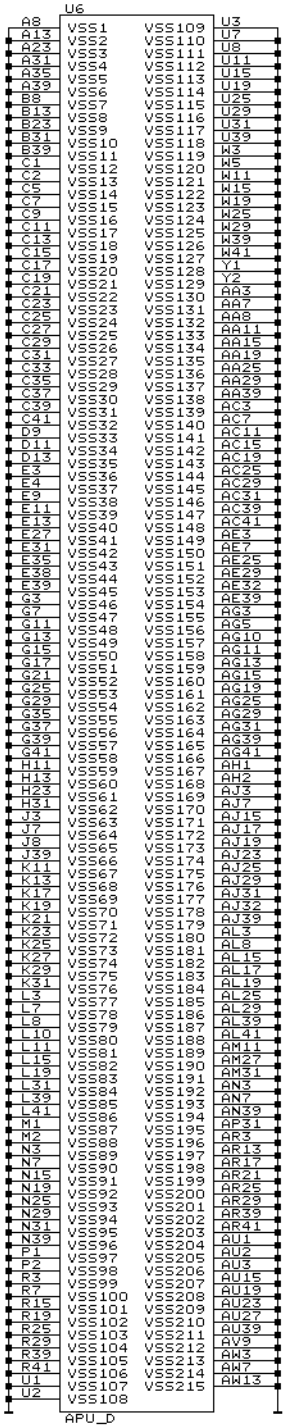
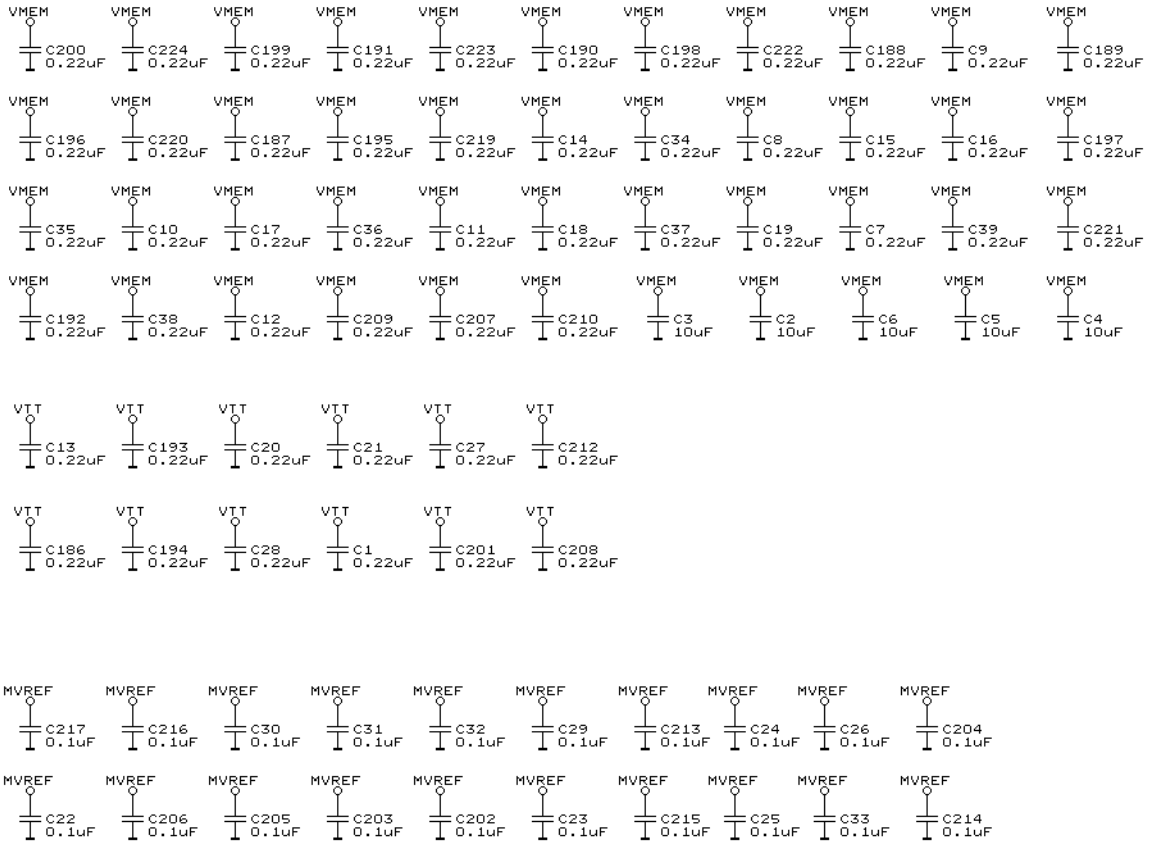


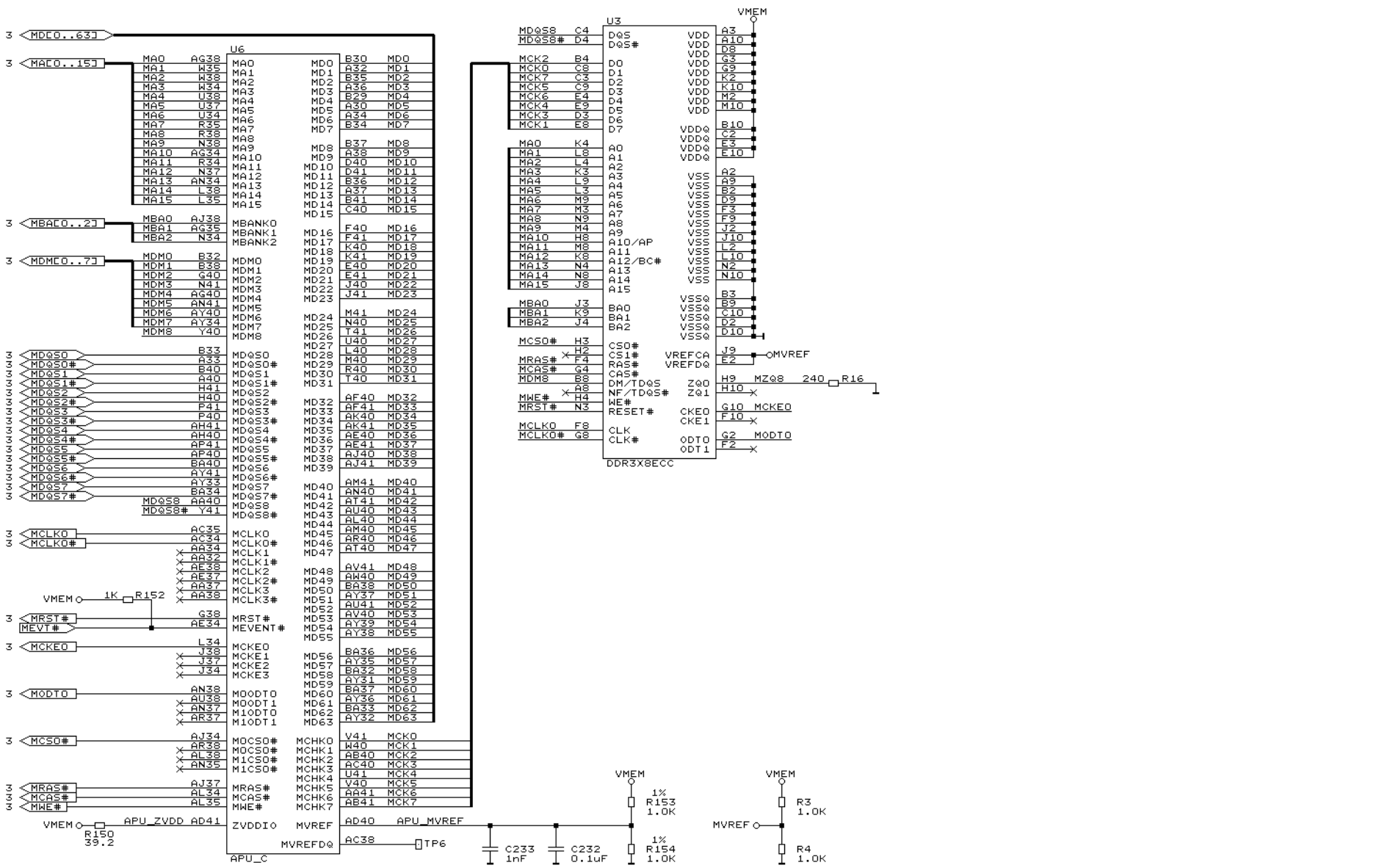
APU ground

DRAM bypass



!LINK
!2.SCH
!3.SCH
!4.SCH
!5.SCH
!6.SCH
!7.SCH
!8.SCH
!9.SCH
!10.SCH
!11.SCH
!12.SCH
!13.SCH
!14.SCH
!15.SCH
!16.SCH
!17.SCH

Title	Ground, DRAM bypass	
Size B	Document Number APU	REV 3A
Date: February 5, 2016	Sheet 1 of 17	



