

## NUC029FAE CMSIS BSP Directory

Directory Introduction for 32-bit NuMicro™ Family

### Directory Information

|                   |   |
|-------------------|---|
| <b>Document</b>   | Driver reference manual and revision history. |
| <b>Library</b>    | Driver header and source files.               |
| <b>SampleCode</b> | Driver sample code.                           |

*The information described in this document is the exclusive intellectual property of Nuvoton Technology Corporation and shall not be reproduced without permission from Nuvoton.*

*Nuvoton is providing this document only for reference purposes of NuMicro microcontroller based system design. Nuvoton assumes no responsibility for errors or omissions.*

*All data and specifications are subject to change without notice.*

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

[www.nuvoton.com](http://www.nuvoton.com)

## 1 Document Information

|   |  |
|---|--|
| <b>CMSIS.html</b>   | Document of CMSIS version 4.5.0                                |
| <b>NuMicro NUC029FAE<br/>CMSIS BSP Revision<br/>History.pdf</b> | This document shows the revision history of NUC029FAE BSP.     |
| <b>NuMicro NUC029FAE<br/>Driver Reference<br/>Guide.chm</b>     | This document describes the usage of drivers in NUC029FAE BSP. |

## 2 Library Information

|                  |  |
|------------------|--|
| <b>CMSIS</b>     | Cortex <sup>®</sup> Microcontroller Software Interface Standard (CMSIS) V4.5.0 definitions by ARM <sup>®</sup> Corp. |
| <b>Device</b>    | CMSIS compliant device header file.  |
| <b>StdDriver</b> | All peripheral driver header and source files.   |

### 3 Sample Code Information

|                          |  |
|--------------------------|--|
| <b>Hard_Fault_Sample</b> | Show hard fault information when hard fault happened.                                  |
| <b>NuTiny-NUC029FAE</b>  | Sample code for NUC029FAE Tiny Board   |
| <b>RegBased</b>          | Sample code implemented without access standard library but access registers directly. |
| <b>Semihost</b>          | Show how to print and get character with IDE console window.                           |
| <b>StdDriver</b>         | Demonstrate the usage of NUC029FAE MCU peripheral driver APIs.                         |
| <b>Template</b>          | A project template for NUC029FAE MCU.  |

## **4 \SampleCode\NuTiny-NUC029FAE**

**LED**

Toggle P2.4 to turn on / off the board LED.

## 5 \SampleCode\RegBased

|                                  |   |
|----------------------------------|---|
| <b>ACMP</b>                      | Demonstrate Analog comparator (ACMP) comparison by comparing CPP0 (P1.5) with VBG voltage and shows the result on UART console.                               |
| <b>ACMP_TriggerTimerCapture</b>  | Show how to use Analog comparator (ACMP) state change to trigger timer capture function. P1.5 is used as comparator positive input and VBG as negative input. |
| <b>ADC_Convert</b>               | Demonstrate ADC function by repeatedly convert the input of ADC channel 5 (P1.5) and shows the result on UART console.  |
| <b>FMC_RW</b>                    | Show FMC read Flash IDs, erase, read, and write function.   |
| <b>GPIO</b>                      | Use GPIO driver to control the GPIO pin direction, control their high/low state, and how to use GPIO interrupts.  |
| <b>I2C_Interrupt_EEPROM</b>      | Read/write EEPROM via an I <sup>2</sup> C interface.  |
| <b>PWM_DoubleBuffer</b>          | Demonstrate the PWM double buffer feature.  |
| <b>SPI_LoopBack</b>              | Demonstrate SPI function by connect MOSI (P0.5) with MISO (P0.6).   |
| <b>Timer_Periodic</b>            | Use the timer periodic mode to generate timer interrupt every 1 second.   |
| <b>Timer_TriggerCountingMode</b> | Use the timer pin P3.2 to demonstrate timer trigger counting mode function. And displays the measured input frequency to UART console.                        |
| <b>UART_IrDA</b>                 | Show how to transmit and receive UART data in UART IrDA mode.   |
| <b>UART_LIN</b>                  | Demonstrate how to transmit LIN header and response.  |
| <b>UART_TxRx_Function</b>        | Transmit and receive data from PC terminal through RS232 interface.   |
| <b>WDT_Polling</b>               | Use Polling mode to check WDT time-out state and reset WDT after time-out occurs.   |

## 6 \SampleCode\StdDriver

|                               |   |
|-------------------------------|---|
| <b>ACMP</b>                   | Demonstrate Analog comparator (ACMP) comparison by comparing CPP0 (P1.5) with VBG voltage and show the result on UART console.  |
| <b>ADC_Compare</b>            | Demonstrate ADC conversion and comparison function by monitoring the conversion result of channel 0.  |
| <b>FMC_IAP</b>                | This sample code includes LDROM image (fmc_ld_iap) and APROM image (fmc_ap_main).<br>It shows how to branch between APROM and LDROM. To run this sample code, the boot mode must be "Boot from APROM with IAP". |
| <b>FMC_RW</b>                 | Show FMC read Flash IDs, erase, read, and write function.   |
| <b>GPIO</b>                   | Use GPIO driver to control the GPIO pin direction, control their high/low state, and how to use GPIO interrupts.  |
| <b>I2C_Interrupt_EEPROM</b>   | Read/write EEPROM via an I <sup>2</sup> C interface.  |
| <b>PWM_DeadZone</b>           | Demonstrate the dead-zone feature with PWM.   |
| <b>SPI_LoopBack</b>           | Demonstrate SPI function by connect MOSI (P0.5) with MISO (P0.6).   |
| <b>SYS</b>                    | Demonstrate how to get PDID, get and clear reset source, configure BOD, and output system clock to CKO pin with the system clock / 4 frequency.   |
| <b>Timer_Delay</b>            | Demonstrate the usage of TIMER_Delay() API to generate a 1 second delay.  |
| <b>Timer_EventCounter</b>     | Use the pin P3.4 to demonstrate timer event counter function.   |
| <b>Timer_FreeCountingMode</b> | Use the timer pin P3.2 to demonstrate timer free counting mode function. Also display the measured input frequency to UART console.   |
| <b>Timer_ToggleOut</b>        | Demonstrate the timer 0 toggle out function on pin P3.4.  |

|                           |   |
|---------------------------|---|
| <b>UART_IrDA</b>          | Show how to transmit and receive UART data in UART IrDA mode.       |
| <b>UART_TxRx_Function</b> | Transmit and receive data from PC terminal through RS232 interface. |
| <b>WDT_Wakeup</b>         | Use WDT to wake up system from Power-down mode periodically.        |



### **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.**

---

*Please note that all data and specifications are subject to change without notice.  
All the trademarks of products and companies mentioned in this datasheet belong to their respective owners.*