



NuTiny-SDK-NUC029FAE User Manual

for NuMicro™ NUC029FAE Series

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1 Overview

The NuTiny-SDK-NUC029FAE is a specific development tool for NuMicro™ NUC029FAE series-NUC029FAE by which users can develop and verify the application program easily. The NuTiny-SDK-NUC029FAE includes two portions: NuTiny-EVB-NUC029FAE (an evaluation board) and Nu-Link-Me (Debug Adaptor). With the NuTiny-SDK-NUC029FAE, users do not need additional ICE or debug equipment.

2 Introduction to NuTiny-SDK-NUC029FAE

The following figure shows the NuTiny-SDK-NUC029FAE for NUC029xAE series, in which the left portion is called NuTiny-EVB-NUC029FAE and the right portion is Debug Adaptor called Nu-Link-Me.

The NuTiny-EVB-NUC029FAE 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 NUC029FAE is mounted on the board. The NuTiny-EVB-NUC029FAE 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.

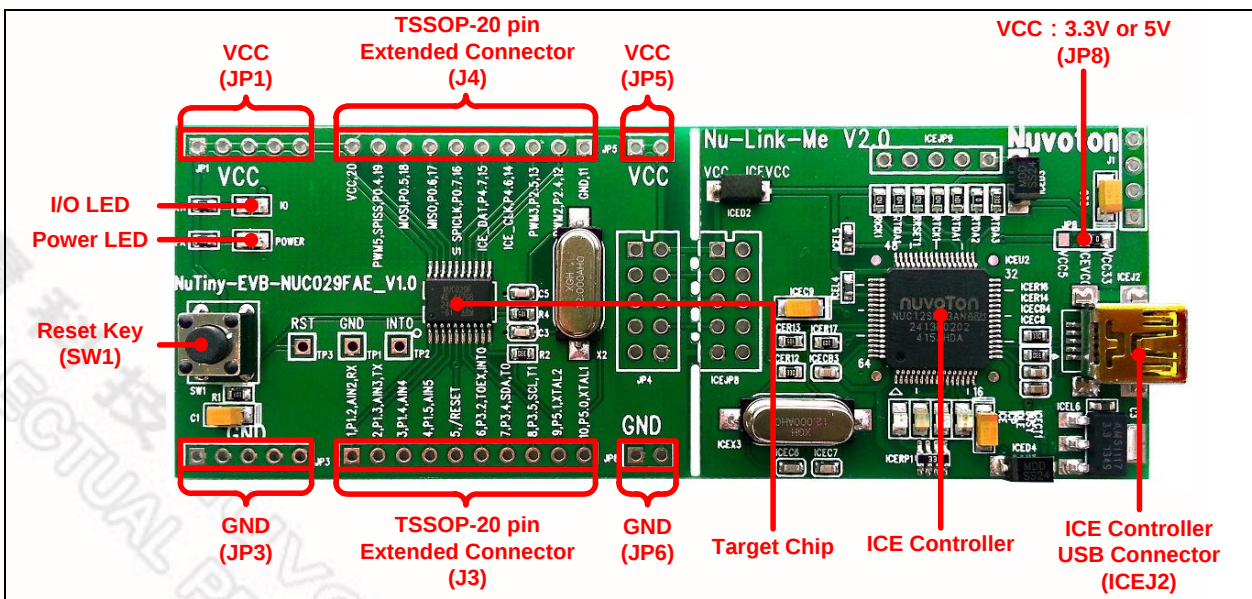


Figure 2-1 NuTiny-SDK-NUC029FAE (Green PCB Board)



2.1 NuTiny-SDK-NUC029FAE Jumper Description

2.1.1 Power Settings

- **JP1 and JP5:** VCC Voltage connector in NuTiny-EVB-NUC029FAE
- **ICEJ2:** USB port in Nu-Link-Me

Model	JP8	ICEJ2 USB port	JP1 and JP5 VCC	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 JP1 and JP5 input

X: Unused.

