

Model Name :

File Name :

Compal Confidential

ULC UMA M/B LA-A994P Schematics Document

Intel Bay Trail M VC

Project Code : ZSO50

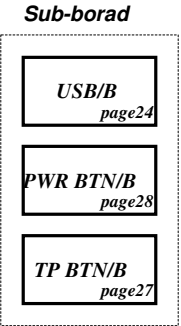
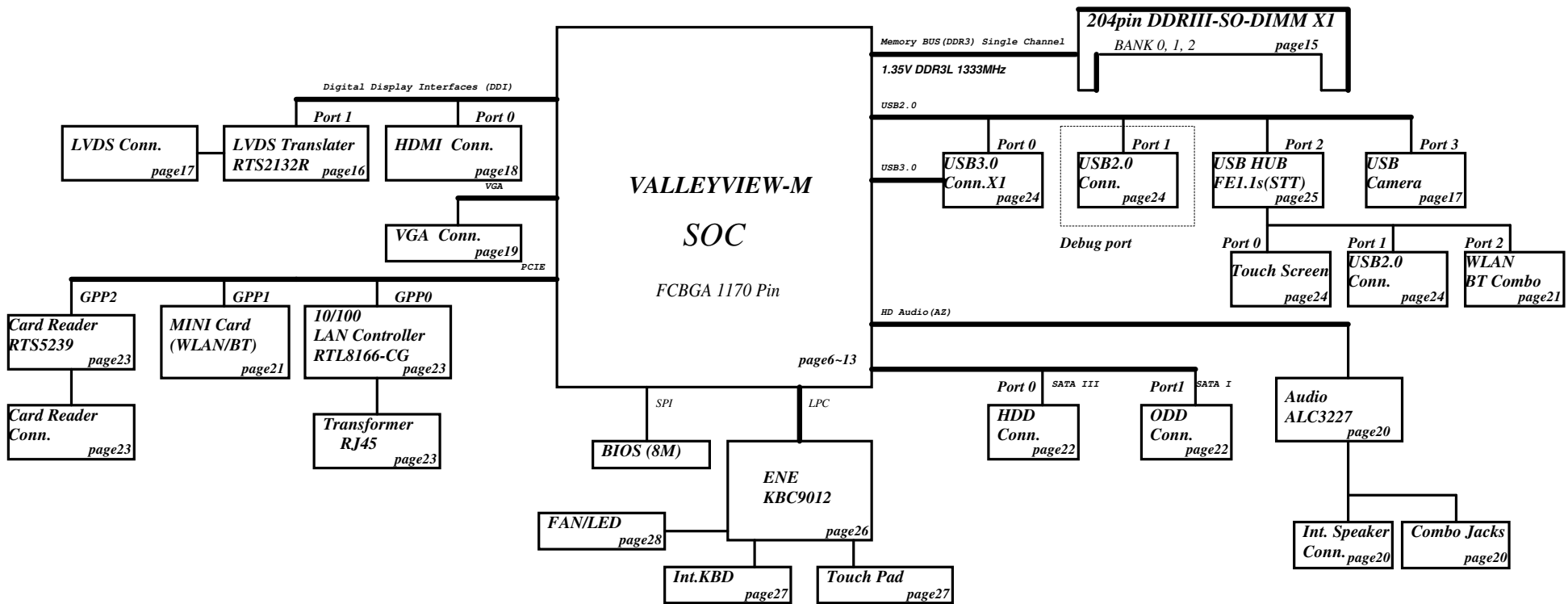
2014/02/05

MV Rev. 1.0

DAX ZSO50 BayTrail-M

Part Number	Description
DAZ14Z00200	PCB 14Z LA-A994P REV0 M/B 4

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Voltage Rails

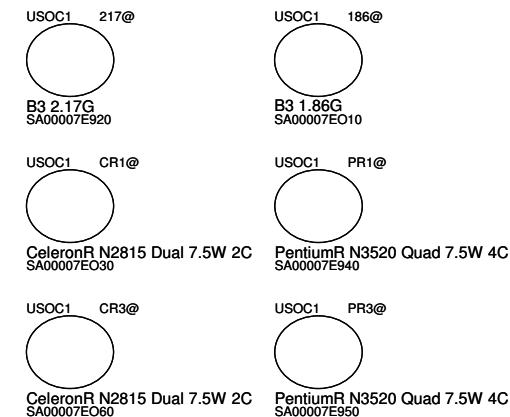
Power Plane	Description	S0	S3	S4/S5
VIN	19V Adapter power supply	ON	ON	ON
BATT+	12V Battery power supply	ON	ON	ON
B+	AC or battery power rail for power circuit. (19V/12V)	ON	ON	ON
+VSB	+VSBP to +VSB always on power rail for sequence control	ON	ON	ON
+RTCVCC	RTC Battery Power	ON	ON	ON
+1.0VALW	+1.0v Always power rail	ON	ON	ON
+1.2VALW	+1.2v Always power rail	ON	ON	ON
+1.8VALW	+1.8v Always power rail	ON	ON	ON
+3VALW	+3.3v Always power rail	ON	ON	ON
+5VALW	+5.0v Always power rail	ON	ON	ON
+1.35V	+1.35V power rail for DDR3L	ON	ON	OFF
+SOC_VCC	Core voltage for SOC	ON	OFF	OFF
+SOC_VNN	GFX voltage for SOC	ON	OFF	OFF
+0.675VS	+0.675V power rail for DDR3L Terminator	ON	OFF	OFF
+1.0VS	+1.0v system power rail	ON	OFF	OFF
+1.05VS	+1.05v system power rail	ON	OFF	OFF
+1.35VS	+1.35v system power rail	ON	OFF	OFF
+1.5VS	+1.5v system power rail	ON	OFF	OFF
+1.8VS	+1.8v system power rail	ON	OFF	OFF
+3VS	+3.3v system power rail	ON	OFF	OFF
+5VS	+5.0v system power rail	ON	OFF	OFF
Note : ON* means that this power plane is ON only with AC power available, otherwise it is OFF.				

BOARD ID Table

Board ID	PCB Revision
DB	0.1
SI	0.2
PV	0.3
MV	1.0

BOM Option Table

BTO Item	BOM Structure
Unpop	@
Connector	CONN@
XDP (Debug Port)	XDP@
EMI requirement	EMI@
EMI requirement unpop	@EMI@
ESD requirement	ESD@
ESD requirement unpop	@ESD@
8161 LAN controller	8161@
8166 LAN controller	8166@
LVDS	LVDS@
LVDS LDO mode	LVDSLDO@
LVDS SWR mode	LVSSWR@
Translator RTS2132S	2132S@
Translator RTS2132R	2132R@
Short Pad	RS@
Clean CMOS	CMOS@
Jump	JP@



EC SM Bus1 address

EC SM Bus2 address

Device	Address	Device	Address
Smart Battery	0001 011X b		

SOC SM Bus address

Device	Address
ChannelA DIMM0 A0	1010 000X JDIMM1(SPD)

43 level BOM table

43 Level	Description	BOM Structure
4319P6B0L01	SMT MB AA231 V1UE3 HDMI	

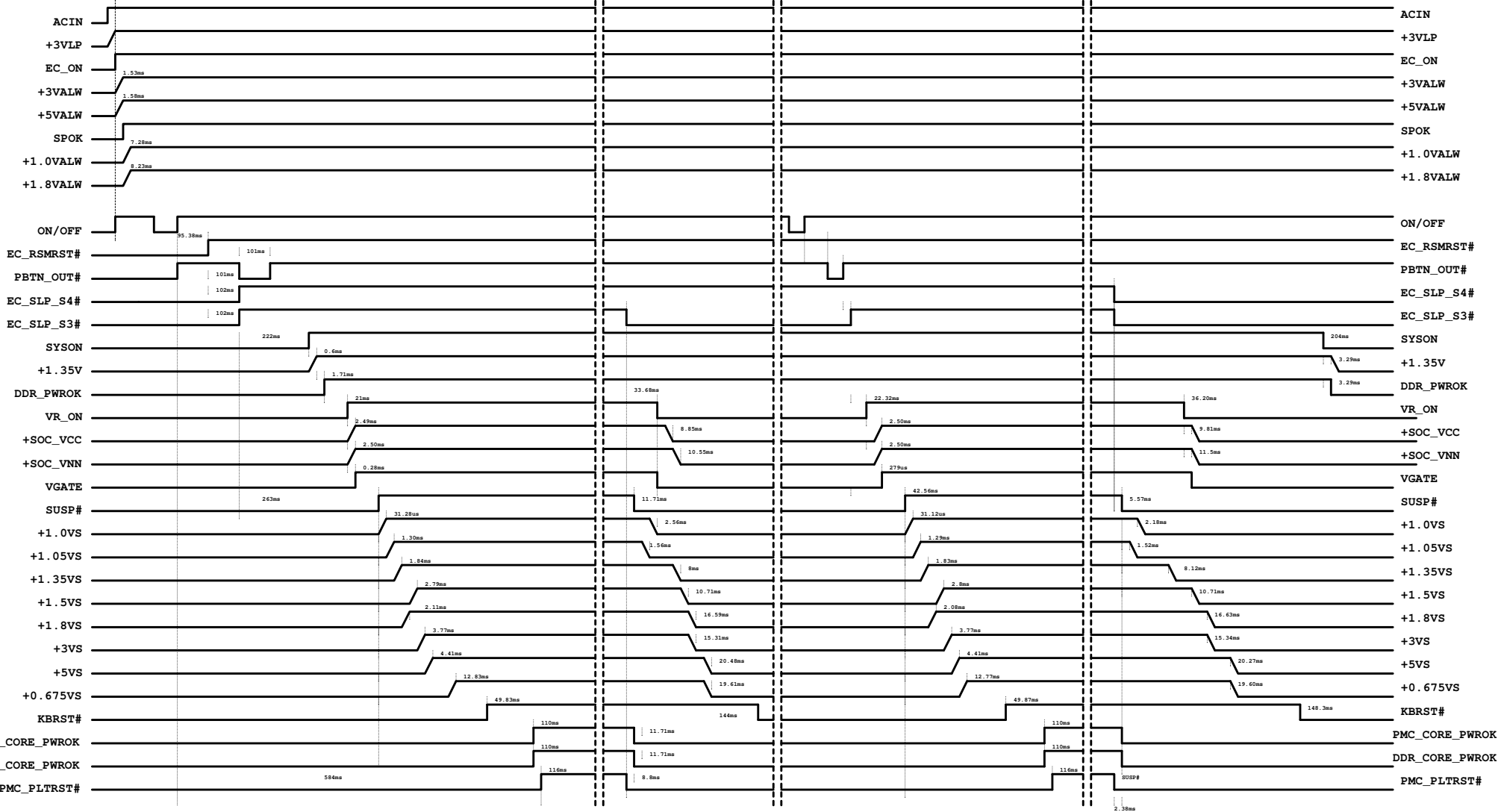
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G3->S0

S0->S3

S3->S0

S0->S5

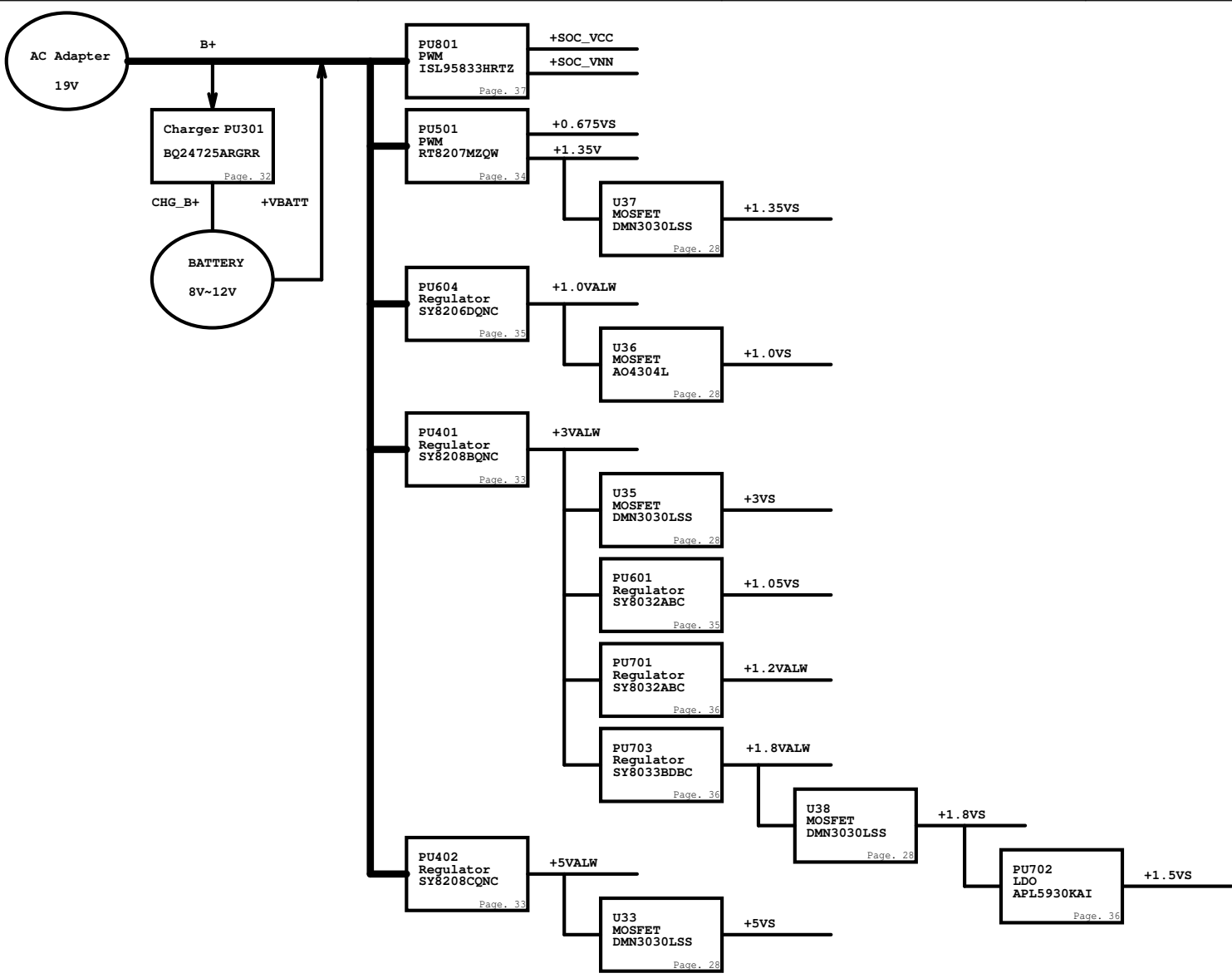


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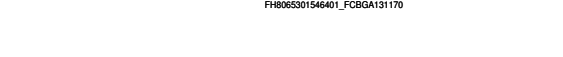
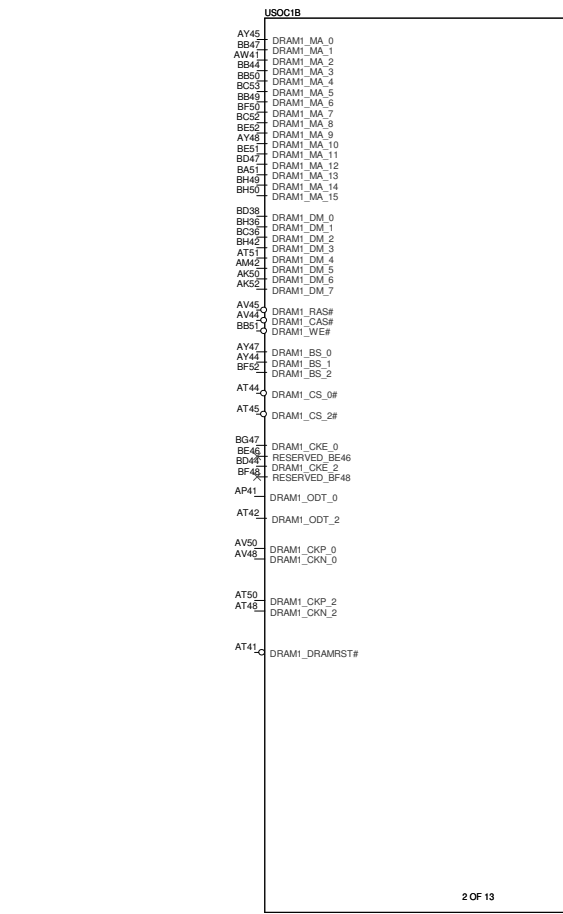
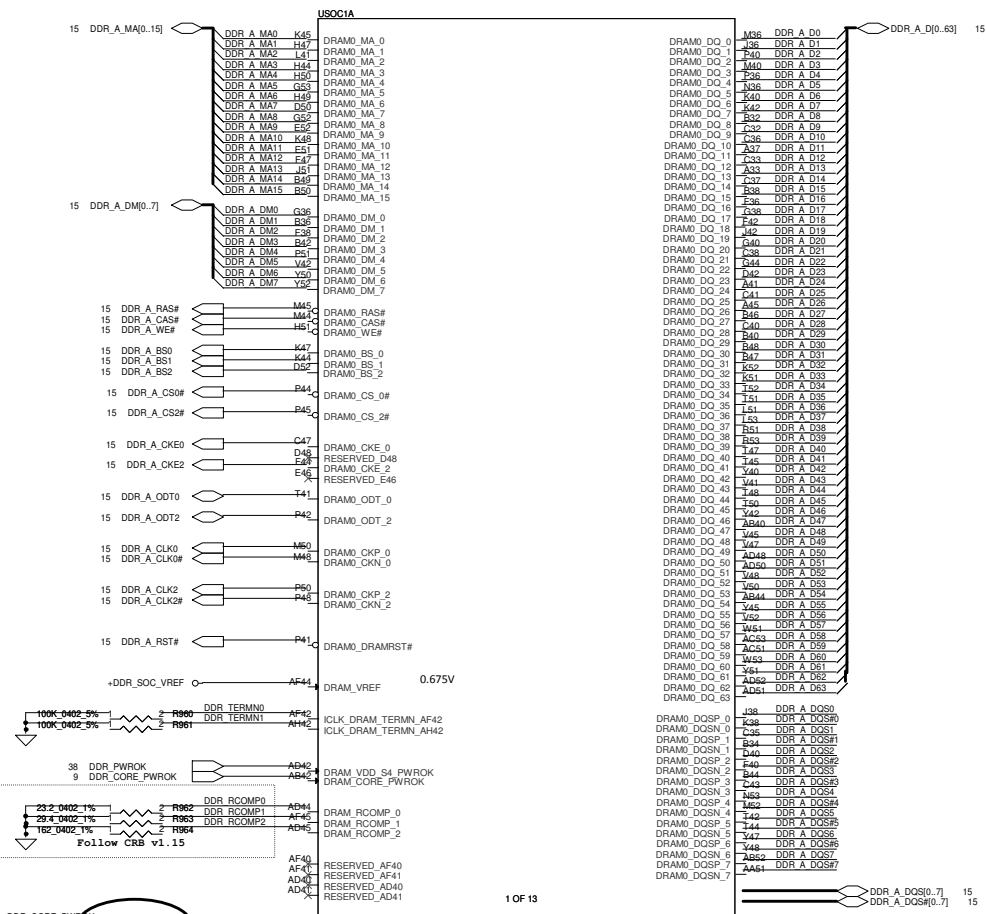
1. T1 and T2 are recommended time for all the VR rails unless specified otherwise. The VR ramp up time T2 and subsequent rail delay T3 are put in place to avoid inrush current which may be caused by multiple loads turning on simultaneously or fast charging of VR output decoupling.

2. Platform devices other than SOC sequencing are not explicitly shown as they are not limited by the SOC sequencing requirement.

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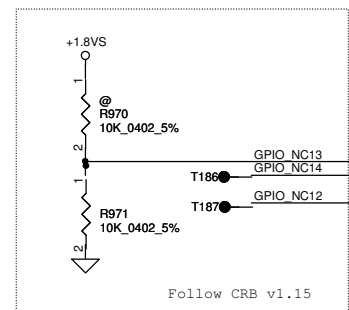
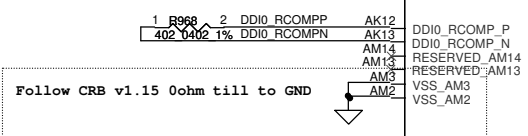
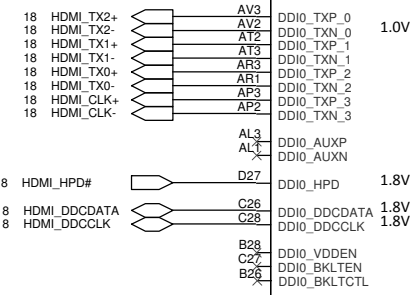
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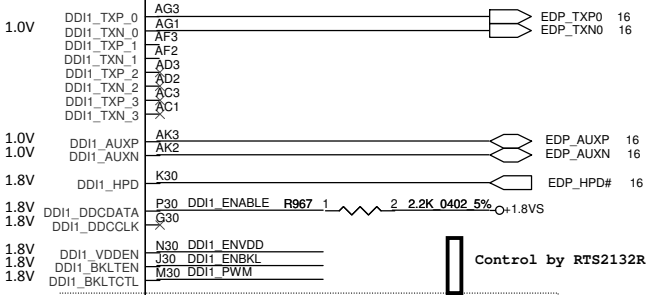
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HDMI

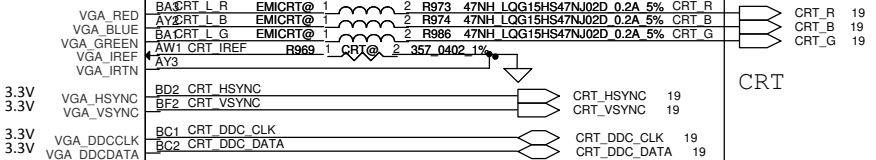
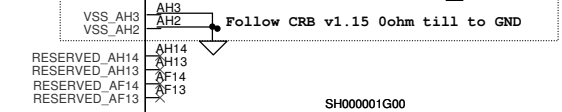
USOC1C



