ARM® Cortex®-M

32-bit Microcontroller

NuMaker-M483KG
User Manual
NuMicro® M483 Series

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

www.nuvoton.com

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1 OVERVIEW

This user manual is aimed to give users a fast introduction to the use of NuMaker-M483KG board.

The NuMaker-M483KG consists of two parts, a M483 platform and an on-board Nu-Link2-Me debugger and programmer. The NuMaker-M483KG allows users to quickly develop and easily program and debug application.

The NuMaker-M483KG offers M483KGCAE2A full pins extension connectors and Arduino UNO compatible extension connectors. It is an easy-to-develop platform for user to expand the functionality and build the applications. The NuMaker-M483KG also provides an ammeter connector, allows user to monitor the microcontroller's power consumption during development.

The Nu-Link2-Me is a debugger and programmer that supports on-line programming and debugging through SWD interface. The on-board 16 Mbit SPI Flash allows it able to off-line programming the target microcontroller. Nu-Link2-Me provides virtual COM port (VCOM) function to print out messages on PC. Nu-Link2-Me can be separated from NuMaker-M483KG, allowing user to use as a mass production programming tool.

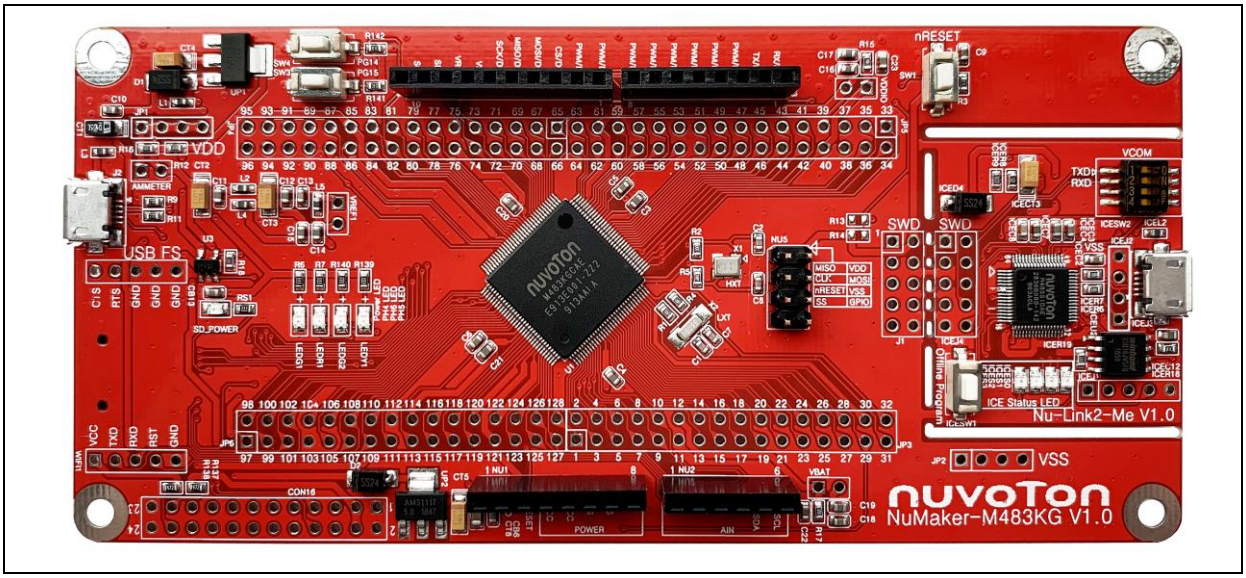

Figure 1-1 NuMaker-M483KG Board

1.1 NuMaker-M483KG Features

- NuMicro® M483KGCAE2A used as main microcontroller with function downward compatible with:
  - M483SGCAE
  - M482LGCAE
  - M482ZGCAE
- M483KGCAE2A full pins extension connectors
- Arduino UNO compatible extension connectors
- Ammeter connector for measuring the microcontroller's power consumption
- Fixable board power supply:
  - External V_{DD} power connector
  - Arduino UNO compatible extension connector Vin
  - USB FS connector on M483 platform

- ICE USB connector on Nu-Link2-Me

- On-board Nu-Link2-Me debugger and programmer:
  - Debug through SWD interface
  - On-line/off-line programming
  - Virtual COM port function

2 NUMAKER-M483KG OVERVIEW

2.1 Front View

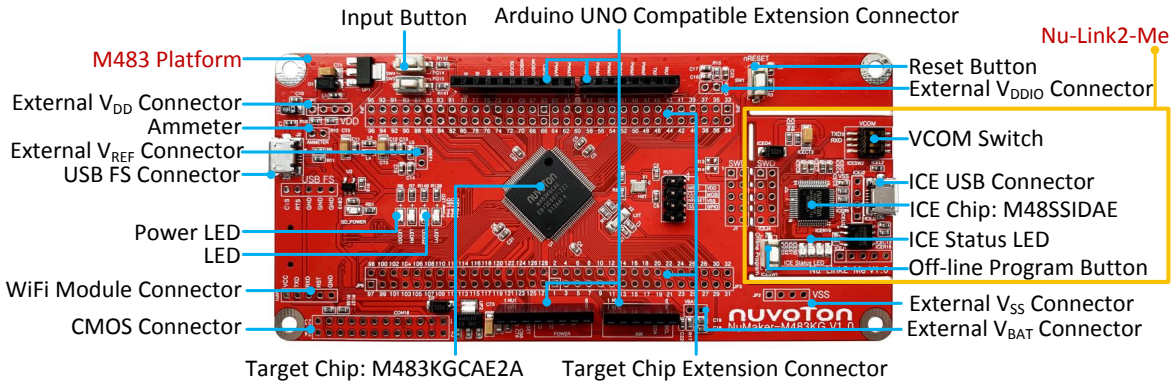

Figure 2-1 Front View of NuMaker-M483KG

Figure 2-1 shows the main components and connectors from the front side of NuMaker-M483KG. The following lists components and connectors from the front view:

- Target Chip: M483KGCAE2A(U1)
- USB FS Connector(J2)
- Arduino UNO Compatible Extension Connectors (NU1, NU2, NU3, NU4)
- M483 Extension Connectors (JP3, JP4, JP5 and JP6)
- External V_{DD} Power Connector(JP1)
- External V_{SS} Power Connector(JP2)
- External V_{REF} Connector(VREF1)
- External V_{BAT} Connector(VBAT)
- External V_{DDIO} Connector(VDDIO)
- WiFi Module Connector(WIFI1)
- CMOS Connector(CON16)
- Input Button(SW3 and SW4)
- Ammeter Connector(AMMETER)
- Reset Button(SW1)
- Power LED, PH4 LED, PH5 LED and PH6 LED(LEDG1, LEDR1, LEDY1 and LEDG2)
- 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)

2.2 Rear View

Figure 2-2 shows the main components and connectors from the rear side of NuMaker-M483KG.

The following lists components and connectors from the rear view:

- SD Card Slot(U9)
- Nu-Link2-Me
  - MCUVCC Power Switch (ICEJPR1)
  - ICEVCC Power Switch (ICEJPR2)

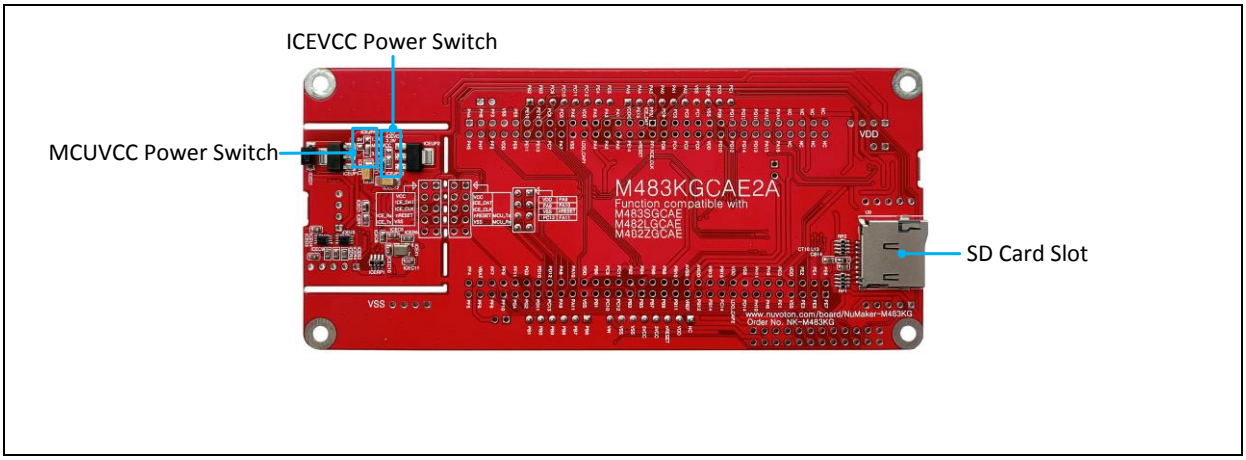

Figure 2-2 Rear View of NuMaker-M483KG

2.3 Arduino UNO Compatible Extension Connectors

Figure 2-3 shows the Arduino UNO compatible extension connectors.

