



General Description

The AT2216 chipset is a highly integrated, cost-effective approach for CobraNet® designs requiring 2 audio channels in and out based on CobraNet® LE technology.

The AT2216 Reference Design incorporates the AT2216 chipset onto a small PCB for evaluation and development. It has all the features of the chipset available and includes headers on many signals for connection to external hardware to allow the reference design board to be used as a development platform.

The audio inputs and outputs on the reference design board are via either RCA connectors or a 1/8" stereo mini jack. A jumper to select which type of connection is used for the inputs. There is a jumper for each channel. The board also has a 9-pin D-type connector for RS-232 level for communication either with the Serial Bridge or the SHMI. The choice of interface is made with a jumper. The reference design also includes an 802.3af compliant PoE power supply which can be used instead of the more traditional wall-wart type power supply.

Features

- Unbalanced stereo analog inputs and outputs, on both RCA and 1/8" stereo mini jacks.
- I2S digital audio outputs available on a header.
- CobraNet Serial Bridge and SHMI functionality accessed through header at logic levels.
- A 9-pin D-type connector with RS-232 levels for use with either Serial Bridge or SHMI
- Access to 8 GPIO pins individually set as inputs or outputs and written/read via the SHMI or SNMP.
- Access to 8 10-bit ADCs read via the SHMI or SNMP, and can be set to provide periodic updates via UDP packets.
- Selectable power source of either a wall wart or PoE.

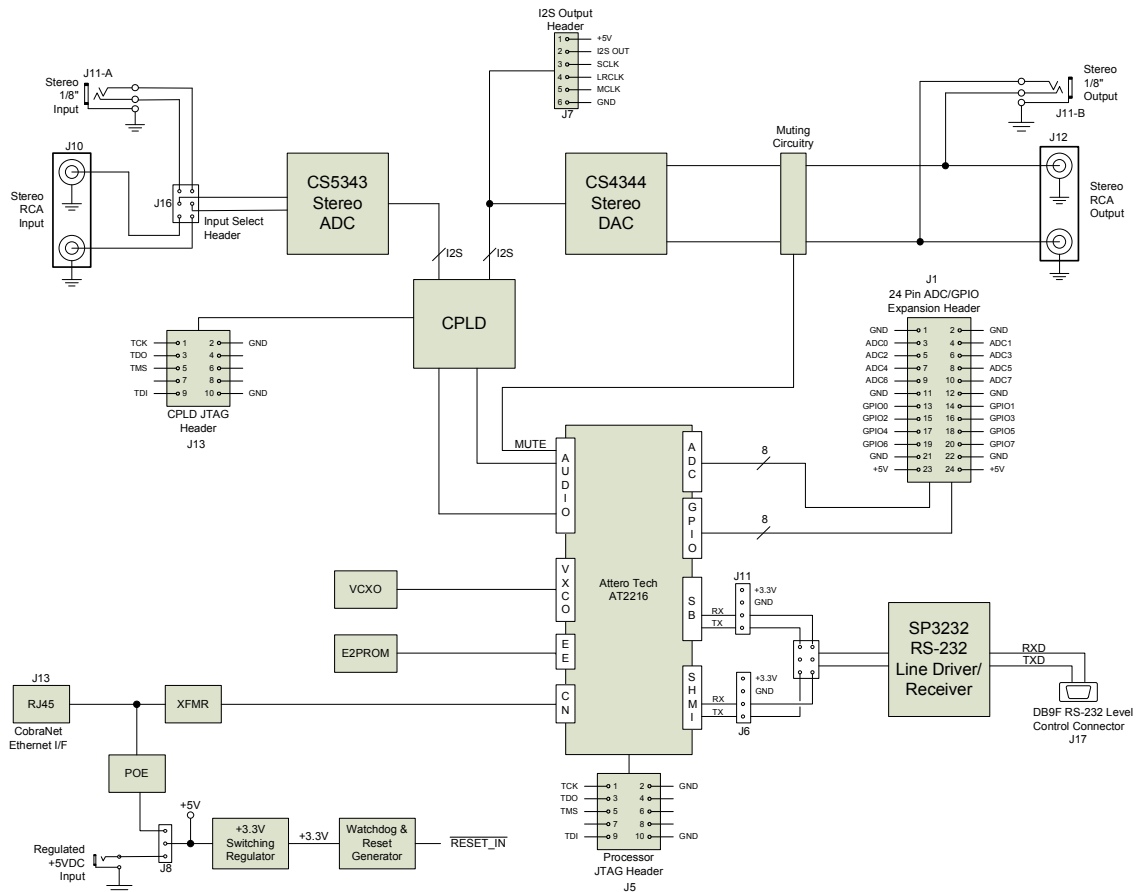


Figure 1 - AT2216 Reference Design Block Diagram

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Overview

The AT2216 Reference Design contains everything needed to evaluate CobraNet LE technology using the AT2216 chipset. It also provides a development platform for prototyping and serves as an example of how to embed the AT2216 chipset into a design.

This document contains details of how to use this board to demonstrate the capabilities of CobraNet LE technology and the AT2216, in particular. Additionally, it includes details such as Jumper positions and header pin outs when the board is used as a development platform. Finally, it includes implementation information on the AT2216 chipset. This includes a complete schematic of the reference design board with PCB layer drawings and a complete bill of material. This is particularly useful for anyone implementing the chipset as it shows a specific example of how to:

- Interface DACs and ADCs to the AT2216 processor
- Interface to an EEPROM for storing SNMP parameters
- Incorporate the VXCO
- Use an 802.3af compliant power supply

Further information on CobraNet LE such as the differences from regular CobraNet, can be found in the CobraNet LE software API document.

What's in the Box?

Each unit should be supplied with the following. If any of these items are not present, please contact your supplier.

- 1 x AT2216 Reference Design Board
- 1 x Power supply (5V DC @ 2.6A)

Quick Start

Use the following steps:

- Select the power supply to be used by setting jumper J8 (see page 7).
- Select the audio input type to be used using jumper J16 (see page 8).
- (Optional) Select the UART I/F that uses the 9-pin D-type connector using jumper J4 (see page 6).
- Connect audio sources to the audio inputs.
- Connect the output to a suitable audio output device.
- If using PoE, connect the CobraNet RJ45 to an 802.3af compatible port on a network switch or mid-span injector. Otherwise, connect it to a standard network switch using a standard CAT-5 cable.
- If not using PoE, connect the PSU to the power connector J2 (see page 5).
- Configure the CobraNet audio (see Audio Setup).

If using the D-type connector for serial communications, a serial cable will be needed to connect the AT2216 reference board to another serial device such as a PC serial port.

If the SHMI is being used, refer to the CobraNet LE Software API document for details on protocol and parameters.

Audio Setup

Audio setup of the AT2216 Reference Design board can be done in various ways but all will involve setting up transmit and receive bundles by passing parameters to and from the device using SNMP¹. Attero Tech provides the Control Center application for control and configuration of the AT2216 Reference Design board, as well as general SNMP control of compatible CobraNet devices. The application allows quick and easy setup of transmit and receive bundles and related parameters. For details on the parameters and how to install and use the software, refer to the Control Center User Guide.

Transmit Bundle Setup

The AT2216 only supports two transmit bundles. When configuring a transmit bundle, keep in mind that the AT2216 only transmits submap channels 1 and 2. Sending a bundle with any other channels will result in a channel being transmitted with no audio content. When using the CobraNet LE, it is recommended that a single bundle be used for bandwidth efficiency. The bundle should contain both active channels and the subcount for that bundle should be set to 2. This will cause the bundle to take up as little bandwidth as possible.

Receive Bundle Setup

The AT2216 only supports two receive bundles. When configuring a receiver bundle, the AT2216 only utilizes two receiver submap channels. Thus, only a submap value set to 33 or 34 will produce any output. The two channels can come from the same or different bundles, and it does not matter how many audio channels are actually received in the bundle as the unused audio can be ignored. Only a single received channel may be allocated to submap 33 and one receive channel to 34. Applying multiple channels to the same submap does not mix the channels and only one of the channels will be output.

