Telit Evaluation Board (EVB) HW User Guide

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APPLICABILITY TABLE

This documentation applies to the following products:

Table 1: Applicability Table

Module Name	Description
LE920A4	
xE922-3GR	
LE910Cx	
LE910Cx - mPCIe	
LE940A6	
LE940A9	
LE940B6	
NE866B1	
NL865B1	
ME866E1	

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1. Introduction

1.1. Scope

This document introduces and describes Telit's generic Evaluation Board.

1.2. Audience

This document is intended for Telit customers, especially SW and system integrators, about to implement their applications using Telit products.

1.3. Contact Information, Support

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

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

Alternatively, use:

http://www.telit.com/support

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

http://www.telit.com

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

The following conventions are used to emphasize specific types of information:

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

WARNING:
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.

NOTE:
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

Table 2: Related Documents

Document Title	Document Number
Ref 1: Telit EVB Arduino User Guide	80000NT11509A

2. Product Description

2.1. Overview

The Telit Evaluation Board is a generic developer's platform, which is designed to provide the complete development environment to the user and intended to be used with a new set of Telit IoT modules as listed in the Applicability Table.

The EVB is designed to carry an Interface Board (IFBD) via three 120-pin B2B connectors, thus making the EVB seamless to an actual size or pinout so that it can support multiple form factors and products.

The Telit module is mounted directly on the IFBD.

Power supply and control interface to the IFBD module are provided from the EVB via the B2B connectors. Several power supply configurations, including battery charging, are available. In addition, all interfaces needed for the developers, such as SIM card holders, JTAG, UART, USB, audio, micro SD, etc., are available on the EVB main board.

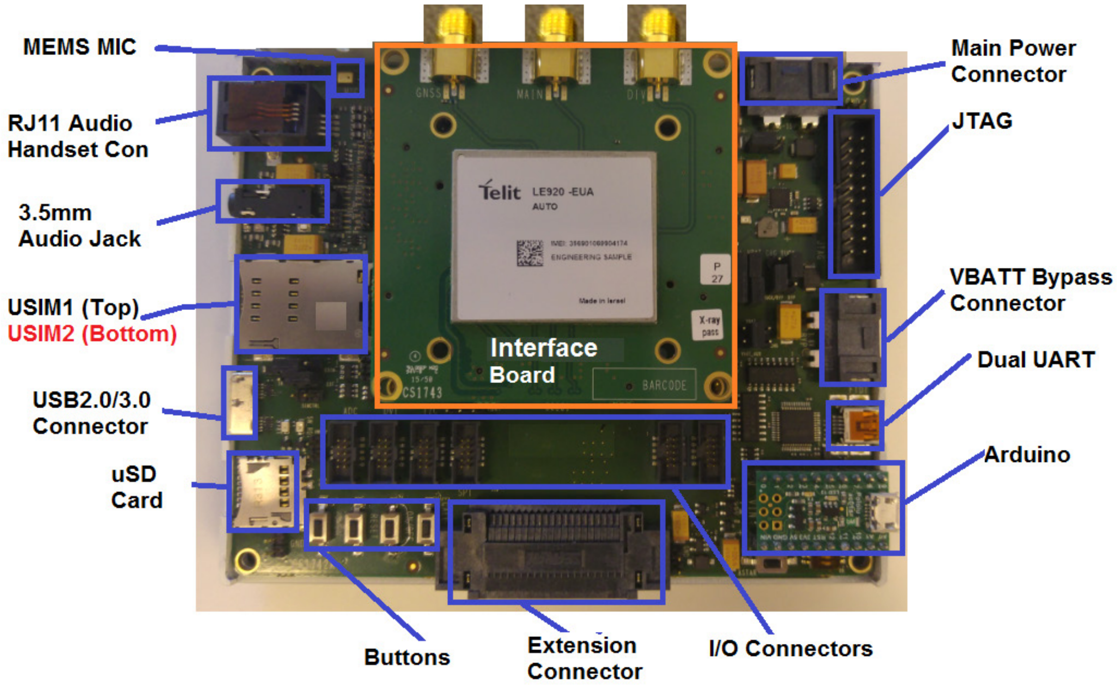
To offer remote control and/or test automation of the EVB environment, the EVB can be equipped with an Arduino-compatible, A-star 32U4 microcontroller board, based on Atmel's Atmega32U4 with USB interface. This Arduino-compatible card is mounted on the EVB using two 10-pin headers.

The EVB functionality and supported features can be extended using the 120-pin SAMTEC extension connector (EXT) which allows adding an additional Extension Card to the system, such as SGMII Ethernet MAC/PHY, WiFi, audio codec, display, camera, Dead Reckoning (DR), etc.

Refer to your Telit representative for more information about the available extension cards that suit the Telit product designed into your application.

Figure 1 shows a typical EVB platform consisting of an EVB main board and an IFBD (IFBD of the Telit LE920 module as an example).

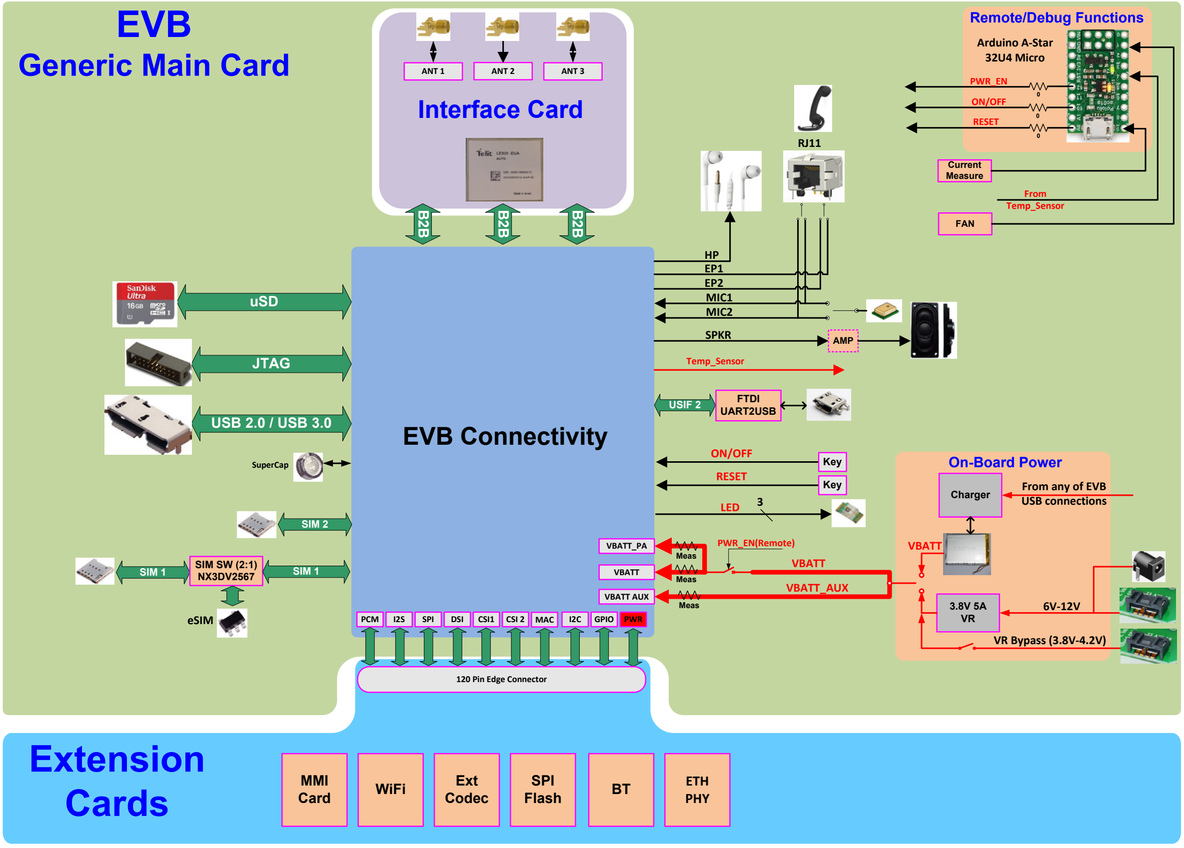
Figure 1: EVB with IFBD on Top



2.2. Block Diagram

Figure 2 is a high-level system overview of the generic EVB development platform.

Figure 2: EVB System Overview

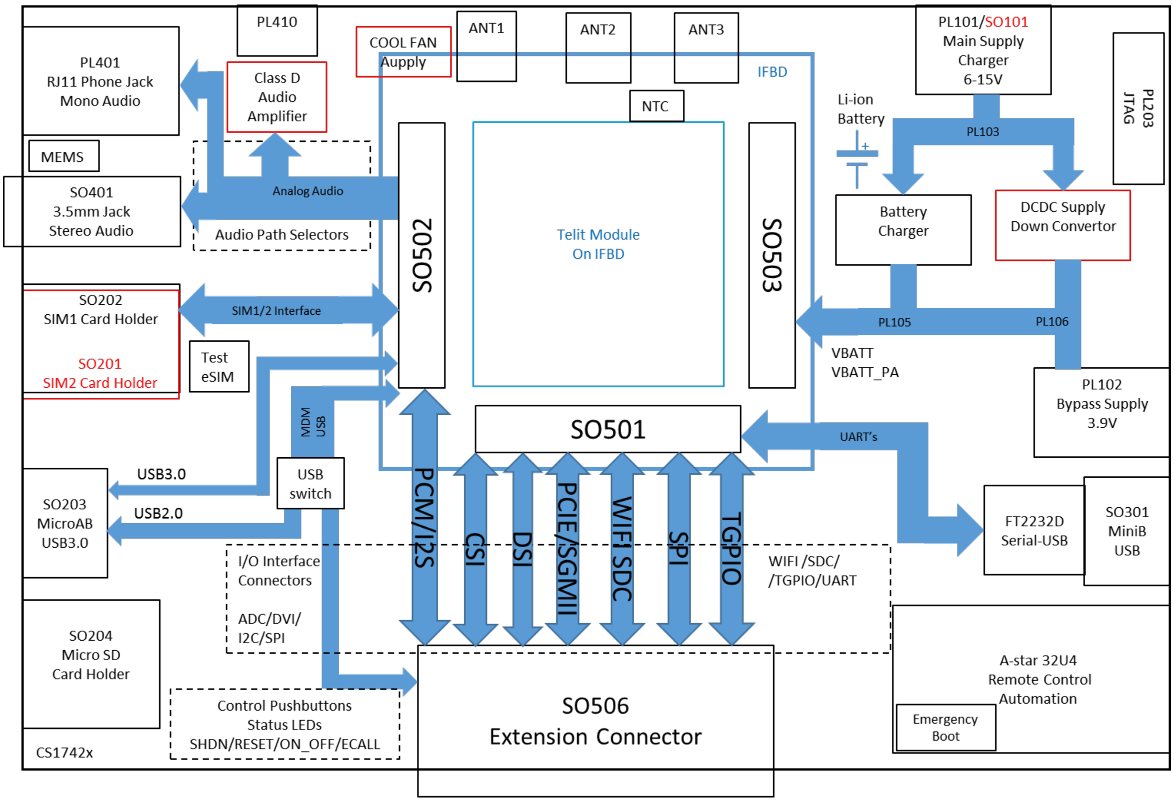


The Extension Card section shown in Figure 2 is only an example of some of the possible EXT Card options that can be developed for the EVB.

Contact your Telit representative for the list of available extension cards that can be used for your specific product/application.

Figure 3 shows a more detailed block diagram of the EVB main board.

Figure 3: EVB Main Board Block Diagram



NOTE:
Items that appear in red color in the diagram are mounted on the bottom side.

2.3. Default Jumper Placement

Normally, EVB kits should be pre-configured according to the following default jumper placement, which corresponds to the regular mode for SW development and functional use.

Main assumptions/conditions:

- Power source by SMPS down convertor (set-point 3.9V) fed from PL101/SO101
- SIM device placed in SIM1 cardholder SO202
- Audio downlink:
  - 3.5mm audio jack uses EAR1 for L-CH and EAR2 to R-CH.
  - RJ11 is not connected.
  - Speaker connected directly (D Class AMP bypassed)
- Audio uplink:
  - 3.5mm audio jack uses MIC1 (Single-ended mode).
  - On-board MEMS microphone uses MIC2.
- Current measure resistors shorted (bypassed)

