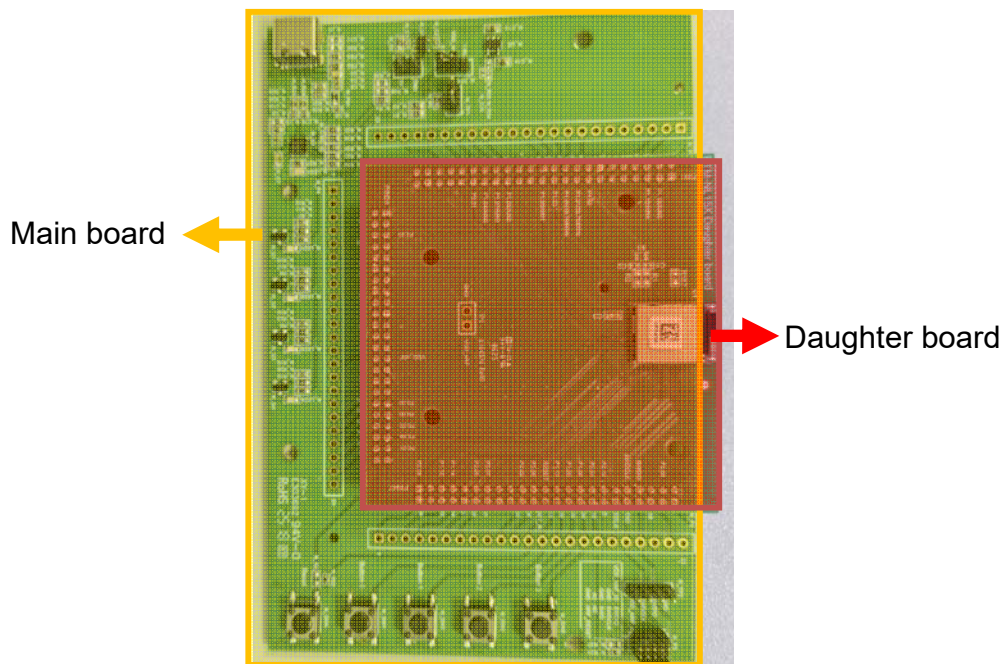


1. Introduction:

The BLE DK board contains the main board and the daughter board. The BLE module is mounted on the daughter board and, daughter board is attached to the main board via three pin headers.

The main board has ready hardware such as buttons, LEDs, UART interface, whose function are determined by the software loaded on the module. General I/O ports terminals are also persevered as pin headers for flexible use.

