

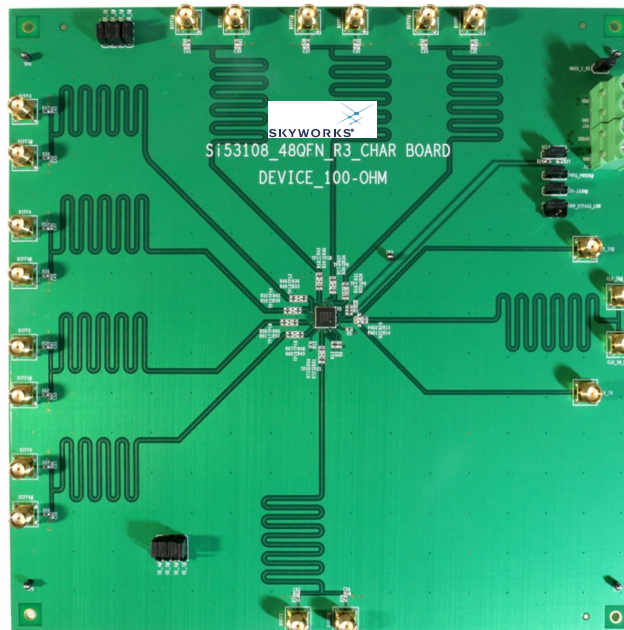
## Si53108 EVALUATION BOARD USER'S GUIDE

### Description

The Si53108-EVB can be used to evaluate the Si53108-A01AGM, an 8-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 Si53108-A01AGM via I<sup>2</sup>C interface.



# Si53108-EVB

## 1. Schematics

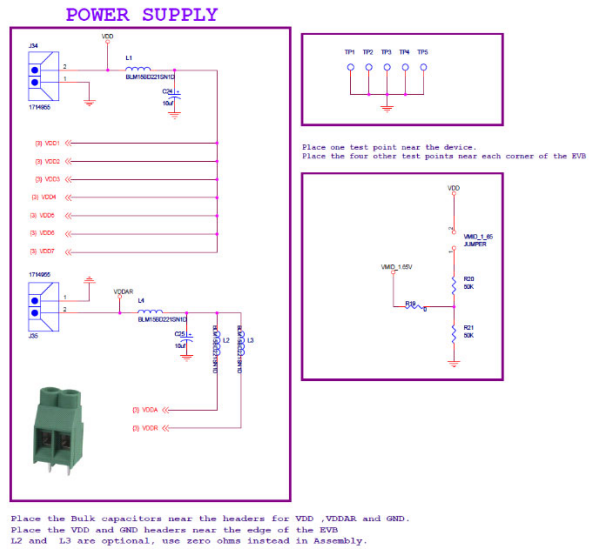
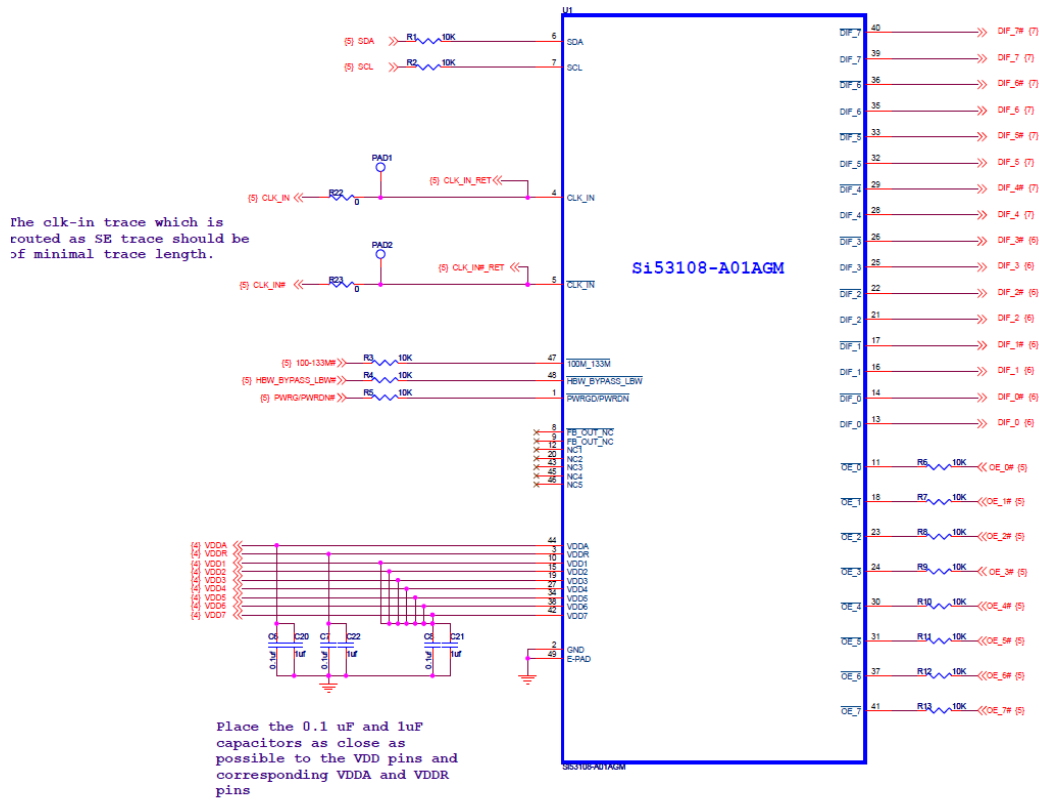


