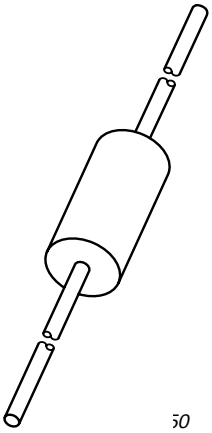
DATA SHEET



BY8200 series

Ultra fast high-voltage soft-recovery controlled avalanche rectifiers

Product specification

1998 Jul 16

Philips
Semiconductors

PHILIPS

Ultra fast high-voltage soft-recovery controlled avalanche rectifiers

BY8200 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.

APPLICATIONS

- For colour television and monitors up to 90 kHz (indication)
- High-voltage applications for:
  - multipliers
  - diode-split-transformers (FBT's).

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 SF6 gas.

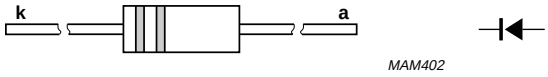


Fig.1 Simplified outline (SOD118A/B) and symbol.

MARKING

Cathode band colour codes

TYPE NUMBER	PACKAGE CODE	INNER BAND	OUTER BAND
BY8206	SOD118A	green	green
BY8208	SOD118A	red	green
BY8210	SOD118B	violet	green
BY8212	SOD118B	orange	green

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM1}	repetitive peak reverse voltage				
	BY8206		–	6	kV
	BY8208		–	8	kV
	BY8210		–	10	kV
	BY8212		–	12	kV
V_{RRM2}	repetitive peak reverse voltage	max. 5 seconds			
	BY8206		–	8.4	kV
	BY8208		–	11.2	kV
	BY8210		–	14.0	kV
	BY8212		–	16.8	kV

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; see Figs 2 to 5			
	BY8206		–	10	mA
	BY8208		–	5	mA
	BY8210		–	5	mA
	BY8212		–	5	mA
I_{FRM}	repetitive peak forward current	note 1	–	500	mA
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature				
	BY8206		–65	+160	°C
	BY8208		–65	+155	°C
	BY8210		–65	+150	°C
	BY8212		–65	+145	°C

Note

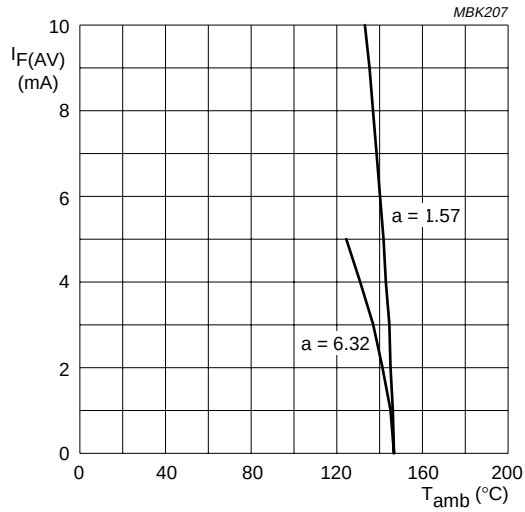
1. Withstands peak currents during flash-over in a picture tube.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Figs 6 to 9				
	BY8206		–	–	19	V
	BY8208		–	–	23	V
	BY8210		–	–	29	V
	BY8212		–	–	35	V
I_R	reverse current	$V_R = V_{RRM1}$; T_j = 120 °C	–	–	3	µA
Q_r	recovery charge	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig 10	–	0.2	–	nC
t_{rr}	reverse recovery time	when switched from I_F = 2 mA to I_R = 4 mA; measured at I_R = 1 mA; see Fig 11	–	–	< 45	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz				
	BY8206		–	0.50	–	pF
	BY8208		–	0.42	–	pF
	BY8210		–	0.35	–	pF
	BY8212		–	0.30	–	pF

