

## Overview

3816-EK is an high quality stand-alone evaluation and reference board based on SAM3816 (PROFESSIONAL AUDIO MULTIPLE PURPOSE PROCESSOR) dedicated to processing of multiple audio tasks (Sound Synthesis, Effect Processing, etc)

Beside the SAM3816, 3816-EK hardware includes:

- 1 Audio CODEC: AKM AK4620B(DAC: 115dB DR, 97dB S/(N+D) / ADC: 110dB DR, 90dB S/(N+D))
- 1 Audio DAC: AKM AK4396 (120dB DR, -100dB THD+N)
- 256k x 16 Low Power SRAM: CYPRESS CY62146EV30LL. 64/128/512k x 16 sizes are also supported (e.g. CY62157EV30LL)
- 64Mbit Parallel Flash Memory: ATMEL AT49BV642DT-70TU. Optional extra AT49BV642DT can be mounted for 128Mbit sound bank.
- MMC / SD™ Card socket

## Power supply

3816-EK can be powered by external power supply or by USB connection. JMP4 jumper should be placed accordingly to power supply source.

## Operating Mode

3816-EK operates on two modes:

- Debug mode:  
The board is connected to a PC COM port thru the Dream DBG-IF3 adaptor. The firmware can be downloaded and debugged into internal RAM or Flash memory with SamVS-C emulation tool. With software tools, it is also possible to program firmware into internal flash memory for stand alone mode.
- Stand-alone mode:  
In this mode, SAM3816 executes the program from its internal and external Flash memory.

## Connectors Configuration

Name	Reference	Type	Description
MMC/SD SOCKET	J1	JAE-SG5S009V1A1	MMC or SD Card slot
DMA 16-BIT // SERIAL SLAVE SYNC	J2	HE10 - 2*17	Access to 8 or 16-bit // Port and to Serial Slave Synchronous Interface
MIDI OUT	J3	5-pin DIN	Standard MIDI OUT at 31.25kb/s
MIDI IN	J4	5-pin DIN	Standard MIDI IN at 31.25kb/s
USB	J5	USB B	USB 2.0 Full Speed interface
DEBUG / PROGRAM / MIDI	J6	1*2	Reset for debug and program
DEBUG / PROGRAM / MIDI	J7	1*6	Connection for debug and program
9/12 V DC 1A	J8	DC Plug	Power Supply, +9V/1A, minus on dip
OUT REAR R	J9	RCA	Rear Right audio output
OUT REAR L	J10	RCA	Rear Left audio output
OUT FRONT R	J11	RCA	Front Right audio output
OUT FRONT L	J12	RCA	Front Left audio output
STEREO AUDIO IN	J13	Mini Jack	Stereo audio input (0 to +18dB)
DIGITAL AUDIO	J14	1*8	Digital audio: Clocks and extra Outputs

## Jumper Configuration

Reference	Default Setting	Description
JMP2	Closed	Allow test with DABD0 digital audio output
JMP3	Closed	Allow test with DABD1 digital audio output
JMP4	1-2	Power supply source: <ul style="list-style-type: none"> <li>1-2: 3816-EK board powered by external power supply connected on J8</li> <li>2-3: 3816-EK board powered by USB bus</li> </ul>
JMP5	Open	ADC gain select (controlled by firmware) <ul style="list-style-type: none"> <li>Open: 0dB for line level</li> <li>Closed: +18dB for mike level</li> </ul>
JMP6	1-2	Select signal for SAM3816 MIDI Input pin <ul style="list-style-type: none"> <li>1-2: MIDI 31.25kb/s from J4</li> <li>2-3: Serial PC from J7 or Serial Slave from J2</li> </ul>
JD1	Closed	For test and measurements on VM power supply
JD2–JD4	AT49BV642DT	Select flash chip pinout type <ul style="list-style-type: none"> <li>AT49BV642DT: Atmel 64 Mb devices pinout type</li> <li>Other: Other type</li> </ul> JD2 to JD4 should be changed together
JD5	A Closed B-Open	Crystal frequency select: <ul style="list-style-type: none"> <li>JD5 A-Closed/B-Open, JD6 A-Closed/B-Open: 12.288 MHz</li> <li>JD5 B-Closed/A-Open, JD6 A-Closed/B-Open: 11.2896 MHz</li> <li>JD5 A-Closed/B-Open, JD6 B-Closed/A-Open: 9.6 MHz</li> <li>JD5 B-Closed/A-Open, JD6 B-Closed/A-Open: 12 MHz</li> </ul>
JD6	A Closed B-Open	
JD7	Closed	For test and measurements on VD33 power supply

