NuTiny-SDK-NUC029LAN User Manual

for NuMicro™ NUC029xAN Series

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

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Table of Contents

1 Overview

The NuTiny-SDK-NUC029LAN is a specific development tool for NuMicro™ NUC029xAN series-NUC029LAN/NUC029TAN by which users can develop and verify the application program easily. The NuTiny-SDK-NUC029LAN includes two portions: NuTiny-EVB-NUC029LAN (an evaluation board) and Nu-Link-Me (Debug Adaptor). With the NuTiny-SDK-NUC029LAN, users do not need additional ICE or debug equipment.

2 Introduction to NuTiny-SDK-NUC029LAN

The following figure shows the NuTiny-SDK-NUC029LAN for NUC029xAN series, in which the left portion is called NuTiny-EVB-NUC029LAN and the right portion is Debug Adaptor called Nu-Link-Me.

The NuTiny-EVB-NUC029LAN is similar to other development board. Users can use it to develop and verify applications to emulate the real behavior. In fact, the real chip NUC029LAN is mounted on the board. The NuTiny-EVB-NUC029LAN can be a real system controller to design user target system.

The Nu-Link-Me is a Debug Adaptor which connects the USB port of your PC 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 Nu-Link-Me Debug adaptor with Keil or IAR, please refer to "Nuvoton NuMicro™ IAR ICE Driver User Manual" or Nuvoton NuMicro™ Keil ICE Driver User Manual" for details.

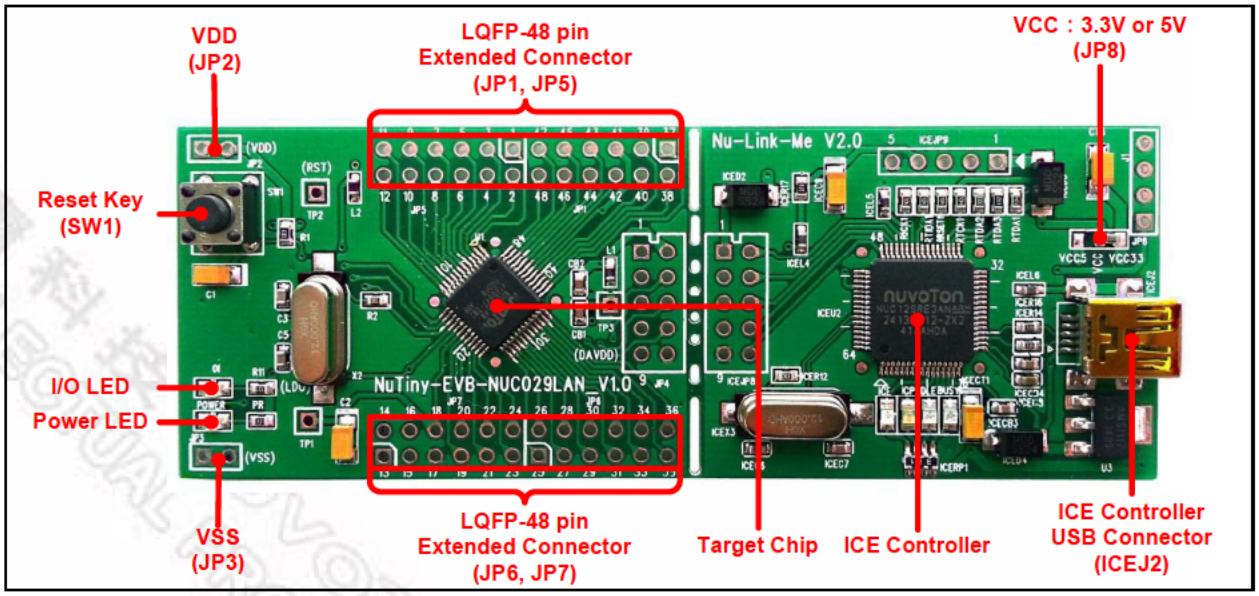


Figure 2-1 NuTiny-SDK-NUC029LAN (Green PCB Board)

2.1 NuTiny-SDK-NUC029LAN Jumper Description

2.1.1 Power Settings

- **JP2**: VDD Voltage connecter in NuTiny-EVB-NUC029LAN
- **ICEJ2**: USB port in Nu-Link-Me

Model	JP8	ICEJ2 USB port	JP2 VDD	MCU Voltage
Model 1	Select VCC33 (default)	Connect to PC	DC 3.3V output	DC 3.3V
Model 2	X	X	DC 2.5 V ~ 5.5 V Input	Voltage by **JP2** input

X: Unused.

2.1.2 Debug Connectors

- **JP4**: Connector in target board (NuTiny-EVB-NUC029LAN) for connecting with Nuvoton ICE adaptor (Nu-Link-Me)
- **ICEJP8**: Connector in ICE adaptor (Nu-Link-Me) for connecting with a target board (e.g. NuTiny-EVB-NUC029LAN)

2.1.3 USB Connectors

- **ICEJ2**: Mini USB Connector in Nu-Link-Me connected to a PC USB port

2.1.4 Extended Connectors

- **JP1**, **JP5**, **JP6** and **JP7**: Show all chip pins in NuTiny-EVB-NUC029LAN

2.1.5 Buttons

- **SW1**: Reset button in NuTiny-EVB-NUC029LAN

2.1.6 Power Connectors

- **JP2**: VDD connector in NuTiny-EVB-NUC029LAN
- **JP3**: VSS connector in NuTiny-EVB-NUC029LAN

2.2 Pin Assignment for Extended Connectors

The NuTiny-EVB-NUC029LAN provides the NUC029LAN target chip on board and the extended connectors (**JP1**, **JP5**, **JP6** and **JP7**) for LQFP48-pin. The following table is the pin assignment for NUC029LAN.

