

## Si5338/Si5356 FIELD PROGRAMMING KIT USER'S GUIDE

### Description

The Si5338/Si5356 Field Programming Kit provides all of the tools necessary for writing a new configuration file to the one-time programmable (OTP) non-volatile memory (NVM) in the Si5338/Si5356 any-frequency, any-output clock generator. This user's guide describes the procedure for writing to the device NVM.

### Field Programming Kit Features

- Fully-powered from a single USB port
- High-quality and easy-to-use socket
- Simple [ClockBuilder Pro](#) user interface
- Status LEDs for Pass or Fail indication

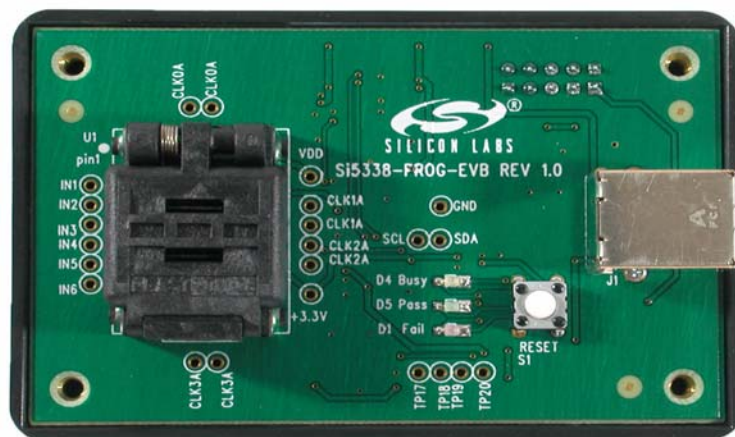


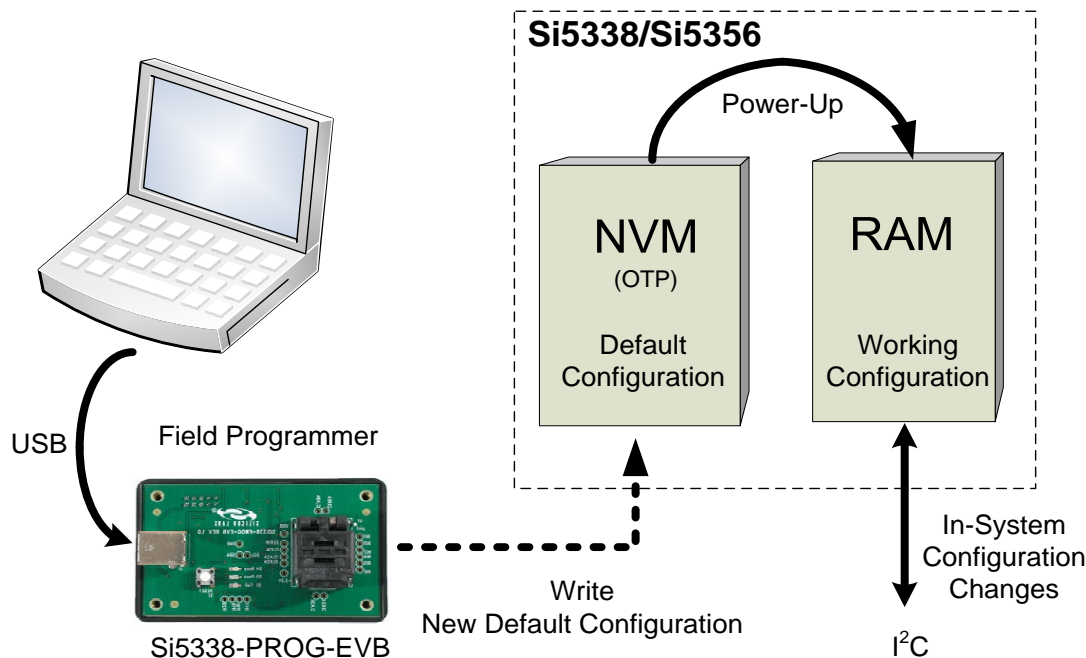
Figure 1. Si5338-PROG-EVB

# Si5338/56-PROG-EVB

## 1. Introduction

The Si5338/Si5356 is a highly-flexible and configurable clock generator/clock buffer. The device has a factory-defined default configuration stored in non-volatile memory (NVM). During powerup, the default configuration is copied into the random access memory (RAM). Having its working configuration stored in RAM allows in-system configuration changes through the I<sup>2</sup>C port. During a power cycle, any configuration changes stored in RAM are overwritten with the factory default configuration from the NVM.

