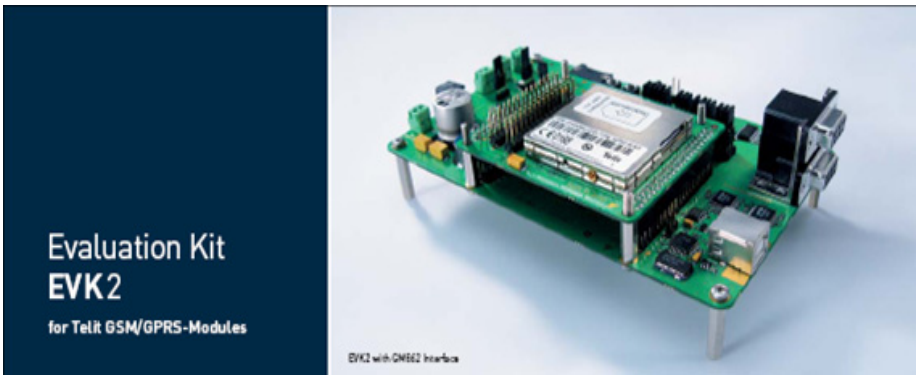
Telit EVK2 User Guide

1vv0300704 Rev.14- 2012/12/11

Making machines talk.

APPLICABILITY LIST:



Model	Part Number	Engine
EVK2	3990150474	Mother Board
GM862 INTERFACE	3990250670	GM862
GE863-PY INTERFACE	3990250684	GE863-PY
GE863-GPS INTERFACE	3990250696	GE863-GPS
GE863-SIM INTERFACE	3990250703	GE863-SIM
GE864-PY INTERFACE	3990250672	GE864-PY
GE864-QUAD V2 INTERFACE	3990250777	GE864-QUAD V2
GE864-DUAL V2 INTERFACE	3990250778	GE864-DUAL V2
GE864-QUAD AUTOMOTIVE V2 INTERFACE	3990250773	GE864-QUAD AUTOMOTIVE V2
GE864-QUAD ATEX V2 INTERFACE	3990250772	GE864-QUAD ATEX V2
GE864-QUAD SIM V2 INTERFACE	3990250771	GE864-QUAD SIM V2
GE864-GPS INTERFACE	3990250820 3990250821 3990250822	GE864-GPS
GC864 INTERFACE	3990250680	GC864
GC864-QUAD-C2 INTERFACE	3990250683	GC864-QUAD-C2
GE865-QUAD INTERFACE	3990250766	GE865-QUAD
GE865/SE867-AGPS INTERFACE	3990250814	GE865-QUAD
GE865/JF2 INTERFACE	3990250868	GE865-QUAD
GL865-QUAD INTERFACE	3990250812	GL865-QUAD
GL865-DUAL INTERFACE	3990250783	GL865-DUAL
GL868-DUAL INTERFACE	3990250790	GL868-DUAL
UC864 INTERFACE	4990150470	UC864

HE863-EUR INTERFACE	3990250797	HE863
HE863-EUG INTERFACE	3990250798	HE863
HE863-NAD INTERFACE	3990250799	HE863
HE863-NAR INTERFACE	3990250800	HE863
HE863-NAG INTERFACE	3990250801	HE863
HE863-AUR INTERFACE	3990250803	HE863
HE863-AUG INTERFACE	3990250804	HE863
HE910 INTERFACE	3990250917	HE910
GE910 INTERFACE	3990250882	GE910
DE910 INTERFACE	3990250886	DE910
CE910 INTERFACE	3990250887	CE910

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Contents

1. Introduction

1.1. Scope

The Aim of this document is the handling description of the *developer's Evaluation KIT* second edition, a laboratory tool named ***EVK2***.

1.2. Audience

All given information shall be used as a guide and a starting point for properly developing of your product. Obviously this document cannot cover all the hardware solutions and products that may be designed.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit's Technical Support Center (TTSC) at:

TS-EMEA@telit.com
TS-NORTHAMERICA@telit.com
TS-LATINAMERICA@telit.com
TS-APAC@telit.com

Alternatively, use:
http://www.telit.com/en/products/technical-support-center/contact.php
For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:
http://www.telit.com
To register for product news and announcements or for product questions contact Telit's Technical Support Center (TTSC).
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's GSM/GPRS Family Software User Guide, 1vv0300784
- Audio settings application note , 80000NT10007a
- Digital Voice Interface Application Note, 80000NT10004a
- HE910 Digital Voice Application Note, 80000NT10050a
- SIM Holder Design Guides, 80000NT10001a
- AT Commands Reference Guide, 80000ST10025a
- Telit EVK2 User Guide, 1vv0300704

1.6. Content of the kit

Please check out the content of your ***EVK2*** kit; if any of the items is missing, please contact your supplier.

Description	Quantity
EVK2 MOTHERBOARD	1
INFORMATION NOTE	1
2 PIN JUMPER FEMALE CONN	18
ASSEMBLED USB A-B CABLE	1
RED & BLACK CABLE WITH PLUGS	1
GSM-UMTS MAGNETIC ANTENNA CABLE RG174 WITH SMA/M	1

Table 1

Figure 1: GE863-PY Interface Board (upper) fitted on EVK2 Motherboard (lower).

2. Description

The motherboard *CS1139B* can be split into several functional blocks depending on the implemented function; the following drawings show a block diagram and the displacement of the main blocks on motherboard.

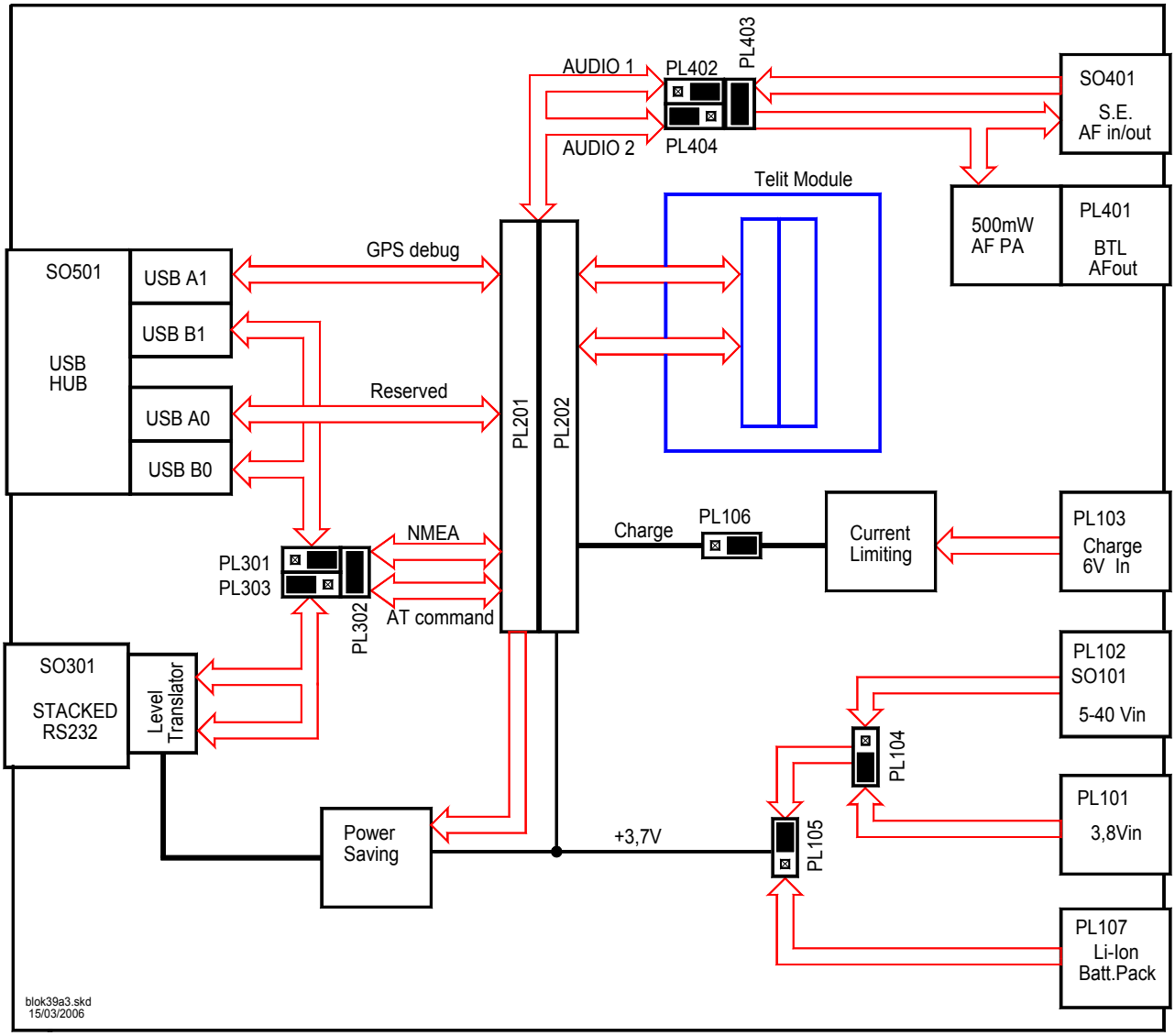


Figure 2: Miscellaneous signals, connections and routing on *CS1139B*.

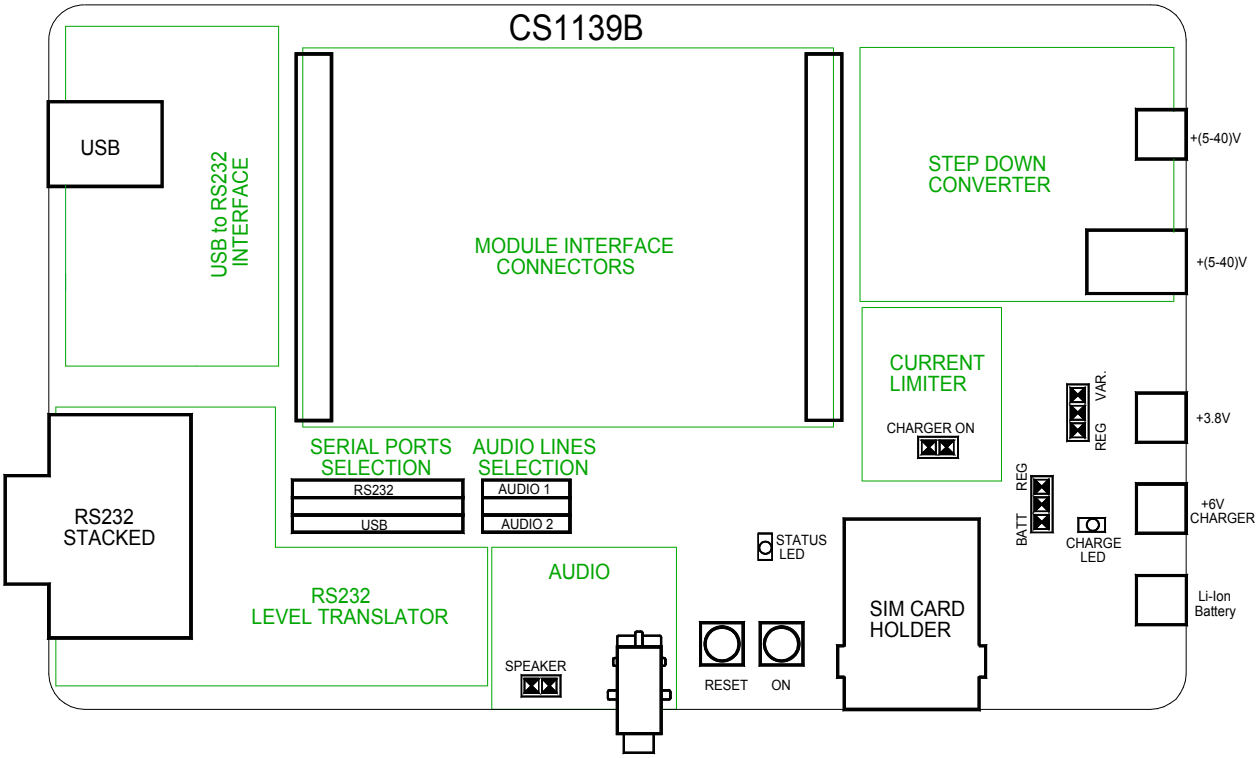


Figure 3: *CS1139B* circuital displacement

2.1. PCB characteristics

Material : FR4
Thickness: 0, 95 mm
Surface finishing: Chemical gold plate Ni 5um/ Au 0,1um

2.2. Mechanical characteristics of the assembled PCBs

2.2.1. Mother Board CS1139B

Length	100 mm (max 102,6 mm)
Width	160 mm (max 166,10mm)
Height	47,6 mm (included the support with columns)
Weight	200 gr (without any interface)

2.2.2. GM862 Interface CS1150B

Length	66,04 mm
Width	78,74 mm
Height	21,00 mm
Weight	27 gr (without the module)

2.2.3. GE863 Interface CS1151A

Length	75 mm (max 84,70mm)
Width	78,74 mm
Height	21,00 mm
Weight	40 gr (with module)
Weight	44,3 gr (with module for GPS version)

2.2.4. GE864 Interface CS1152B

Length	66,04 mm (max 75,20mm)
Width	78,74 mm
Height	21,00 mm
Weight	36 gr (with module)

2.2.5. GE864-GPS Interface CS1439B

Length	78.70 mm (max mm)
Width	83.70 mm
Height	21 mm

2.2.6. GC864 Interface CS1203B

Length	66,04 mm
Width	78,74 mm
Height	21,00 mm
Weight	27 gr (without the module)

2.2.7. GC864-C2 Interface CS1231X

Length	50,00 mm
Width	33,00 mm
Height	5,60 mm
Weight	13,8 gr (with module)

2.2.8. GE865 Interface CS1324A

Length	66,04 mm (max 75,20mm)
Width	78,74 mm
Height	21,00 mm
Weight	34 gr (with module)

2.2.9. GE865/SE867-AGPS Interface CS1433

Length	101.00 mm
Width	78.74 mm
Height	mm

2.2.10. GE865/JF2 Interface CS1521

Length	101,00 mm
Width	78,74 mm
Height	mm

2.2.11. GL865 Interface CS1431A

Length	66,04 mm (max 75,20mm)
Width	78,74 mm
Height	21,00 mm
Weight	34 gr (with module)

2.2.12. UC864-CC864 Interface KS0101C

Length	102,00 mm
Width	67,50 mm
Height	20,80 mm
Weight	55 gr (without module)

2.2.13. HE910 Interface CS1467D

Length	107,00 mm
Width	102,00 mm
Height	25,00 mm

2.2.14. GE910 Interface CS1467D

Length	107,00 mm
Width	102,00 mm
Height	25,00 mm

2.2.15. DE910 Interface CS1467D

Length	107,00 mm
Width	102,00 mm
Height	25,00 mm

2.2.16. CE910 Interface CS1467D

Length	107,00 mm
Width	102,00 mm
Height	25,00 mm

NOTE:

The overall height for every combination (mother board + interface board) is still the height of the mother board

3. Startup procedure

The motherboard factory setup is:

Serial port	**RS232**
DC source	**+ (5÷40) V / ≥ 1A**
Batt.Charger connector (PL106)	**On**
RX Amplifier	**Audio 1**

Respect the following order to use the EVK2:

- insert your SIM card
- set properly all jumpers in the desired position
- plug the module Interface board into PL201 and PL202
- connect the antenna to RF connector (on module or on Interface Board)
- connect the audio accessories if required
- plug the external power supply into the right socket, depending from DC source
- switch ON the power supply
- connect the serial cable between your PC and UART (RS232 or USB 1.1)
- push ON/OFF button on EVK Board for at least 5 seconds, on the XX910 form factor products, push ON/OFF button on Interface Board for at least 5 seconds until the STATUS LED is on

Your EVK2 should now be operational and ready to receive AT Commands.

NOTE:

When you use USB port, it is very important to respect the following sequences:

Start: first turning ON the EVK2 and then connecting it to the PC

Stop: first disconnecting the PC and then turning OFF the EVK2

4. Insertion of the Interface Boards

Every *Interface Board* must be inserted on *CS1139B* paying great attention to match the position of the main connectors; this has been made easy:

optically by a triangle drawn on both printed circuits (except CS1231X) ;
mechanically shifting a column out of regular square cross position.

Both guide systems are highlighted by orange color as shown on the next figure.

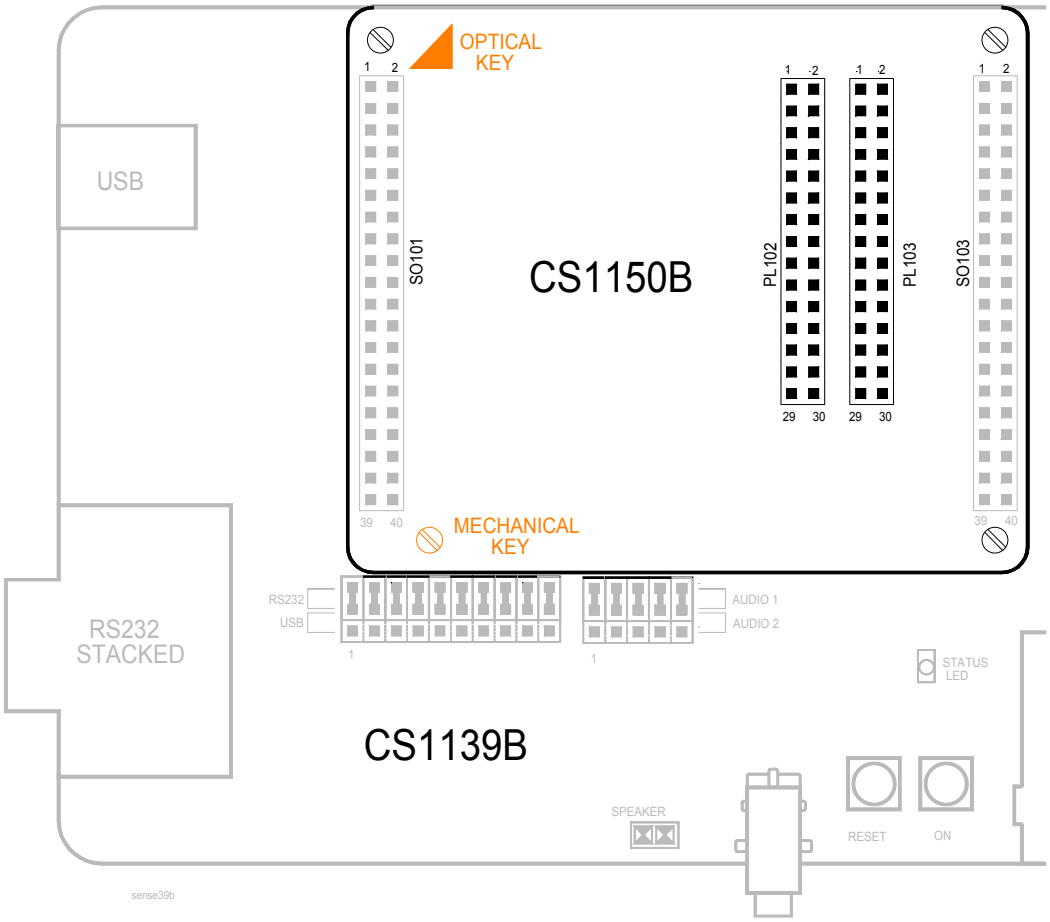


Figure 4: Positioning Guide Systems of *GM862 Interface Board* on CS1139B.

5. Power supply setting

The ***EVK2*** could be powered by different external sources, only one at time. The requested setting is made inserting the proper jumper connectors in the right position as described in the following paragraphs.
Be careful to the connections, even if every supply line is protected by a diode against "*polarity reversing*" and by a 0Ω resistor against "*short circuiting*".

5.1. Fixed DC source

Connect a **+3,8V / ≥ 2A** fixed DC source to PL101 respecting the polarization; short *pin2 & pin3 – PL104* and *pin1 & pin2- PL105* by *2 contacts jumper* connectors. No other jumpers are needed.

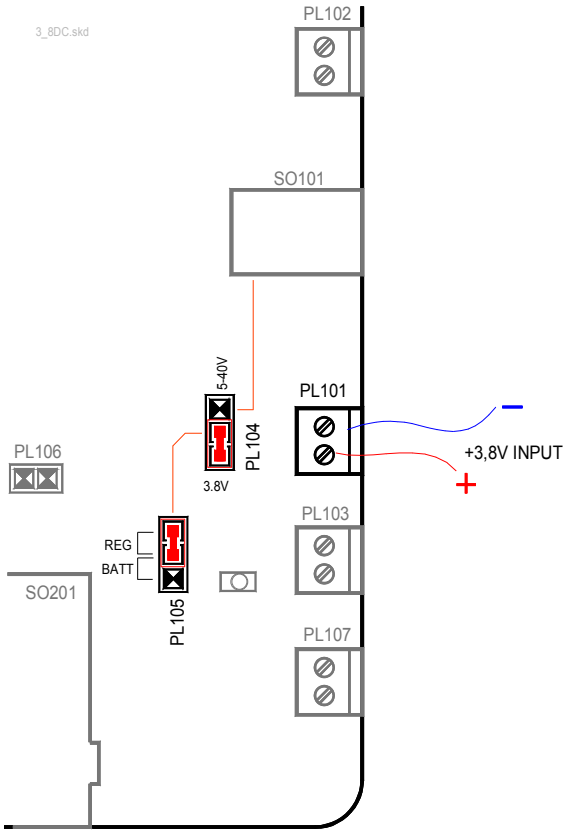


Figure 5: *+3,8V fixed* source setting

5.2. Variable DC source

Connect a ***+ 5÷40 V / ≥ 1A*** variable DC source to PL102 (*by wires*) or to SO101 (*by coaxial plug*), with care to the polarities. Short *pin1& pin2-PL104* and *pin1& pin2-PL105* by inserting 2 *contacts jumper* connectors.
No other jumpers are needed.

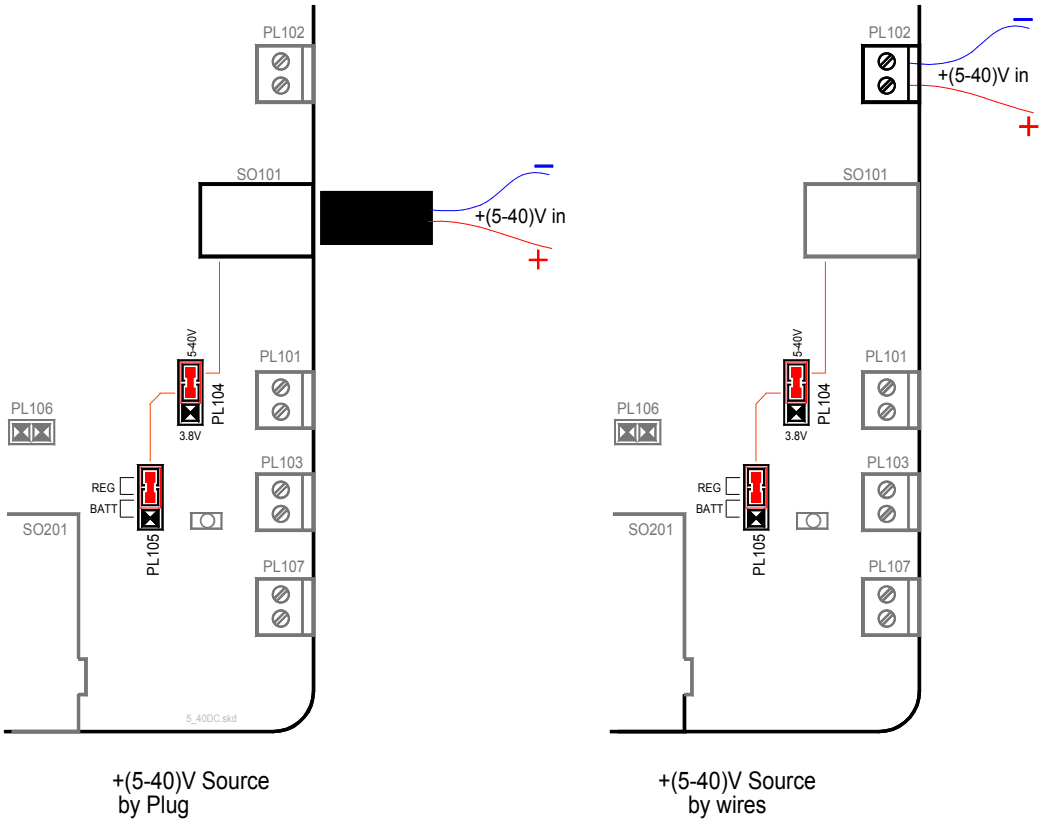


Figure 6: Variable DC source setting

NOTE:

It is useful set the variable DC source at 6V minimum to avoid problems with voltage drops due to the length of the wires or the conductors gauge.

5.2.1. Coaxial Plug

The figure 7 shows the connections of the Power Plug of left part of figure 6.

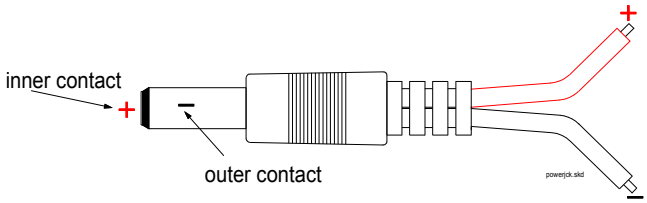


Figure 7: Coaxial "*Power Plug*" connection.

5.3. Li-Ion Battery pack and Charger

Connect a ***Li-Ion battery pack*** to PL107 with care to the polarity then short p*in 2*& *pin3*-PL105 by inserting the *2 contacts jumper* connector.
If the battery pack needs to be recharged, connect a ***+6V /≥ 0,5A*** fixed DC source to PL103, with care to the polarity; short PL106 inserting a *2 contacts jumper* connector as shown in figure 8: the yellow CHARGE LED will be on during the initial phase of charge. If you remove the battery pack when the charge stops (no current flows), immediately **REMOVE** also the jumper of PL106.

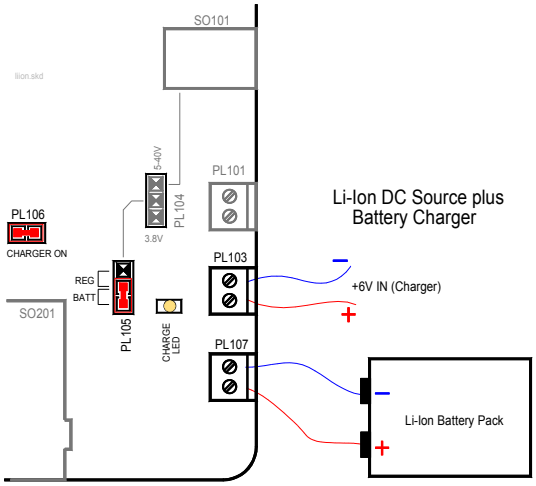


Figure 8: Battery Pack and Battery Charger wired connections and setting.

WARNING:

NEVER CONNECT any Battery Charging source to PL102 without connected Battery!!

5.4. Application Notes

5.4.1. Li-Ion Battery Pack

The 3.7V Li-Ion rechargeable Battery Pack should be connected directly to PL107 connector. Remember to use the connection cables as short as possible, with the appropriate conductors gauge and the other attributes, such as device power budget and cable flexibility, in order to match the specified voltage drop (especially during the high current absorption periods).
To obtain the best performance we suggest a capacity of ***1000 mAh*** (*not lower than 500 mAh*).

5.4.2. About Current Charger

With a ***+6V Current Unlimited Source*** connected to PL103 connector, the battery pack will be directly charged through *VBATT connector pins* of the Telit Modules, under control of the *Internal Charge Algorithm* (only on models where is implemented).
Depending of the size, the Li-Ion cell manufacturers suggest a charge current value not greater than *1,5C* (C= Capacity of the battery pack, expressed in mAh); even if a lower current means a longer charging time, a current equal to *0,5C* is considered to be a good choice.

With reference to the schematic diagram *30276SE11139A –sheet1*, the Current Limiting Circuit (*Q102, Q103, R106, R107, R108, R109, R110, R111, R112, R113, C105*) sets the maximum value of the Charge Current in respect to the law:

$$Ich = \frac{Vbe\ Q102}{R\ par} \rightarrow where$$

$$R\ par = //R110,\ R111,\ R112,\ R113$$

With the default values, the charge current will be ~ 470mA, which will charge Battery Packs with a capacity from 350mAh to 1000mAh, **without any dissipation problem**.

If a higher capacity Battery Pack is needed, you must increment the Time Out in the Telit Modules.

WARNING:

SET THE MAXIMUM VOLTAGE of the ***CURRENT UNLIMITED SOUCE*** lower then +8V.

6. Serial interface

The following figure shows the architecture of the serial ports.

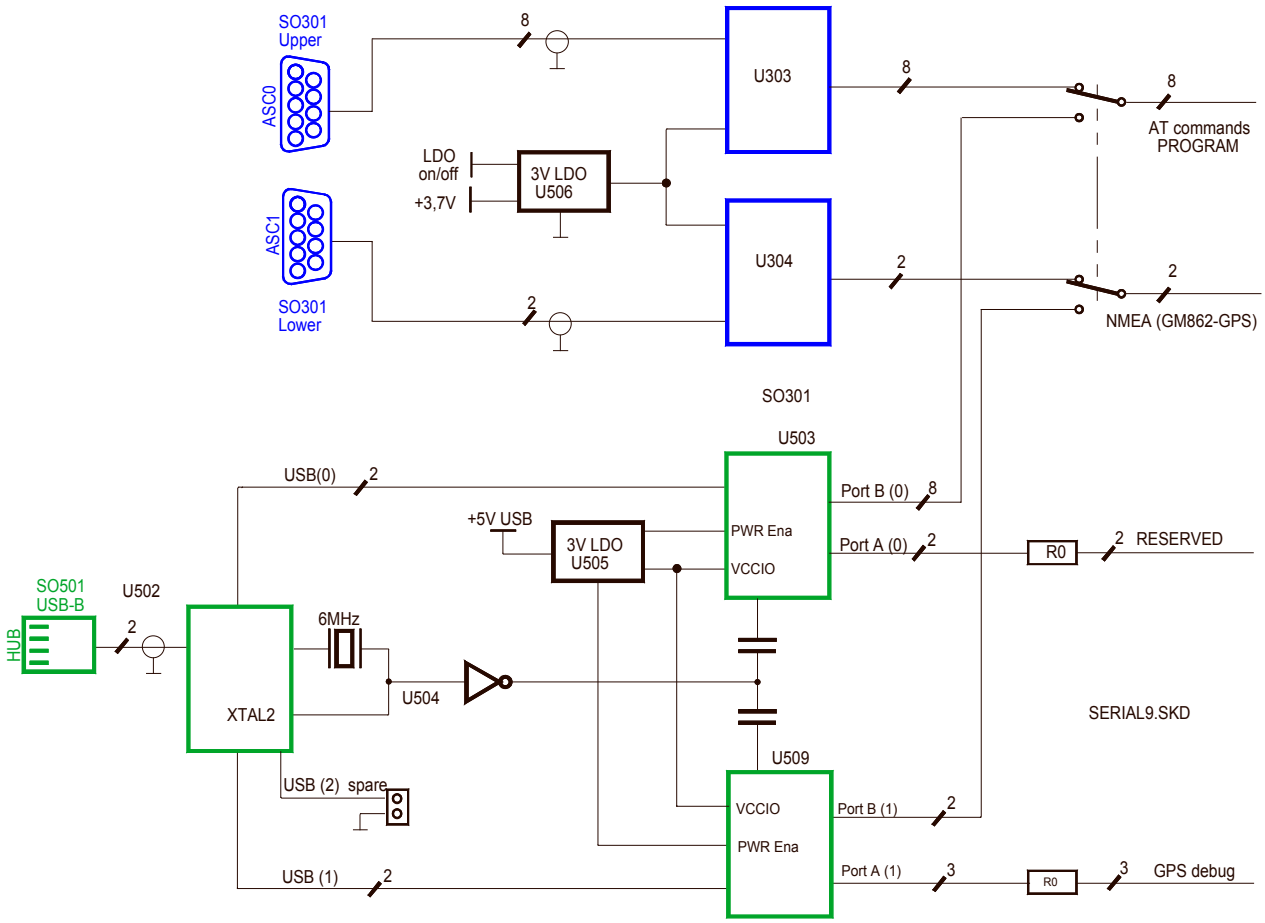


Figure 9: Serial ports block diagram.

6.1. Serial Port Setup

Communications between your application and the Telit modules are allowed connecting the DTE to the *Asynchronous Serial Interfaces* of Base-Band Chip, ASC0 and ASC1, through the *stacked standard RS232 communications port (double 9 way D-socket connector* at slow data rates of *RS232 protocol)* or *a standard USB-B Series receptacle* (*at higher data rates of USB1.1 specification through a CMOS HUB that realizes a multiple attachment point device*).

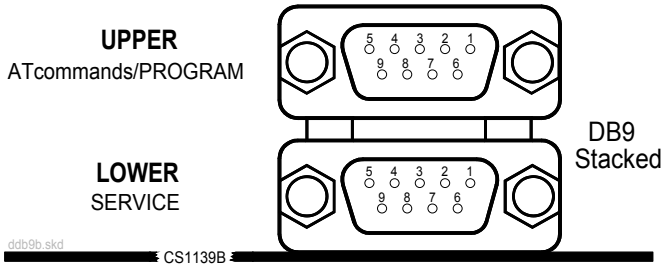


Figure 10: Double 9 way D-Socket Connector

The selection is made short circuiting *PL302&PL303* (*RS232 mode*) or *PL302&PL301* (*USB 1.1 mode*) by 10 pieces of *2 contacts jumpers*. This solution has been implemented because you can isolate every single line during the development.

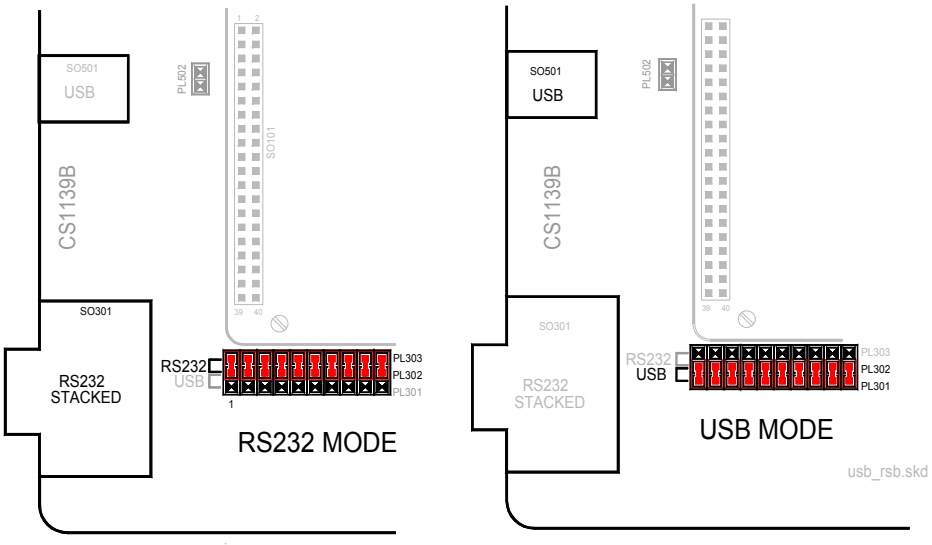


Figure 11: Serial Ports selection

7. Audio Section

7.1. Overview

The Base Band chip of the Telit's modules provides one or two (depends of model) audio paths both in receive and in transmit sections, which could be active only one at time.
To turn on your well-suited section on EVK2, please refer to "*AF Amplifiers Setting* "paragraph and followings.
To know which are the suggested performances of the EVK2 audio transducers, refer to "*Audio Accessories* "paragraph.

7.1.1. History

The Baseband chip of our modules was developed for the cellular phones, which needed two separated amplifiers both in RX and in TX section. A couple of amplifiers had to be used with internal audio transducers (Handset mode, *HS*) while the other couple of amplifiers must be used with external audio transducers (Handsfree mode, *HF*).

Transducers definitions:

Headsets are transducers that receive an electrical signal from a receiver and use speakers placed in close proximity to the ears to convert the signal into audible sound waves.
In the context of telecommunication, the word *Headset* is also commonly understood to refer to a combination of *Headphone* and *Microphone* used for two-way communication, like with a mobile phone.
Earphones are small Headphones that are placed directly outside of the ear canal, but without fully enveloping it. They are generally inexpensive and are favored for their portability and convenience.
Earpiece A part whether of a telephone receiver or hearing aid, that fits in or is held next to the ear.

7.2. Actual

The *HS* and *HF* definitions have been kept in the Software and on the schematics of the Telit modules, but with EVK2 we will refer to *Audio1* and *Audio2* section instead of *Handset* and *Handsfree* respectively, remembering that:

they can have fully equivalent electrical performances (*like the two microphone amplifiers*)
they can activate the same functionalities (*like the Echo Canceller module*)
they can offer slightly different performances (*like the two speaker buffering stages)*

7.2.1. The choice

The activation of the audio path is made Hardware by ***AXE*** line or Software by ***AT#CAP*** command.
If you don't have any load driving constraint (*like a speaker with an impedance coil lower than 16 ohm*), the choice between one or other "*block*" could be done without consideration related to the electrical performances; for example in order to overcome the PCB design difficulties.

7.3. Differential and Single Ended

7.3.1. Concepts

Any voltage can be characterized by a potential difference between two terminals.
The configuration of the two terminals and how the signal is delivered from output to input allows the signal to be more generally described in one of three ways:
Single-ended signal. This is a signal delivered between a signal trace and a ground. One terminal for a single-ended connection is always at fixed potential (*usually Ground*).
Differential Signals. These are signals that travel through a pair of traces. On the signal pair, neither of the terminals is Ground.
Common mode Signals. They represent a special case of differential signals, also travelling between a pair of traces, where the voltage potential on both signals is the same.

7.3.2. Benefits and disadvantages

Differential amplifiers are desirable to use, especially in audio applications where signal levels are very low such as those from microphones.
Classically, the benefits obtained from differential amplification are:

Increase of Common Mode Rejection Ratio (CMRR)
Differential inputs enable cancellation of any noise common on both inputs. Noise generated at the input of the amplifier has a greater effect than noise generated at the output, because any noise on the input is multiplied by the gain of the amplifier.
Increase Signal to Noise Ratio (SNR)
The inputs to the amplifier are especially sensitive to noise because they are typically not driven by a very low impedance source.
High Rejection in Electromagnetic Interference (EMI)
Noise immunity is very important in wireless phones because the RF signal is sent in bursts such that the frequency between bursts is in the audio band. RF rectification is such a problem that many manufacturers shield the audio portion of the phone.
Double Useful signals level
The signal levels from microphone and the voltage swing to the load are doubled. Then the AF power to the load it is 4 times the single-ended Afpower at the same voltage supply.
No output blocking capacitor is needed
Even if the differential outputs are biased at half-supply; no DC voltage exists across the load. You do not need the big, expensive and heavy blocking capacitors (generally from 33 µF to 1000 µF), lowering the cost and saving PCB space
There is no frequency limiting effect due to the high pass filter network created with the speaker impedance and the coupling capacitance.
Less shielding is required from amplifier to load

Mainly we have only one disadvantage using differential amplification: the routing of one more signal line could be more difficult and the additional trace requires more board space.

7.3.3. Settings

Connecting your accessories to *SO401 in/out connector,* you will implement Single Ended Input/Output configurations.
Removing all *2 contacts jumpers* inserted between *PL402&PL403* or *PL403&PL404,* the *in/out lines* of our modules will be directly available on *PL402* and *PL404* connectors.
In such a way, you will be able to implement fully Differential Input/Output configurations.
Only with GC864-QUAD/PY-C2 modules the *Ear output* lines are AC coupled.

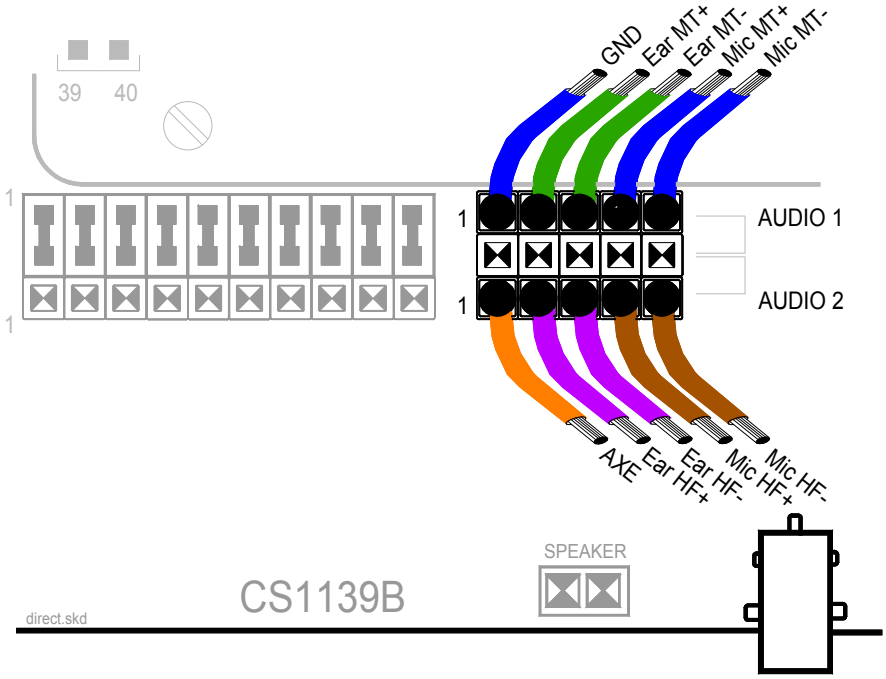


Figure 12: PL402 and PL404 Fully Differential audio lines.

8. AF Amplifiers Setting

The *Base Band Processor Audio Amplifiers* selection is made short-circuiting *PL403&PL402* (*RX Amplifier 1*) or *PL403&PL404* (*RX Amplifier 2*). In such a way you could verify the complete performance of both audio paths.

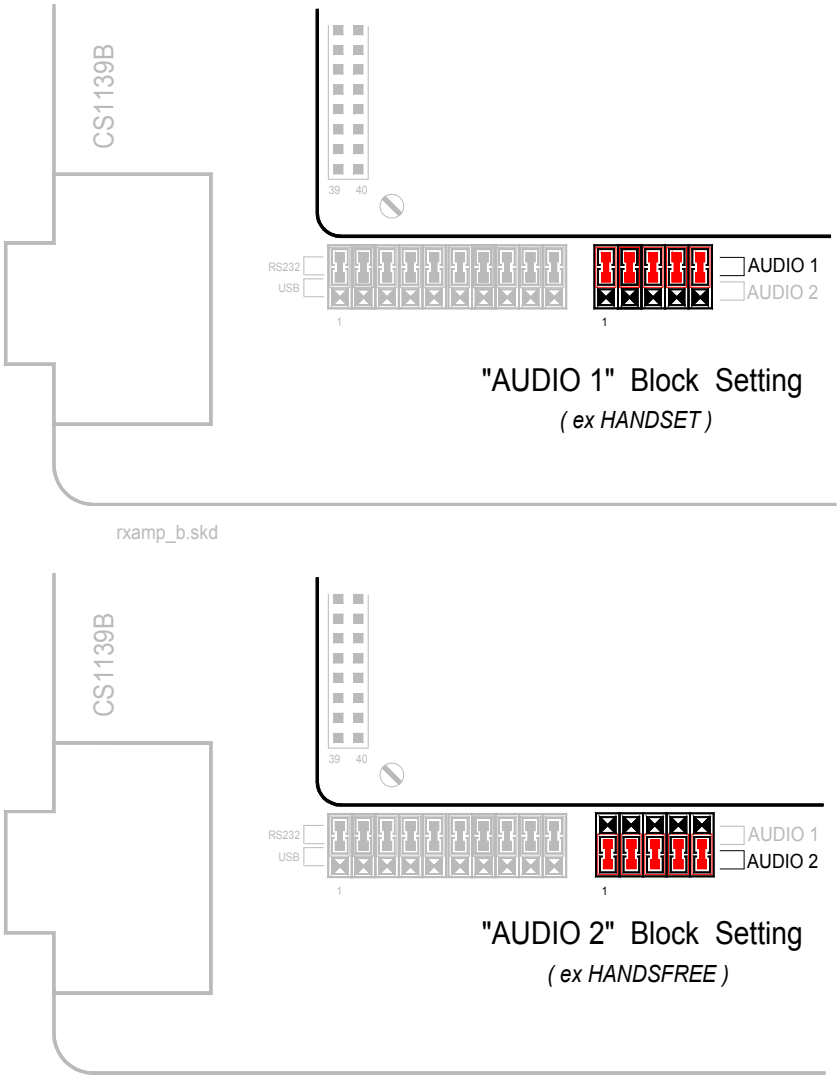


Figure 13: Base Band Audio Amplifiers selection

9. Audio outputs

The EVK2 output audio signals could be drive a device connected to *SO401* (LOW AF POWER mode) or to *PL401* (HIGH AF POWER mode).

9.1. Low AF Power Mode

Inserting the *2 contacts jumpers* as explained at paragraph 9A, a standard *off-the-shelf Headset* should be connected to the *SO401* (*3 contacts, 2.5mm diameter jack connector*).
With such an insertion, the Telit Modules will power the Microphone through a Single Ended input circuit and the Earpiece through a Single Ended/ AC coupled output circuit.

NOTE:

The acoustic performance of the *Headset* (*frequency response, loudness*) largely depends by its housing, fitting and acoustic impedance.

The coil impedance of the Headset should be higher than 15 ohm @ 1KHz.

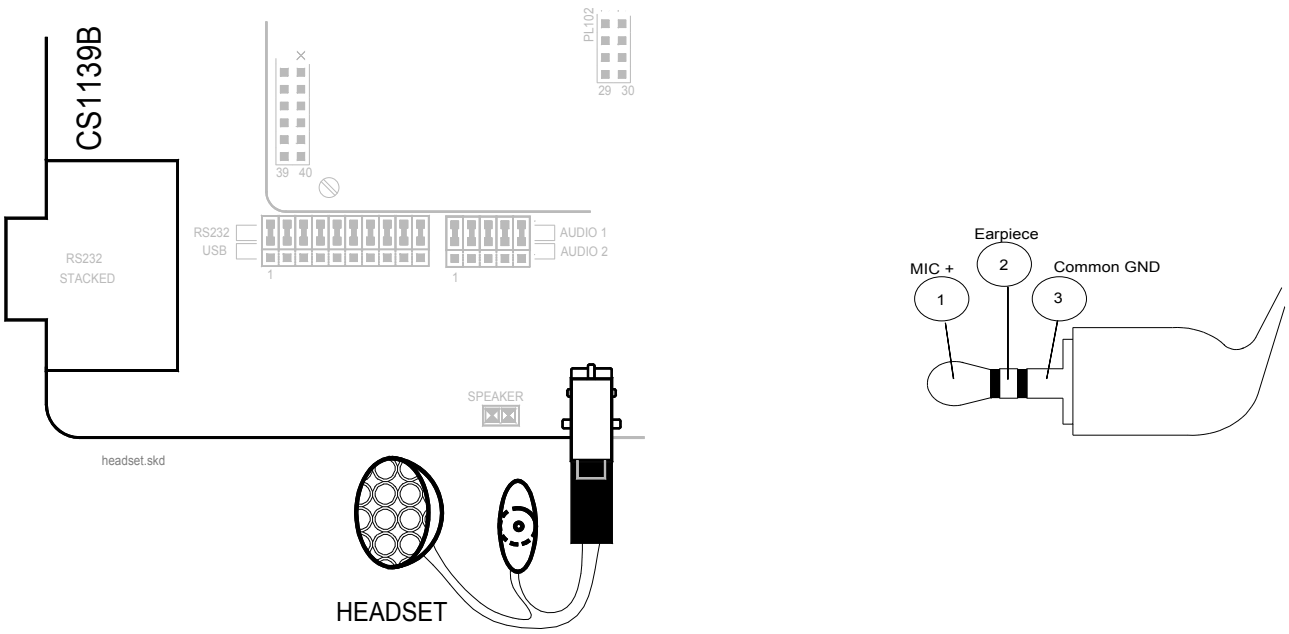


Figure 14: Headset insertion

9.2. High AF Power Mode

Connecting an ***8 ohm*** Speaker to PL401 by a 2 contacts female connector, you could drive it through the 500mW Power Amplifier.
In this case the Speaker will be driven in fully differential configuration, with no side connected to ground and without any output coupling capacitor. Therefore care must be taken because there is DC voltage on both sides of the Speaker.
The overall gain of this amplifier can be modified varying the ratios R406/R404 and R407/R410:

$$A_v = 2 \bullet \frac{R404}{R406} = 2 \bullet \frac{R407}{R410}$$ if R404=R407 and R406=R410

NOTE:

The coil impedance of the Speaker should be higher than 8 ohm @ 1KHz .

