

Overview

5808-DK is a high quality stand-alone development and reference board based on SAM5808B (AUDIO & MUSIC MULTI-DSP PROCESSOR) dedicated to digital piano, keyboard instruments and digital drums.

The SAM5808B can be used in 4 different hardware configurations for different applications. On 5808-DK board the SAM5808B 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.

Beside the SAM5808B the 5808-DK hardware includes:

- 2 x Audio DAC: AKM AK4384 (24-bit, DR:106dB, THD+N:-94dB)
- 1 Audio ADC AKM AK5386 (24-bit, DR:110dB, S/(N+D):96dB)
- 2 x 8Gbit NAND Flash MICRON MT29F8G08ABABAWP (2Gbyte)
- 64Mbit SDRAM: MICRON MT48LC4M16A2P-7E
- DataFlash® memory AT45DB081E (8Mbit) for firmware, saved sequencer and data storage.
- USB High Speed Device Port
- USB High Speed Host Port
- Ethernet PHY and connector

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 SAM5808B offers high performances, security and reliability:

- Support SLC NAND Flash technology (up to 8GByte)
- High polyphony: up to 189 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

Hardware Configuration

5808-DK is designed to be connected to an 88-note velocity sensitive piano keyboard with 2 contacts per key (e.g., FATAR TP40M, 2 contacts).

The 5808PIA-DK reference kit includes the 5000FP-DK front panel.

Operating Modes

5808-DK 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 serial DataFlash memory for stand-alone mode.
The sound bank can loaded into NAND Flash memory from USB stick.
With ProgSam tool it is also possible to program the eFuses on SAM5808B for encryption / copy protection of firmware code and sound bank content.
- **Stand-alone mode:**
In this mode the SAM5808B loads the program from the NAND Flash or serial DataFlash into RAM (internal RAM + external SDRAM) at startup, then executes it in RAM and scans the front panel and the piano keyboard in case of piano application.

Connectors Configuration

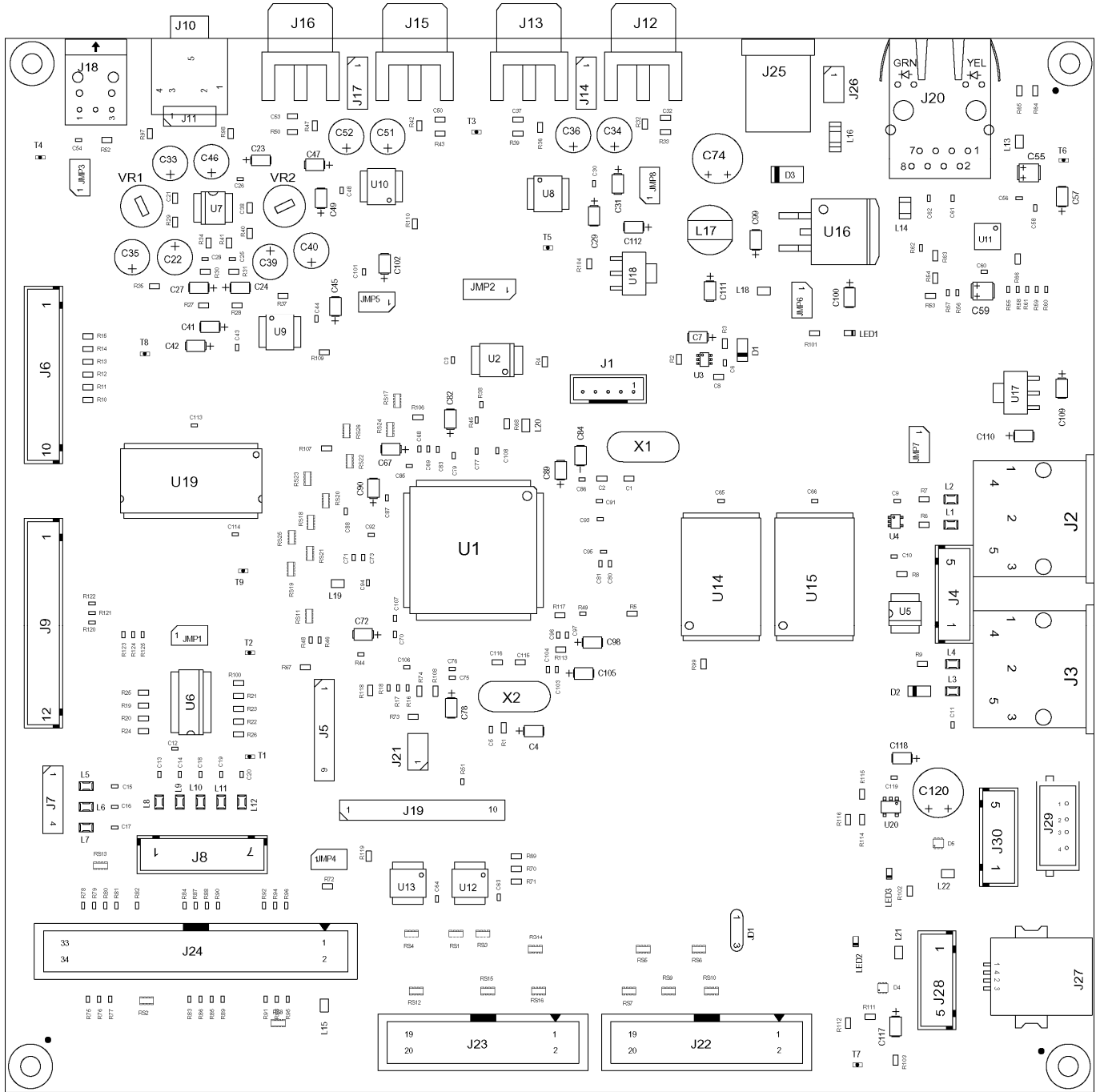
Name	Reference	Type	Description
DEBUG / PROGRAM	J1	JST PH Series, 1*5	Serial connection for debug and program, compatible with Dream 5000DBG-IF
MIDI OUT	J2	5-pin Din	Standard MIDI OUT at 31.25kb/s
MIDI IN	J3	5-pin Din	Standard MIDI IN at 31.25kb/s
	J4 (Optional, n.m.)	1*5	Connection to external MIDI IN an OUT connectors
GPIOs	J5	1*6	General purpose I/Os P0[13:11], P7.13
SPI LCD	J6	JST XH Series, 1*10	SPI connection to a Graphic LCD Display
PEDALS INPUT	J7	1*4	Connection of pedals (analog inputs)
SLIDERS INPUT	J8	JST XH Series, 1*7	Connection for analog potentiometers
TO EXTERNAL MIXED ANALOG	J9	JST XH Series, 1*12	Connection to an analog multiplexer for digital drum applications
LINE IN STEREO	J10	Mini Jack	Stereo audio input(0.02 to 1V RMS)
	J11 (Optional, n.m.)	1*3	Stereo audio input(0.02 to 1V RMS)
LINE OUT L	J12	RCA	Left Main audio line output (1.2V RMS)
LINE OUT R	J13	RCA	Right Main audio line output (1.2V RMS)
	J14 (Optional, n.m.)	1*3	Stereo Main audio line output (1.2V RMS)
AUX OUT L	J15	RCA	Left Aux audio line output (1.2V RMS)
AUX OUT R	J16	RCA	Right Aux audio line output (1.2V RMS)
	J17 (Optional, n.m.)	1*3	Stereo Aux audio line output (1.2V RMS)
SPDIF OUT	J18	DLT2160A	SPDIF audio optical output
AUDIO Extensions	J19 (Optional)	1*10	Extension for additional digital audio I/Os
ETHERNET	J20	WURTH 7499011121A	ETHERNET 10/100
HEADPHONES DETECT	J21	1*2	Headphones detection
KEYBOARD LOWER PART	J22	HE10 - 2*10	Connection of a Fatar type piano keyboard
KEYBOARD HIGHER PART	J23	HE10 - 2*10	Connection of a Fatar type piano keyboard
FRONT PANEL	J24	HE10 - 2*17	Connection of the dedicated front panel
9 V DC	J25	DC Plug	Power Supply, +9V...12V/1A, minus on tip
	J26 (Optional, n.m.)	1*2	Power Supply, +9V...12V/1A
USB DEVICE	J27	USB B	USB Device, full or high speed port.
	J28 (Optional, n.m.)	JST XH Series, 1*5	USB Device, full or high speed port.
USB HOST	J29	USB A	USB Host, full or high speed port.
	J30 (Optional, n.m.)	JST XH Series, 1*5	USB Host, full or high speed port.

