# **DISCRETE SEMICONDUCTORS**

# DATA SHEET



# **BY584**High-voltage soft-recovery rectifier

Product specification Supersedes data of May 1996 1996 Sep 26







## High-voltage soft-recovery rectifier

**BY584** 

#### **FEATURES**

- · Glass passivated
- High maximum operating temperature
- · Low leakage current
- · Excellent stability
- Soft-recovery switching characteristics
- · Compact construction.

#### **APPLICATIONS**

- Grid 2 supply in colour television picture tubes
- High-voltage applications for:
  - High frequencies
  - Switching applications.

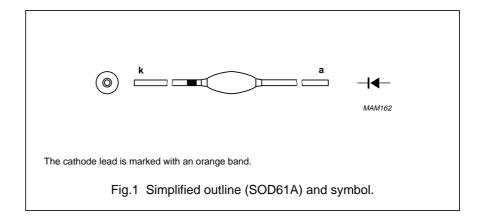
#### **DESCRIPTION**

Rugged glass 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.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.



#### **LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>RSM</sub>	non-repetitive peak reverse voltage		_	1800	V
V <sub>RRM</sub>	repetitive peak reverse voltage		_	1800	V
V <sub>RW</sub>	working reverse voltage		_	1500	V
I <sub>F(AV)</sub>	average forward current	averaged over any 20 ms period; T <sub>tp</sub> = 25 °C; lead length = 10 mm; see Fig.2; see also Fig.4	_	85	mA
		averaged over any 20 ms period;  T <sub>amb</sub> = 60 °C; PCB mounting (see Fig.6); see Fig.3; see also Fig.4	_	50	mA
I <sub>FRM</sub>	repetitive peak forward current		_	800	mA
I <sub>FSM</sub>	non-repetitive peak forward current	$t \le 10$ ms; half sinewave; $T_j = T_{j \text{ max}}$ prior to surge; $V_R = V_{RWmax}$	_	5	A
T <sub>stg</sub>	storage temperature		-65	+120	°C
Tj	junction temperature		-65	+120	°C

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#### **ELECTRICAL CHARACTERISTICS**

 $T_j$  = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V <sub>F</sub>	forward voltage	$I_F = 100 \text{ mA}$ ; $T_j = T_{j \text{ max}}$ ; see Fig.5	_	_	8.5	V
I <sub>R</sub>	reverse current	$V_R = V_{RWmax}; T_j = T_{j max}$	_	_	3	μΑ
Q <sub>r</sub>	recovery charge	when switched from $I_F$ = 100 mA to $V_R \ge$ 100 V and $dI_F/dt$ = -200 mA/ $\mu$ s; see Fig.7	_	_	1	nC
t <sub>f</sub>	fall time	when switched from $I_F$ = 100 mA to $V_R \ge$ 100 V and $dI_F/dt$ = -200 mA/ $\mu$ s; see Fig.7	100	_	_	ns
t <sub>rr</sub>	reverse recovery time	when switched from $I_F$ = 100 mA to $V_R \ge$ 100 V and $dI_F/dt$ = -200 mA/ $\mu$ s; see Fig.7	_	200	_	ns
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz	_	2	_	pF

#### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-tp</sub>	thermal resistance from junction to tie-point	lead length = 10 mm	100	K/W
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	155	K/W

#### Note

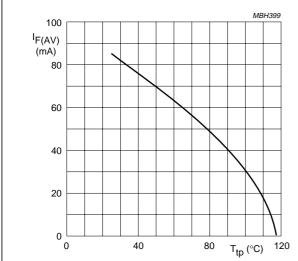
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.6. For more information please refer to the "General Part of associated Handbook".

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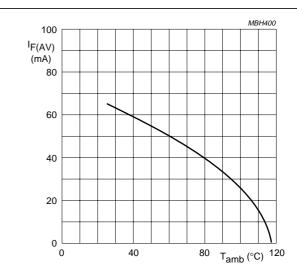
#### **GRAPHICAL DATA**



Switched mode application.

a = 1.42;  $\delta$  = 0.5;  $V_R$  =  $V_{RWmax}$ ; lead length = 10 mm.

