



## **2-line filters**

### **IEC inlet filters**

250 V DC/AC, 50/60 Hz, 1 ... 10 A, 40 °C

|                       |                    |
|-----------------------|--------------------|
| <b>Ordering code:</b> | <b>B84776*A000</b> |
| Date:                 | 2009-11-20         |
| Version:              | 05                 |

## Construction

- 2-line filter with IEC connector, fuse holder and switch
- Appliance connector according to IEC/EN 60320-1
- Fuse holder for 2 fuses  $\varnothing$  5 x 20 mm
- Metal case
- 2-pole rocker switch

## Versions

- Standard version (B84776A\*)
- Medical version with low leakage current (B84776M\*)

## Features

- Easy to install
- Compact design
- Cost optimized construction
- Degree of protection from front side IP 40 <sup>1)</sup>
- Design complies with IEC / EN 60939, UL 1283, CSA 22.2 No.8

## Applications

- Switched-mode power supplies for
  - industrial electronics
  - telecom systems
  - data systems
- DC applications
- Measuring instruments
- Medical engineering

## Terminals

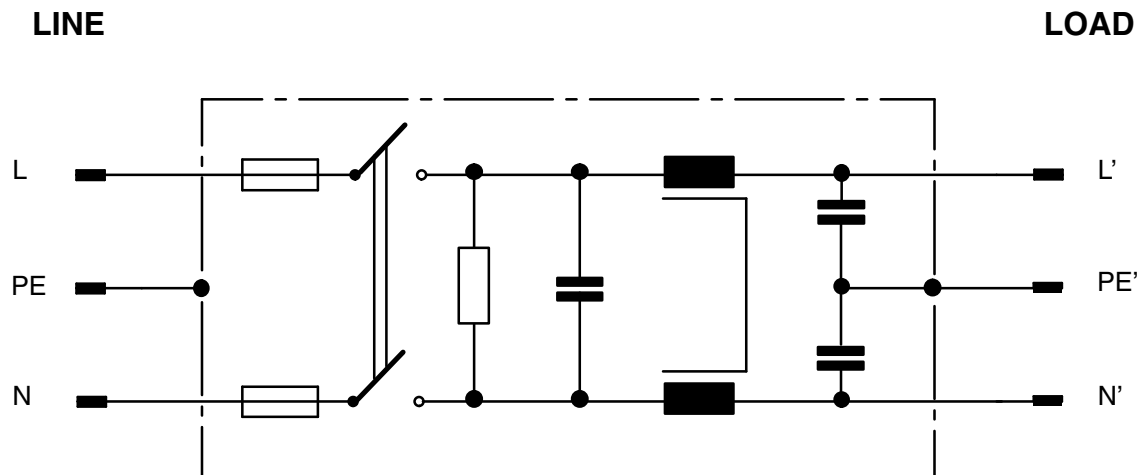
- Line side: IEC inlet C14 according to IEC/EN 60320-1
- Load side: Tab connectors 6.3 x 0.8 mm

## Marking

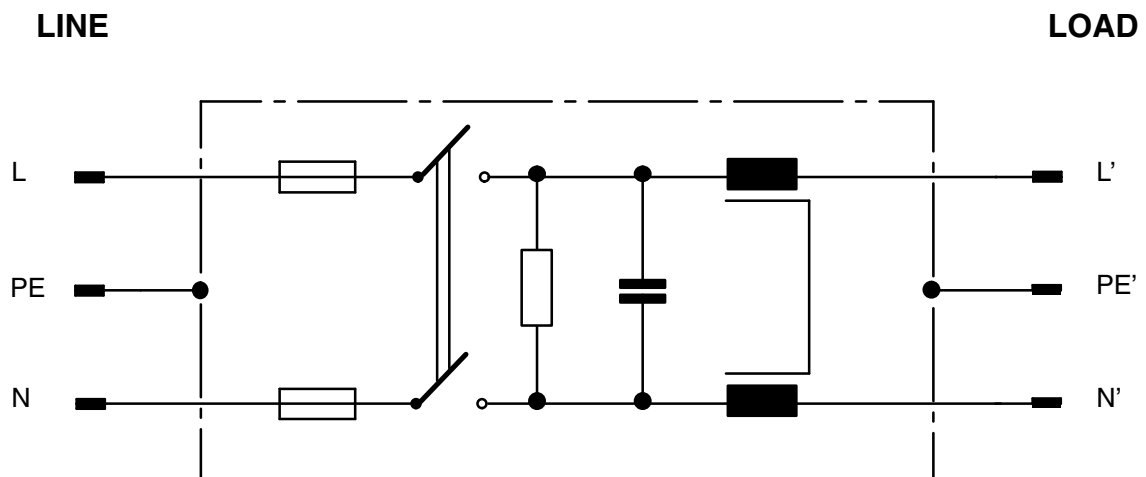
- Marking on component:  
manufacturer's logo, ordering code, rated voltage, rated current, rated temperature, climatic category, date code
- Minimum marking on packaging: manufacturer's logo, ordering code, date code, quantity

