

EK-ST50 User Guide

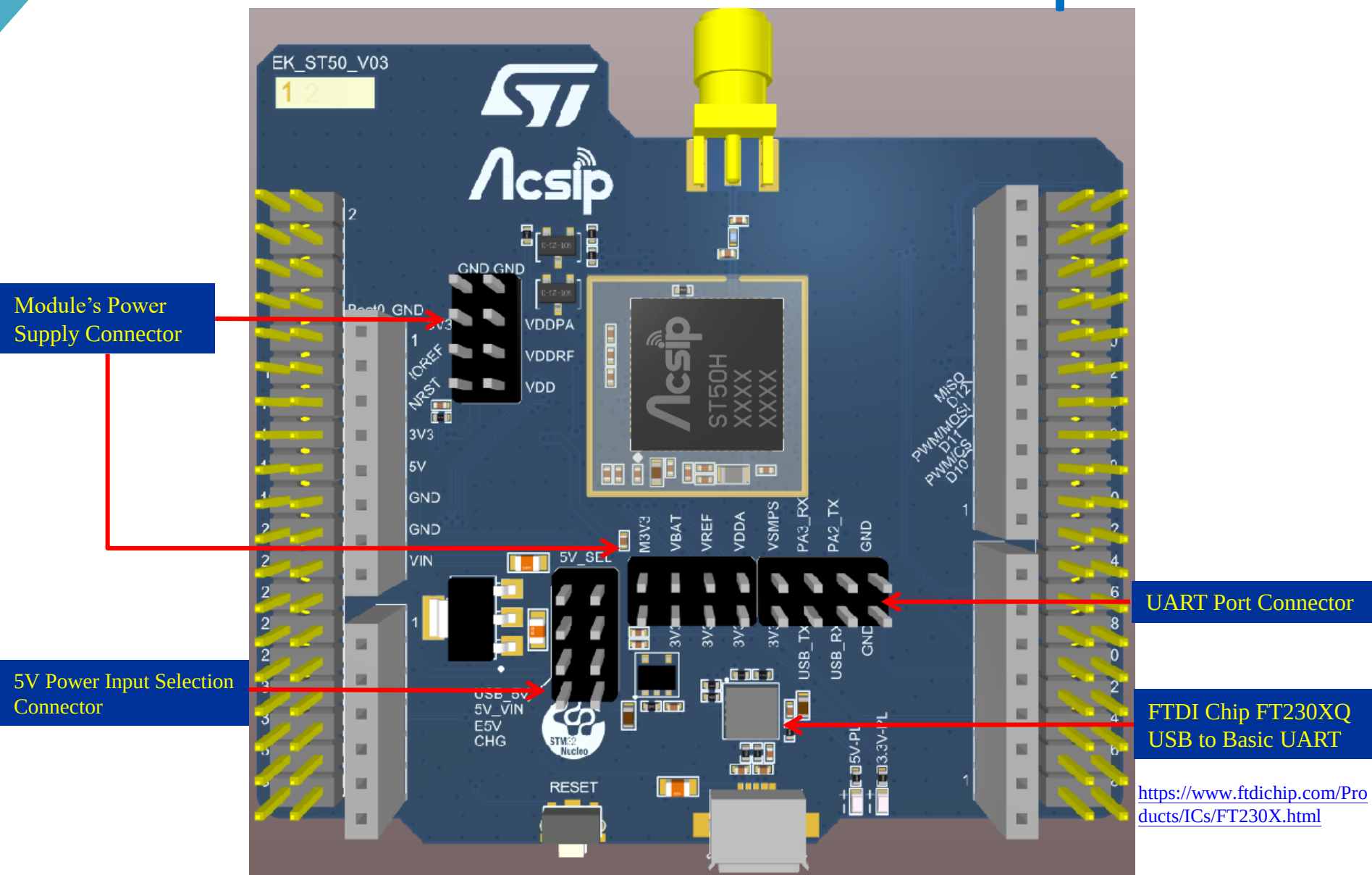


AcSiP Technology Corp.

