LE910Cx Interface Board

Hardware Design Guide

1VV0301323 Rev. 4 – 2022-04-25

Telit Technical Documentation

APPLICABILITY TABLE

PRODUCTS	DESCRIPTION
LE910Cx	LE910Cx Industrial modules

The features described by the present document are provided by the products equipped with the software versions equal to or higher than the versions shown in the table.

CONTENTS

APPLICABILITY TABLE 2

CONTENTS 3

1. INTRODUCTION 4
1.1. Scope 4
1.2. Contact Information, Support 4
1.3. Symbol Conventions 5
1.4. Related Documents 5

2. GENERAL PRODUCT DESCRIPTION 6
2.1. IFBD View 7

3. COMPONENT ASSEMBLY DIAGRAM 8

4. 120-PIN BOARD TO BOARD CONNECTORS 10

5. SCHEMATICS 13

6. PRODUCT AND SAFETY INFORMATION 15
6.1. Copyrights and Other Notices 15
6.1.1. Copyrights 15
6.1.2. Computer Software Copyrights 15
6.2. Usage and Disclosure Restrictions 16
6.2.1. License Agreements 16
6.2.2. Copyrighted Materials 16
6.2.3. High-Risk Materials 16
6.2.4. Trademarks 16
6.2.5. Third Party Rights 17
6.2.6. Waiver of Liability 17
6.3. Safety Recommendations 17

7. GLOSSARY 19

8. DOCUMENT HISTORY 20

1. INTRODUCTION

1.1. Scope

This document describes the LE910Cx Interface Board which is part of the complete LE910Cx Development Kit (Dev-Kit).

1.2. Contact Information, Support

For general contact, technical support services, technical questions, and report documentation errors contact Telit Technical Support at:

- *TS-EMEA@telit.com*
- *TS-AMERICAS@telit.com*
- *TS-APAC@telit.com*
- *TS-SRD@telit.com*

Alternatively, use:

https://www.telit.com/contact-us

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

https://www.telit.com

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates the user feedback on our information.

1.3. Symbol Conventions

	**Danger:** This information MUST be followed or catastrophic equipment failure or personal injury may occur.
	**Warning:** Alerts the user on important steps about the module integration.
	**Note/Tip:** Provides advice and suggestions that may be useful when integrating the module.
	**Electro-static Discharge:** Notifies the user to take proper grounding precautions before handling the product.

Table 1: Symbol Conventions

All dates are in ISO 8601 format, that is YYYY-MM-DD.

1.4. Related Documents

- LE910Cx HW User Guide 1VV0301298
- Generic Evaluation Board Hardware User Guide 1VV0301249

2. GENERAL PRODUCT DESCRIPTION

The Interface Board (IFBD) is custom-designed to interface the Telit module variant LE910Cx with the Telit Generic Evaluation Board (EVB) thus forming the complete LE910Cx Development Kit.

The IFBD provides the mapping of Telit module signals and functions into generic EVB signals and functions

The LE910CX IFBD design includes the following components:

- LE910Cx module
- RF SMA connectors
- Board to Board connectors for interfacing to EVB main board
- Module-specific circuitry that is not included in the EVB's generic circuitry

The IFBD intends to assemble a custom-designed module socket instead of assembling the module.

The power supply and control interface for the RF module is provided by the EVB via the B2B connectors.

To monitor the temperature, a thermistor is placed on the upper GND plane, near the module which should be representative of the temperature on the backside of the module.

The bottom plane solder mask is cut out below the RF module to optimally mount/attach a heatsink that will cool the module via the numerous heat-conducting GND via's.

The board is designed to accommodate new modules based on the LE910 FF (28.4mm x 28.4mm, 185 pads) updated pin mapping.

