

Overview

5504-EK is a high quality stand-alone evaluation board based on SAM5504 (AUDIO & MUSIC MULTI-DSP PROCESSOR).

The SAM5504 can be used in 2 different hardware configurations for different applications. On 5504-EK board the SAM5504 is running in the hardware configuration dedicated to sound module or keyboard instruments built around low cost Quad SPI memory components.

Samples are stored in Quad SPI Flash and read from it in Quad I/O Read Mode (100MHz) through the SAM5504 Sample Cache Controller to reach 81-voice polyphony.

Beside the SAM5504, 5504-EK_Rev0 hardware includes:

- 1 Audio DAC: AKM AK4384(24-bit, DR:106dB, THD+N:-94dB)
- 256Mbit Quad SPI Flash Memory: SPANSION S25FL256SAGMFI001
- USB High Speed Device port
- 2 FFC connectors for optional Keyboard/ Front Panel interface

Operating Mode

5504-EK operates on two modes:

- Debug mode:

The board is connected to a PC through the Dream 5000DBG-IF adaptor. The firmware can be downloaded and debugged into Quad SPI Flash memory with Dream SamVS-C development software. With SamVS or ProgSam software tool it is possible to program the firmware in Quad SPI Flash memory for stand-alone mode. With ProgSam tool it is also possible to program the eFuses on SAM5504 for encryption / copy protection of firmware code and sound bank content.

The sound bank can also be loaded into Quad SPI Flash memory using UXChange.exe software or copying it directly from USB drive connected through 5000USBH-IF adapter.
- Stand-alone mode:

In this mode the SAM5504 executes the program from the Quad SPI Flash memory playing MIDI events from USB Midi and optionally scans the front panel and the piano keyboard.

Connectors Configuration

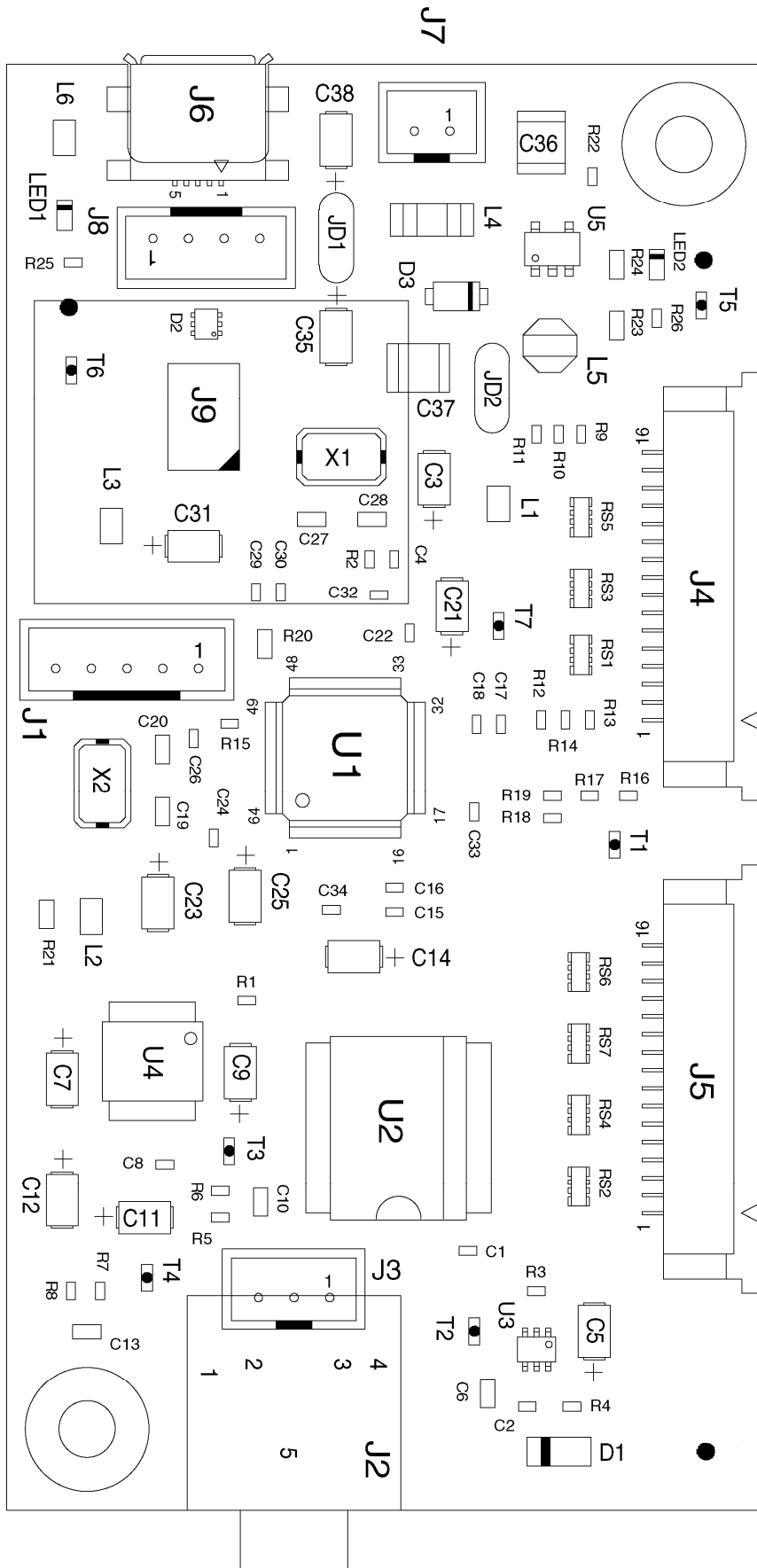
Name	Reference	Type	Description
DEBUG / PROGRAM	J1	JST PH Series, 1*5	Serial connection for debug and program, compatible with Dream 5000DBG-IF
LINE OUT	J2	Mini Jack	Stereo Audio Output (1.2V RMS, Line)
	J3 (Optional, n.m.)	1*3	Stereo Audio Output (1.2V RMS, Line)
MULTI-PURPOSE INTERFACE	J4-J5	FFC 16, 1mm	Can be used as: - MIDI port for firmware download and control from host - VIOs + 3-channel ADC for front panel connection - VIOs + 3-channel ADC for keyboard/front panel scanning connection
USB POWER SUPPLY & USB DEVICE PORT	J6	Mini USB B	USB connector used to power the board. Can also be used as USB device full or high speed port.
POWER SUPPLY	J7 (Optional, n.m.)	1*2	Power supply if JD1 open, +5V/0.5A, GND on pin 1
USB DEVICE PORT	J8 (Optional, n.m.)	1*4	USB device full or high speed port if J7 is not used
To 5000USBH-IF	J9	HARWIN M22 2*3	Connection for USB drive adapter: 5000USBH-IF

