3716-DK_Rev0

Development and Reference Board
for SAM3716

Overview

3716-DK is an high quality stand-alone development and reference board based on SAM3716 (HIGH PERFORMANCE MIDI SYNTH AND EFFECT PROCESSOR) dedicated to processing of multiple audio tasks (Synthesis, Effect Processing, Audio Mixing and Routing, etc)
Beside the SAM3716, 3716-DK hardware includes:

- 2 Audio DAC: AKM AK4384(24-bit DR:106dB, THD+N:-94dB)
- 1 Audio ADC AKM AK5358A (24-bit, DR:102dB, S/(N+D):92dB)
- 64Mbit Flash Memory: ATMEL AT49BV642DT (an extra AT49BV642DT can be added to go to 128Mbit)
- 1 x SRAM CYPRESS CY62146EV30 (256kx16) for High quality effects
- 1 x SRAM CYPRESS CY62126EV30 (64kx16) for debug in case of firmware bigger than 16kx16

Operating Mode

3716-DK operates on two modes:

- Debug mode:
  The board is connected to a PC COM port thru the Dream DBG-IF3 adaptor. If firmware is not bigger than 16kx16, it can be downloaded and debugged into internal SRAM or flash memory with SamVS-C emulation tool. If firmware is bigger than 16kx16 its higher part can be debugged in external 64k*16 SRAM. With software tools, it is also possible to program firmware into internal or external flash memory for stand alone mode.
- Stand-alone mode:
  In this mode, SAM3716 executes the program from its internal and external Flash memory.

Connectors Configuration

Name	Reference	Type	Description
MIDI IN	J1	5-pin DIN	Standard MIDI IN at 31.25kb/s
8-BIT // PORT	J2	HE10 - 2*10	Access to 8-bit parallel Port
SPI	J3	1*8	For SPI extensions
DIGITAL AUDIO I/Os	J4	HE10 - 2*13	Digital audio Inputs/Outputs/Clocks
DEBUG / PROGRAM / MIDI	J5	1*2	Reset for debug and program
DEBUG / PROGRAM / MIDI	J6	1*6	Connection for debug and program
LINE OUT FRONT LEFT	J7	RCA	Front Left audio output
LINE OUT FRONT RIGHT	J8	RCA	Front Right audio output
LINE OUT REAR LEFT	J9	RCA	Rear Left audio output
LINE OUT REAR RIGHT	J10	RCA	Rear Right audio output
MIC/LINE IN 1	J11	Jack 6.35 (Mono)	Audio Input 1 for Mike or Line level signal
MIC/LINE IN 2	J12	Jack 6.35 (Mono)	Audio Input 2 for Mike or Line level signal
9V DC 1A	J13	DC Plug	Power Supply, +9V/1A, minus on dip

