

Overview

5716-DK is a high quality stand-alone development and reference board based on SAM5716 (AUDIO & MUSIC MULTI-DSP PROCESSOR) dedicated to high range sound modules and professional effect devices.

The SAM5716 can be used in 6 different hardware configurations for different applications. On 5716-DK board the SAM5716 is running in the hardware configuration dedicated to applications with firmware and sound bank stored in NAND Flash, sample cache and extended delay lines in SDRAM. Also it can be used for firmware boot-loaded from serial DataFlash®, e.g. in Professional Audio applications in which the NAND Flash is not required.

Beside the SAM5716 the 5716-DK_Rev1 hardware includes:

- 2 x Audio DAC: AKM AK4384 (24-bit, DR:106dB, THD+N:-94dB)
- Audio ADC AKM AK5386 (24-bit, DR:110dB, S/(N+D):96dB)
- 8Gbit NAND Flash MICRON MT29F8G08ABACAWP
- 64Mbit SDRAM: MICRON MT48LC4M16A2P-7E
- SPI NOR Flash memory WINBOND W25X20CLSNIG for firmware and data storage
- USB High Speed Device Port
- Optical SPDIF In and Out

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 256 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 Modes

5716-DK_Rev1 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 or SPI NOR Flash memory for stand-alone mode.
The sound bank can loaded into NAND Flash memory using Dream 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 firmware from the NAND Flash or SPI NOR Flash.