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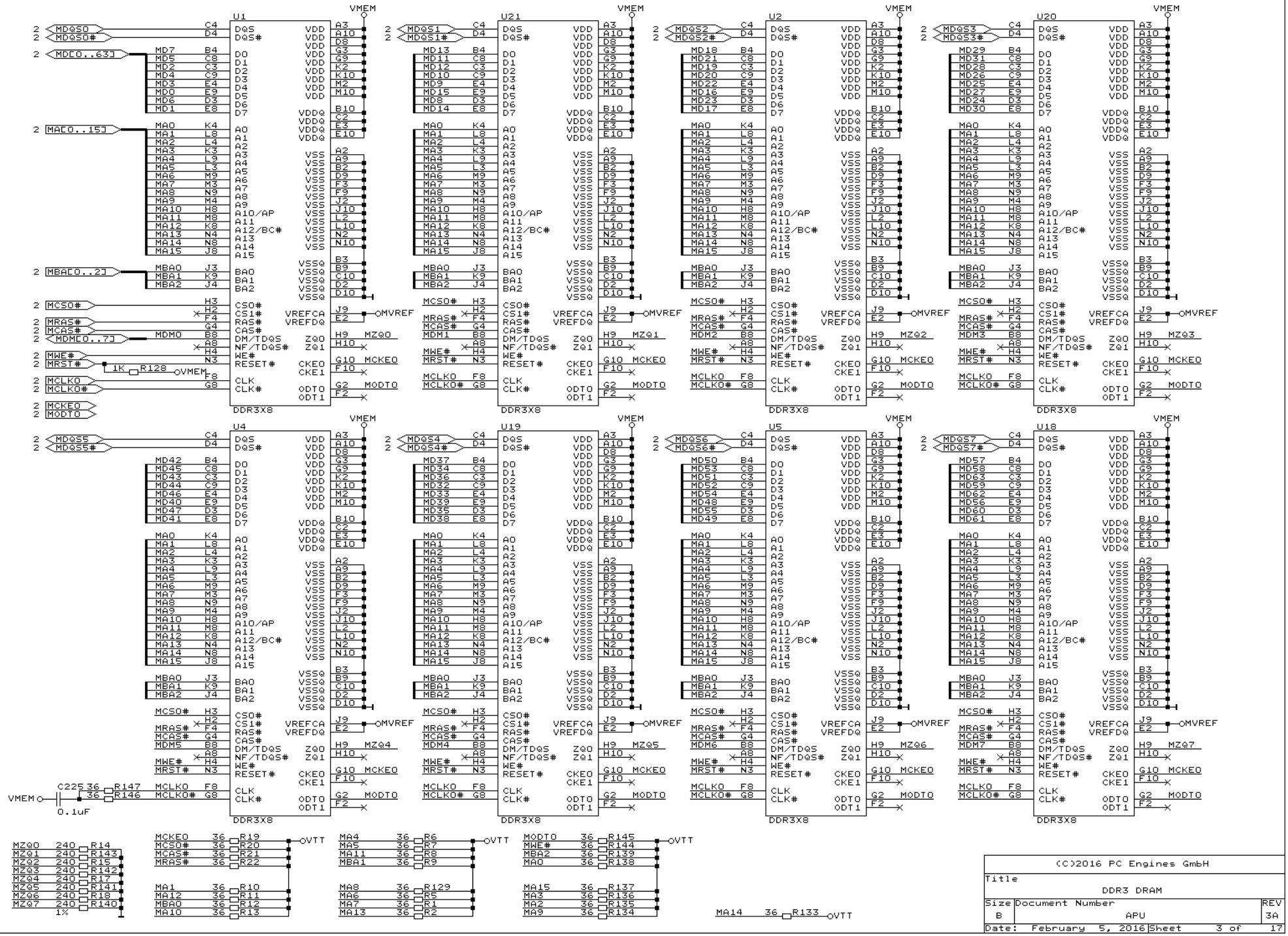
Title	DRAM interface / power	
Size B	Document Number APU	REV 3A
Date: February 5, 2016	Sheet 2 of 17	


