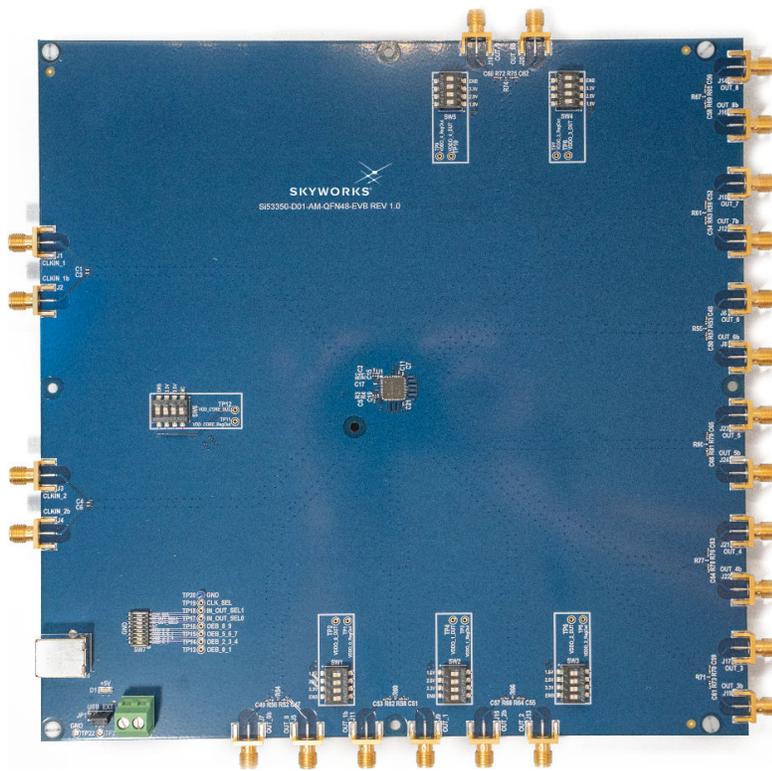


# UG463: Si53350-A-EVB User's Guide (Using Si53350-D01-QFN48-EVB)

The Si53350-D01-AM-QFN48-EVB is used for evaluating the **Si53350A-D01AM** automotive grade, pin configurable, 2 input, 10 output clock buffer devices. The Si53350A-D01AM device can accept 1 of 2 input clocks and generate up to 10 output clock copies in 1 of 4 selectable clock formats.



## EVB FEATURES

- Powered from either USB port (power only) or external +5 V power supply
- Switch selectable device core VDD supply for operation at 3.3 V, 2.5 V, or 1.8 V
- Switch selectable VDDO (output driver) supplies allow each of the clock output banks to have its own power supply voltage selectable from 3.3 V, 2.5 V, or 1.8 V
- Switch selectable output clock formats (from 1 of 4 fixed formats)
- Switch selectable input clock (from 1 of 2 inputs)
- Switch selectable output enable control
- SMA connectors for all input and output clocks
- Output termination circuit on each output clock to allow customization of output termination for selected output clock format and evaluation test equipment requirements

# Table of Contents

- 1. Functional Block Diagram . . . . . 3**
- 2. Si53350-D01-AM-QFN48-EVB Operation . . . . . 4**
  - 2.1 EVB Configuration: Switches & Jumpers . . . . . 4
- 3. LEDs . . . . . 7**
- 4. Input Clocks. . . . . 8**
- 5. Output Clocks . . . . . 9**
- 6. Si53350-D01-AM-QFN48-EVB Rev 1.0 Schematics . . . . . 10**

## 1. Functional Block Diagram

Below is a functional block diagram of the Si53350-D01-AM-QFN48-EVB. The +5 V required by the EVB can come from a powered USB connection (only +5 V is required) or from an external +5 V power supply.

