

Kolar-1 SVT Logic Schematics

KL1KR-1
VER 4.02
Nov/1/2017

BASE LOGIC :
kolar_sit-r_lcfrc_20171026

- 1.TITLE PAGE

2.EC HISTORY

3.CPU(1/16) : DDI/EDP

4.CPU(2/16) : DDR CHANNEL-A

5.CPU(3/16) : DDR CHANNEL-B

6.CPU(4/16) : MISC/JTAG

7.CPU(5/16) : LPC/SPI/SMBUS/C-LINK

8.CPU(6/16) : LPSS/ISH

9.CPU(7/16) : AUDIO/SDXC

10.CPU(8/16) : PCIE/USB/SATA

11.CPU(9/16) : CSI-2/EMMC

12.CPU(10/16) : CLOCK SIGNALS

13.CPU(11/16) : SYSTEM PM

14.CPU(12/16) : CPU POWER (1/2)

15.CPU(13/16) : CPU POWER (2/2)

16.CPU(14/16) : PCH POWER

17.CPU(15/16) : GND

18.CPU(16/16) : CFG/RESERVED

19.XDP CONNECTOR

20.RTC BATTERY

21.SPI FLASH

22.DDR4 BASE MEMORY CH-A (1/2)

23.DDR4 BASE MEMORY CH-A (2/2)

24.DDR4 SO DIMM CHANNEL-B (1/2)

25.DDR4 SO DIMM CHANNEL-B (2/2)

26.LCD I/F

27.LID/MIC/CAMERA/PWR SW

28.DDI DEMUX/HDMI LEVEL SHIFTER

29.USB TYPE-C SWITCH

30.BLANK

31.ALPINE RIDGE(1/2)

32.ALPINE RIDGE(2/2)

33.POWER DELIVERY (SN1701012RSLR)

34.TYPE-C LOW LOGIC MUX

35.CS18 SIDE DOCKING CONNECTOR

36.USB TYPE-C CONNECTOR

37.HDMI CONNECTOR

38.M.2 SOCKET 3 MODULE I/F

39.USB POWER/CONN

40.BLANK

41.GBE JACKSONVILLE

42.GBE LAN SWITCH

43.GBE MAGNETICS

44.RJ45 CONNECTOR

45.M.2 SOCKET 1 MODULE I/F

46.M.2 SOCKET 2 MODULE I/F

47.MEDIA CARD/AUDIO CONNECTOR

48.N17S-LG(1/6) PEG I/F

49.N17S-LG(2/6) VRAM I/F

50.N17S-LG(3/6) POWER

51.N17S-LG(4/6) POWER 2

52.N17S-LG(5/6) GND

53.N17S-LG(6/6) GPIO / XTAL

54.VRAM CHANNEL-A

55.MEC1663 (1/3)

56.MEC1663 (2/3)

57.MEC1663 (3/3)

58.KEYBOARD/TRACK POINT

59.TOUCH PAD/NFC

60.SCR/FPR/LED

61.FAN CONNECTOR

62.APS G-SENSOR

63.DISCRETE TPM 2.0

64.SMBUS SWITCH/LPC DEBUG PORT

65.THINK ENGINE-3 (1/2)

66.THINK ENGINE-3 (2/2)

67.AUDIO ALC3287-CG

68.AUDIO JACK & EXT MIC I/F

69.AUDIO SPEAKER I/F

70.DC-IN

71.BLANK

72.BATTERY INPUT

73.BATTERY CHARGER (BQ25700)

74.DC/DC VCC5M/VCC3M (TPS51285B-1)

75.DC/DC IMVP8 CONTROLLER (NCP81218)

76.DC/DC VCCCPUCORE (NCP302045)

77.DC/DC VCCGFXCORE_I (NCP302045)

78.DC/DC VCCSA (NCP302035)

79.U22 UNIQUE

80.BLANK

81.DC/DC VCC1R0_SUS (NB693GQ)

82.LOAD SW VCCST & VCCSTG

83.DC/DC VCC1R2A /0R6B/2R5A (NB687)

84.BLANK

85.BLANK

86.DC/DC VCC1R8_SUS (BU90104GWZ)

87.BLANK

88.DC/DC NVDD (NCP81278)

89.DC/DC VCC1R35VIDEO (NB693GQ-Z)

90.VCC1R0VIDEO (BD9B304QWZ)

91.VCC1R8VIDEO_AON (BD9B304QWZ)

92.SW VCC1R8VIDEO_MAIN

93.LOAD SW SUS

94.LOAD SW LAN

95.LOAD SW B

96.LOAD SW WLAN

97.PTH FOR SCREW HOLES

EC HISTORY

CS18 KL1KR-1
(kolar_sit-r_lcfc_20171026)

VER.4.01 10/30/2017 APPLIED HW_ECR001-002 / PWR_ECR001
VER.4.02 11/1/2017 APPLIED HW_ECR003-004 / SIT-R HW_ECR011

TABLE: Chip Capacitor Thermal Characteristics

		Code
-55 to 150degC -55 to 125degC	+/-30ppm/degC +/-30ppm/degC	NPO C0G
-55 to 125degC -55 to 105degC -55 to 85degC	+/-15% +/-22% +/-15%	X7R X6S X5R

TABLE: Chip Capacitor Tolerance

Tolerance	Code
+/-0.25pF +/-0.5pF	C D
+/-5% +/-10% +/-20% +80/-20%	J K M Z

TABLE: Chip Part Dimension

Size [mm]	mm Size Code	Inch Size Code
0.40 x 0.20 0.60 x 0.30 1.00 x 0.50 1.60 x 0.80 2.00 x 1.25 2.00 x 1.60 2.50 x 2.00 3.20 x 1.60 3.20 x 2.50 4.50 x 1.60 4.50 x 2.50 4.50 x 3.20 5.00 x 2.50 6.40 x 3.20	0402 0603 1005 1608 2125 2016 2520 3216 3225 4516 4525 4532 5025 6432	01005 0201 0402 0603 0805 0806 1008 1206 1210 1806 1810 1812 2010 2512

↑
LOGIC

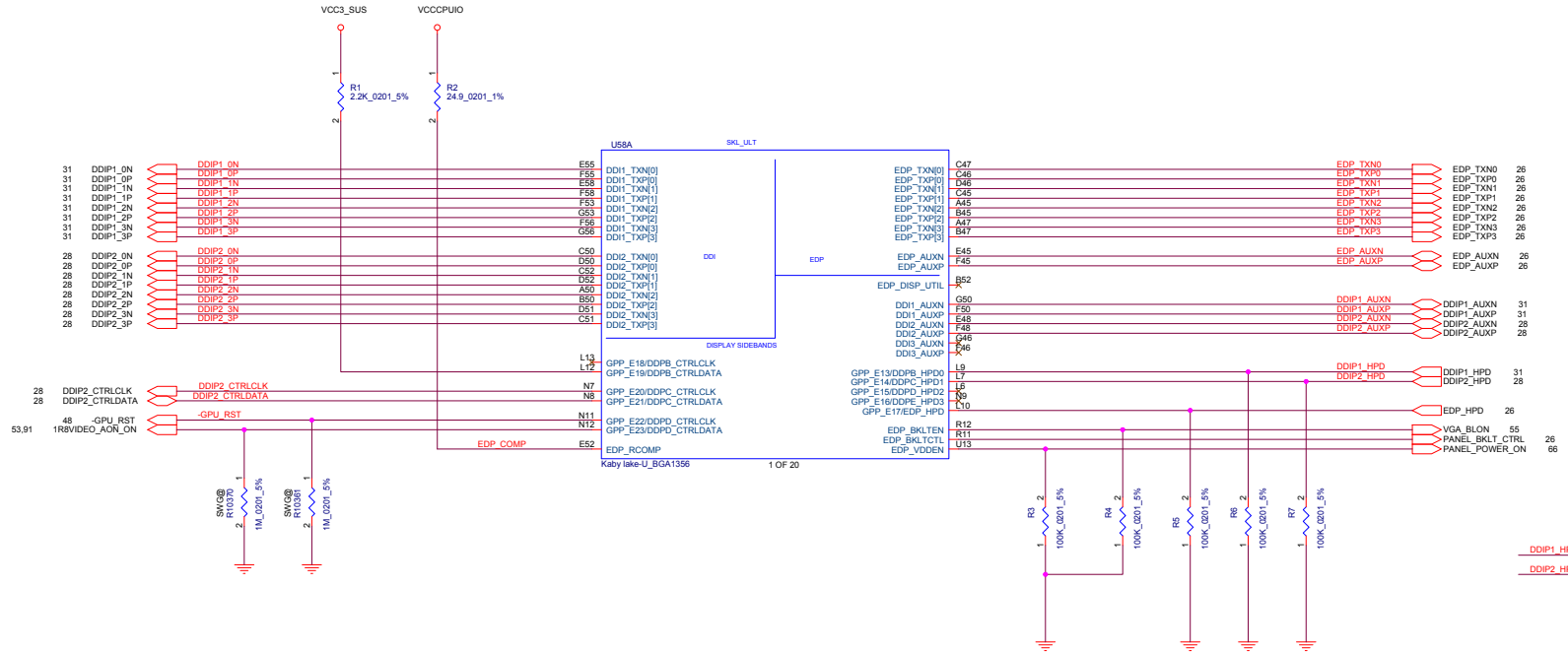
TABLE : Functional Strap

DDPB_CTRLDATA

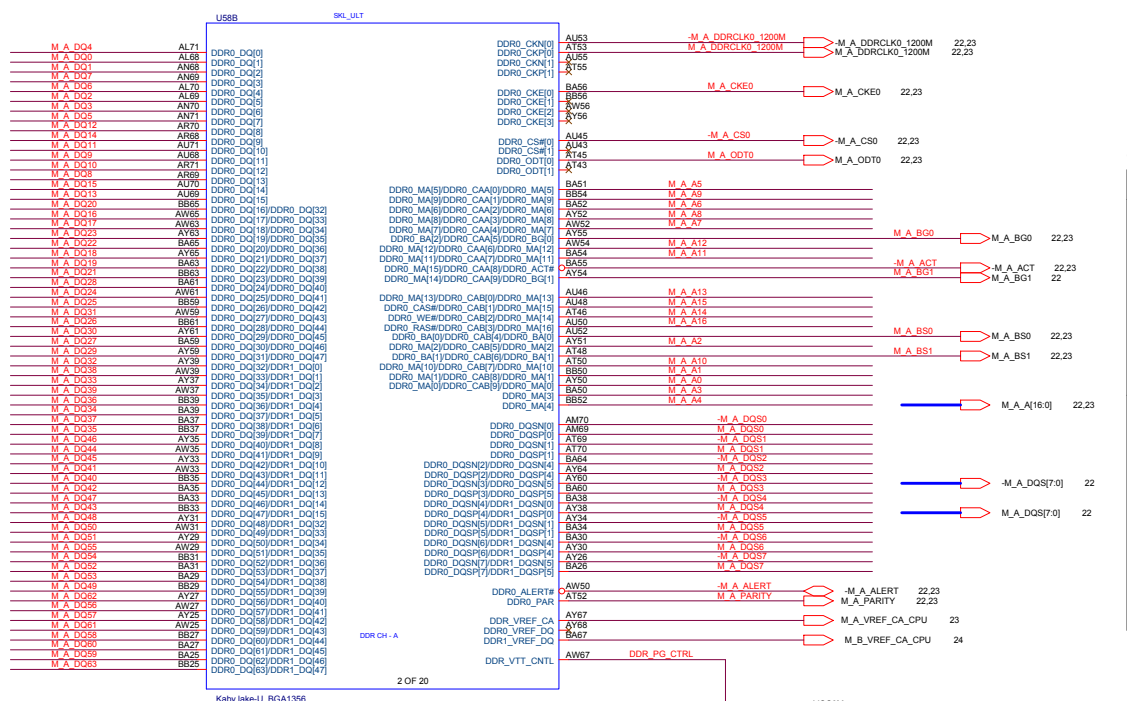
HIGH	Port B is detected.
LOW	Port B is not detected.

DDPC_CTRLDATA

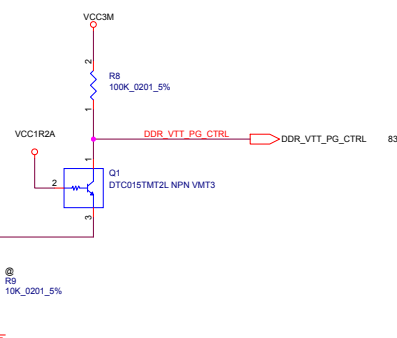
HIGH	Port C is detected.
LOW	Port C is not detected.



	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]
	AN71	DDR0_DQ[7]	DDR0_DQ[7]
	AR70	DDR0_DQ[8]	DDR0_DQ[8]
	AR68	DDR0_DQ[9]	DDR0_DQ[9]
	AU71	DDR0_DQ[10]	DDR0_DQ[10]
	AU68	DDR0_DQ[11]	DDR0_DQ[11]
AR71	DDR0_DQ[12]	DDR0_DQ[12]	
AR69	DDR0_DQ[13]	DDR0_DQ[13]	
AU70	DDR0_DQ[14]	DDR0_DQ[14]	
AU69	DDR0_DQ[15]	DDR0_DQ[15]	
Block 2	BB65	DDR0_DQ[16]	DDR0_DQ[32]
	AW65	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]
	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 4	AY39	DDR0_DQ[32]	DDR1_DQ[0]
	AW39	DDR0_DQ[33]	DDR1_DQ[1]
	AY37	DDR0_DQ[34]	DDR1_DQ[2]
	AW37	DDR0_DQ[35]	DDR1_DQ[3]
	BB39	DDR0_DQ[36]	DDR1_DQ[4]
	BA39	DDR0_DQ[37]	DDR1_DQ[5]
	BA37	DDR0_DQ[38]	DDR1_DQ[6]
	BB37	DDR0_DQ[39]	DDR1_DQ[7]
	AY35	DDR0_DQ[40]	DDR1_DQ[8]
	AW35	DDR0_DQ[41]	DDR1_DQ[9]
	AY33	DDR0_DQ[42]	DDR1_DQ[10]
	AW33	DDR0_DQ[43]	DDR1_DQ[11]
BB35	DDR0_DQ[44]	DDR1_DQ[12]	
BA35	DDR0_DQ[45]	DDR1_DQ[13]	
BA33	DDR0_DQ[46]	DDR1_DQ[14]	
BB33	DDR0_DQ[47]	DDR1_DQ[15]	
Block 6	AY31	DDR0_DQ[48]	DDR1_DQ[32]
	AW31	DDR0_DQ[49]	DDR1_DQ[33]
	AY29	DDR0_DQ[50]	DDR1_DQ[34]
	AW29	DDR0_DQ[51]	DDR1_DQ[35]
	BB31	DDR0_DQ[52]	DDR1_DQ[36]
	BA31	DDR0_DQ[53]	DDR1_DQ[37]
	BA29	DDR0_DQ[54]	DDR1_DQ[38]
	BB29	DDR0_DQ[55]	DDR1_DQ[39]
	AY27	DDR0_DQ[56]	DDR1_DQ[40]
	AW27	DDR0_DQ[57]	DDR1_DQ[41]
	AY25	DDR0_DQ[58]	DDR1_DQ[42]
	AW25	DDR0_DQ[59]	DDR1_DQ[43]
BB27	DDR0_DQ[60]	DDR1_DQ[44]	
BA27	DDR0_DQ[61]	DDR1_DQ[45]	
BA25	DDR0_DQ[62]	DDR1_DQ[46]	
BB25	DDR0_DQ[63]	DDR1_DQ[47]	



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]
AU48	DDR0_CAS#	DDR0_CAB[1]	DDR0_MA[15]
AT46	DDR0_WE#	DDR0_CAB[2]	DDR0_MA[14]
AU50	DDR0_RAS#	DDR0_CAB[3]	DDR0_MA[16]
AU52	DDR0_BA[0]	DDR0_CAB[4]	DDR0_BA[0]
AY51	DDR0_MA[2]	DDR0_CAB[5]	DDR0_MA[2]
AT48	DDR0_BA[1]	DDR0_CAB[6]	DDR0_BA[1]
AT50	DDR0_MA[10]	DDR0_CAB[7]	DDR0_MA[10]
BB50	DDR0_MA[1]	DDR0_CAB[8]	DDR0_MA[1]
AY50	DDR0_MA[0]	DDR0_CAB[9]	DDR0_MA[0]
BA50	DDR0_MA[3]	Not Used	DDR0_MA[3]
BB52	DDR0_MA[4]	Not Used	DDR0_MA[4]



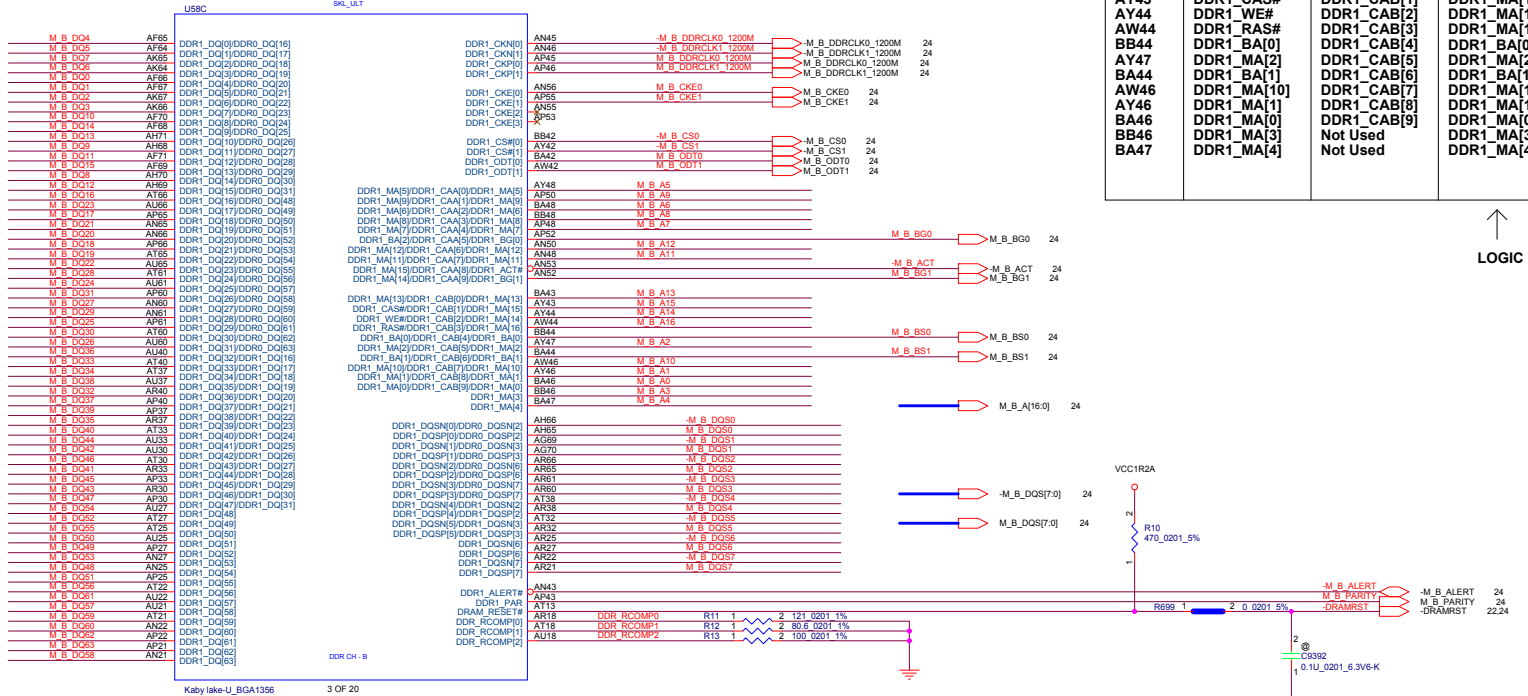
	Pin	Interleave	Non-Interleave
Block 0	AM70 AM69 AT69 AT70	DDR0_DQSN[0] DDR0_DQSP[0] DDR0_DQSN[1] DDR0_DQSP[1]	DDR0_DQSN[0] DDR0_DQSP[0] DDR0_DQSN[1] DDR0_DQSP[1]
Block 2	BA64 AY64 AY60 BA60	DDR0_DQSN[2] DDR0_DQSP[2] DDR0_DQSN[3] DDR0_DQSP[3]	DDR0_DQSN[4] DDR0_DQSP[4] DDR0_DQSN[5] DDR0_DQSP[5]
Block 4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

TABLE

	Pin	Interleave	Non-Interleave
Block 1	AF65	DDR1_DQ[0]	DDR0_DQ[16]
	AF64	DDR1_DQ[1]	DDR0_DQ[17]
	AK65	DDR1_DQ[2]	DDR0_DQ[18]
	AK64	DDR1_DQ[3]	DDR0_DQ[19]
	AF66	DDR1_DQ[4]	DDR0_DQ[20]
	AF67	DDR1_DQ[5]	DDR0_DQ[21]
	AK67	DDR1_DQ[6]	DDR0_DQ[22]
	AK66	DDR1_DQ[7]	DDR0_DQ[23]
	AF70	DDR1_DQ[8]	DDR0_DQ[24]
	AF68	DDR1_DQ[9]	DDR0_DQ[25]
	AH71	DDR1_DQ[10]	DDR0_DQ[26]
	AH68	DDR1_DQ[11]	DDR0_DQ[27]
	AF71	DDR1_DQ[12]	DDR0_DQ[28]
	AF69	DDR1_DQ[13]	DDR0_DQ[29]
	AH70	DDR1_DQ[14]	DDR0_DQ[30]
	AH69	DDR1_DQ[15]	DDR0_DQ[31]
Block 3	AT66	DDR1_DQ[16]	DDR0_DQ[48]
	AU66	DDR1_DQ[17]	DDR0_DQ[49]
	AP65	DDR1_DQ[18]	DDR0_DQ[50]
	AN65	DDR1_DQ[19]	DDR0_DQ[51]
	AN66	DDR1_DQ[20]	DDR0_DQ[52]
	AP66	DDR1_DQ[21]	DDR0_DQ[53]
	AT65	DDR1_DQ[22]	DDR0_DQ[54]
	AU65	DDR1_DQ[23]	DDR0_DQ[55]
	AT61	DDR1_DQ[24]	DDR0_DQ[56]
	AU61	DDR1_DQ[25]	DDR0_DQ[57]
	AP60	DDR1_DQ[26]	DDR0_DQ[58]
	AN60	DDR1_DQ[27]	DDR0_DQ[59]
	AN61	DDR1_DQ[28]	DDR0_DQ[60]
	AP61	DDR1_DQ[29]	DDR0_DQ[61]
	AT60	DDR1_DQ[30]	DDR0_DQ[62]
	AU60	DDR1_DQ[31]	DDR0_DQ[63]
Block 5	AU40	DDR1_DQ[32]	DDR1_DQ[16]
	AT40	DDR1_DQ[33]	DDR1_DQ[17]
	AT37	DDR1_DQ[34]	DDR1_DQ[18]
	AU37	DDR1_DQ[35]	DDR1_DQ[19]
	AR40	DDR1_DQ[36]	DDR1_DQ[20]
	AP37	DDR1_DQ[37]	DDR1_DQ[21]
	AR37	DDR1_DQ[38]	DDR1_DQ[22]
	AT33	DDR1_DQ[39]	DDR1_DQ[23]
	AU33	DDR1_DQ[40]	DDR1_DQ[24]
	AU30	DDR1_DQ[41]	DDR1_DQ[25]
	AT30	DDR1_DQ[42]	DDR1_DQ[26]
	AR33	DDR1_DQ[43]	DDR1_DQ[27]
	AP33	DDR1_DQ[44]	DDR1_DQ[28]
	AR30	DDR1_DQ[45]	DDR1_DQ[29]
	AP30	DDR1_DQ[46]	DDR1_DQ[30]
	AP30	DDR1_DQ[47]	DDR1_DQ[31]
Block 7	AU27	DDR1_DQ[48]	DDR1_DQ[48]
	AT27	DDR1_DQ[49]	DDR1_DQ[49]
	AT25	DDR1_DQ[50]	DDR1_DQ[50]
	AU25	DDR1_DQ[51]	DDR1_DQ[51]
	AP27	DDR1_DQ[52]	DDR1_DQ[52]
	AN27	DDR1_DQ[53]	DDR1_DQ[53]
	AN25	DDR1_DQ[54]	DDR1_DQ[54]
	AP25	DDR1_DQ[55]	DDR1_DQ[55]
	AT22	DDR1_DQ[56]	DDR1_DQ[56]
	AU22	DDR1_DQ[57]	DDR1_DQ[57]
	AU21	DDR1_DQ[58]	DDR1_DQ[58]
	AT21	DDR1_DQ[59]	DDR1_DQ[59]
	AN22	DDR1_DQ[60]	DDR1_DQ[60]
	AP22	DDR1_DQ[61]	DDR1_DQ[61]
	AP21	DDR1_DQ[62]	DDR1_DQ[62]
	AN21	DDR1_DQ[63]	DDR1_DQ[63]

LOGIC

LOGIC



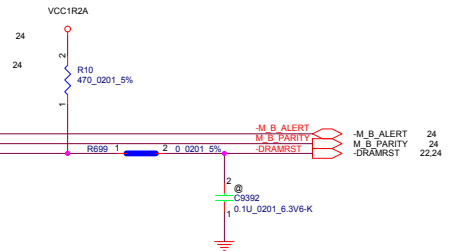
TABLE

	Pin	Interleave	Non-Interleave
Block 1	AH66	DDR1_DQSN[0]	DDR0_DQSN[2]
	AH65	DDR1_DQSP[0]	DDR0_DQSP[2]
	AG69	DDR1_DQSN[1]	DDR0_DQSN[3]
	AG70	DDR1_DQSP[1]	DDR0_DQSP[3]
Block 3	AR66	DDR1_DQSN[2]	DDR0_DQSN[6]
	AR65	DDR1_DQSP[2]	DDR0_DQSP[6]
	AR61	DDR1_DQSN[3]	DDR0_DQSN[7]
	AR60	DDR1_DQSP[3]	DDR0_DQSP[7]
Block 5	AT38	DDR1_DQSN[4]	DDR1_DQSN[2]
	AR38	DDR1_DQSP[4]	DDR1_DQSP[2]
	AT32	DDR1_DQSN[5]	DDR1_DQSN[3]
	AR32	DDR1_DQSP[5]	DDR1_DQSP[3]
Block 7	AR25	DDR1_DQSN[6]	DDR1_DQSN[6]
	AR27	DDR1_DQSP[6]	DDR1_DQSP[6]
	AR22	DDR1_DQSN[7]	DDR1_DQSN[7]
	AR21	DDR1_DQSP[7]	DDR1_DQSP[7]

TABLE

Pin	DDR3L	LPDDR3	DDR4
AY48	DDR1_MA[5]	DDR1_CAA[0]	DDR1_MA[5]
AP50	DDR1_MA[9]	DDR1_CAA[1]	DDR1_MA[9]
BA48	DDR1_MA[6]	DDR1_CAA[2]	DDR1_MA[6]
BB48	DDR1_MA[8]	DDR1_CAA[3]	DDR1_MA[8]
AP48	DDR1_MA[7]	DDR1_CAA[4]	DDR1_MA[7]
AP52	DDR1_BA[2]	DDR1_CAA[5]	DDR1_BG[0]
AN50	DDR1_MA[12]	DDR1_CAA[6]	DDR1_MA[12]
AN48	DDR1_MA[11]	DDR1_CAA[7]	DDR1_MA[11]
AN53	DDR1_MA[16]	DDR1_CAA[8]	DDR1_ACT#
AN52	DDR1_MA[14]	DDR1_CAA[9]	DDR1_BG[1]
BA43	DDR1_MA[13]	DDR1_CAB[0]	DDR1_MA[13]
AY43	DDR1_CAS#	DDR1_CAB[1]	DDR1_MA[15]
AY44	DDR1_WE#	DDR1_CAB[2]	DDR1_MA[14]
AW44	DDR1_RAS#	DDR1_CAB[3]	DDR1_MA[16]
BB44	DDR1_BA[0]	DDR1_CAB[4]	DDR1_BA[0]
AY47	DDR1_BA[1]	DDR1_CAB[5]	DDR1_MA[2]
BA44	DDR1_BA[2]	DDR1_CAB[6]	DDR1_BA[1]
AW46	DDR1_MA[10]	DDR1_CAB[7]	DDR1_MA[10]
AY46	DDR1_MA[11]	DDR1_CAB[8]	DDR1_MA[11]
BA46	DDR1_MA[0]	DDR1_CAB[9]	DDR1_MA[0]
BB46	DDR1_MA[3]	Not Used	DDR1_MA[3]
BA47	DDR1_MA[4]	Not Used	DDR1_MA[4]

