



# BYV32G-200

## Dual ultrafast power diode

Rev. 01 — 11 January 2011

Product data sheet

## 1. Product profile

### 1.1 General description

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

### 1.2 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

### 1.3 Applications

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

### 1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	-	200	V
$I_{O(AV)}$	average output current	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 115$ °C; both diodes conducting; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a>	-	-	20	A
$I_{FSM}$	non-repetitive peak forward current	$T_{j(init)} = 25$ °C; $t_p = 10$ ms; sine-wave pulse; per diode	-	-	125	A
$I_{RRM}$	repetitive peak reverse current	$t_p = 2$ $\mu$ s; $\delta = 0.001$	-	-	0.2	A
$V_{ESD}$	electrostatic discharge voltage	HBM; $C = 250$ pF; $R = 1.5$ k $\Omega$ ; all pins	-	-	8	kV
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 8$ A; $T_j = 150$ °C; see <a href="#">Figure 4</a>	-	0.72	0.85	V



Table 1. Quick reference data ...continued

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V};$ $dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C};$ ramp recovery; see <a href="#">Figure 5</a>	-	20	25	ns
		$I_R = 1 \text{ A}; I_F = 0.5 \text{ A};$ $T_j = 25 \text{ }^\circ\text{C};$ step recovery; measured at reverse current = 0.25 A; see <a href="#">Figure 6</a>	-	10	20	ns

## 2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

**SOT226A (I2PAK)**

## 3. Ordering information

Table 3. Ordering information

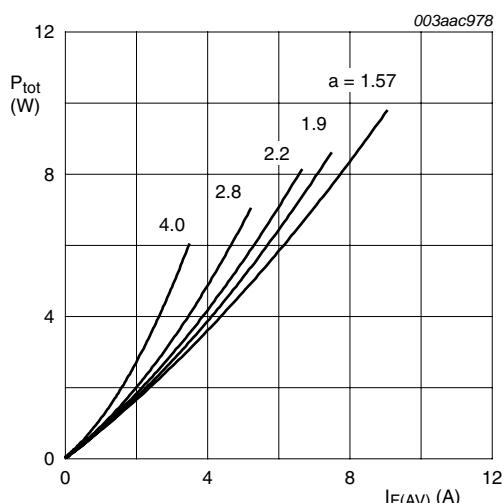
Type number	Package		
	Name	Description	Version
BYV32G-200	I2PAK	plastic single-ended package (I2PAK); TO-262	SOT226A

## 4. Limiting values

**Table 4. Limiting values**

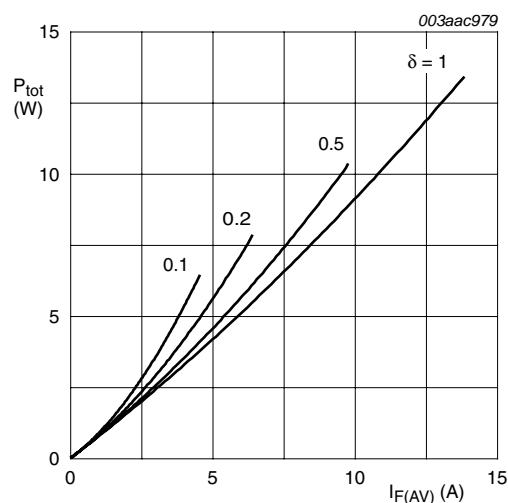
In accordance with the Absolute Maximum Rating System (IEC 60134).

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	square-wave pulse; $\delta = 0.5$ ; $T_{mb} \leq 115$ °C; both diodes conducting; see <a href="#">Figure 1</a> ; see <a href="#">Figure 2</a>	-	20	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25$ µs; $T_{mb} \leq 115$ °C; per diode	-	20	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8.3$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; per diode	-	137	A
		$t_p = 10$ ms; sine-wave pulse; $T_{j(init)} = 25$ °C; per diode	-	125	A
$I_{RRM}$	repetitive peak reverse current	$\delta = 0.001$ ; $t_p = 2$ µs	-	0.2	A
$I_{RSM}$	non-repetitive peak reverse current	$t_p = 100$ µs	-	0.2	A
$T_{stg}$	storage temperature		-40	150	°C
$T_j$	junction temperature		-	150	°C
$V_{ESD}$	electrostatic discharge voltage	HBM; $C = 250$ pF; $R = 1.5$ kΩ; all pins	-	8	kV



$$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$$

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



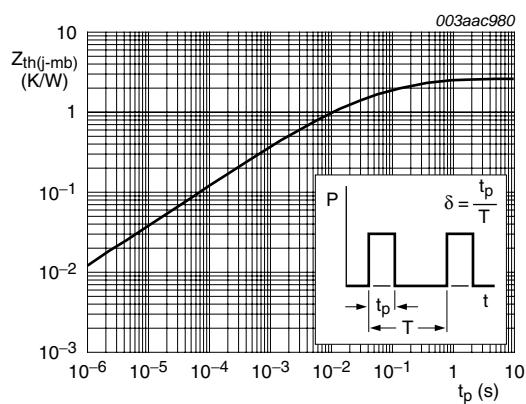
$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$