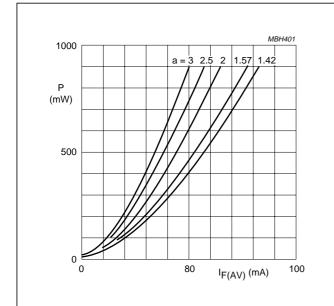
Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



Switched mode application.

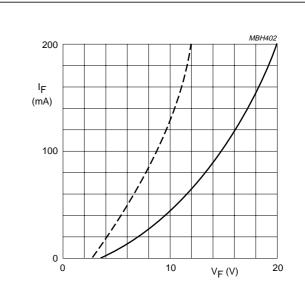
a = 1.42;  $\delta$  = 0.5;  $V_{R}$  =  $V_{RWmax}$ ; device mounted as shown in Fig.6.

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



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

Fig.4 Maximum steady state power dissipation (forward plus leakage losses) as a function of average forward current.



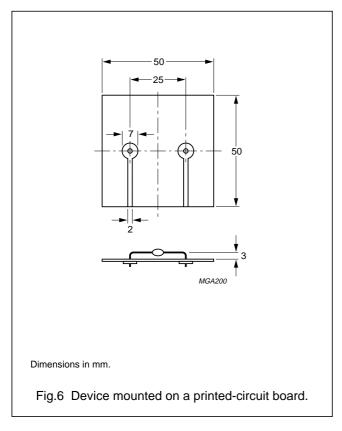
Dotted line:  $T_j = 120 \,^{\circ}\text{C}$ . Solid line:  $T_j = 25 \,^{\circ}\text{C}$ .

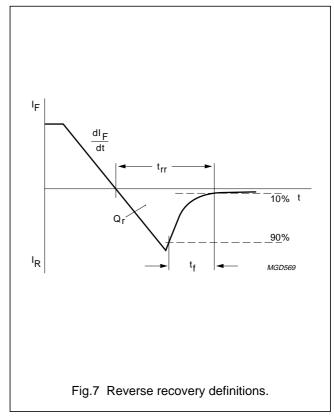
Fig.5 Forward current as a function of maximum forward voltage.

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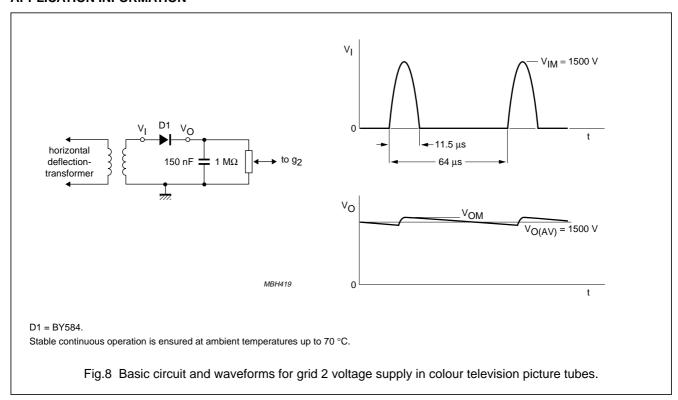
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#### **APPLICATION INFORMATION**



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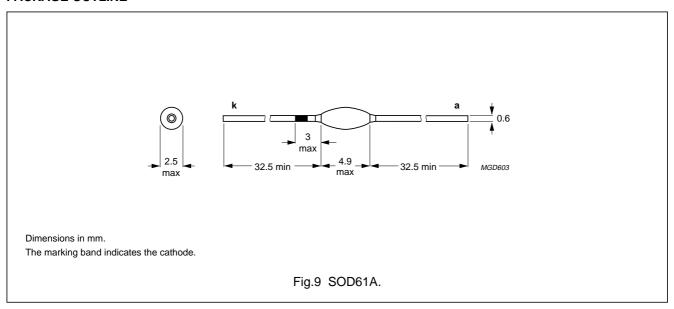
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#### **PACKAGE OUTLINE**



#### **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.		
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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