NuMicro® Family

Arm® Cortex®-M4-based Microcontroller

NuMaker-IoT-M467

User Manual

Evaluation Board for NuMicro® M460 Series

For additional information or questions, please contact: Nuvoton Technology Corporation.

www.nuvoton.com

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1 OVERVIEW

The NuMaker-IoT-M467 is an evaluation board for Nuvoton NuMicro M467SJHAN, M467KJHAN, M467JJHAN, M467HJHAN microcontrollers. The NuMaker-IoT-M467 consists of two parts: an M467 target board and an on-board Nu-Link2-Me debugger and programmer. The NuMaker-IoT-M467 is designed for project evaluation, prototype development and validation with power consumption monitoring function.

The M467 target board contains a Wi-Fi module and a CAN FD transceiver for users to develop industrial IoT applications. Furthermore, the M467 target board is equipped with a thermal sensor and a 6-axis sensor for quick development.

The M467 target board is based on NuMicro M467HJHAN. For the development flexibility, the M467 target board provides the Arduino UNO compatible headers and the capability of adopting multiple power supplies. Furthermore, the Nuvoton-designed ammeter connector can measure the power consumption instantly, which is essential for the prototype evaluation.

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.

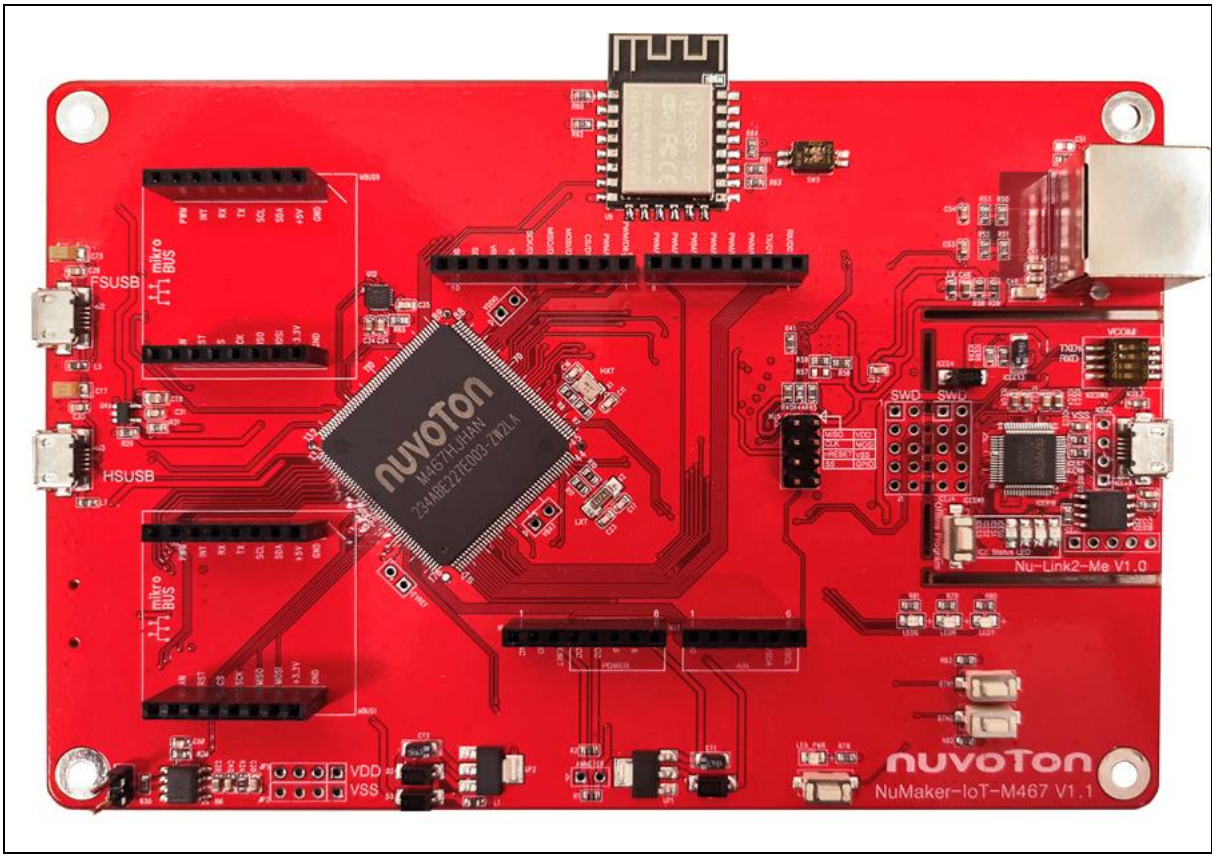


Figure 1-1 NuMaker-IoT-M467 Evaluation Board

NUMAKER-IOT-M467 USER MANUAL

2 FEATURES

- NuMicro M467HJHAN used as main microcontroller with function compatible with:
  - M467SJHAN
  - M467KJHAN
  - M467JJHAN
- Arduino UNO compatible extension connectors
- Ammeter connector for measuring the microcontroller's power consumption
- Flexible board power supply:
  - External V_{DD} power connector
  - Arduino UNO compatible extension connector Vin
  - USB FS connector on M467 target board
  - USB HS connector on M467 target board
  - 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
- On-board components:
  - 32 Mbits SPI Flash
  - Thermal sensor (Nuvoton NCT7717U)
  - User defined LEDs and buttons
  - 10/100M Ethernet PHY
  - USB HS OTG and USB FS OTG
  - Micro SD Card slot
  - CAN FD transceiver
  - Wi-Fi module (ESP-12F)
  - mikroBUS^{TM} interface
  - 6-Axis sensor (MPU6500)

3 INTRODUCTION TO NUMICRO IOT PLATFORM

The NuMicro IoT platform provides the cloud services support, tools, and developer ecosystem to make the creation and deployment of commercial, standards-based IoT solutions possible. As an IoT resource, the NuMicro IoT platform contains a core, and security, key IoT networking and communication capability.

The NuMicro IoT platform allows IoT devices to collaborate and communicate with each other on the basis of transparency. With abstractions API design, the NuMicro IoT platform allows users to focus on application development, not underlying system complexity.

For more information on NuMicro IoT platform, please visit NuMicro IoT platform webpage:

https://www.nuvoton.com/products/iot-solution/iot-platform/

4 HARDWARE CONFIGURATION

4.1 Front View

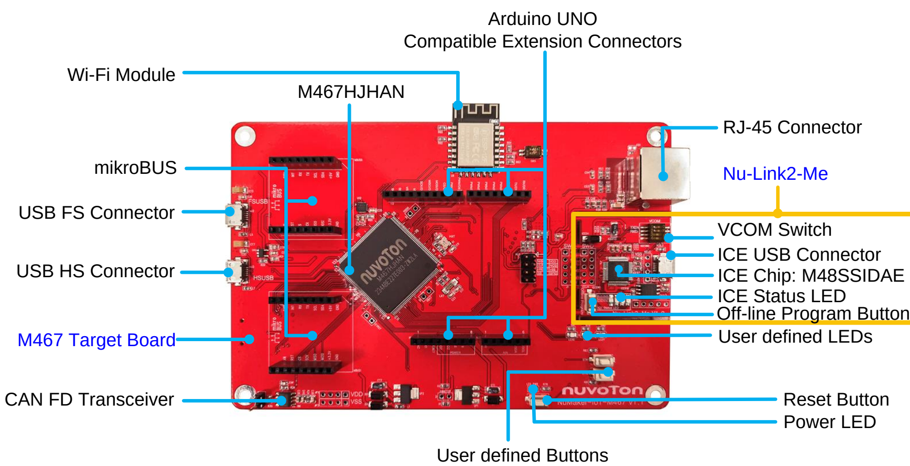


Figure 4-1 Front View of NuMaker-IoT-M467

Figure 4-1 shows the main components and connectors from the front side of NuMaker-IoT-M467. The following lists components and connectors from the front view:

- Target chip: M467HJHAN (U1)
- USB FS Connector (J2)
- USB HS Connector (J3)
- Arduino UNO Compatible Extension Connectors (NU1, NU2, NU3, NU4)
- External V_{DD} Power Connector (JP1)
- External V_{SS} Power Connector (JP2)
- External V_{DDIO} Connector (VDDIO)
- External V_{BAT} Connector (VBAT)
- External V_{REF} Connector (VREF)
- Ammeter Connector (AMMETER)
- Reset Button (RESET)
- Power LED (LED_PWR), PH4 Red LED (LED_R), PH5 Yellow LED (LED_Y) and PH6 Green LED (LED_G)
- Nu-Link2-Me
  - VCOM Switch
  - ICE Chip: M48SSIDAE (ICEU2)
  - ICE USB Connector (ICEJ3)
  - ICE Status LED (ICES0, ICES1, ICES2, ICES3)
  - Off-line Program Button (ICESW1)

4.2 Rear View

Figure 4-2 shows the main components and connectors from the rear side of NuMaker-IoT-M467.

The following lists components and connectors from the rear view:

- Micro SD Card Connector (U5) and SD Card Power LED (SD_PWR)
- Thermal Sensor (U10, Nuvoton NCT7717U)
- SPI Flash (U11)
- Nu-Link2-Me
  - MCUVCC Power Switch (ICEJPR1)
  - ICEVCC Power Switch (ICEJPR2)

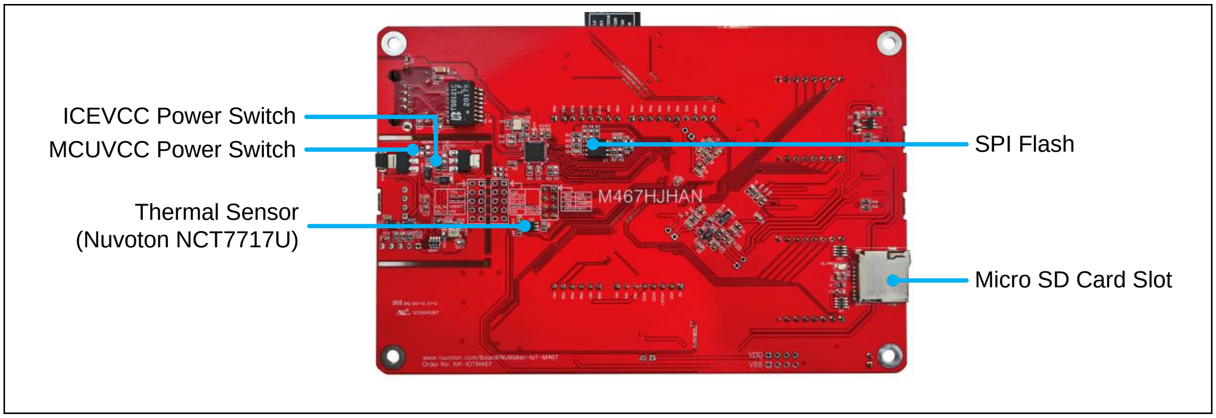


Figure 4-2 Rear View of NuMaker-IoT-M467

4.3 Extension Connectors

Table 4-1 presents the extension connectors.

Connector	Description
NU1, NU2, NU3, NU4 and NU5	Arduino UNO compatible pins on the NuMaker-IoT-M467.

Table 4-1 Extension Connectors

4.3.1 Arduino UNO Compatible Extension Connectors

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

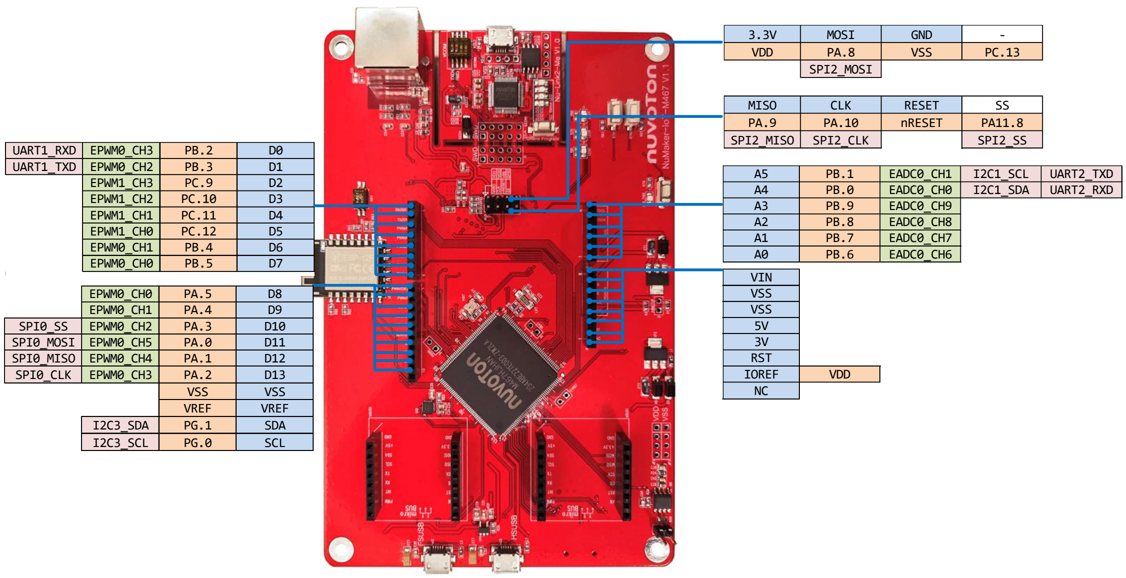


Figure 4-3 Arduino UNO Compatible Extension Connectors

Header		NuMaker-IoT-M467		Header		NuMaker-IoT-M467	
		Compatible to Arduino UNO	GPIO Pin of M467			Compatible to Arduino UNO	GPIO Pin of M467
NU4	NU4.1	D0	PB.2	NU3	NU3.6	A5	PB.6
	NU4.2	D1	PB.3		NU3.5	A4	PB.7
	NU4.3	D2	PC.9		NU3.4	A3	PB.8
	NU4.4	D3	PC.10		NU3.3	A2	PB.9
	NU4.5	D4	PC.11		NU3.2	A1	PB.0
	NU4.6	D5	PC.12		NU3.1	A0	PB.1
	NU4.7	D6	PB.4	NU1	NU1.8	VIN	-
	NU4.8	D7	PB.5		NU1.7	VSS	
NU2	NU2.1	D8	PA.5		NU1.6	VSS	
	NU2.2	D9	PA.4		NU1.5	5V	
	NU2.3	D10	PA.3		NU1.4	3V	
	NU2.4	D11	PA.0		NU1.3	RST	nRESET
	NU2.5	D12	PA.1		NU1.2	IOREF	V_{REF}
	NU2.6	D13	PA.2		NU1.1	NC	-
	NU2.7	VSS	V_{SS}				
	NU2.8	VREF	V_{REF}				
	NU2.9	SDA	PG.0				
	NU2.10	SCL	PG.1				

Table 4-2 Arduino UNO Extension Connectors and M467HJHAN Mapping GPIO List

4.4 mikroBUS™ Interface

NuMaker-IoT-M467 features a MikroElektronika mikroBUS™ socket which has the smallest number of pins but has maximum expandability. The MikroElektronika mikroBUS™ consists of communications pins including SPI, UART and I^{2}C, one PWM pin, one interrupt pin, one analog input pin, one reset pin and one chip select pin, and has 3.3V and 5V power pin. Table 4-3 shows mikroBUS™ mapping with M467HJHAN.

For more information about MikroElektronika mikroBUS™ standard, please visit the MikroElektronika mikroBUS™ website: https://www.mikroe.com/mikrobus .

MBUS0	NuMaker-IoT-M467		MBUS0	NuMaker-IoT-M467	
	Compatible to mikroBUS™	M467HJHAN		Compatible to mikroBUS™	M467HJHAN
1	AN	EADC1_CH1 (PD.11)	16	PWM	EPWM0_CH5 (PH.11)
2	RST	PG.11	15	INT	PG.12
3	CS	SPI1_SS (PI.10)	14	RX	UART5_RXD (PF.10)
4	SCLK	SPI1_CLK (PI.9)	13	TX	UART5_TXD (PF.11)
5	MISO	SPI1_MISO (PI.7)	12	SCL	I2C1_SCL (PG.2)
6	MOSI	SPI1_MOSI (PI.8)	11	SDA	I2C1_SDA (PG.3)
7	3VCC	-	10	5VCC	-
8	GND	-	9	GND	-
MBUS1	**NuMaker-IoT-M467**		**MBUS1**	**NuMaker-IoT-M467**	
	Compatible to mikroBUS™	**M467HJHAN**		**Compatible to mikroBUS™**	**M467HJHAN**
1	AN	EADC1_CH0 (PD.10)	16	PWM	EPWM0_CH4 (PD.14)
2	RST	PG.13	15	INT	PG.14
3	CS	SPI3_SS (PG.5)	14	RX	UART4_RXD (PF.6)
4	SCLK	SPI3_CLK (PG.6)	13	TX	UART4_TXD (PF.7)
5	MISO	SPI3_MISO (PG.7)	12	SCL	I2C4_SCL (PG.9)
6	MOSI	SPI3_MOSI (PG.8)	11	SDA	I2C4_SDA (PG.10)
7	3VCC	-	10	5VCC	-
8	GND	-	9	GND	-

Table 4-3 mikroBUS™ Mapping with M467HJHAN

4.5 Power Supply Configuration

The NuMaker-IoT-M467 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-IoT-M467.

4.5.1 VIN Power Source

Table 4-4 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 UP1 converts the NU1 pin8 input voltage to 5 V and supplies it to NU1_5VCC.

Table 4-4 Vin Power Source

4.5.2 5 V Power Sources

Table 4-5 presents the 5 V power sources.

Connector	Net Name in Schematic	Description
ICEJ3	USB_HS_VBUS	ICE USB connector supplies 5 V power from PC to M467 target board and Nu-Link2-Me.
J2	USB_VBUS	USB FS connector on NuMaker-IoT-M467 supplies 5 V power from PC to M467 target board and Nu-Link2-Me.
J3	HSUSB_VBUS	USB HS connector on NuMaker-IoT-M467 supplies 5 V power from PC to M467 target board and Nu-Link2-Me.
NU1 pin5	UNO_5V	ICEJ3, J2 or NU1 pin8 supplies 5 V power to NU1 pin5. NU1 pin5 supplies 5 V power to target chip or Arduino adapter board.

Table 4-5 5 V Power Sources

4.5.3 3.3 V Power Sources

Table 4-6 presents the 3.3 V power sources.

Voltage Regulator	5 V Source	Description
ICEUP1	USB_HS_VBUS	ICEUP1 converts USB_HS_VBUS to 3.3 V and supplies 3.3 V to M467 target board or ICE chip.
UP2	FSUSB_VBUS	UP2 converts FSUSB_VBUS to 3.3 V and supplies 3.3 V to M467 target board.
UP2	HSUSB_VBUS	UP2 converts HSUSB_VBUS to 3.3 V and supplies 3.3 V to M467 target board.
UP2	UNO_5VCC	UP1 converts NU1_5VCC to 3.3 V and supplies 3.3 V to M467 target board.

Table 4-6 3.3 V Power Sources

4.5.4 Power Connectors

Table 4-7 presents the power connectors.

Connector	Description
JP1	V_{DD} connector on the NuMaker-IoT-M467. **Note:** M467 operating voltage range is from 1.7 V to 3.6 V.
JP2	V_{SS} connector on the NuMaker-IoT-M467.

Table 4-7 Power Connectors

4.5.5 USB Connectors

Table 4-8 presents the USB connectors.

Connector	Description
ICEJ3	ICE USB connector on Nu-Link2-Me for power supply, debugging and programming from PC.
J2	USB FS connector on NuMaker-M467HJ for power supply.
J3	USB HS connector on NuMaker-M467HJ for power supply.

