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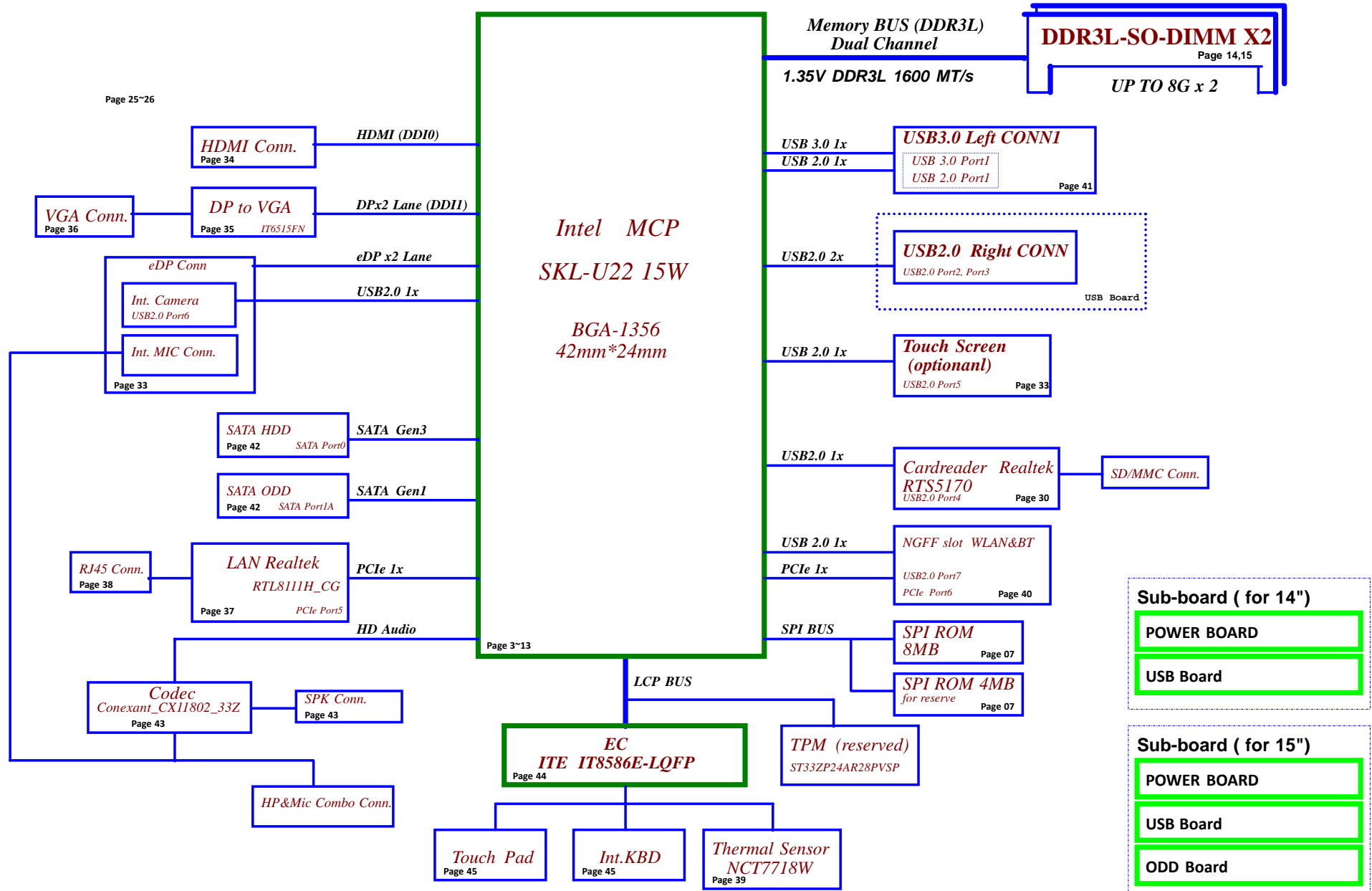
BMWQ1/Q2 UMA M/B Schematics Document

Intel Skylake U22 with DDRIIL

2015-07-12

REV:1.0

Security Classification	LC Future Center Secret Data			Title		
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Title	Block Diagram		
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Voltage Rails (0 --> Means ON , X --> Means OFF)

Power Plane	State	B+	+3VALW +5VALW +3VALW_PCH +1.8VALW +1.0VALW	+1.35V +VCCST	+5VS +3VS +VCCIO +VCCSTG +VCCSA +VCC_GT +CPU_CORE +0.675VS
S0	0	0	0	0	0
S3	0	0	0	0	X
S3 Battery only	0	0	0	0	X
S5 S4/AC Only	0	0	X	X	X
S5 S4 Battery only	0	X	X	X	X
S5 S4 AC & Battery don't exist	X	X	X	X	X

STATE	SIGNAL	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON		HIGH	HIGH	HIGH	ON	ON	ON	ON
S3 (Suspend to RAM)		LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)		LOW	LOW	LOW	ON	OFF	OFF	OFF
S5 (Soft OFF)		LOW	LOW	LOW	ON	OFF	OFF	OFF

HSIO PORT	Function	BOM Structure	BTO Item
USB3.0	1	USB3.0 CONN left	@
	2	NC	14@
	3	NC	15@
	4	NC	14or15@
	5	NC	14or17@
	6	NC	AOAC@
USB2.0	1	USB3.0 CONN Left	BCD@
	2	USB2.0 CONN1 Right	Cannonlake@
	3	USB2.0 CONN2 Right	CD@
	4	Camera	DUALMIC@
	5	Cardreader	EMC@
	6	Touch Panel	EMC_15@
	7	BT	EMC_NS@
	8	NC	EMC_PX@
	9	NC	EMC_PXNS@
	10	NC	ES@
PCIE	1	NC	EXO@
	2	NC	GCLK@
	3	NC	ME@
	4	NC	NTS@
	5	LAN	PCH_SDIO@
	6	WLAN	PCH_SDIO1@
	7	used as SATA	PCH_SDIO2@
	8	used as SATA	PX@
SATA	X4 PCIE (9-12)	DGPU	RANKA@
	0	HDD	RANKB@
	1A	ODD	Realtek_SD@
	1B	used as PCIE	SINGLEMIC@
			SINGLERANK@
			DUALRANK@
			TS@
			TPM@
			UMA@

SMBUS Control Table

	SOURCE	BATT	IT8586E	SODIMM	WLAN WIMAX	Thermal Sensor	PCH	TP Module	charger	DGPU
EC_SMB_CK1	IT8586E	V	V	X	X	X	X	X	V	X
EC_SMB_DA1	+3VALW	V	+3VALW	X	X	X	X	X	V	X
EC_SMB_CK2	IT8586E	X	V	X	X	V	V	X	X	V
EC_SMB_DA2	+3VS	X	+3VS	X	X	+3VS	+3VALW_PCH	X	X	+3VGS
PCH_SMB_CLK	PCH	X	X	V	V	X	V	X	X	X
PCH_SMB_DATA	+3VALW_PCH	X	X	+3VS	+3VS	X	+3VALW_PCH	X	X	X

EC SM Bus1 address

Device	Address
Smart Battery	0X16
Charger	0001 0010 b

EC SM Bus2 address

Device	Address
Thermal Sensor NCT7718W	1001_100xb
PCH	need to update
DGPU	need to update

PCH SM Bus address

Device	Address
DDR DIMMA	1010 000Xb
DDR DIMMB	1010 010Xb
Wlan	Rsvd

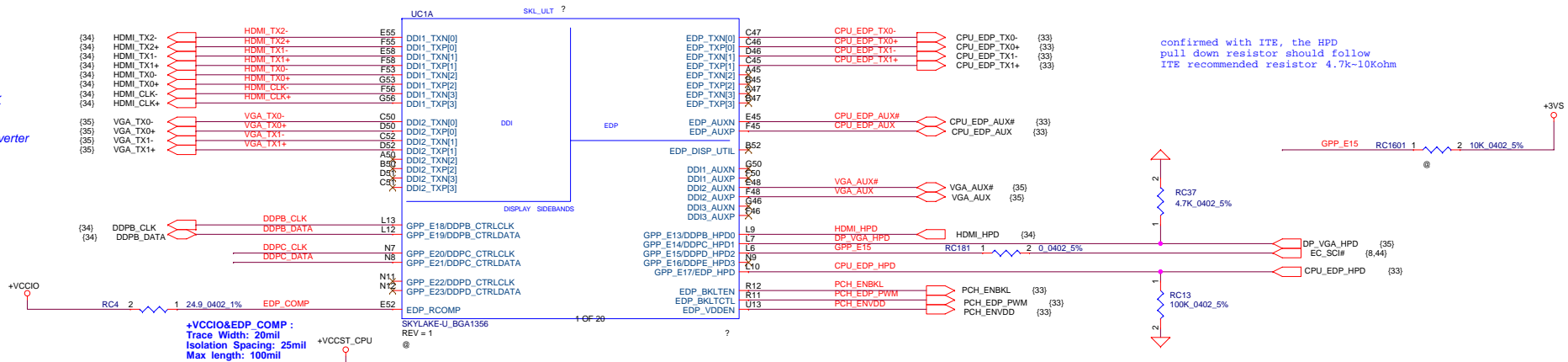
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HDMI D2
HDMI D1
HDMI D0
HDMI CLK

DP TO VGA Converter



confirmed with ITE, the HPD pull down resistor should follow ITE recommended resistor 4.7k-10kohm

+VCCIO&EDP_COMP :
Trace Width: 20mil
Isolation Spacing: 25mil
Max length: 100mil

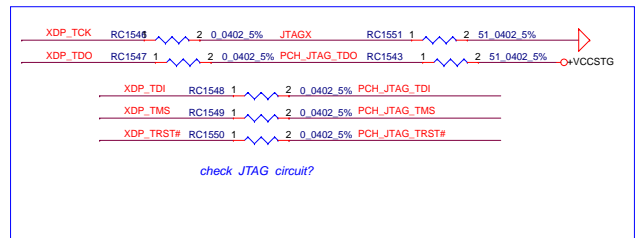
check PROCHOT# circuit with PWR

check H_THRMTRIP# if need to connector to EC

check DDPC_CLK pull high or not?

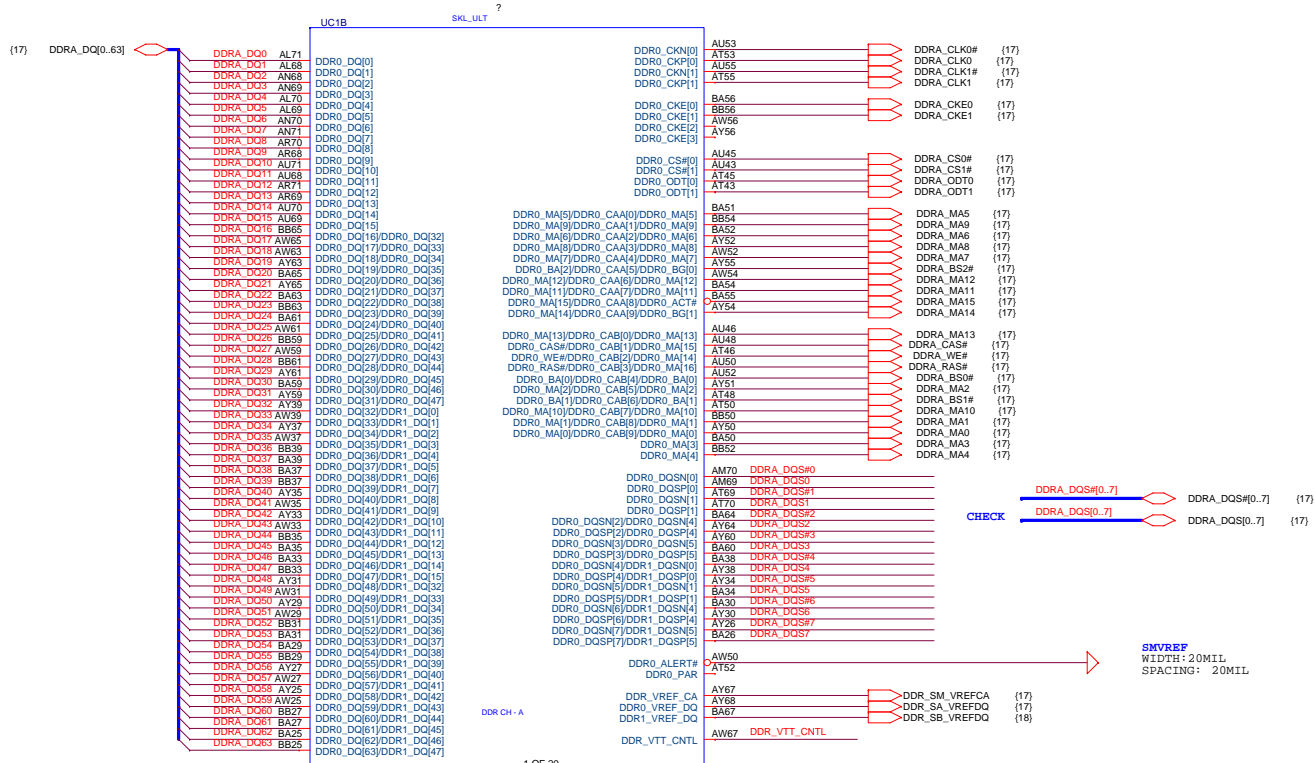
DDP_CTRLDATA strapping sampled on the rising edge of PWROK

Port	Strap	Enable	Disable
Port 1	DDPB_CTRLDATA	Pull up to 3.3 V with 2.2Kohm	NC
Port 2	DDPC_CTRLDATA	Pull up to 3.3 V with 2.2Kohm	NC



check JTAG circuit?

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SKYLAKE-U_BGA1356
REV = 1

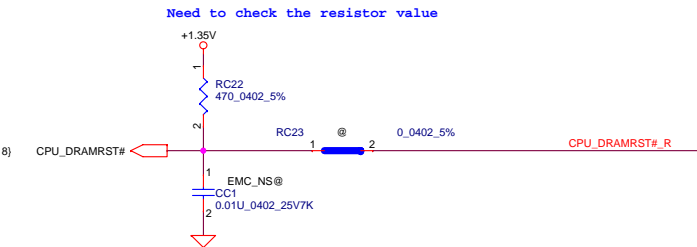
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(18) DDRB_DQ[0..63]



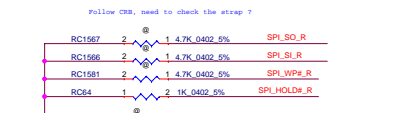
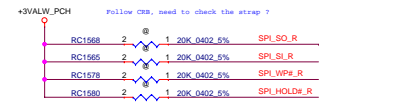
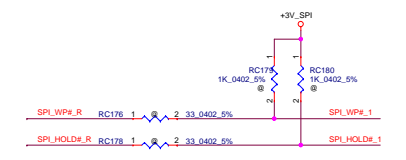
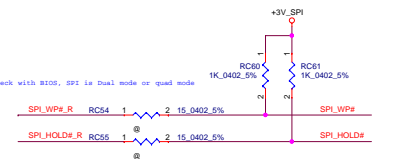
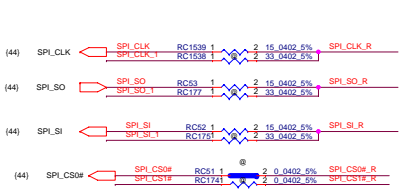
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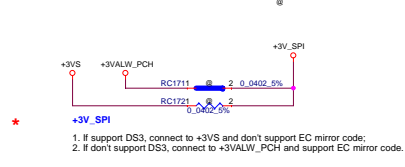
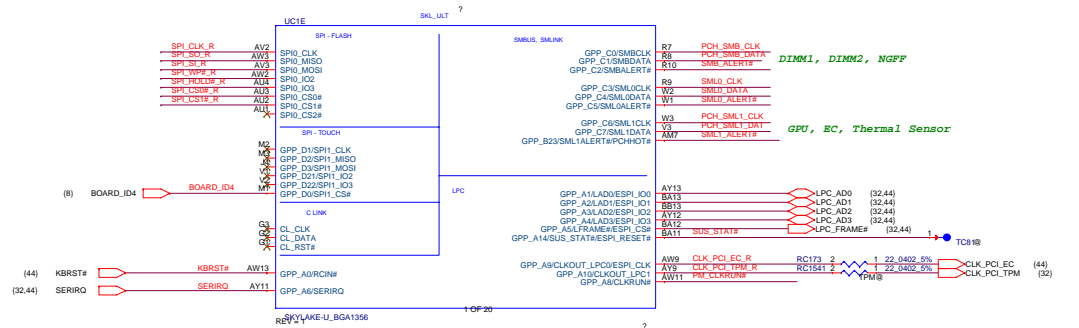


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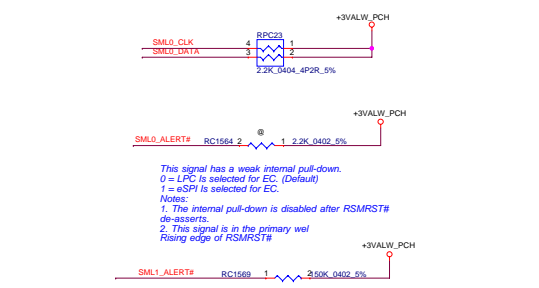
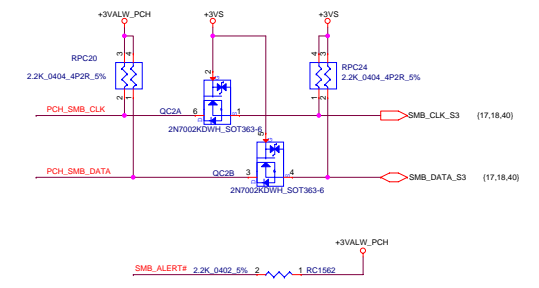
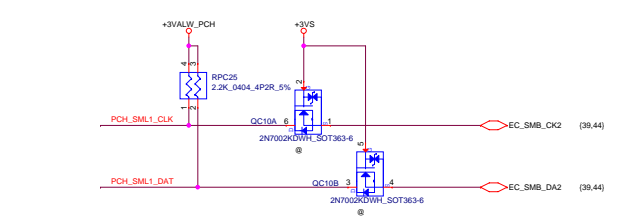
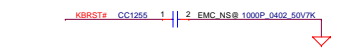
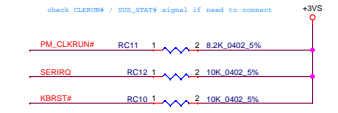
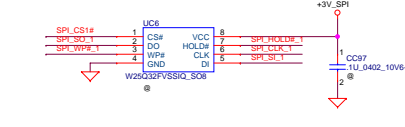
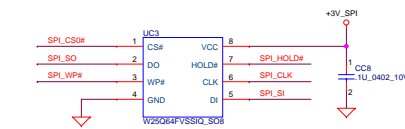
MCP (DDR3LB)		
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Based on WW26 SKL U&Y WOM, RC64 populated, and RC61 de-populated for SKL U ES sample. In this case, customers must ensure that the SPI flash device on the platform has HOLD functionality disabled by default.

