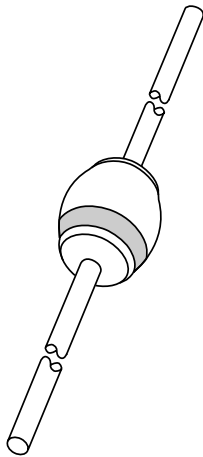


# DATA SHEET



## **BYW28 series** Ultra fast low-loss controlled avalanche rectifier

Product specification  
File under Discrete Semiconductors, SC01

1997 Nov 26

# Ultra fast low-loss controlled avalanche rectifier

## BYW28 series

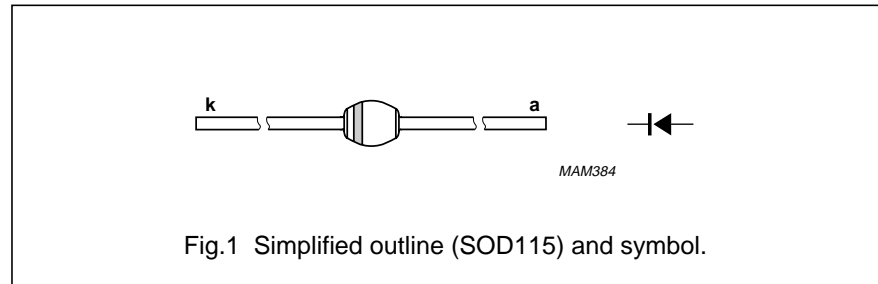
### FEATURES

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

### DESCRIPTION

Rugged glass SOD115 package, using a high temperature alloyed construction.

The package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>R</sub>	repetitive peak reverse voltage BYW28-500 BYW28-600		–	500	V
			–	600	V
V <sub>R</sub>	continuous reverse voltage BYW28-500 BYW28-600		–	500	V
			–	600	V
I <sub>F(AV)</sub>	average forward current	T <sub>tp</sub> = 85 °C; lead length = 10 mm; see Fig.2; averaged over any 20 ms period; see also Fig.6	–	4	A
		T <sub>amb</sub> = 60 °C; printed-circuit board mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	1.7	A
I <sub>FRM</sub>	repetitive peak forward current	T <sub>tp</sub> = 85 °C; see Fig.4	–	46	A
		T <sub>amb</sub> = 60 °C; see Fig.5	–	21	A
I <sub>FSM</sub>	non-repetitive peak forward current	t = 10 ms half sine wave; T <sub>j</sub> = T <sub>jmax</sub> prior to surge; V <sub>R</sub> = V <sub>R</sub> max	–	170	A
E <sub>RSM</sub>	non-repetitive peak reverse avalanche energy	L = 120 mH; T <sub>j</sub> = T <sub>jmax</sub> prior to surge; inductive load switched off	–	20	mJ
T <sub>stg</sub>	storage temperature		–65	+175	°C
T <sub>j</sub>	junction temperature	see Fig.7	–65	+175	°C

# Ultra fast low-loss controlled avalanche rectifier

## BYW28 series

### ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 3.5\text{ A}$ ; $T_j = T_{j\text{max}}$ ; see Fig.8	–	–	0.90	V
		$I_F = 3.5\text{ A}$ ; see Fig.8	–	–	1.15	V
$V_{(BR)R}$	reverse avalanche breakdown voltage BYW28-500 BYW28-600	$I_R = 0.1\text{ mA}$	560	–	–	V
			675	–	–	V
$I_R$	reverse current	$V_R = V_{RRM\text{max}}$ ; see Fig.9	–	–	5	$\mu\text{A}$
		$V_R = V_{RRM\text{max}}$ ; $T_j = 165\text{ }^\circ\text{C}$ ; see Fig.9	–	–	150	$\mu\text{A}$
$t_{rr}$	reverse recovery time	when switched from $I_F = 0.5\text{ A}$ to $I_R = 1\text{ A}$ ; measured at $I_R = 0.25\text{ A}$ ; see Fig.12	–	–	50	ns
$C_d$	diode capacitance	$f = 1\text{ MHz}$ ; $V_R = 0$ ; see Fig.10	–	275	–	pF
$\left  \frac{dI_R}{dt} \right $	maximum slope of reverse recovery current	when switched from $I_F = 1\text{ A}$ to $V_R \geq 30\text{ V}$ and $dI_F/dt = -1\text{ A}/\mu\text{s}$ ; see Fig.13	–	–	4	$\text{A}/\mu\text{s}$

