

# DATA SHEET

**BYV29 series**  
Rectifier diodes  
ultrafast

Product specification

September 2018

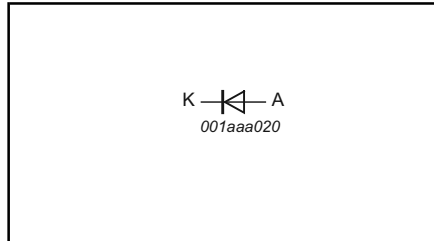
**Rectifier diodes  
ultrafast**

**BYV29 series**

**FEATURES**

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

**SYMBOL**



**QUICK REFERENCE DATA**

$V_R = 300\text{ V} / 400\text{ V} / 500\text{ V}$
$V_F \leq 1.03\text{ V}$
$I_{F(AV)} = 9\text{ A}$
$t_{rr} \leq 60\text{ ns}$

**GENERAL DESCRIPTION**

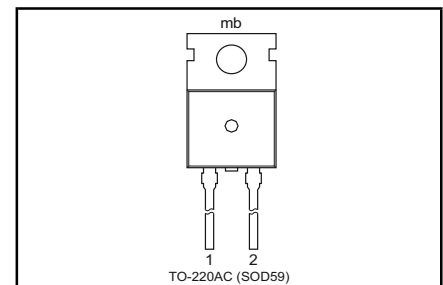
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV29 series is supplied in the conventional leaded SOD59 (TO220AC) package.

**PINNING**

PIN	DESCRIPTION
1	cathode
2	anode
tab	cathode

**SOD59 (TO220AC)**



**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	<b>BYV29</b>	-	<b>-300</b>	<b>-400</b>	<b>-500</b>	V
$V_{RWM}$	Crest working reverse voltage		-	300	400	500	V
$V_R$	Continuous reverse voltage		-	300	400	500	V
$I_{F(AV)}$	Average forward current <sup>1</sup>	square wave; $\delta = 0.5$ ; $T_{mb} \leq 123\text{ }^\circ\text{C}$	-	9			A
$I_{FRM}$	Repetitive peak forward current	$t = 25\text{ }\mu\text{s}$ ; $\delta = 0.5$ ; $T_{mb} \leq 123\text{ }^\circ\text{C}$	-	18			A
$I_{FSM}$	Non-repetitive peak forward current.	$t = 10\text{ ms}$	-	100			A
		$t = 8.3\text{ ms}$ sinusoidal; with reapplied $V_{RRM(max)}$	-	110			A
$T_{stg}$	Storage temperature		-40	150			$^\circ\text{C}$
$T_j$	Operating junction temperature		-	150			$^\circ\text{C}$

**THERMAL RESISTANCES**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base		-	-	2.5	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	in free air.	-	60	-	K/W

<sup>1</sup> Neglecting switching and reverse current losses.

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**ELECTRICAL CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 8\text{ A}; T_j = 150\text{ }^\circ\text{C}$	-	0.90	1.03	V
		$I_F = 8\text{ A}$	-	1.05	1.25	V
		$I_F = 20\text{ A}$	-	1.20	1.40	V
$I_R$	Reverse current	$V_R = V_{RRM}$	-	2.0	50	$\mu\text{A}$
$Q_s$	Reverse recovery charge	$V_R = V_{RRM}; T_j = 100\text{ }^\circ\text{C}$ $I_F = 2\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 20\text{ A}/\mu\text{s}$	-	0.1	0.35	mA
$t_{rr}$	Reverse recovery time	$I_F = 1\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 100\text{ A}/\mu\text{s}$	-	50	60	ns
$I_{rrm}$	Peak reverse recovery current	$I_F = 10\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 50\text{ A}/\mu\text{s}; T_j = 100\text{ }^\circ\text{C}$	-	4.0	5.5	A
$V_{fr}$	Forward recovery voltage	$I_F = 10\text{ A}; di_F/dt = 10\text{ A}/\mu\text{s}$	-	2.5	-	V

