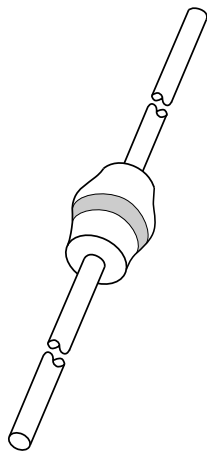


# DATA SHEET



## **BYM36 series** Fast soft-recovery controlled avalanche rectifiers

Product specification  
Supersedes data of 1996 May 30  
File under Discrete Semiconductors, SC01

1996 Sep 18

# Fast soft-recovery controlled avalanche rectifiers

## BYM36 series

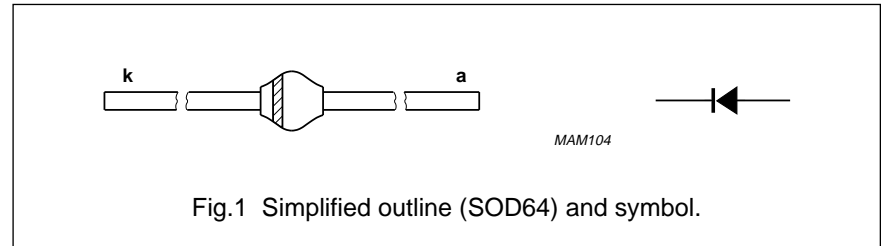
### FEATURES

- 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 <sub>RRM</sub>	repetitive peak reverse voltage				
	BYM36A		–	200	V
	BYM36B		–	400	V
	BYM36C		–	600	V
	BYM36D		–	800	V
	BYM36E		–	1000	V
	BYM36F BYM36G		–	1200 1400	V V
V <sub>R</sub>	continuous reverse voltage				
	BYM36A		–	200	V
	BYM36B		–	400	V
	BYM36C		–	600	V
	BYM36D		–	800	V
	BYM36E		–	1000	V
	BYM36F BYM36G		–	1200 1400	V V
I <sub>F(AV)</sub>	average forward current	T <sub>tp</sub> = 55 °C; lead length = 10 mm; see Figs 2; 3 and 4	–	3.0	A
	BYM36A to C		–	3.0	A
	BYM36D and E BYM36F and G	averaged over any 20 ms period; see also Figs 14; 15 and 16	–	2.9 2.9	A A
I <sub>F(AV)</sub>	average forward current	T <sub>amb</sub> = 65 °C; PCB mounting (see Fig.25); see Figs 5; 6 and 7	–	1.25	A
	BYM36A to C		–	1.25	A
	BYM36D and E BYM36F and G	averaged over any 20 ms period; see also Figs 14; 15 and 16	–	1.20 1.15	A A

## Fast soft-recovery controlled avalanche rectifiers

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SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{FRM}$	repetitive peak forward current	$T_{tp} = 55\text{ °C}$ ; see Figs 8; 9 and 10	–	37	A
	BYM36A to C			33	A
	BYM36D and E BYM36F and G			27	A
$I_{FRM}$	repetitive peak forward current	$T_{amb} = 65\text{ °C}$ ; see Figs 11; 12 and 13	–	13	A
	BYM36A to C			11	A
	BYM36D and E BYM36F and G			10	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10\text{ ms}$ half sine wave; $T_j = T_{j\text{ max}}$ prior to surge; $V_R = V_{RRM\text{ max}}$	–	65	A
$E_{RSM}$	non-repetitive peak reverse avalanche energy	$L = 120\text{ mH}$ ; $T_j = T_{j\text{ max}}$ prior to surge; inductive load switched off	–	10	mJ
$T_{stg}$	storage temperature		–65	+175	°C
$T_j$	junction temperature	see Figs 17 and 18	–65	+175	°C

### ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
$V_F$	forward voltage	$I_F = 3\text{ A}$ ; $T_j = T_{j\text{ max}}$ ; see Figs 19; 20 and 21	–	–	1.22	V	
	BYM36A to C				1.28	V	
	BYM36D and E BYM36F and G				1.24	V	
$V_F$	forward voltage	$I_F = 3\text{ A}$ ; see Figs 19; 20 and 21	–	–	1.60	V	
	BYM36A to C				1.78	V	
	BYM36D and E BYM36F and G				1.57	V	
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1\text{ mA}$				V	
	BYM36A						300
	BYM36B						500
	BYM36C						700
	BYM36D						900
	BYM36E						1100
	BYM36F						1300
BYM36G	1500						
$I_R$	reverse current	$V_R = V_{RRM\text{ max}}$ ; see Fig.22	–	–	5	μA	
		$V_R = V_{RRM\text{ max}}$ ; $T_j = 165\text{ °C}$ ; see Fig.22	–	–	150	μA	

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$t_{rr}$	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. 26	–	–	100	ns
	BYM36A to C					
	BYM36D and E BYM36F and G					
$C_d$	diode capacitance	$f = 1$ MHz; $V_R = 0$ V; see Figs 23 and 24	–	85	–	pF
	BYM36A to C					
	BYM36D and E BYM36F and G					
$\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/ $\mu$ s; see Fig.27	–	–	7	A/ $\mu$ s
	BYM36A to C					
	BYM36D and E BYM36F and G					

