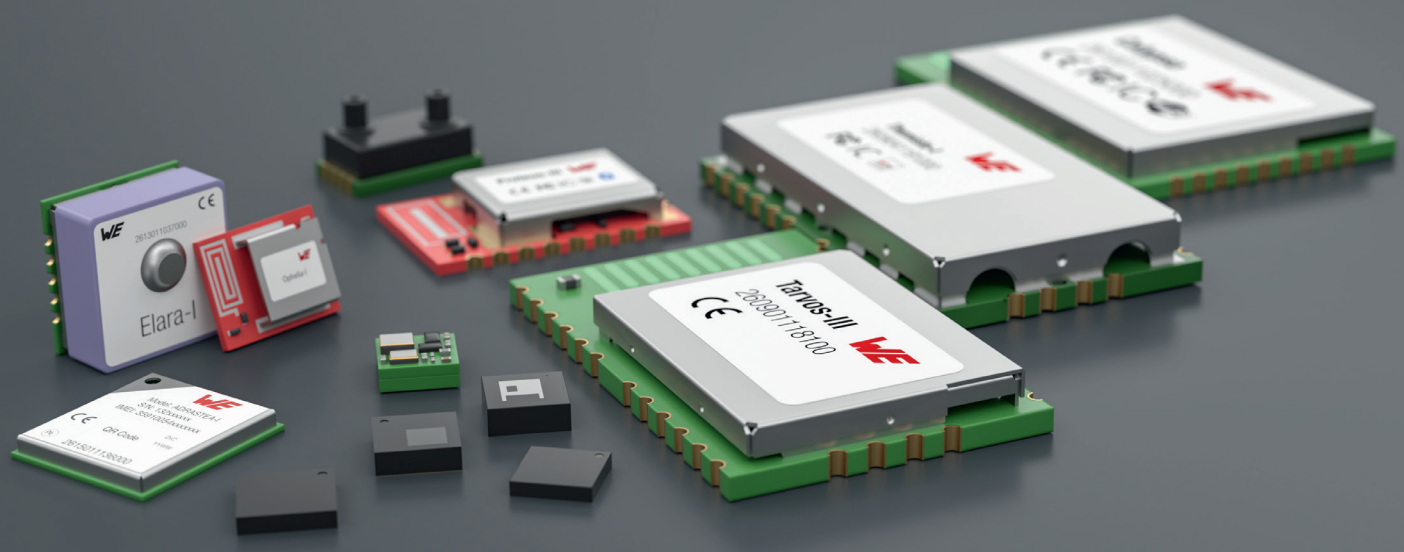

User manual

Evaluation board/kit for radio modules Thyone-I, Proteus-III(-SPI), Setebos-I

26110110240x0, 2611011021000

Version 1.7

March 28, 2025

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

****

MUST READ

Check for firmware updates

Before using the product, make sure you use the most recent firmware version, data sheet, and user manual. This is especially important for Wireless Connectivity products that were not purchased directly from Würth Elektronik eiSos. A firmware update on these respective products may be required.

We strongly recommend including the possibility of a firmware update in the customer system design.

Revision history

Manual version	HW version	Notes	Date
1.0	2.0	• Initial version	February 2020
1.1	2.0	• JP3 description in HW V2.0 is invalid. Updated jumper JP3 description in table 8	March 2020
1.2	2.0	• EV-Kit Long Range is added in table 1 and in table 4 . • Chapter CON4 is updated. • Chapter LFXO crystal is updated. • Chapter Long range measurement - Thyone-I is added.	July 2020
1.3	2.0	• Table 3 corrected.	August 2020
1.4	2.3	• Schematic is updated in chapter 3.7. • Bill of materials is added in chapter 3.9. • LFXO crystal part number is updated in chapter 3.5.5. • Input capacitance variables C_{XC1} and C_{XC2} are changed to C_{XL1} and C_{XL2} respectively 3.5.5. • FCC exemption information is added in chapter 6.	January 2021

1.5	2.3	• Added footnote in "Supported radio modules" section, mentioning the laser marking modules. • Added radiation characteristics in chapter 3.10. • New corporate design.	May 2023
1.6	2.3	• Chapter Marking is added. • Chapter Legal notice is added. • Chapter UART / USB is updated.	October 2024
1.7	3.1	• Update all to hardware version 3.1	March 2025

Abbreviations

Abbreviation	Name	Description
BDM	Business Development Engineer	Support and sales contact person responsible for limited sales area
EV	Evaluation	
ESD	Electro Static Discharge	
FTDI	Future Technology Devices International	
GND	Ground	
HIGH	High signal level	
JTAG	Joint Test Action Group	
LED	Light Emitting Diode	
LFCLK	Low frequency clock	
LFXO	Low frequency crystal oscillator	
LOW	Low signal level	
NFC	Near Field Communication	
PC	Personal Computer	
PCB	Printed Circuit Board	
RF	Radio frequency	Describes everything relating to the wireless transmission.
SMA	SubMiniature version A	
SWD	Serial Wire Debug	
UART	Universal Asynchronous Receiver Transmitter	Universal Asynchronous Receiver Transmitter allows communicating with the module of a specific interface.
USB	Universal Serial Bus	
VDD	Voltage Drain Drain	Supply voltage

Contents

1 Supported radio modules

The EV-Board described in this manual can be used to evaluate the following products:

Order code	Product Name	Description
2611011024000	Proteus-III	Bluetooth® LE 5.1 radio module with smart antenna configuration[1]
2611011021000	Thyone-I	2.4GHz proprietary with smart antenna configuration
2611011024020	Setebos-I	2.4GHz combo module Bluetooth® LE & proprietary - smart antenna configuration

Order code	Product Name
2611019024001	Proteus-III Bluetooth 5.1 EV-Kit
2611019021001	Thyone-I EV-Kit
2611139024021	Setebos-I EV-Kit

Table 1: Compatibility

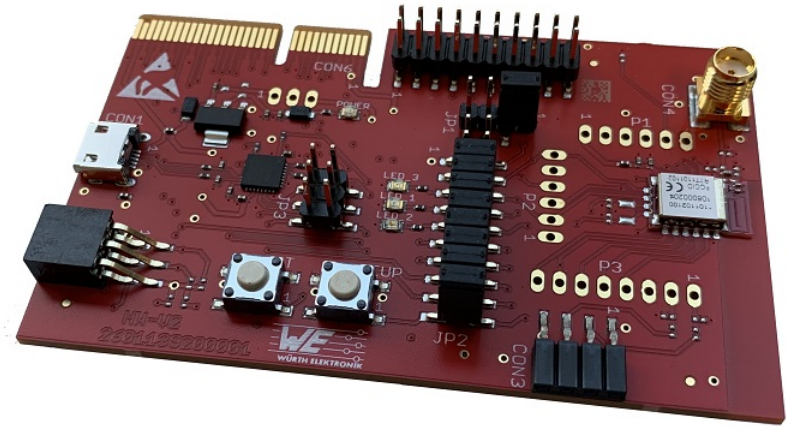

Figure 1: Product image

[1] Please be aware that the EV-Board can be delivered with a module containing a label or a laser marking.

Kit Content 2611019024001	Quantity
EV-Board with Proteus-III	1
USB2 A to USB Micro cable	1
Packaging: Cardboard Box, ESD safe cover	1

Table 2: Content Proteus-III Bluetooth 5.1 EV-Kit

Kit Content 2611019021001	Quantity
EV-Board with Thyone-I with On-board PCB Antenna connection	1
Thyone-I USB radio stick	1
USB2 A to USB Micro cable	1
Packaging: Cardboard Box, ESD safe cover	1

Table 3: Content Thyone-I EV-Kit

Kit Content 2611017221001	Quantity
EV-Board with Thyone-I with SMA connection for external antenna	1
2.4GHz external antenna - 2600130021	1
USB2 A to USB Micro cable	1
Packaging: ESD safe cover	1

Table 4: Content Thyone-I EV-Kit Long Range

2 Functional description

The EV-Board offers the user the possibility to develop hard- and software for the compatible radio module. It can be connected to an USB port of a PC.

For the connection to a micro controller system the development board is equipped with a multi-pin connector which is connected to all pins of the RF module. Jumpers allow the module to be disconnected from components such as the USB interface which are not required.

Feel free to check our YouTube channel:
www.youtube.com/user/WuerthElektronik/videos
for video tutorials, hands-ons and webinars relating to our products.

2.1 Taking into operation

To run the EV-Board place the jumpers on default location as shown in figure 3.
The corresponding FTDI driver package (*www.ftdichip.com/Drivers/VCP.htm*) has to be installed on your PC.

Connect the power jack or external power supply to the EV-Board and make sure the VDD is stable and able to reliably supply the module's static and peak current consumption as specified by the module manual.

The next step is to connect the EV-Board to the PC using a USB-cable. In that way a COM port can be detected and installed on your PC. Check the device manager to acquire the COM port name of the EV-Board. A typical name is "COM12" in Windows systems or "/dev/ttyUSB0" in Linux systems.

The WE UART Terminal PC tool or any other serial terminal program (like hterm for Windows) has to be run and the corresponding COM port has to be opened using the default settings of the mounted radio module. After the module is powered through the USB jack or an alternative power supply, the reset button should be pressed to ensure a clean start-up of the module.

Please refer to the module user manual to get the detailed module specific quick start instructions.

