BYV32G-200

Dual ultrafast power diode

Rev.02 - 7 March 2018 Product data sheet

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
- Very low on-state loss
- Soft recovery characteristic minimizes power consuming oscillations

3. Applications

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

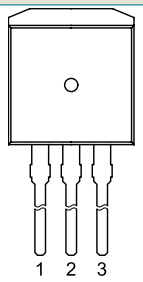
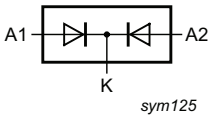
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values				Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage		200				V
$I_{O(AV)}$	average output current	δ = 0.5; square-wave pulse; $T_{mb} \leq 115$ °C; both diodes conducting; Fig. 1; Fig. 2	20				A
I_{RRM}	repetitive peak reverse current	δ = 0.001; t_p = 2 µs;	0.2				A
V_{ESD}	electrostatic discharge voltage	HBM; C = 250 pF; R = 1.5 kΩ; all pins	8				kV
I_{FRM}	repetitive peak forward current	δ = 0.5; t_p = 25 µs; $T_{mb} \leq 115$ °C; per diode	20				A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; sine-wave pulse; $T_{j(init)}$ = 25 °C; per diode	125				A
		t_p = 8.3 ms; sine-wave pulse; $T_{j(init)}$ = 25 °C; per diode	137				A
Symbol	**Parameter**	**Conditions**		**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 8 A; T_j = 150 °C; Fig. 4		-	0.72	0.85	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; ramp recovery; Fig. 5		-	20	25	ns
		I_F = 0.5 A to I_R = 1 A; T_j = 25 °C; measured at I_R= 0.25 A; step recovery; Fig. 6		-	10	20	ns

5. 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		

6. Ordering information

Table 3. Ordering information

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

7. Marking

Table 4. Marking codes

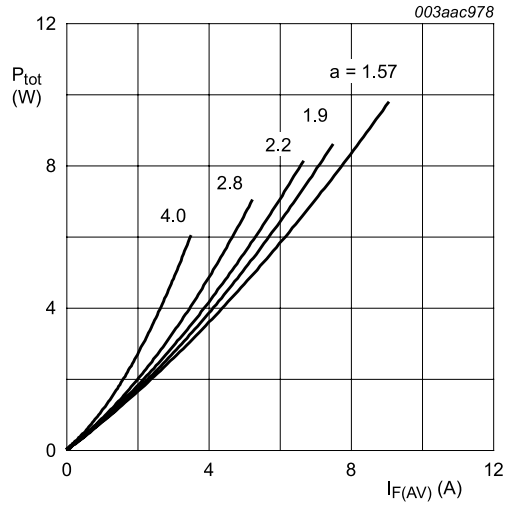
Type number	Marking codes
BYV32G-200	BYV32G-200

8. Limiting values

Table 5. Limiting values

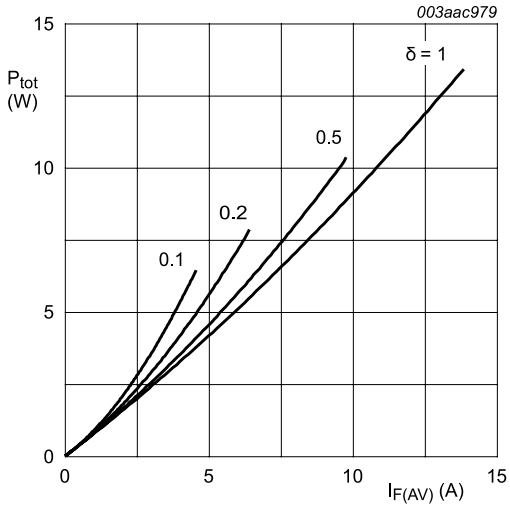
In accordance with the Absolute Maximum Rating System (IEC 60134).