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	75	K/W

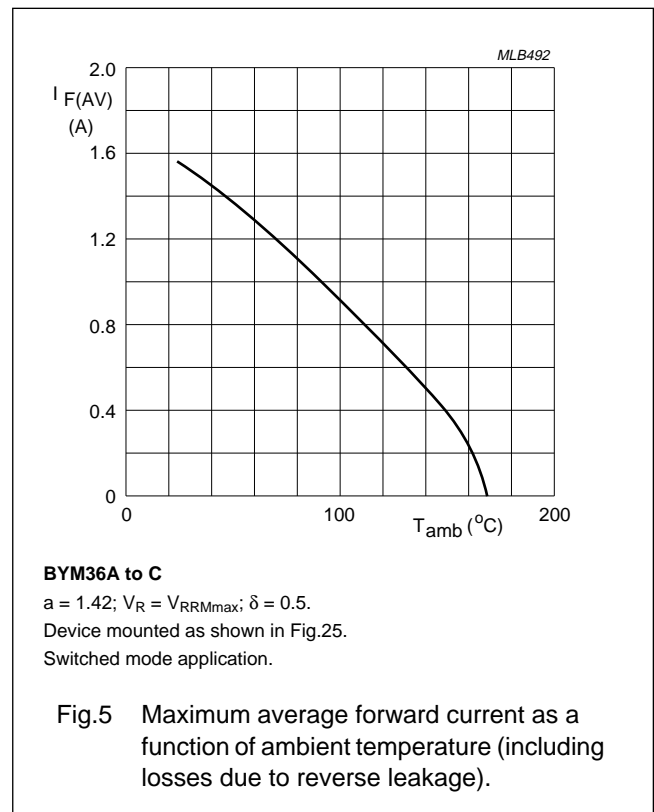
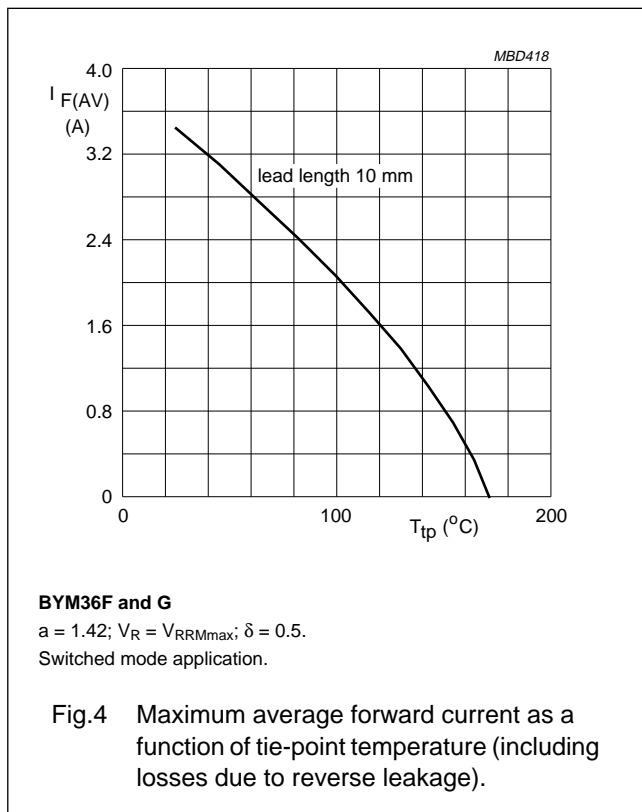
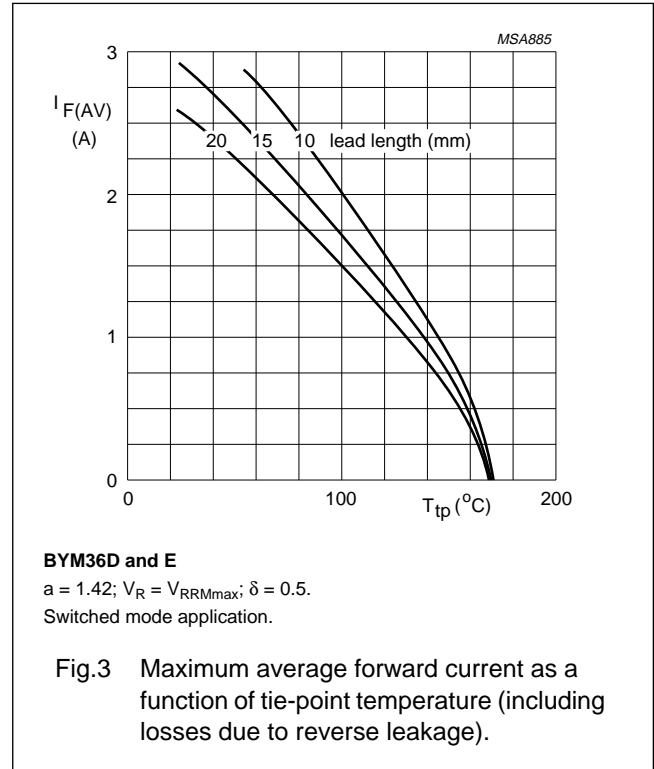
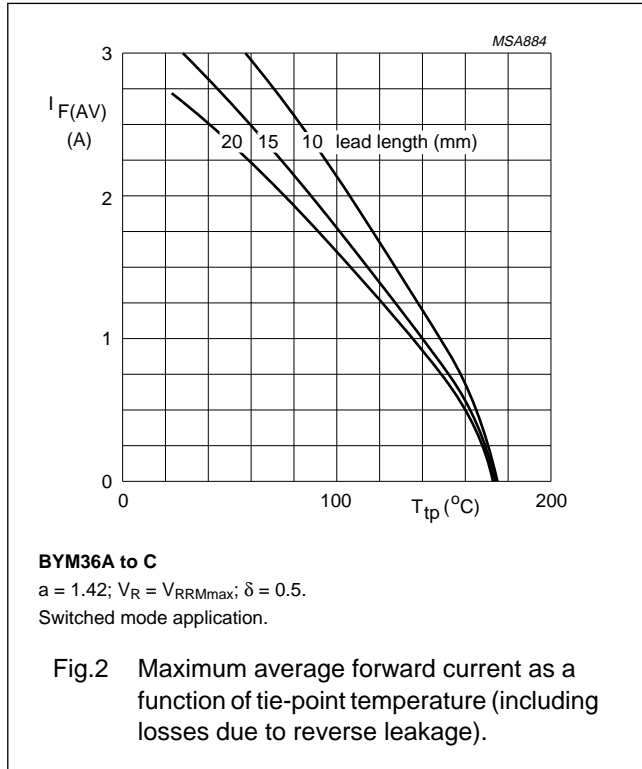
### Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer  $\geq 40$   $\mu$ m, see Fig.25. For more information please refer to the 'General Part of Handbook SC01'.