<sup>1)</sup> To IEC 60529

# Typical circuit diagram of B84776A\*A000 (standard version)



# Typical circuit diagram of B84776M\*A000 (medical version)



# Technical data and measuring conditions of B84776\*A000

|                                              |                            |            |                         |         |
|----------------------------------------------|----------------------------|------------|-------------------------|---------|
| Rated voltage                                |                            | $U_R$      | 250                     | V DC/AC |
| Rated frequency                              |                            | $f_R$      | 50/60                   | Hz      |
| Test voltage line to line for 2 s            |                            | $U_{test}$ | 760                     | V AC    |
| Test voltage line to case for 2 s (B84776A*) |                            | $U_{test}$ | 2000                    | V AC    |
| Test voltage line to case for 2 s (B84776M*) |                            | $U_{test}$ | 2500                    | V AC    |
| Rated temperature                            |                            | $T_R$      | 40                      | °C      |
| Climatic category (IEC 60068-1)              |                            |            | 25/085/21               |         |
| Rocker switch                                | Rating                     |            | 10 A (1/2 HP) / 250 VAC |         |
|                                              | Inrush current             |            | 82                      | A       |
|                                              | Electrical lifetime ON-OFF |            | 10000                   | cycles  |
|                                              | Mechanical lifetime ON-OFF |            | 50000                   | cycles  |