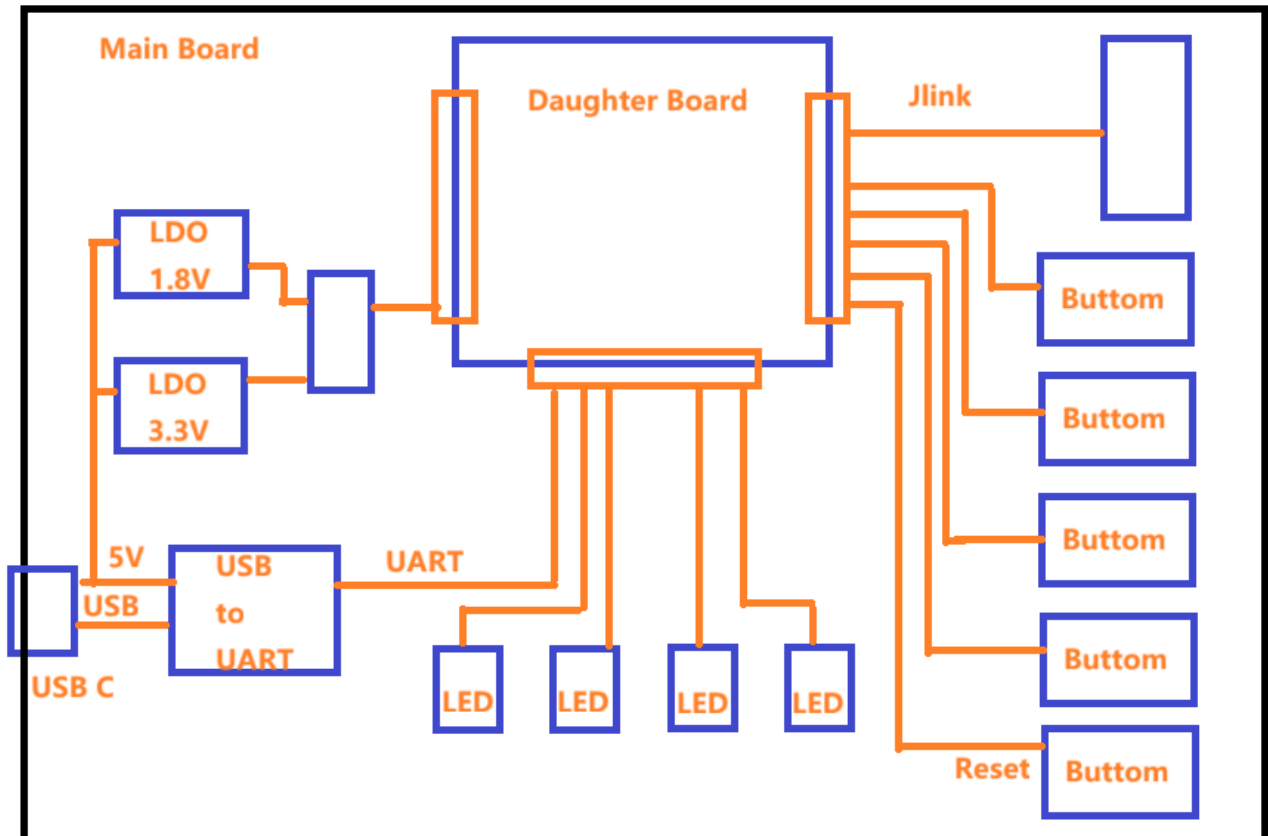
The J-link jumper is also preserved for BLE software development and programming, This allowed the users to develop their own BLE software function for the Nordic solution based module.