“n.m.” = not mounted

Jumper Configuration

Reference	Default Setting	Description
JMP1	Closed	Should be open if mixed analog signal comes from external (J9) <ul style="list-style-type: none"> • Closed: Mixed analog from U6. • Closed: Mixed analog from J9.
JMP2	1-2	Select Digital audio source for Main audio out. <ul style="list-style-type: none"> • 1-2: DABD2 • 2-3: DABD0 (cannot be used while SPDIF OUT is needed)
JMP3	Closed	Should be open if DABD0 is used for Main audio out <ul style="list-style-type: none"> • Closed: SPDIF OUT is used. DABD0 cannot be used. • Closed: SPDIF OUT is not used. DABD0 can be used.
JMP4	Closed	Should be open if SEL0 is used for other purpose on J9 <ul style="list-style-type: none"> • Closed: SEL0 is used for keyboard scanning. • Closed: SEL0 is used on J9 (e.g. for digital drum application).
JMP5	Closed	For test and measurements on VA33
JMP6	Closed	For test and measurements on VD33
JMP7	Closed	For test and measurements on VD50
JMP8	Closed	For test and measurements on VA50
JD1	GND	Keyboard and panel type: <ul style="list-style-type: none"> • Common Anode: GND • Common Cathode: VD33

Layout



Bill of Material

SAM5808B - DEVELOPMENT BOARD - Revised: August 30, 2016

5808-DK.DSN Revision: 1

Page 1

Item	Quantity	Reference	Part	Manufacturer	Designation
1	4	C1, C2, C115, C116	22pF		
2	54	C3, C5, C6, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C25, C26, C28, C30, C43, C44, C48, C54, C56, C58, C60, C61, C62, C63, C64, C65, C66, C68, C70, C71, C75, C77, C80, C83, C86, C87, C91, C92, C93, C95, C97, C101, C103, C106, C107, C108, C113, C114, C119	100nF		
3	23	C4, C23, C24, C27, C29, C31, C42, C45, C47, C49, C67, C72, C78, C82, C89, C90, C98, C100, C102, C105, C110, C112, C118	10µF-T-10V		
4	2	C7, C84	4.7µF-T-10V		
5	1	C8	470pF		
6	2	C21, C38	100pF		
7	2	C22, C39	10µF-Low Dist	PANASONIC	ECA1HAM100X
8	4	C32, C37, C50, C53	2.2nF		
9	2	C33, C46	2.2µF-Low dist	PANASONIC	ECA1HAK2R2X
10	4	C34, C36, C51, C52	22µF-Low dist	PANASONIC	ECA1HAM220X
11	2	C35, C40	4.7µF-Low dist	PANASONIC	ECA1HAM4R7X
12	1	C41	2.2µF-T-10V		
13	2	C55, C59	22µF-T-6V		
14	1	C57	2.2µF-T-6V		
15	10	C69, C73, C76, C79, C81, C85, C88, C94, C96, C104	10nF		
16	1	C74	470µF-25V		
17	3	C99, C109, C111	10µF-T-16V		
18	1	C117	1µF-T		
19	1	C120	150µF		
20	2	D1, D2	LL4148	VISHAY	LL4148
21	1	D3	1N4002		
22	2	D4, D5	TPD2E1B06	TI	TPD2E1B06
23	1	JD1	Jumper Disk2P		
24	7	JMP1, JMP3, JMP4, JMP5, JMP6, JMP7, JMP8	Jumper1P	Generic	BA25-Male-7mm-Gold
25	1	JMP2	Jumper2P	Generic	BA25-Male-7mm-Gold

Item	Quantity	Reference	Part	Manufacturer	Designation
26	1	J1	B5B-PH-K-S	JST	B5B-PH-K-S
27	2	J2, J3	MIDI_DIN		
28	3	J4, J28, J30	N.M.	JST	B5B-XH-A
29	1	J5	HEAD_6	Generic	BA25-Male-7mm-Gold
30	1	J6	B10B-XH-A	JST	B10B-XH-A
31	1	J7	HEAD_4	Generic	BA25-Male-7mm-Gold
32	1	J8	B7B-XH-A	JST	B7B-XH-A
33	1	J9	B12B-XH-A	JST	B12B-XH-A
34	1	J10	JACK 3.5 STEREO	3E	15.427
35	3	J11, J14, J17	N.M.		
36	4	J12, J13, J15, J16	RCA_JACK	KEYSTONE	901
37	1	J18	DLT2160A	AIXIN OPTO-ELECTRICAL	DLT2160A
38	1	J19	HEAD_10	Generic	BA25-Male-7mm-Gold
39	1	J20	7499011121A	WURTH	7499011121A
40	1	J21	HEAD_2	Generic	BA25-Male-7mm-Gold
41	2	J22, J23	HEAD_10X2		
42	1	J24	HEAD_17X2		
43	1	J25	DC PLUG	3E	LD02.02
44	1	J26	N.M.		
45	1	J27	WERI 62910416121	WERI	WERI 62910416121
46	1	J29	WERI 614004135023	WERI	WERI 614004135023
47	1	LED1	TLMS1000-Vishay	VISHAY	TLMS1000-GS08
48	2	LED2, LED3	TLMG1100-Vishay	VISHAY	TLMG1100
49	12	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12	NFM21CC102R1H3	MURATA	NFM21CC102R1H
50	6	L13, L15, L18, L19, L21, L22	742792093	WURTH	742792093
51	1	L14	742792113	WURTH	742792113
52	1	L16	NFM41PC204F1H3	MURATA	NFM41PC204F1H3
53	1	L17	74477510	WURTH	74477510
54	1	L20	7427920415	WURTH	7427920415
55	10	RS1, RS2, RS3, RS4, RS7, RS9, RS10, RS12, RS15, RS16	4x100		
56	6	RS5, RS6, RS8, RS11, RS13, RS14	4x2.2k		
57	10	RS17, RS18, RS19, RS20, RS21, RS22, RS23, RS24, RS25, RS26	4x10		