Pin No	Pin Name	Pin No	Pin Name
01	P1.5,MOSI_0,AIN5, ACMP0_P	25	P2.5,AD13,PWM5,SDA1
02	P1.6,MISO_0,AIN6, ACMP2_N	26	P2.6,AD14,PWM6,ACMP1_O
03	P1.7,SCLK0,AIN7, ACMP2_P	27	P2.7,AD15,PWM7
04	/RST	28	P4.4,nCS,SCL1
05	P3.0,RXD,ACMP1_N	29	P4.5,ALE,SDA1
06	AV_{SS}	30	P4.6,ICE_CLK
07	P3.1,TXD,ACMP1_P	31	P4.7,ICE_DATA
08	P3.2,nINT0,STADC,T0EX	32	P0.7,AD7,SCLK1
09	P3.3,nINT1,MCLK,T1EX	33	P0.6,AD6,MISO_1
10	P3.4, T0,SDA0	34	P0.5,AD5,MOSI_1
11	P3.5,T1,SCL0,CKO	35	P0.4,AD4,SPISS1
12	P4.3,PWM3	36	P4.1,PWM1,T3EX
13	P3.6,nWR,CKO, ACMP0_O	37	P0.3,AD3,RTS0,RXD
14	P3.7,nRD	38	P0.2,AD2,CTS0,TXD
15	XTAL2	39	P0.1,AD1,RTS1,RXD1, ACMP3_N
16	XTAL1	40	P0.0,AD0,CTS1,TXD1, ACMP3_P
17	V_{SS}	41	V_{DD}
18	LDO_CAP	42	AV_{DD}
19	P2.0,AD8,PWM0	43	P1.0,AIN0,T2,nWRL
20	P2.1,AD9,PWM1	44	P1.1,AIN1,T3,nWRH
21	P2.2,AD10,PWM2	45	P1.2,AIN2,RXD1
22	P2.3,AD11,PWM3	46	P1.3,AIN3,TXD1
23	P2.4,AD12,PWM4,SCL1	47	P1.4,AIN4,SPISS0,ACMP0_N
24	P4.0,PWM0,T2EX	48	P4.2,PWM2

Table 2-1 Pin Assignment for NUC029LAN

2.3 NuTiny-SDK-NUC029LAN PCB Placement

The following figure shows the NuTiny-SDK-NUC029LAN PCB placement.

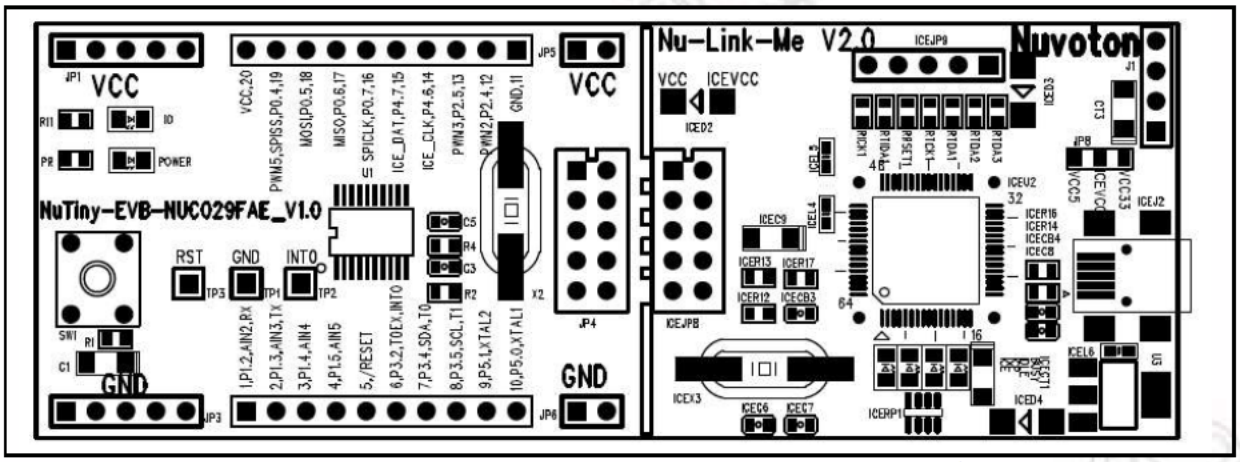


Figure 2-2 NuTiny-SDK-NUC029LAN PCB Placement

3 Starting to Use NuTiny-SDK-NUC029LAN on the Keil µVision® IDE

3.1 Downloading and Installing Keil µVision® IDE Software

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

3.2 Downloading and Installing Nuvoton Nu-Link Driver

Please connect to Nuvoton NuMicro™ website (http://www.nuvoton.com/NuMicro) to download the "*NuMicro™ Keil µVision® IDE driver*" file. Please refer to *section 6.1* for the detailed download flow. After the Nu-Link driver is 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 the following figure.