3 Development board

3.1 Block diagram

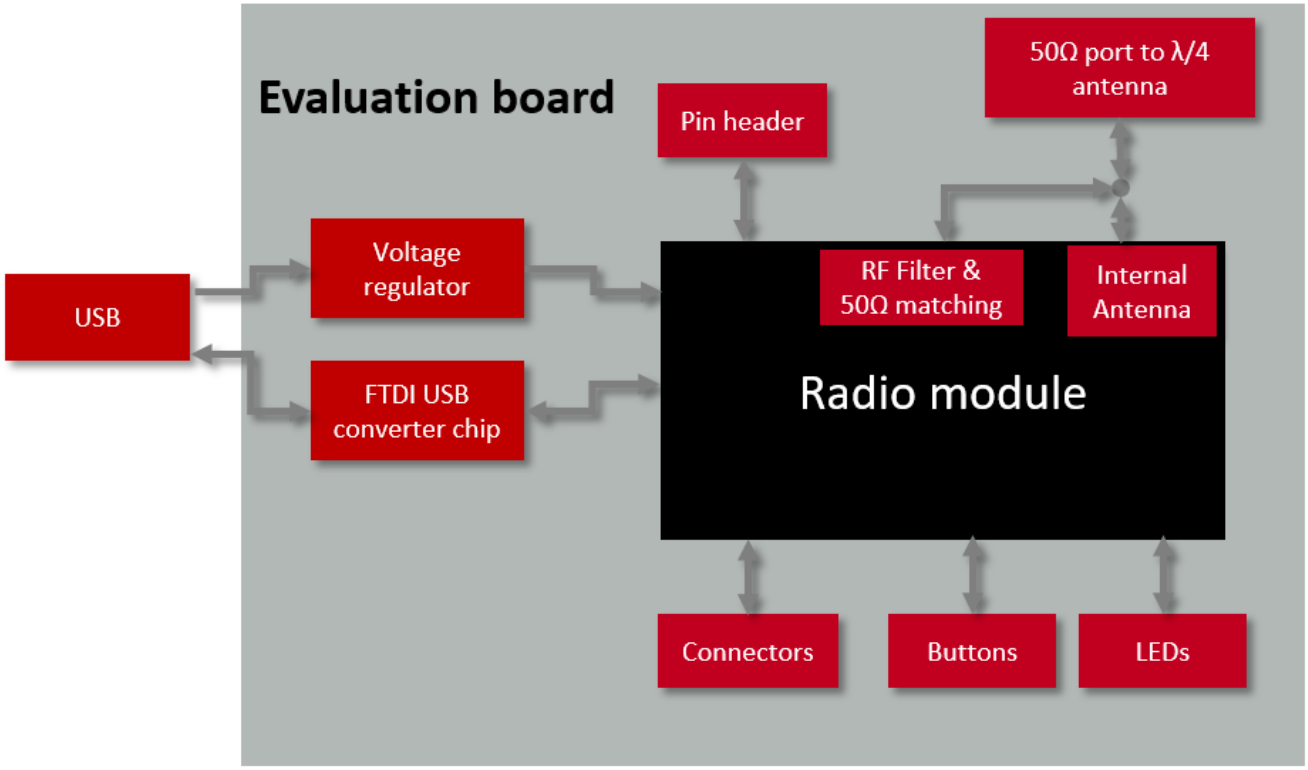

Figure 2: Block diagram

3.2 Jumpers

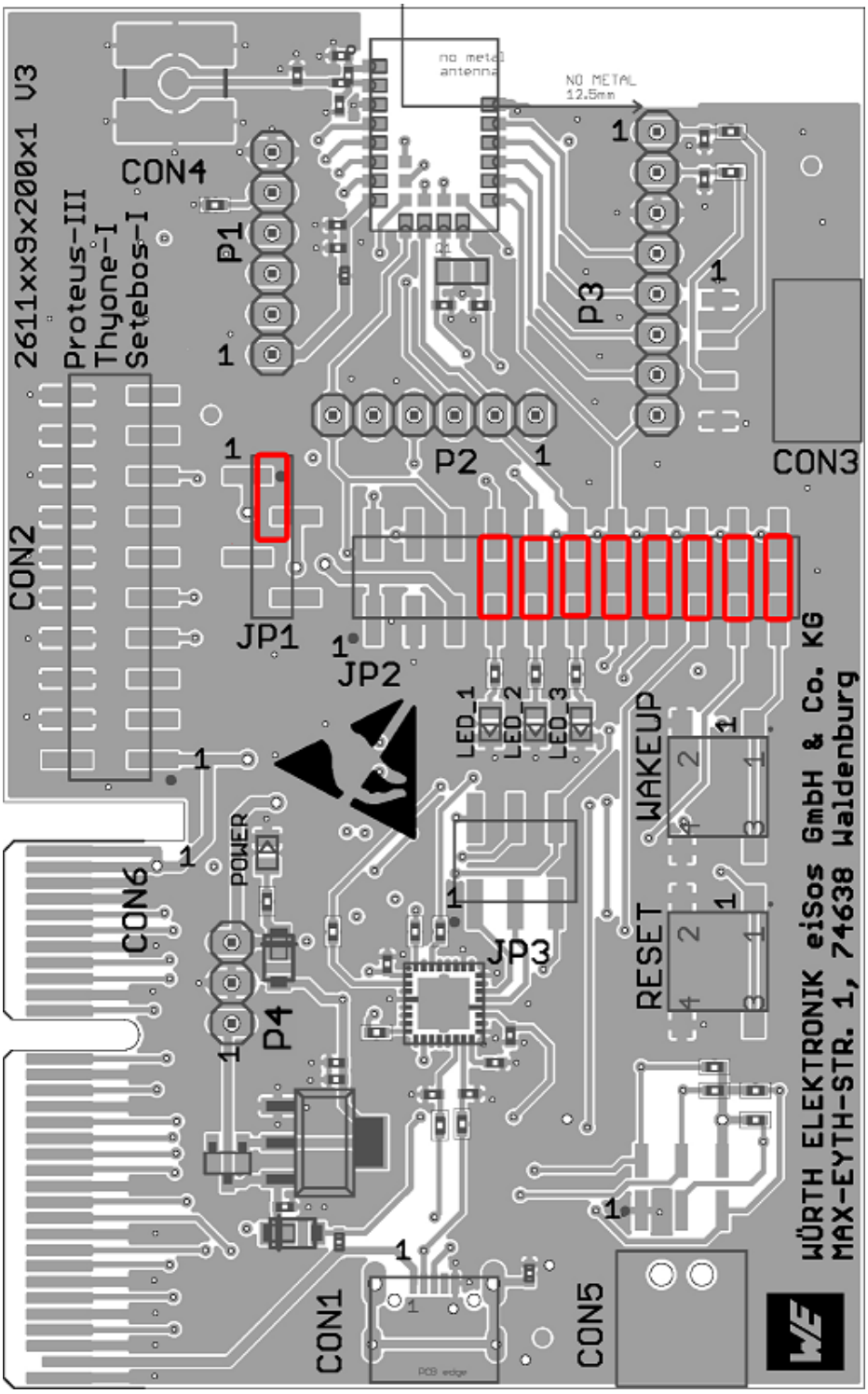

Figure 3: Jumpers, defaults

Pin	Function	Pin	Function	set (default)
1	VDD	2	B1 / RPS for Setebos	No
3	GND	4	BOOT	No
5	VDD	6	MODE_1	No
7	LED1	8	LED1 (module pin)	Yes
9	LED2	10	LED2 (module pin)	Yes
11	LED3	12	BUSY	Yes
13	FTDI's RX	14	module's UTXD	Yes
15	FTDI's TX	16	module's URXD	Yes
17	FTDI's RTS	18	module's CTS	Yes
19	FTDI's CTS	20	module's RTS	Yes
21	Wakeup button	22	WAKE_UP	Yes

Table 5: Jumper JP2 HW-V3

JP2 description printed on the bottom of the EV-Board hardware version 3.0 / 3.1 is corresponding to HW-V2.

JP2	Module Pin Function	Jumper set (default)
1,2	Connect BOOT pin to GND if set	No
3,4	Connect MODE_1 to VDD if set	No
5,6	LED3	Yes
7,8	LED1	Yes
9,10	LED2	Yes
11,12	UART TX	Yes
13,14	UART RX	Yes
15,16	RTS	Yes
17,18	CTS	Yes
19,20	Wake_up	Yes

Table 6: Jumper JP2 HW-V2

Info of table 6 corresponds to HW-V2 for users of previous version.

JP1	Function	Jumper set (default)
1,2	Power bridge	Yes

Table 7: Jumper JP1

JP3	CBUS Connections	Jumper set (default)
1,2	CBUS 0 - Reset	No
3,4	CBUS 1 - Boot	No
5,6	CBUS 2 - Wake-up	No