¹ SNMP stands for Simple Network management protocol and is a standard protocol used over Ethernet to control networked devices.

Device Connectors and Headers

Figure 2 shows the AT2216 Reference Design board with all of the connectors, headers, and jumpers marked. Descriptions and pin outs of each header follow. As for the board itself, the AT2216 processor is the large IC in the center of the board with its companion CPLD, the slightly smaller square IC directly to its left. The components above the processor and CPLD make up the analog section with the audio connectors, ADC and DAC. Below the processor are all the digital interfaces including the serial ports and the CobraNet Ethernet connector. The components on the right-hand side of the board make up the PoE power supply.

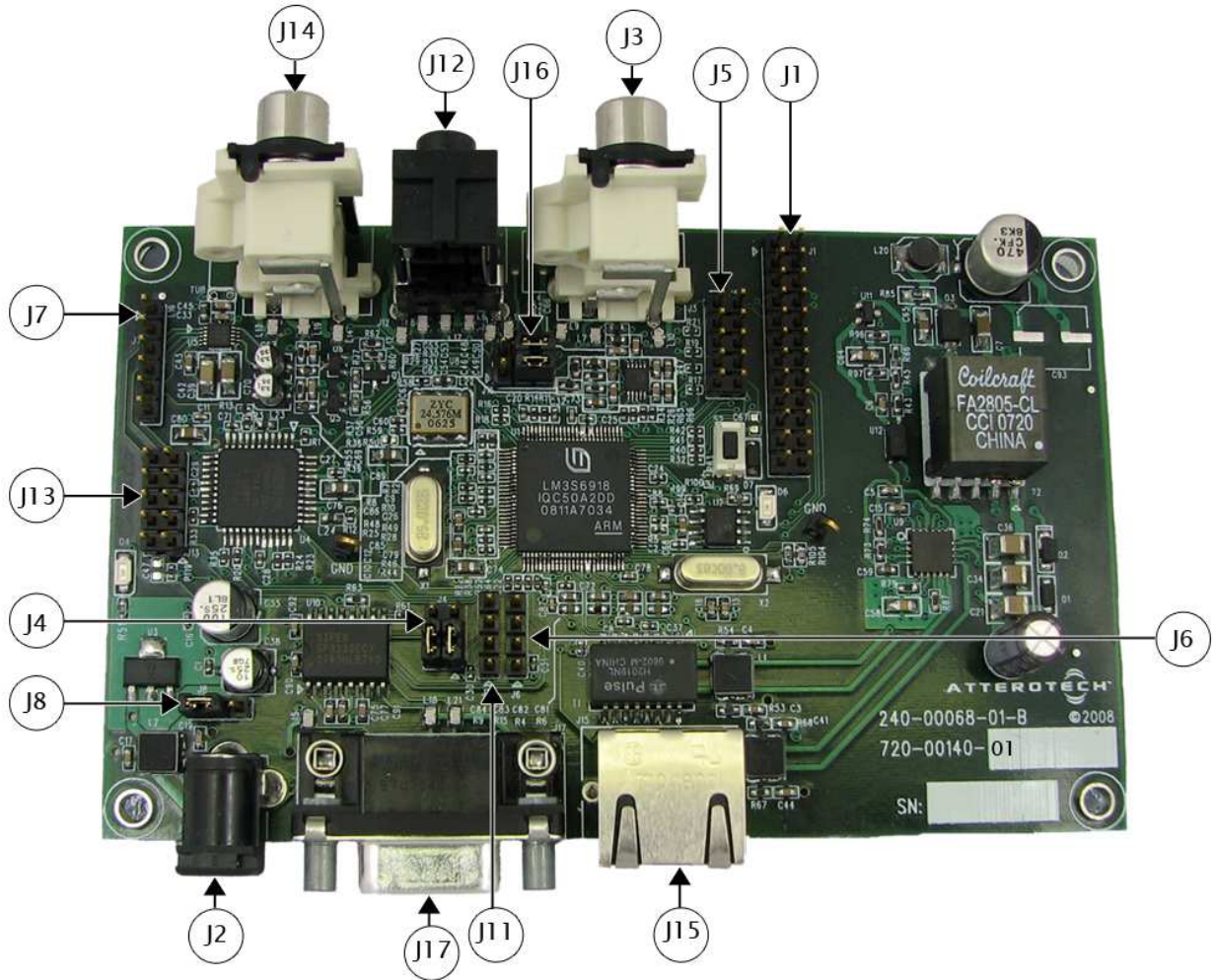


Figure 2 - AT2216 Reference Design Board

J1 - Expansion Header

The expansion header allows external access to the ADC inputs and the GPIO and allows these signals to be connected to other external circuitry. The pin out for the 24-pin header is shown below:

Pin Number	Pin Name	Type	Description
1, 2, 11, 12,21,22	GND	GND	GND reference.
3	ADC0	I	ADC input 0.
4	ADC1	I	ADC input 1.
5	ADC2	I	ADC input 2.
6	ADC3	I	ADC input 3.
7	ADC4	I	ADC input 4.
8	ADC5	I	ADC input 5.
9	ADC6	I	ADC input 6.
10	ADC7	I	ADC input 7.
13	GPIO0	I/O	GPIO 0.
14	GPIO1	I/O	GPIO 1.
15	GPIO2	I/O	GPIO 2.
16	GPIO3	I/O	GPIO 3.
17	GPIO4	I/O	GPIO 4.
18	GPIO5	I/O	GPIO 5.
19	GPIO6	I/O	GPIO 6.
20	GPIO7	I/O	GPIO 7.
24, 24	+5V	PWR	Power supply output.



The +5V output is unprotected. Care must be taken not to short these pins to GND as damage to the reference board may result.

J2 - Power Jack

This is the power source input if a wall wart is used to power the board. This can be left unconnected if PoE is used.

J3 - Audio Input RCA Jacks

This connector provides 2 single-ended audio inputs with RCA connectors. The top connector is channel 1 and the bottom is channel 2.

J4 – Serial Output Selection

Consists of a set of two jumpers that selects which UART interface (SHMI or serial bridge) is available through the 9-pin D-type connector.

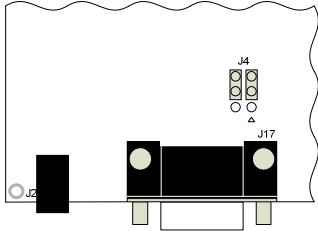


Figure 3 - SHMI Output

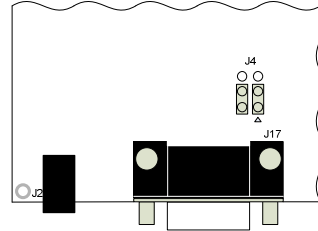



Figure 4 - Serial Bridge Output

Pin 1 is designated by the arrow. With the jumpers covering the upper and middle pins (see Figure 3), the SHMI port is selected. With the jumpers covering the lower and middle pins, the serial bridge is selected (see Figure 4). The jumpers should be removed if the TTL interface connectors are used.

J6 – SHMI TTL I/F

This connector gives access to the TTL level UART signals for the SHMI. The pin out of the header is shown below.


Pin Number	Pin Name	Type	Description
1	+3.3 V	PWR	PSU output (not fused).
2	GND	GND	Ground reference.
3	SHMI Rx	I	Receive input.
4	SHMI Tx	O	Transmit output.

 The +3.3V output is unprotected. Care must be taken not to short this pin to GND as damage to the reference board may result.

J7 – I2S Output Header

This header gives access to the I2S output signals directly for attachment to external circuitry.

Pin Number	Pin Name	Type	Description
1	+5 V	PWR	PSU output (not fused).
2	I2SOUT	O	I2S data line.
3	SCLK	O	SCLK output.
4	LRCLK	O	LRCLK output.
5	MCLK	O	MCLK output.
6	GND	GND	Ground reference.

 The +3.3V output is unprotected. Care must be taken not to short this pin to GND as damage to the reference board may result.

J8 – Power Select Jumper

This jumper selects the type of power supply the board will use.

