

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

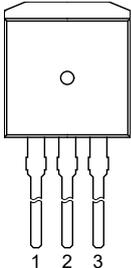
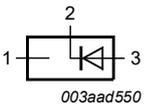
4. Quick reference data

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; Fig. 1 ; Fig. 2	-	-	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
Static characteristics						
V_F	forward voltage	$I_F = 8$ A; $T_j = 25$ °C; Fig. 4	-	1.12	1.25	V
		$I_F = 20$ A; $T_j = 25$ °C; Fig. 4	-	1.31	1.45	V
		$I_F = 8$ A; $T_j = 150$ °C	-	0.97	1.11	V
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $dI_F/dt = 100$ A/ μ s; $T_j = 25$ °C; Fig. 4	-	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; Fig. 1 ; Fig. 2	-	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	$^\circ\text{C}$

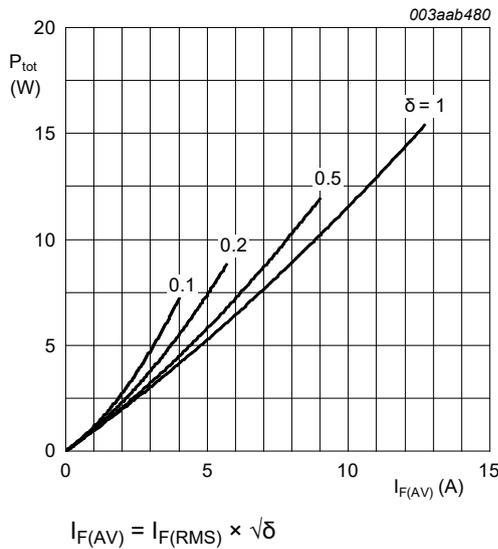


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

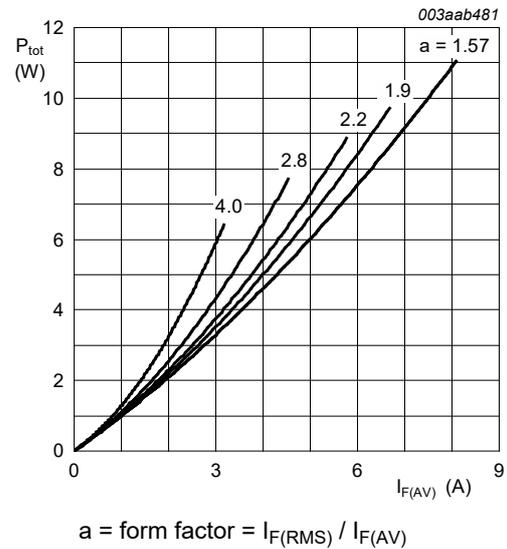


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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; Fig. 3	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air		-	60	-	K/W

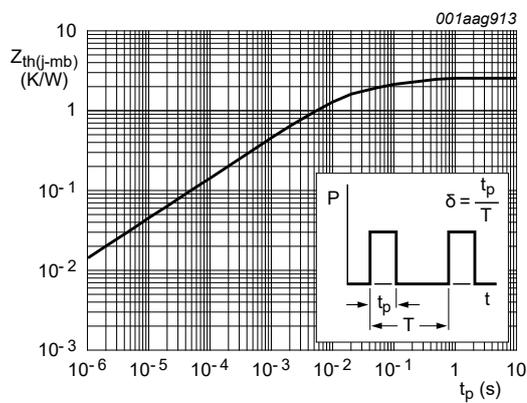
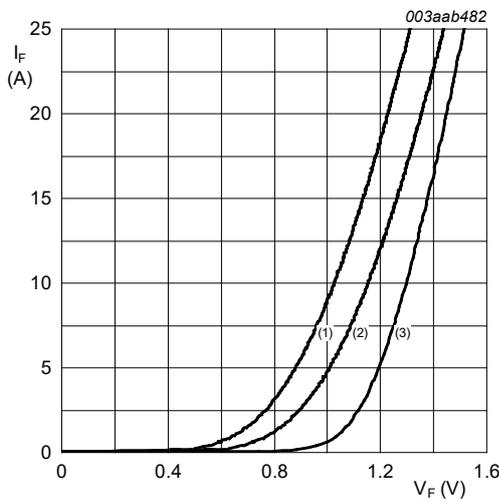


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
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	μA
		$V_R = 600 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$	-	0.1	0.35	mA
Dynamic characteristics						
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

