Si53108-EVB

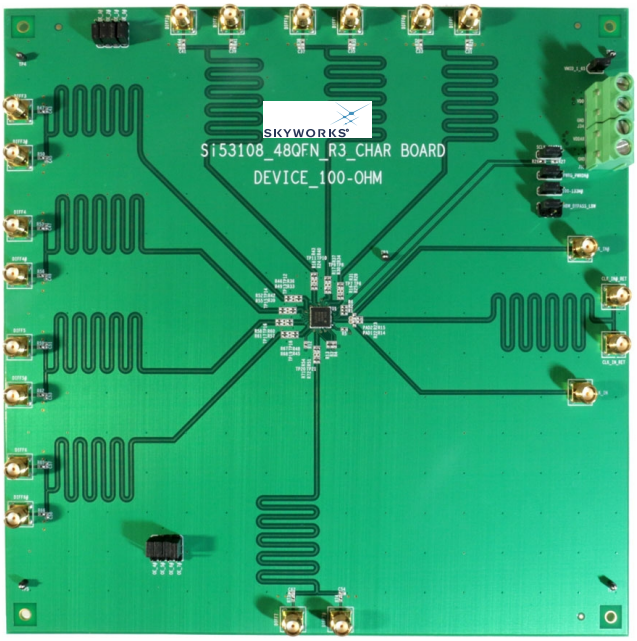
Si53108 Evaluation Board User's Guide

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^2C interface.



