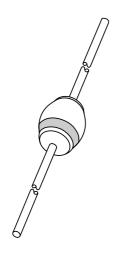
# **DISCRETE SEMICONDUCTORS**

# DATA SHEET



# BYV26 series Fast soft-recovery controlled avalanche rectifiers

Product specification Supersedes data of February 1994 1996 May 30





## **BYV26 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.



### **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				
	BYV26A		_	200	V
	BYV26B		_	400	V
	BYV26C		_	600	V
	BYV26D		_	800	V
	BYV26E		_	1000	V
	BYV26F		_	1200	V
	BYV26G		_	1400	V
V <sub>R</sub>	continuous reverse voltage				
	BYV26A		_	200	V
	BYV26B		_	400	V
	BYV26C		_	600	V
	BYV26D		_	800	V
	BYV26E		_	1000	V
	BYV26F		_	1200	V
	BYV26G		_	1400	V
I <sub>F(AV)</sub>	average forward current	T <sub>tp</sub> = 85 °C; lead length = 10 mm;			
	BYV26A to E	see Figs 2 and 3;	_	1.00	Α
	BYV26F and G	averaged over any 20 ms period; see also Figs 10 and 11	_	1.05	A
I <sub>F(AV)</sub>	average forward current	T <sub>amb</sub> = 60 °C; PCB mounting (see			
	BYV26A to E	Fig.19); see Figs 4 and 5;	_	0.65	Α
	BYV26F and G	averaged over any 20 ms period; see also Figs 10 and 11	_	0.68	A
I <sub>FRM</sub>	repetitive peak forward current	T <sub>tp</sub> = 85 °C; see Figs 6 and 7			
	BYV26A to E		_	10.0	A
	BYV26F and G		_	9.6	А

# Fast soft-recovery controlled avalanche rectifiers

BYV26 series

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I <sub>FRM</sub>	repetitive peak forward current	T <sub>amb</sub> = 60 °C; see Figs 8 and 9			
	BYV26A to E		_	6.0	Α
	BYV26F and G		_	6.4	Α
I <sub>FSM</sub>	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j \text{ max}}$ prior to surge; $V_R = V_{RRMmax}$	_	30	А
E <sub>RSM</sub>	non-repetitive peak reverse avalanche energy	$I_R = 400 \text{ mA}; T_j = T_{j \text{ max}} \text{ prior to}$ surge; inductive load switched off	_	10	mJ
T <sub>stg</sub>	storage temperature		-65	+175	°C
T <sub>j</sub>	junction temperature	see Figs 12 and 13	-65	+175	°C

### **ELECTRICAL CHARACTERISTICS**

 $T_j$  = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V <sub>F</sub>	forward voltage	$I_F = 1 A; T_j = T_{j max};$				
	BYV26A to E	see Figs 14 and 15	_	_	1.3	V
	BYV26F and G		_	_	1.3	V
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 1 A;				
	BYV26A to E	see Figs 14 and 15	_	_	2.50	V
	BYV26F and G		_	_	2.15	V
V <sub>(BR)R</sub>	reverse avalanche breakdown voltage	I <sub>R</sub> = 0.1 mA				
	BYV26A		300	_	_	V
	BYV26B		500	_	_	V
	BYV26C		700	_	_	V
	BYV26D		900	_	_	V
	BYV26E		1100	_	_	V
	BYV26F		1300	_	_	V
	BYV26G		1500	_	_	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = V <sub>RRMmax</sub> ; see Fig.16	_	_	5	μΑ
		$V_R = V_{RRMmax};$ $T_j = 165 ^{\circ}C;$ see Fig.16	_	_	150	μΑ
t <sub>rr</sub>	reverse recovery time	when switched from				
	BYV26A to C	$I_F = 0.5 \text{ A to } I_R = 1 \text{ A};$	_	_	30	ns
	BYV26D and E	measured at I <sub>R</sub> = 0.25 A; see Fig.20	_	_	75	ns
	BYV26F and G	366 i ig.20	_	_	150	ns
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0 V;				
	BYV26A to C	see Figs 17 and 18	_	45	_	pF
	BYV26D and E		_	40	_	pF
	BYV26F and G		_	35	_	pF

# Fast soft-recovery controlled avalanche rectifiers

BYV26 series

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\frac{ dI_R }{dt}$	maximum slope of reverse recovery current	when switched from $I_F = 1 \text{ A to V}_R \ge 30 \text{ V and}$				
" " " " " " " " " " " " " " " " " " "	BYV26A to C	$dI_F/dt = -1 A/\mu s;$	_	_	7	A/μs
	BYV26D and E	see Fig.21	_	_	6	A/μs
	BYV26F and G		_	_	5	A/μs

### THERMAL CHARACTERISTICS

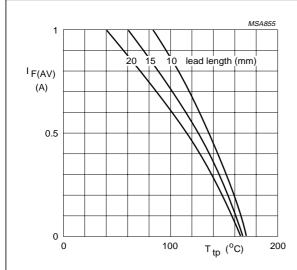
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-tp</sub>	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	100	K/W

### Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.19. For more information please refer to the "General Part of associated Handbook".

