Re-imagining Cellular IoT Solutions

Cavli C10QM/C20QM EVK

User Manual

External Release Version 1.1

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VERSION HISTORY

Version	Edit	Date
1.0	Initial Version	09-08-2023
1.1	Updated features based on latest hardware	11-09-2023

1 Introduction

1.1 Overview

This document aims to familiarize the reader on the different functionalities and interfaces of C10QM/C20QM Evaluation board.
It also helps the customer in getting started with the C10QM/C20QM EVK.

The EVK is a tool designed for engineers, programmers and developers who are looking to:

- Debug and/or improve applications based on Cavli C10QM/C20QM modules.
- Develop a first-pass proof-of-concept device for new application.

1.2 References

The present document is based on the following document:

Cavli C10QM and C20QM Hardware Manuals

2 Interfaces

2.1 Chapter Overview

Description:

This chapter contains all the necessary information on C10QM/C20QM EVK Interfaces and Pin-outs.

2.2 EVK Layout

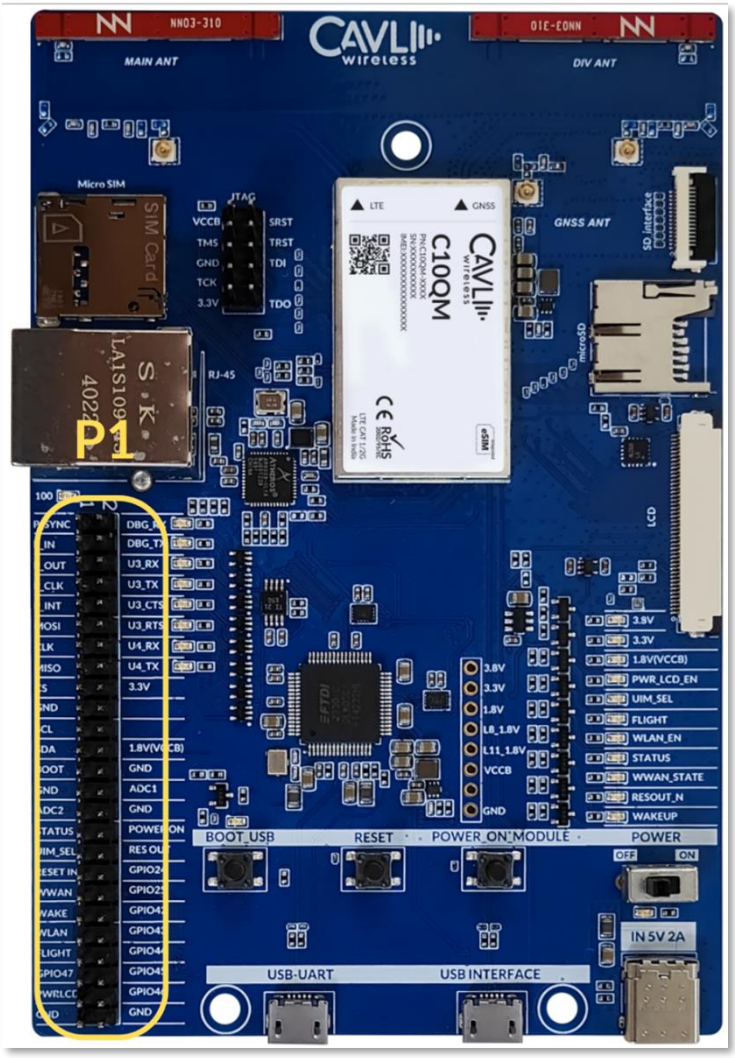

Figure 1: C10QM/C20QM EVK Layout

2.3 Pin Layout

2.3.1 P1 Pinout – C10QM/C20QM

Pin No	Pin name	Pin No.	Pin name
1	P_SYNC	2	DBG_RX
3	P_IN	4	DBG_TX
5	P_OUT	6	U3_RX
7	P_CLK	8	U3_TX
9	P_INT	10	U3_CTS
11	MOSI	12	U3_RTS
13	CLK	14	U4_RX
15	MISO	16	U4_TX
17	CS	18	3.3V
19	GND	20	NC
21	SCL	22	NC
23	SDA	24	1.8V(VCCB)
25	BOOT	26	GND
27	GND	28	ADC1
29	ADC2	30	GND
31	STATUS	32	POWER ON
33	UIM_SEL	34	RES OUT
35	RESET IN	36	GPIO24
37	WWAN	38	GPIO25

39	WAKE	**40**	GPIO42
41	WLAN	**42**	GPIO43
43	FLIGHT	**44**	GPIO44
45	GPIO47	**46**	GPIO45
47	PWRLCD	**48**	GPIO46
49	GND	**50**	GND

3 Component Description

3.1 Antenna

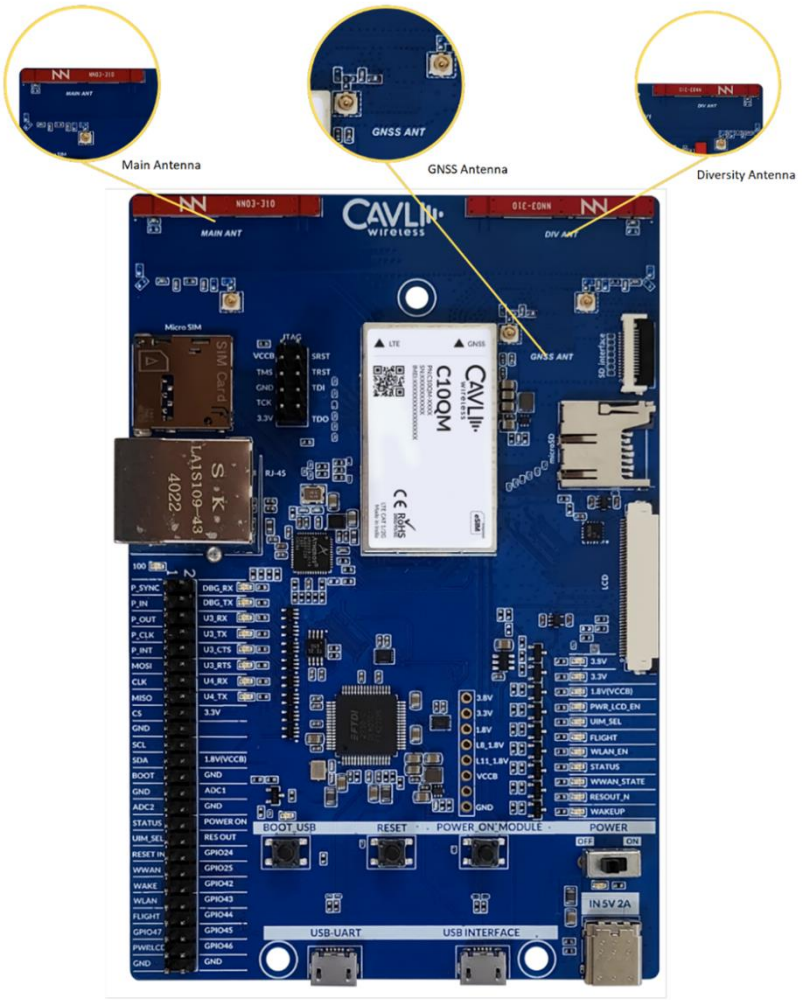

Figure 2: C10QM/C20QM EVK Antennas

3.1.1 LTE Antenna

C10QM/C20QM EVK comes with an integrated LTE antenna from Ignion. This part appears on the top left corner labelled as NN03_310. It offers worldwide coverage and works in multiple frequency regions. The frequency bands covered are Low (698-960 MHz), Mid (1710-2170 MHz) and High bands (2300-2690 MHz).

3.1.2 Diversity Antenna

C10QM/C20QM EVK comes with an integrated chip antenna (NN03_310) for diversity. Also, in every mini PCIe cards, SMA connectors are provided to connect an external antenna if the user wants to.

3.1.3 GNSS Antenna

Users can connect an external GNSS antenna using the U.FL connector on the EVK.