GRAPHICAL DATA



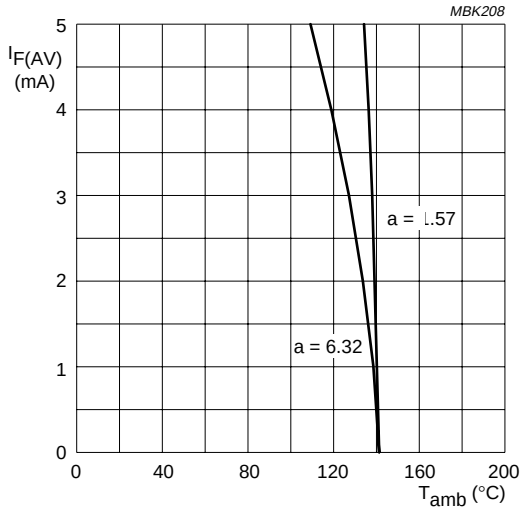
BY8206.

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 6.32: line output transformer application; see Fig 12.

a = 1.57: half-sinewave.

Fig.2 Maximum permissible average forward current as a function of ambient temperature.



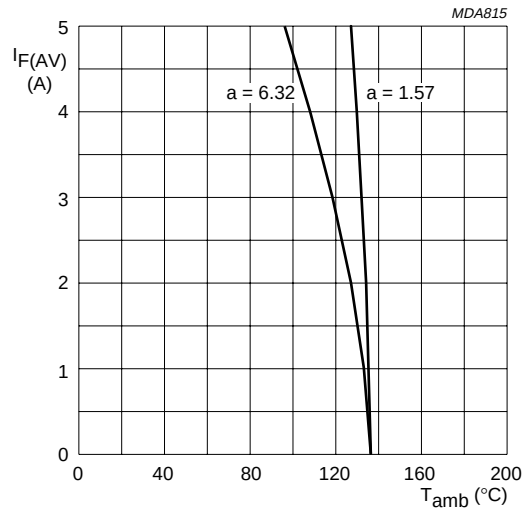
BY8208.

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 6.32: line output transformer application; see Fig 12.

a = 1.57: half-sinewave.

Fig.3 Maximum permissible average forward current as a function of ambient temperature.



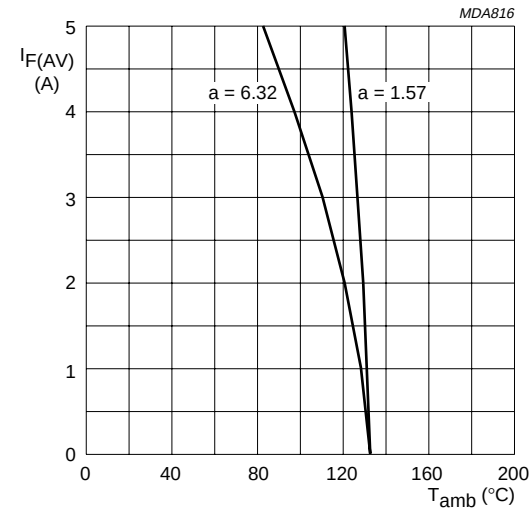
BY8210.

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 6.32: line output transformer application; see Fig 12.

a = 1.57: half-sinewave.

Fig.4 Maximum permissible average forward current as a function of ambient temperature.



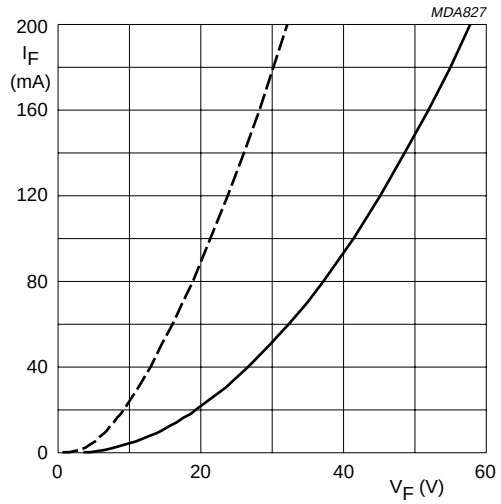
BY8212.

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 6.32: line output transformer application; see Fig 12.

