

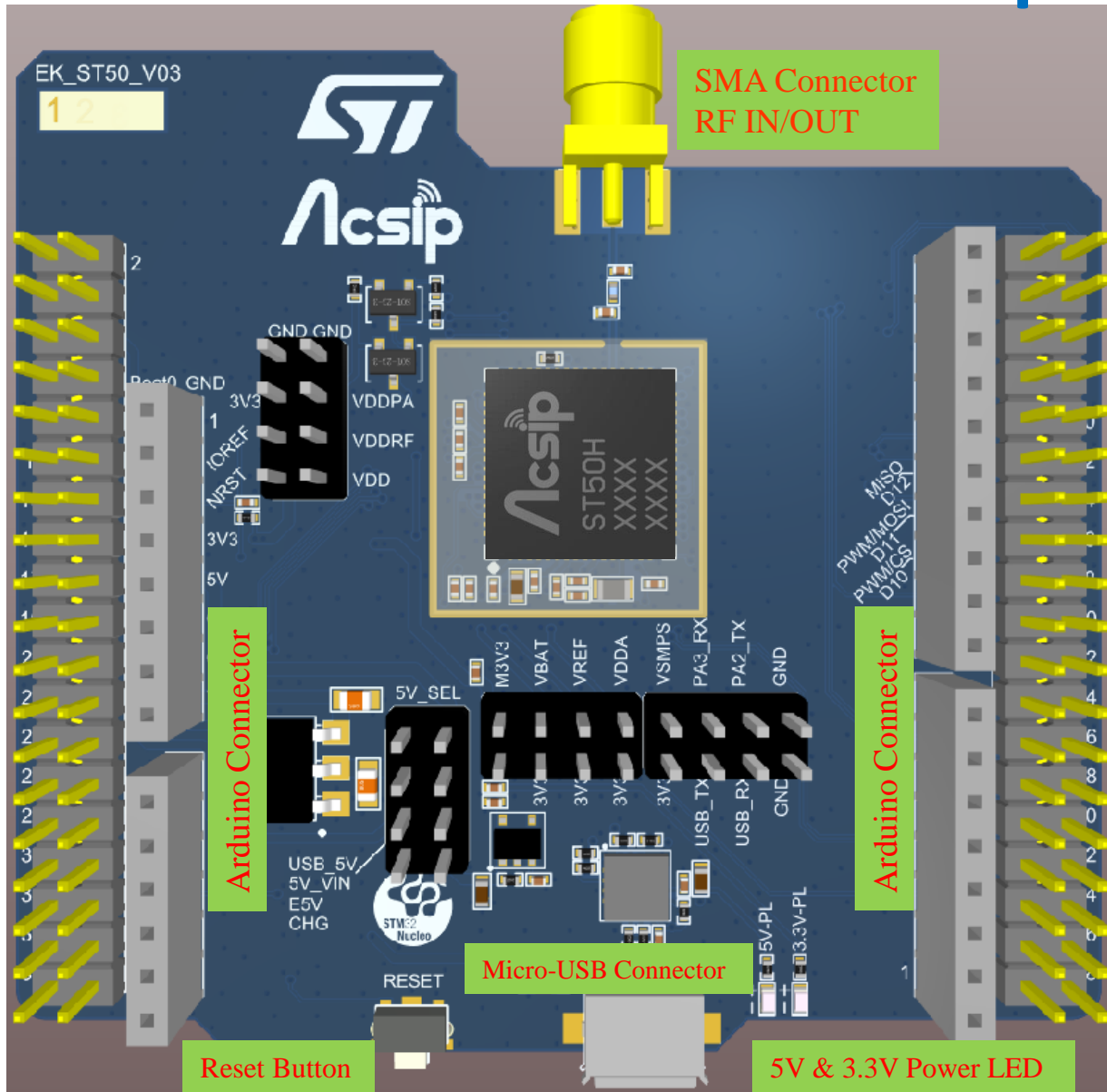
# EK-ST50 User Guide



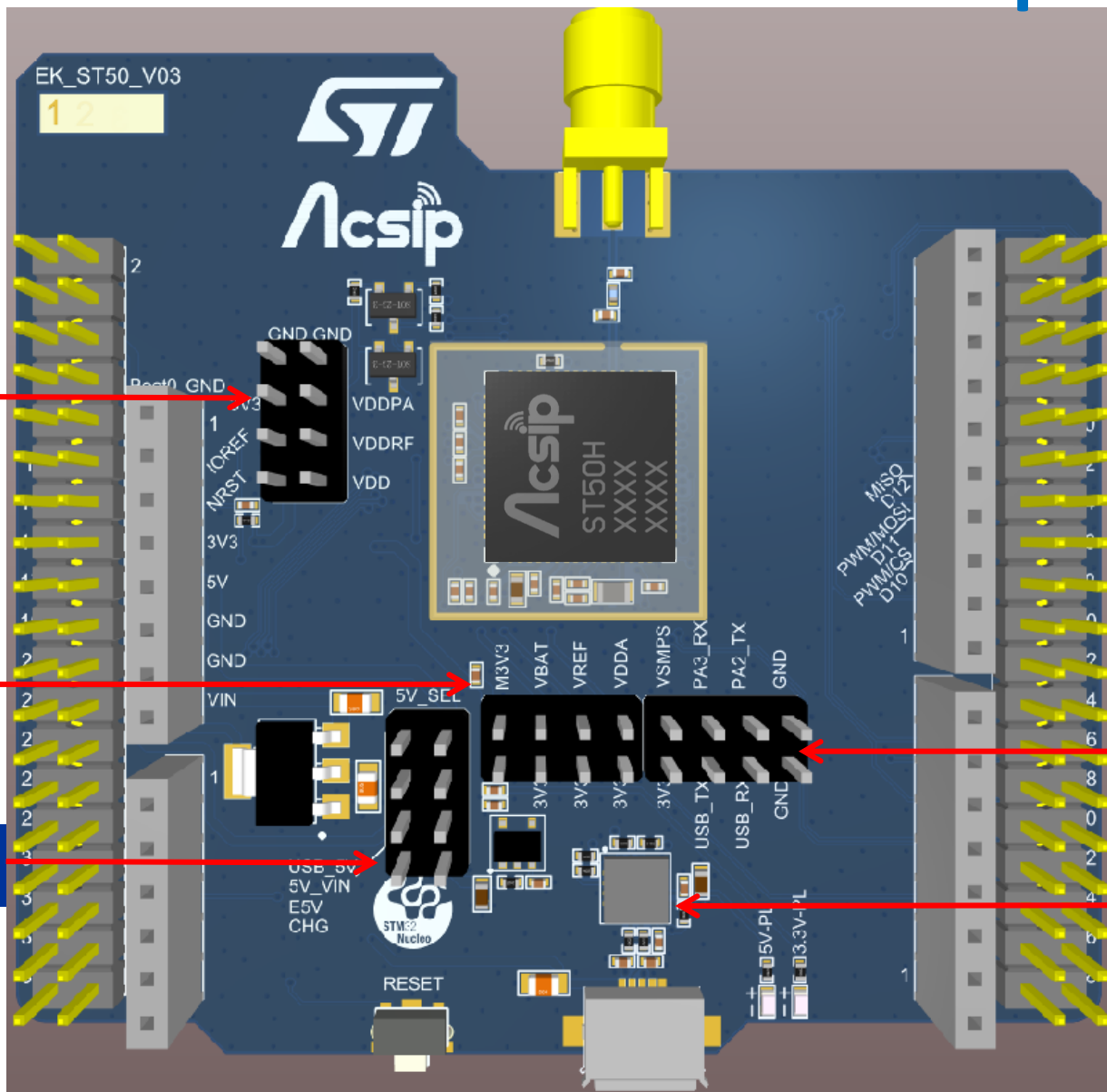
**AcSiP Technology Corp.**

[www.acsip.com.tw](http://www.acsip.com.tw)

