GE310-GNSS

INTERFACES USER GUIDE

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TELIT
TECHNICAL
DOCUMENTATION

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APPLICABILITY TABLE

GE310-GNSS Interface for EVK2	3990251783
GE310-GNSS Interface TLB	3990251811

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1. INTRODUCTION

1.1. Scope

The Aim of this document is the handling description of the Interfaces for the products based on GE31xx form factor.

1.2. Audience

This document is intended for Telit customers, especially system integrators, about to implement their applications using the Telit module.

1.3. 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:

http://www.telit.com/support

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

http://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 feedback from the users of our information.

1.4. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

- Telit EVK2 User Guide, 1VV0300704
- Telit Evaluation Board (EVB) User Guide, 1VV0301249
- GE310-GNSS HW Design Guide, 1VV0301564
- GE310-GNSS AT Commands Reference Guide, 80598ST10945A

2. OVERVIEW

The Telit Evaluation Kit (EVK2) provides a robust, future-proof and flexible environment to streamline all application development based on Telit GSM/GPRS, UMTS/HSPA, CDMA 1x/EV-DO, and LTE module families, significantly reducing time-to-market.

The EVK2 kit includes a motherboard where to connect the Interface board of a Telit module.

This concept allows the EVK2 to be used across various form factors and product generations, both present and future.

The motherboard includes the basic interfaces such as power input, SIM card holder, audio monitor outputs, RS-232, and USB; as well as a Reset button and power switch.

The circuit implemented in the EVK2 motherboard is based on the recommended reference design for the module's peripheral components and I/O connections.

Adapter boards are available for all the different module families.

The interface boards convert the module connection technology (board-to-board or BGA soldering) into a PTH pin connector. The part of the basic interfaces is served by the motherboard, whereas specific interfaces according to the type of the module (antenna, general purpose inputs/outputs GPIO, ADC/DAC, UART) are available on the adapter board to connect it to the user applications, extension boards, measurements equipment or other tools.

All connections are made through 2x40 contacts connectors.

It is possible to use these Interface Boards also in stand-alone mode, inserting the “not mounted” components (related to RESET BUTTON, ON BUTTON, SIM HOLDER and STATUS LED functions) plus the use of an external level translator circuit.

This document is describing the available Adapter Boards for the modules based on the xE866 form factor.

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3. GE310 INTERFACE FOR EVK2

3.1. Description

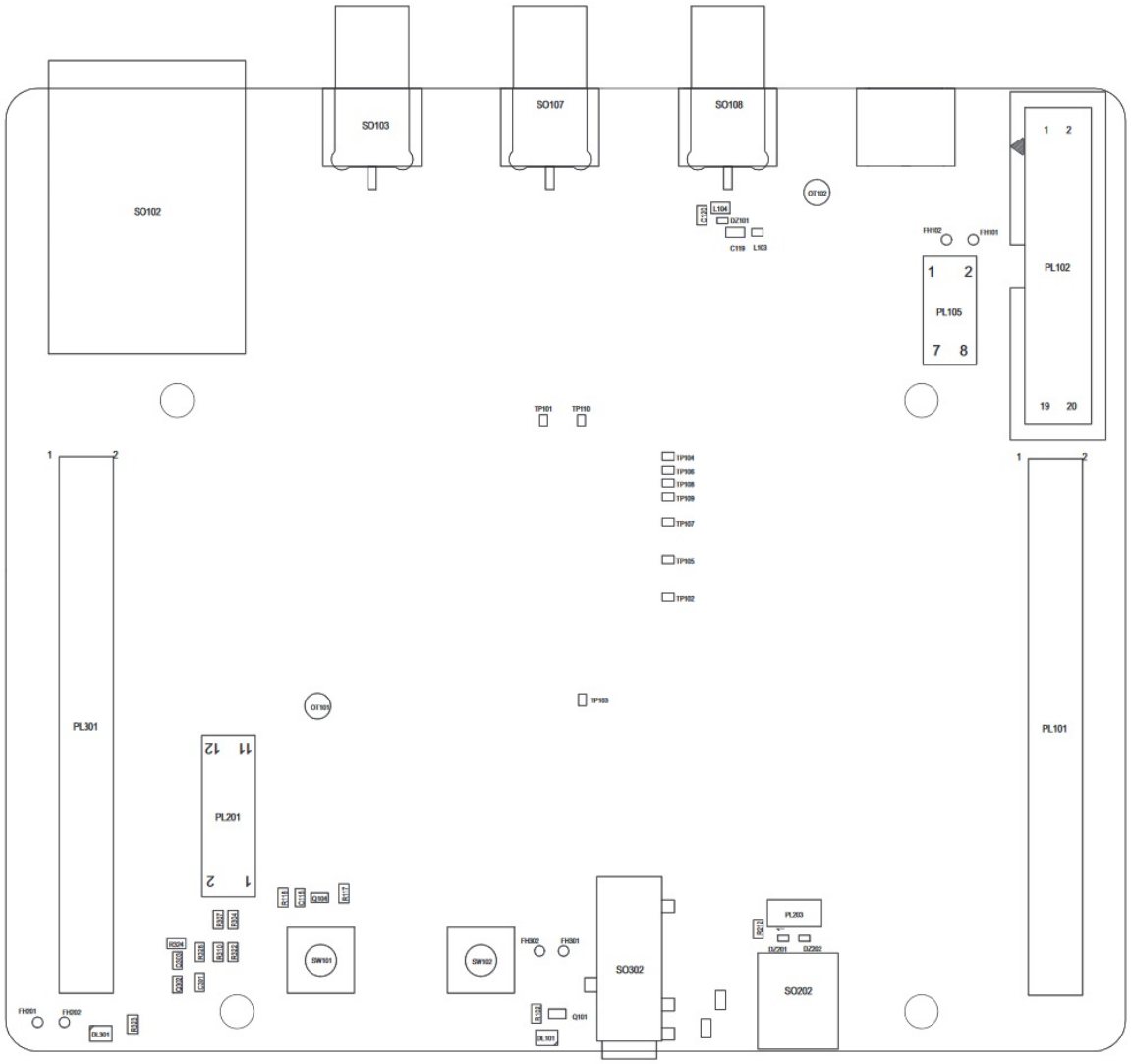
This board allows easily interfacing the GE310 modules with the EVK2 and testing their functionalities.

3.2. Physical Dimensions

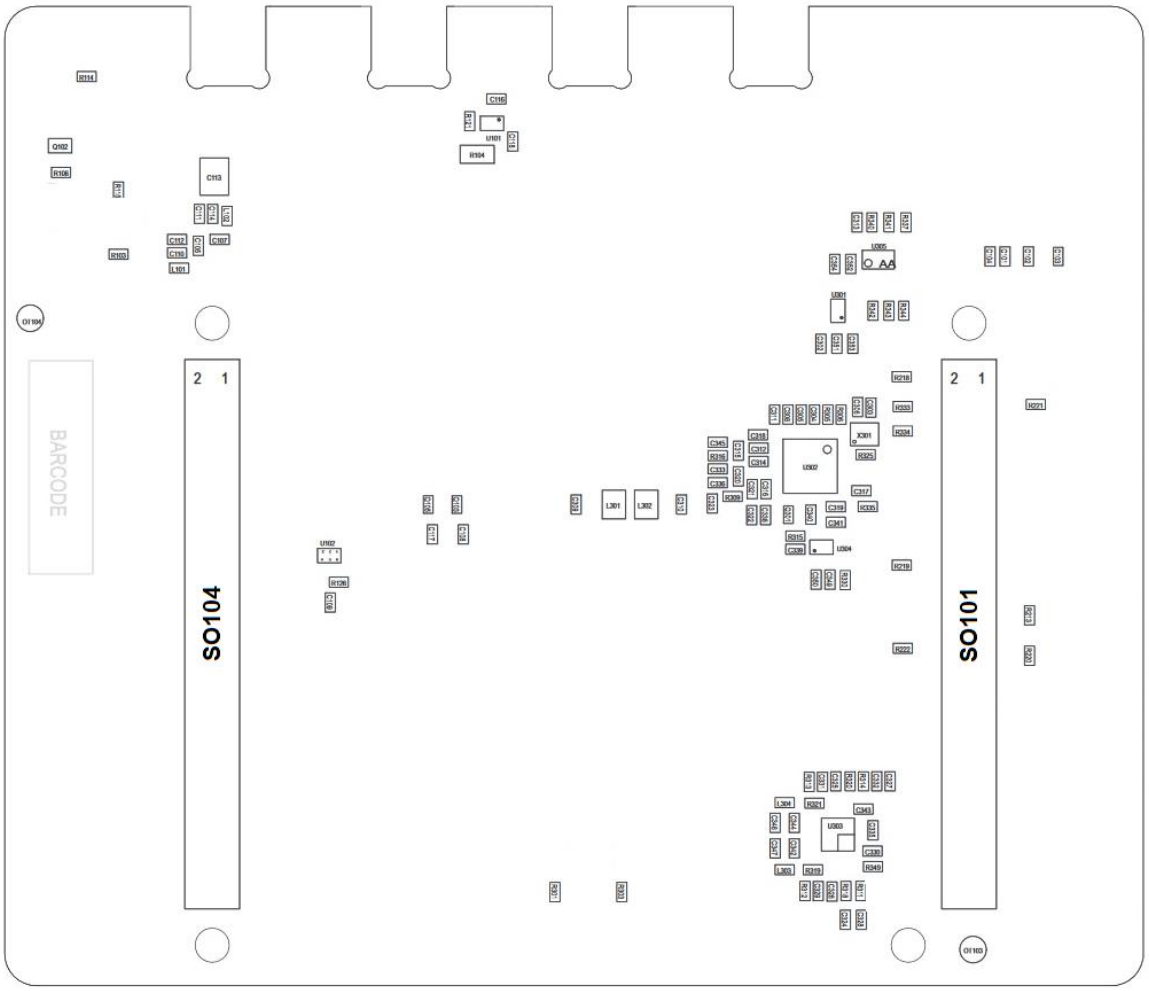
Item	Value
Length	100 mm
Width	107 mm
Height	25 mm

3.3. Interface Details

3.3.1. Connectors Position



TOP SIDE

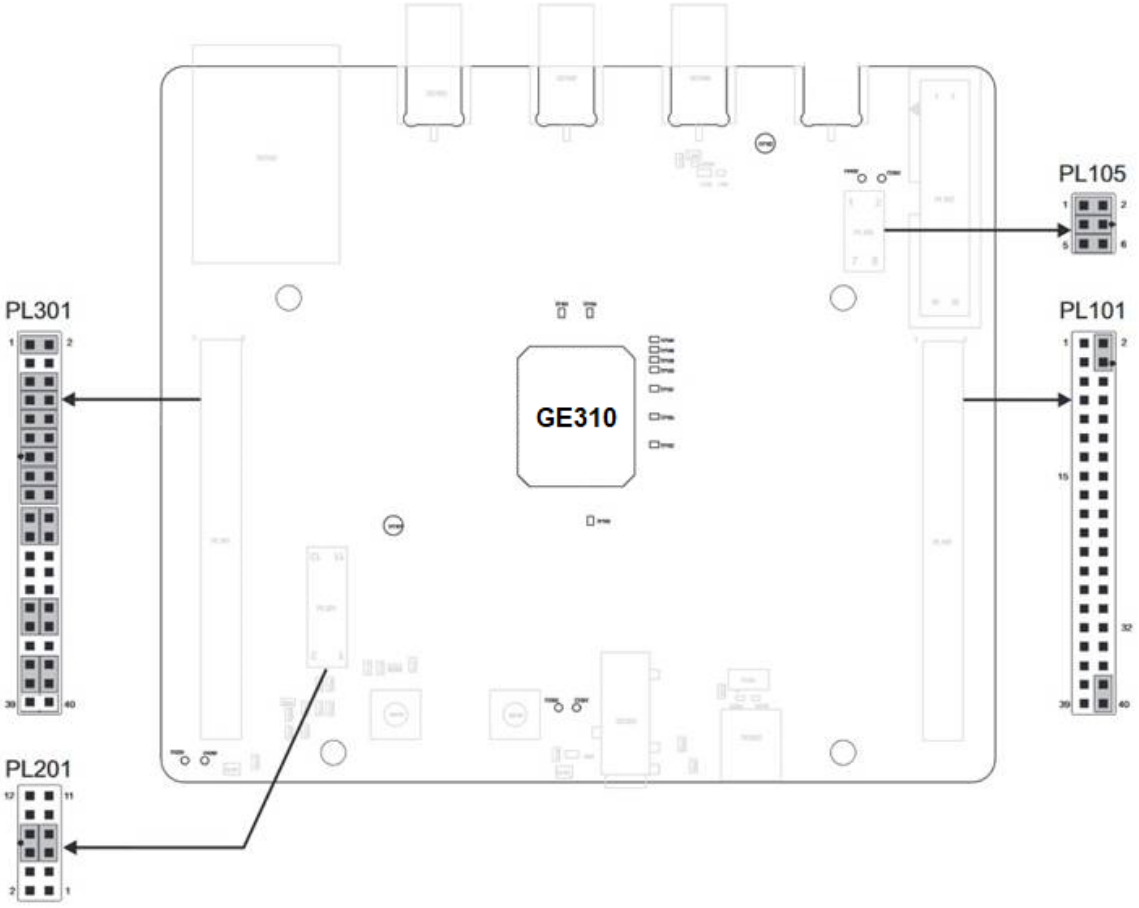


BOTTOM SIDE

3.3.2. Jumpers Setting

The following picture shows the jumpers placement and their default settings.

