Silvertel

POE Ag5810 Evaluation Board User Manual

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4   Introduction

This manual is intended to be a guide to using the "EVALAg5810 evaluation board" with the following Silver Telecom IEEE802.3bt PD module: -

Ag5810

The board is designed to handle 10/100/1000/10GBASE-T Ethernet data rates.

4.1 EvalAg5810

The EVALAG5810 evaluation board is fitted with SilverTel's Ag5810 IEEE802.3bt PD module and can be used to extract power from an IEEE compliant PSE through its RJ45 connector J101.
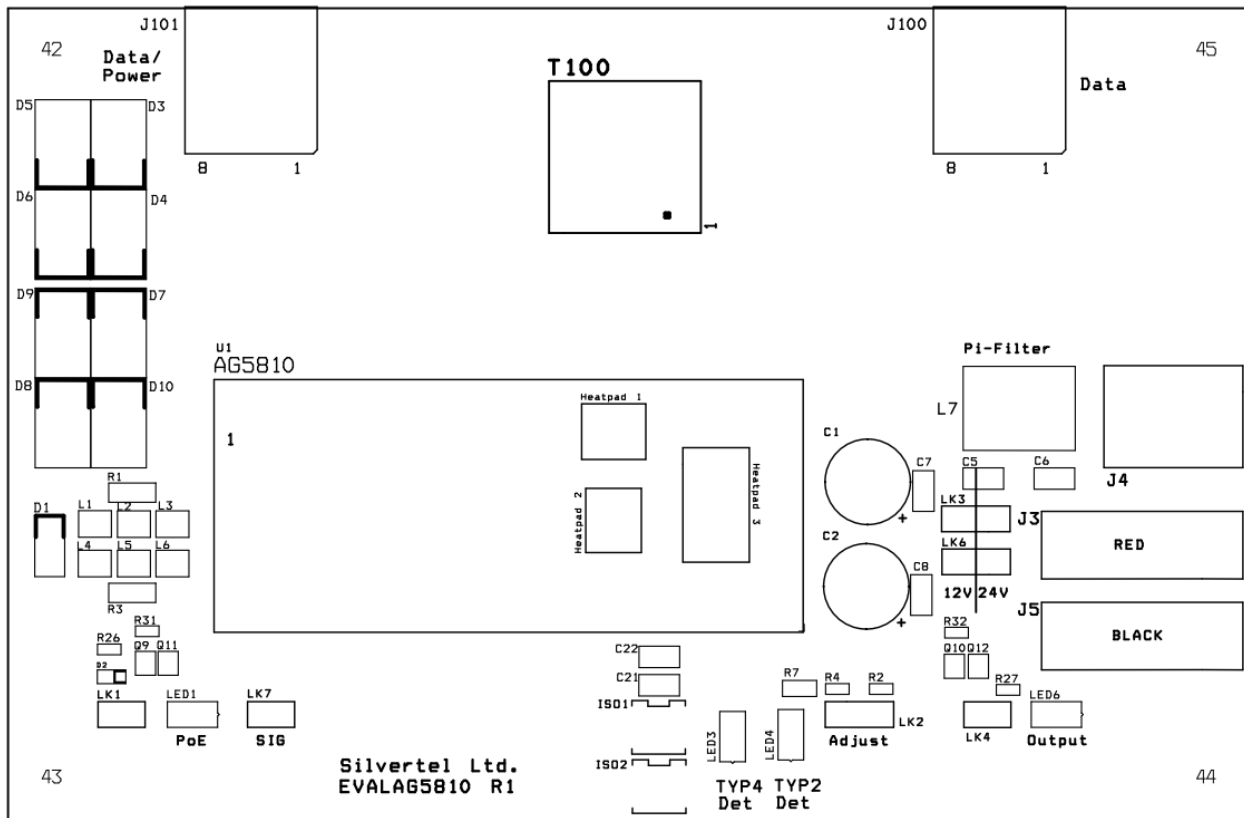
5 Evaluation Board Description

Figure 1: Board Layout

5.1 Link settings

LK1 – Input power LED

LK2 – Output adjust select

LK3 & LK6 – Output configuration (Parallel "12V" or Series "24V")

LK4 – Output power LED

LK7 – Signature Adjustment

5.2 Input

The EVALAG5810 evaluation board can be powered from the EVALAg6800 evaluation board or any IEEE802.3bt PSE. Data and power input is connected through connector J101 (see Figure 1). Data is passed through the data transformer (T100) to the data output connector J100.

