SCHOTTKY BARRIER RECTIFIER

# BYV95 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.

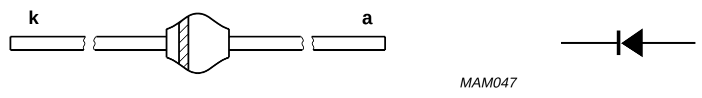



Fig.1 Simplified outline (SOD57) and symbol.

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{RRM}$ | repetitive peak reverse voltage | | | | |
| | BYV95A | | – | 200 | V |
| | BYV95B | | – | 400 | V |
| | BYV95C | | – | 600 | V |
| $V_R$ | continuous reverse voltage | | | | |
| | BYV95A | | – | 200 | V |
| | BYV95B | | – | 400 | V |
| | BYV95C | | – | 600 | V |
| $I_{F(AV)}$ | average forward current | $T_{tp}$ = 65 °C; lead length = 10 mm see Fig. 2; averaged over any 20 ms period; see also Fig. 6 | – | 1.5 | A |
| | | $T_{amb}$ = 65 °C; PCB mounting (see Fig.11); see Fig. 3; averaged over any 20 ms period; see also Fig. 6 | – | 0.8 | A |
| $I_{FRM}$ | repetitive peak forward current | $T_{tp}$ = 65 °C; see Fig. 4 | – | 17 | A |
| | | $T_{amb}$ = 65 °C; see Fig. 5 | – | 9 | A |
| $I_{FSM}$ | non-repetitive peak forward current | t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$ | – | 35 | A |
| $E_{RSM}$ | non-repetitive peak reverse avalanche energy | L = 120 mH; $T_j = T_{j\,max}$ 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 |

### ELECTRICAL CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified.

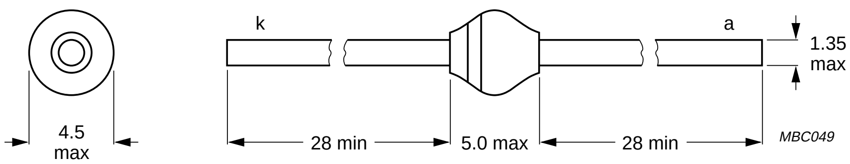
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $V_F$ | forward voltage | $I_F$ = 3 A; $T_j = T_{j\,max}$; see Fig. 8 | – | – | 1.35 | V |
| | | $I_F$ = 3 A; see Fig. 8 | – | – | 1.60 | V |
| $V_{(BR)R}$ | reverse avalanche breakdown voltage | $I_R$ = 0.1 mA | | | | |
| | BYV95A | | 300 | – | – | V |
| | BYV95B | | 500 | – | – | V |
| | BYV95C | | 700 | – | – | V |
| $I_R$ | reverse current | $V_R = V_{RRMmax}$; see Fig. 9 | – | – | 1 | µA |
| | | $V_R = V_{RRMmax}$; $T_j$ = 165 °C; see Fig. 9 | – | – | 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. 12 | – | – | 250 | ns |
| $C_d$ | diode capacitance | f = 1 MHz; $V_R$ = 0 V; see Fig. 10 | – | 45 | – | pF |
| $\left\lvert\frac{dI_R}{dt}\right\rvert$ | 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.13 | – | – | 7 | A/µs |

### THERMAL CHARACTERISTICS

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

**Note**

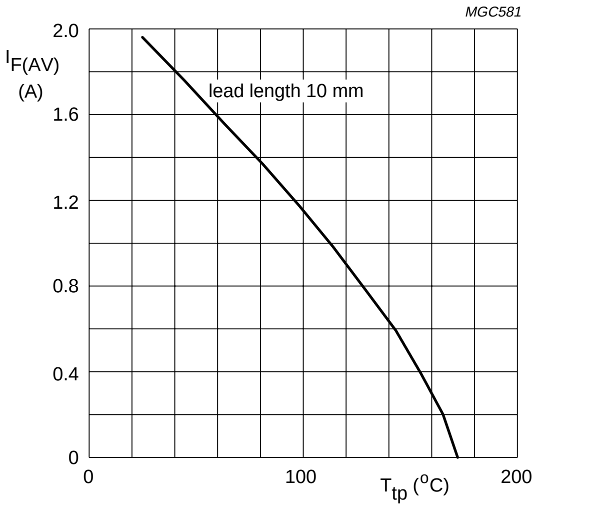
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.11. For more information please refer to the *"General Part of associated Handbook"*.




Dimensions in mm.
The marking band indicates the cathode.

