

GL4A0/GL5A0 Logic Schematics

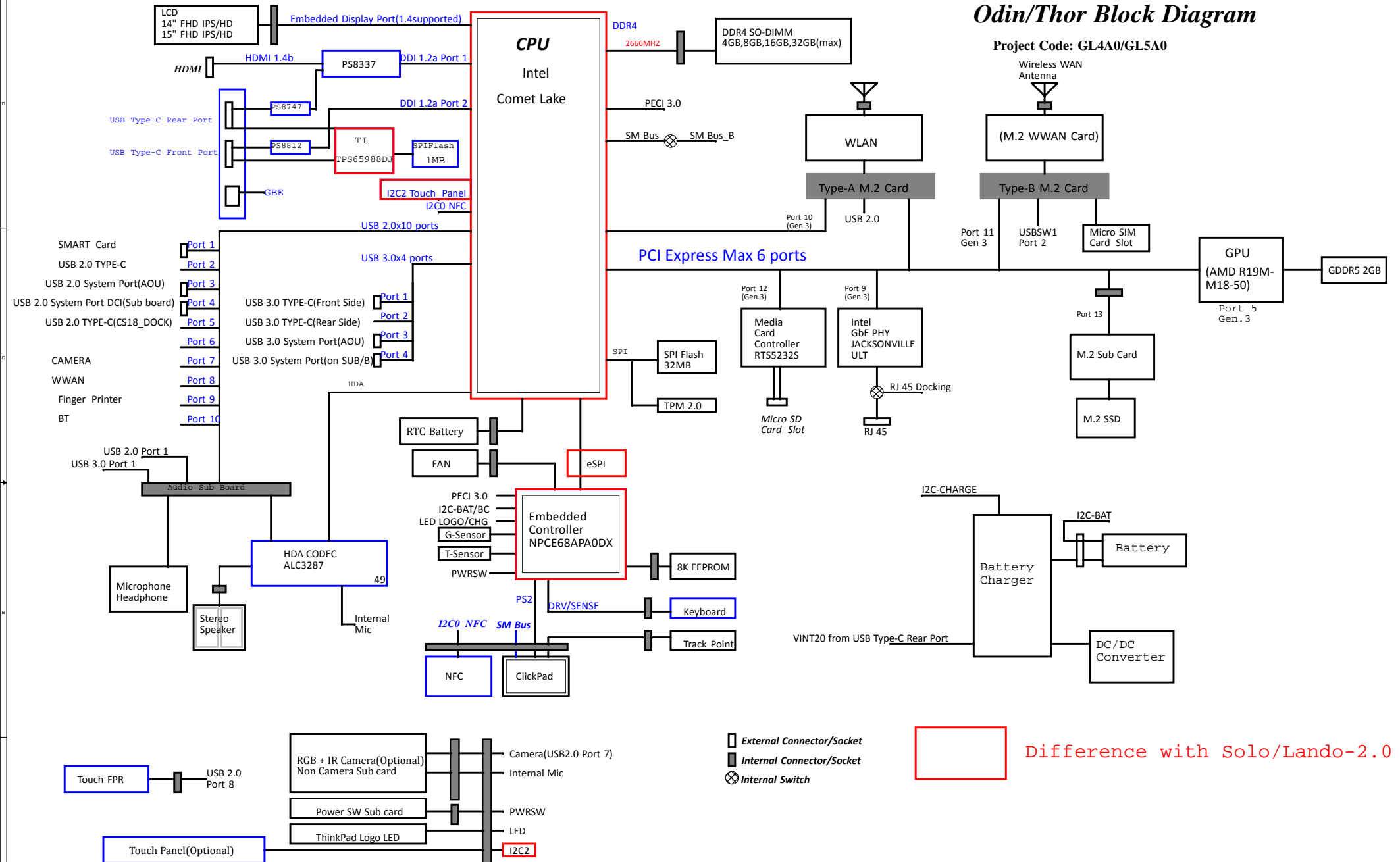
NM-C631

VER 1.0
Feb.12.2020

1.TITLE PAGE	36.DDR4 SUB CHANNEL-B	71.BLANK	106.DC/DC VCC1R2A(SY8310RAC)
2.BLOCK DIAGRAM	37.R19M-M25(1/6) PEG I/F	72.Smart Card Reader	107.DC/DC VCC2R5A(RT8068A)
3.CPU (1/16): DDI/TYPE-C	38.R19M-M25(2/6)_ VRAM I/F	73.GBE JACKSONVILLE	108.DC/DC IMVP8(RT3605BE)
4.CPU (2/16): DDR (1/2)	39.BLANK	74.GBE LAN SWITCH	109.DC/DC VCCCPUCORE (RT9610CGQ)
5.CPU (3/16): DDR (2/2)	40.R19M-M25(3/6)DIGITA / XTAL	75.LAN_B CONNECTOR	110.DC/DC VCCGFXCORE_I (RT9610)
6.CPU (4/16): MISC/JTAG	41.R19M-M25(4/6) STRAP / GPIO	76.MEDIA CARD CONTROLLER	111.DC/DC VCCSA (RT9610CGQW)
7.CPU (5/16): ESPI/SPI/SMBUS/C-LINK	42.R19M-M25(5/6) POWER	77.MEDIA CONNECTOR	112.DC/DC Decoupling Cap
8.CPU (6/16): LPSS/ISH	43.BLANK	78.AUDIO ALC3287	113.BLANK
9.CPU (7/16): AUDIO/SDXC	44.R19M-M25(6/6) GND	79.AUDIO CONNECTOR	114.DC/DC VCC1R05_SUS(NB693)
10.CPU (8/16): PCIE/USB/SATA	45.VRAM CHANNEL-A	80.AUDIO JACK SENSE	115.BLANK
11.CPU (9/16): CSI-2/EMMC/CNVI	46.BLANK	81.AUDIO EXT MIC I/F	116.DC/DC VCC1R8_SUS(RT8068A)
12.CPU (10/16): CLOCK SIGNALS	47.BLANK	82.AUDIO SPEAKER	117.BLANK
13.CPU (11/16): SYSTEM PM	48.BLANK	83.AUDIO BEEP	118.DC/DC VCCGFXCORE_D(RT3662EB)
14.CPU (12/16): CPU POWER (1/2)	49.BLANK	84.AUDIO DEBUG	119.BLANK
15.CPU (13/16): CPU POWER (2/2)	50.Load SW VGA	85.EC_NPCE68APA0DX(1/2)	120.DC/DC VCC1R35VIDEO(NB691GG)
16.CPU (14/16): PCH POWER	51.LCD CAMERA/MIC/TOUCH	86.EC_NPCE68APA0DX(2/2)	121.BLANK
17.CPU (15/16): GND	52.LID/CAMERA/MIC/TOUCH INTERFACE	87.BLANK	122.BLANK
18.CPU (16/16): CFG/RESERVED	53.BLANK	88.KEYBOARD/TRACK POINT	123.LOADSW VCCIO&VCCST&VCCSTG
19.BLANK	54.HDMI CONNECTOR	89.TOUCH PAD/NFC/FPR	124.LOAD SW PCH SUS
20.RTC BATTERY	55.BLANK	90.FAN CONNECTOR	125.BLANK
21.SPI FLASH	56.BLANK	91.APS G-SENSOR	126.LOAD SW LAN
22.BLANK	57.PCIE Re-driver-1	92.THERMAL SENSOR	127.LOAD SW B
23.BLANK	58.PCIE Re-driver-2	93.SMBUS SWITCH	128.LOAD SW WLAN
24.BLANK	59.THUNDERBOLT PD(TPS65988DJ)	94.BLANK	129.PLM BOM
25.BLANK	60.TUNDERBOLT PD(BLANK)	95.BLANK	
26.BLANK	61.USB TYPE-C SWITCH	96.BLANK	
27.BLANK	62.DOCKING CONNECTOR	97.SATA Re-driver	
28.BLANK	63.TYPE-C CONNECTOR	98.DISCRETE TPM 2.0	
29.BLANK	64.M.2 SOCKET 3 MODULE I/F	99.SCREW HOLES	
30.BLANK	65.BLANK	100.DC-IN	
31.BLANK	66.WLAN	101.BATTERY INPUT	
32.BLANK	67.M.2 SOCKET	102.BATTERY CHARGER(BQ25700A)	
33.DDR4 SUB CHANNEL-A	68.DDI DEMULTIPLEXER	103.DC/DC VCC5M (LV6228C)	
34.DDR4 SUB CHANNEL-A	69.USB TYPE-A CONNECTOR	104.DC/DC +5VTPC(LV6228C)	
35.DDR4 SUB CHANNEL-B	70.USB TYPE-A CONN	105.DC/DC VCC3M (SYX198B)	

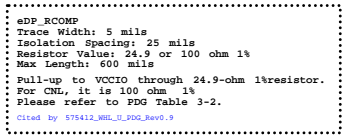
Odin/Thor Block Diagram

Project Code: GL4A0/GL5A0



GPP_E19/DDP1_CTRLDATA/TBT_LSX0_RXD (DDP1 I2C / TBT LSX #0 PINS VCCIO CONFIGURATION)	
GPP_E21/DDP2_CTRLDATA/TBT_LSX1_RXD (DDP2 I2C / TBT LSX #1 PINS VCCIO CONFIGURATION)	
GPP_D10/DDP3_CTRLDATA/TBT_LSX2_RXD (DDP3 I2C / TBT LSX #2 PINS VCCIO CONFIGURATION)	
GPP_D12/DDP4_CTRLDATA/TBT_LSX3_RXD (DDP4 I2C / TBT LSX #3 PINS VCCIO CONFIGURATION)	
HIGH	3.3V
LOW	1.8V

DP port	Enable	Disable
DDPB_CTRLDATA	Pull up to 3.3 V with 2.2-k ohm \pm 5% resistor	no connect
DDPC_CTRLDATA	Pull up to 3.3 V with 2.2-k ohm \pm 5% resistor	no connect

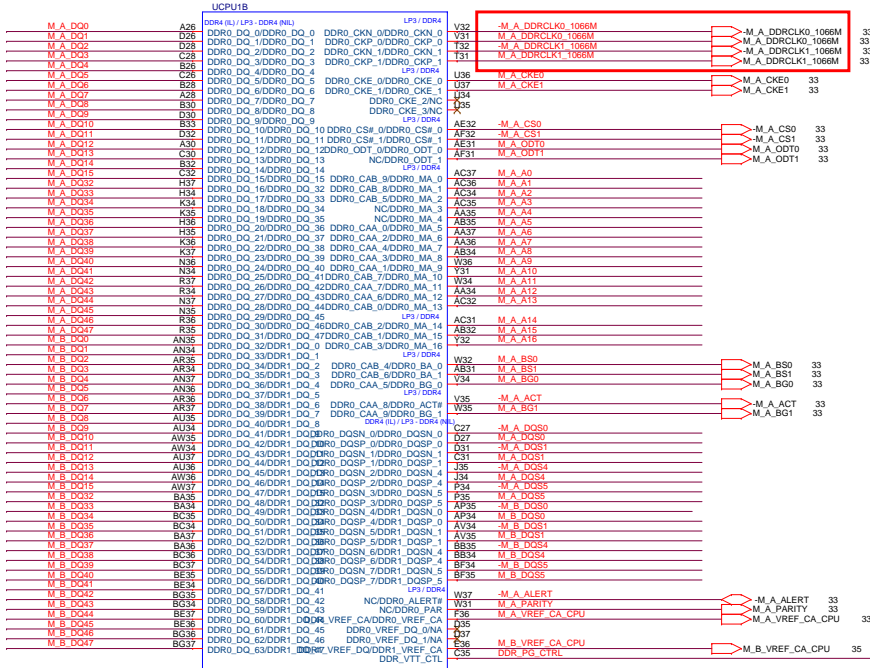


VCC1R2A VCC1R2A 5,15,33,34,35,36,106
VCC3M VCC3M 11,13,15,16,50,51,59,78,84,85,86,88,102,103,104,105,106,114,123,124,126,127,128

TABLE

	Pin	Interleave	Non-Interleave
Block 0	AL71	DDR0_DQ[0]	DDR0_DQ[0]
	AL68	DDR0_DQ[1]	DDR0_DQ[1]
	AN68	DDR0_DQ[2]	DDR0_DQ[2]
	AN69	DDR0_DQ[3]	DDR0_DQ[3]
	AL70	DDR0_DQ[4]	DDR0_DQ[4]
	AL69	DDR0_DQ[5]	DDR0_DQ[5]
	AN70	DDR0_DQ[6]	DDR0_DQ[6]
	AN70	DDR0_DQ[7]	DDR0_DQ[7]
	AR68	DDR0_DQ[8]	DDR0_DQ[8]
	AU71	DDR0_DQ[9]	DDR0_DQ[9]
Block 2	BB65	DDR0_DQ[16]	DDR0_DQ[32]
	AW63	DDR0_DQ[17]	DDR0_DQ[33]
	AW63	DDR0_DQ[18]	DDR0_DQ[34]
	AY63	DDR0_DQ[19]	DDR0_DQ[35]
	BA65	DDR0_DQ[20]	DDR0_DQ[36]
	AY65	DDR0_DQ[21]	DDR0_DQ[37]
	BA63	DDR0_DQ[22]	DDR0_DQ[38]
	BB63	DDR0_DQ[23]	DDR0_DQ[39]
	BA61	DDR0_DQ[24]	DDR0_DQ[40]
	AW61	DDR0_DQ[25]	DDR0_DQ[41]
Block 4	BB59	DDR0_DQ[26]	DDR0_DQ[42]
	AW59	DDR0_DQ[27]	DDR0_DQ[43]
	BB61	DDR0_DQ[28]	DDR0_DQ[44]
	AY61	DDR0_DQ[29]	DDR0_DQ[45]
	BA59	DDR0_DQ[30]	DDR0_DQ[46]
	AY59	DDR0_DQ[31]	DDR0_DQ[47]
Block 6	AY39	DDR0_DQ[48]	DDR1_DQ[32]
	AW39	DDR0_DQ[49]	DDR1_DQ[33]
	AY37	DDR0_DQ[50]	DDR1_DQ[34]
	BB39	DDR0_DQ[51]	DDR1_DQ[35]
	BA39	DDR0_DQ[52]	DDR1_DQ[36]
	BB37	DDR0_DQ[53]	DDR1_DQ[37]
	AY35	DDR0_DQ[54]	DDR1_DQ[38]
	AW35	DDR0_DQ[55]	DDR1_DQ[39]
	AY33	DDR0_DQ[56]	DDR1_DQ[40]
	AW33	DDR0_DQ[57]	DDR1_DQ[41]

LOGIC



TABLE

	Pin	Interleave	Non-Interleave
Block 0	AM70	DDR0_DQSN[0]	DDR0_DQSN[0]
	AM69	DDR0_DQSP[0]	DDR0_DQSP[0]
	AT69	DDR0_DQSN[1]	DDR0_DQSN[1]
	AT70	DDR0_DQSP[1]	DDR0_DQSP[1]
Block 2	BA64	DDR0_DQSN[2]	DDR0_DQSN[4]
	AY64	DDR0_DQSP[2]	DDR0_DQSP[4]
	AY60	DDR0_DQSN[3]	DDR0_DQSN[5]
	BA60	DDR0_DQSP[3]	DDR0_DQSP[5]
Block 4	BA38	DDR0_DQSN[4]	DDR1_DQSN[0]
	AY38	DDR0_DQSP[4]	DDR1_DQSP[0]
	AY34	DDR0_DQSN[5]	DDR1_DQSN[1]
	BA34	DDR0_DQSP[5]	DDR1_DQSP[1]
Block 6	BA30	DDR0_DQSN[6]	DDR1_DQSN[4]
	AY30	DDR0_DQSP[6]	DDR1_DQSP[4]
	AY26	DDR0_DQSN[7]	DDR1_DQSN[5]
	BA26	DDR0_DQSP[7]	DDR1_DQSP[5]

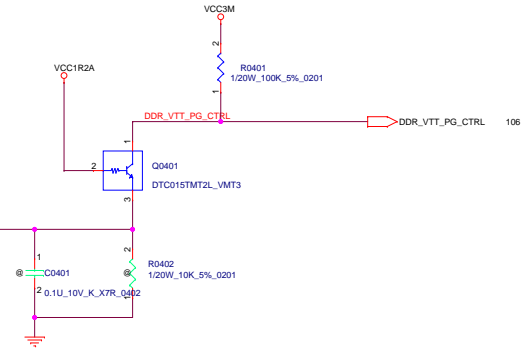
LOGIC

TABLE

Pin	DDR3L	LPDDR3	DDR4
BA51	DDR0_MA[5]	DDR0_CAA[0]	DDR0_MA[5]
BB54	DDR0_MA[9]	DDR0_CAA[1]	DDR0_MA[9]
BA52	DDR0_MA[6]	DDR0_CAA[2]	DDR0_MA[6]
AY52	DDR0_MA[8]	DDR0_CAA[3]	DDR0_MA[8]
AW52	DDR0_MA[7]	DDR0_CAA[4]	DDR0_MA[7]
AY55	DDR0_BA[2]	DDR0_CAA[5]	DDR0_BG[0]
AW54	DDR0_MA[12]	DDR0_CAA[6]	DDR0_MA[12]
BA54	DDR0_MA[11]	DDR0_CAA[7]	DDR0_MA[11]
BA55	DDR0_MA[15]	DDR0_CAA[8]	DDR0_ACT#
AY54	DDR0_MA[14]	DDR0_CAA[9]	DDR0_BG[1]
AU46	DDR0_MA[13]	DDR0_CAB[0]	DDR0_MA[13]
AT46	DDR0_CAS#	DDR0_CAB[1]	DDR0_MA[15]
AU50	DDR0_RAS#	DDR0_CAB[2]	DDR0_MA[14]
AU52	DDR0_BA[0]	DDR0_CAB[3]	DDR0_MA[16]
AY51	DDR0_MA[0]	DDR0_CAB[4]	DDR0_BA[0]
AT48	DDR0_MA[2]	DDR0_CAB[5]	DDR0_MA[2]
AT50	DDR0_BA[1]	DDR0_CAB[6]	DDR0_BA[1]
BB50	DDR0_MA[10]	DDR0_CAB[7]	DDR0_MA[10]
AY50	DDR0_MA[11]	DDR0_CAB[8]	DDR0_MA[11]
BA50	DDR0_MA[0]	DDR0_CAB[9]	DDR0_MA[0]
BB52	DDR0_MA[3]	Not Used	DDR0_MA[3]
	DDR0_MA[4]	Not Used	DDR0_MA[4]

LOGIC

TABLE of (Q0401)		
Vendor	LCFC P/N	Description
ROHM	SB00000WC0J	S TR DTC015MT2L NPN VMT3
TOSHIBA	SB000010700	S TR RN1131MFV NPN VESM
ON	SB000013J00	S TR DTC115MT3T5G NPN SOT-723-



[WHL PDG]for WHL DDR4 COMPENSATION
DDR_RCOMP[0] Pull down 121 ohm resistor
DDR_RCOMP[1] Pull down 80.6 ohm resistor
DDR_RCOMP[2] Pull down 100 ohm resistor

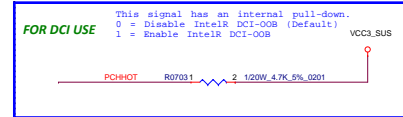
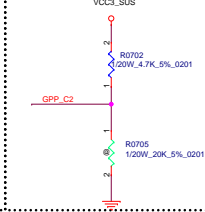
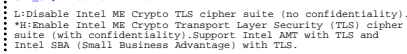
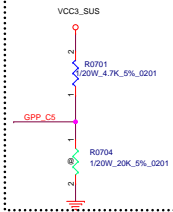
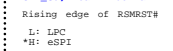
[WHL PDG]for CNL DDR4 COMPENSATION
DDR_RCOMP[0] Pull down 100 ohm resistor
DDR_RCOMP[1] Pull down 100 ohm resistor
DDR_RCOMP[2] Pull down 100 ohm resistor

Table 3-1.

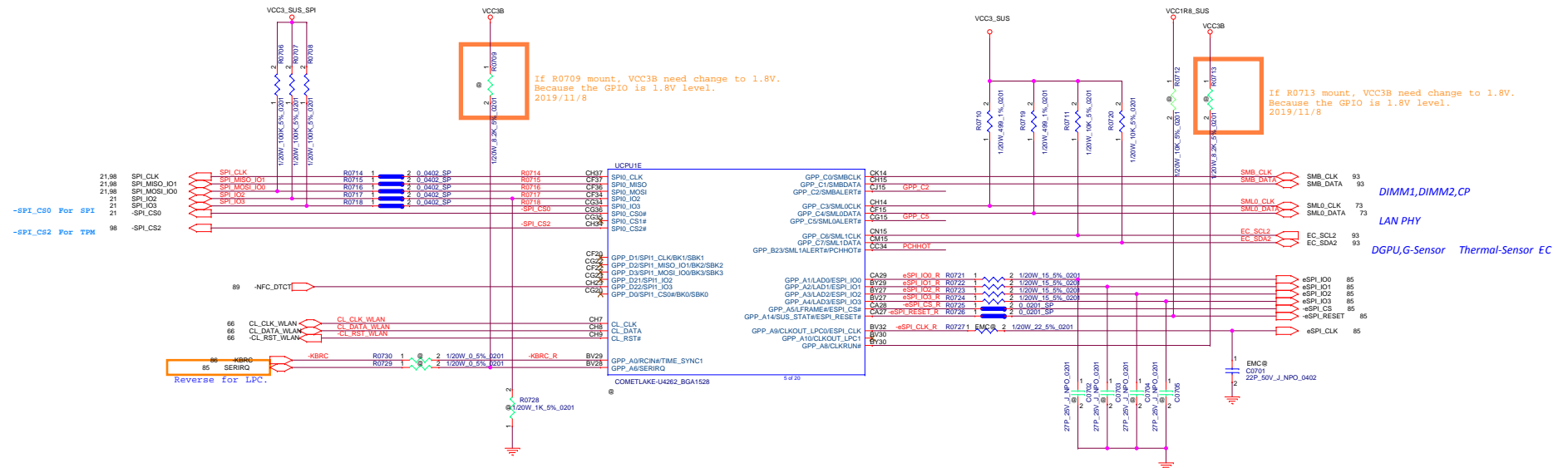
Interface	Pin Name	Board Rterm (Ohm)	Board Rdc (Ohm)	Note
DDR - LP3	DDR_RCOMP[0]	200Ω ±1% on pkg to VSS	N/A	
	DDR_RCOMP[1]	80.6Ω ±1% on pkg to VSS	N/A	
	DDR_RCOMP[2]	162Ω ±1% on pkg to VSS	N/A	
DDR - DDR4 SODIMM	DDR_RCOMP[0]	121Ω ±1% on pkg to VSS	N/A	Different RCOMP value in CNL. Refer to Table 3-2
	DDR_RCOMP[1]	80.6Ω ±1% on pkg to VSS	N/A	
	DDR_RCOMP[2]	100Ω ±1% on pkg to VSS	N/A	

Table 3-2. RCOMP Recommendation for CNI

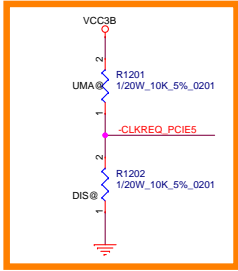
Interface	Pin Name	Board Rterm (Ohm)	Board Rdc (Ohm)	Note
DDR - DDR4 SODIMM	DDR_RCOMP[0]	100Ω ±1% on pkg to VSS	N/A	No LP3 support in CML
	DDR_RCOMP[1]	100Ω ±1% on pkg to VSS	N/A	
	DDR_RCOMP[2]	100Ω ±1% on pkg to VSS	N/A	



SP10_M051	Reserved	Rising edge of RSMS1#	External pull-up is required. Recommended 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it at opposite direction during strap sampling.
SP10_I02	Reserved	Rising edge of RSMS1#	External pull-up is required. Recommended 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it at opposite direction during strap sampling.
SP10_I03	Reserved	Rising edge of RSMS1#	External pull-up is required. Recommended 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it at opposite direction during strap sampling.



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7.3.2.3 WHLU PCH-LP Platform XTAL Routing Guidelines

Figure 7-7. WHLU PCH-LP Platform Crystal XTAL_IN/OUT Topology

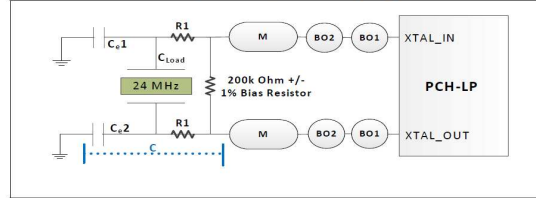


TABLE of (Y1201)		
Vendor	LCFC P/N	Description
TXC	SJ10000S500	S CRYSTAL 24MHZ 12PF +-20PPM 8Y24000034
Harmony	SJ10000RR00	S CRYSTAL 24MHZ 12PF X2C024000DC1H-HU

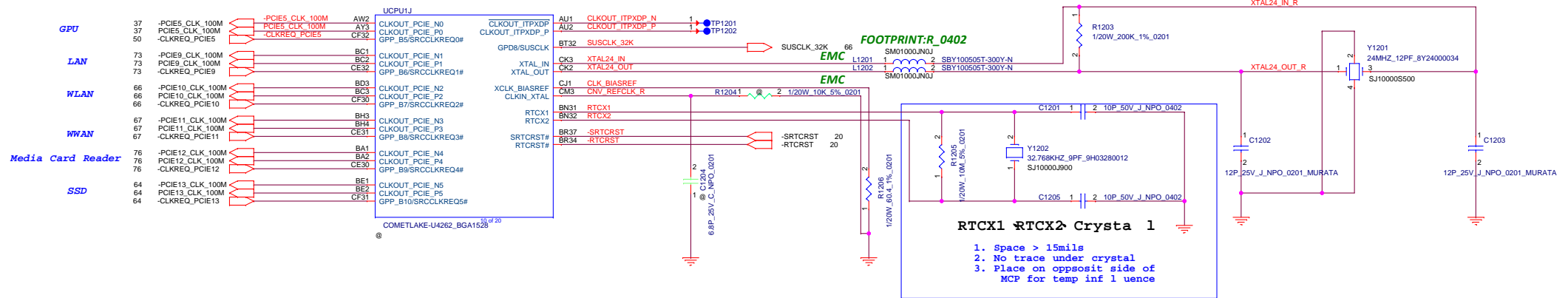
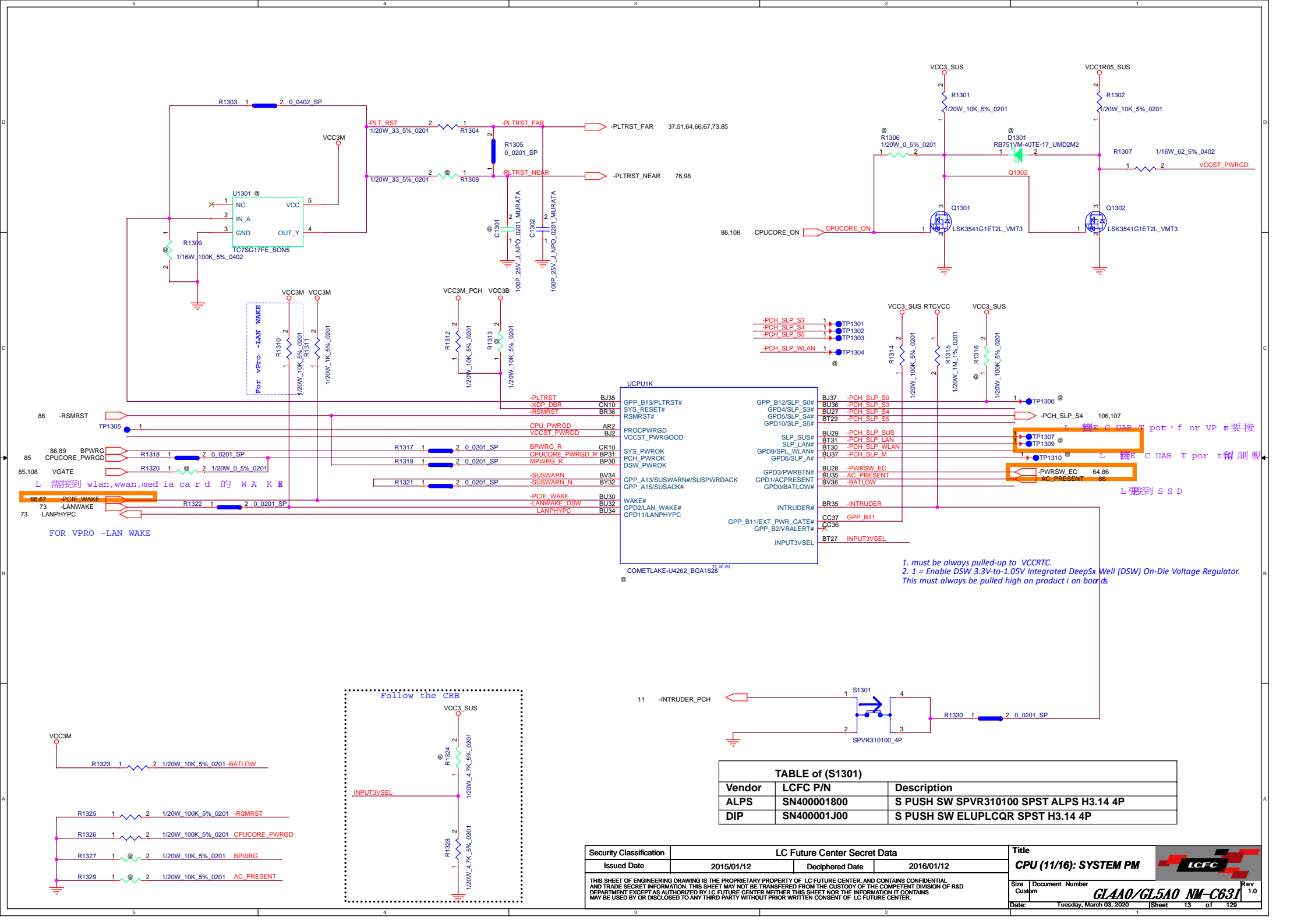


TABLE of XTAL (Y1202)		
Vendor	LCFC P/N	Description
TXC	SJ10000J900	S CRYSTAL 32.768KHZ 9PF 20PPM
KDS	SJ100069400	S CRYSTAL 32.768KHZ 9PF 1TJF09
SEIKO	SJ10000IX00	S CRYSTAL 32.768KHZ 9PF X1A000

