

# Silicon Diode

## **BYV36E**

1kV/1.5A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

## Fast soft-recovery controlled avalanche rectifiers

## BYV36 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.

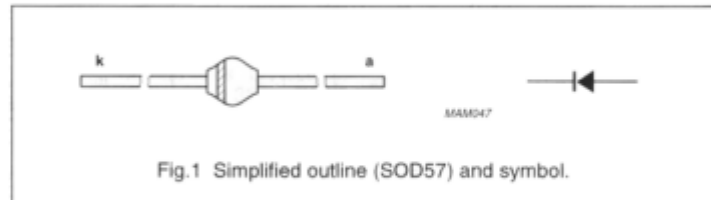


Fig.1 Simplified outline (SOD57) and symbol.

### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{RRM}$	repetitive peak reverse voltage				
	BYV36A		–	200	V
	BYV36B		–	400	V
	BYV36C		–	600	V
	BYV36D		–	800	V
	BYV36E		–	1000	V
	BYV36F BYV36G		–	1200 1400	V
$V_R$	continuous reverse voltage				
	BYV36A		–	200	V
	BYV36B		–	400	V
	BYV36C		–	600	V
	BYV36D		–	800	V
	BYV36E		–	1000	V
	BYV36F BYV36G		–	1200 1400	V
$I_{F(AV)}$	average forward current	$T_{ip} = 60\text{ }^{\circ}\text{C}$ ; lead length = 10 mm; see Figs 2; 3 and 4			
	BYV36A to C	averaged over any 20 ms period; see also Figs 14; 15 and 16	–	1.6	A
	BYV36D and E BYV36F and G		–	1.5	A
$I_{F(AV)}$	average forward current	$T_{amb} = 60\text{ }^{\circ}\text{C}$ ; PCB mounting (see Fig.25); see Figs 5; 6 and 7			
	BYV36A to C	averaged over any 20 ms period; see also Figs 14; 15 and 16	–	0.87	A
	BYV36D and E BYV36F and G		–	0.81	A

