Additional Design Information on the AD9230-250 and AD9211-200 ADC Evaluation Boards

Mahmud Harun* and S.W. Ellingson

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*Bradley Dept. of Electrical & Computer Engineering, 432 Durham Hall, Virginia Polytechnic Institute & State University, Blacksburg, VA 24061 USA. E-mail: mharun@vt.edu

1 Introduction

The AD9230-250 [1] and AD9211-200 [2] are high-speed analog-to-digital converters (ADCs) from Analog Devices. These two ADCs were evaluated using the evaluation boards available from the vendor, Analog Devices. The results were reported in [3], but the design informations of the evaluation boards were not given in detail. This document describes the design of the AD9230-250 evaluation board. It is believed that the design of the AD9211-200 evaluation board is identical, except for the A/D chip used. Figure 1 shows the AD9230-250 evaluation board.

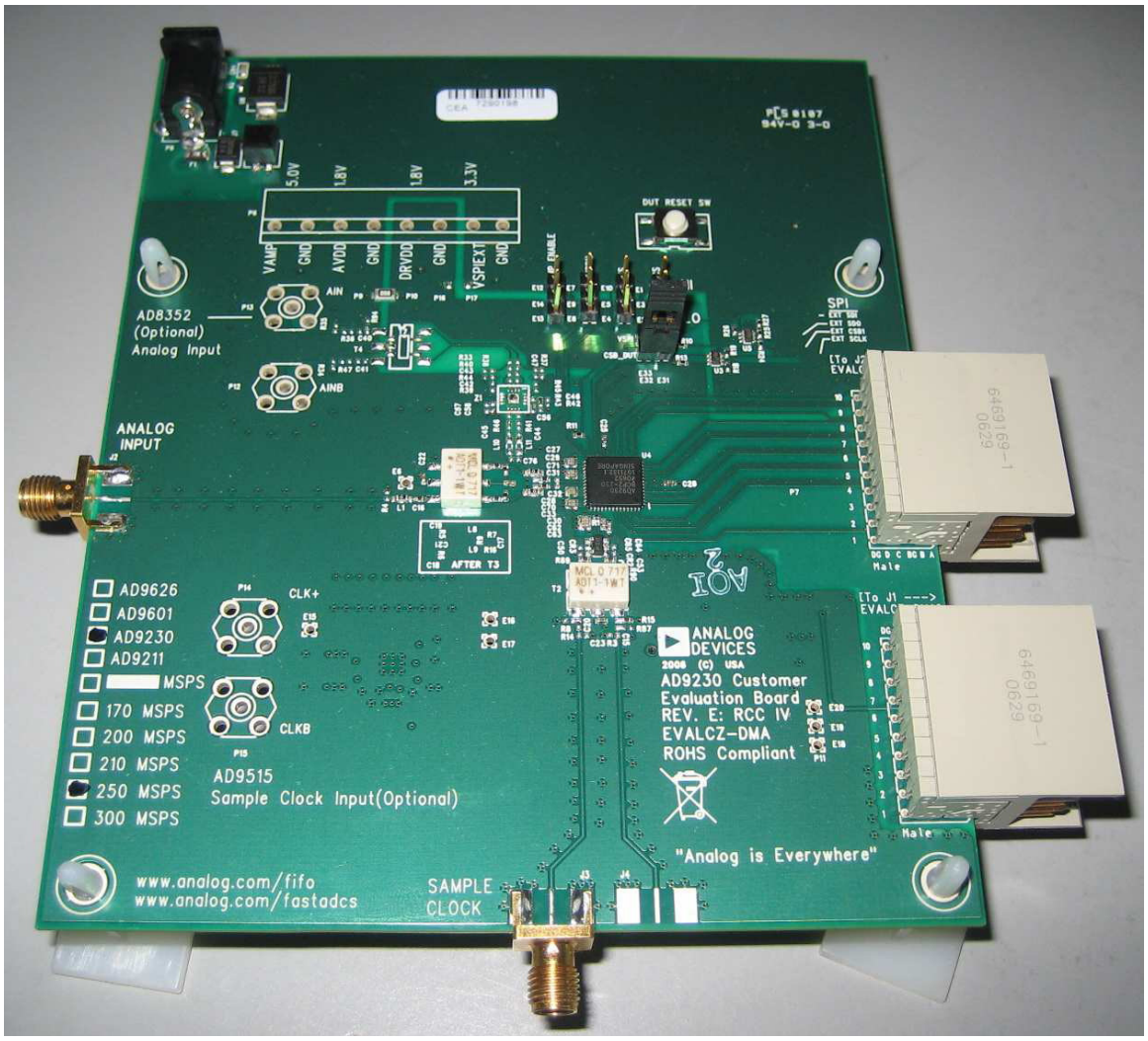

Figure 1: AD9230-250 Evaluation Board (Analog Devices Part No. AD9230-250EBZ)[3]. [Note. The AD9211-200 Evaluation Board is identical except for the A/D chip used.]