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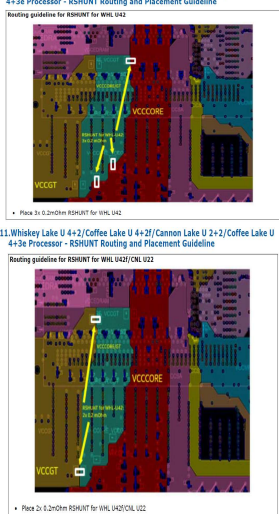
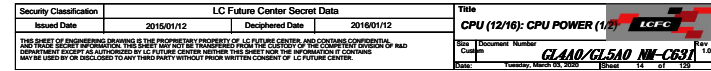
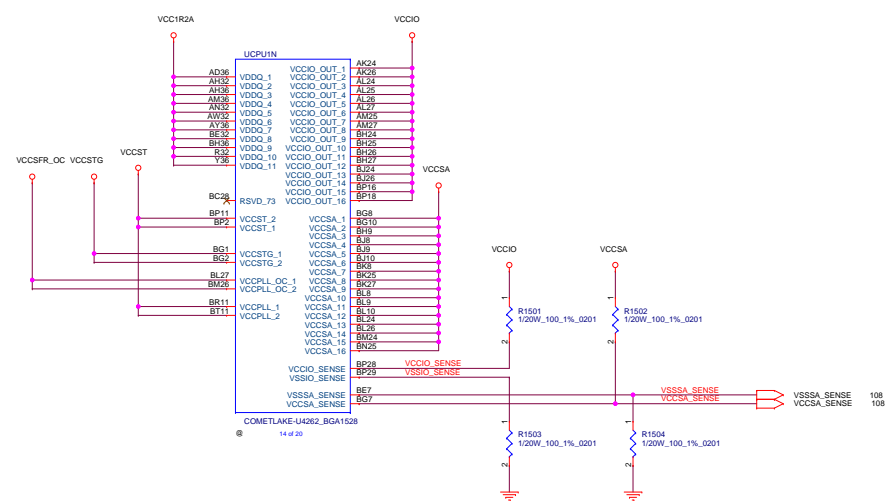
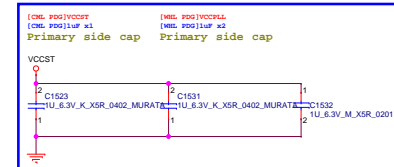
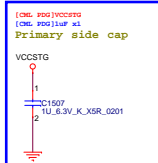
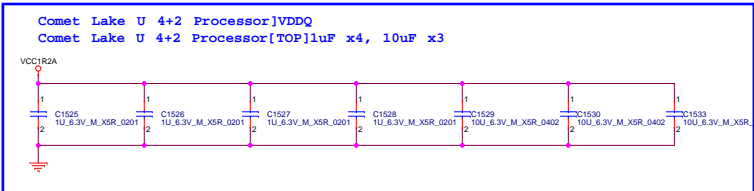
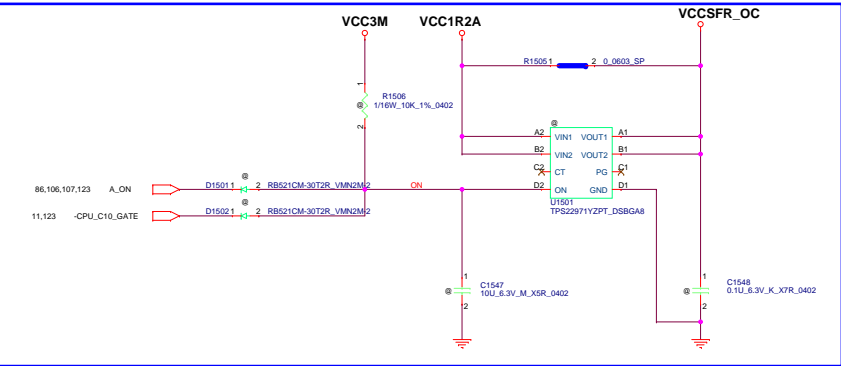


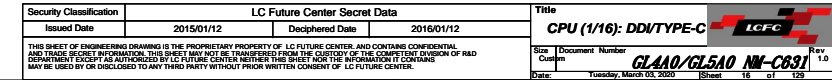
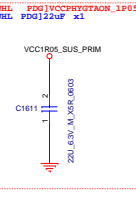
Figure 11-11. Whiskey Lake U 4+2/ Coffee Lake U 4+2f/ Cannon Lake U 2+2/ Coffee Lake U 4+3e Processor - RSHUNT Routing and Placement Guideline

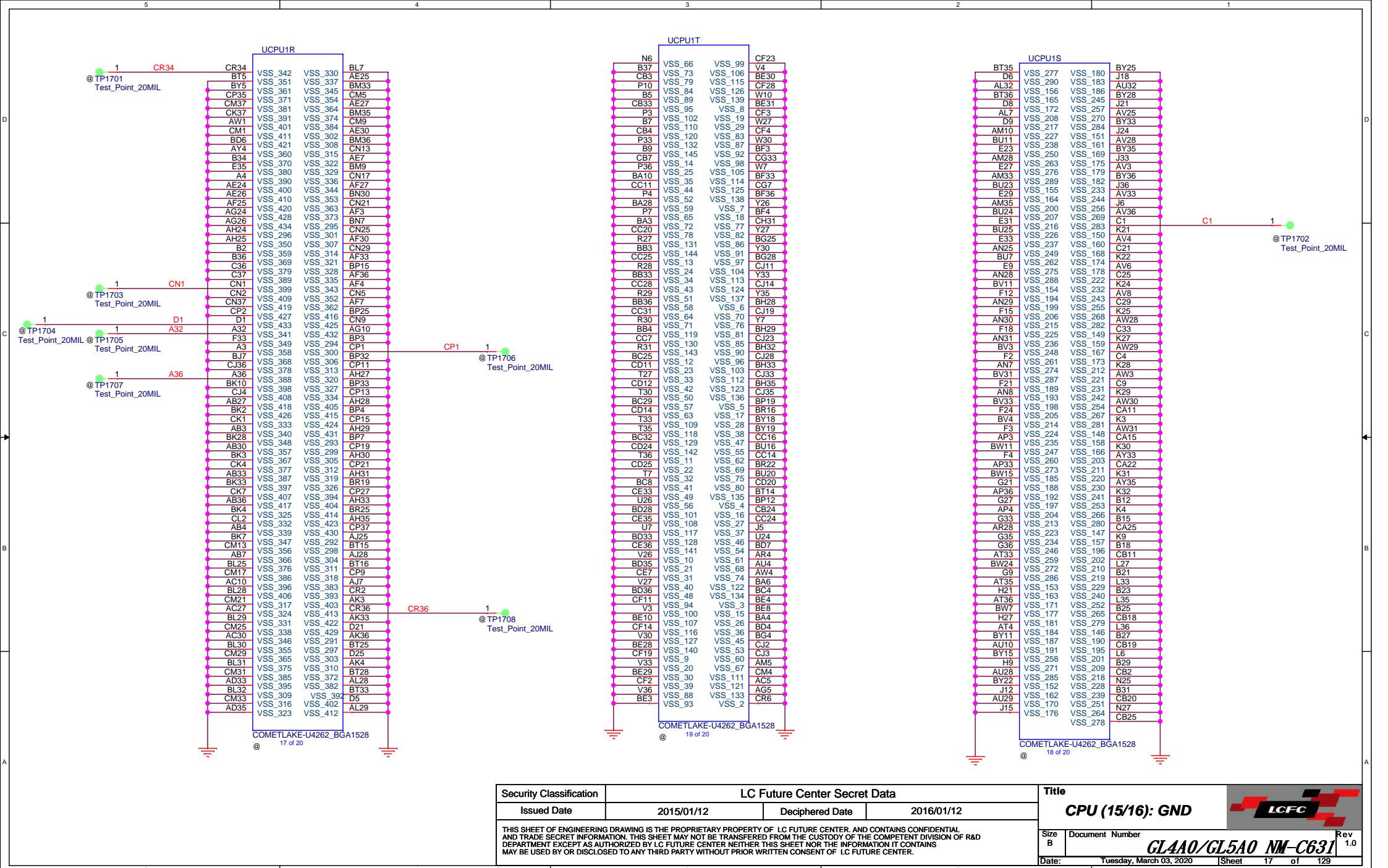
Routing guideline for RSHUNT for WHL U42f/CNL U22






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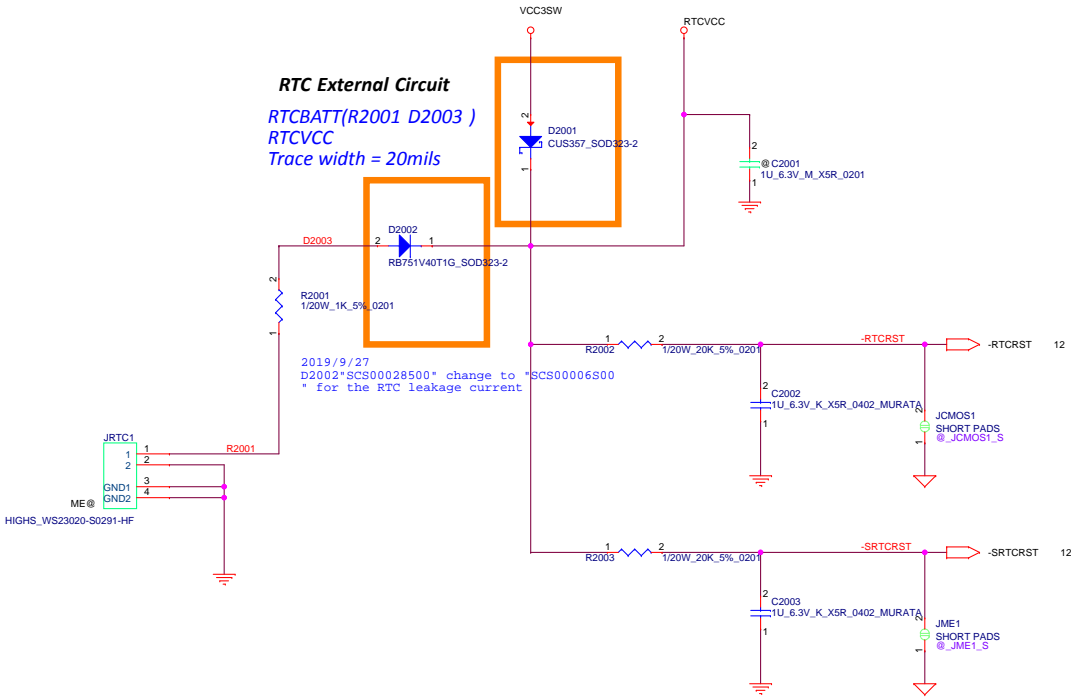



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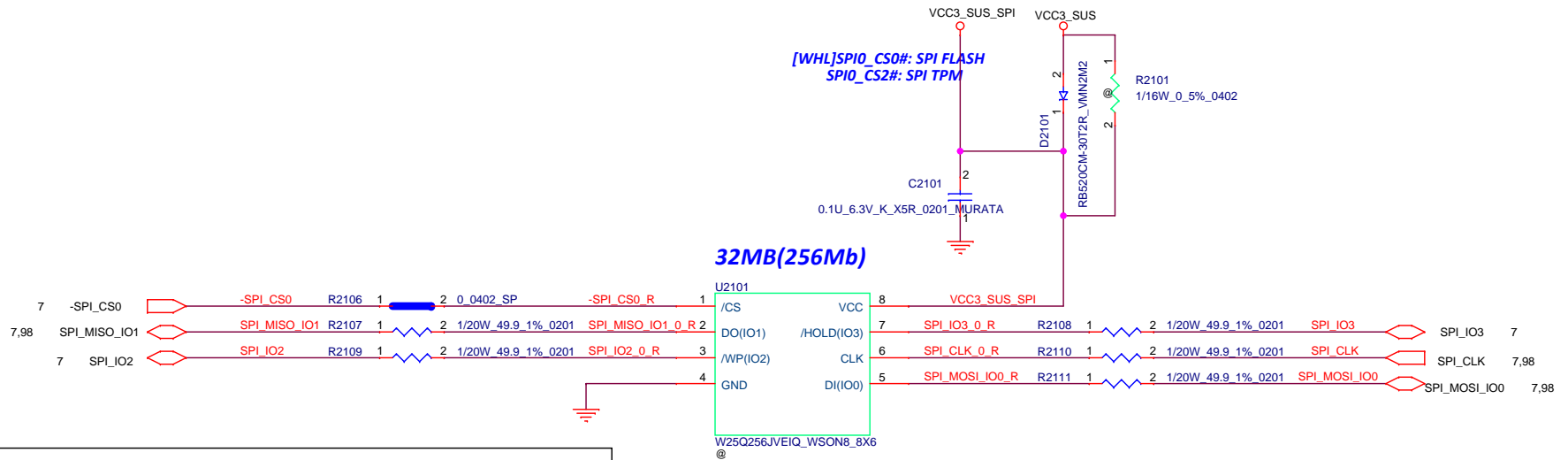
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RTCVCC RTCVCC 13,16

RTC CONN.



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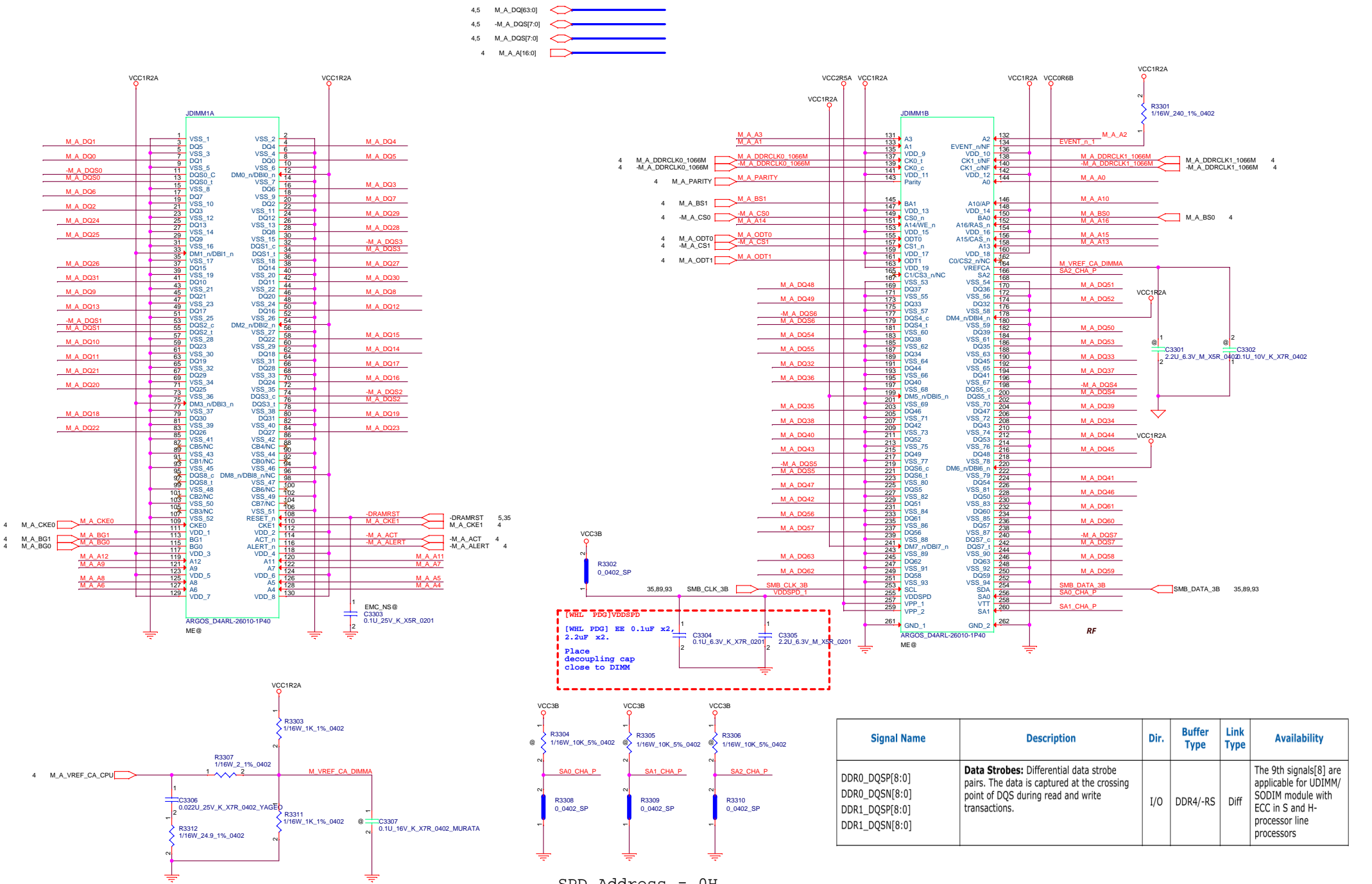
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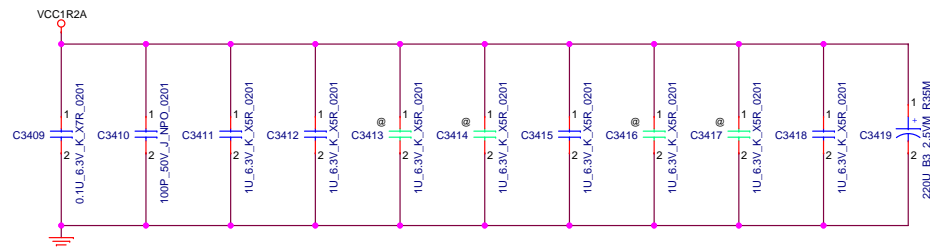
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				<div><div></div><div>Rev 1.0</div></div>	
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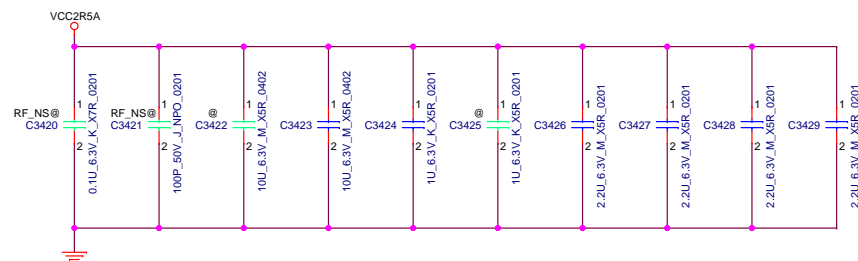


Place 10uF/1uF decoupling cap, 4
near each side of the DIMM
connector close to VDD pins.
330uF placeholder



10U x 6
0.1U x 2
1U x 4
220U x 1

Place decoupling cap on DRAM side.