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SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{FRM}$	repetitive peak forward current	$T_{ip} = 60\text{ }^{\circ}\text{C}$ ; see Figs 8; 9 and 10	–	18	A
	BYV36A to C		–	17	A
	BYV36D and E BYV36F and G		–	15	A
$I_{FRM}$	repetitive peak forward current	$T_{amb} = 60\text{ }^{\circ}\text{C}$ ; see Figs 11; 12 and 13	–	9	A
	BYV36A to C		–	8	A
	BYV36D and E BYV36F and G		–	8	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10\text{ ms}$ half sine wave; $T_j = T_{j\text{max}}$ prior to surge; $V_R = V_{RRM\text{max}}$	–	30	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	$^{\circ}\text{C}$
$T_j$	junction temperature	see Figs 17 and 18	–65	+175	$^{\circ}\text{C}$

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 1\text{ A}$ ; $T_j = T_{j\text{max}}$ ; see Figs 19; 20 and 21	–	–	1.00	V
	BYV36A to C		–	–	1.05	V
	BYV36D and E BYV36F and G		–	–	1.05	V
$V_F$	forward voltage	$I_F = 1\text{ A}$ ; see Figs 19; 20 and 21	–	–	1.35	V
	BYV36A to C		–	–	1.45	V
	BYV36D and E BYV36F and G		–	–	1.45	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1\text{ mA}$				