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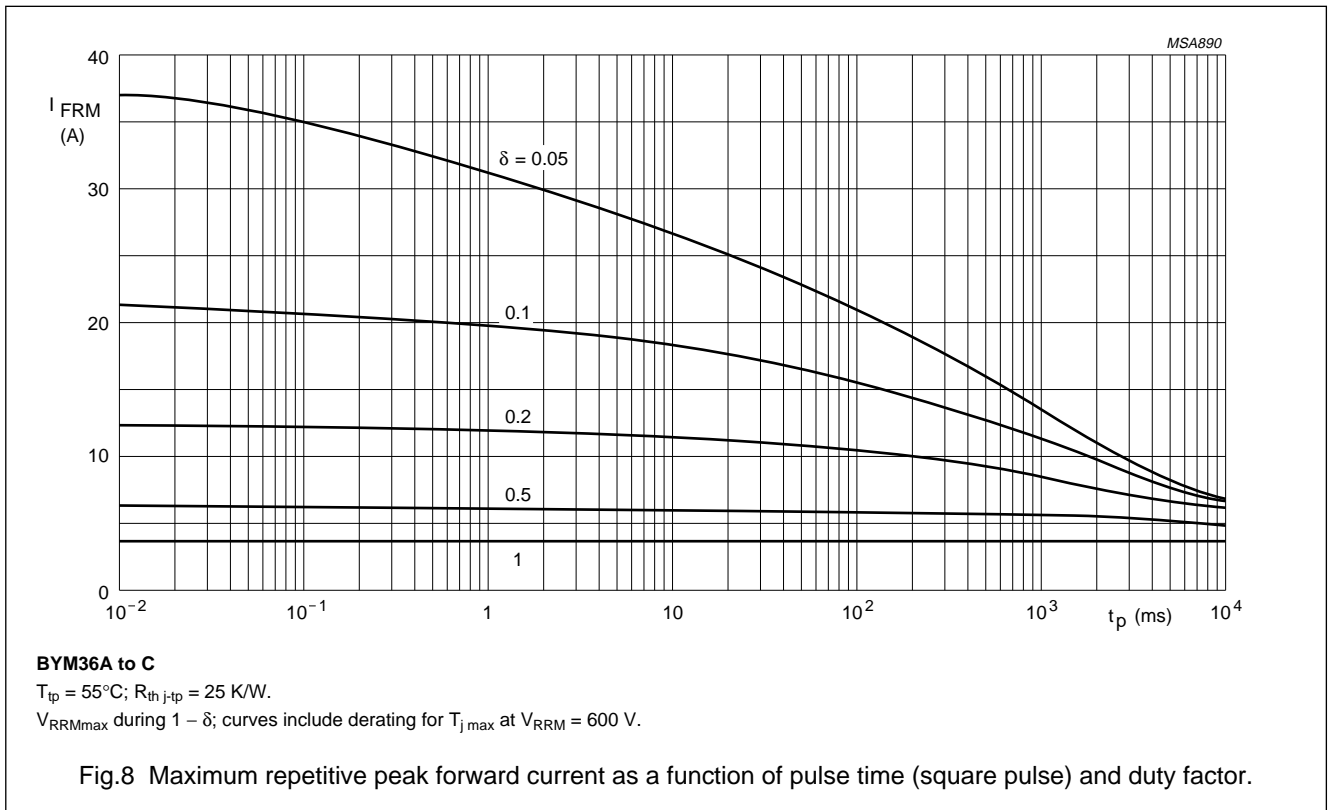
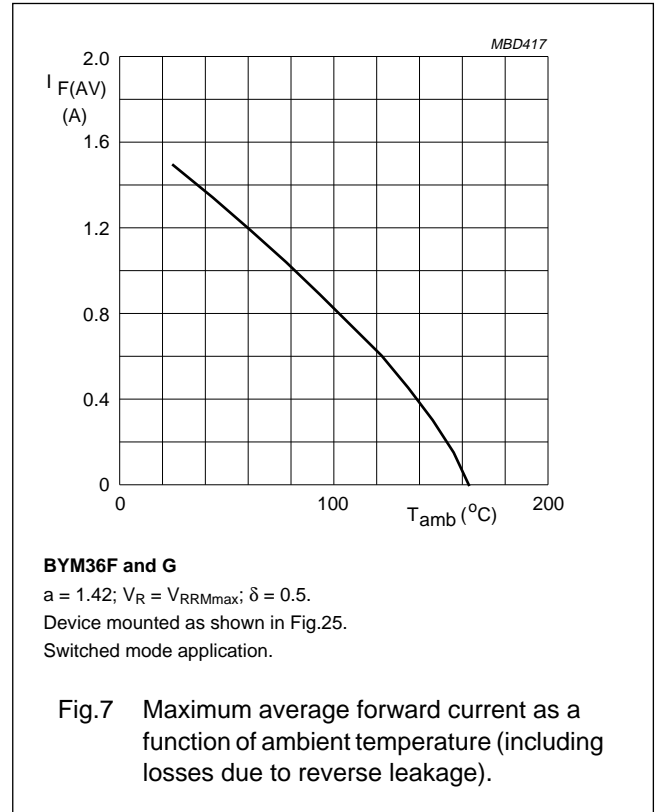
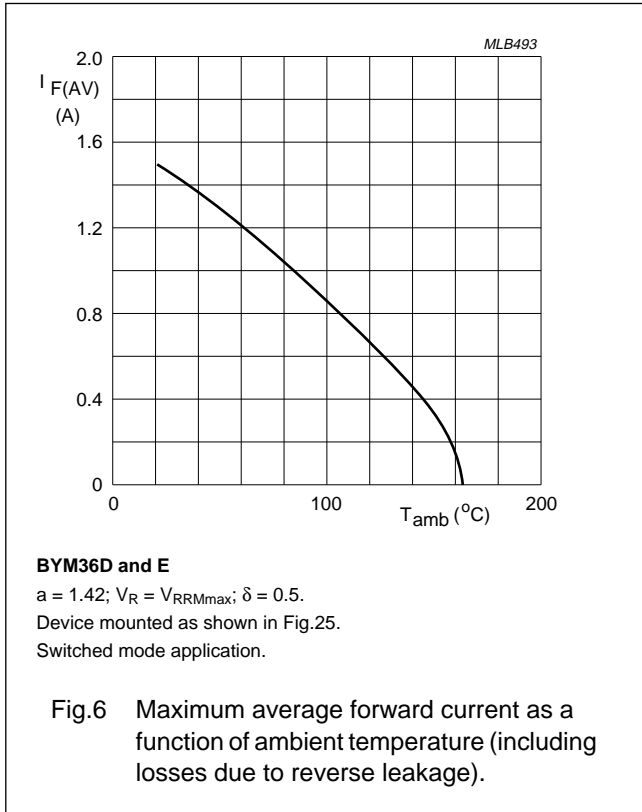
BYM36 series

