**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

- $V_{RRM} \le 600 \text{ V}$
- V<sub>F</sub> ≤ 1.16 V

- $I_{O(AV)} \le 20 \text{ A}$
- $t_{rr} \le 60 \text{ ns}$

## 2. Pinning information

Table 1. Pinning

	3		
Pin	Description	Simplified outline	Symbol
1	anode 1		
2	cathode	mb	1
3	anode 2	705	2
mb	mounting base; cathode	1 2 3	sym084
		SOT78 (3-lead TO-220A	AB)



**Dual rectifier diode ultrafast** 

# 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).

		9 , ( ,			
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; $T_{mb} \le 138  ^{\circ}C$	-	600	V
I <sub>O(AV)</sub>	average output current	square waveform; $\delta$ = 0.5; $T_{mb} \le 107$ °C; both diodes conducting	-	20	Α
I <sub>FRM</sub>	repetitive peak forward current	$t$ = 25 μs; square waveform; $\delta$ = 0.5; $T_{mb} \le$ 107 °C; per diode	-	20	Α
I <sub>FSM</sub>	non-repetitive peak forward current	t = 10 ms; sinusoidal waveform; per diode	-	120	Α
		t = 8.3 ms; sinusoidal waveform; per diode	-	132	Α
T <sub>stg</sub>	storage temperature		-40	+150	°C
Tj	junction temperature		-	150	°C

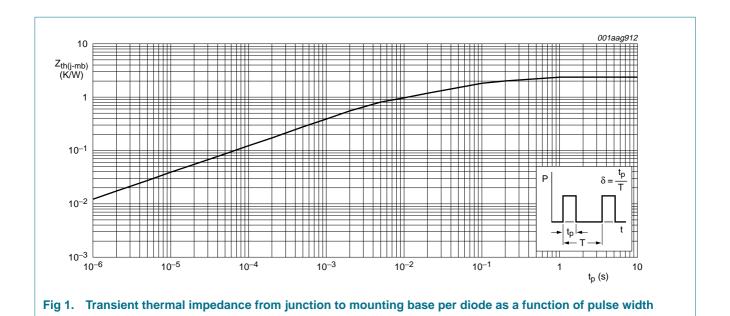
### 5. Thermal characteristics

#### Table 4. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	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

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#### 6. Characteristics

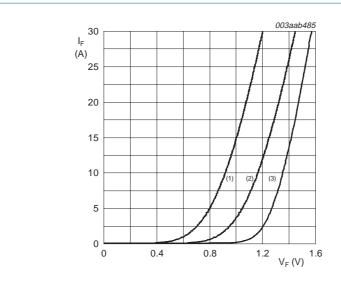
#### Table 5. Characteristics

 $T_i = 25 \,^{\circ}C$  unless otherwise specified.

,						
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static char	racteristics					
$V_{F}$	forward voltage	$I_F = 10 \text{ A}; T_j = 150 ^{\circ}\text{C}; \text{ see } \frac{\text{Figure 2}}{}$	-	0.92	1.16	V
		I <sub>F</sub> = 20 A; see <u>Figure 2</u>	-	1.07	1.48	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 600 V	-	10	50	μΑ
		$V_R = 600 \text{ V}; T_j = 100 ^{\circ}\text{C}$	-	0.2	0.6	mA
Dynamic c	haracteristics					
Q <sub>r</sub>	recovered charge	$I_F$ = 2 A to $V_R$ $\geq$ 30 V; $dI_F/dt$ = 20 A/ $\mu$ s; see Figure 3	-	40	70	nC
t <sub>rr</sub>	reverse recovery time	$I_F = 1 \text{ A to V}_R \ge 30 \text{ V};$ $dI_F/dt = 100 \text{ A/}\mu\text{s}; \text{ see } \frac{\text{Figure 3}}{}$	-	50	60	ns
I <sub>RM</sub>	peak reverse recovery current	$I_F$ = 10 A to $V_R$ $\geq$ 30 V; $dI_F/dt$ = 50 A/ $\mu$ s; $T_j$ = 100 °C; see Figure 3	-	3	5	Α
$V_{FR}$	forward recovery voltage	$I_F = 10 \text{ A}$ ; $dI_F/dt = 10 \text{ A}/\mu\text{s}$ ; see Figure 4	-	3.2	-	V