Table 4-8 USB Connectors

4.5.6 Power Switches

Table 4-9 presents the power switches.

Switch	Description
ICEJPR1	Configures the target chip operating voltage at 1.8 V / 3.3 V / 5 V. **Note:** M467 operating voltage range is from 1.7 V to 3.6 V. Do not switch ICEJPR1 (MCUVCC) to 5 V.
ICEJPR2	Configures the ICE chip operating voltage at 1.8 V / 3.3 V.

Table 4-9 Power Switches

4.5.7 Power Supply Models

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

The external power supply source on Nu-Link2-Me is shown in Figure 4-4.

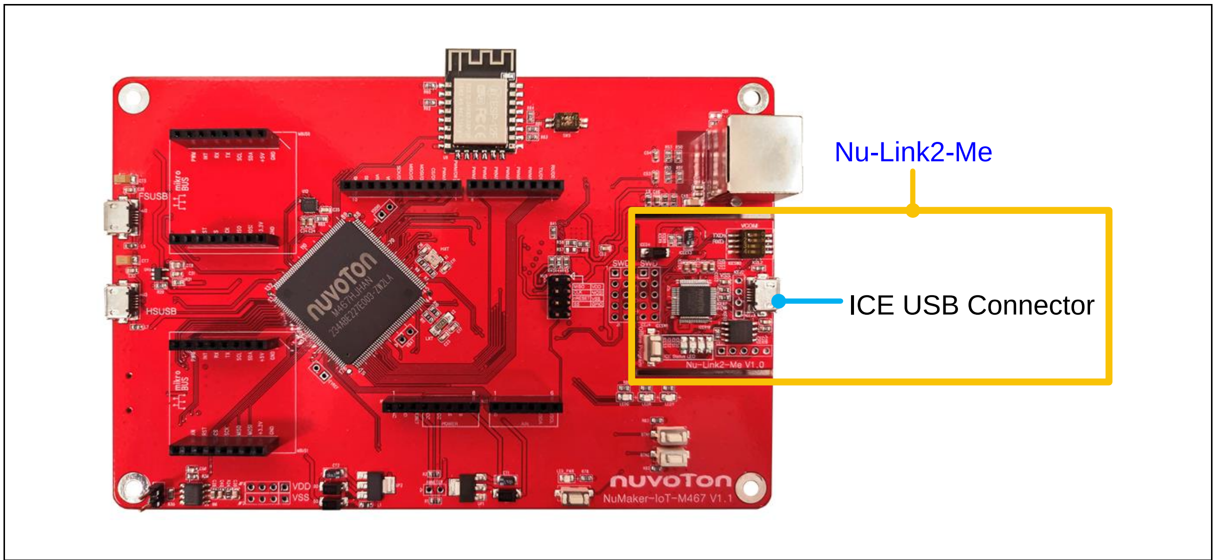


Figure 4-4 External Power Supply Sources on Nu-Link2-Me

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

1. Solder the resistor on ICEJPR1 (MCUVCC) depending on the target chip operating voltage.
2. Solder the resistor on ICEJPR2 (ICEVCC) depending on the ICE chip operating voltage.
3. Connect the external power supply to ICEJ3.

Table 4-10 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	ICEJPR1 (MCUVCC) Selection [1]	ICEJPR2 (ICEVCC) Selection [2]	ICE Chip Voltage	J2	Vin	JP1
1	1.8 V	Connect to PC	1.8 V	1.8 V	1.8 V	-	-	1.8 V output
2	3.3 V	Connect to PC	3.3 V (default)	3.3 V (default)	3.3 V	-	-	3.3 V output
3	5 V	Connect to PC	5 V	3.3 V (default)	3.3 V	-	-	5 V output

Note:

1. 0 Ω should be soldered between ICEJPR1's MCUVCC and 1.8 V / 3.3 V / 5 V.
2. 0 Ω should be soldered between ICEJPR2's ICEVCC and 1.8 V / 3.3 V.
3. -: Unused.

Table 4-10 Supply External Power through Nu-Link2-Me

4.5.7.2 External Power Supply through M467 Target Board to Target Chip

The external power supply sources on M467 target board are shown in Figure 4-5.

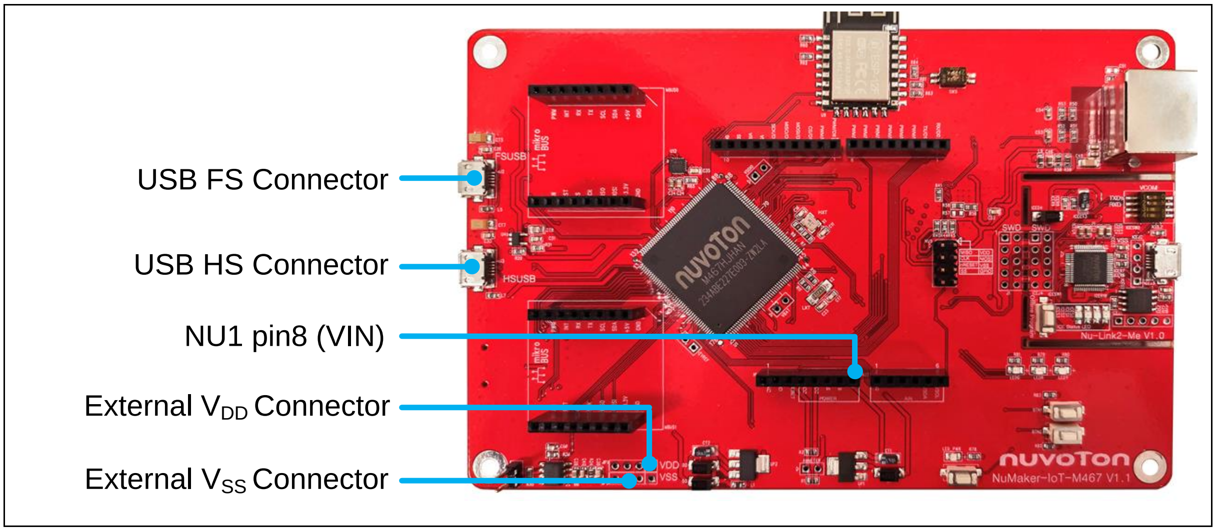


Figure 4-5 External Power Supply Sources on M467 Target Board

To use Vin or J2 or J3 as external power supply source, please follow the steps below:

1. Remove the resistor on ICEJPR1 (MCUVCC).
2. Solder the resistor on ICEJPR2 (ICEVCC) depending on the ICE chip operating voltage.
3. Connect the external power supply to Vin or J2 or J3.

To use JP1 as external power supply source, please follow the steps below:

1. Remove the resistor on ICEJPR1 (MCUVCC).
2. Solder the resistor on ICEJPR2 (ICEVCC) depending on the ICE chip operating voltage.
3. Connect ICEJ3 to PC.
4. Connect the external power supply to JP1.

To use Vin or J2 or J3 as external power supply source with Nu-Link2-Me detached from NuMaker-IoT-M467, please follow the steps below:

1. Detach the Nu-Link2-Me from NuMaker-IoT-M467.
2. Connect the external power supply to Vin or J2 or J3.

To use JP1 as external power supply source with Nu-Link2-Me detached from NuMaker-IoT-M467, please follow the steps below:

1. Detach the Nu-Link2-Me from NuMaker-IoT-M467.
2. Connect the external power supply to JP1.

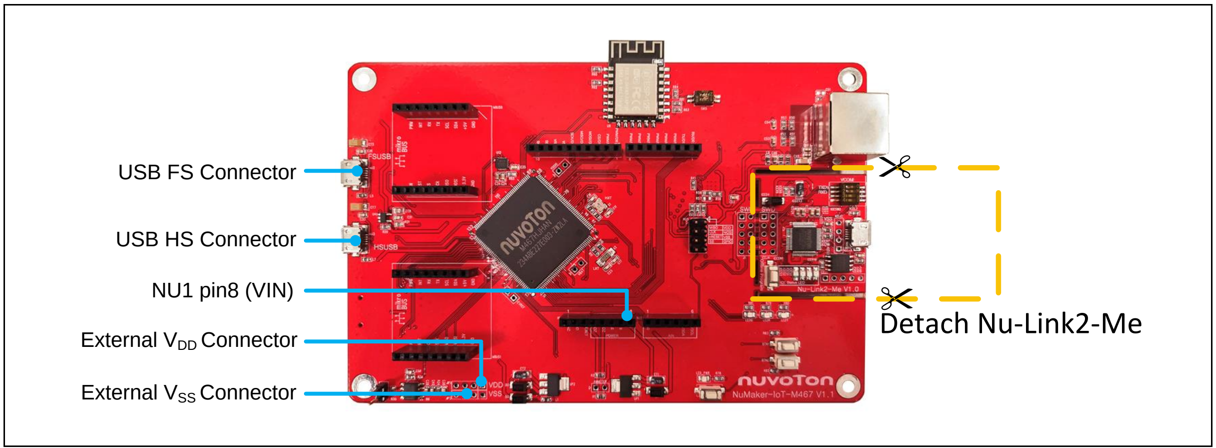


Figure 4-6 Detach the Nu-Link2-Me from NuMaker-IoT-M467

Table 4-11 presents all power models when supplies external power through M467 target board. The M467 target board external power sources are highlighted in yellow.

Model	Target Chip Voltage	Vin [1]	J2[1]	J3[1]	ICEJ3	JP1[2]	ICEJPR1 (MCUVCC) Selection [3]	ICEJPR2 (ICEVCC) Selection [4]	ICE Chip Voltage [5]
4	3.3 V	7 V ~ 12 V Input	-	-	-	3.3 V output	Remove resistor	3.3 V	3.3 V
5	3.3 V	-	Connect to PC	-	-	3.3 V output	Remove resistor	3.3 V	3.3 V
6	3.3 V	-	-	Connect to PC	-	3.3 V output	Remove resistor	3.3 V	3.3 V
7	1.8 V ~ 3.6 V	-	-	-	Connect to PC	DC Input 1.8 V ~ 3.6 V	Remove resistor	1.8 V / 3.3 V	1.8 V / 3.3 V
8	1.8 V ~ 3.6 V	-	-	-	Nu-Link2-Me removed	DC Input 1.8 V ~ 3.6 V	-	-	-

Note:

1. The Vin input voltage will be converted by voltage regulator UP2 to 5 V. Supplying external power to Vin or J2 or J3 can provide 5 V to NU1 pin5 (5V) and 3.3 V to NU1 pin4 (3VCC).
2. JP1 external power input only provides voltage to target chip.
3. 0 Ω should be removed from ICEJPR1's MCUVCC and 1.8 V / 3.3 V / 5 V.
4. 0 Ω should be soldered between ICEJPR2's ICEVCC and 1.8 V / 3.3 V.
5. The ICE chip voltage should be close to the target chip voltage.
6. -: Unused

Table 4-11 Supply External Power for M467 Target Board

4.6 External Reference Voltage Connector

Table 4-13 presents the external reference voltage connector.

Connector	Description
VREF	Connector for user to connect to the external reference voltage pin of the target chip. User needs to remove the L2 ferrite bead.

Table 4-12 External Reference Voltage Connector

4.7 Ammeter Connector

Table 4-13 presents the ammeter connector.

Connector	Description
AMMETER	Connector for user to measure the target chip power consumption easily. User needs to remove the R1 resistor.

Table 4-13 Ammeter Connector

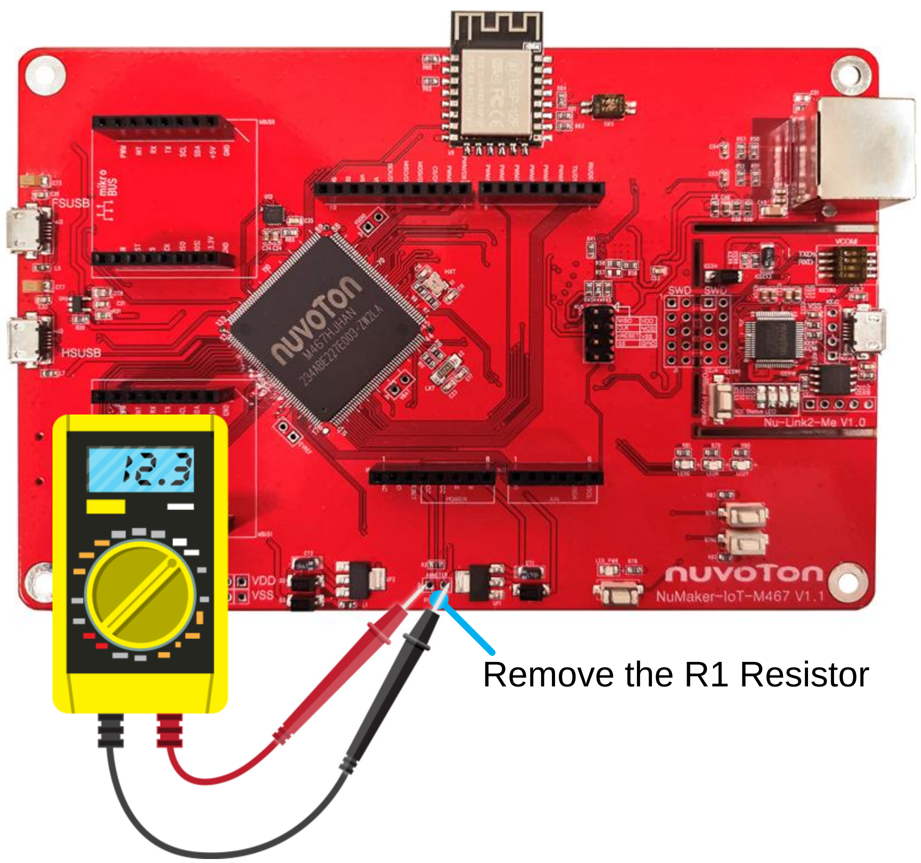


Figure 4-7 Wiring between Ammeter Connector and Ammeter

4.8 Push Buttons

Table 4-14 presents the push buttons.

Component	Description
ICESW1	Offline program button to start offline ICP programming the target chip.
SW1	Reset button to reset the target chip.

Table 4-14 Push Buttons

4.9 LEDs

Table 4-15 presents the LEDs.

Component	Description
Power LED	The power LED indicates that the NuMaker-IoT-M467 is powered.
Red LED	The red LED is connected to the target chip PH.4.
Yellow LED	The yellow LED is connected to the target chip PH.5.
Green LED	The green LED is connected to the target chip PH.6.
ICES0, ICES1, ICES2 and ICES3	Nu-Link2-Me status LED.

Table 4-15 LEDs

4.10 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 become a stand-alone mass production programmer. For more information about Nu-Link2-Me, please refer to *Nu-Link2-Pro Debugger and Programmer User Manual*.

4.10.1 VCOM Switches

Table 4-16 presents how to set the VCOM function by ICESW2.

ICESW2		
Pin	**Function**	**Description**
1	TXD	**On**: Connect target chip PB.13 (UART0_TXD) to Nu-Link2-Me. **Off**: Disconnect target chip PB.13 (UART0_TXD) to Nu-Link2-Me.
2	RXD	**On**: Connect target chip PB.12 (UART0_RXD) to Nu-Link2-Me. **Off**: Disconnect target chip PB.12 (UART0_RXD) to Nu-Link2-Me.
Note: Pin 3 and 4 is unused.		

Table 4-16 VCOM Function of Nu-Link2-Me

4.10.2 Status LEDs

Table 4-15 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 4-17 Operation Status LED Patterns

5 QUICK START

5.1 Toolchains Supporting

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

- KEIL MDK Nuvoton edition
- IAR EWARM
- NuEclipse GCC (for Windows)
- NuEclipse GCC (for Linux)

5.2 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.
- Skip this step when using NuEclipse.

Please install the Nu-Link USB Driver as well at the end of the installation. The installation is presented in Figure 5-1 and Figure 5-2.

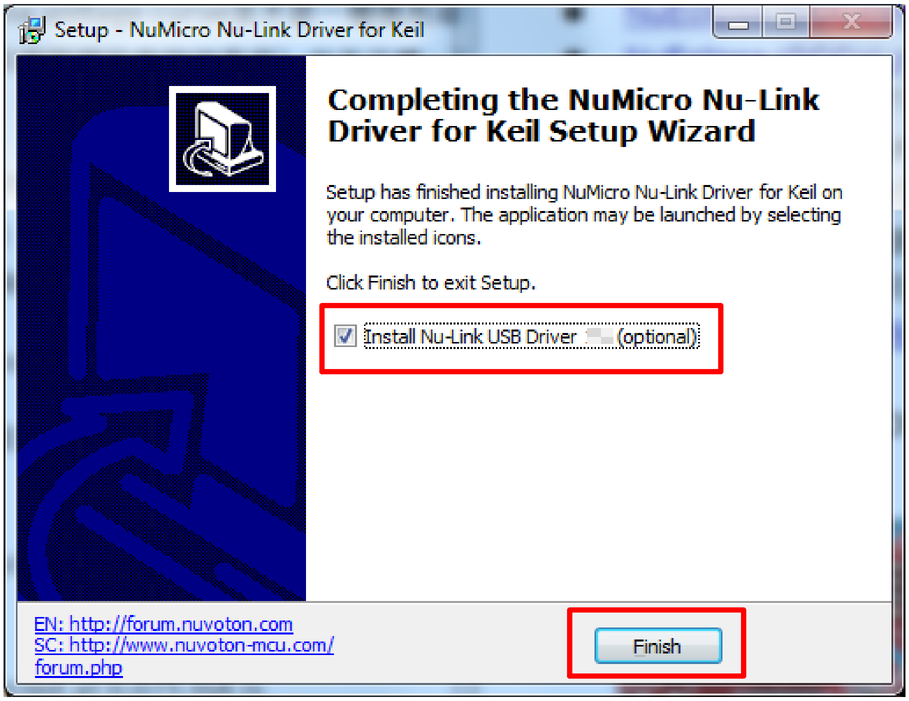


Figure 5-1 Nu-Link USB Driver Installation Setup

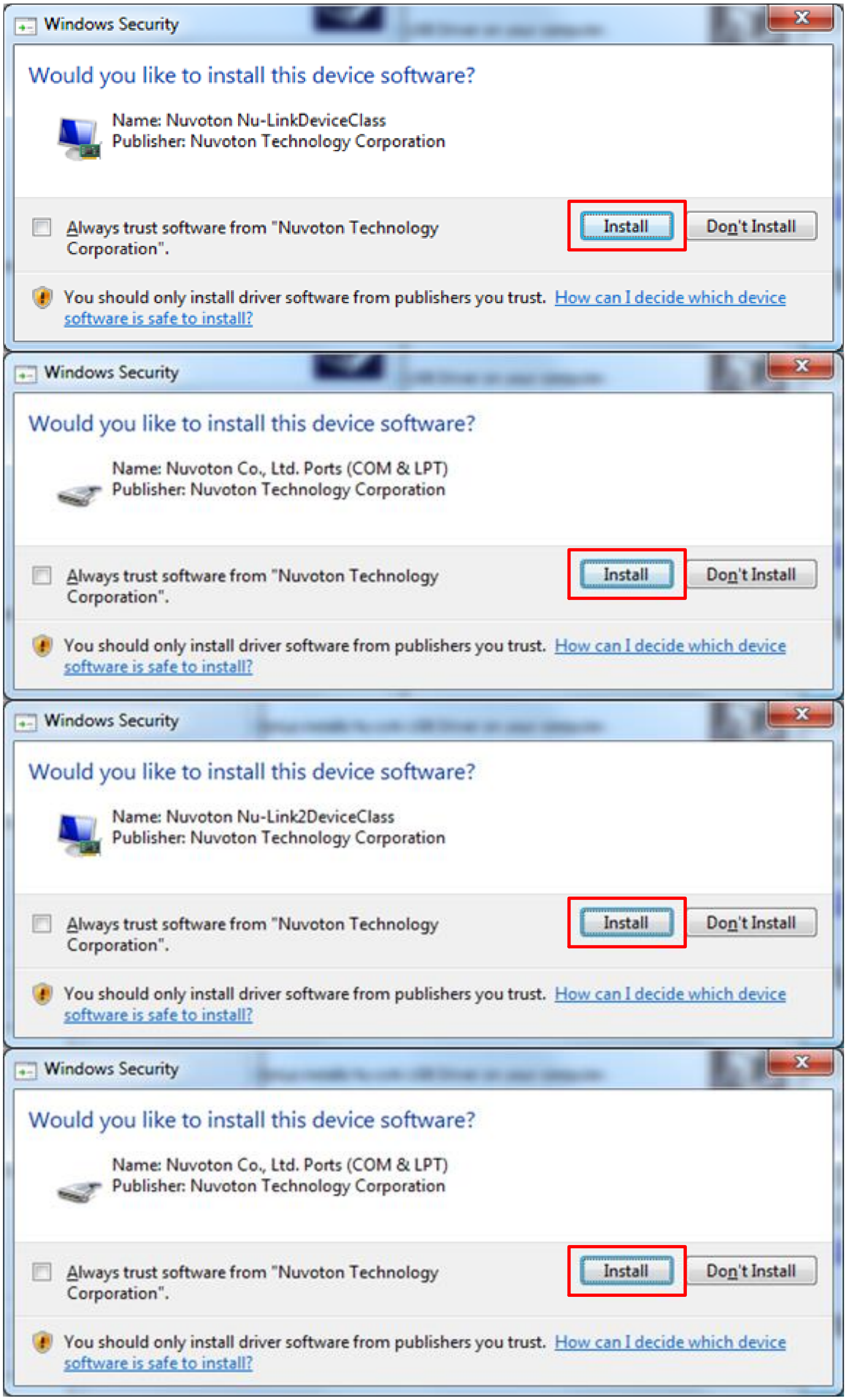


Figure 5-2 Nu-Link USB Driver Installation

5.3 BSP Firmware Download

Download and unzip the Board Support Package (BSP).