2.1. IFBD View

The below pictures show the IFBD Top and Bottom view:

Figure 1: LE910Cx IFBD Top View

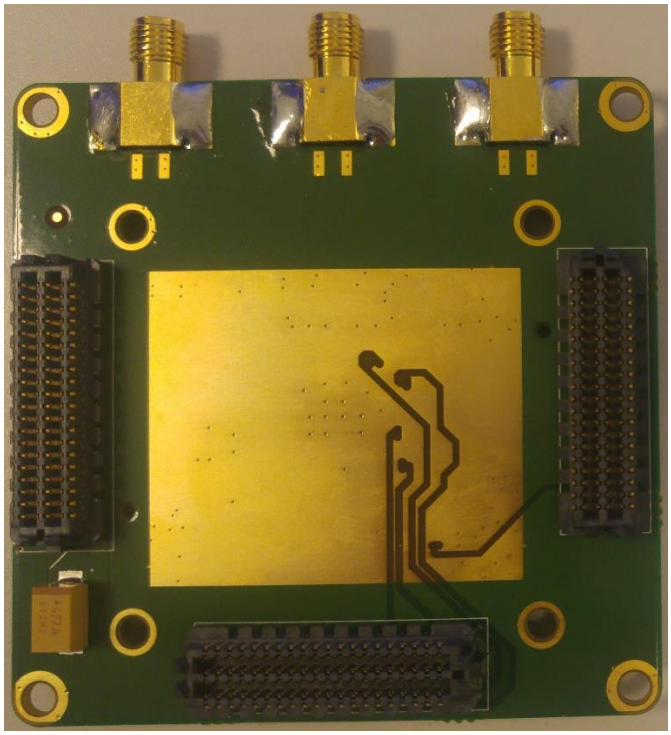

Figure 2: LE910Cx IFBD Bottom View

3. COMPONENT ASSEMBLY DIAGRAM

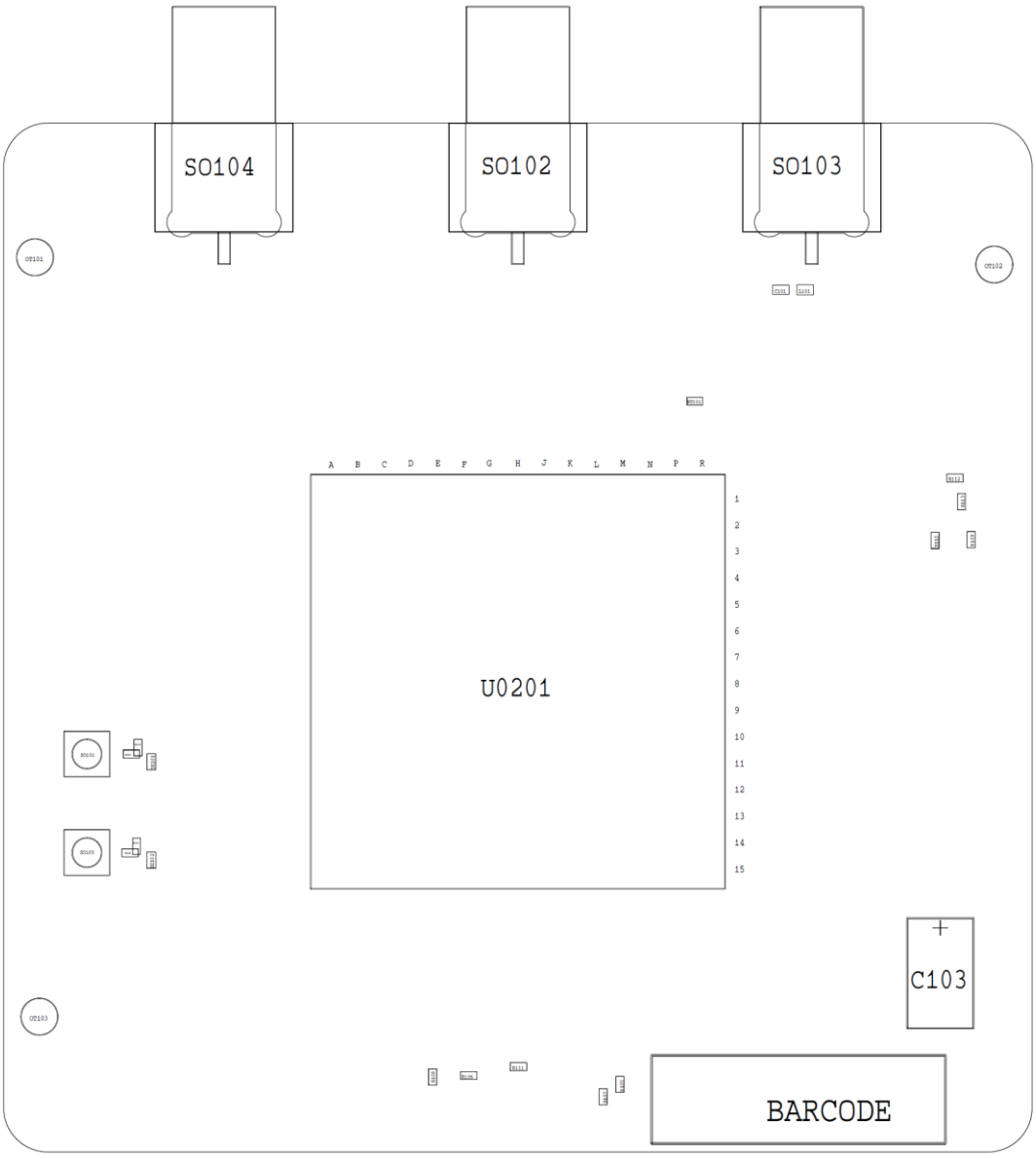

Figure 3: Component Diagram TOP View

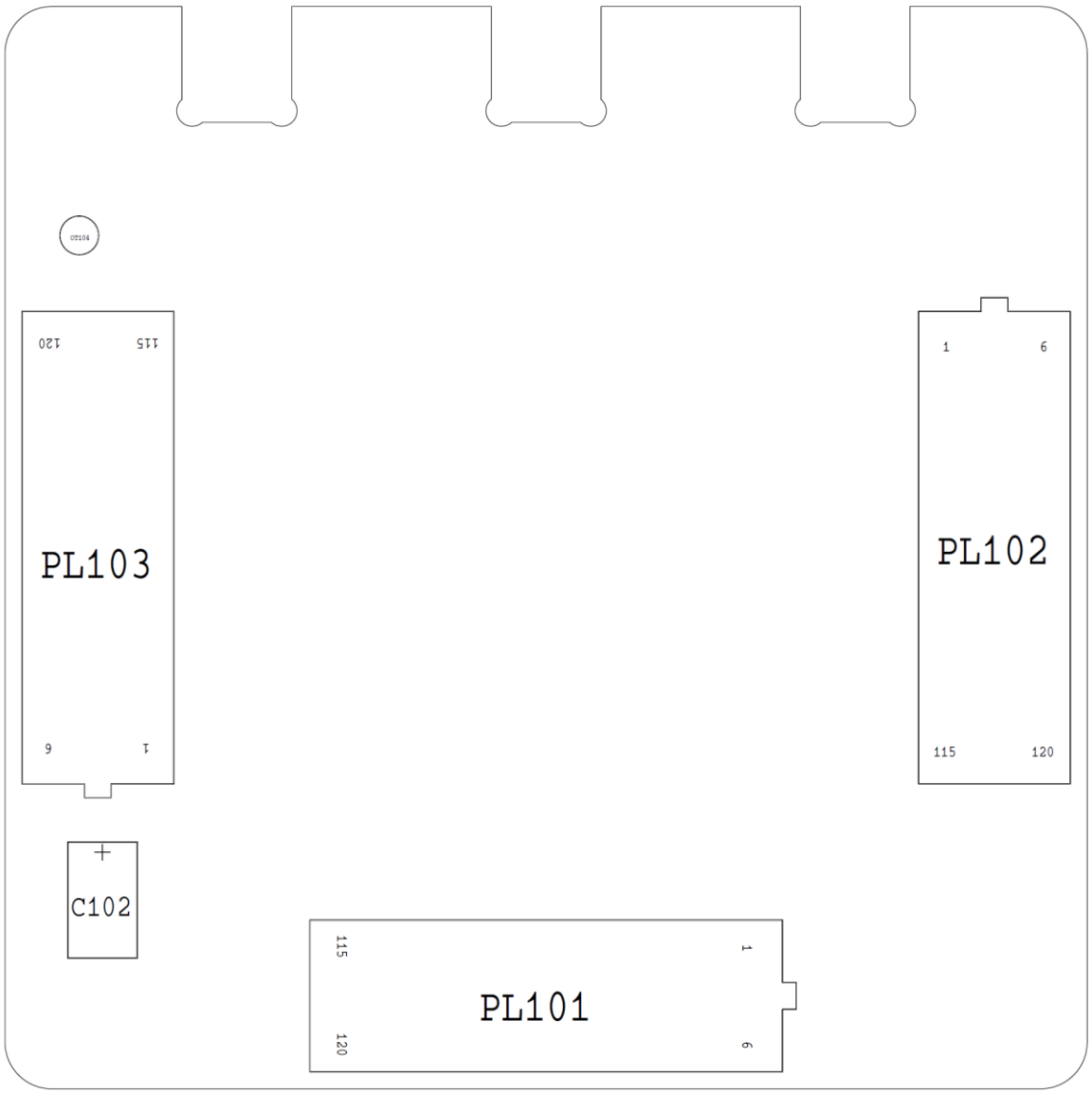

Figure 4: Component Diagram BOTTOM View

4. 120-PIN BOARD TO BOARD CONNECTORS

1	GND	2	GND	3	I2C_SCL_AUX	4	I2C_SDA_AUX	5	GND	6	SGMII_RX_M