LOGIC



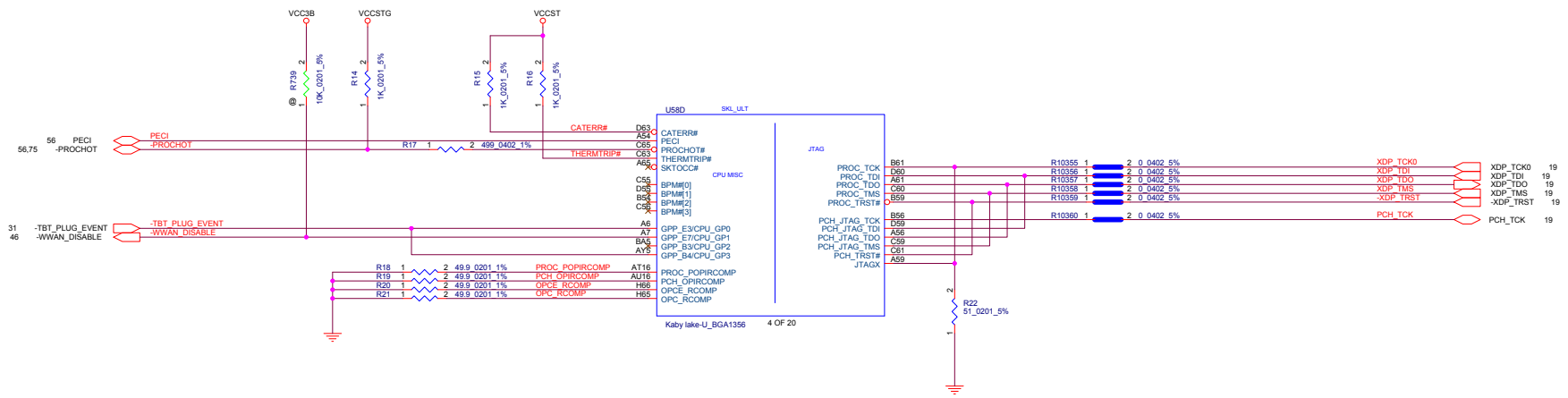


TABLE : Functional Strap

SPI0_MISO (Boot Halt)		
HIGH	Disabled (Default)	
LOW	Enabled	

TABLE : Functional Strap

SPI0_MISO (JTAG ODT Disable)		
HIGH	Enabled (Default)	
LOW	Disabled	

TABLE : Functional Strap

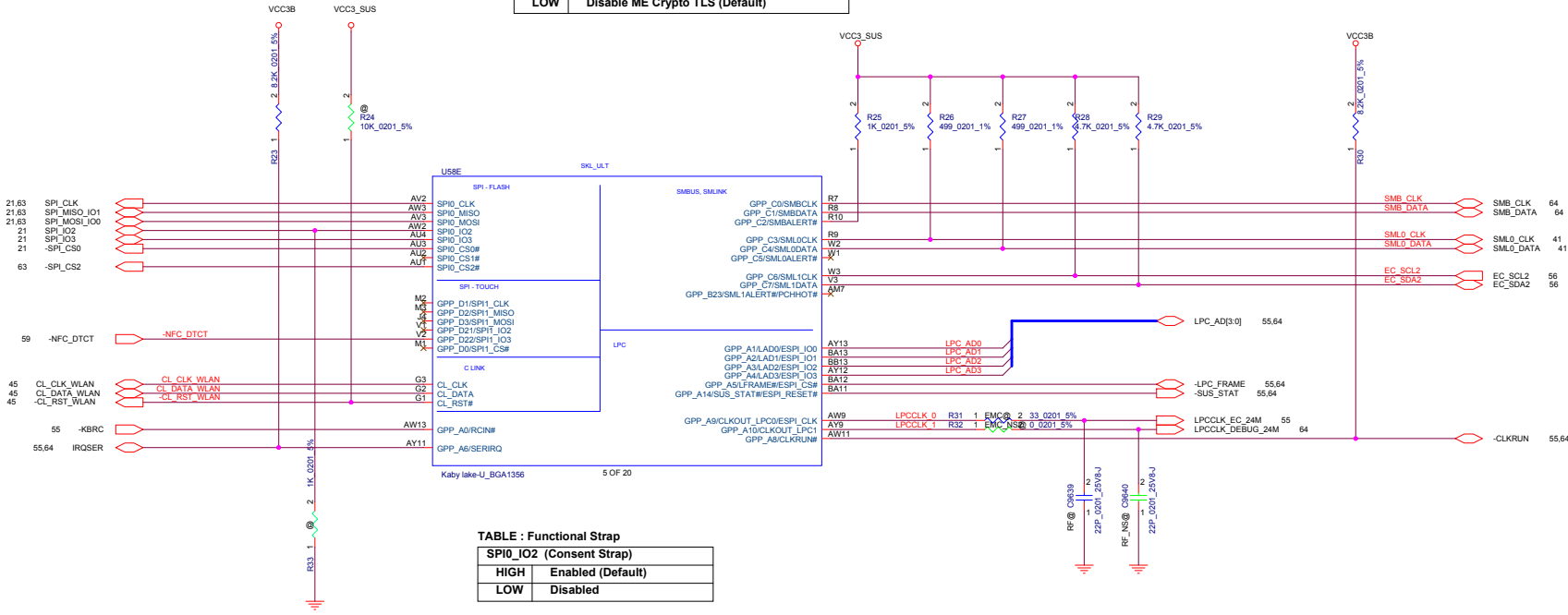
GPP_C5/SML0ALERT# (LPC or eSPI)		
HIGH	eSPI is selected	
LOW	LPC is selected (Default)	

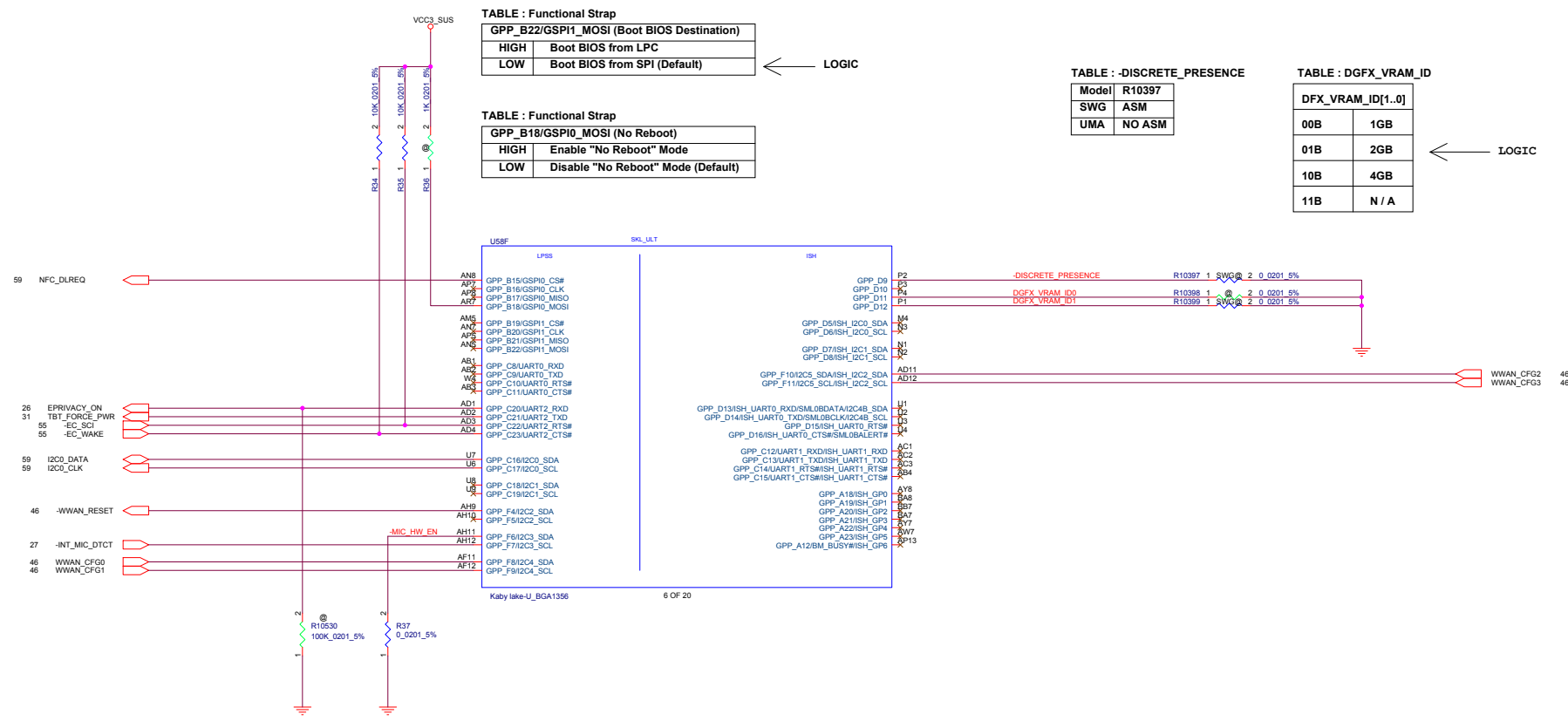
← LOGIC

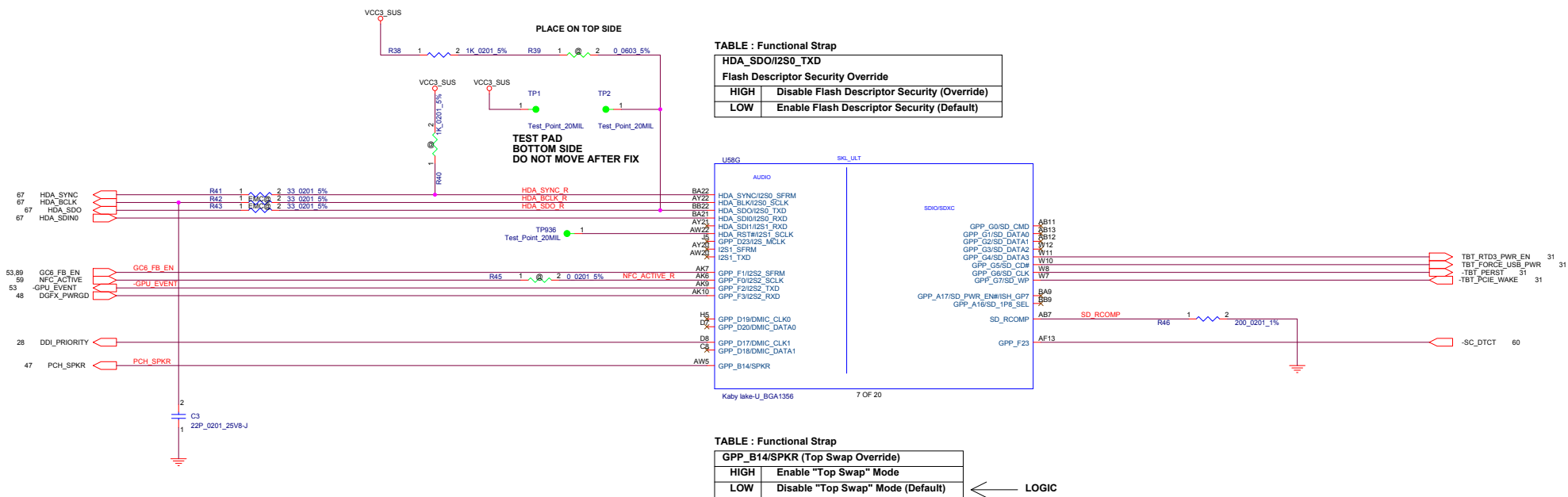
TABLE : Functional Strap

GPP_C2/SMBALERT# (TLS Confidentiality)		
HIGH	Enable ME Crypto TLS with Confidentiality	
LOW	Disable ME Crypto TLS (Default)	

← LOGIC



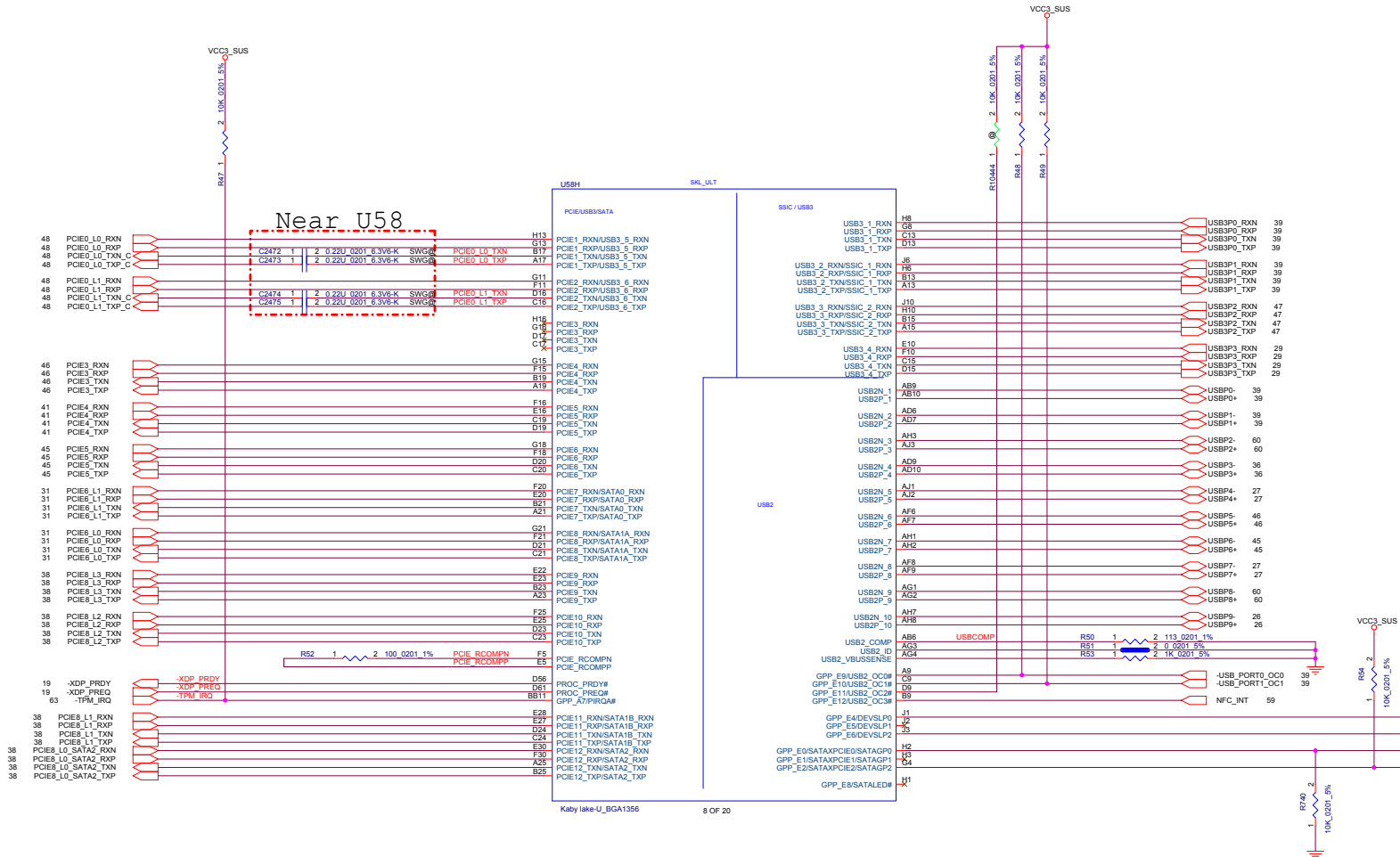




Flexible I/O Configuration			
I/O	High Speed Signals	Configuration	Net Name
Port 1	USB3 1	USB3 1	USB3P0
Port 2	USB3 2/SSIC	USB3 2	USB3P1
Port 3	USB3 3	USB3 3	USB3P2
Port 4	USB3 4	USB3 4	USB3P3
Port 5	USB3 5/PCIE 1	PCIE 1 (x2)	PCIE0_L0
Port 6	USB3 6/PCIE 2	PCIE 2 (x2)	PCIE0_L1
Port 7	PCIE 3 (GbE)	PCIE 3	NA
Port 8	PCIE 4 (GbE)	PCIE 4	PCIE3
Port 9	PCIE 5 (GbE)	PCIE 5 (GbE)	PCIE4
Port 10	PCIE 6	PCIE 6	PCIE5
Port 11	PCIE 7/SATA 0	PCIE 7 (x2)	PCIE6_L0
Port 12	PCIE 8/SATA 1A	PCIE 8 (x2)	PCIE6_L1
Port 13	PCIE 9 (GbE)	PCIE 9 (x4)	PCIE8_L3
Port 14	PCIE 10 (GbE)	PCIE 10 (x4)	PCIE8_L2
Port 15	PCIE 11/SATA 1B	PCIE 11 (x4)	PCIE8_L1
Port 16	PCIE 12/SATA 2	GPIO STRAP	PCIE8_L0_SATA2

PCIe Port Assignment	
0 (x2)	dGPU
2	NA
3	M.2 WWAN Slot
4	GbE PHY
5	M.2 WLAN Slot Port 0
6 (x2)	Thunderbolt
8 (x4)	PCIe SSD

SATA Port Assignment	
0	(PCIE 7)
1A	(PCIE 8)
1B	(PCIE 11)
2	SATA SSD

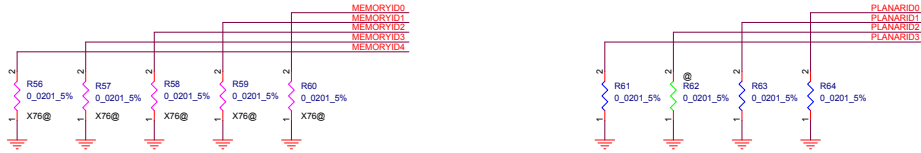


USB Port Assignment	
0	USB 3.0 System Port (AOU)
1	USB 3.0 System Port
2	Smart Card Reader
3	USB Type-C
4	IR Camera
5	M.2 WWAN Slot
6	M.2 WLAN Slot (Bluetooth)
7	RGB Camera
8	Fingerprint Reader
9	Touch Panel

USB 3.0 Port Assignment	
0	USB 3.0 System Port (AOU)
1	USB 3.0 System Port
2	Media Card Controller
3	USB Type-C
4	(PCIE 1)
5	(PCIE 2)

TABLE

MEMORYID[4..0]	U125, U126, U127, U128			
00000b	Micron	MT40A512M16HA-083E:A	8Gbit SDP	4GB (2133)
00001b	Micron	MT40A1G16HBA-083E:A	16Gbit DDP	8GB (2133)
00010b	Samsung	K4A8G165WB-BCPB	8Gbit SDP	4GB (2133)
00011b	SK Hynix	T.B.D.		
00100b	SK Hynix	T.B.D.		
01000b	Micron	MT40A512M16JY-083E:B	8Gbit SDP	4GB (2400)
01001b	Micron	MT40A1G16WBU-083E:B	16Gbit DDP	8GB (2400)
01010b	Samsung	K4A8G165WC-BCRC	8Gbit SDP	4GB (2400)
01011b	Samsung	K4AAG165WB-MCRC	16Gbit DDP	8GB (2400)
01100b	SK Hynix	H5AN8G6NAFR-UHC	8Gbit SDP	4GB (2400)
01101b	SK Hynix	H5ANAG6NAMR-UHC	16Gbit DDP	8GB (2400)
01110b	Micron	MT40A512M16LY-075:E	8Gbit SDP	4GB (2400)
11111b	NO_ASM		No Soldered Memory	

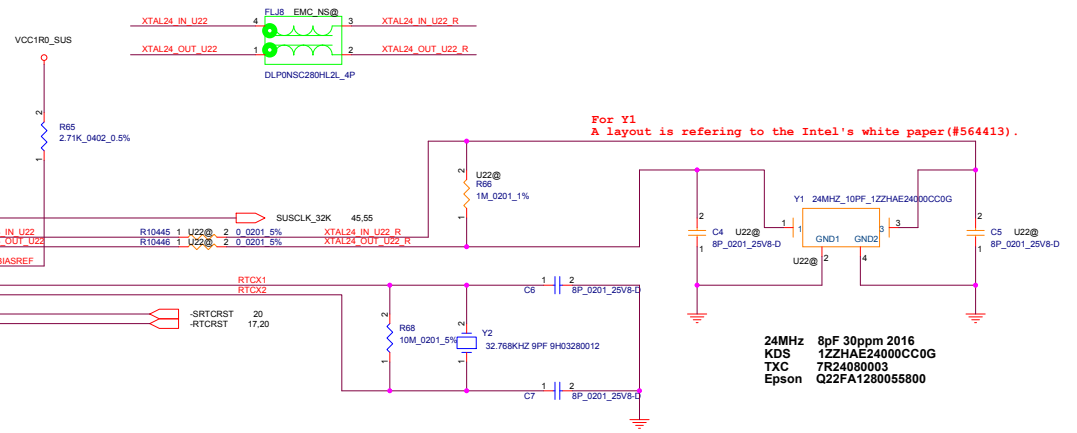
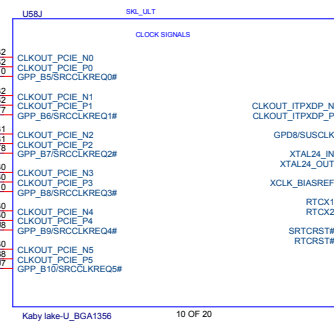
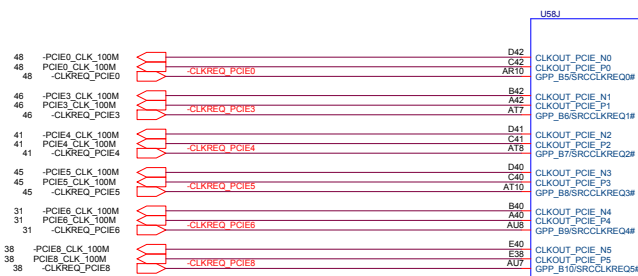
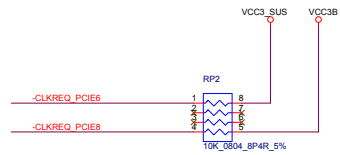
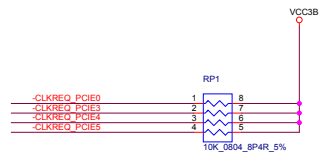


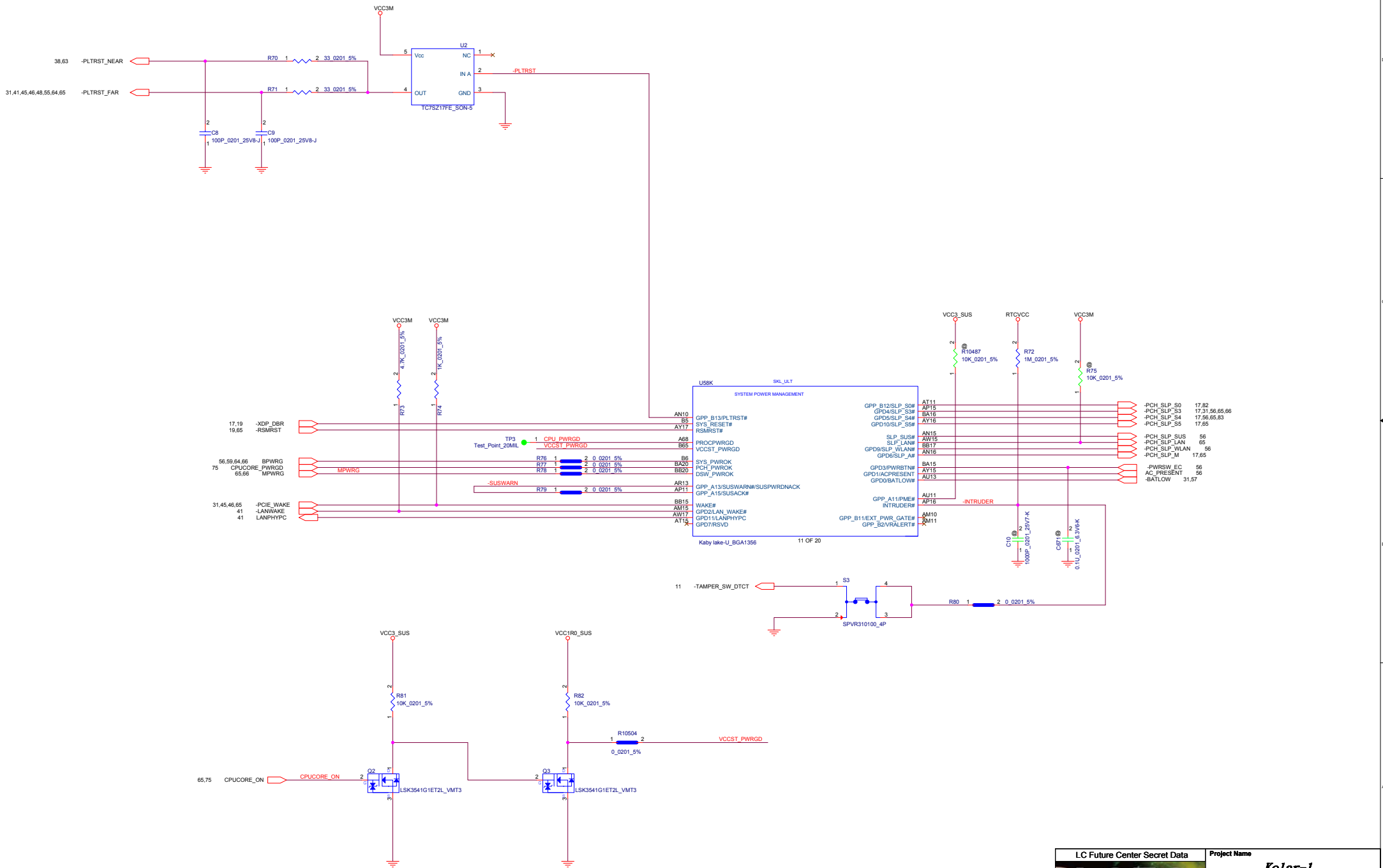
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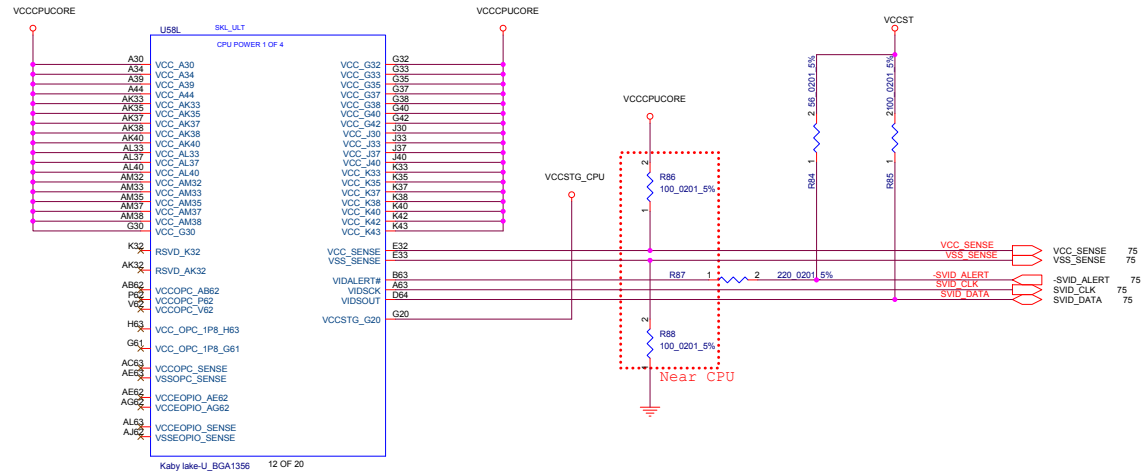
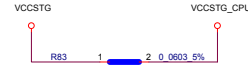
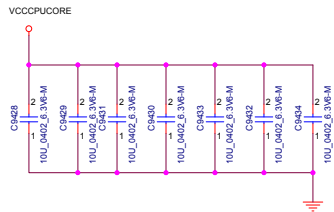
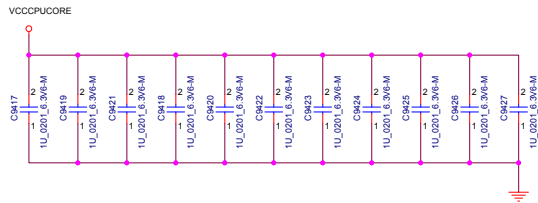
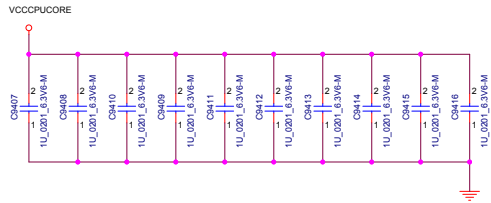
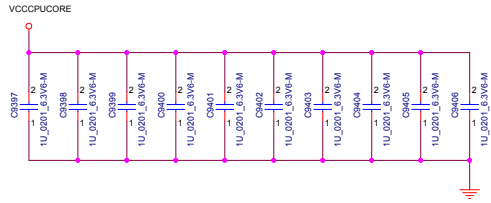
LEVEL	PLANAR ID			
	3	2	1	0
1	NA	NA	NA	NA
0	ASM	ASM	ASM	ASM

TABLE

LEVEL	PLANARID[3..0]
EVT	0000B
FVT	0001B
SIT	0010B
SIT-R	0011B
SVT	0100B







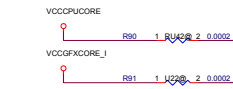
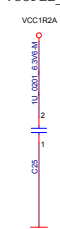
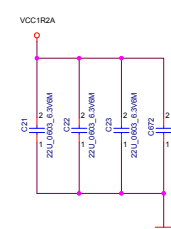
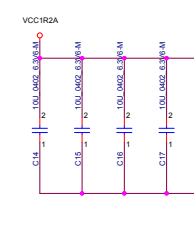
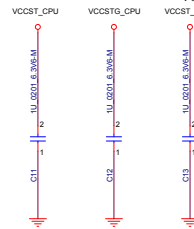
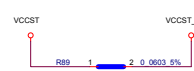
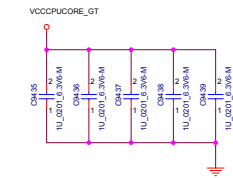
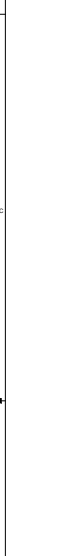
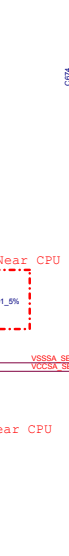
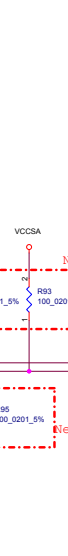
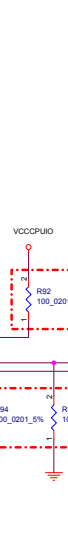
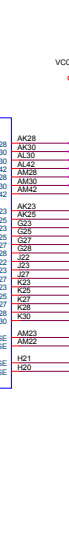
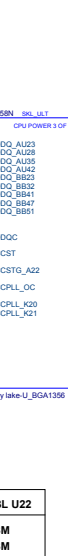
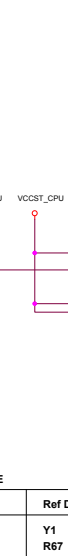
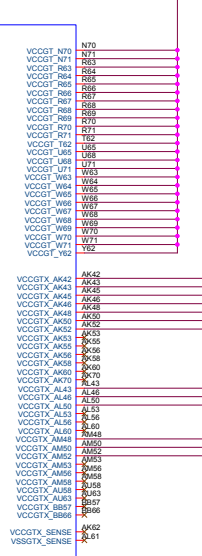
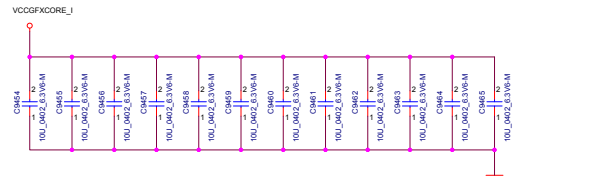
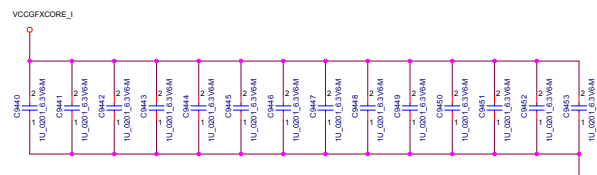
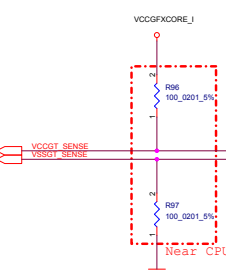
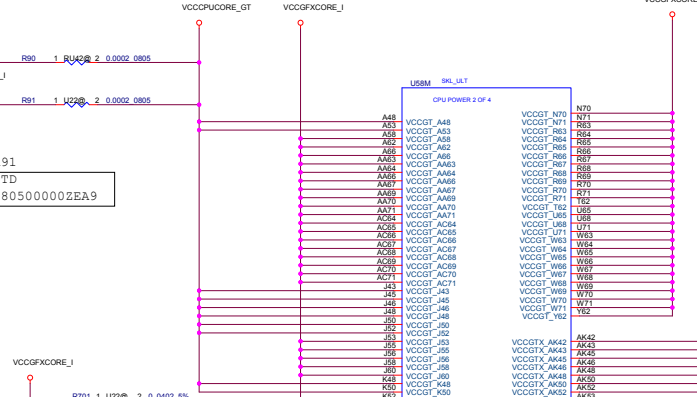
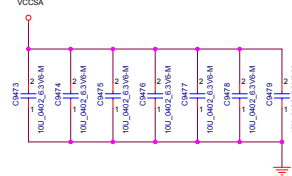
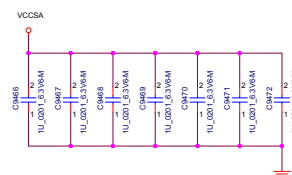