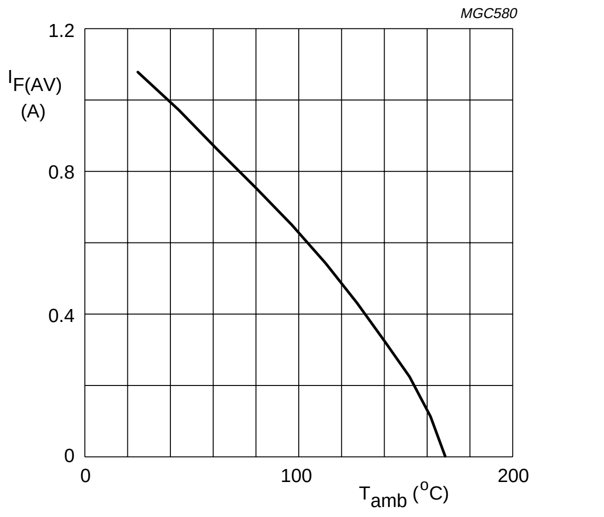
Fig.12 SOD64.

## GRAPHICAL DATA



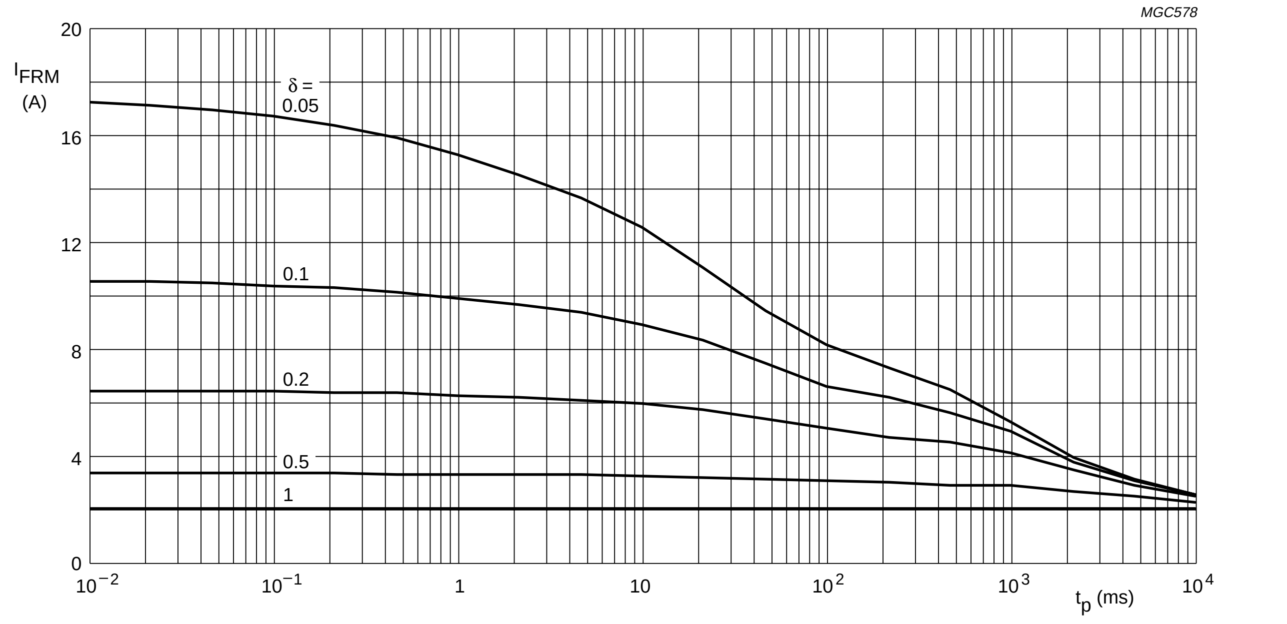

a = 1.42; $V_R$ = $V_{RRMmax}$; δ = 0.5.
Switched mode application.