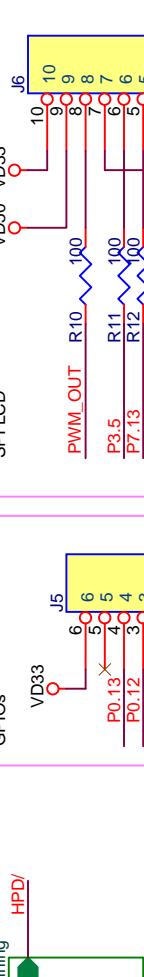
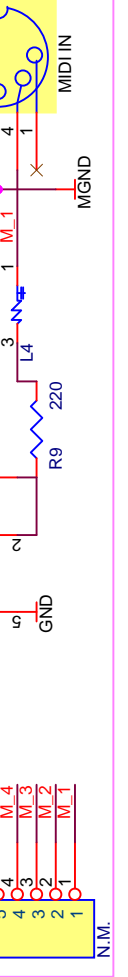
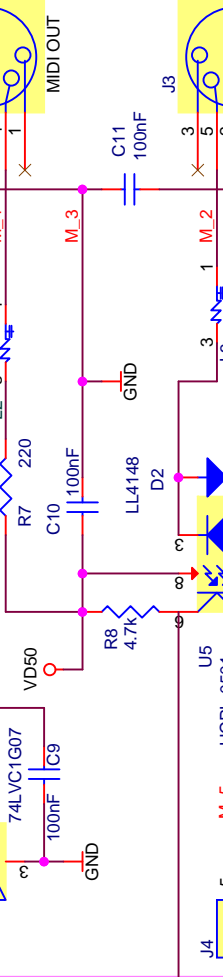
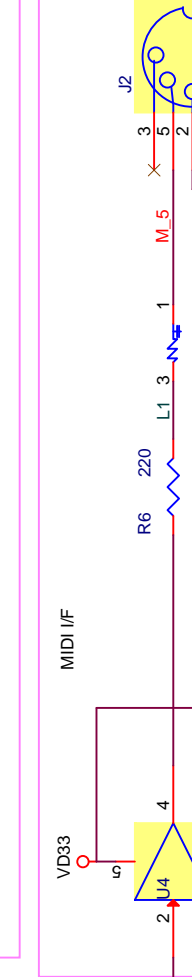
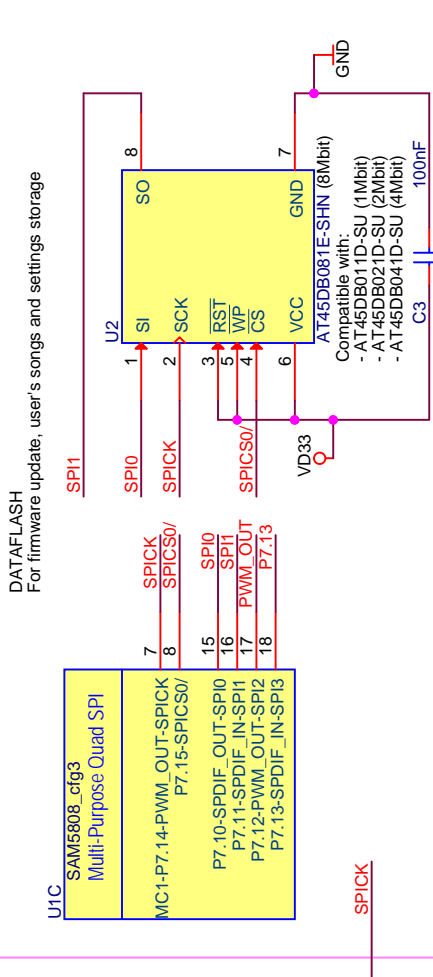
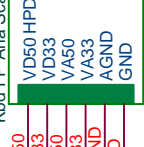
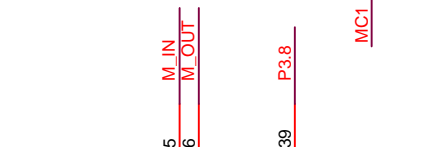
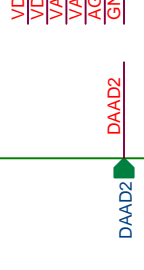
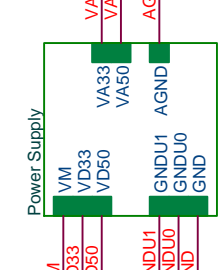
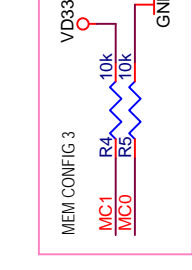
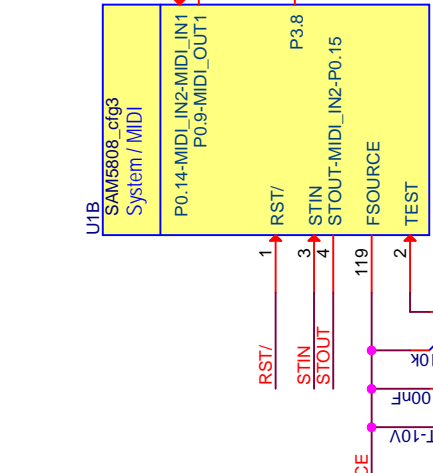
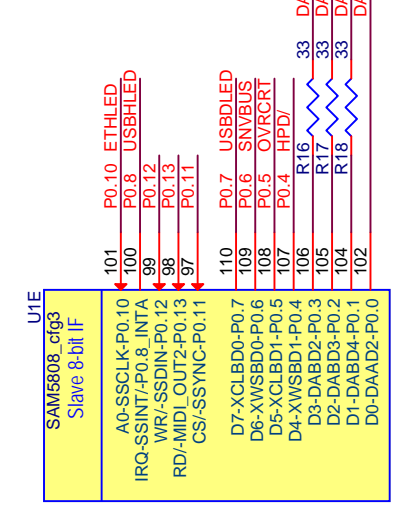
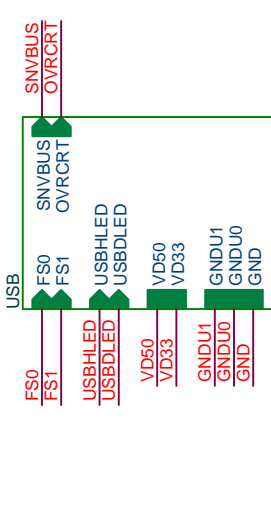
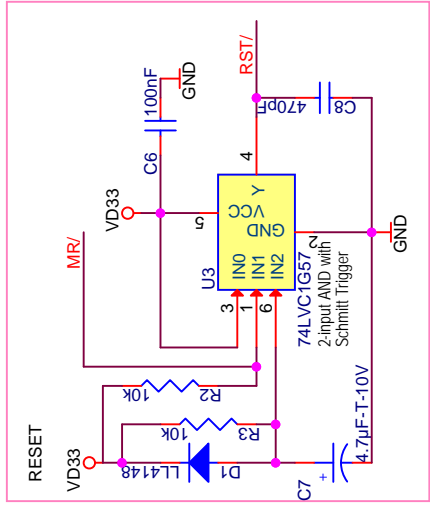
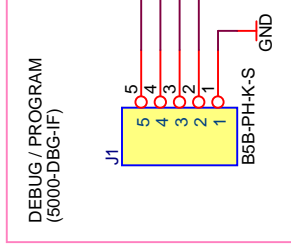
Item	Quantity	Reference	Part	Manufacturer	Designation
58	19	R1, R2, R3, R4, R5, R27, R28, R30, R31, R33, R34, R39, R41, R43, R50, R73, R109, R110, R114	10k		
59	3	R6, R7, R9	220		
60	5	R8, R24, R25, R26, R99	4.7k		
61	8	R10, R11, R12, R13, R14, R15, R97, R98	100		
62	30	R16, R17, R18, R38, R44, R45, R46, R48, R49, R51, R59, R60, R61, R75, R76, R77, R83, R85, R86, R89, R90, R91, R93, R95, R120, R121, R122, R123, R124, R125	33		
63	5	R19, R20, R21, R22, R23	1M		
64	10	R29, R40, R54, R66, R67, R68, R69, R70, R71, R72	1k		
65	4	R32, R36, R42, R47	330		
66	5	R35, R37, R102, R103, R104	0		
67	4	R52, R53, R100, R119	100k		
68	5	R55, R56, R57, R58, R62	47		
69	1	R63	6.49k, 1%		
70	5	R64, R65, R101, R108, R118	750		
71	3	R74, R111, R116	22k		
72	11	R78, R79, R80, R81, R82, R84, R87, R88, R92, R94, R96	100		
73	2	R112, R115	47k		
74	2	R106, R107	10		
75	2	R113, R117	12k, 1%		
76	9	T1, T2, T3, T4, T5, T6, T7, T8, T9	TestPoint	Vogt	N.M. (985.62 or 1000C.22)
77	1	U1	SAM5808_cfg3	DREAM	SAM5808B
78	1	U2	AT45DB081E-SHN	ATMEL	AT45DB081E-SHN
79	1	U3	74LVC1G57	TI	74LVC1G57DCK
80	1	U4	74LVC1G07	TI	74LVC1G07DCK
81	1	U5	HCPL-0501		
82	1	U6	74HC4051	TI	CD74HC4051
83	1	U7	OPA2353	BURR-BROWN	OPA2353
84	2	U8, U10	AK4384	AKM	AK4384VT
85	1	U9	AK5386	AKM	AK5386VT

