

# Silicon Diode

## **BYM36B**

400V/3A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

## Fast soft-recovery controlled avalanche rectifiers

## BYM36 series

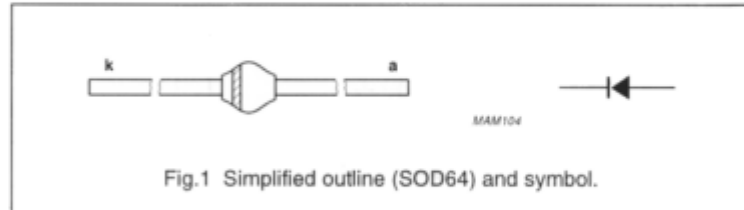
### FEATURES

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

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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			
	BYM36A to C		–	37	A
	BYM36D and E		–	33	A
	BYM36F and G		–	27	A
$I_{FRM}$	repetitive peak forward current	$T_{amb} = 65\text{ °C}$ ; see Figs 11; 12 and 13			
	BYM36A to C		–	13	A
	BYM36D and E		–	11	A
	BYM36F and G		–	10	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10\text{ ms}$ half sine wave; $T_j = T_{j\max}$ prior to surge; $V_R = V_{RRM\max}$	–	65	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	–	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	$I_F = 3\text{ A}$ ; $T_j = T_{j\max}$ ; see Figs 19; 20 and 21	–	–	1.22	V
	BYM36A to C		–	–	1.28	V
	BYM36D and E		–	–	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		–	–	1.57	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1\text{ mA}$				
	BYM36A		300	–	–	V
	BYM36B		500	–	–	V
	BYM36C		700	–	–	V
	BYM36D		900	–	–	V
	BYM36E		1100	–	–	V
	BYM36F		1300	–	–	V
	BYM36G		1500	–	–	V
$I_R$	reverse current	$V_R = V_{RRM\max}$ ; see Fig.22	–	–	5	$\mu\text{A}$
		$V_R = V_{RRM\max}$ ; $T_j = 165\text{ °C}$ ; see Fig.22	–	–	150	$\mu\text{A}$

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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		–	–	150	ns
	BYM36D and E BYM36F and G		–	–	250	ns
$C_d$	diode capacitance	$f = 1$ MHz; $V_R = 0$ V; see Figs 23 and 24	–	85	–	pF
	BYM36A to C		–	75	–	pF
	BYM36D and E BYM36F and G		–	65	–	pF
$\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		–	–	6	A/ $\mu$ s
	BYM36D and E BYM36F and G		–	–	5	A/ $\mu$ s

## 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

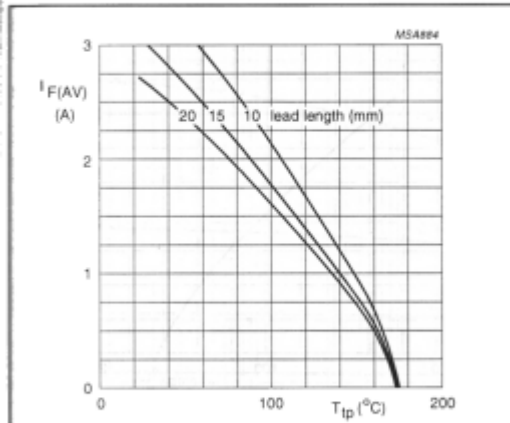
## Note

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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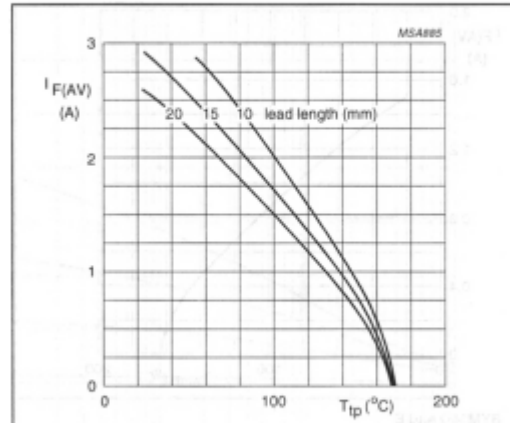
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## GRAPHICAL DATA

**BYM36A to C**

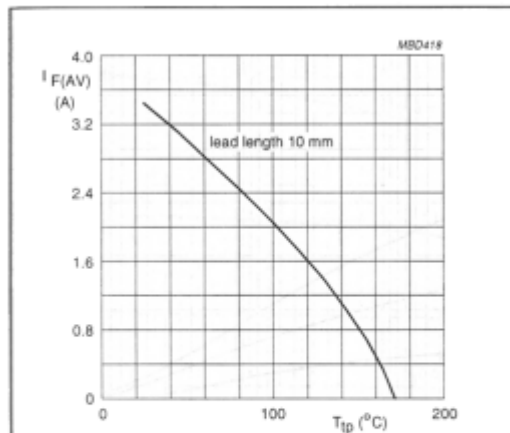
$a = 1.42$ ;  $V_R = V_{RRMmax}$ ;  $\delta = 0.5$ .  
Switched mode application.