3.2 Sim Card Socket

You can insert your SIM card to the micro-SIM card push-push socket.

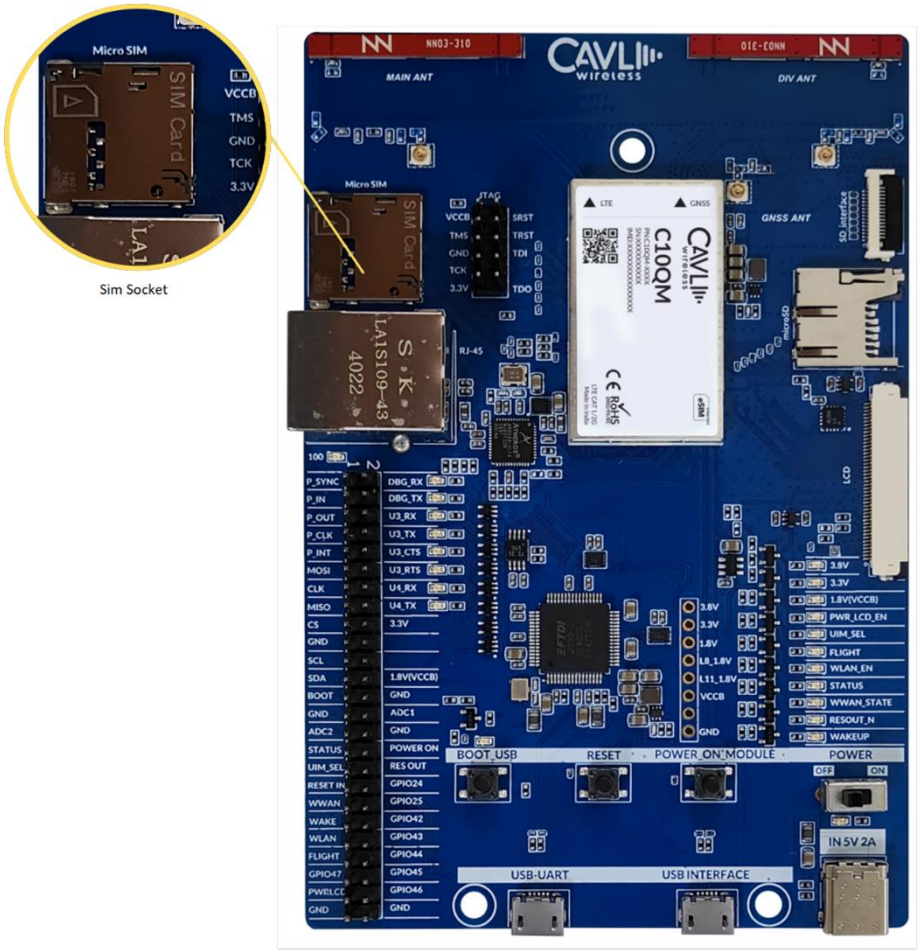

Figure 3: C10QM/C20QM EVK SIMCARD SLOT

3.3 JTAG Interface

The user can program the module using JTAG.

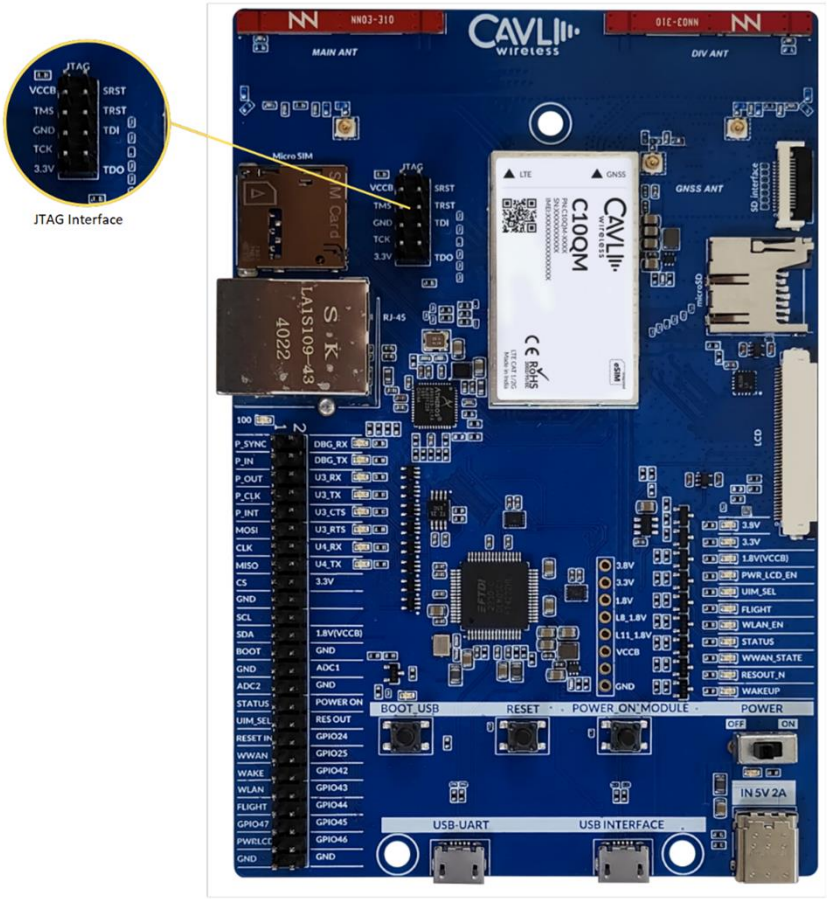

Figure 4: C10QM/C20QM EVK JTAG Interface

3.4 SD Interface

This interface is used to access the SDC of the C10QM/C20QM.

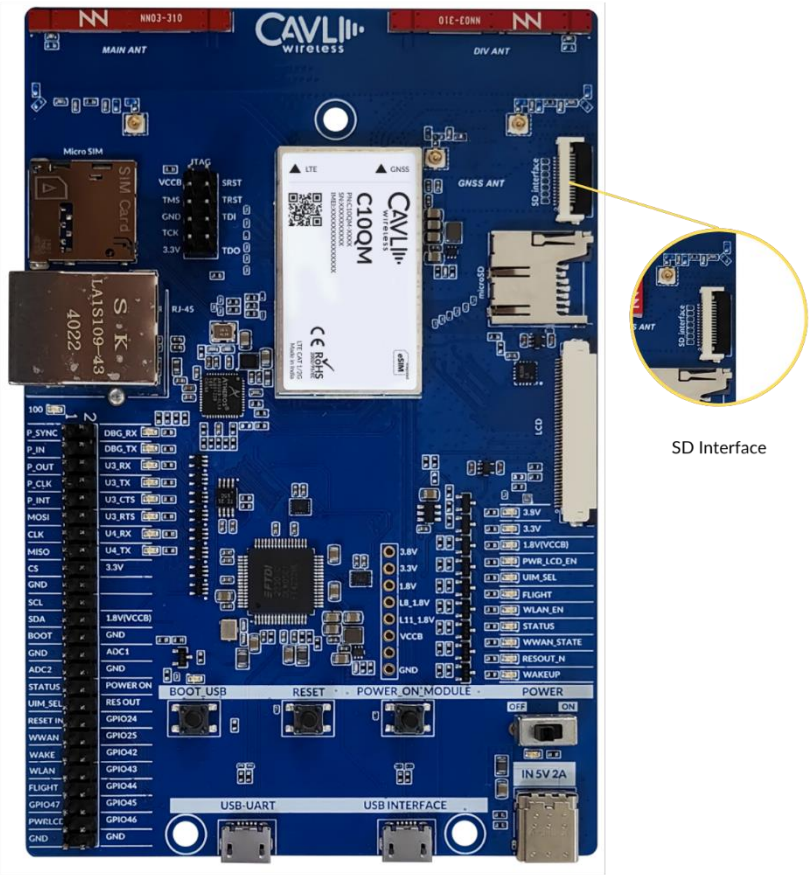

Figure 5: C10QM/C20QM EVK SD interface

3.5 Micro SD Card Socket

The C10QM/C20QM EVK provides a micro-SD card socket. The user can insert a micro-SD card to the connector and access the files using the module.

