Philips Semiconductors   **Product specification**
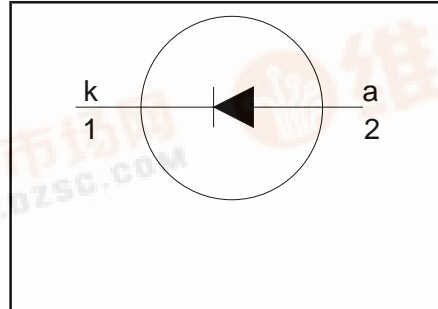
Damper diode fast, high-voltage   BY329X-1500, BY329X-1500S

FEATURES

• Low forward volt drop
• Fast switching
• Soft recovery characteristic
• High thermal cycling performance
• Isolated mounting tab

SYMBOL

$$k \;\; 1 \qquad\qquad a \;\; 2$$

QUICK REFERENCE DATA

$V_R = 1500 \text{ V}$

$V_F \leq 1.35 \text{ V} / 1.5 \text{ V}$

$I_{F(peak)} = 6 \text{ A} \; (f = 16 \text{ kHz})$

$I_{F(peak)} = 6 \text{ A} \; (f = 70 \text{ kHz})$

$I_{FSM} \leq 75 \text{ A}$

$t_{rr} \leq 230 \text{ ns} / 160 \text{ ns}$

GENERAL DESCRIPTION

Glass-passivated double diffused rectifier diode featuring low forward voltage drop, fast reverse recovery and soft recovery characteristic. The device is intended for use in TV receivers and PC monitors.

The BY329X series is supplied in the conventional leaded SOD113 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
tab	isolated

SOD113

case

1   2
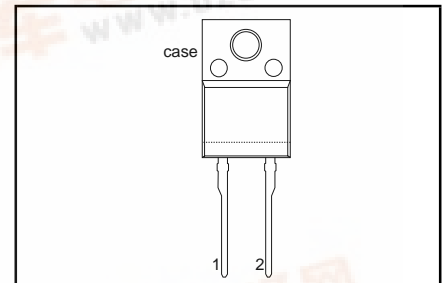
LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
V_{RSM}	Peak non-repetitive reverse voltage		-	1500		V
V_{RRM}	Peak repetitive reverse voltage		-	1500		V
V_{RWM}	Crest working reverse voltage		-	1300		V
		BY329X		**-1500**	**-1500S**	
$I_{F(peak)}$	Peak working forward current	f = 16 kHz	-	6	-	A
		f = 70 kHz	-	-	6	A
I_{FRM}	Peak repetitive forward current	t = 25 µs; δ = 0.5; $T_{hs} \leq 86$ °C	-	14		A
$I_{F(RMS)}$	RMS forward current		-	11		A
I_{FSM}	Peak non-repetitive forward current	t = 10 ms sinusoidal; $T_j = 150$ °C prior to surge; with reapplied $V_{RWM(max)}$	-	75		A
T_{stg}	Storage temperature		-40	150		°C
T_j	Operating junction temperature		-	150		°C

Damper diode fast, high-voltage	BY329X-1500, BY329X-1500S

ISOLATION LIMITING VALUE & CHARACTERISTIC

T_{hs} = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	R.M.S. isolation voltage from both terminals to external heatsink	f = 50-60 Hz; sinusoidal waveform; R.H. ≤ 65% ; clean and dustfree	-		2500	V
C_{isol}	Capacitance from both terminals to external heatsink	f = 1 MHz	-	10	-	pF

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	4.8	K/W
		without heatsink compound	-	-	5.9	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	in free air.	-	55	-	K/W

STATIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

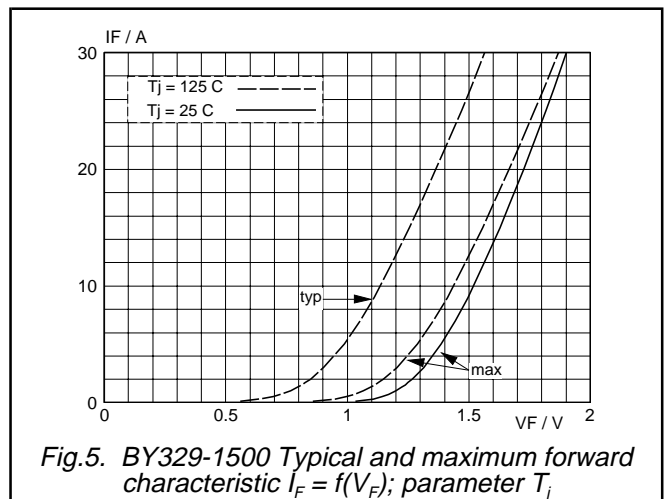| SYMBOL	PARAMETER	CONDITIONS	TYP.		MAX.		UNIT
		BY329X-	1500	1500S	1500	1500S	
V_F	Forward voltage	I_F = 6.5 A	1.1	1.3	1.45	1.6	V
		I_F = 6.5 A; T_j = 125 °C	1.05	1.2	1.35	1.5	V
I_R	Reverse current	V_R = 1300 V	-	250	-	250	µA
		V_R = 1300 V; T_j = 125 °C	-	1	-	1	mA

DYNAMIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP.		MAX.		UNIT
		BY329X	1500	1500S	1500	1500S	
t_{rr}	Reverse recovery time	I_F = 1 A; V_R ≥ 30 V; dI_F/dt = 50A/µs	0.18	0.13	0.23	0.16	µs
Q_s	Reverse recovery charge	I_F = 2 A; $-dI_F/dt$ = 20 A/µs	1.6	0.7	2.0	0.95	µC
V_{fr}	Peak forward recovery voltage	I_F = 6.5A; dI_F/dt = 50A/µs	17	23	30	40	V
t_{fr}	Forward recovery time	I_F = 6.5A; dI_F/dt = 50A/µs	210	220	300	320	ns

Fig.1. Definition of Vfr and tfr

Fig.2. Definition of t_{rr} and Q_s

Fig.3. Basic horizontal deflection circuit.

Fig.4. Maximum allowable pulse width t_p versus line frequency; Basic horizontal deflection circuit.