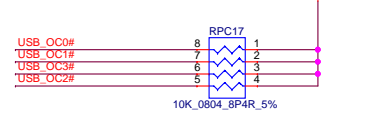
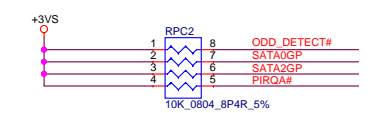
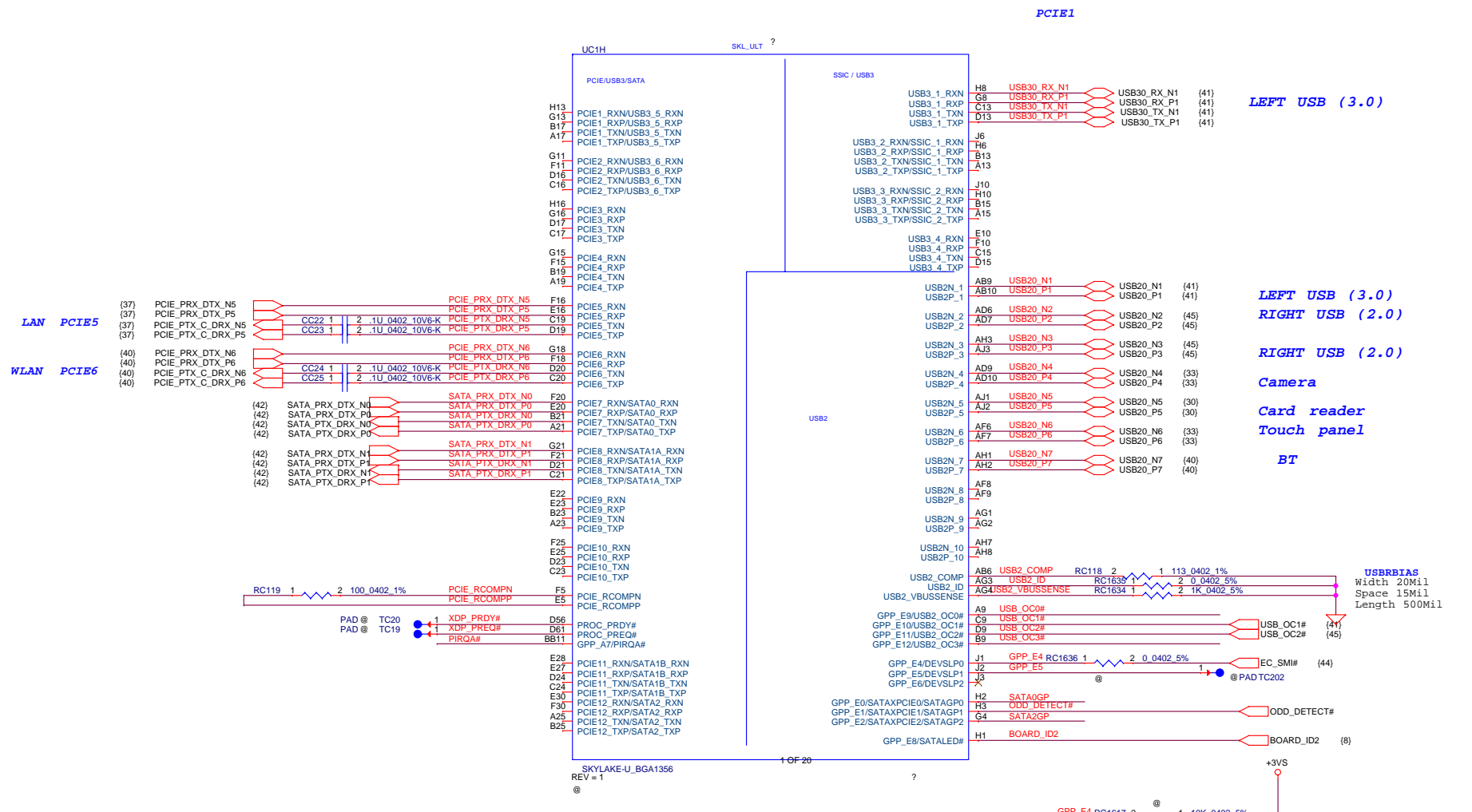


1. If support DS3, connect to +3VS and don't support EC mirror code;
2. If don't support DS3, connect to +3VALW_PCH and support EC mirror code.



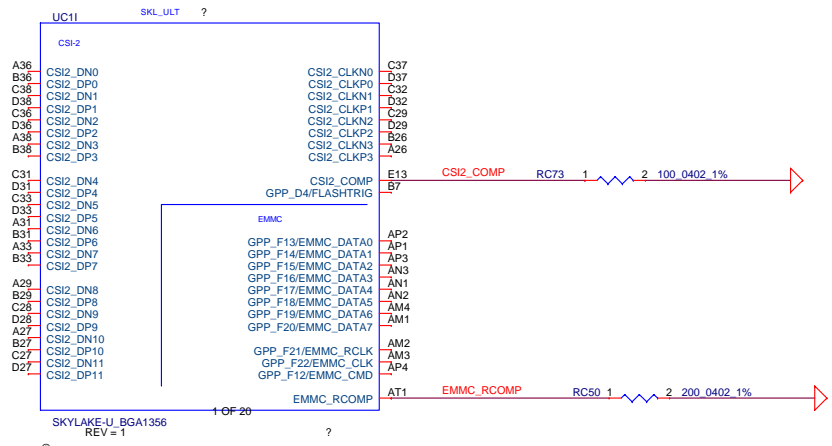
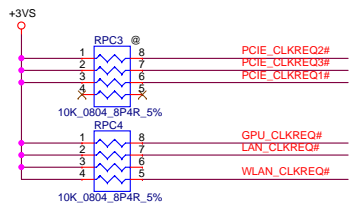
To enable Direct Connect Interface (DCI), a 150K pull up resistor will need to be added to PCHHOT# pin. This pin must be low during the rising edge of RSMRST#. (Refer to WW22_100W)

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check the Pull up resistor

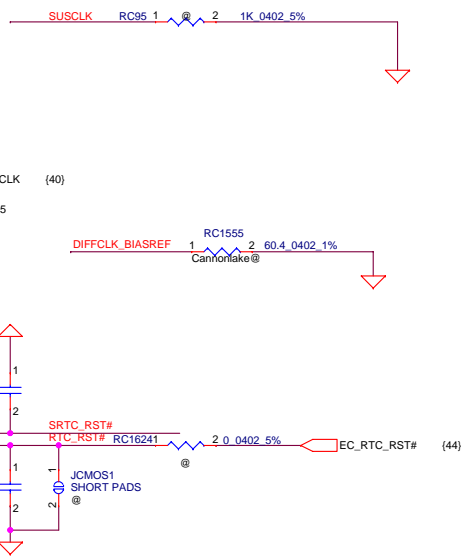
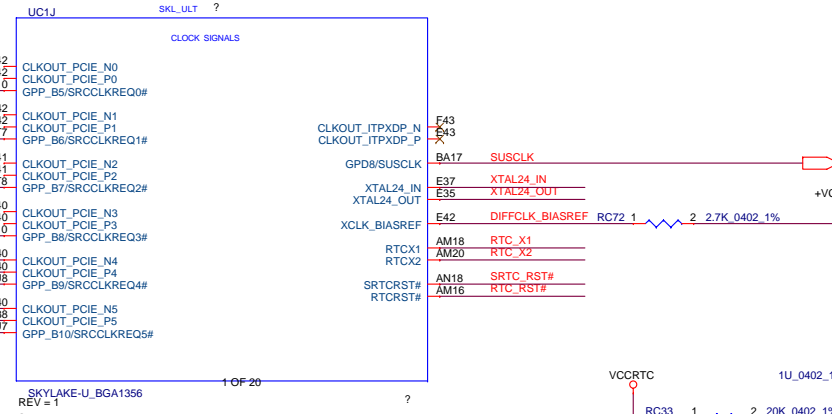


PCIE CLK5 LAN

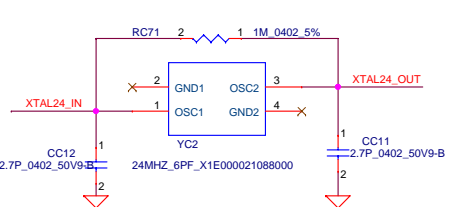
- (37) CLK_PCIE_LAN#
- (37) CLK_PCIE_LAN
- (37) LAN_CLKREQ#

PCIE CLK6 WLAN

- (40) CLK_PCIE_WLAN#
- (40) CLK_PCIE_WLAN
- (40) WLAN_CLKREQ#

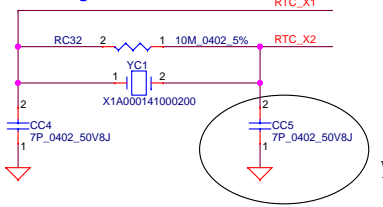


check if need to change to 1M_0402_1% follow PDG, CRB is 1M_0402_5%

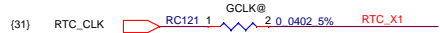


need to use 38.4MHz (30ohm) for Cannonlake-u

change to SJ10000LM00

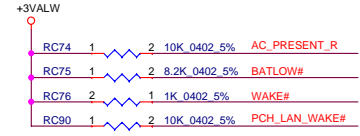
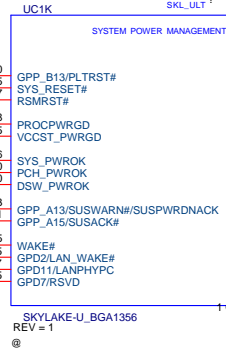
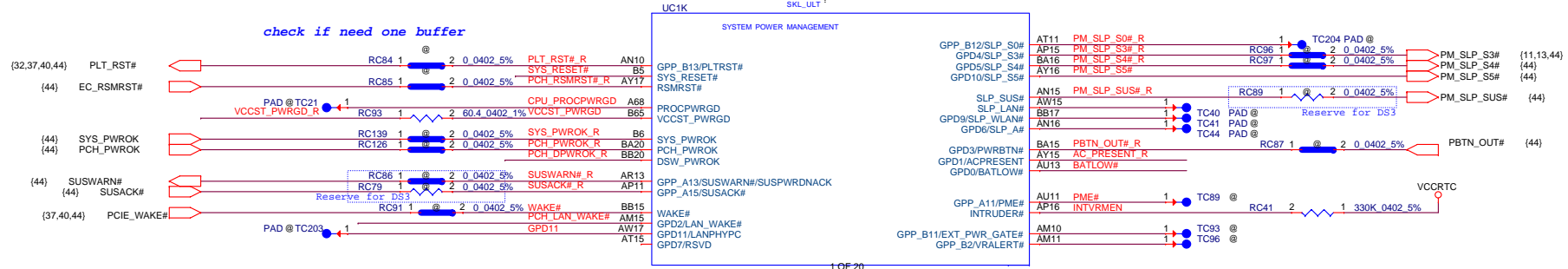


when single end external clock generator used, this pin should be grounded

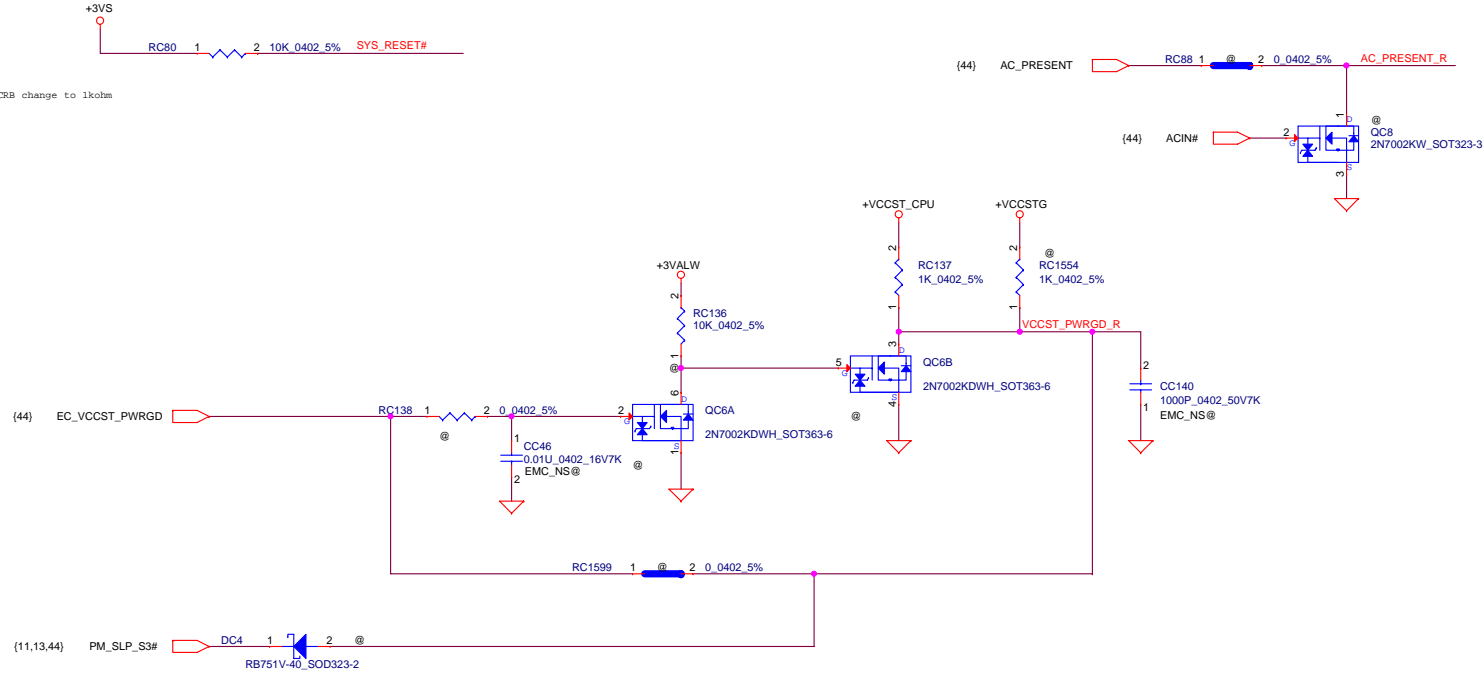
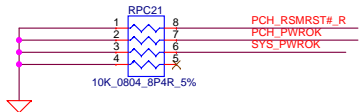
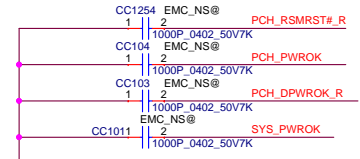
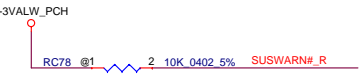


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check if need one buffer



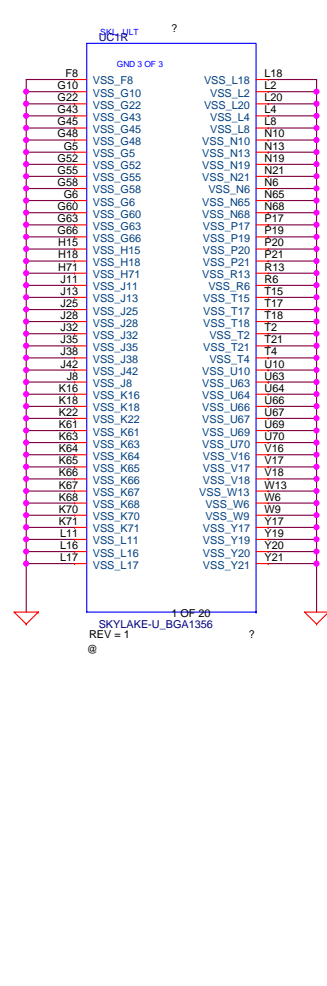
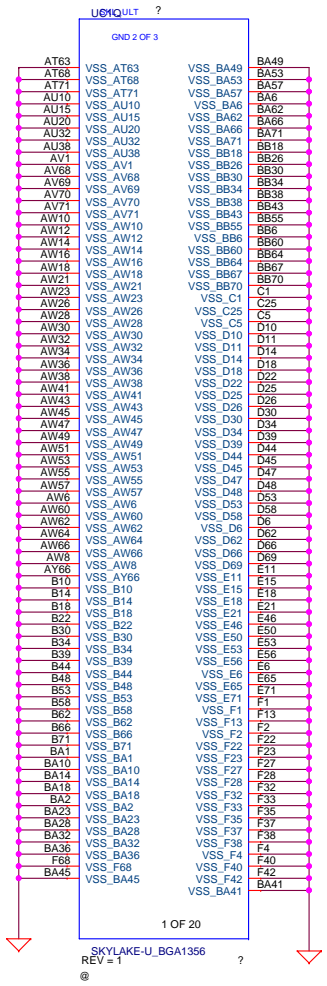
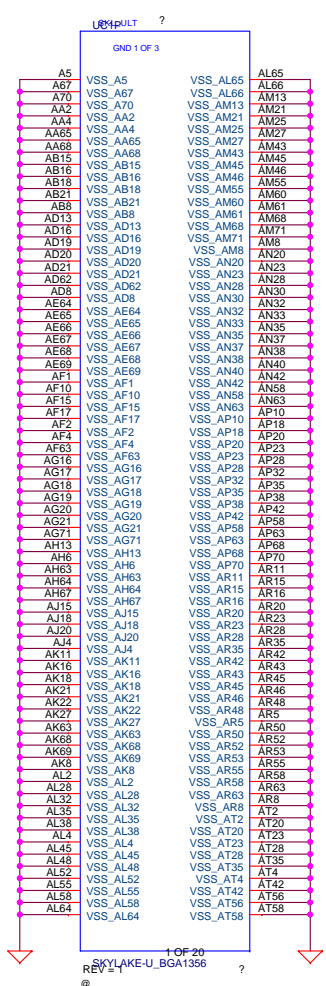
Follow CRB change to 1k0hm