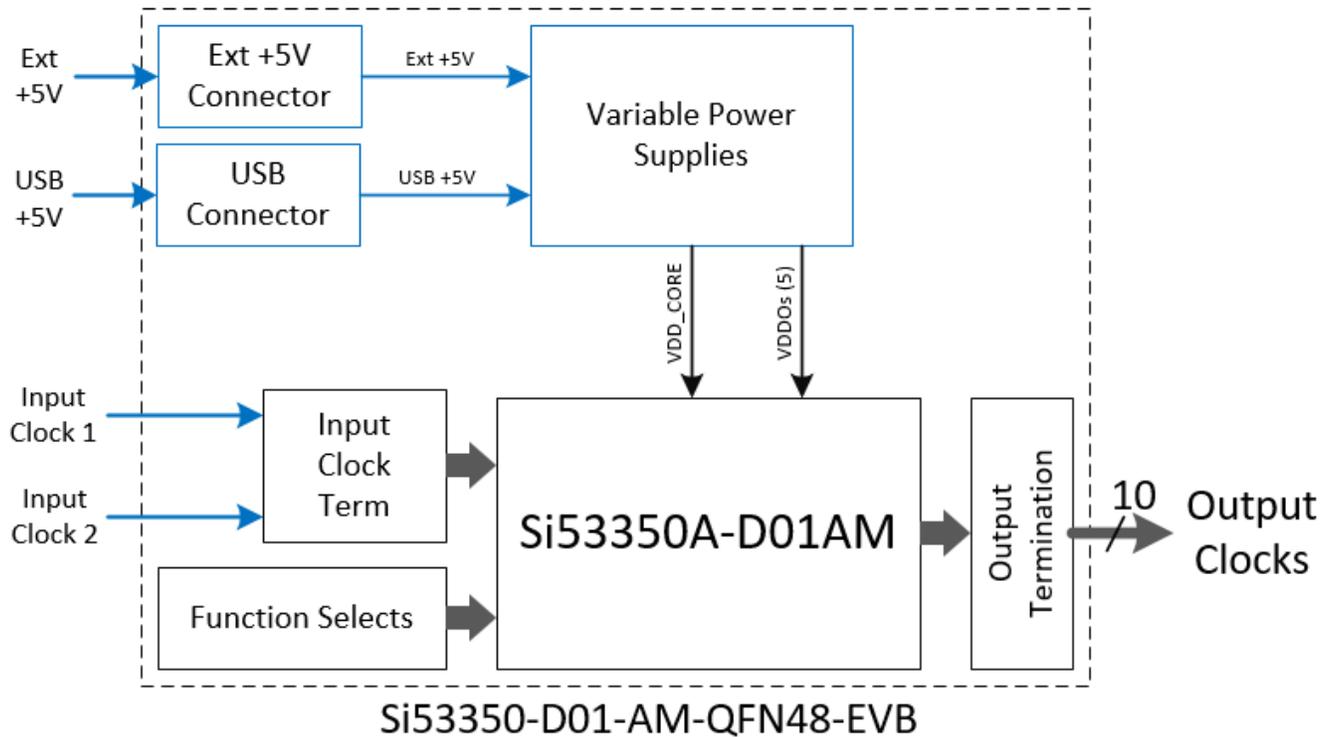


Figure 1.1. Si53350-D01-AM-QFN48-EVB Functional Block Diagram

## 2. Si53350-D01-AM-QFN48-EVB Operation

### 2.1 EVB Configuration: Switches & Jumpers

#### Power Supply Settings:

DIP switches SW1 – SW6 control the on-board power supplies. The table below is a guide to show how to select output voltages for each supply and the EVB default settings. Jumper JP1 selects the source of the +5 V used by all the power supply regulators. JP1 jumper pin 1 to 2 selects USB as power source (default) and pin 2 to 3 selects external +5 V source via the J25 terminal block (refer to the schematic).

Switch Position:		1	2	3	4	
DIP Switch #	Control Function	Enable	1.8 V <sup>1</sup>	2.5 V <sup>1</sup>	3.3 V <sup>1</sup>	EVB Default
SW1	VDDO0	ON	ON	Off	Off	Enabled, +1.8 V
SW2	VDDO1	ON	ON	Off	Off	Enabled, +1.8 V
SW3	VDDO2	ON	ON	Off	Off	Enabled, +1.8 V
SW4	VDDO3	ON	ON	Off	Off	Enabled, +1.8 V
SW5	VDDO4	ON	ON	Off	Off	Enabled, +1.8 V
DIP Switch #	Control Function	Unused	2.5 V <sup>1</sup>	3.3 V <sup>1</sup>	Enable	EVB Default
SW6	VDD_CORE	X	Off	Off	ON	Enabled, +1.8 V

#### Note:

- Switch Position Off = Switch open.
- Switch Position ON = Switch closed (pulls pin to GND).

