Silicon Diode

BYD1100

100V/850mA

DATASHEET

OEM – Philips

Source: Philips Databook 1999

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

Fast soft-recovery rectifier BYD1100

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Smallest surface mount rectifier outline
- Shipped in 8 mm embossed tape.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

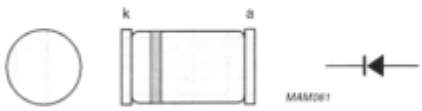

Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	100	V
V_R	continuous reverse voltage		–	100	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; averaged over any 20 ms period; see Figs.2 and 4	–	2.7	A
		T_{tp} = 110 °C; averaged over any 20 ms period; see Figs.2 and 4	–	1.7	A
		T_{amb} = 60 °C; printed-circuit board mounting, see Fig.12; averaged over any 20 ms period; see Figs.3 and 4	–	0.85	A
I_{FRM}	repetitive peak forward current	T_{tp} = 105 °C; see Fig.6	–	16	A
		T_{amb} = 60 °C; see Fig.7	–	8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	15	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

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ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.5	–	–	0.735	V
		I_F = 1 A; see Fig.5	–	–	0.96	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	120	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.8	–	–	5	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.8	–	–	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	–	10	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.9	–	70	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = –1 A/µs; see Fig.11	–	–	2	A/µs

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.12. For more information please refer to the *'General Part of associated Handbook'*.

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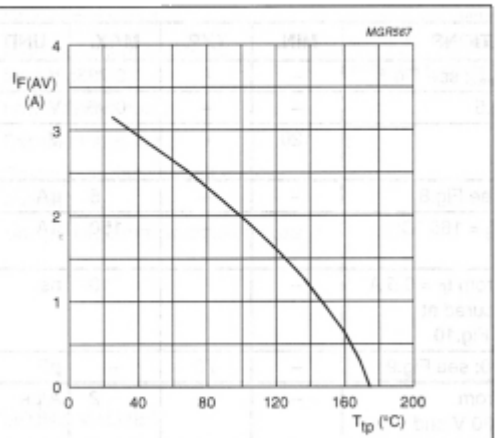
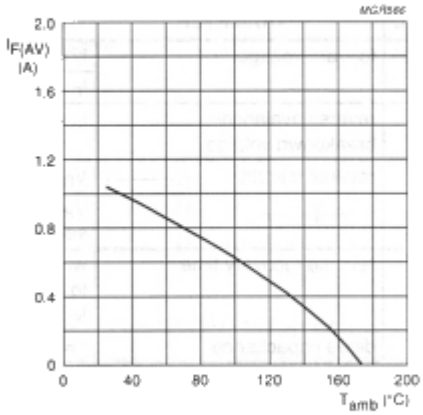
GRAPHICAL DATA



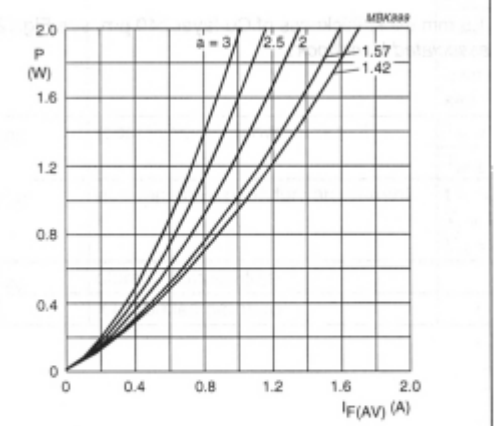
Switched mode application.
$a = 1.42$; $\delta = 0.5$; $V_R = V_{RRMmax}$.

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



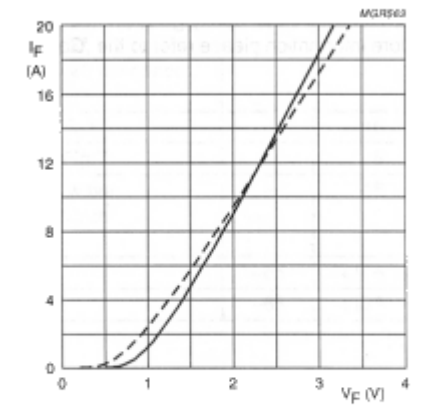
Switched mode application.
$a = 1.42$; $\delta = 0.5$; $V_R = V_{RRMmax}$.
Device mounted as shown in Fig.12.

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



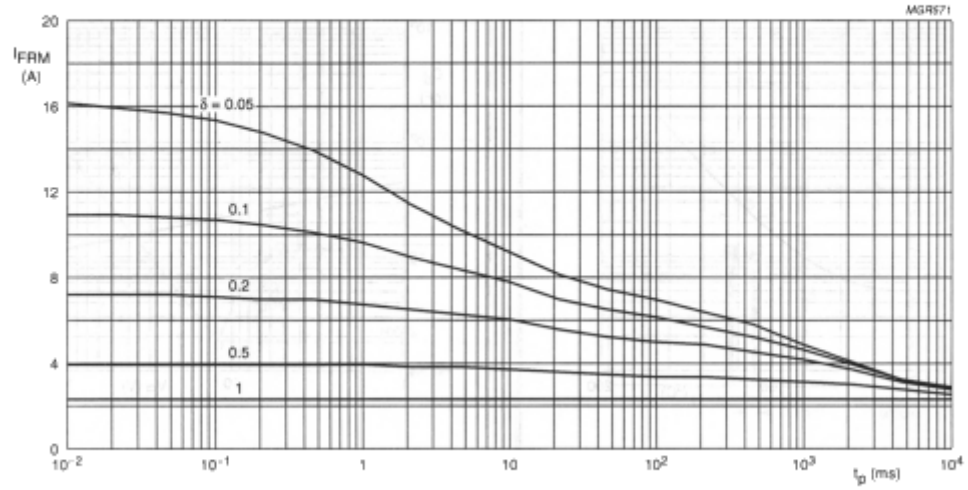
$a = I_{F(RMS)}/I_{F(AV)}$; $\delta = 0.5$; $V_R = V_{RRMmax}$.

