

# Silicon Diode

## **BYD77G**

400V/1.85A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

## Ultra fast low-loss controlled avalanche rectifiers

## BYD77 series

### FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.

### DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™(1) technology. This package is

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

(1) Implotec is a trademark of Philips.

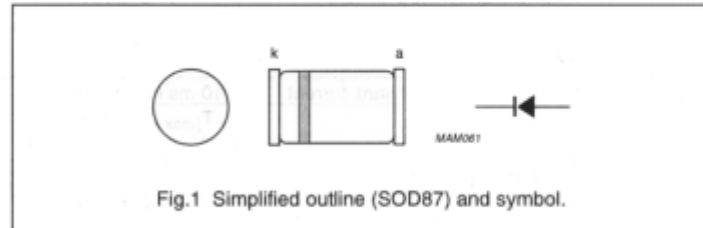


Fig.1 Simplified outline (SOD87) and symbol.

### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{RRM}$	repetitive peak reverse voltage				
	BYD77A		–	50	V
	BYD77B		–	100	V
	BYD77C		–	150	V
	BYD77D		–	200	V
	BYD77E		–	250	V
	BYD77F		–	300	V
	BYD77G		–	400	V
$V_R$	continuous reverse voltage				
	BYD77A		–	50	V
	BYD77B		–	100	V
	BYD77C		–	150	V
	BYD77D		–	200	V
	BYD77E		–	250	V
	BYD77F		–	300	V
	BYD77G		–	400	V
$I_{F(AV)}$	average forward current	$T_{ip} = 105\text{ °C}$ ; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11	–	2.00	A
	BYD77A to D		–	1.85	A
$I_{F(AV)}$	average forward current	$T_{amb} = 60\text{ °C}$ ; PCB mounting (see Fig.16); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11	–	0.85	A
	BYD77A to D		–	0.80	A
	BYD77E to G				

Ultra fast low-loss  
controlled avalanche rectifiers

## BYD77 series

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{FRM}$	repetitive peak forward current BYD77A to D BYD77E to G	$T_{tp} = 105\text{ °C}$ ; see Figs 6 and 7	–	15 13	A
$I_{FRM}$	repetitive peak forward current BYD77A to D BYD77E to G	$T_{amb} = 60\text{ °C}$ ; see Figs 8 and 9	–	8.5 8.0	A
$I_{FSM}$	non-repetitive peak forward current	$t = 10\text{ ms}$ half sine wave; $T_j = T_{jmax}$ prior to surge; $V_R = V_{RRMmax}$	–	25	A
$E_{RSM}$	non-repetitive peak reverse avalanche energy	$L = 120\text{ mH}$ ; $T_j = 25\text{ °C}$ prior to surge; inductive load switched off	–	10	mJ
$T_{stg}$	storage temperature		–65	+175	°C
$T_j$	junction temperature		–65	+175	°C

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	forward voltage BYD77A to D BYD77E to G	$I_F = 1\text{ A}$ ; $T_j = T_{jmax}$ ; see Figs 12 and 13	–	–	0.75 0.83	V
$V_F$	forward voltage BYD77A to D BYD77E to G	$I_F = 1\text{ A}$ ; see Figs 12 and 13	–	–	0.98 1.05	V
$V_{(BR)R}$	reverse avalanche breakdown voltage BYD77A BYD77B BYD77C BYD77D BYD77E BYD77F BYD77G	$I_R = 0.1\text{ mA}$	55 110 165 220 275 330 440	– – – – – – –	– – – – – – –	V
$I_R$	reverse current	$V_R = V_{RRMmax}$ ; see Fig.14	–	–	1	$\mu\text{A}$
		$V_R = V_{RRMmax}$ ; $T_j = 165\text{ °C}$ ; see Fig.14	–	–	100	$\mu\text{A}$
$t_{rr}$	reverse recovery time BYD77A to D BYD77E to G	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.18	–	–	25 50	ns

