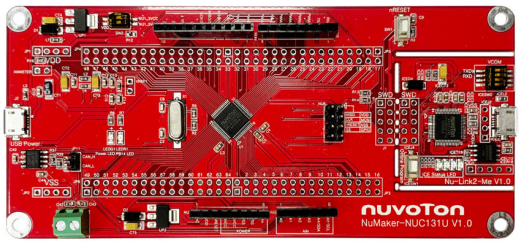

nuvoTon NuTiny-SDK-NUC122 ARM Cortex-M0 32-Bit Microcontroller User Manual

NuTiny-SDK-NUC122 User Manual

ARM Cortex™-M0
32-BIT MICROCONTROLLER

NuTiny-SDK-NUC122 User Manual
For NuMicro™ NUC122 Series

Nuvoton is providing this document only for reference purposes of NuMicro ™ microcontroller-based system design.
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All data and specifications are subject to change without notice.

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

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Contents

Overview

NuTiny-SDK-NUC122 is the specific development tool for the NuMicro™ NUC122 series. Users can use NuTiny-SDK- NUC122P to develop and verify the application program easily.

NuTiny-SDK-NUC122 includes two portions. One is NuTiny-EVB-122 and the other is Nu-Link-Me. NuTiny-EVB-122 is the evaluation board and Nu-Link-Me is its Debug Adaptor. Thus, users do not need other additional ICE or debug the equipment.

NuTiny-SDK-NUC122 Introduction

NuTiny-SDK-NUC122 uses the NUC122RD2AN as the target microcontroller. Figure 2-1 is NuTiny-SDK-NUC122 for the NUC122 series, the left portion is called NuTiny-EVB-122 and the right portion is Debug Adaptor called Nu-Link-Me. NuTiny-EVB-122 is similar to other development boards. Users can use it to develop and verify applications to emulate the real behavior. The onboard chip covers NUC122 series features. The NuTiny-EVB-122 can be a real system controller to design users' target systems.
Nu-Link-Me is a Debug Adaptor. The Nu-Link-Me Debug Adaptor connects your PC's USB port to your target system (via Serial Wired Debug Port) and allows you to program and debug embedded programs on the target hardware. To use the NuLink-Me Debug adaptor with IAR or Keil, please refer to the "Nuvoton NuMicro ™ IAR ICE driver user manual" or "Nuvoton ™ NuMicro Keil ICE driver user manual" for detail. These two documents will be stored in the local hard disk when the user installs each driver.