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-tp}}$	thermal resistance from junction to tie-point	lead length = 10 mm	20	K/W
$R_{th\ j\text{-a}}$	thermal resistance from junction to ambient	note 1	70	K/W

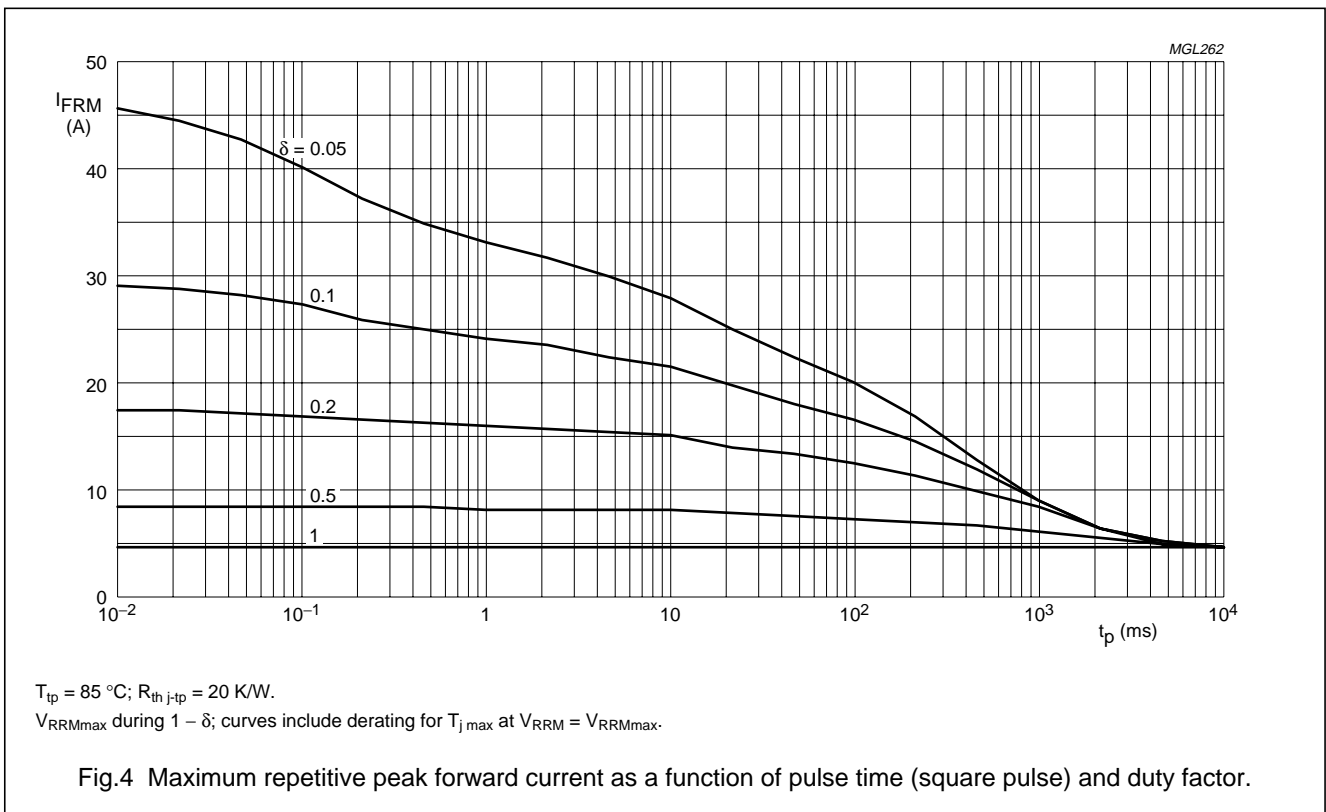