5.4 Hardware Setup

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

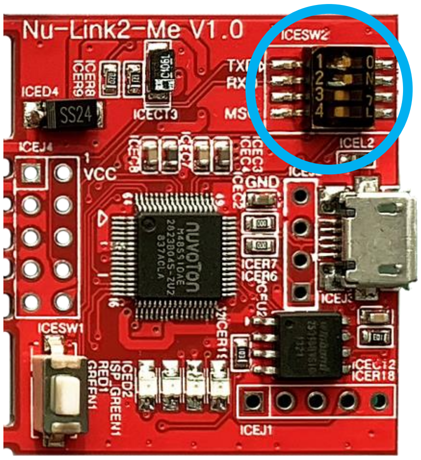


Figure 5-3 Open VCOM Function

2. Connect the ICE USB connector shown in Figure 5-4 to the PC USB port through a USB cable.

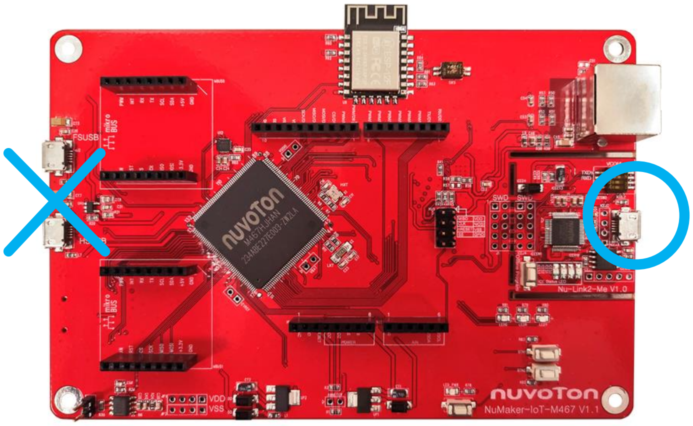


Figure 5-4 ICE USB Connector

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

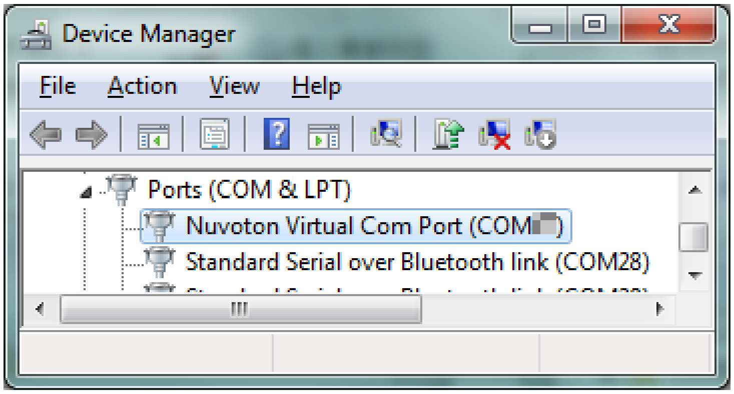


Figure 5-5 Device Manger

4. Open a serial port terminal, PuTTY for example, to print out debug message. Set the speed to 115200. Figure 5-6 presents the PuTTY session setting.

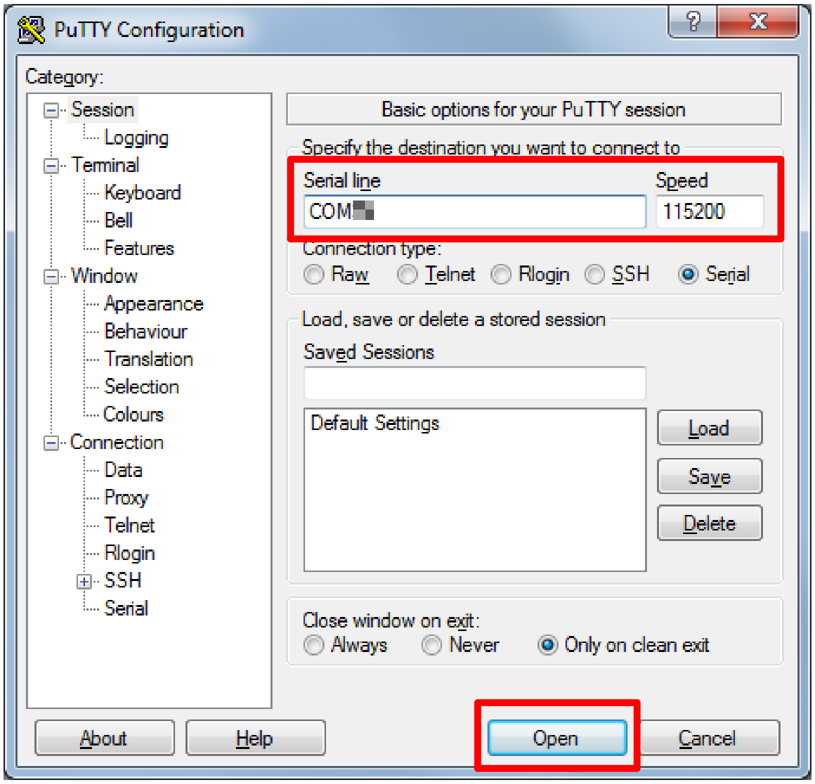


Figure 5-6 PuTTY Session Setting

5.5 Find the Example Project

Use the “Template” project as an example. The project can be found under the BSP folder as shown in Figure 5-7.

- M460_Series_BSP_CMSIS_V3.XX.XXX
  - SampleCode
    - Template
      - GCC
      - Keil
      - IAR

Figure 5-7 Template Project Folder Path

5.6 Execute the Project under Toolchains

Open and execute the project under the toolchain. The section 5.6.1, 5.6.2, and 5.6.3 describe the steps of executing project in Keil MDK, IAR EWARM and NuEclipse, respectively.

5.6.1 Keil MDK

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

1. Double-click the “Template.uvproj” to open the project.

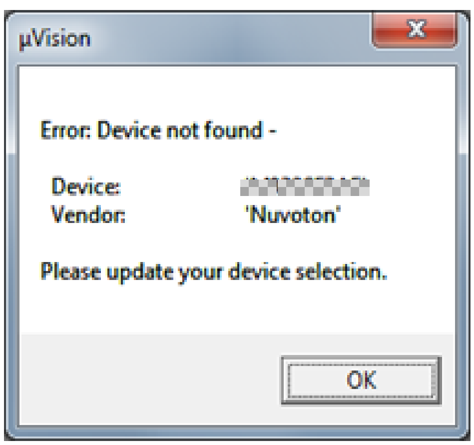


Figure 5-8 Warning Message of “Device not found”

Note: If Figure 5-8 warning message jumps out, please migrate to version 5 format as shown in Figure 5-9. The “.uvproj” filename extension will change to “.uvprojx”.

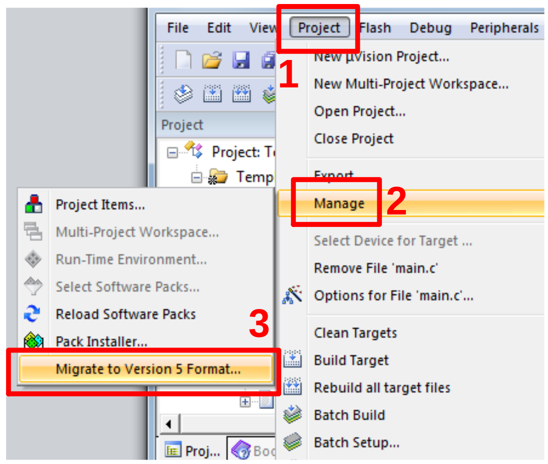


Figure 5-9 Project File Migrate to Version 5 Format

2. Make sure the debugger is “Nuvoton Nu-Link Debugger” as shown in Figure 5-10 and Figure 5-11.

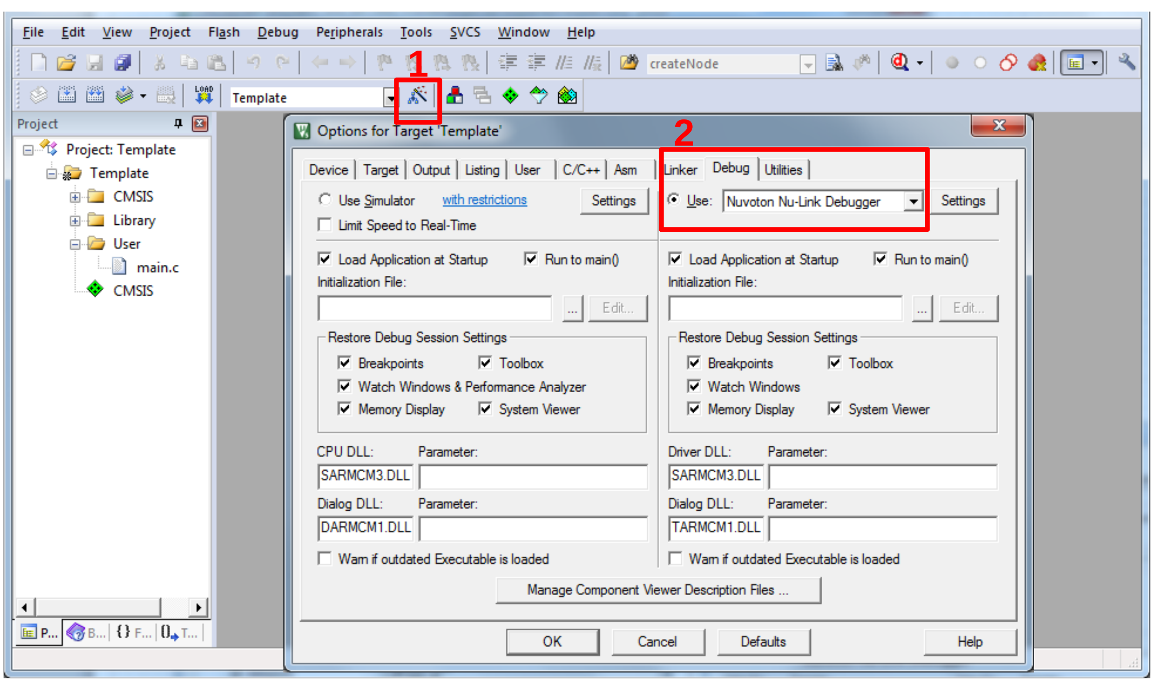


Figure 5-10 Debugger Setting in Options Window

Note: If the dropdown menu in Figure 5-10 does not contain “Nuvoton Nu-Link Debugger” item, please rework section 5.2.

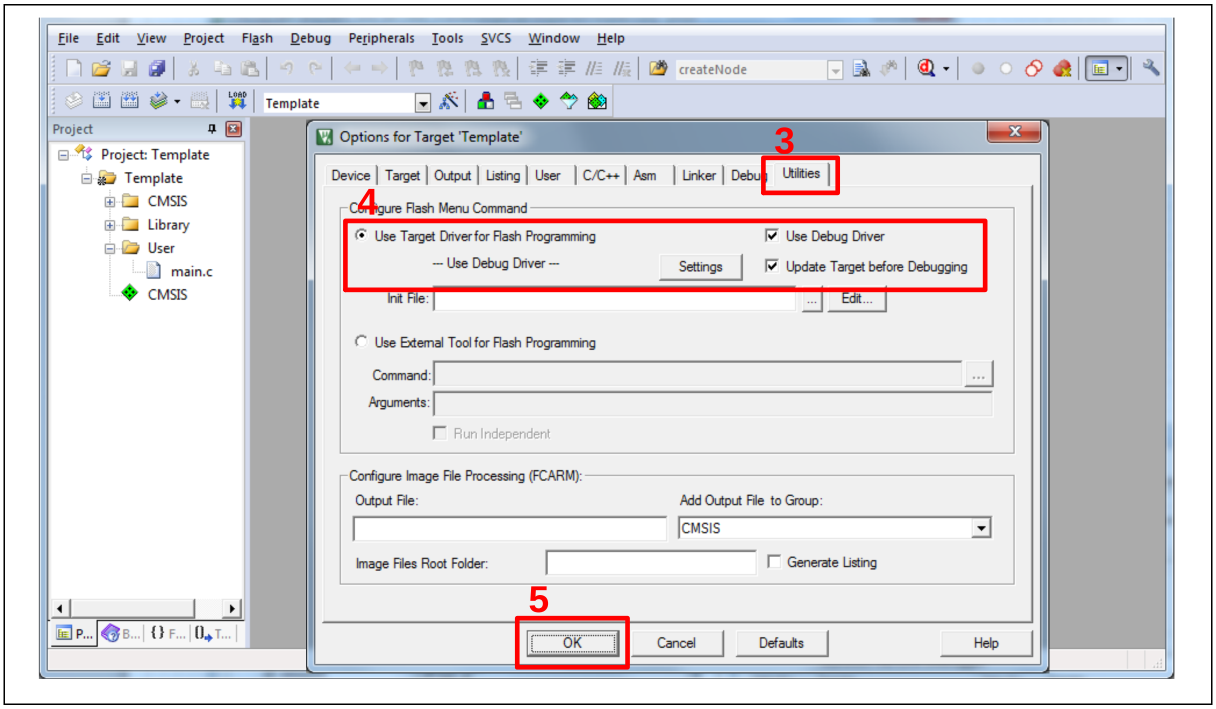


Figure 5-11 Programming Setting in Options Window

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.

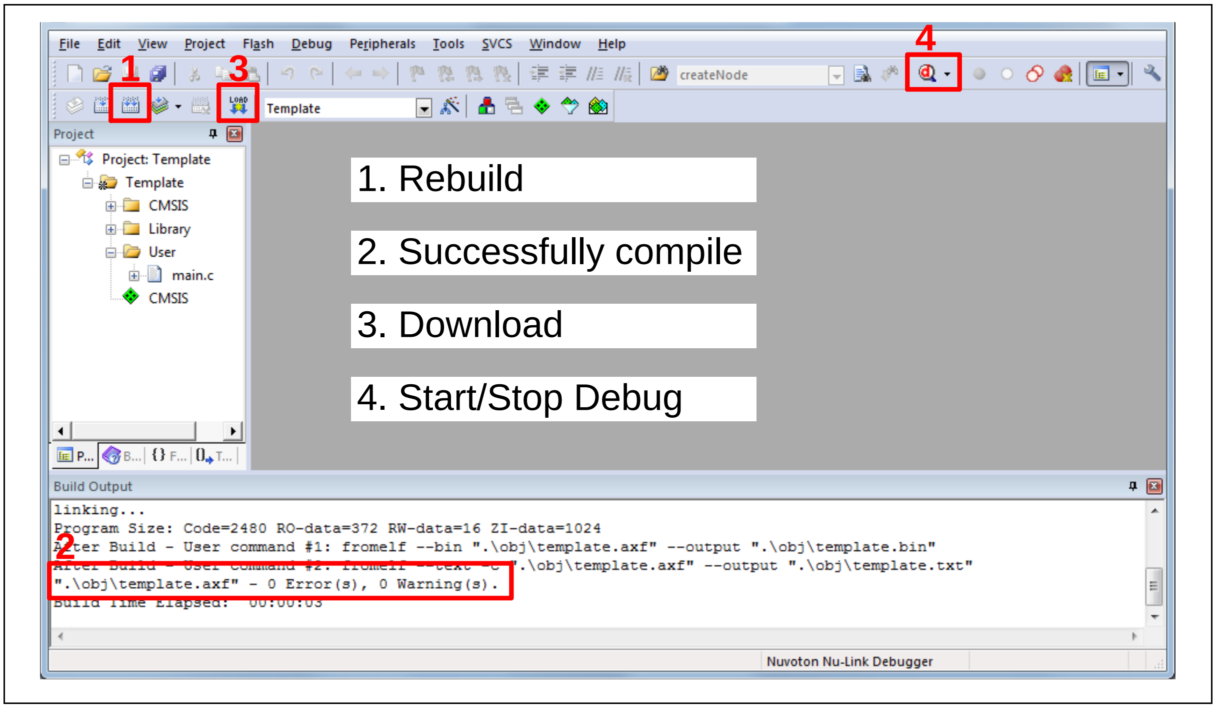


Figure 5-12 Compile and Download the Project

4. Figure 5-13 shows the debug mode under Keil MDK. Click “**Run**” and the debug message will be printed out as shown in Figure 5-14. User can debug the project under debug mode by checking source code, assembly language, peripherals’ registers, and setting breakpoint, step run, value monitor, etc.