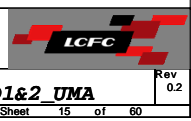
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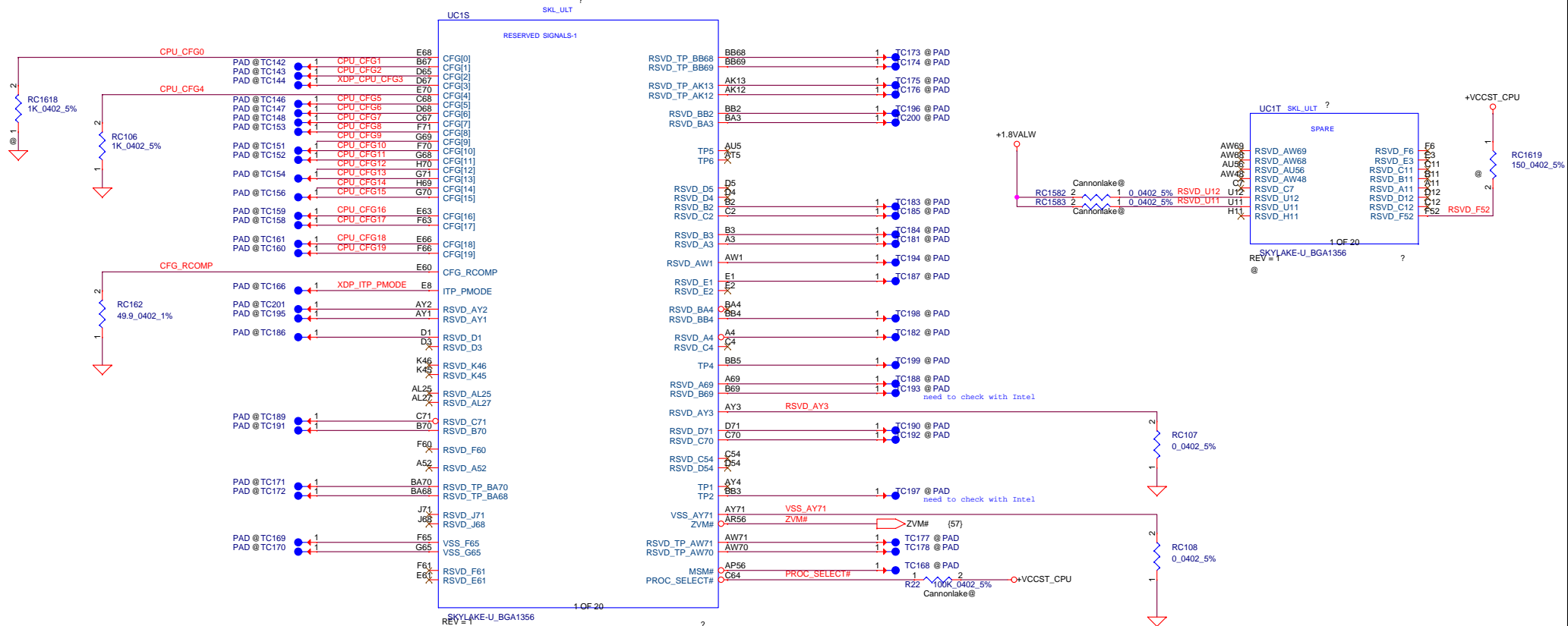
MCP (SYSTEM PWR MANAGE)

BMWQ1&2 UMA



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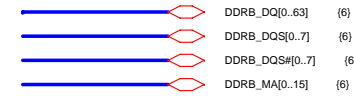


Pin Name	Strap Description	Configuration	Default Value
CFG[4]	Display Port Presence strap	- 1 = eDP Disabled - 0 = eDP Enabled*	1

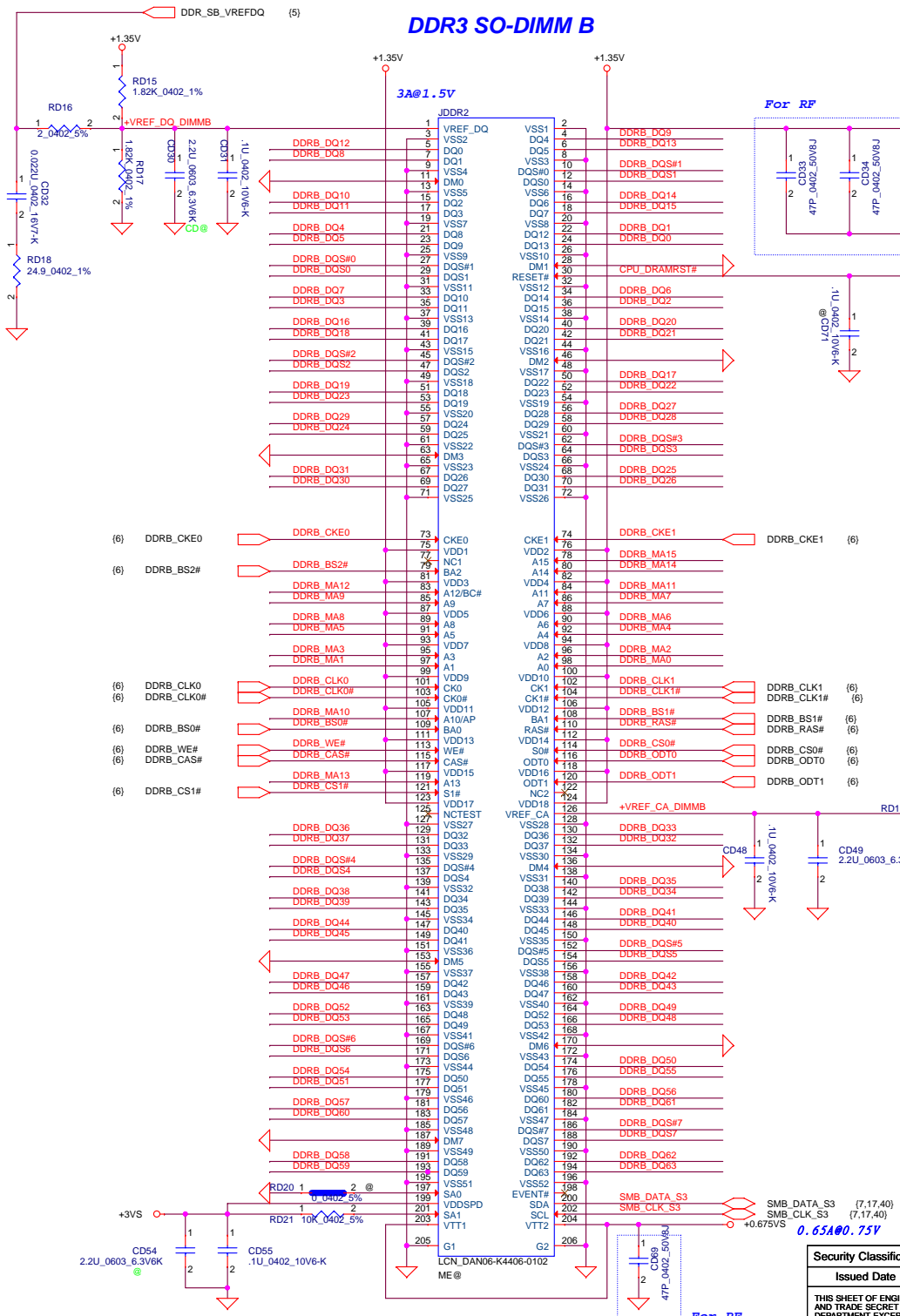
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DDR3 SO-DIMM B

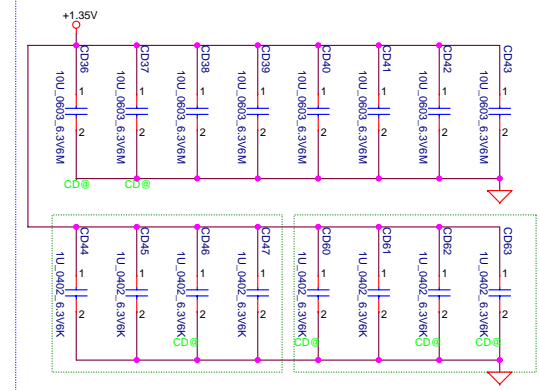
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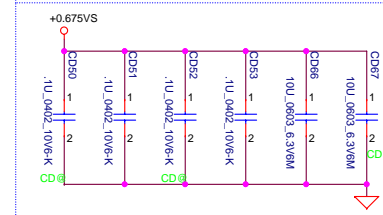
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Layout Note:
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(1U_0402_6.3V)*8



Layout Note:
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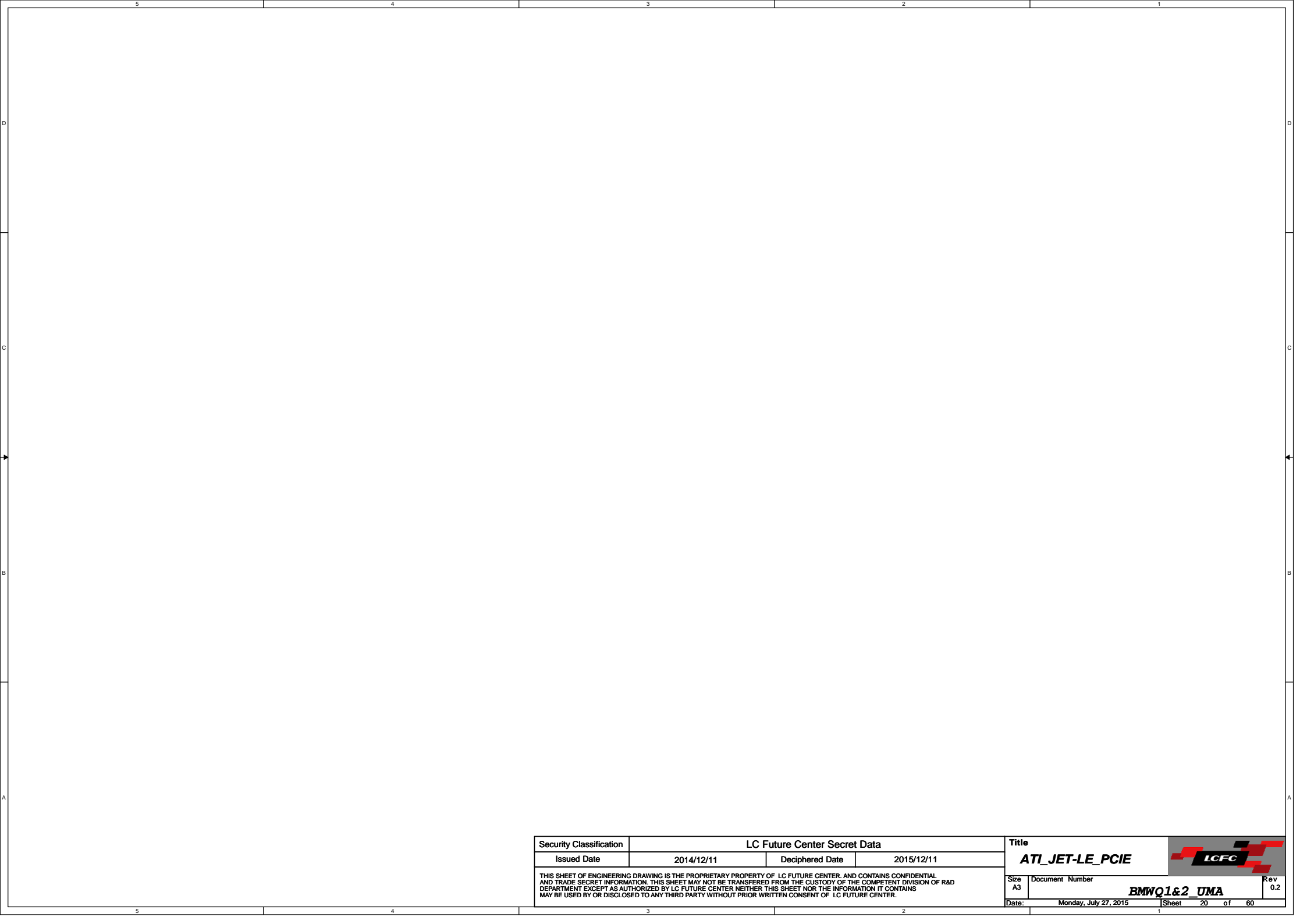
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ATI_JET-LE_TMDP		
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Custom	BMWQ1&2 UMA	0.2
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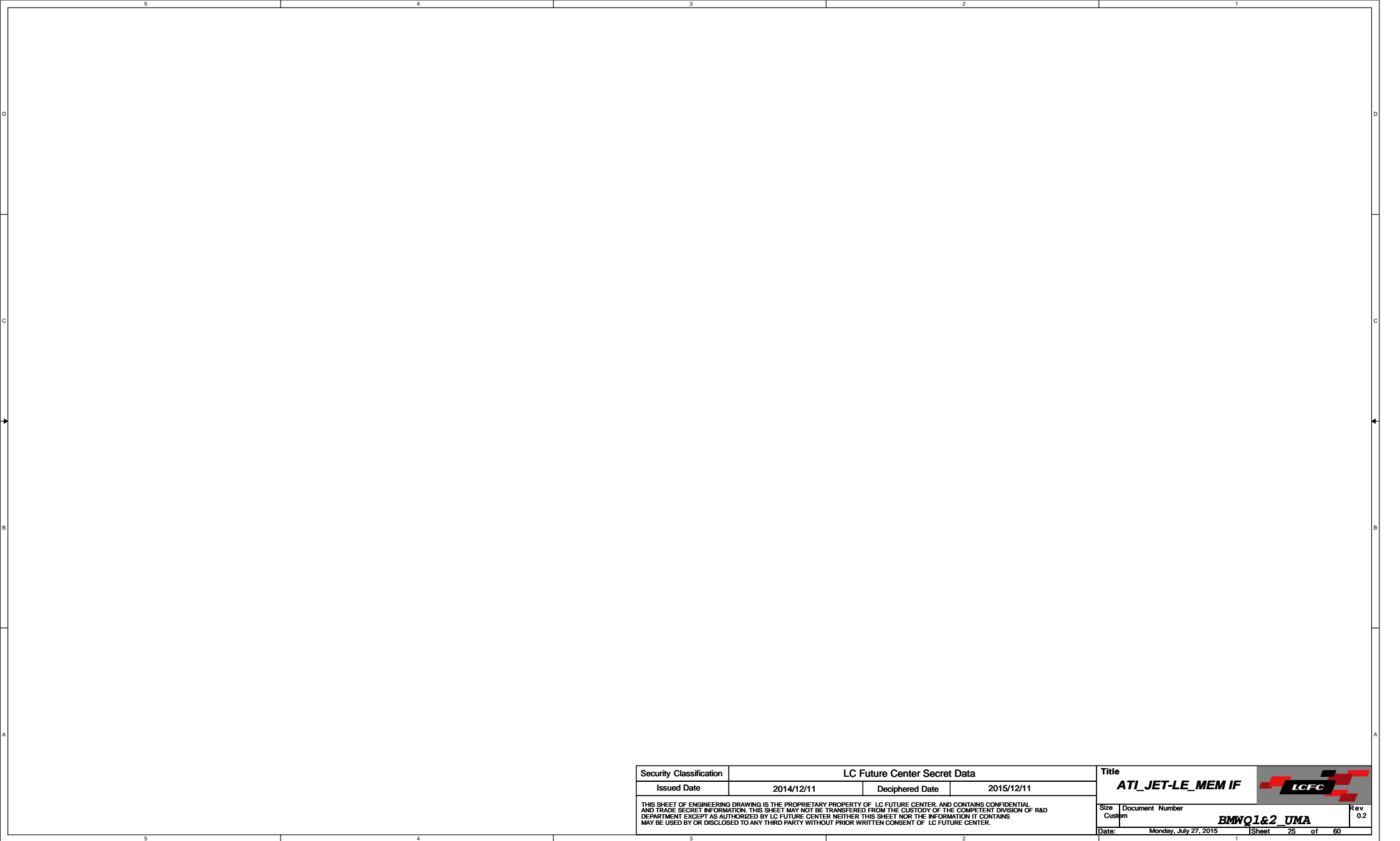
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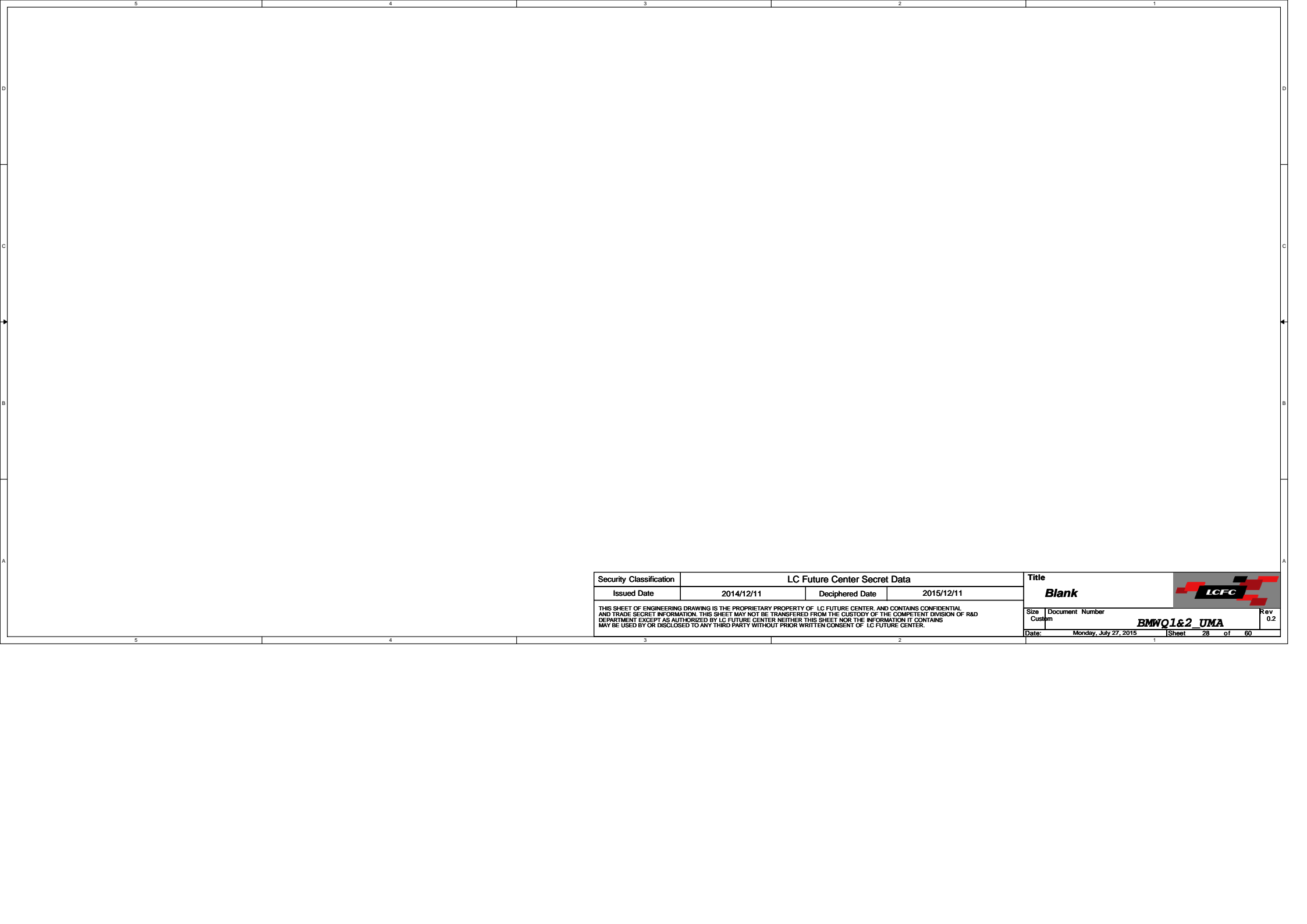
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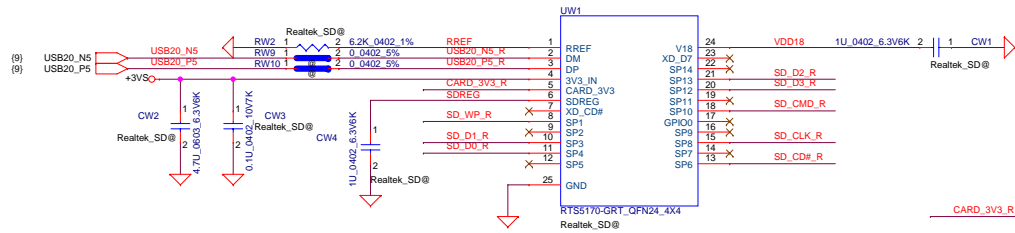
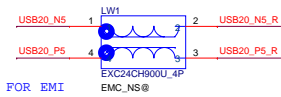


