

NuMicro[®] Family**Based on Arm[®] Cortex[®]-M4**

NuMaker-EVB-KM1M4B-TQFP64

User Manual

NuMicro[®] KM1M4B Series

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1 OVERVIEW

The NuMaker-EVB-KM1M4B-TQFP64 is an evaluation board for Nuvoton KM1M4BF54K microcontroller. The NuMaker-EVB-KM1M4B-TQFP64 consists of two parts: a KM1M4BF54K target board and an on-board Nu-Link2-Me debugger and programmer.

The NuMaker-EVB-KM1M4B-TQFP64 is designed for project evaluation, prototype development. The KM1M4BF54K target board is based on KM1M4BF54K. For the development flexibility, the KM1M4BF54K target board provides the extension connectors of KM1M4BF54K, the Arduino UNO compatible headers.

In addition, there is an attached on-board debugger and programmer “Nu-Link2-Me”. The Nu-Link2-Me supports on-chip debugging, online and offline ICP programming via SWD interface. The Nu-Link2-Me supports virtual COM (VCOM) port for printing debug messages on PC. Besides, the programming status could be shown on the built-in LEDs. Lastly, the Nu-Link2-Me could be detached from the evaluation board and become a stand-alone mass production programmer.

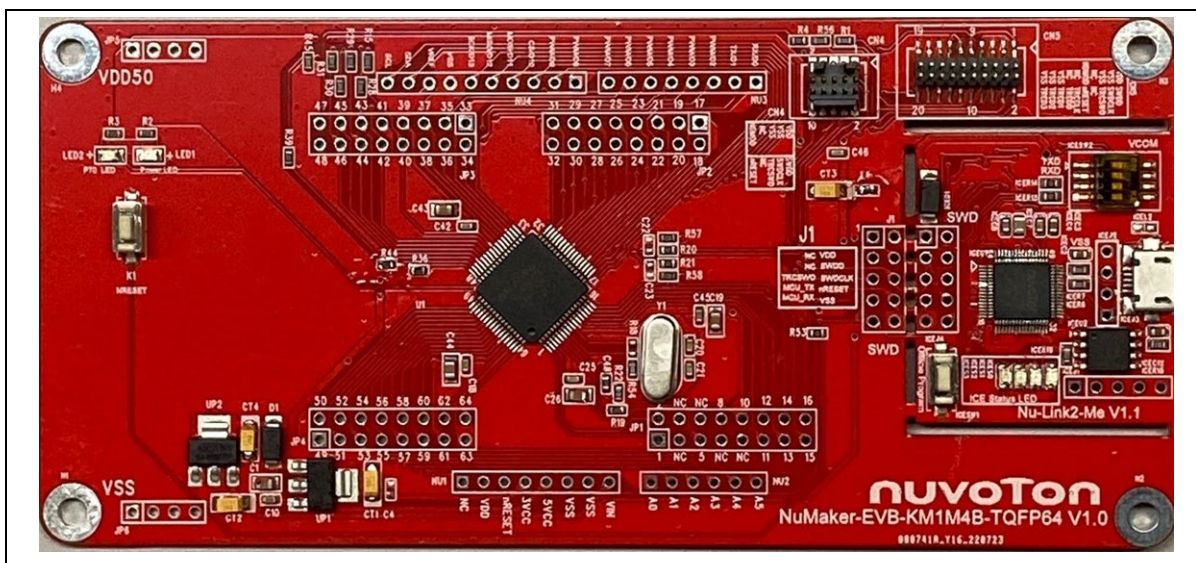


Figure 1-1 NuMaker-EVB-KM1M4B-TQFP64 Evaluation Board

2 FEATURES

- KM1M4BF54K microcontroller with function compatible with:
 - KM1M4BF54G
 - KM1M4BF54K
- KM1M4BF54K extension connectors
- Arduino UNO compatible extension connectors
- Flexible board power supply:
 - External V_{DD} power connector
 - Arduino UNO compatible extension connector V_{in}
 - ICE USB connector on Nu-Link2-Me
- On-board Nu-Link2-Me debugger and programmer:
 - Debug through SWD interface
 - Online/offline programming
 - Virtual COM port function
- Embedded Trace Macrocell (ETM) facilities

3 HARDWARE CONFIGURATION

3.1 Front View

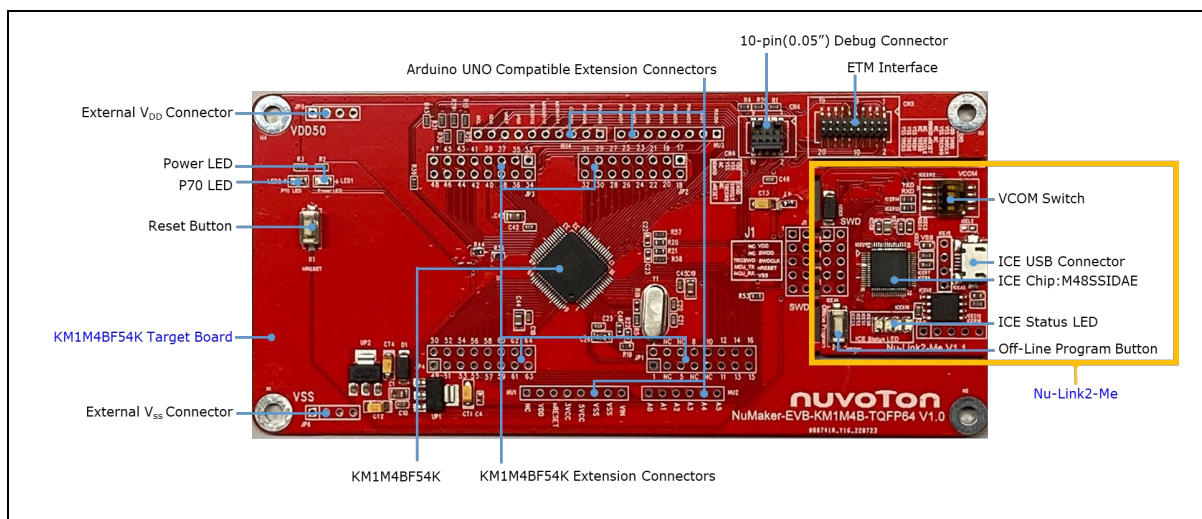


Figure 3-1 Front View of NuMaker-EVB-KM1M4B-TQFP64

Figure 3-1 shows the main components and connectors from the front side of NuMaker-EVB-KM1M4B-TQFP64. The following lists components and connectors from the front view:

- Target chip: KM1M4BF54K (U1)
- Arduino UNO Compatible Extension Connectors (NU1, NU2, NU3, NU4)
- KM1M4BF54K Extension Connectors (JP1, JP2, JP3 and JP4)
- External V_{DD} Power Connector (JP5)
- External V_{SS} Power Connector (JP6)
- Reset Button (K1)
- Power LED and P70 LED (LED1 and LED2)
- Embedded Trace Macrocell (ETM) facilities
- 10-pin(0.05") Arm® Cortex® Debug Connector
- Nu-Link2-Me
 - VCOM Switch
 - ICE Chip: M48SSIDAE (ICEU1)
 - ICE USB Connector (ICEJ3)
 - ICE Status LED (ICES0, ICES1, ICES2, ICES3)
 - Off-line Program Button (ICESW1)

3.2 Rear View

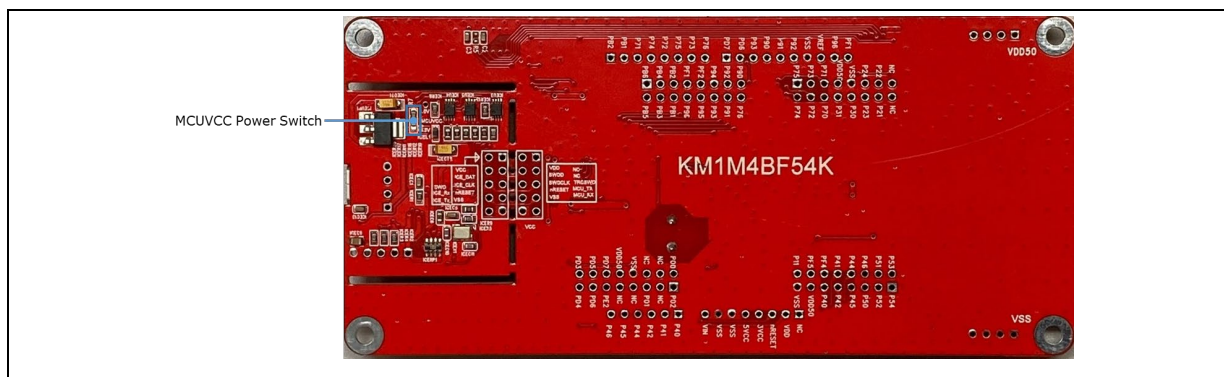


Figure 3-2 Rear View of NuMaker-EVB-KM1M4B-TQFP64

Figure 3-2 shows the main components and connectors from the rear side of NuMaker-EVB-KM1M4B-TQFP64. The following lists components and connectors from the rear view:

- Nu-Link2-Me
 - MCVCC Power Switch (R6, R7)

3.3 Extension Connectors

Table 3-1 presents the extension connectors.

Connector	Description
JP1, JP2, JP3 and JP4	Full pins extension connectors on the NuMaker-EVB-KM1M4B-TQFP64.
NU1, NU2, NU3 and NU4	Arduino UNO compatible pins on the NuMaker-EVB-KM1M4B-TQFP64.

Table 3-1 Extension Connectors

3.3.1 Pin Assignment for Extension Connectors

The NuMaker-EVB-KM1M4B-TQFP64 provides the KM1M4BF54K onboard and extension connectors (JP1, JP2, JP3 and JP4). Figure 3-3 shows the KM1M4BF54K extension connectors.

