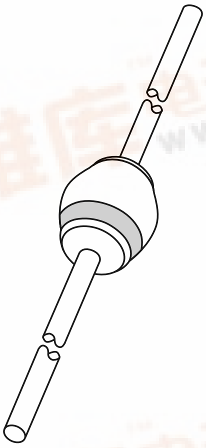
DATA SHEET



BY278

Damper diode

Product specification

1996 Sep 26

Philips Semiconductors

PHILIPS

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

APPLICATIONS

- Damper diode in high frequency horizontal deflection circuits up to 16 kHz.

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.

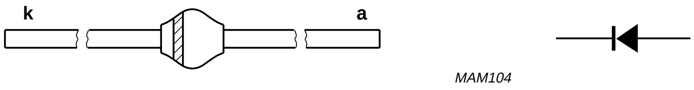


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1700	V
V_{RRM}	repetitive peak reverse voltage		–	1700	V
V_R	continuous reverse voltage		–	1650	V
I_{FWM}	working peak forward current	T_{amb} = 75 °C; PCB mounting (see Fig.4); see Fig.2	–	5	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\ max}$ prior to surge; $V_R = V_{RRMmax}$	–	50	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\ max}$; see Fig.3	1.4	V
		I_F = 5 A; see Fig.3	1.5	V
I_R	reverse current	$V_R = V_{Rmax}$; T_j = 150 °C	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.6	1	µs
t_{fr}	forward recovery time	when switched to I_F = 5 A in 50 ns; $T_j = T_{j\ max}$; Fig.7	1	µs

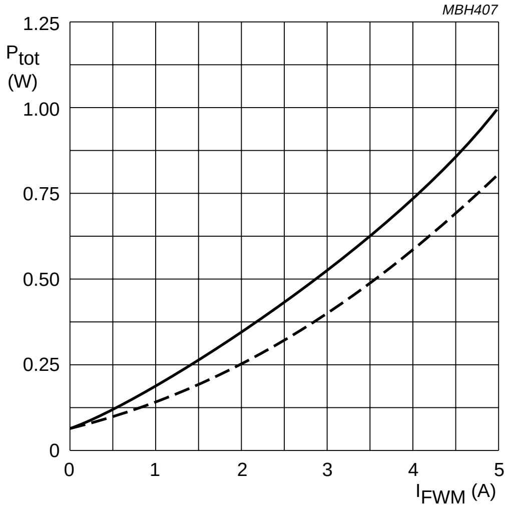
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W
		mounted as shown in Fig.5	40	K/W

Note

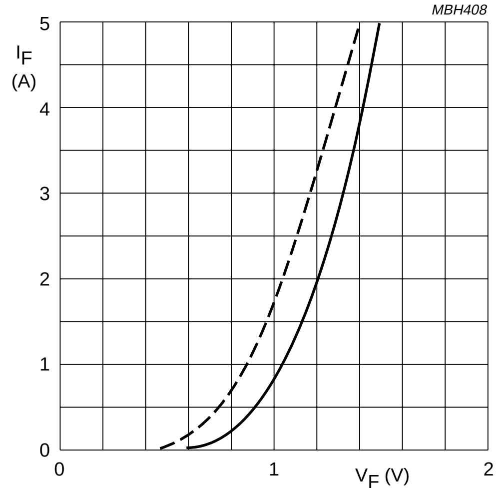
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.4. For more information please refer to the *“General Part of associated Handbook”*.

GRAPHICAL DATA



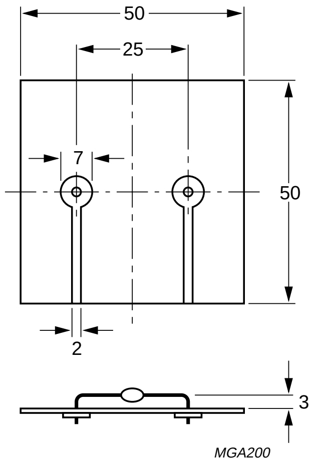
Solid line: basic high-voltage E/W modulator circuit; see Fig.8.
Dotted line: basic conventional horizontal deflection circuit; see Fig.9.
Curves include power dissipation due to switching losses.

Fig.2 Maximum total power dissipation as a function of working peak forward current.



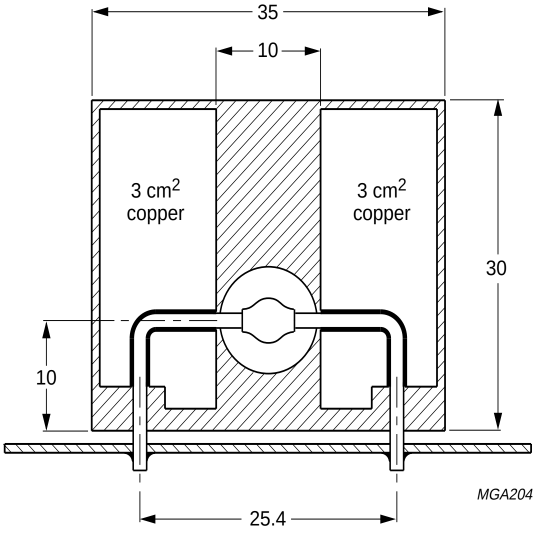
Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; maximum values.



