

## 1. General description

Hyperfast power diode (Bare die with sawn).

## 2. Features and benefits

- Low Forward Voltage Drop
- Low leakage current
- Fast reverse recovery
- Bare die

## 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         | $\delta = 0.5$ ; square-wave pulse  | -   | -   | 30   | A    |
| <b>Static characteristics</b>  |                                 |   |     |     |      |      |
| $V_F^{**}$                     | forward voltage                 | $I_F = 30\text{ A}$ ; $T_j = 25\text{ °C}$  | -   | 2.7 | 3.5  | V    |
| <b>Dynamic characteristics</b> |                                 |   |     |     |      |      |
| $t_{rr}^{**}$                  | reverse recovery time           | $I_F = 1\text{ A}$ ; $V_R = 30\text{ V}$ ; $di_F/dt = 100\text{ A}/\mu\text{s}$ ;<br>$T_j = 25\text{ °C}$ | -   | -   | 65   | ns   |

## 4. Ordering information

Table 2. Ordering information

| Type number   | Orderable part number | Name  | Description                           | Version |
|---------------|-----------------------|-------|---------------------------------------|---------|
| WBSF30FC120AL | WBSF30FC120ALV        | Wafer | Sawn wafer with frame, vacuum packing | 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             | $\delta = 0.5$ ; square-wave pulse  | -   | 30   | A                |
| $I_{FRM}^{**}$   | repetitive peak forward current     | $\delta = 0.5$ ; $t_p = 25 \mu\text{s}$ ; square-wave pulse                                 | -   | 60   | 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  | -   | 270  | A                |
|                  |                                     | $t_p = 8.3 \text{ ms}$ ; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse | -   | 300  | A                |
| $T_{stg}^{**}$   | storage temperature                 |   | -65 | 175  | $^\circ\text{C}$ |
| $T_j^{**}$       | junction temperature                |   |     | 175  | $^\circ\text{C}$ |

## 6. Characteristics

**Table 4. Characteristics**

| Symbol                         | Parameter             | Conditions   | Min | Typ | Max  | Unit          |
|--------------------------------|-----------------------|--|-----|-----|------|---------------|
| <b>Static characteristics</b>  |                       |  |     |     |      |               |
| $V_F^*$                        | forward voltage       | $I_F = 30\text{ A}; T_J = 25\text{ °C}$  | -   | 2.7 | 3.5  | V             |
| $V_F^{**}$                     | forward voltage       | $I_F = 30\text{ A}; T_J = 150\text{ °C}$   | -   | 2.1 | -    | V             |
| $I_R^*$                        | reverse current       | $V_R = 1200\text{ V}; T_J = 25\text{ °C}$  | -   | -   | 250  | $\mu\text{A}$ |
| $I_R^{**}$                     | reverse current       | $V_R = 1200\text{ V}; T_J = 150\text{ °C}$   | -   | -   | 1000 | $\mu\text{A}$ |
| <b>Dynamic characteristics</b> |                       |  |     |     |      |               |
| $t_{rr}^{**}$                  | reverse recovery time | $I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 100\text{ A}/\mu\text{s}; T_J = 25\text{ °C}$    | -   | -   | 65   | ns            |
|                                |                       | $I_F = 30\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}; T_J = 25\text{ °C}$  | -   | 70  | -    | ns            |
|                                |                       | $I_F = 30\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}; T_J = 125\text{ °C}$ | -   | 153 | -    | ns            |
|                                |                       | $I_F = 30\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}; T_J = 150\text{ °C}$ | -   | 173 | -    | ns            |

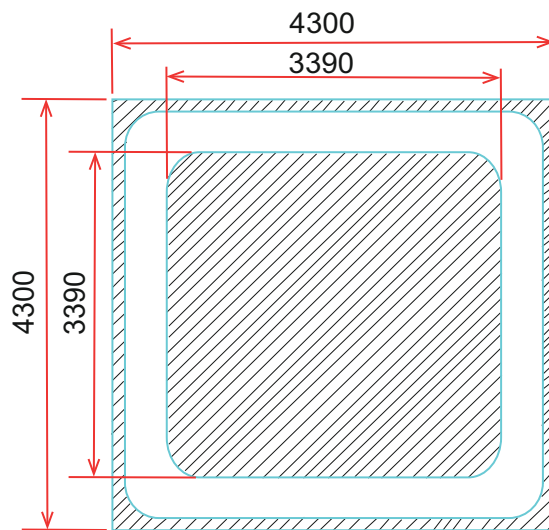
Notes:

(1) \* mean that parameter are 100% test at  $T_{amb} = 25\text{ °C}$

(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 BYC30-1200P / BYC30W-1200P.

| MECHANICAL PATAMETER         |                    |                 |
|------------------------------|--------------------|-----------------|
| Chip size                    | 4.3 x 4.3          | mm <sup>2</sup> |
| Anode pad size               | 3.39 x 3.39        | mm <sup>2</sup> |
| Area total / active          | 18.49 / 11.49      | mm <sup>2</sup> |
| Thickness                    | 300                | μm              |
| Wafer size                   | 125                | mm              |
| Max possible chips per wafer | 561                | pcs             |
| Passivation                  | P.E.C.V.D./ Planar |                 |
| Front metal                  | Al                 |                 |
| Back metal                   | Ti Ni Ag           |                 |

**CHIP LAYOUT**



**Die size: 4300μm x 4300μm**  
**Bond pad size: 3390μm x 3390μm**

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