limiting reverse voltage	DC	-	100	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_{mb} \leq 128\text{ }^\circ\text{C}$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3	-	20	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 126\text{ }^\circ\text{C}$; square-wave pulse; both diodes conducting	-	40	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode; Fig. 4	-	330	A
		$t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode	-	363	A
T_{stg}	storage temperature		-40	150	$^\circ\text{C}$
T_j	junction temperature		-	150	$^\circ\text{C}$



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

$$V_o = 0.562\text{ V}; R_s = 0.0070\ \Omega$$

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



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

$$V_o = 0.562\text{ V}; R_s = 0.0070\ \Omega$$

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

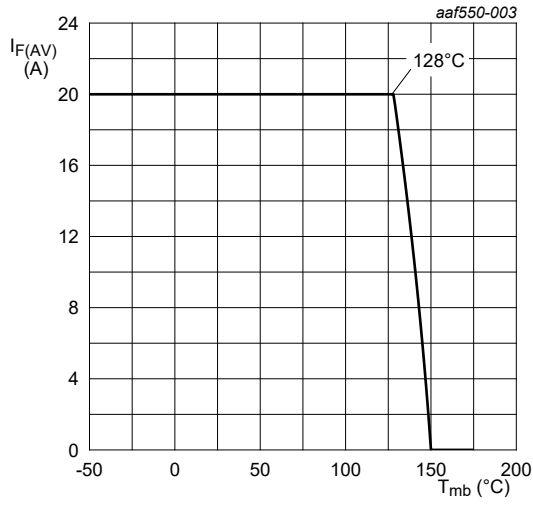


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

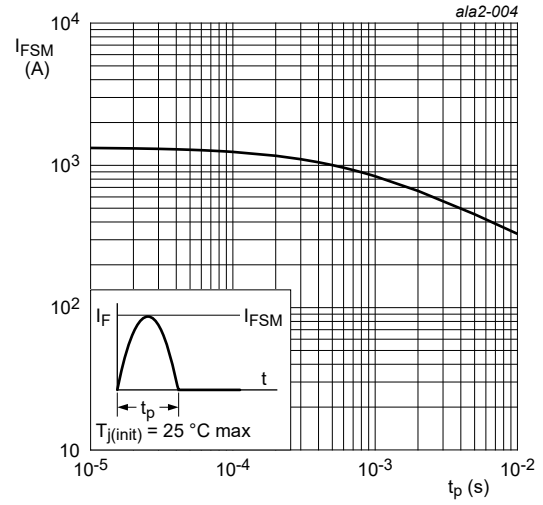


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R _{th(j-mb)}	thermal resistance from junction to mounting base	per diode; Fig. 5	-	-	1.3	K/W
		both diodes conducting	-	-	0.7	K/W
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	-	60	-	K/W

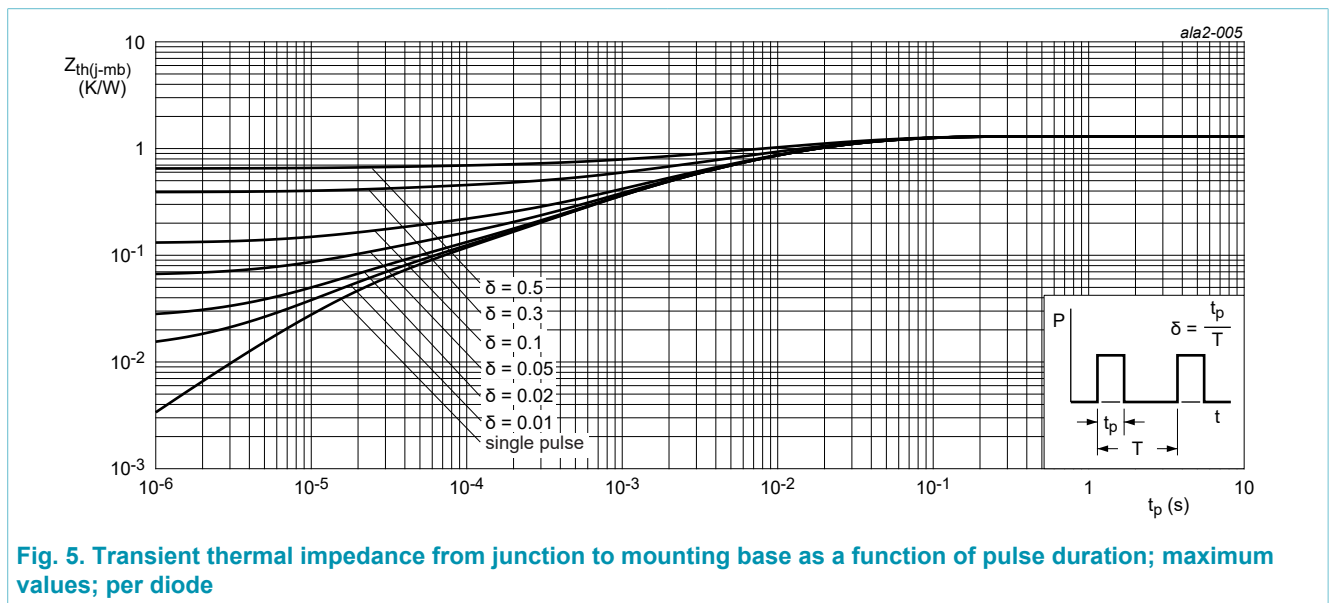
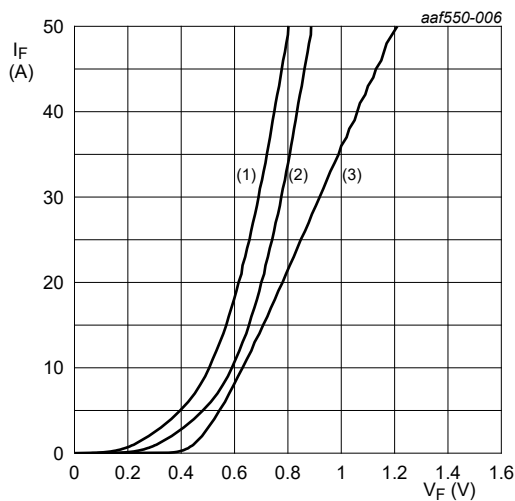