U1
U21
U2
U20
U4
U19
U5
U18
DDR3X8
VMEM
MDQS0
MDQS0#
MDQS1
MDQS1#
MDQS2
MDQS2#
MDQS3
MDQS3#
MDQS5
MDQS5#
MDQS4
MDQS4#
MDQS6
MDQS6#
MDQS7
MDQS7#
MDQ[0..63]
MA[0..15]
MBA[0..2]
MCS0#
MRAS#
MCAS#
MDM[0..7]
MWE#
MRST#
1K
R128
MCLK0
MCLK0#
MCKE0
MODT0
C225
0.1uF
R147
R146
MZQ0
MZQ1
MZQ2
MZQ3
MZQ4
MZQ5
MZQ6
MZQ7
240
1%
VTT
(C)2016 PC Engines GmbH
Title
DDR3 DRAM
Size
B
Document Number
APU
REV
3A
Date: February 5, 2016
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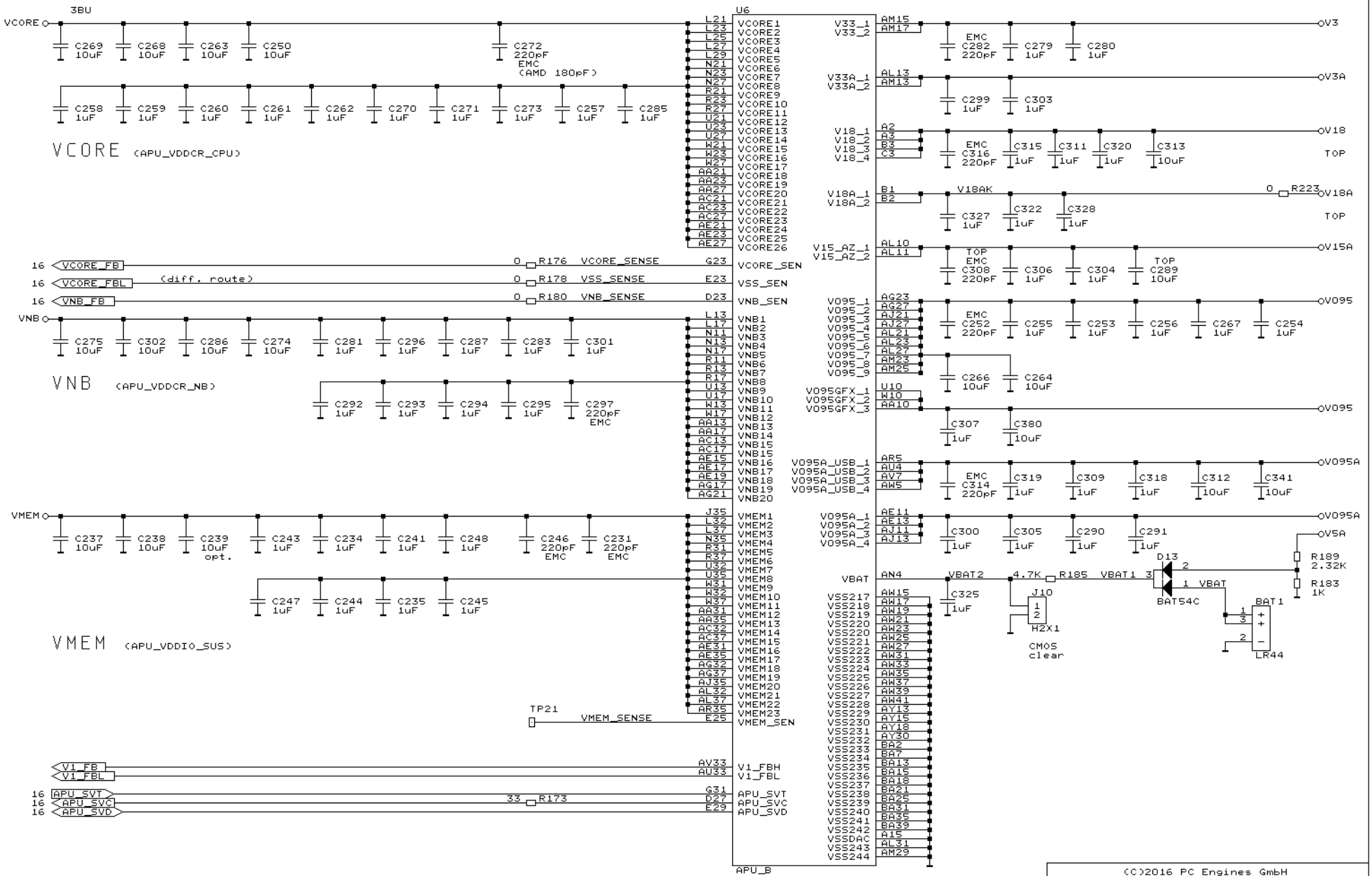
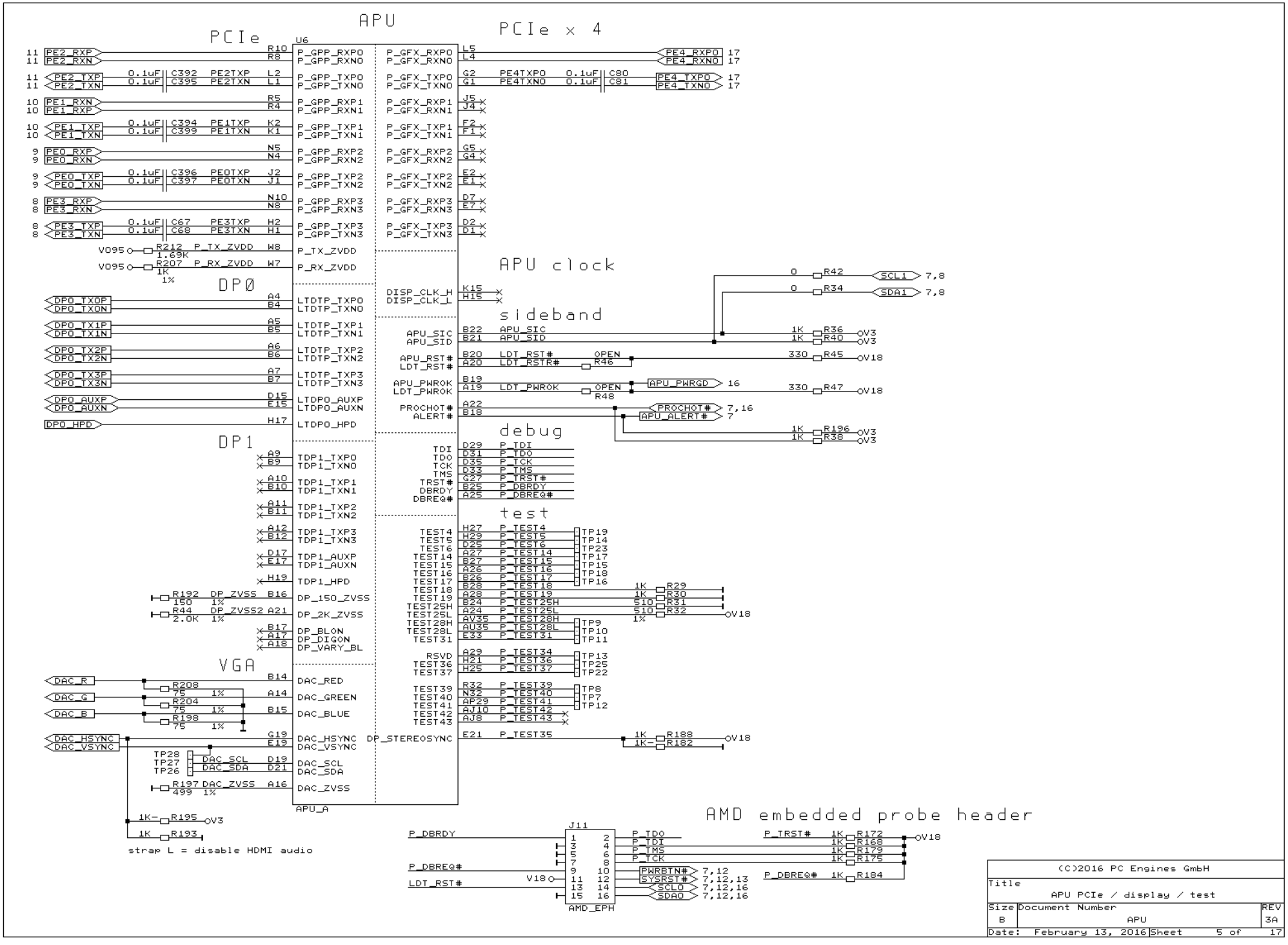
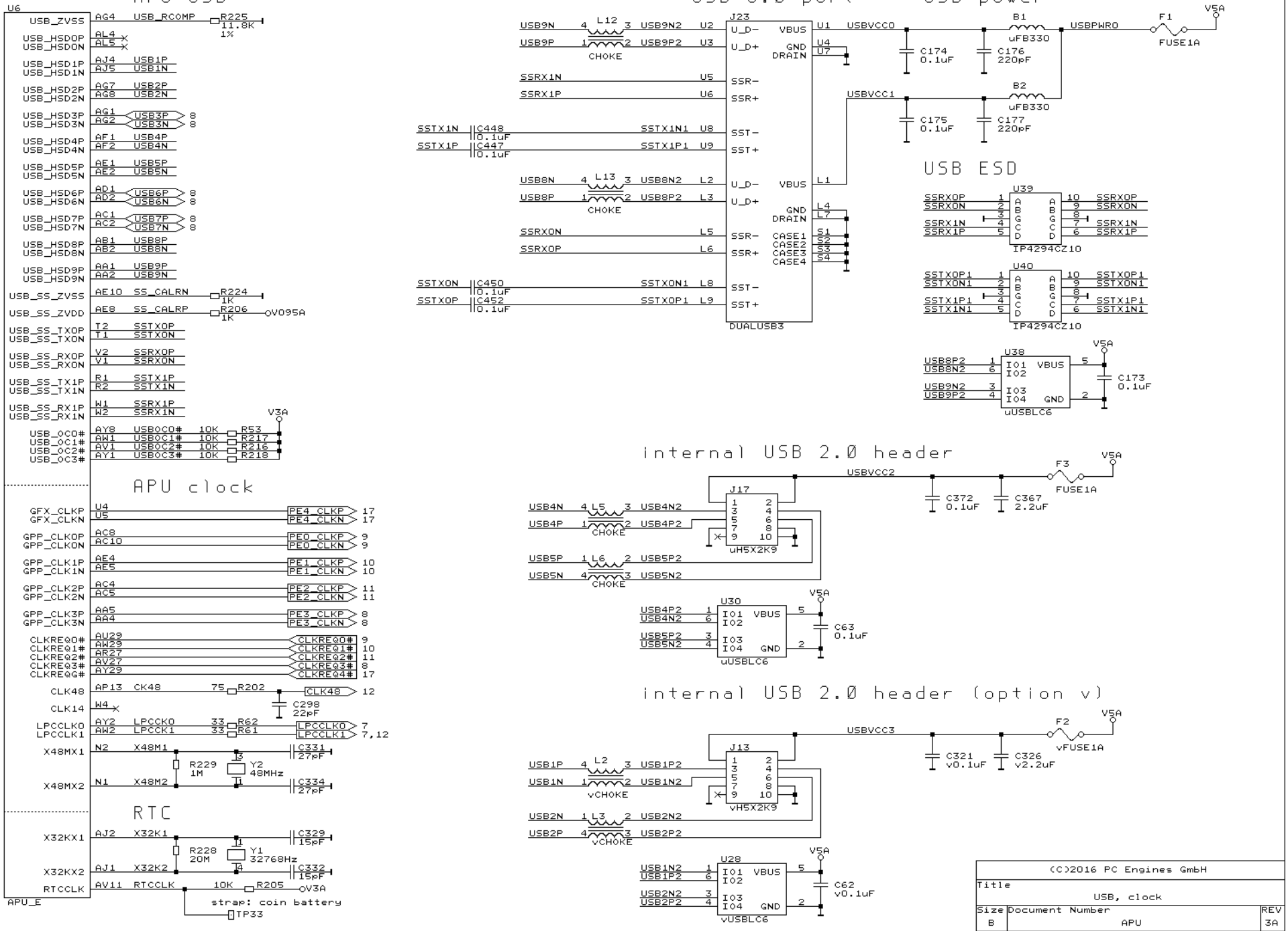
APU power