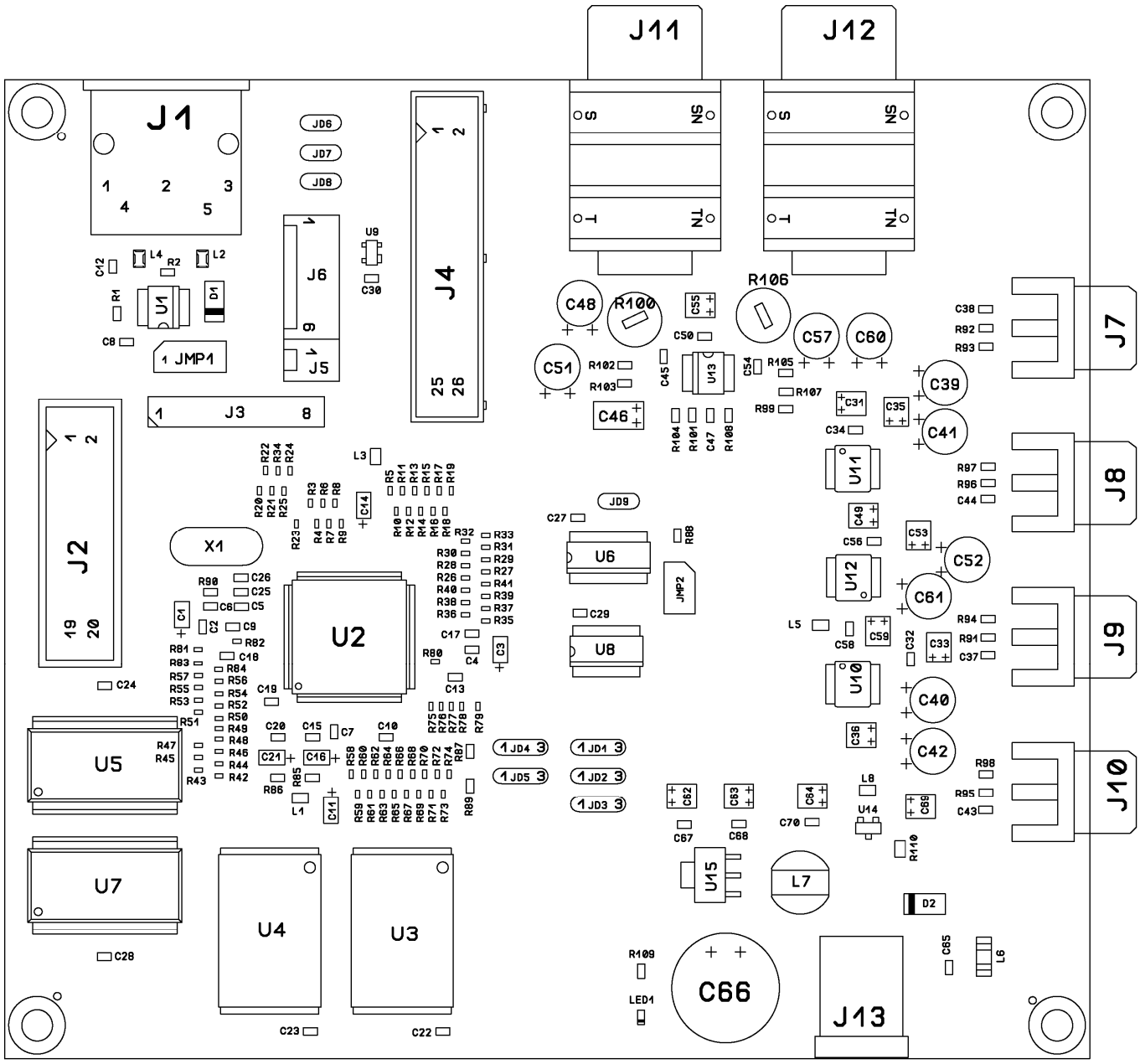
Jumper Configuration

Reference	Default Setting	Description
JMP1	1-2	Select M_IN signal from MIDI interface or J6 • 1-2: M_IN connected to MIDI IN interface • 2-3: M_IN connected to J6
JMP2	Open	Should be closed for debug • Open: Stand alone mode ext Flash U3 mapped in 0x4000 – 0xFFFF • Closed: Debug mode ext RAM U7 mapped in 0x4000 – 0xFFFF
JD1-JD3	AT49BV642DT	Select flash chip pinout type • AT49BV642DT: Atmel 64Mb devices pinout type • Other: Other type JD1 to JD3 should be changed together
JD4	A Closed B Open	Crystal frequency select: • JD4 A-Closed/B-Open, JD5 A-Closed/B-Open: 12.288 MHz • JD4 B-Closed/A-Open, JD5 A-Closed/B-Open: 11.2896 MHz • JD4 A-Closed/B-Open, JD5 B-Closed/A-Open: 9.6 MHz • JD4 B-Closed/A-Open, JD5 B-Closed/A-Open: 12 MHz
JD5	A Closed B Open	
JD6	Closed	Connect DABD1 audio signal to DAC U10
JD7	Closed	Connect DABD0 audio signal to DAC U11
JD8	Closed	Connect DAAD0 audio signal to ADC U12
JD9	Open	Should be closed if debug components are not mounted

