Filter for 10 Mbit data lines with HEMP-Protection according to MIL-STD 188-125-1

15 V, 100 mA, 10 Mbit/s

Series/Type: **B84320Z0010E047**

Date: September 2017

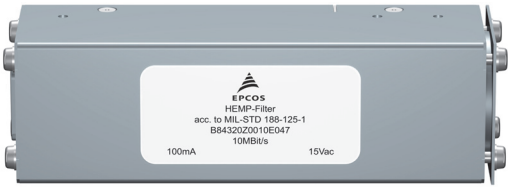
EPCOS AG is a TDK Group Company.

Filter for 10 Mbit data lines with HEMP-Protection

15 V, 100 mA, 10 Mbit/s **B84320Z0010E047**

Features

- HEMP protection acc. MIL-STD-188-125-1
- Extended performance
- For installation outside or inside the shielded area



Design

The electrical components are incorporated in an RF-tight case of tin-plated sheet steel. Coaxial feed-through capacitors are used at the filter circuit.

Installation

Single filters are attached directly to the shielding wall. The single filters can be mounted from outside and from inside to the shielded wall. Larger numbers can be housed in filter cabinets or boxes.

Technical data and measuring conditions

Rated voltage	U_R	± 15 V
Rated current	I_R	100 mA
Passband	f_{Pass}	10 Mbit/s acc. IEEE 802.3
Line impedance	Z_L	100 Ω
Number of lines		1 cable 10BASE-T Ethernet 10 Mbit/s
PoE compatible (Power over Ethernet)		Not possible
DC resistance	R_{DC}	Insulated
Connectors X1 and X2		RJ45 shielded
Used pins		1, 2 for TX, 3, 6 for RX
Rated temperature	T_R	40 °C
Transverse delay time	t_D	< 0.2 µs
Breakdown voltage	V_{br}	20 V
Max. clamping voltage	V_{cl}	28 V
Climatic category (IEC 60068-1: 1992)		25/085/56
Degree of protection (IEC 60529: 2013)		IP 20
Weight		420 g

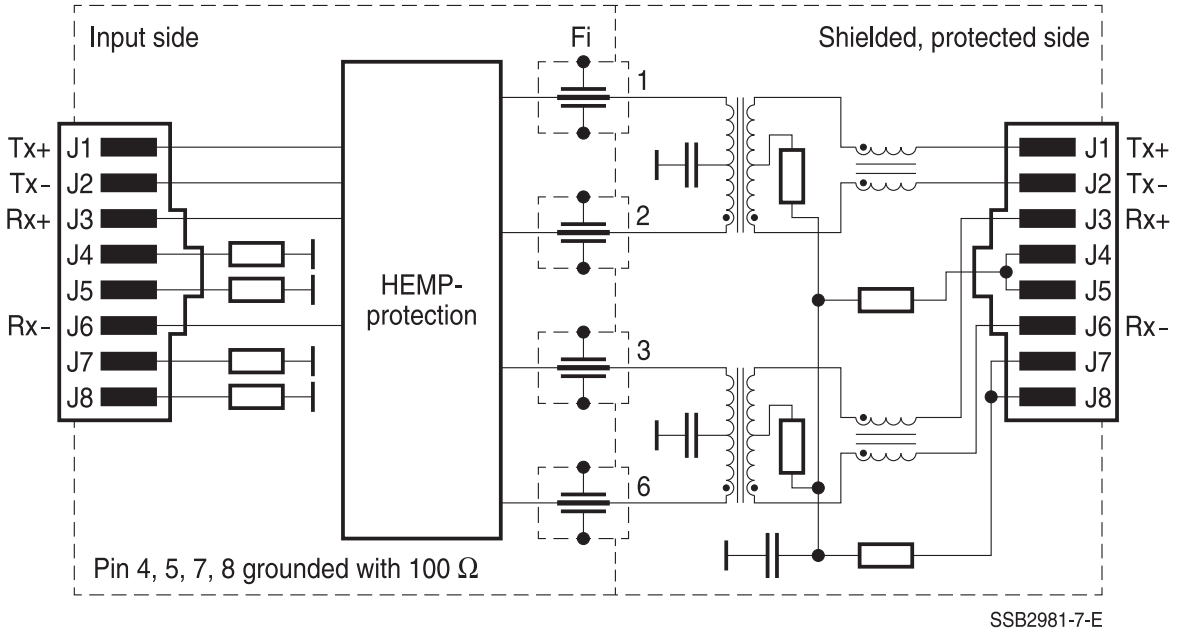
Approvals / Test reports acc. to MIL-STD 188-125-1

