Silicon Diode

BY505

2000V/85mA

DATASHEET

OEM – Philips

Source: Philips Databook 1999

Datasheet Rev. 1.3 – 04/19 – data without warranty / liability

High-voltage soft-recovery rectifier **BY505**

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

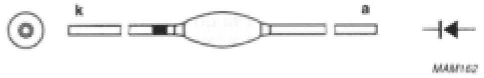
- High-voltage applications for:
  - High frequencies
  - Switching applications.

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.



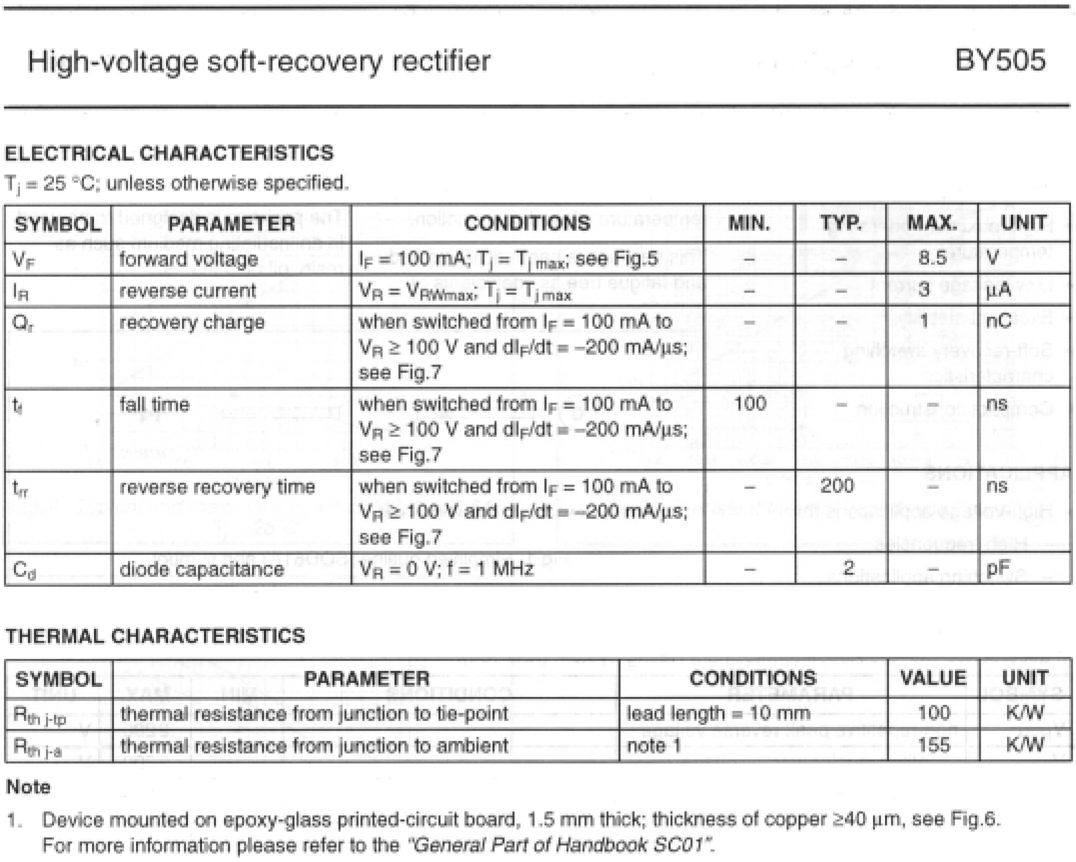
The cathode lead is marked by a black band.

Fig.1 Simplified outline (SOD61A) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	2200	V
V_{RRM}	repetitive peak reverse voltage		–	2200	V
V_{RW}	working reverse voltage		–	2000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 25 °C; lead length = 10 mm; see Fig.2; see also Fig.4	–	85	mA
		averaged over any 20 ms period; T_{amb} = 60 °C; PCB mounting (see Fig.6); see Fig.3; see also Fig.4	–	50	mA
I_{FRM}	repetitive peak forward current		–	800	mA
I_{FSM}	non-repetitive peak forward current	$t \leq 10$ ms; half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWmax}$	–	5	A
T_{stg}	storage temperature		−65	+120	°C
T_j	junction temperature		−65	+120	°C



ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; $T_j = T_{j\,max}$; see Fig.5	–	–	8.5	V
I_R	reverse current	$V_R = V_{RWmax}$; $T_j = T_{j\,max}$	–	–	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.7	–	–	1	nC
t_f	fall time	when switched from I_F = 100 mA to $V_R \geq 100$ V and $dI_F/dt = -200$ mA/µs; see Fig.7	100	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 100 mA to $V_R \geq 100$ V and $dI_F/dt = -200$ mA/µs; see Fig.7	–	200	–	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	2	–	pF

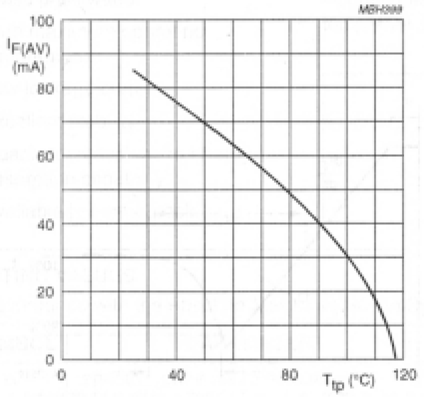
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	100	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	155	K/W

Note

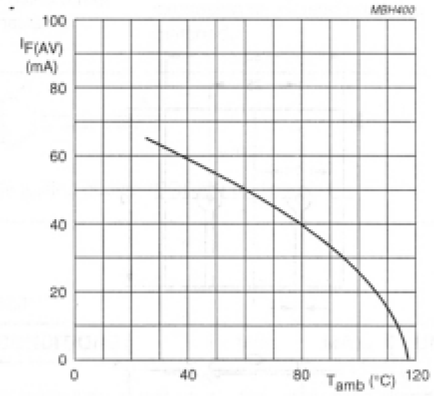
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 µm, see Fig.6. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



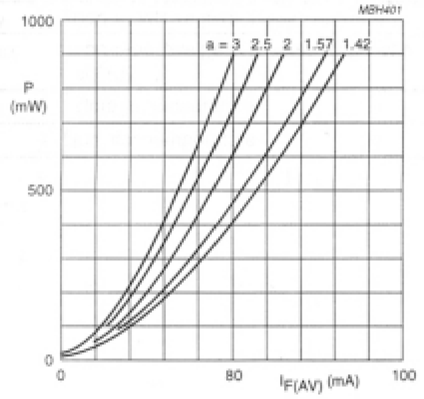
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RWmax}$; lead length = 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



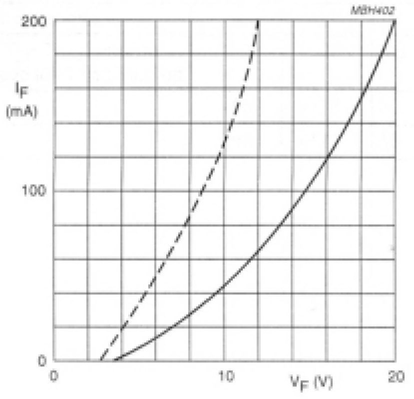
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RWmax}$; device mounted as shown in Fig.6.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



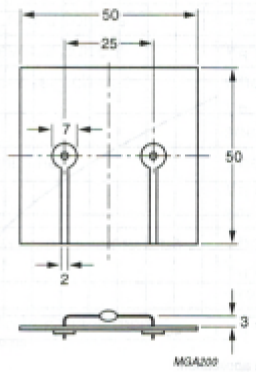
a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RWmax}$.

Fig.4 Maximum steady state power dissipation (forward plus leakage losses) as a function of average forward current.



Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.5 Forward current as a function of maximum forward voltage.



Dimensions in mm.

Fig.6 Device mounted on a printed-circuit board.

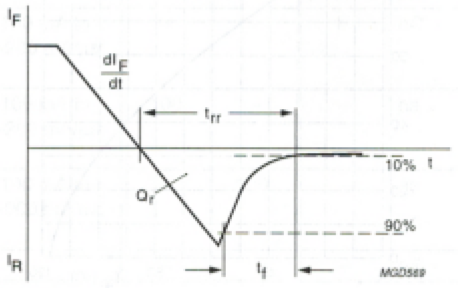


Fig.7 Reverse recovery definitions.