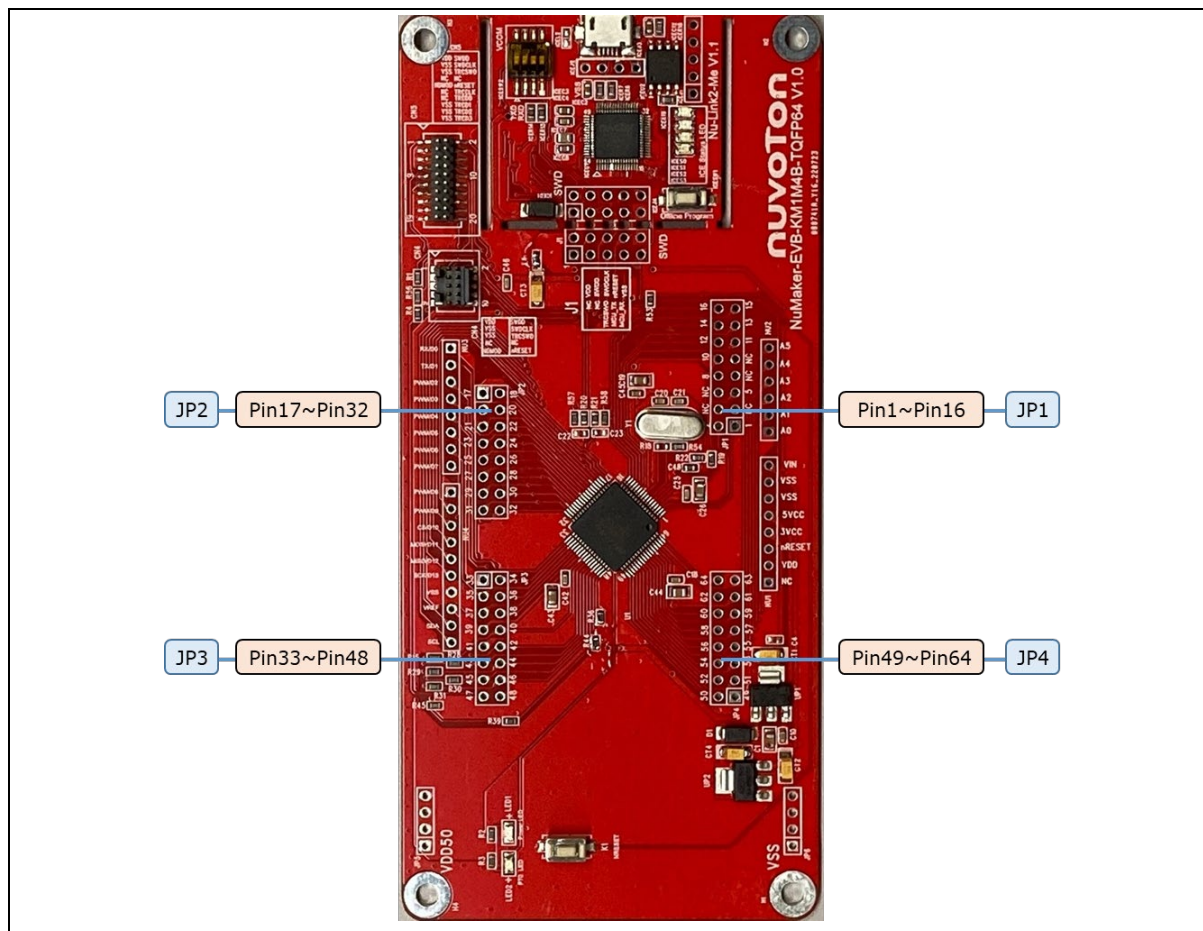


Figure 3-3 KM1M4BF54K Extension Connectors

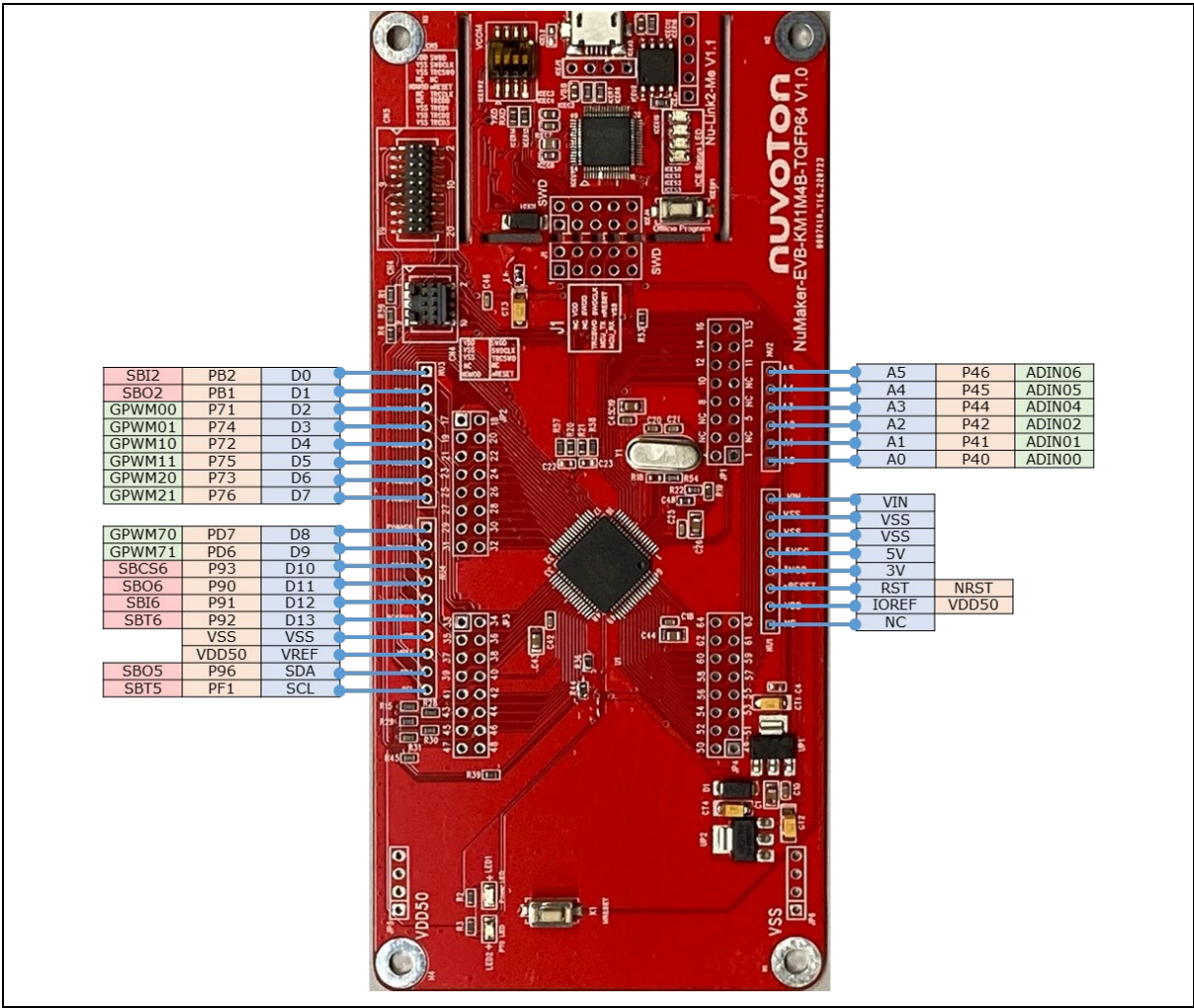
Header		KM1M4BF54K	
		Pin No.	Function
JP1	JP1.1	1	P02/ADST0/SBO4/SBI4/SBCS1/TM15B/IRQ05
	JP1.2	2	P00/ADST1/SBO4/SBI4/IRQ02
	JP1.3	3	N.C.
	JP1.4	4	N.C.
	JP1.5	5	P01/ADST2/SBT4/GPWMST6/IRQ15/IRQ04
	JP1.6	6	N.C.
	JP1.7	7	N.C.
	JP1.8	8	VSS
	JP1.9	9	N.C.
	JP1.10	10	VDD50
	JP1.11	11	PE2/IRQ13/NMI
	JP1.12	12	PD7/TM14A/IRQ35/IRQ31/GPWM70
	JP1.13	13	PD6/ADST0/SBCS3/SBCS1/TM15A/TM01A/IRQ05/GPWM71
	JP1.14	14	PD5/SBT1/SBO1/SBI1/IRQ36/IRQ30/IRQ03
	JP1.15	15	PD4/SBT1/SBO1/TM06B/TM00B/IRQ02
	JP1.16	16	PD3/SBO1/SBI1/TM00A
JP2	JP2.1	17	PB6/SWDCLK/SBT0/SBO0/SBI0/IRQ05/GPWM71
	JP2.2	18	PB5/SWDD/SBO0/SBI0/GPWM61
	JP2.3	19	PB4/SBCS0/IRQ12/IRQ03/GPWM70
	JP2.4	20	PB3/CKMREF/SBT3/SBT2/TM10A/GPWM60
	JP2.5	21	PB2/SBO2/SBI2/TM10B/IRQ30
	JP2.6	22	PB1/SBT2/SBO2/SBI2/TM11A/TM00B
	JP2.7	23	PF1/SBT5/TM02B/TM00A
	JP2.8	24	P96/SBO5/SBI5/GPWMST7/IRQ11/IRQ04
	JP2.9	25	PF2/SBO5/SBI5/IRQ37/IRQ20/IRQ14
	JP2.10	26	P95/GPWM30
	JP2.11	27	P94/GPWM40
	JP2.12	28	P93/SBCS6/GPWM50
	JP2.13	29	P92/SBT6/GPWM31
	JP2.14	30	P91/SBO6/SBI6/GPWM41
	JP2.15	31	P90/SBO6/SBI6/GPWM51
	JP2.16	32	P76/GPWM21/TM05A
JP3	JP3.1	33	P75/TM04A/GPWM11
	JP3.2	34	P74/TM03A/GPWM01
	JP3.3	35	P73/TM02A/GPWM20
	JP3.4	36	P72/TM01A/GPWM10
	JP3.5	37	P71/TM00A/GPWM00
	JP3.6	38	P70/IRQ05/IRQ10
	JP3.7	39	VDD50
	JP3.8	40	P31/IRQ06/IRQ36/TM10A/TM12A/TRCCLK
	JP3.9	41	VSS
	JP3.10	42	P30/IRQ07/TM06B/TM10B/TM12B/SBCS3/GPWMST0/GPWMST3/CMPOT10/CMPOT11/TRCSWO
	JP3.11	43	P24/TM02B/TM06A/SBT3/GPWMST1/GPWMST4/CMPOT00/CMPOT01/DAOT0/TRCD0
	JP3.12	44	P23/TM02A/TM07A/SBI3/SBO3/GPWMST2/GPWMST5/CMPOT10/CMPOT11/CKMREF/TRCD1
	JP3.13	45	P22/IRQ22/IRQ32/TM04A/TM13A/SBI3/SBO3/CMPOT00/CMPOT01/TRCD2
	JP3.14	46	P21/IRQ06/IRQ21/TM04B/TM11A/TM14A/ADIN21/CMPREF11/TRCD3
	JP3.15	-	N.C.
	JP3.16	-	N.C.

Header		KM1M4BF54K	
		Pin No.	Function
JP4	JP4.1	49	P54/IRQ02/ADIN12
	JP4.2	50	P53/IRQ01/ADIN11
	JP4.3	51	P52/IRQ00/ADIN10
	JP4.4	52	P51/IRQ33/ADIN09
	JP4.5	53	P50/ADIN08/VGAN1/CMPIN10/CMPREF10
	JP4.6	54	P46/ADIN06/VGAP10/CMPIN11
	JP4.7	55	P45/ADIN05/VGAP11/CMPIN00/CMPIN01
	JP4.8	56	P44/ADIN04/VGAP12/CMPIN10/CMPIN11
	JP4.9	57	P42/ADIN02/VGAP02
	JP4.10	58	P41/ADIN01/VGAP01
	JP4.11	59	P40/ADIN00/VGAP00/CMPIN01
	JP4.12	60	PF4/ADIN22/VGAN0/CMPIN00/CMPREF00
	JP4.13	61	VDD50
	JP4.14	62	PF5/IRQ34/TM03B/TM12B/GPWM01
	JP4.15	63	VSS
	JP4.16	64	P11/IRQ01/TM03A/TM12A/GPWM00

Table 3-2 KM1M4BF54K Full-pin Extension Connectors and GPIO Function List

3.3.2 Arduino UNO Compatible Extension Connectors

Figure 3-4 shows the Arduino UNO compatible extension connectors.



Header		NuMaker-EVB-KM1M4B-TQFP64		Header		NuMaker-EVB-KM1M4B-TQFP64	
		Compatible to Arduino UNO	GPIO Pin of KM1M4BF54K			Compatible to Arduino UNO	GPIO Pin of KM1M4BF54K
NU3	NU3.1	D0	PB2	NU2	NU2.6	A5	P46
	NU3.2	D1	PB1		NU2.5	A4	P45
	NU3.3	D2	P71		NU2.4	A3	P44
	NU3.4	D3	P74		NU2.3	A2	P42
	NU3.5	D4	P72		NU2.2	A1	P41
	NU3.6	D5	P75		NU2.1	A0	P40
	NU3.7	D6	P73	NU1	NU1.8	VIN	-
	NU3.8	D7	P76		NU1.7	VSS	
NU4	NU4.1	D8	PD7		NU1.6	VSS	
	NU4.2	D9	PD6		NU1.5	5V	
	NU4.3	D10	P93		NU1.4	3V	
	NU4.4	D11	P90		NU1.3	RST	NRST
	NU4.5	D12	P91		NU1.2	IOREF	VDD
	NU4.6	D13	P92		NU1.1	NC	-
	NU4.7	VSS	VSS				
	NU4.8	VREF	AVDD				
	NU4.9	SDA	P96				
	NU4.10	SCL	PF1				

Table 3-3 Arduino UNO Extension Connectors and KM1M4BF54K Mapping GPIO List

3.4 Power Supply Configuration

The NuMaker-EVB-KM1M4B-TQFP64 is able to adopt multiple power supplies. External power sources include NU1 Vin (7 V to 12 V), V_{DD} (depending on the target chip operating voltage), and PC through USB connector. By using switches and voltage regulator, multiple power domains can be created on the NuMaker-EVB-KM1M4B-TQFP64.

3.4.1 VIN Power Source

Table 3-4 presents the Vin power source.

Connector	Net Name in Schematic	Description
NU1 pin8	NU1_VIN	Board external power source, with voltage range from 7 V to 12 V. The voltage regulator UP2 converts the NU1 pin8 input voltage to 5 V and supplies it to VDD5V (NU1 pin5).

Table 3-4 Vin Power Source

3.4.2 5 V Power Sources

Table 3-5 presents the 5 V power sources.

Connector	Net Name in Schematic	Description
ICEJ3	USB-5V	ICE USB connector supplies 5 V power from PC to KM1M4BF54K target board and Nu-Link2-Me.
NU1 pin5	VDD5V	ICEJ3 or NU1 pin8 supplies 5 V power to NU1 pin5. NU1 pin5 supplies 5 V power to target chip or Arduino adapter board.

Table 3-5 5 V Power Sources

3.4.3 3.3 V Power Sources

Table 3-6 presents the 3.3 V power sources.

Voltage Regulator	5 V Source	Description
ICEUP1	USB-5V	ICEUP1 converts USB-5V to 3.3 V and supplies 3.3 V to KM1M4BF54K target board or ICE chip. Note: KM1M4BF54K operating voltage range is 5V.

Table 3-6 3.3 V Power Sources

3.4.4 Power Connectors

Table 3-7 presents the power connectors.

Connector	Description
JP5	V _{DD} connector on the NuMaker-EVB-KM1M4B-TQFP64. Note: KM1M4BF54K operating voltage range is 5V.
JP6	V _{SS} connector on the NuMaker-EVB-KM1M4B-TQFP64.

Table 3-7 Power Connectors

3.4.5 USB Connectors

Table 3-8 presents the USB connectors.

Connector	Description
ICEJ3	ICE USB connector on Nu-Link2-Me for power supply, debugging and programming from PC.

Table 3-8 USB Connectors

3.4.6 Power Switches

Table 3-9 presents the power switches.

Switch	Description
R6, R7	Configures the target chip operating voltage at 5 V / 3.3 V. Note: KM1M4BF54K operating voltage range is 5V.

Table 3-9 Power Switches

3.4.7 Power Supply Models

3.4.7.1 External Power Supply through Nu-Link2-Me to Target Chip

The external power supply source on Nu-Link2-Me is shown in Figure 3-5.

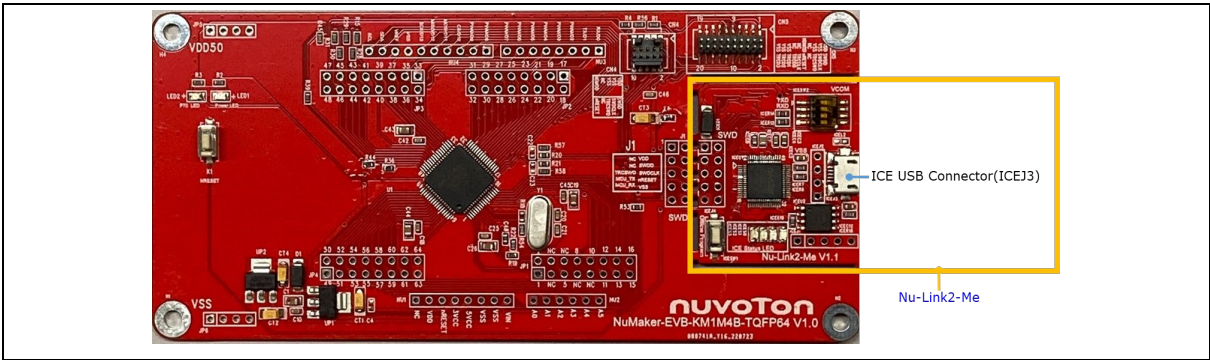


Figure 3-5 External Power Supply Sources on Nu-Link2-Me

To use ICEJ3 as external power supply source with Nu-Link2-Me, please follow the steps below:

1. Solder the resistor on R7 (USB-5V) depending on the KM1M4BF54K chip operating voltage.
Do not solder resistors on R6 (3.3V).
2. Connect the external power supply to ICEJ3.

Table 3-10 presents all power models when supplying external power through Nu-Link2-Me.

The Nu-Link2-Me external power sources are highlighted in yellow.

Model	Target Chip Voltage	ICEJ3	R6 or R7 (MCU_5V) Selection ^[1]	ICE Chip Voltage	Vin	JP5
1	5 V	Connect to PC	5 V (default)	3.3 V	-	5 V output
	Note: 1. 0 Ω should be soldered on R7. 2. -: Unused					

Table 3-10 Supply External Power through Nu-Link2-Me

3.4.7.2 External Power Supply through KM1M4BF54K target board to Target Chip

The external power supply sources on KM1M4BF54K target board are shown in Figure 3-6.