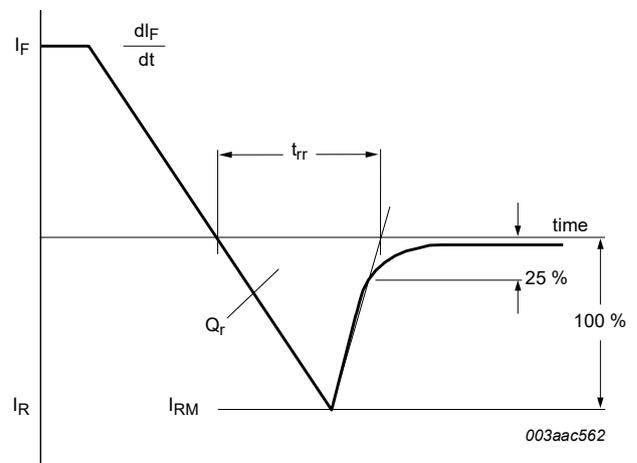


Fig. 5. Reverse recovery definitions; ramp recovery

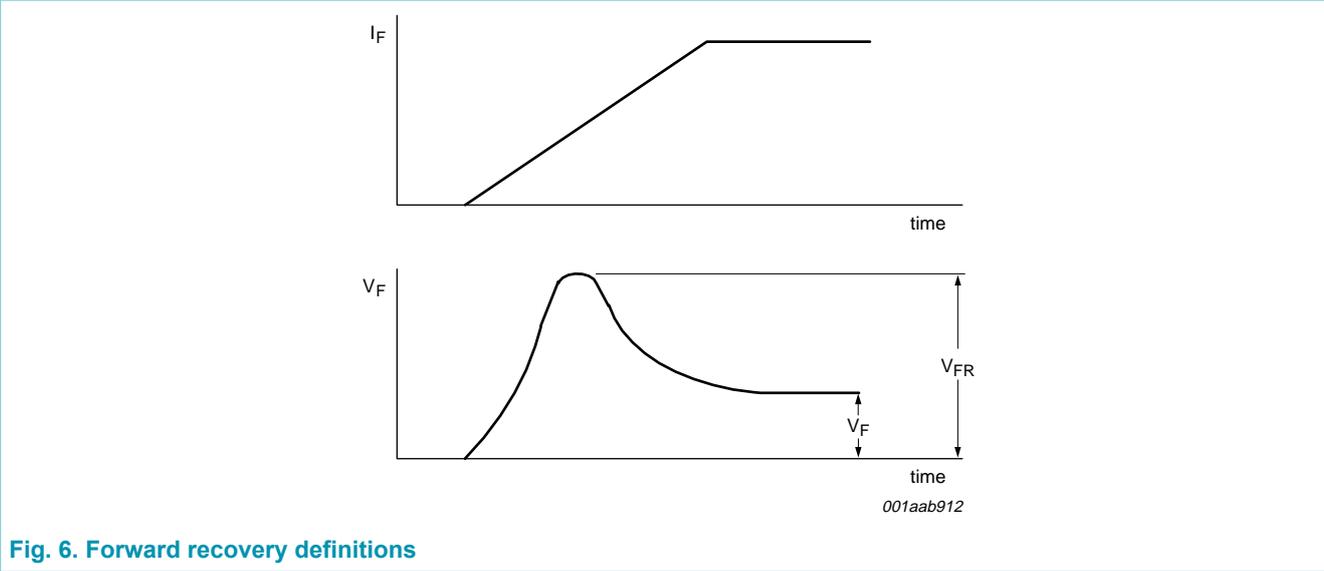
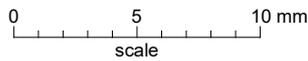
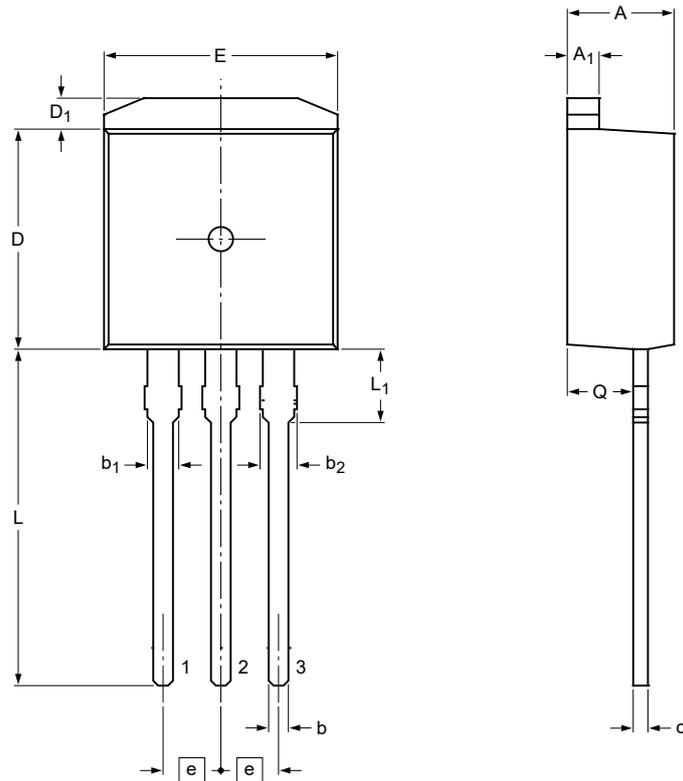


Fig. 6. Forward recovery definitions

10. Package outline

Plastic single-ended package (I2PAK); low-profile 3-lead TO-262

SOT226A



Dimensions

Unit	A	A ₁	b	b ₁	b ₂	c	D	D ₁	E	e	L	L ₁	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

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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