Figure 4: Default Jumper Setting

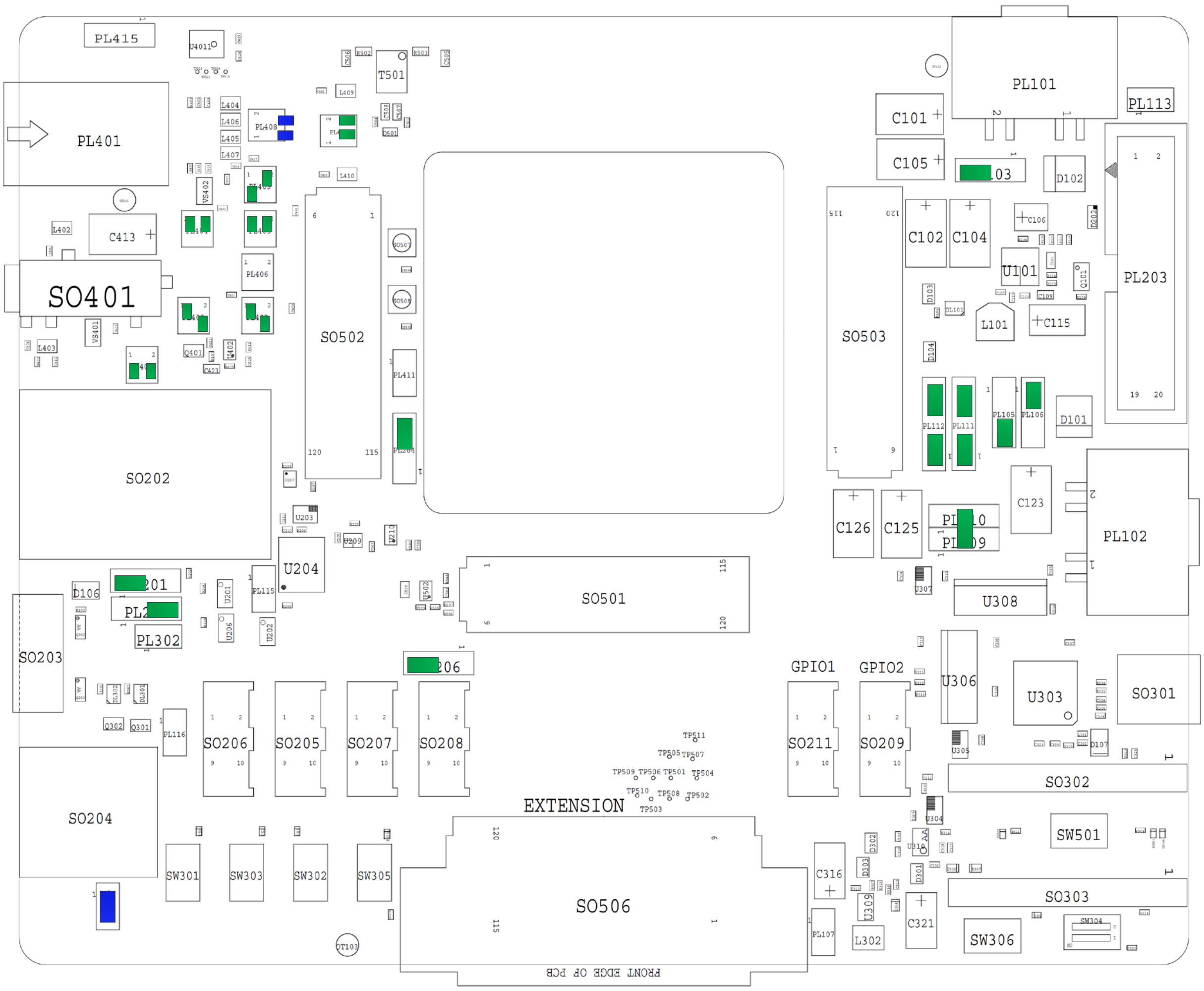


Table 3 summarizes the default jumper settings. Use the following jumper types:

- For 2.56 mm jumpers, use PN 1FFPJ00100.
- For 1.27 mm jumpers, use PN 1FF0600633HRW.

NOTE:
The default jumper settings shown here reflect the latest HW revision of the EVB. For previous versions, refer to previous versions of this document.

Table 3: Default Jumper Settings

Jumper	Jumper Type	Set Position	Description
PL103	2.54 mm	2-3	SO101/PL101 sources SMPS
PL106	2.54 mm	1-2	No direct feed by PL102 (bypass)
PL105	2.54 mm	2-3	SMPS path selected
PL114, PL108	2.54 mm	1-2	Spare
PL111	2.54 mm	1-2/3-4	No current measurement
PL112	2.54 mm	1-2/3-4	No current measurement
PL109/ PL110	2.54 mm	2/2	VBAT_AUX = Main VBAT
PL204	2.54 mm	2-3	USB switch connected to SO203
PL206	2.54 mm	1-2	SPI (SO208) VREG_MSME
PL302	2.54 mm	Open	No SIM Detect control by A-star
PL202	2.54 mm	2-3	Use external SIM device
PL201	2.54 mm	1-2	Use SIM1 cardholder
PL411	2.54 mm	Open	Enable external 3V Bias
PL402	1.27 mm	1-3 4-6	MIC1 uses single-ended mode RJ11 Mic Bias = External 3V EVB Bias

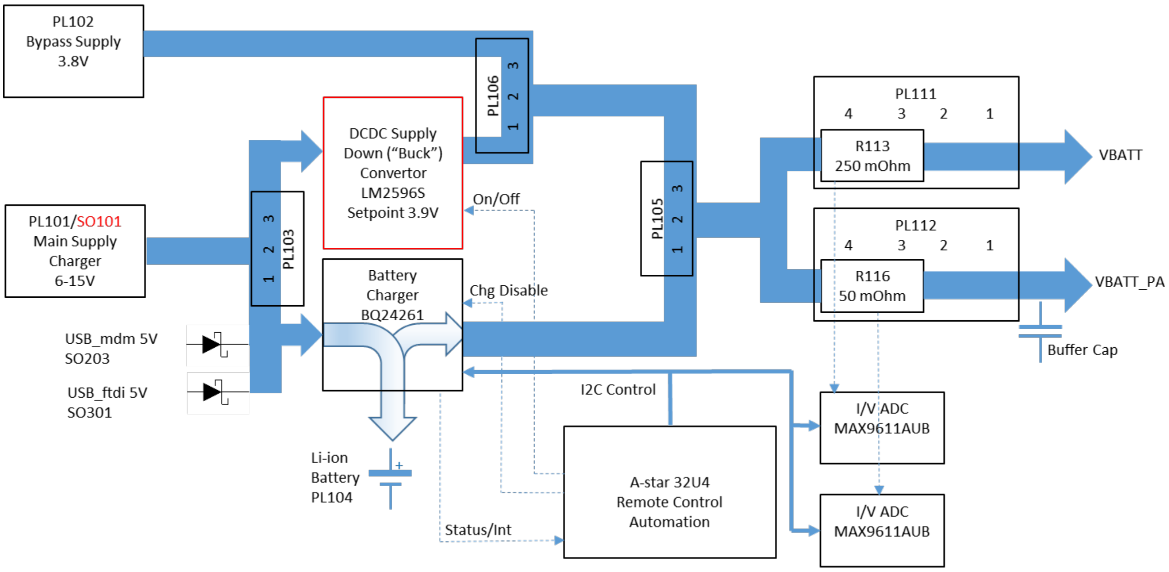
Jumper	Jumper Type	Set Position	Description
PL403	1.27 mm	1-3 4-6	Microphone of the 3.5mm audio jack connected to MIC1 3.5mm audio jack Mic Bias = External 3V EVB Bias
PL404	1.27 mm	1-3/2-4	EAR1 to 3.5mm audio jack Right channel (SO401)
PL405	1.27 mm	1-3/2-4	EAR2 to 3.5mm audio jack Left channel (SO401)
PL406		Open	Microphone of RJ11 is not connected
PL407	1.27 mm	3-5 4-6	MEMS mic connected to MIC2 MEMS Mic Bias = External 3V EVB Bias
PL408	1.27 mm	Pin 5 (single) Pin 6 (single)	2 spare jumpers
PL409	1.27 mm	3-5 2-4	GPS bias controlled via GPIO Class D amp shutdown
PL414	1.27 mm	3-5 4-6	Speaker Right connected directly (Class D bypassed) Speaker Left connected directly (Class D bypassed)

3. Power Supply

3.1. Supply Source Selection

The EVB can be configured for different power supply sources depending on the required use case. The following block diagram shows the different power path options.

Figure 5: EVB Power Supply



The EVB main power connector is PL101/SO101 with an input range of 6-15V.

Normally (i.e. in a typical SW developers setup), the EVB is supplied from the main power connector, and a DCDC buck supply with a set point of 3.9V is used to provide the system VBAT. So the usual jumper configuration is as follows: PL103/2-3; PL106/1-2; PL105/2-3.

PL102 allows an external configurable power supply to feed directly the Telit module VBAT input supply while all the auxiliary peripherals are sourced by the main power connector. For more details, refer to Section 3.3, Auxiliary Supply.

This mode of operation is also needed to test the complete VBAT range during module certification.

For field testing, an additional backup battery can be added (connected to PL104) in the box to overcome sudden or unexpected power drops from the vehicle's 12V source. Since the Telit module does not incorporate an internal battery charger solution, the EVB has an external charger circuit based on BQ24261M from TI.

For field testing (battery incl.) use the following jumper configuration: PL103/1-2; PL106/open; PL105/1-2.

Although strictly not necessary to be present, the A-star control board can be applied to automate the EVB power supply sequencing for testing purposes, battery charger control, as well as for other control and/or current or temperature monitoring functions.

If the A-star module is not mounted in the system, the following default conditions apply:

- Use case of DCDC buck power path selected (PL103/2-3):

  The buck supply is enabled by default and supplies the system with 3.9V.

- Use case of charger path selected (PL103/1-2):

  The TI BQ24261M device offers two features:

  - Power-path control
  - Battery charging

The power-path feature allows the BQ24261M to power the system from a high-efficiency DC-DC converter while simultaneously and independently charging the battery. The power path also permits the battery to supplement the system current requirements when the adapter cannot.

The power path can supply the system even if no battery is connected, but it is limited to 400 mA so most probably the system will not be able to reach full functionality using this mode.

The battery charging feature itself is enabled by default but is limited to 400 mA. For high current battery charging, the charger must be software-controlled and enabled over the I2C communication bus, thus the A-star module must be present and is responsible for enabling and controlling battery charging.

BQ24261 I2C SLAVE 7 bit address: **0x6B**

If no input source of at least 6V is present on PL101/SO101, the charger path can also be supplied from the 5V VBUS USB connector via diodes when connected (either from the module USB connector via D106 or from the FTDI USB-UART connector via D107).

To avoid current to be drawn from the USB host(s) inadvertently, apply an external power source of at least 6V on PL101/SO101, so the Schottky diodes will be reverse polarised.

NOTE:
The current sourced from typical USB hosts is usually limited to 500 mA, so check your USB (charger) source specification or make sure that the SW I2C configured battery charging current is lower.

It is up to the user to place the jumpers according to the power system configuration he wants to apply. The following snapshots of the component diagram clarify the detailed pin locations of the jumpers related to power selection.

The suggested green-colored jumper locations can be used for typical SW developers use to supply the system from an external 6V supply without any battery presence/charging involved.

Figure 6: Jumper PL103

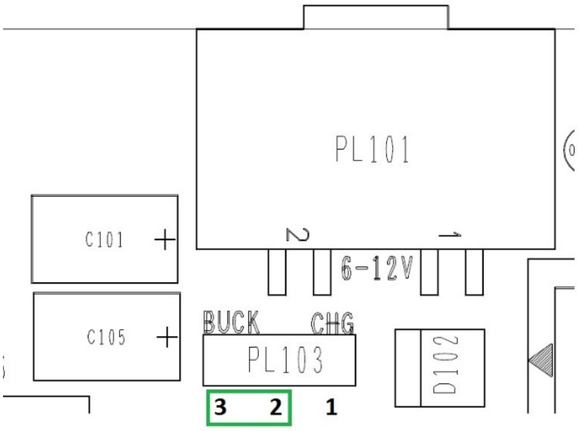
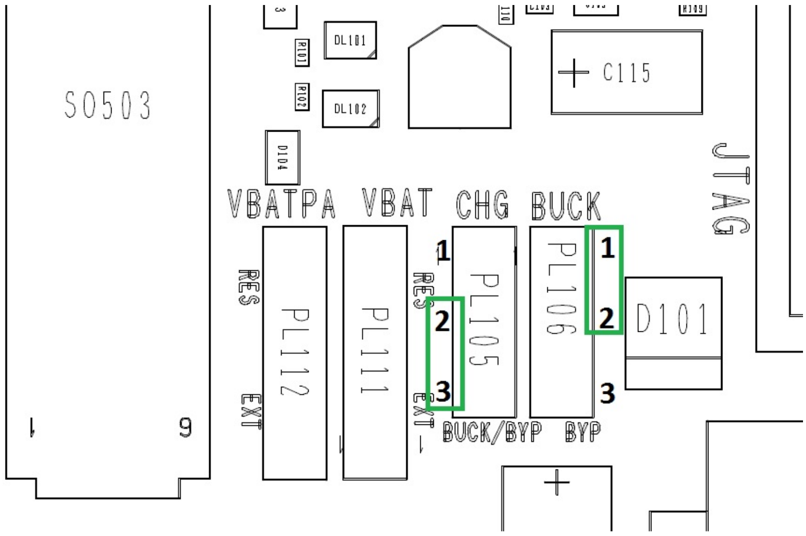


Figure 7: Jumpers PL105 / PL106



3.2. Module Supply Current Monitoring

The system current of the module can be measured, using one of the following options:

- The A-star module can be programmed to automate/measure/log the current consumed by the VBATT and VBATT_PA supply lines from a host PC application. Two MAX9611AUB devices and 1%-precision resistors are used as listed in Table 4.

  Table 4: I/V Convertor Settings

	VBATT	VBATT_PA
Sense Resistor I/V conversion	250 mOhm	50 mOhm
MAX9611 I2C Slave address (W/R)	0xE0/0xE1	0xE6/0xE7

  To enable (insert) the sense resistors in the VBAT supply paths, leave the following jumper positions open:

  PL111 position 3-4 (VBAT) and PL112 position 3-4 (VBAT_PA).

- An external ampere meter for manual measurements:

  PL111 position1-2 and PL112 position1-2 can be opened and used to apply current clamps to an external ampere meter for manual measurements.

- Using an external power supply or power monitor/analyzer device, bypassing the PL102 input power connector:

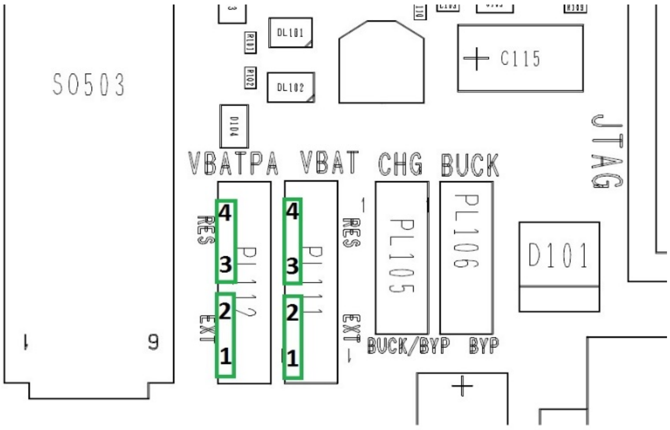
  By placing a jumper on PL106 position 2-3, you can bypass the on-board voltage regulator, connect an external power supply or power monitor/analyzer device, and use a host PC to monitor the system current directly.

  This option is useful for automated test setups with a host PC controlling the full system supply voltage range (via GPIB commands) to cover RF certification.

