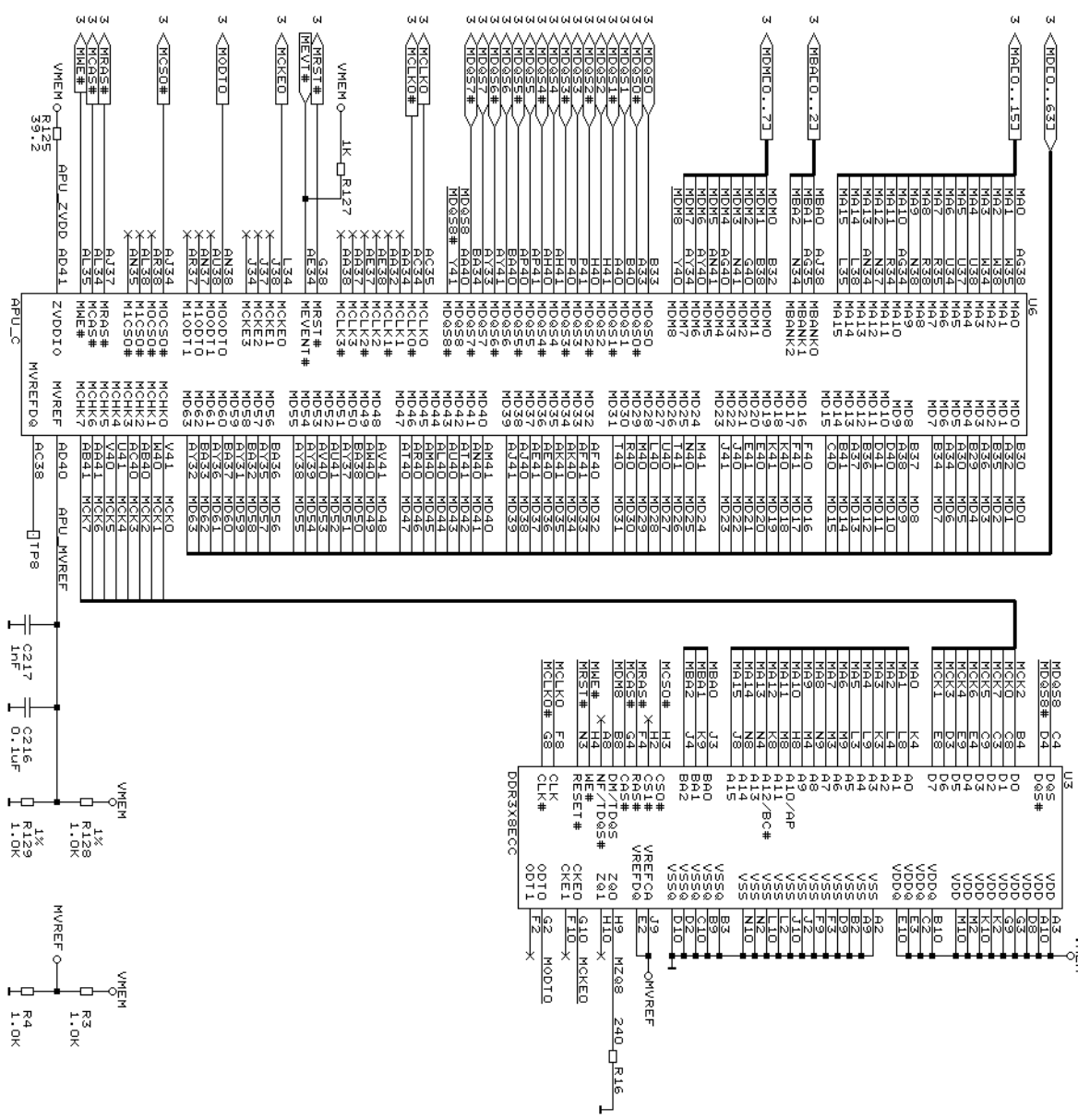
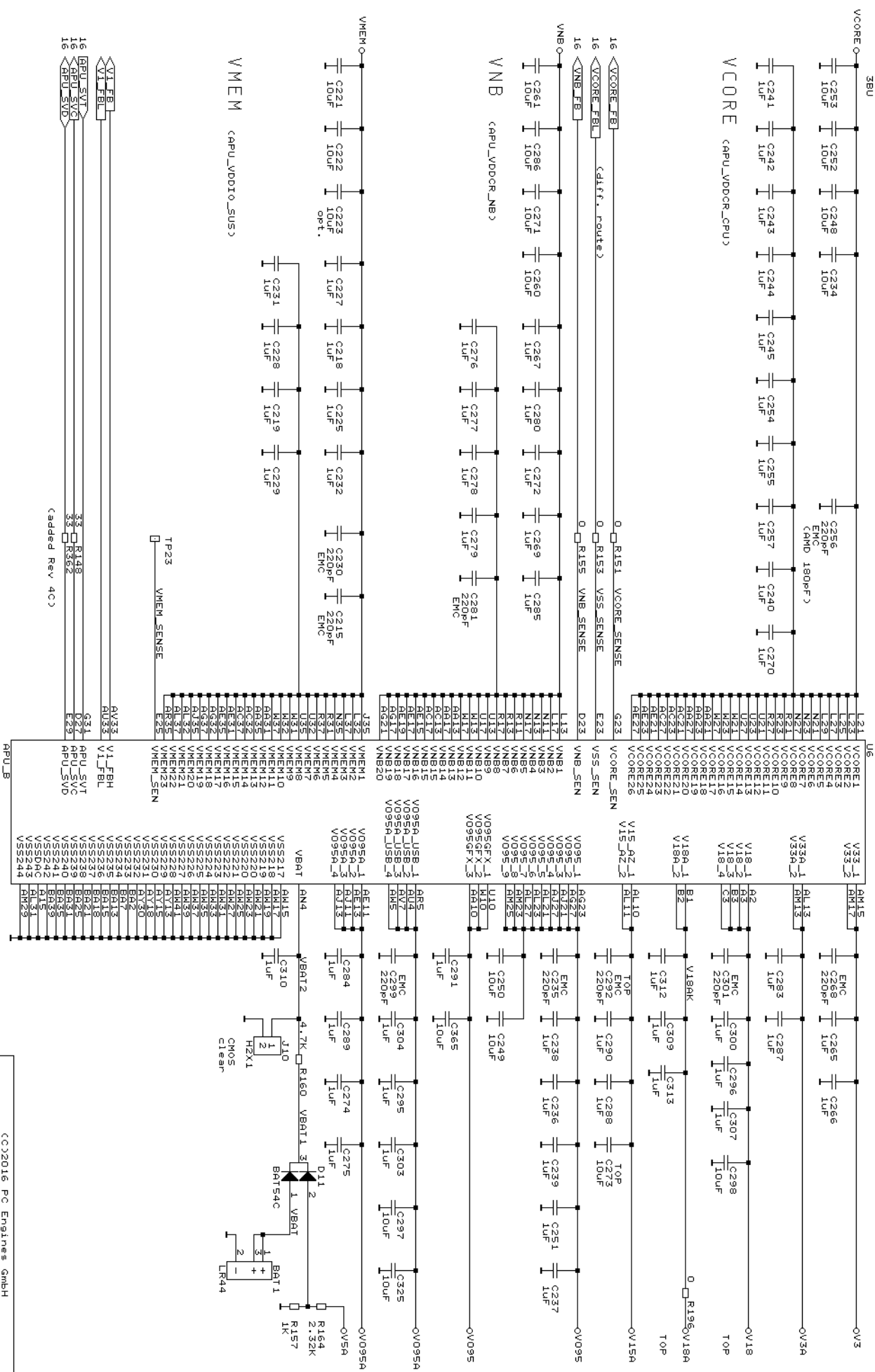