www.acsip.com.tw



EK-ST50 PCB Connector Description

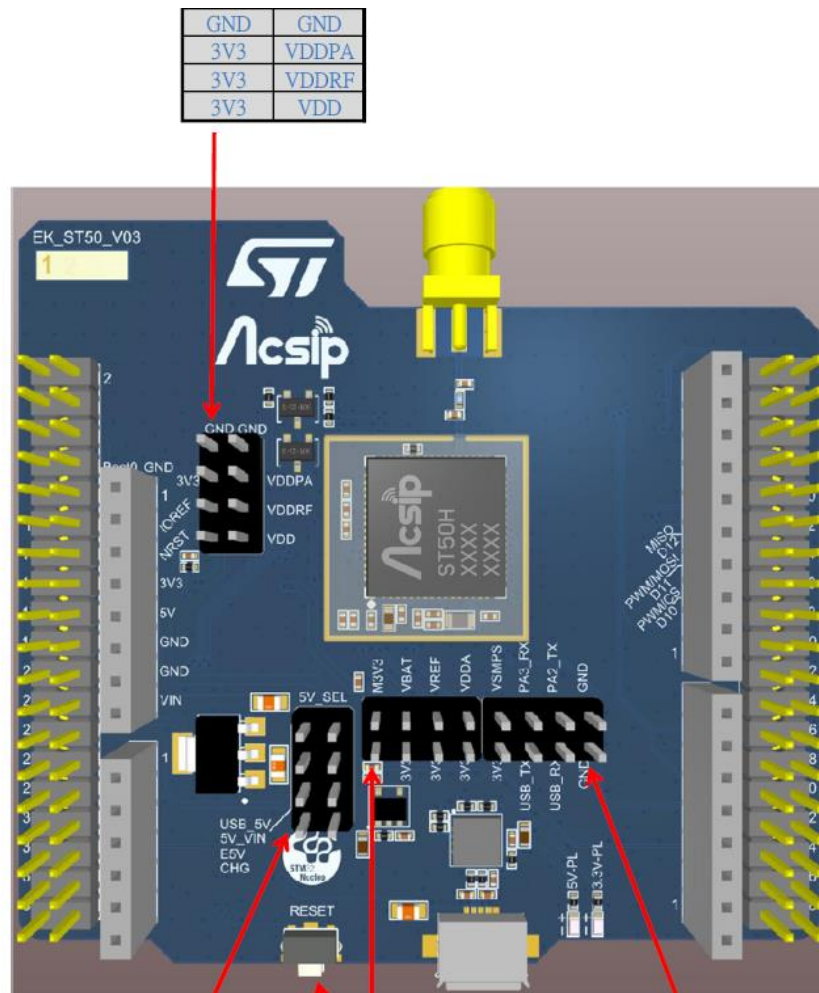


EK-ST50 PCB Connector Description

1	NC	NC	2
3	NC	NC	
5	VDD_MCU	E5V	
7	BOOT0	GND	
9	NC	NC	
11	NC	IOREF	
13	PA13_SWDIO	NRST	
15	PA14_SWCLK	3V3	
17	PA15	5V	
19	GND	GND	
21	NC	GND	
23	PC13	VIN	
25	NC	NC	
27	NC	PB1	
29	NC	PB2	
31	NC	PA10	
33	VBAT	PB4	
35	NC	PB14	
37	NC	PB13	

5V_VIN	1
IOREF	
NRST	
3V3	
5V	
GND	
GND	
VIN	

PB1	1
PB2	
PA10	
PB4	
PB14	
PB13	



GND	GND
3V3	VDDPA
3V3	VDDRF
3V3	VDD

PA12	
PA11	
AVDD	
GND	
PA5	
PA6	
PA7	
PA4	
PA9	
PC2	

1	NC	PC4	2
	PA12	PC5	4
	PA11	NC	6
	AVDD	5V_USB_CHGR	8
	GND	NC	10
	PA5	PC6	12
	PA6	PC0	14
	PA7	PA8	16
	PA4	NC	18
	PA9	GND	20
	PC2	NC	22
	PC1	NC	24
	PB10	PB9	26
	PB8	PB15	28
	PB5	PB11	30
	PB3	GND	32
	PB12	NC	34
	PB6	NC	36
	PB7	PC3	38