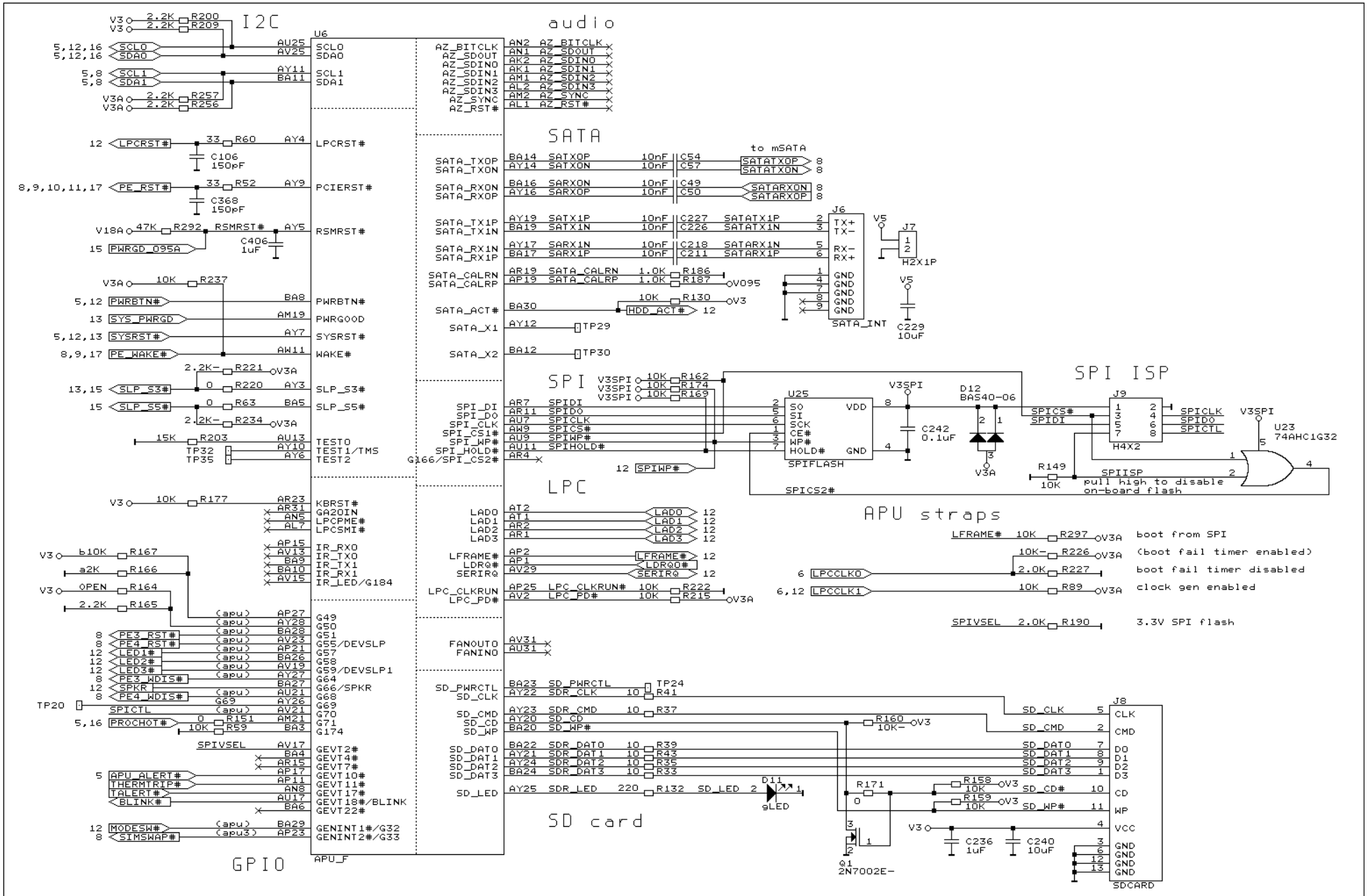


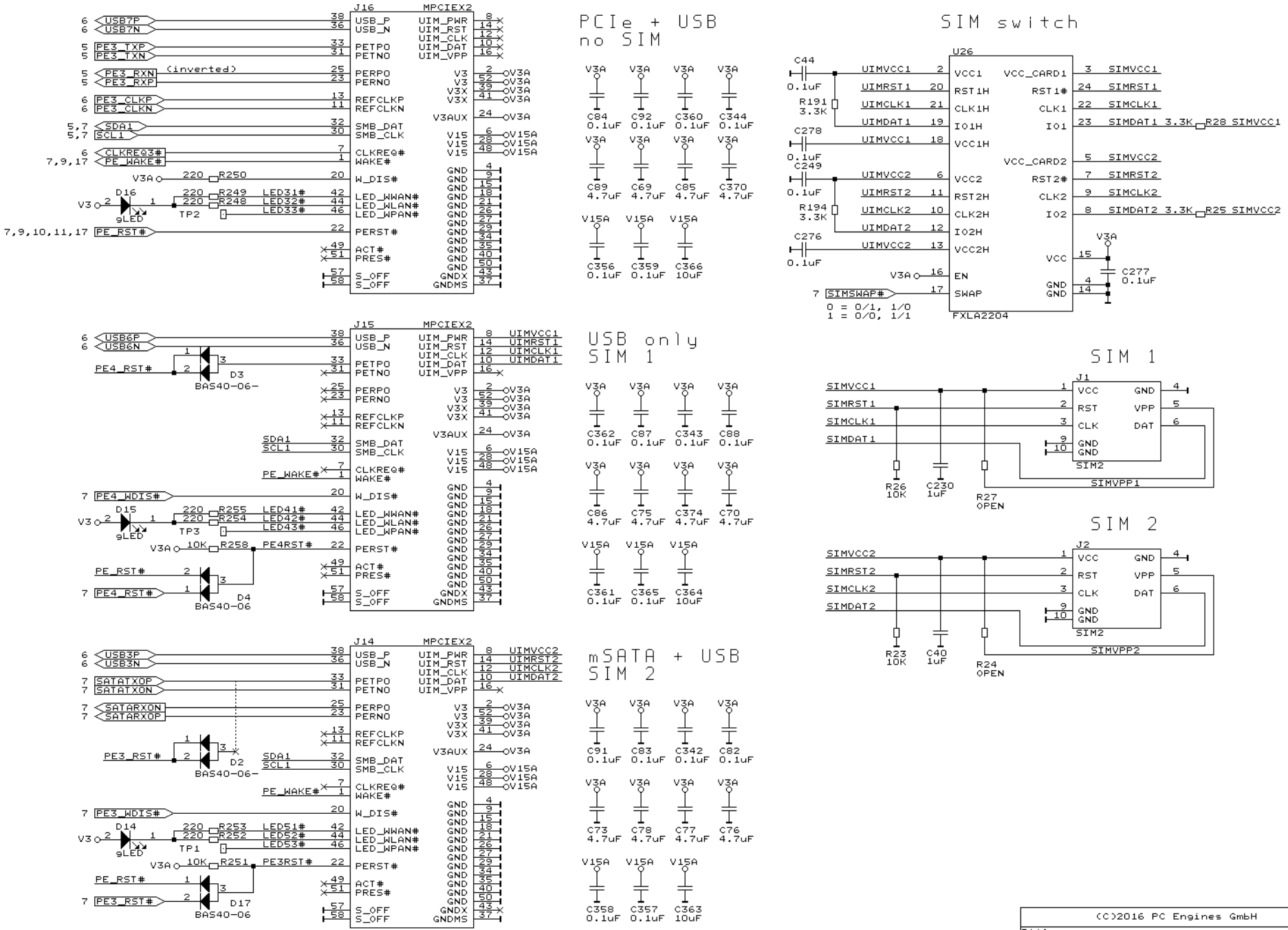
Title	APU power	
Size B	Document Number APU	REV 3A
Date: February 5, 2016	Sheet 4 of 17	


APU
PCIe
PCIe x 4
U6
APU_A
DP0
DP1
VGA
APU clock
sideband
debug
test
AMD embedded probe header
J11
AMD_EPH
strap L = disable HDMI audio
(C)2016 PC Engines GmbH
Title
APU PCIe / display / test
Size B
Document Number APU
REV 3A
Date: February 13, 2016
Sheet 5 of 17



(C)2016 PC Engines GmbH		
Title: USB, clock		
Size: B	Document Number: APU	REV: 3A
Date: March 8, 2016	Sheet 6 of 17	


I2C
audio
SATA
SPI
LPC
GPIO
SD card
SPI ISP
APU straps
U6
APU_F
SATA_INT
SPIFLASH
SDCARD
to mSATA
SPICS2#
G166/SPI_CS2#
boot from SPI
(boot fail timer enabled)
boot fail timer disabled
clock gen enabled
3.3V SPI flash
pull high to disable on-board flash
(C)2016 PC Engines GmbH
Title
SATA, LPC, SPI
Size B
Document Number APU
REV 3A
Date: March 8, 2016 Sheet 7 of 17



