![Silvertel logo]
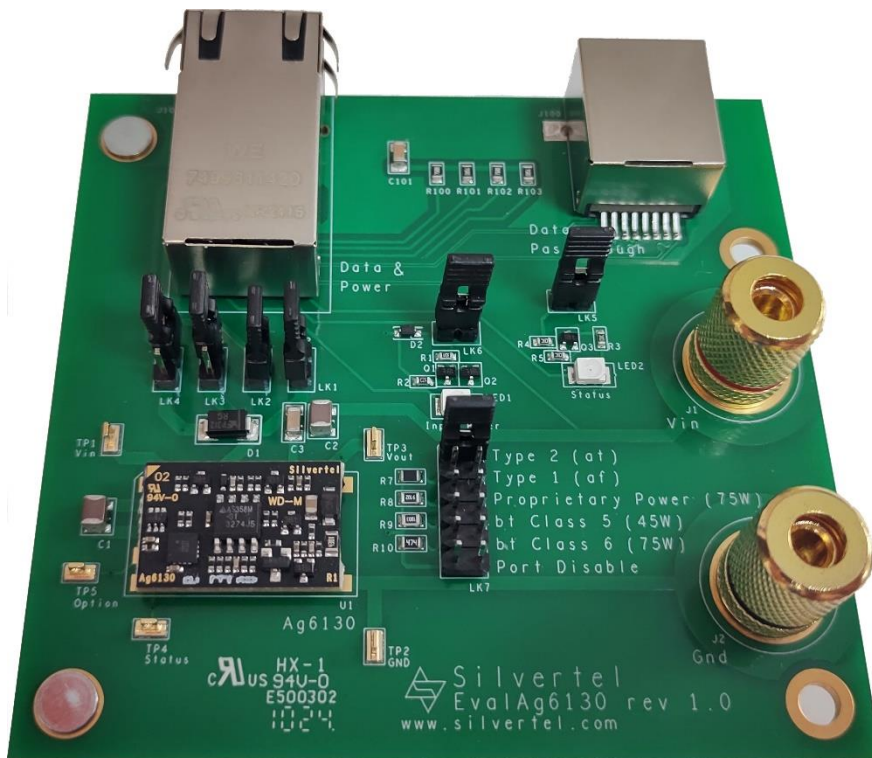
Evaluation Board
User Manual

EvalAg6130
Evaluation Board
User Manual

Version 1.0 – May 2024

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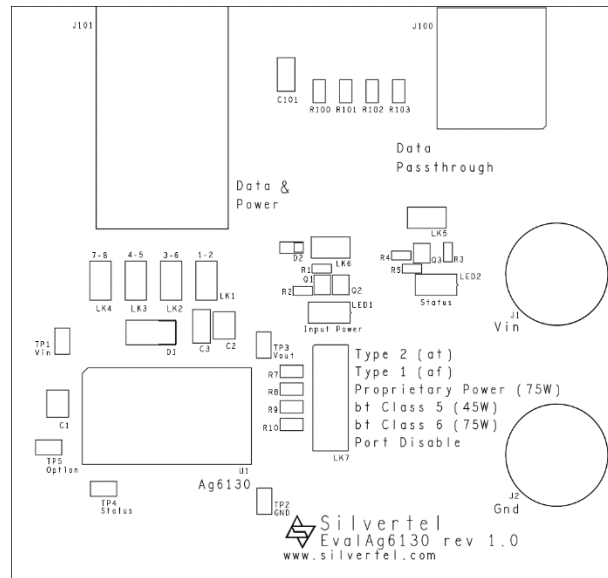
Figure 1: EvalAg6130 Board Layout

2.1 Link Settings

LK1-4 – Output Pairset Enable

LK5   – Status LED Enable

LK6   – Power LED Enable

LK7   – Option Select

2.2 Input Output Connections

J1 & J2   – Supply Binding Posts

J101   – RJ45 for Powered Device

J100   – RJ45 for Data passthrough

3 Introduction

This Manual is a guide to using the EvalAg6130 evaluation board fitted with a Silvertel Ag6130 Single Channel Power Sourcing Equipment (PSE) Module.

This board is designed to assist with evaluating the use of Silvertel's Ag6130 in an application; as such it has been designed to pass through 10/100/1000BASE-T Ethernet data signals from any source connected to J100 onto the powered device connected to J101

4 Input

4.1 Power

The EvalAg6130 evaluation board is powered using a DC Power supply. The positive supply is connected to binding post J1 and 0V to binding post J2 using 4mm Banana connectors, bare wire, or fork connectors.

