

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

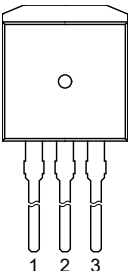
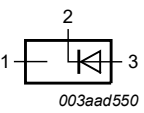
4. Quick reference data

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	δ = 0.5 ; T _{mb} ≤ 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/μs; 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	 I2PAK (SOT226A)	 003aad550
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	δ = 0.5 ; T _{mb} ≤ 123 °C; SQW; Fig. 1; Fig. 2	-	9	A
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t _p = 25 μs	-	18	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
T _{stg}	storage temperature		-40	150	°C
T _j	junction temperature		-	150	°C

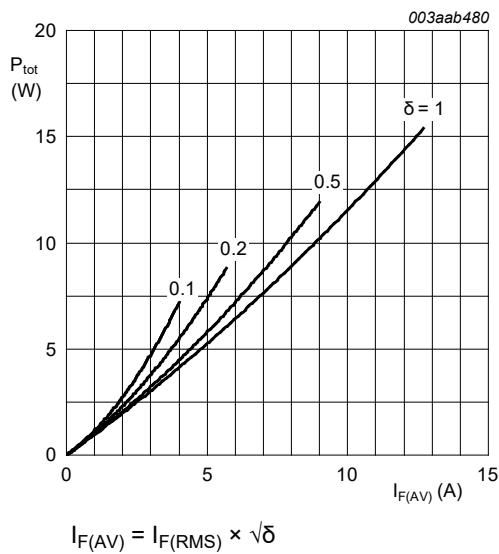


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

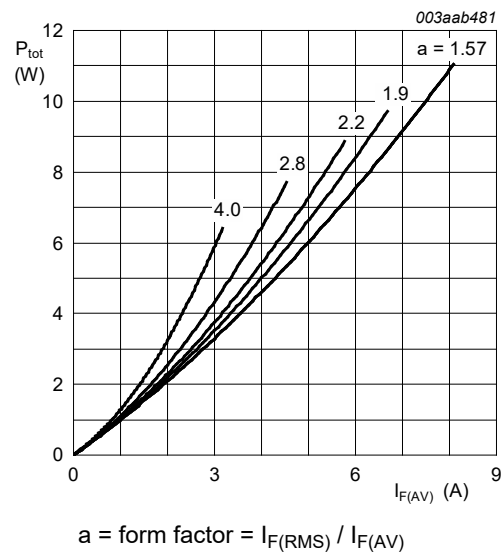


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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

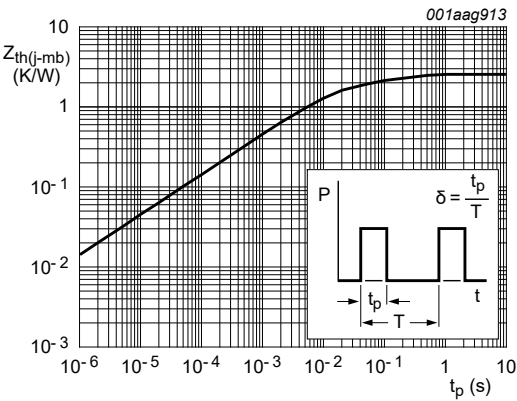
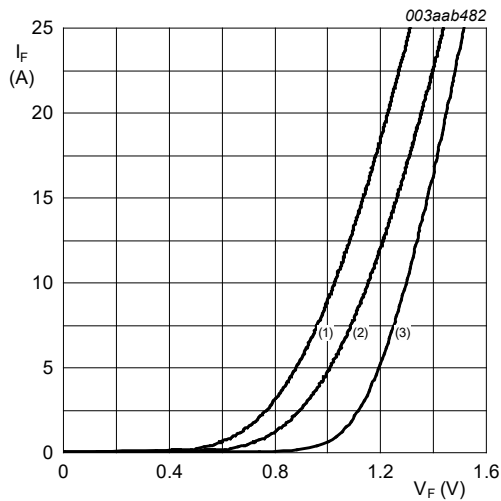


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 8 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; Fig. 4		-	0.97	1.11	V
I _R	reverse current	V _R = 600 V		-	2	50	μA
		V _R = 600 V; T _J = 100 °C		-	0.1	0.35	mA
Dynamic characteristics							
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _J = 25 °C; Fig. 5		-	50	60	ns
I _{RM}	peak reverse recovery current	I _F = 10 A; V _R = 30 V; dI _F /dt = 50 A/μs; Fig. 5		-	3	5.5	A
Q _r	recovered charge	I _F = 2 A; V _R = 30 V; dI _F /dt = 20 A/μs; Fig. 5		-	40	70	nC
V _{FR}	forward recovery voltage	I _F = 10 A; dI _F /dt = 10 A/μs; Fig. 6		-	3.2	-	V



- (1) $T_j = 150^\circ\text{C}$; typical values
 (2) $T_j = 150^\circ\text{C}$; maximum values
 (3) $T_j = 25^\circ\text{C}$; maximum values