---

 Ultra fast low-loss  
 controlled avalanche rectifiers
 

---

BYD77 series

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$C_d$	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V};$ see Fig.15	-	50	-	pF
	BYD77A to D					
	BYD77E to G		-	40	-	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.17	-	-	4	A/ $\mu\text{s}$
	BYD77A to D					
	BYD77E to G		-	-	5	A/ $\mu\text{s}$

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	150	K/W

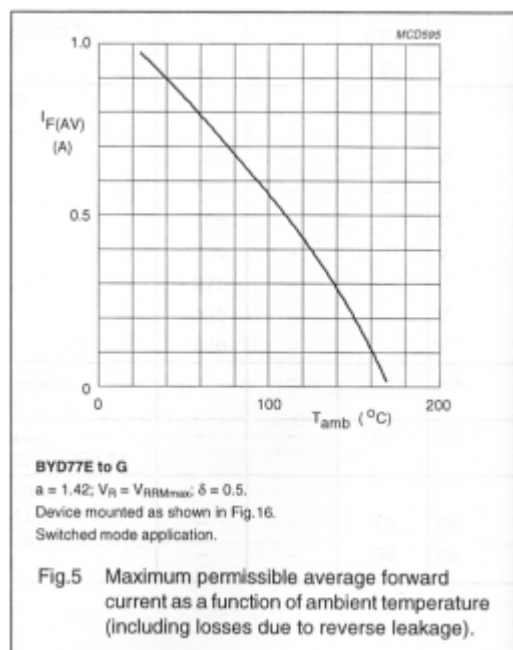
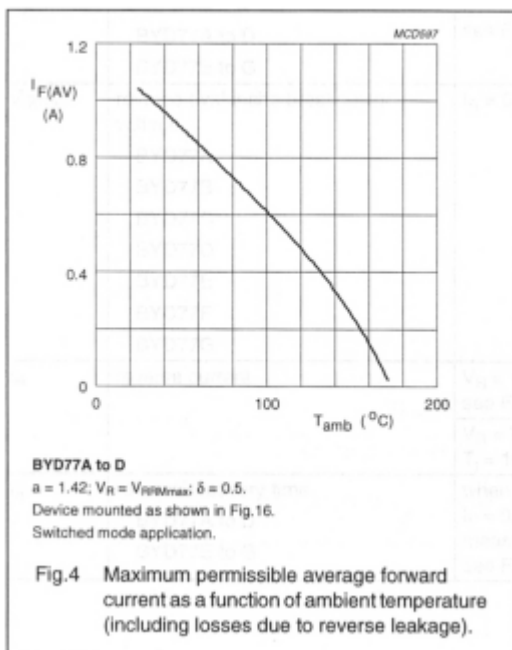
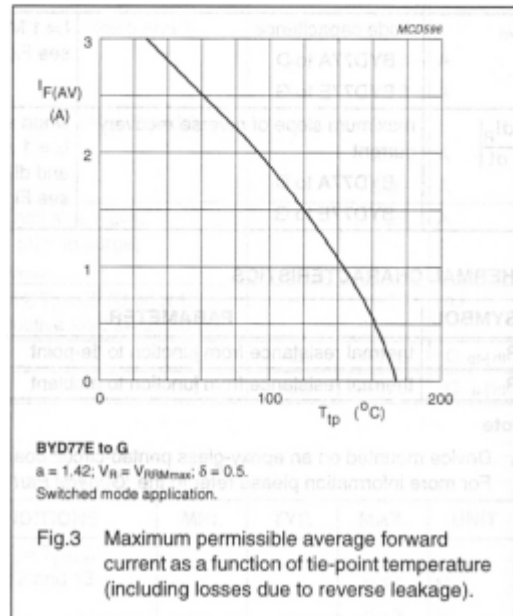
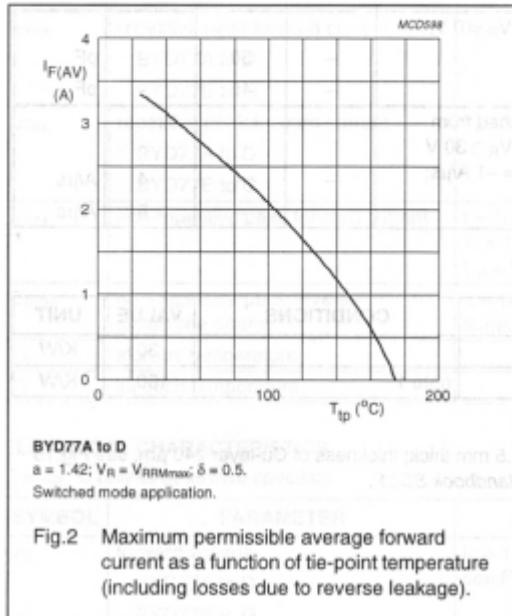
**Note**