Test report from EMCCons DR. RAŠEK GmbH & Co. KG (www.emcc.de) acc. to MIL-STD 188-125-1 (short and intermediate pulse test) available.

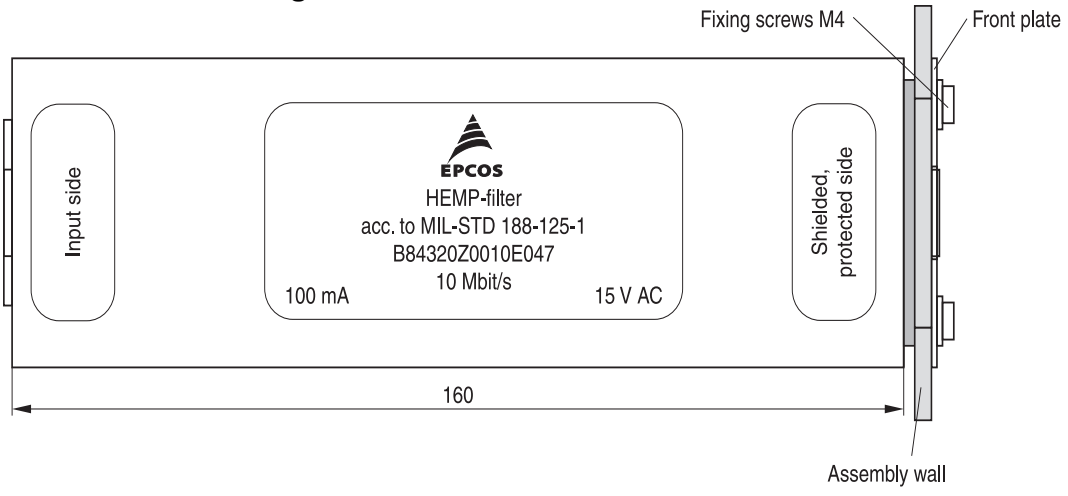
Ordering code		Response current short pulse	Response current intermediate pulse
B84320Z010E047	Test report EMCC-860009.1GD, 2017-01-09	Compliant[1)]	Compliant[1)]

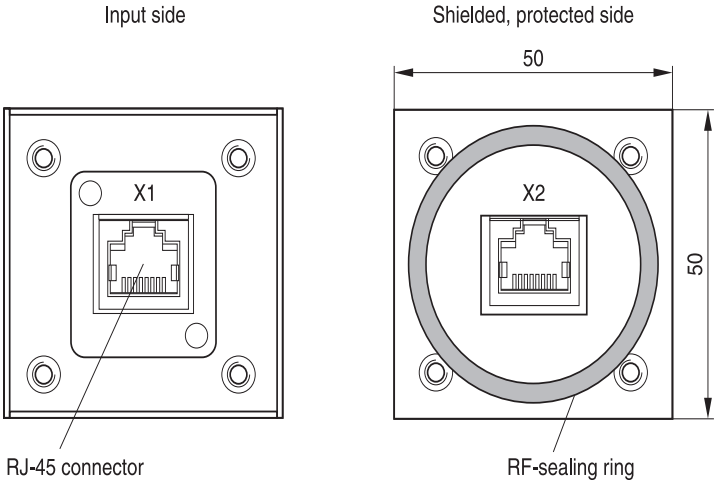
1) Test with cabling instead of RJ45 connector X1. With connector X1 charging voltage 20 kV instead of 100 kV at short pulse and pulse current 100 A instead of 250 A at intermediate pulse.

