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## Si53108 EVALUATION BOARD USER'S GUIDE

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### Description

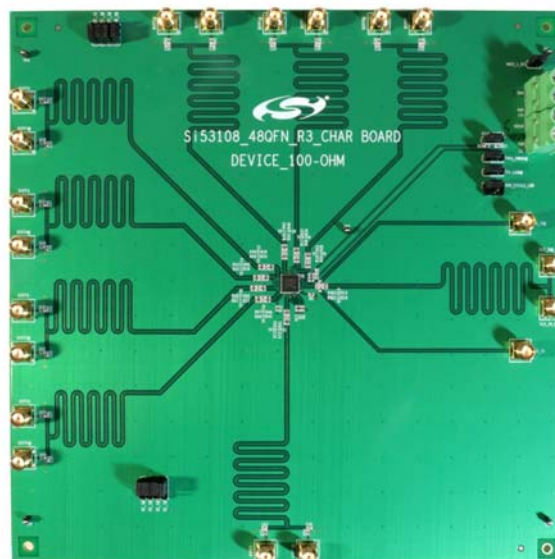
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The Si53108-EVB can be used to evaluate the Si53108-A01AGM, an 8-output PCIe Gen1/2/3 buffer that can operate in either fanout or zero delay mode.

### Features

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- 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

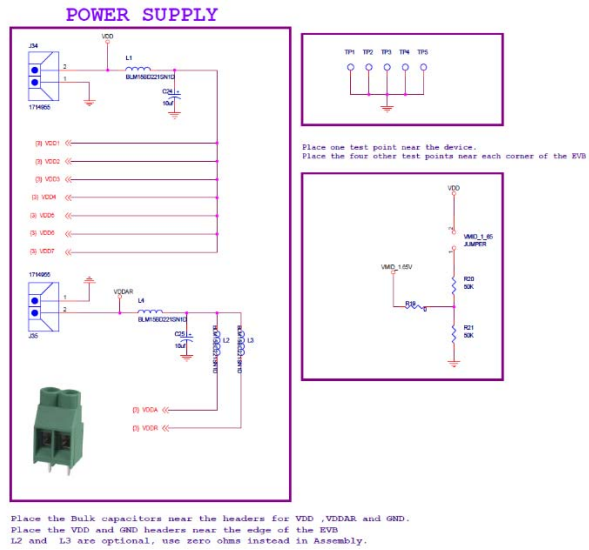
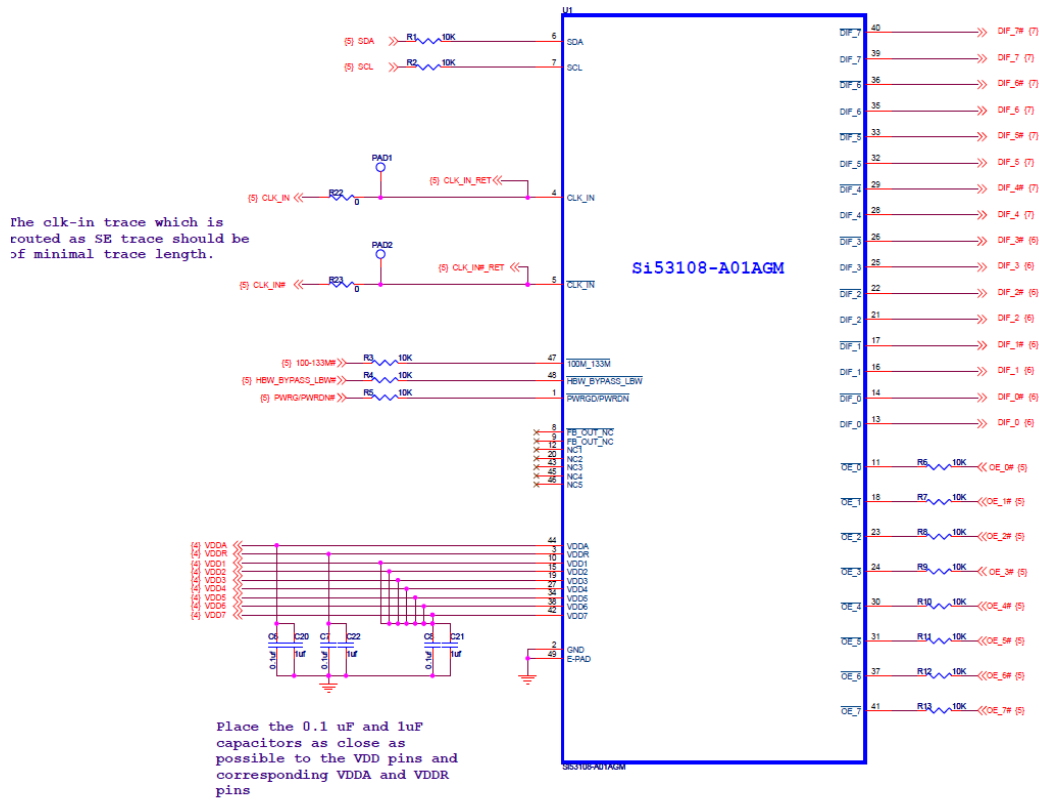