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer  $\geq 40 \mu\text{m}$ , see Fig.16. For more information please refer to the 'General Part of Handbook SC01'.

Ultra fast low-loss  
controlled avalanche rectifiers

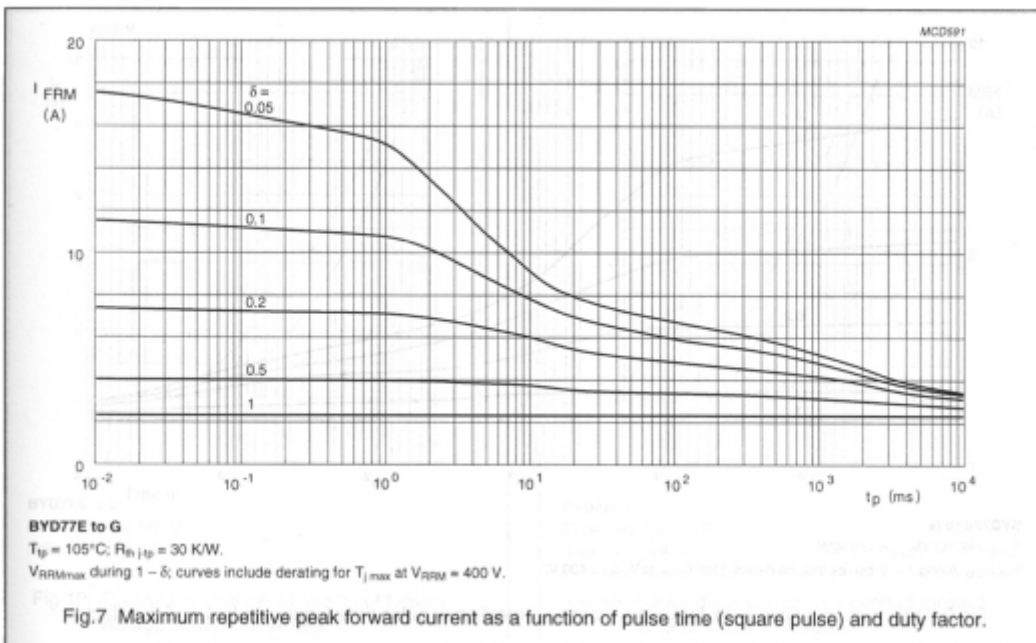
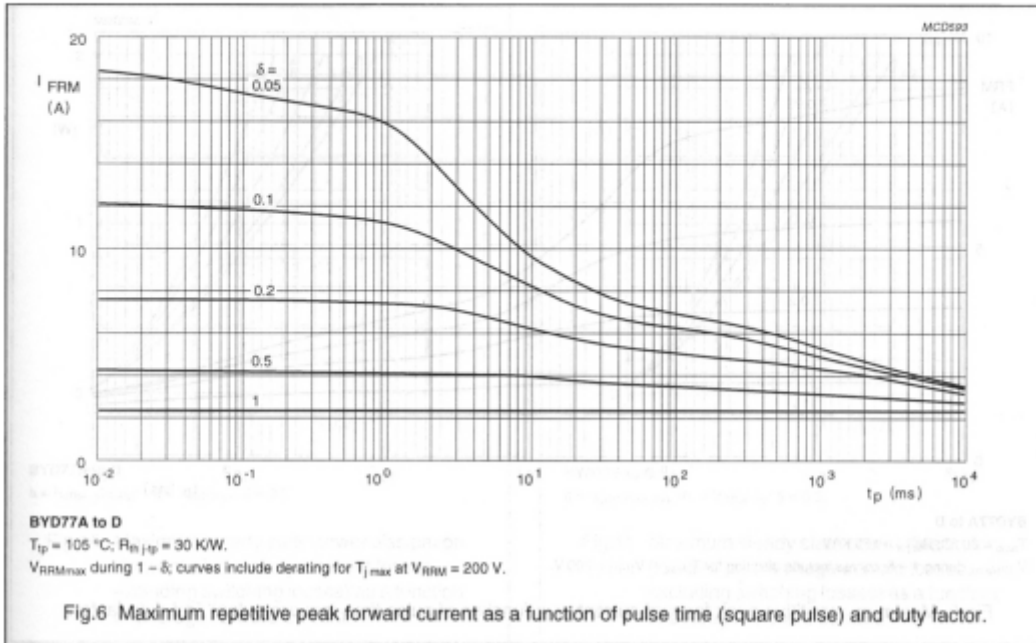
BYD77 series

