



## **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

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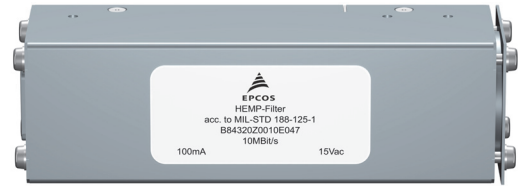
## Filter for 10 Mbit data lines with HEMP-Protection

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### 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	$U_R$	$\pm 15 \text{ V}$
Rated current	$I_R$	100 mA
Passband	$f_{\text{Pass}}$	10 Mbit/s acc. IEEE 802.3
Line impedance	$Z_L$	100 $\Omega$
Number of lines		1 cable 10BASE-T Ethernet 10 Mbit/s
PoE compatible (Power over Ethernet)		Not possible
DC resistance	$R_{\text{DC}}$	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 $\mu\text{s}$
Breakdown voltage	$V_{\text{br}}$	20 V
Max. clamping voltage	$V_{\text{cl}}$	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 EMCCCons DR. RAŠEK GmbH & Co. KG ([www.emcc.de](http://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 <sup>1)</sup>	Compliant <sup>1)</sup>

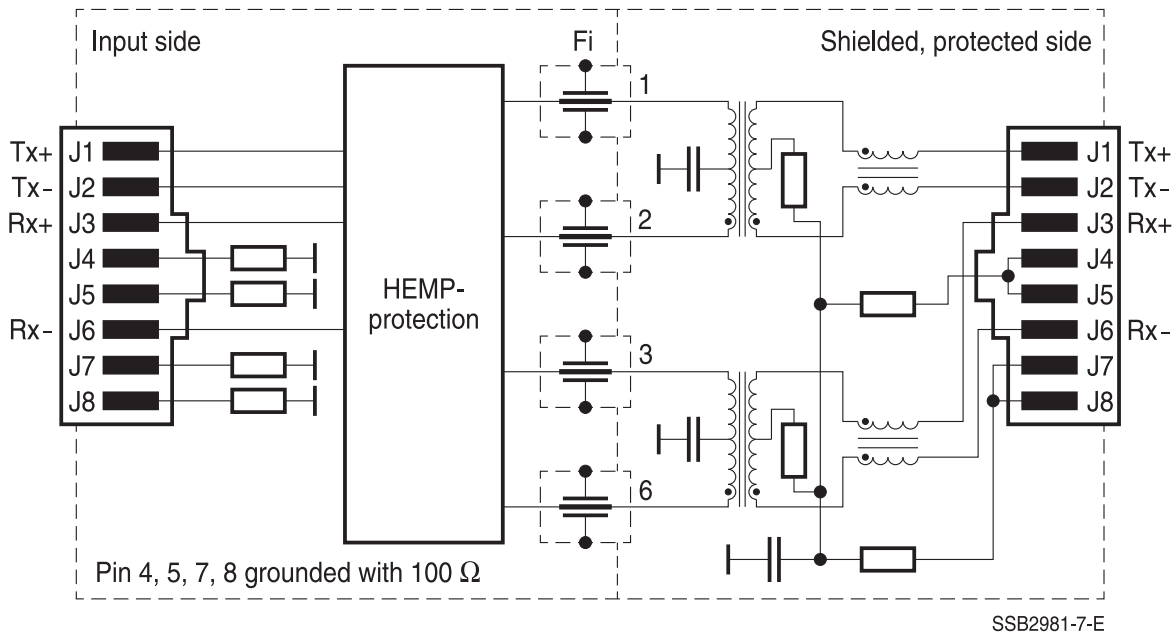
1) Test with cabling instead of RJ45 connector X1. With connector X1 charging voltage 20 kV instead of 100 kV at short pulse and pulse current 100 A instead of 250 A at intermediate pulse.

