

Project Namel: Gambit MLK MT
PCB Number: 17529
PCBA Ver.: A00
SCH Ver.: A00
Project Code : 3PD0A2010001
PCB Size: 257.4 x 244mm, 1.6mm, 4 Layers

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04	CPU_(THERMAL/CLOCK/PM/CFG)
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07	CPU_(DDI/EDP)
08	CPU_(CPU Power)
09	CPU_(VSS)
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12	DDR DIMM_2
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14	(R)
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17	PCH_(PCI-E/SATA)
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PAGE	TITLE
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70	(R)
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72	(R)
73	(R)
74	(R)
75	(R)
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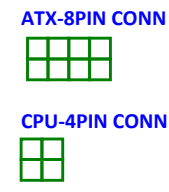
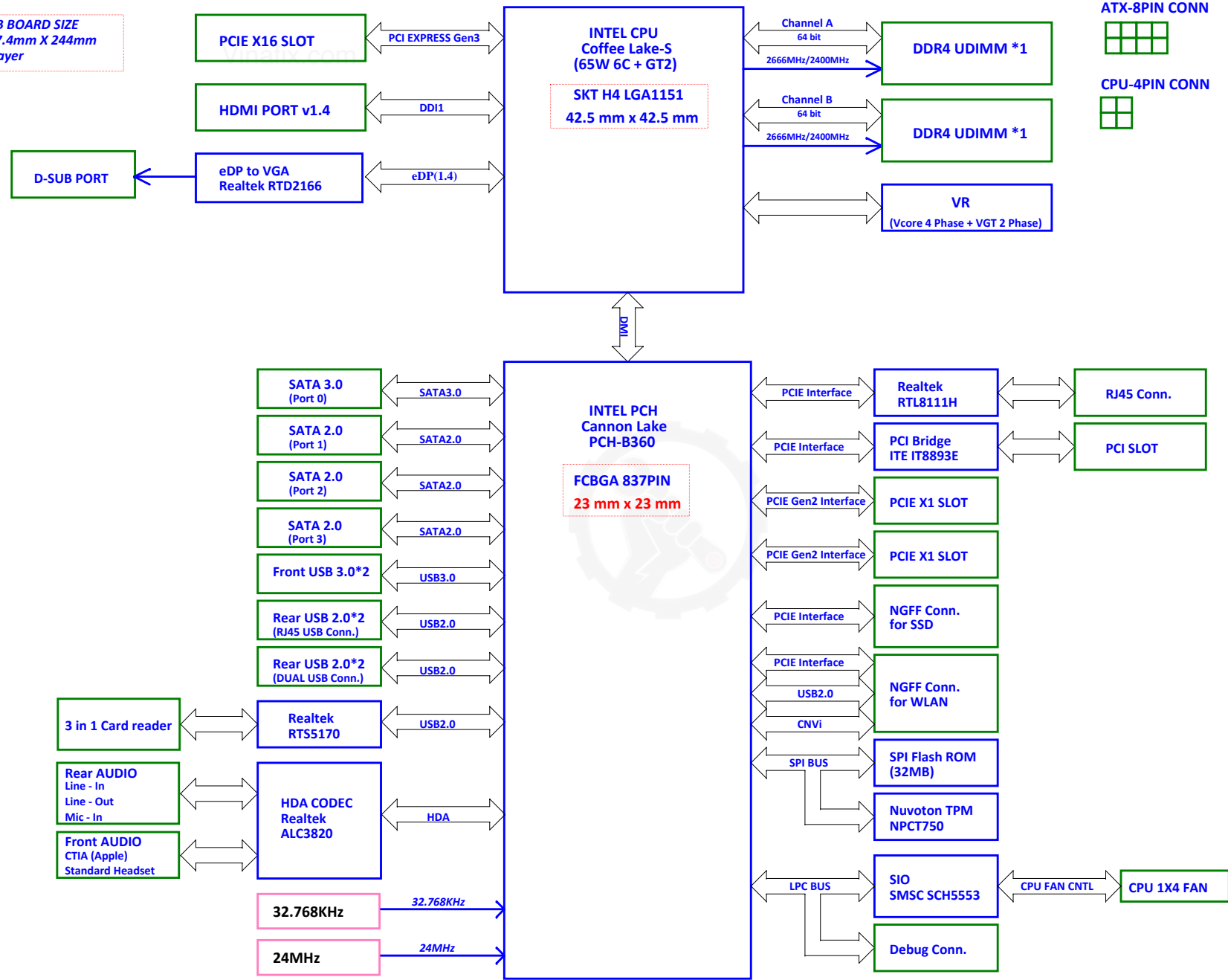
Jumper Setting		
JMP1	Pin 1-2	With Jumper to ME Disable
	Pin 3-4	Without Jumper to Clear Password
	Pin 5-6	With Jumper to Clear CMOS
DB1	PD 1K	PD 1K to GND for Debug, All Power-On