This report has two sections. The first part provides the full schematic of the boards, and the second part lists the bill of materials.

2 Schematic

The schematic was extracted with the help of hardcopy documents provided with the board and datasheet found online [1]. The schematic of the board is divided into three parts. 1) The ADC circuitry (shown in Figure 2)– this part shows the schematic of the analog input, the clock input and the ADC. 2)The Power Distribution circuitry (shown in Figure 3)– this part demonstrates the distribution of power from the power jack (P8 in the schematic). 3)The SPI circuitry (shown in Figure 4)– this part illustrates the circuitry for the SPI interfacing.

3 Bill of Materials

A detailed list of the components is shown in Figure 5.

Acknowledment

The authors are thankful to Analog Devices for their patient assistance.

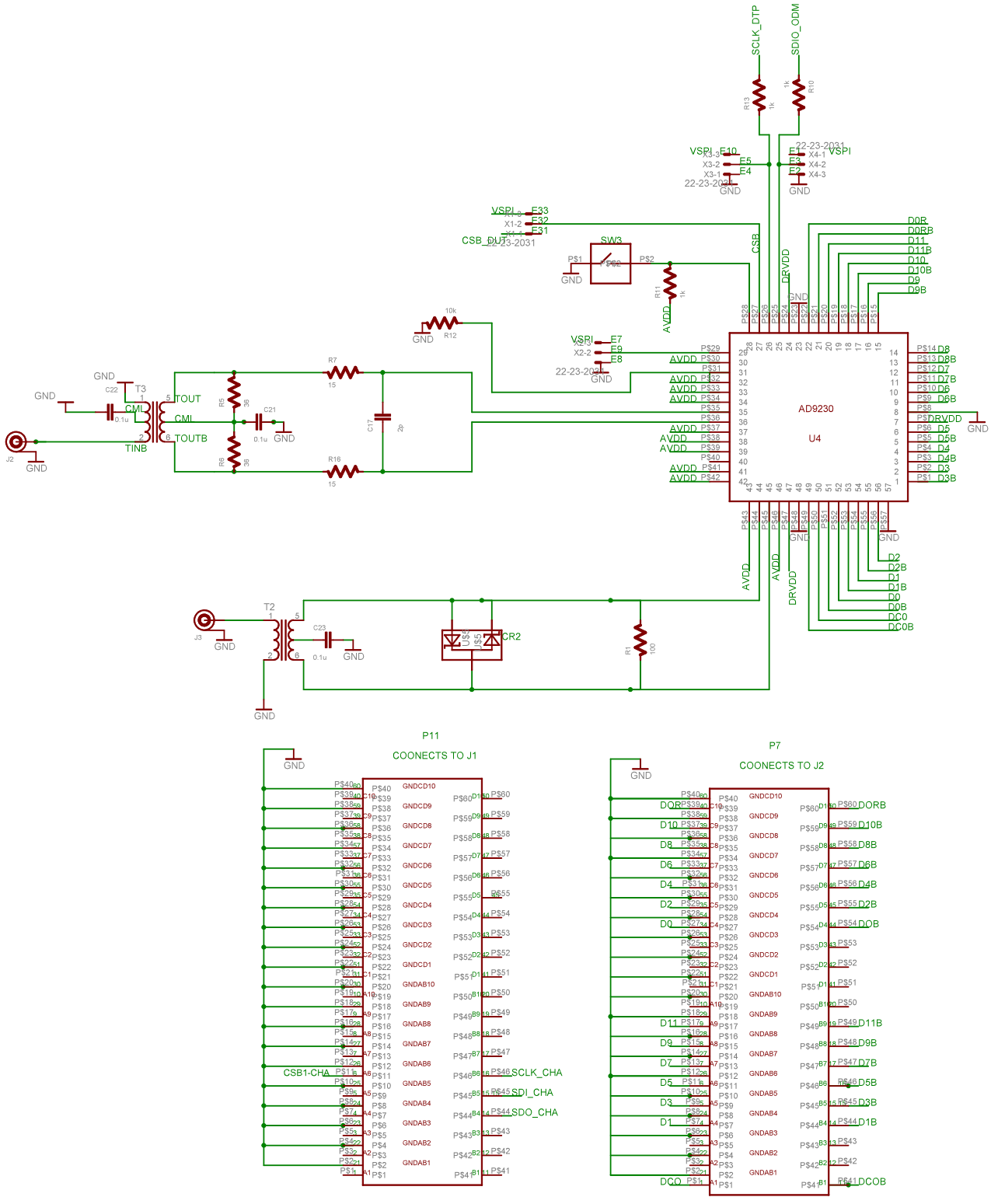

Figure 2: ADC circuitry. [Note. The resistors, capacitors, and inductors are reported in units of ohms, farads and henries respectively.]