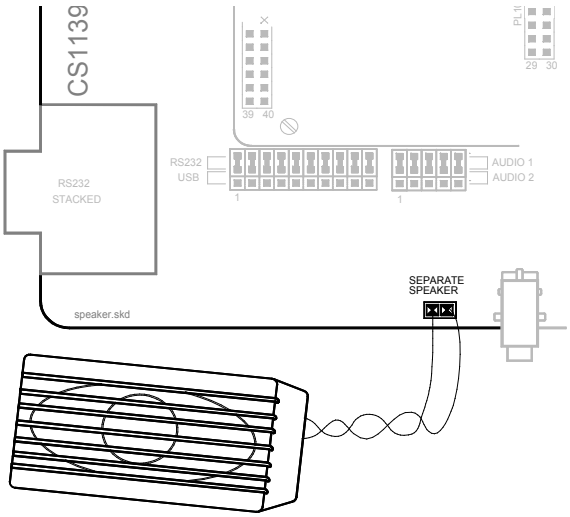


Figure 16: Speaker insertion

9.2.1. Speaker and Stand-alone Microphone

If you are using a Speaker, you can connect a *stand-alone electrete microphone* by a coaxial 2,5mm plug to SO401, respecting the following pin-out.

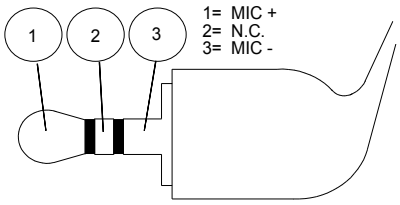


Figure 17: Microphone Plug Connection

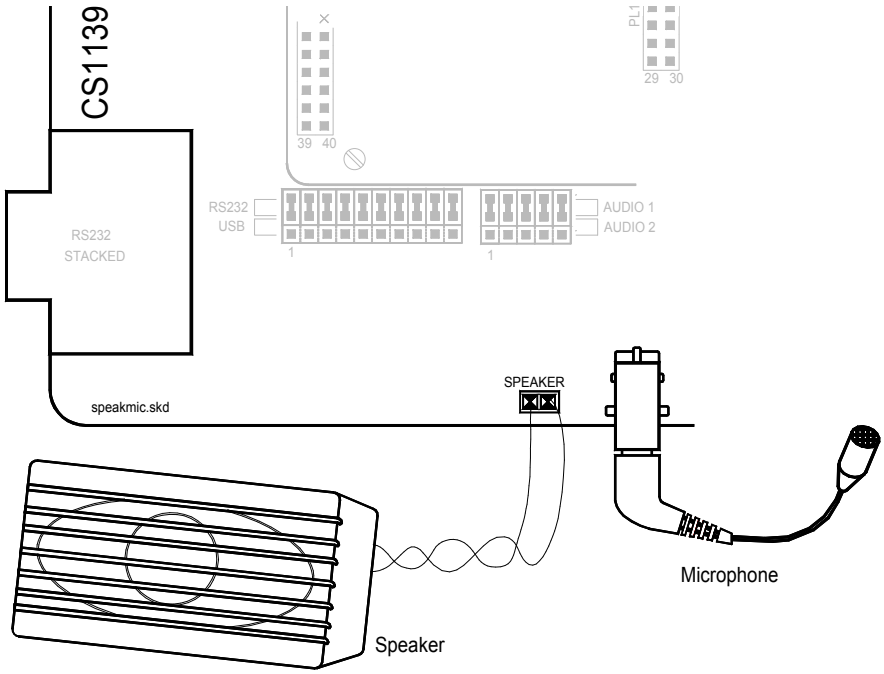


Figure 18: Speaker & Microphone case insertion

9.2.2. Speaker plus Headset

If you have chosen to connect the Speaker to *HIGH AF POWER* output, without having a stand-alone electret microphone, it is also possible to connect a standard *off-the-shelf Headset* to SO401 without any problem, as shown in the figure 18: the AF output signal will be heard on both Speaker and Earpiece.

WARNING:

You must use the right coil impedance depending from audio output you want to use.

If you sort out the LOW AF POWER solution connecting your Headset to SO401, the coil impedance ***must be at least 16Ω@1KHz* or *higher.***

If you sort out the HIGH AF POWER solution connecting your Speaker to PL401, the coil impedance ***must be at least 8Ω@1KHz* or *higher***

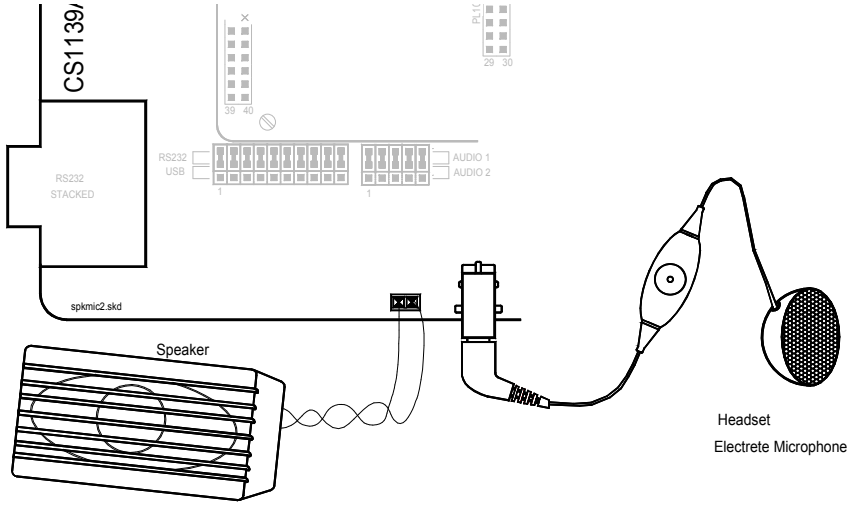


Figure 19: Speaker plus Headset insertion

10. Audio Accessories

The following tables show the suggested specification to obtain the best performance from *off-the-shelf* accessories.

10.1. Headset

Nominal sensitivity	-45dBV$_{rms}$/1Pa (+/- 3dB)
Line coupling	AC
Nominal Voltage	2V
Range of Using Voltage	(1÷10)V
Consumption Current	(150÷500) µA
Impedance	2,2KΩ
Signal to Noise Ratio	56dB /1KHz/1Pa (A curve)
Inner EMI capacitor between terminals	10pF, 33pF

Table 2: Microphone electrical characteristics

Rated Input Power	5mW
Maximum Input Power	20mW
Coil Impedance	32Ω ± 5Ω @ 1kHz
SPL	95±3 dB @ 1KHz/1mW sine wave
Resonance frequency (Fo)	< 350Hz
Useful Bandwidth	Fo ÷ 8000 Hz @ -3dB

Table 3: Earpiece electrical characteristics

10.2. Stand-alone microphone

Nominal sensitivity	-45dBV$_{rms}$/1Pa (+/- 3dB)
Line coupling	AC
Nominal Voltage	2V
Range of Using Voltage	(1÷10)V
Consumption Current	(150÷500) µA
Impedance	2,2KΩ
Signal to Noise Ratio	56dB /1KHz/1Pa /A curve
EMI capacitor between terminals	10pF, 33pF

Table 4: Microphone electrical characteristics

10.3. Speaker

Rated Input Power	500 mW
Maximum Input Power	1W
Coil Impedance	≥ 8Ω
SPL	≥ 85±3 dB @ 1KHz
Resonance frequency (Fo)	< 350Hz
Useful Bandwidth	Fo ÷ 8000 Hz @ -3dB

Table 5: Speaker electrical characteristics

11. Indication and services

11.1. Optical Indicators

11.1.1. Status Led

It is a debug aid that shows information on the network service availability and Call status.

LED status	Device Status
Permanently off	Device off
Fast blinking (period 1s, Ton 0,5s)	Net search / Not registered / turning off
Slow blinking (period 3s, Ton 0,3s)	Registered: full service
Permanently on	A call is active

Table 6: STAT_LED indications

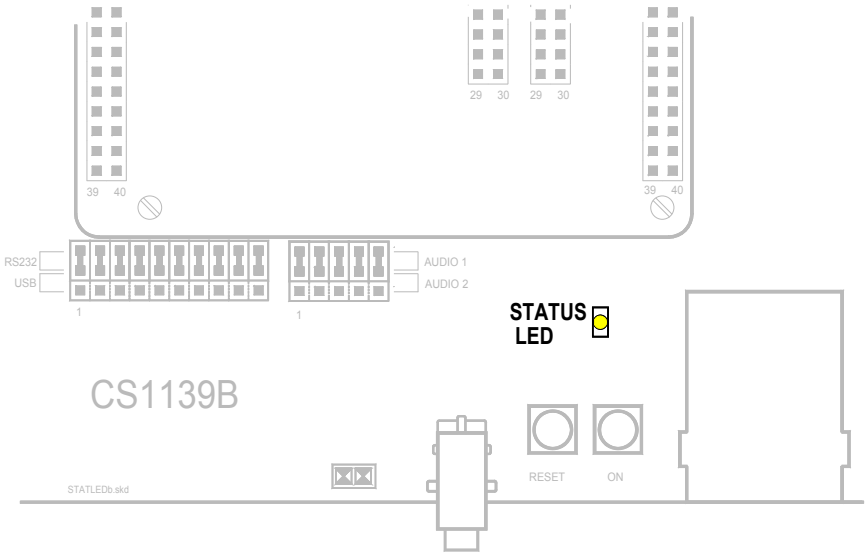


Figure 20: STAT_LED position

11.1.2. CHARGE Led

A yellow LED is used as *Charge In Act* Indicator, as explained in the following table.

CHARGE LED	Meaning
Always on	Start Charge/ Hugh current Charge in act
Always off	Low current Charge in act/Charge stop

Table 7: CHARGE LED indications

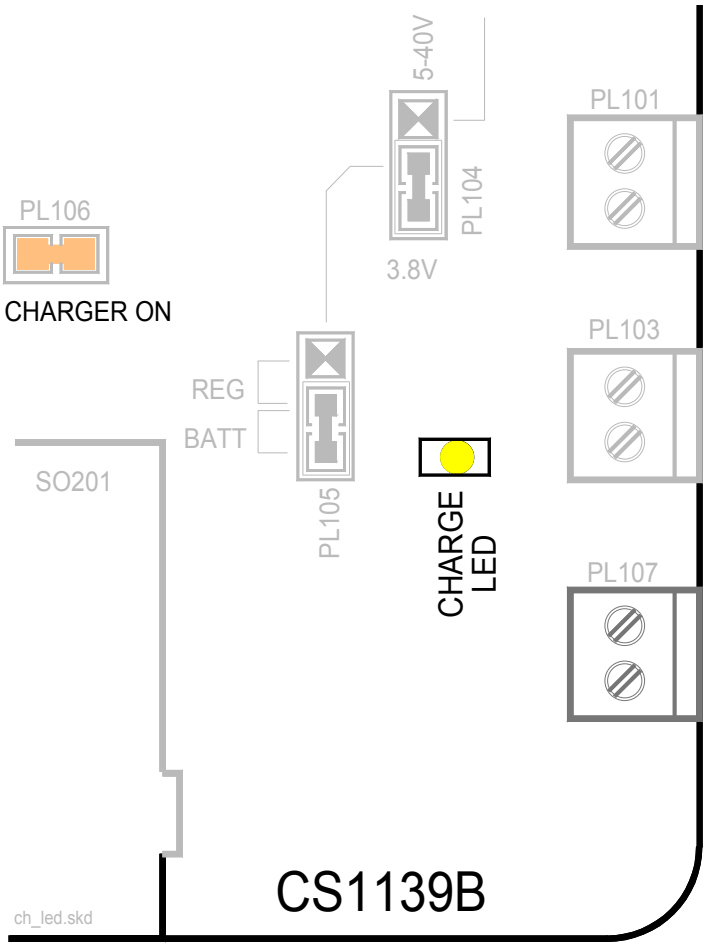


Figure 21: CHARGE LED position

11.2. Switches

You *turn On/Off* or *Reset* the EVK2 by 2 push buttons.

11.2.1. POWER ON Switch

Push ON/OFF button on **EVK Board** for at least 5 seconds, on the XX910 form factor products, push ON/OFF button on **Interface Board** for at least 5 seconds until the STATUS LED starts to slowly blink (*ON state*) or stops to blink (*OFF state*).

11.2.2. RESET Switch

Whenever the RESET SWITCH is pressed, you could reset the Telit module in use.
When the device is reset, it stops any operation without doing any detach operation from the network where it is registered and it reboots after the release of the Reset Switch.
This behavior is not a proper shut down because any GSM device is requested to issue a detach request at turning off. For this reason the Reset pressing action must not be used to normally reboot/shutting down the device, but only as an emergency exit in the rare case the device remains stuck waiting for some network response.
The RESET is internally controlled at start-up to achieve always a proper power-on reset sequence, so there is no need to control this pin on start-up. It may only be used to reset a device already on that is not responding to any command.

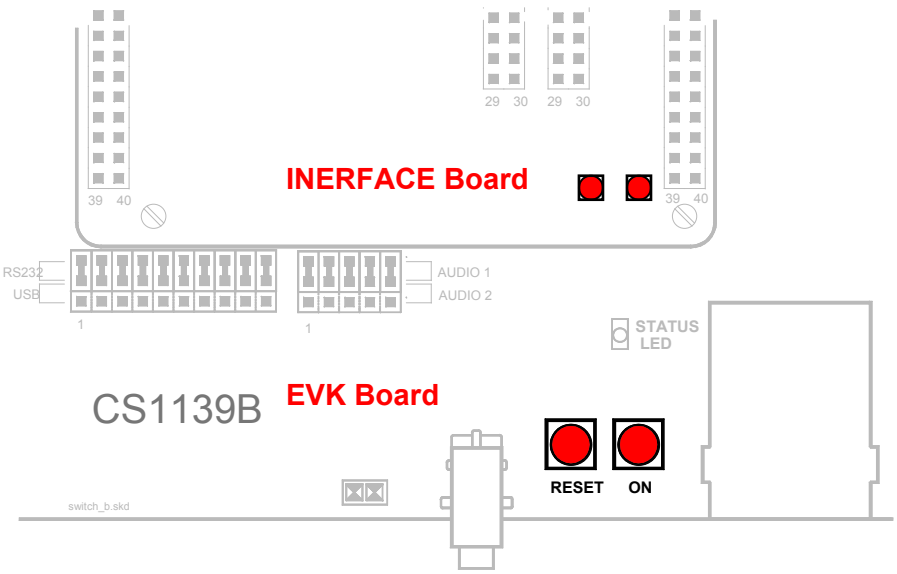


Figure 22: SWITCHES position

12. Connectors pinout

12.1. Motherboard to Module

The connections between CS1139B and every Telit module Interface Board are made through two *40 pin male* connectors. Theirs pin functions are listed in the following tables.

Pin	Signal	Type	Function
1	NC[1]		
2	TX_Trace	Digital Output	to RS232 or USB level translators
3	RX_Trace	Digital Input	from RS232 or USB level translators
4	IIC_SDA_HW	Digital In/Out	from/to USB level translators
5	GND	DC voltage	Power
6	IIC_SCL_HW	Digital Input	from USB level translators
7	SSC0_CLK	Digital Output	to USB level translators
8	SSC0_MTSR	Digital In/Out	from/to USB level translators
9	SSC0_MRST	Digital In/Out	from/to USB level translators
10	NC		
11	GND	DC voltage	Power
12	GND	DC voltage	Power
13	GND	DC voltage	Power
14	GND	DC voltage	Power
15	C109/DCD	Digital Output	to RS232 or USB level translator
16	C104/RXD	Digital Output	to RS232 or USB level translator
17	C103/TXD	Digital Input	from RS232 or USB level translator
18	C108/DTR	Digital Input	from RS232 or USB level translator
19	GND	DC voltage	Power
20	C107/DSR	Digital Output	to RS232 or USB level translator
21	C105/RTS	Digital Input	from RS232 or USB level translator
22	C106/CTS	Digital Output	to RS232 or USB level translator
23	C125/RING	Digital Output	to RS232 or USB level translator
24	NC		
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

[1] DO NOT CONNECT

32	EAR_MT+	AC Out Voltage	Audio
33	AXE	DC voltage	INT/EXT Switching
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

Table 8: PL201-CS1139B

Pin	Function	Type	NOTES
1	VBATT	DC voltage	Power
2	VBATT	DC voltage	Power
3	VBATT	DC voltage	Power
4	VBATT	DC voltage	Power
5	GND	DC voltage	Power
6	GND	DC voltage	Power
7	GND	DC voltage	Power
8	GND	DC voltage	Power
9	CHARGE	DC voltage	Power
10	CHARGE	DC voltage	Power
11	GND	DC voltage	Power
12	GND	DC voltage	Power
13	GND	DC voltage	Power
14	GND	DC voltage	Power
15	ON_OFF*	DC voltage	Pull up to VBATT
16	NC		
17	RESET*	DC voltage	Module Reset
18	NC		
19	NC		
20	NC		
21	STAT_LED	Open Collector	Status Indicator LED
22	NC		
23	NC		
24	NC		
25	GND	DC voltage	Power
26	GND	DC voltage	Power
27	GND	DC voltage	Power
28	GND	DC voltage	Power
29	NC		
30	NC		
31	SIMIO	3V Only	SIM Data I/O
32	SIMCLK	Digital Signal	SIM Clock
33	SIMRST	DC voltage	SIM Reset

34	SIMVCC	DC voltage	SIM Power
35	SIMIN	DC voltage	SIM inside detector
36	NC		
37	NC		
38	GND	DC voltage	Power
39	GND	DC voltage	Power
40	GND	DC voltage	Power

Table 9: PL202-CS1139B

13. Module Interface Boards

13.1. Generality

You can use your **EVK2** with see **APPLICABILITY LIST** Telit modules fitted on its own *Interface Board;* all connections are made through *2x40 contacts* connectors.
It's 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.

For more information refer to Telit Product Description

13.2. Short Description

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.

13.3. Further Accessories for GPS version

When test the GPS products, besides the content of the single kits you need the accessories listed in below table.

SMA/MMCX cable adapter	Module under test	Interface Board	GPS Antenna
1ff1400073tlb		P/N	1rr0100071tlb
1	GM862-GPS	3990250670	1
-	GE863-GPS	3990250671	1
-	GE864-GPS	TBD	1
-	SE867-AGPS	TBD	1
-	HE910	3990250829	1

Table 11. GPS versions further accessories.

14. GM862 Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GM862 can be insert.
No settings are needed.

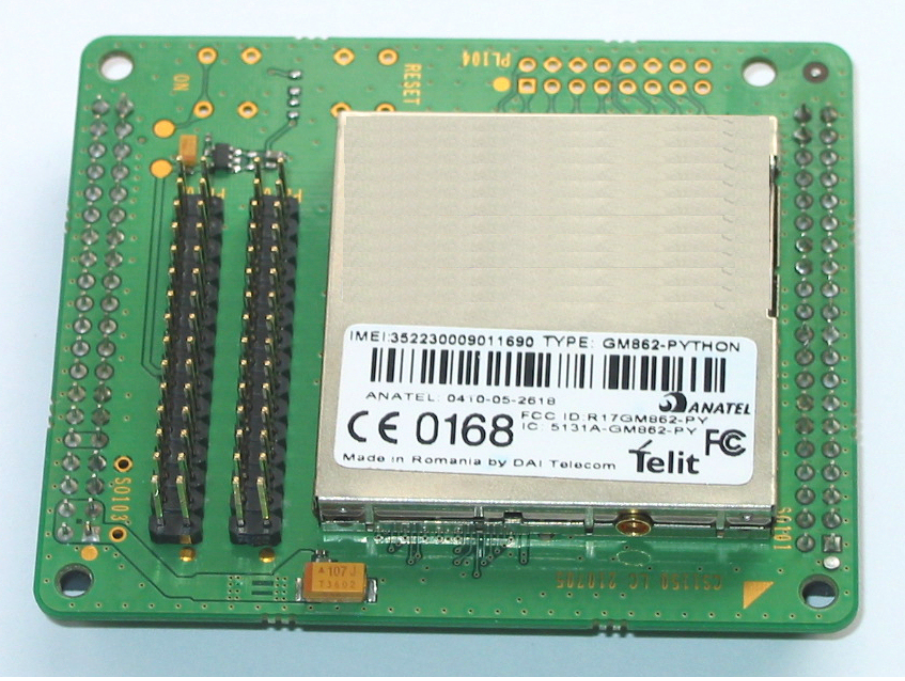


Figure 23. GM862 Interface Board

14.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

RESET Button
ON Button;
STATUS LED and its load resistance.

14.2. Interface connectors

The following connectors are available:

2 male connectors (30 pins each one: PL102, PL103), on which it is possible to connect external devices like user's application, Telit extension boards, measurements equipment or other tools
2 female connectors (40 pins each one: SO101, SO102), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines).

14.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GM862 INTERFACE	1
ASSEMBLED CABLE L–250 RG174 TERMINALS SMA F & MMCX 90 M	1

Table 12.

15. GE863 Interface

This board allows easily interfacing the GE863 modules with the EVK2 and testing their functionalities;

Figure 24. GE863 Interface Boards: GE863-QUAD or GE863-SIM (at left) and GE863-GPS (at right)

15.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount also:

the SIMCARD Holder;
the RESET Button
the ON Button;
the STATUS LED and its load resistance.

15.2. Content of the kits

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

15.2.1. GE863-PY/QUAD version

Description	Quantity
GE863 INTERFACE BOARD	1
2 PIN JUMPER FEMALE CONN	2

Table 13

15.2.2. GE863-GPS version

Description	Quantity
GE863–GPS INTERFACE BOARD	1
2 PIN JUMPER FEMALE CONN	2

Table 14

15.2.3. GE863-SIM version

Description	Quantity
GE863-SIM INTERFACE BOARD	1
2 PIN JUMPER FEMALE CONN	2

Table 15

15.3. Interface connectors

The following connectors are available in any version:

GSM RF connector (*SMA Female*)
2 male connectors (4 pins each one: PL101, PL102) to select the Serial port configuration
2 female connectors (40 pins each one: SO101, SO106) to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines)
2 male connectors (*30 pins each one: PL103, PL104*), on which it is possible to connect external devices like user's application, Telit extension boards, measurements equipment or other tools

15.4. Additional components for GPS version

The following components are available only in GPS version (P/N 3990250671):

GPS RF connector (*SMA Female*)
USB B-type connector and its circuitry (*see schematic 30276SE11151A*)

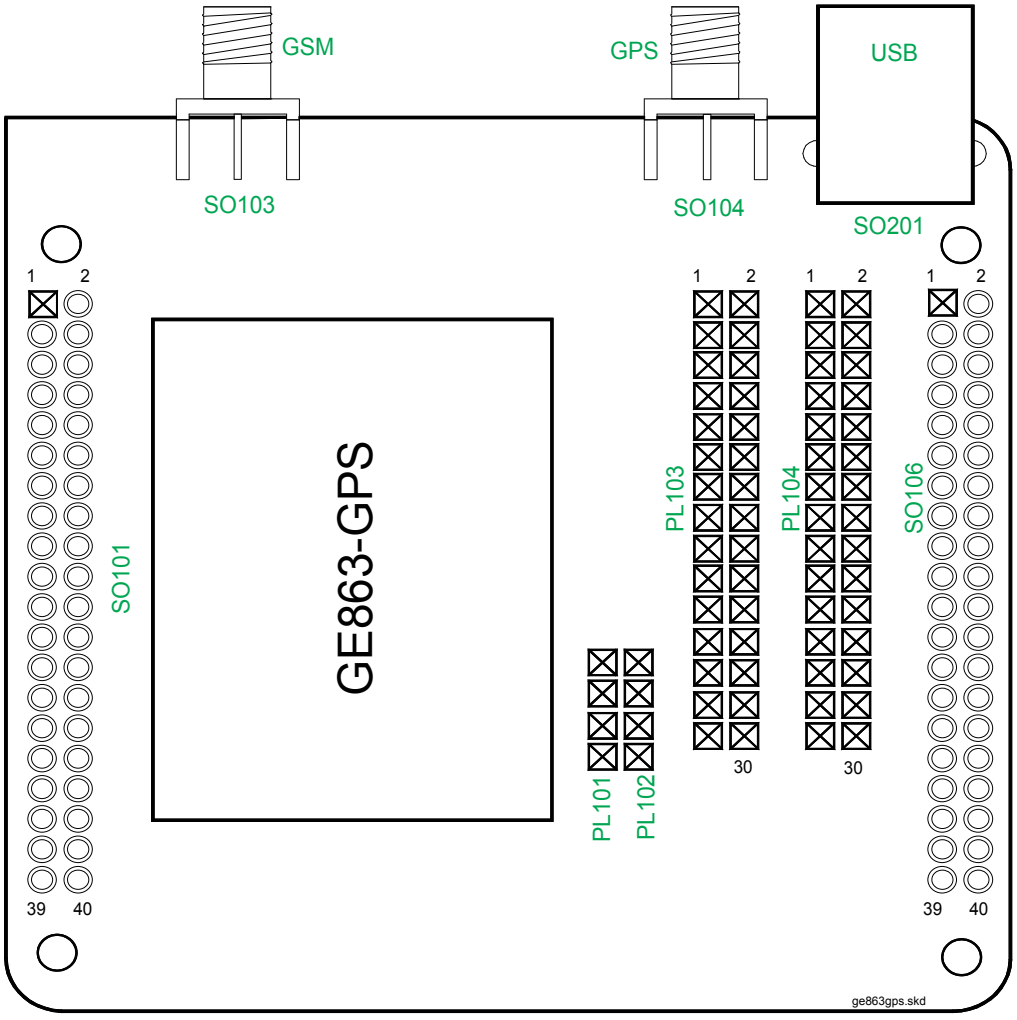


Figure 25: Connectors displacement on GE863-GPS

15.5. USB connector

The USB interface provides 2 serial ports that are related to the *NMEA* serial port and *SIRF-Binary* serial port of GE863-GPS module.
It is possible to select if the *SIRF Binary* serial port will be available on the USB connector or directly connected to the second serial port of the modem (***CONTROLLED MODE***).
For setting refer to paragraphs 16.7.1, 16.7.2.1, 16.7.2.2.

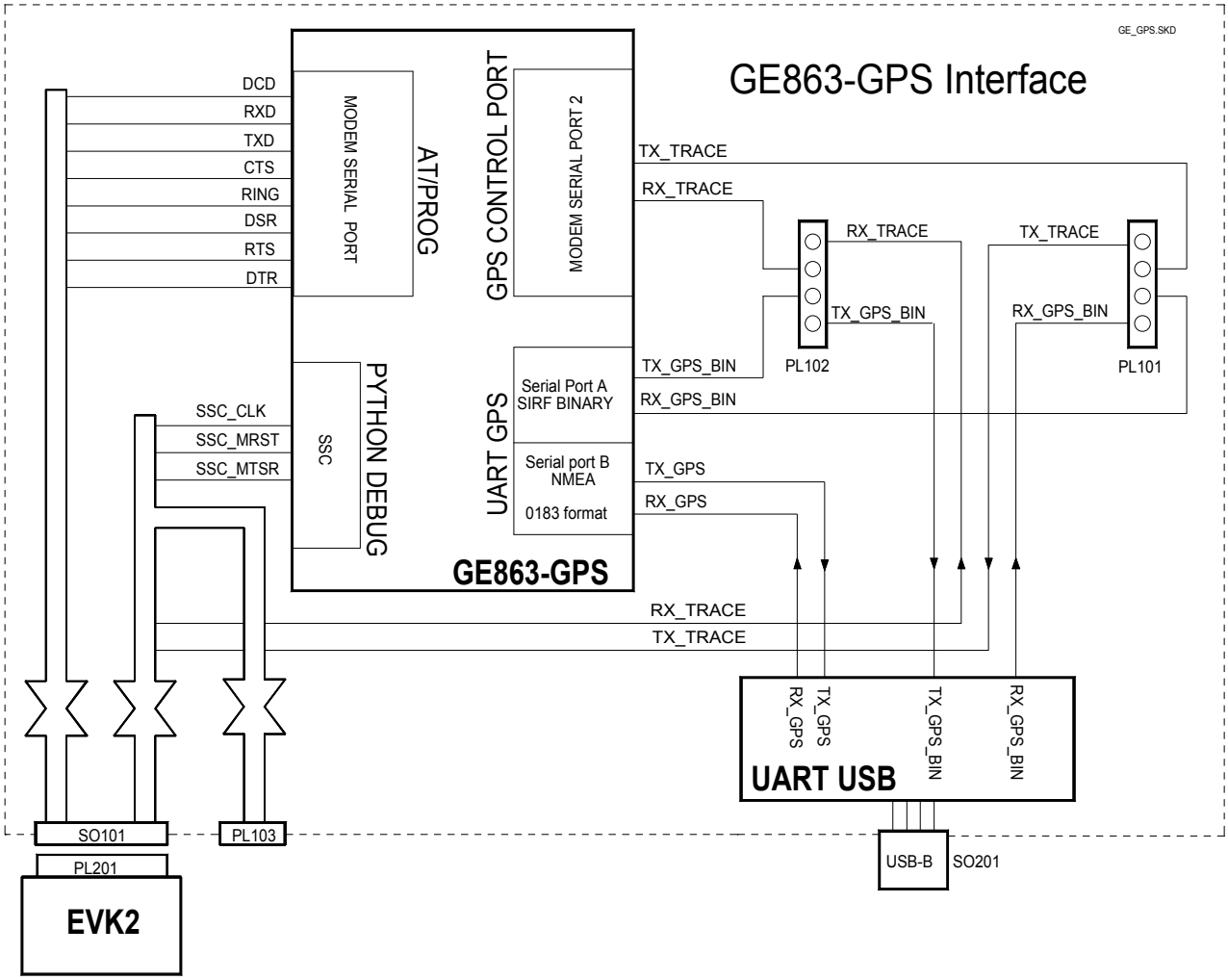


Figure 26: GE863-GPS Serial ports block diagram

15.6. Serial port configuration

To switch the serial lines you must short-circuit the PL101-PL102 connectors by 2 contacts jumpers.

15.6.1. GE863-PY/QUAD

The 2 contacts jumpers have to be fitted between ***pin1&pin2*** of PL101-PL102 connectors. This carries out the *Python Debug Port* on Trace Port of EVK2.

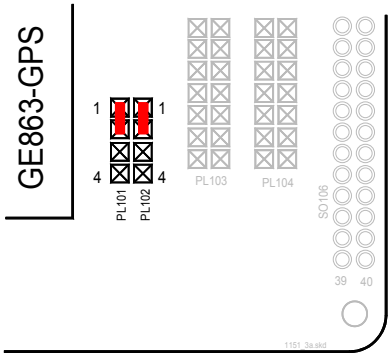


Figure 27: Jumpers setting for GE863-PY/QUAD

15.6.2. GE863 – GPS

The 2 contacts jumpers have to be fitted between ***pin2&pin3*** or **pin3*&pin4*** of PL101-PL102 connectors.

"CONTROLLED MODE"

This set the *SIRF Binary* to serial port of the modem. (*Typical application Design*)

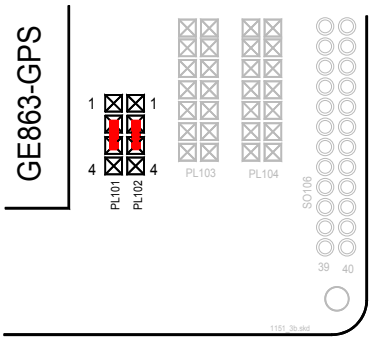


Figure 28: Jumpers setting for SIRF BINARY port connected to MODEM port 2

NOTE: *All AT GPS commands* are available in this configuration

"SEPARATED SERIAL PORT"
This set the *SIRF Binary* available on the USB connector.

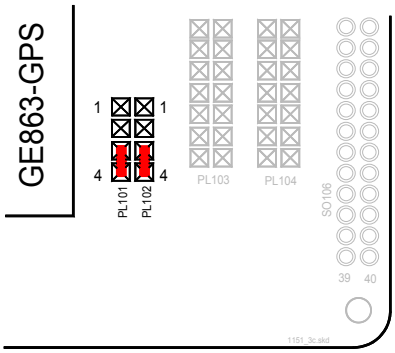


Figure 29: Jumpers setting for SIRF BINARY port available on USB connector

NOTE:

In this configuration soma AT GPS commands are not available. Refer to AT Commands Reference User Guide.

15.7. ANTENNA connectors

15.7.1. GPS ANTENNA connector

An active GPS antenna should be connected to SO104; the GPS section provides the DC feeding.

WARNING:

Don't connect a *GSM* antenna on this connector

15.7.2. GSM ANTENNA connector

A GSM antenna should be connected to SO103.

15.7.3. RFU ANTENNA connector

On PCB there is the mounting possibility of a further RF connector (*SO105*): it is related to future implementation.

16. GE864 Interface

This board allows easily interfacing the GE864 modules with the EVK2 and testing their functionalities;
No settings are needed.

Figure 30. GE864 Interface Board

16.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

- the SIMCARD Holder;
- the RESET Button
- the ON Button;
- the STATUS LED and its load resistance.

16.2. Interface connectors

The following connectors are available:

2 male connectors (30 *PTH pins each one: PL102, PL103*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
2 female connectors (40 PTH pins each one: SO101, SO102), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);

16.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GE864 INTERFACE	1

Table 16

17. GE864-GPS Interface

This board allows testing the functionalities and performance of the GE864-GPS module.

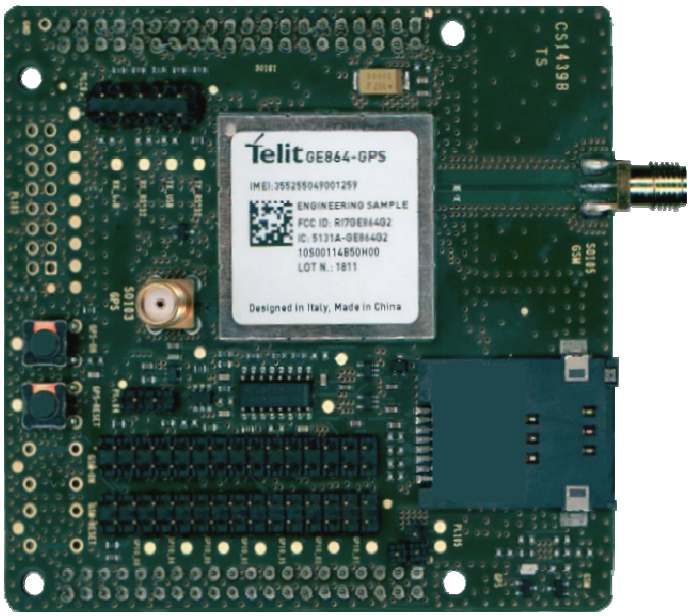


Figure 31. GE864-GPS Interface Board

17.1. Part numbering

This board comes in three different configurations, each characterized by its own part number, depending on the module it contains. In the following paragraphs we will refer to them using an identifier according to the table below:

Part number	Identifier	Module mounted
3990250820	cs1439b	cs1479
3990250821	cs1439b-A	cs1446
3990250822	cs1439b-B	cs1485a

Table 17

17.2. Stand-alone setup

The interface can be used without the EVK2, in this case the following components have to be soldered on the board:
the GSM-RESET button
the GSM-ON button
the STATUS led and its load resistor.

17.3. Interface connectors

The following connectors are available:

2 male connectors (*30 PTH pins each: PL101 and PL102*), to connect external devices, user's applications, Telit extension boards, measurement equipment or other tools; PL102 can also be used to select particular configurations between the GSM module's GPIOs and the GPS module
2 female connectors (40 PTH pins each one: SO101 and SO104), to connect the interface to the EVK2 mother board (power supply lines, serial in/out lines, audio in/out lines)
1 male connector (*3 PTH pins: PL104*), to select an enable signal for the external GPS LNA
1 male connector (*2 PTH pins: PL105*), in order to allow inserting an ammeter in series with the supply, in order to monitor the module's current consumption
1 GSM RF connector (*SMA Female: SO105*)
1 GPS RF connector (*SMA Female: SO103*)
1 JTAG connector (*PL103, not mounted*)
1 male connector (*12 PTH pins: PL201*), to select one of the available configurations for the Serial and USB ports.

17.4. Contents of the kit

Please check out the contents of your interface kit. If any of the following items is missing, contact your Telit supplier.

Description	Quantity
GE864-GPS INTERFACE	1
JUMPERS	13

Table 18

17.5. Power supply

The module (but not the whole interface) receives its power supply from PL105: this jumper must always be plugged in, except when a series measurement instrument is needed.

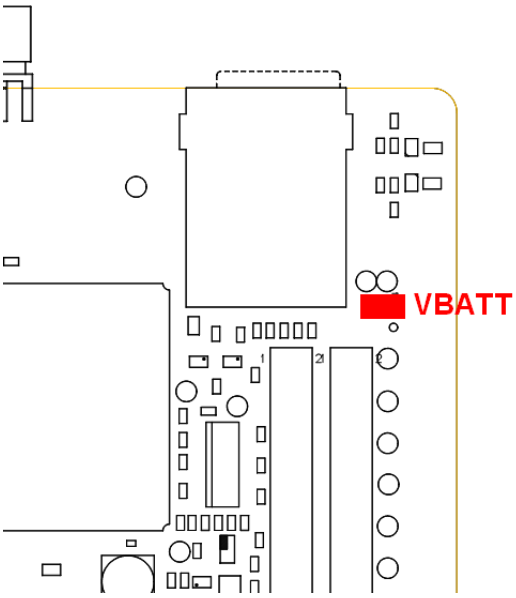


Figure 32. Jumper for VBATT.

17.6. GPS external LNA enable signal

The module contains an internal LNA for the GPS antenna that is enabled by default. The user can though decide to use an external LNA: this option is selected by means of a software command, which puts the internal LNA in a low gain mode and provides an additional signal to enable the external LNA. The interface can provide a bias for the external LNA, and the user can choose whether to enable it by this signal or to leave it always enabled, by means of a jumper on PL104, as shown in the picture below.

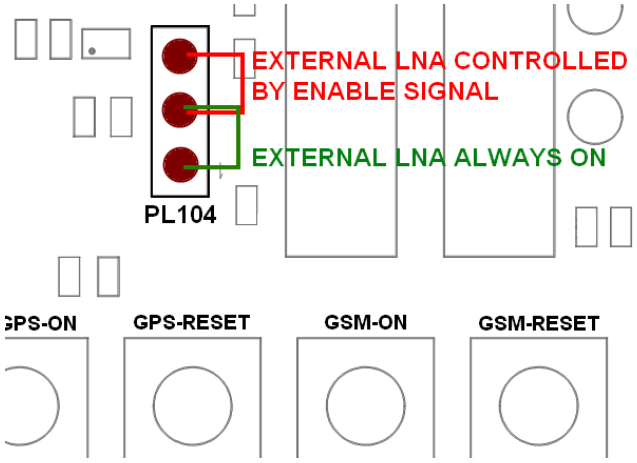


Figure 33. Jumper on PL104.

17.7. Serial port configuration

By means of proper jumper connections on PL201, three different configurations for serial outputs can be selected. These configurations are mutually exclusive.

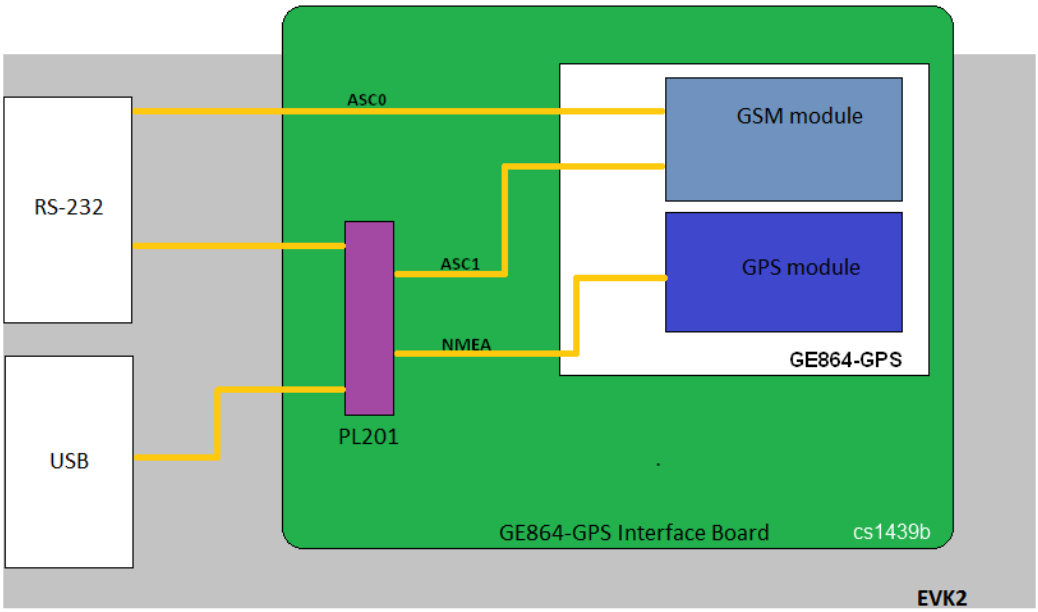


Figure 34. GE864-GPS Interface Board serial connections

17.7.1. ASC1 to RS-232

This configuration connects the ASC1 UART to the Trace serial connector of the EVK2.

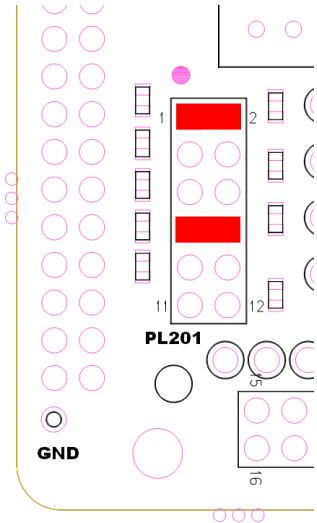


Figure 35. ASC1 to RS-232 (Trace) configuration

17.7.2. GPS to ASC1 (internal host controlling configuration)

This configuration directly connects the host GSM module to the GPS receiver, thus setting the GPS receiver in Controlled Mode.

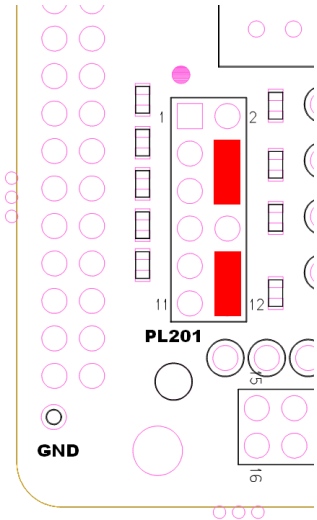


Figure 36. GPS to ASC1 configuration

WARNING:

Other than the ASCII UART, the user must also connect the host module's GPIOs to the corresponding signals of the GPS receiver (as explained in the next paragraphs).

17.7.3. GPS to RS-232 (external host controlling configuration)

This configuration allows sending the GPS output to the Trace serial connector of the EVK2.

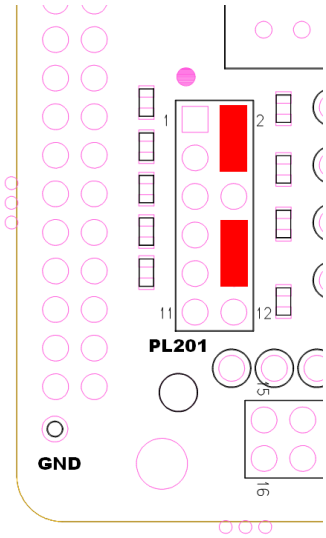


Figure 37. GPS to RS-232 (Trace) configuration

17.7.4. GPS to USB

The NMEA sentences can be redirected to EVK2's USB port by setting PL201 as explained in the Figure 37, i.e. connecting the NMEA line with the RS-232, and at the same time setting the EVK2 serial line on USB Mode, as shown in Paragraph 7.1 of this document.

17.8. GPIO settings

The interface allows choosing among different options for driving the GPS control signals:
Using the GPIOs of the GSM module
Using an external host
Manually controlling the signals by plugging a jumper.
The last option is not available for every signal and every configuration; please refer to the schematics of the interface for more details.
The choice among the options can be made by PL102, as detailed below.

17.8.1. Internal host controlling configuration

The following settings on PL101 and PL102 allow selecting the internal host configuration.
Two different cases have to be considered:
cs1439b-A
cs1439b and cs1439b-B
Refer to the beginning of this chapter for the correspondence between board part number and mounting options.

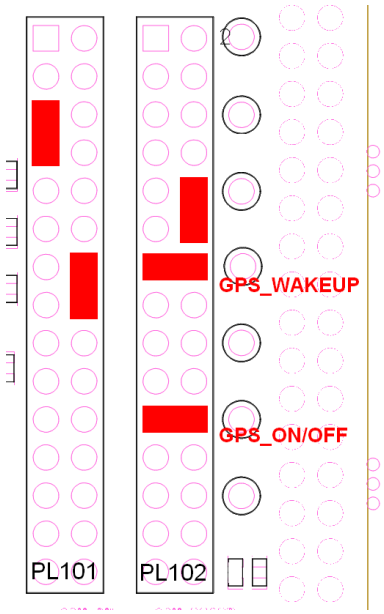


Figure 38. Settings for PL101 and PL102: internal host,**cs1439b-A**

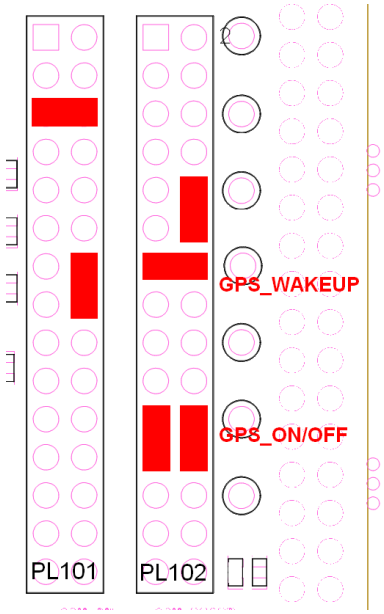


Figure 39. Settings for PL101 and PL102: internal host, **cs1439b** and **cs1439b-B**

Note that jumper settings are detailed in the pictures above.
The signal connected to **pin10** of PL102 is no longer available, and it is recommended to tie it to ground by plugging a jumper between **pin10 & pin12** of PL102.

17.8.2. External host controlling configuration

When an external host is used to drive the GPS module, two different cases have to be considered:
cs1439b-A
cs1439b and **cs1439b-B**
Refer to the beginning of this chapter for the correspondence between board part number and mounting options.
Two jumpers must be plugged, between **pin14 & pin16** of PL101 and **pin10 & pin12** of PL102. Additionally, the host GPIOs must be connected to PL102 as shown in the pictures below.
Note that in this configuration the signal on **pin10** of PL102 is no longer available and it must be connected to ground by plugging a jumper on **pin10 & pin12** of PL102.

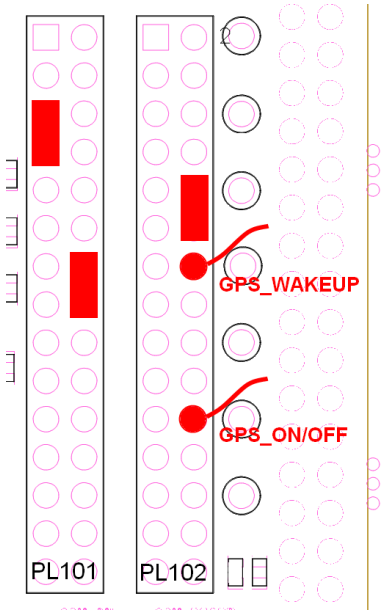


Figure 40. Settings for PL101 and PL102: external host, **cs1439b-A**.

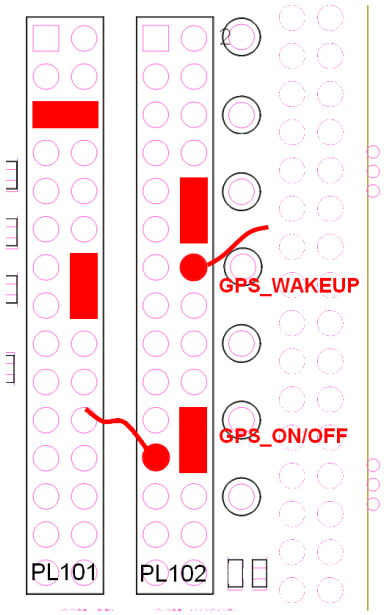


Figure 41. Settings for PL101 and PL102: external host, **cs1439b and cs1439b-B**.

17.9. Antenna connectors

17.9.1. GSM antenna connector

A GSM antenna must be connected to SO105.

17.9.2. GPS antenna connector

A GPS antenna must be connected to SO103.

WARNING:

Don’t connect a *GSM* antenna on this connector

18. GE865 – SE867 AGPS Interface

This board allows testing the functionalities and performance of the GE865 and SE867 modules interconnected according to Telit guidelines.