# EK-ST50 PCB Connector Description



# EK-ST50 PCB Connector Description



Module's Power Supply Connector

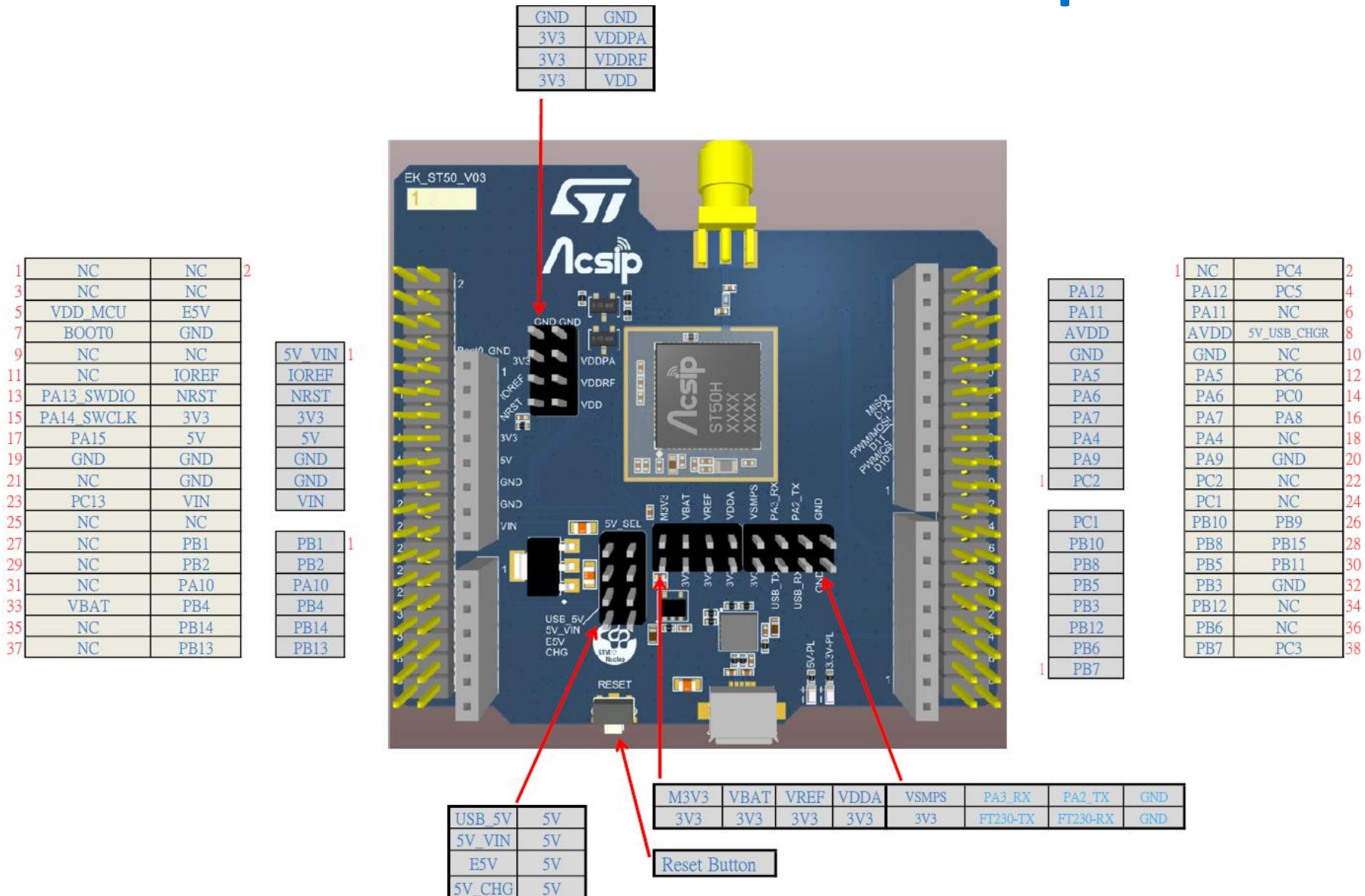
5V Power Input Selection Connector