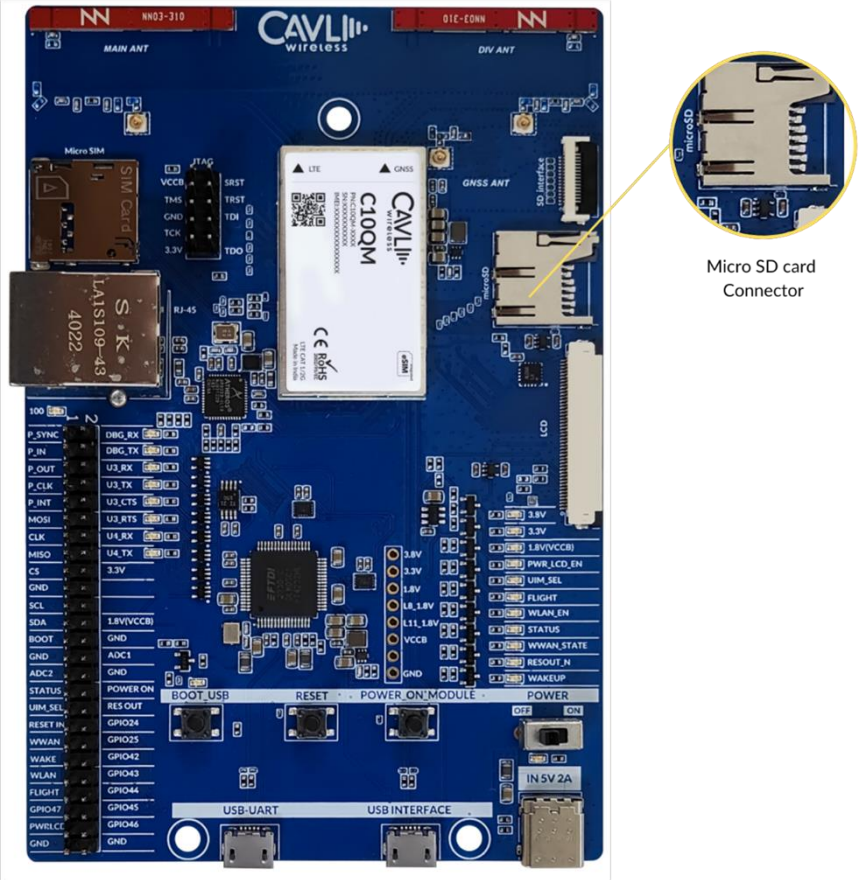

Figure 6: C10QM/C20QM EVK Micro SD socket

3.6 Ethernet

The user can connect the LAN cable to the connector and access the ethernet interface

- Ethernet IC - AR8033
- Connector - RJ45_PLUG

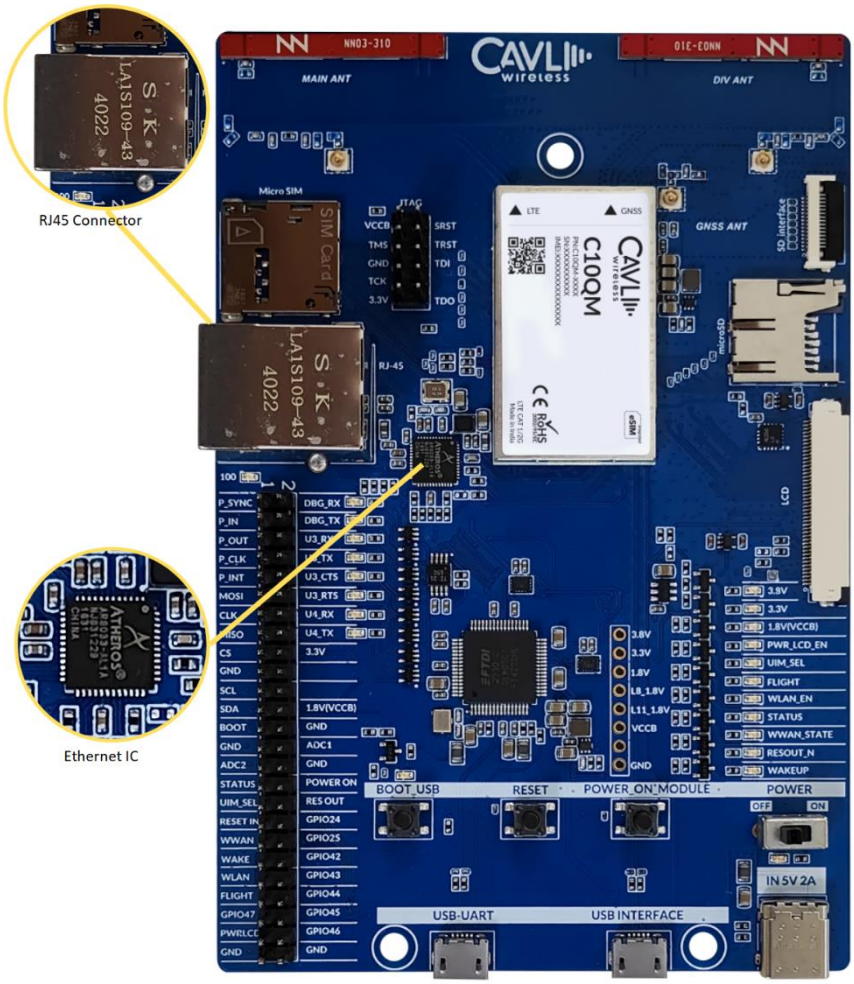

Figure 7:C10QM/C20QM EVK ethernet interface

3.6.1 Ethernet chip

C10QM/C20QM EVK has an ethernet interface. AR8033-ALIA-R is an integrated 10/100/1000 ethernet transceiver. A magnetic modular integrated jack is used to interface the AR8033-ALIA-R with RJ45 interface. The Integrated magnetic modular RJ45 Jack used is KLA1S109-43 LF.

3.7 LCD Interface

This is a MIPI DBI-2 Type B interface used for LCD interfacing.

