

## 1. General description

Standard reverse recovery power diode in a TO220F package.



## 2. Features and benefits

- Low forward voltage drop
- Low leakage current
- High voltage capability
- High inrush current capability

## 3. Applications

- Oring diode
- Bypass diode
- Input rectifier for bridge configurations

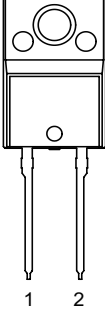
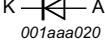
## 4. Quick reference data

Table 1. Quick reference data

| Symbol                         | Parameter                           | Conditions  | Notes | Values |      |      | Unit    |
|--------------------------------|-------------------------------------|---|-------|--------|------|------|---------|
| <b>Absolute maximum rating</b> |                                     |   |       |        |      |      |         |
| $V_{RRM}$                      | repetitive peak reverse voltage     |   |       | 1200   |      |      | V       |
| $I_{F(AV)}$                    | average forward current             | $\delta = 0.5$ ; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> |       | 35     |      |      | A       |
| $I_{FSM}$                      | non-repetitive peak forward current | $t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; <a href="#">Fig. 3</a>       |       | 400    |      |      | A       |
|                                |                                     | $t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse                              |       | 435    |      |      | A       |
| Symbol                         | Parameter                           | Conditions  | Notes | Min    | Typ  | Max  | Unit    |
| <b>Static characteristics</b>  |                                     |   |       |        |      |      |         |
| $V_F$                          | forward voltage                     | $I_F = 35$ A; $T_j = 25$ °C; <a href="#">Fig. 5</a>                                 |       | -      | 1.18 | 1.40 | V       |
| $I_R$                          | reverse current                     | $V_R = 1200$ V; $T_j = 25$ °C   |       | -      | -    | 50   | $\mu$ A |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description             | Simplified outline  | Graphic symbol  |
|-----|--------|-------------------------|---|---|
| 1   | K      | cathode                 |  |  |
| 2   | A      | anode                   |   |   |
| mb  | n.c.   | mounting base; isolated |   |   |

## 6. Ordering information

Table 3. Ordering information

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|-------------|--------------|-----------------------|----------------|------------------------|-----------------|--------------------|
| WND35P12X   | TO220F-2L    | WND35P12XQ            | Tube           | 50                     | TO220Fd-2L      | 02-Aug-2022        |

## 7. Marking

Table 4. Marking codes

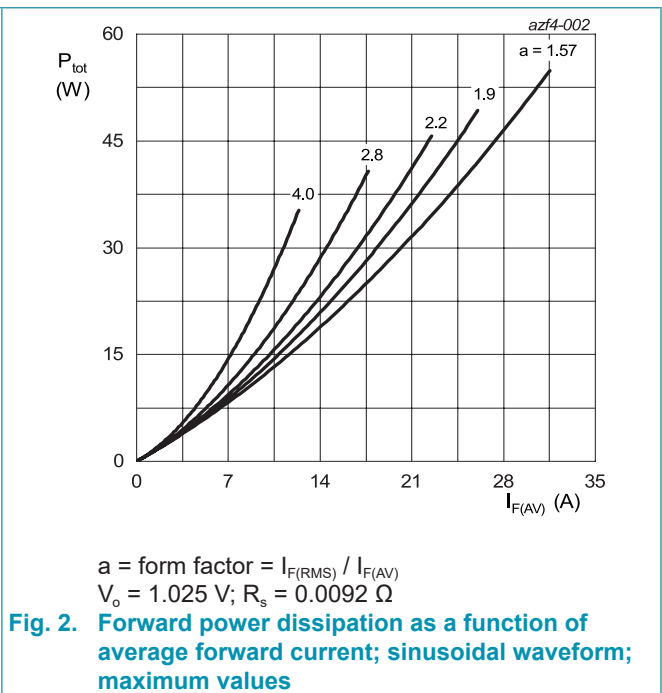
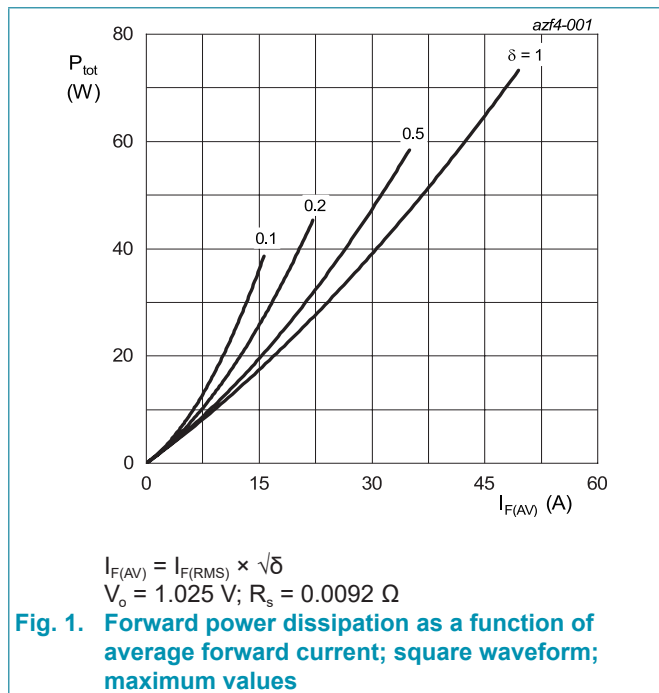
| Type number | Marking codes |
|-------------|---------------|
| WND35P12X   | WND35P12X     |

