

Silicon Diode

BYD53G

400V/750mA

DATASHEET

OEM – Philips

Source: Philips Databook 1999

Fast soft-recovery controlled avalanche rectifiers

BYD53 series

FEATURES

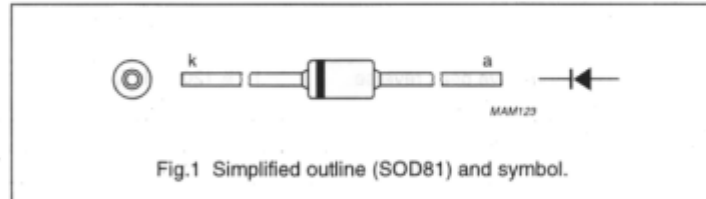
- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass SOD81 package through Implotec™(1) technology. The SOD81 package is

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

(1) Implotec is a trademark of Philips.



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD53D		–	200	V
	BYD53G		–	400	V
	BYD53J		–	600	V
	BYD53K		–	800	V
	BYD53M		–	1000	V
	BYD53U BYD53V		–	1200 1400	V
V_R	continuous reverse voltage				
	BYD53D		–	200	V
	BYD53G		–	400	V
	BYD53J		–	600	V
	BYD53K		–	800	V
	BYD53M		–	1000	V
	BYD53U BYD53V		–	1200 1400	V
$I_{F(AV)}$	average forward current	$T_{ip} = 55\text{ °C}$; lead length = 10 mm see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11	–	0.75	A
	BYD53D to M BYD53U and V		–	0.85	A
$I_{F(AV)}$	average forward current	$T_{amb} = 65\text{ °C}$; PCB mounting (see Fig.17); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11	–	0.40	A
	BYD53D to M BYD53U and V		–	0.45	A
I_{FRM}	repetitive peak forward current	$T_{ip} = 55\text{ °C}$; see Figs 6 and 7	–	6.5	A
	BYD53D to M BYD53U and V		–	8.25	A

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SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	$T_{amb} = 65\text{ }^{\circ}\text{C}$; see Figs 8 and 9	-	3.6	A
	BYD53D to M BYD53U and V			4.45	
I_{FSM}	non-repetitive peak forward current	$t = 10\text{ ms}$ half sine wave; $T_J = T_{Jmax}$ prior to surge; $V_R = V_{RRMmax}$	-	5	A
E_{RSM}	non-repetitive peak reverse avalanche energy	$L = 120\text{ mH}$; $T_J = T_{Jmax}$ prior to surge; inductive load switched off	-	10	mJ
T_{stg}	storage temperature		-65	+175	$^{\circ}\text{C}$
T_J	junction temperature	see Fig.12	-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	$I_F = 1\text{ A}$; $T_J = T_{Jmax}$; see Figs 13 and 14	-	-	2.1	V	
	BYD53D to M BYD53U and V				1.7		
V_F	forward voltage	$I_F = 1\text{ A}$; see Figs 13 and 14	-	-	3.6	V	
	BYD53D to M BYD53U and V				2.3		
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1\text{ mA}$				V	
	BYD53D						300
	BYD53G						500
	BYD53J						700
	BYD53K						900
	BYD53M						1100
	BYD53U BYD53V						1300 1500
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.15	-	-	1	μA	
		$V_R = V_{RRMmax}$; $T_J = 165\text{ }^{\circ}\text{C}$; see Fig.15	-	-	100	μA	
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.18	-	-	30	ns	
	BYD53D to J				75		
	BYD53K and M BYD53U and V				150		
C_d	diode capacitance	$f = 1\text{ MHz}$; $V_R = 0$; see Fig.16	-	20	-	pF	

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\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/ μ s; see Fig.19				
	BYD53D to J		–	–	7	A/ μ s
	BYD53K and M		–	–	6	A/ μ s
	BYD53U and V		–	–	5	A/ μ s