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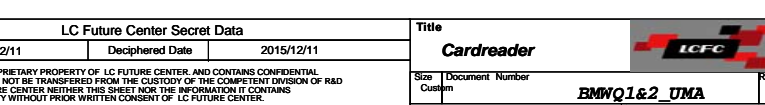
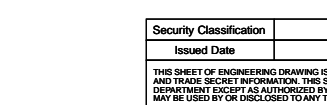
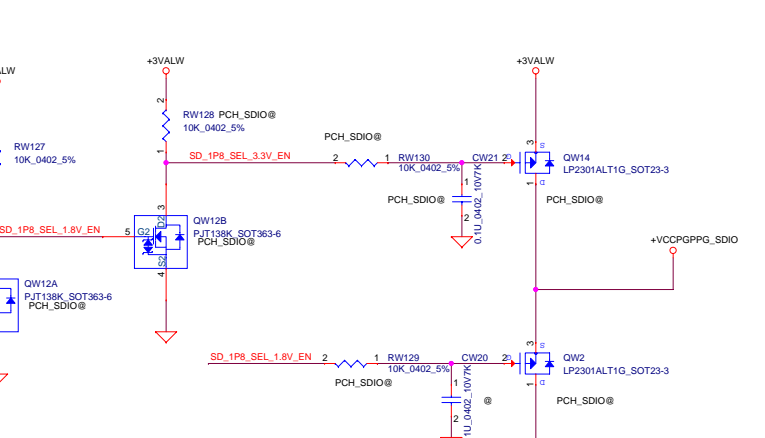
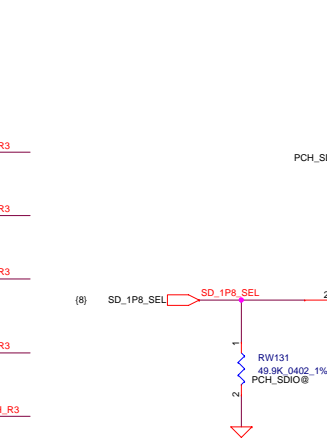
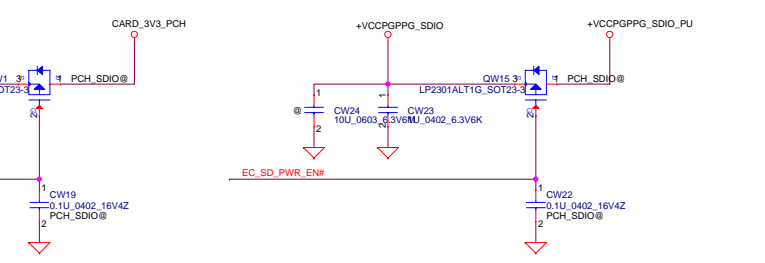
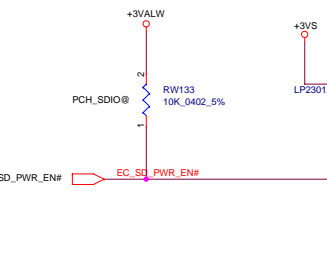
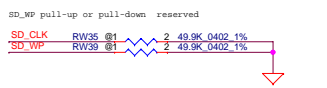
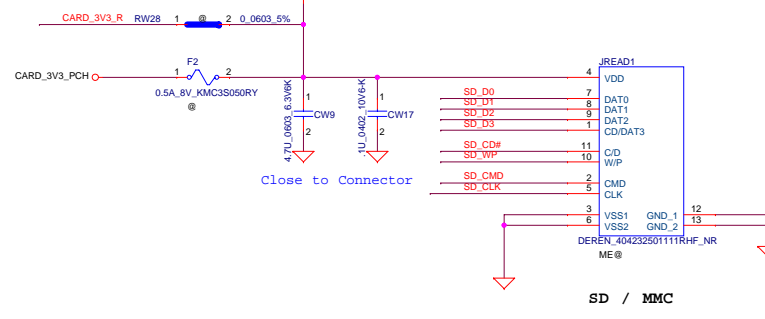
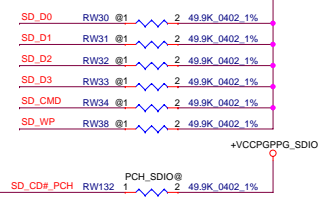
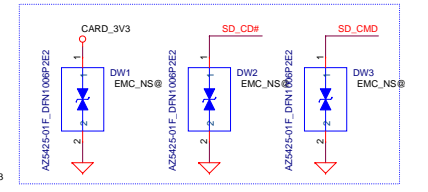
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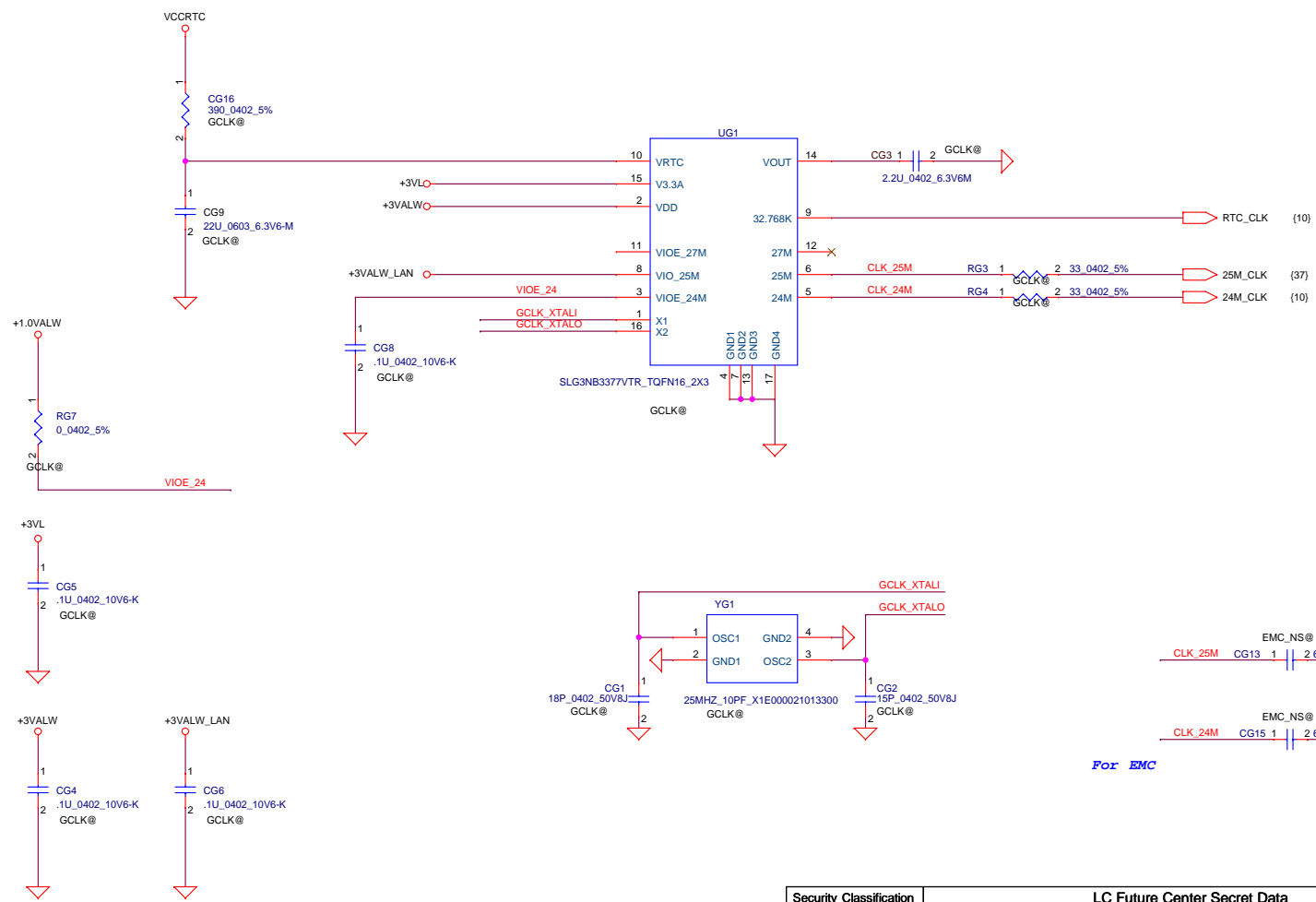
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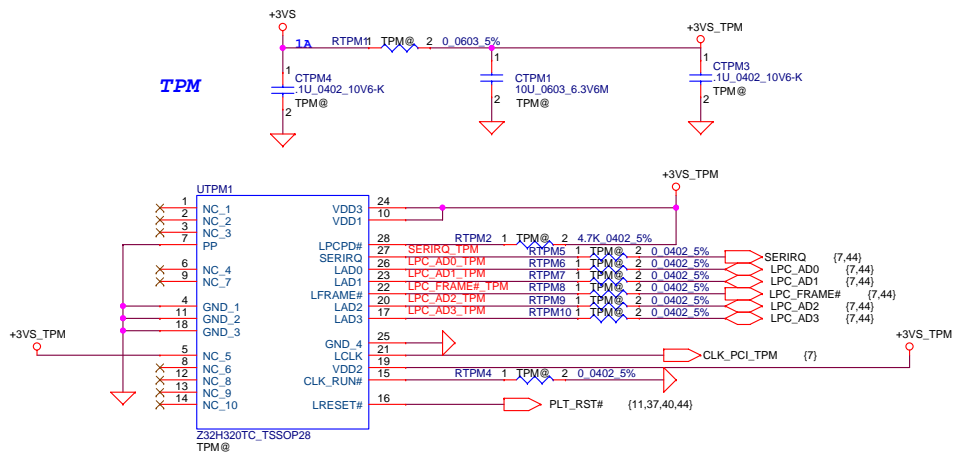


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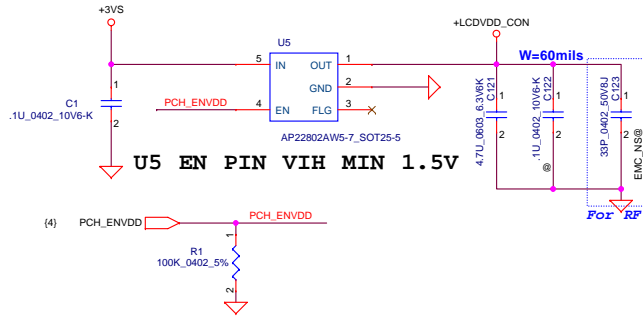




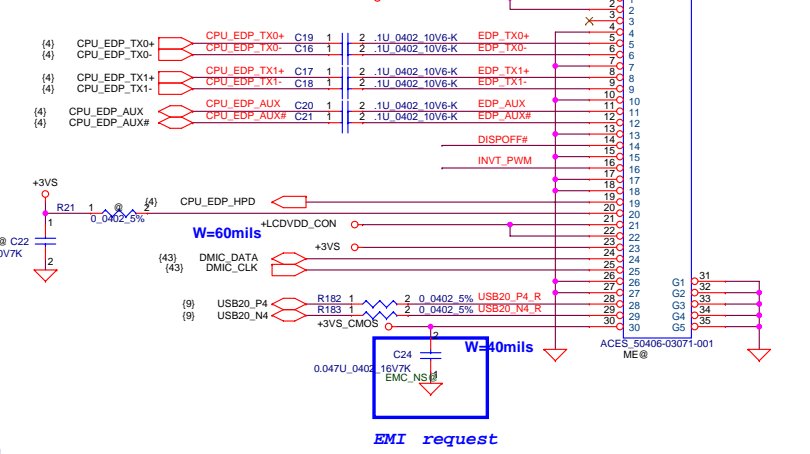
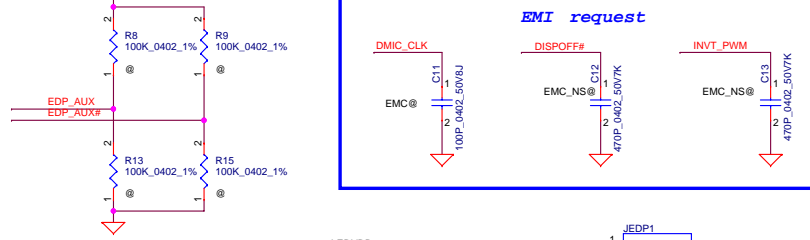
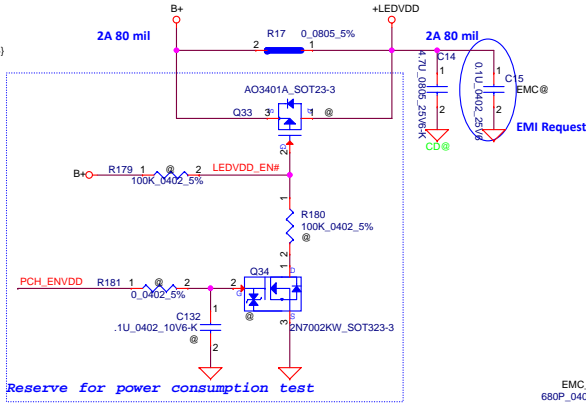
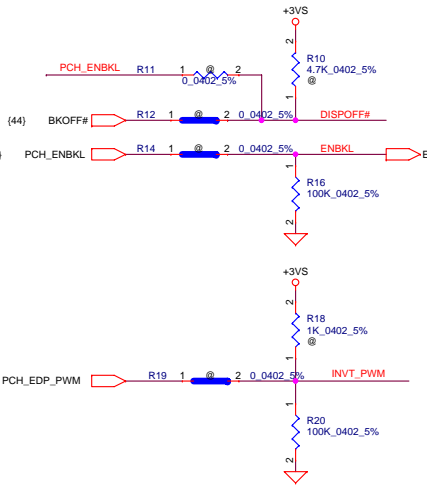
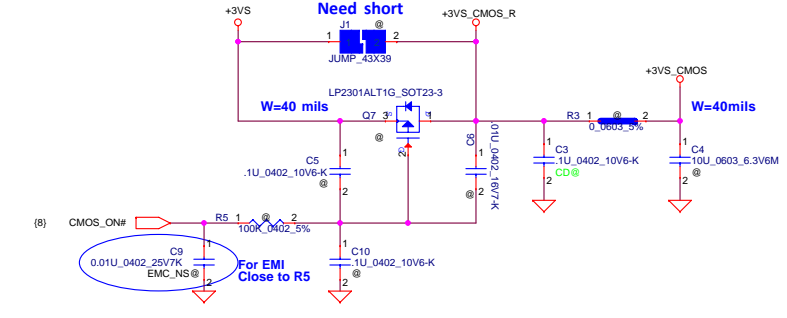
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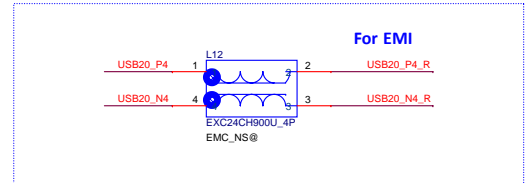
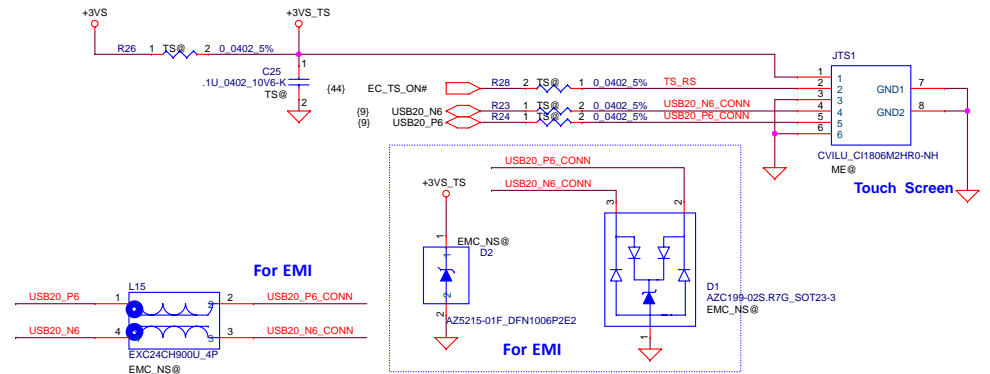
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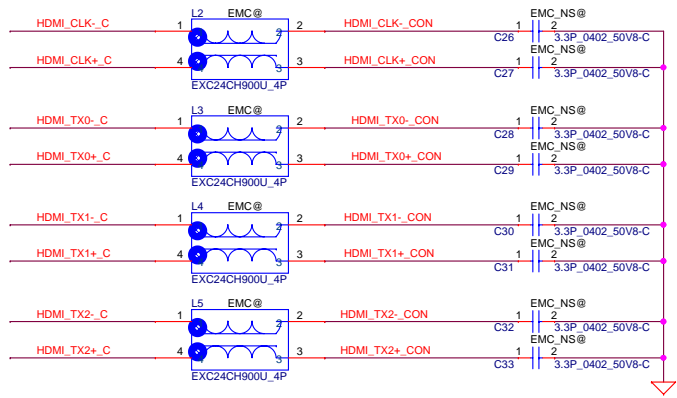


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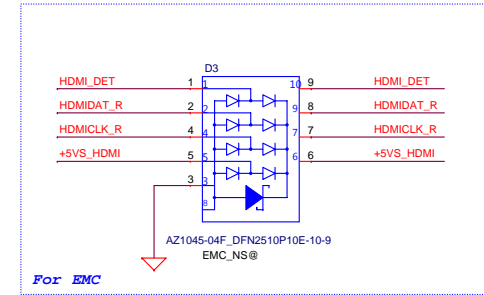
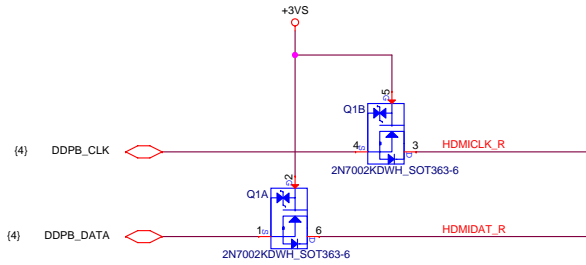