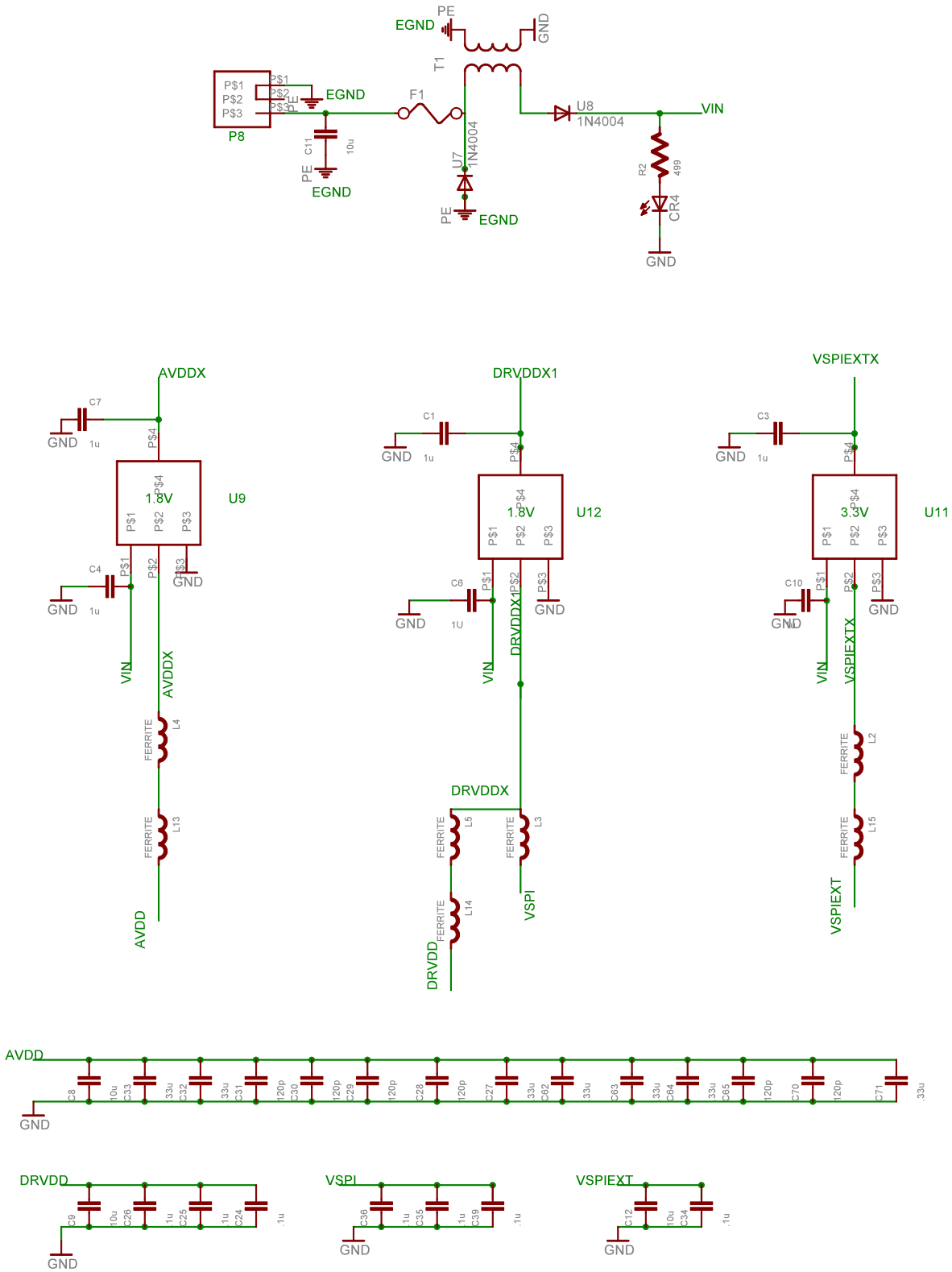

Figure 3: Power Distribution circuitry. [Note. The resistors, capacitors, and inductors are reported in units of ohms, farads and henries respectively.]

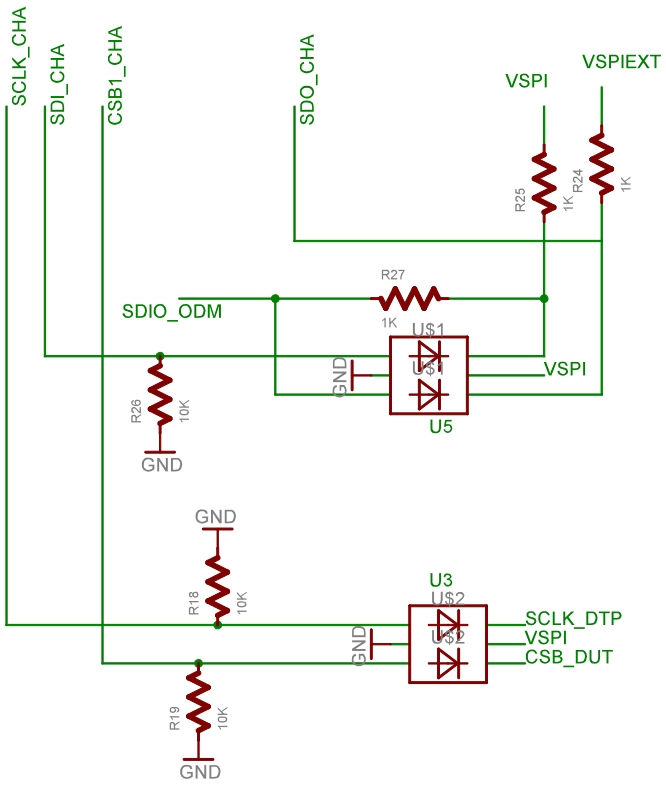

Figure 4: SPI circuitry. [Note. The resistors, capacitors, and inductors are reported in units of ohms, farads and henries respectively.]