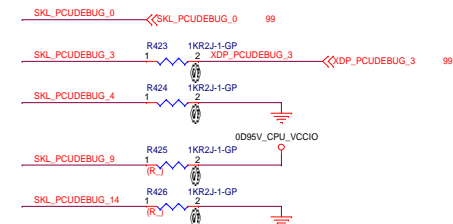
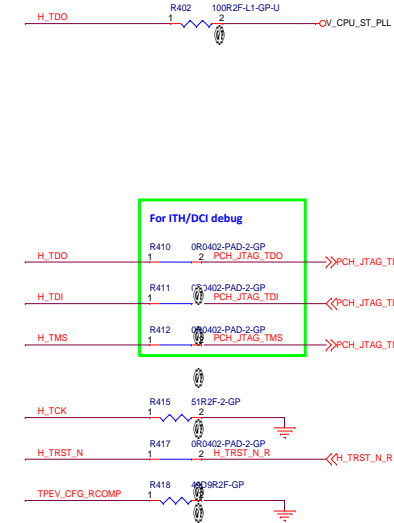
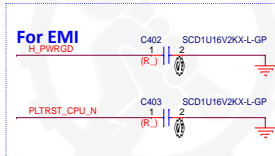
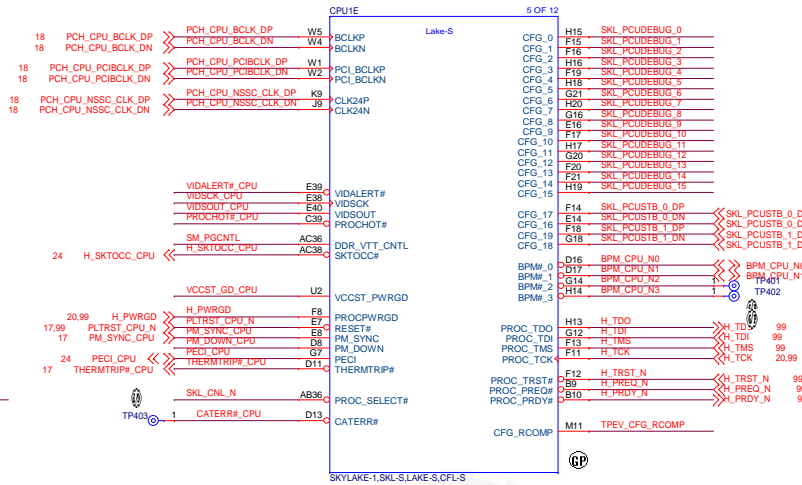
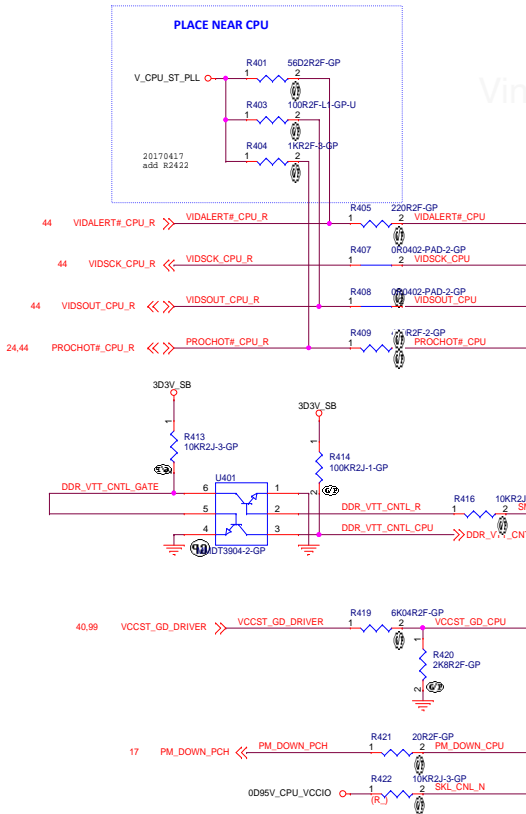
BOM Configuration