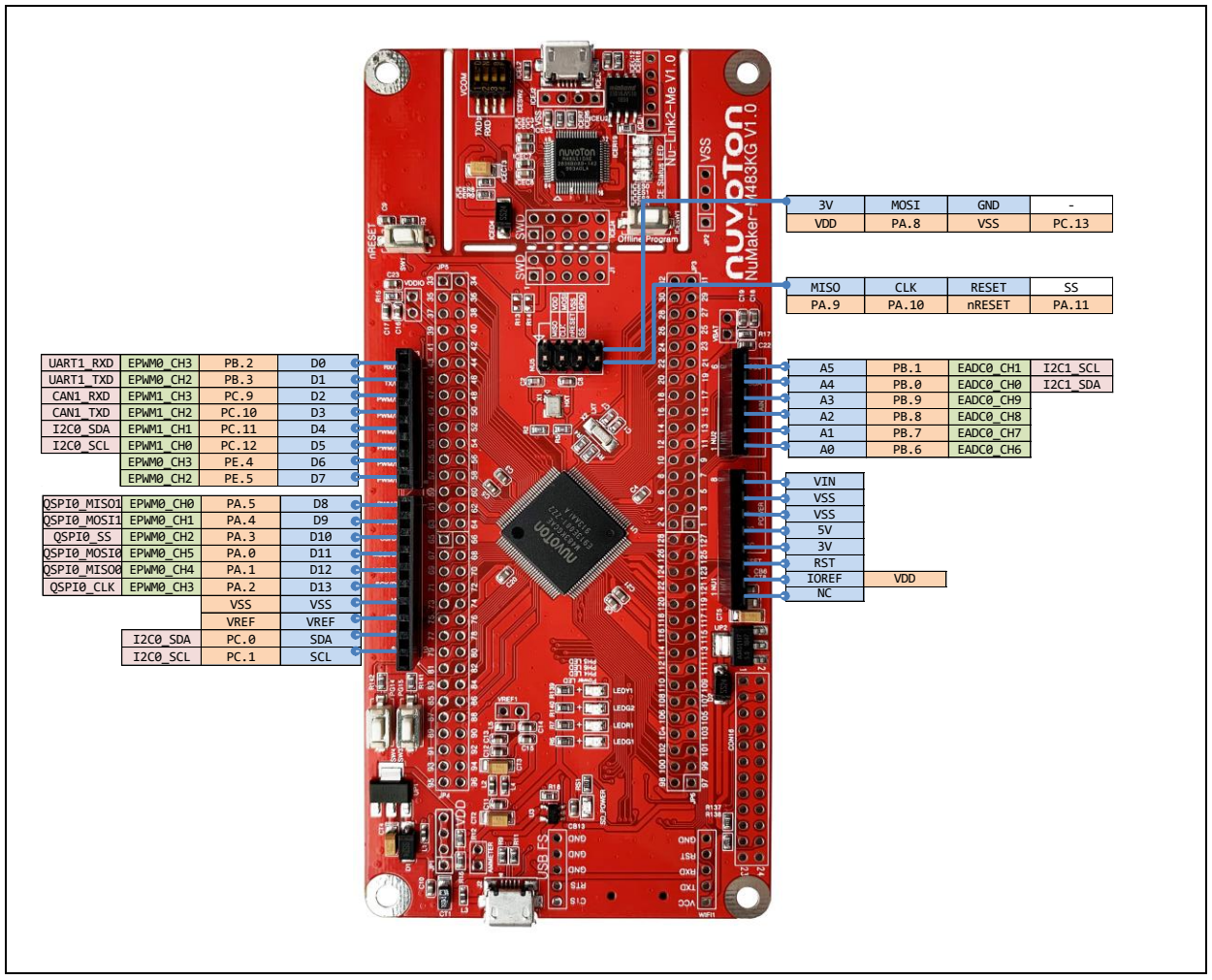

Figure 2-3 Arduino UNO Compatible Extension Connectors

Header		NuMaker-M483KG		Header		NuMaker-M483KG	
		Compatible to Arduino UNO	GPIO Pin of M483			Compatible to Arduino UNO	GPIO Pin of M483
NU3	NU3.1	D0	PB.2	NU2	NU2.6	A5	PB.1
	NU3.2	D1	PB.3		NU2.5	A4	PB.0
	NU3.3	D2	PC.9		NU2.4	A3	PB.9
	NU3.4	D3	PC.10		NU2.3	A2	PB.8
	NU3.5	D4	PC.11		NU2.2	A1	PB.7
	NU3.6	D5	PC.12		NU2.1	A0	PB.6
	NU3.7	D6	PE.4	NU1	NU1.8	VIN	-
	NU3.8	D7	PE.5		NU1.7	VSS	
NU4	NU4.1	D8	PA.5		NU1.6	VSS	
	NU4.2	D9	PA.4		NU1.5	5V	
	NU4.3	D10	PA.3		NU1.4	3V	
	NU4.4	D11	PA.0		NU1.3	RST	nRESET
	NU4.5	D12	PA.1		NU1.2	IOREF	V_{DD}
	NU4.6	D13	PA.2		NU1.1	NC	-
	NU4.7	VSS	V_{SS}				
	NU4.8	VREF	V_{REF}				
	NU4.9	SDA	PC.0				
	NU4.10	SCL	PC.1				

Header		NuMaker-M483KG		Header		NuMaker-M483KG	
		Extension Connectors	GPIO Pin of M483			Extension Connectors	GPIO Pin of M483
NU5	NU5.1	SPI0_MISO	PA.9	NU5	NU5.2	VCC	
	NU5.3	SPI0_CLK	PA.10		NU5.4	SPI0_MOSI	PA.8
	NU5.5	RST			NU5.6	GND	
	NU5.7	SPI0_SS	PA.11		NU5.8	GPIO	PC.13

Table 2-1 Arduino UNO Extension Connectors and M483KGCAE2A Mapping GPIO List

2.4 Pin Assignment for Extension Connectors

The NuMaker-M483KG provides the M483KGCAE2A target chip onboard and full pins extension connectors (JP3, JP4, JP5 and JP6). The Figure 2-4 shows the M483KGCAE2A extension connectors.

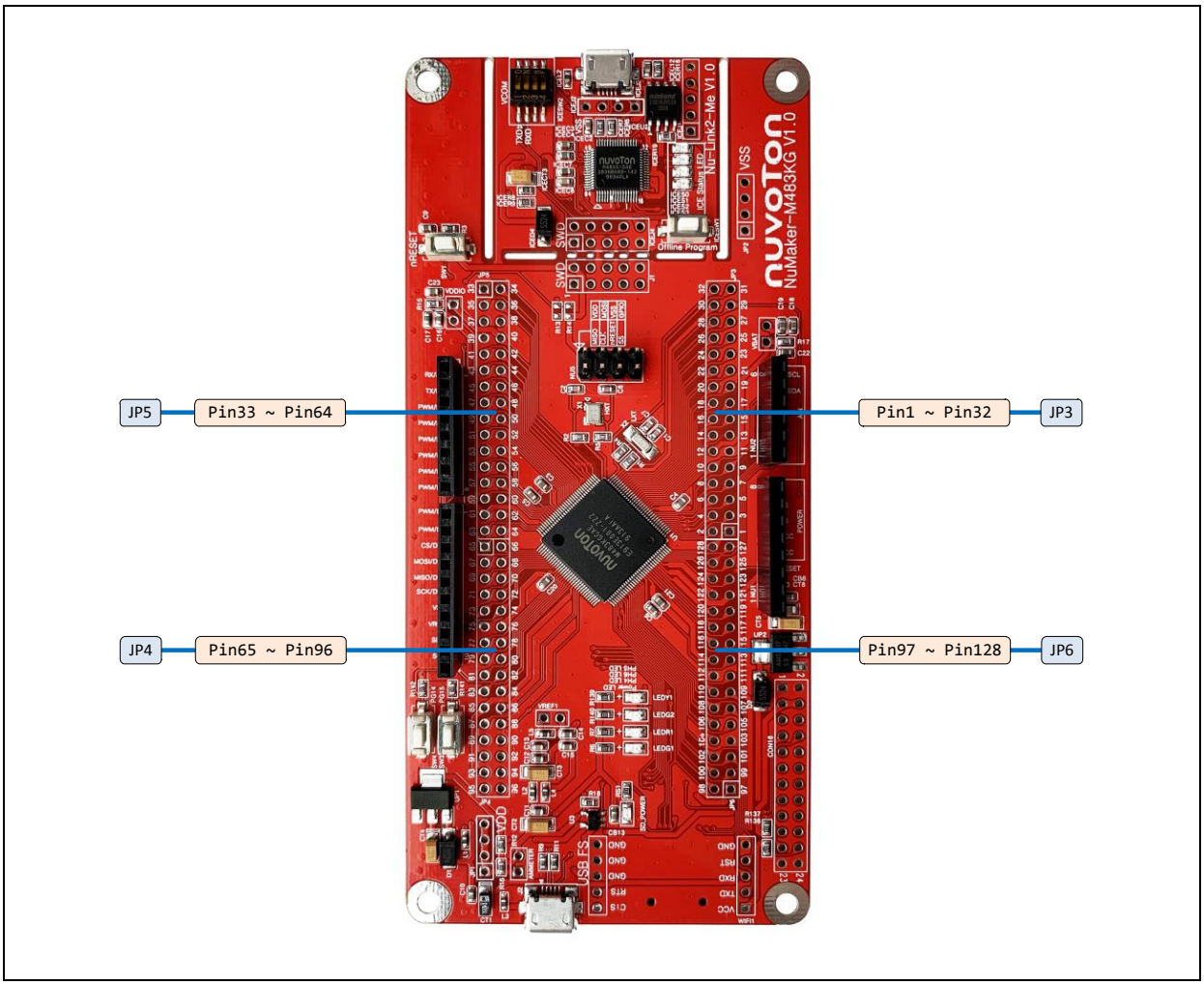

Figure 2-4 M483KGCAE2A Extension Connectors

Header		M483KGCAE2A		Header		M483KGCAE2A	
		Pin No.	Function			Pin No	Function
JP3	JP3.1	1	SD0_DAT3	JP3	JP3.2	2	SD0_DAT2
	JP3.3	3	PB.3		JP3.4	4	PB.2
	JP3.5	5	PC.12		JP3.6	6	PC.11
	JP3.7	7	PC.10		JP3.8	8	PC.9
	JP3.9	9	PB.1		JP3.10	10	PB.0
	JP3.11	11	GND		JP3.12	12	3VCC
	JP3.13	13	PA.11		JP3.14	14	PA.10
	JP3.15	15	PA.9		JP3.16	16	PA.8
	JP3.17	17	PC.13		JP3.18	18	PD.12
	JP3.19	19	PD.11		JP3.20	20	PD.10
	JP3.21	21	PG.2		JP3.22	22	PG.3
	JP3.23	23	PG.4		JP3.24	24	PF.11
	JP3.25	25	PF.10		JP3.26	26	PF.9
	JP3.27	27	PF.8		JP3.28	28	PF.7
	JP3.29	29	PF.6		JP3.30	30	VBAT
	JP3.31	31	XT32_IN		JP3.32	32	XT32_OUT

Table 2-2 Extended Connector JP3 Interface with M483KGCAE2A GPIO

Header		M483KGCAE2A		Header		M483KGCAE2A	
		Pin No.	Function			Pin No	Function
JP5	JP5.1	33	LED_R	JP5	JP5.2	34	LED_Y
	JP5.3	35	LED_G		JP5.4	36	PH.7
	JP5.5	37	XT1_IN		JP5.6	38	XT1_OUT
	JP5.7	39	GND		JP5.8	40	3VCC
	JP5.9	41	PE.8		JP5.10	42	PE.9
	JP5.11	43	PE.10		JP5.12	44	PE.11
	JP5.13	45	PE.12		JP5.14	46	PE.13
	JP5.15	47	PC.8		JP5.16	48	PC.7
	JP5.17	49	PC.6		JP5.18	50	PA.7
	JP5.19	51	PA.6		JP5.20	52	GND
	JP5.21	53	3VCC		JP5.22	54	LDO_CAP1
	JP5.23	55	EPWM0_CH0		JP5.24	56	EPWM0_CH1
	JP5.25	57	QSPI0_SS		JP5.26	58	QSPI0_CLK
	JP5.27	59	QSPI0_MISO		JP5.28	60	QSPI0_MOSI
	JP5.29	61	VDDIO		JP5.30	62	PE.14
	JP5.31	63	PE.15		JP5.32	64	nRESET

Table 2-3 Extended Connector JP5 Interface with M483KGCAE2A GPIO

Header		M483KGCAE2A		Header		M483KGCAE2A	
		Pin No.	Function			Pin No	Function
JP4	JP4.1	65	ICEDAT	JP4	JP4.2	66	ICECLK
	JP4.3	67	I2C2_SCL		JP4.4	68	I2C2_SDA
	JP4.5	69	PC.5		JP4.6	70	PC.4
	JP4.7	71	PC.3		JP4.8	72	PC.2
	JP4.9	73	I2C0_SCL		JP4.10	74	I2C0_SDA
	JP4.11	75	GND		JP4.12	76	3VCC
	JP4.13	77	PG.9		JP4.14	78	PG.10
	JP4.15	79	PG.11		JP4.16	80	PG.12
	JP4.17	81	PG.13		JP4.18	82	SW3
	JP4.19	83	SW2		JP4.20	84	SD0_nCD
	JP4.21	85	USB_VBUS		JP4.22	86	USB_D-
	JP4.23	87	USB_D+		JP4.24	88	USB_ID
	JP4.25	89	-		JP4.26	90	-
	JP4.27	91	-		JP4.28	92	-
	JP4.29	93	-		JP4.30	94	-
	JP4.31	95	-		JP4.32	96	-

Table 2-4 Extended Connector JP4 Interface with M483KGCAE2A GPIO

Header		M483KGCAE2A		Header		M483KGCAE2A	
		Pin No.	Pin Name			Pin No	Pin Name
JP6	JP6.1	97	SD0_CMD	JP6	JP6.2	98	SD0_CLK
	JP6.3	99	EPWM0_CH2		JP6.4	100	EPWM0_CH3
	JP6.5	101	SD0_DAT1		JP6.6	102	SD0_DAT0
	JP6.7	103	GND		JP6.8	104	3VCC
	JP6.9	105	PE.1		JP6.10	106	PE.0
	JP6.11	107	PH.8		JP6.12	108	PH.9
	JP6.13	109	PH.10		JP6.14	110	PH.11
	JP6.15	111	PD.14		JP6.16	112	GND
	JP6.17	113	LDO_CAP2		JP6.18	114	3VCC
	JP6.19	115	USB_VBUS_ST		JP6.20	116	USB_VBUS_EN
	JP6.21	117	PB.14		JP6.22	118	UART0_TX
	JP6.23	119	UART0_RX		JP6.24	120	AVDD
	JP6.25	121	VREF		JP6.26	122	AVSS
	JP6.27	123	PB.11		JP6.28	124	PB.10
	JP6.29	125	EADC0_CH9		JP6.30	126	EADC0_CH8
	JP6.31	127	EADC0_CH7		JP6.32	128	EADC0_CH6

Table 2-5 Extended Connector JP6 Interface with M483KGCAE2A GPIO

2.5 System Configuration

2.5.1 VIN Power Source

Table 2-6 presents the Vin power source.