# Filter for 10 Mbit data lines with HEMP-Protection

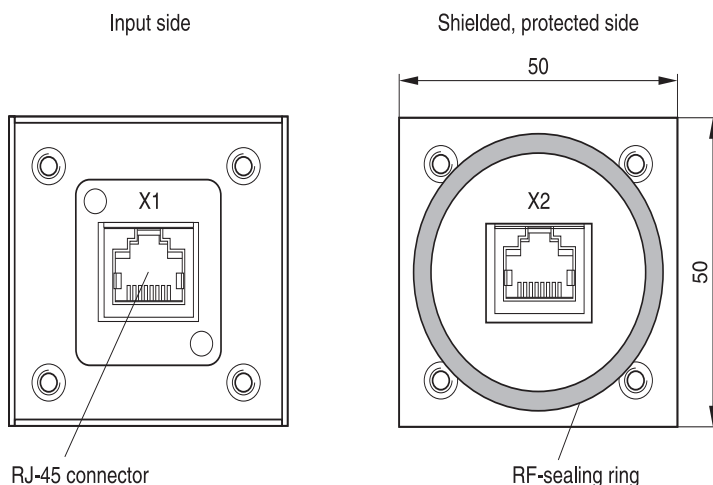
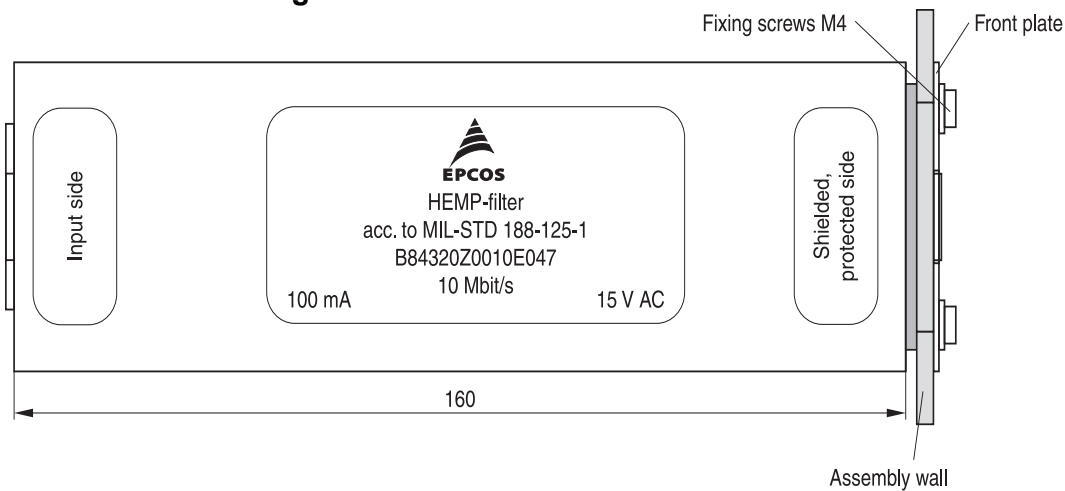
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## Typical circuit diagram



## Dimensional drawings



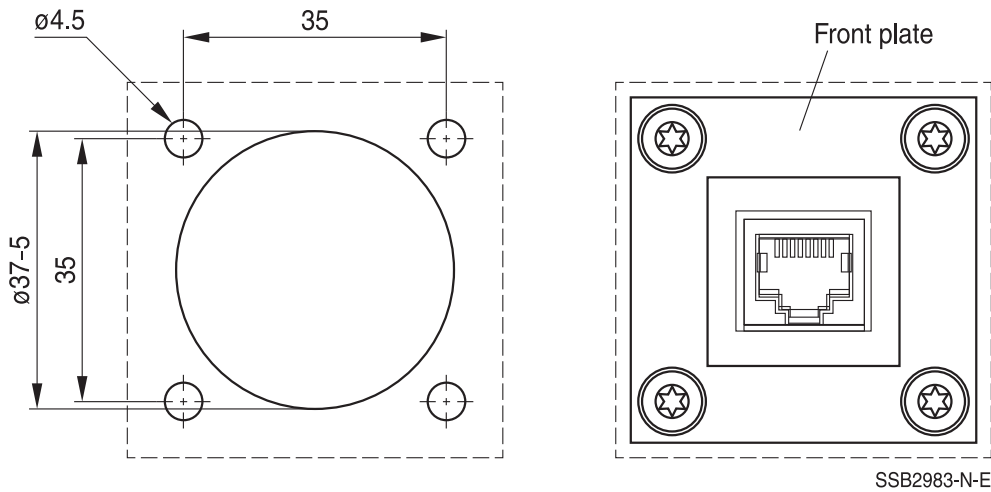
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**Filter for 10 Mbit data lines with HEMP-Protection**