GRAPHICAL DATA



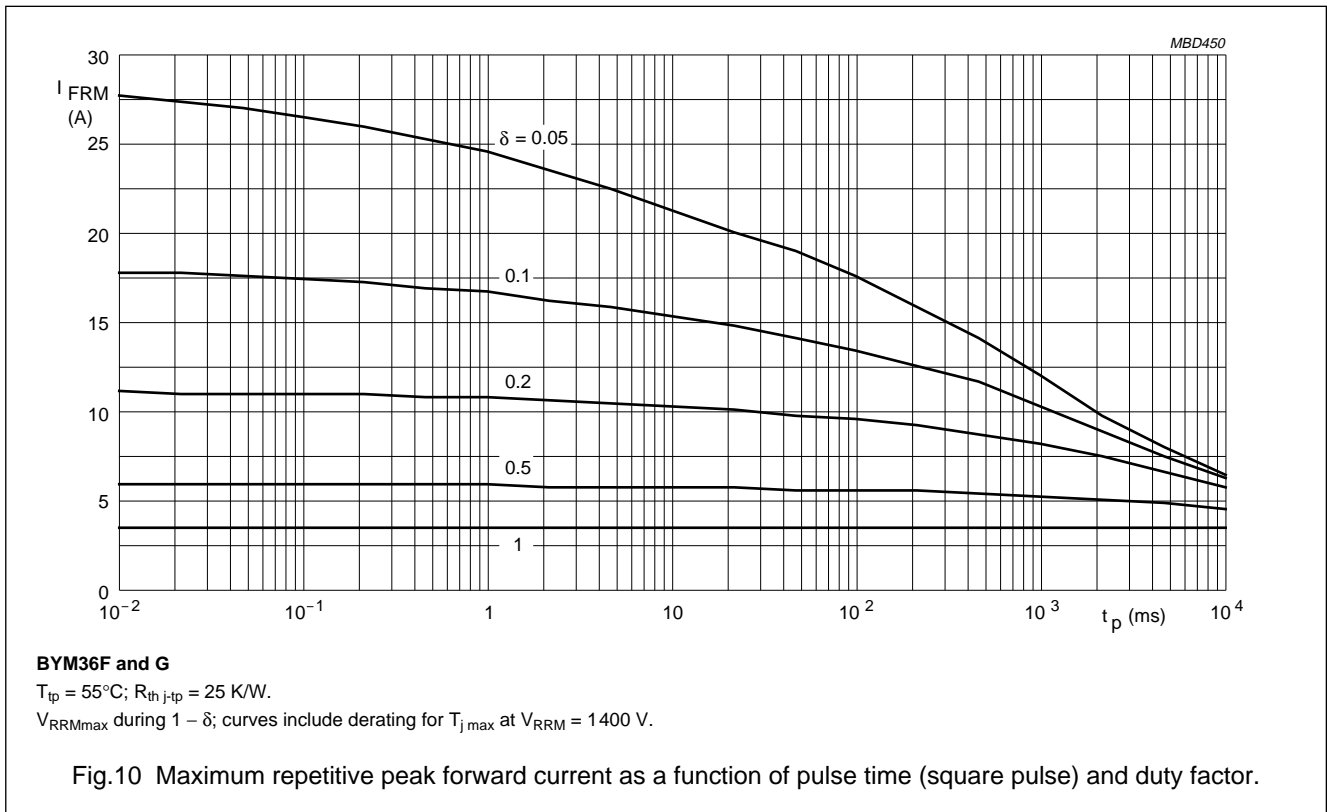
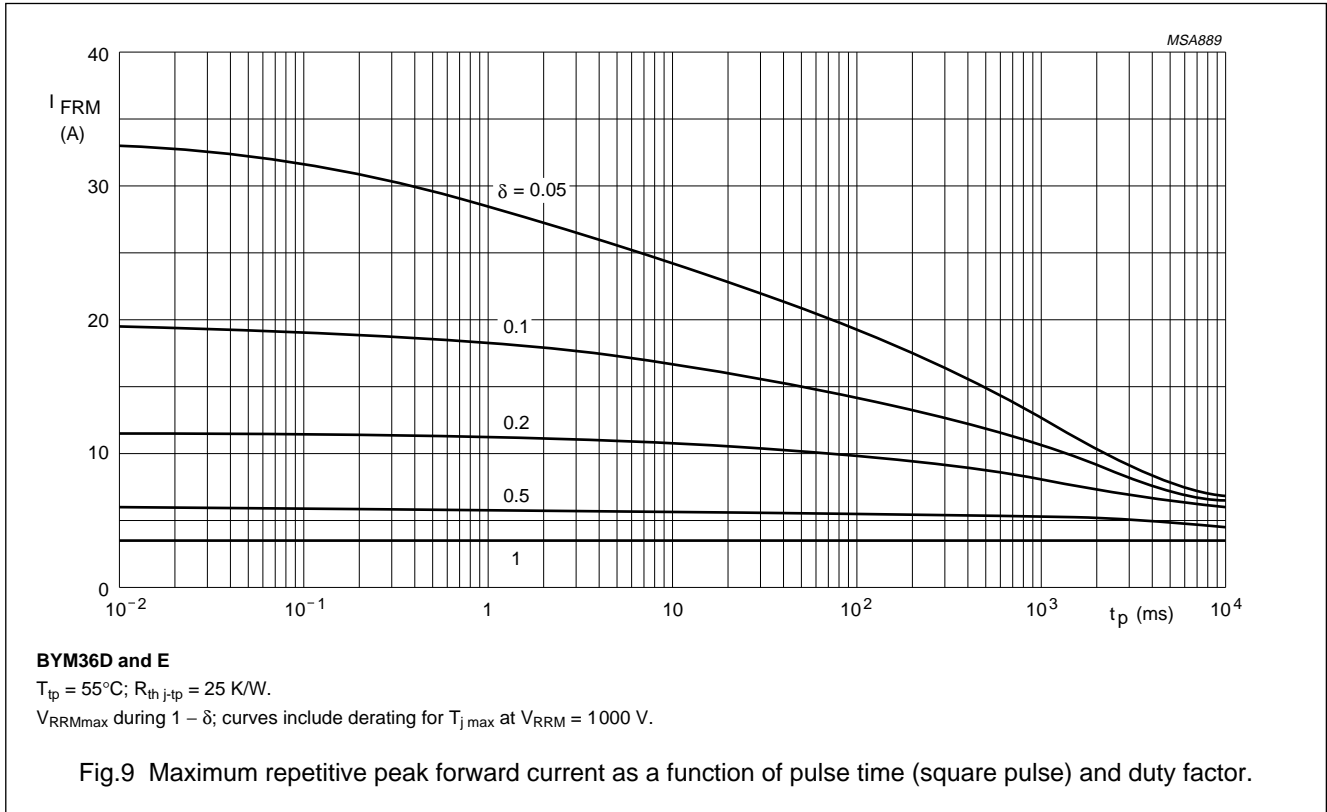
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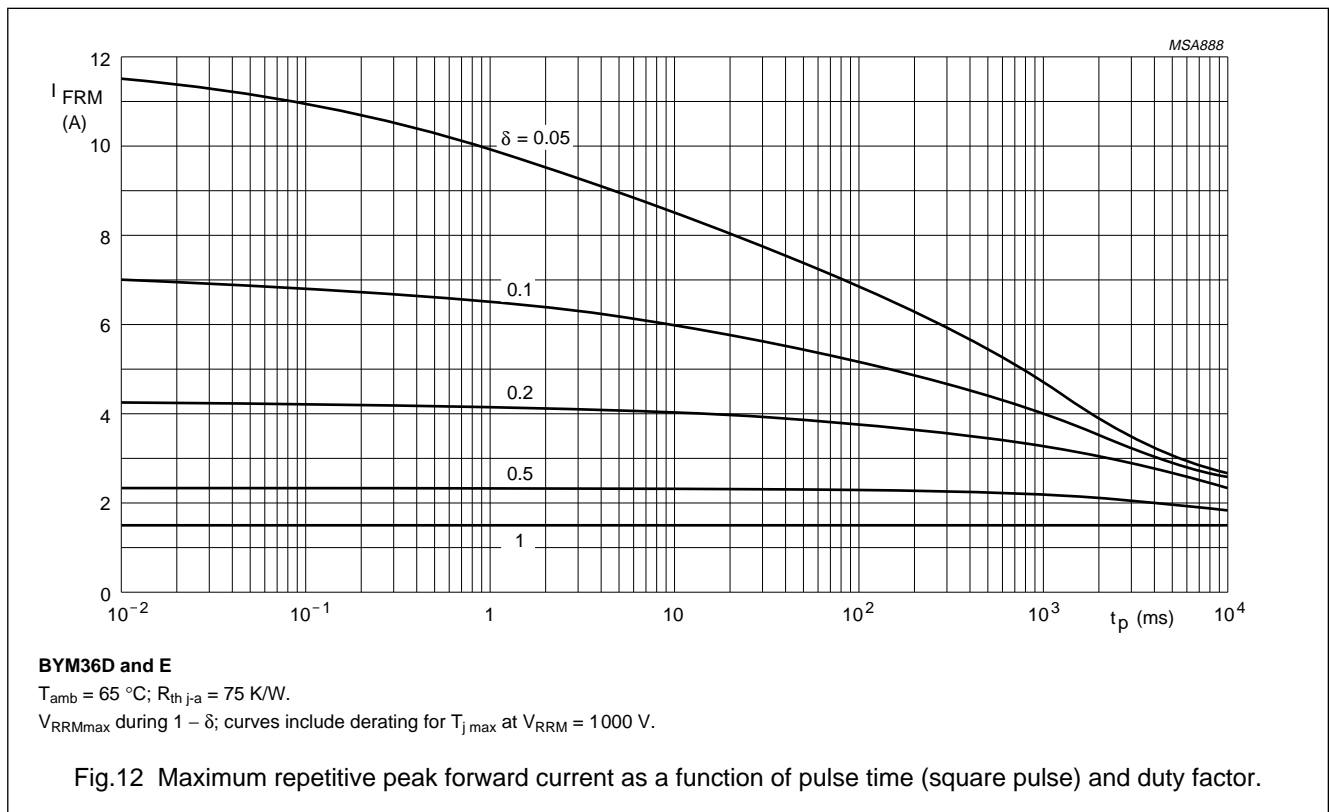
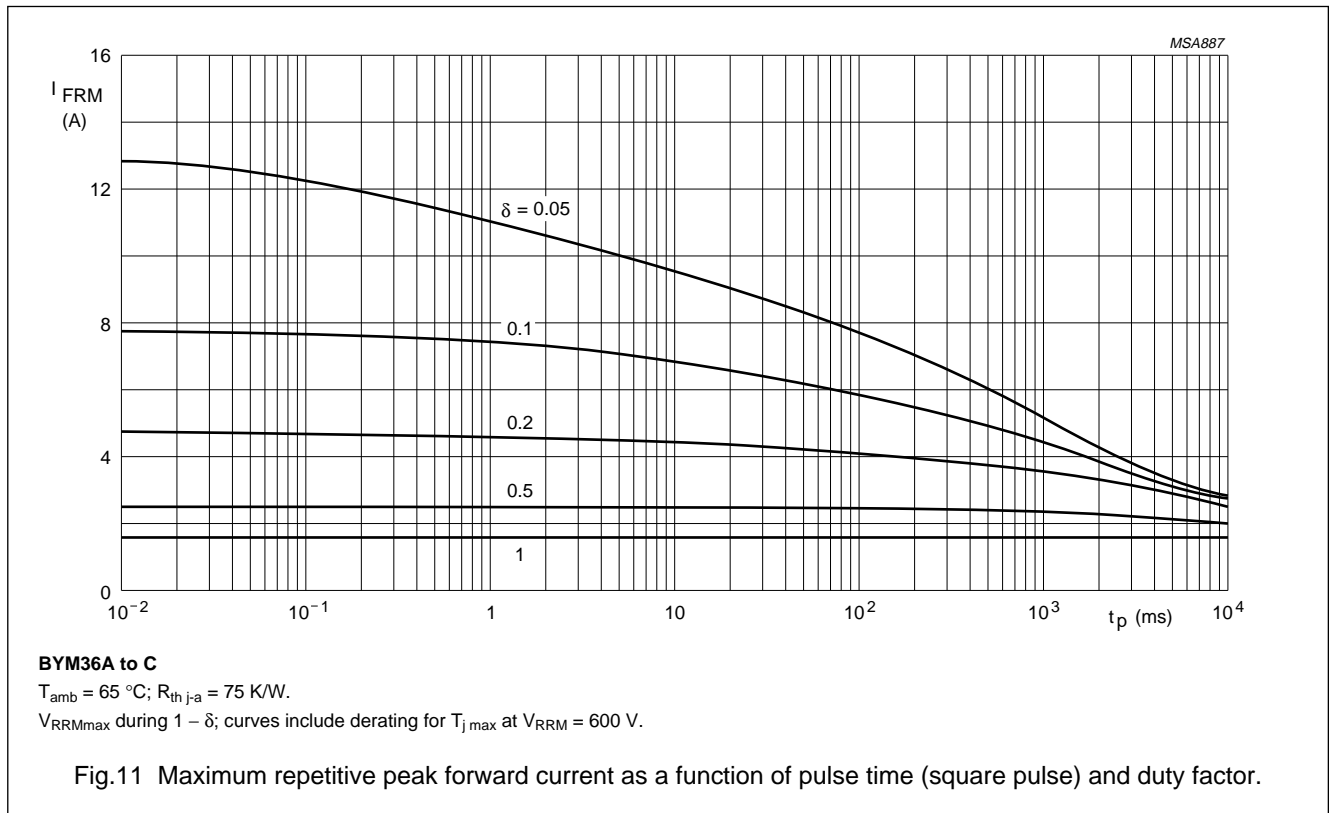
# Fast soft-recovery controlled avalanche rectifiers