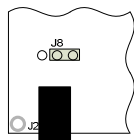


Figure 6 - PoE powered

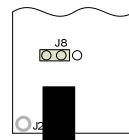


Figure 5 - Wall wart powered

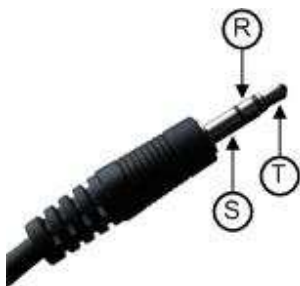
To select a PoE power source, place the jumper over the right hand and middle pins (see Figure 6). To select the power jack, J2, as the power source, place the jumper over the left hand and middle pins (see Figure 5).

J11 – Serial Bridge Connector

This connector gives access to the TTL level UART signals for the Serial Bridge.

Pin Number	Pin Name	Type	Description
1	+3.3 V	PWR	PSU output (not fused).
2	GND	GND	Ground reference.
3	SHMI Rx	I	Receive input.
4	SHMI Tx	O	Transmit output.

J12 – Mini Jack Audio Connection



The mini jack audio connector has two mini jacks. The top connector is the output, the bottom is the input.

In both cases, refer to the diagram and table for the correct connections.

Part	Function
(S)leeve	Ground Reference (Cable shield)
(R)ing	Channel 2 signal
(T)ip	Channel 1 signal

J14 - Audio Output RCA Jacks

This connector provides two single-ended audio outputs with RCA connectors. The top connector is channel 1 and the bottom is channel 2.

J15 – Ethernet Connector

The Ethernet connector is the reference design's connection to the CobraNet network. If power is derived from the Ethernet using PoE, this must be connected to an 802.3af-compliant device such as a PoE switch or a PoE mid-span injector

J16 – Audio Input Selection

These jumpers select which connector the input audio is sourced from.

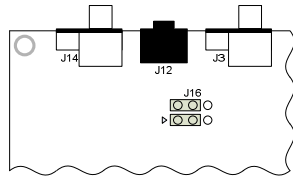


Figure 7 – Mini Jack Inputs Selected

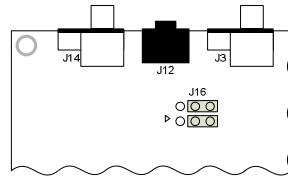


Figure 8 - RCA Inputs Selected

With both jumpers covering the pins closest to the connectors (pins 1 & 2), input is via the 1/8" minjack. With both jumpers covering the pins furthest from the connectors (pins 2 & 3), input is via the RCA connectors. It is recommended that both jumpers select the same source location.

J17 – Serial Output

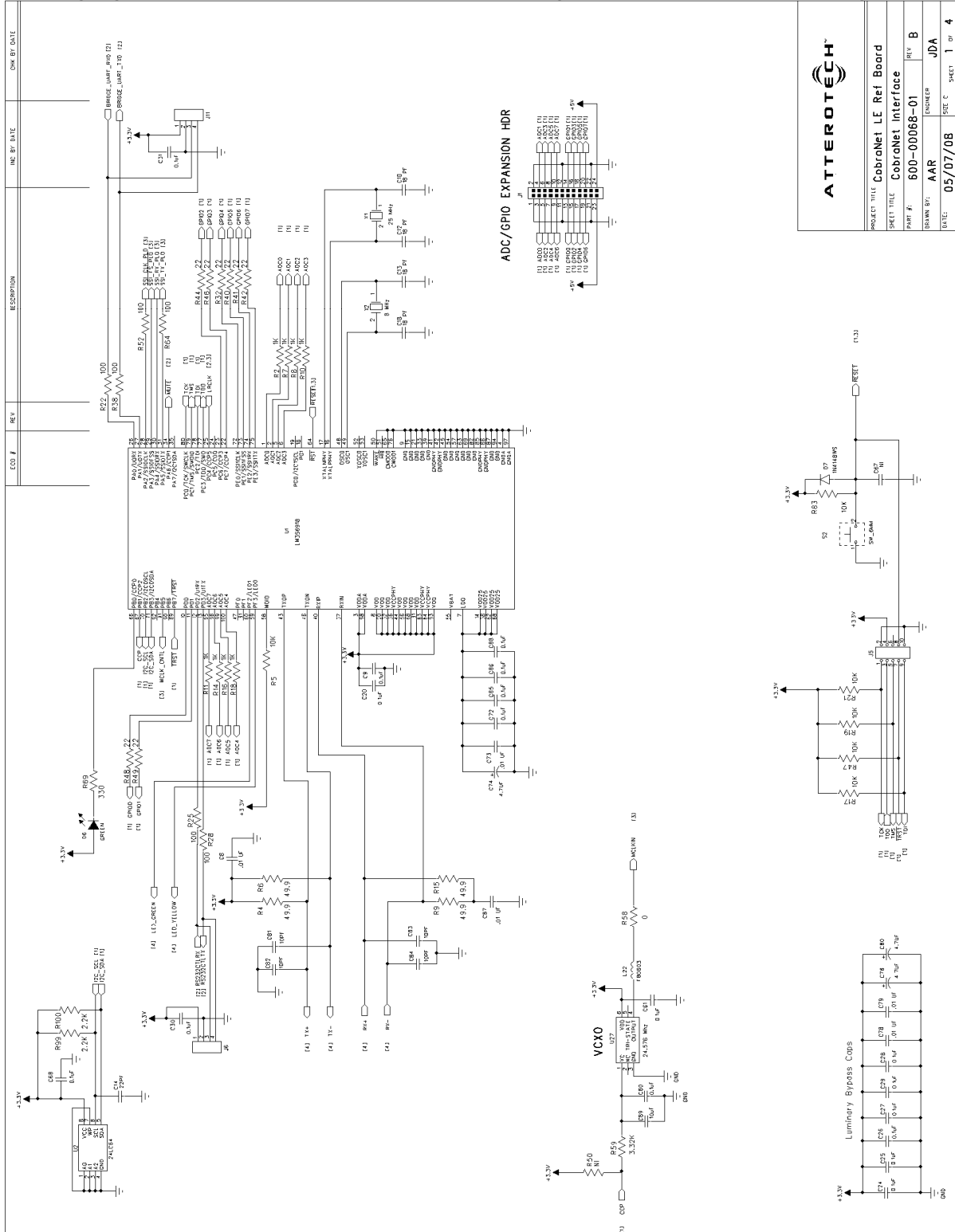
The 9-pin D-type connector can be used to access either the SHMI or the Serial Bridge. Selection of which interface is in use is with J4.

