



NuTiny-SDK-NUC029LAN User Manual

for NuMicro™ NUC029xAN Series

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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.

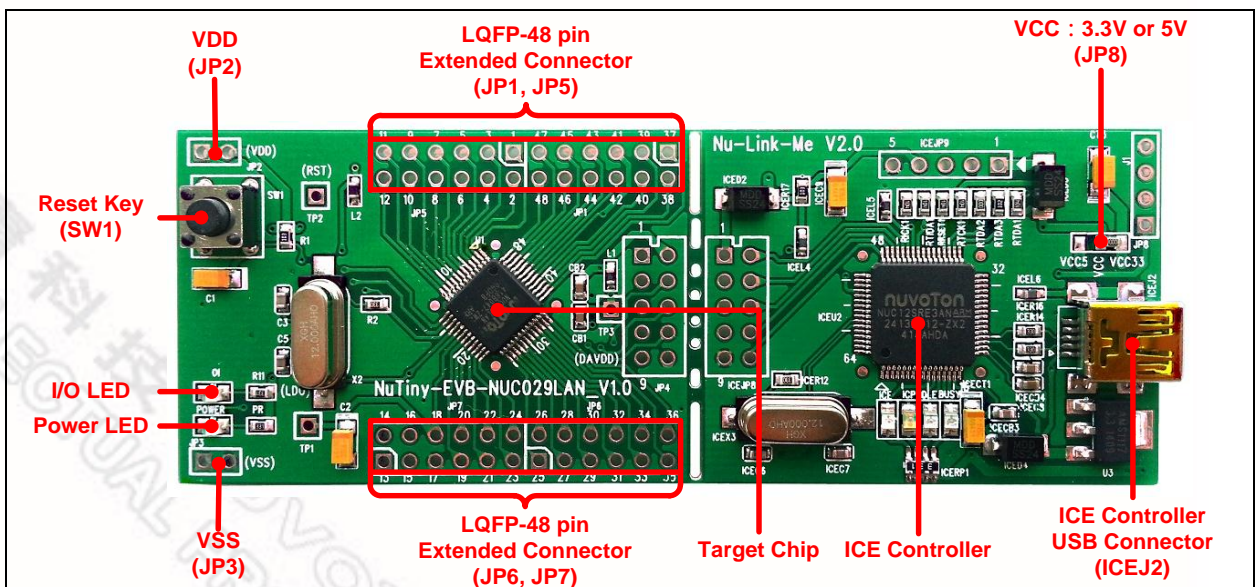


Figure 2-1 NuTiny-SDK-NUC029LAN (Green PCB Board)



2.1 NuTiny-SDK-NUC029LAN Jumper Description

2.1.1 Power Settings

- **JP2**: VDD Voltage connector 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.

