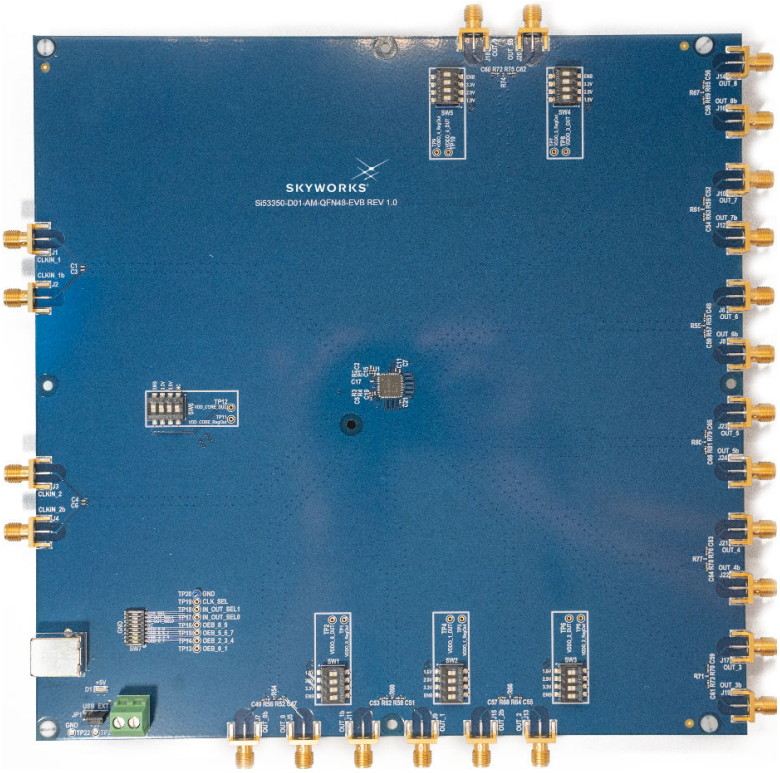
UG463: Si53350-A-EVB User's Guide (Using Si53350-D01-QFN48-EVB)

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

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.

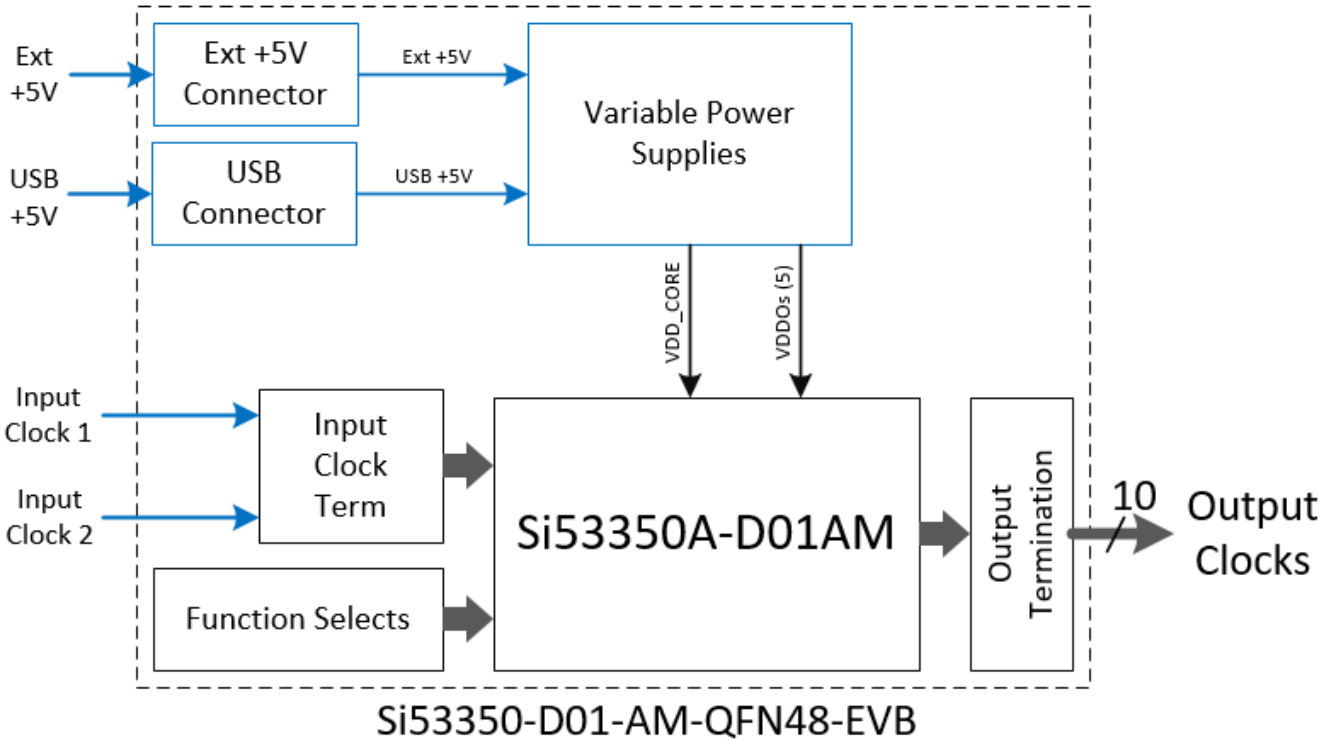


Figure 1.1. Si53350-D01-AM-QFN48-EVB Functional Block Diagram

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 [1]**	**2.5 V [1]**	**3.3 V [1]**	**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 [1]**	**3.3 V [1]**	**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).

