

## 1. General description

Ultrafast power diode in 2-leads TO-262 (I2PAK) plastic package.

## 2. Features and benefits

- Low forward voltage drop
- Low leakage current
- Soft reverse recovery characteristics
- High thermal cycling performance

## 3. Applications

- Home appliance power supply
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

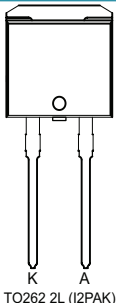
## 4. Quick reference data

Table 1. Quick reference data

| Symbol                  | Parameter                           | Conditions                                                                                                                      | Values |     |      |     | Unit |
|-------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------|-----|------|-----|------|
| Absolute maximum rating |                                     |                                                                                                                                 |        |     |      |     |      |
| V <sub>RRM</sub>        | repetitive peak reverse voltage     |                                                                                                                                 | 600    |     |      |     | V    |
| I <sub>F(AV)</sub>      | average forward current             | δ = 0.5 ; square-wave pulse; T <sub>mb</sub> ≤ 150 °C; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a> | 9      |     |      |     | A    |
| I <sub>FRM</sub>        | repetitive peak forward current     | δ = 0.5 ; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 150 °C; square-wave pulse                                                   | 18     |     |      |     | A    |
| I <sub>FSM</sub>        | non-repetitive peak forward current | t <sub>p</sub> = 10 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse; <a href="#">Fig. 4</a>                                   | 120    |     |      |     | A    |
|                         |                                     | t <sub>p</sub> = 8.3 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse;                                                         | 132    |     |      |     | A    |
| Symbol                  | Parameter                           | Conditions                                                                                                                      |        | Min | Typ  | Max | Unit |
| Static characteristics  |                                     |                                                                                                                                 |        |     |      |     |      |
| V <sub>F</sub>          | forward voltage                     | I <sub>F</sub> = 8 A; T <sub>j</sub> = 25 °C; <a href="#">Fig. 6</a>                                                            |        | -   | 1.05 | 1.3 | V    |
|                         |                                     | I <sub>F</sub> = 8 A; T <sub>j</sub> = 150 °C; <a href="#">Fig. 6</a>                                                           |        | -   | 0.9  | 1.1 | V    |
| Dynamic characteristics |                                     |                                                                                                                                 |        |     |      |     |      |
| t <sub>rr</sub>         | reverse recovery time               | I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>     |        | -   | 40   | 75  | ns   |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description                        | Simplified outline                                                                | Graphic symbol                                                                      |
|-----|--------|------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1   | K      | cathode                            |  |  |
| 2   | A      | anode                              |                                                                                   |                                                                                     |
| mb  | mb     | mounting base; connected to cathod |                                                                                   |                                                                                     |

6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                     |         |
|-------------|---------|-----------------------------------------------------|---------|
|             | Name    | Description                                         | Version |
| BYV29G-600P | TO-262  | Plastic single-ended package(I2PAK); 2 leads TO-262 | I2PAK   |

7. Marking

Table 4. Marking codes

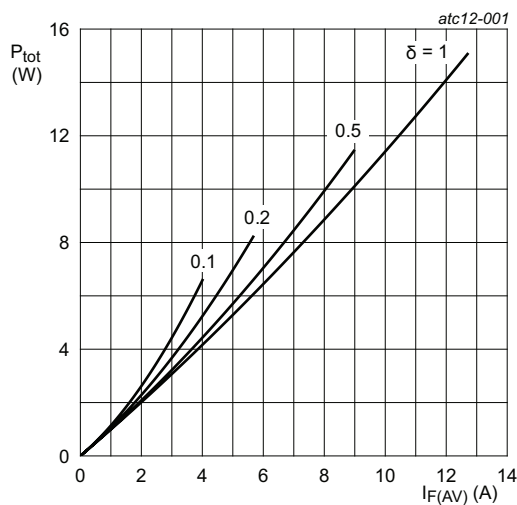
| Type number | Marking codes |
|-------------|---------------|
| BYV29G-600P | BYV29G-600P   |