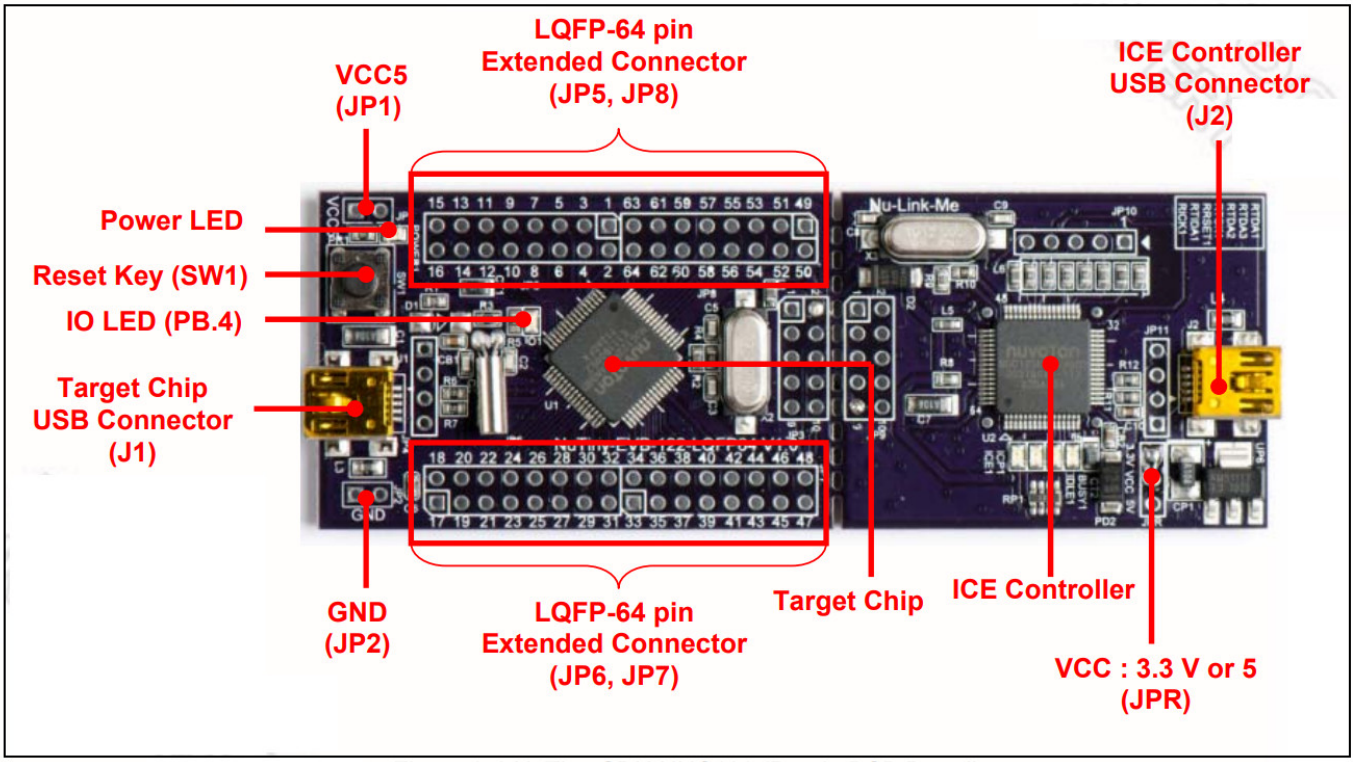


Figure 2-1 NuTiny-SDK-NUC122 (Purple PCB Board)

2.1 NuTiny-SDK-NUC122 Jumper Description

2.1.1 Power Setting

- J1: USB port in NuTiny-EVB-122
- JP1: VCC5 Voltage connecter in NuTiny-EVB-122
- J2: USB port in Nu-Link-Me

POWER Model	J2 USB Port	J1 USB Port	JP1 VCC5
Model 1	Connect to PC	X	DC 3.3 V or 5 V output [1]
Model 2	X	Connect to PC	DC 4.8 V or 5 V output [2]
Model 3	X	X	DC 2.5 V ~ 5.5 V ir

X: Unused.
Note 1: It is depended on the setting (VCC via connecting to 3.3 V or 5 V via) at the JPR jumper in Nu-Link-Me.
Note 2: It must put a diode device (4.8 V) or make both pins short (5 V) at the D1 in NuTiny-EVB-122.

2.1.2 Debug Connector

- JP3: Connector in target board (NuTiny-EVB-122) for connecting with Nuvoton ICE adaptor (Nu-Link or NuLink-Me)
- JP9: Connector in ICE adaptor (Nu-Link-Me) for connecting with a target board (for example NuTiny-EVB-122)

2.1.3 USB Connector

- J1: Mini USB Connector in NuTiny-EVB-122 for application using
- J2: Mini USB Connector in Nu-Link-Me connected to a PC USB port

2.1.4 Extended Connector

- JP5, JP6, JP7, and JP8: Connect to all chip pins in NuTiny-EVB-122

2.1.5 Reset Button

- SW1: Reset the button to reset the target chip in NuTiny-EVB-122

2.1.6 Power Connector

- JP1: VCC5 connector in NuTiny-EVB-122
- JP2: GND connector in NuTiny-EVB-122

2.2 Pin Assignment for Extended Connector

NuTiny-EVB-122 provides NUC122RD2AN on board and the extended connector for the LQFP-64 pin. Table 2-1 is the pin assignment for NUC122RD2AN.

Pin No	**Pin Name**	**Pin No**	**Pin Name**
01	PB.14, /INTO	33	VSS
02	X320	34	PC.13
03	X321	35	PC.12
04	PA.11,12C1SCL	36	PC.11, MOSI10
05	PA.10, I2C1SDA	37	PC.10, MIS010
06	PD.8	38	VDD

07	PD.9	39	PC.9, SPICLK1
08	PD.10	40	PC.8, SPISS10
09	PD 11	41	PA.15, PWM3
10	PB.4, RX1	42	VSS
11	PB.5, TX1	43	PA.14, PWM2
12	PB.6, RTS1	44	PA.13, PWM1
13	PB.7. CTS1	45	PA.12, PWM
14	LDO	46	ICE DAT
15	VDD	47	ICE CK
16	VSS	48	ADD
17	VBUS	49	PD.0
18	VDD33	50	PD.1
19	D-	51	PD.2
20	D+	52	PD.3
21	PB.0, RXO	53	PD.4
22	PB.1, TXO	54	PD.5

23	PB.2, RTSO	55	PB.15, /INT1
24	PB.3, CTS0	56	XT1 OUT
25	PC.5	57	XT1_IN
26	PC.4	58	/RESET
27	PC.3, MOS100	59	VSS
28	PC.2, MIS000	60	VDD
29	PC.1, SPICLKO	61	PS2DAT
30	PC.0, SPISSOO	62	PS2CLK
31	PB.10, TM2, SPISSO1	63	PVSS
32	PB.9, TM1, SPISS11	64	PB.8, TMO

Table 2-1 Pin Assignment for NUC122 LQFP-64

2.3 NuTiny-SDK-NUC122 PCB Placement

Users can refer to Figure 2-2 for the NuTiny–SDK-NUC122 PCB placements.