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

**BYM36D and E**

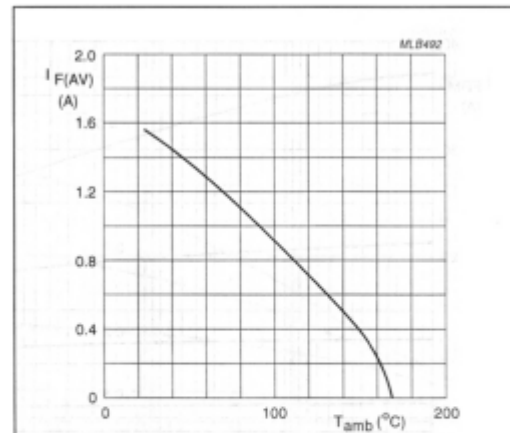
$a = 1.42$ ;  $V_R = V_{RRMmax}$ ;  $\delta = 0.5$ .  
Switched mode application.

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

**BYM36F and G**

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

Fig.4 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

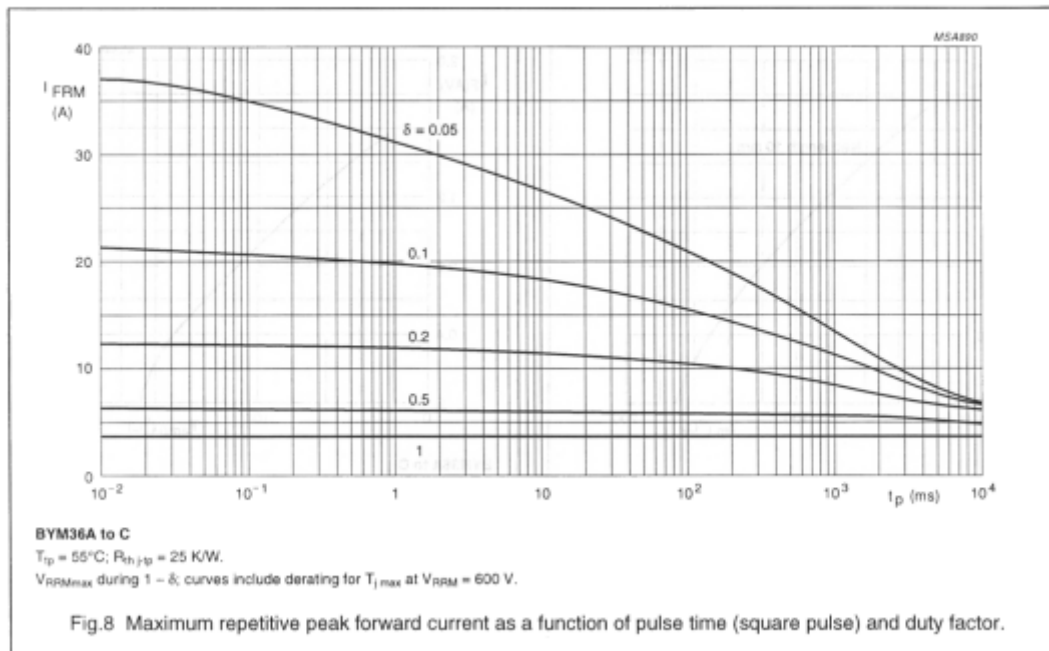
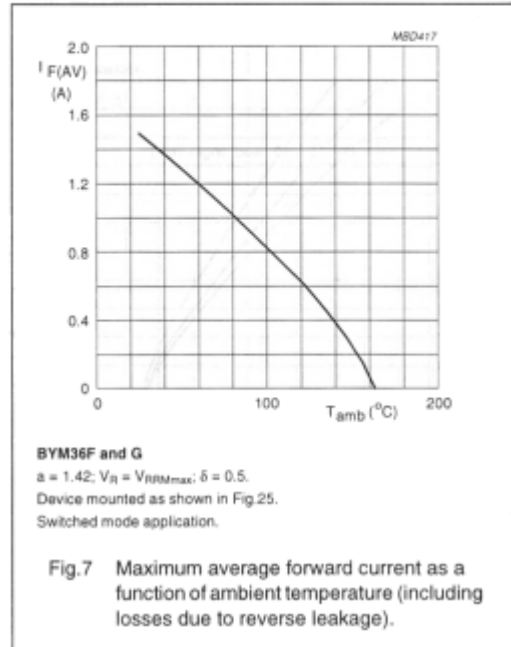
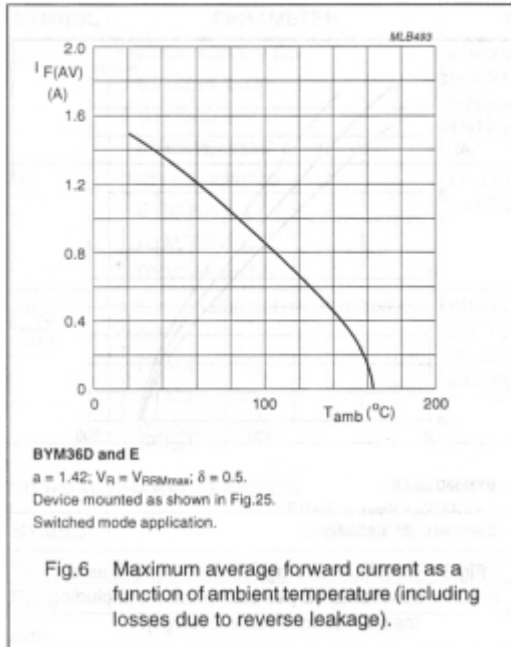
**BYM36A to C**