Details in the following paragraphs.



3.3.3. SO101 & SO104 – EVK2 Connection

The connections between the Interface and the EVK2 is done through two 2x40 pin female connectors present on the bottom (SO101 and SO104). Theirs pin functions are listed in the following tables:

SO101

Pin	Signal	Type	Function
1	NC	-	Do not connect
2	TX_Aux	Digital Output	to RS232 or USB level translators
3	RX_Aux	Digital Input	from RS232 or USB level translators
4	I2C_SDA	Digital	
5	GND	DC Supply	Power
6	I2C_SDA	Digital	
7	NC	-	Do not connect
8	NC	-	Do not connect
9	NC	-	Do not connect
10	NC	-	Do not connect
11	GND	DC Supply	Power
12	GND	DC Supply	Power
13	GND	DC Supply	Power
14	GND	DC Supply	Power
15	NC	-	Do not connect
16	C104/RXD0	Digital Output	to RS232 or USB level translator
17	C103/TXD0	Digital Input	from RS232 or USB level translator
18	NC	-	Do not connect

19	GND	DC voltage	Power
20	NC	-	Do not connect
21	C105/RTS0	Digital Input	from RS232 or USB level translator
22	C106/CTS0	Digital Output	to RS232 or USB level translator
23	NC	-	Do not connect
24	NC	-	Do not connect
25	GND	DC voltage	Power
26	GND	DC voltage	Power
27	GND	DC voltage	Power
28	GND	DC voltage	Power
29	EAR_HF+	AC Out Voltage	Audio
30	EAR_MT-	AC Out Voltage	Audio
31	EAR_HF-	AC Out Voltage	Audio
32	EAR_MT+	AC Out Voltage	Audio
33	NC	-	Do not connect
34	MIC_HF-	AC In Voltage	Audio
35	MIC_MT+	AC In Voltage	Audio
36	MIC_HF+	AC In Voltage	Audio
37	MIC_MT-	AC In Voltage	Audio
38	GND	DC voltage	Power
39	GND	DC voltage	Power
40	GND	DC voltage	Power

SO104

Pin	Signal	Type	Function
1	VBATT_PA	DC Supply	Power
2	VBATT_PA	DC Supply	Power
3	VBATT_AUX	DC Supply	Power
4	VBATT	DC Supply	Power
5	GND	DC Supply	Power
6	GND	DC Supply	Power
7	GND	DC Supply	Power
8	GND	DC Supply	Power
9	NC	-	Do not connect
10	NC	-	Do not connect
11	GND	DC Supply	Power
12	GND	DC Supply	Power
13	GND	DC Supply	Power
14	GND	DC Supply	Power
15	RESERVED	-	
16	NC	-	Do not connect
17	RESET*	Digital Signal	Module Reset
18	NC	-	Do not connect
19	NC	-	Do not connect
20	NC	-	Do not connect

21	STAT_LED	Digital Signal	Status Indicator LED
22	NC	-	Do not connect
23	NC	-	Do not connect
24	NC	-	Do not connect
25	GND	DC Supply	Power
26	GND	DC Supply	Power
27	GND	DC Supply	Power
28	GND	DC Supply	Power
29	NC	-	Do not connect
30	NC	-	Do not connect
31	SIMIO	Digital Signal	SIM Data I/O
32	SIMCLK	Digital Signal	SIM Clock
33	SIMRST	Digital Signal	SIM Reset
34	SIMVCC	DC voltage	SIM Power
35	SIMIN	Digital Signal	SIM Presence detector
36	NC	-	Do not connect
37	NC	-	Do not connect
38	NC	-	Do not connect
39	GND	DC Supply	Power
40	GND	DC Supply	Power

3.3.4. Antenna Connectors

3.3.4.1. SO103 – MAIN Antenna Connector

The MAIN 2G Antenna is available on SO103 and it is a female SMA connector.

A 2G compatible antenna (Refer to the product's HW Design guide) must be connected to SO103.

3.3.4.2. SO107 – Bluetooth Antenna Connector

The Bluetooth Antenna is available on SO107 and it is a female SMA connector.

A BT compatible antenna (Refer to the product's HW Design guide) has to be used.

3.3.4.3. SO108 – GNSS Antenna Connector

The GNSS Antenna is available on SO108 and it is a female SMA connector.

A GNSS compatible antenna (Refer to the product's HW Design guide) has to be used.

3.3.5. PL105 - Power Supply Setting

The PL105 connector is permitting to configure how to supply the module.

The Interface is designed to supply and filter the two Module's inputs VBATT and VBATT_PA and separately the rest of circuits of the Interface (VBATT_AUX)

The connector is provided by 3 Jumpers (Mounted by default) that permits to:

- Select if to supply the module from EVK2 or from an external source
- Insert a Power consumption Meter in series to the supply

The connector carries the following signals:

PL105

Pin	Signal	Function
1	VBATT_PA (Module)	Module's VBATT_PA signal
2	VBATT_PA (EVK2)	VBATT_PA from the EVK2
3	VBATT (Module)	Module's VBATT signal
4	VBATT (EVK2)	VBATT from the EVK2
5	VBATT_AUX (Interface)	Supply input for the Interface circuits (except the module)
6	VBATT_AUX (EVK2)	VBATT_AUX from the EVK2 usable to supply the Interface's circuit.

3.3.6. SIM Holder and SIM Detection

The Interface is provided by a SIM Holder (SO102).

The SIM holder lines are in parallel to the lines connected to the SIM Holder on EVK2 so it is not allowed to have a SIM in both holders.

Due to the fact the product is not provided by a dedicated pin for the HW SIM Presence detection, it is possible to select one GPIO to be used for this function.

On the interface it has been considered to have the possibility to use the GPIO 4 adding a Jumper on PL301.

On PL301 the lines dedicated to this activity are:

Pin	Signal	Function
5	GPIO_04	GPIO_04 on module
6	SIM_IN	SIMIN Line from SIM Holder SO102

3.3.7. RESET

The Interface is provided by a button that permits to RESET the module.

Please refer to the Module's HW user guide for its use and behaviour.

3.3.8. STAT LED

The Interface is provided by a LED controlled by the STAT LED line of the module.

Please refer to the Module's HW user guide for its use and behaviour.

3.3.9. Expansion Connectors

3.3.9.1. PL101

The connector carries the following signals:

Pin	Signal	Function
1	VBATT_AUX	Interface Power supply
2	GNSS_ON	GNSS_ON signal
3	NC	
4	GPIO_06	General Purpose IO #6
5	GPIO_05	General Purpose IO #5
6	NC	
7	GPIO_04	General Purpose IO #4
8	GPIO_03	General Purpose IO #3
9	GPIO_02	General Purpose IO #2
10	GPIO_01	General Purpose IO #1
11	Reserved	Reserved
12	GND	Ground
13	Reserved	Reserved
14	NC	
15	Reserved	Reserved
16	Reserved	Reserved
17	Reserved	Reserved
18	Reserved	Reserved
19	ALARM	ALARM output from Module

20	1PPS	1PPS output from Module
21	Reserved	Reserved
22	Reserved	Reserved
23	VAUX/PWRMON	VAUX/PWRMON from module
24	DAC	Digital to Analog converter output from module
25	Reserved	Reserved
26	ADC	Analog to Digital converter
27	ON_OFF	Module's ON_OFF line
28	NC	
29	GPIO_06	GPIO
30	GPIO_05	GPIO
31	GND	Ground
32	Reserved	Reserved
33	Reserved	Reserved
34	Reserved	Reserved
35	Reserved	Reserved
36	Reserved	Reserved
37	NC	
38	GNSS_LNA_EN	Module's output line to control the external GNSS LNA Enable
39	VBATT_AUX	VBATT supply for Interface
40	LNA SUPPLY EN	Enable line for the GNSS LNA supply

3.3.9.2. PL201

The connector carries the following signals:

Pin	Signal	Function
1	C104/RXD1	SECONDARY UART RX (Output from Module)
2	C103/TXD1	SECONDARY UART RX (Input to Module)
3	TX_TRACE_EVK2	AUX UART RX Input to Level Adapter)
4	RX_TRACE_EVK2	AUX UART RX (Output from Level Adapter)
5	TX_GNSS	GNSS UART TX
6	RX_GNSS	GNSS UART RX
7	C103/TXD1	SECONDARY UART RX (Input to Module)
8	C104/RXD1	SECONDARY UART RX (Output from Module)
9	NC	
10	NC	
11	NC	
12	NC	

There are two Jumpers on this connector that permit to select the following:

- To connect the Secondary UART to the GNSS UART (Hosted configuration) (5-7 and 6-8)
- To connect the Secondary UART to the EVK2 level translators (1-3 and 2-4)
- To connect the GNSS UART to the EVK2 level translators (5-7 and 6-8)

In case is needed to connect an external application to the AUX UART , GNSS UART or simply to isolate them from the rest of the circuitry it is only needed to remove the two jumpers.

3.3.10. Audio Section and Settings

The GE310-GNSS is provided by an Analog Audio line (MIC and SPKR)

3.3.10.1. Audio Settings

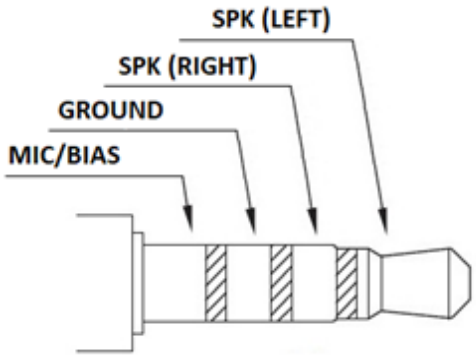
The Interface Board is provided by a set of possible Audio inputs to interface the Audio circuitry of GE310

Its configuration could be set using the Jumpers on PL301.

You could refer to the “PL301 - Audio Settings” paragraph for the details.

3.3.10.1.1. MIC/SPK connector

A MIC/SPK headset could be connected using the SO301 connector (Jack 3.5mm) where the contacts are described in the following Image:



3.3.10.2. PL301 – Audio Settings

The Audio Configuration could be done using the Jumpers on PL301.

3.3.10.2.1. Audio Path Settings

Audio Uplink Setting on PL301

Jumpers on Pin	Signal	Description
19-21 **20-22**	MIC- (Modem) MIC+ (Modem)	From SO301 to Module
25-27 **26-28**	MIC- (Modem) MIC+ (Modem)	From SO301 to Module

Audio DOWNLINK Setting on PL301

Jumpers on Pin	Signal	Description
29-31 **30-32**	SPK+ (Modem)	From Module to SO301
35-37 **36-38**	SPK- (Modem)	From Module to SO301

3.4. GNSS Settings

The GE310-GNSS module is provided by a GNSS receiver.

The interface is permitting to connect and supply an external active antenna and also to set the module in the different working modes.

