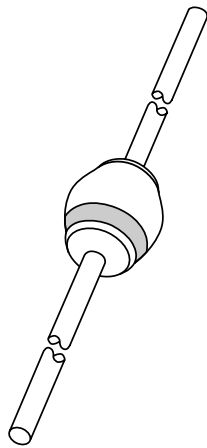


# DATA SHEET



## **BYV28 series** Ultra fast low-loss controlled avalanche rectifiers

Product specification  
Supersedes data of 1996 Oct 02

1997 Nov 24

## Ultra fast low-loss controlled avalanche rectifiers

## BYV28 series

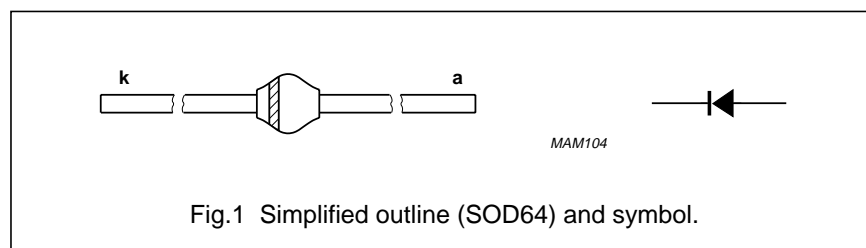
### FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

### DESCRIPTION

Rugged glass SOD64 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.



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{RRM}$	repetitive peak reverse voltage				
	BYV28-50		–	50	V
	BYV28-100		–	100	V
	BYV28-150		–	150	V
	BYV28-200		–	200	V
	BYV28-300		–	300	V
	BYV28-400		–	400	V
	BYV28-500 BYV28-600		–	500 600	V
$V_R$	continuous reverse voltage				
	BYV28-50		–	50	V
	BYV28-100		–	100	V
	BYV28-150		–	150	V
	BYV28-200		–	200	V
	BYV28-300		–	300	V
	BYV28-400		–	400	V
	BYV28-500 BYV28-600		–	500 600	V
$I_{F(AV)}$	average forward current	$T_{tp} = 85\text{ °C}$ ; lead length = 10 mm; see Figs 2 and 3;			
	BYV28-50 to 400 BYV28-500 and 600	averaged over any 20 ms period; see also Figs 10 and 11	– –	3.5 3.1	A A
$I_{F(AV)}$	average forward current	$T_{amb} = 60\text{ °C}$ ; printed-circuit board mounting (see Fig.20);			
	BYV28-50 to 400 BYV28-500 and 600	see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11	– –	1.9 1.5	A A

## Ultra fast low-loss controlled avalanche rectifiers

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SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{FRM}$	repetitive peak forward current	$T_{tp} = 85\text{ °C}$ ; see Figs 6 and 7	–	32	A
	BYV28-50 to 400			31	A
$I_{FRM}$	repetitive peak forward current	$T_{amb} = 60\text{ °C}$ ; see Figs 8 and 9	–	17	A
	BYV28-50 to 400			16	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10\text{ ms}$ half sine wave; $T_j = T_{j\max}$ prior to surge; $V_R = V_{RRM\max}$	–	90	A
$E_{RSM}$	non-repetitive peak reverse avalanche energy	$L = 120\text{ mH}$ ; $T_j = T_{j\max}$ prior to surge; inductive load switched off	–	20	mJ
$T_{stg}$	storage temperature		–65	+175	°C
$T_j$	junction temperature	see Fig.12	–65	+175	°C

### ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT		
$V_F$	forward voltage	$I_F = 3.5\text{ A}$ ; $T_j = T_{j\max}$ ; see Figs 13, 14 and 15	–	–	0.80	V		
	BYV28-50 to 200				0.83	V		
	BYV28-300 and 400				0.98	V		
$V_F$	forward voltage	$I_F = 3.5\text{ A}$ ; see Figs 13, 14 and 15	–	–	1.02	V		
	BYV28-50 to 200				1.05	V		
	BYV28-300 and 400				1.25	V		
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1\text{ mA}$						
	BYV28-50				55	–	–	V
	BYV28-100				110	–	–	V
	BYV28-150				165	–	–	V
	BYV28-200				220	–	–	V
	BYV28-300				330	–	–	V
	BYV28-400				440	–	–	V
	BYV28-500				560	–	–	V
BYV28-600	675	–	–	V				
$I_R$	reverse current	$V_R = V_{RRM\max}$ ; see Fig.16	–	–	5	$\mu\text{A}$		
		$V_R = V_{RRM\max}$ ; $T_j = 165\text{ °C}$ ; see Fig.16	–	–	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.22	–	–	25	ns		
					BYV28-50 to 200	50	ns	
	BYV28-300 to 600							

# Ultra fast low-loss controlled avalanche rectifiers

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0; see Figs 17, 18 and 19	–	190	–	pF
	BYV28-50 to 200		–	150	–	pF
	BYV28-300 and 400 BYV28-500 and 600		–	125	–	pF
$\left  \frac{dI_R}{dt} \right $	maximum slope of reverse recovery current	when switched from I <sub>F</sub> = 1 A to V <sub>R</sub> ≥ 30 V and dI <sub>F</sub> /dt = –1 A/μs; see Fig.21	–	–	4	A/μs

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-tp</sub>	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	75	K/W

