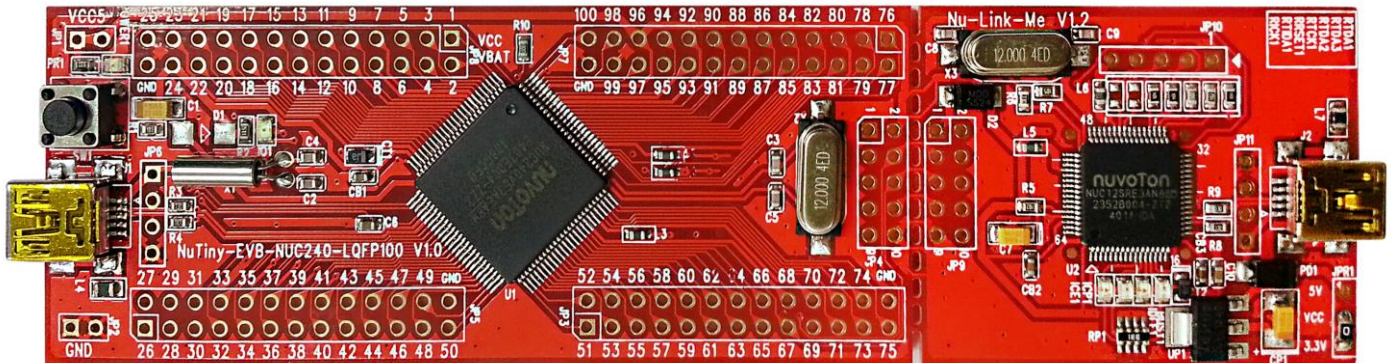




ARM Cortex™-M0

32-BIT MICROCONTROLLER

NuTiny-SDK-NUC240 User Manual For NuMicro™ NUC240 Series



- MCU 별도구매 가능합니다.

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1	Overview	3
2	NuTiny-SDK-NUC240 Introduction	3
2.1	NuTiny -SDK-NUC240 Jumper Description	4
2.2	Pin Assignment for Extended Connector	5
2.3	NuTiny-SDK-NUC240 PCB Placement	6
3	How to Start NuTiny -SDK-NUC240 on the Keil μ Vision [®] IDE	7
3.1	Keil μ Vision [®] IDE Software Download and Install	7
3.2	Nuvoton Nu-Link Driver Download and Install	7
3.3	Hardware Setup	7
3.4	Smpl_NuTiny-NUC240 Example Program	8
4	How to Start NuTiny-SDK-NUC240 on the IAR Embedded Workbench	9
4.1	IAR Embedded Workbench Software Download and Install	9
4.2	Nuvoton Nu-Link Driver Download and Install	9
4.3	Hardware Setup	9
4.4	Smpl_NuTiny-NUC240 Example Program	10
5	NuTiny-EVB-NUC240 Schematic	11
6	Download NuMicro [™] Family Related Files from Nuvoton Company	13
6.1	Download NuMicro [™] Keil μ Vision [®] IDE Driver	13
6.2	Download NuMicro [™] IAR EWARM Driver	15
6.3	Download NuMicro [™] NUC100 Series BSP Software Library	17
7	Revision History.....	18

1 Overview

NuTiny-SDK-NUC240 is the specific development tool for NuMicro NUC240 series. Users can use NuTiny-SDK-NUC240 to develop and verify the application program easily.

NuTiny-SDK-NUC240 includes two portions. One is NuTiny-EVB-NUC240 and the other is Nu-Link-Me. NuTiny-EVB-NUC240 is the evaluation board and Nu-Link-Me is its Debug Adaptor. Thus, users do not need other additional ICE or debug equipments.

2 NuTiny-SDK-NUC240 Introduction

NuTiny-SDK-NUC240 uses the NUC240VE3AE as the target microcontroller. Figure 2-1 is NuTiny-SDK-NUC240 for NUC240 series, the left portion is called NuTiny-EVB-NUC240 and the right portion is Debug Adaptor called Nu-Link-Me.

NuTiny-EVB-NUC240 is similar to other development boards. Users can use it to develop and verify applications to emulate the real behavior. The on board chip covers NUC240 series features. The NuTiny-EVB-NUC240 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 Nu-Link-Me Debug adaptor with IAR or Keil, please refer to “Nuvoton NuMicro™ IAR ICE driver user manual” or “Nuvoton NuMicro™ Keil ICE driver user manual” in detail. These two documents will be stored in the local hard disk when the user installs each driver.

