

# Silicon Diode

## **BY9304**

4kV/10mA

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

## Fast high-voltage soft-recovery controlled avalanche rectifiers

### BY9300 series

#### FEATURES

- Plastic package
- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- 40% overvoltage allowed during 5 sec
- Guaranteed avalanche energy absorption capability
- Very low reverse recovery time
- Soft-recovery switching characteristics
- Compact construction.

#### DESCRIPTION

Plastic package, using glass passivation and a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of

expansion of all used parts are matched.

The package should be used in an insulating medium such as resin, oil or SF<sub>6</sub> gas.

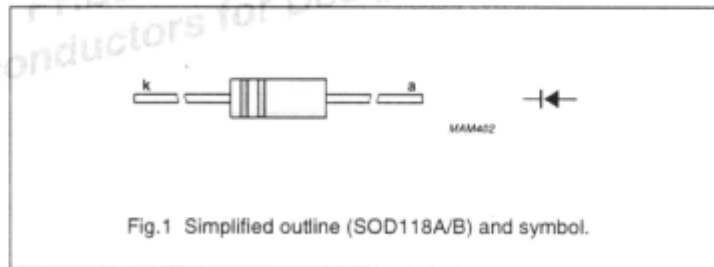


Fig.1 Simplified outline (SOD118A/B) and symbol.

#### APPLICATIONS

- For colour television and monitors up to 32 kHz (indication)
- High-voltage applications for:
  - multipliers
  - diode-split-transformers (FBT's).

#### MARKING

##### Cathode band colour codes

TYPE NUMBER	PACKAGE CODE	INNER BAND	OUTER BAND
BY9304	SOD118A	-	white
BY9306	SOD118A	green	white
BY9308	SOD118A	red	white
BY9310	SOD118B	violet	white
BY9312	SOD118B	orange	white
BY9314	SOD118B	lilac	white
BY9316	SOD118B	grey	white
BY9318	SOD118B	brown	white

#### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>RRM1</sub>	repetitive peak reverse voltage				
	BY9304		-	4	kV
	BY9306		-	6	kV
	BY9308		-	8	kV
	BY9310		-	10	kV
	BY9312		-	12	kV
	BY9314		-	14	kV
	BY9316		-	16	kV
BY9318		-	18	kV	

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SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{RRM2}$	repetitive peak reverse voltage	max. 5 seconds			
	BY9304		–	5.6	kV
	BY9306		–	8.4	kV
	BY9308		–	11.2	kV
	BY9310		–	14.0	kV
	BY9312		–	16.8	kV
	BY9314		–	19.6	kV
	BY9316 BY9318		– –	22.4 25.2	kV kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period			
	BY9304		–	10	mA
	BY9306		–	10	mA
	BY9308		–	5	mA
	BY9310		–	5	mA
	BY9312		–	5	mA
	BY9314		–	5	mA
	BY9316 BY9318		– –	3 3	mA mA
$I_{FRM}$	repetitive peak forward current	note 1	–	500	mA
$T_{stg}$	storage temperature		–65	+175	°C
$T_j$	junction temperature				
	BY9304		–65	+160	°C
	BY9306		–65	+160	°C
	BY9308		–65	+155	°C
	BY9310		–65	+150	°C
	BY9312		–65	+145	°C
	BY9314		–65	+140	°C
	BY9316 BY9318		–65 –65	+140 +135	°C °C

**Note**

1. Withstands peak currents during flash-over in a picture tube.

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**ELECTRICAL CHARACTERISTICS**
 $T_J = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 10\text{ mA}$			
	BY9304		-	10	V
	BY9306		-	14	V
	BY9308		-	20	V
	BY9310		-	24	V
	BY9312		-	30	V
	BY9314		-	34	V
	BY9316		-	40	V
BY9318	-	44	V		
$I_R$	reverse current	$V_R = V_{RRM1}; T_J = 120\text{ °C}$	-	3	$\mu\text{A}$
$Q_r$	recovery charge	when switched from $I_F = 100\text{ mA}$ to $V_R \geq 100\text{ V}$ and $dI_F/dt = -200\text{ mA}/\mu\text{s}$	0.7	-	nC
$t_{rr}$	reverse recovery time	when switched from $I_F = 2\text{ mA}$ to $I_R = 4\text{ mA}$ ; measured at $I_R = 1\text{ mA}$	-	< 100	ns
$C_d$	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$			
	BY9304		1.20	-	pF
	BY9306		0.80	-	pF
	BY9308		0.60	-	pF
	BY9310		0.50	-	pF
	BY9312		0.40	-	pF
	BY9314		0.35	-	pF
	BY9316		0.30	-	pF
BY9318	0.25	-	pF		