	BYV36A		300	–	–	V
	BYV36B		500	–	–	V
	BYV36C		700	–	–	V
	BYV36D		900	–	–	V
	BYV36E		1100	–	–	V
	BYV36F BYV36G		1300 1500	–	–	V
$I_R$	reverse current	$V_R = V_{RRM\text{max}}$ ; see Fig.22	–	–	5	$\mu\text{A}$
		$V_R = V_{RRM\text{max}}$ ; $T_j = 165\text{ }^{\circ}\text{C}$ ; 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
	BYV36A to C		–	–	150	ns
	BYV36D and E BYV36F and G		–	–	250	ns
$C_d$	diode capacitance	$f = 1$ MHz; $V_R = 0$ V; see Figs 23 and 24	–	45	–	pF
	BYV36A to C		–	40	–	pF
	BYV36D and E BYV36F and G		–	35	–	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
	BYV36A to C		–	–	6	A/ $\mu$ s
	BYV36D and E BYV36F 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	46	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	100	K/W

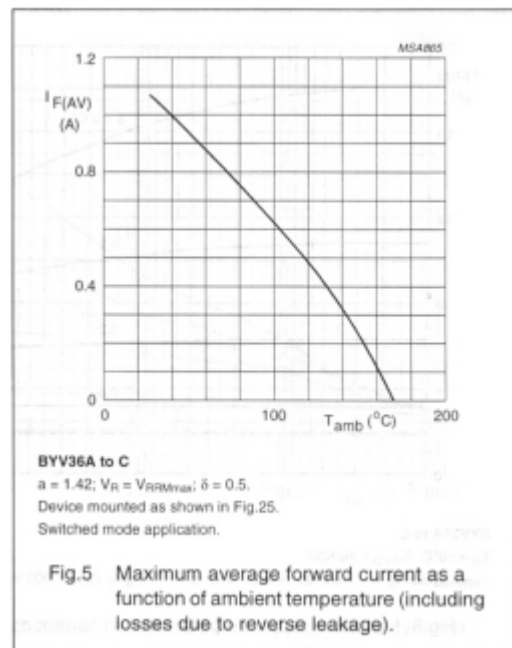
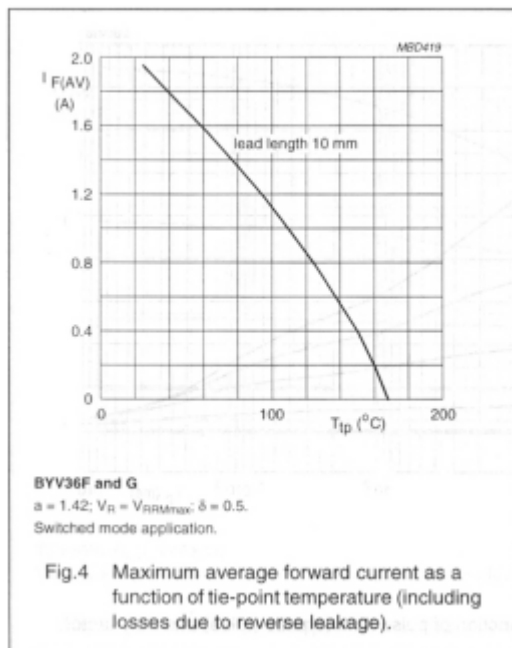
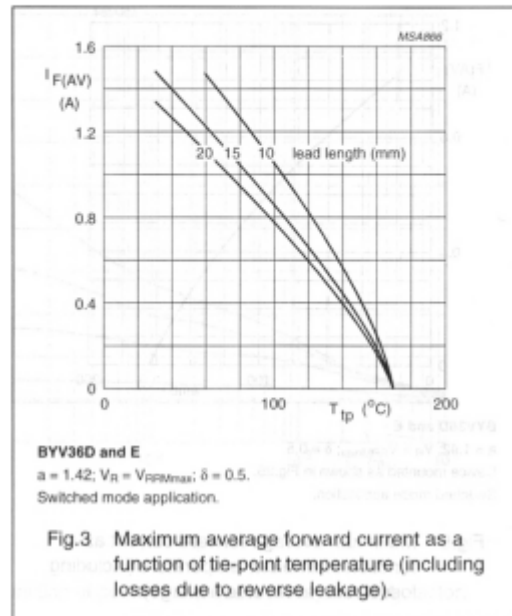
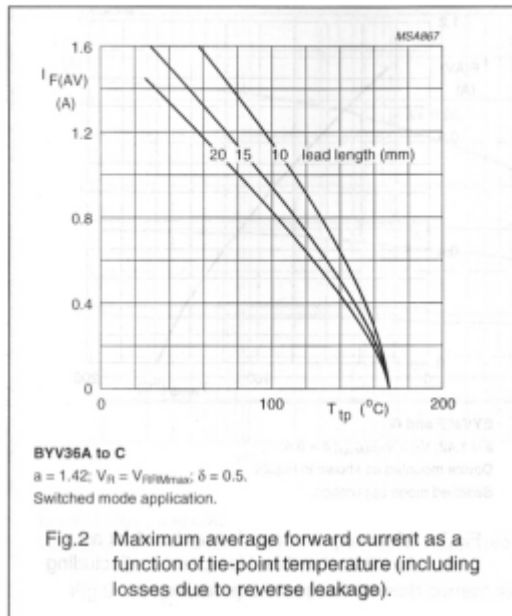
## Note

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

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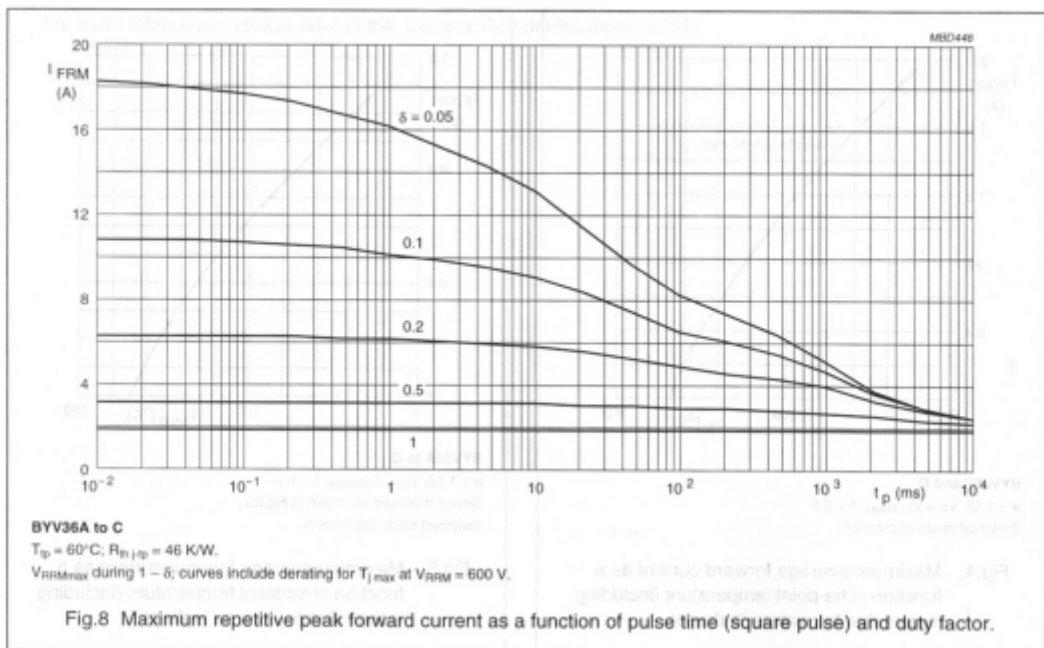
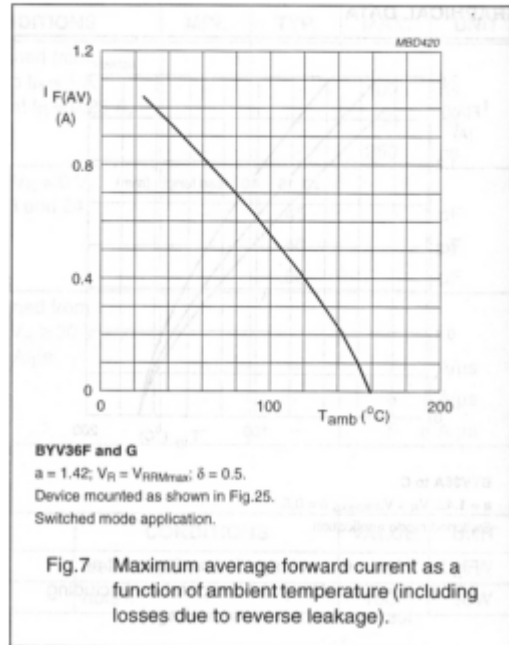
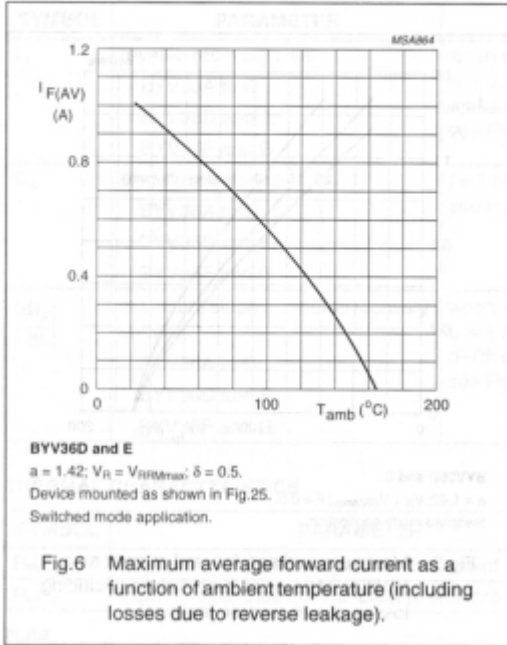