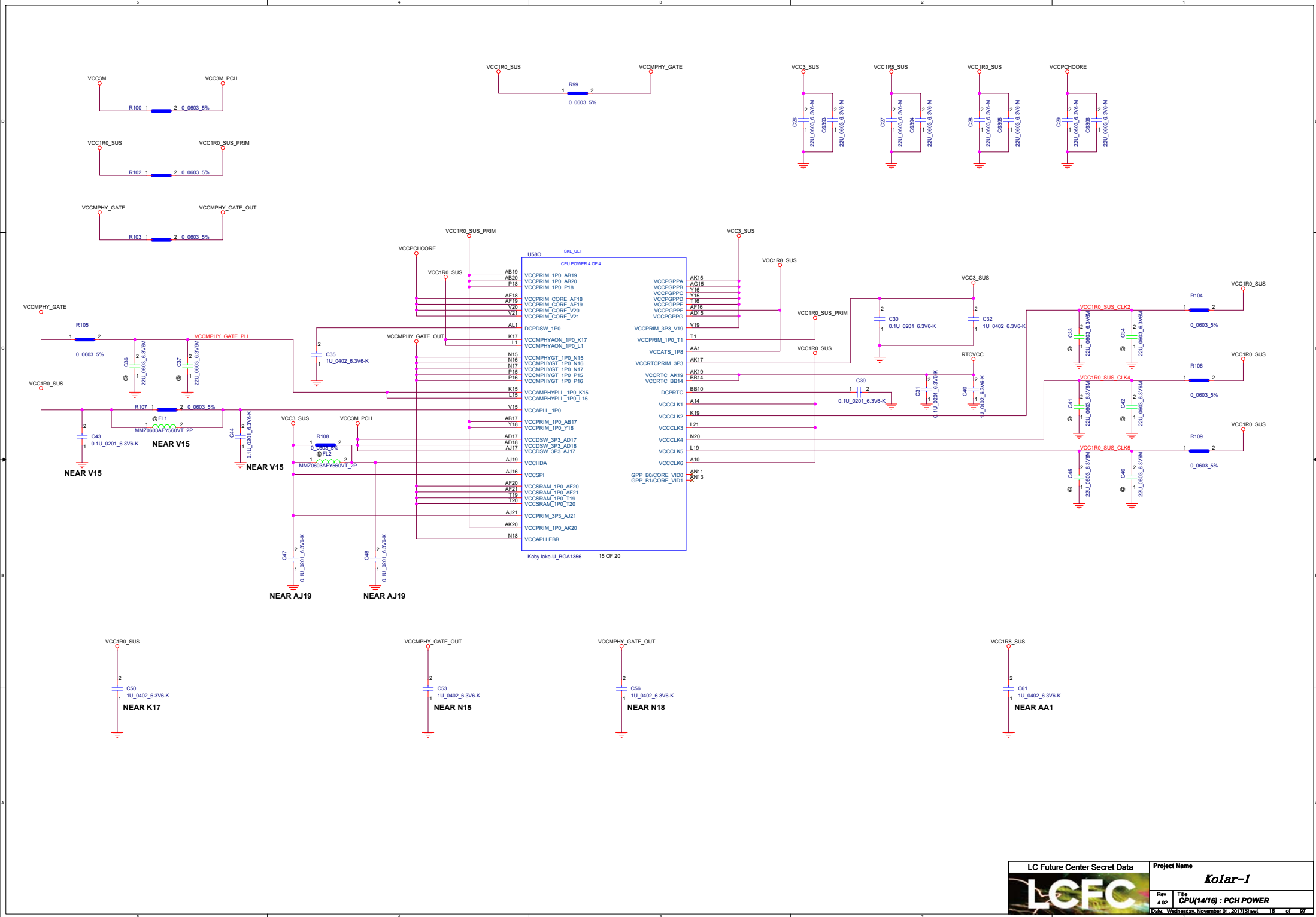
TABLE R90,R91
KOA:TLRZZATTD
VISHAY:VSL0805000002EA9



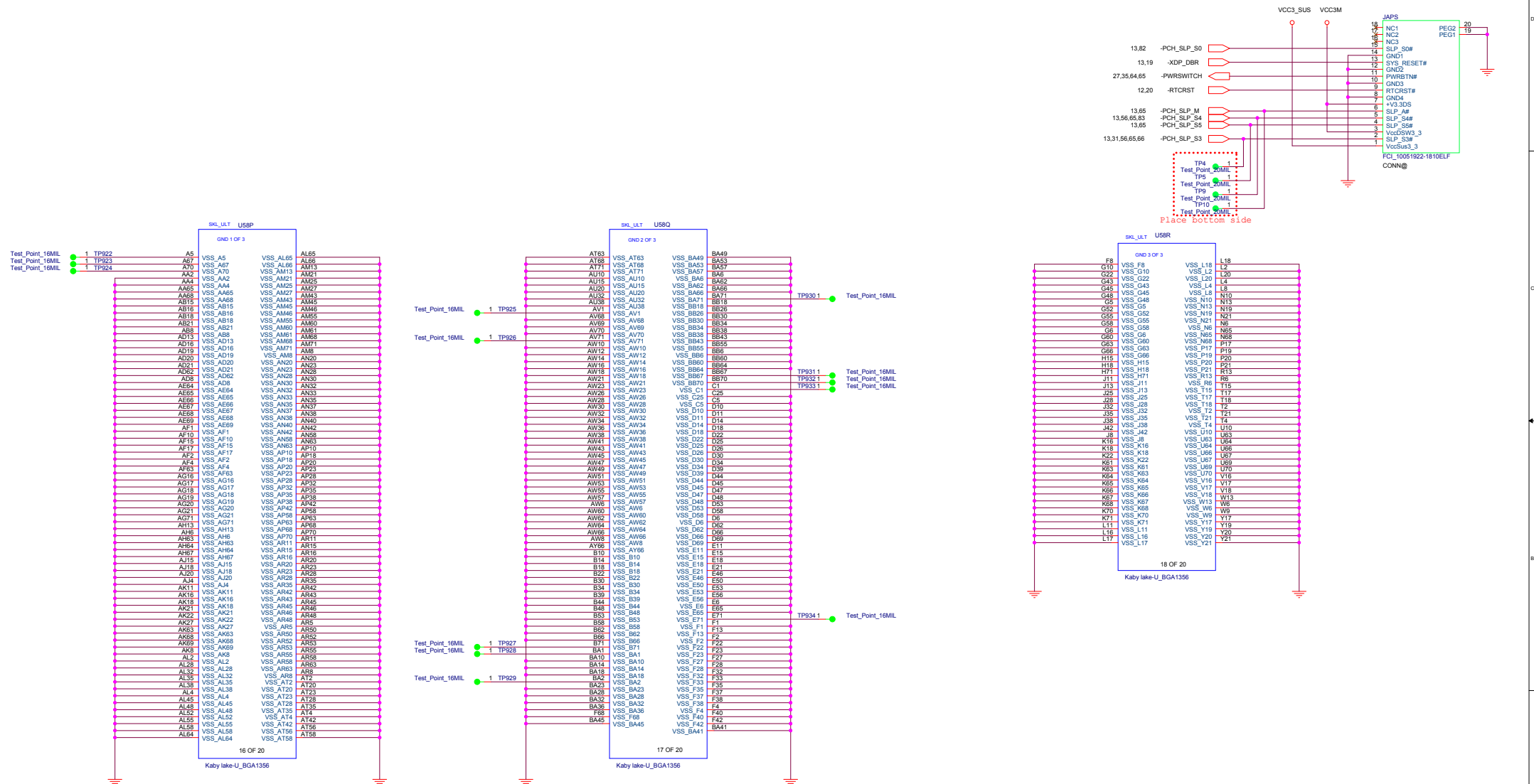
Logic	Ref Des	KBL-R U42	KBL U22
Page 12	Y1	NO_ASM	ASM
	R67	NO_ASM	ASM
	R66	NO_ASM	ASM
	C4	NO_ASM	ASM
	C5	NO_ASM	ASM
	R10445	NO_ASM	ASM
Page 18	Y3	ASM	NO_ASM
	R114	ASM	NO_ASM
	R110	ASM	NO_ASM
	C63	ASM	NO_ASM
	C64	ASM	NO_ASM
	R10466	ASM	NO_ASM
Page 15	R90	ASM	NO_ASM
	R91	NO_ASM	ASM
	R701	NO_ASM	ASM

LOGIC

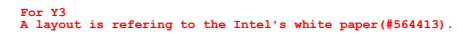


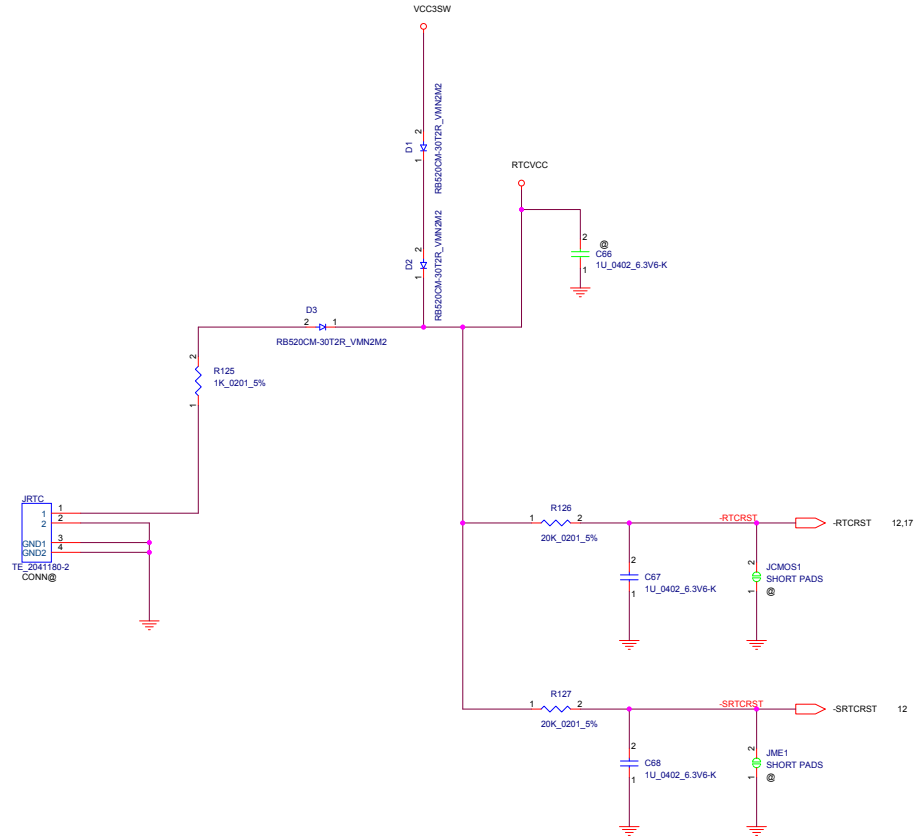


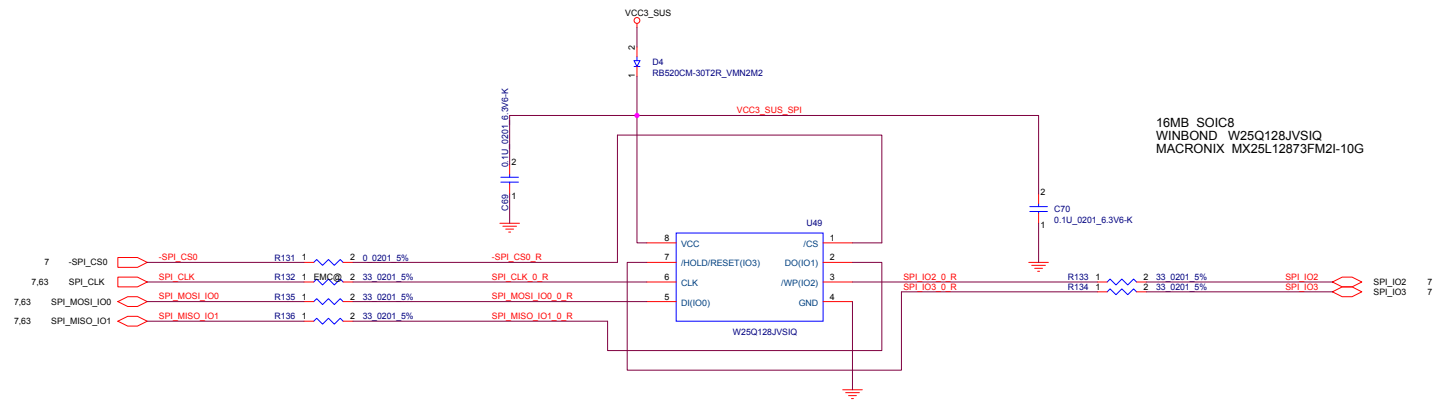
APS/PETS Interface



CFG0 : Stall Reset Sequence after PCU PLL Lock until de-asserted 1 : No Stall 0 : Stall
CFG3 : MSR Privacy Bit Feature 1 : MSR (C80h) bit[0] setting 0 : MSR (C80h) bit[0] overridden
CFG4 : eDP Enable 1 : Disabled 0 : Enabled
CFG9 : SVID Bus Communication 1 : Enabled 0 : Disabled

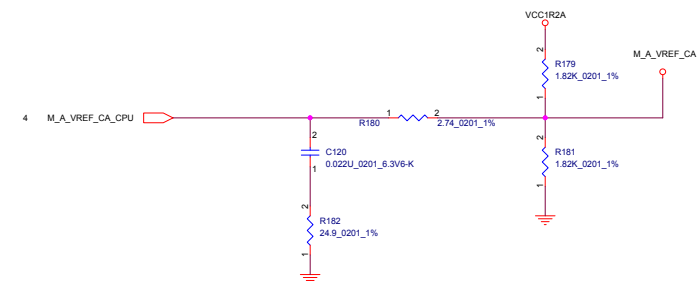
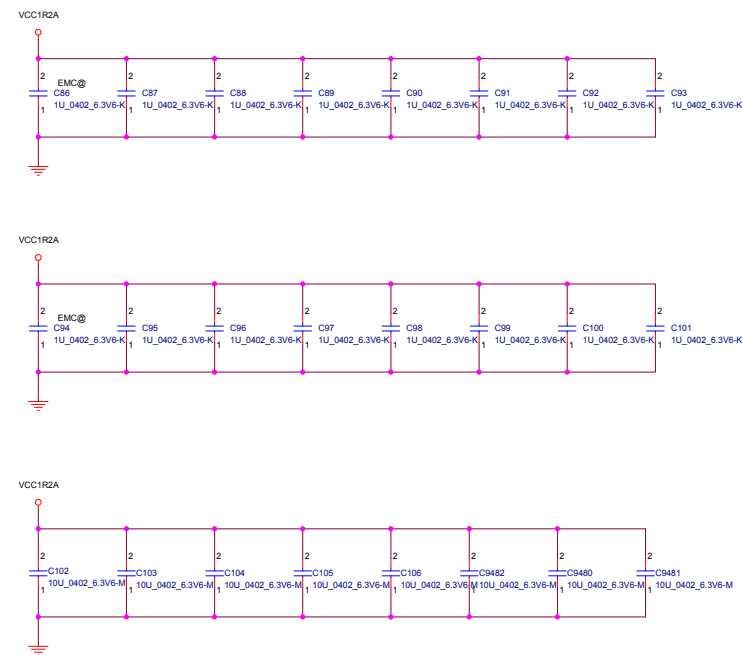




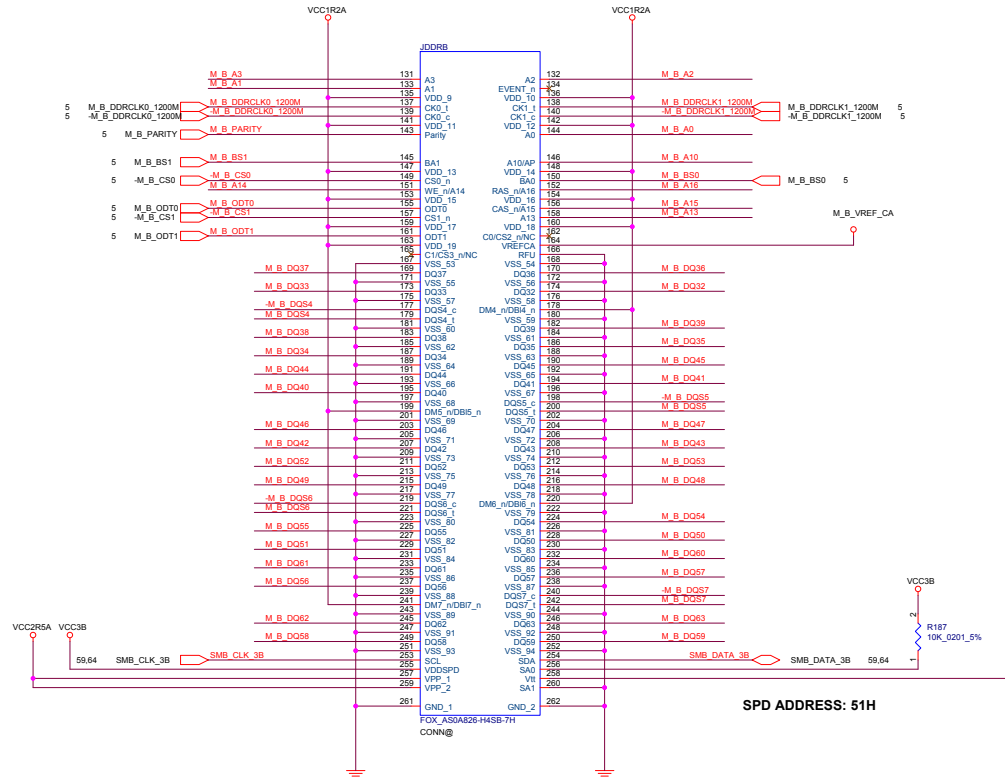
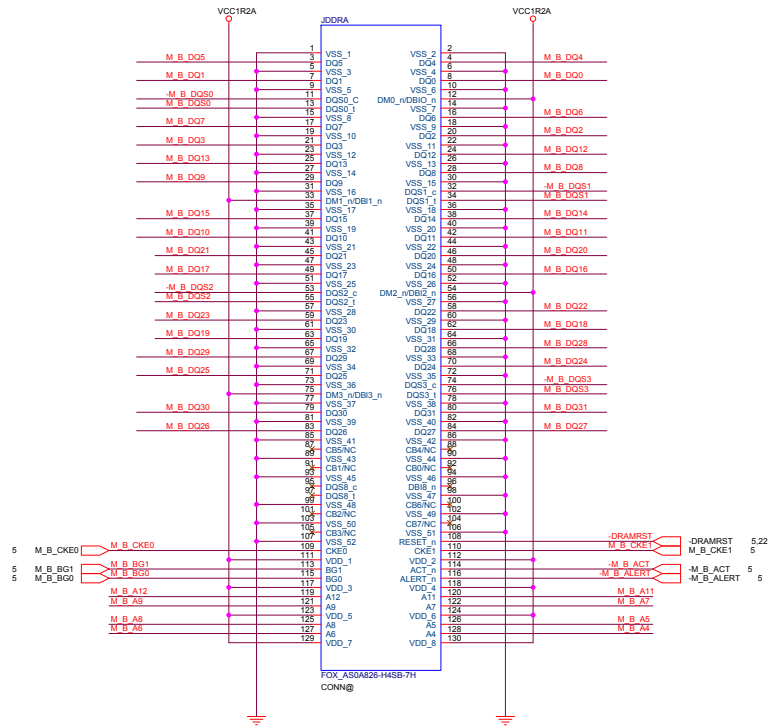


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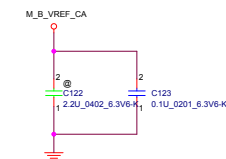
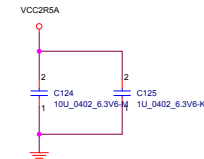
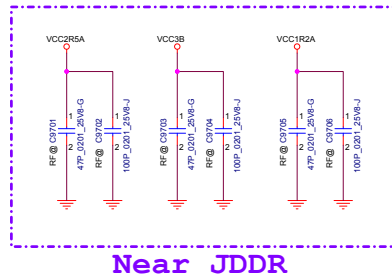
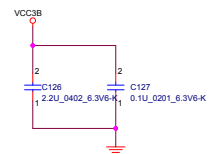
SF100 PIN HEADER INTERFACE (TOP VIEW)							
1	VCC	D4.1	GND	GND	2		
3	CS#	R131.2	R132.2	CLK	4		
5	MISO	R136.2	R135.2	MOSI	6		
7	(KEY)	N/A	N/A	(RESET)	8		

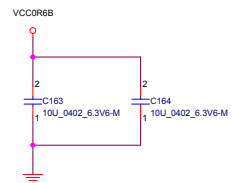
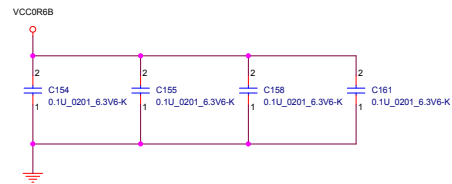
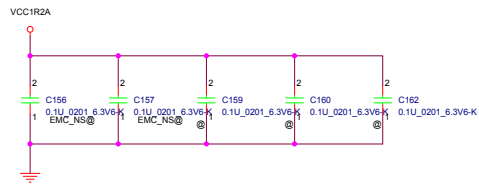
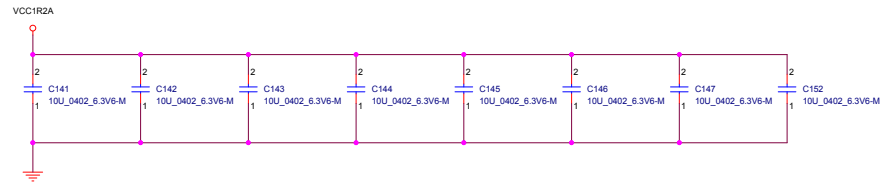
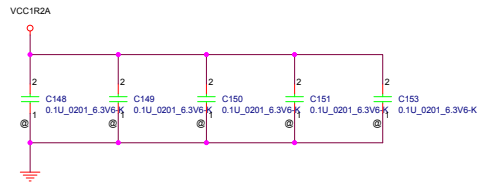
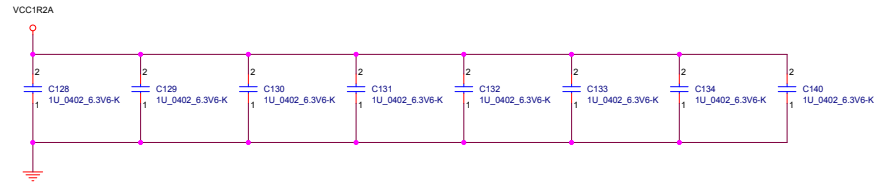
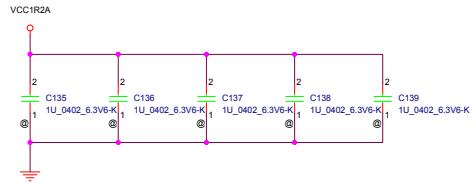


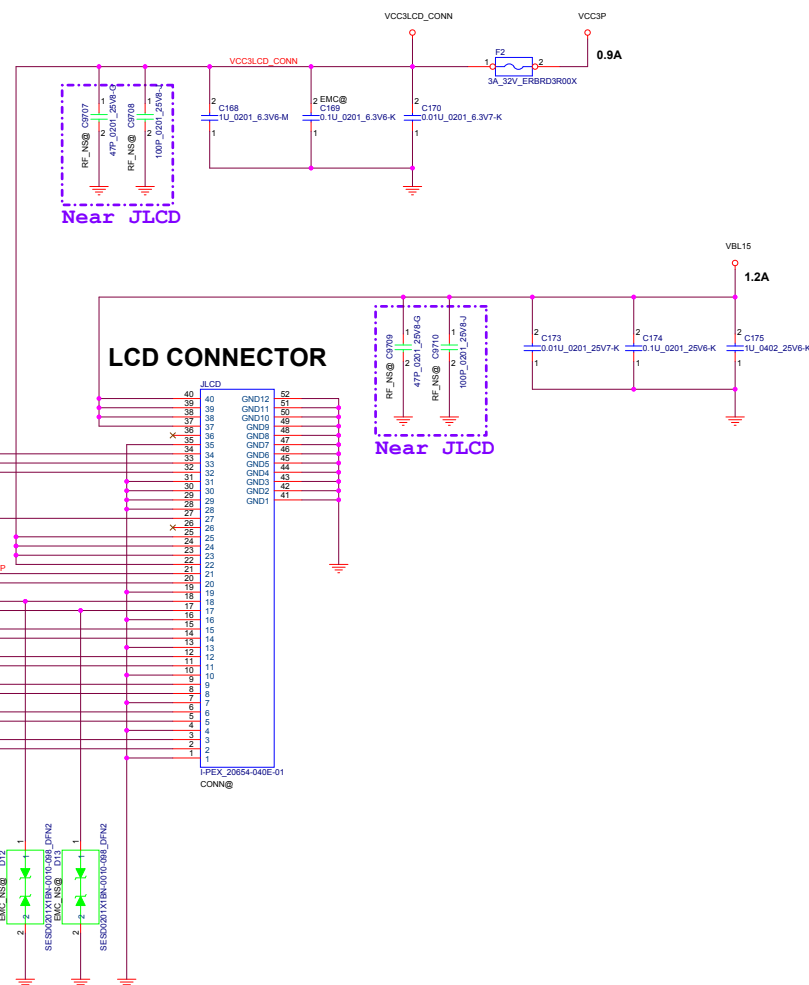
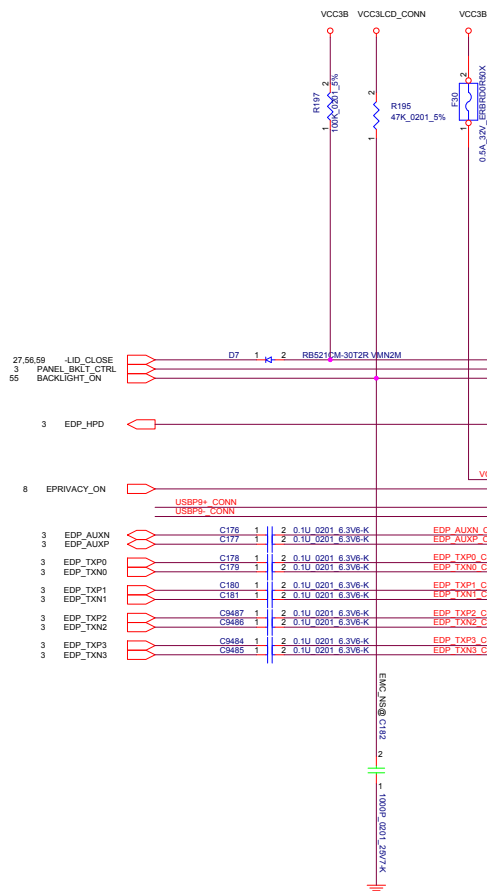
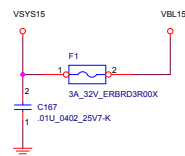
5 M_B_DQ[8:0]
5 -M_B_DQS[7:0]
5 M_B_DQS[7:0]
5 M_B_A[16:0]

