

## 1. General description

Enhanced ultrafast power diode in a TO252 (DPAK) surface-mountable plastic package.

## 2. Features and benefits

- High thermal cycling performance
- Low on-state losses
- Low thermal resistance
- Soft recovery characteristic
- Surface-mountable package

## 3. Applications

- Dual mode (DCM and CCM) Power Factor Correction (PFC)
- Power Factor Correction (PFC) for Interleaved Topology
- U-inverter (DC-AC converter for individual solar panels)

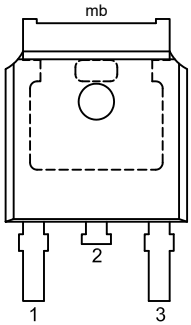
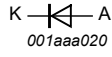
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_R$	reverse voltage	DC	-	-	600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; $T_{mb} \leq 115$ °C; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>	-	-	9	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25$ $\mu$ s; $T_{mb} \leq 115$ °C; square-wave pulse	-	-	18	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>	-	-	91	A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; <a href="#">Fig. 3</a>	-	-	100	A
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8$ A; $T_j = 25$ °C; <a href="#">Fig. 5</a>	-	1.45	1.9	V
		$I_F = 8$ A; $T_j = 150$ °C	-	1.25	1.7	V
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $di_F/dt = 100$ A/ $\mu$ s; $T_j = 25$ °C; <a href="#">Fig. 6</a>	-	17.5	35	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	n.c.	not connected	 <p style="text-align: center;"><b>DPAK (TO252N)</b></p>	
2	K	cathode[1]		
3	A	anode		
mb	K	mounting base; connected to cathode		

[1] It is not possible to connect to pin 2 of the SOT428 package.

## 6. Ordering information

Table 3. Ordering information

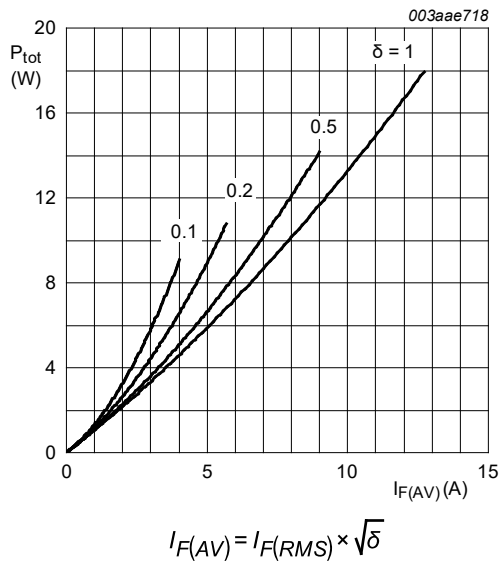
Type number	Package		
	Name	Description	Version
BYV29FD-600	DPAK	plastic single-ended surface-mounted package (DPAK); 3 leads (one lead cropped)	TO252N

## 7. Limiting values

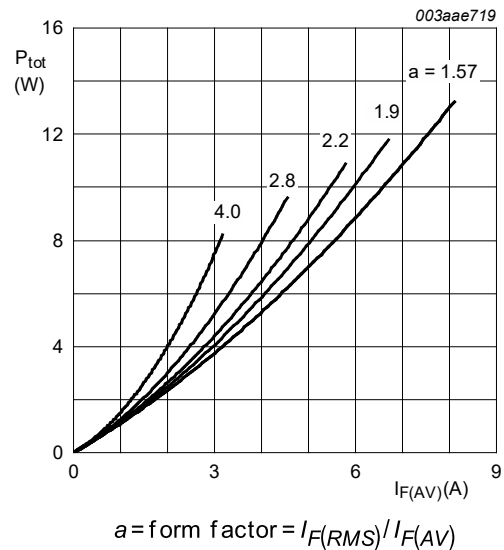
**Table 4. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>RRM</sub>	repetitive peak reverse voltage		-	600	V
V <sub>RWM</sub>	crest working reverse voltage		-	600	V
V <sub>R</sub>	reverse voltage	DC	-	600	V
I <sub>F(AV)</sub>	average forward current	δ = 0.5 ; T <sub>mb</sub> ≤ 115 °C; square-wave pulse; Fig. 1; Fig. 2	-	9	A
I <sub>FRM</sub>	repetitive peak forward current	δ = 0.5 ; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 115 °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; Fig. 3	-	91	A
		t <sub>p</sub> = 8.3 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse; Fig. 3	-	100	A
T <sub>stg</sub>	storage temperature		-40	150	°C
T <sub>j</sub>	junction temperature		-	150	°C