### Characteristics and ordering codes of B84776\*A000

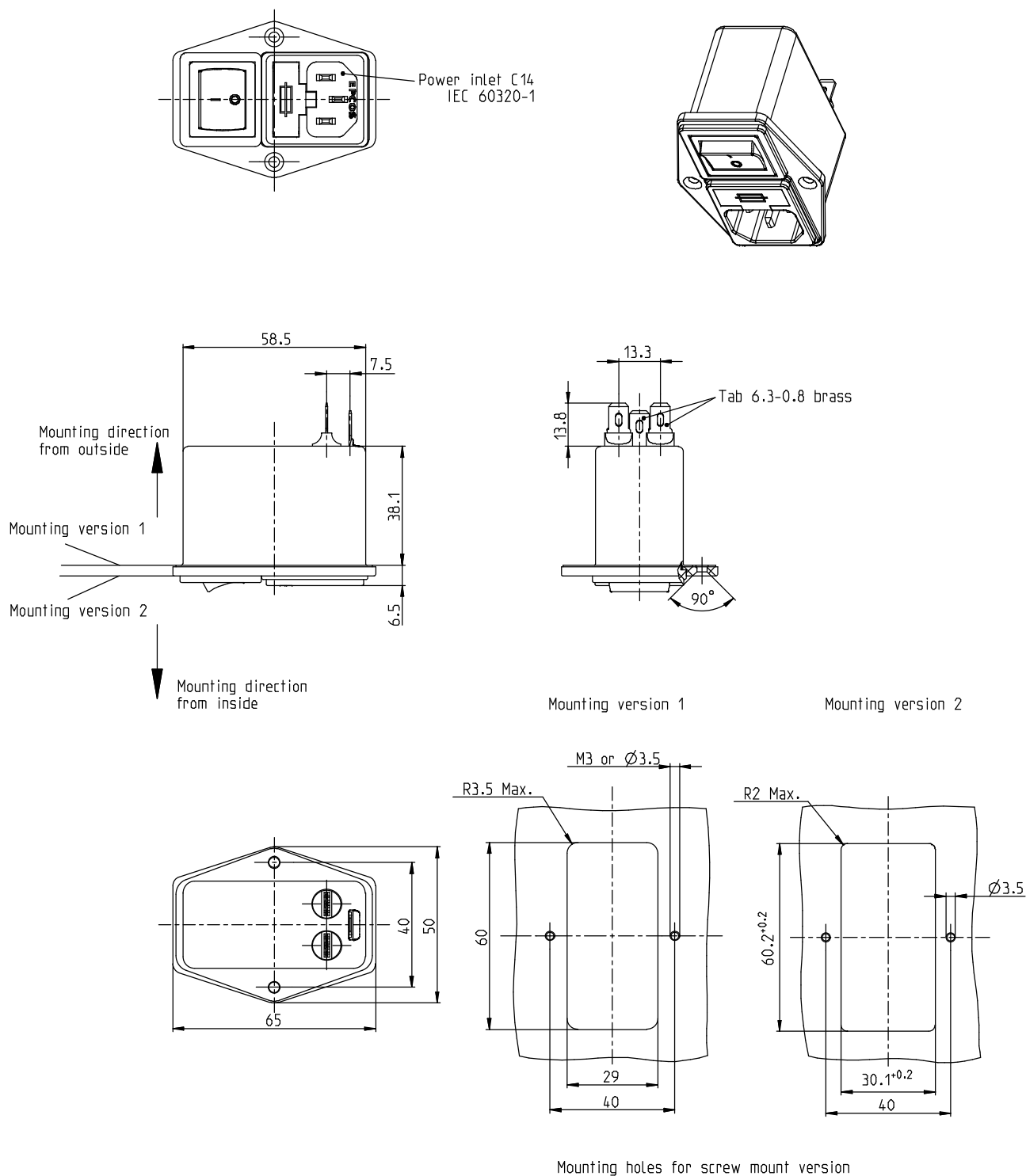
| $I_R$ | $C_R$         |          | $L_R$  | $I_{leak}^{2)}$ | $R_{bleed}$ | Approx. weight | Ordering code   | Approvals                                                                           |                                                                                     |                                                                                     |
|-------|---------------|----------|--------|-----------------|-------------|----------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| A     | X2<br>$\mu F$ | Y2<br>nF | mH     | mA              | M $\Omega$  | g              |                 |  |  |  |
| 1     | 1x0.22        | 2x2.2    | 2x7.6  | 0.173           | 1           | 90             | B84776A0001A000 | +                                                                                   | +                                                                                   | +                                                                                   |
|       | 1x0.22        | –        | 2x7.6  | 0               | 1           | 90             | B84776M0001A000 | +                                                                                   | +                                                                                   | +                                                                                   |
| 2     | 1x0.22        | 2x2.2    | 2x2.0  | 0.173           | 1           | 90             | B84776A0002A000 | +                                                                                   | +                                                                                   | +                                                                                   |
|       | 1x0.22        | –        | 2x2.0  | 0               | 1           | 90             | B84776M0002A000 | +                                                                                   | +                                                                                   | +                                                                                   |
| 4     | 1x0.22        | 2x2.2    | 2x1.0  | 0.173           | 1           | 90             | B84776A0004A000 | +                                                                                   | +                                                                                   | +                                                                                   |
|       | 1x0.22        | –        | 2x1.0  | 0               | 1           | 90             | B84776M0004A000 | +                                                                                   | +                                                                                   | +                                                                                   |
| 6     | 1x0.22        | 2x2.2    | 2x0.46 | 0.173           | 1           | 90             | B84776A0006A000 | +                                                                                   | +                                                                                   | +                                                                                   |
|       | 1x0.22        | –        | 2x0.46 | 0               | 1           | 90             | B84776M0006A000 | +                                                                                   | +                                                                                   | +                                                                                   |
| 10    | 1x0.22        | 2x2.2    | 2x0.33 | 0.173           | 1           | 130            | B84776A0010A000 | +                                                                                   | +                                                                                   | +                                                                                   |
|       | 1x0.22        | –        | 2x0.33 | 0               | 1           | 130            | B84776M0010A000 | +                                                                                   | +                                                                                   | +                                                                                   |

+ = approval will be requested

2) Calculation according draft proposal IEC 60939–1 Ed. 3 (2008–10–29), annex A, "Calculation of leakage current".