## LED Meaning

Reference	Name	Description
LED1	ACTIVITY	Controlled by firmware
LED2	POWER	Light on when VD33 power supply is present



## Bill of Material

SAM3816 EVALUATION BOARD - Revised: Friday, October 24, 2008  
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Item	Quantity	Reference	Part
1	2	C1,C3	2.2µF-T
2	10	C2,C4,C54,C59,C62,C66, C67,C75,C81,C83	470pF
3	33	C5,C6,C7,C8,C9,C10,C12, C14,C15,C16,C18,C19,C21, C22,C23,C26,C27,C28,C29, C32,C35,C36,C45,C50,C52, C57,C60,C68,C70,C74,C76, C84,C86	100nF
4	13	C11,C13,C17,C20,C33,C51, C58,C61,C65,C73,C77,C85, C87	10µF-T
5	1	C24	10nF
6	5	C25,C55,C63,C71,C79	1nF
7	2	C30,C31	22pF
8	2	C34,C44	100nF-X5R
9	1	C37	100µF-25V
10	1	C38	4.7µF-X7R-25V
11	1	C39	100nF-X7R-25V
12	1	C40	22nF-X7R-16V
13	1	C41	3.3nF-X7R
14	1	C42	10nF-X7R
15	3	C43,C46,C49	22µF-X5R
16	1	C47	10µF-T-6V
17	1	C48	22nF-X7R
18	2	C53,C69	47µF-T-6V
19	6	C56,C64,C72,C78,C80,C82	10µF-Low Dist
20	1	C88	1µF-T
21	1	D1	LL4148
22	1	D2	CD214A-B340LF
23	1	D3	ZLLS2000
24	1	D4	CRS08
25	2	JD1,JD7	SOLDER PAD
26	5	JD2,JD3,JD4,JD5,JD6	Jumper Disk2P
27	3	JMP2,JMP3,JMP5	Jumper1P
28	2	JMP4,JMP6	Jumper2P
29	1	J1	JAE-SG5S009V1A1
30	1	J2	HEAD_17X2
31	2	J3,J4	MIDI_DIN
32	1	J5	WERI_61400416121
33	1	J6	MLSS100-02
34	1	J7	MLSS100-06
35	1	J8	DC PLUG
36	4	J9,J10,J11,J12	RCA_JACK
37	1	J13	JACK 3.5 STEREO
38	1	J14	HEAD_8
39	1	LED1	TLMP1100-Vishay
40	1	LED2	TLMS1000-Vishay

Item	Quantity	Reference	Part
41	4	L1,L2,L9,L13	742792093
42	4	L3,L4,L7,L8	NFM21CC102R1H3
43	2	L5,L6	742792040
44	1	L10	NFM21PC104R1E3
45	1	L11	74477120
46	1	L12	744777122
47	7	R1,R3,R5,R118,R129,R136, R147	10k
48	14	R2,R87,R110,R111,R114, R117,R122,R123,R127,R130, R132,R134,R140,R145	4.7k
49	2	R4,R7	470
50	3	R6,R8,R99	22k
51	33	R9,R10,R11,R12,R13,R14, 22 R15,R16,R17,R18,R19,R20, R21,R22,R23,R24,R25,R26, R27,R28,R29,R30,R31,R32, R33,R34,R35,R36,R37,R141, R142,R150,R151	
52	47	R38,R39,R40,R41,R42,R43, R44,R45,R46,R47,R48,R49, R50,R51,R52,R53,R54,R55, R56,R57,R58,R59,R60,R61, R62,R63,R64,R65,R66,R67, R68,R69,R70,R71,R72,R73, R74,R75,R76,R77,R78,R79, R80,R81,R82,R83,R84	33
53	5	R85,R90,R94,R97,R105	100k
54	2	R86,R100	39
55	2	R88,R89	330k
56	3	R91,R148,R149	47k
57	7	R92,R96,R98,R116,R124, R135,R143	220
58	2	R93,R101	750
59	1	R95	820
60	1	R102	150k
61	1	R103	90.9k
62	2	R104,R107	4.99k
63	1	R106	45.3k 1%
64	1	R108	0
65	1	R109	10k 1%
66	8	R112,R119,R120,R126,R128, R137,R138,R146	2.2k
67	8	R113,R115,R121,R125,R131, R133,R139,R144	4.3k
68	1	U1	SAM3816
69	1	U2	AT49BV642DT-70TU
70	1	U3	NM
71	1	U4	CY62146EV30LL
72	1	U5	74LVC1G07DBV
73	1	U6	HCPL-0501
74	1	U7	MAX811REUST