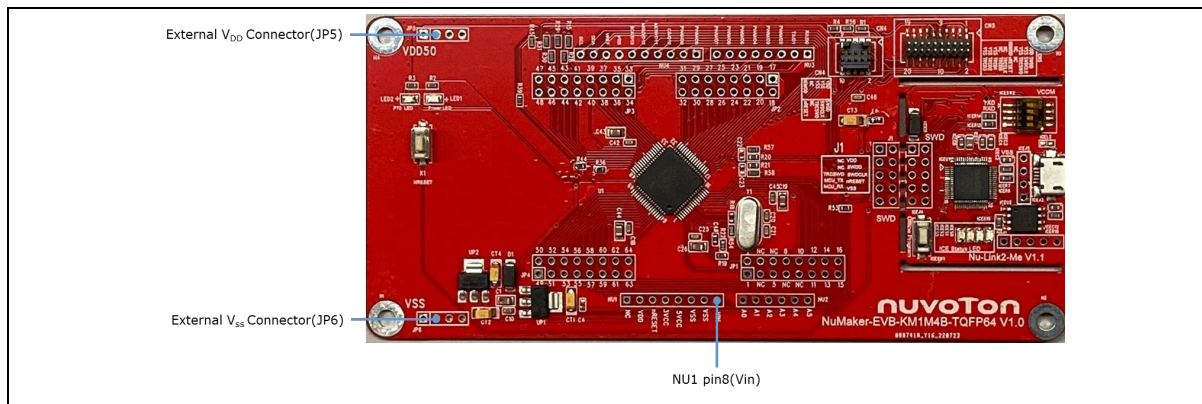


Figure 3-6 External Power Supply Sources on KM1M4BF54K Target Board

To use Vin as external power supply source, please follow the steps below:

1. Remove the resistor on R6 and R7.
2. Connect ICEJ3 to PC.
3. Connect the external power supply to Vin.

To use JP5 as external power supply source, please follow the steps below:

1. Remove the resistor on R6 and R7.
2. Connect ICEJ3 to PC.
3. Connect the external power supply to JP5.

To use Vin as external power supply source with Nu-Link2-Me detached from NuMaker-EVB-KM1M4B-TQFP64, please follow the steps below:

1. Detach the Nu-Link2-Me from NuMaker-EVB-KM1M4B-TQFP64.
2. Connect the external power supply to Vin .

To use JP5 as external power supply source with Nu-Link2-Me detached from NuMaker-EVB-KM1M4B-TQFP64, please follow the steps below:

1. Detach the Nu-Link2-Me from NuMaker-EVB-KM1M4B-TQFP64.
2. Connect the external power supply to JP5.

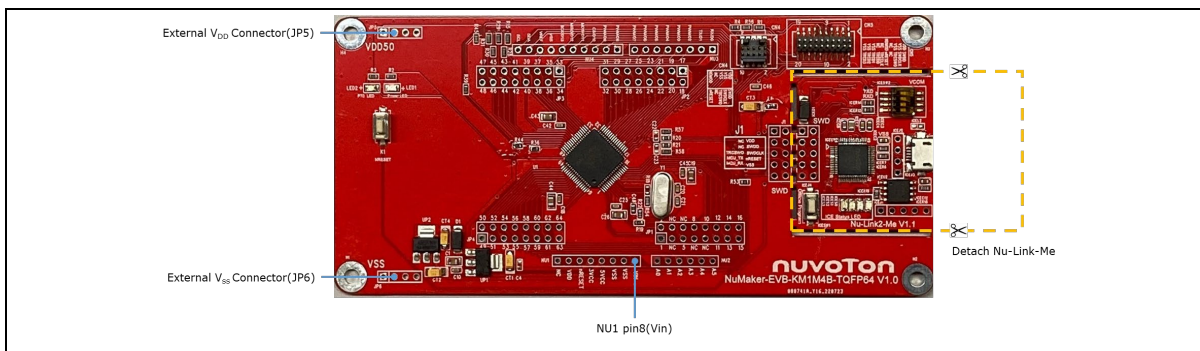


Figure 3-7 Detach the Nu-Link2-Me from NuMaker-EVB-KM1M4B-TQFP64

Table 3-11 presents all power models when supplies external power through KM1M4BF54K target board. The KM1M4BF54K target board external power sources are highlighted in yellow.

Model	Target Chip Voltage	Vin ^[1]	ICEJ3	JP5 ^[2]	R6 or R7(MCU_5V) Selection ^[3]	ICE Chip Voltage
2	5 V	7 V ~ 12 V Input	Connect to PC	5 V output	Remove resistor	3.3 V
3	5V	7 V ~ 12 V Input	Nu-Link2-Me removed	5 V output	-	-
4	5V	-	Connect to PC	DC Input 5 V	Remove resistor	3.3 V
5	5 V	-	Nu-Link2-Me removed	DC Input 5 V	-	-

Note:

1. The Vin input voltage will be converted by voltage regulator UP2 to 5 V. Supplying external power to Vin can provide 5 V to NU1 pin5 (VDD5V) and 3.3 V to NU1 pin4 (VCC33).
2. JP5 external power input only provides voltage to target chip.
3. 0 Ω should be removed resistor R7.
4. -: Unused

Table 3-11 Supply External Power for KM1M4BF54K Target Board

3.5 Push Buttons

Table 3-12 presents the push buttons.

Component	Description
ICESW1	Offline program button to start offline ICP programming the target chip.
K1	Reset button to reset the target chip.

Table 3-12 Push-Buttons

3.6 LEDs

Table 3-13 presents the LEDs.

Component	Description
Power LED	The power LED indicates that the NuMaker-EVB-KM1M4B-TQFP64 is powered.
P70 LED	The LED is connected to the target chip 38pin(P70).
ICES0, ICES1, ICES2 and ICES3	Nu-Link2-Me status LED.

Table 3-13 LEDs

3.7 Debug Connector

Table 3-134 presents the debug connector.

Component	Description
CN4	CN4 is a 10pin(1.27 mm pitch) connector for connecting other vendor's debug adapters.
CN5	CN5 is a 20pin(1.27 mm pitch) ETM connector for connecting other vendor's debug adapters(ETM support).

Table 3-14 Debug Connector

When connecting the debug adapters to CN4 or CN5 and applying voltage from the debug adapters to the target board, check the voltage specifications of the debug adapters and Detach the Nu-Link2-Me from the NuMaker-EVB-KM1M4B-TQFP64 or remove R6, and then use it.

3.8 Nu-Link2-Me

The Nu-Link2-Me is an attached on-board debugger and programmer. The Nu-Link2-Me supports on-chip debugging, online and offline ICP programming through SWD interface. The Nu-Link2-Me also supports virtual COM port (VCOM) for printing debug messages on PC. Besides, the programming status could be shown on the built-in LEDs. Lastly, the Nu-Link2-Me could be detached from the evaluation board and becoming a stand-alone mass production programmer. For more information about Nu-Link2-Me, please refer to *Nu-Link2-Pro Debugger and Programmer User Manual*.

3.8.1 VCOM Switches

Table 3-15 presents how to set the VCOM function by ICESW2.

ICESW2		
Pin	Function	Description
1	TXD	On: Connect target chip PD5 (SBO1) to Nu-Link2-Me. Off: Disconnect target chip PD5 (SBO1) to Nu-Link2-Me.
2	RXD	On: Connect target chip PD3 (SBI1) to Nu-Link2-Me. Off: Disconnect target chip PD3 (SBI1) to Nu-Link2-Me.
4	MSG	On: Normal ICE mode, user can debug and program via SWD interface. Off: Mass storage mode, user can update firmware by pulling bin file to drive.
Note: Pin 3 is unused.		

Table 3-15 VCOM Function of Nu-Link2-Me

3.8.2 Status LEDs

Table 3-16 presents the status LEDs patterns for different operation on Nu-Link2-Me.

Operation Status	Status LED			
	ICES0	ICES1	ICES2	ICES3
Boot	Flash x 3	Flash x 3	Flash x 3	Flash x 3
Idle	On	-	-	-
One Nu-Link2-Me is selected to connect	Flash x 3	Flash x 3	Flash x 3	On
ICE online (Not connected to a target chip)	On	-	Flash x 3	Flash x 3
ICE online (Connected to a target chip)	On	-	-	On
ICE online (Failed to connect to a target chip)	On	Any	Flash	On
During offline programming	-	On	-	Flash
Offline programming completed	On	-	-	-
Offline programming completed (Auto mode)	On	On	-	-
Offline programming failed	On	Flash	-	-
Note: "Online" means Nu-Link2-Me is connected to ICP Programming Tool, IDE or NuTool.				

Table 3-16 Operation Status LED Patterns

4 QUICK START

Toolchains and Nuvoton Nu-Link Driver is bellow. See [nuvoton site](http://www.nuvoton.com) for details

4.1 Toolchains Supporting

Install the preferred toolchain. Please make sure at least one of the toolchains has been installed.

- [KEIL MDK Nuvoton edition Cortex-M \(for Windows, Paid\)](#)
- [IAR EWARM \(Free/Paid\)](#)
- [NuEclipse GCC \(for Windows, nuvoton's IDE & NuLink Driver Site, Free\)](#)

4.2 Nuvoton Nu-Link Driver Installation

Download and install the latest Nuvoton Nu-Link Driver.

- Download and install [Nu-Link_Keil_Driver](#) when using Keil MDK.
- Download and install [Nu-Link_IAR_Driver](#) when using IAR EWARM.
- Download and install NuEclipse.

Please install the Nu-Link USB Driver as well at the end of the installation. The installation is presented in Figure 4-1 and Figure 4-2.

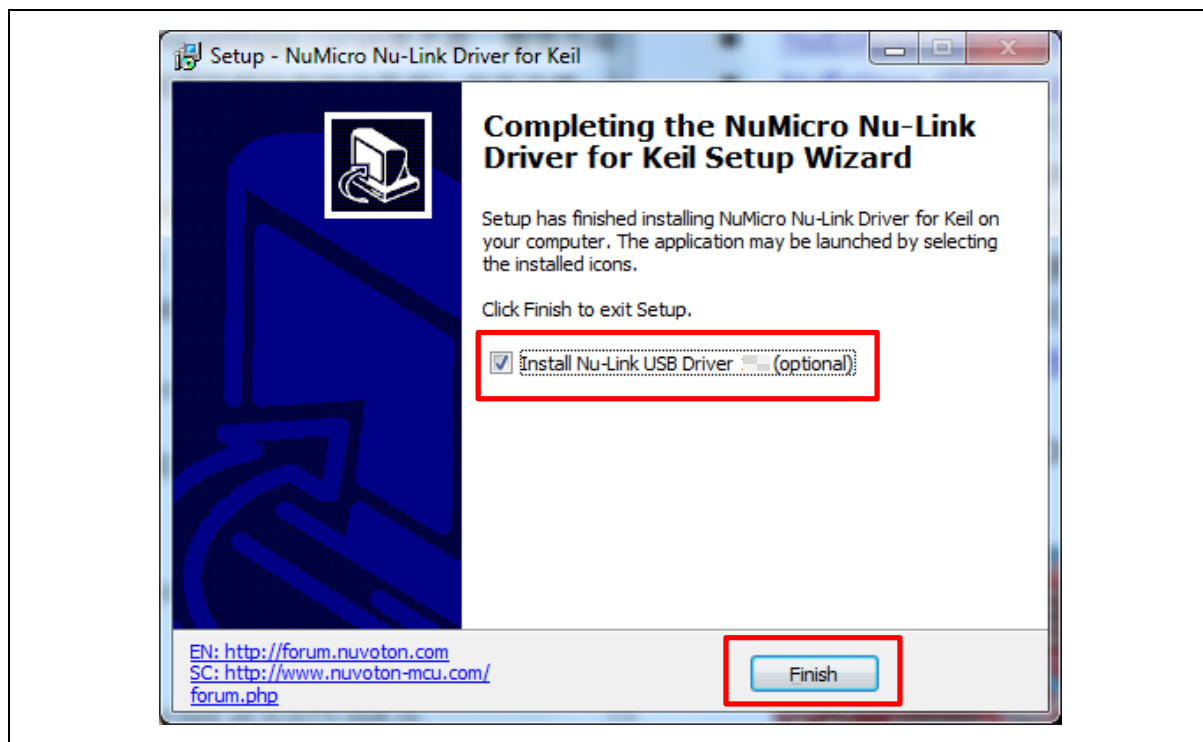


Figure 4-1 Nu-Link USB Driver Installation Setup



Figure 4-2 Nu-Link USB Driver Installation

4.3 BSP Firmware Download

Download and unzip the Board Support Package (BSP).

***Currently, it is not possible to download the BSP from the website, so please contact us for how to get it.**

4.4 Hardware Setup

1. Open the virtual COM (VCOM) function by changing Nu-Link2-Me VCOM Switch No. 1 and 2 to ON.

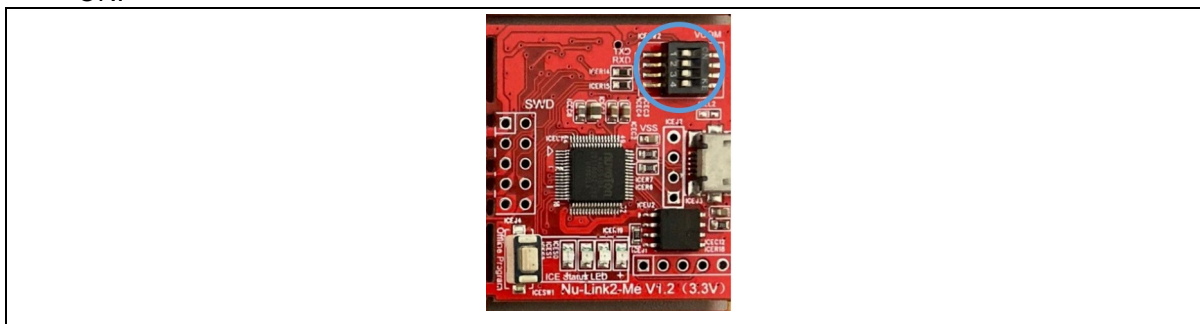


Figure 4-3 Open VCOM Function

2. Connect the ICE USB connector shown in Figure 4-4 to the PC USB port through a USB cable.

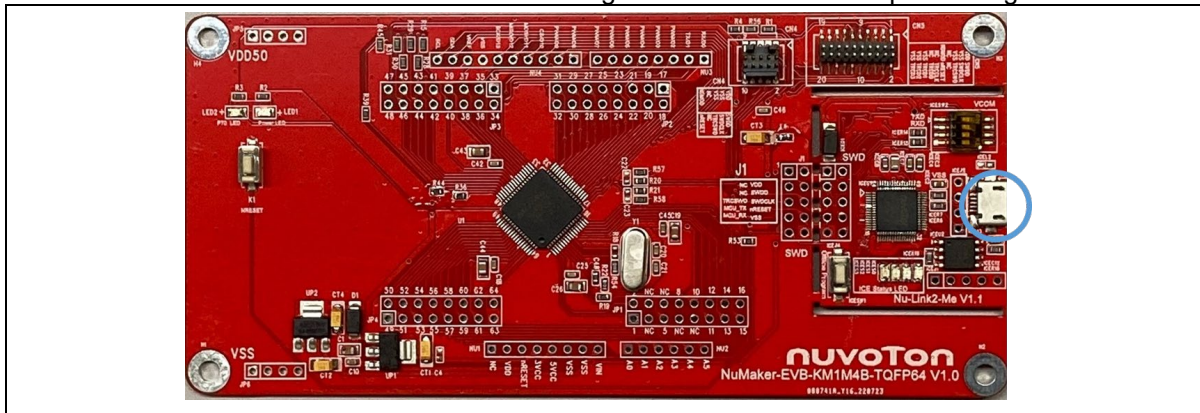


Figure 4-4 ICE USB Connector

- Find the “Nuvoton Virtual COM Port” on the Device Manger as Figure 4-5.