SAM5808B - DEVELOPMENT BOARD - Revised: August 30, 2016

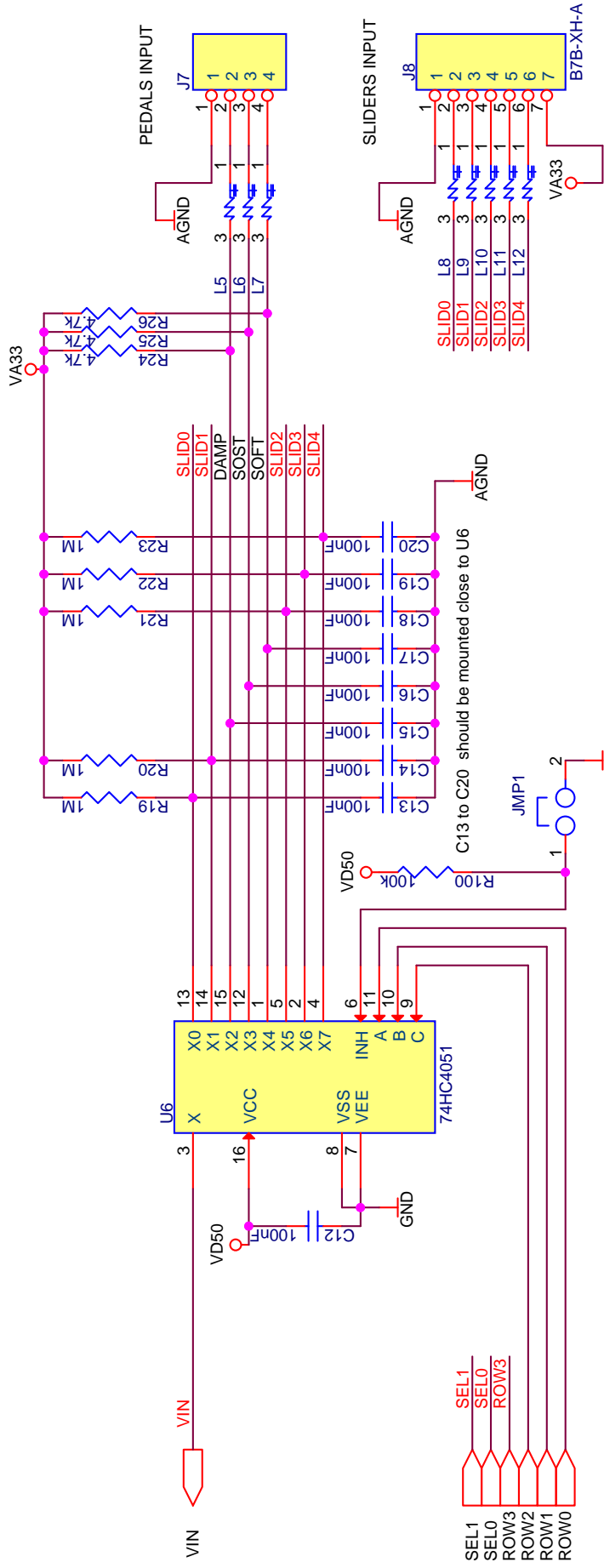
5808-DK.DSN Revision: 1

Page 4

Item	Quantity	Reference	Part	Manufacturer	Designation
86	1	U11	KSZ8081RNDCA	MICREL	KSZ8081RNDCA
87	2	U12, U13	74HC238	TI	74HC238PW
88	2	U14, U15	MT29F8G08ABABA WP	MICRON	MT29F8G08ABABAWP
89	1	U16	LD1086D2T33	ST	LD1086D2T33
90	2	U17, U18	LM1117MPX-5.0	NS	LM1117MPX-5.0
91	1	U19	MT48LC4M16A2P- 7E	MICRON	MT48LC4M16A2P-7E
92	1	U20	MIC2005A-1YM5	MICREL	MIC2005A-1YM5
93	2	VR1, VR2	50k	BOURNS	POT-3329H
94	1	X1	12.288 MHz + socket	FISCHER	PQ18
95	1	X2	12 MHz		

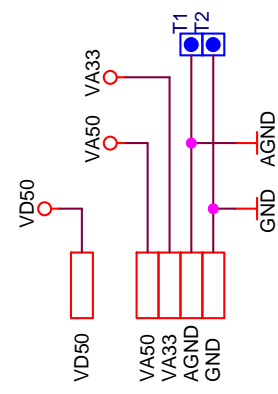
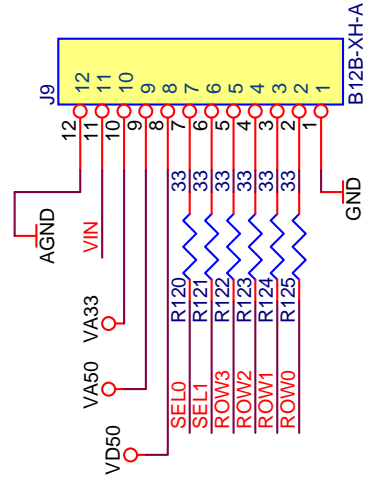


DATAFLASH
For firmware update, user's songs and settings storage



Remove JMP1 to disable U6

TO EXTERNAL MIXED ANALOG



DREAM S.A.S. CONFIDENTIAL DATA

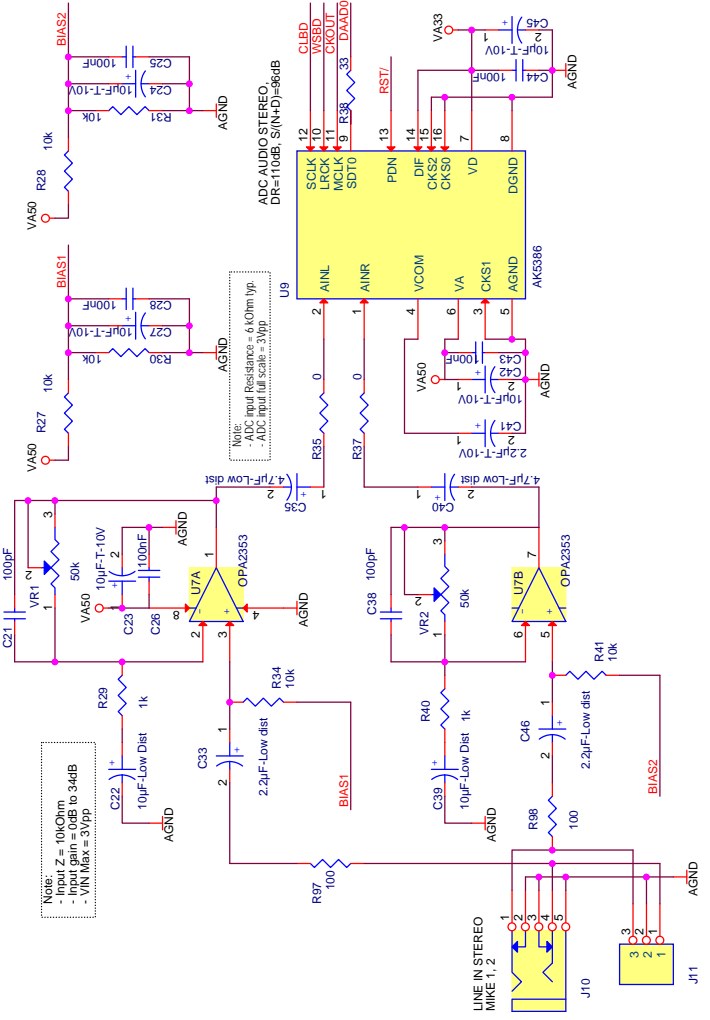
Title SAM5808 - DEVELOPMENT BOARD - Analog Scanning

Size A Document Number 5808-DK.DSN Rev 1.1

Date: Monday, August 31, 2020 Sheet 2 of 9

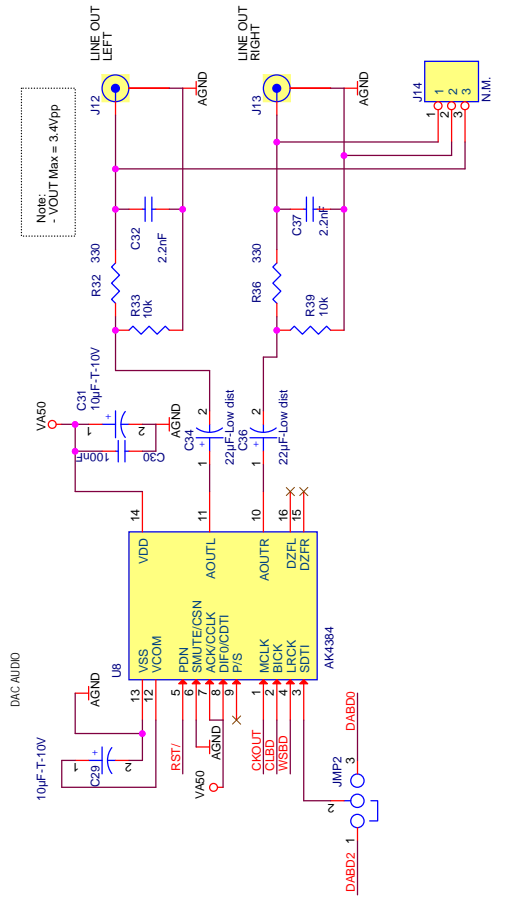
AUDIO IN (Optional)

Note:
 - Z = 10kOhm
 - Input gain = 0dB to 34dB
 - V_{IN} Max = 3Vpp



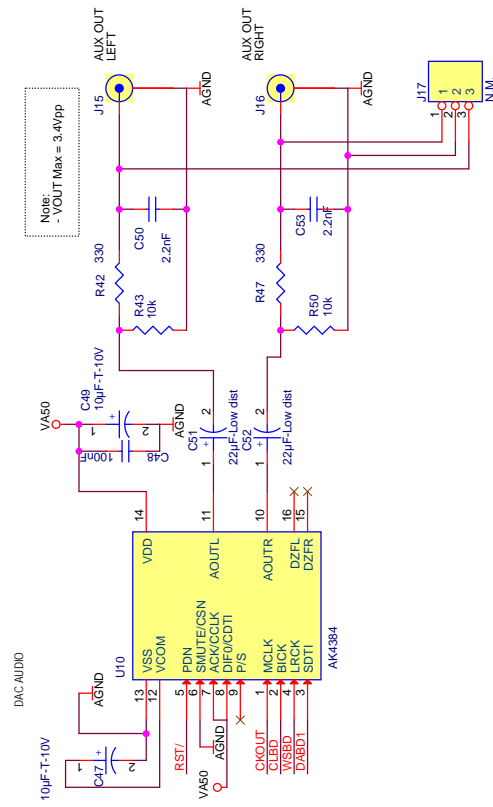
MAIN AUDIO OUT

Note:
 - V_{OUT} Max = 3.4Vpp

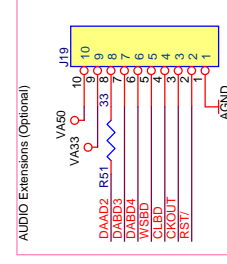


AUX AUDIO OUT (Optional)