Figure 1. Schematic 1

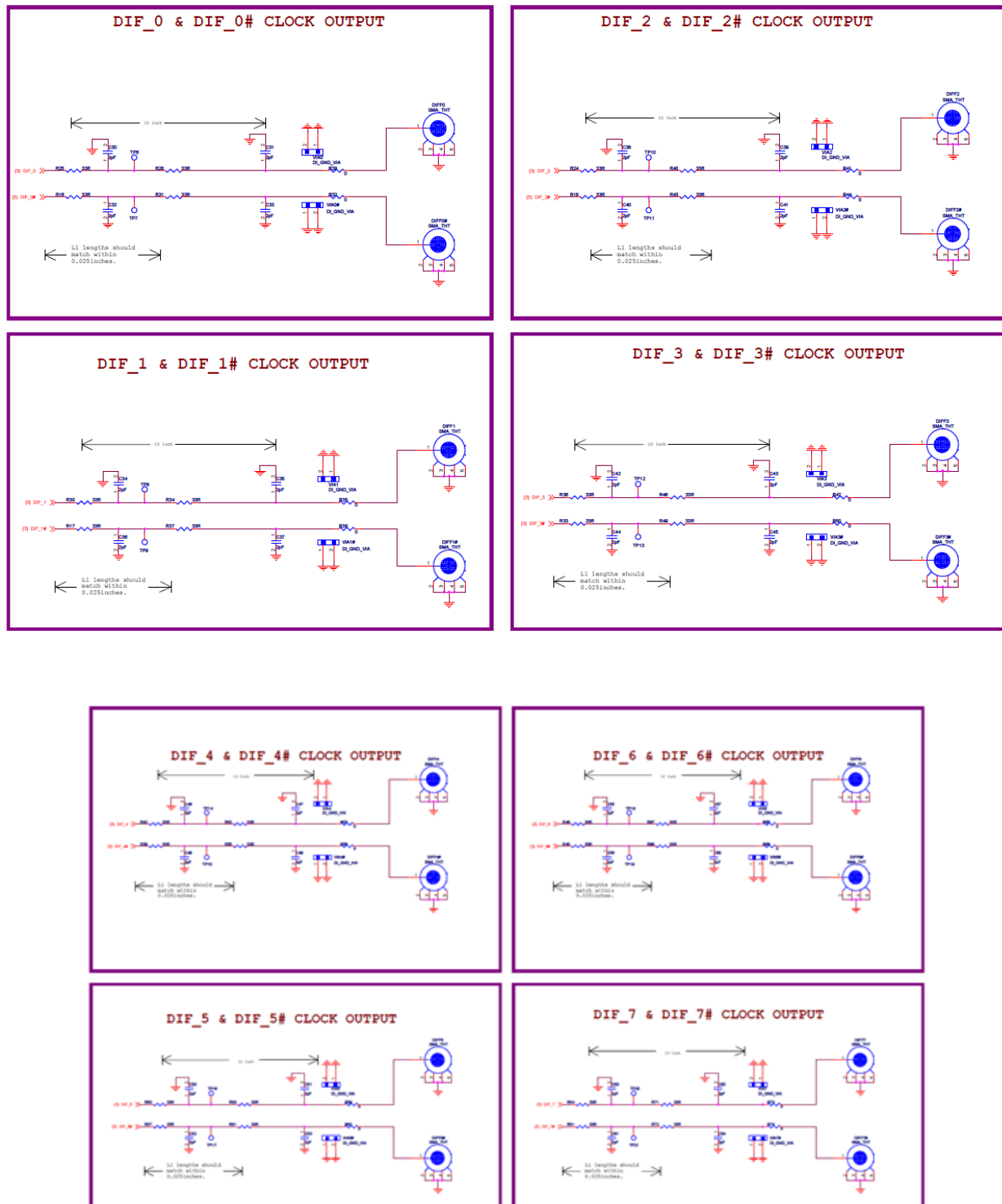


Figure 2. Schematic 2

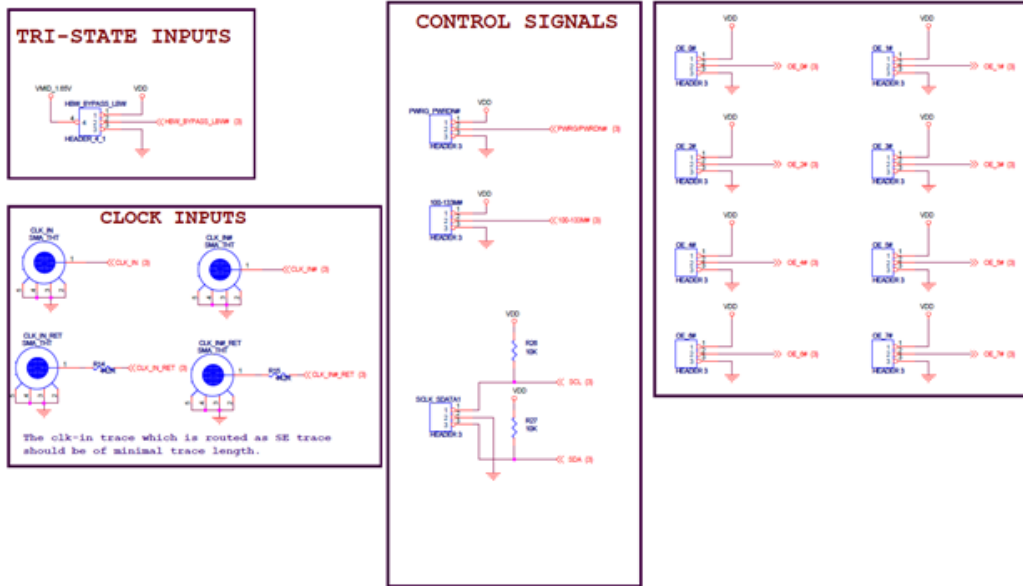


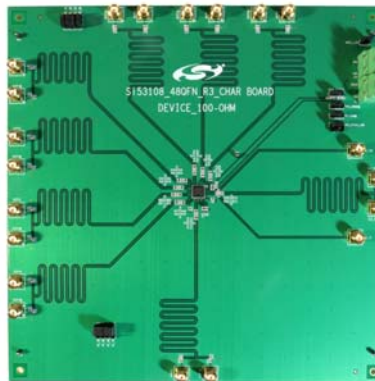
Figure 3. Schematic 3

## 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 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	DIFF10,DIFF11,DIFF23,DIFF2,DIFF3,DIFF5,DIFF6,DIFF8,DIFF9,DIFF10,DIFF11,DIFF12,DIFF13,DIFF14,DIFF15,DIFF16,DIFF17,DIFF18,DIFF19,DIFF20,DIFF21,DIFF22,DIFF24,DIFF25,DIFF26,DIFF27,DIFF28,DIFF29,DIFF30,DIFF31,DIFF32,DIFF33,DIFF34,DIFF35,DIFF36,DIFF37,DIFF38,DIFF39,DIFF40,DIFF41,DIFF42,DIFF43,DIFF44,DIFF45,DIFF46,DIFF47,DIFF48,DIFF49,DIFF50,DIFF51,DIFF52,DIFF53,DIFF54,DIFF55,DIFF56,DIFF57,DIFF58,DIFF59,DIFF60,DIFF61,DIFF62,DIFF63,DIFF64,DIFF65,DIFF66,DIFF67,DIFF68,DIFF69,DIFF70,DIFF71,DIFF72,DIFF73,DIFF74,DIFF75,DIFF76,DIFF77,DIFF78,DIFF79,DIFF80,DIFF81,DIFF82,DIFF83,DIFF84,DIFF85,DIFF86,DIFF87,DIFF88,DIFF89,DIFF90,DIFF91,DIFF92,DIFF93,DIFF94,DIFF95,DIFF96,DIFF97,DIFF98,DIFF99,DIFF100	SMA_TH1	L1:50SF14GT	Vertical PCB thru Hole SMA Jack	UGRHORSE	Component Reference 305-PD.13-1158	
2	3,05	C7,C8	0 1uF	CC0402	C1095UR1A104K	CAP CER 0.1uF 10V 10% X5R 0402	TDK Corporation	
3	3,05	C9,C10	10uF	CC0402	C1095UR1A105K	CAP CER 10uF 10V 10% X5R 0402	TDK Corporation	