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



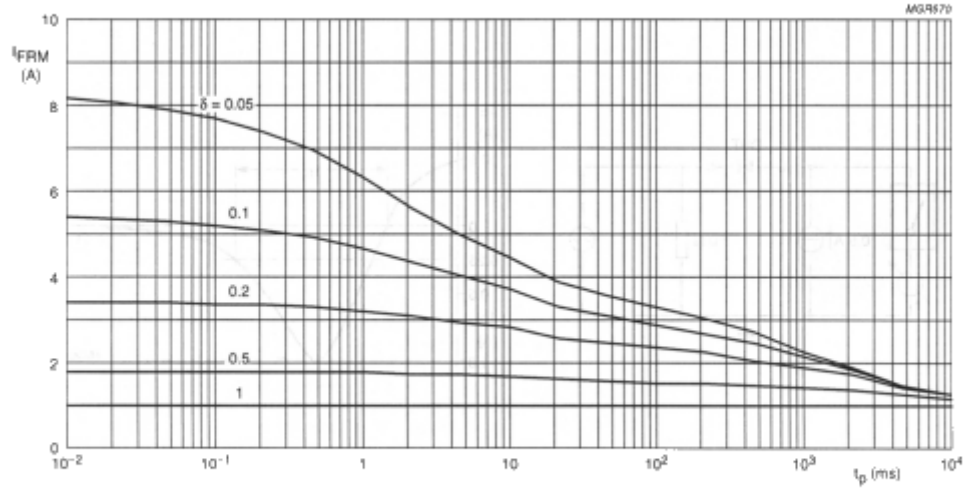
Dotted line: $T_j = 175$ °C.
Solid line: $T_j = 25$ °C.

Fig.5 Maximum forward voltage as a function of forward current.



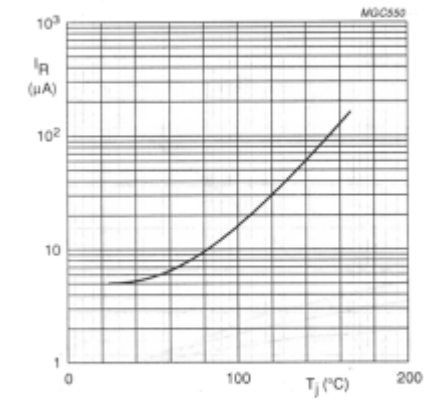
T_{tp} = 105 °C; $R_{th\ j\text{-}tp}$ = 30 K/W; $V_R = V_{RRMmax}$ during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 100 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



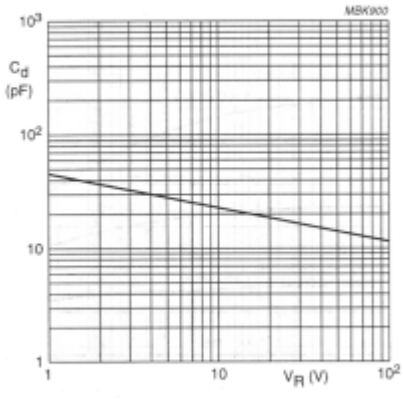
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 150 K/W; $V_R = V_{RRMmax}$ during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 100 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



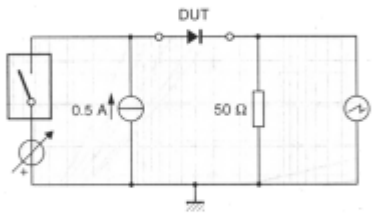
$V_R = V_{RRMmax}$.

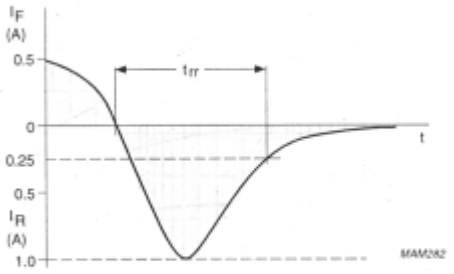
Fig.8 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.





Rise time oscilloscope: $t_r \leq 2$ ns.
Turn-on time switch: $t \leq 3$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

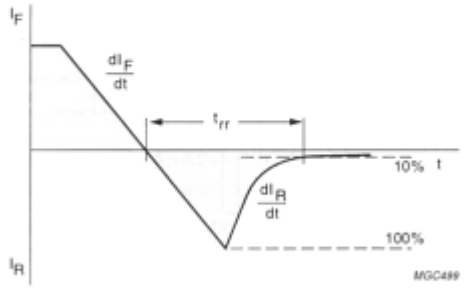
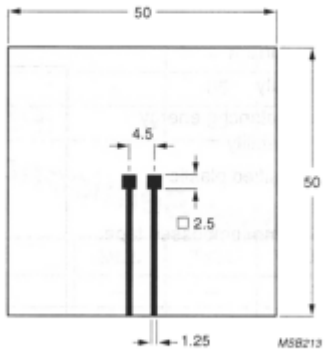


Fig.11 Reverse recovery definitions.



Dimensions in mm.

Fig.12 Device mounted on a printed-circuit board.