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## GRAPHICAL DATA



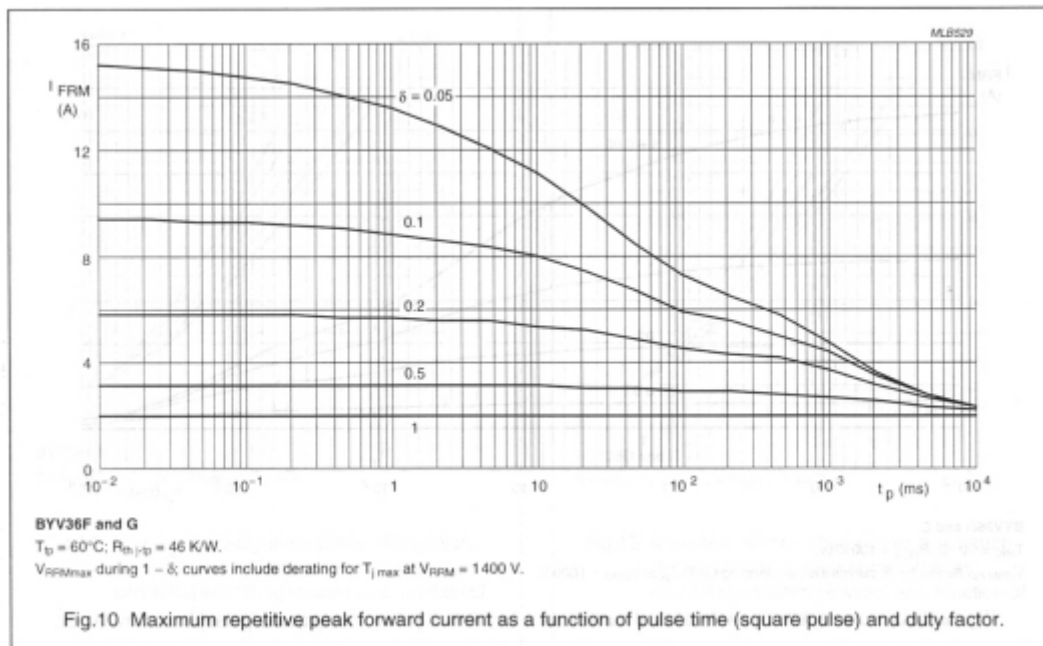
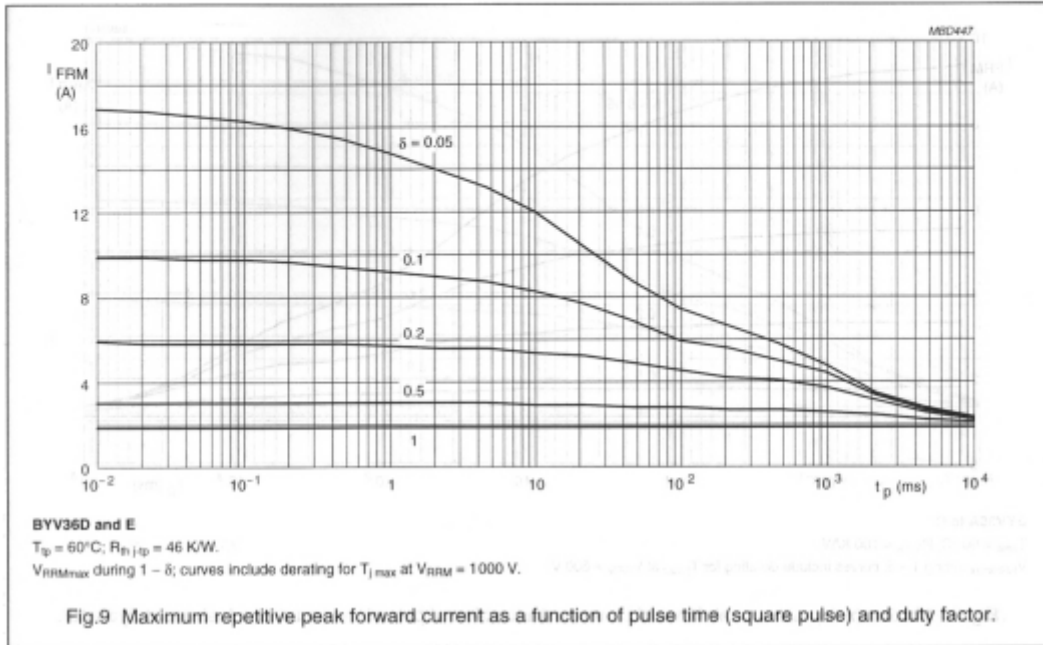
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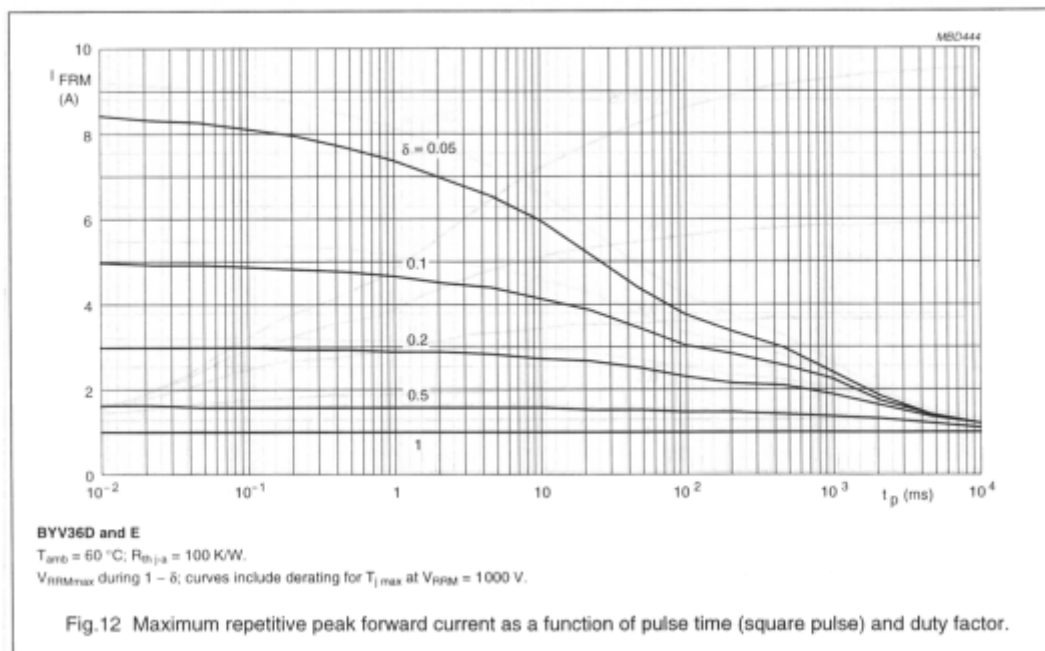
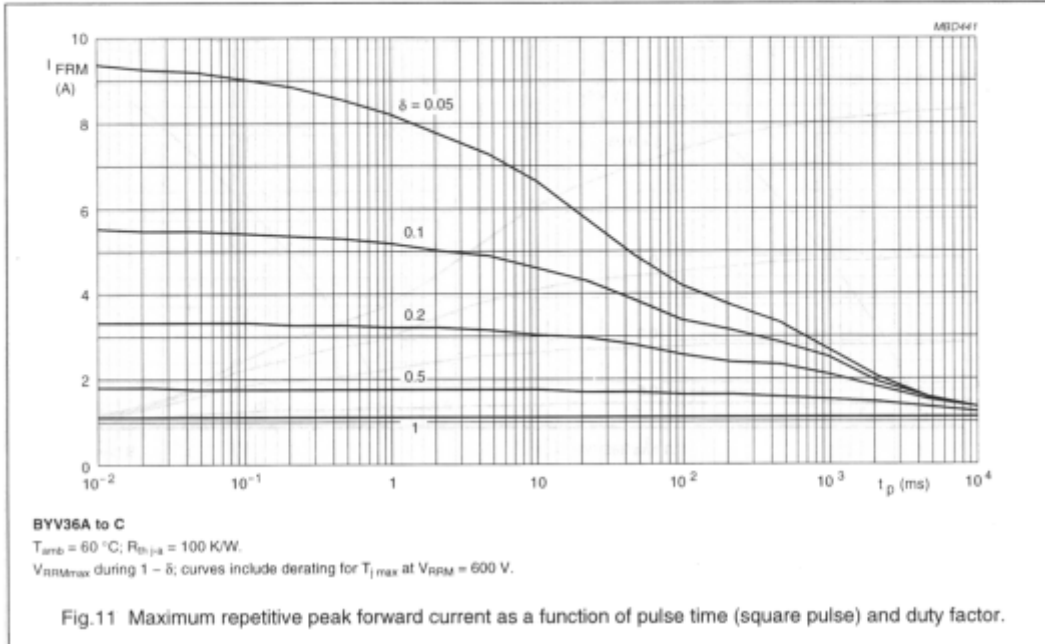
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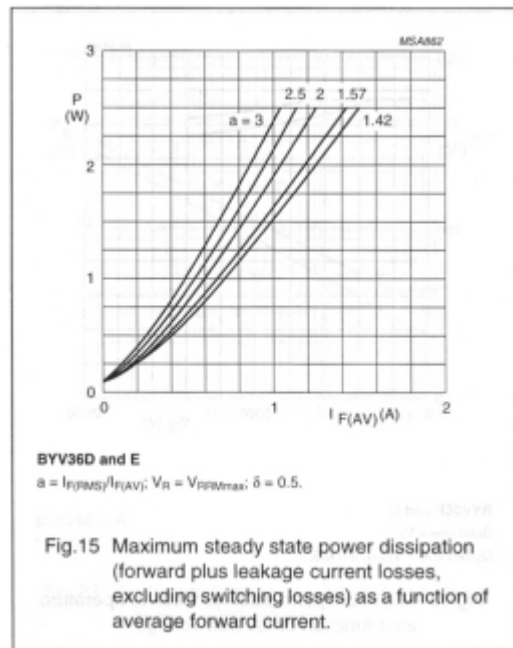
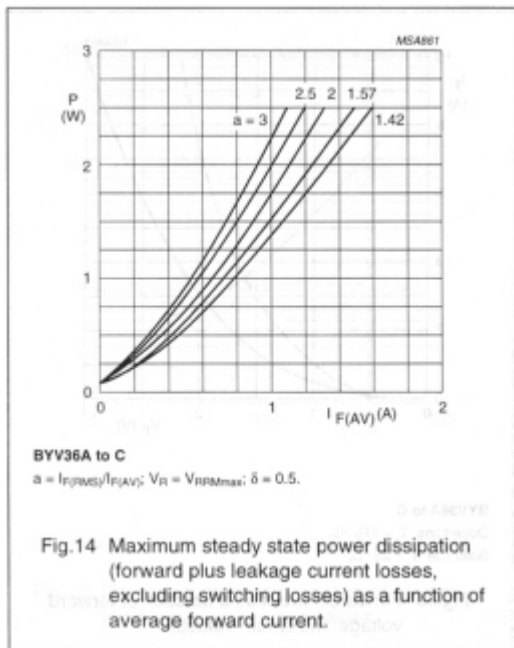
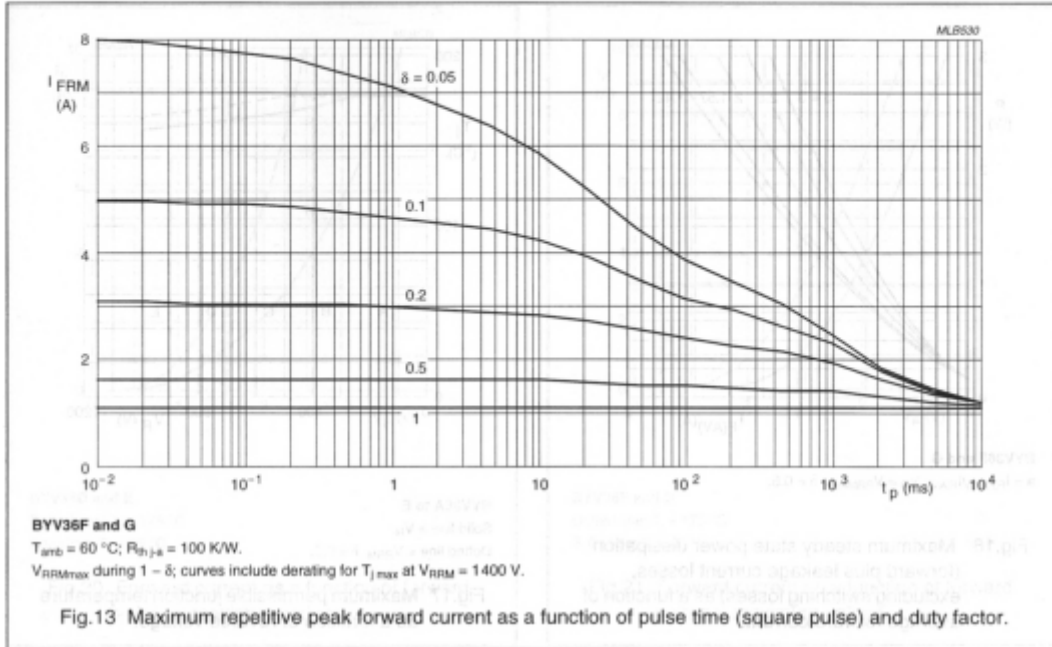
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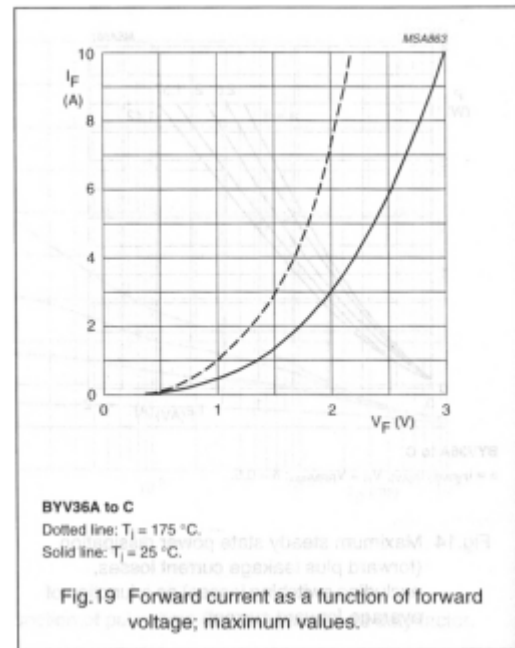
