

Overview

5716-EK is a high quality stand-alone evaluation board based on SAM5716 (AUDIO & MUSIC MULTI-DSP PROCESSOR).

The SAM5716 can be used in 6 different hardware configurations for different applications. On 5716-EK board the SAM5716 is running in the hardware configuration dedicated to Sound module applications with firmware and sound bank stored in NAND Flash, sample cache and extended delay lines in SDRAM.

Beside the SAM5716, 5716-EK_Rev2 hardware includes:

- 1 Audio DAC: AKM AK4430(24-bit, DR:104dB, THD+N:-91dB)
- 8Gbit NAND Flash: MICRON MT29F8G08ABACAWP. Footprint compatible with MT29F4G08ABADAWP (4Gbit) or smaller.
- 64Mbit SDRAM: MICRON MT48LC4M16A2P-7E
- USB High Speed Device port

Dream NAND Flash Solution

DREAM NAND Flash solution allows the storage of large sound banks in cost-effective NAND Flash memory devices. Thanks to its sophisticated sample cache system, the SAM5716 offers high performances, security and reliability:

- Support SLC NAND Flash technology (up to 8GByte)
- High polyphony: up to 168 voices + effects
- Transparent pages transfer from NAND to SDRAM buffers
- Automatic error correction (ECC)
- Bad block management and wear leveling ensuring NAND Flash lifetime
- AES-protected sound banks with on-the-fly decryption
- Sound bank compiler for NAND Flash technology

Operating Mode

5716-EK operates on two modes:

- **Debug/Program mode:**
The board is connected to a PC through the Dream 5000DBG-IF adaptor. Firmware can be downloaded and debugged into internal or external SDRAM with Dream SamVS-C development software.
With SamVS or ProgSam software tool it is possible to program the firmware into NAND Flash memory for stand-alone mode.
The sound bank can be loaded into NAND Flash memory using UXChange.exe software or copying it directly from USB drive connected through 5000USBH-IF adapter.
With ProgSam tool it is also possible to program the eFuses on SAM5716 for encryption / copy protection of firmware code and sound bank content.
- **Stand-alone mode:**
In this mode the SAM5716 loads the program from the NAND Flash to internal RAM or external SDRAM at startup then executes it in internal RAM or external SDRAM.

