

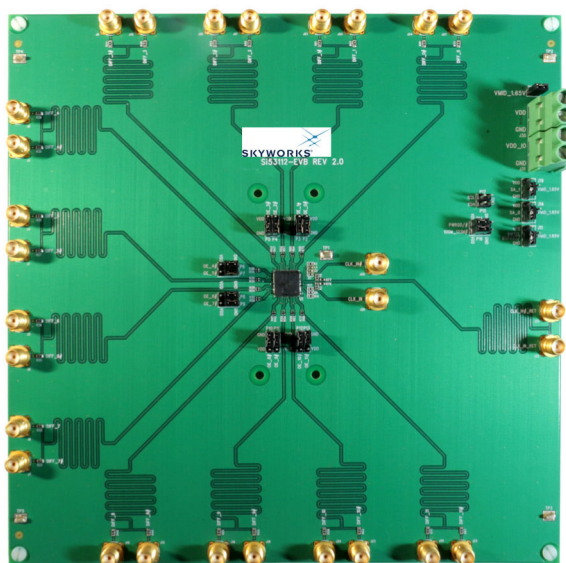
Si53112 EVALUATION BOARD USER'S GUIDE

Description

The Si53112-EVB can be used to evaluate the Si53112-A01AGM, a 12-output PCIe Gen1/2/3 buffer that can operate in either fanout or zero delay mode.

Features

- 10-inch traces to evaluate signal integrity
 - The signal traces of the input and outputs have a single-ended impedance of 50 ohms, and differential impedance of 100 ohms.
 - The series resistance on the outputs are set to match to this impedance design.
- DC pin controls per data sheet specification.
- Ability to measure input to output propagation delay.
- Ability to measure PCIe clock jitter.
- Ability to program features of Si53112-A01AGM via I²C interface.