UART Port Connector

FTDI Chip FT230XQ  
USB to Basic UART

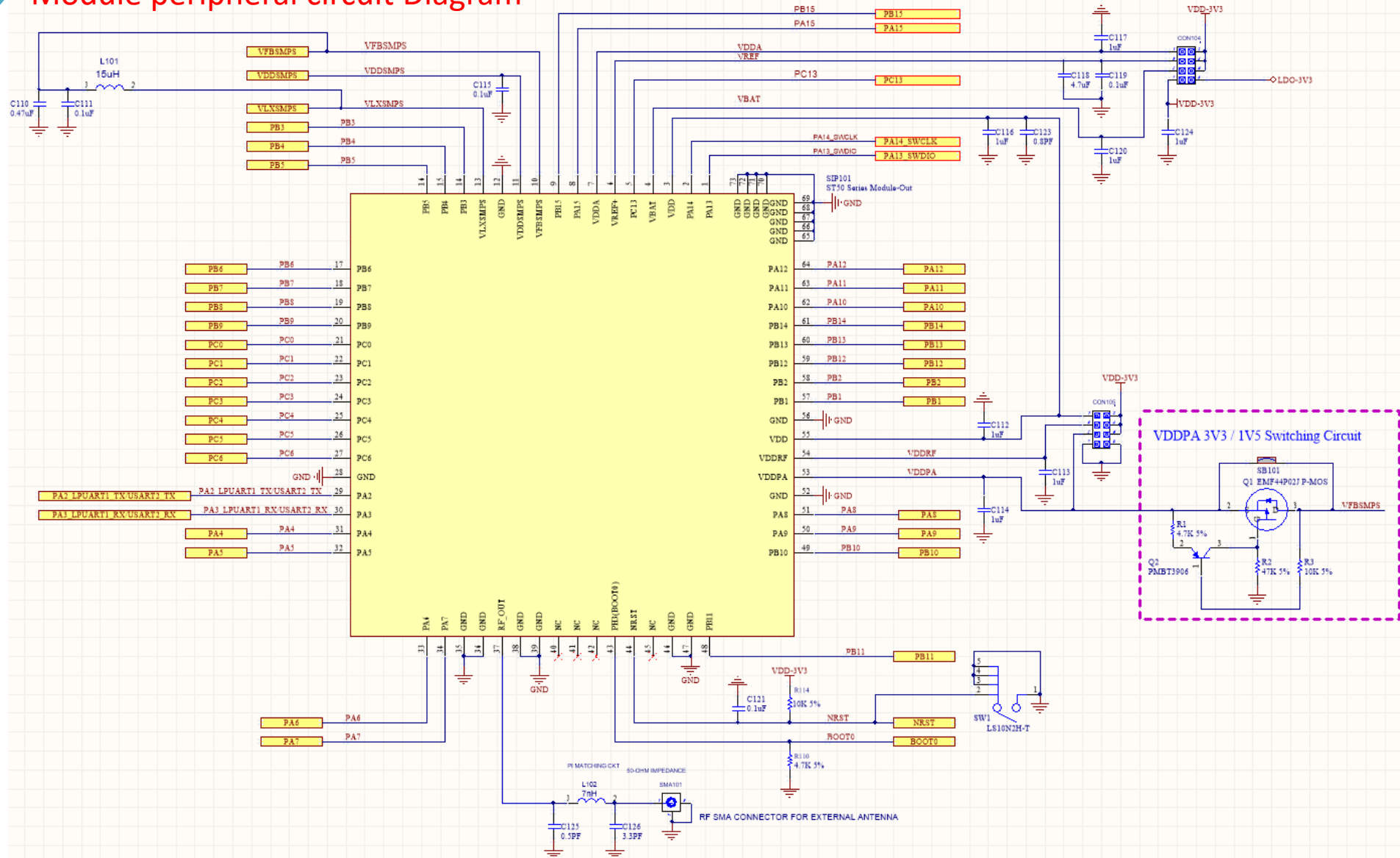
<https://www.ftdichip.com/Products/ICs/FT230X.html>