2.1.2 Debug Connectors

- **JP4:** Connector in target board (NuTiny-EVB-NUC029FAE) 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-NUC029FAE)

2.1.3 USB Connectors

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

2.1.4 Extended Connectors

- **J3** and **J4:** Show all chip pins in NuTiny-EVB-NUC029FAE

2.1.5 Buttons

- **SW1:** Reset button in NuTiny-EVB-NUC029FAE

2.1.6 Power Connectors

- **JP1 and JP5:** VCC connector in NuTiny-EVB-NUC029FAE
- **JP3 and JP6:** GND connector in NuTiny-EVB-NUC029FAE

2.2 Pin Assignment for Extended Connectors

The NuTiny-EVB-NUC029FAE provides the NUC029FAE target chip on board and the extended connectors (**J3** and **J4**) for TSSOP20-pin. The following table is the pin assignment for NUC029FAE.

Pin No	Pin Name	Pin No	Pin Name
01	P1.2,RXD,AIN2,ACMP0_P	11	VSS
02	P1.3,TXD,AIN3,ACMP0_P	12	P2.4,PWM2
03	P1.4,AIN4,ACMP0_N	13	P2.5,PWM3
04	P1.5,AIN5,ACMP0_P	14	P4.6,ICE_CLK
05	nRST	15	P4.7,ICE_DAT
06	P3.2,nINT0,STADC,T0EX,ACMP1_P	16	P0.7,SPICLK0
07	P3.4,T0,SDA0,ACMP1_P	17	P0.6,MISO_0
08	P3.5,T1,SCL0,ACMP1_P	18	P0.5,MOSI_0
09	P5.1,XTAL2	19	P0.4,SPISS0,PWM5
10	P5.0,XTAL1	20	VDD

Table 2-1 Pin Assignment for NUC029FAE

2.3 NuTiny-SDK-NUC029FAE PCB Placement

The following figure shows the NuTiny-SDK-NUC029FAE PCB placement.

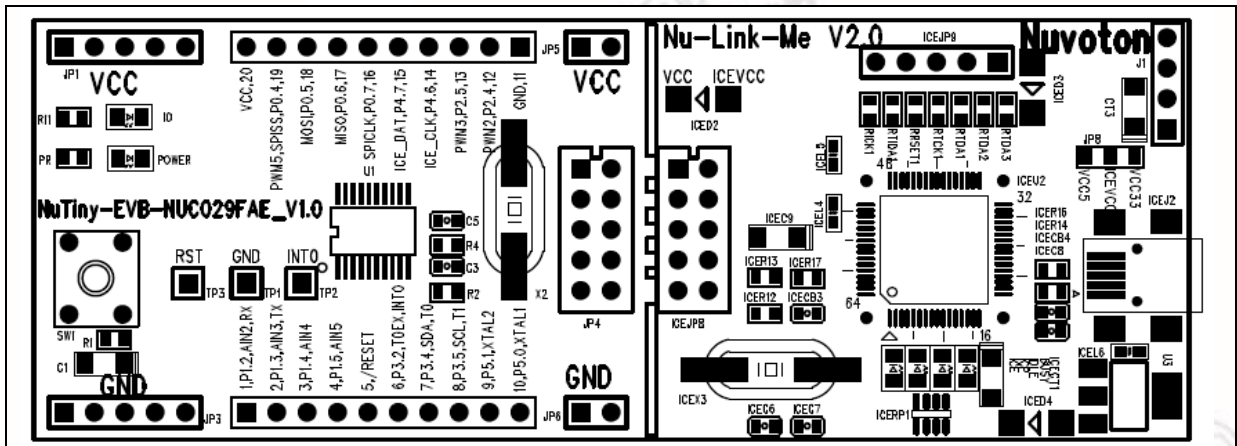


Figure 2-2 NuTiny-SDK-NUC029FAE PCB Placement

3 Starting to Use NuTiny-SDK-NUC029FAE 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-NUC029FAE Hardware Setup



3.4 Example Program

This example demonstrates how to download and debug an application on a NuTiny-SDK-NUC029FAE board.

The example file can be found in the directory list shown in the following figure.