The supply should be between 50V and 57V for normal operation. if the Ag6130 is set to Type 1 Mode the Supply can be as low as 45V

4.2 **Data**

A data source can be connected to the RJ45 Data port J100. 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 10/100/1000BASE-T Ethernet data signals. No processing or amplification of this signal will be performed on the evaluation board

5   Power option select

The Ag6130 has an option to select its output power and class. These can be chosen by placing a jumper on the appropriate pins of LK7. If the power option is changed while a device is being powered by Ag6130, the change will not occur until after the powered device has been powered down and the detection cycle has been performed.

Mode	Option resistor (R_{OPTION})	Application IEEE802.3 Compliance	Peak Output		Connected pairsets*
			Output power*	Class Request	
Type 2 (at)	Open Circuit	Compliant	36W	4	Either
Port Disable	0Ω	-	-		-
Type 1 (af)	43KΩ	Compliant	20W	3	Either
Proprietary high power	91KΩ	Proprietary	75W	4	Both
Type 3 (bt) - Class 5*	180KΩ	Proprietary	50W	5	Either/Both
Type 3 (bt) - Class 6*	470KΩ	Proprietary	75W	6	Both

Table 1: Option selection

* See Datasheet for details

6   Pairset Select

The EvalAg6130 contains four links LK1-4 that connect the cable pairs to the output of the Ag6130. In order to enable power transfer down a given pairset jumpers should be inserted onto the relevant links or removed if power is not desired down the given pairs.

Pairsets 1-2 and 4-5 are connected to the positive output of the Ag6130. While pairsets 3-6 and 7-8 are connected to the negative output of the Ag6130. In high power modes all four jumpers should be fitted.

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

7 Operation

To ensure that the Ag6130 does not apply power to a non-PoE enabled device the output port first checks for a valid PoE signature. If the Ag6130 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 Ag6130 will then perform classification to determine the power requirement of the PD, only after this has occurred will the Ag6130 supply power to the powered device.

8 Status Output

The Status LED will illuminate if the Ag6130 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)
Device Identification Error	1 x Logic 1 Pulse
Input Voltage < UVLO limit	2 x Logic 1 Pulses
Short Circuit	3 x Logic 1 Pulses
Overload Current	4 or 5 x Logic 1 Pulses

Table 2: Status Output

9 Test Setup

Figure 2 shows the basic set up using the EvalAg6130 evaluation board powered by a DC power supply with an output between 50V and 57V. 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
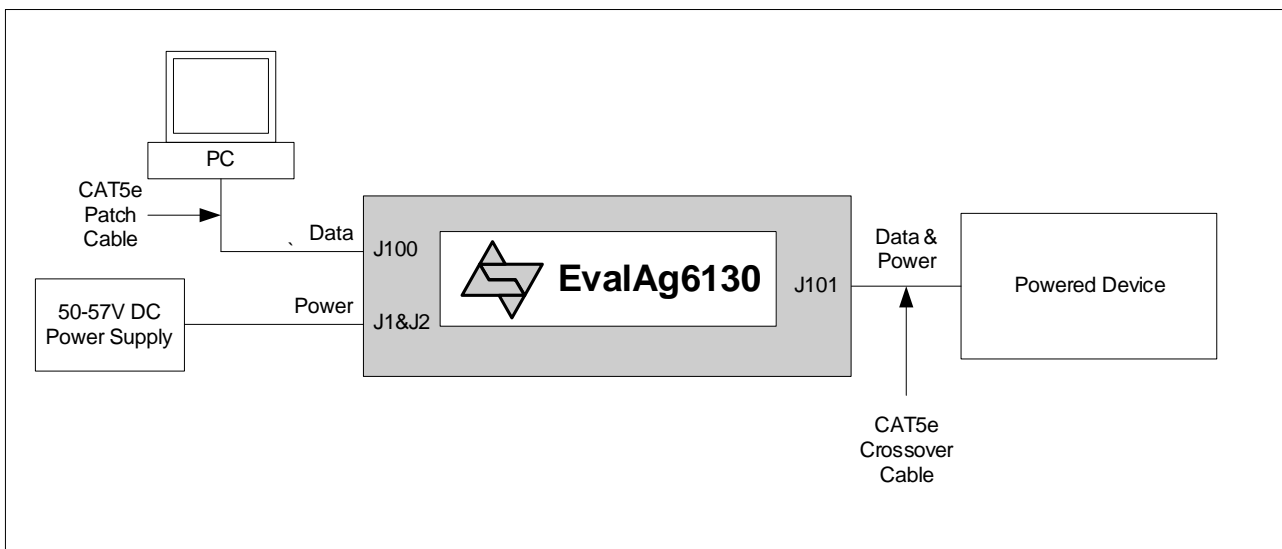
Figure 2 Basic Test Setup

10 Additional information

Full operating conditions and feature set can be found in the Ag6130 product datasheet, available from www.silvertel.com.

