WB20SC120AL

Silicon Carbide Schottky diode - Bare die

Rev.01 - 26 October 2021 Product data sheet

1. General description

Silicon Carbide Schottky diode (Bare Die).

2. Features and benefits

- Extremely fast reverse recovery time
- Low figure of merit (Q_r*V_F)
- Highly stable switching performance
- Superior in efficiency to Silicon Diode alternatives
- Reduced losses in associated MOSFET
- Reduced EMI
- Reduced cooling requirements
- RoHS compliant

3. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}*	repetitive peak reverse voltage			-	-	1200	V
$I_{F(AV)}$**	average forward current	δ = 0.5; square-wave pulse		-	-	20	A
Static characteristics							
V_F**	forward voltage	I_F = 20 A; T_j = 25 °C		-	1.5	1.8	V
		I_F = 20 A; T_j = 150 °C		-	2.1	2.5	V
Dynamic characteristics							
Q_r**	recovered charge	I_F = 20 A; V_R = 400 V; dI_F/dt = 500 A/µs; T_j = 25 °C		-	39	-	nC

4. Ordering information

Table 2. Ordering information

Type number	Orderable part number	Name	Description	Version
WB20SC120AL	WB20SC120ALZ	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			-	1200	V
V_{RWM}*	crest working reverse voltage			-	1200	V
V_R*	reverse voltage	DC		-	1200	V
$I_{F(AV)}$**	average forward current	δ = 0.5; square-wave pulse		-	20	A
I_{FRM}**	repetitive peak forward current	δ = 0.5; t_p = 25 µs; square-wave pulse		-	40	A
I_{FSM}**	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse		-	125	A
		t_p = 10 µs; $T_{j(init)}$ = 25 °C; square-wave pulse		-	1150	A
T_{stg}**	storage temperature			-55	175	°C
T_j**	junction temperature			-	175	°C

6. Characteristics

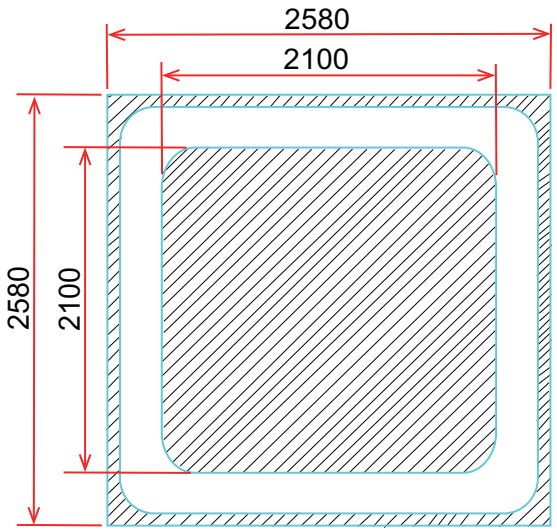
Table 4. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F*	forward voltage	I_F = 20 A; T_j = 25 °C		-	1.5	1.8	V
V_F**	forward voltage	I_F = 20 A; T_j = 150 °C		-	2.1	2.5	V
I_R*	reverse current	V_R = 1200 V; T_j = 25 °C		-	8	200	µA
I_R**	reverse current	V_R = 1200 V; T_j = 150 °C		-	90	-	µA
Dynamic characteristics							
Q_r**	recovered charge	I_F = 20 A; V_R = 400 V; dI_F/dt = 500 A/µs; T_j = 25 °C		-	39	-	nC
C_d**	diode capacitance	f = 1 MHz; V_R = 1 V; T_j = 25 °C		-	845	-	pF
		f = 1 MHz; V_R = 400 V; T_j = 25 °C		-	79	-	pF
		f = 1 MHz; V_R = 800 V; T_j = 25 °C		-	58	-	pF

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 WNSC2D201200W.

MECHANICAL PATAMETER		
Chip size	2.58 x 2.58	mm^2
Anode pad size	2.1 x 2.1	mm^2
Scribe line width	80	µm
Area total / active	6.66 / 4.41	mm^2
Thickness	165	µm
Wafer size	100	mm
Max possible chips per wafer	1063	pcs
Passivation	Polyimide	
Front metal	AlCu (4µm)	
Back metal	Ti Ni Ag (0.2/0.3/2.0µm)	

CHIP LAYOUT



Die size: 2580µm x 2580µm
Bond pad size: 2100µm x 2100µm

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.
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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8. Contents

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