# EK-ST50 PCB Connector Description



# EK-ST50 Schematic Diagram

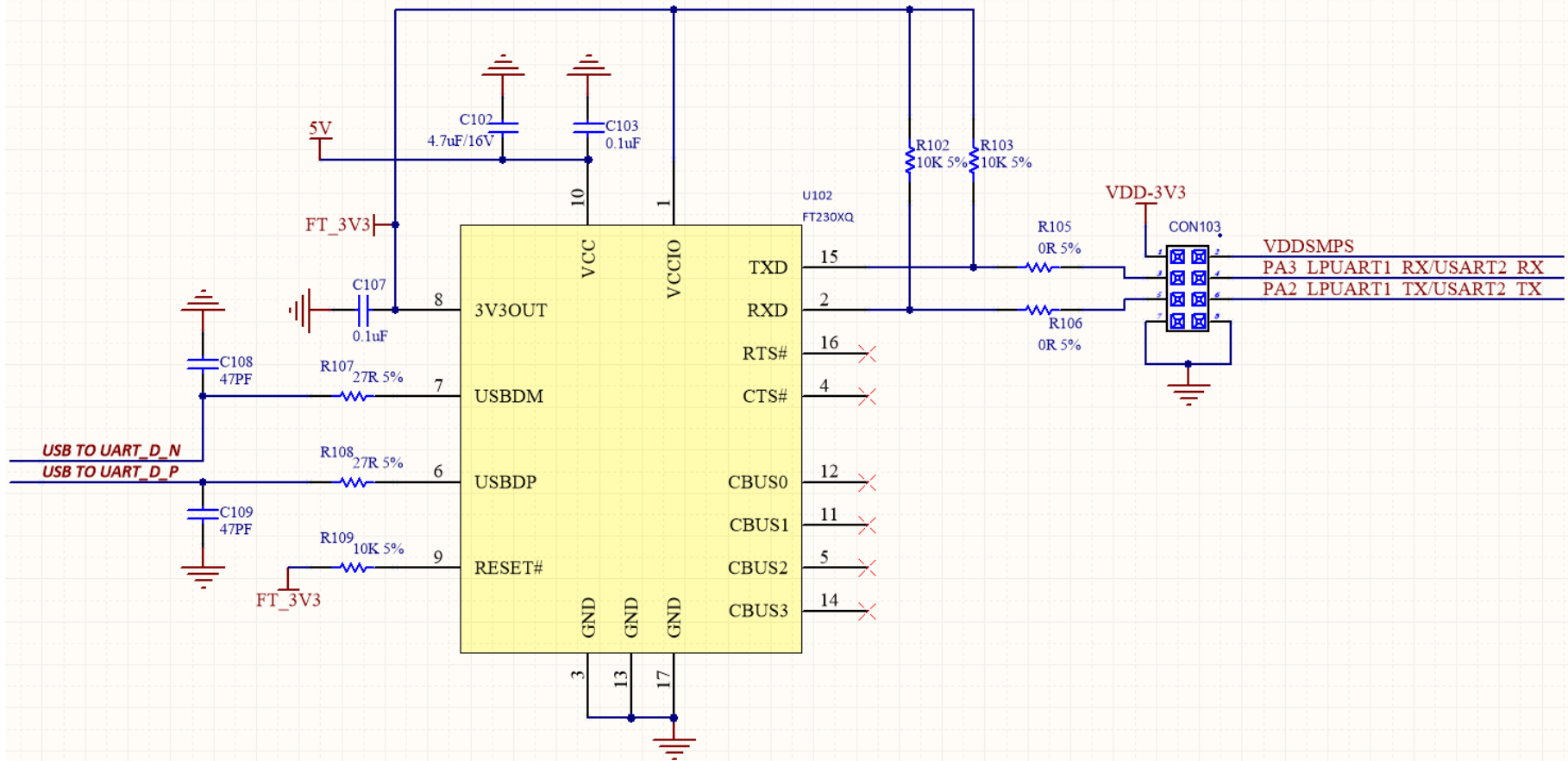
## Module peripheral circuit Diagram



# EK-ST50 Schematic Diagram