Connector	Net Name in Schematic	Comment
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 NuMaker-M483KG.

Table 2-6 Vin Power Source

2.5.2 5 V Power Sources

Table 2-7 presents the 5 V power sources.

Connector	Net Name in Schematic	Comment
ICEJ3	USB_HS_VBUS	ICE USB connector supplies 5 V power from PC to M483 platform and Nu-Link2-Me.
J2	USB_VBUS	USB connector on NuMaker-M483KG supplies 5 V power from PC to M483 platform and Nu-Link2-Me.
NU1 pin5	NU1_5VCC	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. **Note:** M483 operating voltage range is from 1.8 V to 3.6 V. Do not connect 5V to VDD.

Table 2-7 5V Power Sources

2.5.3 3.3 V Power Sources

Table 2-8 presents the 3.3 V power sources.

Voltage Regulator	5V Source	Comment
ICEUP1	USB_HS_VBUS	ICEUP1 converts USB_HS_VBUS to 3.3 V and supplies 3.3V to M483 platform or ICE chip.
UP1	USB_VBUS	UP1 converts USB_VBUS to 3.3 V and supplies 3.3 V to M483 platform. **Note:** R12 should be connected.
UP1	NU1_5VCC	UP1 converts NU1_5VCC to 3.3 V and supplies 3.3 V to M483 platform. **Note:** R12 should be connected.

Table 2-8 3.3 V Power Sources

2.5.4 1.8V Power Sources

Table 2-9 presents the 1.8 V power source.

Voltage Regular	5V Source	Comment
ICEUP2	USB_HS_VBUS	ICEUP2 converts USB_HS_VBUS to 1.8V and supplies 1.8V to M483 platform or ICE chip.

Table 2-9 1.8V Power Sources

2.5.5 Power Connectors

Table 2-10 presents the power connectors.

Connector	Comment
JP1	V_{DD} (1.8 V ~ 3.6 V) connector on the NuMaker-M483KG.
JP2	V_{SS} connector on the NuMaker-M483KG.

Table 2-10 Power Connectors

2.5.6 USB Connectors

Table 2-11 presents the USB connectors.

Connector	Comment
ICEJ3	ICE USB connector on Nu-Link2-Me for power supply, debugging and programming from PC.
J2	USB FS connector on NuMaker-M483KG for power supply.

Table 2-11 USB Connectors

2.5.7 Power Switches

Table 2-12 presents the power switches.

Switch	Comment
ICEJPR1	Configures the target chip operating voltage at 1.8 V / 3.3 V / 5 V.
ICEJPR2	Configures the ICE chip operating voltage at 1.8 V / 3.3 V.

Table 2-12 Power Switches

2.5.8 Power Supply Models

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

The external power supply source on Nu-Link2-Me is shown in Figure 2-5.

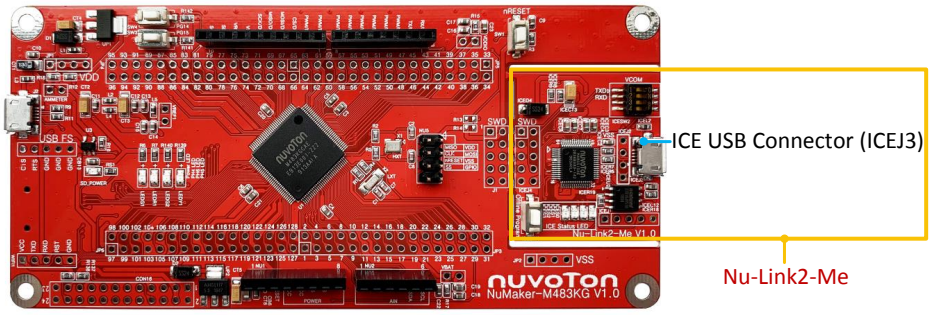

Figure 2-5 External Power Supply Sources on Nu-Link2-Me

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

1. Solder the resistor on ICEJPR1 (MCUVCC) depends on the target chip operating voltage.
2. Solder the resistor on ICEJPR2 (ICEVCC) depends on the ICE chip operating voltage.
3. Connect the external power supply to JP1.

Table 2-13 presents all power models when supplies 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	Ignore	Ignore	1.8 V output
2	3.3 V	Connect to PC	3.3 V (default)	3.3 V (default)	3.3 V	Ignore	Ignore	3.3 V output
3	5 V	Connect to PC	5V	3.3 V (default)	3.3 V	Ignore	Ignore	5 V output
	X: Unused. **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.							

Table 2-13 Supply External Power through Nu-Link2-Me

2.5.8.2 *External Power Supply through M483 platform to Target Chip*

The external power supply sources on M483 platform are shown in Figure 2-6.

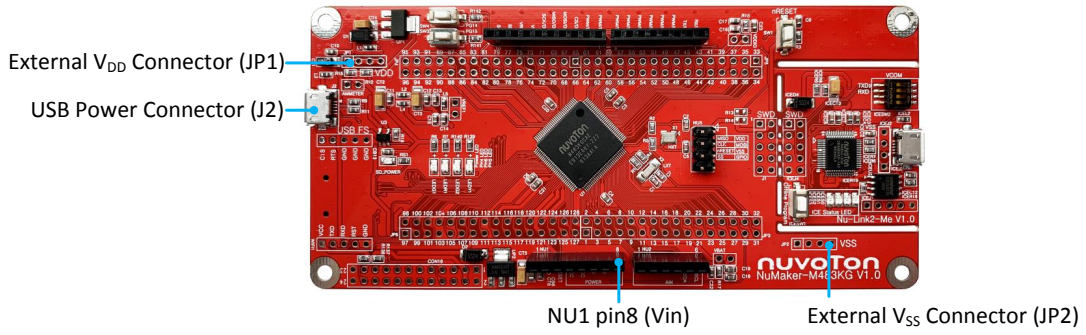

Figure 2-6 External Power Supply Sources on M483 platform

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

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

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

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

To use Vin or J2 as external power supply source with Nu-Link2-Me separated from NuMaker-M483KG, please follow the below steps:

1. Separate the Nu-Link2-Me from NuMaker-M483KG.
2. Connect the external power supply to Vin or J2.

To use JP1 as external power supply source with Nu-Link2-Me separated from NuMaker-M483KG, please follow the below steps:

1. Separate the Nu-Link2-Me from NuMaker-M483KG.
2. Connect the external power supply to JP1.

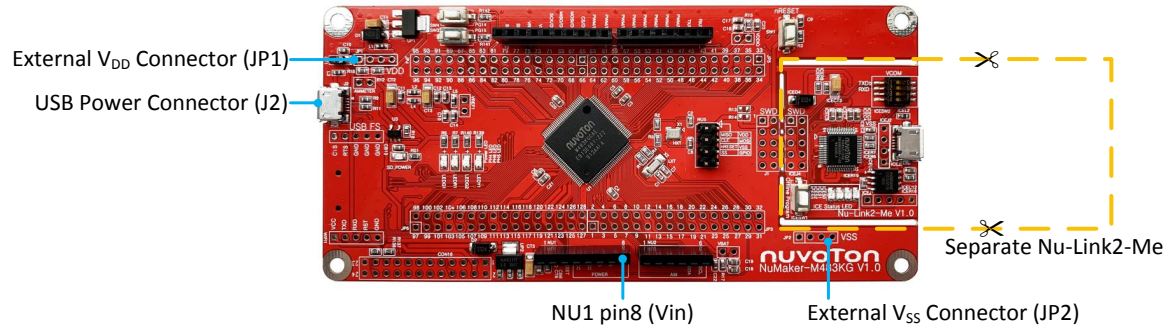

Figure 2-7 Separate the Nu-Link2-Me from NuMaker-M483KG

Table 2-14 presents all power models when supplies external power through M483 platform. The M483 platform external power sources are highlighted in yellow.

Model	Target Chip Voltage	Vin [1]	J2	ICEJ3	R12	JP1	ICEJPR1 (MCUVCC) Selection [2]	ICEJPR2 (ICEVCC) Selection [3]	ICE Chip Voltage [4]
4	3.3 V	7 V ~ 12 V Input	X	Ignore	ON	3.3 V output	Remove resistor	3.3 V	3.3 V
5	3.3 V	X	Connect to PC	Ignore	ON	3.3 V output	Remove resistor	3.3 V	3.3 V
8	1.8 V ~ 3.6 V	Ignore [5]	Ignore [5]	Connect to PC	OFF	DC Input 1.8 V ~ 3.6 V	Remove resistor	1.8 V / 3.3 V	1.8 V / 3.3 V
9	1.8 V ~ 3.6 V	Ignore [5]	Ignore [5]	Nu-Link2-Me removed	OFF	DC Input 1.8 V ~ 3.6 V	X	X	X

X: Unused.

Note:

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

Table 2-14 Supply External Power for M483 platform

2.5.9 External Reference Voltage Connector

Table 2-16 presents the external reference voltage connector.

Connector	Comment
VREF1	Connector for user to easily connect to the external reference voltage pin of the target chip. User needs to remove the L5 ferrite bead.

Table 2-15 External Reference Voltage Connector

2.5.10 Ammeter Connector

Table 2-16 presents the ammeter connector.

Connector	Comment
AMMETER	Connector for user to easily measure the target chip power consumption. User needs to remove the R16 and R12 resistor.

Table 2-16 Ammeter Connector

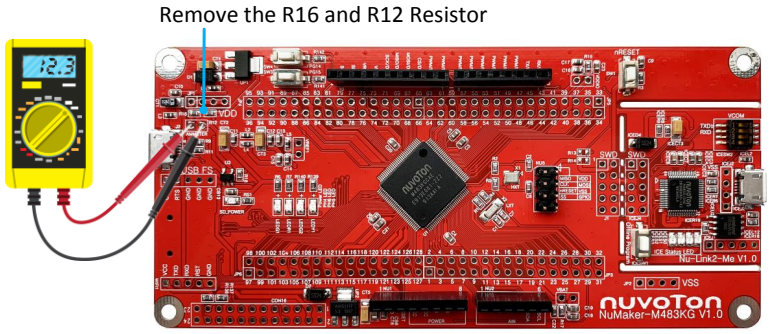

Figure 2-8 Wiring between Ammeter Connector and Ammeter

2.5.11 Extension Connectors

Table 2-17 presents the extension connectors.

Connector	Comment
JP3, JP4, JP5 and JP6	Full pins extension connectors on the NuMaker-M483KG.
NU1, NU2, NU3 and NU4	Arduino UNO compatible pins on the NuMaker-M483KG.