In practice are up to double values to be expected due to the insulation resistance values of the used ceramic capacitors. For the medical version results computationally the value 0. In practice are values 1 ... 2  $\mu A$  to be expected due to the insulation resistance values of the used ceramic capacitors.

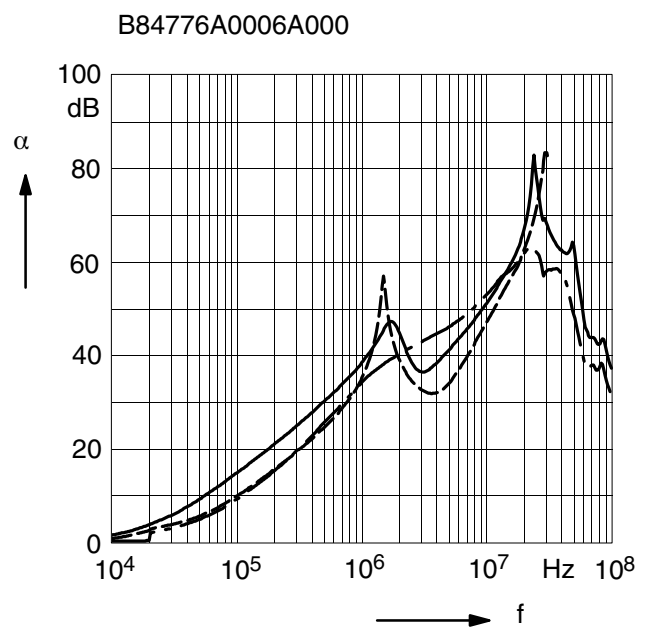
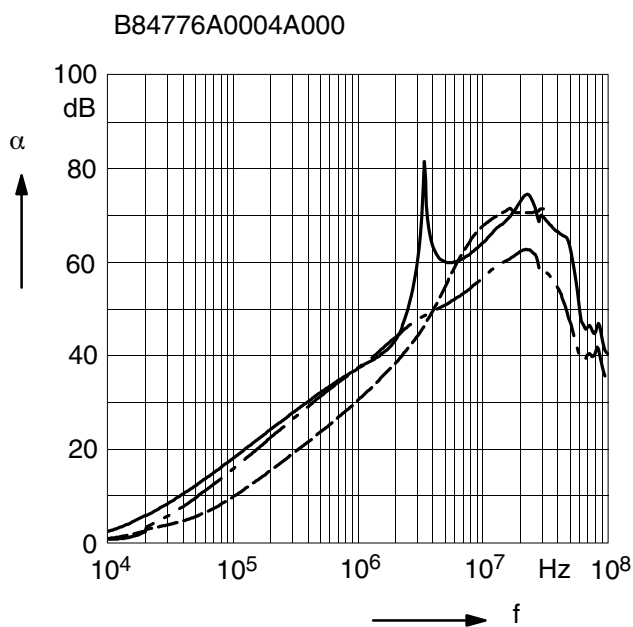
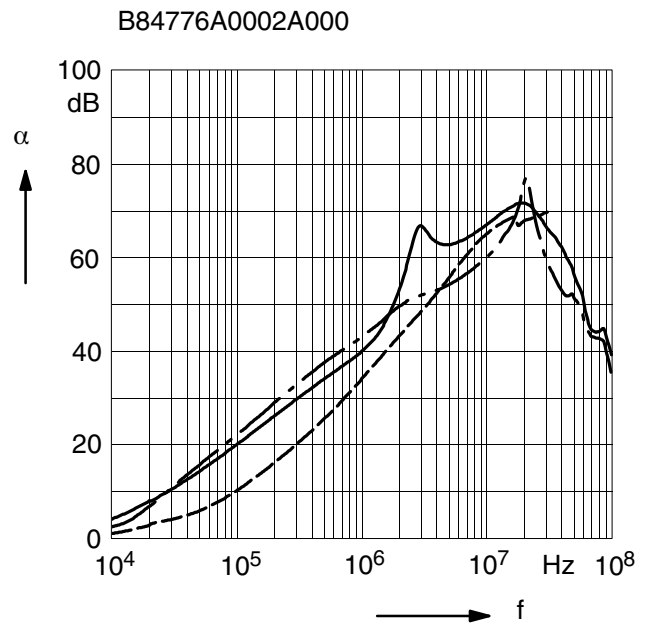
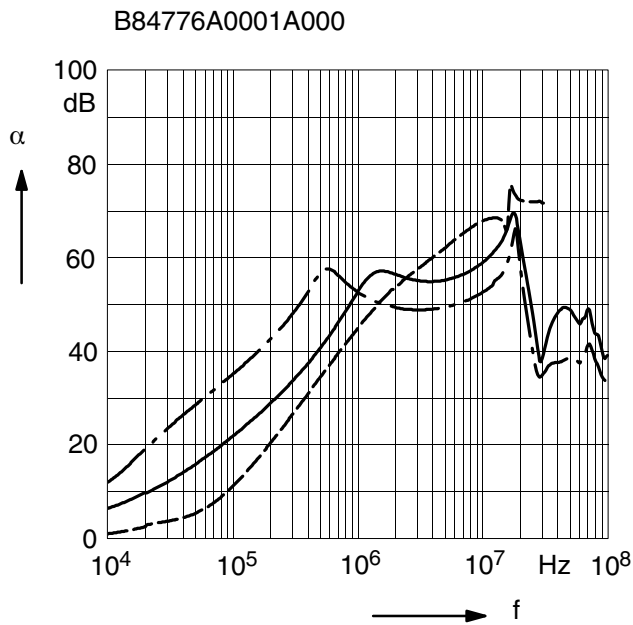
## Dimensional drawing