PC1	
PB10	
PB8	
PB5	
PB3	
PB12	
PB6	
PB7	

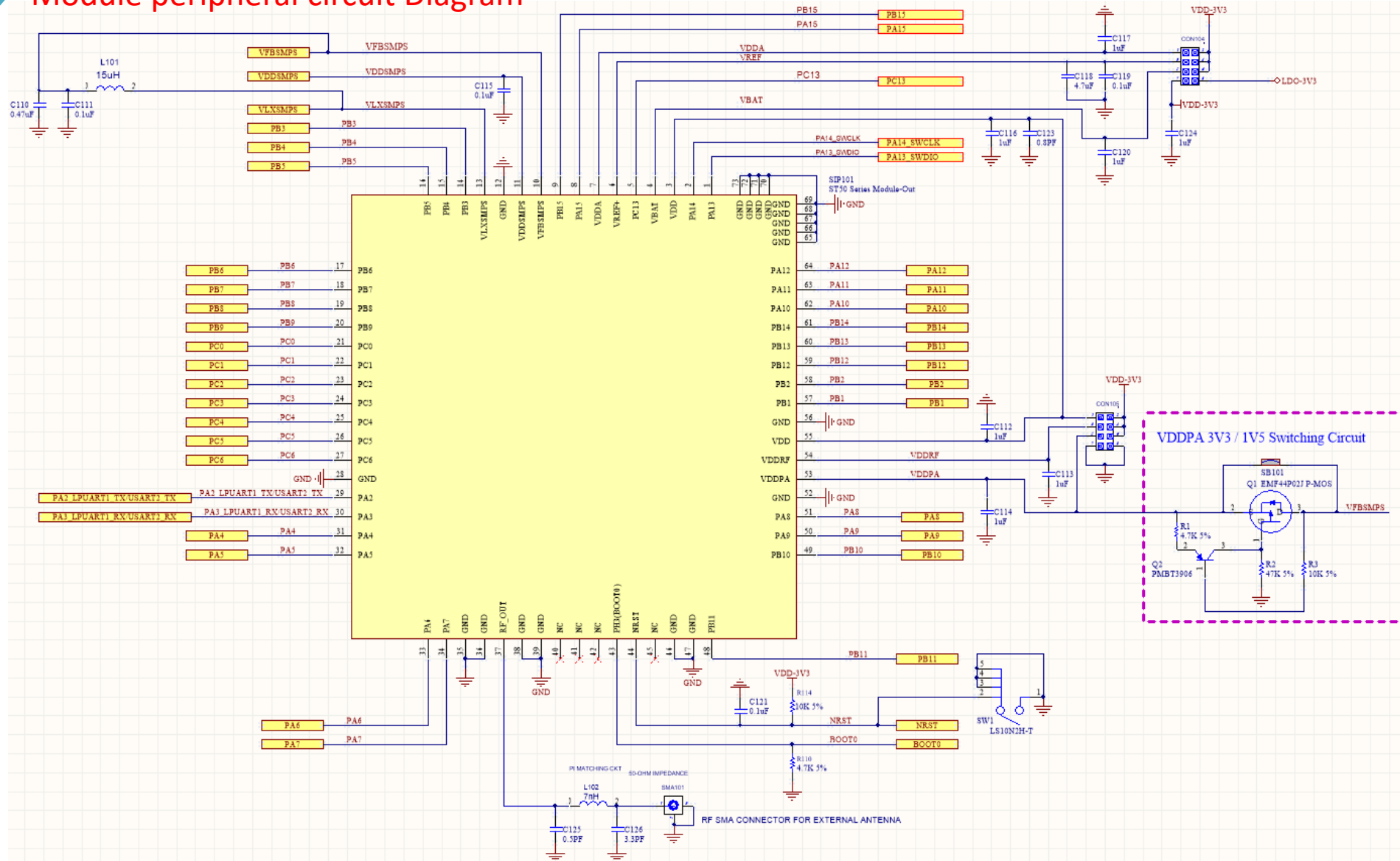
USB_5V	5V
5V_VIN	5V
E5V	5V
5V_CHG	5V

