WNB199V5APTS

Ultrafast power diode - Bare die

Rev.01 - 02 April 2020 Product data sheet

1. General description

Ultrafast power diode (Bare die after sawn).

2. Features and benefits

- Fast switching and soft reverse recovery characteristics
- Low forward voltage drop
- Low leakage current
- Low reverse recovery current
- Bare die

3. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}*	repetitive peak reverse voltage			-	-	600	V
$I_{F(AV)}$**	average forward current	δ = 0.5; square-wave pulse		-	-	60	A
Static characteristics							
V_F**	forward voltage	I_F = 60 A; T_j = 25 °C		-	1.55	2	V
		I_F = 60 A; T_j = 150 °C		-	-	1.6	V
Dynamic characteristics							
t_{rr}**	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 50 A/µs; T_j = 25 °C		-	-	55	ns

4. Ordering information

Table 2. Ordering information

Type number	Orderable part number	Name	Description	Version
WNB199V5APTS	WNB199V5APTSV	Wafer	Bare die on wafer	Die

5. Limiting values

Table 3. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}*	repetitive peak reverse voltage			-	600	V
V_{RWM}*	crest working reverse voltage			-	600	V
V_R*	reverse voltage	DC		-	600	V
$I_{F(AV)}$**	average forward current	δ = 0.5; square-wave pulse		-	60	A
I_{FRM}**	repetitive peak forward current	δ = 0.5; t_p = 25 µs; square-wave pulse		-	120	A
I_{FSM}**	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse		-	600	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse		-	660	A
T_{stg}**	storage temperature			-55	175	°C
T_j**	junction temperature				175	°C

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6. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F*	forward voltage	I_F = 60 A; T_j = 25 °C		-	1.55	2	V
V_F**	forward voltage	I_F = 60 A; T_j = 150 °C		-	-	1.6	V
I_R*	reverse current	V_R = 600 V; T_j = 25 °C		-	-	10	µA
I_R**	reverse current	V_R = 600 V; T_j = 125 °C		-	-	500	µA
Dynamic characteristics							
t_{rr}**	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 50 A/µs; T_j = 25 °C		-	-	55	ns
		I_F = 60 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 25 °C		-	53	-	ns
		I_F = 60 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 125 °C		-	120	-	ns

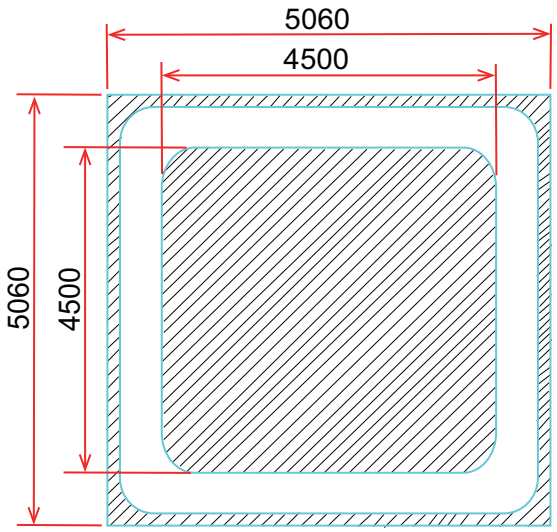
Notes:
(1) * mean that parameter are 100% test at T_{amb} = 25°C
(2) ** means that the guaranteed ratings and parameter limits will depend on the assembled structure. When correctly assembled with suitable die bonding and wire bonding, the device will have ratings and characteristics guaranteed in this data sheet, similar to the assembled devices like BYV60W-600P.

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MECHANICAL PATAMETER		
Chip size	5.06 x 5.06	mm^2
Anode pad size	4.5 x 4.5	mm^2
Area total / active	25.6 / 20.25	mm^2
Thickness	300	µm
Separation lane	80	µm
Wafer size	125	mm
Max possible chips per wafer	418	pcs
Passivation	Glass	
Front metal	Al	
Back metal	Ti Ni Ag	

CHIP LAYOUT



Die size: 5060µm x 5060µm
Bond pad size: 4500µm x 4500µm

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7. 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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Product [short] data sheet	Production	This document contains the product specification.

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[2] The term 'short data sheet' is explained in section "Definitions".
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