Figure 2-2 NuTiny-SDK-NUC122 PCB Placement

How to Start NuTiny-SDK-NUC122 on the Keil µVision® IDE®

3.1 Keil uVision

IDE Software Download and Install

Please visit the Keil company website (**http://www.keil.com**) to download the Keil µVision® IDE and install the RVMDK.

3.2 Nuvoton Nu-Link Driver Download and Install

Please visit the Nuvoton company NuMicro™ website (**http://www.nuvoton.com/NuMicro**) to download "NuMicro™ Keil® µVision
IDE driver" file. Please refer to Chapter 6.1 for the detailed download flow. When the Nu-Link driver has been well downloaded, please unzip the file and execute the "Nu-Link_Keil_Driver.exe" to install the driver.

3.3 Hardware Setup

The hardware setup is shown in Figure 3-1

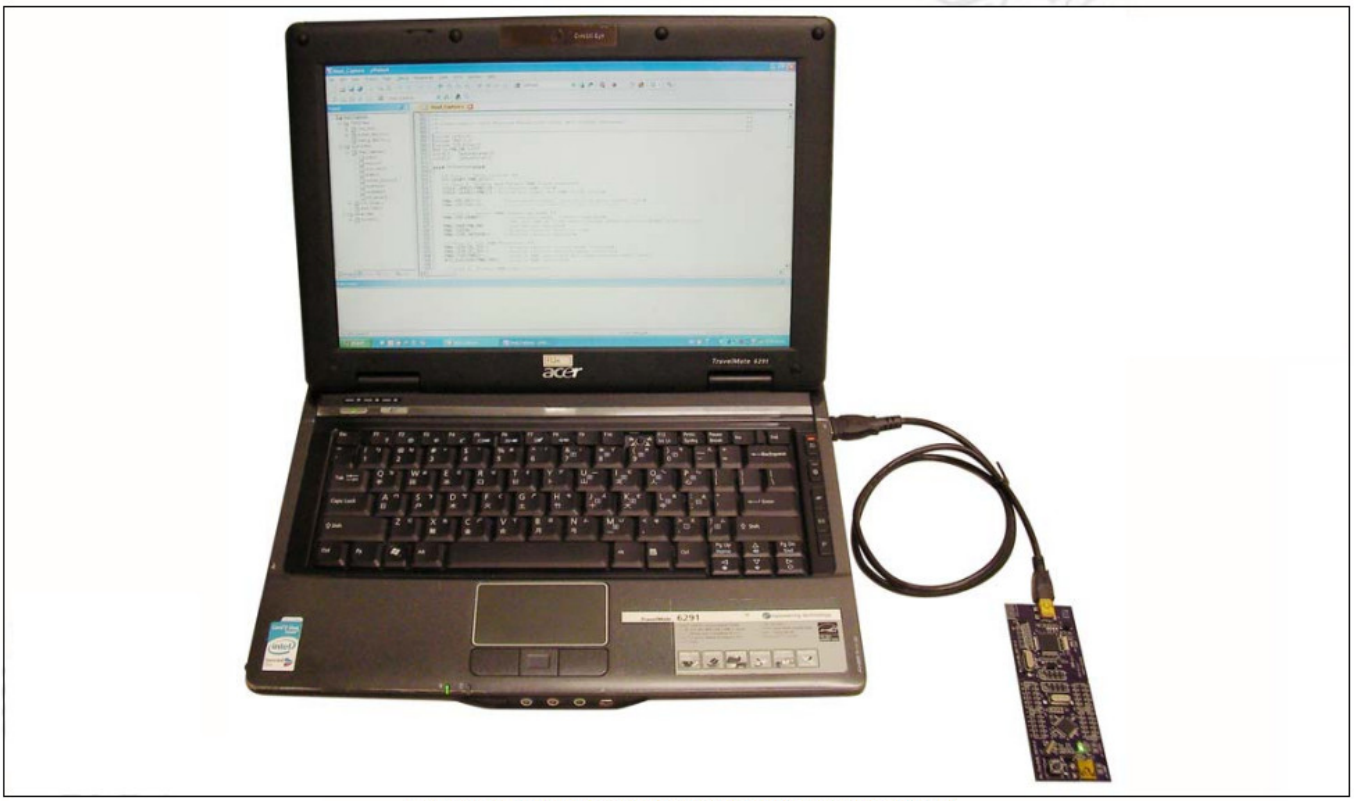


Figure 3-1 NuTiny-SDK-NUC122 Hardware Setup

3.4 Smpl_NuTiny-NUC122 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-NUC122 board. It can be found on the Figure 3-2 list directory and downloaded from the Nuvoton NuMicro™ website following Chapter 6.3.