The NVM is a one-time-programmable (OTP) memory that allows a user to define the default configuration. This is a useful feature, especially if the Si5338/Si5356 is providing clocks to devices that require pre-defined clocks at powerup. As its name implies, the OTP NVM can only be written once.



**Figure 2. Memory Configuration**

The field programming kit allows writing a new default configuration to the Si5338's NVM memory. The kit consists of the Field Programmer (Si5338-PROG-EVB) and a USB cable. This user's guide outlines the steps necessary to write new default values to the NVM.

The NVM file must be created in ClockBuilder Pro before writing it to the Si5338/Si5356. NVM file support for the Si5338 and Si5356 is included in version 2.36 or later of the ClockBuilder Pro Software.

## 2. Overview of Generating and Writing to NVM

The process of generating and writing an NVM file to the device is shown in Figure 3.

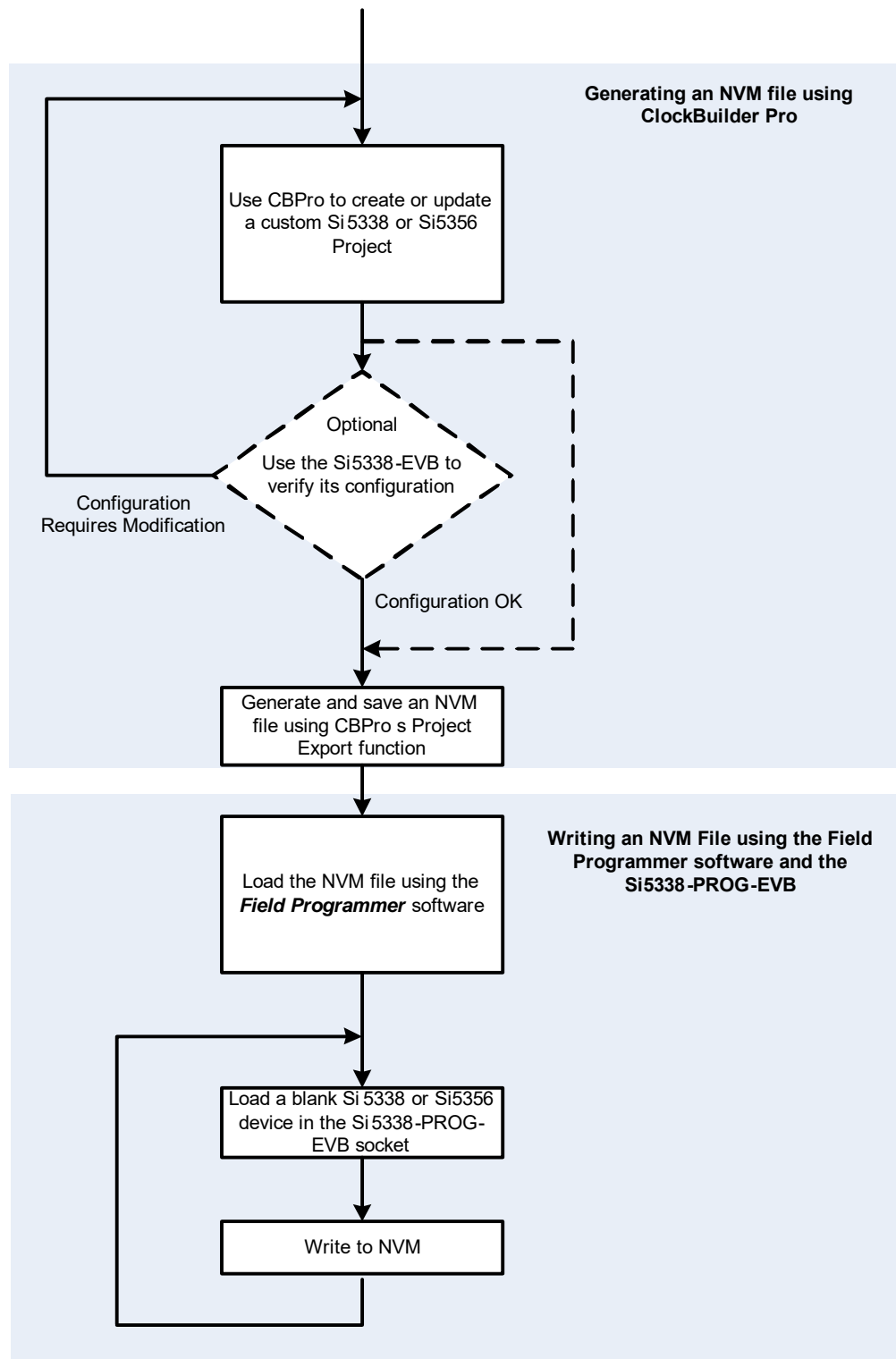


Figure 3. Generating and Writing an NVM File to the Device

# Si5338/56-PROG-EVB

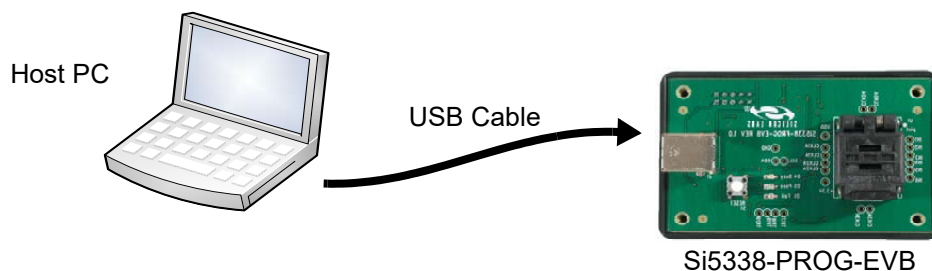
## 3. Getting Started with the Si5338/Si5356 Field Programmer (Si5338-PROG-EVB)

### 3.1. Installing the Software

Before connecting the Field Programmer (Si5338-PROG-EVB) to the host PC, please download and install the latest version of [ClockBuilder Pro](#) from the Silicon Labs website.

### 3.2. Connecting the Hardware

Connect a USB cable from the Si5338-PROG-EVB to the host PC. The Field Programmer is fully powered from the USB port, so no other connections are necessary.



### 3.3. Running the Software

Once installed, open ClockBuilder Pro and connect the Si5338/56-PROG-EVB to the computer with a USB cable. ClockBuilder Pro will recognize the EVB and an option to open the “NVM Program Tool” will show up on the home menu.

