

1. General description

Dual ultrafast power diode in a SOT226A (I2PAK) low-profile plastic package.

2. Features and benefits

- High reverse voltage surge capability
- High thermal cycling performance
- Low thermal resistance
- Soft recovery characteristic minimizes power consuming oscillations
- Very low on-state loss

3. Applications

- Output rectifiers in high-frequency switched-mode power supplies

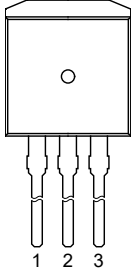
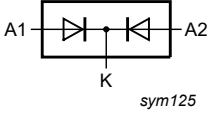
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_R	reverse voltage	DC	-	-	200	V
I_{FSM}	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(\text{init})} = 25$ °C; SIN; per diode	-	-	150	A
		$t_p = 8.3$ ms; $T_{j(\text{init})} = 25$ °C; SIN; per diode	-	-	160	A
Static characteristics						
V_F	forward voltage	$I_F = 15$ A; $T_j = 150$ °C; Fig. 4	-	0.78	0.85	V
		$I_F = 15$ A; $T_j = 25$ °C; Fig. 4	-	0.95	1.05	V
		$I_F = 30$ A; $T_j = 25$ °C; Fig. 4	-	1	1.2	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; ramp recovery; Fig. 5	-	20	28	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 <p>I2PAK (SOT226A)</p>	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV42G-200	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		-	200	V
V_{RWM}	crest working reverse voltage		-	200	V
V_R	reverse voltage	DC	-	200	V
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 104\text{ }^\circ\text{C}$; SQW; both diodes conducting; Fig. 1; Fig. 2	-	30	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 104\text{ }^\circ\text{C}$; per diode	-	30	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; SIN; per diode	-	150	A
		$t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; SIN; per diode	-	160	A
I_{RRM}	repetitive peak reverse current	$\delta = 0.001$; $t_p = 2\text{ }\mu\text{s}$	-	0.2	A
I_{RSM}	non-repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$	-	0.2	A
T_{stg}	storage temperature		-40	150	$^\circ\text{C}$
T_j	junction temperature		-	150	$^\circ\text{C}$
V_{ESD}	electrostatic discharge voltage	HBM; C = 250 pF; R = 1.5 k Ω ; all pins	-	8	kV

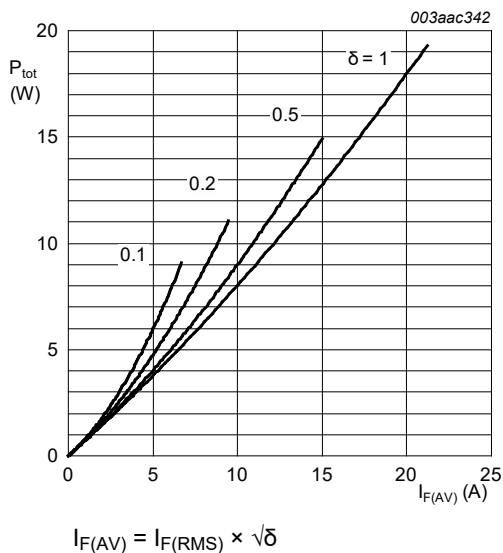


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

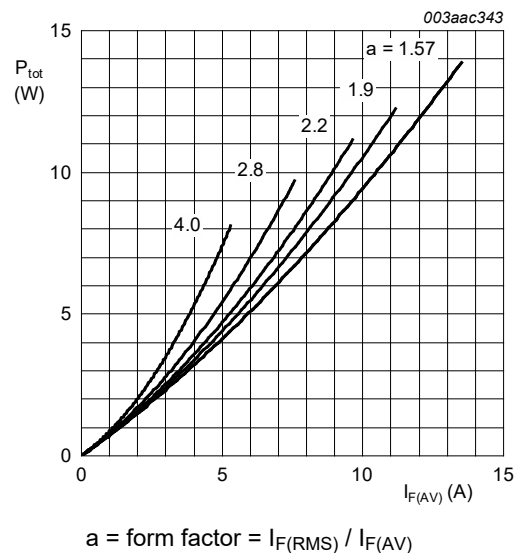


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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; both diodes conducting	-	-	1.4	K/W
		with heatsink compound; per diode; Fig. 3	-	-	2.4	K/W
R _{th(j-a)}	thermal resistance from junction to ambient free air	in free air	-	60	-	K/W