#### Caution:

1. Do not set more than one voltage select switch to ON at the same time and only change power supply setting switches with EVB powered OFF.

**Function Selects:**

DIP switch SW7 is used to control:

1. Clock Output Enables (4 switches, each controlling a specific sets of outputs)
2. Clock Format Selection (2 switches, used to select 1 of 4 clock format options)
3. Input Clock Select (1 switch, to select 1 of 2 inputs)

Switch Position:		1	2	3	4	5	6	7	8	EVB
DIP Switch	Control Function	OE_0_1b	OE_2_3_4b	OE_5_6_7b	OE_8_9b	Unused	IN_OUT_SEL0	IN_OUT_SEL1	CLK_SEL	Default
SW7	Output Enables	ON	ON	ON	ON	—	—	—	—	As shown
	Clock Format Selection	—	—	—	—	—	ON	ON	—	As shown
	Input Clock Select	—	—	—	—	—	—	—	ON	As shown

**Note:**

- Switch Position Off = Switch open (pulled up to VDD).
- Switch Position ON = Switch closed (pulled down to GND).

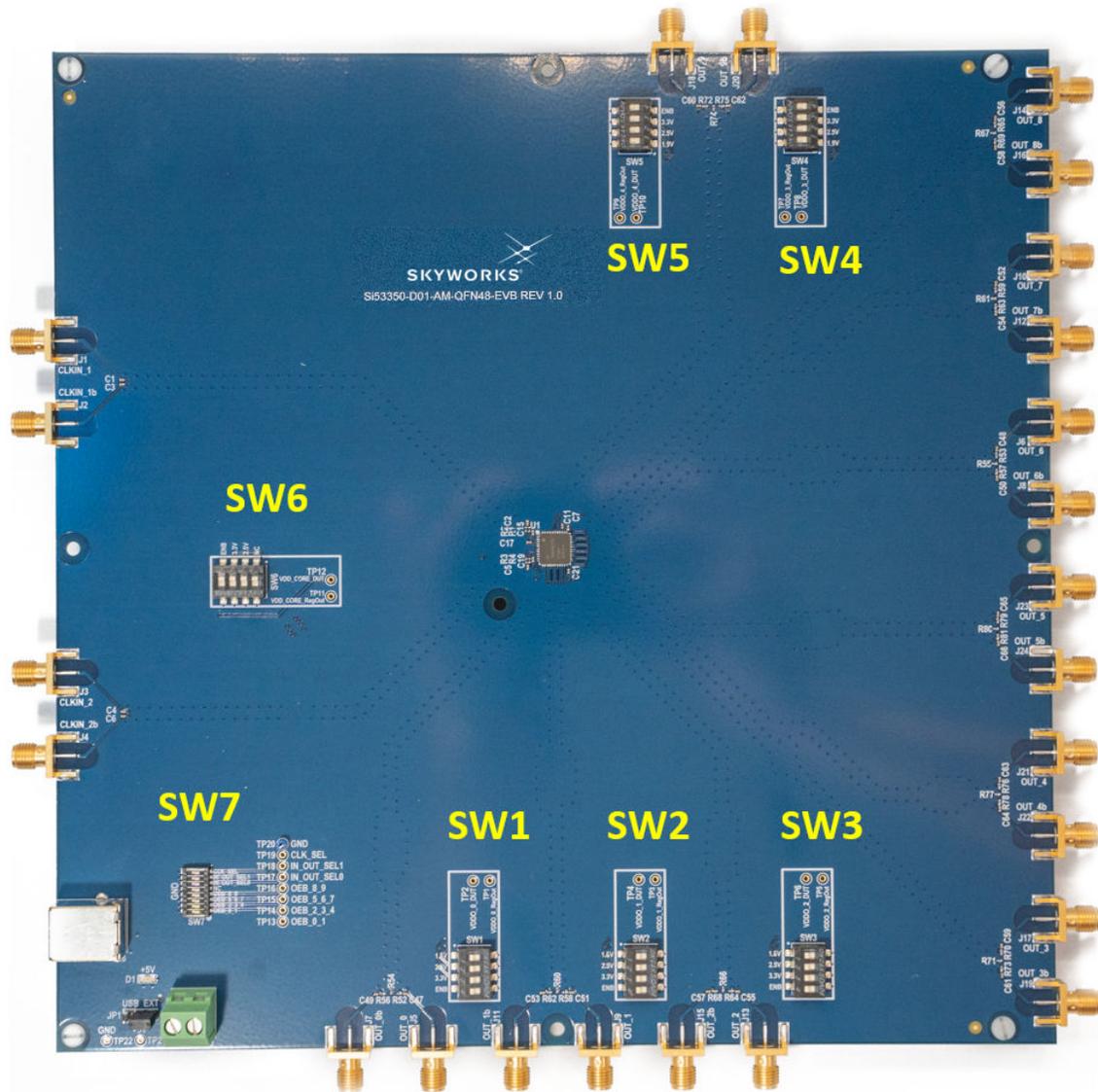
**SW7 Clock Format Selection:**

Clock Format Selection Switches			
IN_OUT_SEL1	IN_OUT_SEL0	Input Format	Output Format
ON (Low)	ON (Low)	LVC MOS	LVC MOS
ON (Low)	Off (High)	Differential	LVPECL
Off (High)	ON (Low)	Differential	LVDS
Off (High)	Off (High)	Differential	HCSL (50 Ω internal term)

**SW7 Input Clock Select:**

Input Clock Select Switch	
CLK_SEL	Input Clock
ON (Low)	CLKIN1
Off (High)	CLKIN2

**Location of DIP Switches:**



### 3. LEDs

The Si53350-D01-AM-QFN48-EVB has a single **Blue LED** (D1) near the USB connector which indicates +5 V presence.

## 4. Input Clocks

The Si53350-D01-AM-QFN48-EVB supports two input clocks, CLKIN\_1/1b and CLKIN\_2/2b, terminated as shown below. Use both sides of a pair (i.e., CLKIN\_1 and CLKIN\_1b) for differential input clocks. For LVCMOS inputs, only the positive input is needed, CLKIN\_1 or CLKIN\_2 respectively. Note that depending on the input clock termination requirements, the shown termination components may need to be modified or removed.

