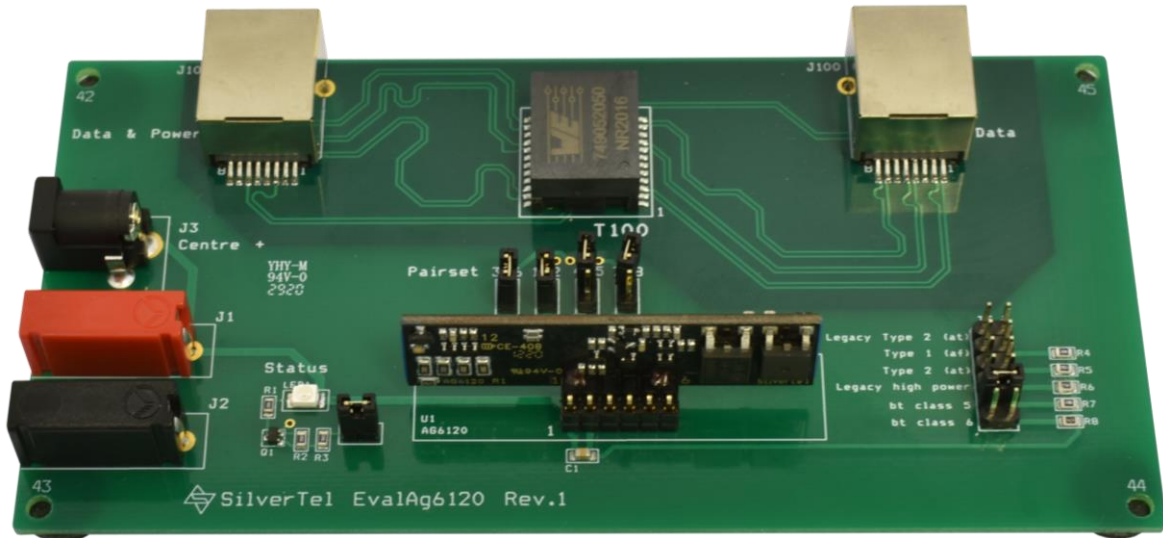




Evaluation Board User Manual



EvalAg6120

Evaluation Board

User Manual

Version 1.0 – September 2020

Table of Contents

1	Kit Contents.....	3
2	Introduction	3
3	Board Layout	3
3.1	Link Settings	3
4	Input	4
4.1	Power	4
4.2	Data	4
5	Power option select	4
6	Pairset Select.....	5
7	Operation	5
8	Status Output	5
9	Test Setup.....	6
10	Additional information.....	6
11	Schematic	7
12	Bill of Materials.....	8

Table of Figures

Figure 1: EvalAg6120 Board Layout.....	3
Figure 2 Basic Test Setup	6

1 Kit Contents

- EvalAg6120 Evaluation Board
- Ag6120 PSE Module

2 Introduction

This Manual is a guide to using the EvalAg6120 evaluation board fitted with a Silvertel Ag6120 Single Channel Power Sourcing Equipment (PSE) Module.

This board is designed to assist with evaluating the use of Silvertel's Ag6120 in an application; as such it has been design to pass through 10/100/1000/10GBASE-T Ethernet data signals from any source connected to J100 onto the powered device connected to J101

This Evaluation board can also be used with the Ag6100 or Ag6110 Modules; however the output power settings are not a feature of those modules.