Figure 3-1 NuTiny-SDK-NUC029LAN Hardware Setup

3.4 Example Program

This example demonstrates how to download and debug an application on a NuTiny-SDK-NUC029LAN board.
The example file can be found in the directory list shown in the following figure.

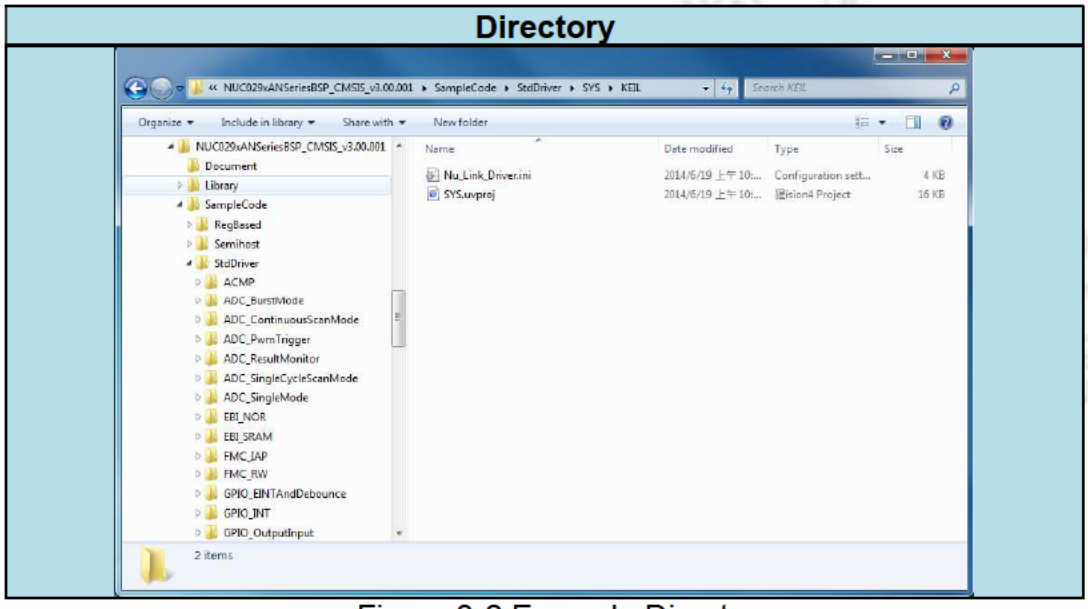


Figure 3-2 Example Directory

To use this example:
The I/O LED on the NuTiny-EVB-NUC029LAN board will turn on.

- **Start µVision®**
- **Project – Open**
  Open the SYS.uvproj project file
- **Project – Build**
  Compile and link the SYS application
- **Flash – Download**
  Program the application code into on-chip Flash ROM
- **Start Debug mode**
  When using the debugger commands, you may:
  - Review variables in the watch window
  - Single step through code
  - Reset the device
  - Run the application

4 Starting to Use NuTiny-SDK-NUC029LAN on the IAR Embedded Workbench

4.1 Downloading and Installing IAR Embedded Workbench Software

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

4.2 Downloading and Installing Nuvoton Nu-Link Driver

Please connect to Nuvoton Company NuMicro™ website (http://www.nuvoton.com/NuMicro) to download "NuMicro™ IAR EWARM Driver" file. Please refer to *section 6.2* for the detail download flow. After the Nu-Link driver is 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 the following figure.