$a = 1.42$ ;  $V_R = V_{RRMmax}$ ;  $\delta = 0.5$ .  
Device mounted as shown in Fig.25.  
Switched mode application.

Fig.5 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).

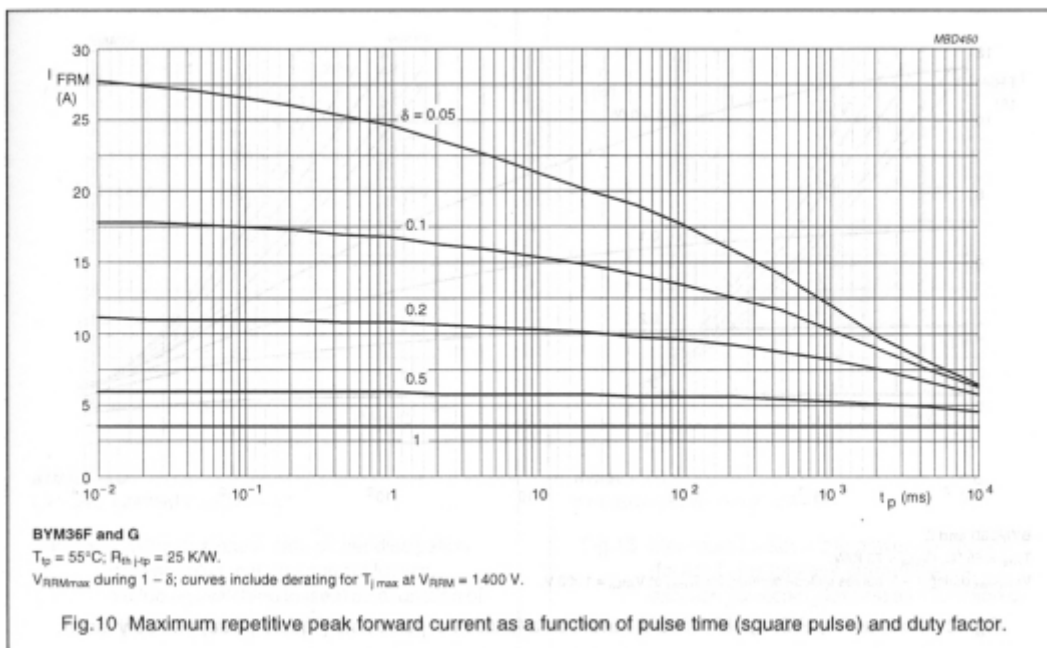