LED Meaning

Reference	Name	Description
LED1	POWER	Light on when VD33 power supply is present

Layout



Bill of Material

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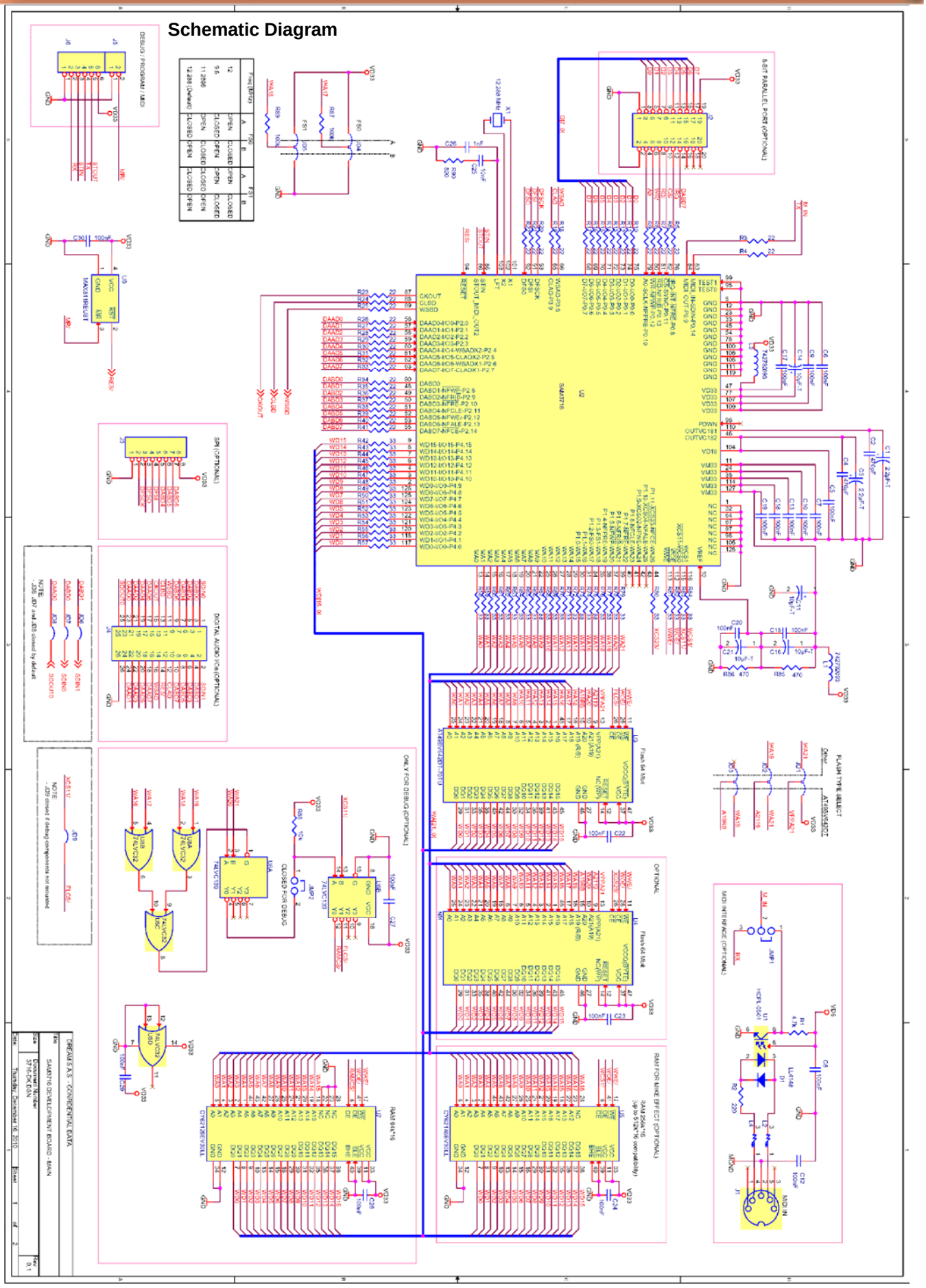
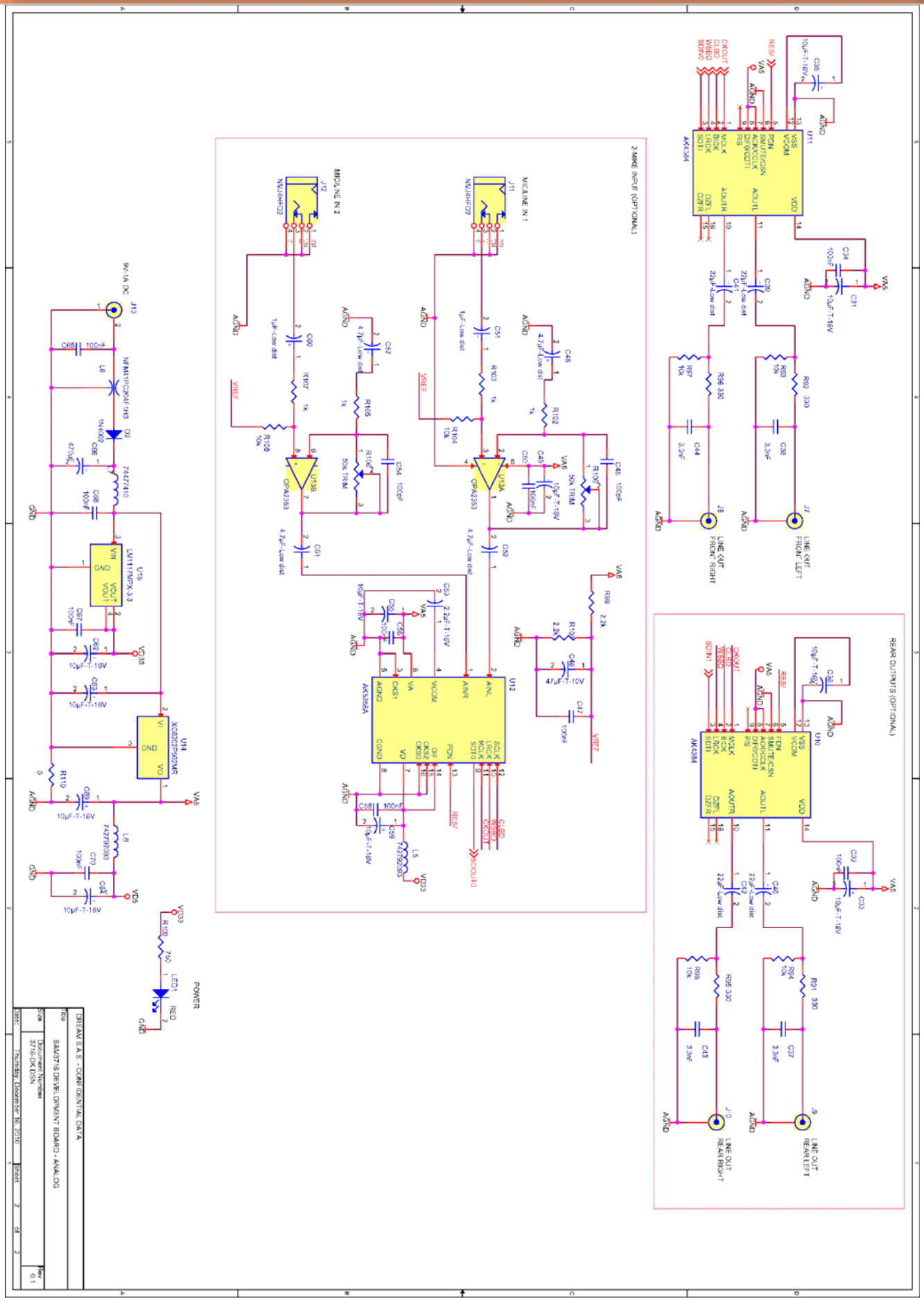
Item	Quantity	Reference	Part	Manufacturer	Reference
1	2	C1,C3	2.2µF-T		
2	2	C2,C4	470pF		
3	30	C5,C6,C7,C8,C9,C10,C12,C13, C15,C17,C18,C19,C20,C22,C23, C24,C27,C28,C29,C30,C32,C34, C47,C50,C56,C58,C65,C67,C68, C70	100nF		
4	4	C11,C14,C16,C21	10µF-T		
5	1	C25	10nF		
6	1	C26	1nF		
7	11	C31,C33,C35,C36,C49,C55,C59, C62,C63,C64,C69	10µF-T-16V		
8	4	C37,C38,C43,C44	3.3nF		
9	4	C39,C40,C41,C42	22µF-Low dist	PANASONIC	ECA1HAM220X
10	2	C45,C54	100pF		
11	1	C46	47µF-T-10V		
12	4	C48,C52,C57,C61	4.7µF-Low dist	PANASONIC	ECA1HAM4R7X