1. Schematics

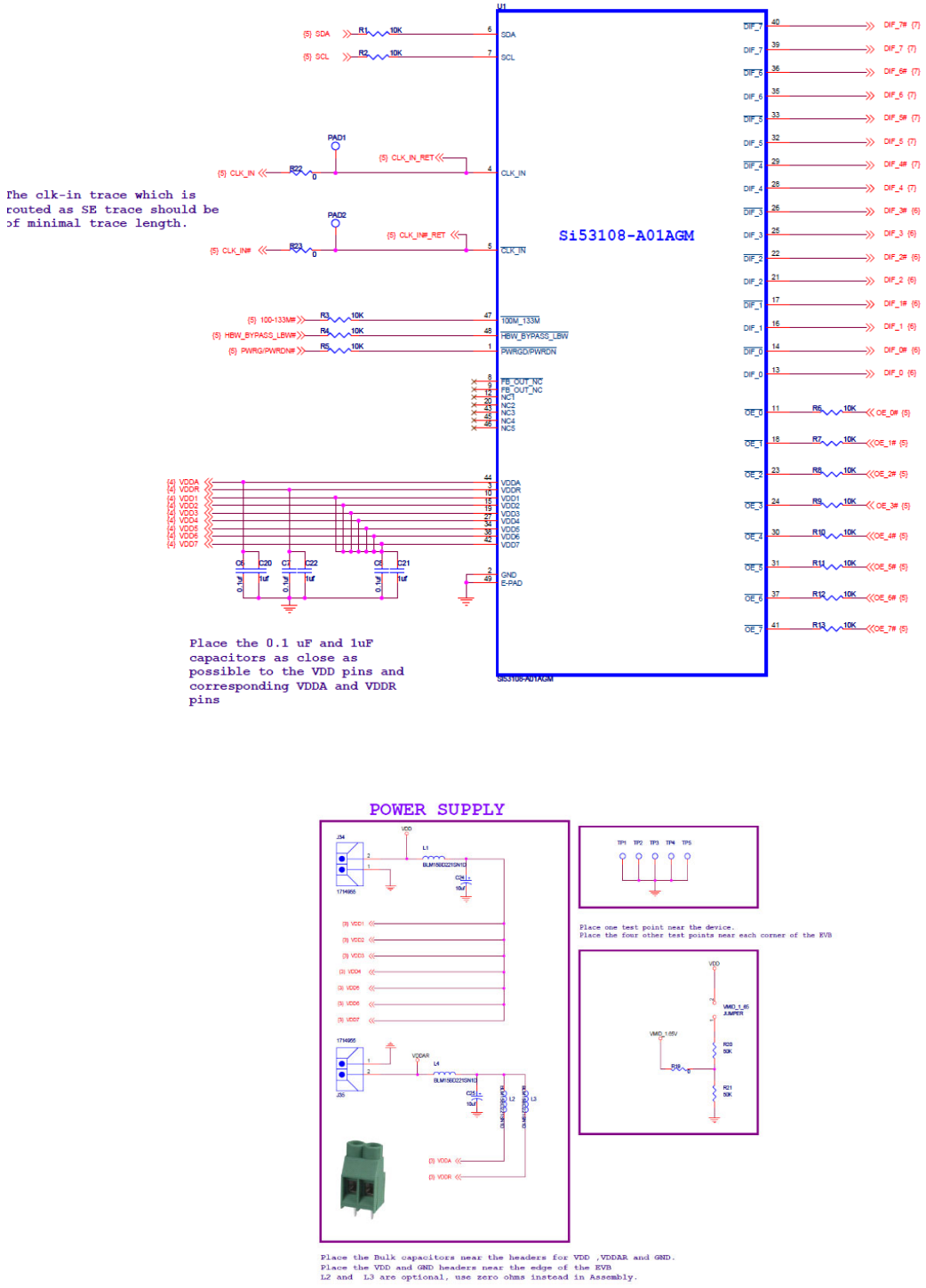


Figure 1. Schematic 1

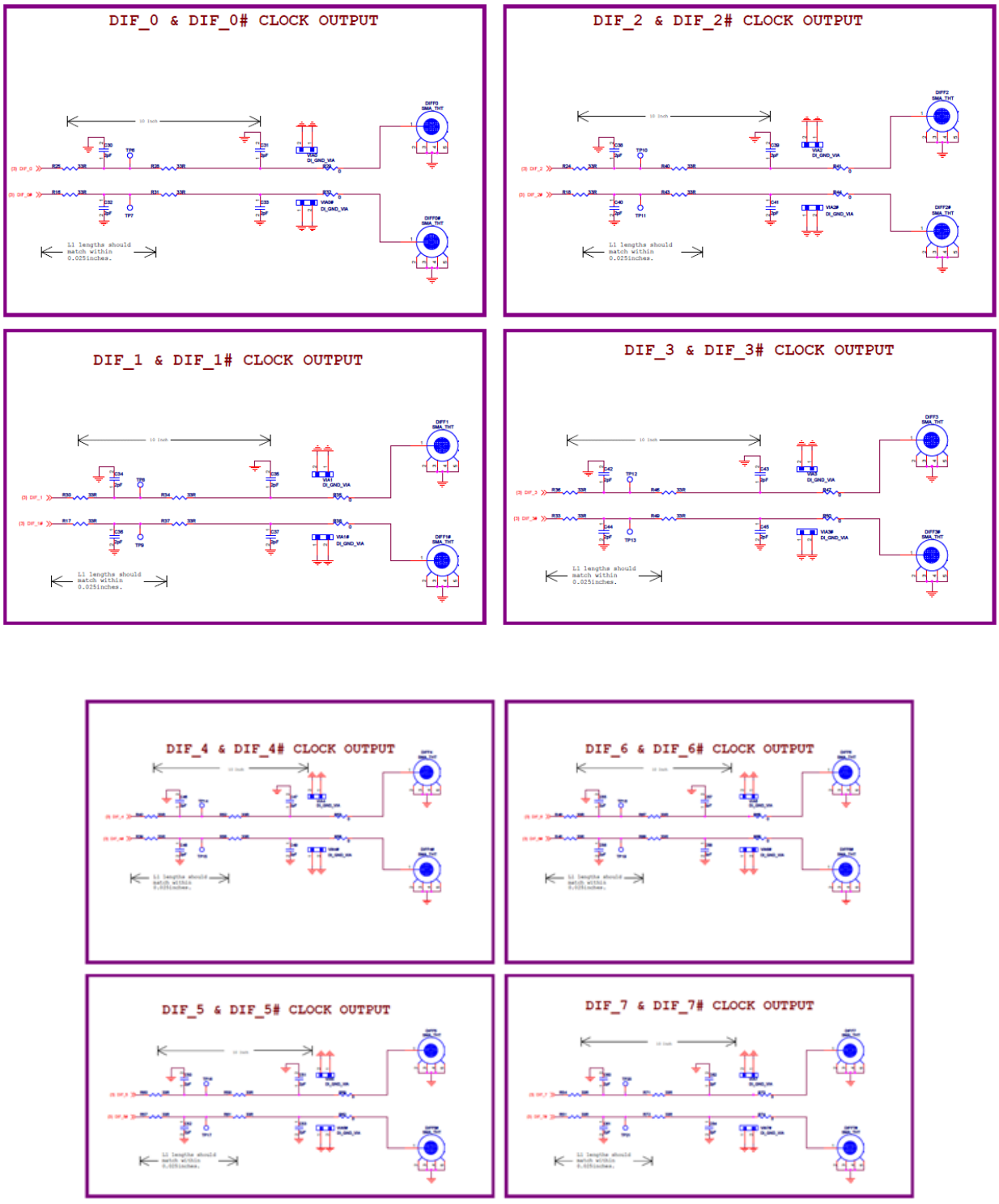


Figure 2. Schematic 2

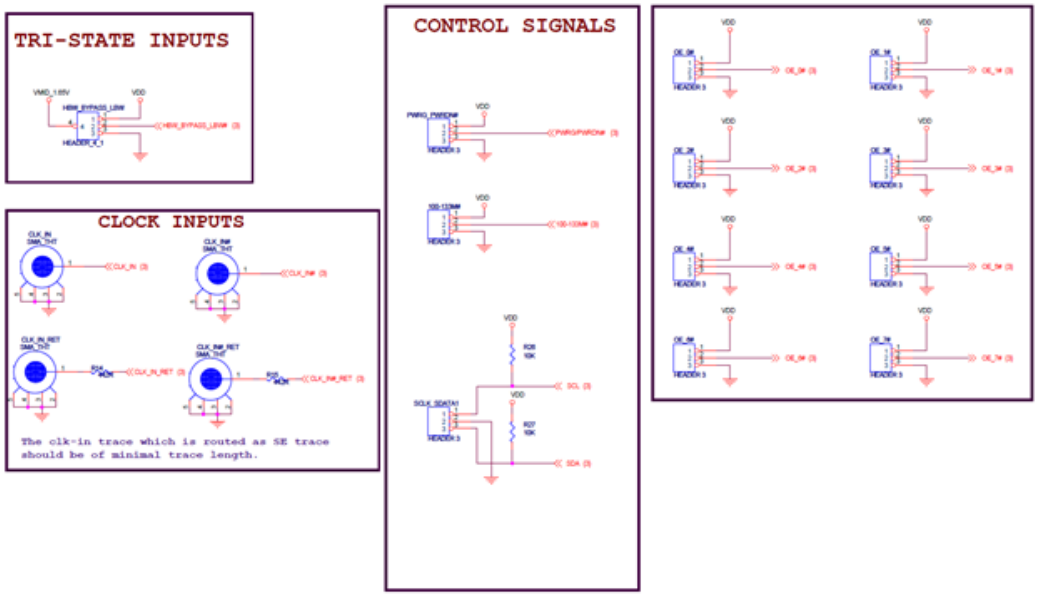


Figure 3. Schematic 3

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.

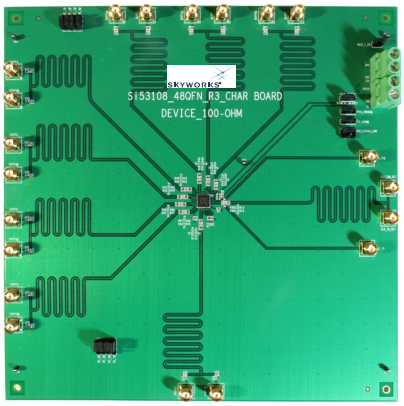


Figure 4. Clock Return Path

   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 prorogation 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^2C interface.

5. Bill of Materials

Item	Quantity	Reference	Part	PCB Footprint	Part Number	Description	Manufacturer	Comments
1	20	DIFF1#,DIFF1_DIFF2#	SMA_THT	SMA_THT	LTI-SASF54GT	Vertical PCB Thru Hole SMA Jack	LIGHTHORSE	Component Reference-305-PD-13-1158
		DIFF2_DIFF3#,DIFF3_						
		DIFF4#,DIFF4_DIFF5#,						
		DIFF5_DIFF6#,DIFF6_						
		DIFF7#,DIFF7_DIFF0#,						
		DIFF0_CLK_IN_RET_						
		CLK_IN#_RET,CLK_IN#_						
		CLK_IN						
2		C6,C7,C8	0.1uf	C0402	C1005X5R1A104K	CAP CER 0.1UF 10V 10% X5R 0402	TDK Corporation	
3		C20,C21,C22	1uf	C0402	C1005X5R1A105K	CAP CER 1UF 10V 10% X5R 0402	TDK Corporation	
4		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,	2pF	C0402	C1005C0G1H020C	CAP CER 2PF 50V NP0 0402	TDK Corporation	
		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						