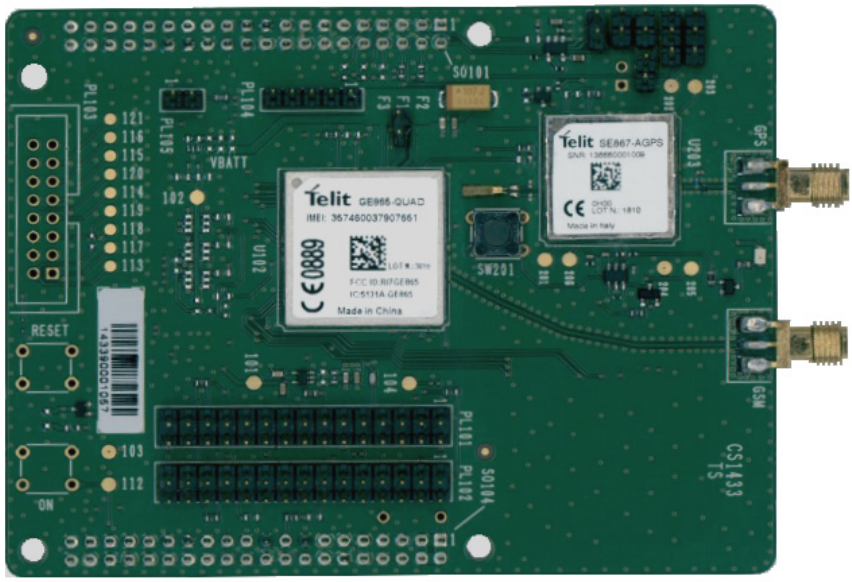


Fig.38. GE865/SE867-AGPS Interface Board

18.1. Stand-alone setup

The interface can be used without the EVK2, in this case the following components have to be soldered on the board:
the RESET button
the ON button
the STATUS led and its load resistor.

18.2. Interface connectors

The following connectors are available:

2 male connectors (*30 PTH pins each: PL101 and PL102*), to connect external devices, user's applications, Telit extension boards, measurement equipment or other tools
2 female connectors (40 PTH pins each one: SO101 and SO104), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines)
1 male connector (5 PTH pins: PL104), which makes available in one place all GPIOs related to PCM
1 GSM RF connector (*SMA Female: SO103*)
1 GPS RF connector (*SMA Female: SO201*)
1 JTAG connector (*PL103, not mounted*)
2 male connectors (*2 PTH pins: PL203, PL205, not mounted*), which allow to manually control some functions, therefore freeing the corresponding GPIOs for other uses
1 male connector (*2 PTH pins: PL204*) by means of which the user can manually disable VIN_GPS
4 male connectors (*2 PTH pins: PL202, PL207; 3 PTH pins: PL201, PL206*) to select one particular UART connection configuration.

18.3. Contents of the kit

Please check out the contents of your interface kit. If any of the following items is missing, contact your Telit supplier.

Description	Quantity
GE865/SE867-AGPS INTERFACE	1
JUMPERS	5

Table 19

Serial connections

By means of proper jumper connections on PL201, PL202, PL206, and PL207, three different configurations for serial outputs can be selected.

18.3.1. GSM to GPS (GSM controlling configuration)

This configuration is achieved by plugging a female jumper connector on **pin1 & pin2** of both PL201 and PL206. It allows to connect the GE865 UART with SE867-AGPS UART, thereby putting the board in the so-called controlled mode. No connection with the EVK2 RS-232 Trace is present.

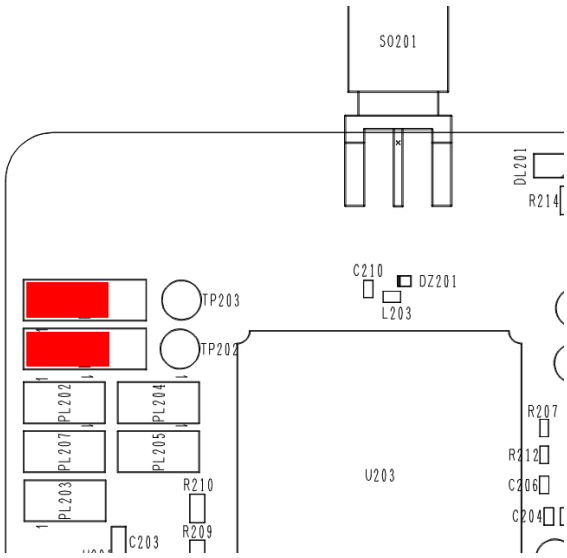


Figure 43. Jumpers in controlled mode configuration.

18.3.2. GSM to Trace

This configuration is realized by plugging a female jumper connector on **pin2 & pin3** of both PL201 and PL206. It allows redirecting the GE865 UART to the EVK2 RS-232 Trace. No connection with the SE867 UART is present.

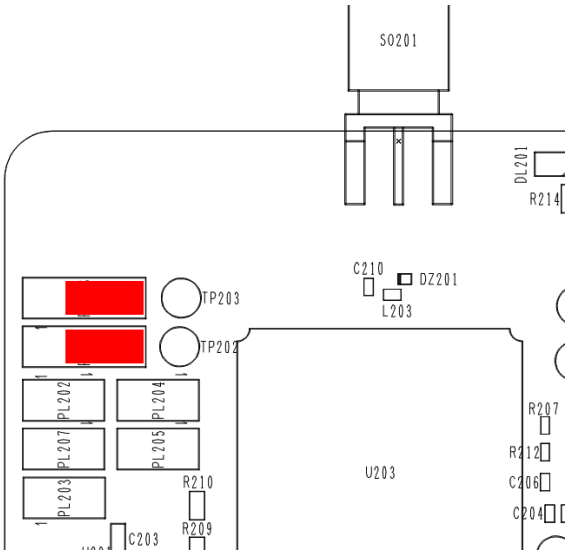


Figure 44. Jumpers in GSM to Trace configuration.

18.3.3. GPS to Trace(external host controlling configuration)

This configuration is achieved by plugging two female jumper connectors on PL202 and PL207. It allows redirecting the SE867 UART to the EVK2 RS-232 Trace. No connection with the GE865 UART is present.

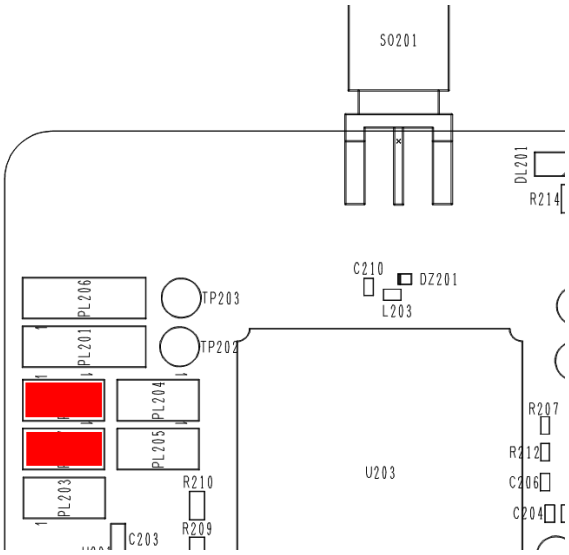


Figure 45. Jumpers in GPS to Trace configuration.

18.4. Antenna connectors

18.4.1. GSM antenna connector

A GSM antenna must be connected to SO103.

18.4.2. GPS antenna connector

A GPS antenna must be connected to SO201.

WARNING:

Don’t connect a *GSM* antenna on this connector

19. GE865 – JF2 Interface

This board allows testing the functionalities and performance of the GE865 and JF2 modules interconnected according to Telit guidelines.

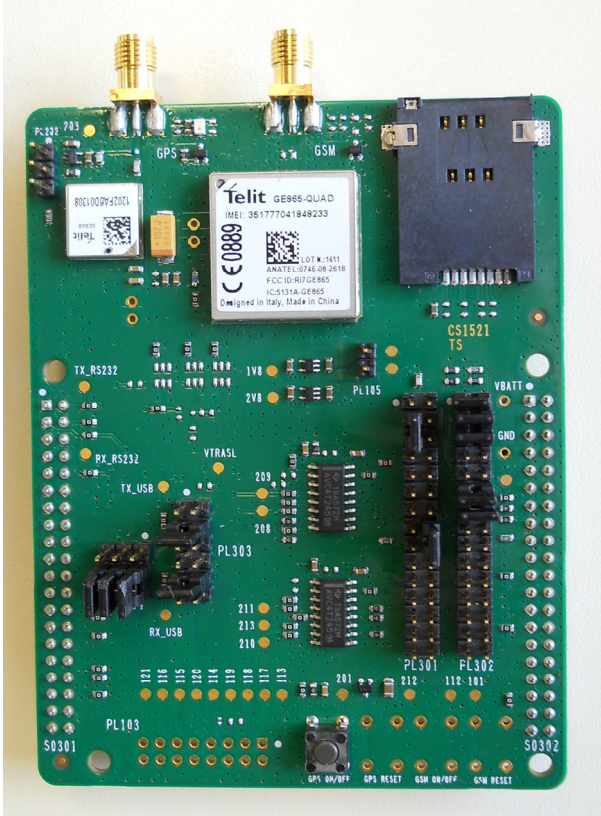


Figure 46.GE865/JF2 Interface Board.

19.1. Stand-alone setup

The interface can be used without EVK2 and in this case the following components have to be soldered to the board:
- RESET button
- GSM ON/OFF button
- GSM STATUS led and its load resistor

19.2. Interface connectors

The following connectors are available:
- 2 male connectors (*30 PTH pins each: PL301 and PL302*), to connect external devices, user's applications, Telit extension boards, measurement equipment or other tools; PL301 can also be used to select particular configurations between the GSM module's GPIOs and the GPS module
- 2 female connectors (40 PTH pins each one: SO301 and SO302), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines)
- 1 GSM RF connector (*SMA Female: SO105*)
- 1 GPS RF connector (*SMA Female: SO201*)
- 1 JTAG connector (*PL103, not mounted*)
- 1 male connector (*3 PTH pins: PL202*), to select an enable signal for the external GPS LNA,
- 1 male connector (*12 PTH pins: PL303*), to select one of the available configurations for the Serial and USB ports.
- 1 male connector (*2 PTH pins: PL105*), that can be used to insert an ammeter in series with the supply, in order to monitor the module's current consumption,
- 1 male connector (*9 PTH pins: PL304*), in order to set the data format between USB or SSC0 lines to send to EVK2.

19.3. Contents of the kit

Please check out the contents of your interface kit. If any of the following items is missing, contact your Telit supplier.

Description	Quantity
GE865/JF2 INTERFACE	1
JUMPERS	15

Table 20

19.4. Power supply

The GE865 module (but not the whole interface) receives its power supply from PL105: this jumper must always be plugged on except when a series measurement instrument is needed.

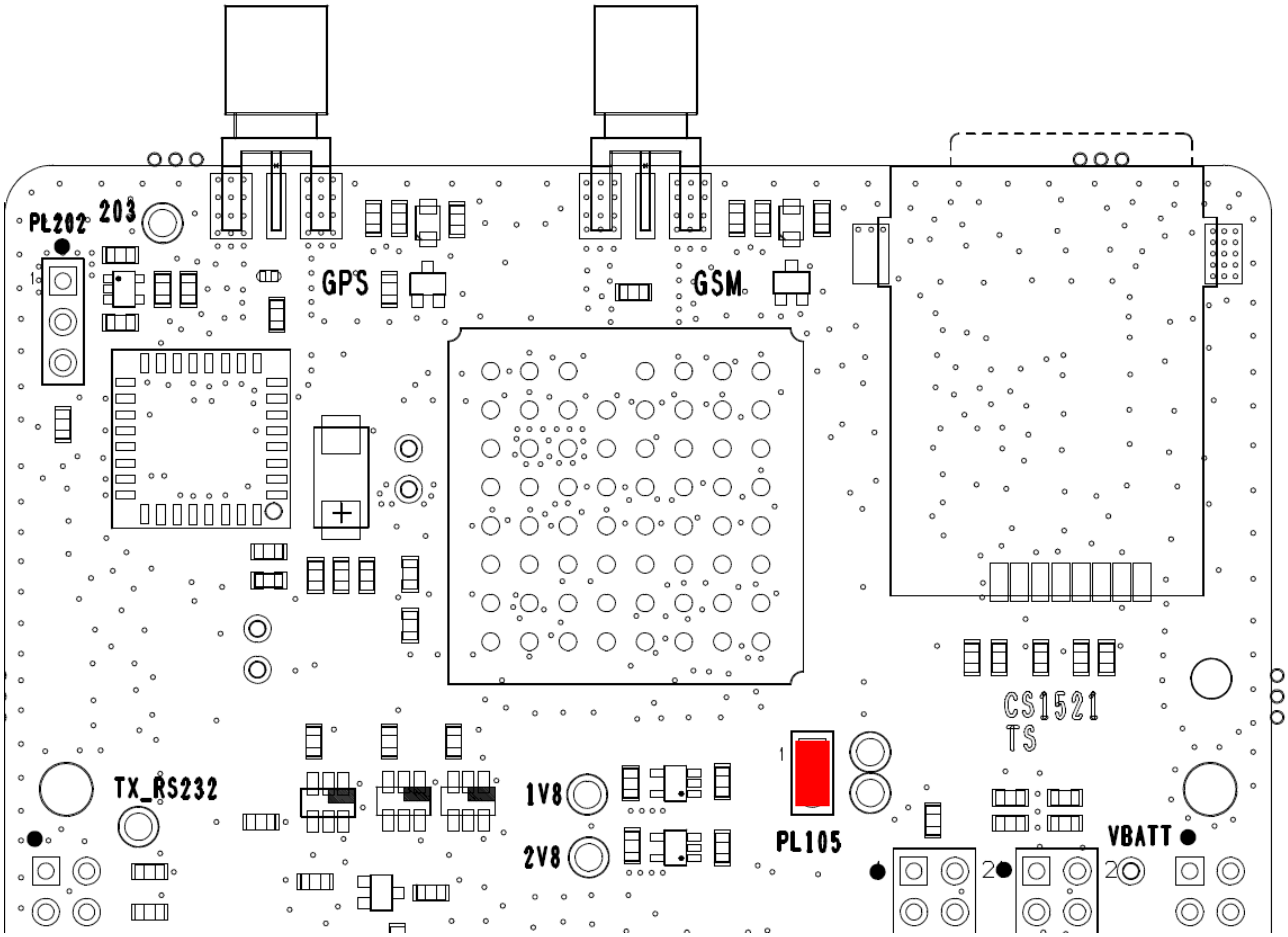


Figure 47.Jumper for VBATT.

19.5. GPS external LNA enable signal

The module contains an internal LNA for the GPS antenna.
The user can though decide to use an external LNA: this option is selected by means of a software command, which puts the internal LNA in a low gain mode and provides an additional signal to enable the external LNA. The interface can provide a bias for the external LNA, and the user can choose whether to enable it by this signal or to leave it always enabled, by means of a jumper on PL202, as shown in the picture below.

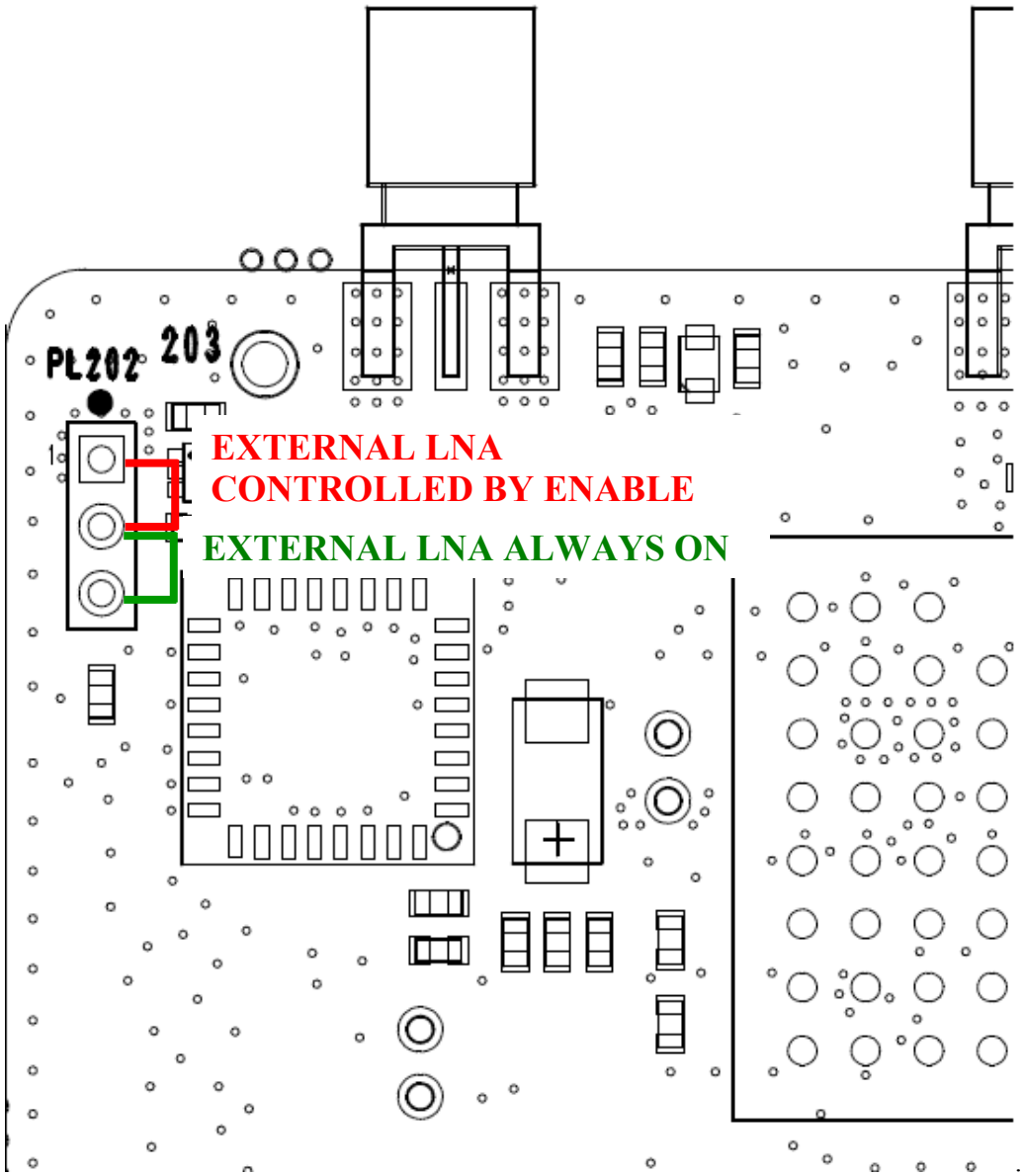


Figure 48.Jumper selection on PL202.

In order to use the External LNA controlled by the GE865 signal the user musts insert a jumper in pins 14-16 of PL301.

19.6. Serial port configuration

By means of proper jumper connections on PL303, it is possible to choose different configurations for serial or USB outputs. These configurations are mutually exclusive.

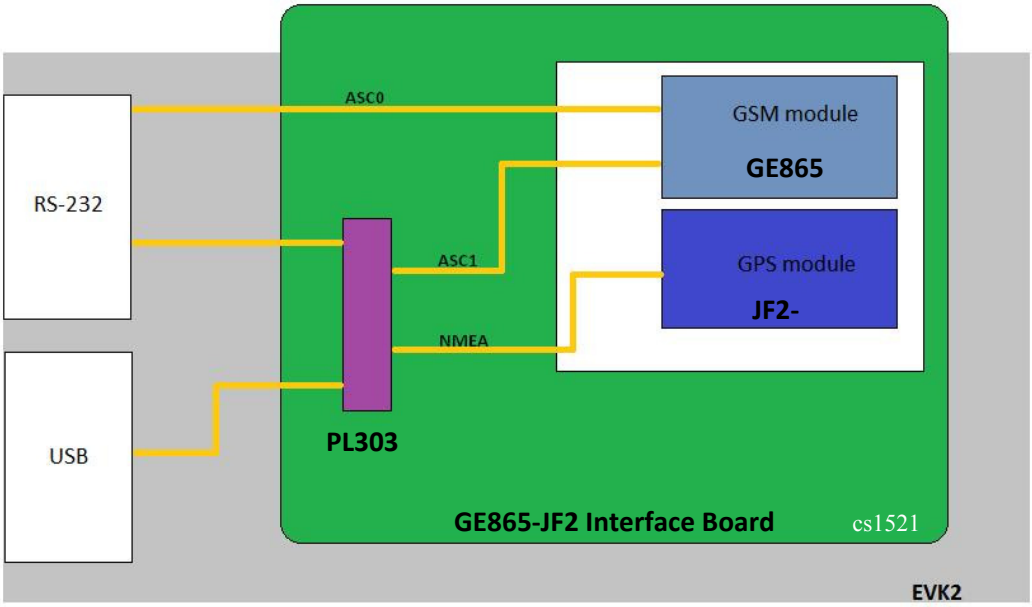


Figure 49.GE865-JF2 Interface Board serial connections

19.7. GSM to Trace

This configuration connects the GSM to the RS232 serial connector of the EVK2.

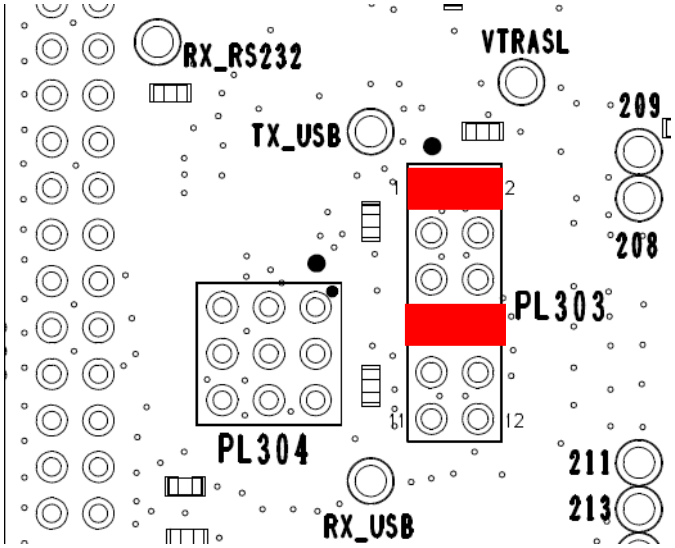


Figure 50.GSM to RS-232 (Trace) configuration

19.8. GPS to Trace

This configuration allows sending the GPS output to the Trace serial connector of EVK2 by means of transceivers.

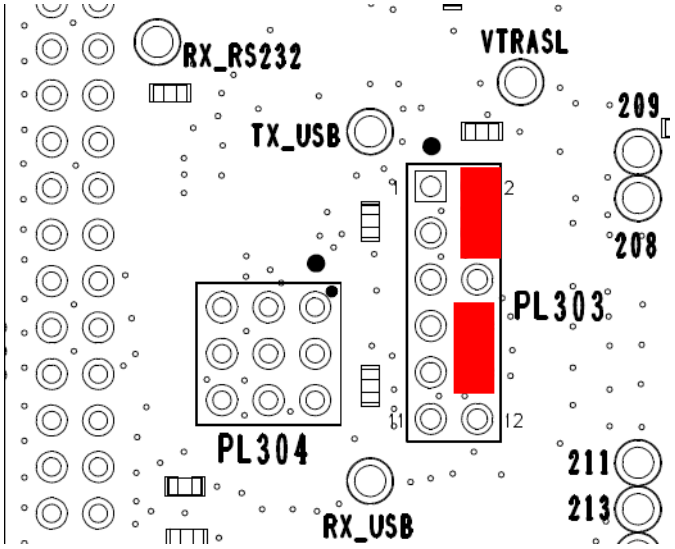


Figure 51.GPS to RS232 (Trace)

19.9. GSM to USB

This configuration connects the GSM to the USB connector of the EVK2.

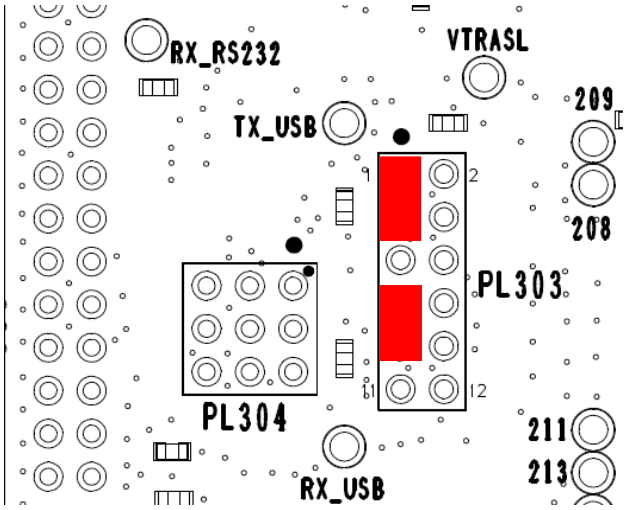


Figure 52.GSM to USB

19.10. GPS to USB

The NMEA sentences can be redirected to the EVK2's USB port by setting the PL303 as explained in the Figure 53, i.e. connecting the NMEA line with the RS-232, and at the same time setting the EVK2 serial line on USB mode, as showed in Paragraph 7.1 of this document.

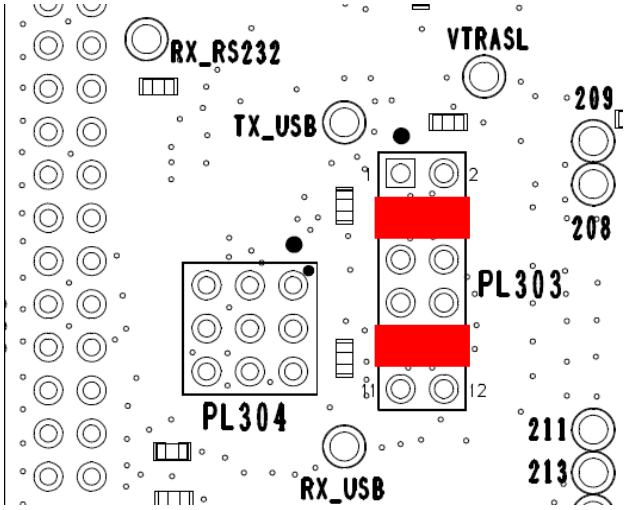


Figure 53.GPS to USB

19.11. GPS to GSM (internal host controlling configuration)

This configuration directly connects the host GSM module to the GPS receiver, thus setting the GPS receiver in Controlled Mode.

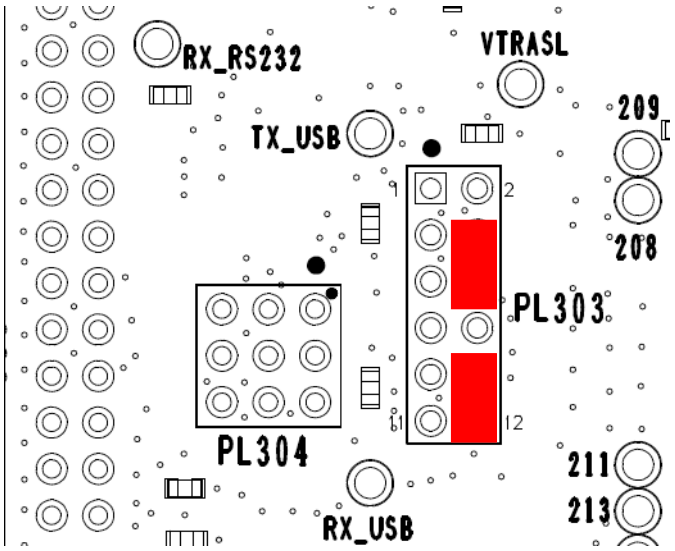


Figure 54.GPS to GSM configuration

19.12. GPIO settings

The interface allows choosing among different options for driving the GPS control signals:
- Using the GPIOs of the GSM module
- Using an external host
- Manually controlling the signals by plugging jumpers.

The last option is not available for every signal and every configuration; please refer to the schematics of the interface for more details.
The choice among the options can be made by PL301 and PL302, as detailed below.

19.12.1. Internal host controlling configuration

The following settings on PL301 and PL302 allow selecting the internal host configuration.

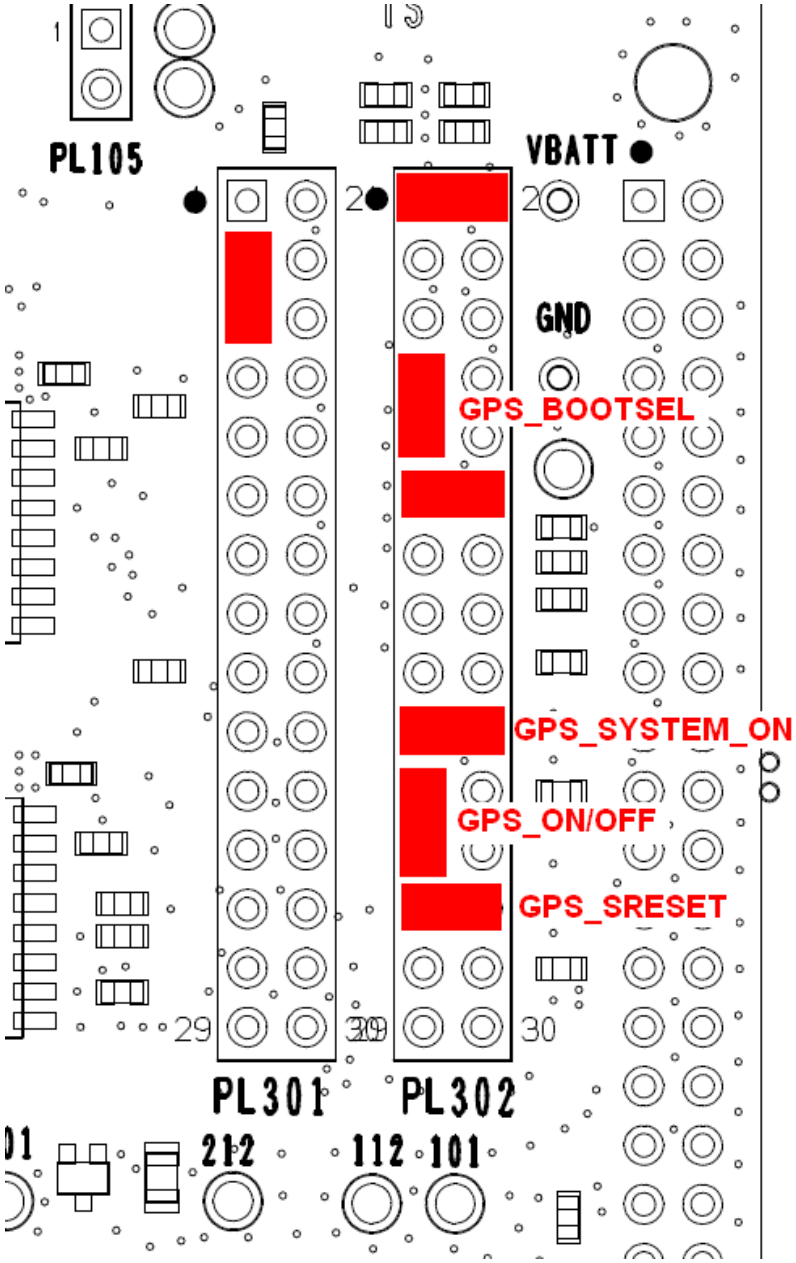


Figure 55.Settings for PL301 and PL302: internal host controlling

19.12.2. External host controlling configuration

The following settings on PL301 and PL302 allow selecting the external host configuration.

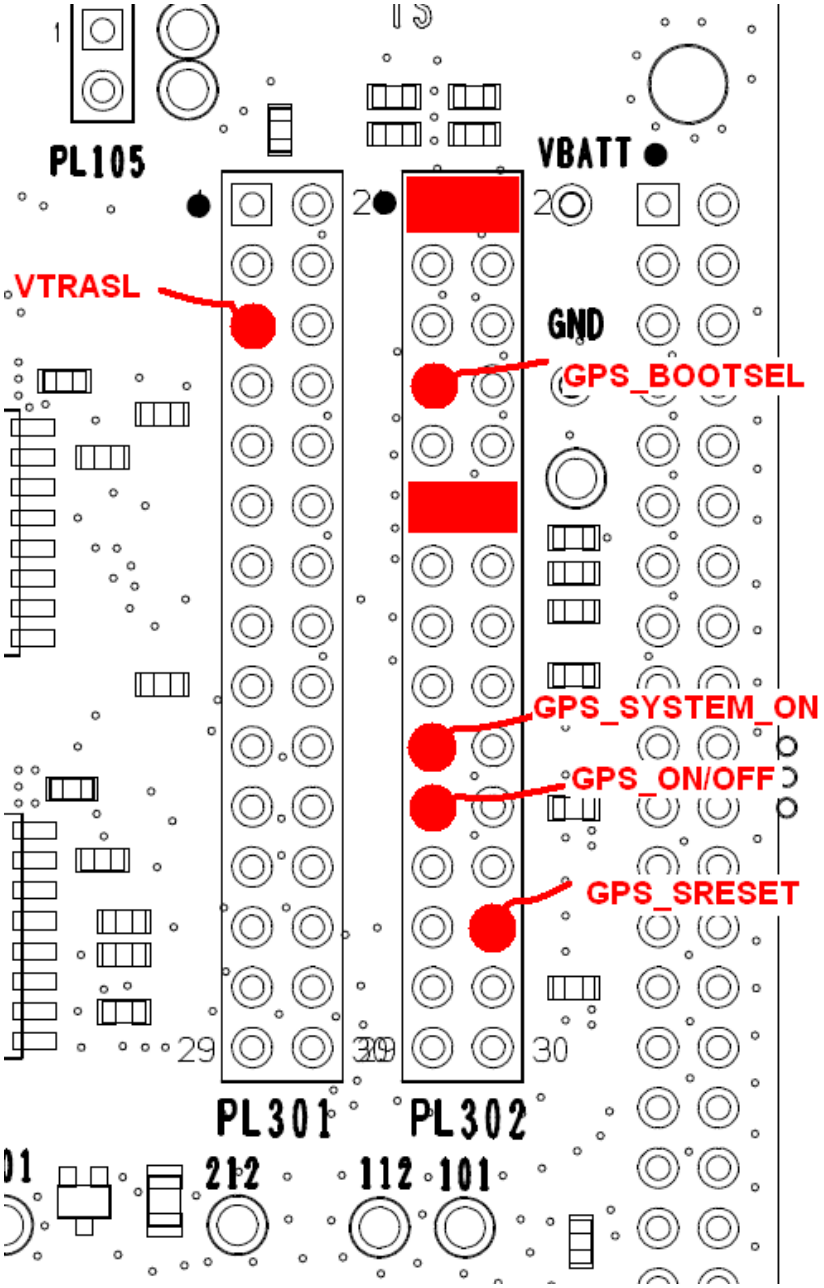


Figure 56.Settings for PL301 and PL302: external host.

19.13. GPS serial interface setting

GPS module has the capability to operate in serial UART mode, SPI mode or I2C mode depending upon how the JF2 GPIO6 and GPIO7 pins are strapped at power up. In the table below is shown the configuration set in PL302 to select the type of serial interface:

MODE	GPS GPIO n.6	GPS GPIO n.7
UART	1-2 pins shorted in PL302	Float
I2C	Float	15-16 pins shorted in PL302
SPI	Float	Float

Table 21

If you connect JF2 module with GE865 module you must use UART configuration. Using an external host, if you want use I2C configuration, you need to plugging on PL302 two jumpers in positions 3-4 and 5-6 in order to connect pull-ups in SDA and SCL lines.

19.14. MEMS Sensor/EEPROM Interface

The DR I2C port of JF2 is used for connecting to MEMS sensors, such as accelerometer or magnetometer.

	GPS GPIO n.4	GPS GPIO n.0	GPS GPIO n.1
With sensor	Float	3-4 pins shorted in PL302	5-6 pins shorted in PL302
Without sensor	13-14 pins shorted in PL302	Float	Float

Table 22

19.15. GPS power-on management

JF2 module power on/off can be controlled by an external host signal or it is possible to have the automatic module transition to the full power state by tying the SYSTEM-ON output to the ON-OFF input. The table below shows how to set these two options:

	Power Mode
10-12 and 19-21 pins shorted in PL302	Full power mode
11-12 pins shorted in PL302	ON/OFF controlled by an external host signal

Table 23

19.16. Antenna connectors

19.16.1. GSM antenna connector

A GSM antenna must be connected to SO105.

19.16.2. GPS antenna connector

A GPS antenna must be connected to SO201.

WARNING:

Don’t connect a *GSM* antenna on the GPS antenna connector

20. GC864 Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GC864 can be inserted.
No settings are needed.

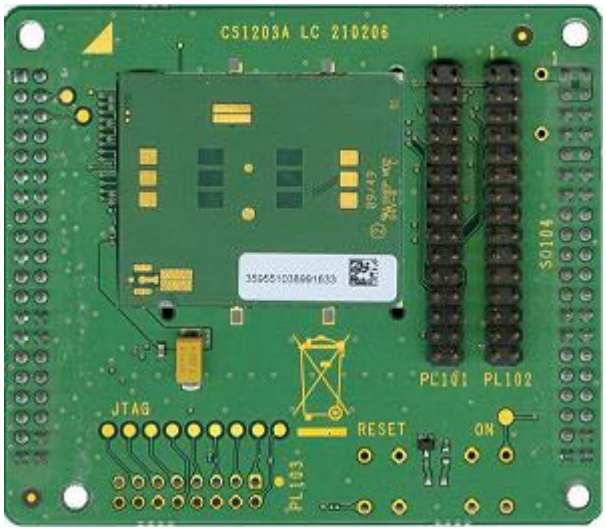


Figure 57. GC864 Interface Board

20.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount also:

the SIMCARD Holder;
the RESET Button
the ON Button;
the STATUS LED and its load resistance.

20.2. Interface connectors

The following connectors are available:

2 male connectors (*30 PTH pins each one: PL102, PL103*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools
2 female connectors (40 PTH pins each one: SO101, SO102), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines).

20.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GC864 INTERFACE	1
ASSEMBLED CABLE L–200 COAX 0.8 TERMINALS GSC & SMA F PANNEL	1

Table 24

21. GC864-C2 family Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GC864-C2 can be inserted.
No settings are needed.

Figure 58. GC864-C2 Interface Board

21.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

the SIMCARD Holder ;
the ON Button ;
the STATUS LED and its load resistance.

21.2. Interface connectors

The following connectors are available:

2 male connectors (*30 PTH pins each one: PL101, PL102*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
2 female connectors (40 PTH pins each one: SO101, SO104), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);

21.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GC864-C2 INTERFACE	1
ASSEMBLED CABLE L–250 RG174 TERMINALS SMA F & MMCX 90 M	1

Table 25

22. GE865 Interface

This board allows easily interfacing the GE865 modules with the EVK2 and testing their functionalities;
No settings are needed.

Figure 59. GE864 Interface Board

22.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

the RESET Button
the ON Button;
the STATUS LED and its load resistance.

22.2. Interface connectors

The following connectors are available:

2 male connectors (30 *PTH pins each one: PL102, PL103*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
2 female connectors (40 PTH pins each one: SO101, SO102), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);

22.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GE865 INTERFACE	1

Table 26

23. GL865 Interface

This board allows easily interfacing the GL865 modules with the EVK2 and testing their functionalities;
No settings are needed.

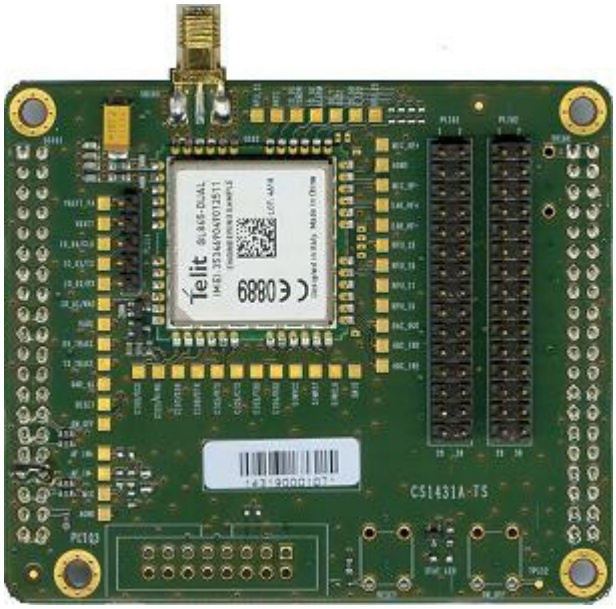


Figure 60. GL865 Interface Board

23.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

the RESET Button
the ON Button;
the STATUS LED and its load resistance.

23.2. Interface connectors

The following connectors are available:

2 male connectors (30 *PTH pins each one: PL102, PL103*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
2 female connectors (40 PTH pins each one: SO101, SO102), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);

23.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GL865 INTERFACE	1

Table 27

24. UC864 family Interface

This board allows easily interfacing the UC864/CC864 modules with the EVK2 and testing their functionalities;
No settings are needed.
For more information please refer to 1vv0300771 (UC864/CC864 Interface Board User Guide)

Figure 61. UC864 Interface Board

24.1. Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

the RESET Button
the ON Button;

24.2. Interface connectors

The following connectors are available:

male connectors (30 *PTH pins each one: PL101, PL102*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
female connectors (40 PTH pins each one: CON102, CON103), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);
2 USB connectors (selectable by Jumper Setting)

For additional details on the connections and the possible Jumper settings please refer to the Interface board User guide (1vv0300771)

24.3. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
UC864/CC864 INTERFACE	1

Table 28

25. HE910 family Interface

This board allows easily interfacing the HE910 modules with the EVK2 and testing their functionalities;
No settings are needed.

Figure 62. HE910 Interface Board

25.1. Stand-alone setup

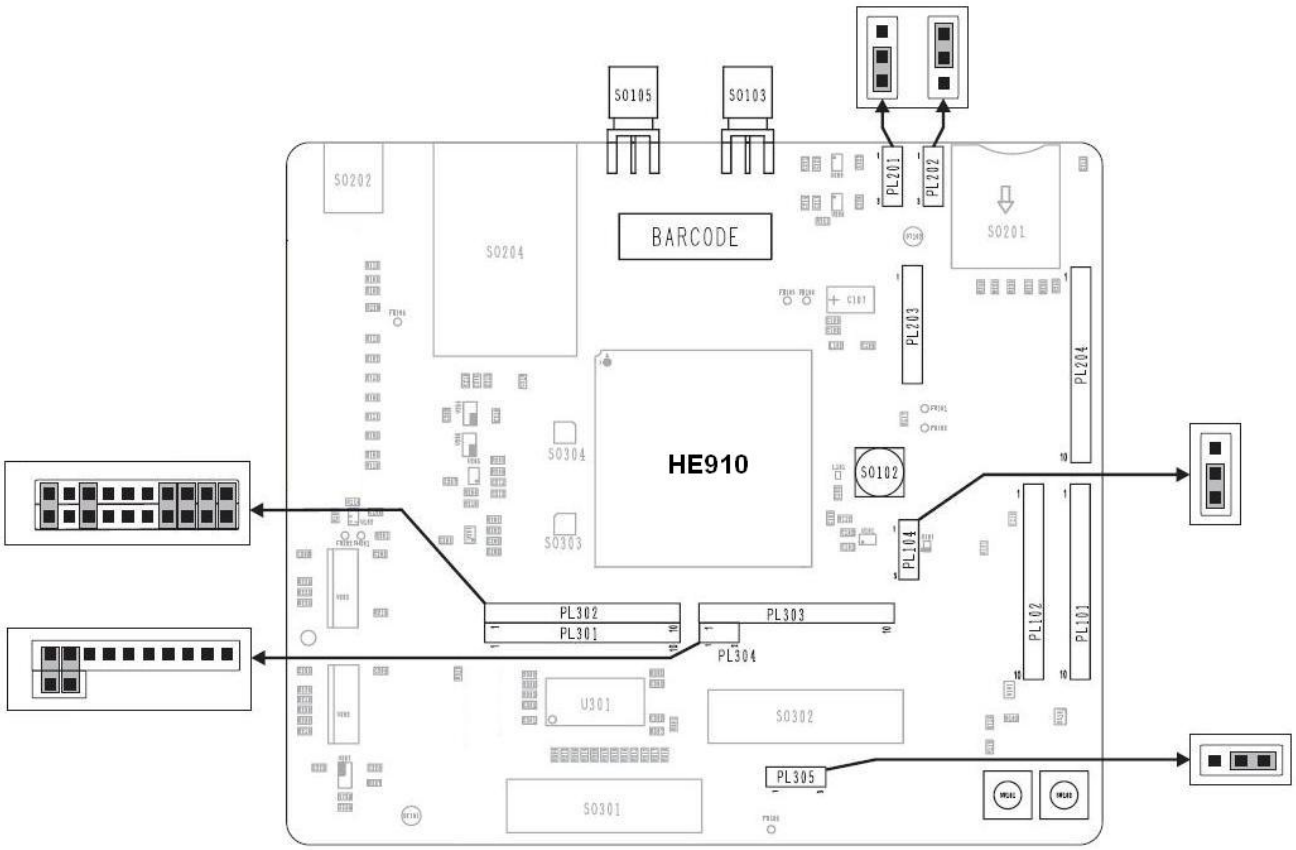
The Jumper setting and the assembled components are ready permitting the standalone use.

25.2. Interface connectors

The following connectors are available:

2 female connectors (40 PTH pins each one: SO101, SO104), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);
1 USB connector (SO202) related to the HE910 USB 2.0 port.
3 RF connectors for GSM/UMTS Antenna (SO103), Receiver Diversity Antenna (SO105) and GPS Antenna (SO102)
1 SIM Holder (SO204)
A group of Male connectors (PL301, PL302, PL303, PL304, PL102, PL203, PL204) that provide the additional signals (i.e. GPIOs) and could select the functions by Jumper setting (see the related document section/schematic for this).

The following picture is showing the connector's positions and the default settings for the Jumpers.



25.3. Antenna connectors

25.3.1. GSM/UMTS Antenna connector

A GSM/UMTS compatible antenna (Refer to the product's HW user guide) antenna must be connected to SO103.

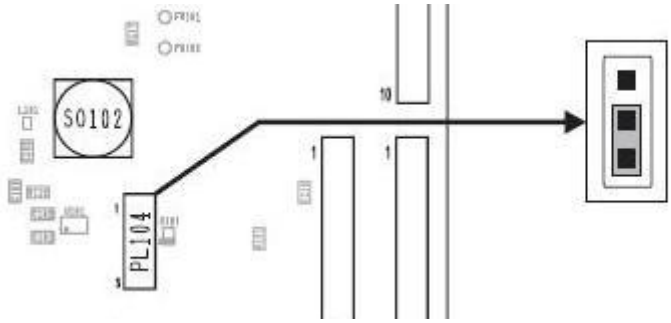
25.3.2. Receiver Diversity Antenna connector

A GSM/UMTS compatible antenna (Refer to the product's HW user guide) antenna could be connected to SO105.

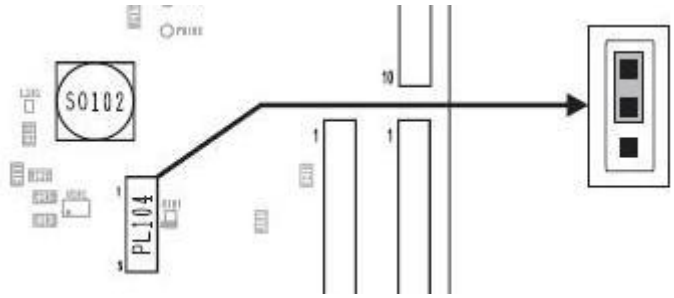
25.3.3. GPS antenna connector

A GPS antenna could be connected to SO102. Please refer to the product's HW user guide for the proper type.
The GPS Antenna (if an active type) could be supplied with a dedicated LDO (3V DC) that could be set in the following way using the Jumpers on PL104.

LDO Enabled by the HE910 Module.



LDO Always Enabled



WARNING:

Don't connect a *GSM/UMTS* antenna on this connector

25.4. Expansion Connectors

25.4.1. PL301/PL302

The connectors are carrying the following signals:

PL301		
Pin#	**Pin Name**	**Description**
1	STAT_LED	Status Led
2	NC	
3	RESERVED	
4	NC	
5	NC	
6	NC	
7	C125/RING	
8	C107/DSR	
9	C109/DCD	
10	RESERVED	

PL302		
Pin#	**Pin Name**	**Description**
1	GPIO_01	Default function is Status Led
2	GPIO_02	
3	GPIO_03	
4	GPIO_04	
5	GPIO_06	
6	GPIO_07	
7	C125/RING	Jumper to EVK2
8	C107/DSR	Jumper to EVK2
9	C109/DCD	Jumper to EVK2
10	RESERVED	Jumper to EVK2

25.4.2. PL303/PL304/PL305

The connectors are carrying the following signals:

PL303		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Auxiliary serial port (TX)
2	RX_AUX	Auxiliary serial port (RX)
3	SPI_CLK	SPI
4	SPI_MRDY	SPI
5	SPI_SRDY	SPI
6	GPIO_08	
7	GPIO_09	
8	GPIO_10	
9	RESERVED	
10	NC	

PL304		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Jumper to EVK2
2	RX_AUX	Jumper to EVK2

PL305		
Pin#	**Pin Name**	**Description**
1	RESERVED	-
2	VDD_IO	Input pin for the bus supply
3	VIO_1V8	VIO supply at 1.8V

25.4.3. PL102

The connector is providing the following signals:

PL102		
Pin#	**Pin Name**	**Description**
1	VAUX/PWRMON	Auxiliary supply / Power On Indicator
2	VRTC	RTC Backup
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_05	GPIO
7	RESERVED	
8	RESERVED	
9	RESERVED	
10	GND	

25.4.4. ON_OFF & UNCONDITIONAL SHUDOWN BUTTONS

The 2 Buttons present on the Interface should be used to control the Power ON and UNCONDITIONAL SHUTDOWN lines of the module.
The 2 Buttons on the EVK2 could not be used with the HE910 Interface.