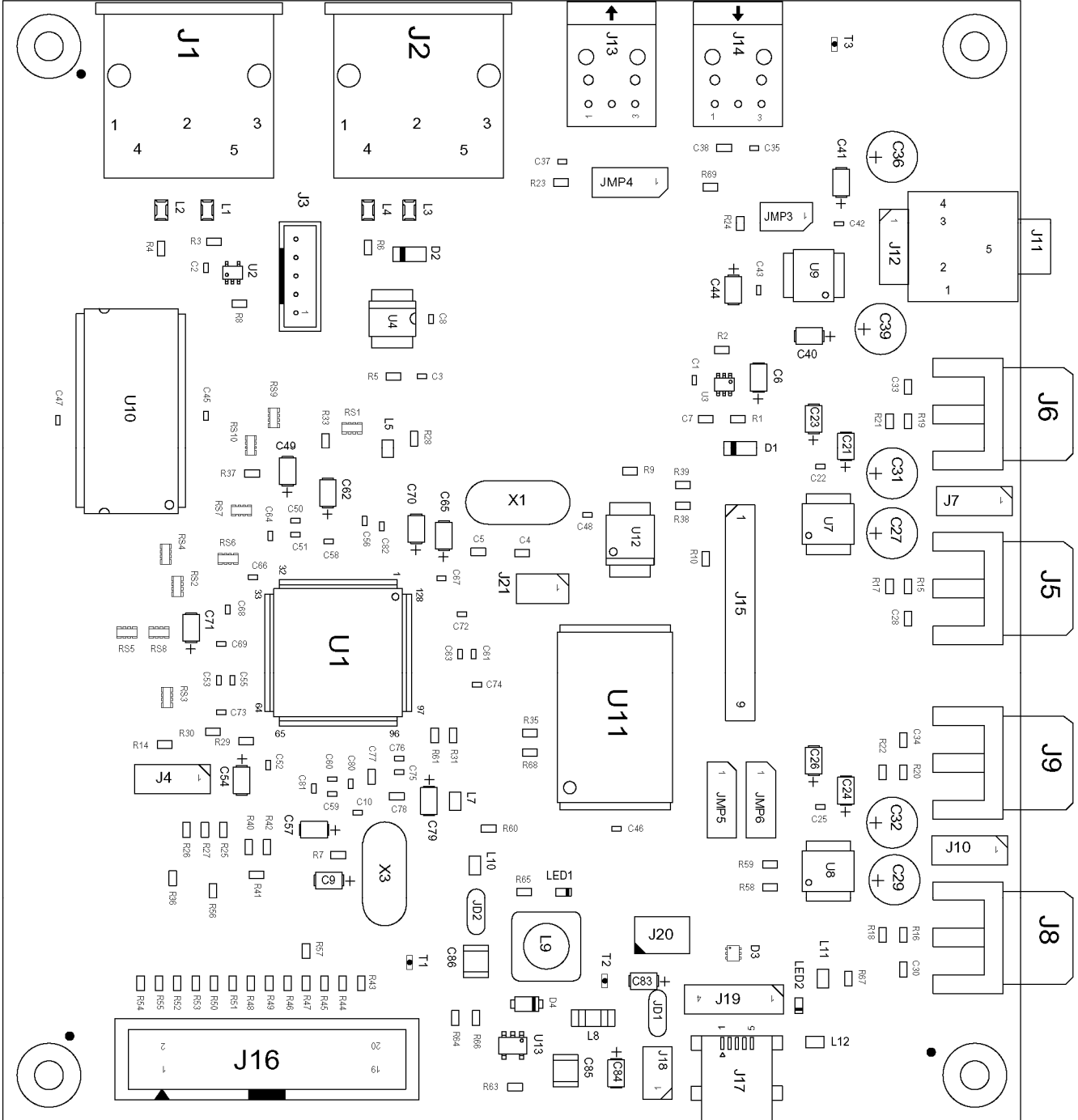
Connectors Configuration

Name	Reference	Type	Description
MIDI OUT	J1	5-pin Din	Standard MIDI OUT at 31.25kb/s
MIDI IN	J2	5-pin Din	Standard MIDI IN at 31.25kb/s
DEBUG / PROGRAM	J3	JST PH Series, 1*5	Serial connection for debug and program, compatible with Dream 5000DBG-IF
VIN	J4	1*3	Analog input for potentiometer
LINE OUT 1L	J5	RCA	Left audio line 1 output (1.2V RMS)
LINE OUT 1R	J6	RCA	Right audio line 1 output (1.2V RMS)
	J7 (Optional, n.m.)	1*3	Stereo audio line 1 output (1.2V RMS)
LINE OUT 2L	J8	RCA	Left audio line 2 output (1.2V RMS)
LINE OUT 2R	J9	RCA	Right audio line 2 output (1.2V RMS)
	J10 (Optional, n.m.)	1*3	Stereo audio line 2 output (1.2V RMS)
LINE IN	J11	Mini Jack	Stereo audio input (1V RMS)
	J12 (Optional, n.m.)	1*3	Stereo audio input (1V RMS)
SPDIF OUT	J13	DLT2160A	SPDIF Audio Optical Output
SPDIF IN	J14	DLR2160	SPDIF Audio Optical Input
AUDIO Extensions	J15 (Optional)	1*9	Extension for additional digital audio I/Os
SLAVE 8-BIT // IF	J16	HE10, 2*10	Access to 8-bit // port and to Serial Slave Synchronous Interface.
USB POWER SUPPLY & USB DEVICE PORT	J17	Mini USB B	USB connector used to power the board. Can also be used as USB device full or high speed port.
POWER SUPPLY	J18 (Optional, n.m.)	1*2	Power supply if JD1 open, +5V/0.5A, GND on pin 1
USB DEVICE PORT	J19 (Optional, n.m.)	1*4	USB device full or high speed port if J17 is not used.
To 5000USBH-IF	J20	HARWIN M22 2*3	Connection for USB drive adapter: 5000USBH-IF.
PWM	J21	1*2	PWM output.

“n.m.” = not mounted

Jumper Configuration

Reference	Default Setting	Description
JMP3	Closed	Connect DAAD0 to LINE IN
JMP4	1-2	SPDIF OUT or DABD0 <ul style="list-style-type: none"> 1-2: SPDIF OUT is not used. DABD0 can be used for LINE OUT 1 2-3: SPDIF OUT is used. DABD0 cannot be used LINE OUT 1
JMP5	0	Main Oscillator OSC1 frequency select: <ul style="list-style-type: none"> JMP6 -> 0, JMP5 -> 0 : 12 MHz (default) JMP6 -> 0, JMP5 -> 1 : 9.6 MHz JMP6 -> 1, JMP5 -> 0 : 11.2896 MHz JMP6 -> 1, JMP5 -> 1 : 12.288 MHz
JMP6	0	
JD1	Closed	Power supply source <ul style="list-style-type: none"> Closed: Power supply from USB VBUS Open: Power supply from J18
JD2	Closed	For test and measurement on 3.3V power supply