The following snapshots clarify the detailed pin location of the jumpers involved for a typical SW Developers Use mode: PL111 and PL112, without the need for sense resistors and/or external ampere meter presence in the supply path.

The jumper positions colored in green are suggested.

Figure 8: Jumpers PL111/PL112



3.3. Auxiliary Supply

To avoid interference between the VBAT current path of interest, (i.e. the current actually drawn by the Telit module), and the current drawn by peripherals in the system. The VBAT_AUX supply path can be isolated from the actual current path of the Telit module.

VBAT_AUX supplies the following subsystems:

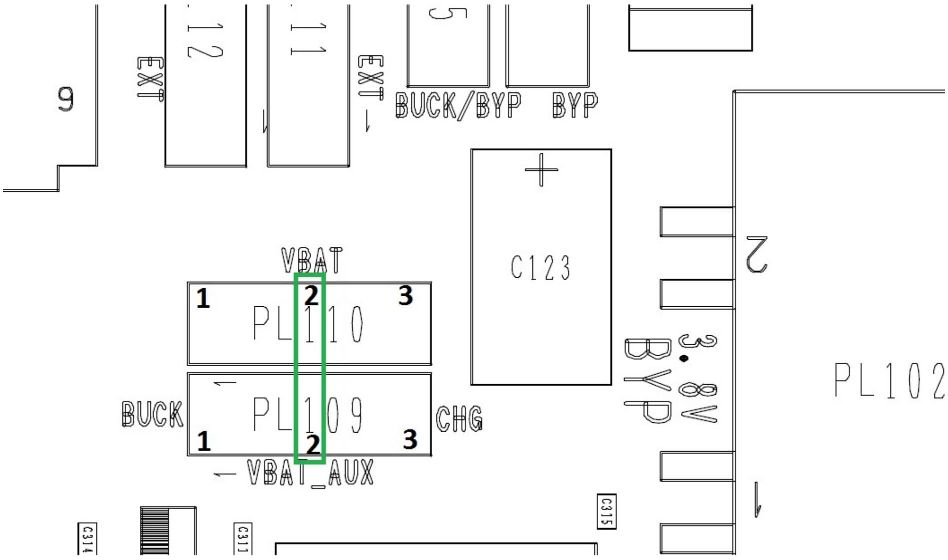
- A-Star remote control module (also supplied from the main input supply if system supply control from A-star GPIO is needed)
- I/O connectors
- MicroSD card supply (3.0V)
- Status LEDs
- GNSS external LNA supply
- Class D audio amplifier
- Cool fan supply
- Expansion board

For maximum flexibility, a 2x3 jumper setup (PL109/PL110) allows to select the VBAT_AUX supply from 3 possible sources:

- Main system supply VBAT (= module supply): PL110 position 2 _ P109 position 2
- DCDC buck SMPS convertor output: PL109 position 1-2
- Battery charger output CHG_BAT: PL109 position 2-3

Figure 9 clarifies the detailed pin position of the two jumpers involved PL109/PL110 and shows the suggested SW Developers Use settings in green color.

Figure 9: Jumpers PL109/PL110



3.4. Battery Charging

The Telit EVB includes a built-in battery that can be optionally installed. The battery can be used during field trials, drive tests, and also for demos. In addition, it can be useful during tests where a power cut is not desired.

The battery is charged using the TI BQ24261MRGER Charger IC.

The BQ24261MRGER is controlled via the A-Star Arduino I2C and enabled by Arduino GPIO0.

- Pull GPIO0 low to enable charging.
- Pull GPIO0 high to disable charging and place the charger in HZ mode.

The BQ24261MRGER slave address is 0xD6.

Charging control and monitoring is done by the A-Star FW and requires the A-Star to be present.

The charging circuit includes a status LED and 2 indications. For more information, refer to Section Battery Charger on p.24.

4. Control Switches and Indicator LEDs

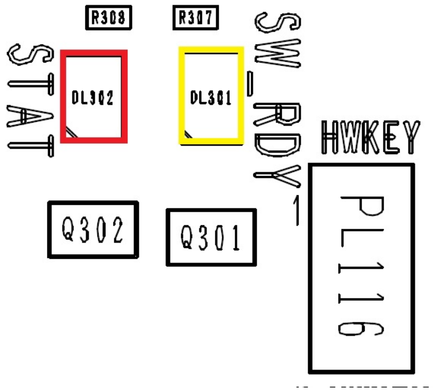
4.1. Telit Module

The generic EVB offers 2 indication LEDs that can be used to signal the module status and state of operation.

- SW_RDY LED (yellow)
- STATUS LED (red)

The actual LED functionality is determined by the Telit module in use and by the connectivity inside the IFBD. Refer to the specific IFBD user guide.

Figure 10: Module Status LEDs



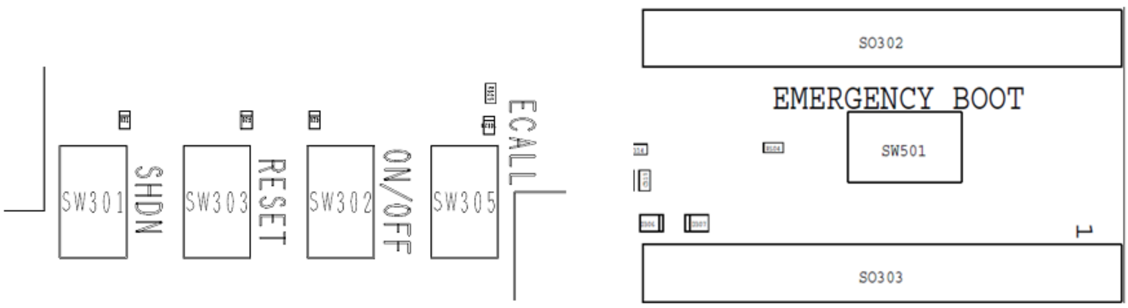
4.2. Control Buttons

The following tact switches are available to control the module:

- SW301: SHDN
- SW303: RESET
- SW302: ON/OFF
- SW305: ECALL
- SW501: EMERGENCY BOOT

Figure 11 shows the location of the LEDs on the EVB main board.

Figure 11: Module Control Buttons



The actual button functionality is determined by the Telit module in use and by the connectivity inside the IFBD. Refer to the specific IFBD user guide.

Not all buttons are used or active with all types of Telit modules. The description below is one example that suits some of the modules.

4.2.1. ON/OFF

The normal power-on/off cycle of the module is controlled by the ON/OFF button.

- Normally, the user presses this button to power ON the module.
- Normally, the user presses this button to power OFF the module, allowing graceful software-controlled power-off.

4.2.2. Reset

Normally, the RESET button is connected to the main Reset of the module in use.

4.2.3. Shutdown (SHDN)

On some modules, pressing the SHDN button triggers the PMIC device to execute a “forced” power supply shutdown (without allowing the software to end all ongoing activities on the modem device properly). It is comparable to a system power cut, but is not entirely the same, since the PMIC still follows the proper power-off cycle started with a modem reset assertion.[1]

4.2.4. ECALL

For automotive modules, the ECALL button (connected to TGPIO_20) can be used to trigger an ECALL event. On some modules, this button has dual functionality and can be used during boot to trigger/force the module into SW download mode.

The actual button functionality is determined by the Telit module in use and by the connectivity inside the IFBD.

4.2.5. EMERGENCY BOOT

The actual button functionality is determined by the Telit module in use and by the connectivity inside the IFBD.

This button is relevant for specific modules while on others, it is simply not connected or can be used for other purposes.

In those specific modules, holding down the EMERGENCY BOOT button during module power-up will force the module to enter into the chipset bootloader (during execution of chipset BootROM).

---

[1] The Arduino A-star controller board has full control over the on_off control pin of the DCDC regulator of the EVB power circuitry.
Using this way to power off the system is a “real” system power cut simulation, compared to SHDN.

4.2.6. Remote Controlling of the Buttons

Instead of by physical pressing, the ON/OFF, RESET, and SHDN buttons can also be soft-controlled from the A-star controller board, according to the following signal mapping table.

Table 5: A-Star Module Power Cycle Control

Push Button	A-star Control Pin
ON/OFF	D11
RESET	D12
SHDN	D5

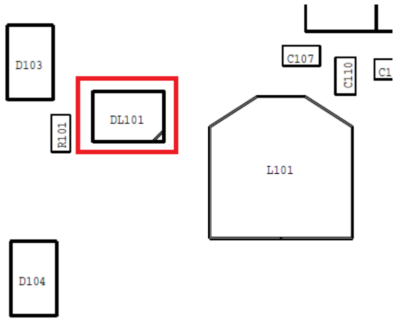
4.3. Battery Charger

A single red status LED provides feedback on the BQ24261M charger device status as follows:

- During charging, the LED is turned on.
- If charging is complete or disabled, the LED turns off.

Figure 12 illustrates the LED position.

Figure 12: Charger Status LED



In addition to the LED, the charger has 2 indication signals that can also be sensed by the A-star controller board, according to the following signal mapping:

Table 6: A-star Sensing of Charger Indicators

Charger Indicator	A-star Sense Pin
STAT (same as the LED)	D4
INT	D6

This requires an A-star internal pull-up configuration on the related signals.

4.4. A-Star

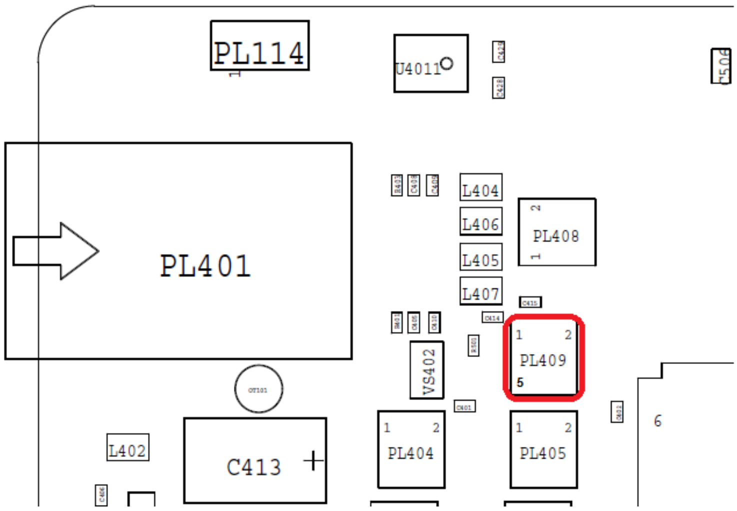
Besides the already mentioned control and sense functions of the A-star controller board, there are a few switches impacting the A-star module itself:

- SW306: Reset button of the A-star module
- SW304: 2pin-dipswitch to (optionally) define (up to) four A-star SW configuration modes

4.5. GPS LNA Control

The generic EVB supports 2 options for providing and controlling the GPS LNA / Active antenna using PL409.

Figure 13: GPS LNA Control



The options are as follows:

- Setting the PL409 jumper to 1-3 (upper left side) will constantly enable the LNA using the EVB on-board power supply.
- Setting the PL409 jumper to 3-5 (lower left side) will enable the LNA to be controlled by a GPIO of the module.

Table 7: GPS LNA Control

PL409	A-star Control Pin
1-3	Always ON
3-5	Enabled by GPIO from the module

NOTE:
Not all modules support the GPIO mode. Refer to the relevant module user guide for more information.

5. Interfaces

5.1. SIM Interface

Most Telit modules offer a dual SIM interface - SIM1 and SIM2. Some of them have an embedded eSIM chip implemented in parallel on the SIM1 interface bus, adding an additional eSIM_RST signal defined on the module pinout interface.

The EVB allows for maximum flexibility by providing the following options for interfacing the SIM devices:

- SIM1 cardholder multiplexed with an EVB on-board embedded “Test eSIM” chip
- SIM2 cardholder

Both SIM1 and SIM2 card holders are of the push-push type and support a full-size SIM.

To avoid SIM1 bus conflicts, each SIM placeholder has a 200k pulldown on its RST line, keeping the SIM device in that location in reset status. The modem-sourced RST signal activates the SIM device in use by overruling the pulldown connected according to the multiplex path configuration.

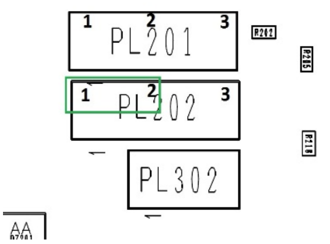
The section below describes the possible SIM configurations:

5.1.1. SIM1+eSIM Configuration (PL202)

PL202 defines which SIM card is physically connected to the SIM1 port:

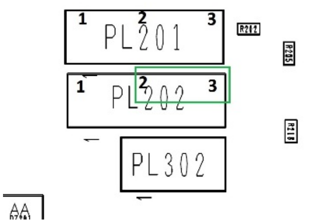
- SIM1 port is connected inside the module, i.e. an eSIM chip inside the cellular module is used: PL202 position 1-2
- SIM1 port uses the EVB SIM1_cardholder /or/ EVB on-board eSIM chip[2]: PL202 position 2-3

Figure 14: PL202 for SIM1 Using the Module-internal eSIM Chip



[2] The eSIM on the EVB is a “Test eSIM”, i.e. it allows the connection to test equipment (base station simulator) but not to a real life network (except using emergency mode).

Figure 15: PL202 for SIM1 Port Using the EVB SIM1 Cardholder or EVB On-board Test eSIM



5.1.1.1. EVB SIM1 Configuration (PL201)

NOTE:
The configuration below is valid only if PL202 is in position 2-3.

PL201 defines the actual EVB SIM connected to SIM1 port.

- SIM1 port is connected to SIM1 cardholder: PL201 position 1-2
- SIM1 port is connected to the EVB on-board eSIM chip: PL201 position 2-3

Figure 16: SIM1 Port Using SIM1 Cardholder PL201

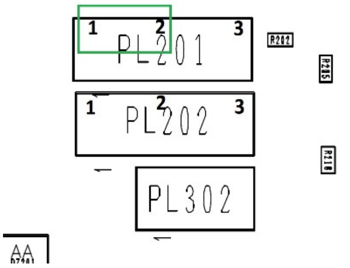
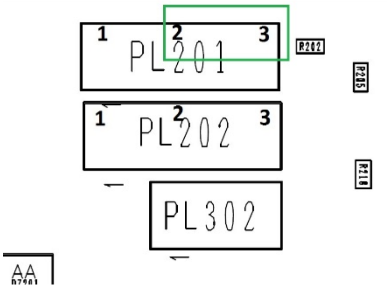


Figure 17: SIM1 Port Using the EVB External eSIM Chip PL201



For test purposes, the EVB on-board A-star controller board can control a SPDT switch (U206) to automate (emulate) SIM card removal detection use cases. This switch can change the status of the SIMIN1 detect line to “not connected”, actually simulating a SIM card removal to the software.