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



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

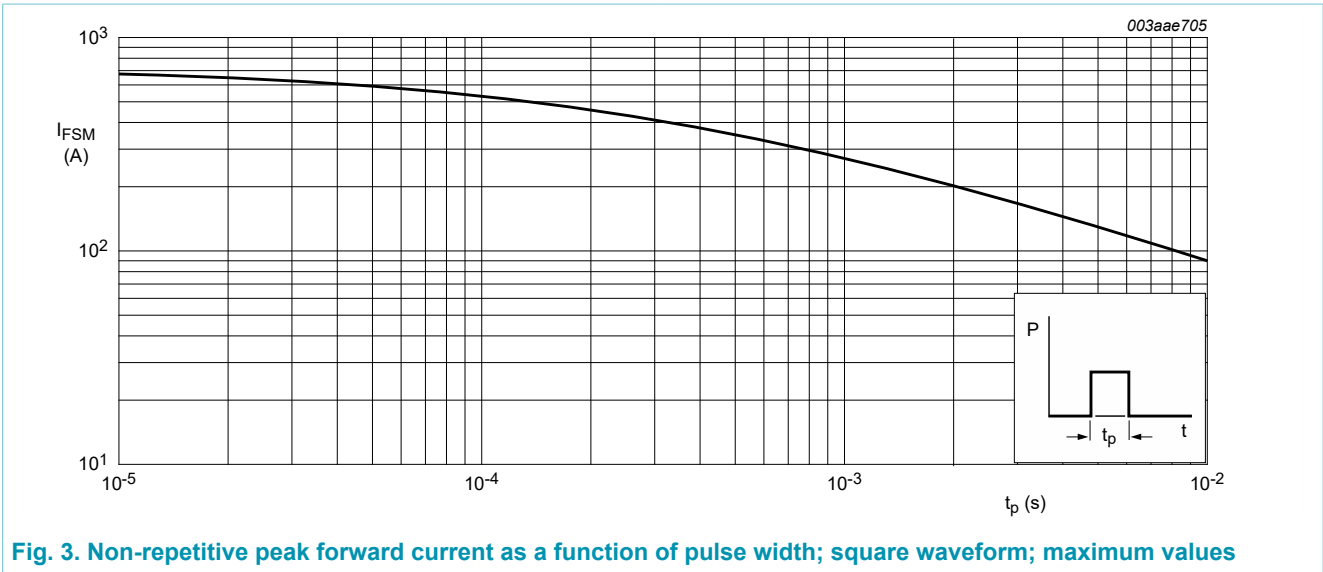


Fig. 3. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

## 8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	<a href="#">Fig. 4</a>	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	60	-	K/W