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



a = 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

9. Thermal characteristics

Table 6. 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; Fig 3		-	-	2.4	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient			-	60	-	K/W

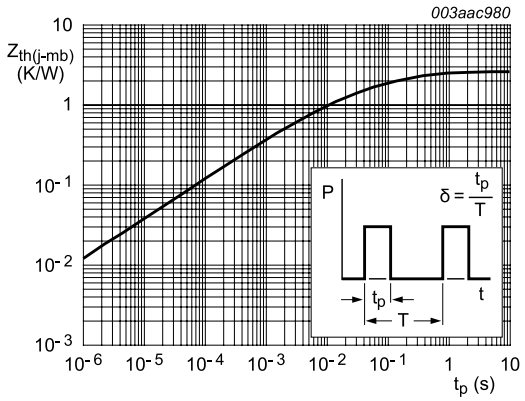
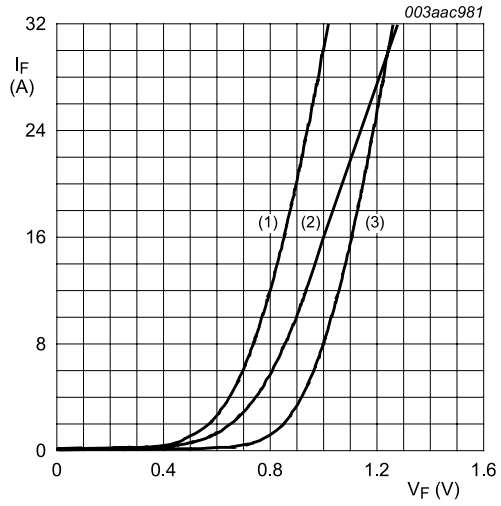


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 8 A; T_j = 150 °C; Fig. 4		-	0.72	0.85	V
		I_F = 20 A; T_j = 25 °C		-	1	1.15	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C		-	6	30	µA
		V_R = 200 V; T_j = 100 °C		-	0.2	0.6	mA
Dynamic characteristics							
Q_r	recovered charge	I_F = 2 A; V_R = 30 V; dI_F/dt = 20 A/µs; T_j = 25 °C		-	8	12.5	nC
t_{rr}	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 100 A/µs; T_j = 25 °C; ramp recovery; Fig. 5		-	20	25	ns
		I_F = 0.5 A to I_R = 1 A; T_j = 25 °C; measured at I_R= 0.25 A; step recovery; Fig. 6		-	10	20	ns
v_{FR}	forward recovery voltage	I_F = 1 A; dI_F/dt = 10 A/µs; T_j = 25 °C; Fig. 7		-	-	1	V