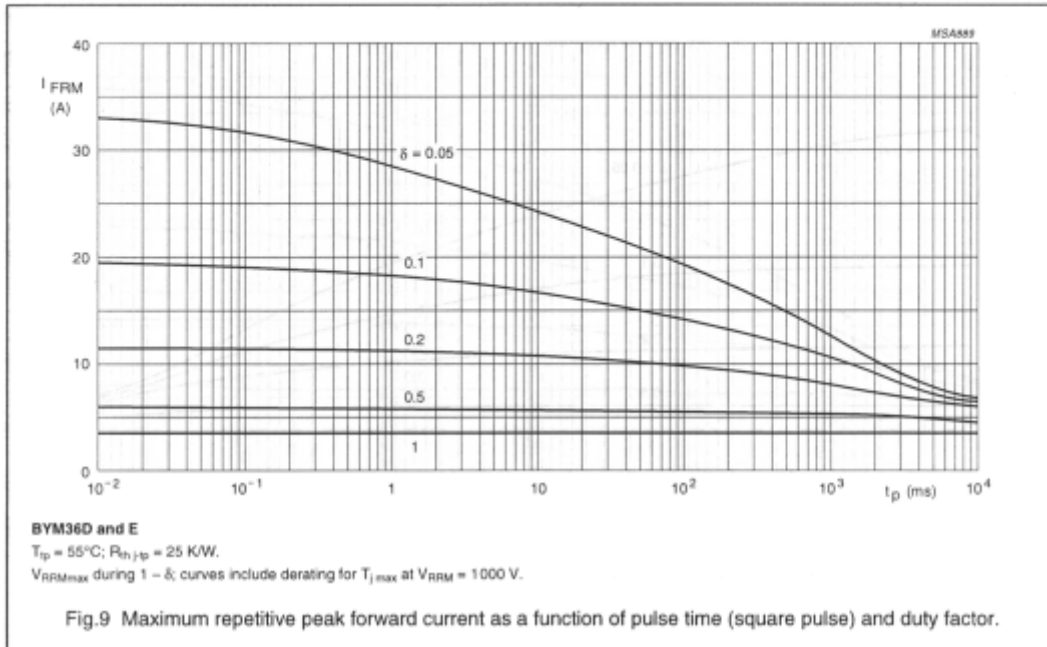
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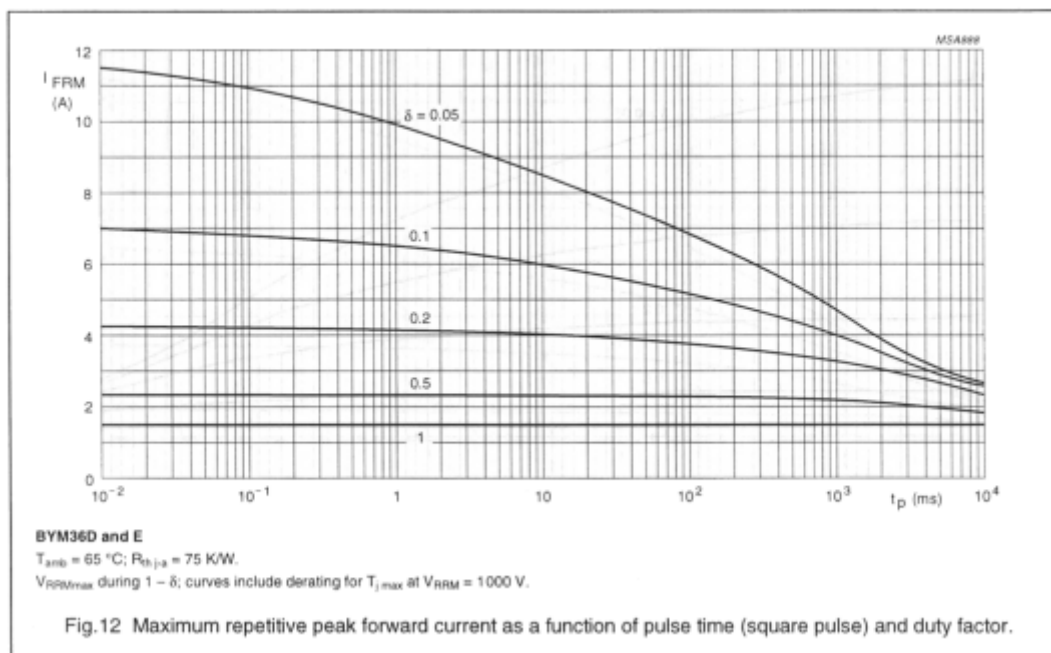
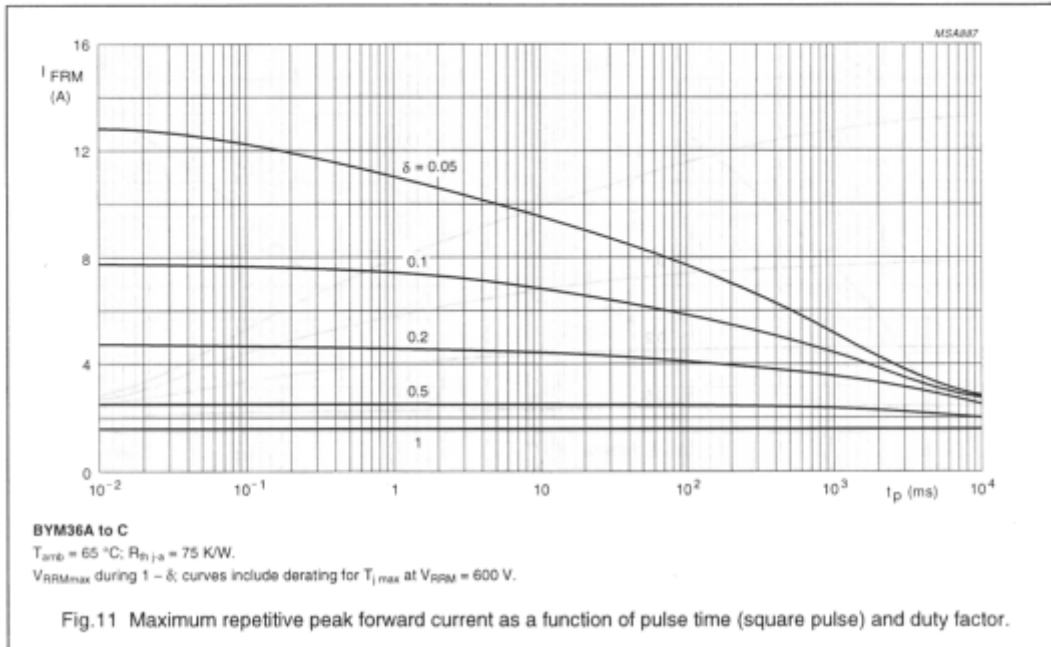