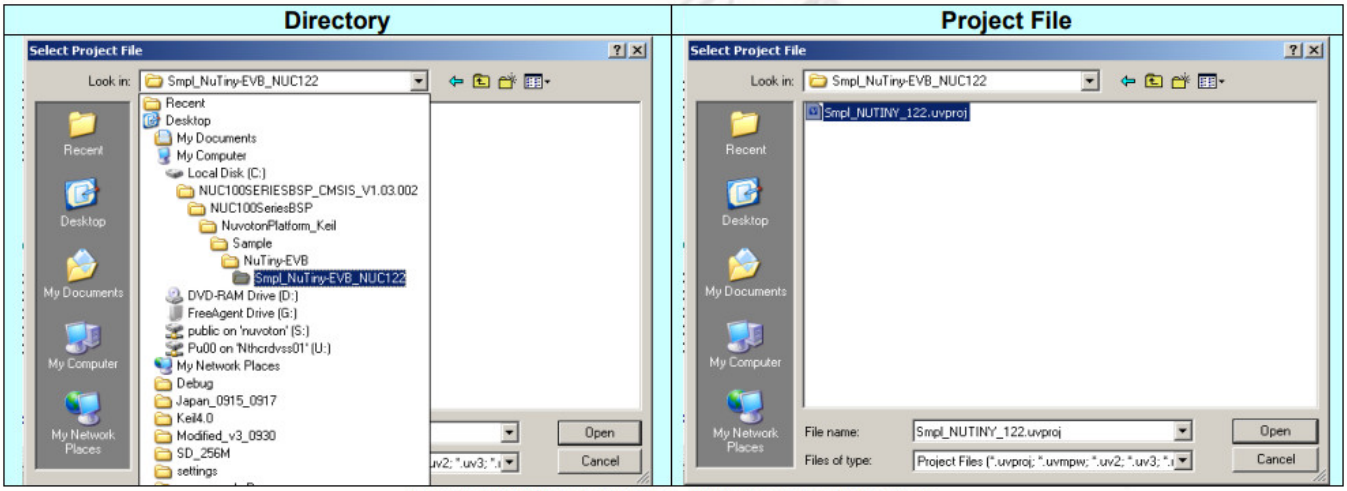


Figure 3-2 Smpl_NuTiny_122 Example Directory

To use this example:
The PB.4 LED will toggle on the NuTiny-EVB-122 board.

- **Start µVision®**
- **Project-Open**

  Open the Smpl_NuTiny_122.uvproj project file
- **Project – Build**

  Compile and link the Smpl_NuTiny-NUC122 application
- **Flash – Download**

  Program the application code into on-chip Flash ROM
- **Start to debug mode**

  Using the debugger commands, you may:
- Review variables in the watch window
- Single-step through code
- Reset the device
- Run the application

How to Start NuTiny-SDK-NUC122 on the IAR Embedded Workbench

4.1 IAR Embedded Workbench Software Download and Install

Please connect to the IAR company website (**http://www.iar.com)** to download the IAR Embedded Workbench and install the EWARM.

4.2 Nuvoton Nu-Link Driver Download and Install

Please connect to the Nuvoton Company NuMicro™ website (http://www.nuvoton.com/NuMicro) to download the “NuMicro™ IAR ICE driver user manual” file. Please refer to Chapter 6.2 for the detailed download flow. When the Nu-Link driver has been well downloaded, please unzip the file and execute the “Nu-Link_IAR_Driver.exe” to install the driver.