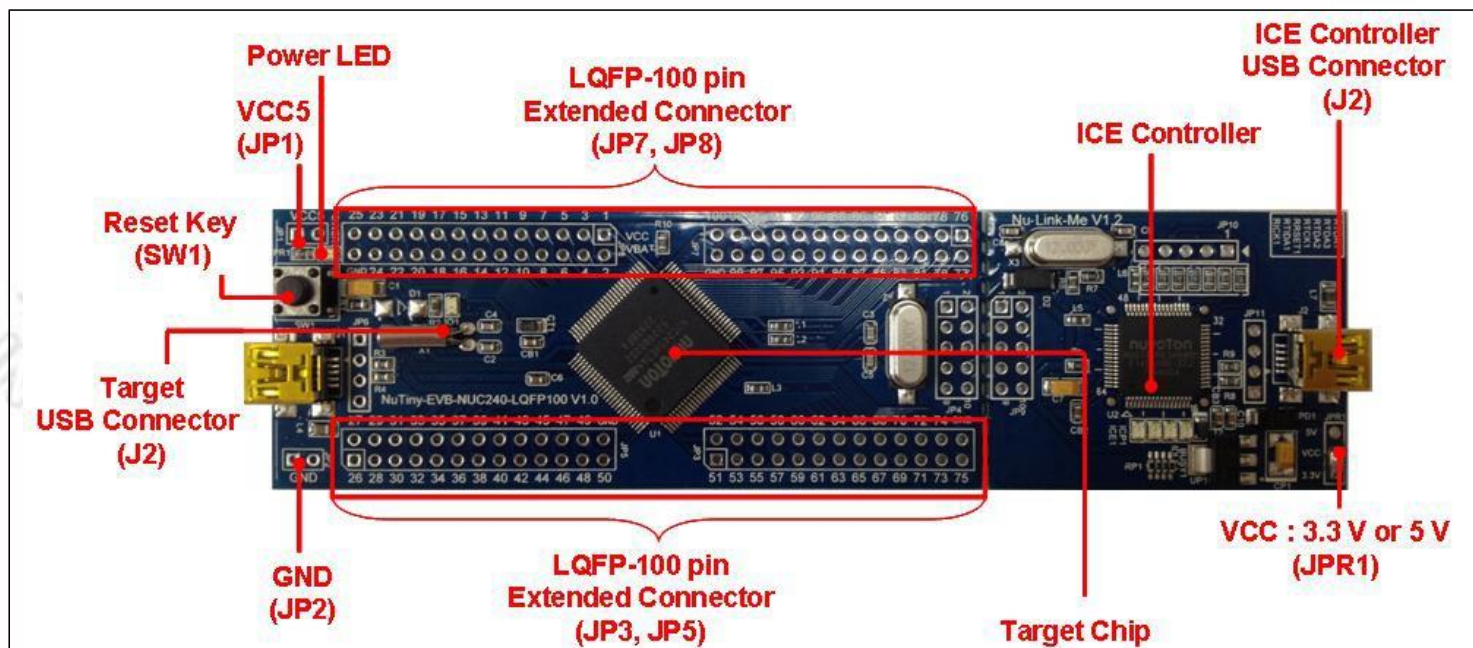


Figure 2-1 NuTiny-SDK-NUC240 (Blue PCB Board)

2.1 NuTiny -SDK-NUC240 Jumper Description

2.1.1 Power Setting

- J1: USB port in NuTiny-EVB-NUC240
- JP1: VCC5 Voltage connector in NuTiny-EVB-NUC240
- J2: USB port in Nu-Link-Me
- JPR1: Select 5V or 3V for system power

POWER model	J1 USB port	J2 USB port	JP2 VCC5	MCU Voltage
Model 1	Connect to PC	X	DC 5V output	DC 5V
Model 2	X	Connect to PC	DC 5V output	DC 5V
Model 3	X	X	DC 2.8-5.5V input	Voltage by VCC input

X: Unused.

2.1.2 Debug Connector

- JP4: Connector in target board (NuTiny-EVB-NUC240) for connecting with Nuvoton ICE adaptor (Nu-Link-Me)
- JP9: Connector in ICE adaptor (Nu-Link-Me) for connecting with a target board (for example NuTiny-EVB-NUC240)

2.1.3 USB Connector

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

2.1.4 Extended Connector

- JP3, JP5, JP7 and JP8: Show all chip pins in NuTiny-EVB-NUC240

2.1.5 Reset Button

- SW1: Reset button in NuTiny-EVB-NUC240

2.1.6 Power Connector

- JP1: VCC connector in NuTiny-EVB-NUC240
- JP2: GND connector in NuTiny-EVB-NUC240

2.2 Pin Assignment for Extended Connector

NuTiny-EVB-NUC240 provides NUC240VE3AE on board and the extended connector for LQFP-100 pin. Table 2-1 is the pin assignment for NUC240VE3AE.