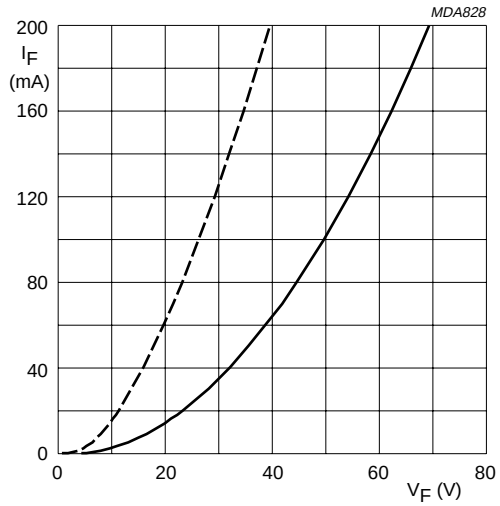
a = 1.57: half-sinewave.

Fig.5 Maximum permissible average forward current as a function of ambient temperature.



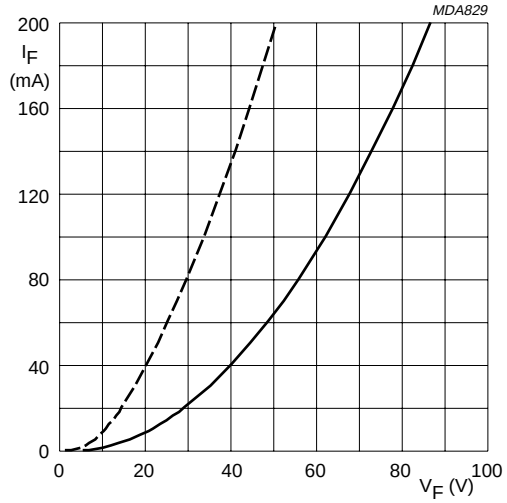
BY8206.
Dotted line: $T_j = T_{j\,max}$.
Solid line: $T_j = 25$ °C.

Fig.6 Forward current as a function of forward voltage; typical values.



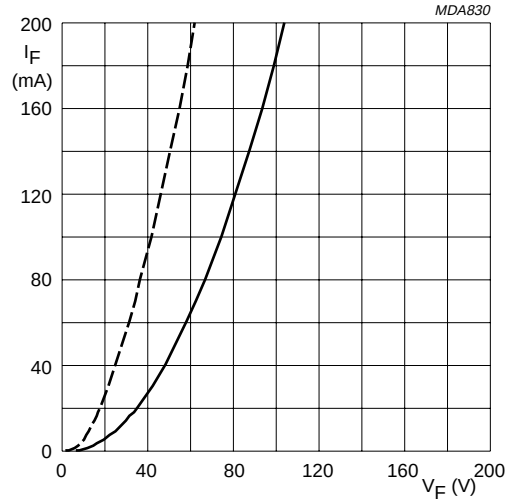
BY8208.
Dotted line: $T_j = T_{j\,max}$.
Solid line: $T_j = 25$ °C.

Fig.7 Forward current as a function of forward voltage; typical values.



BY8210.
Dotted line: $T_j = T_{j\,max}$.
Solid line: $T_j = 25$ °C.

Fig.8 Forward current as a function of forward voltage; typical values.



BY8212.
Dotted line: $T_j = T_{j\,max}$.
Solid line: $T_j = 25$ °C.

Fig.9 Forward current as a function of forward voltage; typical values.

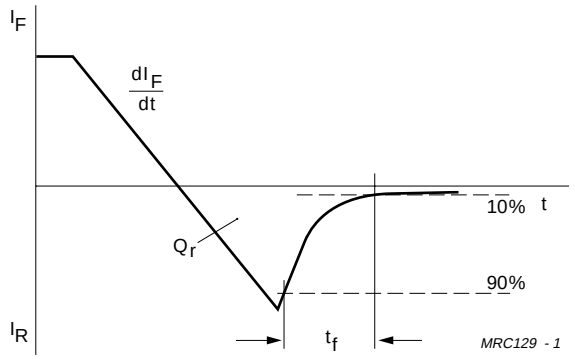
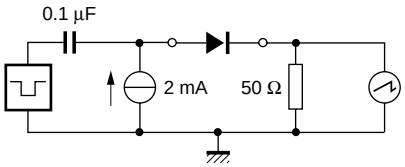
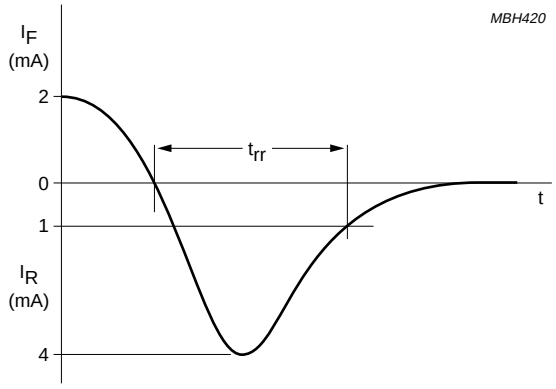


