

## 1. General description

Ultrafast power diode in a SOT226A (I2PAK) plastic package

## 2. Features and benefits

- Fast switching
- High thermal cycling performance
- Low forward voltage drop
- Low on-state losses
- Low profile package facilitating compact designs
- Low thermal resistance
- Soft recovery minimizes power-consuming oscillations

## 3. Applications

- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)
- Output rectifiers in high-frequency switched-mode power supplies

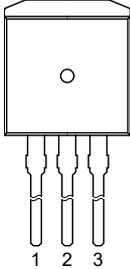
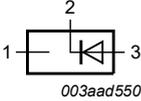
## 4. Quick reference data

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	$\delta = 0.5$ ; $T_{mb} \leq 123$ °C; SQW; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>	-	-	9	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; SIN	-	-	77	A
		$t_p = 10$ ms; $T_{j(init)} = 25$ °C; SIN	-	-	70	A
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8$ A; $T_j = 25$ °C; <a href="#">Fig. 4</a>	-	1.12	1.25	V
		$I_F = 20$ A; $T_j = 25$ °C; <a href="#">Fig. 4</a>	-	1.31	1.45	V
		$I_F = 8$ A; $T_j = 150$ °C	-	0.97	1.11	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. 4</a>	-	50	60	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	n.c.	no connection	 <p>I2PAK (SOT226A)</p>	
2	K	cathode		
3	A	anode		
mb	K	mounting base; cathode		

## 6. Ordering information

Table 3. Ordering information

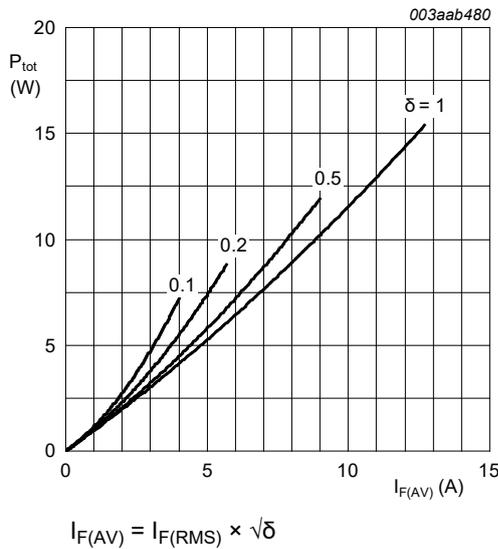
Type number	Package		
	Name	Description	Version
BYV29G-600	I2PAK	plastic single-ended package (I2PAK); TO-262	SOT226A

## 7. Limiting values

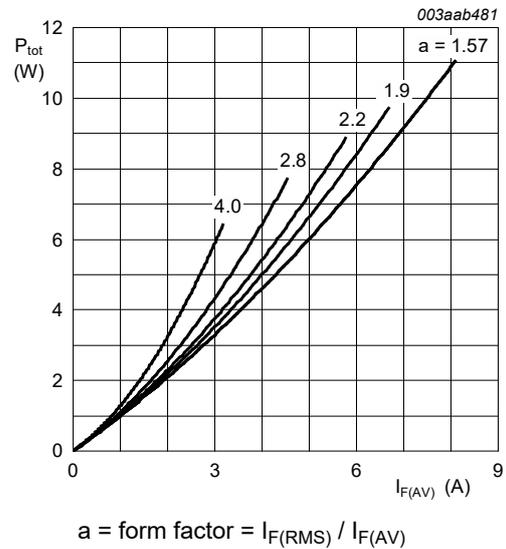
**Table 4. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	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	$\delta = 0.5$ ; $T_{mb} \leq 123\text{ }^\circ\text{C}$ ; SQW; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>	-	9	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\text{ }\mu\text{s}$	-	18	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; SIN	-	77	A
		$t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; SIN	-	70	A
$T_{stg}$	storage temperature		-40	150	$^\circ\text{C}$
$T_j$	junction temperature		-	150	$^\circ\text{C}$



**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**

## 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	with heatsink compound; <a href="#">Fig. 3</a>	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air		-	60	-	K/W