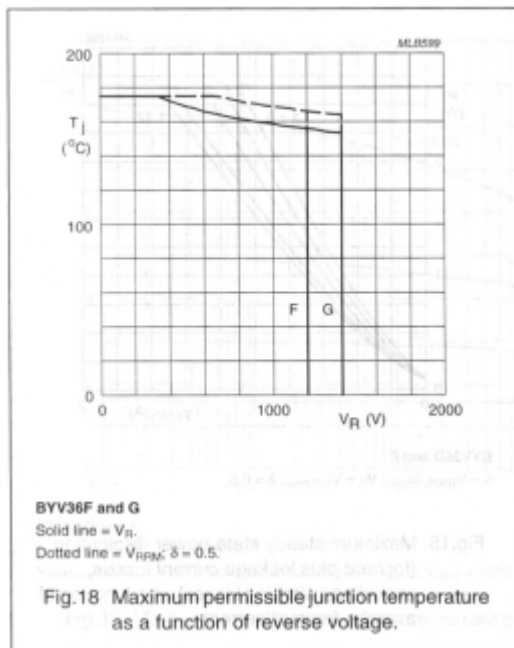
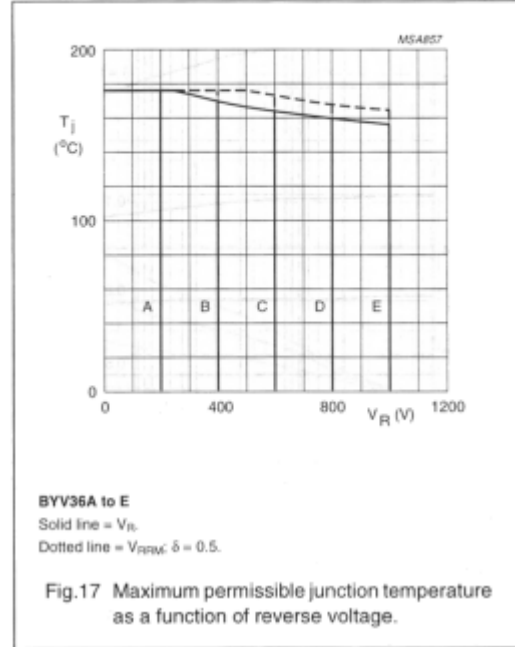
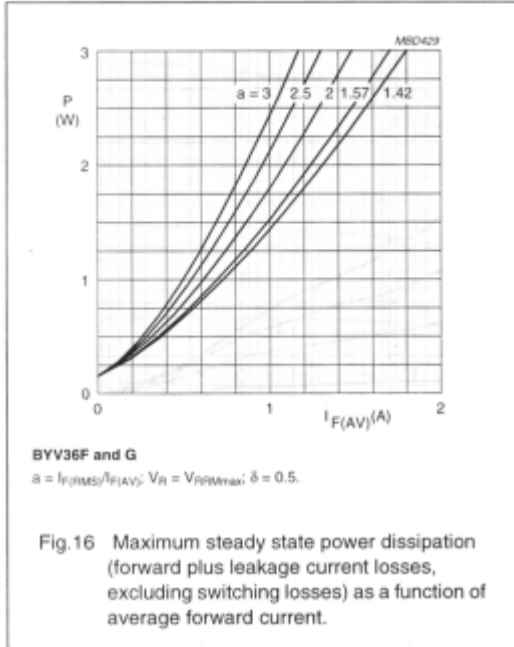
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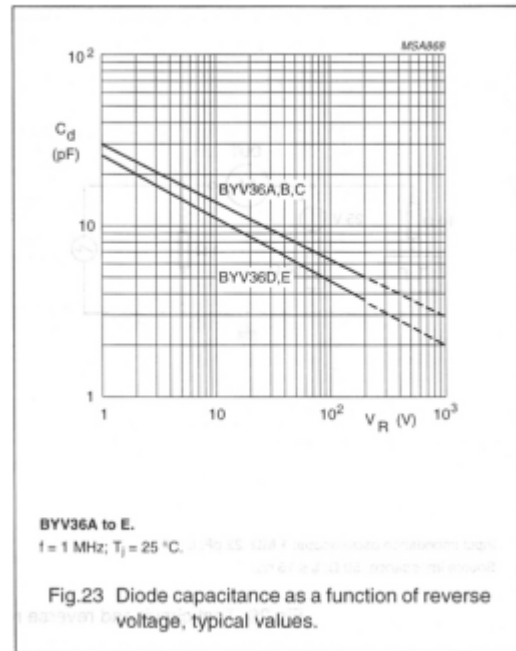
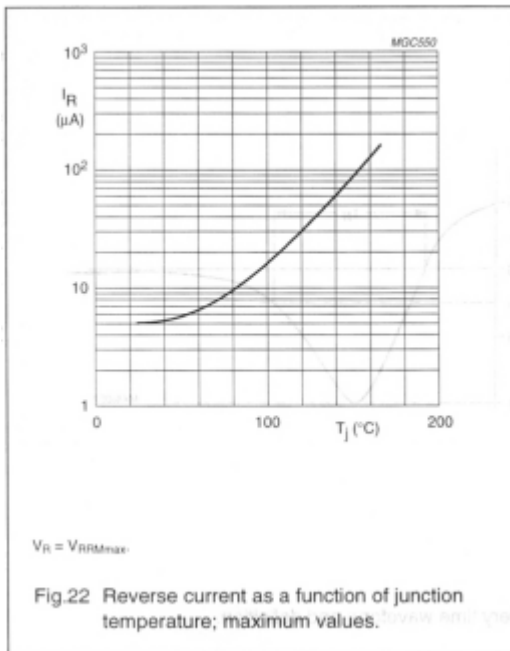
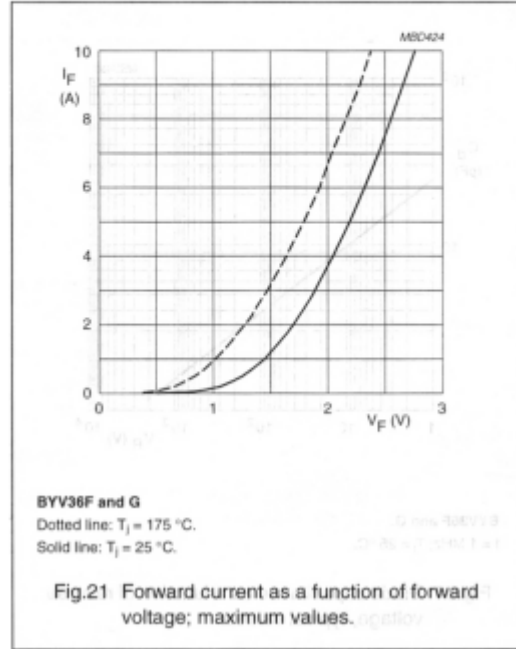
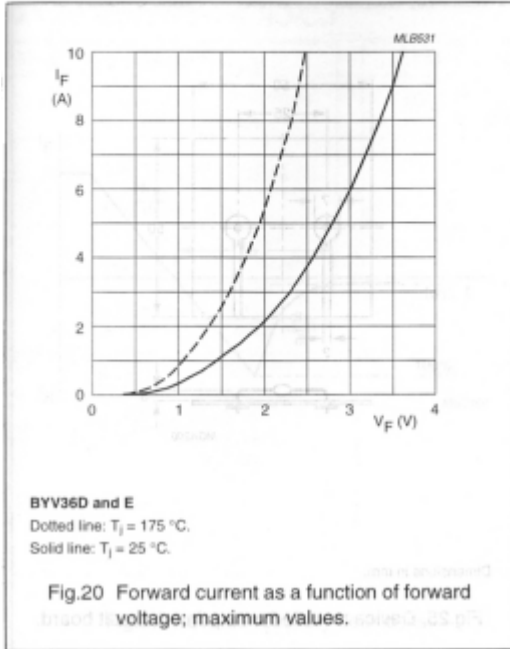
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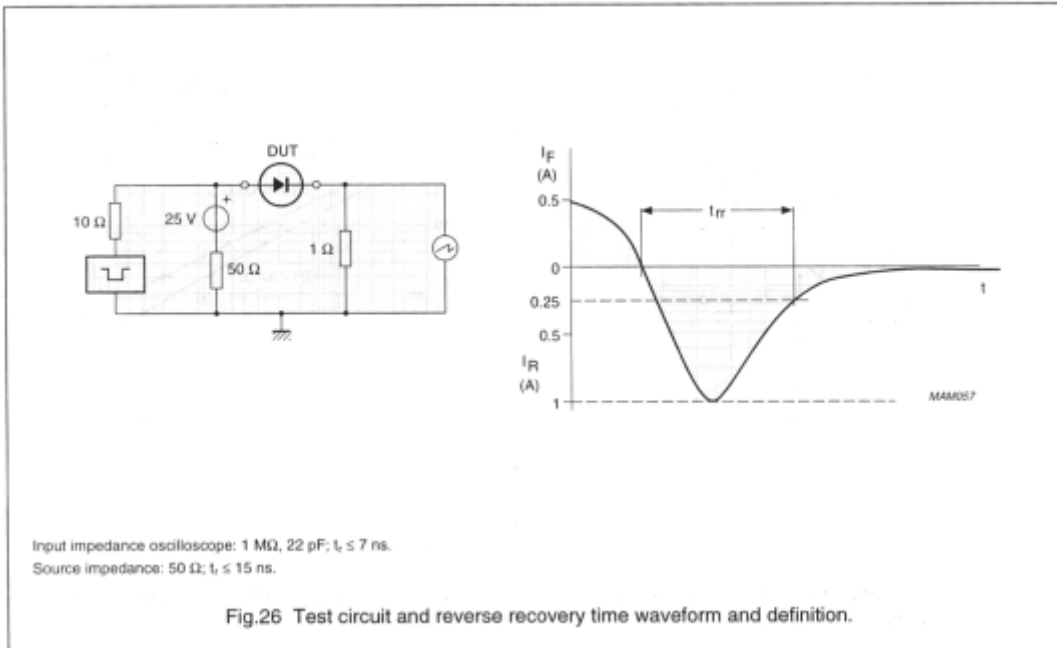
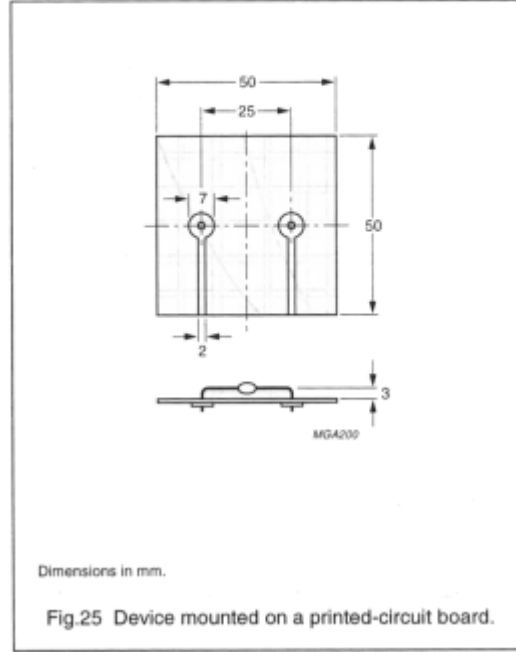
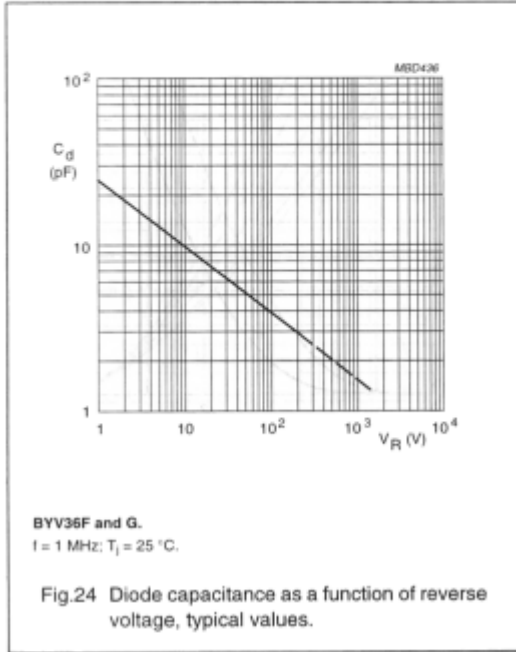
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