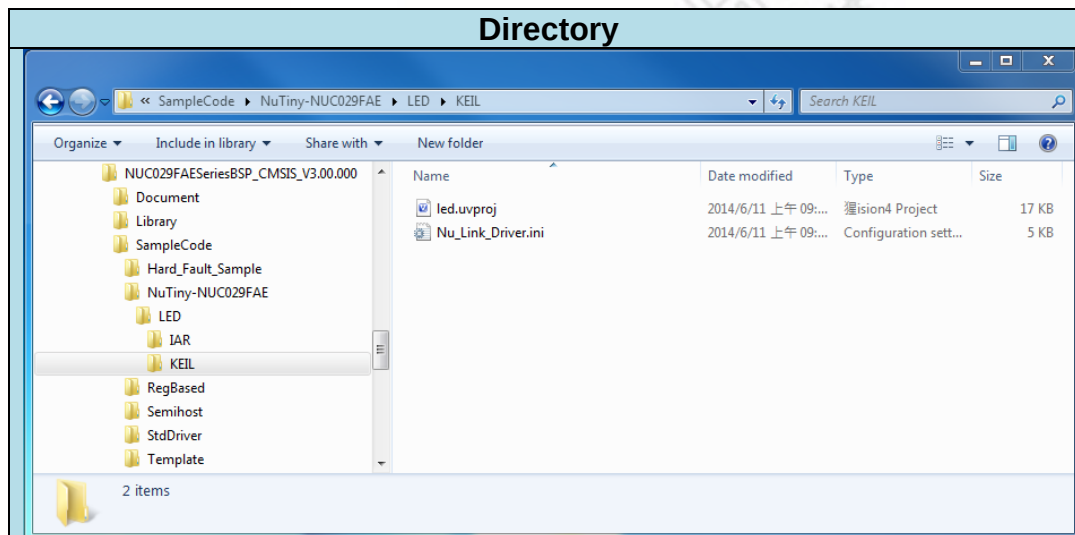


Figure 3-2 Example Directory

To use this example:

The I/O LED on the NuTiny-EVB-NUC029FAE board will be toggled on.

-  **Start µVision®**
- **Project – Open**
Open the led.uvproj project file
-  **Project – Build**
Compile and link the LED 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-NUC029FAE 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-NUC029FAE Hardware Setup

4.4 Example Program

This example demonstrates how to download and debug an application on a NuTiny-SDK-NUC029FAE board.

The example file can be found in the directory list shown in the following figure.

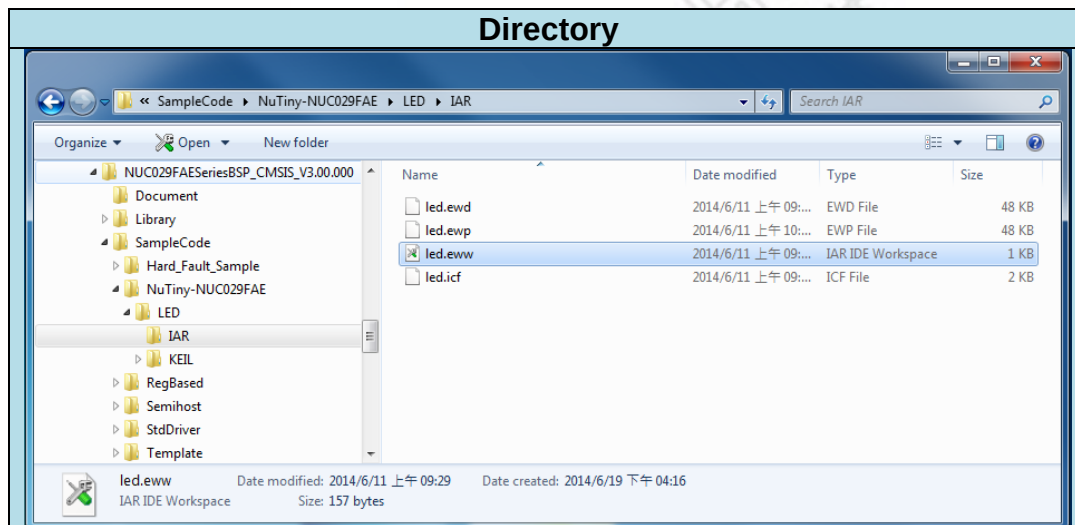


Figure 4-2 Example Directory

To use this example:

The I/O LED on the NuTiny-EVB-NUC029FAE board will be toggled on.