Bill of Material

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Item	Quantity	Reference	Part	Manufacturer	Designation
1	31	C1, C2, C3, C8, C10, C22, C25, C35, C37, C42, C43, C45, C46, C47, C48, C50, C52, C53, C56, C59, C61, C64, C67, C68, C72, C73, C74, C75, C80, C81, C82	100nF		
2	4	C4, C5, C77, C78	22pF		
3	2	C6, C65	4.7µF-T-10V		
4	1	C7	470pF		
5	14	C9, C21, C23, C24, C26, C41, C44, C49, C54, C57, C62, C70, C71, C79	10µF-T-10V		
6	4	C27, C29, C31, C32	22µF-Low dist	PANASONIC	ECA1HAM220X
7	4	C28, C30, C33, C34	2.2nF		
8	2	C36, C39	10µF-Low Dist	PANASONIC	ECA1HAM100X
9	1	C38	30pF		
10	1	C40	2.2µF-T-10V		
11	8	C51, C55, C58, C60, C63, C66, C69, C76	10nF		
12	2	C83, C84	1µF-T		
13	2	C85, C86	22µF-X5R		
14	2	D1, D2	LL4148	VISHAY	LL4148
15	1	D3	TPD2E1B06	TI	TPD2E1B06
16	1	D4	CRS08	TOSHIBA	CRS08
17	2	JD1, JD2	Jumper Disk1P		
18	1	JMP3	Jumper1P	Generic	BA25-Male-7mm-Gold
19	3	JMP4, JMP5, JMP6	Jumper2P	Generic	BA25-Male-7mm-Gold
20	2	J1, J2	MIDI_DIN		
21	1	J3	B5B-PH-K-S	JST	B5B-PH-K-S
22	1	J4	HEAD_3	Generic	BA25-Male-7mm-Gold
23	4	J5, J6, J8, J9	RCA_JACK	KEYSTONE	901
24	2	J7, J10	N.M.		
25	1	J11	JACK 3.5 STEREO	3E	15.427
26	1	J12	N.M.		
27	1	J13	DLT2160A	AIXIN OPTO-ELECTRICAL	DLT2160A
28	1	J14	DLR2160	AIXIN OPTO-ELECTRICAL	DLR2160
29	1	J15	HEAD_9	Generic	BA25-Male-7mm-Gold

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Item	Quantity	Reference	Part	Manufacturer	Designation
30	1	J16	HEAD_10X2		
31	1	J17	651 005 161 21	WERI	651 005 161 21
32	1	J18	N.M.		
33	1	J19	N.M.		
34	1	J20	M22-2020305	HARTWIN	M22-2020305
35	1	J21	HEAD_2	Generic	BA25-Male-7mm-Gold
36	1	LED1	TLMS1000-Vishay	VISHAY	TLMS1000-GS08
37	1	LED2	TLMG1100-Vishay	VISHAY	TLMG1100
38	4	L1, L2, L3, L4	NFM21CC102R1H3	MURATA	NFM21CC102R1H
39	4	L5, L10, L11, L12	742792093	WURTH	742792093
40	1	L7	7427920415	WURTH	7427920415
41	1	L8	NFM41PC204F1H3	MURATA	NFM41PC204F1H3
42	1	L9	744777003	WURTH	744777003
43	10	RS1, RS2, RS3, RS4, RS5, RS6, RS7, RS8, RS9, RS10	4x10		
44	12	R1, R2, R7, R8, R9, R10, R17, R18, R21, R22, R58, R59	10k		
45	3	R3, R4, R6	220		
46	2	R5, R35	4.7k		
47	9	R14, R23, R40, R41, R42, R56, R57, R63, R69	100k		
48	4	R15, R16, R19, R20	330		
49	10	R24, R25, R26, R27, R28, R29, R30, R31, R38, R39	33		
50	2	R33, R37	10		
51	14	R36, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55	22		
52	1	R60	1k		
53	1	R61	12k, 1%		
54	1	R64	45.3k 1%		
55	2	R65, R68	750		
56	1	R66	10k 1%		
57	1	R67	0		