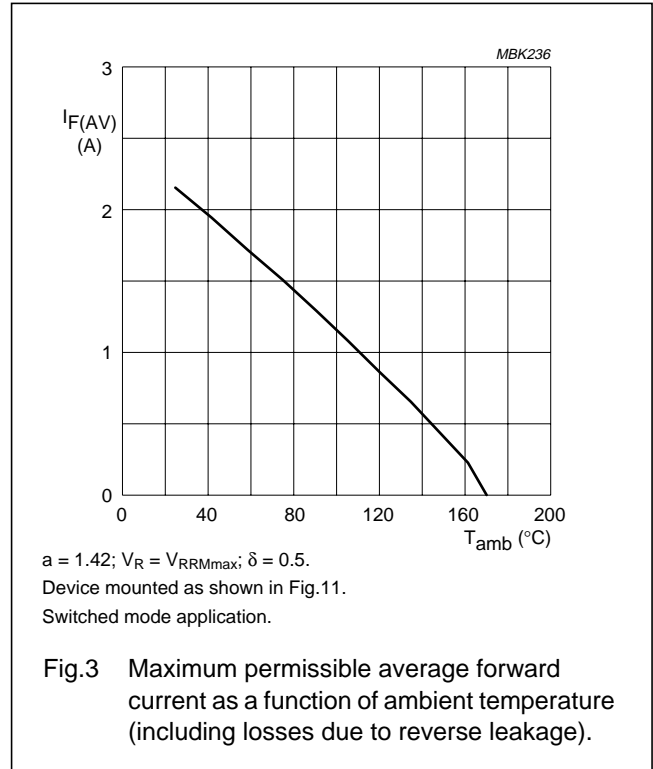
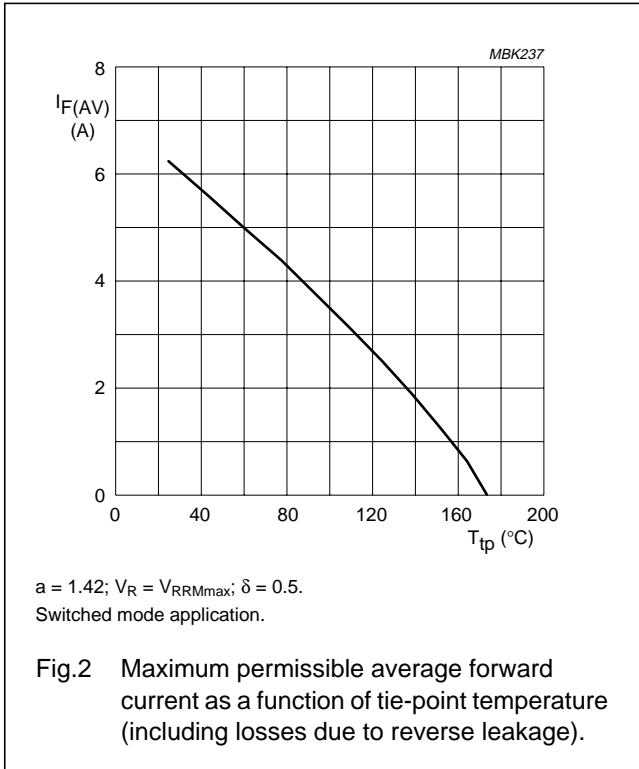
#### Note

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.11. For more information please refer to the 'General Part of Handbook SC01'.