13	2	C51,C60	1µF-Low dist	PANASONIC	ECA1HAM010X
14	1	C53	2.2µF-T-16V		
15	1	C66	470µF		
16	1	D1	LL4148	VISHAY	LL4148
17	1	D2	1N4002		
18	5	JD1,JD2,JD3,JD4,JD5	Jumper Disk2P		
19	4	JD6,JD7,JD8,JD9	Jumper Disk1P		
20	1	JMP1	Jumper2P		
21	1	JMP2	Jumper1P		
22	1	J1	MIDI_DIN		
23	1	J2	HEAD_10X2		
24	1	J3	HEAD_8		
25	1	J4	HEAD_13X2		
26	1	J5	MLSS100-02	ITW PANCON	MLSS100-02
27	1	J6	MLSS100-06	ITW PANCON	MLSS100-06
28	4	J7,J8,J9,J10	RCA_JACK	KEYSTONE	901
29	2	J11,J12	NMJ4HFD2	NEUTRIK	NMJ4HFD2
30	1	J13	DC PLUG	3E	LD02.02
31	1	LED1	TLMS1000-Vishay	VISHAY	TLMS1000
32	4	L1,L3,L5,L8	742792093	WURTH	742792093
33	2	L2,L4	NFM21CC102R1H3	MURATA	NFM21CC102R1H3
34	1	L6	NFM41PC204F1H3	MURATA	NFM41PC204F1H3
35	1	L7	74477410	WURTH	74477410