(R_): Unmount
(X_): Debug
(GAM_): Gambit MLK MT
(EAG_): Eagle MT
(TPM_): TPM function
(NONTPM_): non-TPM function

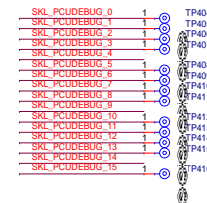
Power sates						
	Name	G3	DSW	S5	S4	S3 S0
+12V	V_12P0_A		O	O	O	O
	+12V					O
-12V	V_12V_CPU_S0		O	O	O	O
	-12V					O
+5V	5V_S0					O
	USBVCC12			O	O	O
3.3V	USBVCC34			O	O	O
	USBVCC78			O	O	O
VBAT	5V_S5		O	O	O	O
	V_5_CODEC		O	O	O	O
VDDQ	3P3V_S0					O
	3P3V_AUD_S0					O
DIMM	3P3V_SB					O
	3P3V_SPI			O	O	O
PCH	3P3V_LAN			O	O	O
	3P3V_M2VAUX					O
CPU	3P3V_PCIVAUX					O
	3P3V_S5		O	O	O	O
VCCSA	3P0V_BAT_VREG		O	O	O	O
	VBAT1		O	O	O	O
VCCIO	VBAT2					O
	+VCCPLL_OC					O
V_CPU_CORE	V_SM					O
	V_SM_VTT					O
V_CPU_GT	V_VPP					O
	V1P0_PCH_SB					O
V_CPU_IO	+V1P0A_VCCAPLL					O
	+V1P0A_VCCF24_1P0			O	O	O
V_CPU_SA	+V1P0A_VCCAMPHYPLL					O
	V_CPU_ST_PLL					O
+VCCFUSEPRG	V_CPU_CORE					O
	V_CPU_GT					O