3 Board Layout

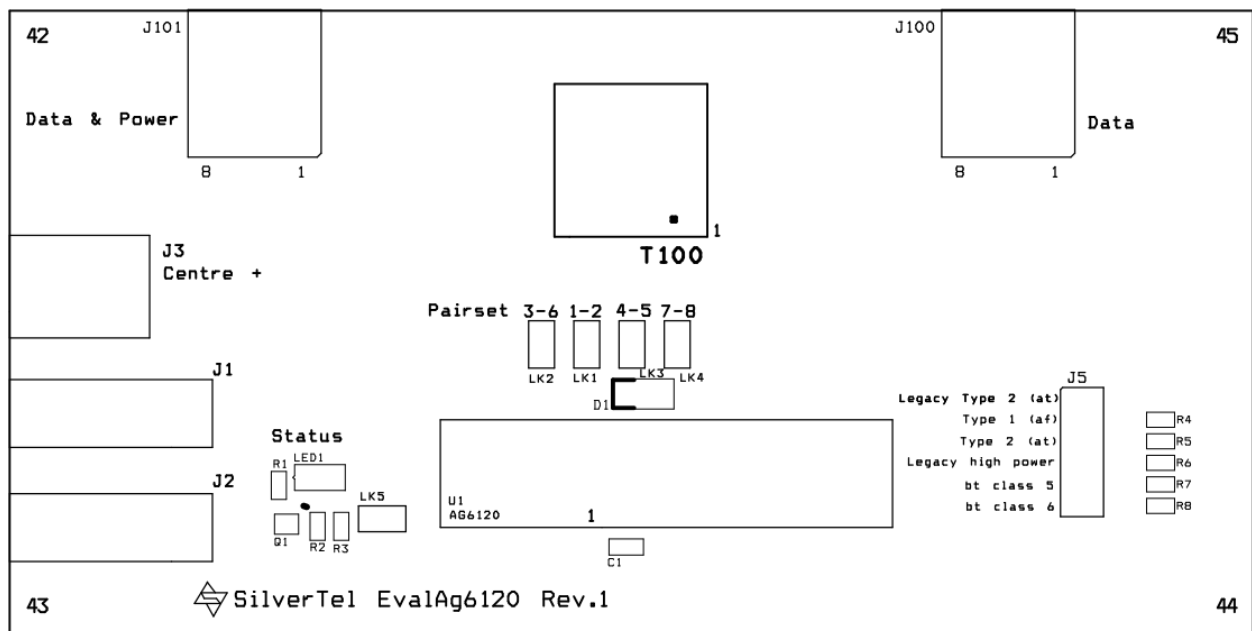


Figure 1: EvalAg6120 Board Layout

3.1 Link Settings

LK1-4 – Output Pairset Enable

LK5 – Status LED Enable

J5 – Output Power Select

4 Input

4.1 Power

The EvalAg6120 evaluation board is powered using a DC Power supply delivering between +44V to +57V. The positive supply is connected to either J1 or the centre pin of J3 and 0V to either the outer ring of J3 or J2.

4.2 Data

A data source can be connected to the Data port J100 via RJ45 connector. This data will be transposed onto the Data and Power output port J101 via the data transformer. The data traces on the evaluation board have been designed to pass through 10/100/1000/10GBASE-T Ethernet data signals. No processing or amplification of this signal will be performed on the evaluation board

5 Power option select

The Ag6120 has an option to select its output power and class. These can be chosen by placing a jumper on the appropriate pins of J5. The power option select should be set while the Ag6120 is powered off, if the power option is changed while the device is powered, the change will not occur until after the Ag6120 output has been power cycled.

Mode	Classification type ^{*2}	Max output power ^{*3}	Connected pair sets ^{*4}
Legacy Type 2 (at) ^{*1}	IEEE802.3at	38W	Either 2
Type 1 (af)	IEEE802.3bt	20W	Either 2
Type 2 (at)	IEEE802.3bt	38W	Either 2
Legacy high power	at + legacy class 5	75W	All 4
BT 1 pair (bt class 5) ^{*5}	IEEE802.3bt	46W	Either 2/all 4
BT Type 3 (bt class 6) ^{*5}	IEEE802.3bt	75W	All 4

Table 1: option selections and limits

^{*1} Not recommend for new designs only for use as drop in replacement of the Ag6100

^{*2} See section 5.5.2: Classification of the Ag6120 Datasheet for details

^{*3} See sections 5.7: Output Current Limits & 5.8: Output Power of the Ag6120 Datasheet for details

^{*4} See section 5.4: Port Output of the Ag6120 Datasheet for details

^{*5} Compatible with IEEE802.3bt single signature PDs

6 Pairset Select

The EvalAg6120 contains four links LK1-4 that connect the pairsets to the outputs of the Ag6120. In order to enable power transfer down a given pairset a jumper should be inserted onto the relevant link or removed if power is not desired down that given pairset.