## 8. Limiting values

**Table 5. Limiting values**

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

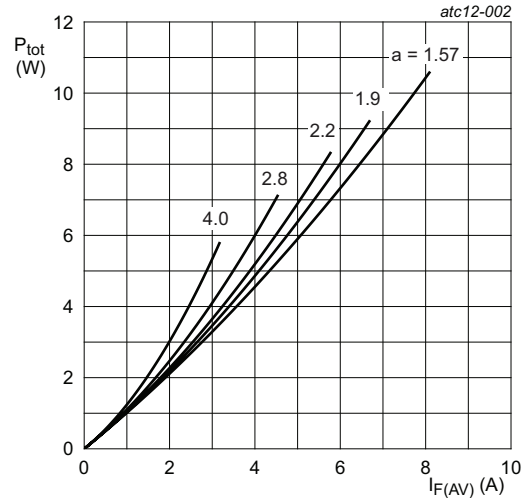
| Symbol      | Parameter                           | Conditions                                                                                                                                                  | Values     | Unit               |
|-------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| $V_{RRM}$   | repetitive peak reverse voltage     |                                                                                                                                                             | 600        | V                  |
| $V_{RWM}$   | crest working reverse voltage       |                                                                                                                                                             | 600        | V                  |
| $V_R$       | reverse voltage                     | DC                                                                                                                                                          | 600        | V                  |
| $I_{F(AV)}$ | average forward current             | $\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 150\text{ }^{\circ}\text{C}$ ;<br><a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a> | 9          | A                  |
| $I_{FRM}$   | repetitive peak forward current     | $\delta = 0.5$ ; $t_p = 25\text{ }\mu\text{s}$ ; $T_{mb} \leq 150\text{ }^{\circ}\text{C}$ ;<br>square-wave pulse                                           | 18         | 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;<br><a href="#">Fig. 4</a>                                       | 120        | A                  |
|             |                                     | $t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$ ; sine-wave pulse;                                                                | 132        | A                  |
| $T_{stg}$   | storage temperature                 |                                                                                                                                                             | -55 to 175 | $^{\circ}\text{C}$ |
| $T_j$       | junction temperature                |                                                                                                                                                             | 175        | $^{\circ}\text{C}$ |



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

$$V_o = 0.973\text{ V}; R_s = 0.0168\text{ }\Omega$$

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



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

$$V_o = 0.973\text{ V}; R_s = 0.0168\text{ }\Omega$$

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

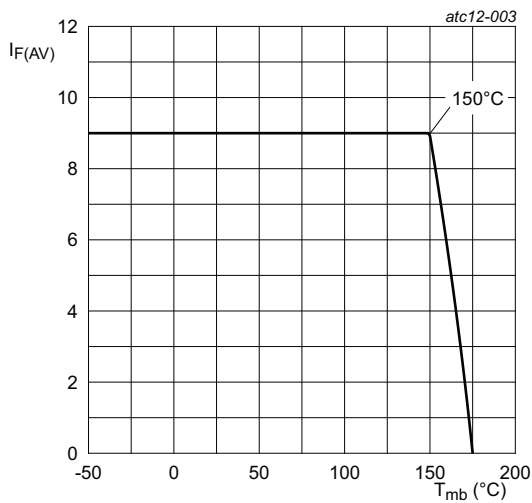


Fig. 3. Forward current as a function of mounting base temperature; maximum values