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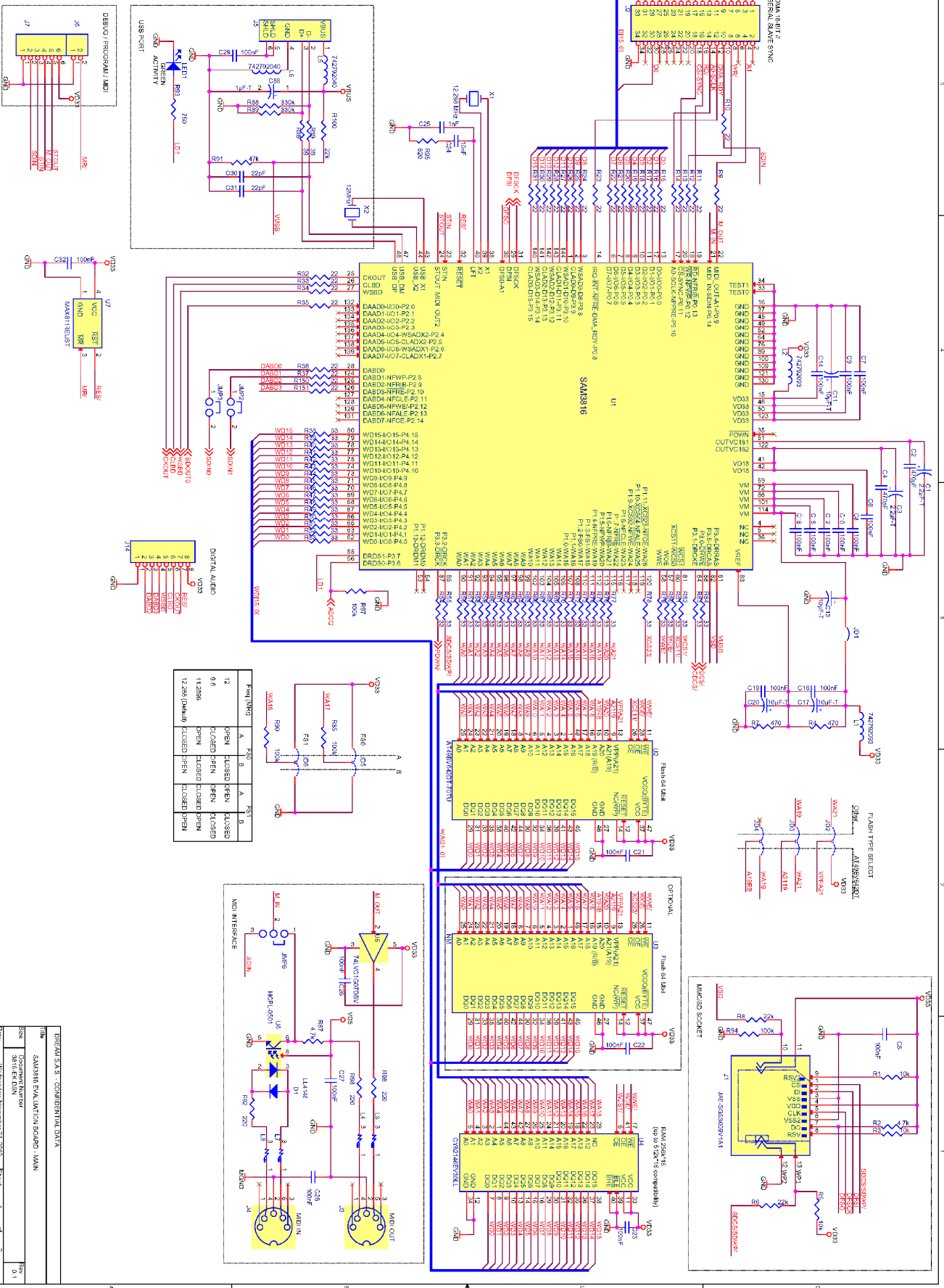
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Item	Quantity	Reference	Part
75	1	U8	LM34914
76	1	U9	LM2830X
77	2	U10,U12	OPA2353
78	1	U11	AK4396
79	1	U13	AK4620B
80	1	X1	12.288 MHz
81	1	X2	12MHz