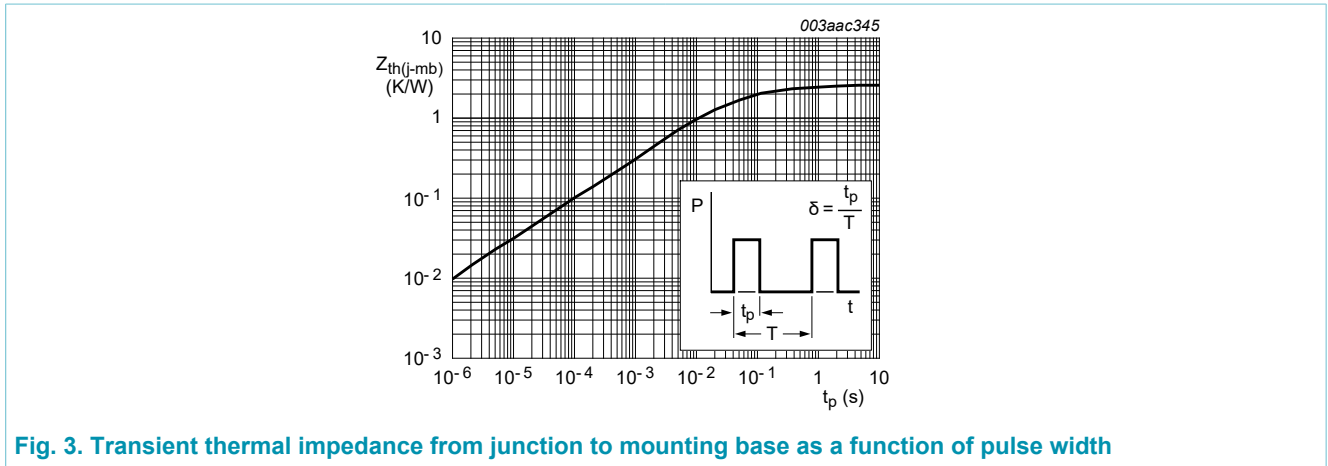
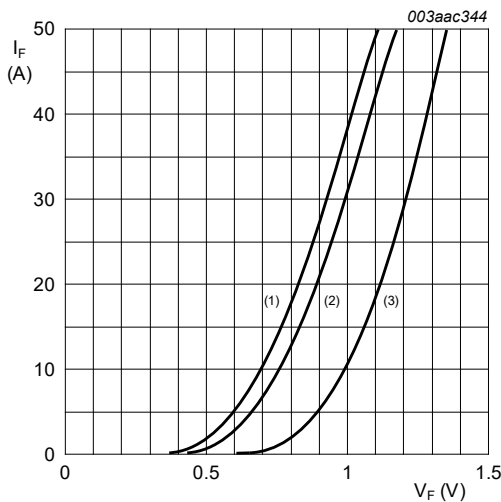


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 15 \text{ A}; T_j = 150 \text{ }^\circ\text{C}; \text{ Fig. 4}$	-	0.78	0.85	V
		$I_F = 15 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 4}$	-	0.95	1.05	V
		$I_F = 30 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 4}$	-	1	1.2	V
I_R	reverse current	$V_R = 200 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$	-	0.5	1	mA
		$V_R = 200 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	10	100	μA
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ ramp recovery}; \text{ Fig. 5}$	-	20	28	ns
		$I_F = 0.5 \text{ A}; I_R = 1 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ step recovery}; \text{ measured at reverse current} = 0.25 \text{ A}; \text{ Fig. 6}$	-	13	22	ns
Q_r	recovered charge	$I_F = 2 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 20 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$	-	6	15	nC
V_{FR}	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	-	1	V