APU DRAM Interface

ECC DRAM

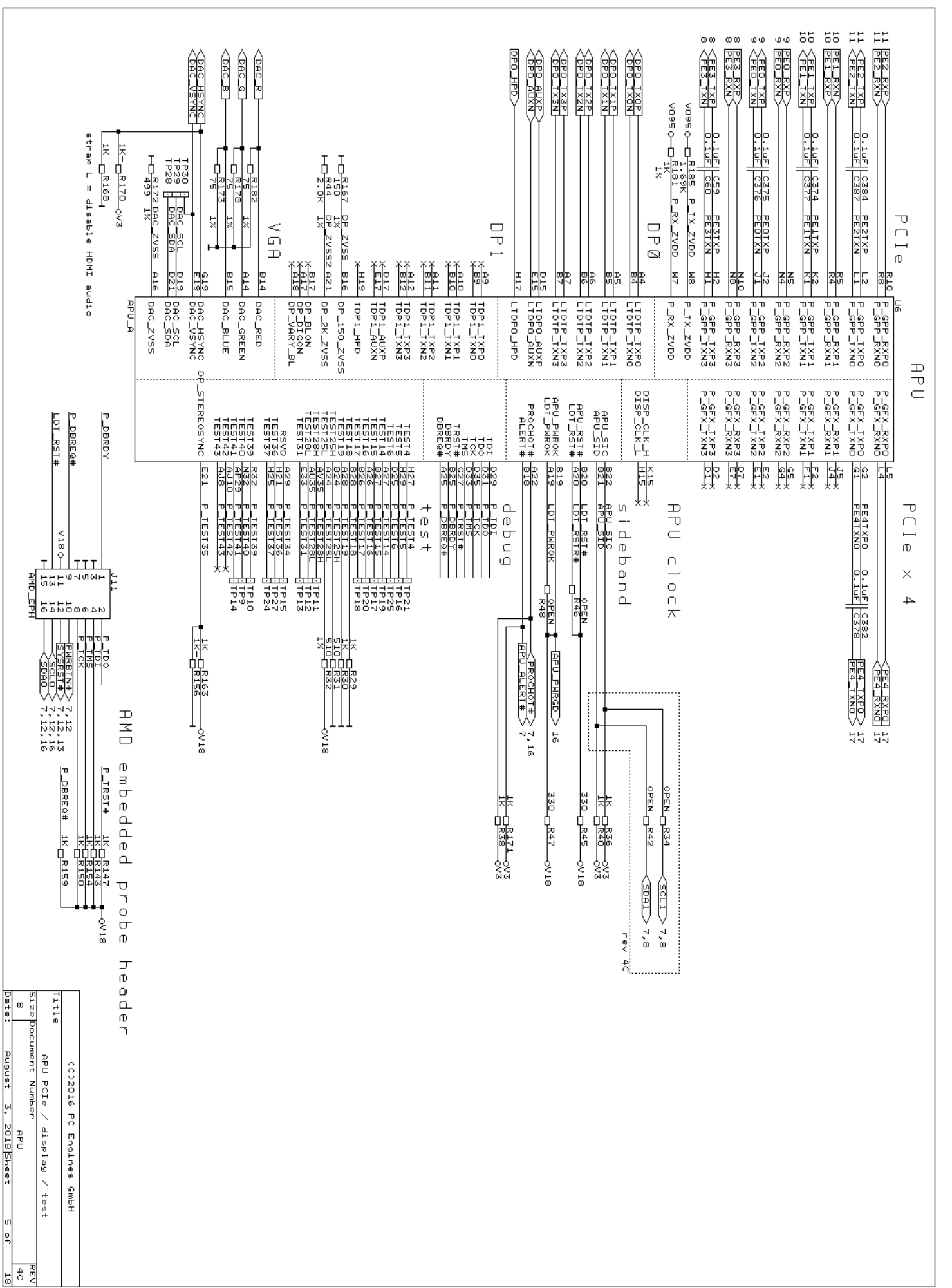


APU power

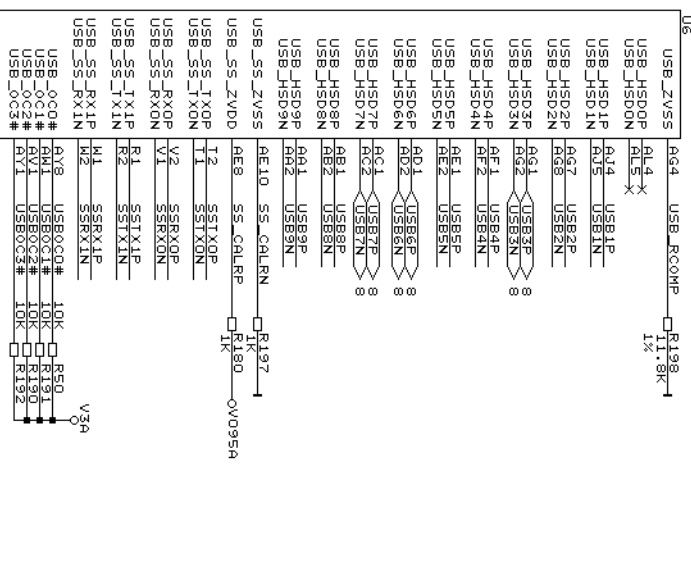


©2016 PC Engines GmbH

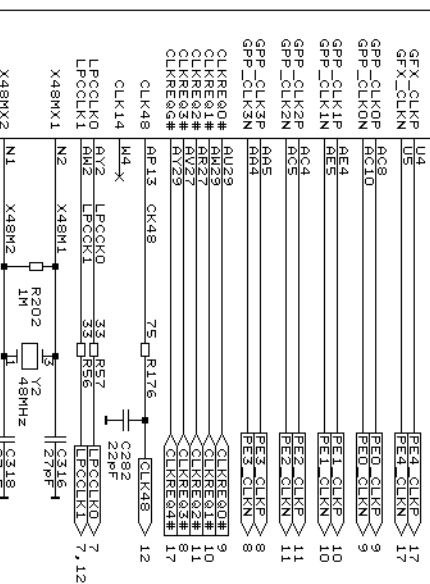
Title	APU power
Size/Document Number	APU
REV	4C
Date:	August 3, 2018/Sheet 4 of 18