Pin No	Pin Name	Pin No	Pin Name	Pin No	Pin Name	Pin No	Pin Name
01	PE15	26	PE8	51	PE4	76	PA5
02	PE14	27	PE7	52	PE3	77	PA6
03	PE13	28	VBUS	53	PE2	78	PA7
04	PB14	29	VDD33	54	PE1	79	Vref
05	PB13	30	D-	55	PE0	80	AVDD
06	VBAT	31	D+	56	PC13	81	PD0
07	X32O	32	PB0	57	PC12	82	PD1
08	X32I	33	PB1	58	PC11	83	PD2
09	PA11	34	PB2	59	PC10	84	PD3
10	PA10	35	PB3	60	PC9	85	PD4
11	PA9	36	PD6	61	PC8	86	PD5
12	PA8	37	PD7	62	PA15	87	PC7
13	PD8	38	PD14	63	PA14	88	PC6
14	PD9	39	PD15	64	PA13	89	PC15
15	PD10	40	PC5	65	PA12	90	PC14
16	PD11	41	PC4	66	ICE_DAT	91	PB15
17	PD12	42	PC3	67	ICE_CK	92	XT1_Out
18	PD13	43	PC2	68	VDD	93	XT1_In
19	PB4	44	PC1	69	VSS	94	/RESET
20	PB5	45	PC0	70	AVSS	95	VSS
21	PB6	46	PE6	71	PA0	96	VDD
22	PB7	47	PE5	72	PA1	97	PS2DAT
23	LDO	48	PB11	73	PA2	98	PS2CLK
24	VDD	49	PB10	74	PA3	99	PVSS
25	VSS	50	PB9	75	PA4	100	PB8

Table 2-1 Pin Assignment for NUC 240 Series

2.3 NuTiny-SDK-NUC240 PCB Placement

Users can refer to Figure 2-2 for the NuTiny-SDK-NUC240 PCB placements.

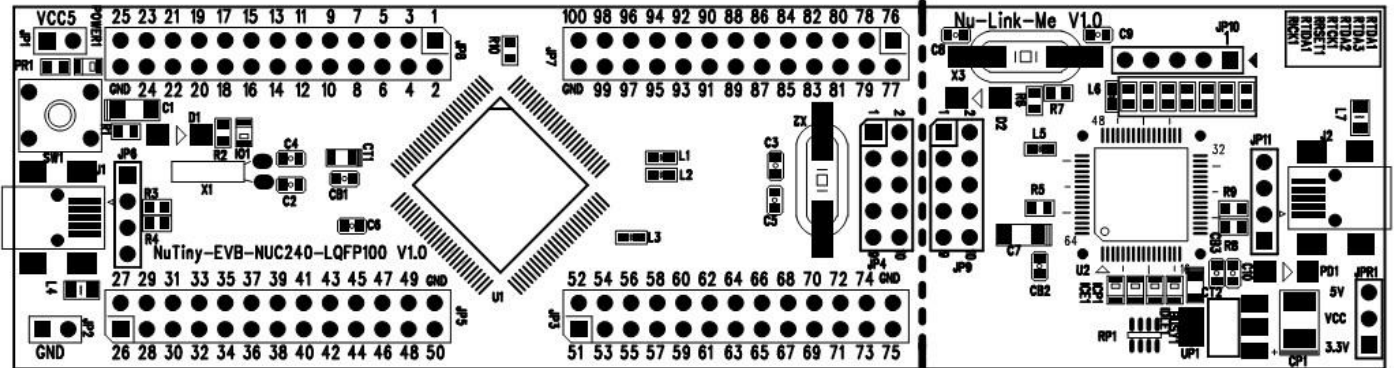


Figure 2-2 NuTiny-SDK-NUC240 PCB Placement

3 How to Start NuTiny -SDK-NUC240 on the Keil μ Vision[®] IDE

3.1 Keil μ Vision[®] IDE Software Download and Install

Please visit the Keil company website (<http://www.keil.com>) to download the Keil μ Vision[®] 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 μ Vision[®] IDE driver” file. Please refer to Chapter 6.1 for the detail 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 as Figure 3-1