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

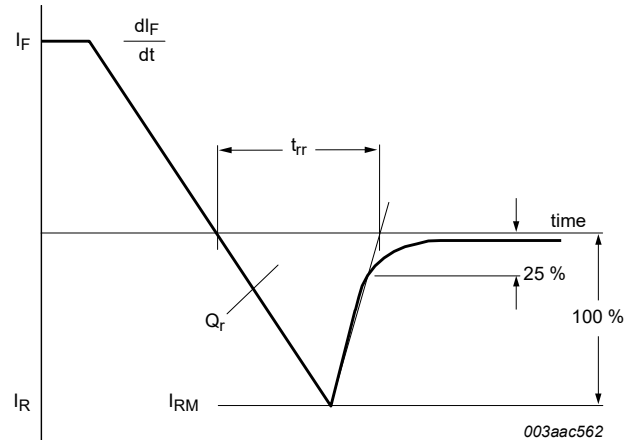


Fig. 5. Reverse recovery definitions; ramp recovery

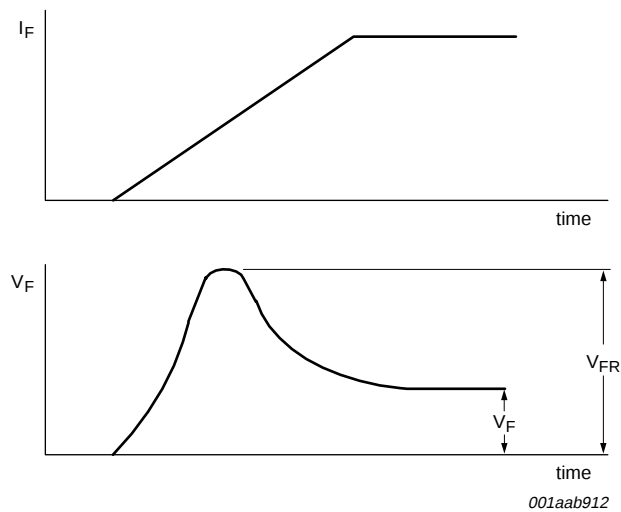
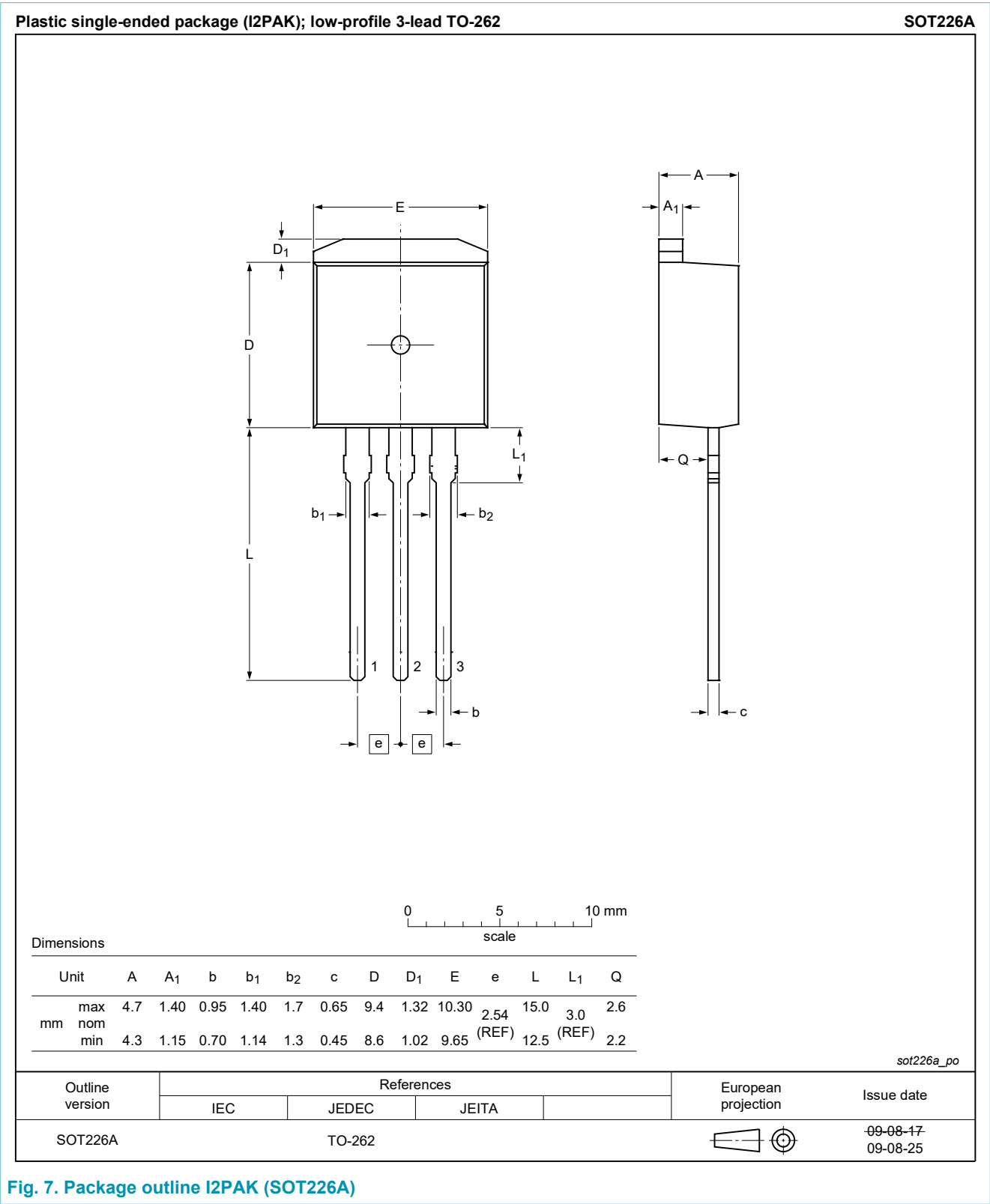


Fig. 6. Forward recovery definitions

10. Package outline



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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12. Contents

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. Limiting values..... 3

8. Thermal characteristics..... 4

9. Characteristics..... 5

10. Package outline..... 7

11. Legal information..... 8

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