Pairsets 1-2 and 4-5 are connected to the positive output of the Ag6120. While pairsets 3-6 and 7-8 are connected to the negative output of the Ag6120. In high power modes all four jumpers should be fitted.

When only two pairsets are to be connected, in order to guarantee operation either pairsets 1-2 & 3-6 should be connected or pairsets 4-5 & 7-8 should be connected.

7 Operation

To ensure that the Ag6120 does not apply power to a non-PoE enabled device the output port first checks for a valid PoE signature. If the Ag6120 does not see a valid signature then it will disconnect, wait approximately 2 seconds then try again. Once a valid signature has been detected the Ag6120 will then perform classification to determine the power requirement of the PD, only after this has occurred will the Ag6120 supply power to the powered device.

8 Status Output

The Status LED will illuminate if the Ag6120 is providing power to the output port. It will also flash as per the table below when an error has occurred. If this functionality is not desired, it can be disabled by removing the jumper on link LK5.

Fault Condition	Status Pulses (200ms)
Short Circuit	1 x Flash
Over Current	2 x Flashes
Signature/Class Error	3 x Flashes
Input Voltage < UVLO limit	4 x Flashes

Table 2: Status Output

9 Test Setup

Figure 2 shows the basic set up using the EvalAg6120 evaluation board powered by a DC power supply with an output between 44V and 57V. The power option select should already be set before supplying power to the module. The powered device and data source need not be connected before power is applied.

The equipment required: -

- Power supply unit, +44-57V output e.g. 60V bench power supply
- Powered device
- CAT5e/CAT6a cables