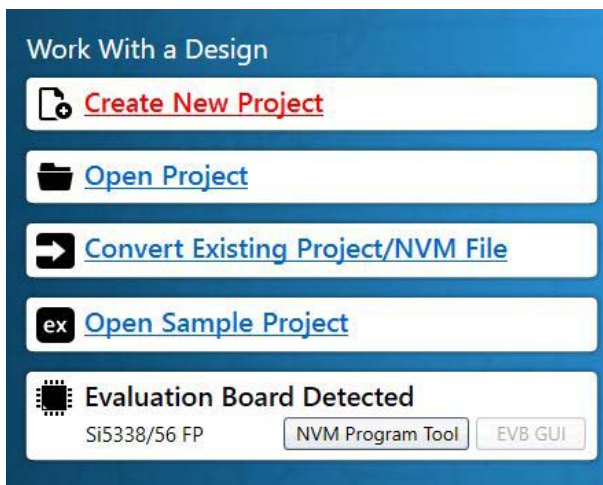
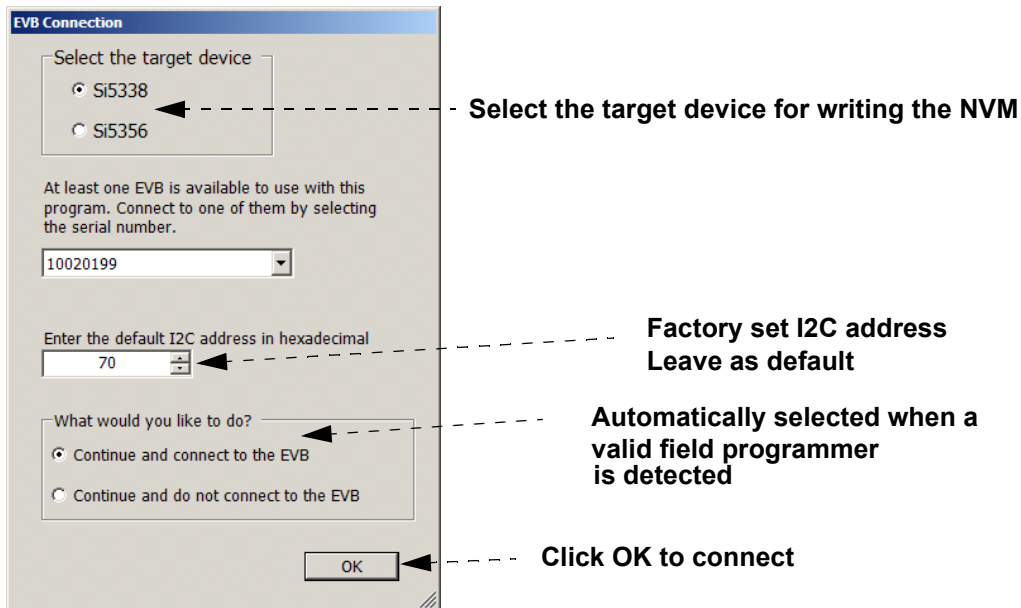


Figure 4. Field Programmer in ClockBuilder Pro

## 3.3.1. Setting up Communication

1. Select the desired target device, Si5356 or Si5338. The one that is selected must be placed in the socket when it is time to program the NVM.
2. Before the software connects with the Field Programmer (Si5338-PROG-EVB), it automatically detects its serial number. If more than one field programmer is connected to the same PC, use the drop-down box to select one of the field programmers. This feature allows one PC to control several field programmers simultaneously.



3. All devices shipped from the factory are pre-programmed with an I<sup>2</sup>C address of 0x70. The field programmer software will automatically use this I<sup>2</sup>C address when communicating with a device loaded into the socket. If the device has a different I<sup>2</sup>C address, enter its new address in the box provided.
4. If the PC is connected to a valid field programmer, it will automatically select "Continue and connect to the EVB". If "Continue and do not connect to the EVB" is selected, the software could not find a valid field programmer. Ensure that the field programmer (Si5338-PROG-EVB) is properly connected to the host PC using a cable.
5. Click on OK.

# Si5338/56-PROG-EVB

## 4. Getting Ready to Write The NVM File

The NVM File contains all of the information needed to configure the NVM of a blank Si5338 or Si5356. Valid Register Map Files have a .nvm extension and are generated in ClockBuilder Pro's Project Export menu.