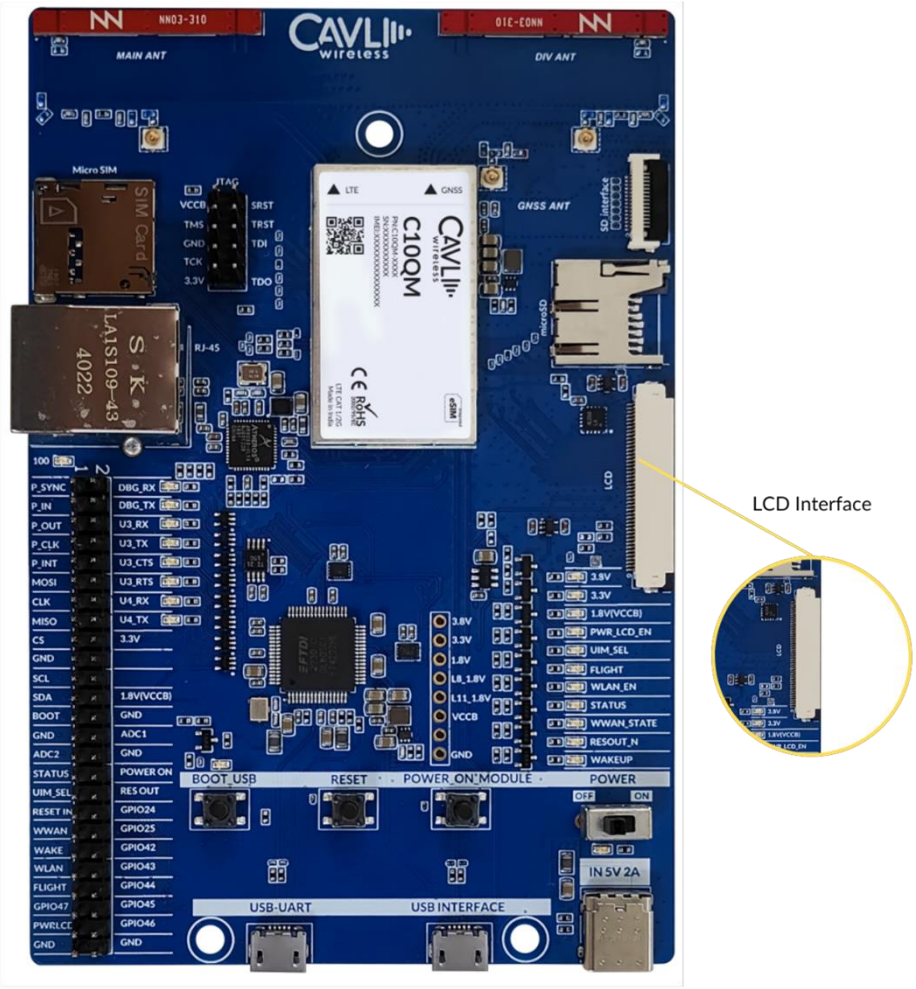

Figure 8: C10QM/C20QM EVK LCD interface

3.8 LED Indicators

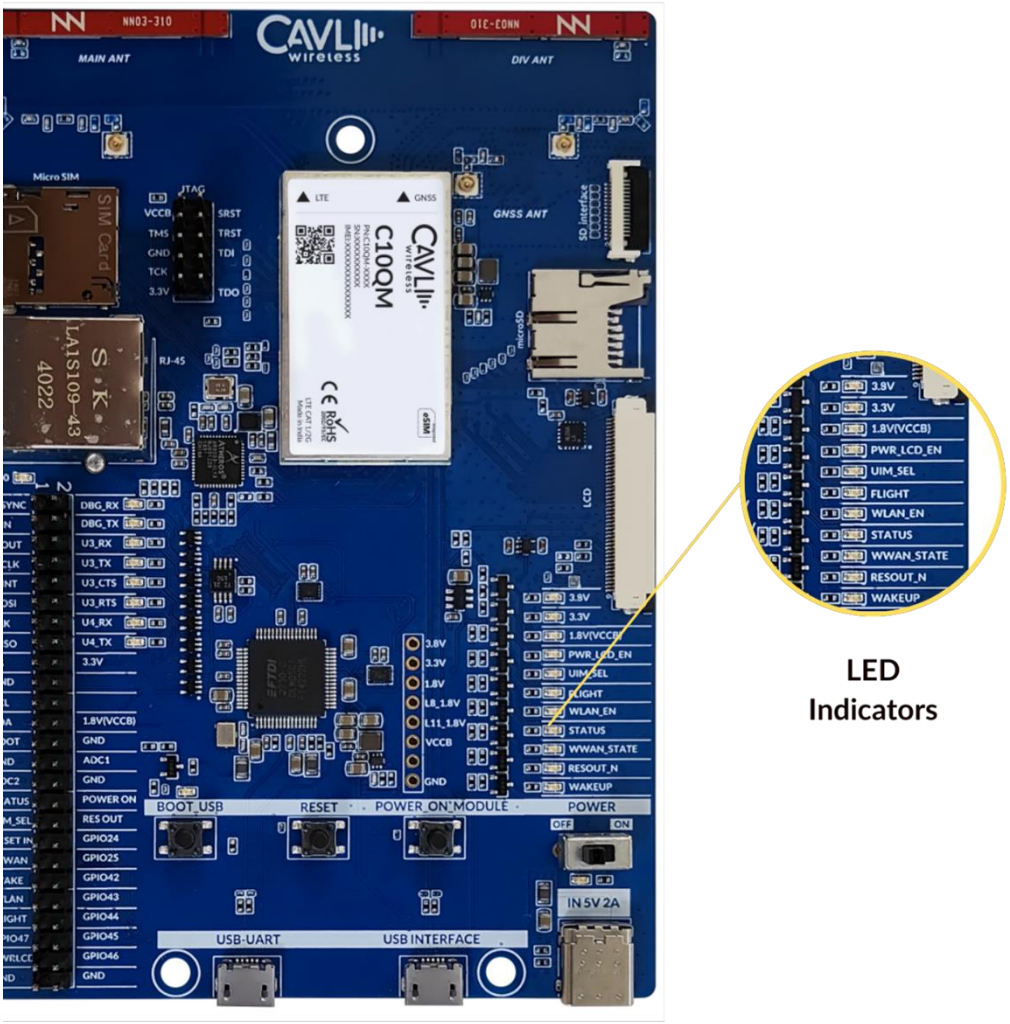

Figure 9 : C10QM/C20QM EVK LED indicators

3.8.1 3.8 V

This LED indicates 3.8V power input.

3.8.2 3.3 V

This LED indicates 3.3V power input.

3.8.3 1.8 V

This LED indicates 1.8V voltage source.

3.8.4 PWR_LCD_EN

This LED is used to indicate power when LCD is enabled.

3.8.5 UIM_SEL

This LED is used to indicate USIM selection.

3.8.6 FLIGHT

This LED indicates flight mode of the module.

3.8.7 WLAN_EN

This LED indicates the status of WLAN.

3.8.8 STATUS

This LED indicates status (on/off) of the module.

3.8.9 WWAN_STATE

This LED indicates network.

3.8.10 RESOUT_N

3.8.11 WAKEUP

This LED is used to indicate wakeup state of the module

3.9 USB- UART Converter

A 48 pin FT4232 converter is used in the DDK. For more details refer UART interface section.

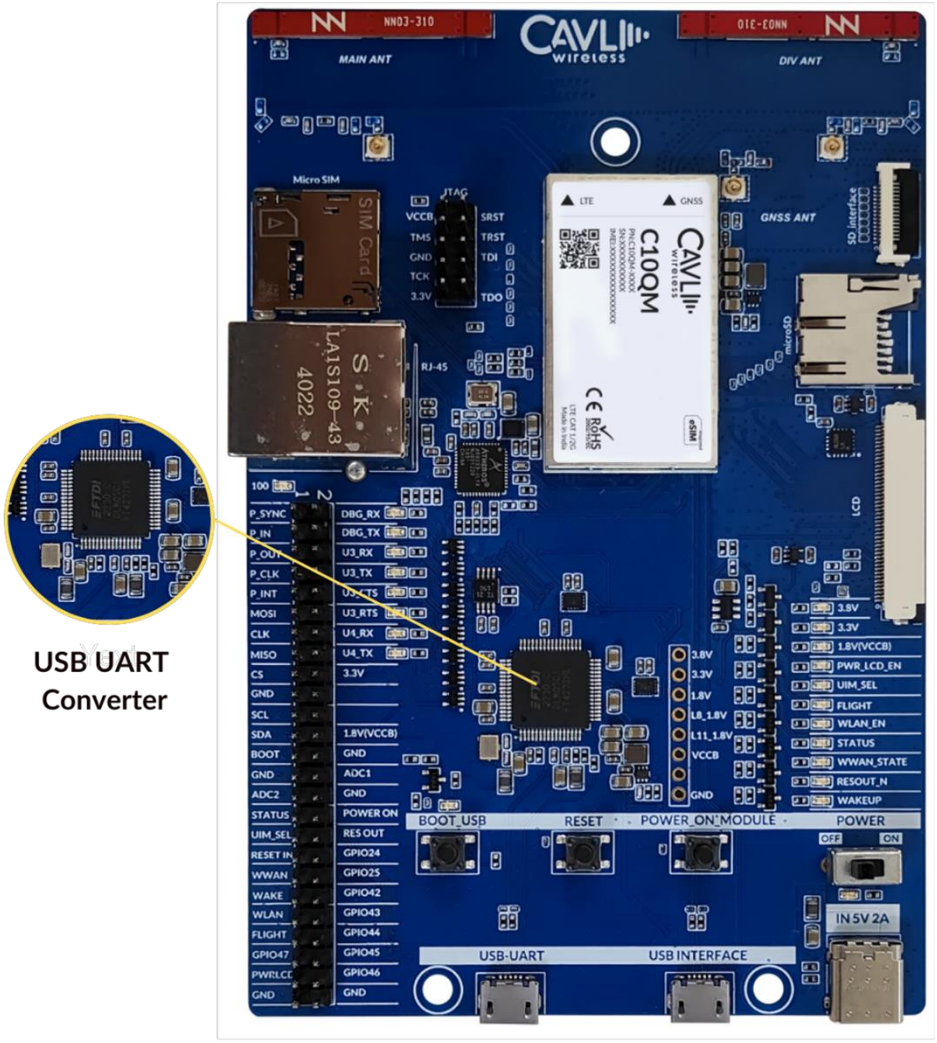

Figure 10: C10QM/C20QM EVK USB UART Convertor

3.10 50 Pin Connector

The 50-pin connector enables the user to access all the available interfaces. The signals from the 80-pin connector are available in this 50-pin connector.