Table 2-17 Extension Connectors

2.5.12 Push-Buttons

Table 2-18 presents the push-buttons.

Component	Comment
ICESW1	Off-line program button to start off-line programming the target chip.
SW1	Reset button to reset the target chip.
SW3	GPIO input button for PG.15.
SW4	GPIO input button for PG.14.

Table 2-18 Push-Buttons

2.5.13 LEDs

Table 2-19 presents the LEDs.

Component	Comment
Power LED	The power LED indicates that the NuMaker-M483KG is powered.
PH4 LED	The LED is connected to the target chip PH.4.
PH5 LED	The LED is connected to the target chip PH.5.
PH6 LED	The LED is connected to the target chip PH.6.
SD_POWER	The power LED indicates that the SD slot is powered.
ICES0, ICES1, ICES2 and ICES3	Nu-Link2-Me status LED.

Table 2-19 LEDs

2.6 Nu-Link2-Me

The Nu-Link2-Me is a debugger and programmer that supports on-line programming and debugging through SWD interface. The on-board 16 Mbit SPI Flash allows it to off-line program the target microcontroller. Additionally, the Nu-Link2-Me provides virtual COM port (VCOM) function to print out messages on PC. Table 2-20 presents how to set the VCOM function by ICESW2.

ICESW2		
Pin	**Function**	**Comment**
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 2-20 VCOM Function of Nu-Link2-Me

2.7 PCB Placement

Figure 2-9 and Figure 2-10 show the front and rear placement of NuMaker-M483KG.

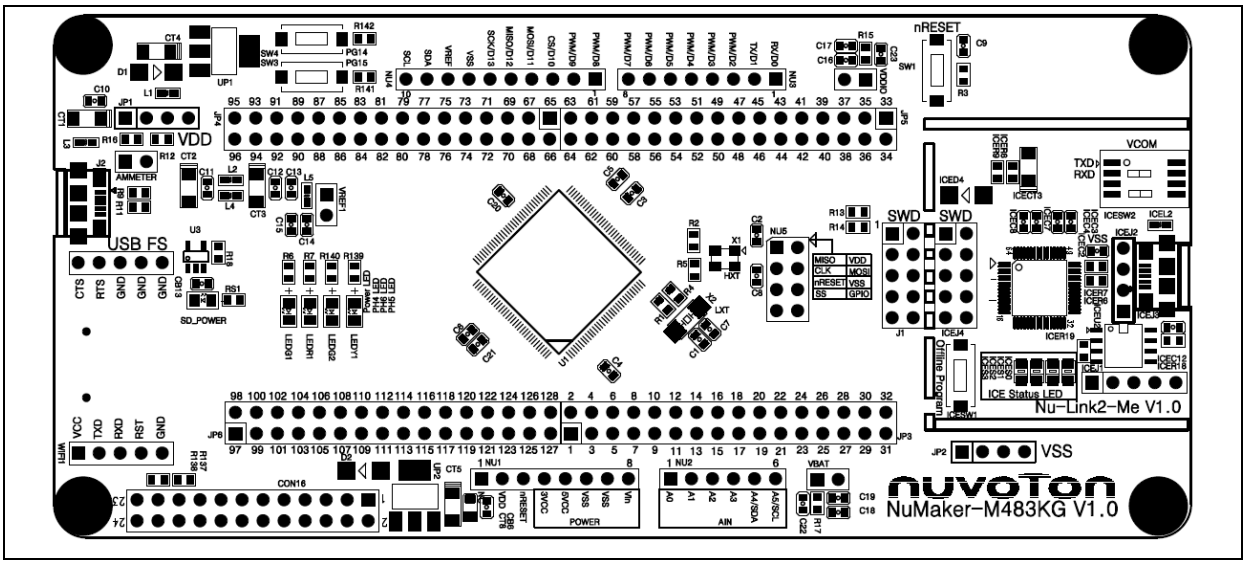

Figure 2-9 Front Placement

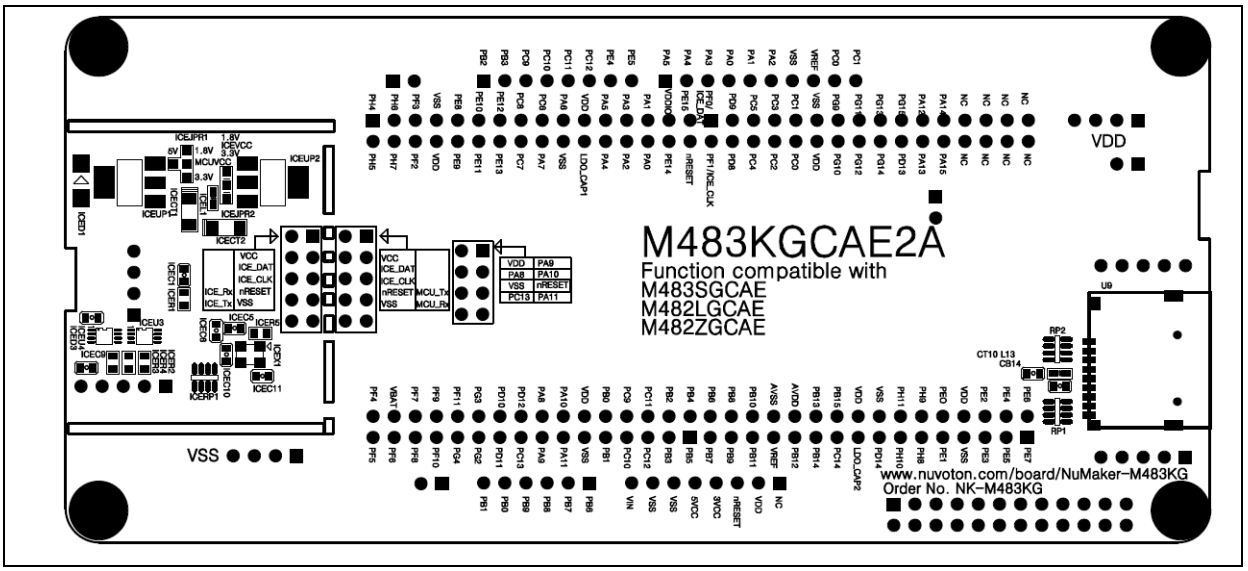

Figure 2-10 Rear Placement

3 QUICK START

3.1 Toolchains Supporting

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

- KEIL MDK Nuvoton edition M0/M23
- IAR EWARM
- NuEclipse (GCC)(Windows)
- NuEclipse (GCC)(Linux)

3.2 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 3-1 and Figure 3-2.

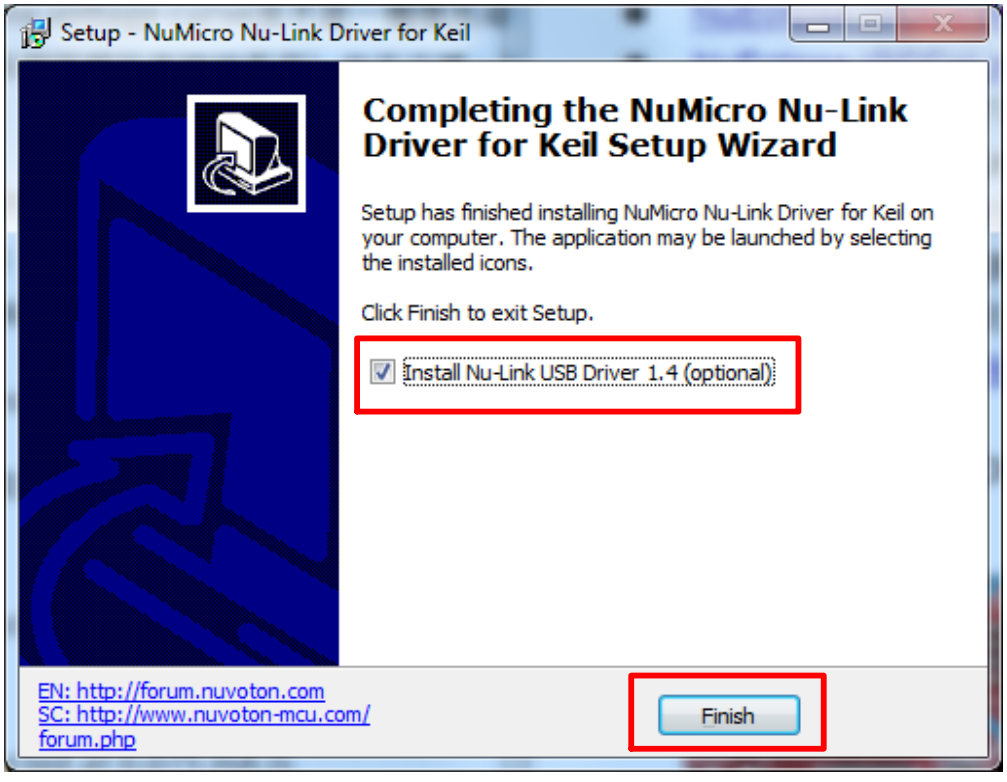

Figure 3-1 Nu-Link USB Driver Installation Setup

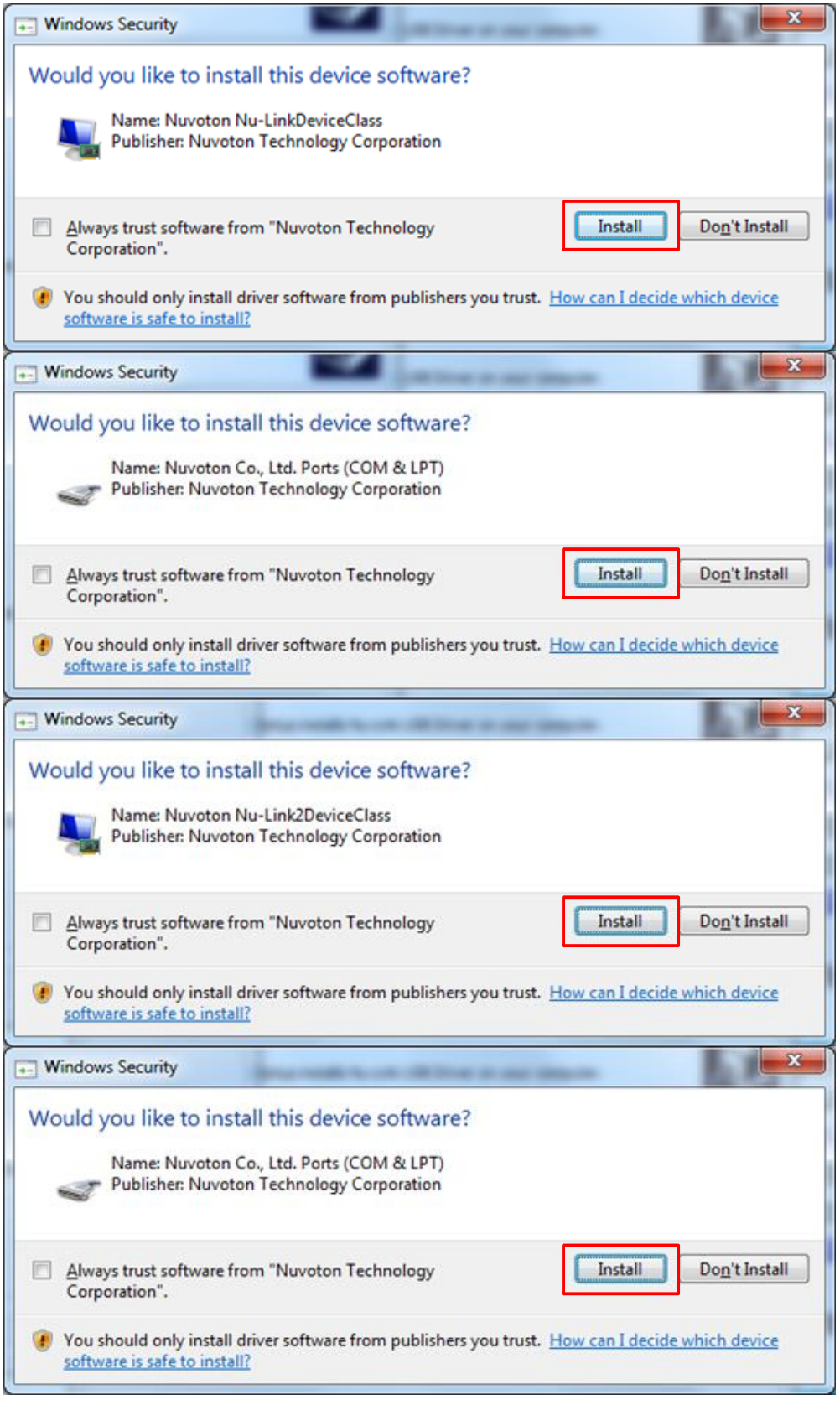

Figure 3-2 Nu-Link USB Driver Installation

3.3 BSP Firmware Download

Download and unzip the M480 Board Support Package (BSP).