(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

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

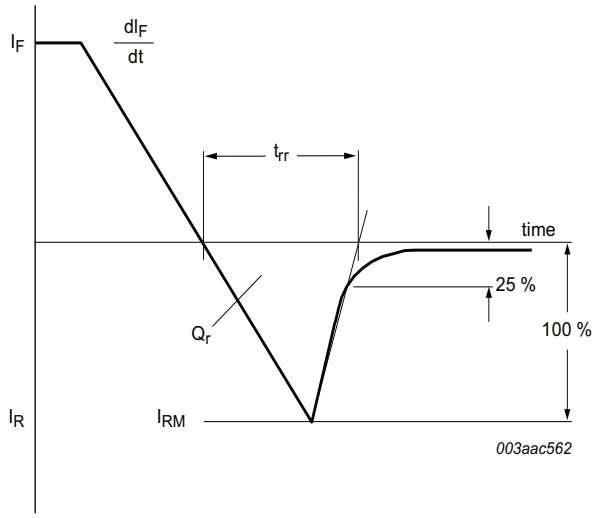


Fig. 5. Reverse recovery definitions; ramp recovery

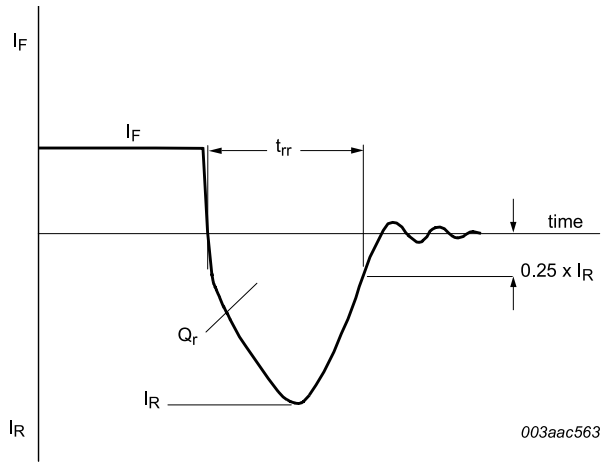


Fig. 6. Reverse recovery definitions; step recovery

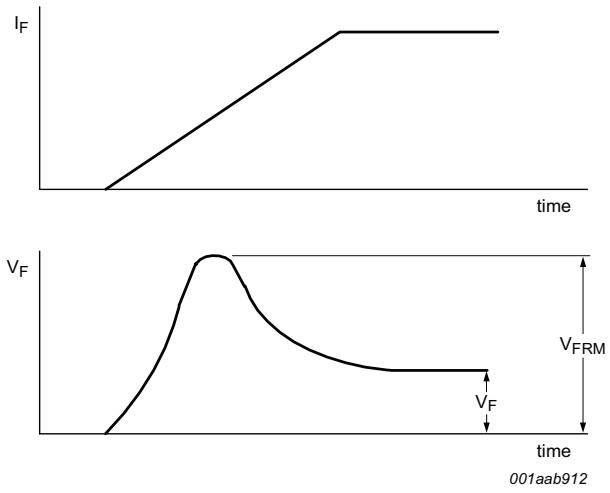
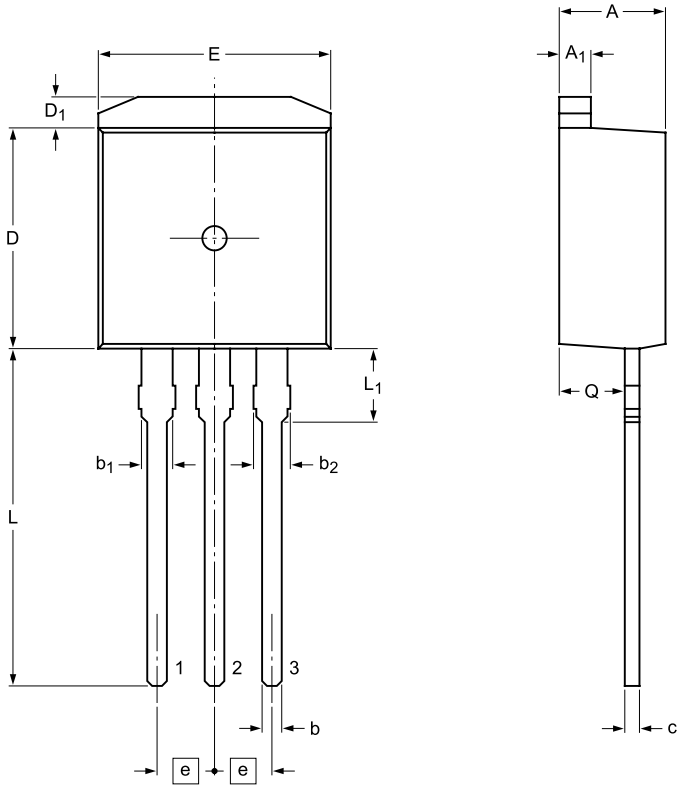


Fig. 7. Forward recovery definitions

11. Package outline

Plastic single-ended package (I2PAK); low-profile 3-lead TO-262 **SOT226A**



0 5 10 mm

scale

Dimensions

Unit		A	A_1	b	b_1	b_2	c	D	D_1	E	e	L	L_1	Q
mm	max	4.7	1.40	0.95	1.40	1.7	0.65	9.4	1.32	10.30	2.54 (REF)	15.0	3.0 (REF)	2.6
	nom													
	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

12. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV32G-200 v.2	20180307	Product data sheet	-	BYV32G-200 v.1
Modifications:	Change from NXP version to WeEn version			
BYV32G-200 v.1	20110111	Product data sheet	-	-

13. 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.
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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