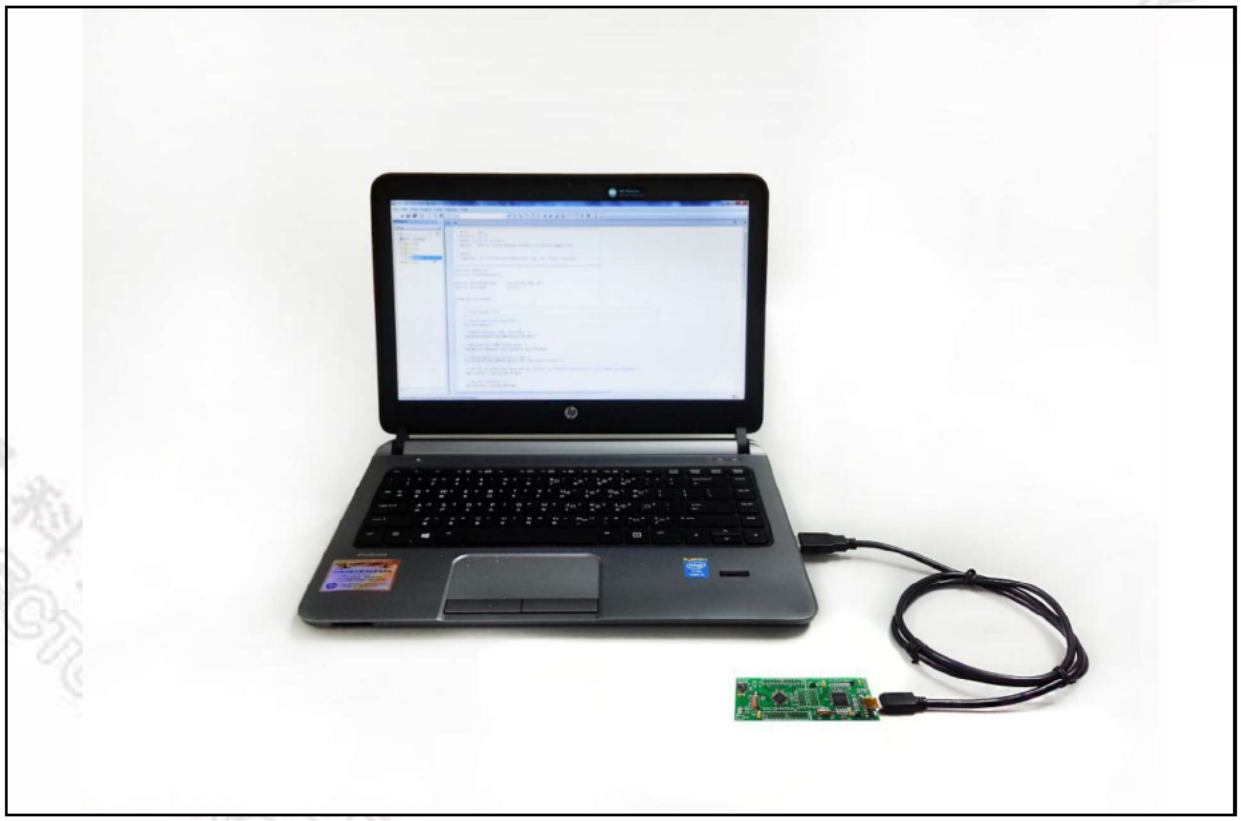


Figure 4-1 NuTiny-SDK-NUC029LAN Hardware Setup

4.4 Example Program

This example demonstrates how to download and debug an application on a NuTiny-SDK-NUC029LAN board.
The example file can be found in the directory list shown in the following figure.

