

# Silicon Diode

## **BYV97G**

1.4kV/1.6A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

## Fast soft-recovery controlled avalanche rectifiers

## BYV97 series

### FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

### DESCRIPTION

Rugged glass SOD57 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.

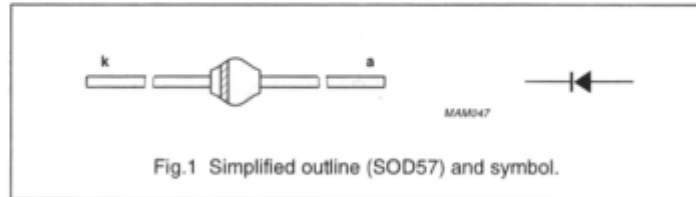


Fig.1 Simplified outline (SOD57) and symbol.

### LIMITING VALUES

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

| SYMBOL      | PARAMETER                                    | CONDITIONS  | MIN. | MAX. | UNIT |
|-------------|--|---|------|------|------|
| $V_{RRM}$   | repetitive peak reverse voltage              | BYV97F  | –    | 1200 | V    |
|             |  | BYV97G  | –    | 1400 | V    |
| $V_R$       | continuous reverse voltage                   | BYV97F  | –    | 1200 | V    |
|             |  | BYV97G  | –    | 1400 | V    |
| $I_{F(AV)}$ | average forward current                      | $T_{ip} = 60\text{ °C}$ ; lead length = 10 mm<br>see Fig.2;<br>averaged over any 20 ms period;<br>see also Fig.6          | –    | 1.6  | A    |
| $I_{F(AV)}$ | average forward current                      | $T_{amb} = 50\text{ °C}$ ; PCB mounting<br>(see Fig. 12); see Fig.3;<br>averaged over any 20 ms period;<br>see also Fig.6 | –    | 0.9  | A    |
| $I_{FRM}$   | repetitive peak forward current              | $T_{ip} = 65\text{ °C}$ ; see Fig.4   | –    | 15   | A    |
|             |  | $T_{amb} = 65\text{ °C}$ ; see Fig.5  | –    | 8    | A    |
| $I_{FSM}$   | non-repetitive peak forward current          | $t = 10\text{ ms}$ half sine wave;<br>$T_j = T_{jmax}$ prior to surge;<br>$V_R = V_{RRMmax}$                              | –    | 20   | A    |
| $E_{RSM}$   | non-repetitive peak reverse avalanche energy | $L = 120\text{ mH}$ ; $T_j = T_{jmax}$ prior to surge; inductive load switched off  | –    | 10   | mJ   |
| $T_{stg}$   | storage temperature                          |   | –65  | +175 | °C   |
| $T_j$       | junction temperature                         | see Fig.7   | –65  | +175 | °C   |

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

| SYMBOL                           | PARAMETER  | CONDITIONS   | MIN. | TYP. | MAX. | UNIT                   |
|----------------------------------|--|--|------|------|------|------------------------|
| $V_F$                            | forward voltage  | $I_F = 3\text{ A}$ ; $T_J = T_{J,max}$ ; see Fig.8   |      |      | 1.35 | V                      |
|                                  |  | $I_F = 3\text{ A}$ ; see Fig.8   | –    | –    | 1.65 | V                      |
| $V_{(BR)R}$                      | reverse avalanche<br>breakdown voltage<br>BYV97F<br>BYV97G | $I_R = 0.1\text{ mA}$  |      |      |      |                        |
|                                  |  |  |      | 1300 | –    | –                      |
|                                  |  |  | 1500 | –    | –    | V                      |
| $I_R$                            | reverse current  | $V_R = V_{RRM,max}$ ;<br>see Fig.9   | –    | –    | 1    | $\mu\text{A}$          |
|                                  |  | $V_R = V_{RRM,max}$ ; $T_J = 165\text{ °C}$ ;<br>see Fig.9   | –    | –    | 150  | $\mu\text{A}$          |
| $t_{rr}$                         | reverse recovery time                                      | when switched from $I_F = 0.5\text{ A}$<br>to $I_R = 1\text{ A}$ ; measured at<br>$I_R = 0.25\text{ A}$ ; see Fig.14               | –    | –    | 500  | ns                     |
| $C_d$                            | diode capacitance  | $f = 1\text{ MHz}$ ; $V_R = 0\text{ V}$ ; see Fig.11   | –    | 35   | –    | pF                     |
| $\left  \frac{dI_R}{dt} \right $ | maximum slope of<br>reverse recovery current               | when switched from $I_F = 1\text{ A}$ to<br>$V_R \geq 30\text{ V}$ and $dI_F/dt = -1\text{ A}/\mu\text{s}$ ;<br>see Figs 10 and 13 | –    | –    | 5    | $\text{A}/\mu\text{s}$ |