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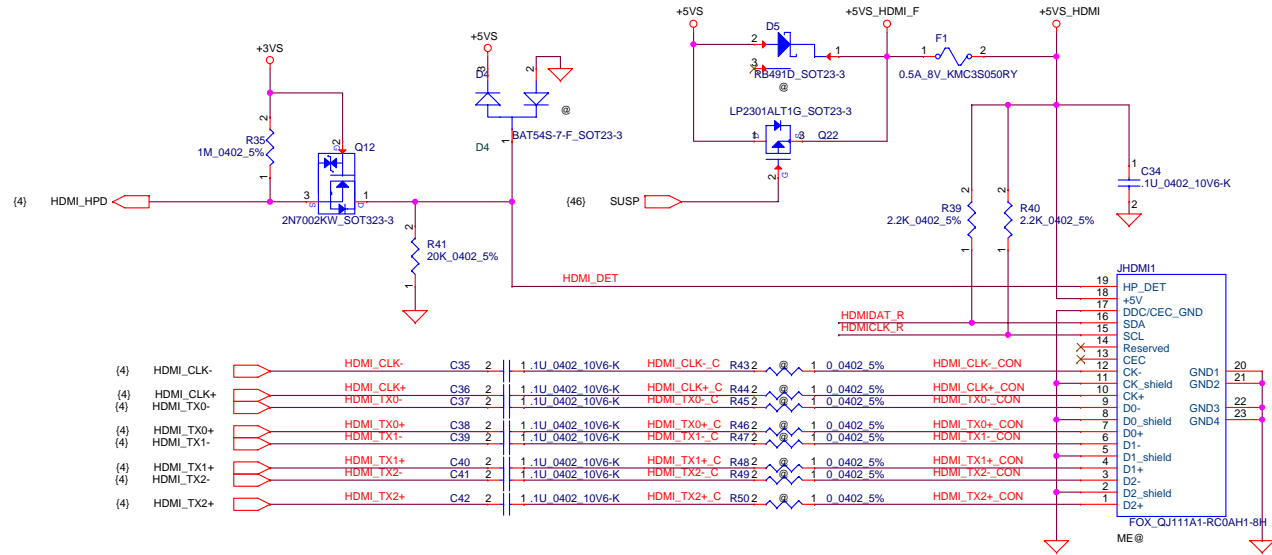
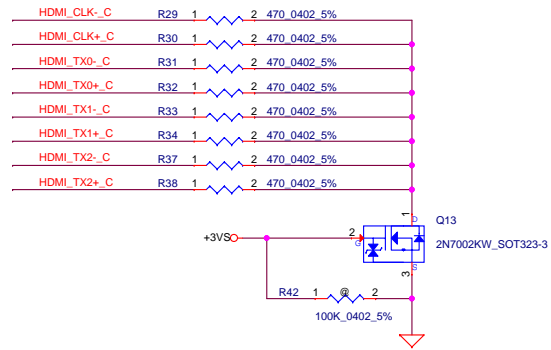




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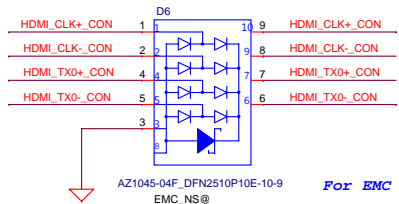


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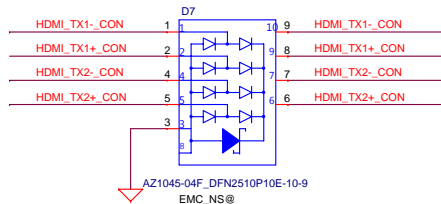


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(4)	HDMI_TX0-	HDMI_TX0-	C37	2	1.1U_0402_10V6-K	HDMI_TX0- C	R45	2	@	1	0	0.402_5%	HDMI_TX0- CON
(4)	HDMI_TX0+	HDMI_TX0+	C38	2	1.1U_0402_10V6-K	HDMI_TX0+ C	R46	2	@	1	0	0.402_5%	HDMI_TX0+ CON
(4)	HDMI_TX1-	HDMI_TX1-	C39	2	1.1U_0402_10V6-K	HDMI_TX1- C	R47	2	@	1	0	0.402_5%	HDMI_TX1- CON
(4)	HDMI_TX1+	HDMI_TX1+	C40	2	1.1U_0402_10V6-K	HDMI_TX1+ C	R48	2	@	1	0	0.402_5%	HDMI_TX1+ CON
(4)	HDMI_TX2-	HDMI_TX2-	C41	2	1.1U_0402_10V6-K	HDMI_TX2- C	R49	2	@	1	0	0.402_5%	HDMI_TX2- CON
(4)	HDMI_TX2+	HDMI_TX2+	C42	2	1.1U_0402_10V6-K	HDMI_TX2+ C	R50	2	@	1	0	0.402_5%	HDMI_TX2+ CON

Close to JHDMI1



For EMC



For EMC

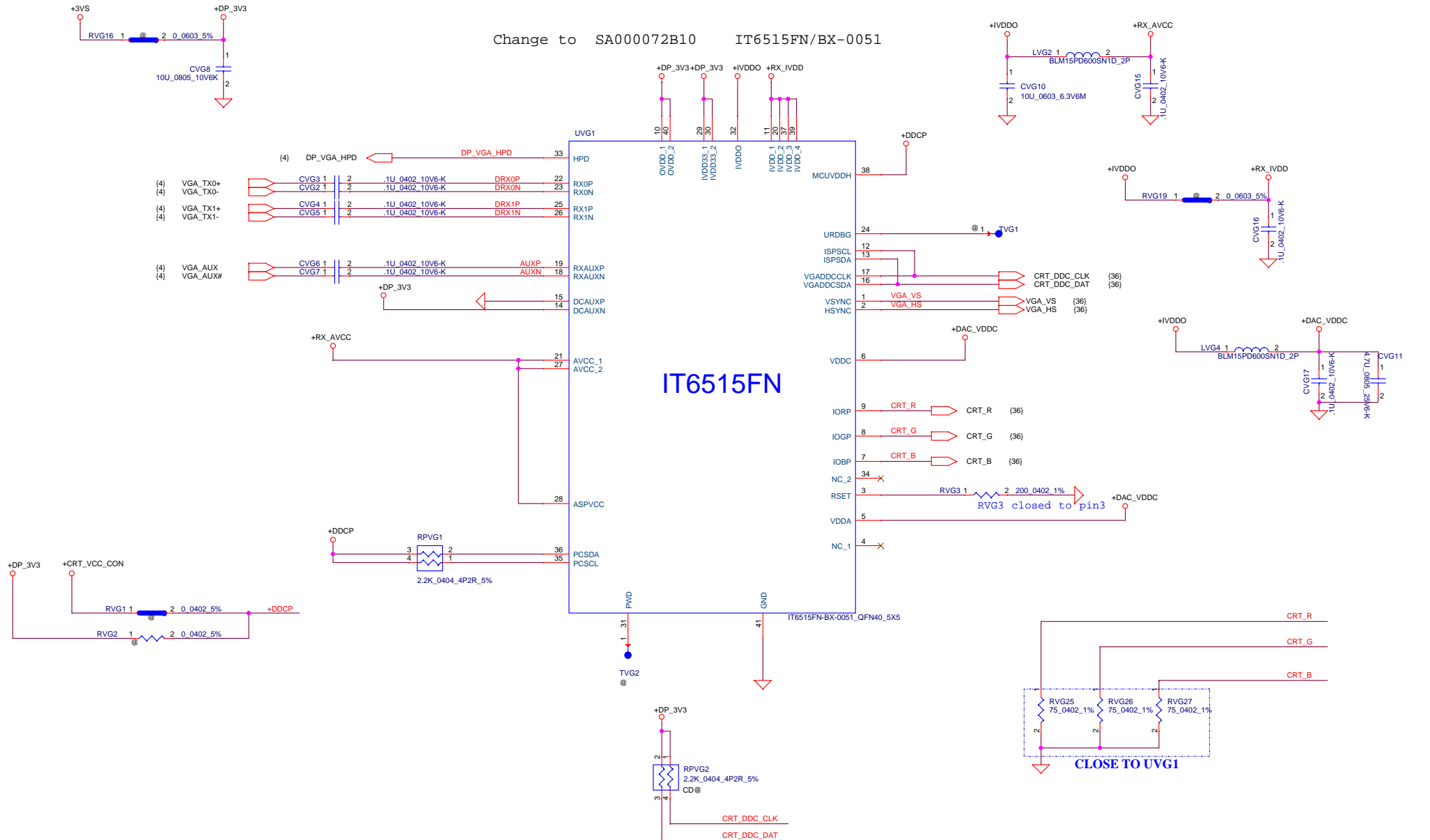
Security Classification	LC Future Center Secret Data		Title
Issued Date	2014/12/11	Deciphered Date	2015/12/11
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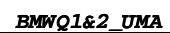
Title		Rev
HDMI_CONN		
Size	Document Number	
Custom		
Date: Monday, July 27, 2015		Sheet 34 of 60



BMQ1&2 UMA

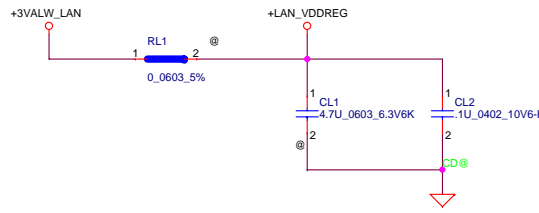
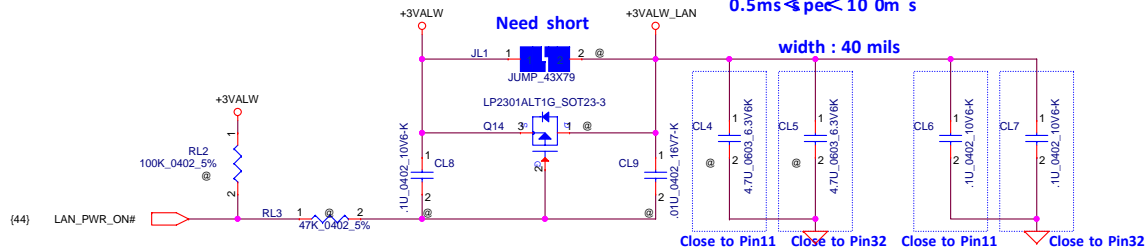
Change to SA000072B10 IT6515FN/BX-0051



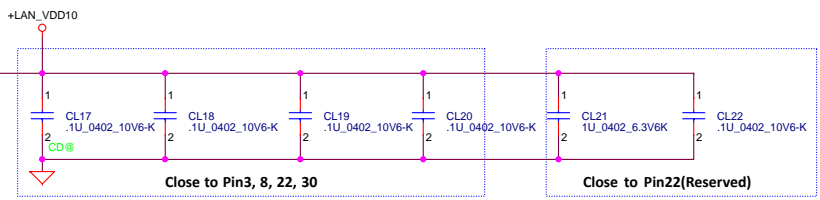
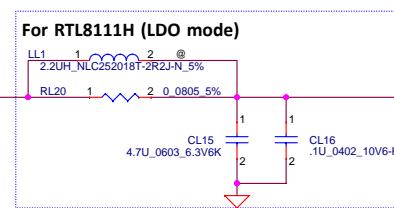
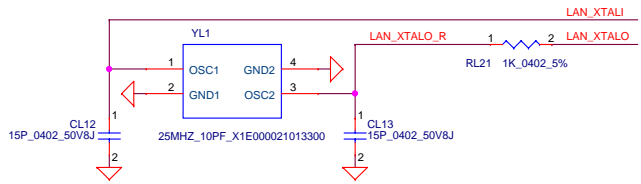
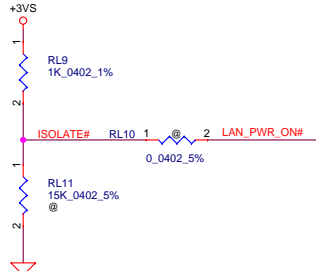
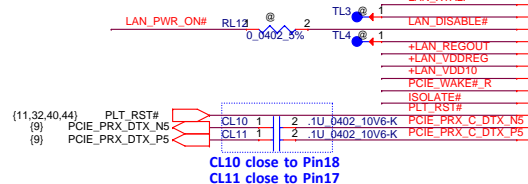
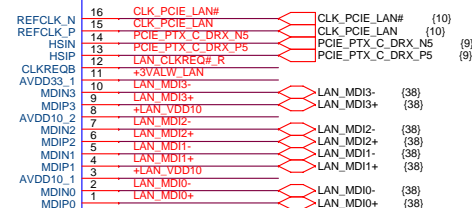
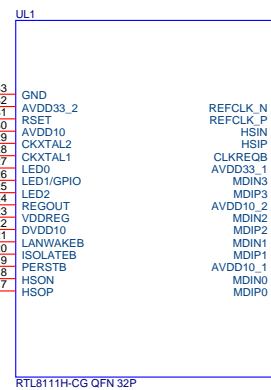
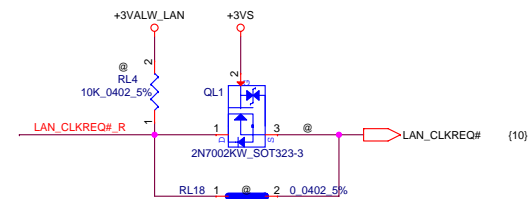
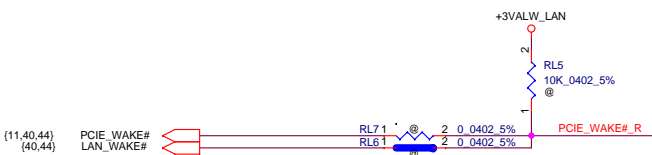
Security Classification				LC Future Center Secret Data		Title	
Issued Date	2014/12/11	Deciphered Date	2015/12/11	DP to CRT Convert(IT6515FN)			
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>							
Size	Document Number					Rev	0.2
Date:	Monday, July 27, 2015	Sheet 35 of 60					

+3VALW TO +3VALW_LAN

+3VALW_LAN rising time (10%~90%)
0.5ms < t_{rise} < 100ms



manual change the Codec PN to RTL8111H-CG QFN

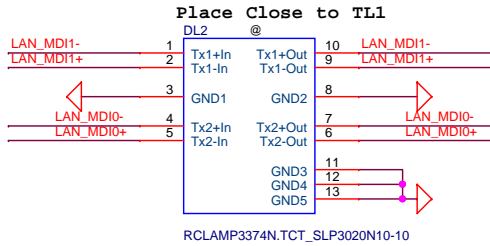
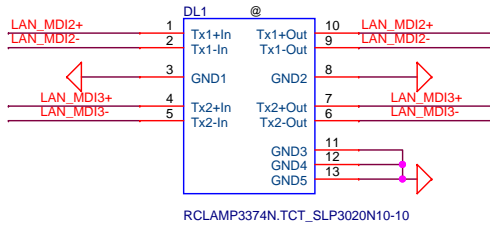


Layout Note: LL1 must be within 200mil to Pin24,
 CL15,CL16 must be within 200mil to LL1
 +LAN_REGOUT: Width =60mil

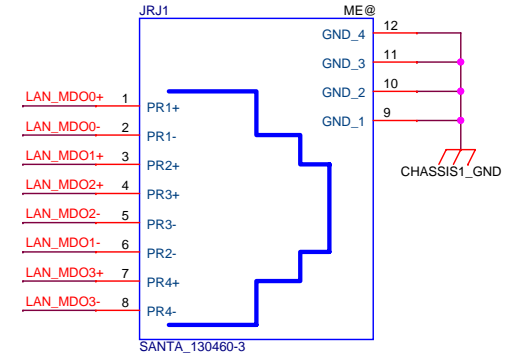
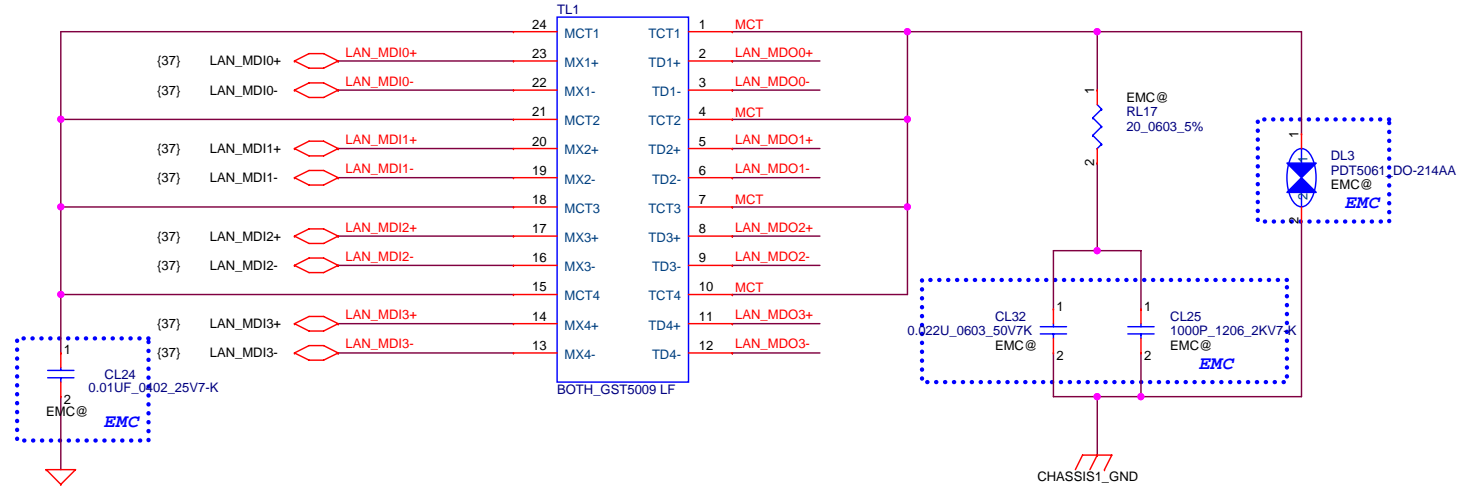
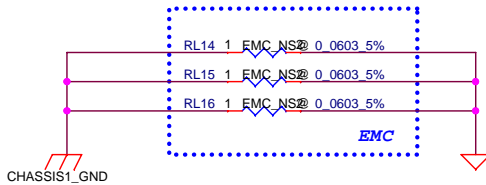


Security Classification		LC Future Center Secret Data		Title	
Issued Date	2014/12/11	Deciphered Date	2015/12/11	LAN_RTL8111H_CG	
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Size Custom	Document Number	BMWQ1&2 UMA		Rev 0.2	
Date:	Monday, July 27, 2015	Sheet	37	of	60