10U x 1
1U x 1

VCC0R6B

RF_NS@ C3430

0.1uH 6.3V_K_X9R_0201

RF_NS@ C3431

100pF 50V_J_NPO_0201

C3432

10uH 6.3V_M_X9R_0402

C3433

10uH 6.3V_M_X9R_0402

C3434

2.2uH 6.3V_M_X9R_0201

C3435

2.2uH 6.3V_M_X9R_0201

C3436

1uH 6.3V_K_X9R_0201

C3437

1.1uH 6.3V_K_X9R_0201

10U x 1
1U x 2

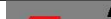
Place decoupling on the VTT plane close to SODIMM

```

Total
10U x 8
0.1U x 2
1U x 7
220U x 1

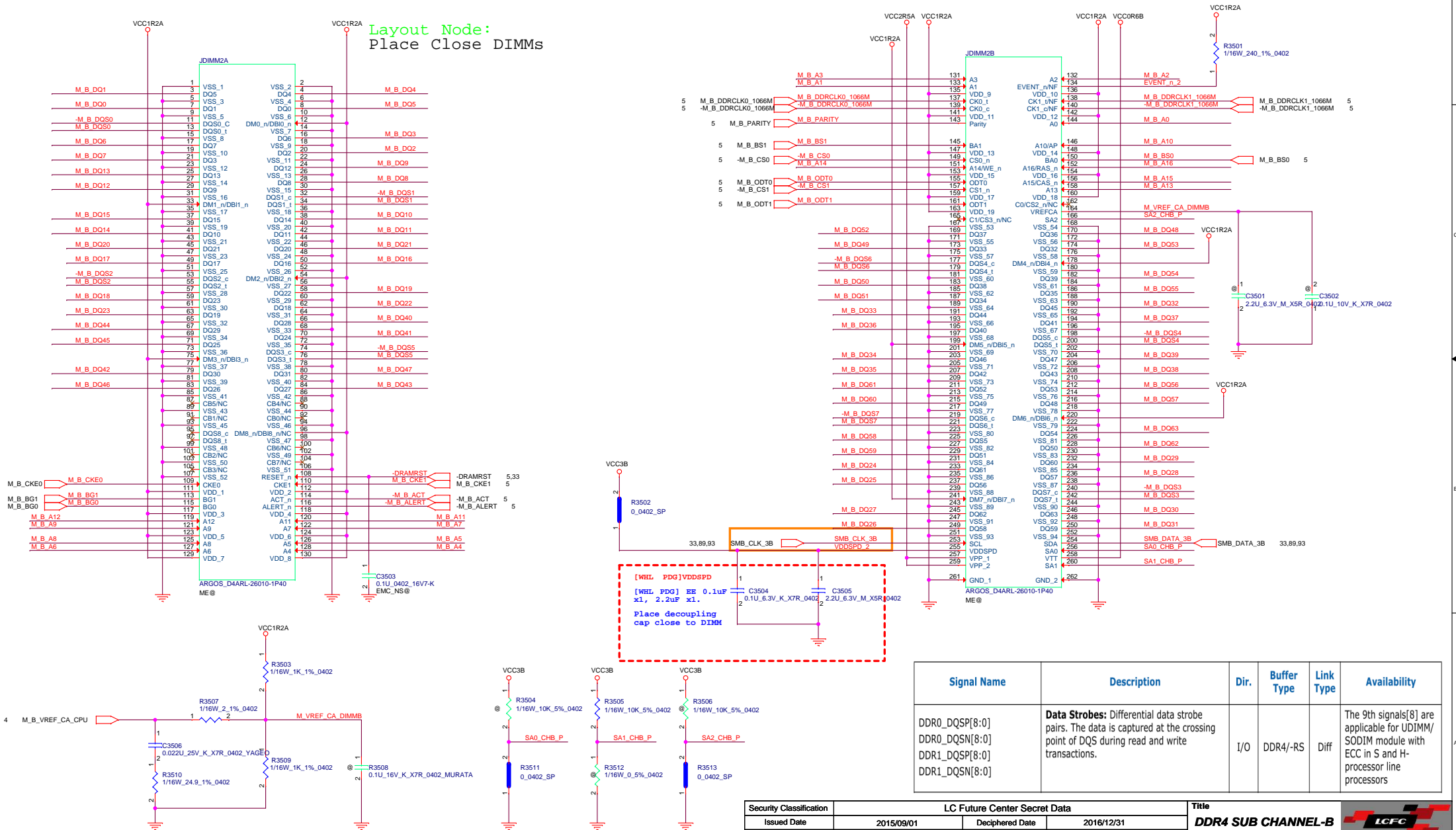
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Title		DDR4 SUB CHANNEL-A			
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4,5 M_B_DQ[63:0]
4,5 -M_B_DQS[7:0]
4,5 M_B_DQS[7:0]
5 M_B_A[16:0]

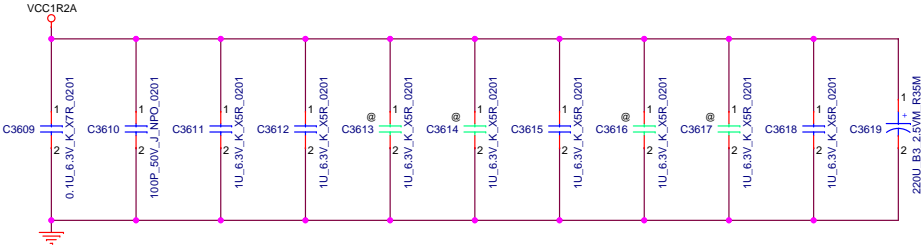
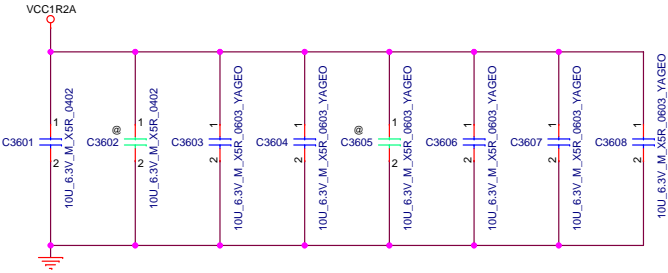
Layout Node:
Place Close DIMMs



Signal Name	Description	Dir.	Buffer Type	Link Type	Availability
DDR0_DQSP[8:0] DDR0_DQSN[8:0] DDR1_DQSP[8:0] DDR1_DQSN[8:0]	Data Strobes: Differential data strobe pairs. The data is captured at the crossing point of DQS during read and write transactions.	I/O	DDR4/-RS	Diff	The 9th signals[8] are applicable for UDIMM/ SODIM module with ECC in S and H-processor line processors

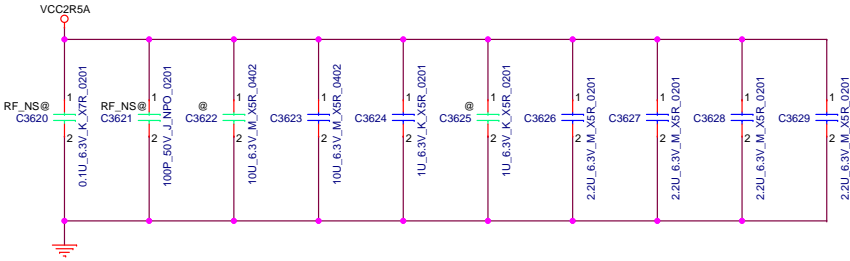
Place 10uF/1uF decoupling cap, 4
near each side of the DIMM
connector close to VDD pins.
330uF placeholder

Total quantity is referring to 2 channels.



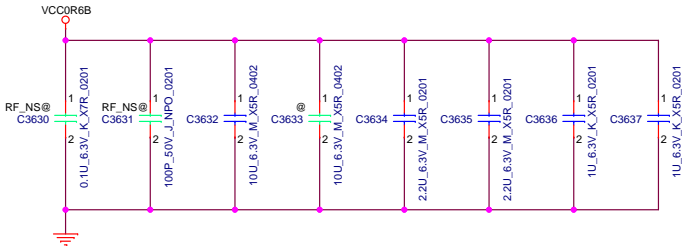
10U x 6
0.1U x 2
1U x 4
220U x 1

[WHL PDG]VPP
[WHL PDG] EE 10uF x2, 1uF x2.
Place decoupling cap on DRAM side.



10U x 1
1U x 1

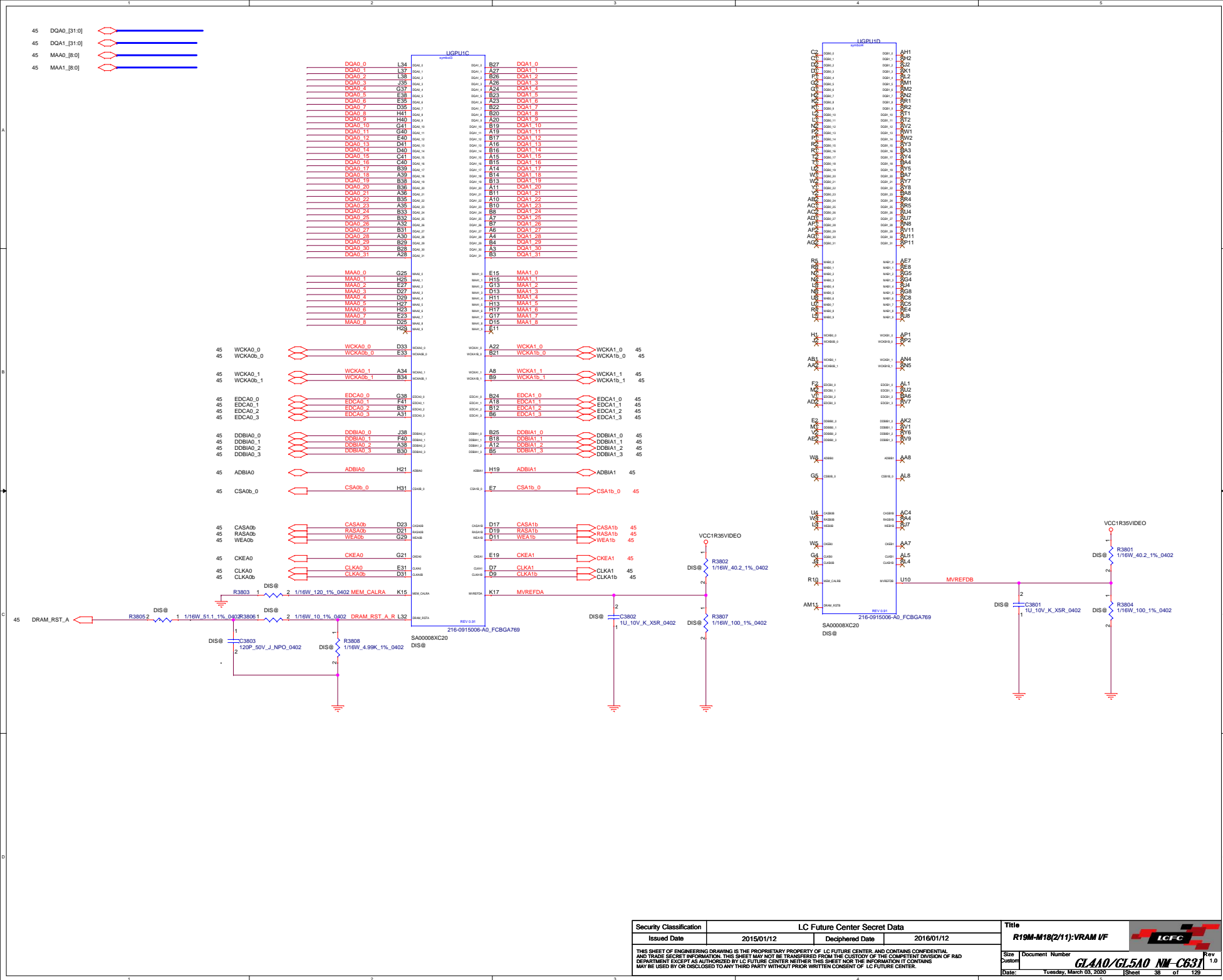
[WHL PDG]VTT
[WHL PDG] EE 10uF x2, 1uF x4.




10U x 1
1U x 2

Place decoupling on the VTT plane close to SODIMM

Total
10U x 8
0.1U x 2
1U x 7
220U x 1



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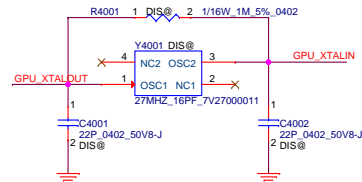
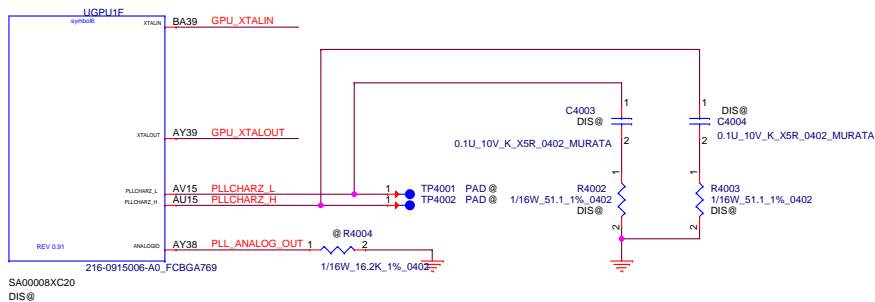
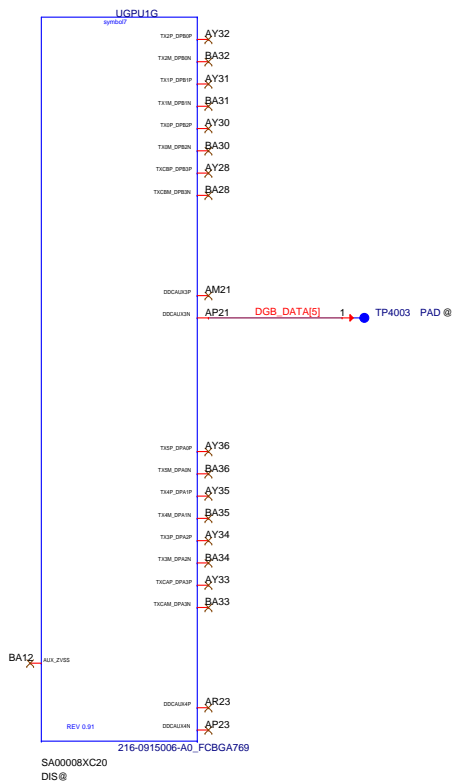
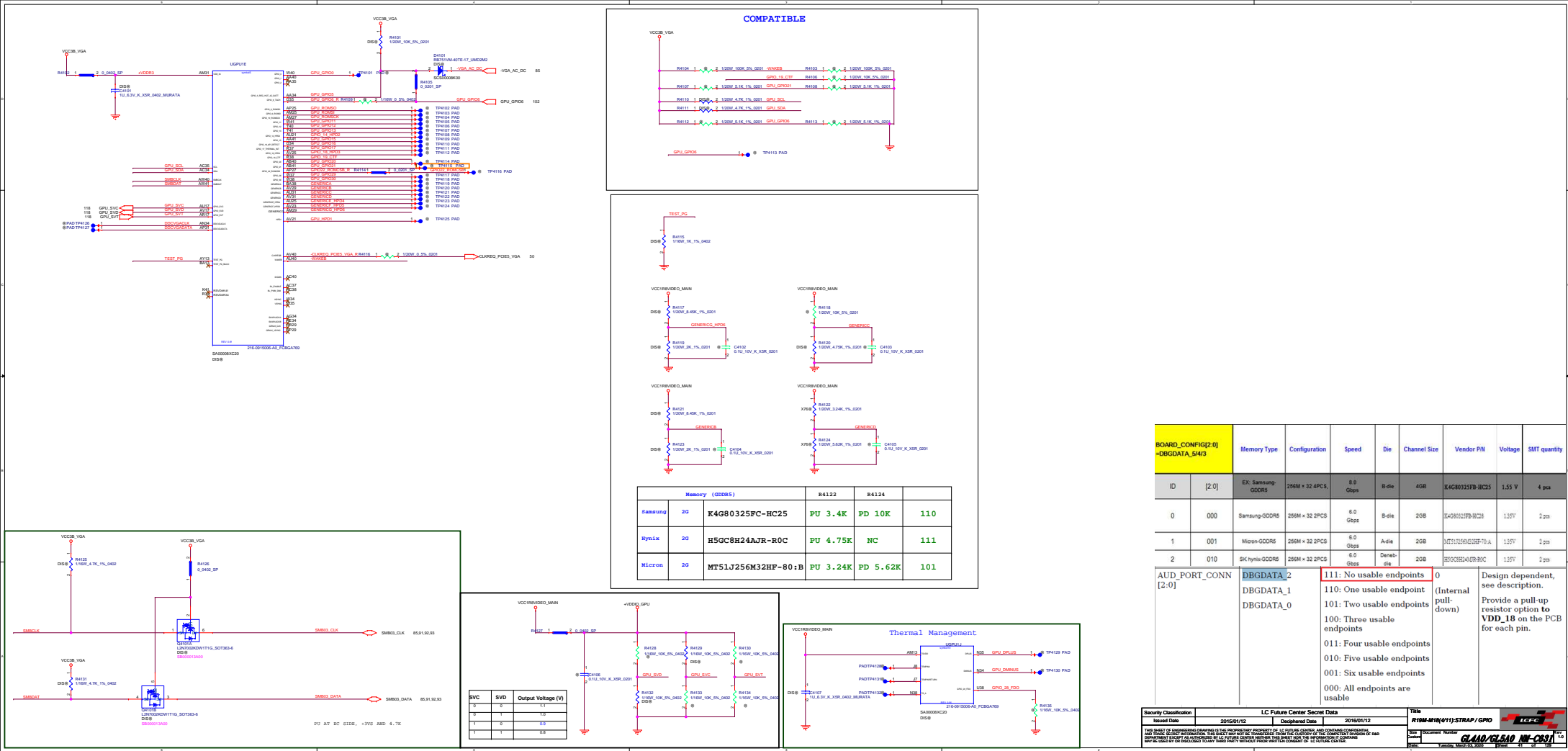
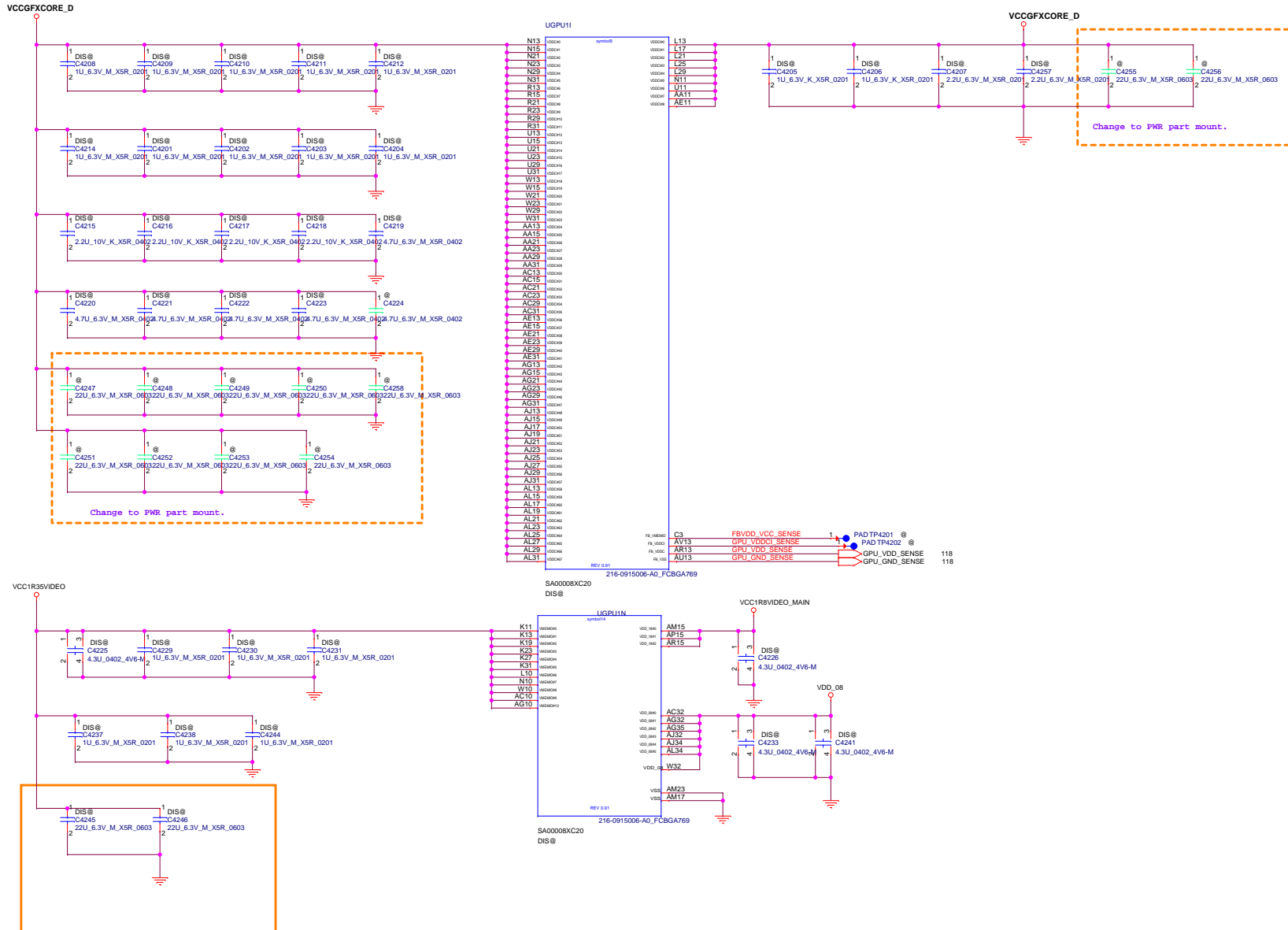


TABLE of (Y4001)		
Vendor	LCFC P/N	Description
TXC	SJ10000GI00	S CRYSTAL 27MHZ 16PF +-30PPM 7
HARMONY	SJ10000CV0J	S CRYSTAL 27MHZ 16PF X3G027000




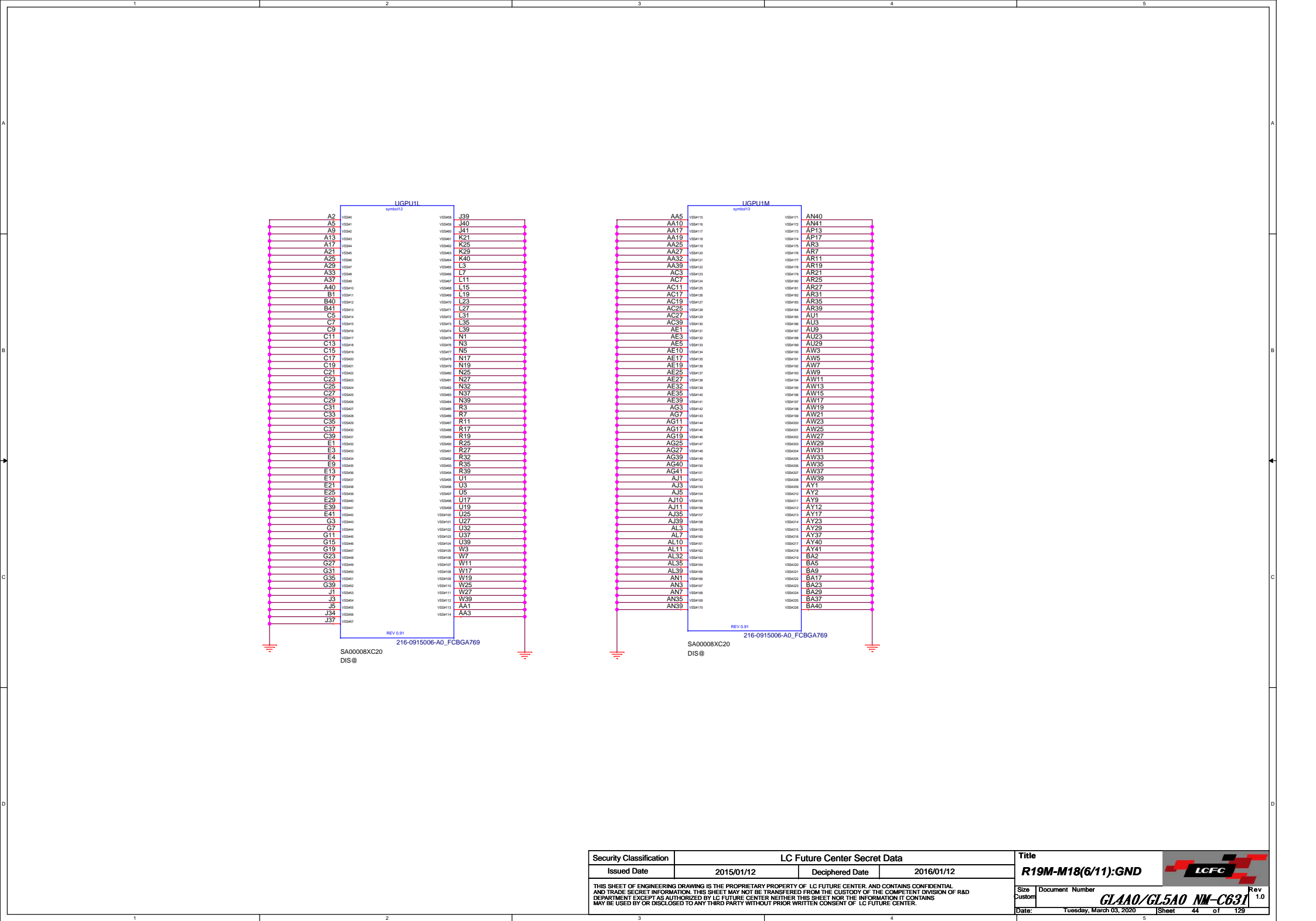


BGA40_CONFIG2-0 =DBGDATA_54/3		Memory Type	Configuration	Speed	Die	Channel Size	Vendor P/N	Voltage	SMT quantity
ID	[2:0]	EX: Samsung-ODDR5	256M x 32 APC8	8.0 Gbps	B-die	40B	K4G80125PB-HC25	1.35V	4 pcs
0	000	Samsung-ODDR5	256M x 32 ZPC8	6.0 Gbps	B-die	20B	K4G80125PB-HC28	1.35V	2 pcs
1	001	Micron-ODDR5	256M x 32 ZPC8	6.0 Gbps	A-die	20B	MT51J256M32HF-R0-A	1.35V	2 pcs
2	010	SK hynix-ODDR5	256M x 32 ZPC8	6.0 Gbps	Deneb-die	20B	J50CCH24J2R-B0C	1.35V	2 pcs
AUD_PORT_CONN [2:0]		DBGDATA_2 DBGDATA_1 DBGDATA_0	111: No usable endpoints 110: One usable endpoint 101: Two usable endpoints 100: Three usable endpoints 011: Four usable endpoints 010: Five usable endpoints 001: Six usable endpoints 000: All endpoints are usable		0 (Internal pull-down)	Design dependent, see description. Provide a pull-up resistor option to VDD_18 on the PCB for each pin.			
Security Classification		LC Future Center Secret Data		Type		RYHM-MIN(411)-STRAP/GPIO			
Release Date		2016/01/12		Dissemination Date		2016/01/12			
Version		1.0		Document Number		GLAD/CL540-NH-CBSA			
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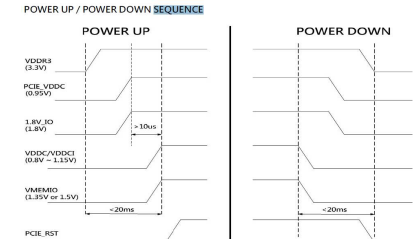
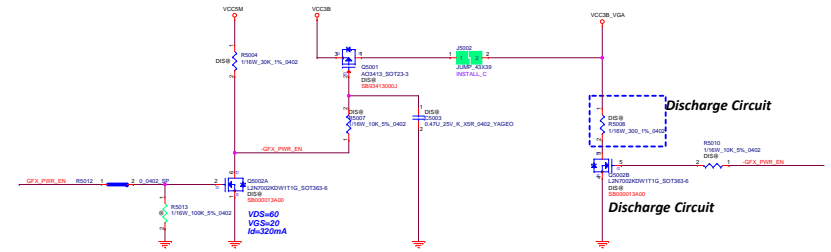
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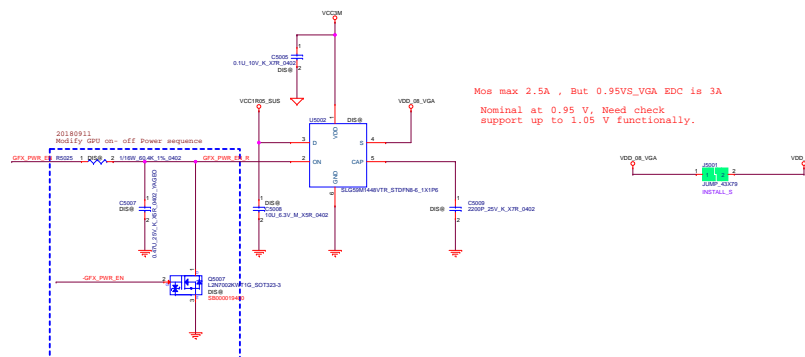
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VCC3B to VCC3B_VGA

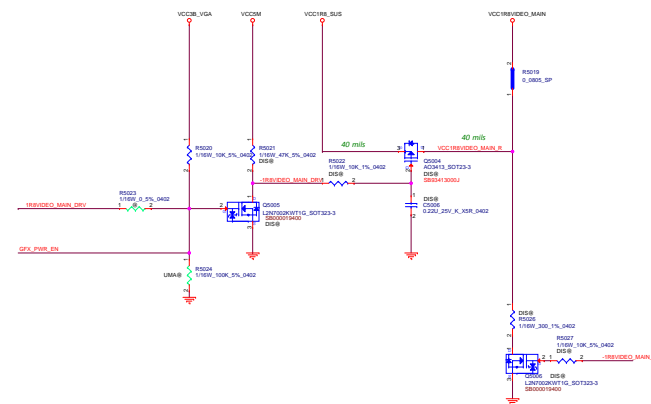


PCC circuit

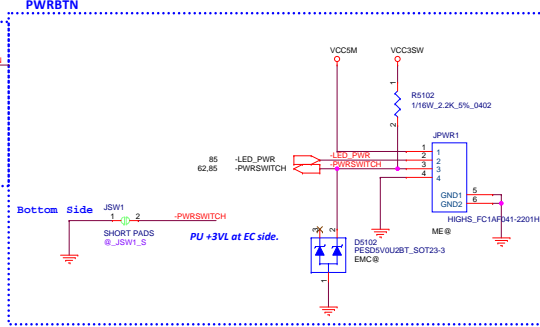
VCC1R05_SUS to VCC1R05B_VGA



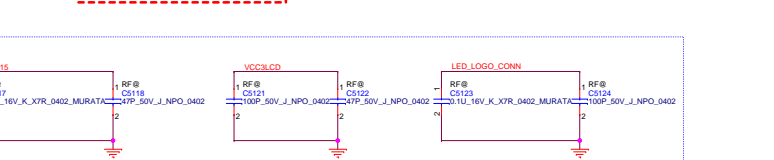
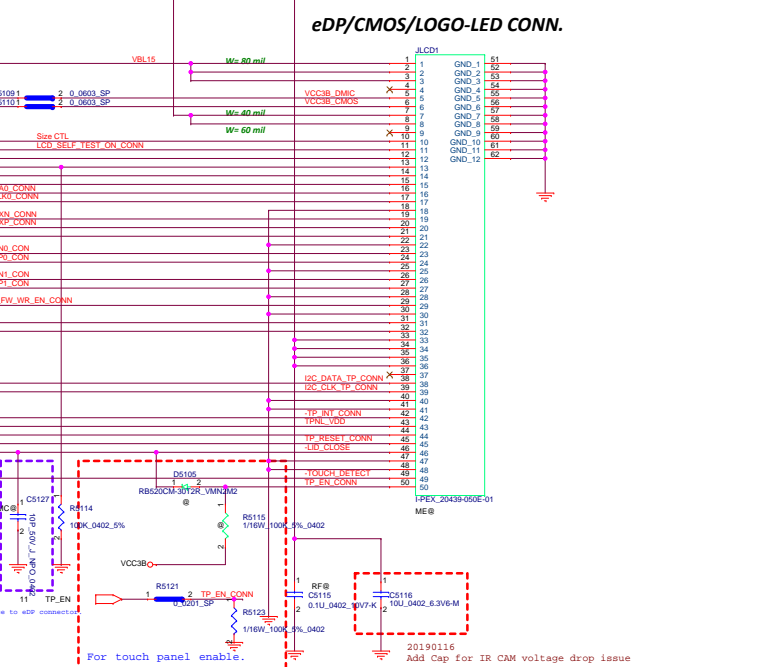
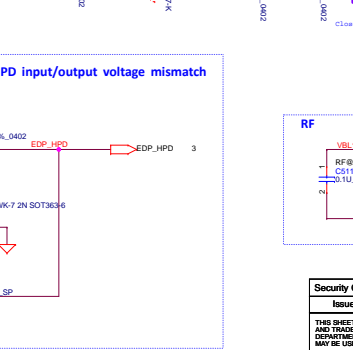
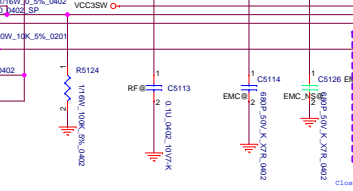
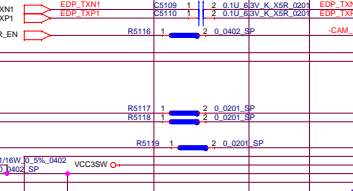
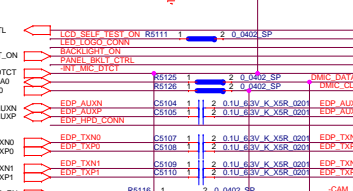
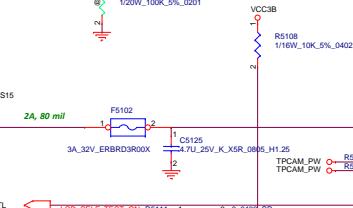
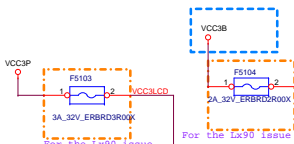
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Doc	LCFC-000001	Doc	LCFC-000001	Doc	LCFC-000001