GRAPHICAL DATA



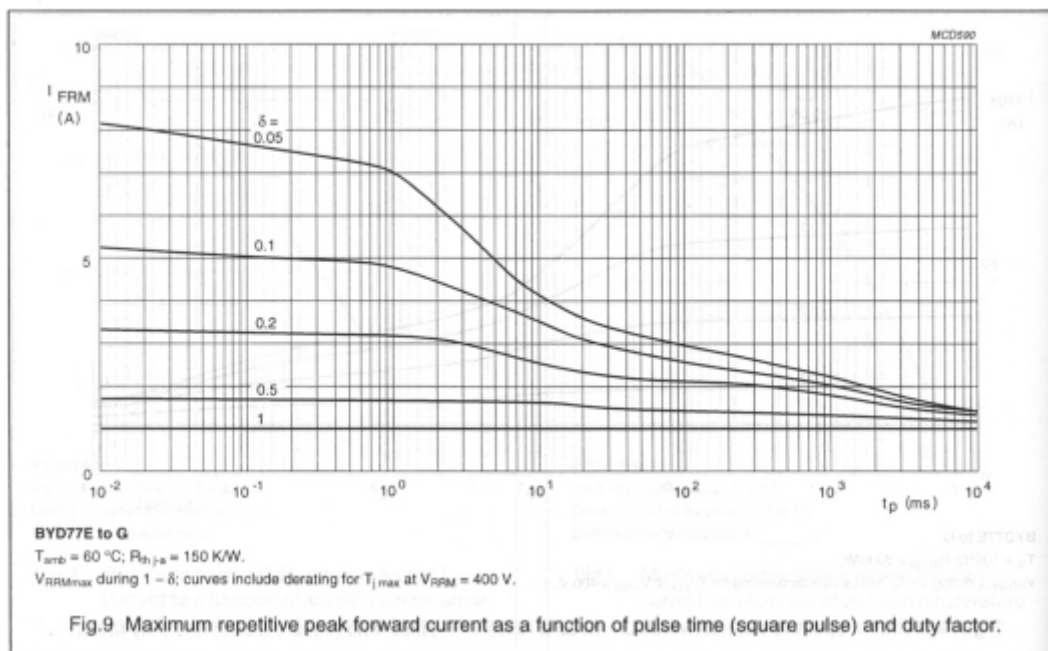
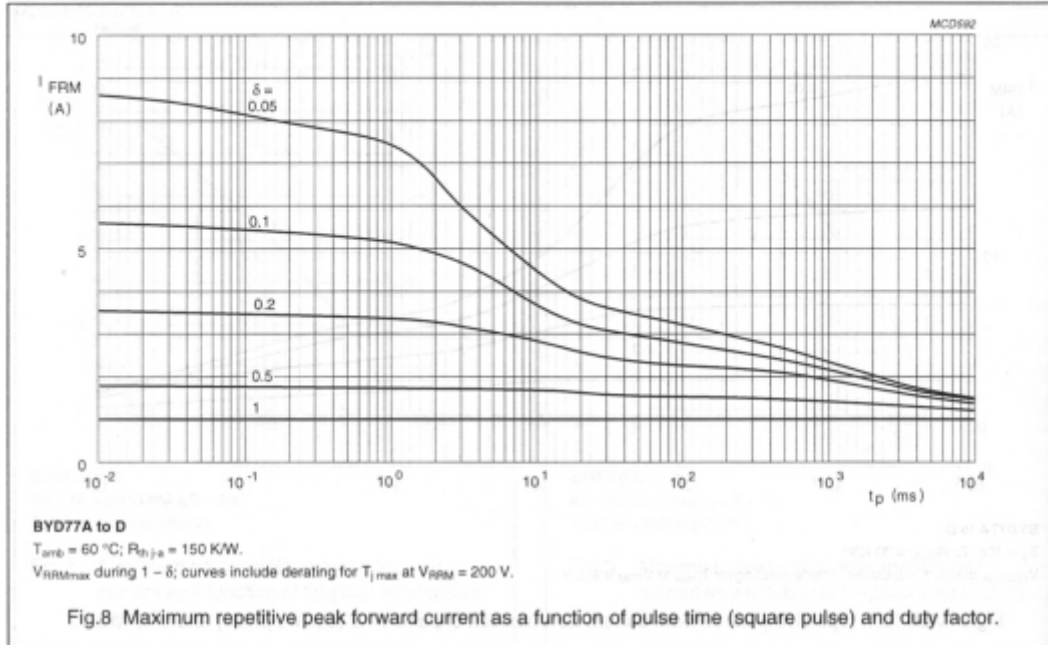
Ultra fast low-loss  
controlled avalanche rectifiers