Connectors Configuration

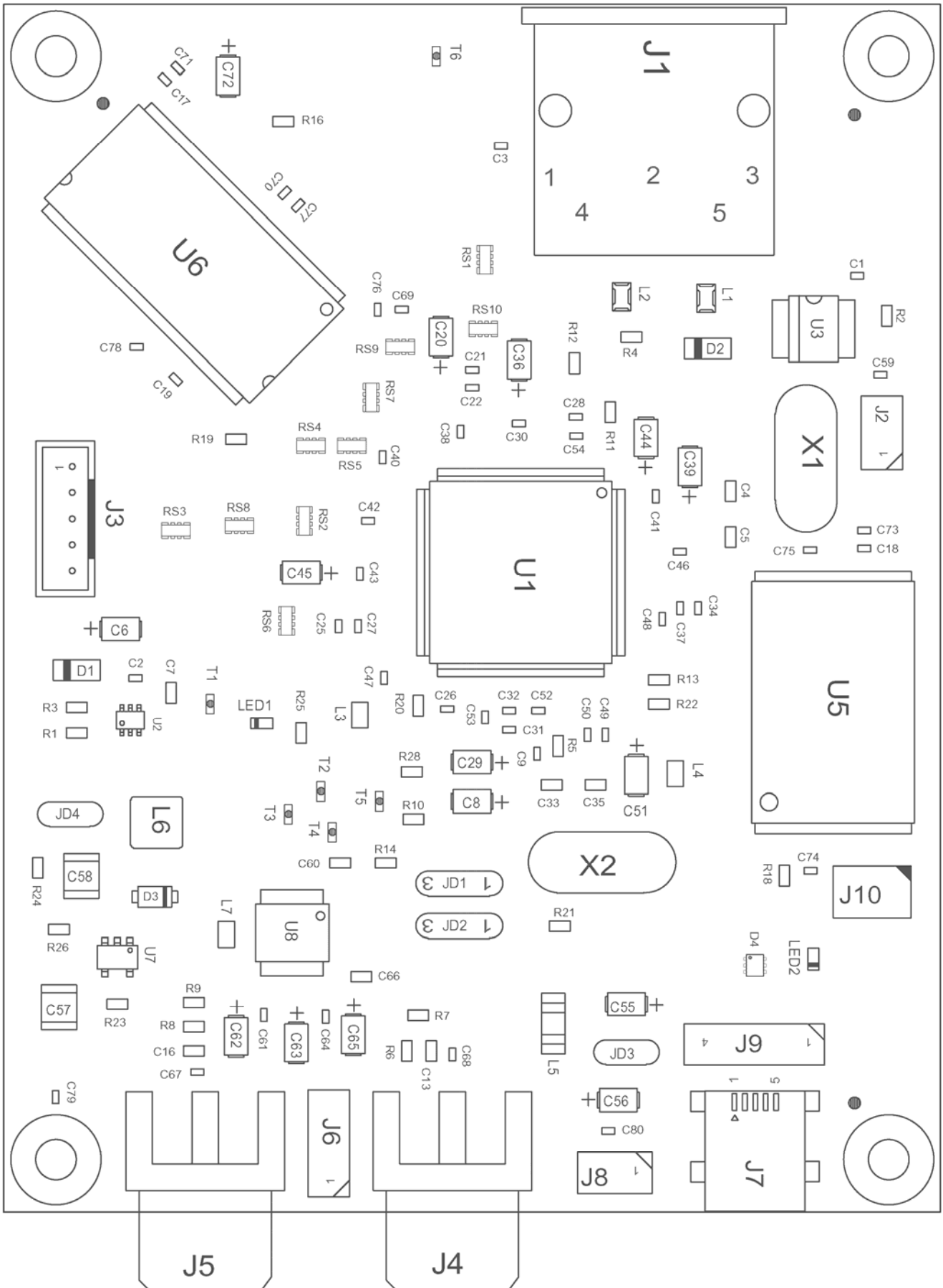
Name	Reference	Type	Description
MIDI IN	J1	5-pin Din	Standard MIDI IN at 31.25kb/s
M_IN	J2 (Optional, n.m.)	1*2	MIDI IN at 31.25kb/s or higher baud rate (firmware depended), 3.3V CMOS Level
DEBUG / PROGRAM	J3	JST PH Series, 1*5	Serial connection for debug and program, compatible with Dream 5000DBG-IF
OUT LEFT	J4	RCA	Left Audio Output (1.2V RMS, Line)
OUT RIGHT	J5	RCA	Right Audio Output (1.2V RMS, Line)
	J6 (Optional, n.m.)	1*3	Stereo Audio Output (1.2V RMS, Line)
USB POWER SUPPLY & USB DEVICE PORT	J7	Mini USB B	USB connector used to power the board. Can also be used as USB device full or high speed port.
POWER SUPPLY	J8 (Optional, n.m.)	1*2	Power supply if JD3 open, +5V/0.5A, GND on pin 1
USB DEVICE PORT	J9 (Optional, n.m.)	1*4	USB device full or high speed port if J7 is not used
To 5000USBH-IF	J10	HARWIN M22 2*3	Connection for USB drive adapter: 5000USBH-IF

“n.m.” = not mounted

Jumper Configuration

Reference	Default Setting	Description	
JD1	0	Main Oscillator OSC1 frequency select: <ul style="list-style-type: none"> • JD2 -> 0, JD1 -> 0 : 12 MHz (default) • JD2 -> 0, JD1 -> 1 : 9.6 MHz • JD2 -> 1, JD1 -> 0 : 11.2896 MHz • JD2 -> 1, JD1 -> 1 : 12.288 MHz 	
JD2	0		
JD3	Closed		Power supply source <ul style="list-style-type: none"> • Closed: Power supply from USB VBUS • Open: Power supply from J8
JD4	Closed		For test and measurement on 3.3V power supply