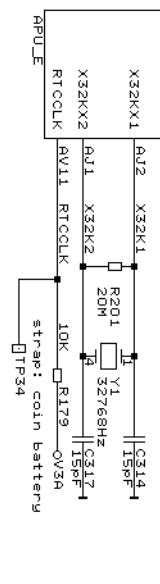
APU USB



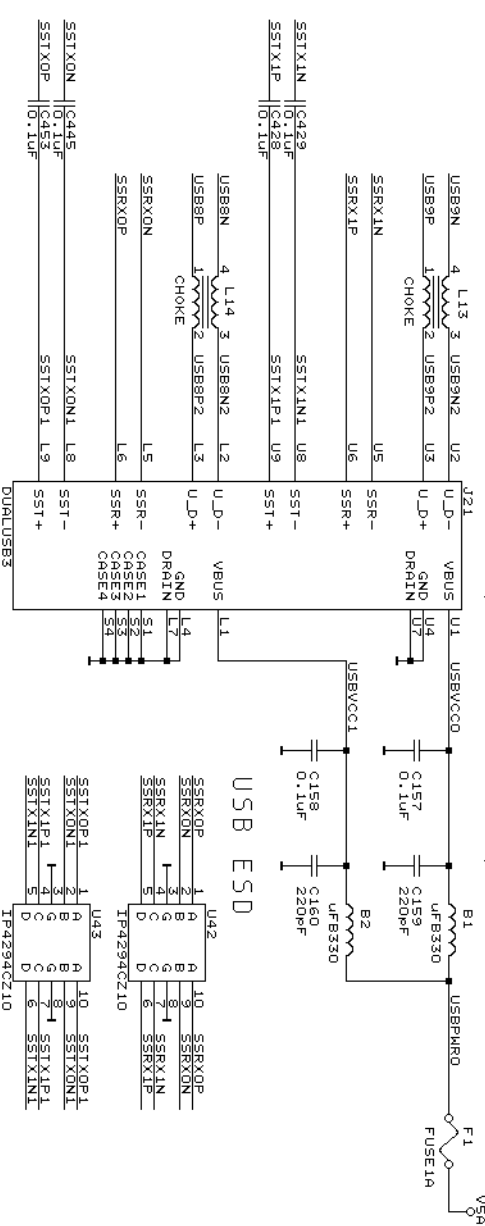
APU clock



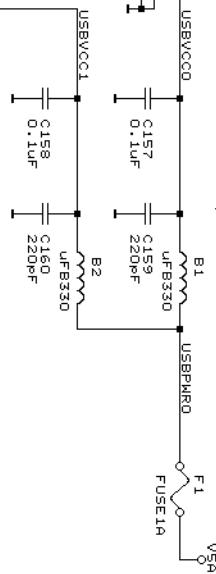
RTC



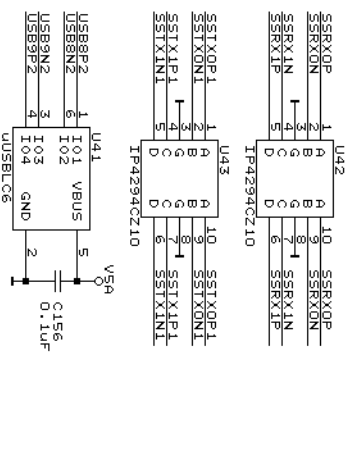
USB 3.0 port



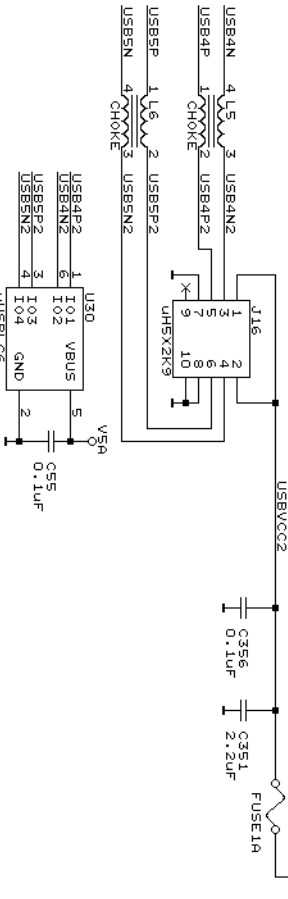
USB power



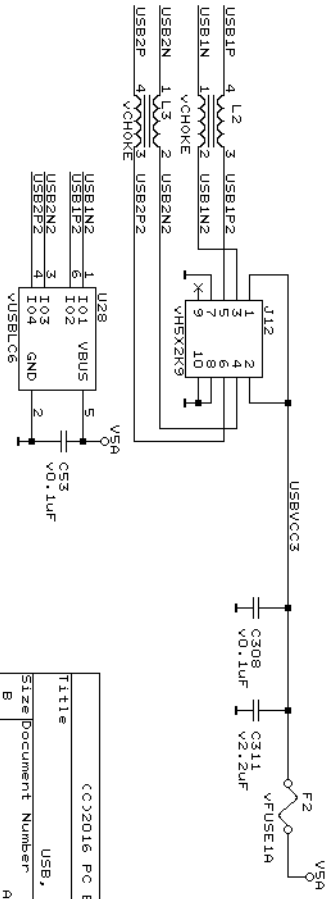
USB ESD



Internal USB 2.0 header

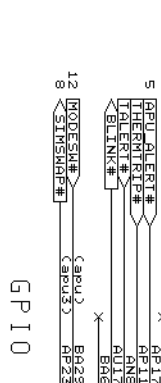
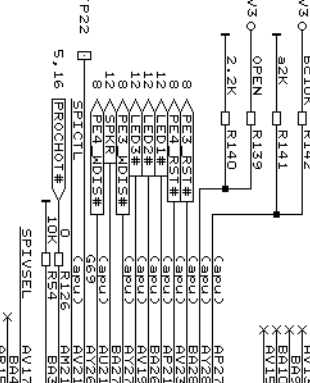
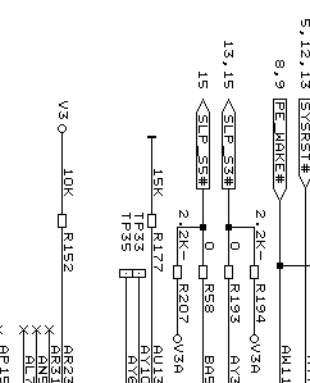
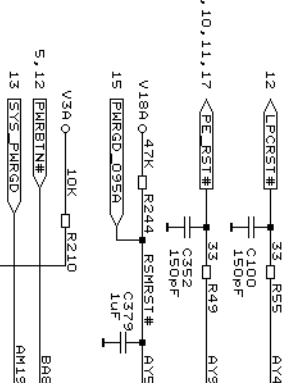
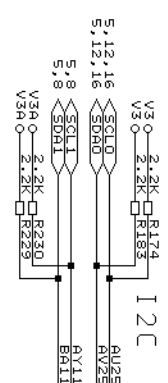


Internal USB 2.0 header (option v)



Title		USB, clock	
Size/Document Number		APU	
Date:		August 31, 2018/Sheet	
		6 of 18	

©2016 PC Engines GmbH



I2C

V3_0	2.2K	R174	AV25	SCL0
V3_0	2.2K	R183	AV25	SDB0
5,12,16	10K	R139	AV11	SCL1
5,8	10K	R141	AV11	SDB1
V3_0	2.2K	R230	AV5	RSWRST#
V3_0	2.2K	R229	AV5	RSWRST#

12	LPG_RST#	AV4	LPG_RST#
13	FE_RST#	AV9	PCIERST#
14	FE_RST#	AV9	PCIERST#
15	PMR_RST#	AV5	RSWRST#
V3_0	10K	R210	BA8
5,12	PMRBTN#	BA8	PMRBTN#
13	SYS_PMRGD	AM19	PMRGOOD
5,12,13	SVSRST#	AY7	SVSRST#
8,9	FE_WAKE#	AM11	MAKE#

13,15	SLP_S3#	AV3	SLP_S3#
15	SLP_S5#	AV3	SLP_S5#
15	SLP_S5#	AV3	SLP_S5#
15K	R177	AV12	TEST0
2.2K	R207	OV3A	TEST1/TMS
15K	R177	AV12	TEST0
15K	R177	AV12	TEST1/TMS
TP33		AV6	TEST2
TP35		AV6	TEST2

V3_0	10K	R152	AR23	KBRST#
			AR31	KBRST#
			AN5	LPCPM#
			AL7	LPCSM#
V3_0	b10K	R142	AV15	TR_PVD
V3_0	a2K	R141	AV13	TR_T1#
			BA9	TR_T1#
			BA10	TR_PX1
			AV13	IR_LED/G184
2.2K	R140	(CPU2)	AP22	G49
		(CPU2)	AV28	G50
		(CPU2)	AV23	G51
		(CPU2)	AV21	G52
		(CPU2)	AV27	G53
		(CPU2)	AV27	G54
		(CPU2)	AV27	G55
		(CPU2)	AV27	G56
		(CPU2)	AV27	G57
		(CPU2)	AV27	G58
		(CPU2)	AV27	G59
		(CPU2)	AV27	G60
TP22	SPI_CLK#	(CPU2)	AV26	G69
5,16	FROCHOT#	(CPU2)	AV24	G70
		(CPU2)	AV24	G71
		(CPU2)	AV24	G72
		(CPU2)	AV24	G73
		(CPU2)	AV24	G74

12	MODESEL#	(CPU3)	BA23	GENINT1#/G33
18	SITSHP#	(CPU3)	BA29	GENINT2#/G33

audio

A2	BITCLK		
AN2	AZ_BITCLK		
AK1	AZ_SDO		
AK2	AZ_SDI		
AK1	AZ_SDO		
AK2	AZ_SDI		
AK1	AZ_SDO		
AK2	AZ_SDI		
AK1	AZ_SDO		
AK2	AZ_SDI		
AK1	AZ_SDO		
AK2	AZ_SDI		
AK1	AZ_SDO		
AK2	AZ_SDI		
AK1	AZ_SDO		
AK2	AZ_SDI		

SATA

BA14	SATA_X0P	10NF	C48	SATA_X0P
BA14	SATA_X0N	10NF	C48	SATA_X0N
BA16	SARX0N	10NF	C45	SARX0N
BA16	SARX0P	10NF	C45	SARX0P
BA19	SATX1P	10NF	C211	SATX1P
BA19	SATX1N	10NF	C211	SATX1N
AV17	SARX1N	10NF	C203	SARX1N
BR17	SARX1P	10NF	C196	SARX1P
BA19	SATA_CALRN	1.0K	R164	SATA_CALRN
BP19	SATA_CALRN	1.0K	R163	SATA_CALRN
BA30	SATA_ACT#	10K	R105	SATA_ACT#
AV12	SATA_X1			SATA_X1
BA12	SATA_X2			SATA_X2