-  **Start IAR Embedded Workbench**

- **File-Open-Workspace**
Open the led.eww workspace file

-  **Project - Make**
Compile and link the LED application

-  **Project – Download and Debug**
Program the application code into on-chip Flash ROM

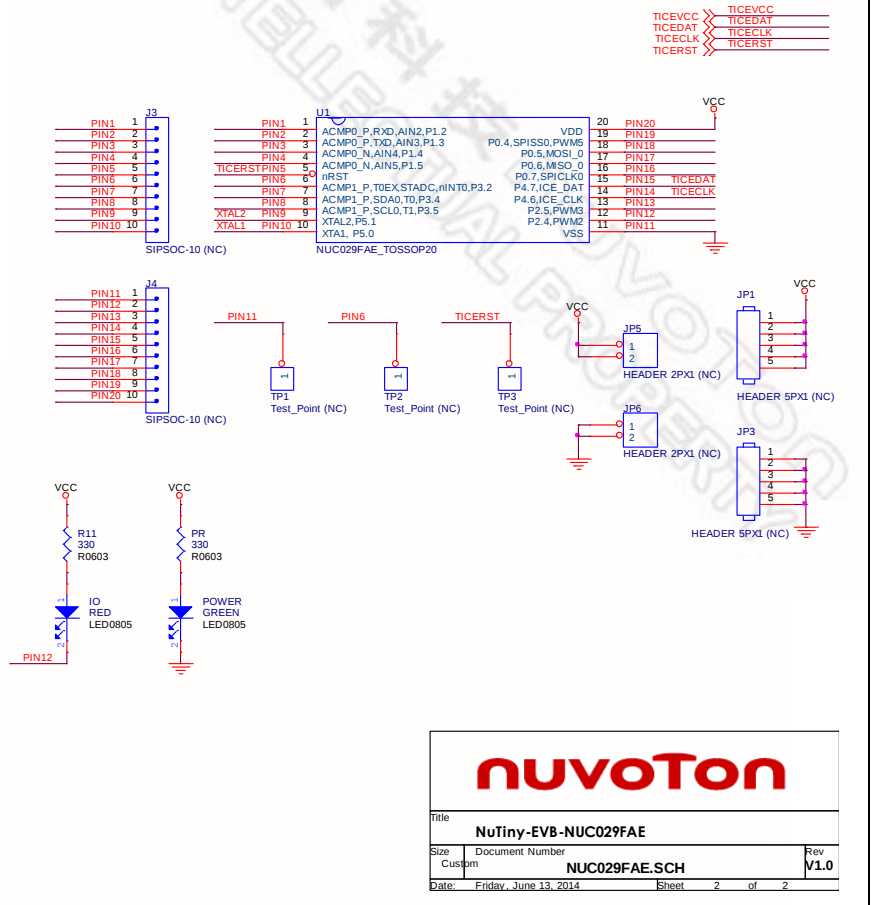
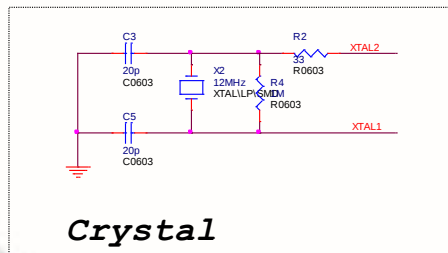
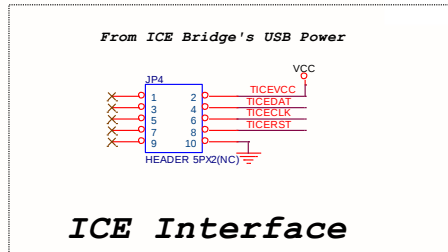
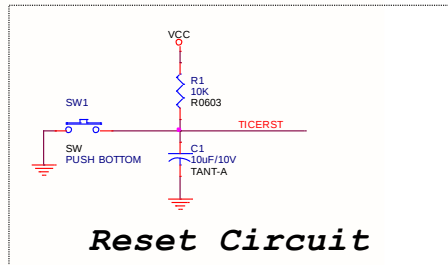
- ◆  Single step through code