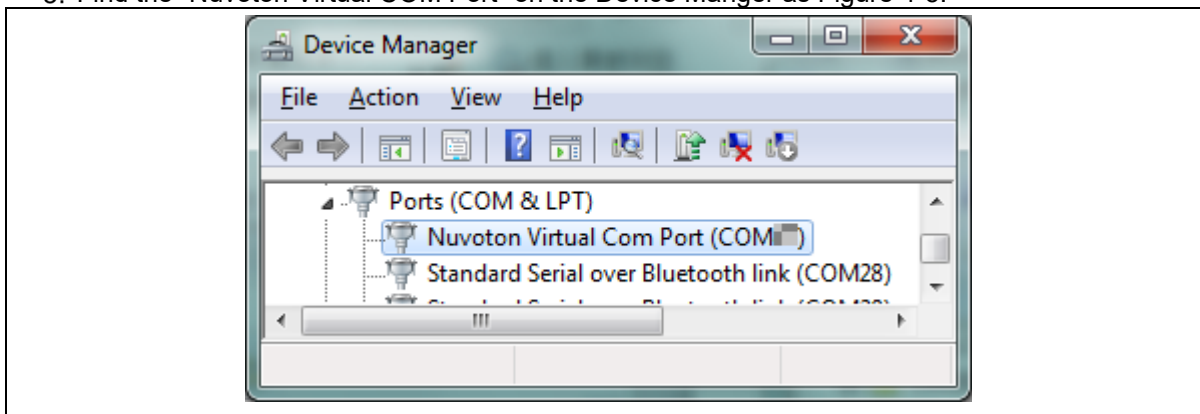


Figure 4-5 Device Manger

- Open a serial port terminal, PuTTY for example, to print out debug message. Set the speed to 115200. Figure 4-6 presents the PuTTY session setting.

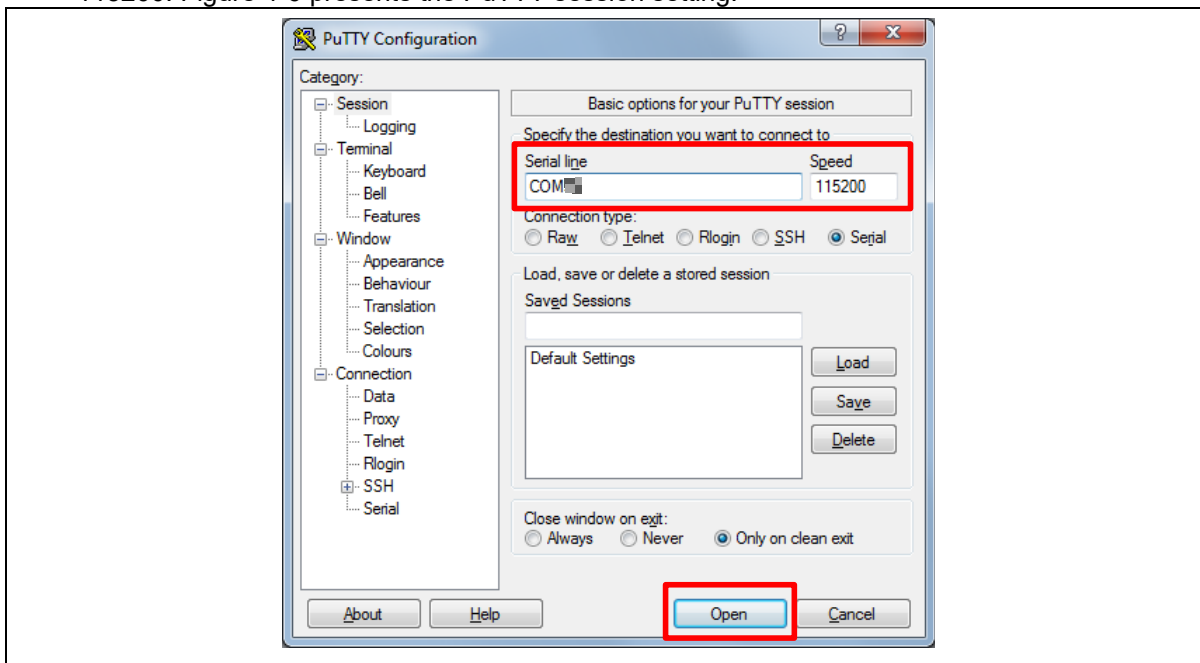


Figure 4-6 PuTTY Session Setting

4.5 Find the Example Project

Use the “Template” project as an example. The project can be found under the BSP folder as shown in Figure 4-7.



Figure 4-7 Template Project Folder Path

4.6 Execute the Project under Toolchains

Open and execute the project under the toolchain. The section 4.6.1, 4.6.2, and 4.6.3 describe the steps of executing project in Keil MDK, IAR EWARM and NuEclipse, respectively.

4.6.1 Keil MDK

This section provides steps to beginners on how to run a project by using Keil MDK.

1. Double-click the “Template.uvprojx” to open the project.
2. Make sure the debugger is “Nuvoton Nu-Link Debugger” as shown in Figure 4-8 and Figure 4-9.

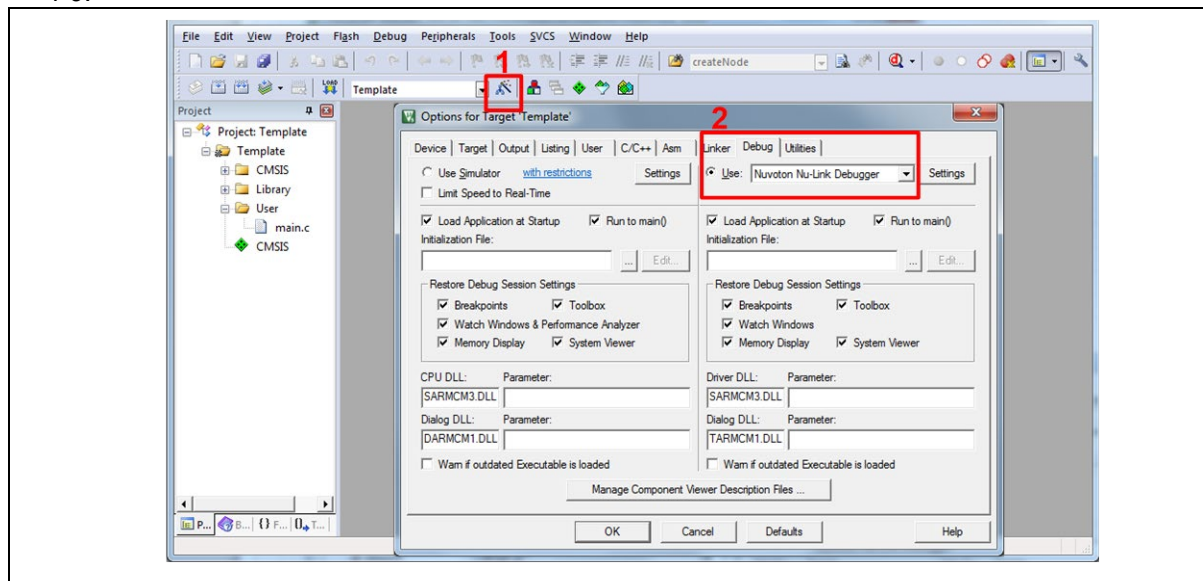


Figure 4-8 Debugger Setting in Options Window

Note: If the dropdown menu in Figure 4-8 does not contain “Nuvoton Nu-Link Debugger” item, please rework section 4.2.

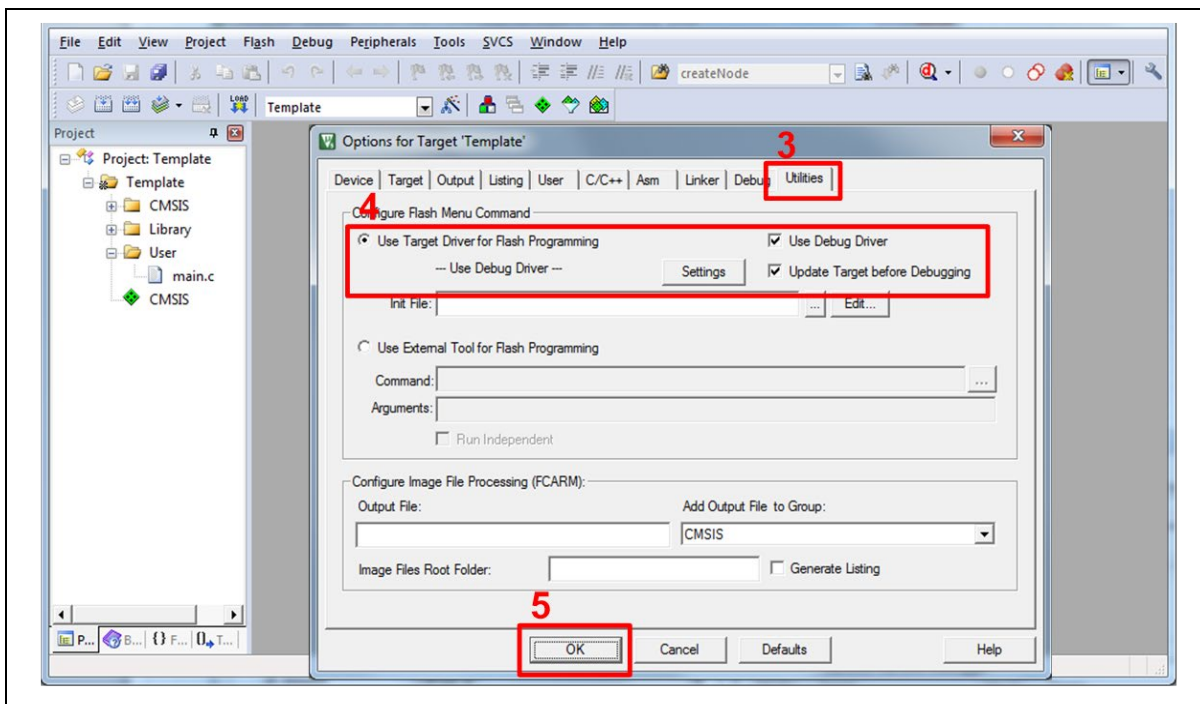


Figure 4-9 Programming Setting in Options Window

3. Rebuild all target files. After successfully compiling the project, download code to the Flash memory. Click **"Start/Stop Debug Section"** button to enter debug mode.

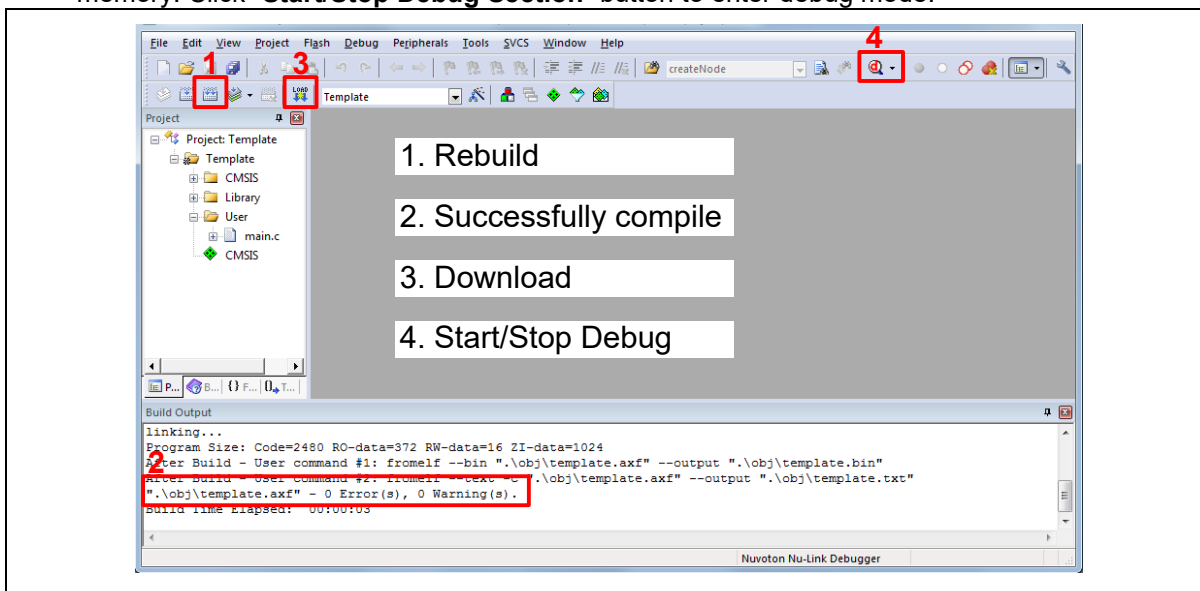


Figure 4-10 Compile and Download the Project

4. Figure 4-11 shows the debug mode under Keil MDK. Click **"Run"** and the debug message will be printed out as shown in Figure 4-12. User can debug the project under debug mode by checking source code, assembly language, peripherals' registers, and setting breakpoint, step run, value monitor, etc.

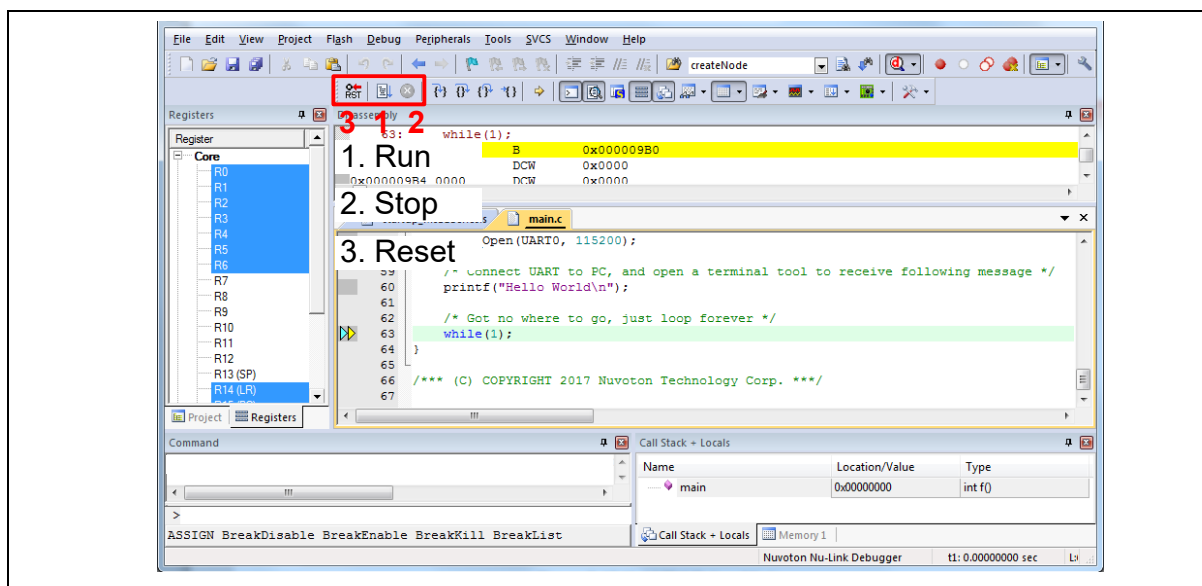


Figure 4-11 Keil MDK Debug Mode



Figure 4-12 Debug Message on Serial Port Terminal Windows

4.6.2 IAR EWARM

This section provides steps to beginners on how to run a project by using IAR EWARM.