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




a = 1.42; $V_R$ = $V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

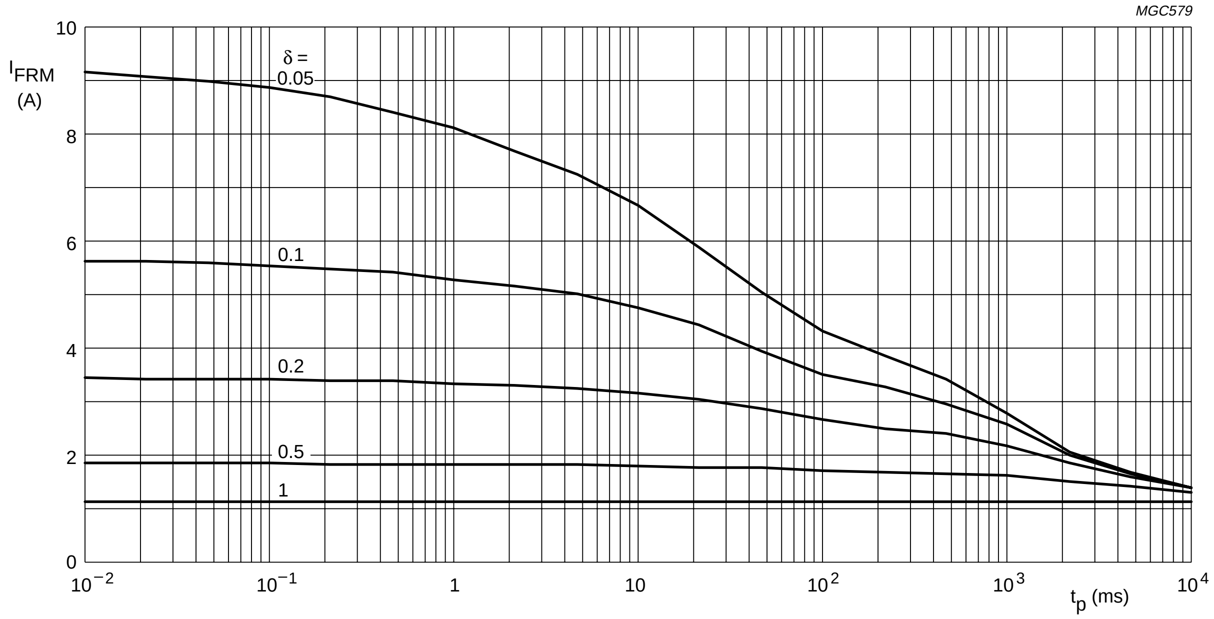
Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).




$T_{tp}$ = 65 °C; $R_{th\ j\text{-}tp}$ = 46 K/W.
$V_{RRMmax}$ during 1 – δ; curves include derating for $T_{j\ max}$ at $V_{RRM}$ = 600 V.

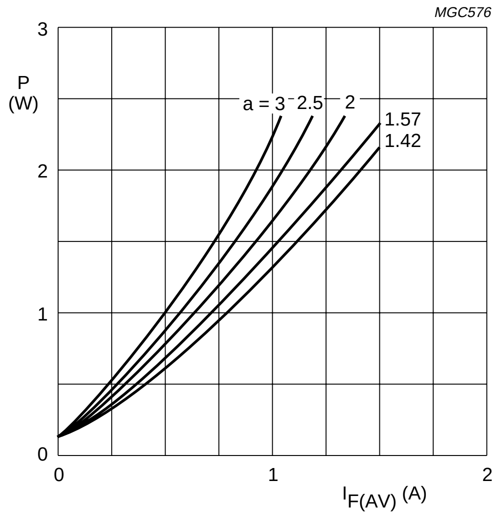
Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

## BYV95 series



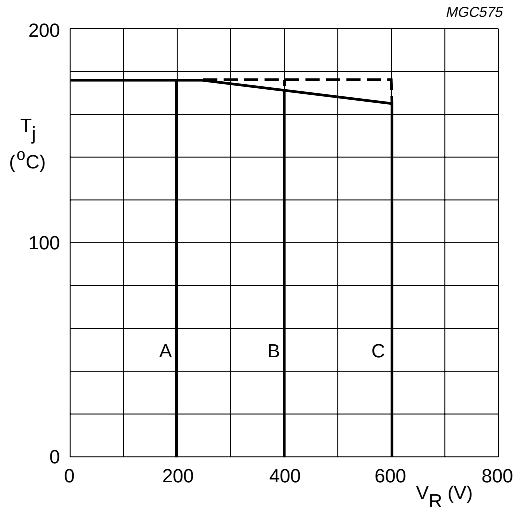

$T_{amb}$ = 65 °C; $R_{th\ j\text{-}a}$ = 100 K/W.
$V_{RRMmax}$ during 1 – δ; curves include derating for $T_{j\ max}$ at $V_{RRM}$ = 600 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



