



One Pair is all you need.

#OnePairIsAllYouNeed
more
than you
expect

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

- 1.5 kV Isolation according to IEC 62368-1
- Simple & compact layout
- Signal stability up to 1000 m
- 10BASE-T1 and 100BASE-T1



Signal Transformer
WE-STST



Common Mode Line Filter
WE-CNSW



TVS Diode
WE-TVS



Ceramic Capacitors
WCAP

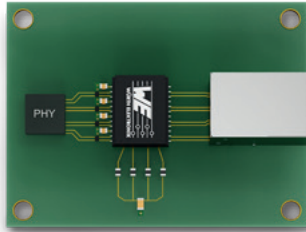
Single Pair Ethernet

Multi Pair Ethernet vs. Single Pair Ethernet

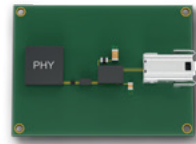
Small:

Up to 75 % reduced PCB size

Multi Pair Ethernet (LAN)



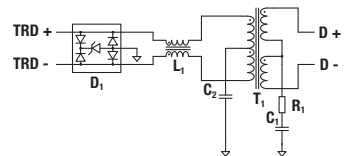
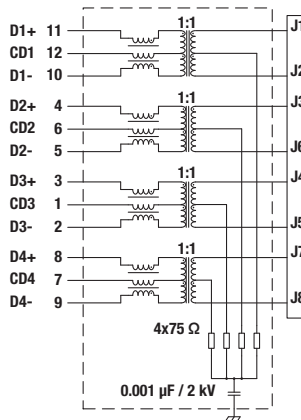
Single Pair Ethernet



For more details please see last page

Simple:

PCB & component space



Light:

Smaller cable diameter and
30 % of weight reduction

- 4 pairs



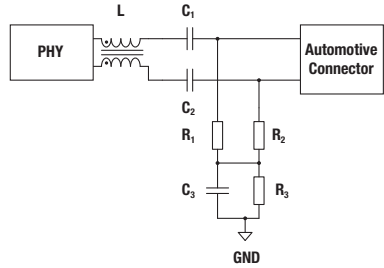
- 1 pair
- Up to 1000 m transmission distances
- Simple cabling



SPE for Automotive & Industrial Applications

Automotive Design Recommendation

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

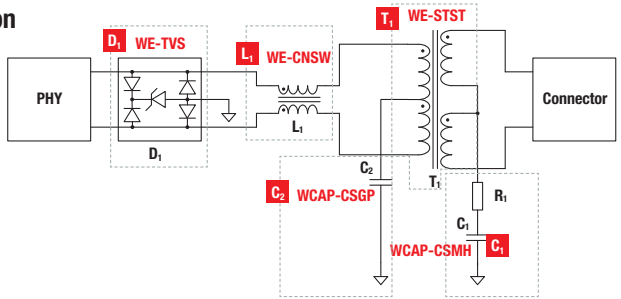


Have a look at our webinar recording:
Single Pair Ethernet – Filter Design
www.we-online.com/spewebinar



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



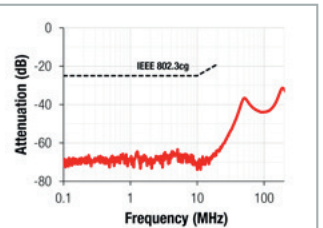
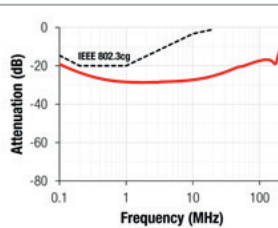
The whole interface solution is compliant with IEEE 802.3cg/bw

Measurement Results

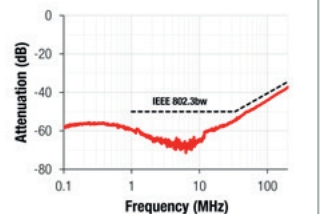
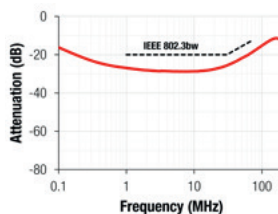
Return Loss Measurement

Mode Conversion Loss Measurement

10BASE-T1

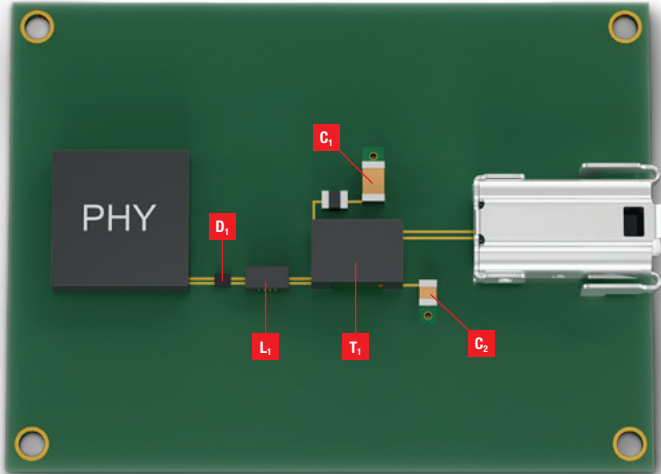


100BASE-T1



Product Overview

Solution for Single Pair Ethernet



Signal Transformer

T₁ WE-STST

L x W x H: 4.7 x 3.22 x 2.9 mm

Order Code: 74930000

Data Rate: 10/100 BASE-T1

L: 350 μ H

V_T: 1500 V_{RMS}

Ceramic Capacitor

C₁ WCAP-CSMH

Size: 1206

Order Code: 885342208024

V_{DC}: 2000 V

C: 1 nF

C₂ WCAP-CSGQ

Size: 0402

Order Code: 885012205086

V_{DC}: 50 V

C: 100 nF

TVS Diode

D₁ WE-TVS

Size: DFN 1210-6L

Order Code: 824012823

ESD Protection up to 8/15 kV

(contact/air)

V_{DC}: 3.3 V

C_{ch}: 0.18 pF

Common Mode Line Filter

L₁ WE-CNSW

Size: 1206

Order Code: 744232222

Z @ 100 MHz: 2200 Ω

I_R: 200 mA