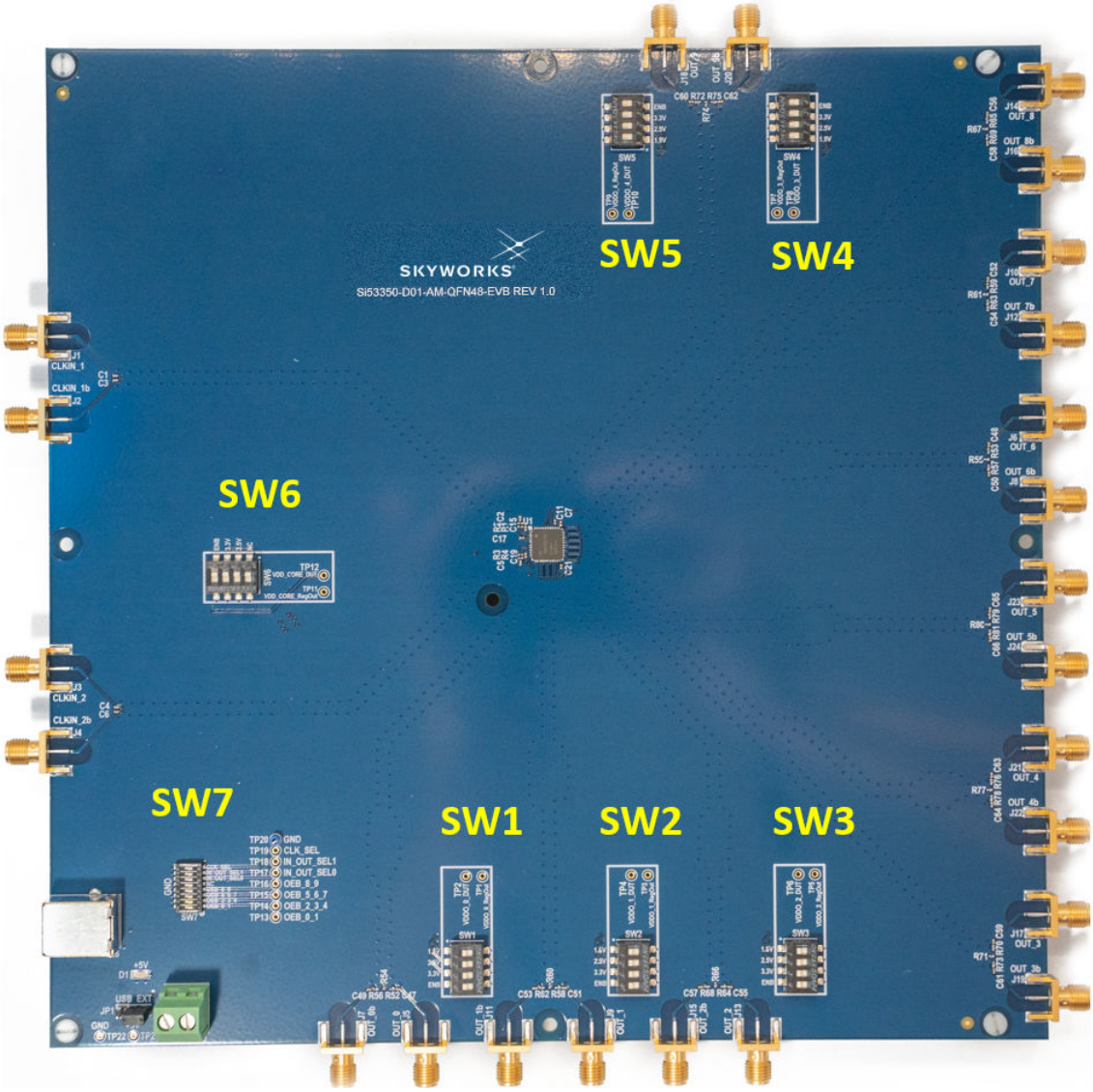
SW7 Clock Format Selection:

Clock Format Selection Switches			
IN_OUT_SEL1	IN_OUT_SEL0	Input Format	Output Format
ON (Low)	ON (Low)	LVCMOS	LVCMOS
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.

