

DATA SHEET

BYW29EB, BYW29ED series

Rectifier diodes
ultrafast, rugged

Product specification

November 1998



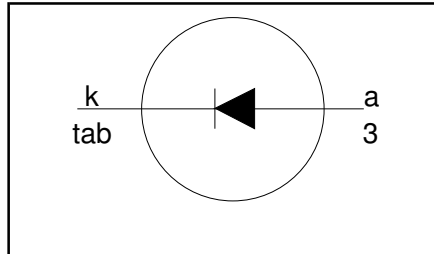
Rectifier diodes ultrafast, rugged

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FEATURES

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- Reverse surge capability
- High thermal cycling performance
- Low thermal resistance

SYMBOL



QUICK REFERENCE DATA

$$V_R = 150 \text{ V} / 200 \text{ V}$$

$$V_F \leq 0.895 \text{ V}$$

$$I_{F(AV)} = 8 \text{ A}$$

$$I_{RRM} = 0.2 \text{ A}$$

$$t_r \leq 25 \text{ ns}$$

GENERAL DESCRIPTION

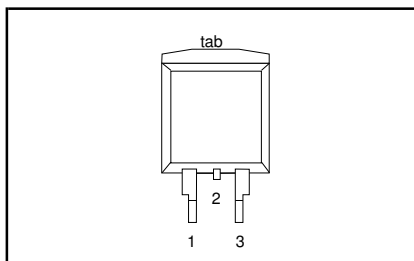
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYW29EB series is supplied in the SOT404 surface mounting package.
The BYW29ED series is supplied in the SOT428 surface mounting package.

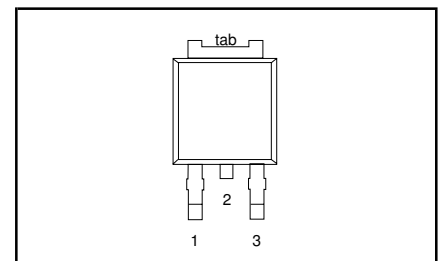
PINNING

PIN	DESCRIPTION
1	no connection
2	cathode ¹
3	anode
tab	cathode

SOT404



SOT428



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
V_{RRM}	Peak repetitive reverse voltage	BYW29EB/ BYW29ED	-	-150 150	-200 200	V
V_{RWM}	Working peak reverse voltage		-	150	200	V
V_R	Continuous reverse voltage		-	150	200	V
$I_{F(AV)}$	Average rectified forward current	square wave; $\delta = 0.5$; $T_{mb} \leq 128 \text{ }^{\circ}\text{C}$	-	8		A
I_{FRM}	Repetitive peak forward current	square wave; $\delta = 0.5$; $T_{mb} \leq 128 \text{ }^{\circ}\text{C}$	-	16		A
I_{FSM}	Non-repetitive peak forward current	$t = 10 \text{ ms}$	-	80		A
		$t = 8.3 \text{ ms}$	-	88		A
		sinusoidal; with reappplied $V_{RRM(max)}$	-	0.2		A
I_{RRM}	Peak repetitive reverse surge current	$t_p = 2 \text{ } \mu\text{s}$; $\delta = 0.001$	-	0.2		A
I_{RSM}	Peak non-repetitive reverse surge current	$t_p = 100 \text{ } \mu\text{s}$	-	0.2		A
T_j	Operating junction temperature		-	150		$^{\circ}\text{C}$
T_{stg}	Storage temperature		- 40	150		$^{\circ}\text{C}$

1. It is not possible to make connection to pin 2 of the SOT428 or SOT404 packages.

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ESD LIMITING VALUE

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_C	Electrostatic discharge capacitor voltage	Human body model; $C = 250 \text{ pF}$; $R = 1.5 \text{ k}\Omega$	-	8	kV

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th \text{ j-mb}}$	Thermal resistance junction to mounting base	SOT404 and SOT428 packages, pcb mounted, minimum footprint, FR4 board	-	-	2.7	K/W
$R_{th \text{ j-a}}$	Thermal resistance junction to ambient		-	50	-	K/W