4.3 Hardware Setup

The hardware setup is shown in Figure 4-1

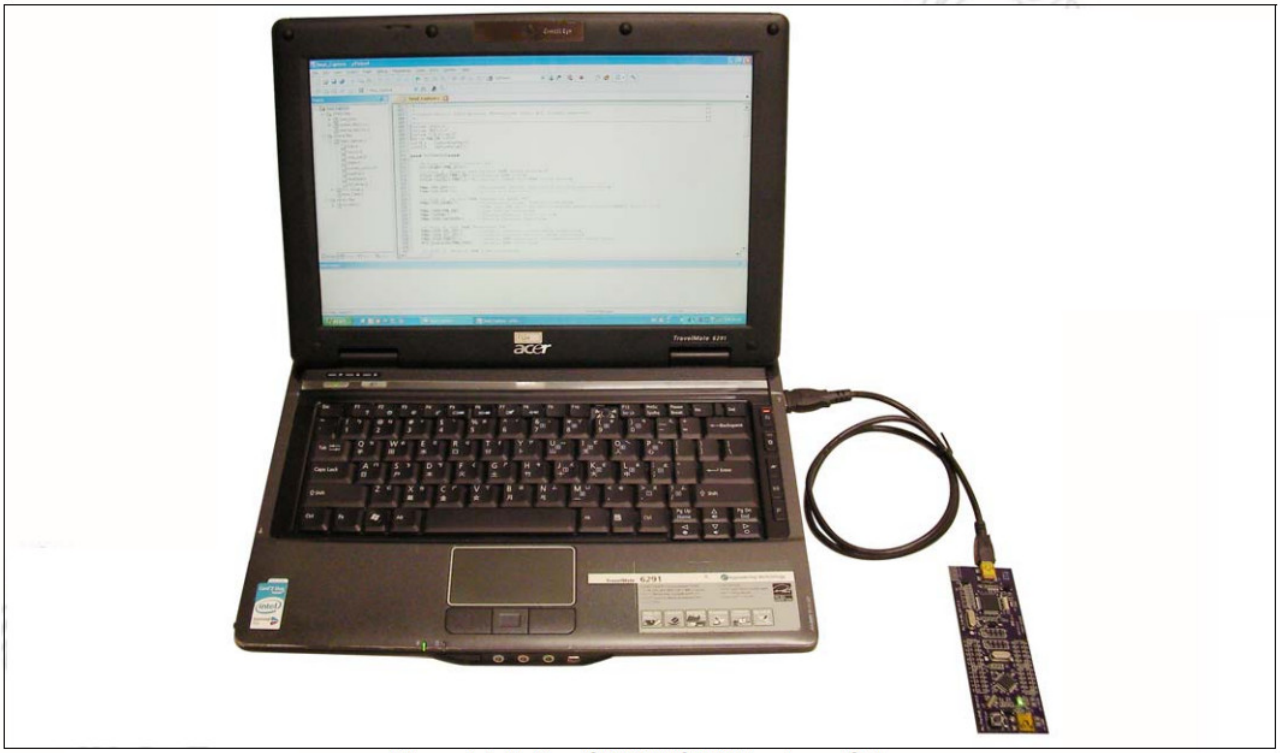


Figure 4-1 NuTiny-SDK-NUC122 Hardware Setup

4.4 Smpl_NuTiny-NUC122 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-NUC122 board. It can be found on Figure 4-2 list directory and downloaded from Nuvoton NuMicro ™ website following on Chapter 6.3.

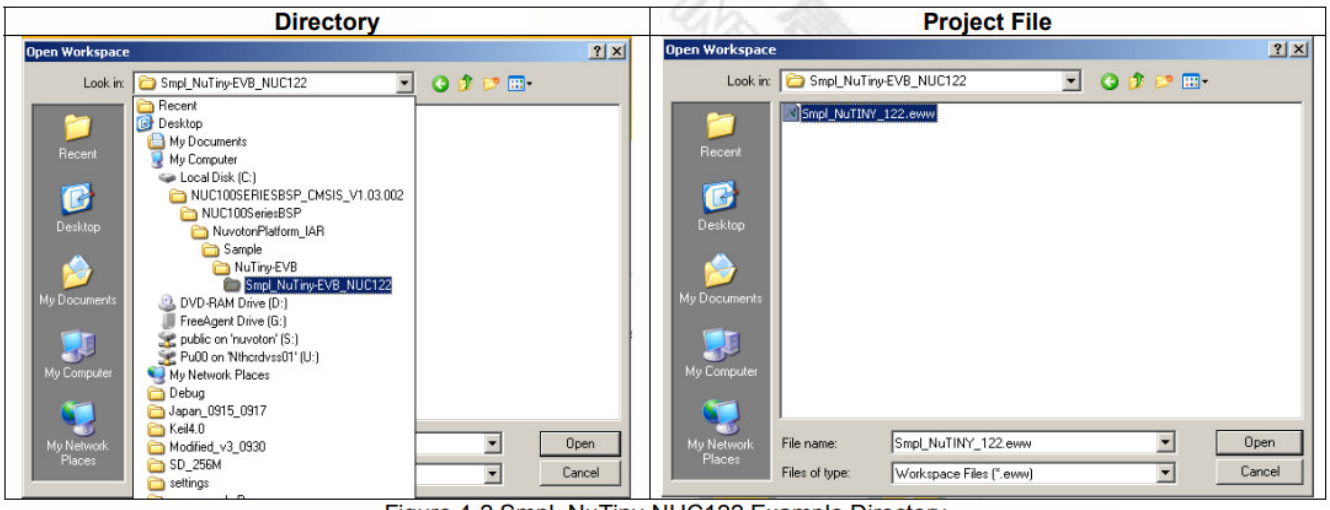


Figure 4-2 Smpl_NuTiny-NUC122 Example Directory

To use this example:

The PB.4 LED will toggle on the NuTiny-EVB-122 board.