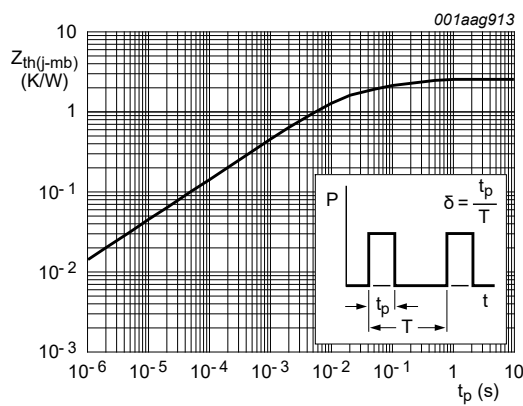
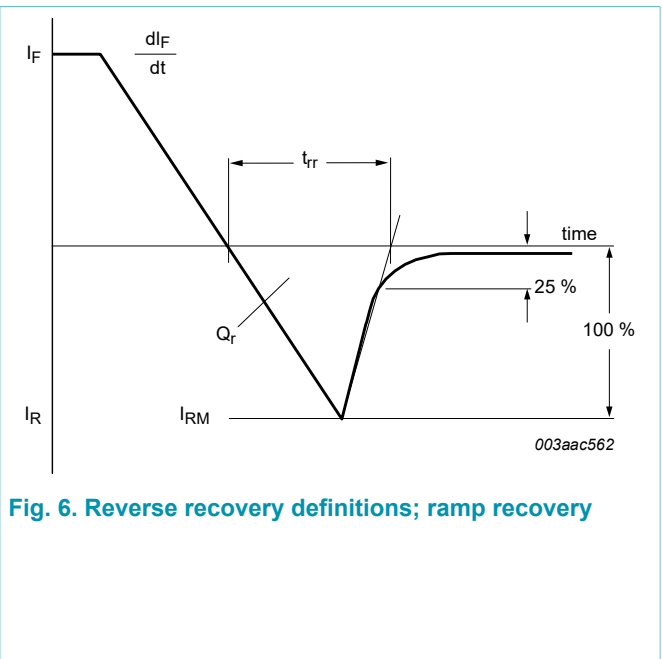
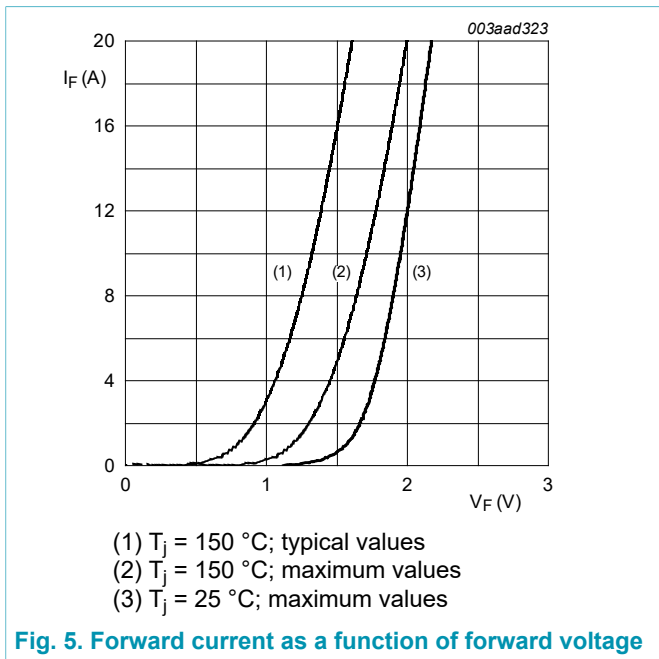


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse width

### 9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 5}$	-	1.45	1.9	V
		$I_F = 8 \text{ A}; T_j = 150 \text{ }^\circ\text{C}$	-	1.25	1.7	V
$I_R$	reverse current	$V_R = 600 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$	-	-	1.5	mA
		$V_R = 600 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	50	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}$	-	17.5	35	ns
$I_{RM}$	peak reverse recovery current	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; \text{ Fig. 6}$	-	1.5	-	A
$Q_r$	recovered charge		-	13	-	nC
$V_{FR}$	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 100 \text{ A}/\mu\text{s}; \text{ Fig. 6}$	-	3.2	-	V