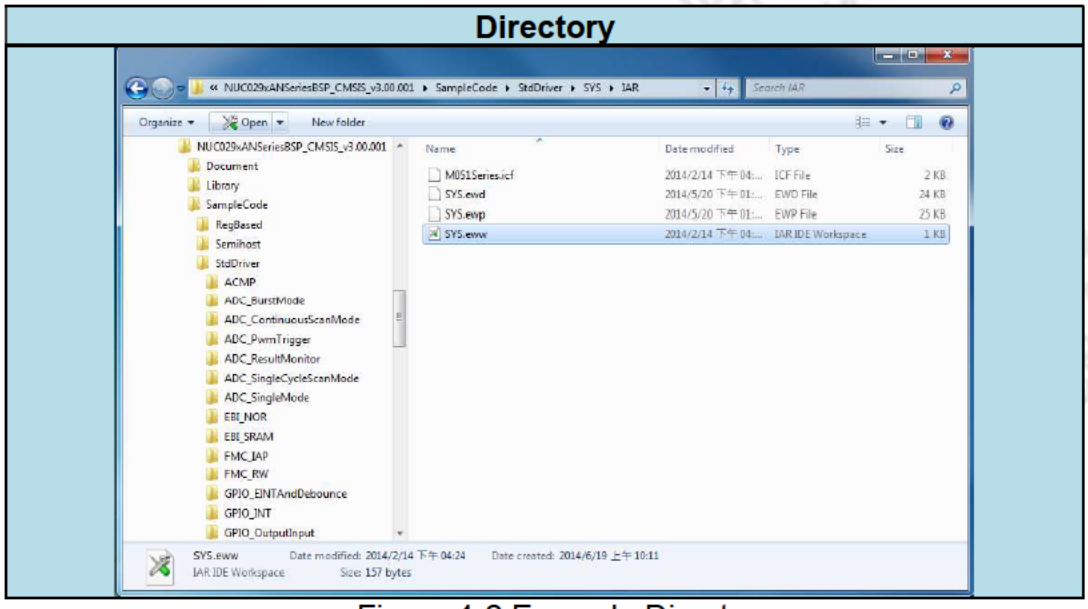


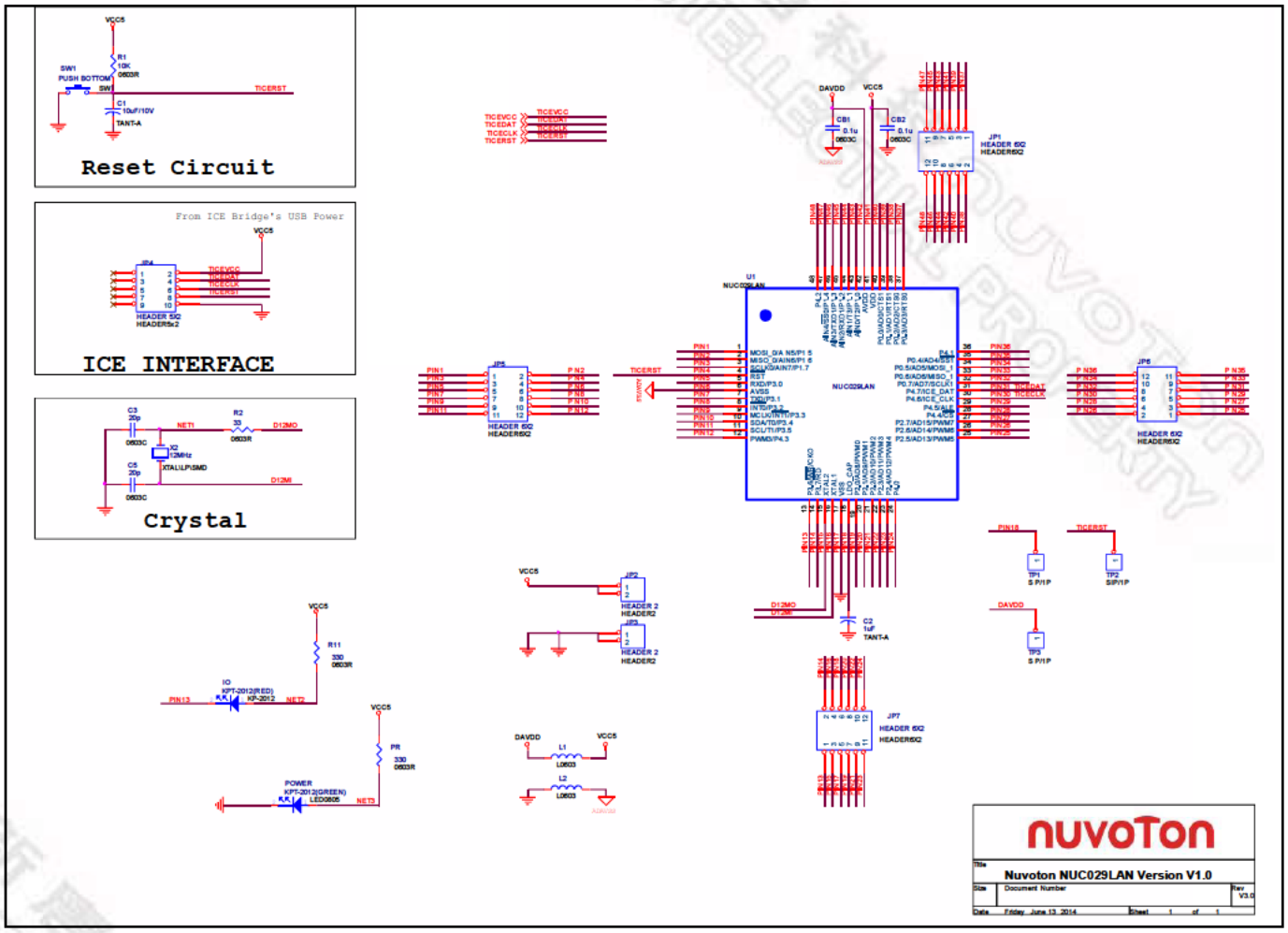
Figure 4-2 Example Directory

To use this example:
The I/O LED on the NuTiny-EVB-NUC029LAN board will turn on.

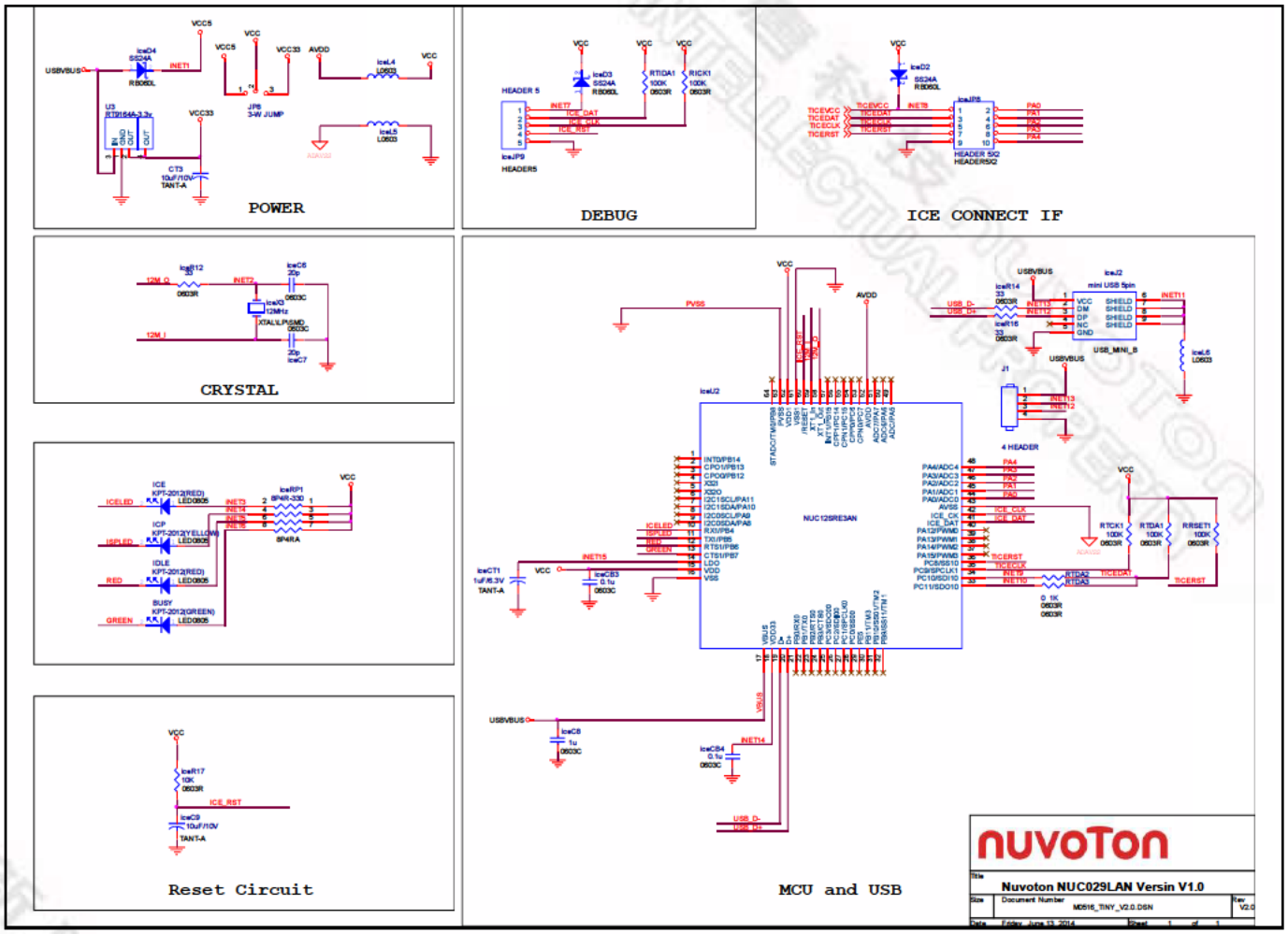
- **Start IAR Embedded Workbench**
- **File-Open-Workspace**
  Open the SYS.eww workspace file
- **Project - Make**
  Compile and link the SYS application
- **Project – Download and Debug**
  Program the application code into on-chip Flash ROM
  - Single step through code
  - Reset the device
  - Run the application