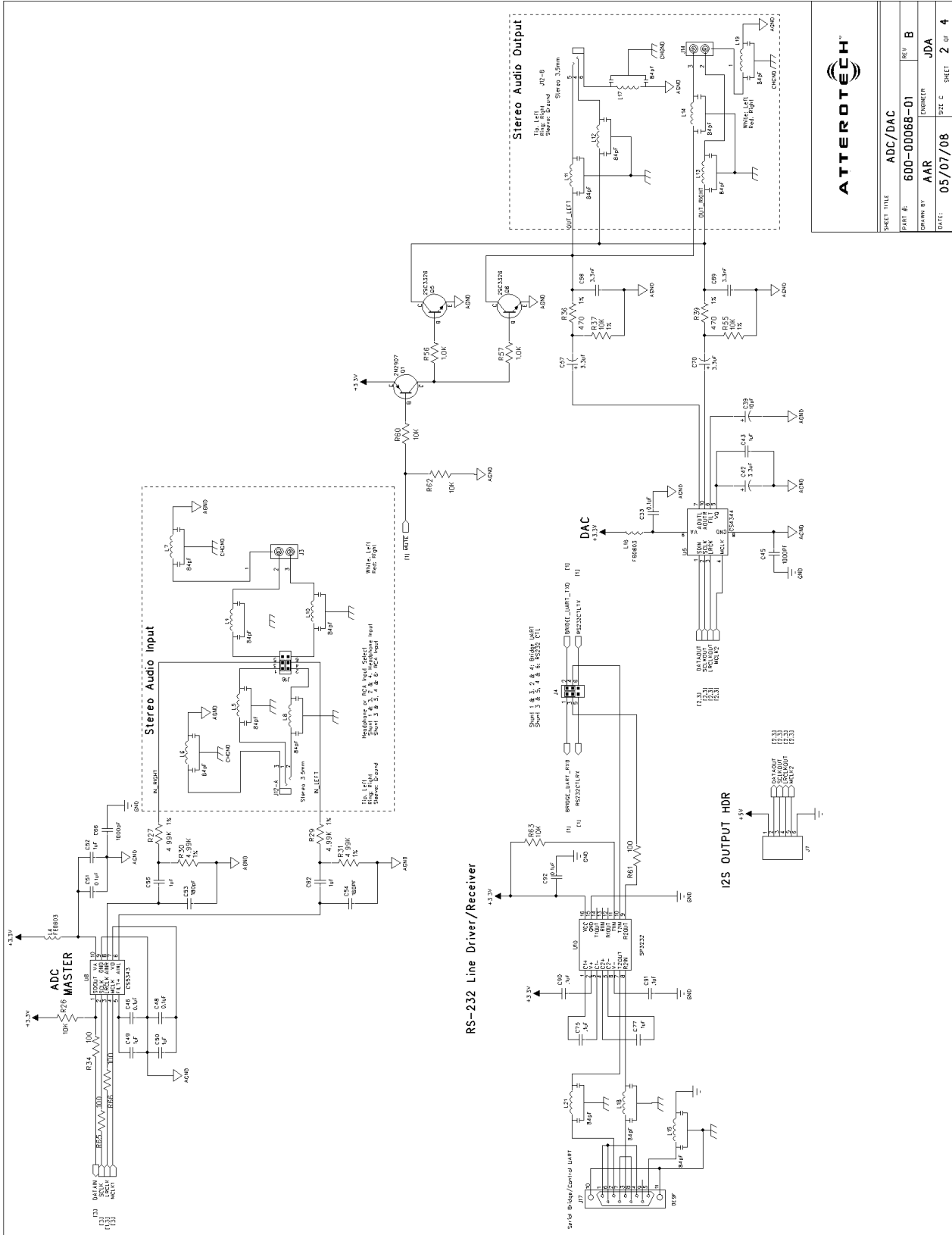
J5/J13 – Factory Use Only

Do not connect any equipment to these headers as incorrect operation or damage to the board may result.

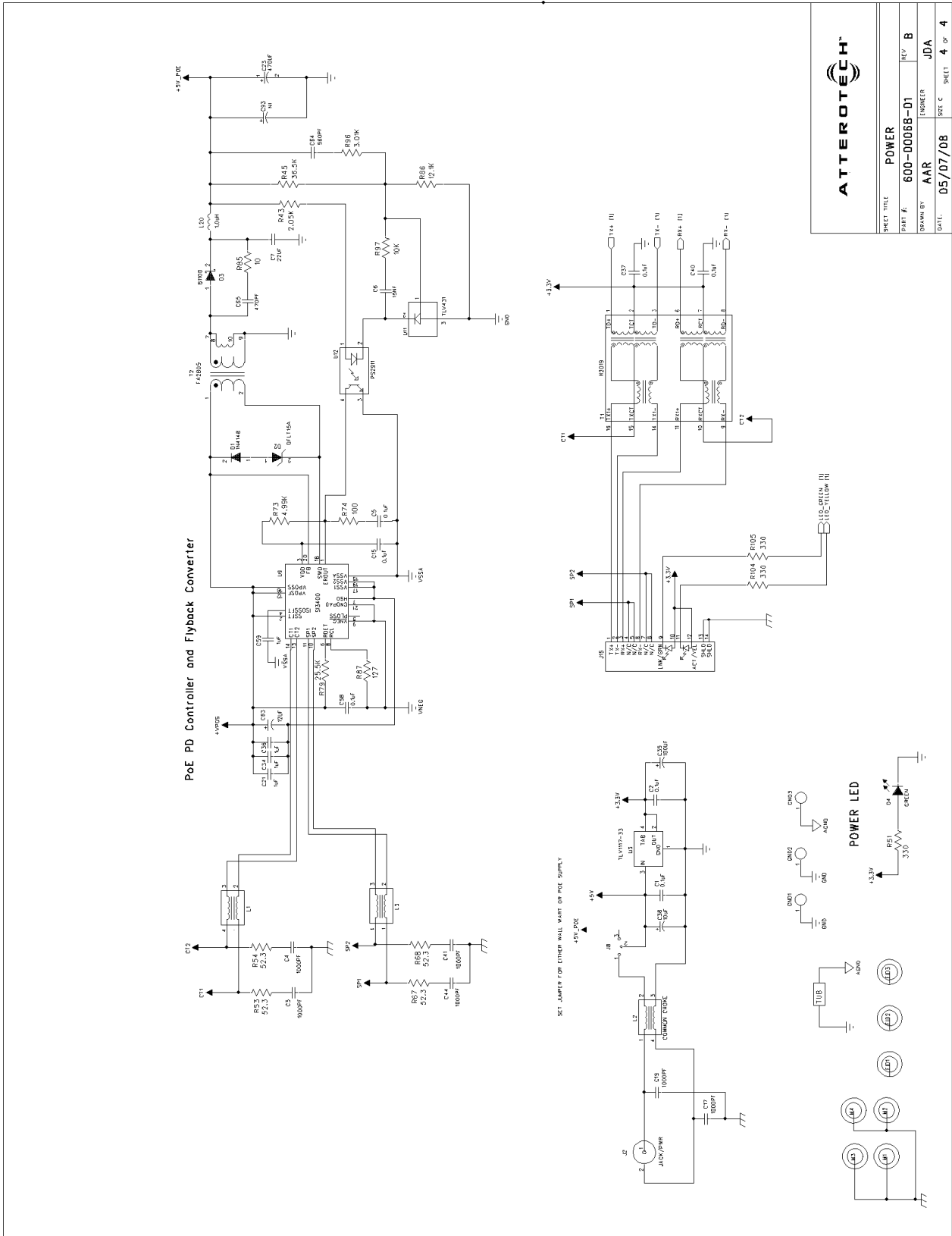
Schematic & PCB Layout

The following pages contain the complete schematic and PCB layout diagrams for the AT2216 Reference Design.