Optional equipment: -

- Data source e.g. PC

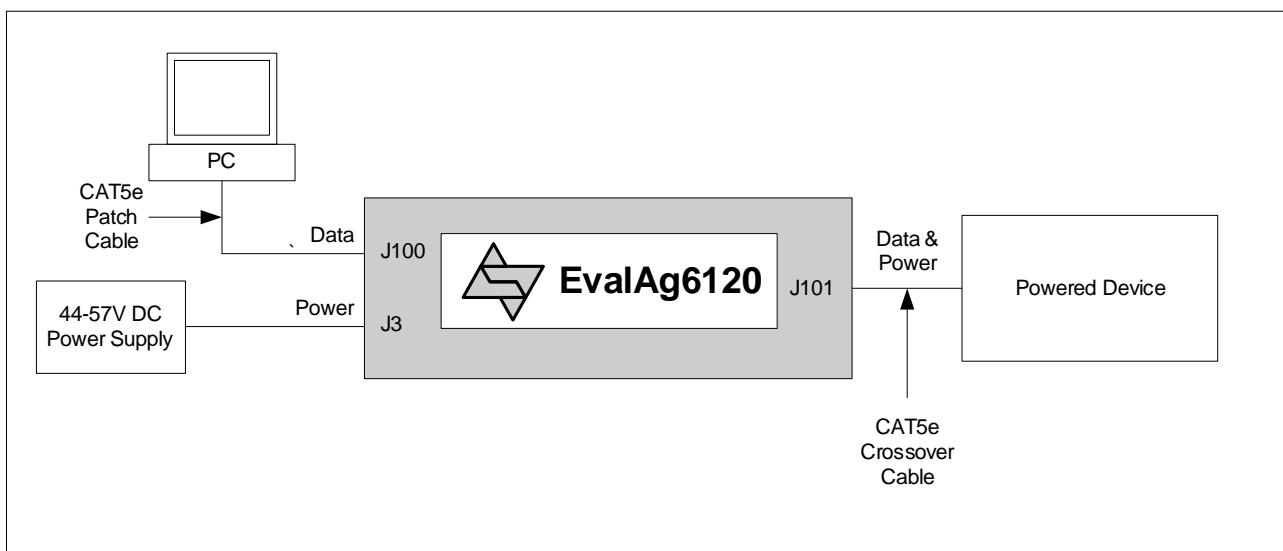
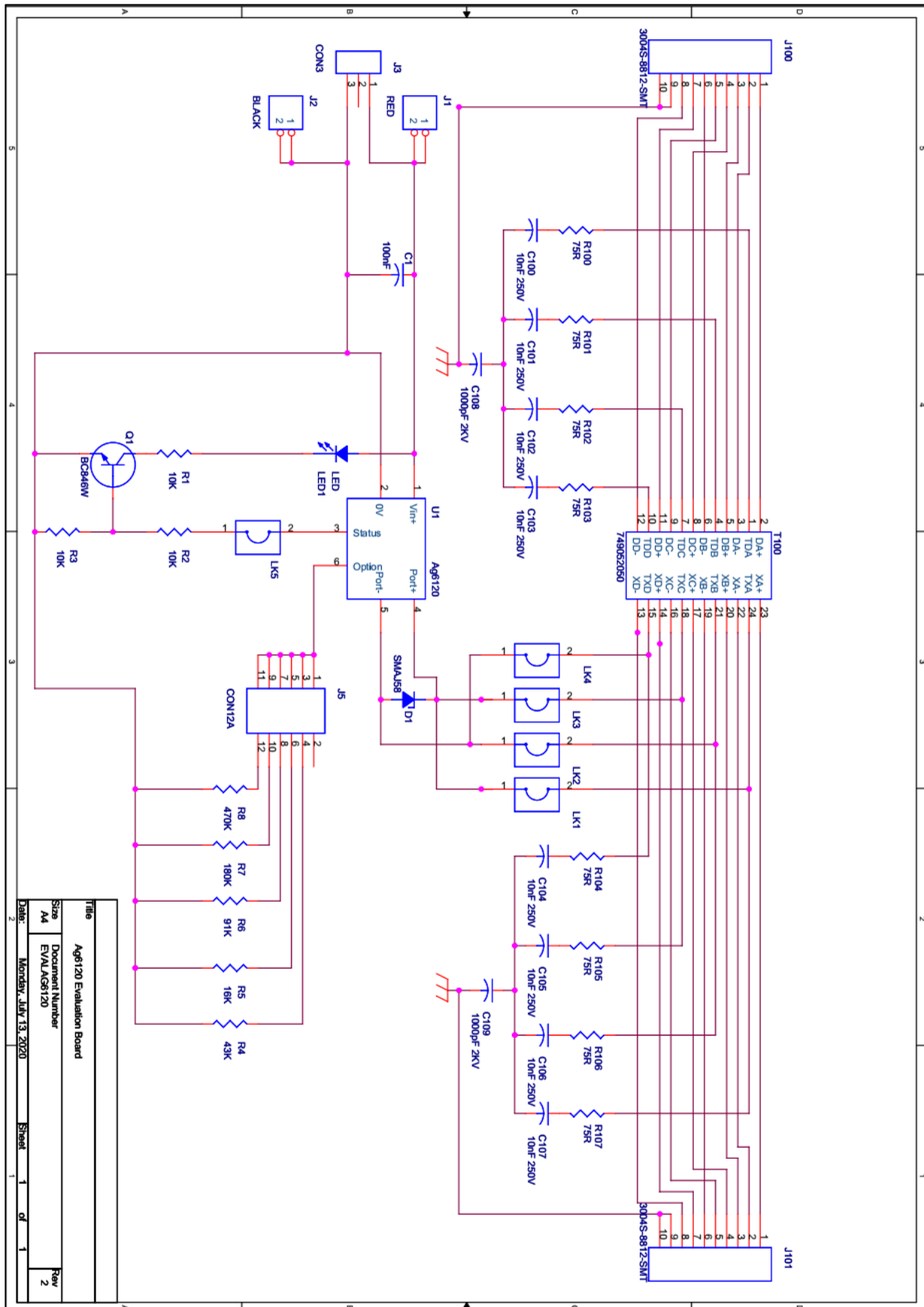