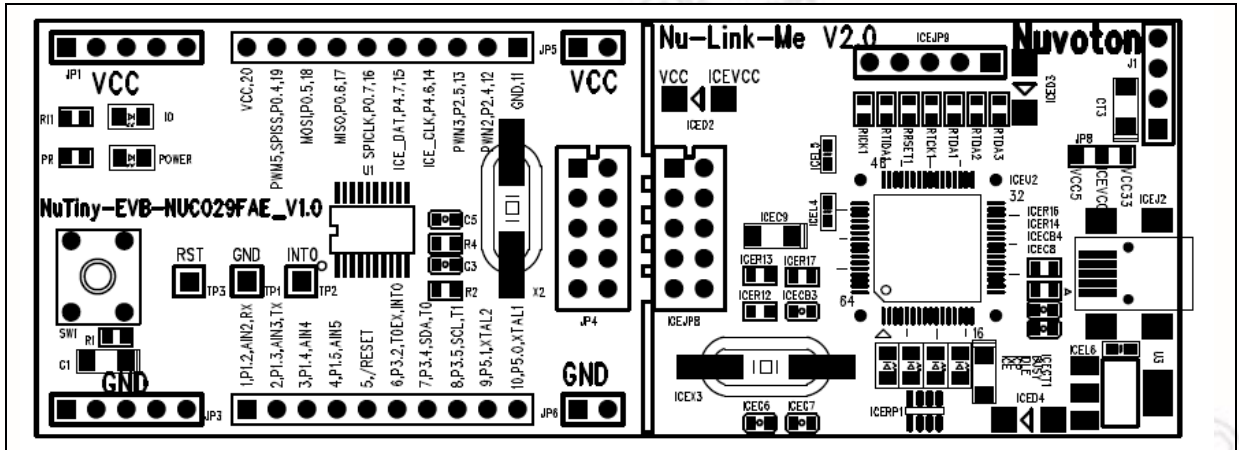


Figure 2-2 NuTiny-SDK-NUC029LAN PCB Placement

3 Starting to Use NuTiny-SDK-NUC029LAN on the Keil μ Vision[®] IDE

3.1 Downloading and Installing Keil μ Vision[®] IDE Software

Please connect to the Keil company website (<http://www.keil.com>) to download the Keil μ Vision[®] 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 μ Vision[®] 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.

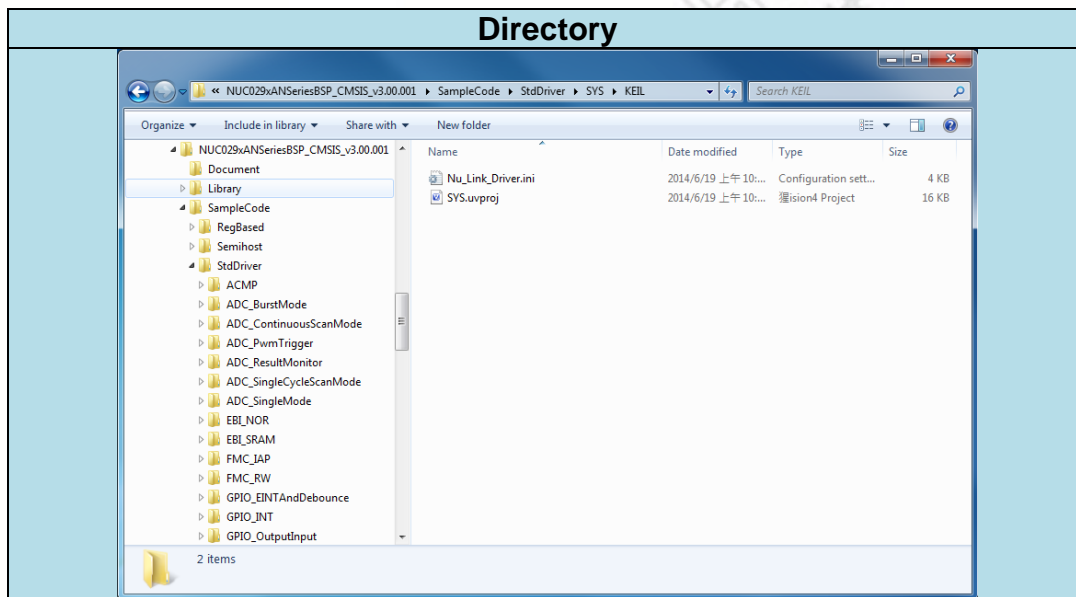


Figure 3-2 Example Directory

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.