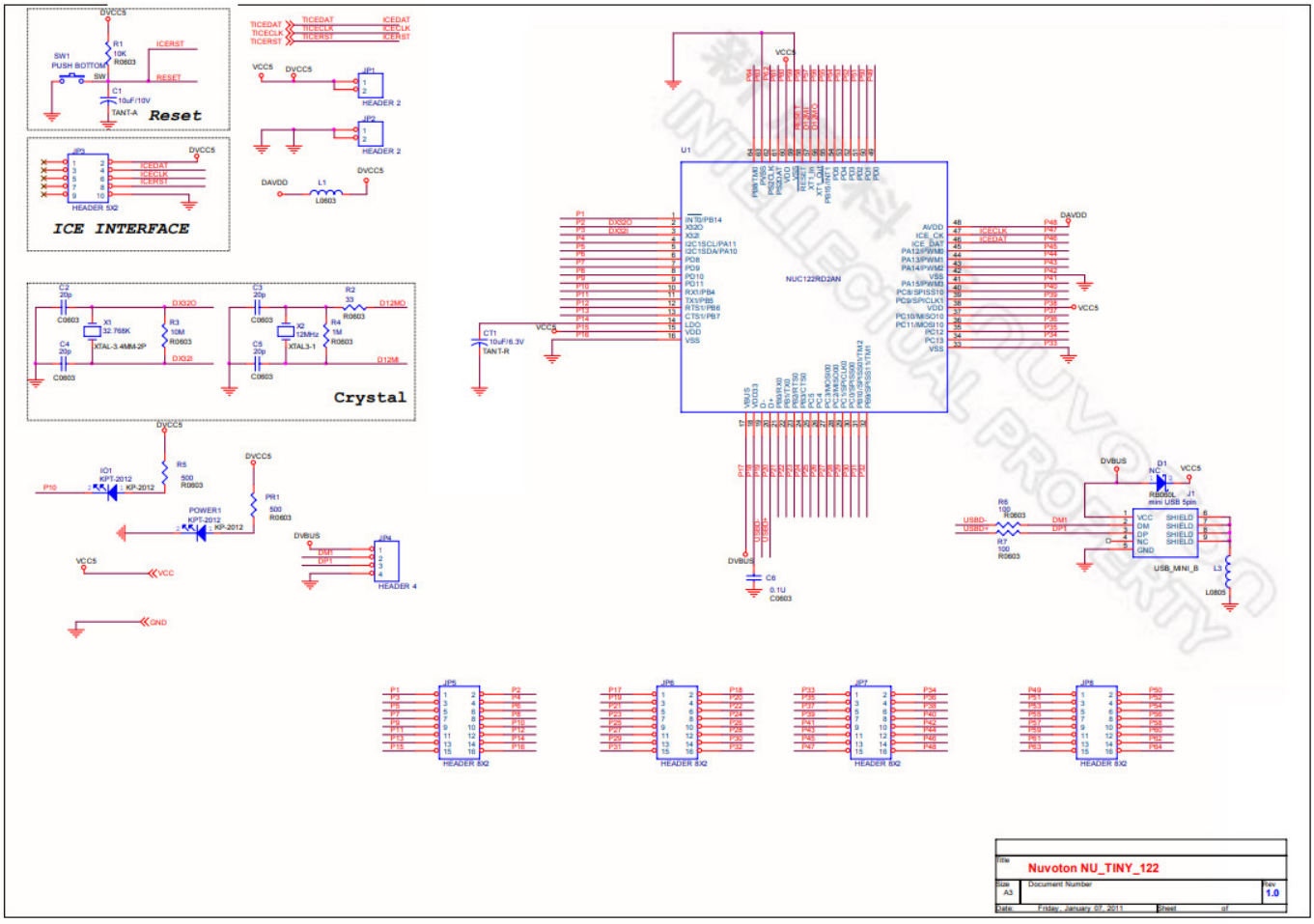
-  **Start IAR Embedded Workbench**
- **File-Open-Workspace**

  Open the Smpl_NuTiny_122.eww workspace file
-  **Project – Make**

  Compile and link the Smpl_NuTiny-122 application
-  **Project – Download and Debug**

  Program the application code into on-chip Flash ROM.
-  Single-step through code
-  Reset the device
-  Run the application