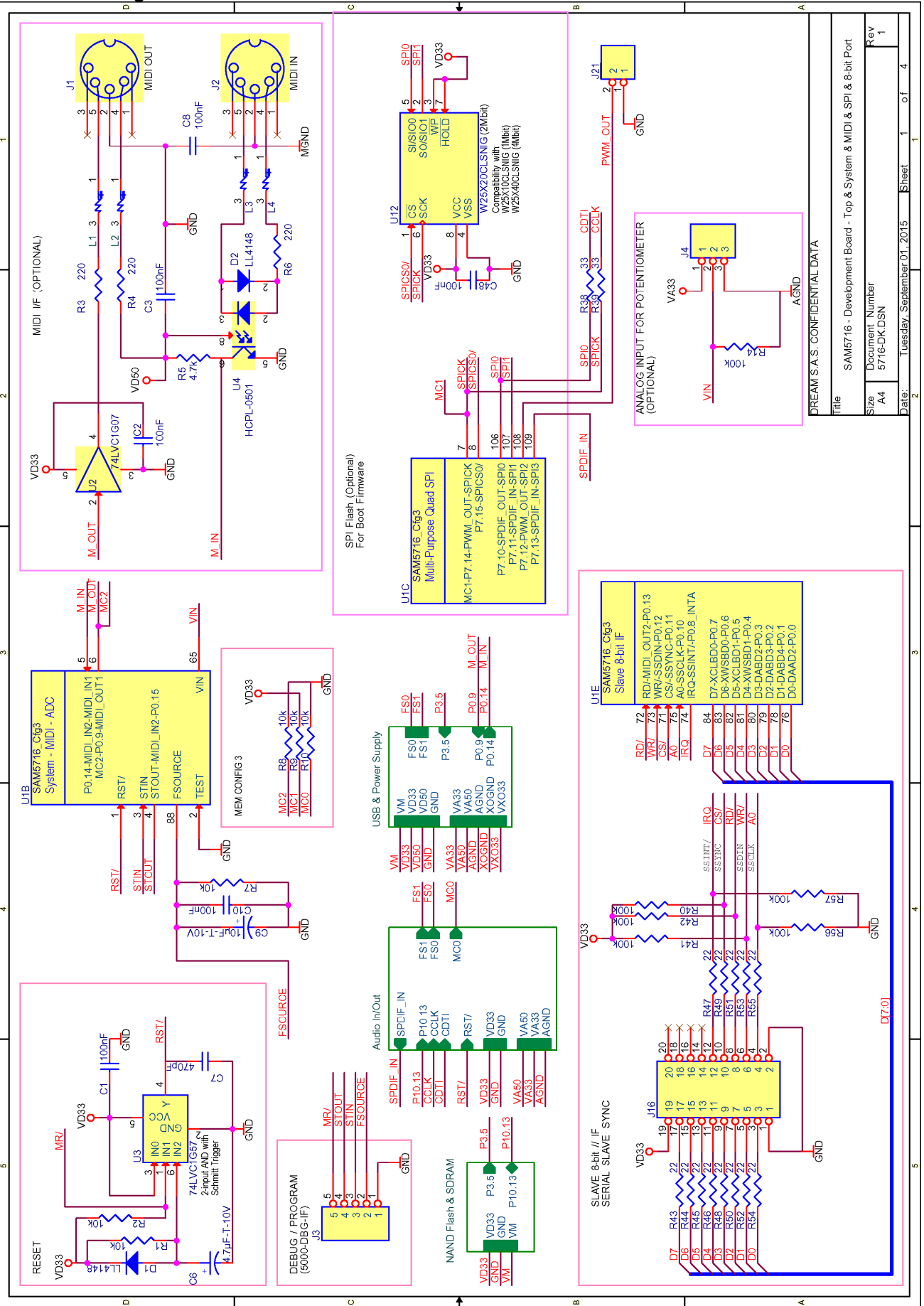
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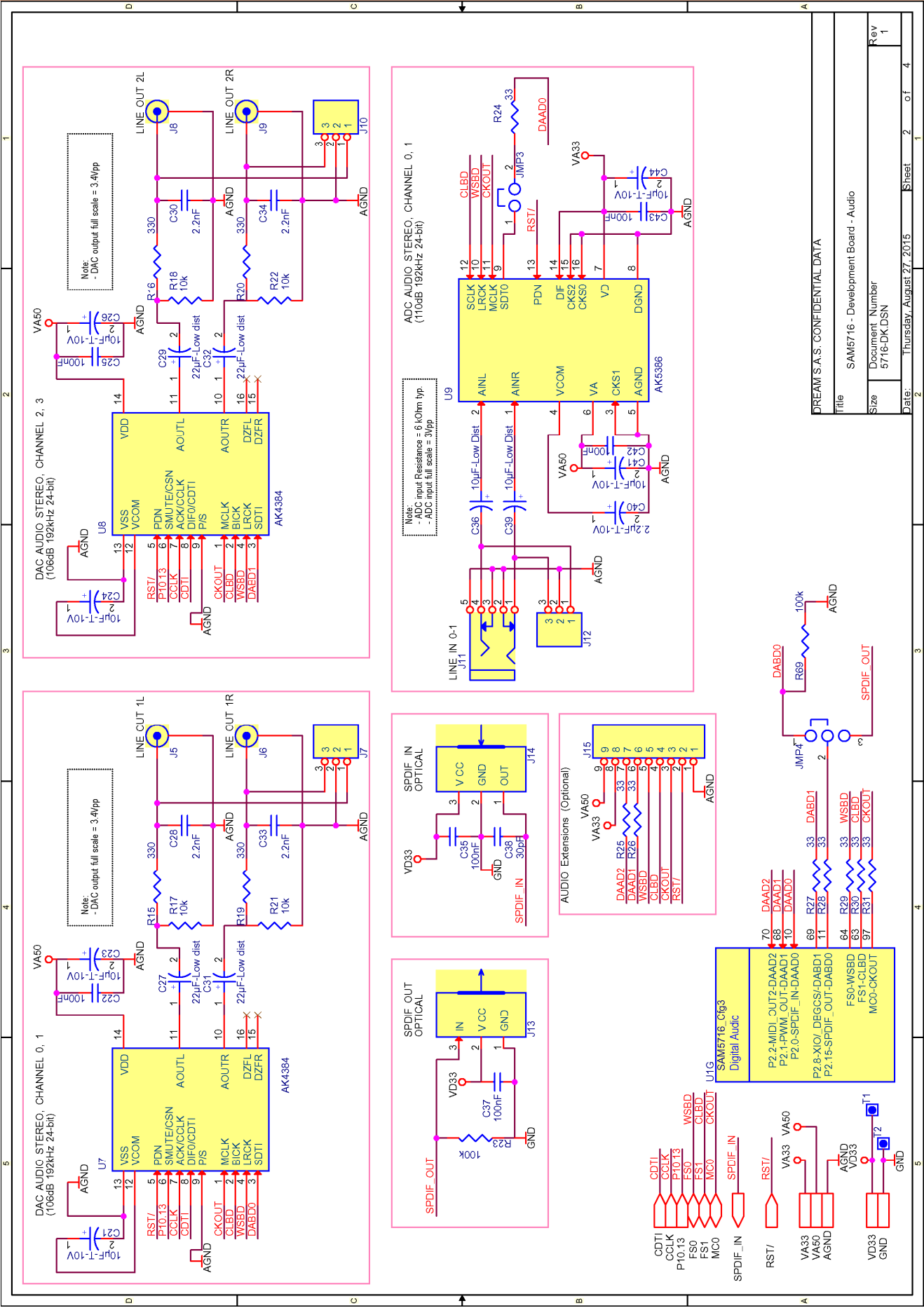
Item	Quantity	Reference	Part	Manufacturer	Designation
58	3	T1, T2, T3	TestPoint	Vogt	N.M. (985.62 or 1000C.22)
59	1	U1	SAM5716_Cfg3	DREAM	SAM5716
60	1	U2	74LVC1G07	TI	74LVC1G07DCK
61	1	U3	74LVC1G57	TI	74LVC1G57DCK
62	1	U4	HCPL-0501		
63	2	U7, U8	AK4384	AKM	AK4384VT
64	1	U9	AK5386	AKM	AK5386VT
65	1	U10	MT48LC4M16A2P-7E	MICRON	MT48LC4M16A2P-7E
66	1	U11	MT29F8G08ABACAW P	MICRON	MT29F8G08ABACAWP
67	1	U12	W25X20CLSNIG	WINBOND	W25X20CLSNIG
68	1	U13	LM2830X	NS	LM2830X
69	1	X1	12.288 MHz + socket	FISCHER	PQ18
70	1	X3	12 MHz + socket	FISCHER	PQ18