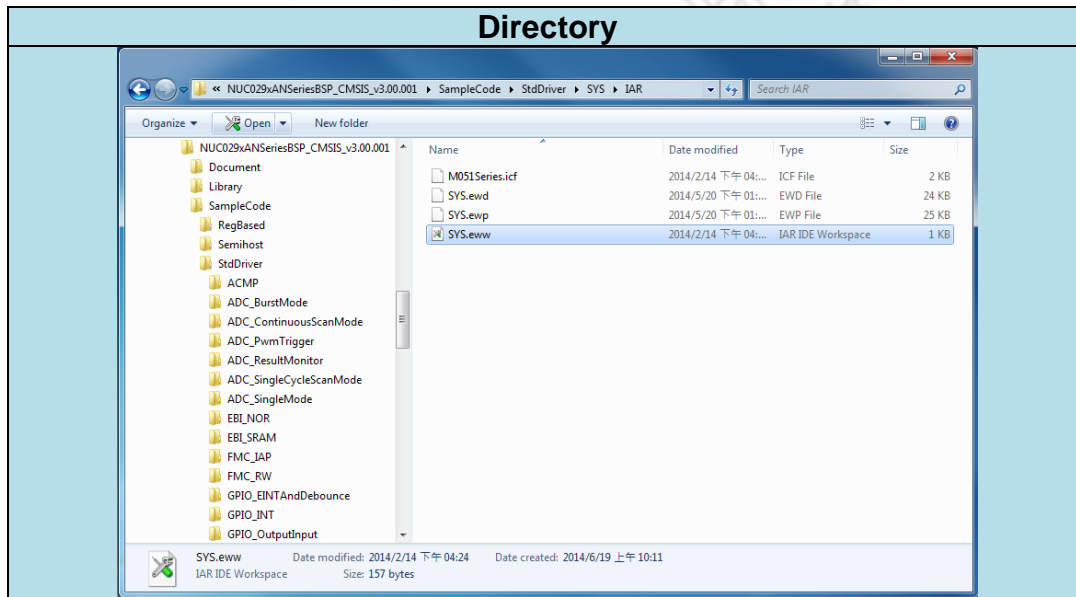








Figure 4-2 Example Directory

To use this example:

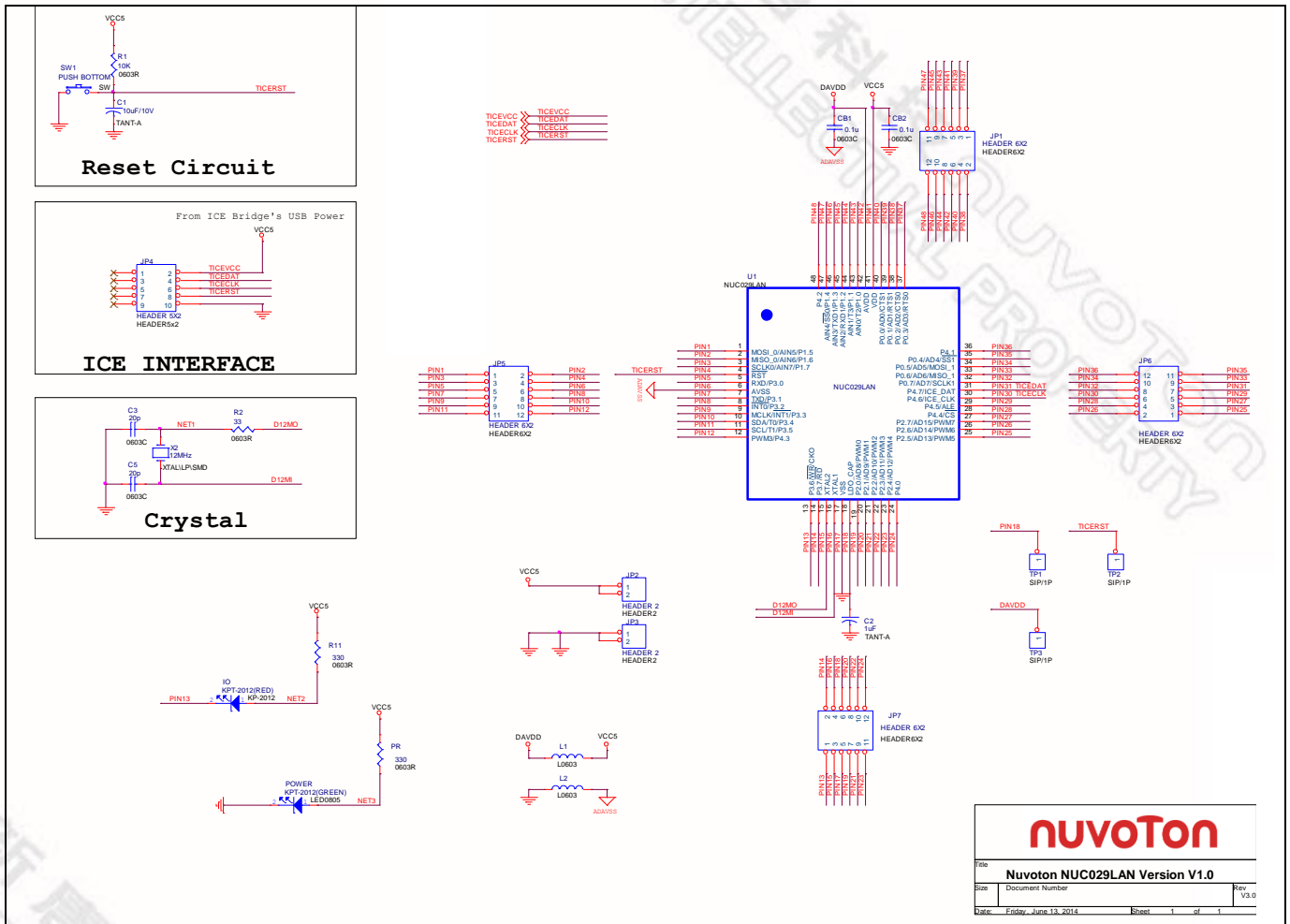
The I/O LED on the NuTiny-EVB-NUC029LAN board will turn on.