6		1 HBW_BYPASS_LBW	HEADER_4_1	BERG4P	P2C04SABN	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#,	HEADER_3	BERG3P	P2C03SABN	CONN HEADER .100 SINGL STR 3POS	Sullins	Component Reference-305-PD-13-1158
		OE_3#,OE_4#,OE_5#,OE_6#,						
		OE_7#,100-133M#,						
		PWRG_PWRDN#,OE_0#						
10		8 PAD1,PAD2	PAD	PAD				NOT A PART
11		15 R1,R2,R3,R4,R5,R6,R7,R8,	10K	RC0402	RC0402JR-0710KL	RES 10K OHM 1/16W 5% 0402 SMD	Yageo	
		R9,R10,R11,R12,R13,R26,						
		R27						
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,	33R	RC0402	ERJ-2RKF33R0X	RES 33.0 OHM 1/10W 1% 0402 SMD	Panasonic - ECG	
		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						
14		19 R19,R22,R23,R29,R32,R35,	0	RC0402	RC0402JR-070RL	RES 0.0 OHM 1/16W 0402 SMD	Yageo	
		R38,R41,R44,R47,R50,R53,						
		R56,R59,R62,R65,R66,R73,						
		R74						
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,	T POINT B	TESTPOINT				NOT A PART
		TP11,TP12,TP13,TP14,TP15,						
		TP16,TP17,TP18,TP19,TP20,						
		TP21						
18		1 U1	Si53108-A01AGM	48QFN				CUSTOMER PART
19		16 VIA1#,VIA1_VIA2#,VIA2_	DI_GND_VIA	DI_GND_VIA				NOT A PART
		VIA3#,VIA3_VIA4#,VIA4_						
		VIA5#,VIA5_VIA6#,VIA6_						
		VIA7#,VIA7_VIA0#,VIA0						
20		1 VMID_1_65	JUMPER	BERG_1X2		Two Pin Regular 100mil Header		REGULAR HEADER

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