

## 1. General description

Enhanced ultrafast power diode in a SOD59 (2-lead TO-220AC) plastic package.

## 2. Features and benefits

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

## 3. Applications

- Dual Mode (DCM and CCM) PFC
- Power Factor Correction (PFC) for Interleaved Topology

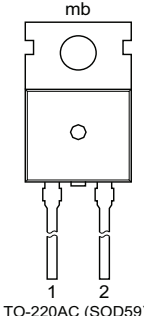
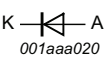
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
<b>Absolute maximum rating</b>						
$V_{RRM}$	repetitive peak reverse voltage		600			V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 126$ °C; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>	5			A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25$ $\mu$ s; $T_{mb} \leq 126$ °C; square-wave pulse	10			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>	60			A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; <a href="#">Fig. 3</a>	66			A
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 5$ A; $T_j = 25$ °C; <a href="#">Fig. 5</a>	-	1.3	1.9	V
		$I_F = 5$ A; $T_j = 150$ °C; <a href="#">Fig. 5</a>	-	1.1	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	K	cathode		
2	A	anode		
mb	K	mounting base; cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV25F-600	TO-220AC	plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC	SOD59

## 7. Marking

Table 4. Marking codes

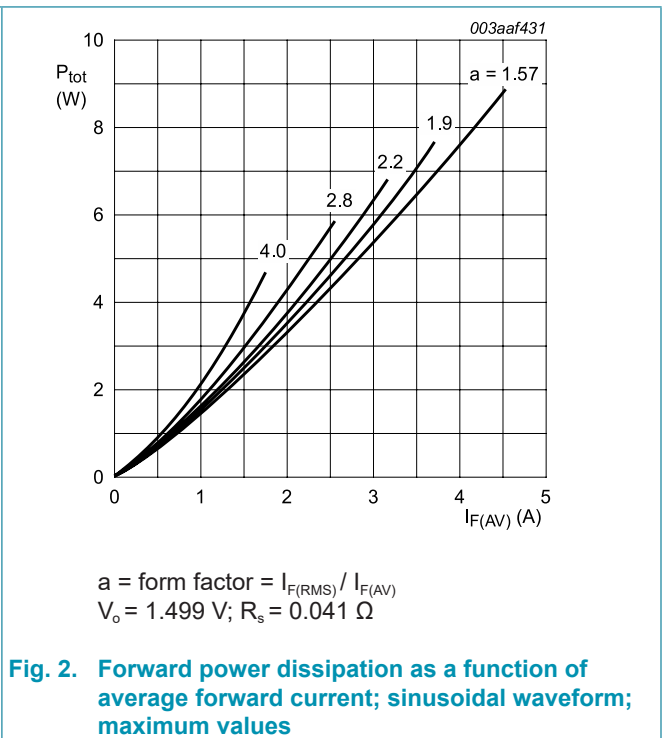
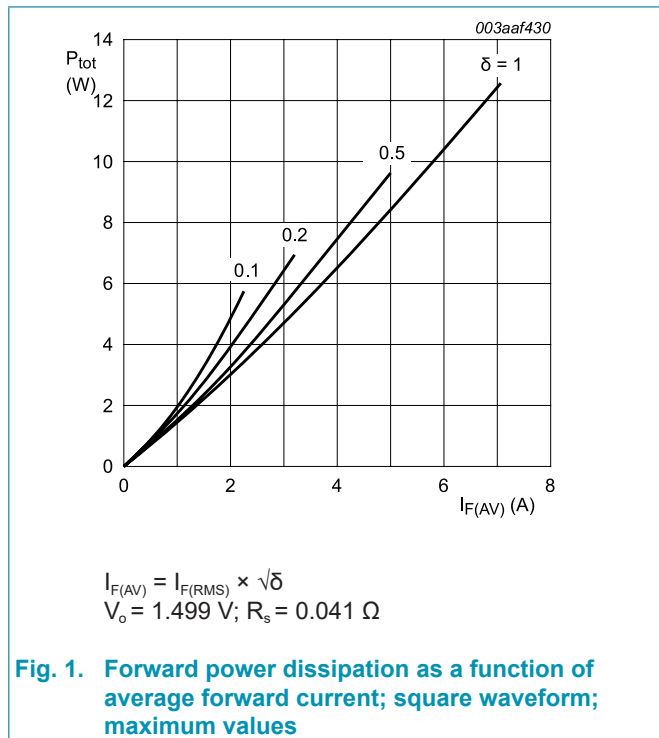
Type number	Marking codes
BYV25F-600	BYV25F-600