1. Schematics

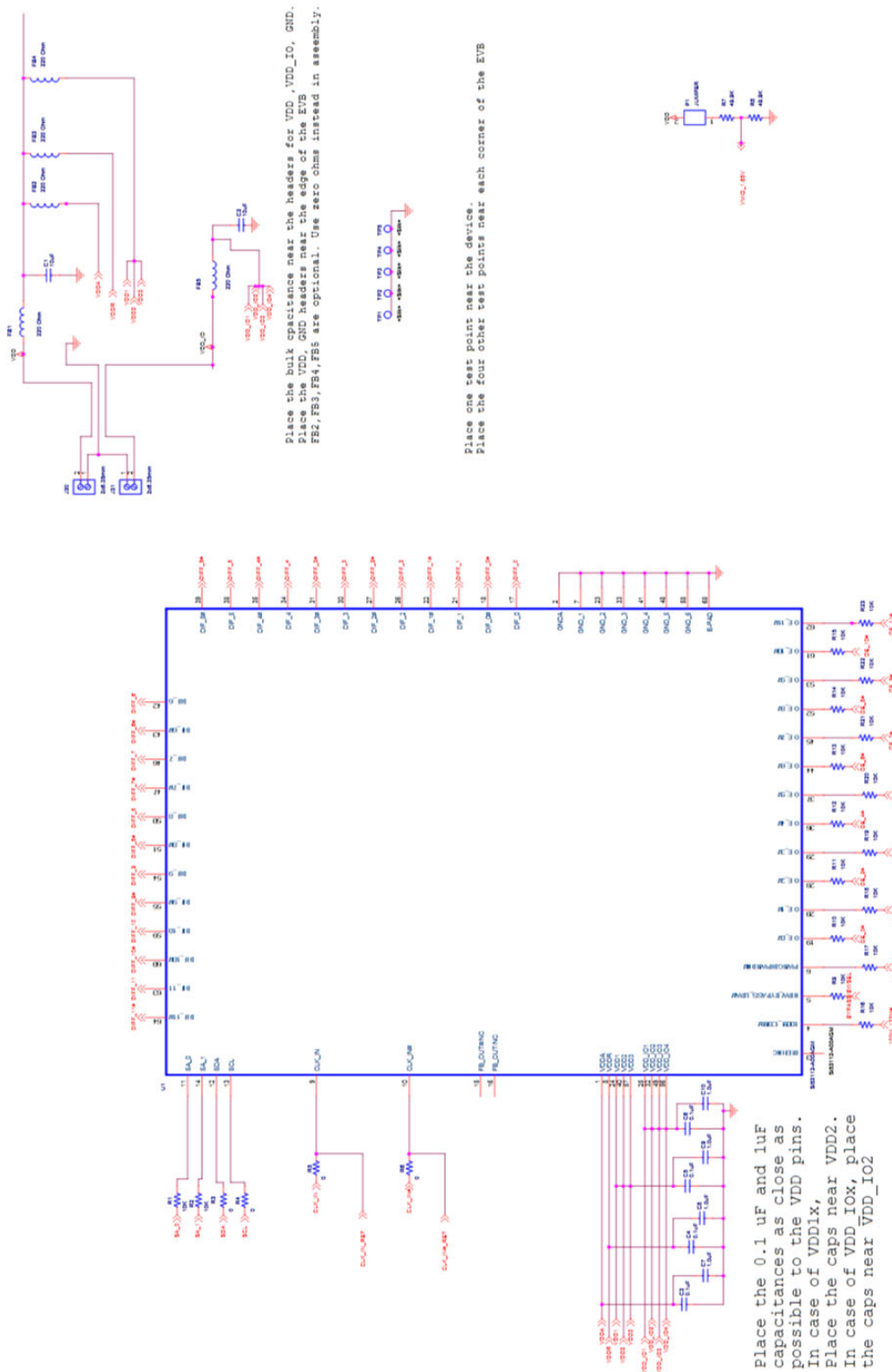


Figure 1. Schematic 1

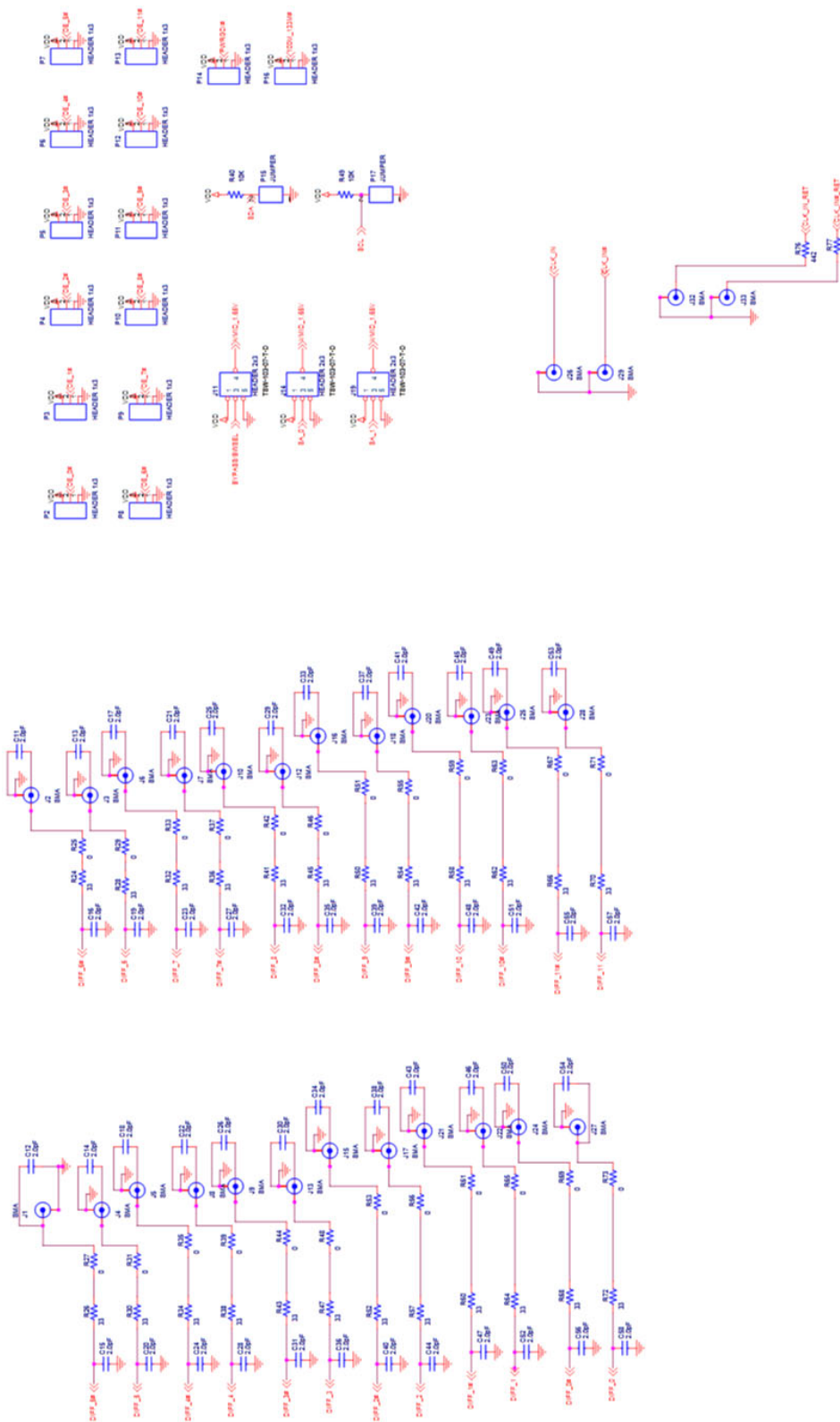


Figure 2. Schematic 2

2. Jumpers

Jumpers can be set per the diagram above. Please refer to the Si53112-A01AGM data sheet for a description on how the pin states affect the device. (M--Insert link here to data sheet when it's released.)

1. P2-P13 are OEBx pin controls (x=0 to 11) for each clock output pair. They can be pulled either to VDD or Ground.
2. P15 and P17 disable I2C control when shorted.
3. P14 can be used to set PWRGD# (VDD or Ground).
4. P16 can be used to set outputs clocks to either 100MHz or 133MHz (controls the 100_133@# pin).
5. Jumpers J11, J14, and J19 are tri-level jumpers that control BYPASS/BWSEL, SA_0, and SA_1 respectively.
6. P1 needs to be shorted to enable generation of VDD/2.

Default jumper setting on the EVB:

1. P2-P13 are all pulled to ground (all OE#x pins).
2. P15, P17 are shorted, disabling I²C.
3. P14 is shorted to VDD (PWRGD# = High).
4. P16 is shorted to VDD (100_133# = High).
5. BYPASS/BWSEL, SA_0, SA_1 are all pulled low (J11, J14, J19 pulled to ground).