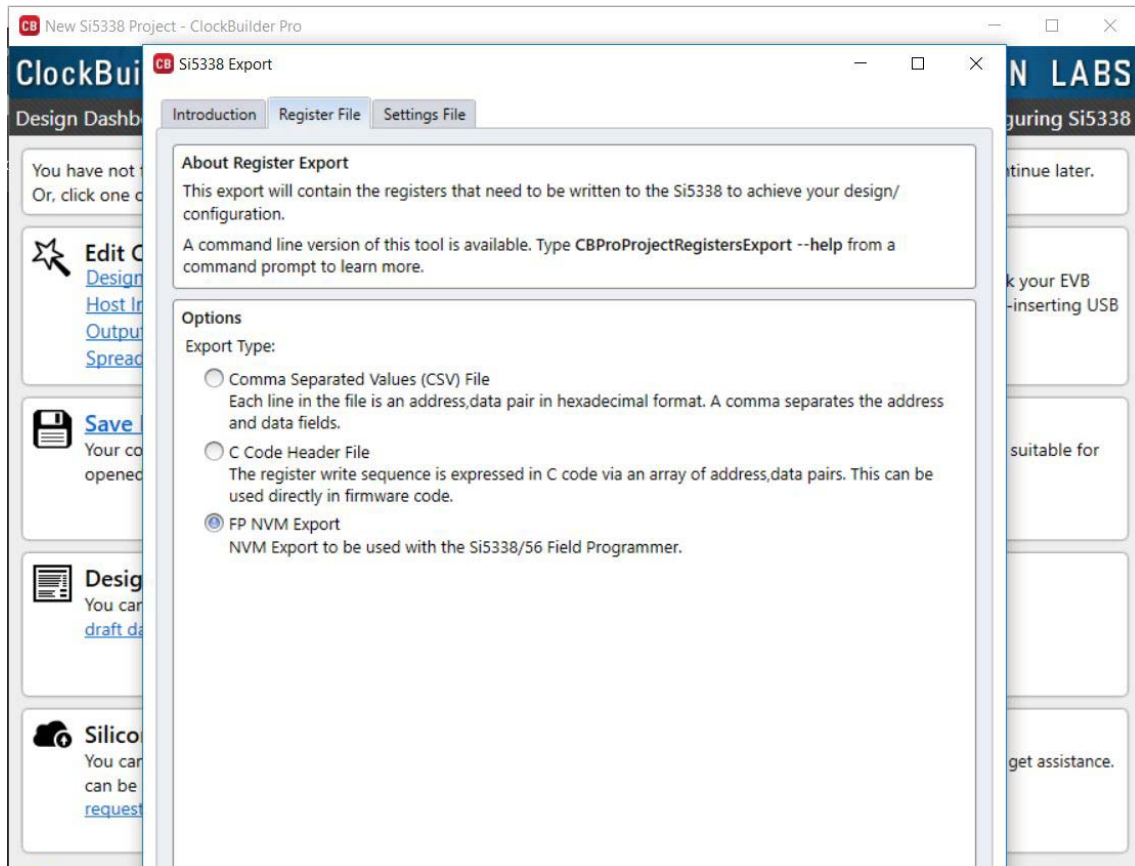
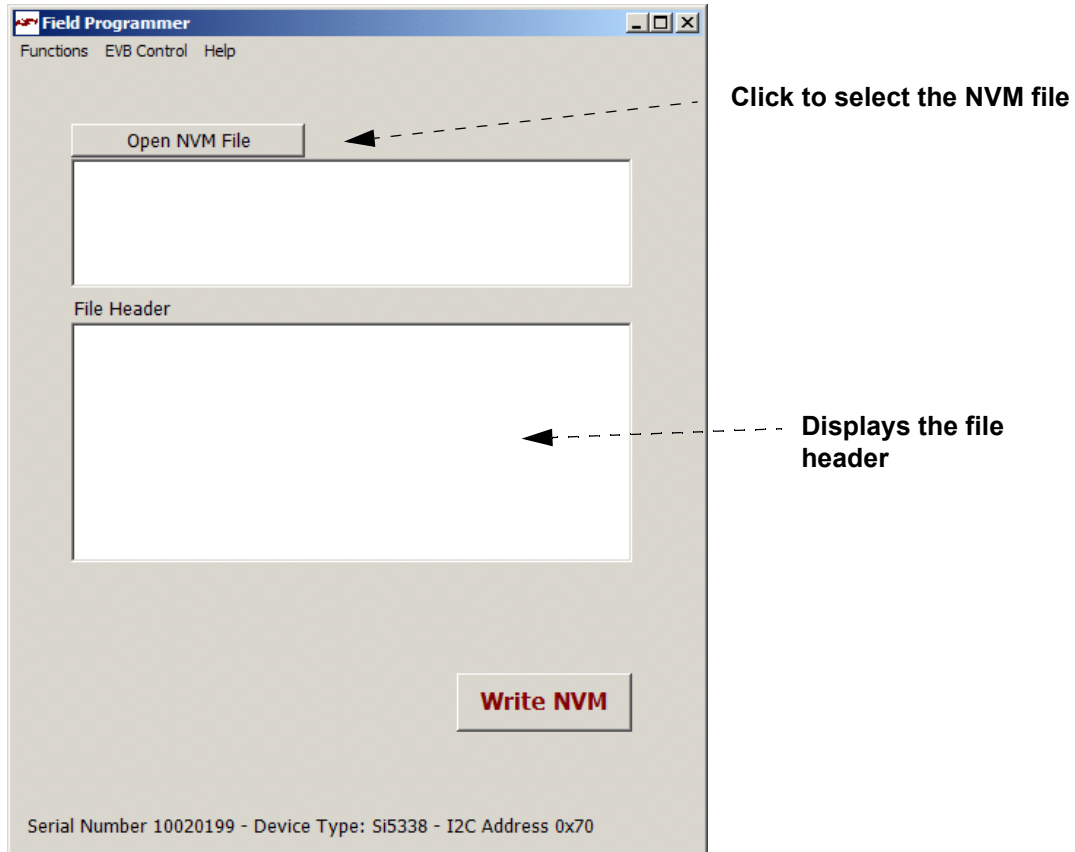


