

## 1. General description

Dual ultrafast power diode in a SOT226A (I2PAK) low-profile plastic package.

## 2. Features and benefits

- High reverse voltage surge capability
- High thermal cycling performance
- Low thermal resistance
- Very low on-state loss
- Soft recovery characteristic minimizes power consuming oscillations

## 3. Applications

- Output rectifiers in high-frequency switched-mode power supplies

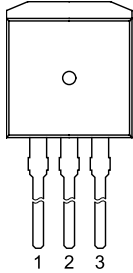
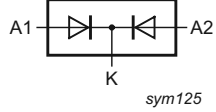
## 4. Quick reference data

Table 1. Quick reference data

| Symbol                         | Parameter                           | Conditions  | Values |      |      | Unit |
|--------------------------------|-------------------------------------|---|--------|------|------|------|
| <b>Absolute maximum rating</b> |                                     |   |        |      |      |      |
| $V_{RRM}$                      | repetitive peak reverse voltage     |   | 200    |      |      | V    |
| $I_{O(AV)}$                    | average output current              | $\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 115\text{ °C}$ ; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>         | 20     |      |      | A    |
| $I_{RRM}$                      | repetitive peak reverse current     | $\delta = 0.001$ ; $t_p = 2\ \mu\text{s}$ ;   | 0.2    |      |      | A    |
| $V_{ESD}$                      | electrostatic discharge voltage     | HBM; $C = 250\ \text{pF}$ ; $R = 1.5\ \text{k}\Omega$ ; all pins  | 8      |      |      | kV   |
| $I_{FRM}$                      | repetitive peak forward current     | $\delta = 0.5$ ; $t_p = 25\ \mu\text{s}$ ; $T_{mb} \leq 115\text{ °C}$ ; per diode  | 20     |      |      | A    |
| $I_{FSM}$                      | non-repetitive peak forward current | $t_p = 10\ \text{ms}$ ; sine-wave pulse; $T_{j(\text{init})} = 25\text{ °C}$ ; per diode  | 125    |      |      | A    |
|                                |                                     | $t_p = 8.3\ \text{ms}$ ; sine-wave pulse; $T_{j(\text{init})} = 25\text{ °C}$ ; per diode   | 137    |      |      | A    |
| Symbol                         | Parameter                           | Conditions  | Min    | Typ  | Max  | Unit |
| <b>Static characteristics</b>  |                                     |   |        |      |      |      |
| $V_F$                          | forward voltage                     | $I_F = 8\ \text{A}$ ; $T_j = 150\text{ °C}$ ; <a href="#">Fig. 4</a>  | -      | 0.72 | 0.85 | V    |
| <b>Dynamic characteristics</b> |                                     |   |        |      |      |      |
| $t_{rr}$                       | reverse recovery time               | $I_F = 1\ \text{A}$ ; $V_R = 30\ \text{V}$ ; $di_F/dt = 100\ \text{A}/\mu\text{s}$ ; $T_j = 25\text{ °C}$ ; ramp recovery; <a href="#">Fig. 5</a> | -      | 20   | 25   | ns   |
|                                |                                     | $I_F = 0.5\ \text{A}$ to $I_R = 1\ \text{A}$ ; $T_j = 25\text{ °C}$ ; measured at $I_R = 0.25\ \text{A}$ ; step recovery; <a href="#">Fig. 6</a>  | -      | 10   | 20   | ns   |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description                         | Simplified outline   | Graphic symbol  |
|-----|--------|-------------------------------------|--|---|
| 1   | A1     | anode 1                             |  |  |
| 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    | Description                                  | Version |
| BYV32G-200  | I2PAK   | plastic single-ended package (I2PAK); TO-262 | SOT226A |