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values; per diode

9. Characteristics

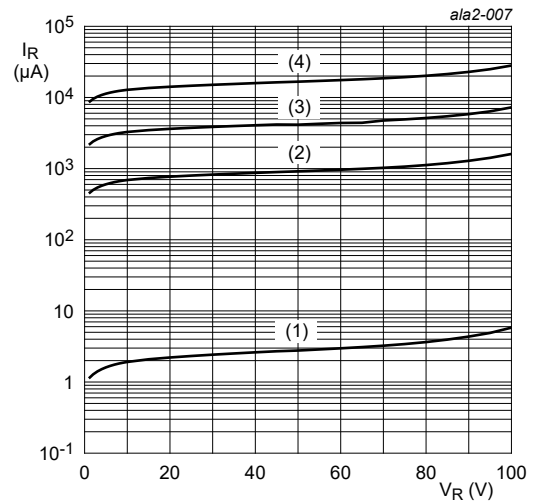
Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 5 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}; \text{ per diode}$	-	0.48	-	V
		$I_F = 5 \text{ A}; T_j = 125 \text{ }^\circ\text{C}; \text{ Fig. 6}; \text{ per diode}$	-	0.41	-	V
		$I_F = 20 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}; \text{ per diode}$	-	0.71	0.78	V
		$I_F = 20 \text{ A}; T_j = 125 \text{ }^\circ\text{C}; \text{ Fig. 6}; \text{ per diode}$	-	0.64	0.71	V
I_R	reverse current	$V_R = 100 \text{ V}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}; \text{ Fig. 8}; \text{ per diode}$	-	-	50	μA
		$V_R = 100 \text{ V}; T_j = 125 \text{ }^\circ\text{C}; \text{ Fig. 7}; \text{ Fig. 8}; \text{ per diode}$	-	-	30	mA



$V_o = 0.562 \text{ V}; R_s = 0.0070 \text{ } \Omega$
 (1) $T_j = 150 \text{ }^\circ\text{C}; \text{ typical values}$
 (2) $T_j = 150 \text{ }^\circ\text{C}; \text{ maximum values}$
 (3) $T_j = 25 \text{ }^\circ\text{C}; \text{ maximum values}$

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



(1) $T_j = 25 \text{ }^\circ\text{C}; \text{ typical values}$
 (2) $T_j = 100 \text{ }^\circ\text{C}; \text{ typical values}$
 (3) $T_j = 125 \text{ }^\circ\text{C}; \text{ typical values}$
 (4) $T_j = 150 \text{ }^\circ\text{C}; \text{ typical values}$

