BYV34-600

Dual rectifier diode ultrafast

Rev. 02 — 28 September 2018 Product data sheet

1. Product profile

1.1 General description

Ultrafast, dual common cathode, epitaxial rectifier diode in a SOT78 (TO-220AB) plastic package.

1.2 Features

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

1.3 Applications

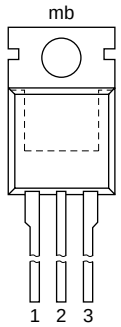
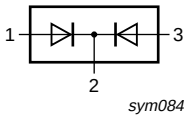
- Output rectifiers in high frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

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	Symbol
1	anode 1		
2	cathode		
3	anode 2		
mb	mounting base; cathode		

SOT78 (3-lead TO-220AB)

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BYV34-600	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

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	square waveform; $\delta = 1.0$; $T_{mb} \leq 138$ °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 = 25 µs; square waveform; $\delta = 0.5$; $T_{mb} \leq 107$ °C; per diode	-	20	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms; sinusoidal waveform; per diode	-	120	A
		t = 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
$R_{th(j-mb)}$	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
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W

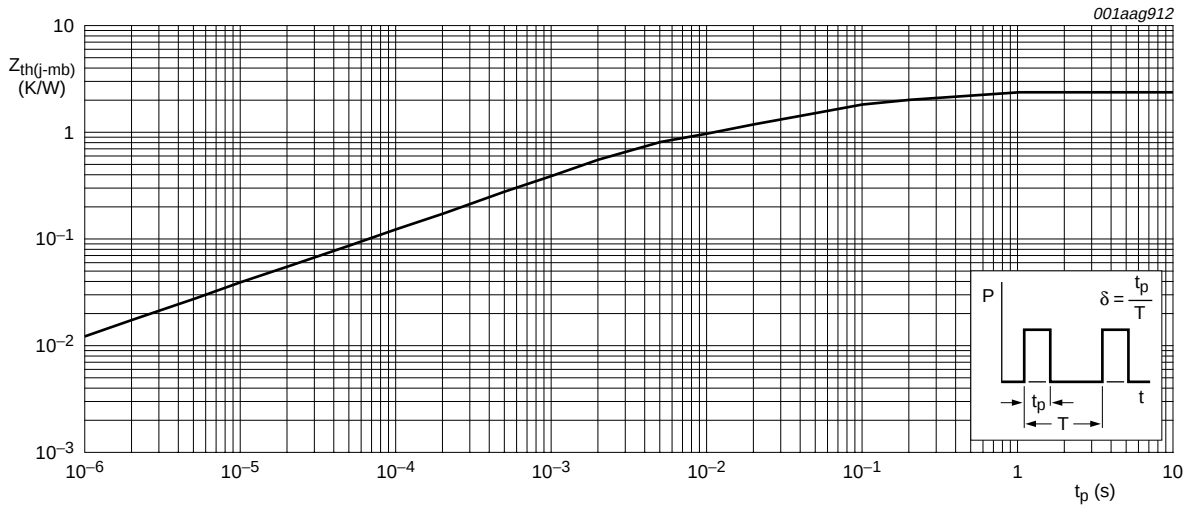


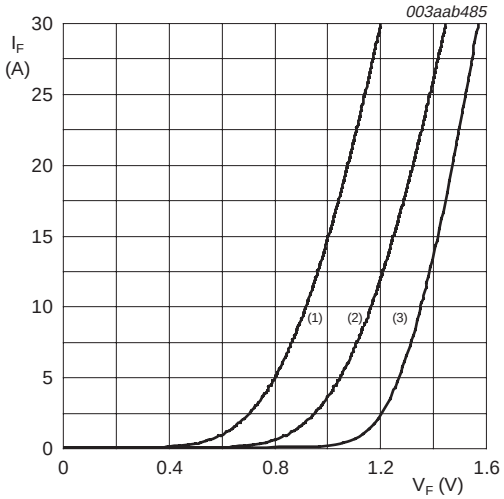
Fig 1. Transient thermal impedance from junction to mounting base per diode as a function of pulse width

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; see Figure 2	-	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 $V_R \geq$ 30 V; dI_F/dt = 20 A/µs; see Figure 3	-	40	70	nC
t_{rr}	reverse recovery time	I_F = 1 A to $V_R \geq$ 30 V; dI_F/dt = 100 A/µs; see Figure 3	-	50	60	ns
I_{RM}	peak reverse recovery current	I_F = 10 A to $V_R \geq$ 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

