使用EADC捕捉DAC訊號

NuMicro® 32 位系列微控制器範例代碼介紹

文件資訊

代碼簡述	本範例代碼使用EADC捕捉DAC所產生的正弦波
BSP 版本	M480 Series BSP CMSIS V3.04.000
開發平台	NuMaker-PFM-M487 Ver 3.0

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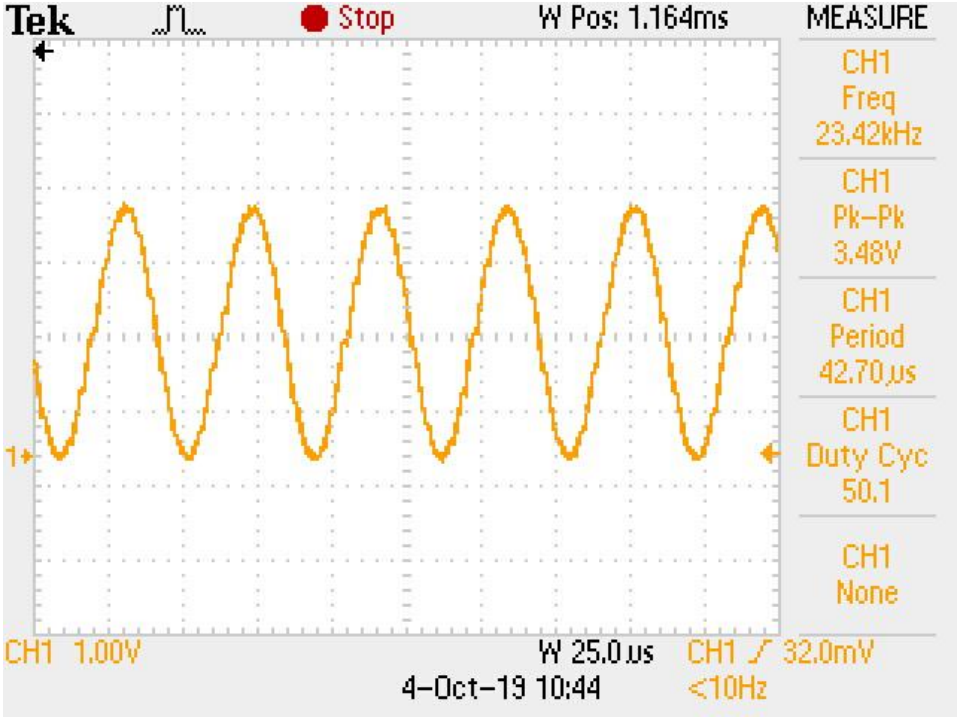
1 功能介紹

1.1 簡介

範例程式中，使用軟體觸發的機制使DAC輸出正弦波，並且等DAC輸出穩定後使用軟體觸發讓EADC讀取其數值，正弦波由64個階層組成。DAC所用腳位為PB.13，EADC所用腳位為PB.0，用戶須把此兩腳位連接。

1.2 執行結果

從EADC所量到訊號如下圖



2 代碼介紹

首先初始化DAC與EADC模組為軟體觸發：

```
void DAC_Init()
{
    /* Set the software trigger DAC and enable D/A converter */
    DAC_Open(DAC1, 0, DAC_SOFTWARE_TRIGGER);

    /* The DAC conversion settling time is 1us */
    DAC_SetDelayTime(DAC1, 1);

    /* Set DAC 12-bit holding data */
    DAC_WRITE_DATA(DAC1, 0, 0x400);
}
void EADC_Init()
{
    /* Set input mode as single-end and enable the A/D converter */
    EADC_Open(EADC, EADC_CTL_DIFFEN_SINGLE_END);

    /* Configure the sample module 0 for analog input channel 2 and software trigger
source.*/
    EADC_ConfigSampleModule(EADC, 0, EADC_SOFTWARE_TRIGGER, 0);

    /* Clear the A/D ADINT0 interrupt flag for safe */
    EADC_CLR_INT_FLAG(EADC, EADC_STATUS2_ADIF0_Msk);
}
```

接著在 while 迴圈內軟體觸發 DAC，並且等待 DAC 輸出完成後，軟體觸發 EADC 開始讀取資料。

```
while(1) {
        for(index = 0; index < 64; index++) {
            /* Write data to DAC */
            DAC_WRITE_DATA(DAC1, 0, sine[index++]);
            /* Software trigger DAC to start converting */
            DAC_START_CONV(DAC1);
            /* Wait DAC convertion complete */
            while(DAC_IS_BUSY(DAC1,0));
```

```
            /* Software trigger ADC to start converting */
            EADC_START_CONV(EADC, BIT0);
            /* Wait ADC convertion complete */
            while(EADC_IS_BUSY(EADC));
            /* Get the conversion result of the sample module 0 */
            i32ConversionData = EADC_GET_CONV_DATA(EADC, 0);
        }
    }
```

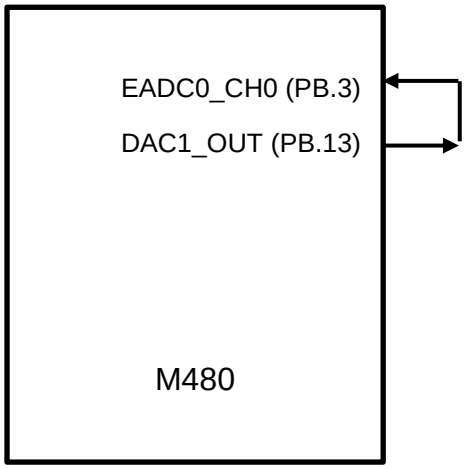
3 軟體與硬體環境

● 軟體環境

- ■ BSP 版本
  - ◆ M480 Series BSP CMSIS V3.04.000
- ■ IDE 版本
  - ◆ Keil uVersion 5.26

● 硬體環境

- ■ 電路元件
  - ◆ NuMaker-PFM-M487 or other M480 Development Board
- ■ 示意圖



4 目錄資訊

- EC_M480_EADCCaptureDAC_V1.00
  - 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 如何執行範例程式

1. 根據目錄資訊章節進入 ExampleCode 路徑中的 KEIL 資料夾，雙擊 EADCCaptureDAC.uvproj
2. 進入編譯模式介面
   a. 編譯
   b. 下載代碼至記憶體
   c. 進入 / 離開除錯模式
3. 進入除錯模式介面
   a. 執行代碼

6 修訂紀錄

Date	Revision	Description
Oct. 1, 2019	1.00	1. 初始發布.

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