To enable this control, place Jumper PL302, connecting the A-star interface (pin D8) to SIMCTRL. If PL302 is not placed, SIMCTRL is set to 1, which is the default setting.

Table 8: SIMCTRL Truth Table

SIMCTRL	SIM Card Detect Status (SIMIN1)
0	Simulated removal of SIM
1	Actual SIM card status

5.1.2. SIM2

The SIM2 port is not configurable and is directly connected to the SIM2 cardholder (SO201), which is located on the bottom side of the EVB (under the SIM1 holder).

5.2. USB Interface

The EVB provides a HS USB connection to the Telit module USB port to support the use cases below:

- Flash/update firmware
- Data connection port
- Diagnostics

The EVB supports USB3.0 for compatibility with future Telit modules.

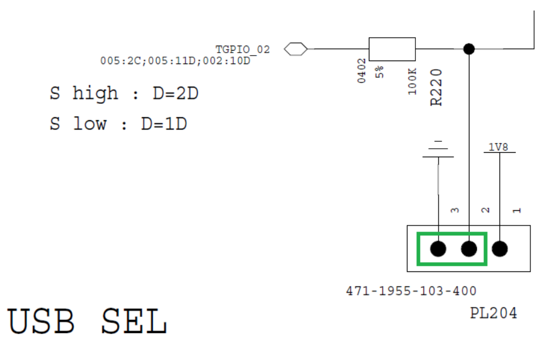
The Micro USB AB connector is located on the EVB main board.

Besides routing the USB bus to this main connector, there is a second USB path available towards the extension connector SO506, which allows designing extension cards with USB connection to the USB port of the module.

The active USB path used is defined by the multiplexer switch (refer to Figure 18) which is controlled via a jumper or a GPIO.

By default, Jumper PL204 is in position 2-3, which means that the USB switch is forced to allow USB connectivity between the EVB USB connector and the Telit module as shown below.

Figure 18: USB Connectivity Jumper



If dynamic control is required, set PL204 to position 1-2. In this case, the switch will be controlled by TGPIO_02 of the Telit module.

Refer to the IFBD User Guide for the actual connectivity of TGPIO_02 to the module.

Table 9: USB Path Selection

TGPIO_02	Active USB Path
0	Micro-AB USB connector SO203 (default)
1	Extension connector SO506

5.3. UART Interface

The EVB includes two generic UART interfaces:

- UART1 – 4-wire UART
- UART2 - Auxiliary UART with 2 pins

On the EVB, both UART interfaces are routed to a dual serial-USB convertor FT2232D, accessible via mini-B USB connector SO301.

The actual mapping of the module's UART interfaces to the EVB UART ports is defined in the IFBD. Refer to the IFBD User Guide for more information.

5.4. Micro SD Card Interface

The EVB provides a Micro-SD card socket (SO204) for cases where the Telit module supports an SD Card interface.

The EVB supports a 4-bit dual-voltage (1.8/2.95V) SD card interface.

The EVB main board allows SD 3.0 at up to 200 MHz SDR / 50 MHz DDR.

The actual speed and voltage support is determined by the module in use and the IFBD connectivity.

The EVB supports card detection as well.

On top of the digital SD interface lines, the module also provides a reference supply (VMMC) for the external pullup resistors[3].

The power supply of the memory card must be sourced externally using the on-board 3.0V linear regulator (U205). The Regulator Enable pin, which is active HIGH, is connected to VMMC.

5.5. JTAG Interface

For debugging the SW code level with a JTAG pod, the standard 20-pin header connector PL203 gives access to the module chipset JTAG interface.

[3] SD card pull-ups by default are present on EVB, but can be omitted if such pull-ups are available within the module (either on-board or chipset-internal).

6. Analog Audio

6.1. Audio Connector Selection

The EVB board offers two generic Analog audio interface connectors:

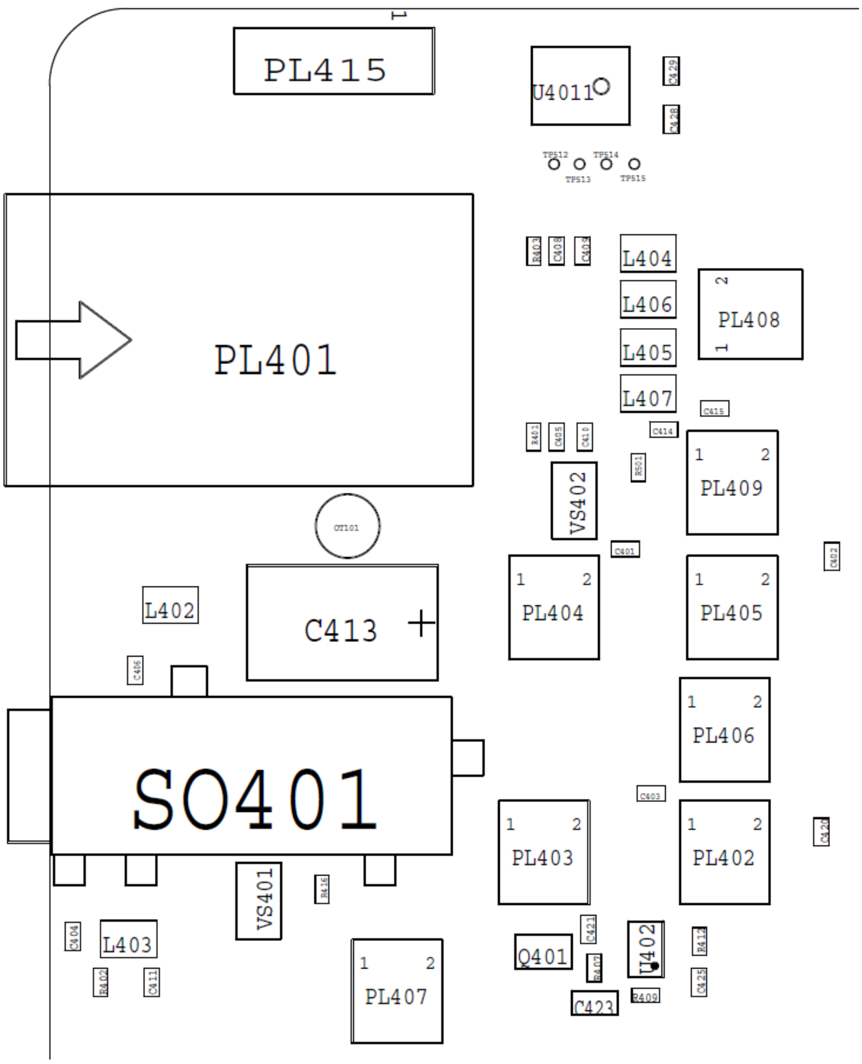
- 3.5mm stereo audio jack - SO401
- RJ11 Terminal phone type mono audio socket - PL401

The actual audio features supported by the specific module are described in the module Hardware User Guide.

The actual connectivity of the module audio interfaces to the EVB generic audio connectors is described in the relevant IFBD User Guide.

To cover all use cases and audio path multiplexing options, a jumper-based set of connectors provides a matrix of all possible audio path selections as detailed in following subsections.

Figure 19: Analog Audio Path Selection Matrix



6.1.1. 3.5-mm Audio Jack Configurations

6.1.1.1. Configuring 3.5-mm Audio Jack to a Stereo + MIC

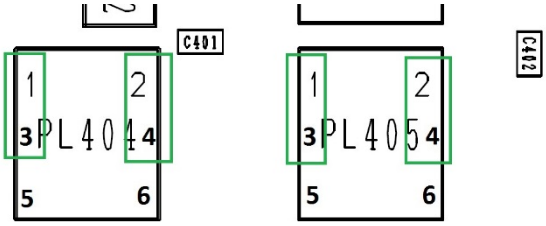
Downlink 3.5-mm audio jack:

- EAR1_MT+: JACK_L
- EAR1_MT-: AC coupled to GND
- EAR2_MT+: JACK_R
- EAR2_MT-: AC coupled to GND

Jumper configuration:

- PL404: Position 1-3 & 2-4
- PL405: Position 1-3 & 2-4

Figure 20: Downlink 3.5-mm Audio Jack PL404/PL405



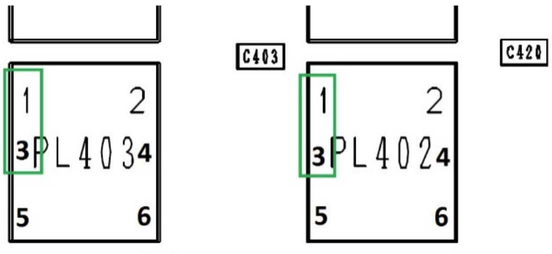
Uplink 3.5-mm audio jack using MIC1 path:

- MIC1_MT+: JACK_MIC+
- MIC1_MT-: AC coupled to GND

Jumper configuration:

- PL402: Position 1-3
- PL403: Position 1-3

Figure 21: Uplink 3.5-mm Audio Jack MIC1 PL402/PL403



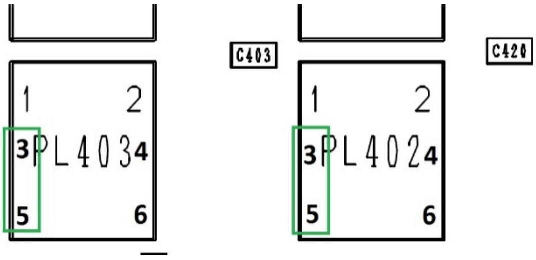
Uplink 3.5-mm audio jack using MIC2 path:

- MIC2_MT+: JACK_MIC+
- MIC2_MT-: AC coupled to GND

Jumper configuration:

- PL402: Position 3-5
- PL403: Position 3-5

Figure 22: Uplink 3.5-mm Audio Jack MIC2 PL402/PL403



6.1.1.2. Configuring MIC BIAS

The EVB provides two options for providing bias to the 3.5-mm jack microphone:

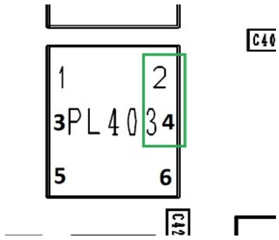
MICBIAS:

In this case, the bias is generated by the module's built-in audio codec (actual voltage level is determined by the module).

Jumper configuration:

- PL403: Position 2-4

Figure 23: Uplink 3.5-mm Audio Jack MICBIAS Codec 1.5V PL403



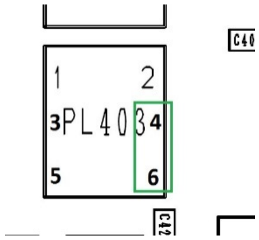
BIAS:

In this case, the bias is generated locally on the EVB: 3V

Jumper configuration:

- PL403: Position 4-6
- PL401: Open

Figure 24: Uplink 3.5-mm Audio Jack BIAS Local 3V PL403



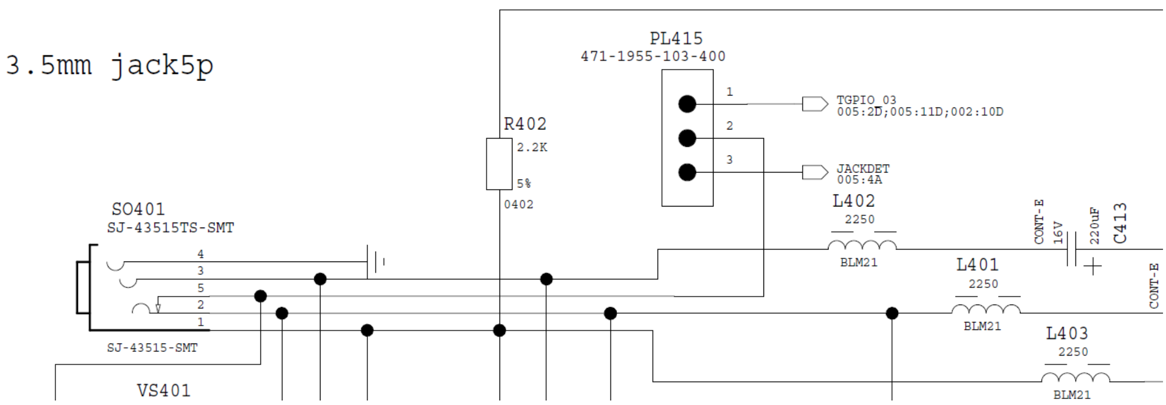
6.1.1.3. 3.5-mm Jack Detection (HS DET) Feature

The EVB supports the headset detection feature. The detection can be done via GPIO3 of the platform or via a dedicated pin in the B2B connectors. PL415 selects between the detection signal options.

By default, PL415 is not mounted.

If the dedicated "JACKDET" is used, the actual GPIO assigned for the detection is defined in the relevant IFBD.