## 7. Marking

Table 4. Marking codes

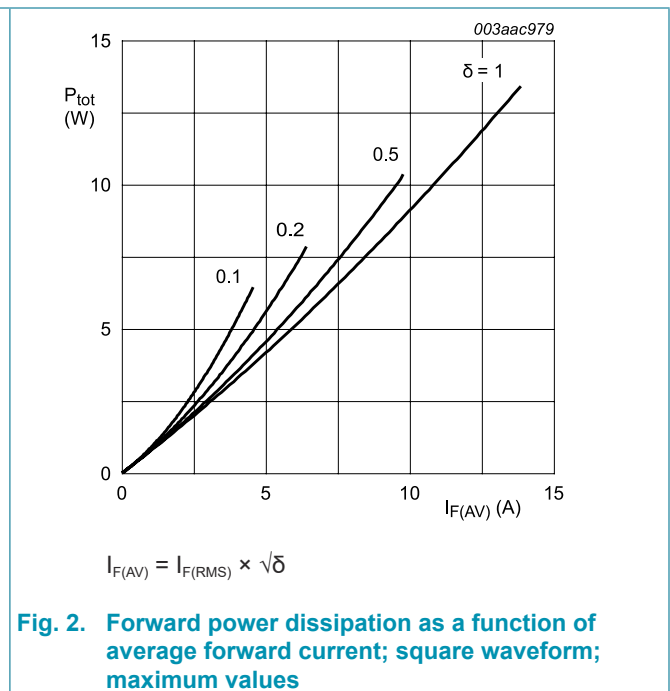
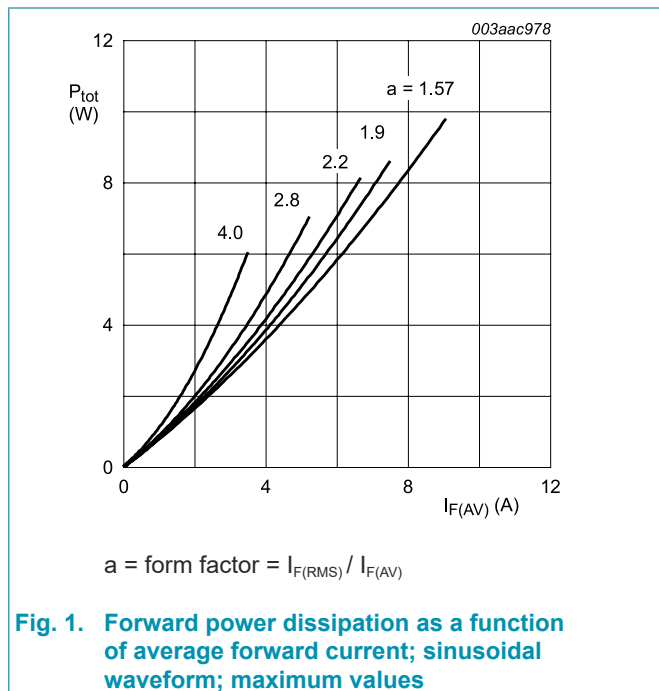
| Type number | Marking codes |
|-------------|---------------|
| BYV32G-200  | BYV32G-200    |

## 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     |  | 200        | V    |
| $V_{RWM}$   | crest working reverse voltage       |  | 200        | V    |
| $V_R$       | reverse voltage                     | DC   | 200        | V    |
| $I_{O(AV)}$ | average output current              | $\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 115\text{ °C}$ ; both diodes conducting; Fig 1; Fig 2 | 20         | A    |
| $I_{FRM}$   | repetitive peak forward current     | $\delta = 0.5$ ; $t_p = 25\ \mu\text{s}$ ; $T_{mb} \leq 115\text{ °C}$ ; per diode                     | 20         | A    |
| $I_{FSM}$   | non-repetitive peak forward current | $t_p = 10\text{ ms}$ ; sine-wave pulse; $T_{j(\text{init})} = 25\text{ °C}$ ; per diode                | 125        | A    |
|             |                                     | $t_p = 8.3\text{ ms}$ ; sine-wave pulse; $T_{j(\text{init})} = 25\text{ °C}$ ; per diode               | 137        | A    |
| $I_{RRM}$   | repetitive peak reverse current     | $\delta = 0.001$ ; $t_p = 2\ \mu\text{s}$ ; per diode  | 0.2        | A    |
| $I_{RSM}$   | non-repetitive peak reverse current | $t_p = 100\ \mu\text{s}$ ; per diode   | 0.2        | A    |
| $T_{stg}$   | storage temperature                 |  | -40 to 150 | °C   |
| $T_j$       | junction temperature                |  | 150        | °C   |
| $V_{ESD}$   | electrostatic discharge voltage     | HBM; all pins; C = 250 pF; R = 1.5 kΩ  | 8          | kV   |