LED 1 indicates that power is being supplied to the PD. This can be disabled by removing the jumper link LK1, removing these links does not affect the power being delivered to the PD.

5.3 Diode Bridge Selection

The EVALAg5810 on-board diode bridge rectifiers will ensure that the correct input polarity is applied to the Ag5810 by extracting the power from the input center taps of T100 and passing the voltage to the input of the Ag5810.

Due to the amount of power and high currents involved in the IEEE802.3bt standard we would recommend using SMC package Schottky diodes with low reverse leakage current to be used as diode bridges. The EvalAg5810 is fitted with SS36 Schottky diodes configured as a diode bridge.

5.4 Input Signature

The EVALAg5810 board will automatically direct the power from J101 to the Ag5810's input.

The Ag5810 provides a 25K signature required to be powered from an IEEE compliant PSE. The EvalAg5810 has been designed to be powered from an IEEE802.3bt PSE such as SilverTel's Ag6800 PSE module. However the Ag5810 has also provisions for being powered from Legacy PSE's such as PoH or Phihongs 12.5K signature PSE.

5.4.1 Powered from Phihong 12.5K Signature PSE

The Ag5810 is designed to work with Legacy PSE's such as Phihongs POE80U/POE60U PSE. By fitting LK7 it will connect the SA1 and SA2 signature adjustment pins altering the Ag5810 signature to 12.5K.

For all other PSE's these pins should be left unconnected.

5.5 PSE Detect

When the EVALAG5810 board is connected to a compliant IEEE PSE the Ag5810 will detect the Type of PSE and the on board LED's will illuminate accordingly:

For example if an IEEE802.3at (PoE+) compliant PSE such as a Phihong POE36U-1AT-R is connected via J101 the PSE will detect Class 4 and output 2-Event classification pulses. In turn the Ag5810 detects these pulses and activates the Type 2 detect output. This output is connected to an opto-isolator to cross the isolation barrier and LED 4 will be illuminated.

When the EVALAG5810 board is connected to an IEEE802.3bt Type 3 compliant PSE, the Ag5810 it will not activate either the Type 2 or Type 4 detect outputs and as a result neither LED 3 or 4 will be illuminated.

When the EVALAG5810 board is connected to an IEEE802.3bt Type 4 compliant PSE, the Ag5810 activates the Type 4 detect output and LED 3 will be illuminated.

5.6 PD Output Selection

Before using the EVALAg5810 evaluation board, it is important to setup the output configuration jumpers for the correct output voltage.

The Ag5810 has two DC outputs that must be connected in parallel or in series. The outputs cannot be run independently so the EVALAg5810 board has output selector links LK3 and LK6.

For parallel outputs both of these links must be in position "12V" - VOUT1 connected to VOUT 2 and 0V 1 connected to 0V 2.

For series outputs both links must be in position "24V" – VOUT 1 connected to 0V 2.

The DC10 connector J4 delivers a nominal 12V when the outputs are in parallel or 24V when the outputs are in series.

The output power from the Ag5810 is supplied to the connectors J3 to J5 (see Figure1), where J3 provides the positive output and J5 provides the 0V return path.

LED 6 will be illuminated, if LK4 is fitted, once the PD is powered and outputs 12V or 24V.

5.7 Output adjustment

The Ag5810 has an ADJ pin, which allows the output voltage to be increased or decreased from its nominal value.

The adjustment range allows the Ag5810 to provide a Primary output voltage from 10.55V up to 15V. The secondary output will track the adjusted primary output voltage.