1. Double click the “Template.eww” to open the project.
2. Make sure the toolbar contains “Nu-Link” item as shown in Figure 4-13.

Note: If the toolbar does not contain “Nu-Link” item, please rework section 4.2.

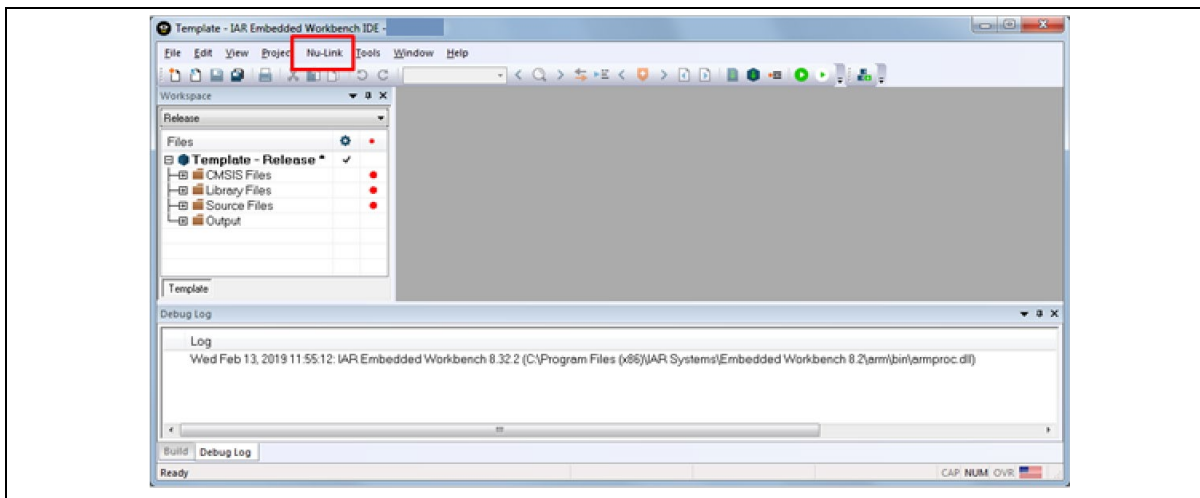


Figure 4-13 IAR EWARM Window

3. Make a target file as presented in Figure 4-14. After successfully compiling the project, download code to the Flash memory and enter debug mode.

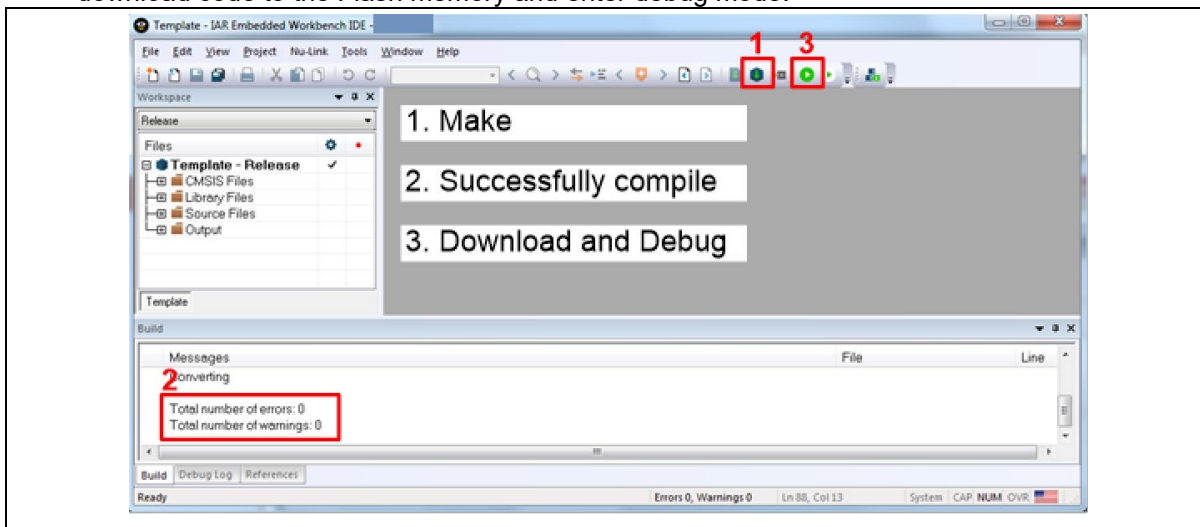


Figure 4-14 Compile and Download the Project

4. Figure 4-15 shows the debug mode under IAR EWARN. Click “Go” and the debug message will be printed out as shown in Figure 4-16. User can debug the project under debug mode by checking source code, assembly language, peripherals’ registers, and setting breakpoint, step run, value monitor, etc.

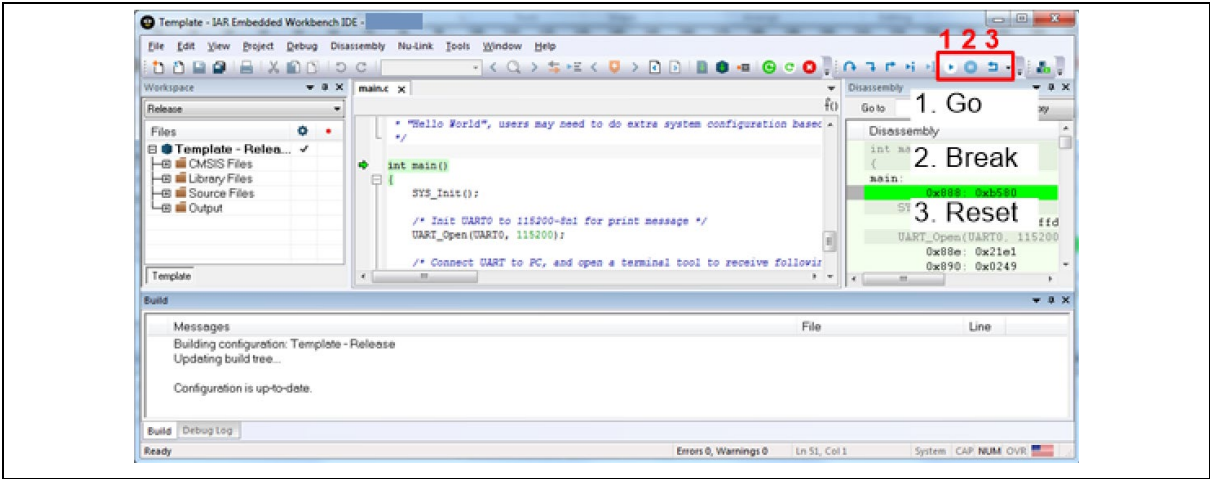


Figure 4-15 IAR EWARM Debug Mode

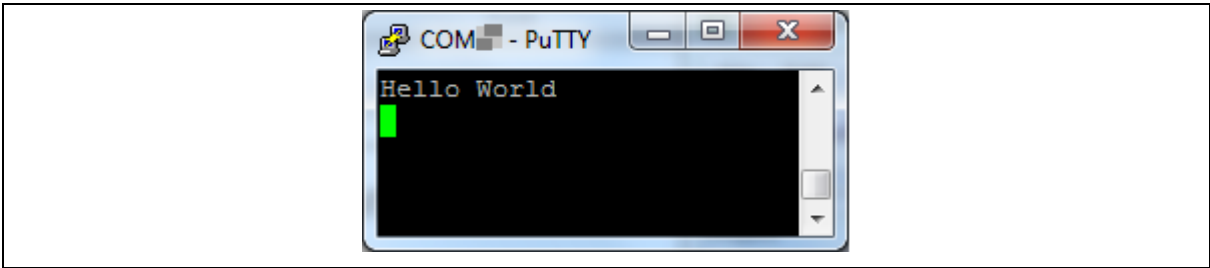


Figure 4-16 Debug Message on Serial Port Terminal Windows

4.6.3 NuEclipse

This section provides steps to beginners on how to run a project by using NuEclipse. Please make sure the filenames and project folder path contain neither invalid character nor space.

(See section 4.6.4 for NuMaker firmware updates.)

1. Double-click "NuEclipse.exe" to open the toolchain.
2. Import the "Template" project by following the steps presented in Figure 4-17 and Figure 4-18.

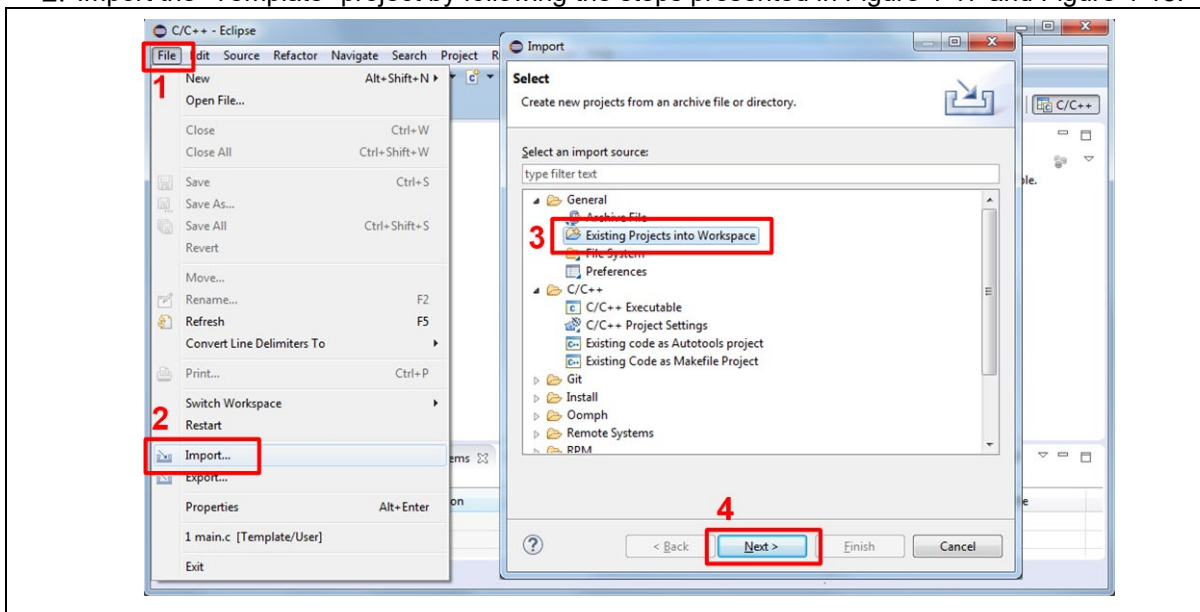


Figure 4-17 Import the Project in NuEclipse

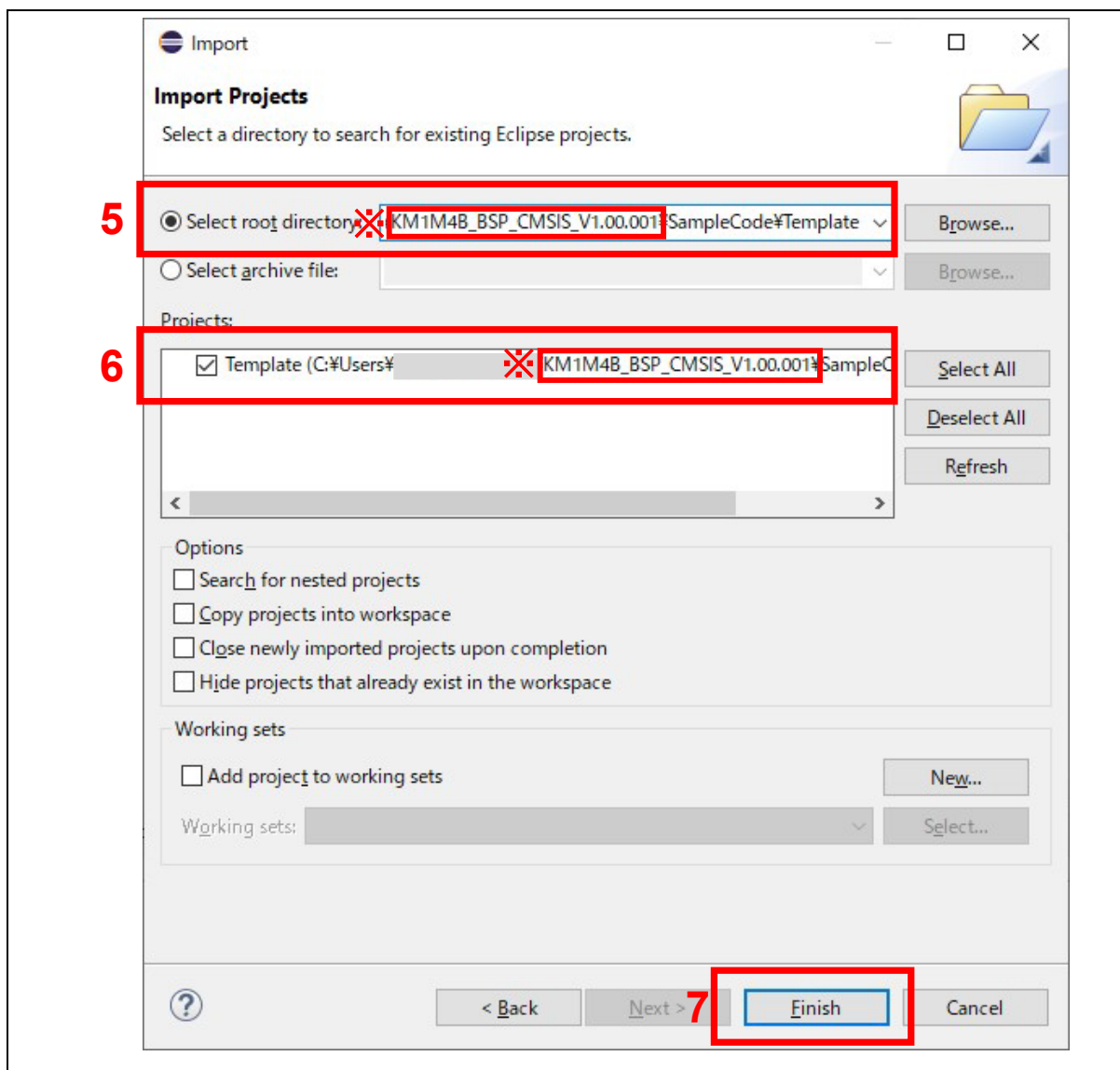


Figure 4-18 Import Projects Windows

- Click the “Template” project and find the project properties as shown in Figure 4-19. Make sure the settings are the same as settings in Figure 4-20.