## 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 | with heatsink compound; both diodes conducting           | -   | -   | 1.6 | K/W  |
|                |   | with heatsink compound; per diode; <a href="#">Fig 3</a> | -   | -   | 2.4 | K/W  |
| $R_{th(j-a)}$  | thermal resistance from junction to ambient       |  | -   | 60  | -   | K/W  |

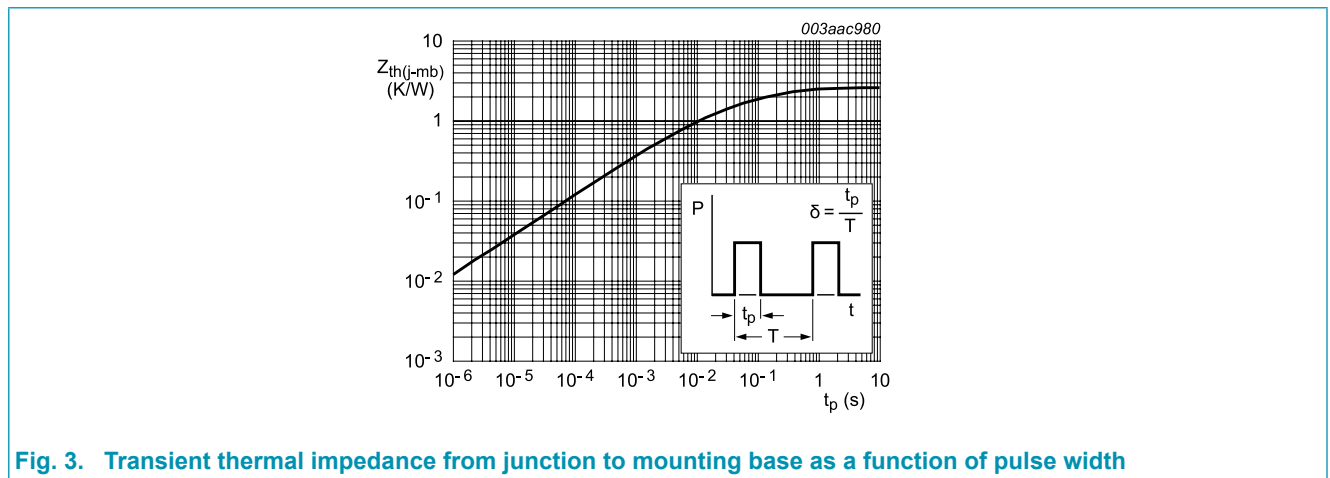
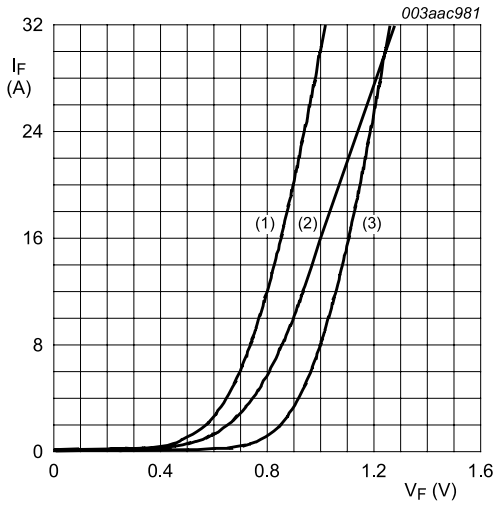