LPC

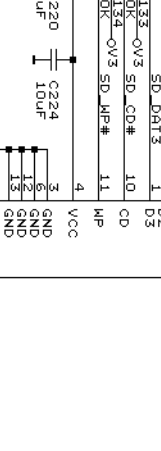
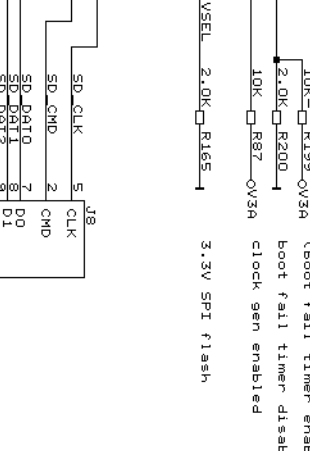
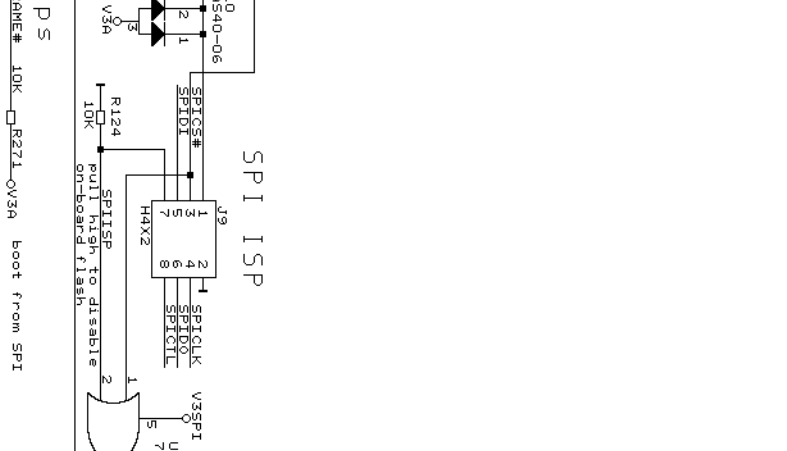
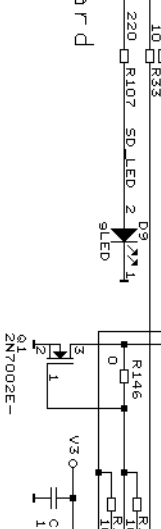
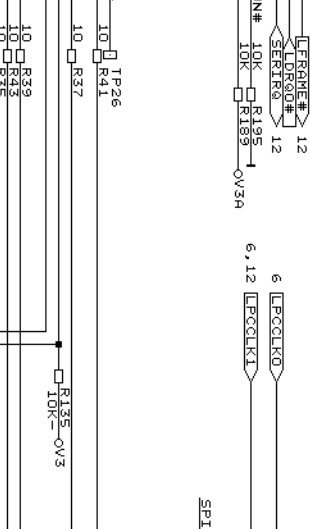
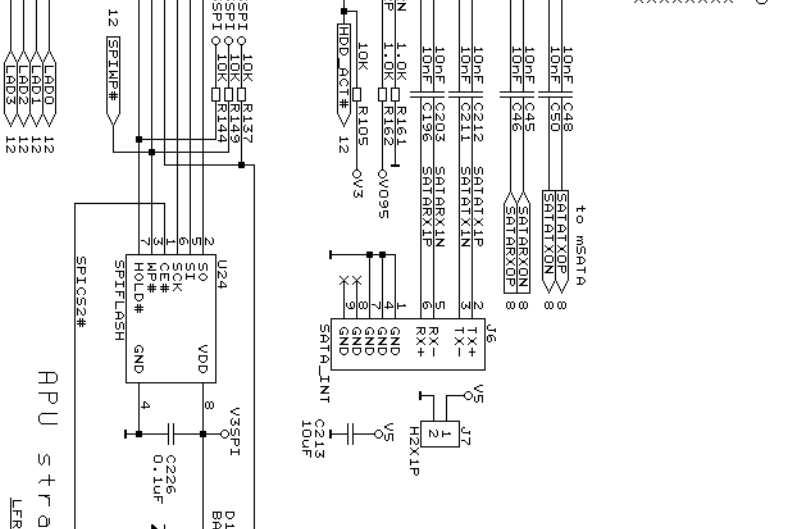
AT2	LAD0		
AT1	LAD1		
AT2	LAD2		
AT1	LAD3		
AP2	LDRG#		
AP1	SERR0		
AP2	LPC_CLKRUN	10K	R195
AP2	LPC_P0#	10K	R189
			OV3A

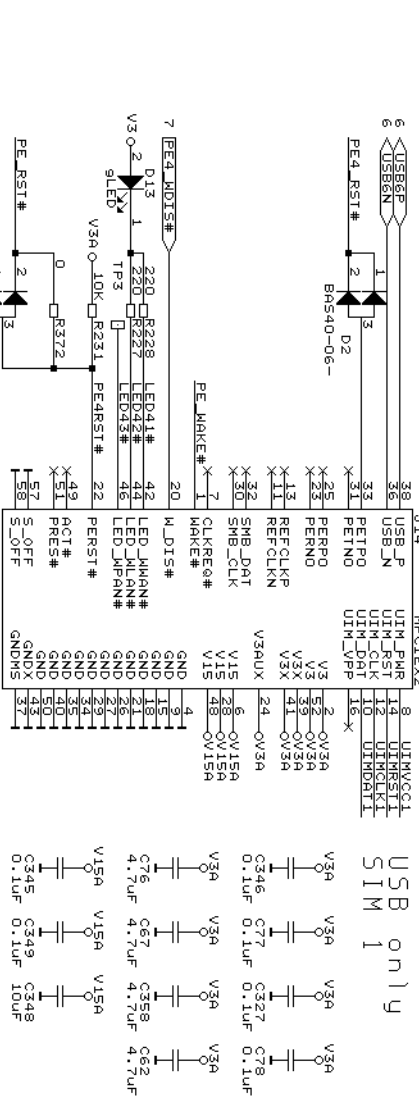
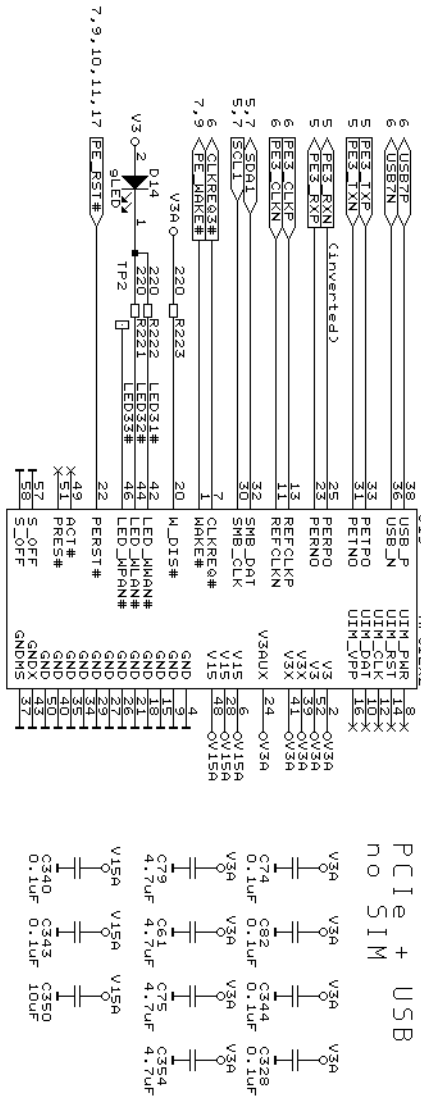
APU strapps

LFRAME#	10K	R271	OV3A	boot from SPI
10K-	R199	OV3A		(boot fail timer enabled)
2.0K	R200			boot fail timer disabled
10K	R87	OV3A		clock gen enabled
SPIVSEL	2.0K	R165		3.3V SPI flash