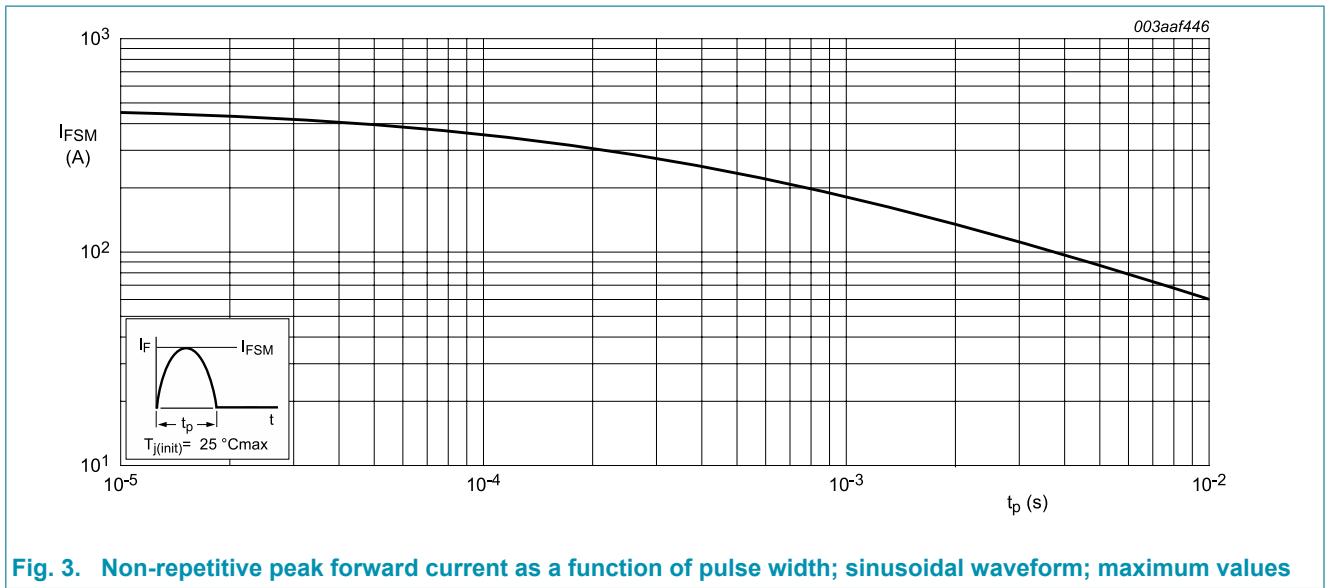
## 8. Limiting values

**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; $T_{mb} \leq 126\text{ }^\circ\text{C}$ ; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>	5	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\text{ }\mu\text{s}$ ; $T_{mb} \leq 126\text{ }^\circ\text{C}$ ; square-wave pulse	10	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; <a href="#">Fig. 3</a>	60	A
		$t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; sine-wave pulse; <a href="#">Fig. 3</a>	66	A
$T_{stg}$	storage temperature		-40 to 150	$^\circ\text{C}$
$T_j$	junction temperature		150	$^\circ\text{C}$





