



Evaluation Board User Manual



EvalAg15QiK Evaluation Kit User Manual

Containing Ag321 & Ag320R

Version 1.0 – July 2020

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1 Kit Contents

- Ag321T Evaluation Board
- Ag320R Evaluation Board
- Ag321T 15W Qi Transmitter Module
- Ag320R 15W Wireless Receiver Module

2 Introduction

This Manual is intended to be a guide to using the EvalAg15QiK evaluation kit, containing an Ag321T Evaluation Board and Ag320R Evaluation Board along with the Ag321T and Ag320R wireless power transmitter and receiver modules.

3 EvalAg321T

3.1 Board Layout

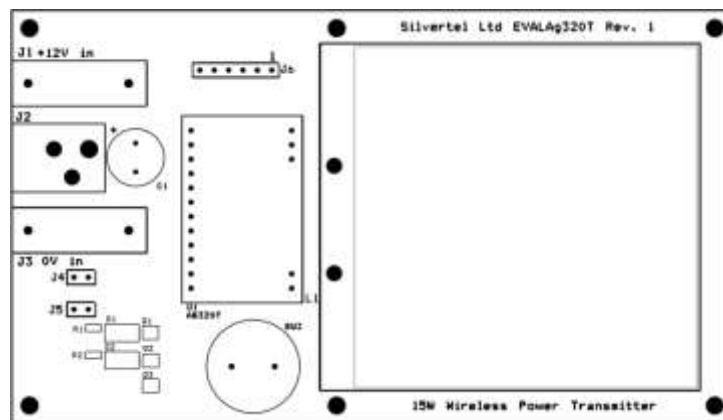


Figure 1: EvalAg321T Board Layout

3.2 Link Settings

J4 – Shutdown Control

J5 – Status Output Enable

3.3 Input

The EvalAg321T evaluation board should be powered using a DC Power supply delivering between +11.5V to +12.5V. The positive supply should be connected to either J1 or the centre pin of J2 and 0V to either the outer ring of J2 or J3.

3.4 Operation

The EvalAg321T polls for a Power receiver placed over the power transfer Primary coil L1, at intervals of 500ms. When an EvalAg320R, 15W Qi compatible, or 5W Qi compatible receiving device has been placed over the coil, The EvalAg321T will negotiate with the receiver to establish a wireless power transfer contract. Once this has happened D1 will become illuminated and a 500ms tone will be produced by the buzzer. D2 will **not** be illuminated.

3.5 End of Power Transfer

When the power receiver requests a non-error related end of power transfer, such as battery fully charged, power transmission will cease and both D1 & D2 will become illuminated.

In case of an error, power transmission will cease, D2 will become illuminated and D1 will no longer be illuminated.

These errors include:-

- Foreign object detection/transmission coil misalignment
- Non recoverable Communications error
- Receiver over loaded
- Receiver regulation error
- Non compatible receiver

If the shutdown pin on the Ag321T is pulled low, by shorting the two pins on J4, power transmission will be halted and disabled indicating an error with D2 illuminated and D1 will not be illuminated.

To resume power transfer after any of the above conditions, a new power transfer will need to be established, this can be done by either power cycling the EvalAg321T or by removing and replacing the receiver coil.

3.6 Status Outputs

If the link on J5 is removed, all status outputs are disabled so D1 and D2 will not be illuminated and BUZ will remain silent.

3.7 Data Communication

J6 can be used in conjunction with J5 of the EvalAg320R to receive data from the powered application for the user. See section 5.6 of the Ag321T datasheet for full description of communications operation.

4 EvalAg320R

4.1 Board Layout

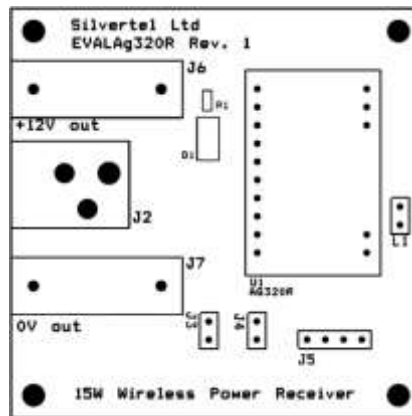


Figure 2: EvalAg320R Board Layout

4.2 Link Settings

J3 – Charge Complete Control

J4 – Cut-off Control

4.3 Operation

The EvalAg320R evaluation board is powered through the power receiver coil, L1. After being placed over the output coil of a wireless power transmitter, such as the included EvalAg321T, The EvalAg320R will negotiate with the transmitter to establish a wireless power transfer contract, once this has occurred and power transmission commences, D1 will become illuminated and output is switched on.

