



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 Figure 1 ; see Figure 2	-	-	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	$t_p = 2$ μ s; $\delta = 0.001$	-	-	0.2	A
V_{ESD}	electrostatic discharge voltage	HBM; C = 250 pF; R = 1.5 k Ω ; all pins	-	-	8	kV
Static characteristics						
V_F	forward voltage	$I_F = 8$ A; $T_j = 150$ °C; see Figure 4	-	0.72	0.85	V

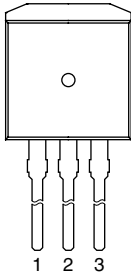
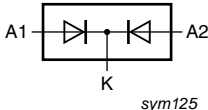


Table 1. Quick reference data ...continued

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $di_F/dt = 100\text{ A}/\mu\text{s}$; $T_j = 25\text{ }^\circ\text{C}$; ramp recovery; see Figure 5	-	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 $= 0.25\text{ A}$; see Figure 6	-	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

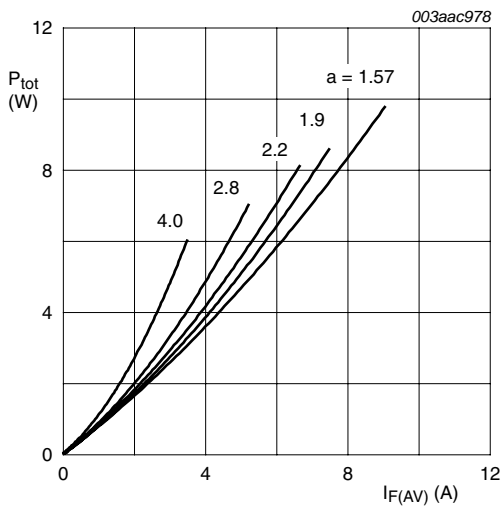
Type number	Package		Version
	Name	Description	
BYV32G-200	I2PAK	plastic single-ended package (I2PAK); TO-262	SOT226A

4. Limiting values

Table 4. Limiting values

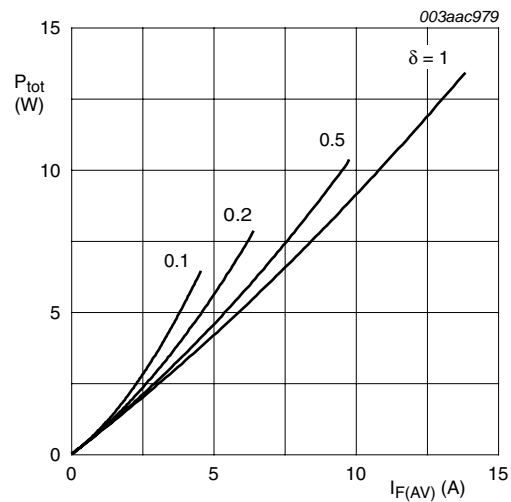
In accordance with the Absolute Maximum Rating System (IEC 60134).

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; $\delta = 0.5$; $T_{mb} \leq 115\text{ }^\circ\text{C}$; both diodes conducting; see Figure 1 ; see Figure 2	-	20	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 115\text{ }^\circ\text{C}$; per diode	-	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8.3\text{ ms}$; sine-wave pulse; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; per diode	-	137	A
		$t_p = 10\text{ ms}$; sine-wave pulse; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; per diode	-	125	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



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

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
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	with heatsink compound; both diodes conducting	-	-	1.6	K/W
		with heatsink compound; per diode; see Figure 3	-	-	2.4	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient		-	60	-	K/W