Figure 25: HS Jack Detection Circuit



6.1.2. RJ11 Phone Type Socket Configuration

RJ11 provides a differential mode / mono audio connection. The EVB allows the user to connect any combination of EAR1/EAR2 and MIC1/MIC2 to the RJ11 connector as described below:

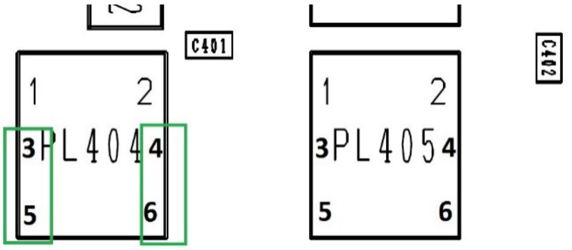
Downlink RJ11 phone socket using EAR1:

- EAR1_MT+: RJ11_EAR+
- EAR1_MT-: RJ11_EAR-

Jumper configuration:

- PL404: Position 3-5 & 4-6
- PL405: Open

Figure 26: Downlink RJ11 EAR1 PL404/PL405



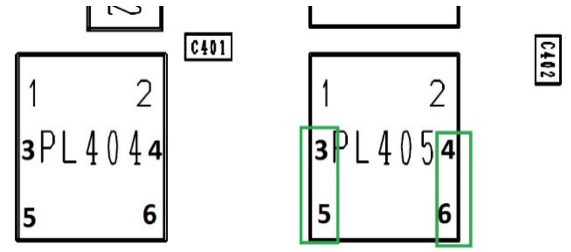
Downlink RJ11 phone socket using EAR2:

- EAR2_MT+: RJ11_EAR+
- EAR2_MT-: RJ11_EAR-

Jumper configuration:

- PL405: Position 3-5 & 4-6
- PL405: Open

Figure 27: Downlink RJ11 EAR2 PL404/PL405



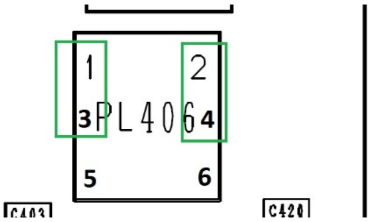
Uplink RJ11 phone socket using MIC1:

- MIC1_MT+: RJ11_MIC+
- MIC1_MT-: RJ11_MIC-

Jumper configuration:

- PL406: Position 1-3 & 2-4

Figure 28: Uplink RJ11 MIC1 PL406



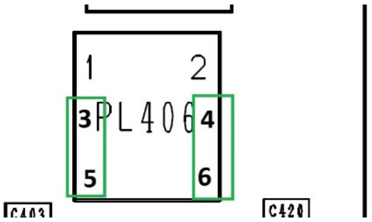
Uplink RJ11 phone socket using MIC2:

- MIC2_MT+: RJ11_MIC+
- MIC2_MT-: RJ11_MIC-

Jumper configuration:

- PL406: Position 3-5 & 4-6

Figure 29: Uplink RJ11 MIC2 PL406



6.1.2.1. Configuring MIC BIAS

The EVB provides two options for providing bias to the RJ11 microphone:

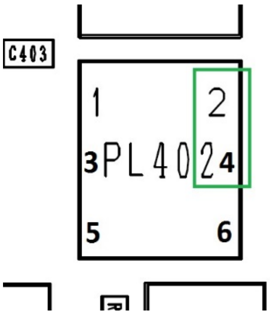
MICBIAS:

In this case, the bias is generated by the module's built-in audio codec. (The actual MICBIAS voltage is determined by the specific module in use - refer to relevant IFBD User Guide.)

Jumper configuration:

- PL402: Position 2-4

Figure 30: Uplink RJ11 MICBIAS Supplied from Module PL402



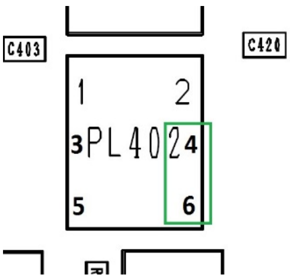
BIAS:

In this case, the bias is generated locally on EVB: 3V

Jumper configuration:

- PL402: Position 4-6

Figure 31: Uplink RJ11 BIAS Supplied Locally 3V PL402



6.2. MEMS Microphone

For demonstration use cases, the EVB provides an on-board Analog MEMS microphone: SPU0410HR5H (from Knowles)

The MEMS microphone can be connected to either MIC1 or MIC2 (supporting single-ended mode only).

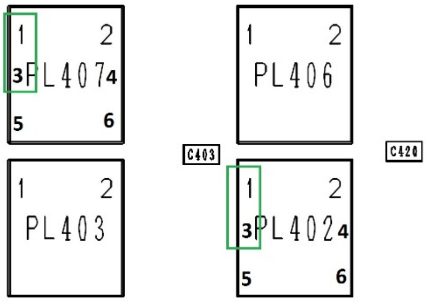
To connect the microphone to the MIC1 path :

- MIC1_MT+: MEMS_OUT
- MIC1_MT-: AC coupled to GND

Jumper configuration:

- PL407: Position 1-3
- PL402: Position 1-3

Figure 32: Uplink MEMS MIC1 PL402/PL407



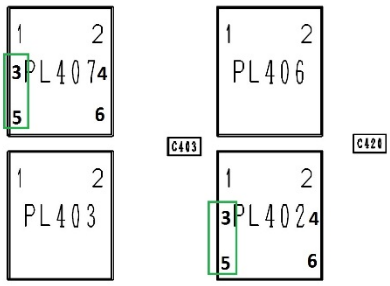
To connect the microphone to the MIC2 path:

- MIC2_MT+: MEMS_OUT
- MIC2_MT-: AC coupled to GND

Jumper configuration:

- PL407: Position 3-5
- PL402: Position 3-5

Figure 33: Uplink MEMS MIC2 PL402/PL407



The EVB provides two options for providing bias to the MEMC microphone:

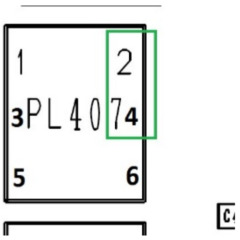
MICBIAS:

In this case, the bias (MEMC supply) is generated by the module's built-in audio codec. (The actual MICBIAS voltage is determined by the specific module in use - refer to the relevant IFBD User Guide.)

Jumper configuration:

- PL407: Position 2-4

Figure 34: Uplink MEMS MICBIAS Supplied from Module PL407



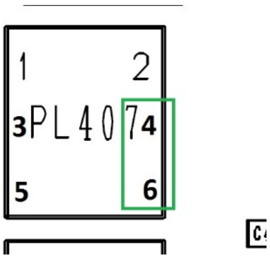
BIAS:

In this mode, the bias (MEMC supply) is generated locally on the EVB: 3V

Jumper configuration:

- PL407: Position 4-6

Figure 35: Uplink MEMS BIAS Local 3V PL407



6.3. Class D Amplifier

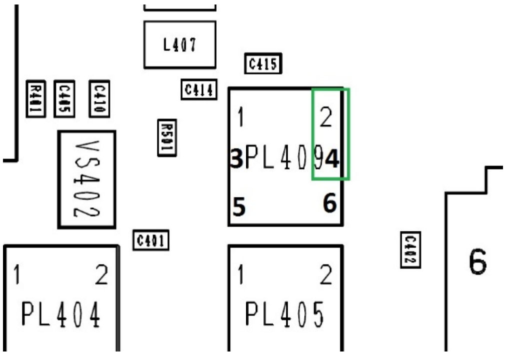
For demos, a Class D audio amplifier is provided on the EVB, using the LM48511 from TI with the following conditions:

- Supplied from VBAT_AUX
- Amplification gain is set by external set resistors: Default gain is 1
- FB_SEL= 0 High voltage setting:
  - R3 = 24k
  - R4 = 2.4k
  - R1 = 4.87k

  This results in PV1 = 7.3V
- Typical PWR_OUT (THDN 1%) for VBAT_AUX = 3.6V: 2.5W at 8 Ohm / 4W at 4 Ohm

The amplifier is enabled by default. To disable it, set Jumper PL409 to Position 2-4.

Figure 36: Class D Amplifier Disabled PL409



The output of the amplifier can be connected to a speaker (4 Ohm, 8 Ohm) via connector PL410.

Class D can be connected to either one of the downlink audio parts (EAR1 or EAR2).

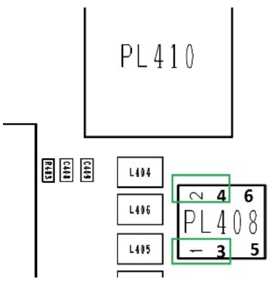
Connecting Class D to EAR1:

- EAR1_MT+: AMP_P
- EAR1_MT-: AMP_M

Jumper configuration:

- PL408: Position 1-3 & 2-4

Figure 37: Downlink Class D to EAR1 PL408



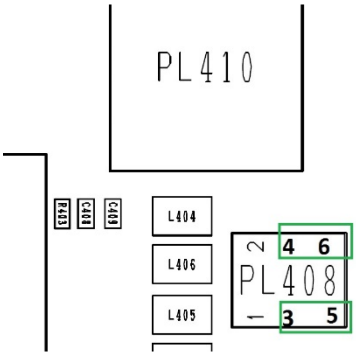
Connecting Class D to EAR2:

- EAR2_MT+: AMP_P
- EAR2_MT-: AMP_M

Jumper configuration:

- PL408: Position 3-5 & 4-6

Figure 38: Downlink Class D to EAR2 PL408

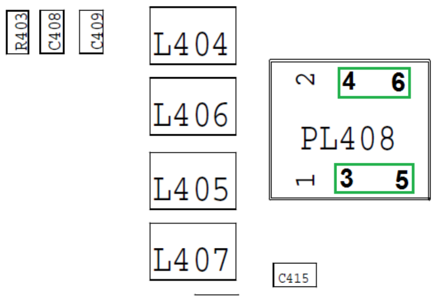


Bypass of Class D Amplifier:

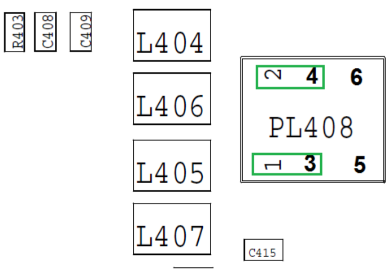
The Telit EVB supports the option of bypassing the Class D amplifier, thus allowing modules with internal speaker amplifiers to connect directly to the speaker while bypassing the on-board Class D amplifier.

PL414 selects the Class D connectivity as follows:

- For Class D bypass: PL414 Position 3-5 & 4-6



- To use on-board Class D: PL414 Position 1-3 & 2-4



7. Thermal Monitoring & Cooling

7.1. Thermal Monitoring

Normally, the Interface board contains a 10k NTC thermistor, which is placed on the top-layer GND plane, close to the module boundary. The measured NTC temperature should reflect the module's backside temperature.

The readout of the thermistor is done via the ADC feature of the A-star controller board, interface pin AIN0.

A 10k pullup resistor is connected to the 5V A-star IO supply, resulting in resistive division, having a typical ADC readout nominal around 2.5V, at 25°C.

7.2. Cooling

To provide cooling to the Telit module (via the module's bottom plate), a cool-fan and an heatsink combination can be attached on the backside of the IFBD.

The cool-fan and heatsink combination targeted for this application is:

- Any 40x40x10mm PWM compatible 5V fan
- ATS-55350D-C2-R0 (35x35x9.5mm) heatsink from Advanced Thermal Solutions Inc.

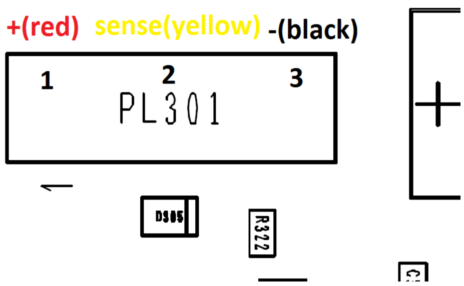
The cool-fan and heatsink mechanical attachment is part of the plastics housing concept, custom-designed for the complete Development Kit. A dedicated fan supply is present on the EVB, controlled by the A-star controller board.

Table 10: Cool Fan A-star Control Pin Mapping

A-star Interface Pin	Function	Active Level
D18	FAN enable	High
A10	PWM speed control	High
D19	Speed sense	N/A

The detailed pin mapping of the cool-fan connector is indicated in Figure 39. It is a 3-pin connector located on the bottom side of the EVB.

Figure 39: Coolfan Pin Mapping PL301



8. Connectors

8.1. IO Connectors

Besides the main 120p extension connector, several dedicated IO interface connectors are available. The I/O interface connectors are based on the Samtec 10p pin header connector type: SHF-105-01-L-D-SM-LC, which can be mated with Samtec IDC wire cable FFSD-05-D.

The tables below list the signals available / visible at each header.

Table 11: SO206: ADC

1	VBAT_AUX	2	ADC_IN1
3	GND	4	ADC_IN2
5	GND	6	ADC_IN3
7	GND	8	TGPIO_07
9	1.8V	10	GND

Table 12: SO205: DVI

1	DVI_WAO	2	VBAT_AUX
3	DVI_TX	4	1.8V
5	DVI_RX	6	TGPIO_04
7	DVI_CLK	8	GND
9	REF_CLK	10	GND

Table 13: SO207: I2C

1	VBAT_AUX	2	I2C_SDA
3	1.8V	4	I2C_SCL
5	TGPIO_22	6	GND
7	I2C_SDA_AUX	8	GND
9	I2C_SCL_AUX	10	GND

Table 14: SO208: SPI

1	SPI_MOSI	2	VBAT_AUX / 1.8V (selected by PL206)
3	SPI_MISO	4	TGPIO_11
5	SPI_CS	6	TGPIO_12
7	SPI_CLK	8	GND
9	GND	10	GND

Table 15: SO211: GPIO1

1	1.8V	2	TGPIO_01
3	TGPIO_02	4	TGPIO_03
5	TGPIO_04	6	TGPIO_05
7	TGPIO_06	8	TGPIO_07
9	TGPIO_08	10	GND

Table 16: SO209: GPIO2

1	VBAT_AUX	2	1.8V
3	TGPIO_09	4	TGPIO_10
5	TGPIO_11	6	TGPIO_12
7	TGPIO_20	8	TGPIO_21
9	TGPIO_22	10	GND

8.2. 120-pin Male B2B Connectors

The interface between IFBD and EVB is implemented via three units of 120p (20p x 6 rows) Samtec SEARAY 1.27mm High Speed/High Density B2B connectors (10mm stack height SEAM/SEAF).

The tables below provide the detailed pin mapping.

The actual pin functionality applied to each pin is determined according to the specific module features and according to the mapping implemented on each specific IFBD.

Signal names and signal functionality are likely to change across platforms.

Refer to the User Guide of the specific IFBD in use for the actual pin mapping and pin description.