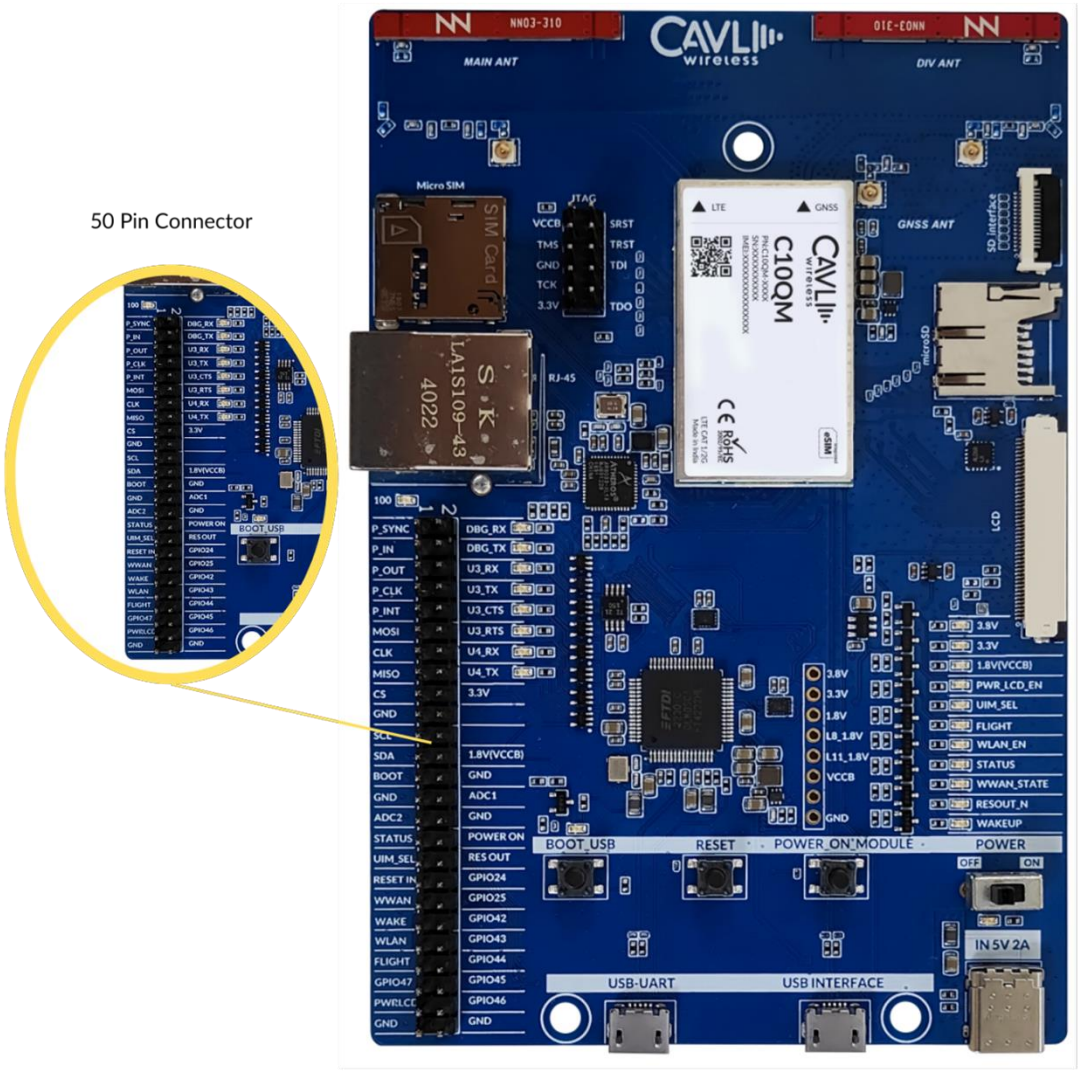

Figure 11: C10QM/C20QM EVK 50 pin connector

3.11 USB Boot Button

This button is used to enter into bootloader.

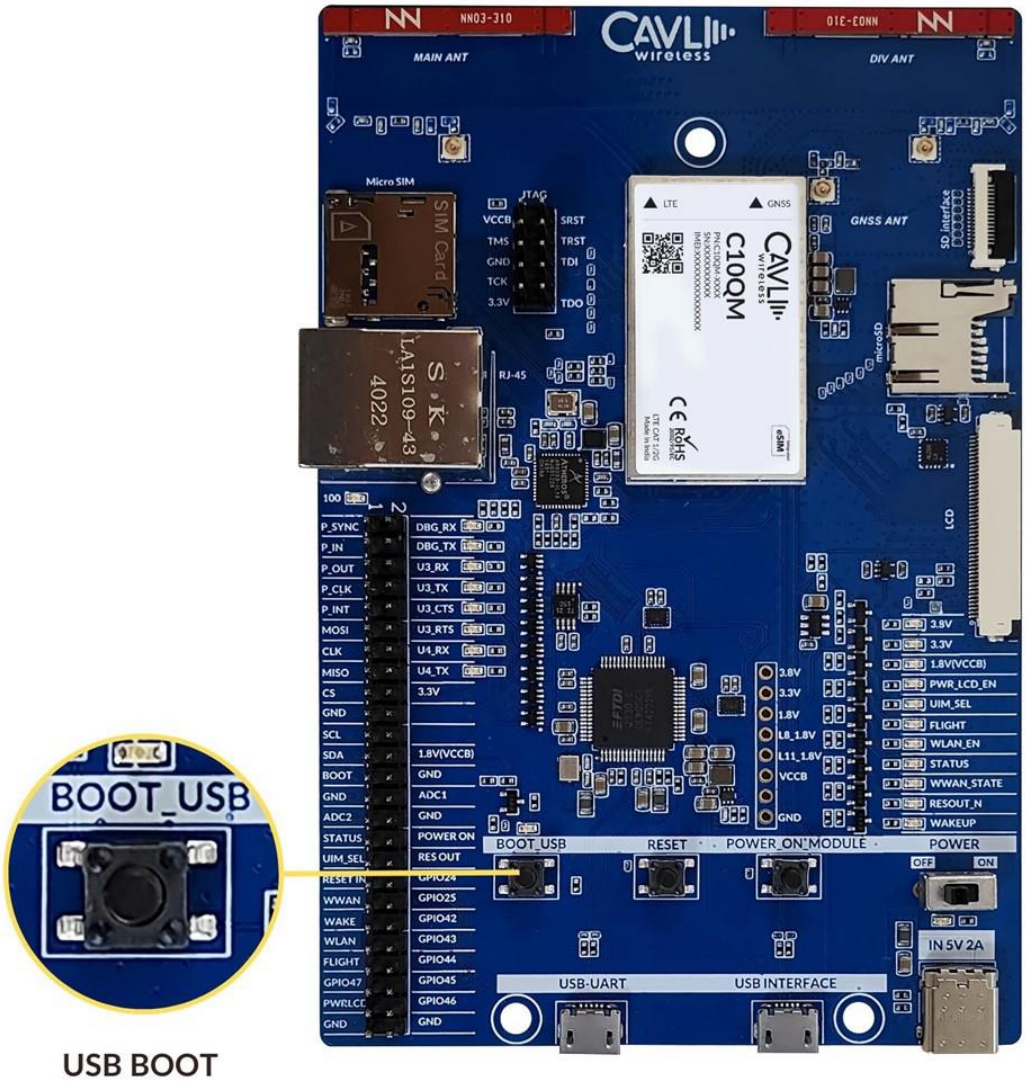

Figure 12: C10QM/C20QM EVK USB boot button

3.12 Reset Button

This button is used to reset the module.