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

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

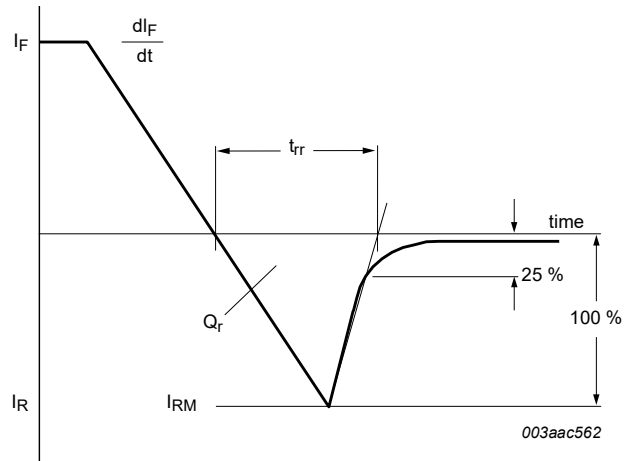
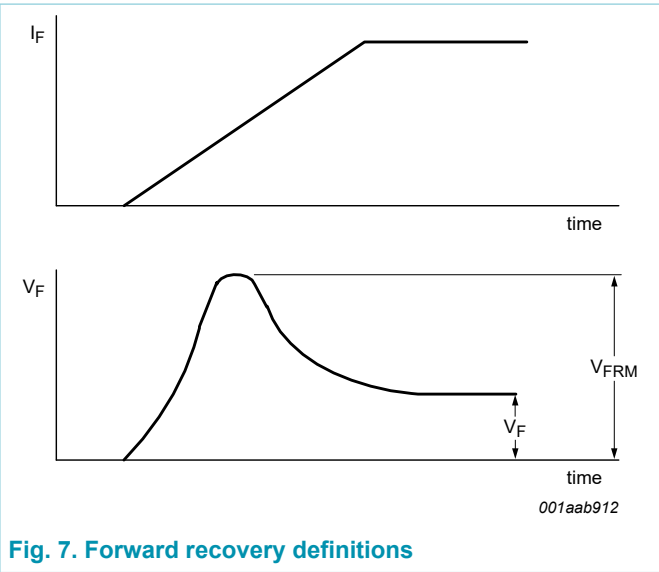
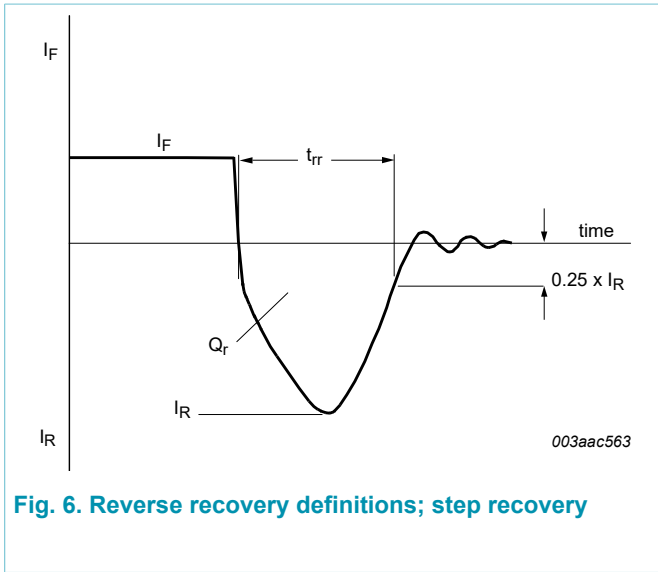