Table 17: SO501

1	GND	2	GND	3	I2C_SCL_AUX	4	I2C_SDA_AUX	5	GND	6	SGMII_RX_M
7	USB_SS_RX_P	8	GND	9	I2C_SDA	10	TGPIO_06	11	SGMII_TX_M	12	SGMII_RX_P
13	USB_SS_RX_M	14	GND	15	TGPIO_05	16	I2C_SCL	17	SGMII_TX_P	18	GND
19	GND	20	GND	21	VREG_MSME	22	VREG_MSME	23	GND	24	PCIE_RX_P
25	USB_SS_TX_P	26	GND	27		28		29	PCIE_TX_P	30	PCIE_RX_M
31	USB_SS_TX_M	32	GND	33	TGPIO_12	34	SPI_MOSI	35	PCIE_TX_M	36	GND
37	GND	38		39	TGPIO_11	40	TGPIO_04	41	GND	42	PCIE_REFCLK_P
43	SPI_CS	44	TGPIO_02	45	TGPIO_03	46	SPI_MISO	47		48	PCIE_REFCLK_M
49	VAUX/PWRMON	50	VAUX/PWRMON	51	LED_DRV_EN	52	SPI_CLK	53		54	
55	TGPIO_08	56	TGPIO_07	57	TGPIO_01	58	TGPIO_09	59		60	CSI2_D0_N
61	TGPIO_21	62	TGPIO_10	63	TGPIO_22	64	TGPIO_20	65		66	CSI2_D0_P
67	VMMC	68	VMMC	69	MMC_CD	70	MMC_DAT3	71		72	CSI2_CLK_N
73	MMC_DAT0	74	MMC_DAT2	75	MMC_CLK	76	MMC_DAT1	77	PCIE_EP_RESET_N	78	CSI2_CLK_P
79	GND	80	GND	81	C107/DSR	82	MMC_CMD	83	PCIE_CLKREQ_N	84	CSI1_D0_N
85	WIFI_SD0_TGPIO15	86	WIFI_SD1_TGPIO16	87	WIFI_SDCMD_TGPIO14	88	WIFI_SDRST_TGPIO13	89	TX_AUX	90	CSI1_D0_P
91	WIFI_SD5_TGPIO24	92	WIFI_SD2_TGPIO17	93	WIFI_SD3_TGPIO18	94	WIFI_SD4_TGPIO23	95	RX_AUX	96	CSI1_D1_N
97	WIFI_SD6_TGPIO25	98	WIFI_SD7_TGPIO26	99	WIFI_SDCLK_TGPIO19	100	WCI_TX	101	WCI_RX	102	CSI1_D1_P
103	C125/RING	104	RFCLK2_QCA	105	WLAN_SLEEP_CLK	106	C105/RTS	107	PCIE_EP_WAKE_N	108	CSI1_D2_N
109	C104/RXD	110	C109/DCD	111	C103/TXD	112	C106/CTS	113	C108/DTR	114	CSI1_D2_P
115		116		117	CSI1_CLK_P	118	CSI1_CLK_N	119	CSI1_D3_P	120	CSI1_D3_N

Table 18: SO502

1	GPS_LNA_BIAS	2	GND	3	GPS_LNA_EN	4	MICBIAS	5	GND	6	JACKDET
7	GND	8	GND	9	GND	10	GND	11	GND	12	
13	MIC2_MT+	14	MIC2_MT-	15	GND	16	EAR2_MT-	17	EAR2_MT+	18	
19	GND	20	GND	21	GND	22	GND	23	GND	24	GND
25	MIC1_MT+	26	MIC1_MT-	27	GND	28	EAR1_MT-	29	EAR1_MT+	30	GND
31	SPKR_N	32	SPKR_P	33		34		35		36	MIC_VDD
37	GND	38	GND	39	D_MIC_CLK	40	D_MIC_DAT_1	41	GND	42	GND
43	TRXN0	44	GND	45	GND	46	GND	47	GND	48	GND
49	TRXP0	50	GND	51	GND	52	ADC_IN3	53	ADC_IN2	54	ADC_IN1
55		56		57		58		59		60	
61	DVI_RX	62	DVI_TX	63	DVI_CLK	64	DVI_WAO	65	REF_CLK	66	GND
67	GND	68	GND	69	GND	70	GND	71	GND	72	eSIM_RST
73	GND	74	GND	75	GND	76	GND	77	SIMVCC1	78	SIMVCC1
79	HSIC_STB	80	HSIC_DATA	81	SIMCLK1	82	SIMIN1	83	SIMIO1	84	SIMRST1
85	HW_KEY	86	VRTC	87	ETH_RST_N	88	ETH_INT_N	89	SIMVCC2	90	SIMVCC2
91	USB_VBUS	92	USB_ID	93	SIMIN2	94	SIMIO2	95	SIMRST2	96	SIMCLK2
97	GND	98	GND	99	MAC_REF_CLK	100	MAC_TXEN_ER	101	MAC_MDIO	102	MAC_RXDV_ER
103	USB_D+	104	GND	105	MAC_TXD[0]	106	MAC_MDC	107	MAC_RXD[0]	108	MAC_CRS_DV
109	USB_D-	110	GND	111	MAC_TXD[1]	112	MAC_TXD[2]	113	MAC_RXD[1]	114	MAC_RXD[2]
115	GND	116	GND	117	MAC_TX_CLK	118	MAC_TXD[3]	119	MAC_RX_CLK	120	MAC_RXD[3]

Table 19: SO503

1	VBATT	2	VBATT	3	VBATT	4	VBATT_PA	5	VBATT_PA	6	VBATT_PA
7	VBATT	8	VBATT	9	VBATT	10	VBATT_PA	11	VBATT_PA	12	VBATT_PA
13	VBATT	14	VBATT	15	VBATT	16	VBATT_PA	17	VBATT_PA	18	VBATT_PA
19		20		21		22	VBATT_PA	23	VBATT_PA	24	VBATT_PA
25		26		27		28		29		30	
31		32		33		34		35		36	
37	DSI_CLK_P	38	DSI_CLK_N	39		40		41		42	
43	DSI_D3_P	44	DSI_D3_N	45		46		47		48	
49	DSI_D2_P	50	DSI_D2_N	51		52		53		54	
55	DSI_D1_P	56	DSI_D1_N	57	TGPIO_27_TXD_GPS	58	TGPIO_28_RXD_GPS	59	TGPIO_29_RTS_GPS	60	TGPIO_30_CTS_GPS
61	DSI_D0_P	62	DSI_D0_N	63		64		65		66	D8_THERM_ASTAR
67		68		69		70		71		72	
73		74		75		76		77		78	
79	GND	80	GND	81	GND	82	GND	83	GND	84	GND
85	GND	86	GND	87	GND	88	GND	89	GND	90	GND
91	RESET	92	ON_OFF	93	STAT_LED	94	LED_DRV	95	SW_RDY	96	SHDN
97	GND	98	GND	99	GND	100	GND	101		102	
103	GPS_PPS	104	GPS_RFPAON	105	GPS_CLK	106	GND	107		108	JTAG_PS_HOLD
109	GND	110	GND	111	GND	112	GND	113	JTAG_TDI	114	D_MIC_DAT_2
115	JTAG_TMS	116	JTAG_TDO	117	JTAG_TRST	118	JTAG_TCK	119	JTAG_RTCK	120	JTAG_RESOUT

8.3. Extension Connector

As described above, the EVB features can be extended by adding / designing extension cards, which are then plugged into the SO506 connector of the EVB main board.

The detailed pin allocation of the extension connector is shown in the table below.

The actual functionality of each signal is determined by the specific module in use and by the specific extension card. Signal names and signal functionality are likely to change across platforms.

Refer to the relevant extension card HW User Guide.

Table 20: Extension Connector

1	VBAT_AUX	2	VBAT_AUX	3	DSI_CLK_N	4	DSI_CLK_P	5	DSI_D3_N	6	DSI_D3_P
7	GND	8	GND	9	GPS_PPS	10	WIFI_SDCMD_TGPIO14	11	WCI_RX	12	DSI_D2_N
13	VAUX/PWRMON	14	WIFI_SD4_TGPIO23	15	LED_DRV	16	WIFI_SDCLK_TGPIO19	17	TGPIO_30_CTS_GPS	18	DSI_D2_P
19	1V8	20	WIFI_SD3_TGPIO18	21	LED_DRV_EN	22	WIFI_SD7_TGPIO26	23	DSI_D1_N	24	DSI_D1_P
25	WCI_TX	26	RFCLK2_QCA	27	WIFI_SD2_TGPIO17	28	WIFI_SD5_TGPIO24	29	DSI_D0_N	30	DSI_D0_P
31	I2C_SCL_AUX	32	I2C_SDA_AUX	33	WIFI_SD0_TGPIO15	34	WIFI_SD1_TGPIO16	35	CSI1_CLK_P	36	CSI1_CLK_N
37	I2C_SDA_EXT	38	I2C_SCL_EXT	39	WIFI_SD6_TGPIO25	40	WIFI_SDRST_TGPIO13	41	CSI1_D3_P	42	CSI1_D3_N
43	TGPIO_20	44	TGPIO_01	45	TGPIO_02	46	TGPIO_03	47	CSI1_D2_P	48	CSI1_D2_N
49	TGPIO_21	50	TGPIO_04	51	TGPIO_05	52	TGPIO_06	53	CSI1_D1_P	54	CSI1_D1_N
55	TGPIO_22	56	TGPIO_07	57	TGPIO_08	58	TGPIO_09	59	CSI1_D0_P	60	CSI1_D0_N
61	ETH_INT_N	62	TGPIO_10	63	TGPIO_11	64	TGPIO_12	65	CSI2_CLK_P	66	CSI2_CLK_N
67	ETH_RST_N	68	PCIE_CLKREQ_N	69	PCIE_EP_WAKE_N	70	PCIE_EP_RESET_N	71	CSI2_D0_P	72	CSI2_D0_N
73	MAC_RXDV_ER	74	MAC_MDIO	75	TGPIO_29_RTS_GPS	76	TGPIO_28_RXD_GPS	77	TGPIO_27_TXD_GPS	78	PCIE_REFCLK_M
79	MAC_CRS_DV	80	MAC_MDC	81	WLAN_SLEEP_CLK	82	REF_CLK	83	GND	84	PCIE_REFCLK_P
85	MAC_RXD[3]	86	MAC_TXEN_ER	87	DVI_CLK	88	DVI_WAO	89	PCIE_TX_M	90	GND
91	MAC_RXD[2]	92	MAC_REF_CLK	93	DVI_RX	94	DVI_TX	95	PCIE_TX_P	96	PCIE_RX_M
97	MAC_RX_CLK	98	MAC_TXD[2]	99	SPI_CLK	100	SPI_CS	101	GND	102	PCIE_RX_P
103	MAC_RXD[1]	104	MAC_TX_CLK	105	SPI_MISO	106	SPI_MOSI	107	SGMII_TX_P	108	GND
109	MAC_RXD[0]	110	MAC_TXD[1]	111	GND	112	GND	113	SGMII_TX_M	114	SGMII_RX_P
115	MAC_TXD[3]	116	MAC_TXD[0]	117	USB_EXT_D-	118	USB_EXT_D+	119	GND	120	SGMII_RX_M