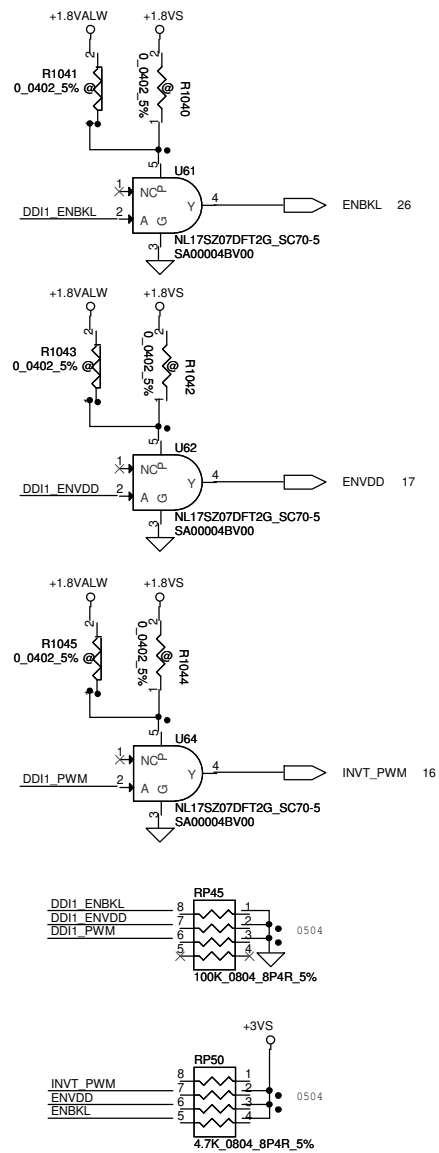
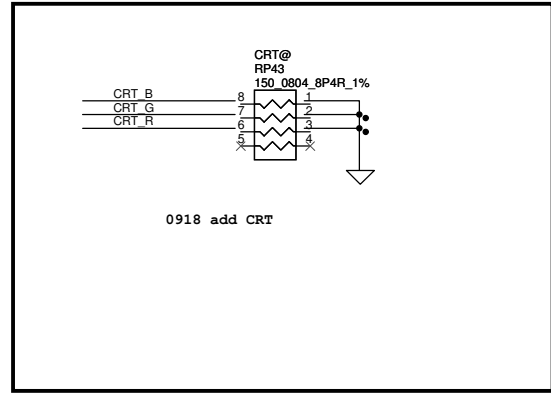
GPIO_S0_NC[13]:
 Multiplexed with Hardware Straps Pin:MDSI_DDCDATA



eDP Panel



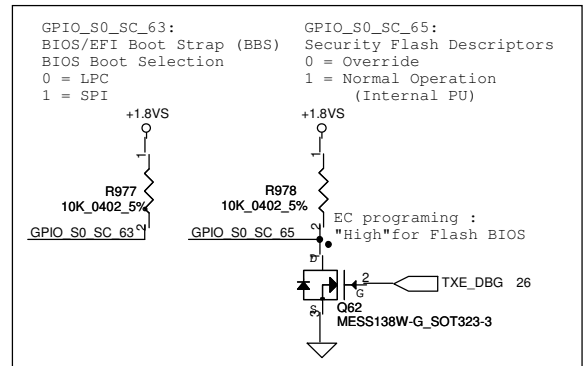
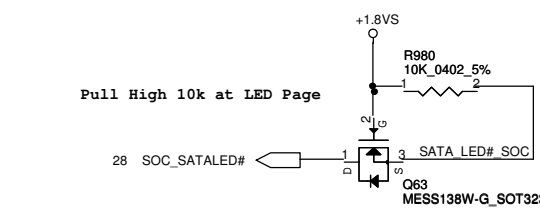
CRT



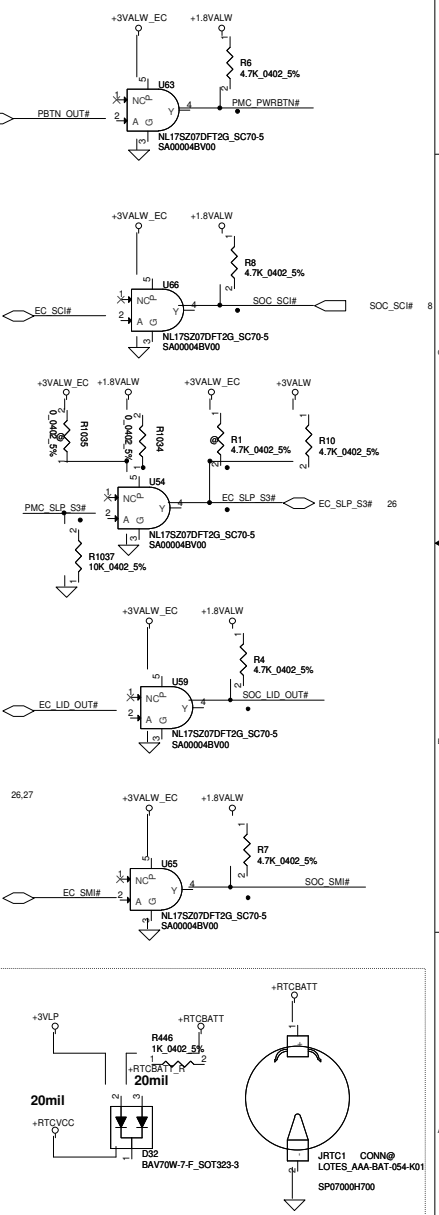
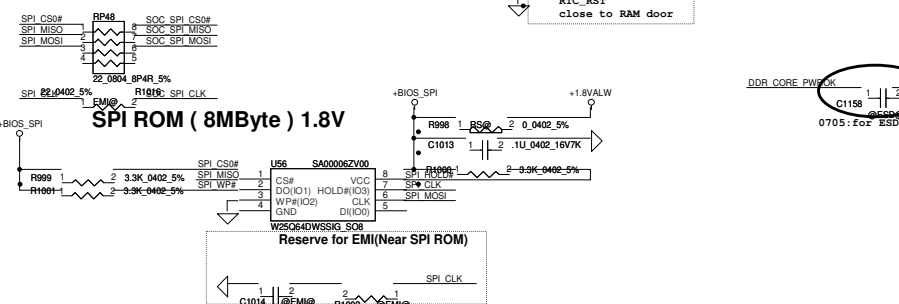
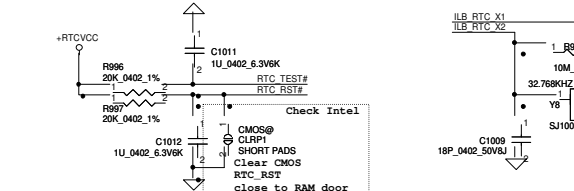
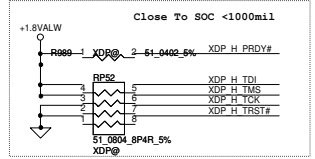
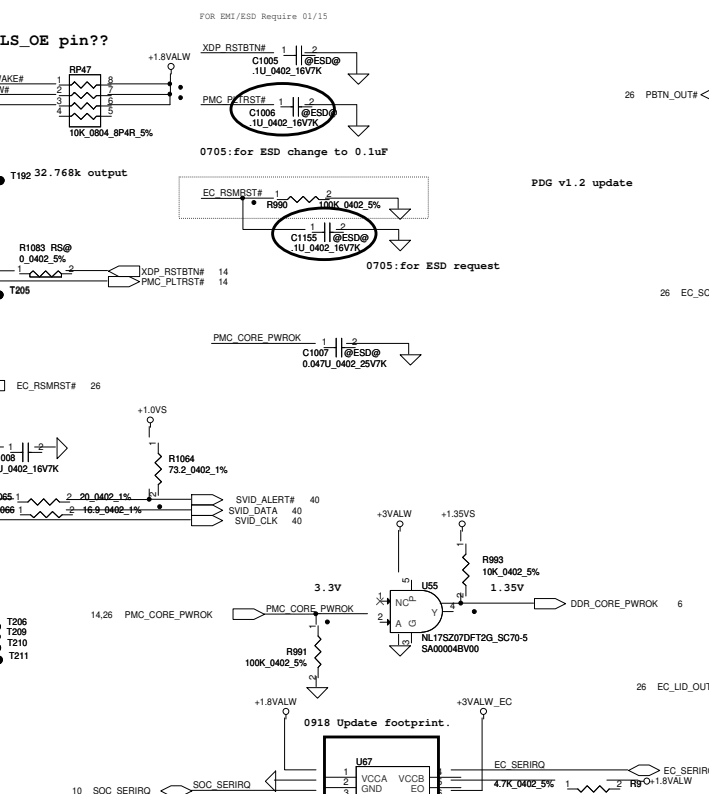
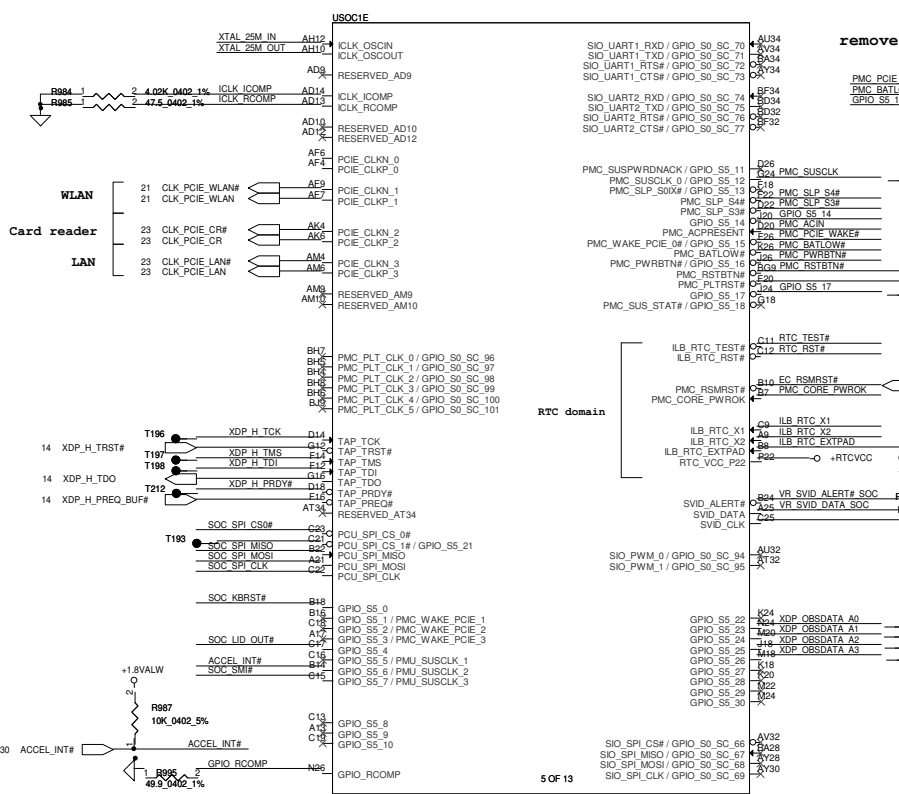
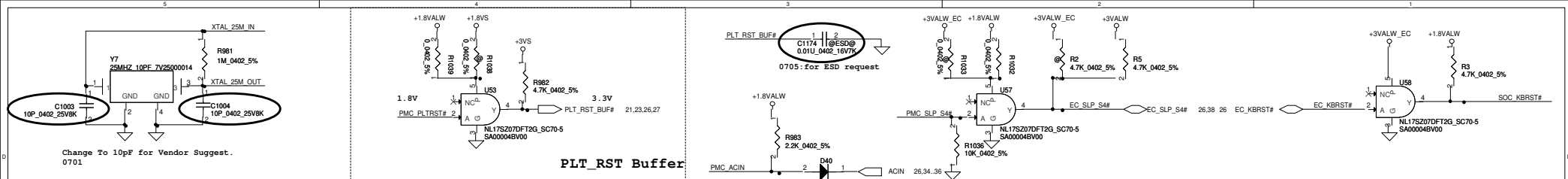
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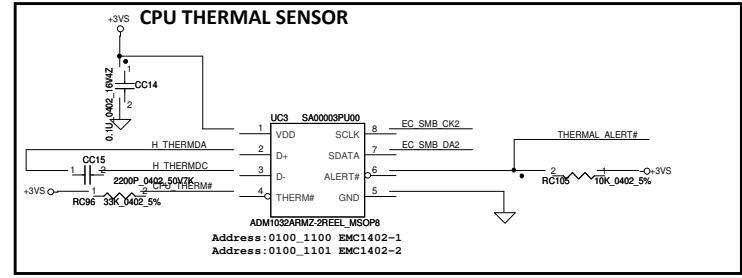
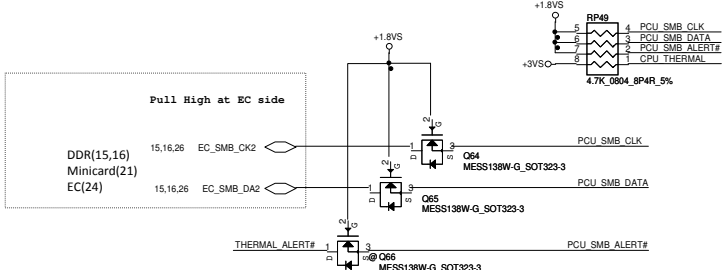
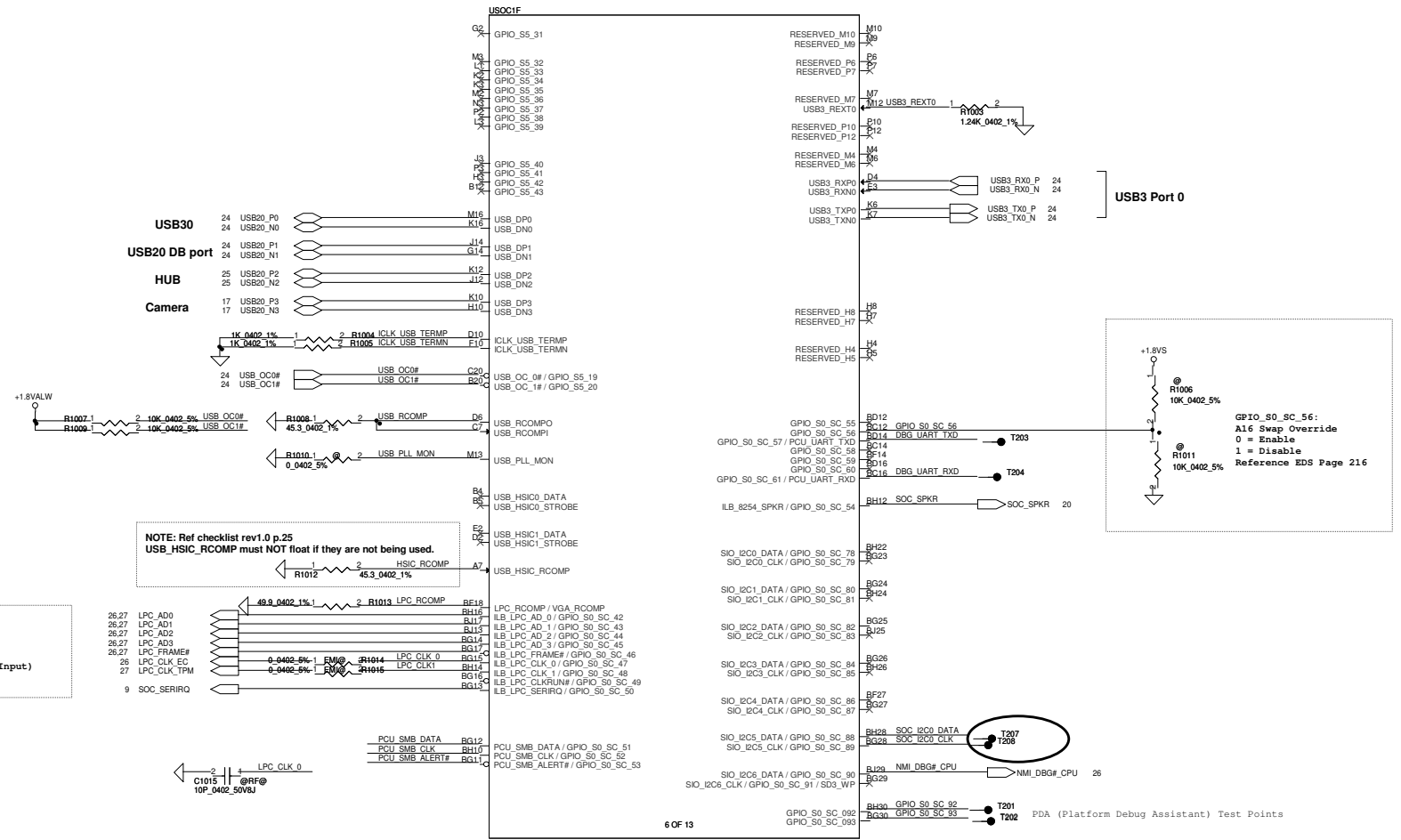
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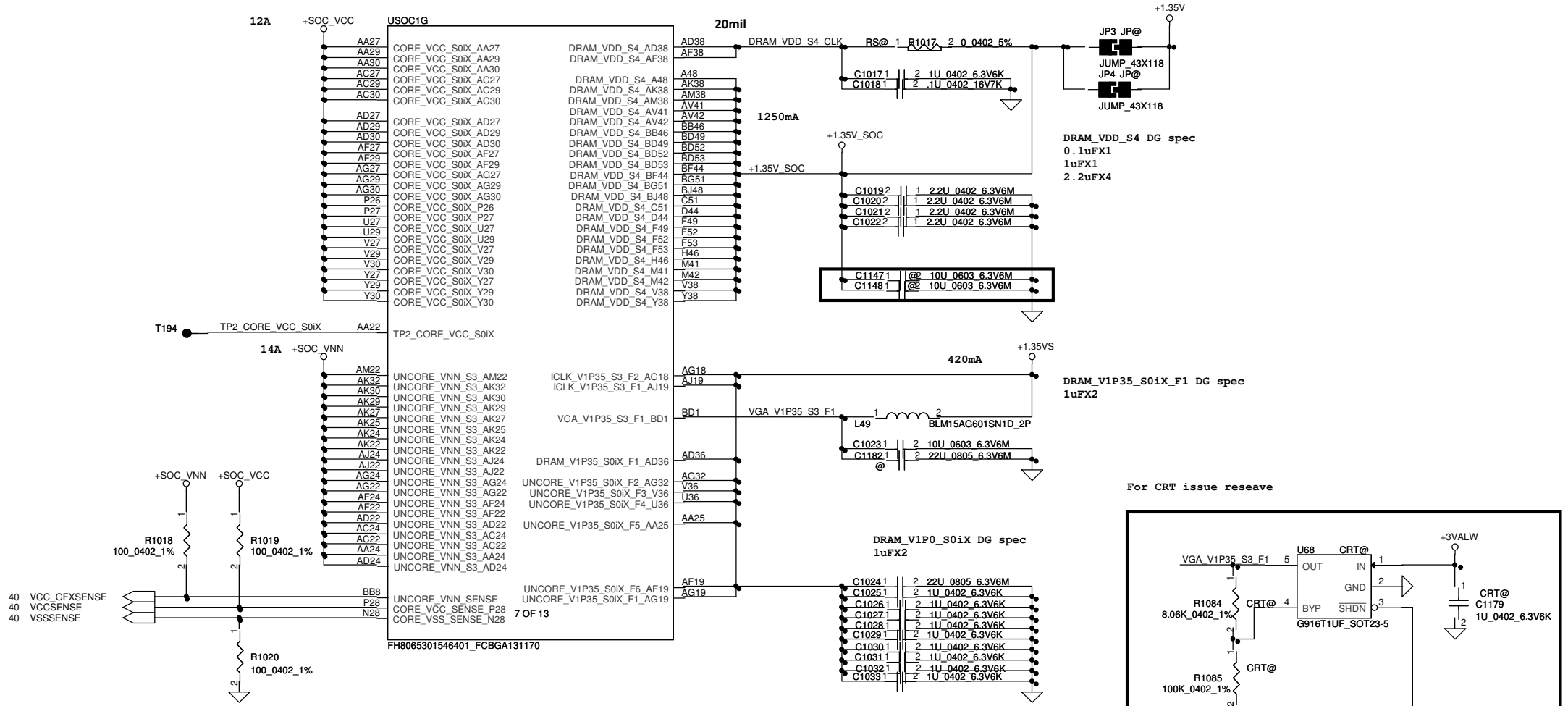
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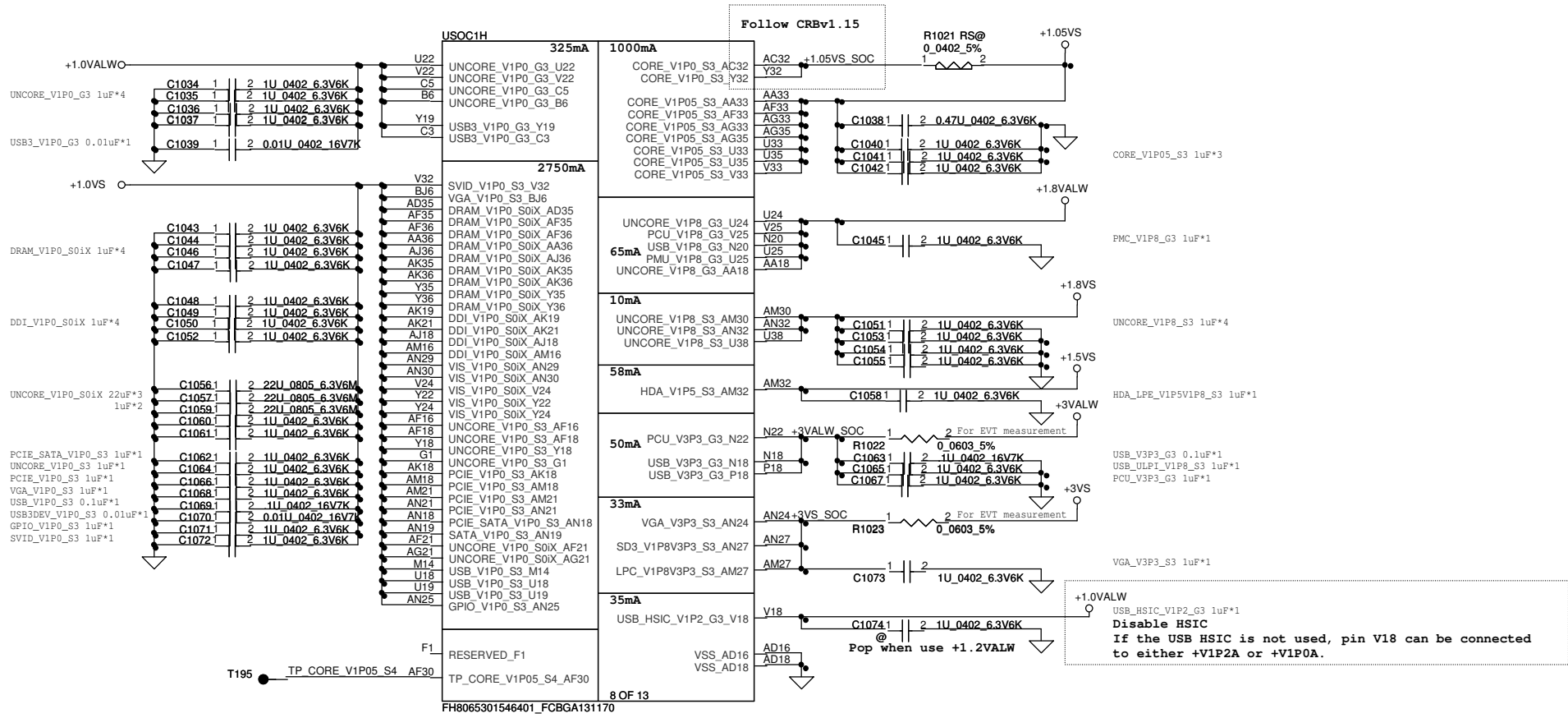