## 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 4</a>	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W

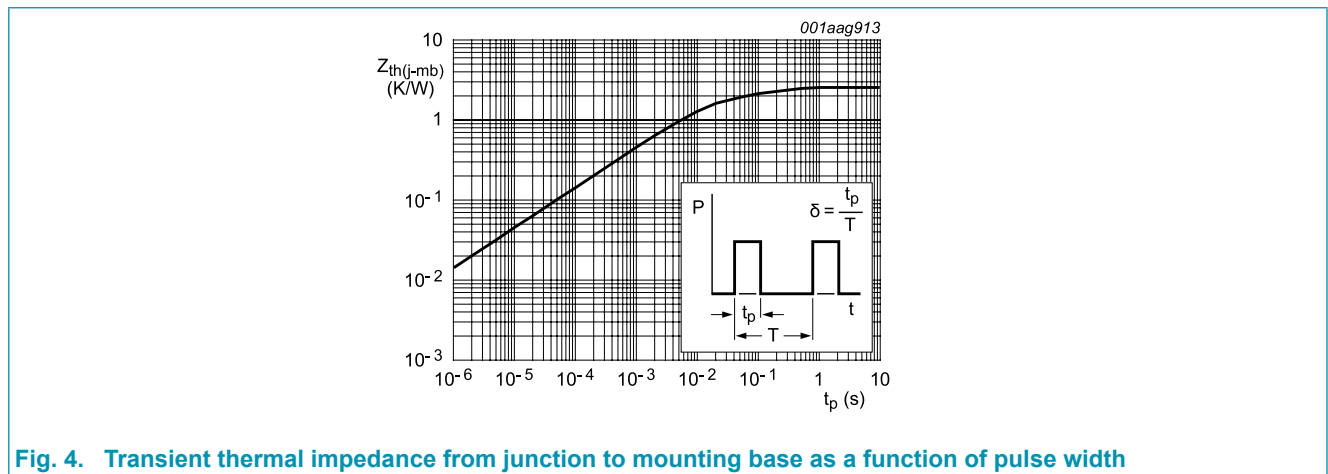
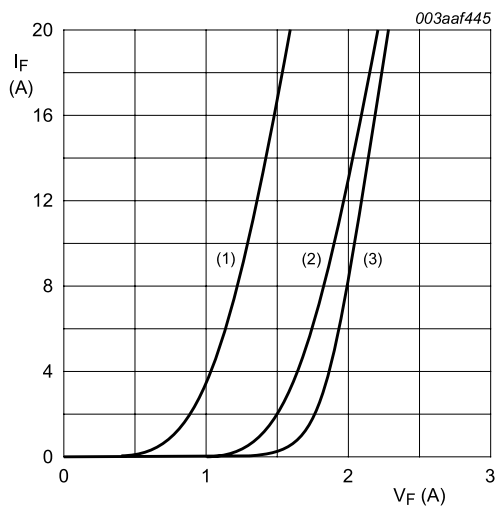


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse width

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 5 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 5}$	-	1.3	1.9	V
		$I_F = 5 \text{ A}; T_j = 150 \text{ }^\circ\text{C}; \text{ Fig. 5}$	-	1.1	1.7	V
$I_R$	reverse current	$V_R = 600 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	50	$\mu\text{A}$
		$V_R = 600 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$	-	-	1.5	mA
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}$	-	13	-	nC
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}$	-	17.5	35	ns
$I_{RM}$	peak reverse recovery current	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}$	-	1.5	-	A
$V_{FRM}$	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	3.2	-	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  
 $V_o = 1.499 \text{ V}; R_s = 0.041 \text{ } \Omega$