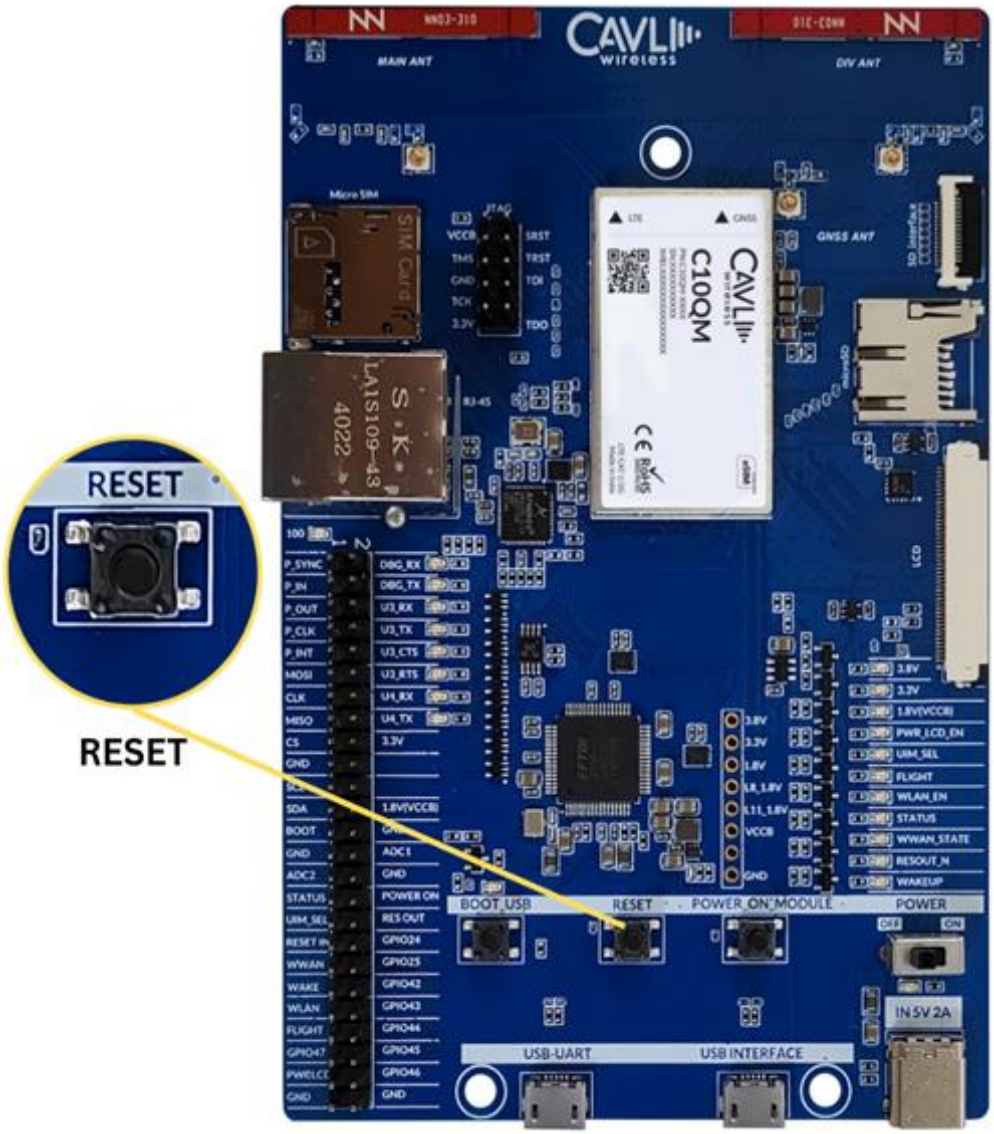

Figure 13: C10QM/C20QM EVK Reset button

3.13 Power Button

This button is used to power on the module.

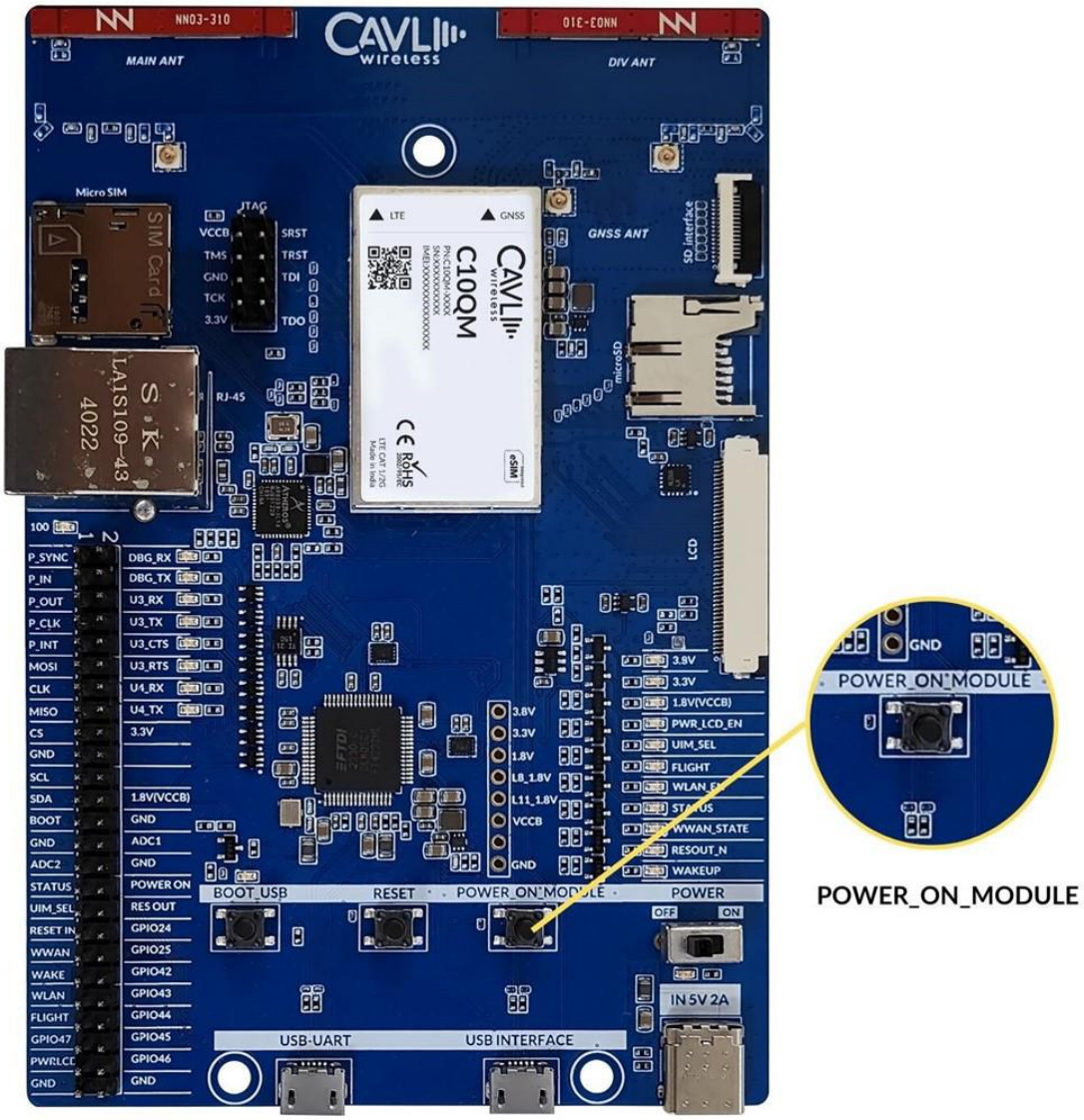

Figure 14: C10QM/C20QM EVK power button

3.14 Power Switch

The power switch is used to power on and off the EVK board.