3.4.1. GNSS Signals

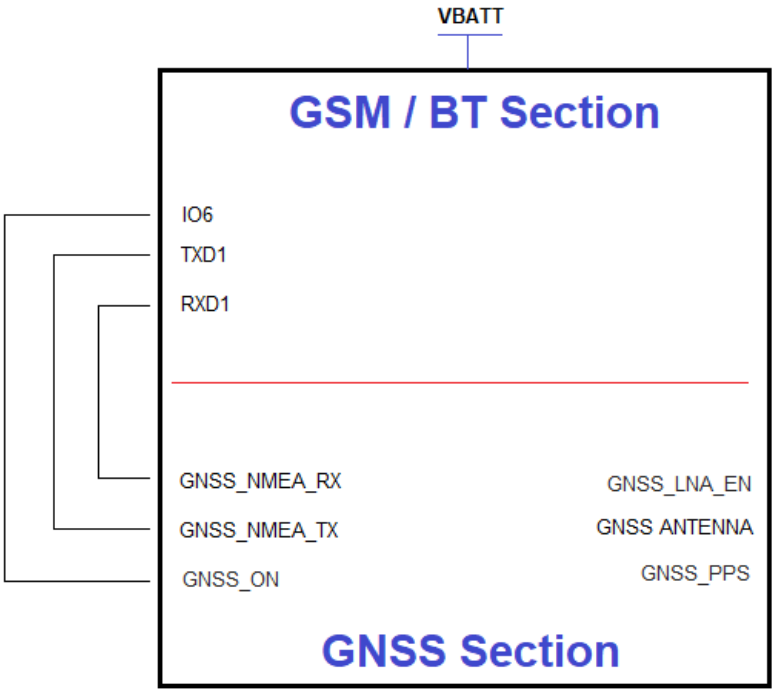
The GE310 is including the following signals usable with the GNSS section:

Pin	Signal	I/O	Function	Type	Comment
Asynchronous Serial Port (USIF1)					
Y12	TXD1	I	Serial data input (TXD) from DTE	CMOS 2.8V	
AA11	RXD1	O	Serial data output (RXD) to DTE	CMOS 2.8V	
GNSS Serial Port					
Y10	GNSS_NMEA_TX	O	GNSS UART UART (TX Data to DTE)	CMOS 2.8V	
AA9	GNSS_NMEA_RX	I	GNSS UART (RX Data from DTE)	CMOS 2.8V	
DIGITAL IO					
D13	IO6	I/O	Configurable GPIO06	CMOS 2.8V	Usable to control GNSS_ON
GNSS Control Signals					
H18	GNSS_LNA_EN	O	GNSS external LNA enable	CMOS 2.8V	Used to enable the external LNA supply
J16	GNSS_ON	I	GNSS Receiver Enable	CMOS 2.8V	
G16	GNSS_PPS	O	1 Pulse per Second	CMOS 2.8V	
RF Section					
E19	GNSS ANTENNA	I	GNSS Antenna	RF	

3.4.2. Hosted GNSS Settings

As described in HW User Guide the GE310-GNSS module permits to use the GNSS section as host for the 2G section or as a separated device.

The Hosted configuration could be set in the following way:



3.5. Interface Stand-alone Use

The GE310 Interface could be used in Stand alone (without the EVK2 mainboard) with the following remarks:

- The Power supply could be provided connecting a Power supply to SO104 or PL105 (removing the Jumpers)
- The Power supply level has to be carefully verified in the Module's HW User Guide
- The SIM could be inserted in the SO102 Holder
- The communication with the module through the UART requires the use of a level adapter between the PC and the Interface (the lines are available on SO101 but please be aware that the signals on that connector have been adapted to the 2.8V logic levels of EVK2)
- The Audio section could be used accessing directly to the Analog lines (see above chapters for pinout) or through the codec using SO301 and SO302
- The RESET line could be controlled using the SW101 Button
- The STAT LED line is present on the Interface (DL101)
- The Antenna could be connected on the related SMA connectors (Ref to Module's HW User Guide for the correct model)

3.6. FIRMWARE UPDATE

You can update the Telit Module firmware through the serial port.

In case the GNSS section needs a SW upgrade this could be done setting the Interface in this way:

- PL101: Jumper Between Pin 2 and Pin 4.
- PL201: Jumper Between Pin 5 and Pin 7 and Jumper between Pin 6 and Pin 8.

Please refer to the GE310 HW Design Guide Documentation for details.

4. GE310 TLB INTERFACE FOR EVB

4.1. Description

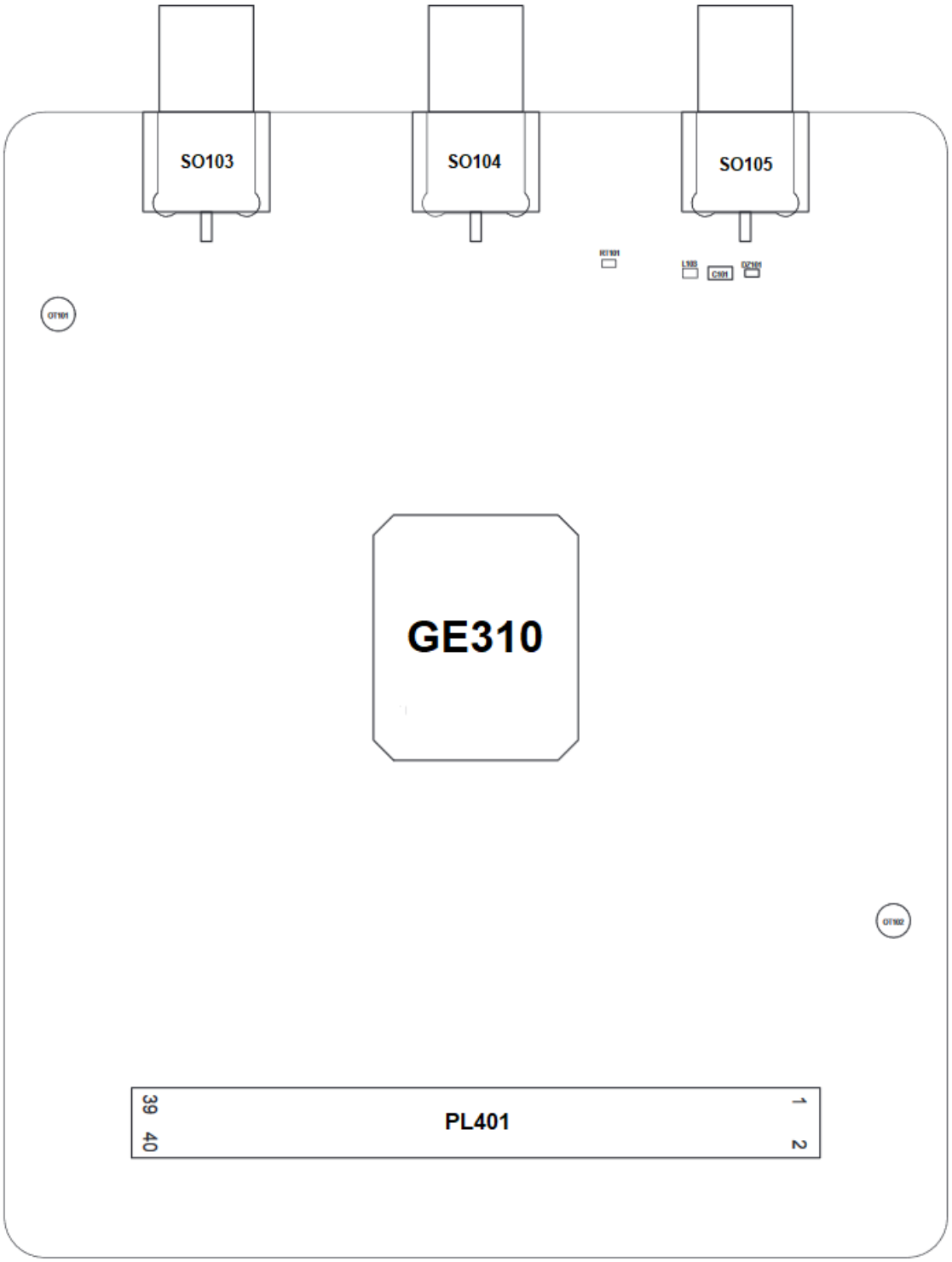
This board allows easily interfacing the GE310 modules with the Telit Evaluation Board (EVB) and testing their functionalities.

4.2. Physical Dimensions

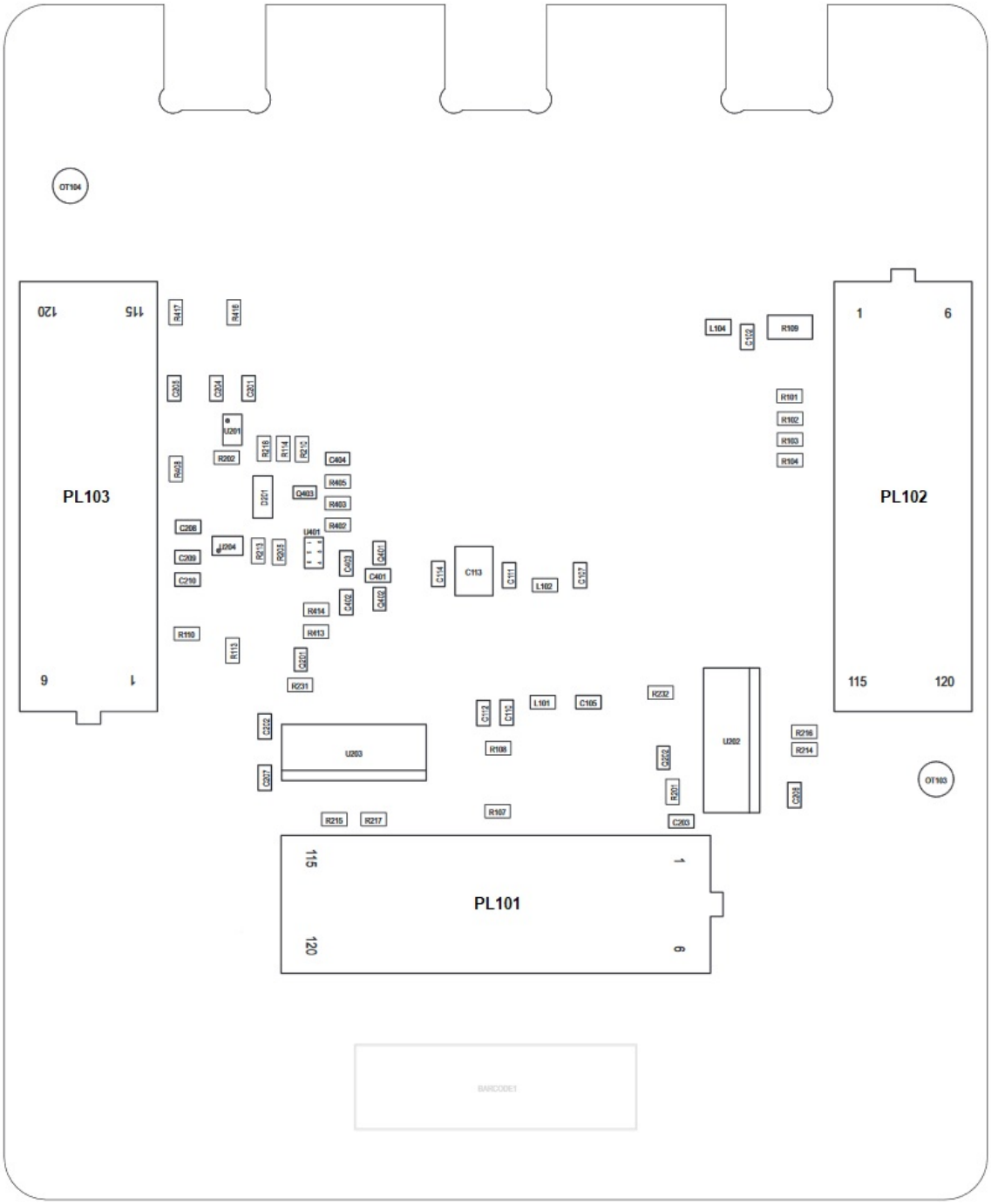
Item	Value
Length	100 mm
Width	70 mm
Height	25 mm