**THERMAL CHARACTERISTICS**

| SYMBOL         | PARAMETER                                     | CONDITIONS          | VALUE | UNIT |
|----------------|---|---------------------|-------|------|
| $R_{th\ j-tp}$ | thermal resistance from junction to tie-point | lead length = 10 mm | 46    | K/W  |
| $R_{th\ j-a}$  | thermal resistance from junction to ambient   | note 1              | 100   | K/W  |

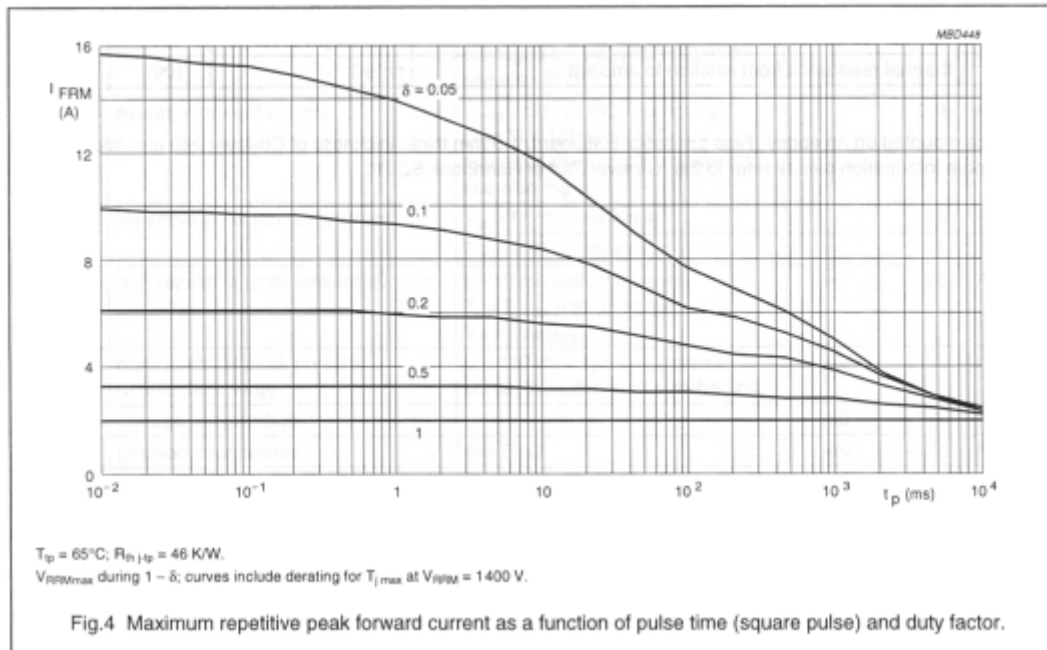
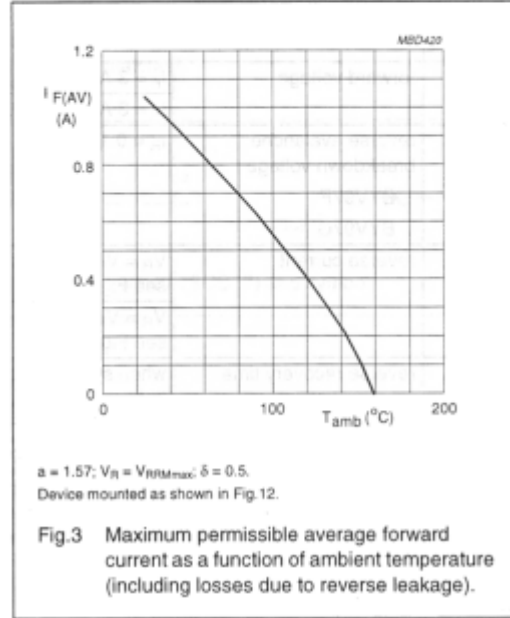
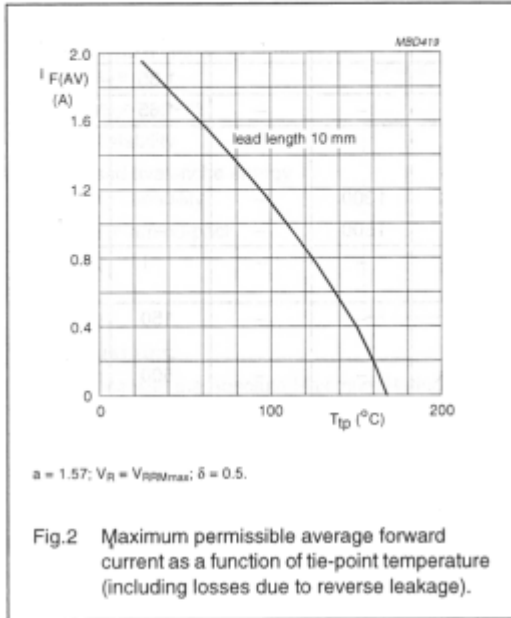
**Note**

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer  $\geq 40\text{ }\mu\text{m}$ , see Fig. 12. For more information please refer to the 'General Part of Handbook SC01'.

