

Lab 2 – Using the Si5351 clock generator circuit with ItsyBitsy

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Abstract

We use an ItsyBitsy to build a Si5352 clock generator circuit to generate waveforms at various frequencies.

1 Introduction

In various circuits we need “clock signals” at some precise frequency. A modern solution is to use clock generator ICs, which have advantages of being low-cost, having reasonable performance, and being able to generate signals at different frequencies with a single IC.

In this lab we will generate clock signals using the [Si5351](#) IC, and we will send the control I²C signals to the Si5351 using the [ItsyBitsy](#) microcontroller and CircuitPython.

2 Experimental Setup

We did the assembly following the instructions [online at adafruit](#), while replacing the pinout for the Arduino microcontroller with that of the ItsyBitsy microcontroller:

1. We soldered pins onto the ItsyBitsy and the Si5351 breakout board.
2. We soldered SMA connectors onto the Si5351 breakout board. SMA connectors are needed to carry the generated clock signals that are essentially RF.
3. According to the documentation of [Adafruit Si5351 Breakout Board](#) and [ItsyBitsy](#), using jumper wires we connected
 - (a) the 3V pin (ItsyBitsy) to the Vin pin (Si5351 breakout),
 - (b) the GND pin (ItsyBitsy) to the GND pin (Si5351 breakout),
 - (c) the SCL pin (ItsyBitsy) to the SCL pin (Si5351 breakout),
 - (d) and the SDA pin (ItsyBitsy) to the SDA pin (Si5351 breakout).

4. We updated the bootloader of the ItsyBitsy following the [instructions](#). And we installed CircuitPython following the instructions [here](#).
5. And the CircuitPython code is taken directly from the [Adafruit website](#).

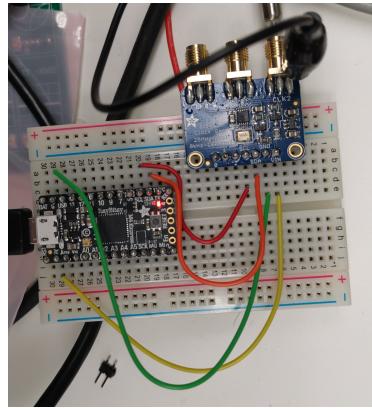


Figure 1: Si5351 Clock Generator controlled By ItsyBitsy

The assembled circuit is shown in Figure 1.

3 Results

The generated clock signals are shown in Figure 2.

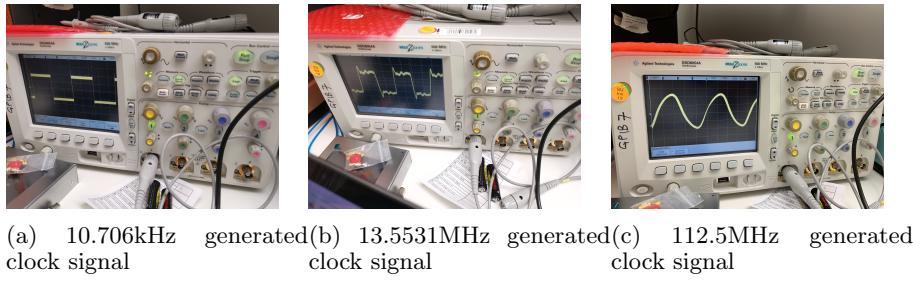


Figure 2: Generated Clock Signals at Various Frequencies

4 Discussion

5 Conclusions