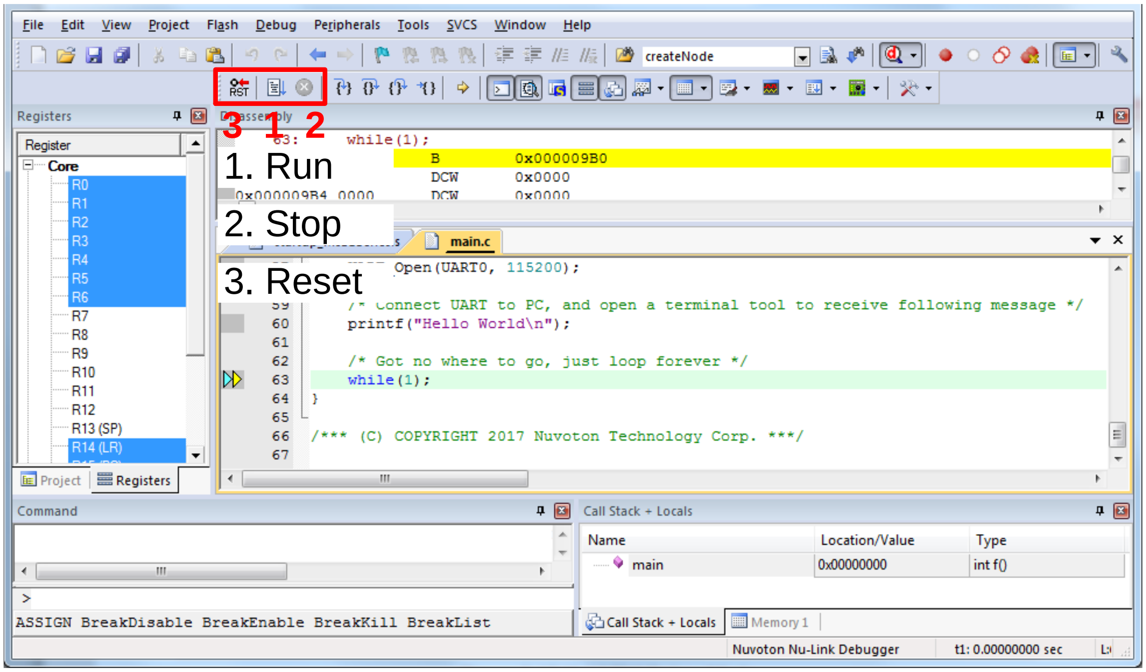


Figure 5-13 Keil MDK Debug Mode

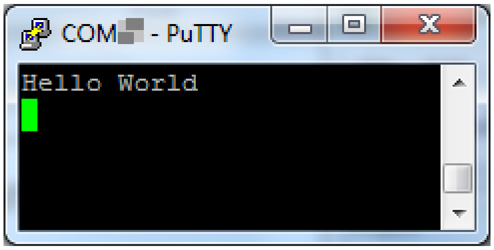


Figure 5-14 Debug Message on Serial Port Terminal Windows

5.6.2 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 5-15.

Note: If the toolbar does not contain "Nu-Link" item, please rework section 5.2.

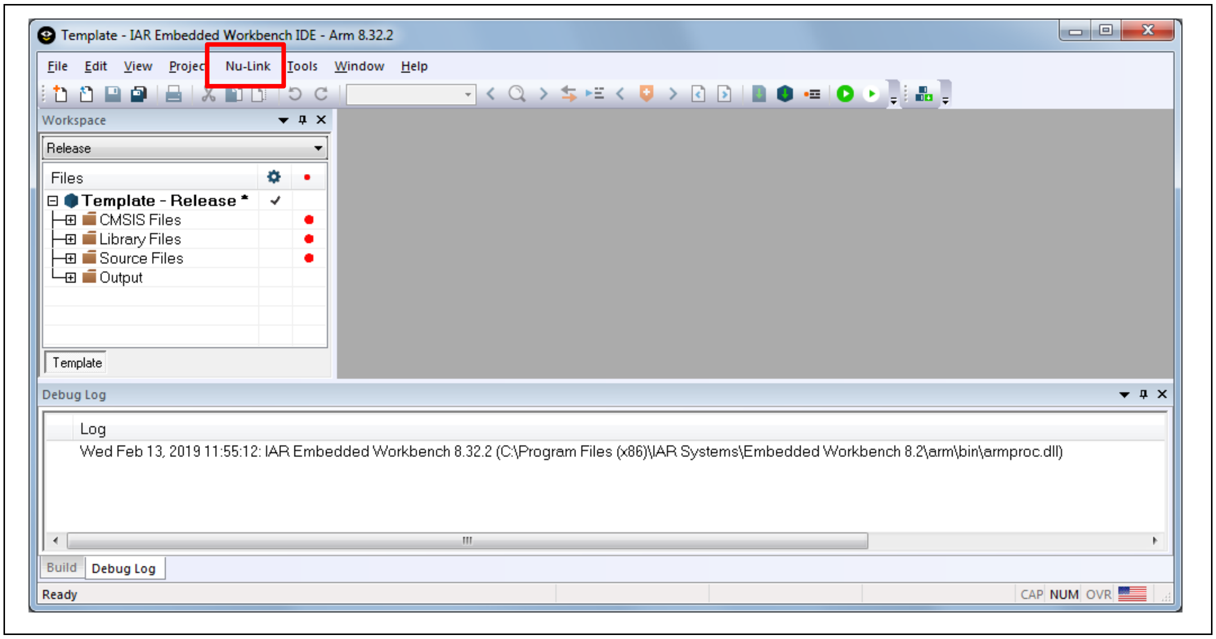


Figure 5-15 IAR EWARM Window

3. Make a target file as presented in Figure 5-16. After successfully compiling the project, download code to the Flash memory and enter debug mode.

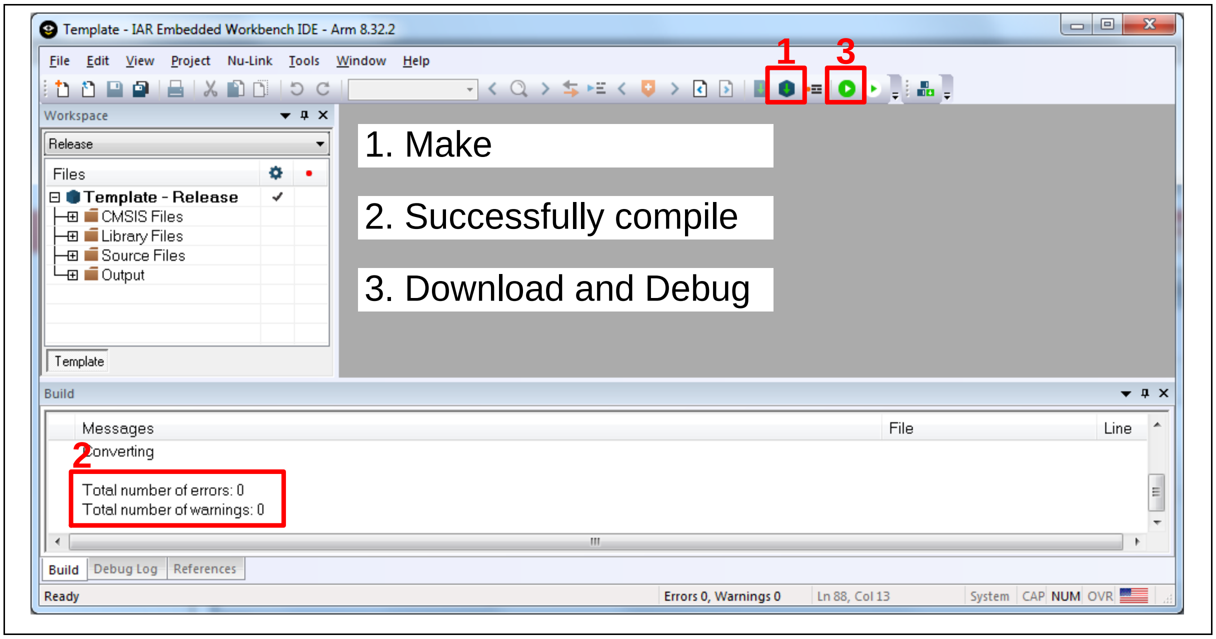


Figure 5-16 Compile and Download the Project

4. Figure 5-17 shows the debug mode under IAR EWARN. Click “**Go**” and the debug message will be printed out as shown in Figure 5-18. User can debug the project under debug mode by checking source code, assembly language, peripherals’ registers, and setting breakpoint, step run, value monitor, etc.

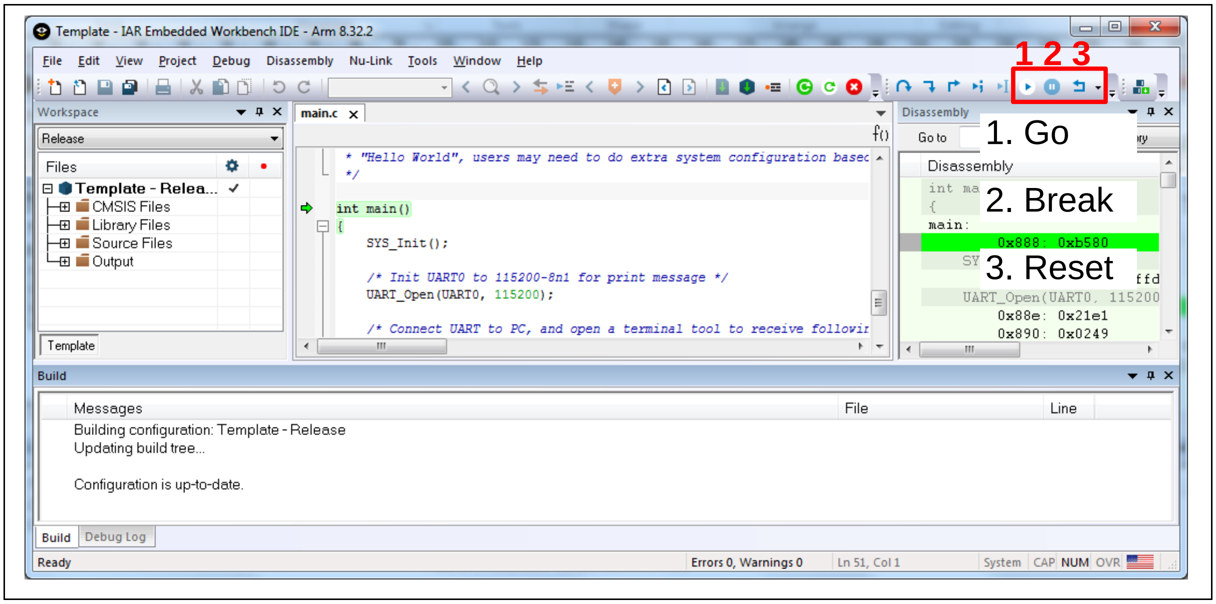


Figure 5-17 IAR EWARM Debug Mode

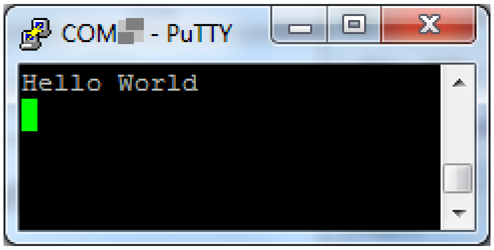


Figure 5-18 Debug Message on Serial Port Terminal Windows

5.6.3 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.

1. Double-click “NuEclipse.exe" to open the toolchain.
2. Import the “Template” project by following the steps presented in Figure 5-19 and Figure 5-20.

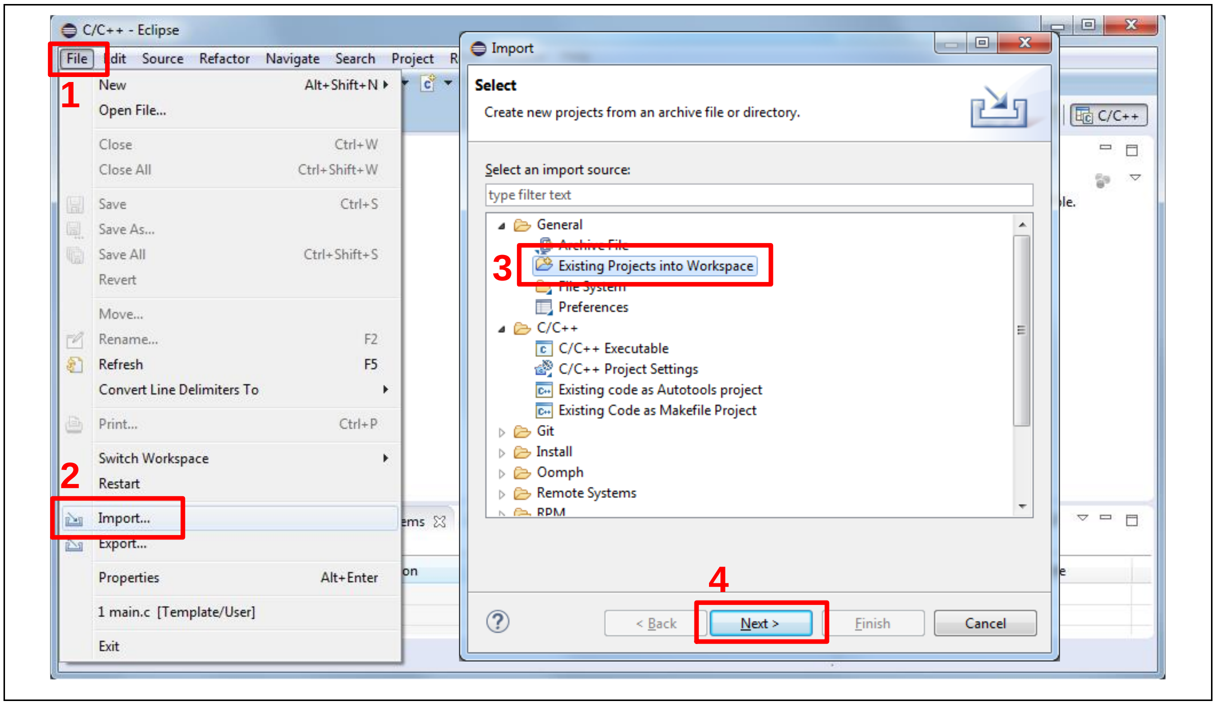


Figure 5-19 Import the Project in NuEclipse

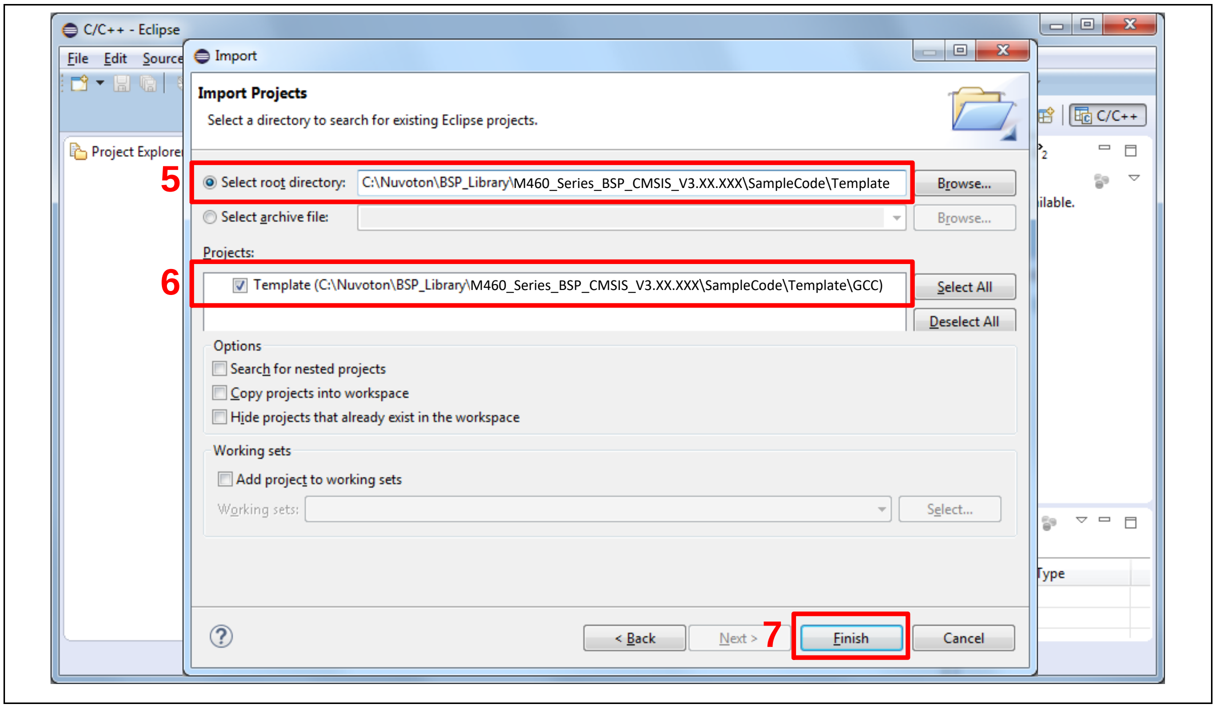


Figure 5-20 Import Projects Windows

3. Click the “Template” project and find the project properties as shown in Figure 5-21. Make sure the settings are the same as settings in Figure 5-22.