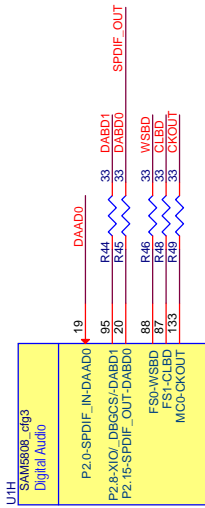
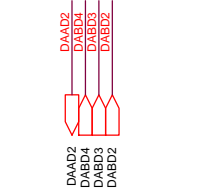
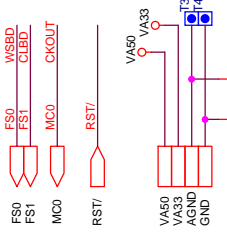
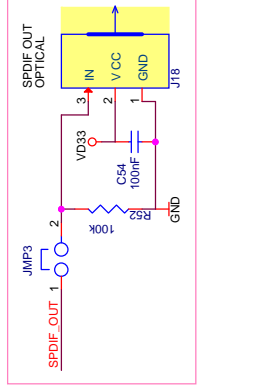
Note:
 - V_{OUT} Max = 3.4Vpp

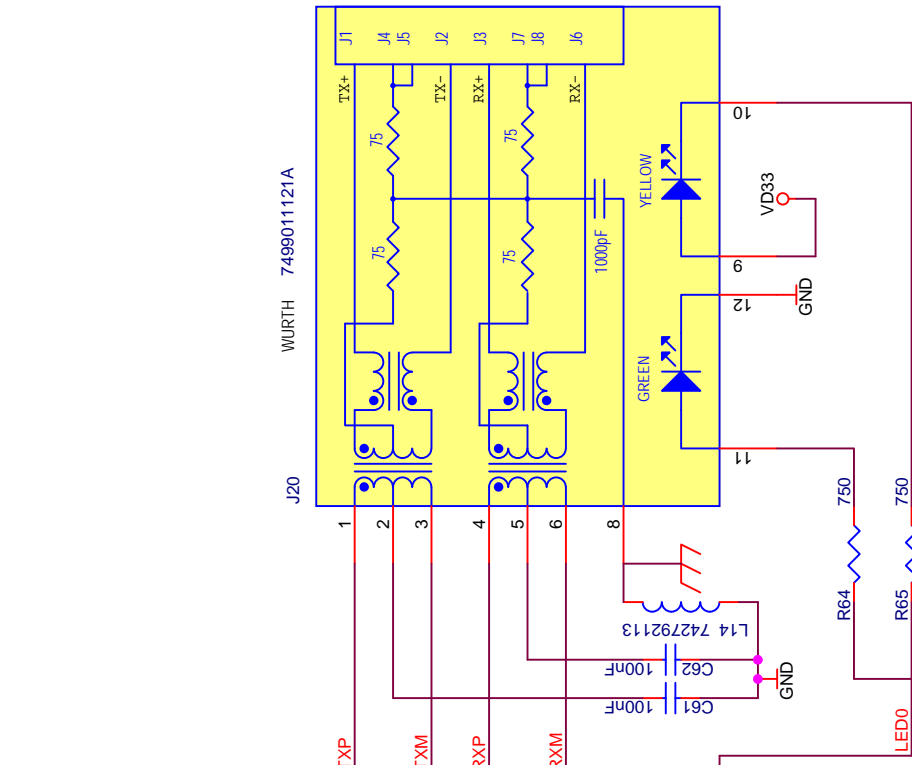
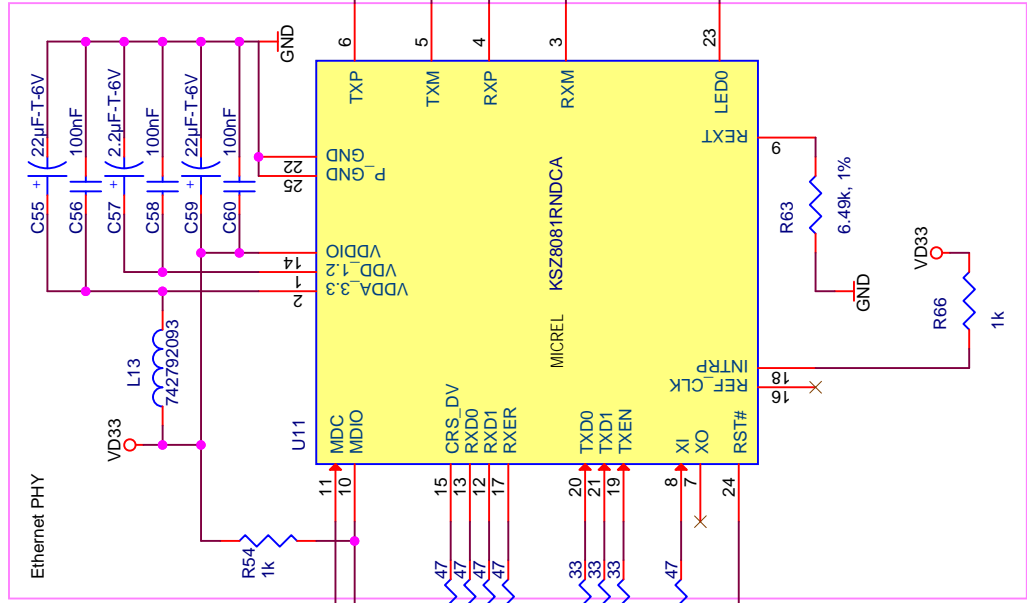


AUDIO Extensions (Optional)

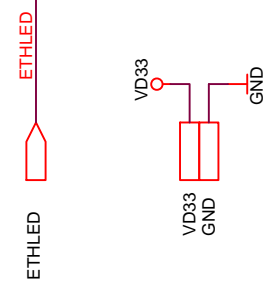
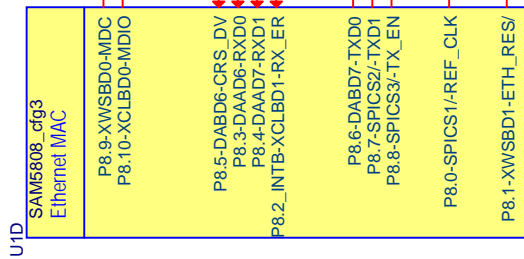