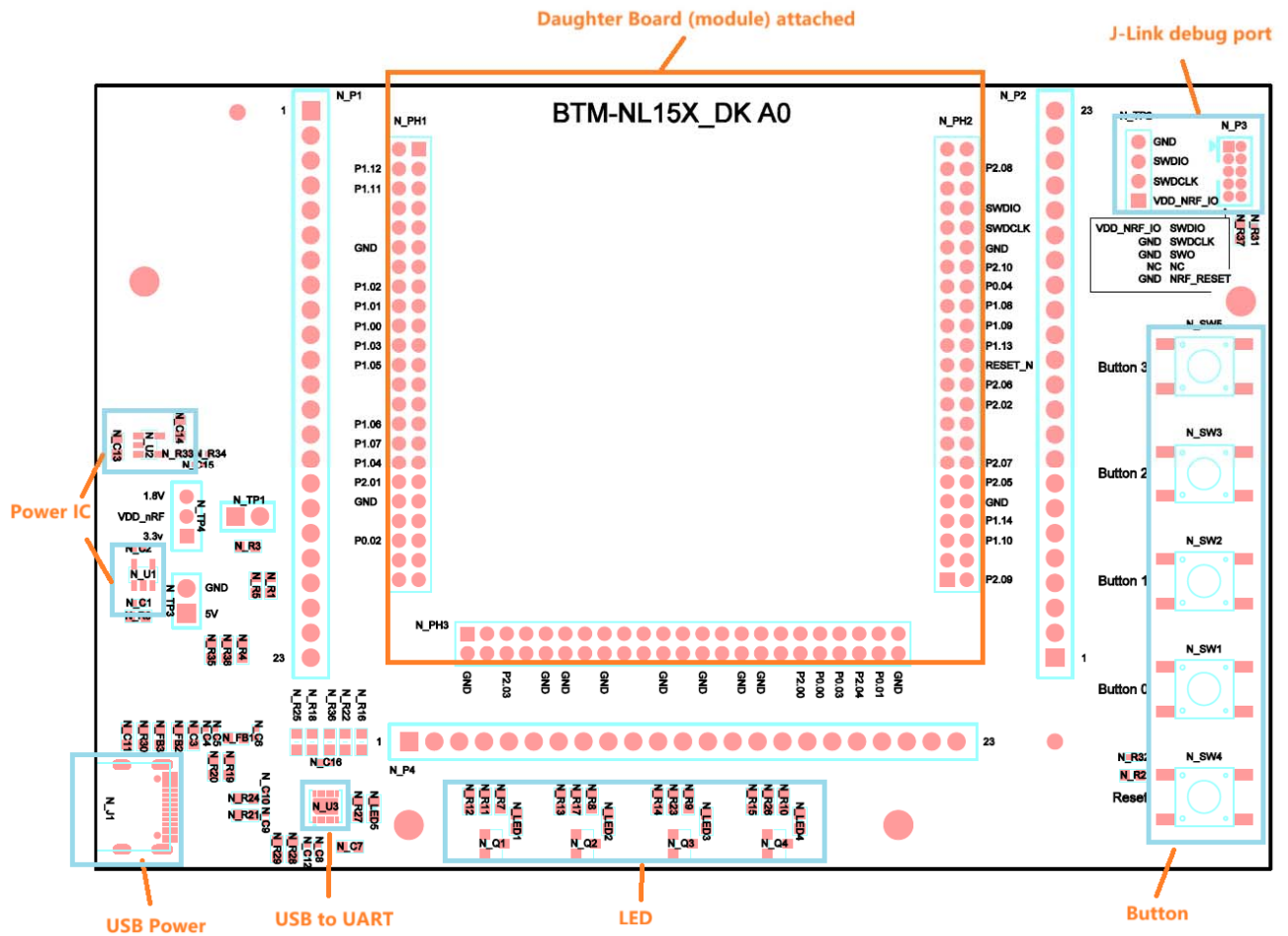
2. Block Diagram

The block diagram of the BLE DK is shown below.

The BLE development kit (BLE DK) is powered via a 5V USB input and features a built-in LDO power IC that converts 5V to either 3.3V or 1.8V to supply power to the module. It includes a USB-to-UART interface for data communication, as well as onboard LED indicators and push buttons. Pin headers are also provided to facilitate expansion and additional applications.