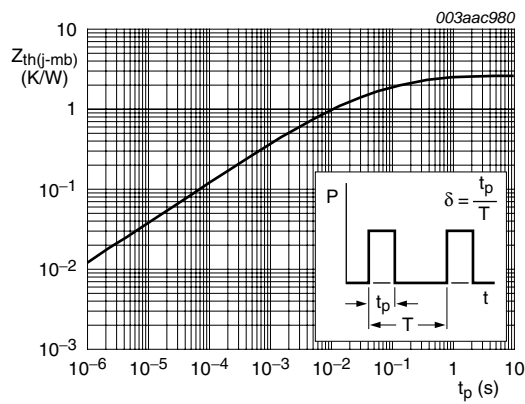
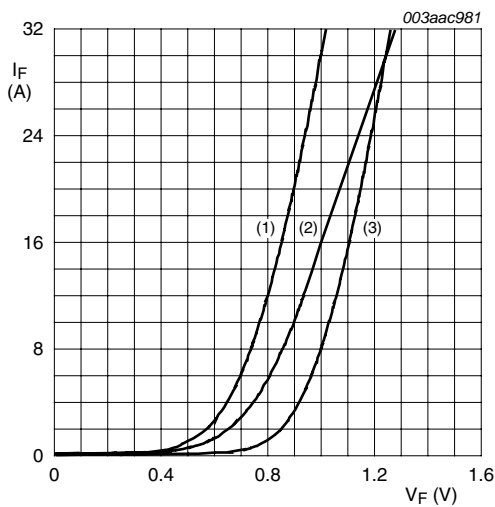


Fig 3. Transient thermal impedance from junction to mounting base as a function of pulse width

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 20\text{ A}; T_j = 25\text{ °C}$	-	1	1.15	V
		$I_F = 8\text{ A}; T_j = 150\text{ °C}$; see Figure 4	-	0.72	0.85	V
I_R	reverse current	$V_R = 200\text{ V}; T_j = 100\text{ °C}$	-	0.2	0.6	mA
		$V_R = 200\text{ V}; T_j = 25\text{ °C}$	-	6	30	μA
Dynamic characteristics						
Q_r	recovered charge	$I_F = 2\text{ A}; V_R = 30\text{ V}; dI_F/dt = 20\text{ A}/\mu\text{s}; T_j = 25\text{ °C}$	-	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; $T_j = 25\text{ °C}$; see Figure 5	-	20	25	ns
		$I_F = 0.5\text{ A}; I_R = 1\text{ A}$; step recovery; measured at reverse current = 0.25 A; $T_j = 25\text{ °C}$; see Figure 6	-	10	20	ns
V_{FR}	forward recovery voltage	$I_F = 1\text{ A}; dI_F/dt = 10\text{ A}/\mu\text{s}; T_j = 25\text{ °C}$; see Figure 7	-	-	1	V