Layout



Bill of Material

SAM5716 Evaluation Board - Revised: October 2, 2017

5716-EK.DSN Revision: 3

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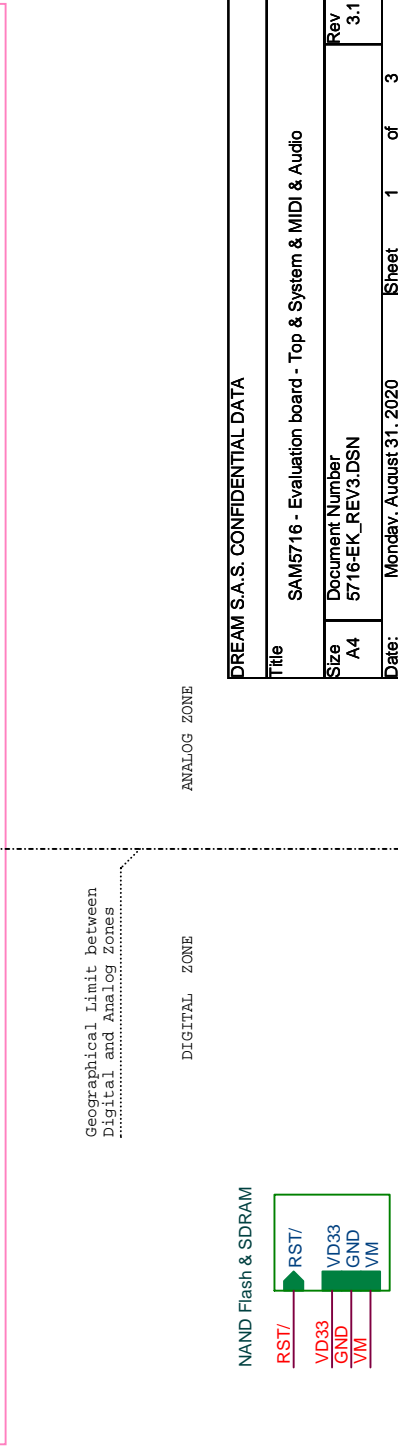
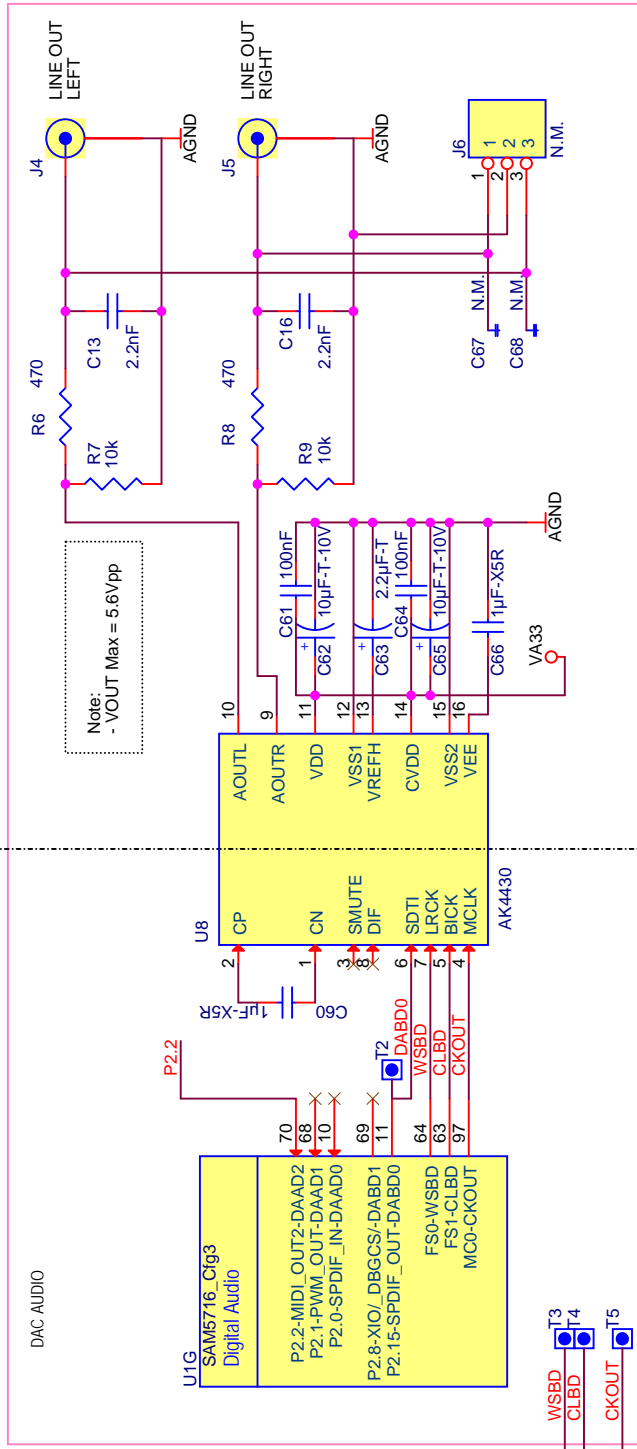
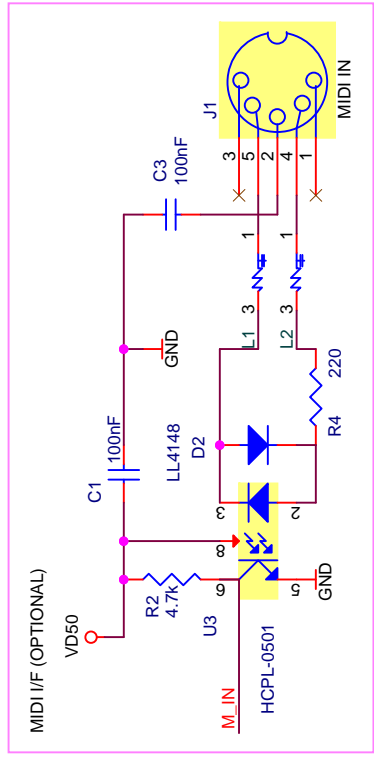
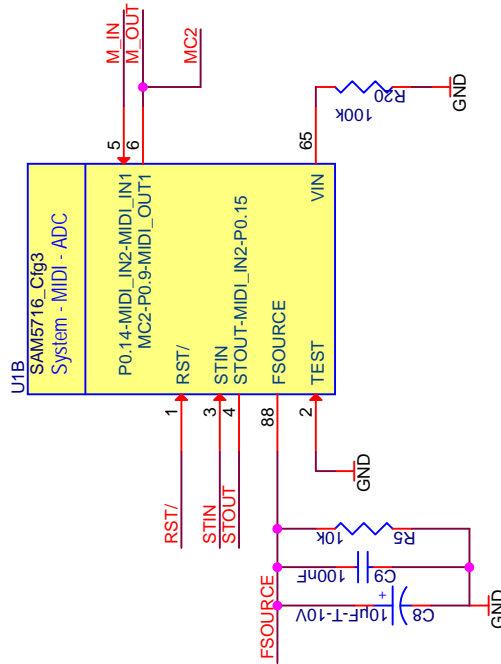
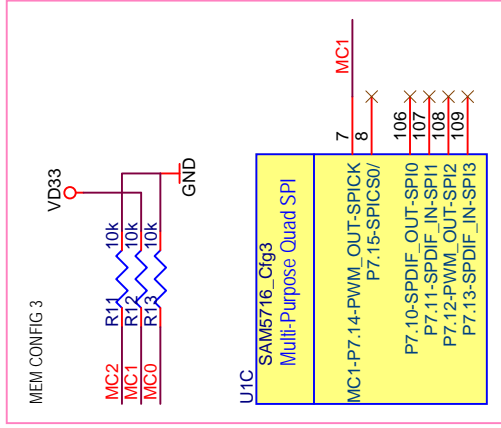
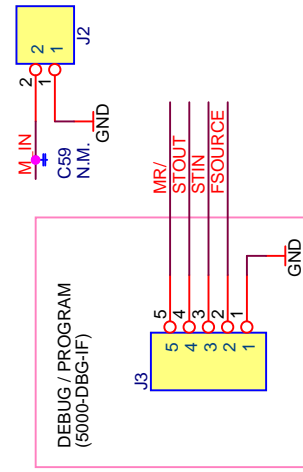
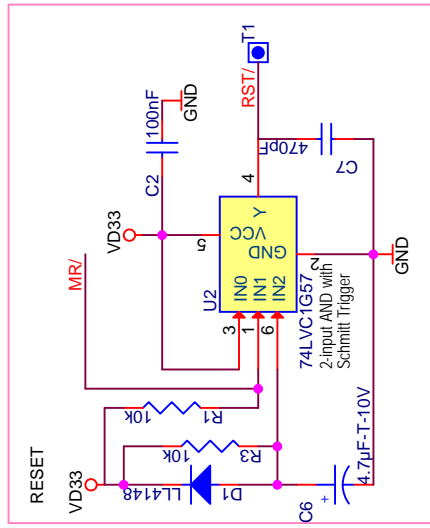
Item	Quantity	Reference	Part	Manufacturer	Designation
1	27	C1, C2, C3, C9, C17, C18, C19, C21, C25, C26, C28, C31, C34, C40, C41, C42, C46, C47, C49, C52, C53, C61, C64, C75, C76, C77, C78	100nF		
2	4	C4, C5, C33, C35	22pF		
3	2	C6, C39	4.7μF-T-10V		
4	10	C8, C20, C29, C36, C44, C45, C51, C62, C65, C72	10μF-T-10V		
5	2	C13, C16	2.2nF		
6	7	C7, C22, C38, C43, C48, C54, C70, C74	470pF		