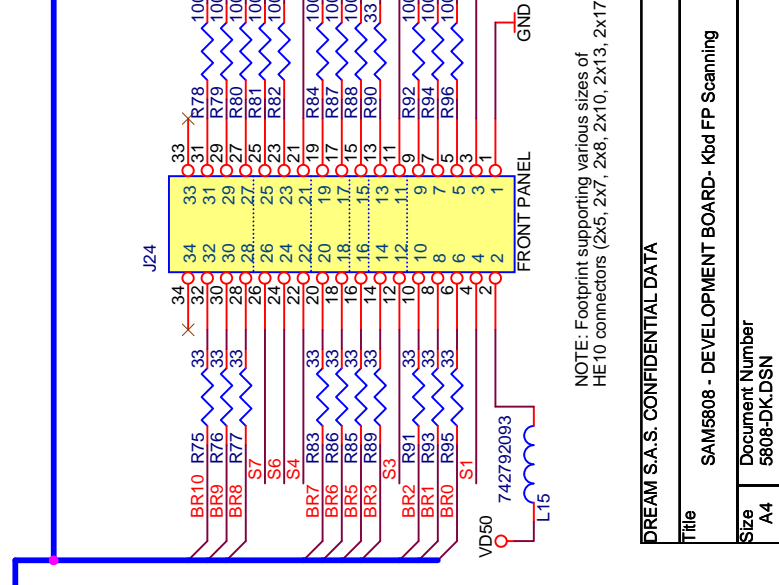
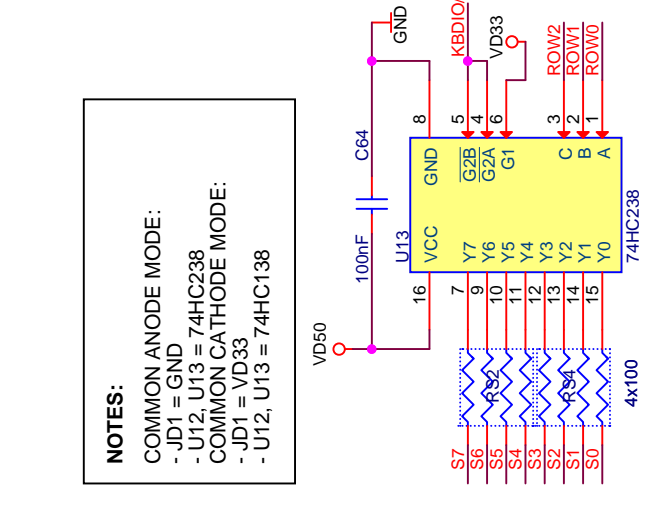
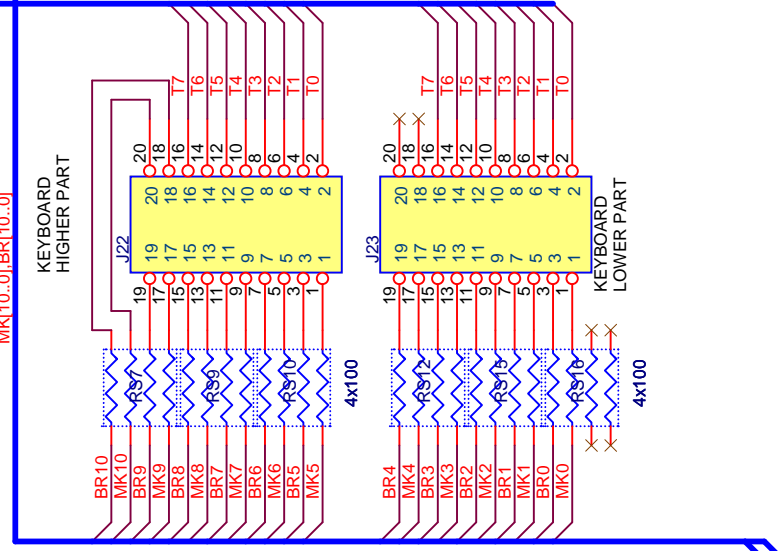
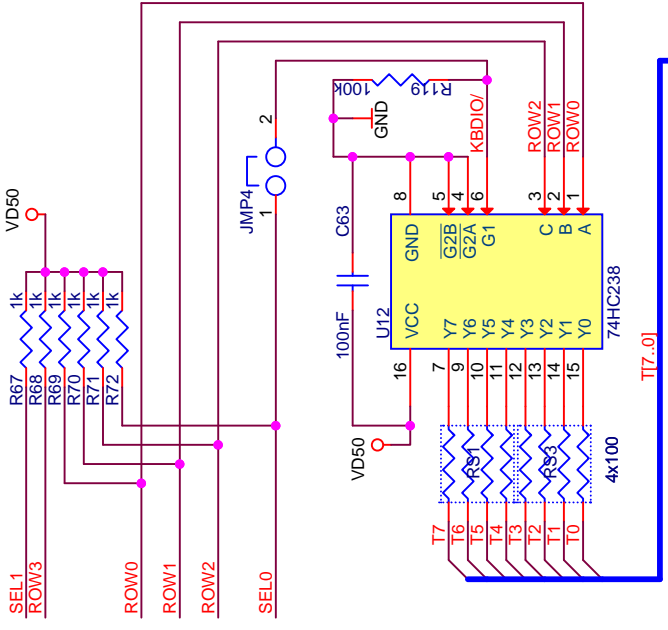
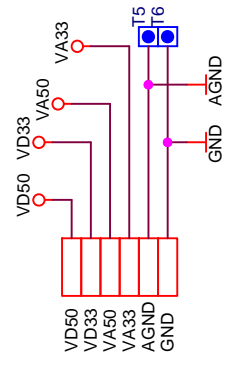
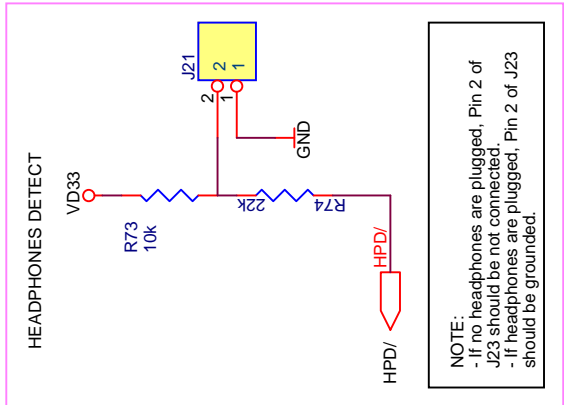
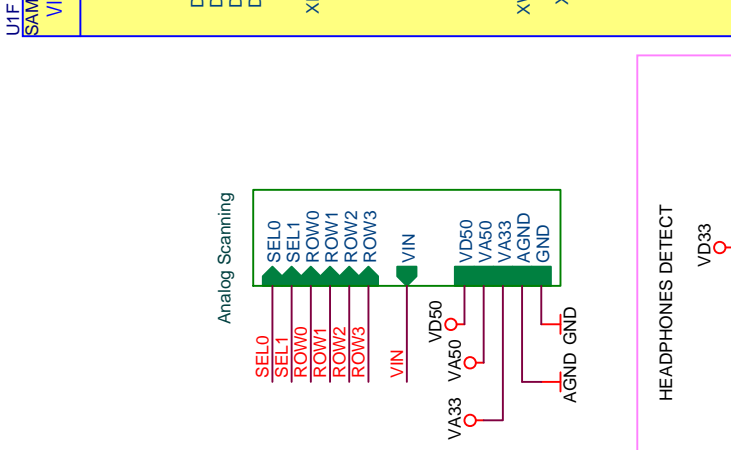
SPDIF OUT OPTICAL



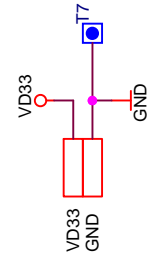
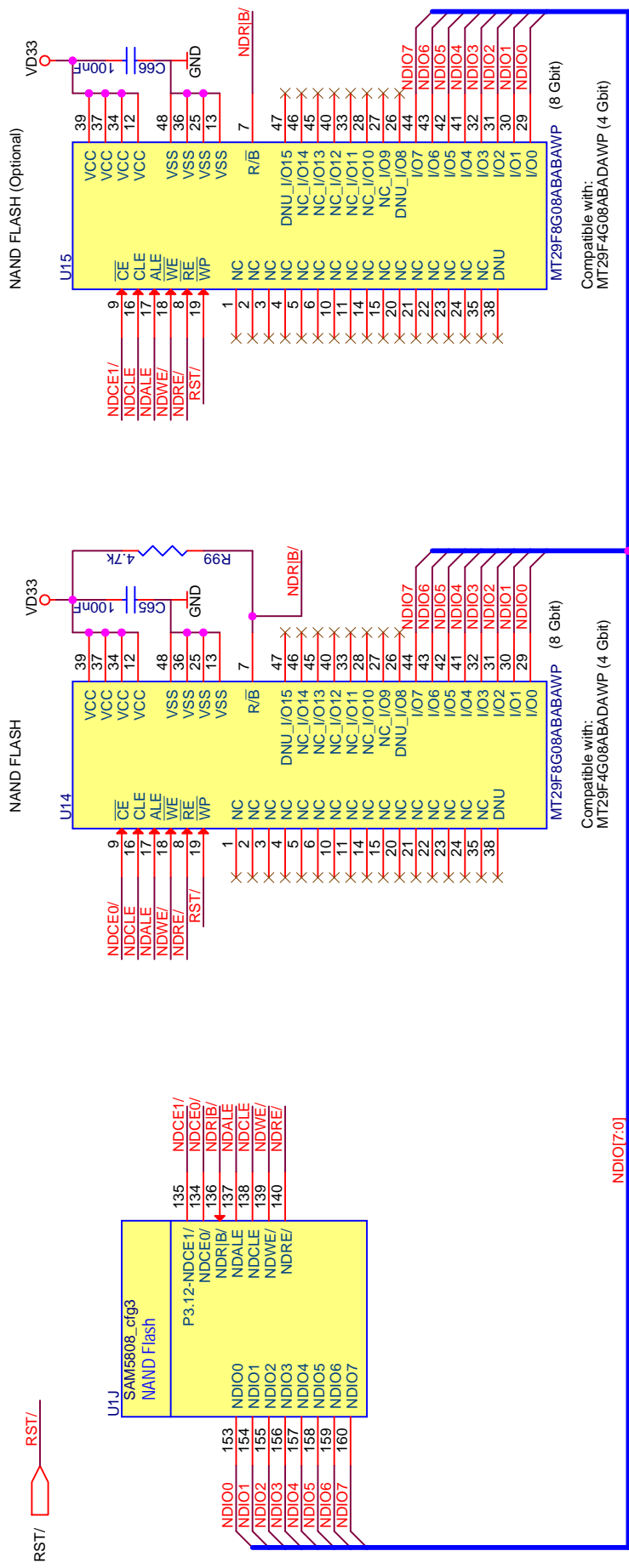