4.3. Interface Details

4.3.1. Connectors Position



TOP SIDE

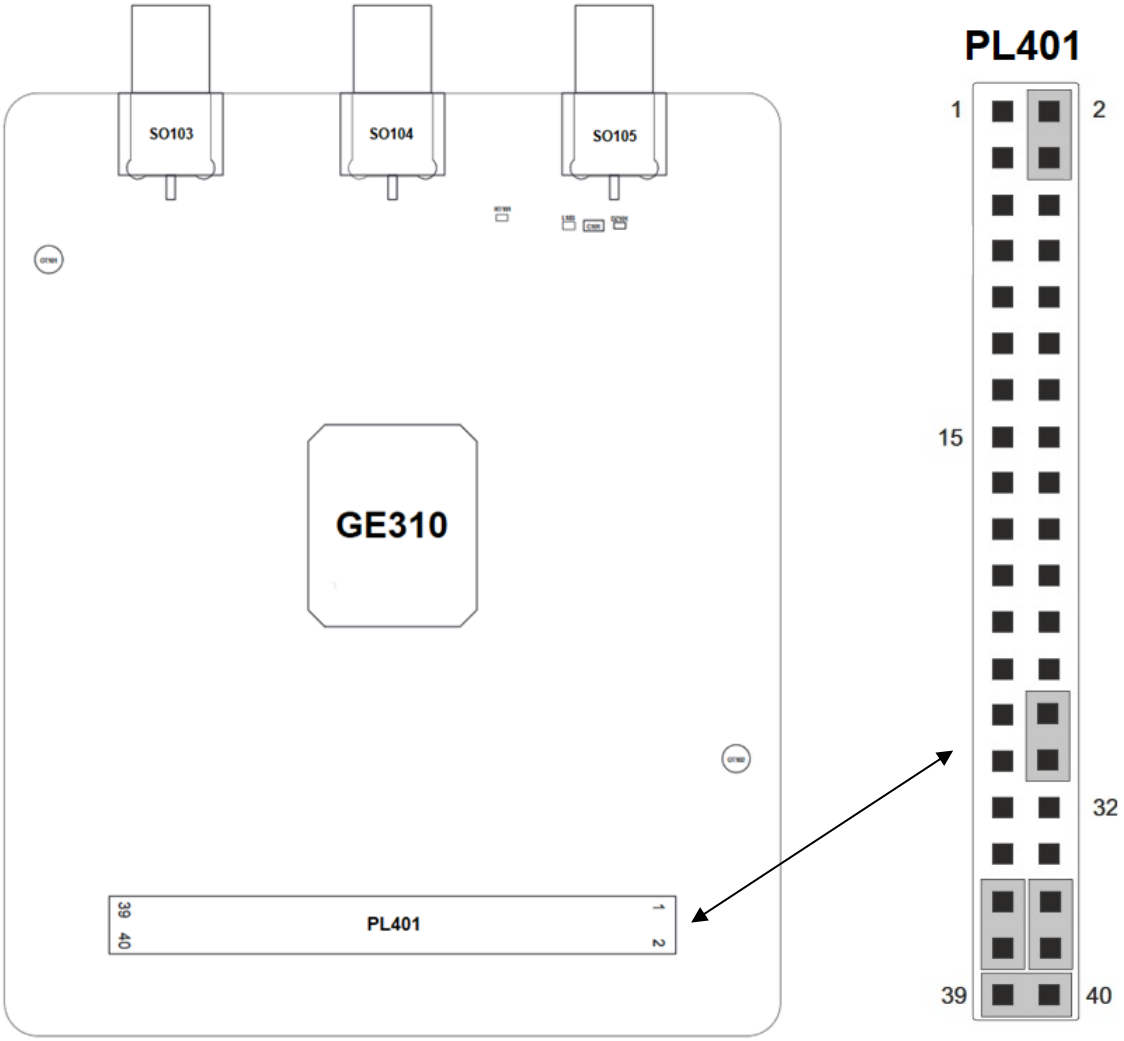


BOTTOM SIDE

4.3.2. Jumpers Setting

The following picture shows the jumpers placement and their default settings.

Details in the following paragraphs.



4.3.3. PL101, PL102, PL103 – EVB Connection

The connections between the Interface and the EVB is done through three 6x20 pin connectors present on the bottom (PL101, PL102 and PL103).

The connector is a Semtec SEAM Series - .050" (1.27 mm) High Speed/High Density Open Pin Field with p/n is SEAM-20-03.5-L-06-2-A-K-TR

Theirs pin functions are listed in the following tables:

PL101											
1	GND	2	GND	3	NC	4	NC	5	GND	6	NC
7	NC	8	GND	9	Reserved	10	GPIO_06	11	NC	12	NC
13	NC	14	GND	15	GPIO_05	16	Reserved	17	NC	18	GND
19	GND	20	GND	21	VREG_MSME	22	VREG_MSME	23	GND	24	NC
25	NC	26	GND	27	NC	28	NC	29	NC	30	NC
31	NC	32	GND	33	NC	34	Reserved	35	NC	36	GND
37	GND	38	NC	39	NC	40	GPIO_04	41	GND	42	NC
43	Reserved	44	GPIO_02	45	GPIO_03	46	Reserved	47	NC	48	NC
49	VAUX/PWRMON	50	VAUX/PWRMON	51	NC	52	Reserved	53	NC	54	NC
55	NC	56	NC	57	GPIO_01	58	NC	59	NC	60	NC
61	NC	62	NC	63	NC	64	NC	65	NC	66	NC
67	Reserved	68	Reserved	69	Reserved	70	Reserved	71	NC	72	NC
73	Reserved	74	Reserved	75	Reserved	76	Reserved	77	NC	78	NC
79	GND	80	GND	81	Reserved	82	Reserved	83	NC	84	NC
85	NC	86	NC	87	NC	88	NC	89	C104/RXD1	90	NC
91	NC	92	NC	93	NC	94	NC	95	C103/TXD1	96	NC
97	NC	98	NC	99	NC	100	Reserved	101	NC	102	NC
103	Reserved	104	Reserved	105	Reserved	106	C105/RTS0	107	NC	108	NC
109	C104/RXD0	110	Reserved	111	C103/TXD0	112	C106/CTS0	113	Reserved	114	NC
115	NC	116	NC	117	NC	118	NC	119	NC	120	NC

PL102											
1	GPS_LNA_BIAS	2	GND	3	GPS_LNA_EN	4	NC	5	GND	6	NC
7	GND	8	GND	9	GND	10	GND	11	GND	12	NC
13	NC	14	NC	15	GND	16	NC	17	NC	18	NC
19	GND	20	GND	21	GND	22	GND	23	GND	24	GND
25	NC	26	NC	27	GND	28	NC	29	NC	30	GND
31	NC	32	NC	33	NC	34	NC	35	NC	36	NC
37	GND	38	GND	39	NC	40	NC	41	GND	42	GND
43	NC	44	GND	45	GND	46	GND	47	GND	48	GND
49	NC	50	GND	51	GND	52	Reserved	53	Reserved	54	ADC_IN1
55	NC	56	NC	57	NC	58	NC	59	NC	60	NC
61	Reserved	62	Reserved	63	Reserved	64	Reserved	65	Reserved	66	GND
67	GND	68	GND	69	GND	70	GND	71	GND	72	NC
73	GND	74	GND	75	GND	76	GND	77	SIMVCC1	78	SIMVCC1
79	Reserved	80	NC	81	SIMCLK1	82	SIMIN1	83	SIMIO1	84	SIMRST1
85	NC	86	Reserved	87	NC	88	NC	89	NC	90	NC
91	Reserved	92	Reserved	93	NC	94	NC	95	NC	96	NC
97	GND	98	GND	99	NC	100	NC	101	NC	102	NC
103	Reserved	104	GND	105	NC	106	NC	107	NC	108	NC
109	Reserved	110	GND	111	NC	112	NC	113	NC	114	NC
115	GND	116	GND	117	NC	118	NC	119	NC	120	NC

PL103											
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	NC	20	NC	21	NC	22	VBATT_PA	23	VBATT_PA	24	VBATT_PA
25	NC	26	NC	27	NC	28	NC	29	NC	30	NC
31	NC	32	NC	33	NC	34	NC	35	NC	36	NC
37	NC	38	NC	39	NC	40	NC	41	NC	42	NC
43	NC	44	NC	45	NC	46	NC	47	NC	48	NC
49	NC	50	NC	51	NC	52	NC	53	NC	54	NC
55	NC	56	NC	57	NC	58	NC	59	NC	60	NC
61	NC	62	NC	63	NC	64	NC	65	NC	66	NC
67	NC	68	NC	69	NC	70	NC	71	NC	72	NC
73	NC	74	NC	75	NC	76	NC	77	NC	78	NC
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	NC	95	NC	96	NC
97	GND	98	GND	99	GND	100	GND	101		102	NC
103	NC	104	NC	105	NC	106	GND	107		108	NC
109	GND	110	GND	111	GND	112	GND	113	Reserved	114	Reserved
115	Reserved	116	Reserved	117	Reserved	118	Reserved	119	Reserved	120	Reserved

4.3.4. Antenna Connectors

4.3.4.1. SO103 – MAIN Antenna Connector

The MAIN 2G Antenna is available on SO103 and it is a female SMA connector.

A 2G compatible antenna (Refer to the product's HW Design guide) must be connected to SO103.

4.3.4.2. SO104 – Bluetooth Antenna Connector

The Bluetooth Antenna is available on SO104 and it is a female SMA connector.

A BT compatible antenna (Refer to the product's HW Design guide) has to be used.

4.3.4.3. SO105 – GNSS Antenna Connector

The GNSS Antenna is available on SO105 and it is a female SMA connector.

A GNSS compatible antenna (Refer to the product's HW Design guide) has to be used.

4.3.5. SIM Holder and SIM Detection

The Interface is using the SIM Holder available on the EVB mainboard.

Due to the fact the product is not provided by a dedicated pin for the HW SIM Presence detection, it is possible to select one GPIO to be used for this function.

On the interface it has been considered to have the possibility to use the GPIO_05 adding a Jumper on PL401.

On PL401 the lines dedicated to this activity are:

Pin	Signal	Function
39	GPIO_04	GPIO_04 on module
40	SIM_IN	SIMIN Line from EVB SIM Holder

4.3.6. RESET

The module could be reset using the related button on EVB mainboard.

4.3.7. STAT LED

The EVB Interface is provided by a LED controlled by the STAT LED line of the module.

Please refer to the Module's HW user guide for its use and behaviour.

4.3.8. Expansion Connectors

4.3.8.1. PL401

The connector carries the following signals:

Pin	Signal	Function
1	VBATT_AUX	Interface Power supply
2	GNSS_ON	GNSS_ON signal
3	NC	
4	GPIO_06	General Purpose IO #6
5	GPIO_05	General Purpose IO #5
6	NC	
7	GPIO_04	General Purpose IO #4
8	GPIO_03	General Purpose IO #3
9	GPIO_02	General Purpose IO #2
10	GPIO_01	General Purpose IO #1
11	Reserved	Reserved
12	GND	Ground
13	Reserved	Reserved
14	ALARM	ALARM output from Module
15	1PPS	PPS output signal from GNSS receiver
16	Reserved	Reserved
17	Reserved	Reserved
18	VAUX/PWRMON	VAUX/PWRMON from module
19	Reserved	Reserved

20	CTS0	Output for Clear to send signal (CTS) to DTE (Main UART)
21	RTS0	Input for Request to send signal (RTS) from DTE (Main UART)
22	GND	Ground
23	Reserved	Reserved
24	Reserved	Reserved
25	Reserved	Reserved
26	Reserved	Reserved
27	Reserved	Reserved
28	GNSS_LNA_EN	GNSS external LNA enable
29	VBATT_AUX	VBATT input to supply the Interface circuitery
30	GNSS_LNA_EN_EVB	GNSS LNA enable line from EVB
31	RXD0	Serial data output (RXD) to DTE (Main UART)
32	TXD0	Serial data input (TXD) from DTE (Main UART)
33	RXD1	Serial data output (RXD) to DTE (Secondary UART)
34	TXD1	Serial data input (TXD) from DTE (Secondary UART)
35	GNSS_NMEA_RX	GNSS UART (RX Data from DTE)
36	GNSS_NMEA_TX	GNSS UART UART (TX Data to DTE)
37	TXD0	Serial data input (TXD) from DTE (Main UART)
38	RXD0	Serial data output (RXD) to DTE (Main UART)
39	GPIO_04	General purpose IO 4
40	SIMIN	SIM detection line from the SIM Holder of EVB

There are two Jumpers on this connector that permit to select the following:

- To connect the Secondary UART to the GNSS UART (Hosted configuration) (35-37 and 36-38)
- To connect the Secondary UART to the EVB level translators (31-33 and 32-34)
- To connect the GNSS UART to the EVK2 level translators (33-35 and 34-36)

In case is needed to connect an external application to the AUX UART , GNSS UART or simply to isolate them from the rest of the circuitry it is only needed to remove the two jumpers.

4.4. GNSS Settings

The GE310-GNSS module is provided by a GNSS receiver.

The interface is permitting to connect and supply an external active antenna and also to set the module in the different working modes.