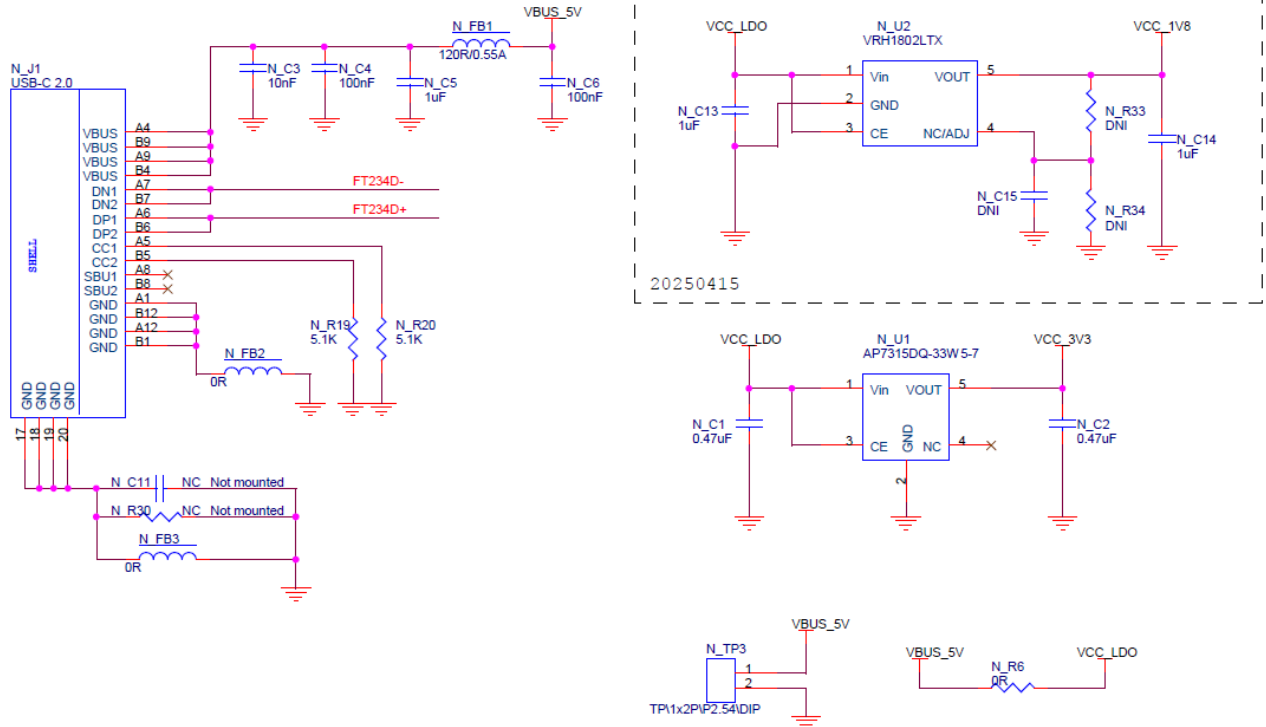


3. Board Layout



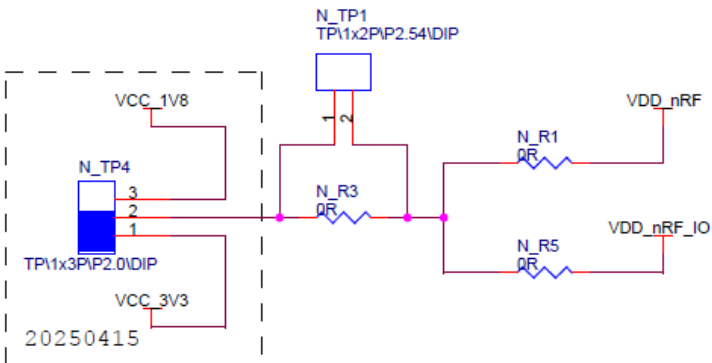
4. Power Supply

The 5V input provided via USB Type-C is regulated by a power IC to output either 3.3V or 1.8V.



The jumper on N_TP4 can be used to select either 1.8V or 3.3V as the supply voltage for the module.

N_TP1 can be used as a current test point for connecting an ammeter to measure the module's power consumption.



5. Pin maps

The following table shows the mapping between the daughter board module's function pins and the pin headers 'N_PH1', 'N_PH2' and 'N_PH3'. These allow user to wiring the module's function pins easily.

Daughter board		
pin no.	pin name.	Main board Function
1	NC	
2	P1.12/AIN5	
3	P1.11/AIN4	
4	NC	
5	NC	
6	GND	
7	NC	
8	P1.02	
9	P1.01/32.768KHz	
10	P1.00/32.768KHz	
11	P1.03	
12	P1.05/AIN1	
13	NC	
14	NC	
15	P1.06/AIN2	
16	P1.07/AIN3	
17	P1.04/AIN0	
18	P2.01	
19	GND	
20	NC	
21	P0.02/UART_RTS	UART_RTS
22	NC	
23	NC	
24	GND	
25	NC	
26	P2.03	
27	NC	
28	GND	
29	GND	
30	NC	
31	GND	
32	NC	
33	NC	