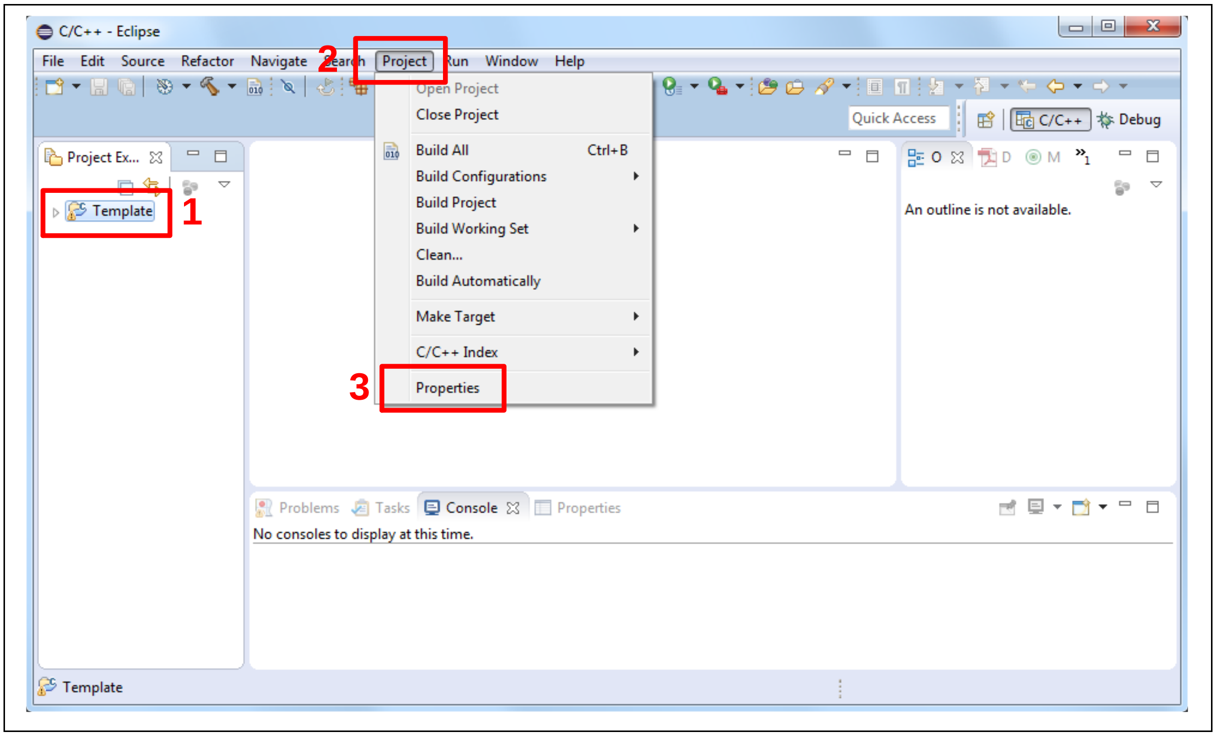


Figure 5-21 Open Project Properties Window

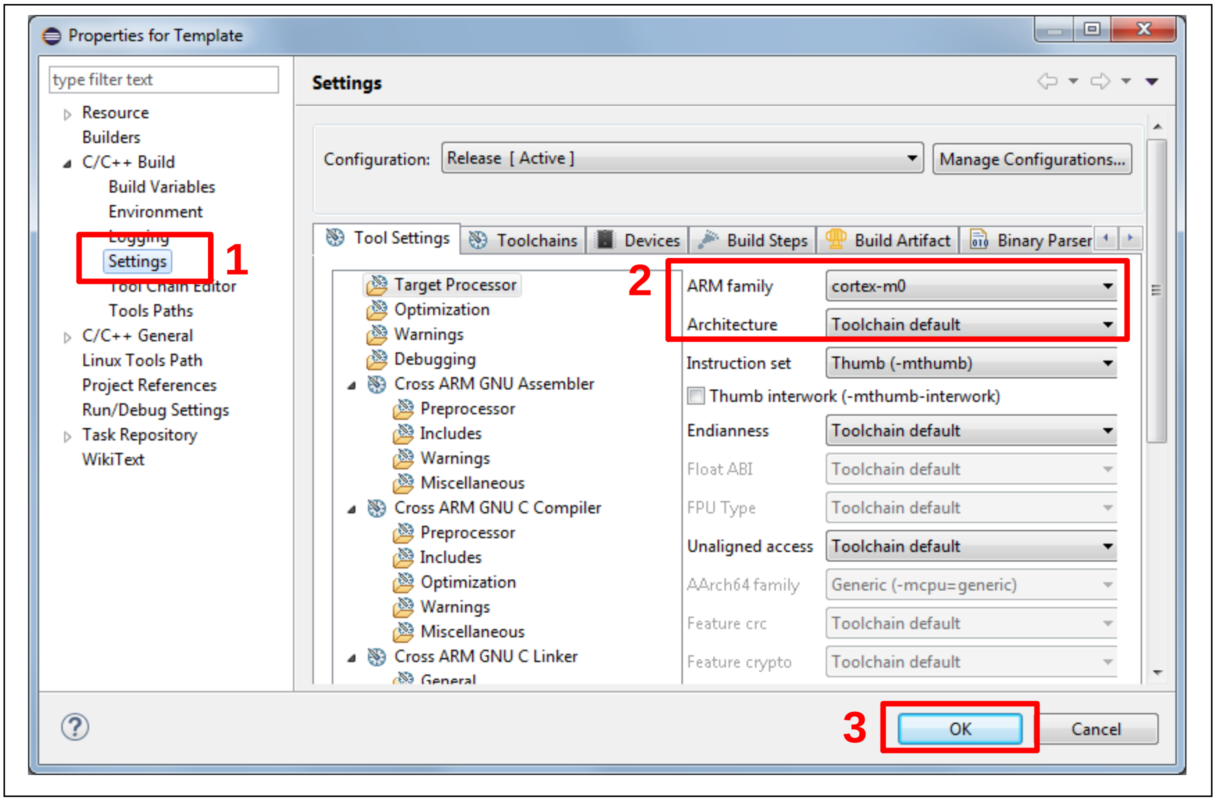


Figure 5-22 Project Properties Settings

4. Click the "Template" project and build the project.

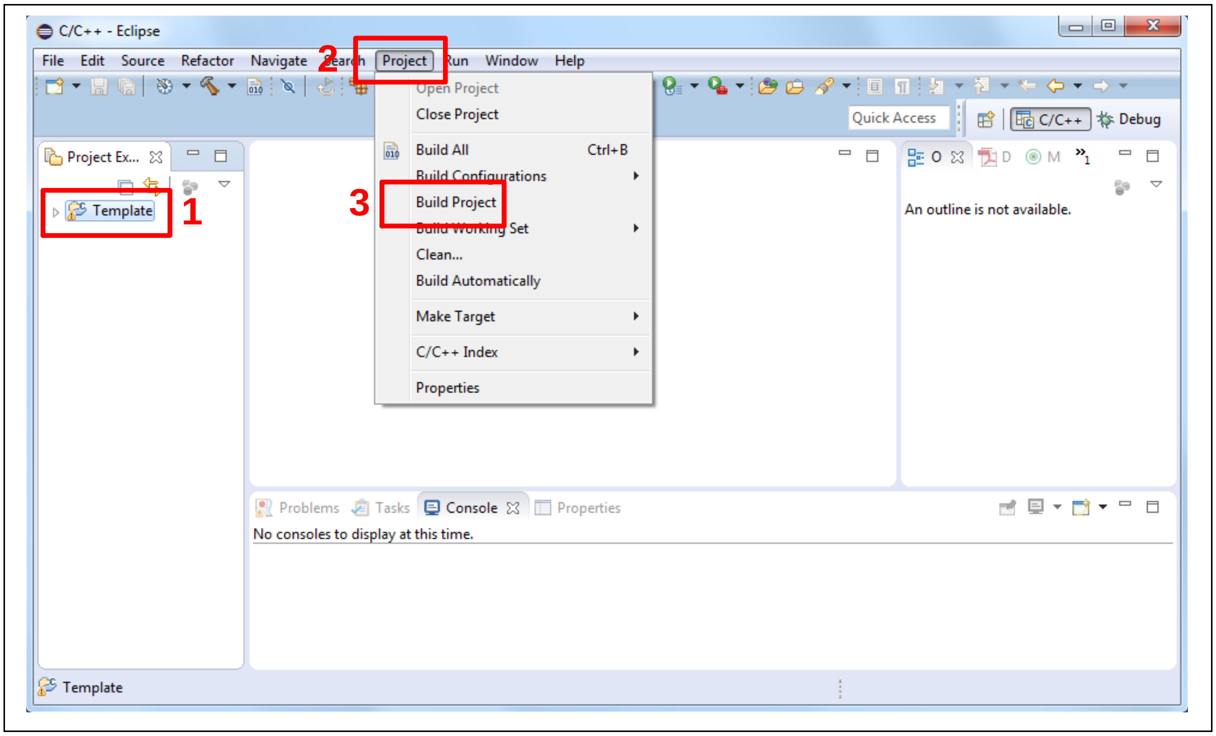


Figure 5-23 Build Project

5. After the project is built, click the "Template" project and set the "Debug Configuration" as shown in Figure 5-24. Follow the settings presented in Figure 5-25, Figure 5-26 and Figure 5-27 to enter debug mode.

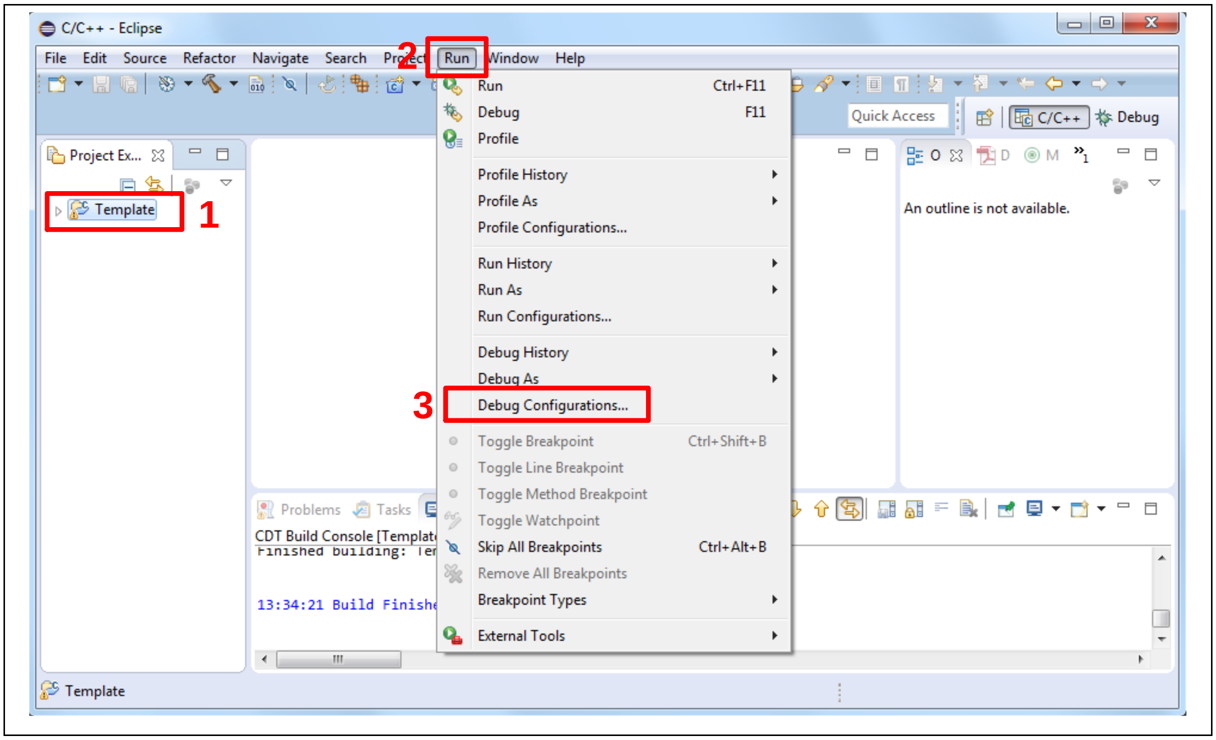
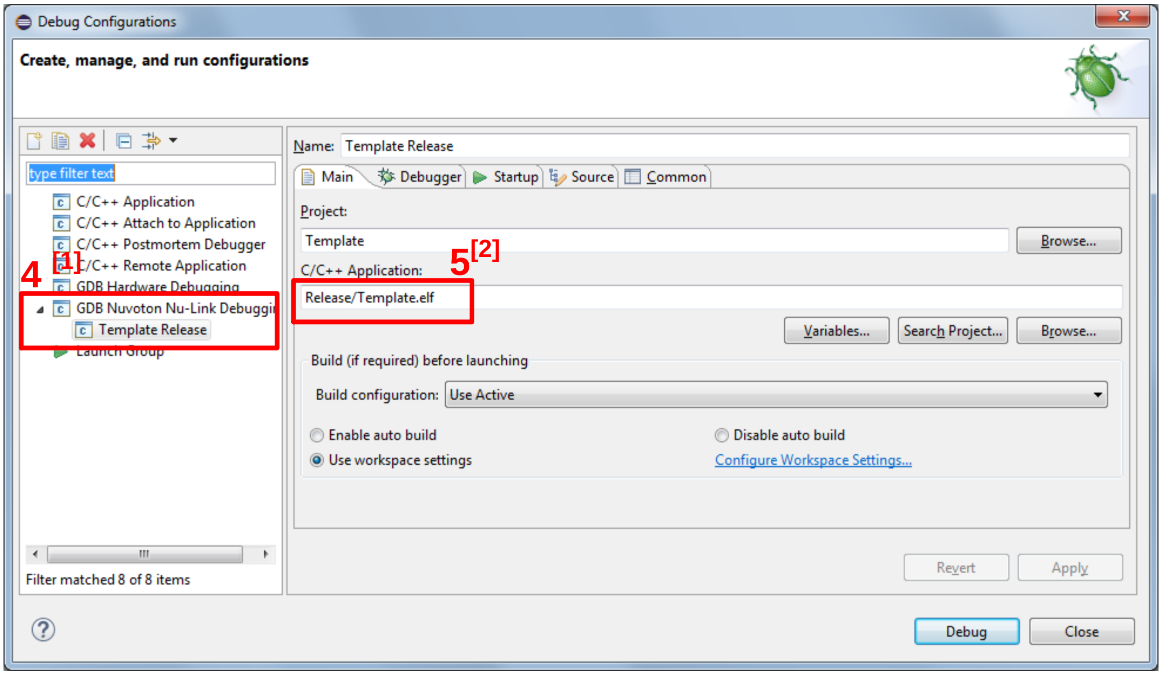


Figure 5-24 Open Debug Configuration



Note 1: Double-click the "GDB Nuvoton Nu-Link Debugging" to create the sub item.

Note 2: After the project is built, the "*.elf" file will be shown in "C/C++ Application" frame.

Figure 5-25 Main Tab Configuration

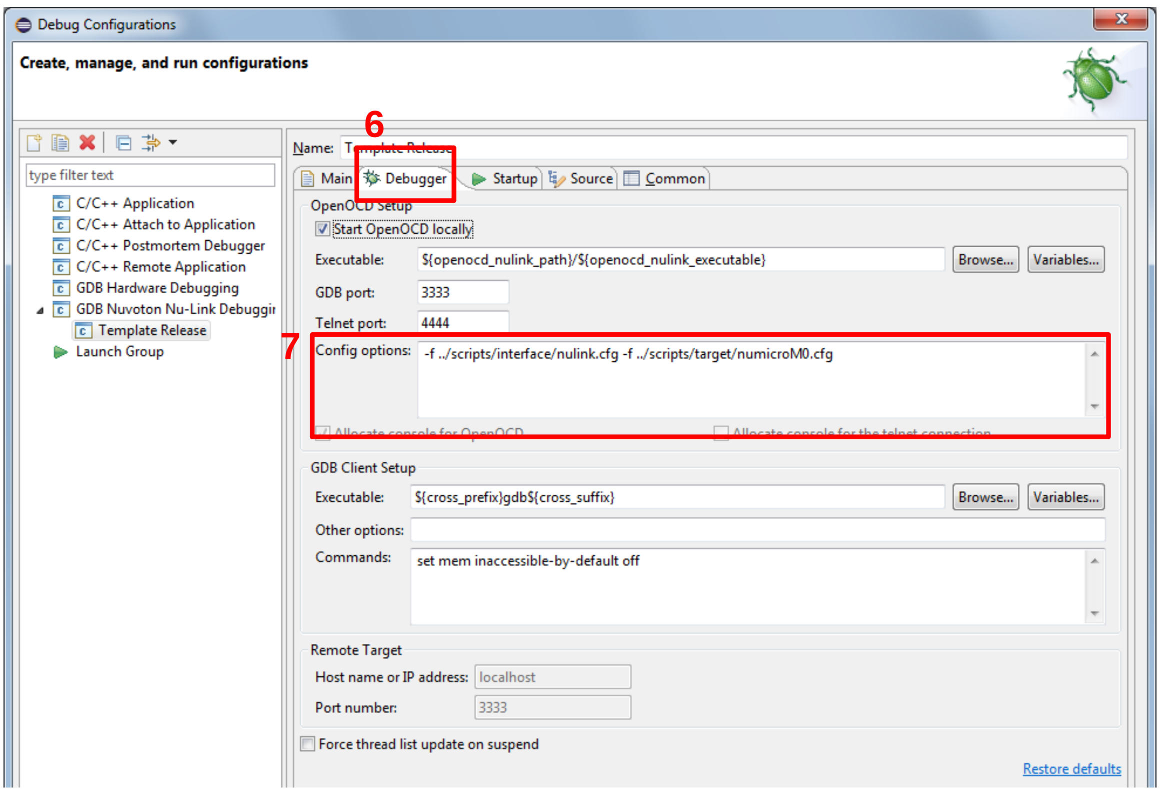
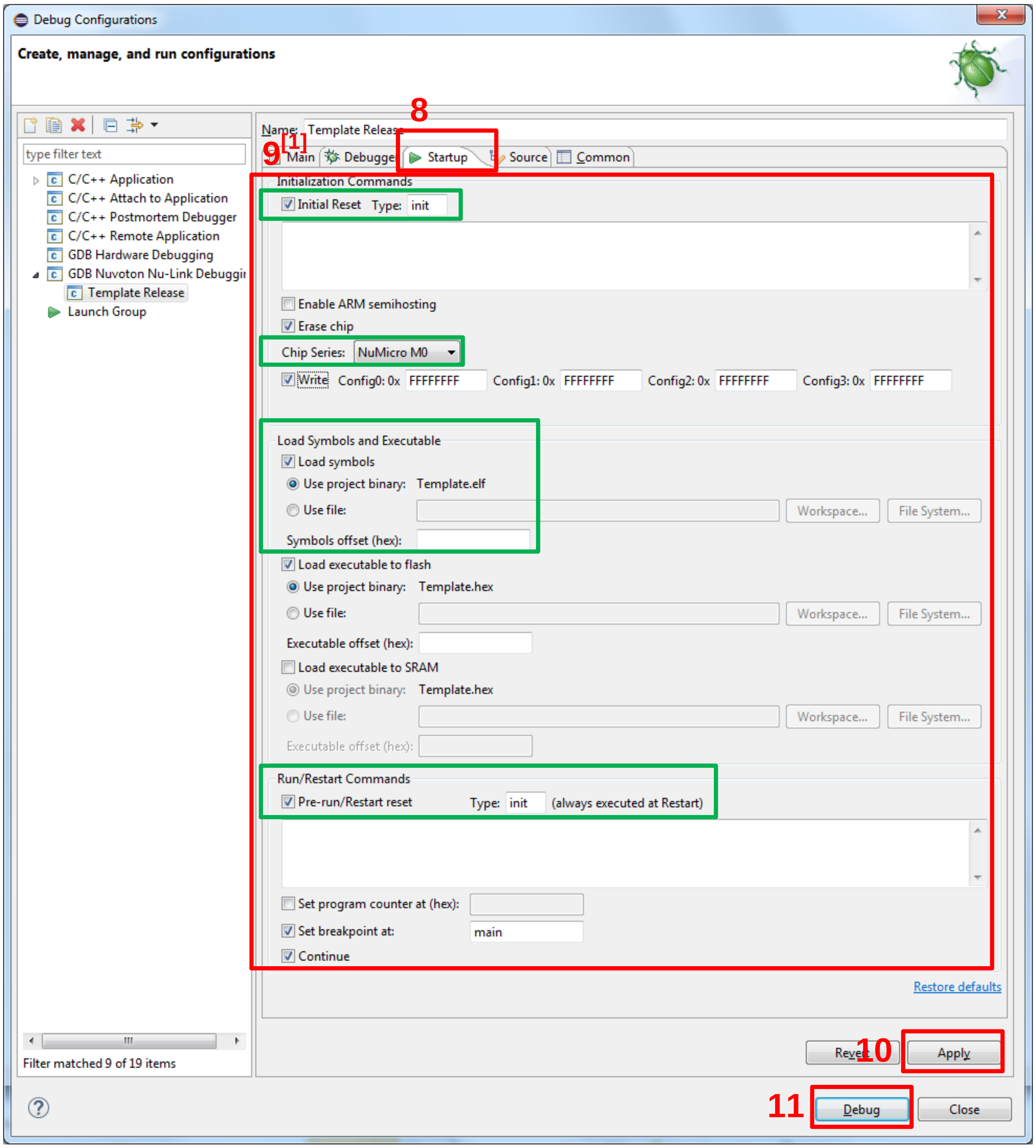


Figure 5-26 Debugger Tab Configuration



Note: User must follow those settings highlighted in green, and configure other settings depending on the needs.

Figure 5-27 Startup Tab Configuration

6. Figure 5-28 shows the debug mode under NuEclipse. Click "**Resume**" and the debug message will be printed out as shown in Figure 5-29. 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*.