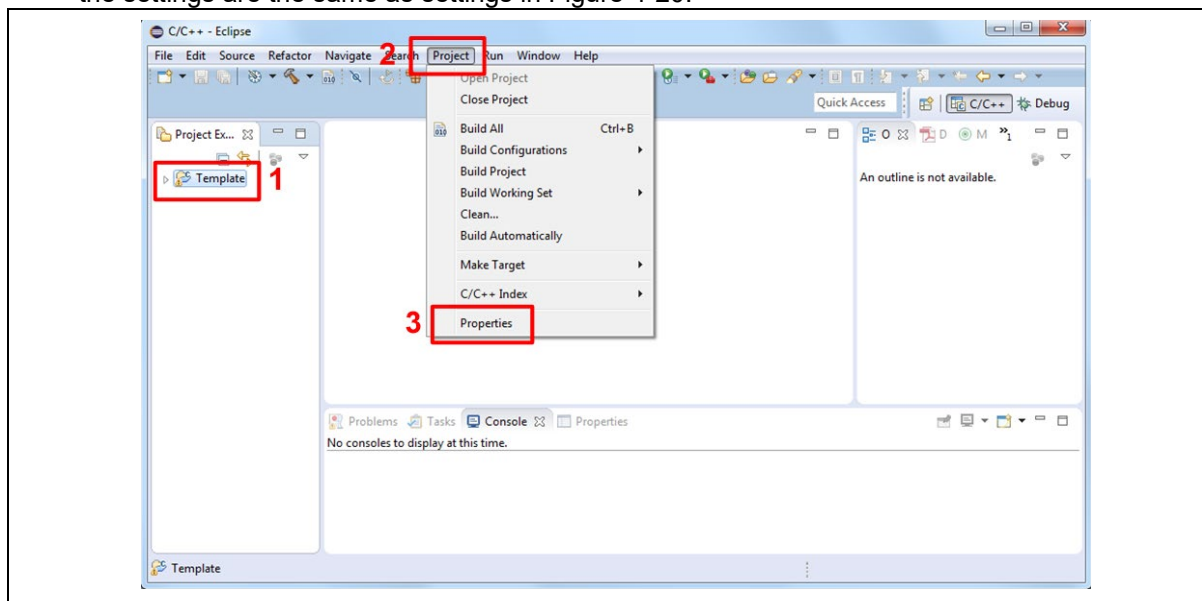


Figure 4-19 Open Project Properties Window

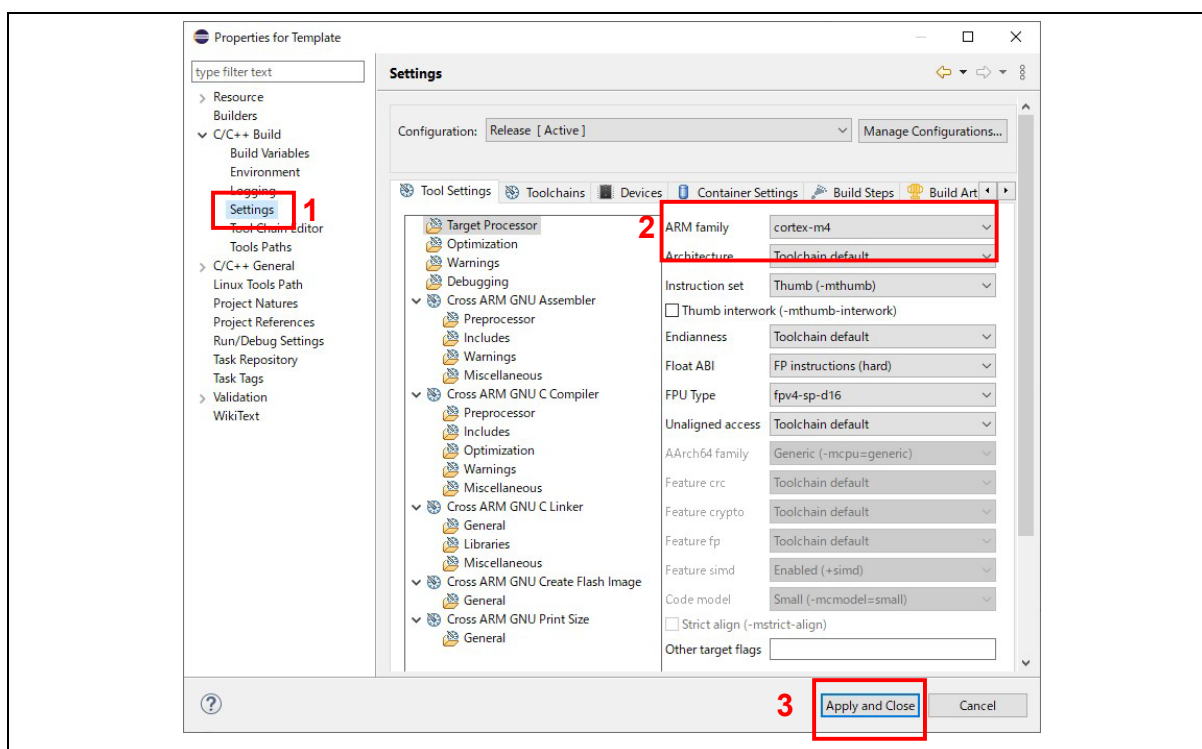


Figure 4-20 Project Properties Settings

4. Click the “Template” project and build the project.

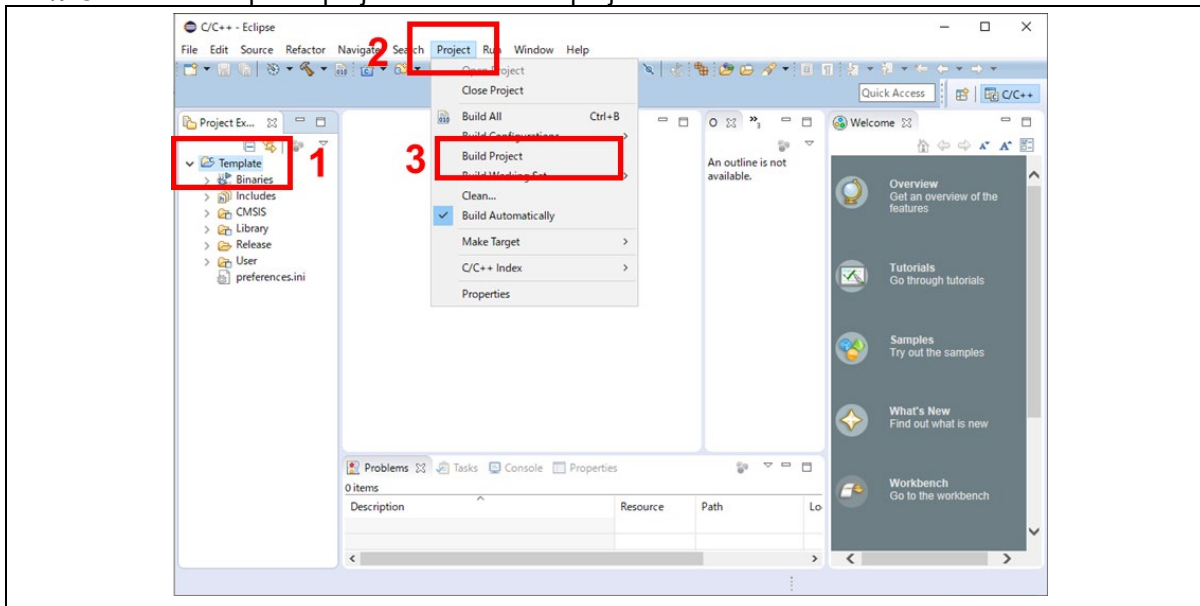


Figure 4-21 Build Project

5. After the project is built, click the “Template” project and set the “Debug Configuration” as shown in Figure 4-22. Follow the settings presented in Figure 4-23, Figure 4-24 and Figure 4-25 to enter debug mode.