## BYM36 series



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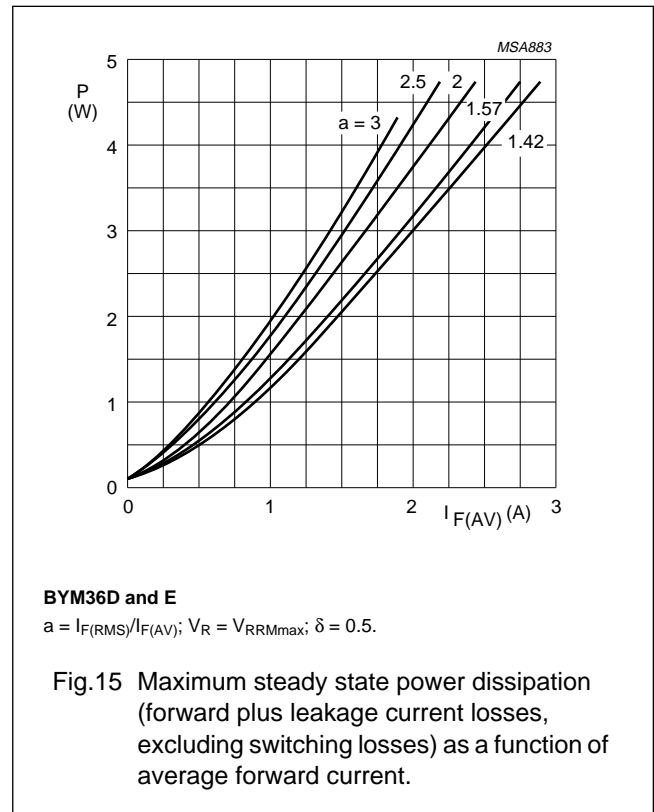
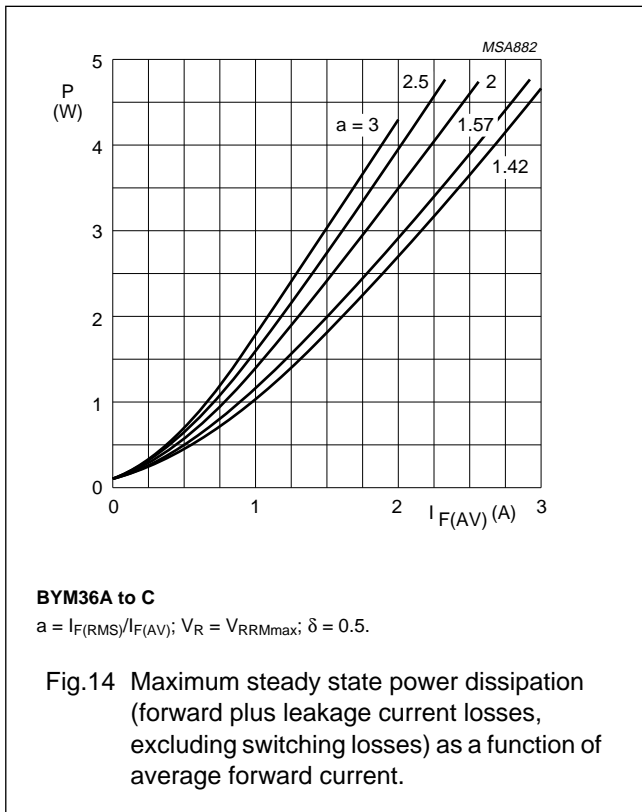
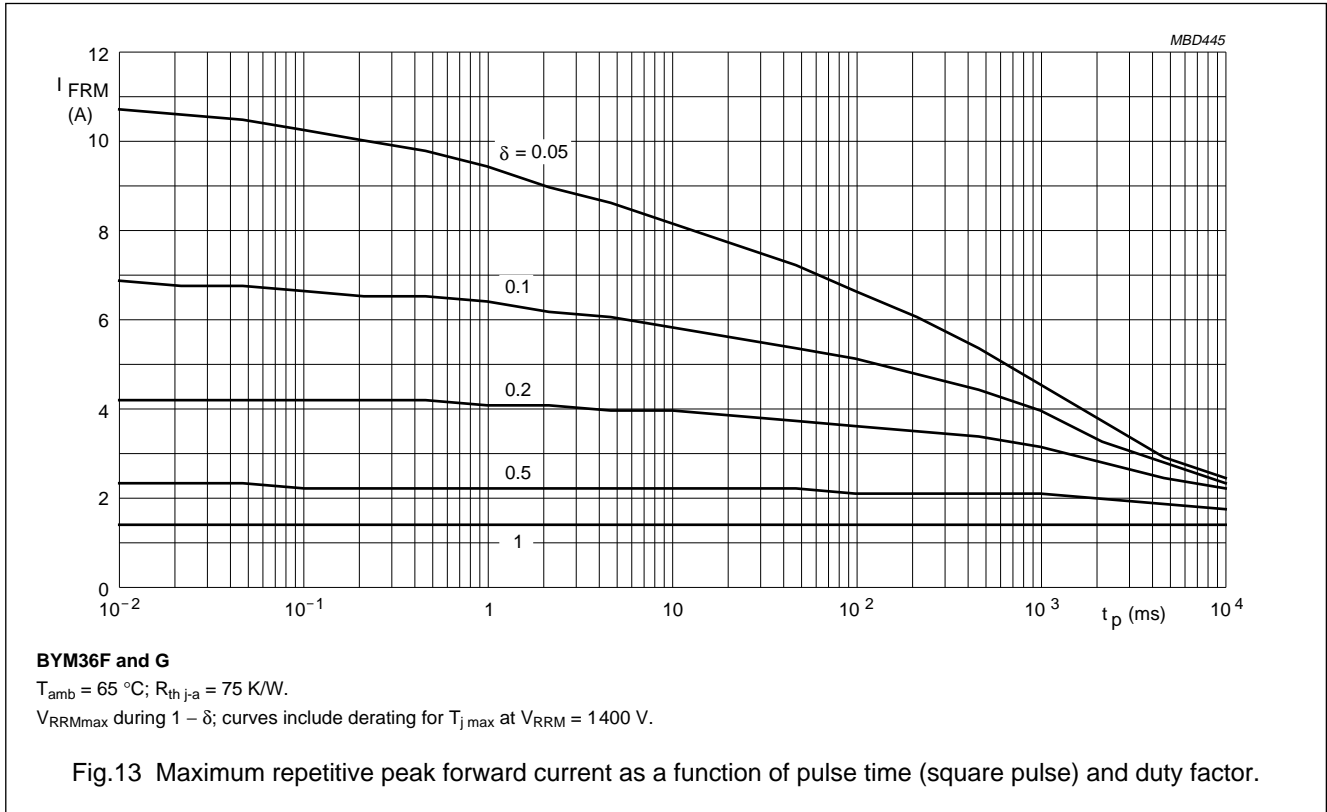
BYM36 series