4.4.1. GNSS Signals

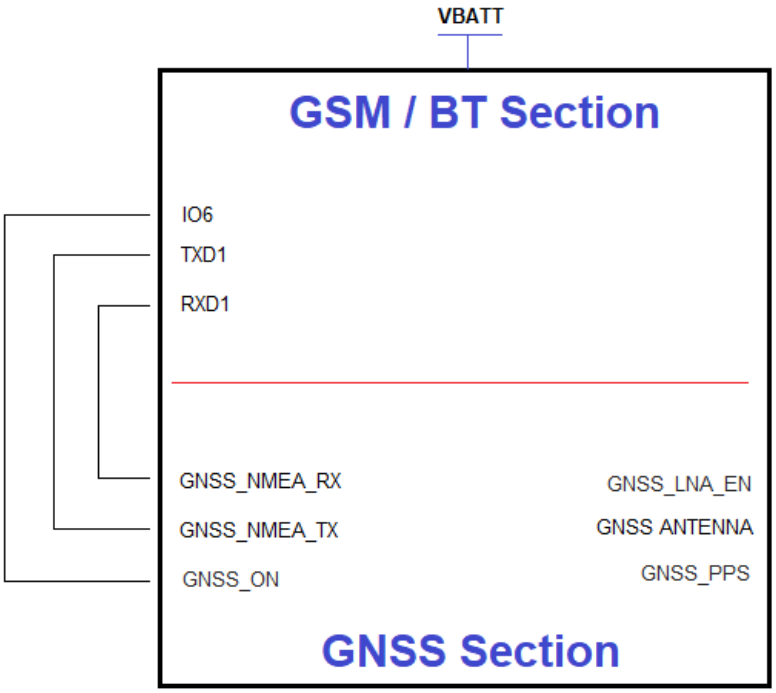
The GE310 is including the following signals usable with the GNSS section:

Pin	Signal	I/O	Function	Type	Comment
Asynchronous Serial Port (USIF1)					
Y12	TXD1	I	Serial data input (TXD) from DTE	CMOS 2.8V	
AA11	RXD1	O	Serial data output (RXD) to DTE	CMOS 2.8V	
GNSS Serial Port					
Y10	GNSS_NMEA_TX	O	GNSS UART UART (TX Data to DTE)	CMOS 2.8V	
AA9	GNSS_NMEA_RX	I	GNSS UART (RX Data from DTE)	CMOS 2.8V	
DIGITAL IO					
D13	IO6	I/O	Configurable GPIO06	CMOS 2.8V	Usable to control GNSS_ON
GNSS Control Signals					
H18	GNSS_LNA_EN	O	GNSS external LNA enable	CMOS 2.8V	Used to enable the external LNA supply
J16	GNSS_ON	I	GNSS Receiver Enable	CMOS 2.8V	
G16	GNSS_PPS	O	1 Pulse per Second	CMOS 2.8V	
RF Section					
E19	GNSS ANTENNA	I	GNSS Antenna	RF	

4.4.2. Hosted GNSS Settings

As described in HW User Guide the GE310-GNSS module permits to use the GNSS section as host for the 2G section or as a separated device.

The Hosted configuration could be set in the following way:



4.5. FIRMWARE UPDATE

You can update the Telit Module firmware through the serial port.

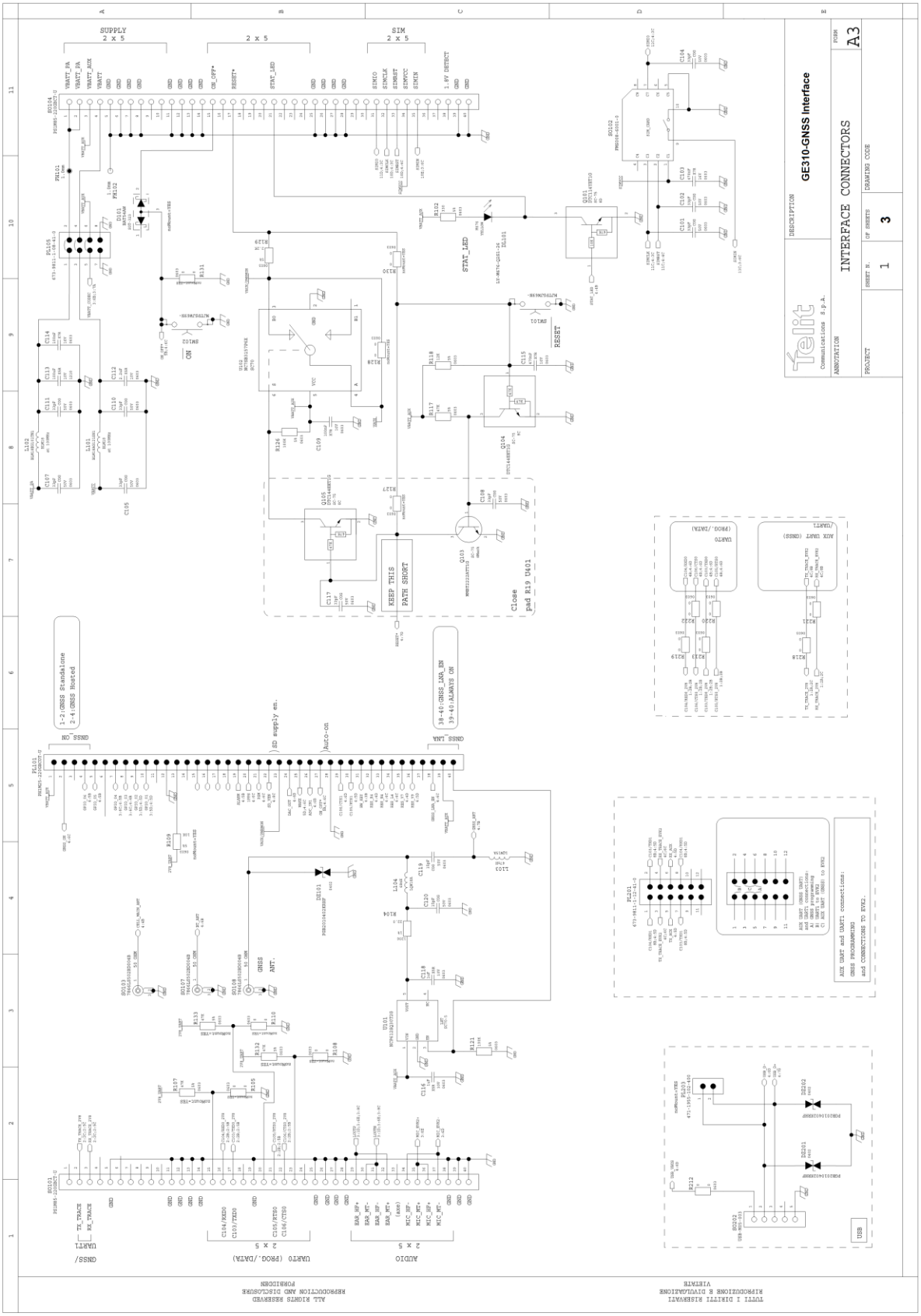
In case the GNSS section needs a SW upgrade this could be done setting the Interface in this way:

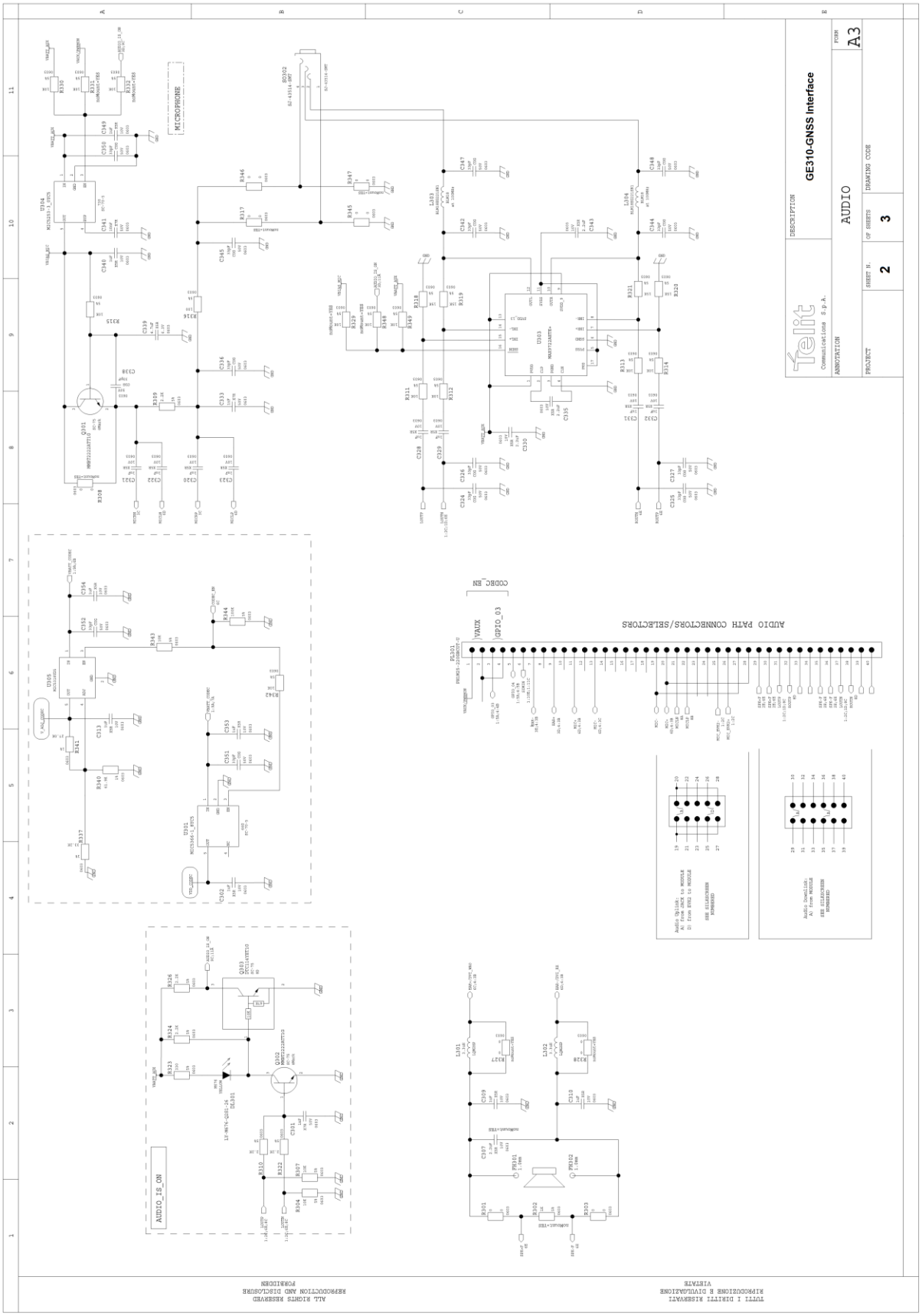
PL401: Jumper between Pin 2 and Pin 4, Jumper between Pin 35 and Pin 37 and Jumper between Pin 36 and Pin 38.

Please refer to the GE310 HW Design Guide Documentation for details.