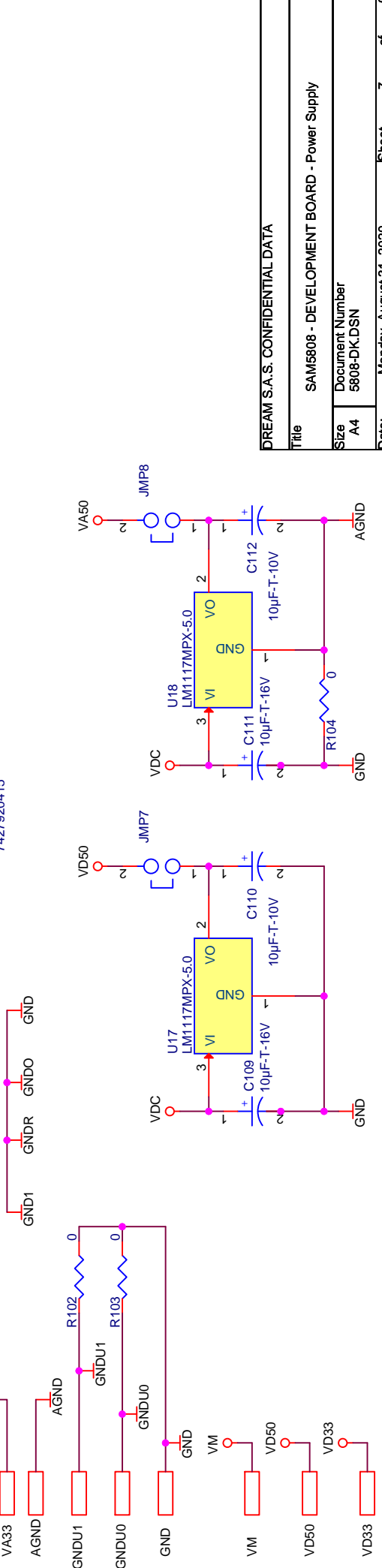
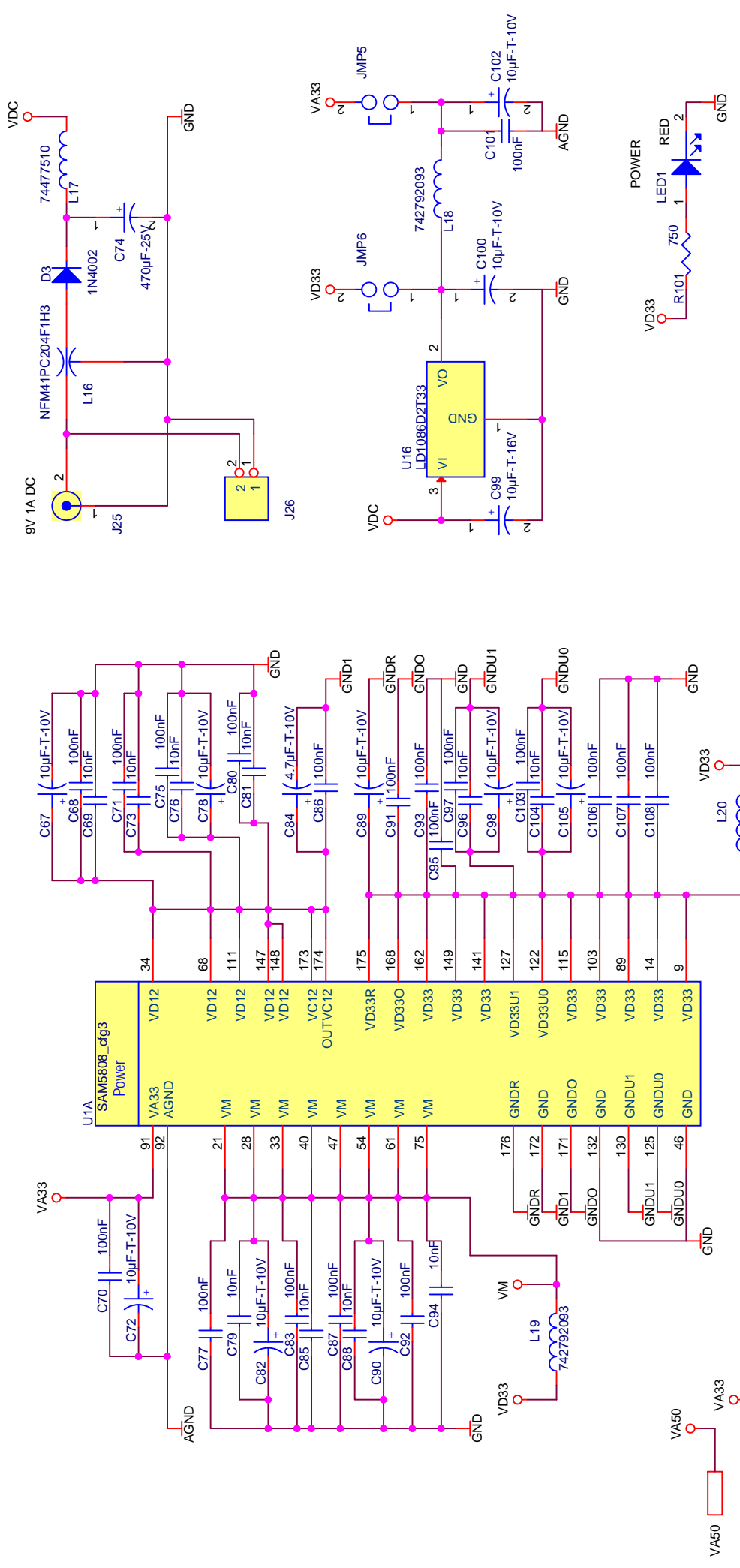
Ethernet PHY