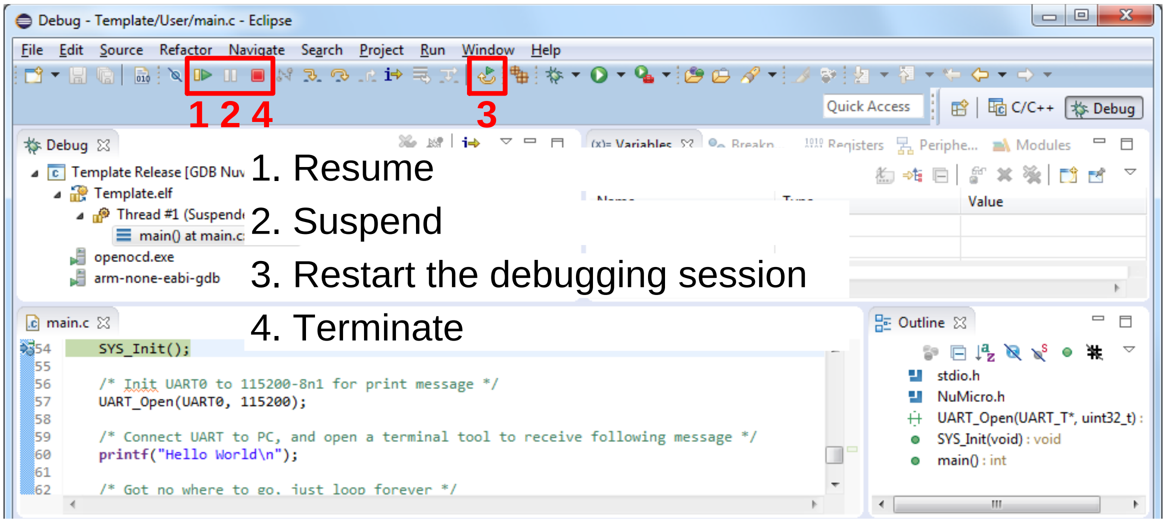


Figure 5-28 NuEclipse Debug Mode

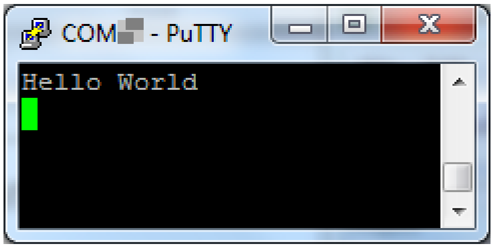


Figure 5-29 Debug Message on Serial Port Terminal Windows

6 NUMAKER-IOT-M467 SCHEMATICS

6.1 Nu-Link2-Me

Figure 6-1 shows the Nu-Link2-Me circuit.

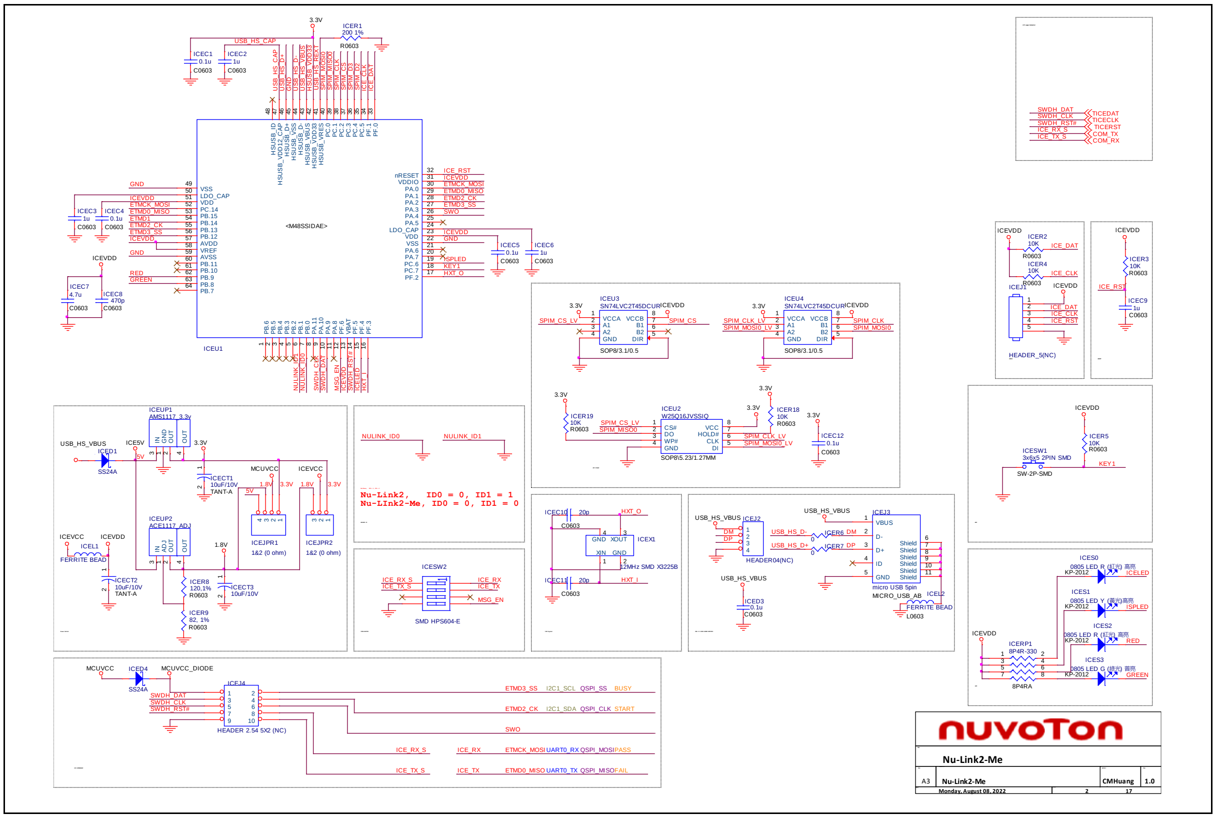


Figure 6-1 Nu-Link2-Me Circuit

6.2 M467 Target Board

6.2.1 Power Source

Figure 6-2 shows the power source circuit.

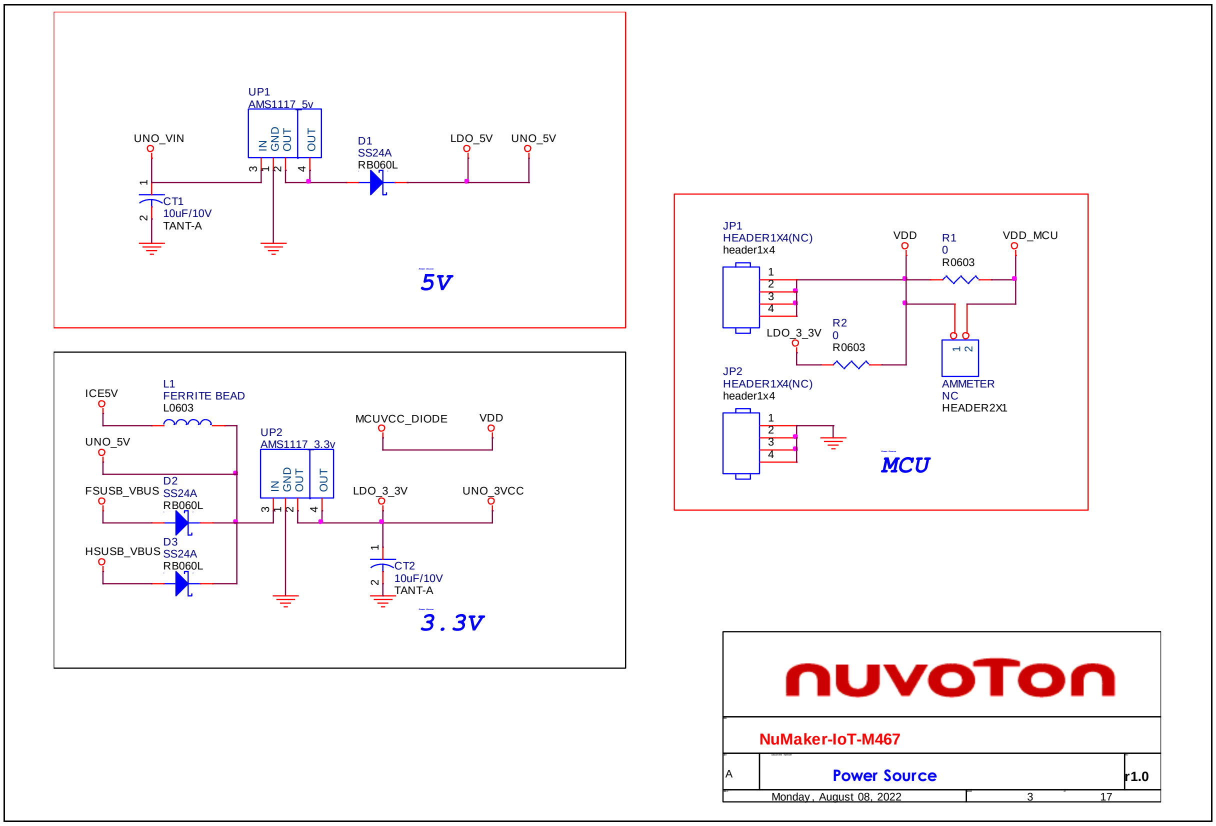


Figure 6-2 Power Source Circuit

6.2.2 M467HJHAN

Figure 6-3 shows the M467HJHAN circuit.

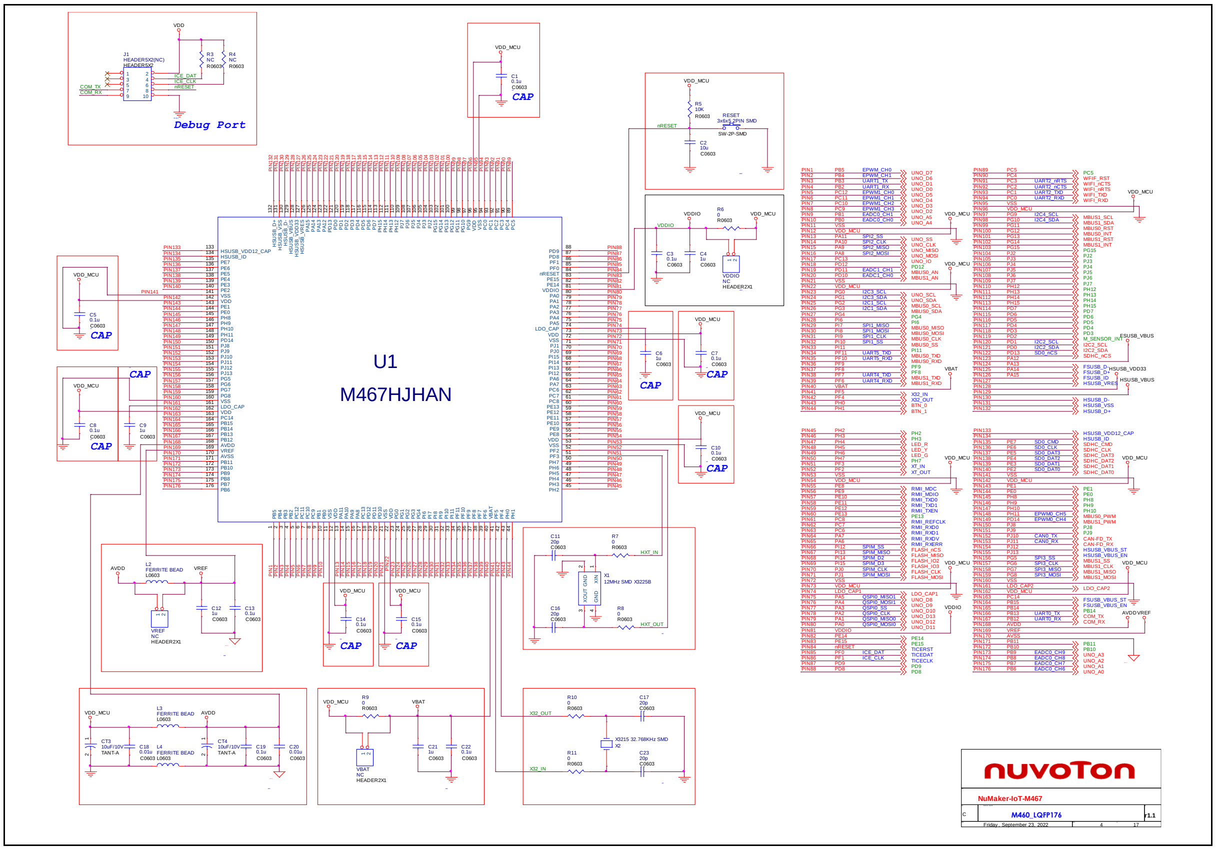


Figure 6-3 M467HJHAN Circuit

6.2.3 SPI Flash

Figure 6-4 shows the SPI Flash circuit.

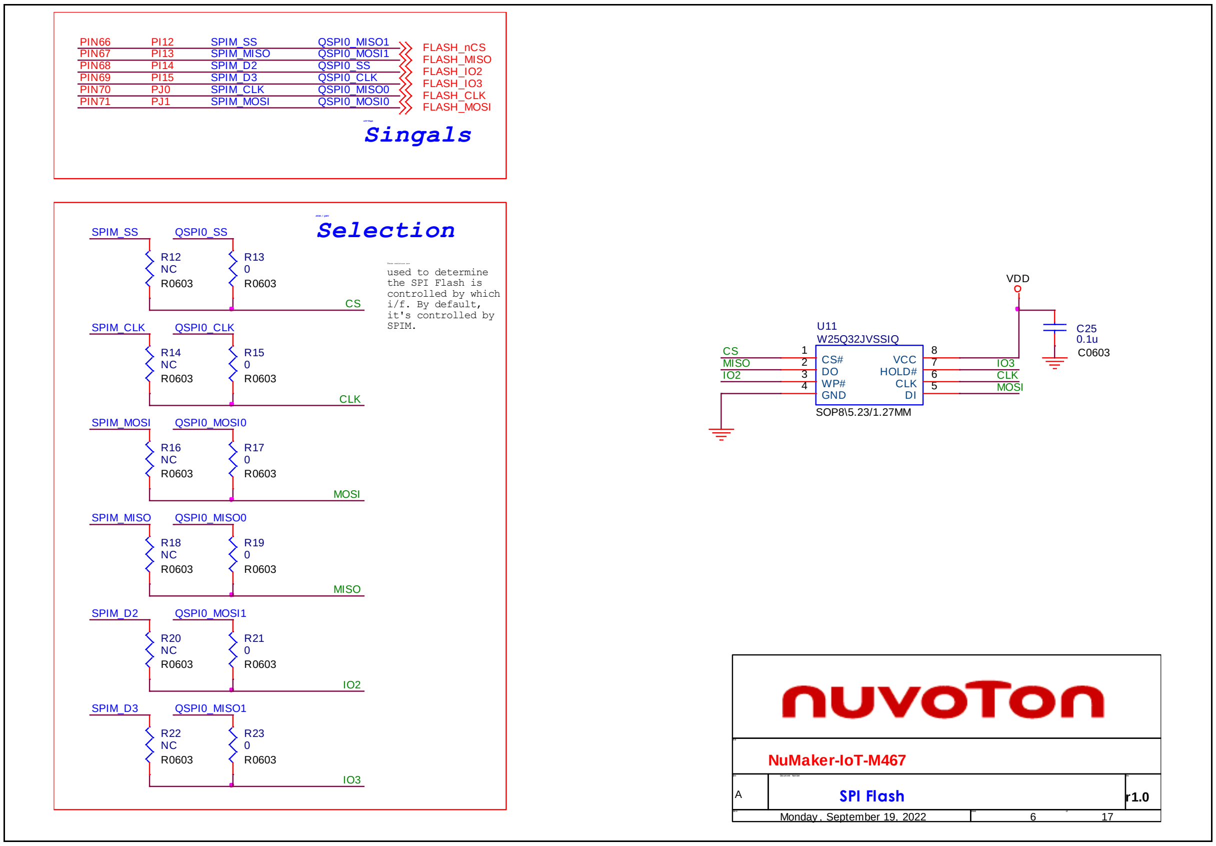


Figure 6-4 SPI Flash Circuit

6.2.4 Full-speed USB

Figure 6-5 shows the full-speed USB circuit.

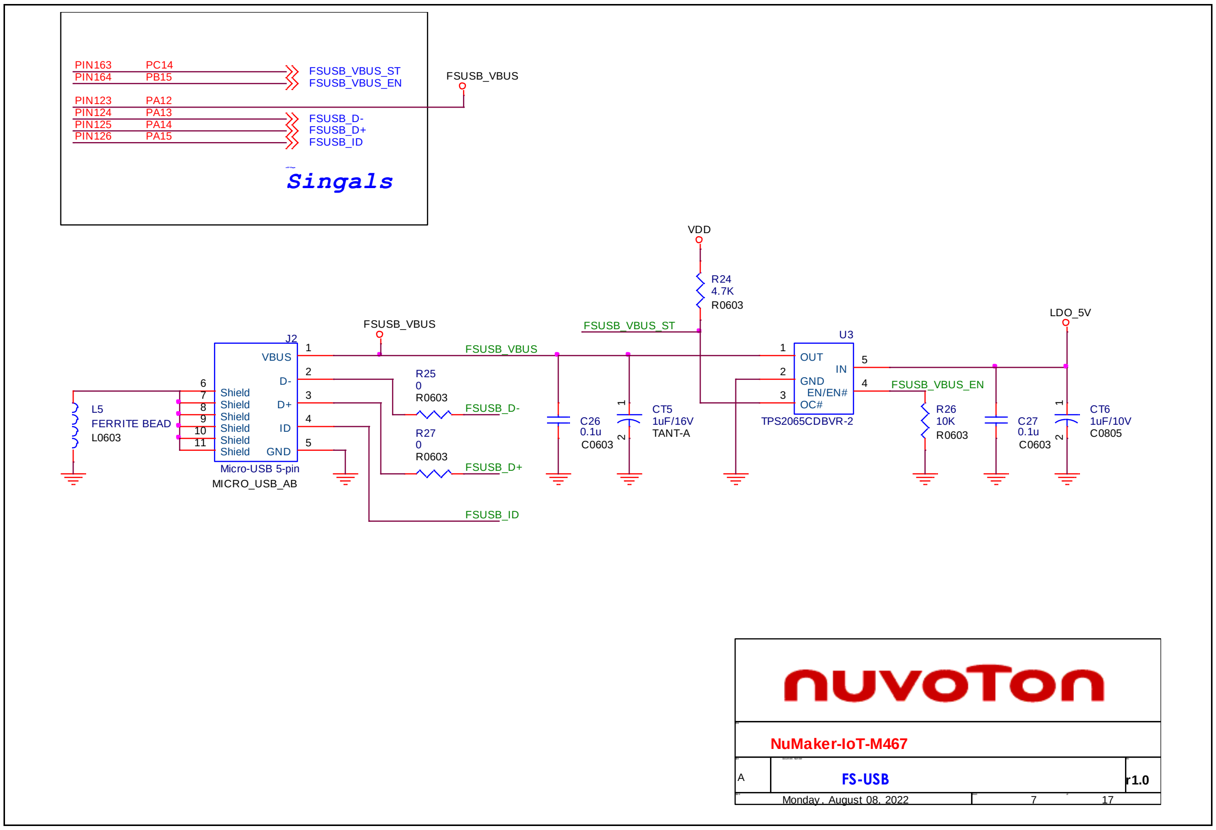


Figure 6-5 Full-speed USB Circuit

6.2.5 High-speed USB

Figure 6-6 shows the high-speed USB circuit.