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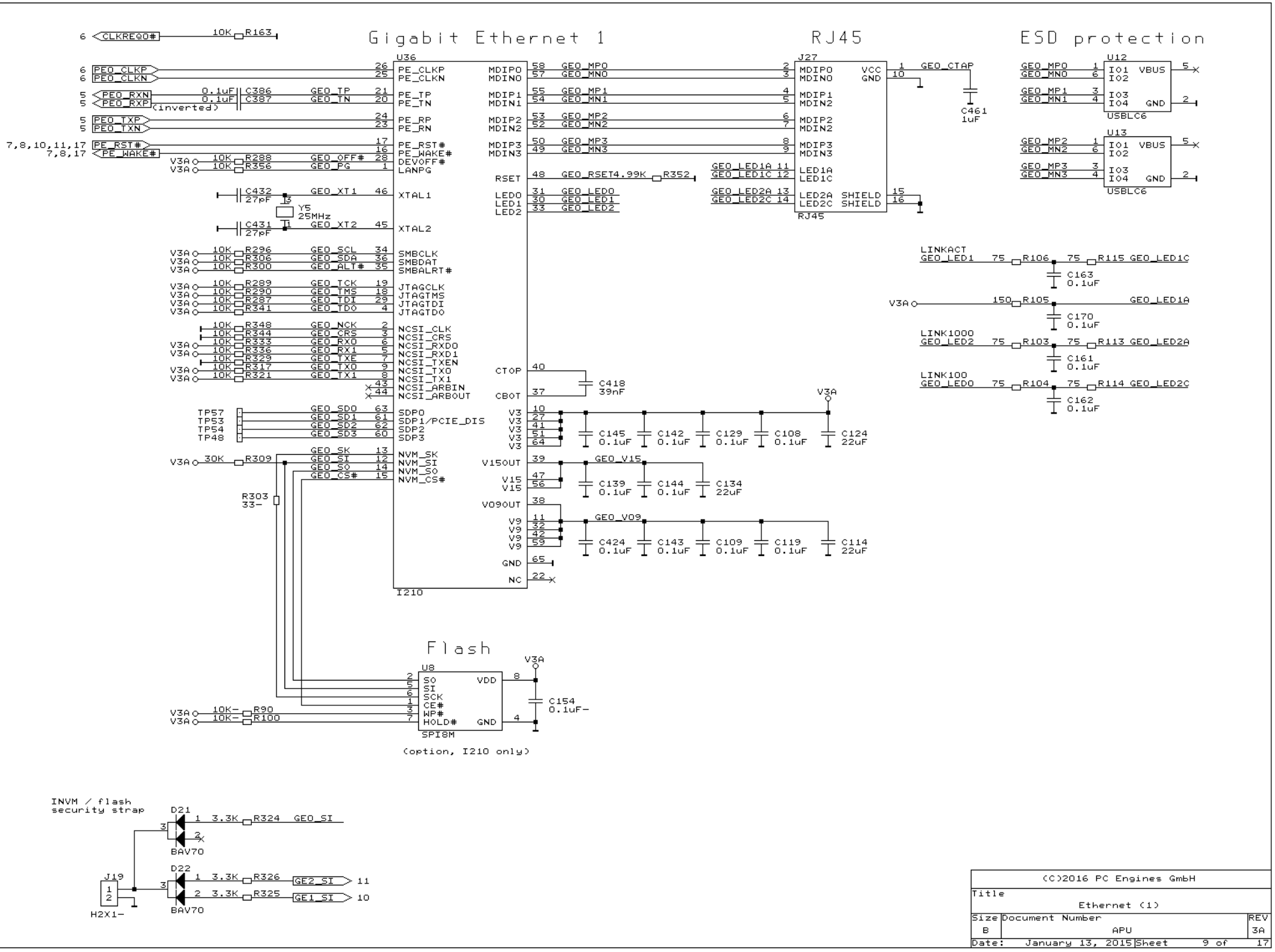
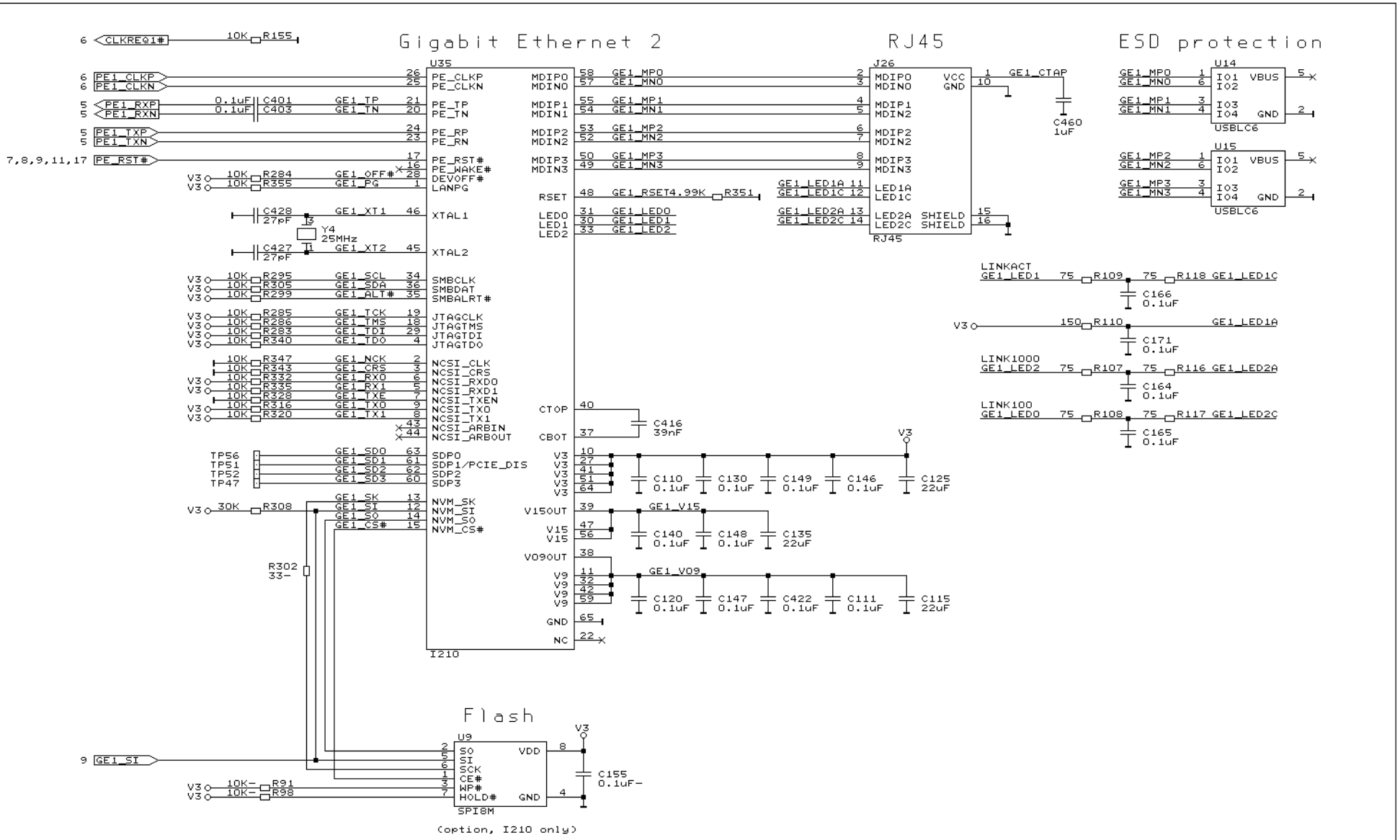
Title	miniPCI express	
Size B	Document Number APU	REV 3A
Date: March 4, 2016	Sheet 8 of 17	


Gigabit Ethernet 1
RJ45
ESD protection
Flash
U36
I210
J27
RJ45
U12
U13
USBLC6
U8
SPI8M
(option, I210 only)
INVM / flash security strap
D21
D22
BAV70
J19
H2X1-
(C)2016 PC Engines GmbH
Title
Ethernet (1)
Size B
Document Number APU
REV 3A
Date: January 13, 2015 Sheet 9 of 17