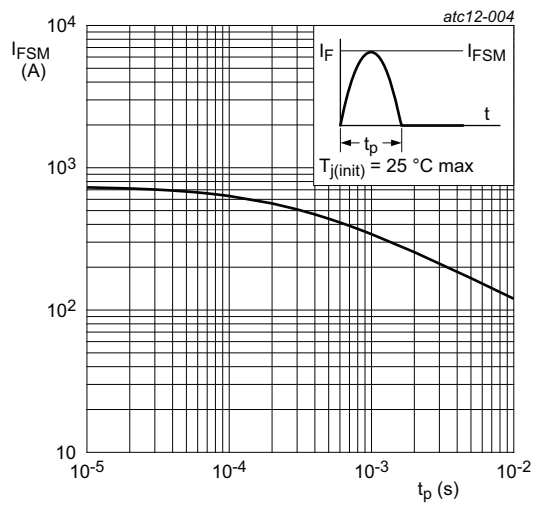


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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    | <a href="#">Fig. 5</a> | -   | -   | 2.2 | K/W  |
| $R_{th(j-a)}$  | thermal resistance from junction to ambient free air | in free air            | -   | 55  | -   | K/W  |

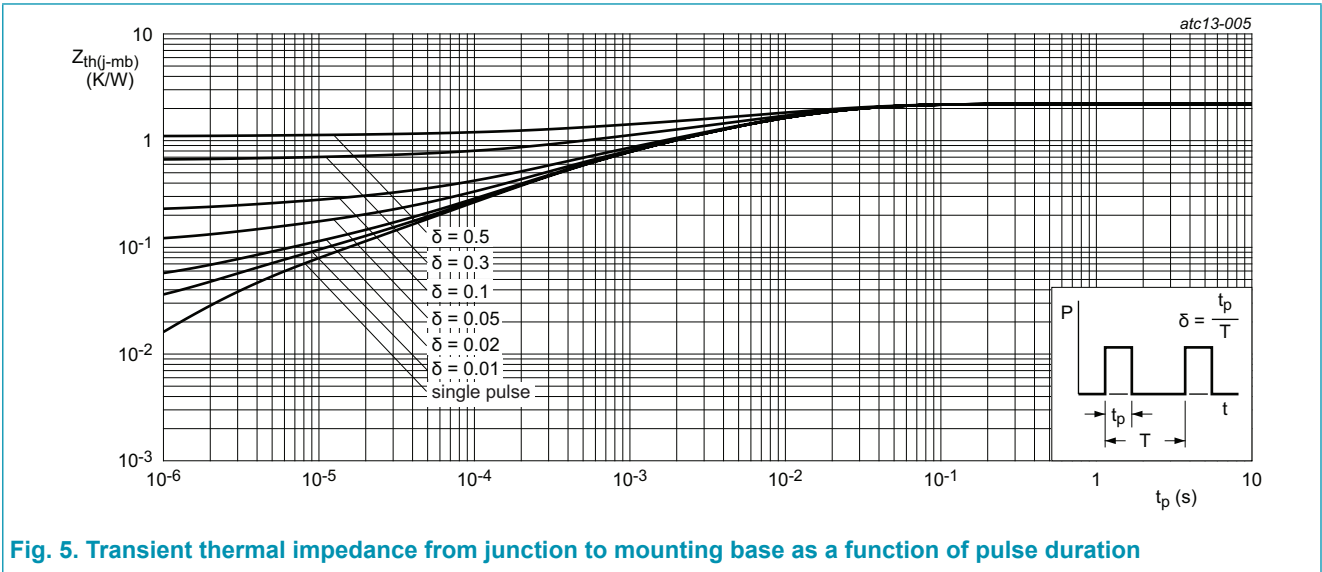
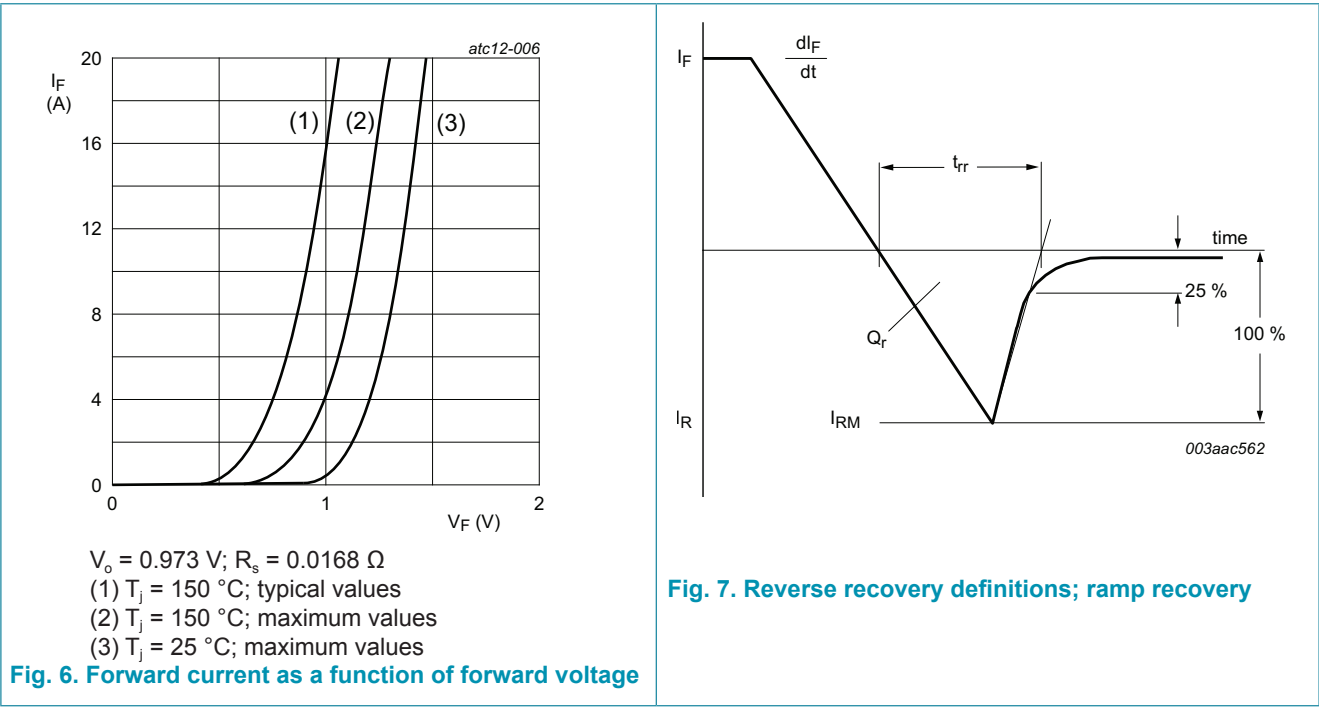