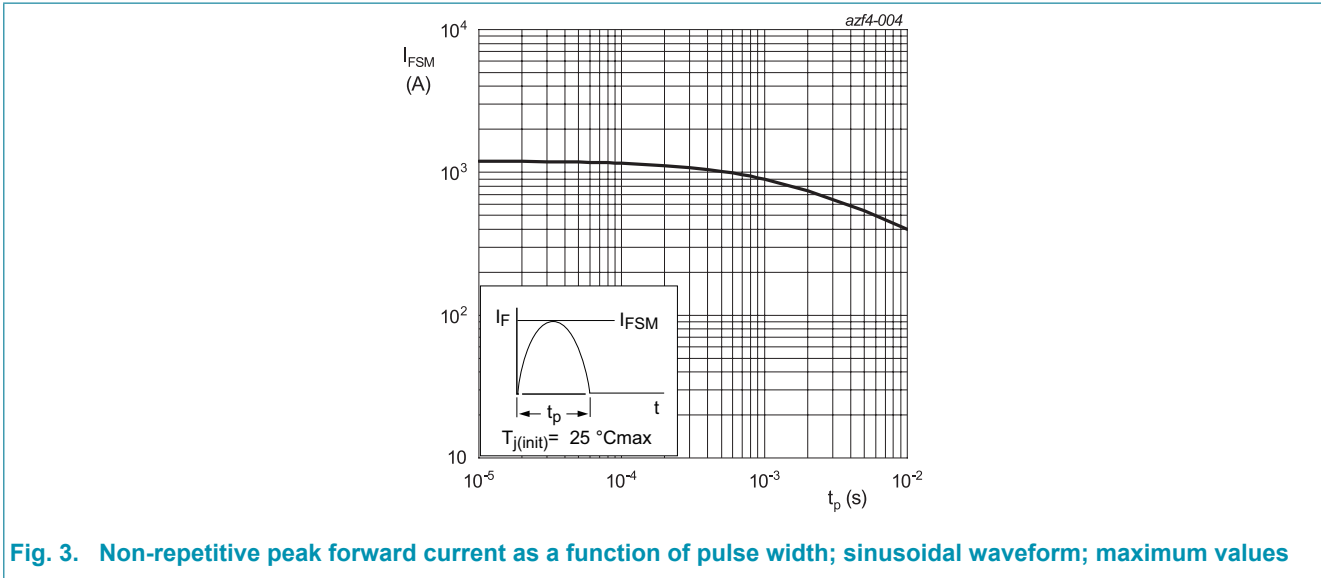
## 8. Limiting values

**Table 5. Limiting values**

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

| Symbol      | Parameter                           | Conditions  | Notes | Values     | 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; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> |       | 35         | A                |
| $I_{FSM}$   | non-repetitive peak forward current | $t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; <a href="#">Fig. 3</a>       |       | 400        | A                |
|             |                                     | $t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse                              |       | 435        | A                |
| $I^2t$      | $I^2t$ for fusing                   | $t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse                               |       | 800        | A <sup>2</sup> s |
| $T_{stg}$   | storage temperature                 |   |       | -40 to 150 | °C               |
| $T_j$       | junction temperature                |   |       | -40 to 150 | °C               |