4	2,04	C25,C26	10uF	C3216A	745A100M0000AT	CAP TANT 100UF 20V 20% 1206	Avnet	Component Reference 305-PD.13-1158
5	32	C37,C38,C39,C40,C41,C42,C43,C44,C45,C46,C47,C48,C49,C50,C51,C52,C53,C54,C55,C56,C57,C58,C59,C60	2pF	CC0402	C1095C03H920C	CAP CER 2PF 50V NP0 0402	TDK Corporation	
6	1	11,12,13,14	HEADER 4 1	BERG3P	P202AS4EN	CONN HEADER 100 SHIEL STR 4POS	Sullins Connector Solutions	Component Reference 305-PD.13-1158
7	2	15,16,17,18	1714855	1714855	1714855	CONN TERM BLOCK ZPOS 6 3MM PCB	Phoenix Contact	
8	4	L1,L2,L3,L4	BLM15ED21SHD	L0402	BLM15ED21SHD	FERRITE CHIP 220 OHM 300MA 0402	Murata Electronics North America	
9	11	SCLK,SDATA0,OE_19,OE_20,OE_21,OE_22,OE_23,OE_24,OE_25,OE_26,OE_27,OE_28,OE_29,OE_30,OE_31,OE_32,OE_33,OE_34,OE_35,OE_36,OE_37,OE_38,OE_39,OE_40,OE_41,OE_42,OE_43,OE_44,OE_45,OE_46,OE_47,OE_48,OE_49,OE_50,OE_51,OE_52,OE_53,OE_54,OE_55,OE_56,OE_57,OE_58,OE_59,OE_60	HEADER 3	BERG3P	P202AS4EN	CONN HEADER 100 SHIEL STR 3POS	Sullins	Component Reference 305-PD.13-1158
10	2	PA01,PA02	PA02	PA02	RCN02JR-0710K	RES 10K 08M 1/16W 5% 0402 SMD	Yageo	NOT A PART
11	15	R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11,R12,R13,R26,R27	10K	RC0402	RCN02JR-0710K	RES 10K 08M 1/16W 5% 0402 SMD	Yageo	