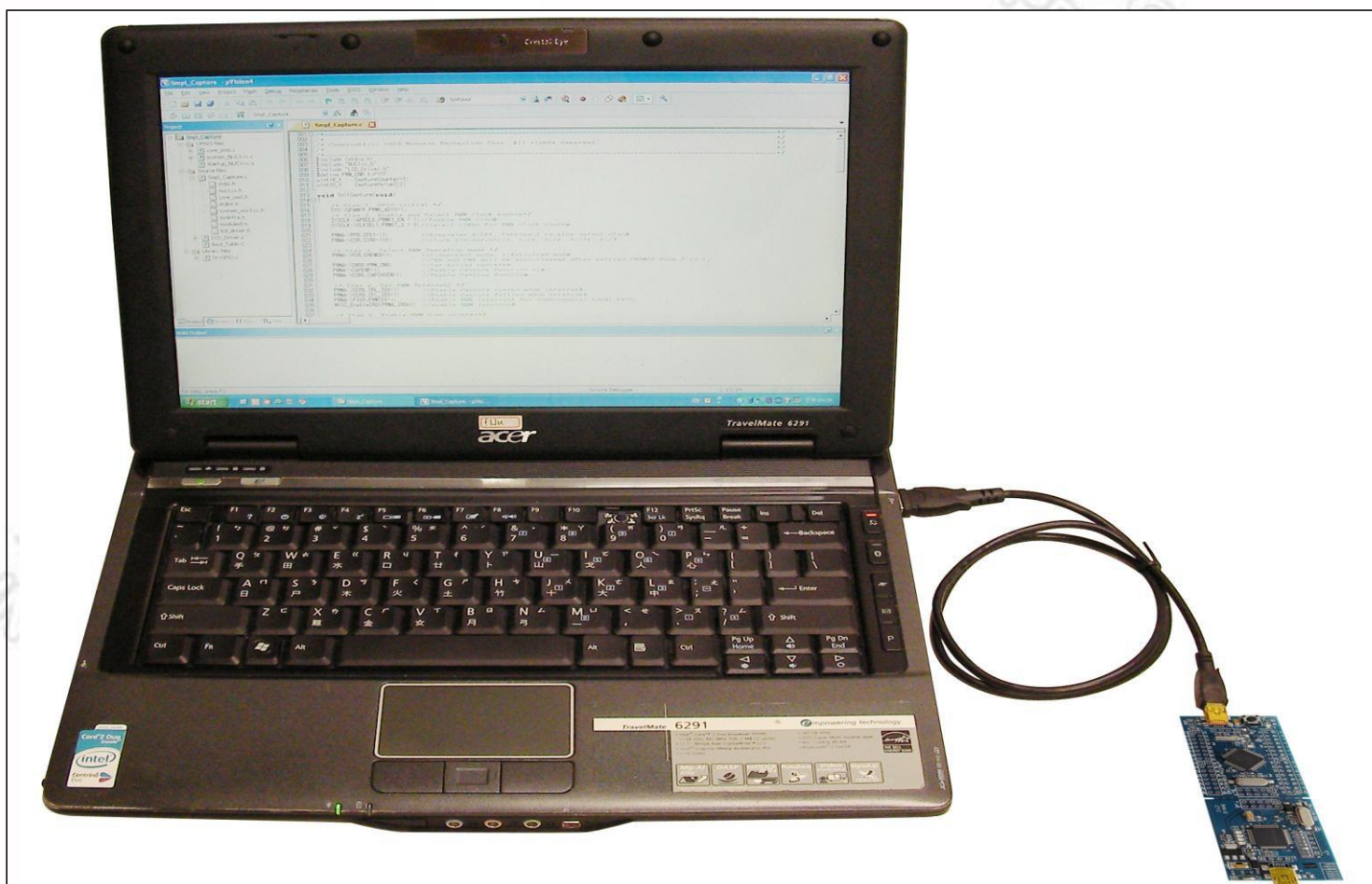


Figure 3-1 NuTiny-SDK-NUC240 Hardware Setup

3.4 Smpl_NuTiny-NUC240 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-NUC240 board. It can be found on Figure 3-2 list directory and downloaded from Nuvoton NuMicro™ website following on Chapter 6.3.

Directory	Project File

Figure 3-2 Smpl_NuTiny_240 Example Directory

To use this example:
The PA.10 LED will toggle on the NuTiny-EVB-NUC240 board.

-  **Start µVision®**
- **Project-Open**
Open the Smpl_NuTiny_240.uvproj project file
-  **Project - Build**
Compile and link the Smpl_NuTiny-NUC240 application
-  **Flash – Download**
Program the application code into on-chip Flash ROM
-  **Start debug mode**
Using the debugger commands, you may:
 - ◆  Review variables in the watch window
 - ◆  Single step through code
 - ◆  Reset the device
 - ◆  Run the application

4 How to Start NuTiny-SDK-NUC240 on the IAR Embedded Workbench

4.1 IAR Embedded Workbench Software Download and Install

Please connect to 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 “NuMicro™ IAR ICE driver user manual” file. Please refer to Chapter 6.2 for the detail 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 as Figure 4-1