“n.m.” = not mounted

Jumper Configuration

Reference	Default Setting	Description
JD1	Closed	Power supply source <ul style="list-style-type: none"> • Closed: Power supply from USB VBUS • Open: Power supply from J7
JD2	Closed	For test and measurement on 3.3V power supply

Layout



Bill of Material

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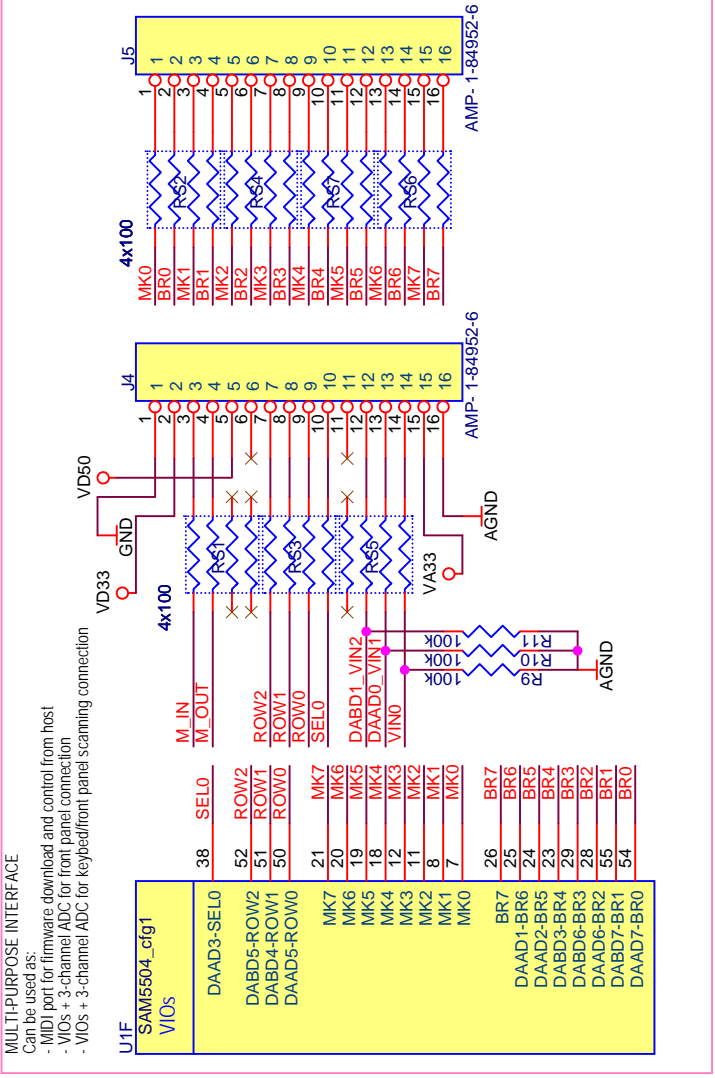
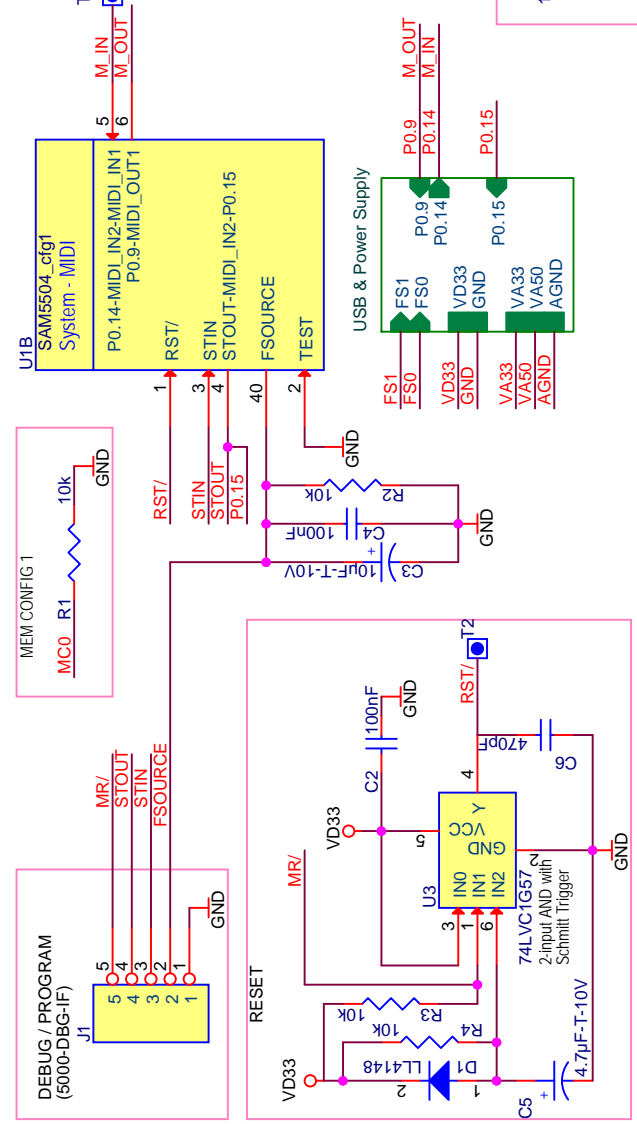
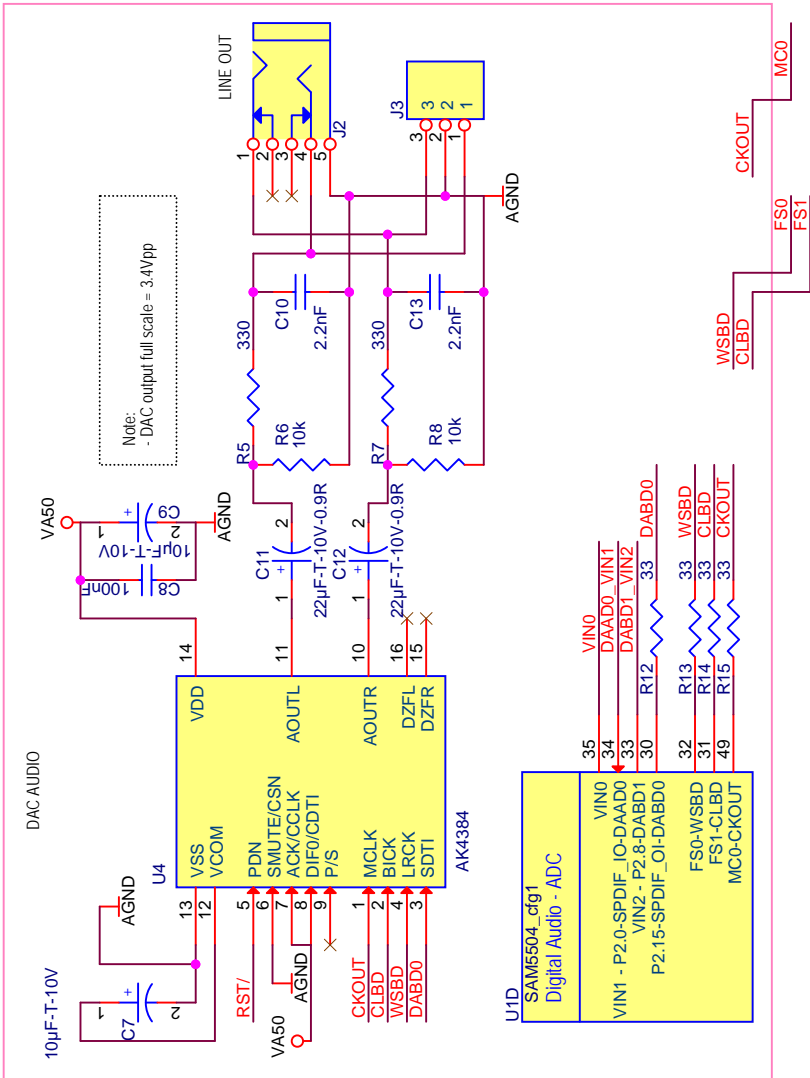
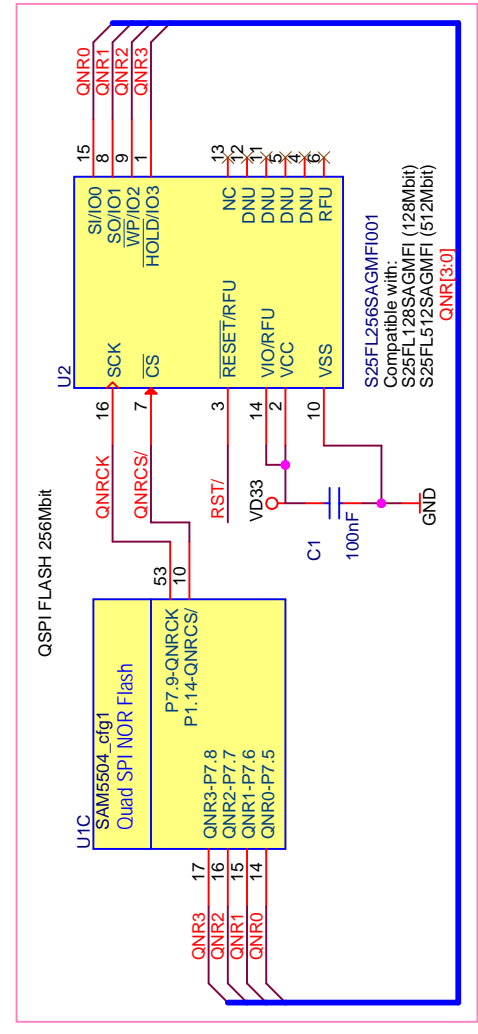
Item	Quantity	Reference	Part	Manufacturer	Designation