5 NuTiny-SDK-NUC029LAN Schematics

5.1 NuTiny-EVB-NUC029LAN Schematic

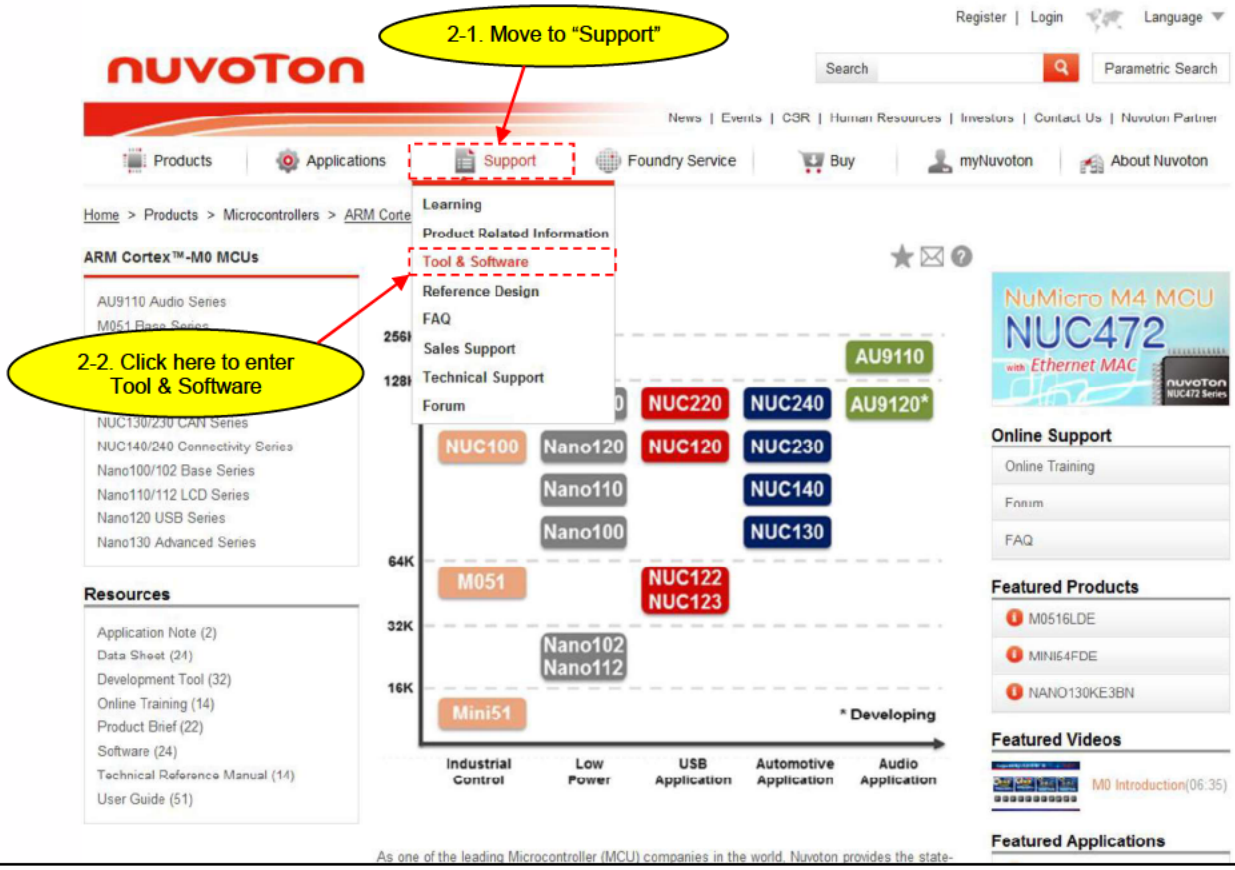


5.2 Nu-Link-Me Schematic



6 Downloading NuMicro™ Related Files from Nuvoton Website

6.1 Downloading NuMicro™ Keil µVision® IDE Driver

Step1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro.
Step2	

Step3

Step4

Programmer Software Tools Package

File name	Description	Version	Date
ICP Programming Tool V1.25.6287.zip Revision History	NuMicro ICP tool & user manual	V1.25.6287	2014-01-16
ISP Programming Tool V1.44.zip Revision History	NuMicro ISP Programming Tool & user manual	V1.44	2014-01-20
NuGang Programmer V6.21.zip Revision History	ware & user manual	V6.21	2014-01-24

Click here to download the file.