Status	Size CTL (GPP_C19)
15@ R5106	0 (GND Low)
14@ R5105	1 (NC High)




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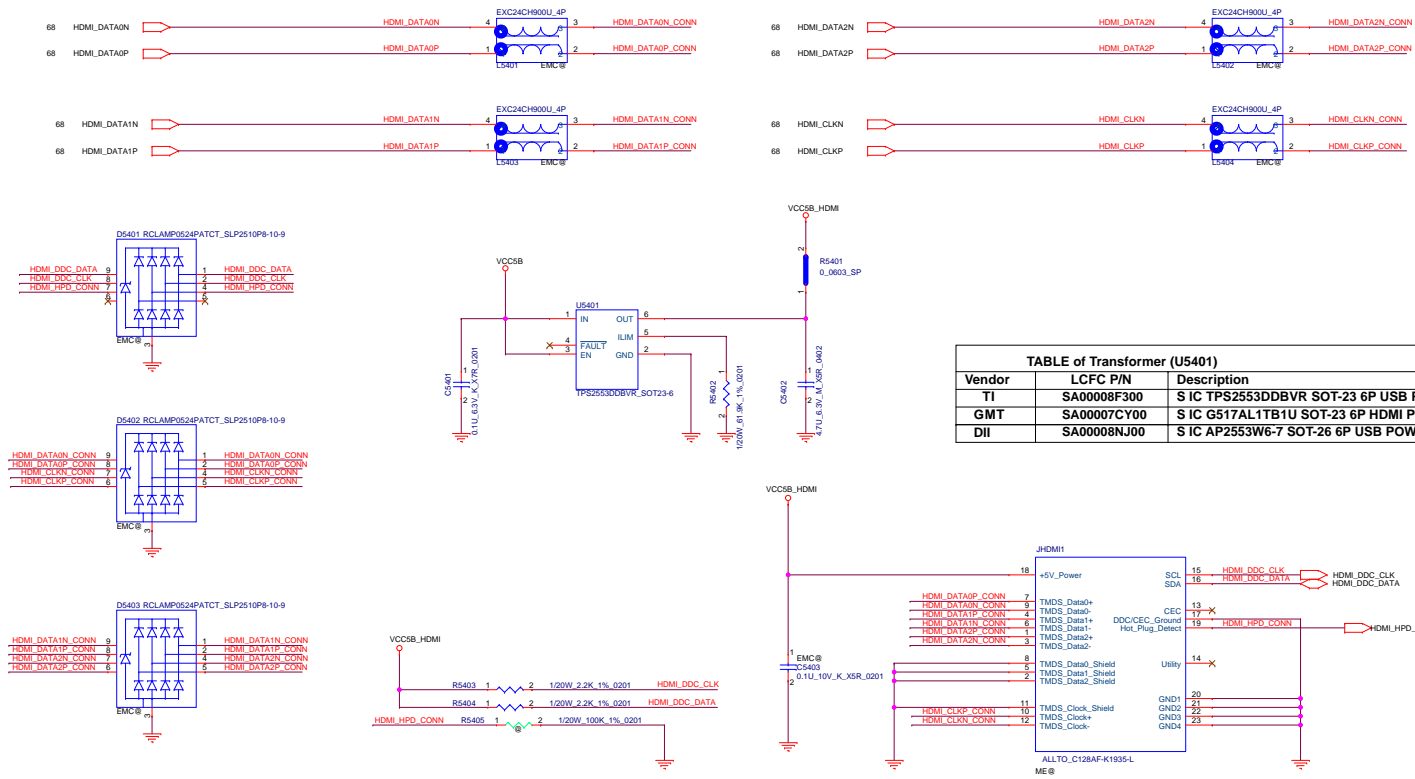


Figure 7-12. HDMI 1.4* HPD Active Level Shifter Design Recommendation

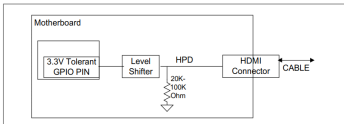
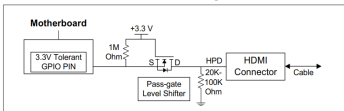



Figure 7-13. HDMI 1.4* HPD Cost Reduced Level Shifter Design Recommendation




Note: 3.3V transistor gate supply must turn off when CPU power is turned off.

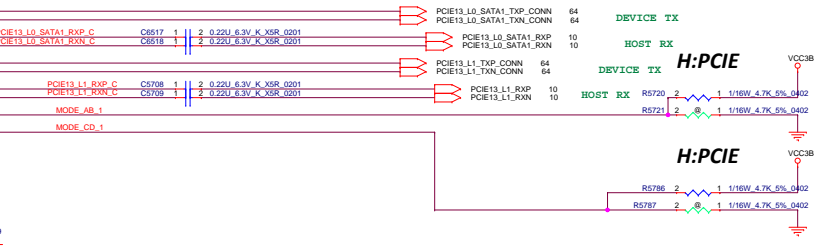
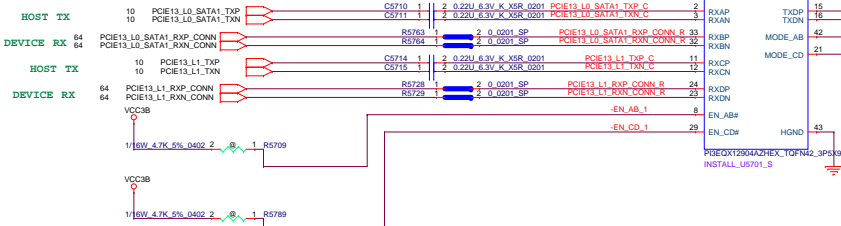
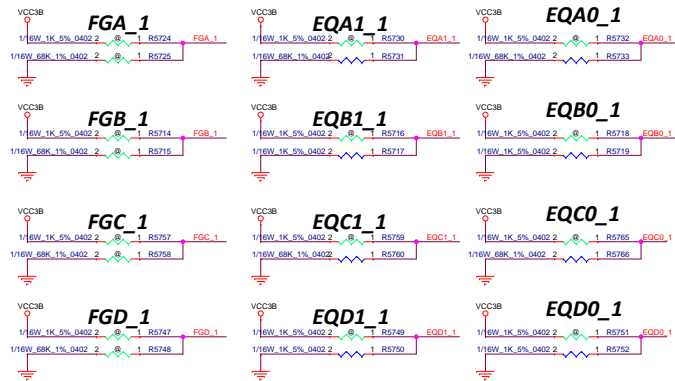
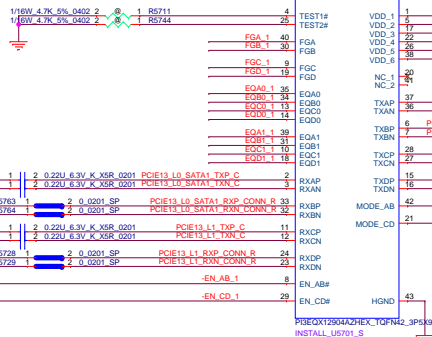
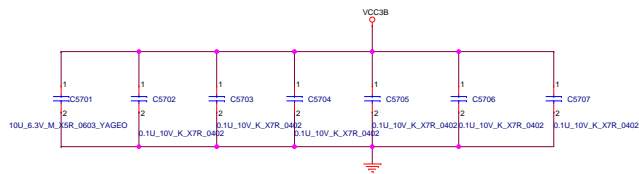
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			<div>Customer</div> <div>GLA40/CL540 NM-C631</div>
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Equalization Setting: EQA/B are the selection pins for the equalization selection

EQ		Equalizer setting (dB)			
A1/B1	A0/B0	@1.25GHz	@2.5GHz	@3GHz	@4GHz
0	0	0.4	1.8	2.4	3.9
0	R	0.6	2.3	3.2	4.9
0	F	0.8	2.9	3.9	5.8
0	1	1.0	3.5	4.6	6.6
R	0	2.1	4.4	5.3	7.2
R	R	2.3	4.9	5.9	7.9
R	F	2.5	5.3	6.4	8.5
R	1	2.7	5.8	7.0	9.1
F	0	3.7	6.5	7.7	9.7
F	R	3.9	6.9	8.1	10.2
F	F	4.1	7.3	8.5	10.6
F	1	4.3	7.6	8.9	11.0
1	0	5.4	8.4	9.5	11.4
1	R	5.6	8.7	9.8	11.8
1	F	5.8	9.0	10.2	12.1
1	1	5.9	9.2	10.4	12.5

Flat Gain Setting: FGA/B are the selection bits for the DC gain

FGA/B	Flat Gain Settings
0	-3.5
R	-1.5
F	0 (Default)
1	+1.5

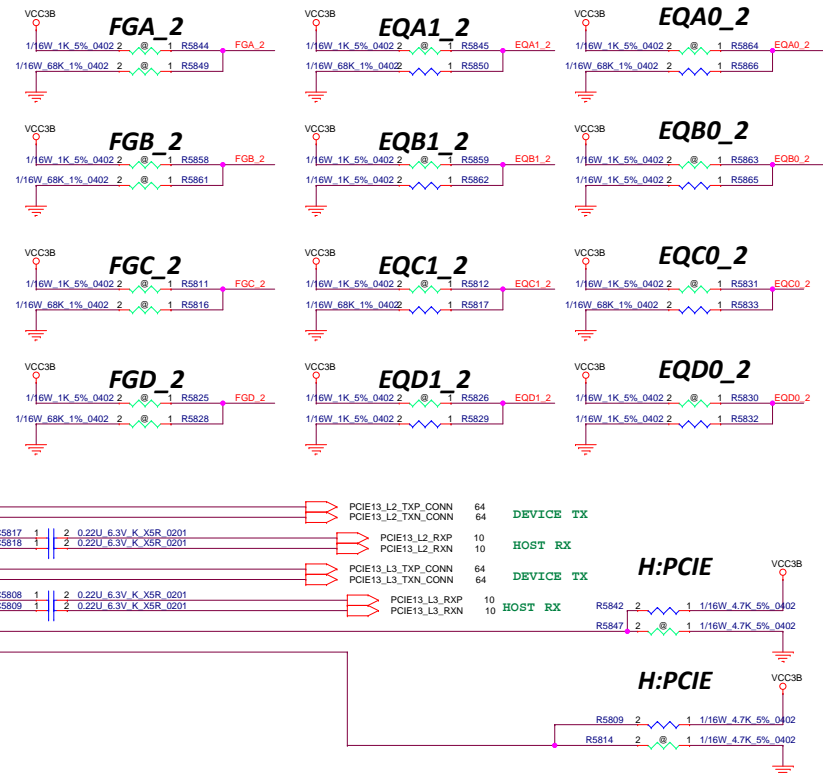
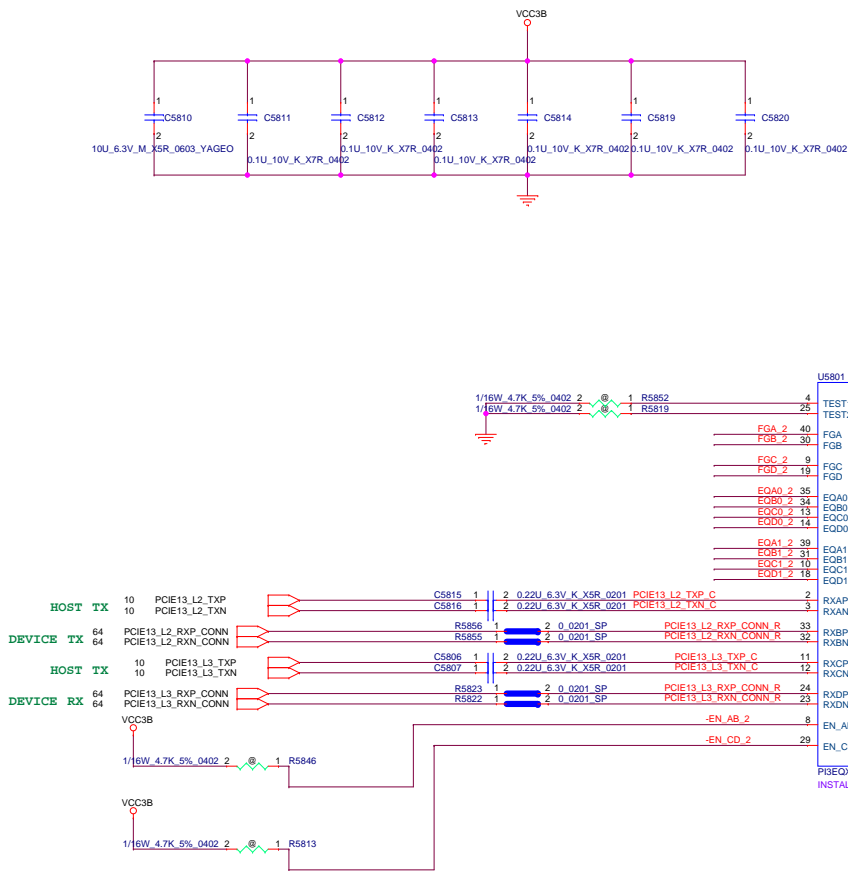
-1dB compression point output Swing Setting:

SWA/B	Output Linear Swing Settings
0	990
R	1050
F	1000 (Default)
1	1120

EL480/580 Setting					
TX EQ	TX SW	TX Gain	RX EQ	RX SW	RX Gain
A1:R	1	F	B1:0	1	F
A0:F			B0:1		
TX EQ	TX SW	TX Gain	RX EQ	RX SW	RX Gain
A1:R	1	F	B1:0	1	F
A0:F			B0:1		


For 12902A
0 means , pull down to GND thru 1K ohm
F, Floating
1, pull up to VDD thru 1K ohm
R, pull down to GND thru 68K ohm.

Channel Enable Setting	
EN #	Setting
0	Enabled (Default)
1	Disabled

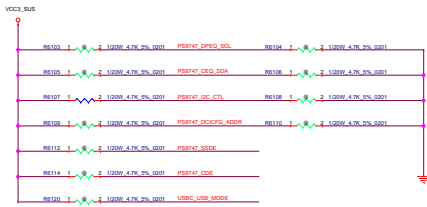
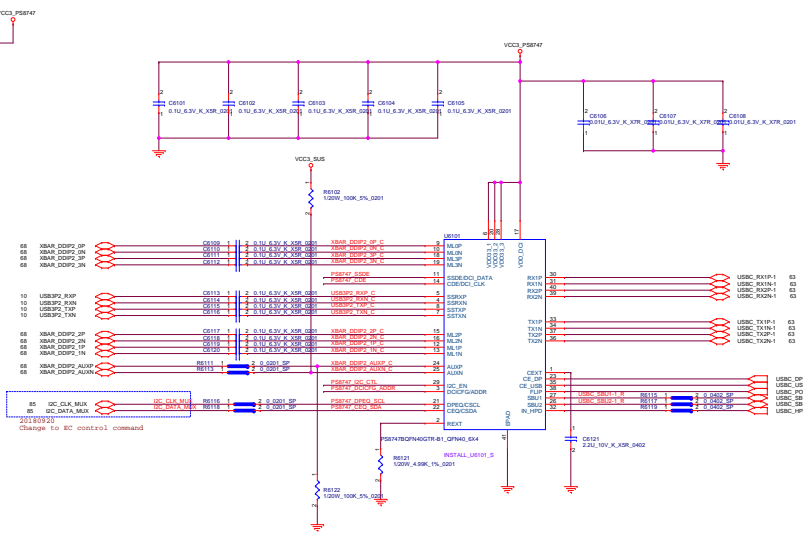


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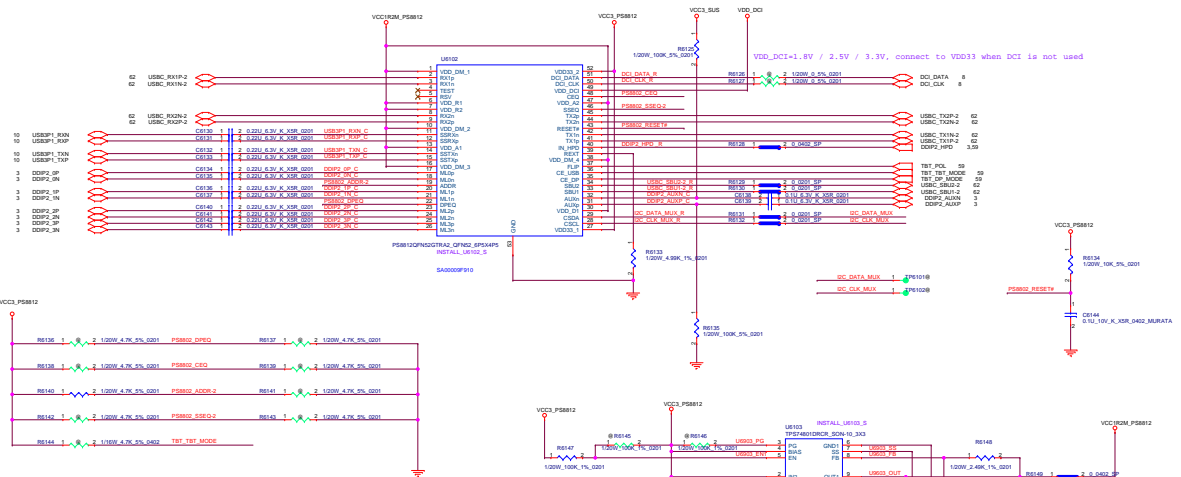
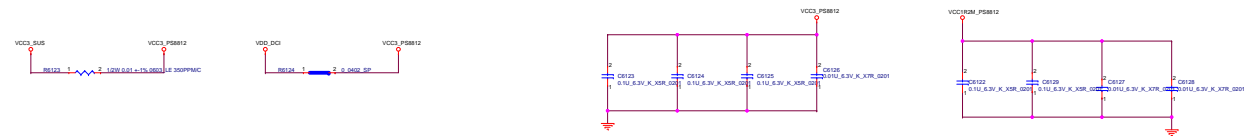
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Module Configuration for PS8743 Mode Selection				
State #	CE_DP Pin32 (CTL1)	CE_USB Pin3 (CTL8)	FLIP Pin38 (FLIP)	MODE
0	H	H	H	1-port USB on SS2 2-lane DP. DP ML0 is on SSRX1(Flipped)
1	H	H	L	1-port USB on SS1 2-lane DP. DP ML0 is on SSRX2(Un-flipped)
2	H	L	H	4-lane DP. DP ML0 is on SSRX1(Flipped)
3	H	L	L	4-lane DP. DP ML0 is on SSRX2(Un-flipped)
4	L	H	H	1-port USB only on SS2 channels (Flipped)
5	L	H	L	1-port USB only on SS1 channels (Un-flipped)
6	L	L	H	Chip power down
7	L	L	L	Chip power down



Module Configuration for PS8743 Mode Selection				
State #	CE_DP Pin32 (CTL1)	CE_USB Pin3 (CTL8)	FLIP Pin38 (FLIP)	MODE
0	H	H	H	1-port USB on SS2 2-lane DP. DP ML0 is on SSRX1(Flipped)
1	H	H	L	1-port USB on SS1 2-lane DP. DP ML0 is on SSRX2(Un-flipped)
2	H	L	H	4-lane DP. DP ML0 is on SSRX1(Flipped)
3	H	L	L	4-lane DP. DP ML0 is on SSRX2(Un-flipped)
4	L	H	H	1-port USB only on SS2 channels (Flipped)
5	L	H	L	1-port USB only on SS1 channels (Un-flipped)
6	L	L	H	Chip power down
7	L	L	L	Chip power down

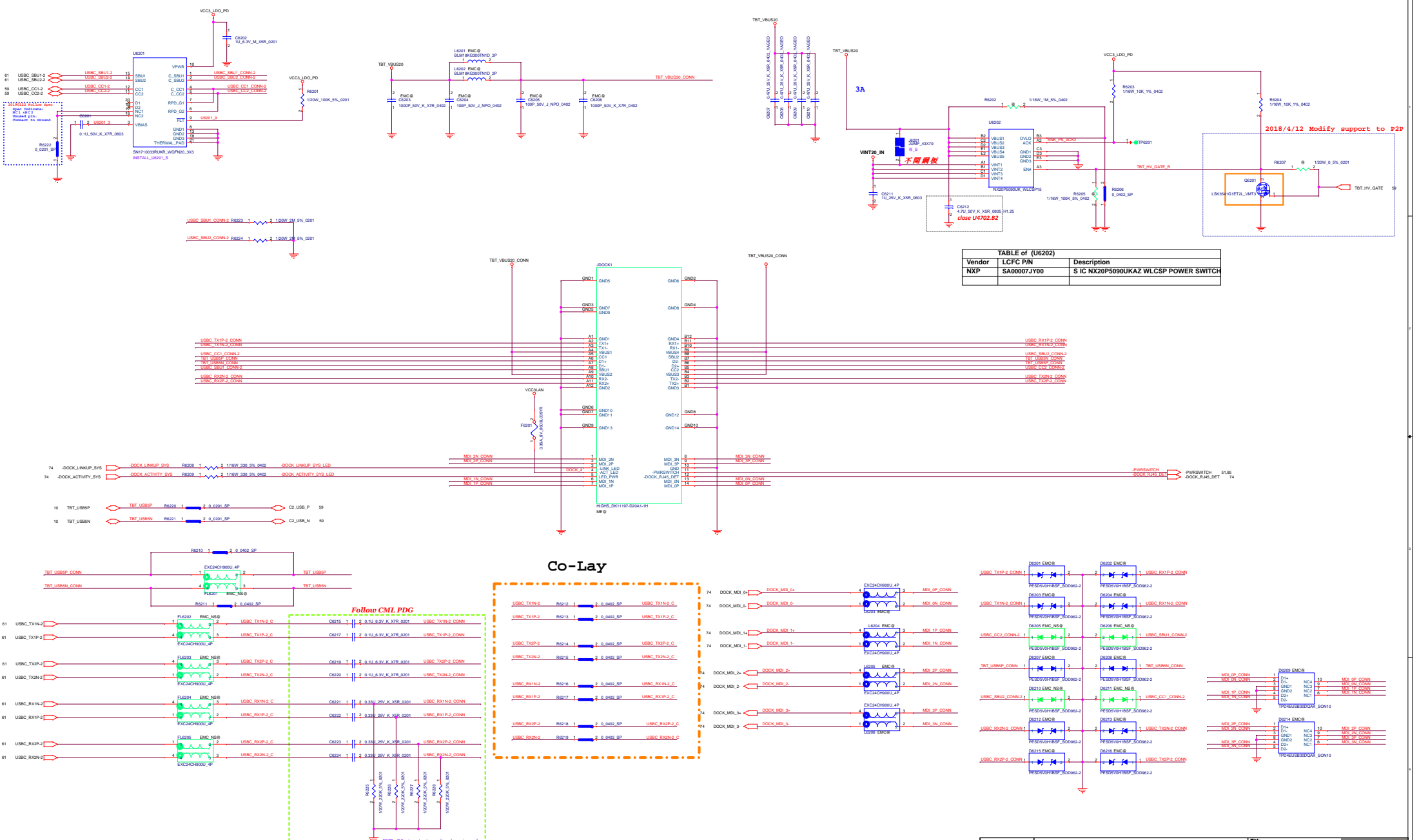


TABLE of (U6202)		
Vendor	LCFC P/N	Description
NXP	SA00007JY00	S IC NX20P5090UKAZ WLCSP POWER SWITCH

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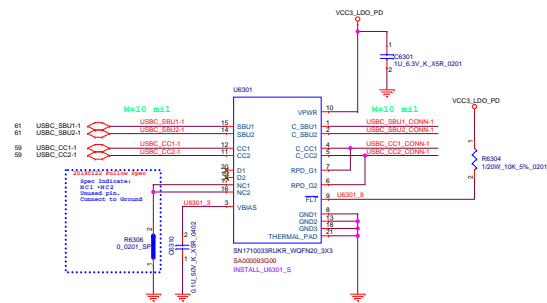
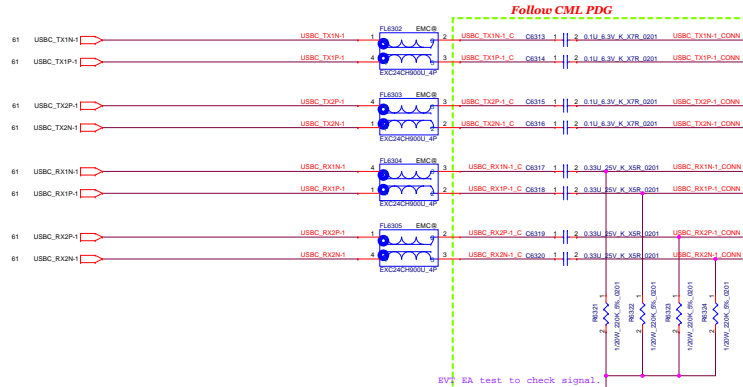
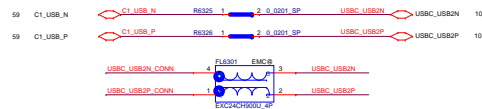


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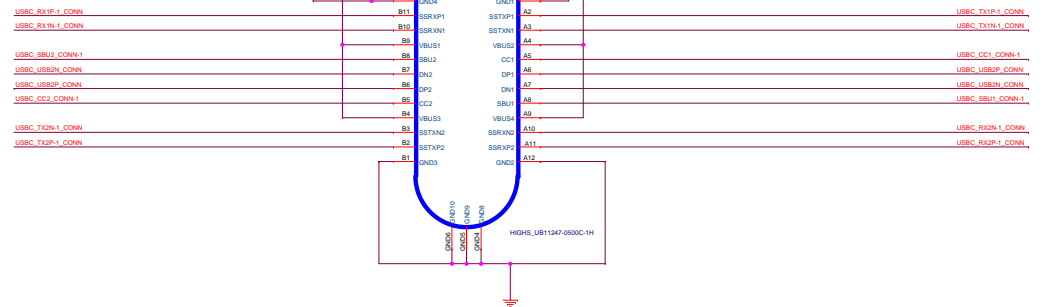
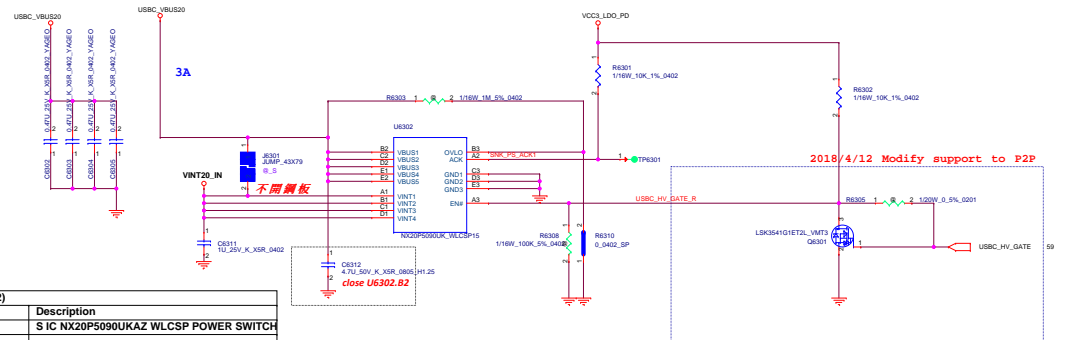


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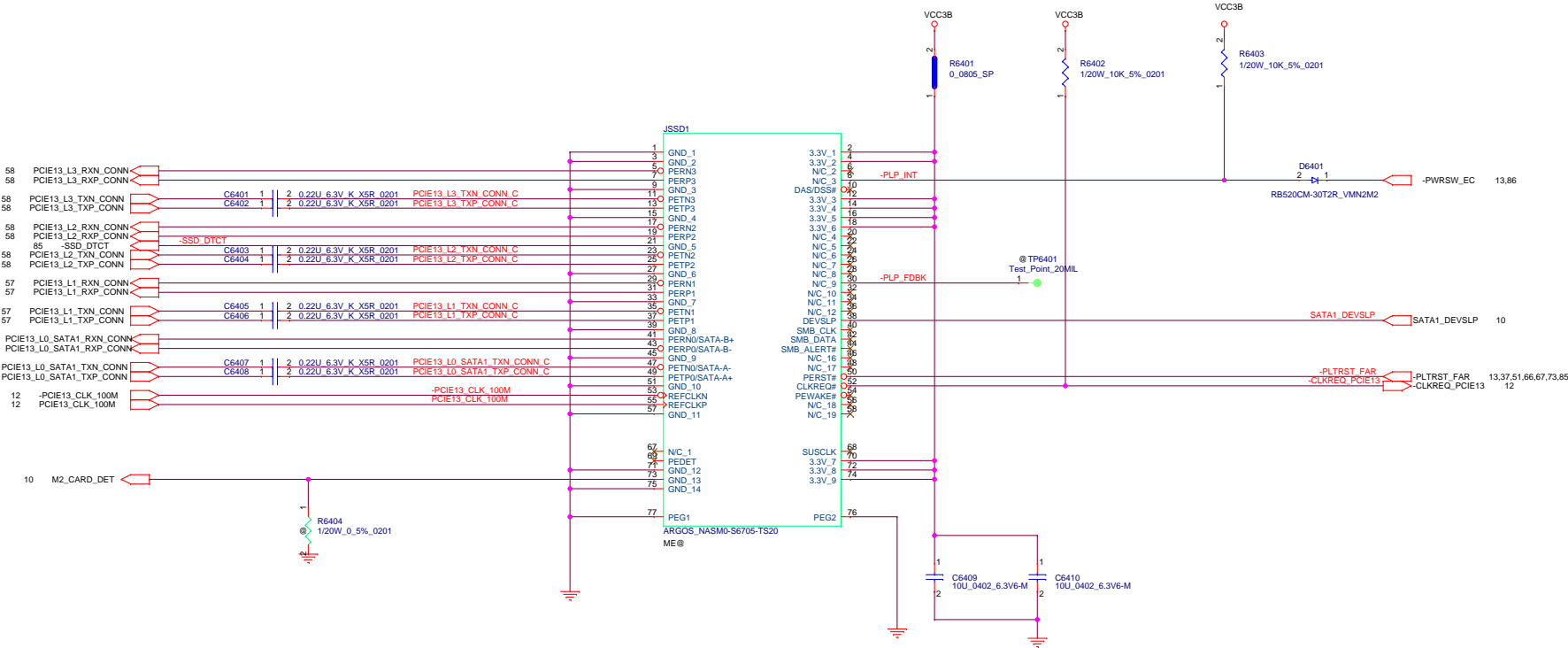
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TABLE of (U6302)		
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NXP	SA00007JY00	S IC NX20P5090UKAZ WLCSP POWER SWITCH



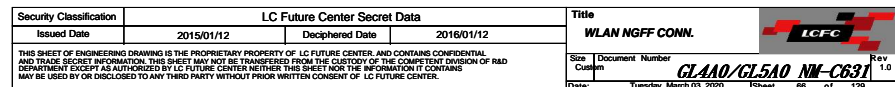
