Smart Meter Shield for Power Line Communication

- To be installed between smart meter and home installation
- Improves signal-to-noise ratio on smart meter side
- Reduces PLC signal on house-hold side
- Low power consumption
- Low reactive power loss
- Effect focussed on PLC frequency spectrum < 100 kHz

### Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance</td>
<td>25 - 72 Ohm in the CENELEC A band</td>
</tr>
<tr>
<td>Energy absorption</td>
<td>3.4 W typical (7.5 W maximum)</td>
</tr>
<tr>
<td>Nominal Current</td>
<td>0 to 40 A rms</td>
</tr>
<tr>
<td>Peak Current</td>
<td>90 A</td>
</tr>
<tr>
<td>Nominal operating voltage</td>
<td>230 V AC +/- 10 %</td>
</tr>
<tr>
<td>Rated operating voltage</td>
<td>185 - 264 V AC</td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>III, according IEC 62052:31</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>-25 °C to +70 °C</td>
</tr>
<tr>
<td>Climatic category</td>
<td>25/085/21 acc. IEC60068-1</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>PD2 acc. IEC 60664-1</td>
</tr>
<tr>
<td>Protection category</td>
<td>IP20</td>
</tr>
<tr>
<td>Rated currents</td>
<td>0 to 40 A @50°C</td>
</tr>
<tr>
<td>Flammability corresponding to</td>
<td>UL94-V0</td>
</tr>
</tbody>
</table>

### Performance indicators

<table>
<thead>
<tr>
<th>PLC target frequency range [kHz]</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>&gt;100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated current [A]</td>
<td>5</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Approval & Compliances

- CE
- RoHS

### Typical applications

- Roll-out of PLC smart meter infrastructure
- Clean-up process after smart meter roll-out
- Trouble shooting at PLC networks
- Low impedance load de-coupling

### Features and benefits

- Small and cost effective solution to improve PLC communication
- Compatible to one-phase smart meters up to 40 A rated current
- Compatible to G3-PLC and PLAN+ (CENELEC A)
- Creates an impedance 25 - 72 Ohm between 37.8 kHz and 91 kHz
- Typical Signal-To-Noise-Ratio Enhancement (SNRE): 28 - 40 dB in the CENELEC A band at 1 Ohm load impedance
- No interruption of the power line. The impedance is induced to the line.
- No high current termination / connection required

### Typical installation schematic

Power lines are looped through the 15 mm apertures in the housing.
Not in the picture: Auxiliary power connection of typical 160 mA at 230V AC.
Filter selection table

<table>
<thead>
<tr>
<th>Filter</th>
<th>Rated current @50 Hz [A]</th>
<th>Phases</th>
<th>Impedance* Z [Ohm]</th>
<th>Typical power loss [W]</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIS140C-1E</td>
<td>40</td>
<td>1</td>
<td>25 - 72</td>
<td>3.4</td>
<td>330</td>
</tr>
</tbody>
</table>

* In the frequency range of CENELEC A

Typical Signal-to-Noise-ratio Enhancement (SNRE)

Design Standard

Electricity metering equipment (AC) - General requirements, tests and test conditions:
- IEC EN 62052-11 Metering equipment
- IEC EN 62052-31 Product safety requirements and tests

Product Compliances

- EMC directive 2014/30/EU
- Low voltage directive 2014/35/EU

LED Indication

- PWR - Power On
- OVLD - Overload / Error

Electrical Connections

Load connection 40 A

- No conductive connection is needed
- P & N are looped through ø15mm holes

Auxiliary Power Connection

- Push-in terminal
- Solid and litz wires
- Maximum size 1,5mm² / AWG14
- Typical input 160 mA rms @ 230 Vac

Dimensions*

- For dimensions [mm] without tolerances: ISO2768-m/EN22768-m applies

*under review.
Insertion Loss at different grid impedances

**Typical Insertion Loss Characteristics LIS140C-1E - with $Z_{out} = 1\Omega$**

**Typical Insertion Loss Characteristics LIS140C-1E - with $Z_{out} = 5\Omega$**
EMC/EMI Products

Schaffner Group
Datasheets
10 Sep 2021

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