Gigabit Ethernet 2
RJ45
ESD protection
Flash
U35
I210
J26
RJ45
U14
U15
USBLC6
U9
SPI8M
(option, I210 only)
CLKREQ1#
PE1_CLKP
PE1_CLKN
PE1_RXP
PE1_RXN
PE1_TXP
PE1_TXN
PE_RST#
GE1_OFF#
GE1_PG
GE1_XT1
GE1_XT2
Y4
25MHz
GE1_SCL
GE1_SDA
GE1_ALT#
GE1_TCK
GE1_TMS
GE1_TDI
GE1_TDO
GE1_NCK
GE1_CRS
GE1_RXO
GE1_RX1
GE1_TXE
GE1_TXO
GE1_TX1
GE1_SDO
GE1_SD1
GE1_SD2
GE1_SD3
GE1_SK
GE1_SI
GE1_SO
GE1_CS#
GE1_RSET4.99K
GE1_LED0
GE1_LED1
GE1_LED2
GE1_MP0
GE1_MN0
GE1_MP1
GE1_MN1
GE1_MP2
GE1_MN2
GE1_MP3
GE1_MN3
GE1_CTAP
GE1_LED1A
GE1_LED1C
GE1_LED2A
GE1_LED2C
LINKACT
LINK1000
LINK100
GE1_V15
GE1_V09
V3
(C)2016 PC Engines GmbH
Title
Ethernet (2)
Size B
Document Number APU
REV 3A
Date: December 11, 2014
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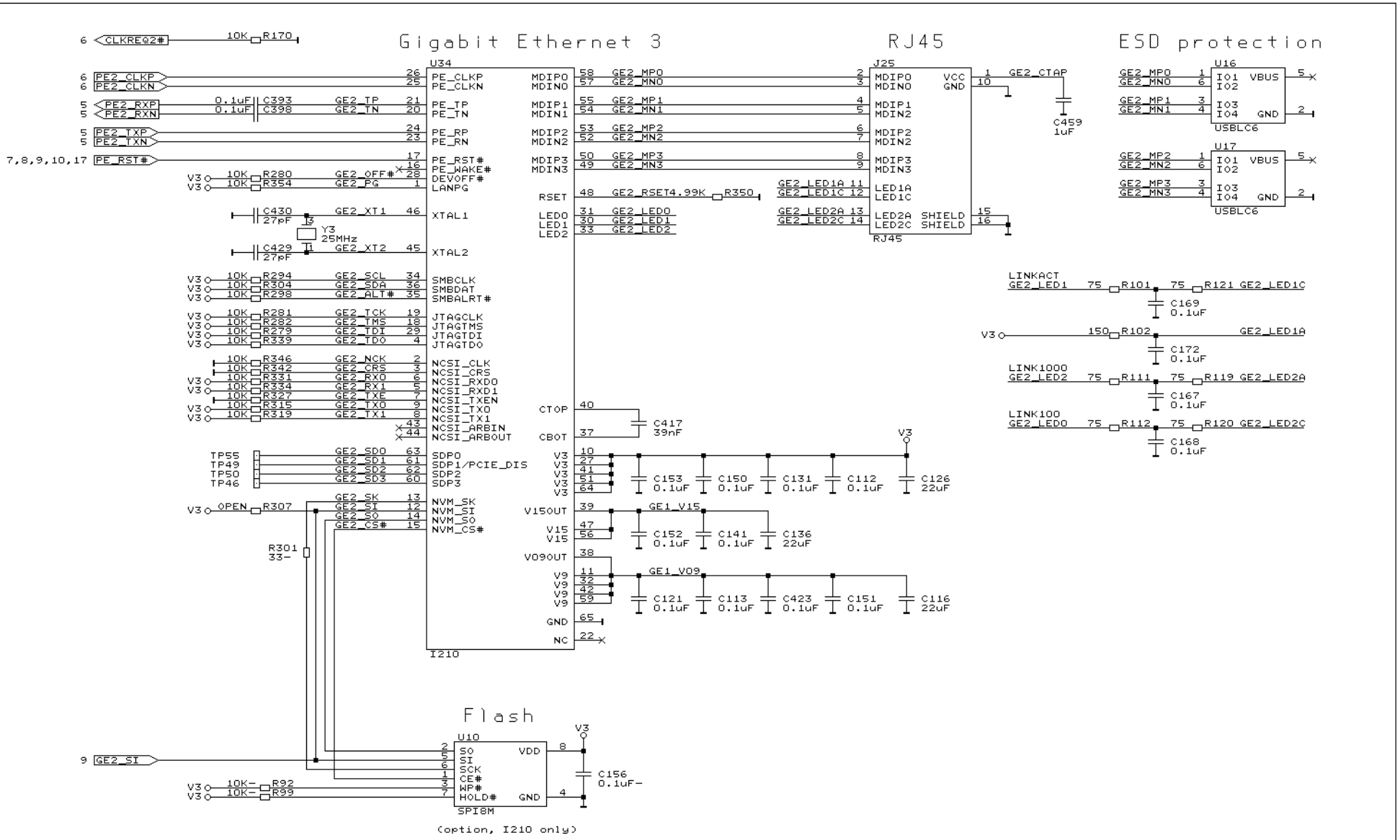
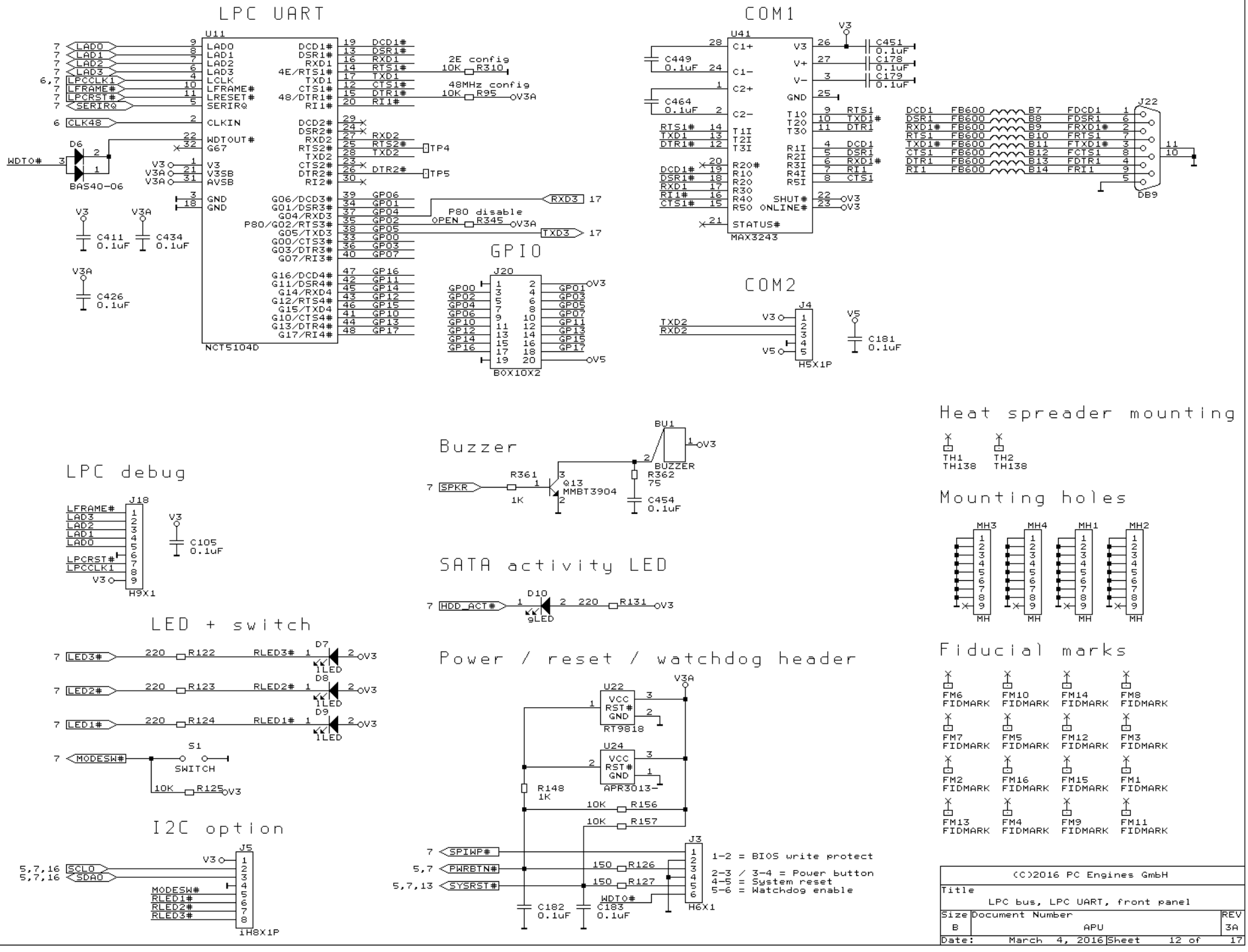
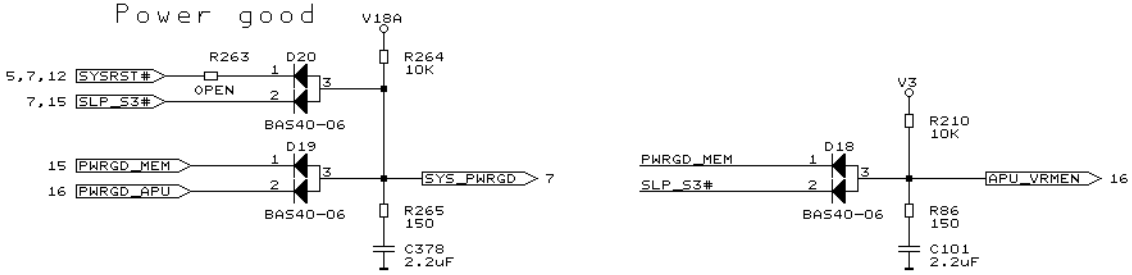


Title	Ethernet (3)	
Size B	Document Number APU	REV 3A
Date: December 11, 2014	Sheet 11 of 17	

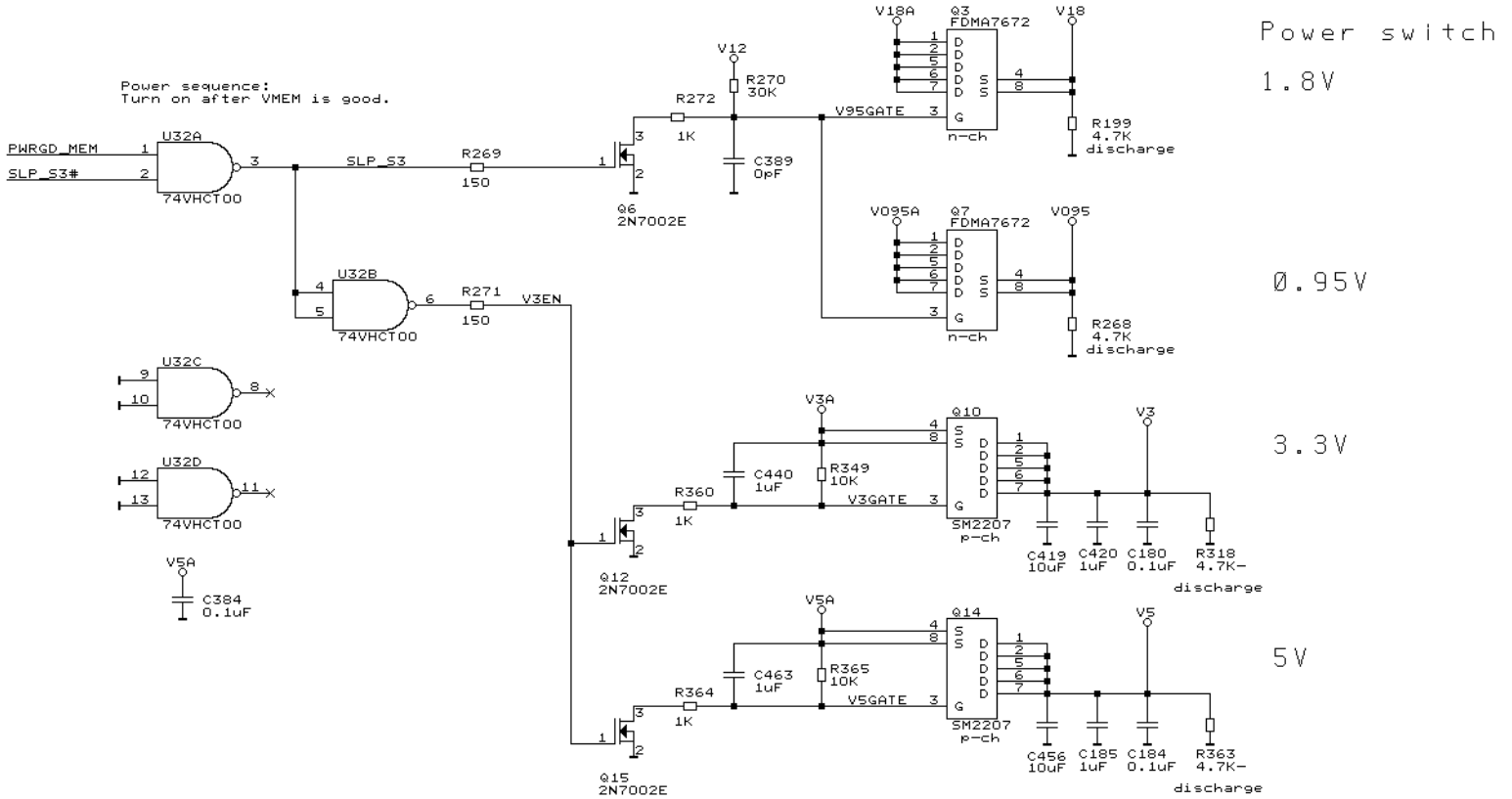


Title	LPC bus, LPC UART, front panel	
Size B	Document Number APU	REV 3A
Date: March 4, 2016	Sheet 12 of 17	