7	5	C27, C30, C32, C37, C50	10nF		
8	2	C55, C56	1μF-T		
9	2	C57, C58	22μF-X5R		
10	7	C59, C67, C68, C69, C71, C73, C80	N.M.		
11	2	C60, C66	1μF-X5R		
12	1	C63	2.2μF-T		
13	1	C79	220pF		
14	2	D1, D2	LL4148	VISHAY	LL4148
15	1	D3	CRS08	TOSHIBA	CRS08
16	1	D4	TPD2E1B06	TI	TPD2E1B06
17	4	H1, H2, H3, H4	Fixing_Hole		
18	2	JD1, JD2	Jumper Disk2P		
19	2	JD3, JD4	Jumper Disk1P		
20	1	J1	MIDI_DIN		
21	2	J2, J8	N.M.		
22	1	J3	B5B-PH-K-S	JST	B5B-PH-K-S
23	2	J4, J5	RCA_JACK	KEYSTONE	901
24	1	J6	N.M.		
25	1	J7	651 005 161 21	WERI	651 005 161 21
26	1	J9	N.M.		
27	1	J10	M22-2020305	HARTWIN	M22-2020305
28	1	LED1	TLMS1000-Vishay	VISHAY	TLMS1000-GS08
29	1	LED2	TLMG1100-Vishay	VISHAY	TLMG1100
30	2	L1, L2	NFM21CC102R1H3	MURATA	NFM21CC102R1H
31	2	L3, L7	742792093	WURTH	742792093
32	1	L4	7427920415	WURTH	7427920415
33	1	L5	NFM41PC204F1H3	MURATA	NFM41PC204F1H3