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

## 5. Thermal characteristics

**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j\text{-mb})}$	thermal resistance from junction to mounting base	with heatsink compound; both diodes conducting	-	-	1.6	K/W
		with heatsink compound; per diode; see <a href="#">Figure 3</a>	-	-	2.4	K/W
$R_{th(j\text{-a})}$	thermal resistance from junction to ambient		-	60	-	K/W

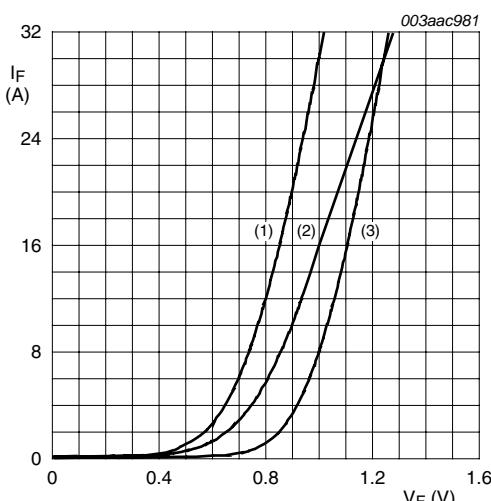


**Fig 3. Transient thermal impedance from junction to mounting base as a function of pulse width**

## 6. Characteristics

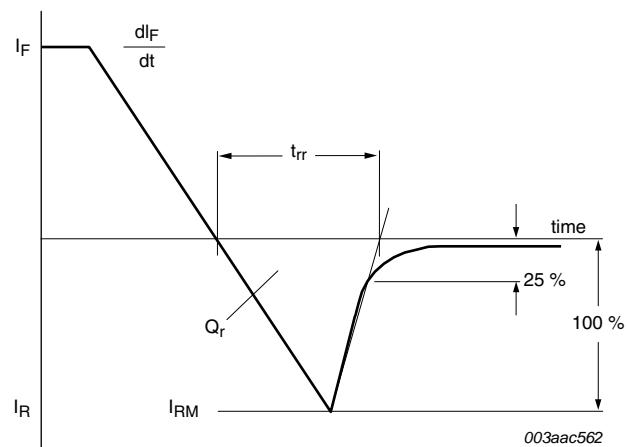
**Table 6. Characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 20 \text{ A}; T_j = 25 \text{ }^\circ\text{C}$ $I_F = 8 \text{ A}; T_j = 150 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 4</a>	-	1	1.15	V
$I_R$	reverse current	$V_R = 200 \text{ V}; T_j = 100 \text{ }^\circ\text{C}$ $V_R = 200 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	0.2	0.6	mA
-	-	-	-	6	30	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 2 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 20 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$	-	8	12.5	nC
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}$ ; ramp recovery; $T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 5</a>	-	20	25	ns
		$I_F = 0.5 \text{ A}; I_R = 1 \text{ A}$ ; step recovery; measured at reverse current = 0.25 A; $T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 6</a>	-	10	20	ns
$V_{FR}$	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$ ; see <a href="#">Figure 7</a>	-	-	1	V

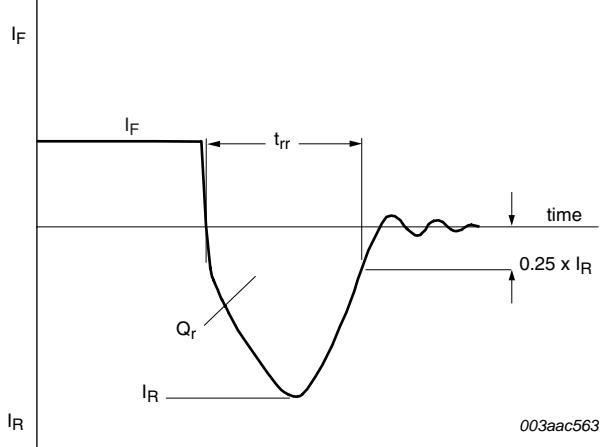


- (1)  $T_j = 150 \text{ }^\circ\text{C}$ ; typical values
- (2)  $T_j = 150 \text{ }^\circ\text{C}$ ; maximum values
- (3)  $T_j = 25 \text{ }^\circ\text{C}$ ; maximum values