Table 8: Jumper JP3

3.3 Connectors and pin headers

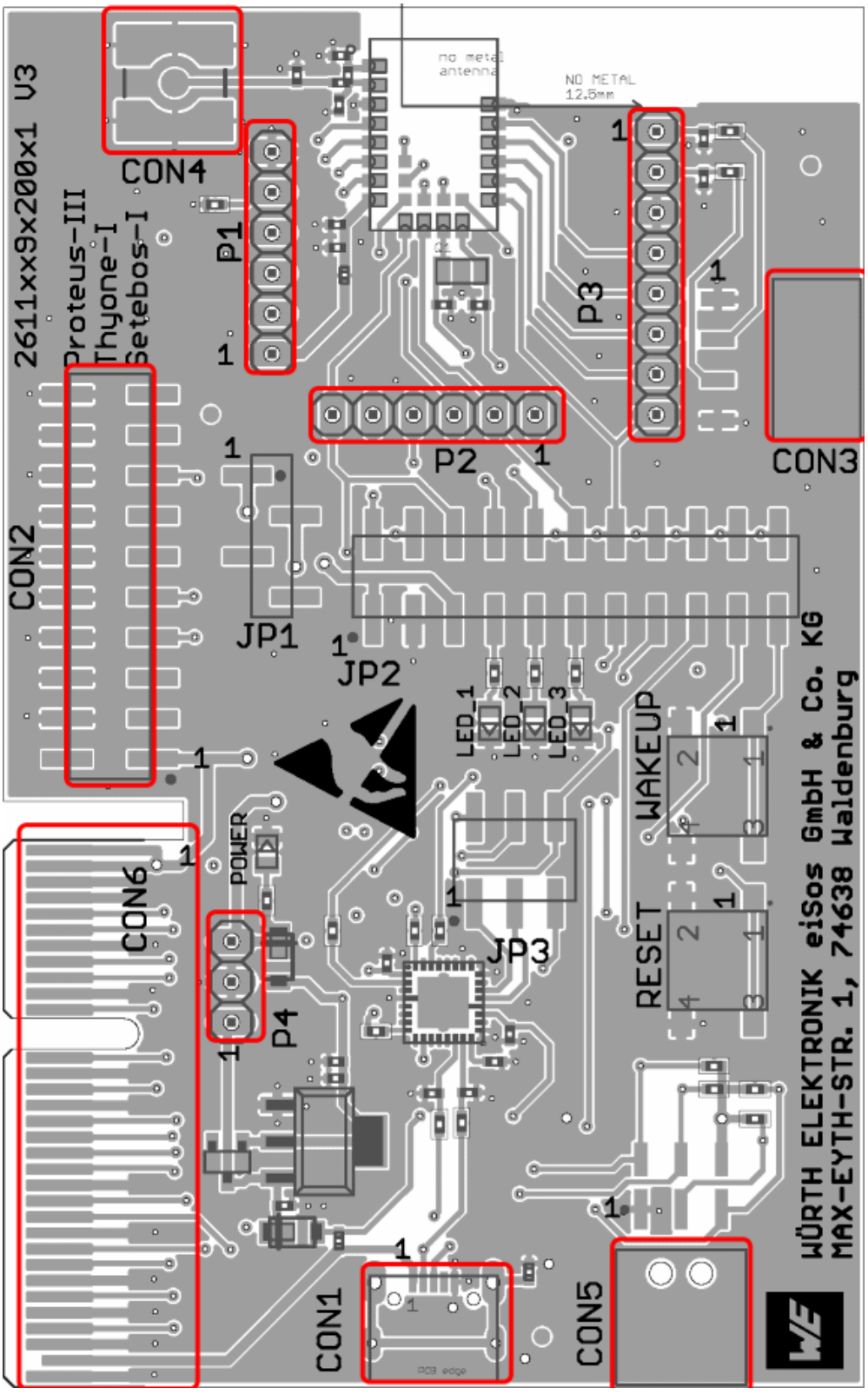

Figure 4: Connectors

Connector	Function
CON1	Micro-USB connector for host connection and VDD bus supply
CON2	2×10 JTAG/SWD Connector
CON3	Optional connection for NFC Antenna
CON4	SMA connector for external antenna
CON5	Optional connection for WE sensor EV-Boards
CON6	Edge card connector, see table 11

Table 9: Connector overview

3.3.1 CON1

Connector CON1 is a micro-USB connector that enables connection to PC via standard micro-USB cable.

CON1	Function
	Micro-USB connector for host connection and VDD bus supply

3.3.2 CON2

Connector CON2 is the JTAG debugging interface.

CON2	nRF52840	Function
1		VDD
7	SWDIO	SWDIO
9	SWCLK	SWCLK
15	P0.18	RESET
4,6,8,10,12,14,16,18,20		GND
2,3,5,11,13,17,19		Not Connected

Table 10: Connector CON2

3.3.3 CON3

Connector CON3 is used to connect a NFC antenna. This feature is subjected to a customized firmware and not supported by default firmware.

CON3	nRF52840	Function
1		GND
2	P0.09	NFC1
3	P0.10	NFC2
4		GND

3.3.4 CON4

Connector CON4 (SMA receptacle) is used to connect an external antenna. The 2.4 GHz antenna Himalia-2600130021 shall be used.

CON4	Function
Inner	RF signal
Outer	GND

The board supports 50 Ω connection by just soldering/unsoldering one component to use either module's internal PCB antenna or to connect an external antenna.

In order to use the external antenna for long range tests, Capacitor C6 has to be populated with a 22pF capacitor *885012005027* and C28 should be left unpopulated.

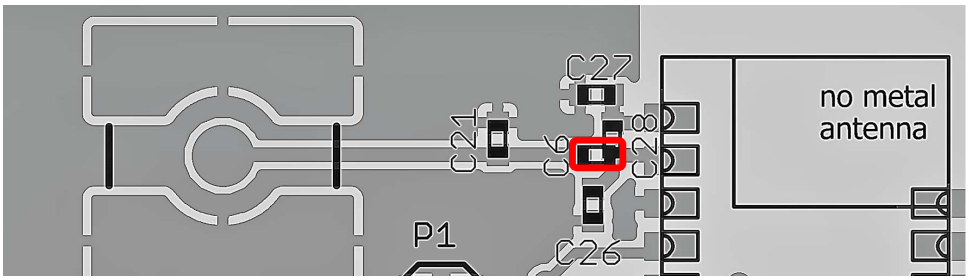

Figure 5: Capacitor connection to external antenna

In order to use the internal PCB antenna of the module, C28 has to be populated with a 22pF capacitor *885012005027* and C6 should be left unpopulated.

3.3.5 CON5

Connector CON5 is used to connect the WE Sensor EV-Boards. This feature is subjected to a customized firmware and not supported by default firmware.

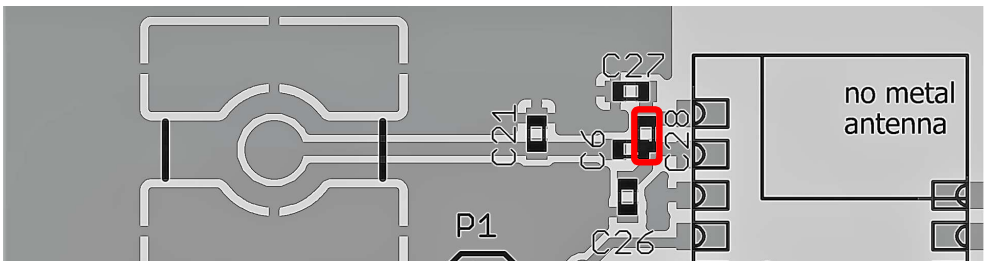

Figure 6: Capacitor connection to internal antenna

CON5	nRF52840	Function
1		GND
2	P0.07	RSVD
3	P0.23	RSVD
4	P1.00	RSVD
5	P0.21	RSVD
6		VDD

3.3.6 CON6

Connector CON6 is an Edge card connector.

CON6	nRF52840	Function
B1, B2		VDD 3V
B3, B4, B7,B9, B13, B15, B20, B23, B26, B28, B30, B32		GND
B5	SWCLK	SWCLK
B6	SWDIO	SWDIO
B8	P0.03	WAKE_UP
B9	P0.02	BOOT
B11	P0.12	CTS
B12	P0.11	RTS
B14	P0.18	RESET
B16	P0.23	RSVD
B17	P0.21	RSVD
B18	P0.07	RSVD
B19	P1.00	RSVD
B21	P1.08	UTXD
B22	P1.09	URXD
B24	P0.19	MODE_1
B25	P0.22	BUSY

B27		D+ USB
B29		D- USB
B31		VDD 5 V

Table 11: Connector CON6

P1	nRF52840	Function
1		VDD 3V
2	P0.02	BOOT
3	P0.18	RESET
4	SWDIO	SWDIO
5	SWCLK	SWCLK
6		GND

Table 12: Pinheader P1

P2	nRF52840	Function
1	P0.21	RSVD
2	P0.22	BUSY
3	P0.23	RSVD
4	P1.00	RSVD
5	P0.07	RSVD
6	P0.19	MODE_1

Table 13: Pinheader P2

P3	nRF52840	Function
1	P0.09	NFC1, RSVD
2	P0.10	NFC2, RSVD
3		GND
4	P0.03	WAKE_UP
5	P0.12	CTS
6	P0.11	RTS
7	P1.09	URXD
8	P1.08	UTXD

Table 14: Pinheader P3

P4	nRF52840	Function
1		VDD 3V
2		GND
3		VDD 5 V

Table 15: Pinheader P4

3.4 Buttons

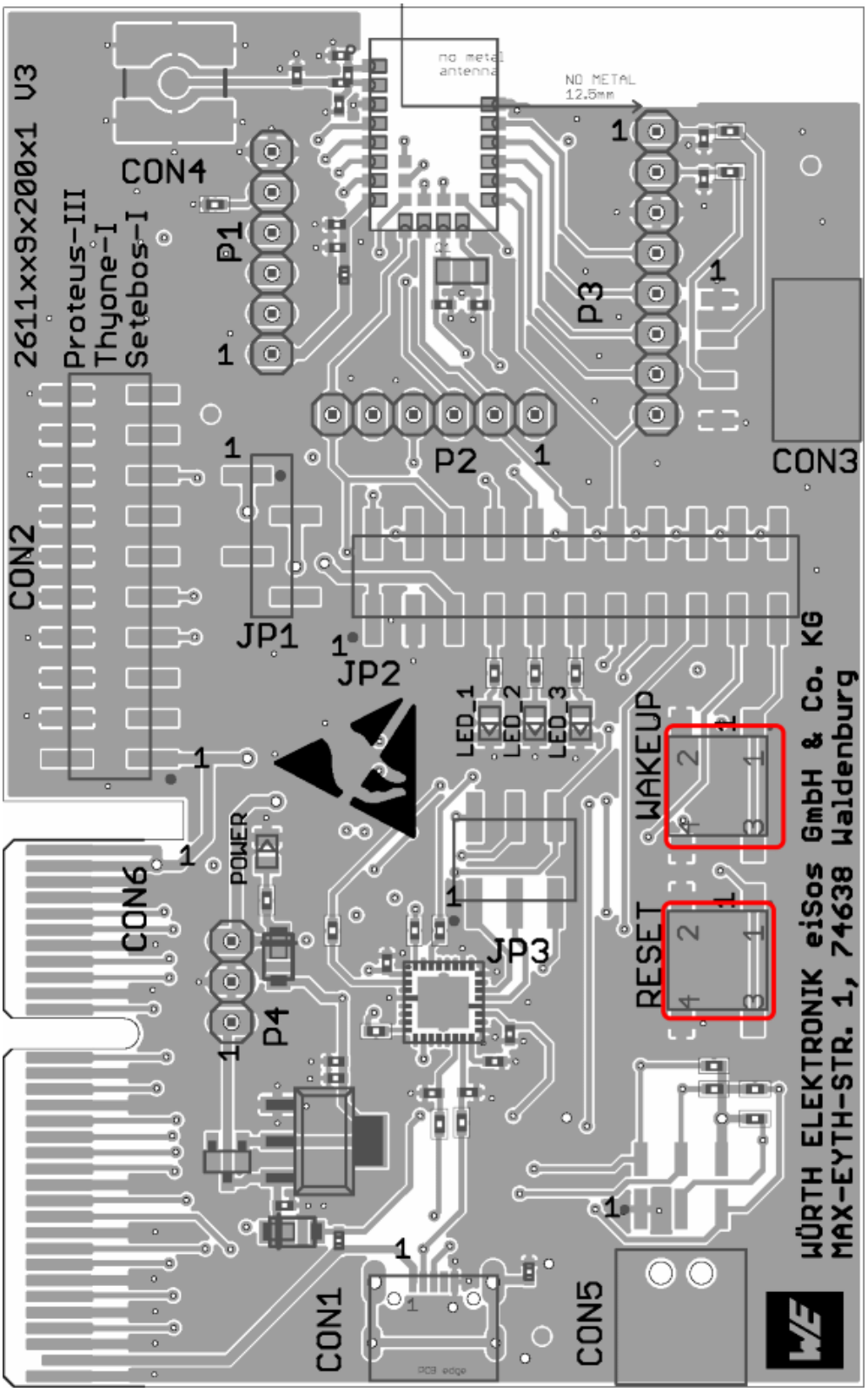

Figure 7: Buttons

3.4.1 RESET button

Internally the active low reset input of the micro processor is connected via a RC combination with the power supply to ensure a proper startup of the module. Any module provides a */RESET* pin that is connected to this button so the module can be restarted properly. Most modules provide an internal pull-up resistor. Please refer to the module specific manual for detailed information.