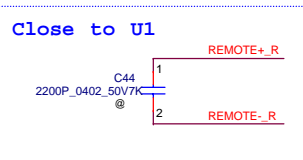
DL1/DL2
1'S PN:SC40007R00



Place Close to TL2

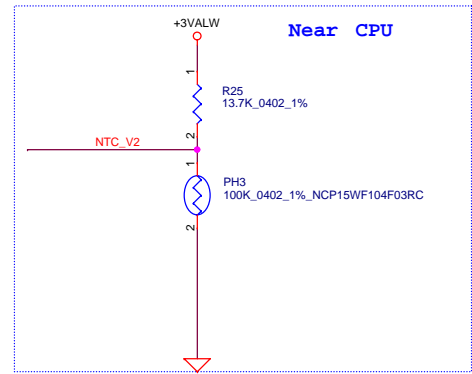
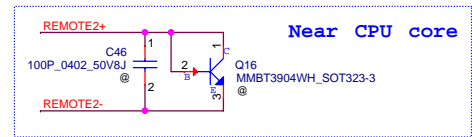
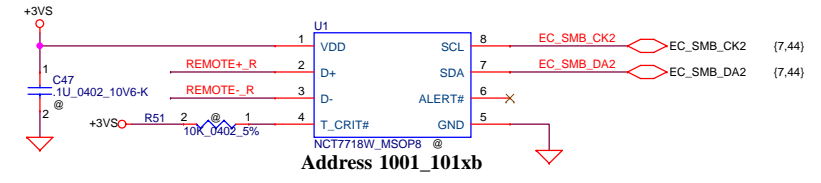


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Issued Date	2014/12/11	Deciphered Date	2015/12/11	LAN_Transformer	
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				3	BMWQ1&2 UMA
				Date:	Monday, July 27, 2015
				Sheet	38 of 60
				Rev	0.2

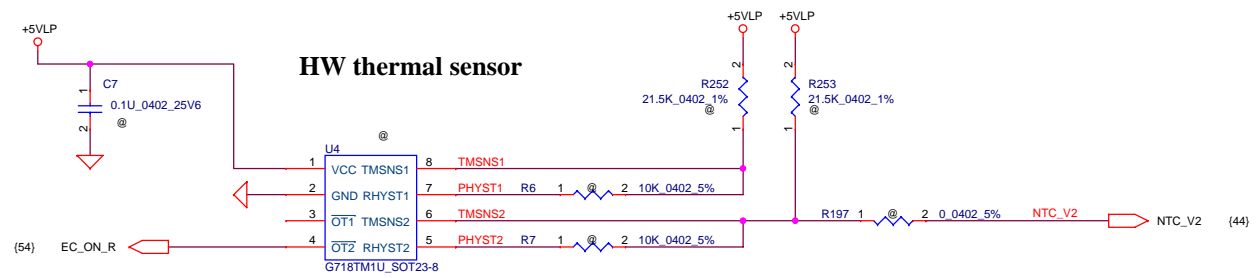


REMOTE+/_R, REMOTE1+/_R, REMOTE2+/_R:
Trace width/space:10/10 mil
Trace length:<8"

SMSC thermal sensor placed near DIMM

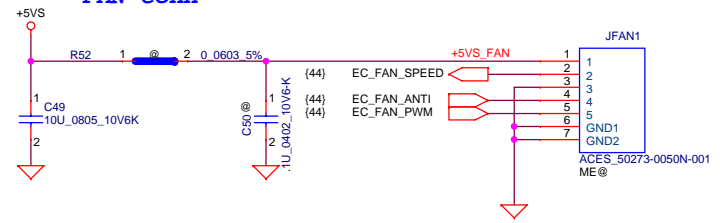


HW thermal sensor



over temperature threshold:
RSET=3*RTMH
92+/-30C
Hysteresis temperature threshold.
RHYST=(RSET*RTML)/(3*RTML-RSET)
56+/-30C

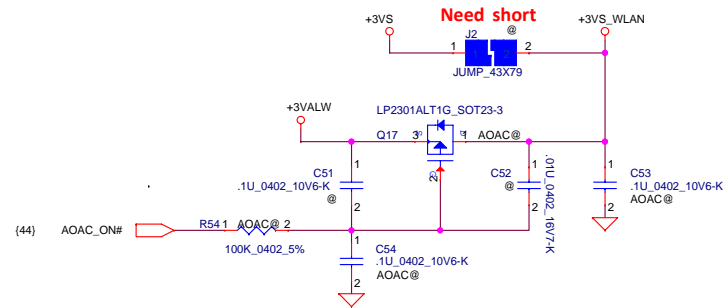
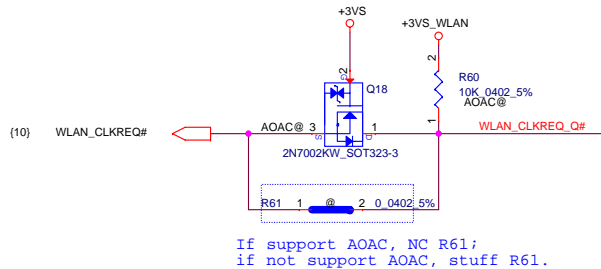
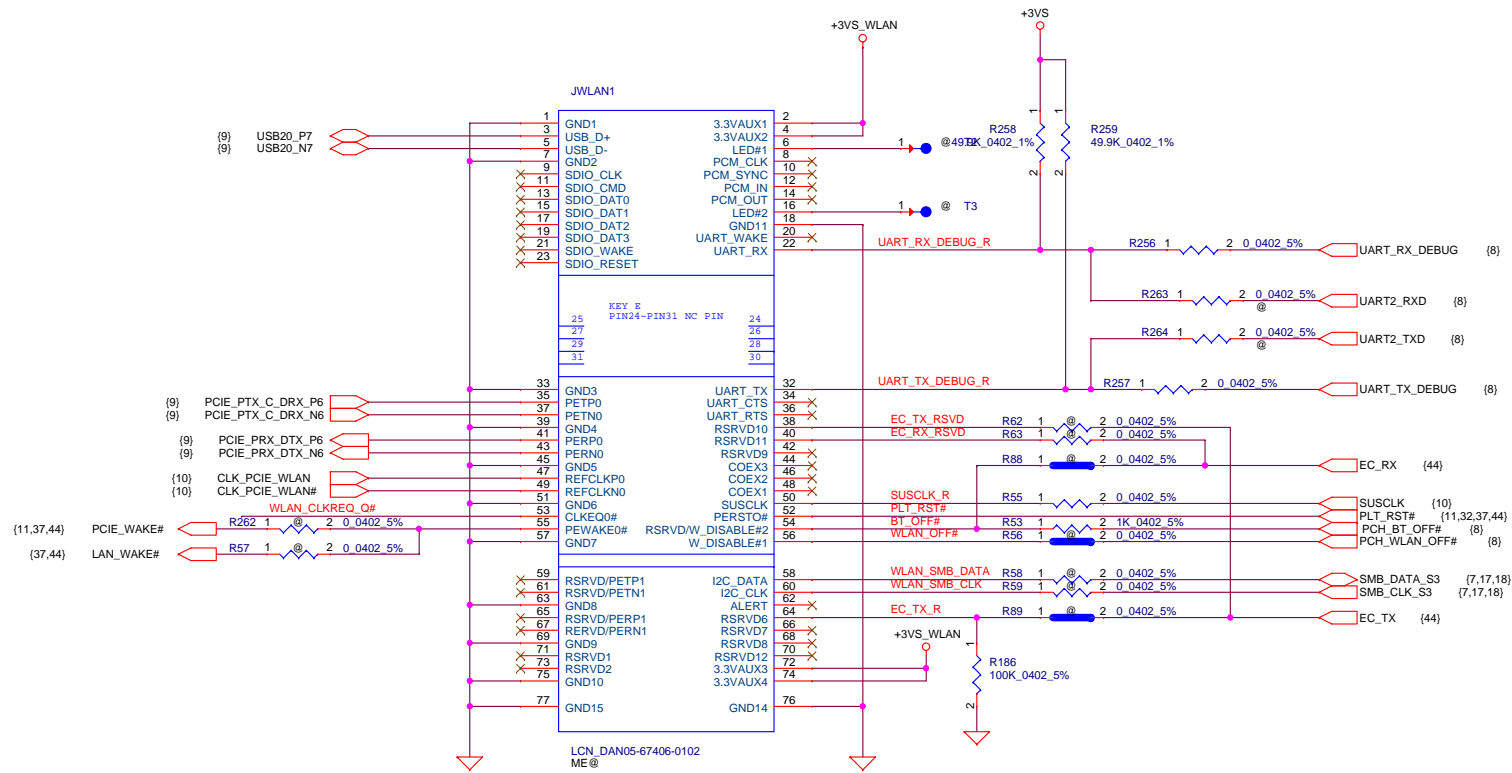
FAN Conn



Security Classification	LC Future Center Secret Data		
Issued Date	2014/12/11	Deciphered Date	2015/12/11
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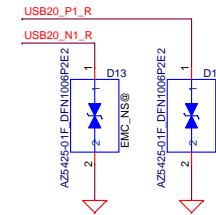
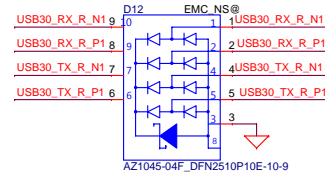
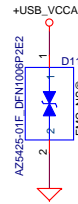
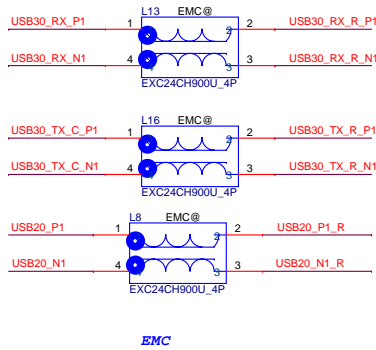
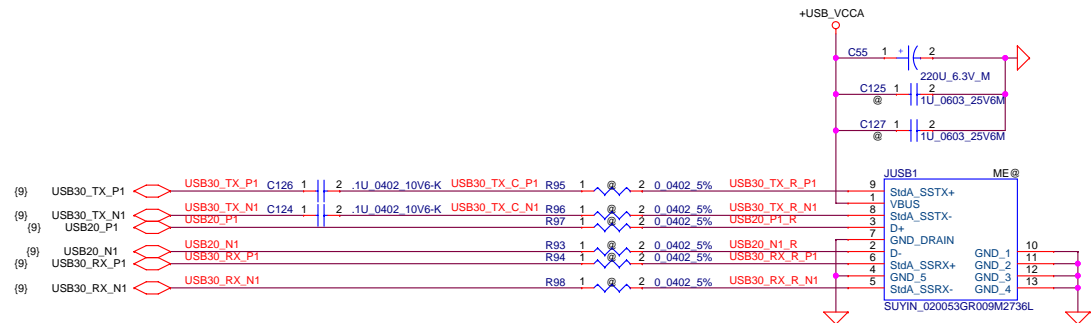
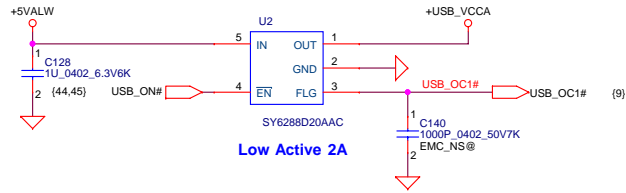
Title		
Thermal sensor/FAN CONN/TPM		
Size	Document Number	
Custom		
Date:	Monday, July 27, 2015	Rev 0.2
Sheet	39	of 60


Mini-Express Card(WLAN/WiMAX)



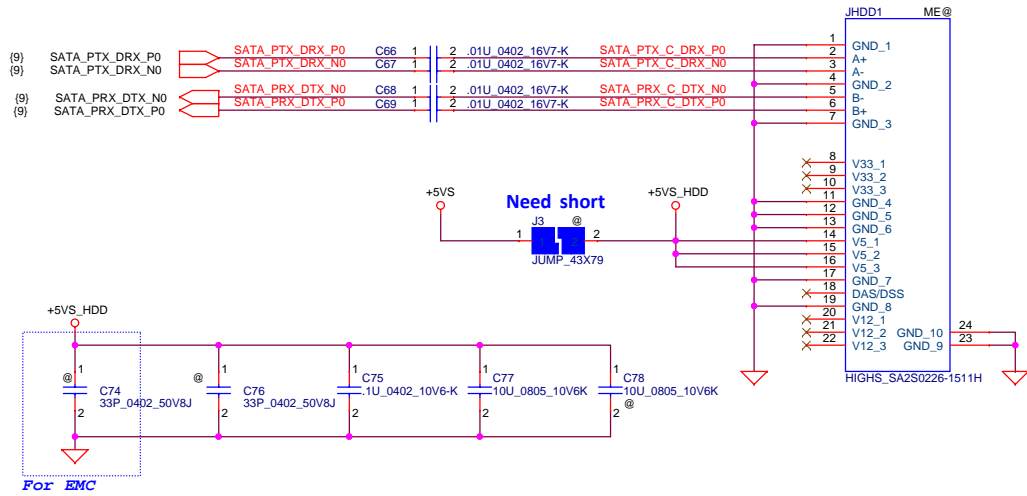
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2014/12/11	Deciphered Date	2015/12/11	NGFF WLAN	
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Date:	Monday, July 27, 2015		Sheet	40 of 60	

LEFT SIDE USB3.0 PORT x1

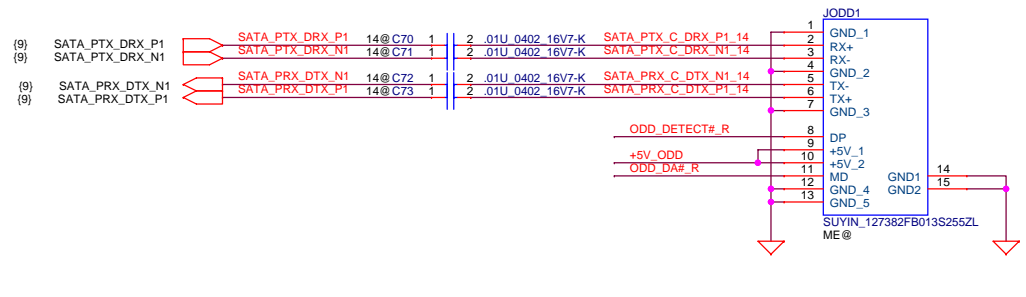


Security Classification	LC Future Center Secret Data			Title	 P32-USB3.0 PORT (LEFT)
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				Date:	Monday, July 27, 2015
				Sheet	41 of 60

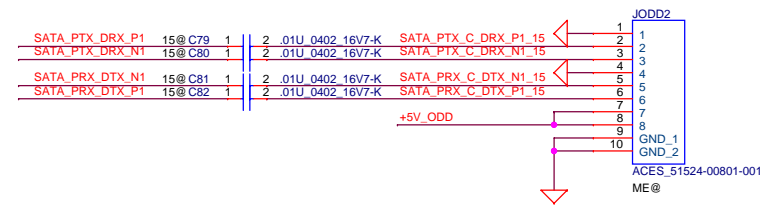
SATA HDD Conn.



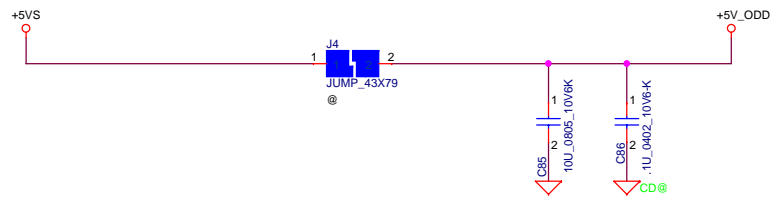
FOR 14" SATA ODD Conn.



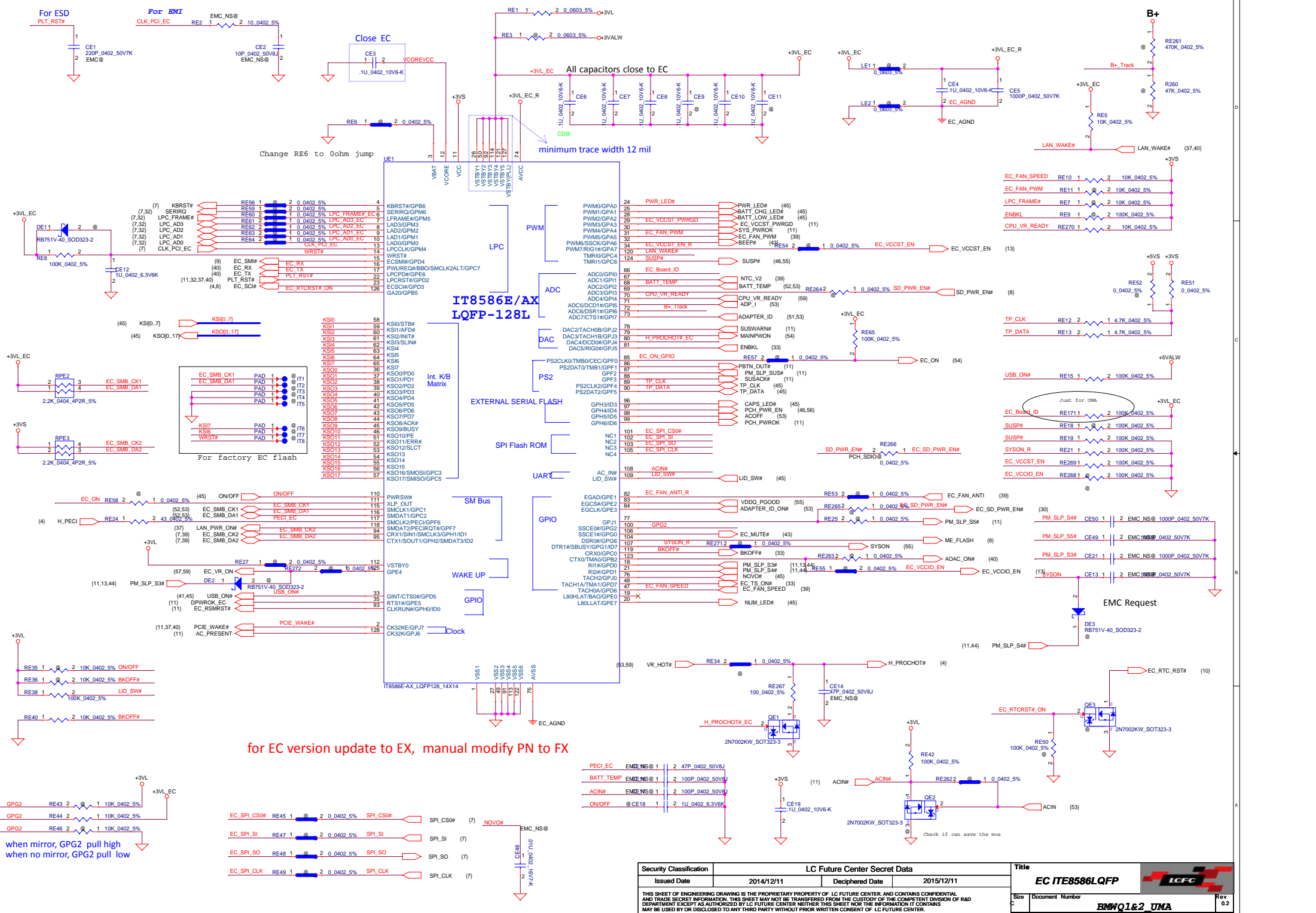
FOR 15" SATA ODD FFC Conn



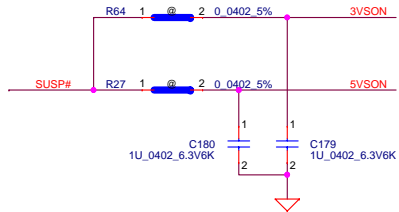
Need Short



Security Classification				LC Future Center Secret Data		Title			
Issued Date		2014/12/11		Deciphered Date		2015/12/11			HDD/ODD CONN
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Date: Monday, July 27, 2015				Sheet 42		of 60			



