**Single Pair Ethernet**

Würth Elektronik offers the full industry fitting solution for Single Pair Ethernet on the PCB. The SPE design is the first to be fully compliant with IEEE 802.3 signal requirements while also fulfilling Ethernet safety requirements for 1.5 kV isolation.

Take advantage of the first compact, high performance SPE design with safety isolation according to IEC 62368-1. Products available from stock. Samples free of charge.

For further information, please visit: [www.we-online.com/spe](http://www.we-online.com/spe)
Single Pair Ethernet

Multi Pair Ethernet vs. Single Pair Ethernet

**Small:**
Up to 75% reduced PCB size

**Simple:**
PCB & component space

**Light:**
Smaller cable diameter and 30% of weight reduction

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For more details please see last page.
SPE for Automotive & Industrial Applications

Automotive Design Recommendation
- Isolation – 50 V
- Not sufficient according to IEC 62368-1

Have a look at our webinar recording:
Single Pair Ethernet – Filter Design
www.we-online.com/spewebinar

Industrial Design Recommendation
- D1 – ESD Protection up to 15 kV (IEC 61000-4-2)
- L1 – Noise Attenuation
- T1 – Isolation 1.5 kV (IEC 62368-1)
- C1 – EMC improvement
- C2 – EMC improvement

The whole interface solution is compliant with IEEE 802.3cg/bw

Measurement Results

<table>
<thead>
<tr>
<th>10BASE-T1</th>
<th>100BASE-T1</th>
</tr>
</thead>
</table>

- **Return Loss Measurement**
- **Mode Conversion Loss Measurement**

The diagrams show the attenuation in dB over frequency for both standards.
Product Overview

Solution for Single Pair Ethernet

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Transformer</strong></td>
<td>WE-STST&lt;br&gt;Size: 1206&lt;br&gt;Order Code: 74930000&lt;br&gt;Data Rate: 10/100 BASE-T1&lt;br&gt;L: 350 µH&lt;br&gt;V&lt;sub&gt;TH&lt;/sub&gt;: 1500 V&lt;sub&gt;RMS&lt;/sub&gt;</td>
</tr>
<tr>
<td><strong>Ceramic Capacitor</strong></td>
<td>WCAP-CSMH&lt;br&gt;Size: 0402&lt;br&gt;Order Code: 885342208024&lt;br&gt;V&lt;sub&gt;DC&lt;/sub&gt;: 2000 V&lt;br&gt;C: 1 nF</td>
</tr>
<tr>
<td><strong>TVS Diode</strong></td>
<td>WE-TVS&lt;br&gt;Size: DFN 1210-6L&lt;br&gt;Order Code: 824012823&lt;br&gt;ESD Protection up to 8/15 kV (contact / air)&lt;br&gt;V&lt;sub&gt;DC&lt;/sub&gt;: 3.3 V&lt;br&gt;C&lt;sub&gt;TH&lt;/sub&gt;: 0.18 pF</td>
</tr>
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**Common Mode Line Filter**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L&lt;sub&gt;1&lt;/sub&gt;</td>
<td>WE-CNSW&lt;br&gt;Size: 1206&lt;br&gt;Order Code: 744232222&lt;br&gt;Z @ 100 MHz: 2200 Ω&lt;br&gt;I&lt;sub&gt;R&lt;/sub&gt;: 200 mA</td>
</tr>
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