M3V3	VBAT	VREF	VDDA	VSMPS	PA3_RX	PA2_TX	GND
3V3	3V3	3V3	3V3	3V3	FT230-TX	FT230-RX	GND

Reset Button

EK-ST50 Schematic Diagram

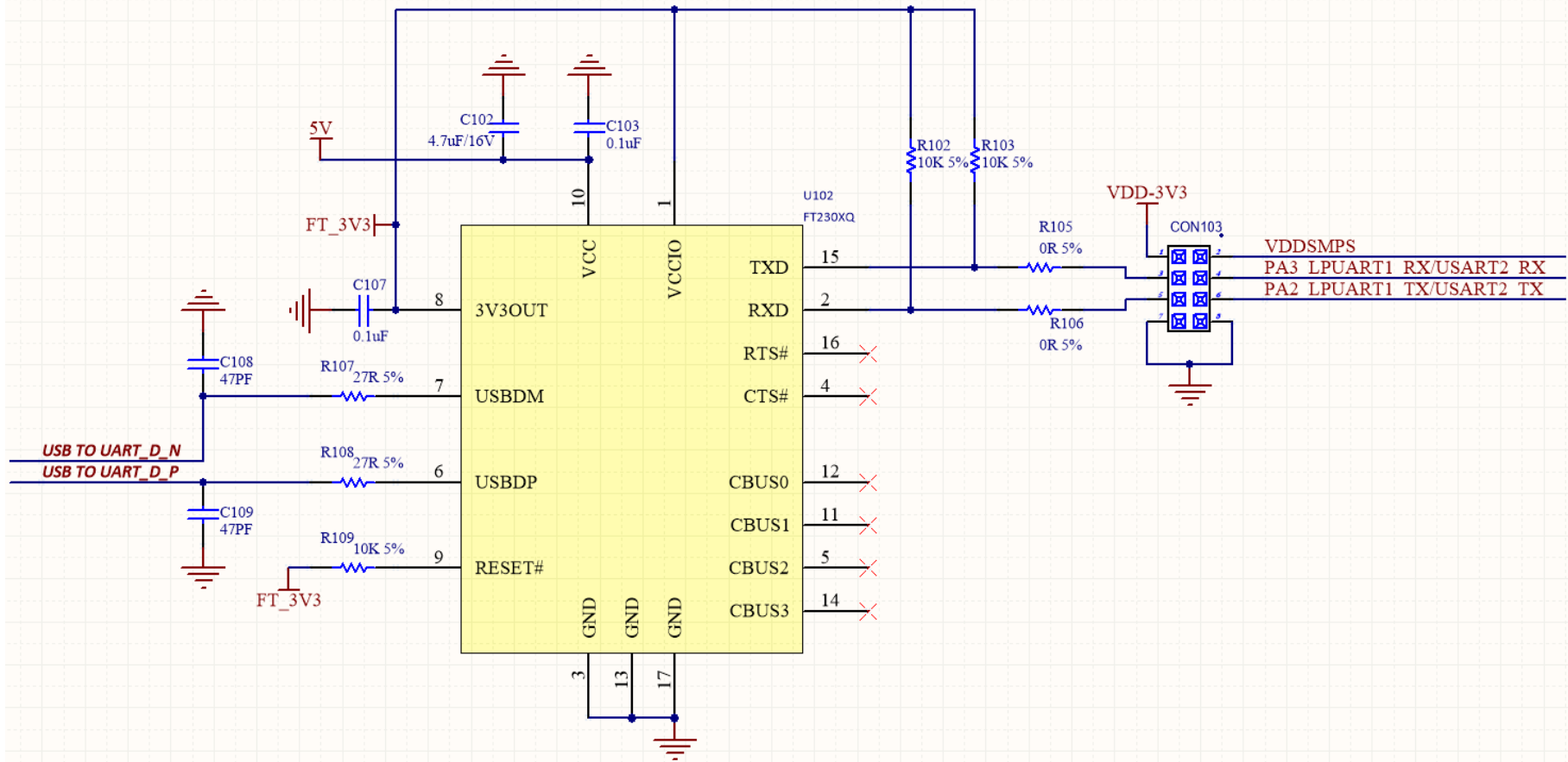