ATTEROTECH™	
SHEET TITLE	ADC/DAC
PART #	600-00068-01
REV	B
DESIGNED BY	AAR
ENGINEER	JDA
DATE	05/07/08
SHEET	2 OF 4



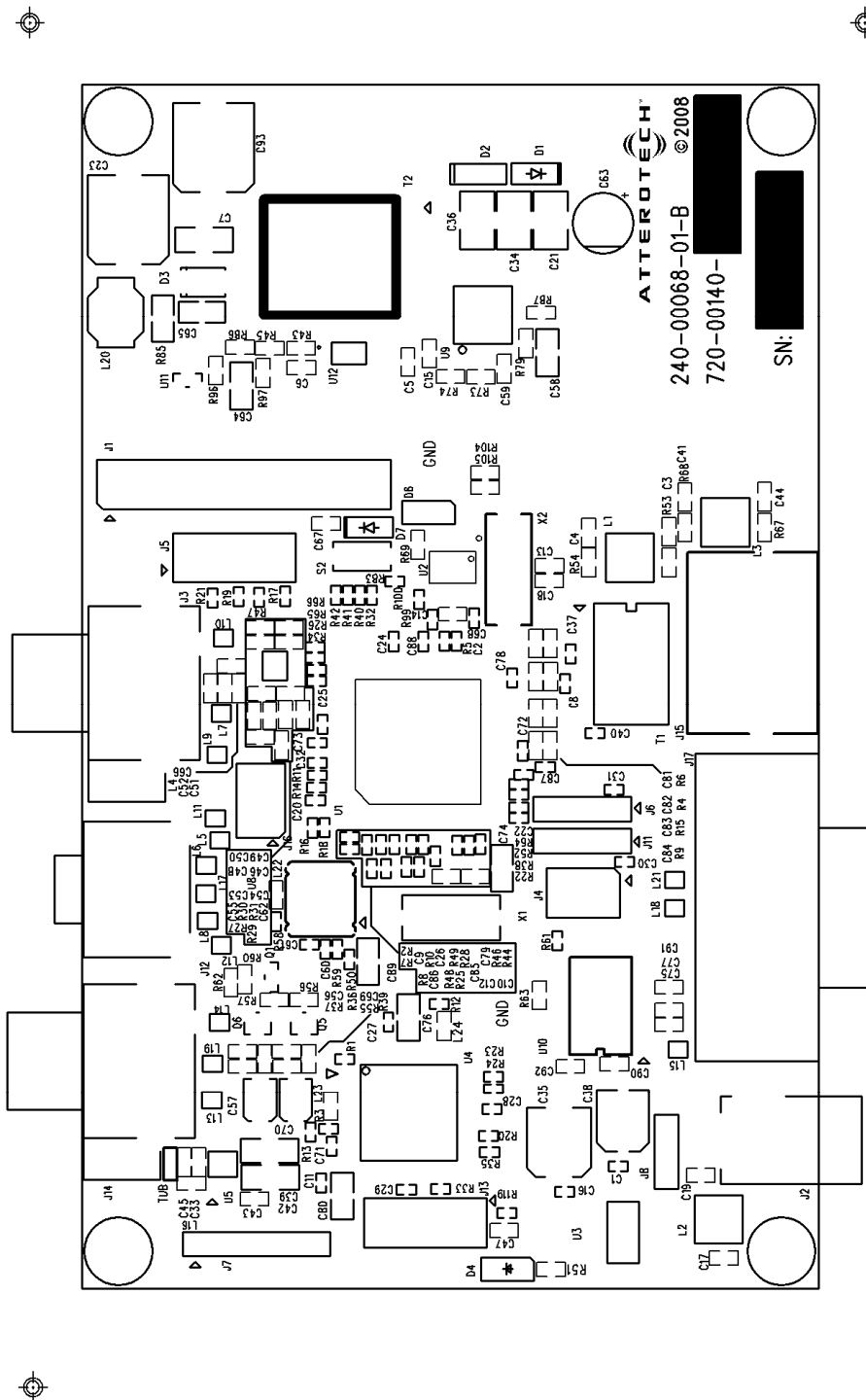


Figure 9 - Platform Board Silkscreen Layer

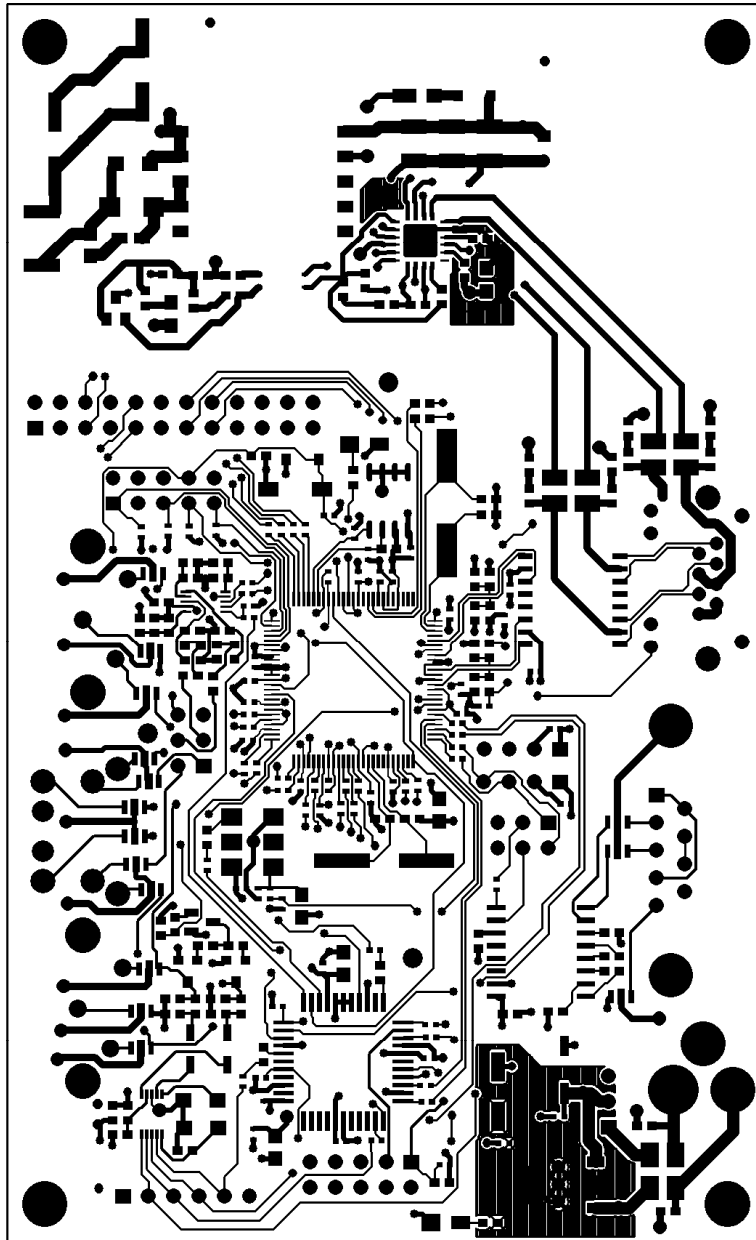
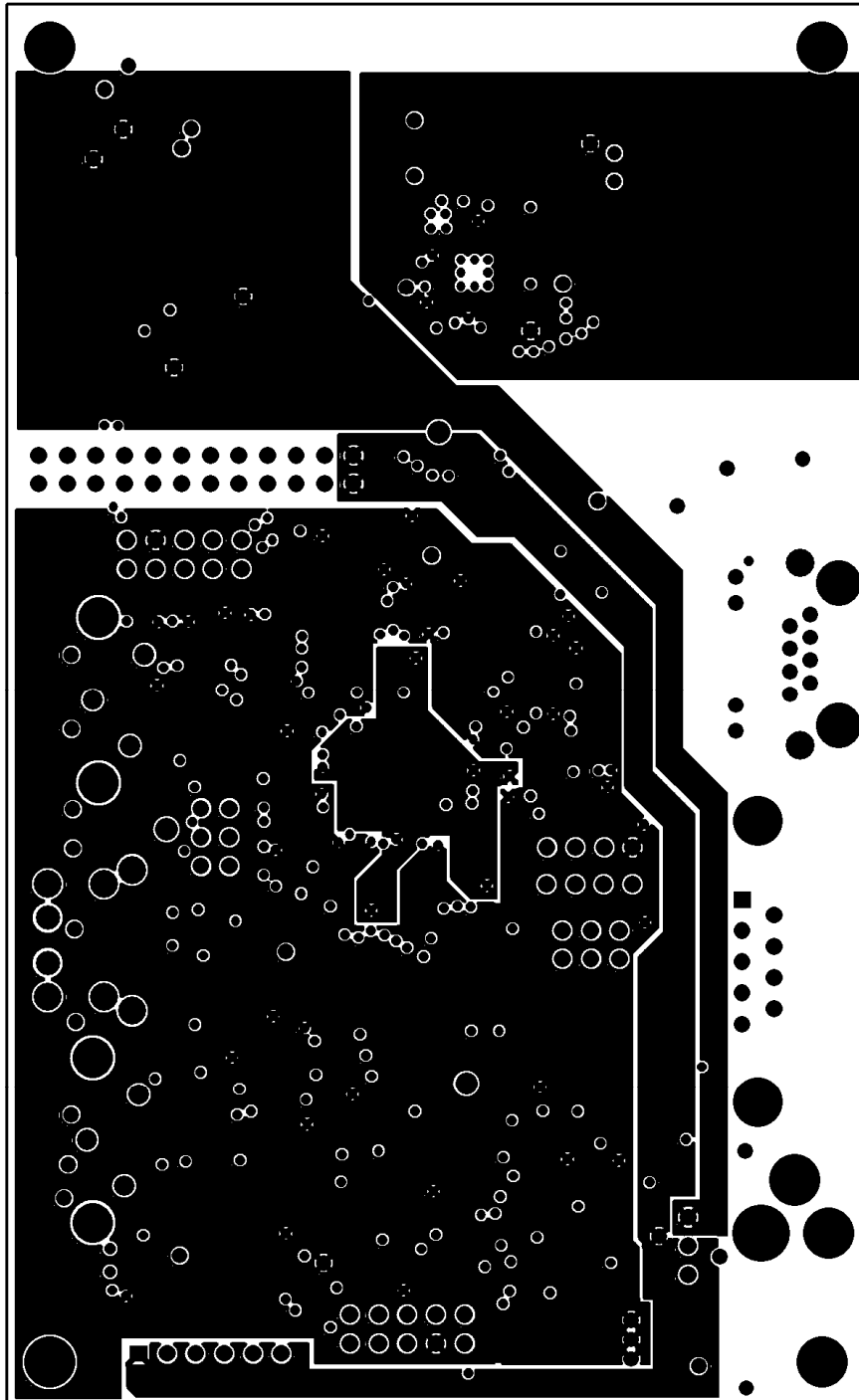
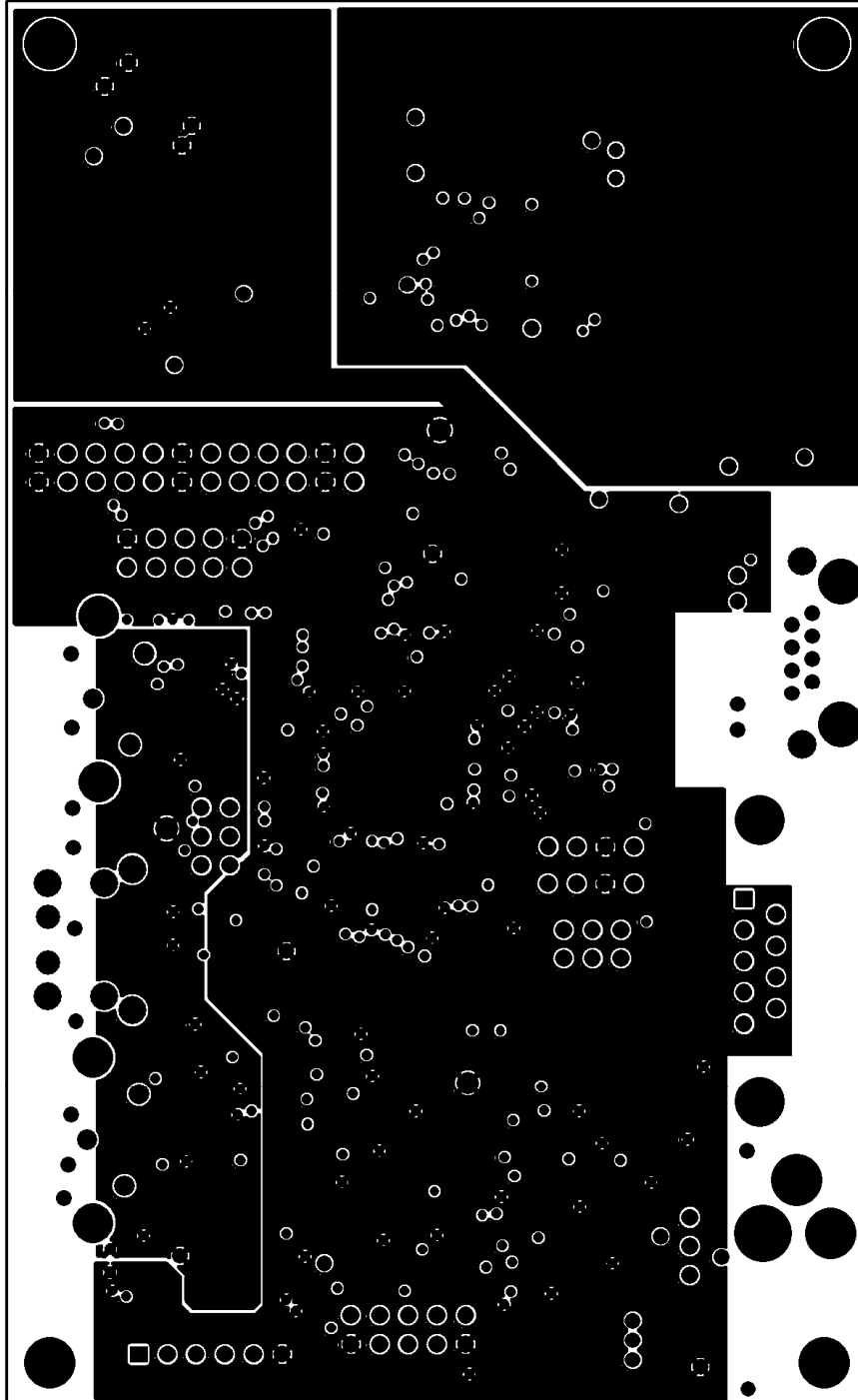