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**TYPE-A NGFF SLOT FOR WLAN
3.2H CONNECTOR**



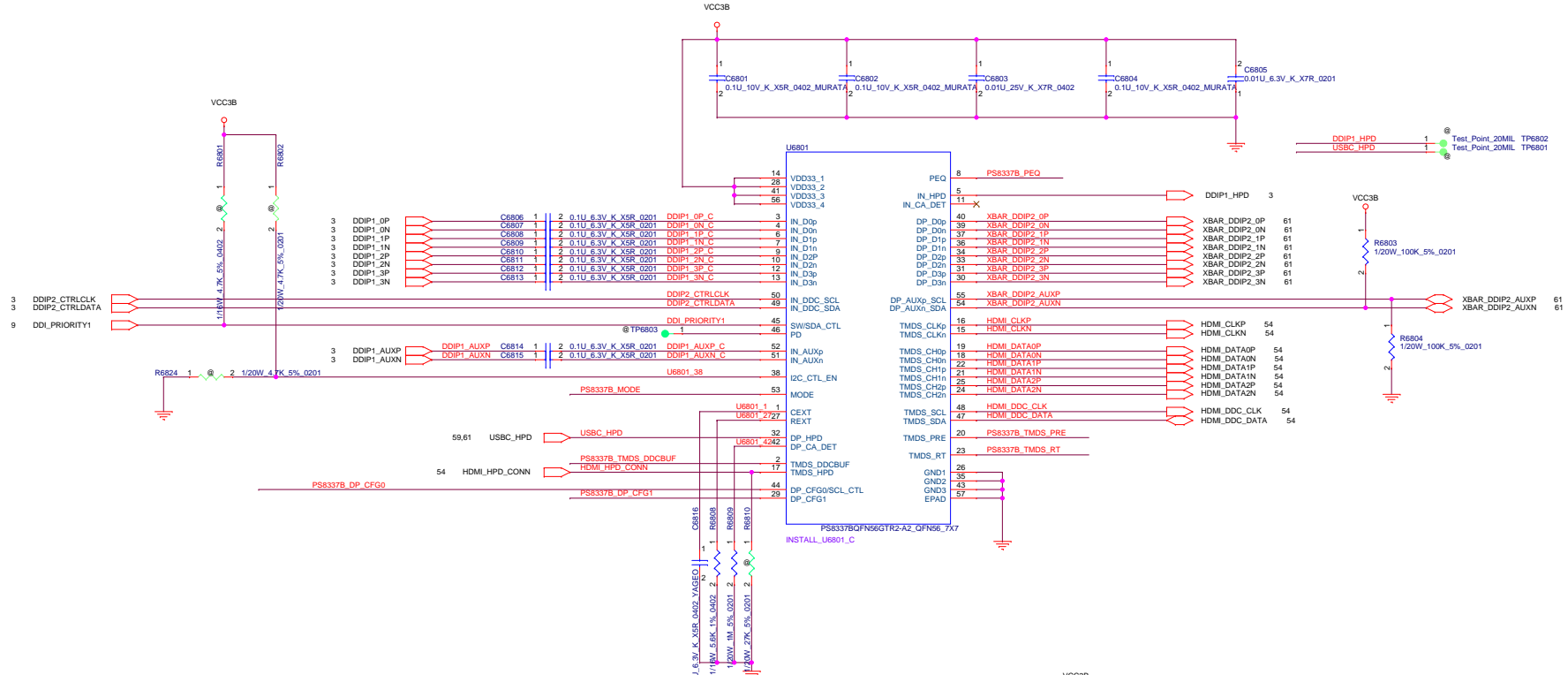
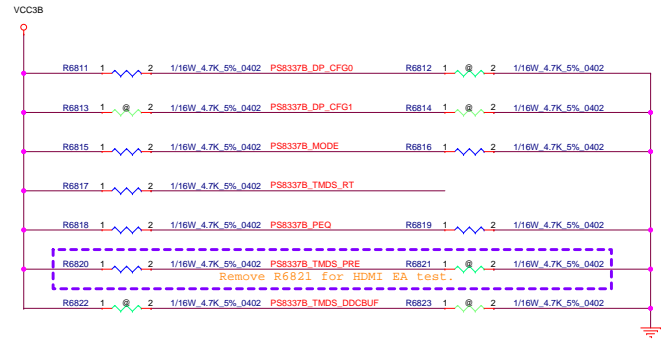


TABLE: Automatic Switching Mode (MODE=H/M)

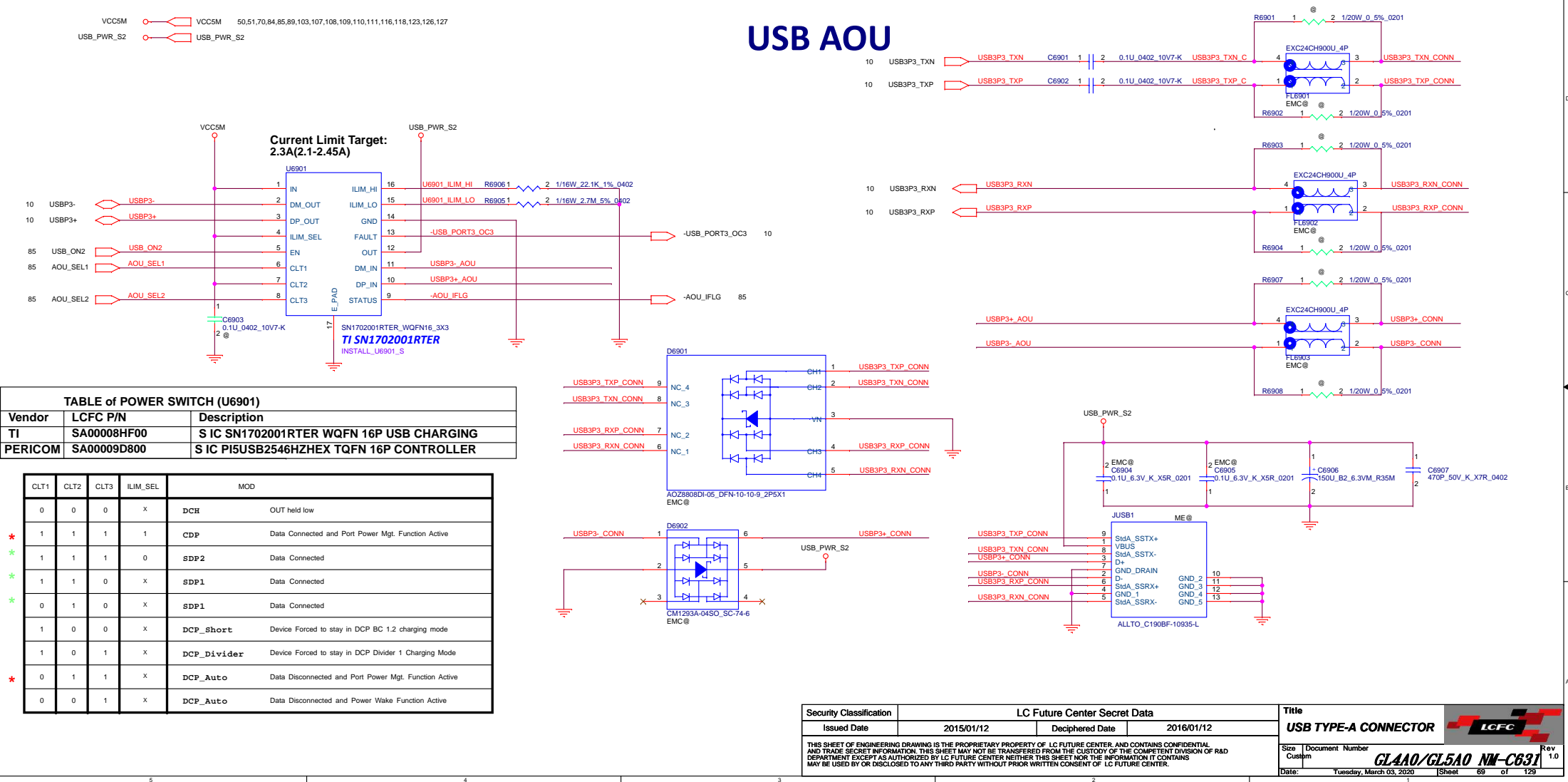
SW(DDI_PRIORITY1)	
L	DP Port has higher priority when both ports are plugged
H	TMDS Port has higher priority when both ports are plugged

MODE =	
H	Automatic Switching mode, HDMI ID Disabled
M	Automatic Switching mode, HDMI ID Enabled
L	Control Switching mode, HDMI ID Disabled

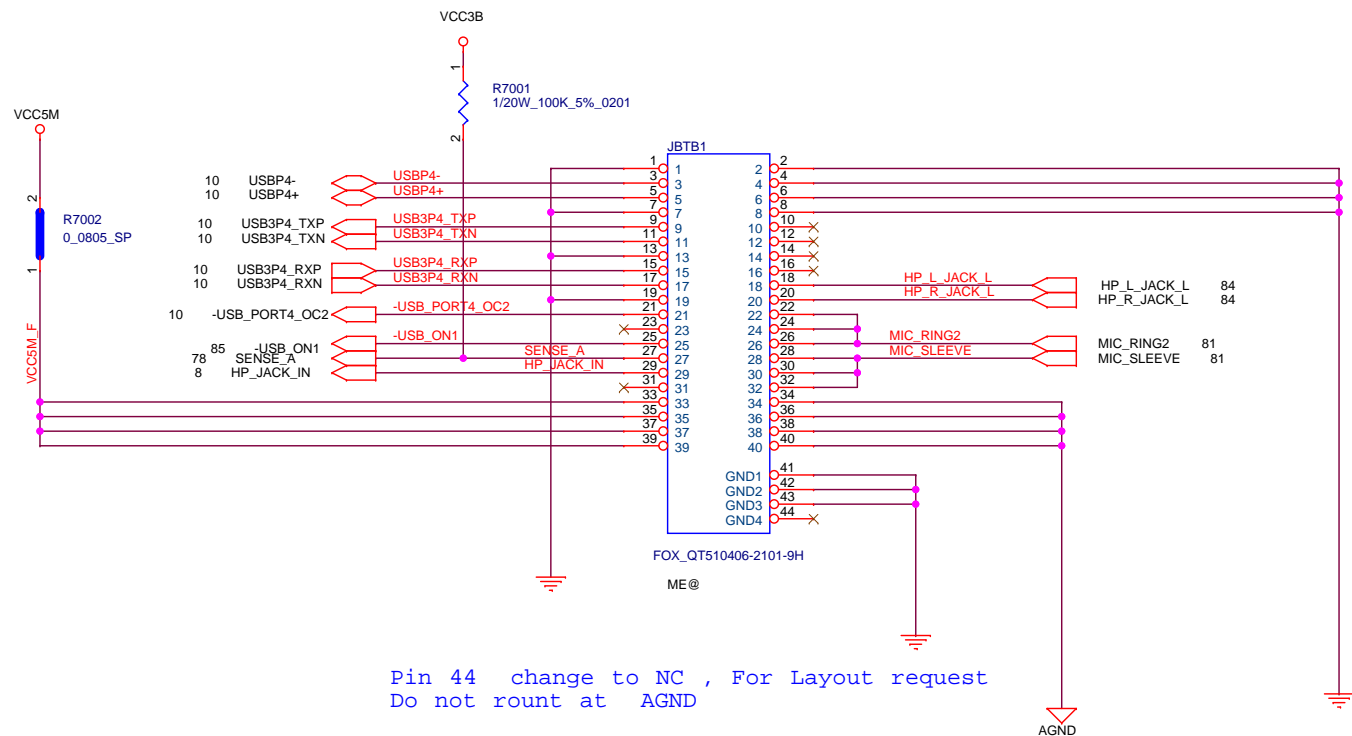


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USB AOU



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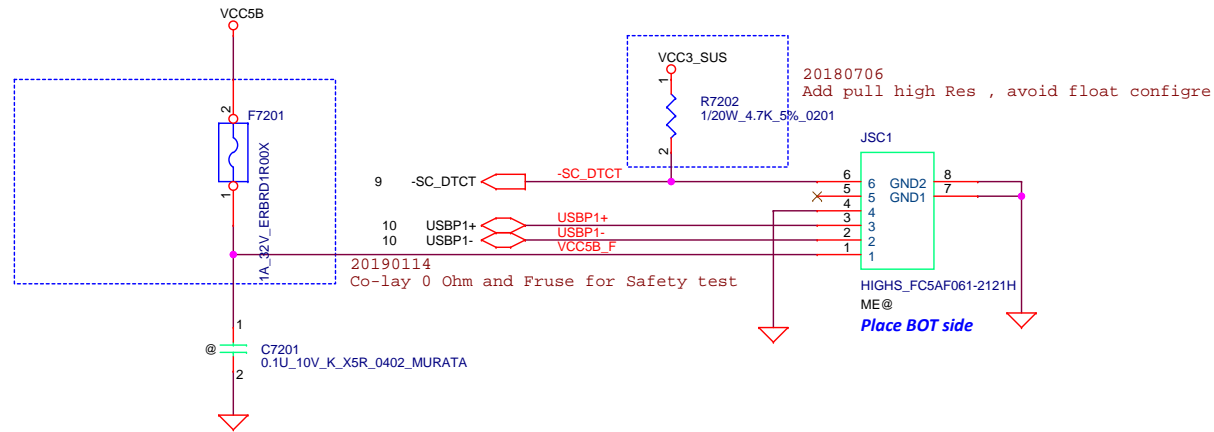


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SMART CARD CONN.

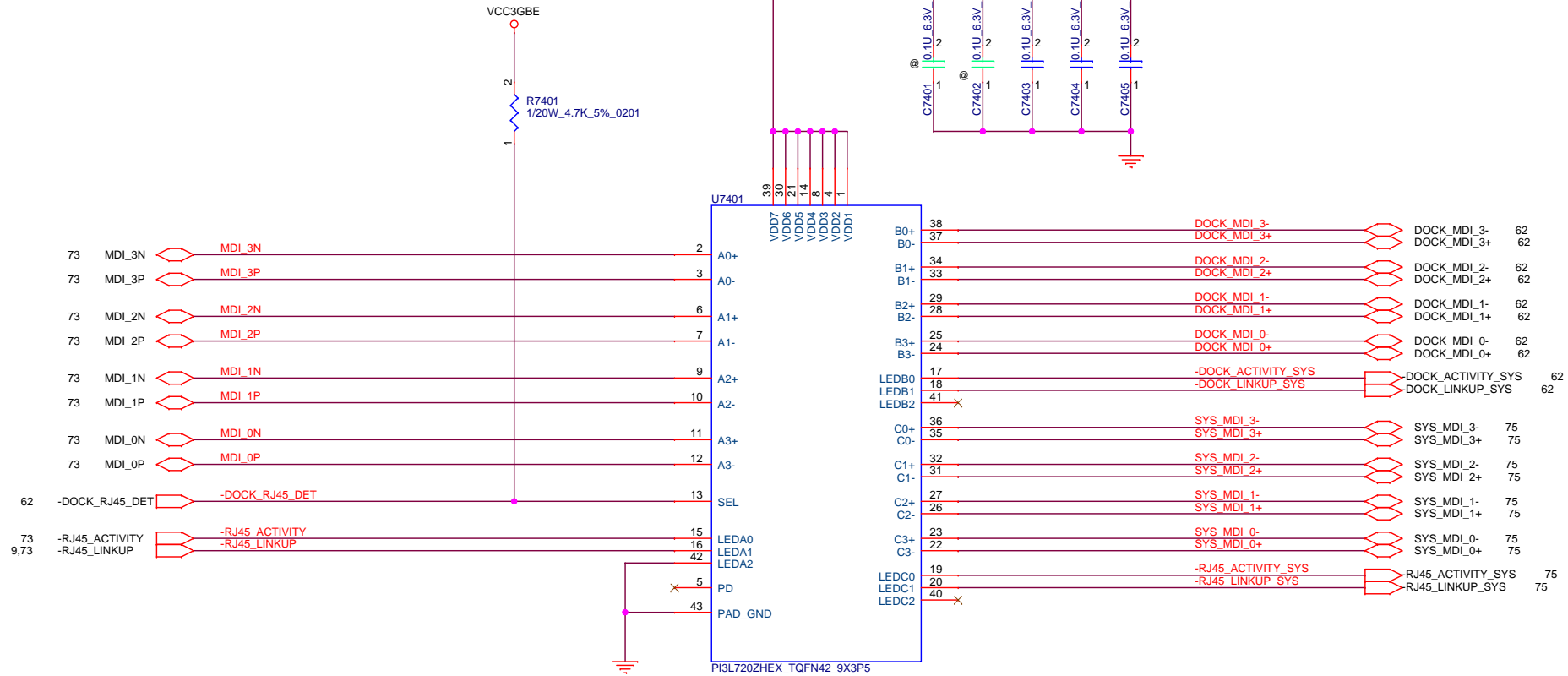


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Rev 1.0

VCC3GBE VCC3GBE 73,75



SA00007E900
INSTALL_U7401_S

TABLE of LAN SWITCH (U7401)

Vendor	LCFC P/N	Description
PERICOM	SA00007E900	S IC PI3L720ZHE+CX TQFN GBE LA
TI	SA000072400	S IC TS3L501ERUAR WQFN 42P LAN


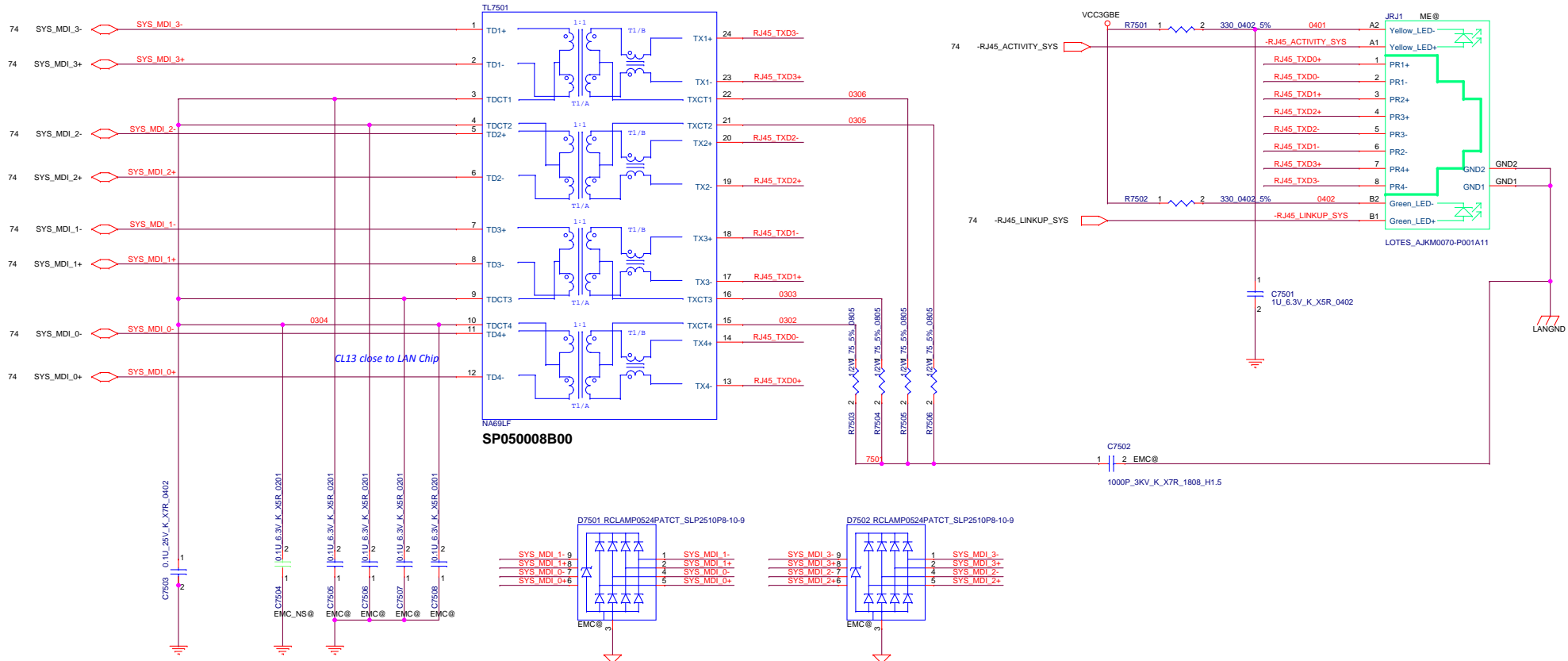

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Issued Date	2015/01/12	Deciphered Date	2016/01/12	LAN SWITCH		
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Date:		Tuesday, March 03, 2020		Sheet 74 of 129		

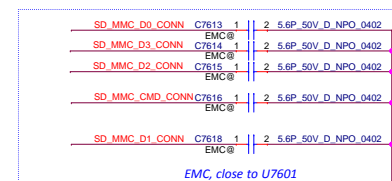
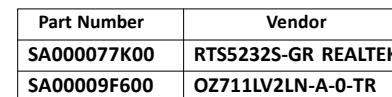
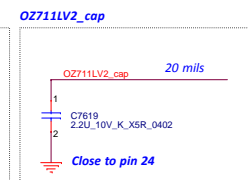
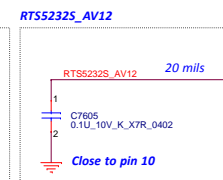
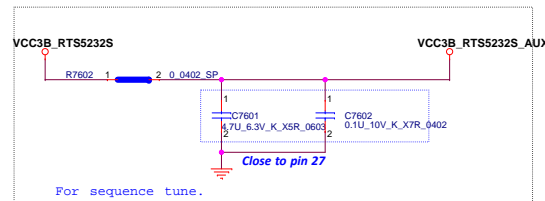
TABLE of Transformer (TL7501)		
Vendor	LCFC P/N	Description
BOTHHAND	SP050008B00	S X'FORM_ NA0069R LF LAN
TAIMAG	SP050009U00	S X'FORM_ IH-189-G LAN

LAN X' FORM

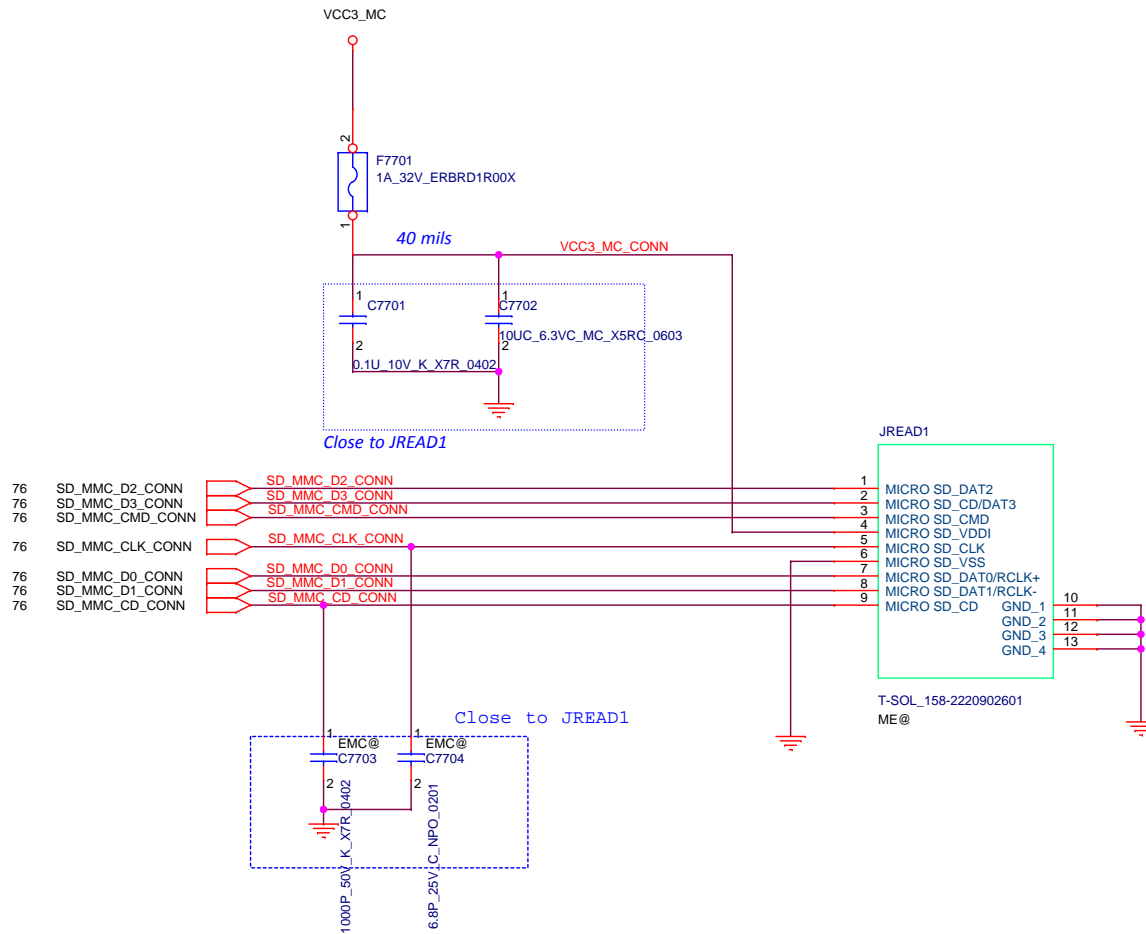
RJ45 Conn.



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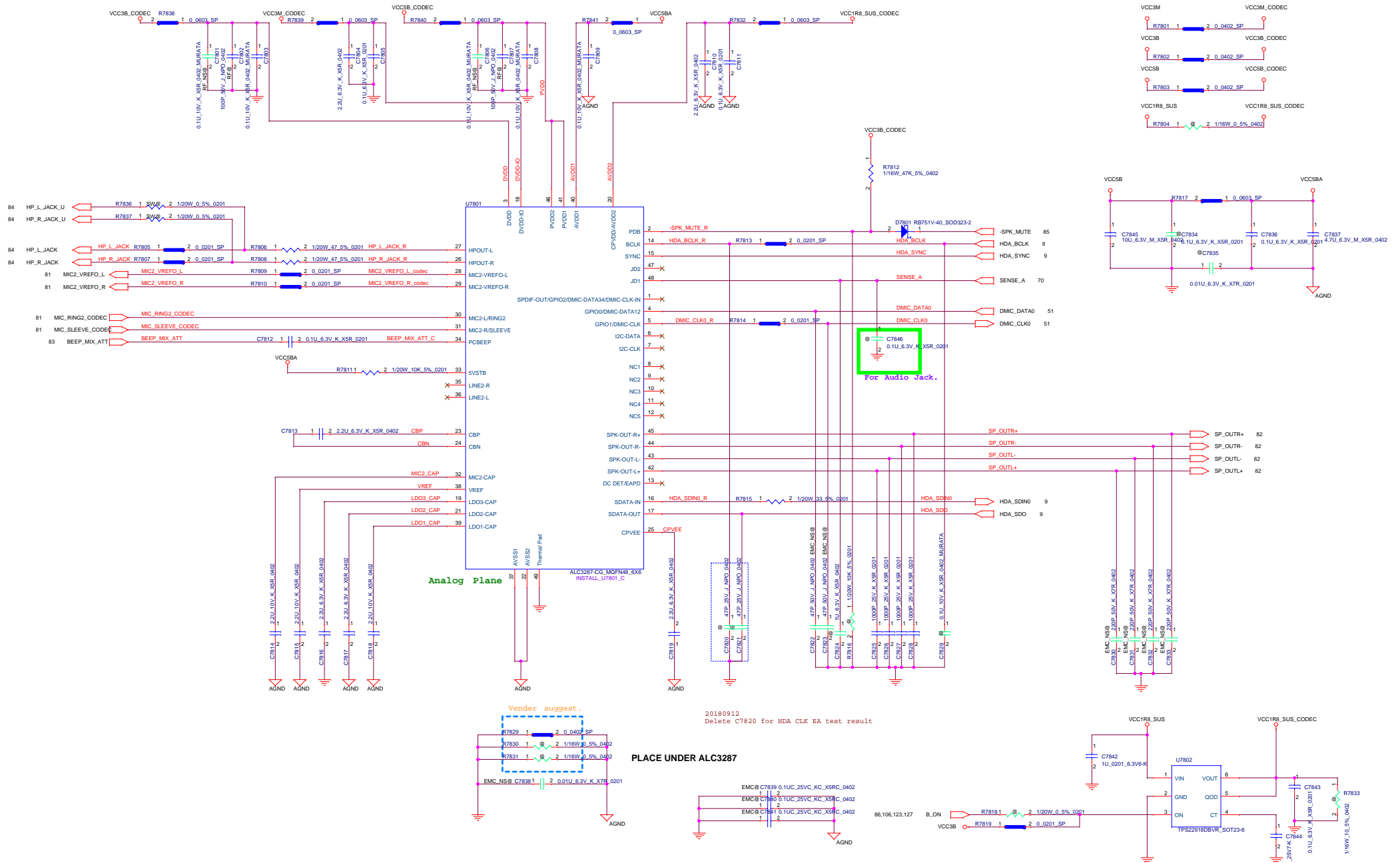
VCC3_MC VCC3_MC 76




Mode	Detect
Normal	short
Card Insert	open

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Issued Date	2015/01/12	Deciphered Date	2016/01/12
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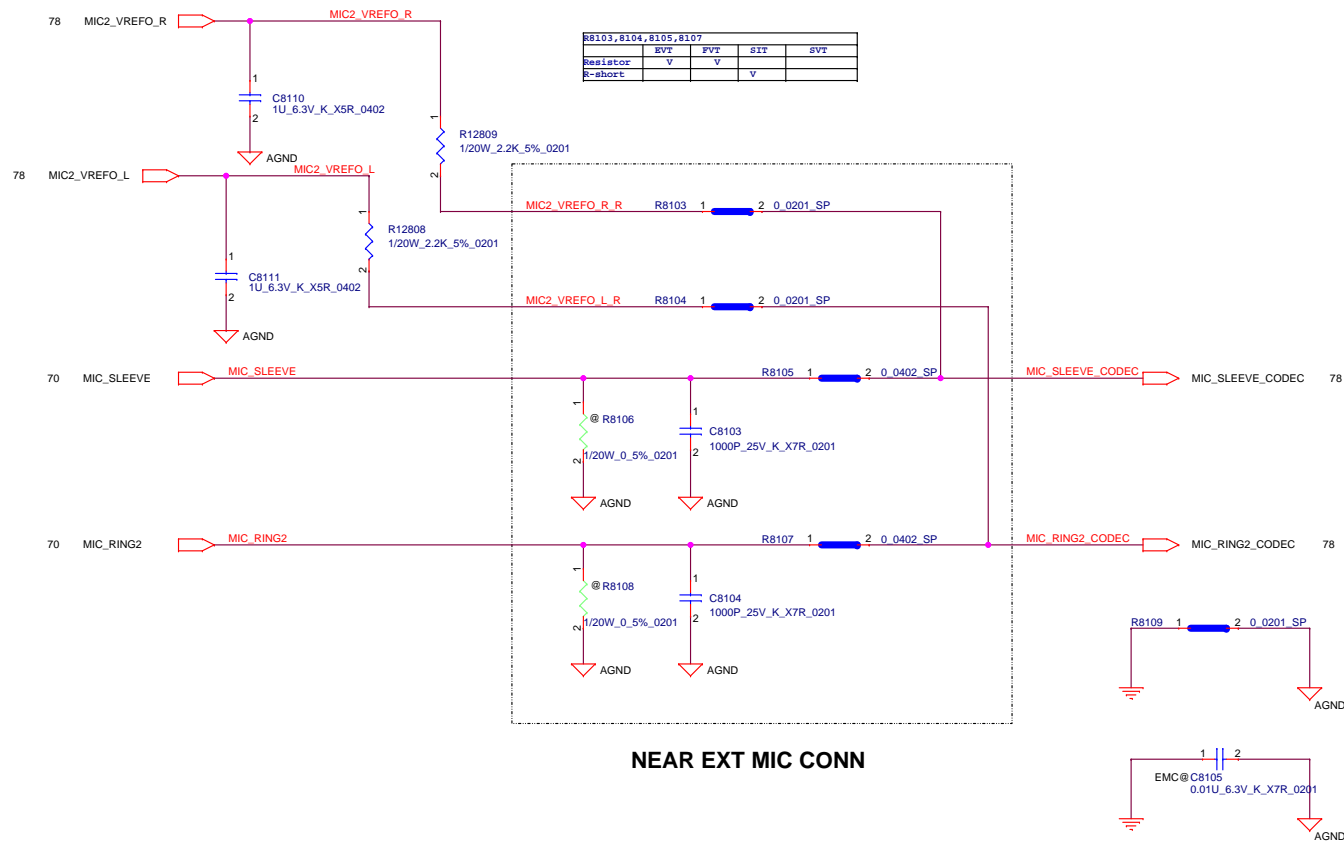


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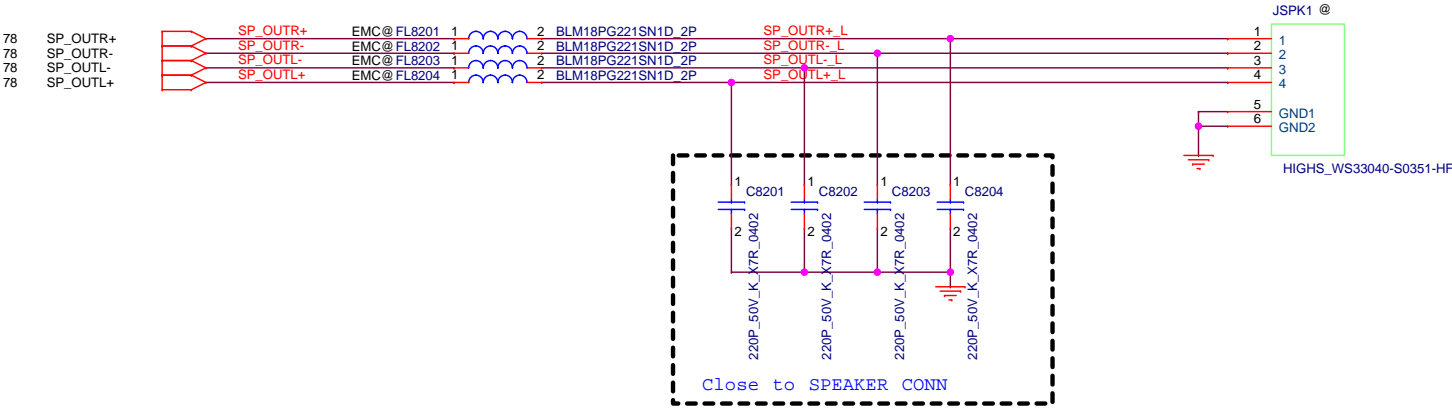
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Issued Date		2015/01/12		Deciphered Date		2016/01/12			
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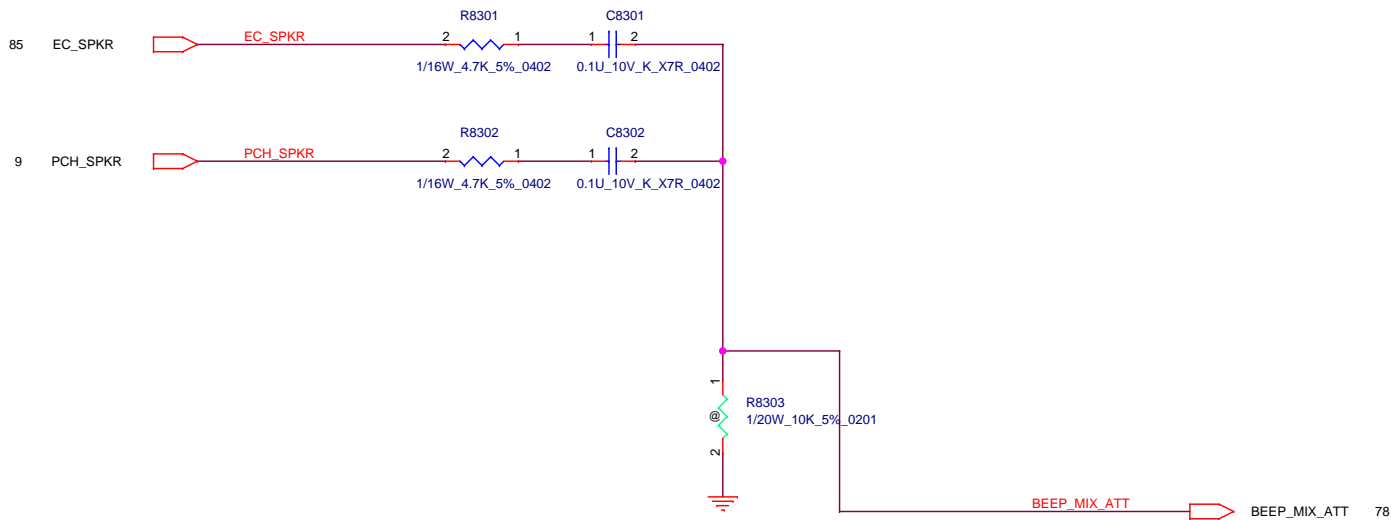



SPK CONN.



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Audio Beep



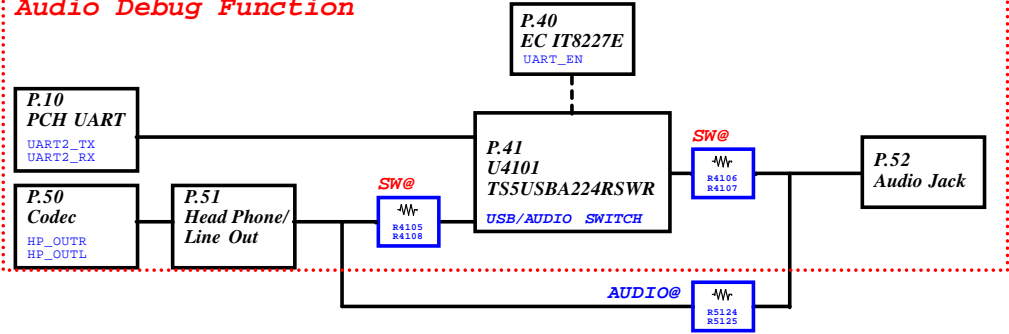
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Issued Date	2015/01/12	Deciphered Date	2016/01/12	AUDIO BEEP		
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FUNCTION TABLE

A _{SEL}	V _{AUDIO}	V _{BUS}	L,R	D+, D-
L	L	L	OFF	OFF
L	L	H	OFF	OFF
L	H	L	ON	OFF
L	H	H	OFF ⁽¹⁾	ON
H	L	L	OFF	OFF
H	L	H	OFF	OFF
H	H	L	ON	OFF
H	H	H	ON	OFF

(1) 100Ω shunt resistors are enabled in this state.

Audio Debug Function



AUDIO DEBUG PORT

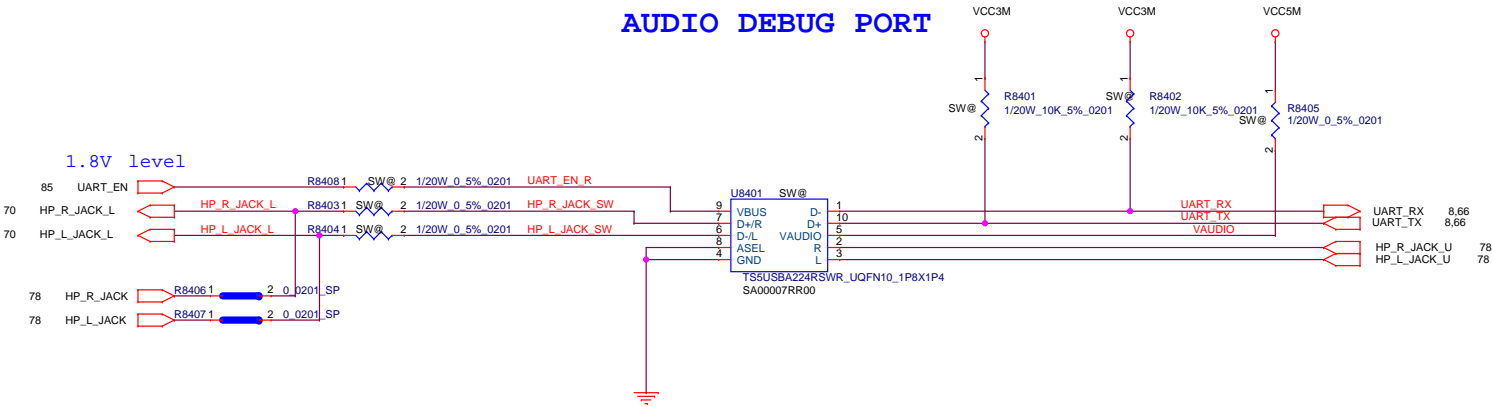
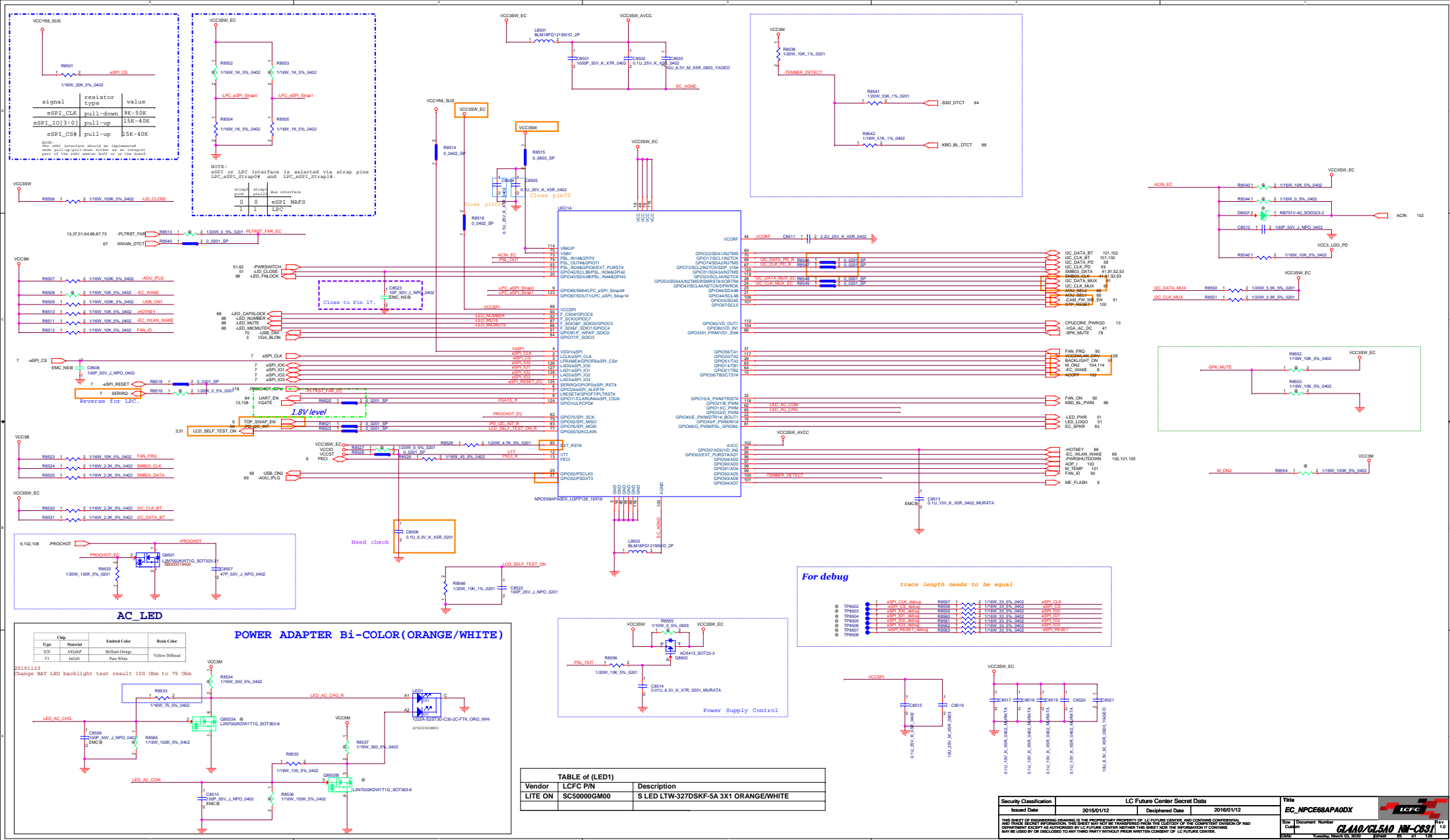


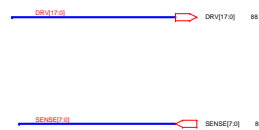
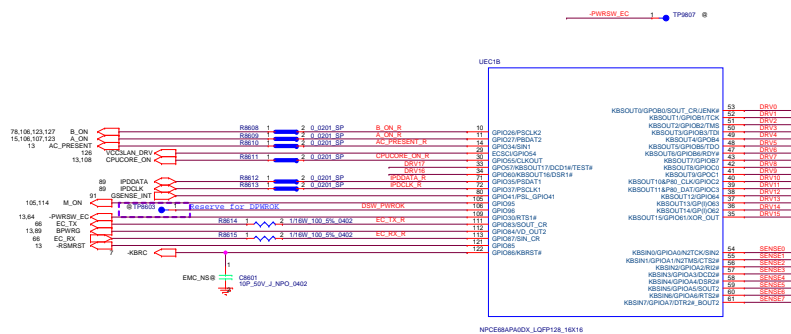
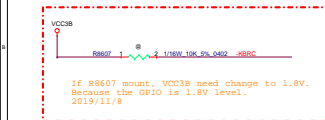
TABLE:


Mode	Audio	UART
UART_EN	L	H

TABLE:


Part Name	For NPI	For MP
U8401 SW@	ASM	NA
R8403 SW@	ASM	NA
R8404 SW@	ASM	NA
R8401 SW@	ASM	NA
R8402 SW@	ASM	NA
R8405 SW@	ASM	NA
R8506 AUDIO@	NA	ASM
R8507 AUDIO@	NA	ASM



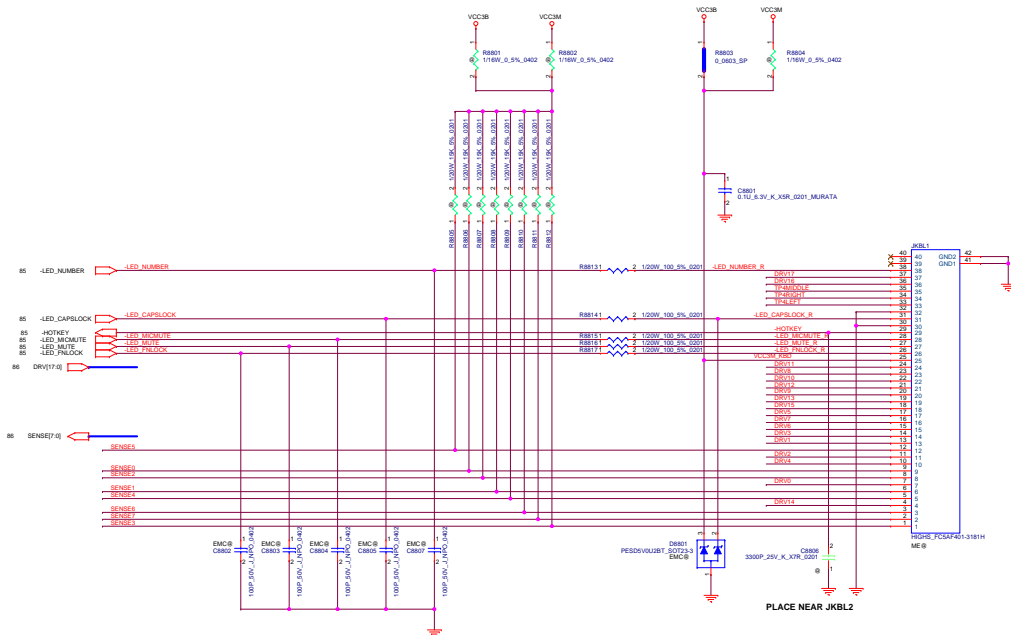


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Keyboard CONN



Assign	Purpose
Vcc	Vcc 3V for LED
LED1	LED for FnLk
LED2	LED for F1
LED3	LED for F4
LED4	LED for CapsLk
LED5	LED for NumLock

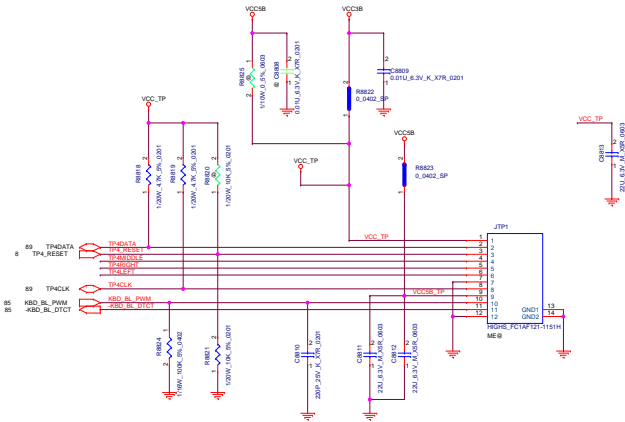
Assign	Purpose
MC	Common pin for TrackPoint click button
M1	Left button
M2	Right button
M3	Center button

Pin #	Assign
1	SENSE3
2	SENSE7
3	SENSE5
4	DRV14
5	SENSE4
6	SENSE1
7	DRV0
8	SENSE2
9	SENSE0
10	DRV4
11	DRV2
12	SENSE5
13	DRV1
14	DRV3
15	DRV6
16	DRV7
17	DRV5
18	DRV15
19	DRV13
20	DRV9
21	DRV12
22	DRV10
23	DRV8
24	DRV11
25	Vcc
26	LED1
27	LED2
28	LED3
29	HOTKEY
30	GND
31	LED4
32	MC
33	M1