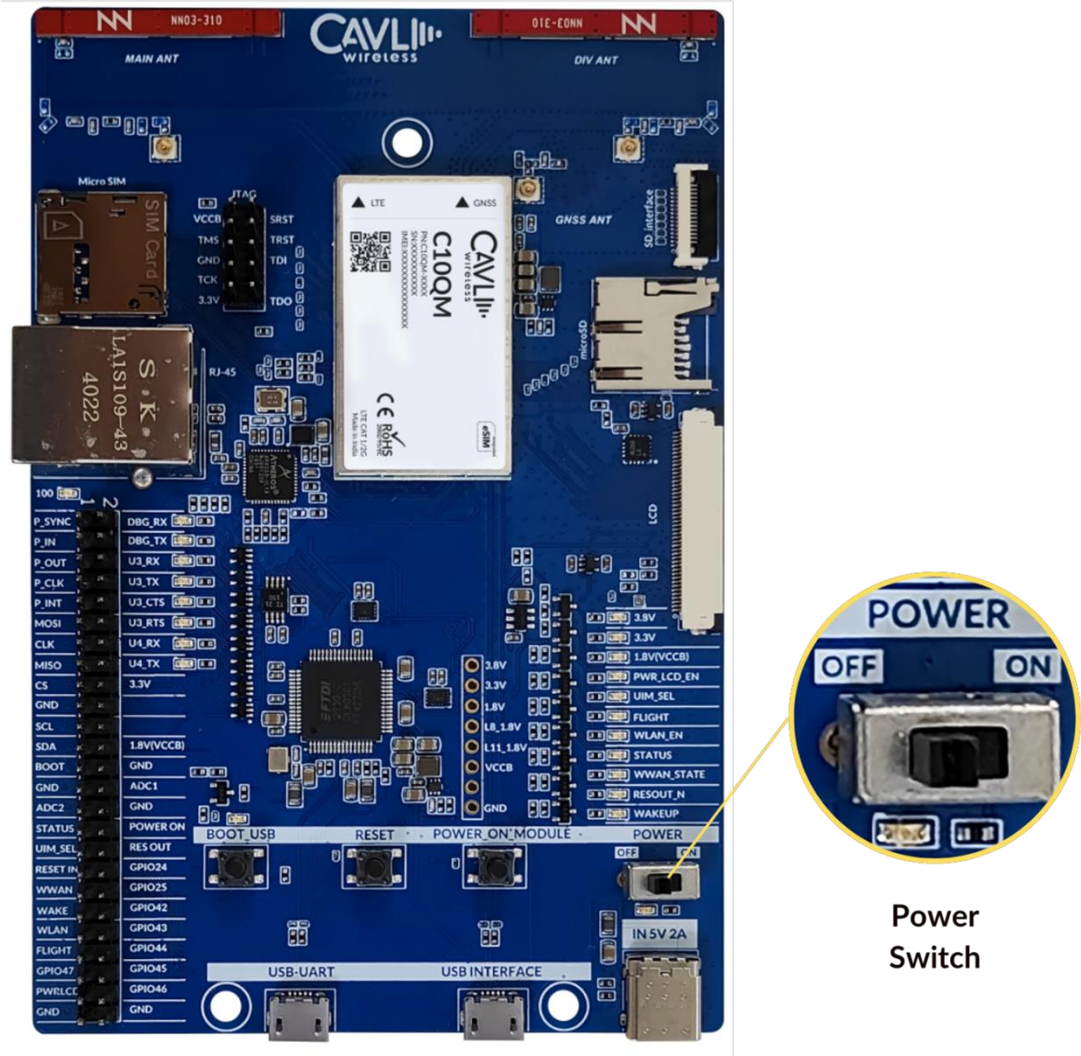

Figure 15: C10QM/C20QM EVK Power switch

3.15 Power Input- (Type C)

It is recommended to use a 5V/2A adapter for the input power supply. The user can also use PC USB port

to power the modules.

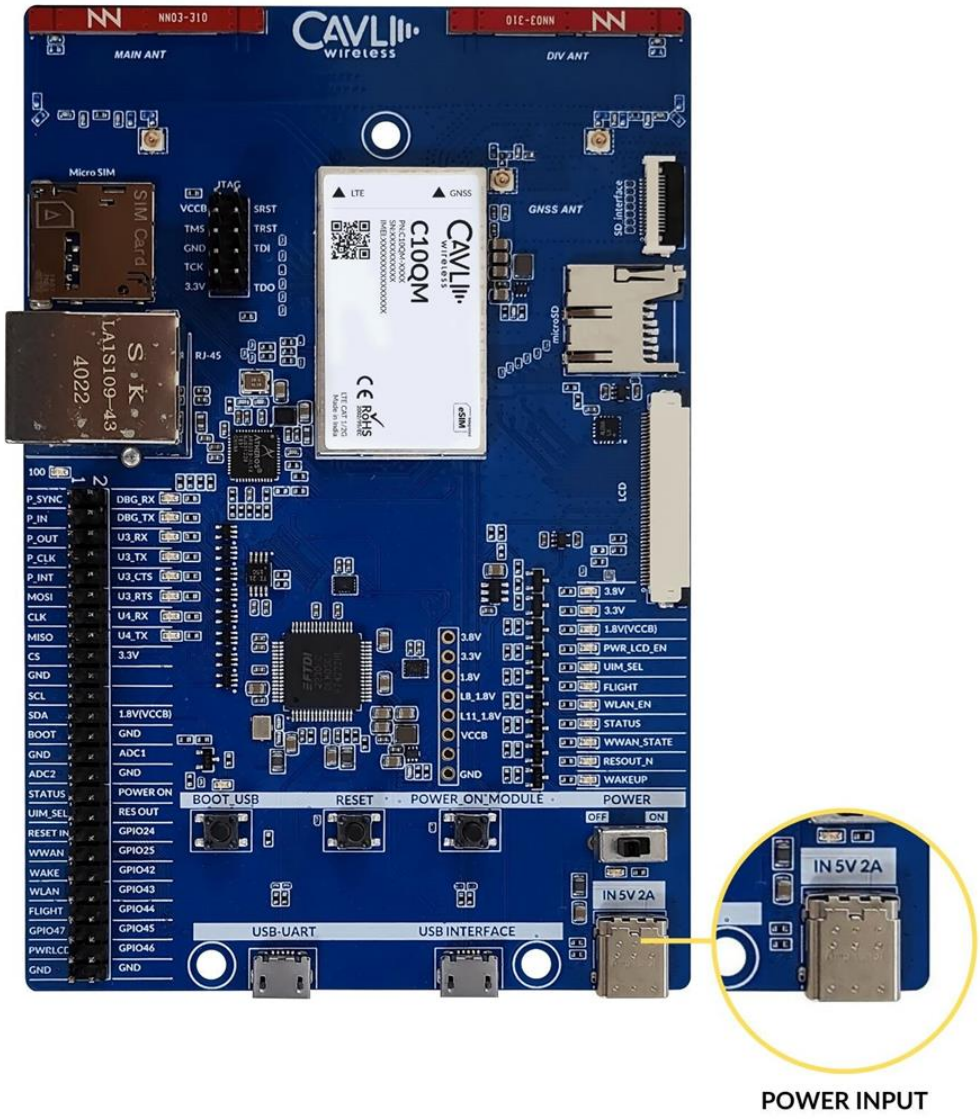

Figure 16: C10QM/C20QM EVK Power input

3.16 USB Interface

- Micro-USB Interface to access the module's USB 2.0 Interface .