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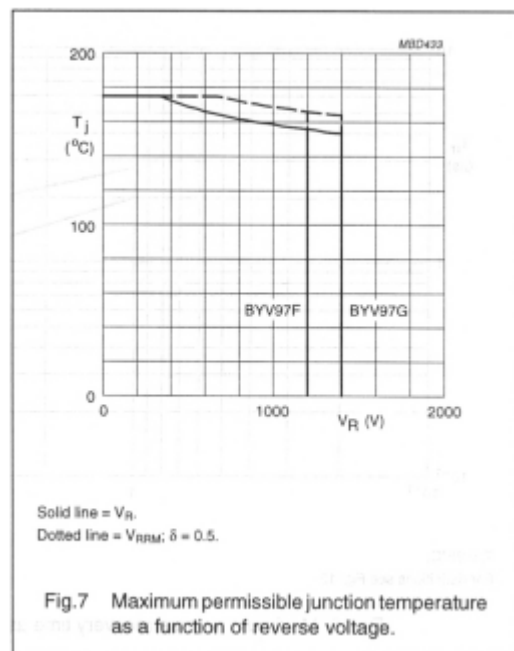
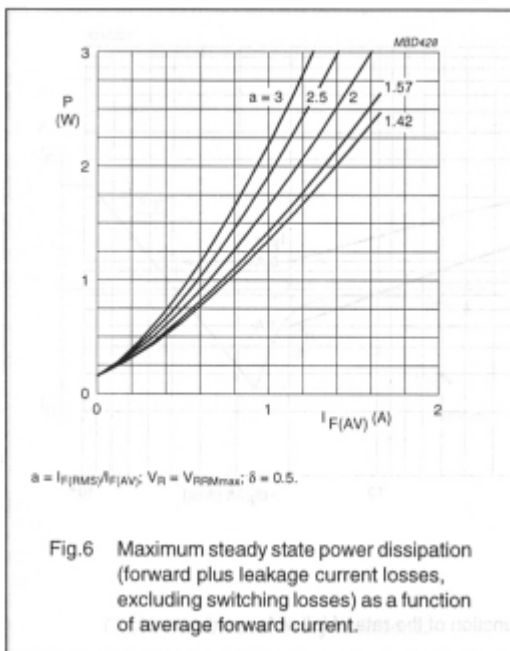
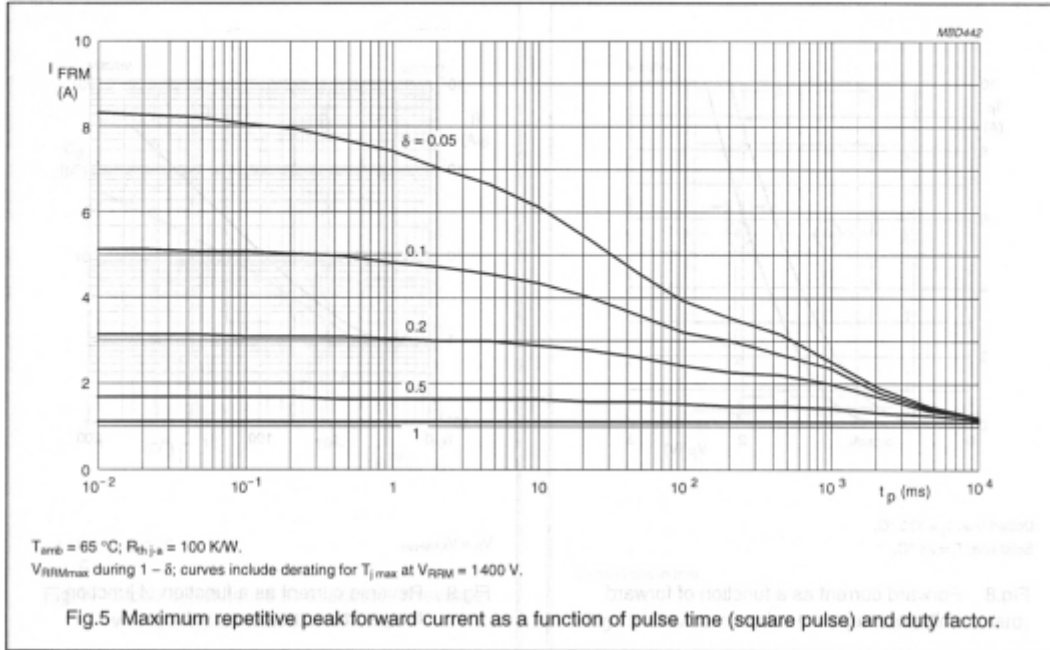
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GRAPHICAL DATA