All dimensions in mm

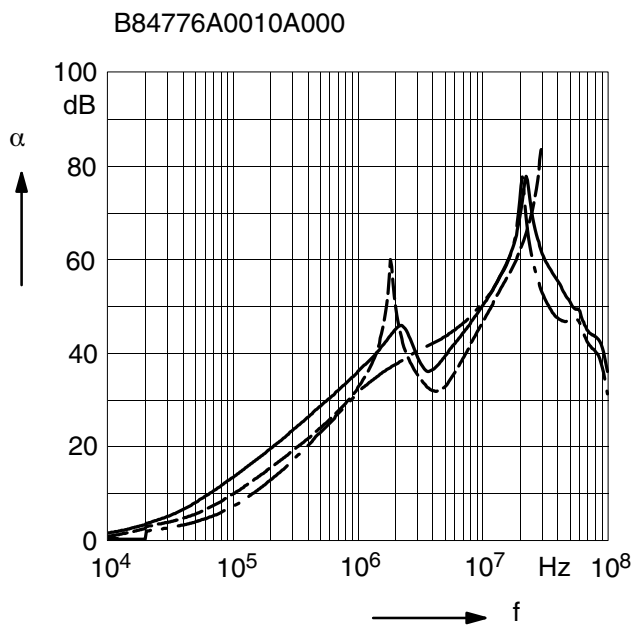
**Insertion loss** (typical values at  $Z = 50 \Omega$ )

- unsymmetrical, adjacent branches terminated
- - - common mode, all branches in parallel (asymmetrical)
- - - differential mode (symmetrical)