BYD77 series



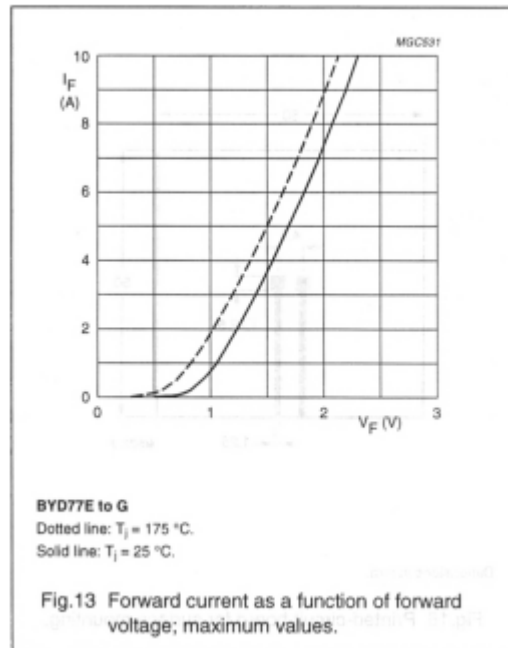
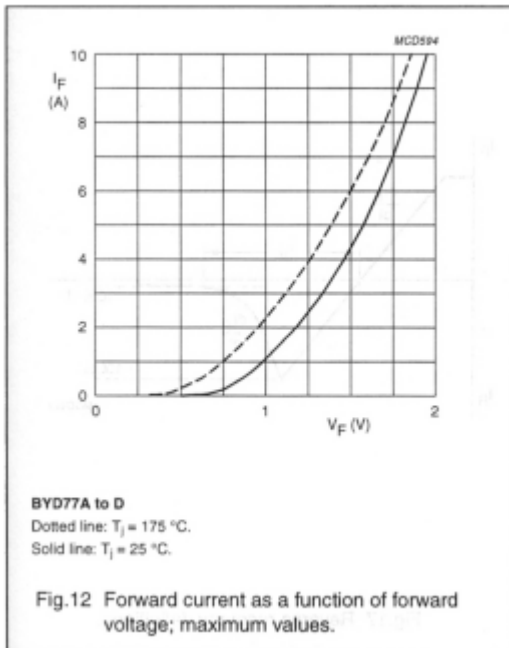
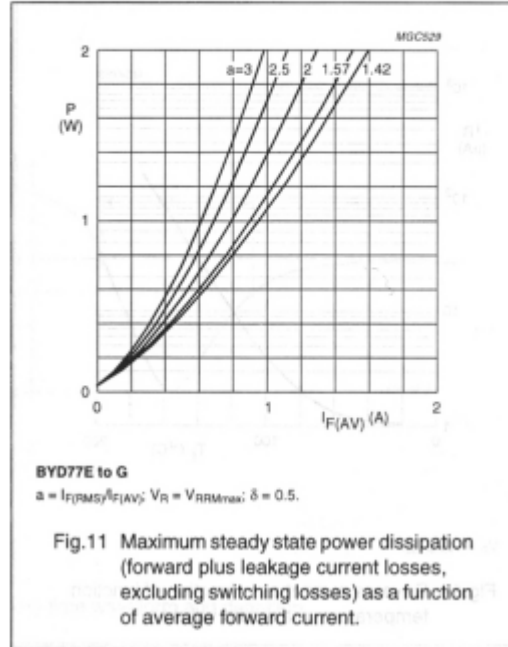
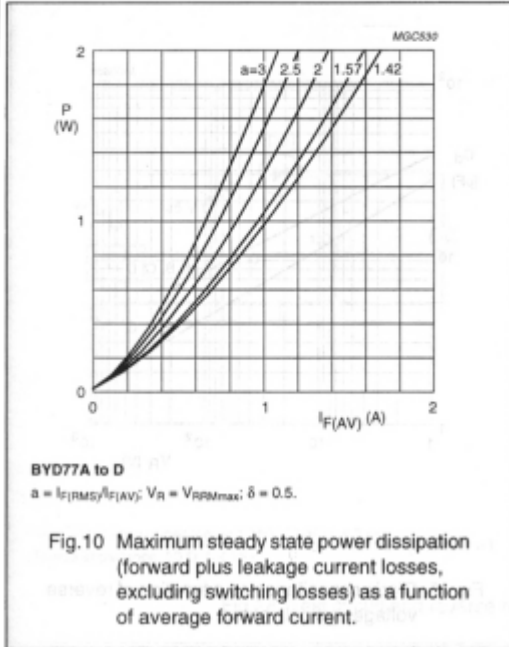
Ultra fast low-loss  
controlled avalanche rectifiers