7	USB_SS_RX_P	8	GND	9	I2C_SDA	10	TGPIO_06	11	SGMII_TX_M	12	SGMII_RX_P
13	USB_SS_RX_M	14	GND	15	TGPIO_05	16	I2C_SCL	17	SGMII_TX_P	18	GND
19	GND	20	GND	21	VREG_MSME	22	VREG_MSME	23	GND	24	
25	USB_SS_TX_P	26	GND	27		28		29		30	
31	USB_SS_TX_M	32	GND	33		34	SPI_MOSI	35		36	GND
37	GND	38		39		40	TGPIO_04	41	GND	42	
43	SPI_CS	44	TGPIO_02	45	TGPIO_03	46	SPI_MISO	47		48	
49	VAUX/PWRMON	50	VAUX/PWRMON	51		52	SPI_CLK	53		54	
55	TGPIO_08	56	TGPIO_07	57	TGPIO_01	58	TGPIO_09	59		60	
61		62	TGPIO_10	63		64	TGPIO_20	65		66	
67	VMMC	68	VMMC	69	MMC_CD	70	MMC_DAT3	71		72	
73	MMC_DAT0	74	MMC_DAT2	75	MMC_CLK	76	MMC_DAT1	77		78	
79	GND	80	GND	81	C107/DSR	82	MMC_CMD	83		84	
85	WIFI_SD0_TGPIO15	86	WIFI_SD1_TGPIO16	87	WIFI_SDCMD_TGPIO14	88	WIFI_SDRST_TGPIO13	89	TX_AUX	90	
91		92	WIFI_SD2_TGPIO17	93	WIFI_SD3_TGPIO18	94		95	RX_AUX	96	
97		98		99	WIFI_SDCLK_TGPIO19	100	WCI_TX	101	WCI_RX	102	
103	C125/RING	104	RFCLK2_QCA	105	WLAN_SLEEP_CLK	106	C105/RTS	107		108	
109	C104/RXD	110	C109/DCD	111	C103/TXD	112	C106/CTS	113	C108/DTR	114	
115		116		117		118		119		120	