Figure 2 Basic Test Setup

10 Additional information

Full operating conditions and feature set can be found in the Ag6120 product datasheet, available from www.silvertel.com.

11 Schematic



12 Bill of Materials

EVALAg6120 Eval Board - Rev.1										13th July 2020		Date
Strictly Private and Company Confidential												
Silver Part No.	Description	Value	Location:	Qty.	Package:	Rating:	Tol:	Supplier Pt NO:	Comments:			
	POE+ PSE Module	Ag6120	U1	1	Custom	-	-	Silver Telecom Part				
	Transistor NPN 60V Single	BC9468W	Q1	1	SOT323	-	-	Infineon or RXP Only				
	Protection Diode	SMA156A	D1	1	SMA	-	-	Würth- 824 500 581 Vishay, ST Micro, Diodes Inc				
	Transformer - Data	10G BaseT PoE+	T100	1	SMT	-	-	Würth- 749052050				
	SM LED	RED LED	LED1	1	SMT	-	-	Würth- 150 141 RS7 310 0				
	Ceramic multi-layer	100nF	C1	1	0805	100V	20%	Samsung, NTC, TDK, Murata, Kemet & AVX				
	Ceramic multi-layer	10nF	C100 - C107	8	0805	250V	20%	Samsung, NTC, TDK, Murata, Kemet & AVX				
	Ceramic multi-layer	1000µF 2KV	C108, C109	2	1206	2KV	20%	Samsung, NTC, TDK, Murata, Kemet & AVX, Würth-885342208024				
	Resistor - 0603	10K	R1, R2, R3	3	0603	63mW	1%	Royal Ohm, Eurohm & Yageo				
	Resistor - 0805	75R	R100 - R107	8	0805	125mW	1%	Royal Ohm, Eurohm & Yageo				
	Resistor - 0805	43K	R4	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo				
	Resistor - 0805	16K	R5	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo				
	Resistor - 0805	91K	R6	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo				
	Resistor - 0805	180K	R7	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo				
	Resistor - 0805	470K	R8	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo				
	Red Connector	4mm PCB Socket	J1	1	Through Hole	-	-	Hirschmann 973582100				
	Black Connector	4mm PCB Socket	J3	1	Through Hole	-	-	Hirschmann 973582101				
	Ethernet Connector	RJ45	J100, J101	2	SMT	-	-	Toby 3004S-8821-SMT				
	DC Power Connector	DC-001	J3	1	Through Hole	-	-	Toby DC-001-B-2.5MM-R, Würth 694108301002				
	Link	2x6 Way	J5	1	Through Hole	-	-	Toby ETHD-06R-110-055-030, Würth: 61301221121				
	Link	2 Way	LK1-LK5	5	Through Hole	-	-	Toby LHCS-02S-R-060-034, Würth 61300211121				
	Module Socket	6 Way	U1	1	Through Hole	-	-	Toby SLW-106-01-G-S				
	PCB	Rev 2R - 127mm x 102mm		1		-	-					
	Jumper Links	Links	LK1 - LK5, J5	6		-	-					
	Feet	Sticky Feet		4		-	-	Atfix RF-022				
				45		Total						

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Silvertel:](#)

[EVALAG6120](#)