10. Package outline

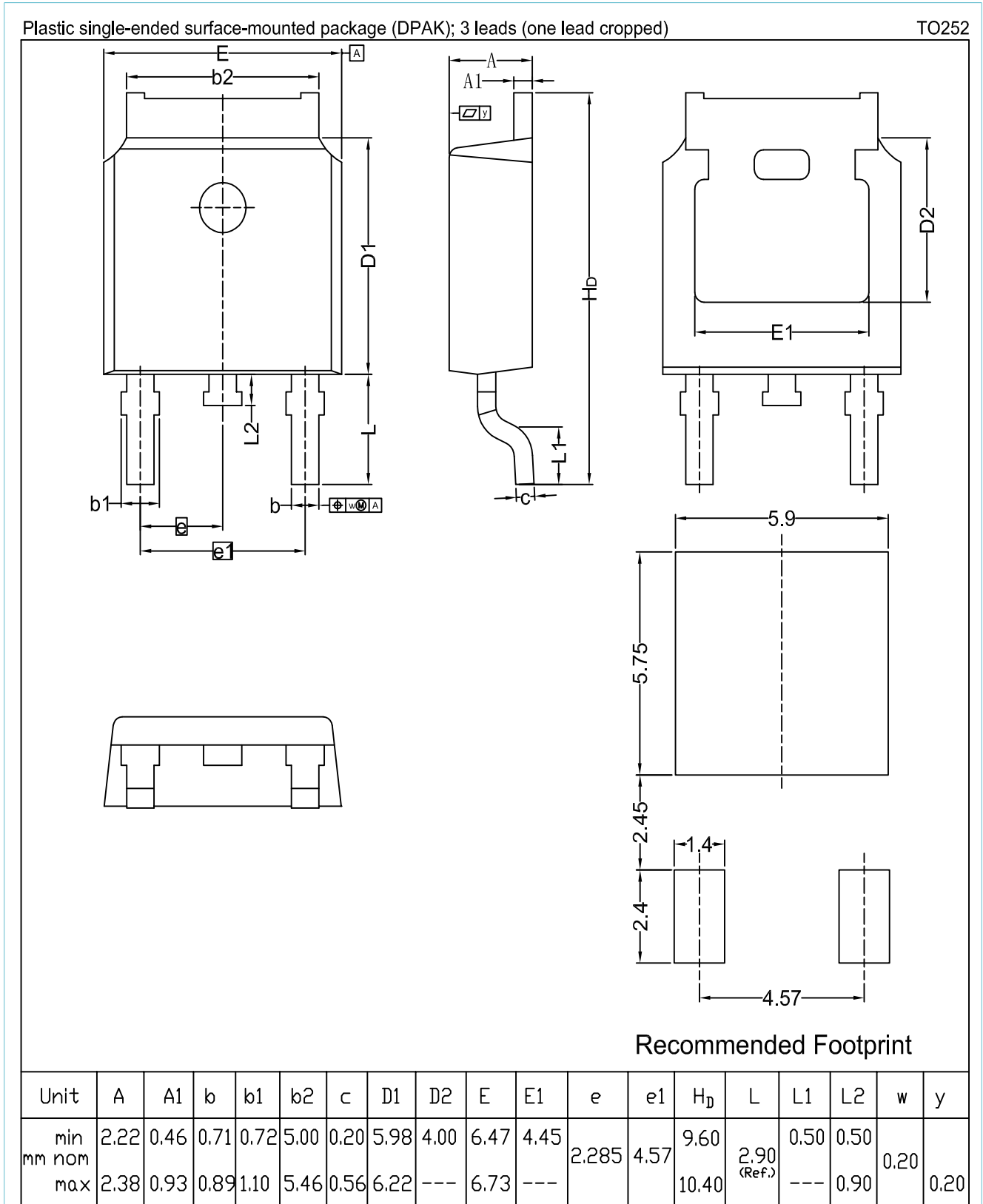


Fig. 7. Package outline DPAK (TO252N)

## 11. Revision history

**Table 6. Revision history**

Document ID	Date	Changes
BYV29FD-600 Rev.01	20110307	<ul style="list-style-type: none"><li>Initial release</li></ul>
BYV29FD-600 Rev.02	20170815	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new identity guidelines of WeEn Semiconductors.</li><li>Legal texts have been adapted to the new company name where appropriate.</li><li>Update "Package outline" due to subcon transfer.</li></ul>
BYV29FD-600 Rev.03	20171122	<ul style="list-style-type: none"><li>Add version number and revision history on this datasheet.</li><li>Update "SOT428" to "TO252" on "General description" section.</li></ul>



## 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.
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".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.ween-semi.com>.

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