6. P1 is shorted to enable VDD/2 (needed for tristate input pin conditioning).

3. Input and Power Supply Sequencing

The Si53112-A00AGM should be powered up with supply at both the VDD and VDD_IO nodes (at the jumpers available on the EVB). A 100 MHz or 133 MHz HCSL input clock should be applied to pins 9 and 10, and should comply with HCSL formats. There is no internal or onboard resistive termination, therefore HCSL termination needs to be provided at the input if needed by the driver. The input clock should be applied only after the supplies are stable.

4. Quick Start Guide:

1. Enable supply on the VDD pin.
2. Enable supply on the VDDIO pin.
3. Apply input clock on SMA connectors J26, J29 measure the return path clock on J32, J33 (as shown below).

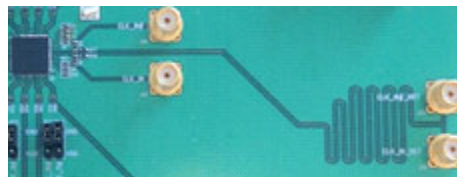


Figure 3. Clock Return Path

- a. The input clock measured at J32, J33 needs a 50-ohm termination on the scope.
 - b. The attenuation will be 1:10 after the above termination. Appropriate scaling (10x) needs to be set at the scope to adjust for the scaling.
4. The output clocks are now set up and can be measured on an oscilloscope or frequency domain measurement instrument.