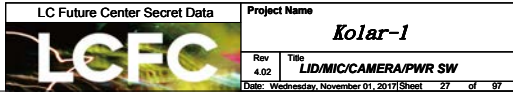


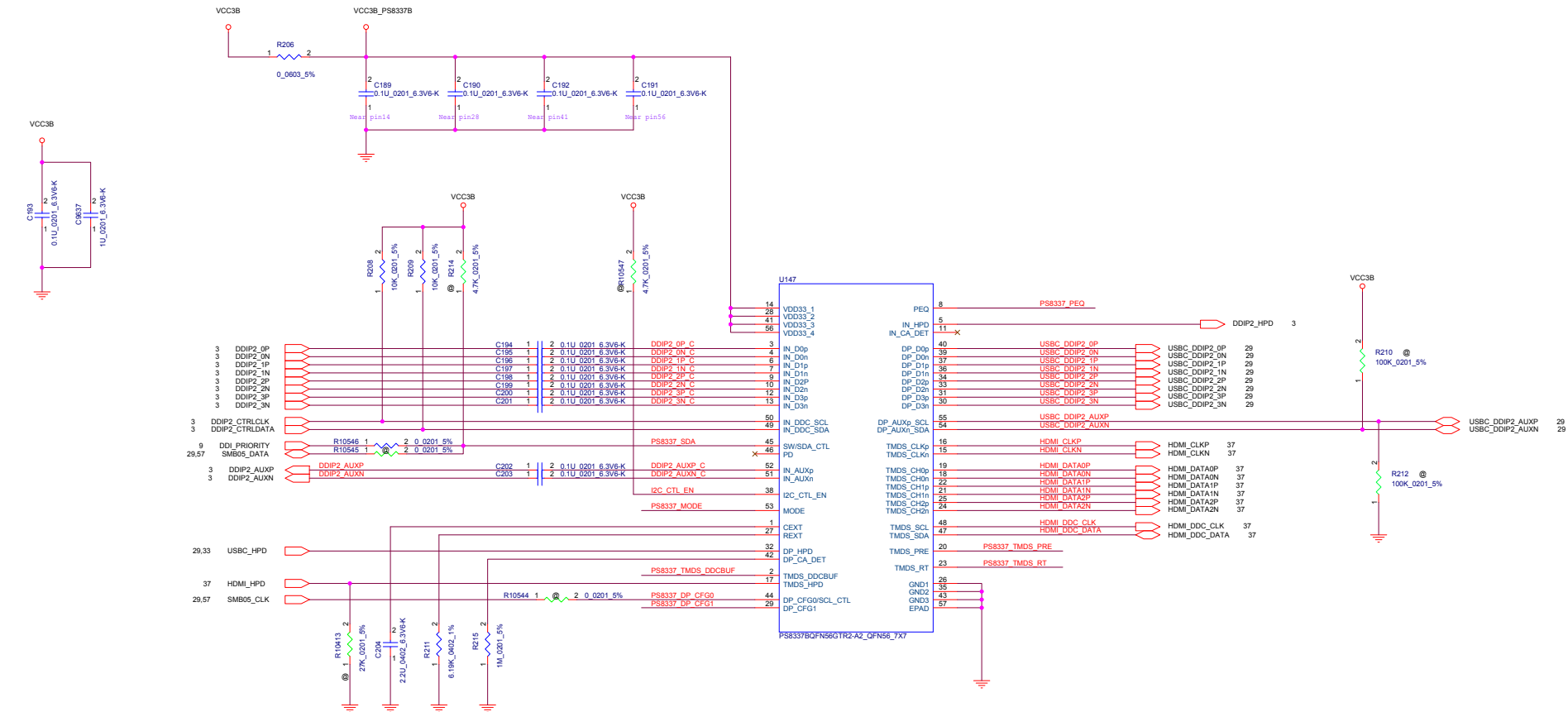
SPD ADDRESS: 51H

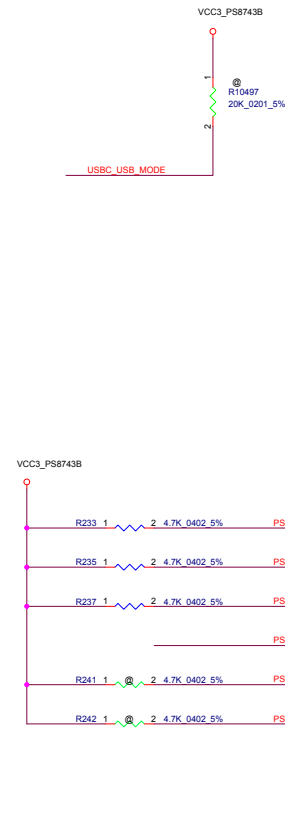
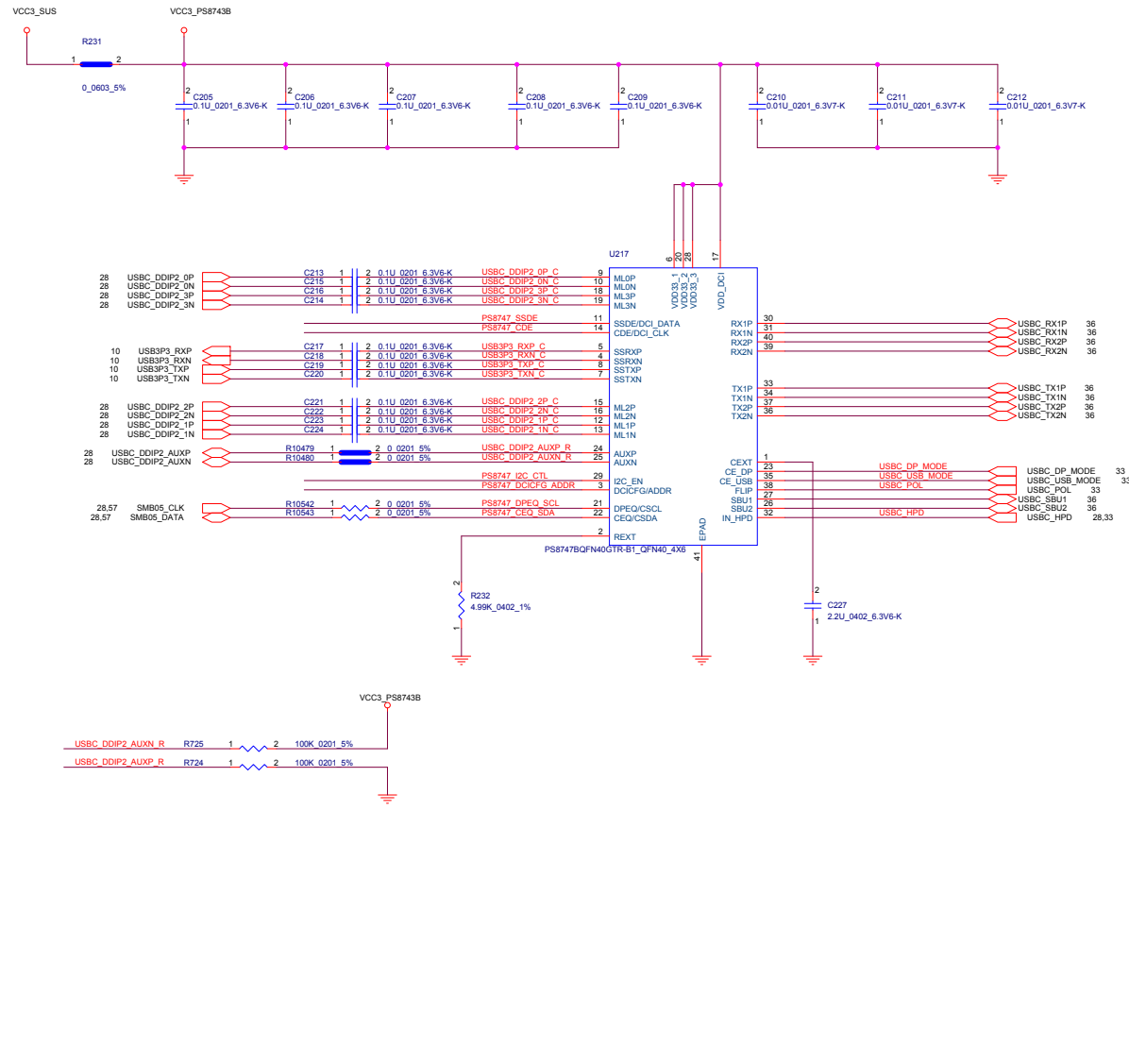






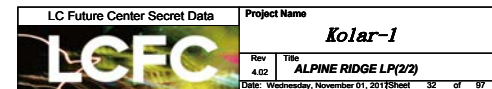






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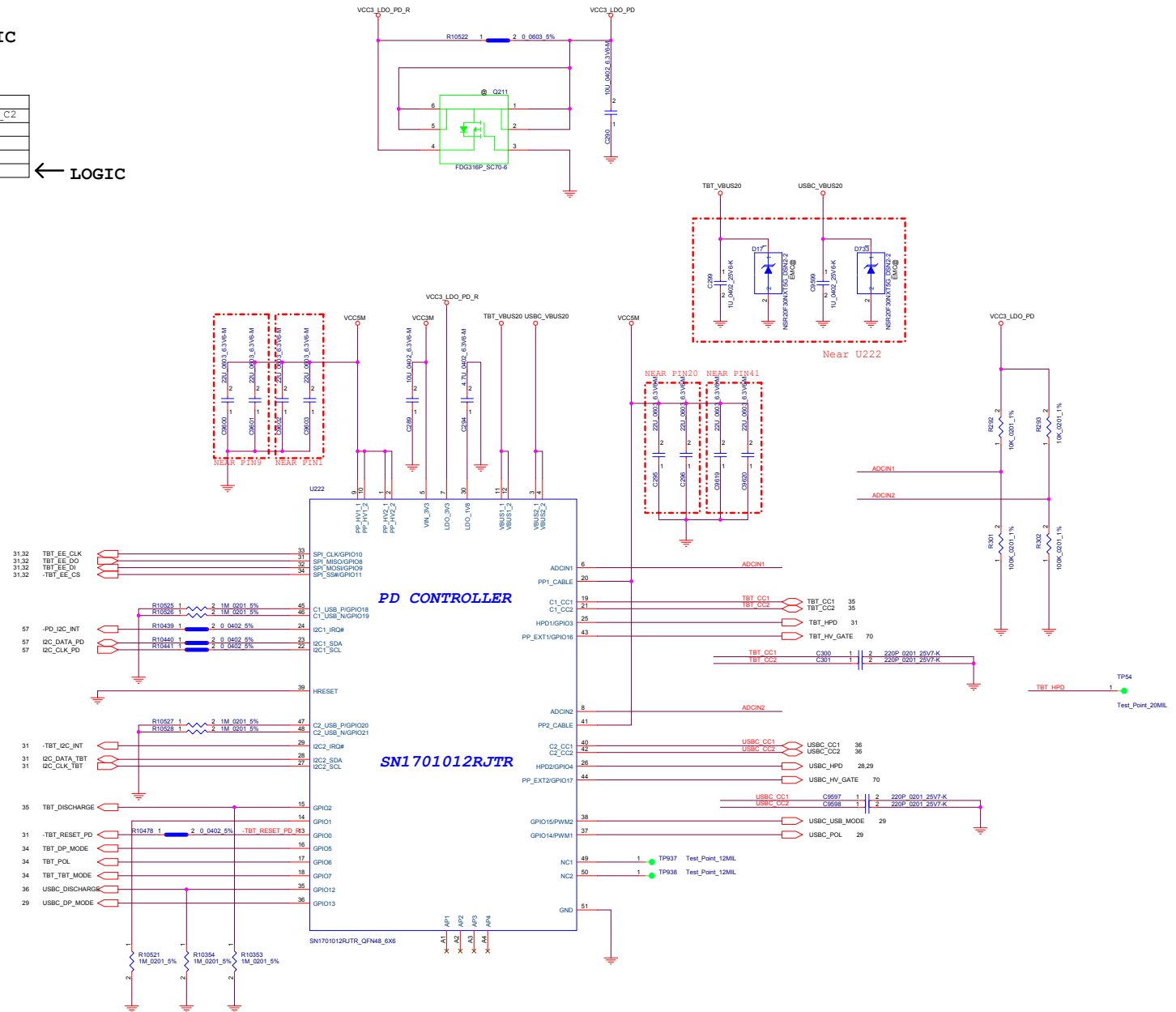


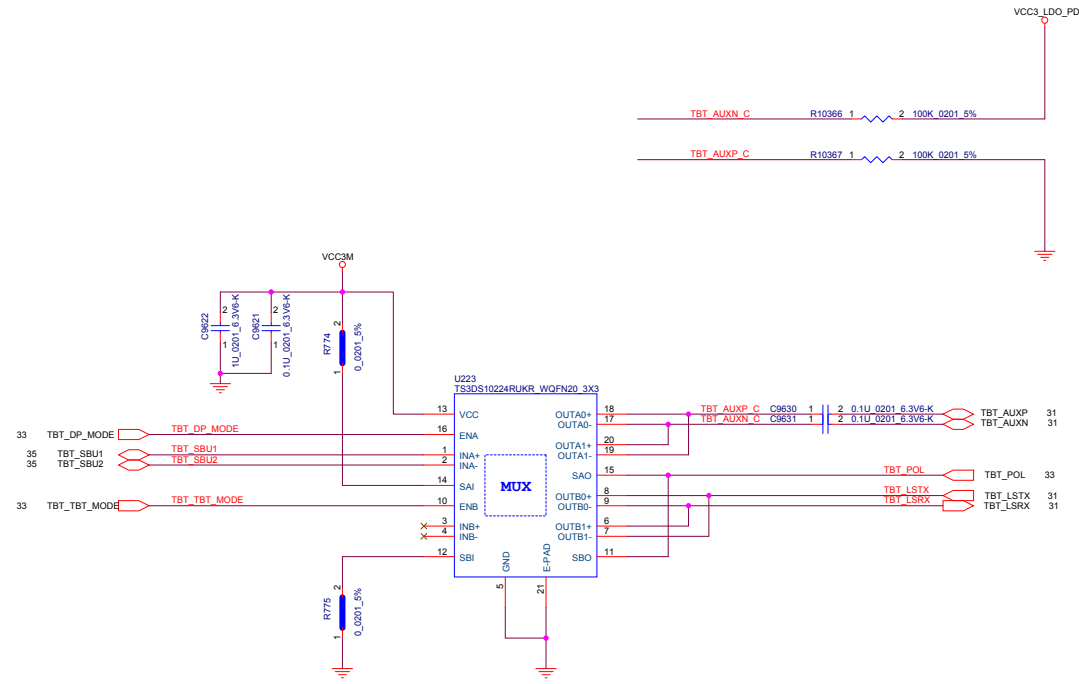


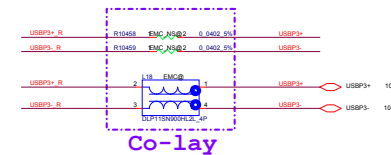
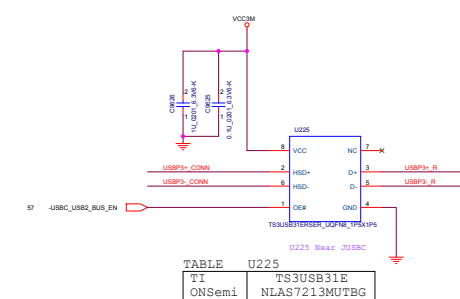
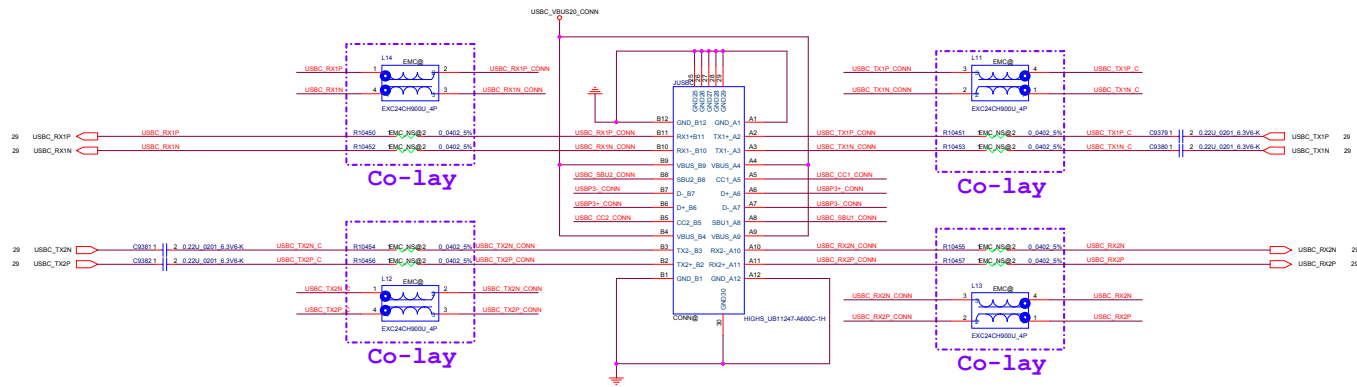
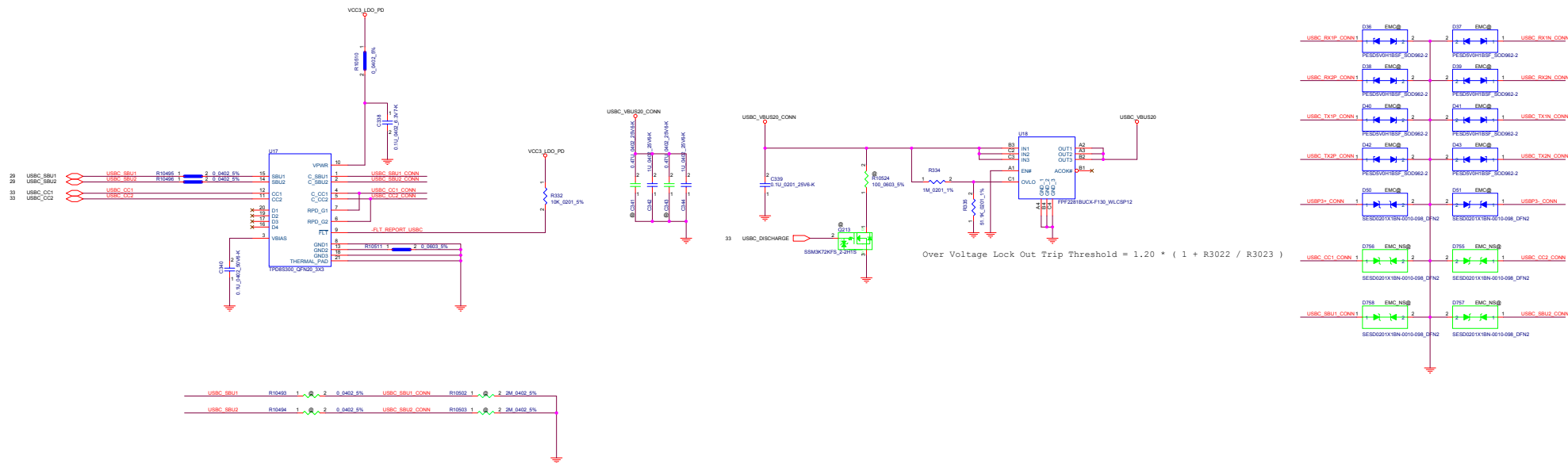
DIV = R301 / (R292 + R301)		CONFIGURATION	
DIV MIN	DIV MAX		
0.00	0.18		BP_NoResponse
0.20	0.38		BP_WaitFor3V3_Internal
0.40	0.58		BP_WaitFor3V3_External
0.60	1.00		BP_NoWait

DIV = R302 / (R293 + R302)		I2C Unique Address [3:1]	
DIV MIN	DIV MAX	ADC_ADDR_DECODE_C1	ADC_ADDR_DECODE_C2
0.00	0.18	000b	100b
0.20	0.38	001b	101b
0.40	0.58	010b	110b
0.60	1.00	011b	111b

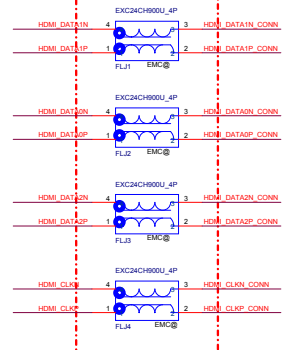
I2C1 (to EC)	TBT PORT	0X23
	USBC PORT	0X27
I2C2 (to AR)	TBT PORT	0X38
	USBC PORT	0X3F



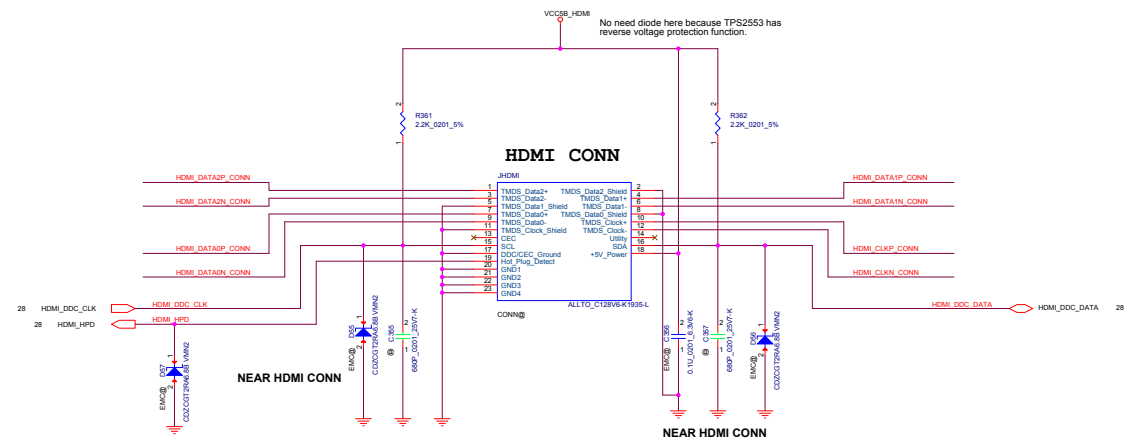
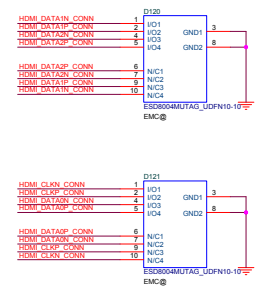
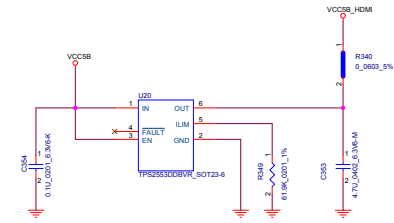




28	HDMI_DATA0P	HDMI_DATA0P	R301	1	EMC	RES	0.0402	5%	HDMI_DATA0P_CONN
28	HDMI_DATA0N	HDMI_DATA0N	R302	1	EMC	RES	0.0402	5%	HDMI_DATA0N_CONN
28	HDMI_DATA1P	HDMI_DATA1P	R303	1	EMC	RES	0.0402	5%	HDMI_DATA1P_CONN
28	HDMI_DATA1N	HDMI_DATA1N	R304	1	EMC	RES	0.0402	5%	HDMI_DATA1N_CONN
28	HDMI_DATA2P	HDMI_DATA2P	R305	1	EMC	RES	0.0402	5%	HDMI_DATA2P_CONN
28	HDMI_DATA2N	HDMI_DATA2N	R306	1	EMC	RES	0.0402	5%	HDMI_DATA2N_CONN
28	HDMI_DATA3P	HDMI_DATA3P	R307	1	EMC	RES	0.0402	5%	HDMI_DATA3P_CONN
28	HDMI_DATA3N	HDMI_DATA3N	R308	1	EMC	RES	0.0402	5%	HDMI_DATA3N_CONN
28	HDMI_CLKP	HDMI_CLKP	R309	1	EMC	RES	27.0402	5%	HDMI_CLKP_CONN
28	HDMI_CLKN	HDMI_CLKN	R310	1	EMC	RES	27.0402	5%	HDMI_CLKN_CONN

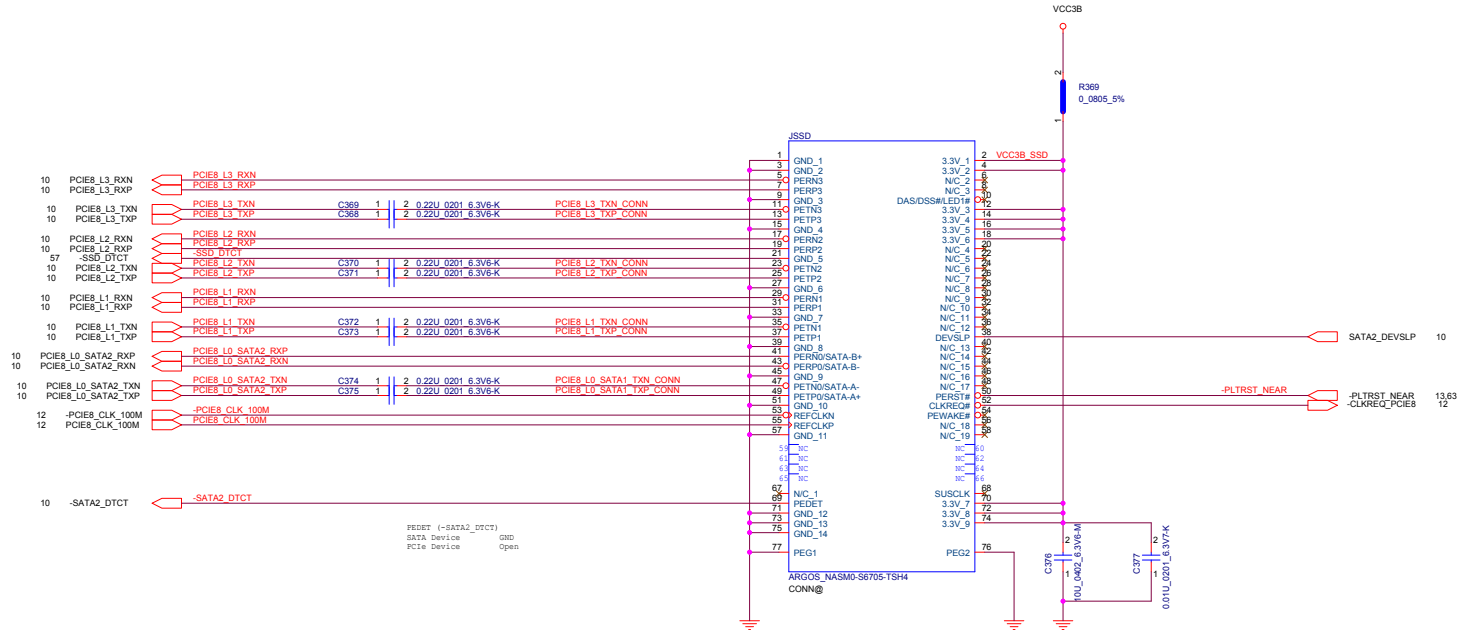


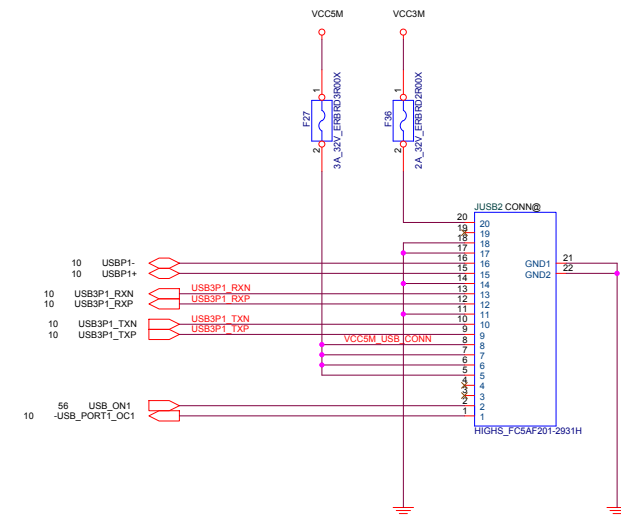
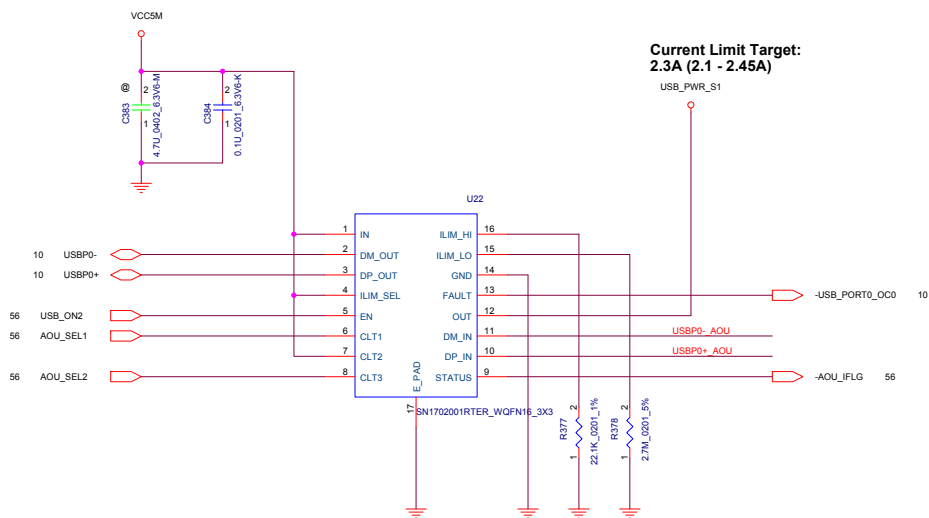
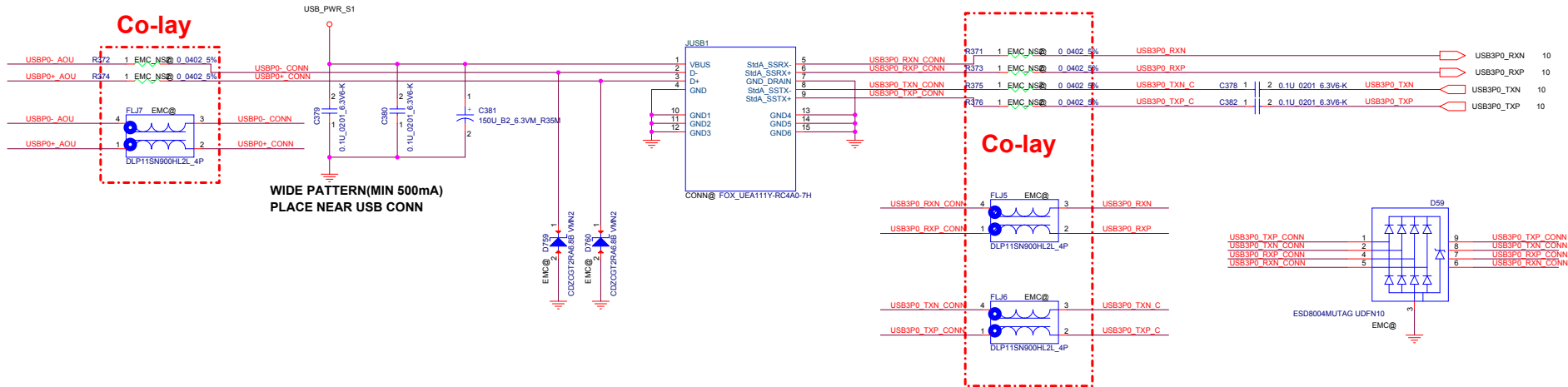
Co-layout