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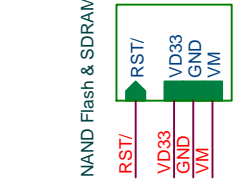
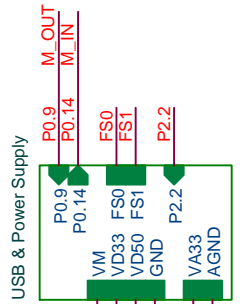
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Item	Quantity	Reference	Part	Manufacturer	Designation
34	1	L6	744031004	WURTH	744031004
35	10	RS1, RS2, RS3, RS4, RS5, RS6, RS7, RS8, RS9, RS10	4x33		
36	10	R1, R3, R5, R7, R9, R10, R11, R12, R13, R14	10k		
37	2	R2, R18	4.7k		
38	1	R4	220		
39	2	R6, R8	470		
40	2	R16, R19	33		
41	2	R20, R23	100k		
42	1	R21	1k		
43	1	R22	12k, 1%		
44	1	R24	45.3k 1%		
45	2	R25, R28	750		
46	1	R26	10k 1%		
47	6	T1, T2, T3, T4, T5, T6	TestPoint	Vogt	N.M. (985.62 or 1000C.22)
48	1	U1	SAM5716_Cfg3	DREAM	SAM5716B
49	1	U2	74LVC1G57	TI	74LVC1G57DCK
50	1	U3	HCPL-0501		
51	1	U5	MT29F8G08ABACAWP	MICRON	MT29F8G08ABACAWP
52	1	U6	MT48LC4M16A2P-7E	MICRON	MT48LC4M16A2P-7E
53	1	U7	LM2830X	NS	LM2830X
54	1	U8	AK4430	AKM	AK4430ET
55	1	X1	12.288 MHz		
56	1	X2	12 MHz		