3.4.2 WAKE-UP button

Some modules use the wake-up button connected to their *WAKE-UP* pin to exit from sleep mode of the module. Please refer to the module specific manual for detailed information.

3.5 Function blocks

3.5.1 Power supply

3.5.1.1 Bus powered, power supply through USB

The development board can be run via USB. The integrated voltage regulator regulates the connected USB voltage 5 V down to 3V and supplies the remaining parts of the circuit. If the EV-Board is power sourced the power *Power LED* lights up.

3.5.2 JP1 - Current measurement

By default, JP1 is bridged for normal operation. If a current meter is connected in place of the jumper, the power consumption of the radio module can be measured.
If the meter is not attached and the bridge is not set, the module will not receive a supply voltage. However, the power *Power LED* may be active, as it is connected prior to the current measurement bridge in order not to distort the module's power consumption.

3.5.3 UART / USB

The UART of the module can be connected to the USB converter by setting the bridge JP2. In this case it is available on the USB jack. Using the FTDI-driver the PC will show a virtual COM-Port which can be used to communicate with the module.

The USB cable length must not exceed 3 meters.

In order to establish a stable UART communication between the FTDI USB to UART converter chipset and the radio module's chipset, the difference between the baud rates of each entity must not exceed the respective immunity level. Both devices use an internal clock to generate the configured UART baud rate. Due to the fixed clock frequency, only specific baud rates can be run without frequency error.
To figure out which baud rates of the radio module can be evaluated using the mounted FTDI chipset (FT232R or FT231X), it is important to know the real baud rate B with its introduced error. To get them, the FTDI's clock of 3000 kHz must be divided by the respective prescaler P:

$$B = \frac{3000}{P} \text{ [kBaud]}$$

The supported prescalers P can be chosen as:

$$P \in \{1, 1.5\} \text{ or } P = 2 + (N \cdot 0.125) \text{ with } N \in \{0, 1, 2, 3, 4, \ldots\}$$

When a baud rate is configured in the FTDI chip, the prescaler is chosen that meets the closest baud rate. In that case, the real baud rate differs from the configured one, introducing a UART clock error, which may lead to UART communication issues.

Example: In case the desired baud rate $B_{desired} = 1250$ kBaud, the desired prescaler is $P_{desired} = \frac{3000}{1250} = 2.4$. The closest prescaler P is determined by $P = 2 + (N \cdot 0.125) = 2.375$ with $N = 3$. This results in a real baud rate $B = \frac{3000}{2.375} = 1263$ kBaud, which introduces an error of $\frac{B - B_{desired}}{B_{desired}} = 1.04$ % with respect to the desired baud rate.

Desired baud rate [kBaud]	Closest prescaler P	Real baud rate B [kBaud]	Error [%]
3000	1	3000	0
2500	1.5	2000	-20
2000	1.5	2000	0
1500	2	1500	0
1250	2.375	1263	1.04
1411.764706	2.125	1411.764706	0
⋮	⋮	⋮	⋮
1000	3	1000	0
921.6	3.25	923.0769231	0.16
⋮	⋮	⋮	⋮
230.4	13	230.7692308	0.16
⋮	⋮	⋮	⋮
115.2	26	115.3846154	0.15
⋮	⋮	⋮	⋮
38.4	78.125	38.4	0
⋮	⋮	⋮	⋮
19.2	156.25	19.2	0
⋮	⋮	⋮	⋮
9.6	312.5	9.6	0
⋮	⋮	⋮	⋮

Table 16: Example baud rates

3.5.4 UART direct

If a micro-controller is to be connected to the module, remove the bridges on JP2. The UART can be connected directly on the pin strip JP2 (all even numbered pins). The module *RXD* line must be handled accordingly by your host (i.e. pulled up while inactive and during module boot-up).
Beware of IO level incompatibility. The host must obey the values stated in the module's manual. Especially the IO level restrictions must be implemented by a host system (i.e. using a level shifter to use the allowed IO levels).

3.5.5 LFXO crystal

For higher LFCLK accuracy (better than ±250 ppm) a low frequency crystal oscillator of 32.768 kHz (LFXO) shall be used. A crystal, 3.2 ×1.6 mm package, for example *830009706*, can be placed

on the EV-Board to position Q1. The needed load capacitance can be reached with capacitors C9 and C10, 0402 package.

nRF52840 pin P0.00/XL1 and P0.01/XL12 are connected to module pad LED_1 and LED_2 respectively. If a LFXO is mounted to the EV-Board the JP2.7-8 and JP2.9-10 jumpers shall not be connected, therefore the LED_1 and LED_2 function is no longer available.

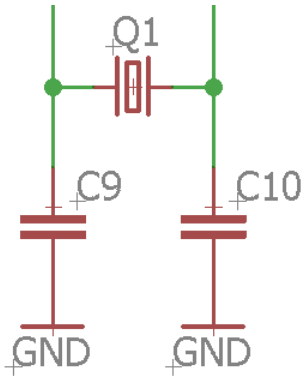

Figure 8: LFXO mounting

The input capacitance of the pad LED_1 and LED_2 are 4 pF. The values of C9 and C10 can be calculated as follows.

The load capacitance of LFXO is given by

$$C_l = \frac{C9_l * C10_l}{C9_l + C10_l} \tag{1}$$

If $C9_l$= $C10_l$ = C, then

$$C_l = \frac{C}{2} \tag{2}$$

whereas,

$$C9 = C - C_{XL1} - C_{PCB} \tag{3}$$

$$C10 = C - C_{XL2} - C_{PCB} \tag{4}$$

C_l = Load capacitance of LFXO crystal.
C_{XL1} = Input capacitance of Pad LED_1 (4 pF)
C_{XL2} = Input capacitance of Pad LED_2 (4 pF)
C_{PCB} = Parasitic capacitance of PCB Parasitic capacitance of the PCB can vary depending on design and track length. It can vary from 0.5 pF to 2 pF.

For the crystal *830009706* with load capacitance of 9pF and parasitic capacitance of 2 pF. The value of C9 and C10 results in 12 pF which was also tested on the evauation board.

Depending on parasitic capacitance of Host PCB, a capacitance of 12 pF may be a good starting value for C9 and C10.

Using standard firmware the external crystal is not needed. To enable use of the LFXO a custom firmware is required.

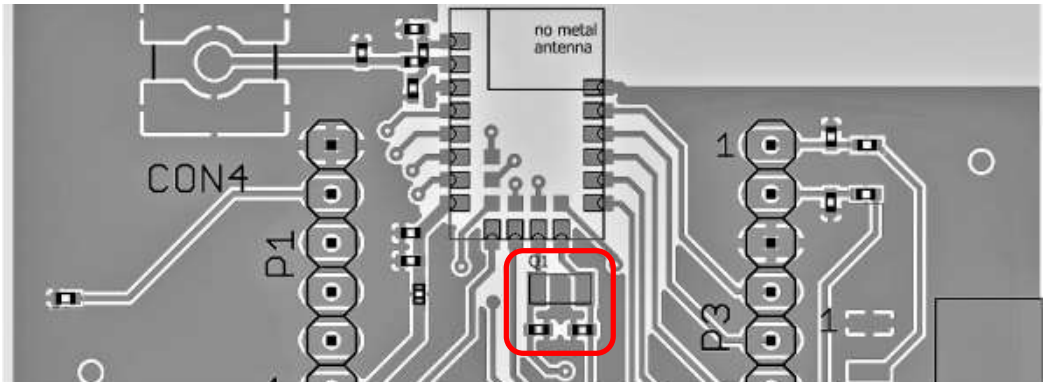

Figure 9: LFXO mounting

3.5.6 NFC

Using standard firmware NFC is not supported. To enable use of the NFC a custom firmware is required and an antenna and antenna matching network needs to be connected to the corresponding pins. In case of using NFC function, the corresponding pins are connected to the CON3 through place holders for matching circuitry to tune the NFC antenna.

3.5.7 Programming interface

The EV-Board provides a 2×10 pin connector to connect directly to a JTAG flash adapter used for development. Please take care of the correct mounting of the flash adapter. The recommended flash adapter is one of the "Segger J-Link" family.
Jumper JP6 will prevent the module from starting in debug mode when no flash adapter is connected. To apply this, remove the flash adapter connection. Make sure a jumper at JP6 is placed. Unplug and replug the USB connection of the device. Press the reset button on the EV-Board.

3.6 Long range measurement - Thyone-I

The EV-Board as described in the previous sections offers both internal and external antenna connection. To test the long range functions of the Thyone-I module, two modules with external antenna connection should be taken into operation.

For long range measurments one of the following configuration is necessary. One option is listed in Table 17 , the other is in Table 18 .

