BYV42G-200

Dual ultrafast power diode

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

3. Applications

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

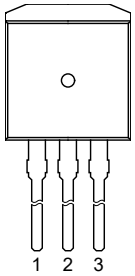
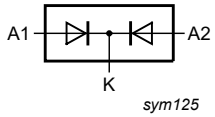
4. Quick reference data

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; $T_{j(init)}$ = 25 °C; SIN; per diode		-	-	150	A
		t_p = 8.3 ms; $T_{j(init)}$ = 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/µs; 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	 I2PAK (SOT226A)	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

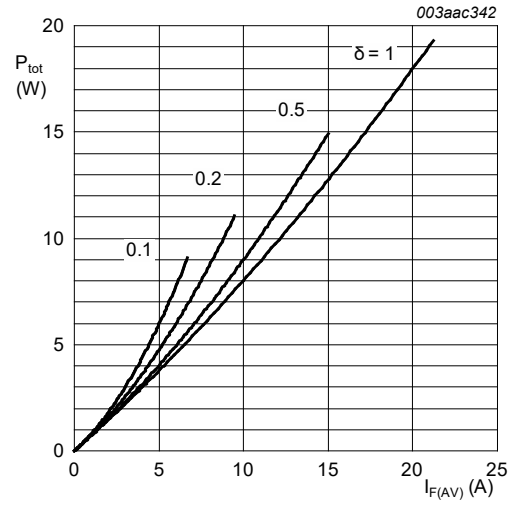
Type number	Package		
	Name	Description	Version
BYV42G-200	I2PAK	plastic single-ended package (I2PAK); TO-262	SOT226A

7. Limiting values

Table 4. Limiting values

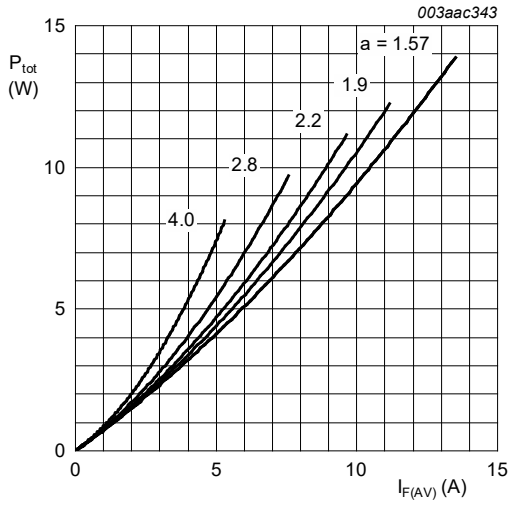
In accordance with the Absolute Maximum Rating System (IEC 60134).

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	δ = 0.5; T_{mb} ≤ 104 °C; SQW; both diodes conducting; Fig. 1; Fig. 2		-	30	A
I_{FRM}	repetitive peak forward current	δ = 0.5; t_p = 25 µs; T_{mb} ≤ 104 °C; per diode		-	30	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; SIN; per diode		-	150	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; SIN; per diode		-	160	A
I_{RRM}	repetitive peak reverse current	δ = 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



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

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



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

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

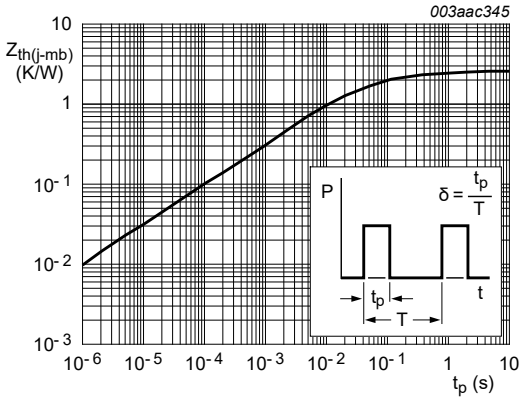
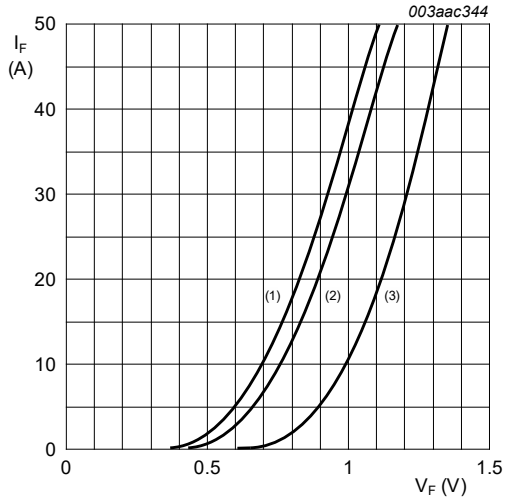


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 15 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
I_R	reverse current	V_R = 200 V; T_j = 100 °C		-	0.5	1	mA
		V_R = 200 V; T_j = 25 °C		-	10	100	µA
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	28	ns
		I_F = 0.5 A; I_R = 1 A; T_j = 25 °C; step recovery; measured at reverse current = 0.25 A; Fig. 6		-	13	22	ns
Q_r	recovered charge	I_F = 2 A; V_R = 30 V; dI_F/dt = 20 A/µs; T_j = 25 °C		-	6	15	nC
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