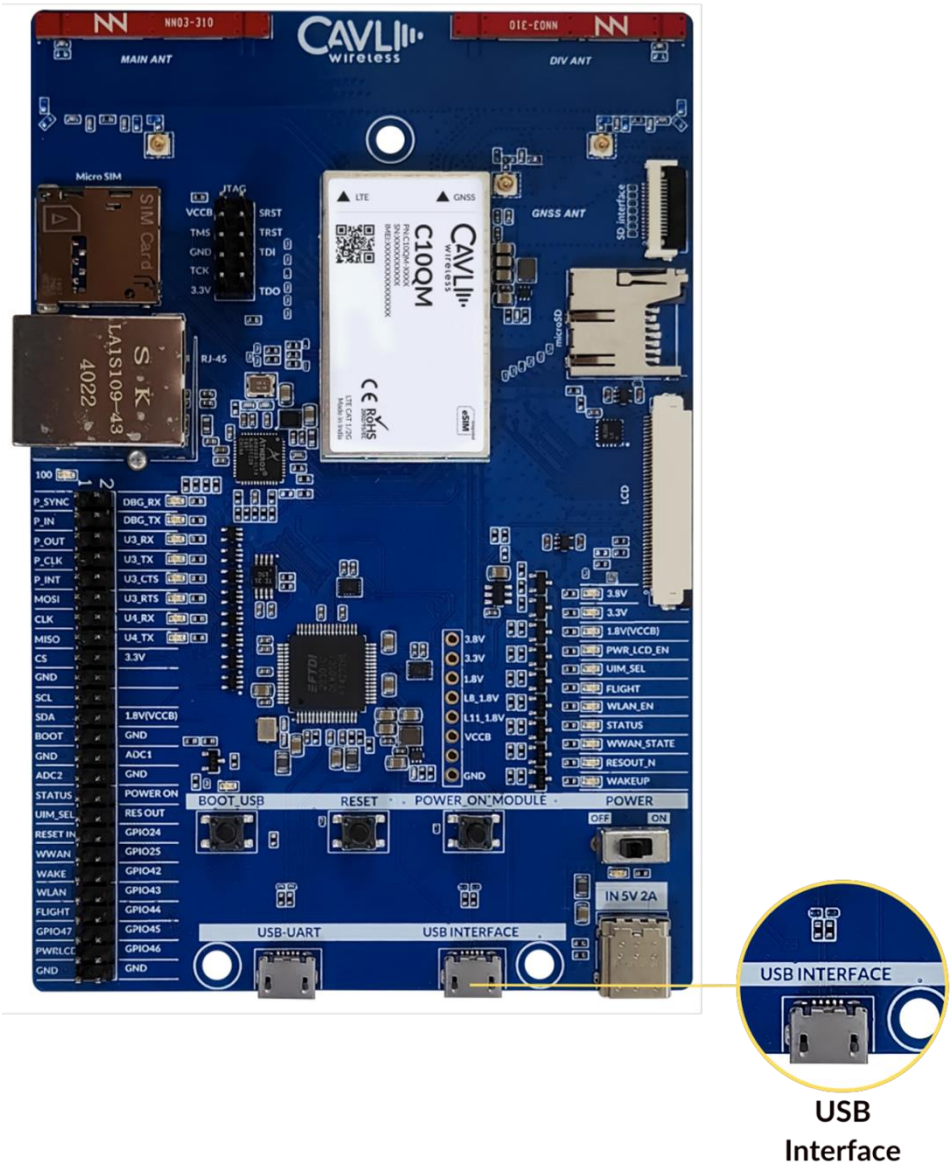

Figure 17: C10QM/C20QM EVK USB Interface

3.17 UART Interface

When the user connects a USB cable to the UART micro-USB port, four ports will be displayed in the serial terminal. In which the first one is debug port and the third one is the AT Port.

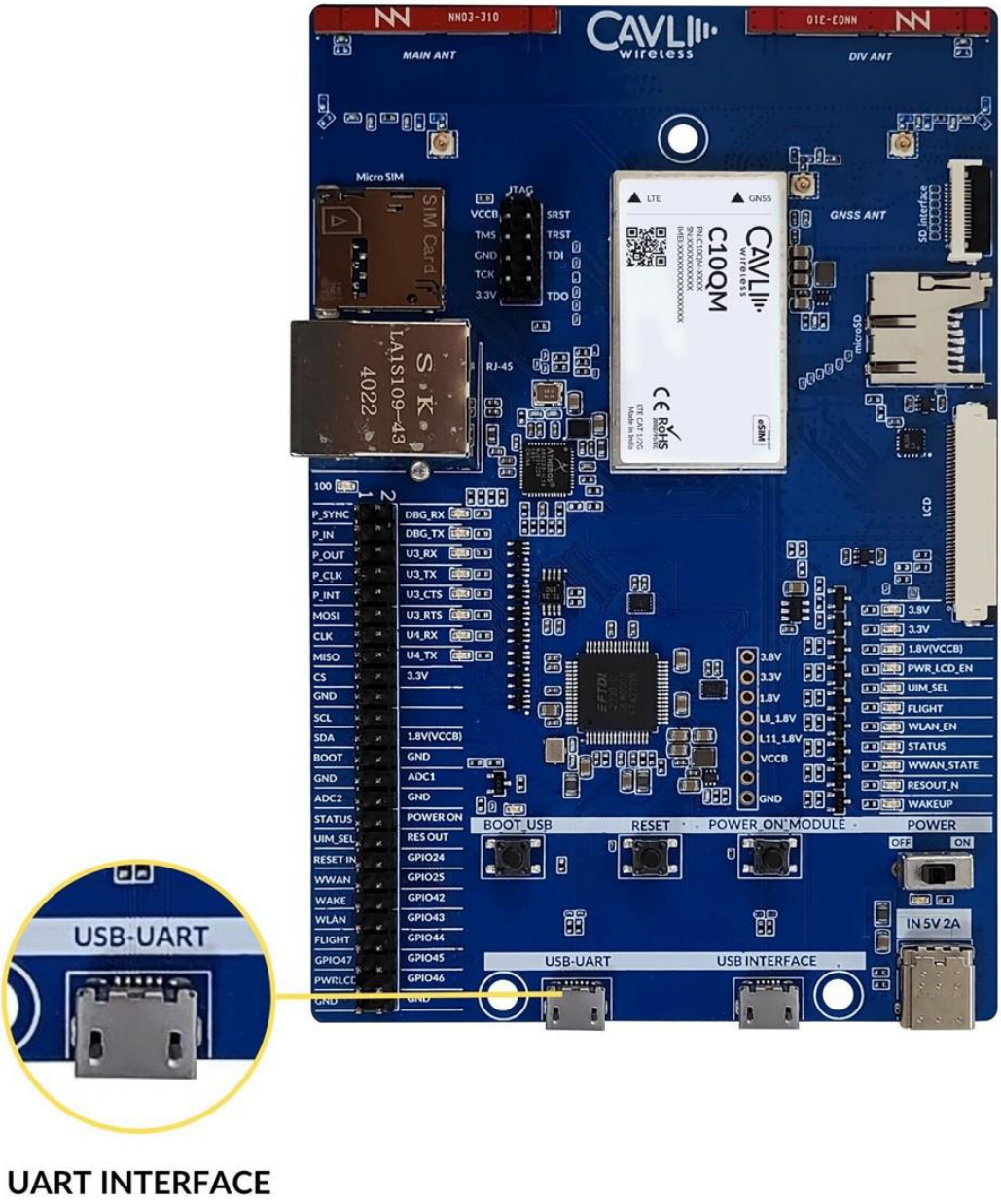

Figure 18: C10QM/C20QM EVK UART interface

4 Setup Guide

Given below are the various steps involved in the connection of C10QM/C20QM with a PC:

1. Place the EVK on an insulated platform.
2. Connect the GNSS Antenna (if needed) to the corresponding UFL Connectors.
3. Connect the needed power supply input (We have used Type-C) and the POWER ON LED turns green indicating the power supply.
4. Connect micro-USB cable to USB-UART to access the AT port via UART.
5. Toggle the Power switch then 3.8V and 3.3V LEDs turns green.
6. Turn ON the POWER_ON_MODULE switch.
7. Using the micro-USB cable connected to the USB-UART interface, after powering on, COM ports will be automatically be initialized onto your Windows PC (ttyUSB in Linux).
8. If USB interface is connected, NMEA port for NMEA streaming and diagnostics port will appear under Ports.