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

## 10. Characteristics

Table 7. Characteristics

| Symbol                         | Parameter                | Conditions   | Min | Typ  | Max  | Unit          |
|--------------------------------|--------------------------|--|-----|------|------|---------------|
| <b>Static characteristics</b>  |                          |  |     |      |      |               |
| $V_F$                          | forward voltage          | $I_F = 8 \text{ A}; T_j = 150 \text{ }^\circ\text{C};$ <a href="#">Fig. 4</a>  | -   | 0.72 | 0.85 | V             |
|                                |                          | $I_F = 20 \text{ A}; T_j = 25 \text{ }^\circ\text{C}$  | -   | 1    | 1.15 | V             |
| $I_R$                          | reverse current          | $V_R = 200 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$   | -   | 6    | 30   | $\mu\text{A}$ |
|                                |                          | $V_R = 200 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$  | -   | 0.2  | 0.6  | mA            |
| <b>Dynamic characteristics</b> |                          |  |     |      |      |               |
| $Q_r$                          | recovered charge         | $I_F = 2 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 20 \text{ A}/\mu\text{s};$<br>$T_j = 25 \text{ }^\circ\text{C}$  | -   | 8    | 12.5 | nC            |
| $t_{rr}$                       | reverse recovery time    | $I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s};$<br>$T_j = 25 \text{ }^\circ\text{C};$ ramp recovery; <a href="#">Fig. 5</a>      | -   | 20   | 25   | ns            |
|                                |                          | $I_F = 0.5 \text{ A}$ to $I_R = 1 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$<br>measured at $I_R = 0.25 \text{ A};$ step recovery;<br><a href="#">Fig. 6</a> | -   | 10   | 20   | ns            |
| $V_{FR}$                       | forward recovery voltage | $I_F = 1 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C};$<br><a href="#">Fig. 7</a>  | -   | -    | 1    | V             |