4.4 Output

The EvalAg320R has a 12V output. The high output will be present on J6 or the centre pin of J2, while the low output is available on J7 or the outer ring of J2.

4.5 Ending Power Transfer

When the two pins of J3 are shorted the EvalAg320R will switch off the output and indicate to the power transmitter that the power transfer has completed successfully (e.g. battery fully charged).

When the two pins of J4 are shorted the EvalAg320R will switch off the output and indicate a wireless power transfer error to the power transmitter (e.g. using an external over temperature circuit).

4.1 Data communication

J5 can be used in conjunction with J6 of the EvalAg321T to send data back to the transmitter for the user's application. See section 5.4 of the Ag320R datasheet for full description of communications operation.

5 Test Setup

Figure 3 shows the basic set up using the EvalAg320R evaluation board powered by the EvalAg321T evaluation board. The EvalAg320R should have the load connected before placing it on the primary coil of the EvalAg321T.

The equipment required: -

- Power supply unit, +12V output e.g. 12V bench power supply
- Output power cable and load

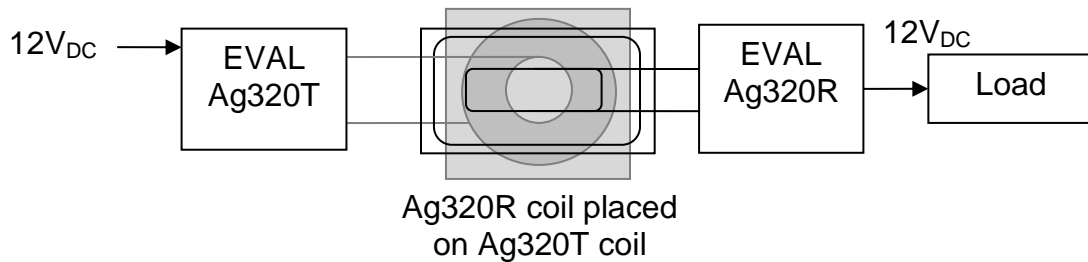


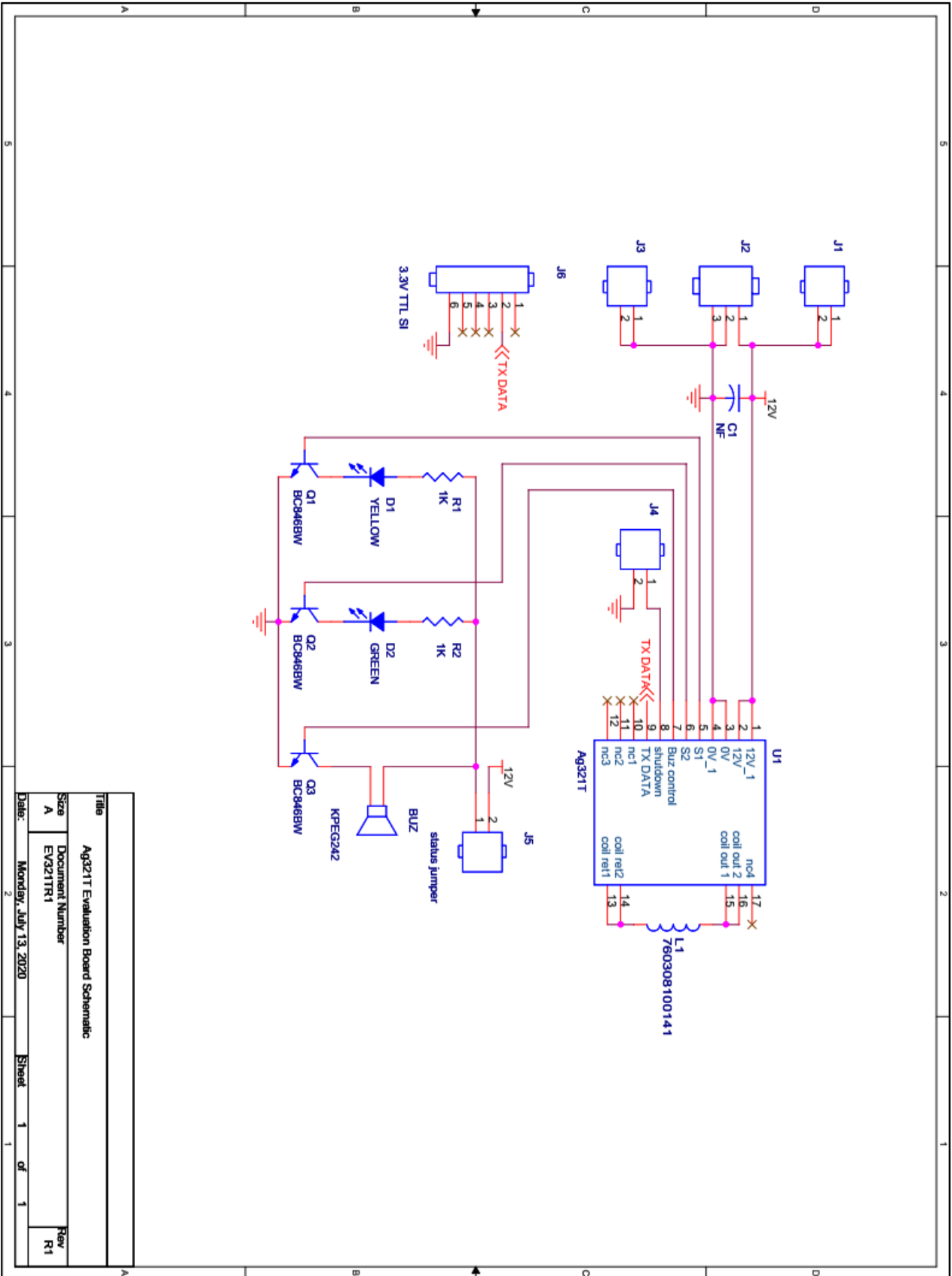
Figure 3 Basic Test Setup

6 Additional information

Full operating conditions and feature set can be found in the respective Ag320R and Ag321T product datasheets, available from www.silvertel.com.