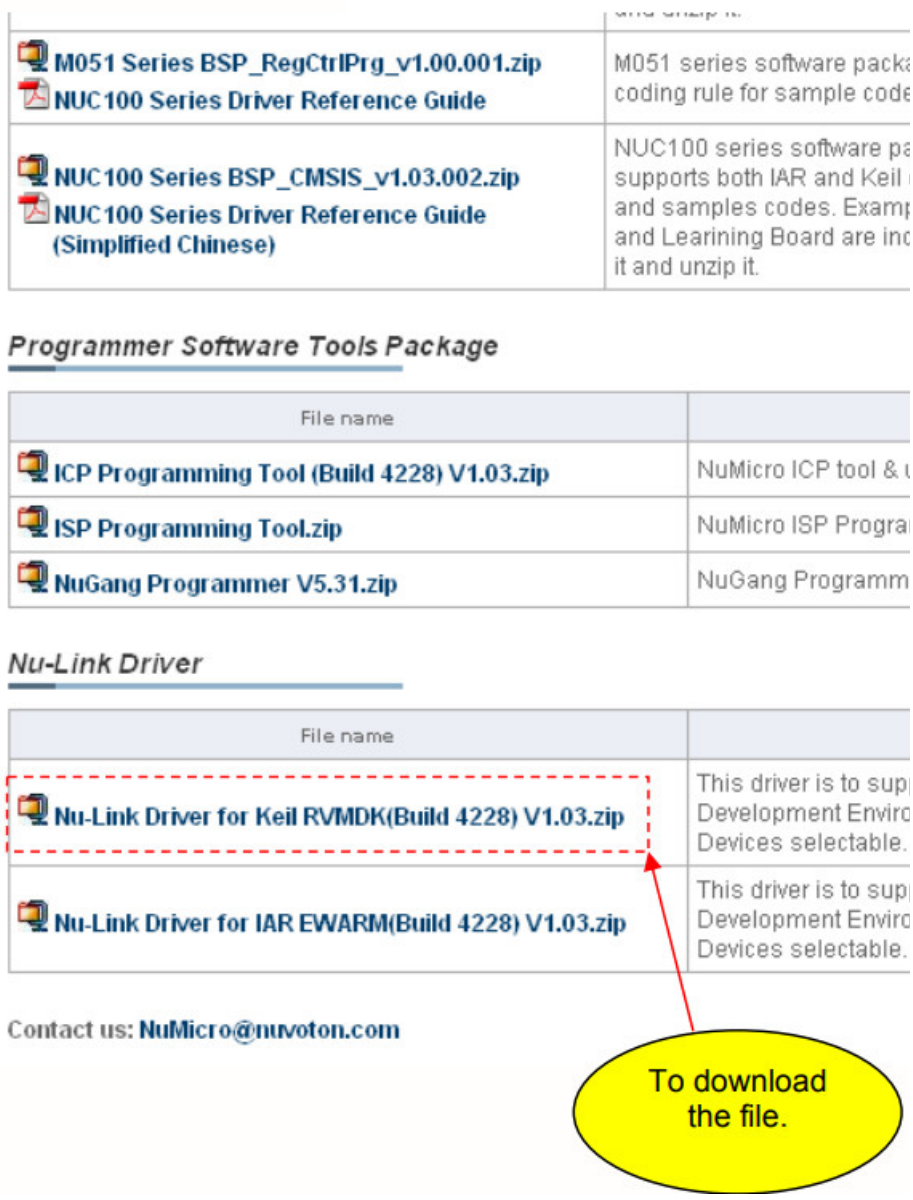
NuTiny-EVB-122 Schematic



Download NuMicro™ Family Related Files from Nuvoton Website

6.1 Download NuMicro™ Keil µVision® IDE Driver

Step 1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro
Step 2	

Step 3	
Step 4	Download the NuMicro ™ Keil µVision® IDE driver

6.2 Download NuMicro™ IAR EWARM Driver

Step 1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro

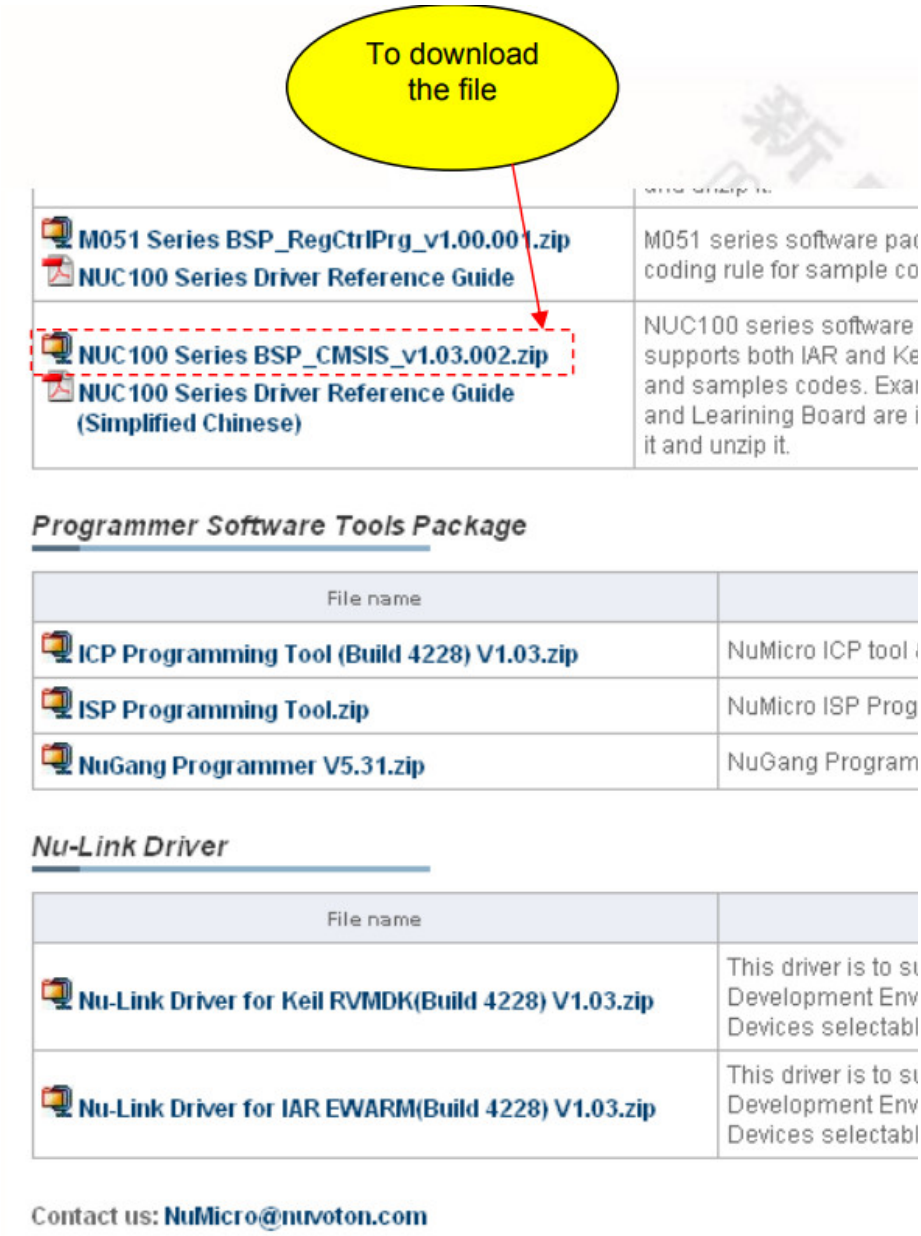
Step 2	 nuvoTon About Nuvoton Products & Sales News & Events Investor Home \ Product & Sales \ Product Lines \ Industrial IC \ ARM Microcontroller \ ARM Cortex™-M0 NuMicro™ Family ARM Cortex™-M0 NuMicro® Family 32-bit ARM Cortex™-M0 MCU NuMicro® Family is Nuvoton's brand-new 32-bi with rich peripherals to offer superb features ar NUC140 series, a new series the NuMicro M05 customers' 8-bit/16-bit microcontroller demar Products MCU Products Brochure (English) MCU Products Brochure (Chinese) Online Products Selection Distributor Information Development Resources Products Brief, DataSheet Technical Reference Manual Development Tools Device Driver and Software Library NuMicro Development Tools Third Party Starter Kit Application Notes Technical Sup Quick Start Online Training Forum (Chines FAQ Click here to enter Device Driver and Software Library NuMicro® Family M051 Base Line

Step 3	
Step 4	Download the NuMicro™ IAR Embedded Workbench® driver

6.3 Download NuMicro™ NUC100 Series BSP Software Library

Step 1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro