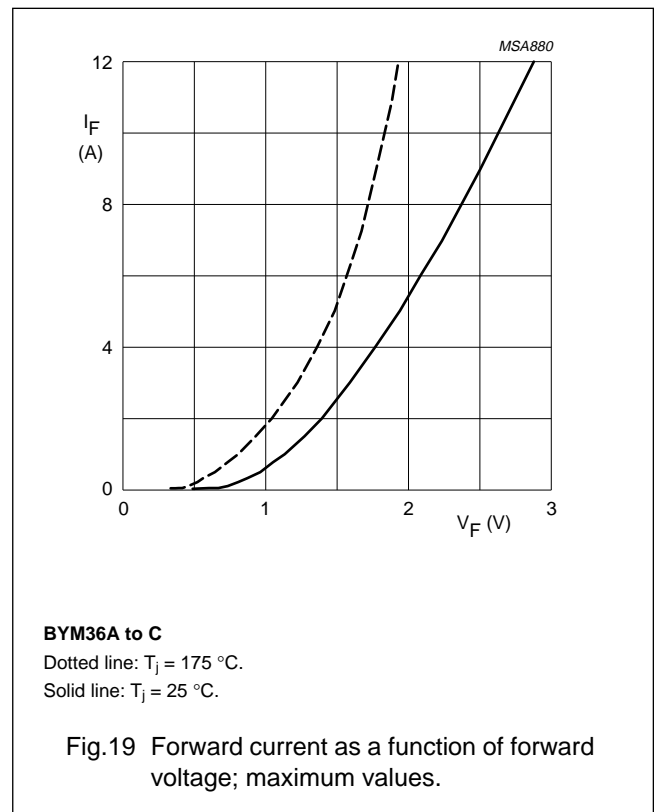
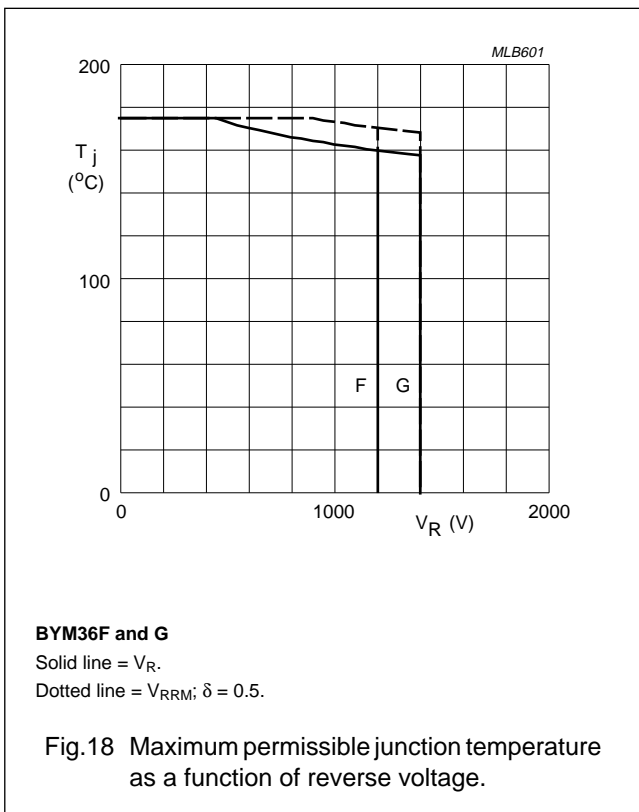
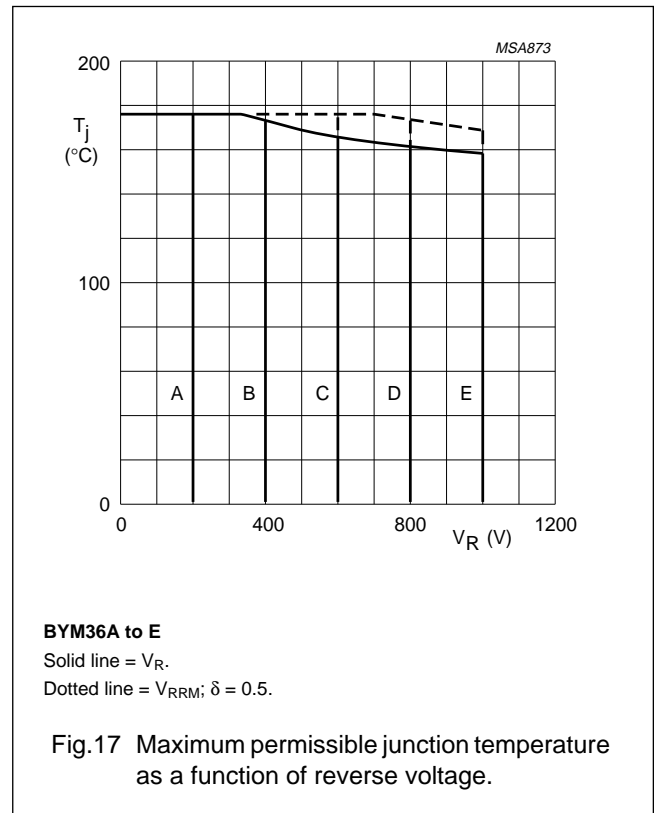
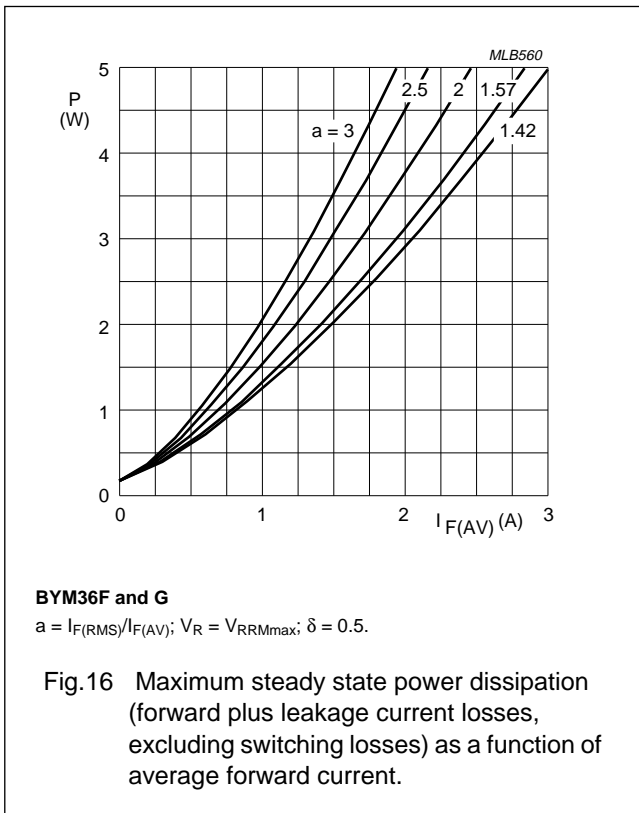
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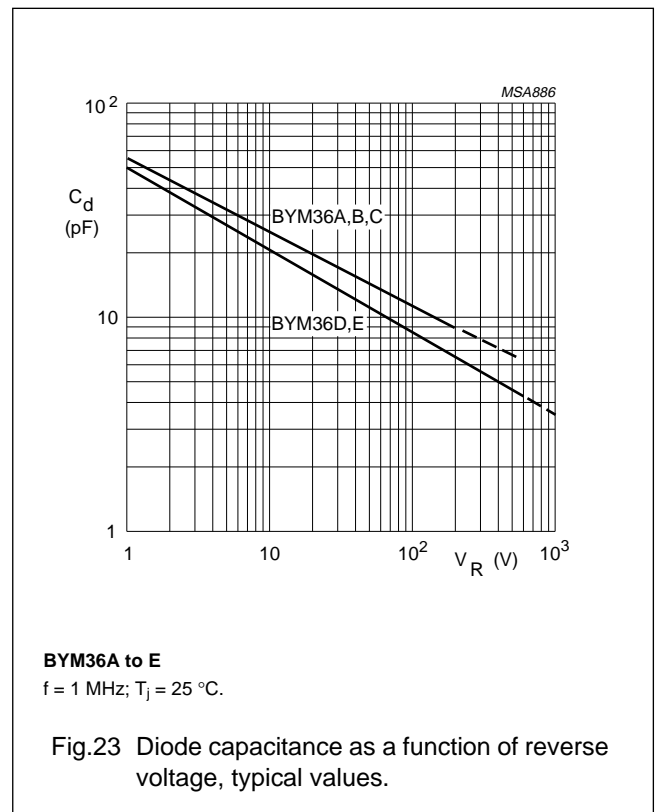
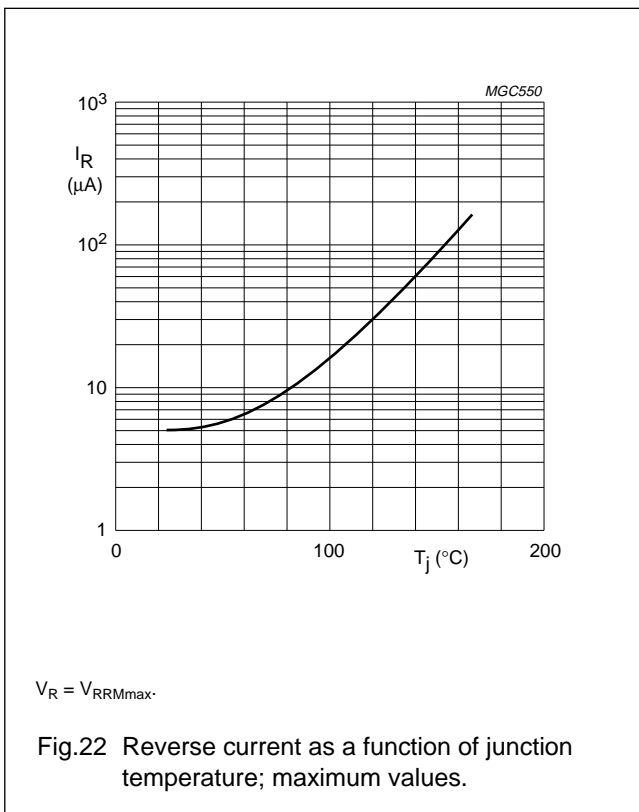
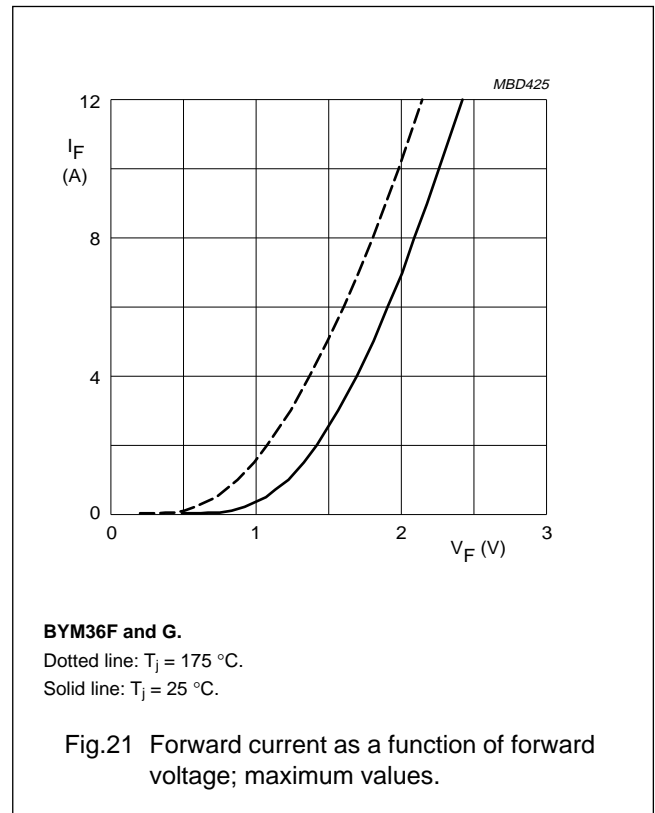
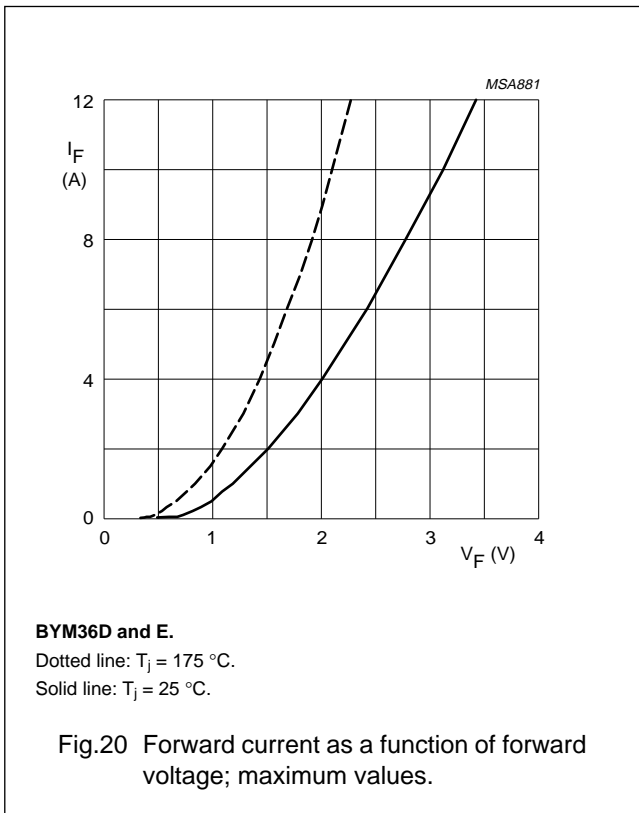