12	2	R14,R15	442R	RC0402	RMCF0402F442R	RES 442 OHM 1/16W 1% 0402	Saskpole Electronics Inc	
13	32	R16,R17,R18,R24,R25,R29,R30,R31,R32,R33,R34,R35,R36,R37,R38,R39,R40,R41,R42,R43,R44,R45,R46,R47,R48,R49,R51,R52,R54,R55,R57,R58,R60,R61,R67,R68,R71,R72	33R	RC0402	ERJ2RF33R0X	RES 33 0 OHM 1/10W 1% 0402 SMD	Panasonic - ECG	
14	19	R19,R22,R29,R32,R35,R38,R41,R44,R47,R50,R53,R56,R59,R62,R65,R66,R73,R74	0	RC0402	RCN02JR-070BL	RES 0 0 OHM 1/16W 0402 SMD	Yageo	
15	2	R20,R21	50K	RC0402	RCN02JR-0749KL	RES 50 5K OHM 1/16W 1% 0402 SMD	Yageo	Component Reference 305-PD.13-1158
16	16	TP1,TP2,TP3,TP4,TP5,TP11,TP12,TP13,TP14,TP15,TP16,TP17,TP18,TP19,TP20,TP21	TP POINT B	TESTPOINT	RC0402FR-0749KL3601	TEST POINT PCB 0808 G1P D BLACK	Raystone Electronics	NOT A PART
17	1	UT	48QFN	48QFN	SI53108-A01A03M	Si53108-A01A03M	SiGe Systems	CUSTOMER PART
18	16	VIA1, VIA1, VIA2, VIA3, VIA4, VIA5, VIA5, VIA6, VIA6, VIA7, VIA7, VIA8, VIA8	D_GND_VIA	D_GND_VIA				NOT A PART
19	1	WB	JUMPER	BERG_1X2		Two Pin Regular 100mil Header		REGULAR HEADER





## ClockBuilder Pro

One-click access to Timing tools, documentation, software, source code libraries & more. Available for Windows and iOS (CBGo only).

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