Fig.5. BY329-1500 Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

Fig.6. BY329-1500S Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

Fig.7. Transient thermal impedance $Z_{th} = f(t_p)$
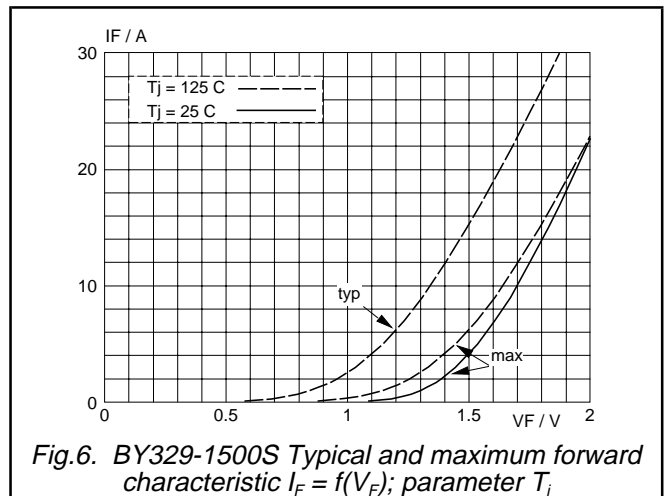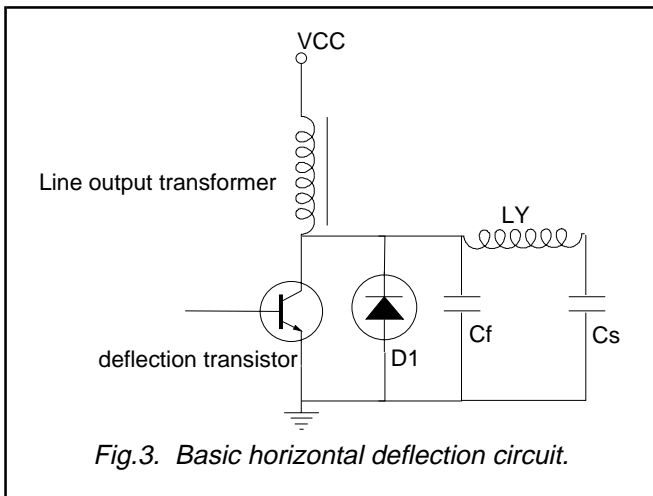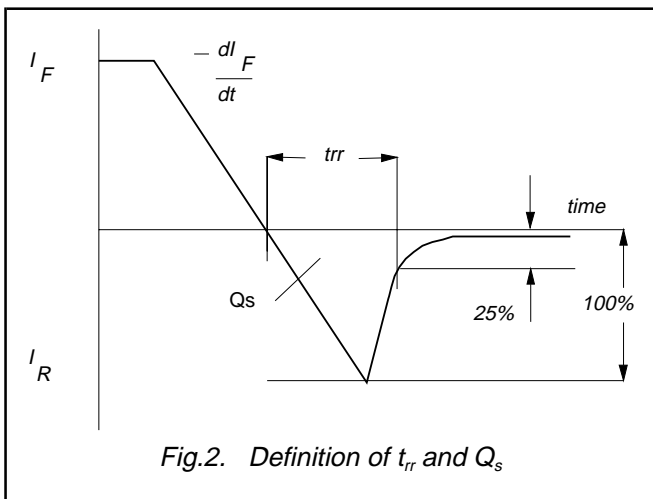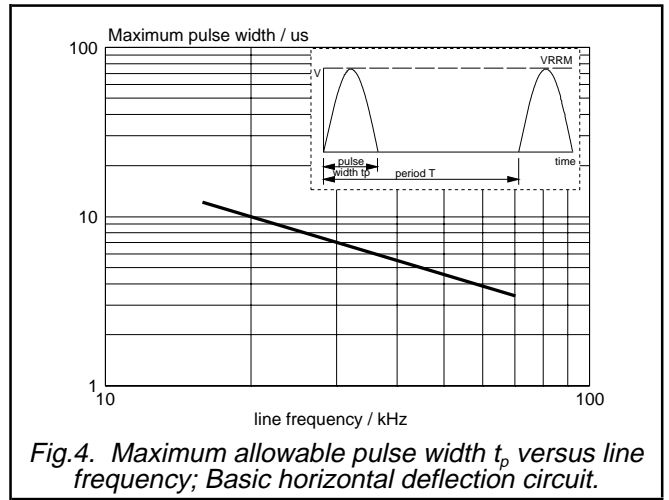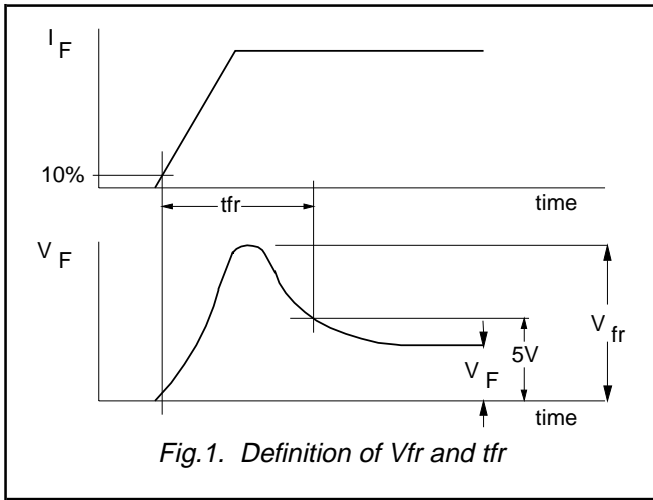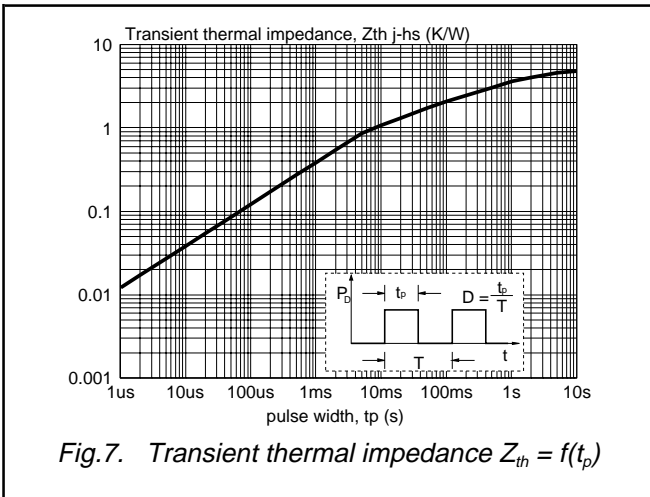
Damper diode
fast, high-voltage

BY329X-1500, BY329X-1500S

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

Recesses (2x)
∅ 2.5
0.8 max. depth

3 max.
not tinned

13.5
min.