Figure 1. Schematic 1

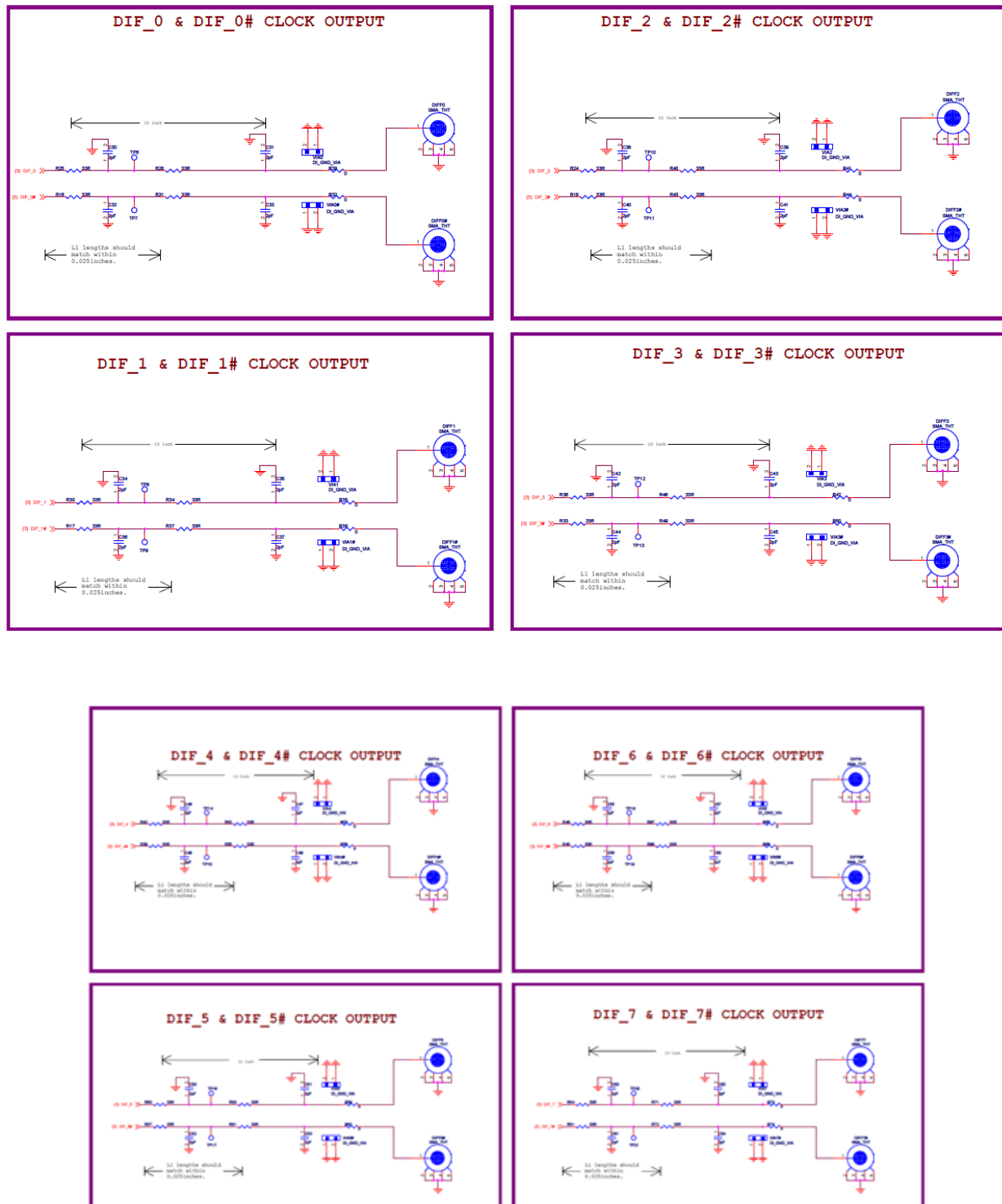


Figure 2. Schematic 2

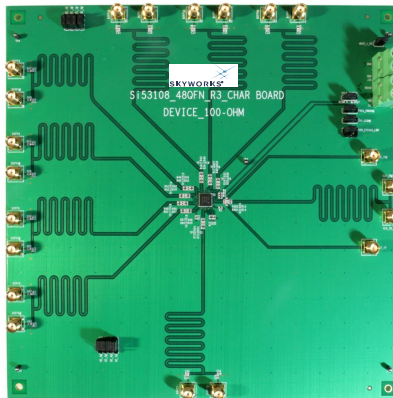


## 2. Input and Power Supply Sequencing

The Si53108-A01AGM should be powered up with supply at both the VDD and VDD\_IO nodes (at the jumpers available on the EVB). A 100MHz or 133MHz HCSL input clock should be applied to pins 8 and 9. There is no internal or on-board 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.

## 3. Quick Start Guide:

1. Enable supply on the VDD pin.
2. Enable supply on the VDDIO pin.
3. Apply input clock on the SMA connectors CLK\_IN/CLK\_IN# and measure the return path clock on CLK\_IN\_RET, CLK\_IN#\_RET.



**Figure 4. 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.

## 4. Usage of the EVB

1. Once the EVB has been set up, the following can be evaluated:
2. Signal integrity of the device when driving 10-inch, 100-ohm differential traces.
3. Effect of capacitance load on output signal integrity.
4. Output-to-output skew over 10-inch traces.
5. Input-to-output propagation delay in BYPASS, HBW, and LBW modes using the input clock return path.
6. Measuring the power consumption of the device.
7. Modification of the device settings via the I<sup>2</sup>C interface.