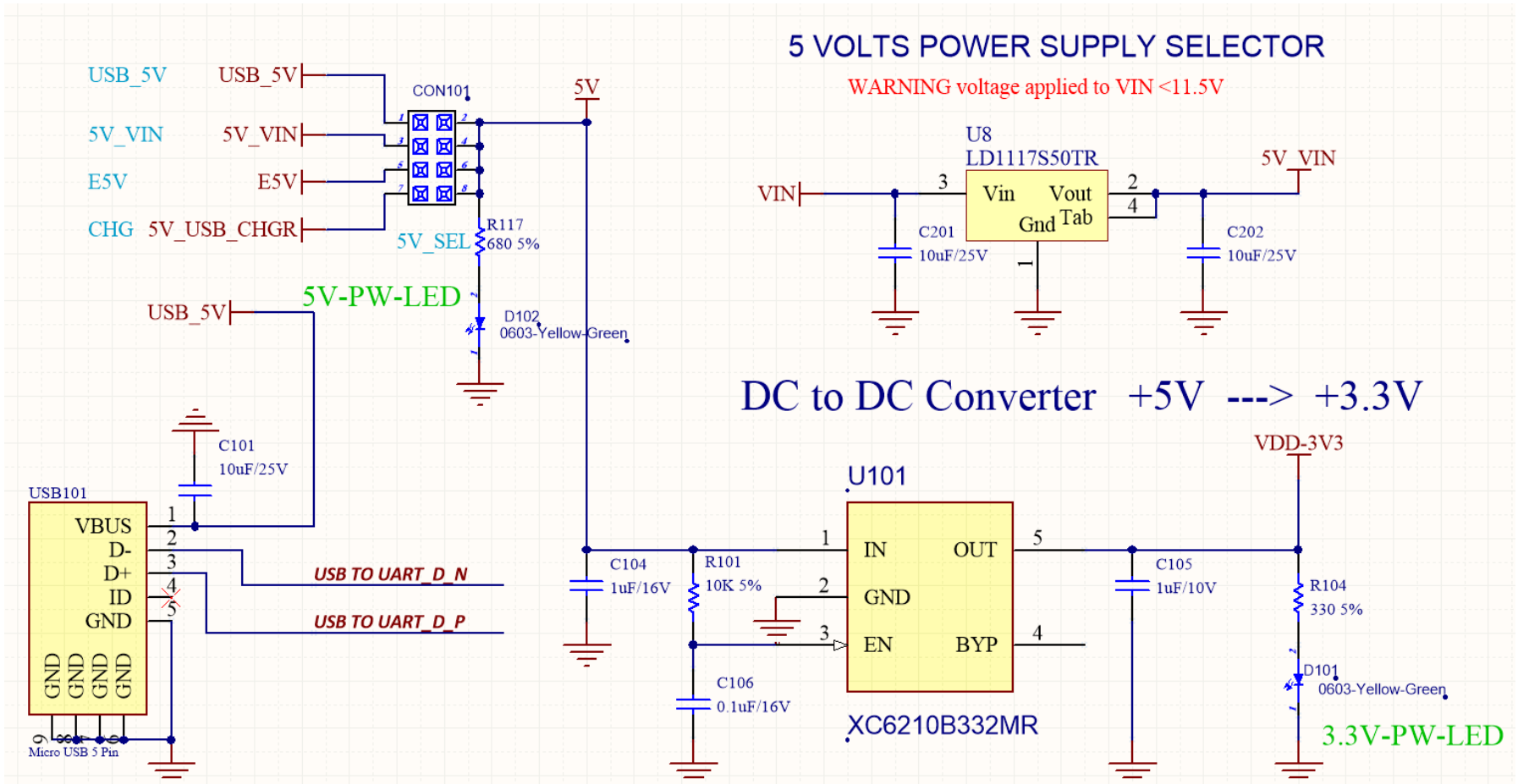
## USB to UART Circuit Diagram

### Uart to USB



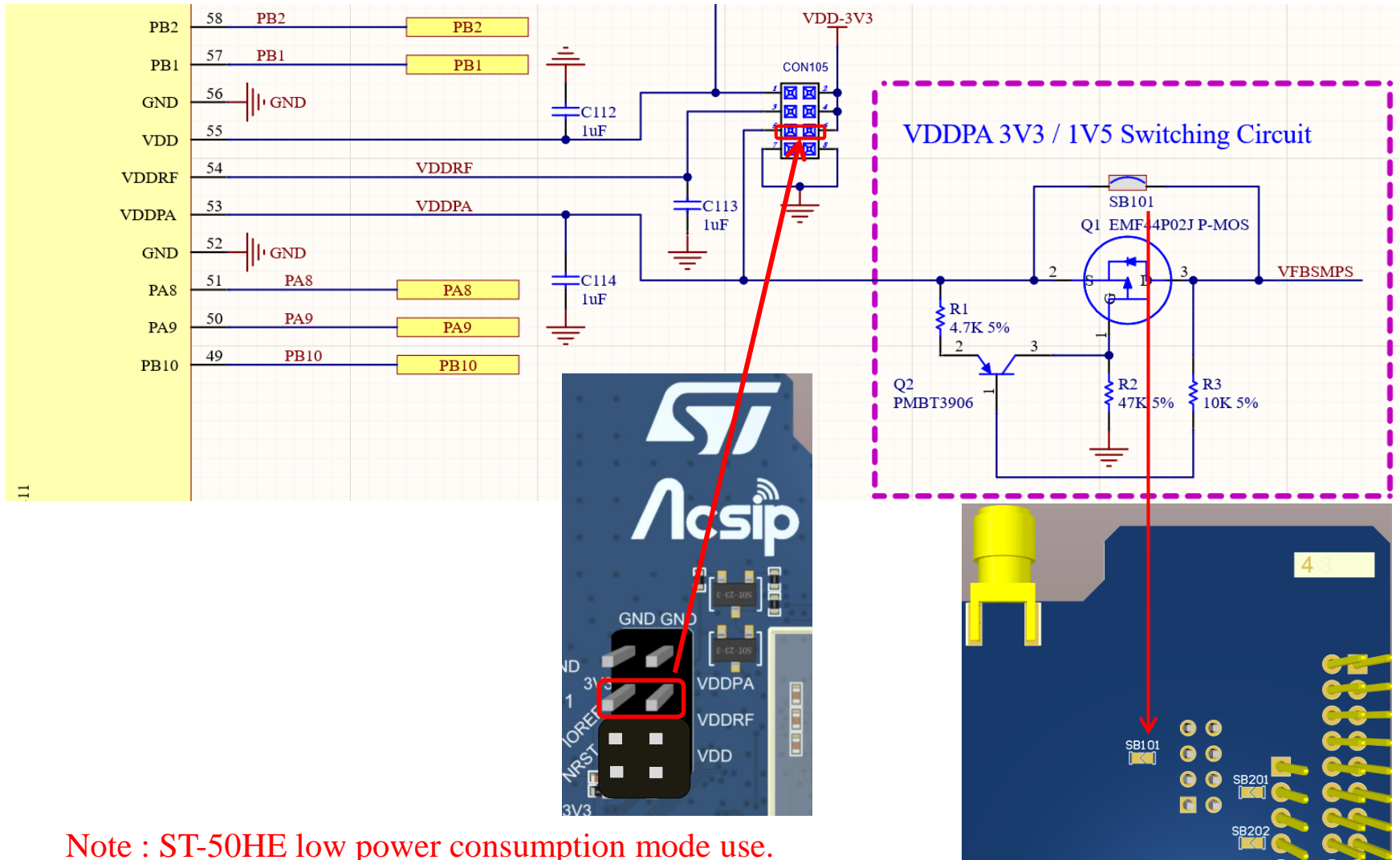
# EK-ST50 Schematic Diagram

## Power Supply Circuit Diagram