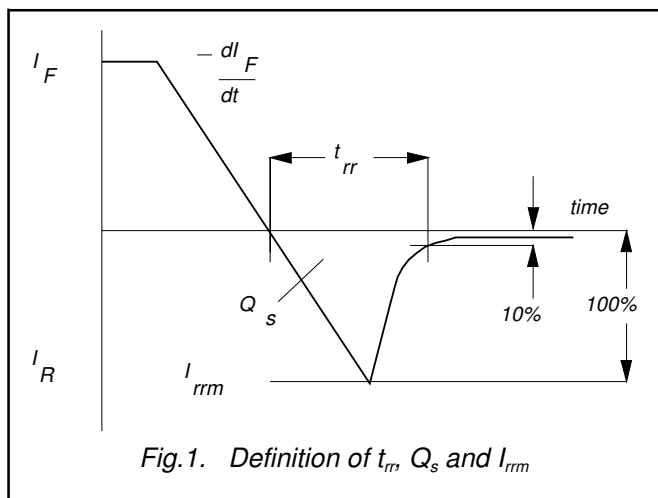


Fig.1. Definition of  $t_{rr}$ ,  $Q_s$  and  $I_{rrm}$

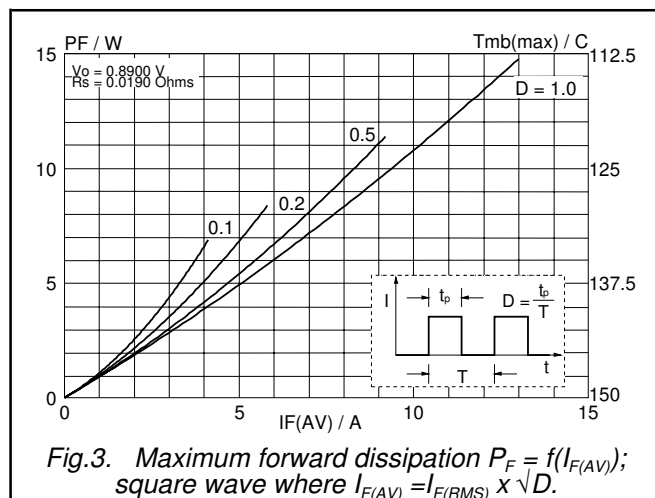


Fig.3. Maximum forward dissipation  $P_F = f(I_{F(AV)});$  square wave where  $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$ .

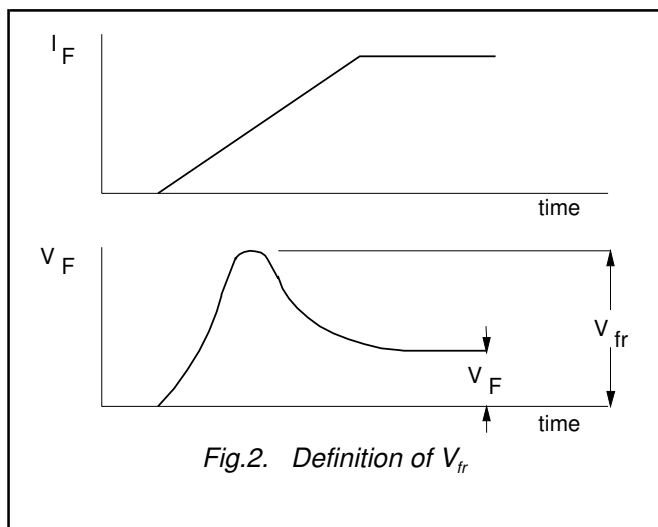


Fig.2. Definition of  $V_{fr}$

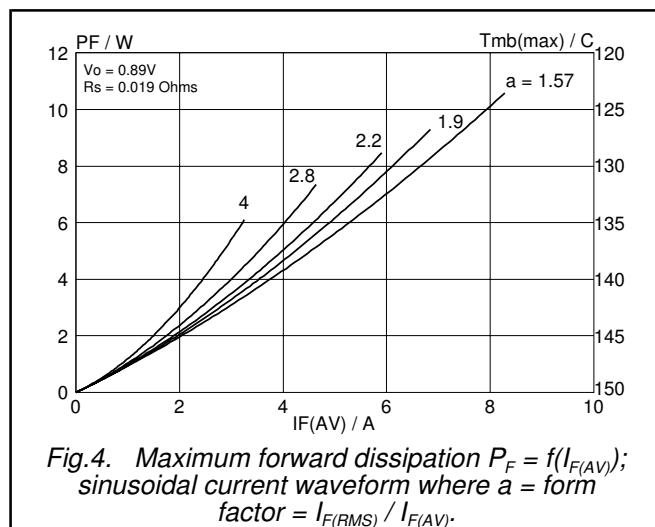


Fig.4. Maximum forward dissipation  $P_F = f(I_{F(AV)});$  sinusoidal current waveform where  $a =$  form factor  $= I_{F(RMS)} / I_{F(AV)}$ .