M.2 Socket 3 (Key-M) for 2280 S3 SSD

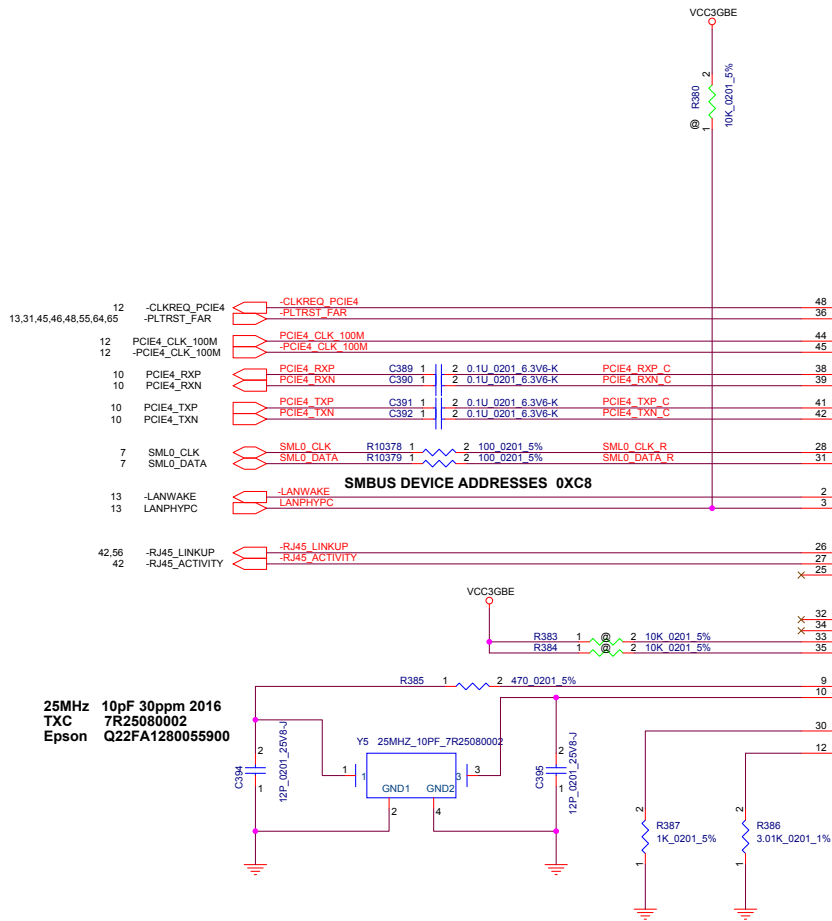
H=2.00mm Connector





BLANK

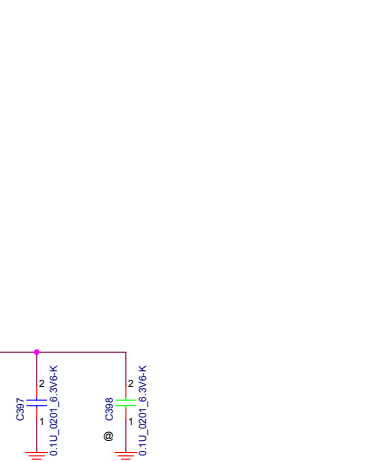
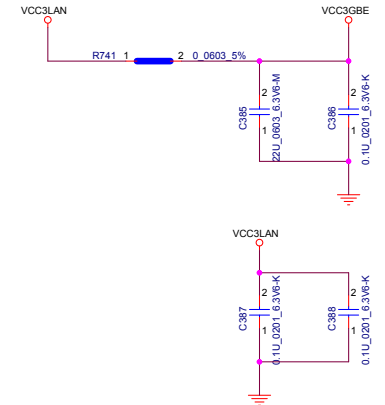
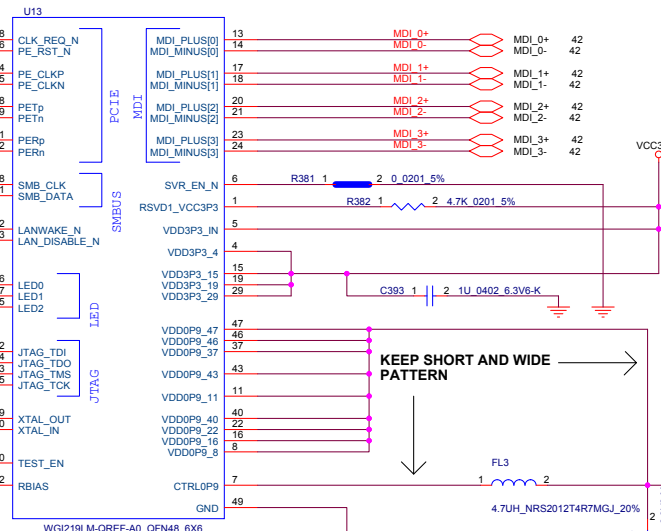
LC Future Center Secret Data		Project Name	
		<i>Kolar-1</i>	
		Rev	Title
		4.02	BLANK
Date: Wednesday, November 01, 2017 Sheet 40 of 97			

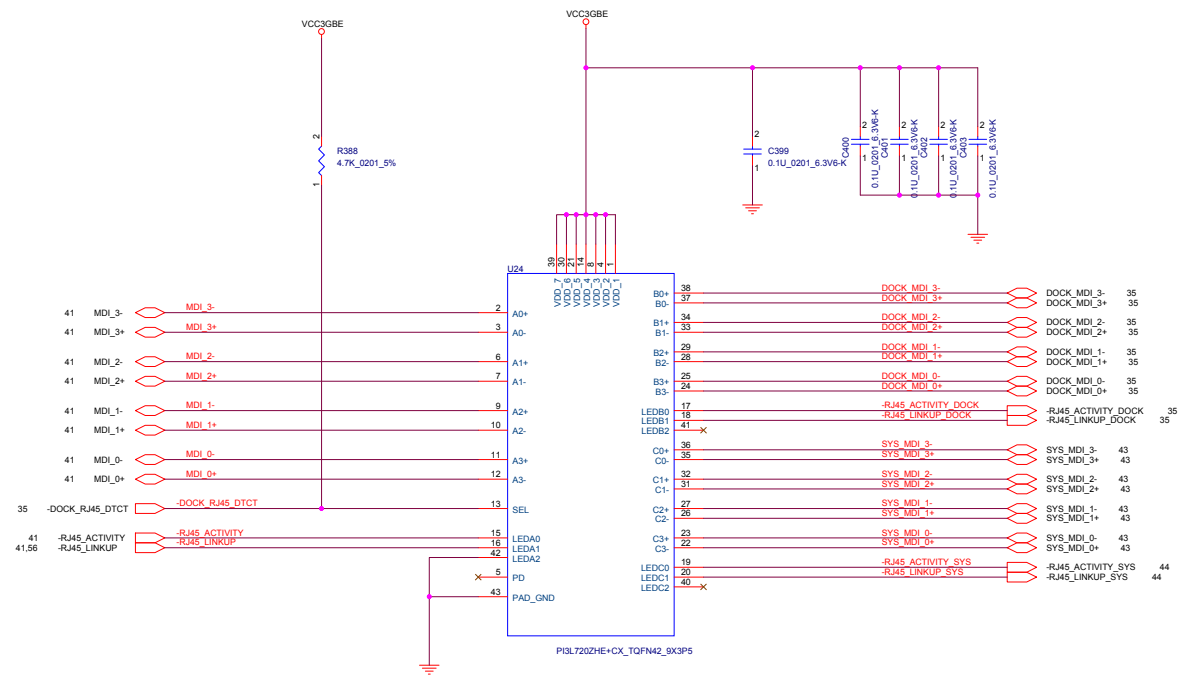


TABLE

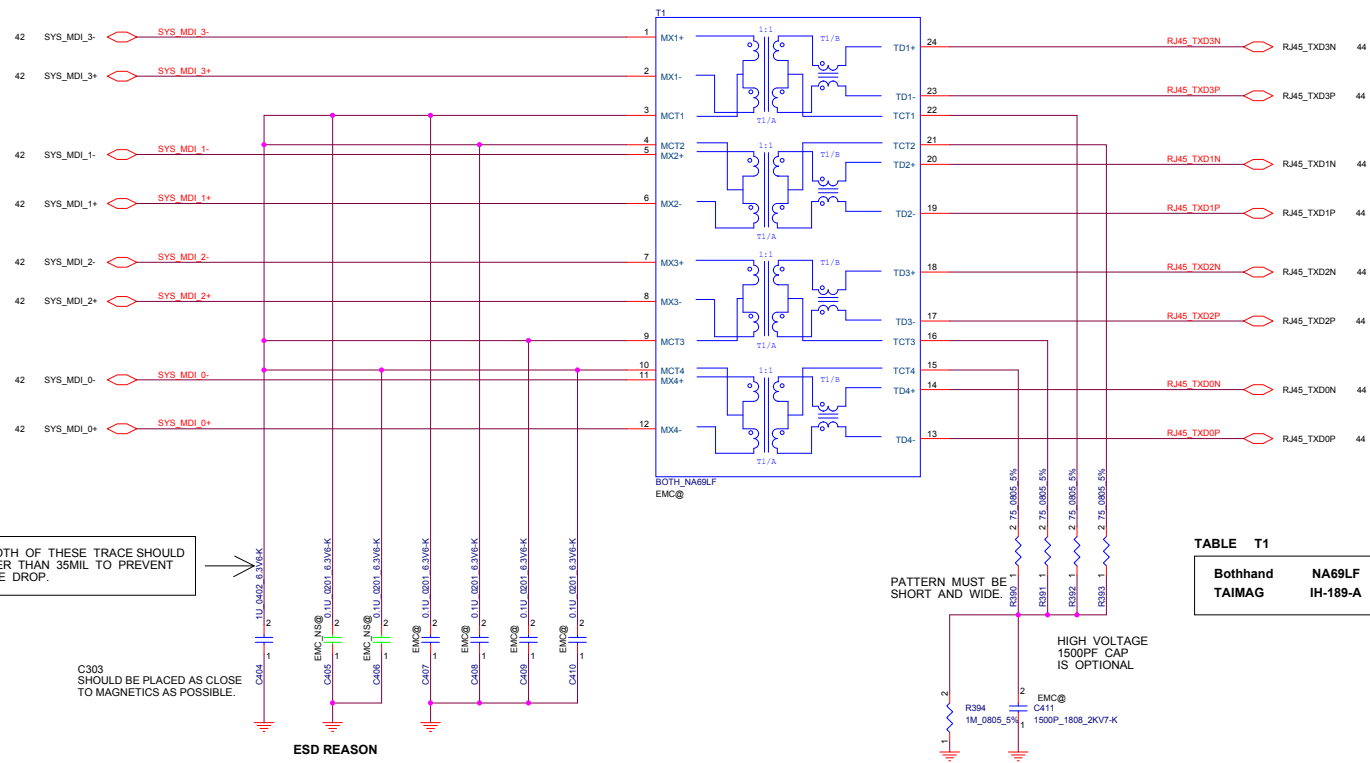
vPro Capability		
GbE PHY	Yes	No
U13	Jacksonville-LM	Jacksonville-V

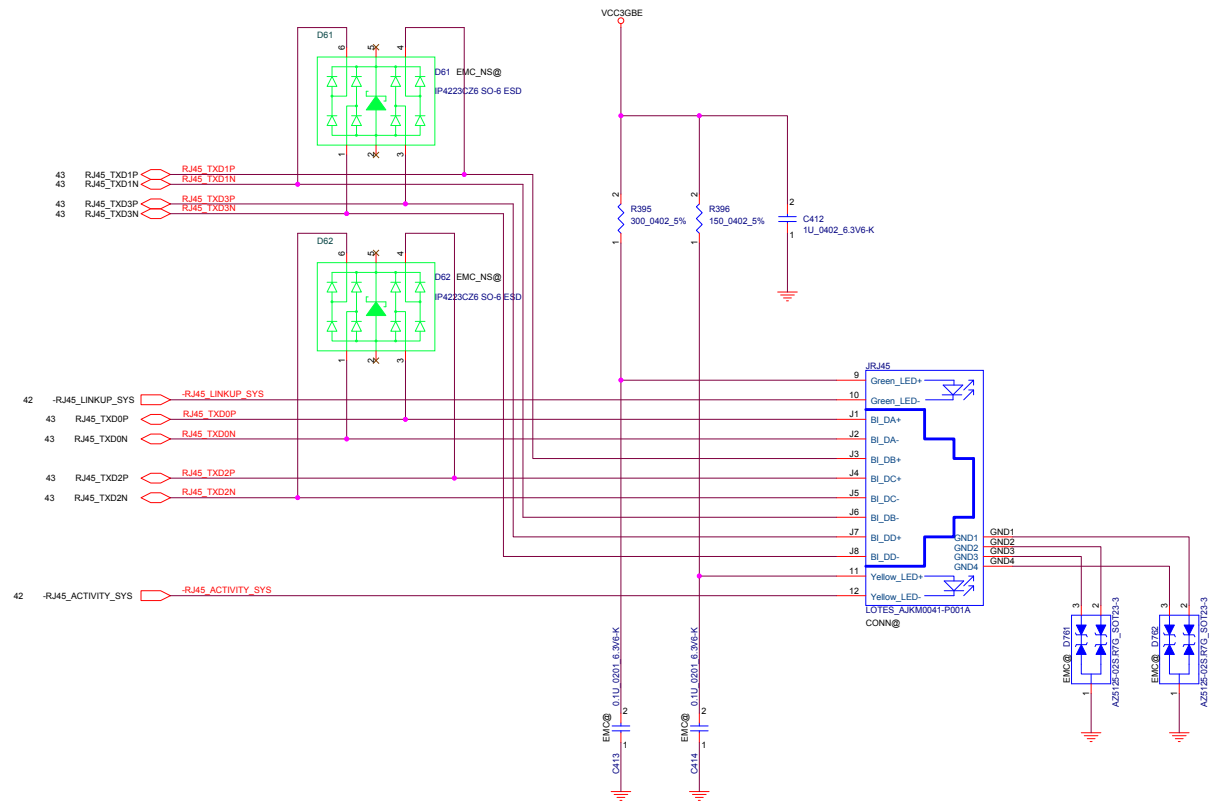
LOGIC



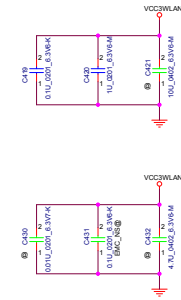


Manufacturer P/N	LCFC P/N
PI3L720ZHE+CX	SA00007E900
TS3L501ERUAR	SA000072400

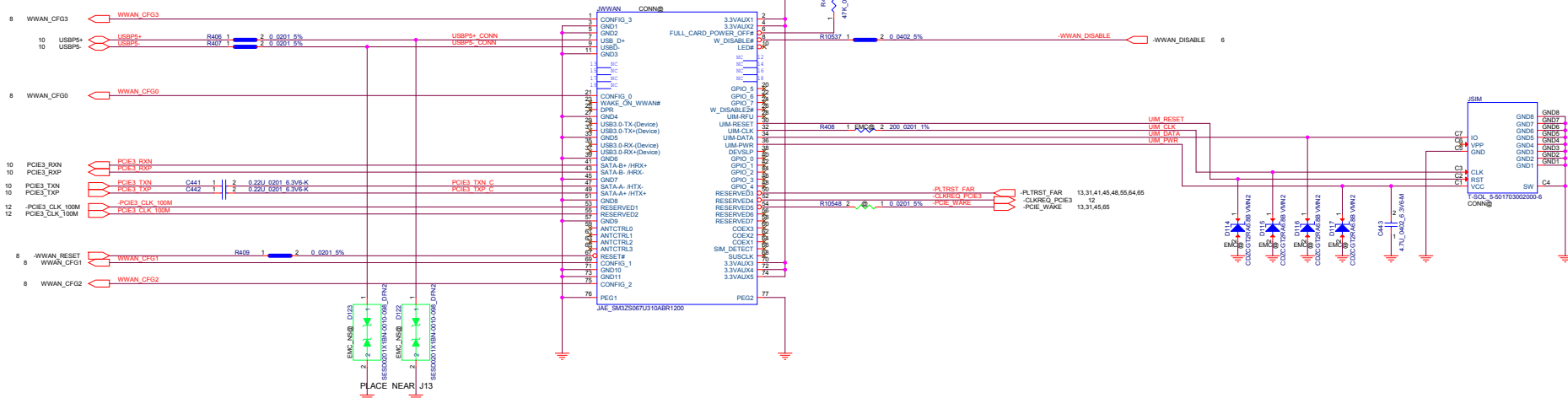





H=2.00mm Connector



The diagram shows a network of capacitors (C433, C434, C435, C436, C437, C438) and a resistor (R403) connected to the VCC3B and VCC3B_WAN pins. The network is labeled 'Near JWWAN'.



	CONFIG 0	CONFIG 3	CONFIG 2	CONFIG 1
Fibocom L830-EB	GND	N.C.	GND	GND
Sierra EM7565	GND	N.C.	N.C.	GND

LC Future Center Secret Data		Project Name	
		<i>Kolar-1</i>	
		Rev	Title
		4.02	PCIE M.2 (NGFF) CARD SLOT
Date: Wednesday, November 01, 2017 Sheet 46 of 97			

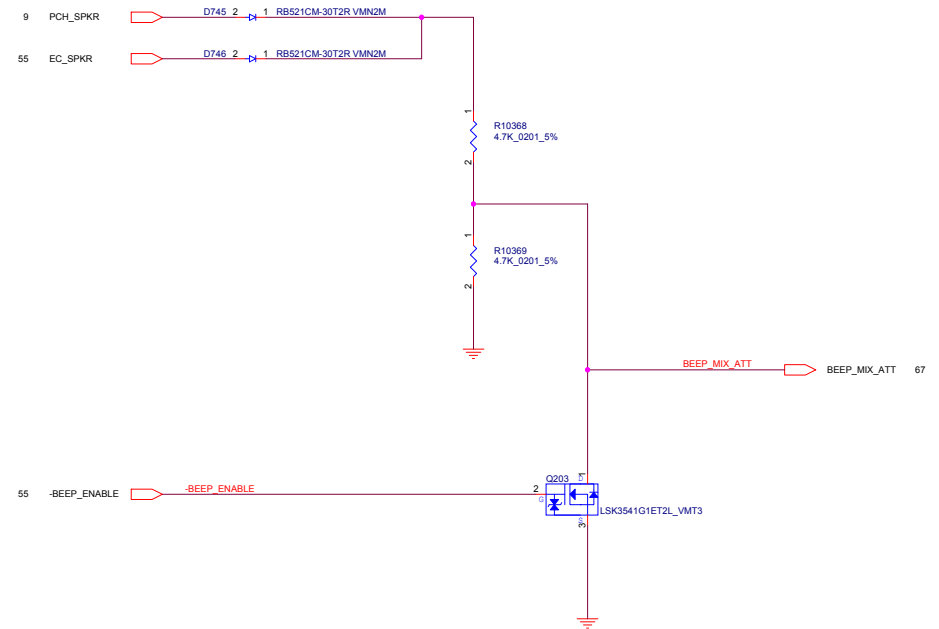
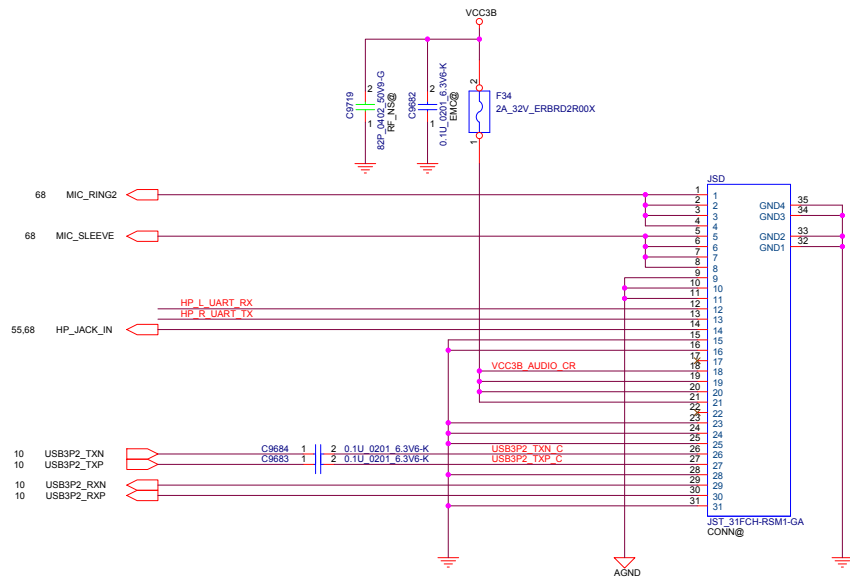


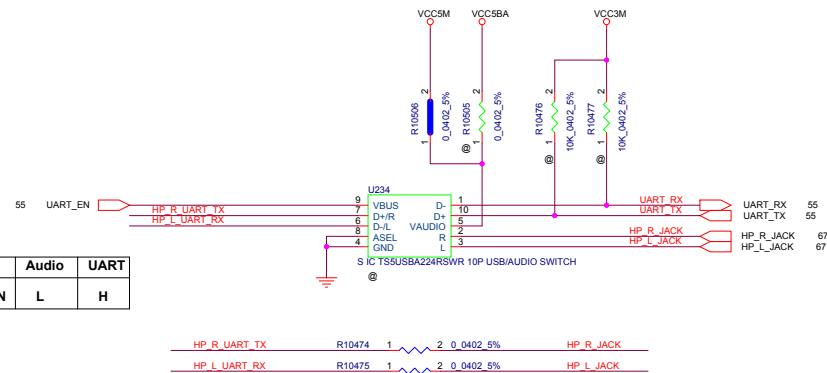
TABLE:

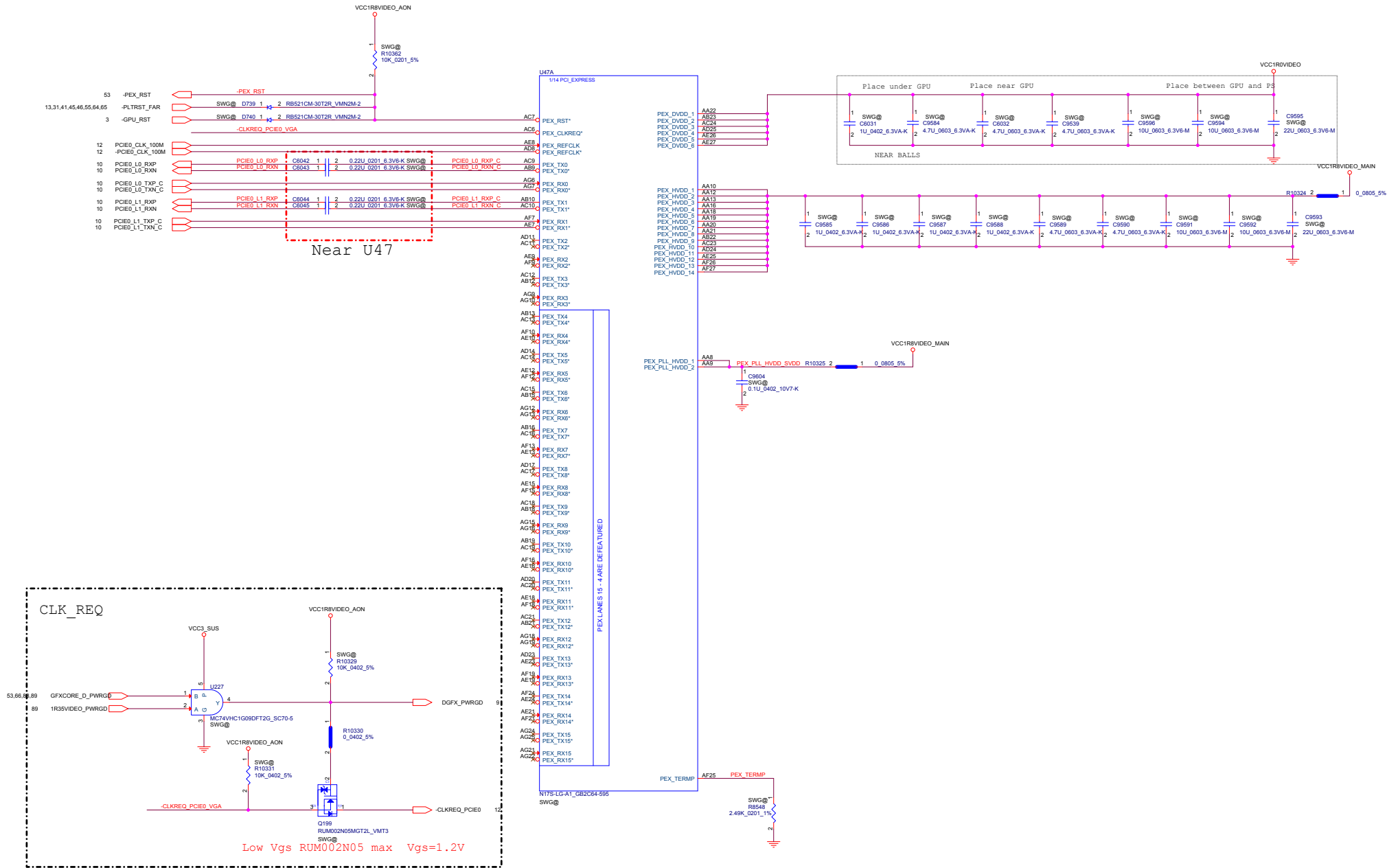
Debug feature	Enable	Disable
U234	ASM	NA
R10476	ASM	NA
R10477	ASM	NA
R10468	Don't care	ASM
R10469	Don't care	ASM
R10470	ASM	NA
R10471	ASM	NA
R10474	NA	ASM
R10475	NA	ASM

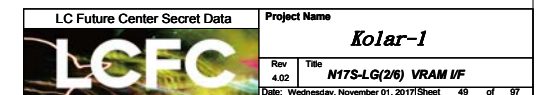
↑
LOGIC

TABLE:

Mode	Audio	UART
UART_EN	L	H

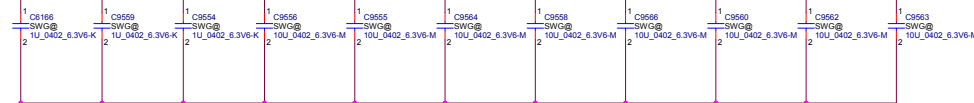




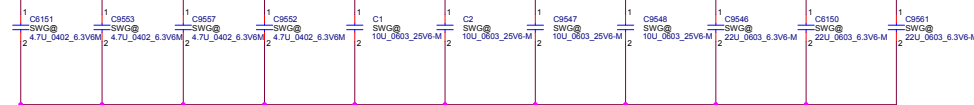


VCCGFXCORE_D

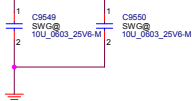
Place under GPU



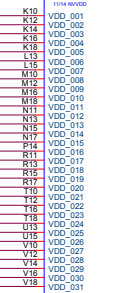
Place near GPU



Place near GPU



U47C



VDD_SENSE

GND_SENSE



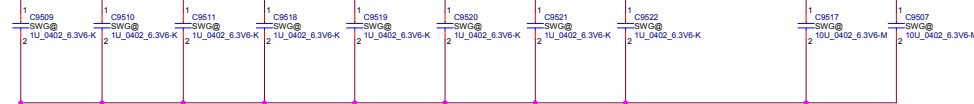
trace width: 16mils
differential voltage sensing.
differential signal routing.