Step 2	 nuvoTon About Nuvoton Products & Sales News & Events Investor Home \ Product & Sales \ Product Lines \ Industrial IC \ ARM Microcontroller \ ARM Cortex™-M0 NuMicro™ Family ARM Cortex™-M0 NuMicro® Family 32-bit ARM Cortex™-M0 MCU NuMicro® Family is Nuvoton's brand-new 32-bi with rich peripherals to offer superb features an NUC140 series, a new series the NuMicro M05 customers' 8-bit/16-bit microcontroller deman Products MCU Products Brochure (English) MCU Products Brochure (Chinese) Online Products Selection Distributor Information Development Resources Products Brief, DataSheet Technical Reference Manual Development Tools Device Driver and Software Library NuMicro Development Tools Third Party Starter Kit Application Notes Technical Sup Quick Start Online Training Forum (Chines FAQ Click here to enter Device Driver and Software Library NuMicro® Family M051 Base Line

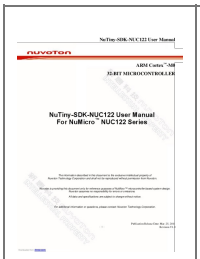
Step 3	
Step 4	Download the NuMicro™ NUC100 series software library

Revision History

Version D	Date	Page	Description
1	Mar. 25, 2011	—	Initial Release

Publication Release Date: Mar. 25, 2011
Revision V1.0

Documents / Resources

	nuvoTon NuTiny-SDK-NUC122 ARM Cortex-M0 32-Bit Microcontroller [pdf] User Manual NuTiny-SDK-NUC122, ARM Cortex-M0 32-Bit Microcontroller, NuTiny-SDK-NUC122 ARM Cortex-M0 32-Bit Microcontroller

References

- IAR
- Keil Embedded Development Tools for Arm, Cortex-M, Cortex-R4, 8051, C166, and 251 processor families.
- ARM Cortex-M0 MCUs - Nuvoton