34	M2
35	M3
36	DRV16
37	DRV17
38	LED5
39	NC
40	NC

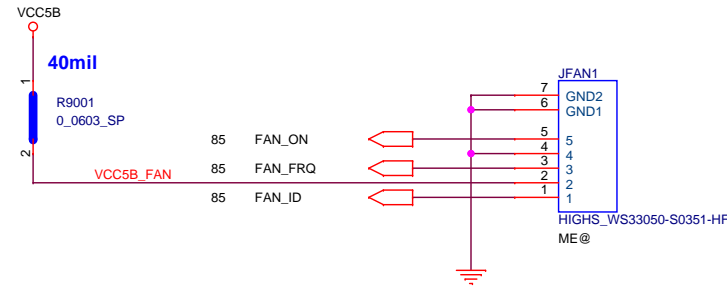
Track Point

TrackPoint and Backlight FPC Pin Assignment

Pin #	Assign
1	VCC (3.3V)
2	IPD DATA
3	IPD RST
4	MIDDLE
5	RIGHT
6	LEFT
7	IPD GND
8	IPD CLK
9	LED VCC5 (5V)
10	LED PWM
11	Backlight detection
12	LED GND



FAN CONN.



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Thermal Sensor Close to DIMM

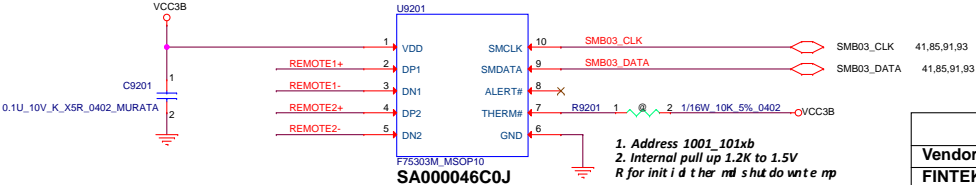
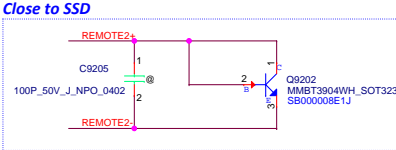
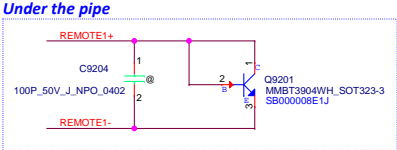
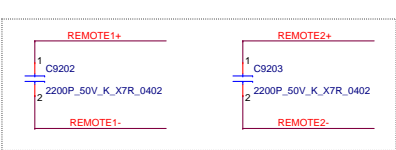


TABLE of Thermal Sensor (U9201)		
Vendor	LCFC P/N	Description
FINTEK	SA000046C0J	S IC F75303M MSOP 10P SENSOR
Nuvoton	SA000065D00	S IC NCT7719W MSOP 10P THERMAL SENSOR



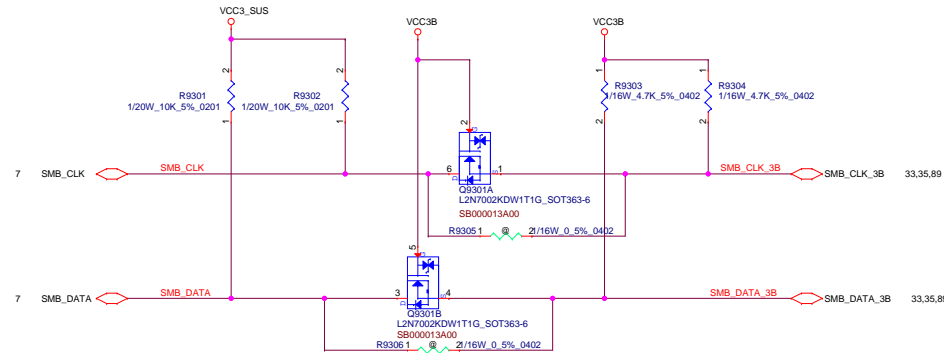
Trace width/space:10/10 mil
Trace length:<8"

TABLE of Thermal Sensor (Q9201,Q9202)		
Vendor	LCFC P/N	Description
PANJIT	SB000008E1J	S TR MMBT3904WH NPN SOT323-3
NXP	SB000000YV00	S TR PMST3904 NPN SOT323-3
LRC	SB000000ZJ00	S TR LMBT3904WT1G NPN SOT323-3

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Issued Date		2015/01/12	Deciphered Date	2016/01/12	THERMAL SENSOR		
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SMBus

DIMM1,DIMM2,CP



GPU, Thermal Sensor, Embedded Controller, G sensor

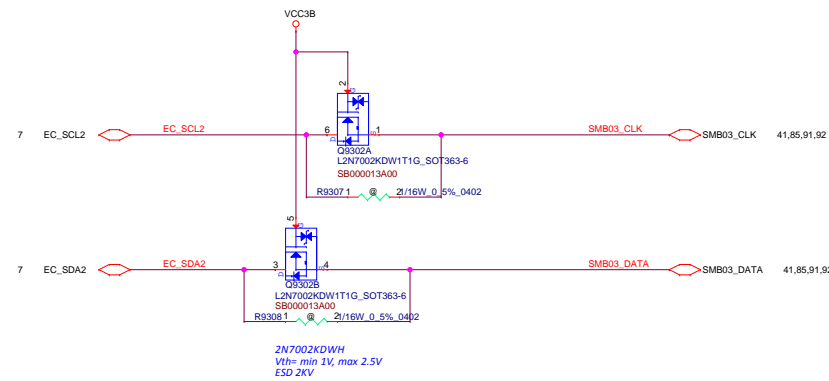



TABLE of U9301/U9302/U9303/U9304		
Vendor	P/N	LCFC P/N
TI	SN74LVC1G66DCK	SA00005BE0J
NXP	74LVC1G66GW	SA00007KS00
ONsemi	MC74VHC1G66DFT2G	SA00008JQ00


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Title		SMBUS SWITCH	
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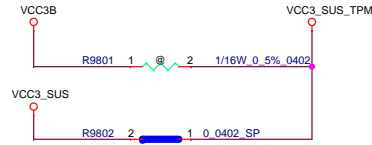
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				Date:	Tuesday, March 03, 2020	Rev 1.0
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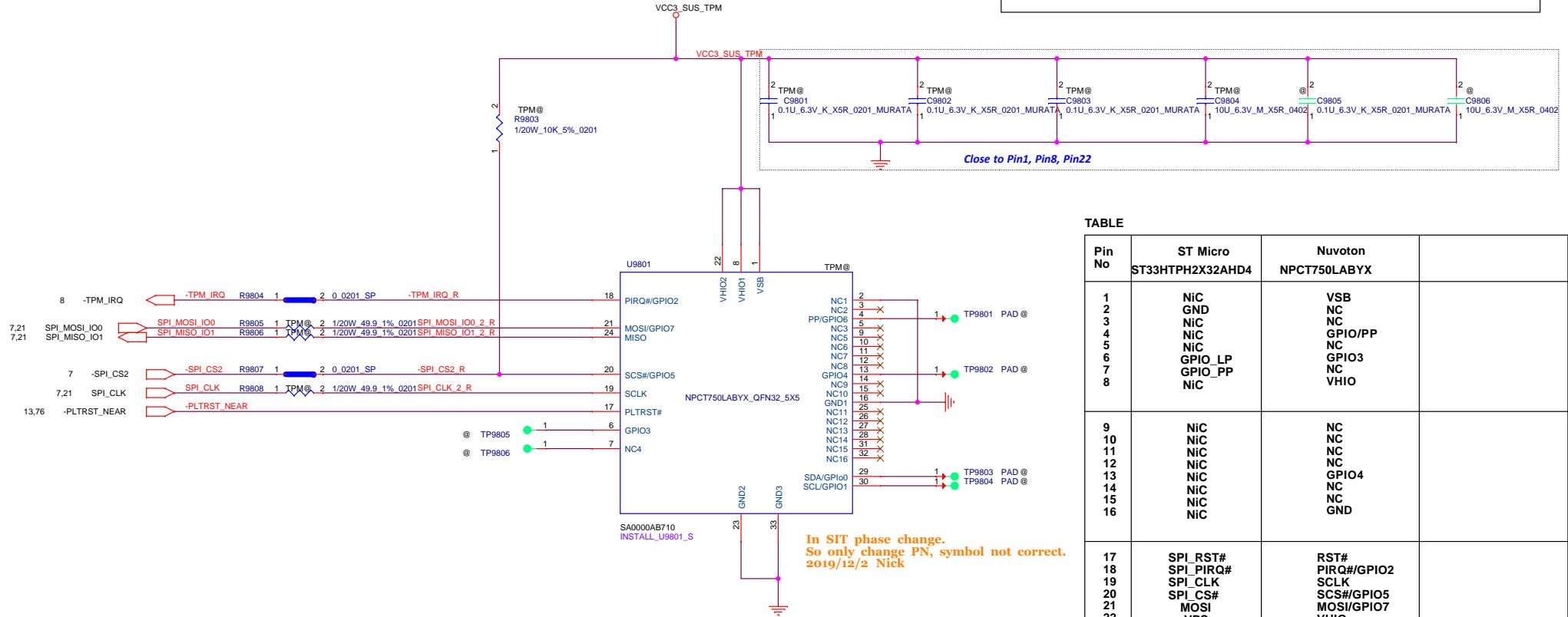
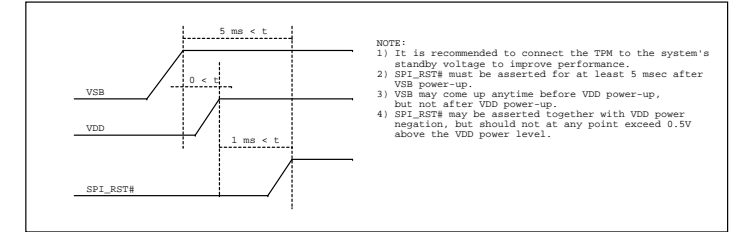
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Issued Date	2015/01/12	Deciphered Date	2016/01/12			
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NOTE:
Check timing sequence in SDV phase.



TABLE


Pin No	ST Micro ST33HTPH2X32AHD4	Nuvoton NPCT750LABYX	
1	NIC	VS	
2	GND	NC	
3	NIC	NC	
4	NIC	GPIO/PP	
5	NIC	NC	
6	GPIO_LP	GPIO3	
7	GPIO_PP	NC	
8	NIC	VHIO	
9	NiC	NC	
10	NiC	NC	
11	NiC	NC	
12	NiC	NC	
13	NiC	GPIO4	
14	NiC	NC	
15	NiC	NC	
16	NiC	GND	
17	SPI_RST#	RST#	
18	SPI_PIRQ#	PIRQ#/GPIO2	
19	SPI_CLK	SCLK	
20	SPI_CS#	SCS#/GPIO5	
21	MOSI	MOSI/GPIO7	
22	VPS	VHIO	
23	NIC	GND	
24	MISO	MISO	
25	NiC	NC	
26	NiC	NC	
27	NiC	NC	
28	NiC	NC	
29	NiC	SDA/GPIO1	
30	NiC	SDA/GPIO0	
31	NiC	NC	
32	NiC	NC	

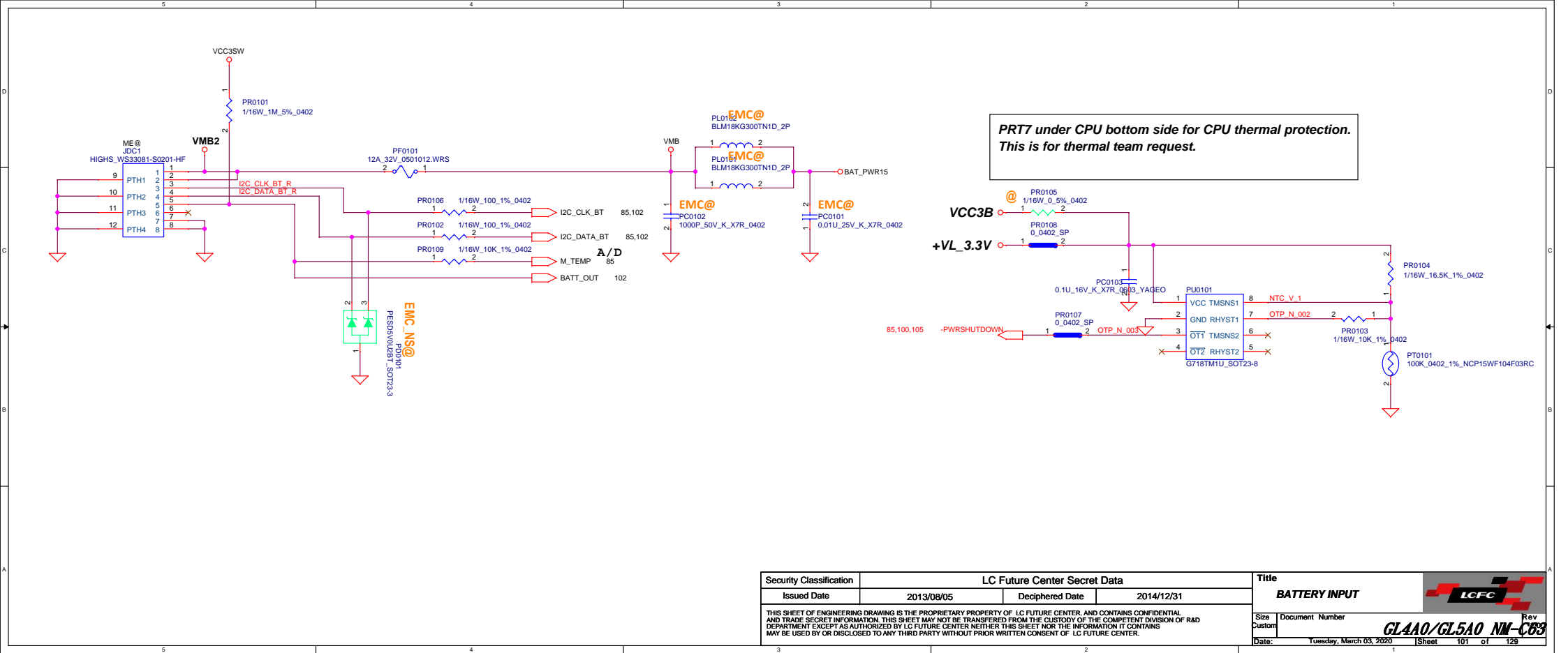
TABLE of TPM (U9801)

Vendor	LCFC P/N	Description
ST	SA0000AB710	S IC ST33HTPH2X32AHD4 VQFN 32P TPM 2.0
NUVOTON	SA00008KS20	S IC NPCT750LABYX QFN 32P TPM 2.0

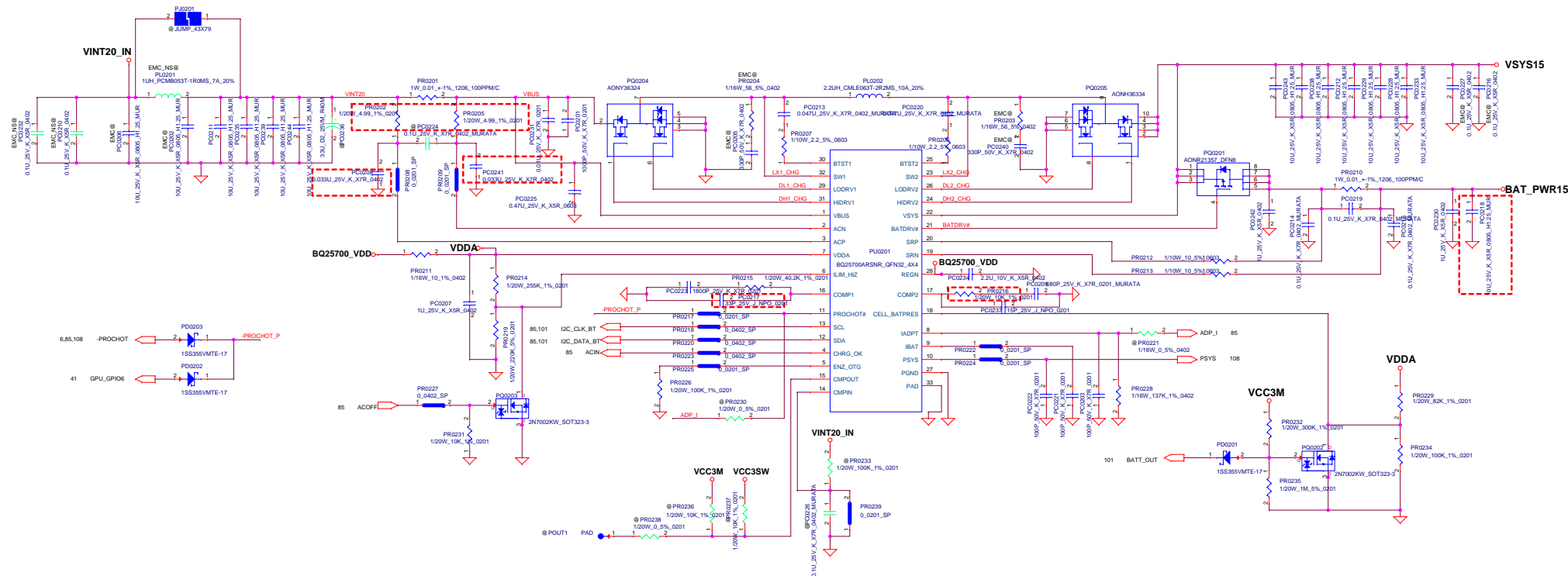
For ME GND hole Screw Hole



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Size		Document Number		Date:		Rev	
Custom		GL440/GL540 NM-C631		Tuesday, March 03, 2020		1.0	
				Sheet 99 of 129			

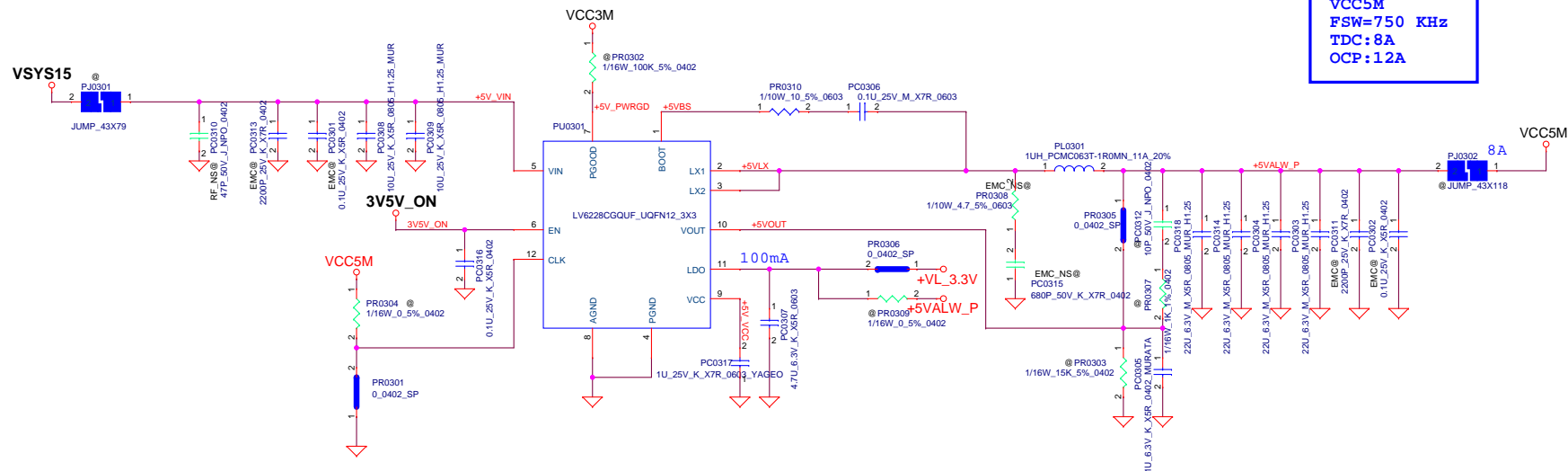



VINT20_IN VINT20_IN 62.63,100
VSY515 VSY515 51,100,103,104,105,106,108,109,110,111,114,118,120
BAT_PWR15 BAT_PWR15 101



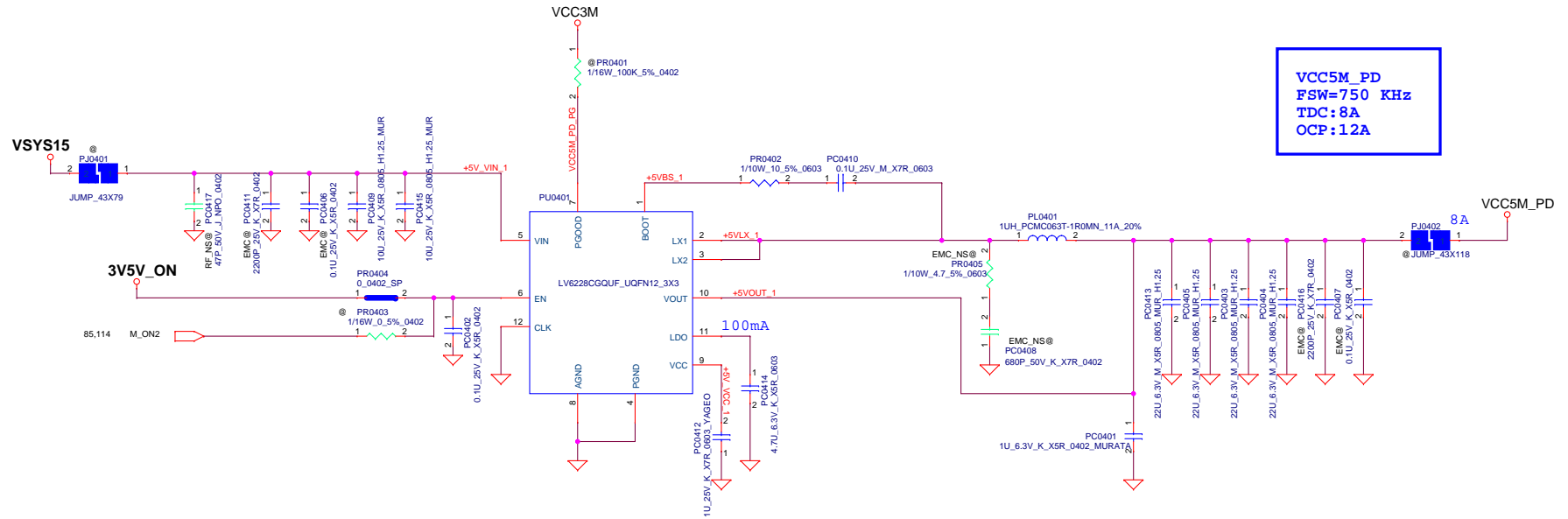
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/05	Deciphered Date	2014/12/31
BATTERY CHARGER(BQ25700A)			
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Size	Document Number	Rev	
System	GL440/GL540 NM-C83	Date	
Tuesday, March 05, 2005		Sheet	102 of 129

VSYS15		VSYS15	51,100,102,104,105,106,108,109,110,111,114,118,120
VCC5M		VCC5M	50,51,69,70,84,85,89,107,108,109,110,111,116,118,123,126,127




Security Classification		LC Future Center Secret Data		Title	
Issued Date		2013/08/08	Deciphered Date		2013/08/05
				DC/DC VCC5M (LV6228)	
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Size		Document Number		Rev	
Custom		GL440/GL5A0 NW-C63		2.0	
Date:		Tuesday, March 03, 2020		Sheet 103 of 129	

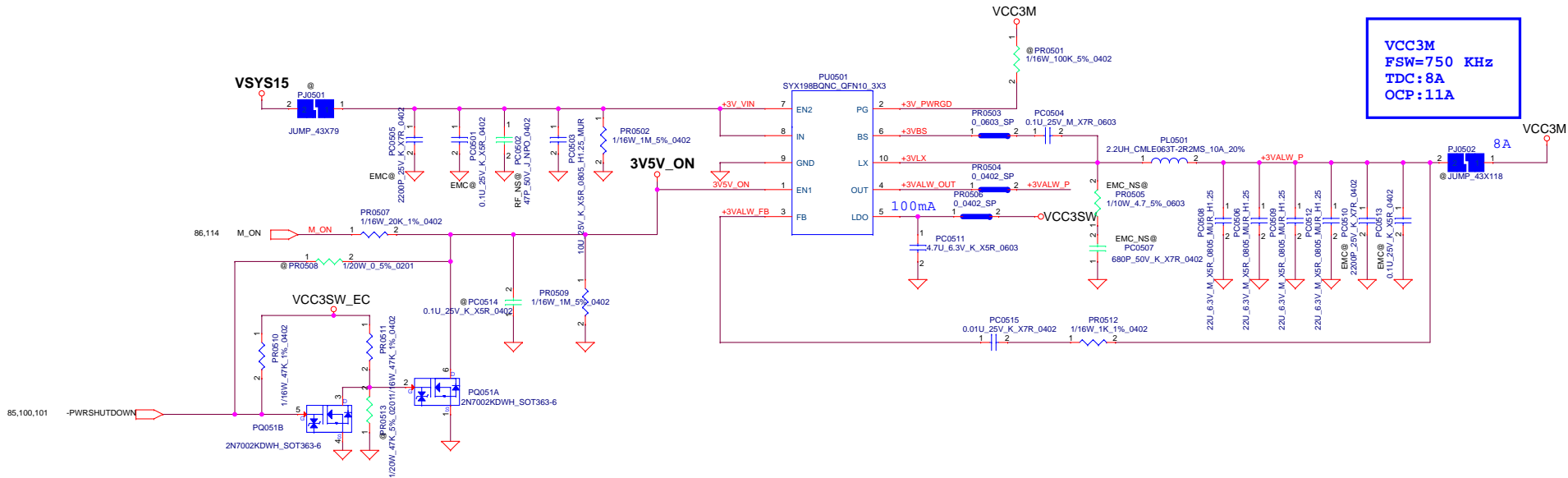
VSYS15
VCC5M_PD




VCC5M_PD
FSW=750 KHz
TDC:8A
OCP:1.2A

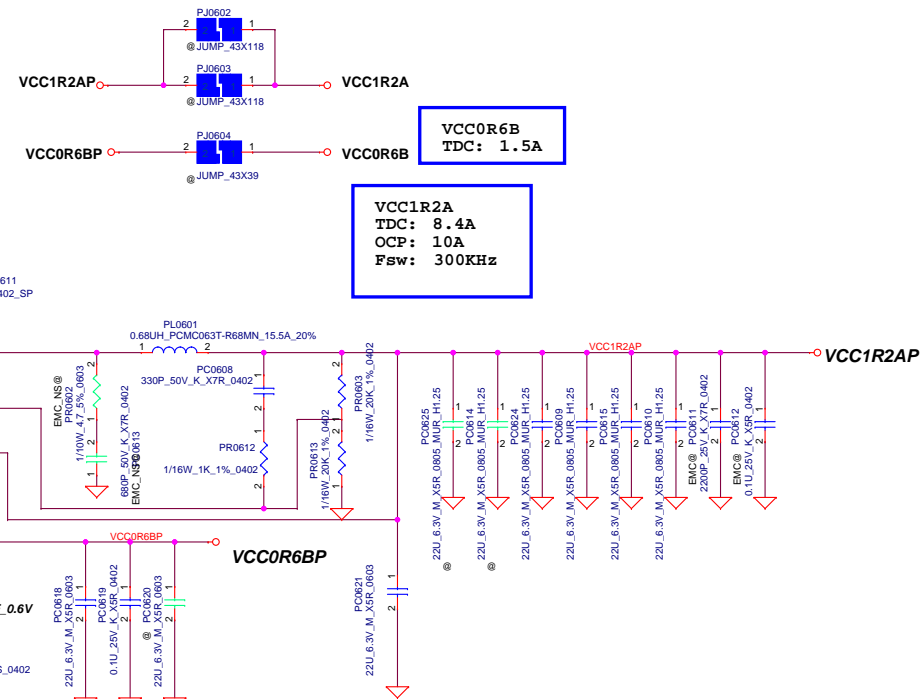