Quantity	Product	Order Code
1	Thyone-I Evaluation-Kit	2611019021001
1	Himalia Antenna	2600130021
1	Thyone-I EV-Kit Long Range	2611017221001

Table 17: Configuration-I

By default the onboard PCB antenna is used in the Thyone-I Evaluation-Kit (2611019021001)

In order to use the external antenna, the capacitor connection to SMA connector should be made according to the chapter 3.3.4 and figure 5

Quantity	Product	Order Code
2	Thyone-I EV-Kit long range	2611017221001

Table 18: Configuration-II

By default the SMA connector of the EV-Boards in the Thyone-I EV-Kit long range (2611017221001) is connected to the module

In order to use the module's onboard PCB antenna, the capacitor connection to SMA connector should be made according to the chapter 3.3.4 and figure 6

3.7 Schematic

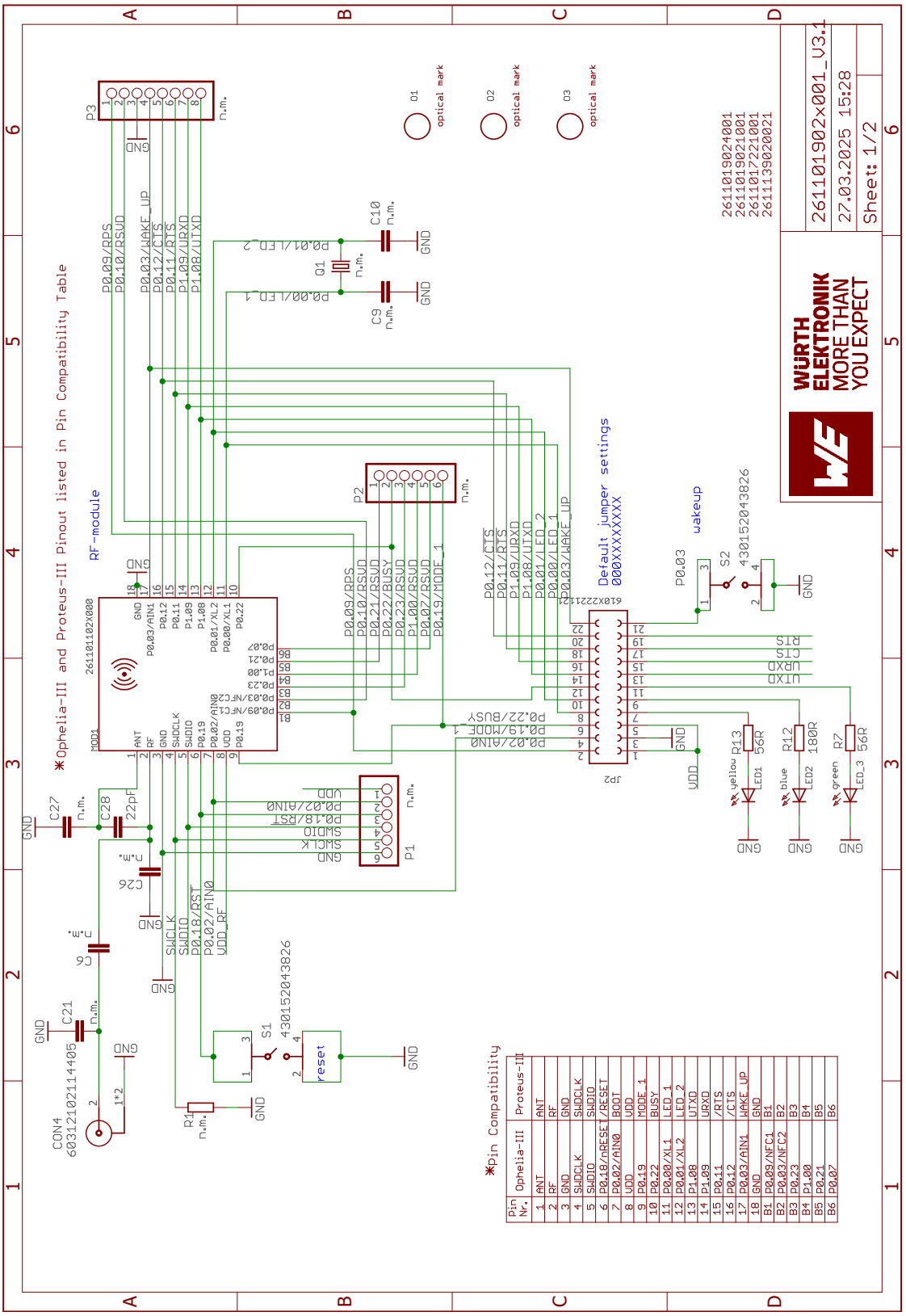

Figure 10: Schematic sheet-1

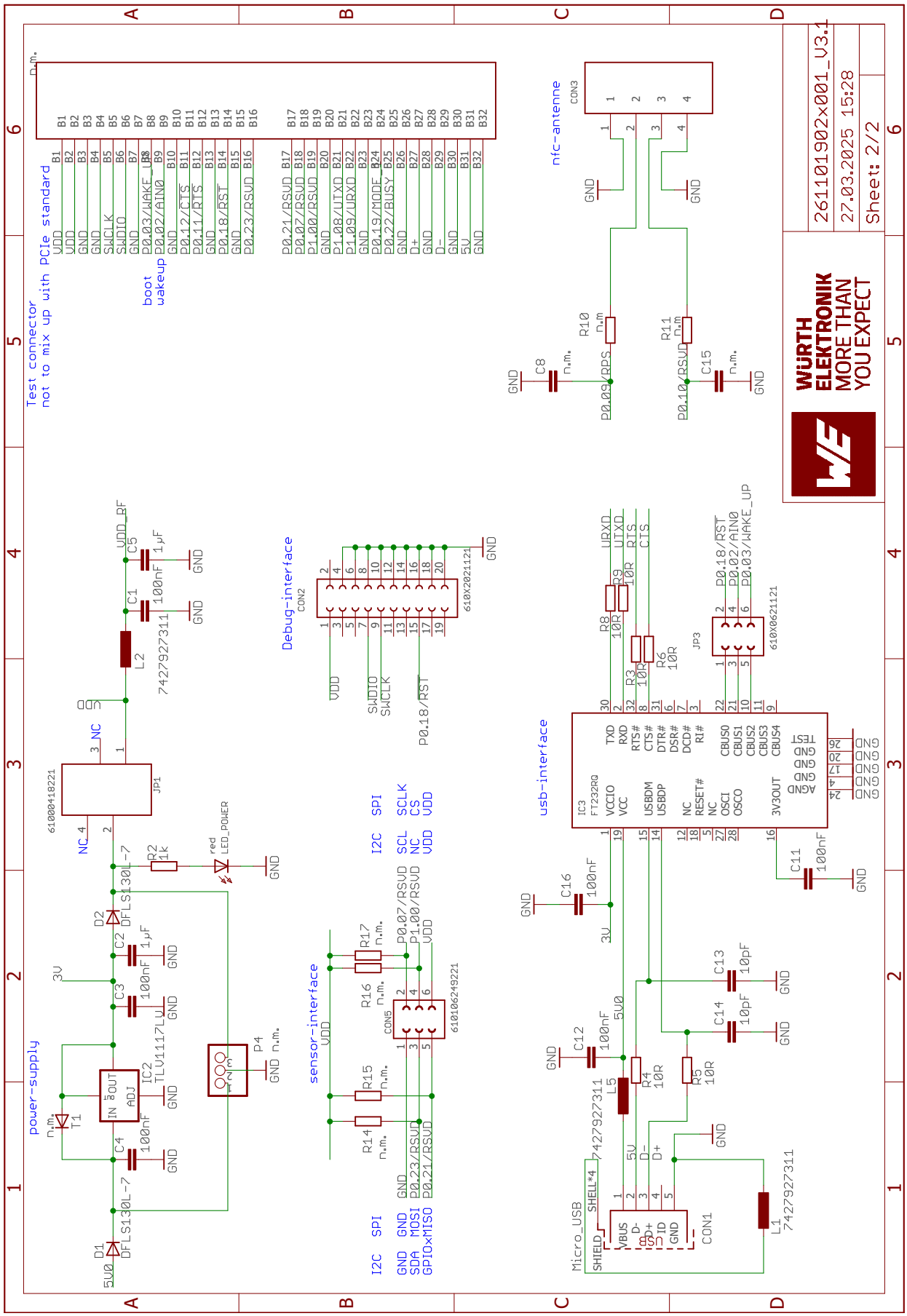

Figure 11: Schematic sheet-2

3.8 Layout

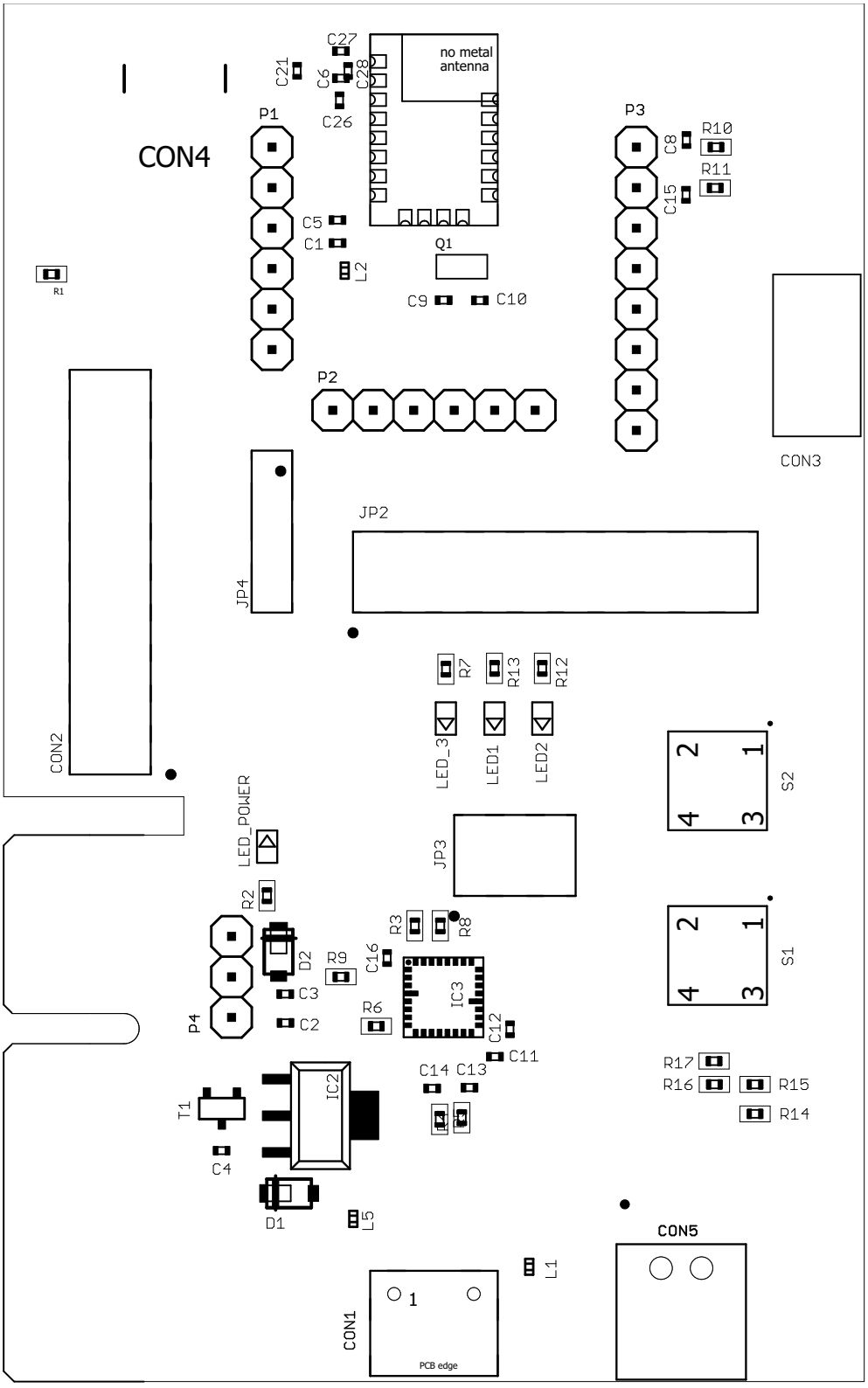

Figure 12: Assembly diagram

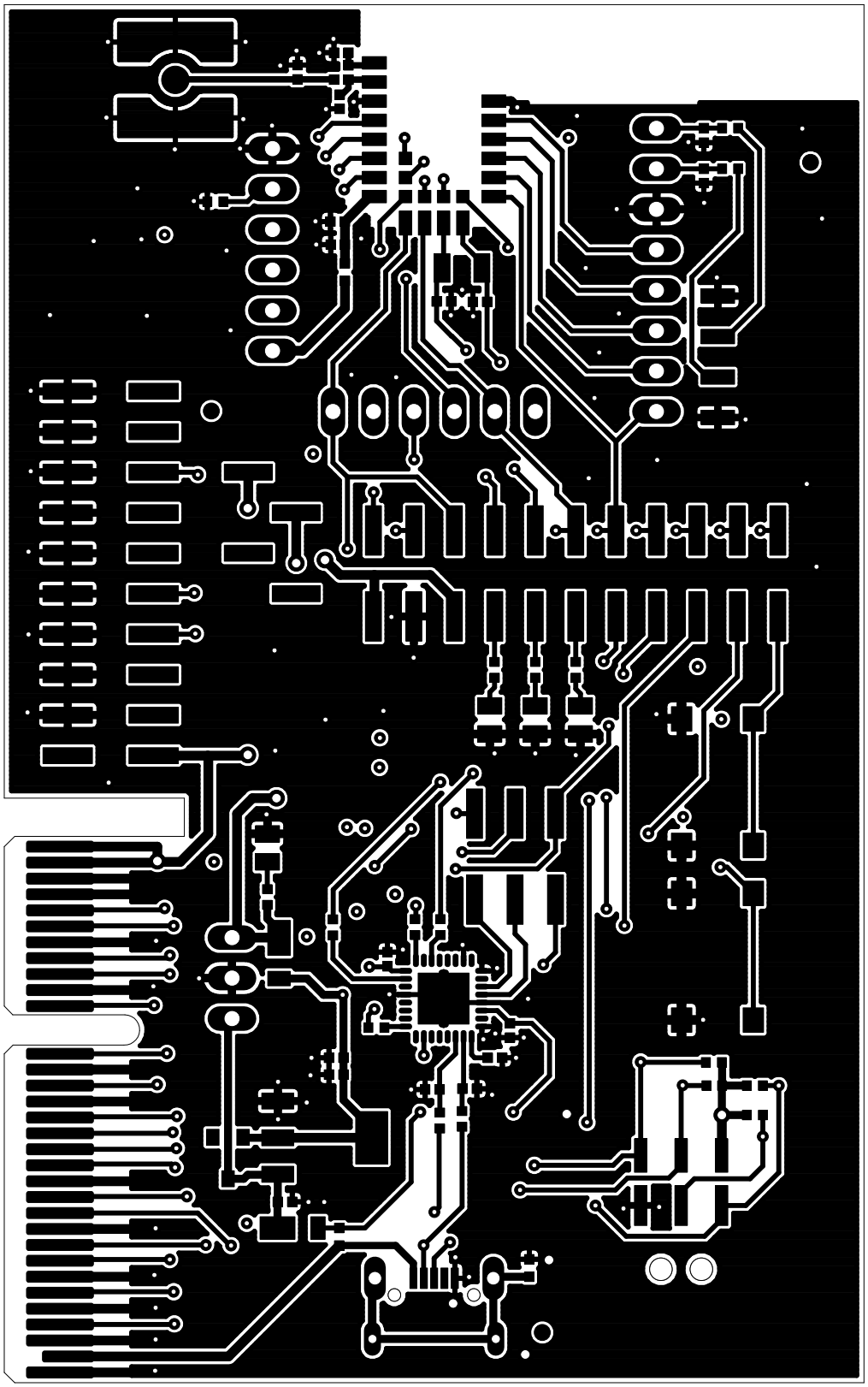

Figure 13: Top

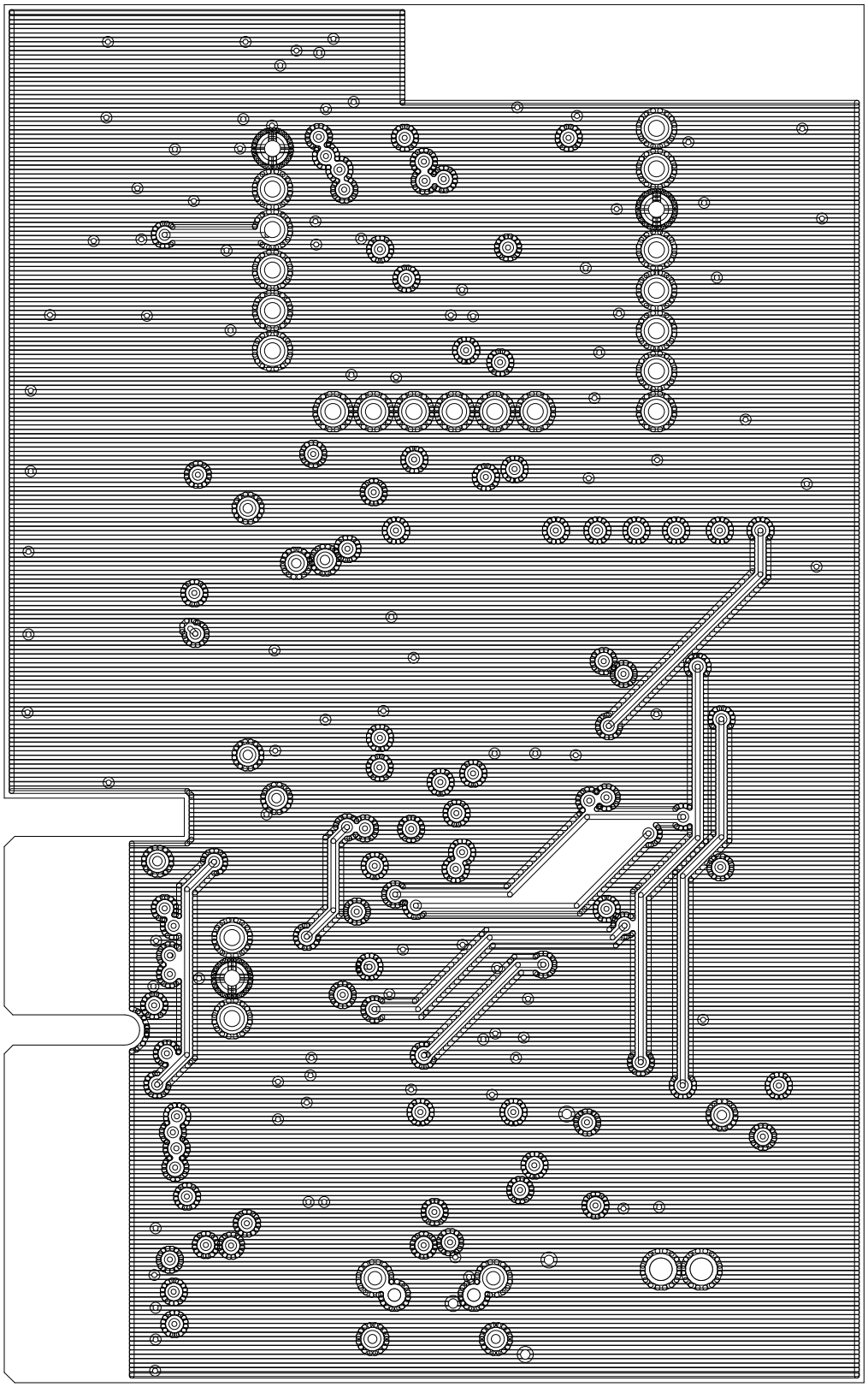

Figure 14: Layer 2

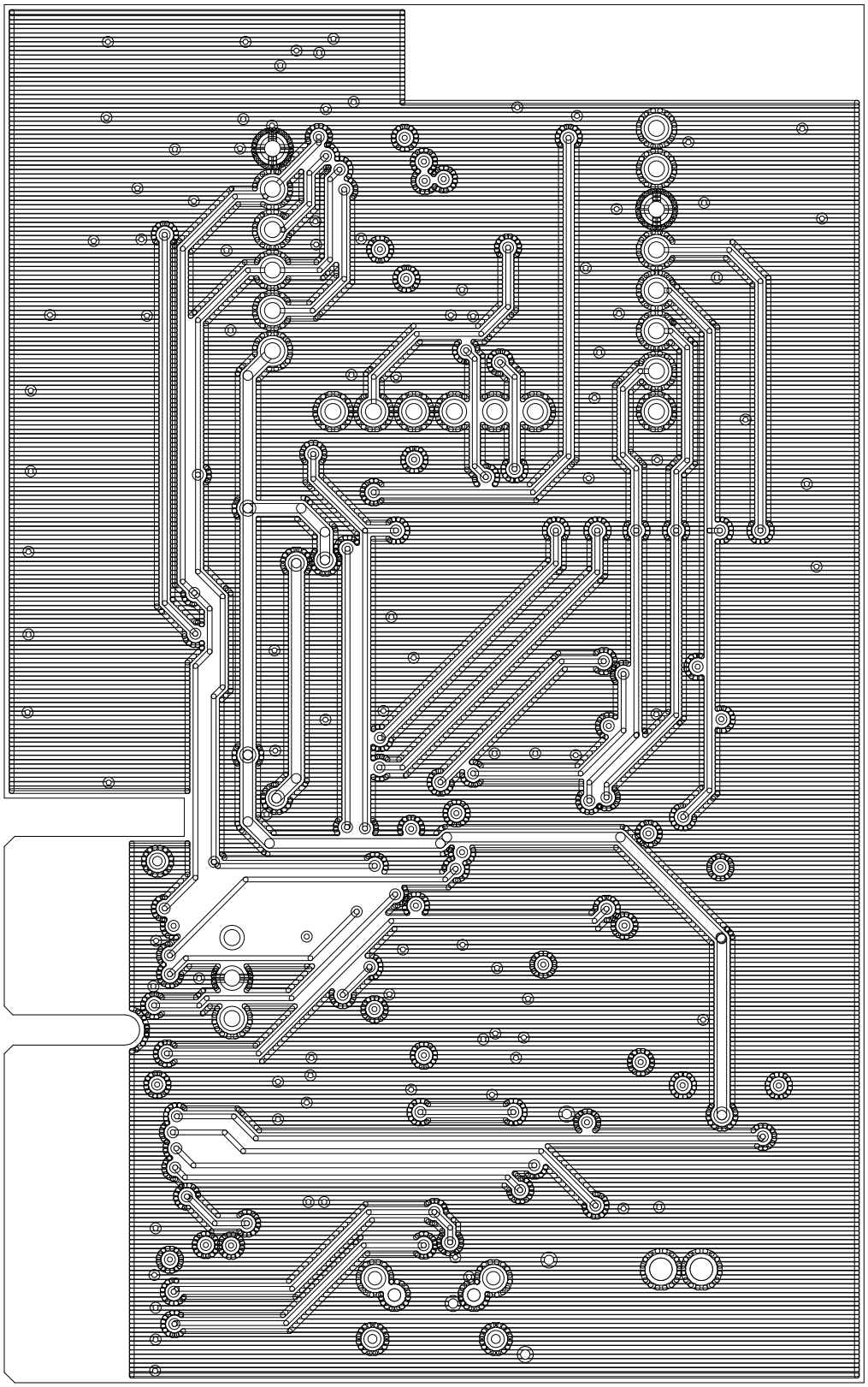

Figure 15: Layer 3