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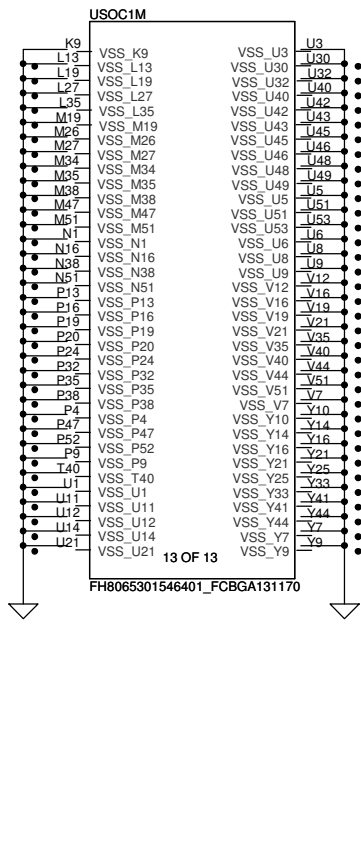
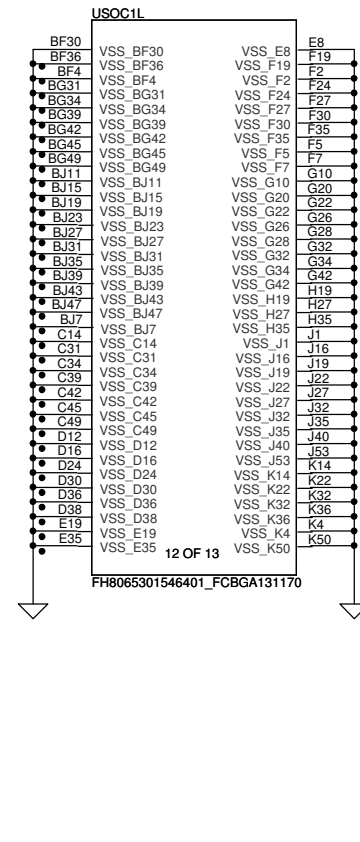
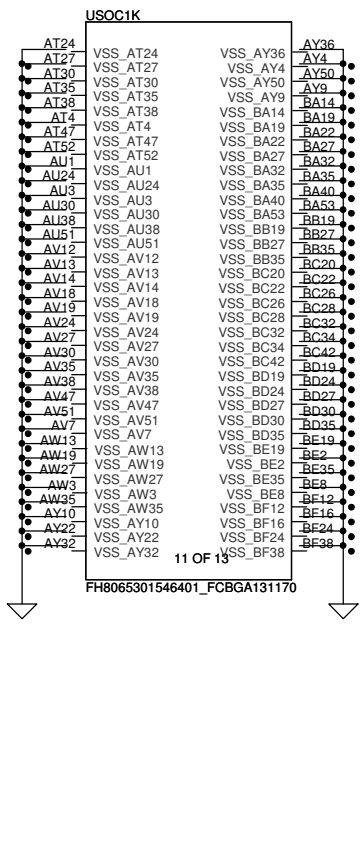
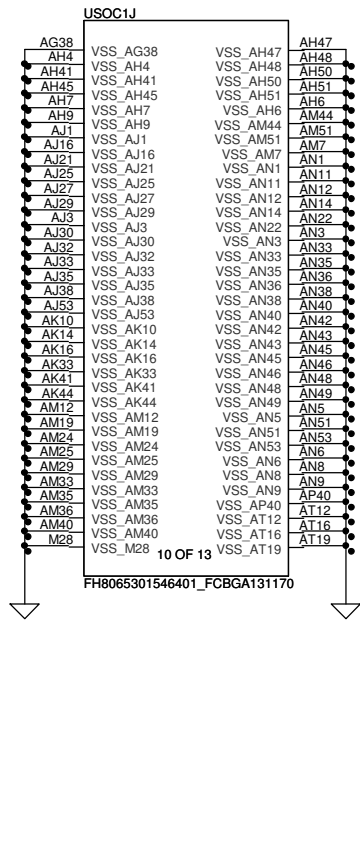
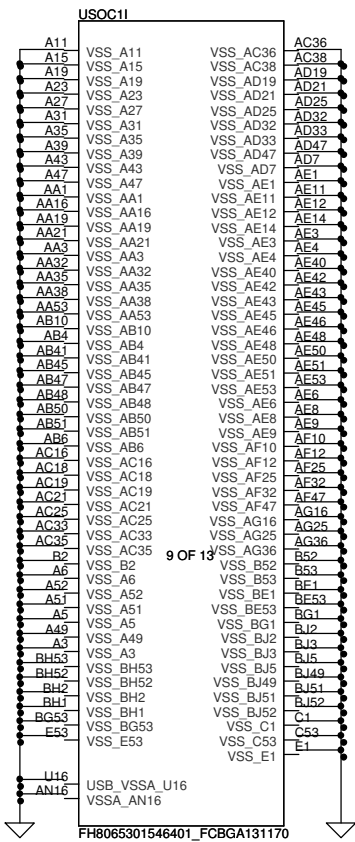


40 VCC_GFXSENSE
40 VCCSENSE
40 VSSSENSE

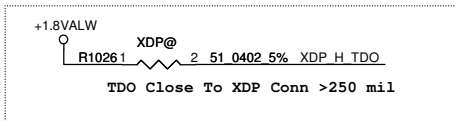
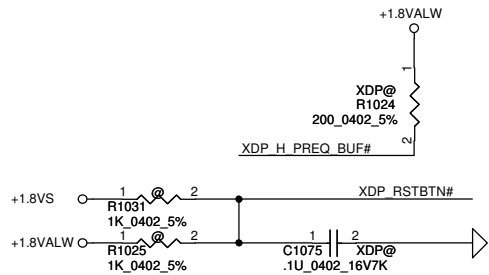
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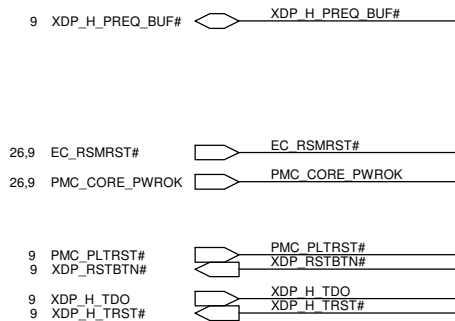
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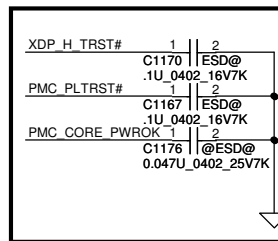
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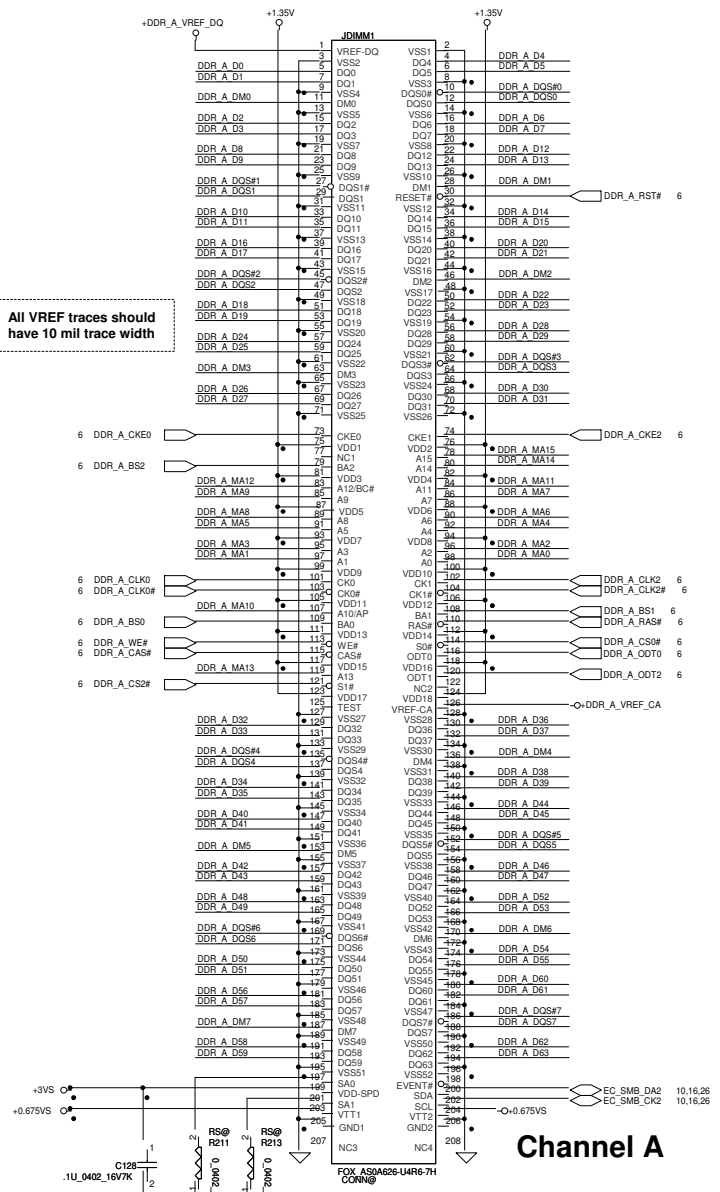
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0927: for ESD request

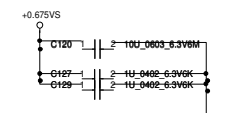
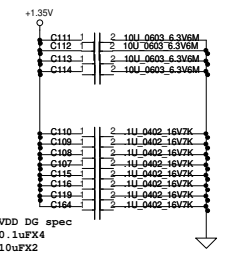


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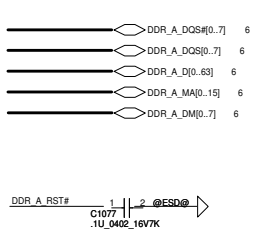


All VREF traces should have 10 mil trace width

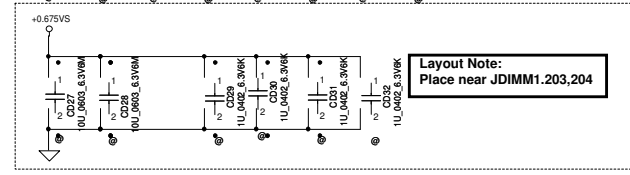
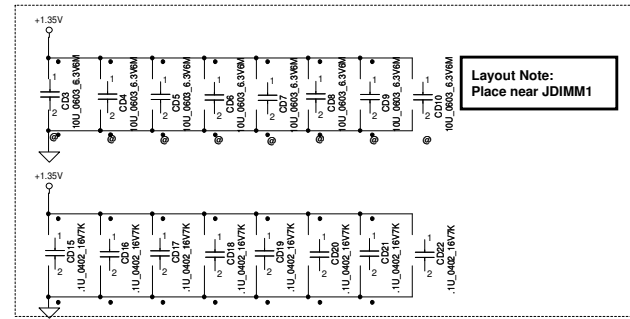
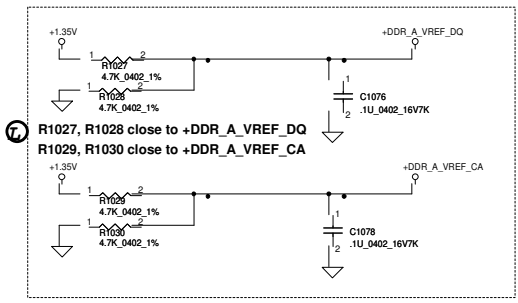
Layout Note:
Place near JDIMM1



Layout Note:
Place near JDIMM1.203,204



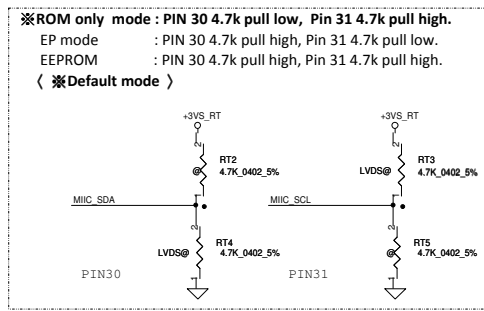
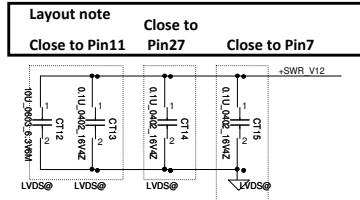
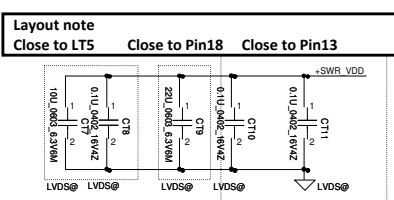
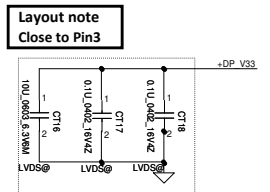
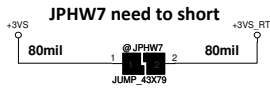
Signal voltage level = 0.675 V
PLACE TWO 4.7K RESISTORS CLOSE TO DIMMS ON DIMM_VREF_CA / DIMM_VREF_DQ
Decoupling caps are needed; one 0.1 uF placed close to VREF pins of each DDR3 SODIMM.



Channel A

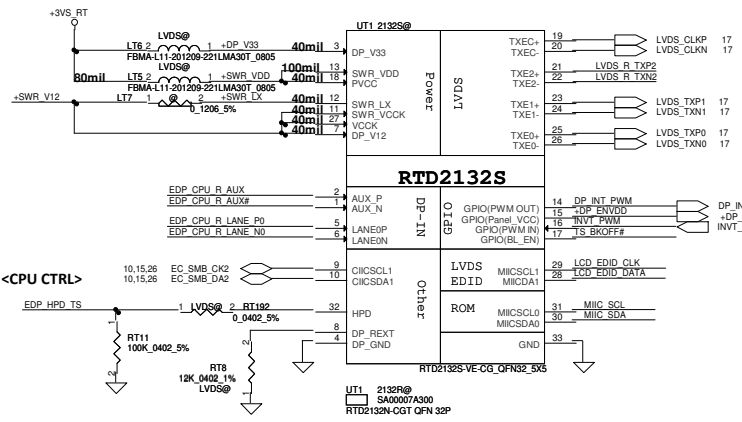
<Address: SA1:SA0=00 (A0H)>
DIMM_1 STD H:4mm

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	LDO	SWR
2132S	Do not support	mount LT7
2132R	Use 0 ohm	mount LT7

* If use 2132R, please select LDO mode as default.



<CONN>

<CONN>
<CPU>

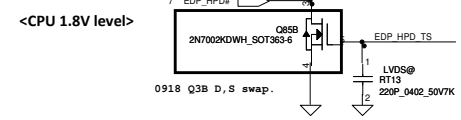
	PIN15
2132S	TL_ENVDD
2132R	+LCD_VDD *

	PIN16	Accept voltage input (high level)
2132S		3.3V
2132R		1.5-3.3V

* Version R internal Power Switch, can output 1A, Rds(on)=0.2 ohm

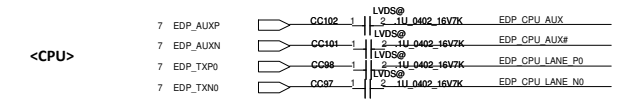
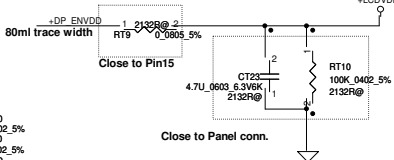
* Version R has internal level shifter, remove level shifter circuit on AMD platform

Different between 2132S and 2132R	
2132S	2132R
1. Support SWR mode	1. Support LDO mode and SWR mode 2. Internal ROM 3. Support LCD_VDD(internal Power switch) 4. Integrates Level shifter



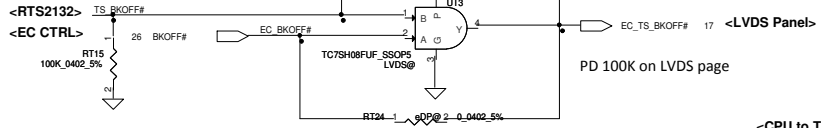
<CPU 1.8V level>

Layout note
Close to Pin8



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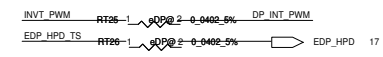
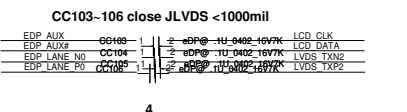
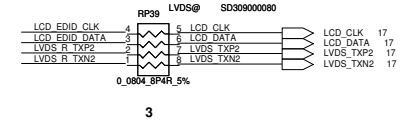
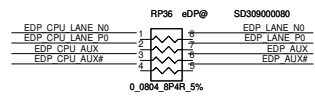
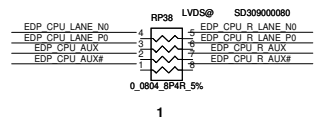
<SI> Update UT3 footprint (As UV11) 10/09



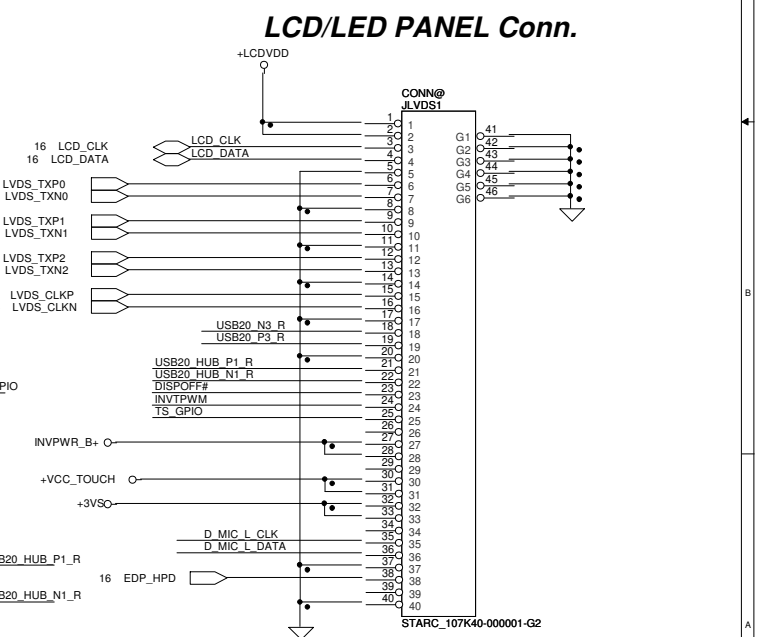
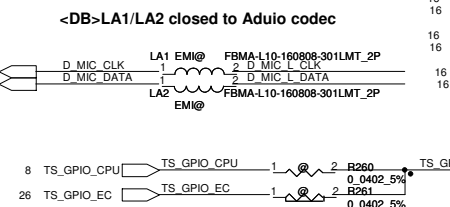
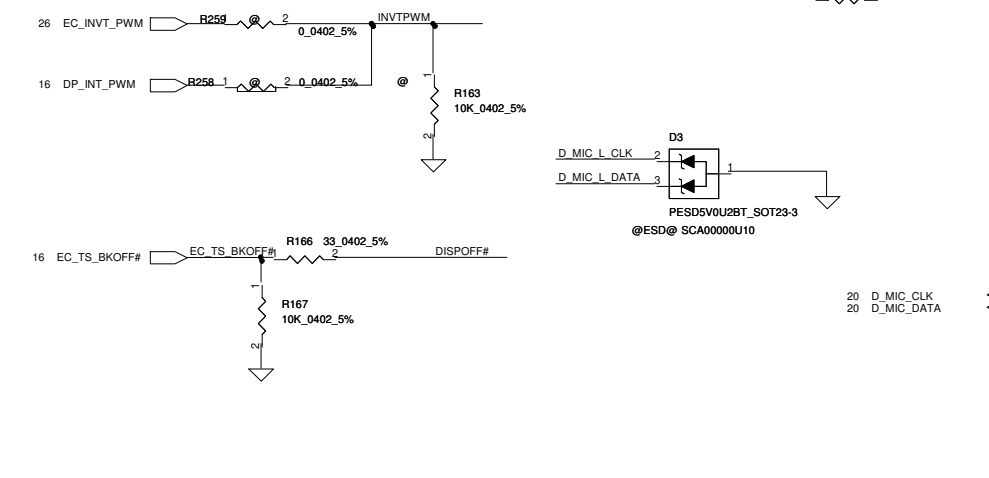
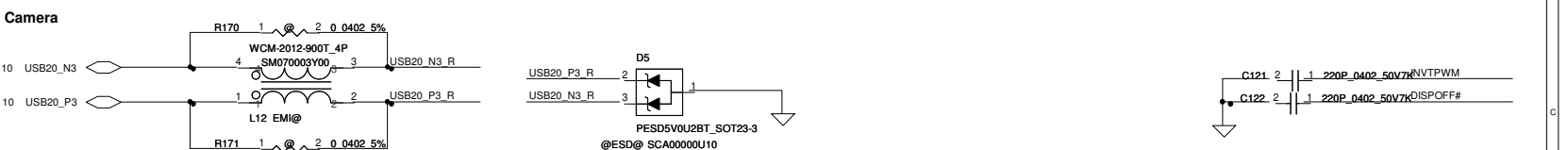
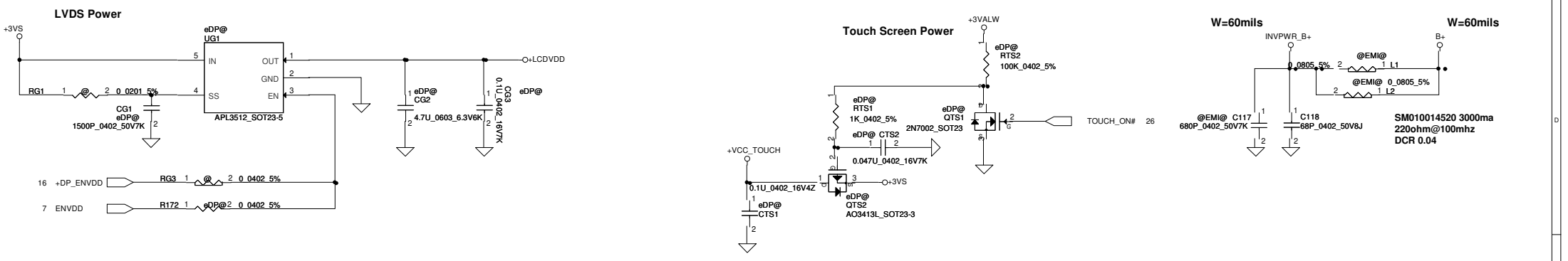
131111 add RT15 for power sequence

<LVDS panel> ==>

<eDP panel> ==>

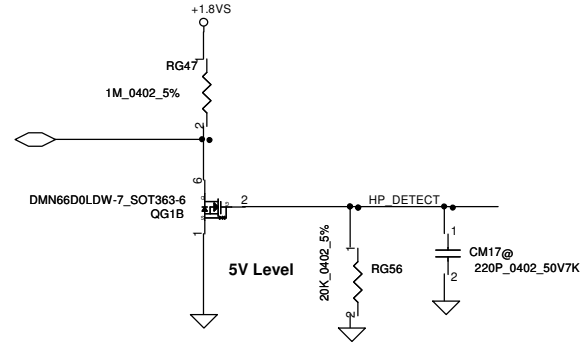
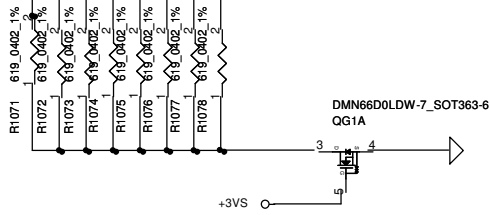
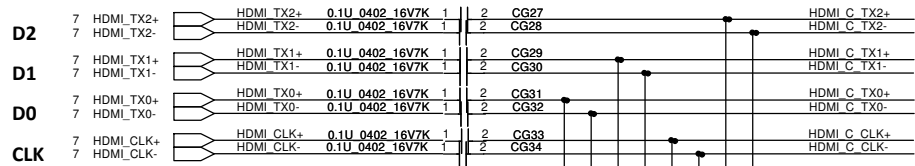


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Size	Document Number	Rev			
	LA-A92P	D.1			
Date	Friday, February 21, 2014	Sheet	16	of 43	