Ultra fast low-loss  
controlled avalanche rectifier

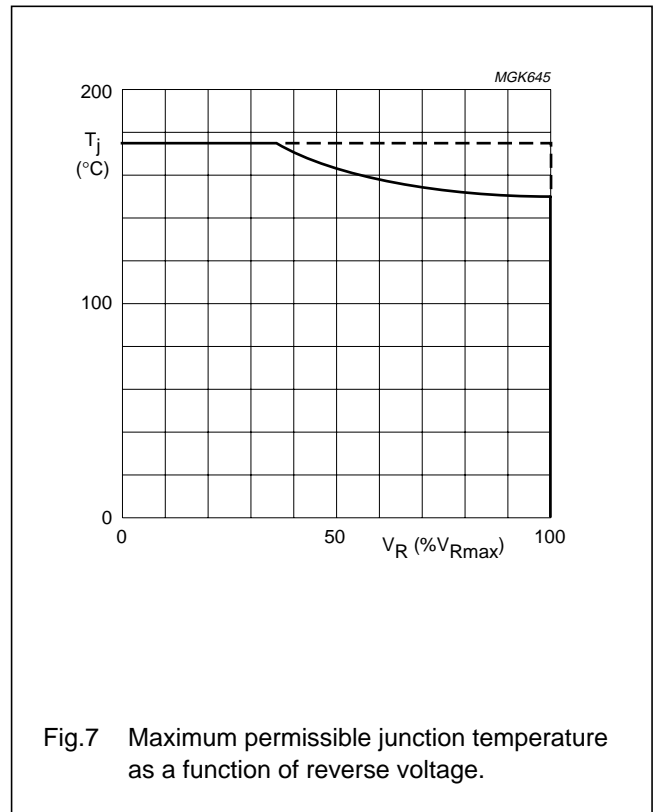