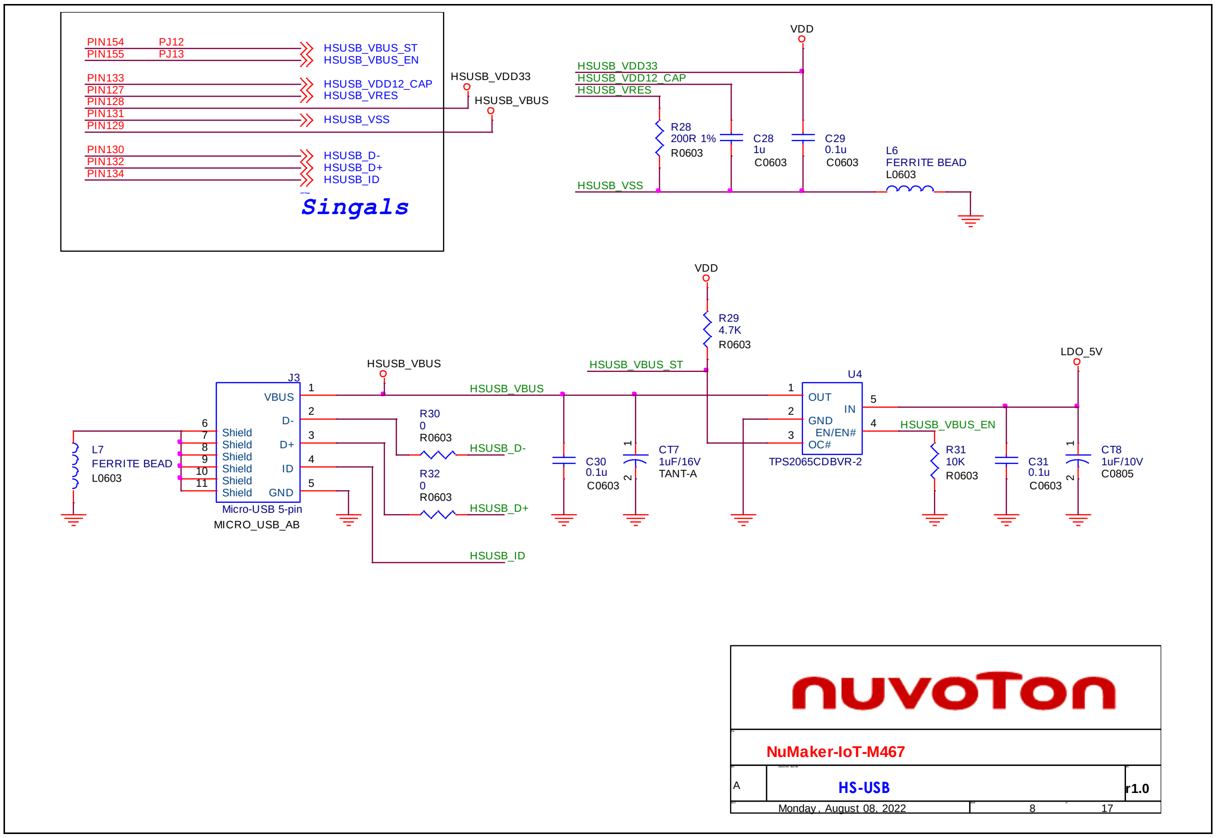


Figure 6-6 High-speed Circuit

NUMAKER-IOT-M467 USER MANUAL

6.2.6 Micro SD Card

Figure 6-7 shows the micro SD card circuit.

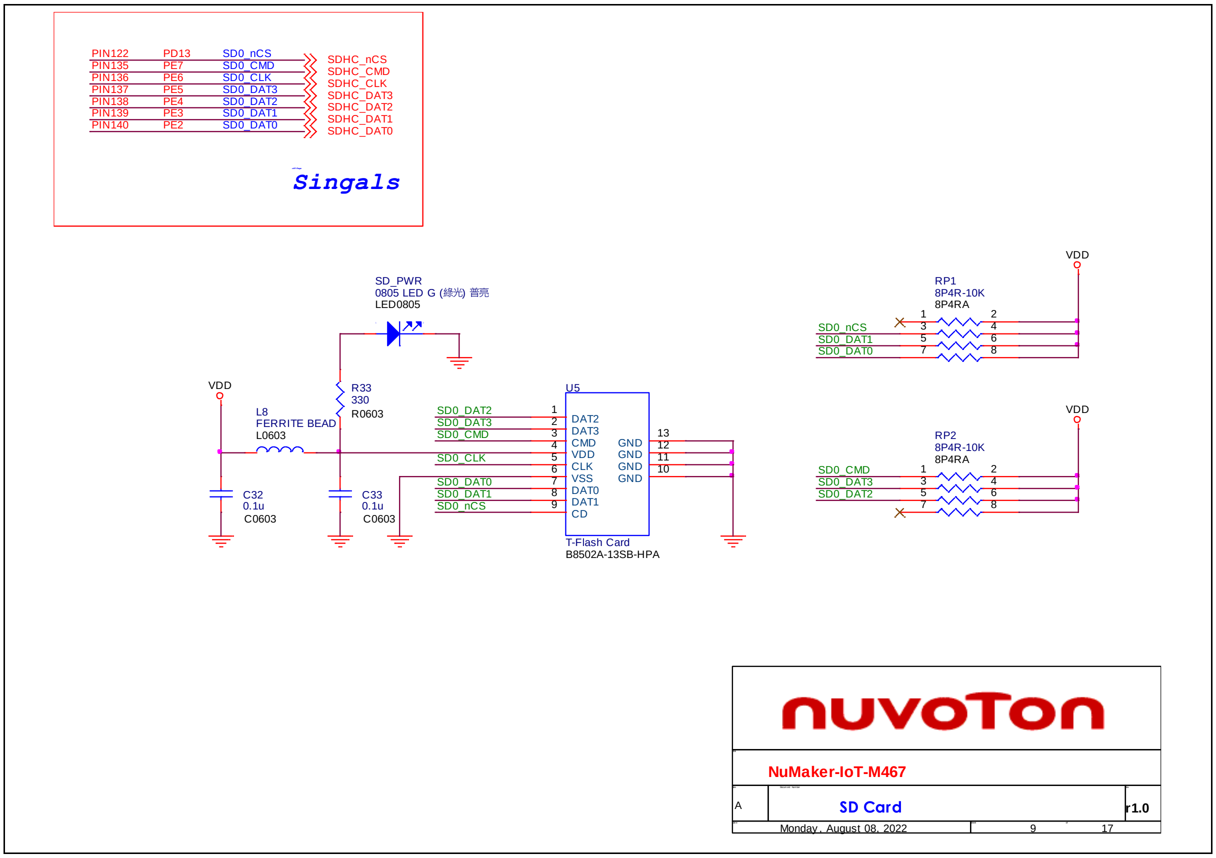


Figure 6-7 Micro SD Card Circuit

6.2.7 Arduino UNO I/F

Figure 6-8 shows the Arduino UNO interface circuit.

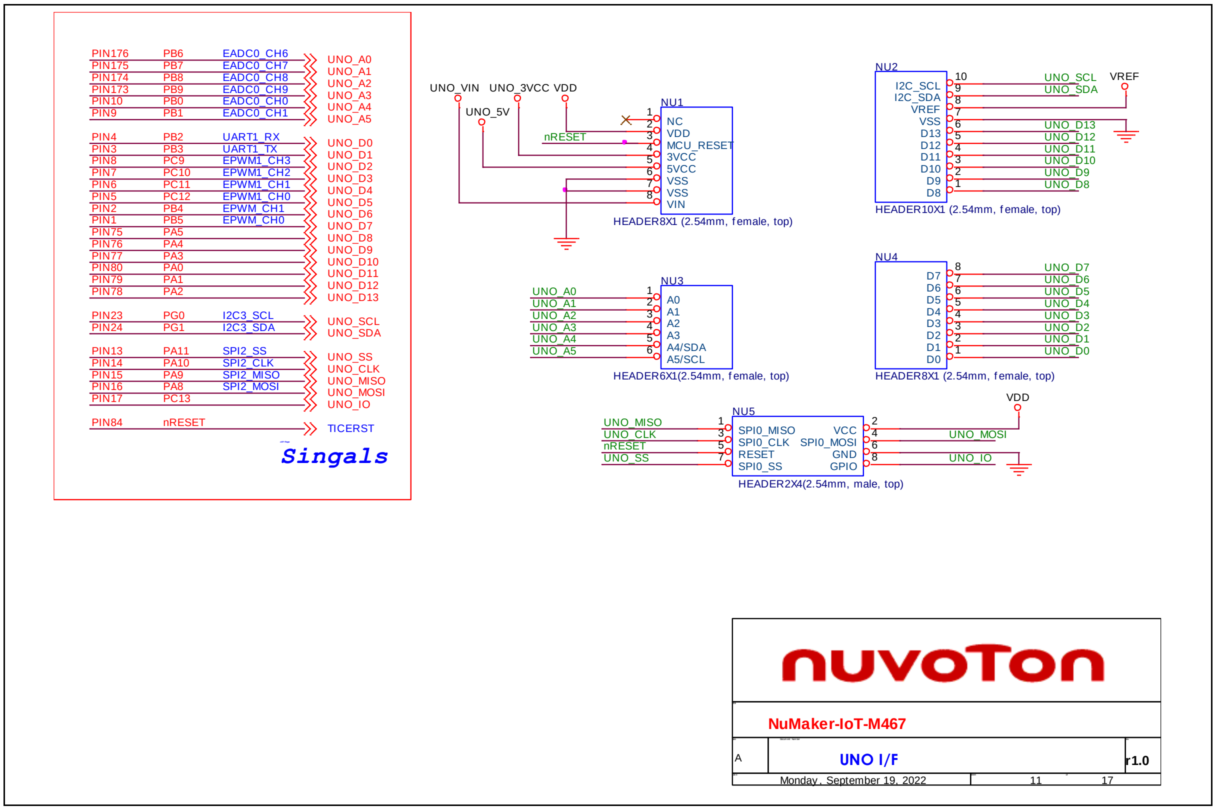


Figure 6-8 Arduino Uno I/F Circuit

6.2.8 CAN FD Transceiver

Figure 6-9 shows the CAN FD transceiver circuit.

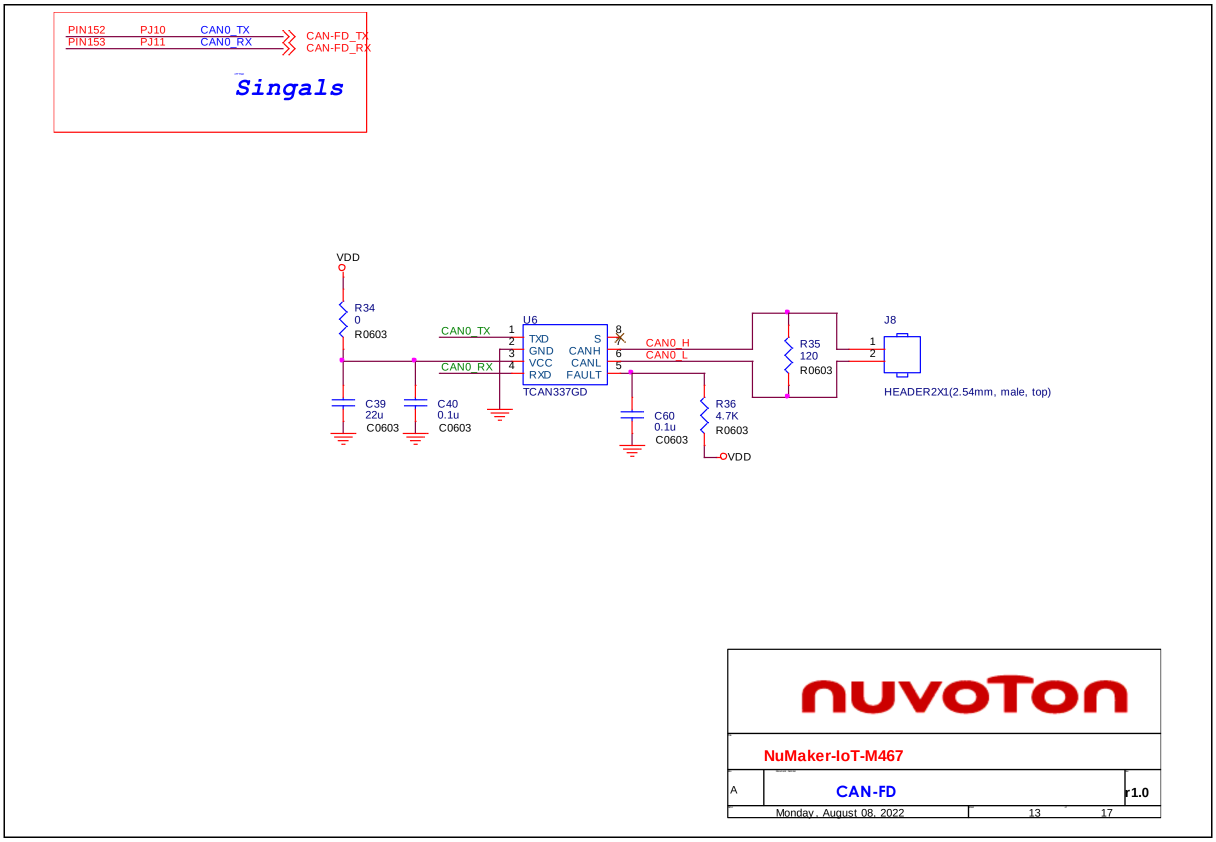


Figure 6-9 CAN FD Transceiver Circuit

6.2.9 Ethernet PHY

Figure 6-10 shows the Ethernet PHY circuit.

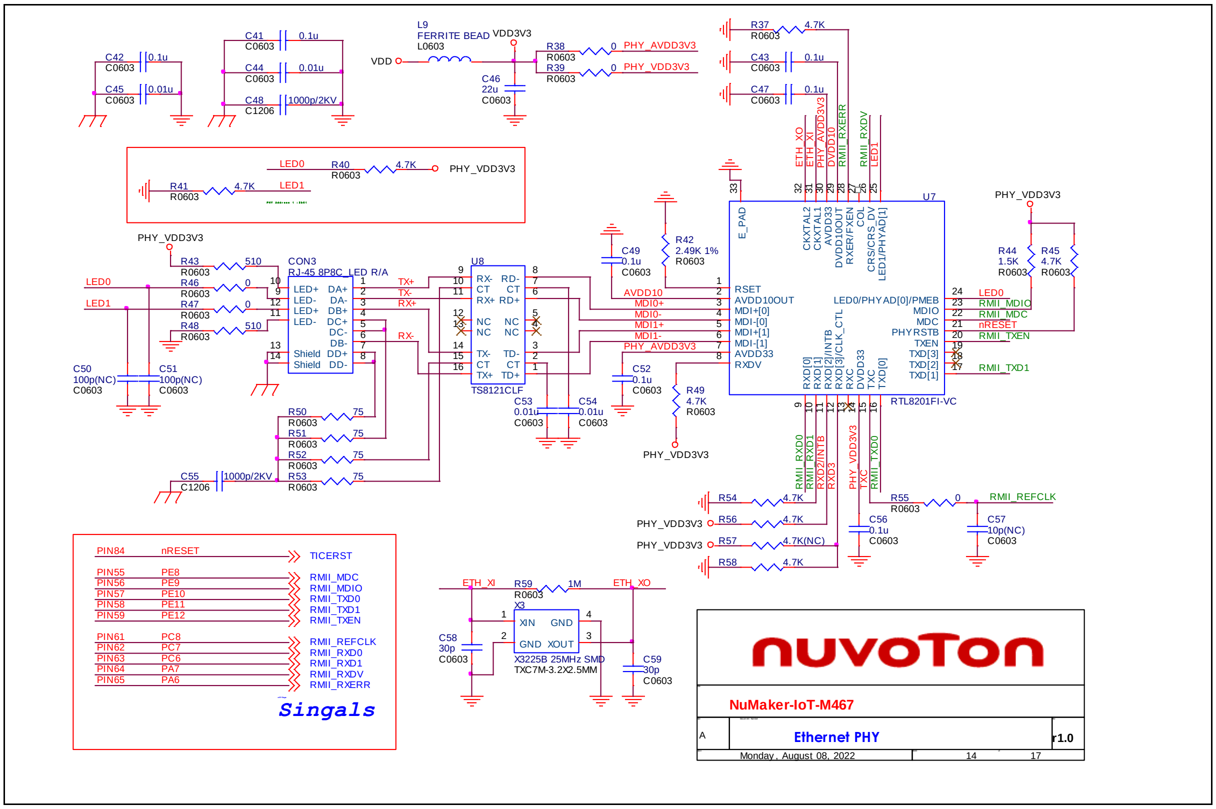


Figure 6-10 Ethernet PHY Circuit

6.2.10 Thermal Sensor

Figure 6-11 shows the thermal sensor circuit.

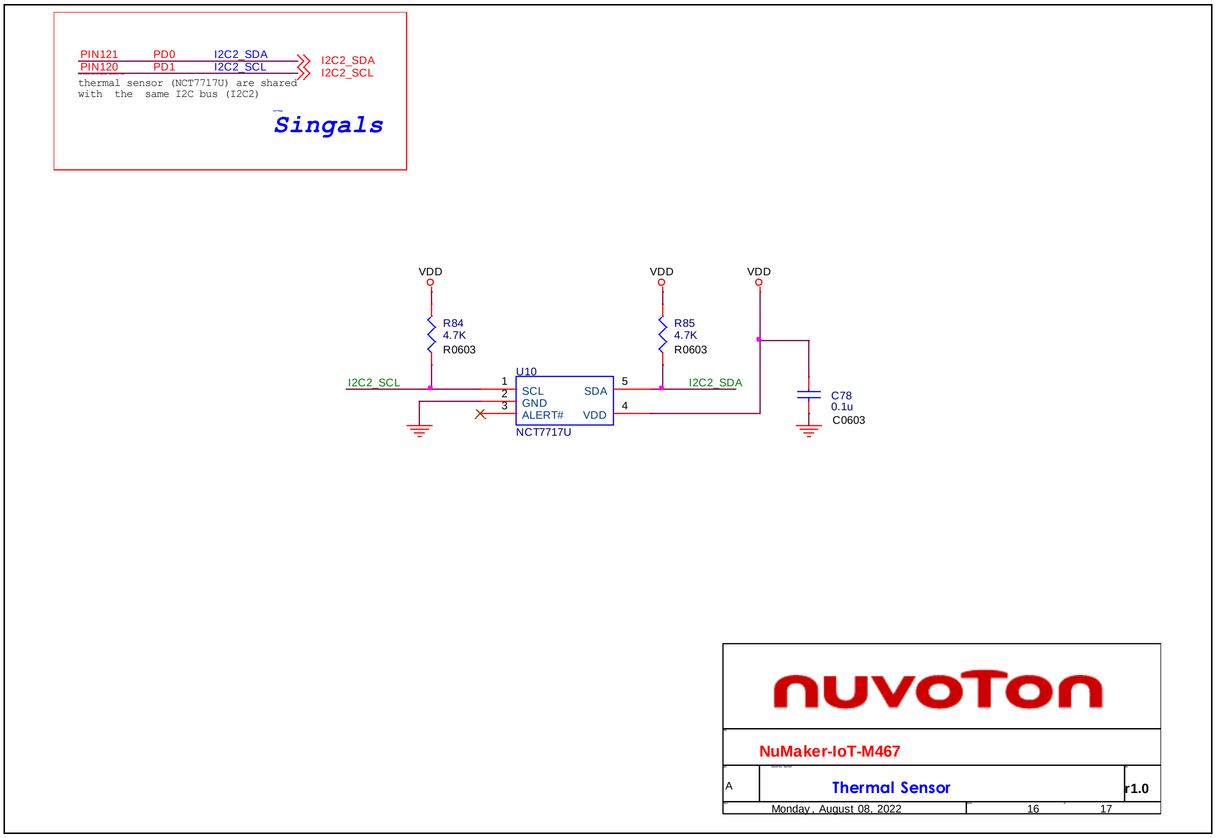


Figure 6-11 Thermal Sensor Circuit

6.2.11 LEDs & Buttons

Figure 6-12 shows the LEDs and buttons circuit.