25.5. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
HE910 INTERFACE	1
MINI USB CABLE	1

26. GE910 Interface

This board allows easily interfacing the GE910 module with the EVK2 and testing their functionalities;
No settings are needed.

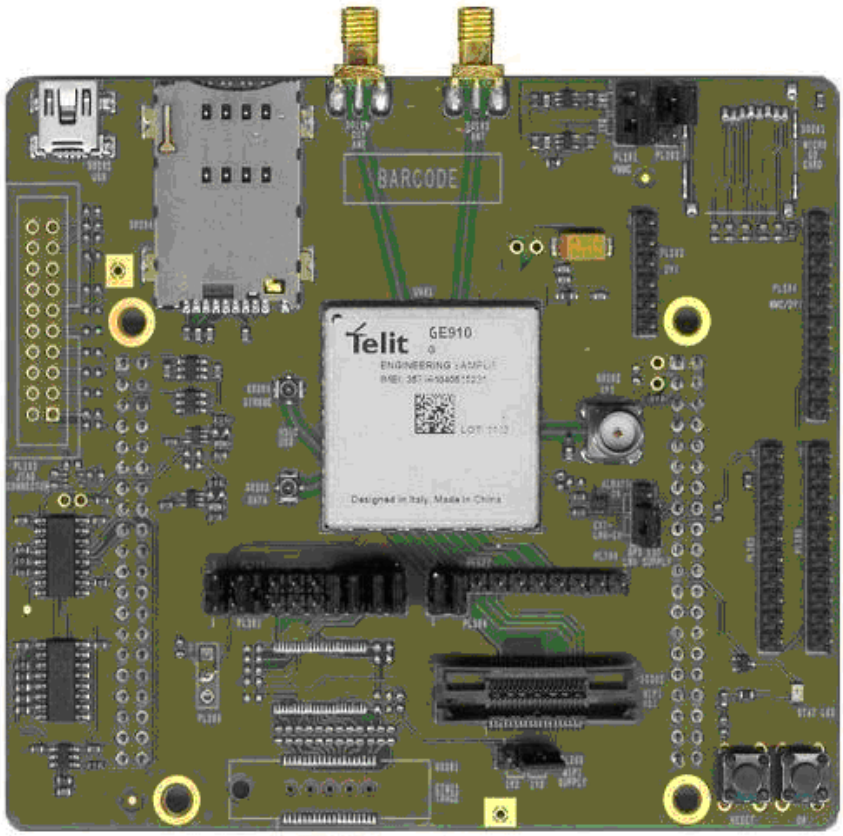


Figure 63. GE910 Interface Board

26.1. Stand-alone setup

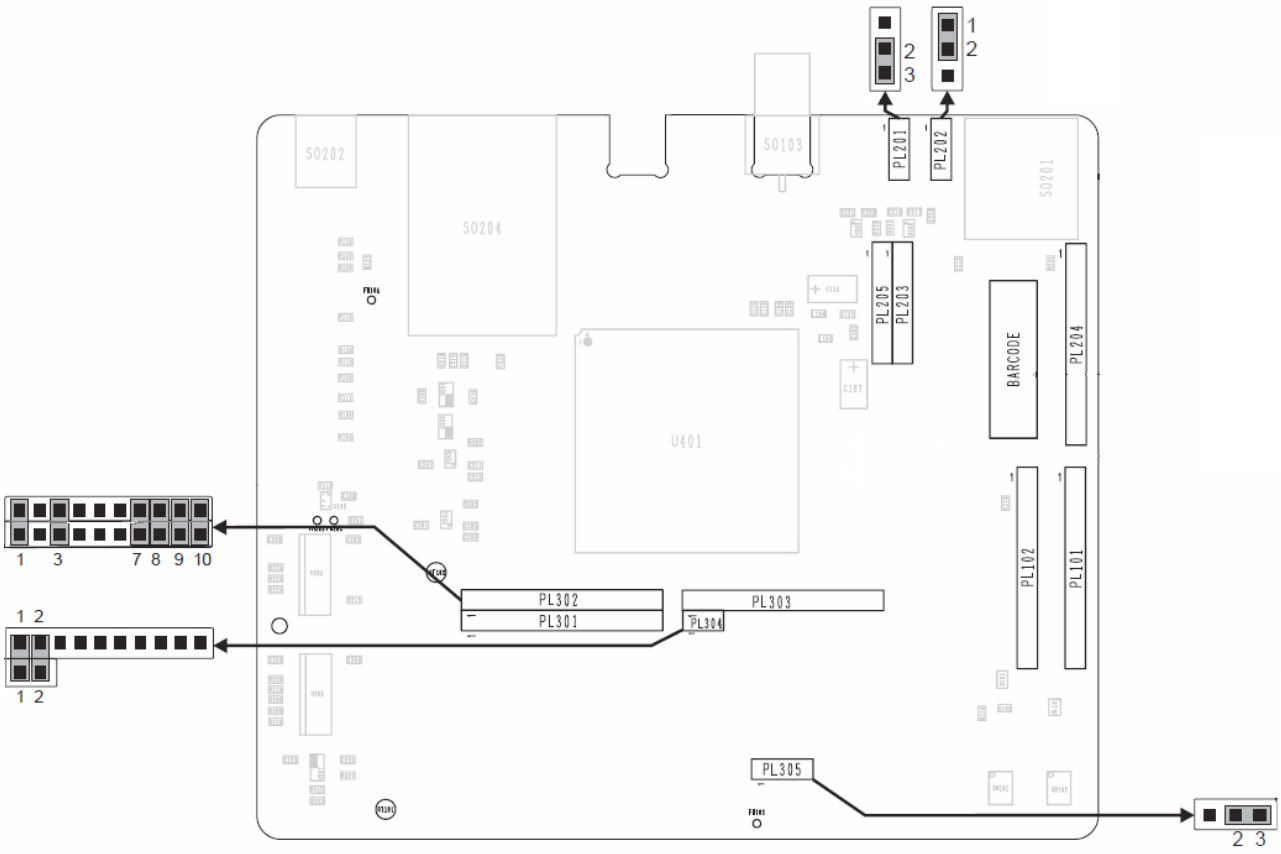
The Jumper setting and the assembled components are ready permitting the standalone use.

26.2. Interface connectors

The following connectors are available:

2 female connectors (40 PTH pins each one: SO101, SO104), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);
1 USB connector (SO202) related to the GE910 USB 2.0 port.
1 RF connectors for GSM/GPRS Antenna (SO103),
1 SIM Holder (SO204)
A group of Male connectors (PL301, PL302, PL303, PL304, PL102, PL203, PL204,PL205) that provide the additional signals (i.e. GPIOs) and could select the functions by Jumper setting (see the related document section/schematic for this).

The following picture is showing the connector's positions and the default settings for the Jumpers.



26.3. Antenna connectors

26.3.1. GSM/GPRS Antenna connector

A GSM/GPRS compatible antenna (Refer to the product's HW user guide) antenna must be connected to SO103.

26.4. Expansion Connectors

26.4.1. PL301/PL302

The connectors are carrying the following signals:

PL301		
Pin#	**Pin Name**	**Description**
1	STAT_LED	Status Led
2	NC	
3	RESERVED	
4	NC	
5	NC	
6	NC	
7	C125/RING	
8	C107/DSR	
9	C109/DCD	
10	RESERVED	

PL302		
Pin#	**Pin Name**	**Description**
1	GPIO_01	Default function is Status Led
2	GPIO_02	
3	GPIO_03	
4	GPIO_04	
5	GPIO_06	
6	GPIO_07	
7	C125/RING	Jumper to EVK2
8	C107/DSR	Jumper to EVK2
9	C109/DCD	Jumper to EVK2
10	RESERVED	Jumper to EVK2

26.4.2. PL303/PL304

The connectors are carrying the following signals:

PL303		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Auxiliary serial port (TX)
2	RX_AUX	Auxiliary serial port (RX)
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_08	
7	GPIO_09	
8	GPIO_10	
9	RESERVED	
10	NC	

PL304		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Jumper to EVK2
2	RX_AUX	Jumper to EVK2

26.4.3. PL102

The connector is providing the following signals:

PL102		
Pin#	**Pin Name**	**Description**
1	VAUX/PWRMON	Auxiliary supply / Power On Indicator
2	VRTC	RTC Backup
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_05	GPIO
7	RESERVED	
8	RESERVED	
9	RESERVED	
10	GND	

26.4.4. ON_OFF & UNCONDITIONAL SHUTDOWN BUTTONS

The 2 Buttons present on the Interface should be used to control the Power ON and UNCONDITIONAL SHUTDOWN lines of the module.
The 2 Buttons on the EVK2 could not be used with the GE910 Interface.

26.5. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GE910 INTERFACE	1
MINI USB CABLE	1

27. DE910 family Interface

This board allows easily interfacing the DE910 modules with the EVK2 and testing their functionalities;
No settings are needed.

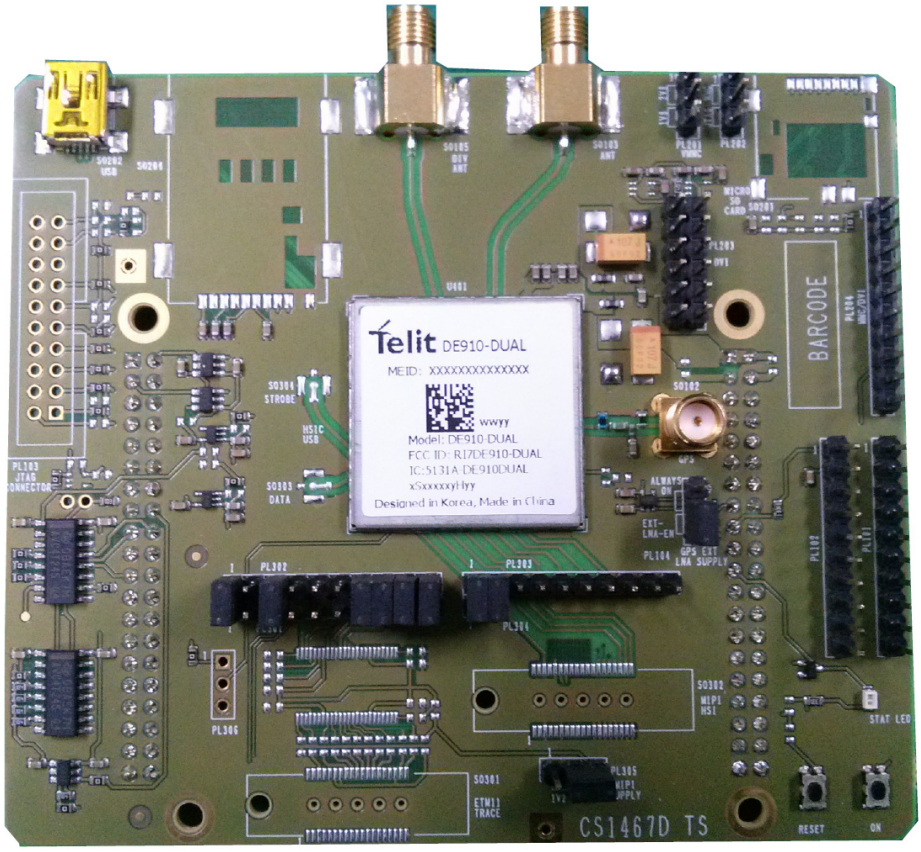


Figure 64. DE910 Interface Board

27.1. Stand-alone setup

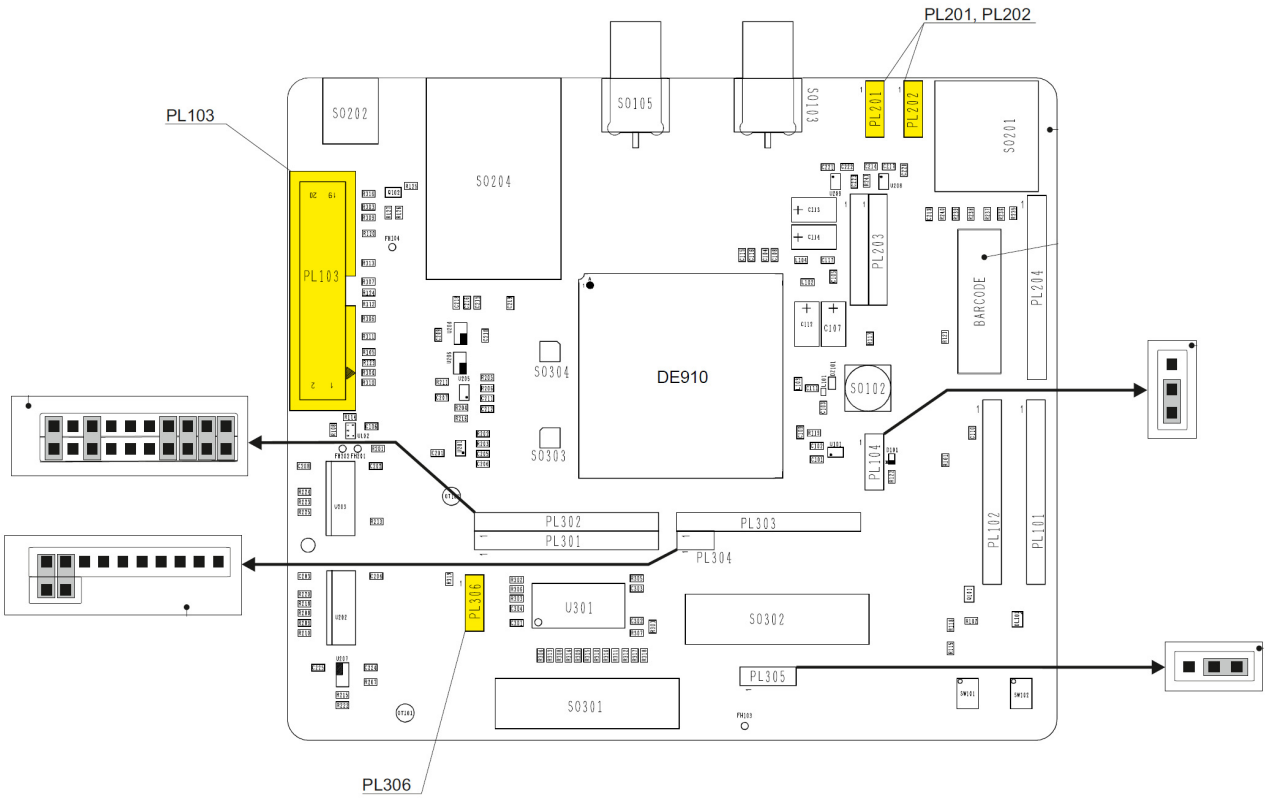
The Jumper setting and the assembled components are ready permitting the standalone use.

27.2. Interface connectors

The following connectors are available:

2 female connectors (40 PTH pins each one: SO101, SO104), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);
1 USB connector (SO202) related to the DE910 USB 2.0 port.
3 RF connectors for CDMA Antenna (SO103), Receiver Diversity Antenna (SO105) and GPS Antenna (SO102)
1 RUIM Holder (SO204)
A group of Male connectors (PL301, PL302, PL303, PL304, PL102, PL203, PL204) that provide the additional signals (i.e. GPIOs) and could select the functions by Jumper setting (see the related document section/schematic for this).

The following picture is showing the connector's positions and the default settings for the Jumpers.



27.3. Antenna connectors

27.3.1. CDMA Antenna connector

A CDMA compatible antenna (Refer to the product's HW user guide) must be connected to SO103.

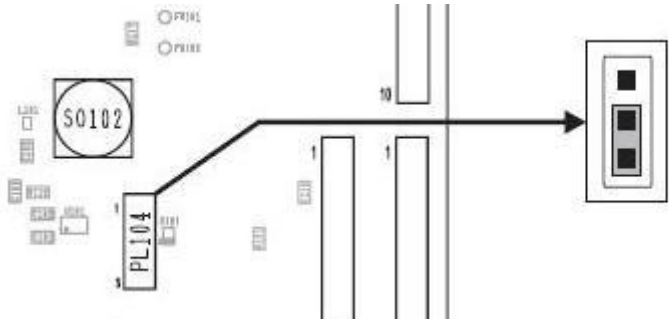
27.3.2. Receiver Diversity Antenna connector

A CDMA compatible antenna (Refer to the product's HW user guide) could be connected to SO105.

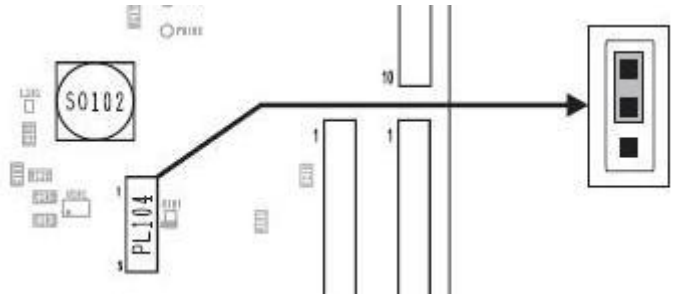
27.3.3. GPS antenna connector

A GPS antenna could be connected to SO102. Please refer to the product's HW user guide for the proper type.
The GPS Antenna (if an active type) could be supplied with a dedicated LDO (3V DC) that could be set in the following way using the Jumpers on PL104.

LDO Enabled by the DE910 Module.



LDO Always Enabled



WARNING:

Don't connect a CDMA antenna on this connector

27.4. Expansion Connectors

27.4.1. PL301/PL302

The connectors are carrying the following signals:

PL301		
Pin#	**Pin Name**	**Description**
1	STAT_LED	Status Led
2	NC	
3	RESERVED	
4	NC	
5	NC	
6	NC	
7	C125/RING	
8	C107/DSR	
9	C109/DCD	
10	RESERVED	

PL302		
Pin#	**Pin Name**	**Description**
1	GPIO_01	Default function is Status Led
2	GPIO_02	
3	GPIO_03	
4	GPIO_04	
5	GPIO_06	
6	GPIO_07	
7	C125/RING	Jumper to EVK2
8	C107/DSR	Jumper to EVK2
9	C109/DCD	Jumper to EVK2
10	RESERVED	Jumper to EVK2

27.4.2. PL303/PL304/PL305

The connectors are carrying the following signals:

PL303		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Auxiliary serial port (TX)
2	RX_AUX	Auxiliary serial port (RX)
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_08	
7	GPIO_09	
8	GPIO_10	
9	RESERVED	
10	NC	

PL304		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Jumper to EVK2
2	RX_AUX	Jumper to EVK2

PL305		
Pin#	**Pin Name**	**Description**
1	RESERVED	-
2	VDD_IO	Input pin for the bus supply
3	VIO_1V8	VIO supply at 1.8V

27.4.3. PL102

The connector is providing the following signals:

PL102		
Pin#	**Pin Name**	**Description**
1	VAUX/PWRMON	Auxiliary supply / Power On Indicator
2	VRTC	RTC Backup
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_05	GPIO
7	RESERVED	
8	RESERVED	
9	RESERVED	
10	GND	

27.4.4. ON_OFF & UNCONDITIONAL SHUDOWN BUTTONS

The 2 Buttons present on the Interface should be used to control the Power ON and UNCONDITIONAL SHUTDOWN lines of the module.
The 2 Buttons on the EVK2 could not be used with the DE910 Interface.

27.5. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
DE910 INTERFACE	1
MINI USB CABLE	1

28. CE910 family Interface

This board allows easily interfacing the CE910 modules with the EVK2 and testing their functionalities;
No settings are needed.

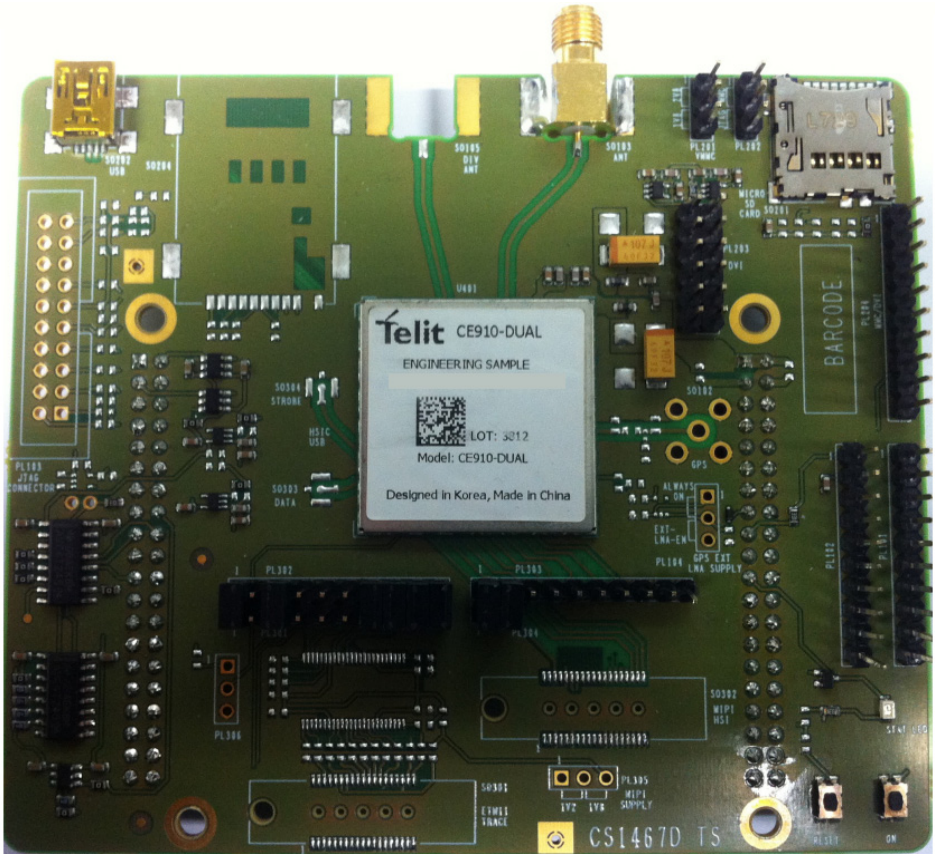


Figure 65. CE910 Interface Board

28.1. Stand-alone setup

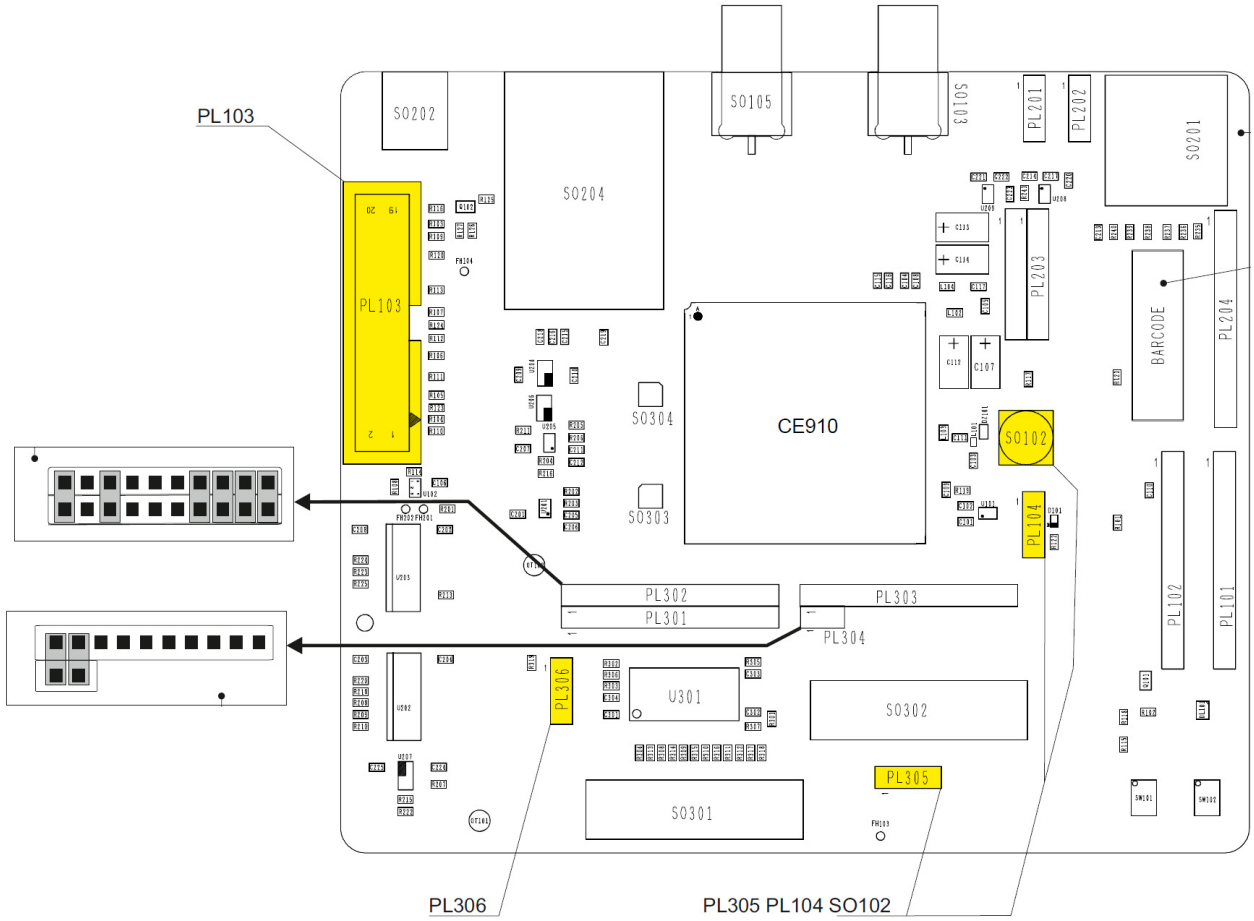
The Jumper setting and the assembled components are ready permitting the standalone use.

28.2. Interface connectors

The following connectors are available:

2 female connectors (40 PTH pins each one: SO101, SO104), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines);
1 USB connector (SO202) related to the CE910 USB 2.0 port.
1 RF connectors for CDMA Antenna (SO103)
1 RUIM Holder (SO204)
A group of Male connectors (PL301, PL302, PL303, PL304, PL102, PL203, PL204) that provide the additional signals (i.e. GPIOs) and could select the functions by Jumper setting (see the related document section/schematic for this).

The following picture is showing the connector's positions and the default settings for the Jumpers.



28.3. Antenna connectors

28.3.1. CDMA Antenna connector

A CDMA compatible antenna (Refer to the product's HW user guide) must be connected to SO103.

28.4. Expansion Connectors

28.4.1. PL301/PL302

The connectors are carrying the following signals:

PL301		
Pin#	**Pin Name**	**Description**
1	STAT_LED	Status Led
2	NC	

3	RESERVED	
4	NC	
5	NC	
6	NC	
7	C125/RING	
8	C107/DSR	
9	C109/DCD	
10	RESERVED	

PL302		
Pin#	**Pin Name**	**Description**
1	GPIO_01	Default function is Status Led
2	GPIO_02	
3	GPIO_03	
4	GPIO_04	
5	GPIO_06	
6	GPIO_07	
7	C125/RING	Jumper to EVK2
8	C107/DSR	Jumper to EVK2
9	C109/DCD	Jumper to EVK2
10	RESERVED	Jumper to EVK2

28.4.2. PL303/PL304

The connectors are carrying the following signals:

PL303		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Auxiliary serial port (TX)
2	RX_AUX	Auxiliary serial port (RX)
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_08	
7	GPIO_09	
8	GPIO_10	
9	RESERVED	
10	NC	

PL304		
Pin#	**Pin Name**	**Description**
1	TX_AUX	Jumper to EVK2
2	RX_AUX	Jumper to EVK2

28.4.3. PL102

The connector is providing the following signals:

PL102		
Pin#	**Pin Name**	**Description**
1	VAUX/PWRMON	Auxiliary supply / Power On Indicator
2	VRTC	RTC Backup
3	RESERVED	
4	RESERVED	
5	RESERVED	
6	GPIO_05	GPIO
7	RESERVED	
8	RESERVED	
9	RESERVED	
10	GND	

28.4.4. ON_OFF & UNCONDITIONAL SHUDOWN BUTTONS

The 2 Buttons present on the Interface should be used to control the Power ON and UNCONDITIONAL SHUTDOWN lines of the module.
The 2 Buttons on the EVK2 could not be used with the CE910 Interface.

28.5. Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
CE910 INTERFACE	1
MINI USB CABLE	1

29. GPIO ports

A certain number of GPIO ports (General Purpose Input/Output) are available on every Telit Module Interface Board, giving you the possibility to drive digital devices and report their own status.
Some of these ports are dedicated. *Refer to Telit Product Description and Telit Hardware User Guide* to have all information about characteristics of every GPIO port.

You can consult the following paragraphs to see the displacement of GPIO on every Interface Board.

29.1. GPIO location

29.1.1. GM862 Interface

(Refer to schematic diagram *30276SE11150B*)

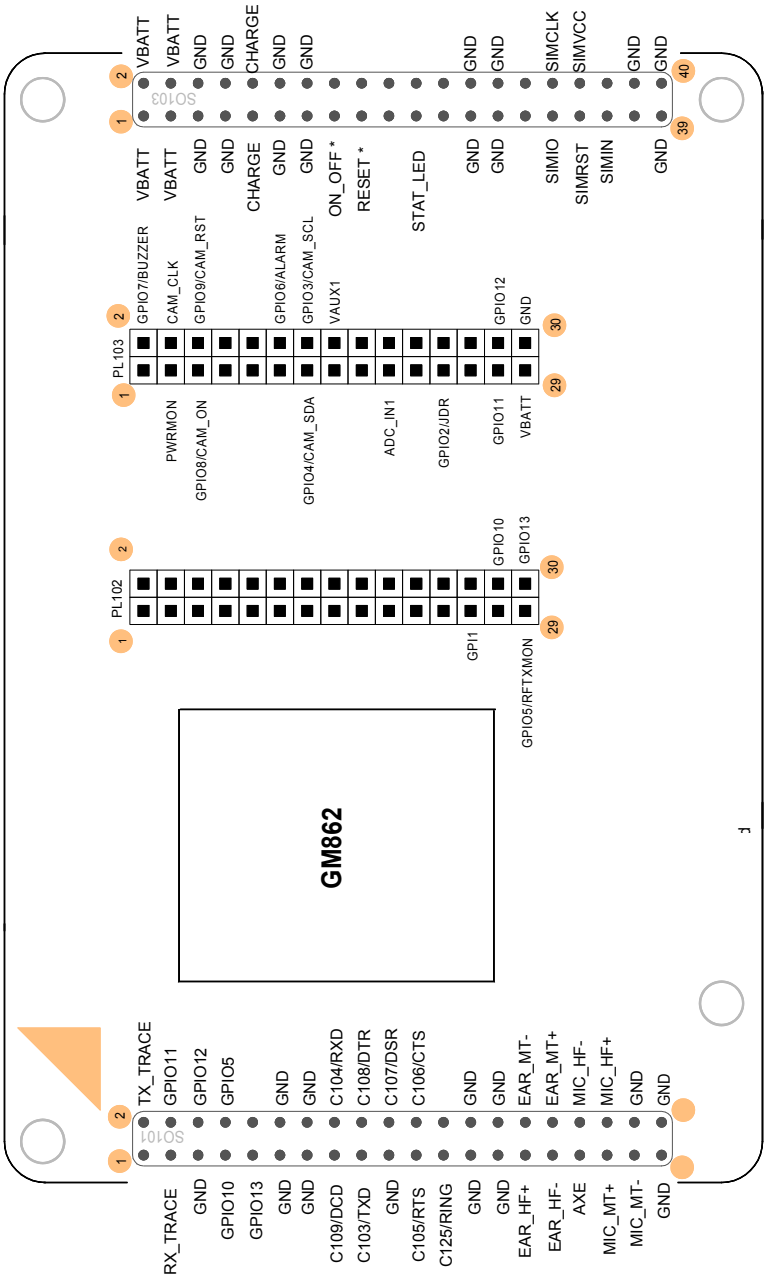


Figure 63: Position of GPIO ports on GM862 interface

Note on GM862-GPS version

If you use this interface in conjunction with GM862-GPS version ***be careful*** that the following two pins of SO101 connector assume different functions, and precisely:

Pin 2 = TX_GPS
Pin 3 = RX_GPS

29.1.2. GE863-GPS Interface

(Refer to schematic diagram *30276SE11151A*)

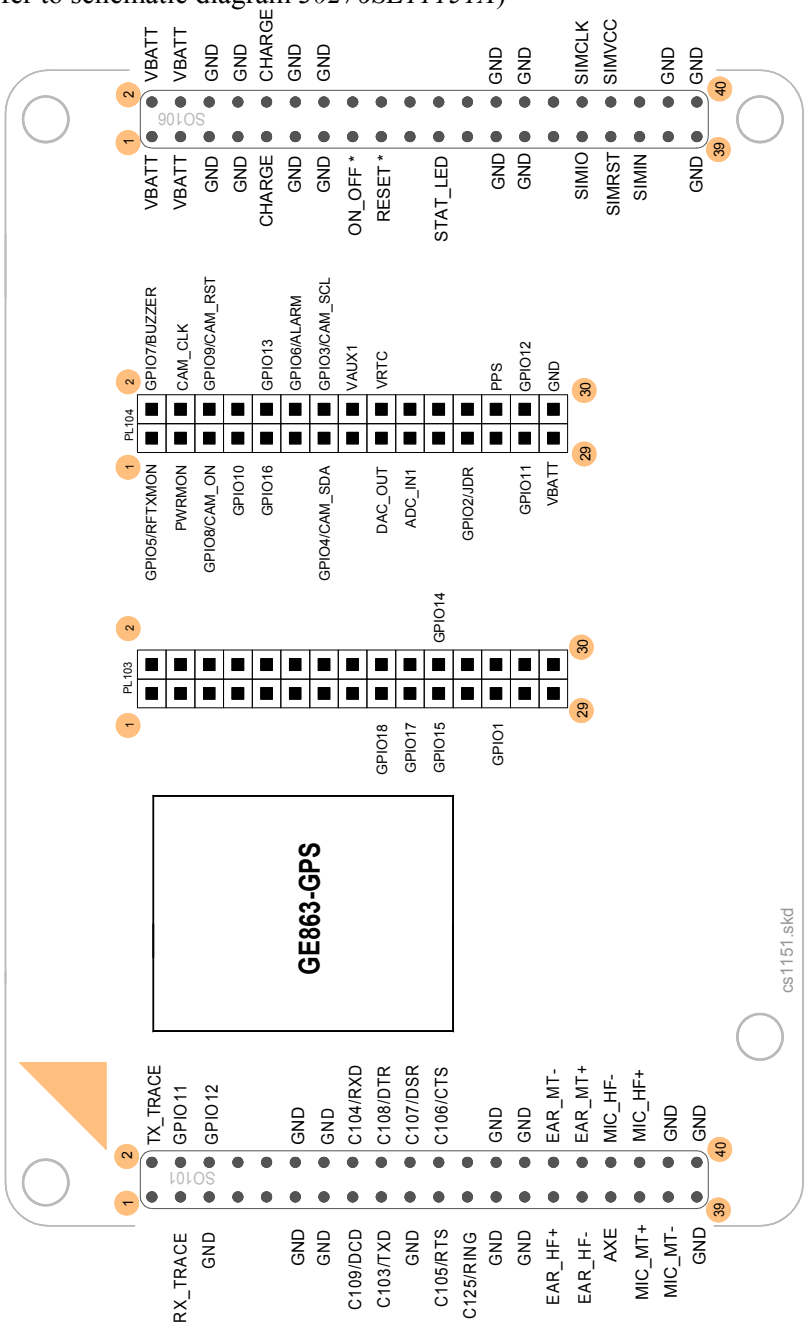


Figure 64: Position of GPIO ports on GE863-GPS interface

Note on p/n 3990250684 and p/n 3990250685 GE863
(Refer to schematic diagrams *30276SE11151A-C*, *30276SE11151A-D*)

If you use these interfaces the following two pins of PL104 connector assume different functions, and precisely:

Pin 20 = ADC_IN2
Pin 21 = ADC_IN3
Pin 26 = N.C

29.1.3. GE863 Interfaces (p/n 3990250684 -3990250685-3990250703)

Refer to schematic diagrams 3\0276SE11151A-C; 30276SE11151A-D; 30276SE11151A-G

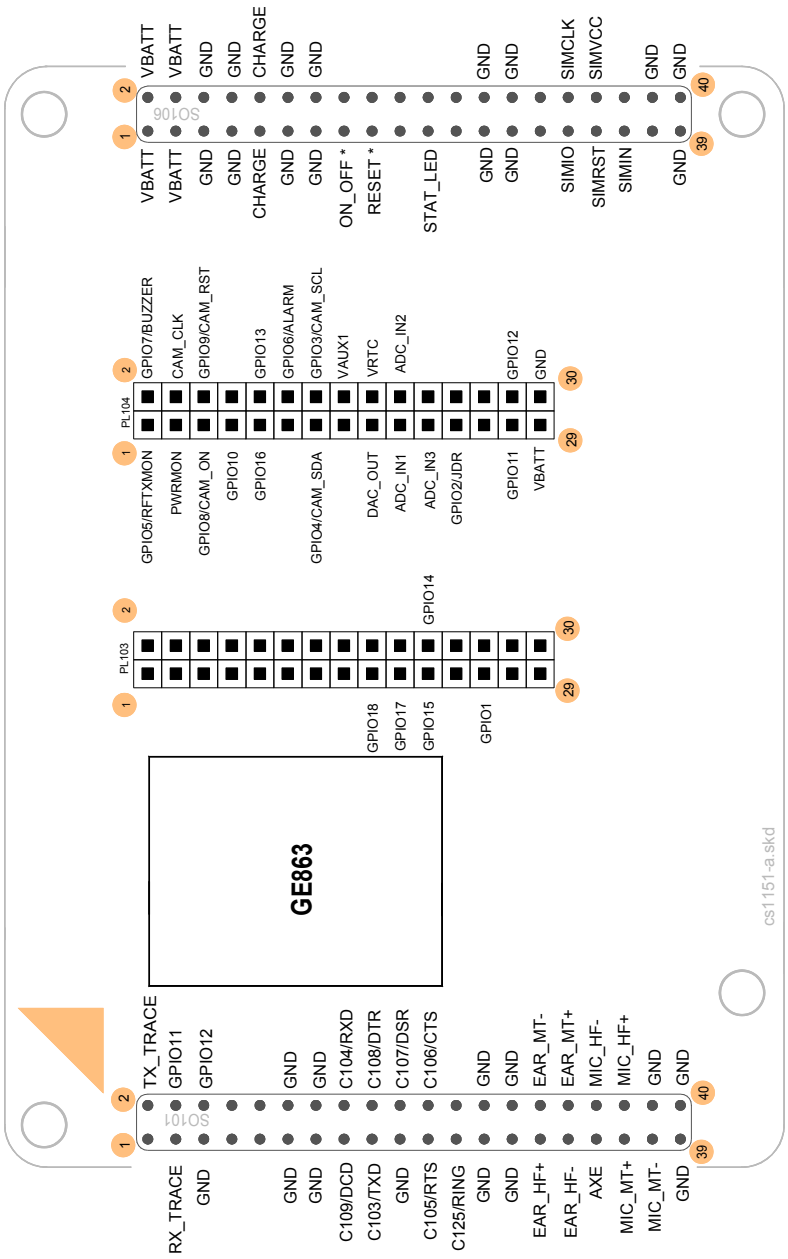


Figure 65: Position of GPIO ports on GE863 interfaces

29.1.4. GE864 Interface (p/n 3990250672)

(Refer to schematic diagram *30276SE1152B*)

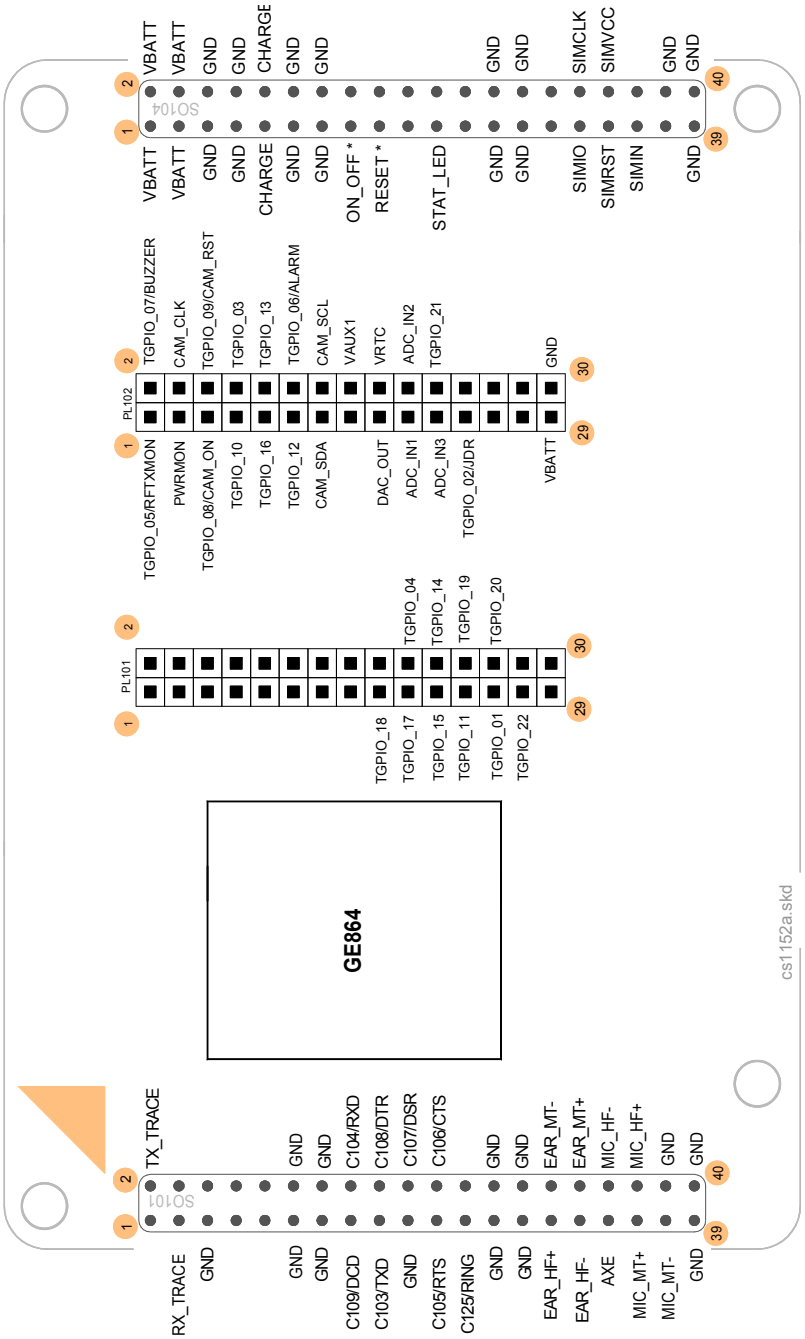


Figure 66: Position of GPIO ports on GE864 interface

29.1.5. GE864-GPS Interface (p/n 3990250822)

(Refer to schematic diagram 30373SE11439b)

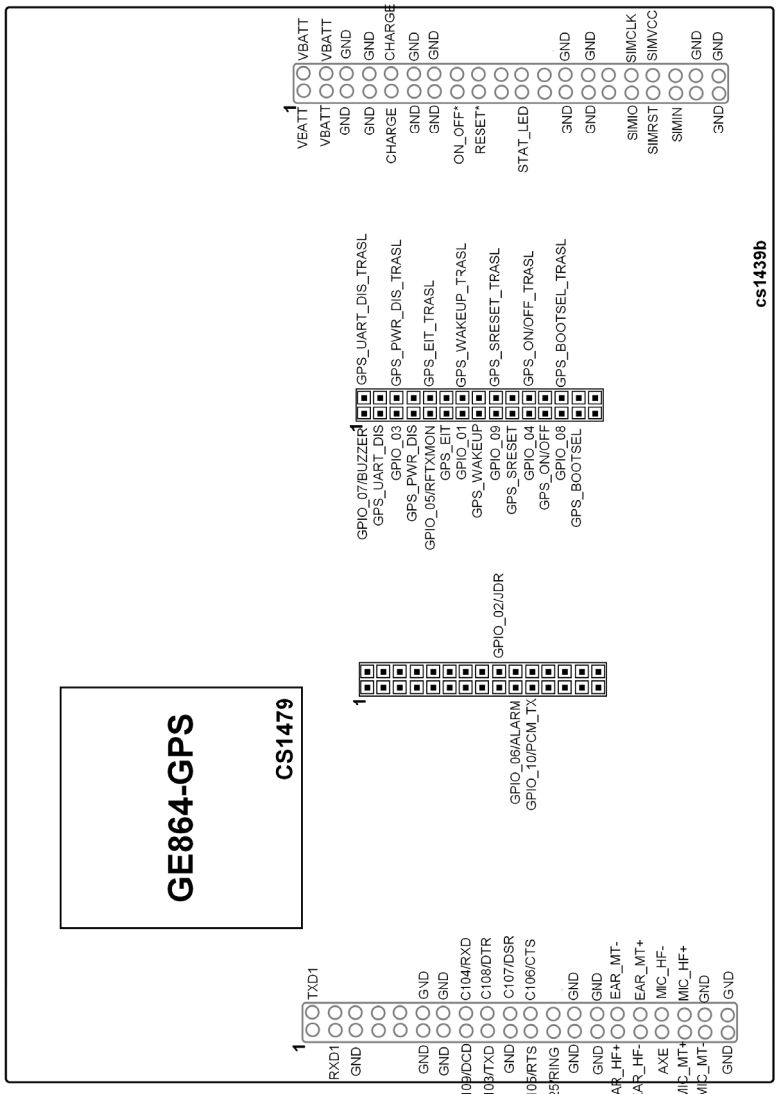


Figure 67: Position of GPIO ports on GE864-GPS interface

29.1.6. GE865/SE867-AGPS Interface (p/n 3990250814)

(Refer to schematic diagram 30311SE11433)

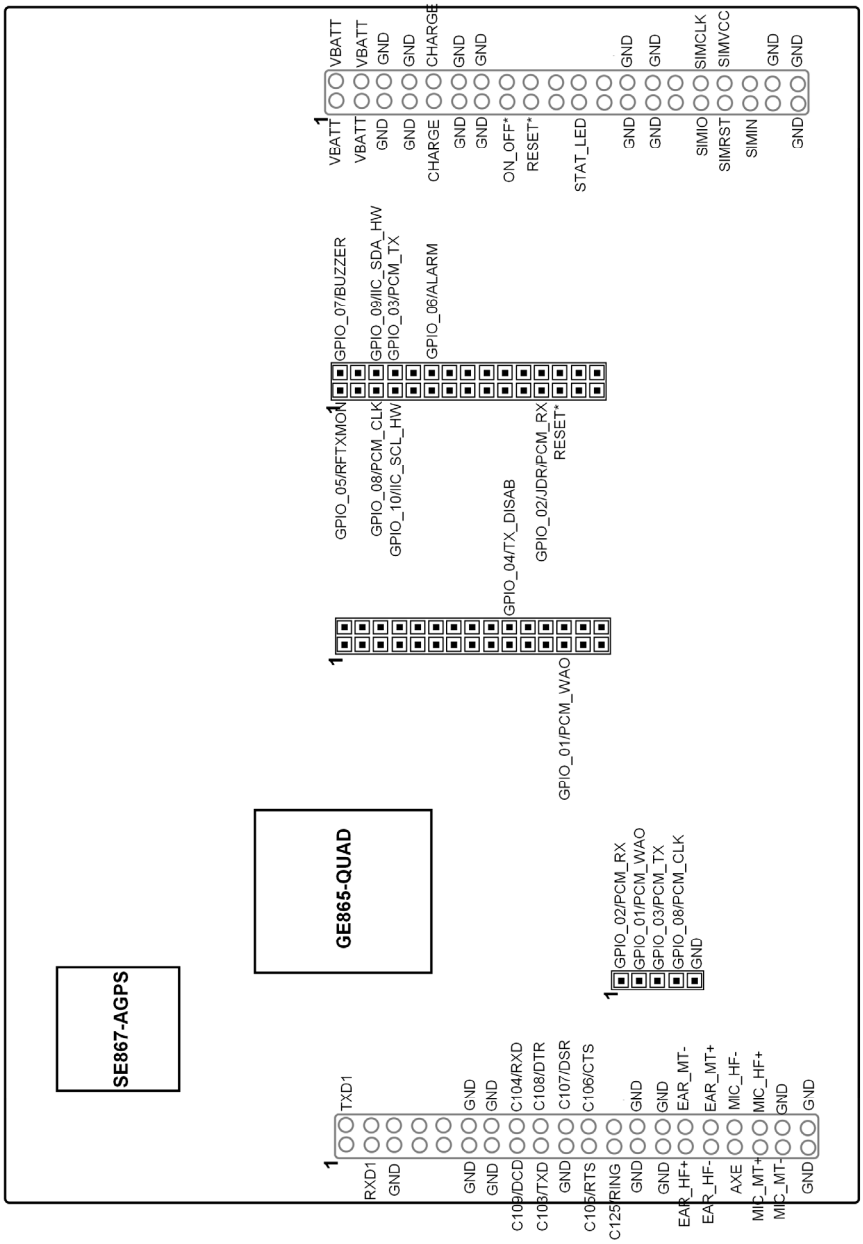


Figure 68: Position of GPIO ports on GE865/SE867-AGPS interface

29.1.7. GC864 Interface

(Refer to schematic diagram *30276SE111203B*)