Table 2: Connector PL101

1	GPS_LNA_BIAS	2	GND	3	GPS_LNA_EN	4		5	GND	6	
7	GND	8	GND	9	GND	10	GND	11	GND	12	
13		14		15	GND	16		17		18	
19	GND	20	GND	21	GND	22	GND	23	GND	24	GND
25		26		27	GND	28		29		30	GND
31		32		33		34		35		36	
37	GND	38	GND	39		40		41	GND	42	GND
43		44	GND	45	GND	46	GND	47	GND	48	GND
49		50	GND	51	GND	52	ADC_IN3	53	ADC_IN2	54	ADC_IN1
55		56		57		58		59		60	
61	DVI_RX	62	DVI_TX	63	DVI_CLK	64	DVI_WAO	65	REF_CLK	66	GND
67	GND	68	GND	69	GND	70	GND	71	GND	72	
73	GND	74	GND	75	GND	76	GND	77	SIMVCC1	78	SIMVCC1
79	HSIC_STB	80	HSIC_DATA	81	SIMCLK1	82	SIMIN1	83	SIMIO1	84	SIMRST1
85	HW_KEY	86	VRTC	87	ETH_RST_N	88	ETH_INT_N	89	SIMVCC2	90	SIMVCC2
91	USB_VBUS	92	USB_ID	93	SIMIN2	94	SIMIO2	95	SIMRST2	96	SIMCLK2
97	GND	98	GND	99		100		101	MAC_MDIO	102	
103	USB_D+	104	GND	105		106	MAC_MDC	107		108	
109	USB_D-	110	GND	111		112		113		114	
115	GND	116	GND	117		118		119		120	

Table 3: Connector PL102

1	VBATT	2	VBATT	3	VBATT	4	VBATT_PA	5	VBATT_PA	6	VBATT_PA
7	VBATT	8	VBATT	9	VBATT	10	VBATT_PA	11	VBATT_PA	12	VBATT_PA
13	VBATT	14	VBATT	15	VBATT	16	VBATT_PA	17	VBATT_PA	18	VBATT_PA
19		20		21		22	VBATT_PA	23	VBATT_PA	24	VBATT_PA
25		26		27		28		29		30	
31		32		33		34		35		36	
37		38		39		40		41		42	
43		44		45		46		47		48	
49		50		51		52		53		54	
55		56		57		58		59		60	
61		62		63		64		65		66	D8_THERM_ASTAR
67		68		69		70		71		72	
73		74		75		76		77		78	
79	GND	80	GND	81	GND	82	GND	83	GND	84	GND
85	GND	86	GND	87	GND	88	GND	89	GND	90	GND
91	RESET	92	ON_OFF	93	STAT_LED	94		95	SW_RDY	96	SHDN
97	GND	98	GND	99	GND	100	GND	101		102	
103	GPS_SYNC	104	GPS_RFPAON	105	GPS_CLK	106	GND	107		108	JTAG_PS_HOLD
109	GND	110	GND	111	GND	112	GND	113	JTAG_TDI	114	
115	JTAG_TMS	116	JTAG_TDO	117	JTAG_TRST	118	JTAG_TCK	119	JTAG_RTCK	120	JTAG_RESOUT