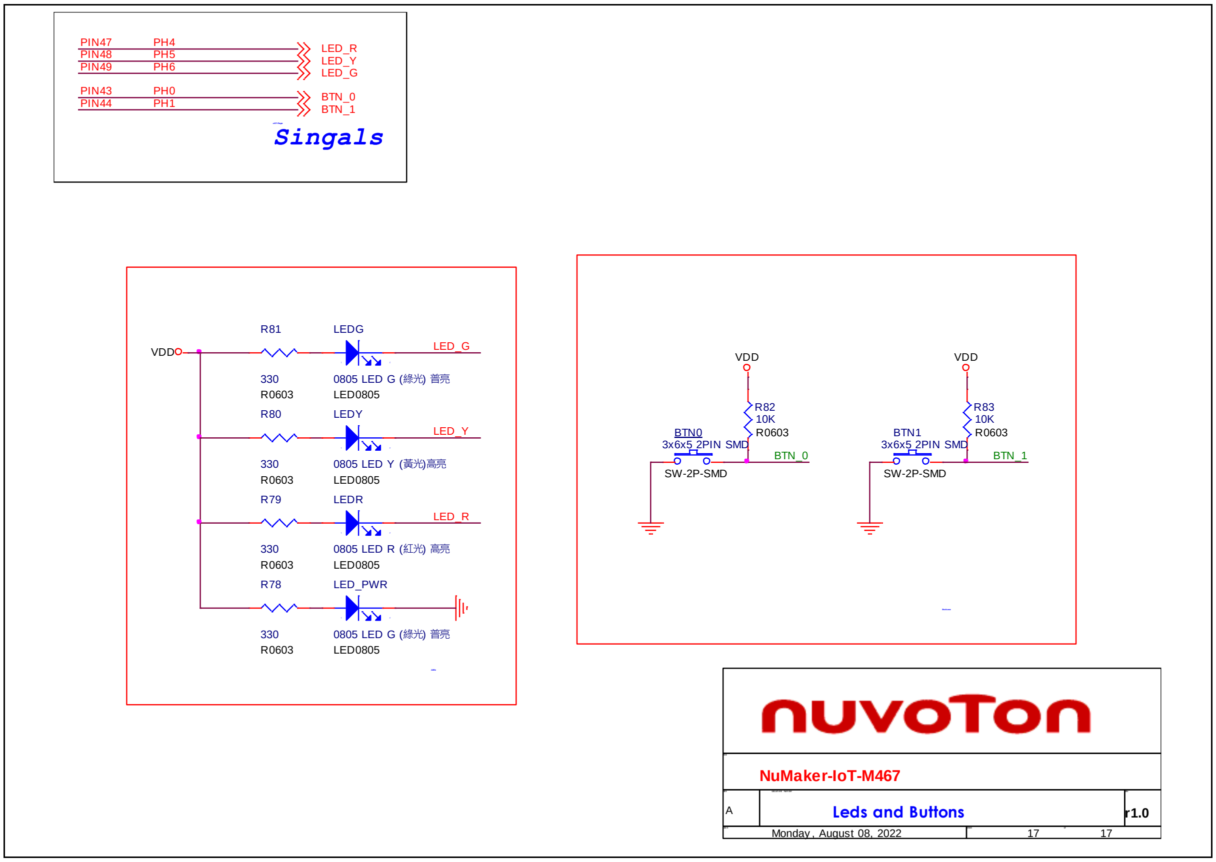


Figure 6-12 LEDs and Buttons Circuit

6.2.12 Wi-Fi Module

Figure 6-13 shows the Wi-Fi module circuit.

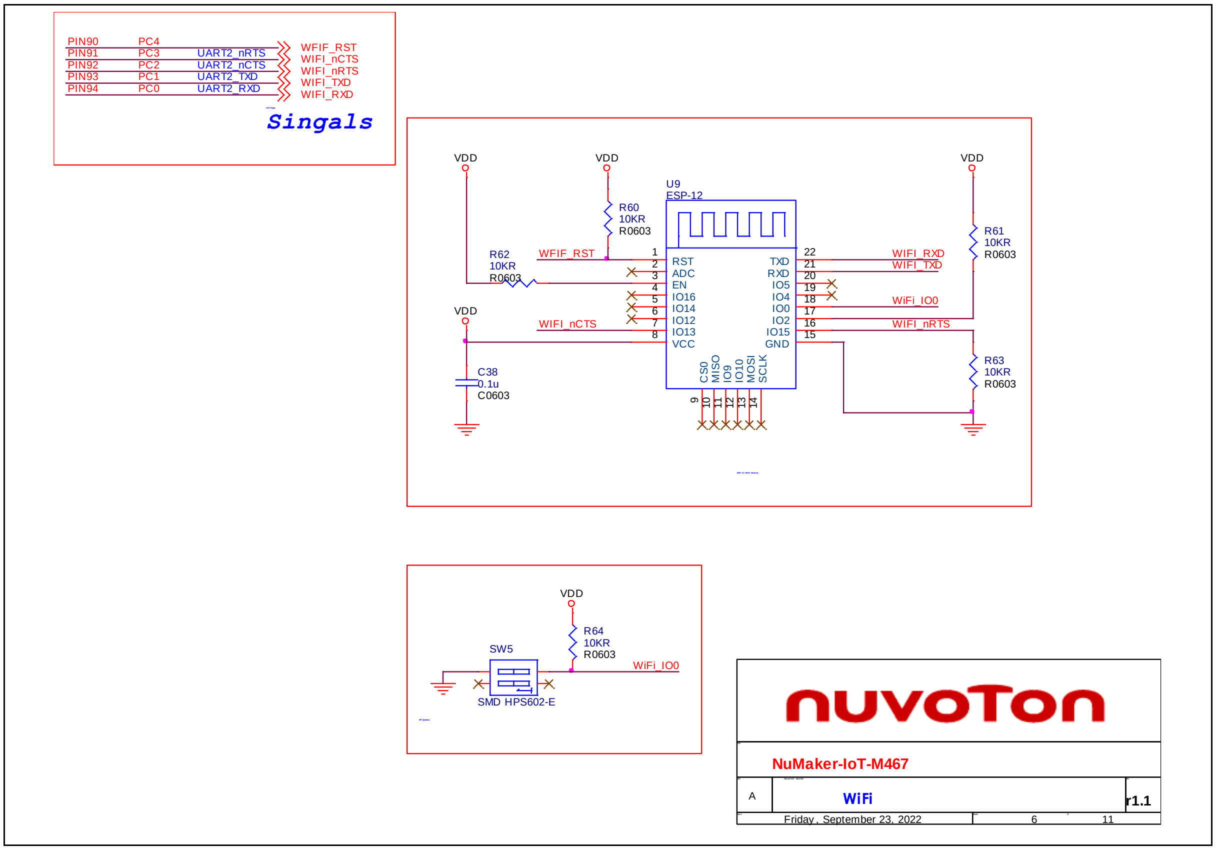


Figure 6-13 Wi-Fi Module Circuit

6.2.13 mikroBUSTM Interface

Figure 6-14 shows the mikroBUSTM interface circuit.

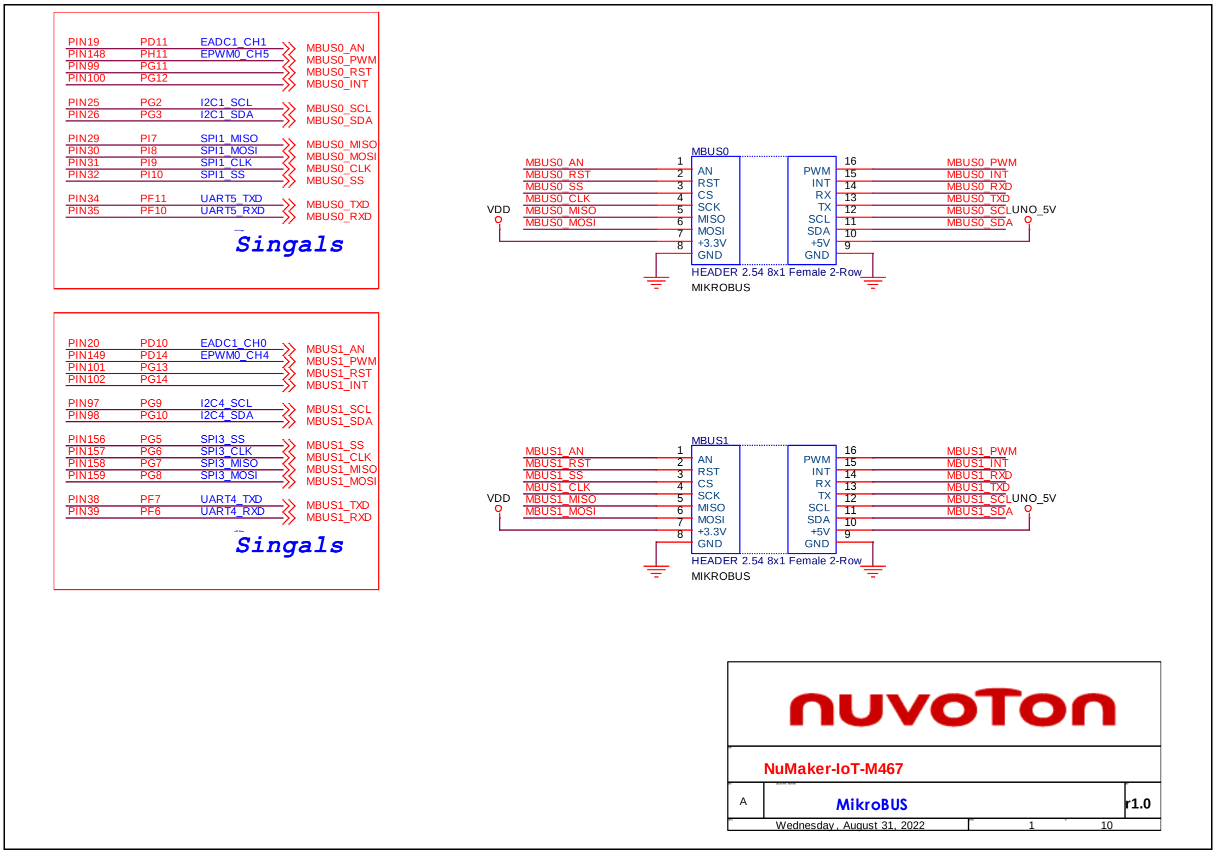


Figure 6-14 mikroBUSTM Interface Circuit

6.2.14 6-Axis Sensor

Figure 6-15 shows the 6-Axis sensor circuit.

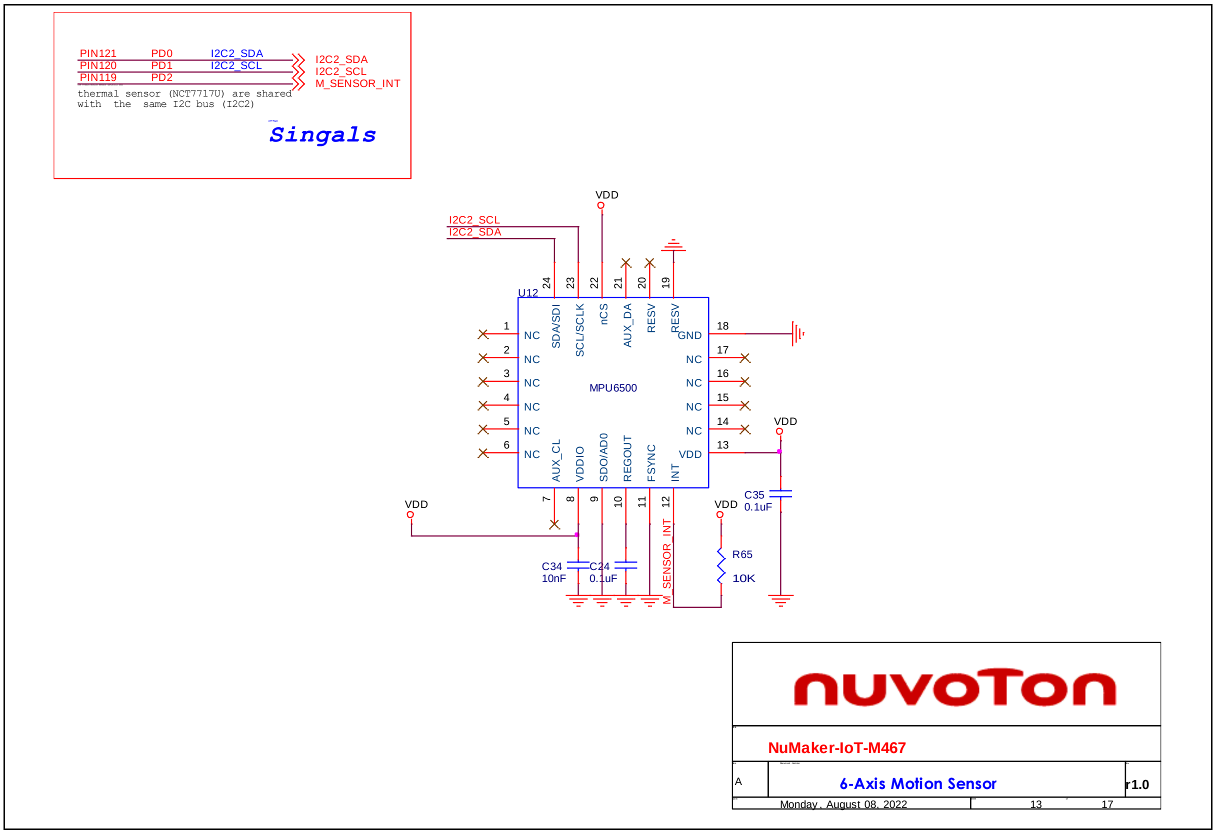


Figure 6-15 6-Axis Sensor Circuit

6.3 PCB Placement

Figure 6-16 and Figure 6-17 show the front and rear placement of NuMaker-IoT-M467.

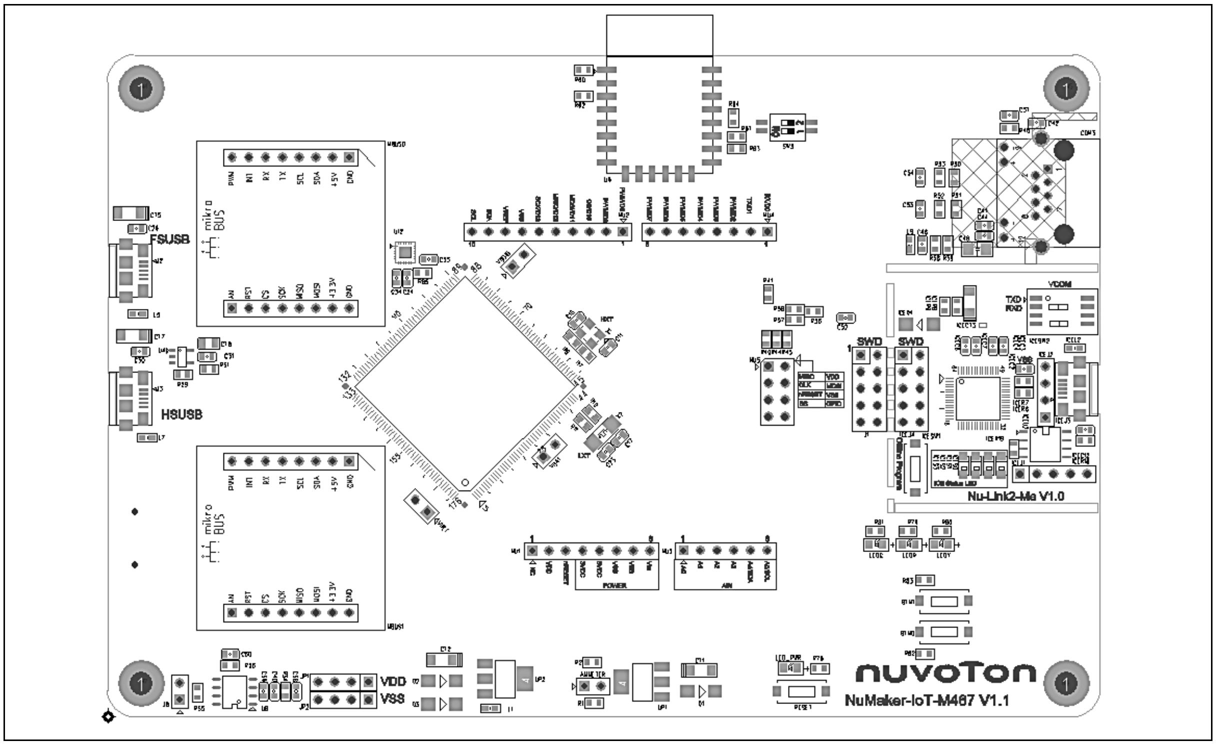


Figure 6-16 Front Placement

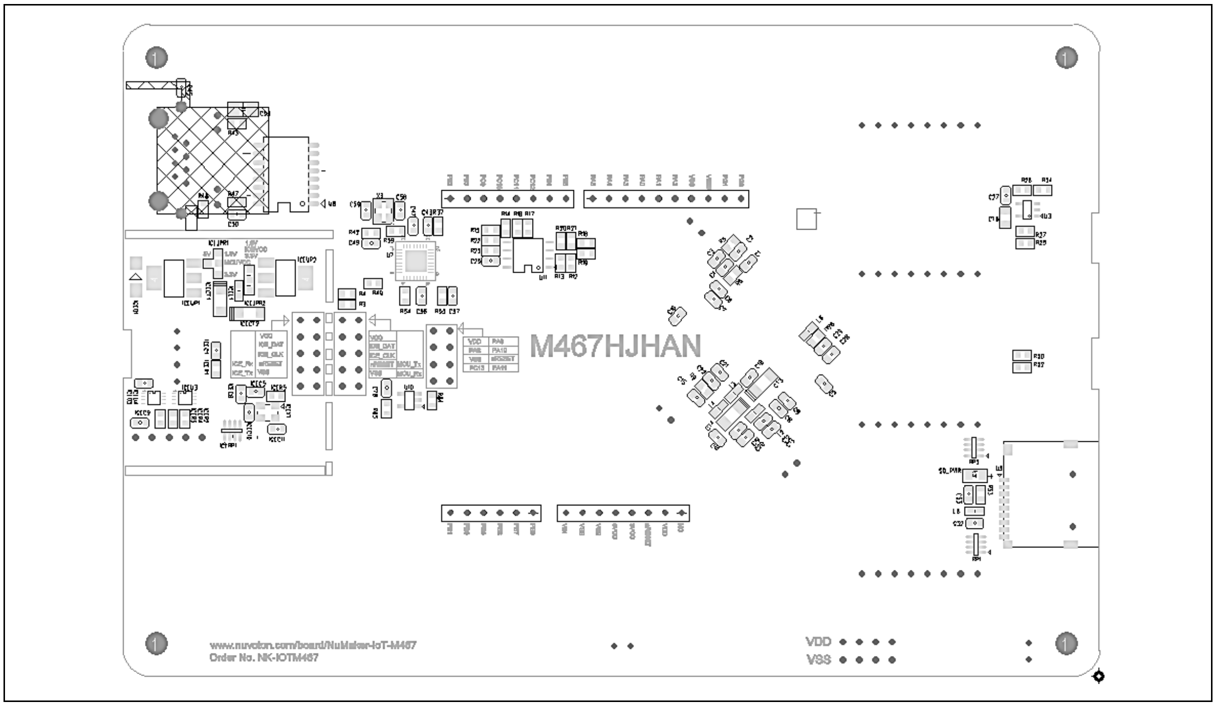


Figure 6-17 Rear Placement

7 REVISION HISTORY

Date	Revision	Description
2022.11.10	1.00	Initial version.

Important Notice

Nuvoton Products are neither intended nor warranted for usage in systems or equipment, any malfunction or failure of which may cause loss of human life, bodily injury or severe property damage. Such applications are deemed, "Insecure Usage".

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.

All Insecure Usage shall be made at customer's risk, and in the event that third parties lay claims to Nuvoton as a result of customer's Insecure Usage, customer shall indemnify the damages and liabilities thus incurred by Nuvoton.