9. EVB Component Diagram

CS1742E_Placement
.pdf

Figure 40: EVB Component Diagram Top View

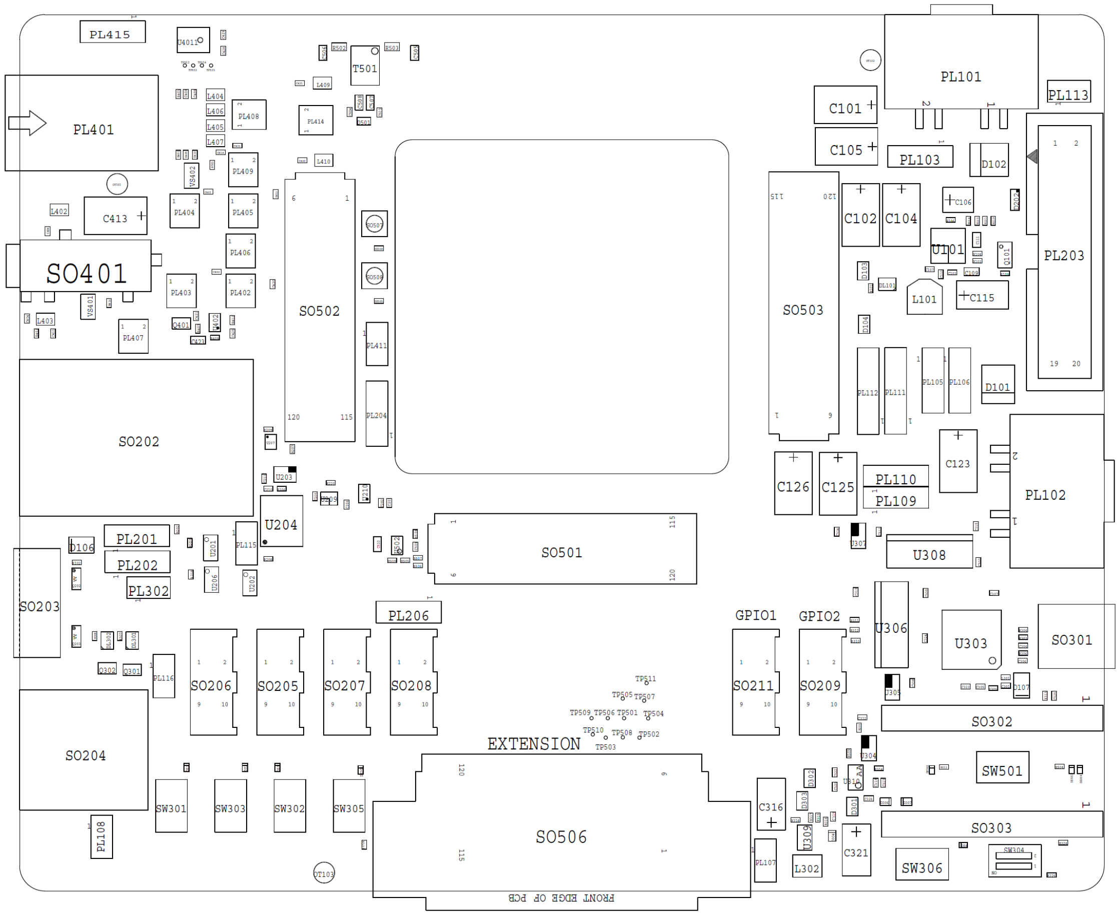
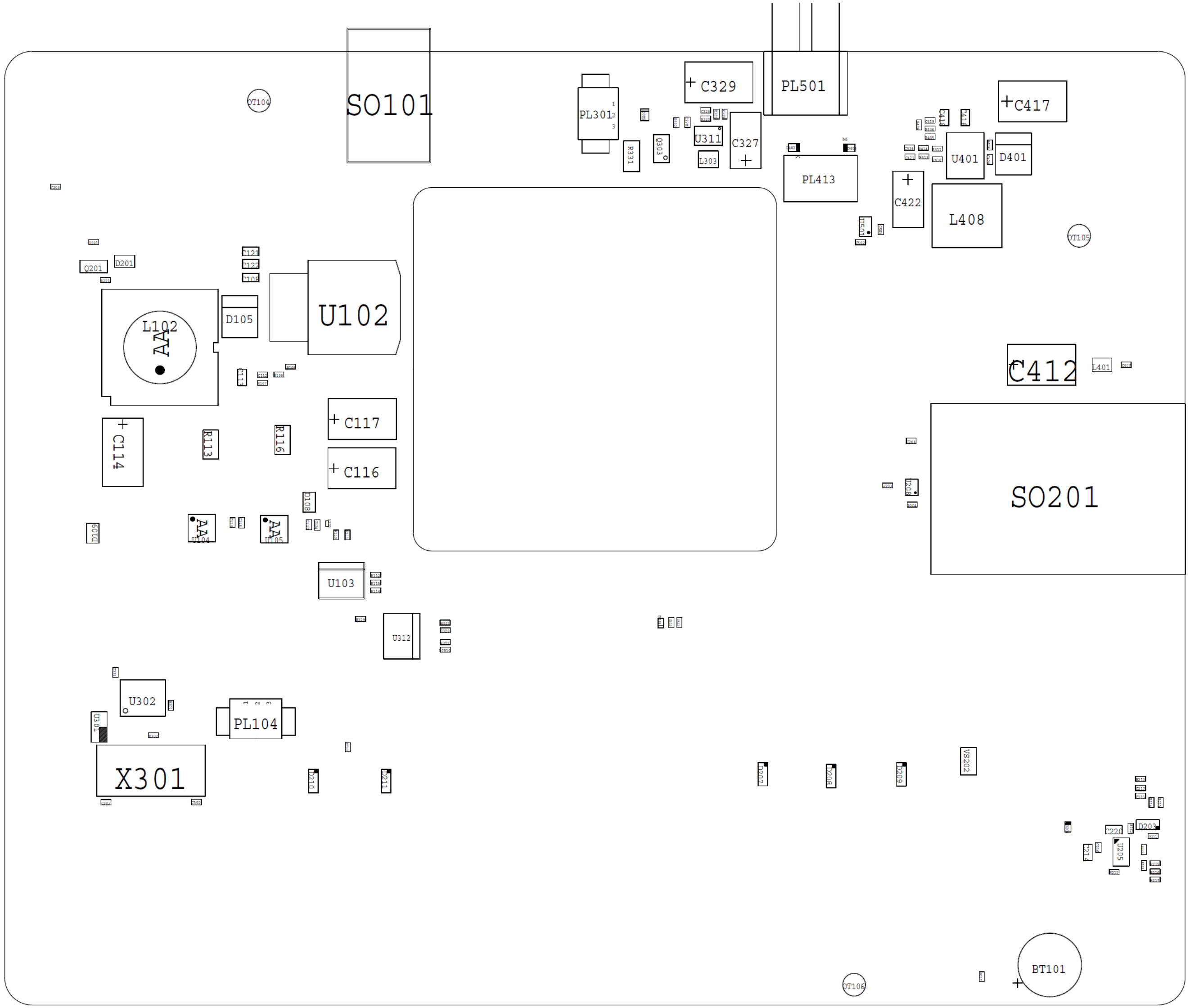
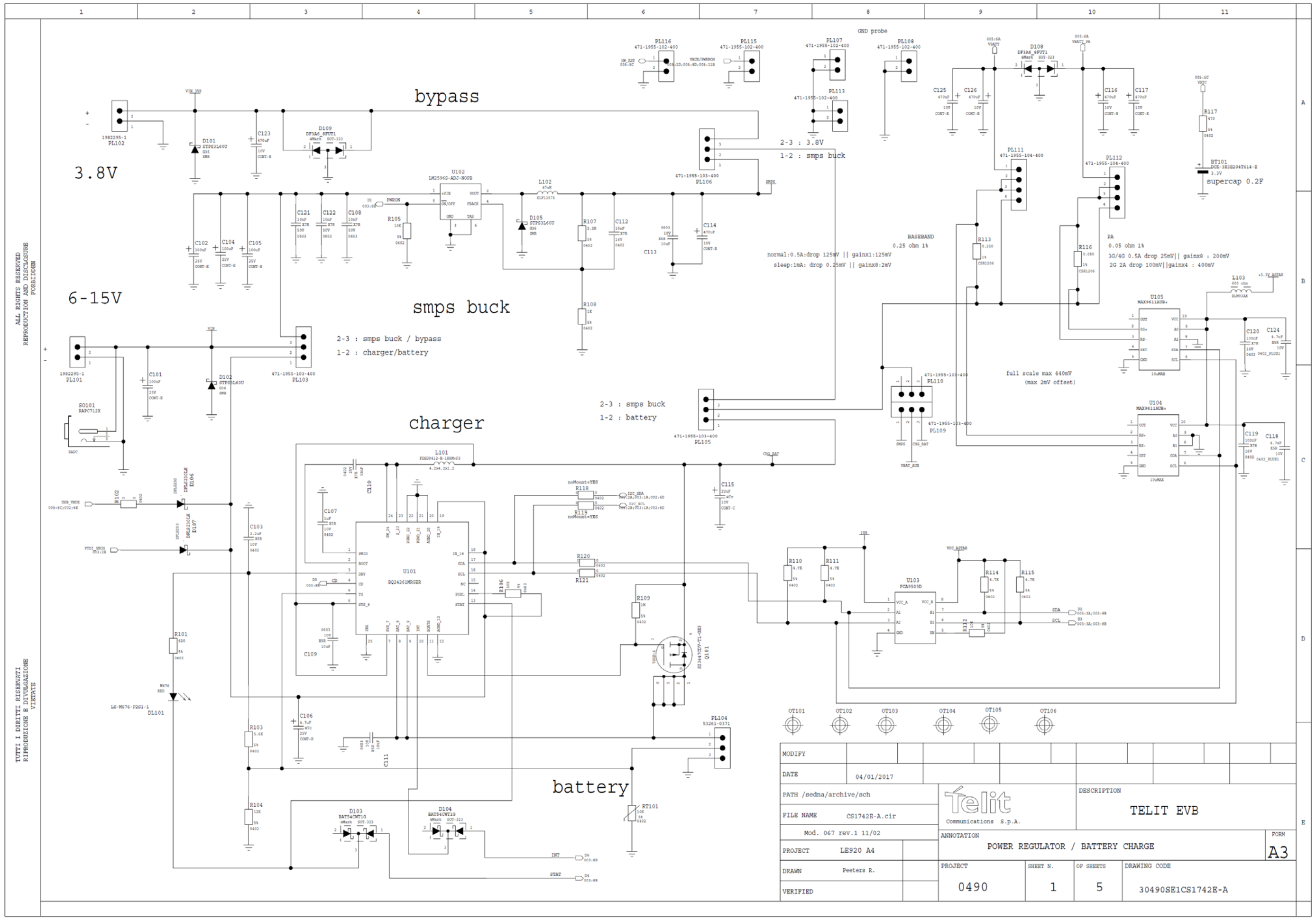


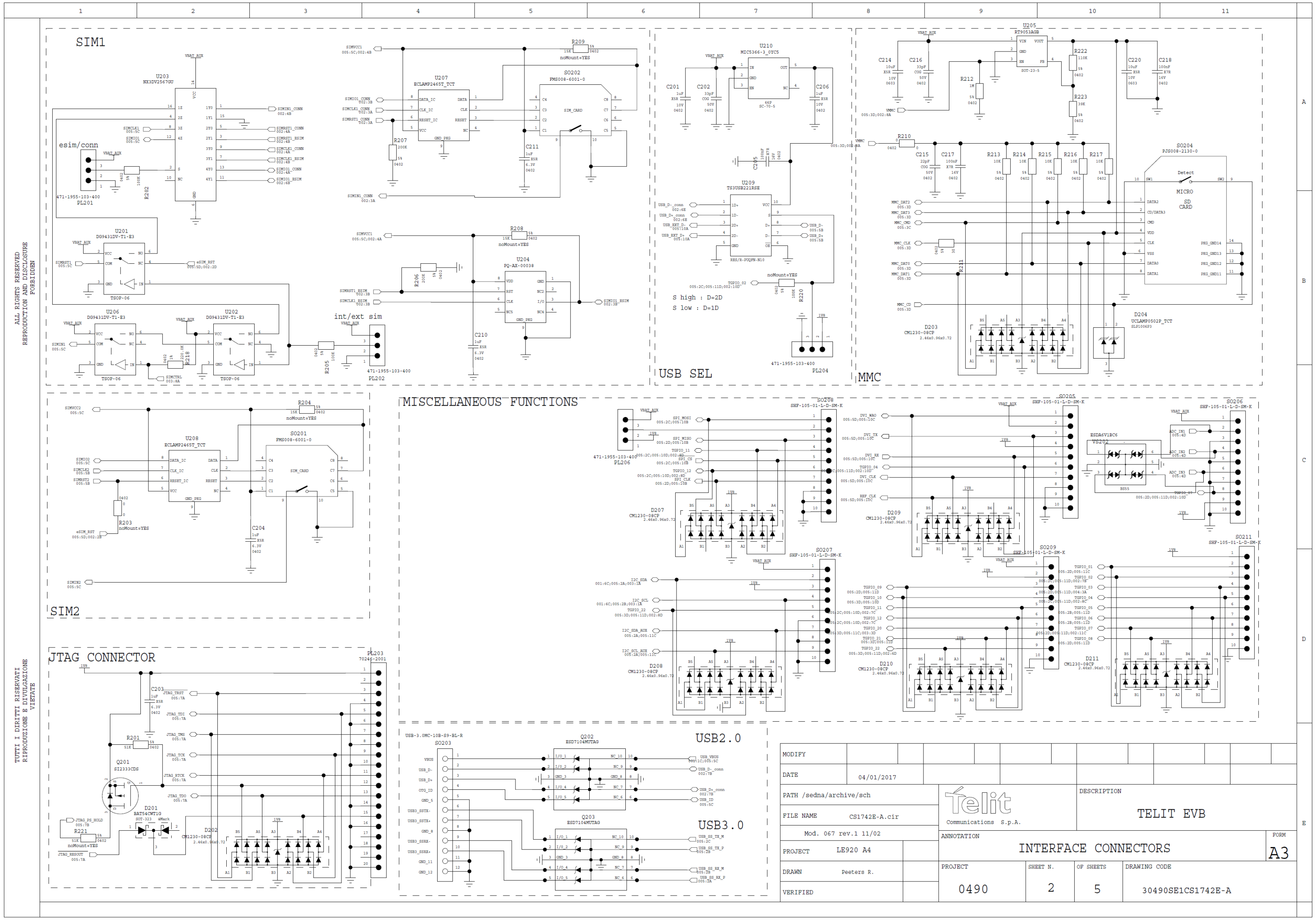
Figure 41: EVB Component Diagram Bottom View