# EK-ST50 Schematic Diagram

## VDDPA Switching Circuit Diagram



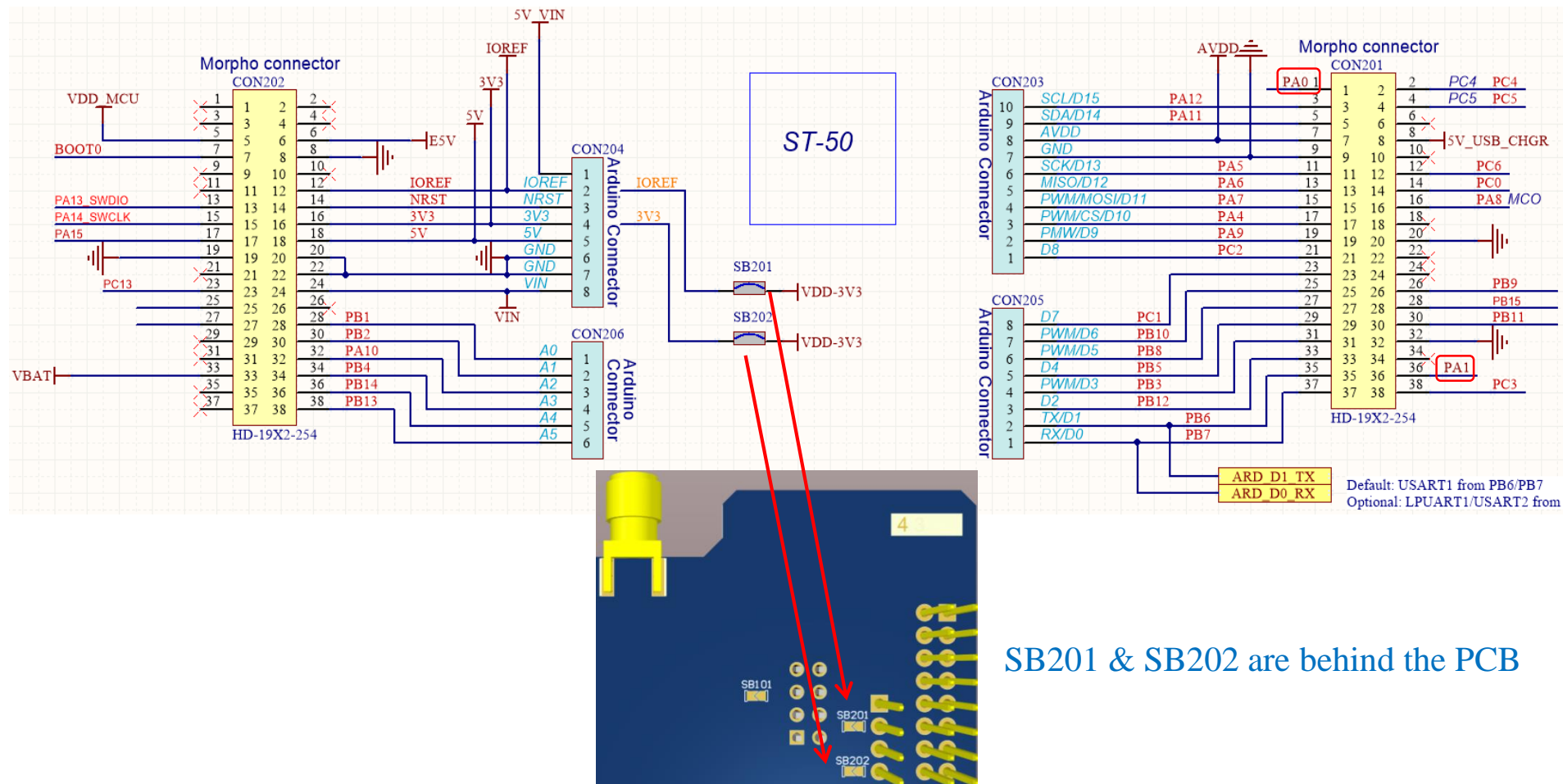
Note : ST-50HE low power consumption mode use.  
(Jumper must be remove )