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	120	K/W

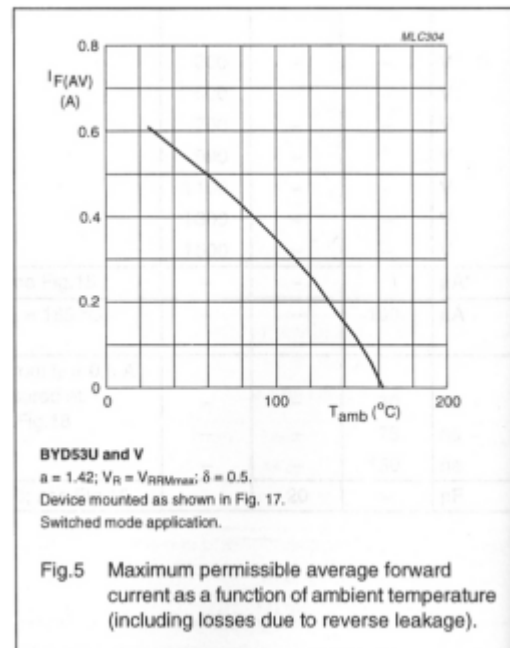
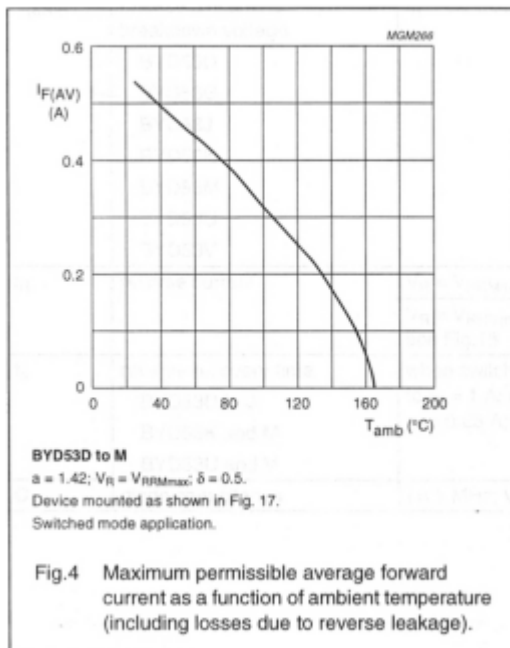
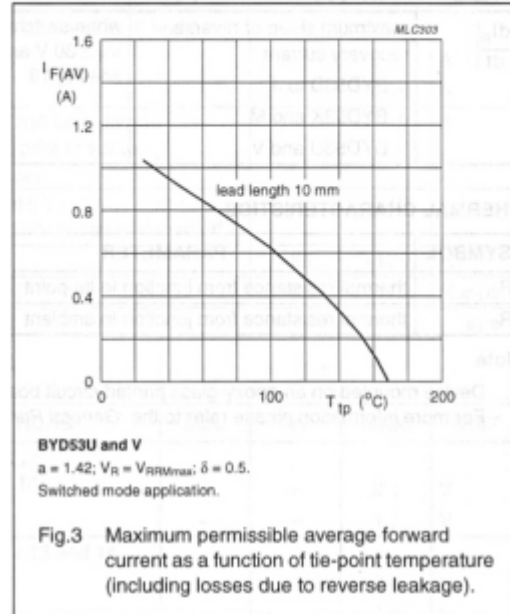
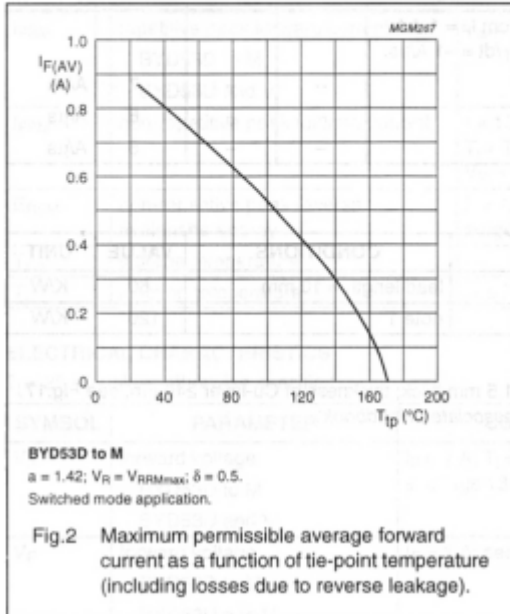
Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥ 40 μ m, see Fig.17. For more information please refer to the 'General Part of associated Handbook'.