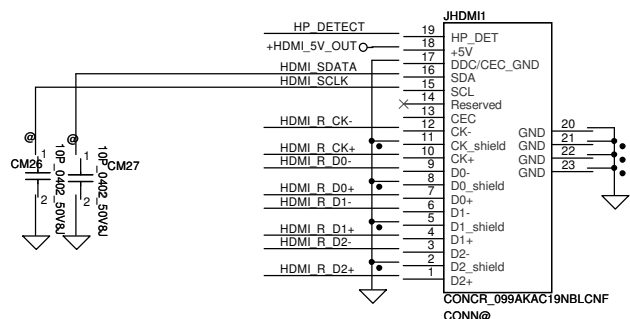
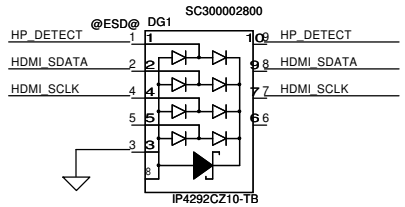
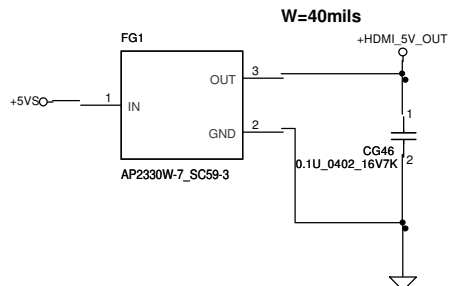
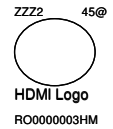
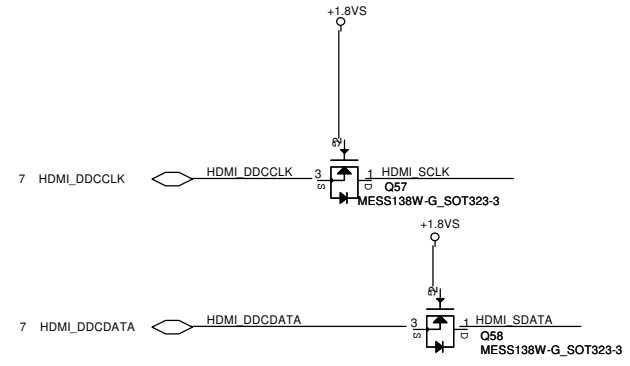
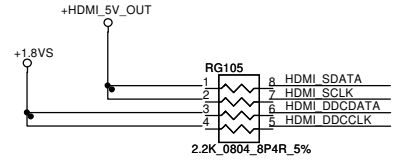
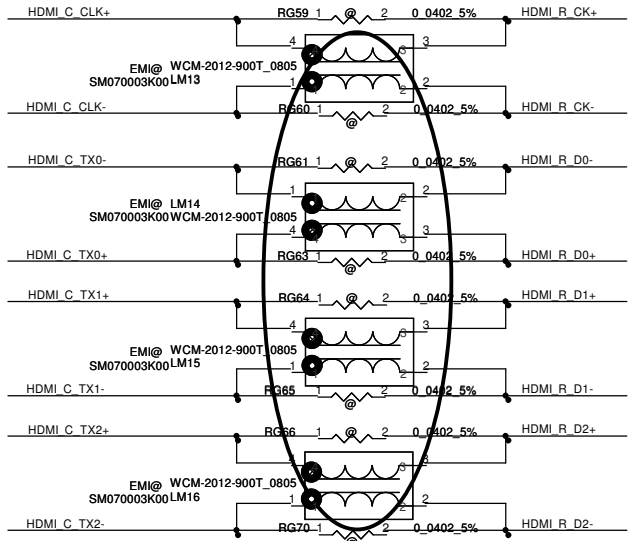


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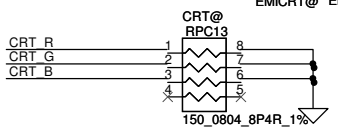
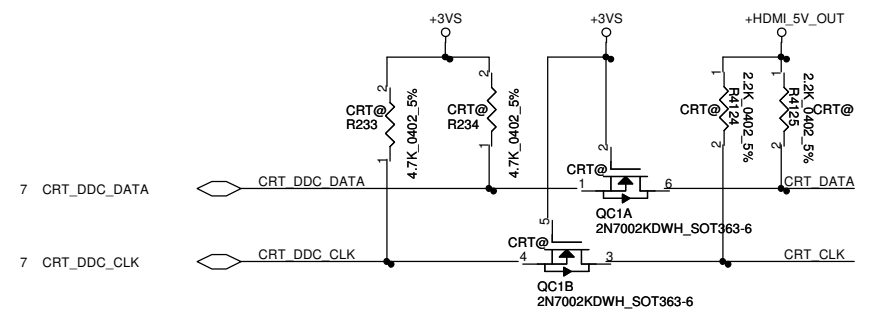
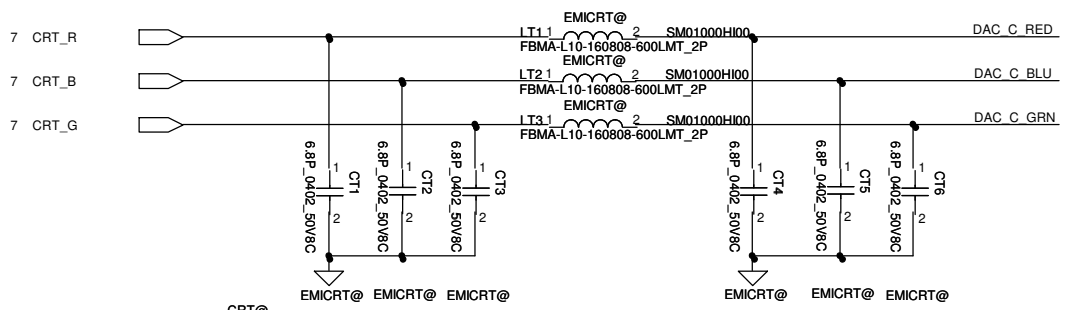
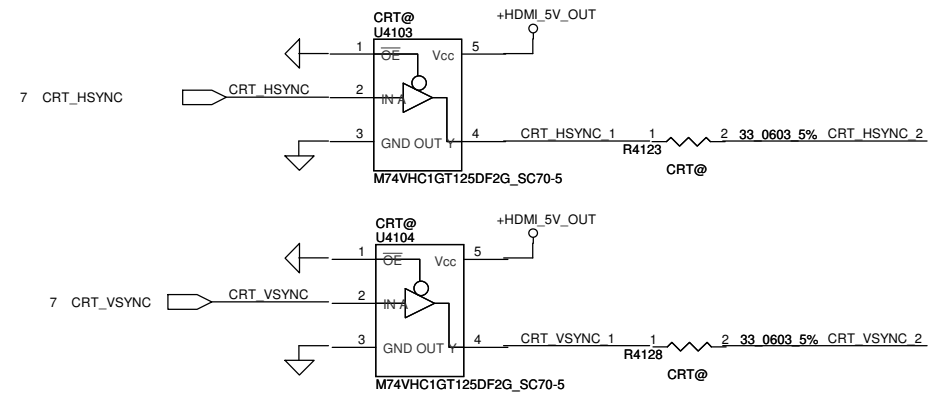
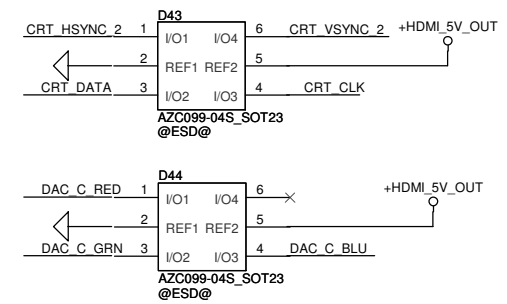
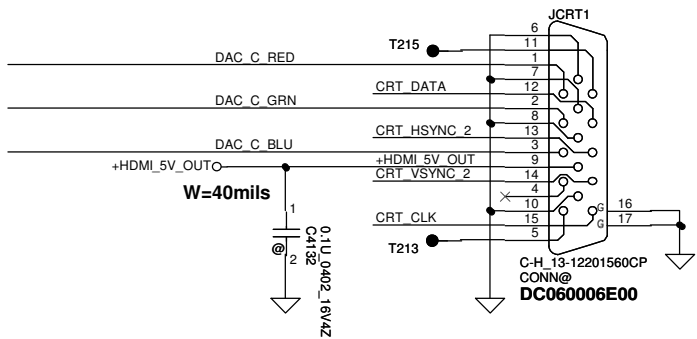
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10/21 BOM change SM070003K00

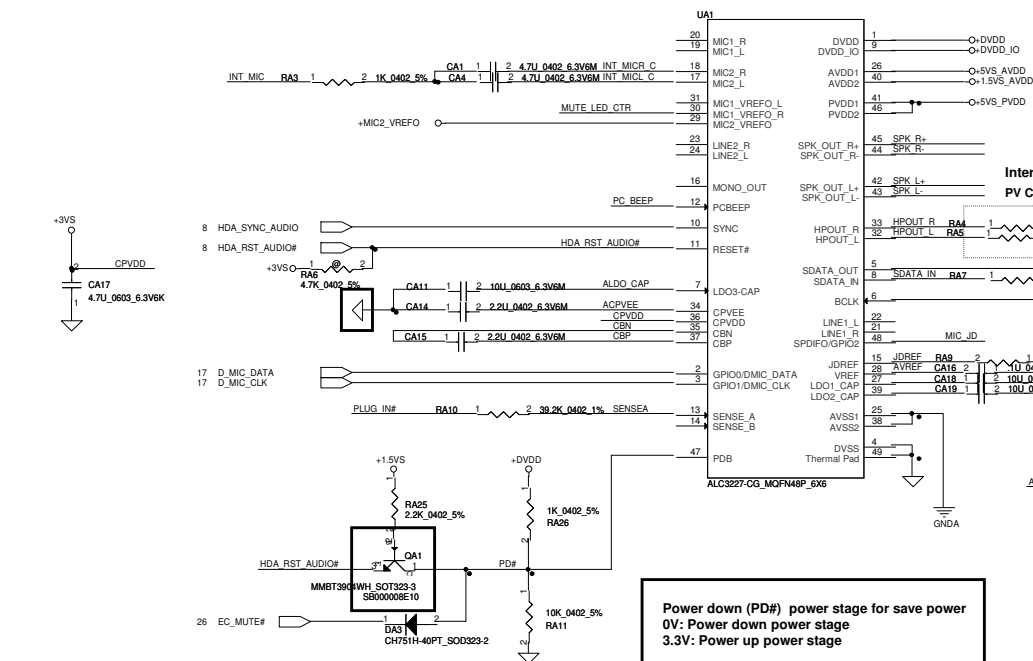


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				LA-A992P	Rev 0.1
				Date:	Friday, February 21, 2014
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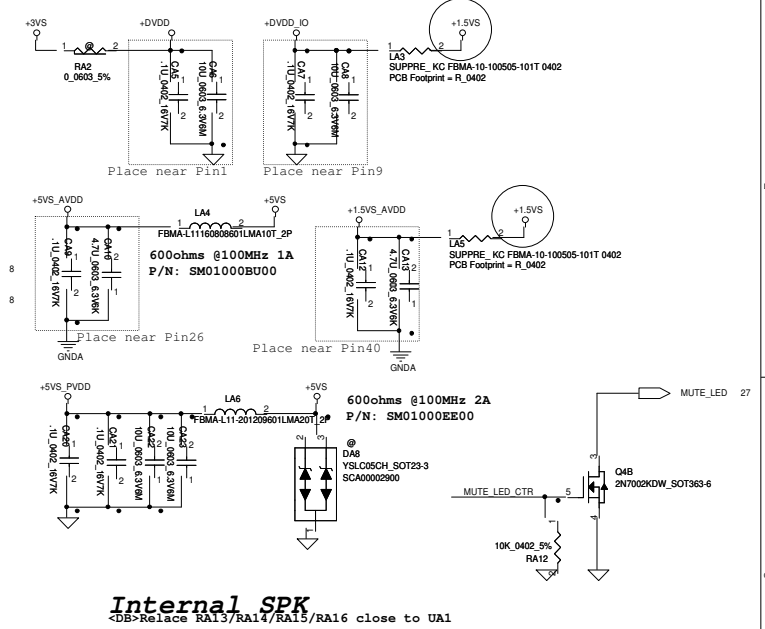
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Issued Date		Deciphered Date		CRT Connector	
2013/02/26		2015/07/08		Document Number	
				LA-A994P	
				Date: Friday, February 21, 2014	
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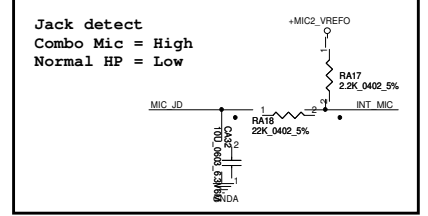
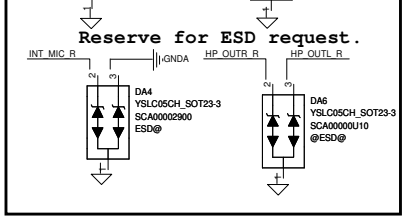
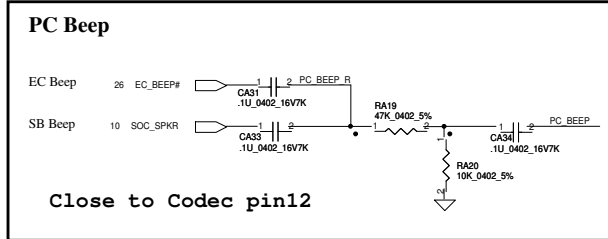
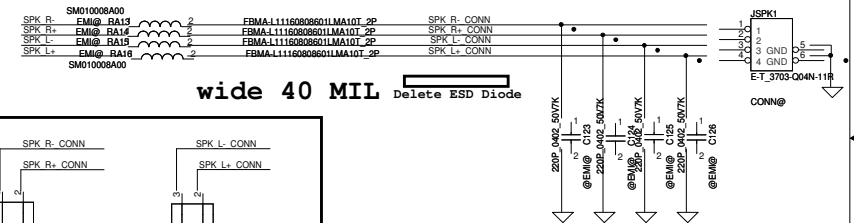
Internal Speaker
PV Change RA4/RA5 from 75 to 100 ohm

Headphone



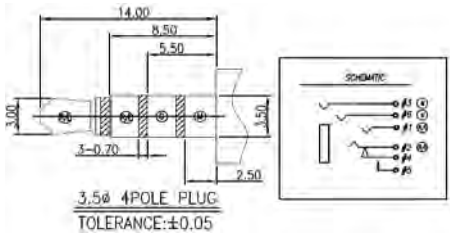
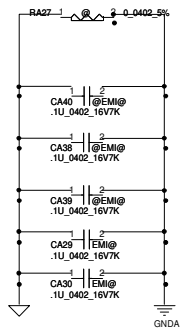
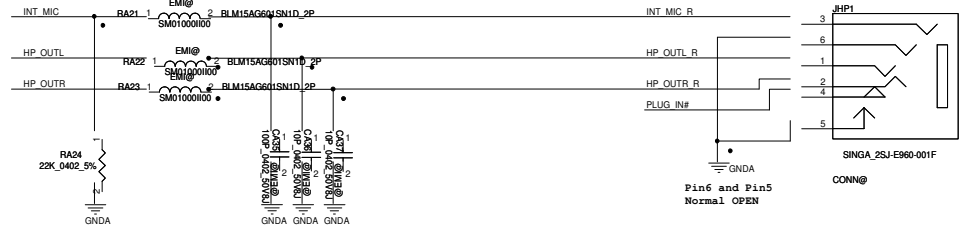
Power down (PD#) power stage for save power
0V: Power down power stage
3.3V: Power up power stage

Internal SPK
DB-Relace RA13/RA14/RA15/RA16 close to UA1

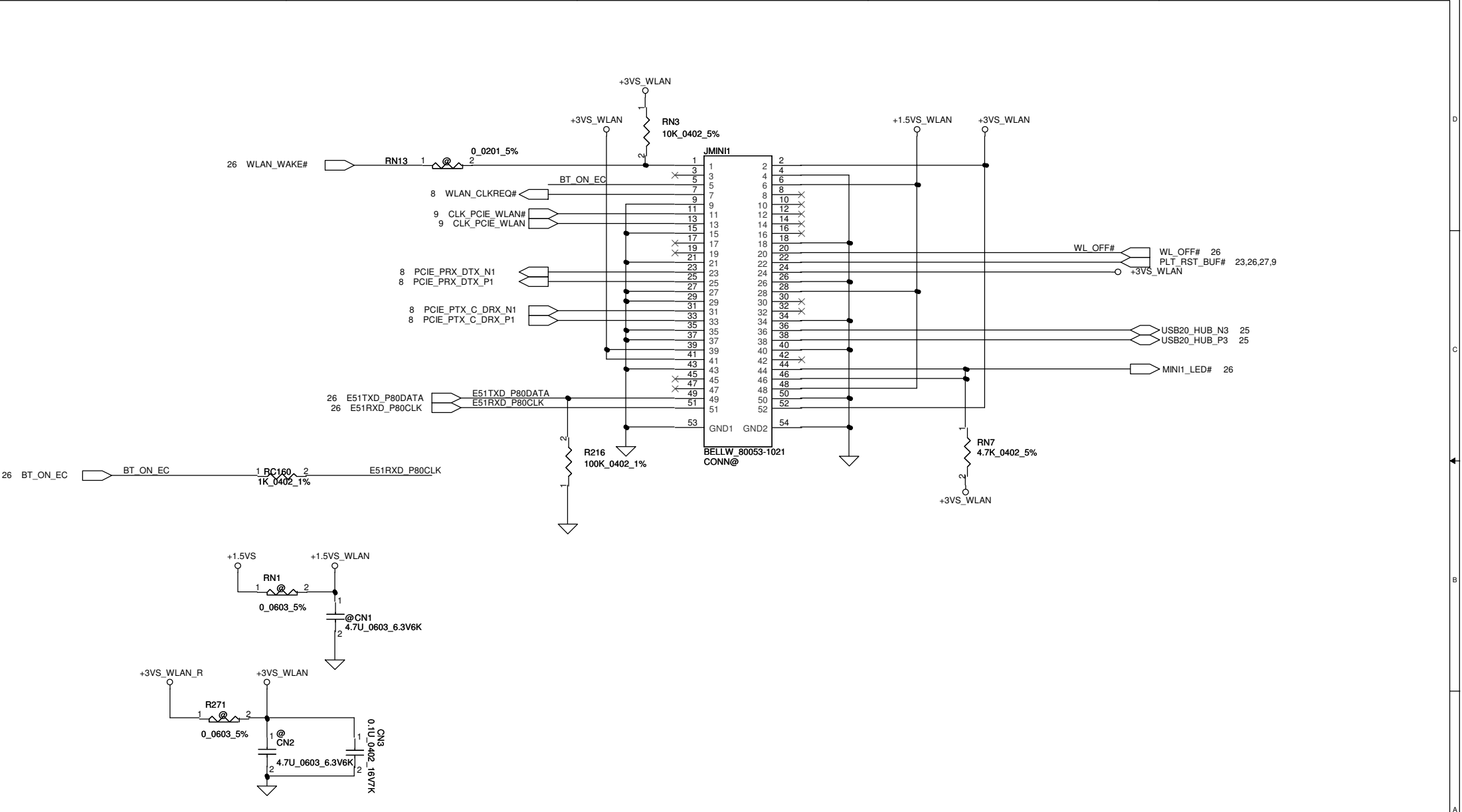


COMBO AUDIO JACK

HPR, HPL, 15mil Keep 30mil

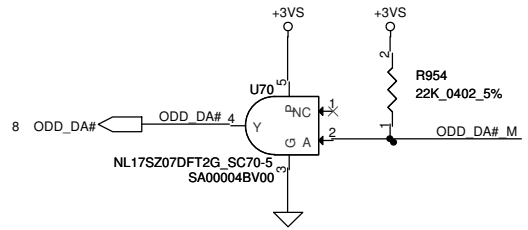
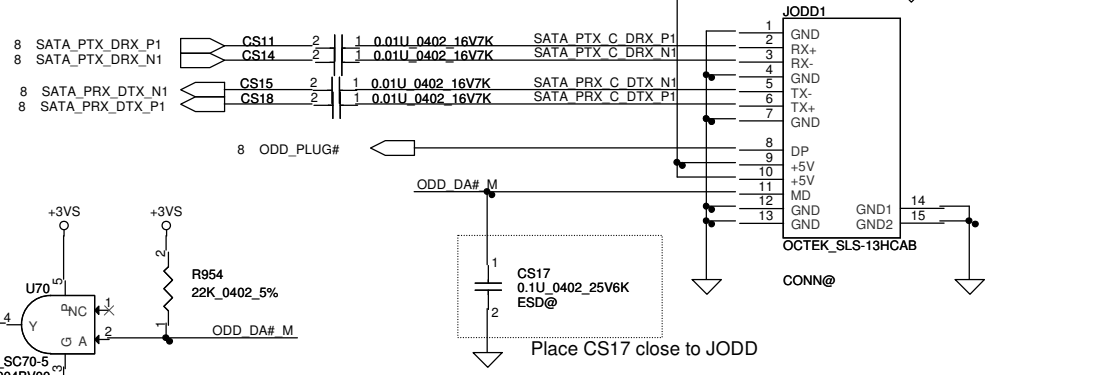
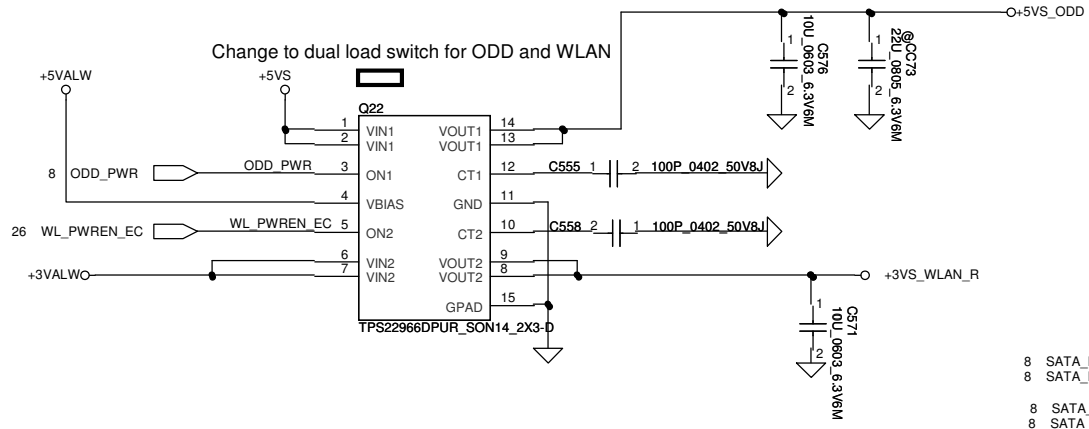
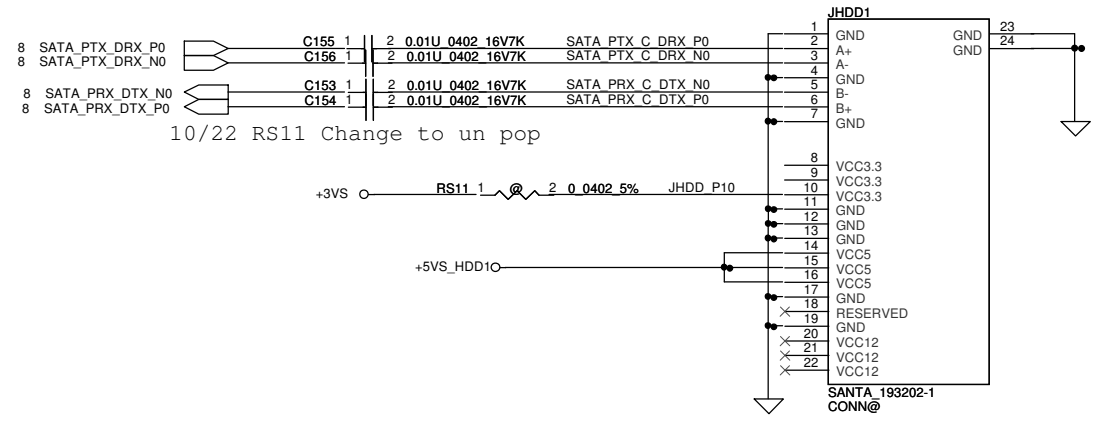
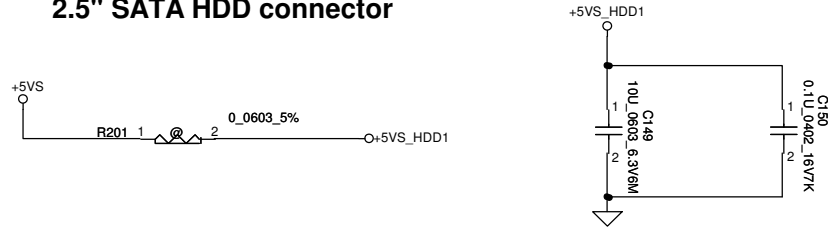