Figure 10 - Platform Board Top Copper Layer



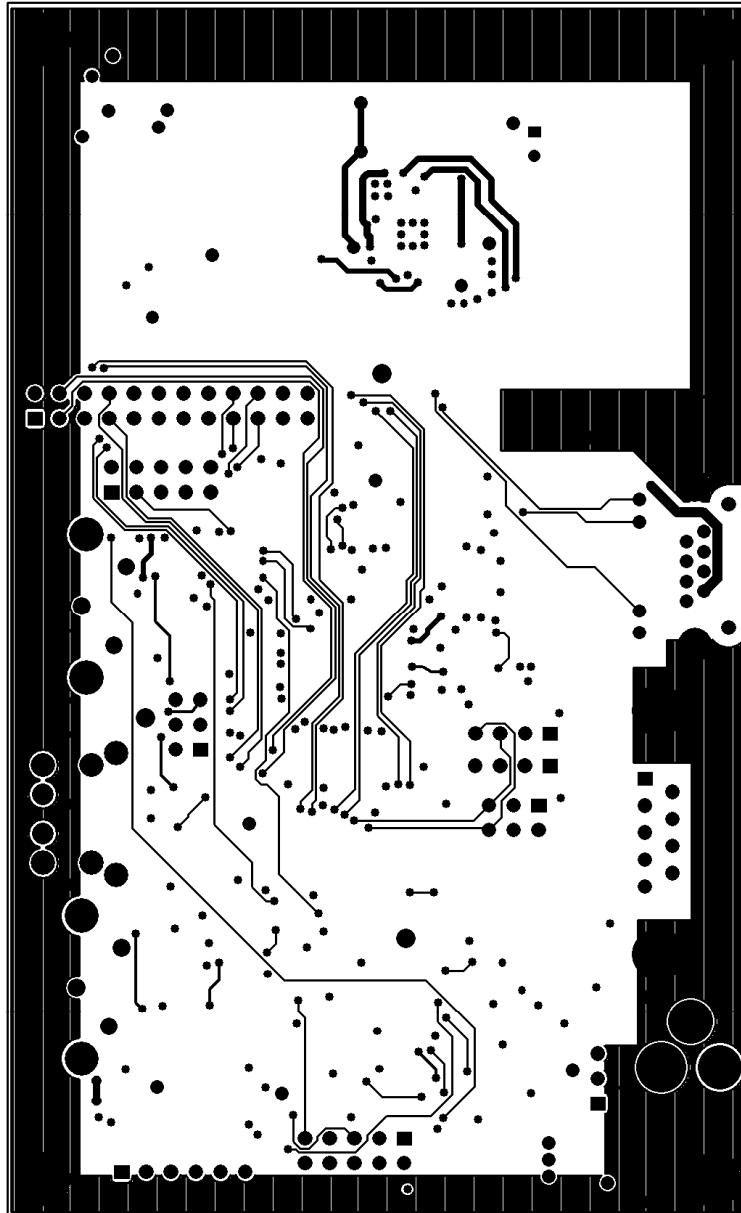
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Figure 11 - Platform Board Inner Layer 1



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Figure 12 - Platform Board Inner Layer 2



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Figure 13 - Platform Board Bottom Copper Layer

Bill of Material

The following table includes all of the components used in the reference design. Manufacturer and part numbers are included. It should be noted that substitute components may be used for many of the parts. Those that can be substituted are noted in the table.