5. Bill of Materials

Item	Quantity	Reference	Part	PCB Footprint	Part Number	Description	Manufacturer	Comments
1	20	DIFF1# DIFF1 DIFF2# DIFF2 DIFF3# DIFF3# DIFF4# DIFF4 DIFF5# DIFF5 DIFF6# DIFF6# DIFF7# DIFF7 DIFF0# DIFF0 CLK_IN_RET. CLK_IN# RET_CLK_IN# CLK_IN	SMA_THT	SMA_THT	LTI-SASF54GT	Vertical PCB Thru Hole SMA Jack	LIGHTHORSE	Component Reference-305.PD-13-1158
2	3	C6 C7 C8	0.1uf	CC0402	C1005X5R1A104K	CAP CER 0.1UF 10V 10% X5R 0402	TDK Corporation	
3	3	C20 C21 C22	1uf	CC0402	C1005X5R1A105K	CAP CER 1UF 10V 10% X5R 0402	TDK Corporation	
4	2	C24 C25	10uf	C3216-A	T494A106M020AT	CAP TANT 10UF 20V 20% 1206	Kemet	Component Reference-305.PD-13-1158
5	32	C30 C31 C32 C33 C34 C35. C36 C37 C38 C39 C40 C41. C42 C43 C44 C45 C46 C47. C48 C49 C50 C51 C52 C53. C54 C55 C56 C57 C58 C60. C61 C62	2pF	CC0402	C1005C0G1H020C	CAP CER 2PF 50V NP0 0402	TDK Corporation	
6	1	HBW_BYPASS_LBW	HEADER_4_1	BERG4P	PZC04SABN	CONN HEADER 100 SINGL STR 4POS	Sullins Connector Solutions	Component Reference-305.PD-13-1158
7	2	J34 J35	1714955	1714955	1714955	CONN TERM BLOCK 2POS 6.35MM PCB	Phoenix Contact	
8	4	L1 L2 L3 L4	BLM15BD221SN1D	L0402	BLM15BD221SN1D	FERRITE CHIP 220 OHM 300MA 0402	Murata Electronics North America	
9	11	SCLK_SDATA1 OE_1# OE_2#. OE_3# OE_4# OE_5# OE_6#. OE_7# 100-133M#. PWRG_PWRDN# OE_0#	HEADER 3	BERG3P	PZC03SABN	CONN HEADER 100 SINGL STR 3POS	Sullins	Component Reference-305.PD-13-1158
10	2	PAD1 PAD2	PAD	PAD				NOT A PART
11	15	R1 R2 R3 R4 R5 R6 R7 R8. R9 R10 R11 R12 R13 R26. R27	10K	RC0402	RC0402JR-0710KL	RES 10K OHM 1/16W 5% 0402 SMD	Yageo	
12	2	R14 R15	442R	RC0402	RMCF0402FT442R	RES 442 OHM 1/16W 1% 0402	Stackpole Electronics Inc	
13	32	R16 R17 R18 R24 R25 R28. R30 R31 R33 R34 R36 R37. R39 R40 R42 R43 R45 R46. R48 R49 R51 R52 R54 R55. R57 R58 R60 R61 R67 R68. R71 R72	33R	RC0402	ERJ-2RKF33R0X	RES 33.0 OHM 1/10W 1% 0402 SMD	Panasonic - ECG	
14	19	R19 R22 R23 R29 R32 R35. R38 R41 R44 R47 R50 R53. R56 R59 R62 R65 R66 R73. R74	0	RC0402	RC0402JR-070RL	RES 0.0 OHM 1/16W 0402 SMD	Yageo	
15	2	R20 R21	50K	RC0402	RC0402FR-0749K9L	RES 49.9K OHM 1/16W 1% 0402 SMD	Yageo	
16	5	TP1 TP2 TP3 TP4 TP5	T_POINT B	TP	5001	TEST POINT PC MINI 040"D BLACK	Keystone Electronics	Component Reference-305.PD-13-1158
17	16	TP6 TP7 TP8 TP9 TP10. TP11 TP12 TP13 TP14 TP15. TP16 TP17 TP18 TP19 TP20. TP21	T_POINT B	TESTPOINT				NOT A PART
18	1	U1	SI53108-A01AGM	48QFN				CUSTOMER PART
19	16	VIA1# VIA1 VIA2# VIA2. VIA3# VIA3 VIA4# VIA4. VIA5# VIA5 VIA6# VIA6. VIA7# VIA7 VIA0# VIA0	DI_GND_VIA	DI_GND_VIA				NOT A PART
20	1	VMD_1_65	JUMPER	BERG_1X2		Two Pin Regular 100mil Header		REGULAR HEADER



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