#	QTY	REFDES	PACKAGE	DESCRIPTION	VENDOR	PART NUMBER
1	1		PCB	pcb, AD9230 CUSTOMER EVALUATION BOARD REV E	MOOG	
2	8	C1,C3,C4,C5,C6,C7,C10	603	CAPACITOR, 1 µF, 0603, X5R, CERAMIC, 6.3V, 10%	Panasonic	ECJ-1VB0J105K
3	6	C8,C9,C11,C12,C14,C55	6032-28	Capacitor, 10 µF, Tantalum, 16 V, 10% tol	Kemet	T491C106K016AS
4	1	C17	402	CAPACITOR, 2.0pF 50V CERAMIC 0402 SMD	Murata	GRM1555C1H2R0CB01D
5	7	C27,C32,C33,C62,C63,C64,C71	402	Capacitor, 0.33 µF, Ceramic, X7R, 25 V, 10%	Murata	GRM319R71E334KA01J
6	6	C28,C29,C30,C31,C65,C70	402	Capacitor, 120 pF, Ceramic, C0G, 25 V, 5%	Murata	GRM1555C1H121JA01J
7	10	C21,C22,C23,C24,C25.C26,C34,C35,C36,C39	402	Capacitor, 0.1 µF, Ceramic, X5R, 10 V, 10%	Murata	
8	1	CR4	603	LED GREEN, SMT, 0603, SS-TYPE	Panasonic	LNJ314G8TRA
9	1	CR2	Mini 3P	Diode, 30 V, 20 mA	Agilent	HSMS2812
10	1	F1	1210	Fuse, 6.0 V, 2.2 A trip current resettable fuse	Tyco/Raychem	NANOSMDC110F-2
11	15	E1,E2,E3,E4,E5,E7,E8,E9,E10,E12,E13,E14, E31,E32,E33,		CONNECTOR, HEADER 0.1"	Samtec	TSW-150-08-G-S
12	2	J2,J3,	SMA end launch	Connector, SMA PCB Coax End Launch, Johnson142	Johnson	142-0701-851
13	9	L2,L3,L4,L5,L7,L12,L13,L14,L15	1206	Ferrite Bead, BLM, 3A, 50Ω @ 100MHz	Murata	BLM31P500S
14	1	P8		Power Jack, Male, 2.1mm power jack DC	CUI Inc	CP-102A-ND
15	1	R1	201	Resistor, 100 Ω, 0201, 1/20 W, 1%	NIC Components	NRC02F1000TRF
16	1	R2	603	Resistor, 499 Ω, 0603, 1/10 W, 1%	NIC Components	NRC06F4990TRF
17	2	R5,R6	402	Resistor, 36 Ω, 0402, 1/16 W, 1%	Panasonic	ERJ-2GEJ360X
18	2	R7,R16	402	Resistor, 15 Ω, 0402, 1/16 W, 5%	NIC Components	NRC04J150TRF
19	6	R10,R11,R13,R24,R25,R27	402	Resistor, 1 kΩ, 0402, 1/16 W, 1%	NIC Components	NRC04F1001TRF