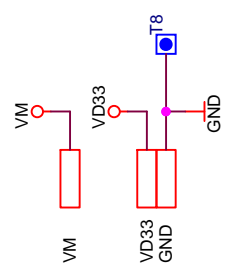
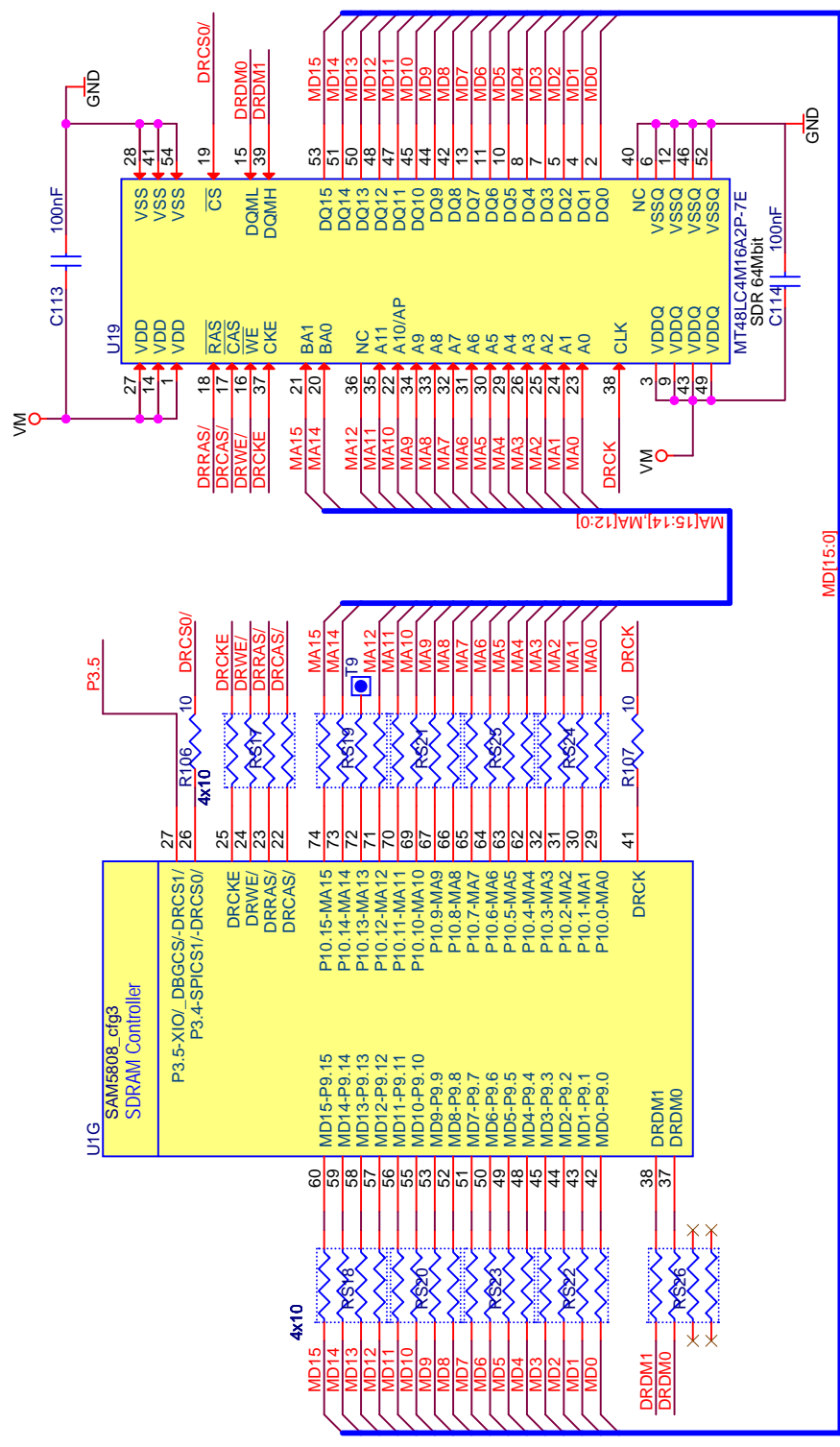
NOTE: Footprint supporting various sizes of HE10 connectors (2x5, 2x7, 2x8, 2x10, 2x13, 2x17)





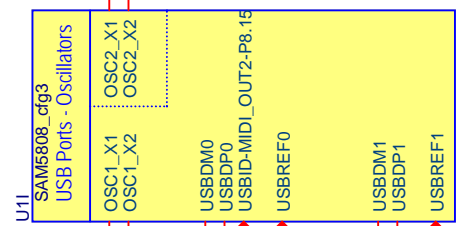
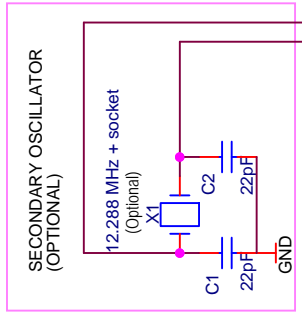
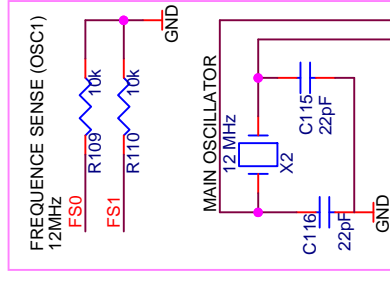
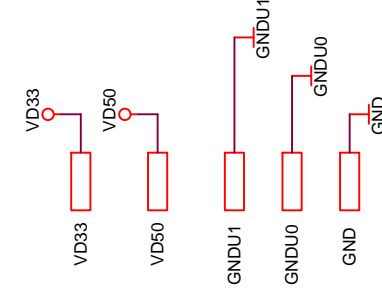
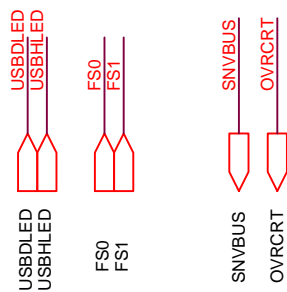
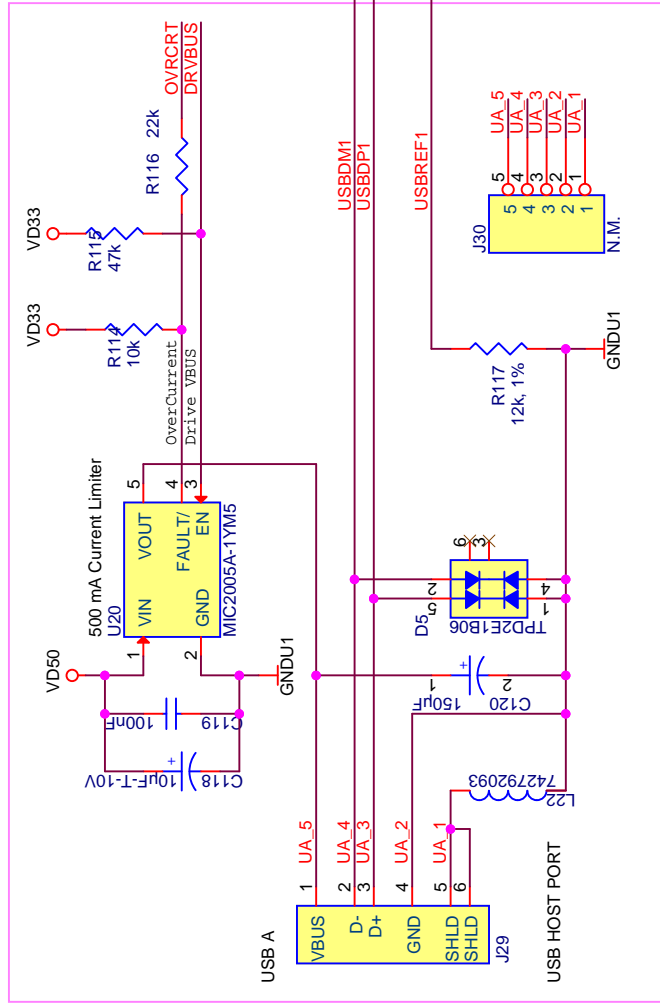
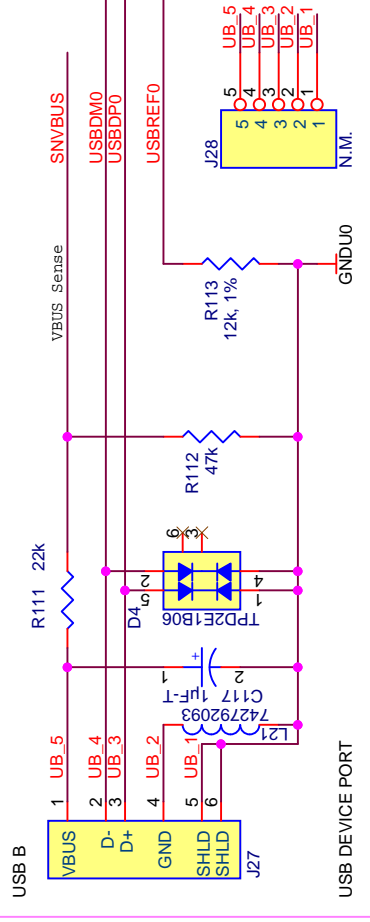
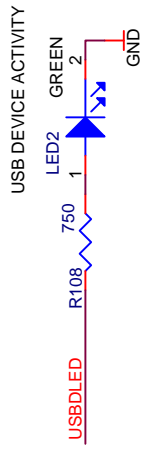
DREAM S.A.S. CONFIDENTIAL DATA

Title	SAM5808 - DEVELOPMENT BOARD - Power Supply
Size	Document Number
A4	5808-DK.DSN
Date:	Monday, August 31, 2020
Sheet	7 of 9
Rev	1.1



DREAM S.A.S. CONFIDENTIAL DATA

Title		SAM5808 - DEVELOPMENT BOARD - SDR SDRAM	
Size	A4	Document Number	5808-DK.DSN
Date:	Monday, August 31, 2020	Sheet	8 of 9
Rev	1.1		



Dream Contact

info@dream.fr

Website

<http://www.dream.fr>

This publication neither states nor implies any warranty of any kind, including, but not limited to, implied warrants of merchantability or fitness for a particular application. Dream assumes no responsibility for the use of any circuitry. No circuit patent licenses are implied. The information in this publication is believed to be accurate in all respects at the time of publication but is subject to change without notice. Dream assumes no responsibility for errors and omissions, and disclaims responsibility for any consequences resulting from the information included herein.