Figure 5. NVM Export Screenshot

## 4.1. Loading the NVM File

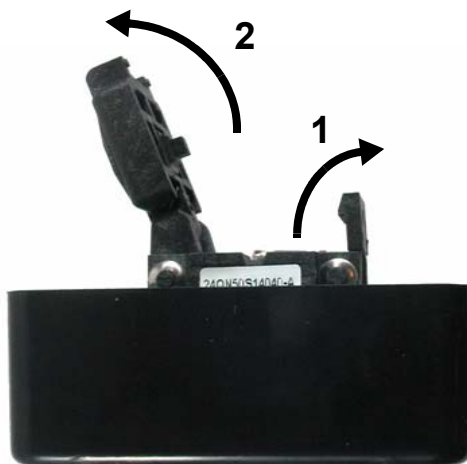
Click on the Open NVM File button to select the desired .nvm file. The header of the register map file is displayed in the File Header window if the software detects that it is a valid NVM file.



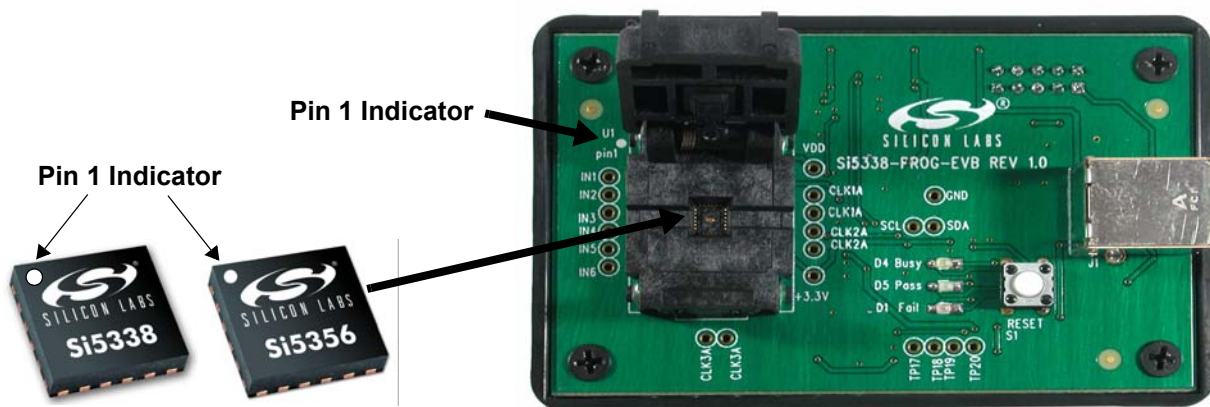
# Si5338/56-PROG-EVB

## 4.2. Load a Blank Device in the Socket

1. Before writing the NVM, a device must be loaded into the socket as shown below. Pull the lever to unlock the lid. Ensure that there is not another device in the socket before proceeding. **Note: Some field programming kits are shipped with a plastic slug loaded in the socket. This plastic slug must be removed before loading a device.**