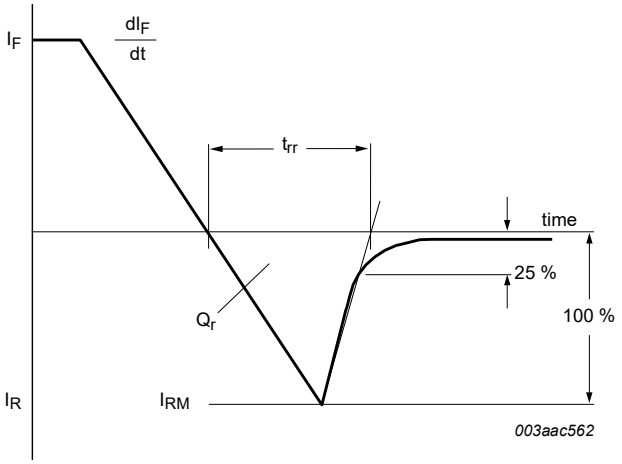


Fig. 5. Reverse recovery definitions; ramp recovery

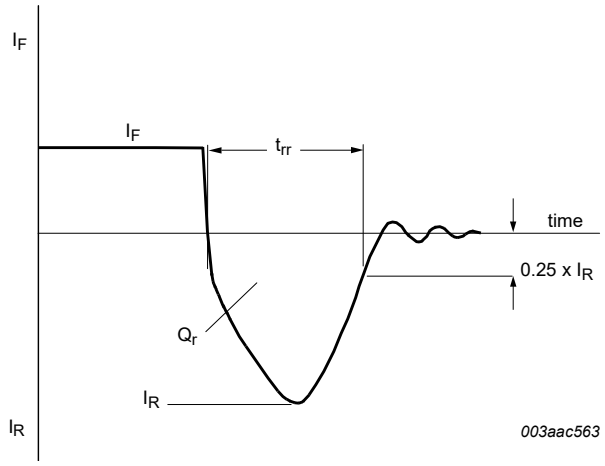


Fig. 6. Reverse recovery definitions; step recovery

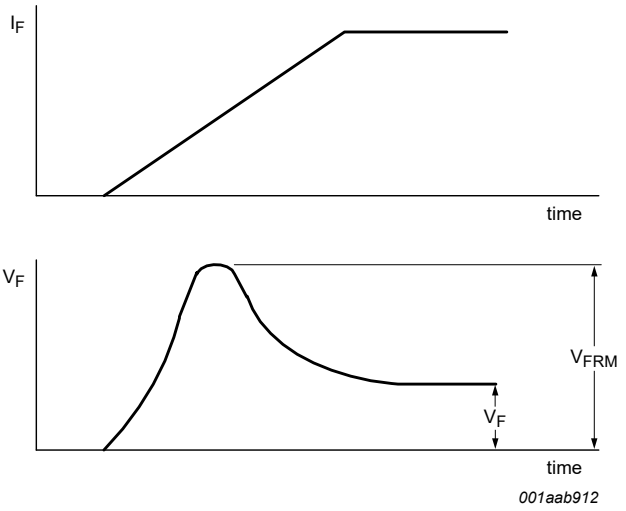
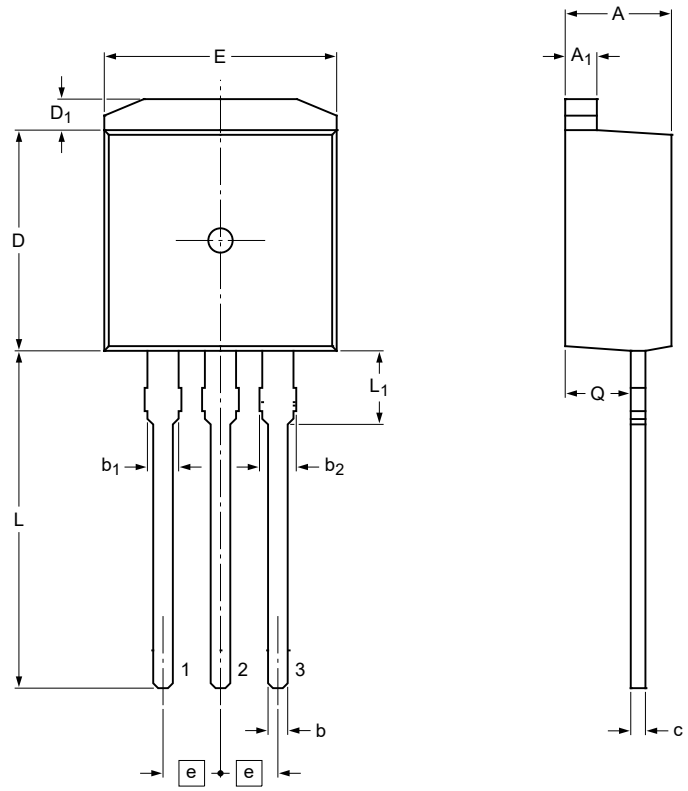


Fig. 7. Forward recovery definitions

10. 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
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

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.
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12. Contents

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