Module peripheral circuit Diagram



EK-ST50 Schematic Diagram

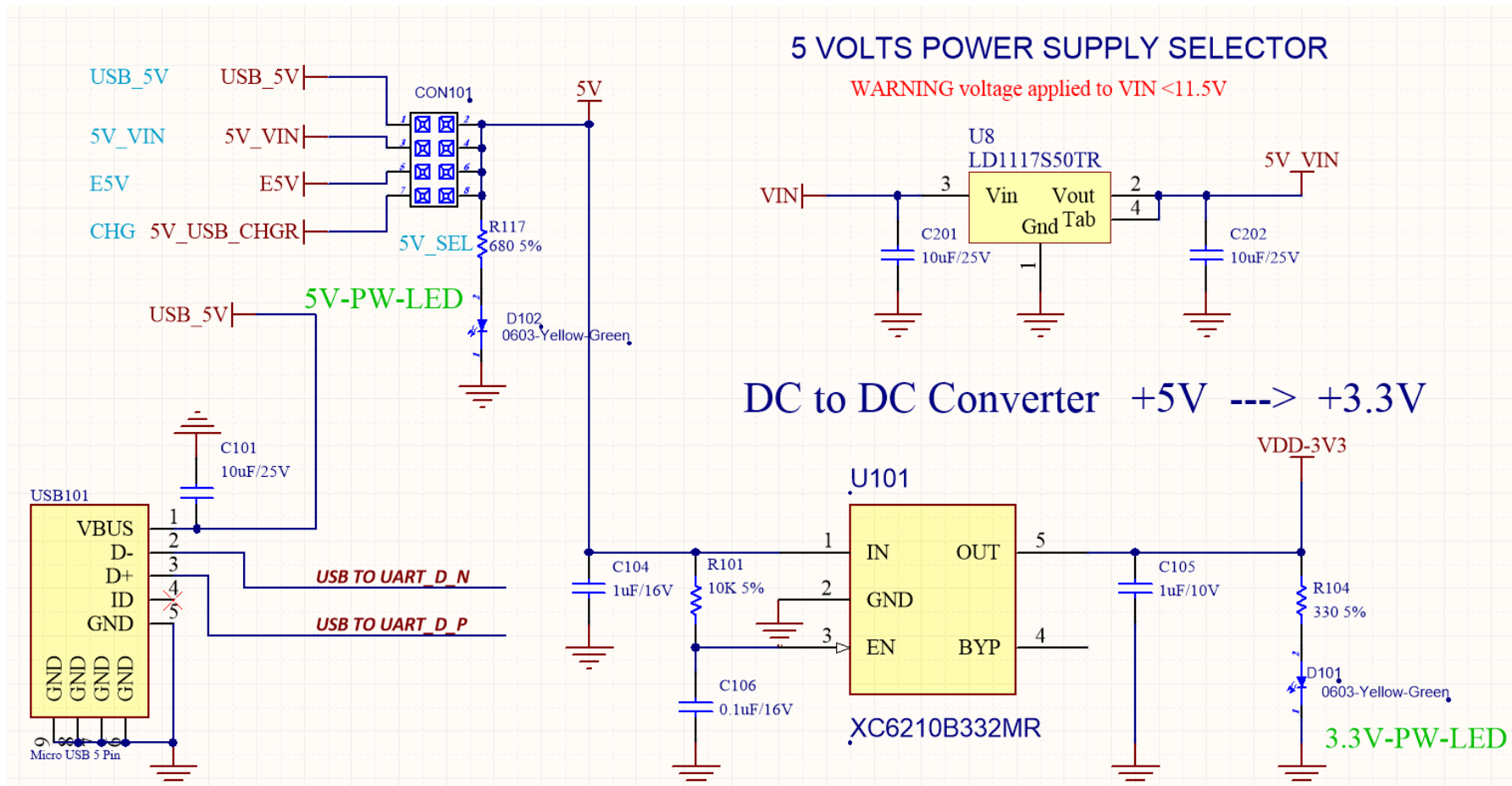
USB to UART Circuit Diagram

