BYV34G-600

Dual ultrafast power diode

Rev.02 12 October 2016 Product data sheet

1. Product profile

1.1 General description

Ultrafast, dual common cathode, epitaxial rectifier diode in a SOT226 (I2PAK), low-profile plastic package.

1.2 Features

- Fast switching
- Soft recovery characteristic
- Low switching loss
- Low thermal resistance
- High thermal cycling performance
- Low forward voltage drop

1.3 Applications

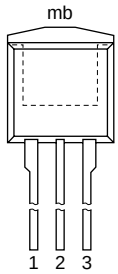
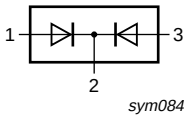
- Output rectifiers in high frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

1.4 Quick reference data

- $V_{RRM} \leq 600$ V
- $V_F \leq 1.16$ V
- $I_{O(AV)} \leq 20$ A
- $t_{rr} \leq 60$ ns

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode 1		
2	cathode		
3	anode 2		
mb	mounting base; cathode		

SOT226 (I2PAK)

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BYV34G-600	I2PAK	plastic single-ended package (I2PAK); low-profile 3-lead TO-220AB	SOT226B

4. Limiting values

Table 3. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	600	V
V_{RWM}	crest working reverse voltage		-	600	V
V_R	reverse voltage	DC; $T_{mb} \leq 138$ °C	-	600	V
$I_{O(AV)}$	average output current	square waveform; $\delta = 0.5$; $T_{mb} \leq 107$ °C; both diodes conducting	-	20	A
I_{FRM}	repetitive peak forward current	$t_p = 25$ µs square waveform; $\delta = 0.5$; $T_{mb} \leq 107$ °C; per diode	-	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10$ ms; sinusoidal waveform; per diode	-	120	A
		$t_p = 8.3$ ms; sinusoidal waveform; per diode	-	132	A
T_{stg}	storage temperature		–40	+150	°C
T_j	junction temperature		-	150	°C

5. Thermal characteristics

Table 4. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j\text{-}mb)}$	thermal resistance from junction to mounting base	with heatsink compound per diode; see Figure 1	-	-	2.4	K/W
		with heatsink compound; both diodes conducting	-	-	1.6	K/W
$R_{th(j\text{-}a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W