Geographical Limit between Digital and Analog Zones



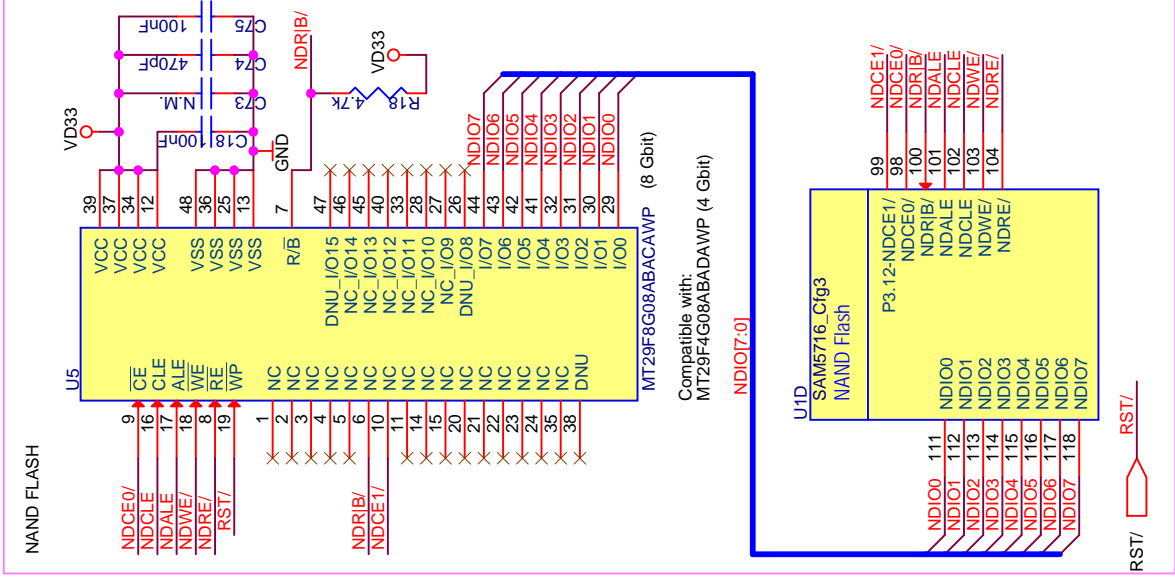
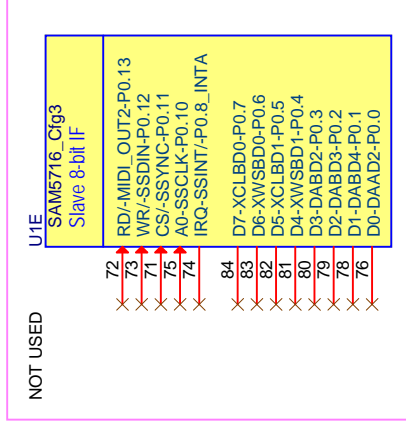
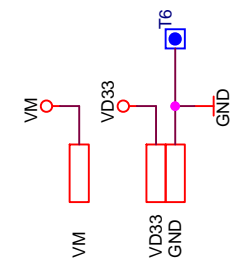
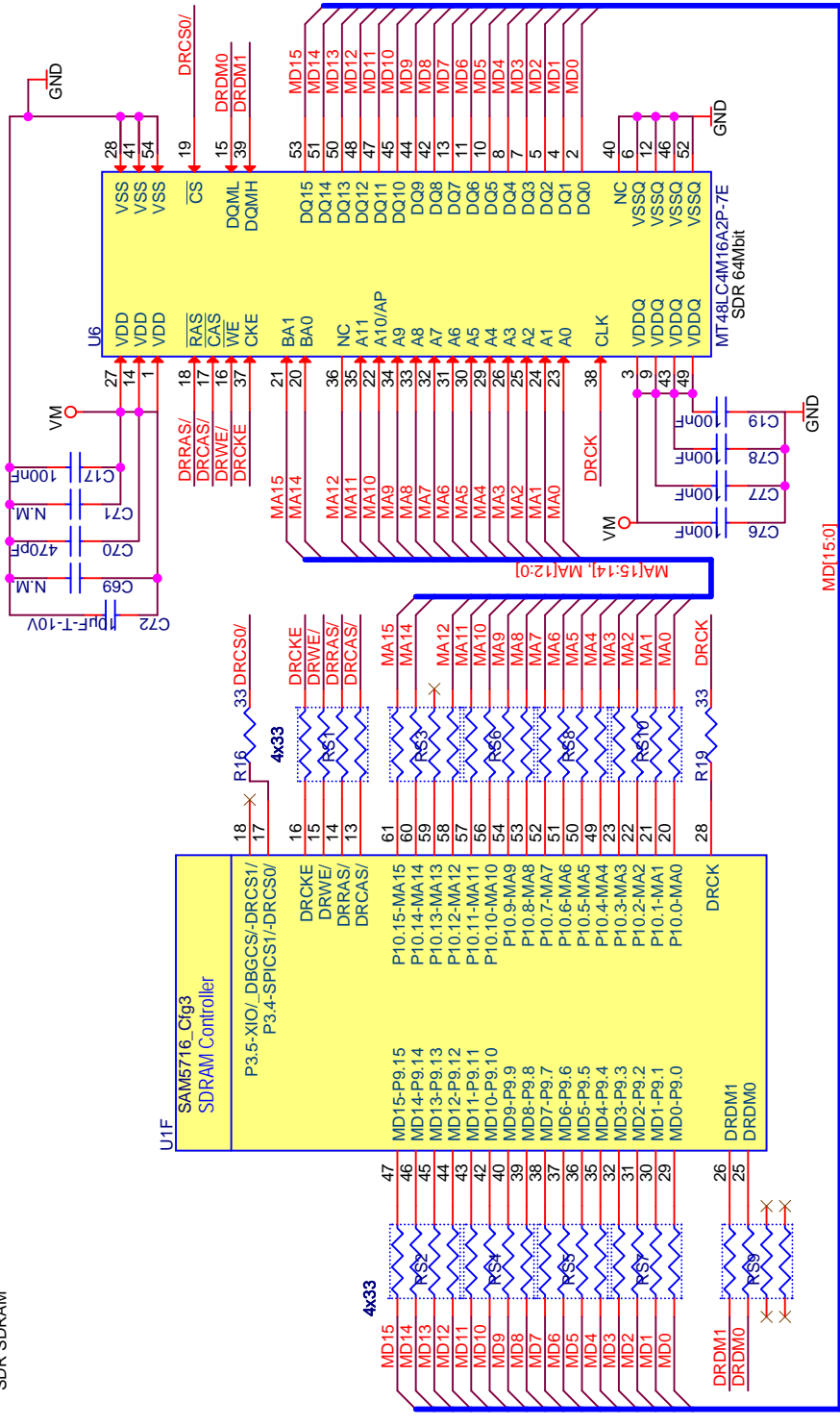
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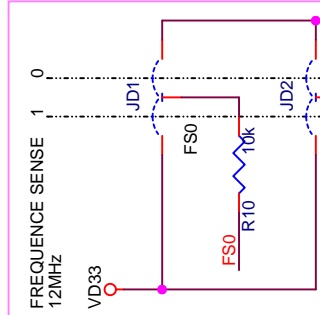
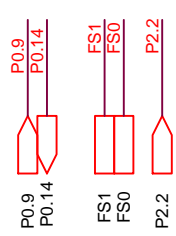
DIGITAL ZONE