1	13	C1, C2, C4, C8, C15, C17, C22, C24, C26, C29, C32, C33, C34	100nF		
2	7	C3, C7, C9, C14, C21, C25, C31	10µF-T-10V		
3	2	C5, C23	4.7µF-T-10V		
4	1	C6	470pF		
5	2	C10, C13	2.2nF		
6	2	C11, C12	22µF-T-10V-0.9R	AVX	TPSA226K010R0900
7	3	C16, C18, C30	10nF		
8	4	C19, C20, C27, C28	22pF		
9	2	C35, C38	1µF-T		
10	2	C36, C37	22µF-X5R		
11	1	D1	LL4148	VISHAY	LL4148
12	1	D2	TPD2E1B06	TI	TPD2E1B06
13	1	D3	CRS08	TOSHIBA	CRS08
14	2	JD1, JD2	Jumper Disk1P		
15	1	J1	B5B-PH-K-S	JST	B5B-PH-K-S
16	1	J2	JACK 3.5 STEREO	3E	15.427
17	1	J3	N.M.	JST	B3B-PH-K-S
18	2	J4, J5	AMP- 1-84952-6	TYCO ELECTRONICS	AMP- 1-84952-6
19	1	J6	47642-0001	MOLEX	47642-0001
20	1	J7	N.M.	JST	B2B-PH-K-S
21	1	J8	N.M.	JST	B4B-PH-K-S
22	1	J9	M22-2020305	HARWIN	M22-2020305
23	1	LED1	TLMG1100-Vishay	VISHAY	TLMG1100
24	1	LED2	TLMS1000-Vishay	VISHAY	TLMS1000-GS08
25	4	L1, L2, L3, L6	742792093	WURTH	742792093
26	1	L4	NFM41PC204F1H3	MURATA	NFM41PC204F1H3
27	1	L5	744029003	WURTH	744029003
28	7	RS1, RS2, RS3, RS4, RS5, RS6, RS7	4x100		
29	8	R1, R2, R3, R4, R6, R8, R17, R19	10k		
30	2	R5, R7	330		
31	4	R9, R10, R11, R22	100k		
32	4	R12, R13, R14, R15	33		
33	2	R16, R18	N.M.		