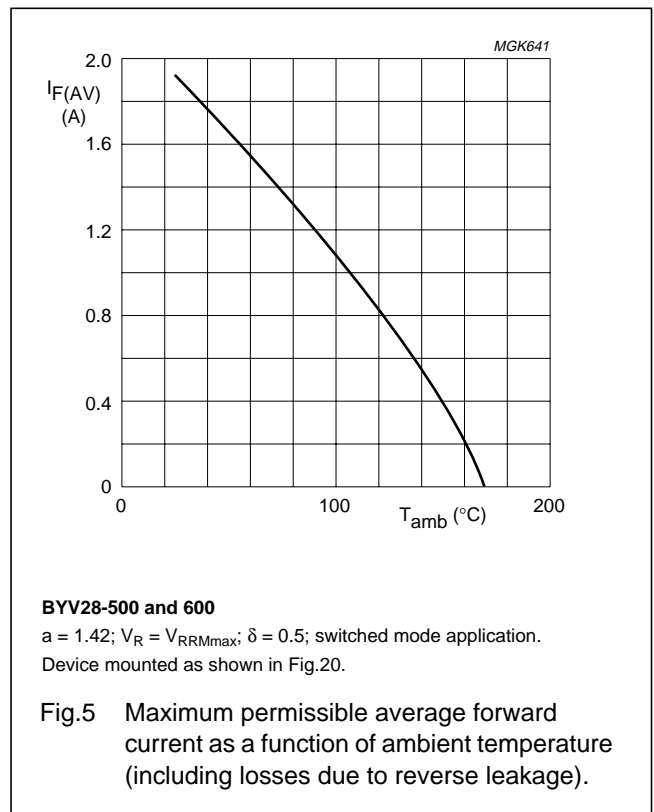
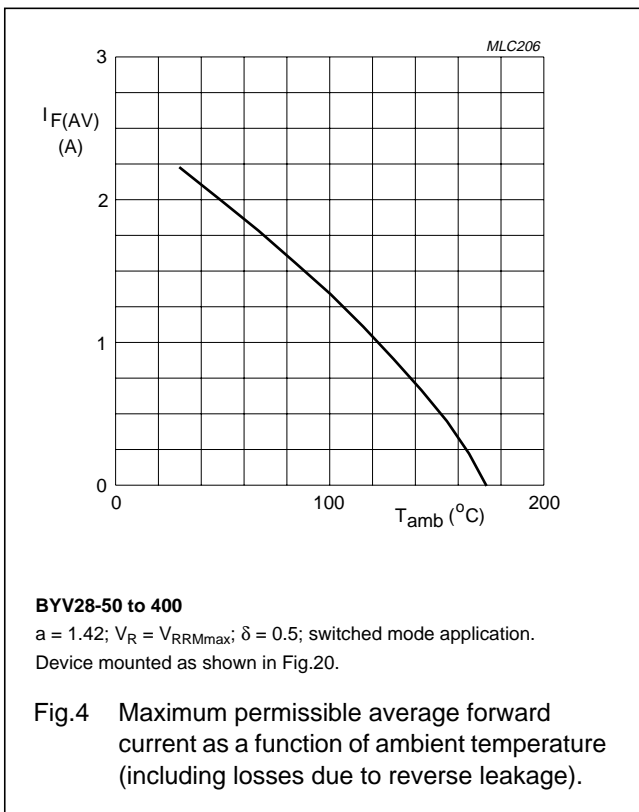
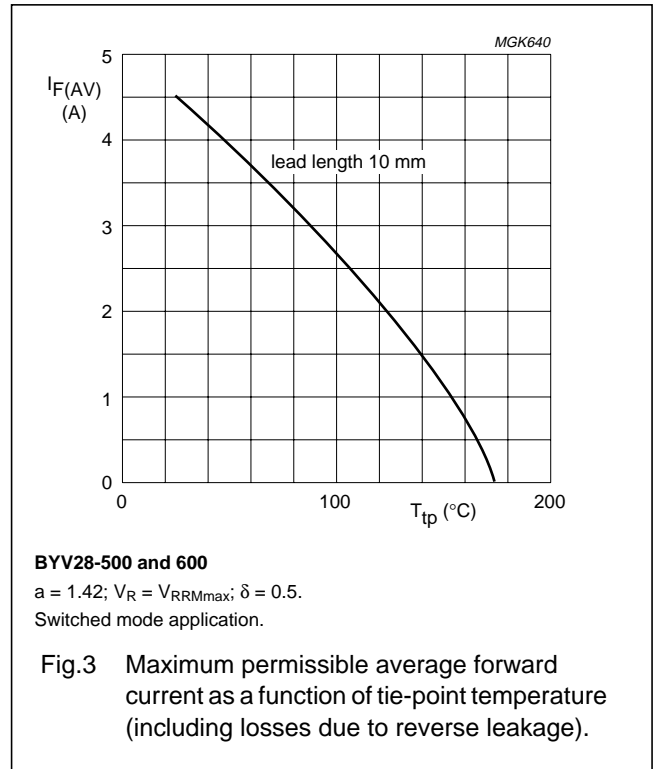
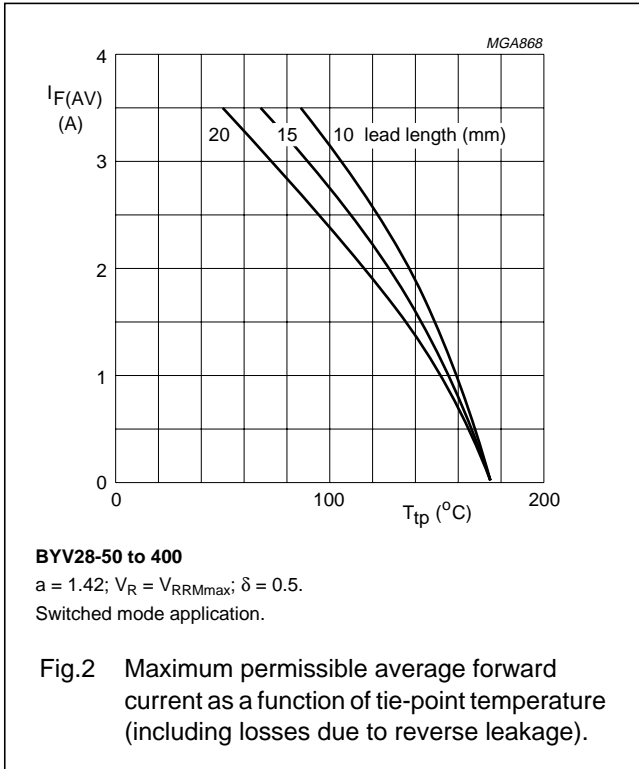
#### Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.20  
For more information please refer to the "General Part of associated Handbook".