DREAM S.A.S. CONFIDENTIAL DATA

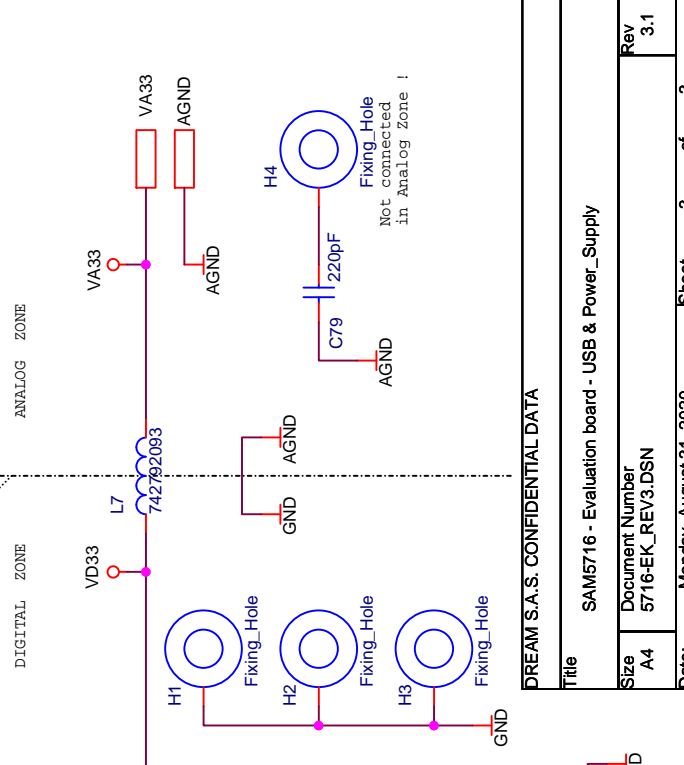
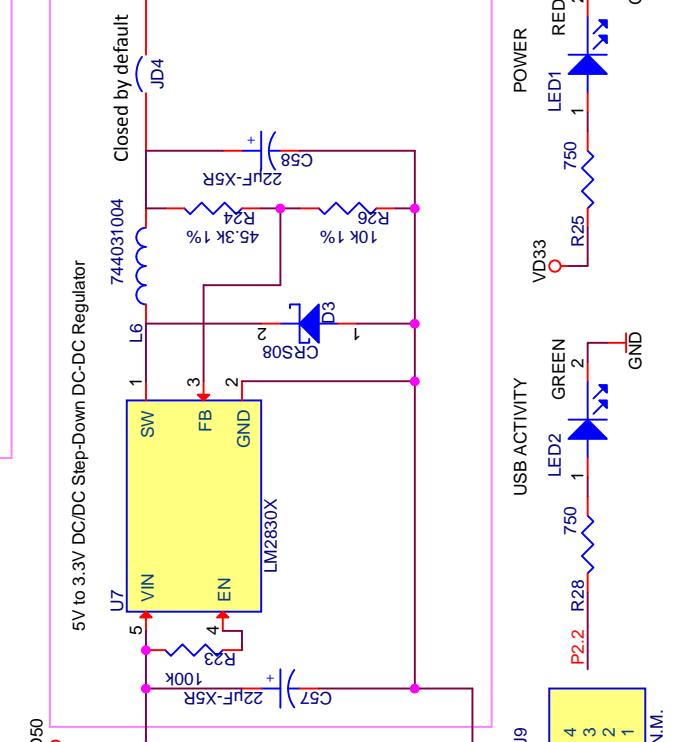
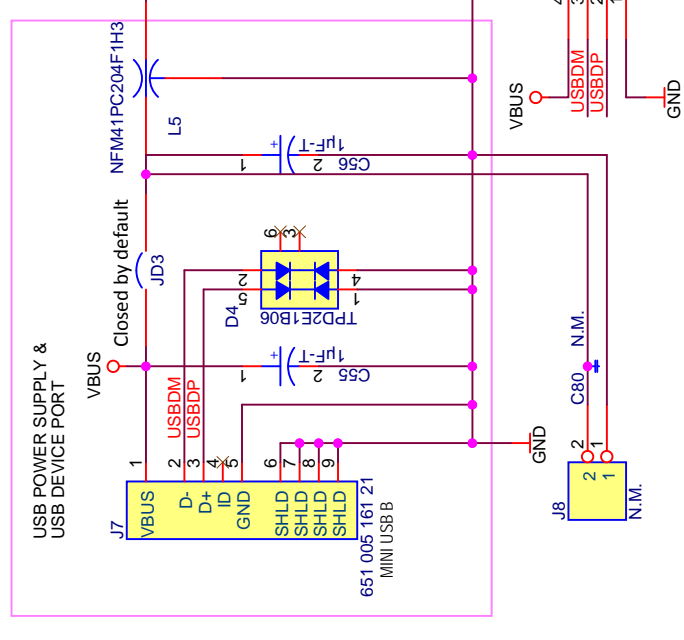
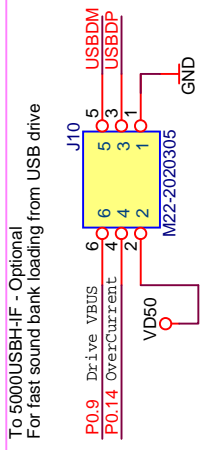
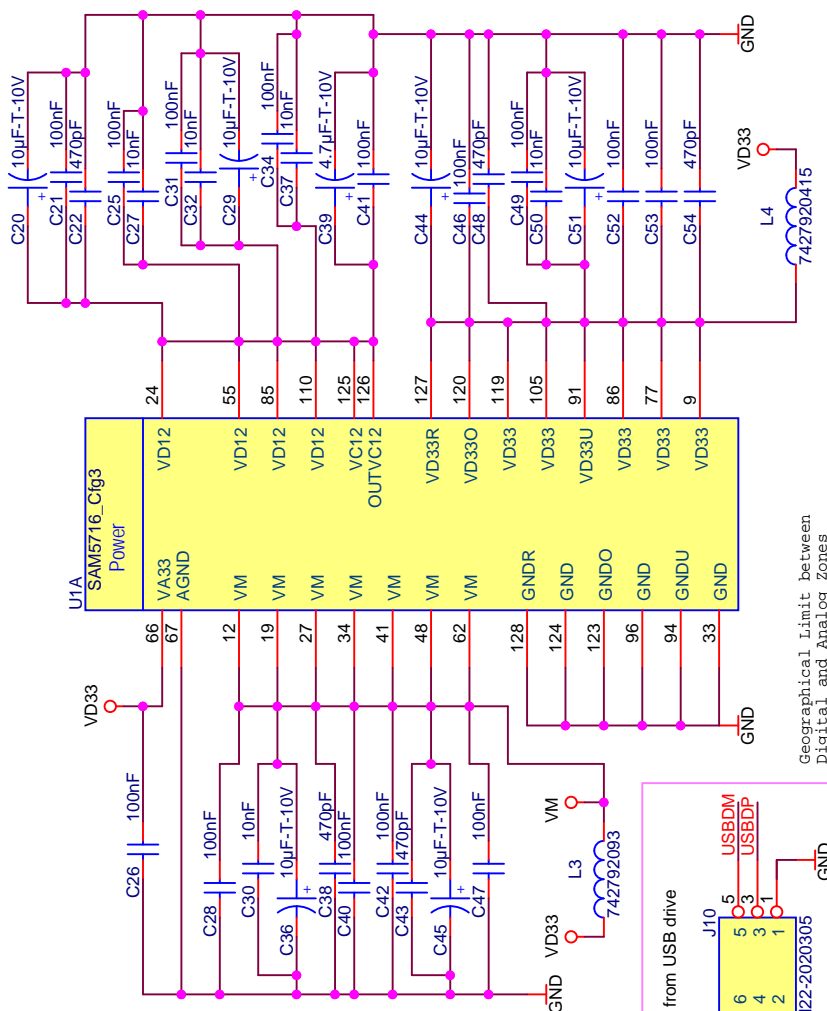
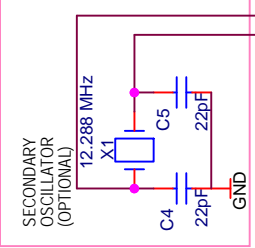
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Size	Document Number
A4	5716-EK_REV3.DSN
Date:	Monday, August 31, 2020
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SDR SDRAM





Freq (MHz)	FS1	FS0
12 (Default)	0	0
9.6	0	1
11.2886	1	0
12.288	1	1



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Title SAM5716 - Evaluation board - USB & Power_Supply

Size A4 Document Number 5716-EK_REV3.DSN

Date: Monday, August 31, 2020 Sheet 3 of 3

Rev 3.1

Dream Contact

info@dream.fr

Website

<http://www.dream.fr>

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