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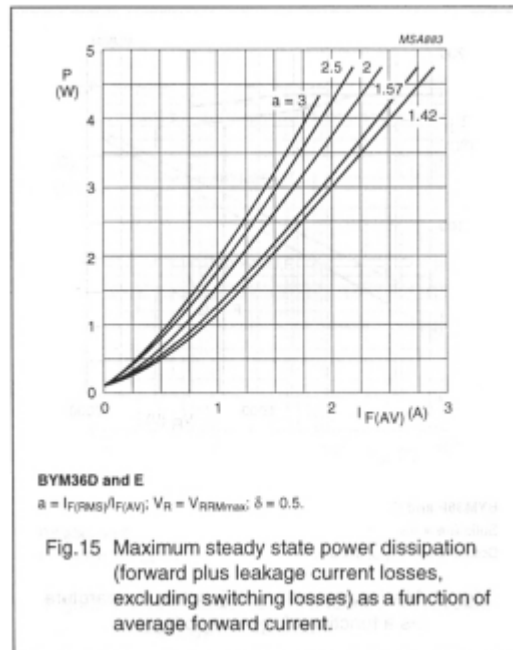
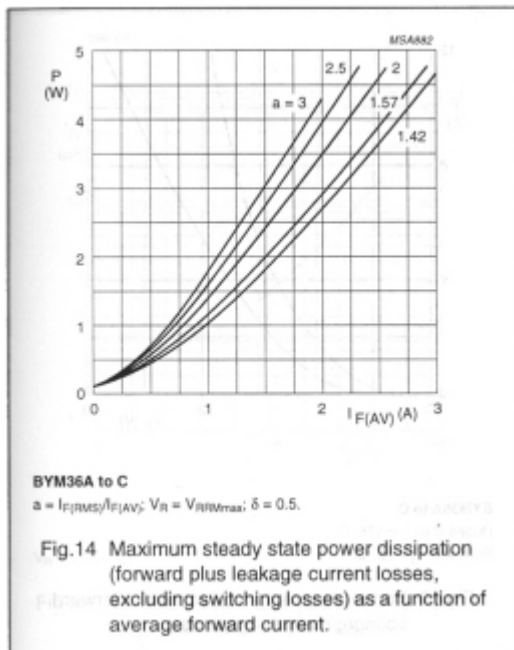
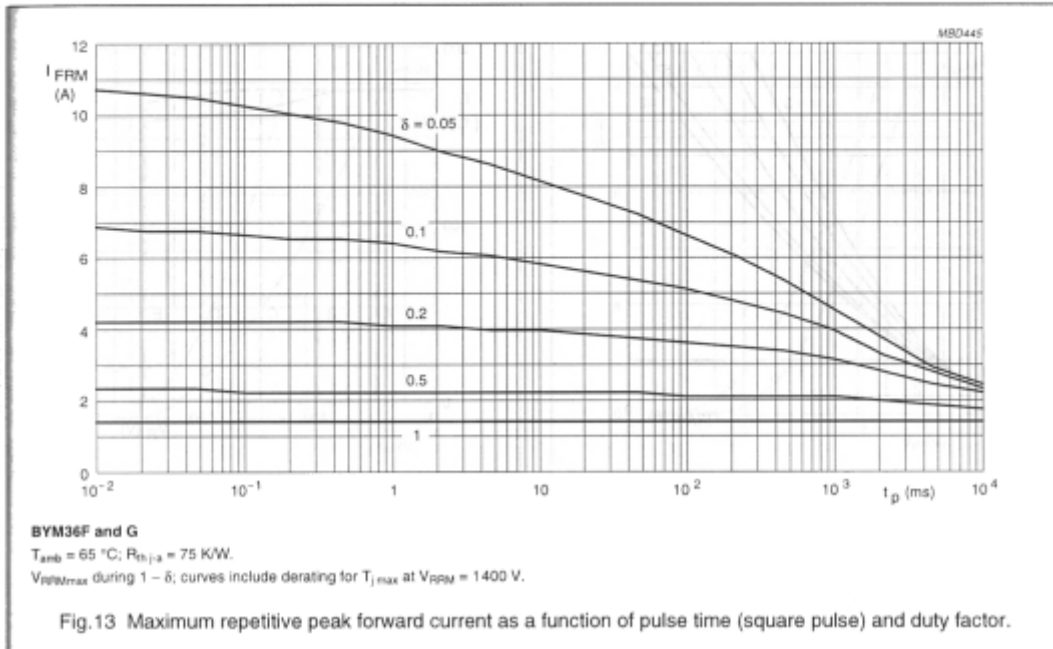
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