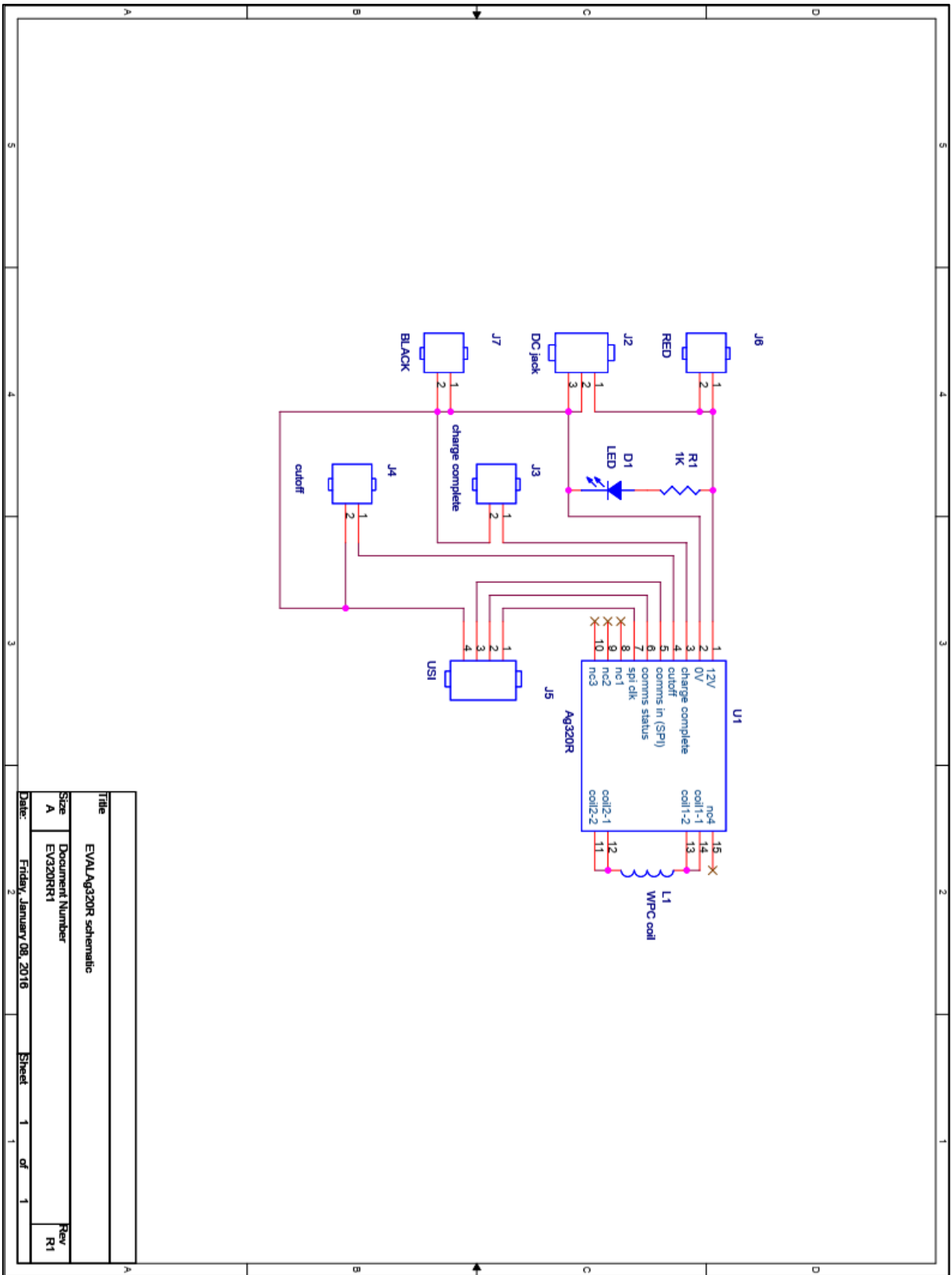
7 Schematic

7.1 EvalAg321T



Title	Ag321T Evaluation Board Schematic		
Size	Document Number	Rev	
A	EV321TR1	R1	
Date:	Monday, July 13, 2020	Sheet	1 of 1

7.2 EvalAg320R



Title	EVALAg320R schematic	
Size	Document Number	Rev
A	EV320RR1	R1
Date:	Friday, January 08, 2016	Sheet 1 of 1