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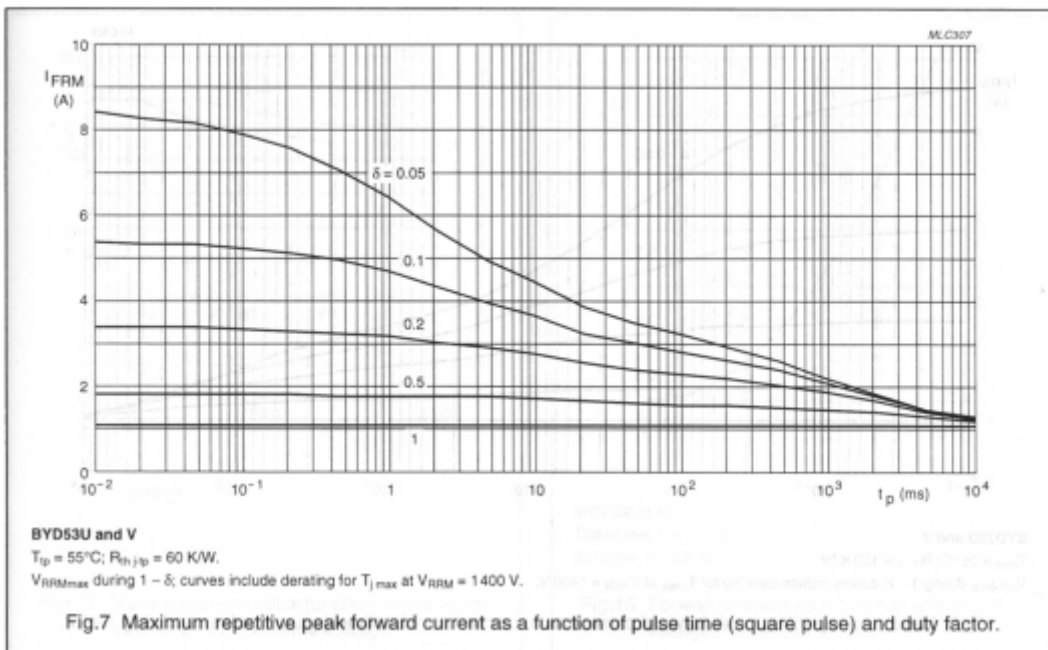
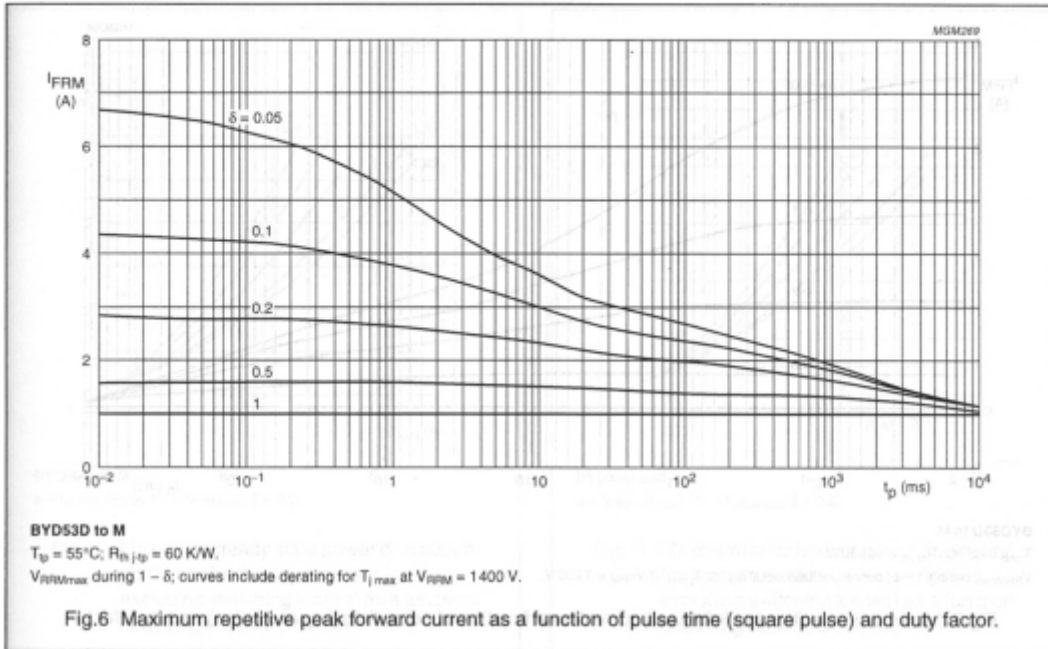
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GRAPHICAL DATA