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Size	C	Document Number	LA-A992P	Rev	0.1
Date	Friday, February 21, 2014	ISheet	30	of	43



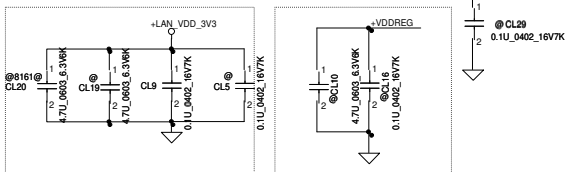
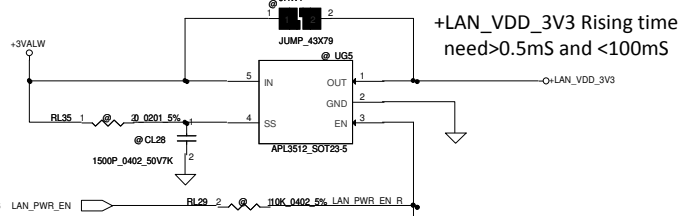
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Issued Date	2013/02/26	Deciphered Date	2015/07/08			Size
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					Date:	Friday, February 21, 2014

2.5" SATA HDD connector



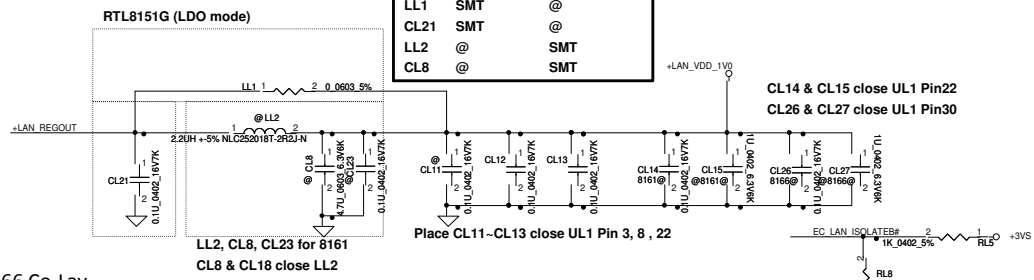
Security Classification	Compal Secret Data			Compal Electronics, Inc.		
Issued Date	2013/02/26	Deciphered Date	2015/07/08	Title	ODD/SATA Conn	
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				B	LA-A992P	0.1
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JHW1 need to short

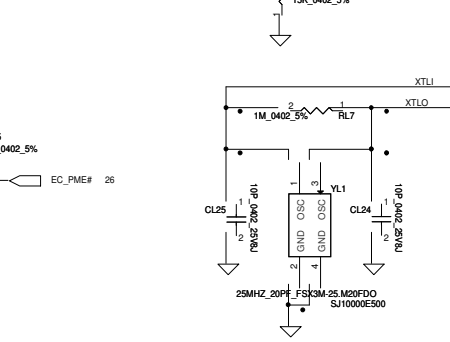
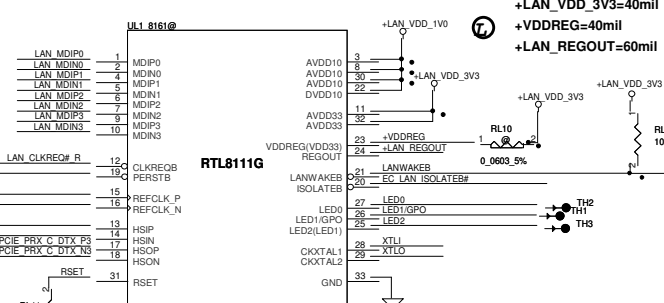


CL9 & CL5 close to UL1: Pin 11,32
 CL19 close to UL1: Pin 32
 CL20 close to UL1: Pin 11
 CL10 & CL16 close to UL1: Pin 23

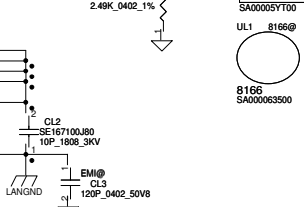
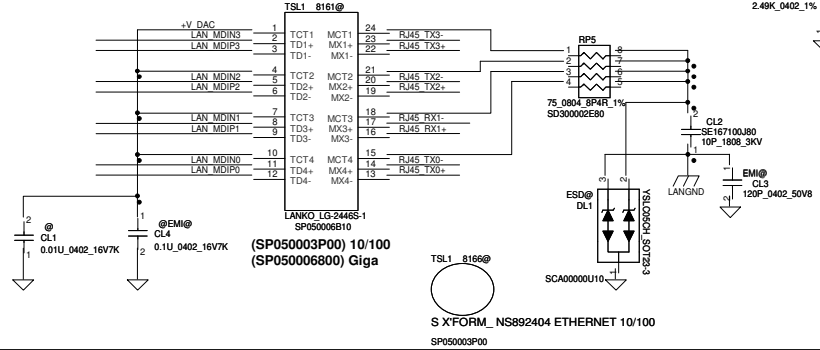
	LDO mode	Switching mode
LL1	SMT	@
CL21	SMT	@
LL2	@	SMT
CL8	@	SMT



8151/8166 Co-Lay

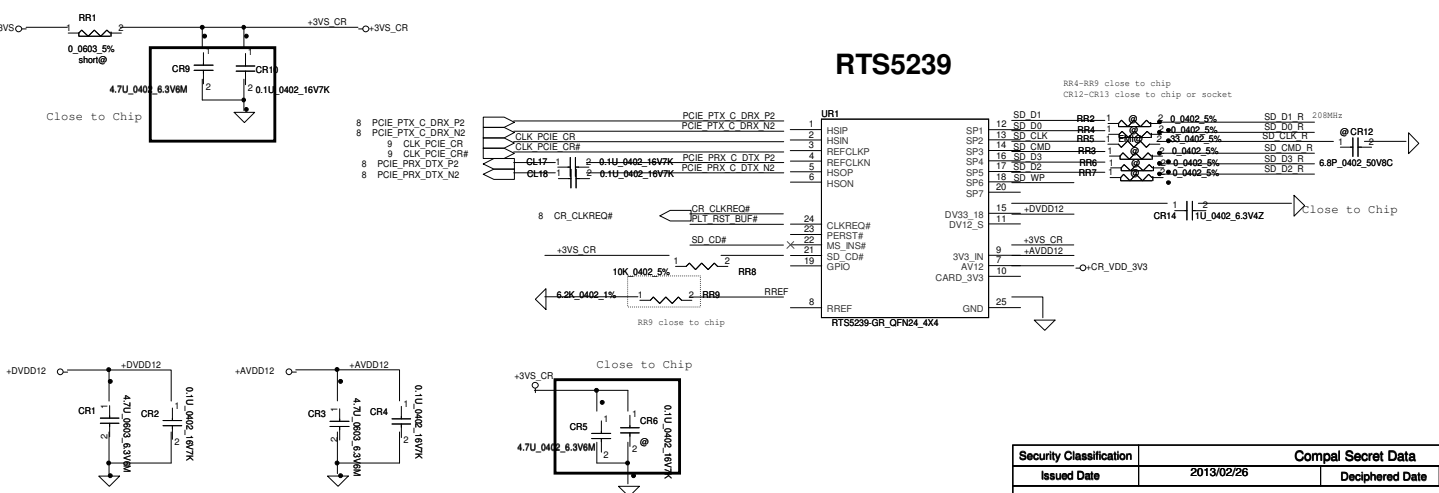


SP05005L00 Footprint

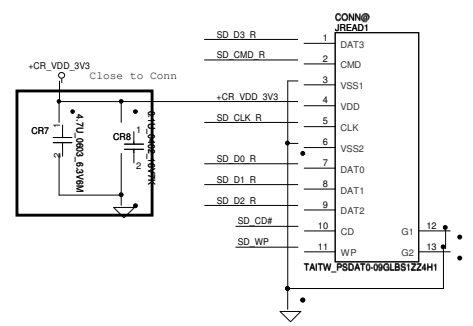


SANTA_130456-291		JLAN1 CONN@	
RJ45 TX3+	8	PR4-	10
RJ45 TX3-	7	PR4+	9
RJ45 RX1-	6	PR2-	8
RJ45 TX2-	5	PR3-	7
RJ45 TX2+	4	PR3+	6
RJ45 RX1+	3	PR2+	5
RJ45 TX1-	2	PR1-	4
RJ45 TX0+	1	PR1+	3

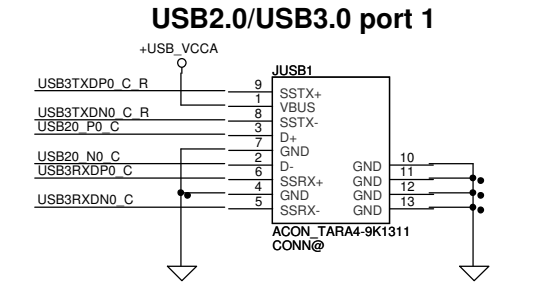
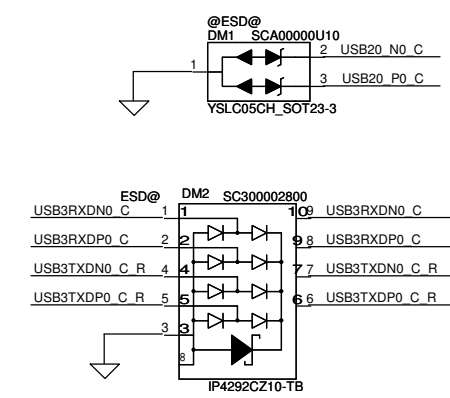
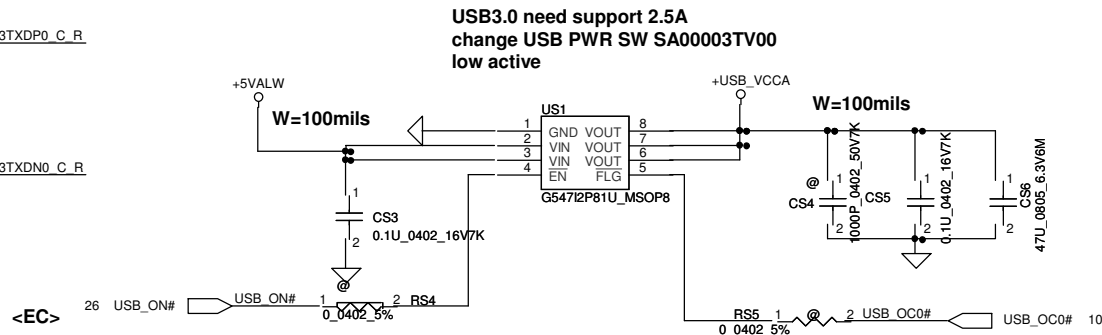
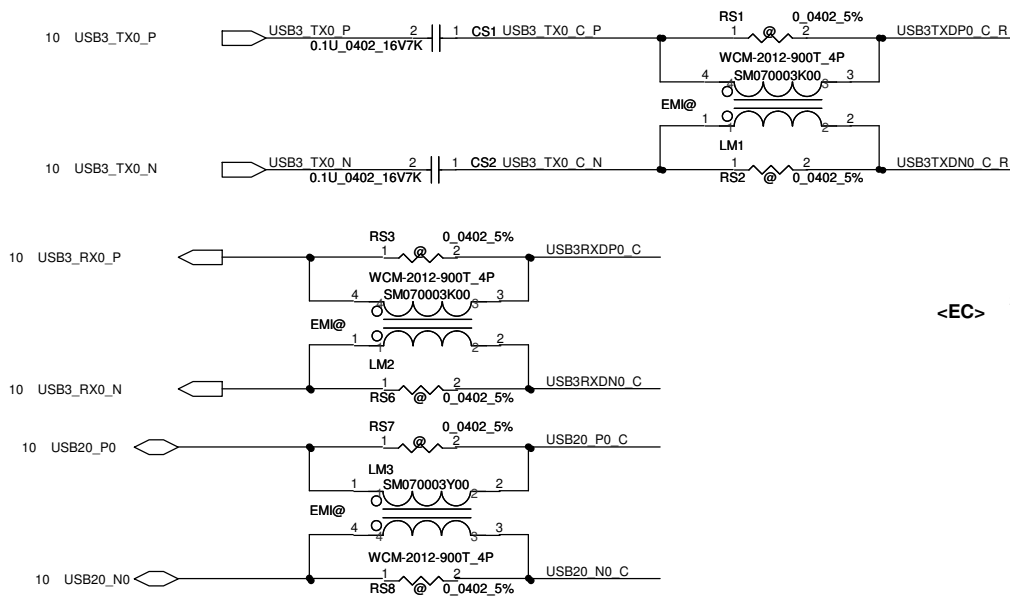
RTS5239



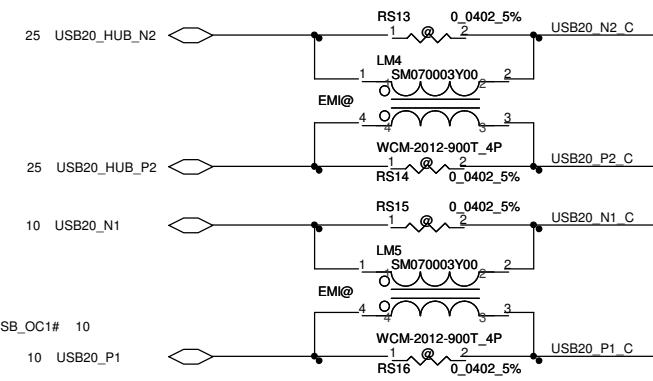
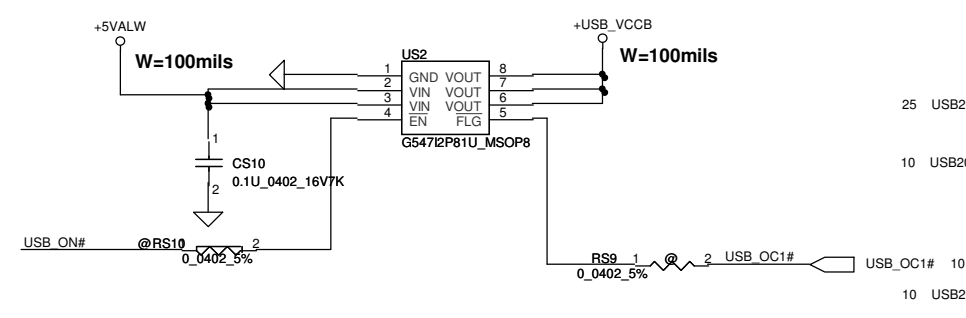
Card Reader Connector



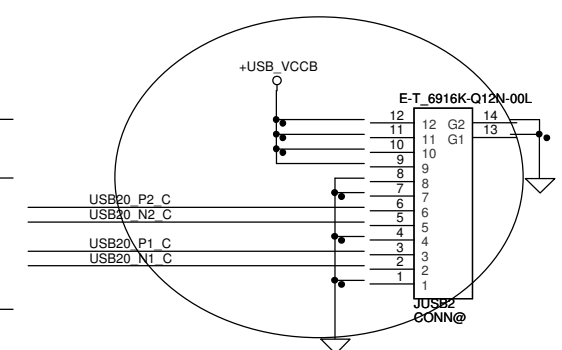
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Issued Date	2013/02/26	Deciphered Date		2015/07/08	LAN 8111G	
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				0.1	LA-A992P	0.1
				Date	Friday, February 21, 2014	Sheet 28 of 48



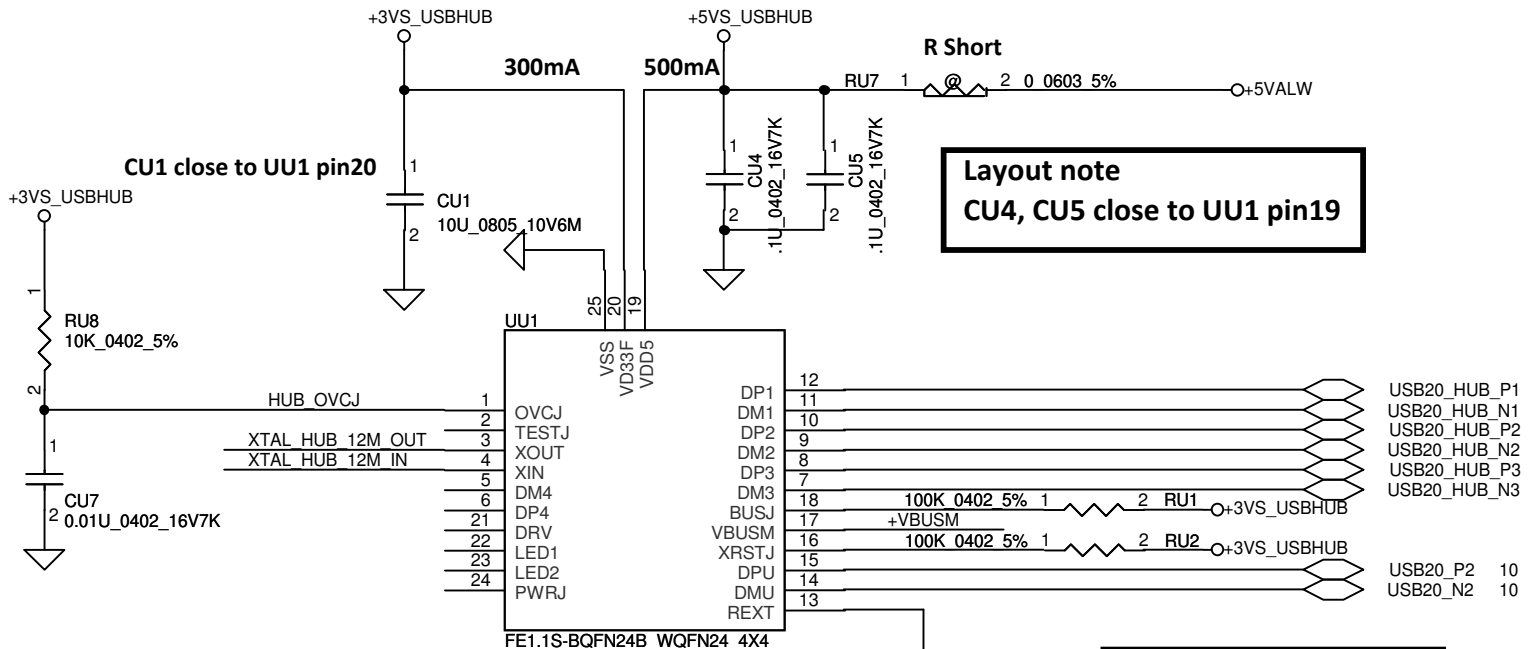
USB2.0 port x 2



131109 Follow 15" Haswell LA-A992PR02



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				Date: Friday, February 21, 2014	Sheet 24	of 43

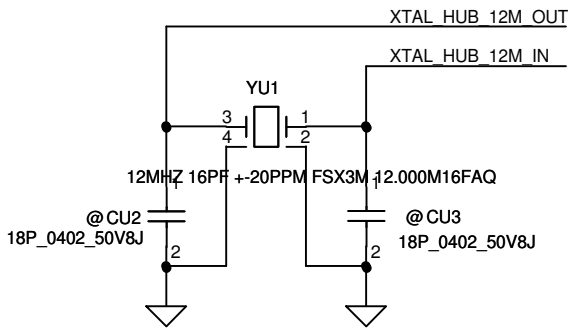


Layout note
CU4, CU5 close to UU1 pin19

USB20_HUB_P1 17 **Touch Screen**
 USB20_HUB_N1 17
 USB20_HUB_P2 24 **<USB20 port2>**
 USB20_HUB_N2 24
 USB20_HUB_P3 21 **<WLAN>**
 USB20_HUB_N3 21
 USB20_P2 10 **<CPU side>**
 USB20_N2 10

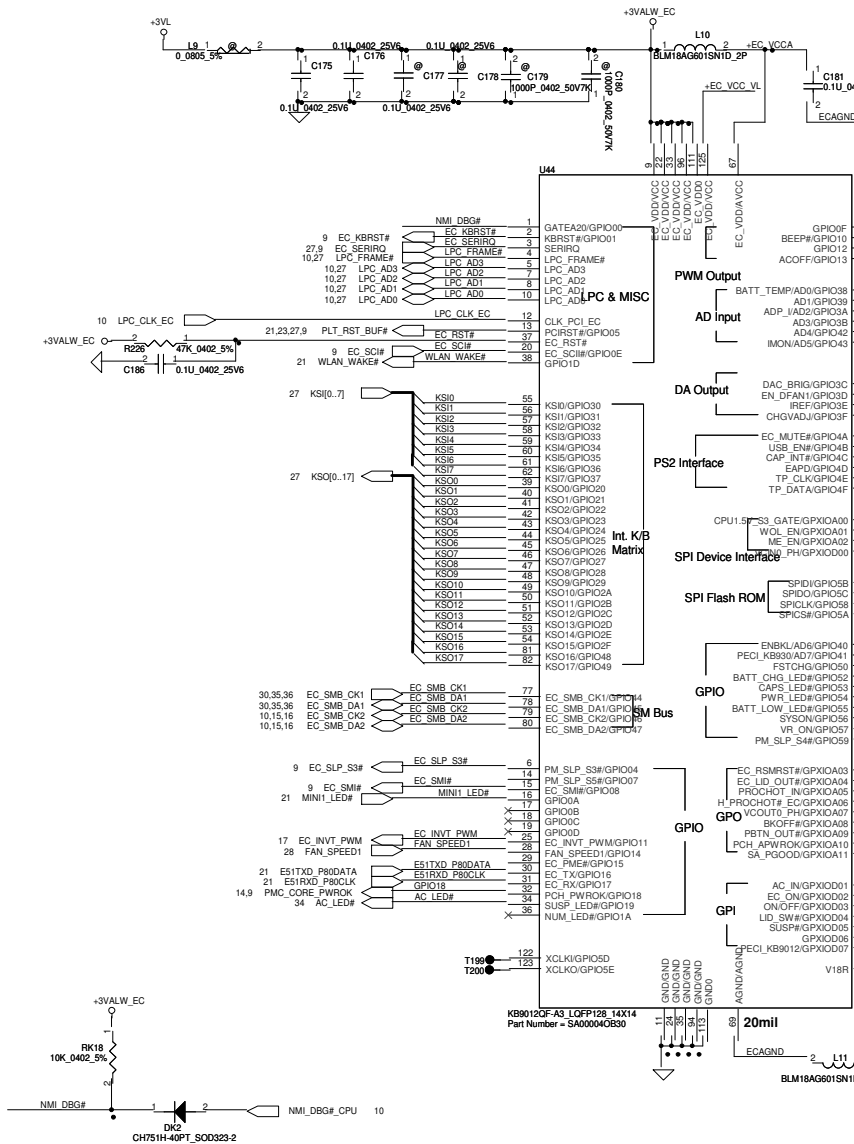
Layout note
RU3 close to UU1
RU3 pin2 GND Vias3