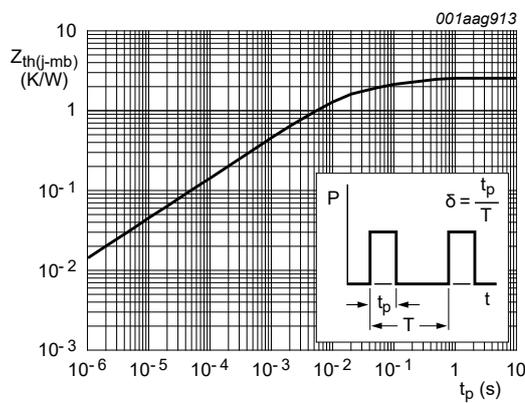
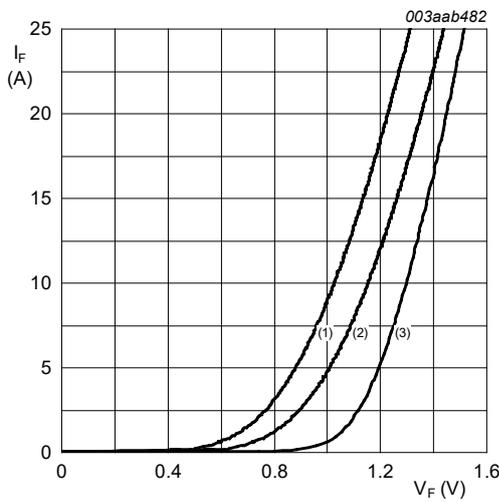


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

### 9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{Fig. 4}$	-	1.12	1.25	V
		$I_F = 20 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{Fig. 4}$	-	1.31	1.45	V
		$I_F = 8 \text{ A}; T_j = 150 \text{ }^\circ\text{C}; \text{Fig. 4}$	-	0.97	1.11	V
$I_R$	reverse current	$V_R = 600 \text{ V}$	-	2	50	$\mu\text{A}$
		$V_R = 600 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$	-	0.1	0.35	mA
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{Fig. 5}$	-	50	60	ns
$I_{RM}$	peak reverse recovery current	$I_F = 10 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 50 \text{ A}/\mu\text{s}; \text{Fig. 5}$	-	3	5.5	A
$Q_r$	recovered charge	$I_F = 2 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 20 \text{ A}/\mu\text{s}; \text{Fig. 5}$	-	40	70	nC
$V_{FR}$	forward recovery voltage	$I_F = 10 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}; \text{Fig. 6}$	-	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