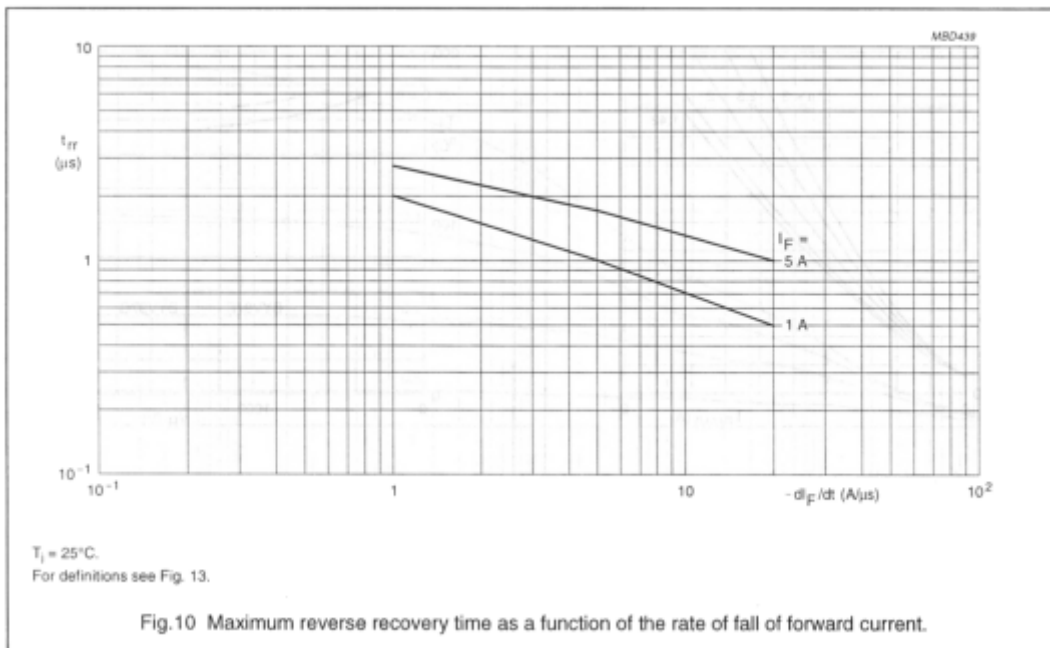
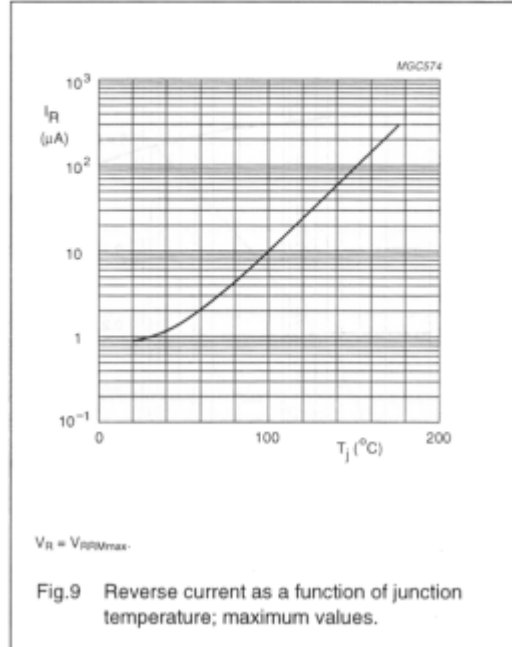
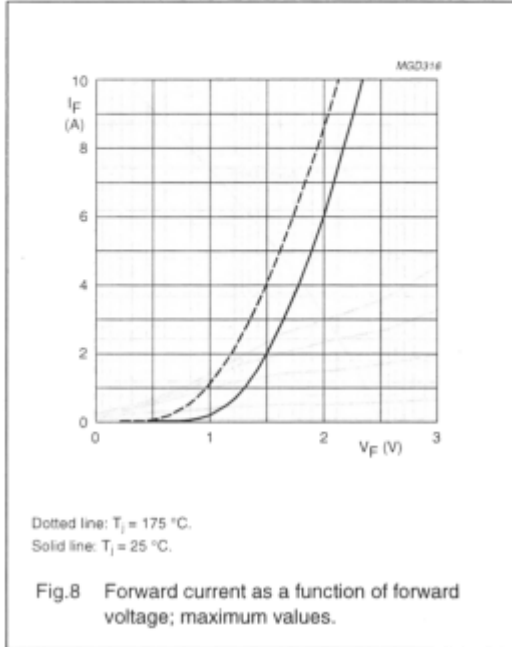
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