Table 4: Connector PL103

5. SCHEMATICS

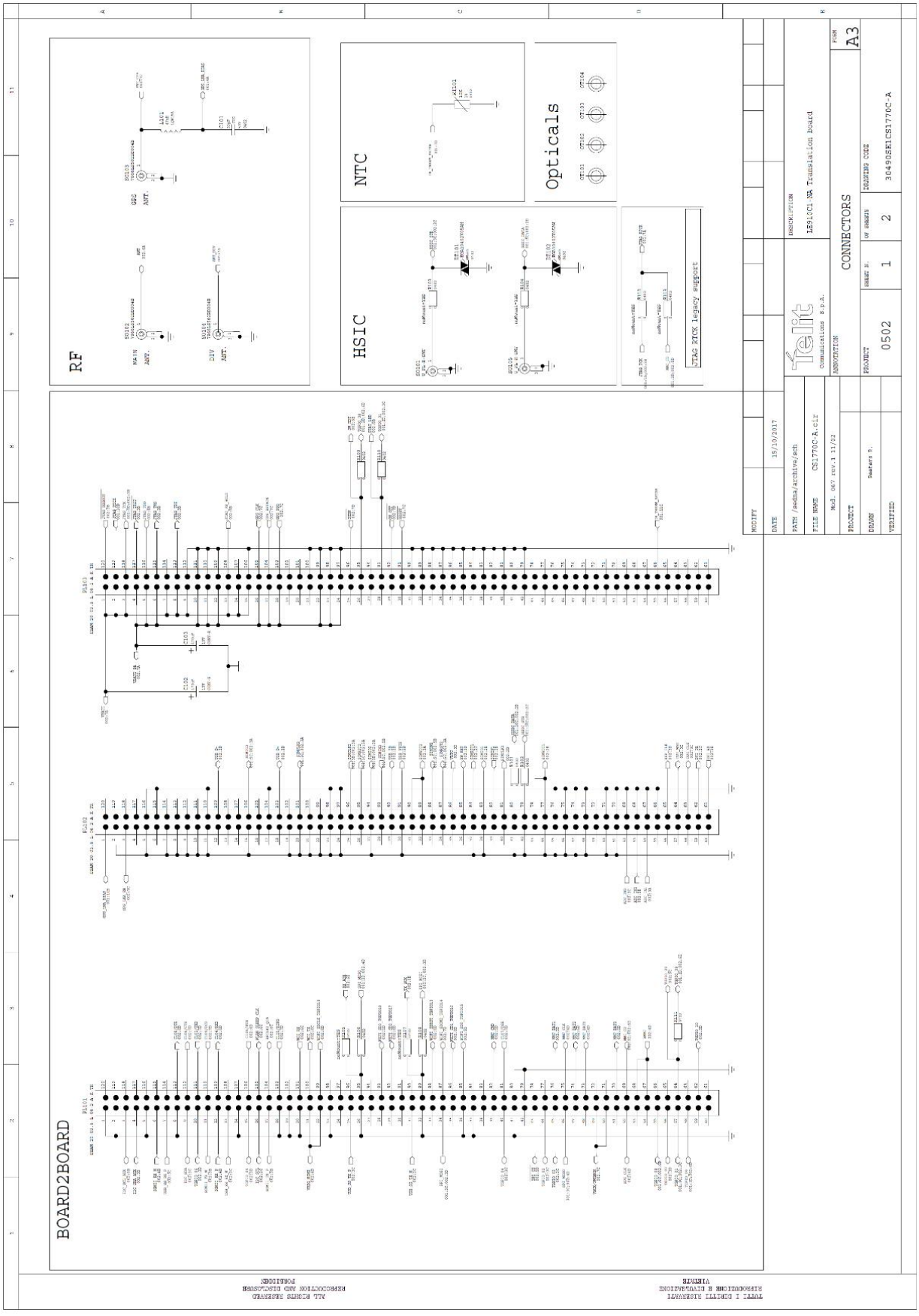

Figure 5: Schematic Page 1

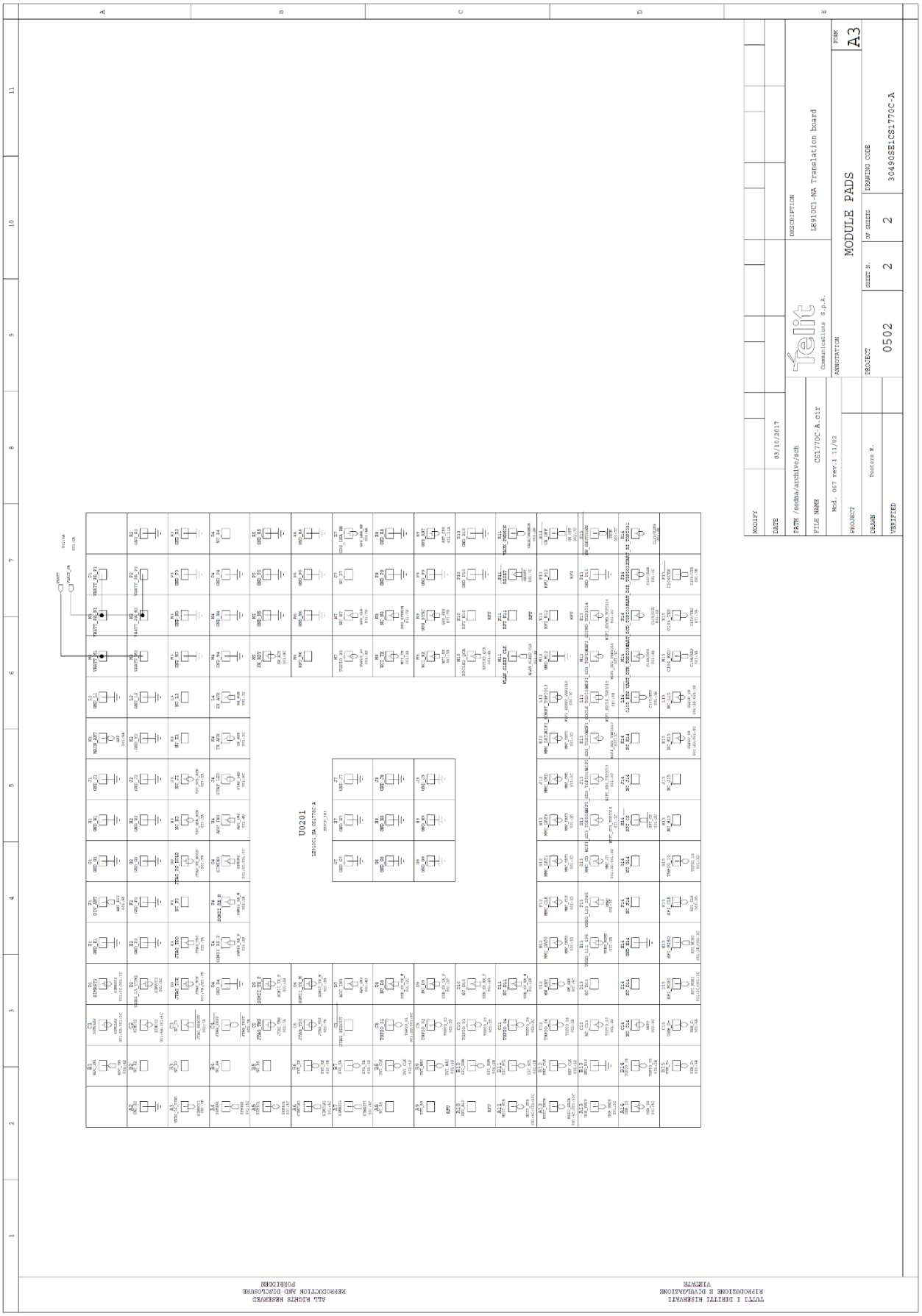

Figure 6: Schematics Page 2

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- it can interfere with other electronic devices, particularly in environments such as hospitals, airports, aircrafts, etc.

- there is a risk of explosion such as gasoline stations, oil refineries, etc. It is the responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conformed to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible for the functioning of the final product. Therefore, the external components of the module, as well as any project or installation issue, have to be handled with care. Any interference may cause the risk of disturbing the GSM network or external devices or having an impact on the security system. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed carefully in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.
The equipment is intended to be installed in a restricted area location.
The equipment must be supplied by an external specific limited power source in compliance with the standard EN 62368-1:2014.
The European Community provides some Directives for the electronic equipment introduced on the market. All of the relevant information is available on the European Community website:

https://ec.europa.eu/growth/sectors/electrical-engineering_en

7. GLOSSARY

EVB	Evaluation Board
IFBD	Interface Board
GPIO	General-purpose input/output
SD	Secure digital
UART	Universal asynchronous receiver transmitter
UMTS	Universal mobile telecommunications system
USB	Universal serial bus
USIF	Universal serial interface
WCDMA	Wideband code division multiple access

8. DOCUMENT HISTORY

Revision	Date	Changes
4	2022-04-25	Minor changes in the language
3	2021-03-17	Minor changes in the language Minor changes to the layout Legal Notices updated
2	2018-05-27	Updated document template Modules version updated
1	2017-09-06	Initial Version
0	2017-09-06	First issue

From Mod.0818 rev.3

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