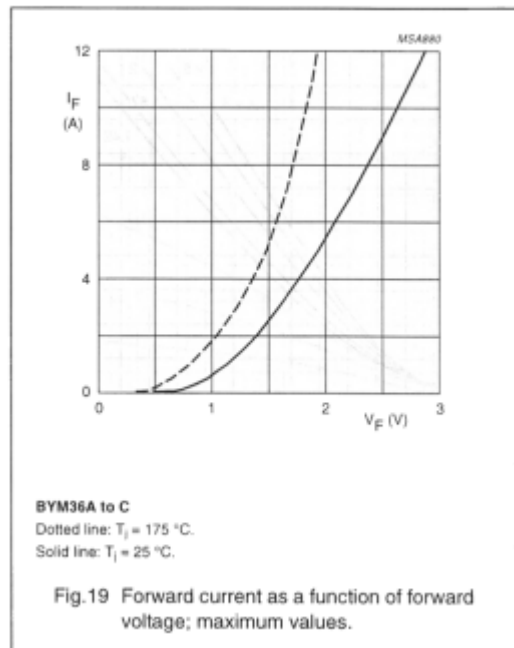
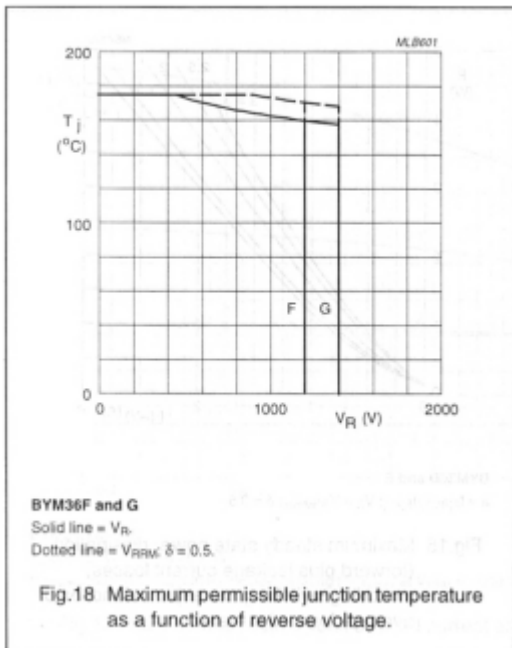
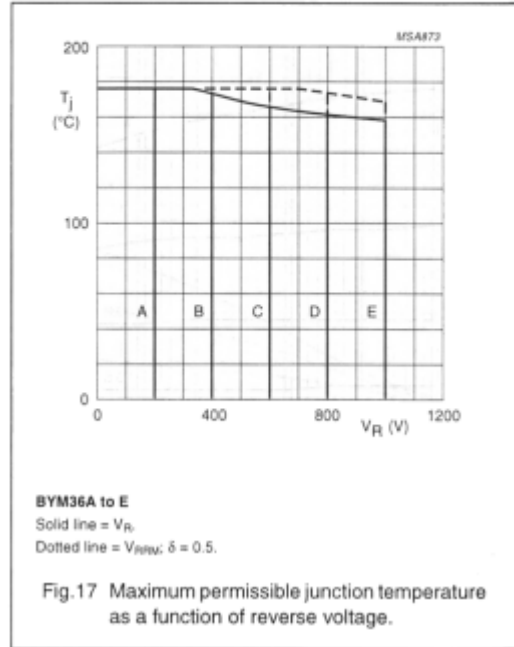
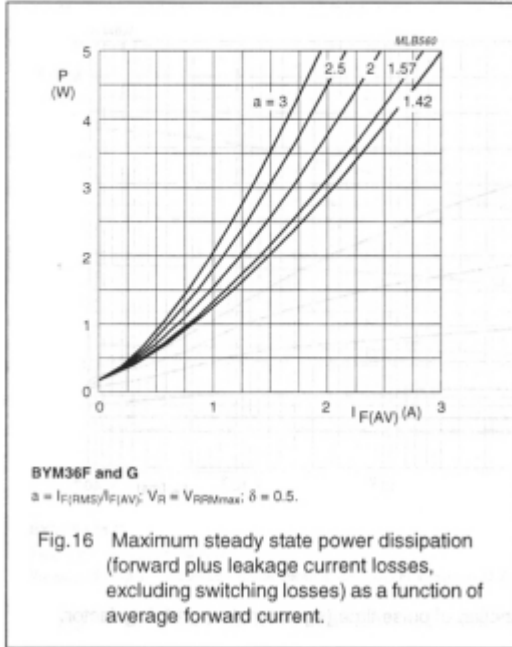
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