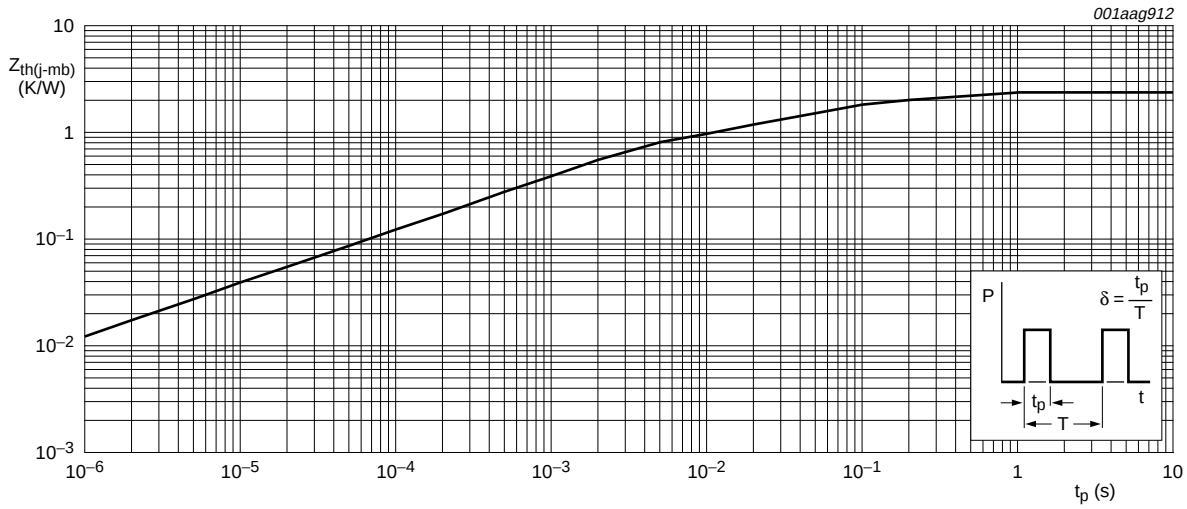


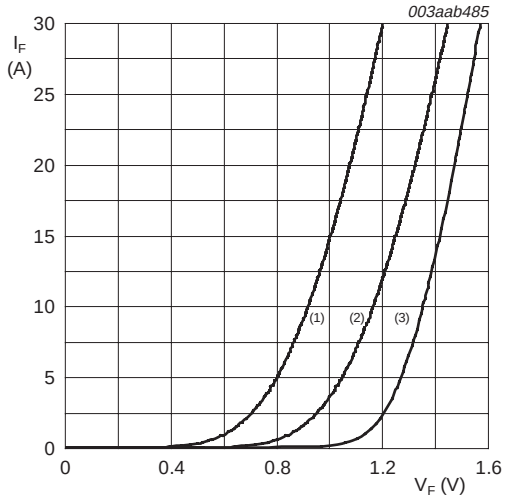
Fig 1. Transient thermal impedance from junction to mounting base per diode as a function of pulse width

6. Characteristics

Table 5. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	I_F = 10 A; T_j = 150 °C; see Figure 2	-	0.92	1.16	V
		I_F = 20 A	-	1.07	1.48	V
I_R	reverse current	V_R = 600 V	-	10	50	µA
		V_R = 600 V; T_j = 100 °C	-	0.2	0.6	mA
Dynamic characteristics						
Q_r	recovered charge	I_F = 2 A to V_R = 30 V; dI_F/dt = 20 A/µs; see Figure 3	-	40	70	nC
t_{rr}	reverse recovery time	I_F = 1 A to V_R = 30 V; dI_F/dt = 100 A/µs; ramp recovery; see Figure 3	-	50	60	ns
I_{RM}	peak reverse recovery current	I_F = 10 A to V_R = 30 V; dI_F/dt = 50 A/µs; T_j = 100 °C; see Figure 3	-	3	5	A
V_{FR}	forward recovery voltage	I_F = 10 A; dI_F/dt = 10 A/µs; see Figure 4	-	3.2	-	V