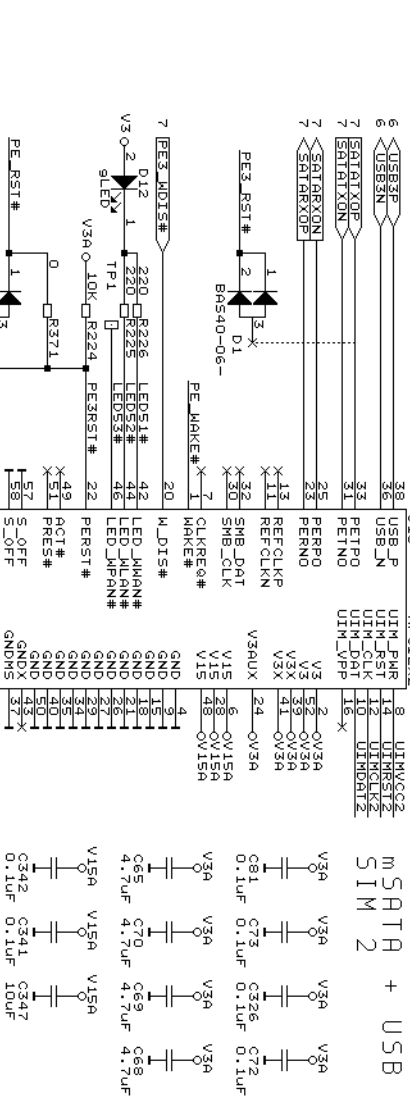
SD card

BA22	SD_PMC_CLK	10	R37	TP26
AV23	SD_CMD			
BA20	SD_WP#			
BA22	SD_DQ10	10	R39	
AV24	SD_DQ11	10	R42	
BA24	SD_DQ12	10	R35	
BA24	SD_DQ13	10	R35	
AV25	SDR_LED	220	R107	SD_LED 2
				SD_LED 1

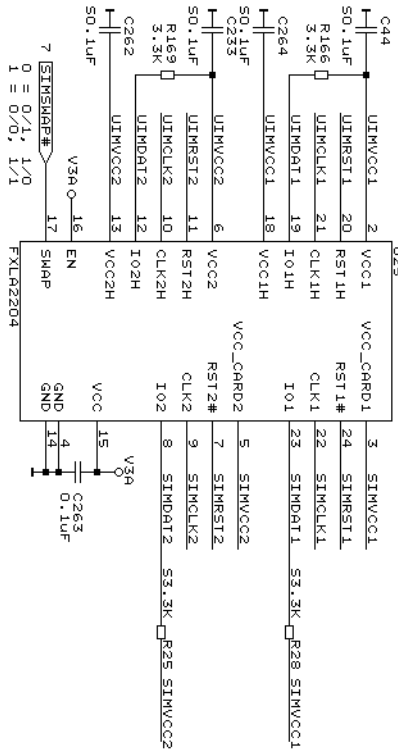




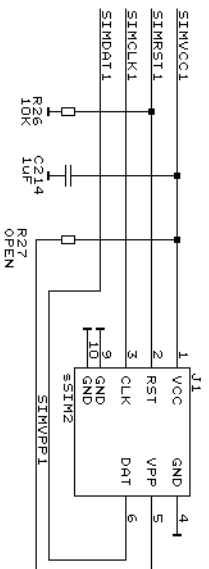
mSATA + USB SIM 2



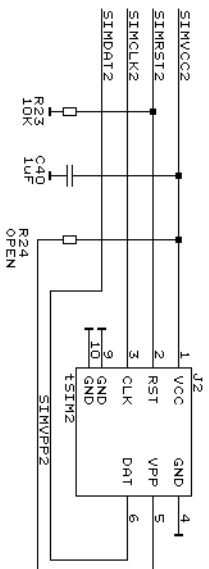
SIM switch



SIM 1



SIM 2

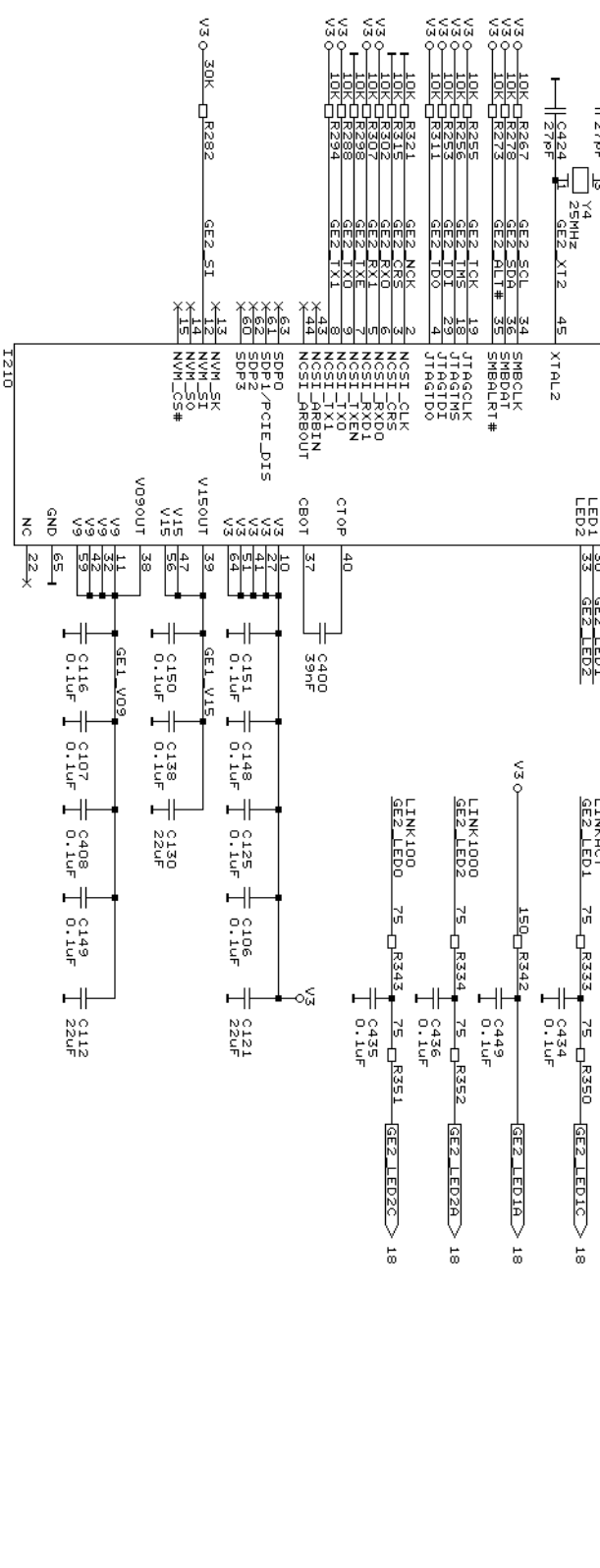
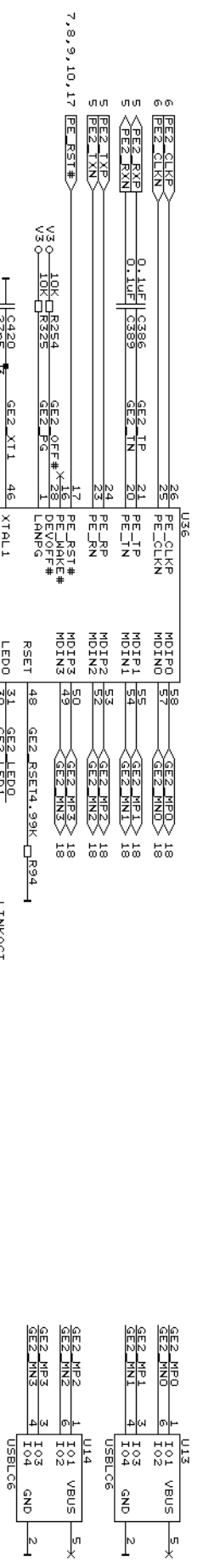


Note: Depopulate LED42# / LED52# resistors if necessary (CUSTOM_DET pin on Huawei modems)