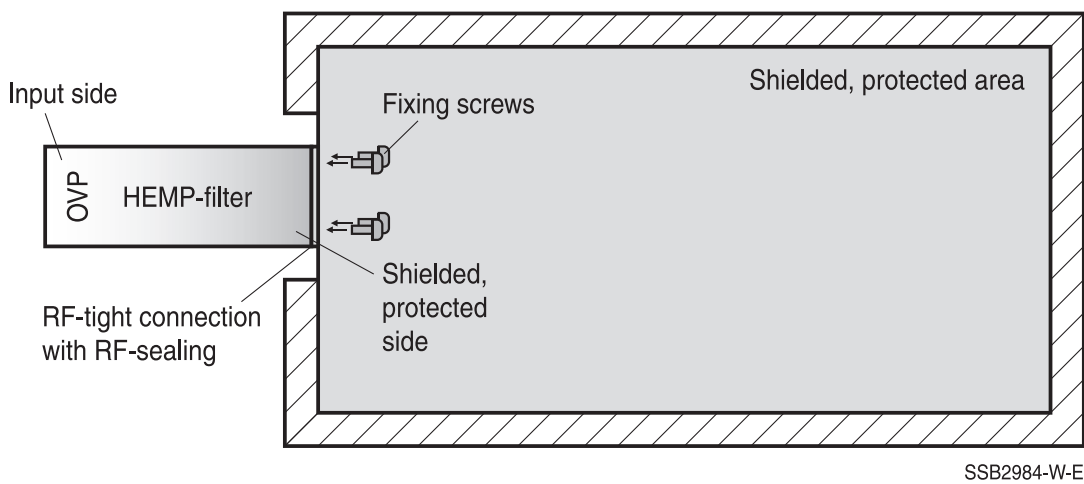
**15 V, 100 mA, 10 Mbit/s**

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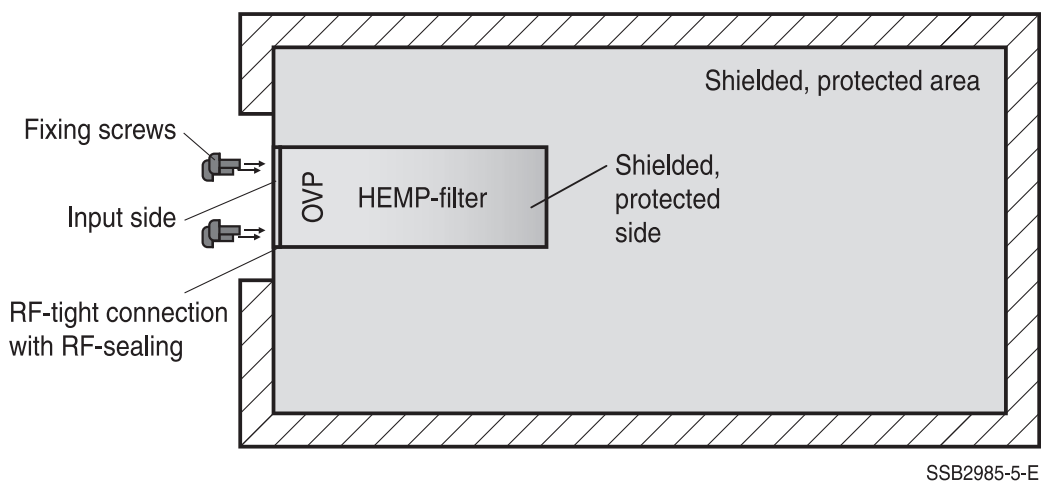
**Assembly at the shielded wall**



**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  $I_L^{(1)} \leq 10$  mA the PE conductor must have a KU value<sup>2)</sup> of 4.5<sup>3)</sup>; for leakage currents  $I_L > 10$  mA the PE conductor must have a KU value of 6<sup>4)</sup>.
- 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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1)  $I_L$  = 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)  $I_L$  = A value of KU = 4.5 with respect to interruptions is attained with: a) permanently connected protective earth connection  $\geq 1.5$  mm<sup>2</sup> and b) a protective earth connection  $\geq 2.5$  mm<sup>2</sup> via connectors for industrial equipment (IEC 6030902)

4) KU = 6 with respect to interruptions is achieved for fixed-connection lines  $\geq 10$  mm<sup>2</sup> where the type of connection and installation correspond to the requirements for PEN conductors as specified in relevant standards.

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**Symbols and terms**
**B84320Z0010E047**

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
$\alpha_e$	Insertion loss	Einfügungsdämpfung
$\Delta V$	Voltage drop	Spannungsabfall

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