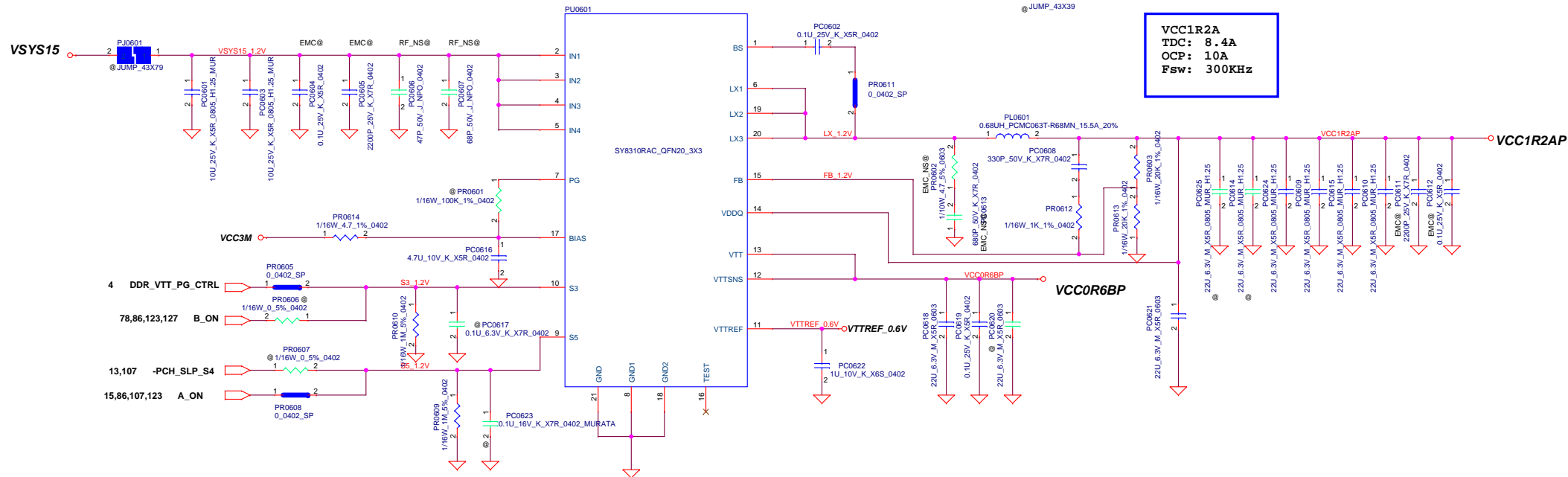
Security Classification	LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	
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				Document Number GL44A0/GL5A0 NM-C83
				Rev 2.0
				Date: Tuesday, March 03, 2020 [Sheet 104 of 129]

VSYS15		VSYS15	51,100,102,103,104,106,108,109,110,111,114,118,120
VCC3M		VCC3M	4,11,13,15,16,50,51,59,78,84,85,86,88,102,103,104,106,114,123,124,126,127,128



Security Classification		LC Future Center Secret Data		Title		
Issued Date		2013/08/08	Deciphered Date	2013/08/05		
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Size Custom		Document Number		GL4A0/GL5A0 NM-C63		Rev 2.0
Date:		Tuesday, March 03, 2020		Sheet 105 of 129		

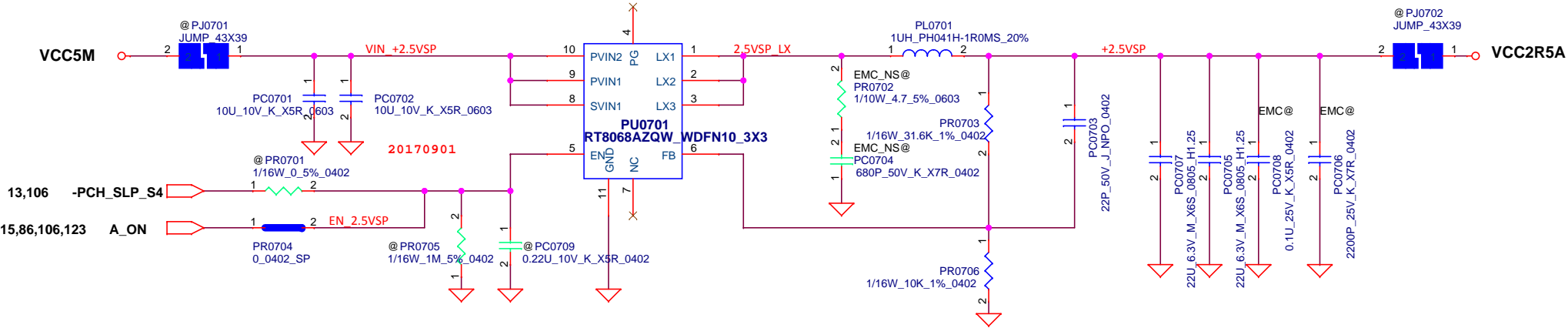
VSYS15 VSYS15 51,100,102,103,104,105,108,109,110,111,114,118,120
VCC1R2A VCC1R2A 4,5,15,33,34,35,36
VCC0R6B VCC0R6B 33,34,35,36



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Issued Date	2013/08/05	Deciphered Date	2014/12/31	DC/DC VCC1R2A(RT8231)	
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				Custom	GL4A0/GL5A0 NM-C63
				Date:	Tuesday, March 05, 2020
				Sheet	106 of 129

VCC5M 50,51,69,70,84,85,89,103,108,109,110,111,116,118,123,126,127
VCC2R5A 33,34,35,36

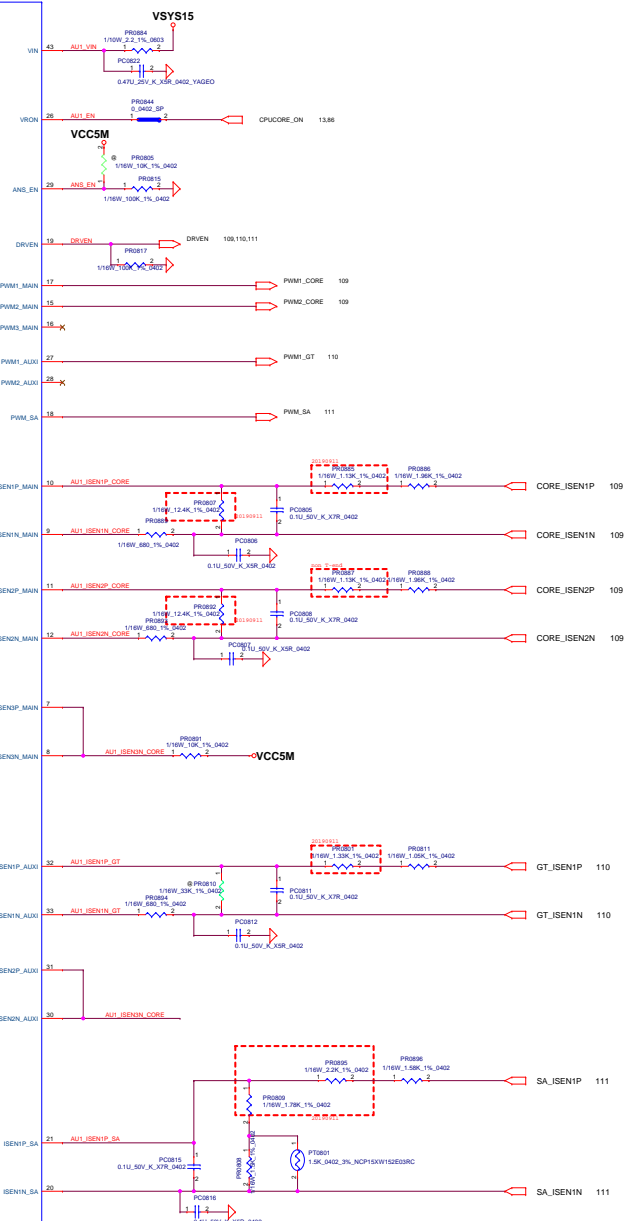
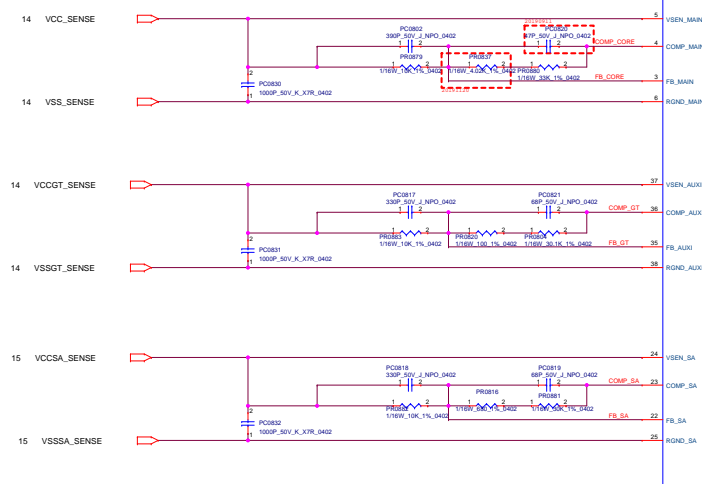
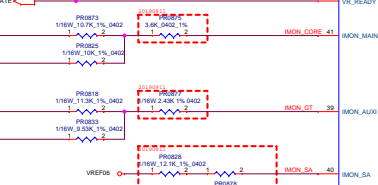
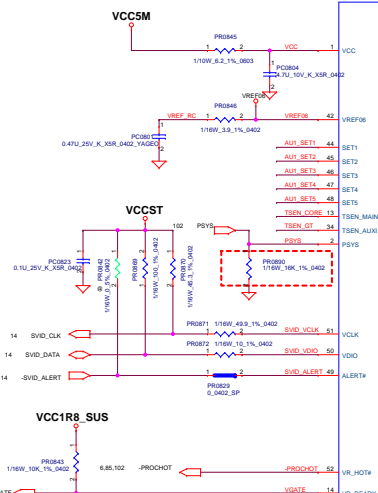
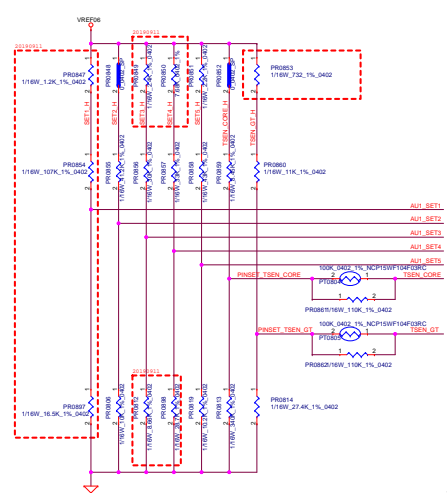
VCC2R5A
TDC: 2A
OCP: 4A
Fsw: 1MHz



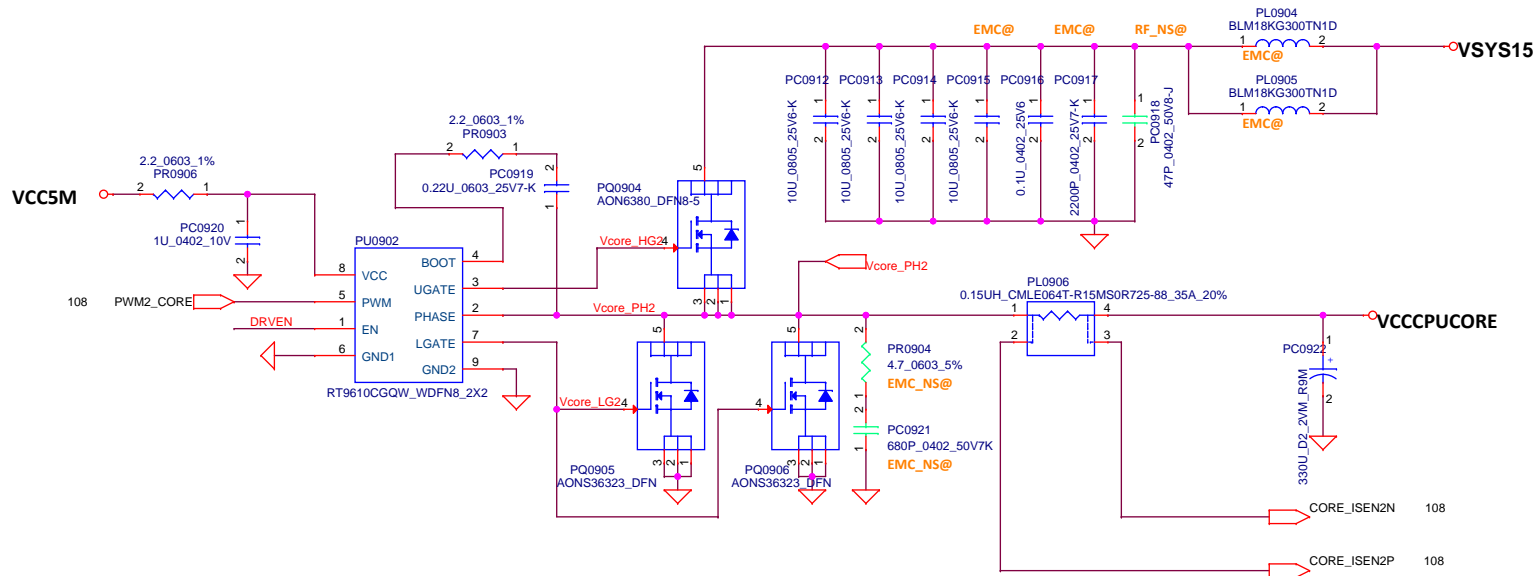
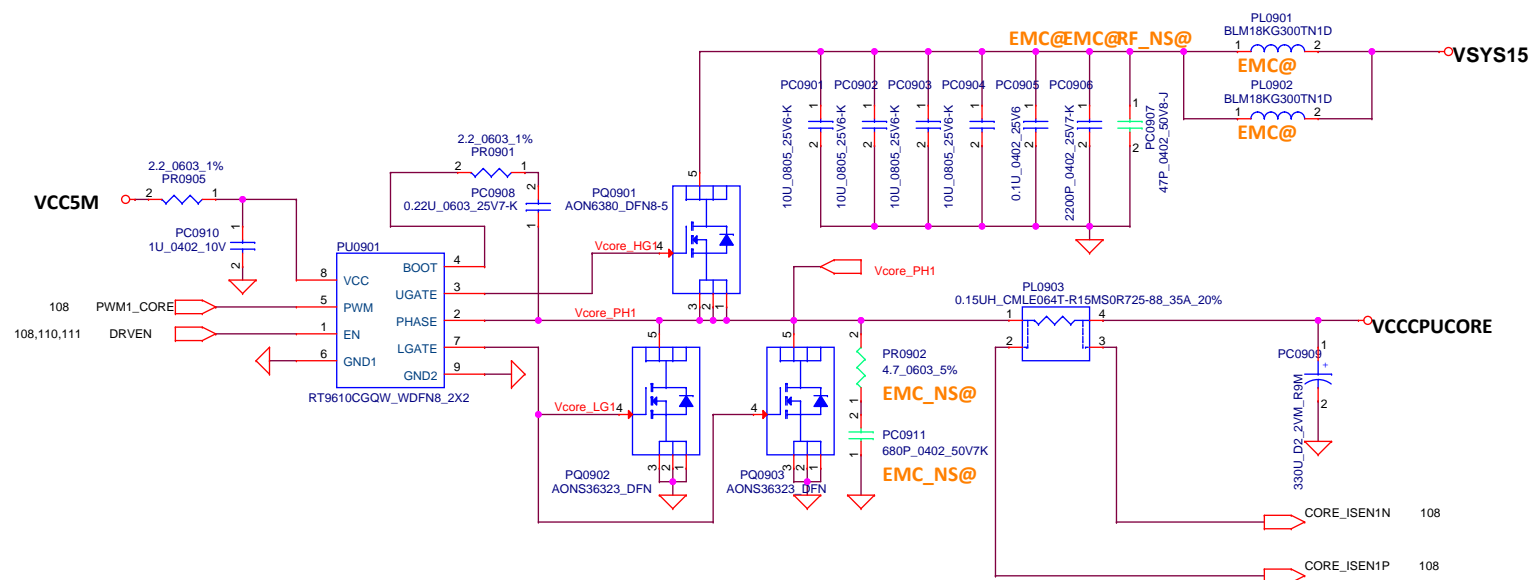
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Security Classification				DC/DC VCC2R5A(RT8068A)	
Issued Date	2013/08/05	Deciphered Date	2014/12/31	Size	Document Number
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				Date:	Tuesday, March 03, 2020
				Sheet	107 of 129

GL4A0/GL5A0 NM-C63

VSYS15 51,100,102,103,104,105,106,108,110,111,114,116,120
VCC5M 50,51,69,70,84,86,103,107,109,110,111,116,118,122,126,127
VCCST 6,14,16,85,103




For U42
VCCCPUCORE
TDC= 48A
IccMAX=70A
OCP=76A

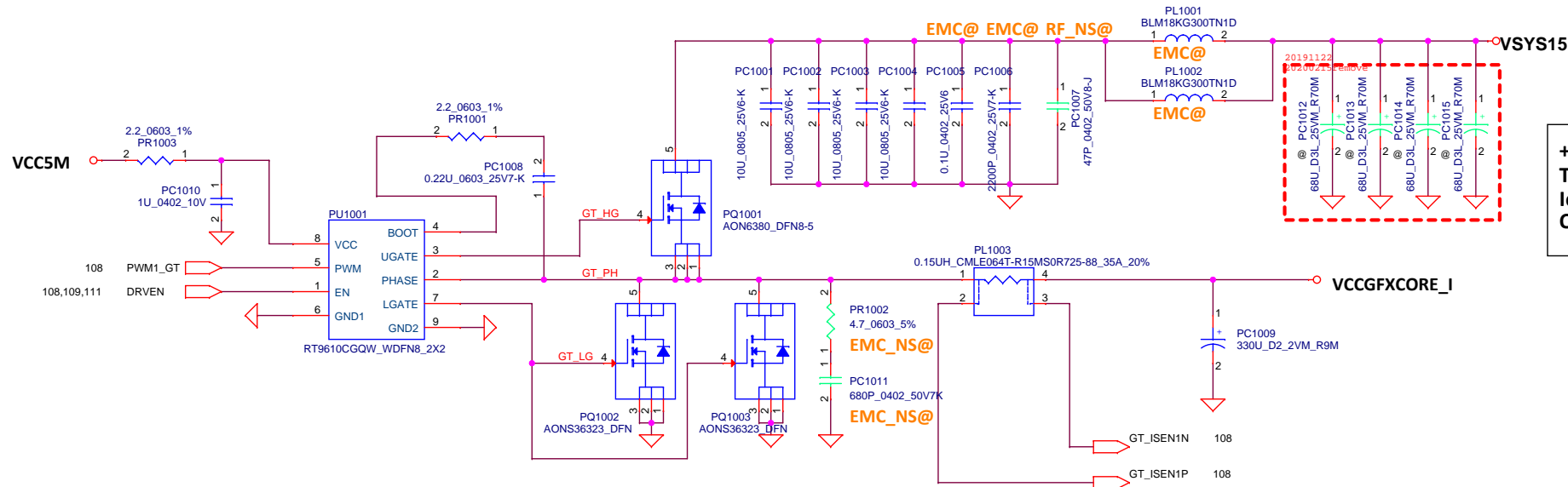


Security Classification		LC Future Center Secret Data	
Issued Date	2013/08/05	Deciphered Date	2014/12/31

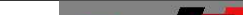
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Title				Rev
+VCC_CORE				
Size	Document Number	<i>GL4A0/GL5A0 NM</i>		C03
Custom				
Date:	Tuesday, March 03, 2020	Sheet	109	of 129

GL4A0/GL5A0 NM-C63

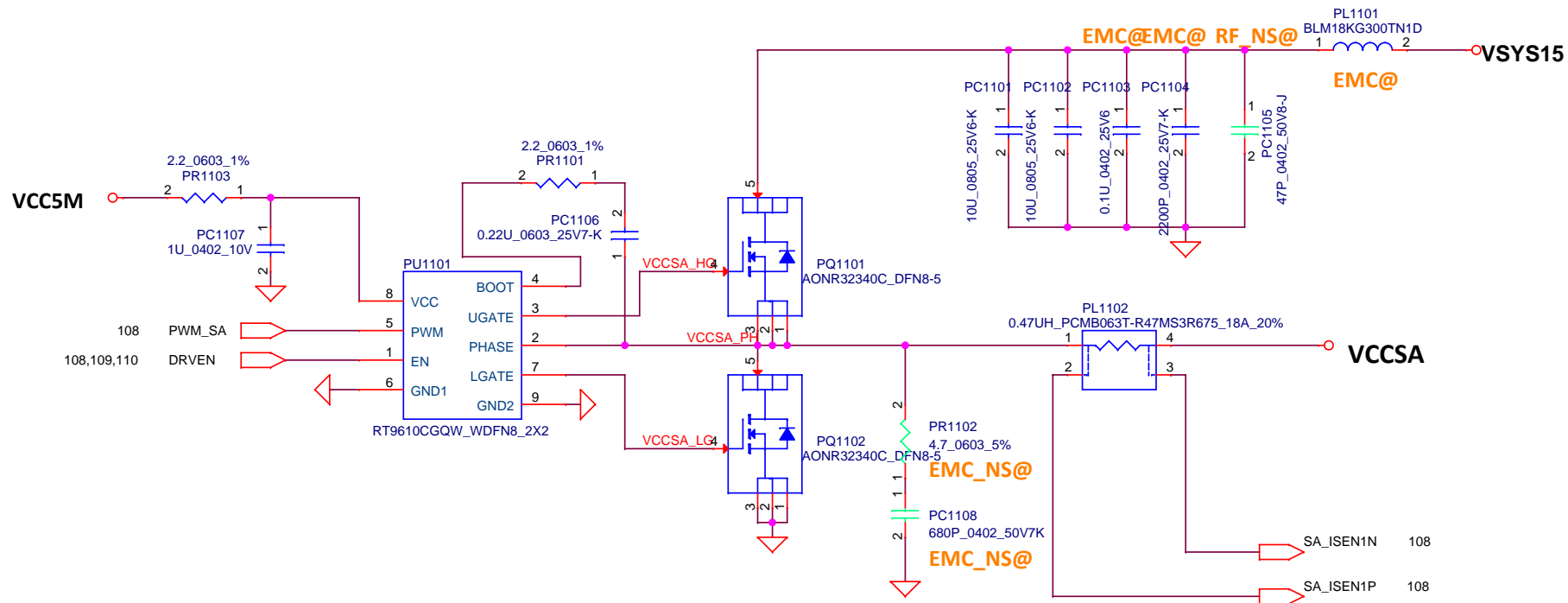


+VCC_GT
 TDC= 22A
 IccMAX=31A
 OCP min = 40A

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Issued Date	2013/08/05	Deciphered Date	2014/12/31	+VCC_GT	
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Date:	Tuesday, March 03, 2020		Sheet	110	of 129



GL4A0/GL5A0 NM-C63



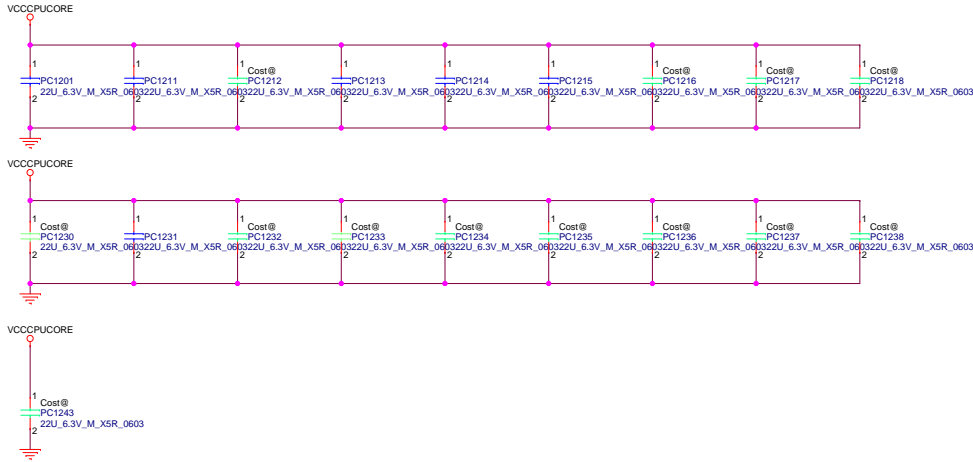
+VCC_SA
TDC= 4A
IccMAX=6A
OCP = 9A

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Issued Date	2013/08/05	Deciphered Date	2014/12/31	VCCSA	
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				Date:	Tuesday, March 03, 2020
				Sheet	111 of 129

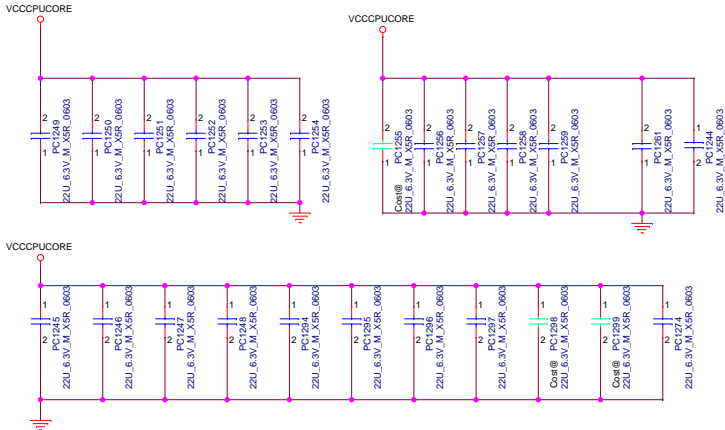


Rev
GL4A0/GL5A0 NM-C63

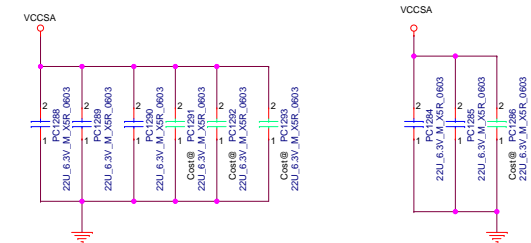
VCCCPUCORE
[Decoupling Requirements for Comet Lake U 4+2 Processor]10uFx8, 47uFx20
Primary side cap.



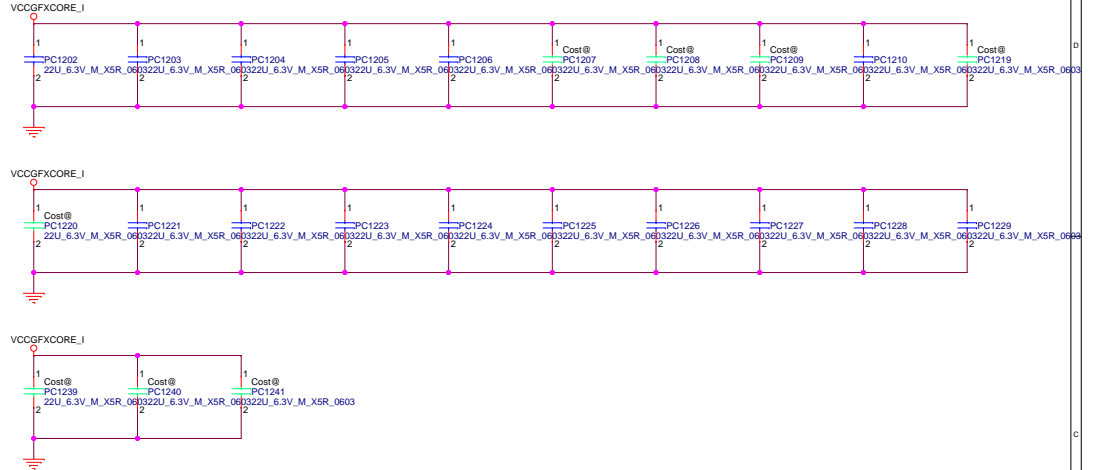
VCCCPUCORE
[Decoupling Requirements for Comet Lake U 4+2 Processor]10uFx8, 47uFx20
Primary side cap.



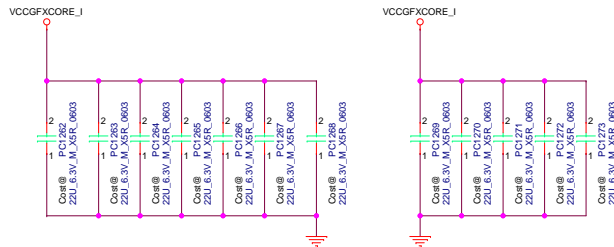
VCCSA
[Decoupling Requirements for Comet Lake U 4+2 Processor]10uFx6, 47uFx2, 10uFx7
Primary side cap.



VCCGFXCORE_I
[Decoupling Requirements for Comet Lake U 4+2 Processor]22uFx15, 47uFx4
Primary side cap.




VCCGFXCORE_I
[Decoupling Requirements for Comet Lake U 4+2 Processor]1uFx15, 10uFx15
Secondary side cap.



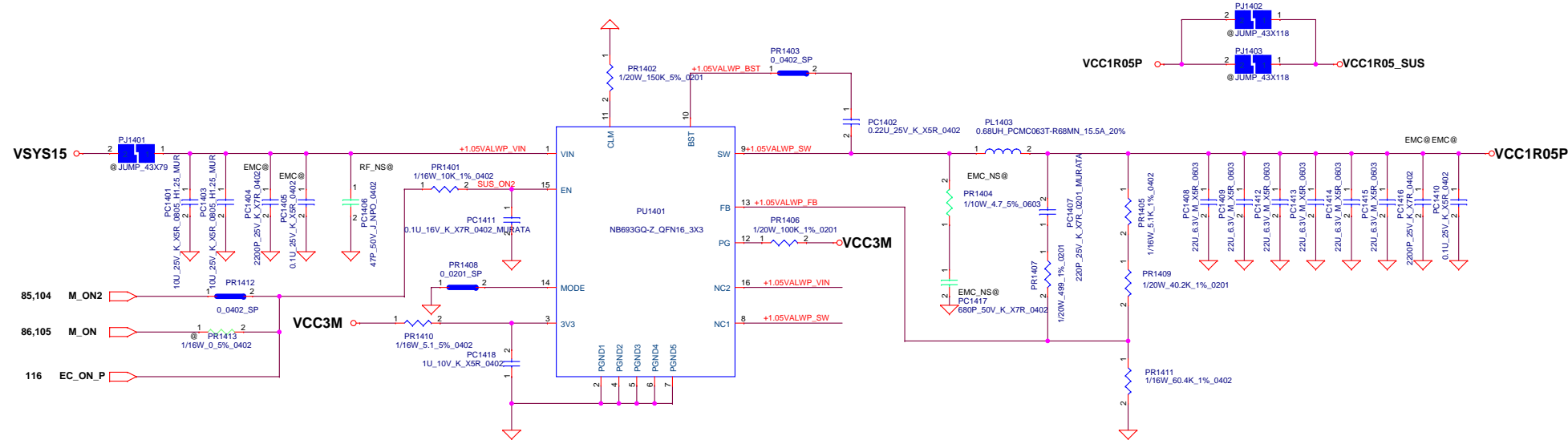
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Issued Date	2015/01/12	Deciphered Date	2016/01/12
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Date:	Tuesday, March 03, 2020	Sheet	112 of 129

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				Date:	Tuesday, March 03, 2020	Sheet 113 of 129