5. INTERFACE SCHEMATICS

5.1. EVK2 Interface Schematic




MICROPHONE
AUDIO_IS_ON
AUDIO PATH CONNECTORS/SELECTORS
CODEC_EN
GPIO_03
VAUX
GE310-GNSS Interface
AUDIO
Telit Communications S.p.A.
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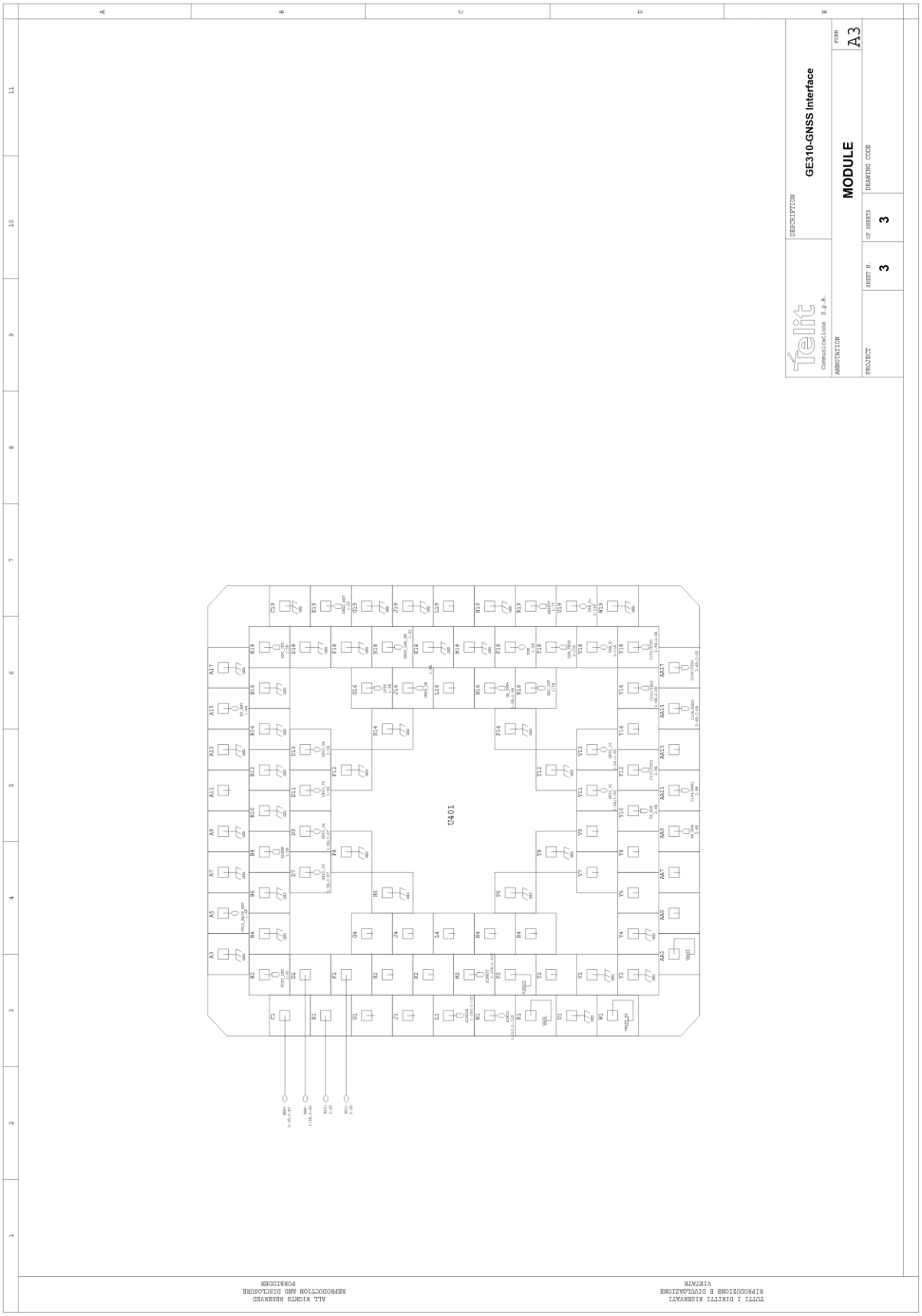
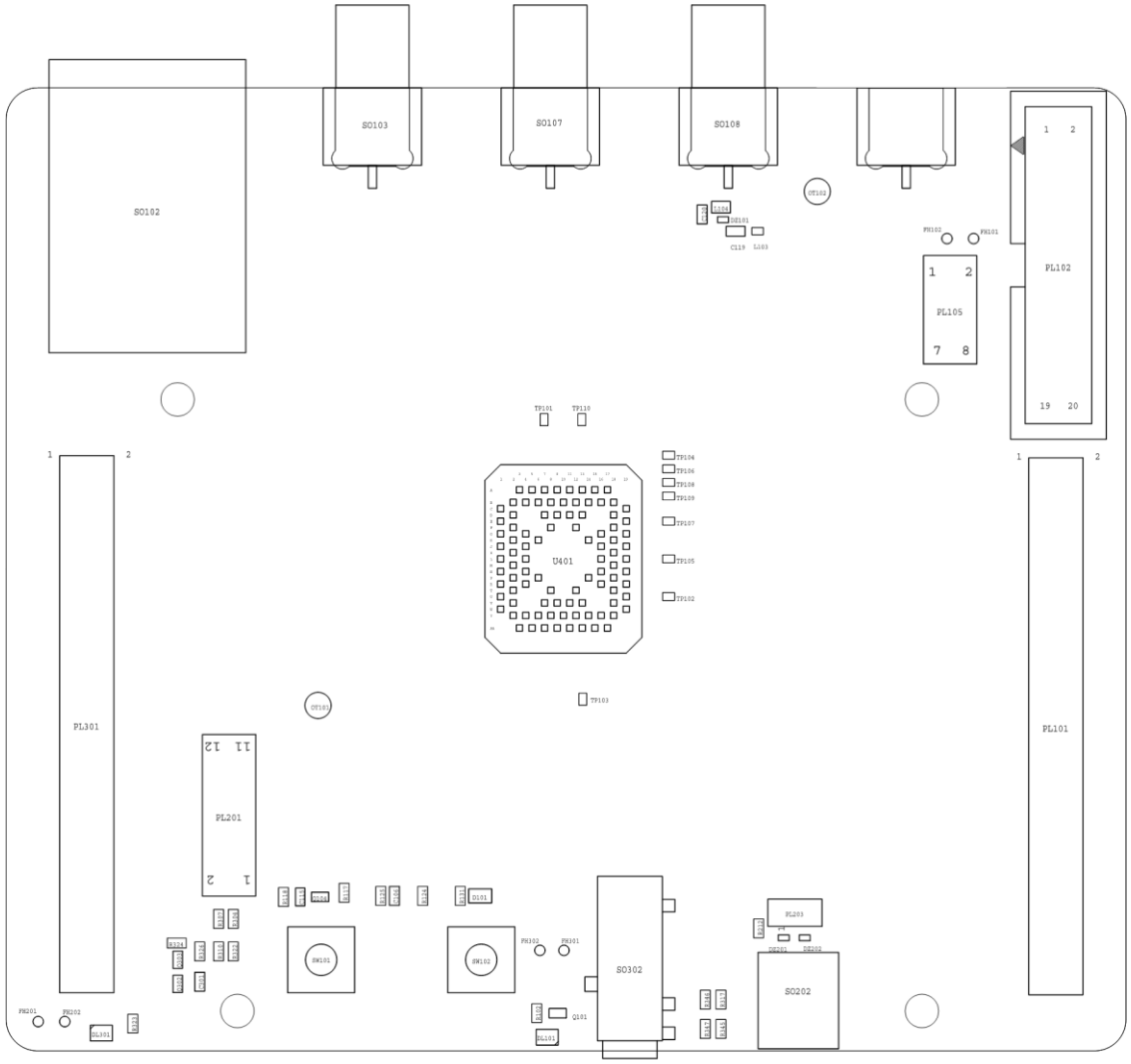
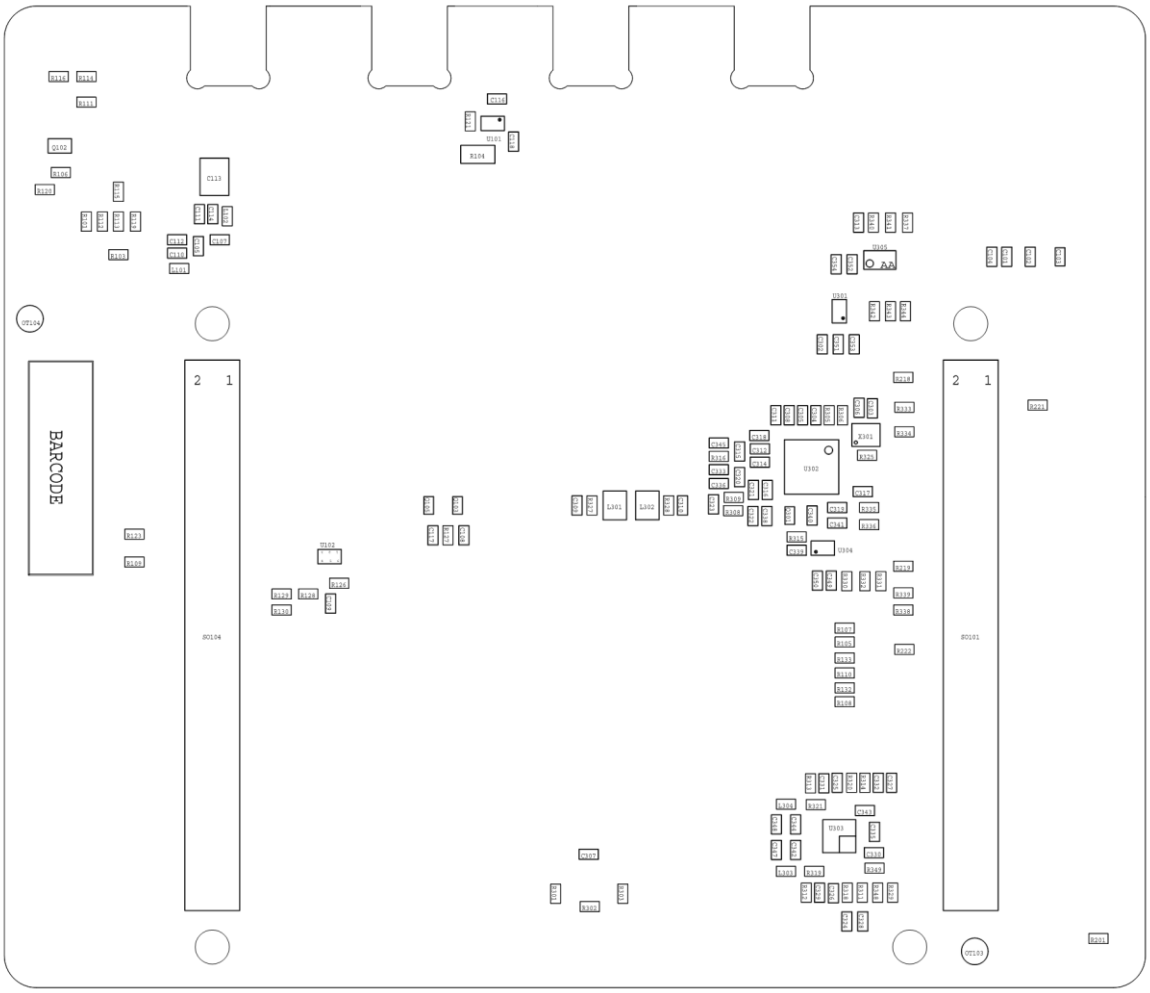
RIPRODUZIONE E DIVULGAZIONE
VIETATE