11 Schematic

Figure 3: Schematic

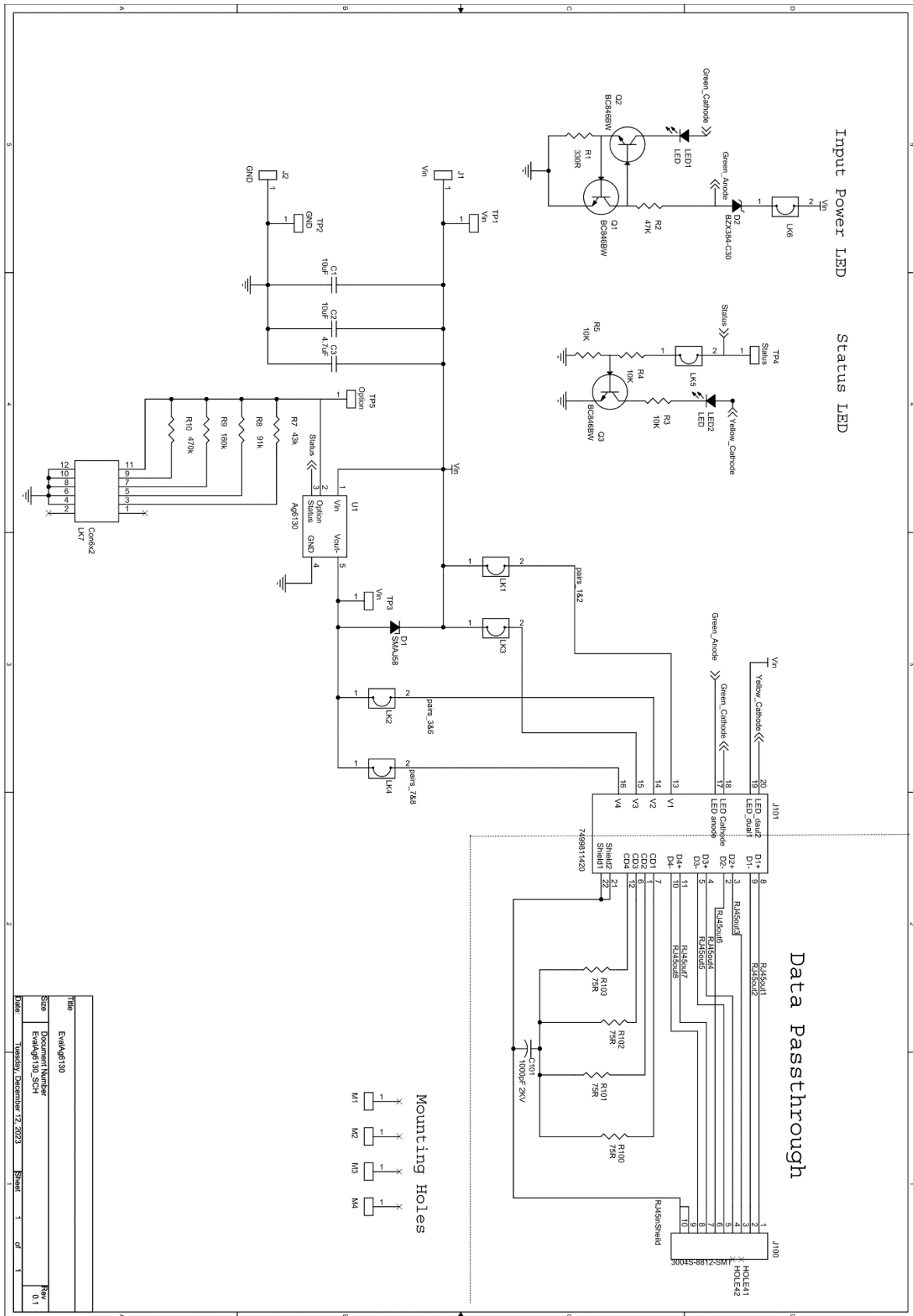# 12 Bill of Materials

EvalAg6130 Eval Board - Rev.1.0 **Date: 26th January, 2024**

*****Strictly Private and Company Confidential*****

| Silver Part No.	Description	Value	Location:	Qty:	Package:	Rating:	Tol:	Supplier Pt NO:	Comments:
	PD Module	Ag6130	U1	1	Custom	-	-	Silver Telecom Part	
	Transistor NPN 60v Single	BC846BW	Q1,Q2, Q3	3	SOT323	-	-	Infineon or NXP Only	
	Protection Diode	SMAJ58A	D1	1	SMA	-	-	Wurth - 824 500 581,Vishay, ST Micro, Diodes Inc	
	Zener Diode - 30v	BZX384-C30	D2	1	SOD323	-	-	Vishay	
	SM LED	RED LED	LED1, LED2	2	SMT	-	-	Wurth - 150 141 RS7 310 0	
	Ceramic multi-layer	10uF	C1, C2	2	1210	100V	20%	Samsung, NIC, TDK, Murata, Kemet, AVX, Wurth	
	Ceramic multi-layer	4.7uF	C3	1	1206	100V	20%	Samsung, NIC, TDK, Murata, Kemet, AVX, Wurth	
	Ceramic multi-layer	1nF	C101	1	1206	1500V	20%	Samsung, NIC, TDK, Murata, Kemet, AVX, Wurth	
	Resistor - 0603	330R	R1	1	0603	64mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0603	47K	R2	1	0603	64mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0603	10K	R3, R4, R5	3	0603	64mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0805	43K	R7	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0805	91K	R8	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0805	180K	R9	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0805	470K	R10	1	0805	125mW	1%	Royal Ohm, Eurohm & Yageo	