⊕ ∅ 0.4 Ⓜ

5.08

2.54

10.3
max

3.2
3.0

2.8

15.8
max.

19
max.

3

4.6
max

2.9 max

6.4

15.8
max

seating
plane

2.5

0.5

0.6

2.5

1.0 (2x)

0.9
0.7

Fig.8. SOD113; The seating plane is electrically isolated from all terminals.
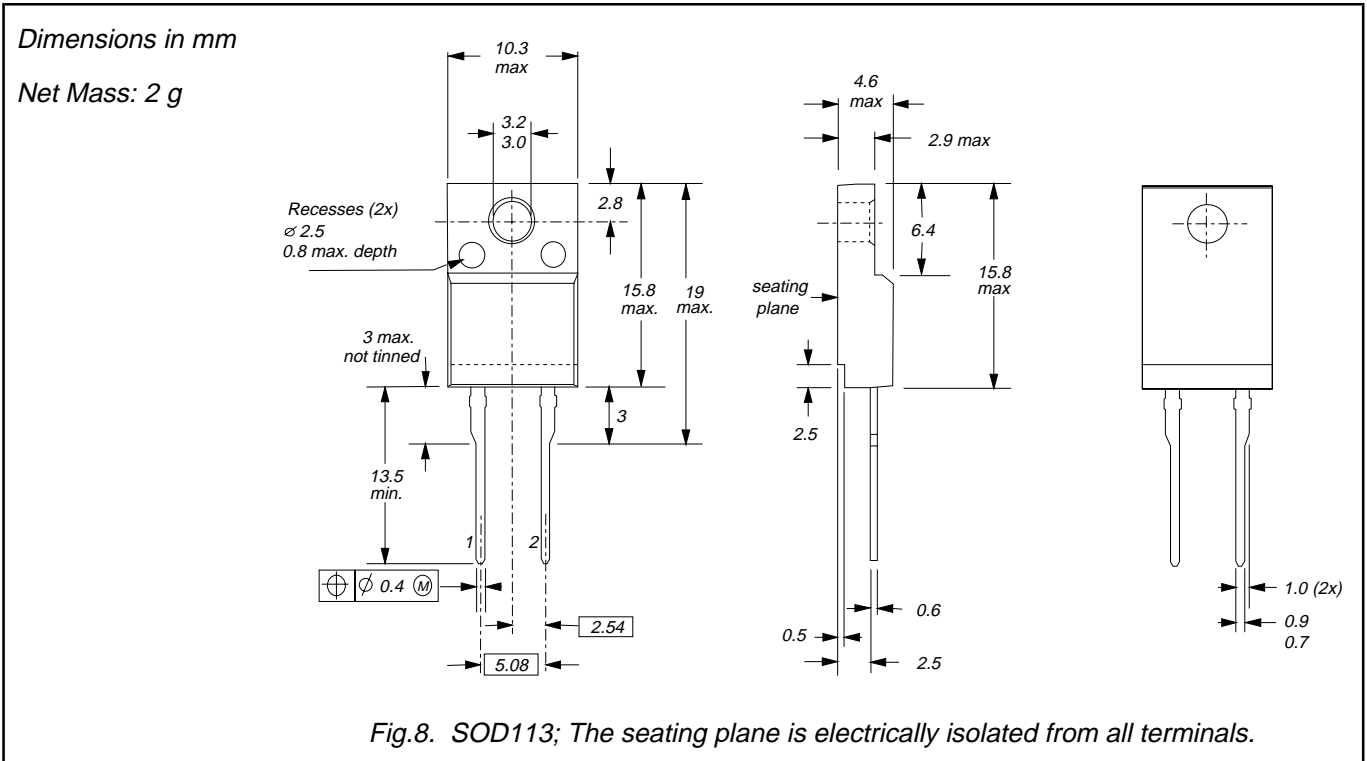
Notes
1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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.
Limiting values	
Limiting values are given 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 this 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.	
© **Philips Electronics N.V. 1998**	
All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.	
The information presented in this document does not form part of any quotation or contract, it is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent or other industrial or intellectual property rights.	

LIFE SUPPORT APPLICATIONS