**Fig. 3. 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             | Notes | Min | Typ | Max | Unit |
|---------------|--|------------------------|-------|-----|-----|-----|------|
| $R_{th(j-h)}$ | thermal resistance from junction to heatsink         | <a href="#">Fig. 4</a> |       | -   | -   | 3.2 | K/W  |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient free air | in free air            |       | -   | 60  | -   | K/W  |

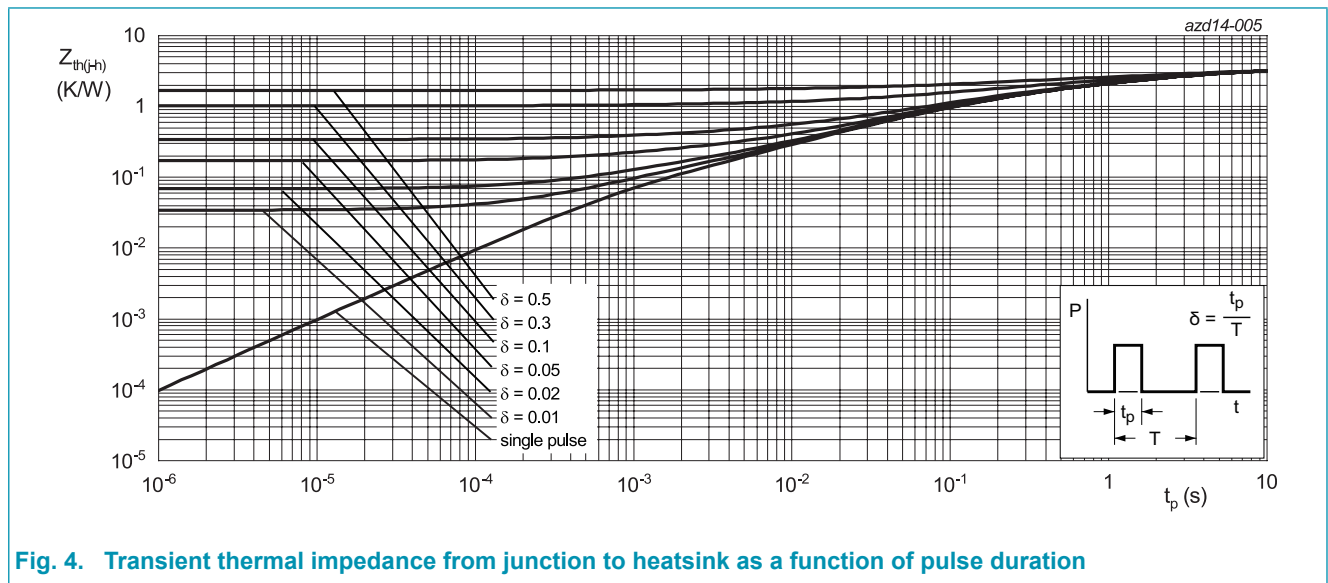


Fig. 4. Transient thermal impedance from junction to heatsink as a function of pulse duration