Layout note
RU5,RU6,CU5 close to UU1 pin17

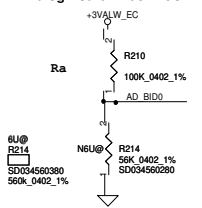


Vender review:CU2, CU3 cap no install

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					Size Custom
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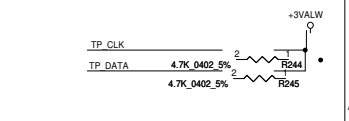
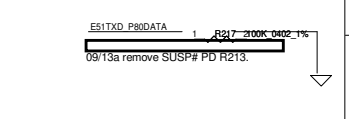
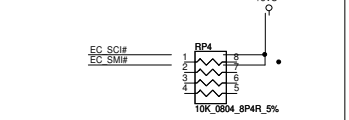
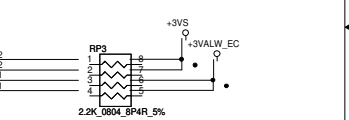
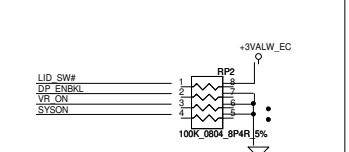
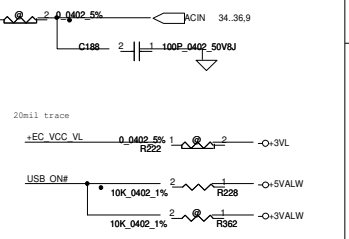
Analog Board ID definition



15"	DB	SI	PV	MV
Board ID R214	12K ohm	20K ohm	33K ohm	56K ohm
Project ID R210	100k ohm	100k ohm	100k ohm	100k ohm

15" TS	DB	SI	PV	MV
Board ID R214	NA	100K ohm	160K ohm	240K ohm
Project ID R210	100k ohm	100k ohm	100k ohm	100k ohm

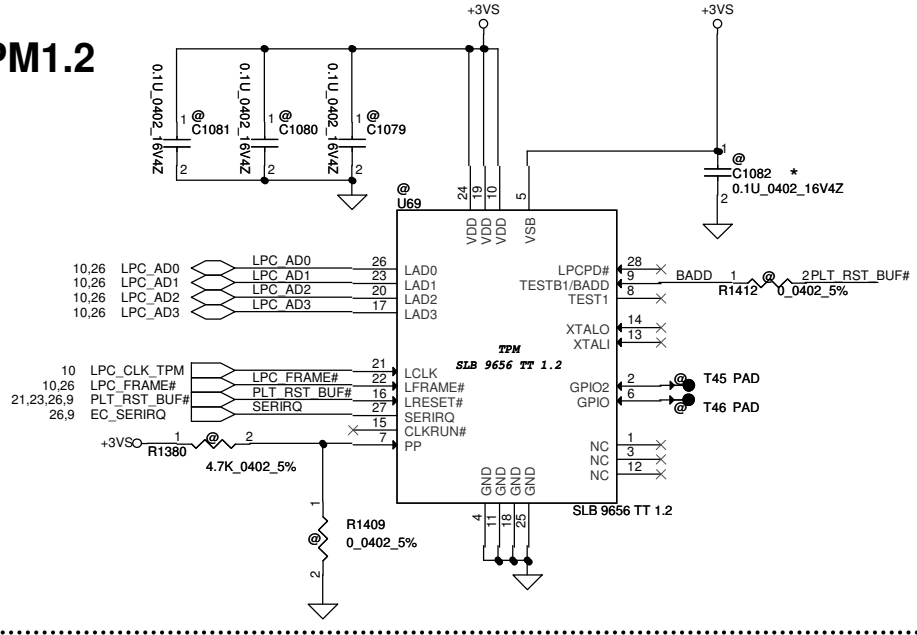
15" 6U	DB	SI	PV	MV
Board ID R214	NA	NA	330K ohm	560K ohm
Project ID R210	NA	NA	100k ohm	100k ohm



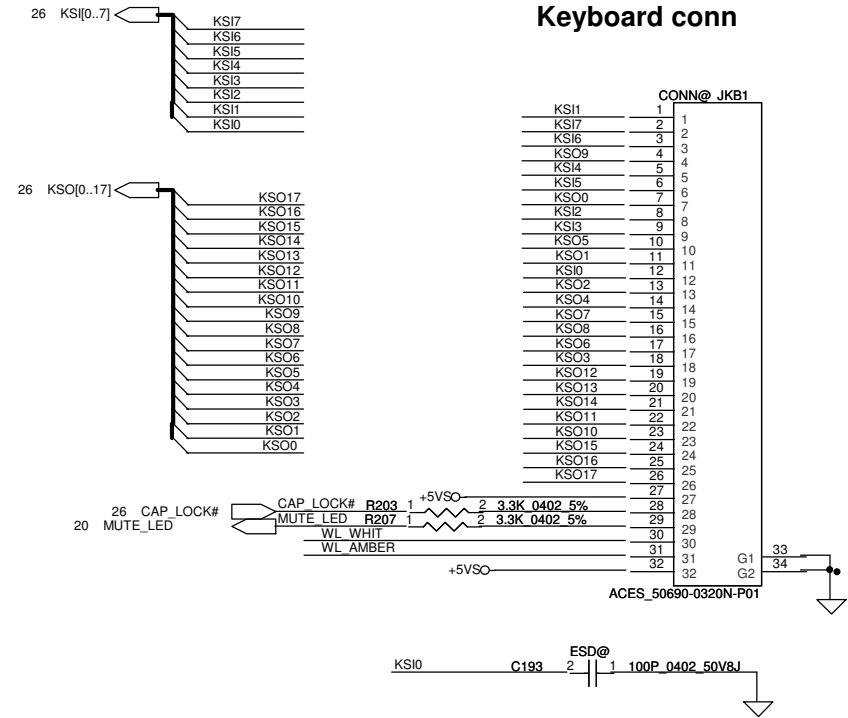
Latest design guide suggest change to 74LVC1G06.

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Size	C	Document Number	LA-A994P	Rev	0.1
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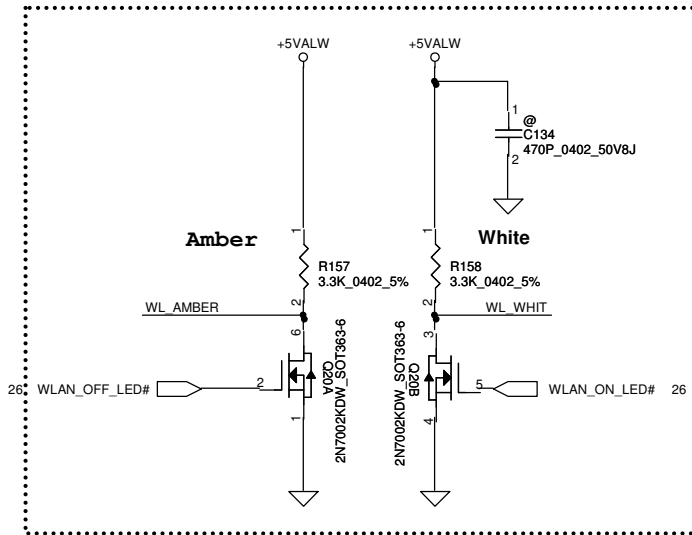
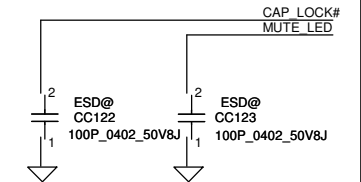
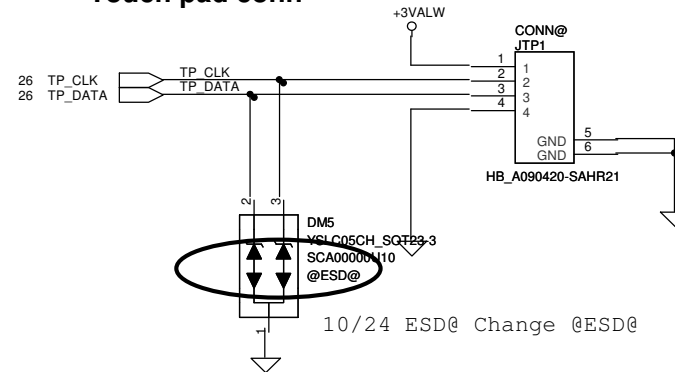
TPM1.2



Keyboard conn

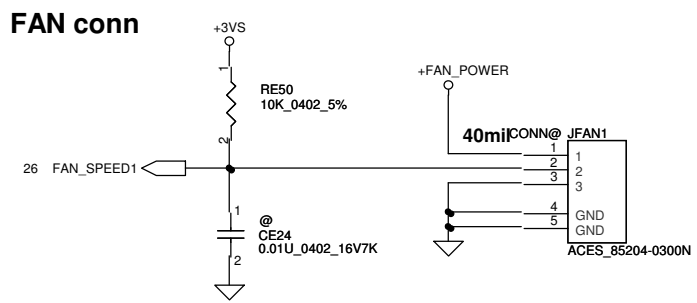
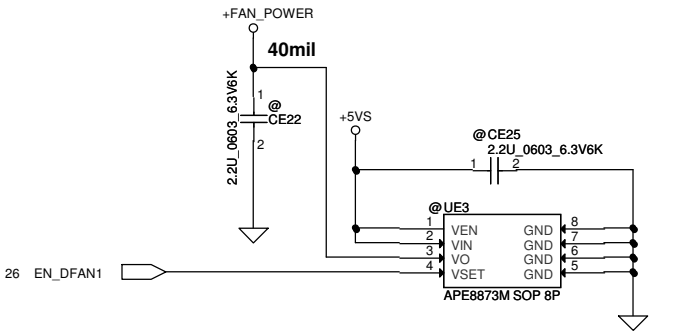
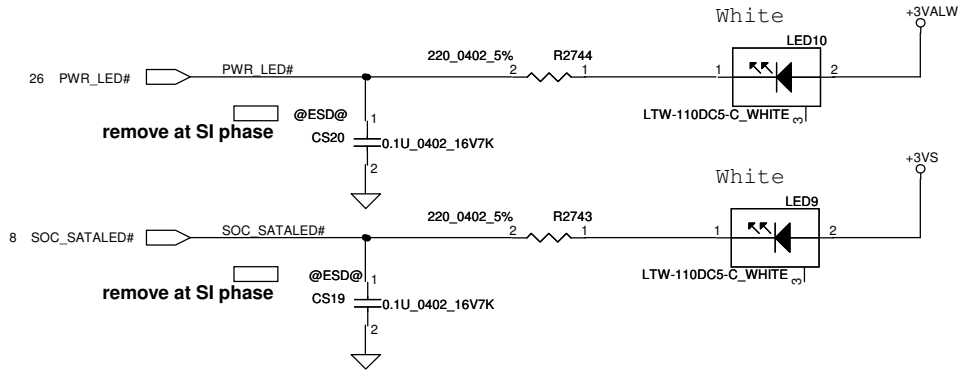
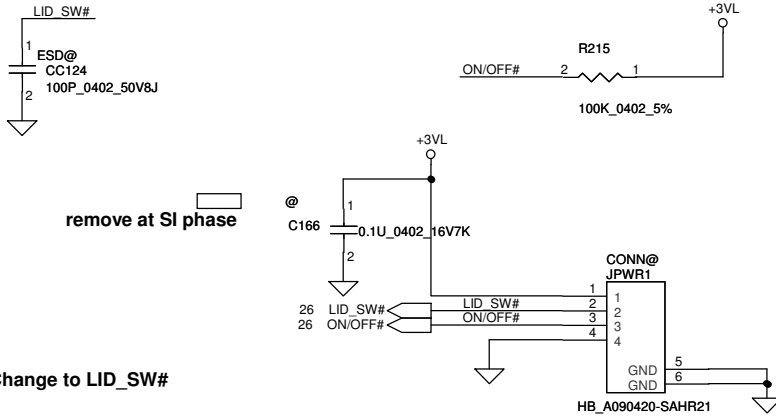


Touch pad conn



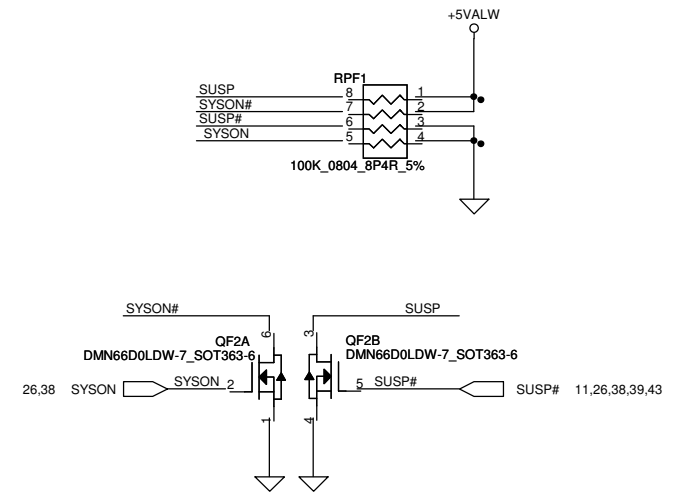
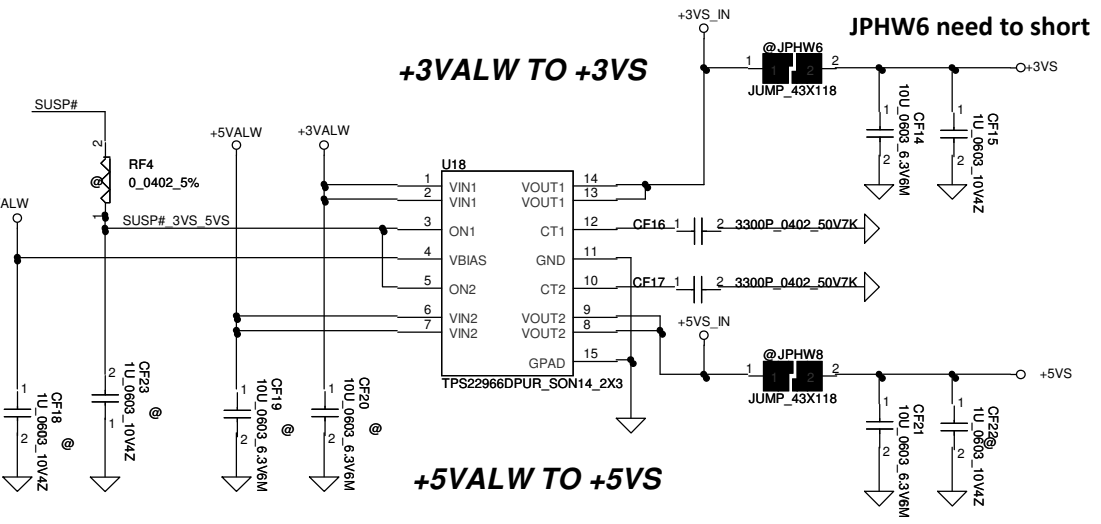
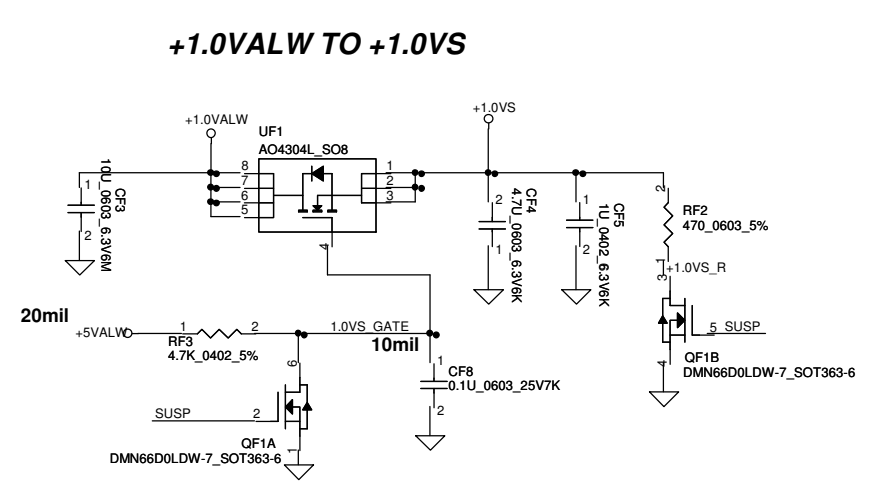
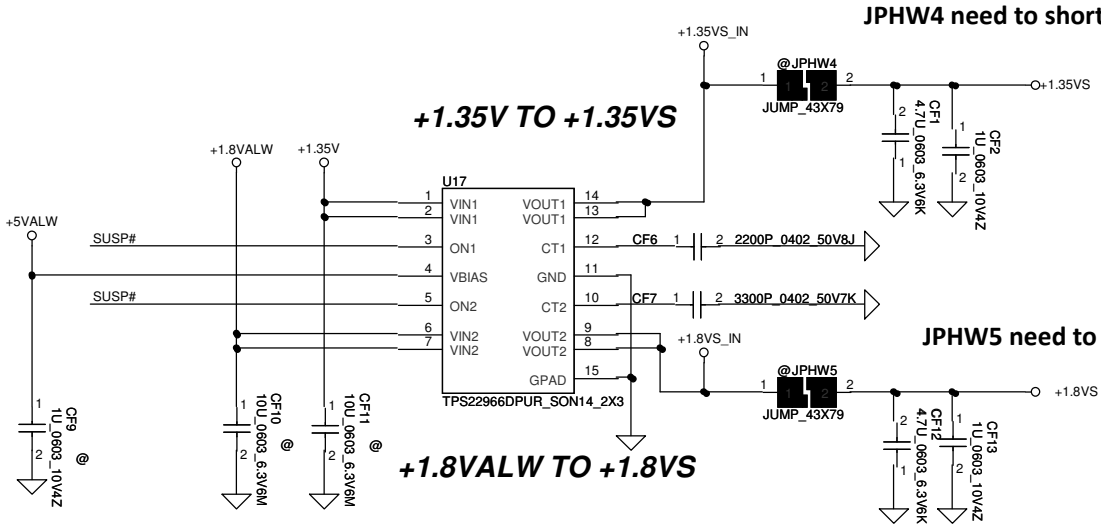
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Issued Date	2013/02/26	Deciphered Date	2015/07/08	Title	KB/TP	
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Power Button Connector



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				LA-A992P
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				0.1
Date: Friday, March 14, 2014			Sheet	28 of 43

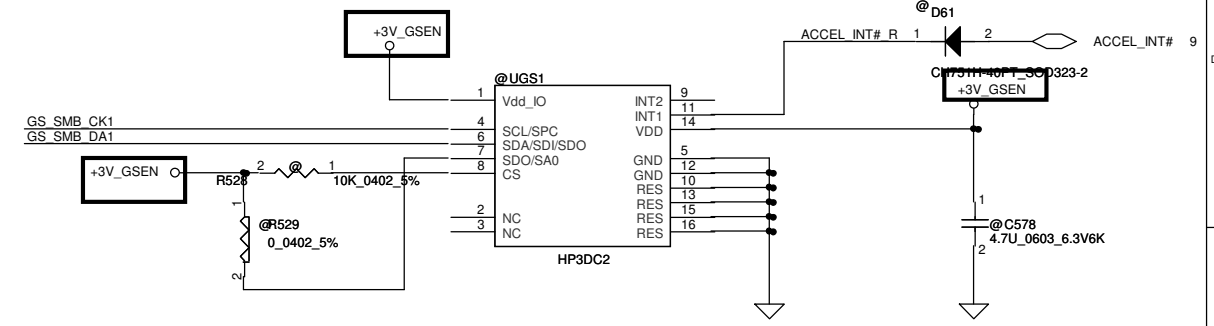
Bay trail M new power up sequence



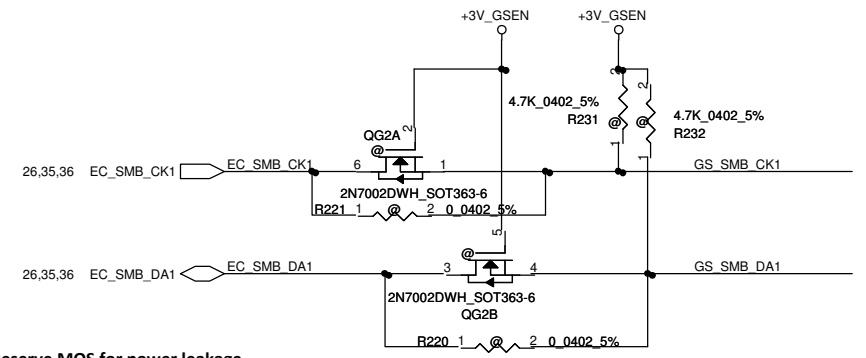
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Issued Date	2013/02/26	Deciphered Date	2015/07/08	Title
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Date:	Friday, February 21, 2014	Sheet	29 of 43	Rev 0.1

10/21 +3VALW Change +3VL

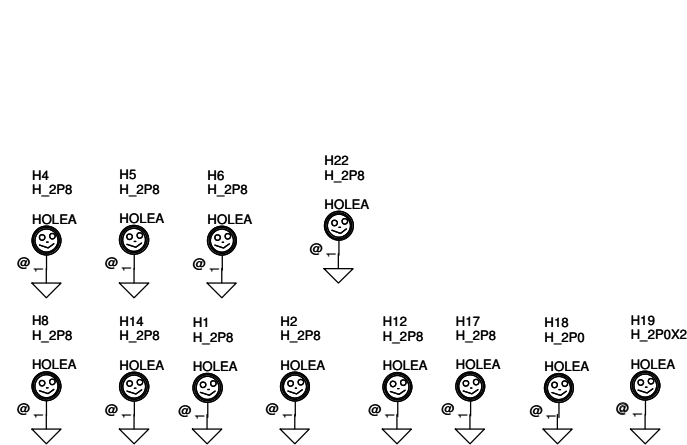
ACCELEROMETER



(L) Must be placed in the center of the system.