10. Schematics

CS1742E_Schematics.pdf

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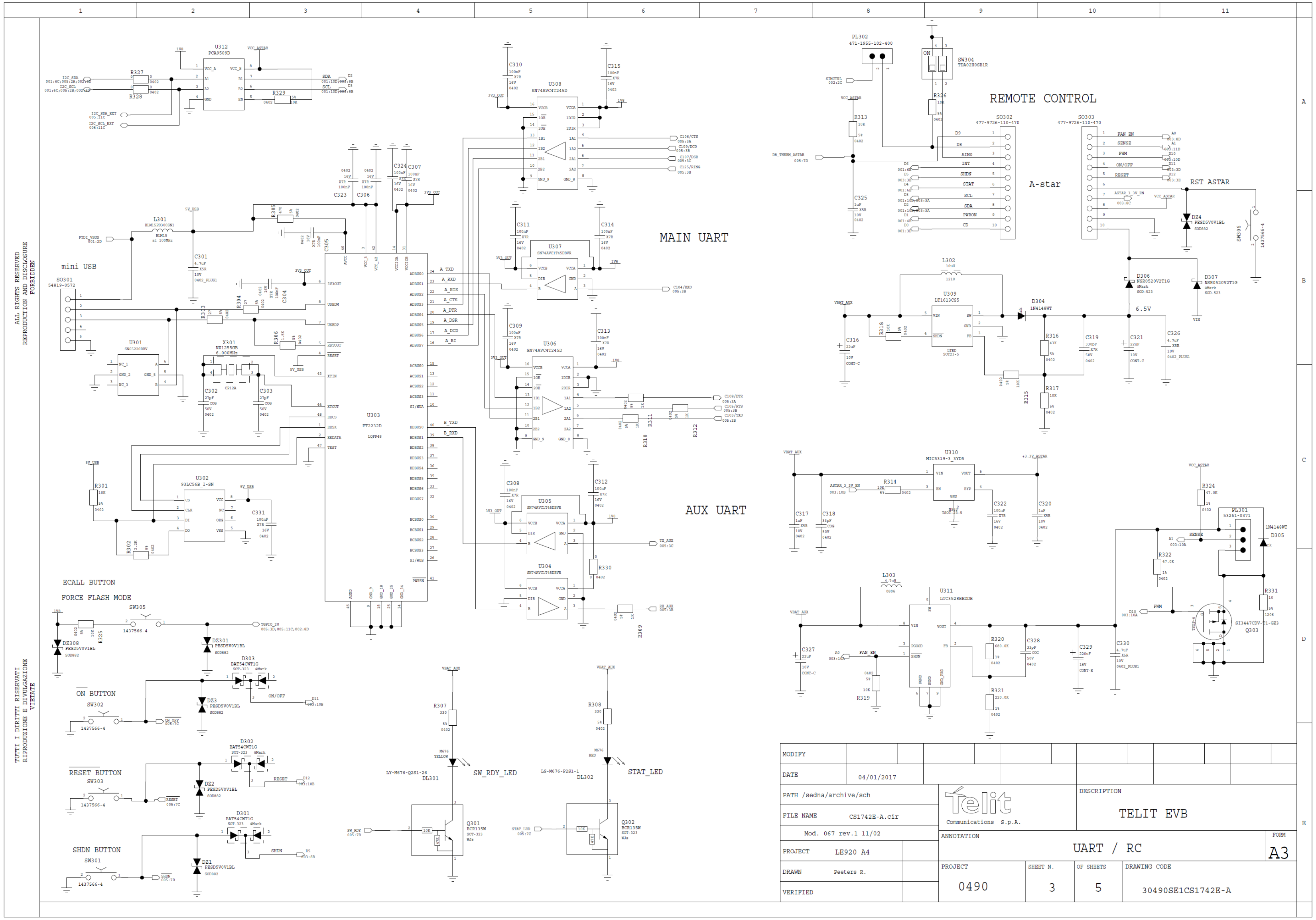
esim/conn
int/ext sim
USB SEL
MMC
S high : D=2D
S low : D=1D
MISCELLANEOUS FUNCTIONS
SIM2
JTAG CONNECTOR
USB2.0
USB3.0
ALL RIGHTS RESERVED REPRODUCTION AND DISCLOSURE FORBIDDEN
TUTTI I DIRITTI RISERVATI RIPRODUZIONE E DIVULGAZIONE VIETATE
MODIFY
DATE 04/01/2017
PATH /sedna/archive/sch
FILE NAME CS1742E-A.cir
Mod. 067 rev.1 11/02
PROJECT LE920 A4
DRAWN Peeters R.
VERIFIED
Telit Communications S.p.A.
DESCRIPTION
TELIT EVB
ANNOTATION
INTERFACE CONNECTORS
FORM A3
PROJECT 0490
SHEET N. 2
OF SHEETS 5
DRAWING CODE 30490SE1CS1742E-A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RST ASTAR
MAIN UART
AUX UART
mini USB
ECALL BUTTON
FORCE FLASH MODE
ON BUTTON
RESET BUTTON
SHDN BUTTON
SW_RDY_LED
STAT_LED
6.5V
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE
MODIFY
DATE 04/01/2017
PATH /sedna/archive/sch
FILE NAME CS1742E-A.cir
Mod. 067 rev.1 11/02
PROJECT LE920 A4
DRAWN Peeters R.
VERIFIED
Telit Communications S.p.A.
DESCRIPTION
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ANNOTATION
UART / RC
FORM
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PROJECT 0490
SHEET N. 3
OF SHEETS 5
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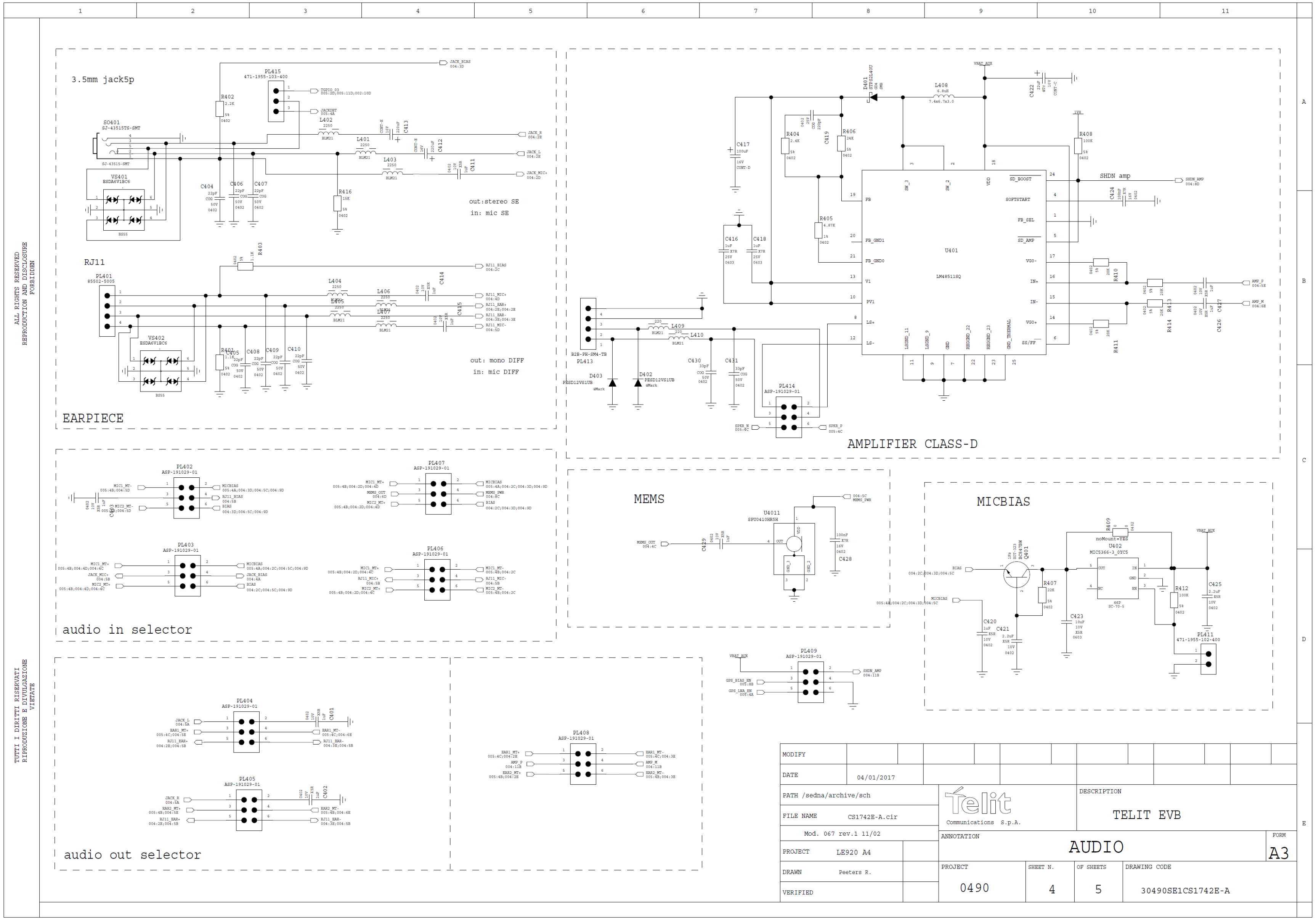
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out:stereo SE
in: mic SE
out: mono DIFF
in: mic DIFF
EARPIECE
AMPLIFIER CLASS-D
SHDN amp
U401
LM48511SQ
MEMS
MICBIAS
audio in selector
audio out selector
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TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE VIETATE
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DATE
04/01/2017
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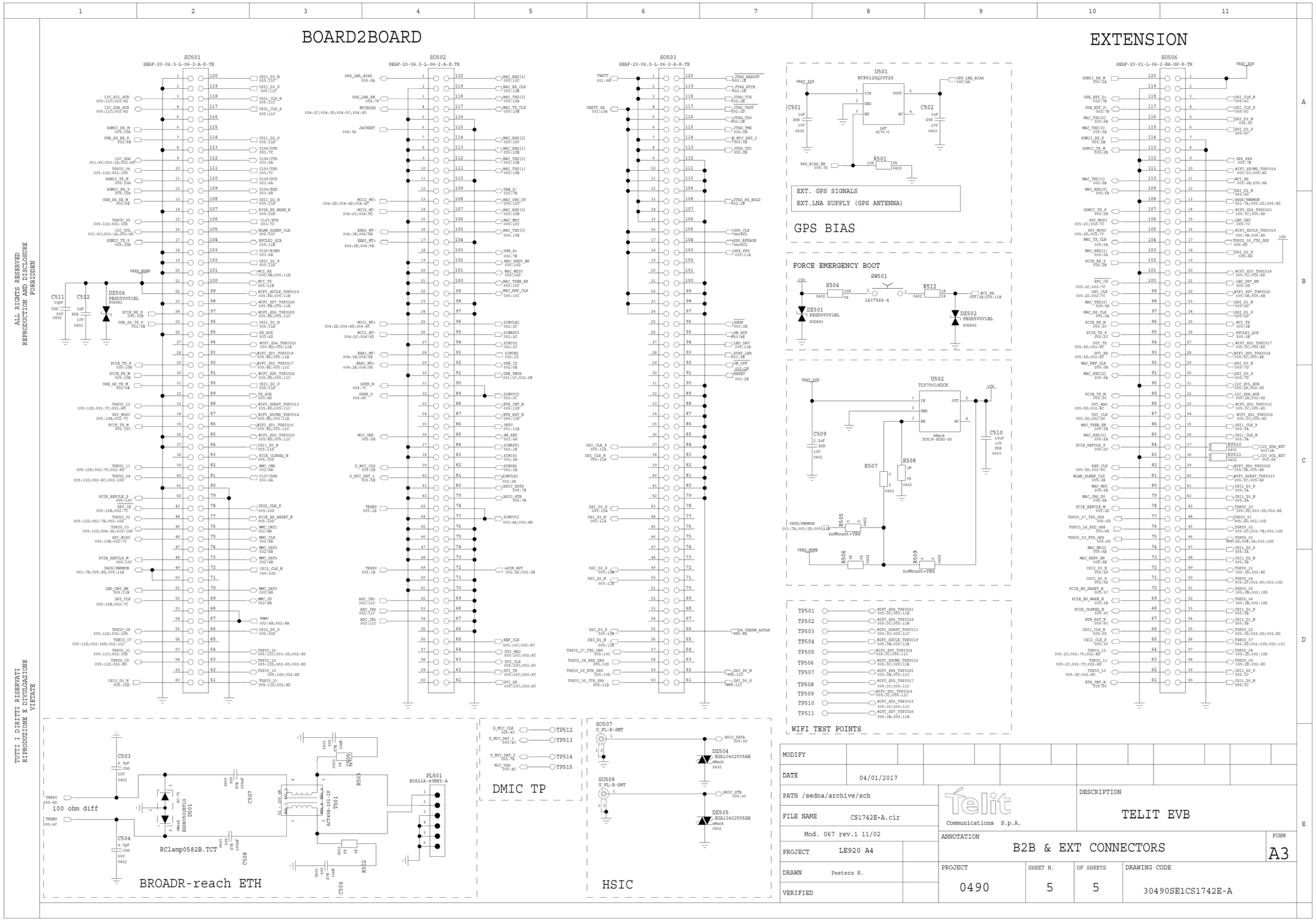
Mod. 067 rev.1 11/02
PROJECT
LE920 A4
DRAWN
Peeters R.
VERIFIED
Telit
Communications S.p.A.
DESCRIPTION
TELIT EVB
ANNOTATION
AUDIO
FORM
A3
PROJECT
0490
SHEET N.
4
OF SHEETS
5
DRAWING CODE
30490SE1CS1742E-A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EXTENSION
GPS BIAS
FORCE EMERGENCY BOOT
WIFI TEST POINTS
BROADR-reach ETH
DMIC TP
HSIC
TELIT EVB
B2B & EXT CONNECTORS
A3
0490
30490SE1CS1742E-A

11. Safety Recommendations

READ CAREFULLY

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

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc.
- Where there is risk of explosion such as gasoline stations, oil refineries, etc.

It is the responsibility of the user to enforce the country regulations and the specific environment regulations.

Do not disassemble the product; any mark of tampering will compromise the warranty validity.

It is recommended following the instructions of the hardware user guides for correct wiring of the product. The product must be supplied with a stabilized voltage source and the wiring conform to the security and fire prevention regulations.

The product must be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. The same caution must be taken for the SIM, checking carefully the instructions for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible for the functioning of the final product; therefore, care must be taken of the external components of the module, as well as of any project or installation issue, because of the risk of disturbing the GSM network or external devices or having any impact on safety. Should there be any doubt, please refer to the technical documentation and the regulations in force.

Every module must be equipped with a proper antenna with the specified characteristics. The antenna must be installed with care in order to avoid any interference with other electronic devices and must be installed with the guarantee of a minimum 20 cm distance from a human body. In case this requirement cannot be satisfied, the system integrator must assess the final product against the SAR regulation.

The European Community provides some Directives for electronic equipment introduced on the market. All the relevant information is 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 equipment is available, while the applicable Directives (Low Voltage and EMC) are available at:

http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm

12. Acronyms

CABC	Content Adaptive Backlight Control
CSI	Camera serial interface
DSI	Display serial interface
EVB	Evaluation Board
GPIO	General-purpose input/output
IFBD	Interface Board
MIPI	Mobile Industry Processor Interface
SD	Secure digital
SIM	Subscriber Identity module
UART	Universal asynchronous receiver transmitter
UMTS	Universal mobile telecommunications system
USB	Universal serial bus
USIF	Universal serial interface
WCDMA	Wideband code division multiple access

13. Document History

Table 21: Document History

Revision	Date	Changes
1.0	2018-01-23	Minor updates related to new board version (CS1742E) Added support for numerous product families Updated to new template
0.9	2016-09-20	Added Class D bypass option Updated jumpers settings
0.8	2016-09-02	Minor edits
0.7	2016-08-24	Added GPS LNA control description Several formatting changes Changed naming convention: from SDK to EVB
0.6	2016-06-06	Fixed typo in Chapter 4 (default jumper setting)
0.5	2016-05-28	Update according to internal review comments
0.4	2016-05-23	Updates for HE922-3GR Updates for a proper generic EVB description
0.3	2016-02-08	Minor edits
0.2	2016-01-02	Minor edits
0.1	2015-12-16	First draft

SUPPORT INQUIRIES

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

www.telit.com

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