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

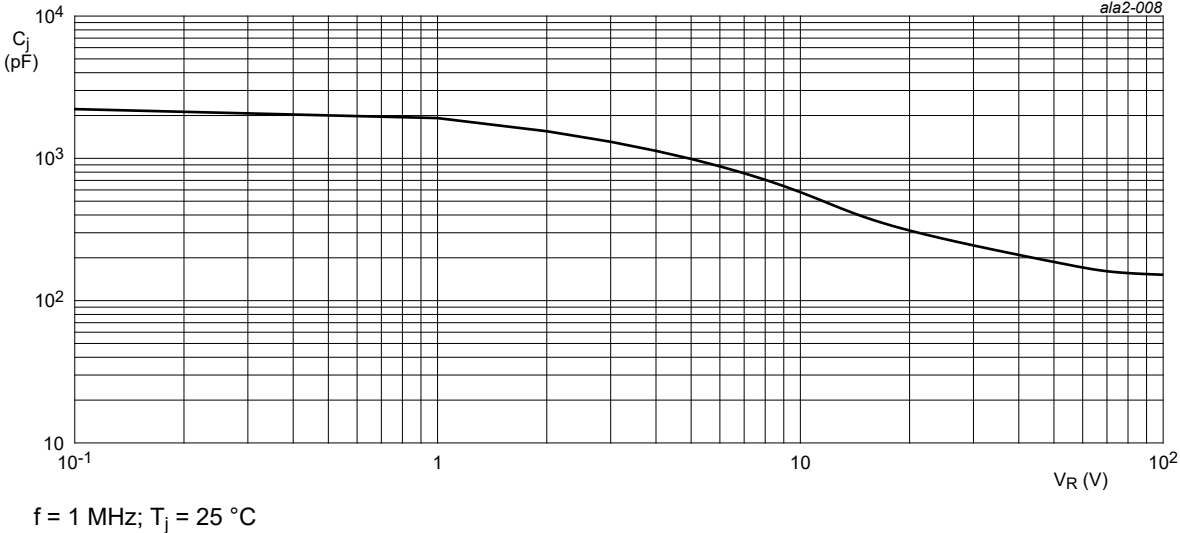
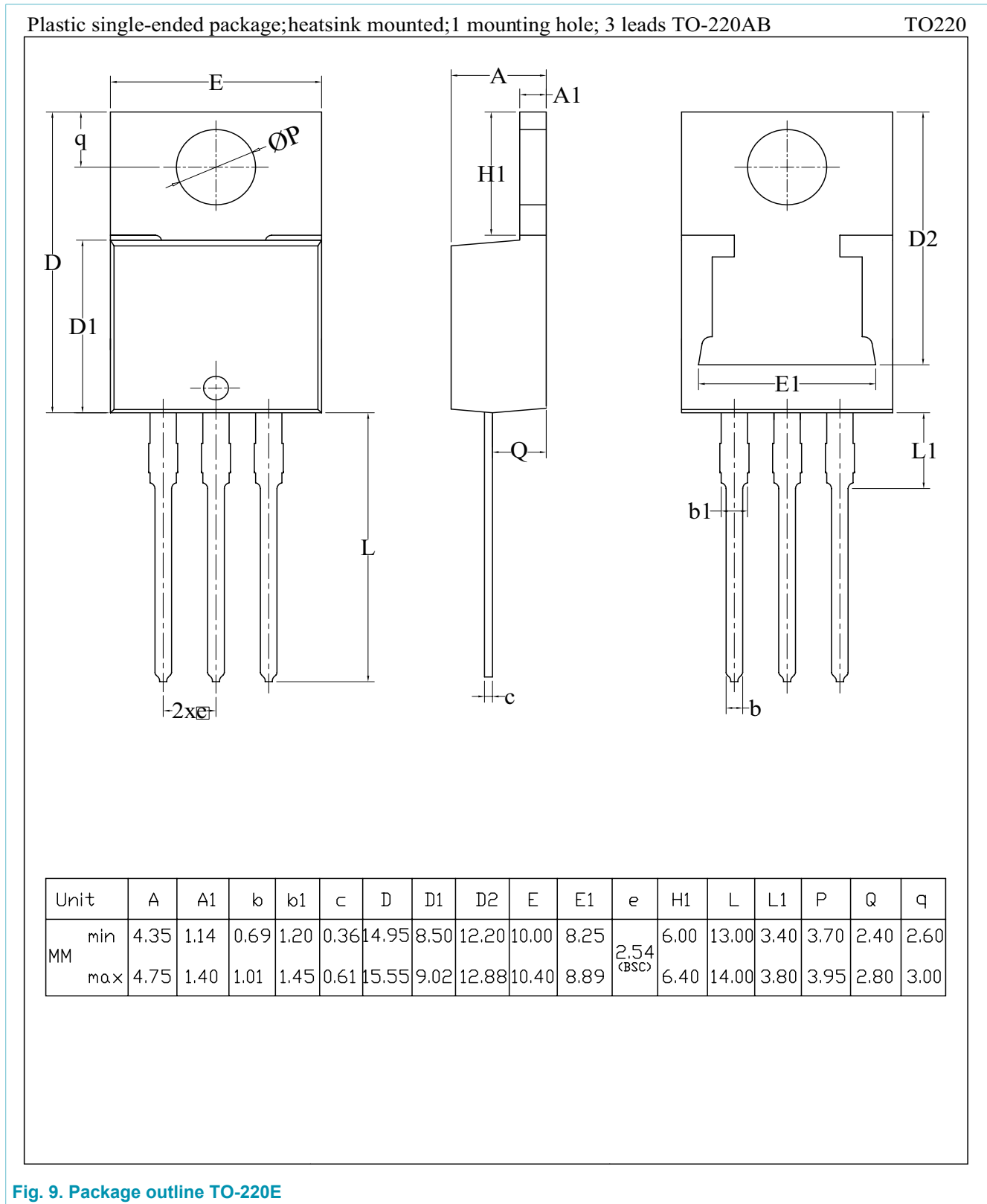


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

10. Package outline



11. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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- [2] The term 'short data sheet' is explained in section "Definitions".
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Date of release: 26 April 2019

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