STEVAL-XPLM01CPL

Power line communication AC coupling circuit

Features

- Complete AC coupling circuit suitable for use with any power line communication (PLC) solution
- Can be paired with the X-NUCLEO-PLM01A1 to add full AC coupling capability
- Tuned for transmission inside CENELEC B to D bands
- Implements isolation and protections for safe operation
- Suitable for the connection of laboratory equipment for PLC measurement and testing
- RoHS compliant

Description

The STEVAL-XPLM01CPL is a simple yet very useful tool for power line communication testing on AC power networks.

It includes simple two-wire connectivity to any PLC transmitter/receiver and a standard connector for an AC power cord (2-pin AC plug, 8-shape female end). The main components to achieve suitable signal coupling are:

- PLC 1:1 transformer for differential coupling and basic electrical isolation

- SM6T15CA 600 W Transil +320 V ac varistor for effective protection against ESD, EFT and surge disturbances from the power line

- High voltage AC blocking capacitor with X2 safety class

- Tuning series inductor to adjust the frequency response

The STEVAL-XPLM01CPL can be very easily interfaced with the X-NUCLEO-PLM01A1 to test PLC communication performance over an AC mains network.

The frequency response of the coupling circuit is wide enough to fit any narrow-band PLC signal under normal test conditions. However, it can be easily adjusted by changing only the tuning series inductor L1.

The STEVAL-XPLM01CPL is suitable for lab measurements using equipment like an isolated probe for an oscilloscope or a spectrum analyzer, or to inject a signal from an arbitrary function generator.

1 Schematic diagram

Figure 1: STEVAL-XPLM01CPL circuit schematic
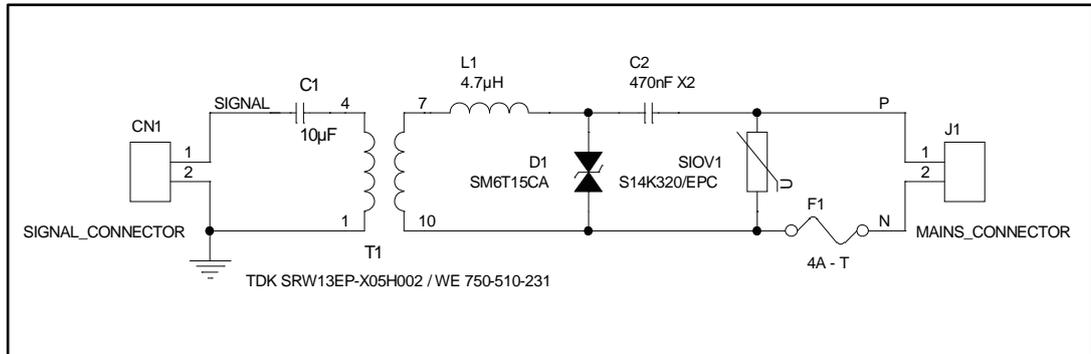
> **IMPORTANT – Safety recommendations**
>
> The STEVAL-XPLM01CPL must be used by expert technicians only. Due to the high voltage (85 - 265 Vac) present on the non-isolated parts, special care must be taken in order to avoid electric risks for people safety.
>
> There are no protections against high voltage accidental human contact.
>
> After disconnection of the board from the mains, no live part can be touched immediately because of the energized capacitor.
>
> Do not connect any instrument probe to high voltage parts if the board is not isolated from the mains supply, in order to avoid damaging any equipment.
>
> ST assumes no responsibility for the consequences of any improper use of this development tool.

2   Revision history

Table 1: Document revision history

Date	Version	Changes
06-Jun-2017	1	Initial release.

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