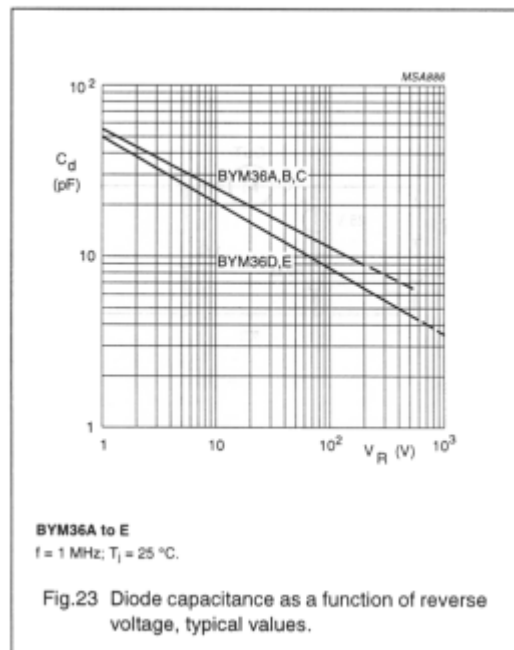
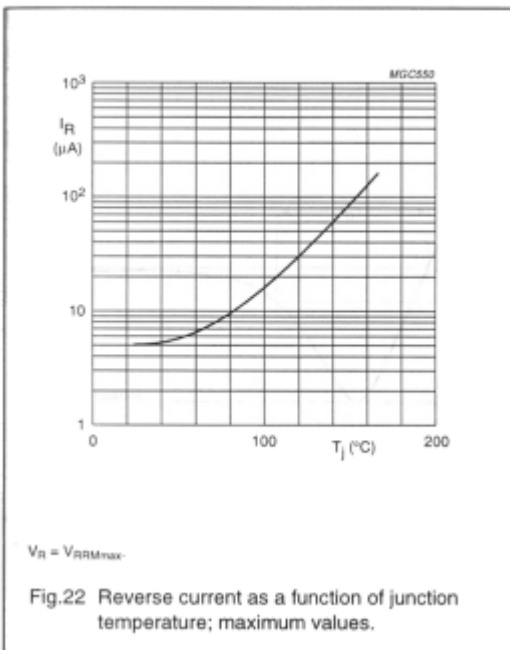
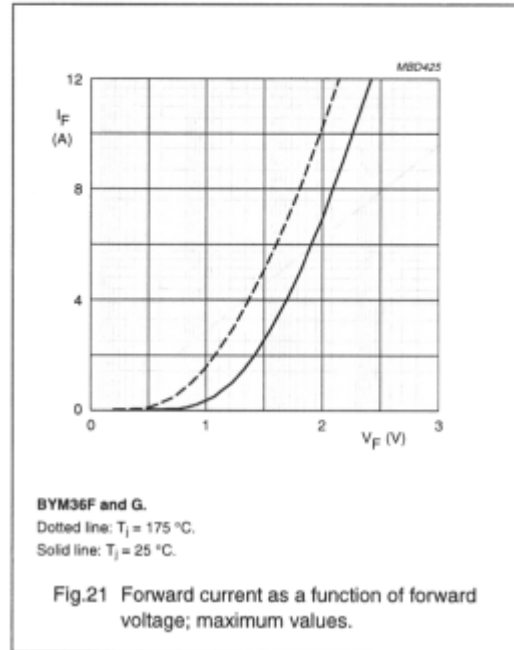
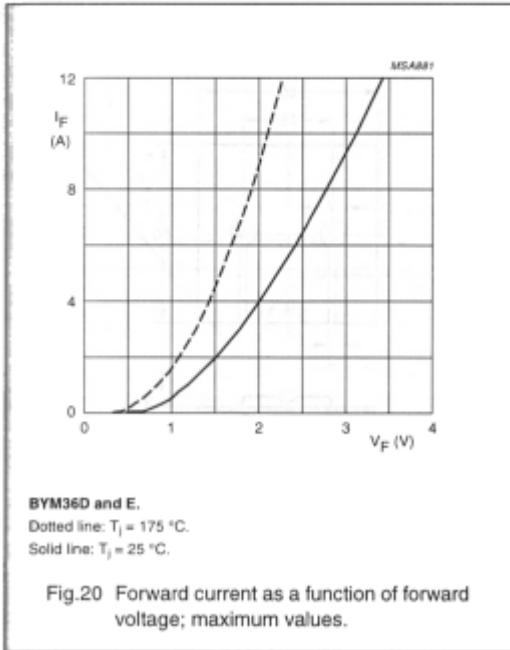