## 10. Isolation characteristics

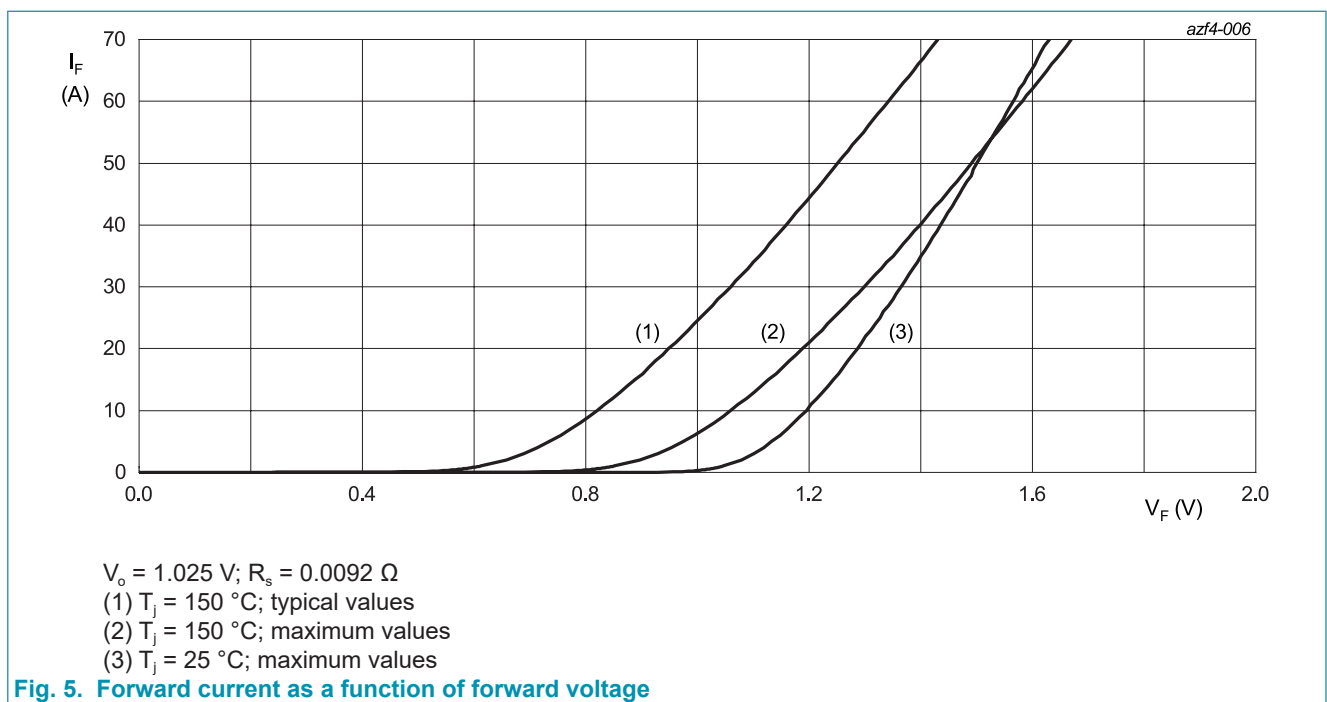
Table 7. Isolation characteristics

| Symbol          | Parameter             | Conditions  | Notes | Min | Typ | Max  | Unit |
|-----------------|-----------------------|---|-------|-----|-----|------|------|
| $V_{isol(RMS)}$ | RMS isolation voltage | 50 Hz $\leq$ f $\leq$ 60 Hz; RH $\leq$ 65 %; from all pins to external heatsink; sinusoidal waveform; clean and dust free |       | -   | -   | 2500 | V    |
| $C_{isol}$      | isolation capacitance | from cathode to external heatsink   |       | -   | 10  | -    | PF   |