# BYV26 series

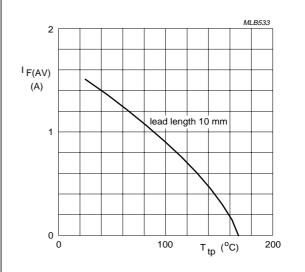
### **GRAPHICAL DATA**



#### BYV26A to E

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

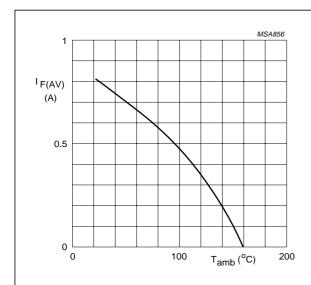
Fig.2 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).



#### BYV26F and G

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

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



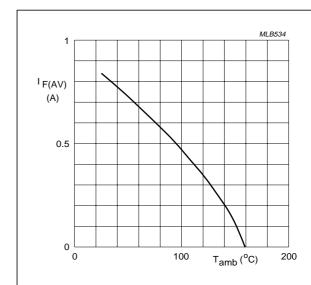
### BYV26A to E

a = 1.42;  $V_R = V_{RRMmax}$ ;  $\delta = 0.5$ . Device mounted as shown in Fig.19.

Switched mode application

Switched mode application.

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



#### BYV26F and G

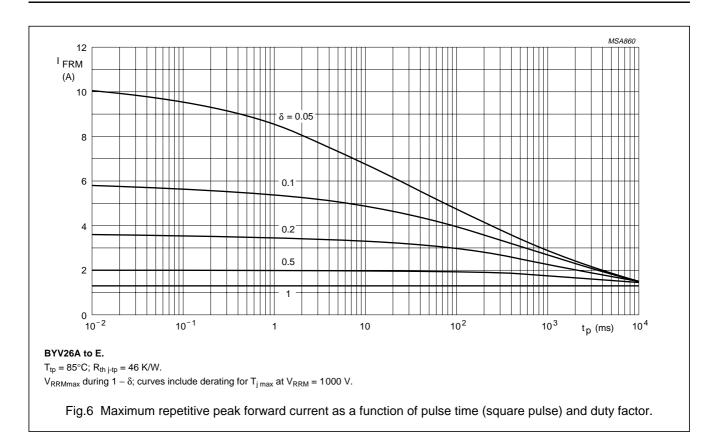
a = 1.42;  $V_R = V_{RRMmax}$ ;  $\delta$  = 0.5. Device mounted as shown in Fig.19.

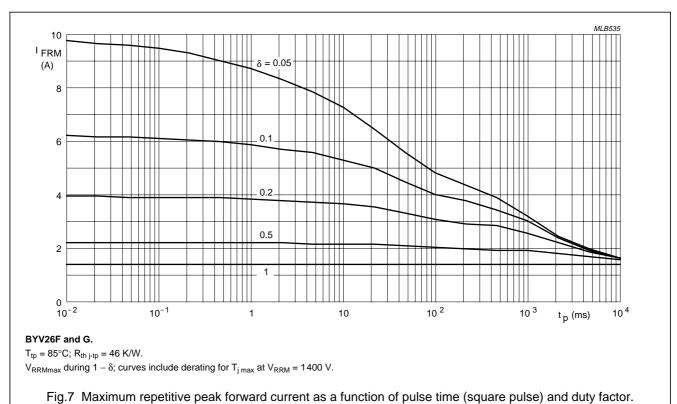
Switched mode application.