VRM test points

V5A	TP58	V5	TP45
V3A	TP44	V3	TP43
V18A	TP37	V18	TP36
V15A	TP40		
VMEM	TP34	VTT	TP31
V095A	TP42	V095	TP41
VCORE	TP38	VNB	TP39



Power switch

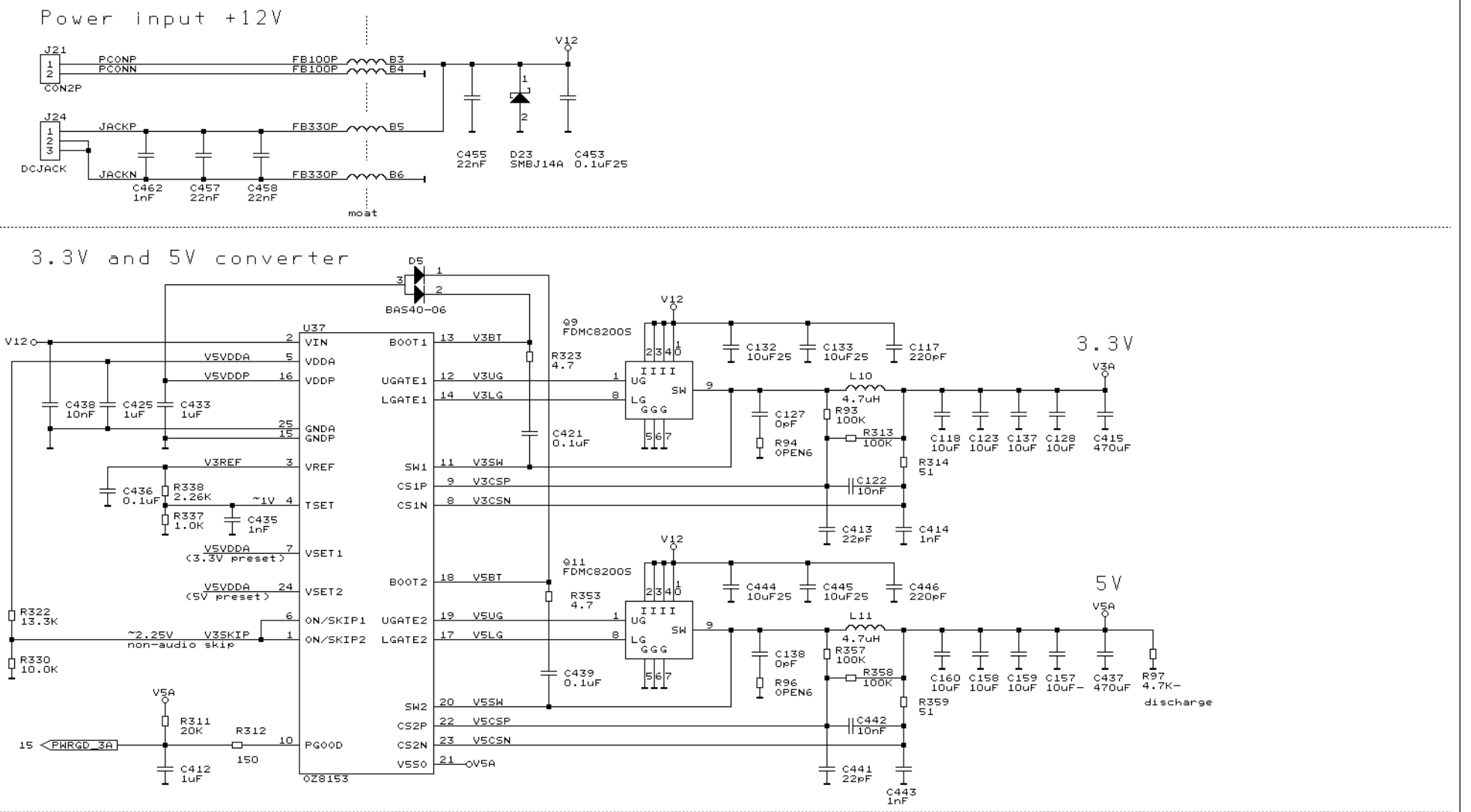
1.8V

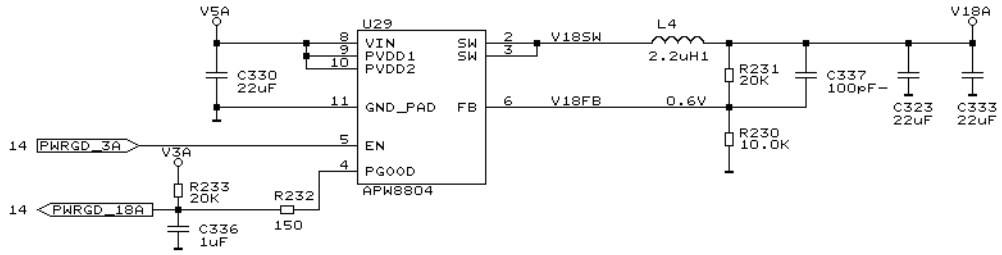
0.95V

3.3V

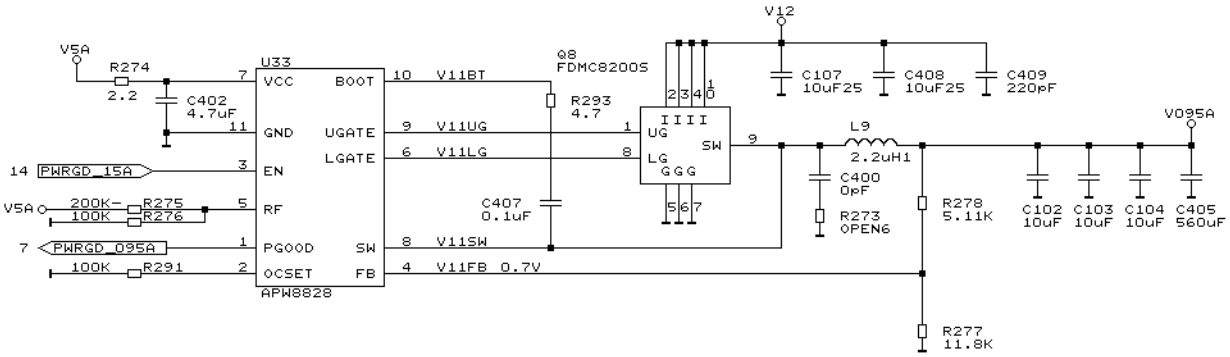
5V

Title	power good, power switch	
Size B	Document Number APU	REV 3A
Date: February 5, 2016	Sheet 13 of 17	


Power input +12V
J21
PCONP
PCONN
FB100P B3
FB100P B4
CON2P
V12
J24
JACKP
FB330P B5
DCJACK
JACKN
FB330P B6
C462 1nF
C457 22nF
C458 22nF
moat
C455 22nF
D23 SMBJ14A
C453 0.1uF25
3.3V and 5V converter
D5
BAS40-06
U37
VIN
VDDA
VDDP
GNDA
GNDP
VREF
TSET
VSET1
VSET2
ON/SKIP1
ON/SKIP2
BOOT1
UGATE1
LGATE1
SW1
CS1P
CS1N
BOOT2
UGATE2
LGATE2
SW2
CS2P
CS2N
V5S0
PGOOD
OZ8153
V5VDDA
V3REF
V3SKIP
~2.25V
non-audio skip
~1V
(3.3V preset)
(5V preset)
V3BT
V3UG
V3LG
V3SW
V3CSP
V3CSN
V5BT
V5UG
V5LG
V5SW
V5CSP
V5CSN
V5A
PWRGD_3A
Q9 FDMC8200S
Q11 FDMC8200S
3.3V
5V
L10 4.7uH
L11 4.7uH
R323 4.7
R353 4.7
R322 13.3K
R330 10.0K
R338 2.26K
R337 1.0K
R311 20K
R312 150
R93 100K
R313 100K
R314 51
R357 100K
R358 100K
R359 51
R94 OPEN6
R96 OPEN6
R97 4.7K-
discharge
C438 10nF
C425 1uF
C433 1uF
C436 0.1uF
C435 1nF
C412 1uF
C421 0.1uF
C439 0.1uF
C132 10uF25
C133 10uF25
C117 220pF
C444 10uF25
C445 10uF25
C446 220pF
C127 0pF
C138 0pF
C122 10nF
C442 10nF
C413 22pF
C414 1nF
C441 22pF
C443 1nF
C118 10uF
C123 10uF
C137 10uF
C128 10uF
C415 470uF
C160 10uF
C158 10uF
C159 10uF
C157 10uF-
C437 470uF
3.3V -> 1.5V LDO (0.5A)
U31
APL5930
VIN
VDD
EN
VOUT
FB
PGOOD
GND
0.8V
V15A
PWRGD_18A
PWRGD_15A
R259 8.66k
R260 10K
R266 150
R267 20K
C379 10uF
C382 1uF
C373 56pF
C376 22uF
C381 1uF
(C)2016 PC Engines GmbH
Title
power in, 3.3V, 5V, 1.5V
Size B
Document Number APU
REV 3A
Date: February 5, 2016
Sheet 14 of 17