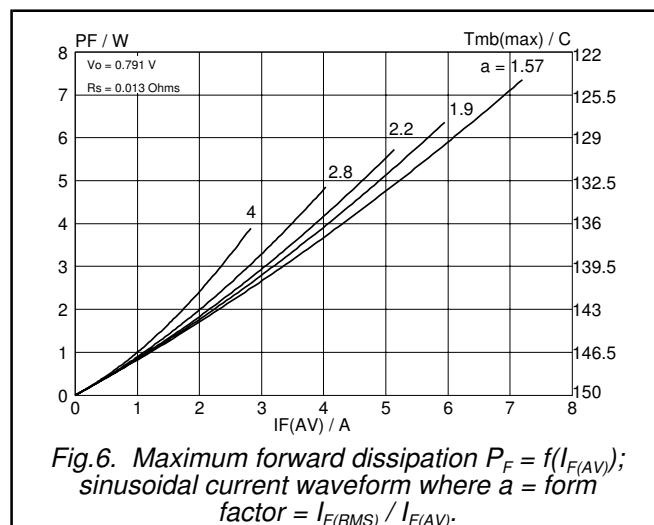
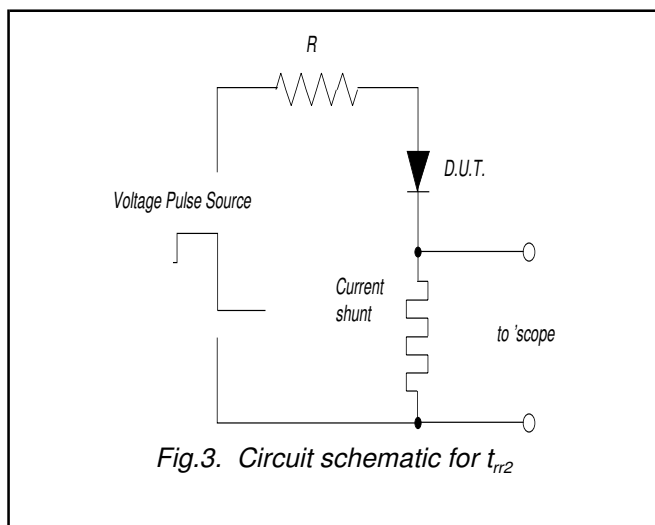
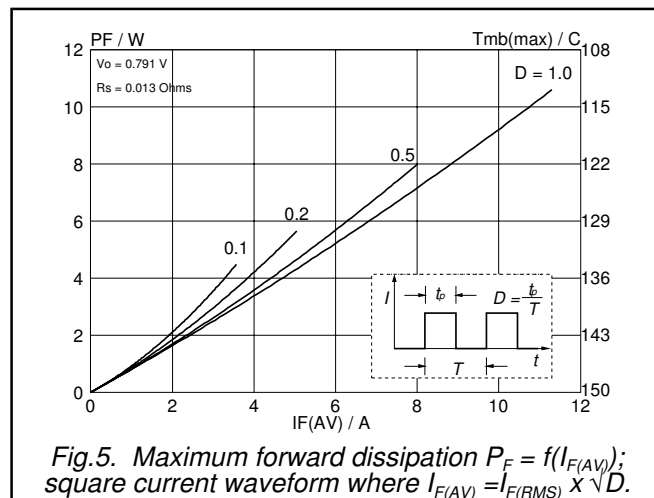
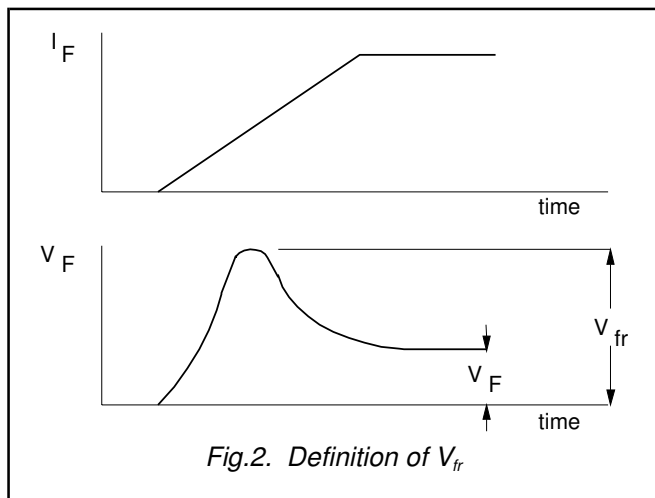
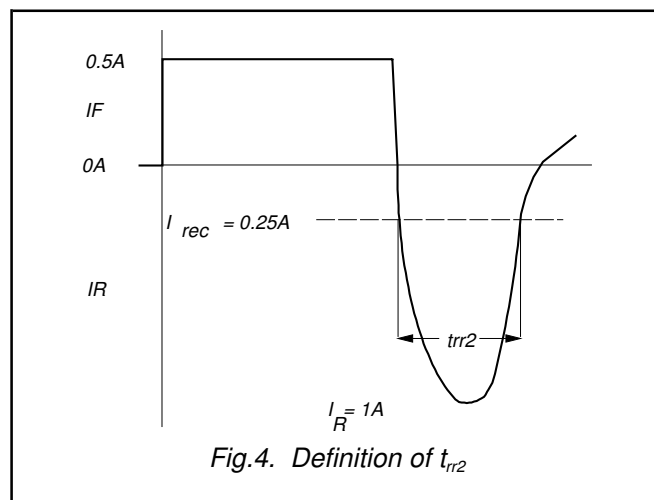
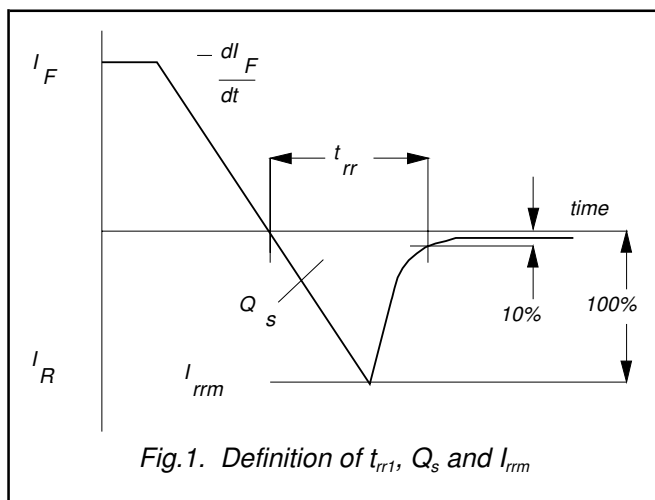
ELECTRICAL CHARACTERISTICS