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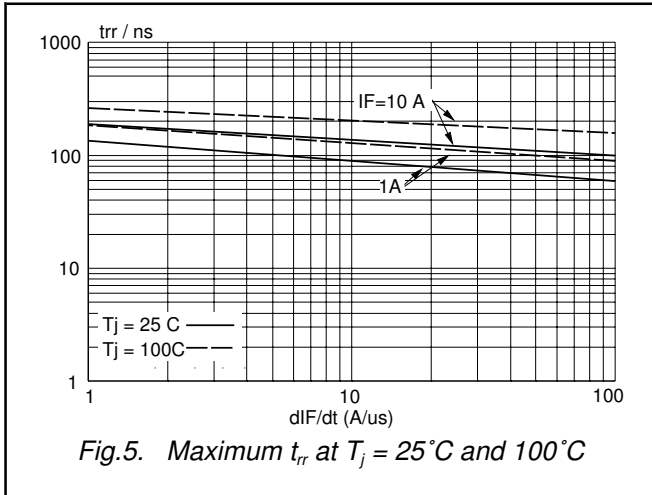


Fig.5. Maximum  $t_{rr}$  at  $T_j = 25^\circ\text{C}$  and  $100^\circ\text{C}$

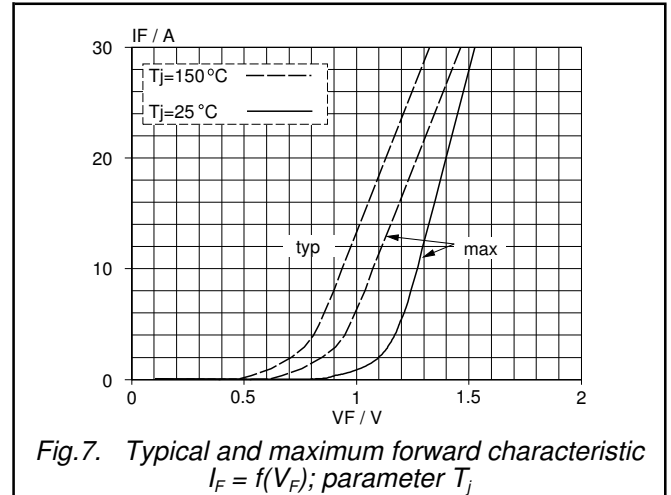


Fig.7. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$

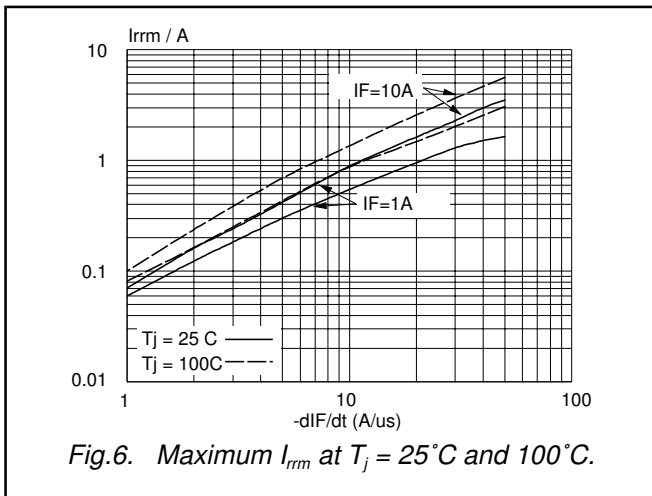


Fig.6. Maximum  $I_{rrm}$  at  $T_j = 25^\circ\text{C}$  and  $100^\circ\text{C}$ .