Schematic Diagram



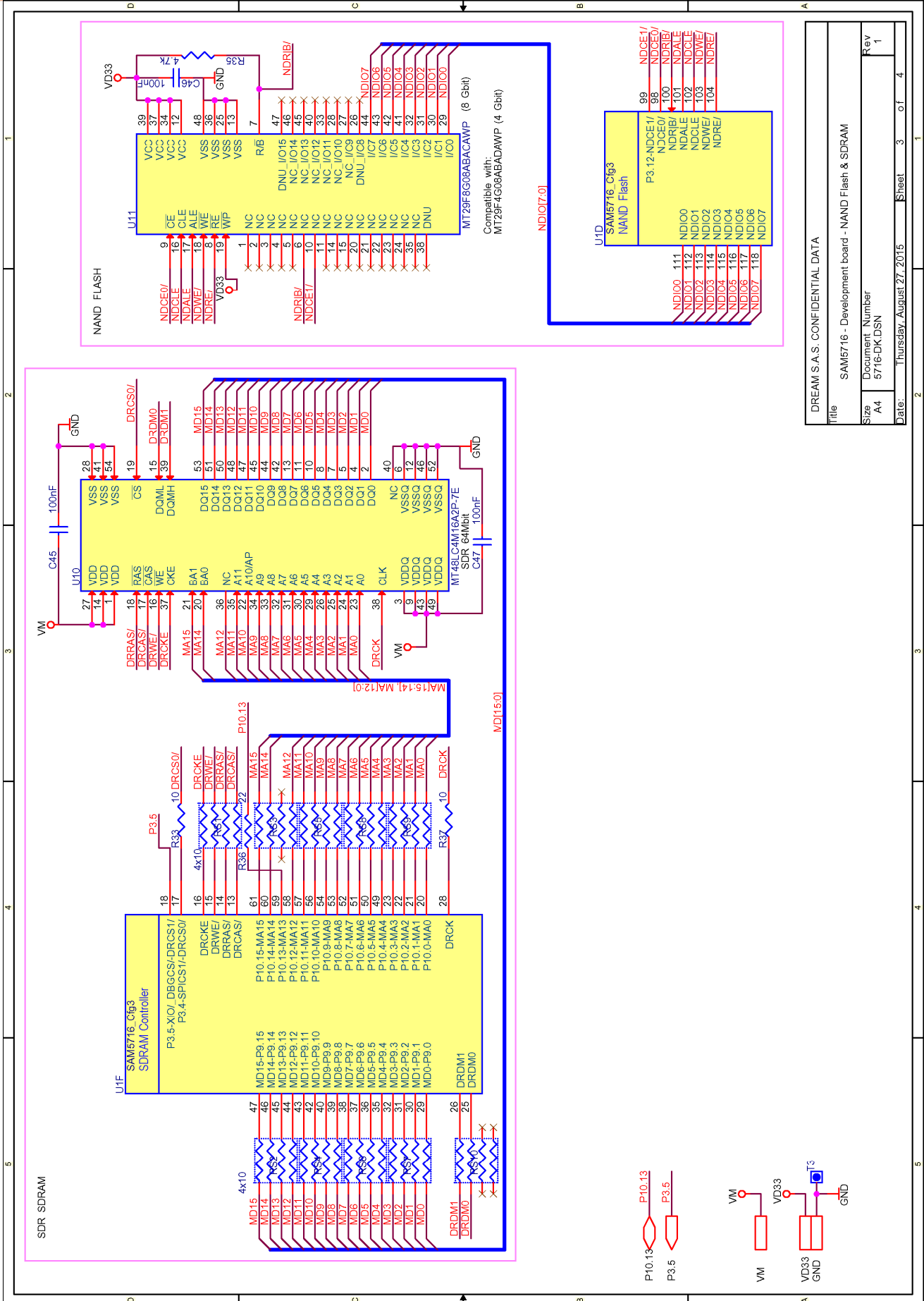
DREAM S.A.S. CONFIDENTIAL DATA

Title	SAM5716 - Development Board - Top & System & MIDI & SPI & 8-bit Port		
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DREAM S.A.S. CONFIDENTIAL DATA