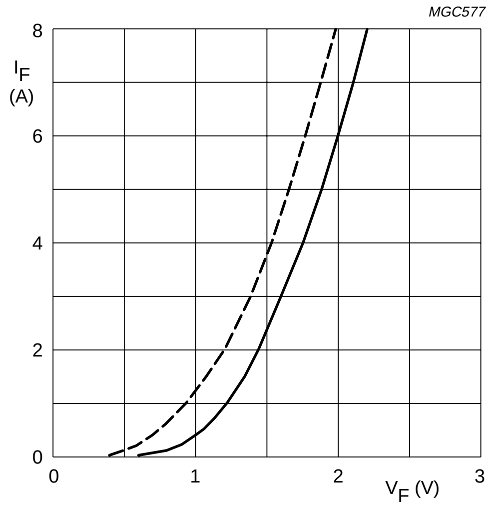

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



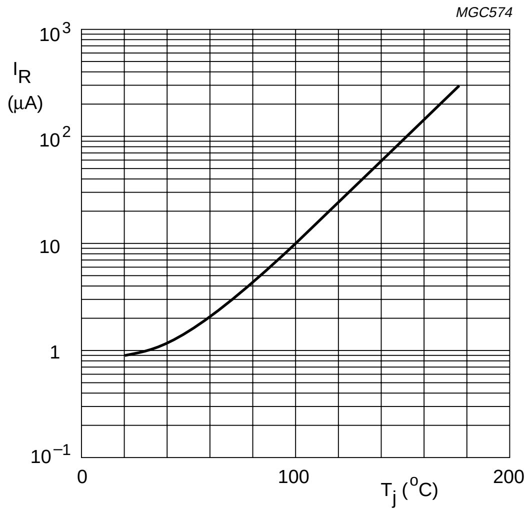

Solid line = $V_R$.
Dotted line = $V_{RRM}$; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



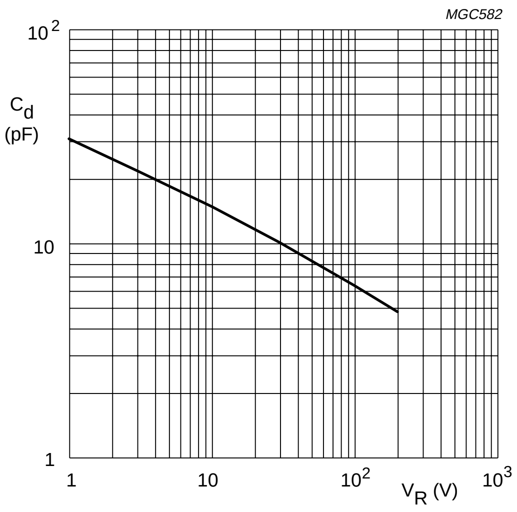

Dotted line: $T_j$ = 175 °C.
Solid line: $T_j$ = 25 °C.

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



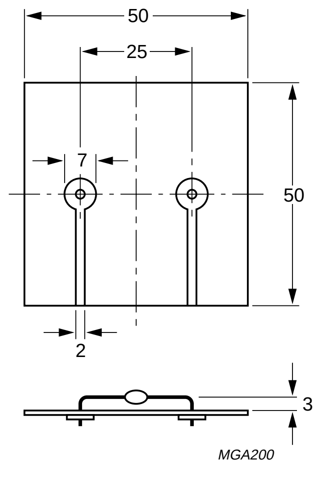

$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.




f = 1 MHz; $T_j$ = 25 °C.

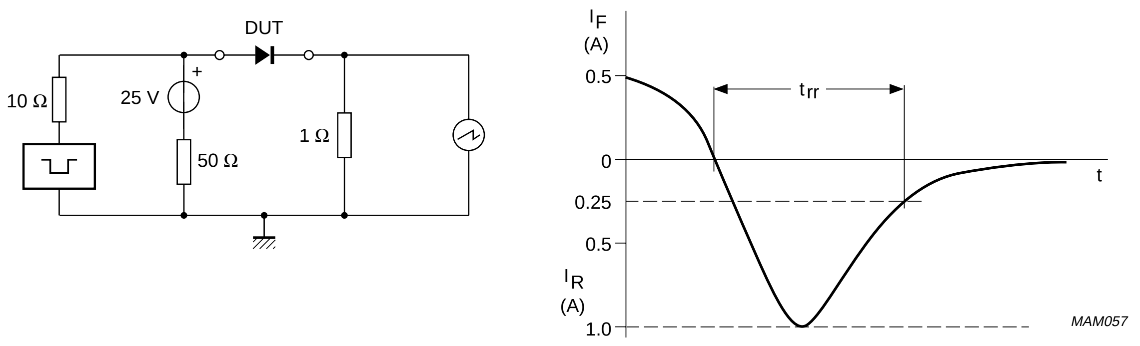
Fig.10 Diode capacitance as a function of reverse voltage; typical values.




Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.

## BYV95 series




Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

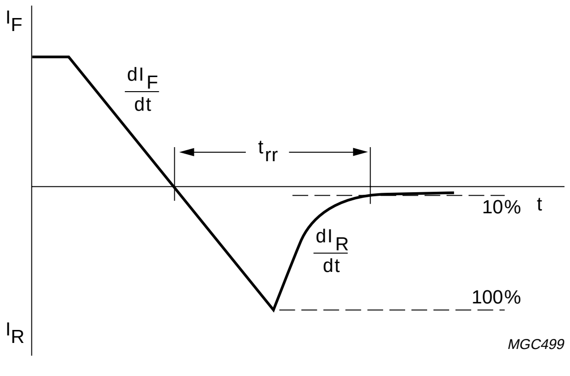



Fig.13 Reverse recovery definitions.