Uart to USB



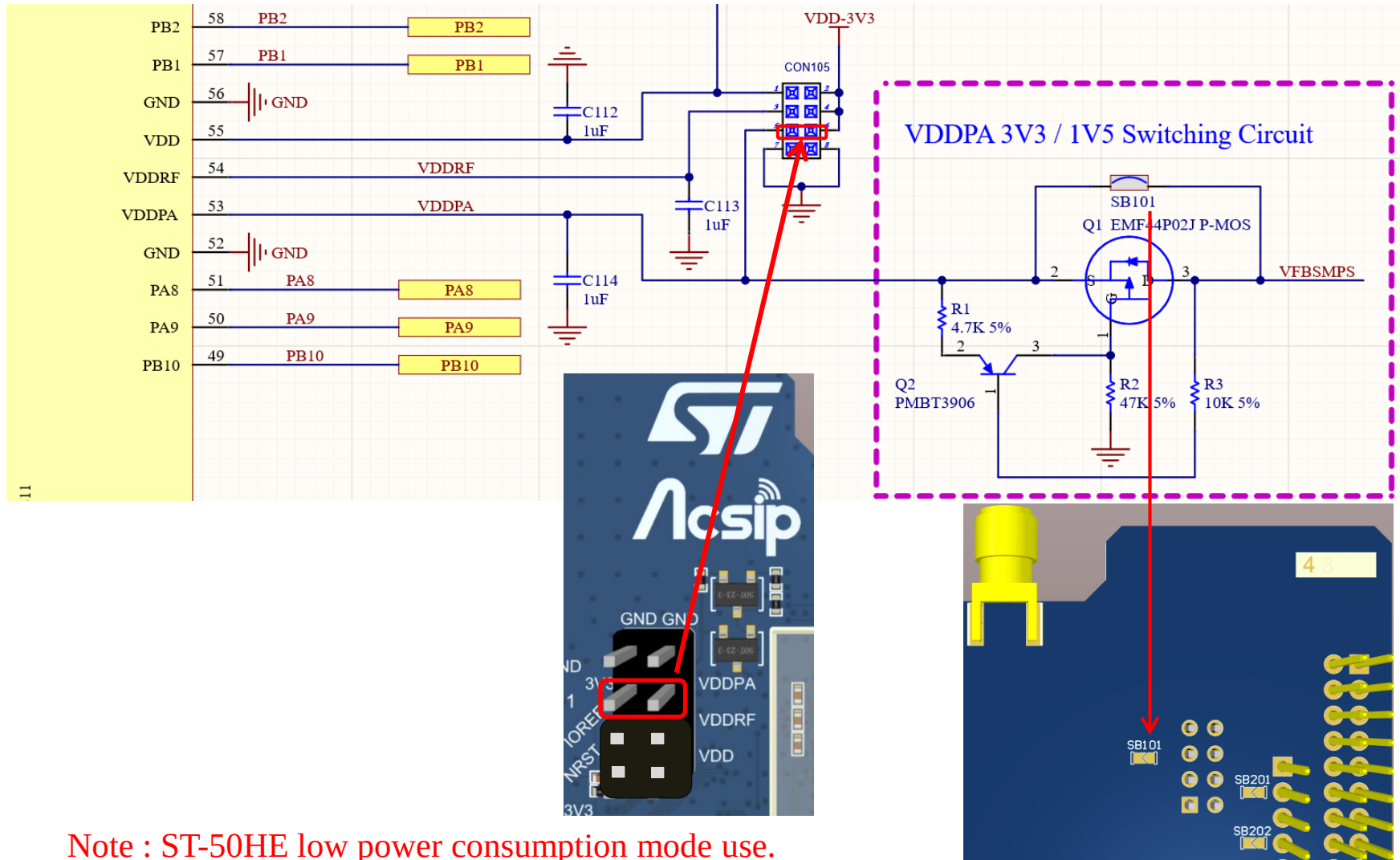
EK-ST50 Schematic Diagram

Power Supply Circuit Diagram



EK-ST50 Schematic Diagram