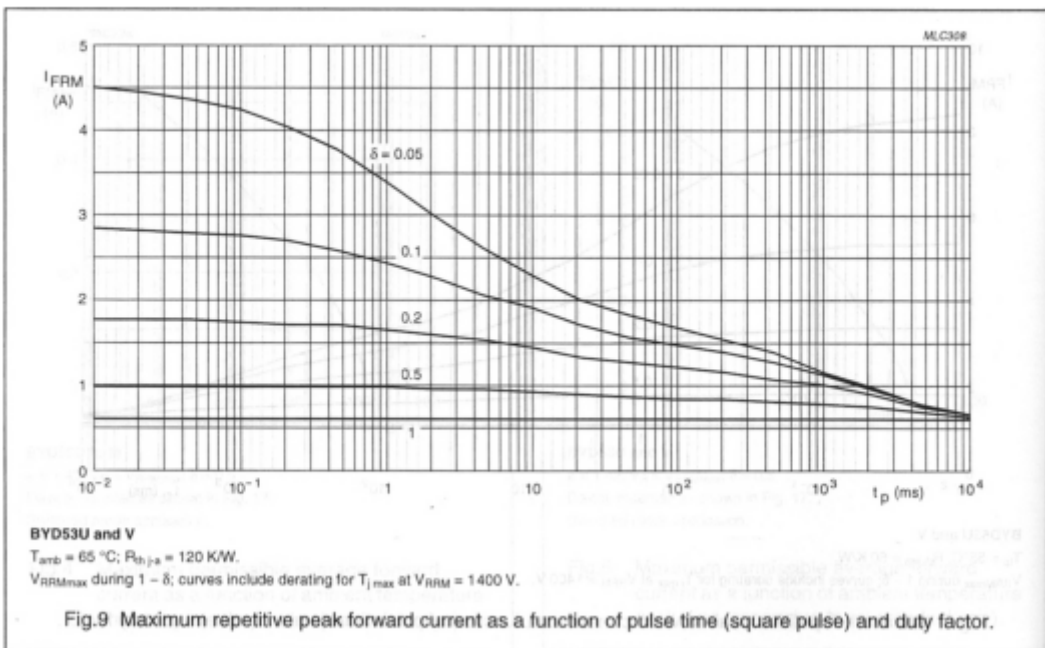
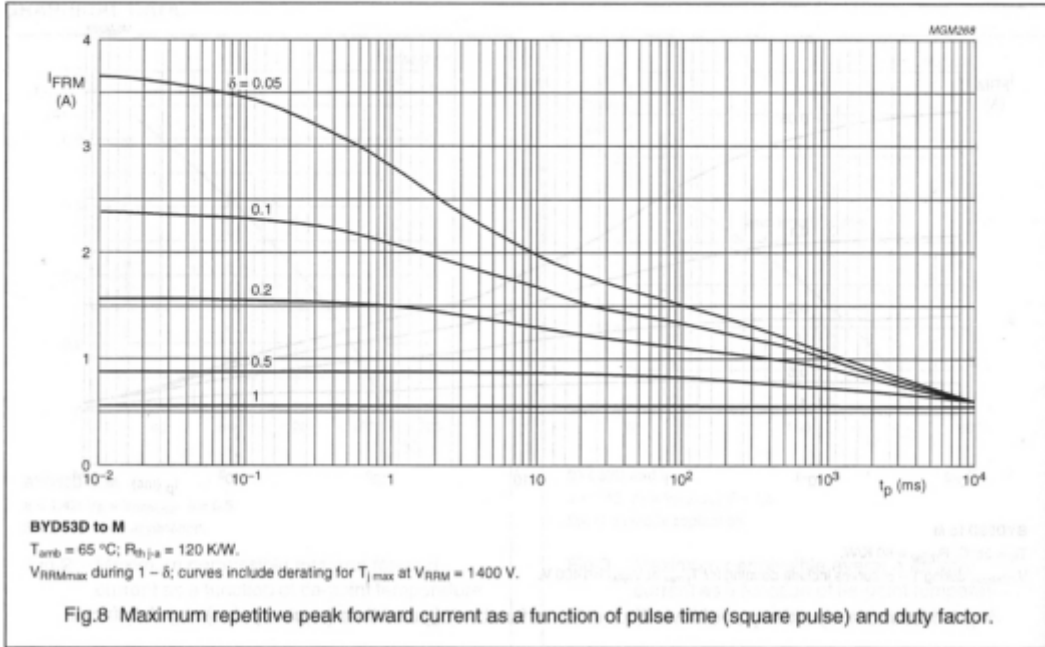
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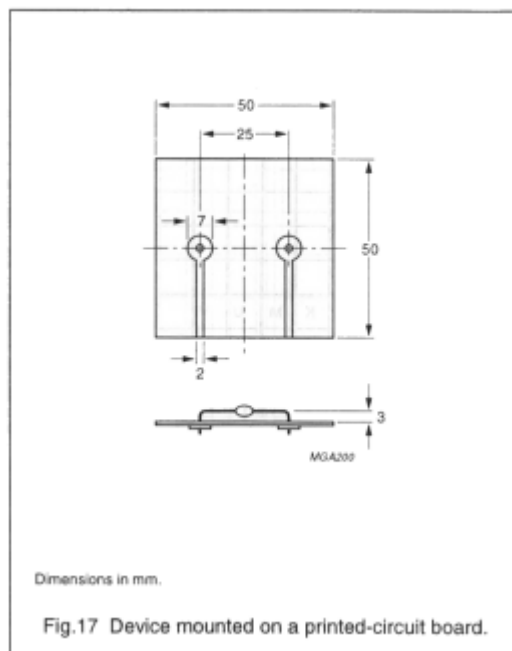