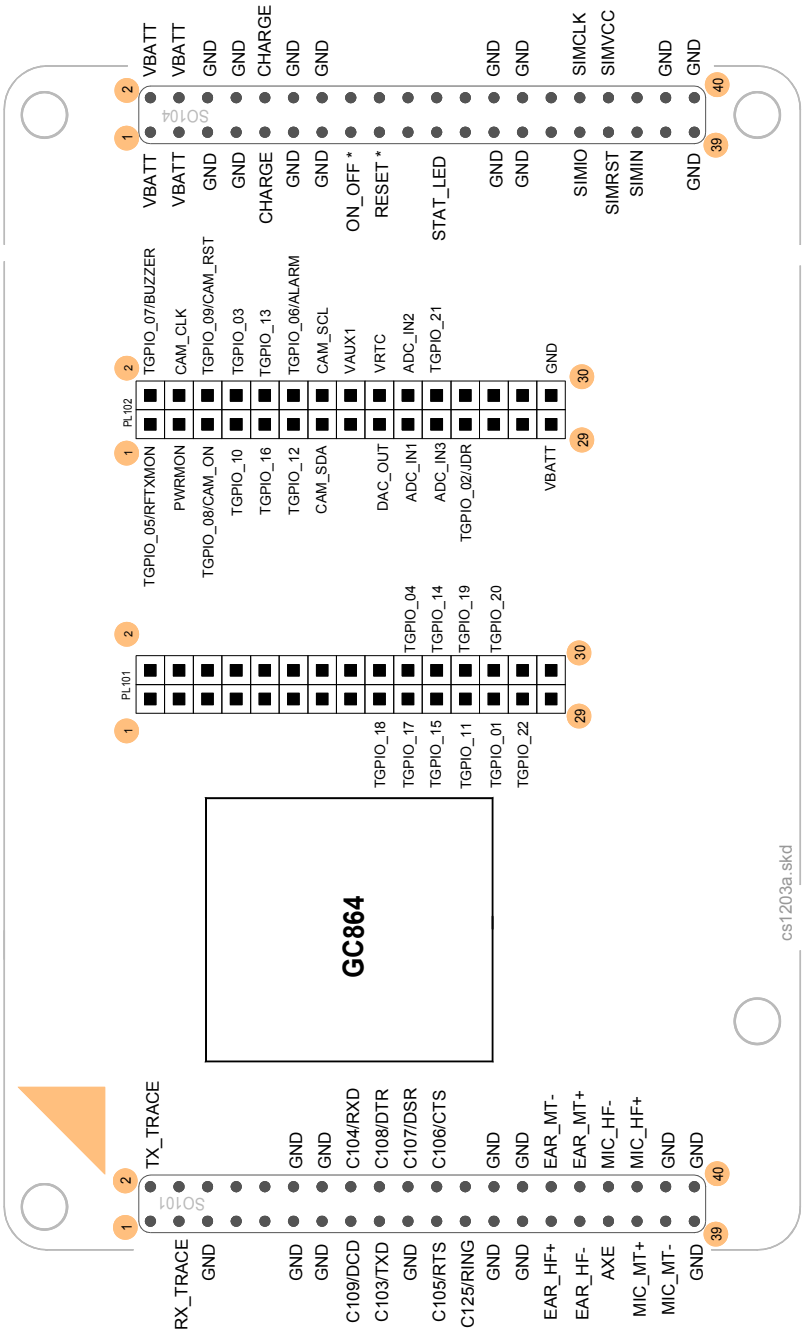


Figure 69. Position of GPIO ports on GC864 interface

29.1.8. GC864-C2 Interface (p/n 3990250683)

(Refer to schematic diagram *30276SE11231X*)

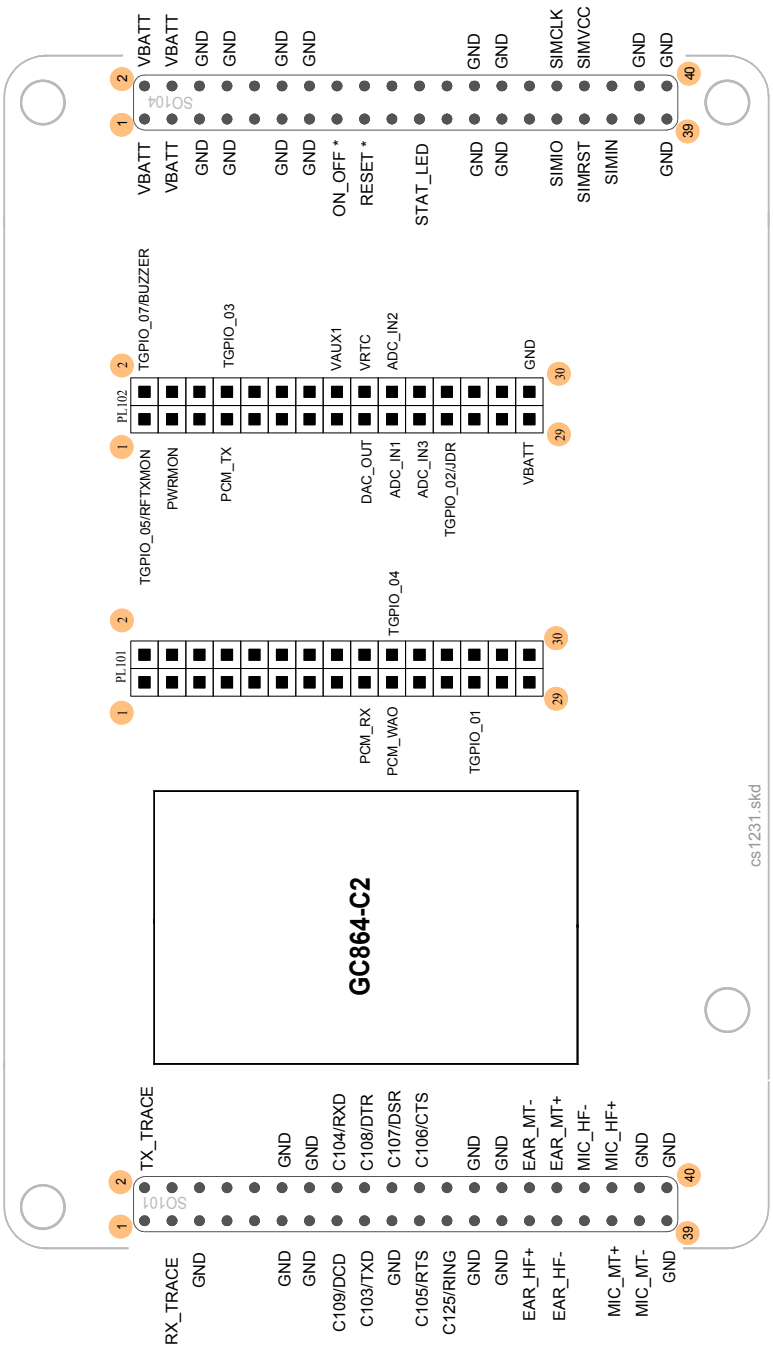


Figure 70. Position of GPIO ports on GC864-C2 interface

29.1.9. UC864 Interface

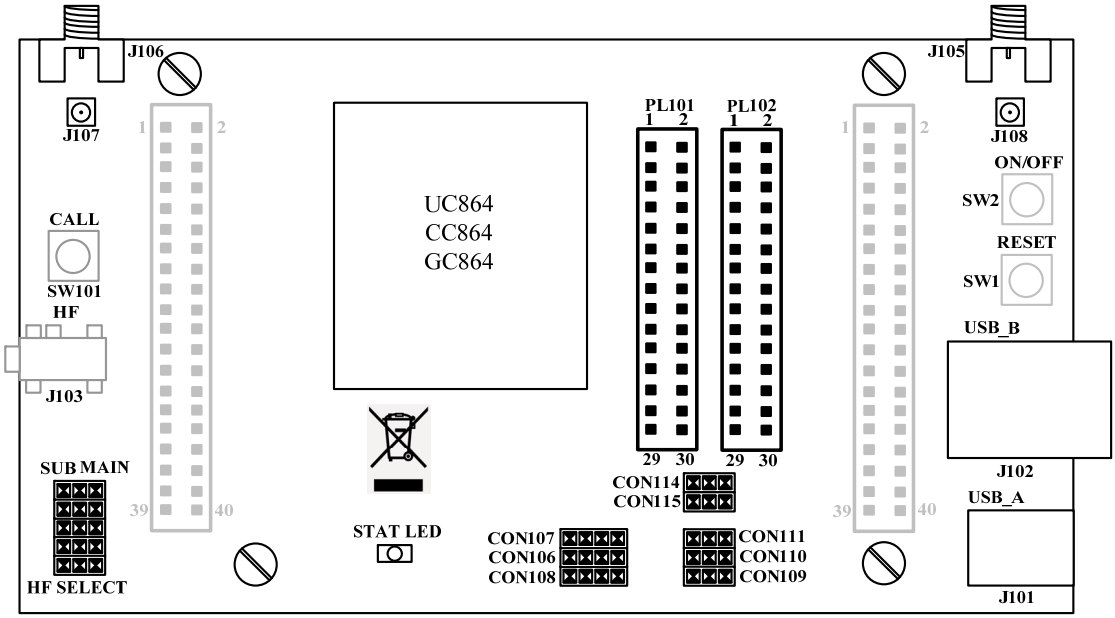


Figure 71. Position of GPIO on connectors of UC864 interface

PL101			
N.C	1	2	N.C
N.C	3	4	N.C
N.C	5	6	N.C
N.C	7	8	N.C
N.C	9	10	N.C
N.C	11	12	N.C
N.C	13	14	N.C
N.C	15	16	N.C
TGPIO_18/ PCM_RX	17	18	N.C
TGPIO_17/ PCM_SYNC	19	20	TGPIO_04
TGPIO_15	21	22	TGPIO_14
TGPIO_11	23	24	TGPIO_19
TGPIO_01	25	26	TGPIO_20
TGPIO_22	27	28	N.C
N.C	29	30	N.C

PL102			
TGPIO_05/ RTXMON	1	2	TGPIO_07/ BUZZER
PWRMON	3	4	RESERVED
TGPIO_08	5	6	TGPIO_09
TGPIO_10/ PCM_TX	7	8	TGPIO_03
TGPIO_16	9	10	TGPIO_13
TGPIO_12	11	12	TGPIO_06/ ALARM
PCM_CLOCK	13	14	USB_ID
N.C.	15	16	VAUX1
DAC_OUT	17	18	VRTC
ADC_IN1	19	20	ADC_IN2
ADC_IN3	21	22	TGPIO_21
TGPIO_02/JDR	23	24	N.C
N.C	25	26	N.C
RESERVED	27	28	RESERVED
VBATT	29	30	GND

Table 30 GPIO pin positioning

29.1.10. HE910 Interface

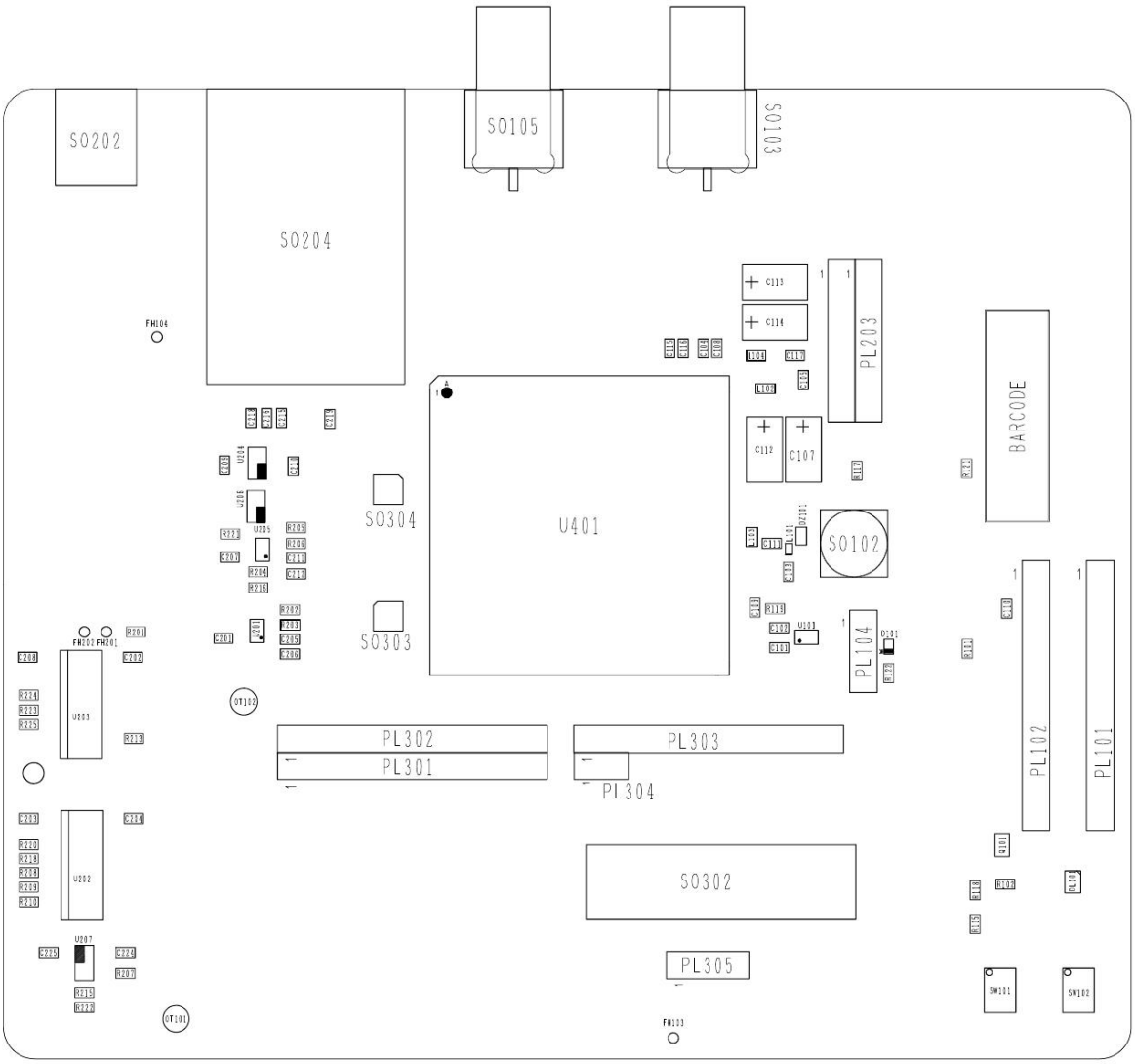


Figure 72. Position of GPIO on connectors of HE910 interface

The connectors are carrying the following signals:

Pin Name	Pin/Connector
GPIO_01	Pin 1 (PL302)
GPIO_02	Pin 2 (PL302)
GPIO_03	Pin 3 (PL302)
GPIO_04	Pin 4 (PL302)
GPIO_05	Pin 6 (PL102)
GPIO_06	Pin 5 (PL302)
GPIO_07	Pin 6 (PL302)
GPIO_08	Pin 6 (PL303)
GPIO_09	Pin 7 (PL303)
GPIO_10	Pin 8 (PL303)

PL305		
Pin#	**Pin Name**	**Description**
1	-	Reserved
2	VDD_IO	Input pin for the bus supply
3	VIO_1V8	VIO supply at 1.8V

29.1.11. GE910 Interface

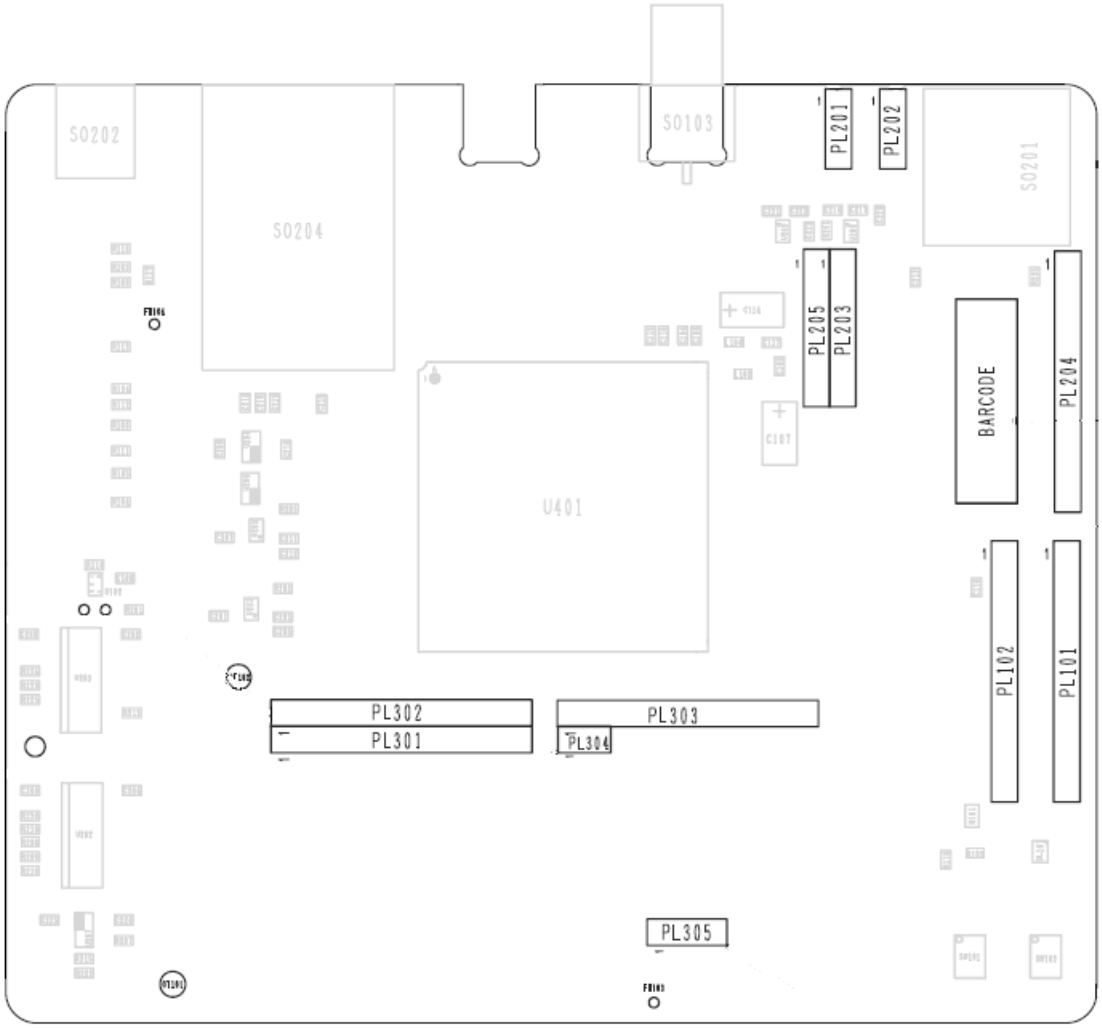


Figure 73. Position of GPIO on connectors of GE910 interface

The connectors are carrying the following signals:

Pin Name	Pin/Connector
GPIO_01	Pin 1 (PL302)
GPIO_02	Pin 2 (PL302)
GPIO_03	Pin 3 (PL302)
GPIO_04	Pin 4 (PL302)
GPIO_05	Pin 6 (PL102)
GPIO_06	Pin 5 (PL302)
GPIO_07	Pin 6 (PL302)
GPIO_08	Pin 6 (PL303)
GPIO_09	Pin 7 (PL303)
GPIO_10	Pin 8 (PL303)

PL305		
Pin#	**Pin Name**	**Description**
1	-	Reserved
2	VDD_IO	Input pin for the bus supply
3	VIO_1V8	VIO supply at 1.8V

29.1.12. DE910 Interface

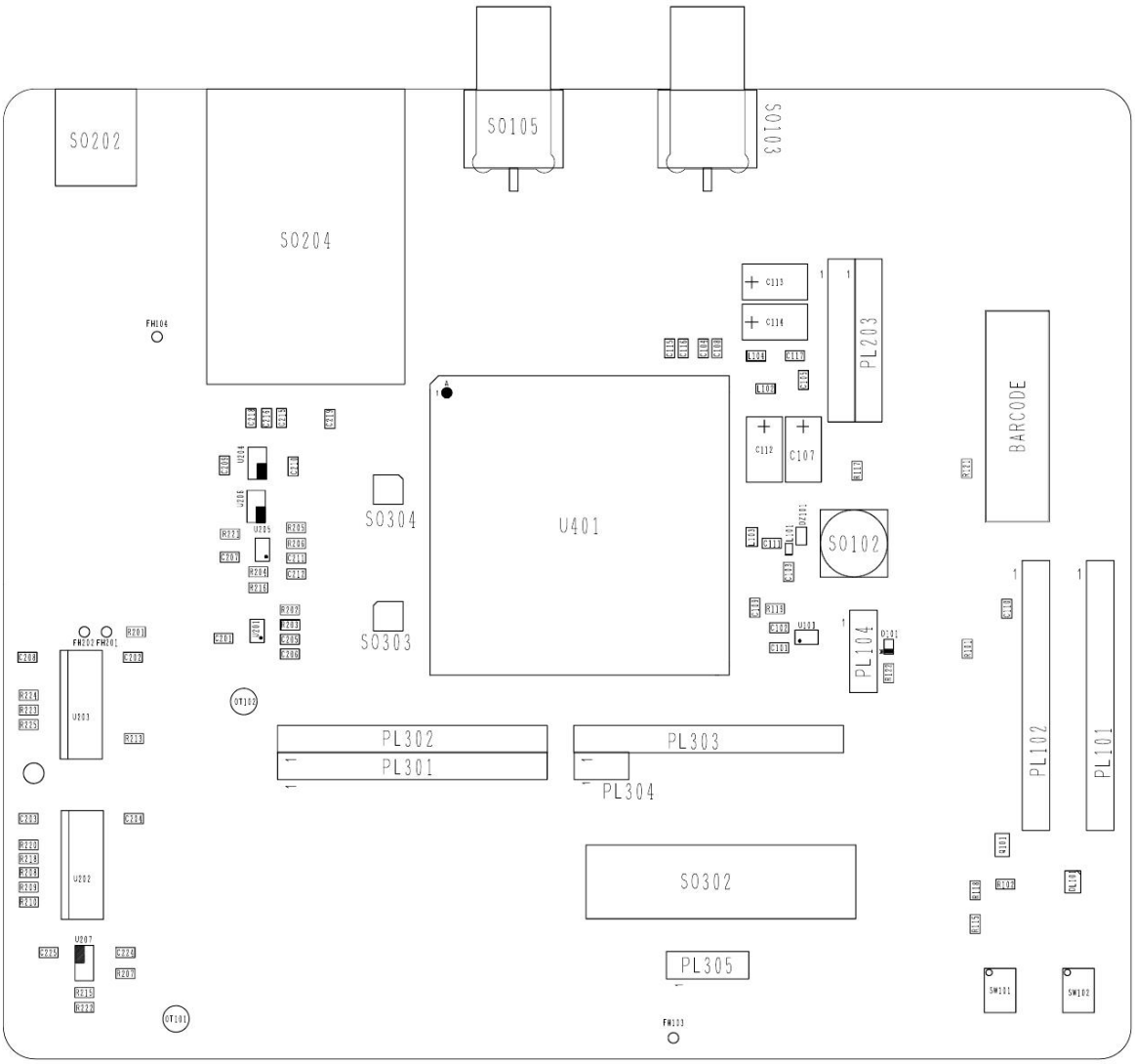


Figure 74. Position of GPIO on connectors of DE910 interface

The connectors are carrying the following signals:

Pin Name	Pin/Connector
GPIO_01	Pin 1 (PL302)
GPIO_02	Pin 2 (PL302)
GPIO_03	Pin 3 (PL302)
GPIO_04	Pin 4 (PL302)
GPIO_05	Pin 6 (PL102)
GPIO_06	Pin 5 (PL302)
GPIO_07	Pin 6 (PL302)
GPIO_08	Pin 6 (PL303)
GPIO_09	Pin 7 (PL303)
GPIO_10	Pin 8 (PL303)

PL305		
Pin#	**Pin Name**	**Description**
1	-	Reserved
2	VDD_IO	Input pin for the bus supply
3	VIO_1V8	VIO supply at 1.8V

29.1.13. CE910 Interface

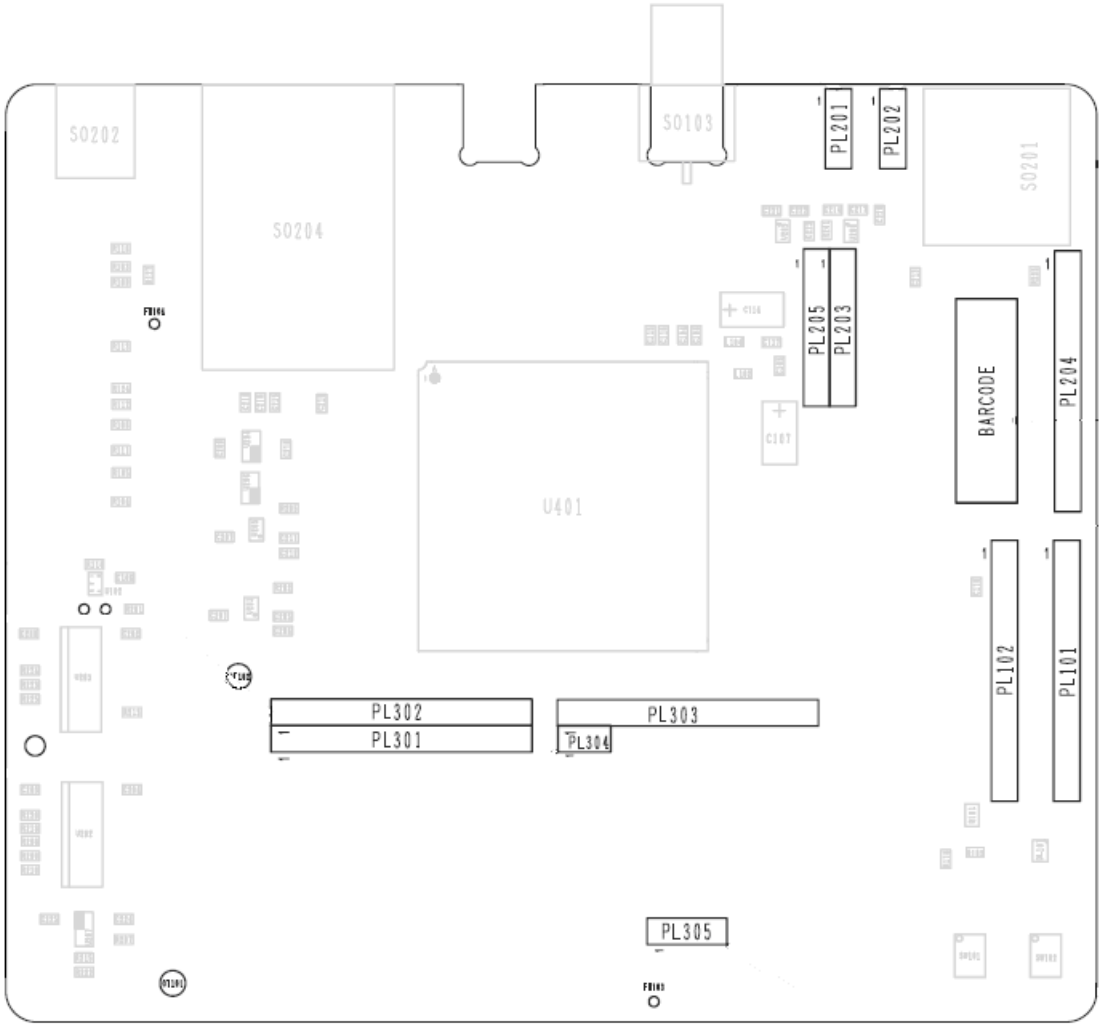


Figure 75. Position of GPIO on connectors of CE910 interface

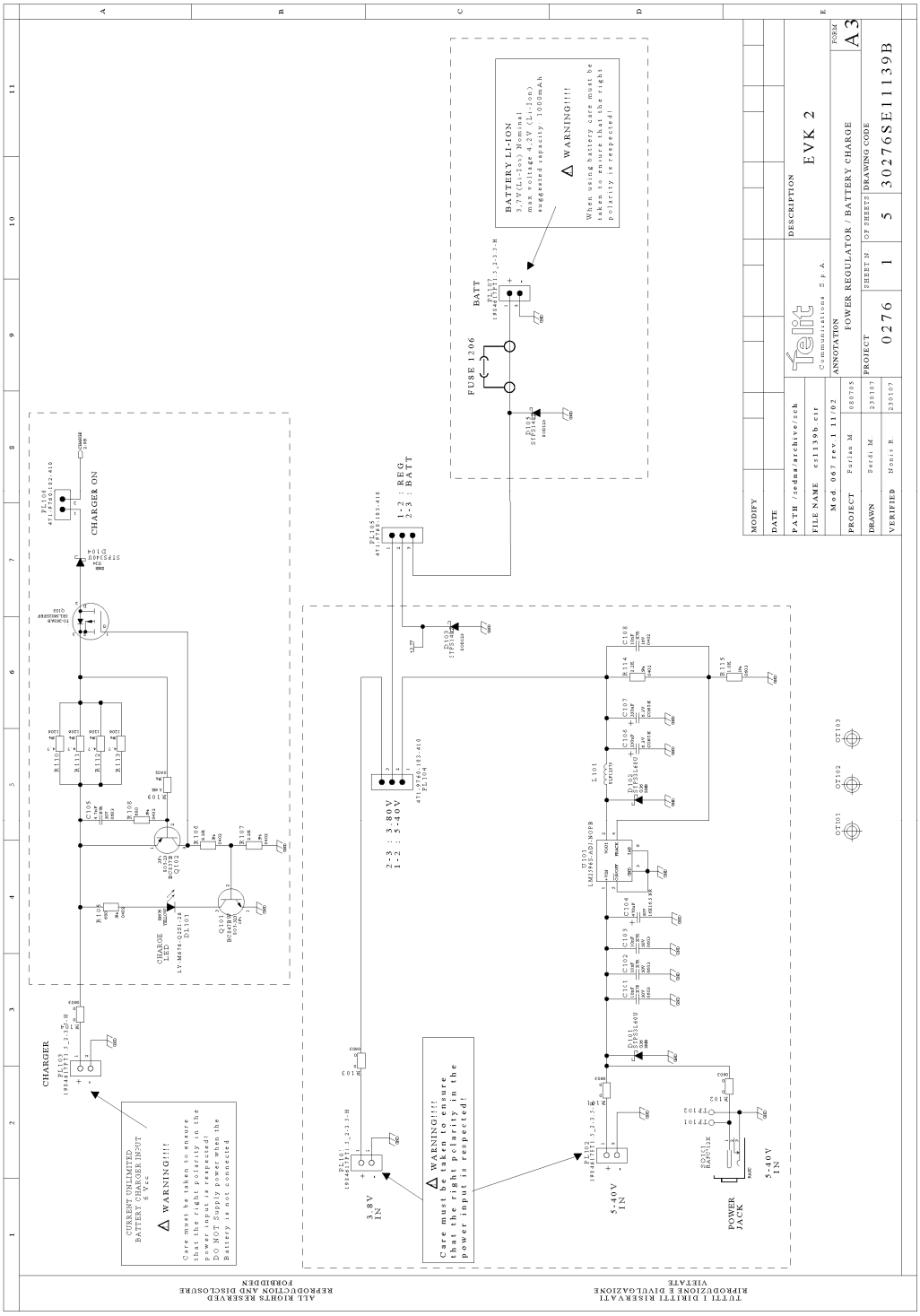
The connectors are carrying the following signals:

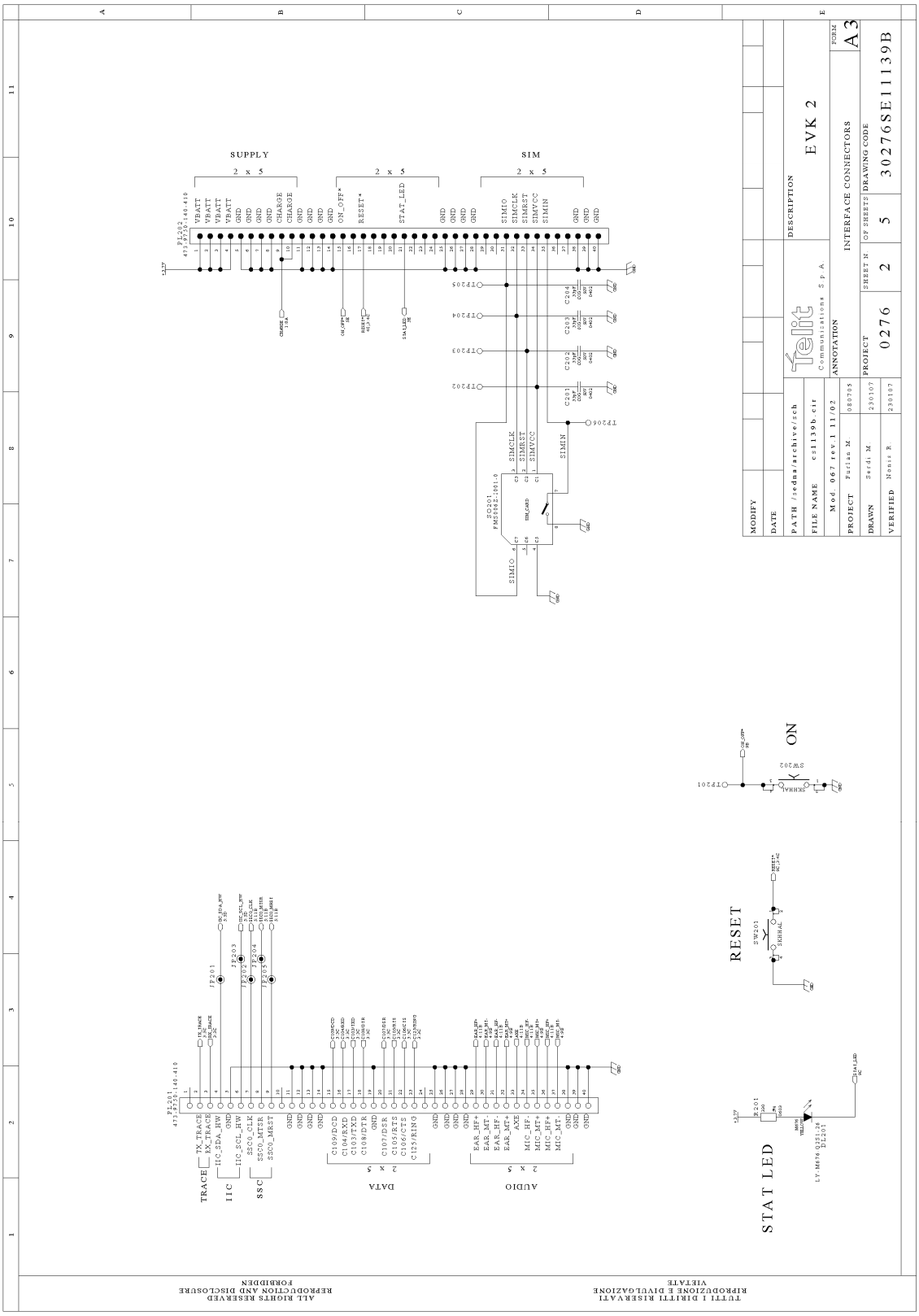
Pin Name	Pin/Connector
GPIO_01	Pin 1 (PL302)
GPIO_02	Pin 2 (PL302)
GPIO_03	Pin 3 (PL302)
GPIO_04	Pin 4 (PL302)
GPIO_05	Pin 6 (PL102)
GPIO_06	Pin 5 (PL302)
GPIO_07	Pin 6 (PL302)
GPIO_08	Pin 6 (PL303)
GPIO_09	Pin 7 (PL303)
GPIO_10	Pin 8 (PL303)

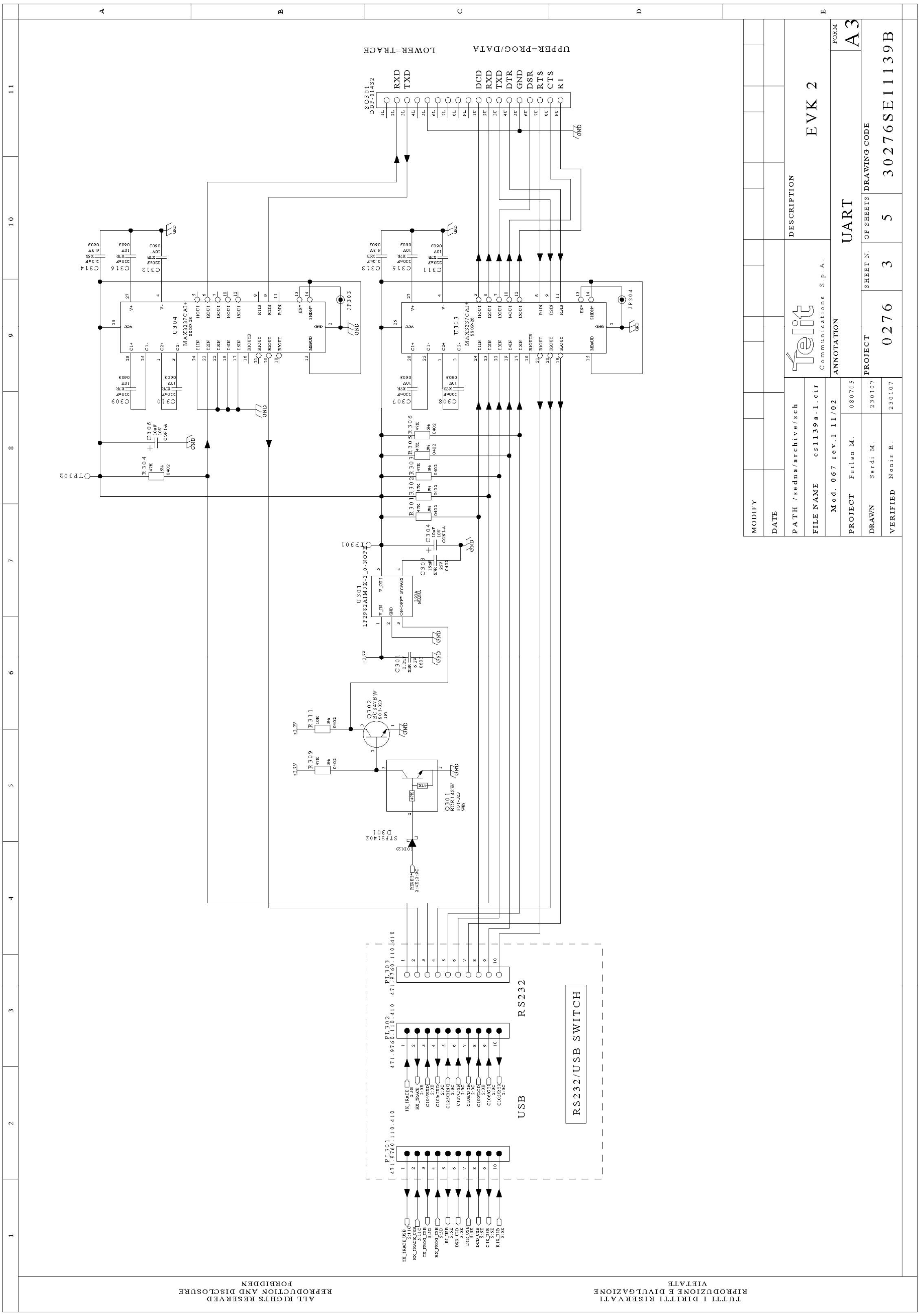
30. SCHEMATICS

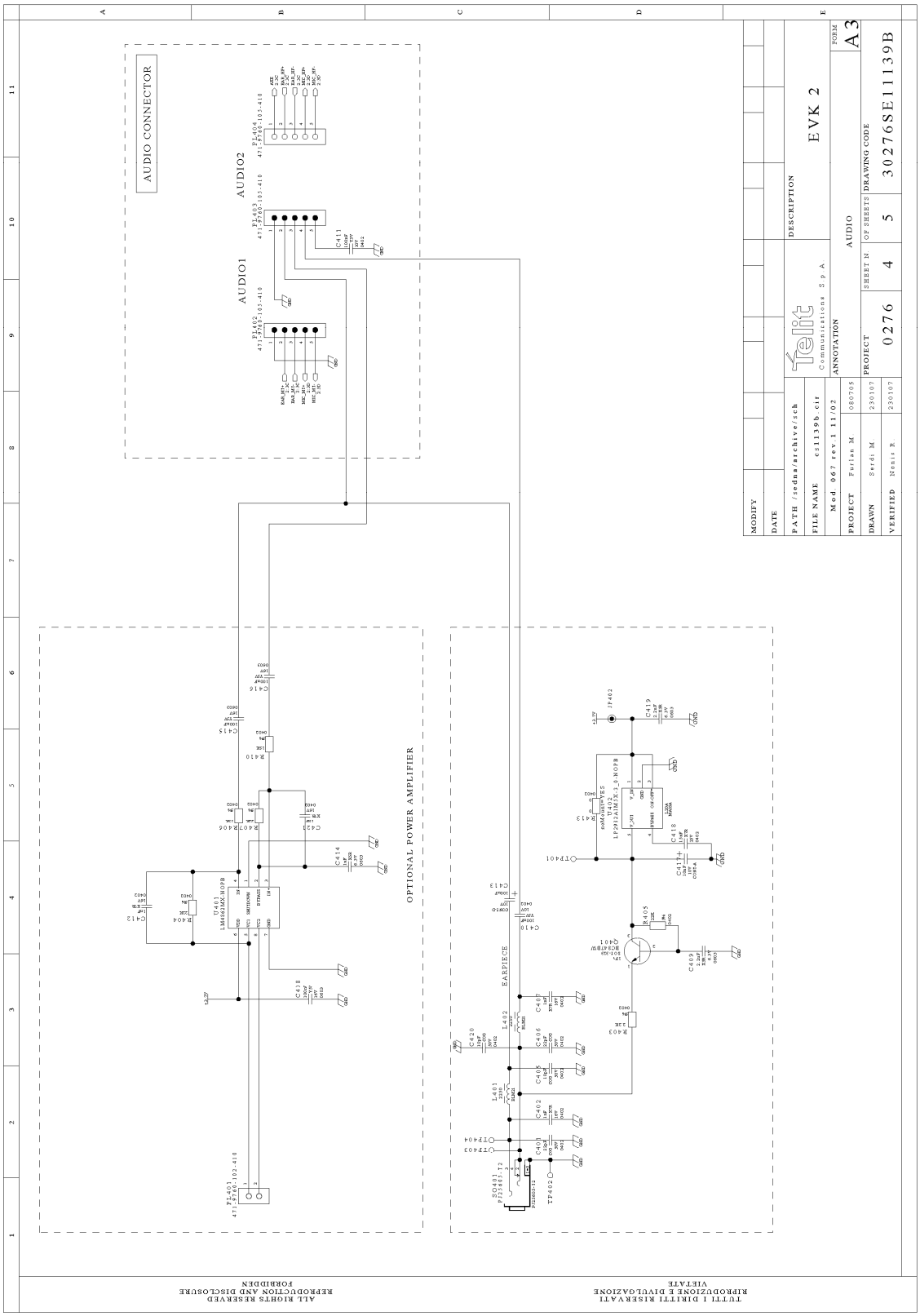
In the following paragraphs the user can find the schematics related to all EVK2 boards, therefore to the Mother Board, to the Interface Boards and to the Extension Boards.