Title	SAM5716 - Development Board - Audio
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Rev	1

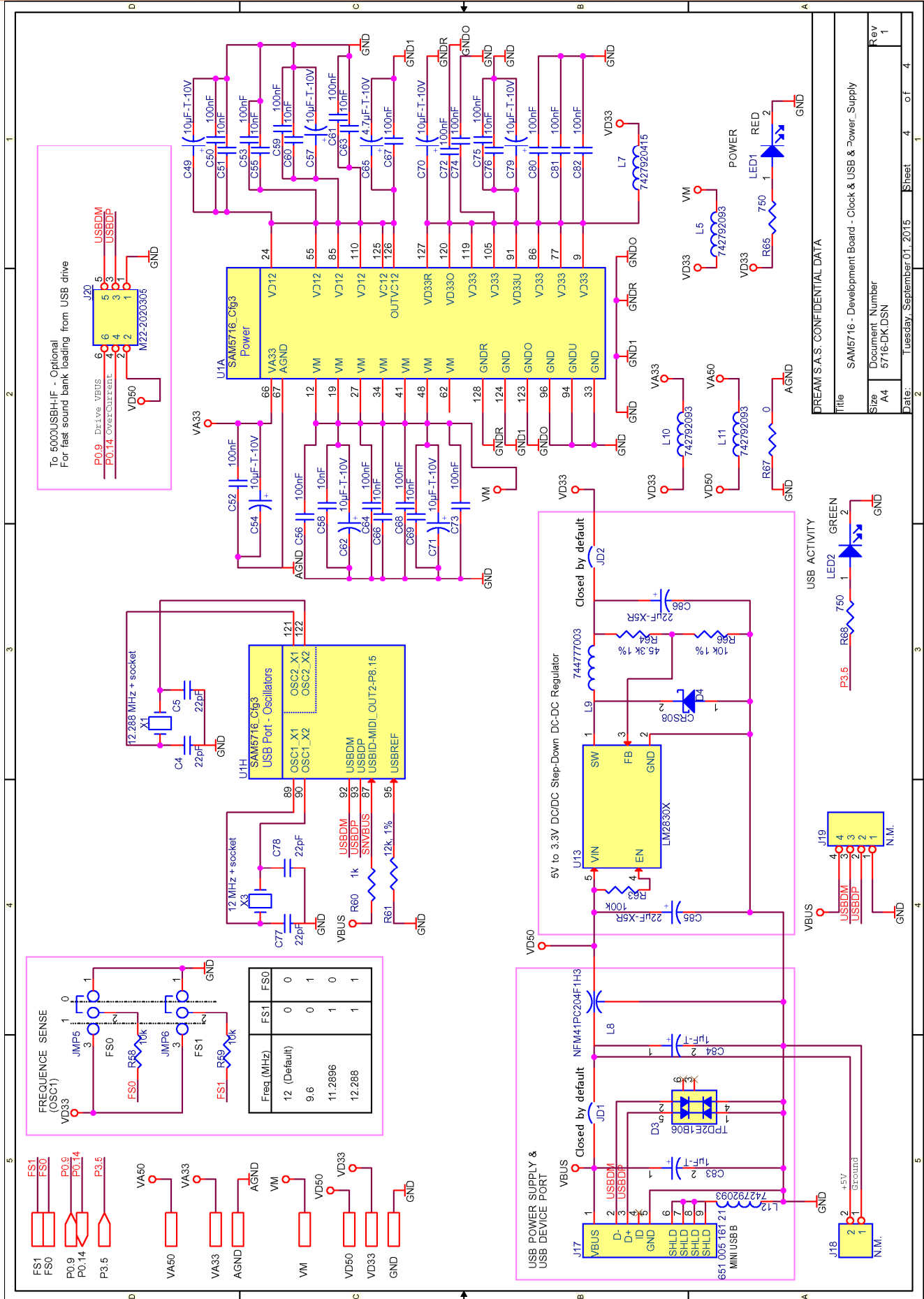


DREAM S.A.S. CONFIDENTIAL DATA

Title: SAM5716 - Development board - NAND Flash & SDRAM

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A4	5716-DK-DSN	1

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DREAM S.A.S. CONFIDENTIAL DATA

Title	SAM5716 - Development Board - Clock & USB & Power_Supply
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