Timer Trigger DAC and PDMA

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	Demonstrate PDMA trigger DAC convert sine wave outputs.
BSP Version	Nano100B Series BSP CMSIS V3.03.000
Hardware	NuTiny-EVB-Nano130-LQPF128

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1 Function Description

1.1 Introduction

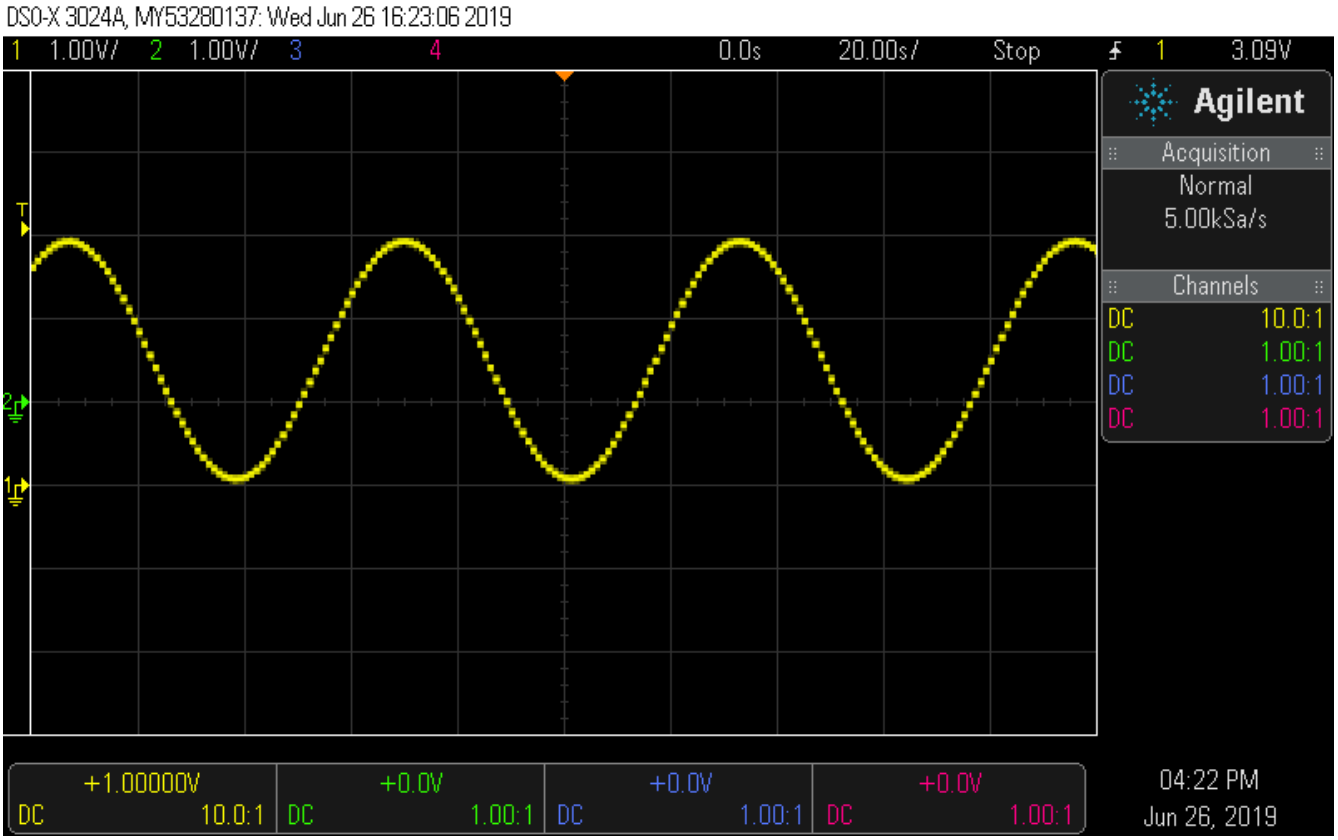
Demonstrate PDMA trigger DAC convert sine wave outputs.

1.2 Principle

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

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

1.3 Demo Result


DSO-X 3024A, MY53280137: Wed Jun 26 16:23:06 2019
1 1.00V/ 2 1.00V/ 3 4 0.0s 20.00s/ Stop 1 3.09V
Agilent
Acquisition
Normal
5.00kSa/s
Channels
DC 10.0:1
DC 1.00:1
DC 1.00:1
DC 1.00:1
+1.00000V
DC 10.0:1
+0.0V
DC 1.00:1
+0.0V
DC 1.00:1
+0.0V
DC 1.00:1
04:22 PM
Jun 26, 2019

2 Code Description

Set timer trigger DAC and timer interrupt：

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

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

Set PDMA transfer DAC data：

```
    /* Configure  PDMA channel 1 to trigger DAC */
    PDMA_Open(1 << 1);
    PDMA_SetTransferCnt(1, PDMA_WIDTH_16, sizeof(a16Sine) / sizeof(uint16_t));
    // Set source to wrap around mode to generate sine wave continuously
    // Set destination to DAC DATA0 address.
    #ifdef PDMA_Mem_DAC
        PDMA_SetTransferAddr(1, (uint32_t)a16Sine, PDMA_SAR_WRA, (uint32_t)&DAC->DATA0,
PDMA_DAR_FIX);
    #else
        PDMA_SetTransferAddr(1, (uint32_t)a16Sine, PDMA_SAR_WRA, (uint32_t)a16Dest,
PDMA_DAR_WRA);
    #endif
    // Set channel 1 transfer mode to DAC channel 0 TX


    PDMA_SetTransferMode(1, PDMA_TMR0, 0,0); //memory to ip
```

3 Software and Hardware Environment

Software Environment

- BSP version
  - Nano100B Series BSP CMSIS V3.03.000
- IDE version
  - Keil uVersion 5.26

4 Directory Information

- EC_Nano100_TIMER_Trigger_DAC_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_DAC_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. 24, 2019	1.00	1. Initially issued.

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