- ◆  Reset the device

- ◆  Run the application

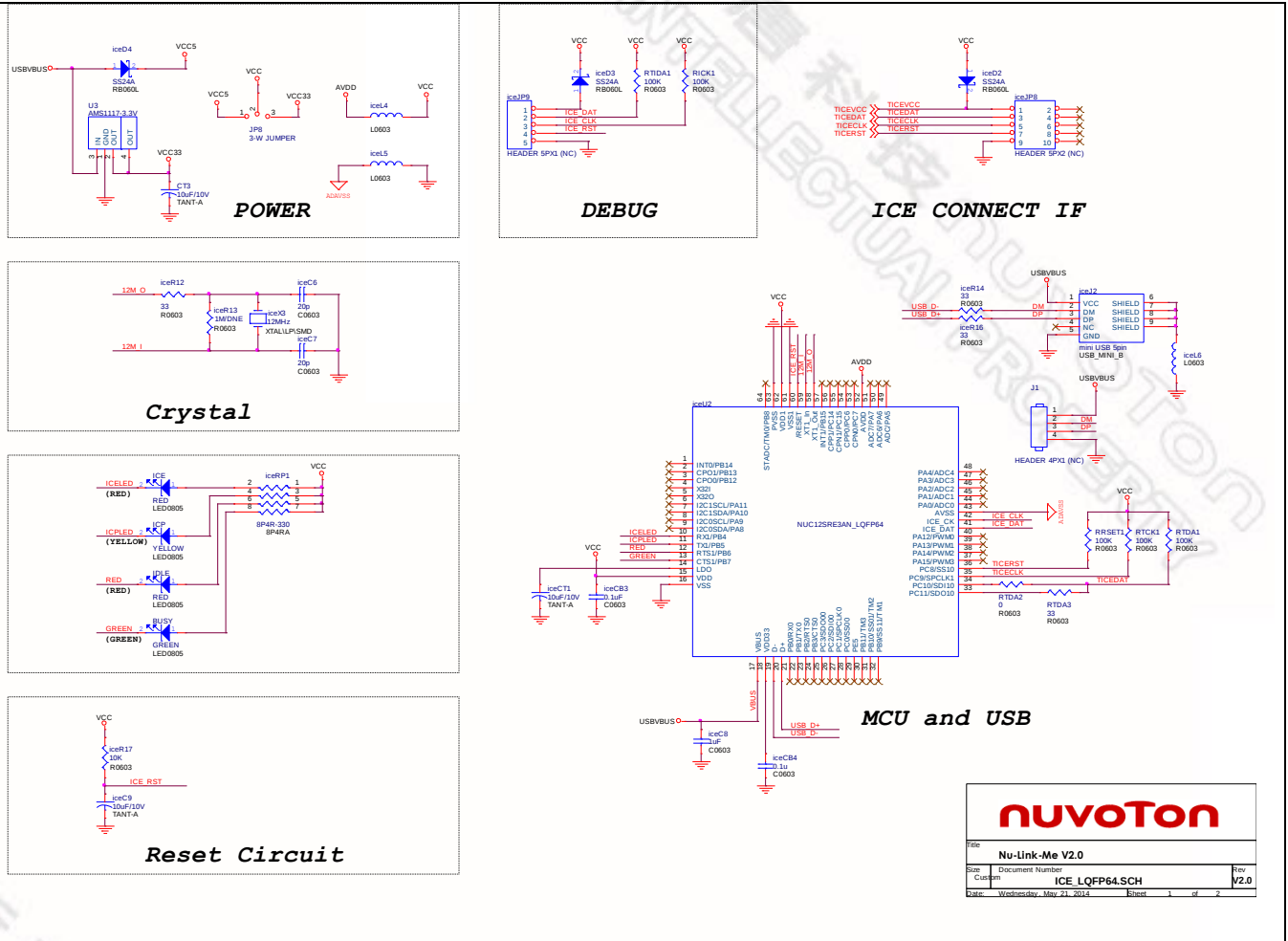
5 NuTiny-SDK-NUC029FAE Schematics

5.1 NuTiny-EVB-NUC029FAE Schematic



nuvoTon			
Title: NuTiny-EVB-NUC029FAE			
Size: Custom	Document Number: NUC029FAE.SCH	Rev: V1.0	
Date: Friday, June 13, 2014	Sheet: 2	of 2	