3.4 Hardware Setup

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

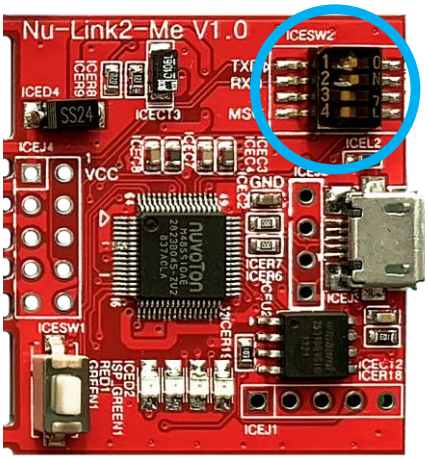

Figure 3-3 Open VCOM Function

2. Connect the ICE USB connector shown in Figure 3-4 to the PC USB port through USB cable.

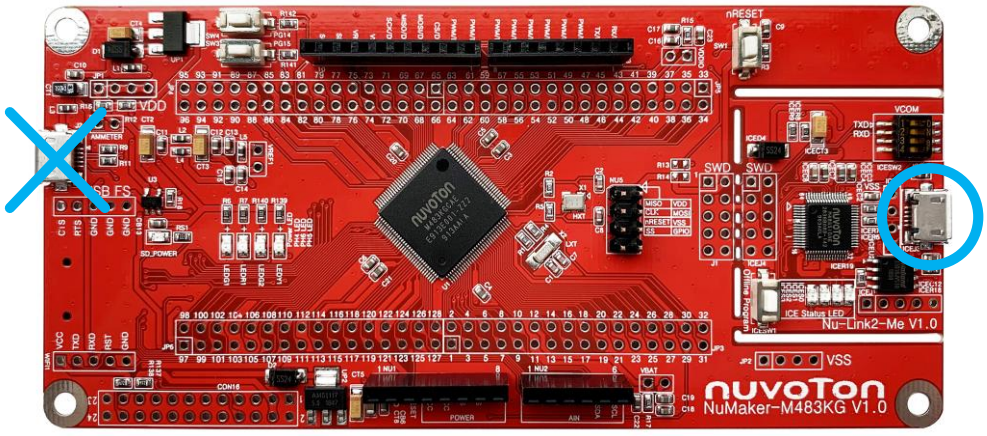

Figure 3-4 ICE USB Connector

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

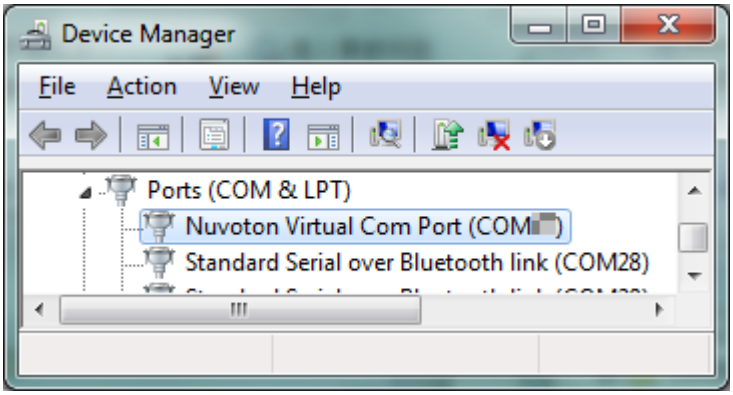

Figure 3-5 Device Manger

4. Open a serial port terminal, PuTTY for example, to print out debug message. Set the speed to 115200. Figure 3-6 presents the PuTTY session setting.

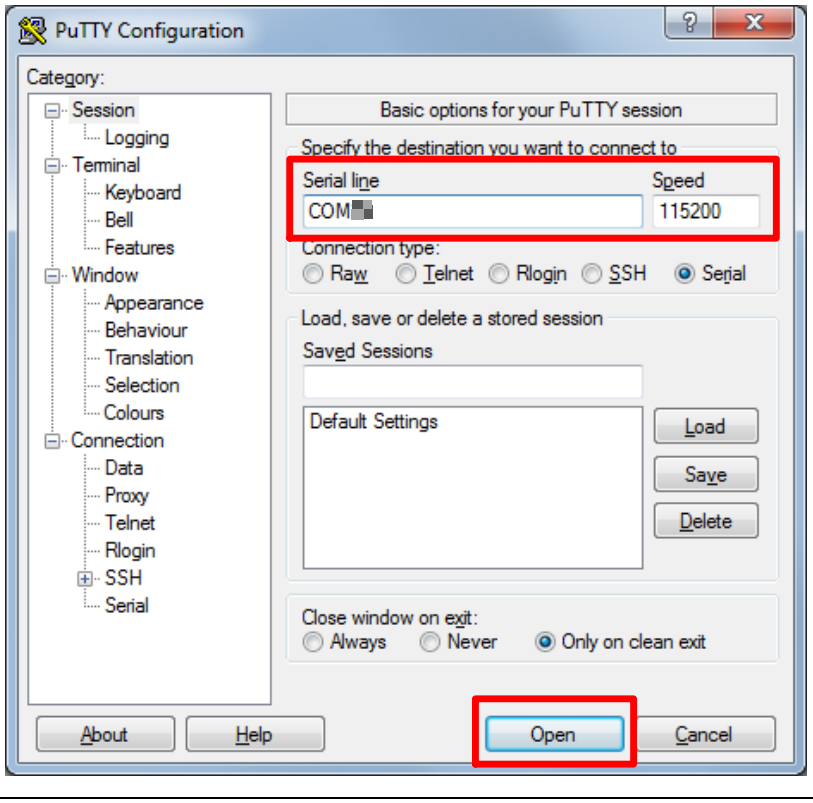

Figure 3-6 PuTTY Session Setting

3.5 Find the Example Project

Use the “Template” project as an example. The project can be found under the BSP folder as shown in Figure 3-7.

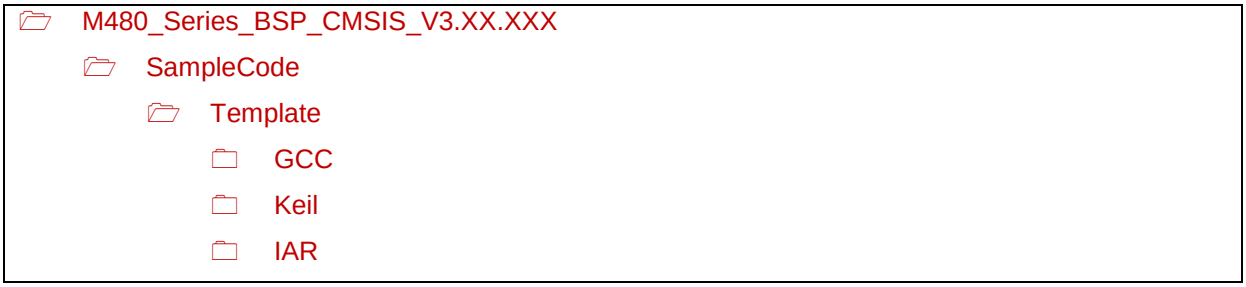

Figure 3-7 Template Project Folder Path

3.6 Execute the Project under Toolchains

Open and execute the project under the toolchain. The section 3.6.1, 0, and 3.6.3 describe the steps of executing project in Keil MDK, IAR EWARM and NuEclipse, respectively.

3.6.1 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.

   Note: If Figure 3-8 warning message jumps out, please migrate to version 5 formats as shown in Figure 3-9. The “.uvproj” filename extension will change to “.uvprojx”.

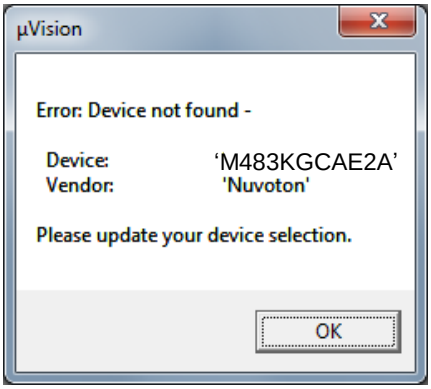

Figure 3-8 Warning Message of “Device not found”

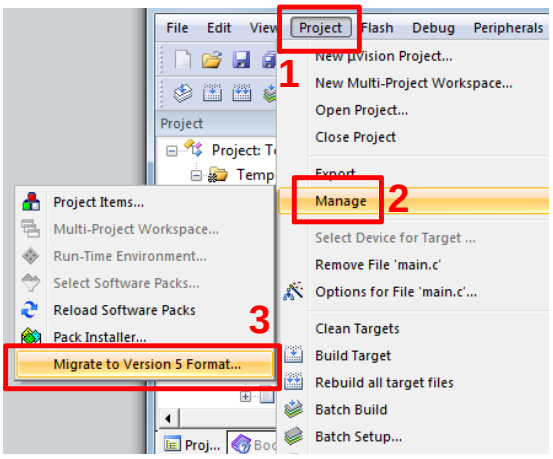

Figure 3-9 Project File Migrate to Version 5 Format

2. Make sure the debugger is “Nuvoton Nu-Link Debugger” as shown in Figure 3-10 and Figure 3-11.

   Note: If the dropdown menu in Figure 3-10 does not contain “Nuvoton Nu-Link Debugger” item, please rework section 3.2.