Item	Quantity	Reference	Part	Manufacturer	Reference
36	1	R1	4.7k		
37	1	R2	220		
38	39	R3,R4,R5,R6,R7,R8,R9,R10, R11,R12,R13,R14,R15,R16,R17, R18,R19,R20,R21,R22,R23,R24, R25,R26,R27,R28,R29,R30,R31, R32,R33,R34,R35,R36,R37,R38, R39,R40,R41	22		
39	43	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		
40	2	R85,R86	470		
41	2	R87,R89	100k		
42	7	R88,R93,R94,R97,R98,R104, R108	10k		
43	1	R90	820		
44	4	R91,R92,R95,R96	330		
45	2	R99,R101	2.2k		
46	2	R100,R106	50k TRIM		
47	4	R102,R103,R105,R107	1k		
48	1	R109	750		
49	1	R110	0		
50	1	U1	HCPL-0501		
51	1	U2	SAM3716	DREAM	SAM3716
52	1	U3	AT49BV642DT-70TU	ATMEL	AT49BV642DT-70TU
53	1	U4	NM	ATMEL	AT49BV642DT-70TU
54	1	U5	CY62146EV30LL	CYPRESS	CY62146EV30LL
55	1	U6	74LVC139		
56	1	U7	CY62126EV30LL	CYPRESS	CY62126EV30LL
57	2	U8,U16	74LVC32		
58	1	U9	MAX811REUST	MAXIM	MAX811REUST
59	2	U10,U11	AK4384	AKM	AK4384VT
60	1	U12	AK5358A	AKM	AK5358AET
61	1	U13	OPA2353	BURR-BROWN	OPA2353
62	1	U14	XC6202P502MR	TOREX	XC6202P502MR
63	1	U15	LM1117MPX-3.3	NATIONAL	LM1117MPX-3.3
64	1	X1	12.288 MHz		

Schematic Diagram





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