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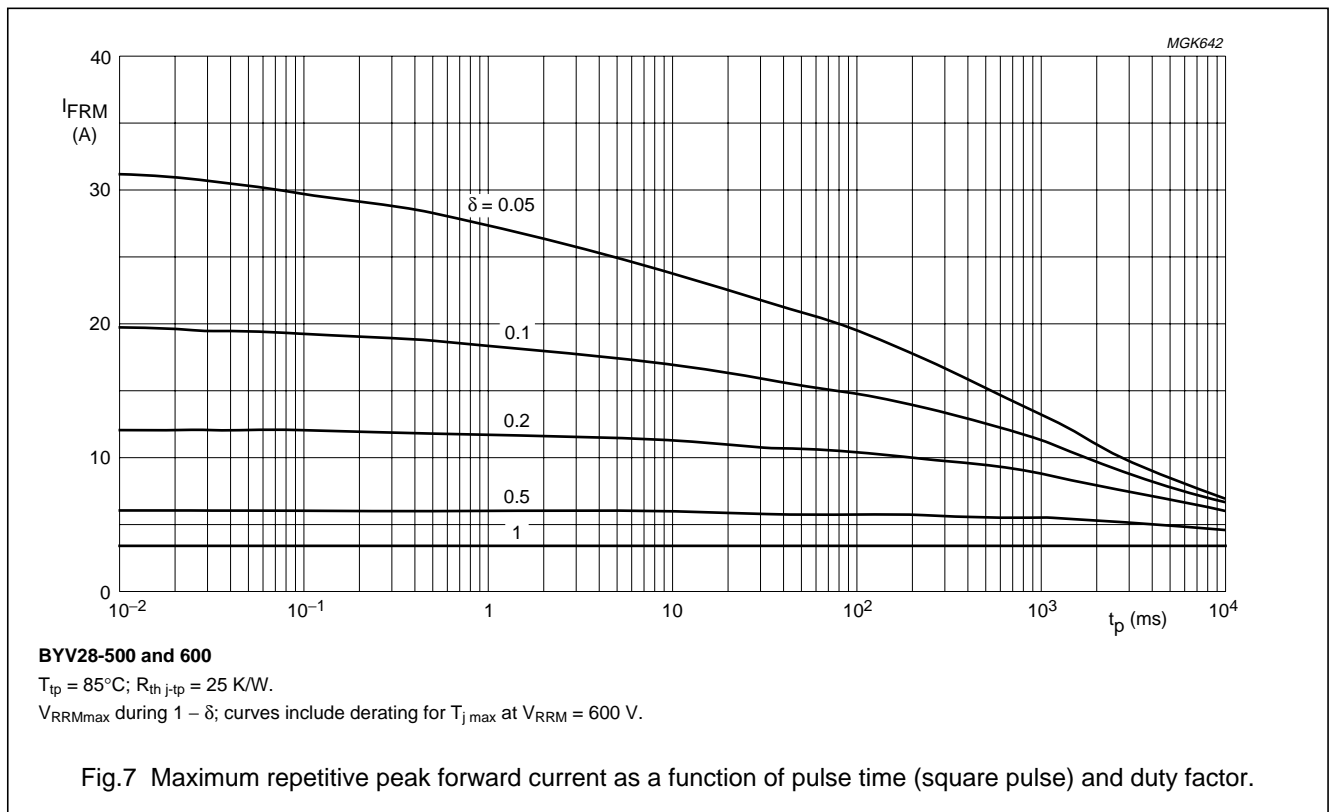
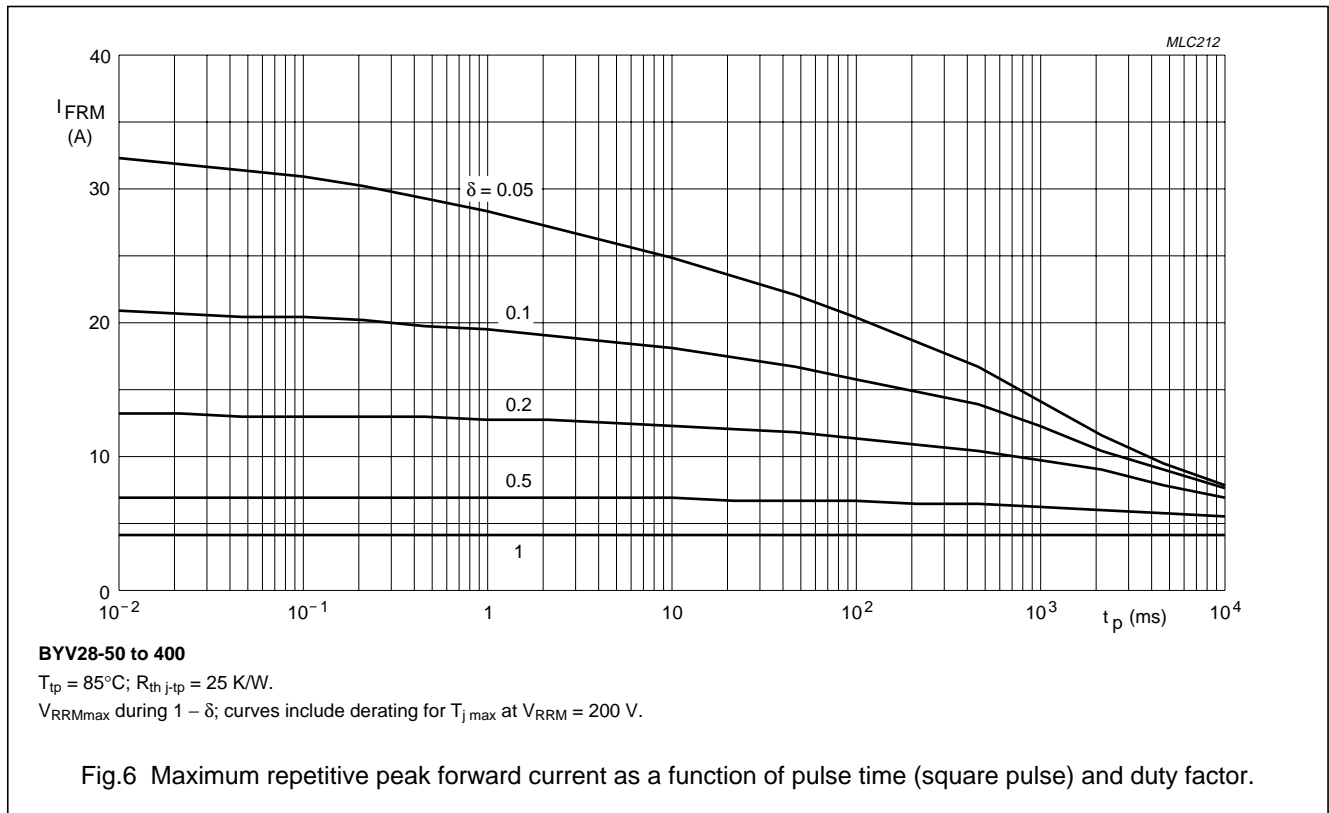
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GRAPHICAL DATA