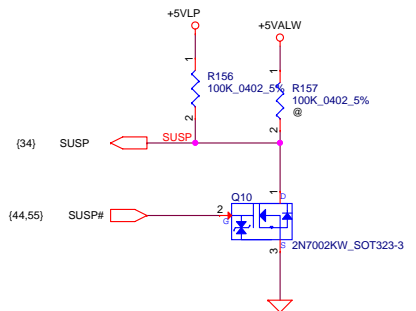
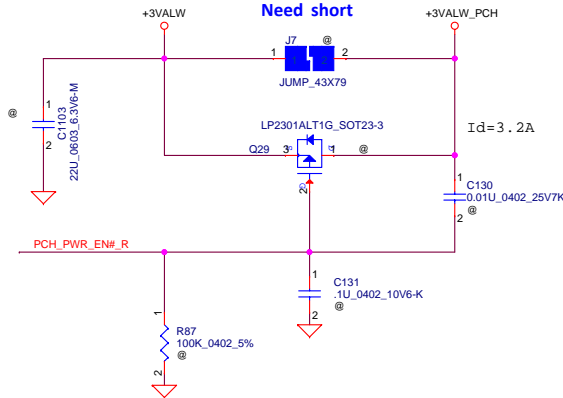
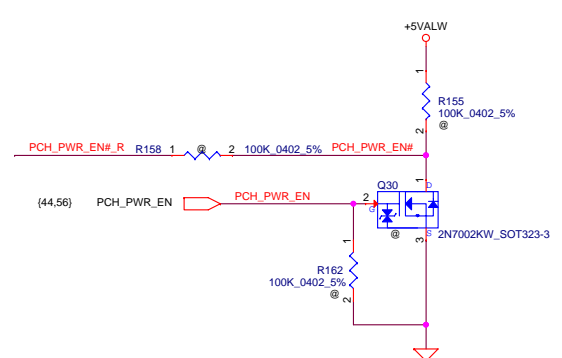
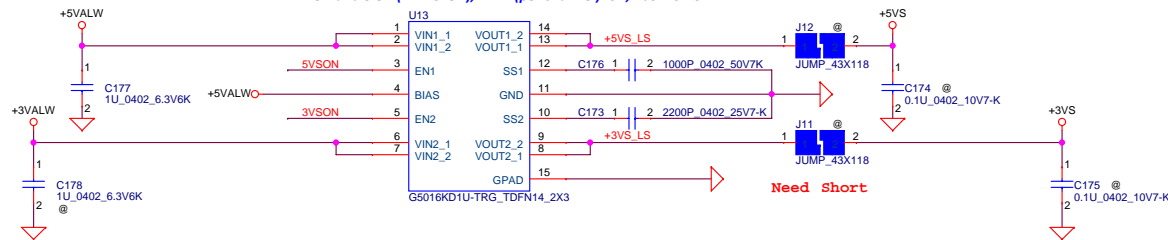
Security Classification	LC Future Center Secret Data		Title
Issued Date	2014/12/11	Deciphered Date	2015/12/11
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Size	Document Number	Rev	02
Date:	Mondy, July 27, 2015	Sheet	44 of 80



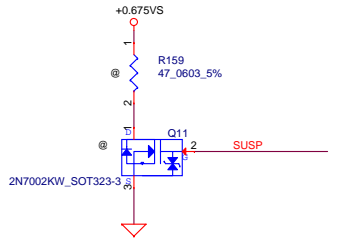
Load Switch
+5VALW To +5VS
+3VALW To +3VS


+3VS, C173 --> 2.74ms
+5VS, C176 --> 2.03ms

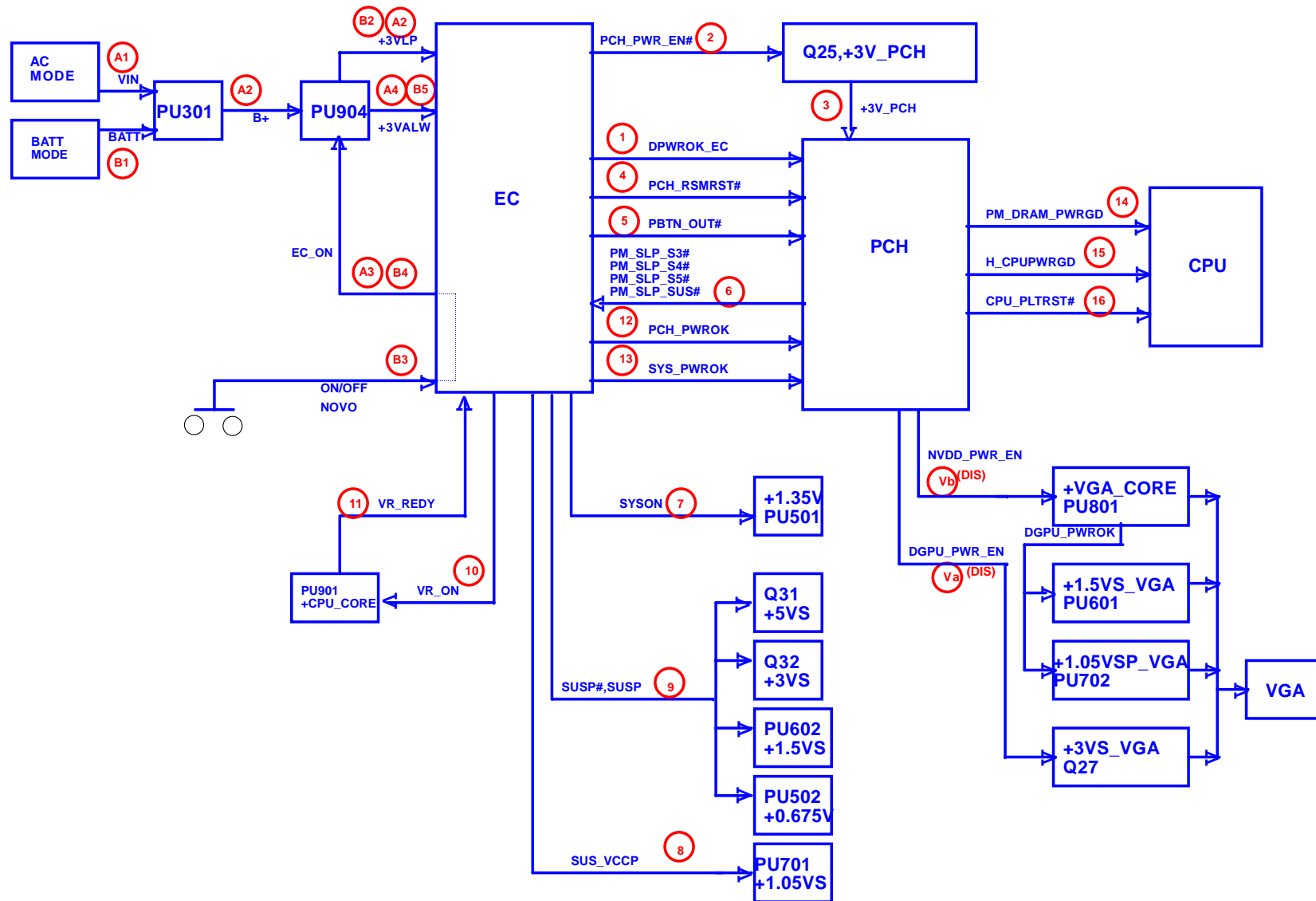
VIN 5V and 3.3V (VBIAS=5V), I_{MAX}(per channel)=6A, R_{ds}=16mohm




For DisCharge



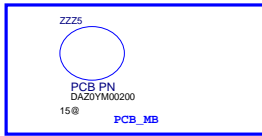
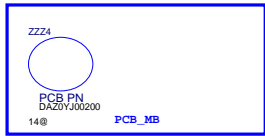
Security Classification	LC Future Center Secret Data		Title
Issued Date	2014/12/11	Deciphered Date	2015/12/11
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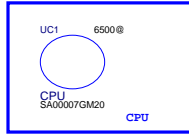
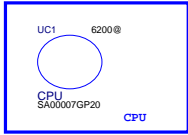
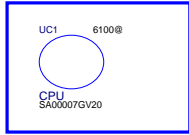
Security Classification	LC Future Center Secret Data	
Issued Date	2014/12/11	Deciphered Date
		2015/12/11
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Title		
Power sequence Block		
Size	Document Number	Rev
Custom	BMWQ1&2_UMA	0.2
Date:	Monday, July 27, 2015	Sheet 47 of 60

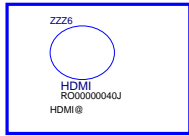
PCB



CPU



HDMI



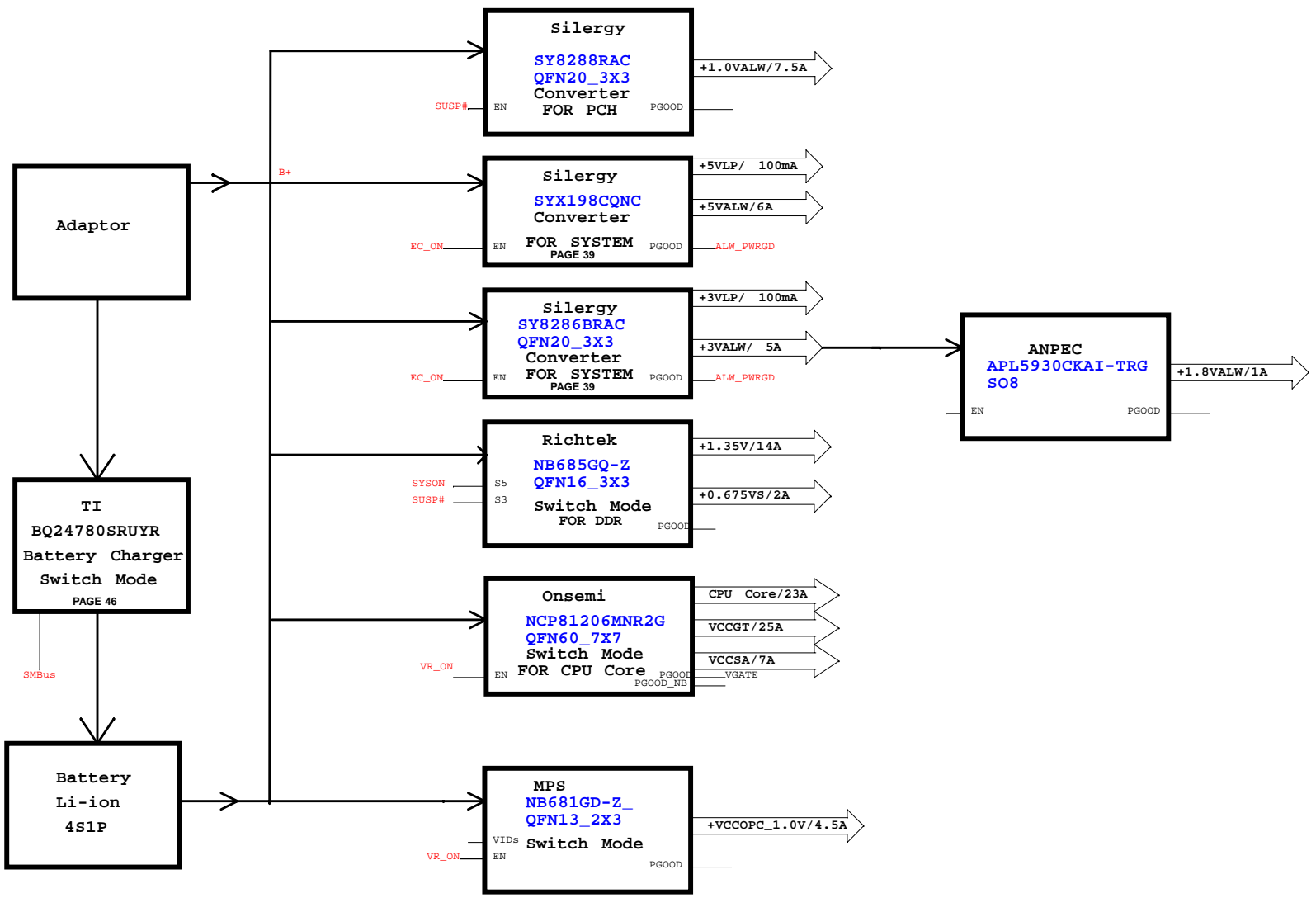
Board ID

BOARD_ID0	BOARD_ID1	BOARD_ID2	BOARD_ID3	Description	Stuff Resistor
0	0	0	1	14* + Jet-LE + Single-Rank sku	RC107,RC108,RC109,RC121
0	0	1	1	14* + Jet-LE + Dual-Rank sku	RC107,RC108,RC102,RC121
0	1	0	1	15* + Jet-LE + Single-Rank sku	RC107,RC101,RC109,RC121
0	1	1	1	15* + Jet-LE + Dual-Rank sku	RC107,RC101,RC102,RC121
1	0	0	1	14* + Topaz-XT + Single-Rank sku	RC100,RC108,RC109,RC121
1	0	1	1	14* + Topaz-XT + Dual-Rank sku	RC100,RC108,RC102,RC121
1	1	0	1	15* + Topaz-XT + Single-Rank sku	RC100,RC101,RC109,RC121
1	1	1	1	15* + Topaz-XT + Dual-Rank sku	RC100,RC101,RC102,RC121

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Adaptor

TI BQ24780SRUYR Battery Charger Switch Mode
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Battery Li-ion 4S1P

Silergy SY8288RAC QFN20_3X3 Converter FOR PCH

Silergy SYX198CQNC Converter FOR SYSTEM PAGE 39


Silergy SY8286BRAC QFN20_3X3 Converter FOR SYSTEM PAGE 39

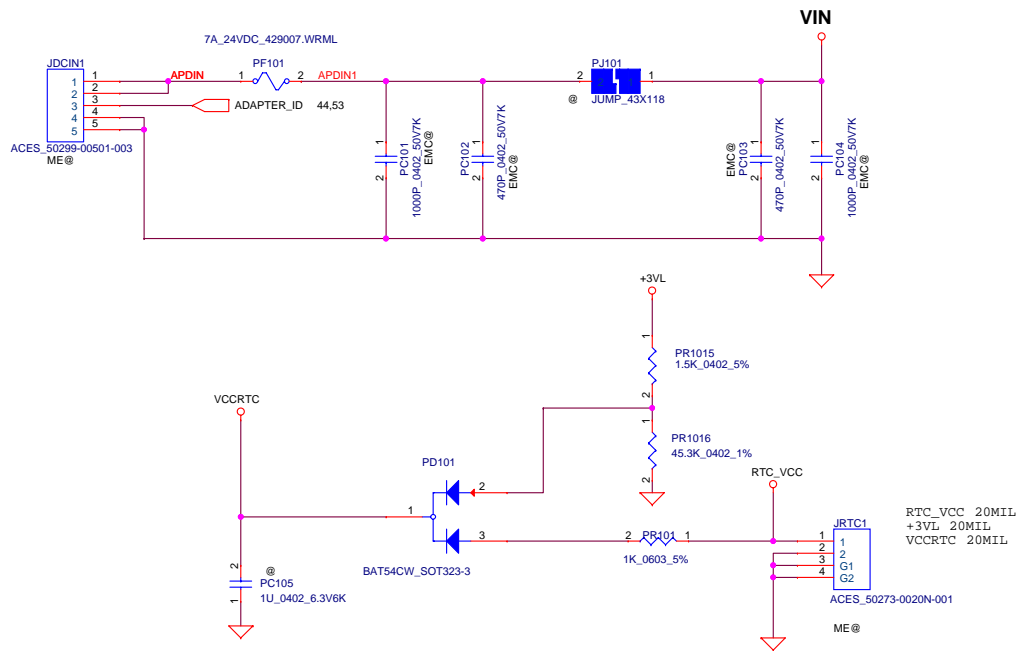
Richtek NB685GQ-Z QFN16_3X3 Switch Mode FOR DDR