34	GND	
35	NC	
36	GND	
37	VDD_nRF	
38	GND	
39	GND	
40	NC	
41	P2.00	
42	P0.00/UART_TX	UART_TX
43	P0.03/UART_CTS	UART_CTS
44	P2.04	
45	P0.01	UART_RX
46	GND	
47	P2.09	LED1
48	NC	
49	P1.10	LED2
50	P1.14	LED4
51	GND	
52	P2.05	
53	P2.07	LED3
54	NC	
55	NC	
56	P2.02	
57	P2.06	
58	RESET_N	RESET
59	P1.13	BUTTON0
60	P1.09	BUTTON1
61	P1.08	BUTTON2
62	P0.04	BUTTON3
63	P2.10	
64	GND	
65	SWDCLK	
66	SWDIO	
67	NC	
68	P2.08	
69	NC	

6. Function pins groups

The following sections show specific function pins groups from the pin map.

6.1 Analog pins group

Nordic		
Daughter board pin no.	BTM-NL15C Daughter board pin name	Analog input
Pin17	P1.04	AIN0
Pin12	P1.05	AIN1
Pin15	P1.06	AIN2
Pin16	P1.07	AIN3
Pin3	P1.11	AIN4
Pin2	P1.12	AIN5

6.2 Buttons and LEDs

There are four buttons, N_SW1 – N_SW5, which are working as active low. If you are programming the module for these switches input, be aware to configure the function pins P1.13, P1.09, P1.08 and P0.04 to be with an internal pull-up resistor.

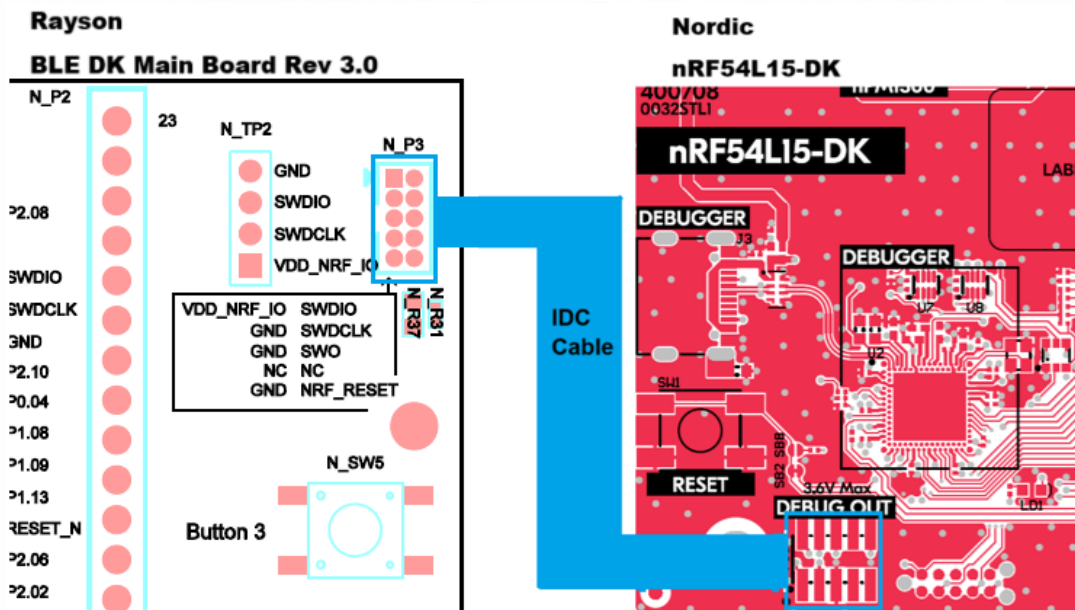
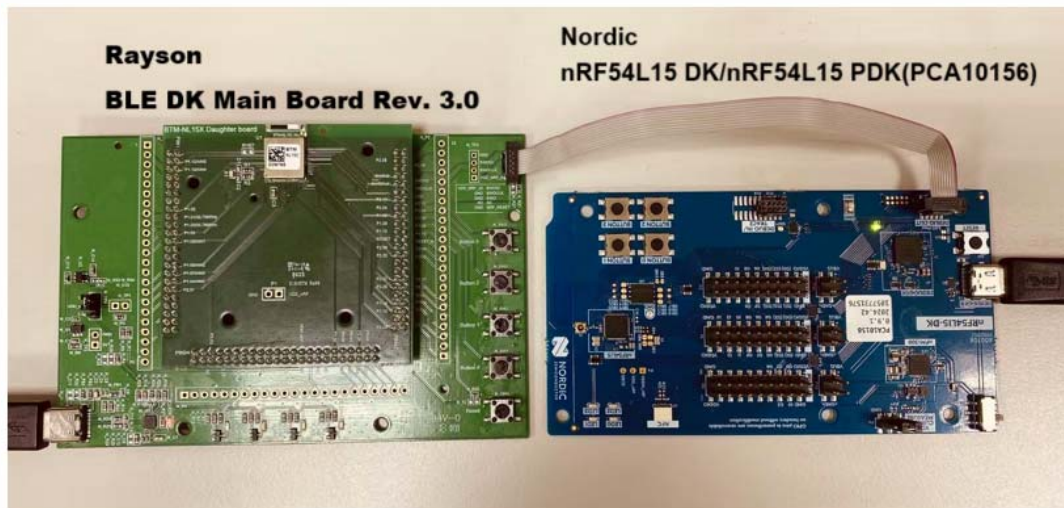
There are four LEDs, LED1 - LED4, which connected to the function pins P2.09, P1.10, P2.07 and P1.14