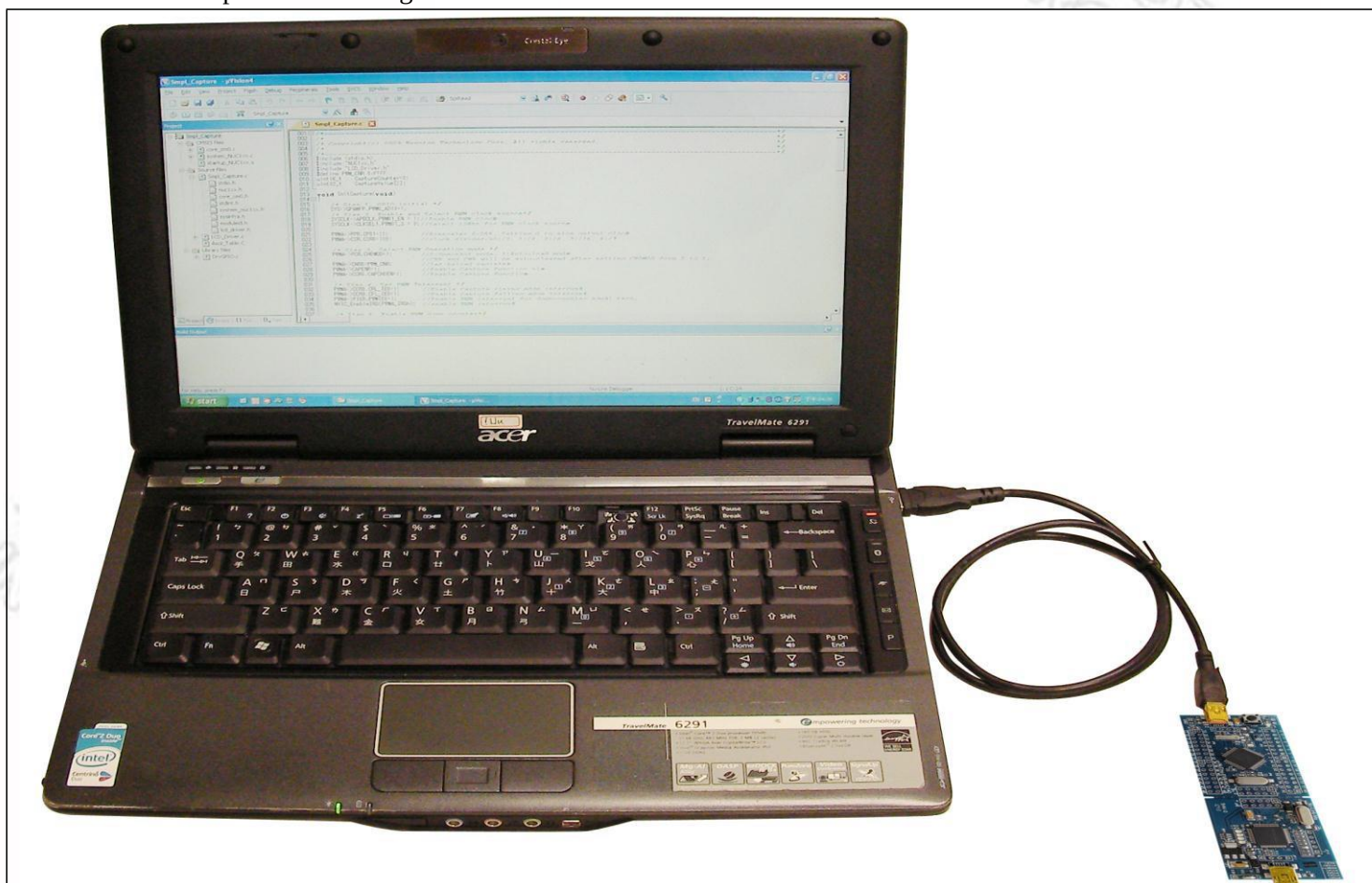


Figure 4-1 NuTiny- SDK-NUC240-100 Hardware Setup

4.4 Smpl_NuTiny-NUC240 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-NUC240 board. It can be found on Figure 4-2 list directory and downloaded from Nuvoton NuMicro™ website following on Chapter 6.3.