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

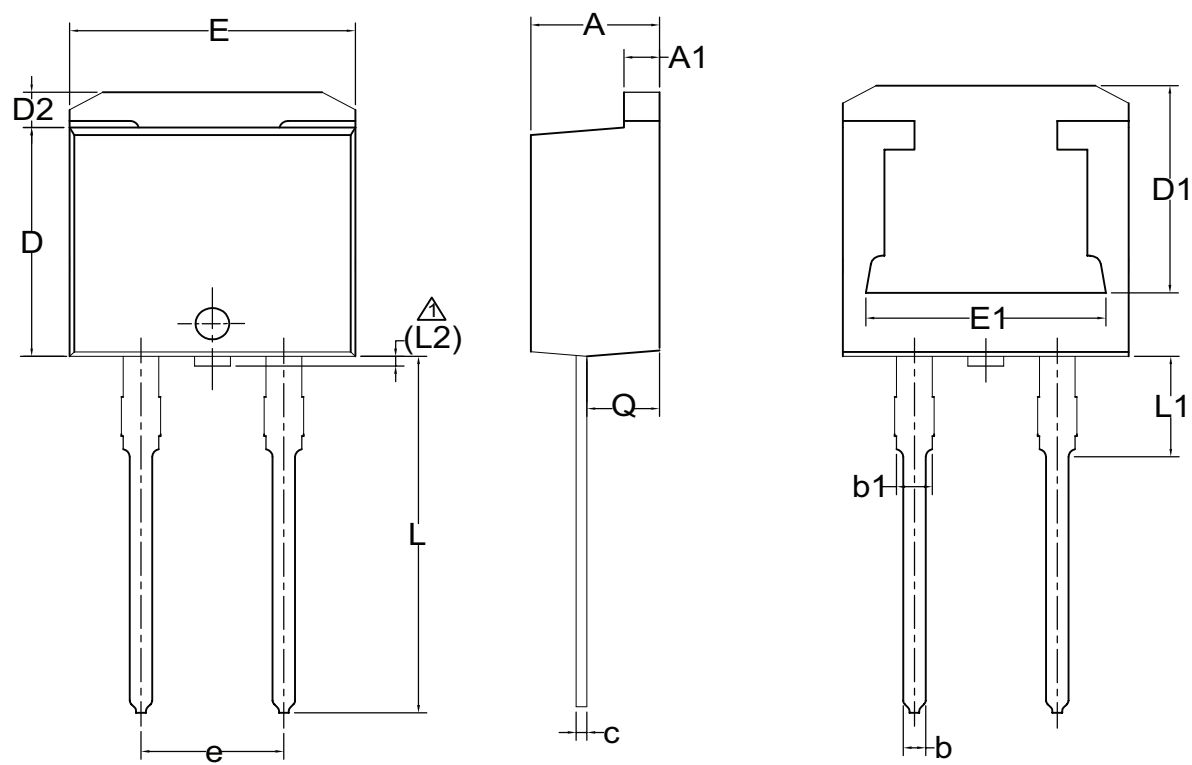
| Symbol                  | Parameter                     | Conditions                                                                                                                  |  | Min | Typ  | Max | Unit |
|-------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--|-----|------|-----|------|
| Static characteristics  |                               |                                                                                                                             |  |     |      |     |      |
| V <sub>F</sub>          | forward current               | I <sub>F</sub> = 8 A; T <sub>j</sub> = 25 °C; <a href="#">Fig. 6</a>                                                        |  | -   | 1.05 | 1.3 | V    |
|                         |                               | I <sub>F</sub> = 8 A; T <sub>j</sub> = 150 °C; <a href="#">Fig. 6</a>                                                       |  | -   | 0.9  | 1.1 | V    |
| I <sub>R</sub>          | reverse current               | V <sub>R</sub> = 600 V; T <sub>j</sub> = 25 °C                                                                              |  | -   | -    | 10  | μA   |
|                         |                               | V <sub>R</sub> = 600 V; T <sub>j</sub> = 150 °C                                                                             |  | -   | -    | 0.4 | mA   |
| Dynamic characteristics |                               |                                                                                                                             |  |     |      |     |      |
| Q <sub>r</sub>          | reverse charge                | I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a> |  | -   | 55   | -   | nC   |
| t <sub>rr</sub>         | reverse recovery time         | I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a> |  | -   | 40   | 75  | ns   |
| I <sub>RM</sub>         | peak reverse recovery current | I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 50 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>  |  | -   | 1.9  | -   | A    |
|                         |                               | I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a> |  | -   | 2.8  | -   | A    |



11. Package outline

Plastic single-ended package(I2PAK);2 leads TO-262

TO262-2L



| Unit | A   | A1   | b    | b1   | c    | D    | D1   | D2   | E    | E1    | e    | L     | L1   | L2   | Q    |
|------|-----|------|------|------|------|------|------|------|------|-------|------|-------|------|------|------|
| MM   | min | 4.35 | 1.14 | 0.69 | 1.14 | 0.36 | 8.50 | 7.50 | 1.00 | 10.00 | 8.25 | 13.00 | 3.40 |      | 2.40 |
|      | max | 4.75 | 1.40 | 1.01 | 1.73 | 0.61 | 9.02 | 8.00 | 1.65 | 10.40 | 8.89 | 14.00 | 3.80 | 0.35 | 2.80 |

Notes:  
△ L2 protrusion is the mold resin.

## 12. 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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