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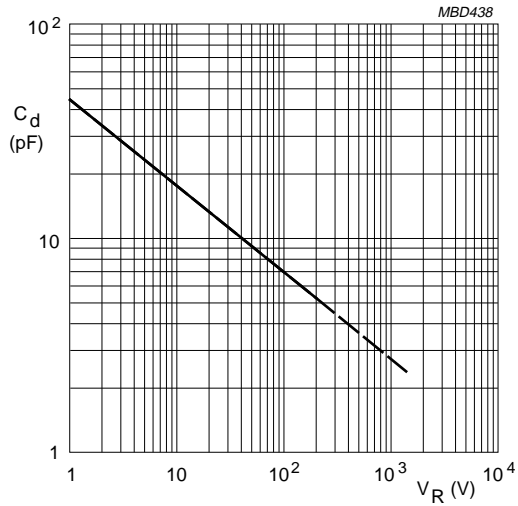
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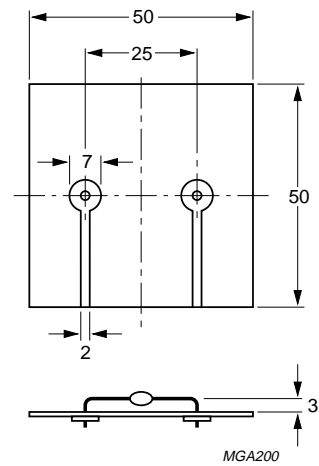
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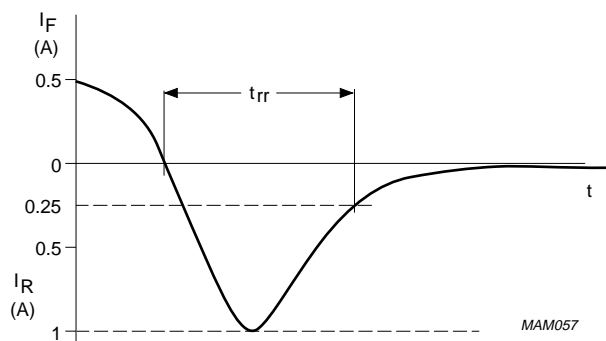
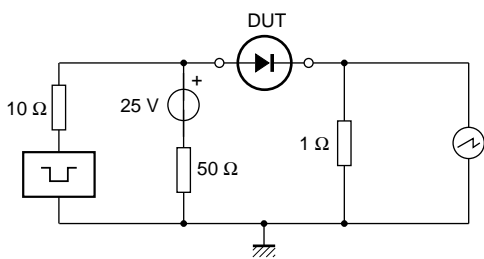
**BYM36F and G**  
 $f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