$T_j = 25^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	$I_F = 8 \text{ A}$; $T_j = 150^\circ\text{C}$	-	0.8	0.895	V
I_R	Reverse current	$I_F = 8 \text{ A}$	-	0.92	1.05	V
		$I_F = 20 \text{ A}$	-	1.1	1.3	V
		$V_R = V_{RWM}$	-	2	10	μA
		$V_R = V_{RWM}$; $T_j = 100^\circ\text{C}$	-	0.2	0.6	mA
Q_{rr}	Reverse recovered charge	$I_F = 2 \text{ A}$; $V_R \geq 30 \text{ V}$; $-dI_F/dt = 20 \text{ A}/\mu\text{s}$	-	4	11	nC
t_{rr1}	Reverse recovery time	$I_F = 1 \text{ A}$; $V_R \geq 30 \text{ V}$; $-dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	20	25	ns
t_{rr2}	Reverse recovery time	$I_F = 0.5 \text{ A}$ to $I_R = 1 \text{ A}$; $I_{rec} = 0.25 \text{ A}$	-	15	20	ns
V_{fr}	Forward recovery voltage	$I_F = 1 \text{ A}$; $dI_F/dt = 10 \text{ A}/\mu\text{s}$	-	1	-	V

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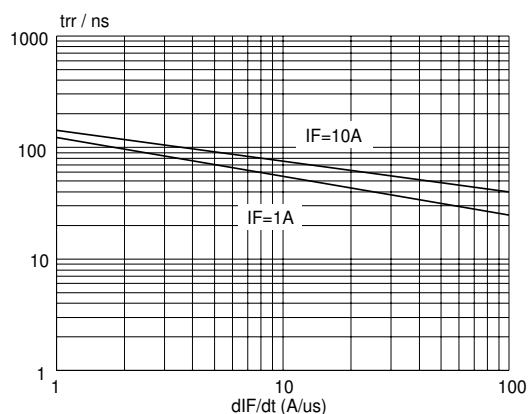


Fig. 7. Maximum t_{rr} at $T_j = 25\text{ }^{\circ}\text{C}$.