ITEM	QTY	REF	MFR	DESCRIPTION	PART NUMBER	NOTES
1	8	C3 C4 C17 C19 C41 C44 C45 C66	PANASONIC	CAP, 1000PF, 50V, 0603, 10%	ECJ-1VB1H102K	1
2	1	C35	PANASONIC	CAP, 100UF, ELYT, 25V, 20%, D8	EEE-1EA101XP	1
3	1	C39	PANASONIC	CAP, 10UF, 25V, 1206, 20%	ECJ-3YB1E106M	1
4	1	C38	PANASONIC	CAP, 10UF, 25V, 20%, ELYT SMT C	EEE-1EA100SR	1
5	1	C89	PANASONIC	CAP, 10UF, 10%, 6.3V, 0805, 10%	ECJ-2FB0J106K	1
6	4	C81 C82 C83 C84	PANASONIC	CAP, 10PF, 50V, .5PF, 0603	ECJ-1VC1H100D	1
7	1	C63	NICHICON	CAP, 12UF, 100V, 20%, RAD	UPM2A120MED	1
8	1	C6	PANASONIC	CAP, 15NF, 25V, 10%, 0603	ECJ-1VB1E153K	1
9	2	C53 C54	PANASONIC	CAP, 180PF, 50V, 5%, 0603	ECJ-1VC1H181J	1
10	4	C10 C12 C13 C18	PANASONIC	CAP, 18PF, 50V, 0603, 5%	ECJ-1VC1H180J	1
11	3	C21 C34 C36	MURATA	CAP, 1uF, 100V, 10%, 1206	GRM32ER72A105KA01	1
12	6	C49 C50 C52 C55 C59 C62	PANASONIC	CAP, 1UF, 16V, 10%, 0603	ECJ-1VB1C105K	1
13	1	C7	PANASONIC	CAP, 22UF, 16V, 20%, 1206	ECJ-3YB1C226M	1
14	1	C14	PANASONIC	CAP, 22PF, 50V, 5%, 0603	ECJ-1VC1H220J	1
15	1	C42	PANASONIC	CAP, 3.3UF,10V, 10%, 1206	ECJ-3YB1A335K	1
16	2	C57 C70	PANASONIC	CAP, 3.3UF, 35V, 20%, SMT A	EEE-1VS3R3SR	1
17	2	C56 C69	PANASONIC	CAP, 3300PF, 50V, 10%, 0603	ECJ-1VB1H332K	1
18	1	C23	PANASONIC	CAP, 470 UF, 16V, 20%, SMT_F	EEE-FK1C471P	1
19	1	C65	PANASONIC	CAP, 470PF, 50V, 5%, 0805	ECJ-2VC1H471J	1
20	3	C74 C76 C80	PANASONIC	CAP, 4.7UF, 25V, 20%, 0805	ECJ-2FB1E475M	1
21	1	C64	PANASONIC	CAP, 560PF, 50V, 5%, 0805	ECJ-2VC1H561J	1

22	6	C8 C11 C73 C78 C79 C87	PANASONIC	CAP, 0.01UF, 25V, 10%, 0402	ECJ-0EB1E103K	1
23	1	C58	KEMET	CAP, 0.1UF, 100V, X7R, 0805	C0805C104K1RACTU	1
24	12	C5 C15 C33 C43 C46 C48 C51 C75 C77 C90 C91 C92	PANASONIC	CAP, .1UF, 25V, 10%, 0603	ECJ-1VB1E104K	1
25	25	C1 C2 C9 C16 C20 C22 C24 C25 C26 C27 C28 C29 C30 C31 C32 C37 C40 C60 C61 C68 C71 C72 C85 C86 C88	MURATA	CAP, 0.1UF, 25V, Y5V, 0402	GRM155F51E104ZA01D	1
26	2	D1 D7	DIODES INC	DIODE, SWT, 100V, 300MA, SOD123	1N4148W-7-F	1
27	1	D3	DIODES INC.	DIODE, SKY, 1A, 100V PWR RECTIFIER, SMA	B1100-13-F	1
28	1	D2	DIODES INC	DIODE, TVS, 15V, 225W, PWRDI 123	DFLT15A-7	1
29	2	D4 D6	PANASONIC	LED, SMT, 3216, GREEN	LN1351CTR	1
30	3	GND1 GND2 GND3	SAMTEC	HEADER, 1X1, .1 GROUND POINT	TSW-101-07-G-S	1
31	5	JP1, JP2, JP3, JP4, JP5	KOBICONN	HEADER, SHORTING JUMPER, .100 UNPLATED. BLK	151-8000-E	1
32	1	J12	CUI INC	CON, AUDIO JACK 3.5MM PCBMT,DUAL VERT	SJD-3510-33	1
33	1	J17	AMP	CON, DB9, FEMALE, RA, W/BD-LOCK, S-LOCK	5747844-6	1
34	1	J2	CUI STACK	CON, PWR JACK, 2.1MM PCB	PJ-202A	1
35	2	J3 J14	KOBICONN	CON, RCA, 1X2, VERT, RED/WHITE	161-4219-E	1
36	1	J15	AMPHENOL	CON, RECEPT., RJ45 W/DUAL LEDS	RJHSE-5381	1
37	2	J6 J11	SAMTEC	HEADER, 1X4, .1, THRU	TSW-104-07-G-S	1
38	1	J7	SAMTEC	HEADER, 1X6 PIN, .1" THRU	TSW-106-07-G-S	1
39	1	J8	SAMTEC	HEADER, 1X3, 0.1 THRU	TSW-103-07-G-S	1
40	1	J1	SAMTEC	HEADER, 2X12, .1, THRU	TSW-112-07-G-D	1
41	2	J4 J16	SAMTEC	HEADER, 2X3, .1, THRU, MALE	TSW-103-07-G-D	1
42	2	J5 J13	SAMTEC	HEADER, 2X5, .1", THRU	TSW-105-07-G-D	1
43	1	L20	COILCRAFT	IND, 1.0UH, 2.9A, SMT	DO1608C-102MLB	1
44	3	L1 L2 L3	MURATA	CHOKE COMMON MODE 1K OHM 2020	DLW5BTN102SQ2L	1