# Schematic Diagram



Pin	Function	A	B	A	B
12	Flash (M29)	OPEN	CLOSED	OPEN	CLOSED
9/8		CLOSED	OPEN	OPEN	CLOSED
11/2/8/6		OPEN	CLOSED	CLOSED	OPEN
12/2/8/6 (Default)		CLOSED	OPEN	CLOSED	OPEN

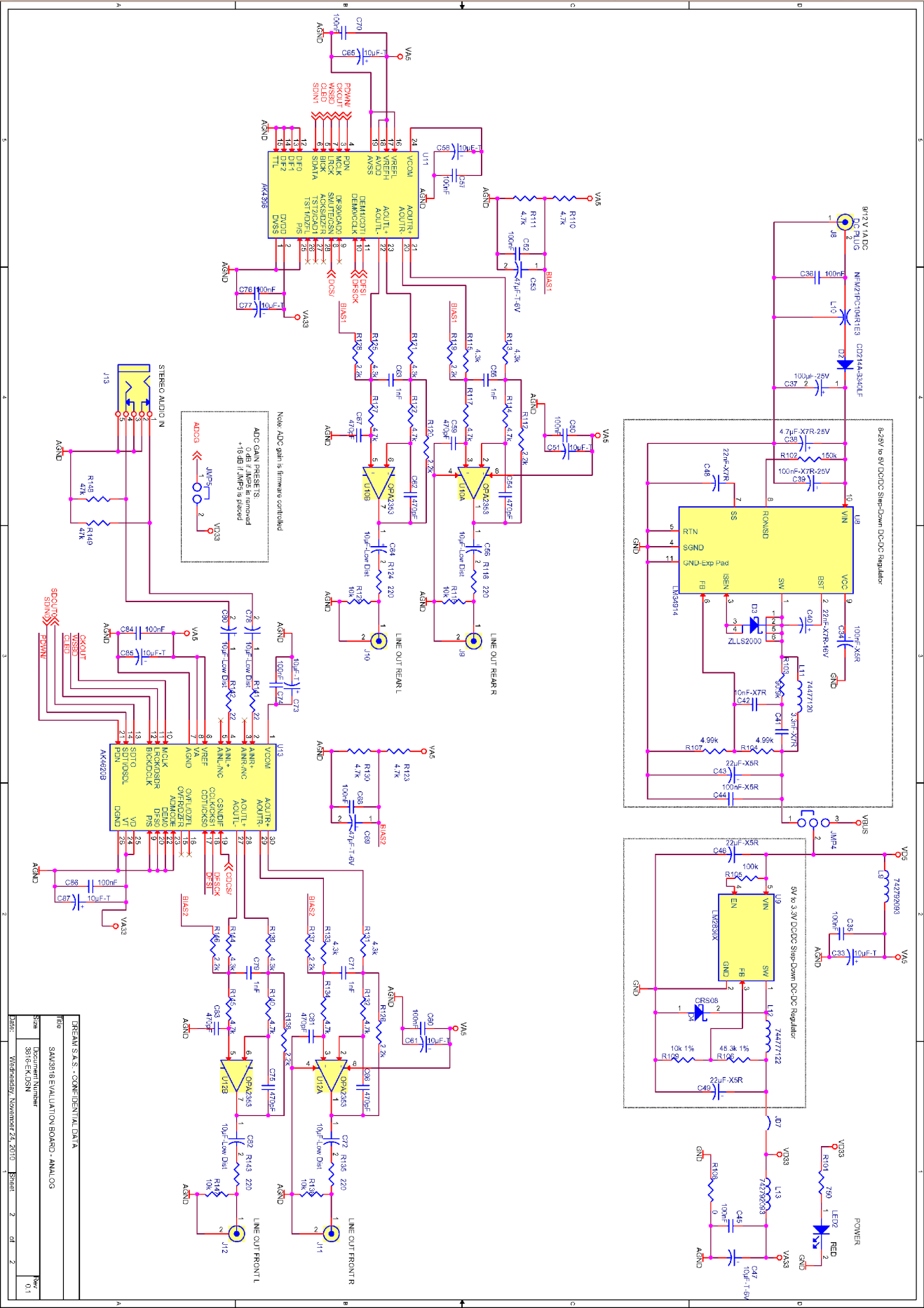
BOARD S.A.S. - CONFIDENTIAL DATA

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