## 11. Characteristics

Table 8. Characteristics

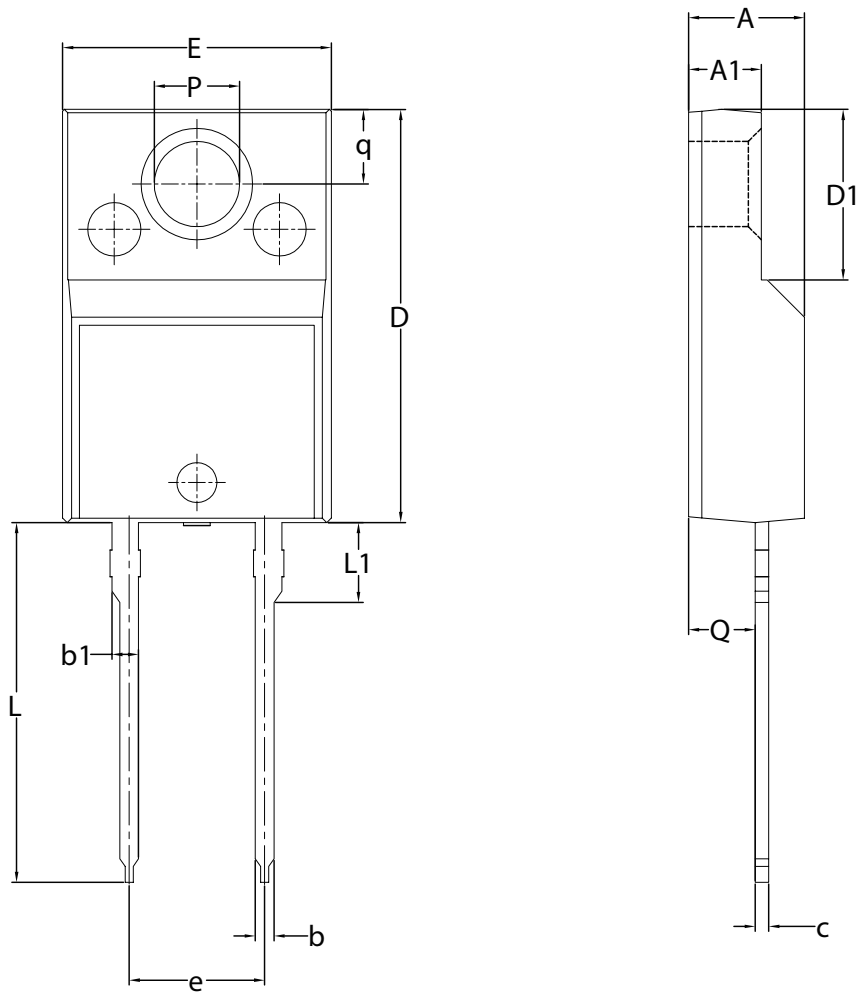
| Symbol                        | Parameter       | Conditions   | Notes | Min | Typ  | Max  | Unit          |
|-------------------------------|-----------------|--|-------|-----|------|------|---------------|
| <b>Static characteristics</b> |                 |  |       |     |      |      |               |
| $V_F$                         | forward current | $I_F = 35 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 5}$  |       | -   | 1.18 | 1.40 | V             |
|                               |                 | $I_F = 35 \text{ A}; T_j = 150 \text{ }^\circ\text{C}; \text{ Fig. 5}$ |       | -   | 1.15 | 1.35 | V             |
| $I_R$                         | reverse current | $V_R = 1200 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$                |       | -   | -    | 50   | $\mu\text{A}$ |
|                               |                 | $V_R = 1200 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$               |       | -   | -    | 1    | mA            |



## 12. Package outline

Plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 2 leads TO-220 'full pack'

TO220F-2L



| Unit | A   | A1   | b    | b1   | c    | D     | D1   | E     | e             | L     | L1   | P    | Q    | q    |
|------|-----|------|------|------|------|-------|------|-------|---------------|-------|------|------|------|------|
| MM   | min | 4.00 | 2.50 | 0.70 | 0.90 | 15.20 | 6.30 | 9.80  | 5.08<br>(BSC) | 13.50 | 2.80 | 3.00 | 2.30 | 2.60 |
|      | max | 4.60 | 3.10 | 0.90 | 1.10 | 15.80 | 6.50 | 10.30 |               | 14.40 | 3.30 | 3.40 | 2.80 | 3.00 |

Note:

1. All dimensions don't include mold flash and metal protrusion.

## 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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## 14. Contents

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|                                     |    |
|-------------------------------------|----|
| 1. General description.....         | 1  |
| 2. Features and benefits .....      | 1  |
| 3. Applications .....               | 1  |
| 4. Quick reference data.....        | 1  |
| 5. Pinning information.....         | 2  |
| 6. Ordering information.....        | 2  |
| 7. Marking.....                     | 2  |
| 8. Limiting values .....            | 3  |
| 9. Thermal characteristics .....    | 5  |
| 10. Isolation characteristics ..... | 5  |
| 11. Characteristics.....            | 6  |
| 12. Package outline .....           | 7  |
| 13. Legal information .....         | 8  |
| 14. Contents .....                  | 10 |

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