-  **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



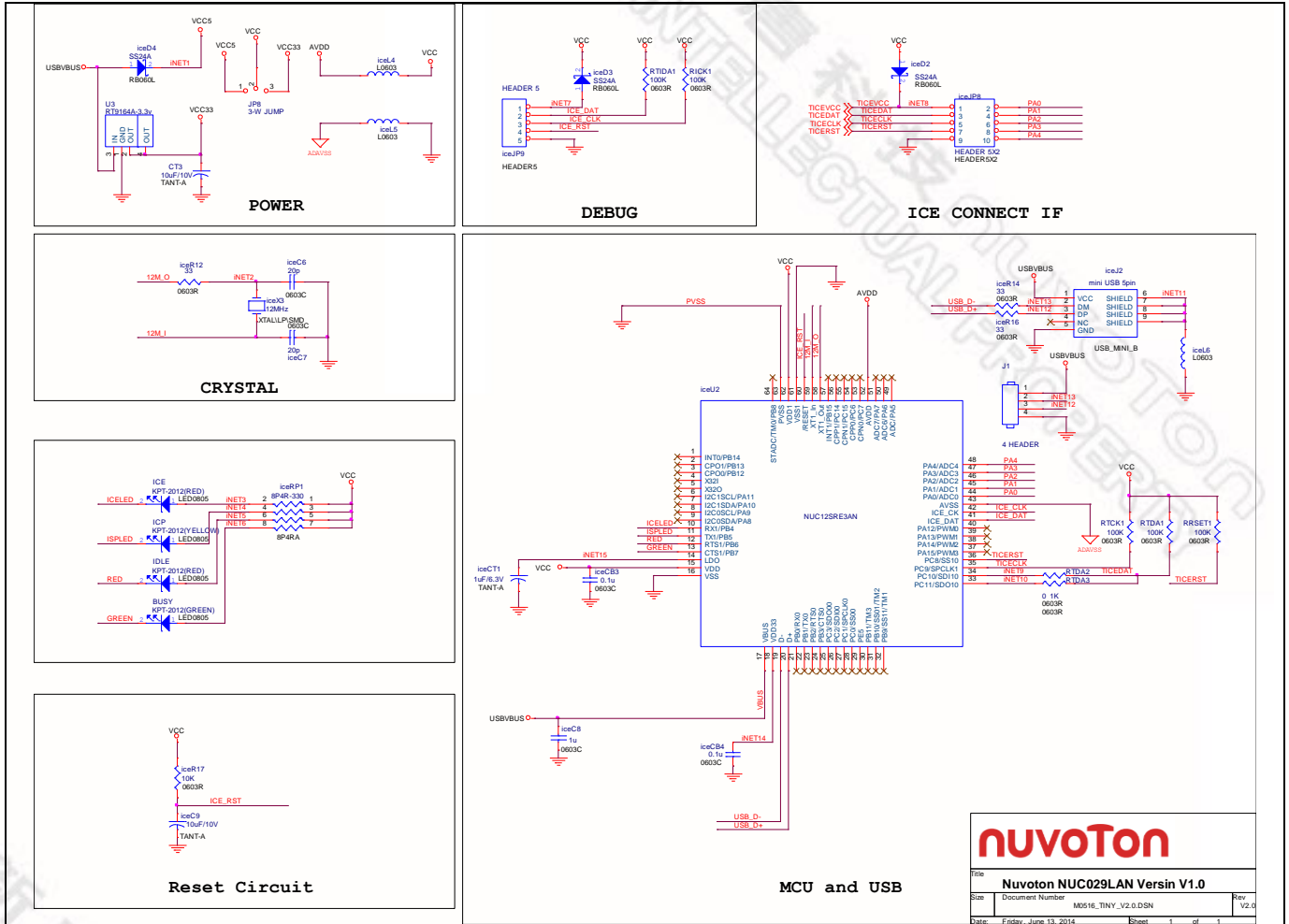
5 NuTiny-SDK-NUC029LAN Schematics

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

<p>Step1</p>	<p>Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro.</p>
<p>Step2</p>	<p>The screenshot shows the Nuvoton website interface. A yellow oval labeled '2-1. Move to "Support"' points to the 'Support' link in the top navigation bar. A red dashed box highlights the 'Support' dropdown menu, which includes options like 'Learning', 'Product Related Information', 'Tool & Software', 'Reference Design', 'FAQ', 'Sales Support', 'Technical Support', and 'Forum'. A second yellow oval labeled '2-2. Click here to enter Tool & Software' points to the 'Tool & Software' option in the dropdown menu. The main content area displays a product matrix for ARM Cortex™-M0 MCUs, categorized by application (Industrial Control, Low Power, USB Application, Automotive Application, Audio Application) and price range (16K, 32K, 64K, 128K, 256K). Specific product models like NUC100, Nano120, NUC120, NUC230, NUC140, NUC130, M051, Nano102, Nano112, NUC122, NUC123, and AU9110 are shown. A sidebar on the right features 'Online Support' (Training, Forum, FAQ), 'Featured Products' (M0516LDE, MINI54FDE, NANO130KE3BN), 'Featured Videos' (M0 Introduction), and 'Featured Applications'.</p>

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IC Programming

Navoton Gang Programmer

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In System Programming

nuvoTon ISP AP

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6.2 Downloading NuMicro™ IAR EWARM Driver

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

Step2

The screenshot shows the Nuvoton NuMicro website interface. A yellow oval labeled "2-1. Move to 'Support'" points to the "Support" link in the top navigation bar. A red dashed box highlights the "Support" dropdown menu, with a yellow oval labeled "2-2. Click here to enter Tool & Software" pointing to the "Tool & Software" option. The main content area displays a product matrix for ARM Cortex-M0 MCUs, categorized by core size (16K, 32K, 64K, 128K, 256K) and application (Industrial Control, Low Power, USB Application, Automotive Application, Audio Application). A sidebar on the left lists "ARM Cortex™-M0 MCUs" and "Resources".

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- Customer Target Board
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Step5	Download the NuMicro™ IAR EWARM driver.																		