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

2-1. Move to "Support"

2-2. Click here to enter Tool & Software

The screenshot shows the Nuvoton NuMicro website. The 'Support' menu is highlighted, and the 'Tool & Software' option is selected. The page also displays a product matrix for various NuMicro MCUs and a list of resources.

Product Matrix:

MCU Series	Industrial Control	Low Power	USB Application	Automotive Application	Audio Application
256K					
128K					
64K					
32K					
16K					

Resources:

- Application Note (2)
- Data Sheet (24)
- Development Tool (32)
- Online Training (14)
- Product Brief (22)
- Software (24)
- Technical Reference Manual (14)
- User Guide (51)

Featured Products:

- M0516LDE
- MINI54FDE
- NANO130KE3BN

Featured Videos:

- M0 Introduction(06:35)

Featured Applications:



Step3

The screenshot shows the NuvoTon website interface. The top navigation bar includes links for Register, Login, Language, and a search bar. Below this is a secondary navigation bar with links for News, Events, CSR, Human Resources, Investors, Contact Us, and NuvoTon Partner. The main content area is titled 'Development Tool Hardware' and features a sidebar on the left with a list of links: Learning, Product Related Information, Tool & Software, Development Tool Hardware, Development Kit, Learning Board, Programmer, **Software** (highlighted with a red dashed box), Third Party Tool, Reference Design, FAQ, Sales Support, Technical Support, and Forum. A yellow callout bubble points to the 'Software' link with the text 'Click here to enter Software download page'. The main content area is divided into three columns: 'Development', 'Mass Production', and 'Upgrade'. The 'Development' column shows links for Evaluation Board, Customer Target Board, and NuTiny Board. The 'Mass Production' column shows links for On-Line In Circuit Programming, Off-Line In Circuit Programming, and IC Programming. The 'Upgrade' column shows links for In System Programming and Through. On the right side of the page, there is a section for 'NuMicro M4 MCU NUC472 with Ethernet MAC' and a 'News' section with a link to 'Nuvoton Announces Monthly Revenue for May 2014'.

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	NuMicro NuGang Programmer V6.21 software & 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
	 User Feedback ↑ TOP			
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

2-1. Move to "Support"

2-2. Click here to enter Tool & Software

As one of the leading Microcontroller (MCU) companies in the world, Nuvoton provides the state-



Step3

The screenshot shows the NuvoTon website's 'Development Tool Hardware' page. The left sidebar contains a list of links: Learning, Product Related Information, Tool & Software, Development Tool Hardware, Development Kit, Learning Board, Programmer, **Software** (highlighted with a red dashed box), Third Party Tool, Reference Design, FAQ, Sales Support, Technical Support, and Forum. A yellow callout bubble with the text 'Click here to enter Software download page' points to the 'Software' link. The main content area is divided into three columns: 'Development' (featuring Evaluation Board, Customer Target Board, and NuTiny Board), 'Mass Production' (featuring On-Line In Circuit Programming, Off-Line In Circuit Programming, and IC Programming), and 'Upgrade' (featuring In System Programming). The right sidebar includes a banner for 'NuMicro M4 MCU NUC472 with Ethernet MAC', an 'Events' section with a link to 'Nuvoton Technology Hosts 32-bit Cortex™-M4 Ether...', and a 'News' section with a link to 'Nuvoton Announces Monthly Revenue for May 2014'.

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			
	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
	 User Feedback ↑ TOP			
Step5	Download the NuMicro™ IAR EWARM driver.			