GE310-GNSS Interface
MODULE
A3
U401

5.2. EVK2 Interface Components Layout

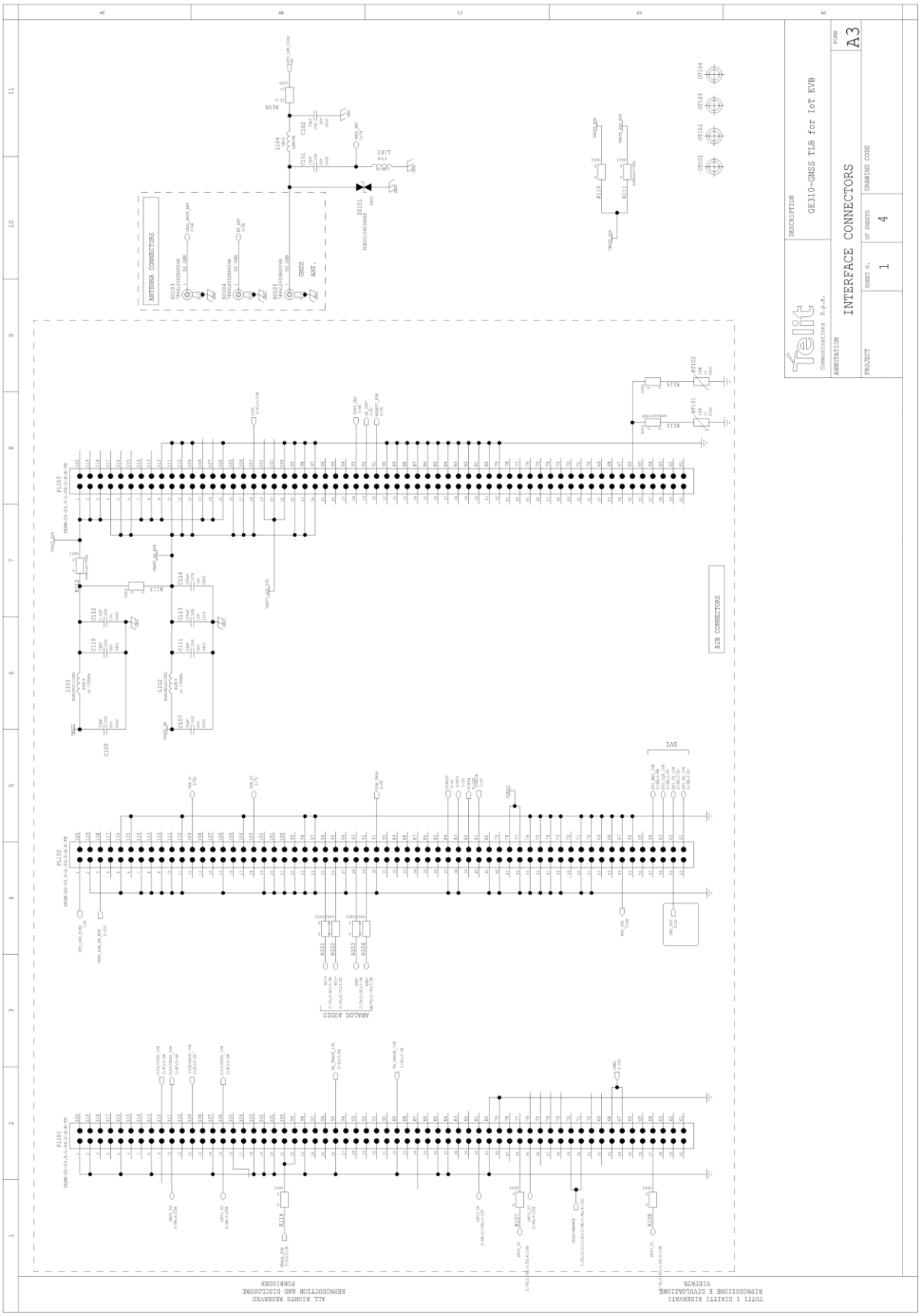


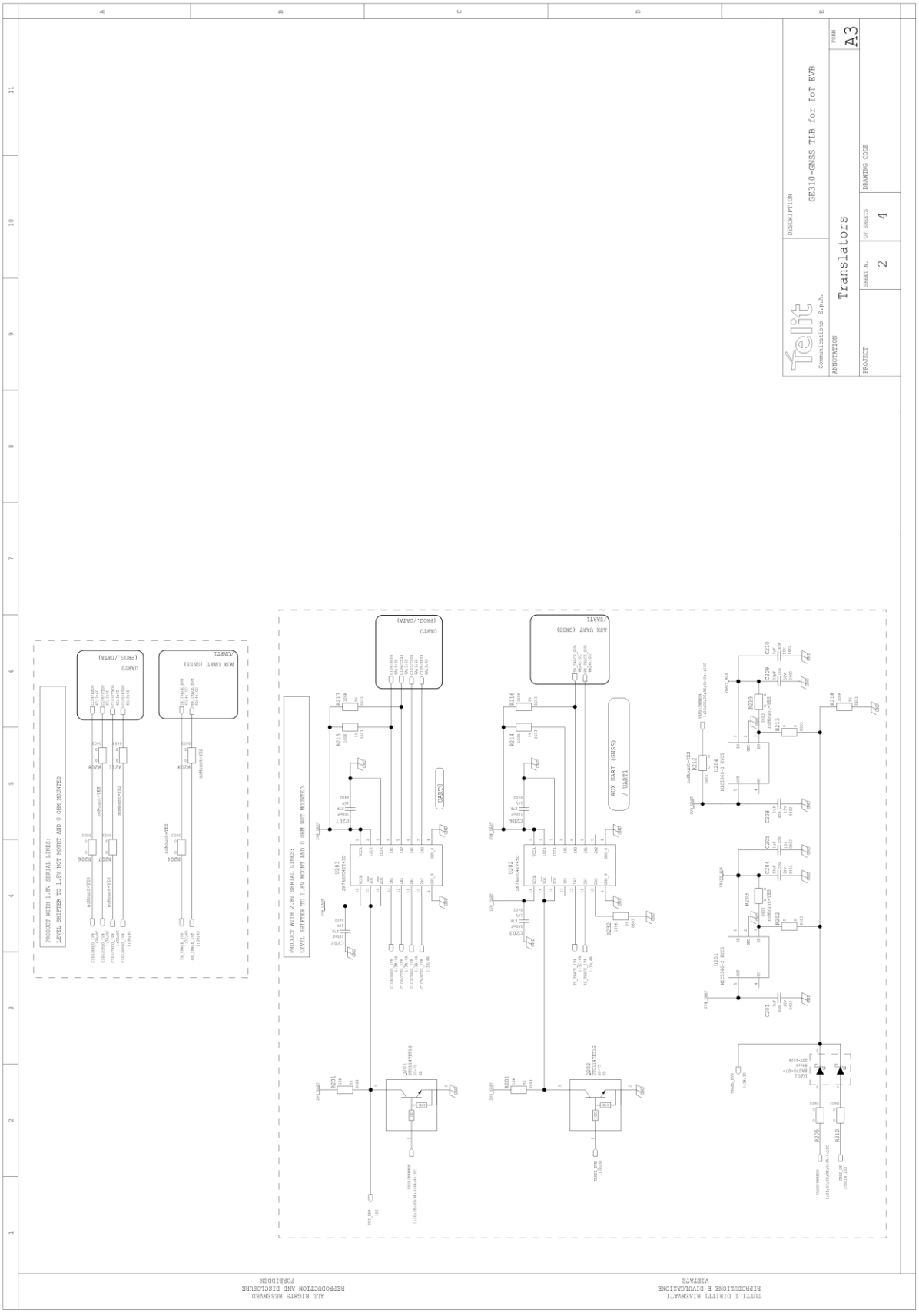
TOP

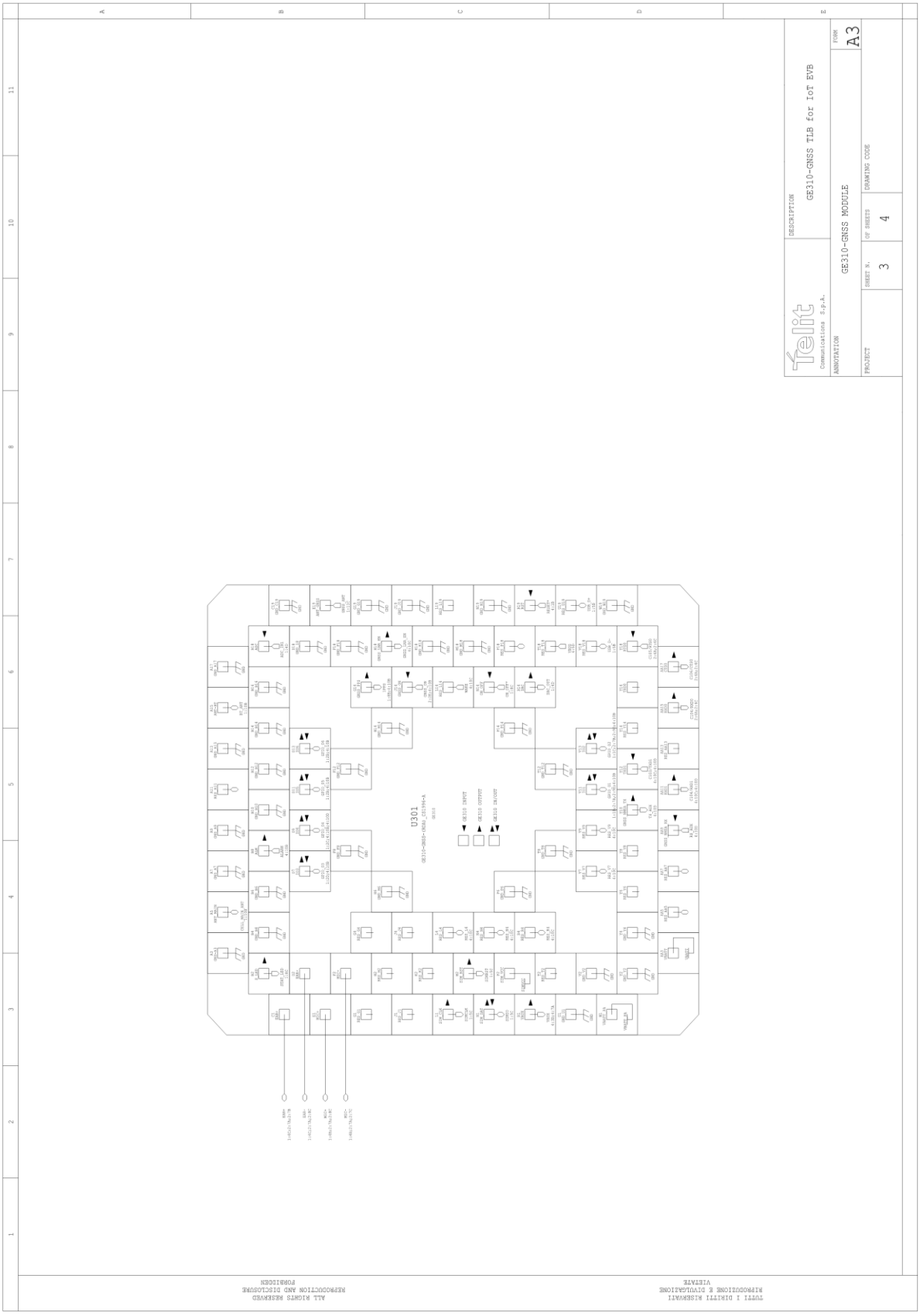


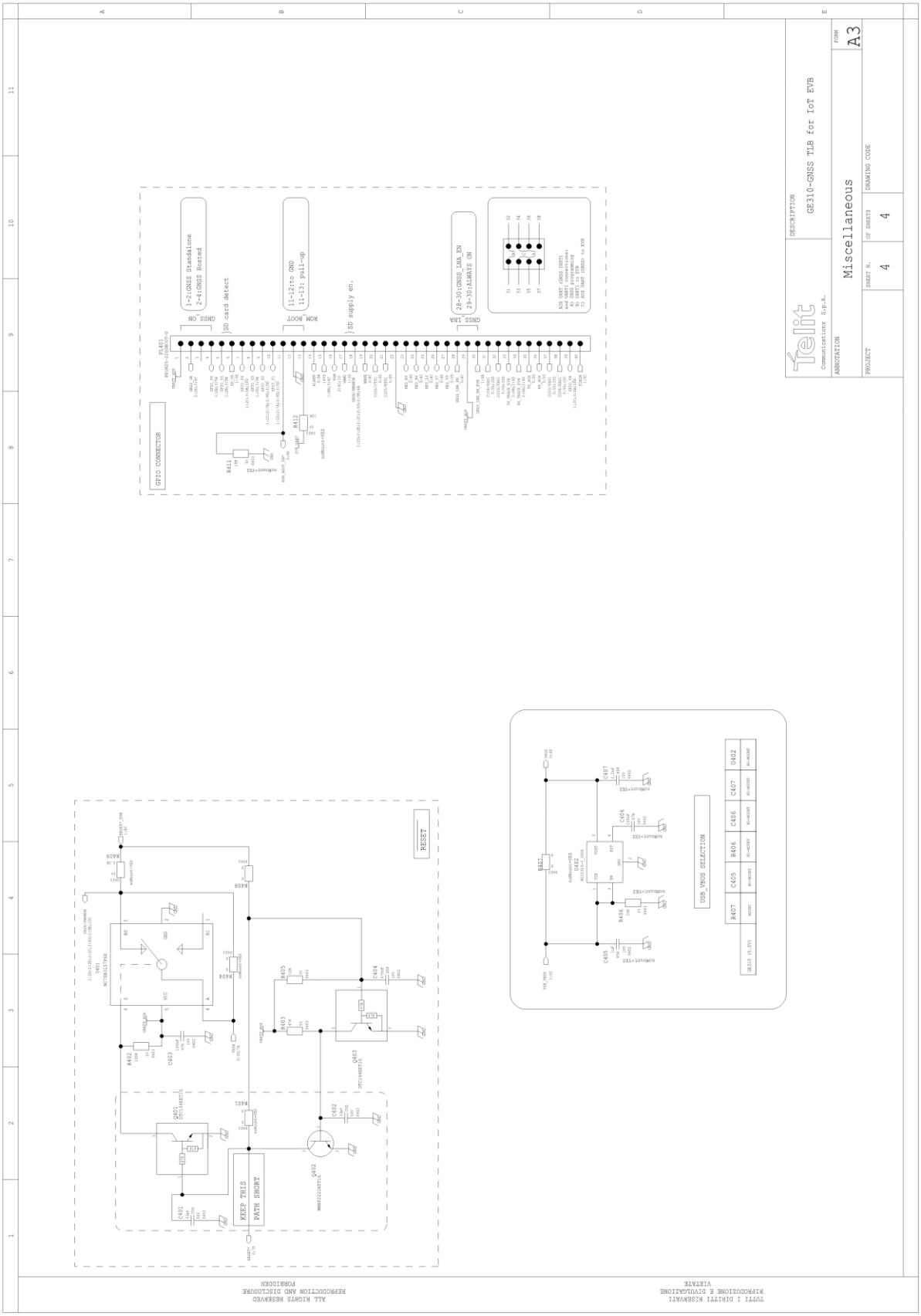
BOTTTOM

5.3. TLB Interface Schematics

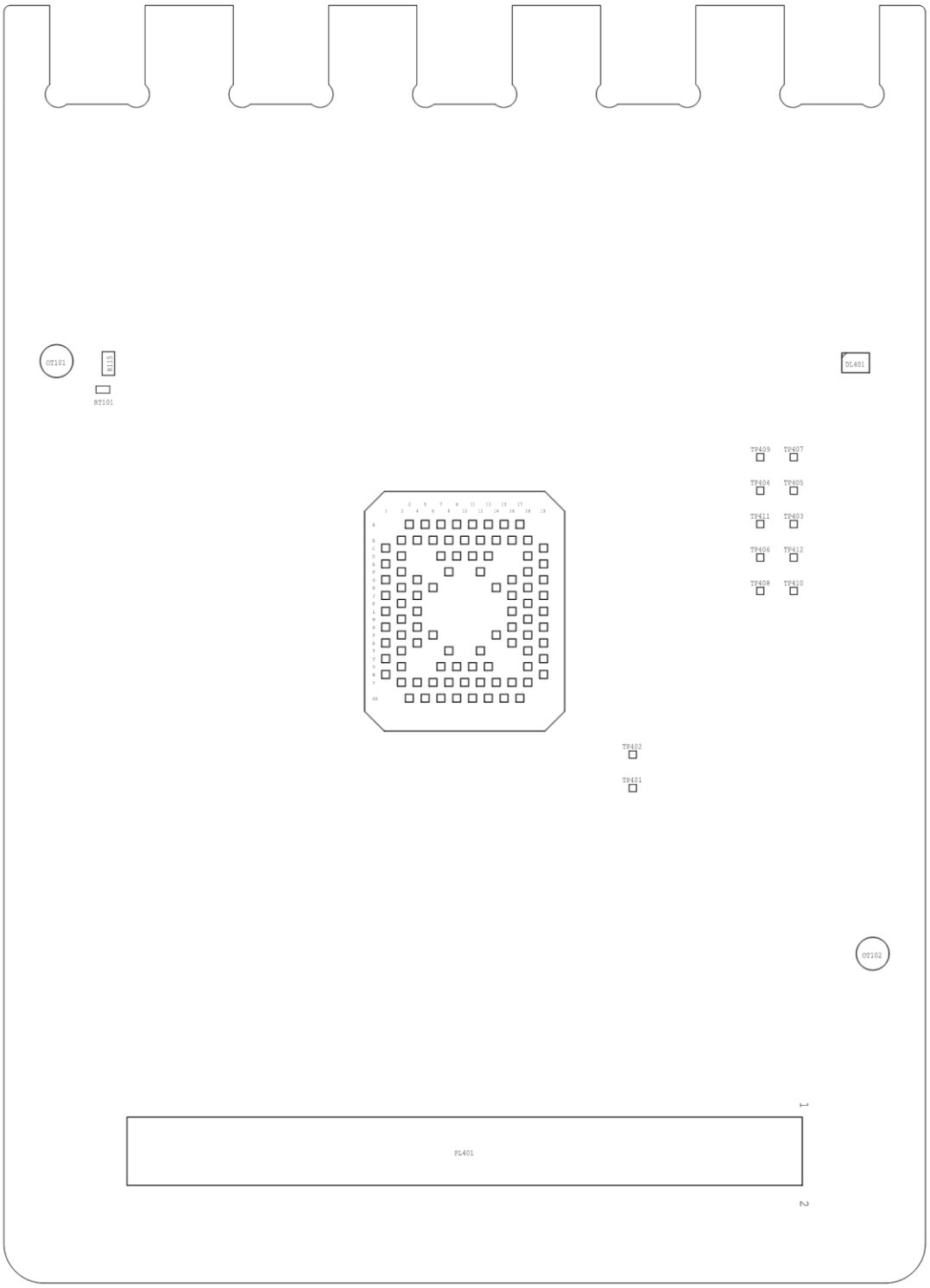



GE310-GNSS TLB for IoT EVB
Translators
A3
2
4

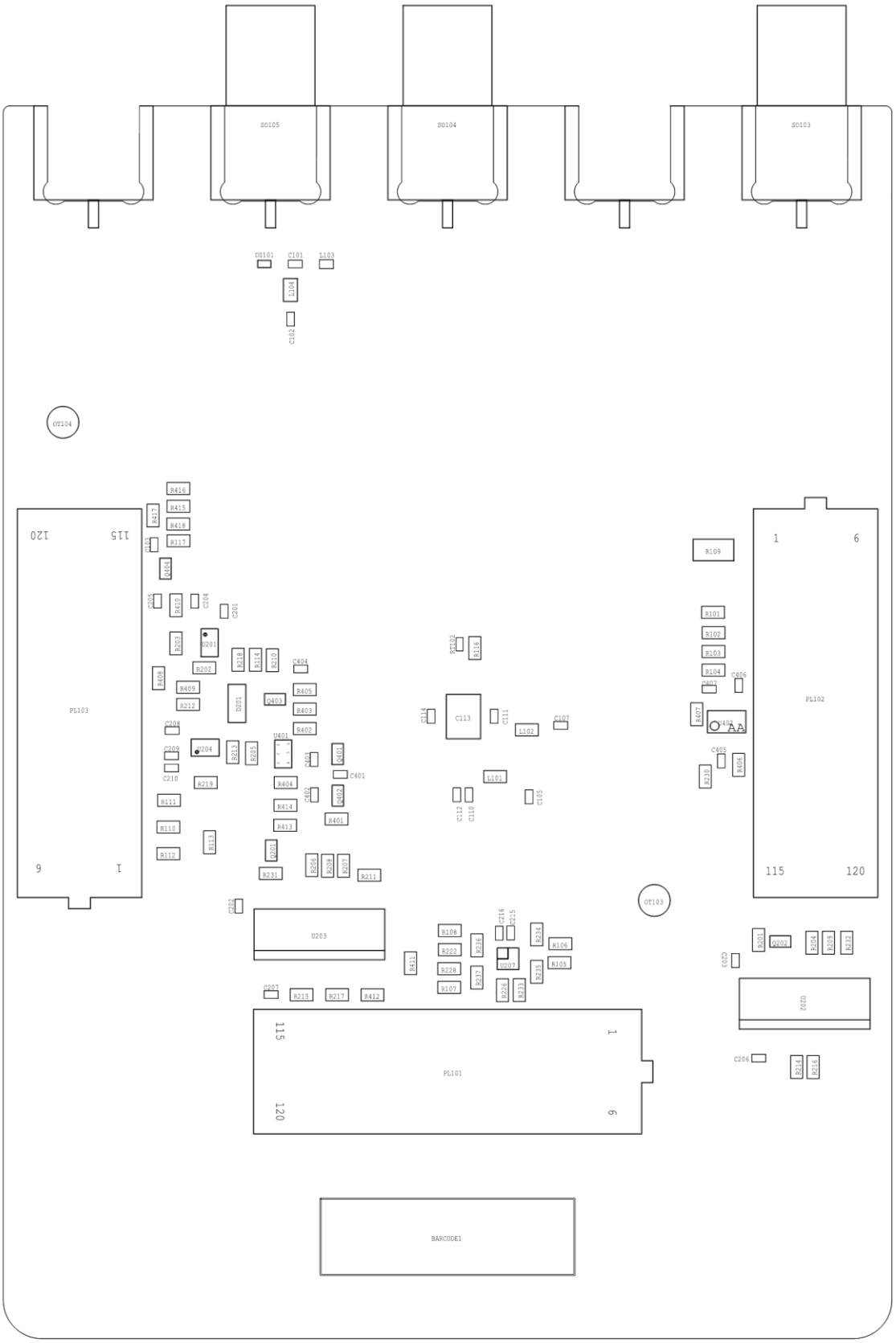

DESCRIPTION
GE310-GNSS TLB for IoT EVB
GE310-GNSS MODULE
FORM
A3
SHEET N.
3
OF SHEETS
4
DRAWING CODE
PROJECT
ANNOTATION
Telit Communications S.p.A.
U301
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE


GE310-GNSS TLB for IoT EVB
Miscellaneous
A3
GPIO CONNECTOR
GNSS_ON
MOM_BOOT
GNSS_LNA
SD card detect
SD supply en.
RESET
KEEP THIS PATH SHORT
USB_VBUS SELECTION

5.4. TLB Interface Components Layout



TOP


SO105
SO104
SO103
PL103
PL102
PL101
U203
U202
U201
U401
BARCODE1

BOTTOM

6. SAFETY RECOMMENDATIONS

6.1. READ CAREFULLY

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc.
- Where there is 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, care has to be taken to the external components of the module, as well as any project or installation issue, because the risk of disturbing the LTE network or external devices or having impact on the security. 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 with care 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 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:

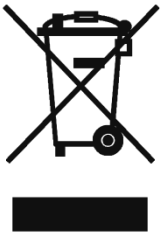
http://ec.europa.eu/enterprise/sectors/rtte/documents/

The text of the Directive 99/05 regarding telecommunication equipment is available,

while the applicable Directives (Low Voltage and EMC) are available at:

http://ec.europa.eu/enterprise/sectors/electrical/

6.2. Disposal of this product in the European Union



According to the WEEE Directive 2012/19/EU, the crossed-out wheeled bin symbol on the product or on its packaging indicates that the product must not be disposed of with your other household waste.