Typical circuit diagram

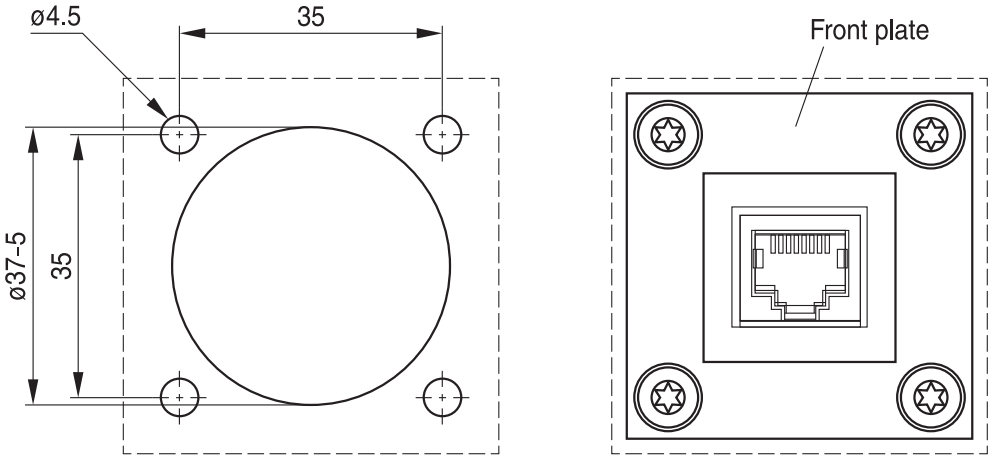


Dimensional drawings

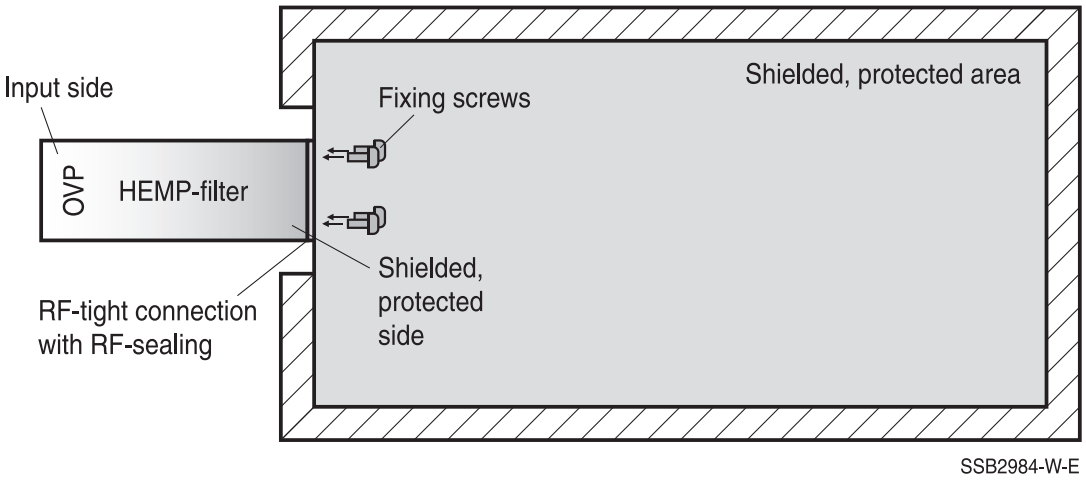




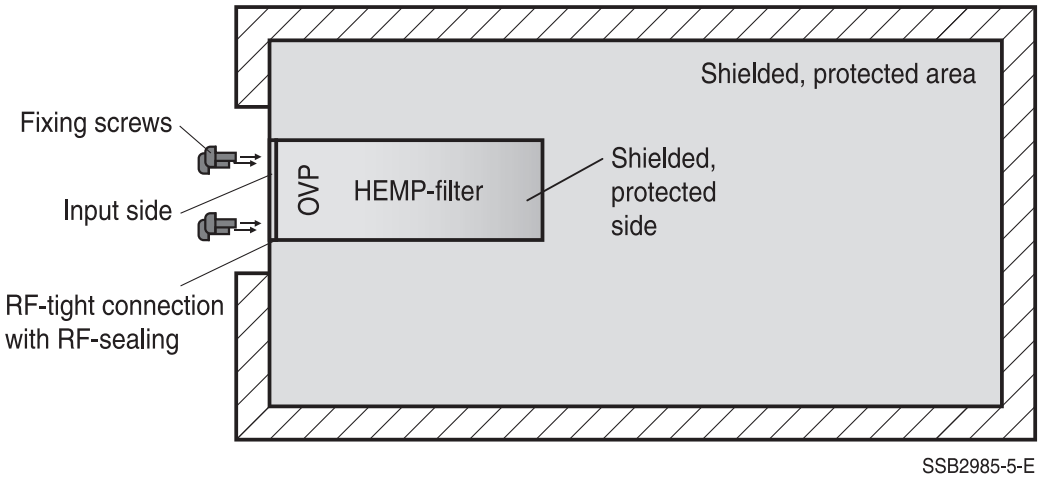
Assembly at the shielded wall



Assembly outside at the shielded wall



Assembly inside at the shielded wall



Please read all safety and warning notes carefully before installing the filter and putting it into operation. The same applies to the warning signs on the filter. Please ensure that the signs are not removed nor their legibility impaired by external influences.

Death, serious bodily injury and substantial material damage to equipment may occur if the appropriate safety measures are not carried out or the warnings in the text are not observed.

Using according to the terms

The filters may be used only for their intended application within the specified values in low voltage networks in compliance with the instructions given in the data sheets and the data book.
The conditions at the place of application must comply with all specifications for the filter used.

Warning

- 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. 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 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 filter or 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).
- Filters must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective devices.
- In case of leakage currents >3.5 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 [1)] ≤10 mA the PE conductor must have a KU value[2)] of 4.5[3)] ; for leakage currents I_L >10 mA the PE conductor must have a KU value of 6[4)] .
- Because the product can become very hot during operation, there is the risk of burns if touched. The product can remain hot for some time after the power is switched off!

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The ordering code for one and the same EPCOS product can be represented differently in data sheets, data books, other publications, on the EPCOS website, or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products**. Detailed information can be found on the Internet under www.epcos.com/orderingcodes