6.3 Downloading NuMicro™ NUC029FAE Series BSP Software Library

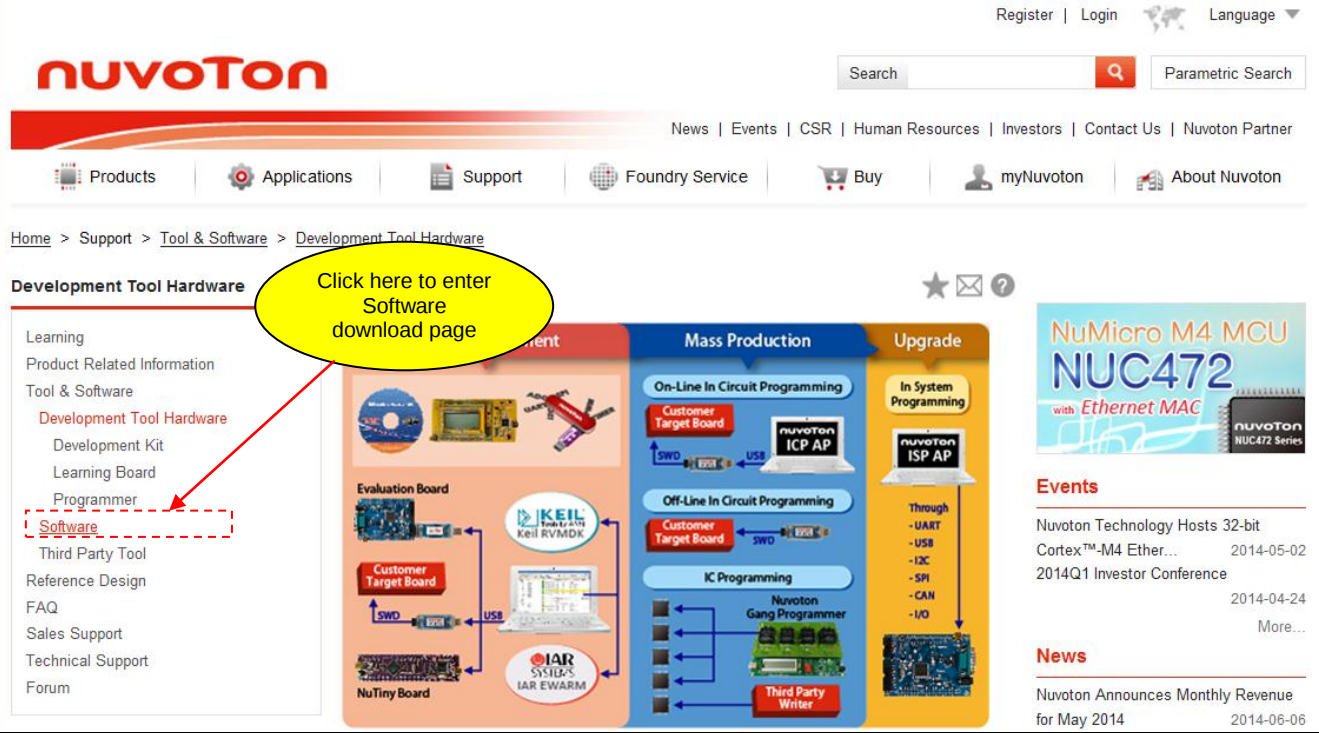
Step1 Visit the Nuvoton NuMicro™ website: <http://www.nuvoton.com/NuMicro>.

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2-1. Move to "Support"

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As one of the leading Microcontroller (MCU) companies in the world, Nuvoton provides the state-

Step3	 The screenshot shows the NuvoTon website's 'Development Tool Hardware' page. On the left, a sidebar lists various resources, with 'Software' highlighted by a red dashed box and a red arrow pointing to it. A yellow callout bubble with the text 'Click here to enter Software download page' points to this 'Software' link. The main content area is divided into three columns: 'Development', 'Mass Production', and 'Upgrade', each containing links to various development tools and boards. On the right, there are sections for 'NuMicro M4 MCU NUC472', 'Events', and 'News'.
Step4	Download the NuMicro™ NUC029FAE 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™ NUC029FAE Series BSP Software Library Step4.

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