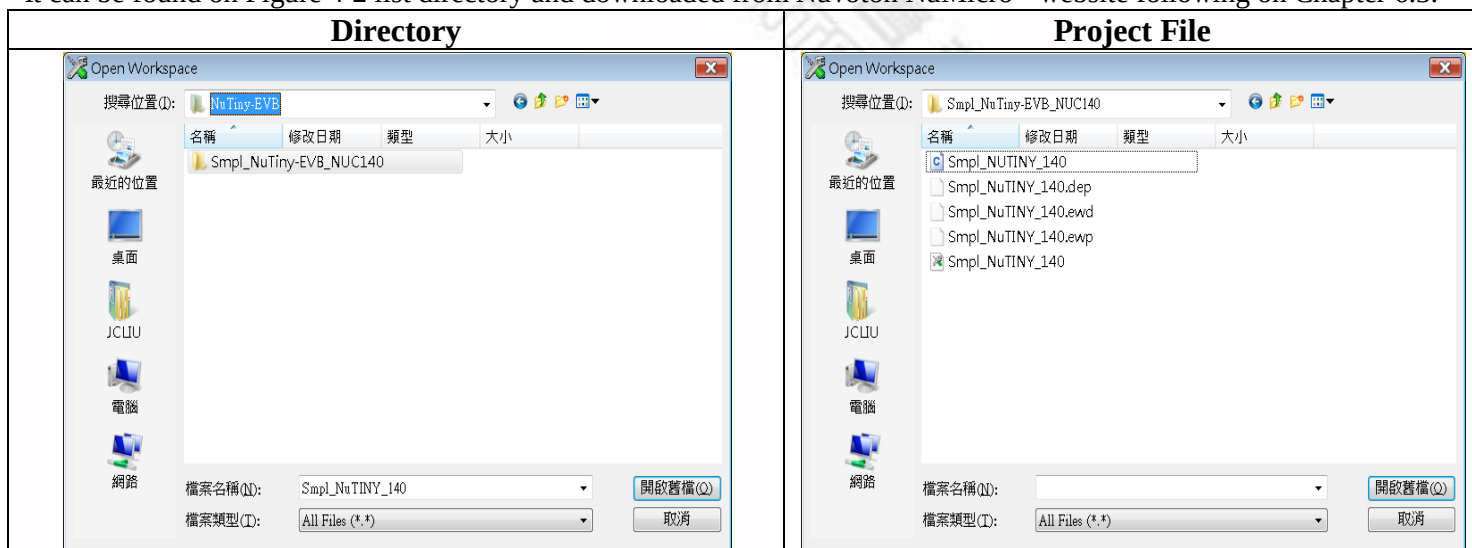


Figure 4-2 Smpl_NuTiny-NUC240 Example Directory

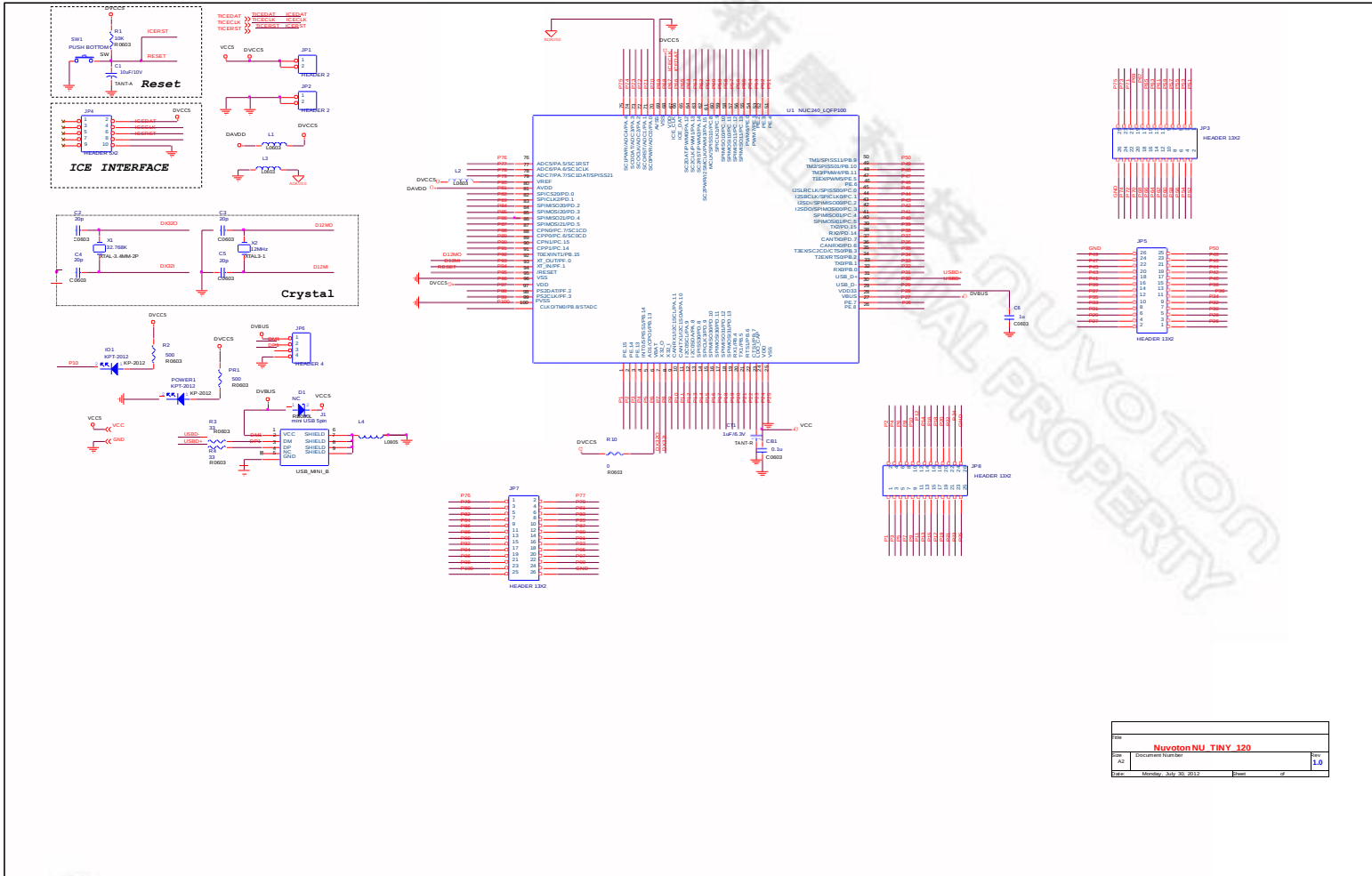
To use this example:

The PA.10 LED will toggle on the NuTiny-EVB-NUC240 board.

-  **Start IAR Embedded Workbench**
- **File-Open-Workspace**
Open the Smpl_NuTiny_240.eww workspace file
-  **Project - Make**
Compile and link the Smpl_NuTiny-240 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-EVB-NUC240 Schematic

