Timer Trigger ADC and PDMA

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	Use PDMA channel 1 to transfer the data converted from channel 0, 1, 2 of the ADC to SRAM.
BSP Version	Nano100B Series BSP CMSIS v3.03.000
Hardware	NuTiny-EVB-Nano130-LQPF128

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1 Function Description

1.1 Introduction

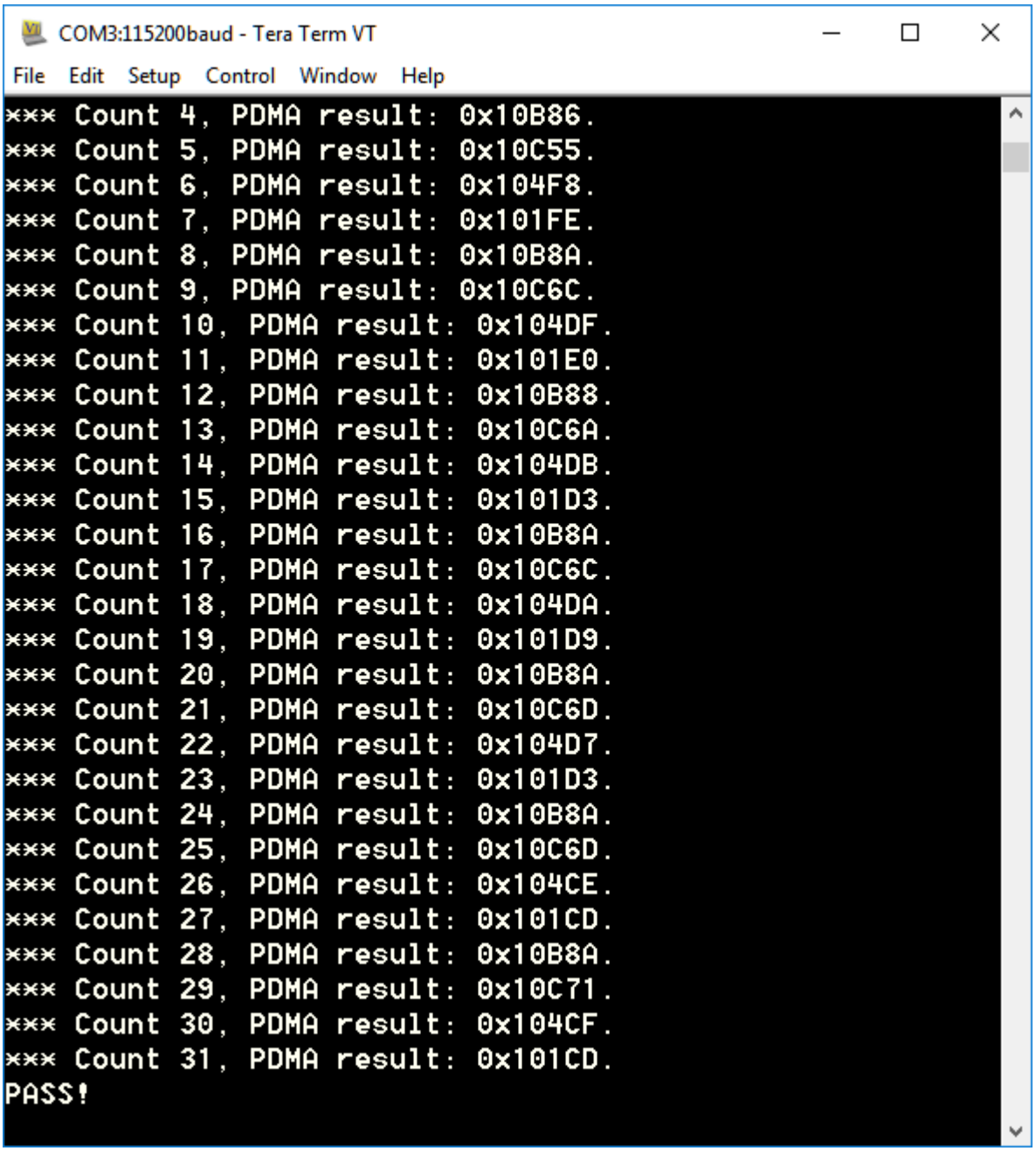
Use PDMA channel 1 to transfer the data converted from channel 0, 1, 2 of the ADC to SRAM.

1.2 Principle

Use the timer to trigger the ADC and PDMA functions every second.