VDDPA Switching Circuit Diagram

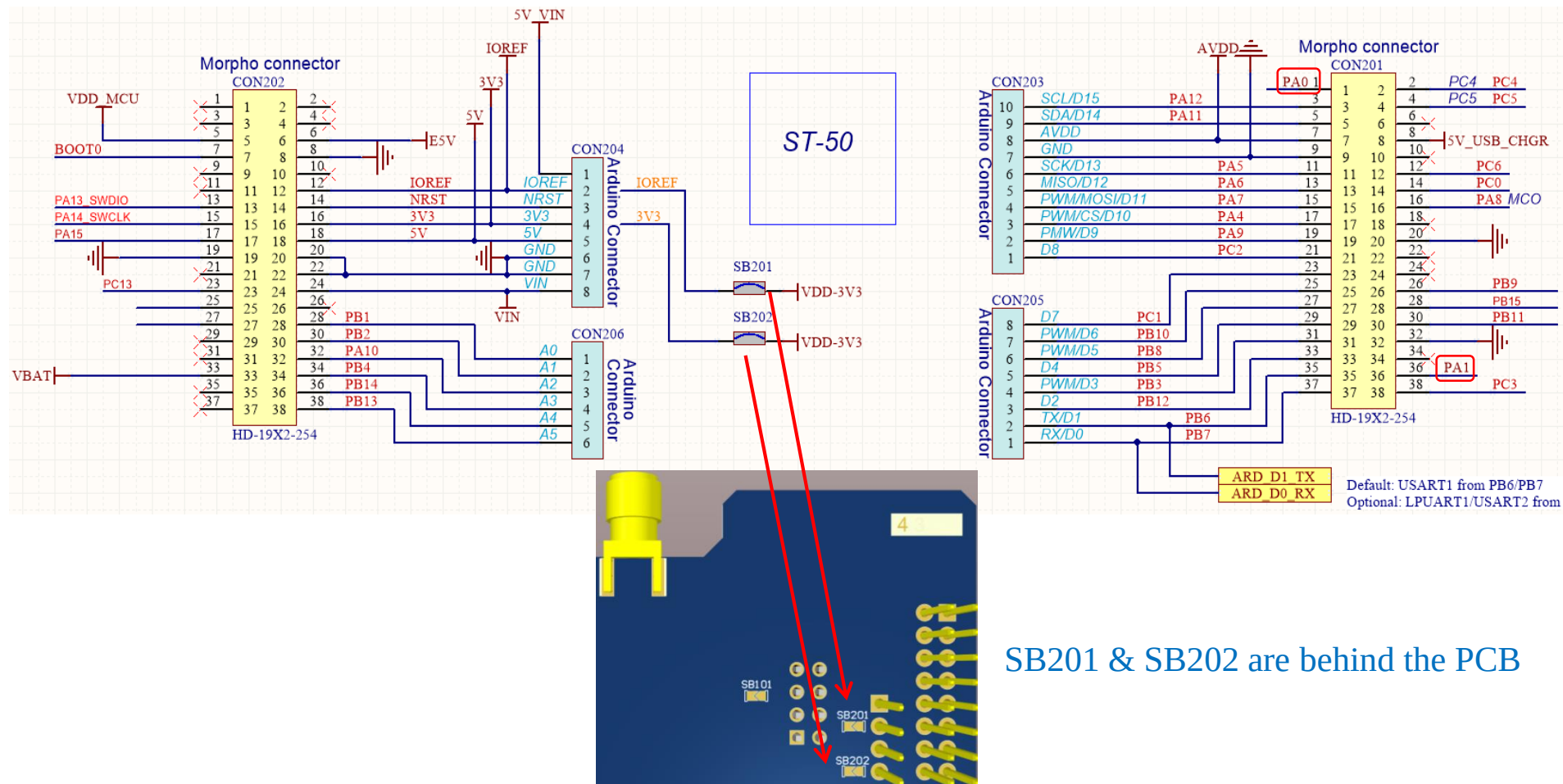


Note : ST-50HE low power consumption mode use.
(Jumper must be remove)