(1) T_j = 150 °C; typical values

(2) T_j = 150 °C; maximum values

(3) T_j = 25 °C; maximum values

Fig 2. Forward current as a function of forward voltage

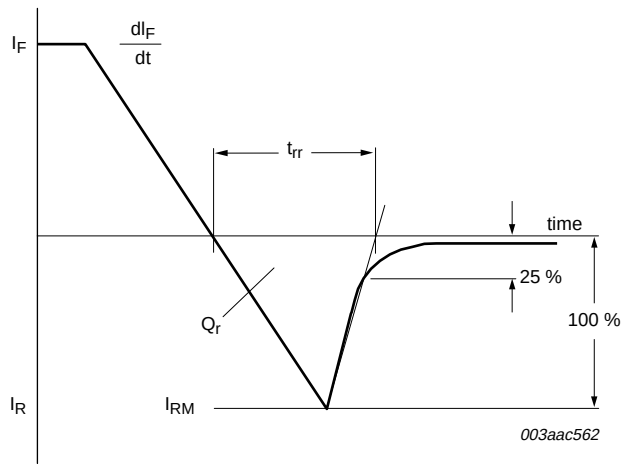


Fig 3. Reverse recovery definitions

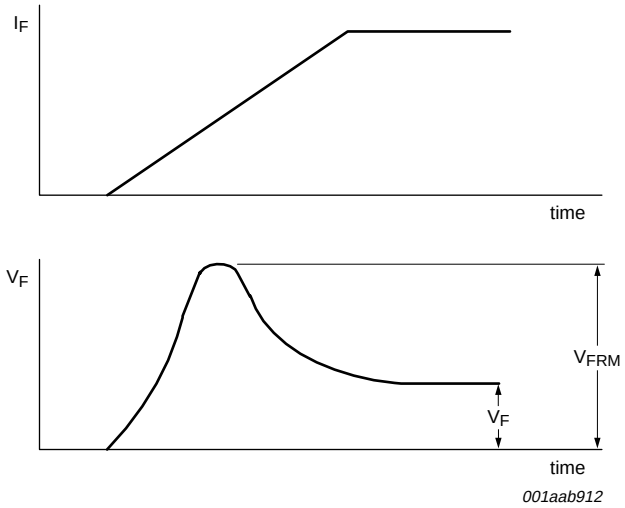
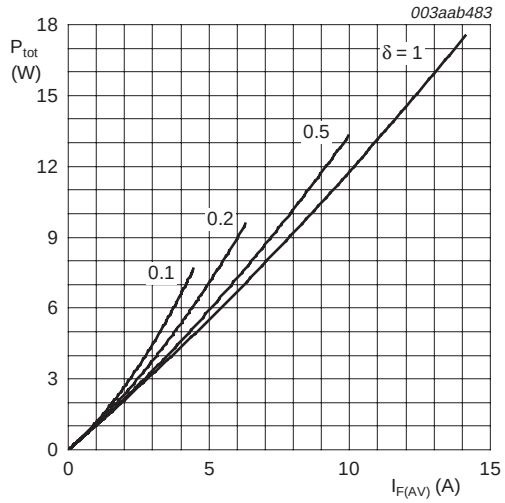
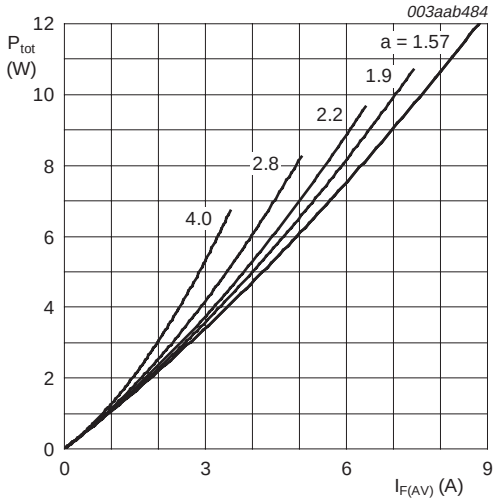


Fig 4. Forward recovery definitions



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

Fig 5. Forward power dissipation as a function of average forward current; square waveform; maximum values

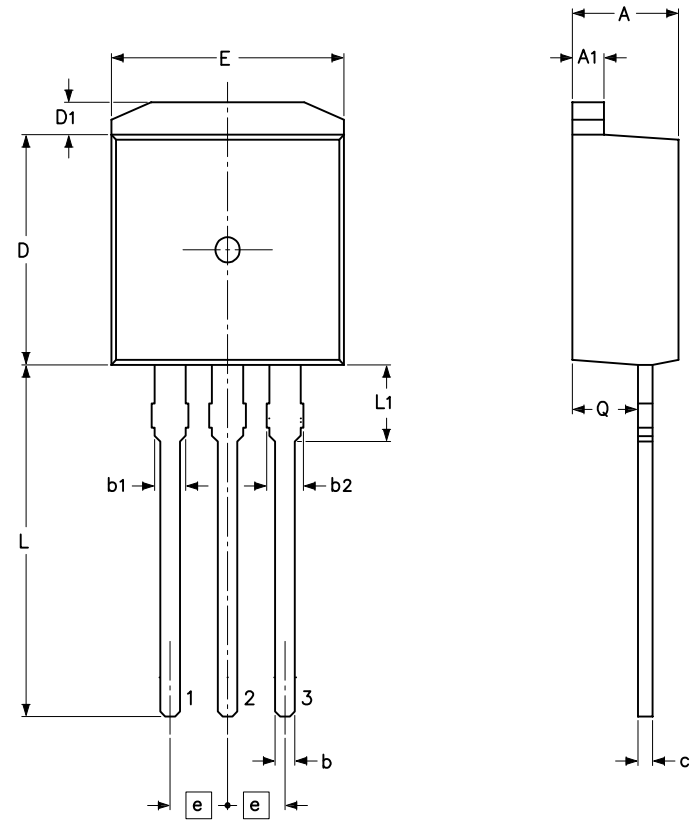


a = form factor = $I_{F(RMS)} / I_{F(AV)}$

Fig 6. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

7. Package outline

Plastic single−ended package (I2PAK); low−profile 3−lead TO−262 SOT226B



0 5 10 mm

scale

Dimensions

Unit		A	A1	b	b1	b2	c	D	D1	E	e	L	L1	Q
mm	max	4.7	1.40	0.85	1.40	1.7	0.65	9.4	1.32	10.30	2.54 (REF)	15.0	3.30	2.6
	nom	4.3	1.15	0.60	1.14	1.3	0.45	8.6	1.02	9.65		12.5	2.79	2.2
	min													

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT226B		TO−262				16−10−17

Fig. 1. Package outline I2PAK (SOT226B)

8. Revision history

Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV34G-600_1	20090225	Product data sheet	-	-

9. 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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