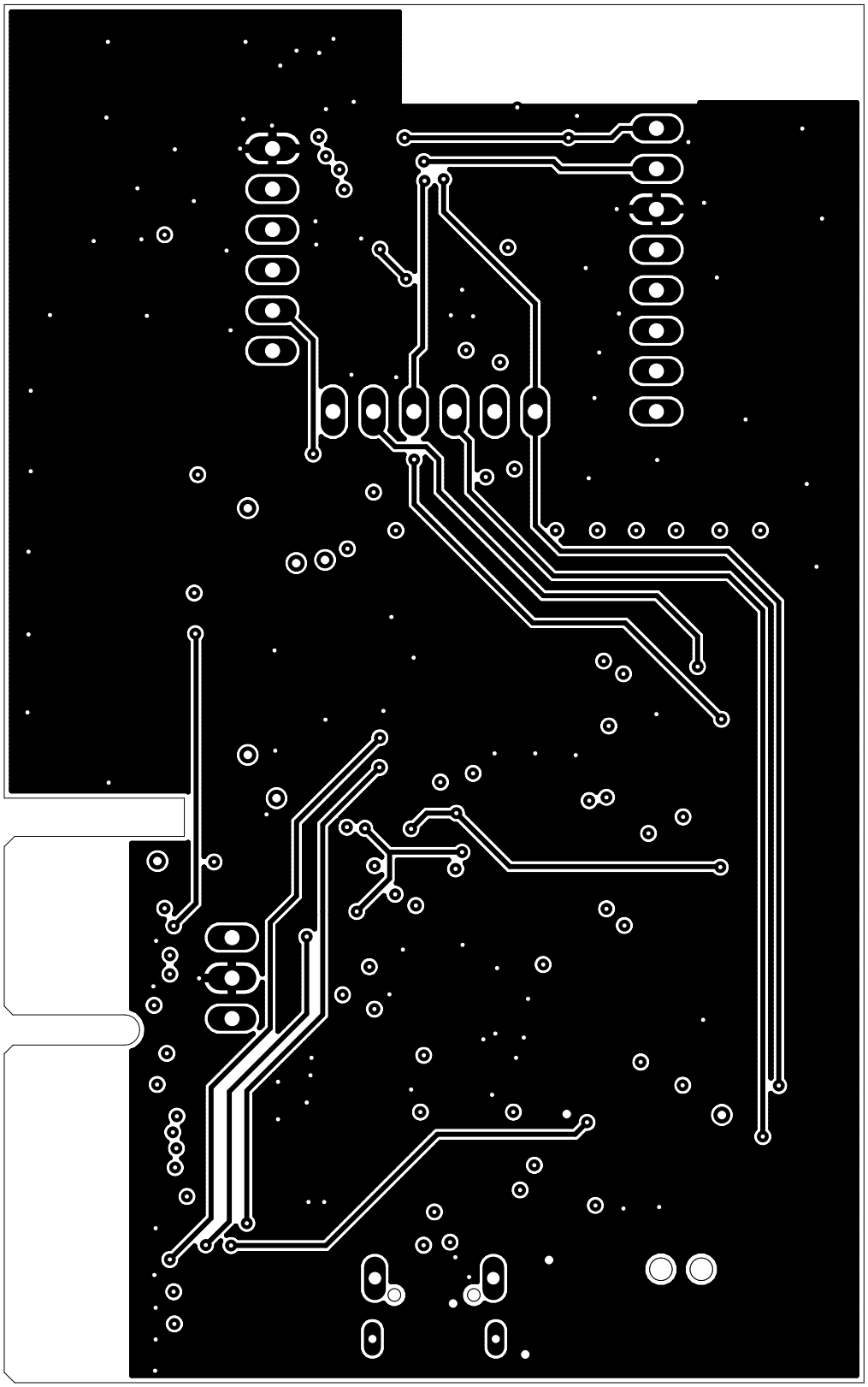

Figure 16: Bottom

3.9 Bill of materials

Part	Value	PACK	MANUFACTURER	NR
C1	100nF	0402	Würth Elektronik	885012205037
C2	1µF	0402	Würth Elektronik	885012105012
C3	100nF	0402	Würth Elektronik	885012205037
C4	100nF	0402	Würth Elektronik	885012205037
C5	1µF	0402	Würth Elektronik	885012105012
C6	**not mounted for EV Order code 2611019021001 2611019024001 (Internal Antenna)**			
C6	**22pF for EV Order code 2611017221001 (SMA Connection)**	**0402**	**Würth Elektronik**	**885012005027**
C8	not mounted	0402		
C9	not mounted	0402		
C10	not mounted	0402		
C11	100nF	0402	Würth Elektronik	885012205037
C12	100nF	0402	Würth Elektronik	885012205037
C13	10pF	0402	Würth Elektronik	885012005055
C14	10pF	0402	Würth Elektronik	885012005055
C15	not mounted	0402		
C16	100nF	0402	Würth Elektronik	885012205037
C21	not mounted	0402		
C26	not mounted	0402		
C27	not mounted	0402		
C28	**22pF for EV Order code 2611019021001 2611019024001 (Internal Antenna)**	**0402**	**Würth Elektronik**	**885012005027 for EV Order code 2611019021001 2611019024001**
C28	**not mounted for EV Order code 2611017221001 (SMA Connection)**			
CON1	Micro_USB		Würth Elektronik	629105150521
CON2	2x10		Würth Elektronik	61002021121