N17S-LG-A1_GB2C64-595

SWG@

VCC1R35VIDEO

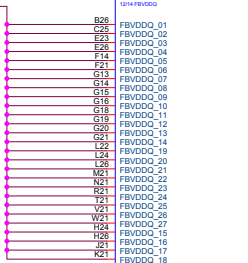
Place under GPU



Place near GPU



U47D



N17S-LG-A1_GB2C64-595

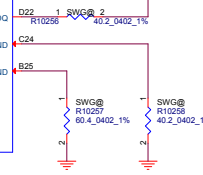
SWG@

FB_CAL_PD_VDDQ

FB_CAL_PU_GND

FB_CAL_TERM_GND

VCC1R35VIDEO



VCCGFXCORE_D

Place under GPU

C9577
1U_0402_6.3V6-K
SWG@

C9579
1U_0402_6.3V6-K
SWG@

C9570
1U_0402_6.3V6-M
SWG@

C9567
1U_0402_6.3V6-M
SWG@

C9568
1U_0402_6.3V6-M
SWG@

C9569
1U_0402_6.3V6-M
SWG@

Place near GPU

C9571
1U_0603_25V6-M
SWG@

C9572
1U_0603_25V6-M
SWG@

C9574
1U_0603_25V6-M
SWG@

C9576
1U_0603_25V6-M
SWG@

C9578
1U_0603_25V6-M
SWG@

C9580
1U_0603_25V6-M
SWG@

C9581
1U_0603_25V6-M
SWG@

C9575
22U_0603_6.3V6-M
SWG@

Place near GPU

C9526
1U_0402_6.3V6-M
SWG@

C9523
1U_0402_6.3V6-M
SWG@

C9525
1U_0402_6.3V6-M
SWG@

C9524
1U_0402_6.3V6-M
SWG@

U47F

7/14 VDDS

L11
VDDS_1
L17
VDDS_2
M14
VDDS_3
P10
VDDS_4
P12
VDDS_5
P16
VDDS_6
Y14
VDDS_7
U11
VDDS_8
U17
VDDS_9
VDDS_10

GM108

RSVD

RSVD

N17S-LG-A1_GB2C64-595

SWG@

VDDS_SENSE

GNDS_SENSE

F4

R2

VCCGFXCORE_D

U47G

6/14 XVDD

G1
XVDD_1
G2
XVDD_2
G3
XVDD_3
G4
XVDD_4
G5
XVDD_5
G6
XVDD_6
H3
XVDD_7
H4
XVDD_8
H5
XVDD_9
J1
XVDD_10
J2
XVDD_11
J3
XVDD_12
J4
XVDD_13
J5
XVDD_14
J6
XVDD_15
J7
XVDD_16
K1
XVDD_17
K2
XVDD_18
K3
XVDD_19
K4
XVDD_20
K5
XVDD_21
K6
XVDD_22
K7
XVDD_23
L3
XVDD_24
L4
XVDD_25
M1
XVDD_26
M2
XVDD_27
M3
XVDD_28
M4
XVDD_29
M5
XVDD_30
M7
XVDD_31
N1
XVDD_32
N2
XVDD_33
N3
XVDD_34
XVDD_35

XVDD_36
XVDD_37
XVDD_38
XVDD_39
XVDD_40
XVDD_41
XVDD_42
XVDD_43
XVDD_44
XVDD_45
XVDD_46
XVDD_47
XVDD_48
XVDD_49
XVDD_50
XVDD_51
XVDD_52
XVDD_53
XVDD_54
XVDD_55
XVDD_56
XVDD_57
XVDD_58
XVDD_59
XVDD_60
XVDD_61
XVDD_62
XVDD_63
XVDD_64
XVDD_65
XVDD_66
XVDD_67
XVDD_68
XVDD_69

GM108

RSVD

N17S-LG-A1_GB2C64-595

SWG@

U47E

14/14 VDD18

VDD18_1
VDD18_2
1V8_AON_1
1V8_AON_2

G8
G9
G10
G12

N17S-LG-A1_GB2C64-595

SWG@

VCC1R8VIDEO_MAIN

0.1U_0402_16V7K
1U_0402_16V7K
SWG@

0.1U_0402_16V7K
1U_0402_16V7K
SWG@

C9529
1U_0402_6.3V6-K
SWG@

C9562
4.7U_0402_6.3V6-M
SWG@

VCC1R8VIDEO_AON

0.1U_0402_16V7K
1U_0402_16V7K
SWG@

0.1U_0402_16V7K
1U_0402_16V7K
SWG@

C9530
1U_0402_6.3V6-K
SWG@

C9562
4.7U_0402_6.3V6-M
SWG@

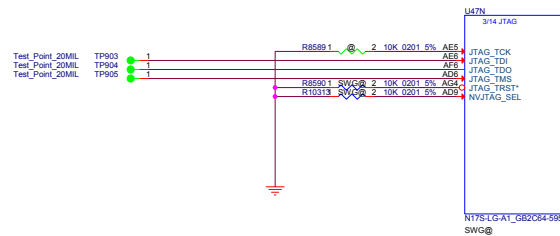
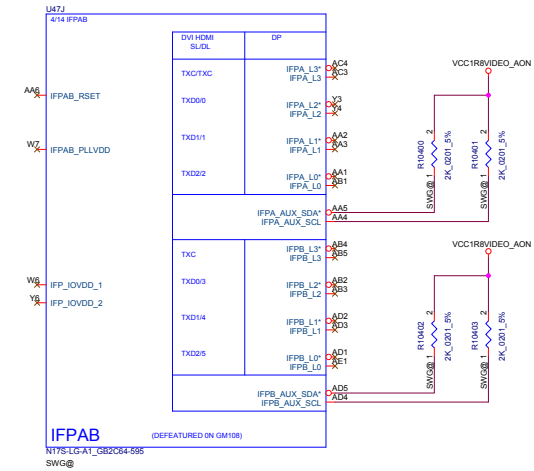
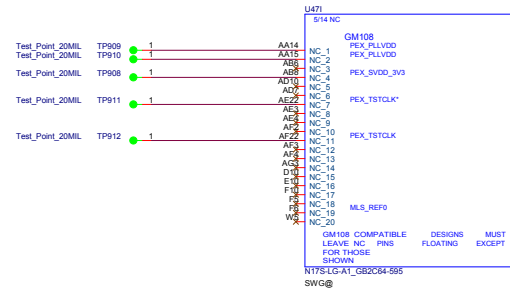
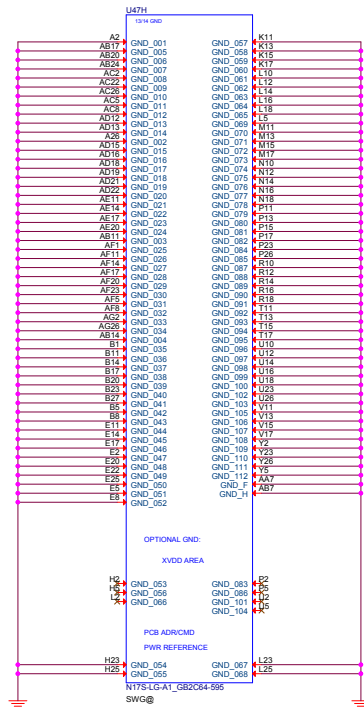
LC Future Center Secret Data

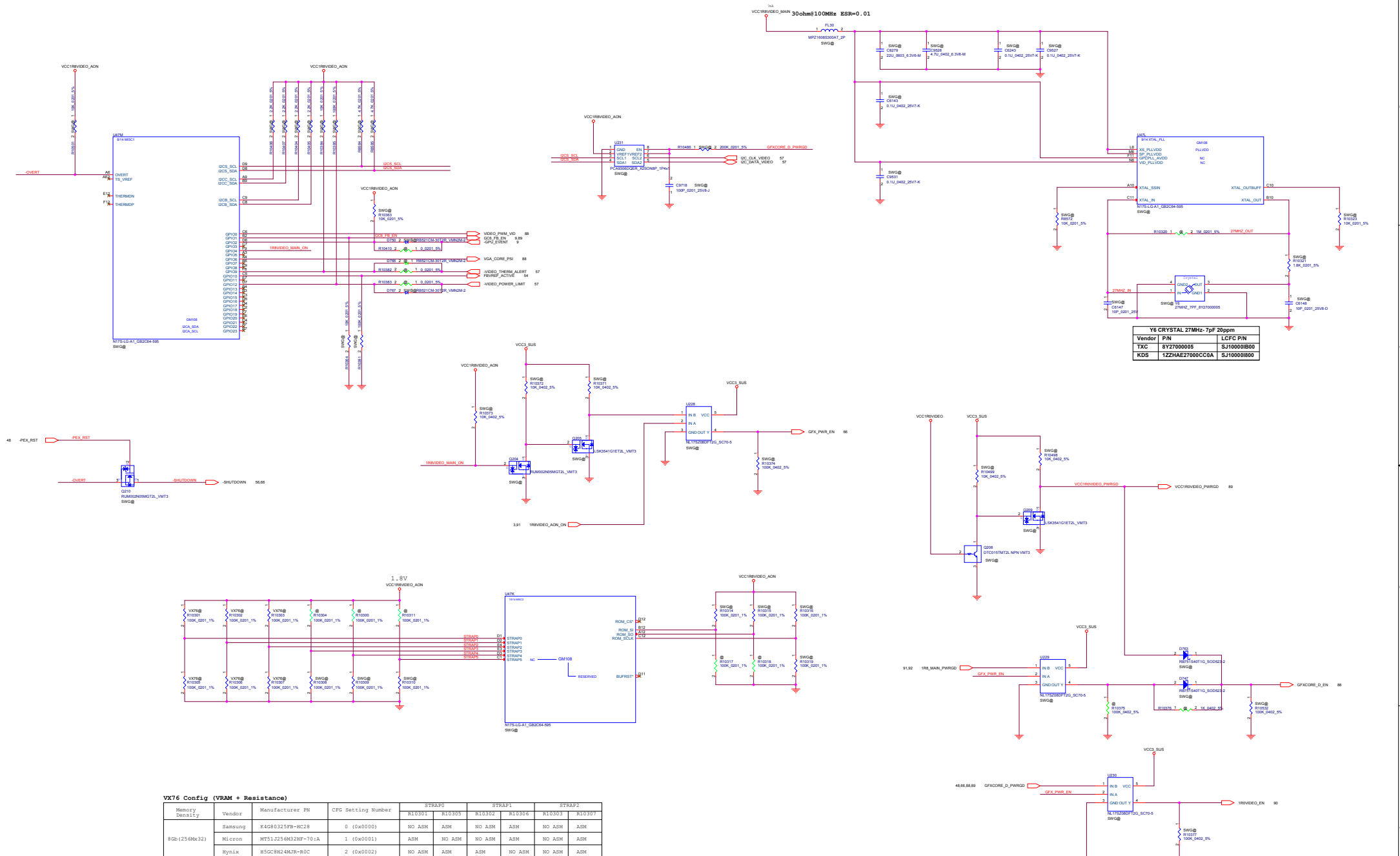
Project Name

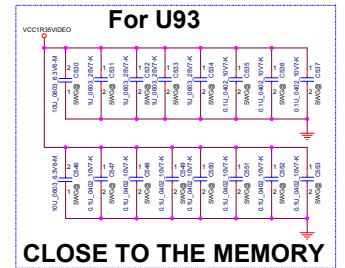
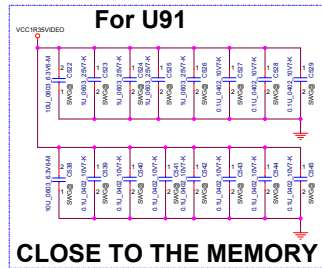


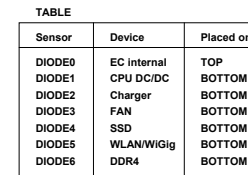
Kolar-1

Rev 4.02 Title N17S-LG(4/6) POWER 2 Date: Wednesday, November 01, 2017 Sheet 51 of 97

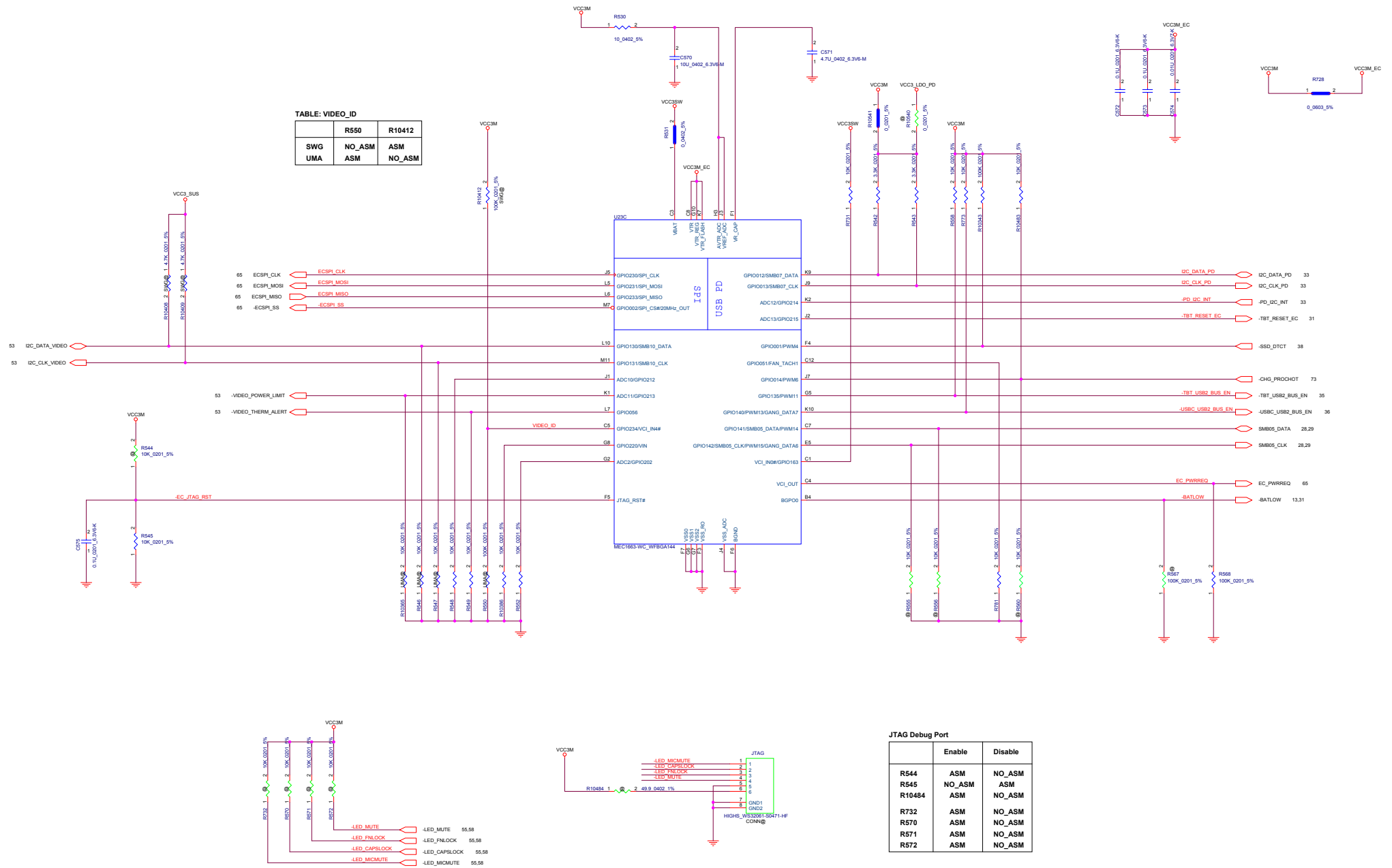




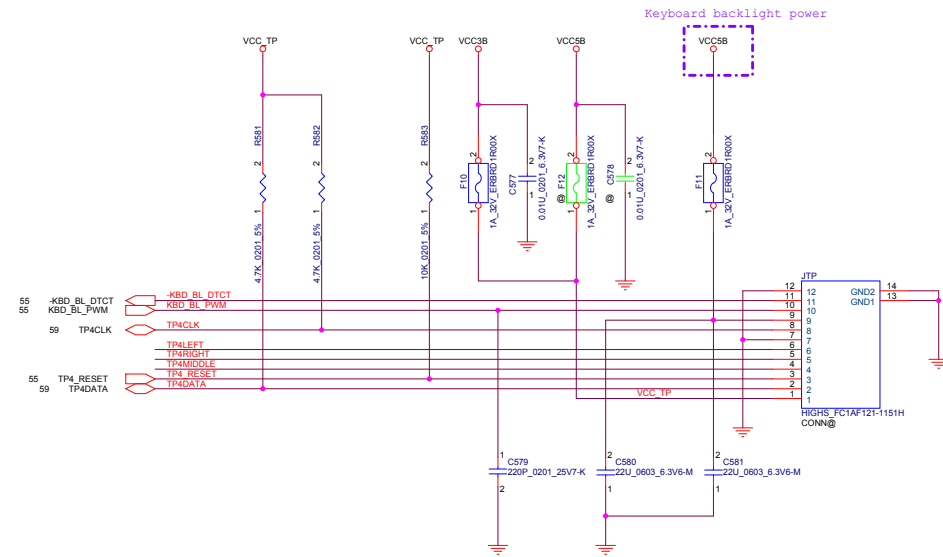
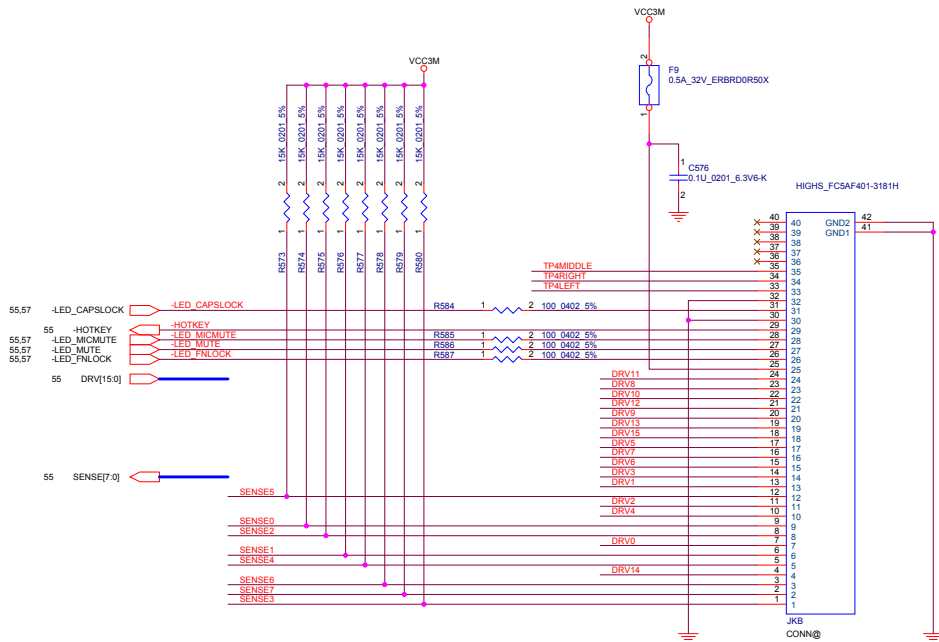




	R550	R10412
SWG	NO_ASM	ASM
UMA	ASM	NO_ASM



JTAG Debug Port		
	Enable	Disable
R544	ASM	NO_ASM
R545	NO_ASM	ASM
R10484	ASM	NO_ASM
R732	ASM	NO_ASM
R570	ASM	NO_ASM
R571	ASM	NO_ASM
R572	ASM	NO_ASM



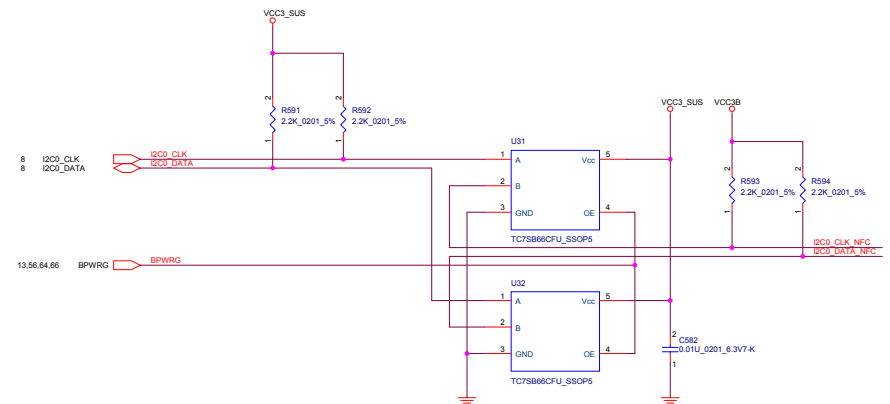
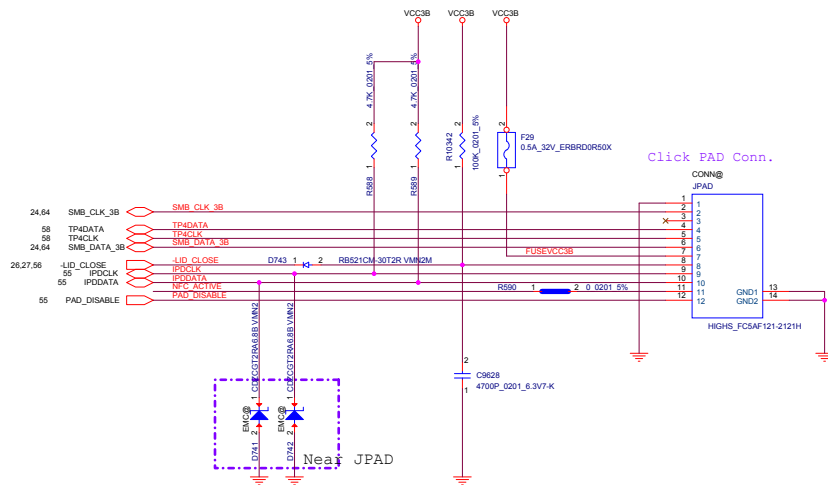
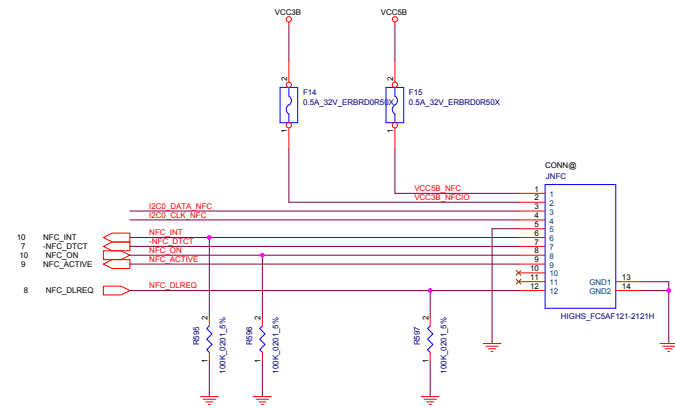
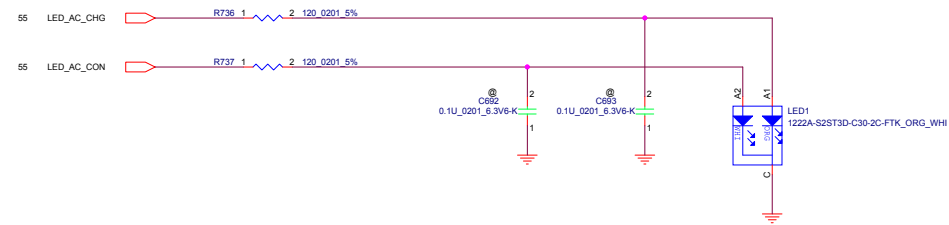
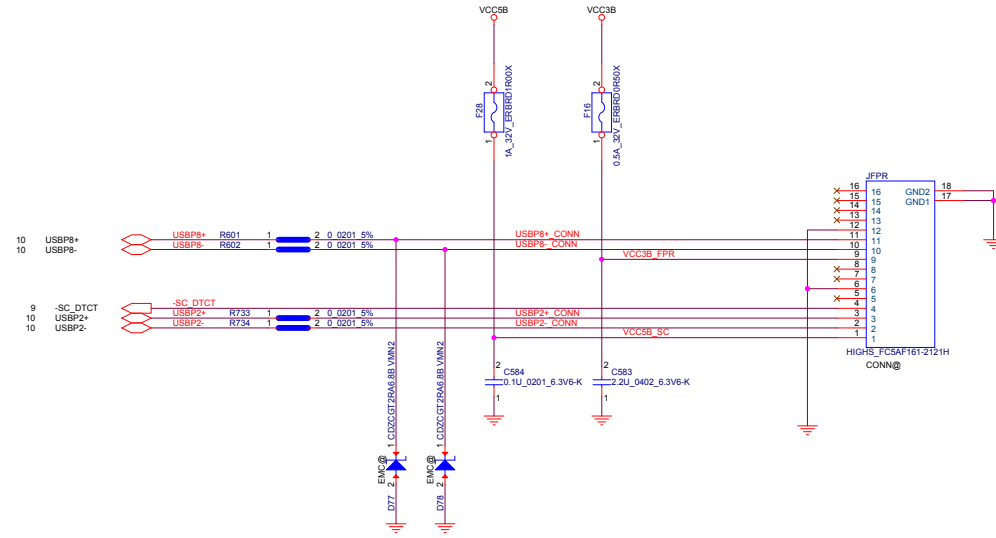
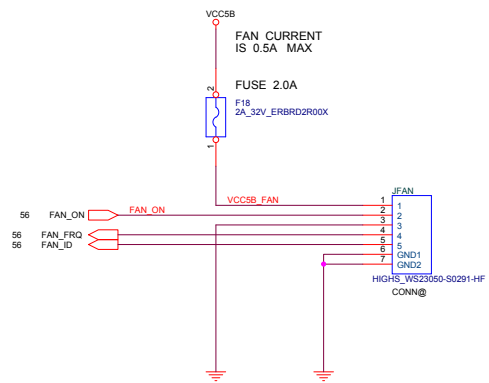


TABLE of U31/U32		
Vendor	P/N	LCFC P/N
TOSHIBA	TC7SB66CFU	SA00008DZ00
TI	SN74LVC1G66DCKR	SA00005BE0J





TABLE

P/N	ADDR_SEL	Address
BMA255	H	32h (W) & 33h (R)
	L	30h (W) & 31h (R)
KX022-1020	H	3Eh (W) & 3Fh (R)
	L	3Ch (W) & 3Dh (R)

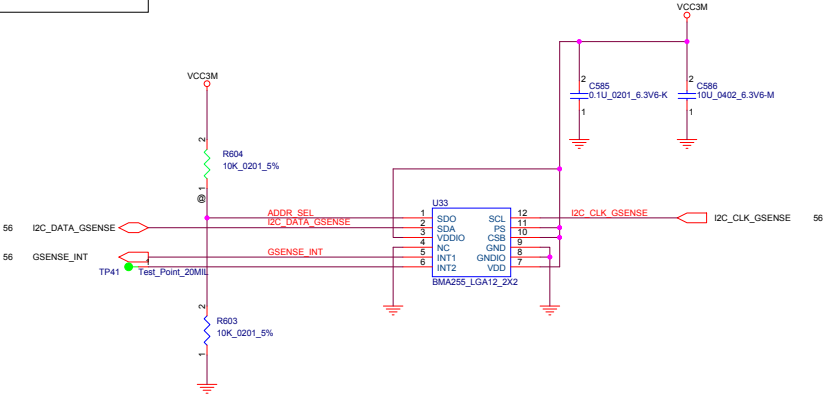
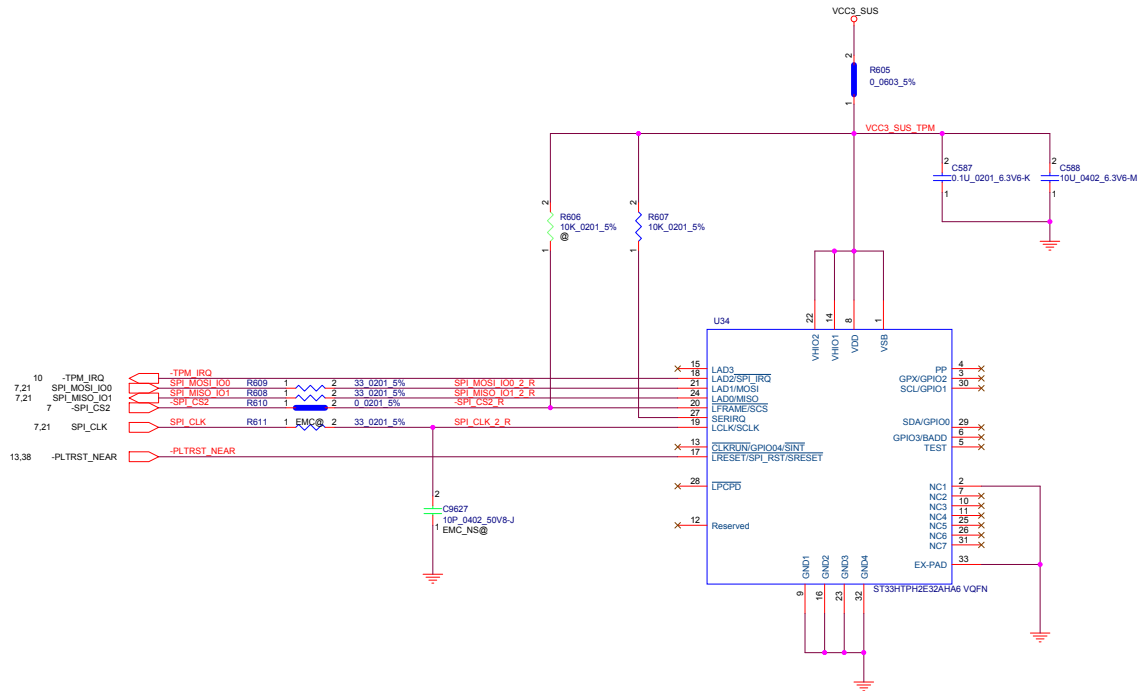


TABLE of G-Sensor (U148)