Nu-Link Driver

File name	Description	Version	Date
Nu-Link Driver for Keil RVMDK V1.25.6287.zip Revision History	This driver is to support Nu-Link to work under Keil RVMDK Development Environment for all NuMicro Family Devices.	V1.25.6287	2014-01-16
Nu-Link Driver for IAR EWARM V1.25.6287.zip Revision History	This driver is to support Nu-Link to work under IAR EWARM Development Environment for all NuMicro Family Devices.	V1.25.6287	2014-01-16

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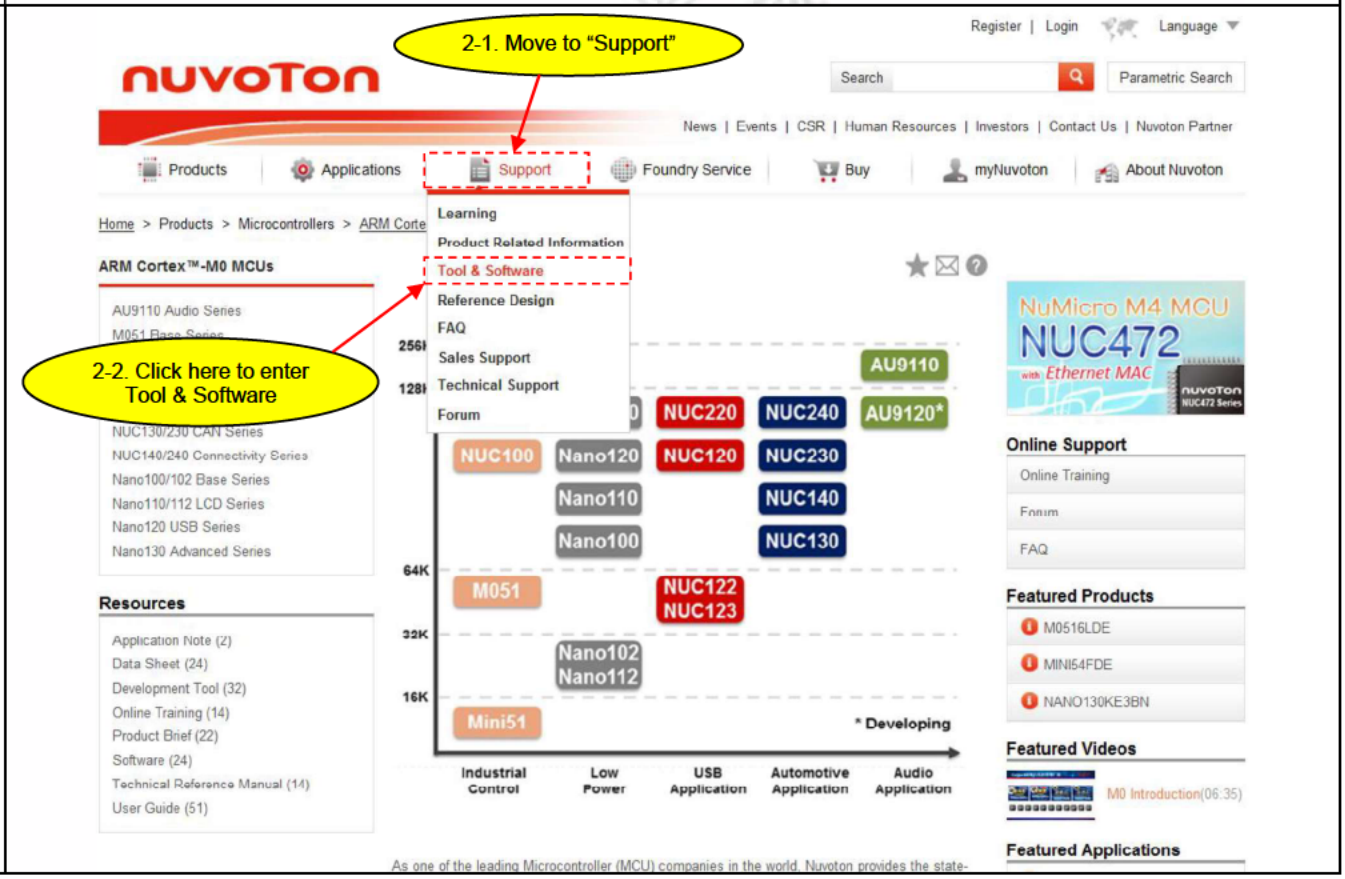
Step5 Download the NuMicro™ Keil µVision® IDE driver.

