Si5350, Si5351 Frequently Asked Questions

This FAQ document answers the most frequently asked questions for the Si5350 and the Si5351 CMOS Clock Generator products.

Si5350/51 Product Family Outline

Si5350 (Pin Controlled)
Si5350A – XTAL only
Si5350B – XTAL & VCXO capability
Si5350C – XTAL & CLKIN

Si5351 (I2C Programmable)
Si5351A – XTAL only
Si5351B – XTAL & VCXO capability
Si5351C – XTAL & CLKIN

Table 1. Si5350, Si5351 Product Links

Link Type	Link
Si5350/Si5351 Product Pages	https://www.silabs.com/products/timing/clocks/cmos-clock-generators
Evaluation Boards / Development Kits	https://www.silabs.com/products/development-tools/timing/clock/si535x-b20qfn-evb-development-kit
ClockBuilder Pro Software	https://www.silabs.com/products/development-tools/software/clock
Quality and Reliability Reports	www.silabs.com/quality
Request Technical Support	www.silabs.com/support (Go to "E-Mail Support Request" link)

Table 2. Si5350, Si5351 Relevant Application Notes

Link Type	Link
AN619: Manually Generating an Si5351 Reg Map	https://www.silabs.com/documents/public/application-notes/AN619.pdf
AN554: Si5350/51 PCB Layout Guide	https://www.silabs.com/documents/public/application-notes/AN554.pdf
AN551: Crystal Selection Guide for Si5350/51 Devices	https://www.silabs.com/documents/public/application-notes/AN551.pdf

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1 Where is the RoHs, REACH, or other material related compliance information for the Si5350 or the Si5351?

- Please refer to our Corporate, Product and Environmental Data Search (by Part Number) webpage for full RoHS, REACH and other material composition information.

2 Where is the FIT information for the Si5350 or the Si5351?

- FIT information for all Silicon Labs products can be found on the Corporate Commitment to Quality Page.
  - Look for the Quality and Reliability Monitor Report near the bottom.
- Look for the Si535X part number.
  - The Si5350 and the Si5351 both use 0.13um technology.

3 How can I get a Si5350 or Si5351 with a custom startup frequency?

- You can use ClockBuilder Pro to create a custom part number.
- After you create your custom plan, you will have the option to submit the configuration to us. This will officially create the part number in our system. You will then be able to contact your local distributor to order this new part number.
- Here is a link to our ClockBuilder Pro software: https://www.silabs.com/products/development-tools/software/clock

4 What is the default I2C Address of the Si5351 when the part does not have an A0 pin?

- The default address of the Si5351 will always be 0x60h.
- The A0 bit described in figure 8 in the datasheet is only an option for the Si5351A. All other Si5351 devices will either have 0x60h as their default address, or they can have a custom I2C address defined by a custom configuration from ClockBuilder Pro.
- When you create a custom part number for the Si5351, you will have the option to define a new I2C address if you want to.

5 What finish is used on the contacts of the Si5350 or the Si5351?

- 10 Lead MSOP, 3x3 is Matte Sn with 10 um min. thickness
- 20 Lead QFN, 4x4 is NiPdAu, with:
  - Ni: 10u'' min
  - Pd: 0.1u'' min
  - Ag-Au alloy: 0.2u'' min

6 How can I burn the NVM on a blank Si5351 part?

- Silicon Labs does not currently support customer NVM burning for this product family.
- However, you can easily create a new custom part with a newly defined default startup state using ClockBuilder Pro. Once the part is submitted at the end of the process, you will be able to contact your local distributor to order the new part number.

7 What if I want a feature in my custom Si5350 or Si5351 that is not configurable in ClockBuilder Pro?

- If ClockBuilder Pro is currently missing a configuration option for your Si5350 or Si5351 that you would like included in your custom part, just create a new support ticket and we will be able to add your new settings for you.
  - An example of a configuration option currently missing in ClockBuilder Pro might be the ability to buffer external references like an xtal or CLKIN directly to an output.
- Just remember to include your existing ClockBuilder Pro Project and a description of the functionality you would like added. We can then send a new updated ClockBuilder Pro Project file back to you. Just submit the new modified configuration and your new part number will include your desired functionality.

8 Can a CMOS clock be driven into the XA or XB pins of the Si5350 or Si5351?

- Yes, just drive the clock into XA and leave XB unconnected. However, limit the signal level into XA to <1Vpp.

9 What is the output-to-output skew of the Multisynth outputs?

- All outputs are within +/- 500ps of one another at power up (if pre-programmed) or if PLLA and PLLB are reset simultaneously via register 177.
    - If only PLLA or PLLB is reset, then only the outputs associated with the PLL in question will be guaranteed to be within +/-500ps of each other.
- If an output frequency is dynamically changed, output-to-output skew of that clock is not guaranteed until a soft reset is performed.

10 How long does a glitchless frequency transition take?

- The Int, R and N register values inside the Interpolative Dividers are updated when the LSB of R is written via I2C.
- A good rule for calculating the transition time is: $5 * Multisynth\_Period + 200ns$.
- Using the frequency select pin, the transition time is on the order of 100us.

11 What is the power-up sequence of the Si5350 or the Si5351?

- All VDDO need to come up no later than VDD when the phase relationship between multiple outputs is concerned

12 Can the Si5350 or Si5351 duplicate a PWM input?

- Yes, just set the output to buffer the CLKIN signal. The Si5350 or Si5351 will not have an issue buffering a PWM input.
- Set the CLKx_SRC[1:0] bits in the CLKx Control register to 01.
    - This will bypass the PLL/VCXO and MultiSynth synthesis stages and connect CLKx directly to the CLKIN input.
    - See AN619 for more details

13 Will changing the Drive Strength through the control registers change the output slew rate?

- Yes, decreasing the drive strength from 8mA will increase the rise/fall times and subsequently decrease the slew rate.
- **Note:** The datasheet rise/fall times are all based on an 8mA drive strength.