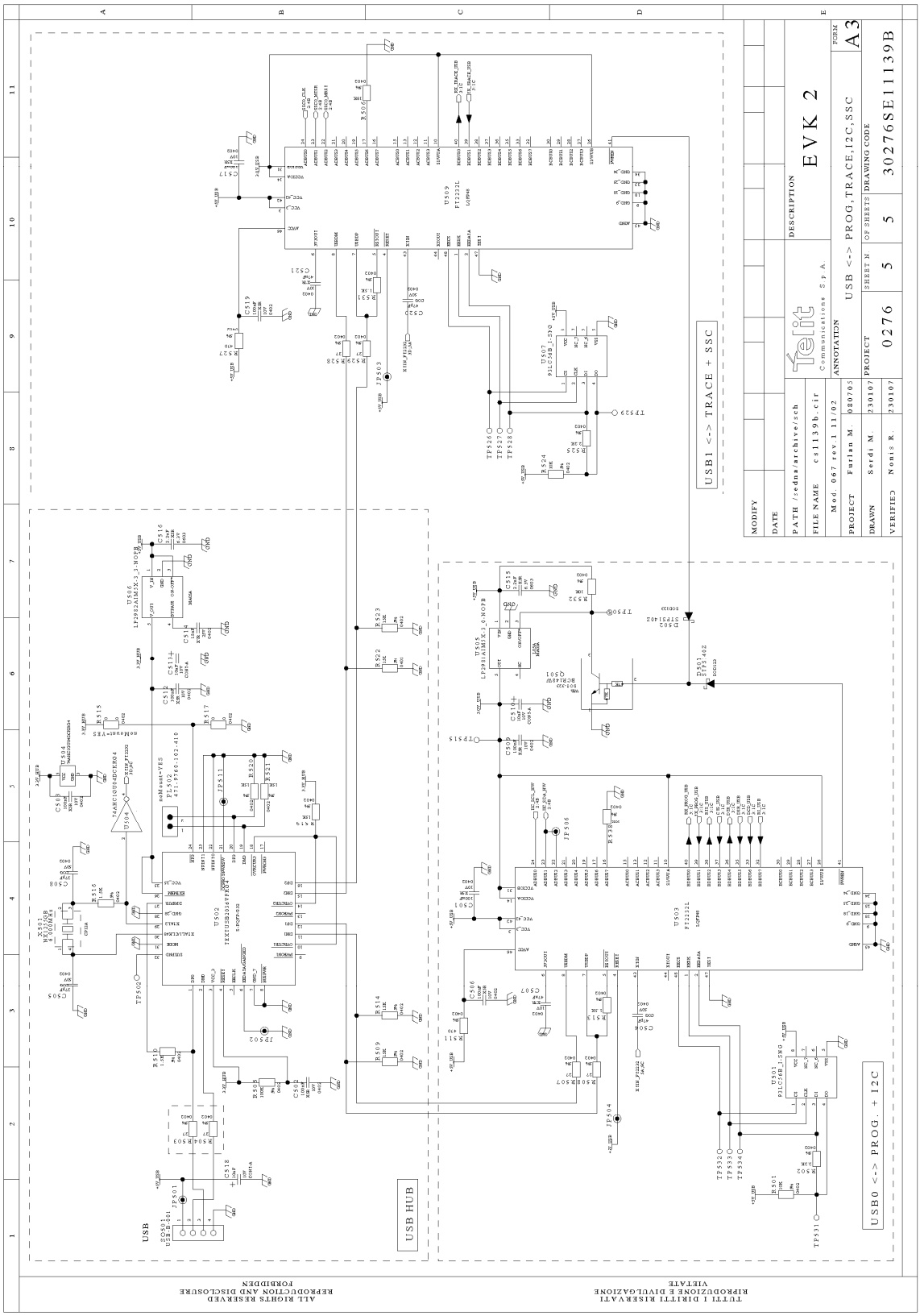
30.1. EVK2 Mother Board










USB1 <-> TRACE + SSC
USB0 <-> PROG. + I2C
USB HUB
USB
USB <-> PROG.TRACE,I2C,SSC
EVK 2
30276SE11139B
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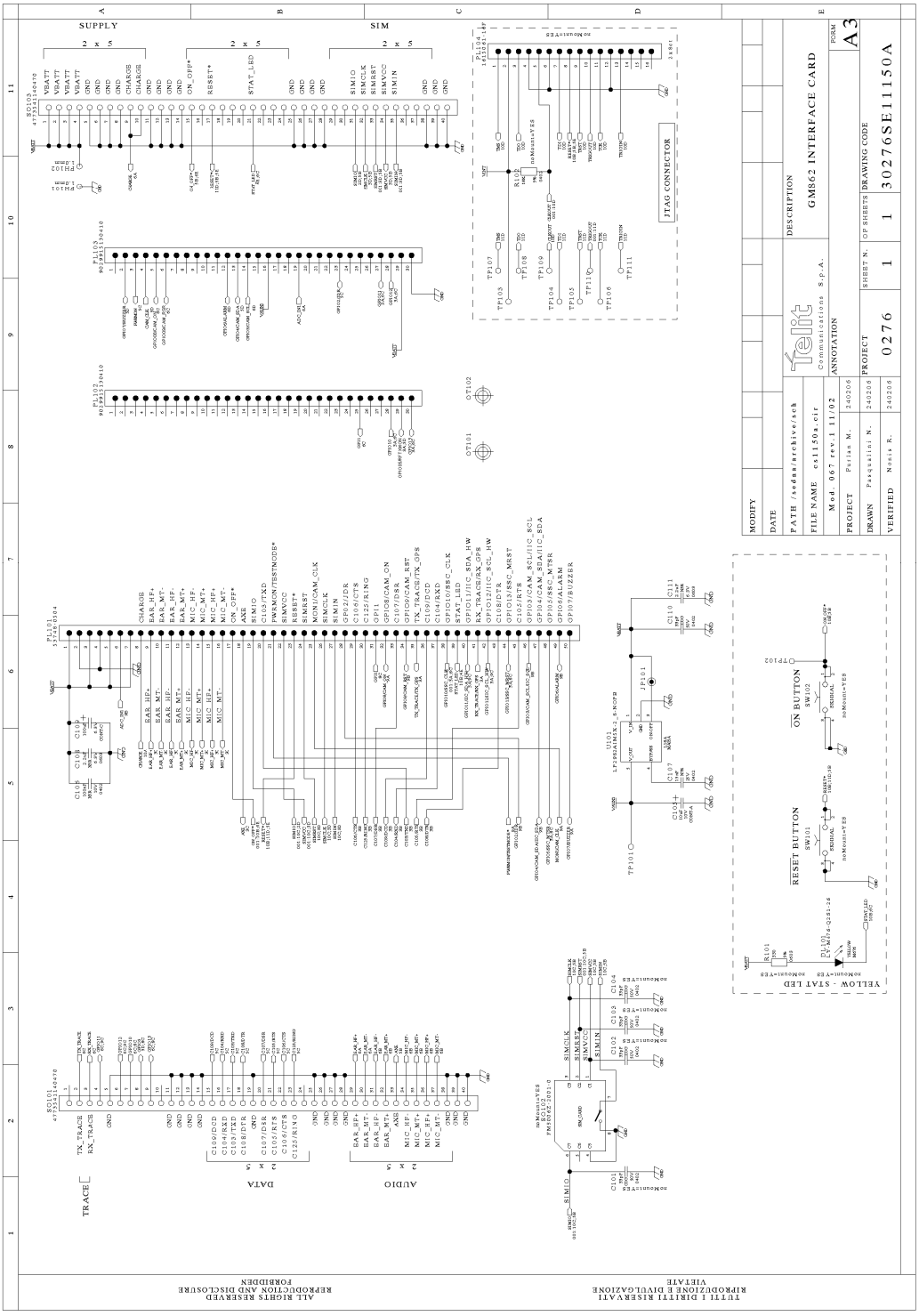
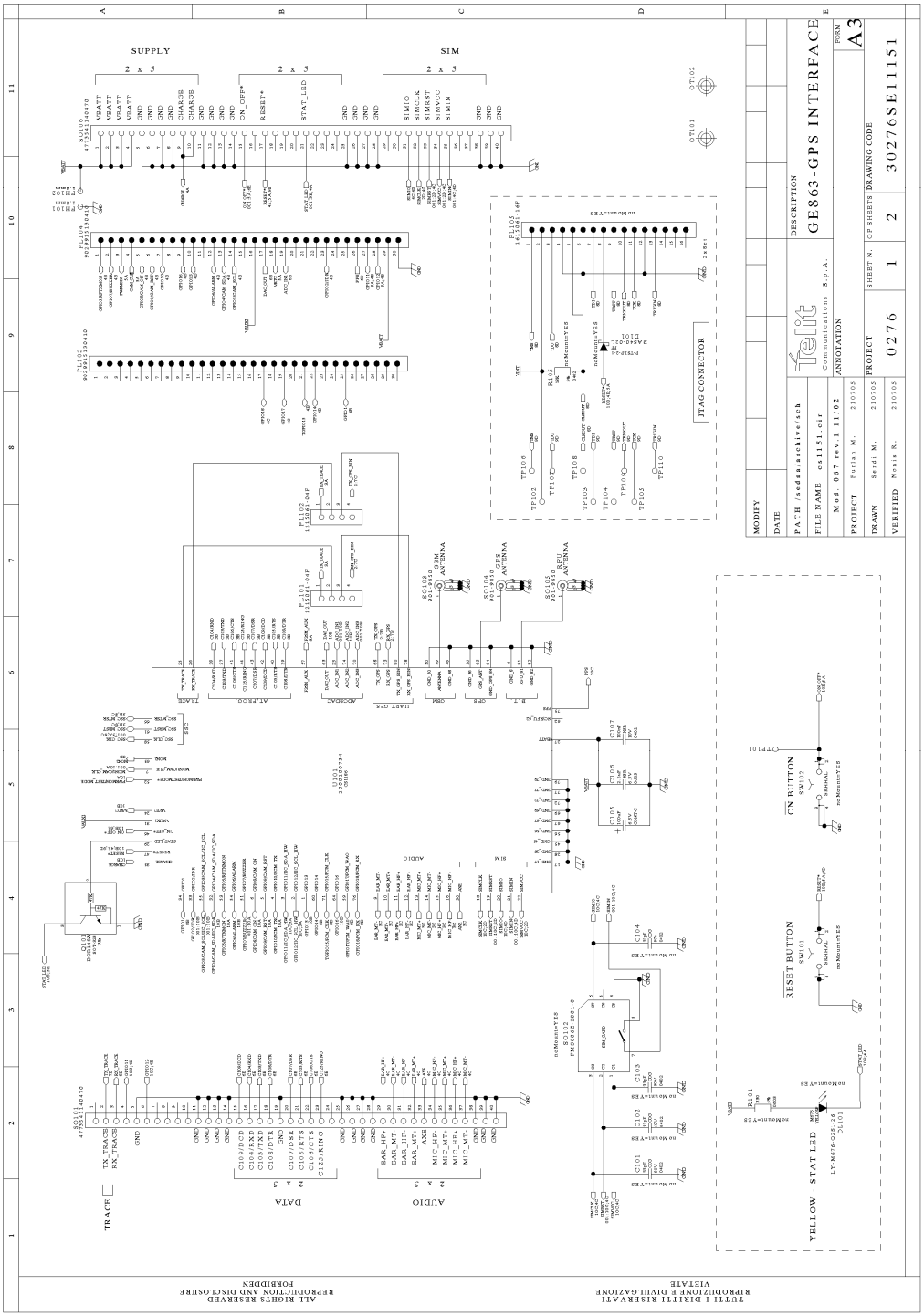
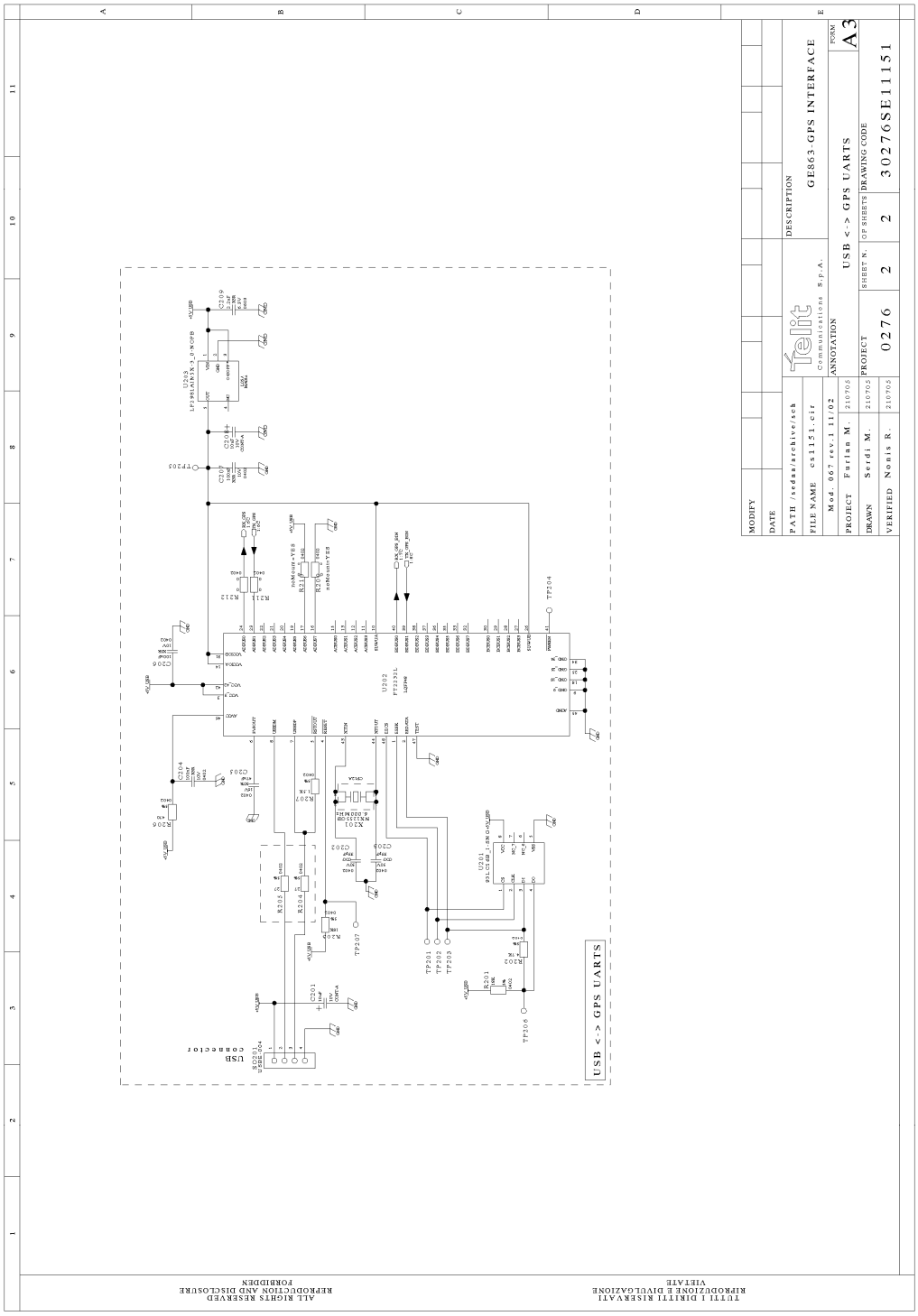
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE

30.2. GM862 Interface Board



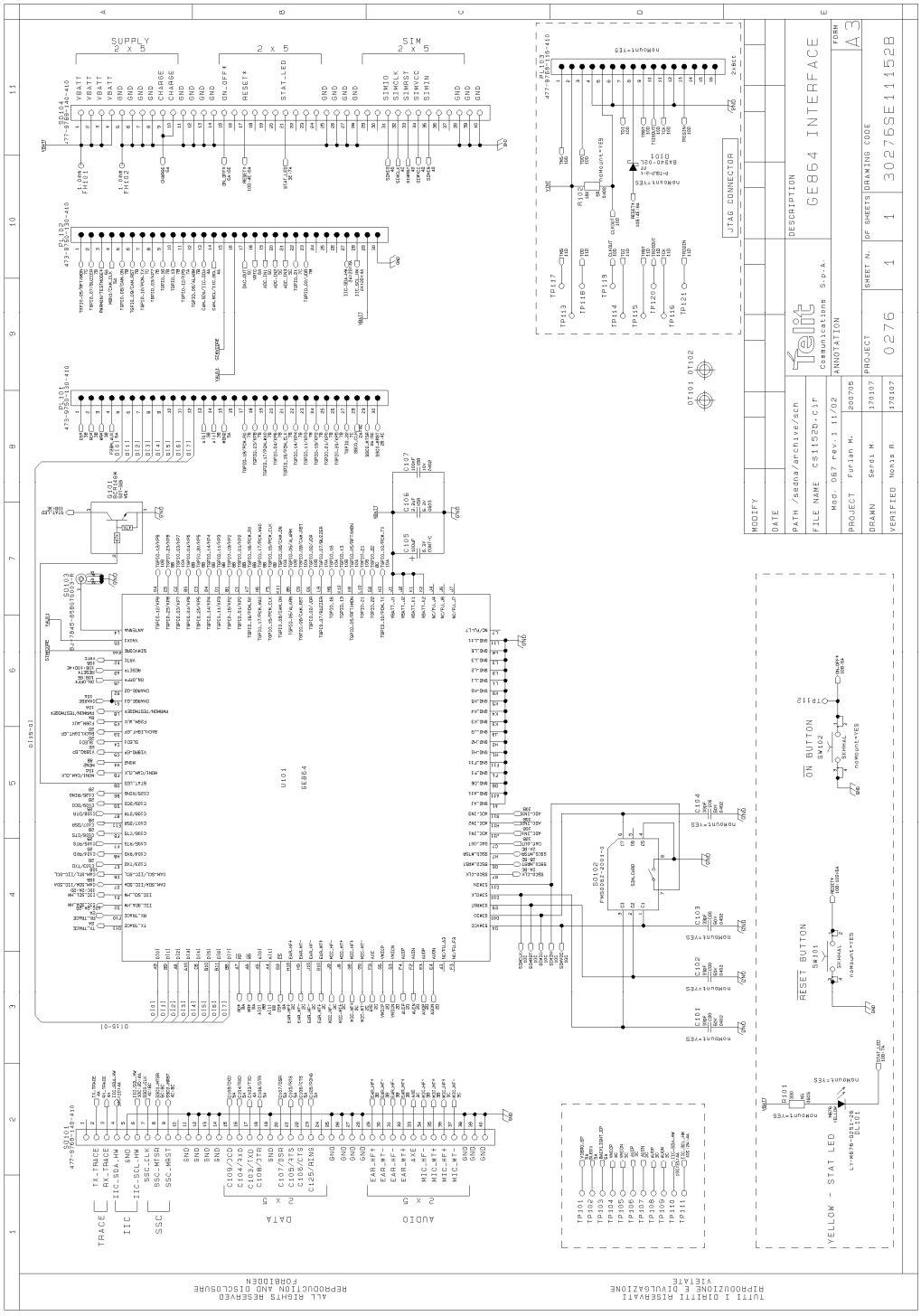
30.3. GE863 Interface Board



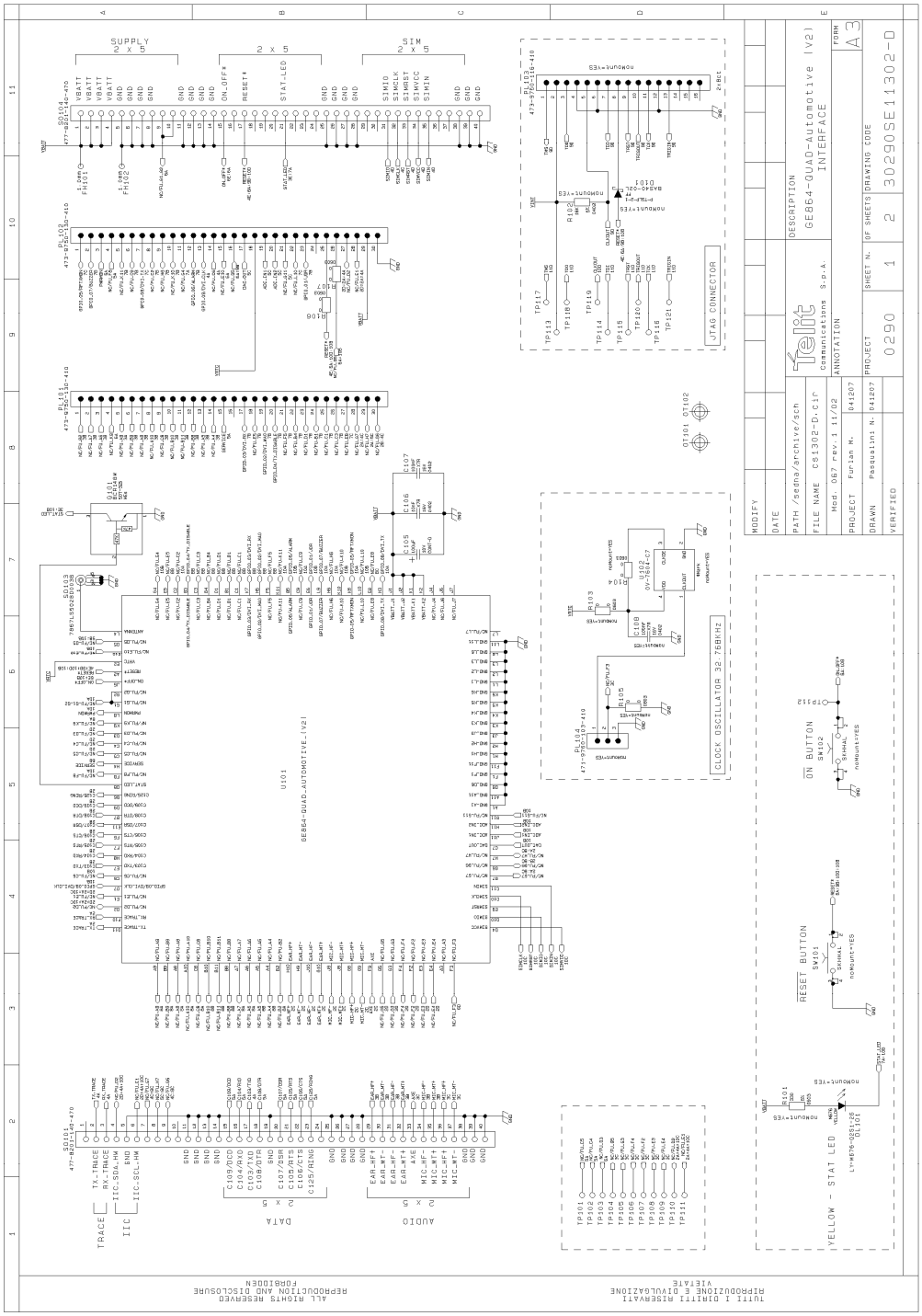


NOTE: This sheet is related only to GPS version.

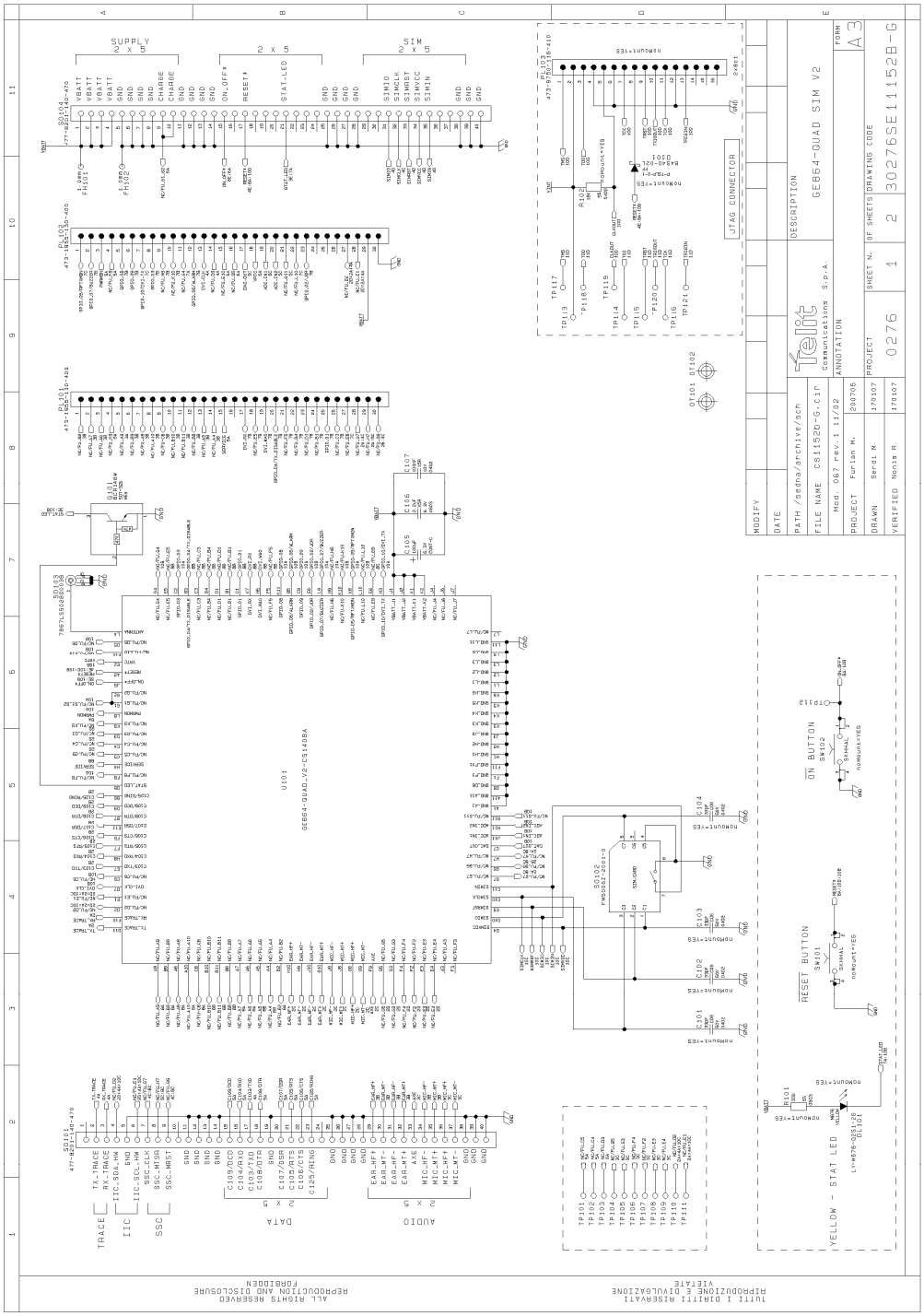
30.4. GE864 Interface board



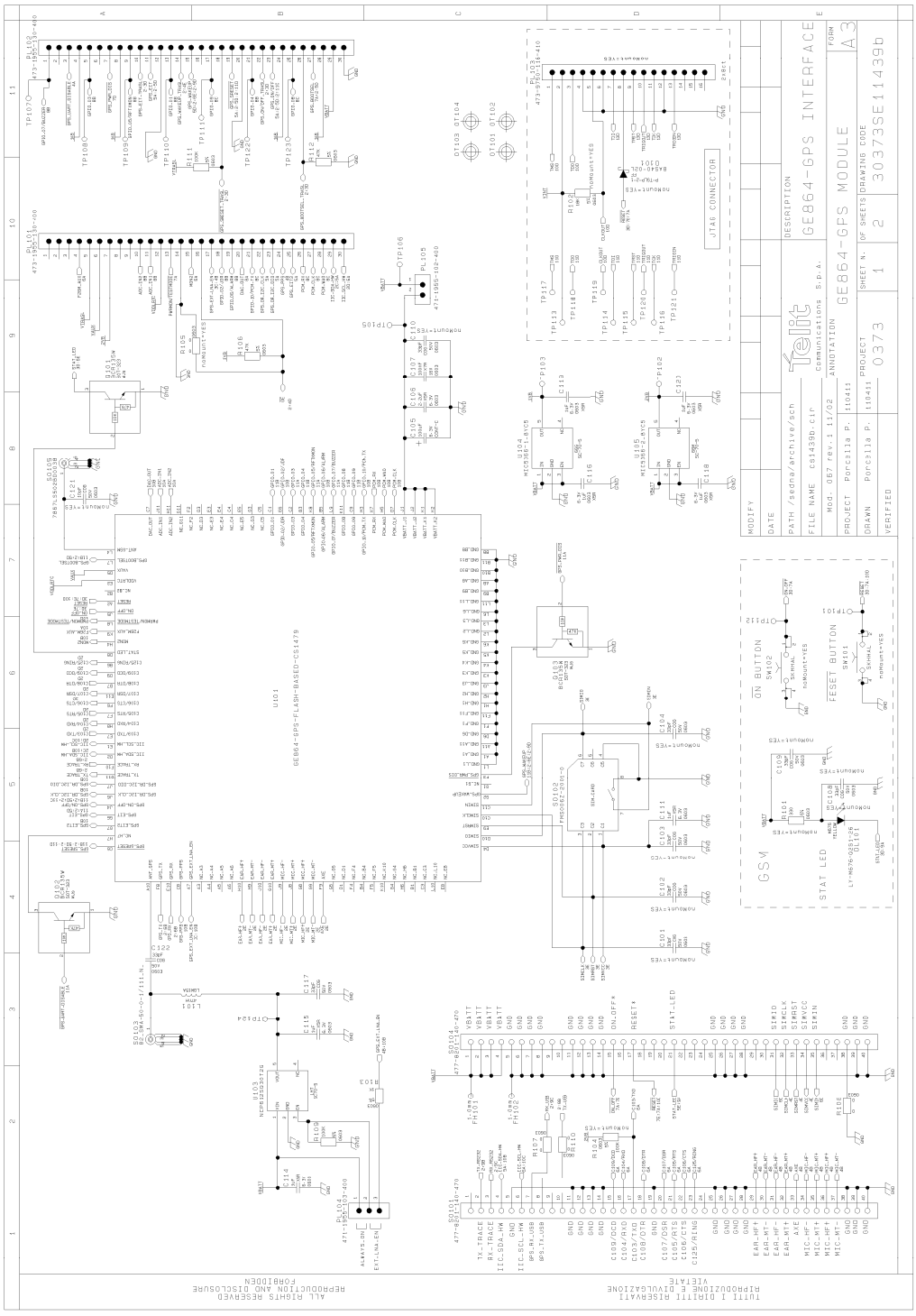
30.5. GE864 Interface board – Automotive

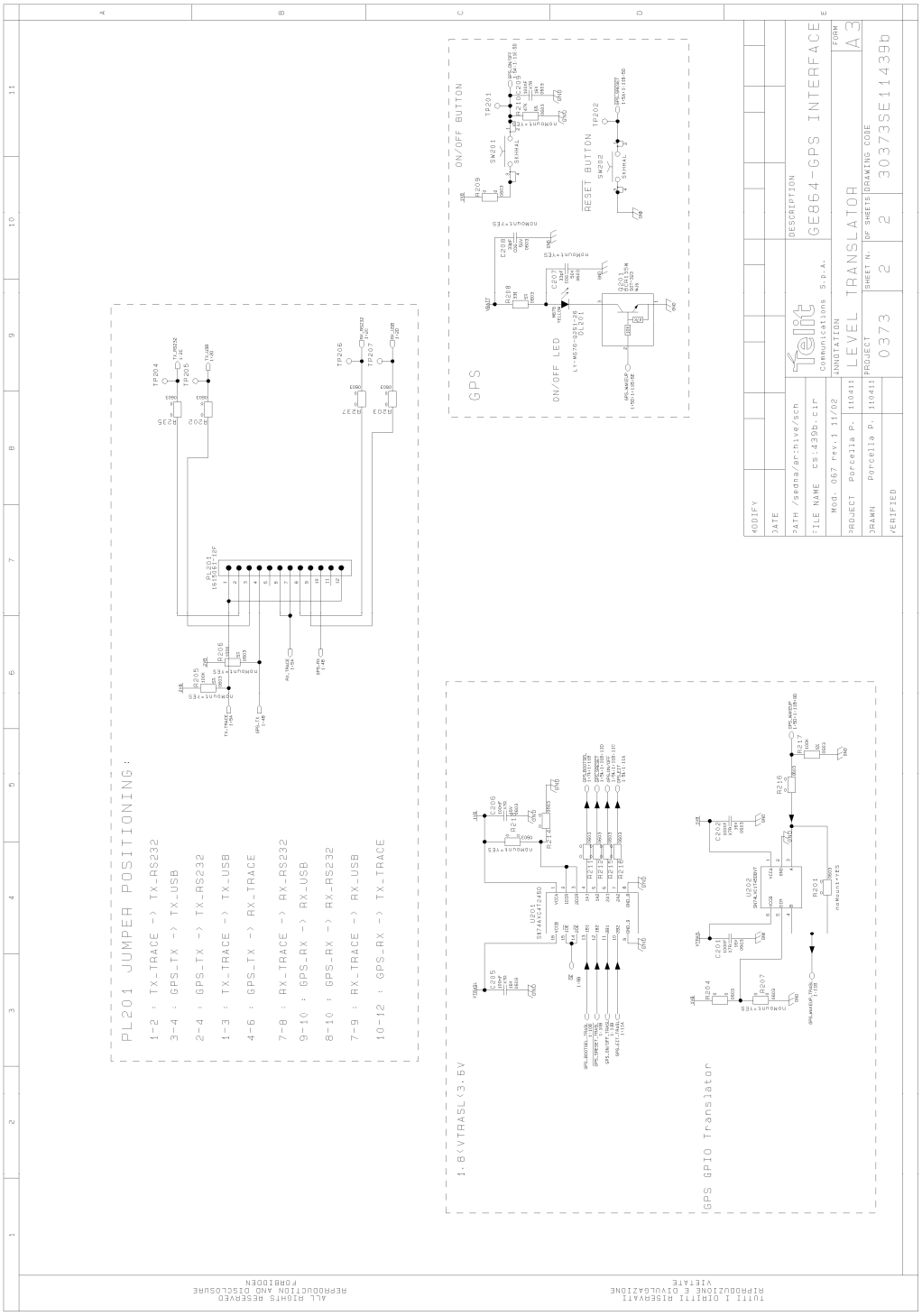


30.6. GE864 Interface board – V2

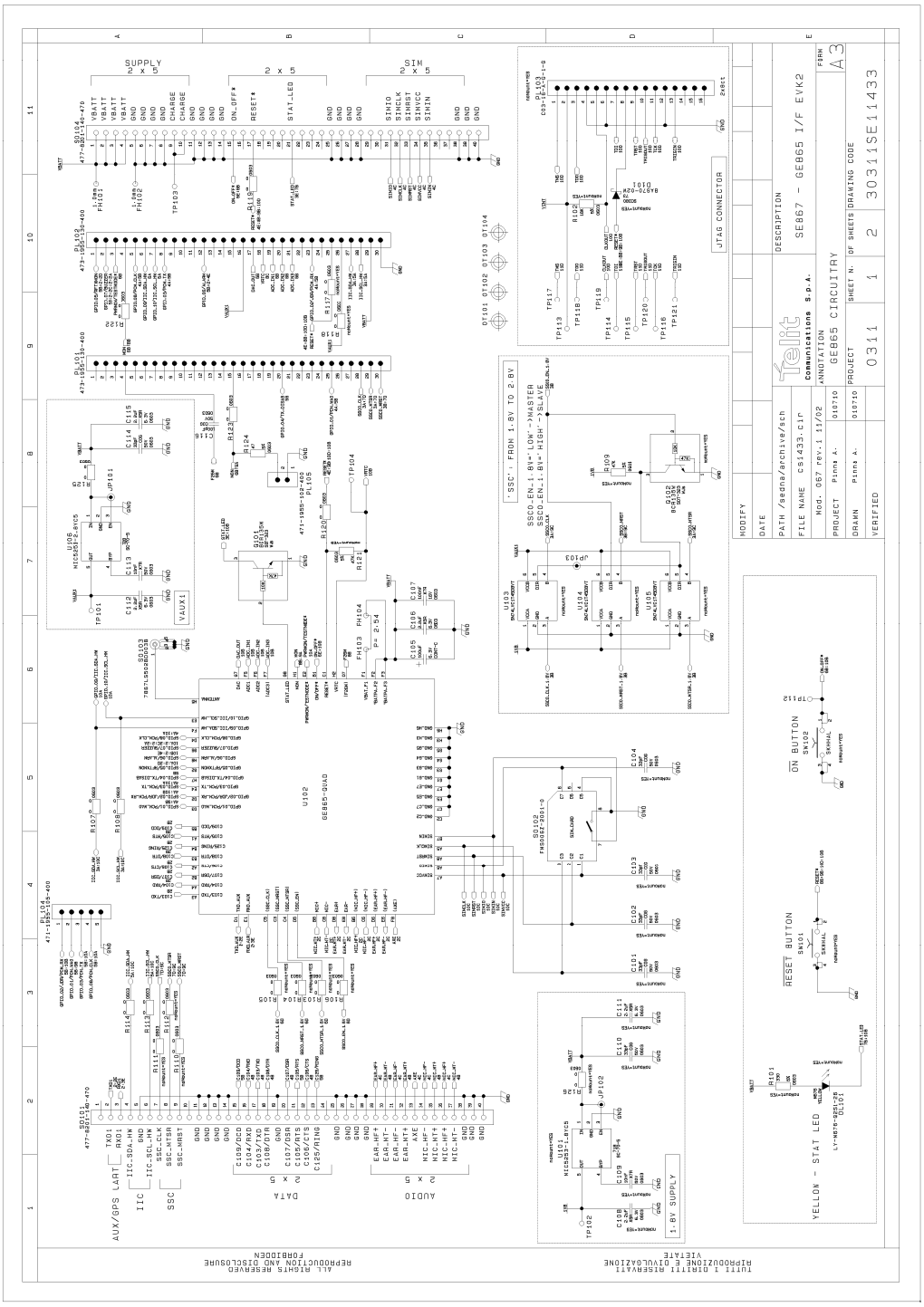


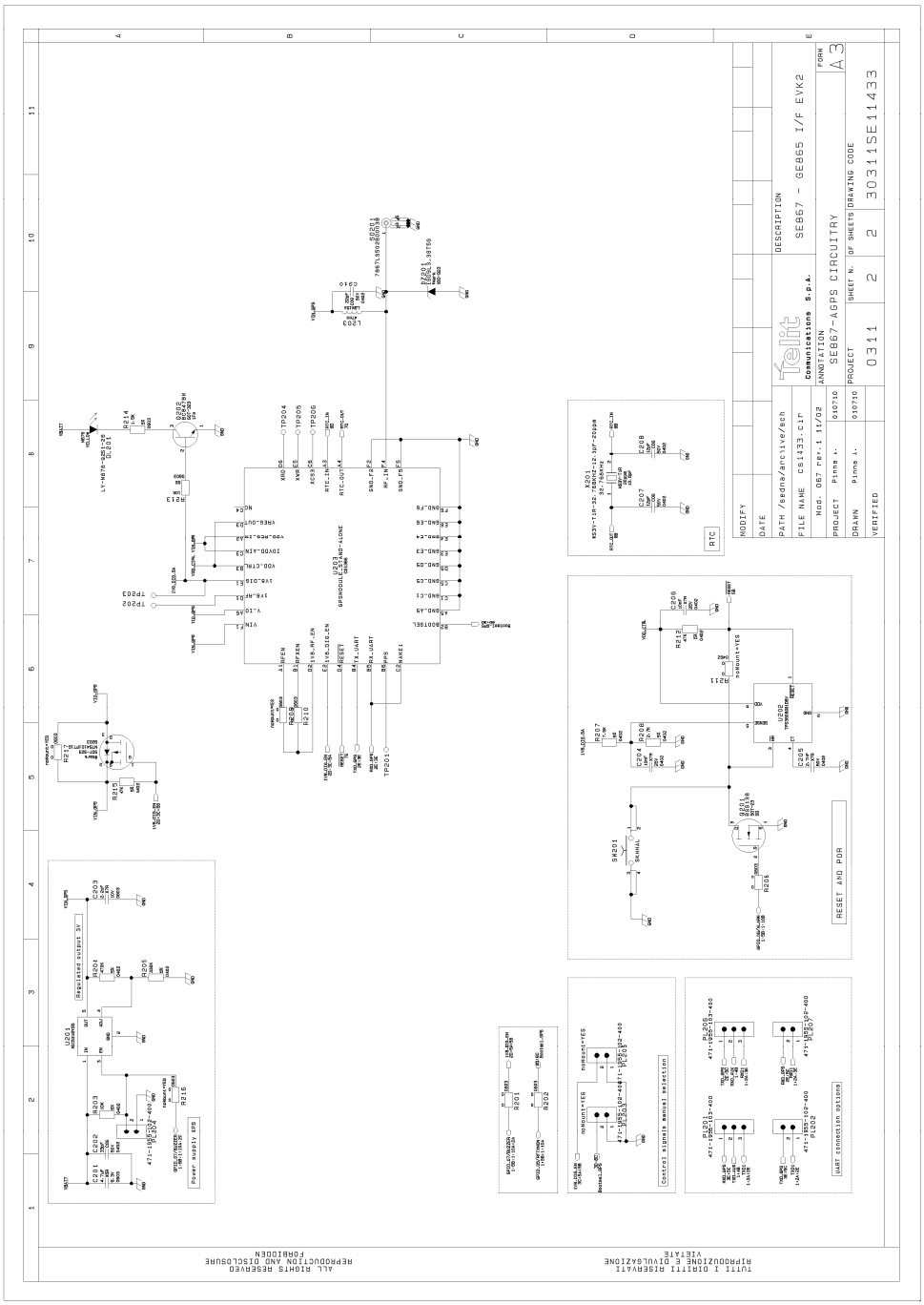
30.7. GE864-GPS Interface board



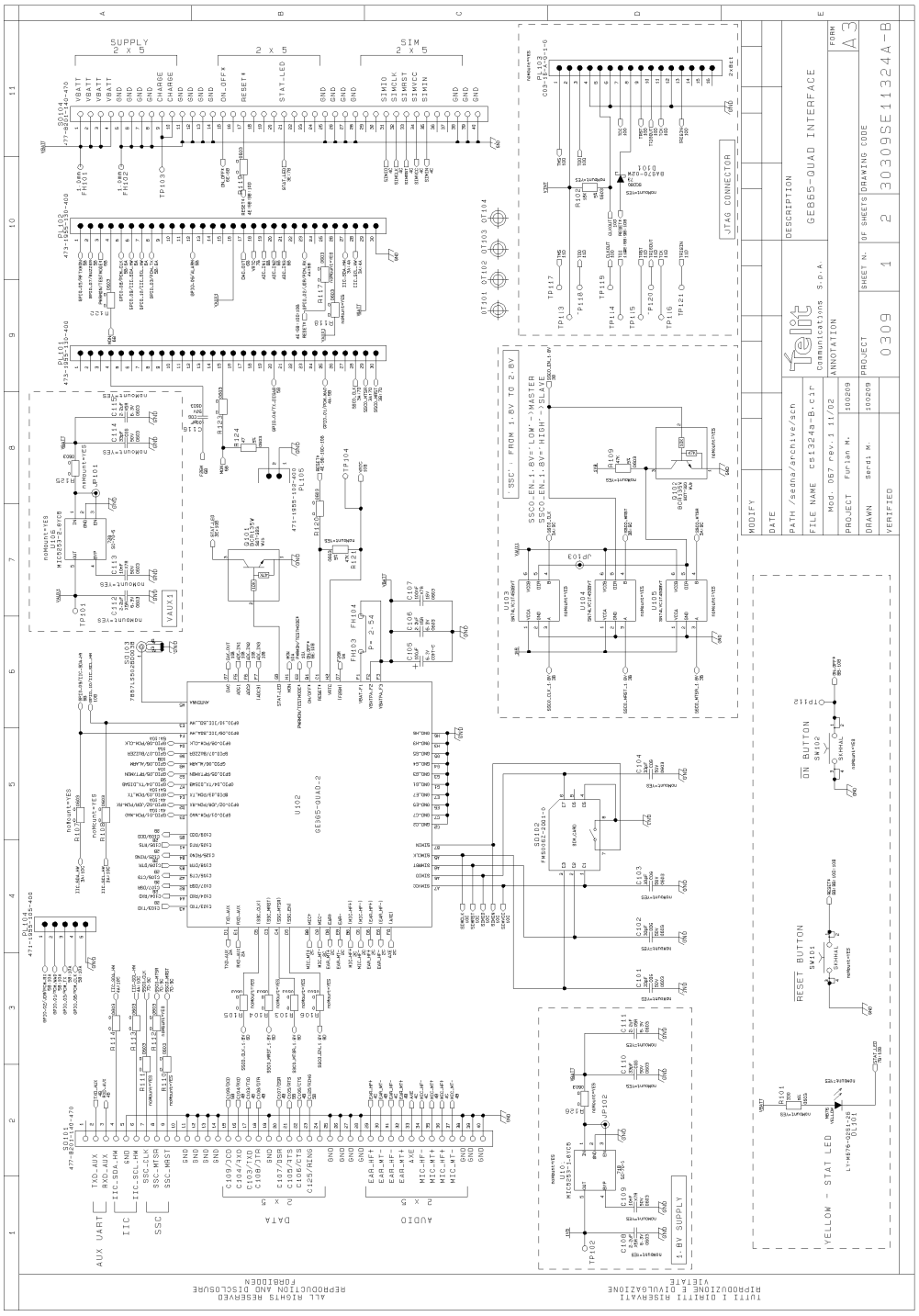

PL201 JUMPER POSITIONING:
1-2 : TX_TRACE -> TX_RS232
3-4 : GPS_TX -> TX_USB
2-4 : GPS_TX -> TX_RS232
1-3 : TX_TRACE -> TX_USB
4-6 : GPS_TX -> RX_TRACE
7-8 : RX_TRACE -> RX_RS232
9-10 : GPS_RX -> RX_USB
8-10 : GPS_RX -> RX_RS232
7-9 : RX_TRACE -> RX_USB
10-12 : GPS_RX -> TX_TRACE
GPS
ON/OFF BUTTON
RESET BUTTON
ON/OFF LED
GPS GPIO Translator
GE864-GPS INTERFACE
LEVEL TRANSLATOR
Telit Communications S.p.A.