Fig. 5. Forward current as a function of forward voltage

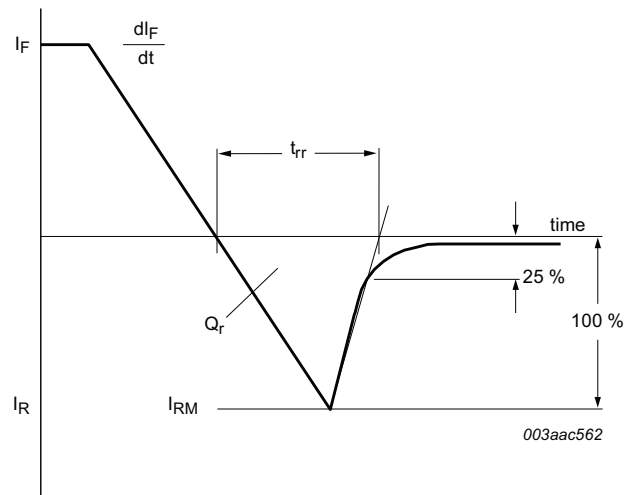


Fig. 6. Reverse recovery definitions; ramp recovery

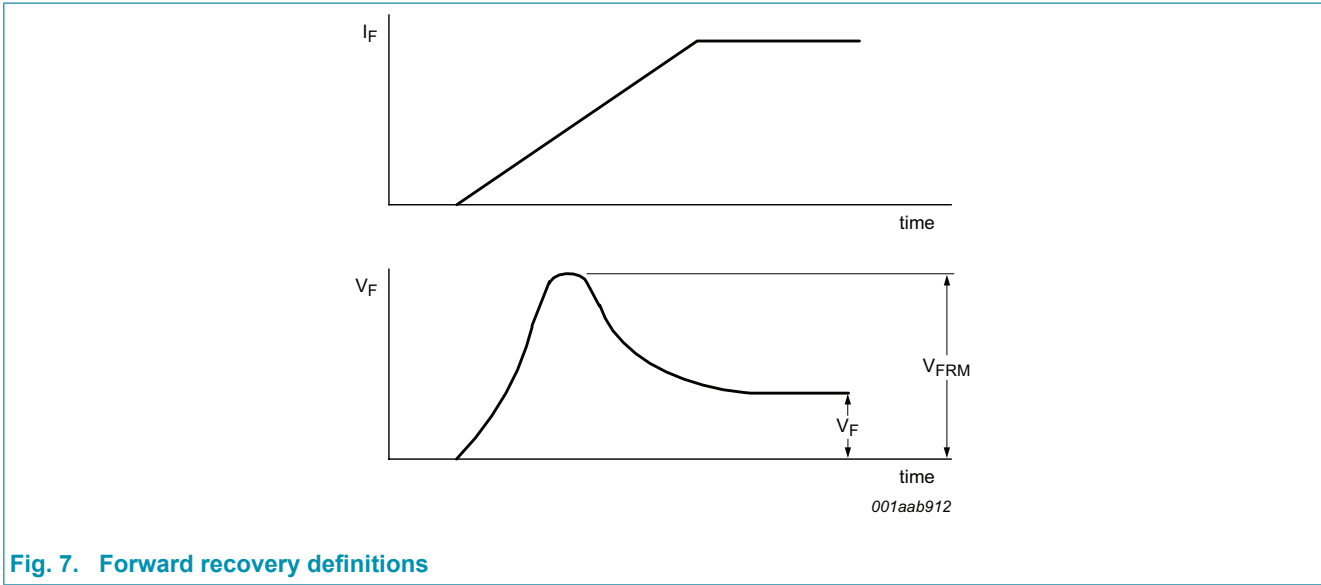
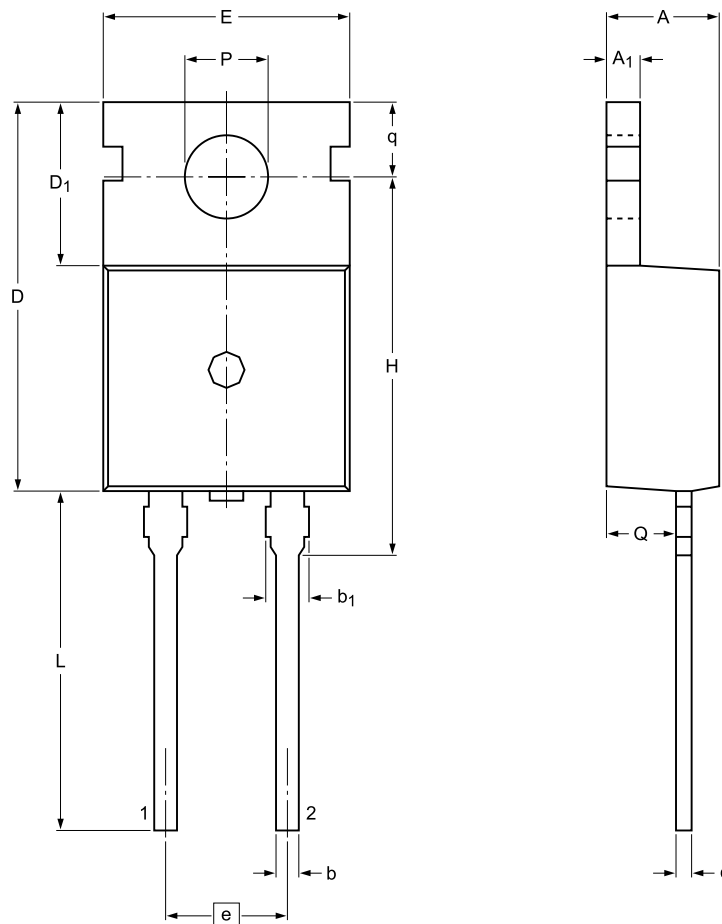


Fig. 7. Forward recovery definitions

### 11. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC

SOD59



Dimensions

Unit	A	A <sub>1</sub>	b	b <sub>1</sub> ( <sup>1</sup> )	c	D	D <sub>1</sub>	E	e	H	L	P	Q	q	
mm	max	4.7	1.40	0.95	1.7	0.65	15.8	6.8	10.30	5.08	16.25	15.0	3.80	2.6	2.9
	nom									(REF)					
	min	4.3	1.15	0.70	1.3	0.45	15.6	6.4	9.65		15.70	12.5	3.65	2.2	2.7

Note

1. Protruded dambar are included in the dimension.

sod059\_po

Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOD59	2-lead TO-220AC				09-08-25 12-11-27



## 12. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV25F-600 v.3	20180305	Product data sheet	-	BYV25F-600 v.2
Modifications:	Change from NXP version to WeEn version			
BYV25F-600 v.2	20110307	Product data sheet	-	BYV25F-600 v.1
Modifications:	Various changes to content.			
BYV25F-600 v.1	20101001	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.
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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