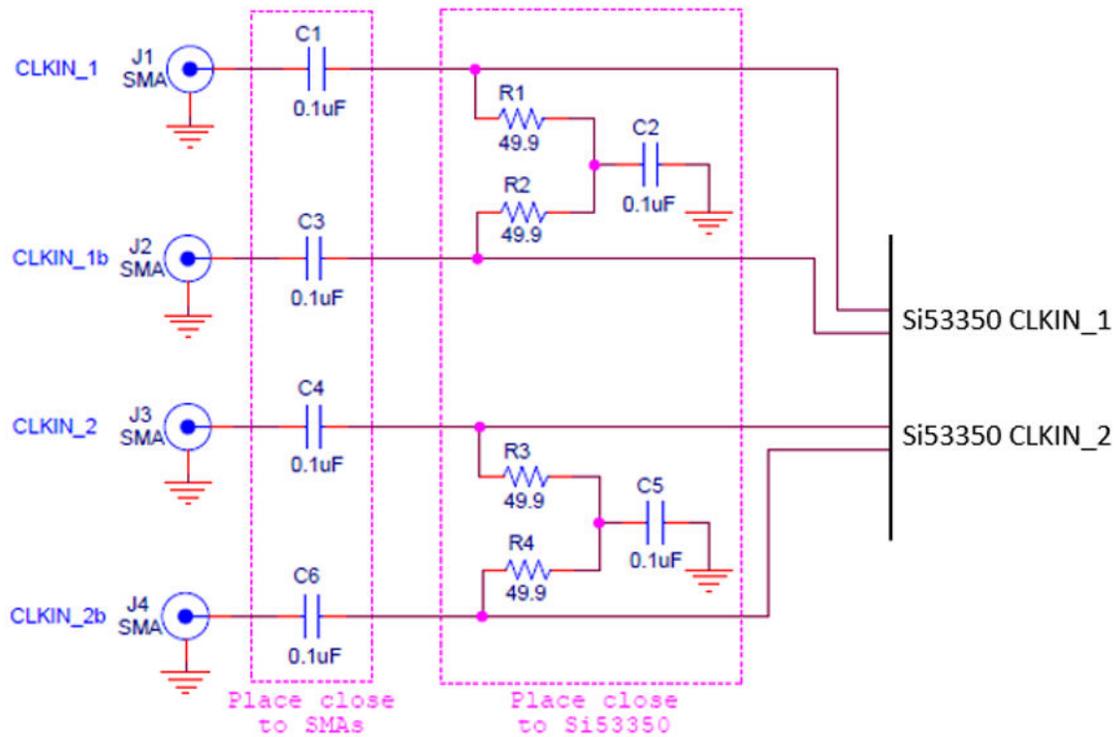


Figure 4.1. Si53350-D01-AM-QFN48-EVB Input Clock Termination Circuit

## 5. Output Clocks

The Si53350-D01-AM-QFN48-EVB supports up to 20 LVCMOS or 10 differential pair output clocks, each terminated as shown in the figure below. By default, the outputs are simply ac-coupled to the SMA connectors. The components tagged with “NI” are not installed and these locations are available for the user to populate with components as necessary for any specific termination requirements. If dc termination is required, the 0.1  $\mu\text{F}$  caps can be replaced with 0  $\Omega$  (or other suitable value) resistors.

The default output termination components (0  $\Omega$  and 0.1  $\mu\text{F}$ ) combined with the “NI” (not installed) component sites on the EVB can be used as locations to create the desired output termination configuration. For example, if dc output termination is required, the 0.1  $\mu\text{F}$  caps can be replaced with 0  $\Omega$  resistors. Note that not all possible termination schemes can be supported by the circuit below and in some cases external components may be required.

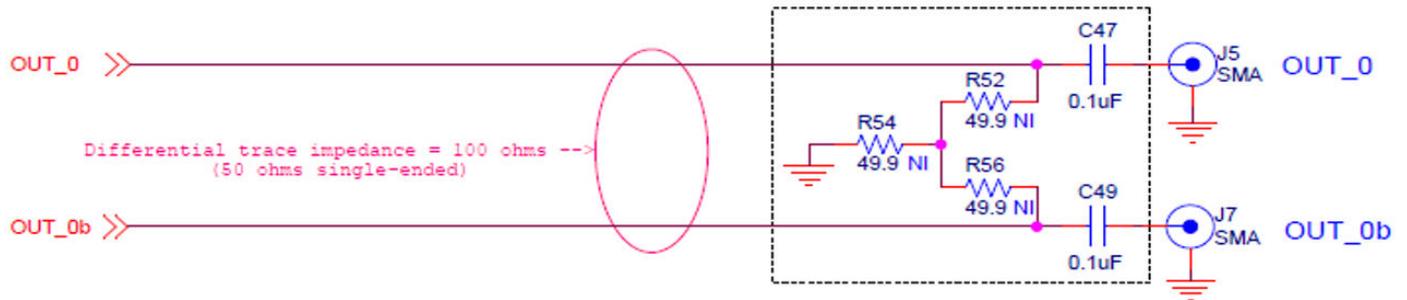


Figure 5.1. Si53350-D01-AM-QFN48-EVB Output Clock Termination Circuit