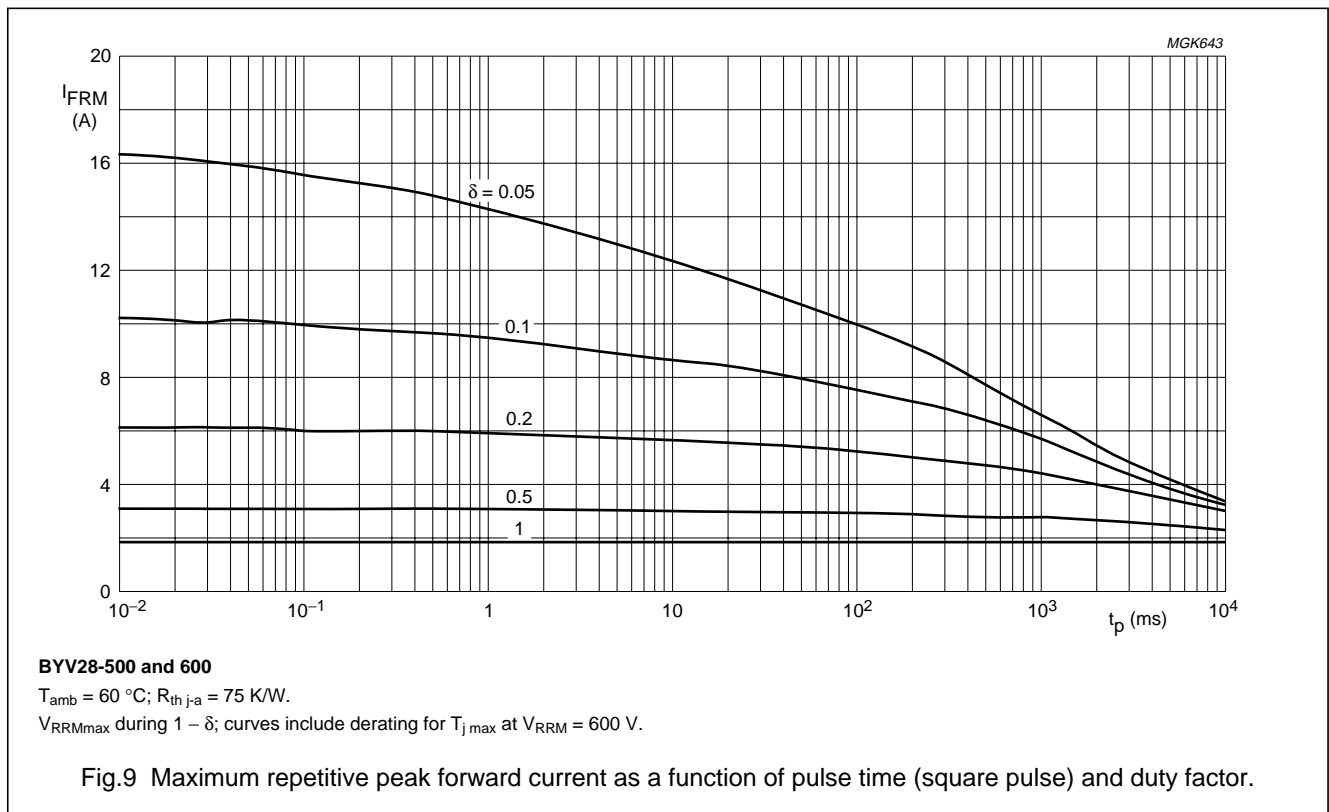
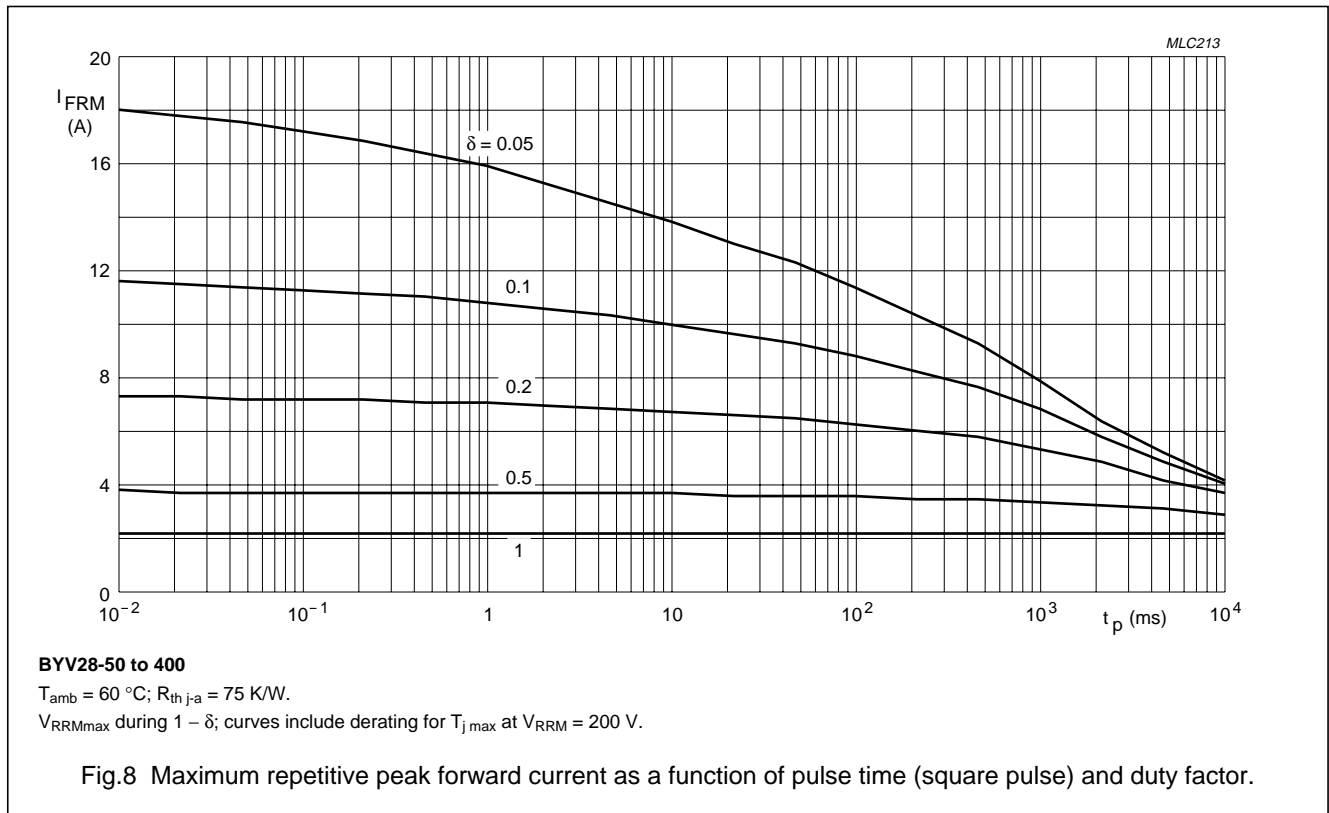
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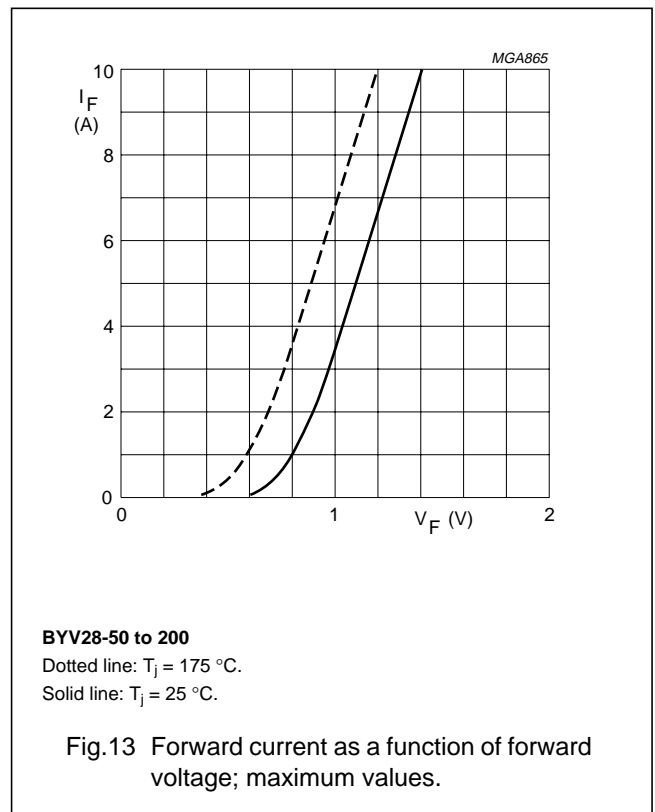
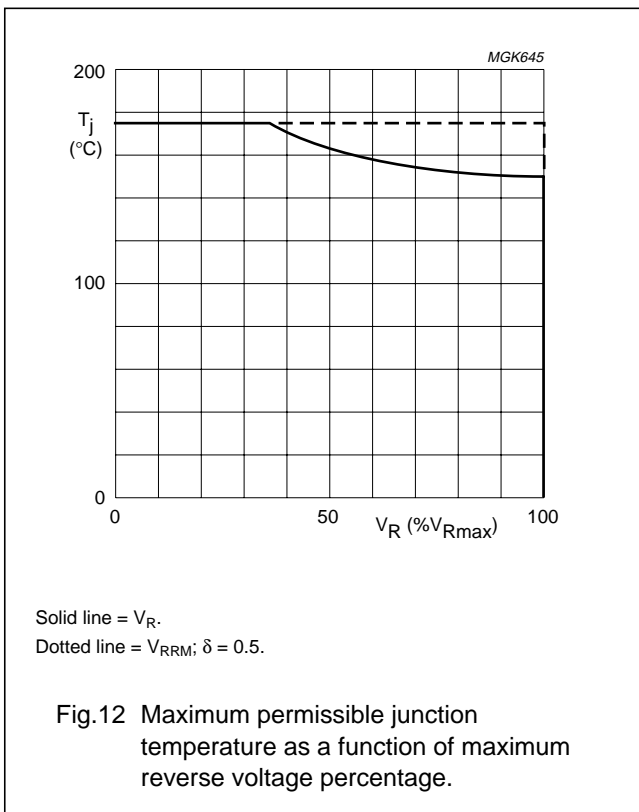
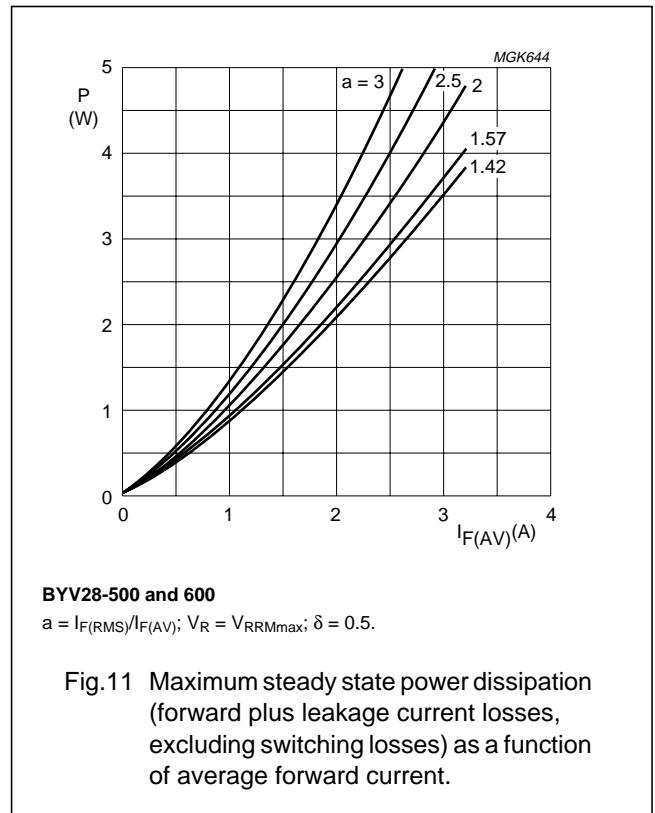
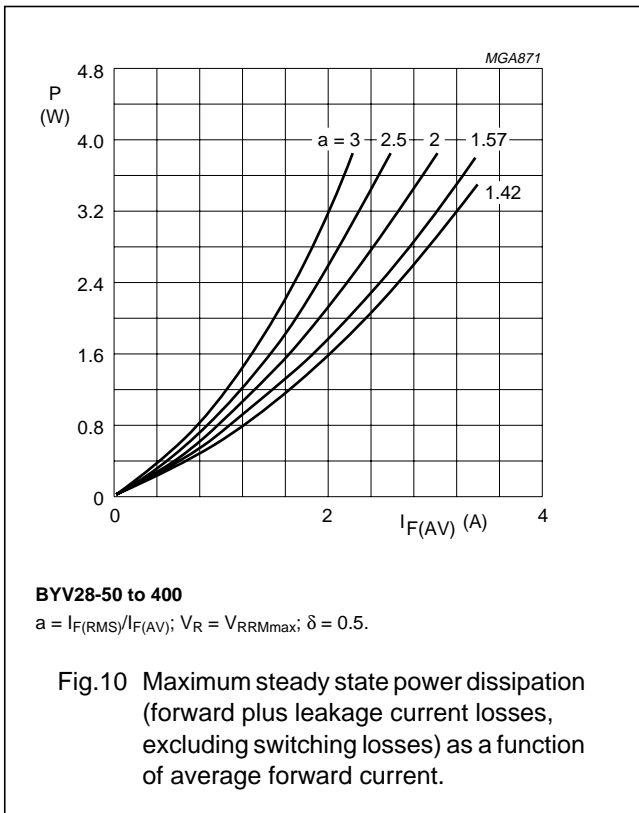
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Ultra fast low-loss  