1) IL = leakage current let-go
2) 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.
3) IL = A value of KU = 4.5 with respect to interruptions is attained with: a) permanently connected protective earth connection ≥1.5 mm^2 and b) a protective earth connection ≥2.5 mm^2 via connectors for industrial equipment (IEC 6030902)
4) KU = 6 with respect to interruptions is achieved for fixed-connection lines ≥10 mm^2 where the type of connection and installation correspond to the requirements for PEN conductors as specified in relevant standards.

Symbol	English	German
dv/dt	Rate of voltage rise	Spannungsanstiegsgeschwindigkeit
f_R	Rated frequency	Bemessungsfrequenz
f_{Pass}	Passband	
I_{LK}	Filter leakage current	Filter-Ableitstrom
$I_{reactive}$	Capacitive reactive current	Kapazitiver Blindstrom
I_N	Nominal current	Nennstrom
I_R	Rated current	Bemessungsstrom
I_{over}	Overcurrent	Überstrom
P_D	Power dissipation	Verlustleistung
R_I	Internal resistance	Innenwiderstand
R_{DC}	Maximum DC resistance	Max. Gleichstromwiderstand (Gleichspannung)
T_A	Ambient temperature	Umgebungstemperatur
T_D	Transverse delay time	
T_R	Rated temperature	Bemessungstemperatur
THD_{max}	Max. permissible harmonic distortion	
V_{br}	Breakdown voltage	
V_{cl}	Max. clamping voltage	
V_N	Nominal network voltage	Netzspannung
V_{test}	Test voltage	Prüfspannung
V_R	Rated voltage	Bemessungsspannung
Z	Impedance	Scheinwiderstand
Z_L	Line impedance	Leitungsimpedanz
α_e	Insertion loss	Einfügungsdämpfung
ΔV	Voltage drop	Spannungsabfall

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The following applies to all products named in this publication:

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 we are 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 a product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
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