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

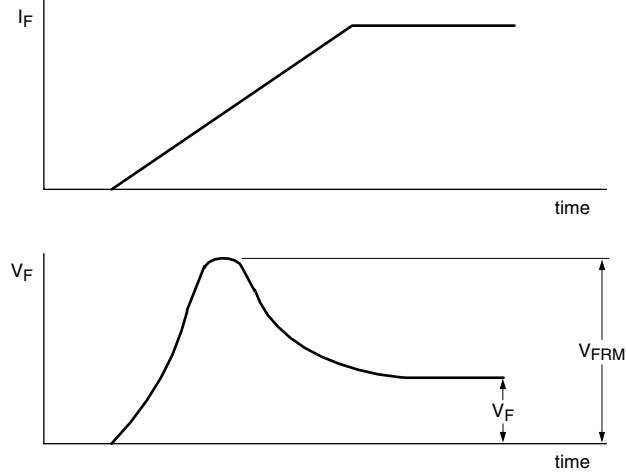


**Fig 5. Reverse recovery definitions; ramp recovery**



003aac563

Fig 6. Reverse recovery definitions; step recovery



001aab912

Fig 7. Forward recovery definitions

## 7. Package outline

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

SOT226A

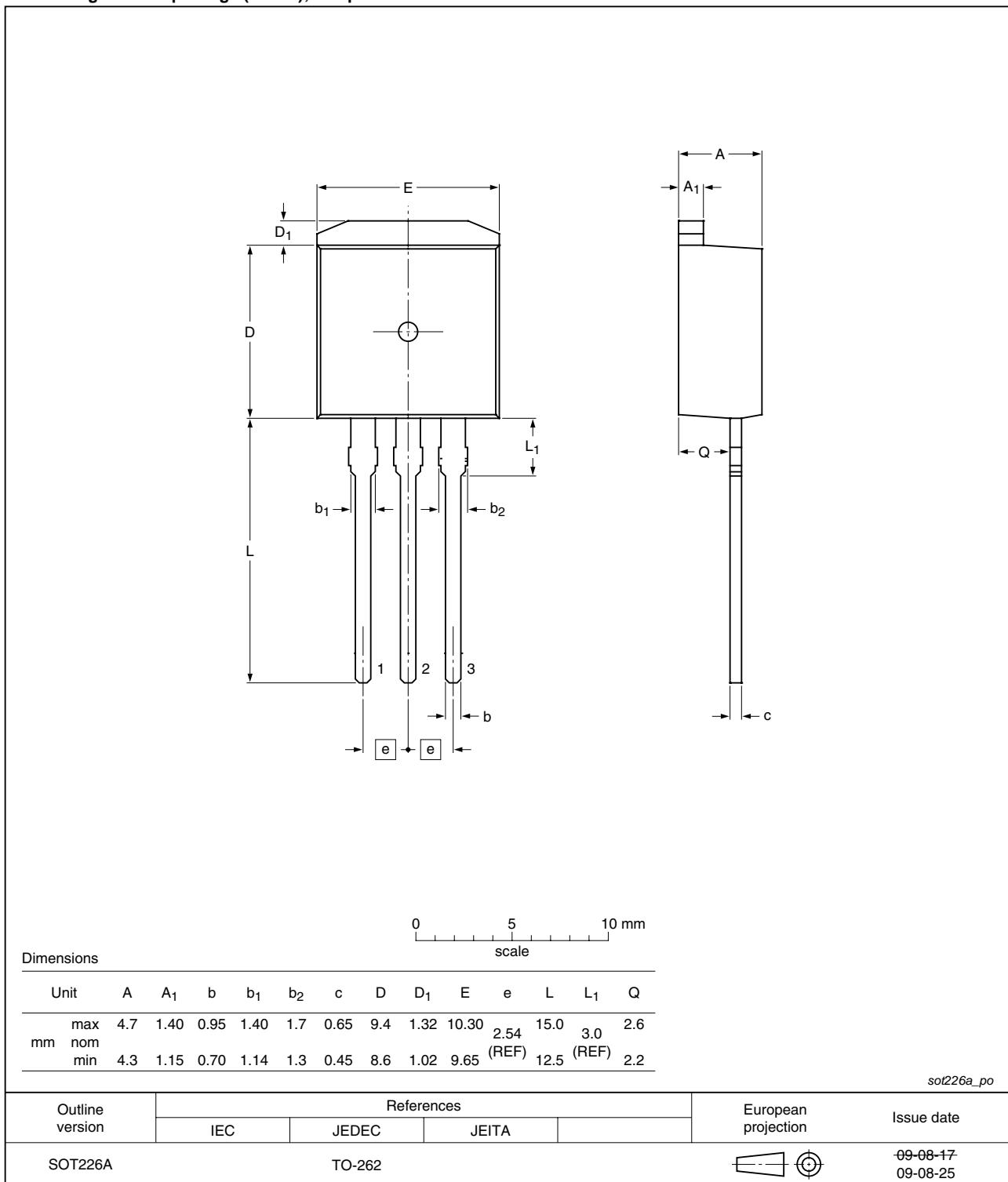


Fig 8. Package outline SOT226A (I2PAK)

## 8. Revision history

**Table 7. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV32G-200 v.1	20110111	Product data sheet	-	-

## 9. Legal information

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Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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