**Insertion loss** (typical values at  $Z = 50 \Omega$ )

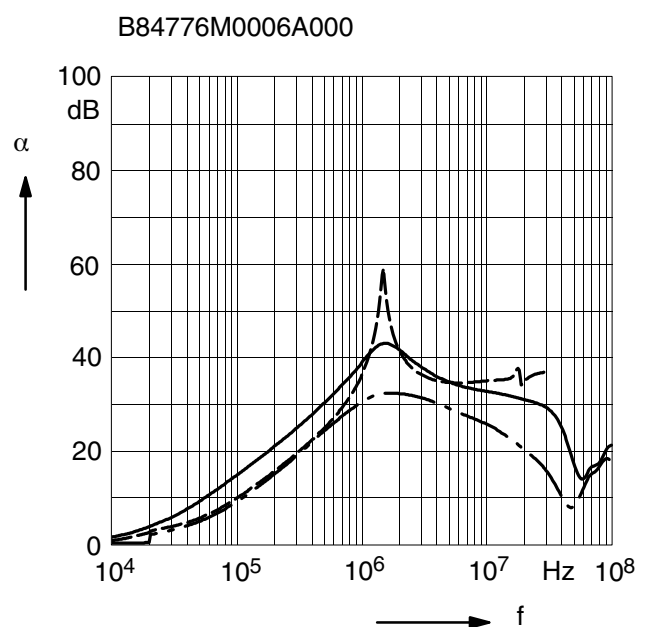
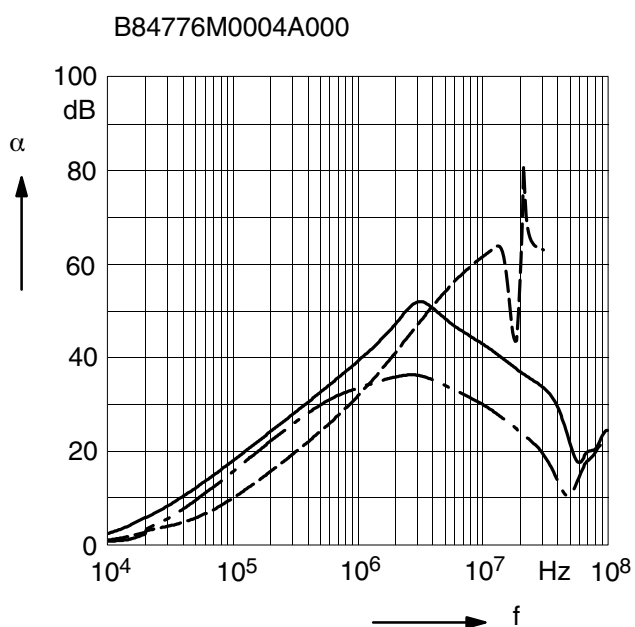
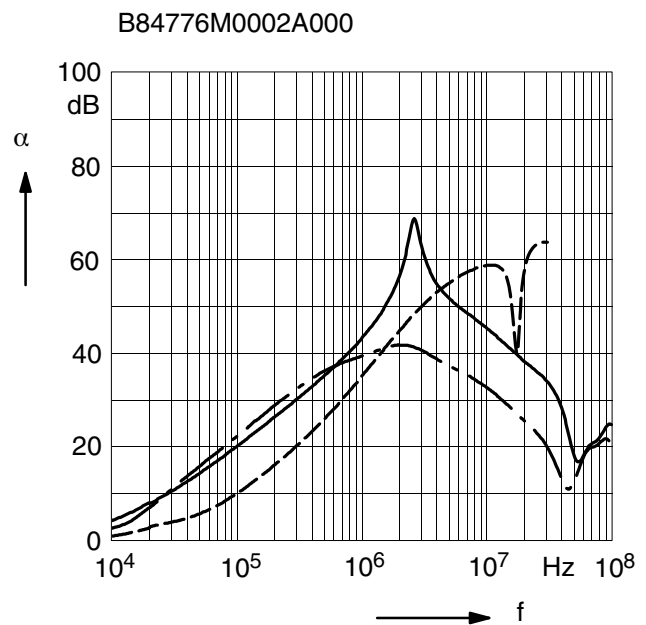
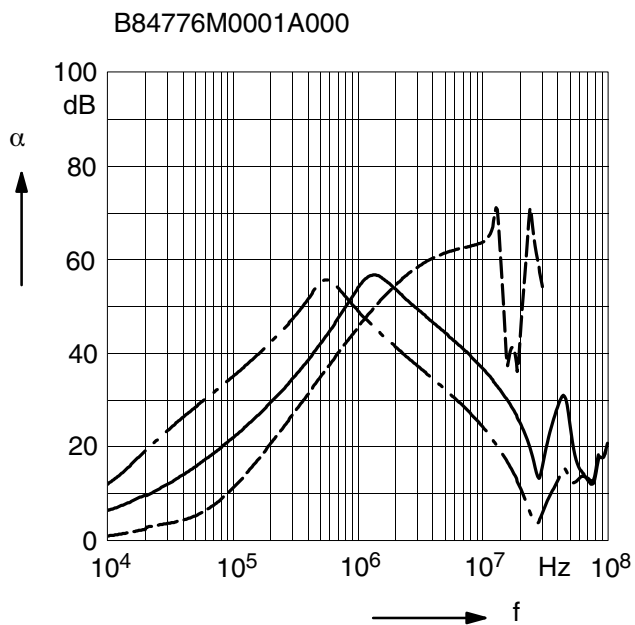
- unsymmetrical, adjacent branches terminated
- · - common mode, all branches in parallel (asymmetrical)
- - - differential mode (symmetrical)