For equipment in private household, it's user's responsibility to dispose of his waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. For more information about where you can drop off your waste equipment from private household for recycling, please contact your local city office, your household waste disposal service or the retailer where you purchased the product. As a producer of electronic devices, TELIT provides for the financing of the treatment and recycling of waste returned through the designated collection points in accordance with local requirements. If you have professional electronic equipment that you purchased directly from TELIT that you wish to have picked up for recycling, please contact us to receive necessary information and instructions. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

Reference Directives:

2012/19/EU Directive of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).

6.3. Disposal of this product in other countries outside the European Union

Please dispose of this product in accordance with local requirements; contact your local authorities or dealer and ask for the correct method of disposal.

7. REFERENCE TABLE OF RF BANDS CHARACTERISTICS

Mode	Freq. Tx (MHz)	Freq. Rx (MHz)	Channels	Tx-Rx Offset
PCS 1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8	512 ~ 810	80 MHz
DCS 1800	1710 ~ 1785	1805 ~ 1880	512 ~ 885	95 MHz
GSM 850	824.2 ~ 848.8	869.2 ~ 893.8	128 ~ 251	45 MHz
EGSM 900	890 ~ 915	935 ~ 960	0 ~ 124	45 MHz
	880 ~ 890	925 ~ 935	975 ~ 1023	45 MHz

8. ACRONYMS

TTSC	Telit Technical Support Centre
USB	Universal Serial Bus
HS	High Speed
DTE	Data Terminal Equipment
UMTS	Universal Mobile Telecommunication System
WCDMA	Wideband Code Division Multiple Access
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
UART	Universal Asynchronous Receiver Transmitter
HSIC	High Speed Inter Chip
SIM	Subscriber Identification Module
SPI	Serial Peripheral Interface
ADC	Analog – Digital Converter
DAC	Digital – Analog Converter
I/O	Input Output
GPIO	General Purpose Input Output
CMOS	Complementary Metal – Oxide Semiconductor
MOSI	Master Output – Slave Input

MISO	Master Input – Slave Output
CLK	Clock
MRDY	Master Ready
SRDY	Slave Ready
CS	Chip Select
RTC	Real Time Clock
PCB	Printed Circuit Board
ESR	Equivalent Series Resistance
VSWR	Voltage Standing Wave Radio
VNA	Vector Network Analyzer

9. DOCUMENT HISTORY

Revision	Date	Changes
Rev 0	2018/10/01	First issue
Rev 1	2018/11/19	Added TLB interface description
Rev 2	2018/12/14	Added Schematics

SUPPORT INQUIRIES

Link to **www.telit.com** and contact our technical support team for any questions related to technical issues.

www.telit.com

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