Vendor	P/N	LCFC P/N
BOSCH	BMA255	SA00005YJ00
Kionix	KX022-1020	SA000081E00



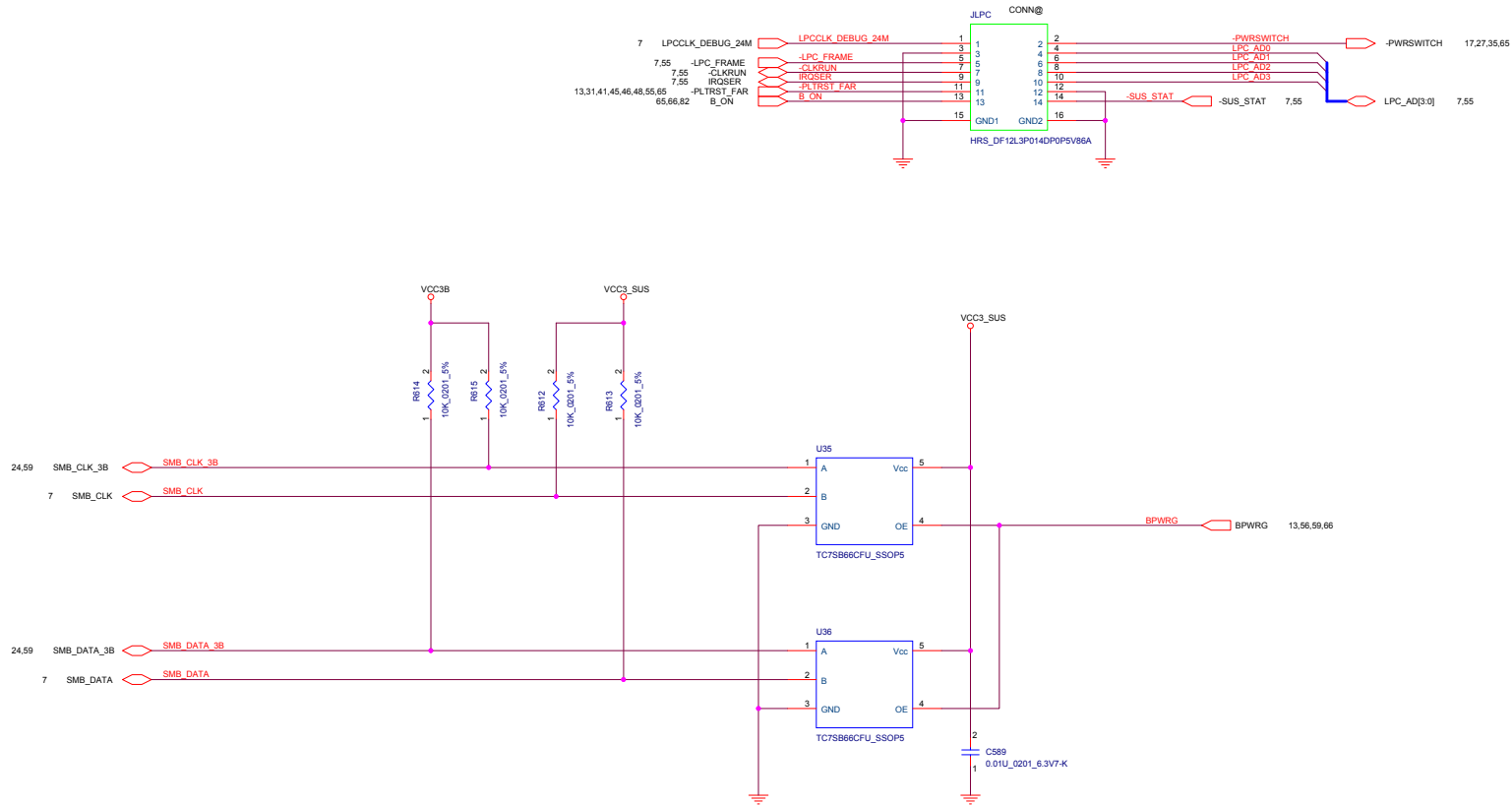
TABLE

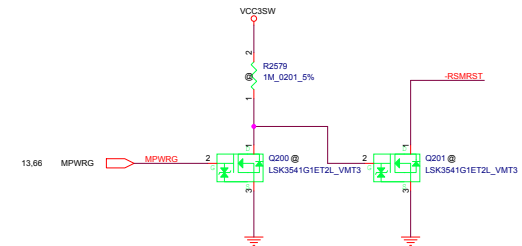
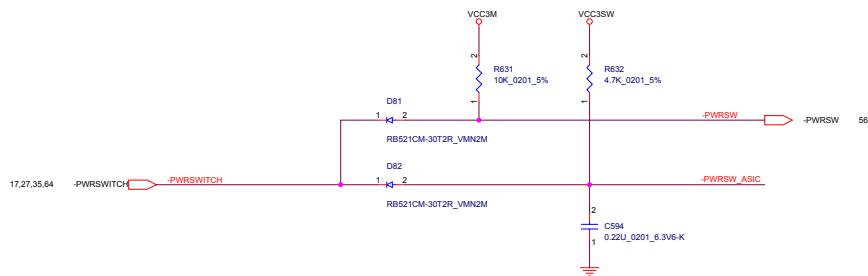
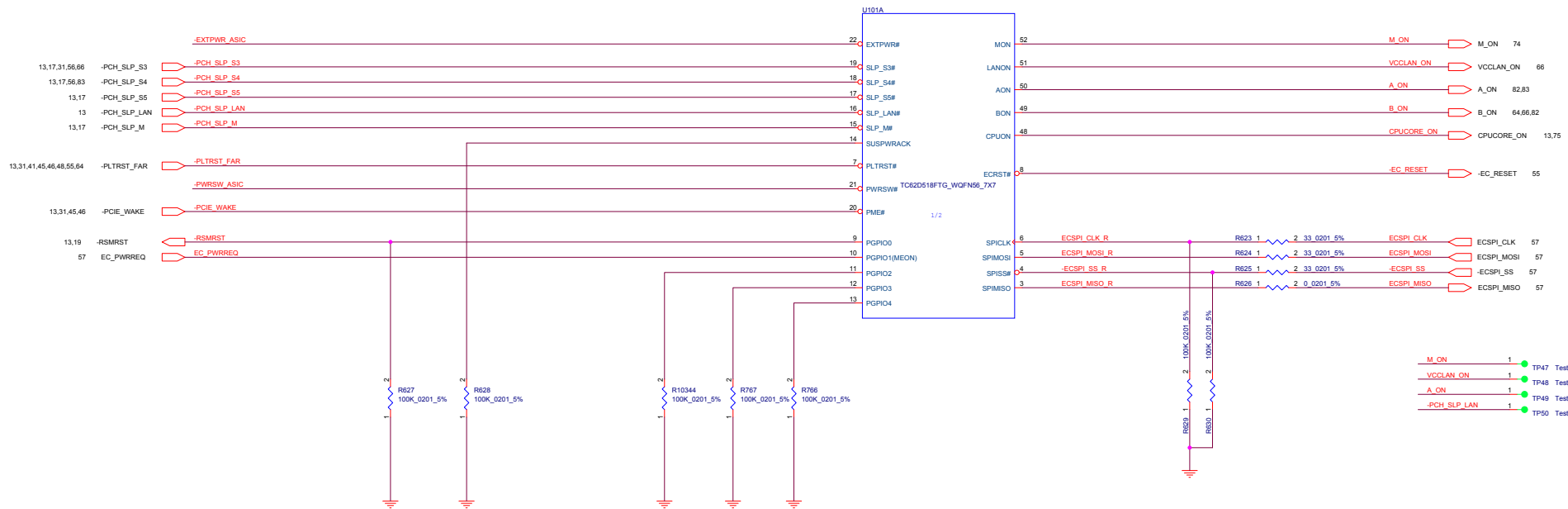
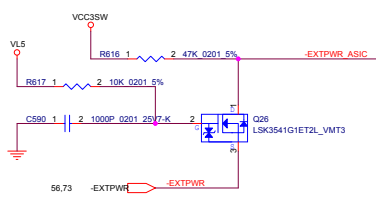
Pin No	TCG PTP Spec (v38)	Infineon SLB9670VQ2.0 FW 7.63	ST Micro ST33HTPH2E32AHB4
1	VDD	VDD	NC
2	GND	GND	GND
3	GPIO	NC	NC
4	GPIO	NC	PP
5	NC	NC	NC
6	VNC/GPIO	GPIO	NC
7	GPIO/VDD	PP	GPIO
8	VDD	VDD	NC
9	GND	GND	NC
10	VNC	NC	NC
11	NC	NC	NC
12	NC	NC	NC
13	VNC/GPIO	NC	NC
14	VDD	NC	NC
15	NC	NC	NC
16	GND	NC	NC
17	SPI_RST#	RST#	SPI_RST#
18	SPI_PIRQ#	PIRQ#	SPI_PIRQ#
19	SPI_CLK	SCLK	SPI_CLK
20	SPI_CS#	CS#	SPI_CS#
21	MOSI	MOSI	MOSI
22	VDD	VDD	VPS
23	GND	GND	NC
24	MISO	MISO	MISO
25	NC	NC	NC
26	NC	NC	NC
27	NC	NC	NC
28	NC	NC	NC
29	VNC/GPIO	NC	NC
30	VNC/GPIO	NC	NC
31	VNC	NC	NC
32	GND	GND	NC

TABLE

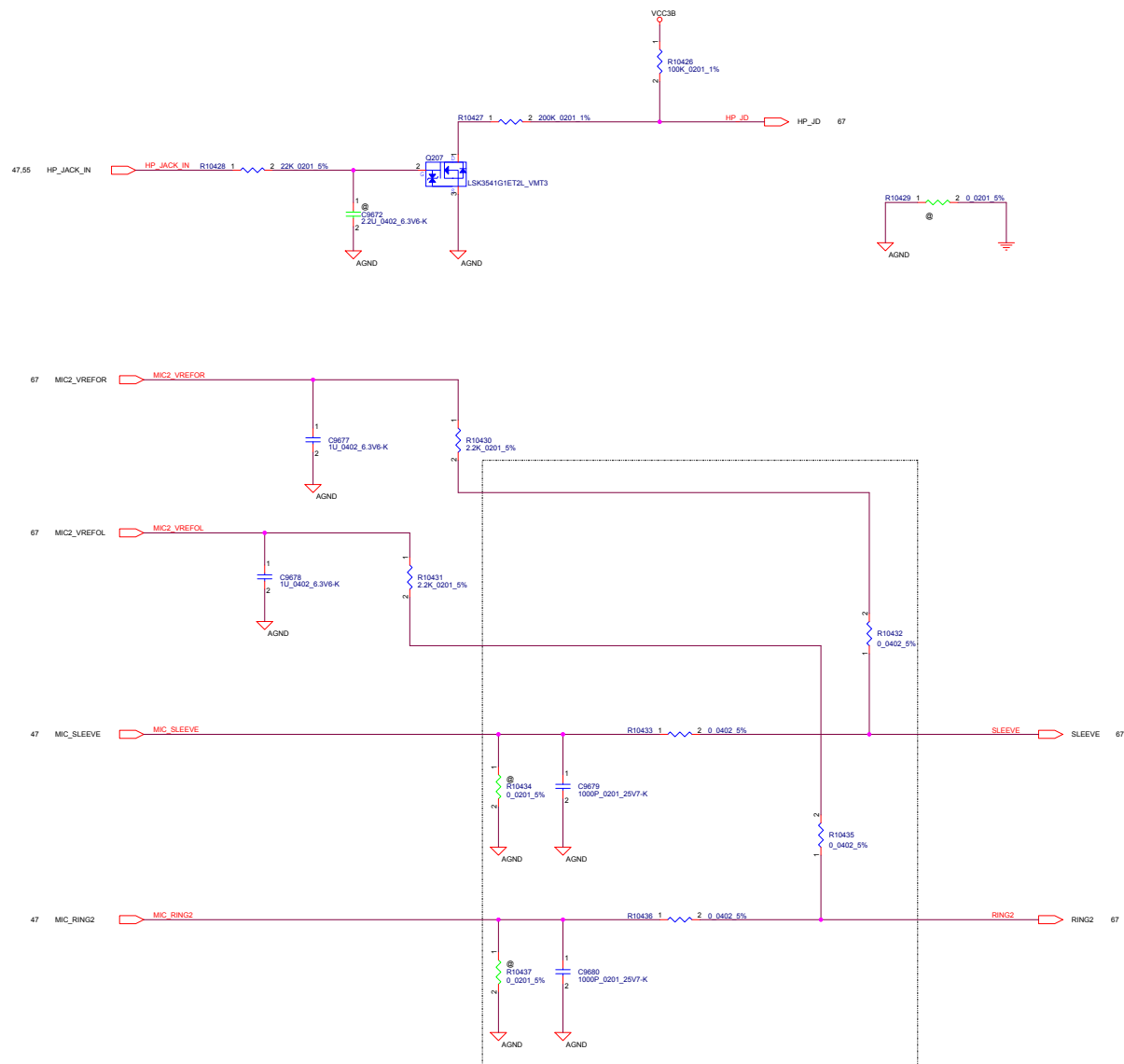
REF DES	ENABLE	DISABLE
JLPC	ASM	NO_ASM
R32	ASM	NO_ASM

LOGIC

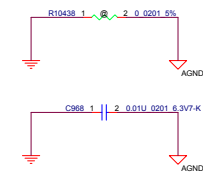


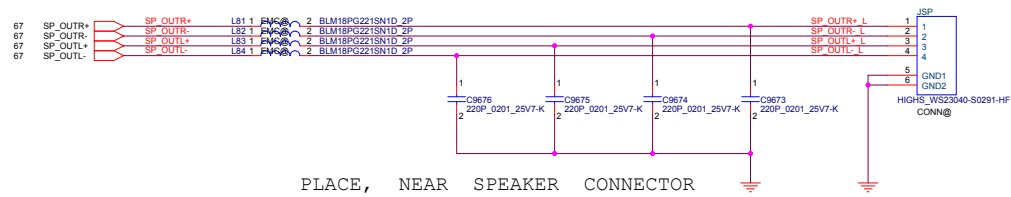


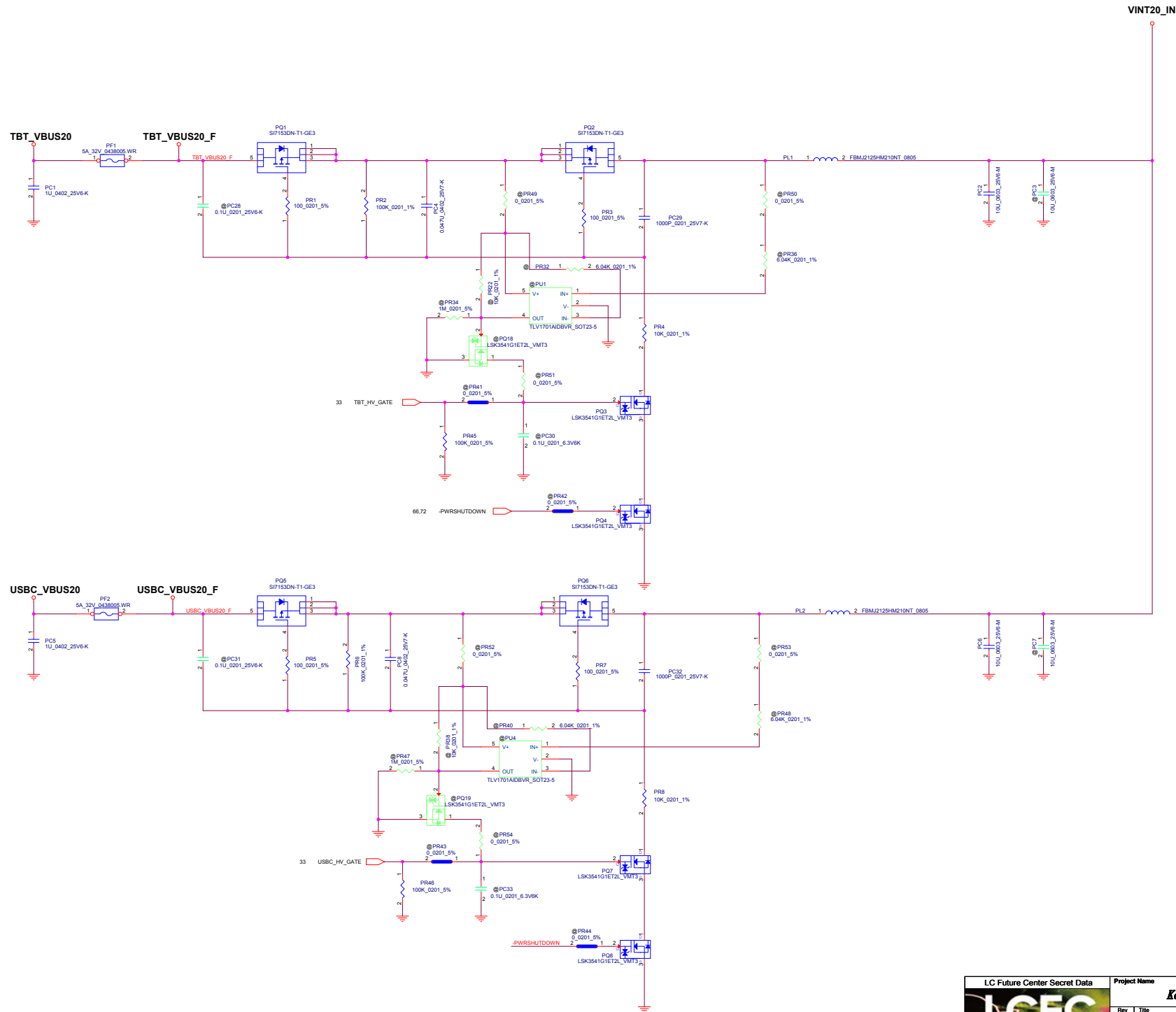




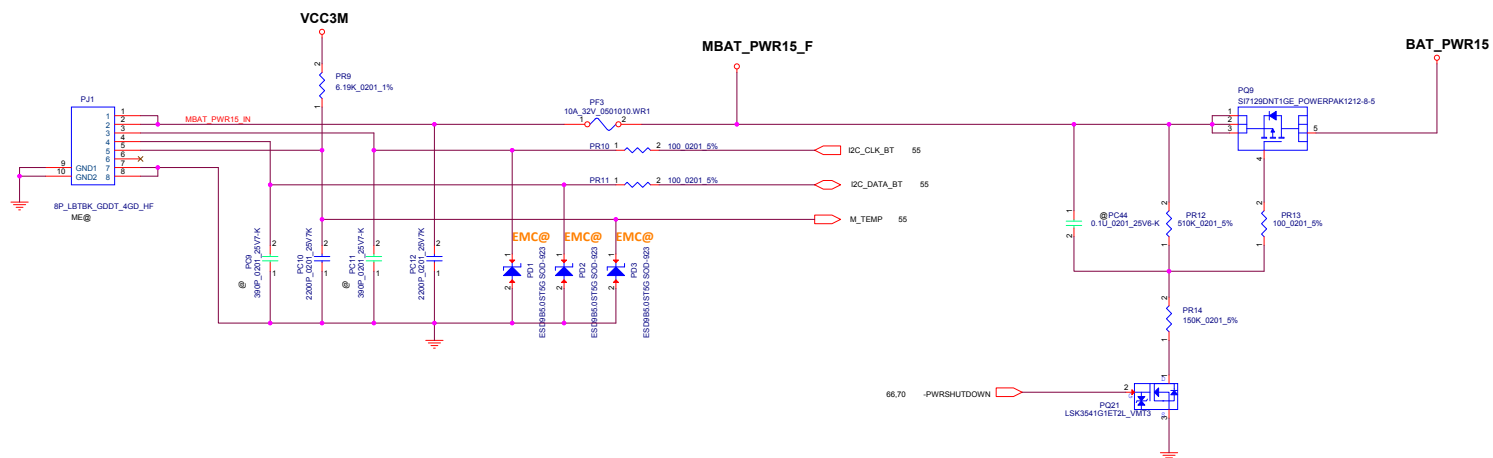
NEAR EXT MIC CONN



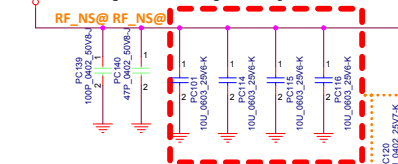




BLANK



VINT20_IN MLCCs must be placed symmetrically on Top and Bottom.



Should be placed near ACP, ACN

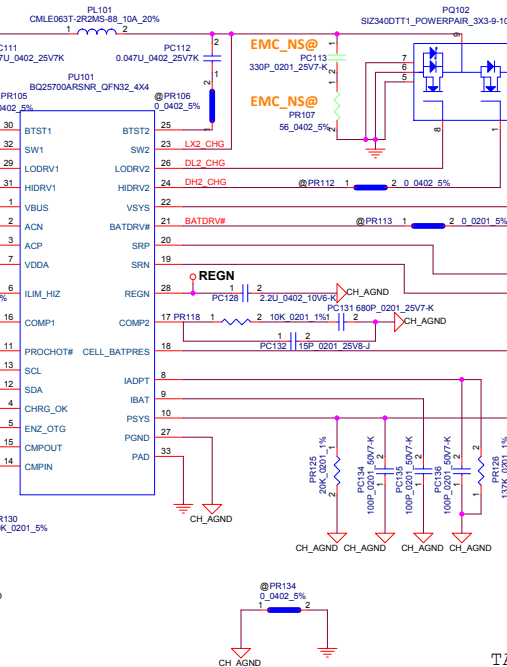
Keep these two signals as pair routing

Keep these two signals as pair routing

MLCCs must be placed symmetrically on Top and Bottom.

Table PL101

CYNTEC, CMLE063T-2R2MS-88
TOKO, FDSD0630-H-2R2M=P3



VSYS15

BAT_PWR15

TABLE:ILIM_HIZ

IDPM	V(ILIM)	PR123
500mA	1.2V	402K
1.0A	1.4V	332K
1.5A	1.6V	280K
2.0A	1.8V	237K
3.0A	2.2V	174K
3.25A	2.3V	162K

← LOGIC

TABLE

Inductor	R(IADP)	fsw@POR
1.0uH	93kohm	800kHz
1.5uH	108kohm	800kHz
2.2uH	137kohm	800kHz

TABLE:CELL_BATPRES

# of CELL	VCCELL_PRES	PR129
1-CELL	1.5V	301K
2-CELL	2.5V	140K
3-CELL	3.5V	71.5K
4-CELL	4.5V	33.2K

← LOGIC

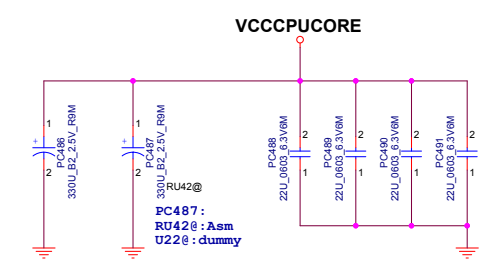
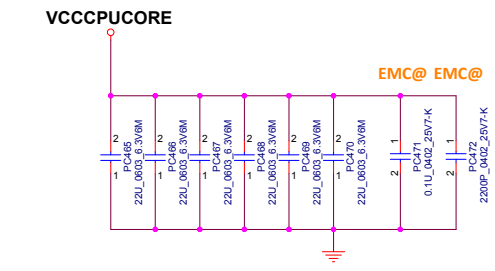
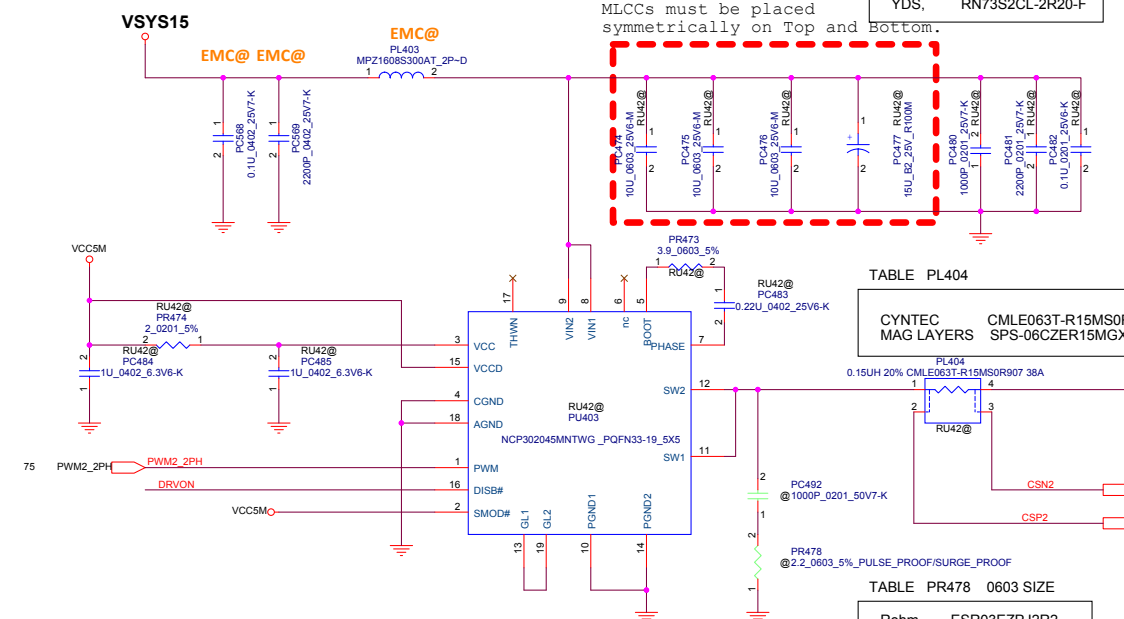
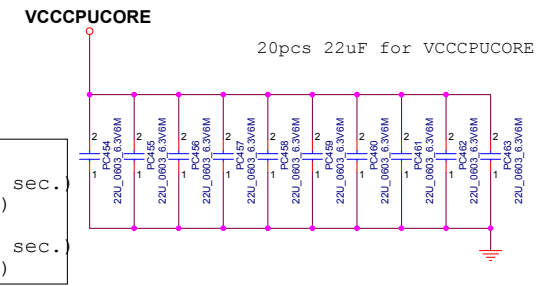
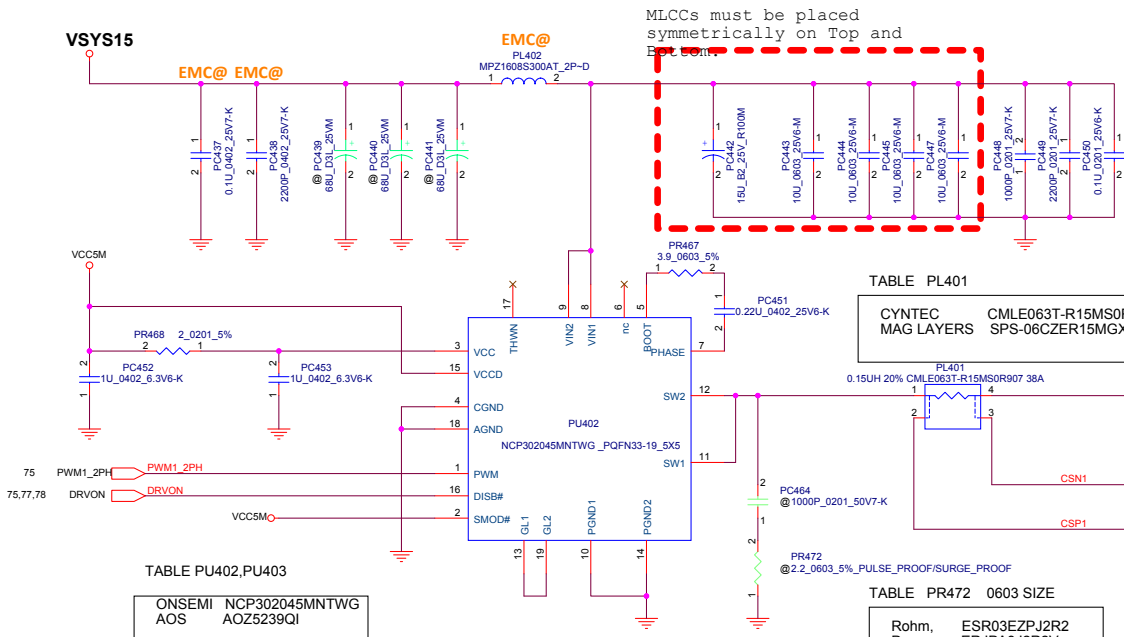
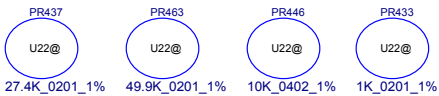



Table for PC486, PC487

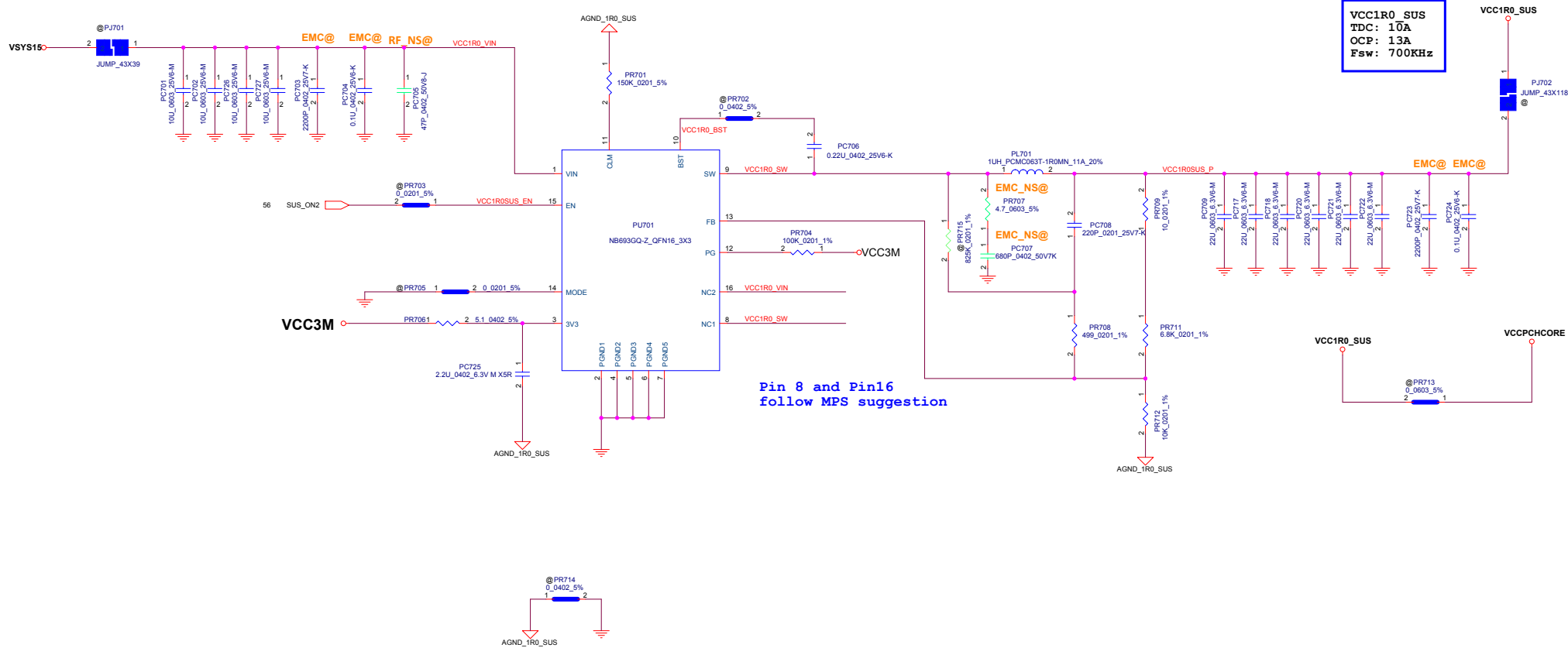
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NEC TOKIN	PSGB20E337M9
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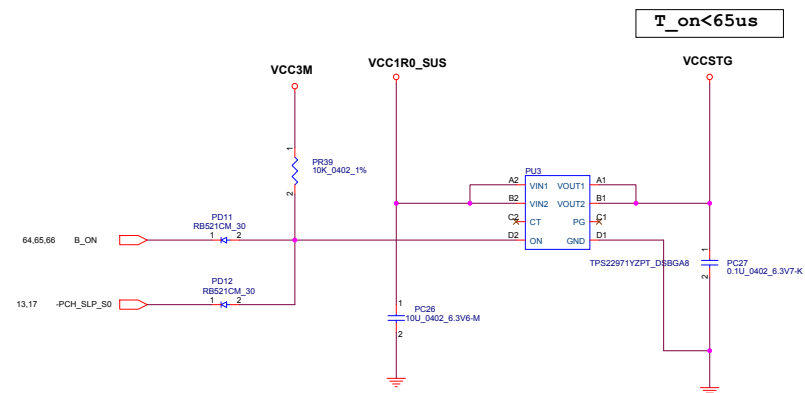
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LC Future Center Secret Data		Project Name	
		<i>Kolar-1</i>	
		Rev 4.02	Title BLANK
Date: Wednesday, November 01, 2018Sheet 80 of 97			