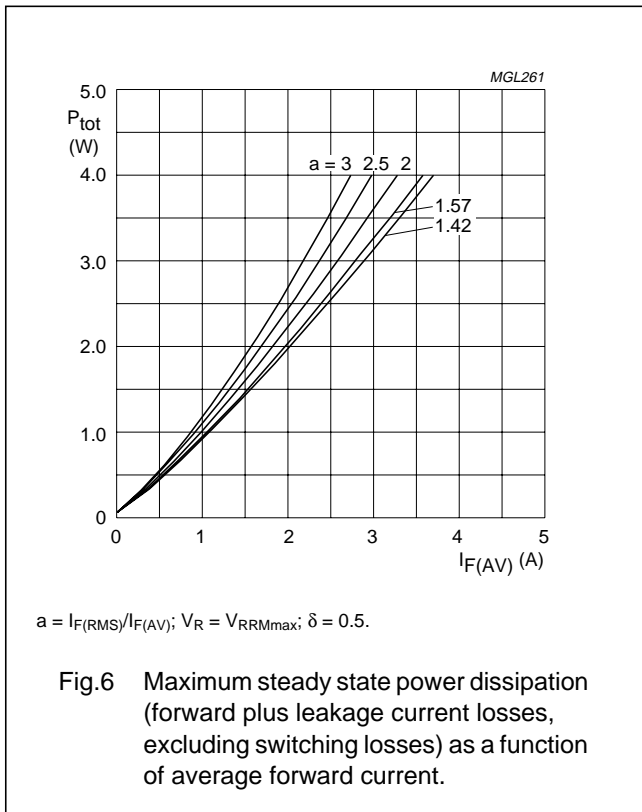
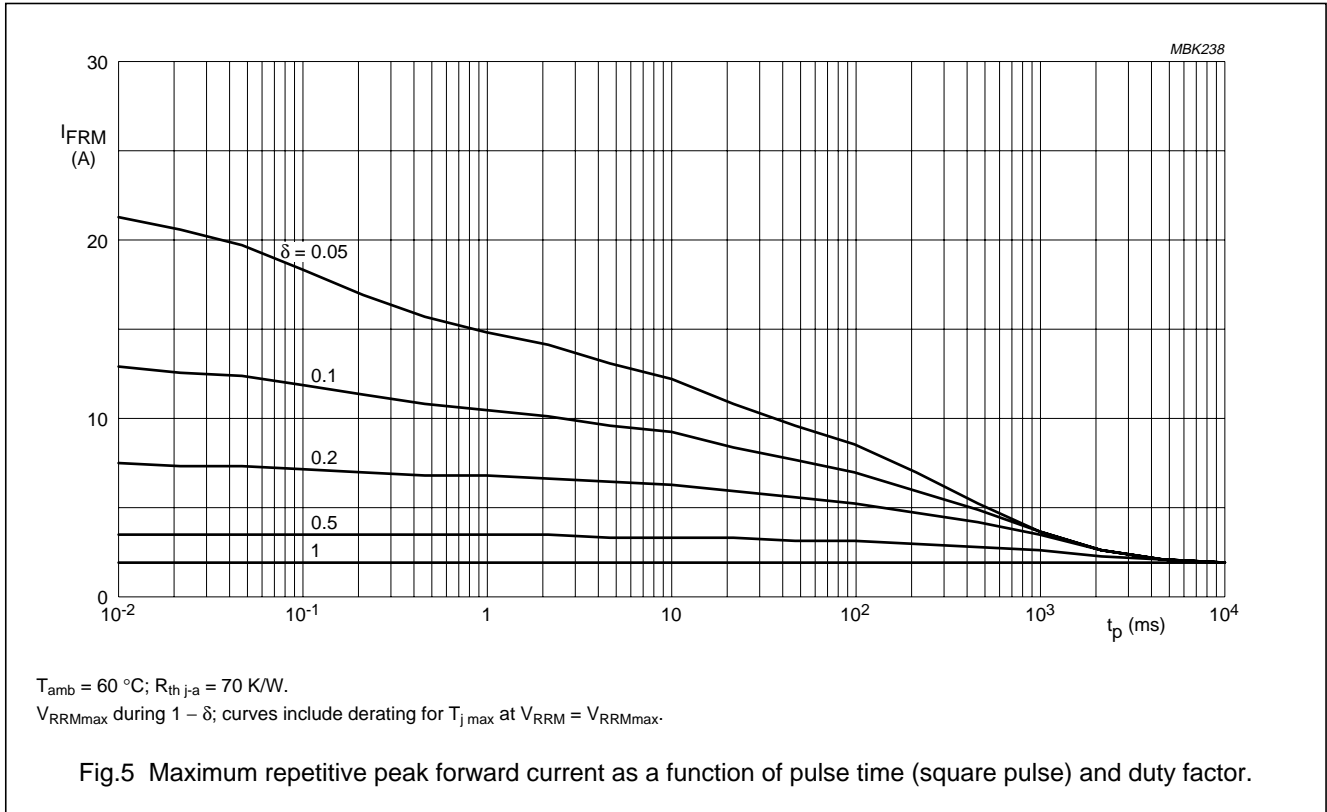
BYW28 series