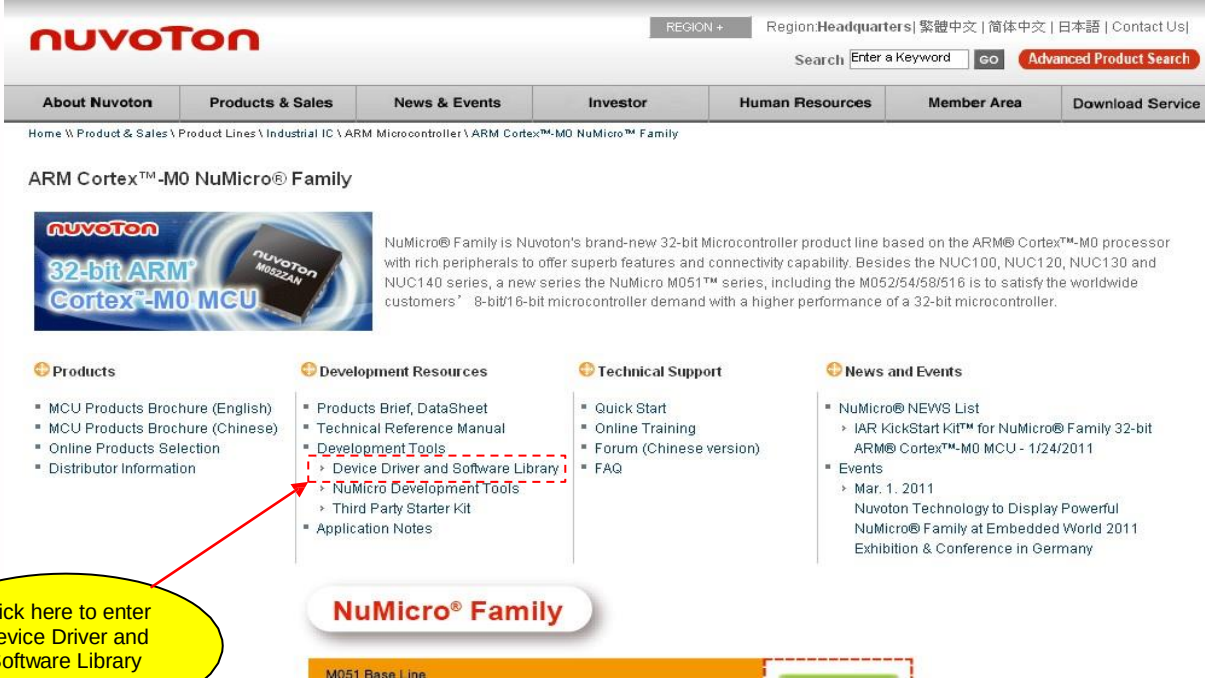


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Ver	History, July 30, 2011	Print	of