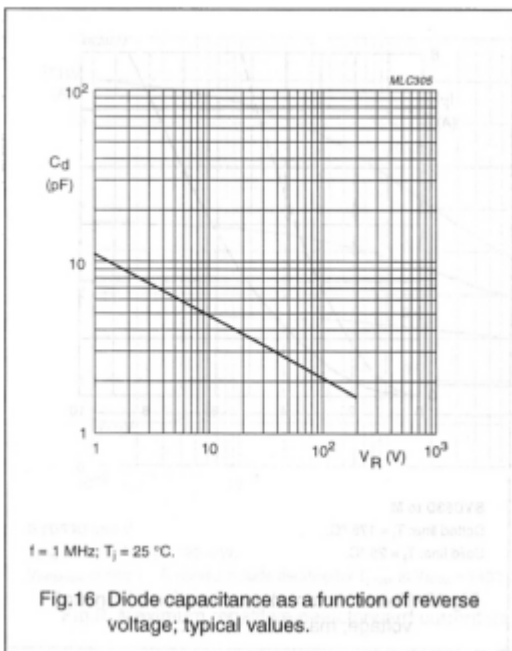
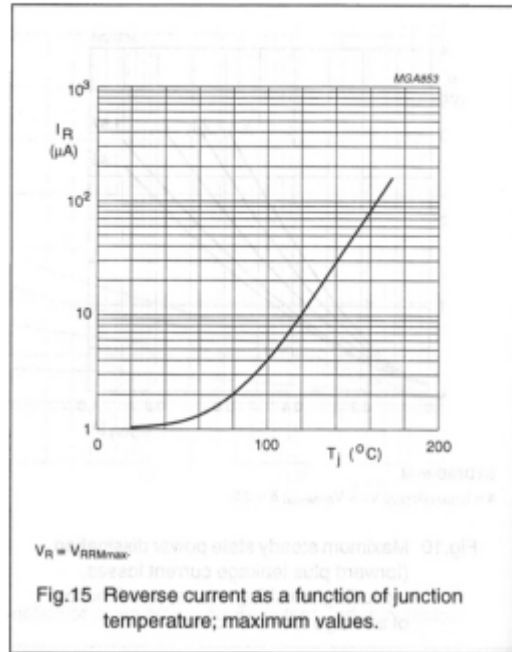
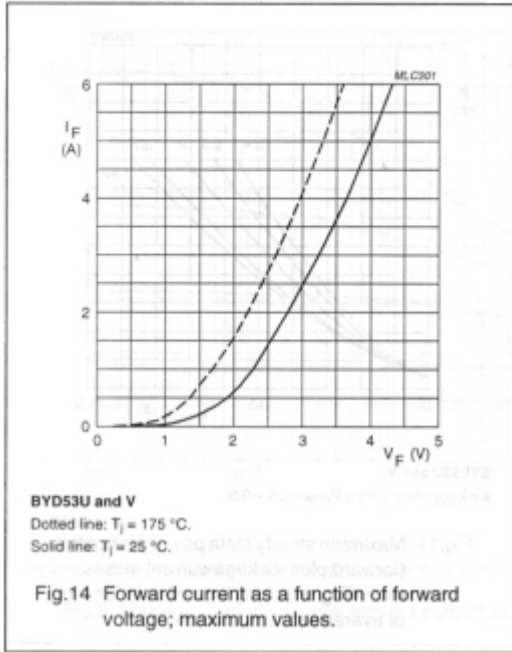
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