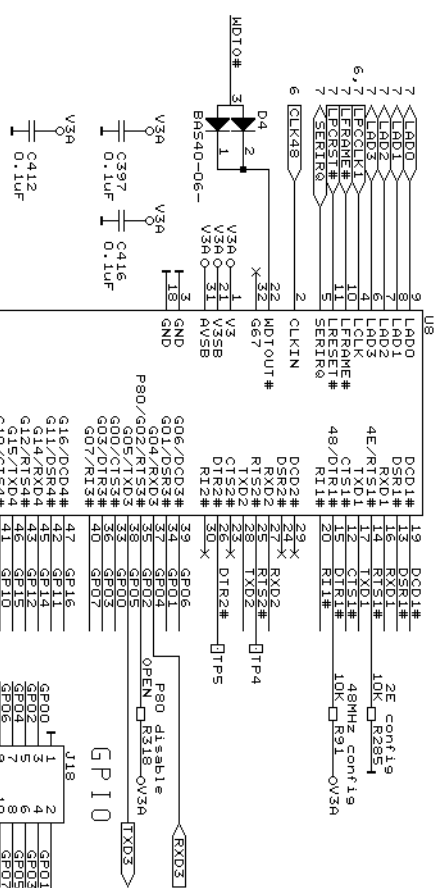
6 CLKREG2# 10K R145

1 G1 gabit Ethernet 3

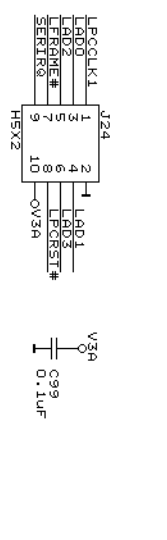
ESD protection



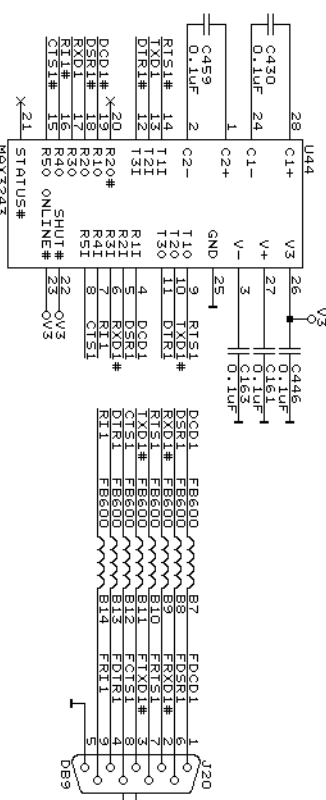
LPC UART



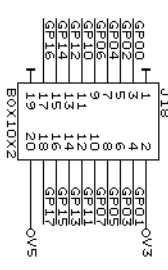
LPC debug / TPM



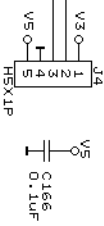
COM1



GPIO

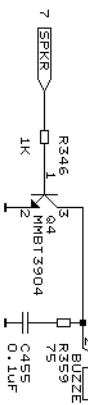


COM2

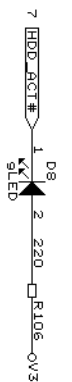


caution: GPIO is V3A domain.