CON3	BLLPSMD4S			
CON4	SMA		Würth Elektronik	60312102114405
CON5	2x3		Würth Elektronik	610106249221
CON6	not mounted			
D1	DFLS130L-7			
D2	DFLS130L-7			
IC2	LDO, 3V3			
IC3	FT232RQ			

JP1	1x4		Würth Elektronik	61000418221
JP2	2x11		Würth Elektronik	61002221121
JP3	2x3		Würth Elektronik	61000621121
L1	7427927311	0402	Würth Elektronik	7427927311
L2	7427927311	0402	Würth Elektronik	7427927311
L5	7427927311	0402	Würth Elektronik	7427927311
LED1	yellow		Würth Elektronik	150080YS75000
LED2	blue		Würth Elektronik	150080BS75000
LED_3	green		Würth Elektronik	150080GS75000
LED_POWER	red		Würth Elektronik	150080RS75000
O1	OPT_MARKE			
O2	OPT_MARKE			
O3	OPT_MARKE			
P1	not mounted			
P2	not mounted			
P3	not mounted			
P4	not mounted			
PROTEUS-III /THYONE-I/SETEBOS-I	**EV Kit dependant**		**Würth Elektronik**	**261101102x0x0 (EV Kit dependant)**
Q1	not mounted			
R1	not mounted	0402		
R2	1k			
R3	10R			
R4	10R			
R5	10R			
R6	10R			
R7	56R			
R8	10R			
R9	10R			
R10	not mounted			
R11	not mounted			
R12	180R	0402		
R13	56R			
R14	not mounted			
R15	not mounted			
R16	not mounted			
R17	not mounted			
S1	430152043826		Würth Elektronik	430152043826
S2	430152043826		Würth Elektronik	430152043826
T1	not mounted			