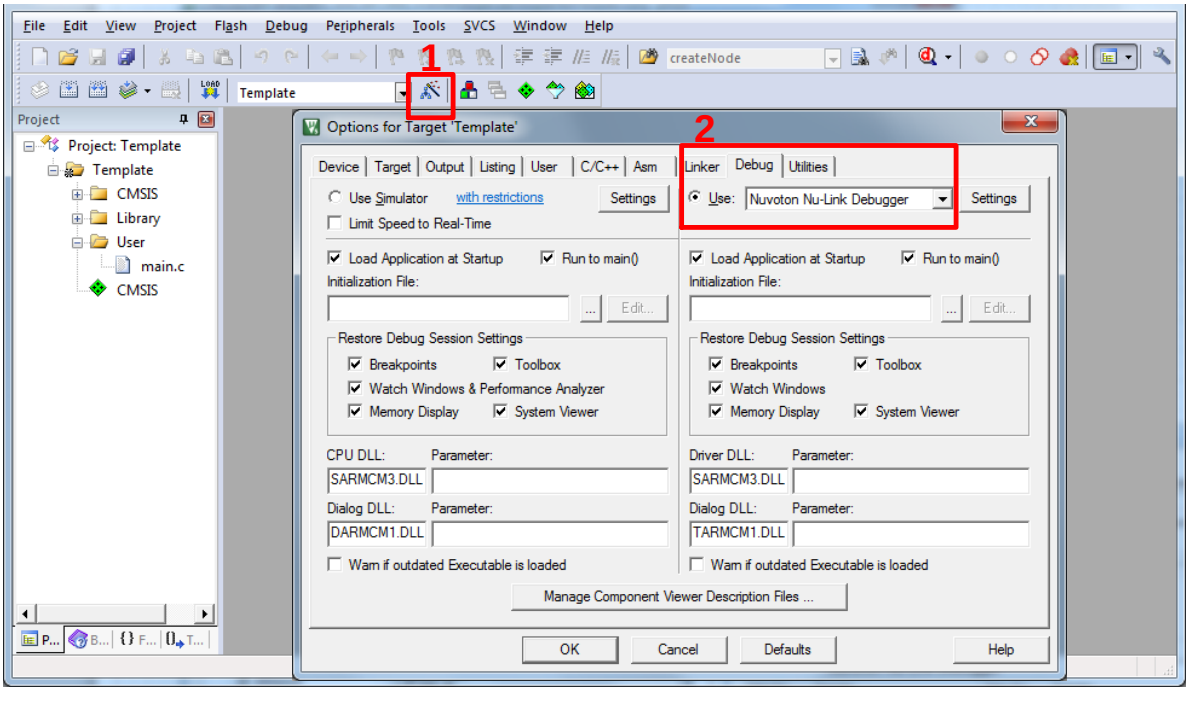

Figure 3-10 Debugger Setting in Options Window

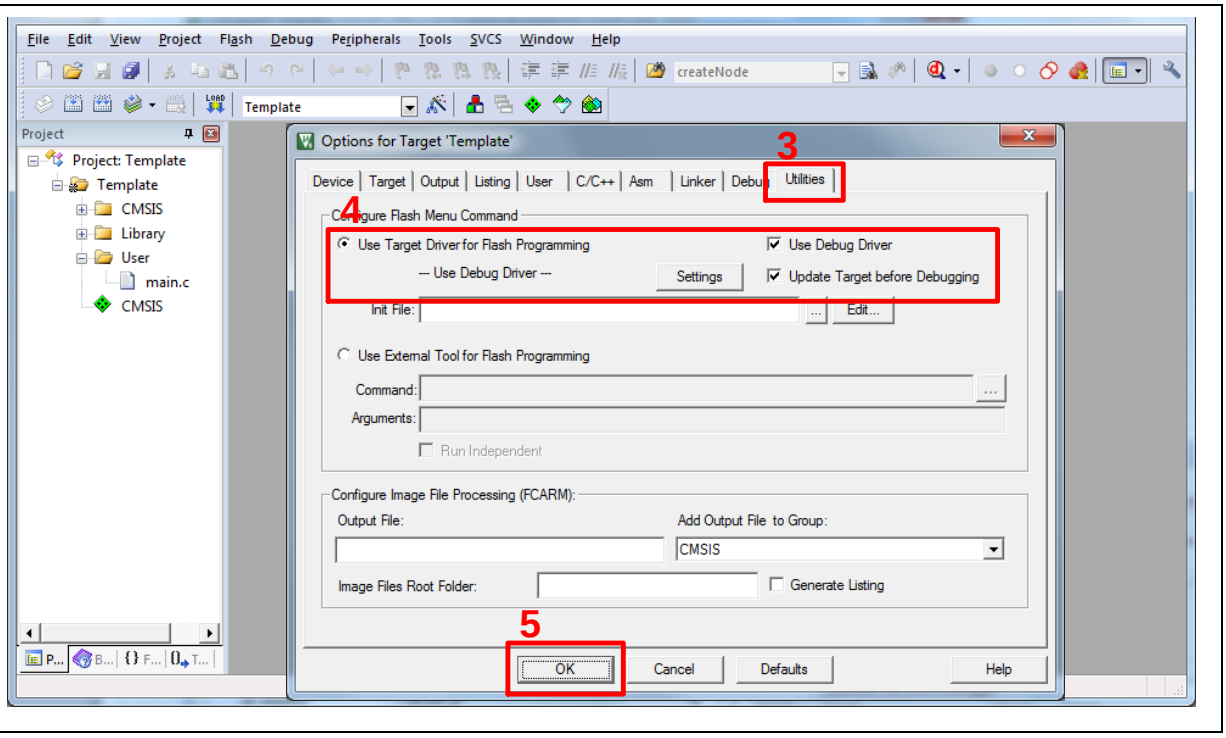

Figure 3-11 Programming Setting in Options Window

3. Rebuild all target files. After successfully compile the project, download code to the flash memory. Click “Start/Stop Debug Section” button can enter debug mode.

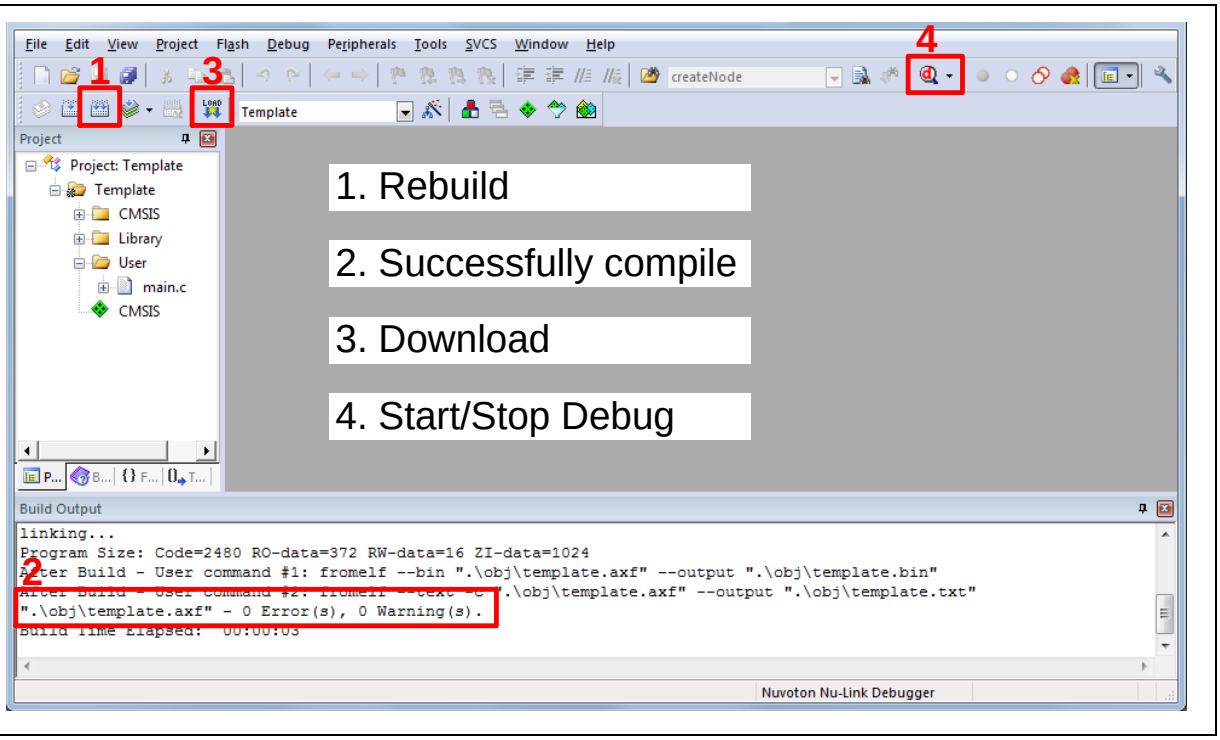

Figure 3-12 Compile and Download the Project

4. Figure 3-13 shows the debug mode under Keil MDK. Click “Run” and the debug message will be printed out as shown in Figure 3-14. User can debug the project under debug mode by checking

source code, assembly language, peripherals' registers, and setting breakpoint, step run, value monitor, etc.

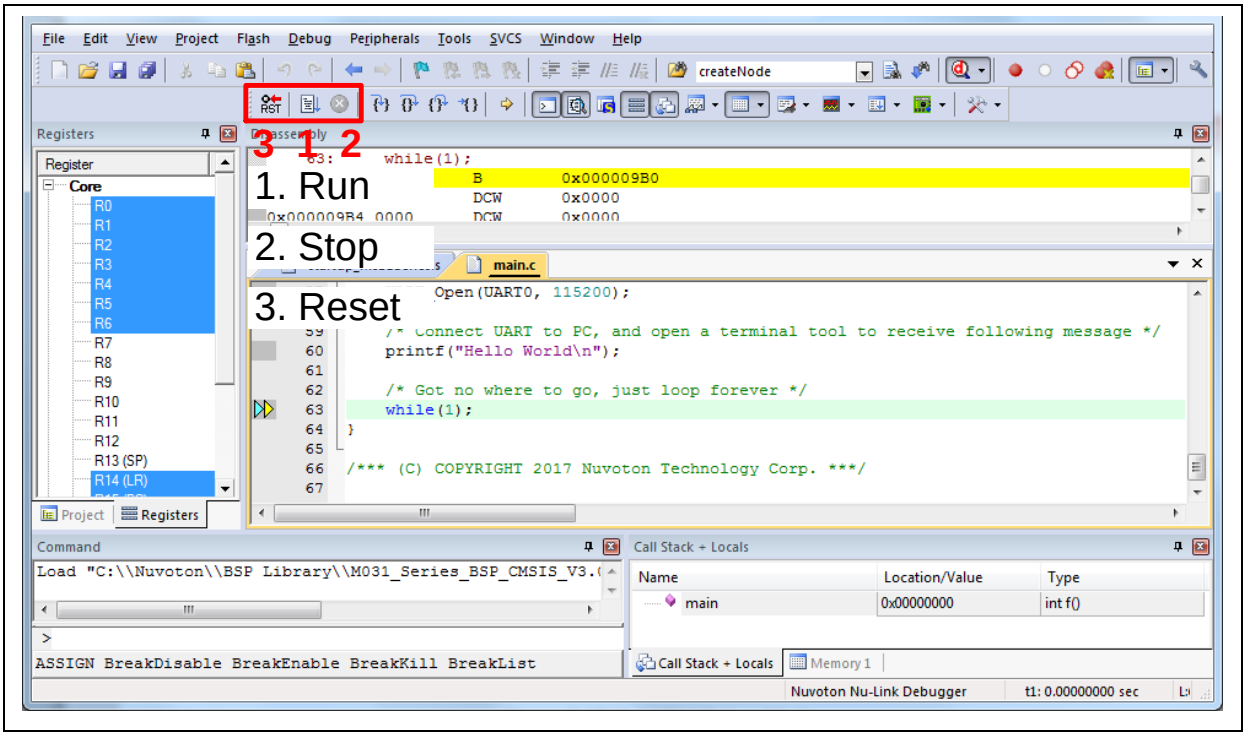

Figure 3-13 Keil MDK Debug Mode

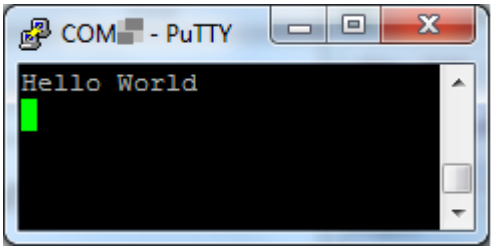

Figure 3-14 Debug Message on Serial Port Terminal Windows

3.6.2 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 contain “Nu-Link” item as shown in Figure 3-15.