## **6. Si53350-D01-AM-QFN48-EVB Rev 1.0 Schematics**

Complete Si53350-D01-AM-QFN48-EVB schematic, BOM, and layout information can be found at the following link:

<https://www.skyworksinc.com/en/Products/Timing/Evaluation-Kits/clock-buffer/si53350-evaluation-kit>



# 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](http://www.skyworksinc.com/CBPro)



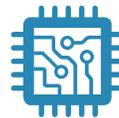
**Portfolio**

[www.skyworksinc.com/ia/timing](http://www.skyworksinc.com/ia/timing)



**SW/HW**

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



**Quality**

[www.skyworksinc.com/quality](http://www.skyworksinc.com/quality)



**Support & Resources**

[www.skyworksinc.com/support](http://www.skyworksinc.com/support)

### Copyright © 2021 Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks' Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of Skyworks' published specifications or parameters.

Skyworks, the Skyworks symbol, Sky5®, SkyOne®, SkyBlue™, Skyworks Green™, Clockbuilder®, DSPLL®, ISOModem®, ProSLIC®, and SiPHY® are trademarks or registered trademarks of Skyworks Solutions, Inc. or its subsidiaries in the United States and other countries. Third-party brands and names are for identification purposes only and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at [www.skyworksinc.com](http://www.skyworksinc.com), are incorporated by reference.