Nordic		
Daughter board pin no.	BTM-NL15C Daughter board pin name	Button
Pin59	P1.13	Button0
Pin60	P1.09	Button1
Pin61	P1.08	Button2
Pin62	P0.04	Button3
Daughter board pin no.	BTM-NL15C Daughter board pin name	LED
Pin47	P2.09	LED1
Pin49	P1.10	LED2
Pin53	P2.07	LED3
Pin50	P1.14	LED4

6.3 Programming and debug port

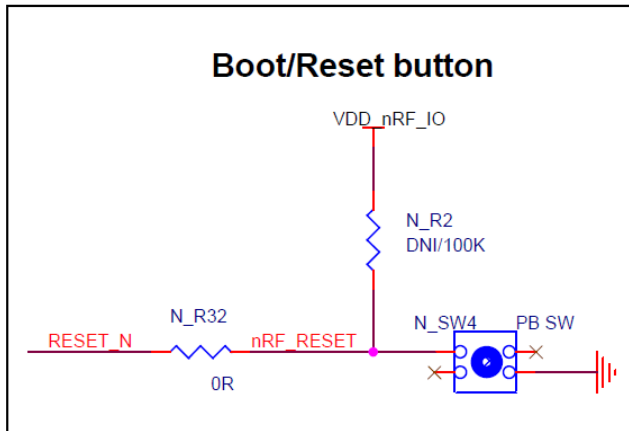
Please use the Nordic nRF54L15DK/nRF54L15PDK as the programmer, along with the Rayson BTM-NL15X-DK development board as the development tool, to perform code compilation and development for the nRF54L15.

- Step 1: Power the NRF54L15 DK and BTM-NL15X-DK via a USB cable.
- Step 2: Connect the Nordic nRF54L15 DK and Rayson BTM-NL15X-DK using an IDC (SWD) cable.



6.4 Reset button

The N_SW4 is the reset button for the daughter board module.



6.5 UART interface

The DK features a USB-to-UART bridge function, enabling easy serial communication with a computer.

Nordic		
Daughter board	Daughter board	UART
pin no.	pin name	
pin42	P0.06	UART_TX
pin45	P0.08	UART_RX
pin43	P0.07	UART_CTS
pin21	P0.05	UART_RTS