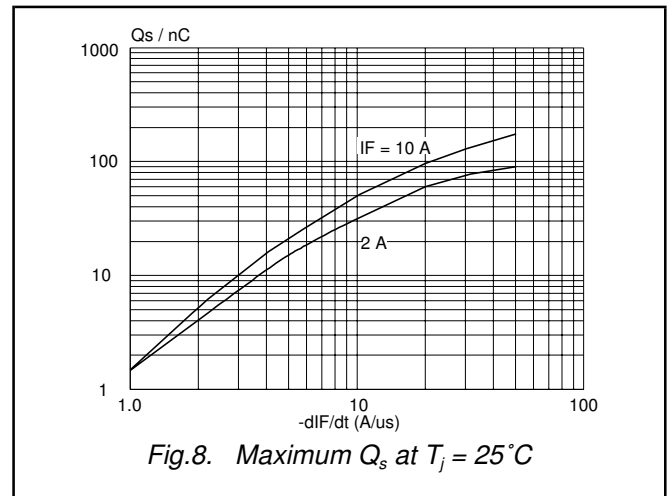


Fig.8. Maximum  $Q_s$  at  $T_j = 25^\circ\text{C}$

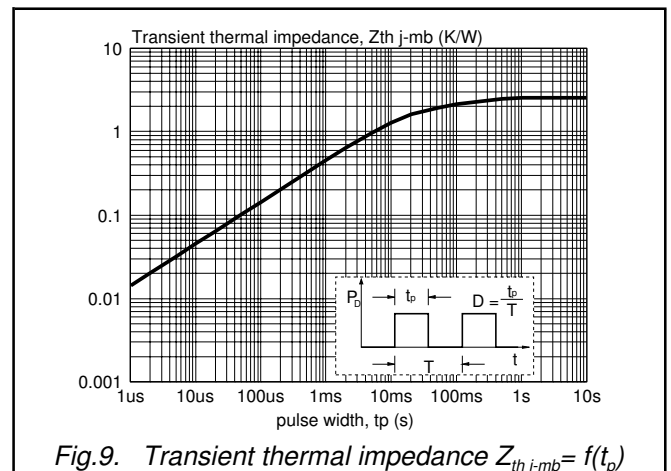


Fig.9. Transient thermal impedance  $Z_{th\ j-mb} = f(t_p)$

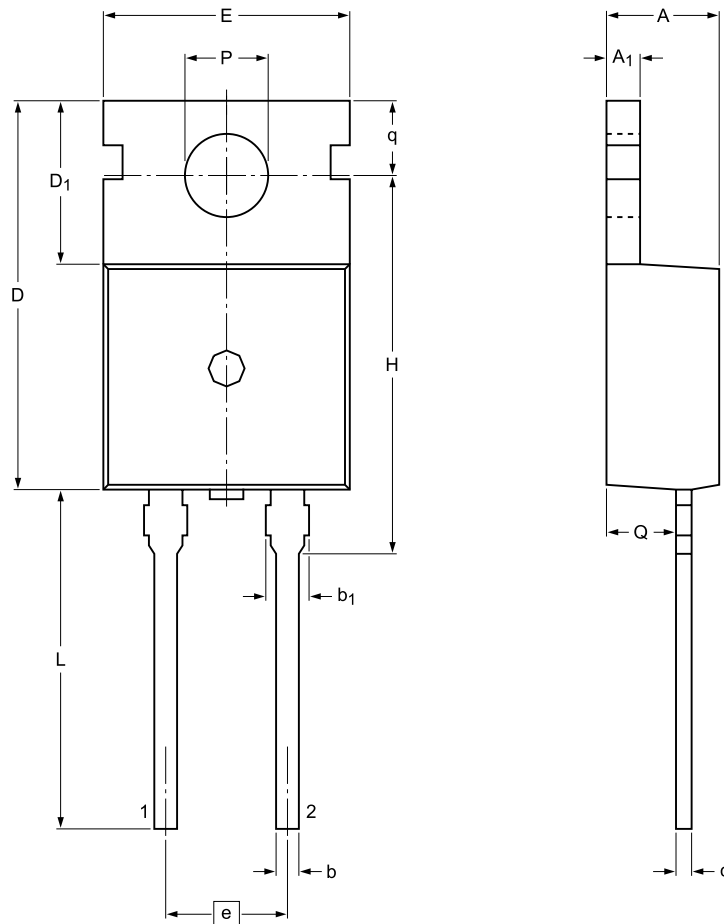
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**MECHANICAL DATA**

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC

SOD59



Dimensions

Unit	A	A <sub>1</sub>	b	b <sub>1</sub> (1)	c	D	D <sub>1</sub>	E	e	H	L	P	Q	q
mm	max 4.7	1.40	0.95	1.7	0.65	15.8	6.8	10.30	5.08	16.25	15.0	3.80	2.6	2.9
	nom								(REF)					
	min 4.3	1.15	0.70	1.3	0.45	15.6	6.4	9.65		15.70	12.5	3.65	2.2	2.7

Note

1. Protruded dambar are included in the dimension.

sod059\_po

Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOD59	2-lead TO-220AC				-09-08-25- 12-11-27

## 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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