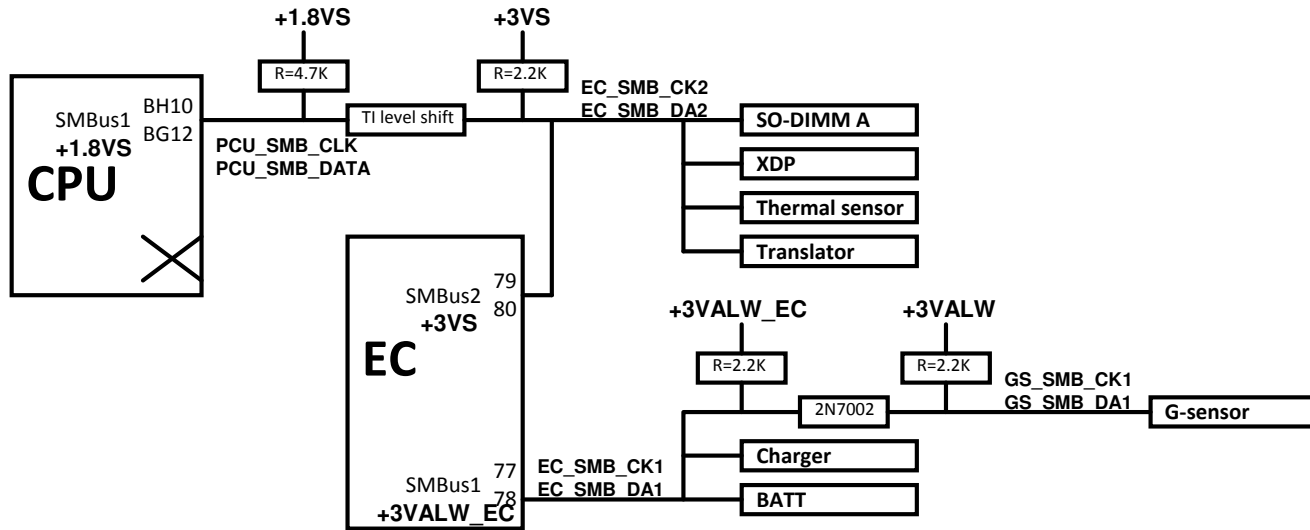


Reserve MOS for power leakage



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<SMBus Routing>



<USB2.0/3.0 port>

USB2.0	USB3.0	Function	Note
0	X	Left port (USB2.0)	
1	0	Right port-1 (USB2.0/3.0)	
2	X	Right port-2 (USB2.0)	
3	X	WLAN	USB2.0x4 Hub
4	X	Touch screen	USB2.0x4 Hub
5	X	Camera	USB2.0x4 Hub
6	X	NC	USB2.0x4 Hub

<PCI-E port>

PCI-E	Function	Note
0	LAN	
1	WLAN	
2	Card reader	
3	NC	

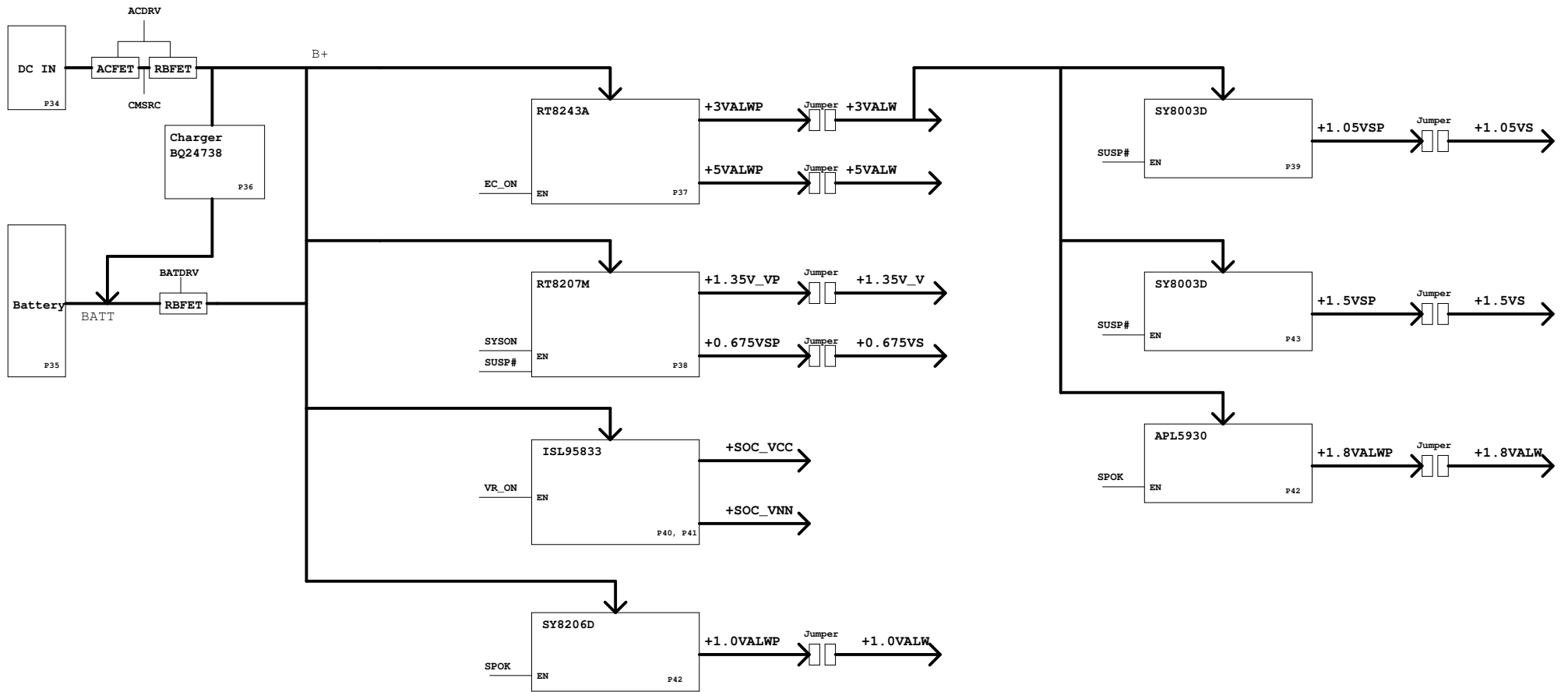
<SATA port>

PCI-E	Function	Note
0	HDD	
1	NC	

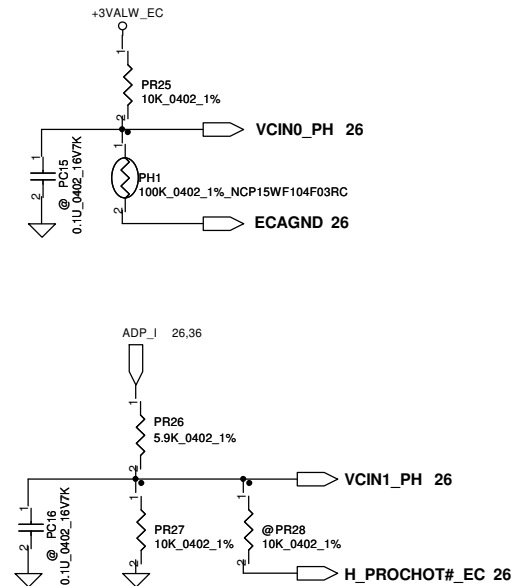
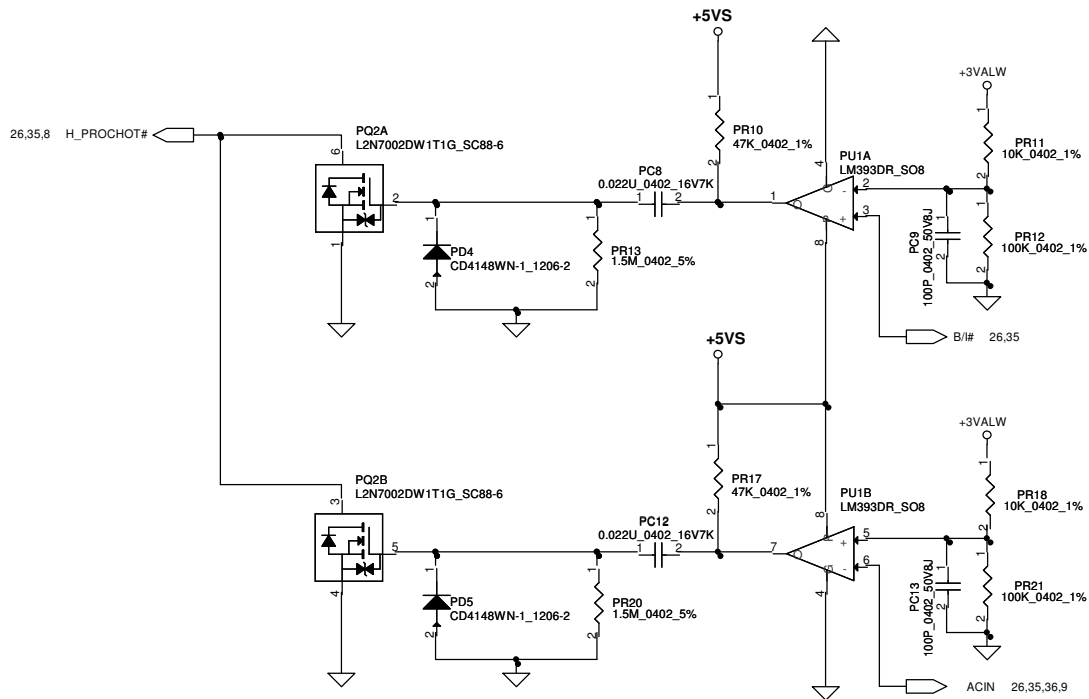
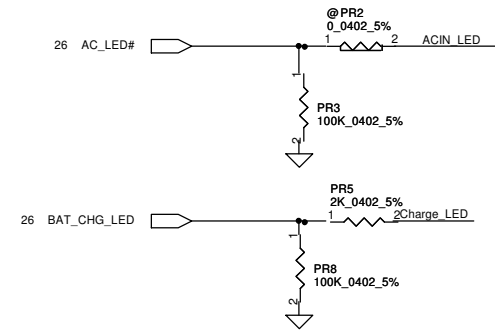
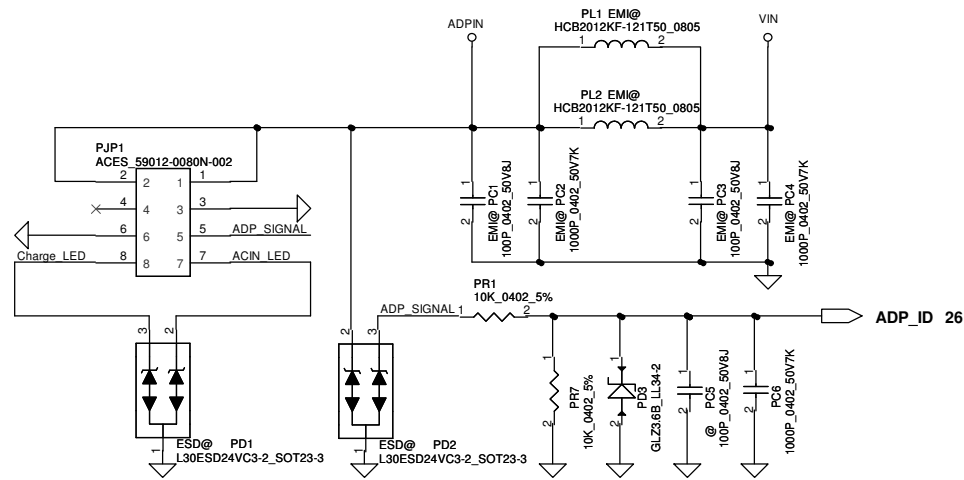
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Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
1	29		131107		1.Change PN of RPF1 from SD302100380 to SD309100380		
2	28		131109		1.Change Control pin of LID from NEM_LID_SW(R218) to LID_SW#(R219)		
3	24		131109		1.Follow 14" Haswell LA-A993PRO2's USB2 Conn.		
4	16		131111		1.Update UT3 footprint follow Haswell platform		
5	22		131111		1.Delete R954 ,Q84 for ODD_DA# 2.unpop RS11		
6	18		131111		1.Change PN of LM13,LM14,LM15 & LM16 from SM070001V00 to SM070003K00		
7	30		131111		1.Change Power Rail of G sensor from +3VALM to +3VL & unpop QG2		
8	30		131111		1.pop DM5		
9	26		131111		1.change Board ID to SI phase		
10	16		131111		1.add PD 100K RT15K for power sequence		

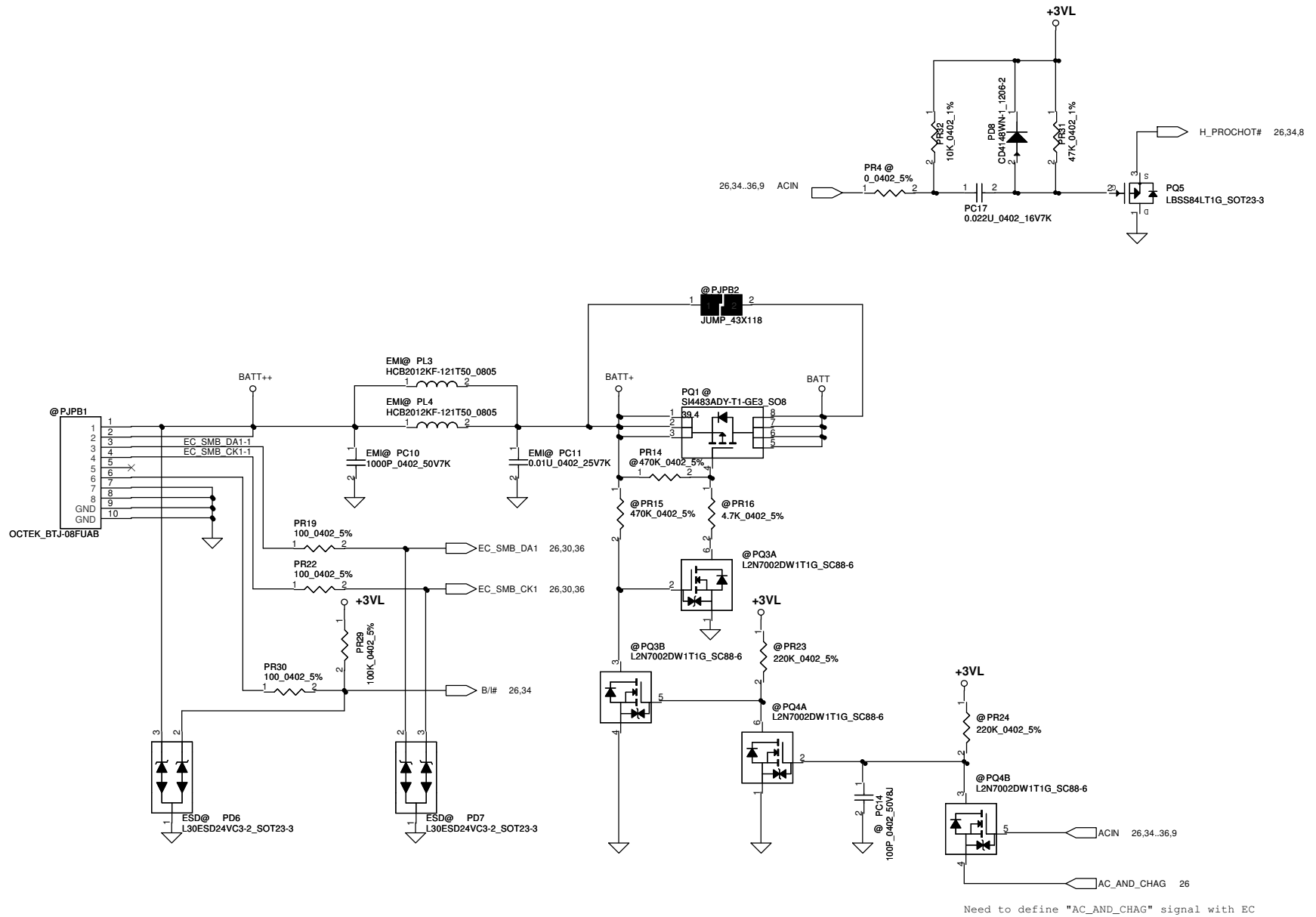
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Issued Date	2013/04/12	Deciphered Date	2014/04/12	Title	
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				Custom	0.1
				Date	Friday, February 21, 2014
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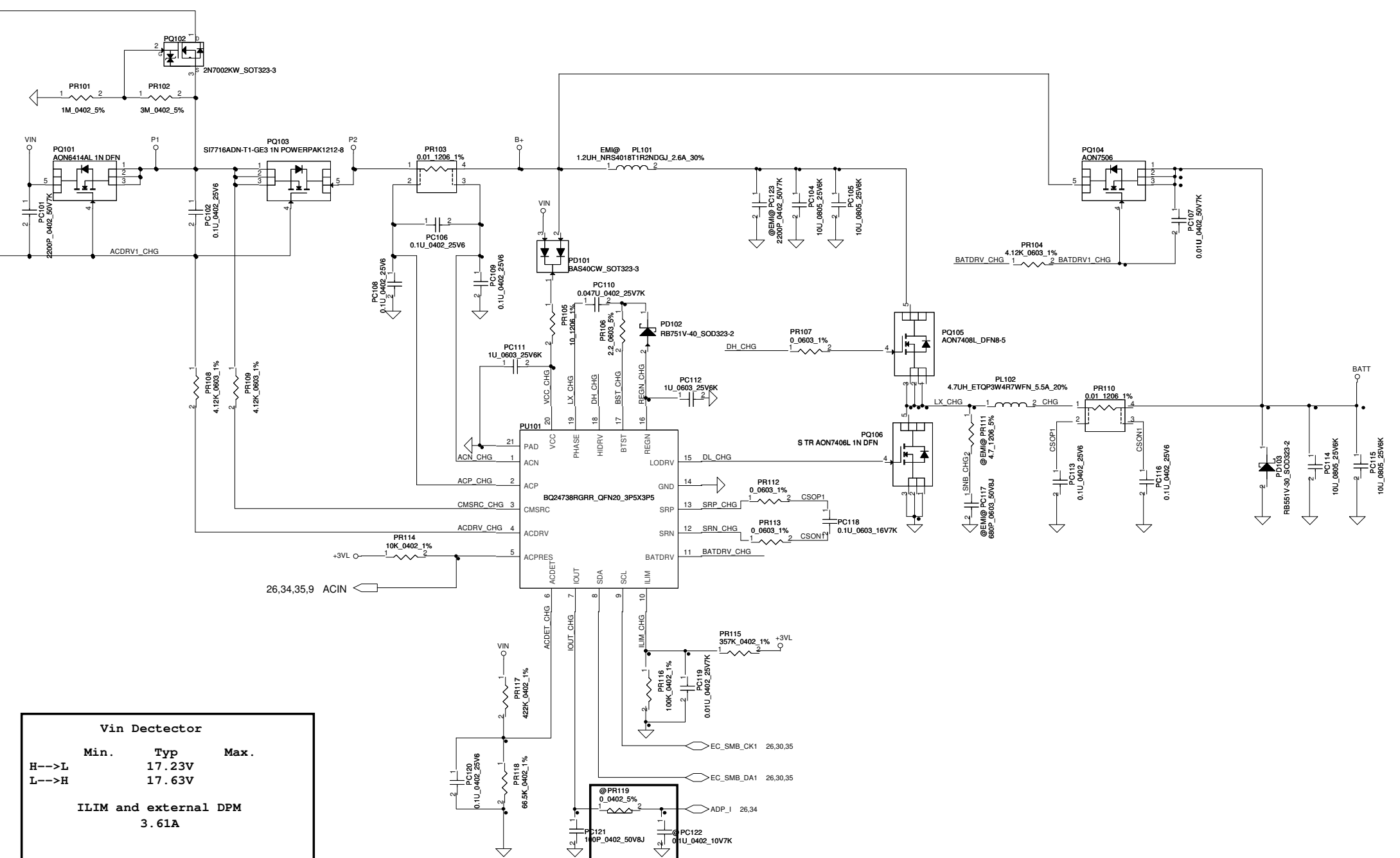
Security Classification	Compal Secret Data			Compal Electronics, Inc.	
Issued Date	2013/08/20	Deciphered Date	2016/08/31	Title	Power Block Diagram
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				Date:	Monday, February 24, 2014
				Sheet	35 of 43



Vin Detector

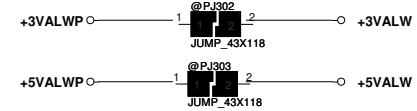
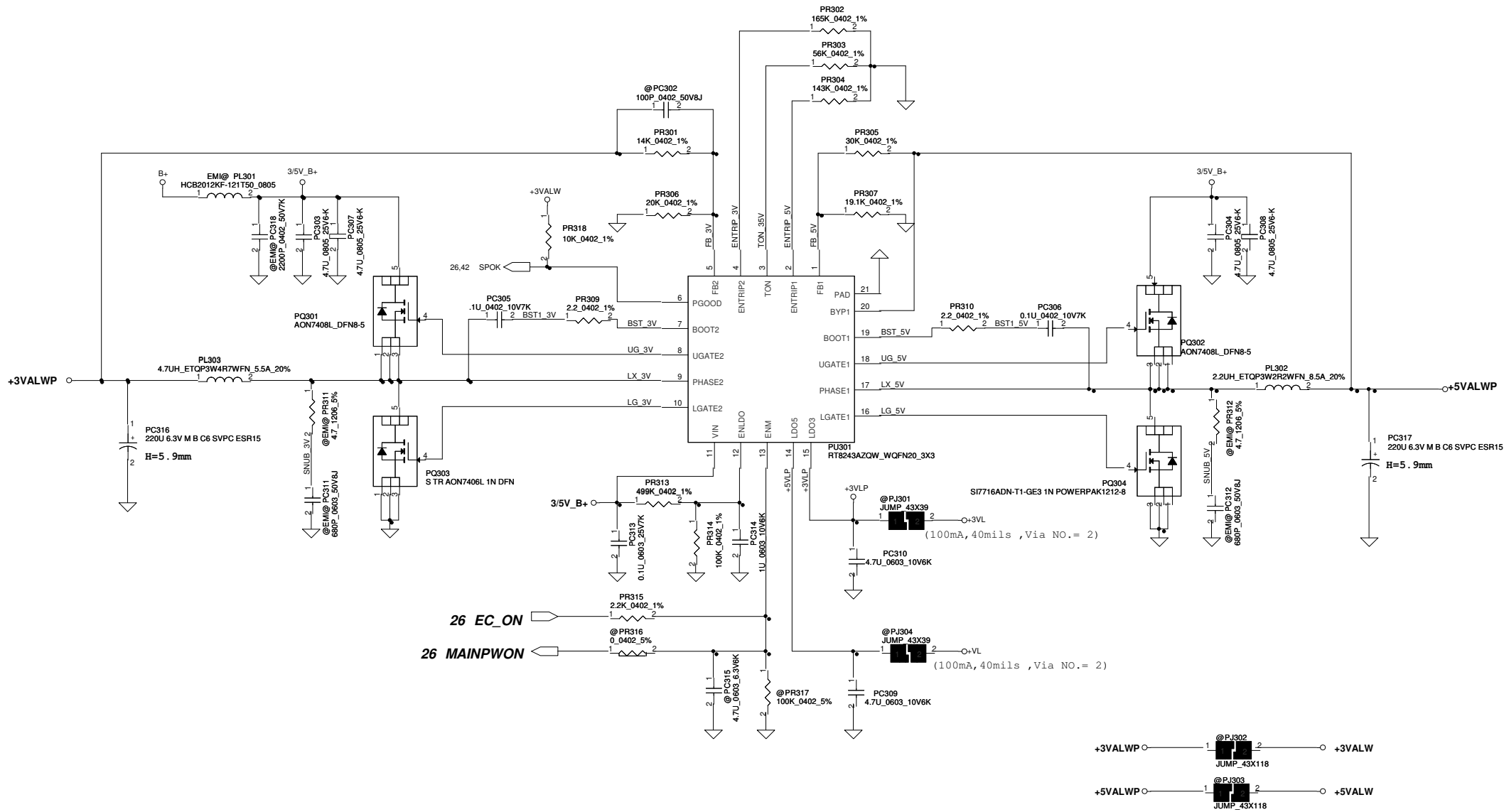
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H-->L		17.23V	
L-->H		17.63V	