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

Fig 4. Forward current as a function of forward voltage

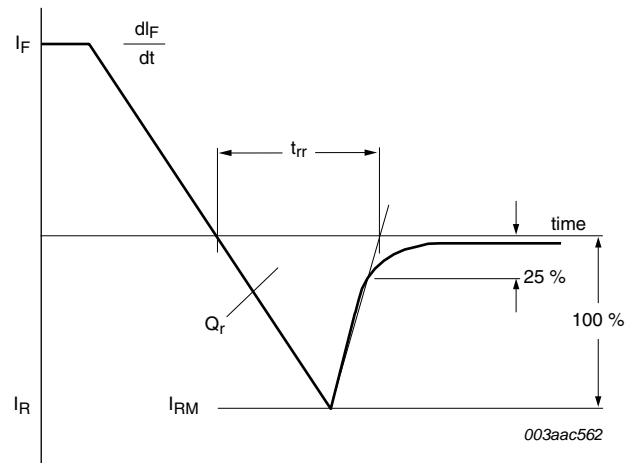


Fig 5. Reverse recovery definitions; ramp recovery

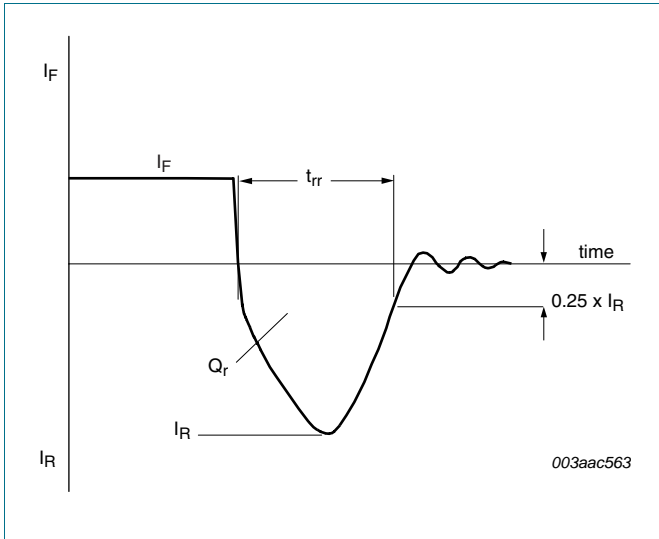


Fig 6. Reverse recovery definitions; step recovery

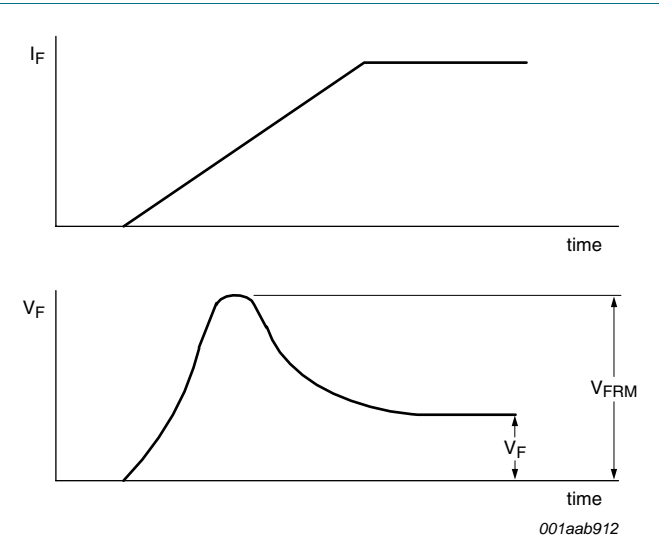
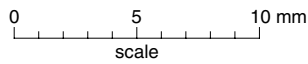
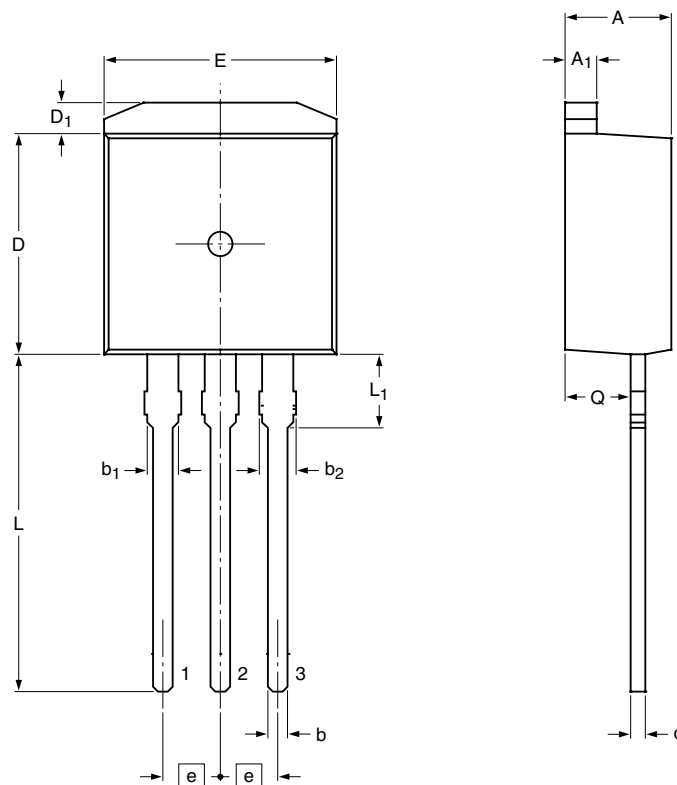


Fig 7. Forward recovery definitions

7. 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

so226a_po

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

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

9.1 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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