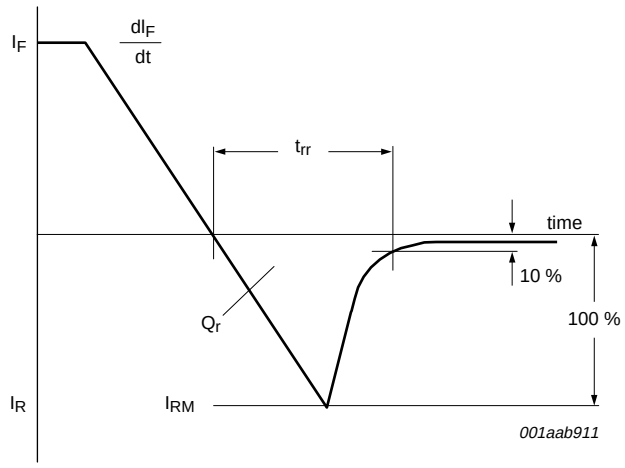


Fig 3. Reverse recovery definitions

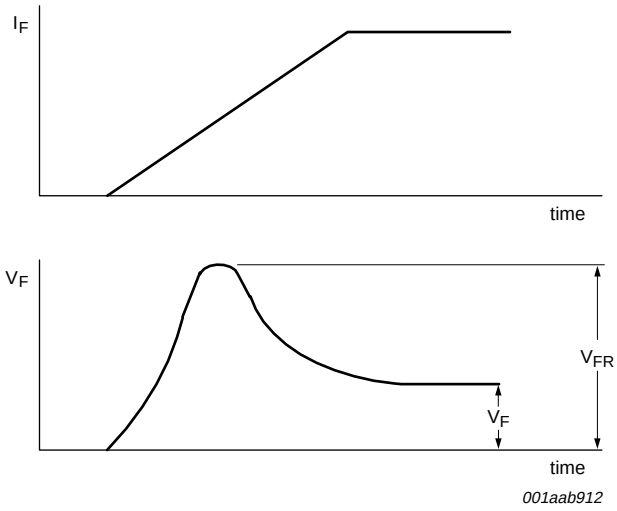
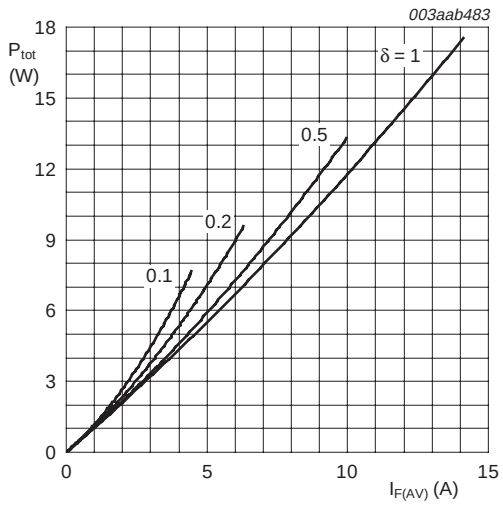
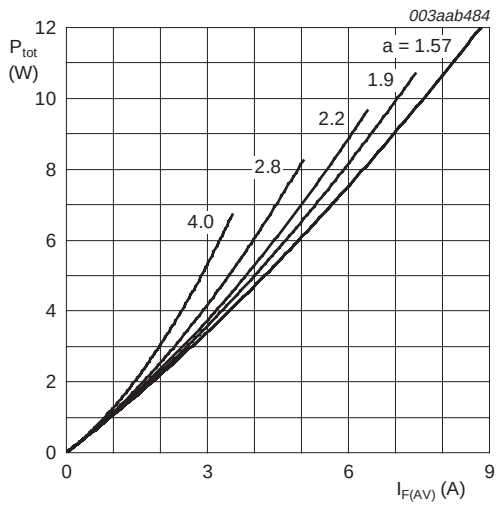


Fig 4. Forward recovery definitions



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

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

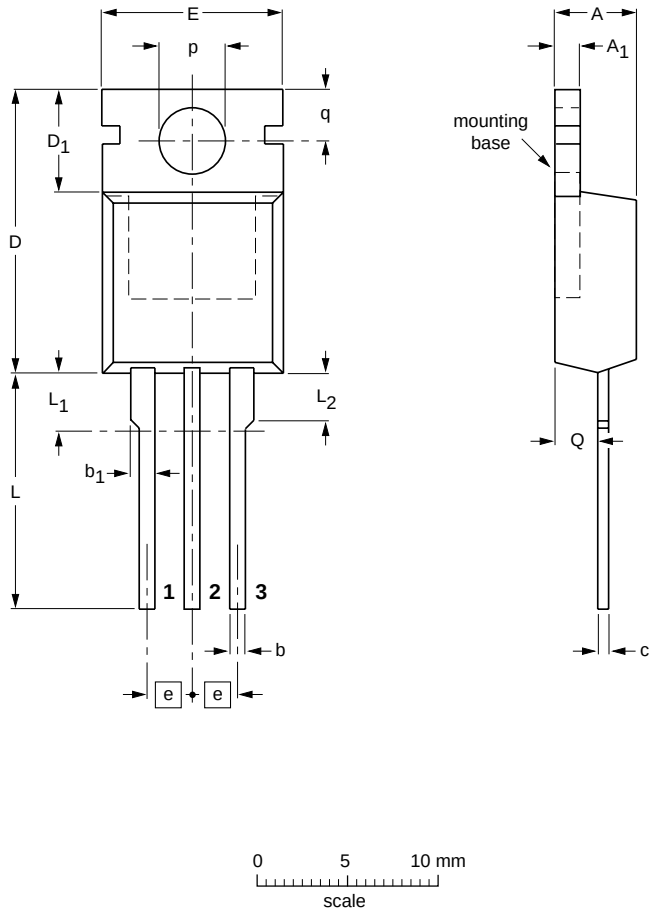


a = form factor = $I_{F(RMS)} / I_{F(AV)}$

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

7. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB **SOT78**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	b_1	c	D	D_1	E	e	L	L_1	L_2 max.	p	q	Q
mm	4.7 4.1	1.40 1.25	0.9 0.6	1.45 1.00	0.7 0.4	16.0 15.2	6.6 5.9	10.3 9.7	2.54	15.0 12.8	3.30 2.79	3.0	3.8 3.5	3.0 2.7	2.6 2.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT78		3-lead TO-220AB	SC-46			~~05-03-22~~ 05-10-25

Fig 7. Package outline SOT78 (3-lead TO-220AB)

8. Revision history

Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV34-600 V.2	20180928	Product data sheet	-	BYV34-600_1
Modification:	Change from NXP version to WeEn Version			
BYV34-600_1	20071004	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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