SB101 is behind the PCB

EK-ST50 Schematic Diagram

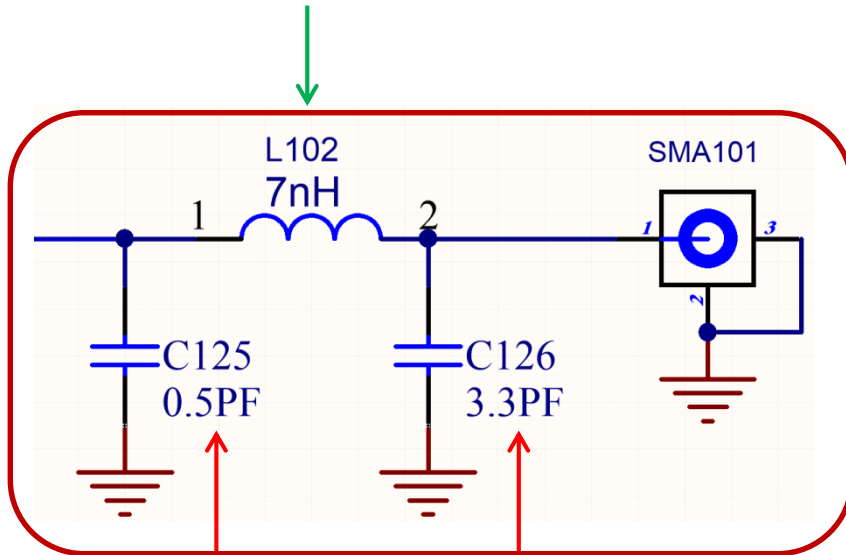
Pin definition Circuit Diagram



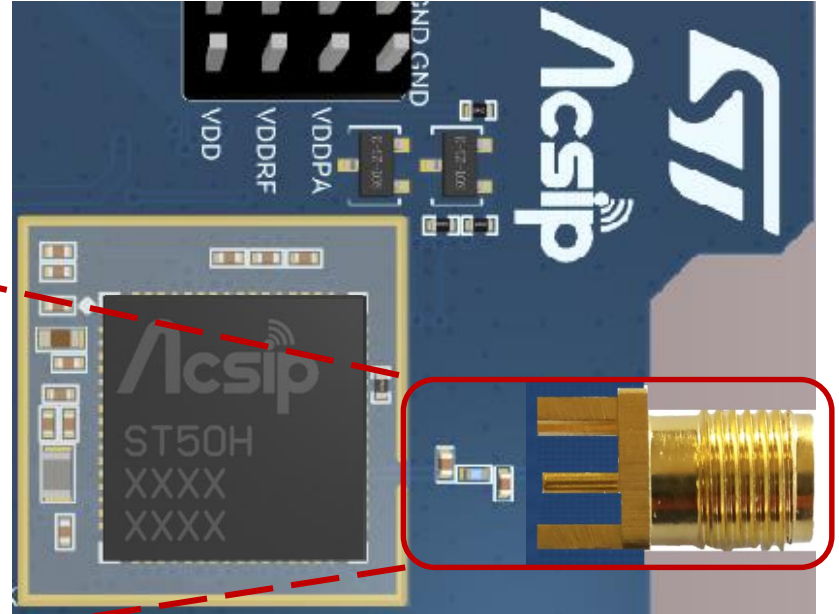
Note : The PA0 and PA1 pins in ST50H have been controlled by Acsip's software , So these two pins on the PCB are NC pins.

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 Ω
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.