8 Bill of Materials

8.1 EvalAg321T

EvalAg321T Eval Board - Rev.1 - 13th July 2020											
Strictly Private and Company Confidential											
Silver Part No.	Description	Value	Location	Qty	Package	Rating	Tol.	Supplier P/NO.	Comments	Date	
	Module	Ag321T	V1	1	Custom	-	-	Silver Telecom Part			
	Wireless power transfer coil	10uH	L1	1	Through Hole	-	-	Würth 760308100141			
	Buzzer	12V DC buzzer	BUZ	1	Through Hole	-	-	KPEG242			
	Transistor - single NPN	BC246BW	Q1 Q2 Q3	3	SOT 23	-	-	Infrared, Osh Semi, IZP, Doodle Inc			
	SMD LED	GREEN LED	D1	1	SMT	-	-	Würth 150 141 V87 310 0			
	SMD LED	YELLOW LED	D2	1	SMT	-	-	Würth 150 141 A87 310 0			
	Capacitor Electronic	1K 470uF1	C1	0	Through Hole	25V	20%	Panasonic EEUPH1E471 Würth 862940475008			
	Resistor - 0603	1K	R1 R2	2	0803	50mW	1%	Royal Ohm, Euronid & Yopoo			
	Reel Connector	4mm PCB Socket	J1	1	Through Hole	-	-	Heraeus Heraeus 873587100			
	Reel Connector	4mm PCB Socket	J2	1	Through Hole	-	-	Heraeus Heraeus 873587100			
	DC Power Connector	DC-001	J3	1	Through Hole	-	-	Heraeus Heraeus 873587100			
	DC Power Connector	DC-001	J4	1	Through Hole	-	-	169V DC-001-H-7-800W-24 Würth 604 108 301 002			
	DC Power Connector	DC-001	J5	1	Through Hole	-	-	169V LPHS-06S-R-060-034 Würth 6130061121			
	DC Power Connector	DC-001	J6	1	Through Hole	-	-	169V LPHS-06S-R-060-034 Würth 6130021121			
	Link	2 Way	J6 J5	2	Through Hole	-	-	169V SLW 112-01-G-S			
	Module Socket	12 Way	U1a	1	Through Hole	-	-	169V SLW 102-01-G-S			
	CounterSink Plastic Machine Screw	2 Way	U1b	1	Through Hole	-	-	169V SLW 102-01-G-S			
	CounterSink Plastic Machine Screw	3 Way	U1c	1	Through Hole	-	-	169V SLW 102-01-G-S			
	Plastic Nut	M3 x 6mm	-	4	Mechanical	-	-	16 505-101 Tdwy M3			
	Hex Machine Threaded Standoff	6mm M3 x M3	-	4	Mechanical	-	-	16 505-101 Tdwy M3			
	ABS coil cover	73.2 mm x 73.2 mm	-	1	Mechanical	-	-				
	PCB	Rev.1 - 127.48 mm x 73.20 mm	-	1	-	-	-				
	Jurgen Links	Link	J5	1	-	-	-				
	Feet	Sticky Feet	-	4	-	-	-				
Total				37							

8.2 EvalAg320R

EVALAg320R Eval Board - Rev. 1 - 13th May 2020										Date
****Strictly Private and Company Confidential****										
Item Part No.	Description	Value	Location	Qty.	Package	Radius	Tol.	Supplier P/NO.	Comments	
	Knob	AG320R	U1	1	Custom	-	-	Silver / electron Part		
	Wireless power Receiver coil	10.5mm	L1	1	Through Hole	-	-	Abraxon AW100A-4803XH11-001-B		
	SM LED	HE01ED	D1	1	SMT	-	-	Vishay - 150 141 H5V 310 D		
	Resistor - 0003	1K	R1	1	0803	0.5mm	±%	Roynal Oem Eurocom & Vantage		
	Red Connector	4mm PCB Socket	J6	1	Through Hole	-	-	Hirschmann 972582100		
	Black Connector	4mm PCB Socket	J7	1	Through Hole	-	-	Toby DC-001-B-2 5MM R. Wirth 504 100 301 002		
	DC Power Connector	DC-001	J2	1	Through Hole	-	-	Toby LHCS-025 R-060-034 Wirth 6130041121		
	Pin Header	4 Wire	J5	1	Through Hole	-	-	Toby LHCS-025 R-060-034 Wirth 6130021121		
	Link	J3 J4	J3 J4	2	Through Hole	-	-			
	Module Socket	10 Wire	U1a	1	Through Hole	-	-	Toby SLW-110-01-6-S		
		2 Wire	U1b	1	Through Hole	-	-	Toby SLW-102-01-6-S		
		3 Wire	U1c	1	Through Hole	-	-	Toby SLW-103-01-6-S		
	Countersunk Brass Machine Screw	M3 x 6mm		4	Mechanical	-	-	H = 291-501 1.68V D3NF		
	Plastic Nut	M3		4	Mechanical	-	-	H = 525-701 1.68V M3		
	Hex Magnet embed Threaded Standoff	6mm, M3 x M3		4	Mechanical	-	-	H = 302-967 1.68V 1P5		
	ABS coil cover	57 15 mm x 57 15 mm		1	Mechanical	-	-			
	PCB	Rev 1 - 57 15 mm x 57 15 mm		-	-	-	-			
	Links	Jumper Link		0	-	-	-			
			Total	20						

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