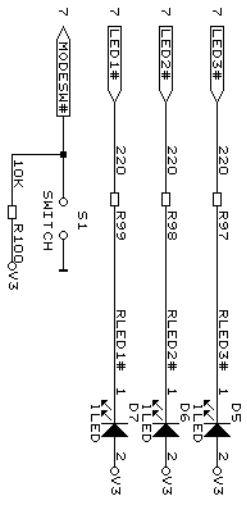
Buzzer



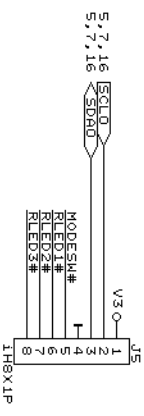
SATA activity LED



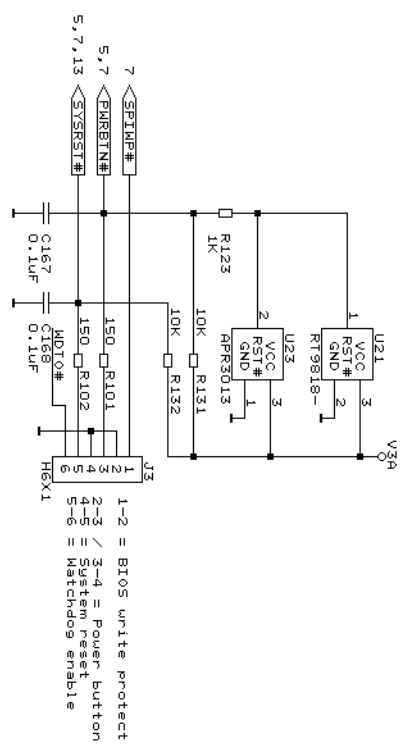
LED + switch



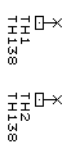
I2C option



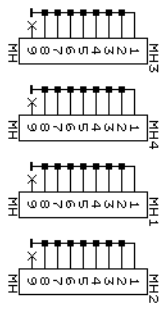
Power / reset / watchdog header



Heat spreader mounting



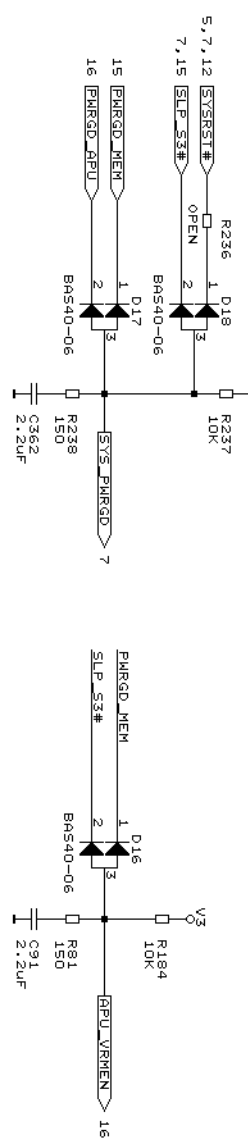
Mounting holes



Fiducial marks

FM6	FM10	FM14	FM8
FM7	FM5	FM12	FM3
FM17	FM15	FM16	FM1
FM13	FM9	FM4	FM11

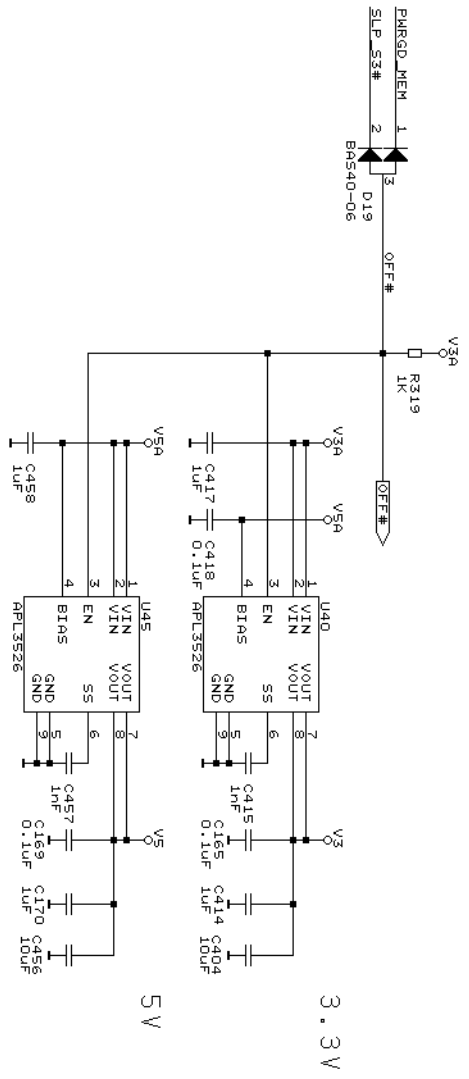
Power good v18a



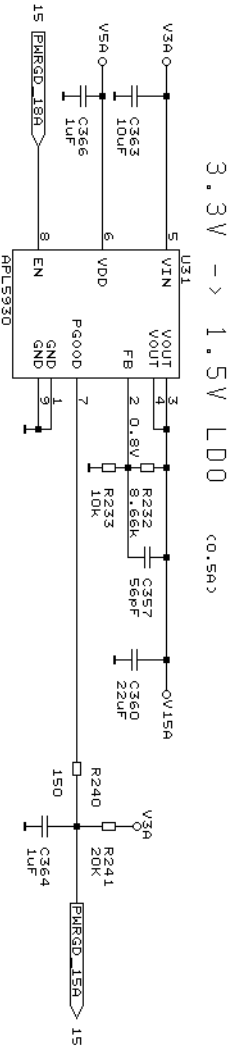
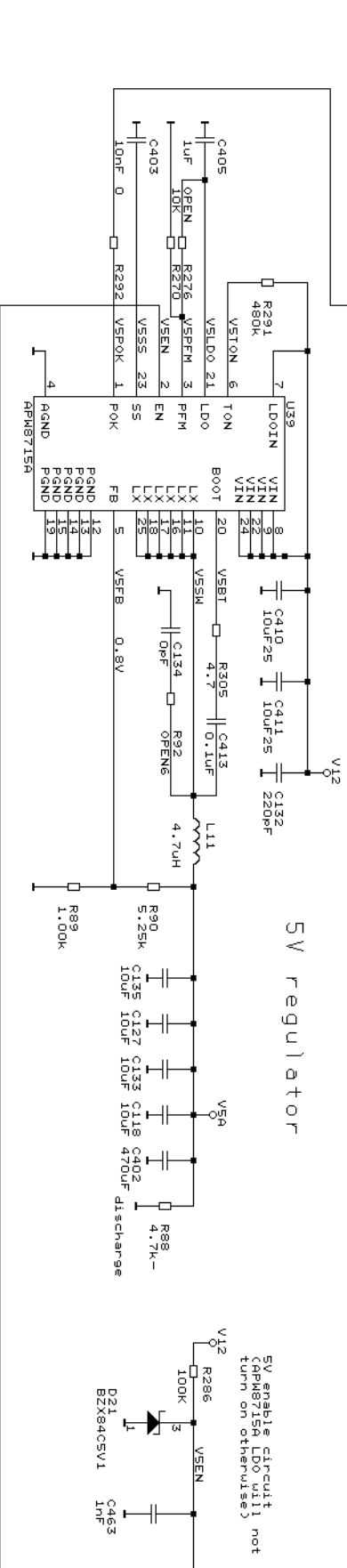
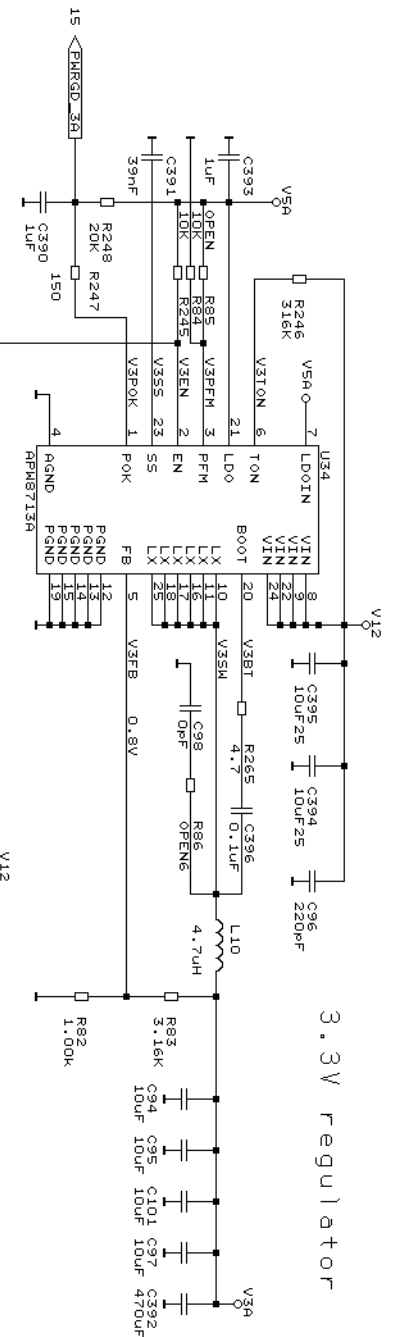
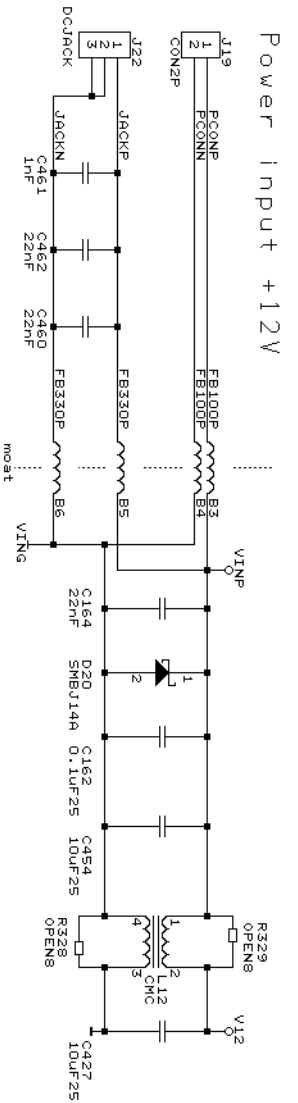
VRM test points

- V5A0 — TP46
- V5A0 — TP45
- V3A0 — TP44
- V3 — TP43
- V18A0 — TP37
- V18 — TP36
- V15A0 — TP40
- V15A0 — TP40
- VMEM0 — TP42
- V15A0 — TP42
- V095A0 — TP42
- V095A0 — TP41
- VCORE0 — TP38
- VNB0 — TP39

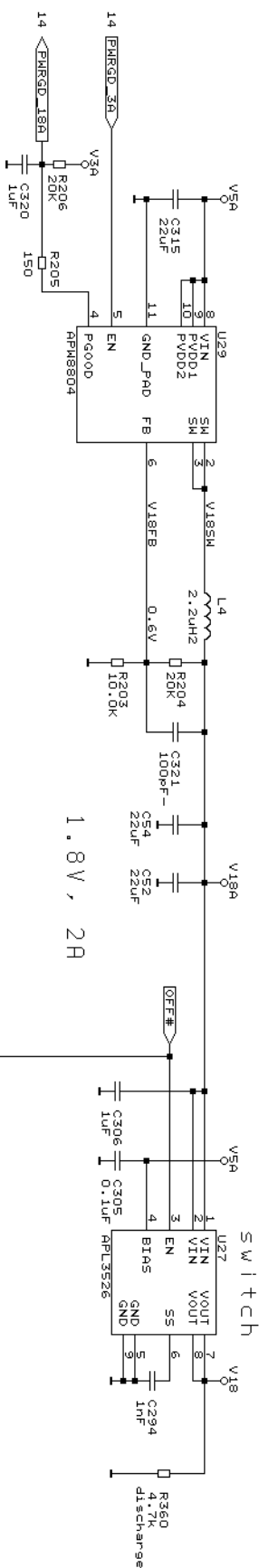
Power sequence:
Turn on after VMEM is good.



