

UG229: Si51211/Si51218 Evaluation Board User's Guide

The Si51211/Si51218 evaluation boards (the Si5121x-EVB) can be used to emulate custom Si5121x part numbers as below:

Base Part Number	EVB
Si51210/14	Si51211 EVB
Si51211	
Si51218	Si51218 EVB

The Si5121x-EVB has an on-board programmable Si514 that generates the input clock frequency and can demonstrate function of up to two dc input pins and one output clock or up to three output clocks from the Si5121x part, depending on the part emulated and the frequency plan.

EVB FEATURES

- · Powered from USB port
- Onboard Si514 to generate any input clock based on the frequency plan
- * CBProTM GUI programmable V_{DD} supply allows device at 3.3 V or 2.5 V



1. Identifying the EVB Part

Look for the "check" on one of the two boxes for either the Si51211-EVB or the Si51218-EVB as shown in Figure 1.1 Si5121x-EVB Identification on page 2. Other than this check box selection (and the Si5121x device used in the EVB), the EVBs are both identical by design. Therefore, the user guide to the EVBs is a common document. CBProTM also has the ability to identify the EVBs and displays the EVB type as shown in Figure 1.2 Si5121x-EVB Identification by CBPro on page 2.



Figure 1.1. Si5121x-EVB Identification



Figure 1.2. Si5121x-EVB Identification by CBPro

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2. Functional Block Diagram



Figure 2.1. Si5121x- CEVB Functional Block Diagram

The C8051F380 MCU is used to control the Si514, Si5121x devices, and the voltage regulators and implement the plans created on CBPro.

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3. Installing ClockBuilderPro (CBPro) Desktop Software

To install the CBPro software on any Windows 7 or above PC, go to https://www.skyworksinc.com/en/application-pages/clockbuilderpro-software and download the CBPro software. Installation instructions and a User's Guide for CBPro can be found at the download link shown above. Follow the instructions as indicated.

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4. Using the Si5121x EVB

4.1 Connecting to a Si5121x EVB using CBPro

Once CBPro software is installed, connect to the EVB with a USB cable as shown in the figure below:



Figure 4.1. Connecting to Si5121x EVB via CBPro

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4.2 Programing the Si5121x EVB using CBPro

There are three ways to select (or arrive at) a frequency plan on the CBProsoftware. They are as follows:

- 1. Selecting a "default plan" from CBPro.
- 2. Creating a plan using the CBPro wizard.
- 3. Opening an existing plan stored as a CBPro project file.

At the end of any of these three steps, the starting point to programming the EVB will be as shown in the following figures:

CB Si51218_LowBW_3MHz_Output_41_41_21_5_MHz - ClockBuilder Pro				
ClockBuilder Pro v2.5.7 🍫 (4 setting overrides)	SKYWORKS			
Design Dashboard 🔻	Configuring Si51218			
Loaded Si51218 design from C:\Temp\planner\Si51218_LowBW_3MHz_Output_41_41_21_5_MHz.slabtimeproj.				
Edit Configuration with Wizard Design Notes · Block Diagram & Supply Voltages · Jitter Criteria · Pins & Clocks	Evaluation Board Detected Si51218 EVB S/N00-00-17-6F-83-C1 Write Design to EVB Open EVB GUI			
Save Design to Project File Your configuration is stored to a project file, which can be opened in ClockBuilder Pro at a later time.	Export Feature not available. The Si51218 does not support in- system programming.			
Design Report & Datasheet Addendum You can view a <u>design report (text)</u> or create a <u>draft datasheet addendum (PDF)</u> for your design.	Documentation Si51218 Datasheet Si51218 EVB User's Guide			
For Silicon Labs Cloud Services You can create a custom part number for your design. This can be used to order factory pre-programmed devices based on your configuration.	Ask for Help Have a question about your design? Click here to get assistance.			
🕒 Frequency Plan Valid 🧭 Design OK	Home Close			

Figure 4.2. Starting Screen for EVB Write

CB Write Design to Evaluation B	oard - ClockBuilder Pro				
Programming Overview	Set Jumper to DUT Program Mode	Set Jumper to DUT Run Mode	Finished Programming DUT		
This wizard will step you through writing your CBPro configuration to the Si521xx device present on the EVB. You will be asked to move a jumper to ready the device for programming and then switch the jumper back to standard run mode when programming is complete.					
Click Next > to begin.					
		< Back Nex	t > Cancel		

Figure 4.3. Step 1 of 4 in EVB Write

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Click "Next" to get to the next window.



Figure 4.4. Step 2 of 4 in EVB Write

Now, ensure that the jumper JP3 is shorted and jumper JP4 is open. Then click "Next" to get to the window in Figure 4.5 Step 3 of 4 in EVB Write on page 7.



Figure 4.5. Step 3 of 4 in EVB Write

Next, ensure that the jumper JP4 is shorted and jumper JP3 is open. Then click "Next" to get to the window in Figure 4.6 Step 4 of 4 in EVB Write on page 8.



Figure 4.6. Step 4 of 4 in EVB Write

This step completes the programming. The plan can be evaluated now.

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5. Controlling Input Pins

The input pin (IN1 or IN2) will be:

- · High when the pin is left open, such as the IN2 setting in the figure below, or
- · Low when the pin is shorted using an INx_CTRL jumper, such as the IN1 setting in the figure below.



Figure 5.1. Input Pin Control

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6. Bill of Materials (BOM), Layout, and Schematic

The Si5121x EVB Bill of Materials (BOM), Layout, and Schematic design files can be found online at: https://www.skywork-sinc.com/search?q=Si5121xx-evb#documents.

Note: Please be aware the Si5121x EVB schematic is in OrCad Capture hierarchical format and not in a typical "flat" schematic format.

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7. Revision History

Revision 0.2

February 2021

• Updated link to design files in section 6. Bill of Materials (BOM), Layout, and Schematic.

Revision 0.1

April 20, 2016

· Initial release.

SKYWORKS

ClockBuilder Pro

Customize Skyworks clock generators, jitter attenuators and network synchronizers with a single tool. With CBPro you can control evaluation boards, access documentation, request a custom part number, export for in-system programming and more!

www.skyworksinc.com/CBPro



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