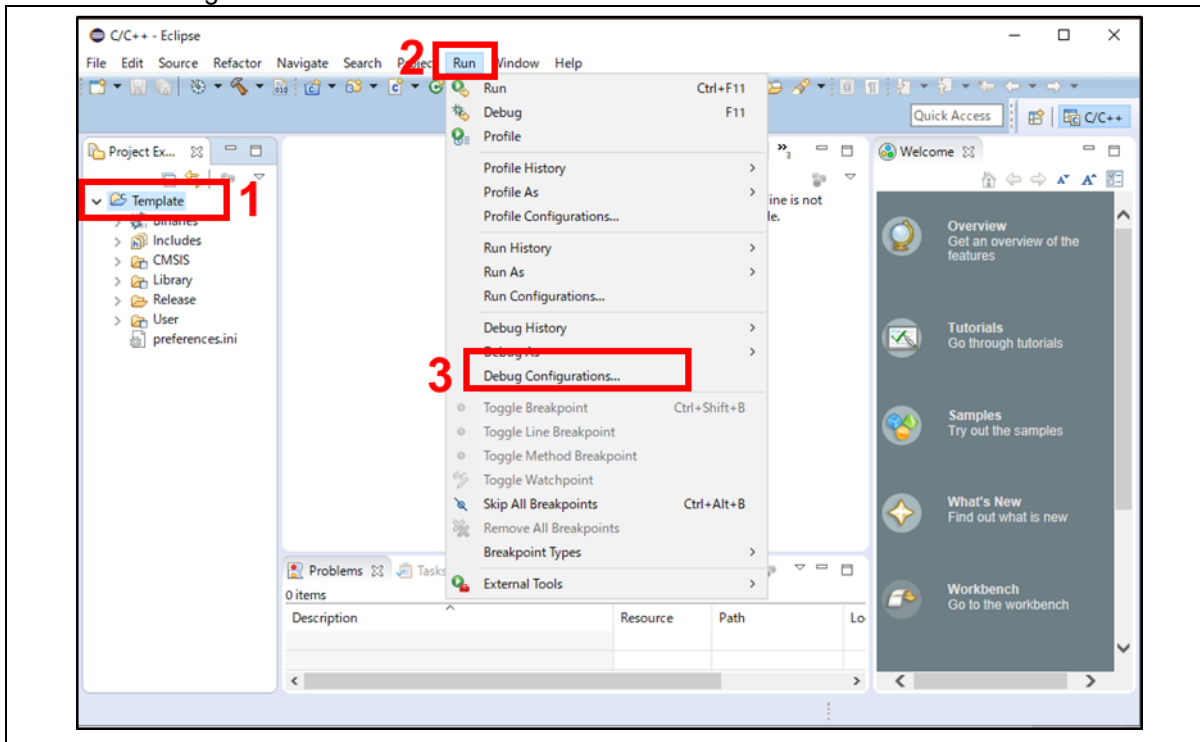


Figure 4-22 Open Debug Configuration

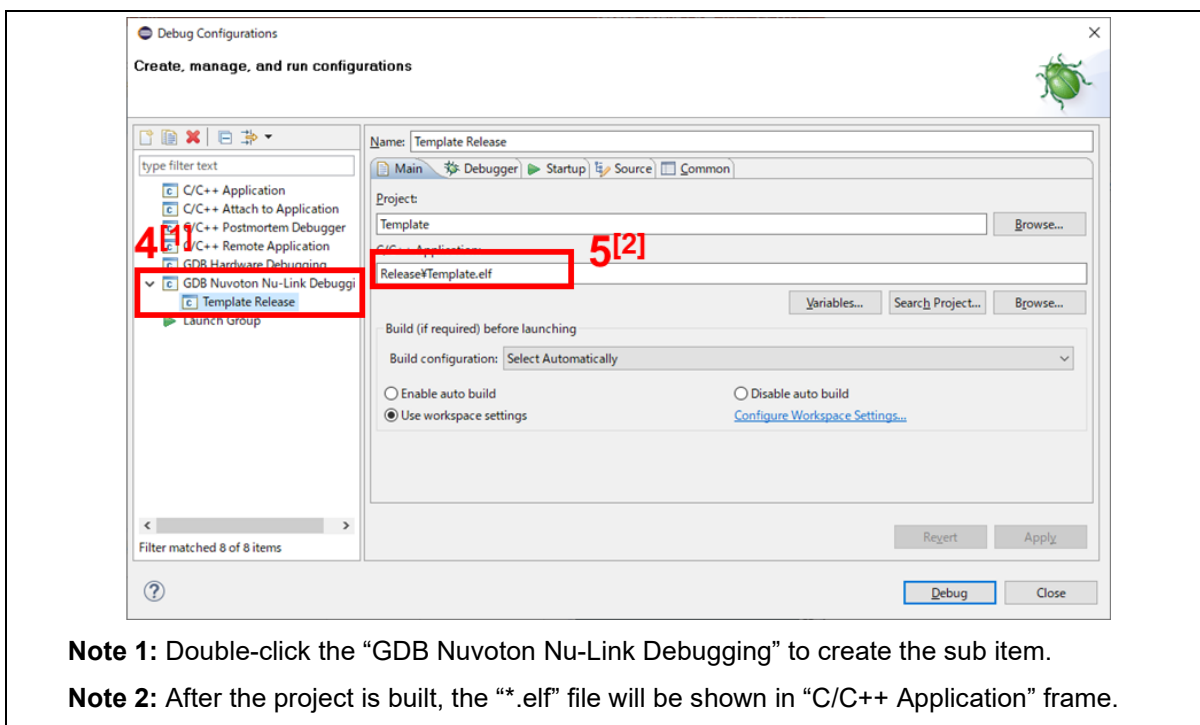


Figure 4-23 Main Tab Configuration

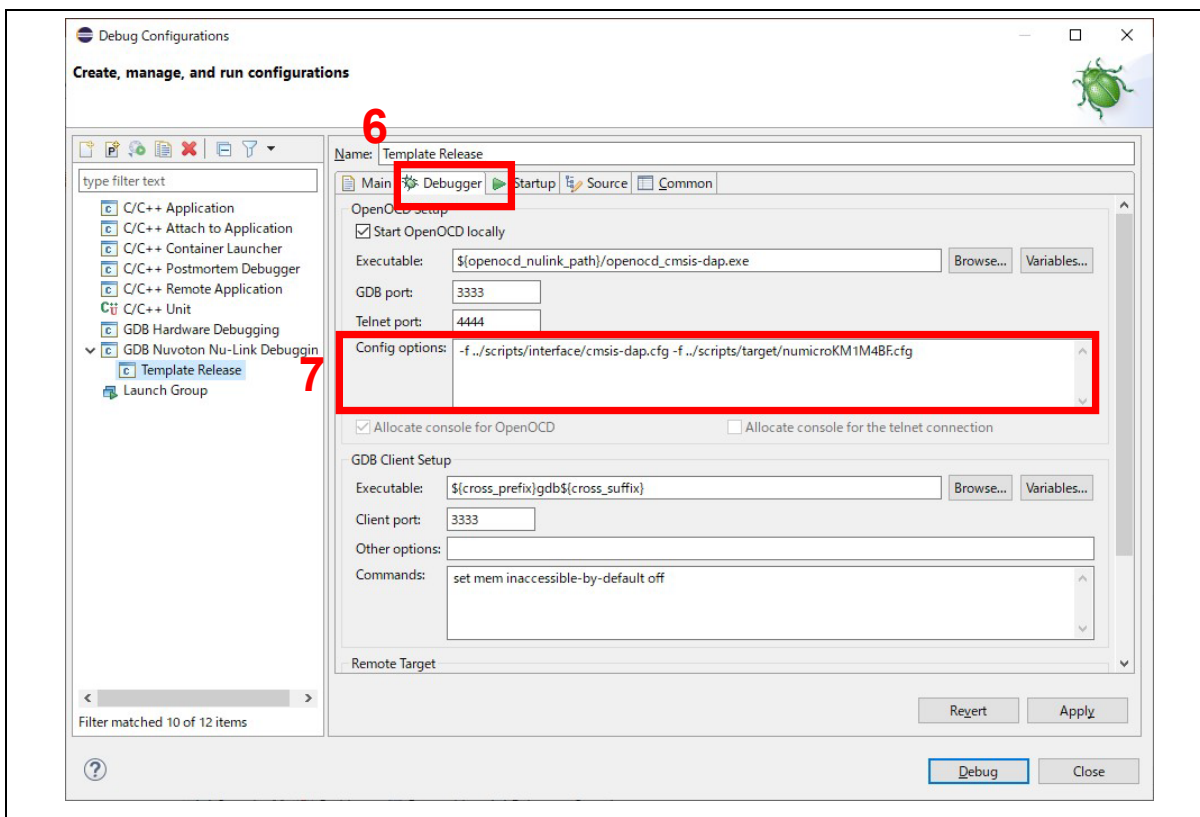


Figure 4-24 Debugger Tab Configuration

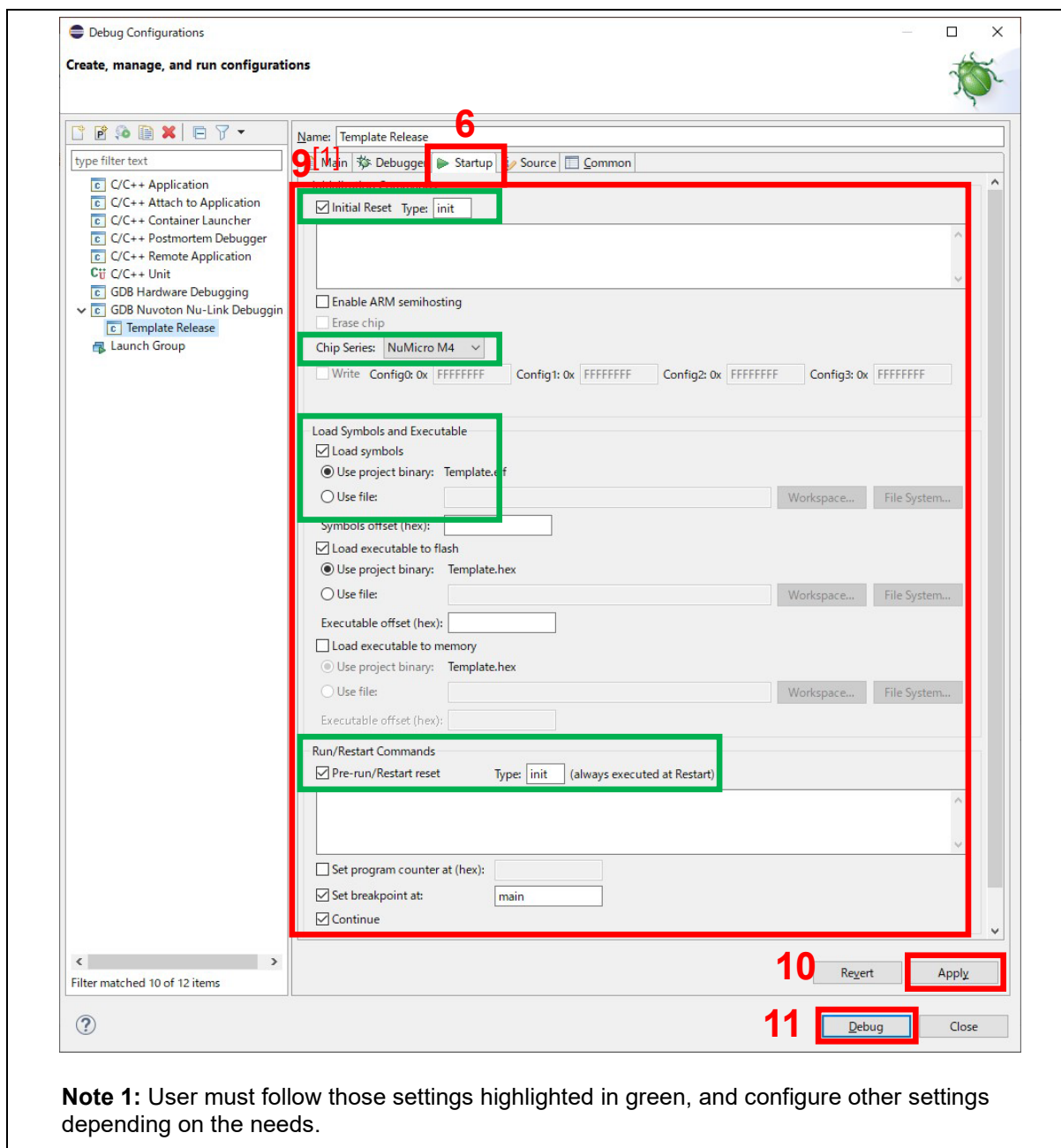


Figure 4-25 Startup Tab Configuration

6. Figure 4-26 shows the debug mode under NuEclipse. Click “**Resume**” and the debug message will be printed out as shown in Figure 4-27. User can debug the project under debug mode by checking source code, assembly language, peripherals’ registers, and setting breakpoint, step run, value monitor, etc. For more information about how to use NuEclipse, please refer to the *NuEclipse User Manual*.

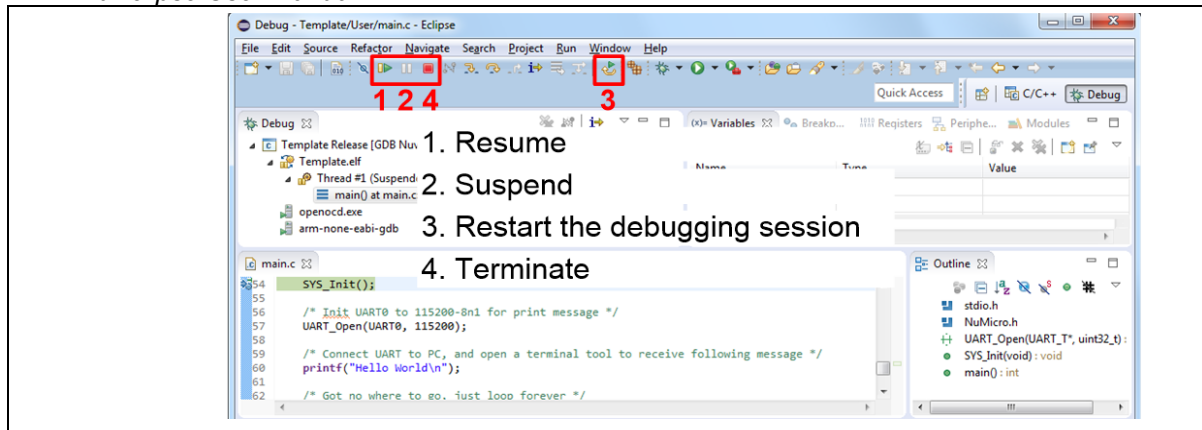


Figure 4-26 NuEclipse Debug Mode

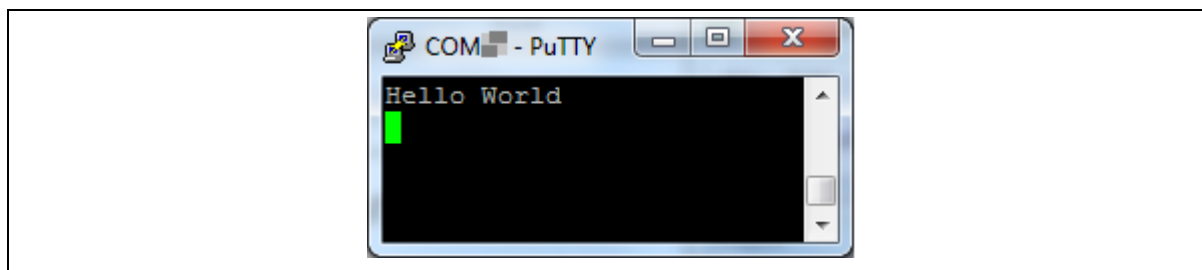


Figure 4-27 Debug Message on Serial Port Terminal Windows

4.6.4 NuMaker Firmware Update

This subsection provides steps of NuMaker Firmware Update. NuMaker Firmware Update are performed using ICP. Please make sure the filenames and project folder path contain neither invalid character nor space.

1. Download ICP from the URL below.
https://www.nuvoton.com/resource-download.jsp?tp_GUID=SW1720200221181328
2. Figure 4-28 shows the final screen of ICP installation. Installing ICP Check “Install Nu-Link USB Driver @.@@(Optional)” in the last Figure 4-28 and check the <Finish> button.

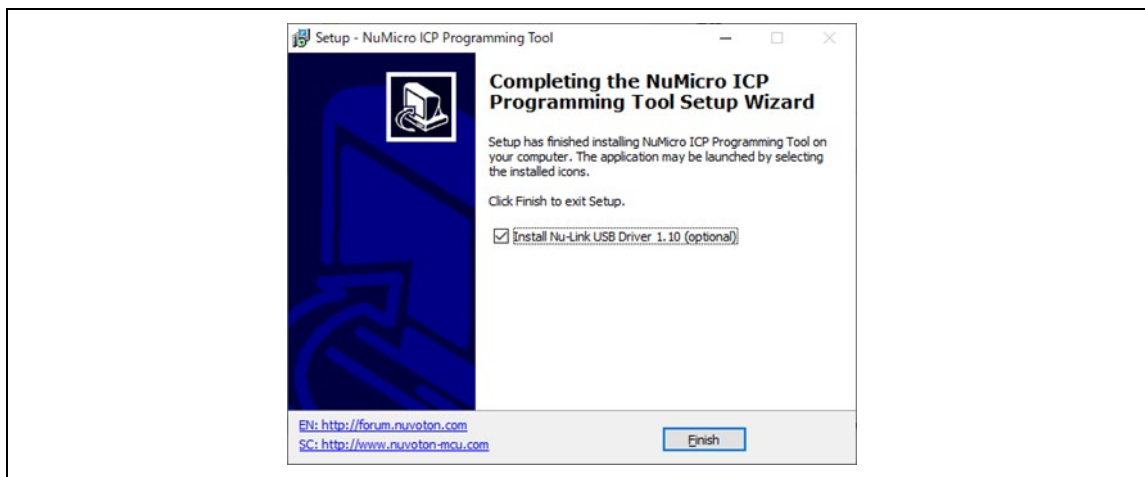


Figure 4-28 Final Screen of ICP Installation

3. Figure 4-29 shows ICP Settings. Start ICP with NuMaker connected, select the NuMaker MCU series in [MCU Series of Tool] on the screen shown in Figure 4-29, and click the <Continue> button.

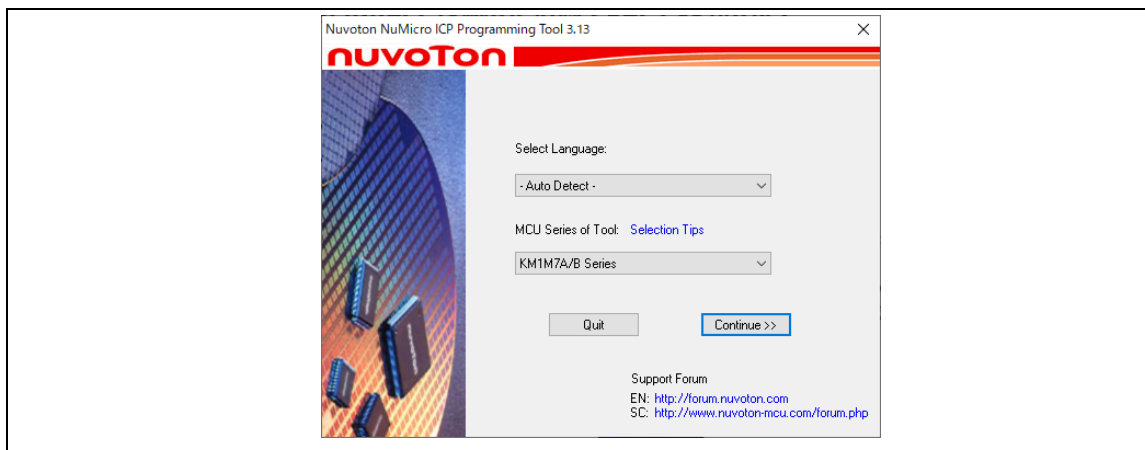


Figure 4-29 ICP Settings

- Figure 4-30 shows ICP Connection Settings. Click the <Connect> button on the screen in Figure 4-30.

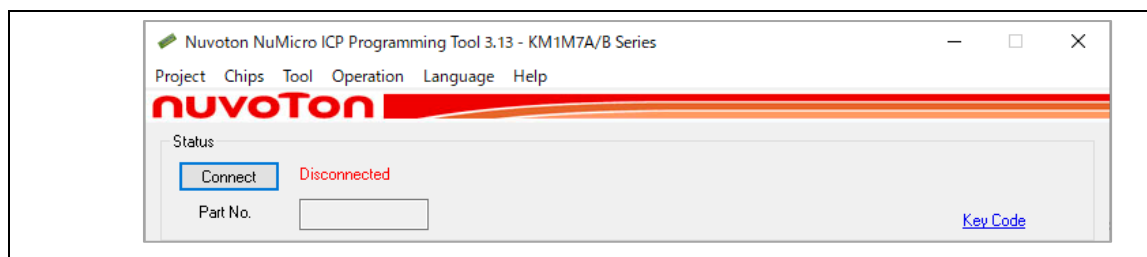


Figure 4-30 ICP Connection Settings

- Figure 4-31 shows NuMaker Firmware Update Flow. When the NuMaker firmware update screen shown in Figure 4-31 is displayed, click the <Yes> button to update the firmware. If it is not displayed, there will be no update.