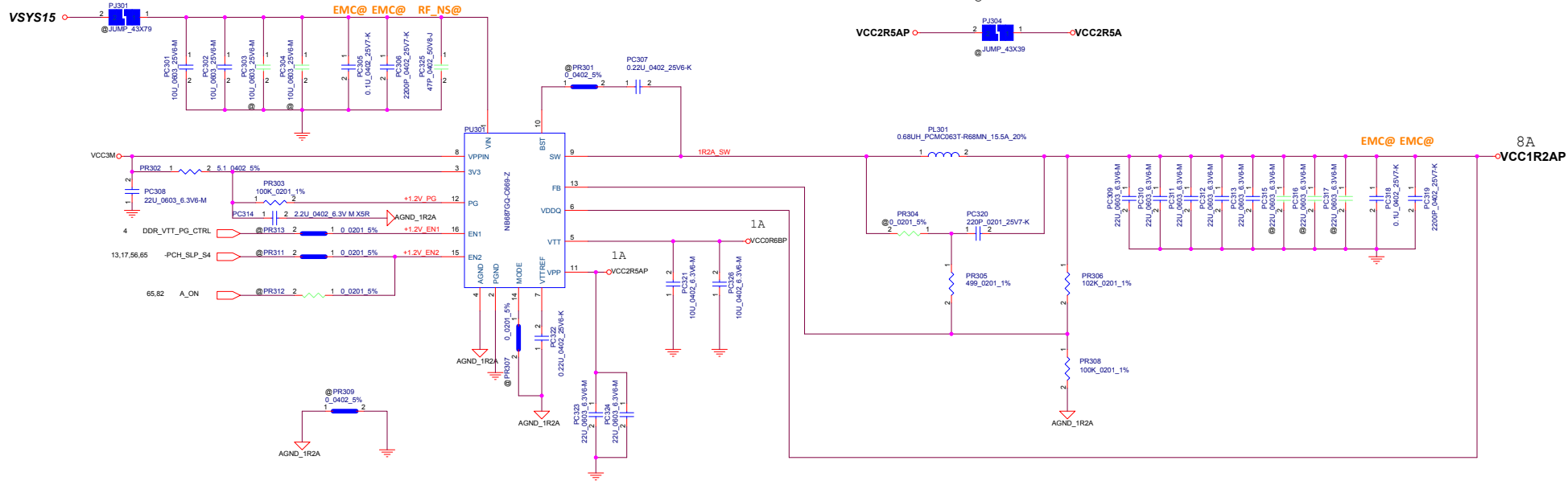



TABLE NB687GQ:EN1/EN2

State	EN1	EN2	VDDQ	VTTREF	VTT	VPP
S0	High	High	ON	ON	ON	ON
S3	Low	High	ON	ON	OFF (High-Z)	ON
S4/S5	Low	Low	OFF	OFF	OFF	OFF
Others	High	Low	OFF	OFF	OFF	OFF

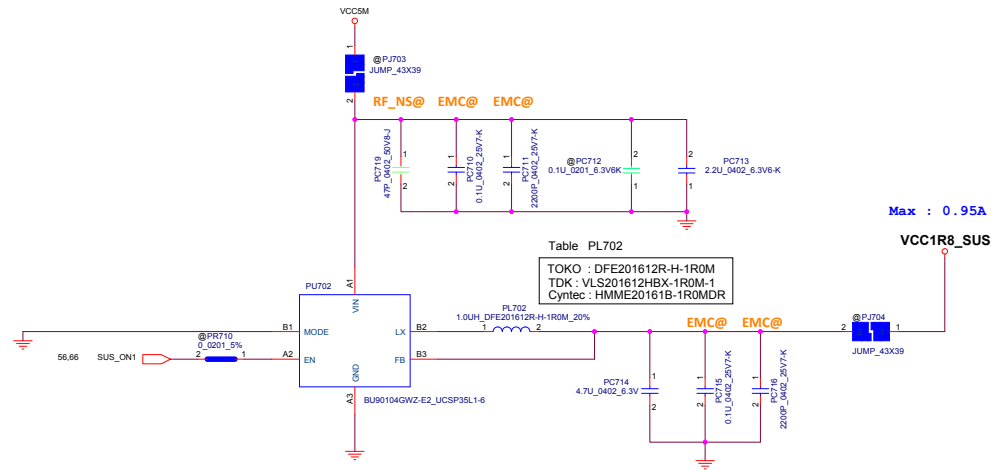
TABLE NB687GQ:MODE

State	USM	Fs	Resistor to GND
M1	NO	700KHz	0
M2	YES	700KHz	90K
M3	NO	500KHz	150K
M4	YES	500KHz	>230K or Float


LC Future Center Secret Data		Project Name	
		Kolar-1	
		DC/DC VCC1R2A(NB687)	
Rev	Title	Date	Sheet
4.02		Wednesday, November 01, 2011	83 of 97

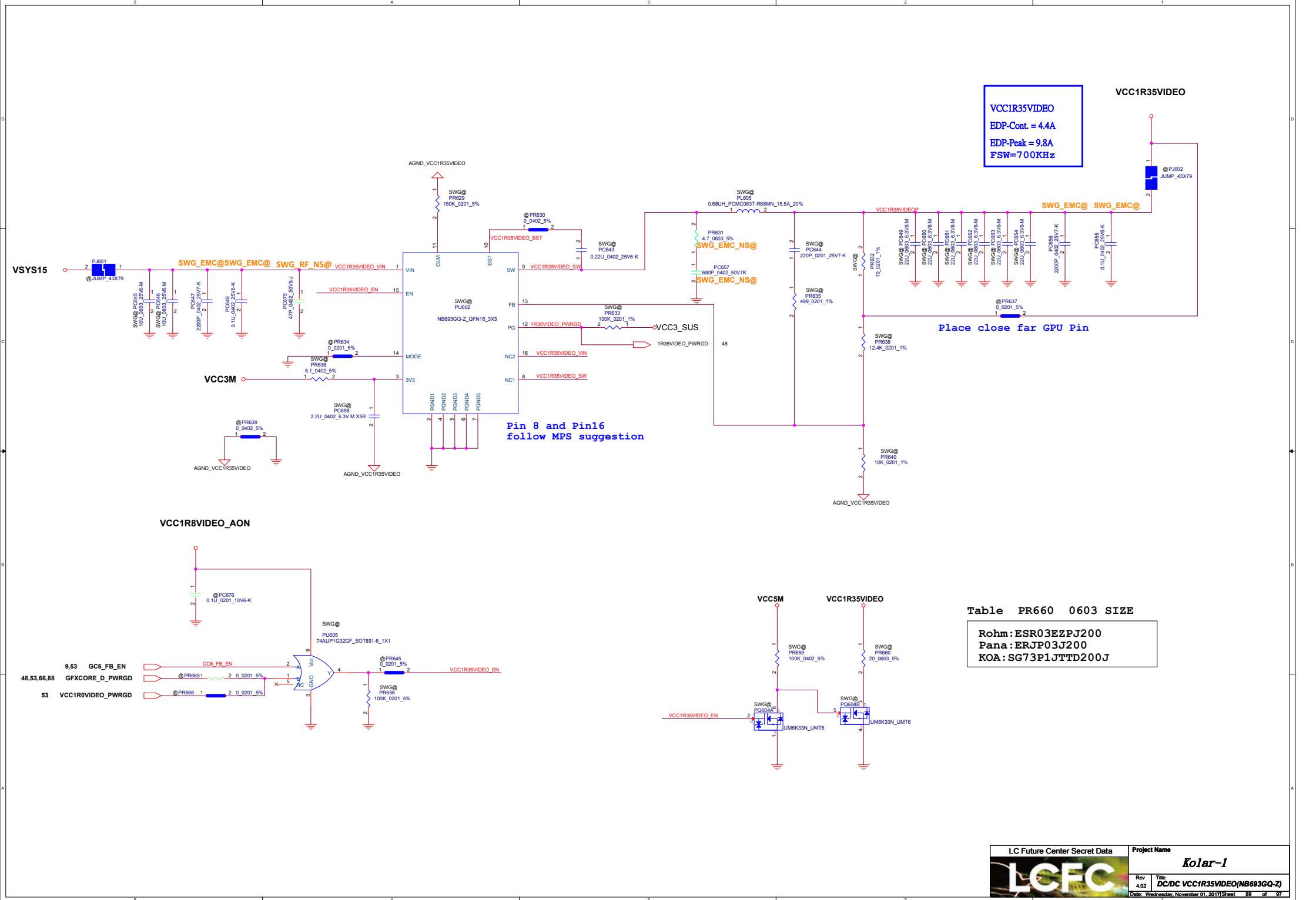
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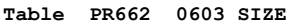
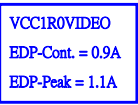
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LC Future Center Secret Data		Project Name	
		<i>Kolar-1</i>	
Rev	Title		
4.02	BLANK		
Date: Wednesday, November 01, 2017		Sheet	87 of 87





Rohm:ESR03EZPJ200
Pana:ERJP03J200
KOA:SG73P1JTTD200J

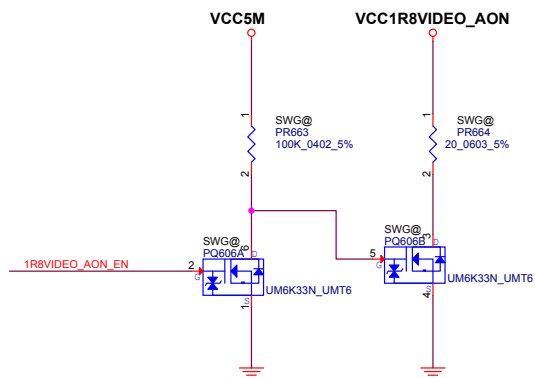
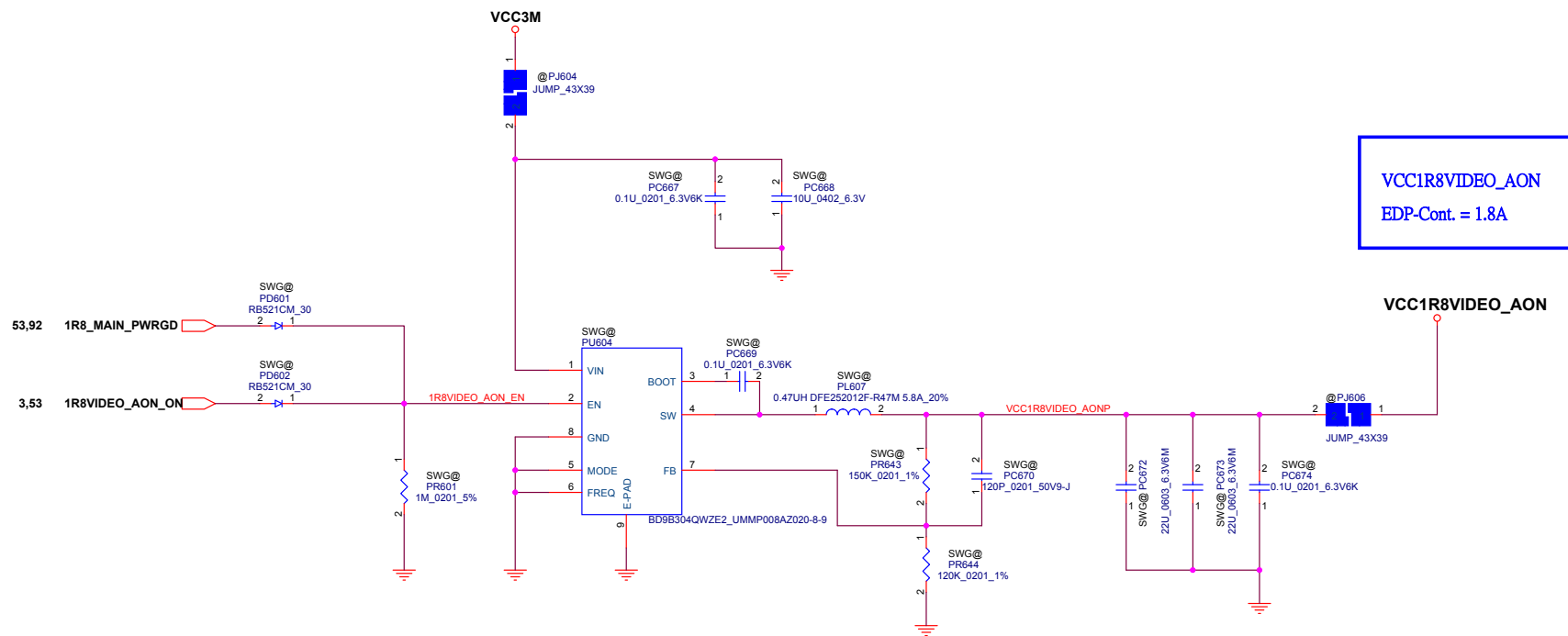


Table PR664 0603 SIZE

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Pana: ERJP03J200
KOA: SG73P1JTTD200J

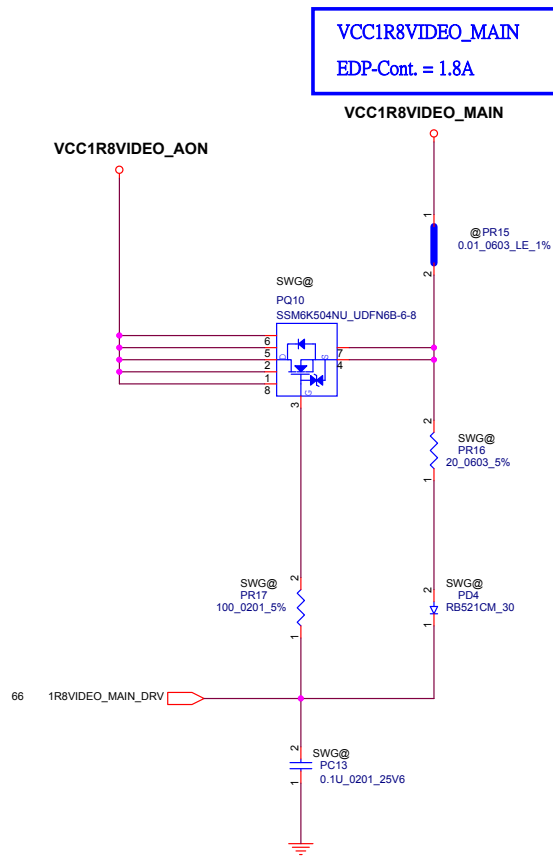
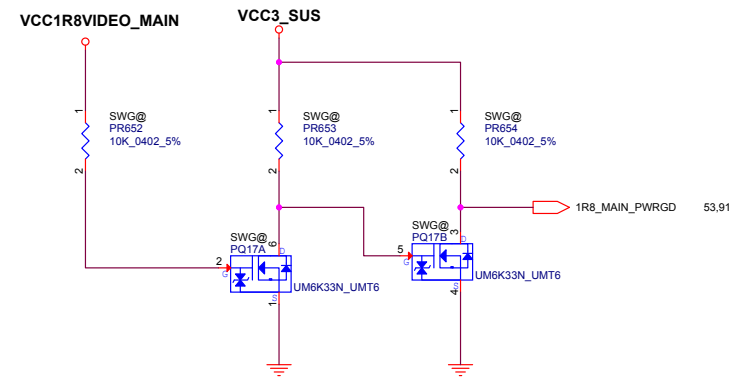


Table PR16 0603 SIZE

Rohm:ESR03EZPJ200
Pana:ERJP03J200
KOA:SG73P1JTTD200J



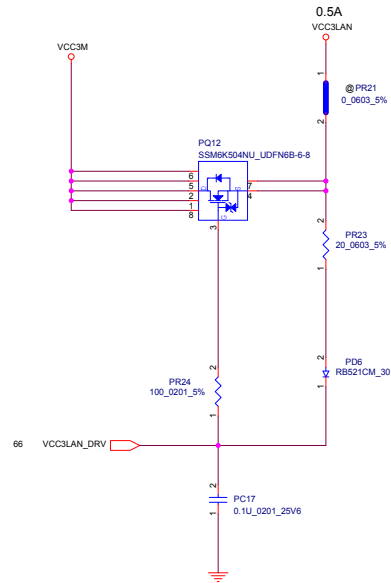
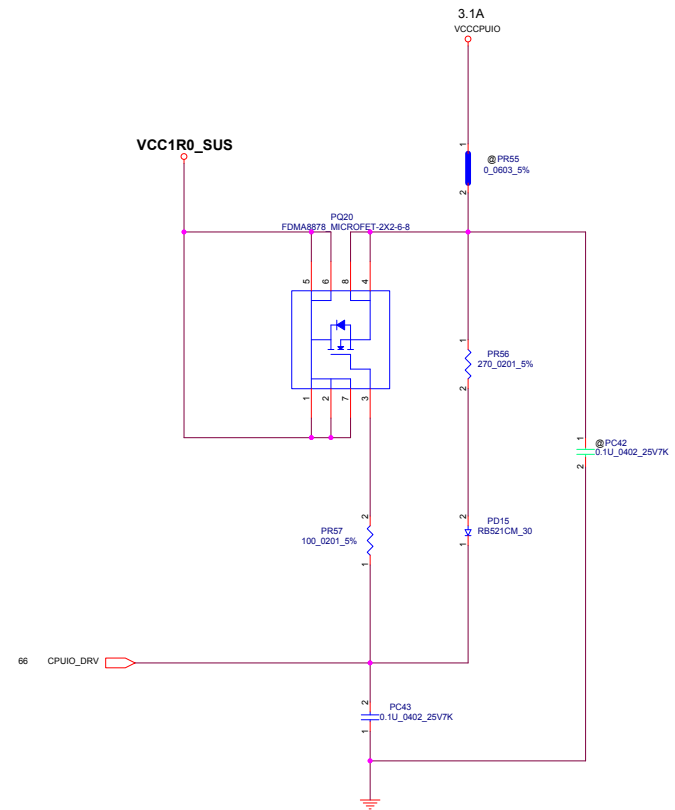
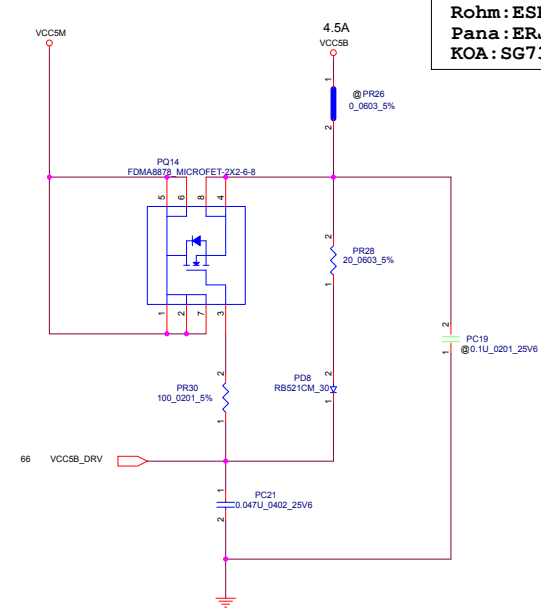
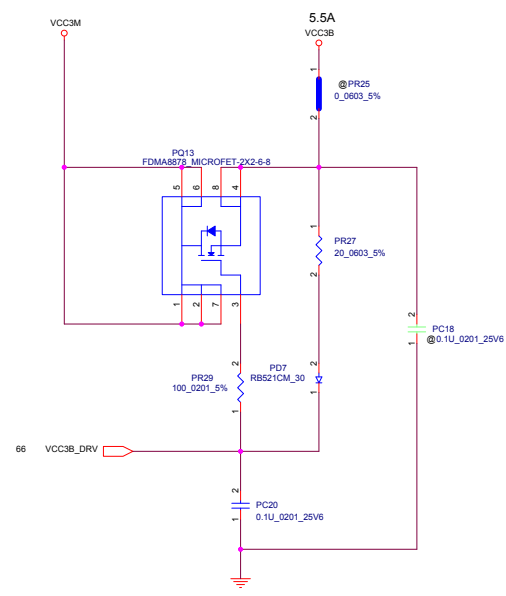


Table PR23 0603 SIZE

Rohm:ESR03EZPJ200
Pana:ERJP03J200
KOA:SG73P1JTTD200J

Table PR27,PR28 0603 SIZE

Rohm: ESR03EZPJ200
Pana: ERJP03J200
KOA: SG73P1JTTD200J



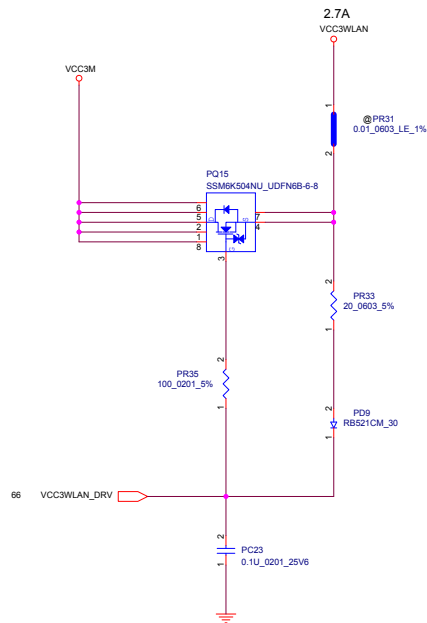
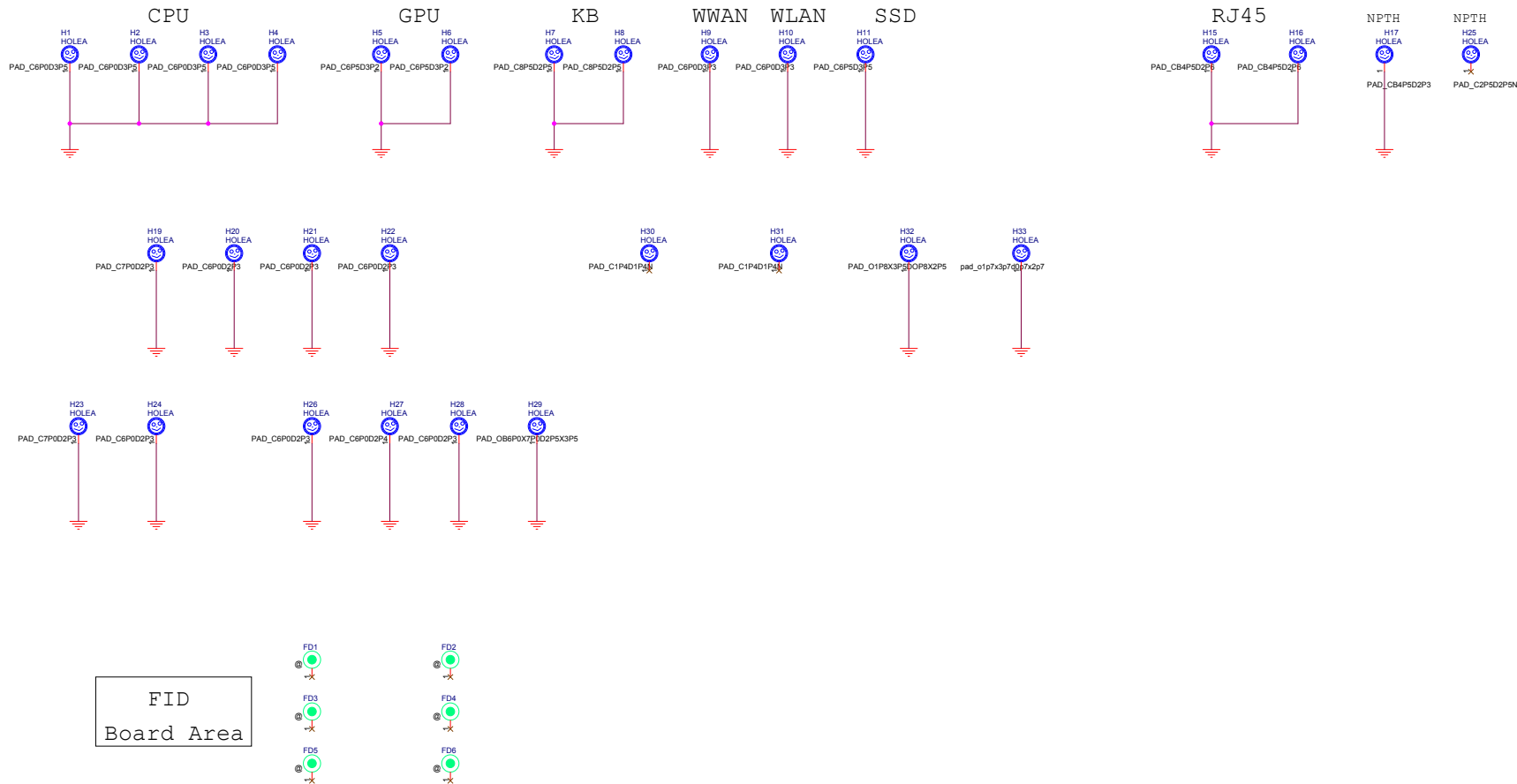
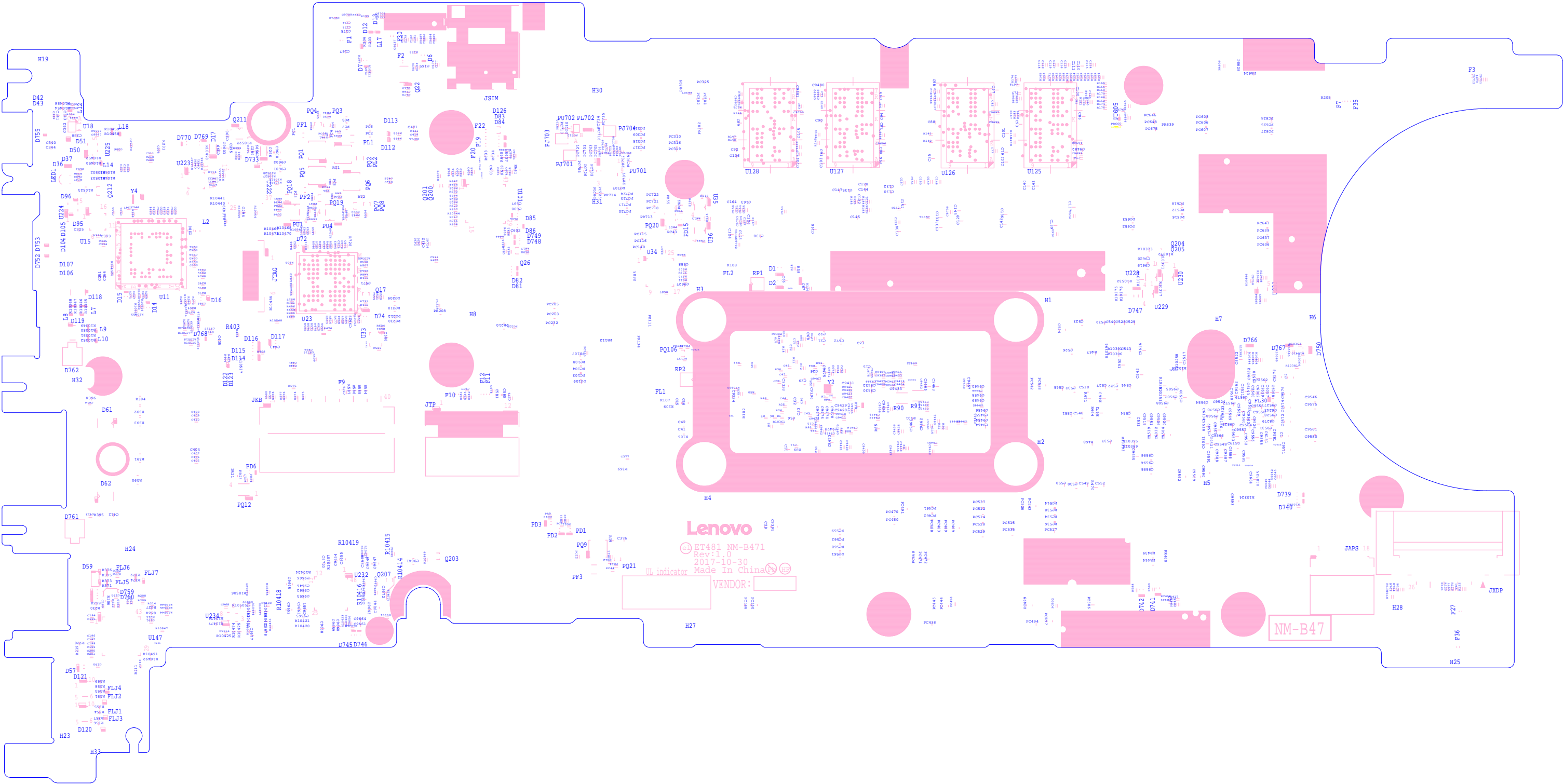


Table PR33 0603 SIZE

Rohm:ESR03EZPJ200
Pana:ERJP03J200
KOA:SG73P1JTTD200J





LCFC ELECTRONICS. INC.	
PROJECT	ET481
BOARD NO.	NM-B471 REV:1.0
LAYER NO.	SILKSCREEN_TOP
DRAW BY	JANE
Issued Date	2017-10-30
Security level	Confidential
Decipherment date	2018-10-30



Decipherment date	2018-10-30
Security level	Confidential
Issued Date	2017-10-30
DRAW BY	JANE
LAYER NO.	SILKSCREEN_BOTTOM
BOARD NO.	NM-B471 REV:1.0
PROJECT	ET481
LCFC ELECTRONICS . INC.	