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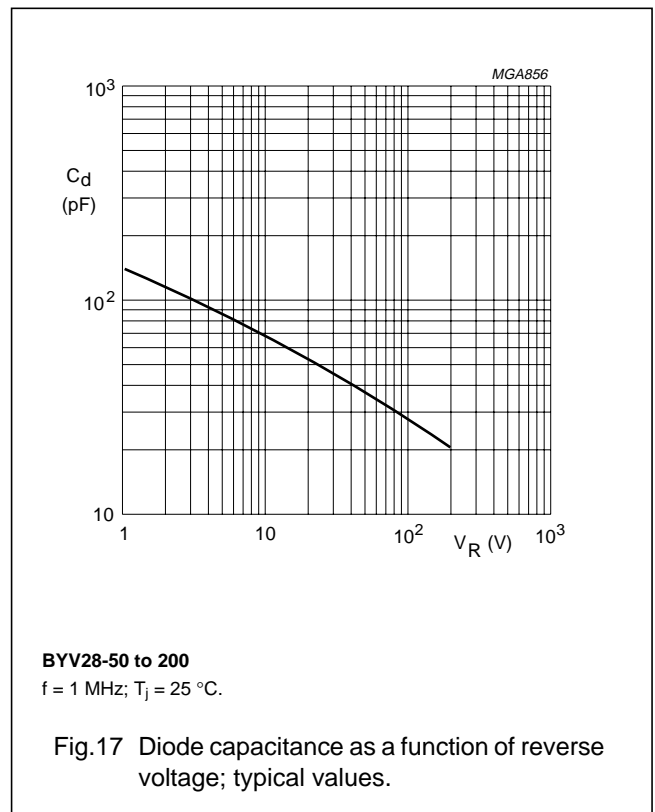
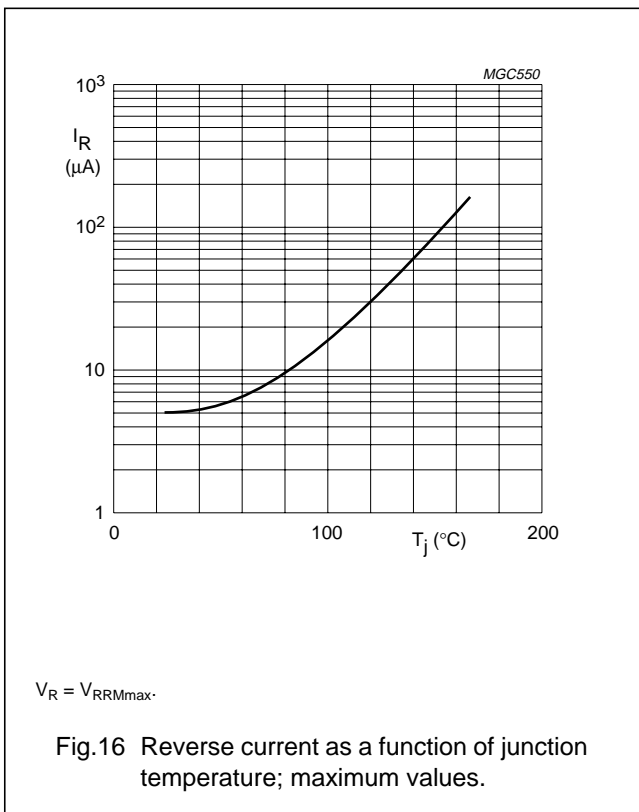
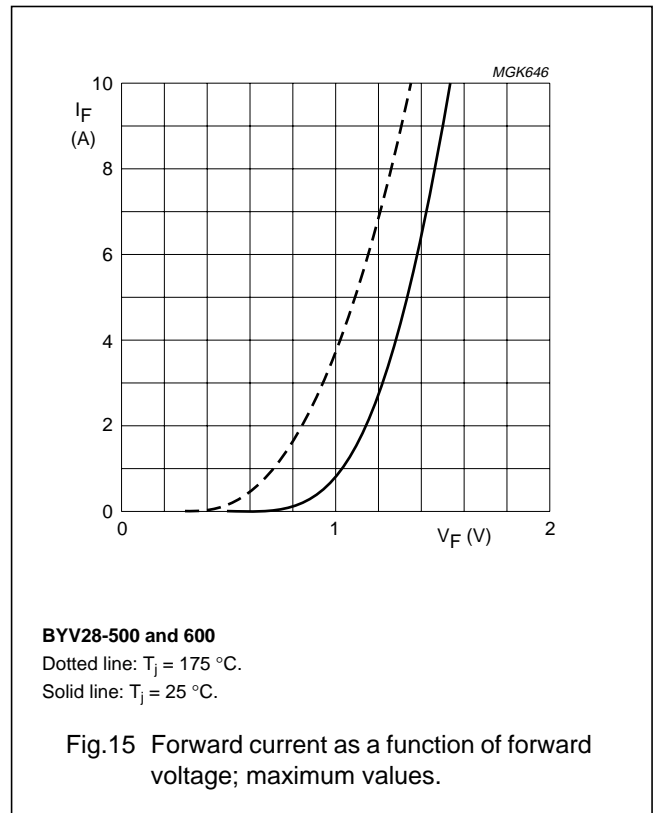
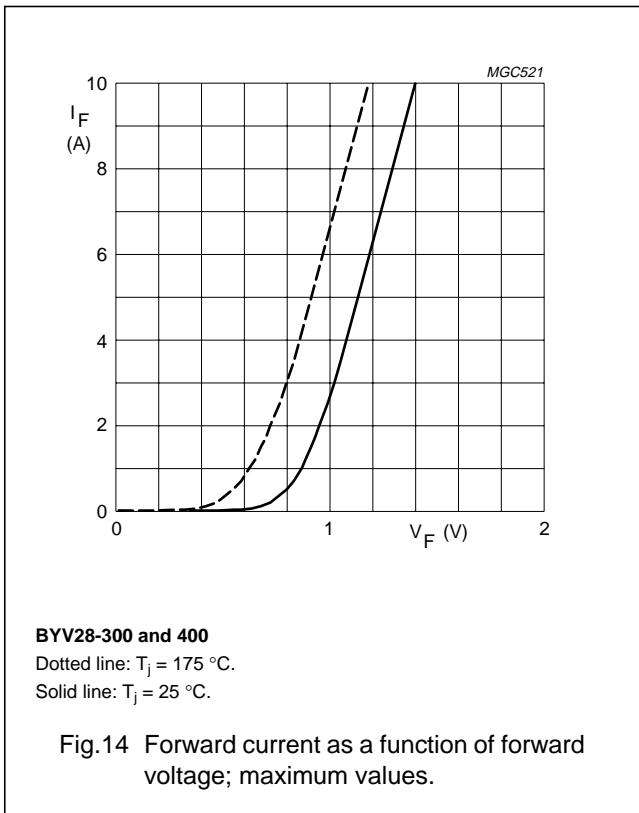
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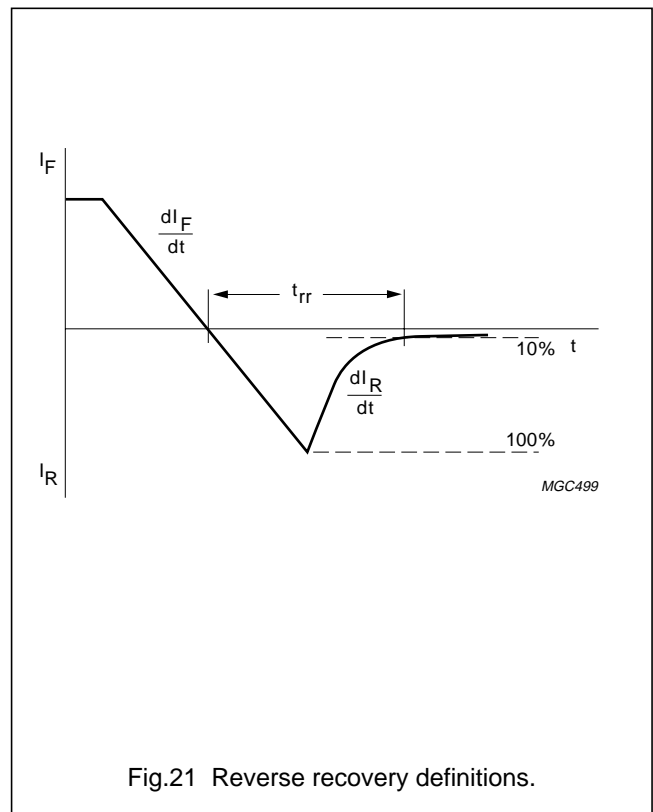
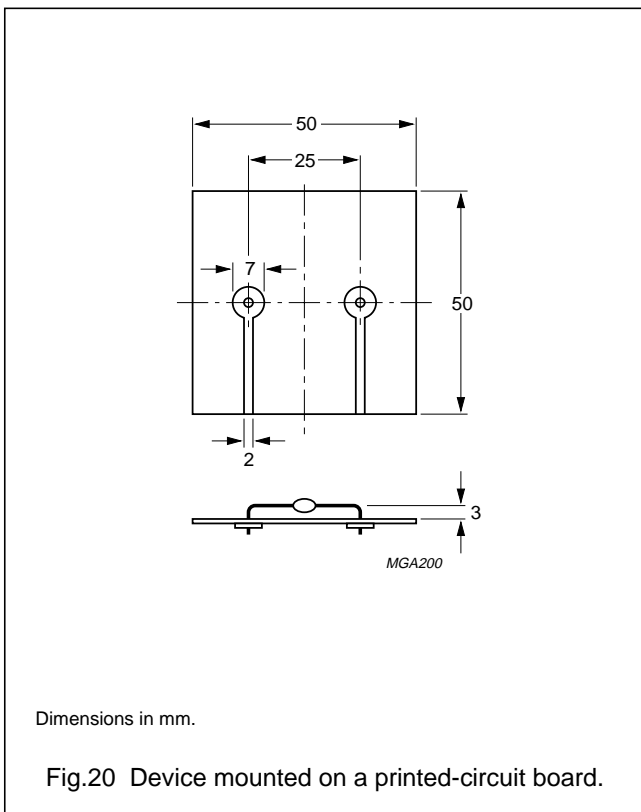
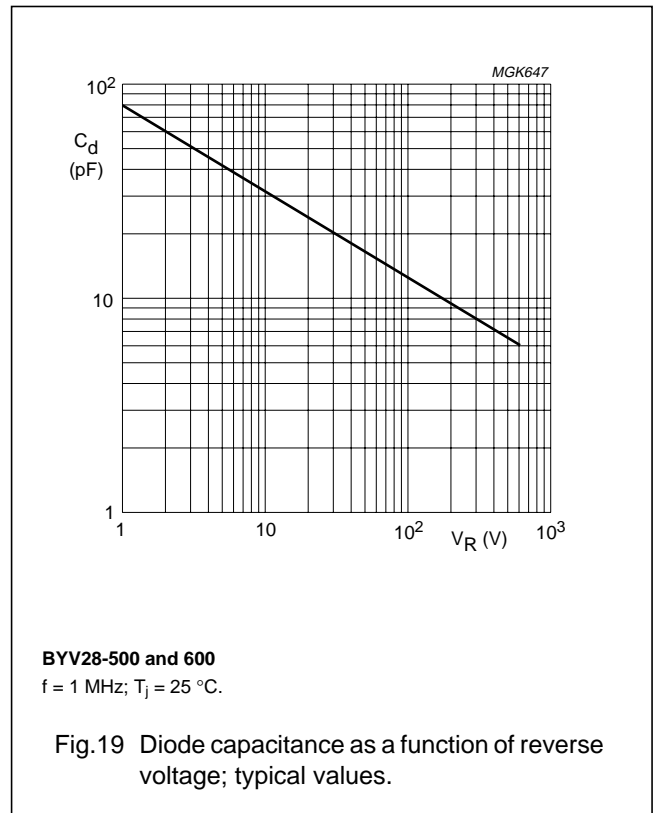