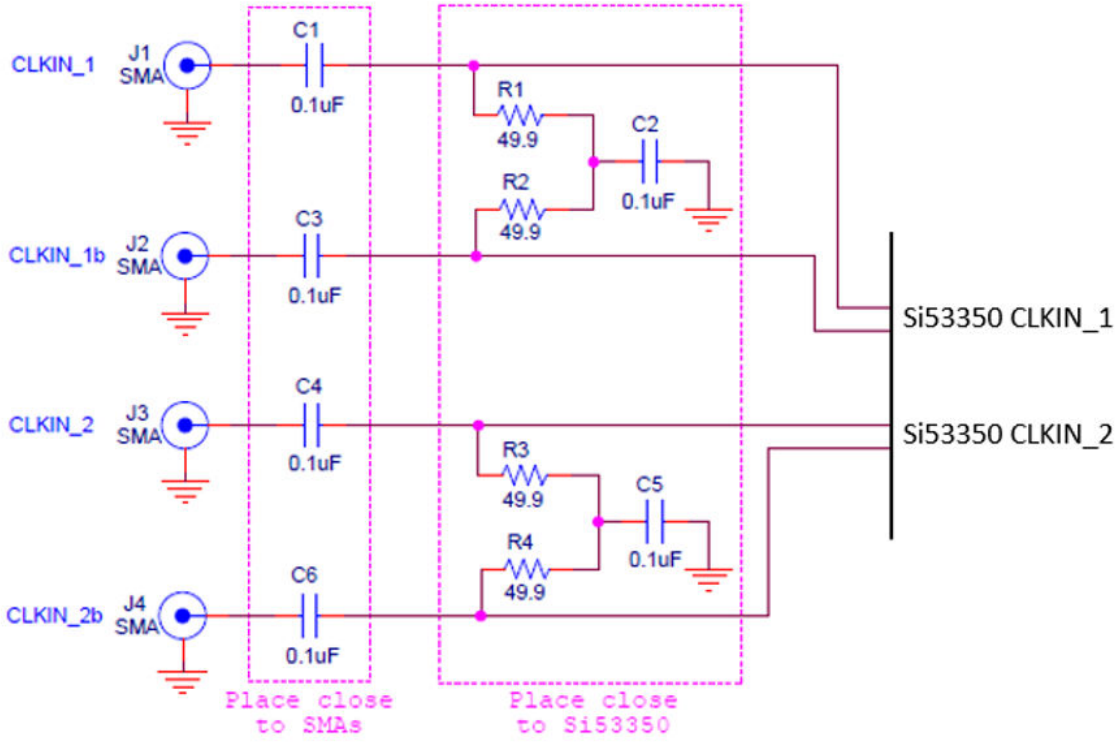


Figure 4.1. Si53350-D01-AM-QFN48-EVB Input Clock Termination Circuit

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 µF caps can be replaced with 0 Ω (or other suitable value) resistors.

The default output termination components (0 Ω and 0.1 µF) 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 µF caps can be replaced with 0 Ω resistors. Note that not all possible termination schemes can be supported by the circuit below and in some cases external components may be required.

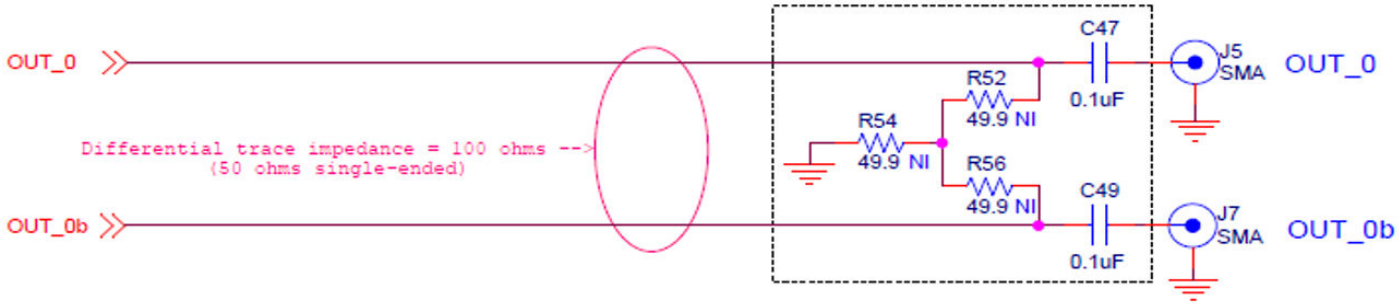


Figure 5.1. Si53350-D01-AM-QFN48-EVB Output Clock Termination Circuit

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

Portfolio
www.skyworksinc.com/ia/timing

SW/HW
www.skyworksinc.com/CBPro

Quality
www.skyworksinc.com/quality

Support & Resources
www.skyworksinc.com/support

Skyworks Solutions, Inc. | Nasdaq: SWKS | sales@skyworksinc.com | www.skyworksinc.com
USA: 781-376-3000 | Asia: 886-2-2735 0399 | Europe: 33 (0)1 43548540 |