VSYS15 51,100,102,103,104,105,106,108,109,110,111,118,120
VCC1R05_SUS 13,16,50,123

VCC1R05_SUS
FSW=700KHz
TDC:10A
OCP:13A



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Size		Document Number		GL4A0/GL5A0 NM-CB3	
Date:		Tuesday, March 03, 2020		Sheet 114 of 129	

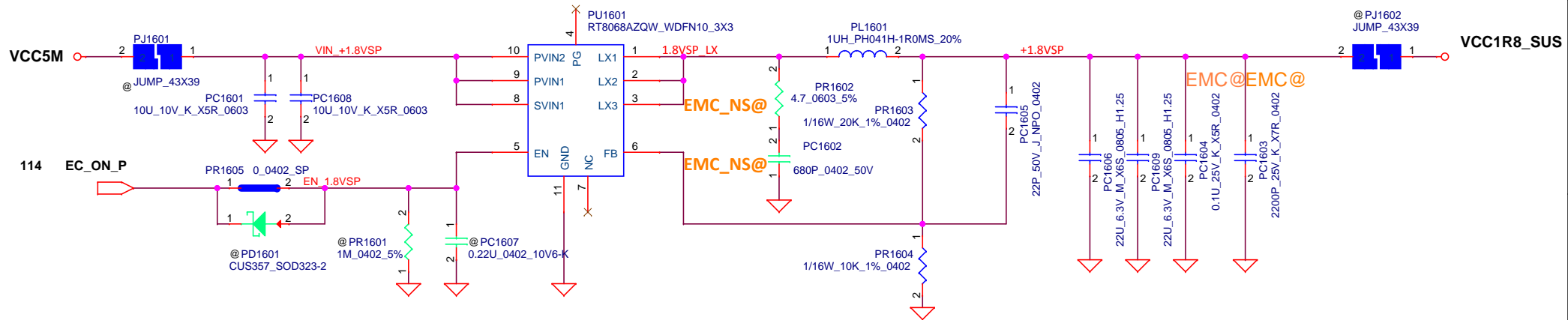
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				Date:	Tuesday, March 03, 2020	Sheet 115 of 129

VCC5M 50,51,69,70,84,85,89,103,107,108,109,110,111,118,123,126,127


VCC1R8_SUS 7,8,16,50,67,78,85,108

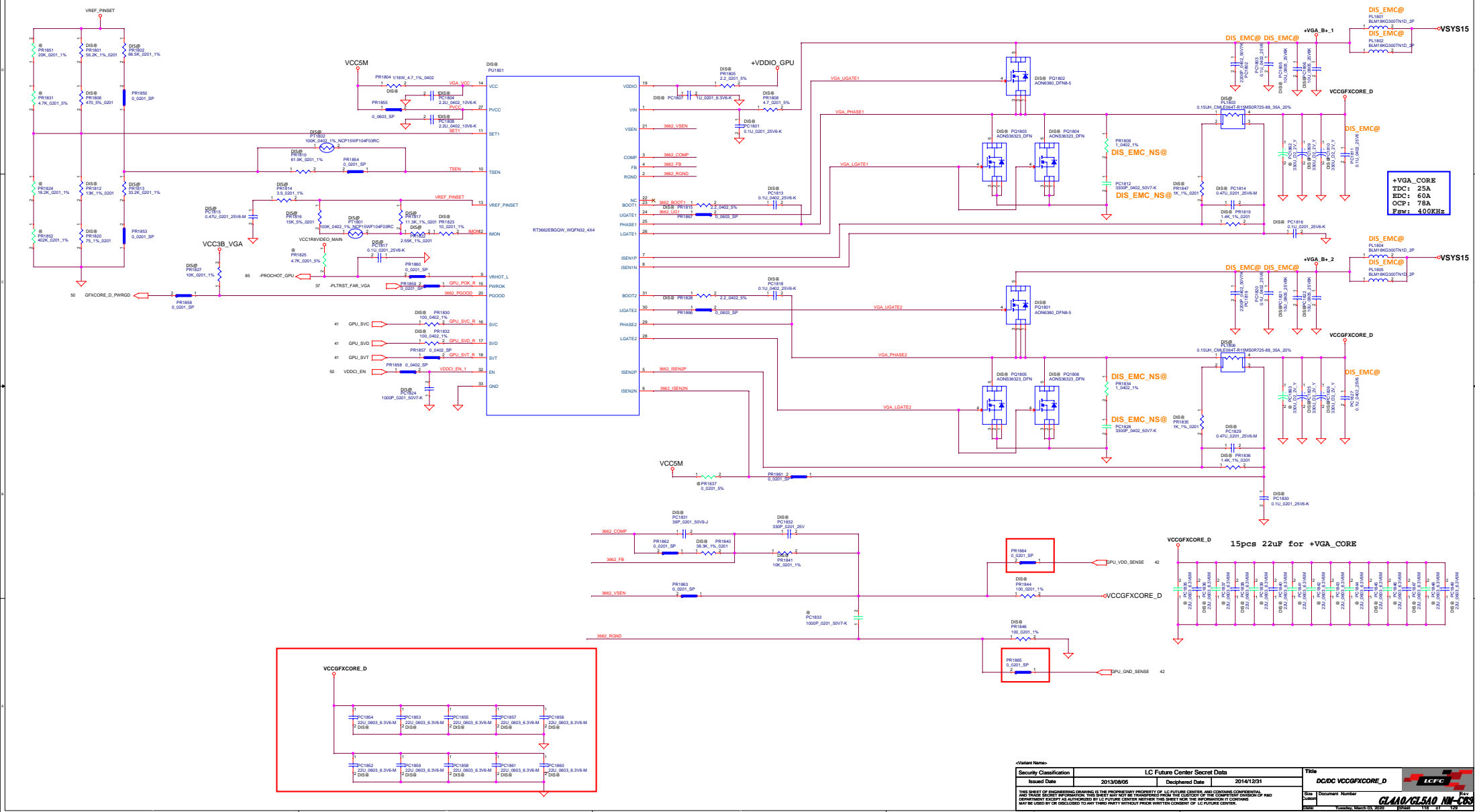
VCC1R8_SUS
TDC: 2A
OCP: 4A
Fsw: 1MHz




Security Classification		LC Future Center Secret Data		Title		
Issued Date		2013/08/05	Deciphered Date	2014/12/31	DC/DC VCC1R8_SUS	
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Size		Document Number				GL4A0/GL5A0 NM-C63
Custom						
Date:		Tuesday, March 03, 2020		Sheet	116 of 129	

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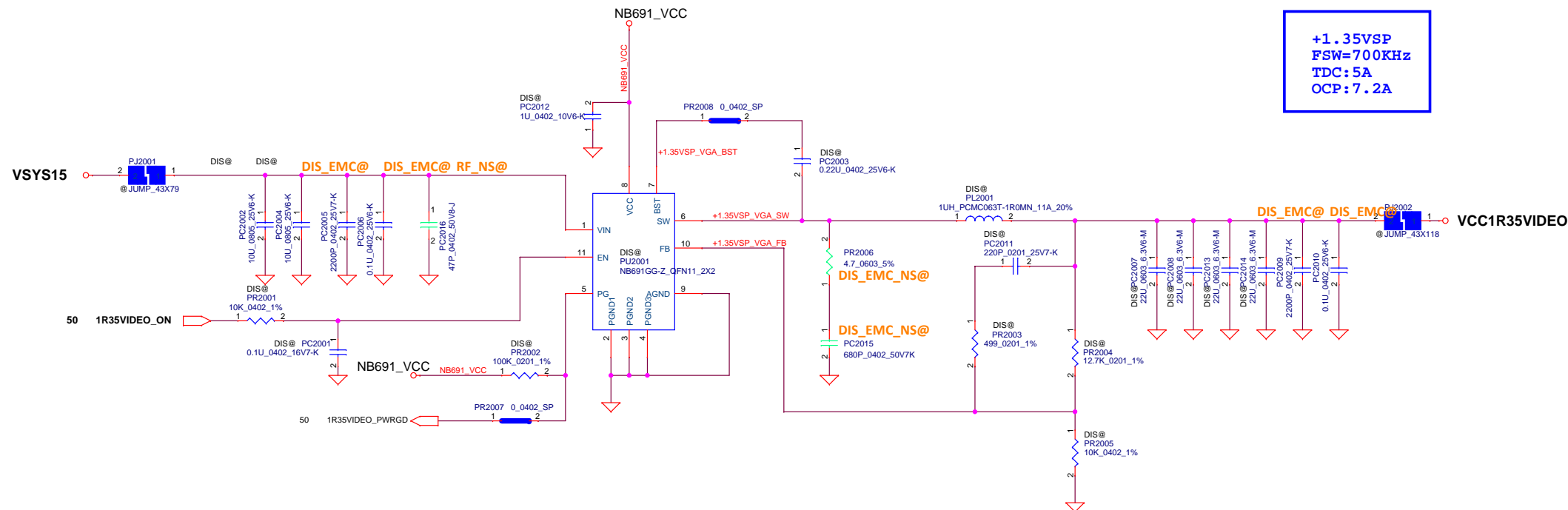
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				Date:	Tuesday, March 03, 2020	Sheet 117 of 129

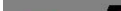


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				Date:	Tuesday, March 03, 2020	Sheet 119 of 129

VCC1R35VIDEO VCC1R35VIDEO 38,42,45




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Issued Date	2013/08/05	Deciphered Date	2014/12/31	DC/DC VCC1R35/VIDEO		
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				Date:	Tuesday, March 03, 2020	Rev GL4A0/GL5A0 NM-C63
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				Date:	Tuesday, March 03, 2020	Rev 1.0
					Sheet 121 of 128	

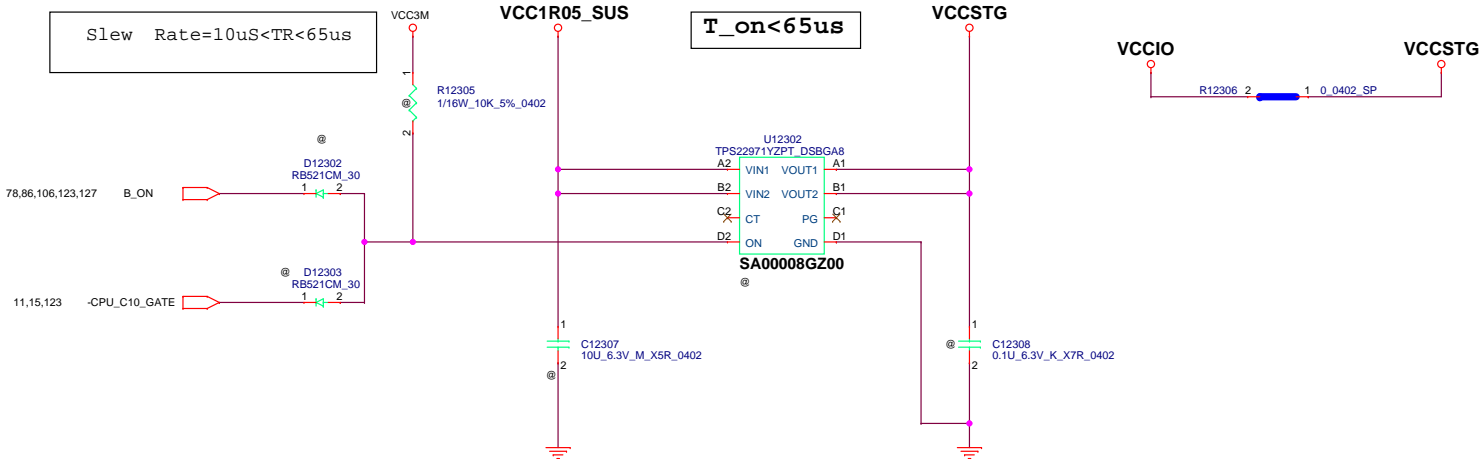
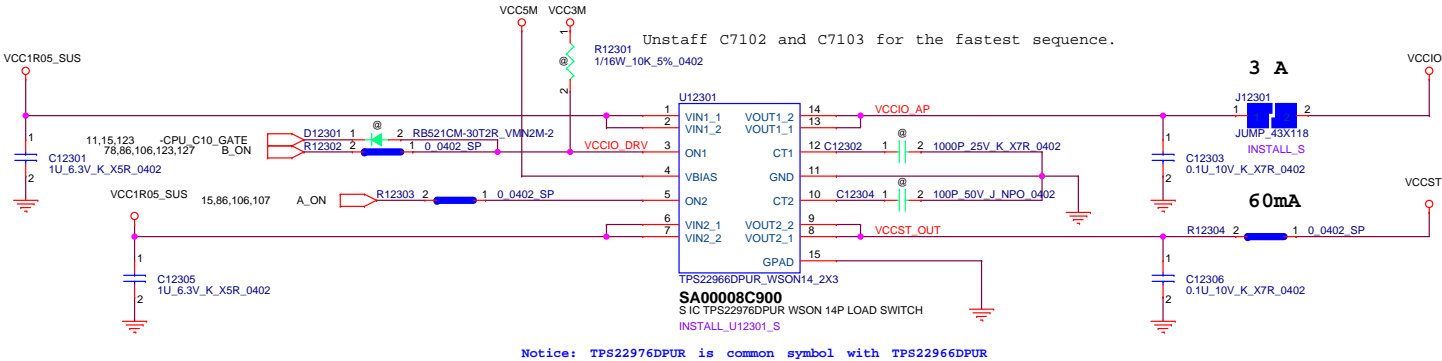
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Security Classification		LC Future Center Secret Data		Title		
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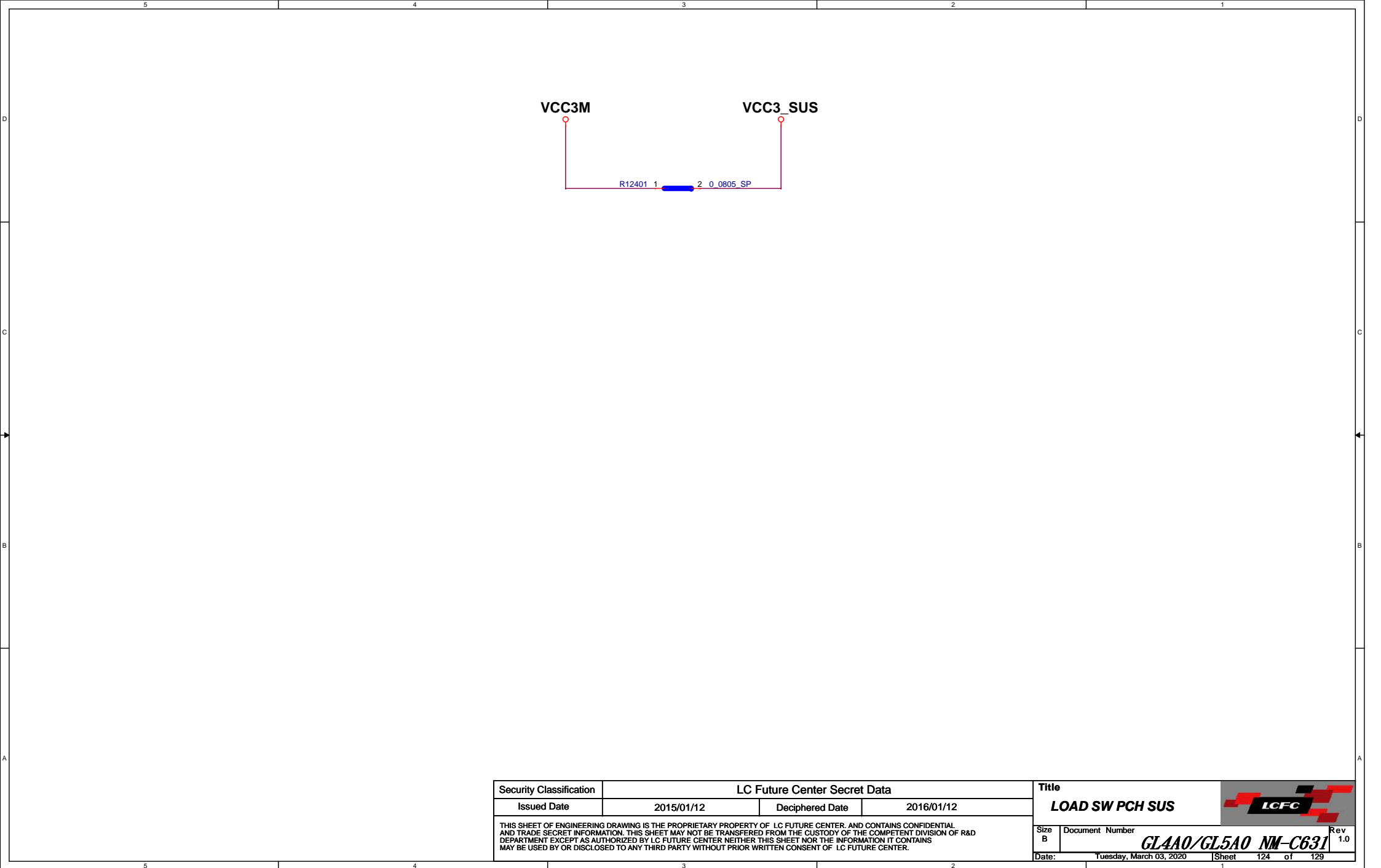
VCC1R05_SUS	VCC1R05_SUS	13,16,50,114
VCCSTG	VCCSTG	6,14,15
VCCIO	VCCIO	3,15,18,85
VCC5M	VCC5M	50,51,69,70,84,85,89,103,107,108,109,110,111,116,118,126,127
VCCST	VCCST	6,14,15,85,108

TABLE of POWER SWITCH (U12301)		
Vendor	LCFC P/N	Description
TI	SA00008C900	S IC TPS22976DPUR WSON 14P LOAD SWITCH
GMT	SA00008F400	S IC G2898KD1U TDFN 14P LOAD SWITCH
RICHTEK	SA000067200	S IC RT9740AGQW WDFN 14P LOAD SWITCH


VCC1R05M to VCCIO & VCCST



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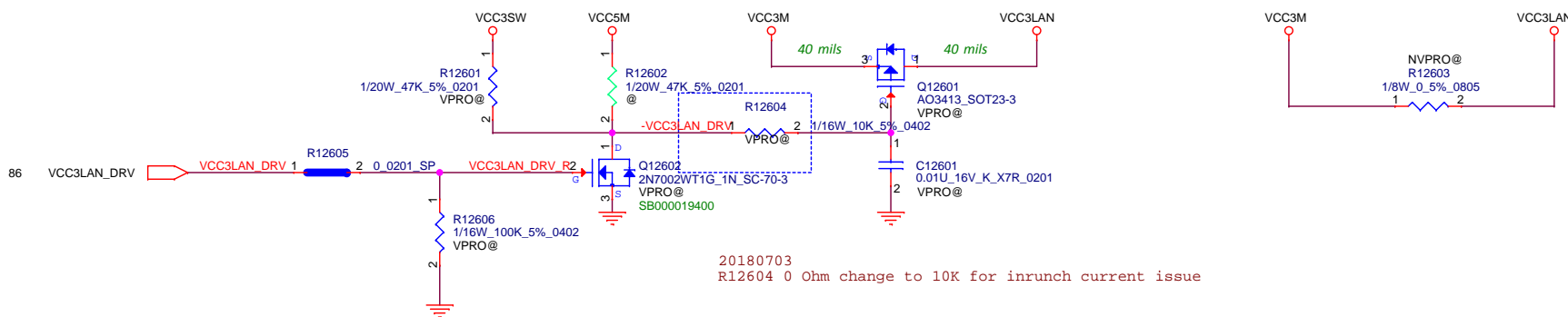
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VCC3LAN 62,73

Due to solve G3 to S5 wake on lan issue
+3VALW must meet INTEL spec.
Control LAN power sequence must be stuff.

For VPRO

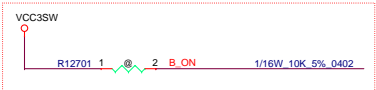
For NVPRO



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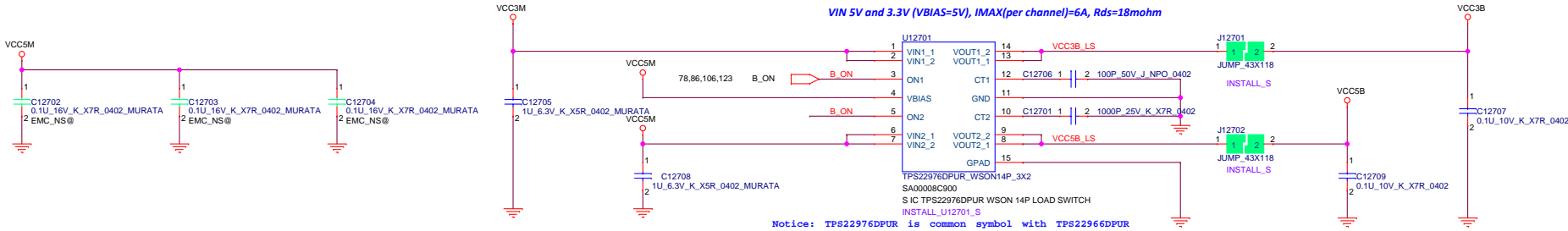
GL4A0/GL5A0 NM-C631

VCC3SW		VCC3SW	20,51,85,101,102,105,126
VCC3M		VCC3M	4,11,13,15,16,50,51,59,78,84,85,86,88,102,103,104,105,106,114,123,124,126,128
VCC5M		VCC5M	50,51,69,70,84,85,89,103,107,108,109,110,111,116,118,123,126
VCC5B		VCC5B	51,54,72,78,88,89,90
VCC3B		VCC3B	3,7,8,9,10,12,13,33,35,50,51,57,58,64,66,67,68,70,73,76,78,85,86,88,89,91,92,93,98,101




1. MIRROR code, is correct????
2. After reset EC, EC control "Low", not High or Disable.

Smart Switch
VCC5M To VCC5B
VCC3M To VCC3B



Notice: TPS22976DPUR is common symbol with TPS22966DPUR

TABLE of POWER SWITCH (U12701)		
Vendor	LCFC P/N	Description
TI	SA00008C900	S IC TPS22976DPUR WSON 14P LOAD SWITCH
GMT	SA00008F400	S IC G2898KD1U TDFN 14P LOAD SWITCH
RICHTEK	SA000067200	S IC RT9740AGQW WDFN 14P LOAD SWITCH

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VCC3WLAN VCC3WLAN 6,8,66

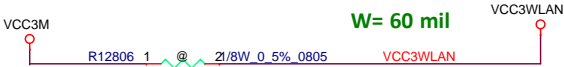
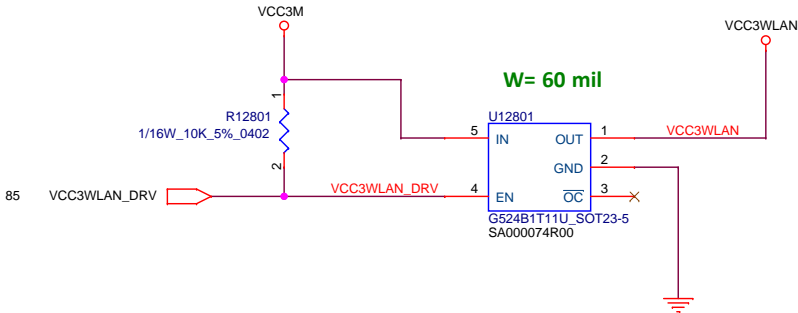
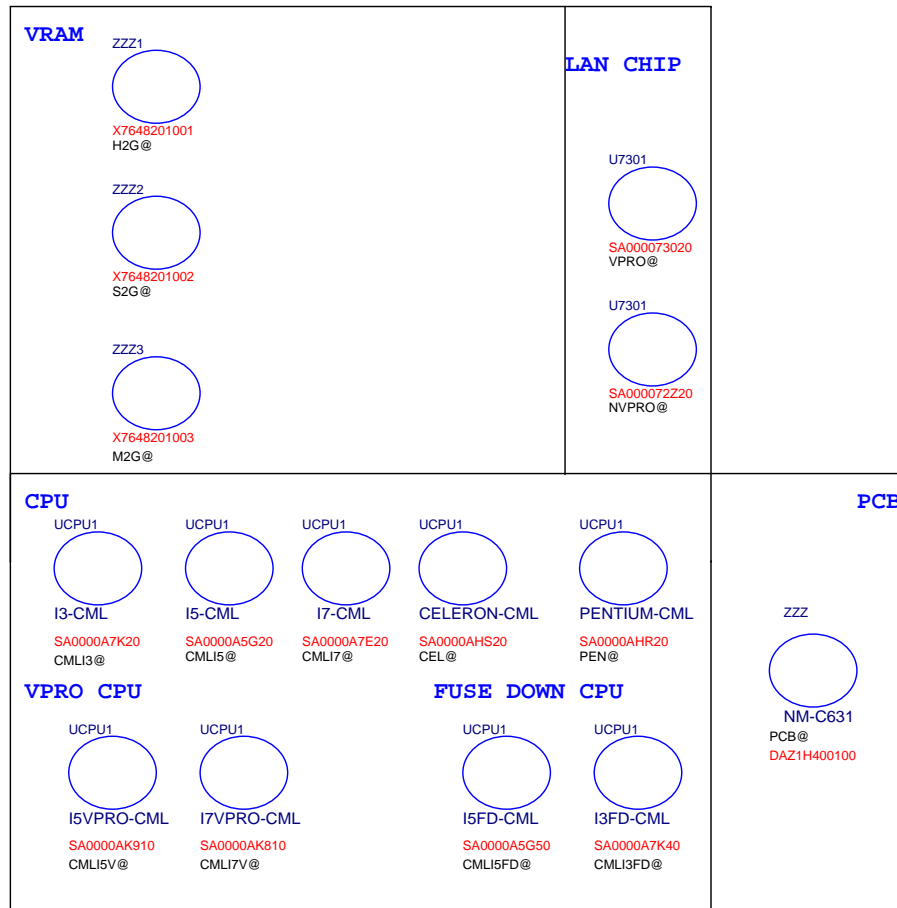


TABLE of POWER SWITCH (U12801)		
Vendor	LCFC P/N	Description
GMT	SA000074R00	S IC G524B1T11U SOT23 5P POWER SWITCH
SILERGY	SA000074P00	S IC SY6288C20AAC SOT23 5P POWER SWITCH
RICHTEK	SA0000A2M00	S IC RT9742CGJ5 TSOT-23 5P PWR SW

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