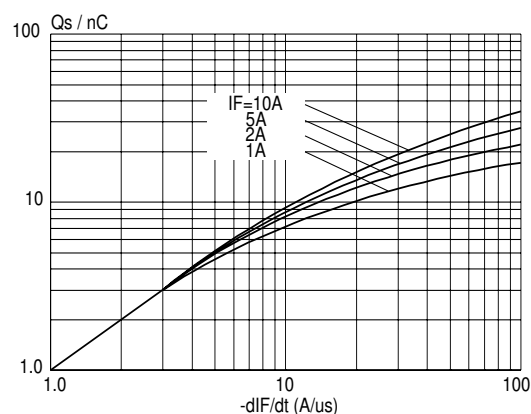


Fig. 10. Maximum Q_s at $T_j = 25\text{ }^{\circ}\text{C}$.

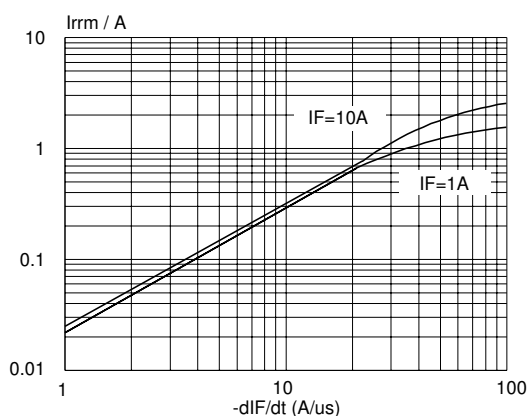


Fig. 8. Maximum I_{rrm} at $T_j = 25\text{ }^{\circ}\text{C}$.

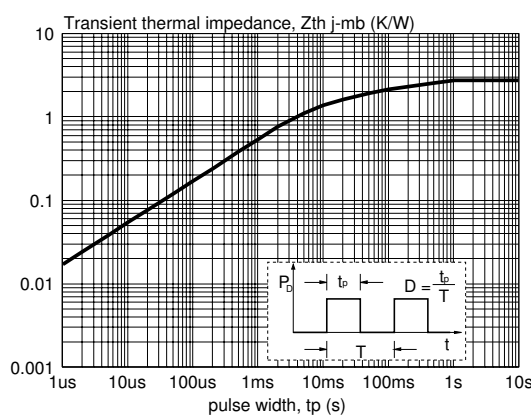


Fig. 11. Transient thermal impedance; $Z_{th\ j-mb} = f(t_p)$.

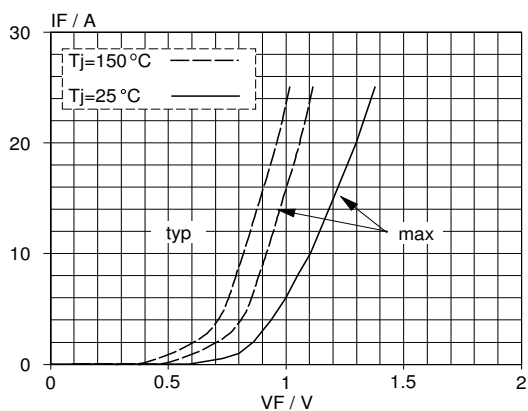


Fig. 9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

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MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