20	4	R12,R18,R19,R26,	402	Resistor, 10 kΩ, 0402, 1/16 W, 5%	NIC Components	NRC04J103TRF
21	7	R15,C16,C18,C19, C20,R89,R90	402	Resistor, 0 Ω, 0402, 1/16 W, 5%	NIC Components	NRC04ZOTRF
22	3	L1,L8,L9	603	Resistor, 0 Ω, 0603, 1/10 W, 5%	NIC Components	NRC06ZOTRF
23	1	P9-P10	805	Resistor, 0 Ω, 0805, 1/8 W, 1%	NIC Components	NRC10ZOTRF
24	1	SW3	EVQ-Q2F03W	Switch, Light Touch SMD	Panasonic	P12937SCT-ND
25	1	T1	2020	Ferrite Bead, 5A, 50V, 190Ω @ 100MHz	Murata	DLW5BSN191SQ2L
26	2	T2,T3,	CD542	Transformer, 0.5W, 30mA	Mini-Circuits	ADT1-1WT+
27	1	U3	6-SC70	IC, BUFFER, INVERTER, UHS DUAL SC70-6	Fairchild	NC7WZ16P6X
28	1	U5	6-SC70	IC, BUFFER, INVERTER, UHS DUAL OD OUT SC70-6	Fairchild	NC7WZ07P6X
29	1	U7	DO-214AA	Diode, 50 V, 2A	Micro Commercial	S2A-TPMSTR-ND
30	1	U8	DO-214AB	Diode, 30 V, 3A, (SMC)	Micro Commercial	SK33-TPMSCT-ND
31	1	U11	SOT-223	Voltage Regulator, 3.3V, 1.5A	ADI	ADP3339AKCZ-3.3
32	2	U9,U12,	SOT-223	Voltage Regulator, 1.8V, 1.5A	ADI	ADP3339AKCZ-1.8
33	1	U4	LFCSP	AD9230 12-Bit, 170 MSPS/210 MSPS/250 MSPS, 1.8 V A/D Converter, LFCSP 56P	ADI	
34	2	P7,P11	HM-Zd PCB	CONNECTOR, 2-Pr 10 Clmn High Speed HM-Zd PCB Mt	TYCO	6469169-1

Figure 5: Bill of Materials

References

[1] Analog Devices, Inc., "12-Bit, 170 MSPS/210 MSPS/250 MSPS, 1.8 V Analog-to-Digital Con- verter AD9230" (datasheet), Rev. 0, 2007

[2] Analog Devices, Inc., "10-Bit, 200 MSPS/250 MSPS/300 MSPS, 1.8 V Analog-to-Digital Con- verter AD9211" (datasheet), Rev. 0, 2007.

[3] S. Ellingson, Mahmud Harun, and Kyehun Lee, "Evaluation of the AD9230 and AD9211 Analog-to-Digital Converters," LWA Memo 112, December 3, 2007. http://www.phys.unm.edu/∼lwa/memos.