GRAPHICAL DATA



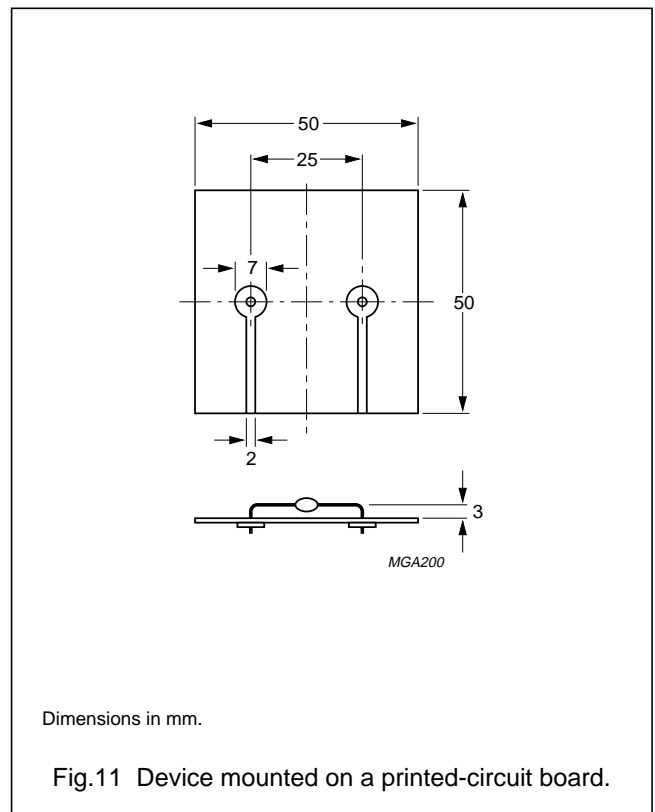
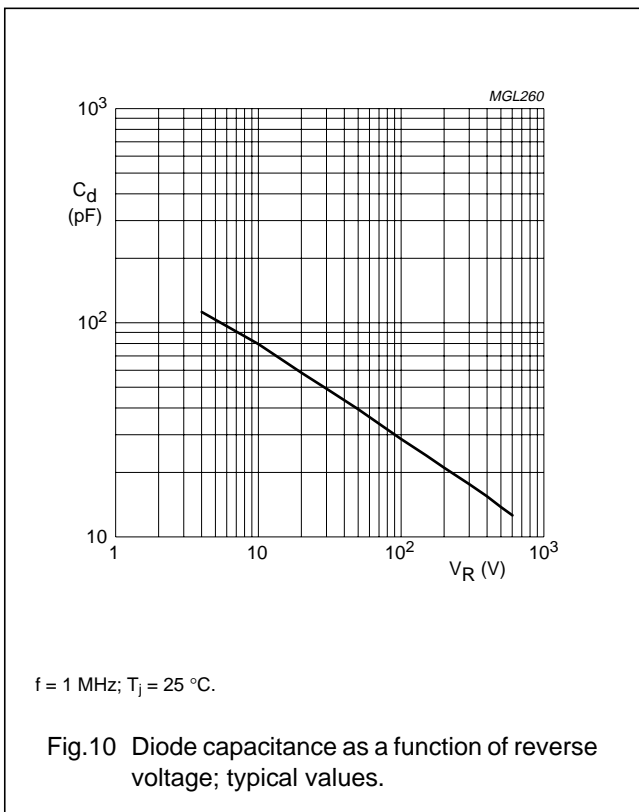
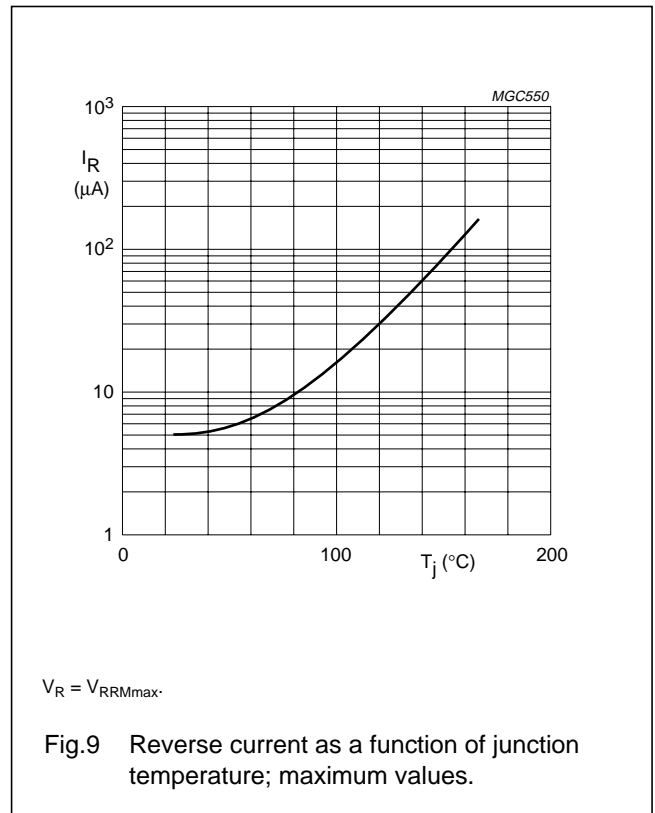
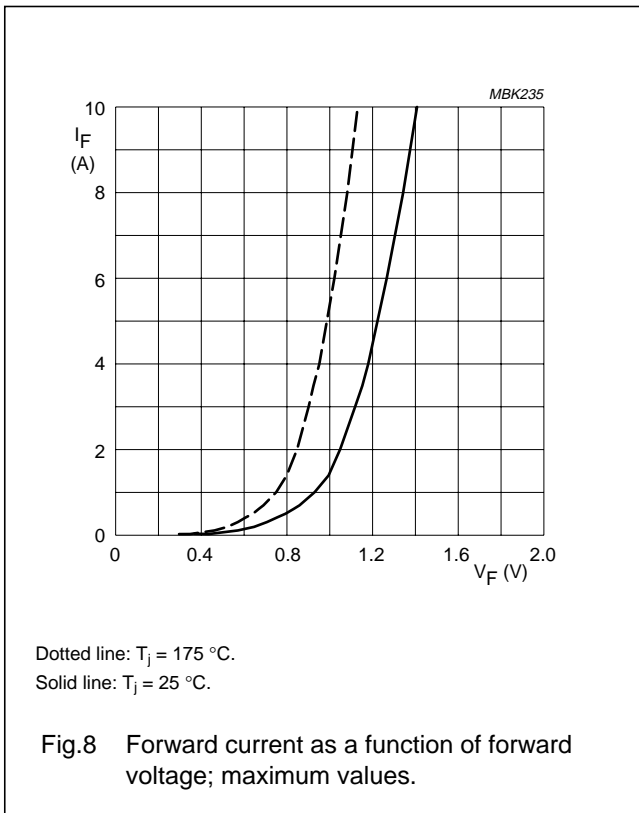
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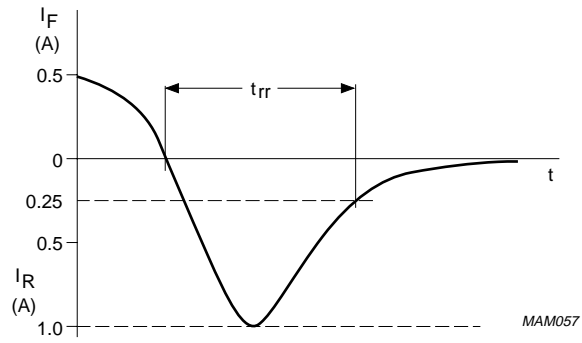
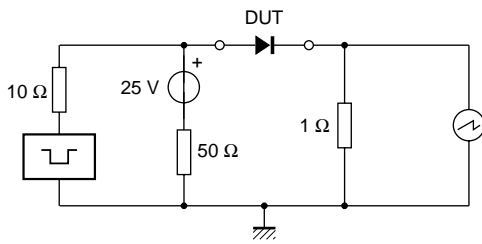
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controlled avalanche rectifier

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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.

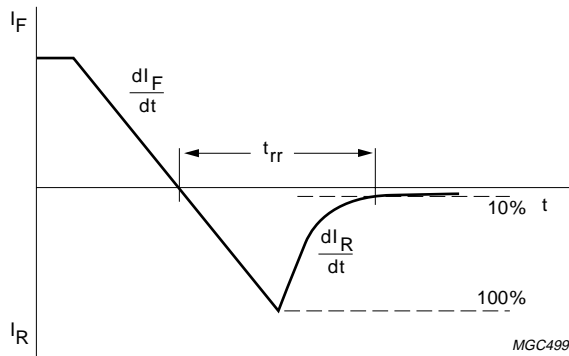


Fig.13 Reverse recovery definitions.

Ultra fast low-loss  
controlled avalanche rectifier

BYW28 series

PACKAGE OUTLINE

Hermetically sealed glass package; axial leaded; 2 leads

SOD115

**DIMENSIONS (mm are the original dimensions)**

UNIT	b max.	D max.	G max.	L min.
mm	1.35	5.5	6.0	27

**Note**  
1. The marking band indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD115						97-10-14

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.	

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**NOTES**

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**NOTES**

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