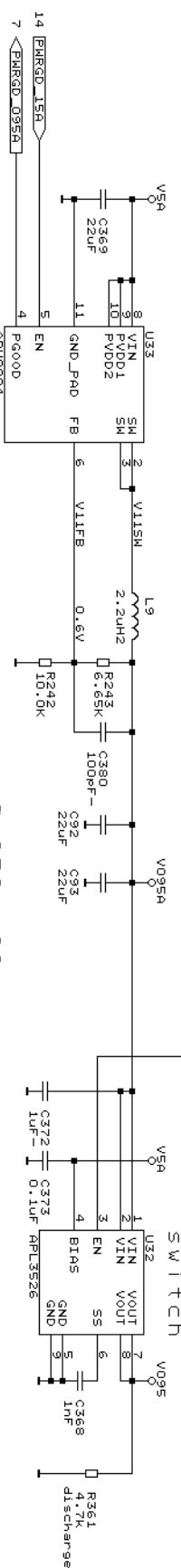
©2016 PC Engines GmbH	
Title	power good, power switch
Size	Document Number
B	APU
Date:	December 7, 2016
Sheet	13 of 18
REV	4C



©2016 PC Engines GmbH	
Title	power In, 3.3V, 5V, 1.5V
Size	Document Number
B	APU
Date:	October 27, 2017 Sheet 14 of 18
REV	4C

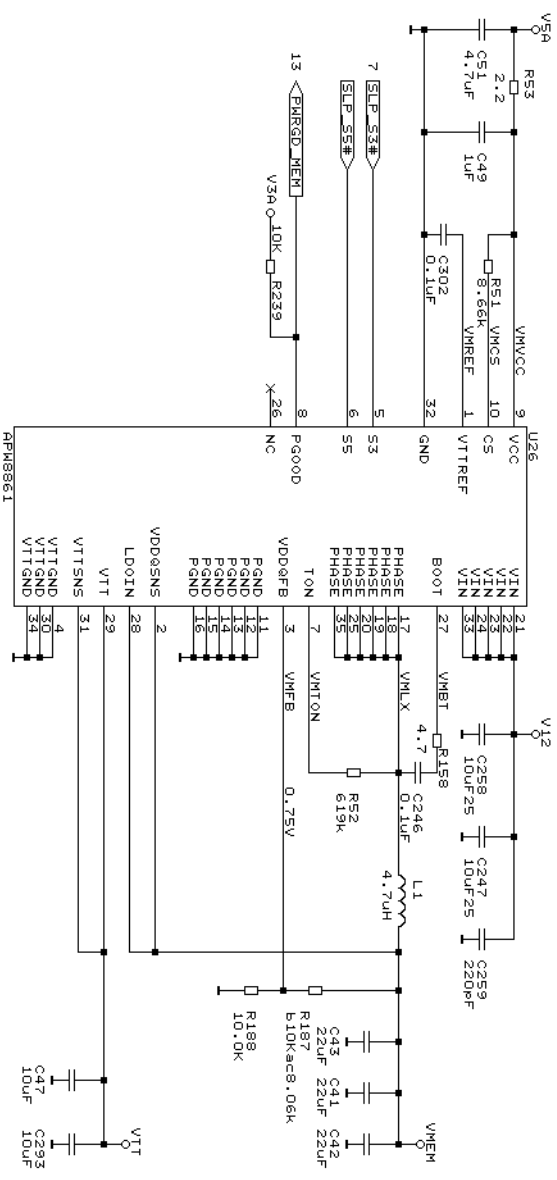


1.8 V, 2A



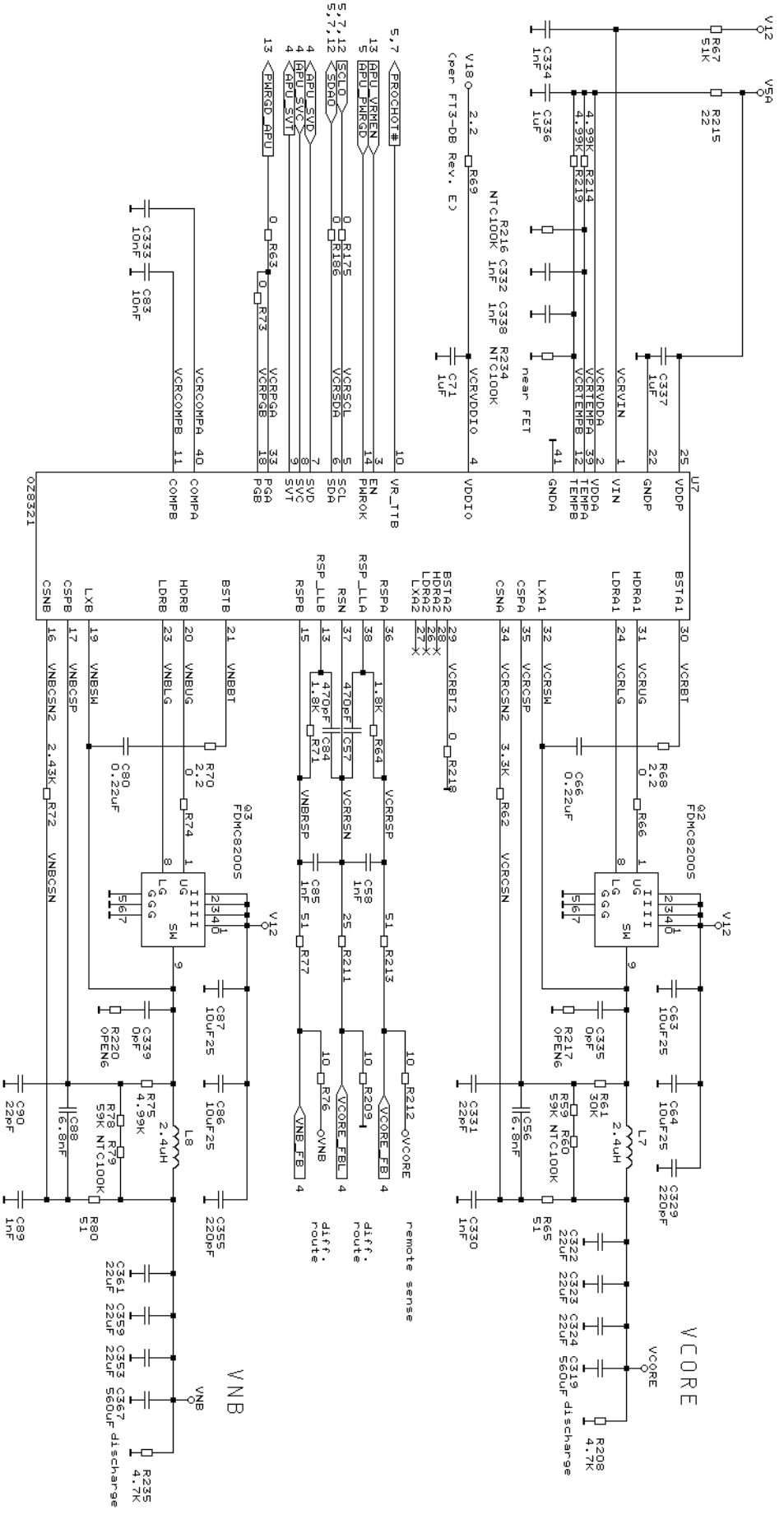
0.95A, 3A

1.5V / 1.35V VMEM
0.75V / 0.675V VTT

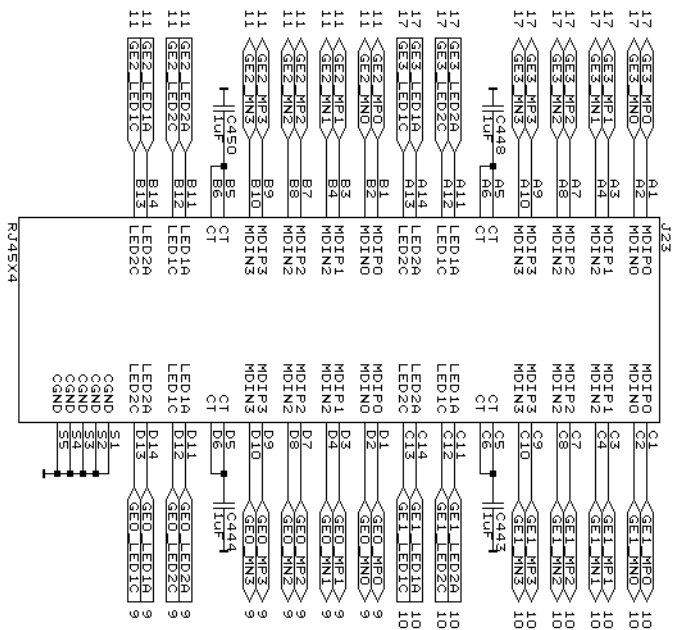


Title		CC202016 PC Engines GmbH	
Size		1.8V, 0.95V, VMEM, VTT	
Document Number		APU	
Date		August 6, 2018	
Sheet		15 of 18	
REV		4C	

VCORE and VNB converter



Title		VCORE, VNB	
Size/Document Number		APU	
Date: February 5, 2016		Sheet	16 of 18
REV		4C	



©2016 PC Engines GmbH	
Title	Ethernet connector
Size	Document Number
B	APU
Date:	June 7, 2016 Sheet 18 of 18
	REV 4C