   Note: If the toolbar does not contain “Nu-Link” item, please rework section 3.2.

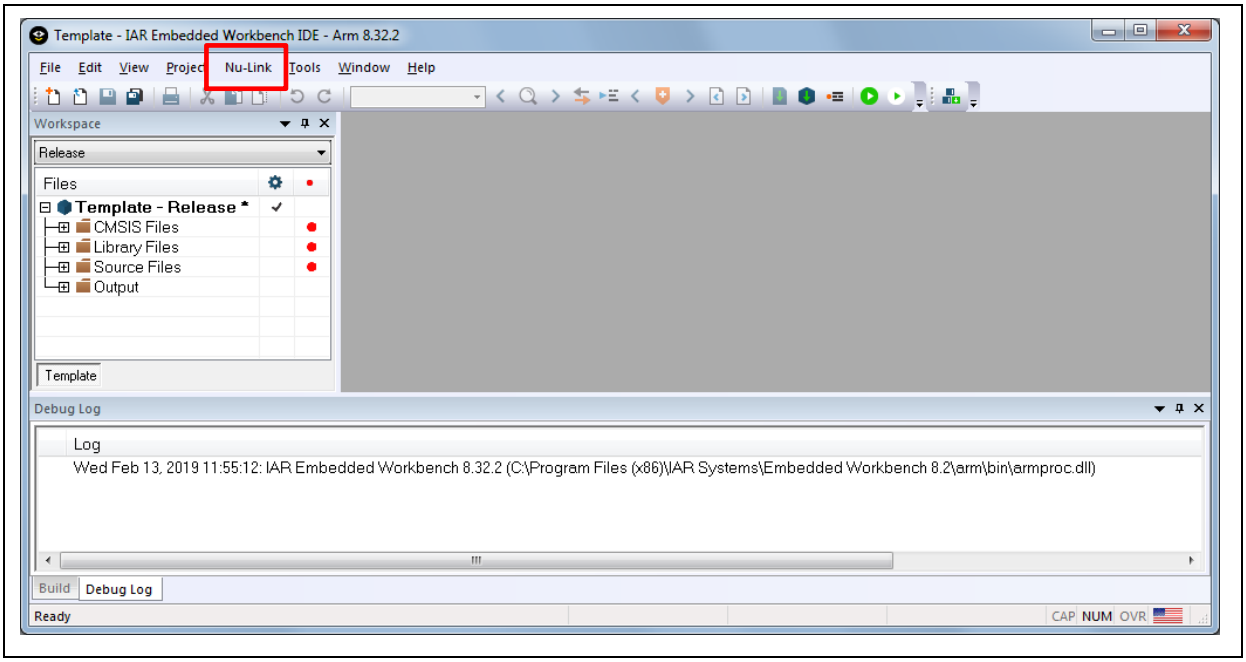

Figure 3-15 IAR EWARM Window

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

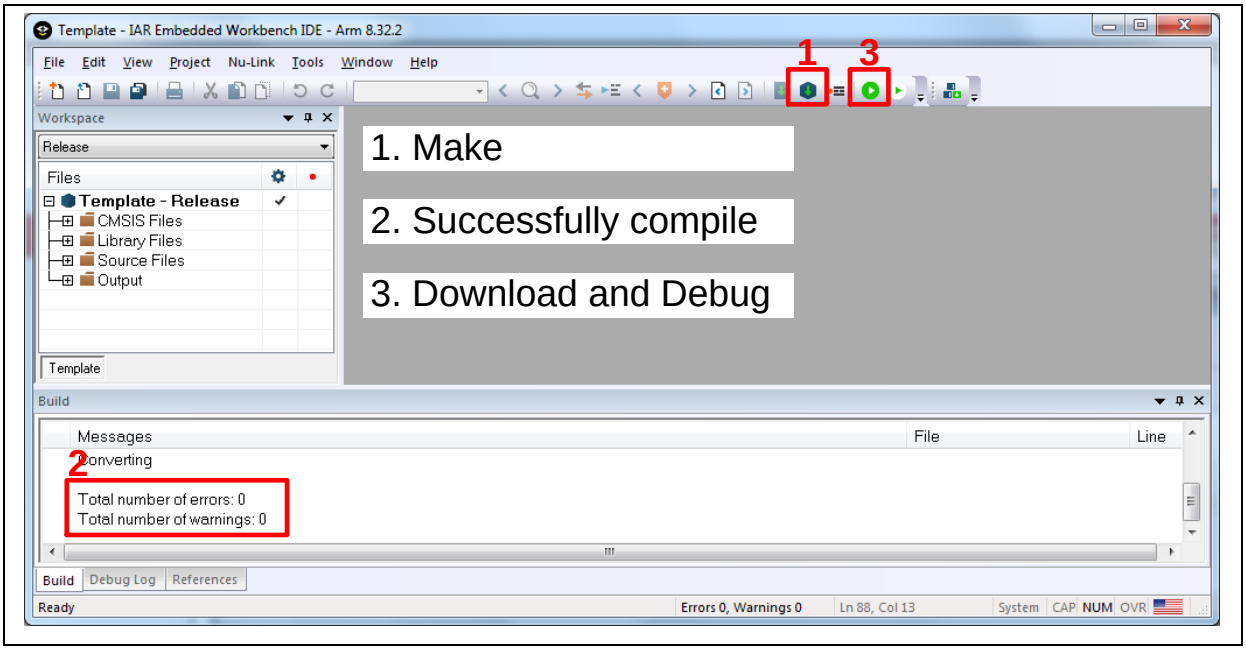

Figure 3-16 Compile and Download the Project

4. Figure 3-17 shows the debug mode under IAR EWARN. Click “Go” and the debug message will be printed out as shown in Figure 3-18. User can debug the project under debug mode by checking source code, assembly language, peripherals’ registers, and setting breakpoint, step run, value monitor, etc.

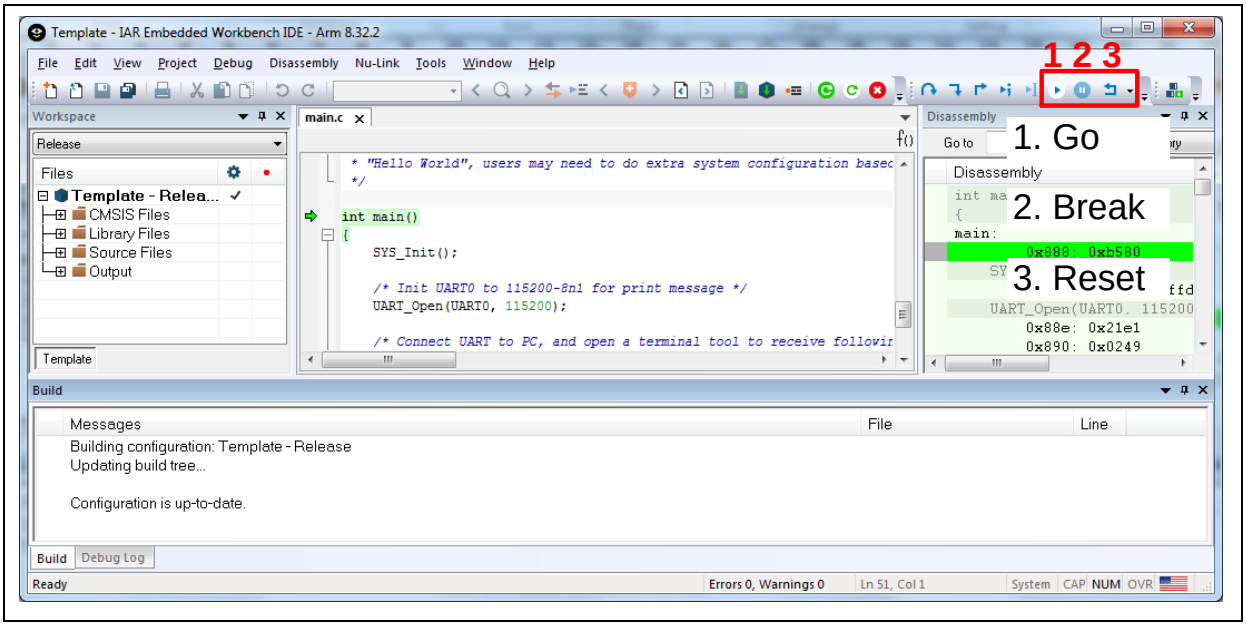

Figure 3-17 IAR EWARM Debug Mode

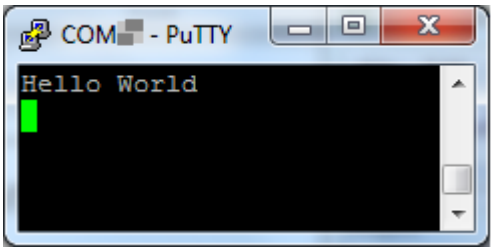

Figure 3-18 Debug Message on Serial Port Terminal Windows

3.6.3 NuEclipse

For more information about how to use NuEclipse, please refer to the NuEclipse User Manual.

4 NUMAKER-M483KG SCHEMATICS

4.1 Nu-Link2-Me

Figure 4-1 shows the Nu-Link2-Me circuit. The Nu-Link2-Me is a debugger and programmer that supports on-line programming and debugging through SWD interface.

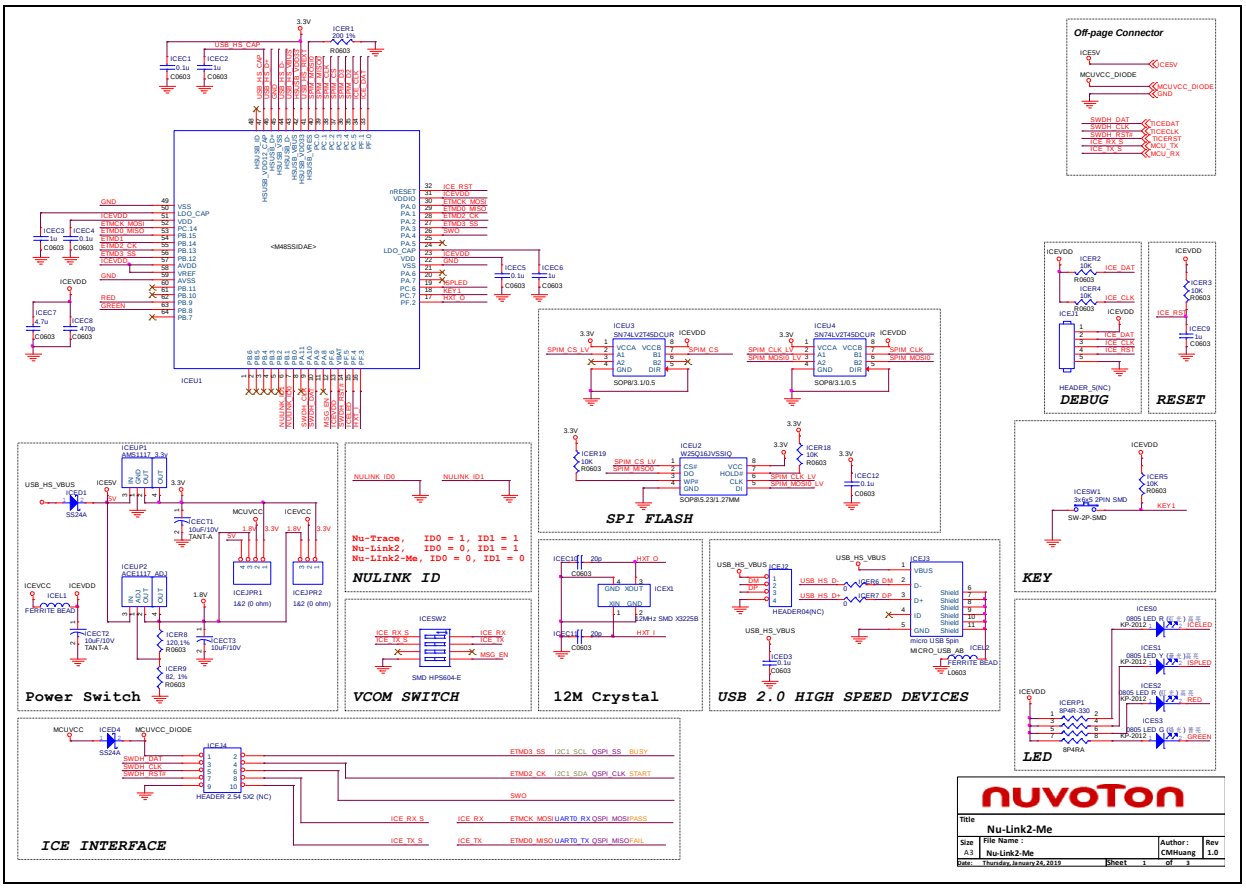

Figure 4-1 Nu-Link2-Me Circuit

4.2 M483 platform

Figure 4-2 shows the M483 platform circuit.