Fig. 5. Reverse recovery definitions; ramp recovery



10. Package outline

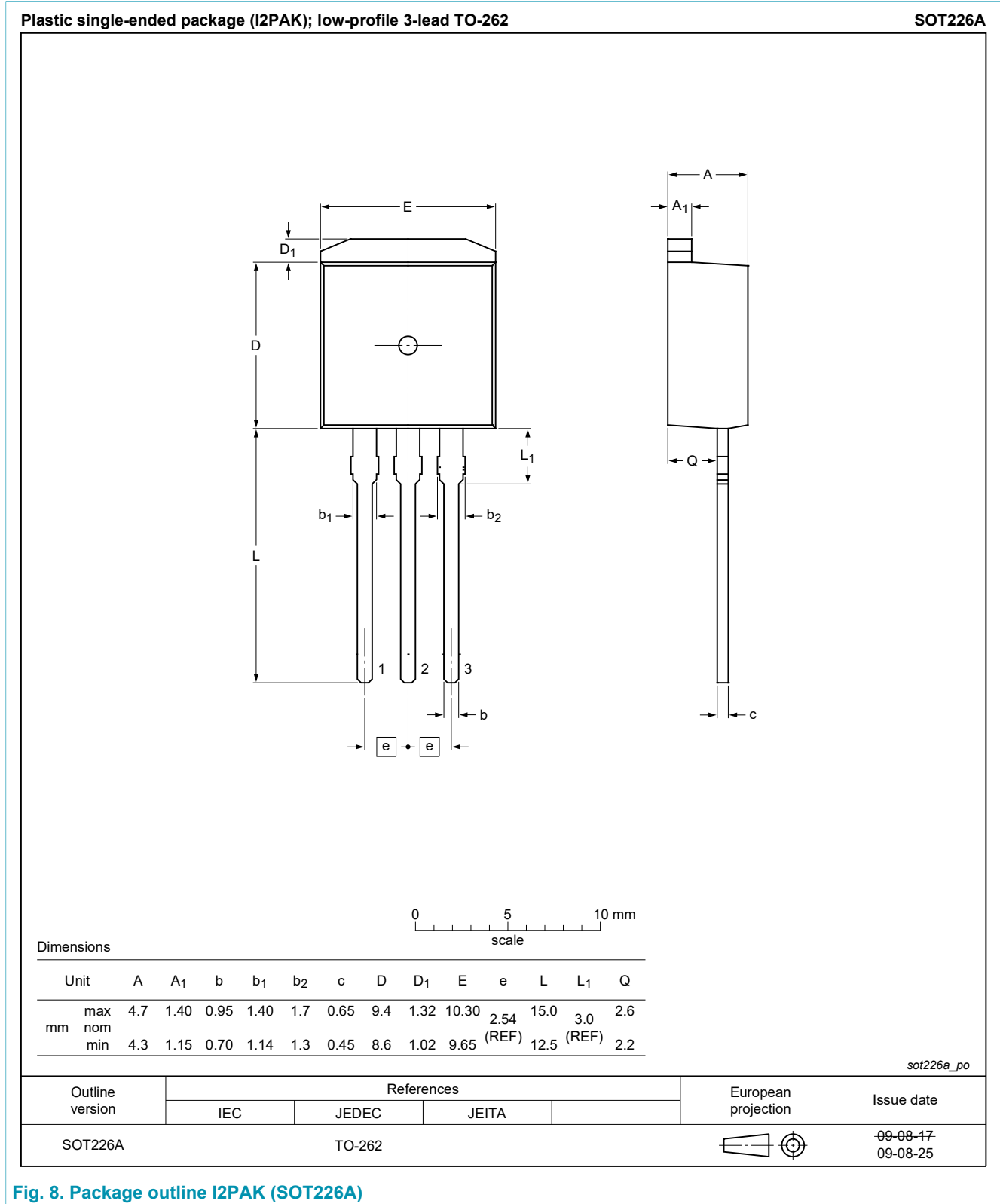


Fig. 8. Package outline I2PAK (SOT226A)

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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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