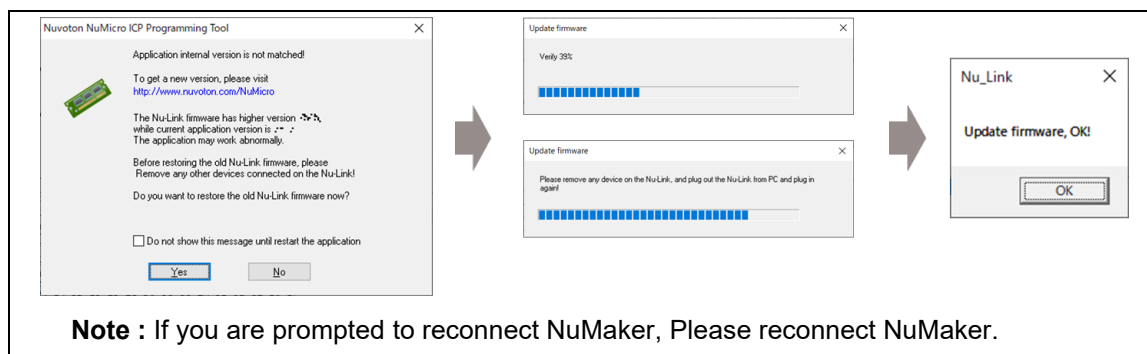


Figure 4-31 NuMaker Firmware Update Flow

- Figure 4-32 shows ICP Disconnection Settings. Once the firmware has been updated and the connection completed, click the <Disconnect> button on the screen in Figure 4-32 to exit ICP.

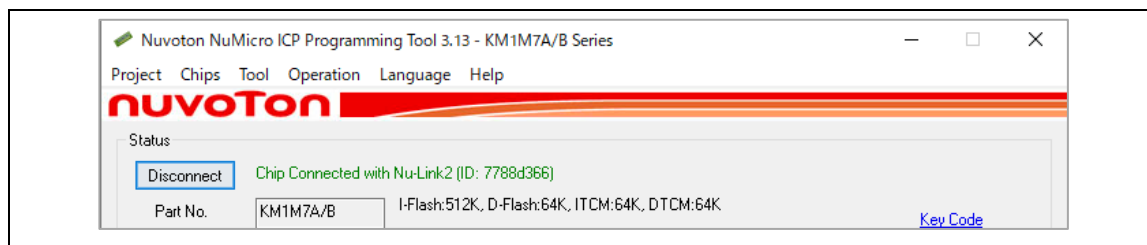


Figure 4-32 Disconnection Settings

5 NUMAKER-EVB-KM1M4B-TQFP64 SCHEMATICS

5.1 Nu-Link2-Me

Figure 5-1 shows the Nu-Link2-Me circuit.

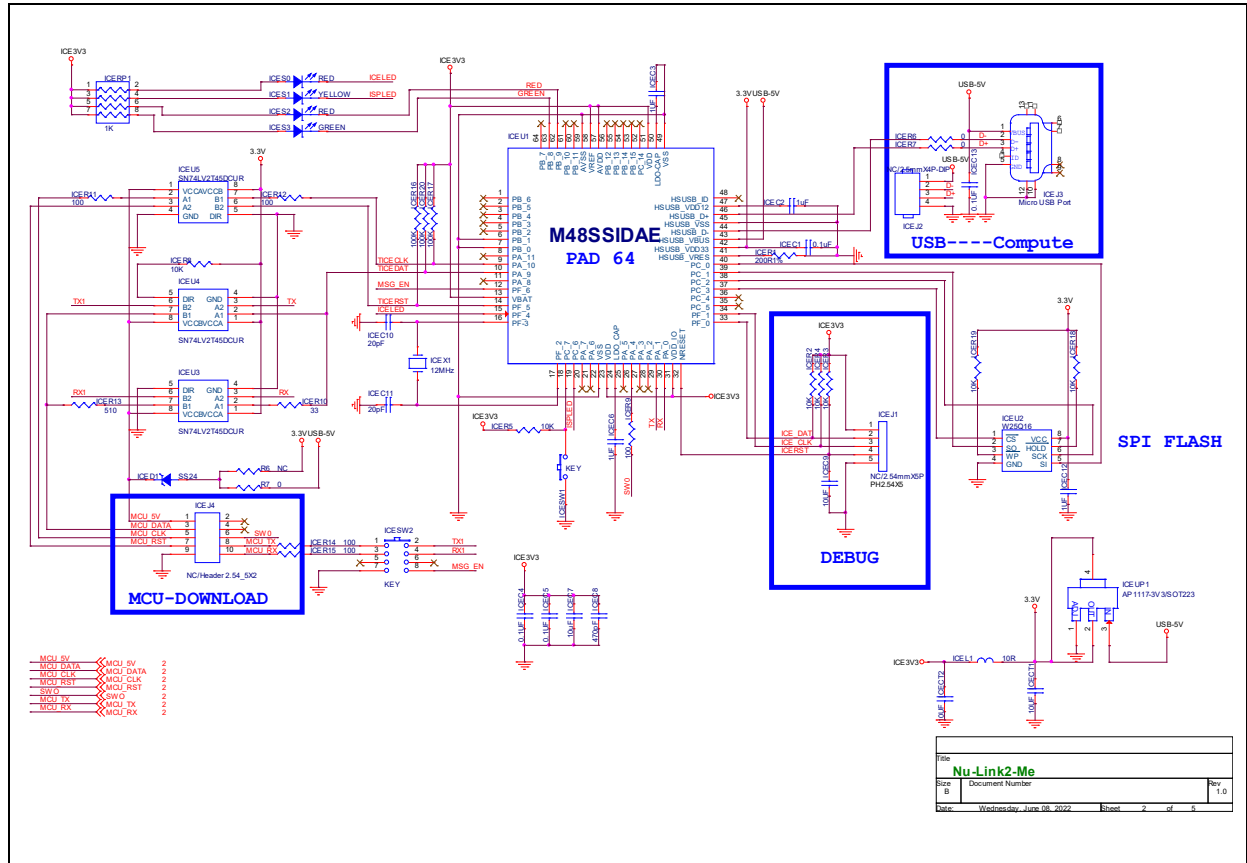


Figure 5-1 Nu-Link2-Me Circuit

5.2 KM1M4BF54K Target Board

Figure 5-2 shows the KM1M4BF54K target board circuit.

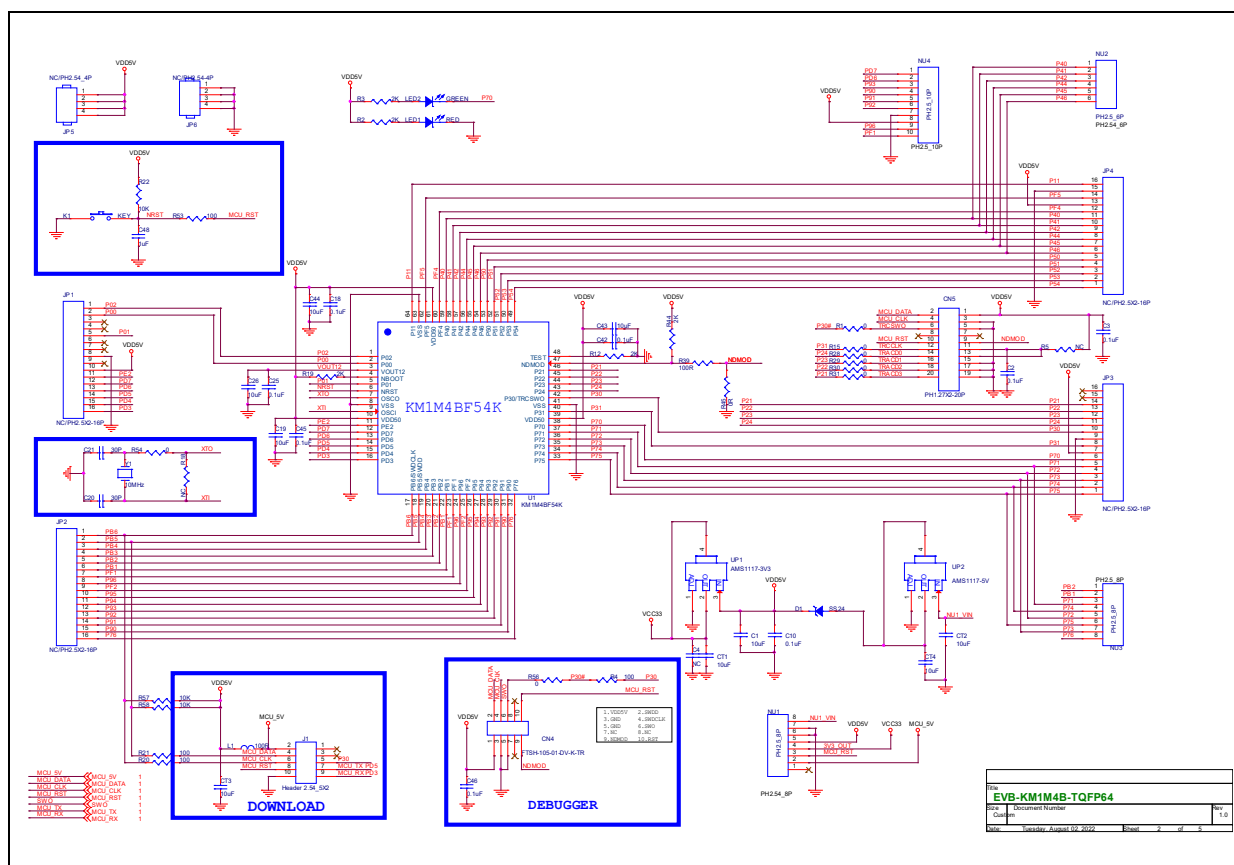


Figure 5-2 KM1M4BF54K Target Board Circuit

5.3 PCB Placement

Figure 5-3 and Figure 5-4 show the front and rear placement of NuMaker-EVB-KM1M4B-TQFP64.

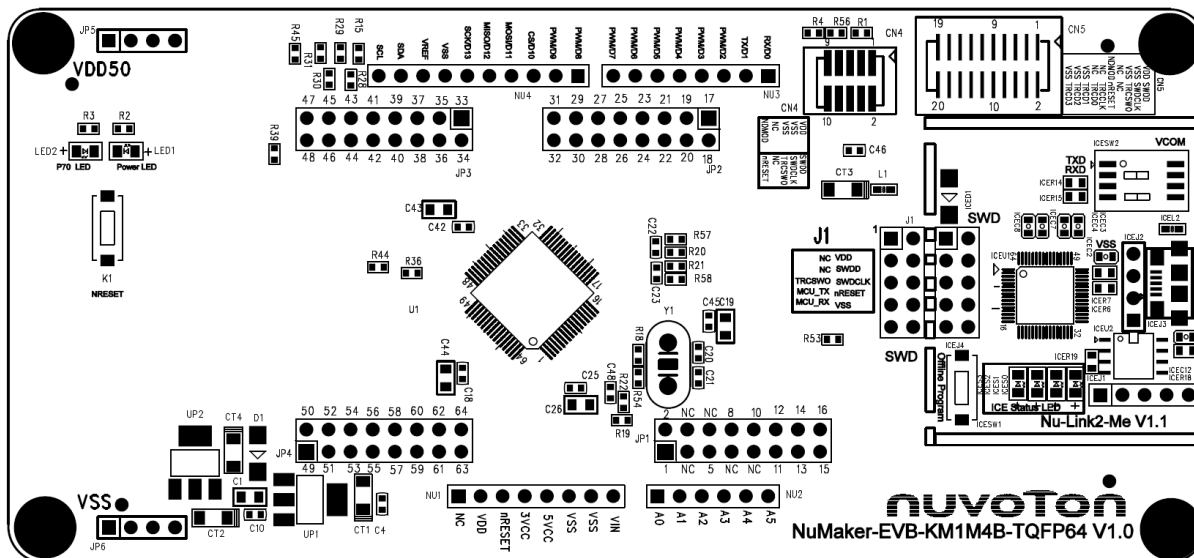


Figure 5-3 Front Placement

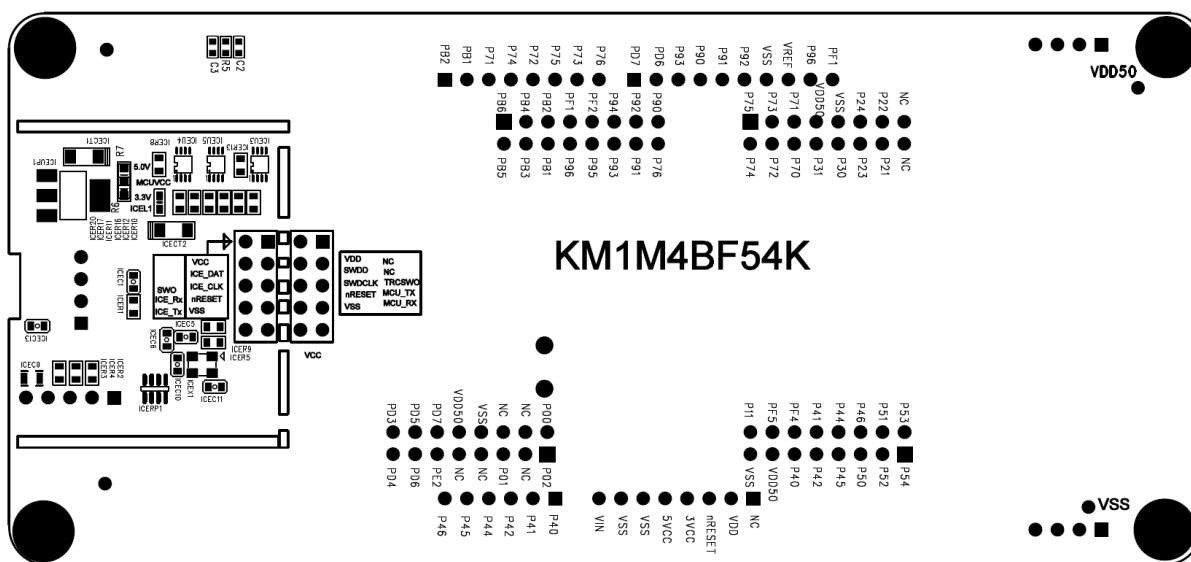


Figure 5-4 Rear Placement

6 REVISION HISTORY

Date	Revision	Description
2022.10.18	0.90	- Preliminary version
2022.12.08	0.91	- Corrected description in 3.4.7 Power Supply Model. - Add 3.7 Debug Connector - Add 3.8.1 MSG
2023.03.14	0.92	- Corrected description in 3.7 Debug Connector.
2023.12.15	0.93	- Add Section 4
2024.03.29	1.00	- Add 4.6.4 NuMaker Firmware Update

Important Notice

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Insecure usage includes, but is not limited to: equipment for surgical implementation, atomic energy control instruments, airplane or spaceship instruments, the control or operation of dynamic, brake or safety systems designed for vehicular use, traffic signal instruments, all types of safety devices, and other applications intended to support or sustain life.

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