2. Insert a blank Si5338 or Si5356 device in the socket using a pair of tweezers or a suction tool. **It is very important that the Si5338 or Si5356 be inserted into the socket with the correct pin 1 orientation.** Pin 1 on the device is marked with a white dot. Pin 1 on the socket is labeled on the PCB as shown below.

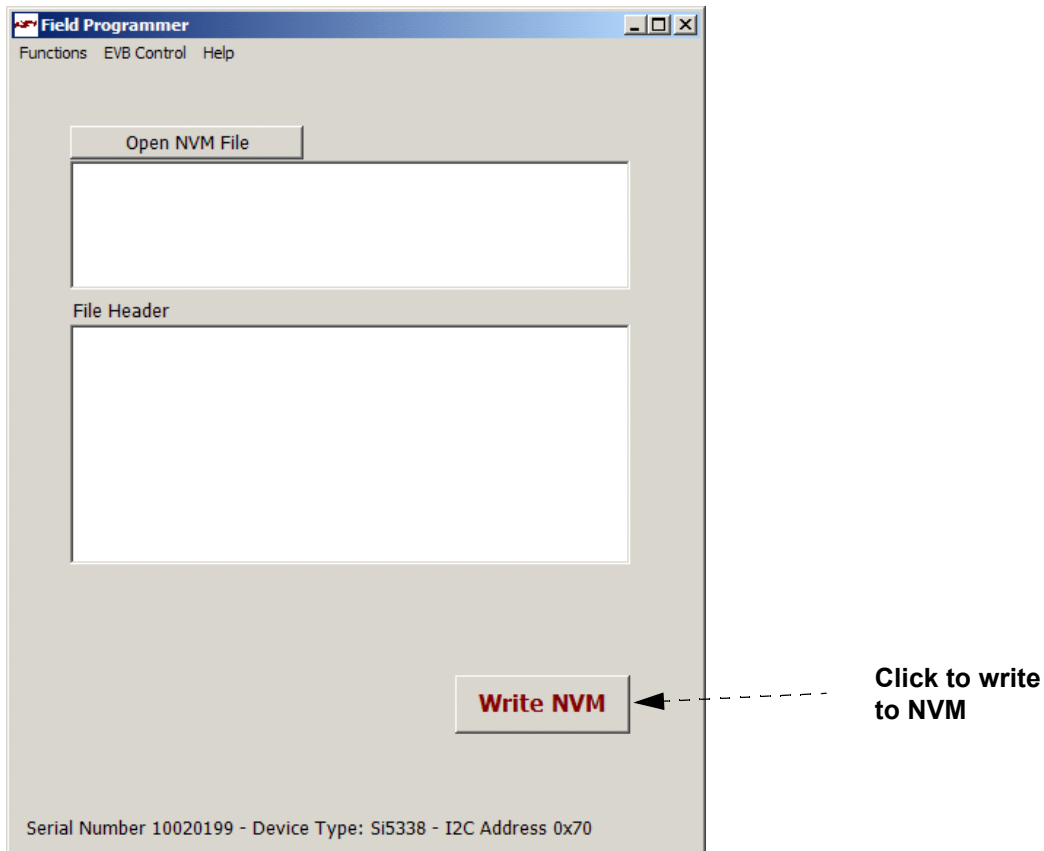


3. Once the device is properly loaded, close the lid. Ensure that the lid is fully closed and in the locked position. Some tension is normal when closing the lid. This ensures proper contact with the device.