Figure 17: BOM

3.10 Internal antenna radiation characteristics

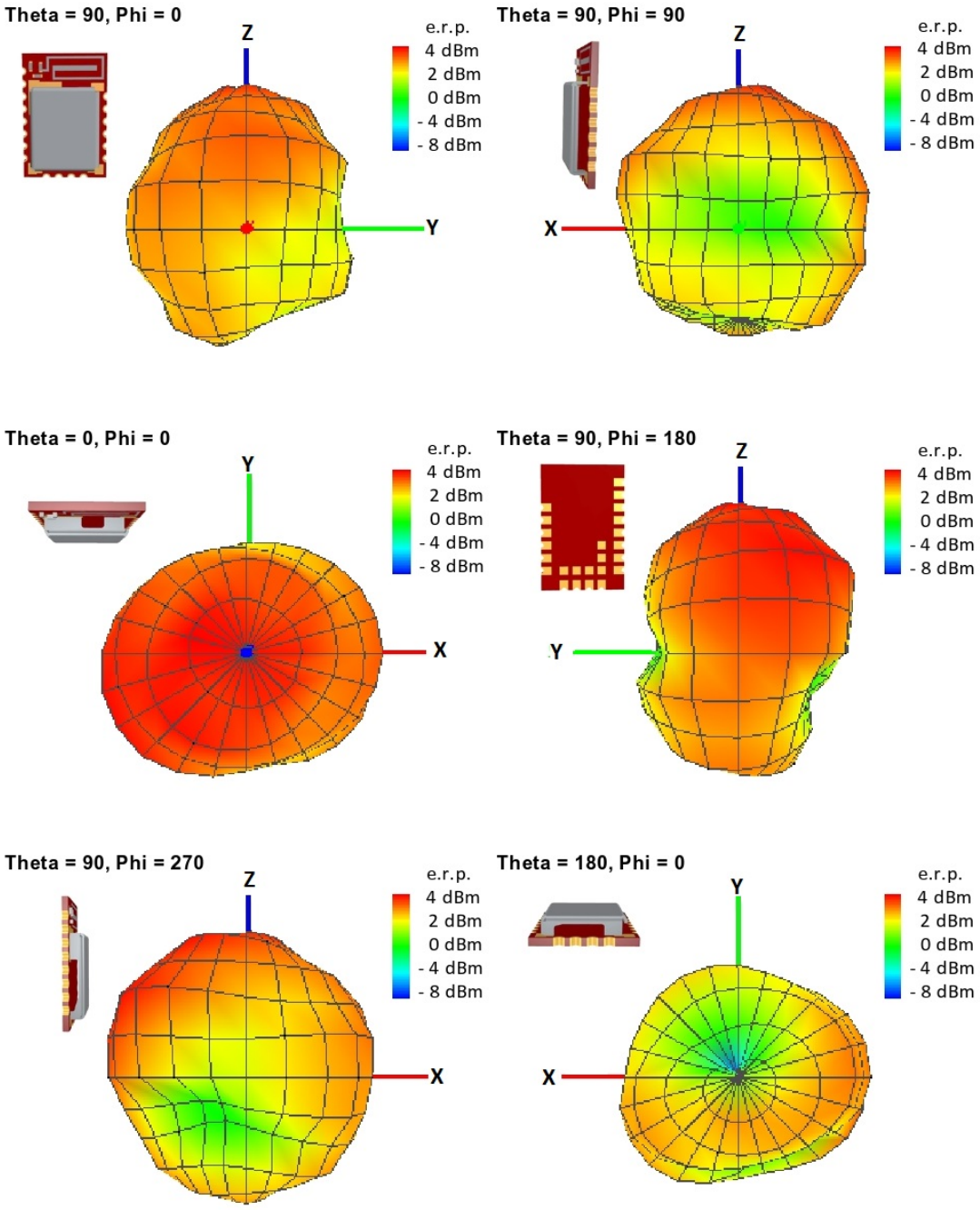

Figure 18: Antenna characteristic from integrated antenna measured on official EV-Board[1]

[1] Radiation characteristic shown is valid for the module on the EV-Board. It is important to be aware that size of groundplane and placement of module has influence on the radiation pattern

4 Hardware history

Version 3.2 "Release"

- 3.0 Layout change JP2
- 3.1 Internal change production
- 3.2 silkscreen on bottom deleted, R2 changed to 1 kΩ

5 Marking

5.1 Lot number

The 15 digit lot number is printed in numerical digits as well as in form of a machine readable bar code. It is divided into 5 blocks as shown in the following picture and can be translated according to the following table.

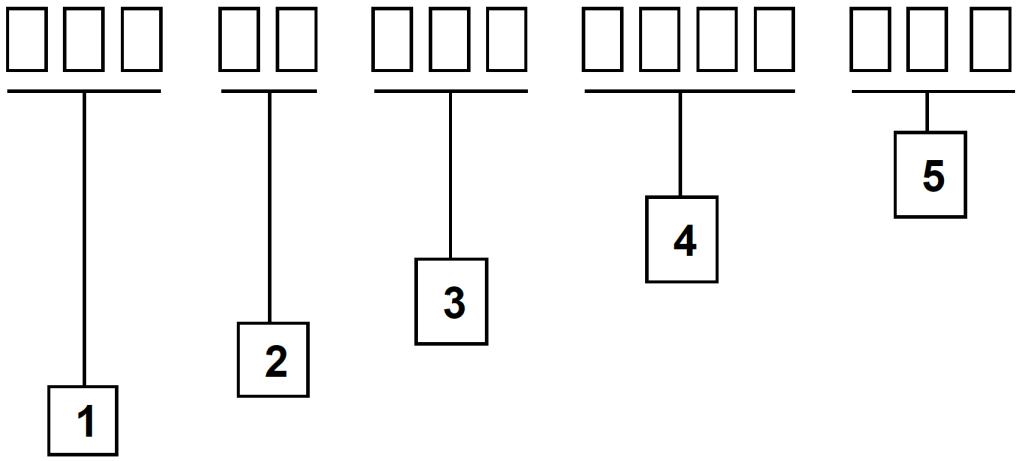

Figure 19: Lot number structure

Block	Information	Example(s)
1	eiSos internal, 3 digits	438
2	eiSos internal, 2 digits	01
3	Radio module hardware version, 3 digits	V2.4 = 024, V12.2 = 122
4	Date code, 4 digits	1703 = week 03 in year 2017, 1816 = week 16 in year 2018
5	Radio module firmware version, 3 digits	V3.2 = 302, V5.13 = 513

Table 19: Lot number details

As the user can perform a firmware update the printed lot number only shows the factory delivery state. The currently installed firmware can be requested from the module using the corresponding product specific command. The firmware version as well as the hardware version are restricted to show only major and minor version not the patch identifier.

6 Regulatory compliance information

6.1 European Conformity

Pursuant to Article 1 (2.) of the EU directive 2014/53/EU, Article 1 (2.) the directive does not apply to equipment listed in Annex I (4.): custom-built EV-Kits designed for professionals to be used solely at research and development facilities for such purposes.

6.2 FCC

Pursuant to §2.803 (c) of Title 47 Chapter I Subchapter A Part 2 Subpart I, the EV-Kit falls under the FCC exception. Therefore it is marked as "For evaluation only; not FCC approved for resale".

6.3 Exemption clause

Relevant regulation requirements are subject to change. Würth Elektronik eiSos does not guarantee the accuracy of the before mentioned information. Directives, technical standards, procedural descriptions and the like may be interpreted differently by the national authorities. Equally, the national laws and restrictions may vary with the country. In case of doubt or uncertainty, we recommend that you consult with the authorities or official certification organizations of the relevant countries. Würth Elektronik eiSos is exempt from any responsibilities or liabilities related to regulatory compliance.

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7 Important notes

The following conditions apply to all goods within the wireless connectivity and sensors product range of Würth Elektronik eiSos GmbH & Co. KG:

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Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact, it is up to the customer to evaluate, where appropriate to investigate and to decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not. Accordingly, the customer is cautioned to verify that the documentation is current before placing orders.

Customer responsibility related to specific, in particular safety-relevant applications
It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications. The same statement is valid for all software source code and firmware parts contained in or used with or for products in the wireless connectivity and sensor product range of Würth Elektronik eiSos GmbH & Co. KG. In certain customer applications requiring a high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health, it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component.

Best care and attention
Any product-specific data sheets, manuals, application notes, PCNs, warnings and cautions must be strictly observed in the most recent versions and matching to the products revisions. These documents can be downloaded from the product specific sections on the wireless connectivity and sensors homepage.

Customer support for product specifications
Some products within the product range may contain substances, which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case, the Business Development Engineer (BDM) or the internal sales person in charge should be contacted who will be happy to support in this matter.

Product improvements
Due to constant product improvement, product specifications may change from time to time. As a standard reporting procedure of the Product Change Notification (PCN) according to the JEDEC-Standard, we inform about major changes. In case of further queries regarding the PCN, the Business Development Engineer (BDM), the internal sales person or the technical support team in charge should be contacted. The basic responsibility of the customer as per section 7 and 7 remains unaffected.
All software like ¨wireless connectivity SDK¨, ¨Sensor SDK¨ or other source codes as well as all PC software tools are not subject to the Product Change Notification information process.

Product life cycle
Due to technical progress and economical evaluation, we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this, we cannot ensure that all products within our product range will always be available. Therefore, it needs to be verified with the Business Development Engineer (BDM) or the internal sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products. The approach named above does not apply in the case of EV-Boards. EV-Boards may be changed without any notification.

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- The EVB should never be left unattended during operation.
- Capacitors must be completely discharged. The capacitors must be actively discharged using a suitable resistor.

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Before putting the EVB into operation, please read the instructions for use and especially the various hazards and warnings described therein. The instructions for use contain important safety information on voltages and temperatures. You take full responsibility and liability for the proper and safe handling of the EVB. You agree to comply with all safety requirements, rules and regulations related to the use of the EVB. You also take full responsibility for: (1) establishing safeguards to ensure that the use of the EVB does not cause damage to property, personal injury or death, even if the EVB does not function as described, intended or expected, (2) the test setup in which the EVB is integrated, all safety requirements, rules and regulations and also that no damage to property, personal injury or other hazardous situation occurs even if the EVB fails, and (3) ensuring the safety of all activities performed by you or your employees when using the EVB. In particular, this means that the technical rules VDE [German Electrical Engineering, Electronic and Information Technology Association] 0105-100 and BGI [German trade association information] 891 (or corresponding applicable safety regulations outside Germany) for the operation of electrical test setups must be observed, the test area is protected against unauthorized access or accidental touching, current limitations, and emergency stop mechanisms are functional and test setups are never operated unattended. If you have any questions about the safe use of the EVB, please contact WE at *regulatory-compliance@we-online.com* for more information.

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As the EVB is not a finished product, it may not comply with applicable regulatory, safety or certification standards that are normally as-

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