

Dept. of Computer Science and Engineering

EECS3215 – Embedded Systems

DAC and Waveform Generation

Lab 5

Objectives:

To learn how to use the DAC unit and to generate waveforms using it

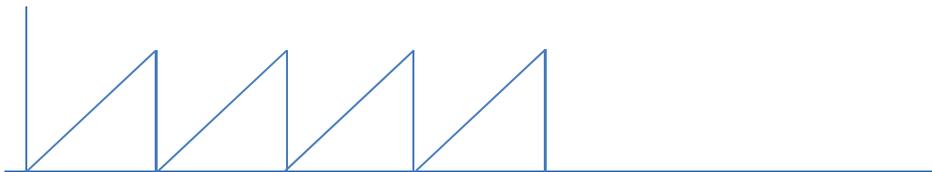
LAB

Part 1

In this part, you have to set up the DAC to produce a fixed value on the analog output and to use the scope to measure/display it.

Part 2

Generate a saw tooth waveform as the one shown below. This is achieved by setting the register values to a sequence of numbers and converting it to analog



Snippets of code will be posted on Monday to guide you in setting and operating the DAC. calculate the frequency of the wave both from the program you wrote and verify it with the scope.

Deliverables

Demo the program to the TA, A lab report is due march 5.

DAC in KL43Z

In order to use the DAC on the FRDM-KL43z board you have to set it up and initialize it, there are two ways to do so

From scratch

- ◆ The DAC output (look at the schematic) is PTE30
- ◆ You have to enable the clock to port E and configure pine 30 as output
- ◆ Then, you have to set the DAC clock enable bit in SIM->SCGC6
- ◆ Set the DAC enable bit in DAC0->C0
- ◆ Set DAC->C1 to 0 (no DMA or buffer needed)
- ◆ Ten the digital data to convert should be in DAC0 data High and Low (12 bits) DAC0->DAT[0].DATL and DATH

Using the API

Or you can use the API in MCUXpresso IDE, look at the DAC example and consider the API such as `DAC_GetDefaultConfig()`, `DAC_Init()`, `DAC_Enable()`
For a list of the API, look at

https://mcuxpresso.nxp.com/api_doc/dev/210/group__dac.html