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

Fig. 4. Forward current as a function of forward voltage

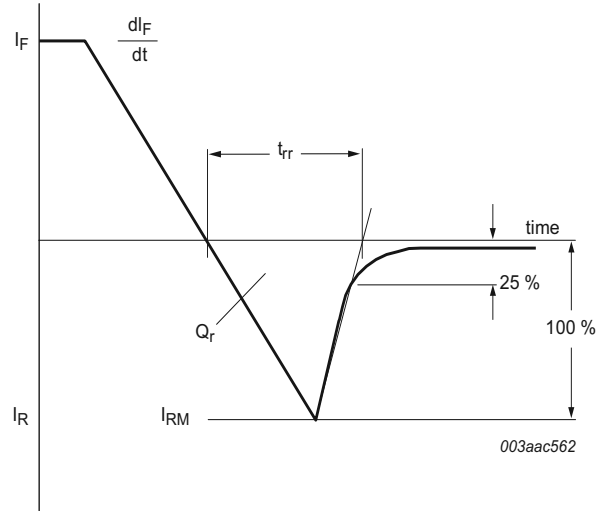


Fig. 5. Reverse recovery definitions; ramp recovery

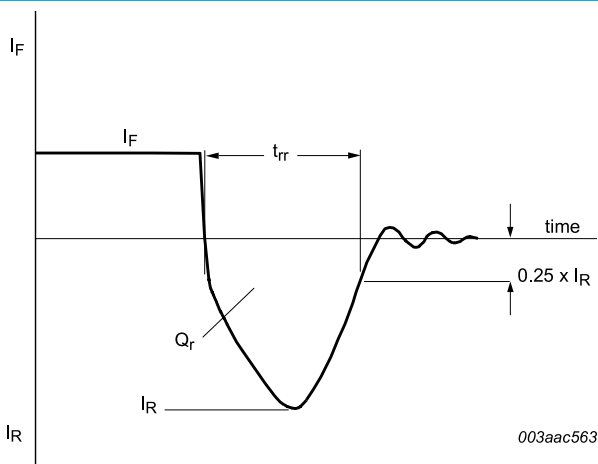


Fig. 6. Reverse recovery definitions; step recovery

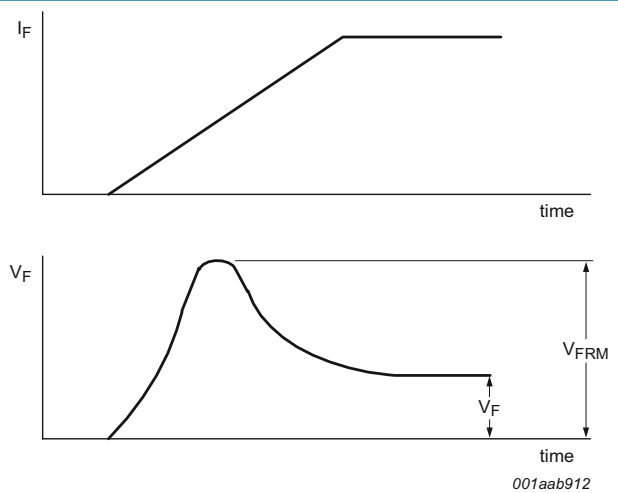
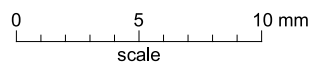
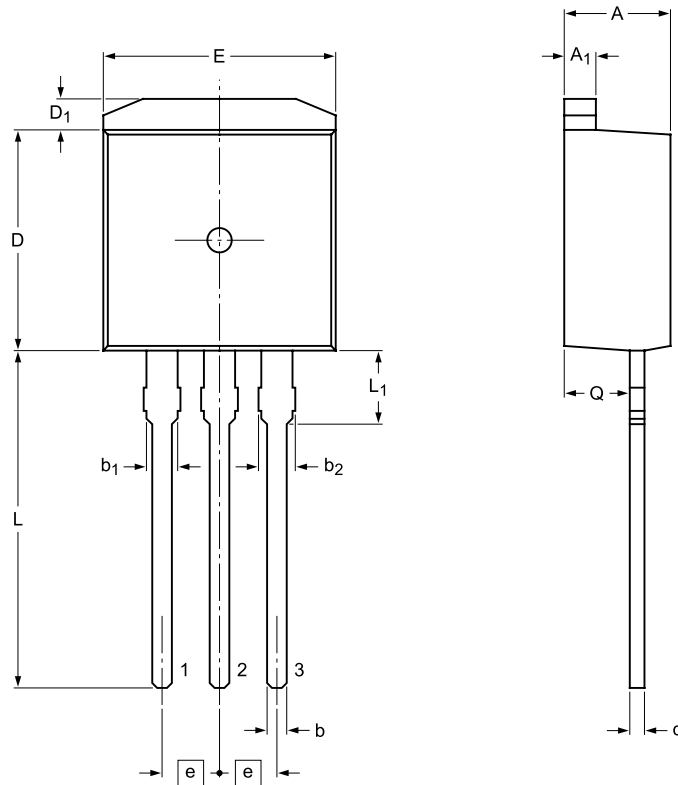


Fig. 7. Forward recovery definitions

### 11. Package outline

Plastic single-ended package (I2PAK); low-profile 3-lead TO-262

SOT226A



Dimensions

| Unit | A   | A <sub>1</sub> | b    | b <sub>1</sub> | b <sub>2</sub> | c    | D   | D <sub>1</sub> | E     | e     | L    | L <sub>1</sub> | Q   |
|------|-----|----------------|------|----------------|----------------|------|-----|----------------|-------|-------|------|----------------|-----|
| max  | 4.7 | 1.40           | 0.95 | 1.40           | 1.7            | 0.65 | 9.4 | 1.32           | 10.30 | 2.54  | 15.0 | 3.0            | 2.6 |
| nom  |     |                |      |                |                |      |     |                |       | (REF) |      | (REF)          |     |
| min  | 4.3 | 1.15           | 0.70 | 1.14           | 1.3            | 0.45 | 8.6 | 1.02           | 9.65  |       | 12.5 |                | 2.2 |

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| Outline version | References |        |       | European projection | Issue date           |
|-----------------|------------|--------|-------|---------------------|----------------------|
|                 | IEC        | JEDEC  | JEITA |                     |                      |
| SOT226A         |            | TO-262 |       |                     | 09-08-17<br>09-08-25 |

## 12. Revision history

Table 8. Revision history

| Document ID    | Release date | Data sheet status                       | Change notice | Supersedes     |
|----------------|--------------|---|---------------|----------------|
| BYV32G-200 v.2 | 20180307     | Product data sheet                      | -             | BYV32G-200 v.1 |
| Modifications: |              | Change from NXP version to WeEn version |               |                |
| BYV32G-200 v.1 | 20110111     | Product data sheet                      | -             | -              |



## 13. 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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- [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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