Fig.10 Reverse recovery definitions.





Rise time oscilloscope: t_r < 7 ns.
Generator pulse width: 1.0 µs.

Fig.11 Test circuit and reverse recovery time waveform and definition.

APPLICATION INFORMATION

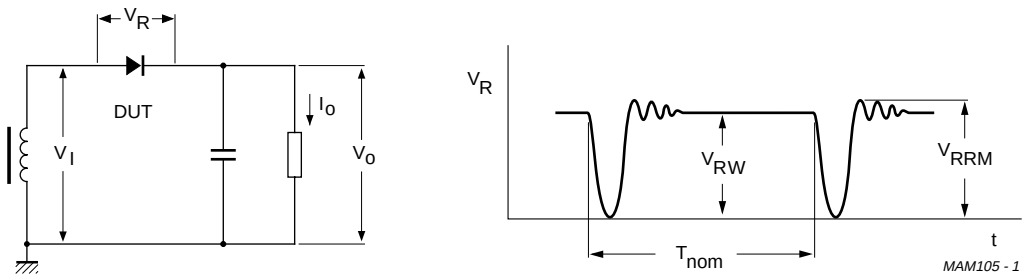
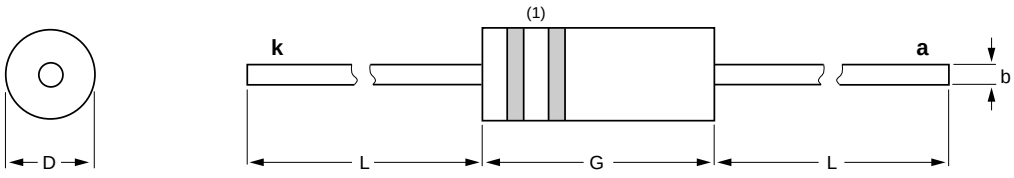


Fig.12 Typical operation circuit and voltage waveform.

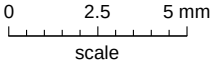
PACKAGE OUTLINES

Hermetically sealed plastic package; axial leaded; 2 leads **SOD118A**



DIMENSIONS (mm are the original dimensions)

UNIT	b	D	G	L min.
mm	0.5	2.6 2.4	6.7 6.3	31

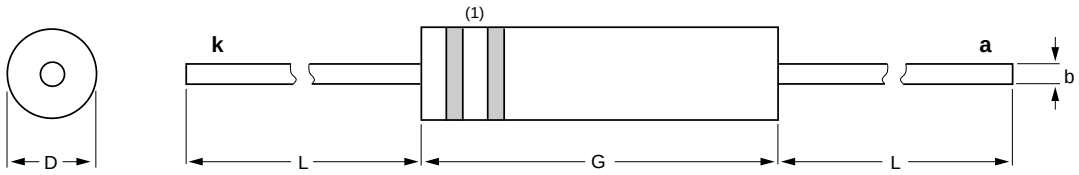


Note

1. The marking bands indicate the cathode.

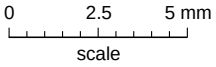
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD118A						98-05-28

Hermetically sealed plastic package; axial leaded; 2 leads **SOD118B**



DIMENSIONS (mm are the original dimensions)

UNIT	b	D	G	L min.
mm	0.5	2.6 2.4	10.5 9.5	29



Note

1. The marking bands indicate the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD118B						98-05-28

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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