30.8. GE865/SE867-AGPS Interface board

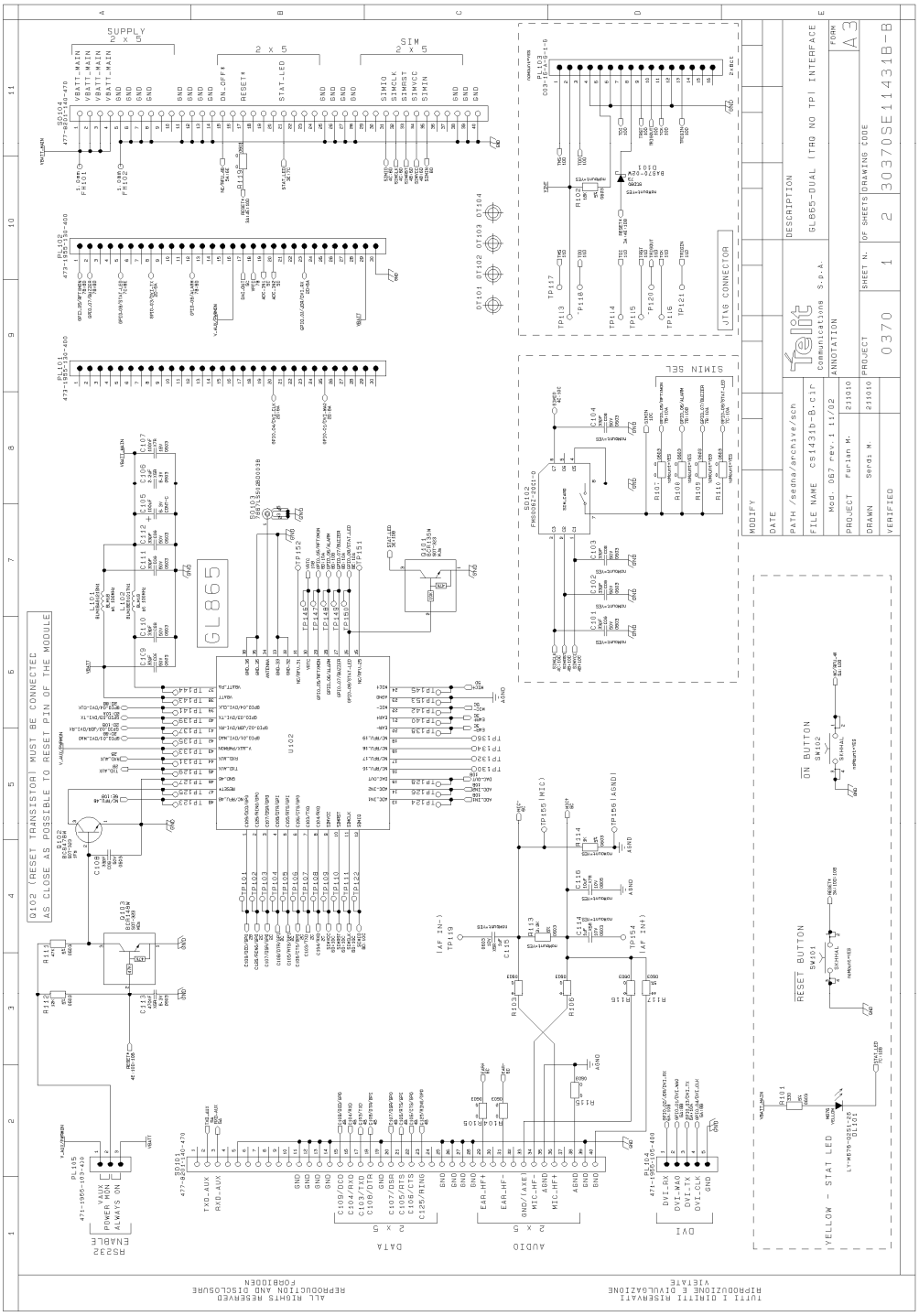




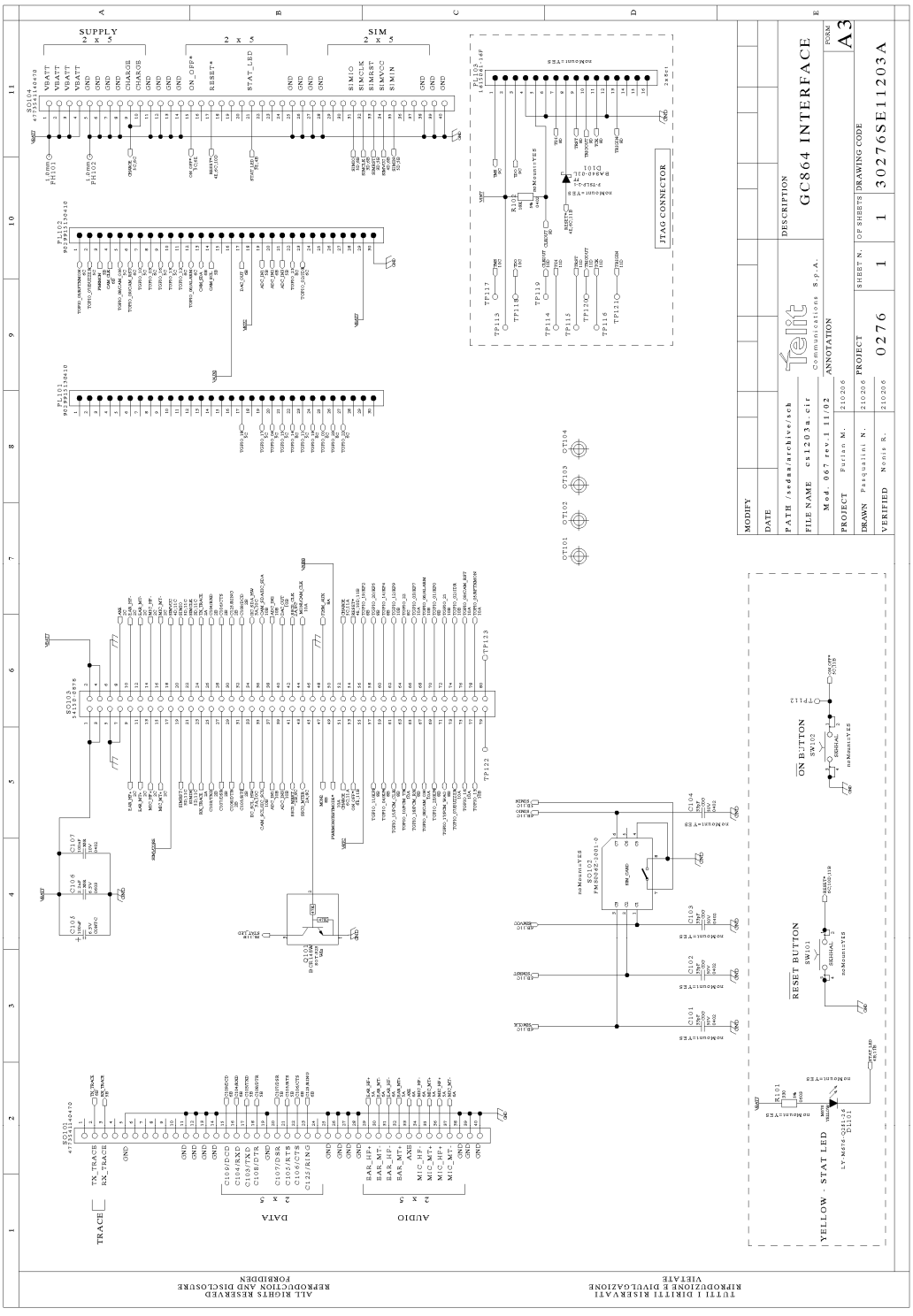
30.9. GE865 Interface board



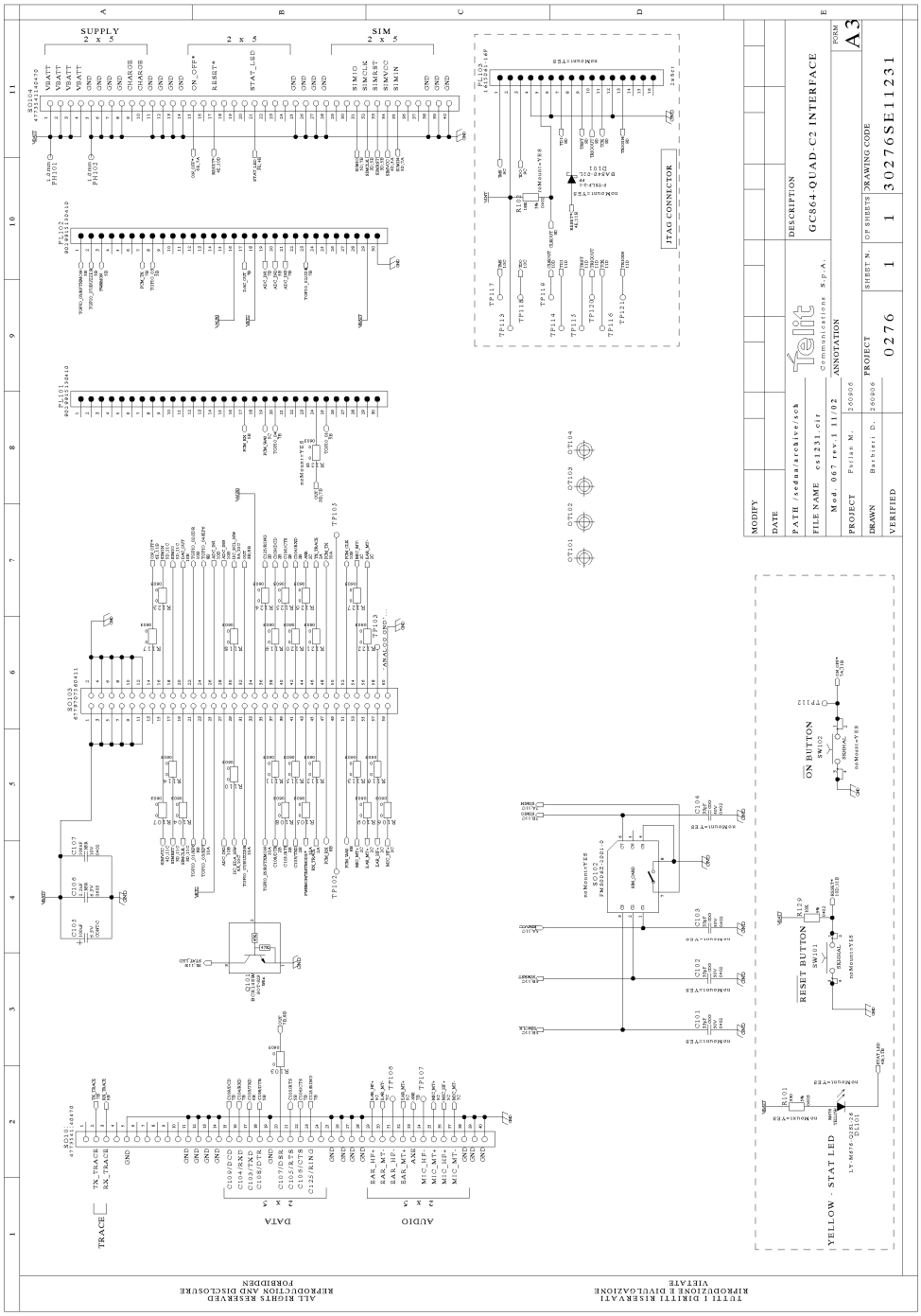
30.10. GL865 Interface board



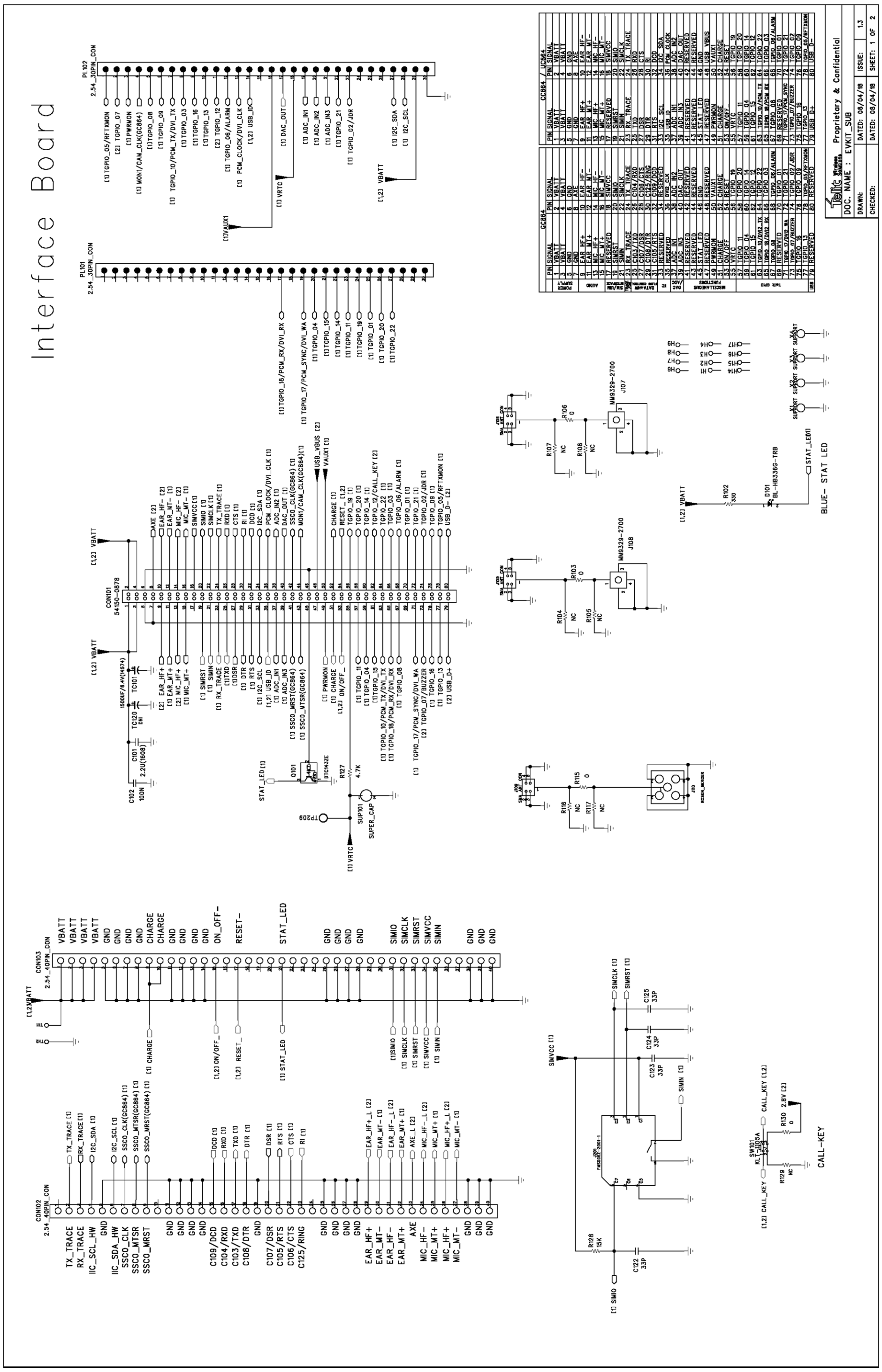
30.11. GC864 Interface board

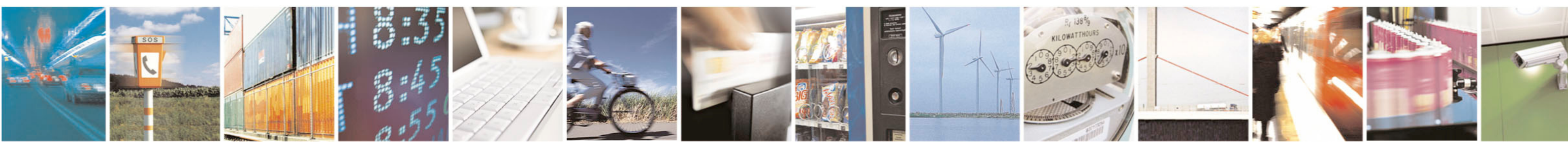


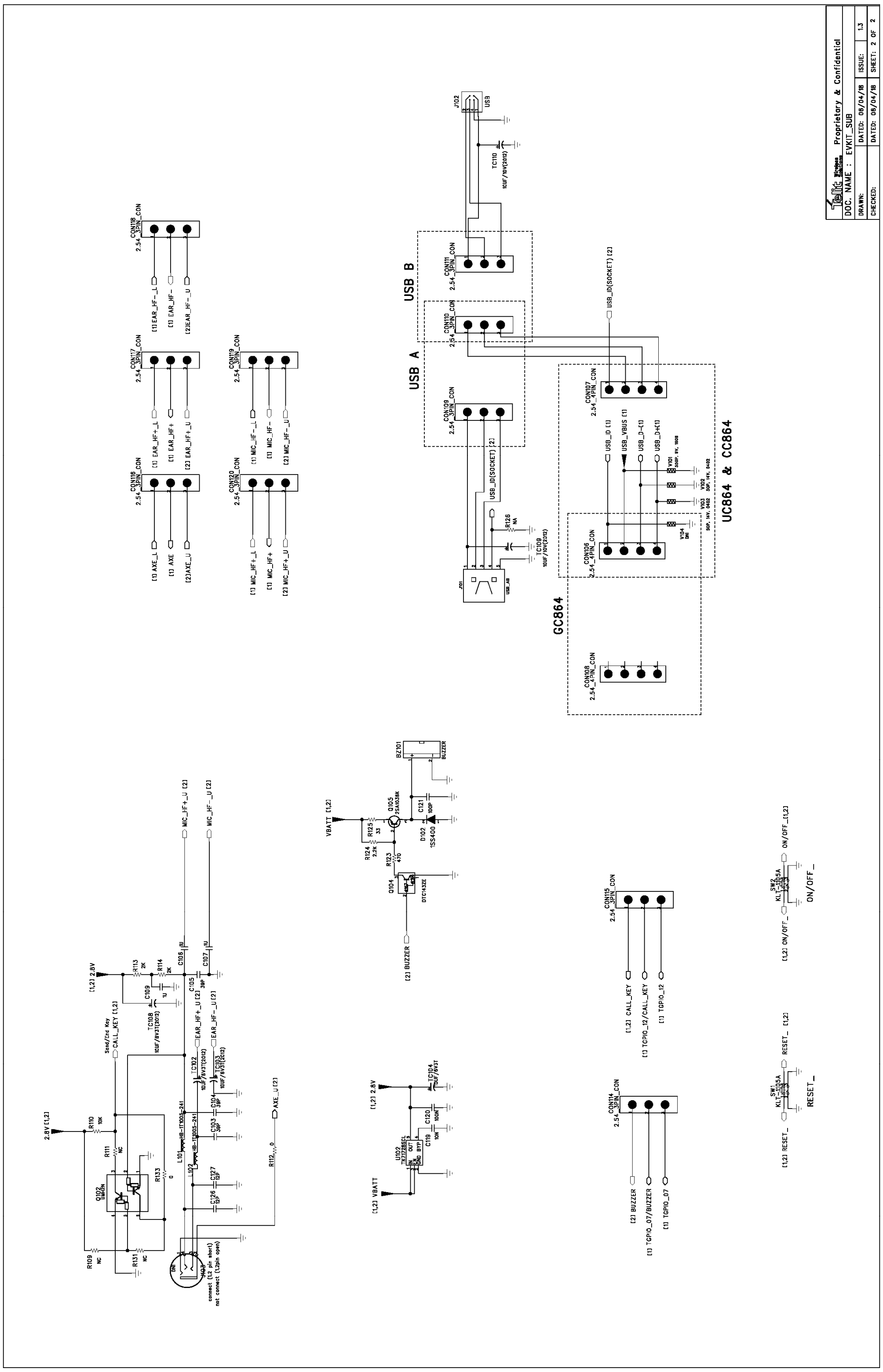
30.12. GC864-C2 Interface board



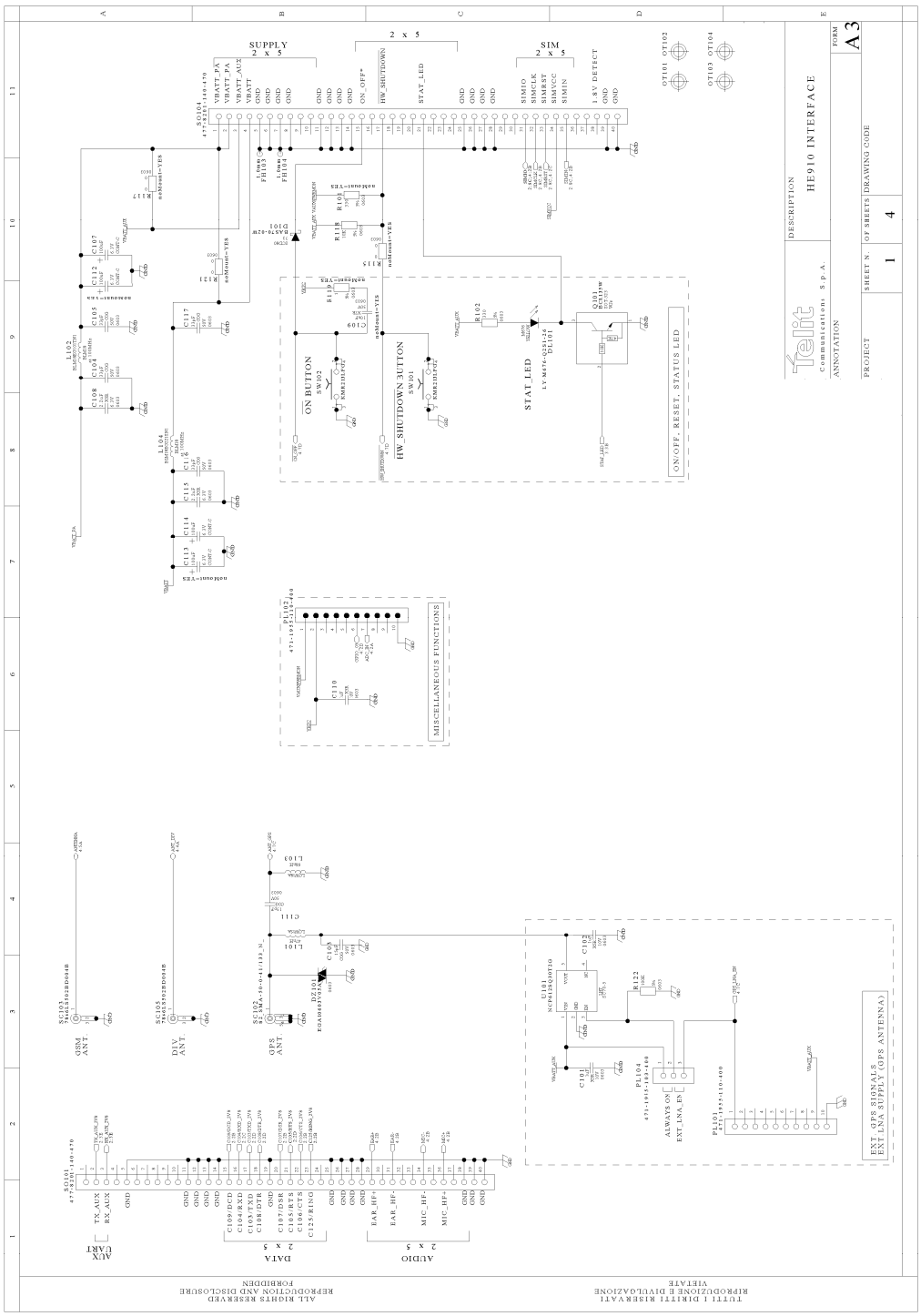
30.13. UC864 Interface board

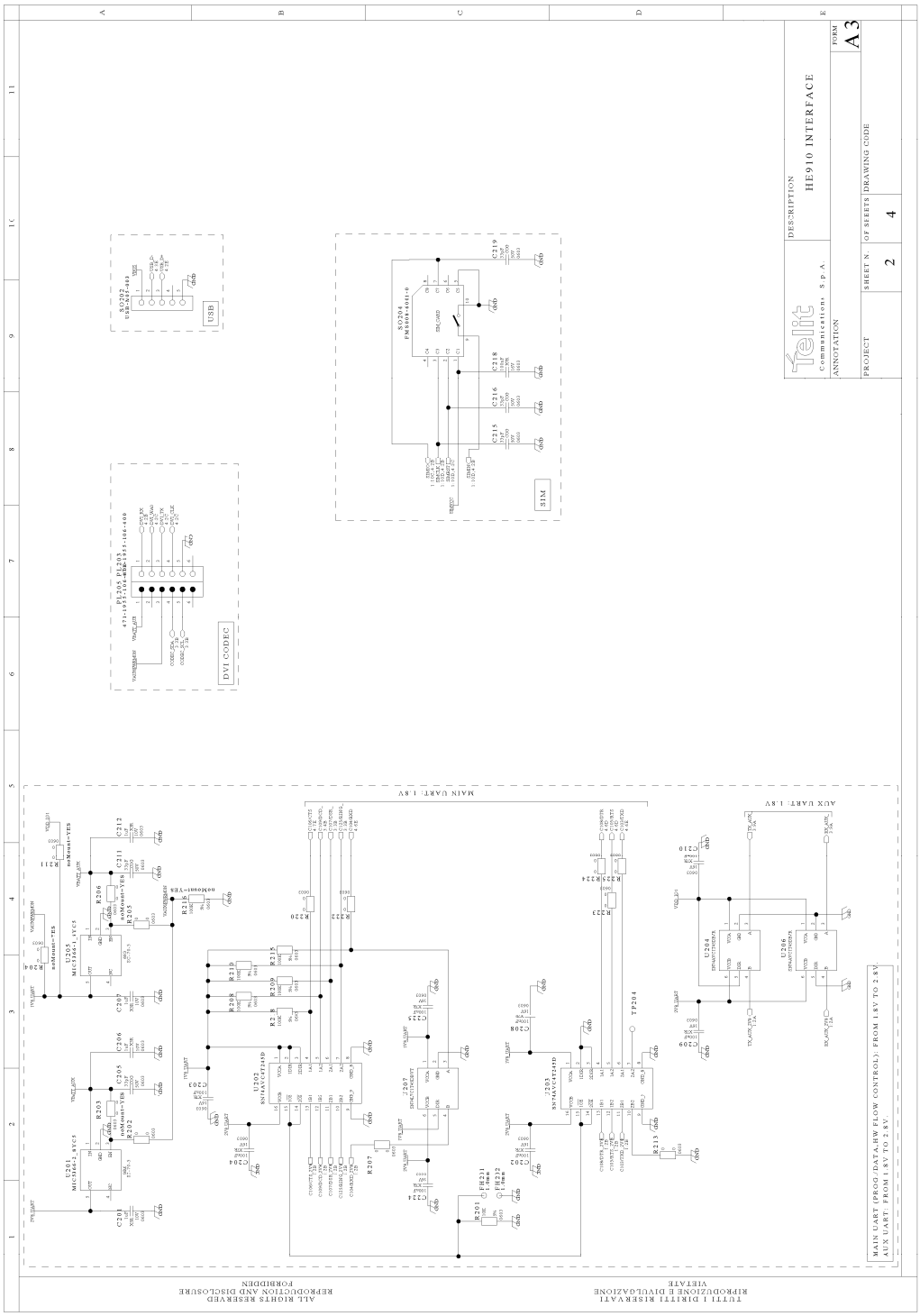






30.14. HE910 Interface board




HE910 INTERFACE
DES-RIPTION
PROJECT
ANNOTATION
SHEET N
OF SHEETS
DRAWING CODE
FORMAT
A3
USB
DVI CODEC
SIM
MAIN UART: 1.8V
AUX UART: 1.8V
MAIN UART (PROG./DATA,HW FLOW CONTROL): FROM 1.8V TO 2.8V
AUX UART: FROM 1.8V TO 2.8V
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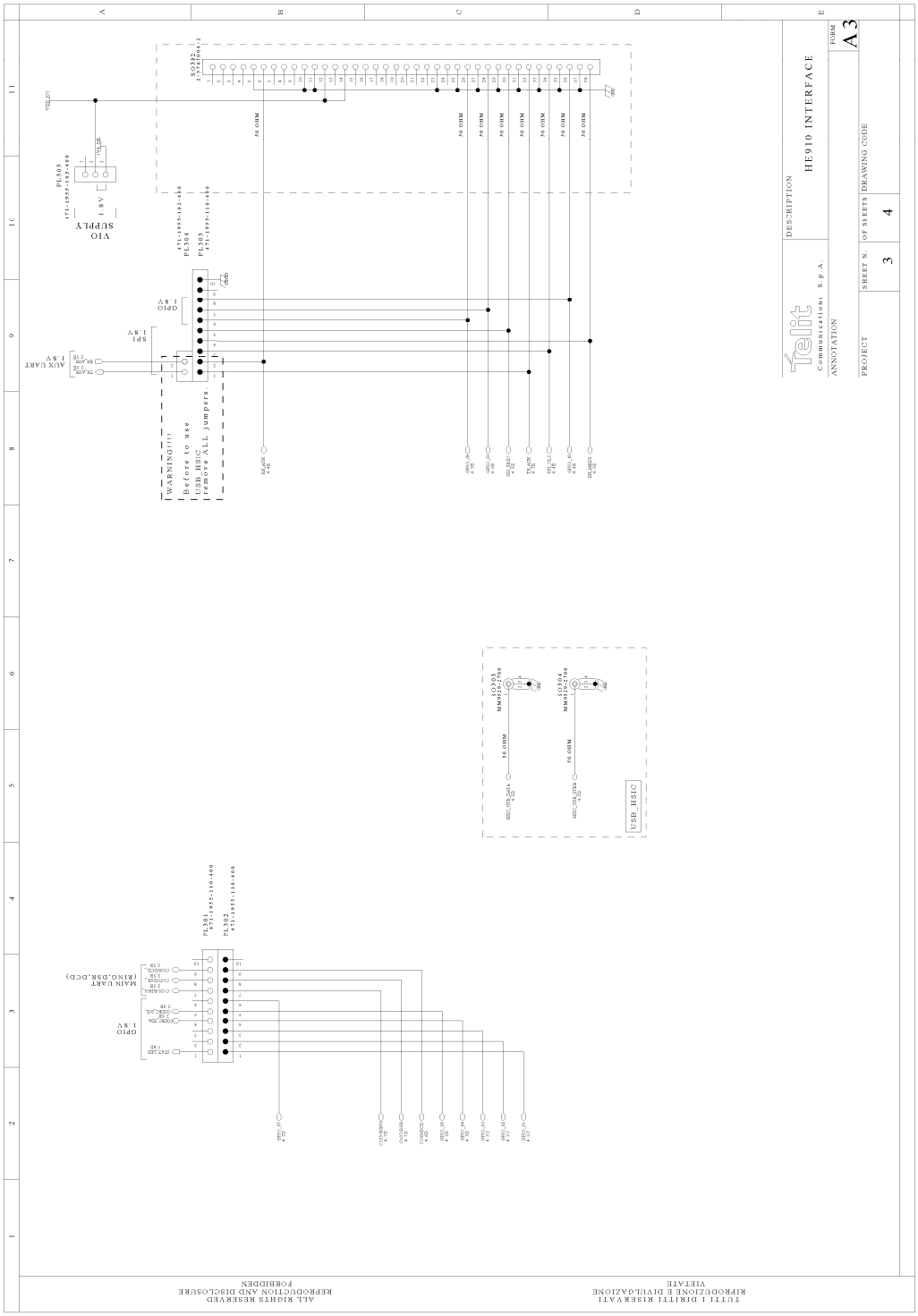
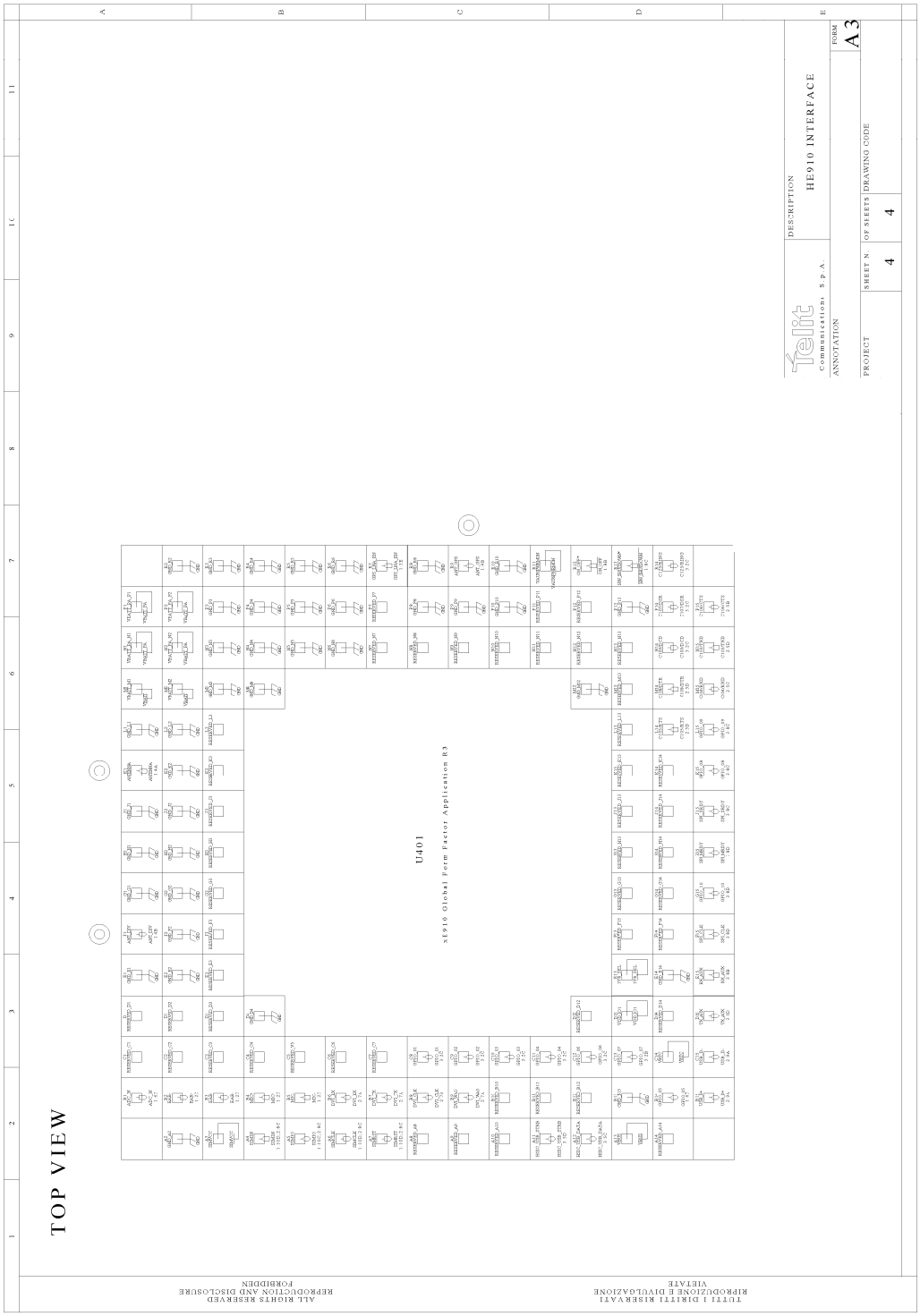
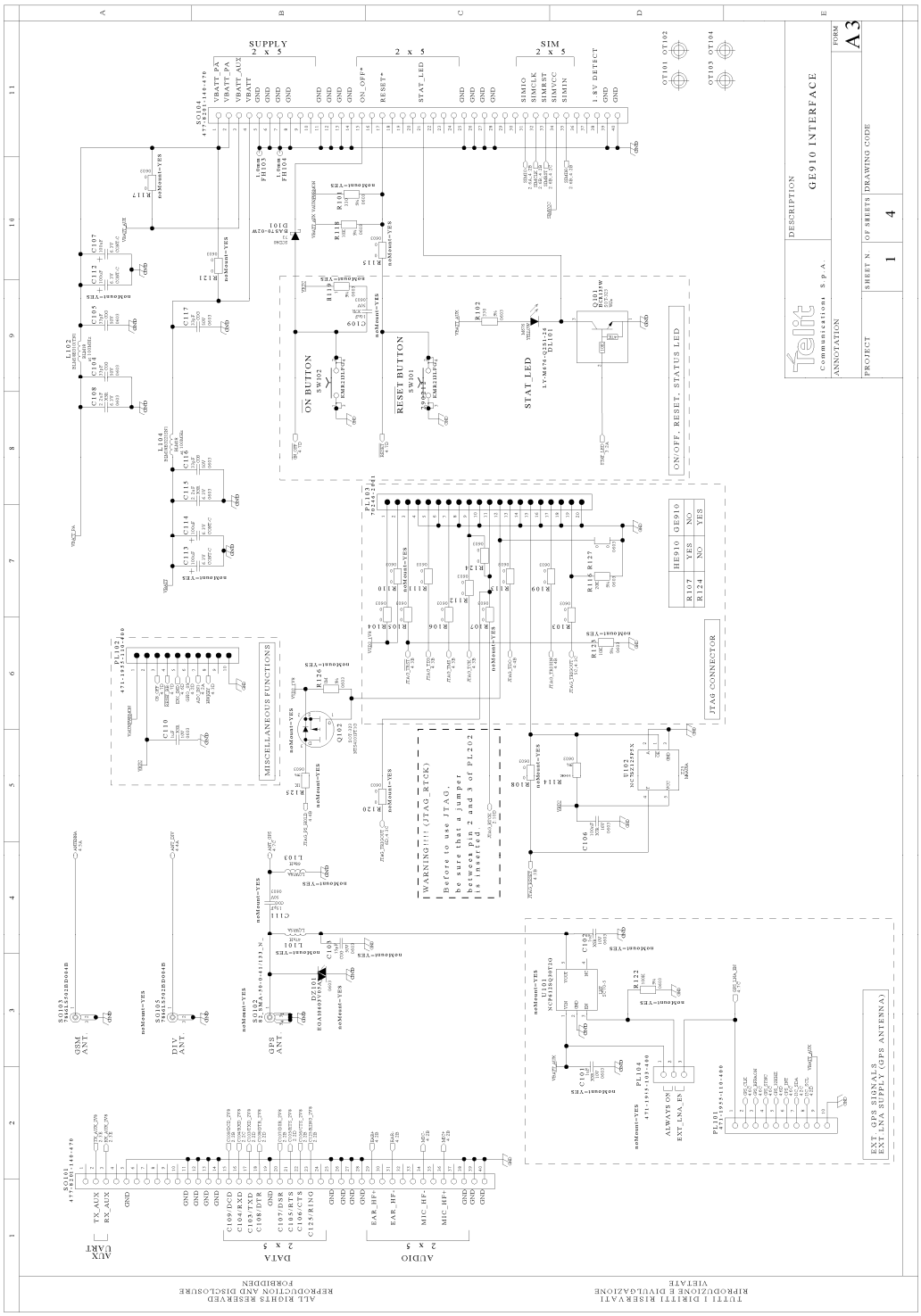
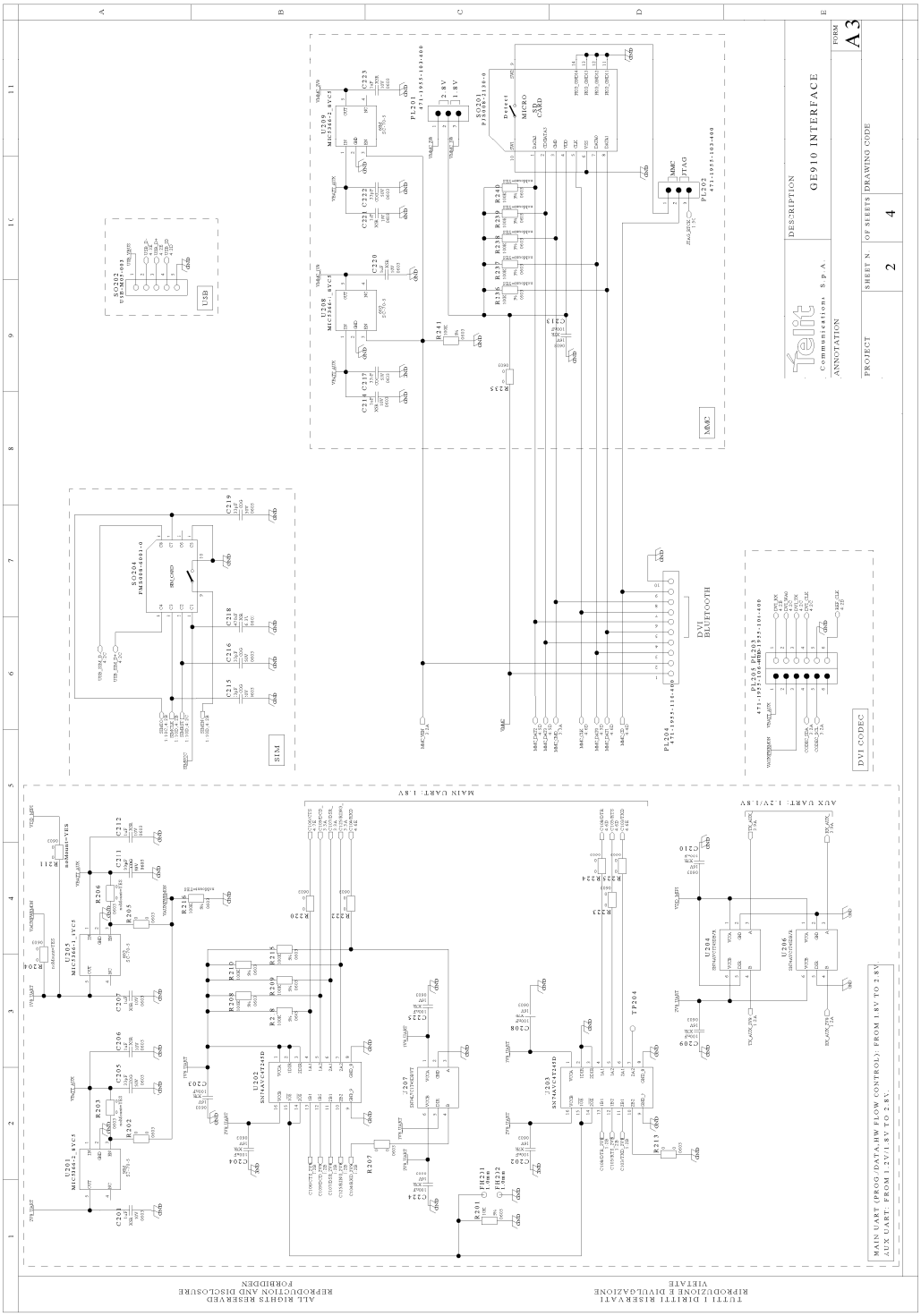
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE

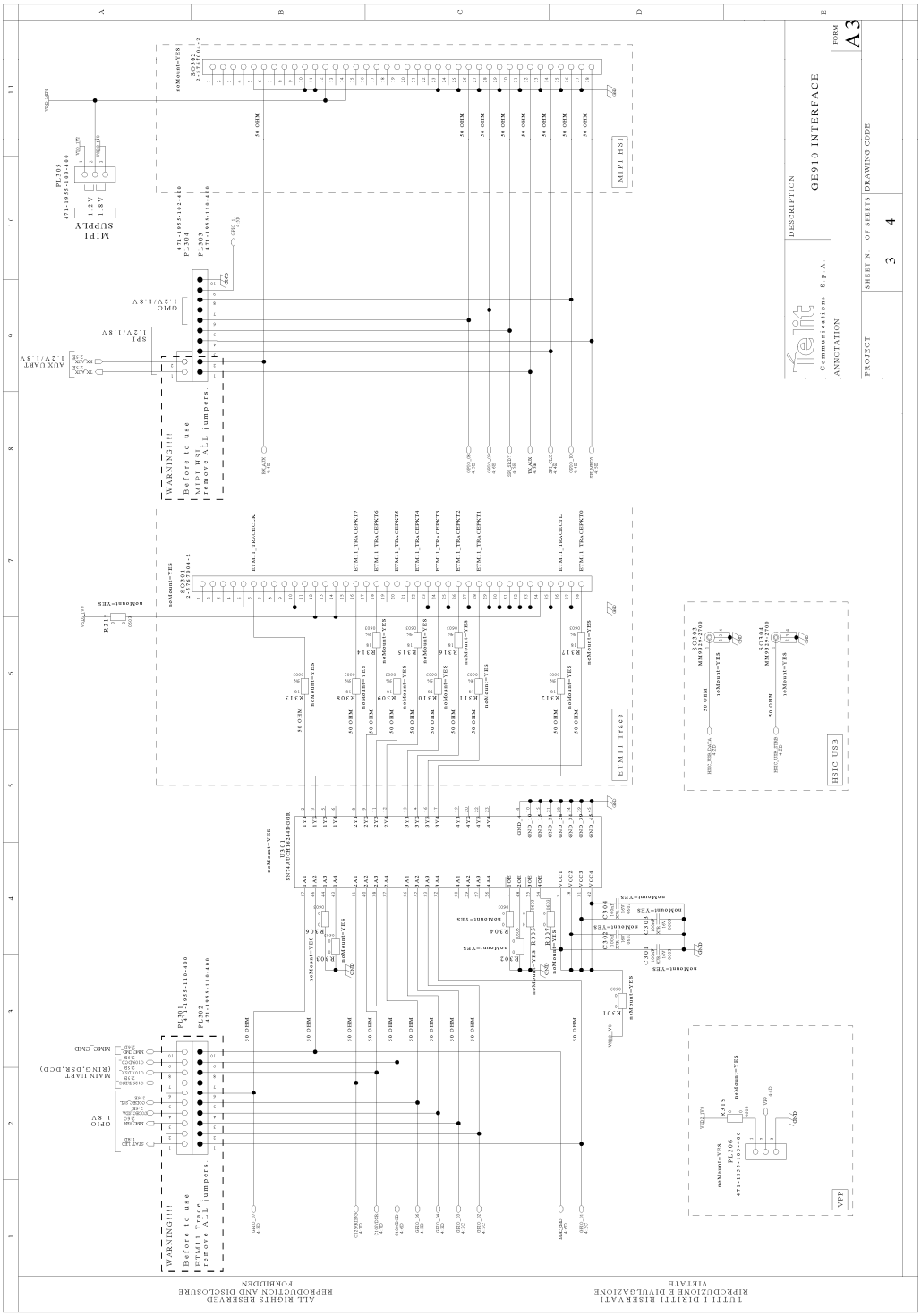

HE910 INTERFACE
A3
WARNING!!!
Before to use
USB_HSIC
remove ALL jumpers.
USB_HSIC
MAIN UART (RING,DSR,DCD)
AUX UART
SPI
GPIO
VIO SUPPLY
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE

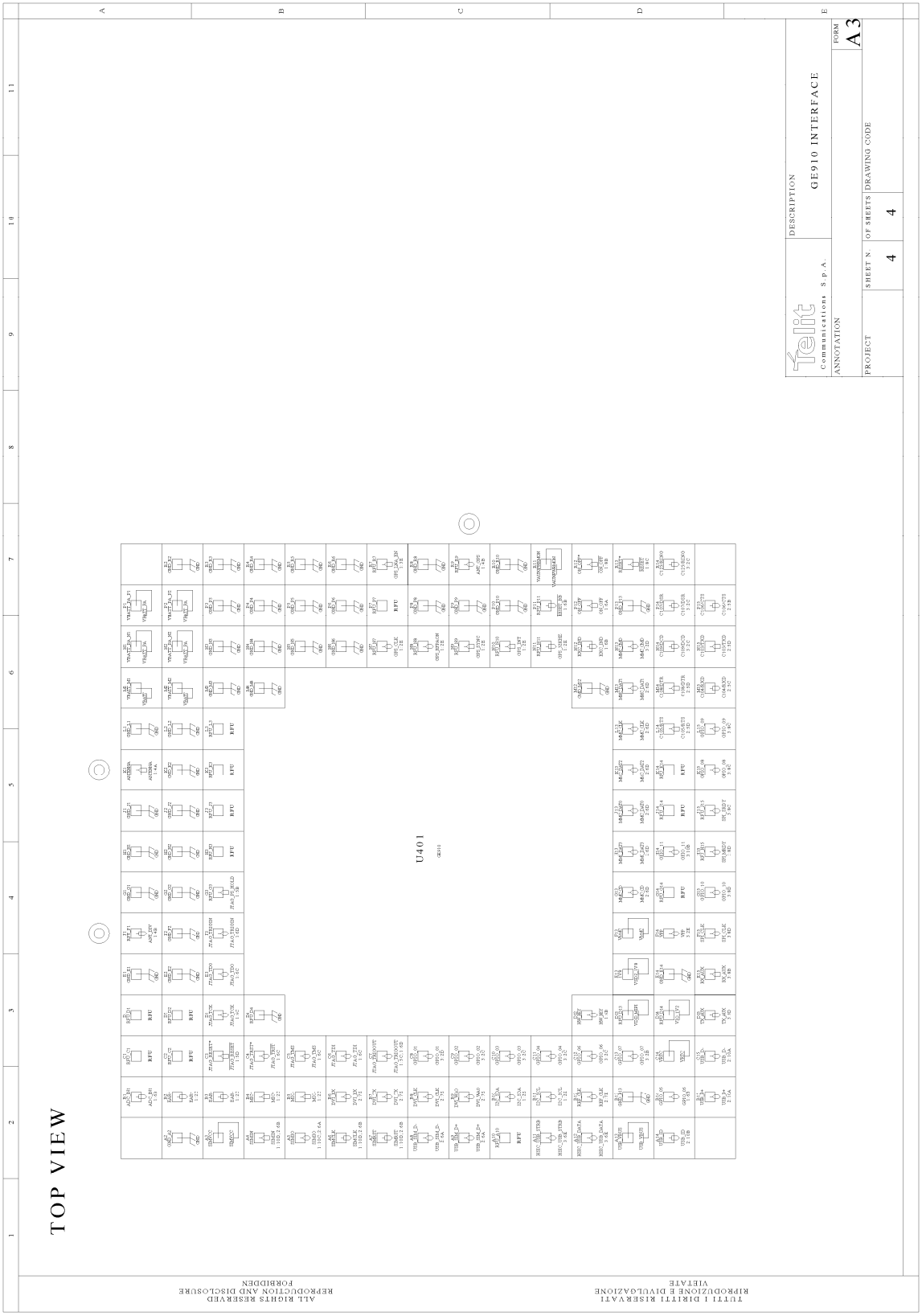

TOP VIEW
U401
HE910 INTERFACE
A3
ALL RIGHTS RESERVED
TUTTI I DIRITTI RISERVATI

30.15. GE910 Interface board




GE910 INTERFACE
DVI CODEC
SIM
USB
DVI BLUETOOTH
MAIN UART: 1.8V
AUX UART: 1.2V/1.8V
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE


GE910 INTERFACE
A3
Telit Communications S.p.A.
DESCRIPTION
ANNOTATION
PROJECT
SHEET N.
OF SHEETS
DRAWING CODE
MIPI HS1
ETM11 Trace
H1C USB
VPP
WARNING!!!
Before to use
MIPI HS1, remove ALL jumpers
ETM11 Trace, remove ALL jumpers
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE


TOP VIEW
U401
DESCRIPTION
GE910 INTERFACE
PROJECT
SHEET N
4
OF SHEETS
4
DRAWING CODE
FORM
A3
ANNOTATION
Telit Communications S.p.A.
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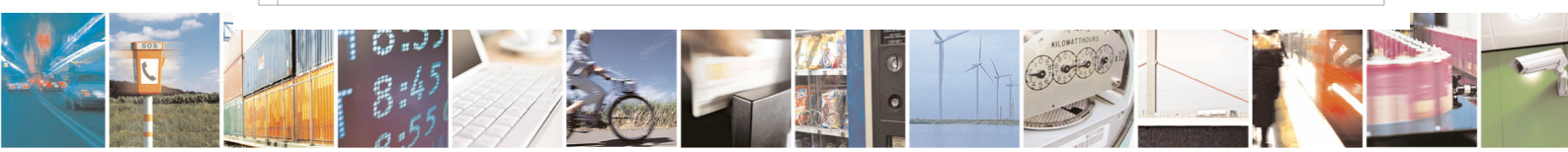
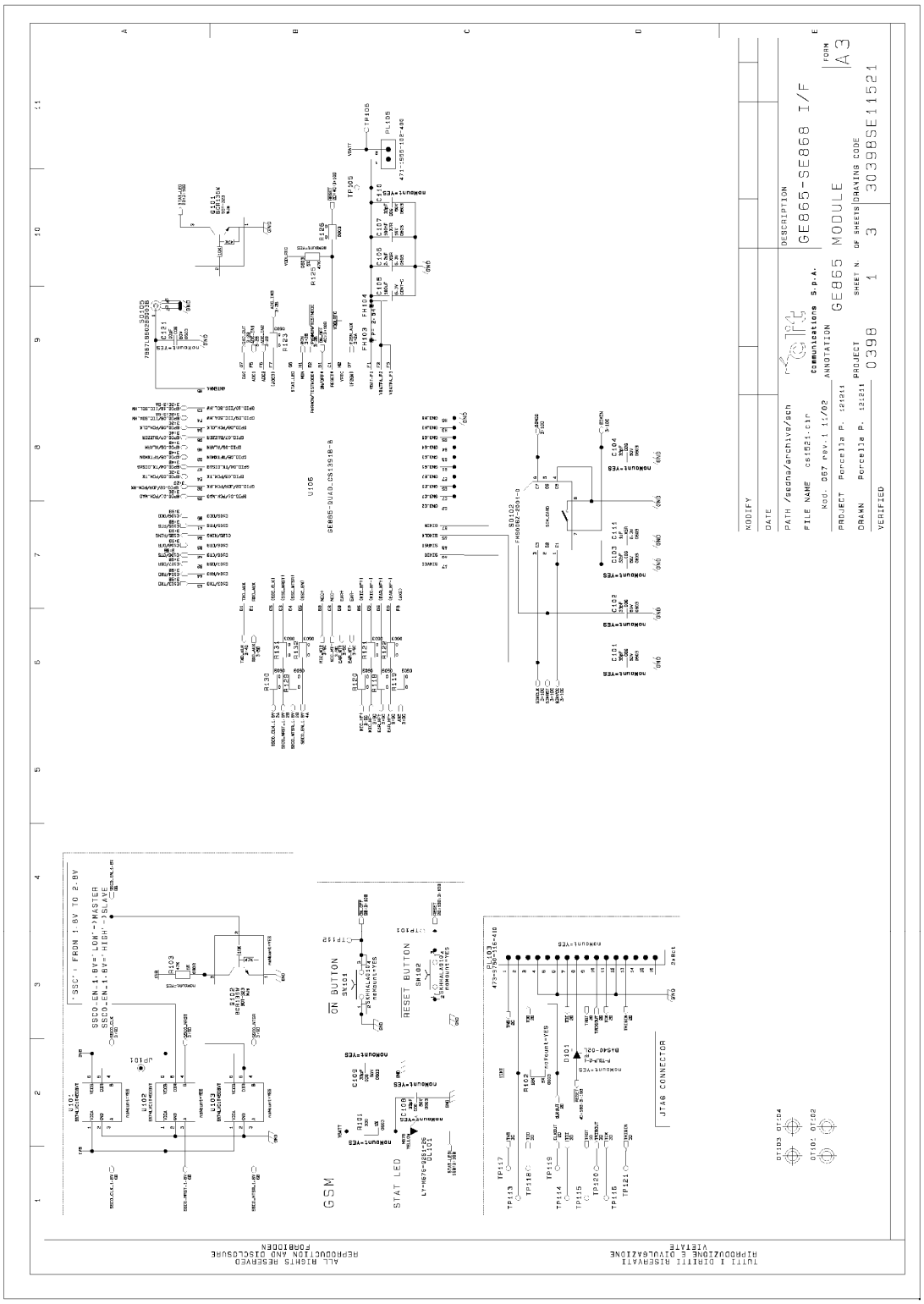
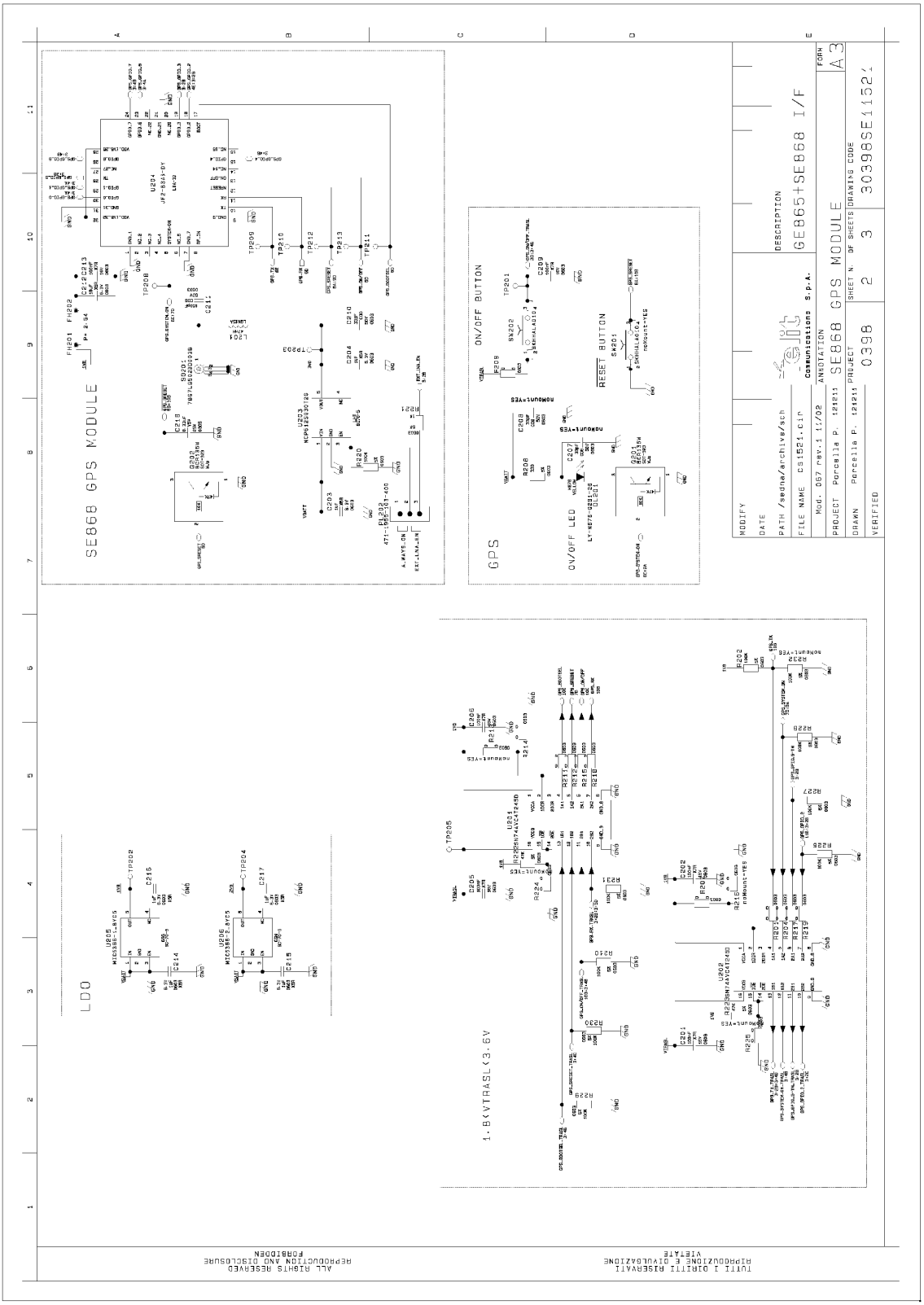
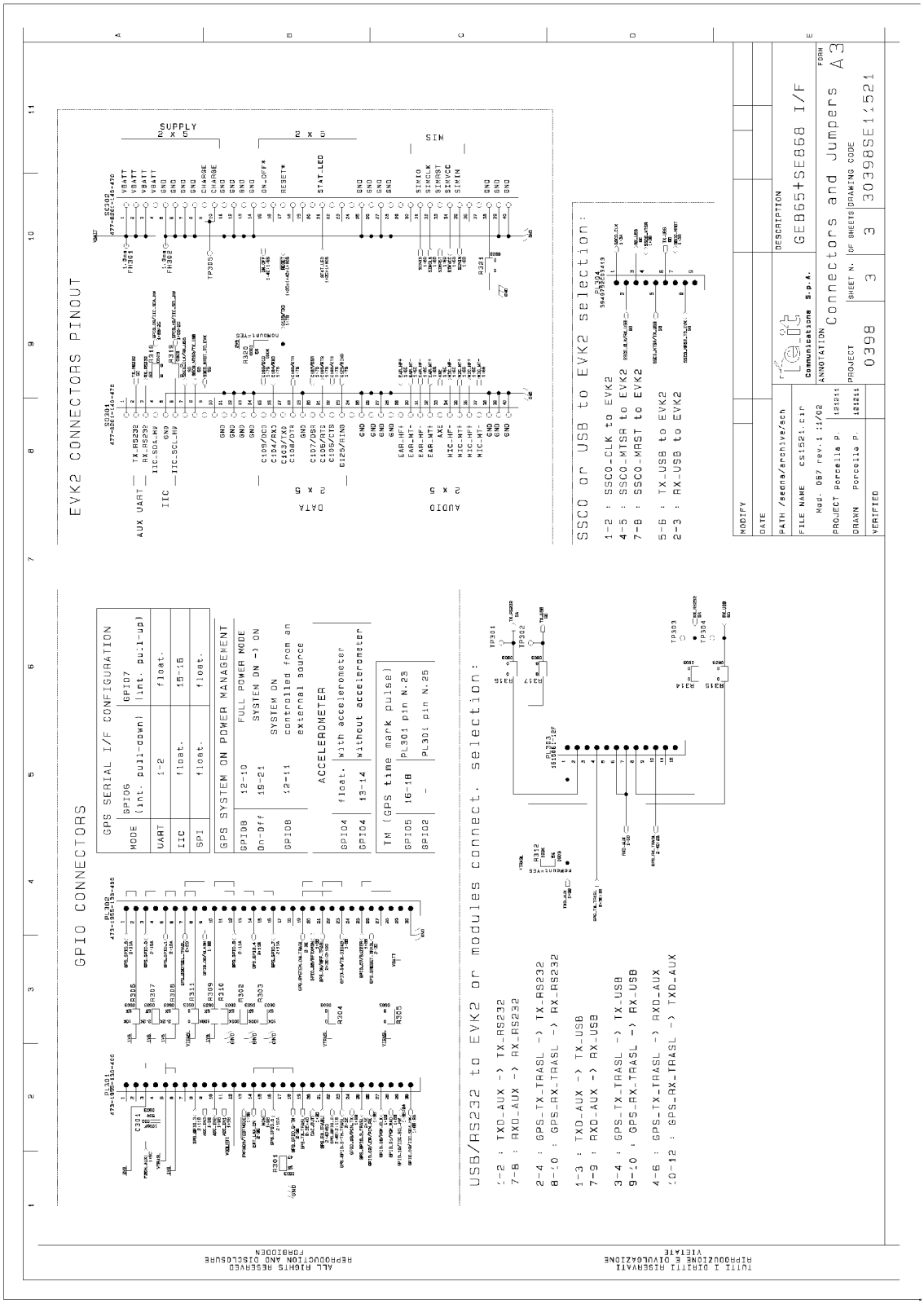
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE



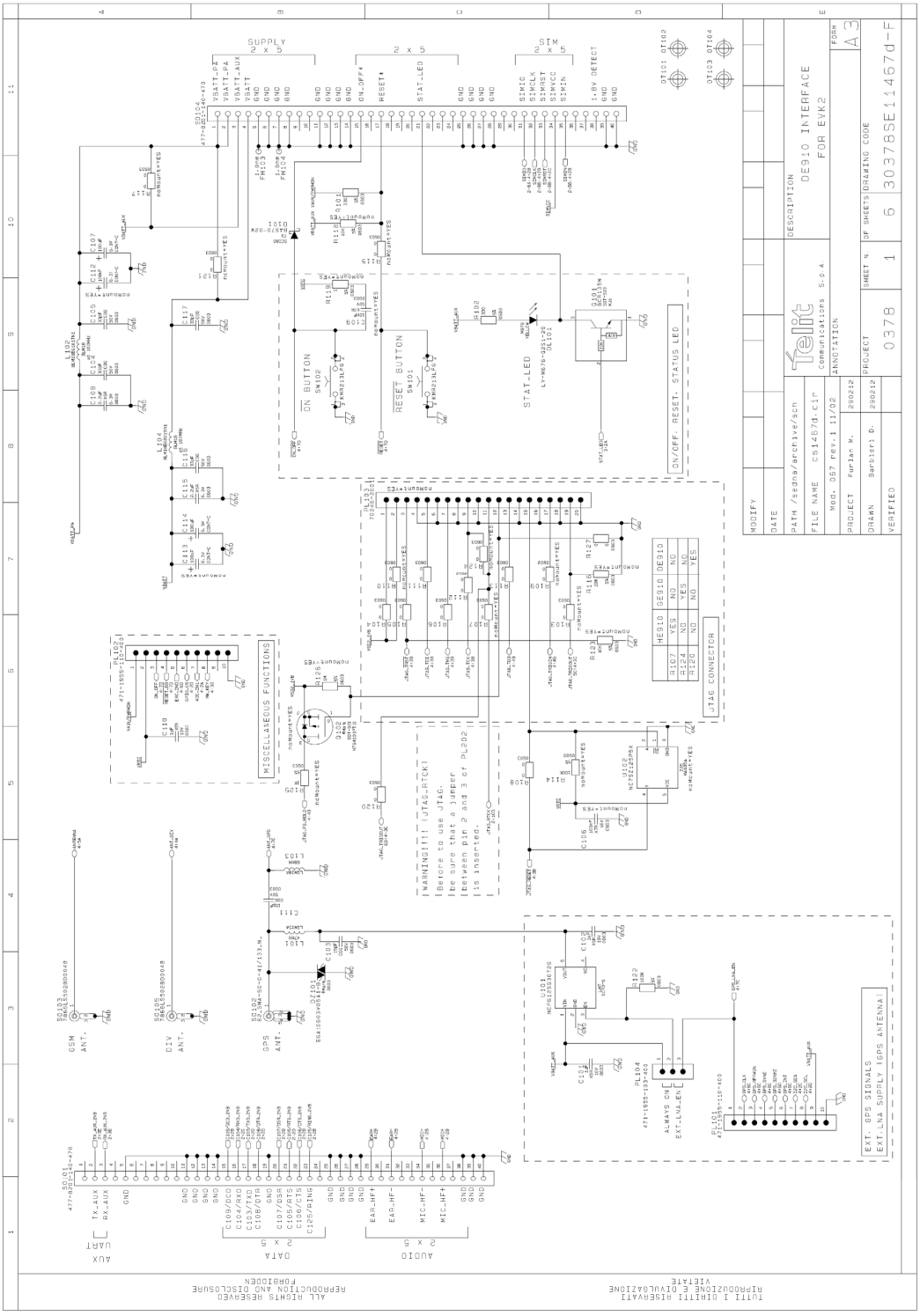
30.16. GE865 – JF2 Interface board

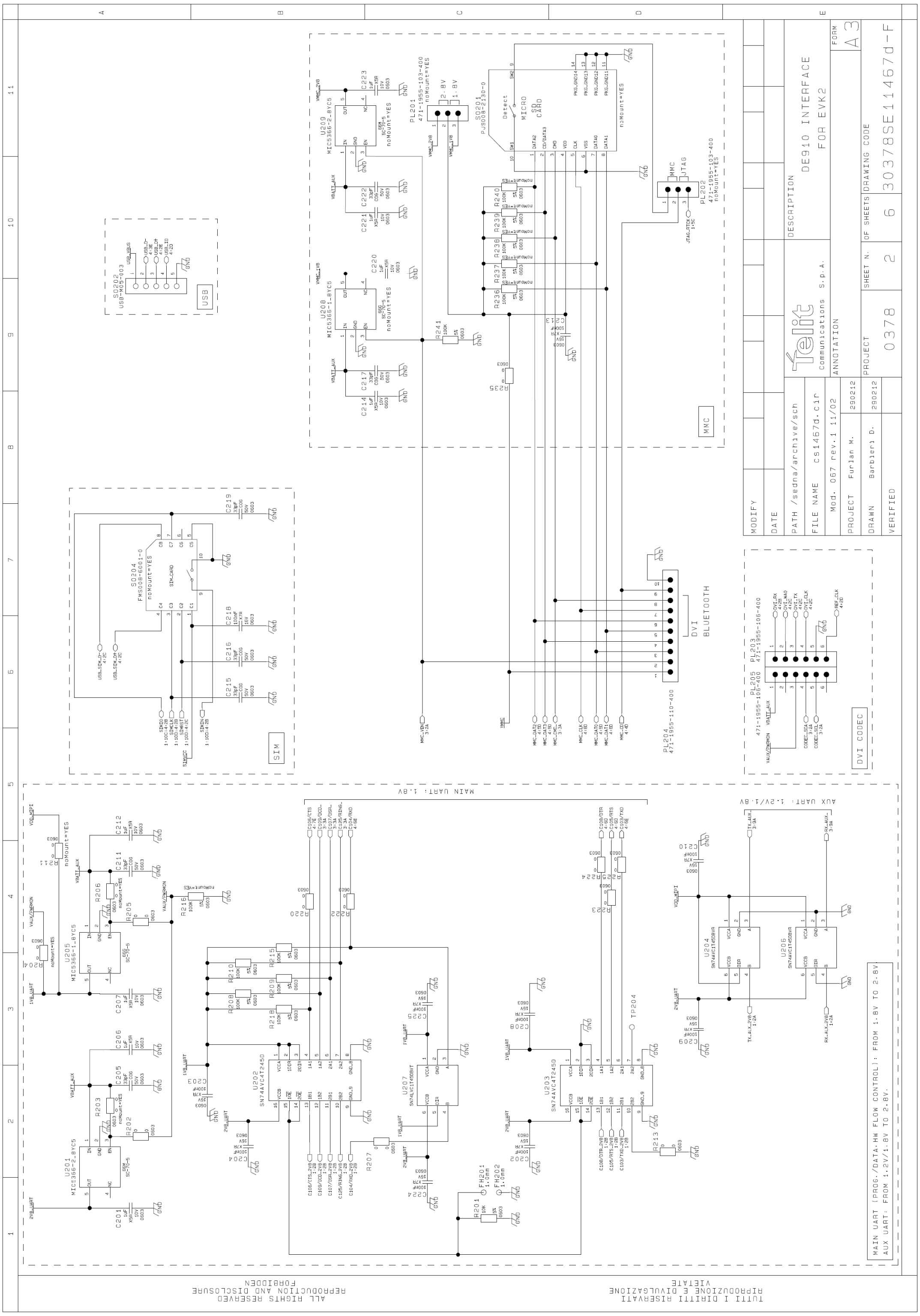


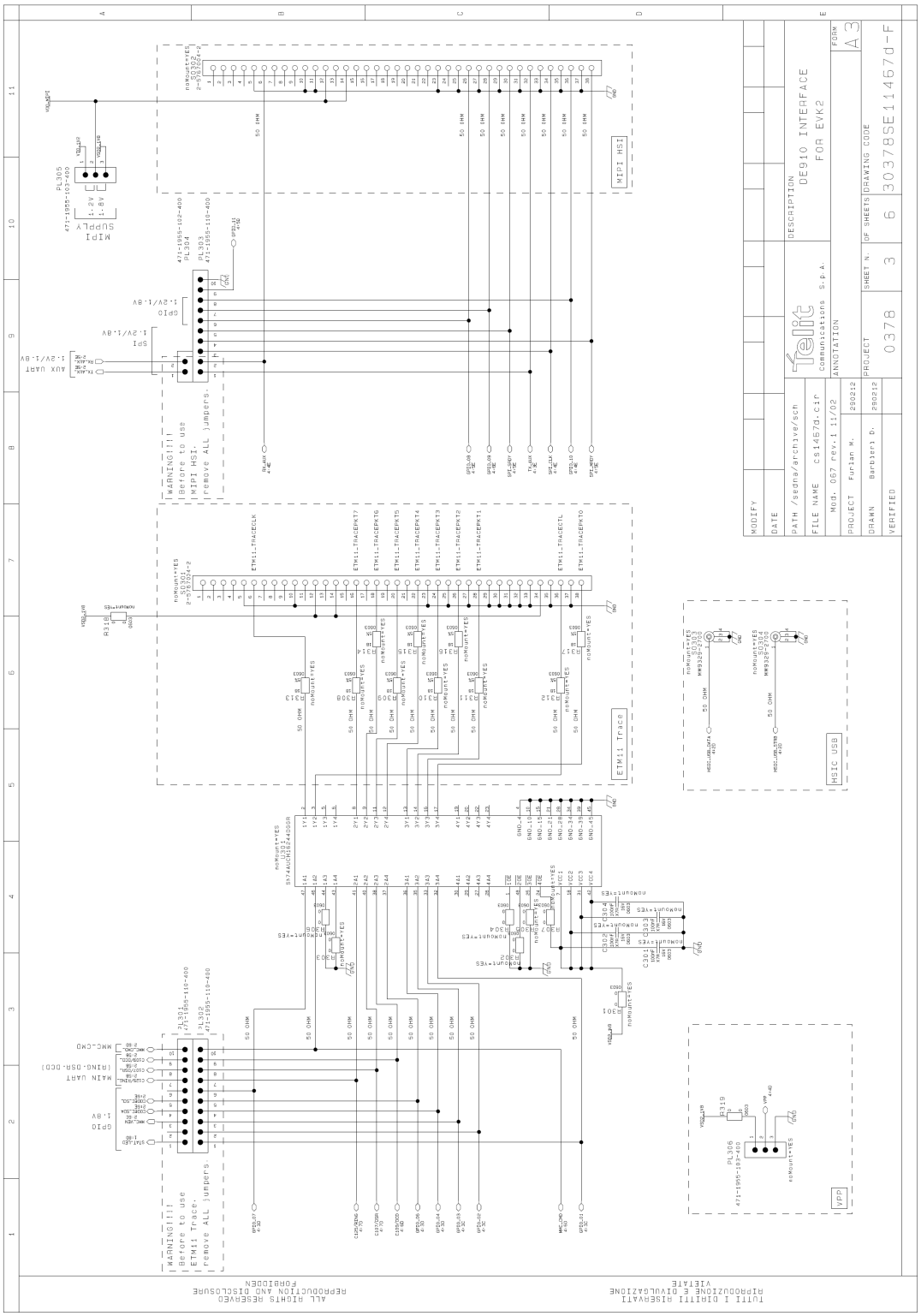

SE868 GPS MODULE
ON/OFF BUTTON
RESET BUTTON
GPS
ON/OFF LED
LDO
1.8V/TRASL/3.6V
DESCRIPTION
GE865+SE868 I/F
SE868 GPS MODULE
3039SE1152A
A3

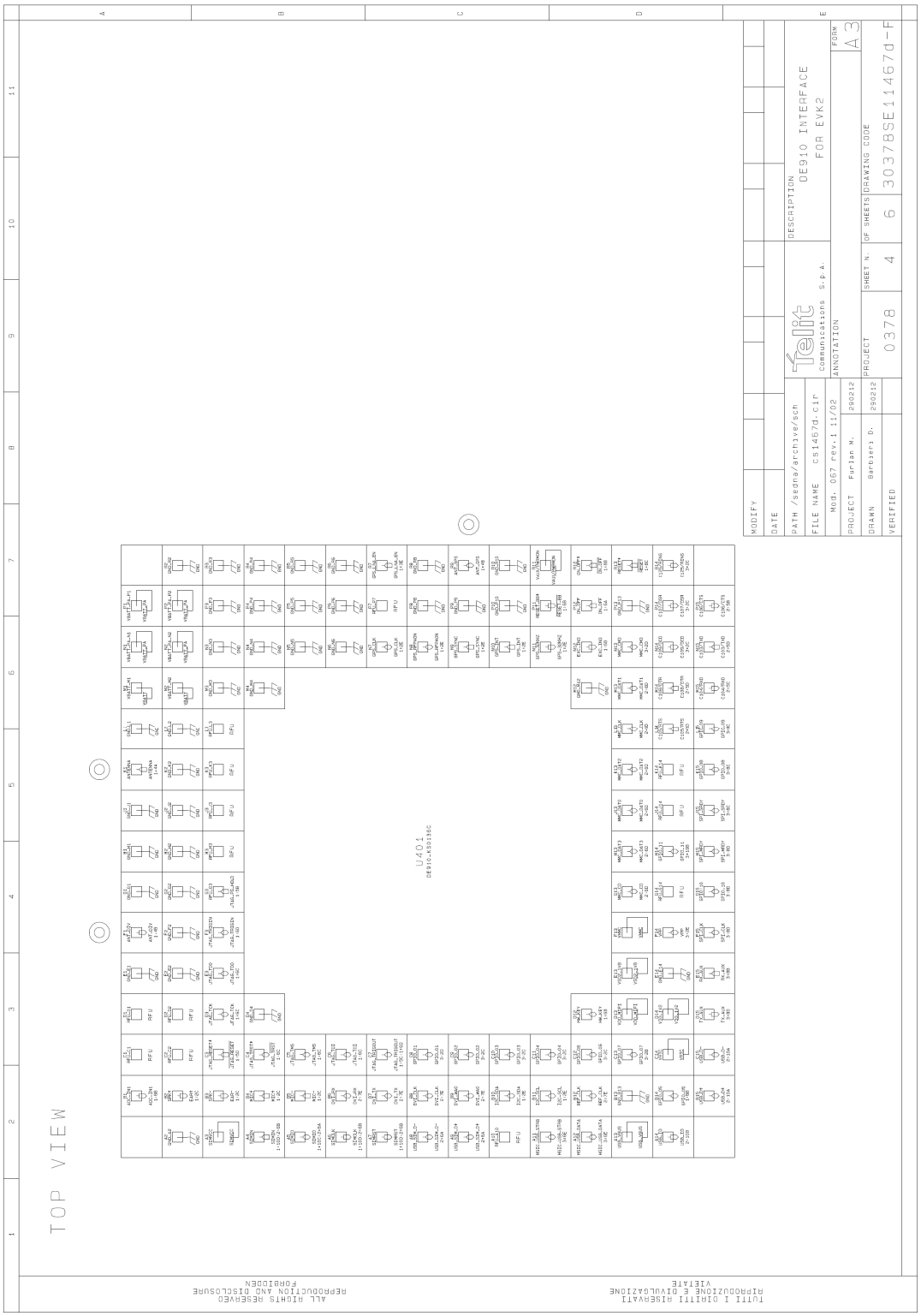

EVK2 CONNECTORS PINOUT
SUPPLY
SIM
AUDIO
DATA
AUX UART
IIC
STAT_LED
ON_OFF#
RESET#
SSCO or USB to EVK2 selection:
1-2 : SSCO_CLK to EVK2
4-5 : SSCO_MTSR to EVK2
7-8 : SSCO_MAST to EVK2
5-6 : TX_USB to EVK2
2-3 : RX_USB to EVK2
GPIO CONNECTORS
GPS SERIAL I/F CONFIGURATION
GPS SYSTEM ON POWER MANAGEMENT
ACCELEROMETER
TM (GPS time mark pulse)
USB/RS232 to EVK2 or modules connect. selection:
1-2 : TXD_AUX -> TX_RS232
7-8 : RXD_AUX -> RX_RS232
2-4 : GPS_TX_TRASL -> TX_RS232
8-10 : GPS_RX_TRASL -> RX_RS232
1-3 : TXD_AUX -> TX_USB
7-9 : RXD_AUX -> RX_USB
3-4 : GPS_TX_TRASL -> TX_USB
9-10 : GPS_RX_TRASL -> RX_USB
4-6 : GPS_TX_TRASL -> RXD_AUX
10-12 : GPS_RX_TRASL -> TXD_AUX
GE865+SE868 I/F
Connectors and Jumpers
A3
0398
30398SE1:521
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE

30.17. DE910 Interface board

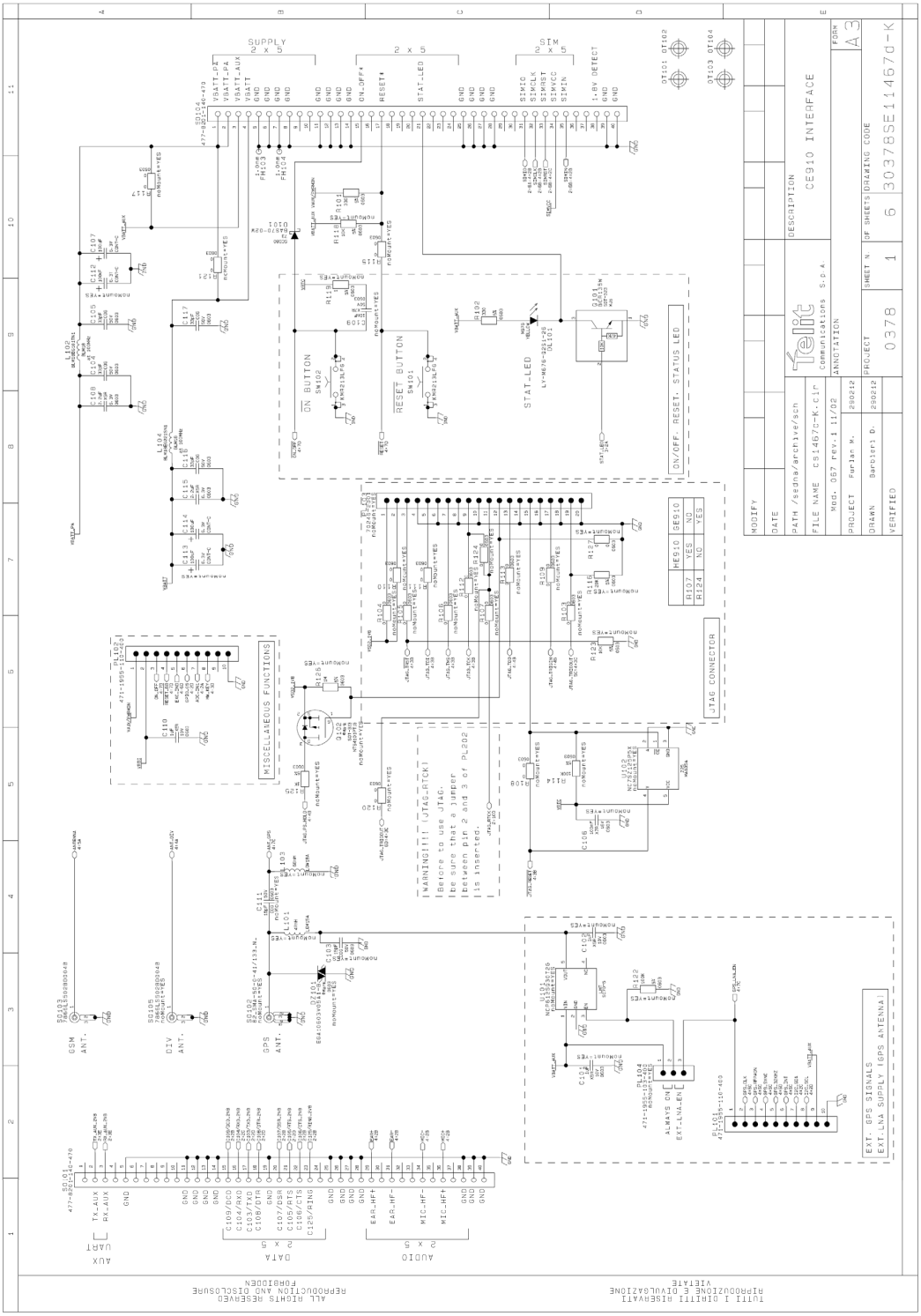


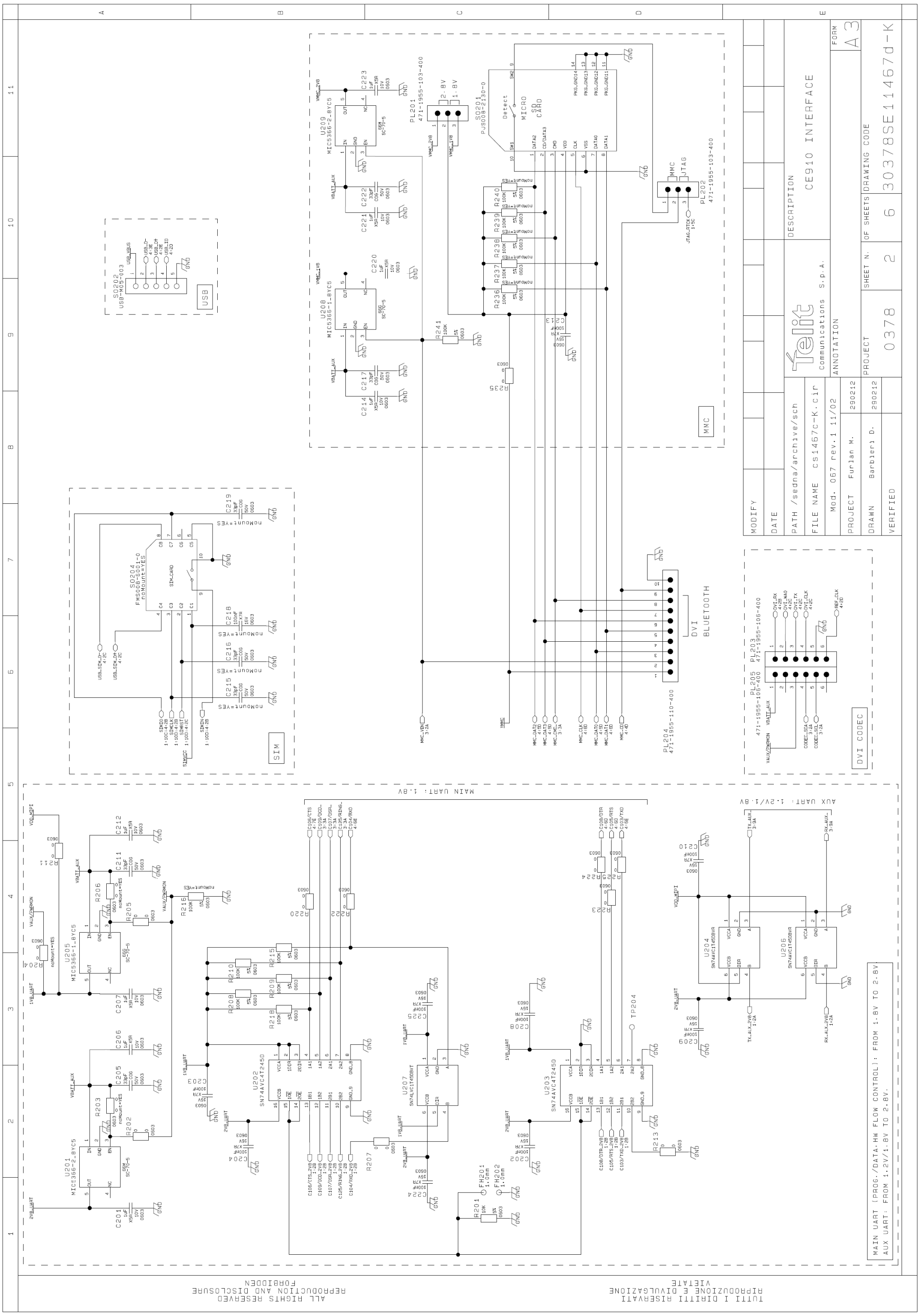

DE910 INTERFACE
FOR EVK2
MAIN UART: 1.8V
AUX UART: 1.2V/1.8V
SIM
USB
MMC
DVI
BLUETOOTH
DVI CODEC
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE

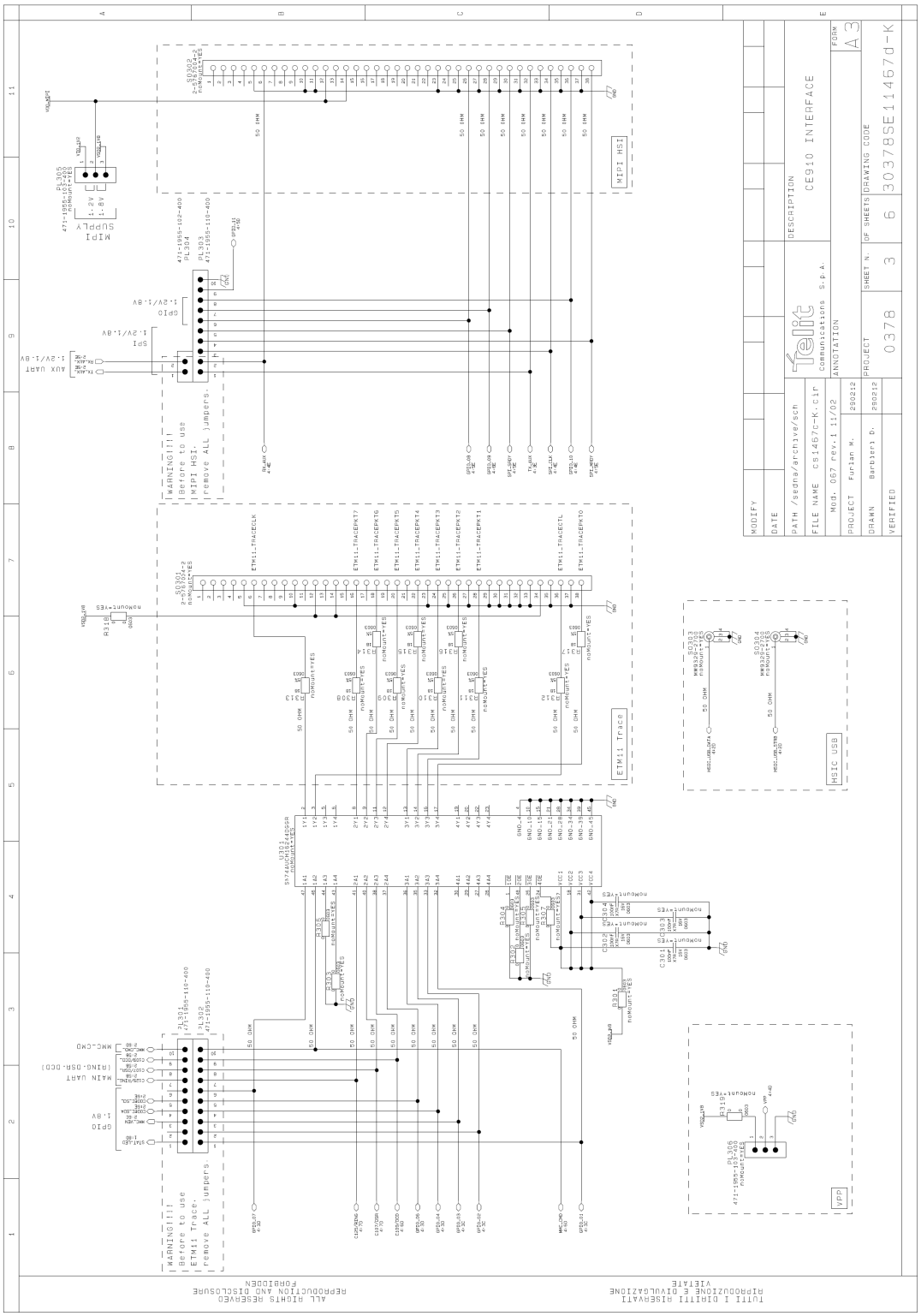

DE910 INTERFACE
FOR EVK2
ETM11 Trace
MIPI HSI
HSIC USB
MAIN UART
AUX UART
SPI
GPIO
MIPI SUPPLY
1.2V
1.8V
WARNING!!!
Before to use
ETM11 Trace,
remove ALL jumpers
WARNING!!!
Before to use
MIPI HSI,
remove ALL jumpers.
VPP

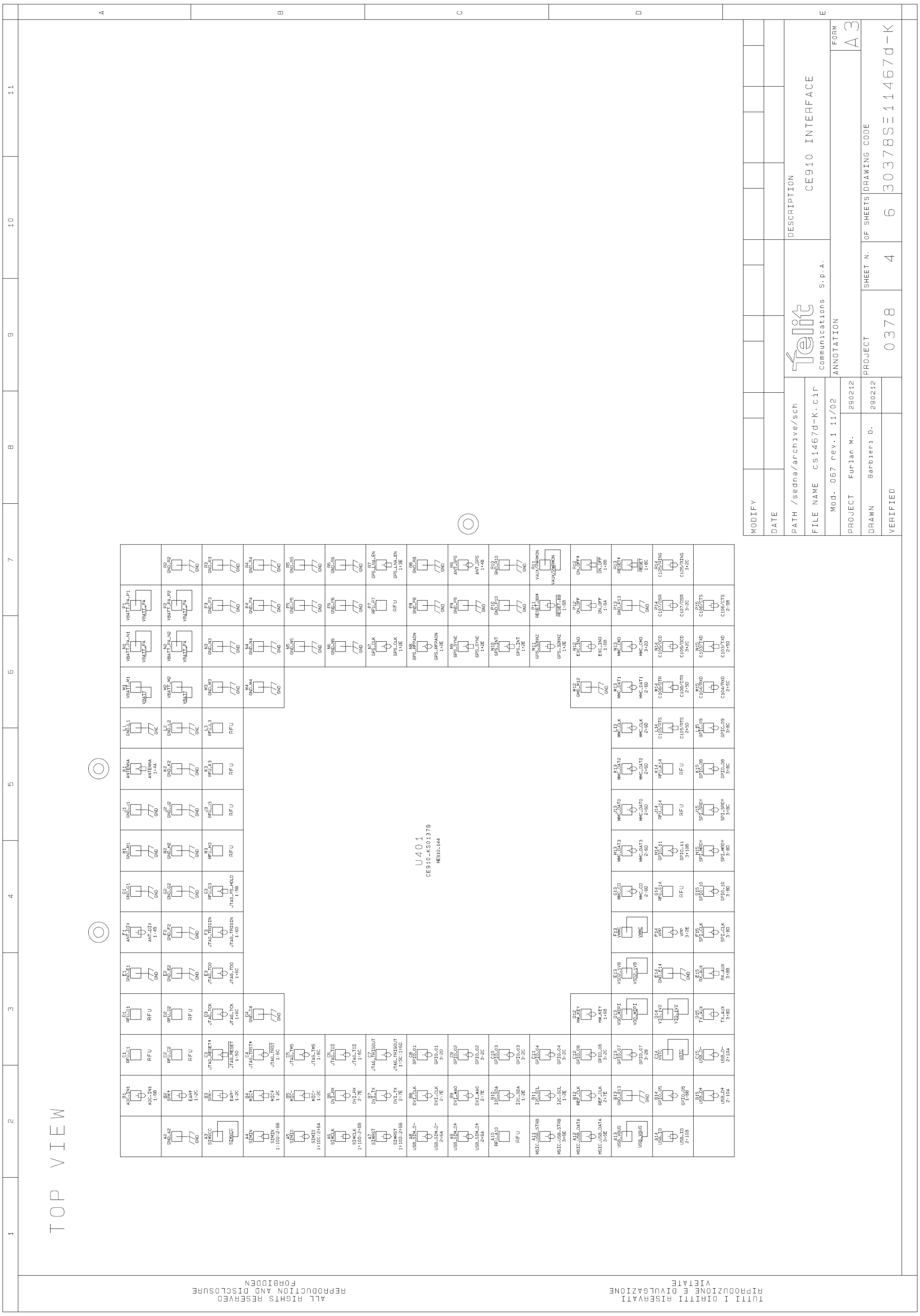

TOP VIEW
DE910 INTERFACE
FOR EVK2
30378SE11467d-F
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE

30.18. CE910 Interface board








TOP VIEW
U401
CE910 INTERFACE
DESCRIPTION
PROJECT
0378
SHEET N.
4
OF SHEETS
6
DRAWING CODE
30378S=11467d-K
FORM
A3

31. Service and firmware update

You can update the Telit Module firmware through the serial cables (RS232 or USB 1.1) used for the communication with a PC. The firmware update can be done with a specific software tool provided by Telit that runs on windows based PCs.

All levels are conformed to RS232 and V.24 standard and a PC serial port can be directly connected to this connector.

32. SAFETY RECOMMENDATIONS

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 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 a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming 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 of the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as of any project or installation issue, because the risk of disturbing the GSM 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 people (20 cm). In case of 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 equipments introduced on the market. All the relevant information's are available on the European Community website:
http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm

The text of the Directive 99/05 regarding telecommunication equipments is available, while the applicable Directives (Low Voltage and EMC) are available at:
http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm

32.1. Disposal of this product in the European Union

According to the directives 2002/95/CE, 2002/96/CE and 2003/108/CE, which have been transposed in Italian Legislative Decree of July 25, 2005, n. 151, Telit Communications S.p.A informs that:

The symbol of the crossed-out wheeled bin reproduced on the product or on the packaging, indicates that the product, at the end of life cycle, must be gathered separately from the other waste.
The separate collection of rubbish for this product at the end of its life cycle is arranged and managed by the manufacturer.
The user, who wants to dispose the product, must contact the manufacturer and follow the available system that allows the separate collection of rubbish for this product that has reached the end of the life cycle.
The suitable separate collection of rubbish, necessary for the subsequent transfer of the obsolete product for the recycling, the treatment and the compatible environment disposal, contributes to avoid possible negative effects to the environment and the health, and helps in the re-use and/or recycle of the materials from which this product is composed.
The illegitimate disposal of the product by the holder implies the enforcement of the administrative penalties provided for the regulations in force.
The company is enrolled on the register of the manufacturers of Electric and Electronic Equipment (EEE) of the Italian Minister for the Environment with the number: **IT08020000002357**

Reference Directives and Laws

2002/95/EC	Directive of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
2002/96/EC	Directive of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE)
2003/108/EC	Directive of the European Parliament and of the Council of 8 December 2003 amending directive 2002/96/EC on waste electrical and electronic equipment (WEEE)
Italian Legislative Decree of July 25, 2005, n. 151	Attuazione delle direttive 2002/95/CE, 2002/96/CE e 2003/108/CE, relative alla riduzione dell'uso di sostanze pericolose nelle apparecchiature elettriche ed elettroniche, nonche' allo smaltimento dei rifiuti.

33. RoHS Certifications

Telit Communications S.p.A.

EU RoHs DECLARATION OF CONFORMITY

1.

PRODUCTS NAMES	Telit's CODE
EVK2	3990150474
GM862 INTERFACE	3990250670
GE863-PY INTERFACE	3990250684
GE863-GPS INTERFACE	3990250696
GE863-SIM INTERFACE	3990250703
GE864-PY INTERFACE	3990250672
GE864-QUAD V2 INTERFACE	3990250777
GE864-DUAL V2 INTERFACE	3990250778
GE864-QUAD AUTOMOTIVE V2 INTERFACE	3990250773
GE864-QUAD ATEX V2 INTERFACE	3990250772
GE864-QUAD SIM V2 INTERFACE	3990250771
GE864-GPS INTERFACE	3990250820
GC864 INTERFACE	3990250680
GC864-QUAD-C2 INTERFACE	3990250683
GE865-QUAD INTERFACE	3990250766
GE865/SE867-AGPS INTERFACE	3990250814
GL865-QUAD INTERFACE	3990250812
GL865-DUAL INTERFACE	3990250783
GL868-DUAL INTERFACE	3990250790
UC864 INTERFACE	4990150470
HE910 EVK2 INTERFACE	3990250829

2. Telit Communications S.p.A Via Stazione di Prosecco, 5/b 34010 Sgonico (TRIESTE)-ITALY (manufacturer).
3. This declaration of conformity is issued under the sole responsibility of the manufacturer.
4. Evaluation board for product's development and product's specific interfaces.

5. The products described above are in conformity with EU Community harmonisation 2002/95/CE (EU-ROHS Directive) on Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS), subsequent amendments and the European Court of Justice decision on Deca-BDE substances from July 1, 2008.

6. This information represents Telit´s knowledge and belief as of the date that it is provided. Telit bases its material content knowledge on information provided by third parties and has taken and continues to take commercially reasonable steps to provide representative and accurate information, but may not have conducted chemical analysis on incoming materials and chemicals.

The documents relevant to the products described above and which support this Declaration of Conformity, are held at Telit Communications S.p.A Via Stazione di Prosecco, 5/b 34010 Sgonico (TRIESTE) ITALY that managed the compliance assessment process.

Signed on behalf of Telit Communications S.p.A.

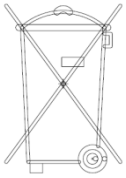
Trieste, ***2011-07-21***

Quality System Manager
Cesare Robelli

Mod 0216 2011-06 Rev.0 - This Declaration of Conformity is issued in compliance with 768/2008/EC

34. Disposal of old Electrical & Electronic Equipment (WEEE Mark)

This symbol, applied on our products and/or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.



35. Document History

Revision	Date	Changes
Rev 0	05/01/2006	First issue
Rev 1	23/01/2006	Added PCB weight and dimensions pag.9 Added default setup pag.8 Correct mA/h with mAh pag.16 Unified the scripting “impedance coil” pag.19 and pag.20 Insert the power supply pag.7 Correct the serial lines scripting on block diagrams Insert the pin number of CS1150 connector. Correct the serial interfaces descriptions pag.7
Rev 2	31/01/2006	Modified in chapter 11.1 description of CS1170 pag. 29
Rev.3	14/04/2006	Moved par.2.2 to par.4 and extended the STARTUP PROCEDURE to pag.11 Par.3 pag.9: Added mother boards block diagrams Pag.11: Correct GE863 Interface physical dimensions and added Dual Camera Interface physical dimensions. Moved par.4.4 and 4.5 to par.6.5 as Application Notes Moved par.7.3, 7.4 and 7.5 to par.9.3 as Warning Pag.26: Correct the Reset Button function description. Pag.20: Updated the Cross List Table From par.14 to par.18: Added interfaces description Removed all “Interface Board” “Printed Circuits Name” cross references Par.20: Added all electric diagrams.
Rev.4	14/07/2006	Replaced GC864 interface photo pag.46

Rev.5	13/10/2006	Renamed figure from 38 to 42 Pag.2 Added products name and P/N for GE863-PY/QUAD interface and GC864-C2 interface 3.2.6 Added mechanical characteristics GC864-C2 interface 5.0 Correct Optically Positioning Guide system description 7.1 Correct the line selection description 6.5.2 Updated Current Charger footnote Generality: added note for the VGA camera Added in the Cross List GE864-PY/QUAD interface and GC864-C2 interface 15.2.1 Inserted P/N of GE863-GPS version Added GC864-C2 interface description 20.1 Corrected GPIO location and added p/n of GM862 interface 20.2 Corrected GPIO location and added p/n of GE863-GPS interface Corrected GPIO location and added p/n of GE863 interface Corrected GPIO location and added p/n of GE864 interface Corrected GPIO location and added p/n of GC864 interface Corrected GPIO location and added p/n of GC864-C2 interface Added GC864-C2 interface Schematic GM862 Interface p/n 3990250670: added RoHS certification GE863-PY Interface p/n 3990250669: added RoHS certification GE863-GPS Interface p/n 3990250671: added RoHS certification GE863-PY Interface p/n 3990250684: added RoHS certification GC864-QUAD Interface p/n 3990250685: added RoHS certification GE864-PY Interface p/n 3990250672: added RoHS certification GC864-PY Interface p/n 3990250680: added RoHS certification
Rev.6	24/05/2007	Pag. 2 Product Table updated Pag. 10 Table 1 updated Pag.24 Modified the formula Pag.22 Inserted the Audio Section chapter Pag.39 Table 10 modified PCB release updating Erased all Dual Camera paragraph Figures and table updated Paragraph 15.3 16.2 17.3 18.3 19.3 inserted 24.1 EVK2 SYS p/n 3990150463: added RoHS certification 24.9 GE864-QUAD Interface p/n 3990250688: added RoHS certification 24.11 GE864-QUAD-C2 Interface p/n 3990250683: added RoHS certification

Rev.7	22/01/2008	Pag. 2 Product Table updated with UC864-E and GE863-SIM Pag.7 Disclaimer Date modified Pag.13 Inserted UC864 Interface dimensions Pag.36 Inserted refer to GE863-SIM Pag.38 Table 10 Inserted UC864 and GE863-SIM Interface Code Pag.38 Order Code Table updated Pag.42 Added figure 24 with GE863-SIM photo Pag.43 Added GE863-SIM version kit list Pag.54 Inserted UC864 Interface photo Pag.64 Inserted figure 40 and Table 17 of UC864 GPIO positioning Pag.77-78 Inserted UC864 Interface Schematic diagrams Removed notes regarding interface board of phased out models from the GE863 family (Please refer to the previous version of this document if you need information for the interfaces with the following P/N: 3990250669 & 3990250677)
Rev.8	20/03/2008	Pag.64 Updated 40 and Table 19 of UC864 GPIO positioning Pag.66-70 Updated EVK mother board schematics Pag.81 Added new European WEEE directive
Rev9	28/05/2008	Pag.77-78 Replaced UC864 Interface board schematics with more readable drawings.
Rev10	20/06/2011	Pag.02 Replaced the applicability list – Pag.123 replaced the RoHS certifications
Rev11	18/07/2011	HE910 added to the document GE864-GPS section update to align with latest PCB development
Rev 12	2012/05/21	Added GE865-JF2 sections
Rev 13	2012/06/25	Updated fig.48 Updated HE910 interface board P/N in applicability Table. Update GE865+JF2 drawings §27.1
Rev 14	2012/12/11	Updated with GE910 interface board; P/N in applicability Table. Updated Startup procedure chapter with XX910 products and timings; Updated Power ON Switch chapter with XX910 products and timings; Updated Figure 22 Switches position Added info for DE910 and CE910 20 2.2.15 DE910 Interface CS1467D 20 2.2.16 CE910 Interface CS1467D 27 DE910 family Interface 28 CE910 family Interface 29.1.12 DE910 Interface 29.1.13 CE910 Interface 30.17 DE910 Interface board schematic 30.18 CE910 Interface board schematic

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