BYD77 series



Ultra fast low-loss  
controlled avalanche rectifiers

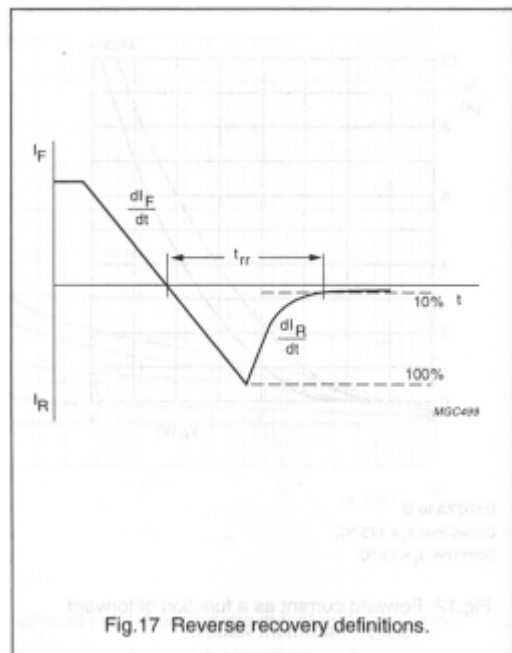
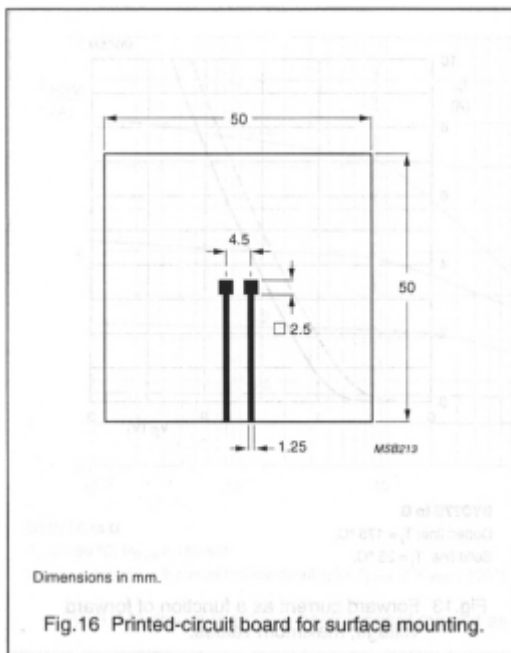
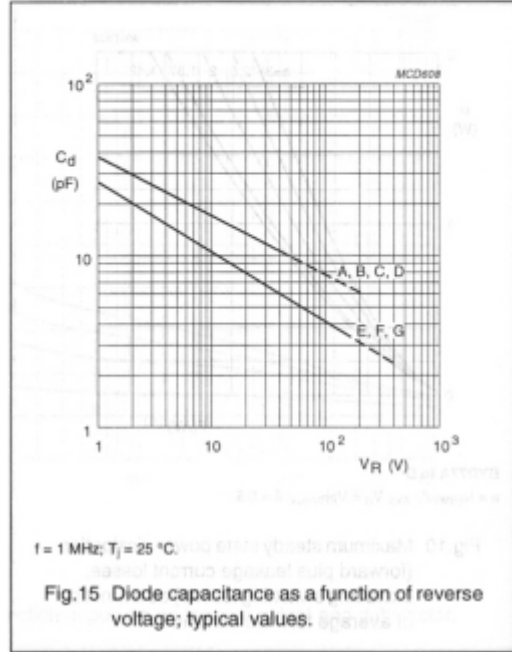
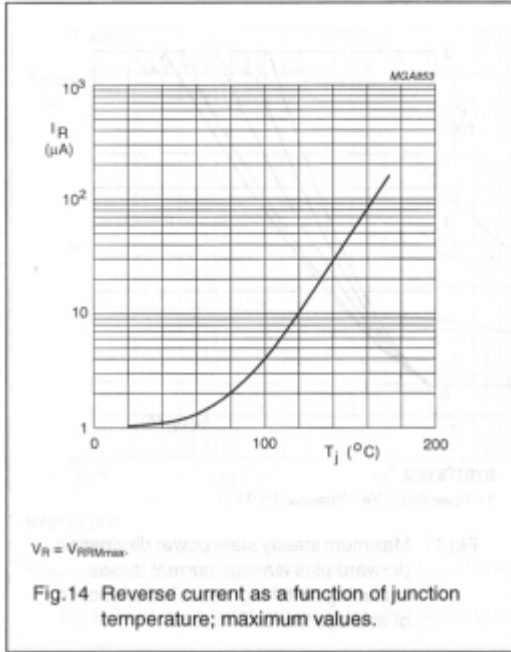
BYD77 series





Ultra fast low-loss  
controlled avalanche rectifiers

BYD77 series



---

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

---

**BYD77 series**