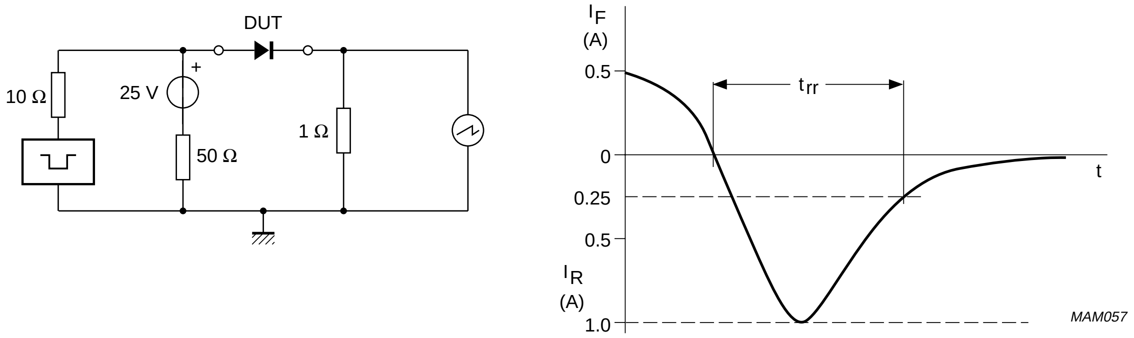
Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.



Dimensions in mm.

Fig.5 Mounting with additional printed-circuit board for heat sink purposes.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \le 7$ ns.
Source impedance: 50 Ω; $t_r \le 15$ ns.

Fig.6 Test circuit and reverse recovery time waveform and definition.

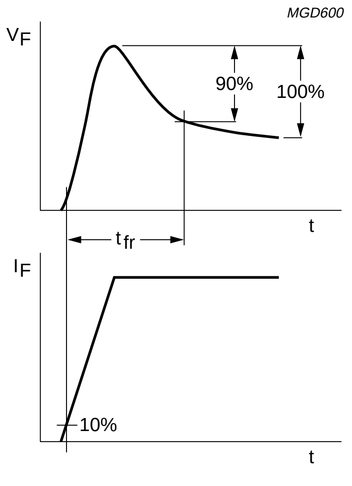


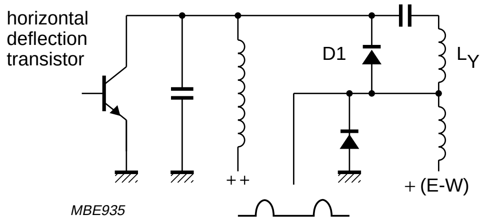
Fig.7 Forward recovery time definition.

APPLICATION INFORMATION

For horizontal deflection circuits, two basic applications are shown in Figs 8 and 9.

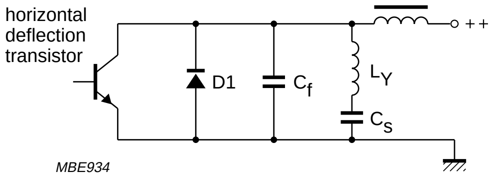
The maximum allowable total power dissipation for the diode can be calculated from the thermal resistance $R_{th\ j\text{-}a}$ and the difference between $T_{j\ max}$ and $T_{amb\ max}$ in the application. The maximum I_{FWM} can then be taken from Fig.2.

The basic application waveforms in Fig.10 relate to the circuit in Fig.8. In the circuit in Fig.9 the forward conduction time of the diode is shorter, allowing a higher I_{FWM} (see Fig.2).



D1 = BY278.

Fig.8 Application in basic high-voltage E/W modulator circuit.



D1 = BY278.

Fig.9 Application in basic horizontal deflection circuit.

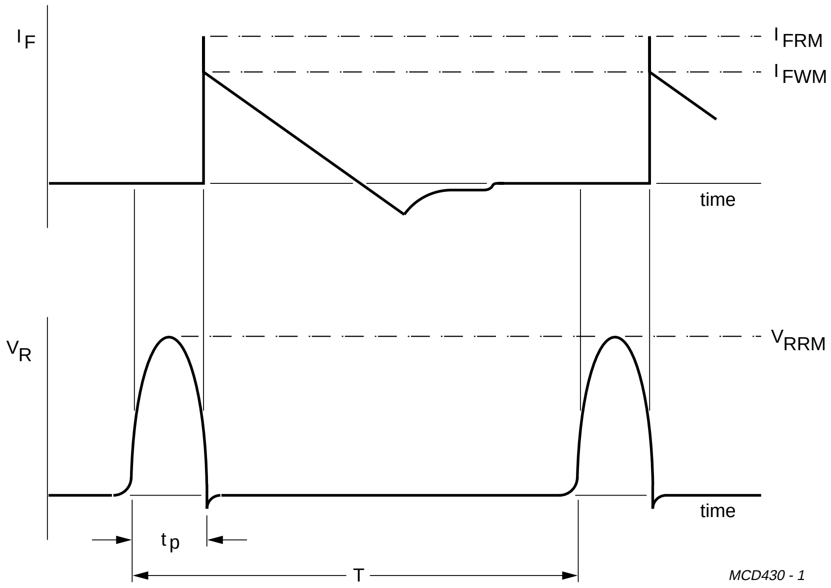
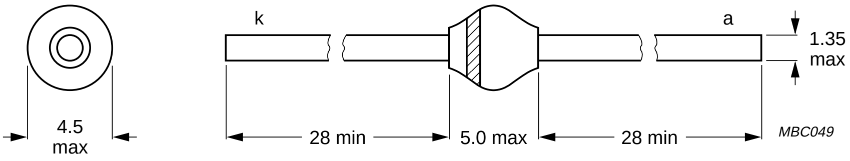


Fig.10 Basic application waveforms.

PACKAGE OUTLINE



Dimensions in mm.
The marking band indicates the cathode.

Fig.11 SOD64.

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.