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Item	Quantity	Reference	Part	Manufacturer	Designation
34	1	R20	12k, 1%		
35	1	R21	0		
36	1	R23	45.3k 1%		
37	1	R24	10k 1%		
38	2	R25, R26	750		
39	7	T1, T2, T3, T4, T5, T6, T7	TestPoint	Vogt	N.M. (985.62 or 1000C.22)
40	1	U1	SAM5504_cfg1		
41	1	U2	S25FL256SAGMFI001	SPANSION	S25FL256SAGMFI001
42	1	U3	74LVC1G57	TI	74LVC1G57DCK
43	1	U4	AK4384	AKM	AK4384VT
44	1	U5	LM2830X	NS	LM2830X
45	1	X1	12 MHz	ABRACON	ABM3-12.000MHZ-D2Y-T
46	1	X2	N.M.		



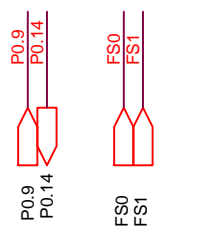
DREAM S.A.S. CONFIDENTIAL DATA

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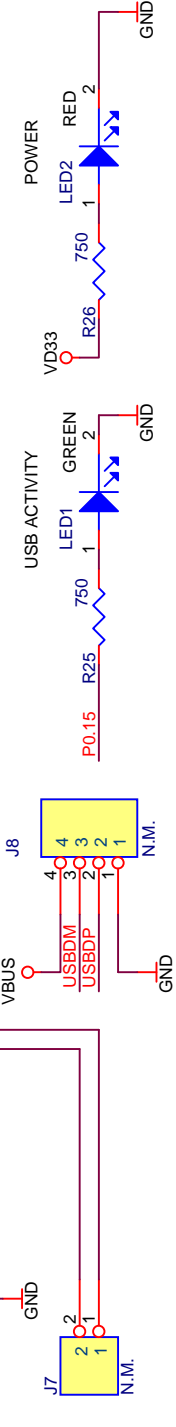
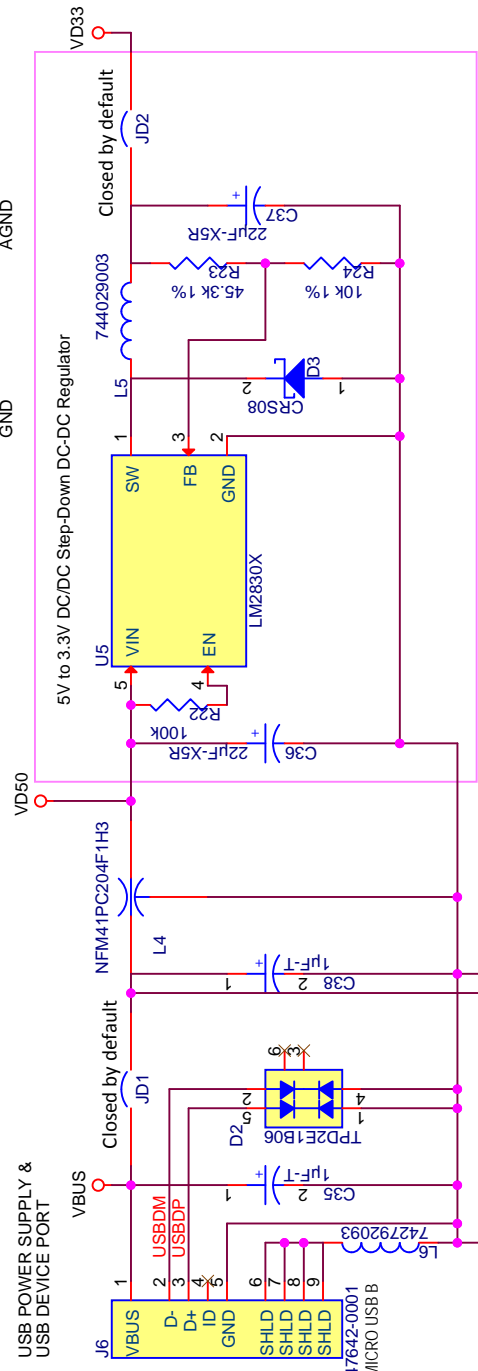
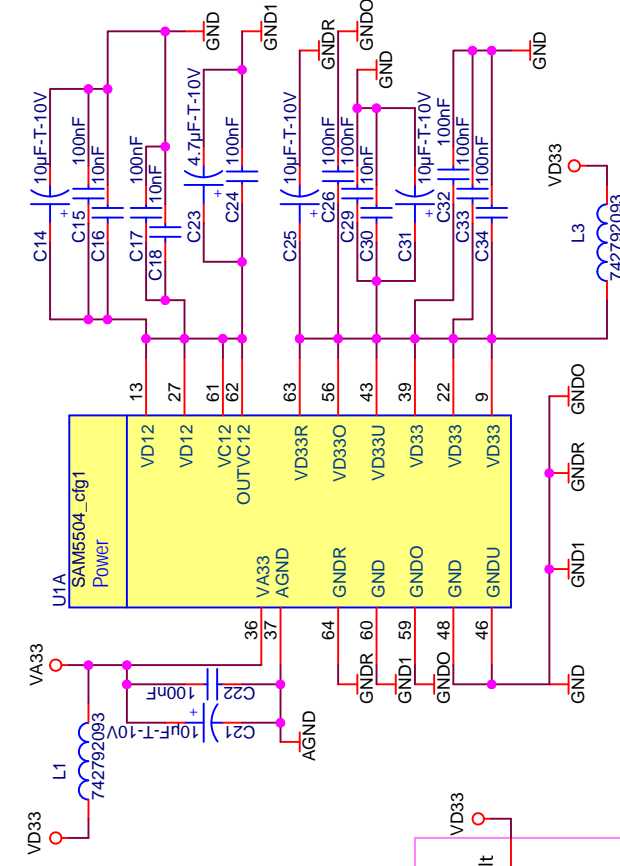
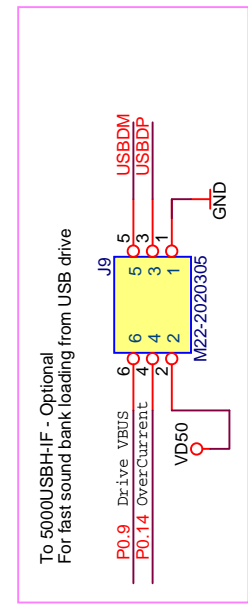
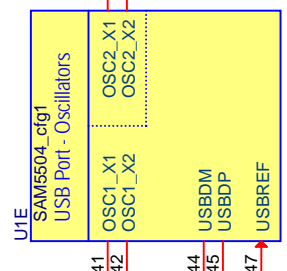
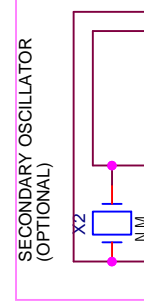
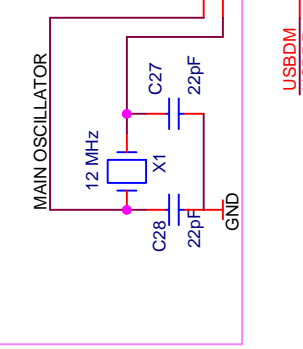
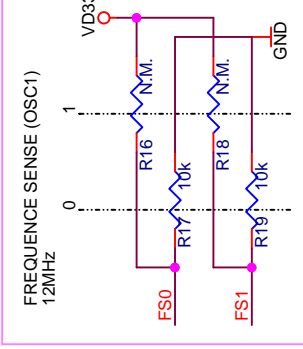
Size A4
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Date: Thursday, September 03, 2015 Sheet 1 of 2

Rev 1.1



Freq (MHz)	FS1	FS0
12 (Default)	0	0
9.6	0	1
11.2896	1	0
12.288	1	1



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