5. Usage of the EVB

Once the EVB has been set up, the following can be evaluated:

1. Signal integrity of the device when driving 10-inch, 100-ohm differential traces.
2. Effect of capacitance load on output signal integrity.
3. Output-to-output skew over 10-inch traces.
4. Input-to-output propagation delay in BYPASS, HBW, and LBW modes using the input clock return path.
5. Measuring the power consumption of the device.
6. Modification of the device settings via the I²C interface.

Si53112-EVB

6. Bill of Materials

Item	NI	Quantity	Reference	Value	PCB Footprint	Manufacturer Part Number	Manufacturer	Sub	Comments
1		2	C1 C2	10uF	C0603	C0603X5R100-106K	Venkel		
2		4	C3 C4 C5 C6	0.1uF	C0402	C0402X7R100-104K	Venkel		
3		4	C7 C8 C9 C10	1.0uF	C0402	C0402X5R6R3-105K	Venkel		
4		24	C11 C12 C13 C14 C17 C18 C21 C22C25 C26 C29 C30 C33 C34 C37 C38 C41 C43 C45 C46 C49 C50 C53 C54	2.0pF	C0402	C0402C0G500-2R0B	Venkel		
5		24	C15 C16 C19 C20 C23 C24 C27 C28 C31 C32 C35 C36 C39 C40 C42 C44 C47 C48 C51 C52 C55 C56 C57 C58	2.0pF	C0402	C0402C0G500-2R0B	Venkel		DO NOT POPULATE
6		5	FB1 FB2 FB3 FB4 FB5	220 Ohm	L0402	BLM15EG221SN1	MuRata		
7		28	J1 J2 J3 J4 J5 J6 J7 J8 J9 J10 J12 J13 J15 J16 J17 J18 J20 J21 J22 J23 J24 J25 J26 J27 J28 J29 J32 J33	SMA	CONN-SMA-ST	142-0701-201	Johnson Components		
8		3	J11 J14 J19	HEADER 2x3	CONN2X3_4PIN	TSW-103-07-T-D	Samtec		
9		2	J30 J31	2x6.35mm	CONN-TB-1714955	1714955	Phoenix Contact		
10		3	P1 P15 P17	JUMPER	CONN1X2	TSW-102-07-L-S	Samtec		
11		14	P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P16	HEADER 1x3	CONN-1X3	TSW-103-07-L-S	Samtec		
12		17	R1 R2 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23	10K	R0402	CR0402-16W-103J	Venkel		
13		2	R3 R4	0	R0402	CR0402-16W-000	Venkel		
14		26	R5 R6 R25 R27 R29 R31 R33 R35 R37 R39 R42 R44 R46 R48 R51 R53 R55 R56 R59 R61 R63 R65 R67 R69 R71 R73	0	R0805	CR0805-10W-000	Venkel		
15		2	R7 R8	49.9K	R0402	CR0402-16W-4992D	Venkel		
16		24	R24 R26 R28 R30 R32 R34 R36 R38 R41 R43 R45 R47 R50 R52 R54 R57 R58 R60 R62 R64 R66 R68 R70 R72	33	R0402	CR0402-16W-330J	Venkel		
17		2	R40 R49	10K	R0402	CR0402-16W-1002F	Venkel		
18		2	R74, R75	442	R0603	ERJ-3EKF4420V	Panasonic		
19		5	TP1 TP2 TP3 TP4 TP5	TESTPOINT	TP_COMPACT_SMT	5016	Keystone		
20		1	U1	Si53112-A00AGM	QFN64M9X9P0.5E6.1	Si53112-A00AGM	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



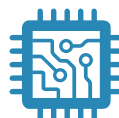
Portfolio

www.skyworksinc.com/ia/timing



SW/HW

www.skyworksinc.com/CBPro



Quality

www.skyworksinc.com/quality



Support & Resources

www.skyworksinc.com/support

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, are incorporated by reference.

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 | [in](#) [f](#) [t](#) [v](#)