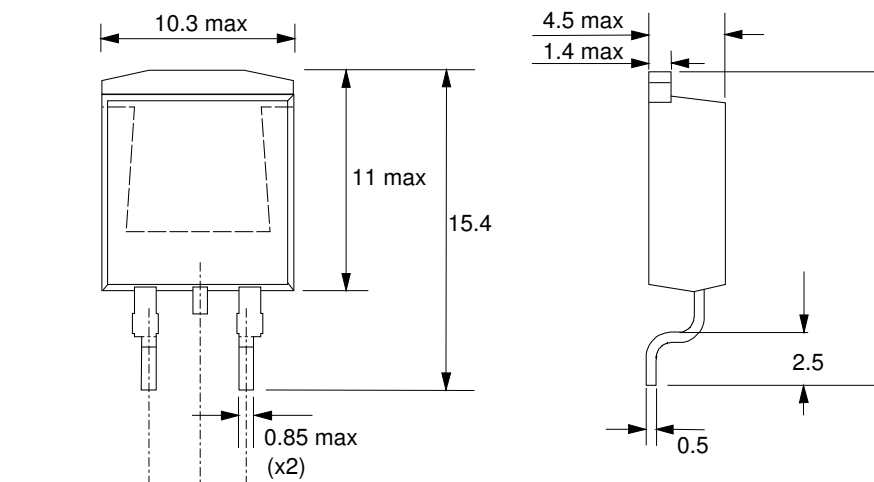


Fig.12. SOT404 : centre pin connected to mounting base.

MOUNTING INSTRUCTIONS

Dimensions in mm

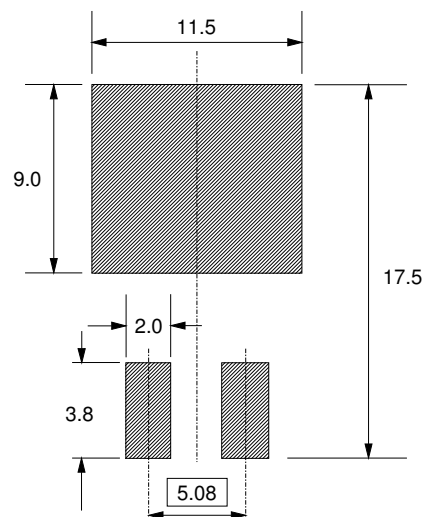


Fig.13. SOT404 : soldering pattern for surface mounting.

Notes

1. Epoxy meets UL94 V0 at 1/8".

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MECHANICAL DATA

Dimensions in mm

Net Mass: 1.1 g

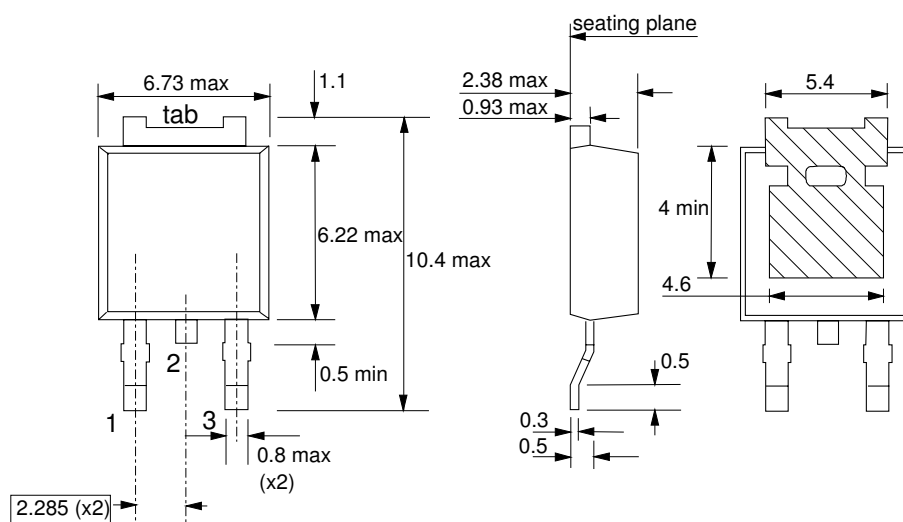


Fig.14. SOT428 : centre pin connected to tab.

MOUNTING INSTRUCTIONS

Dimensions in mm

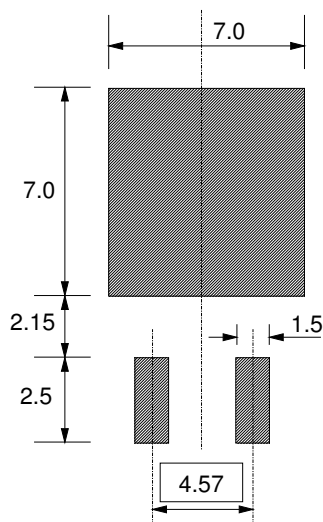


Fig.15. SOT428 : minimum pad sizes for surface mounting.

Notes

1. Plastic meets UL94 V0 at 1/8".

Legal information

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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