Click here to download the file.



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6.3 Downloading NuMicro™ NUC029xAN Series BSP Software Library

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

Step2

The screenshot shows the Nuvoton NuMicro website interface. A yellow oval labeled "2-1. Move to 'Support'" points to the "Support" link in the top navigation bar. A red dashed box highlights the "Support" dropdown menu, with a yellow oval labeled "2-2. Click here to enter Tool & Software" pointing to the "Tool & Software" option within the menu. The main content area displays a product matrix for ARM Cortex-M0 MCUs, categorized by core size (256K, 128K, 64K, 32K, 16K) and application (Industrial Control, Low Power, USB Application, Automotive Application, Audio Application). A "Support" dropdown menu is open, showing options like Learning, Product Related Information, and Tool & Software. The "Tool & Software" option is highlighted with a red dashed box. The "Support" dropdown menu is also highlighted with a red dashed box. The "Tool & Software" option is highlighted with a yellow oval. The "Support" dropdown menu is also highlighted with a red dashed box. The "Tool & Software" option is highlighted with a yellow oval.

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<p>Step3</p>	<p>The screenshot shows the NuvoTon website's 'Development Tool Hardware' page. The left navigation menu includes: Learning, Product Related Information, Tool & Software, Development Tool Hardware, Development Kit, Learning Board, Programmer, Software (highlighted with a red dashed box and a yellow callout bubble), Third Party Tool, Reference Design, FAQ, Sales Support, Technical Support, and Forum. The main content area is divided into three columns: 'Development' (with links for Evaluation Board, Customer Target Board, and NuTiny Board), 'Mass Production' (with links for On-Line In Circuit Programming, Off-Line In Circuit Programming, and IC Programming), and 'Upgrade' (with links for In System Programming and Through). A yellow callout bubble with the text 'Click here to enter Software download page' points to the 'Software' link in the navigation menu.</p>
<p>Step4</p>	<p>Download the NuMicro™ NUC029xAN Series CMSIS BSP.</p>

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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.

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.

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