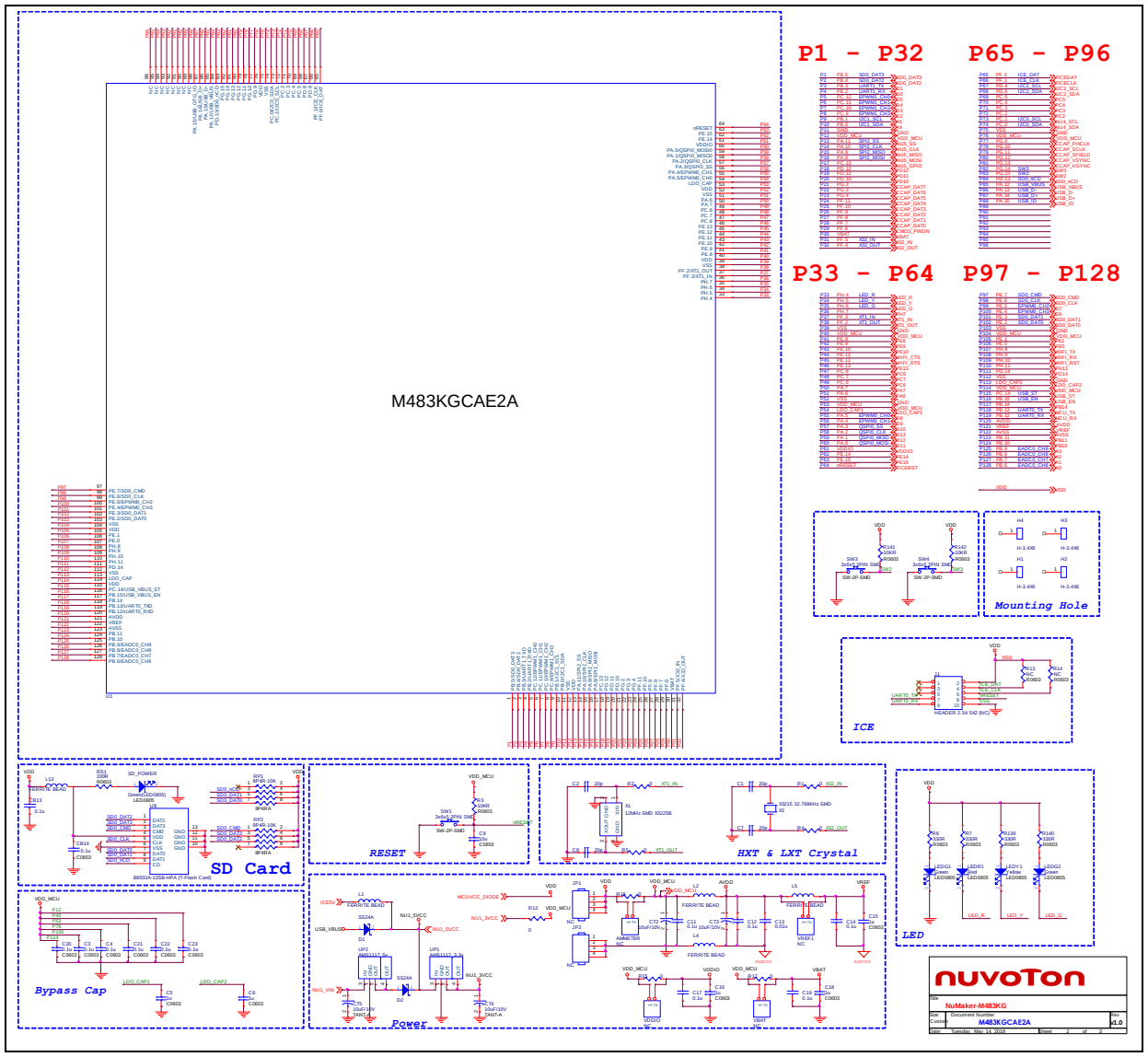

Figure 4-2 M483 platform Circuit

4.3 Extension Connector

Figure 4-3 shows extension connectors of NuMaker-M483KG.

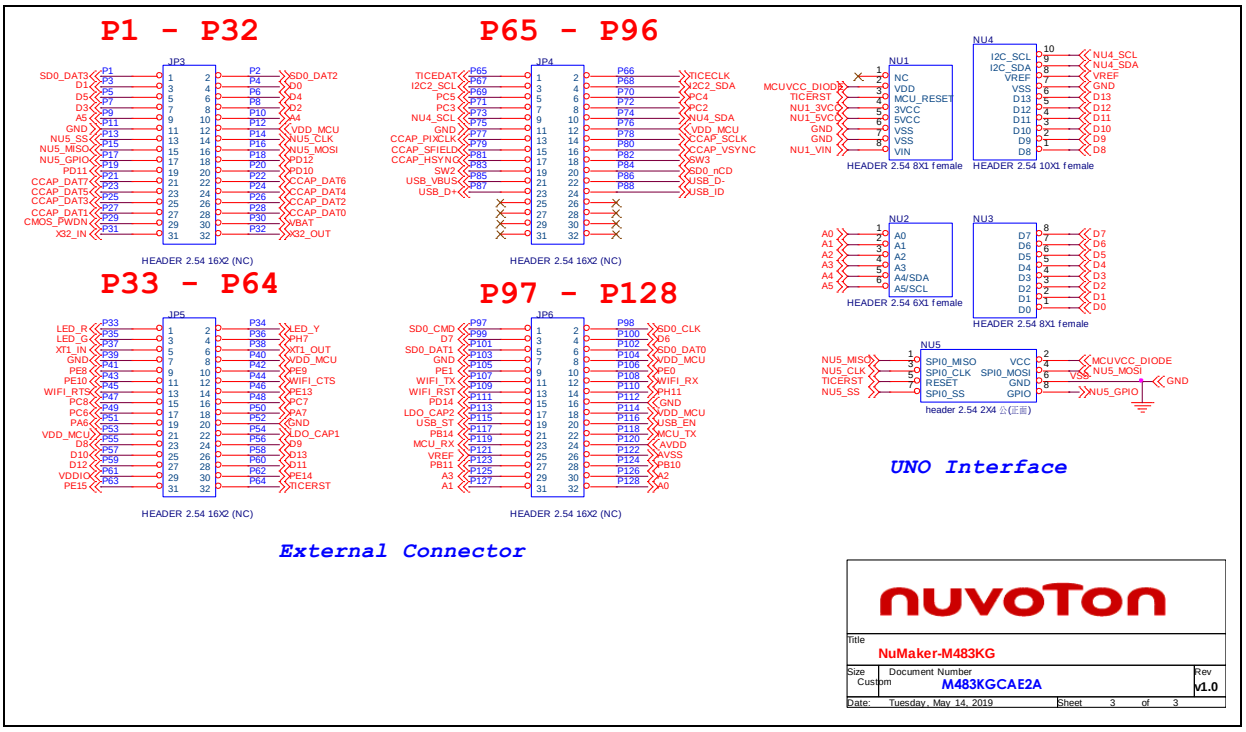

Figure 4-3 Extension Connectors Circuit

4.4 Advance Connector

Figure 4-3 shows advance connectors of NuMaker-M483KG.

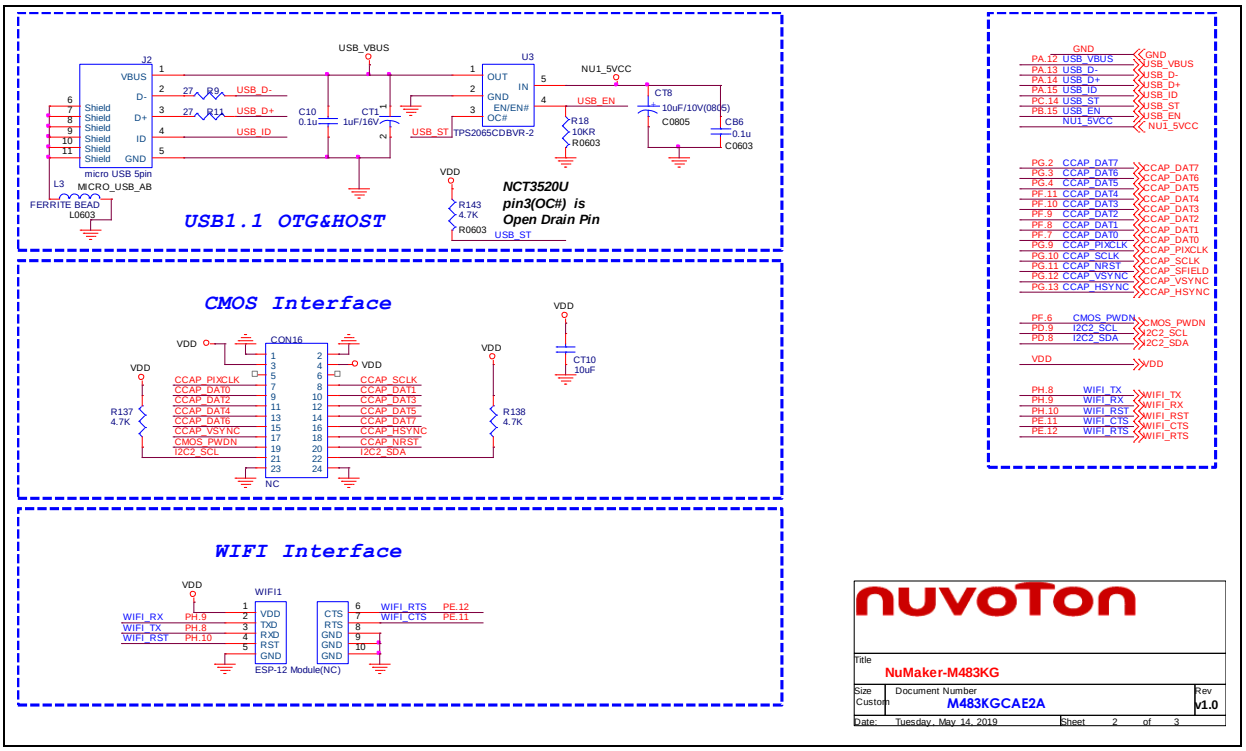

Figure 4-4 Advance Connectors Circuit

5 REVISION HISTORY

Date	Revision	Description
2019.05.10	1.00	1. Initially issued.

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.