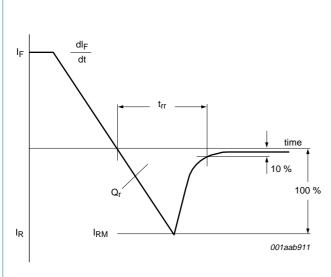
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- (1)  $T_j = 150 \,^{\circ}\text{C}$ ; typical values
- (2)  $T_j = 150 \,^{\circ}\text{C}$ ; maximum values
- (3)  $T_j = 25$  °C; maximum values

Fig 2. Forward current as a function of forward voltage



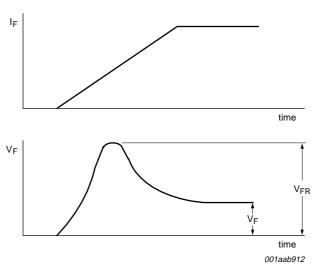
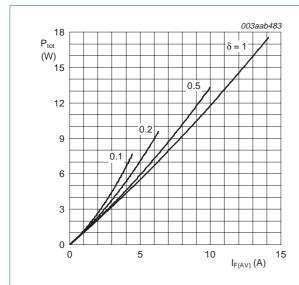


Fig 3. Reverse recovery definitions

Fig 4. Forward recovery definitions

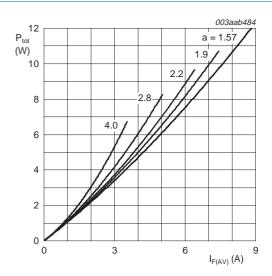
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 $I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$ 

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



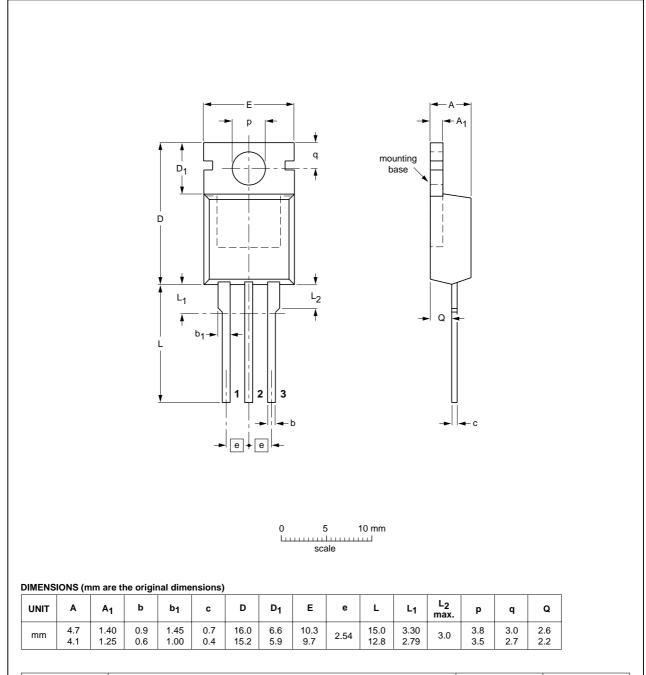
 $a = form factor = I_{F(RMS)} / I_{F(AV)}$ 

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

# 7. Package outline

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

SOT78



OUTLINE		REFER	ENCES	EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	JEITA	PROJECTION		
SOT78		3-lead TO-220AB	SC-46		<del>05-03-22</del> 05-10-25	

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

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# 8. Revision history

#### Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYV34-600_1	20071004	Product data sheet	-	-

BYV34-600

#### **Dual rectifier diode ultrafast**

### 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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# **BYV34-600**

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