ILIM and external DPM

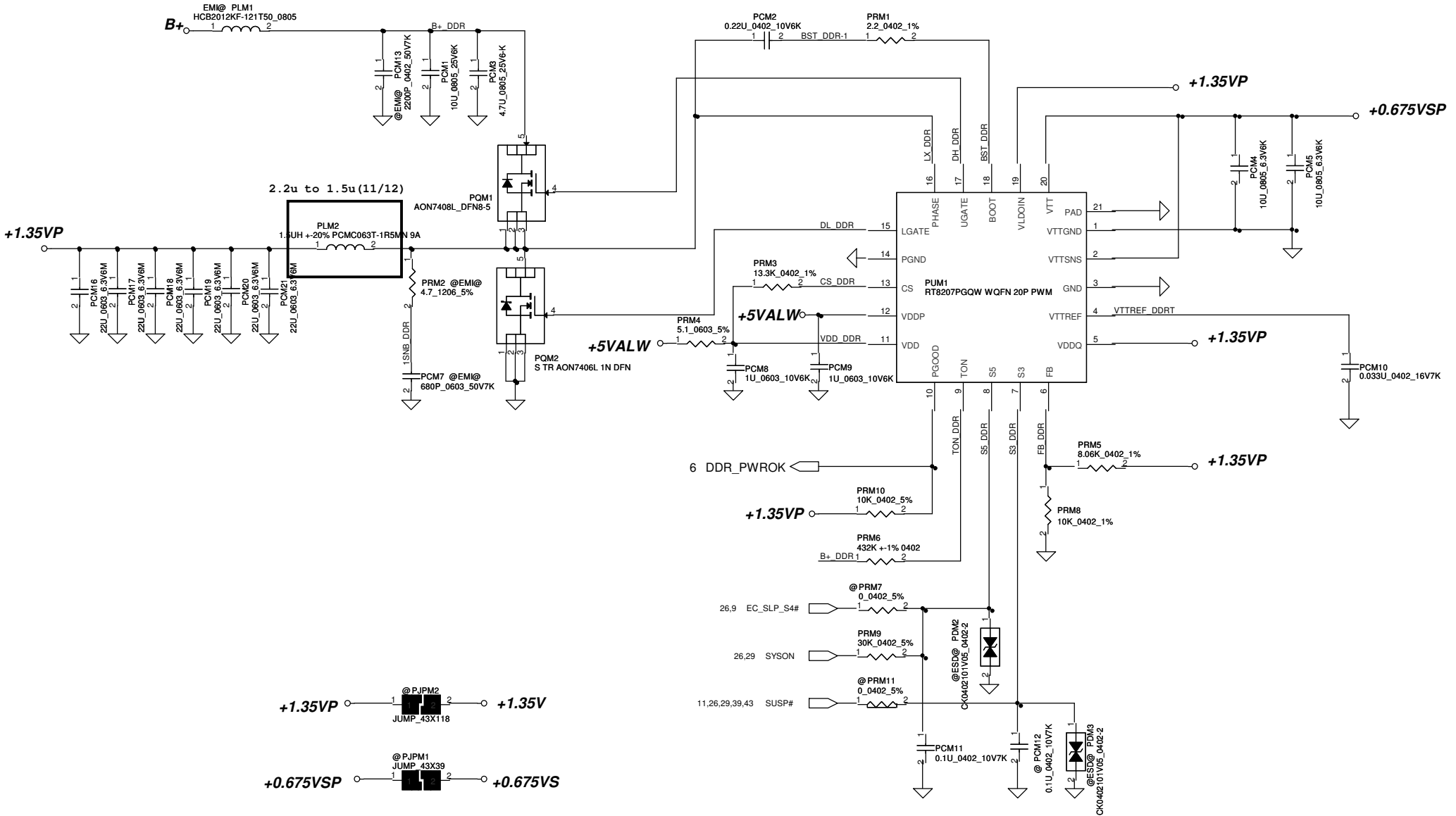
3.61A

Please locate the RC
Near EC chip
2011-02-22

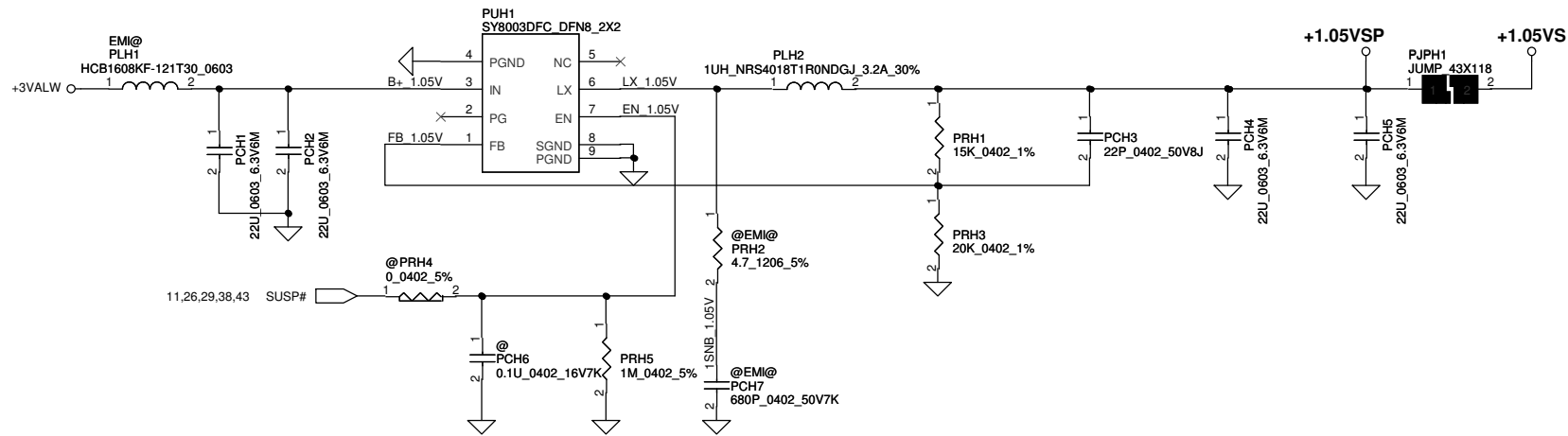
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				Custom	LAB151P
				Date:	Rev 0.1
				Sheet	36 of 43



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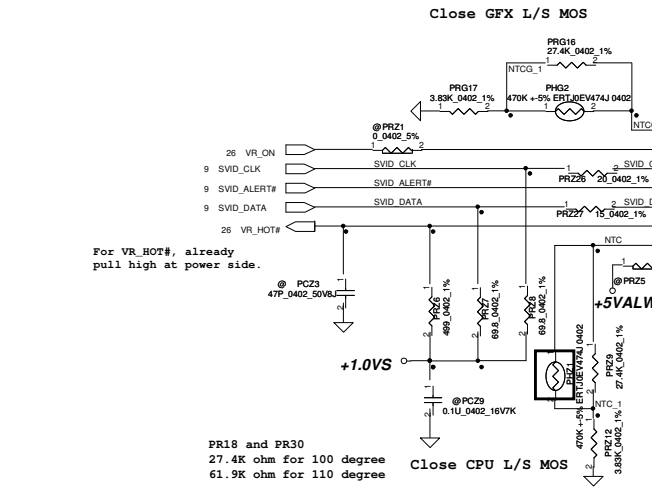


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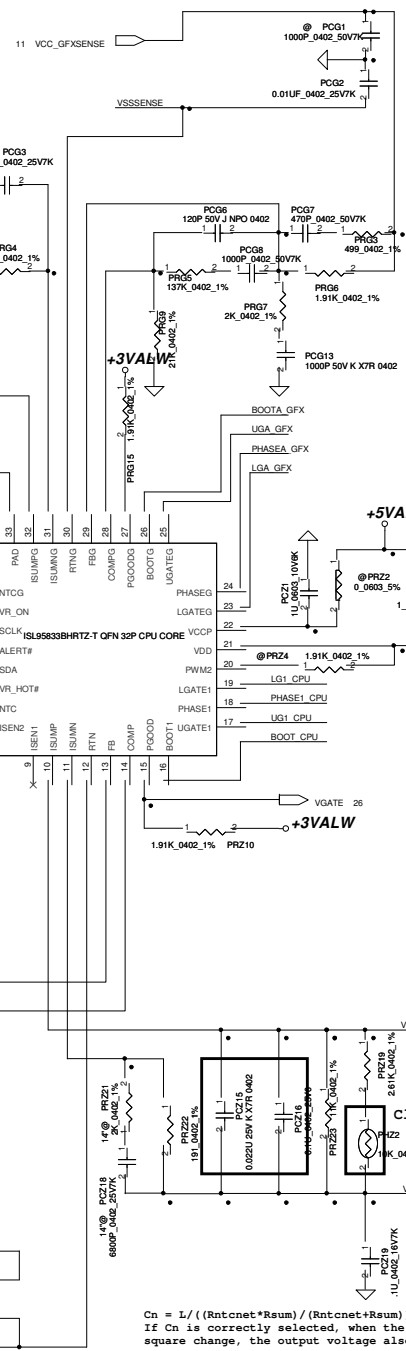
Design Note
 This circuit is for ULC 1+1 7.5W.
 CPU: Icc=12A
 Loadline: -5.9 m V/A
 GFX(GT2): Icc=14A
 Loadline: -5.9 m V/A



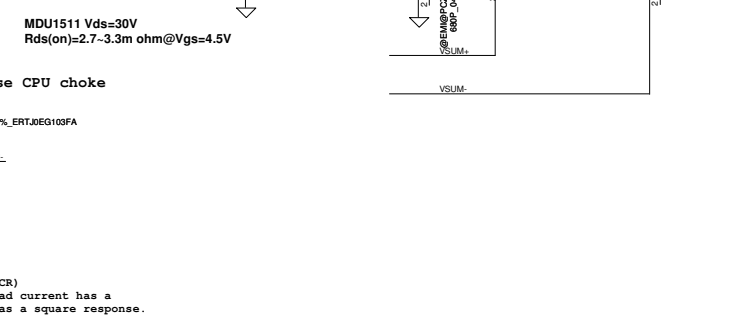
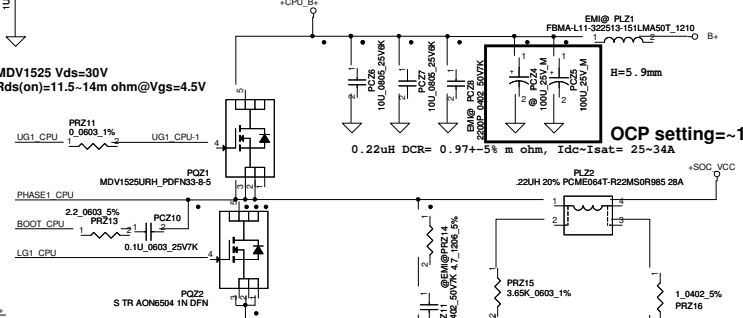
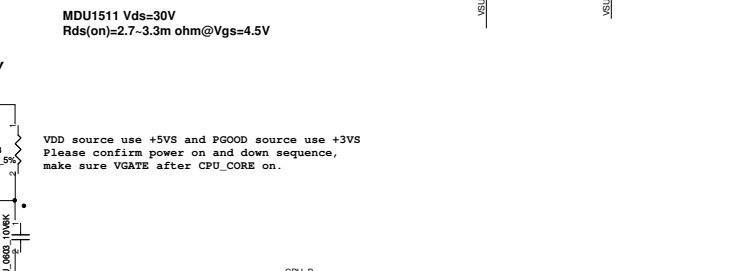
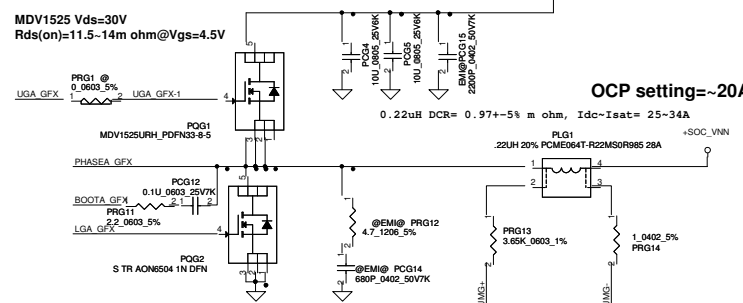
For VR_HOT#, already pull high at power side.

PR18 and PR30
 27.4K ohm for 100 degree
 61.9K ohm for 110 degree

Layout Note
 SVID routing
 1. Alert# signal must be routed between the Clock and Date lines to reduce the cross talk between them. Signal order arrangement: mobile order is Clock-Alert-Date.
 2. SVID spacing requirement is 18mils (0.475mm)@VSSSENSE
 3. Maximum total microstrip routing length of each SVID signal must not exceed 6000mils (152.4mm).
 4. The SVID bus must be ground reference, It cannot be referenced to input (Vbat or 12V) power plans as they can couple noise into the SVID bus as power states change.
 5. Avoid routing under noisy circuit, e.g. switch node, Gate driver, B+, Vin, high speed signal.
 6. When SVID signal changes Layer, GND return path may be changed also. We need add GND via for GND reference.



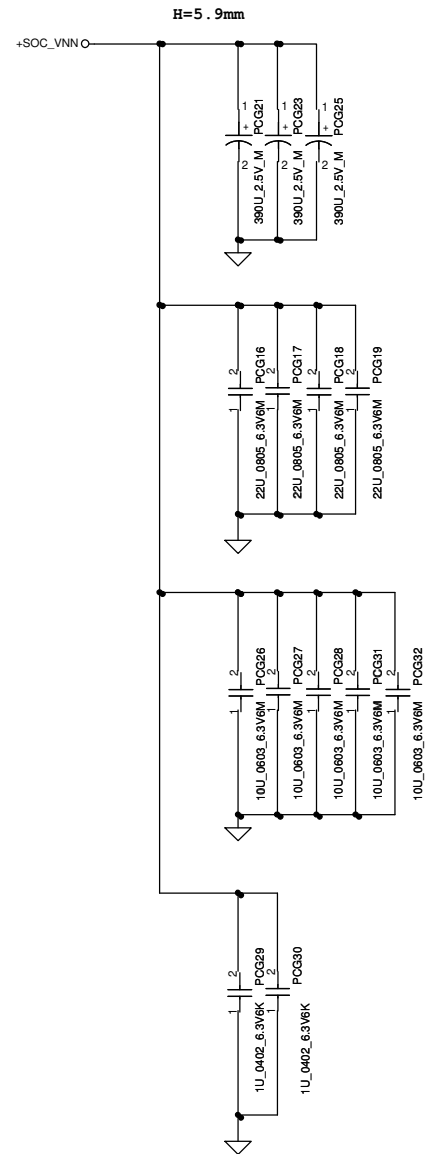
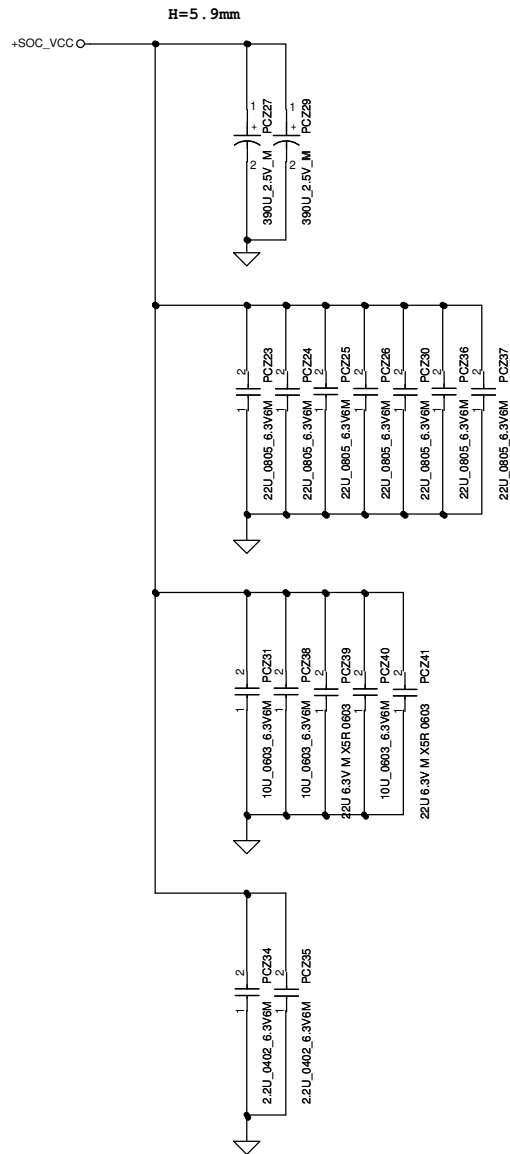
Layout Note
 Reduce Acoustic Noise
 1. The AL bulk capacitor of B+ should be very close to CPU_CORE MOSFET.
 2. Input ceramic caps must place on symmetry same location on top side and bottom side.



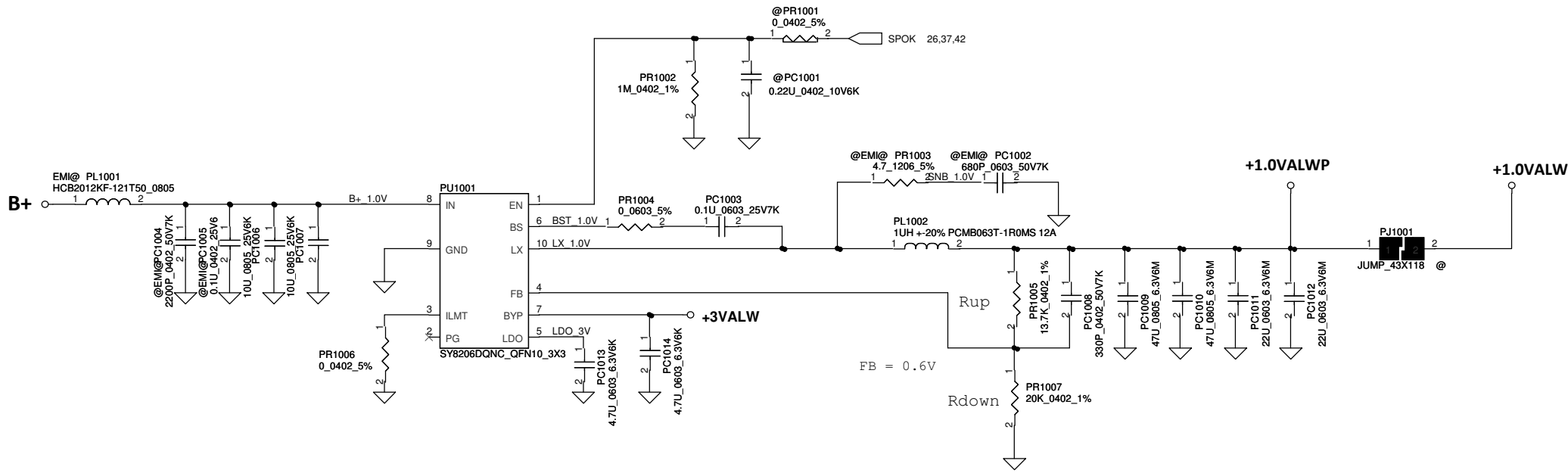
$$C_n = L / ((R_{ntcnet} * R_{sum}) / (R_{ntcnet} + R_{sum}) * DCR)$$

If Cn is correctly selected, when the load current has a square change, the output voltage also has a square response.

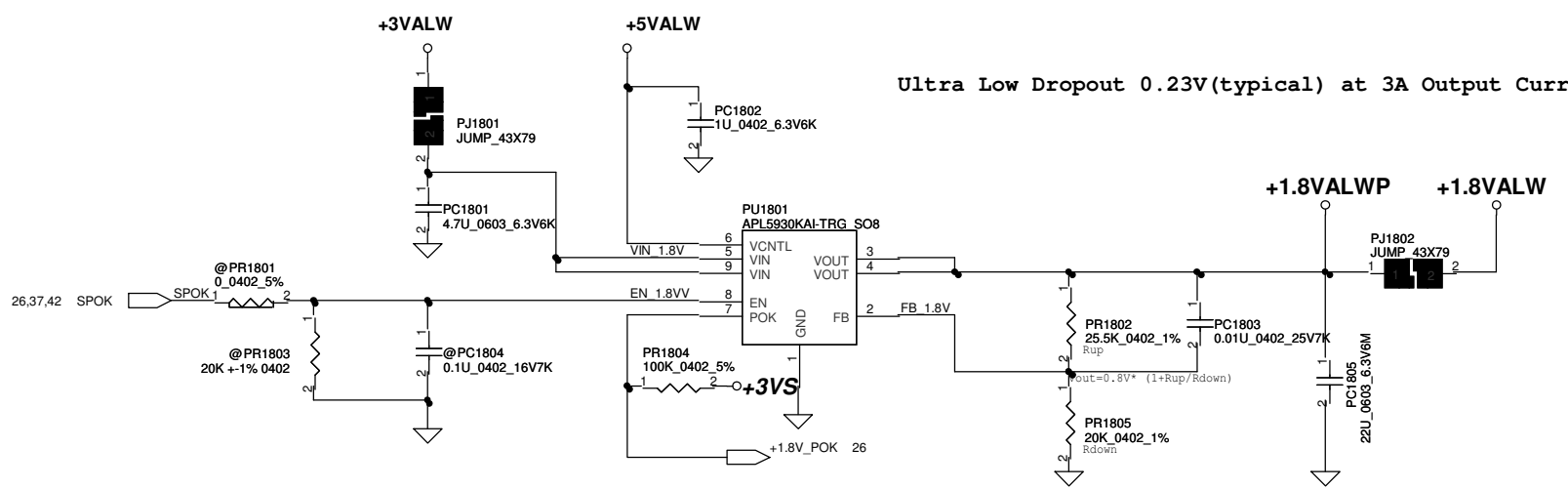
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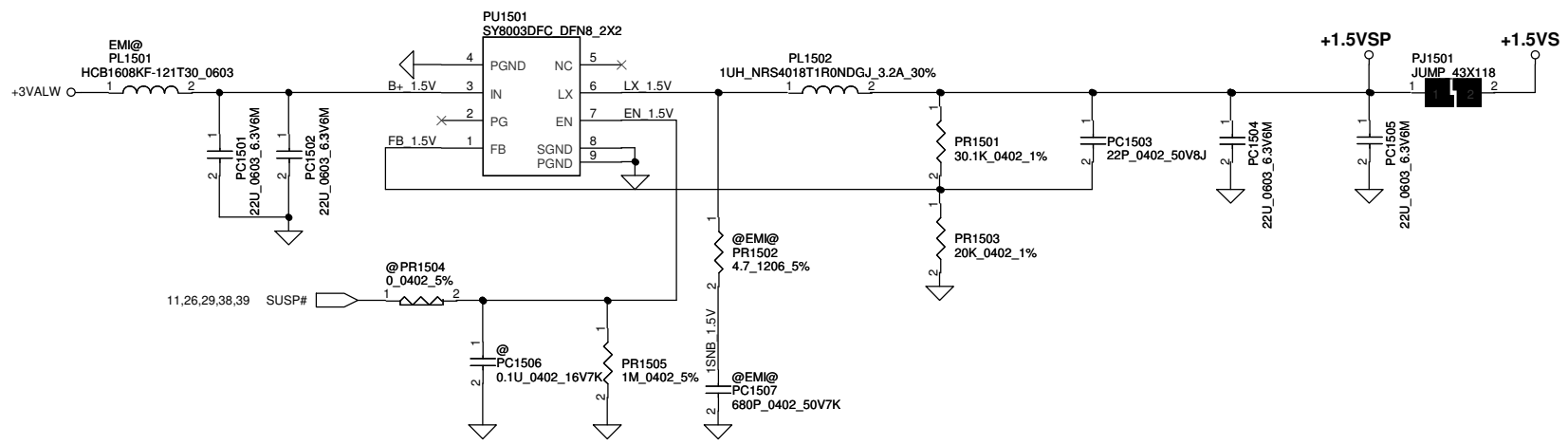
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+3VALW **+5VALW** **Ultra Low Dropout 0.23V(typical) at 3A Output Current**



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