## 5. Write to NVM

1. Click on the “Write NVM” button to make a final write to the one-time programmable NVM. Writing to the NVM should only take a few seconds. When writing to the NVM is successful, the green LED will light. If there was an error while writing to the NVM, the red LED will light. See the "Appendix A—Troubleshooting Guide" on page 10 to find the possible causes of an NVM failure.



2. Once the NVM is written, the device is ready for use.
3. Remove the device from the socket.
4. Load a new device into the socket.
5. Press the Write NVM button.
6. Repeat Steps 3 to 5.

# Si5338/56-PROG-EVB

---

## APPENDIX A—TROUBLESHOOTING GUIDE

---

Use this guide to help troubleshoot possible sources of errors when an NVM write fails.

### Writing to NVM Results in a “Fail” Status



#### Possible Causes

1. A device can only be programmed once. If the device loaded into the socket has already been programmed (NVM was previously written), it cannot be re-programmed. This will cause a fail status. Load a blank device into the socket.
2. Writing to NVM failed. The device may be defective and should be discarded. Load a new device into the socket.

### Writing to NVM Causes the “Busy” LED to Stay On



#### Possible Causes

1. The device loaded into the socket has incorrect polarity. Refer to “4.2. Load a Blank Device in the Socket” for proper device orientation. Press the reset button on the Si5338-PROG-EVB; discard the device in the socket, and load a blank device into the socket.
2. There is no device loaded in the socket. Press the reset button on the Si5338-PROG-EVB and load a blank device into the socket.

## REVISION HISTORY

### Revision 0.5

April, 2020

- Replaced ClockBuilder Desktop instructions with ClockBuilder Pro instructions.

### Revision 0.4

June, 2010

- Changed “Any Rate Clock Generator” to “ClockBuilder Desktop” throughout.
- Changed “MultiSynth Clock Programmer” to “ClockBuilder Desktop” throughout.
- Updated Figure 4 on page 12.

### Revision 0.3

March, 2010

- Changed document title from Si5338-PROG-EVB to Si5338/56-PROG-EVB.
- Added the Si5356 to the Field Programming Kit.

### Revision 0.2

August, 2009

- Changed “Si533x configuration” to “Any Rate Clock Generator” throughout.
- Changed “Si5338 Programmer” to “MultiSynth Clock Programmer” throughout.
- Updated Figures 3 and 4.

### Revision 0.1

March, 2009

- Initial release.



## ClockBuilder Pro

One-click access to Timing tools, documentation, software, source code libraries & more. Available for Windows and iOS (CBGo only).

[www.silabs.com/CBPro](http://www.silabs.com/CBPro)



**Timing Portfolio**  
[www.silabs.com/timing](http://www.silabs.com/timing)



**SW/HW**  
[www.silabs.com/CBPro](http://www.silabs.com/CBPro)



**Quality**  
[www.silabs.com/quality](http://www.silabs.com/quality)



**Support and Community**  
[community.silabs.com](http://community.silabs.com)

### Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required, or Life Support Systems without the specific written consent of Silicon Labs. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications.

### Trademark Information

Silicon Laboratories Inc.®, Silicon Laboratories®, Silicon Labs®, SiLabs® and the Silicon Labs logo®, Bluegiga®, Bluegiga Logo®, ClockBuilder®, CMEMS®, DSPLL®, EFM®, EFM32®, EFR, Ember®, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Ember®, EZLink®, EZRadio®, EZRadioPRO®, Gecko®, Gecko OS, Gecko OS Studio, ISOModem®, Precision32®, ProSLIC®, Simplicity Studio®, SiPHY®, Telegesis, the Telegesis Logo®, USBXpress®, Zentri, the Zentri logo and Zentri DMS, Z-Wave®, and others are trademarks or registered trademarks of Silicon Labs. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Kell is a registered trademark of ARM Limited. Wi-Fi is a registered trademark of the Wi-Fi Alliance. All other products or brand names mentioned herein are trademarks of their respective holders.



Silicon Laboratories Inc.  
400 West Cesar Chavez  
Austin, TX 78701  
USA

<http://www.silabs.com>

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9