PDMA moves the ADC data from the source array to the destination array each time

1.3 Demo Result


COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
*** Count 4, PDMA result: 0x10B86.
*** Count 5, PDMA result: 0x10C55.
*** Count 6, PDMA result: 0x104F8.
*** Count 7, PDMA result: 0x101FE.
*** Count 8, PDMA result: 0x10B8A.
*** Count 9, PDMA result: 0x10C6C.
*** Count 10, PDMA result: 0x104DF.
*** Count 11, PDMA result: 0x101E0.
*** Count 12, PDMA result: 0x10B88.
*** Count 13, PDMA result: 0x10C6A.
*** Count 14, PDMA result: 0x104DB.
*** Count 15, PDMA result: 0x101D3.
*** Count 16, PDMA result: 0x10B8A.
*** Count 17, PDMA result: 0x10C6C.
*** Count 18, PDMA result: 0x104DA.
*** Count 19, PDMA result: 0x101D9.
*** Count 20, PDMA result: 0x10B8A.
*** Count 21, PDMA result: 0x10C6D.
*** Count 22, PDMA result: 0x104D7.
*** Count 23, PDMA result: 0x101D3.
*** Count 24, PDMA result: 0x10B8A.
*** Count 25, PDMA result: 0x10C6D.
*** Count 26, PDMA result: 0x104CE.
*** Count 27, PDMA result: 0x101CD.
*** Count 28, PDMA result: 0x10B8A.
*** Count 29, PDMA result: 0x10C71.
*** Count 30, PDMA result: 0x104CF.
*** Count 31, PDMA result: 0x101CD.
PASS!

2 Code Description

Set timer trigger ADC and timer interrupt：

```
    // Set timer frequency to 1Hz
    TIMER_Open(TIMER0, TIMER_PERIODIC_MODE, 1);
    // Set Timer 0 time out to trigger ADC
    TIMER_SetTriggerSource(TIMER0, TIMER_TIMEOUT_TRIGGER);
    TIMER_SetTriggerTarget(TIMER0, TIMER_CTL_ADC_TEEN_Msk|TIMER_CTL_PDMA_TEEN_Msk);

    // Enable timer interrupt
    TIMER_EnableInt(TIMER0);
    NVIC_EnableIRQ(TMR0_IRQn);
```

Set PDMA transfer ADC data：

```
    void PDMA_INIT(void)
    {
        uint32_t u32SrcAddr, u32DstAddr;

        /* Configure PDMA channel 1 to trigger ADC */
        PDMA_Open(1 << PDMA_CH);
        PDMA_SetTransferCnt(PDMA_CH, PDMA_WIDTH_32, ADC_TEST_COUNT);
        u32SrcAddr = (uint32_t)&ADC->PDMA;
        u32DstAddr = (uint32_t)g_au32RxPDMADestination;
        PDMA_SetTransferAddr(PDMA_CH, u32SrcAddr, PDMA_SAR_FIX, u32DstAddr, PDMA_DAR_INC);
        PDMA_SetTimeOut(PDMA_CH, 0, 0x5555);
        PDMA_EnableInt(PDMA_CH, PDMA_IER_TD_IE_Msk);
        NVIC_EnableIRQ(PDMA_IRQn);

        /* Set PDMA Channel 1 for ADC, and start timeout counting */
        PDMA_SetTransferMode(PDMA_CH, PDMA_ADC, 0, 0);

        PDMA_Trigger(PDMA_CH);
    }
```

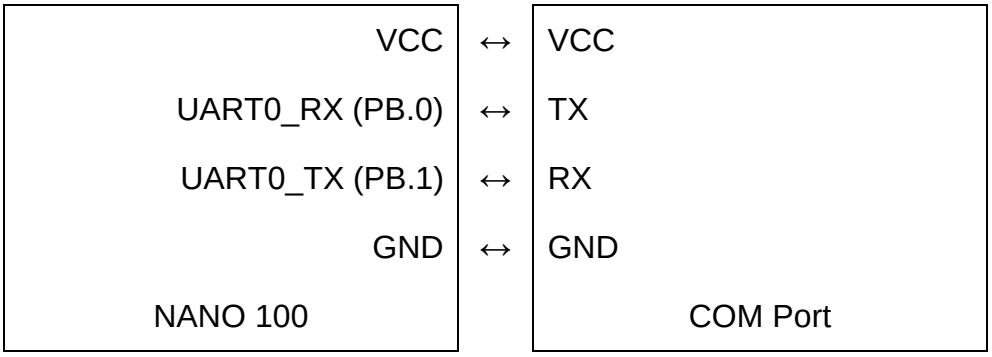
3 Software and Hardware Environment

Software Environment

- BSP version
  - Nano100B Series BSP CMSIS v3.03.000
- IDE version
  - Keil uVersion 5.26

Hardware Environment

- Circuit components
  - NuTiny-EVB-NANO130-LQPF128
- Diagram



4 Directory Information

- EC_Nano100_TIMER_Trigger_ADC_PDMA
  - Library — Sample code header and source files
    - CMSIS — Cortex® Microcontroller Software Interface Standard (CMSIS) by Arm® Corp.
    - Device — CMSIS compliant device header file
    - StdDriver — All peripheral driver header and source files
  - SampleCode
    - ExampleCode — Source file of example code

5 How to Execute Example Code

1. Browsing into sample code folder by Directory Information (section 4) and double click Nano100_TIMER_Trigger_ADC_PDMA.uvproj.
2. Enter Keil compile mode
   a. Build
   b. Download
   c. Start/Stop debug session
3. Enter debug mode
   a. Run

6 Revision History

Date	Revision	Description
Apr. 5, 2019	1.00	1. Initially issued.

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