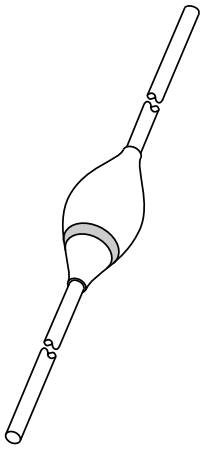
DATA SHEET



BYX101G to BYX104G
High-voltage soft-recovery controlled avalanche rectifiers

Preliminary specification
File under Discrete Semiconductors, SC01

1996 May 24

Philips Semiconductors

PHILIPS

High-voltage soft-recovery controlled avalanche rectifiers

BYX101G to BYX104G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Recovery times ranging from 600 to 50 ns
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

- High-voltage power supply units in, for example, X-ray or radar systems.

DESCRIPTION

Rugged glass package, using 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 is designed to be used in an insulating medium such as resin, oil or SF6 gas.

See also the chapter on custom made high-voltage rectifiers in the *"General Part of Handbook SC01"*.

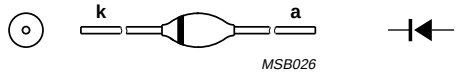


Fig.1 Simplified outline (SOD88A) and symbol.

MARKING

TYPE NUMBER	CATHODE BAND
BYX101G	black
BYX102G	red
BYX103G	green
BYX104G	violet

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	10	kV
V_{RW}	working reverse voltage		–	9	kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 25 °C			
	BYX101G		–	400	mA
	BYX102G		–	360	mA
	BYX103G		–	310	mA
	BYX104G		–	225	mA
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 70 °C			
	BYX101G		–	285	mA
	BYX102G		–	255	mA
	BYX103G		–	220	mA
	BYX104G		–	160	mA
I_{FSM}	non-repetitive peak forward current	t = 10 ms; half sinewave; T_j = 45 °C prior to surge			
	BYX101G		–	20	A
	BYX102G		–	15	A
	BYX103G		–	14	A
	BYX104G		–	14	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{RSM}	non-repetitive peak reverse power dissipation	t = 10 µs; triangular pulse; $T_j = T_{j\ max}$ prior to surge	–	4	kW
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; T_j = 165 °C				
	BYX101G		–	–	17.5	V
	BYX102G		–	–	19.5	V
	BYX103G		–	–	22.5	V
	BYX104G		–	–	31.0	V
V_F	forward voltage	I_F = 1 A				
	BYX101G		–	–	20.5	V
	BYX102G		–	–	23.9	V
	BYX103G		–	–	29.7	V
	BYX104G		–	–	52.0	V
I_R	reverse current	$V_R = V_{RWmax}$	–	–	15	µA
		$V_R = V_{RWmax}$; T_j = 165 °C	–	–	50	µA
t_{rr}	reverse recovery time	when switched from I_F = 50 mA to I_R = 100 mA; measured at I_R = 25 mA				
	BYX101G		–	–	600	ns
	BYX102G		–	–	350	ns
	BYX103G		–	–	175	ns
	BYX104G		–	–	50	ns

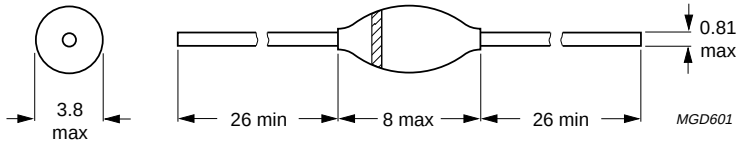
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}oil}$	thermal resistance from junction to oil	note 1	20	K/W

Note

1. For more information please refer to the *"General Part of Handbook SC01"*.

PACKAGE OUTLINE



Dimensions in mm.

Fig.2 SOD88A.

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.	

LIFE SUPPORT APPLICATIONS

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.