6.2 Downloading NuMicro™ IAR EWARM Driver

Step1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro.
Step2	

Step3

Step4

Programmer Software Tools Package

File name	Description	Version	Date
ICP Programming Tool V1.25.6287.zip Revision History	NuMicro ICP tool & user manual	V1.25.6287	2014-01-16
ISP Programming Tool V1.44.zip Revision History	NuMicro ISP Programming Tool & user manual	V1.44	2014-01-20
NuGang Programmer V6.21.zip Revision History	NuGang Programmer software & user manual	V6.21	2014-01-24

Nu-Link Driver

Click here to download the file.

File name	Description	Version	Date
Nu-Link Driver for Keil RVMDK V1.25.6287.zip Revision History	This driver is to support Nu-Link to work under Keil RVMDK Development Environment for all NuMicro Family Devices.	V1.25.6287	2014-01-16
Nu-Link Driver for IAR EWARM V1.25.6287.zip Revision History	This driver is to support Nu-Link to work under IAR EWARM Development Environment for all NuMicro Family Devices.	V1.25.6287	2014-01-16

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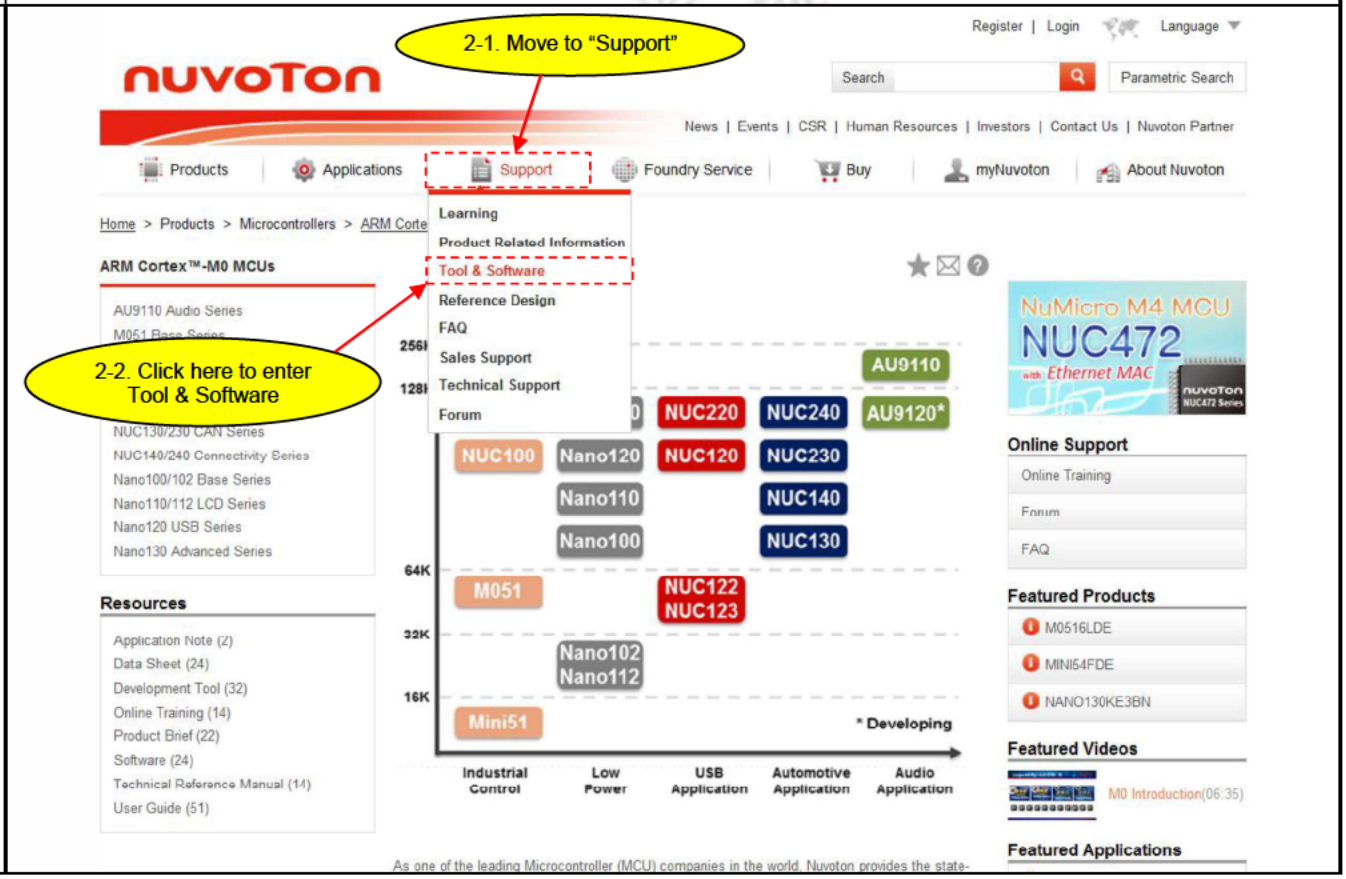
Step5 Download the NuMicro™ IAR EWARM driver.

6.3 Downloading NuMicro™ NUC029xAN Series BSP Software Library

Step1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro.
Step2	

Step3	
Step4	Download the NuMicro™ NUC029xAN Series CMSIS BSP.

7 Revision History

Revision	Date	Description
1.00	Jun. 19, 2014	First version.
1.01	Dec. 24, 2014	Fix the typo on 6.3 Downloading NuMicro™ NUC029xAN Series BSP Software Library Step4.