SB101 is behind the PCB



# EK-ST50 Schematic Diagram

## Pin definition Circuit Diagram

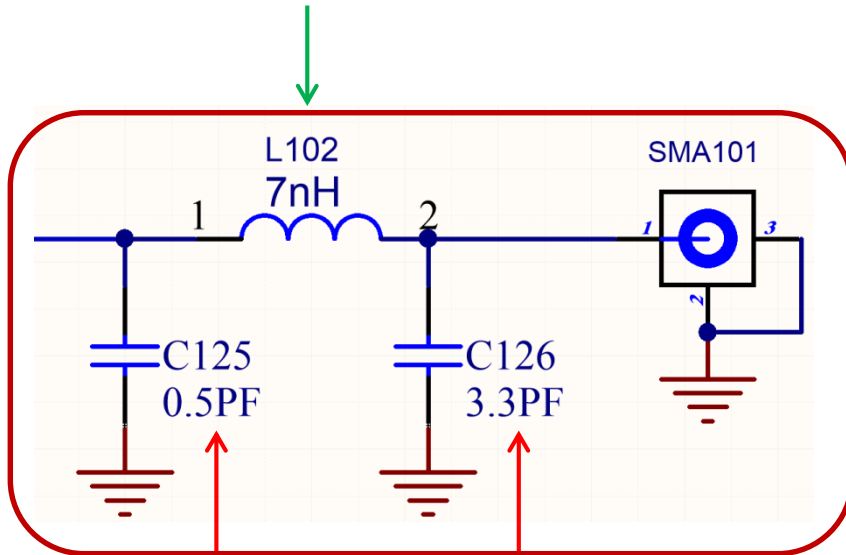


SB201 & SB202 are behind the PCB

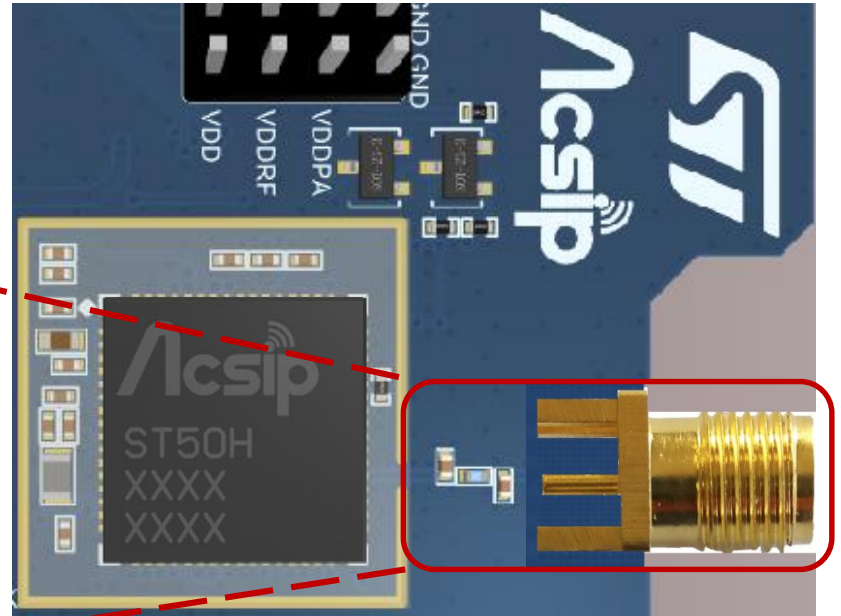
Note : The PA0 and PA1 pins in ST50H have been controlled by Acsip's software , So these two pins on the PCB are NC pins.

# Low-Pass Filter Circuit for EMI Test

Inductor : Murata LQW15AN7N0G00



Capacitor : Murata GRM1555C1HR50BA01D  
GRM1555C1H3R3CA01D



The screwed and glue-fixed antenna to connect on the SMA connector and provided in the blister is Antenna (RFA-08-C58-U-B70) from ARISTOTLE company. This antenna have been used for the FCC/CE certifications. This antenna must be used as a reference antenna for radiation test on EK-ST50 board.

# Antenna Specifications

**ARISTOTLE**  
ENTERPRISES INC.

Specifications

## RFA-08-C58-U-B70

### Specifications

Frequency range	902~915 MHz
Peak gain	0.97dBi
Average gain	0.8dBi
VSWR	2.5 : 1 Max.
Polarization	Linear, vertical
Impedance	50 $\Omega$
Connector	SMA PLUG

### Environment & Mechanical Characteristics

Temperature	- 10°C to +55°C
Humidity	95% @ 25°C



# Professional Installation Instruction

## 1. Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

## 2. Installation location

The product shall be installed at a location where the radiating antenna can be kept 20cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

## 3. External antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

## 4. Installation procedure

Please refer to user's manual for the detail.

## 5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.

# Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on,

the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter

## **Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

**This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:**

**KDB 996369 D03 OEM Manual v01 rule sections:**

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15.

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body.

If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna Type	Dipole
Antenna connector	SMA

## 2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2ADWC-EK-ST50H”.

The grantee's FCC ID can be used only when all FCC compliance requirements are met.

## 2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

## 2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

## **Manual Information To the End User**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

## **OEM/Host manufacturer responsibilities**

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module.

The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market.

This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules.

This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.