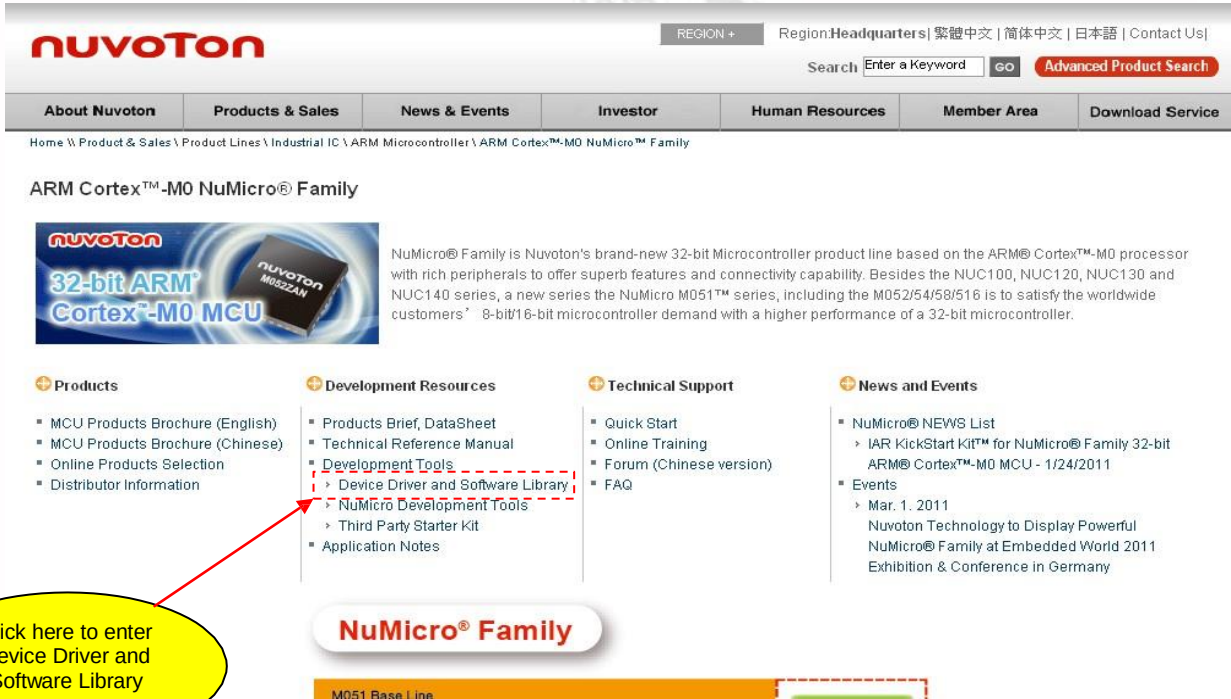


6 Download NuMicro™ Family Related Files from Nuvoton Company

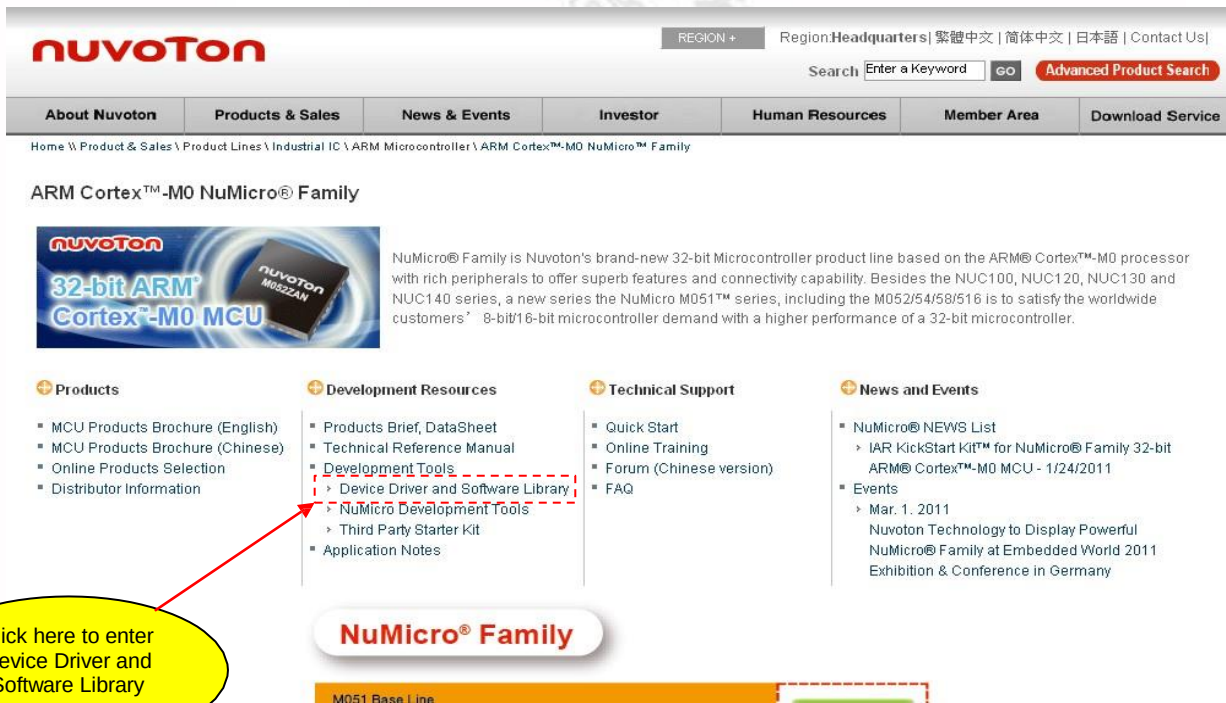
6.1 Download NuMicro™ Keil μVision® IDE Driver

Step1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro
Step2	 The screenshot shows the Nuvoton NuMicro website. The main heading is 'ARM Cortex™-M0 NuMicro® Family'. Below this, there are four columns of links: Products, Development Resources, Technical Support, and News and Events. Under 'Development Resources', the 'Development Tools' link is highlighted with a red dashed box, and a red arrow points to the 'Device Driver and Software Library' link. A yellow callout bubble with the text 'Click here to enter Device Driver and Software Library' points to this link. The 'NuMicro® Family' logo is also visible at the bottom of the page.

6.2 Download NuMicro™ IAR EWARM Driver

Step1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro
Step2	 The screenshot shows the Nuvoton website's NuMicro Family page. The page includes a navigation bar with links like 'About Nuvoton', 'Products & Sales', 'News & Events', 'Investor', 'Human Resources', 'Member Area', and 'Download Service'. Below the navigation bar, there's a section for 'ARM Cortex™-M0 NuMicro® Family' featuring a product image and a description. A sidebar on the left contains four main categories: 'Products', 'Development Resources', 'Technical Support', and 'News and Events'. Under 'Development Resources', the 'Development Tools' link is highlighted with a red dashed box, and a red arrow points from a yellow callout bubble to it. The callout bubble contains the text: 'Click here to enter Device Driver and Software Library'. Below the sidebar, there's a 'NuMicro® Family' section with a progress bar for the 'M051 Base Line'.

6.3 Download NuMicro™ NUC100 Series BSP Software Library

Step1	Visit the Nuvoton NuMicro™ website: http://www.nuvoton.com/NuMicro
Step2	 The screenshot shows the Nuvoton website's NuMicro Family page. The 'Development Resources' section contains a list of links, with 'Device Driver and Software Library' highlighted by a red dashed box. A yellow oval with a red arrow points to this link, accompanied by the text 'Click here to enter Device Driver and Software Library'.
Step 3	Download the NuMicro™ NUC200 series software library

7 Revision History

Version	Date	Page	Description
1.0	Sep. 14, 2013	--	Initial Release

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