Voltage must not be adjusted to less than 10.5V or permanent damage may be caused. Contact Silvertel for further details

The EVALAg5810 board has an adjust link LK2 and two resistors R2 (91K) and R4 (8K2) which allows the output to be adjusted to its maximum and minimum values. To reduce the output voltage to its minimum level, connect a link to LK2 beneath R2. To increase the output voltage to its maximum level, connect a link beneath R4.

5.8 Heat Sink

As the Ag5810 is a 60W power supply, thermal management is essential and is designed to be used with a heat-sink at all times to distribute the heat away from the board so the board can run at full operation.

A suggested heat-sink is shown in Section 10 of the Ag5810 datasheet

5.9 Output Filter

The Ag5810 output ripple and noise is reduced by the included output Pi filter.

5.10 Ag5810 Information

Full operating conditions and feature set can be found in the Ag5810 product datasheet, available from www.silvertel.com.

6 Typical Set-up

6.1 Power Supply Input

Figure 2 shows the basic set up using SilverTel's EVALAG6800 evaluation board along with the EVALAG5810 evaluation board with a power supply input to JP1.

The equipment required: -

- ➢ Power supply Input +57V IN e.g. Meanwell SP-240-48 available from mouser which will give 57V
- ➢ Ethernet Data Cable (CAT5e cable) Input and Output
- ➢ CAT5e or CAT6 interlink cable (between EvalAg6800 and EvalAg5810)
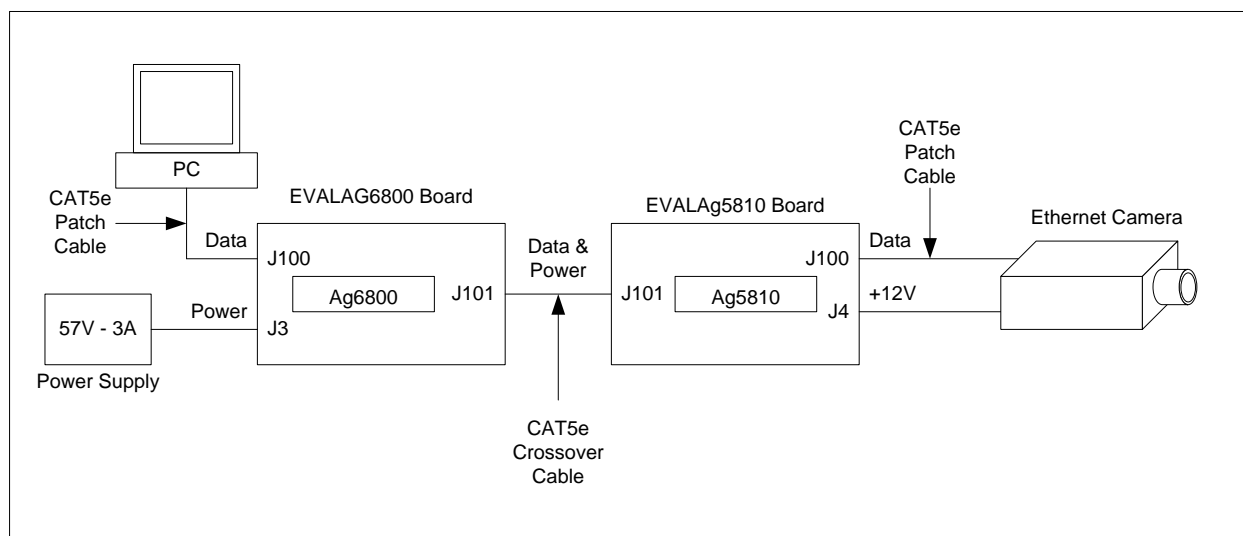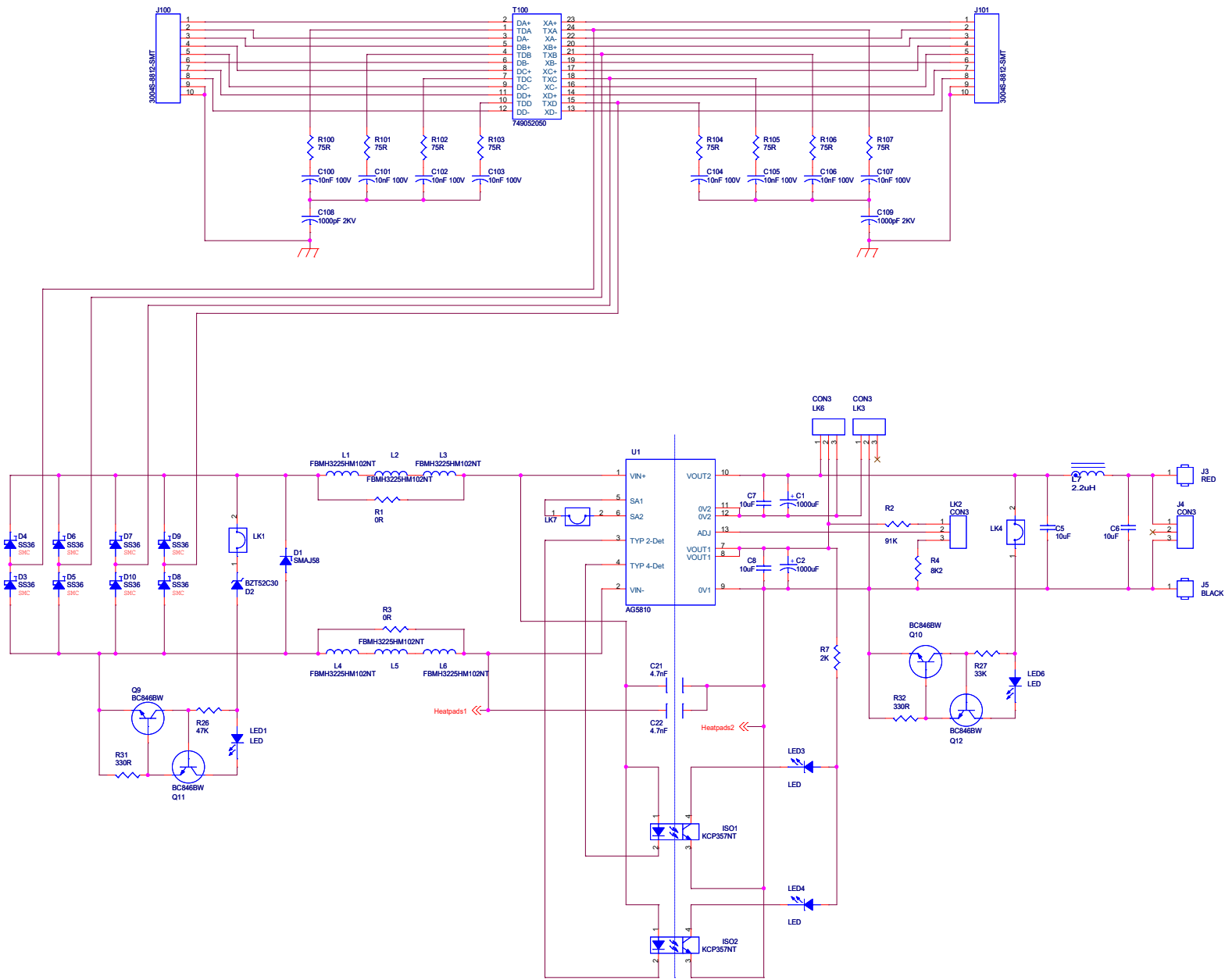- ➢ Output power cable

Figure 2: Typical set-up

6.2 Data Input

To pass data via the Evaluation boards, the data input (e.g. Internet) can be connected to J100 on the Ag6800 Eval Board using a cat5e cable. The data is then passed through the data transformer, where power is added and sent out via connector J101 of the Ag6800 Eval Board. The Data and power is extracted through J100 of the EVALAg5810 board and then divided into its separate power and data through the data transformer. The data output is then available from J100 of the EvalAg5810 Board, which can then be connected to your device.