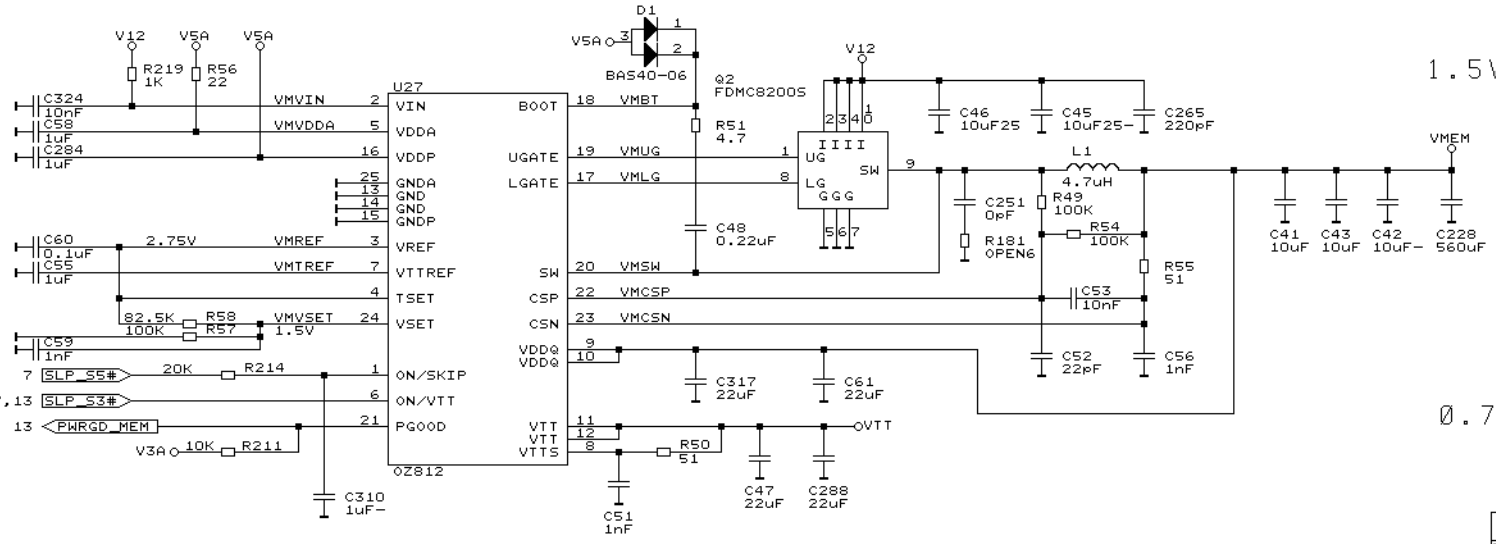


1.8V, 2A



Ø.95A, 5A

VMEM converter and VTT LDO

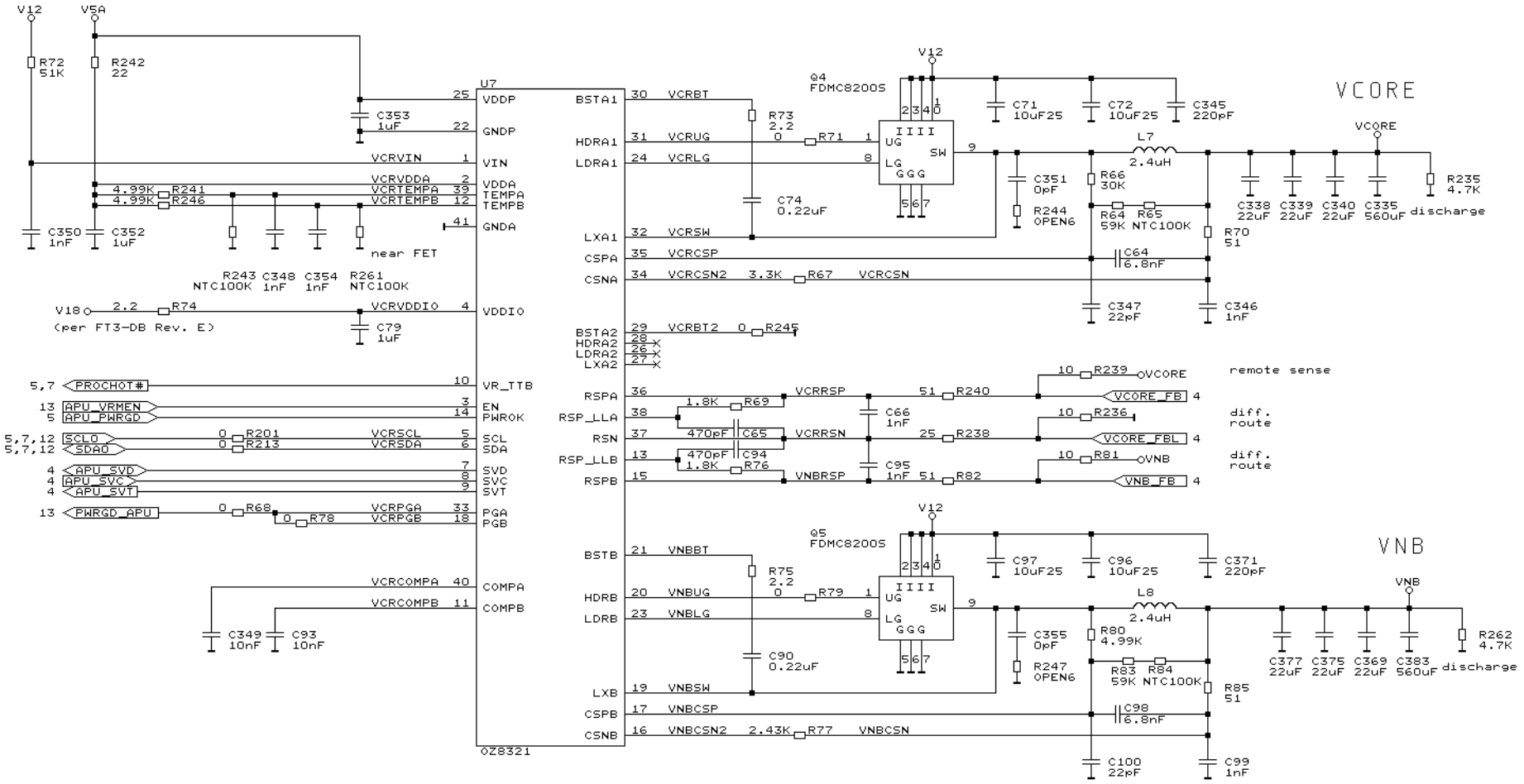


1.5V VMEM

Ø.75V VTT

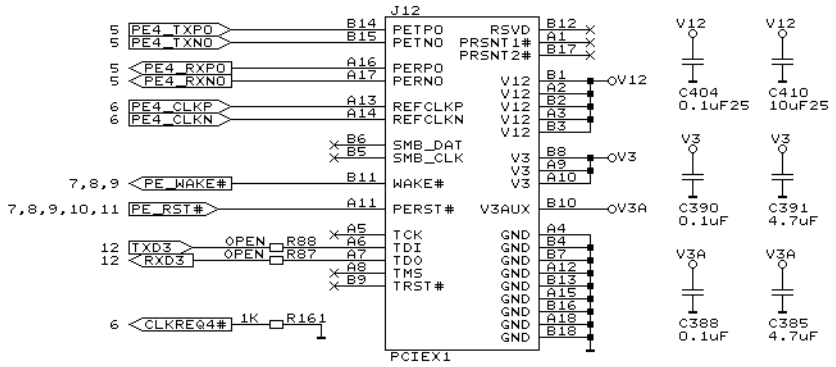
Title	1.8V, 0.95V, VMEM, VTT	
Size B	Document Number APU	REV 3A
Date: February 5, 2016	Sheet 15 of 17	

VCORE and VNB converter



Title	VCORE, VNB	
Size B	Document Number APU	REV 3A
Date: February 5, 2016	Sheet 16 of 17	

PCIe x1 expansion



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Title: PCIe x1		
Size: B	Document Number: APU	REV: 3A
Date: March 8, 2016	Sheet 17 of 17	