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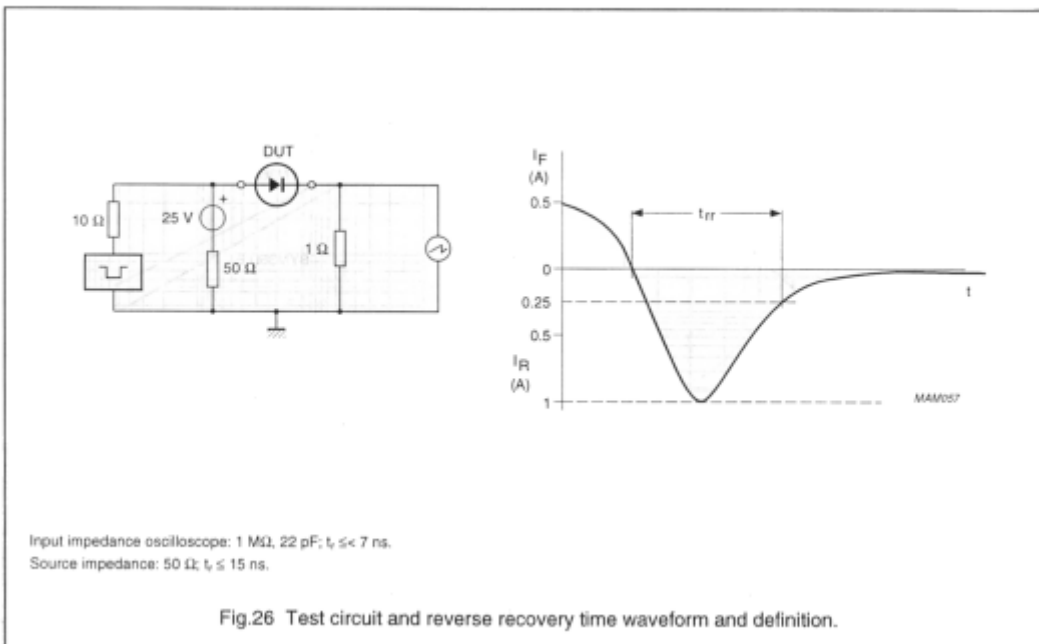
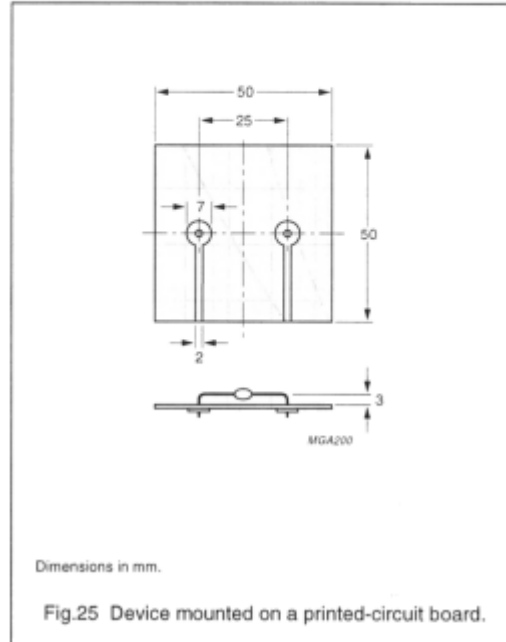
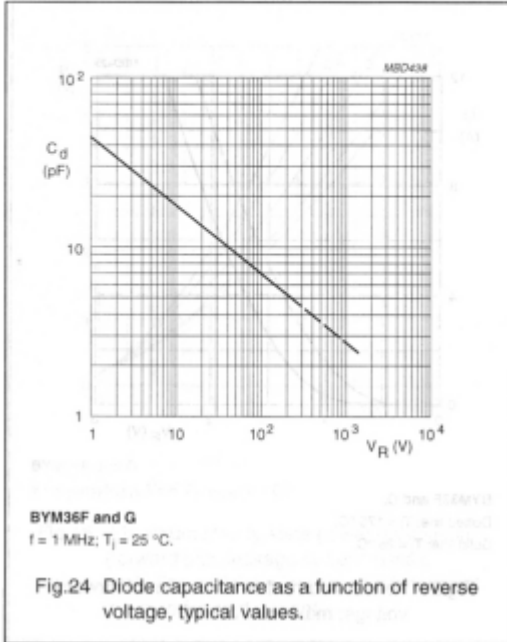
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