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

# Fast soft-recovery controlled avalanche rectifiers

# BYV26 series



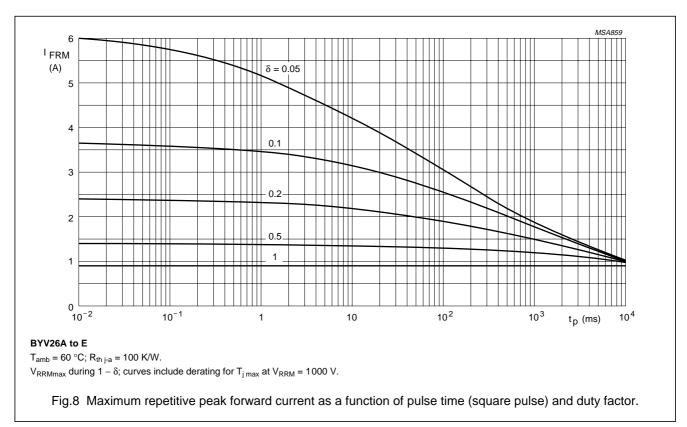


6

1996 May 30

# Fast soft-recovery controlled avalanche rectifiers

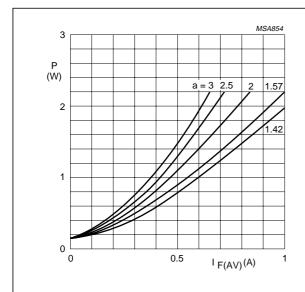
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8 I FRM 6  $\delta = 0.05$ 0.1 4 0.2 2 0.5 10-2  $10^{-1}$ 10 10<sup>2</sup> 10<sup>4</sup> t<sub>p</sub> (ms) BYV26F and G  $T_{amb}$  = 60 °C;  $R_{th\ j-a}$  = 100 K/W.  $V_{RRMmax}$  during 1 -  $\delta;$  curves include derating for  $T_{j\,max}$  at  $V_{RRM}$  = 1400 V.

Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

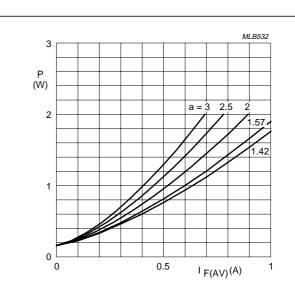
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#### BYV26A to E

 $a = I_{F(RMS)}/I_{F(AV)}; \ V_R = V_{RRMmax}; \ \delta = 0.5.$ 

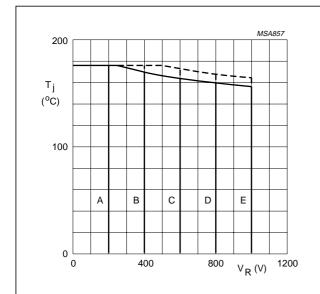
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



#### BYV26F and G

 $a = I_{F(RMS)}/I_{F(AV)}; \ V_R = V_{RRMmax}; \ \delta = 0.5.$ 

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

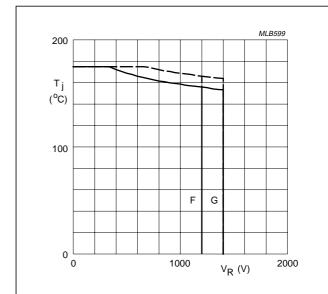


### BYV26A to E

Solid line = V<sub>R</sub>.

Dotted line =  $V_{RRM}$ ;  $\delta$  = 0.5.

Fig.12 Maximum permissible junction temperature as a function of reverse voltage.



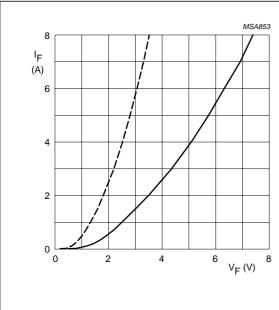
### BYV26F and G

Solid line = V<sub>R</sub>.

Dotted line =  $V_{RRM}$ ;  $\delta$  = 0.5.

Fig.13 Maximum permissible junction temperature as a function of reverse voltage.

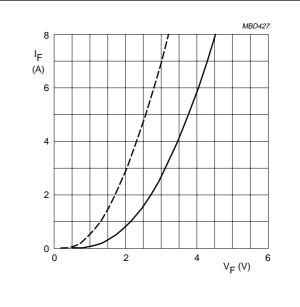
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BYV26A to E

Dotted line:  $T_j = 175 \,^{\circ}\text{C}$ . Solid line:  $T_j = 25 \,^{\circ}\text{C}$ .

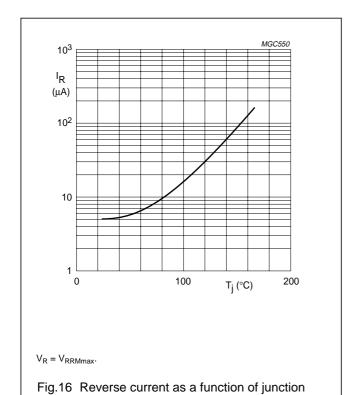
Fig.14 Forward current as a function of forward voltage; maximum values.