Onsemi NCP81206MNR2G QFN60_7X7 Switch Mode FOR CPU Core


MPS NB681GD-Z QFN13_2X3 Switch Mode

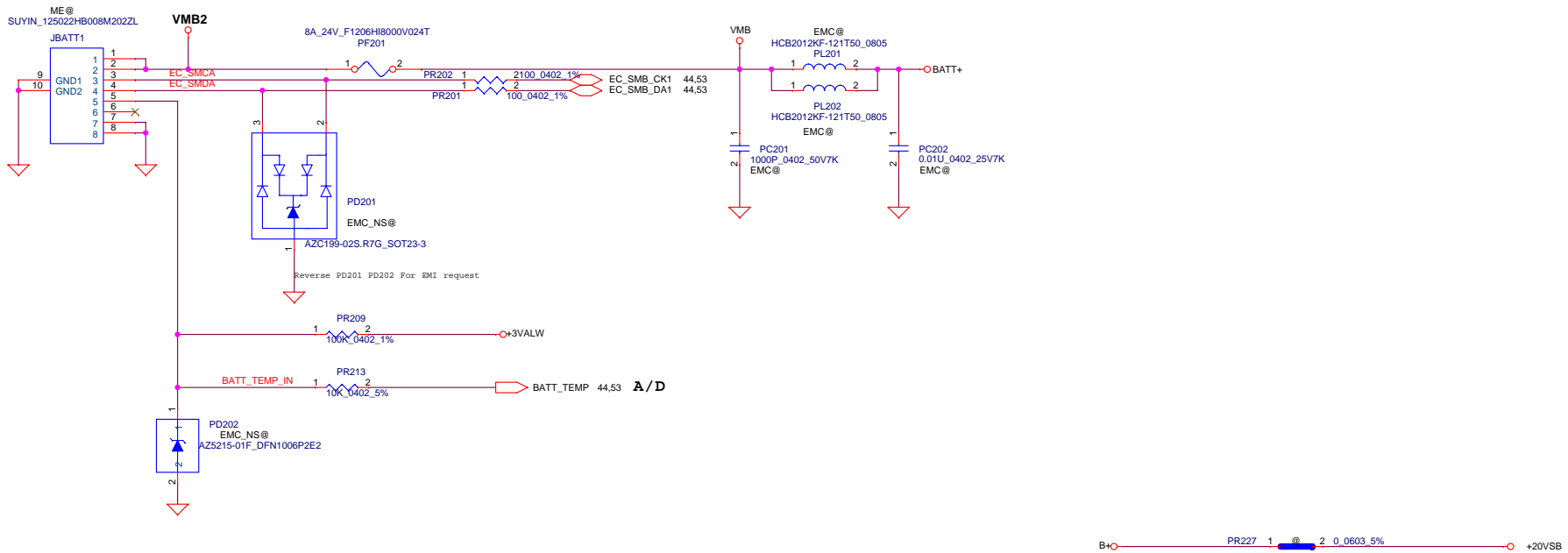
ANPEC APL5930CKAI-TRG SOB


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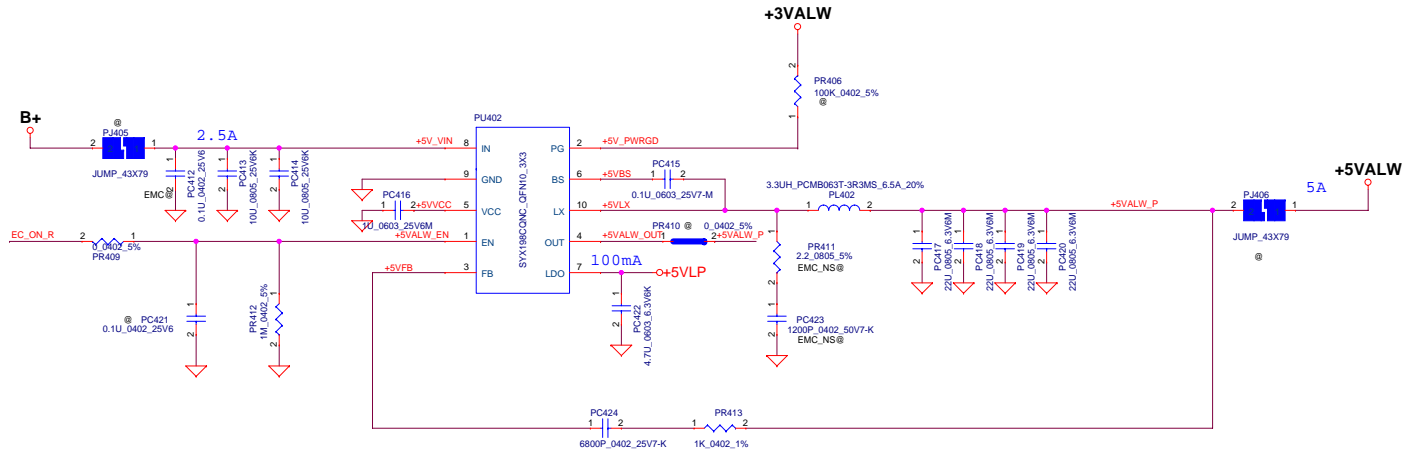
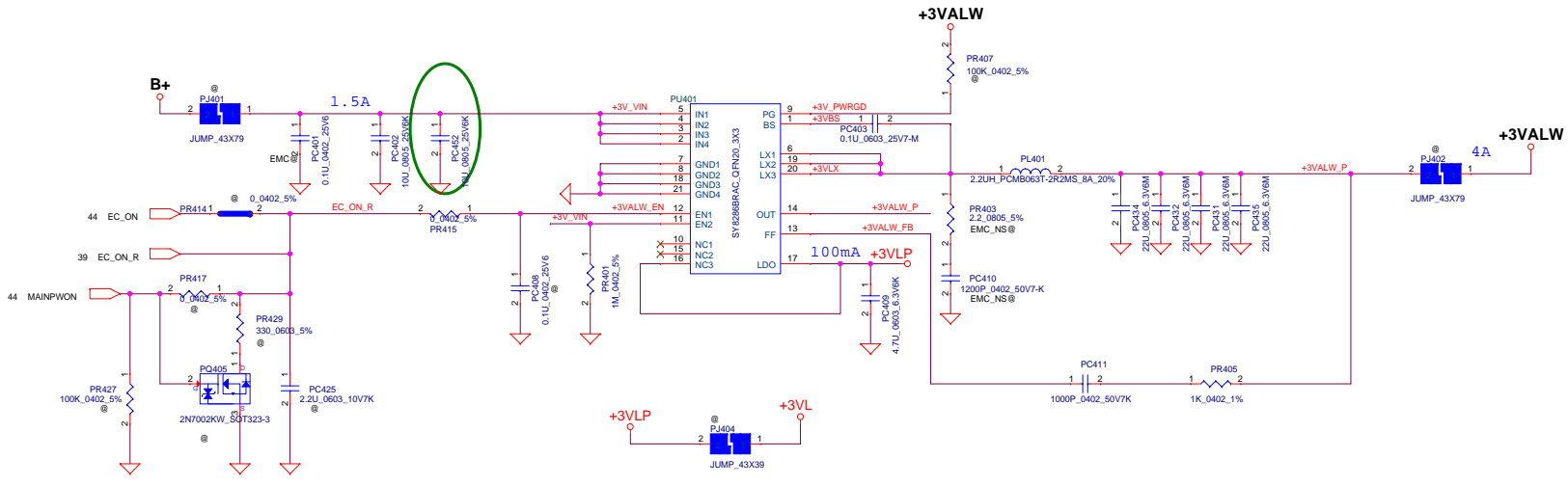


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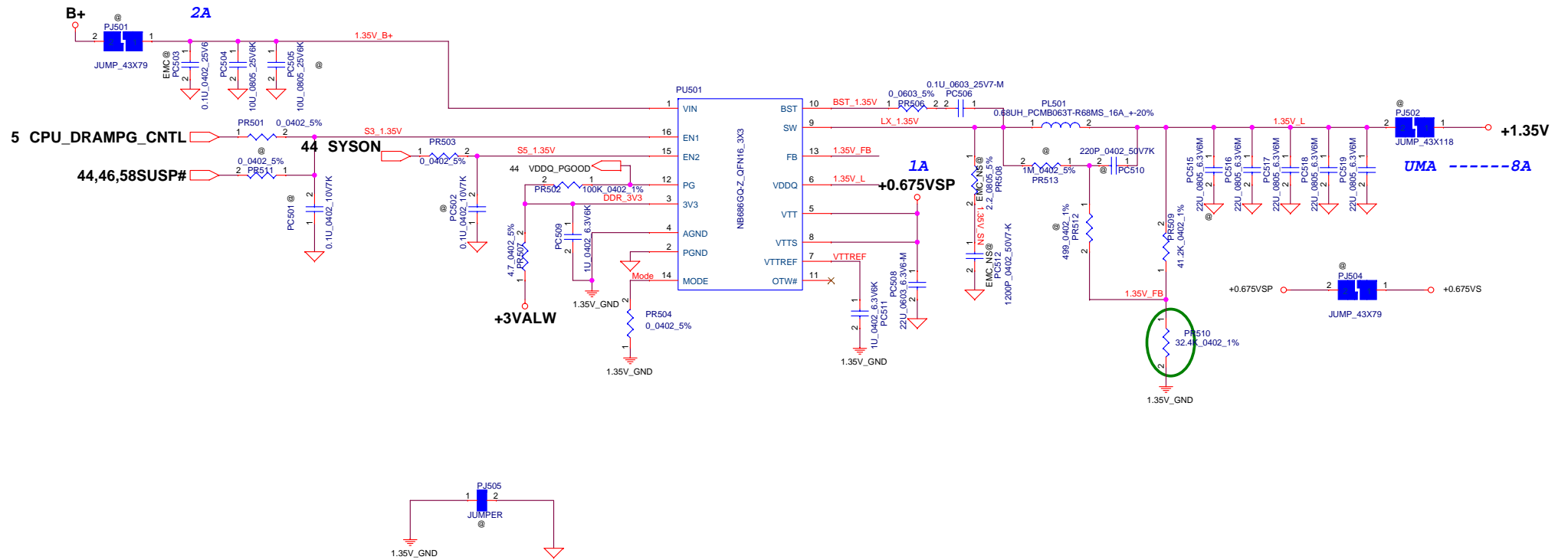


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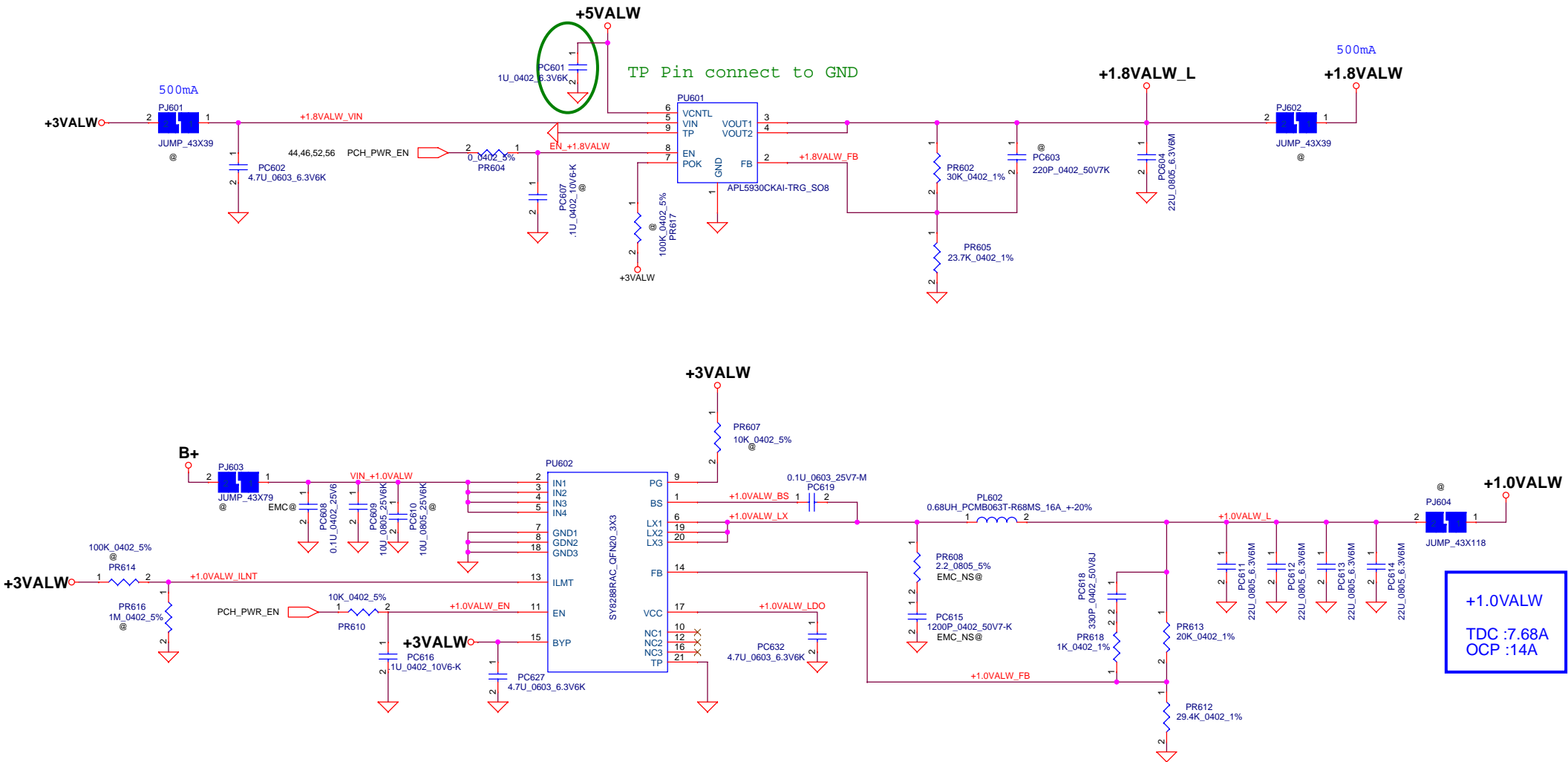
6800pf soft start 2ms
47nf soft start 7ms

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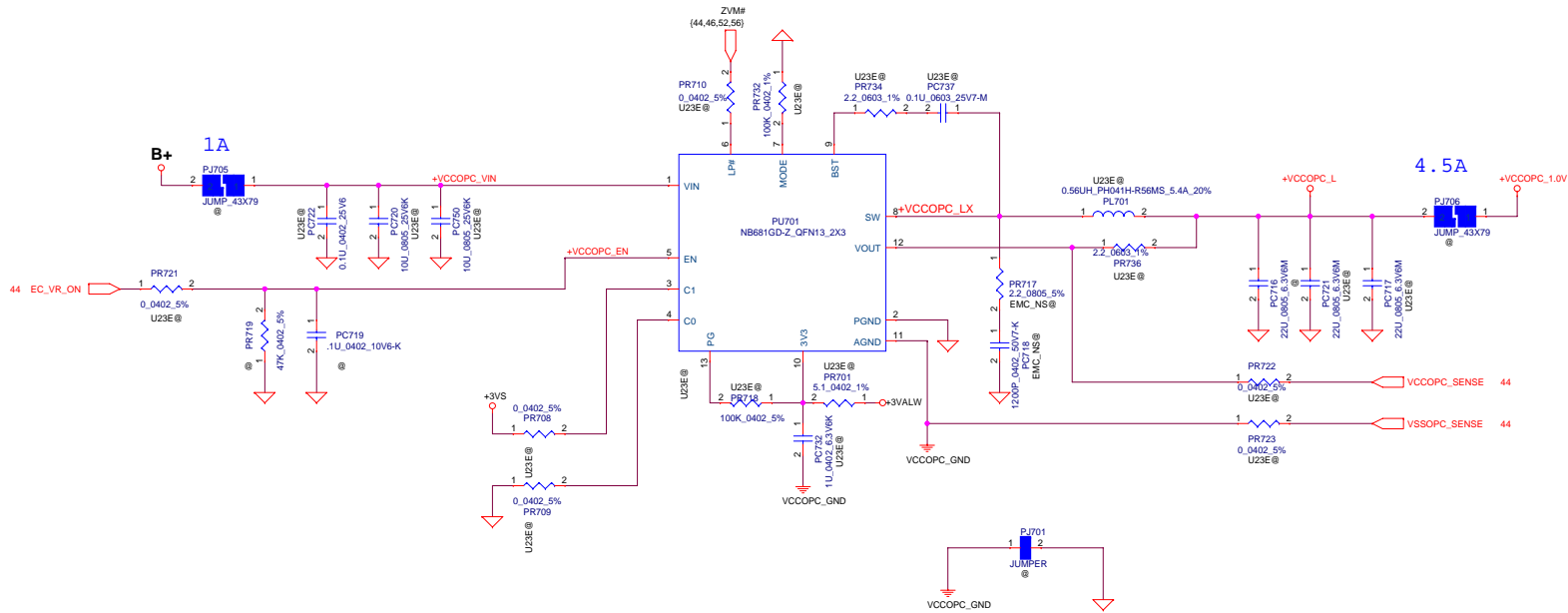
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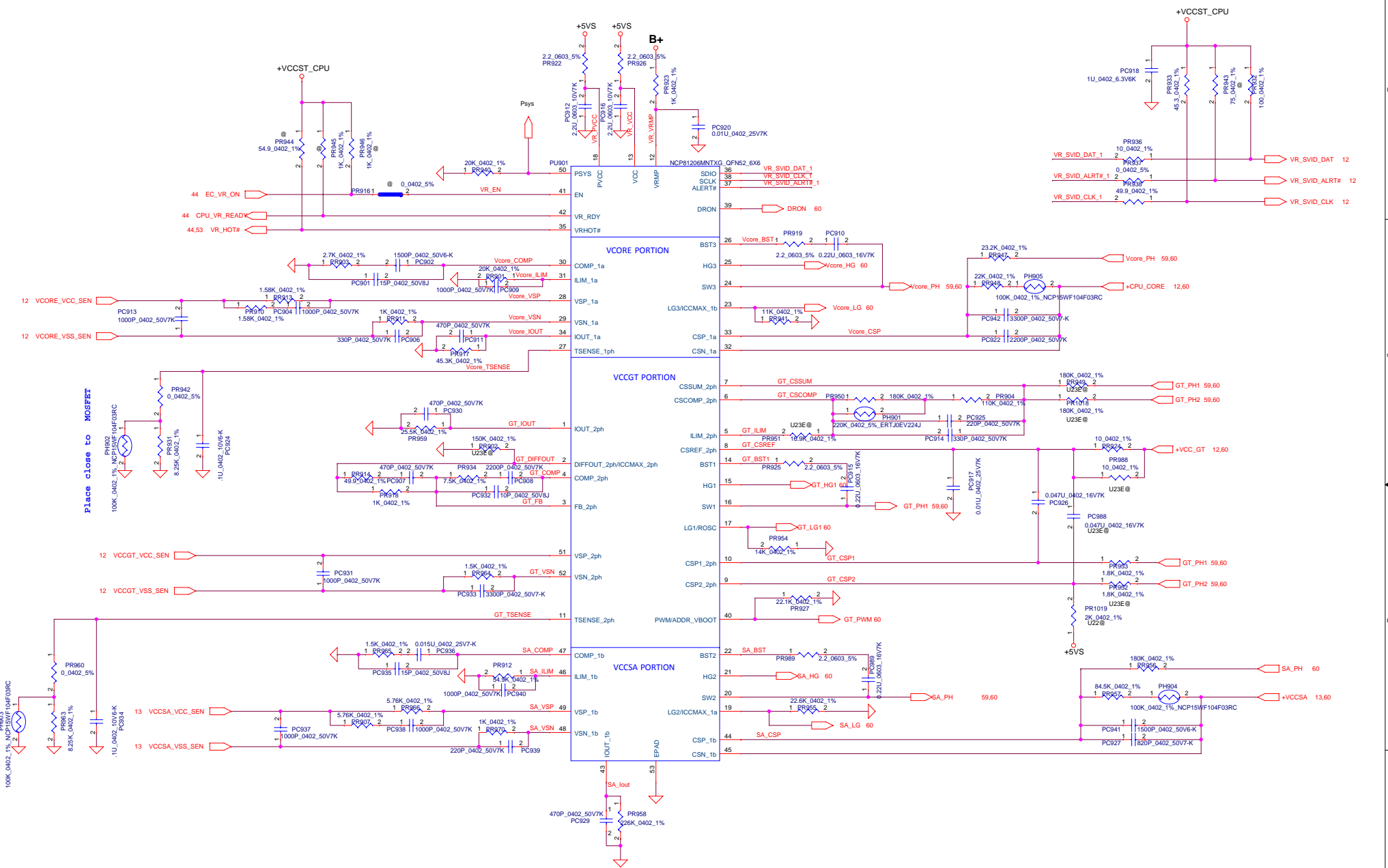


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