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

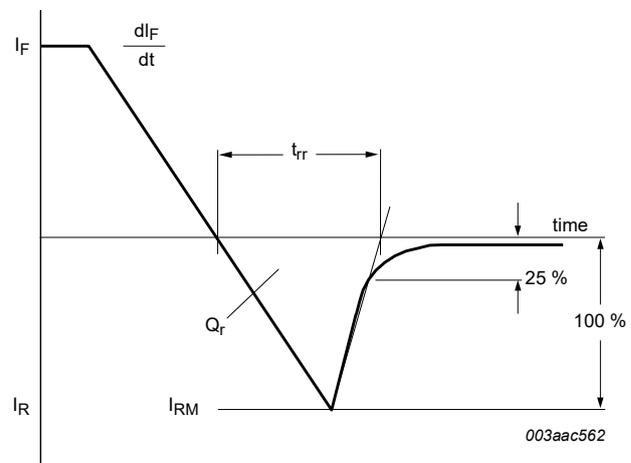


Fig. 5. Reverse recovery definitions; ramp recovery

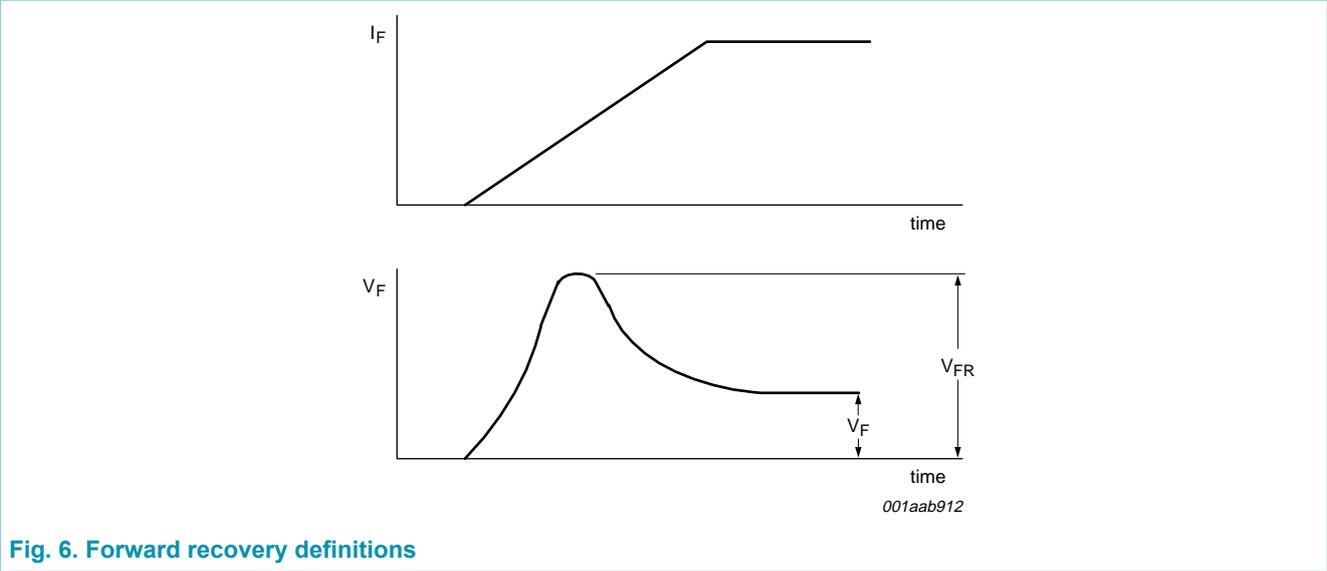
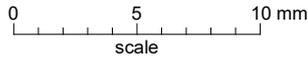
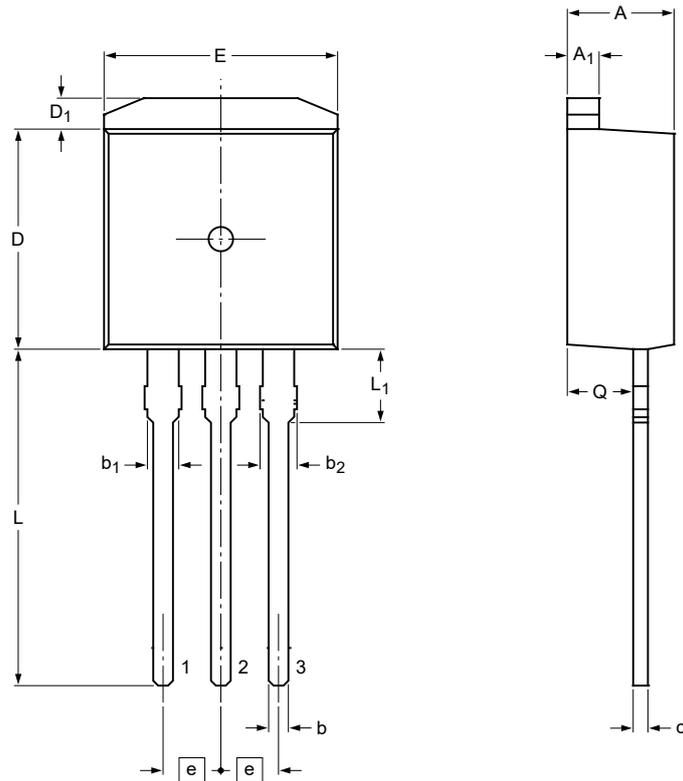


Fig. 6. Forward recovery definitions

### 10. 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

sot226a\_po

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

Fig. 7. Package outline I2PAK (SOT226A)

## 11. Legal information

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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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