#### BYV26F and G

Dotted line:  $T_j = 175 \,^{\circ}\text{C}$ . Solid line:  $T_j = 25 \,^{\circ}\text{C}$ .

Fig.15 Forward current as a function of forward voltage; maximum values.



temperature; maximum values.

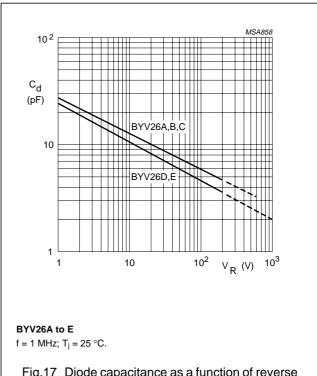
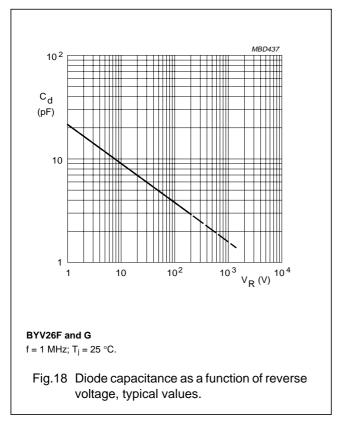
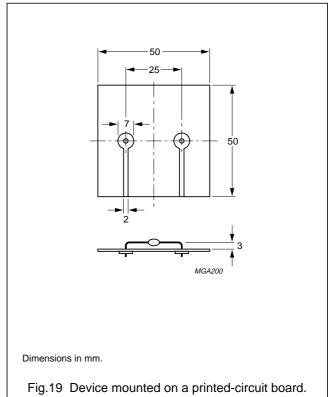


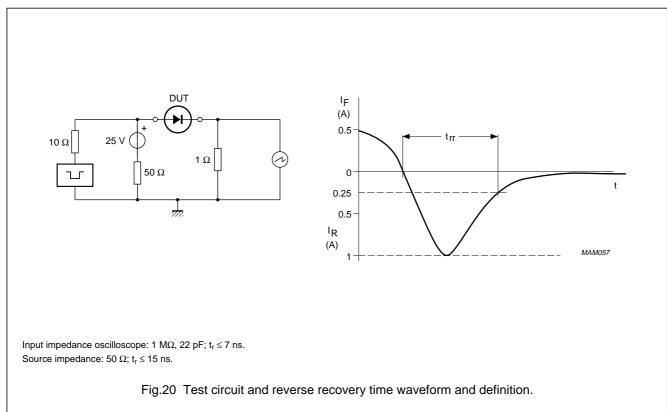
Fig.17 Diode capacitance as a function of reverse voltage, typical values.

# Fast soft-recovery controlled avalanche rectifiers

# BYV26 series

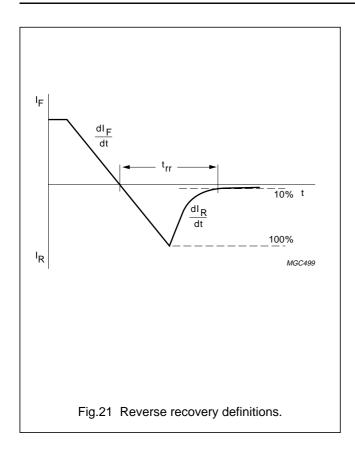






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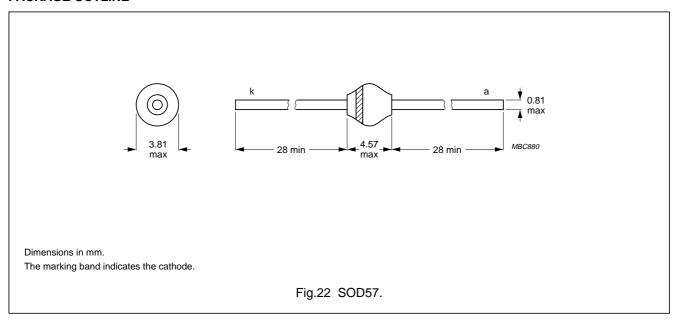
BYV26 series



# Fast soft-recovery controlled avalanche rectifiers

BYV26 series

#### **PACKAGE OUTLINE**



#### **DEFINITIONS**

Data Sheet Status	
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.
Limitina values	

### **Limiting values**

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.

### **Application information**

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.

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