	Resistor - 0805	75R	R100-103	4	0805	125mW	1%	Royal Ohm, Eurohm & Yageo	
	Red Connecor	Binding Post	J1	1	Screw Mount	-	-	Switch Electronics 354147	
	Black Connector	Binding Post	J2	1	Screw Mount	-	-	Switch Electronics 354146	
	Ethernet Connector	RJ45	J100	1	SMT	-	-	Toby 3004S-8821-SMT	
	Ethernet Connector With Magnetics	7499811420	J101	1	SMT	-	-	Wurth - 7499811420	
	Test point	HK-1-G	TP1-5	5	SMT	-	-	Mac 8	
	Link	2x6 Way	LK7	1	Through Hole	-	-	Toby-FTHD-06R-110-055-030, Wurth: 613012211121	
	Link	2 Way	LK1-LK6	6	Through Hole	-	-	Valcon LHCS-02S-R-060-034 , Wurth 61300211121	
	PCB	Rev.0.1 - 87.63mm x 82.55mm		1	-	-	-		
	Stud Screw	M4 10mm Flush Stud	M1, M2	0	-	-	-	TR FASTENINGS M4HCS10STZ50	
	Stud Screw	M4 10mm Flush Stud	M3, M4	2	-	-	-	TR FASTENINGS M4HCS10STZ50	
	M4 Nut	M4 Nut	M3,M4	2	-	-	-		
	Jumper Links	Links	LK1 - LK3		-	-	-		
	Feet	GRF24006A	-		-	-	-	Essentra	
			Total	46					

Figure 4: Bill of Materials

13Layer Routing

Figure 5: Top Layer Routing
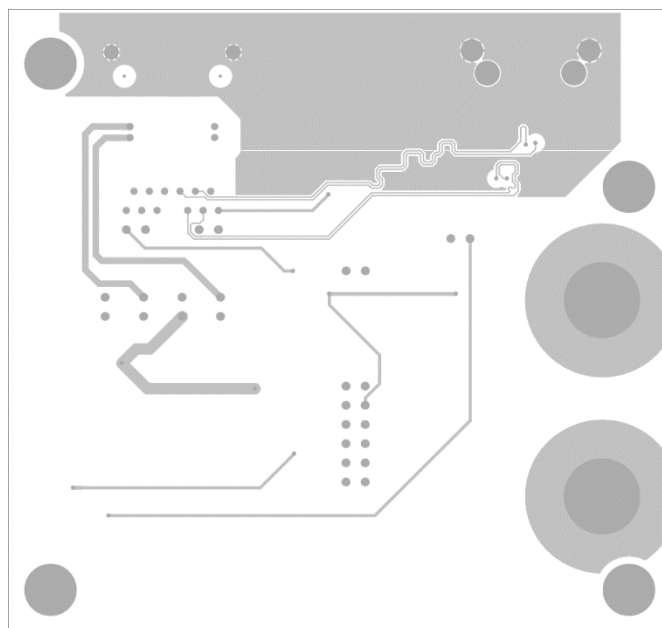
Figure 6: Bottom Layer Routing

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