Fig.24 Diode capacitance as a function of reverse voltage, typical values.



Dimensions in mm.

Fig.25 Device mounted on a printed-circuit board.



Input impedance oscilloscope:  $1 \text{ M}\Omega, 22 \text{ pF}; t_r \leq 7 \text{ ns}.$   
 Source impedance:  $50 \text{ }\Omega; t_r \leq 15 \text{ ns}.$

Fig.26 Test circuit and reverse recovery time waveform and definition.

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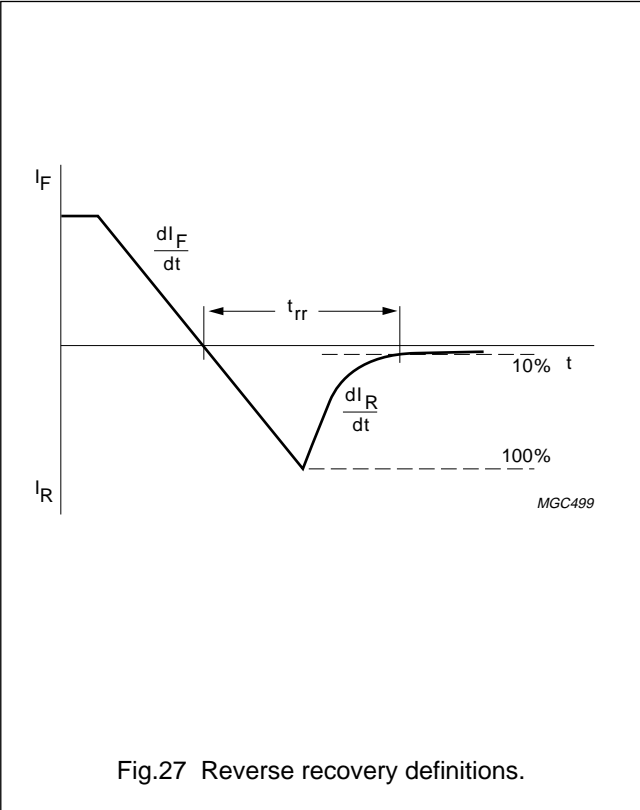
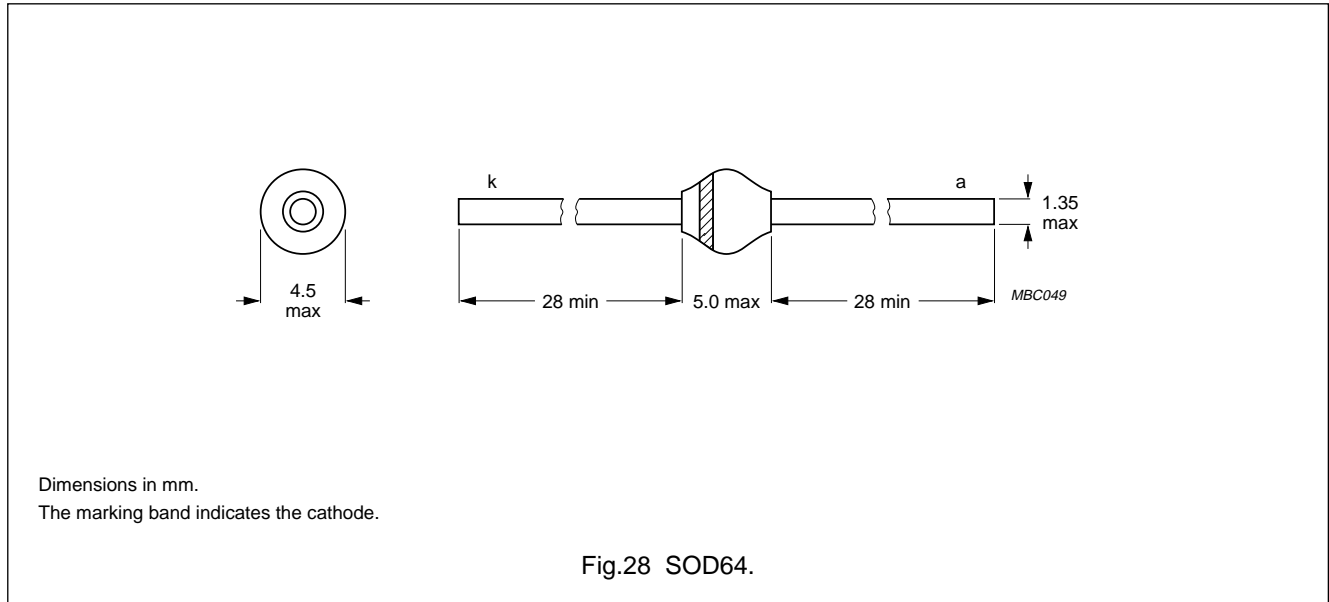


Fig.27 Reverse recovery definitions.

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PACKAGE OUTLINE



DEFINITIONS

<b>Data Sheet Status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

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.