45	2	L4 L16	STEWART	FERRITE, 68_OHM, 1A, 0603	MI0603J680R-10	1
46	3	L22 L23 L24	MURATA	FERRITE, 220_OHM, 200MA, 0603	BLM18AG221SN1	1
47	15	L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L17 L18 L19 L21	MURATA	FERRITE, EMI FILTER, LC, 0805	NFL21SP506X1C3	1
48	2	Q5 Q6	TOSHIBA	TRAN, SIG, NPN, 20 V, SOT23	2SC3326A(T5LFT)	1
49	1	Q1	ON SEMI	TRAN, SIG, PNP, 60V, SOT-23	MMBT2907ALT1G	1
50	3	R12 R13 R58	VISHAY	RES, 0.0 OHM, 1/16W, 5%, 0402	CRCW04020000Z0ED	1
51	8	R2 R7 R8 R10 R11 R14 R16 R18	VISHAY	RES, 1.00K OHM 1/16W, 1%, 0402	CRCW04021K00FKED	1
52	2	R56 R57	PANASONIC	RES, 1.0K, 1/10W, 5%, 0603	ERJ-3GEYJ102V	1
53	1	R85	PANASONIC	RES, 10 OHM, 1/8W, 1%, 0805	ERJ-6ENF10R0V	1
54	15	R20 R22 R23 R24 R25 R28 R33 R34 R35 R38 R52 R61 R64 R65 R66	VISHAY	RES, 100 OHM, 1/16W, 1%, 0402, SMD	CRCW0402100RFKED	1
55	1	R74	PANASONIC	RES, 100 OHM, 1/10W, 1%, 0603	ERJ-3EKF1000V	1
56	10	R1 R3 R5 R17 R19 R21 R26 R47 R83 R119	ROHM	RES, 10.0K OHM, 1/16W, 1%, 0402	MCR01MZPF1002	1
57	6	R37 R55 R60 R62 R63 R97	PANASONIC	RES, 10K, 1/10W, 1%, 0603	ERJ-3EKF1002V	1
58	1	R87	PANASONIC	RES, 127 OHM, 1/10W, 1%, 0603	ERJ-3EKF1270V	1
59	1	R86	PANASONIC	RES, 12.1K, 1/10W, 1%, 0603	ERJ-3EKF1212V	1
60	8	R32 R40 R41 R42 R44 R46 R48 R49	PANASONIC	RES, 22.0 OHM 1/16W 1% 0402	ERJ-2RKF22R0X	1
61	1	R79	PANASONIC	RES, 25.5K, 1/10W, 1%, 0603	ERJ-3EKF2552V	1
62	1	R96	PANASONIC	RES, 3.01K, 1/10W, 1%, 0603	ERJ-3EKF3011V	1
63	1	R43	PANASONIC	RES, 2.05K, 1/10W, 1%, 0603	ERJ-3EKF2051V	1
64	2	R99 R100	VISHAY	RES, 2.20K OHM, 1/16W, 1%, 0402	CRCW04022K20FKED	1
65	4	R51 R69 R104 R105	PANASONIC	RES, 330 OHM, 1/10W, 5%, 0603	ERJ-3GEYJ331V	1
66	1	R45	PANASONIC	RES, 36.5K, 1/10W, 1%, 0603	ERJ-3EKF3652V	1
67	1	R59	PANASONIC	RES, 3.32K, 1/16W, 1%, 0402	ERJ-2RKF3321X	1

68	2	R36 R39	ROHM	RES, 470, 1/10W, 0603, 1%	MCR03EZPFX4700	1
69	4	R4 R6 R9 R15	PANASONIC	RES, 49.9 OHM, 1/10W, 1%, 0603	ERJ-3EKF49R9V	1
70	5	R27 R29 R30 R31 R73	PANASONIC	RES, 4.99K, 1/10W, 1%, 0603	ERJ-3EKF4991V	1
71	4	R53 R54 R67 R68	PANASONIC	RES, 52.3 OHM, 1/10W, 1%, 0603	ERJ-3EKF52R3V	1
72	1	S2	PANASONIC	SWITCH, TACT, 2LEAD 3X6MM	EVQ-PE104K	1
73	1	T2	COILCRAFT	XFMR, 40UH, POE, 5V OUTPUT	FA2805-CLB	1
74	1	T1	PULSE ENG.	XFMR, PWR OVER ETHERNET, 16SOIC	H2019NL	1
75	1	U2	MICROCHIP TECH	IC SERIAL EEPROM 64K 2.5V 8-SOIC	24LC64-1/SN	1
76	1	U5	CIRRUS LOGIC	IC MXS, STEREO DAC, TSSOP10	CS4344-CZZ	
77	1	U8	CIRRUS LOGIC	IC MXS, A/D CONVERT, 10 TSSOP	CS5343-CZZ	
78	1	U4	ALTERA	IC DIG, MAX 3000A CPLD 32 44-TQFP	EPM3032ATC44-10N	3
79	1	U1	ATTERO TECH	IC DIG, AT2216, 100-LQFP	067-00008-01-A	2
80	1	U12	NEC	IC LNR, OPTOCOUPLER, 40V 40mA, MINI 4	PS2911-1-A	1
81	1	U9	SILICON LABS	IC DIG, POE CONTROL, SW, 20QFN	SI3400-E1-GM	
82	1	U10	SIPEX	IC DIG, DUAL RS232, 3.3V, WSOIC16	SP3232ECT-L	1
83	1	U3	TEXAS INST	IC LDO REG 800MA 3.3V SOT223-4	TLV1117-33CDCYR	1
84	1	U11	TEXAS INST	IC LNR, SHUNT VOLTAGE, SOT-23, 1.24-6V	TLV431ACDBZR	1
85	1	X1	CITIZEN	XTL, 25.00MHZ, 30PPM, 18PF, HCM-49, SMT	HCM49-25.000MABJ-UT	1
86	1	X2	CITIZEN	XTL, 8.0MHz, 50PPM, SMD	HCM49-8.000MABJ-UT	1
87	1	U27	JOYOUS	VCXO, 24.576MHZ, 3.3V 5X7MM SMT	ZYCA5A1-24.576M	
88	1			PCB		

NOTE# 1: Equivalent device substitutions can be made for these items at the discretion of the manufacturer. It is the responsibility of the manufacturer to verify device equivalency.

NOTE# 2: These parts must be purchased from Attero Tech.

NOTE# 3: The firmware for this part is available from Attero Tech.

Not Installed Components

ITEM	QTY	REFERENCE	MFG #1	DESCRIPTION	PART NUMBER	NOTES:
1	0	C93				4
2	0	C47 C67				4
3	0	R50				4

NOTE# 4: These items are not to be installed or included in purchased quantities.

Device Specifications

Audio Inputs

Gain: 0 dB
 Input Type: Unbalanced
 Input Impedance: 10K ohms
 Maximum Input Levels: +4 dBu

Audio Outputs

Output Type: Unbalanced
 Output Impedance: 470 ohms
 Maximum output level: +4 dBu

Audio Performance:

Noise: -75 dBu
 System THD+N: 0.03%
 Frequency Response +/- 1 dB, 20 - 20kHz

CobraNet Network

Physical Level: Standard Ethernet
or
 Standard Ethernet with PoE (802.3af)
 Connector: Single RJ-45
 Cable Quality: CAT-5
 Transmission Speed: 100 Mbps

RS-232 Port

Physical Levels: Standard RS-232
 Connector: 9-pin D-Type

Power Requirements

5 VDC, 802.3af PoE

Power Consumption

PSU: \approx 275 mA @ 5 V
 PoE: \approx 2 W

Dimensions

1.25" H x 5" W x 3" D

Weight

3 ounces

Compliance

RoHS

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Notice of Open Source Software Components used in CobraNet LE firmware

Bootloader

<http://www.menie.org/georges/embedded/tftpnaive/>

```

/*
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```

AES Encryption

This code is based off of code under the Lesser GNU Public License. The code is located at

http://www.irisa.fr/texmex/people/dufouil/ffmpegdoxy/aes_8c-source.html

```

/*
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 *
 * some optimization ideas from aes128.c by Reimar Doeffinger
 */

```

Operating System

<http://www.freertos.org/>

```

/*
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Also see <http://www.SafeRTOS.com> for an IEC 61508 compliant version along with commercial development and support options.

*/

TCP/IP Stack

<http://savannah.nongnu.org/projects/lwip/>

```

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 *
 * This file is part of the lwIP TCP/IP stack.
 *
 * Author: Adam Dunkels <adam@sics.se>
 *
 * Improved by Marc Boucher <marc@mbsi.ca> and David Haas <dhaas@alum.rpi.edu>
 */

```

SNMP Implementation

```

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 *
 * Author: Christiaan Simons <christiaan.simons@axon.tv>
 */

```

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Revision	Date	Author	Description of change
1.0	09/03/08	CNL	Initial Release
1.1	12/02/08	CNL	Updates following Review from Sarah
001	12/4/08	SMS	Release
01_a	11/11/2010	CNL	Changed title to AT2216 Reformatted footer
01_b	11/24/10	CNL	Changed references from CobraNet LE reference Board to AT2216 Reference Board
01_c	12/01/10	CNL	Updates following review by Tom Updated block diagram to remove orange blocks Replaced Luminary in BOM with Attero pre-programmed P/N
02	12/02/10	CNL	Release Version 02