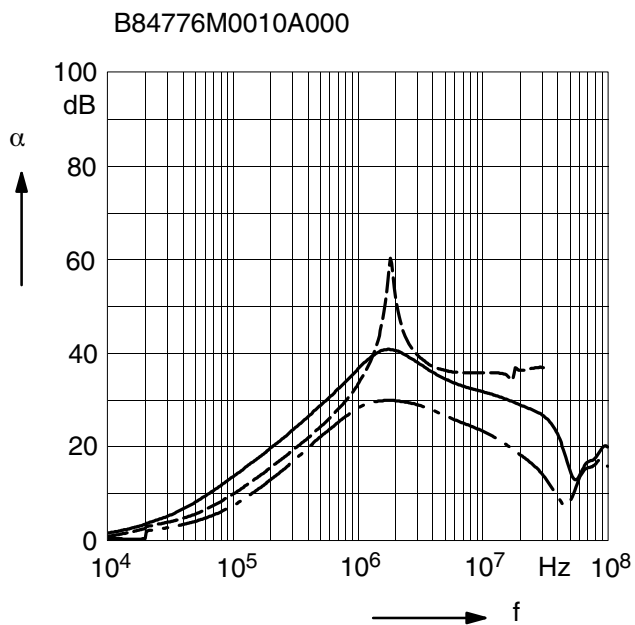
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### Caution and warnings

- Please note the advices in our data book “EMC Filters” (latest edition); attention should be paid to the chapter “General safety notes”.
- It shall be ensured that only qualified persons (electricity specialists) are engaged on work such as planning, assembly, installation, operation, repair and maintenance. They must be provided with the corresponding documentation.
- Danger of electric shock. EMC filters contain components that store an electric charge. Dangerous voltages can continue to exist at the filter terminals for longer than five minutes even after the power has been switched off.
- The protective earth connections shall be the first to be made when the EMC filter is installed and the last to be disconnected. Depending on the magnitude of the leakage currents, the particular specifications for making the protective–earth connection must be observed.
- Impermissible overloading of the EMC filter, such as with circuits able to cause resonances, impermissible voltages at higher frequencies etc. can lead to bodily injury and death as well as cause substantial material damages (e.g. destruction of the filter housing).
- EMC filters must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective.
- In case of leakage currents  $> 3.5 \text{ mA}$  you shall mount the PE conductor stationary with the required cross section before beginning of operation and save it against disconnecting. For leakage currents  $I_L^{4)} < 10 \text{ mA}$  the PE conductor must have a KU value <sup>3)</sup> of 4.5; for leakage currents  $I_L \geq 10 \text{ mA}$  the PE conductor must have a KU value of 6.

3) The KU value (symbol KU) is a classification parameter of safety–referred failure types designed to ensure protection against hazardous body currents and excessive heating.

A value of KU = 4.5 with respect to interruptions is attained:

– with a permanently connected protective earth circuit  $\geq 1.5 \text{ mm}^2$

– with a protective earth circuit  $\geq 2.5 \text{ mm}^2$  connected via shroud connectors (IEC 60309–2).

KU = 6 with respect to interruptions is achieved for fixed–connection lines  $\geq 10 \text{ mm}^2$  where the type of connection and line layout correspond to the requirements for PEN conductors as specified in relevant standards.

4)  $I_L$  = leakage current let–go

## Important notes

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1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
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