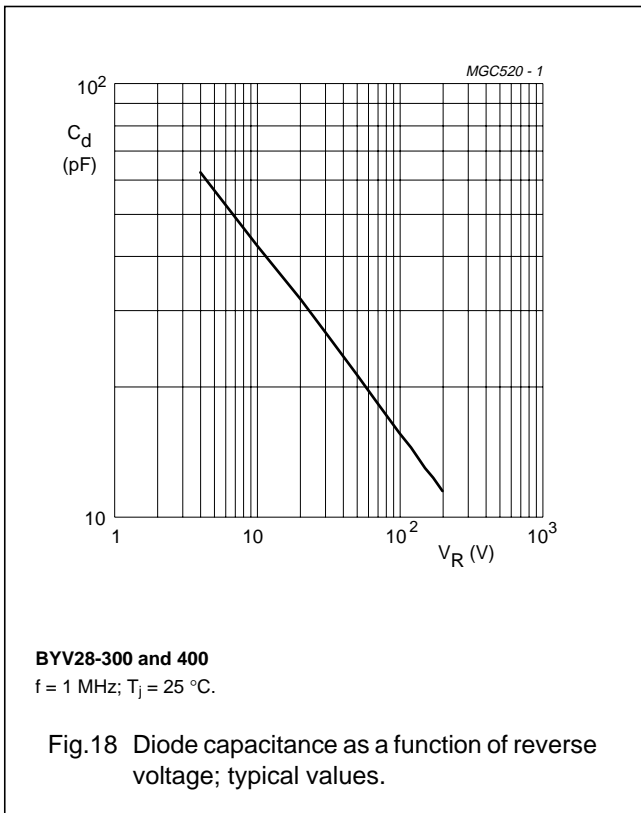
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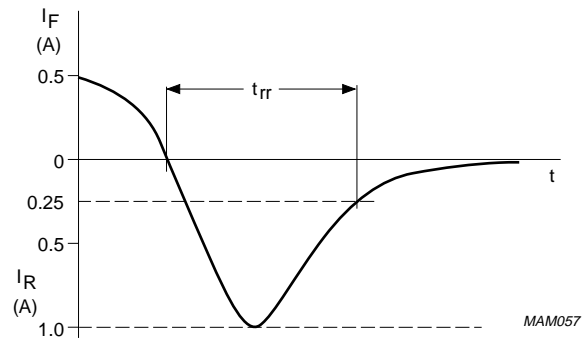
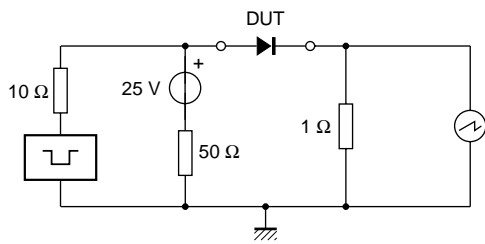
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# Ultra fast low-loss controlled avalanche rectifiers

## BYV28 series



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

Fig.22 Test circuit and reverse recovery time waveform and definition.

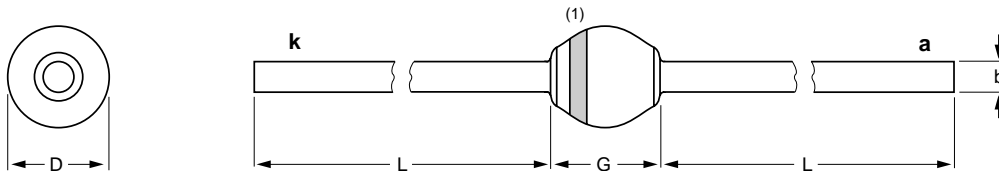
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PACKAGE OUTLINE

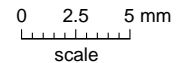
Hermetically sealed glass package; axial leaded; 2 leads

SOD64



DIMENSIONS (mm are the original dimensions)

UNIT	b max.	D max.	G max.	L min.
mm	1.35	4.5	5.0	28



Note

1. The marking band indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD64						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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These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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NOTES

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NOTES

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