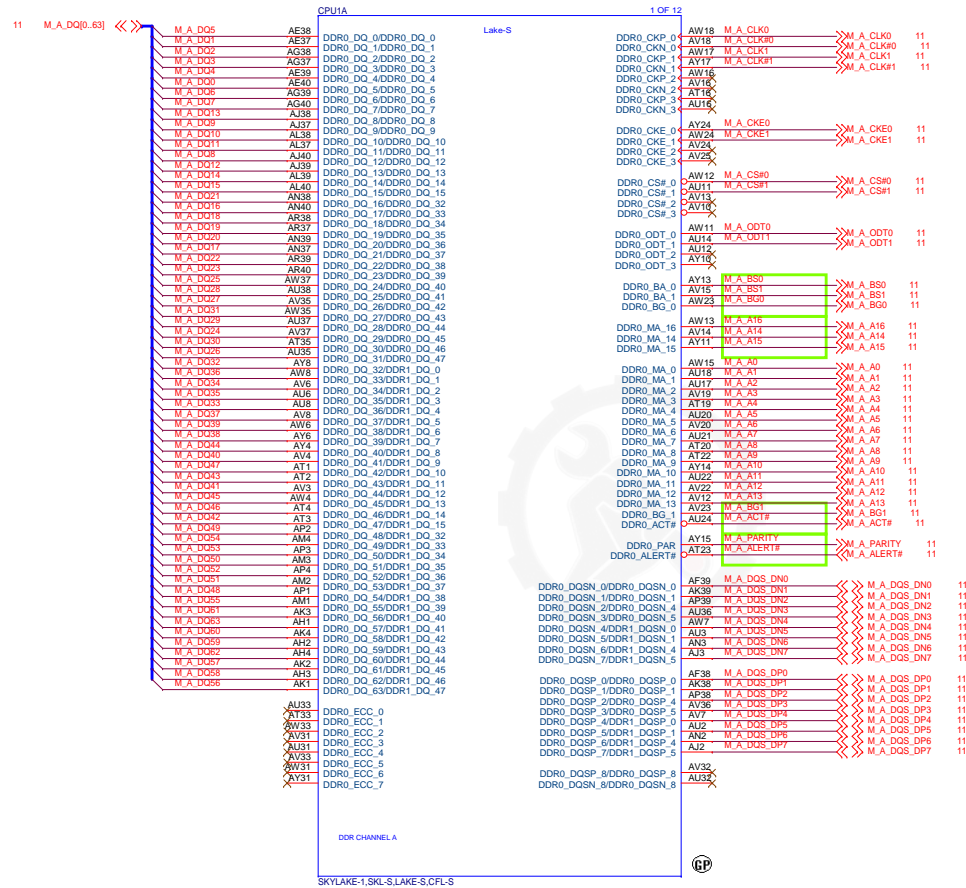
PCB BOARD SIZE
257.4mm X 244mm
4 Layer

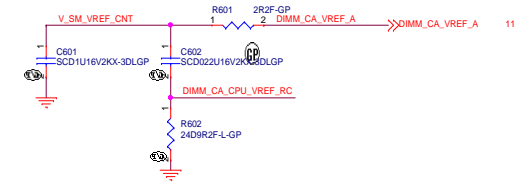
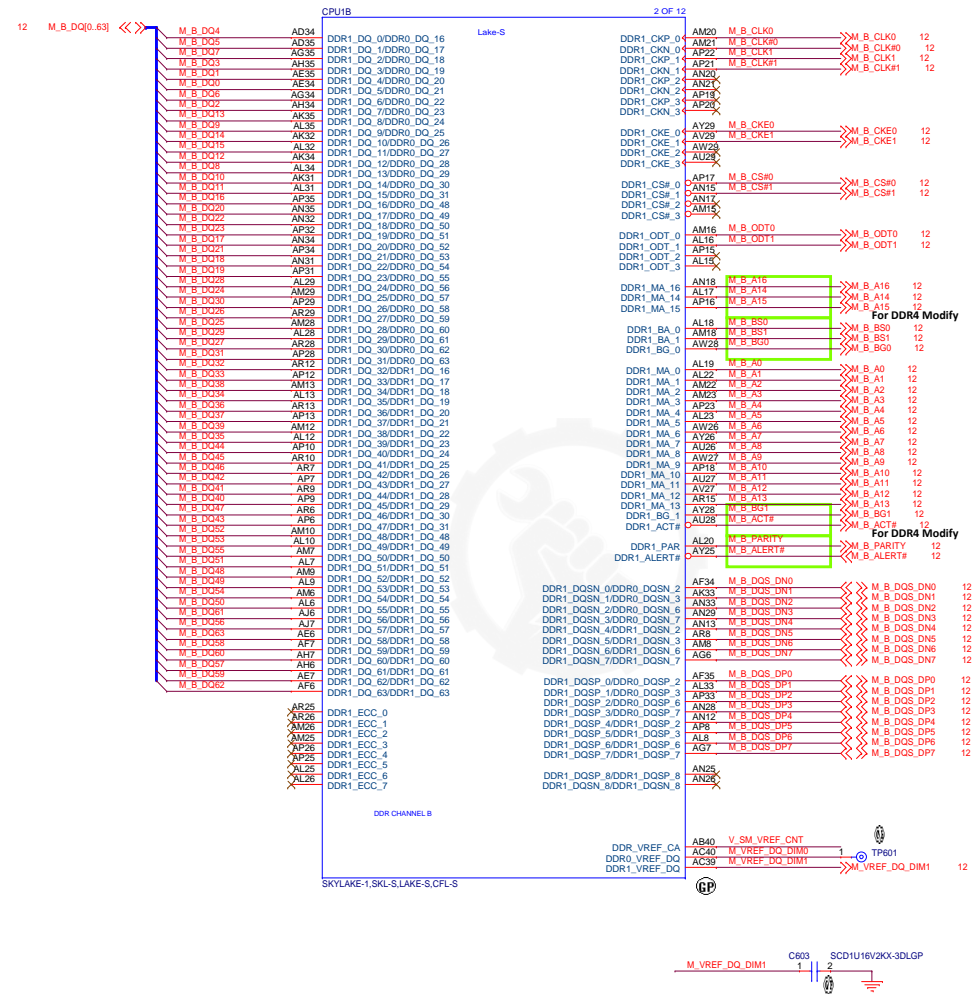


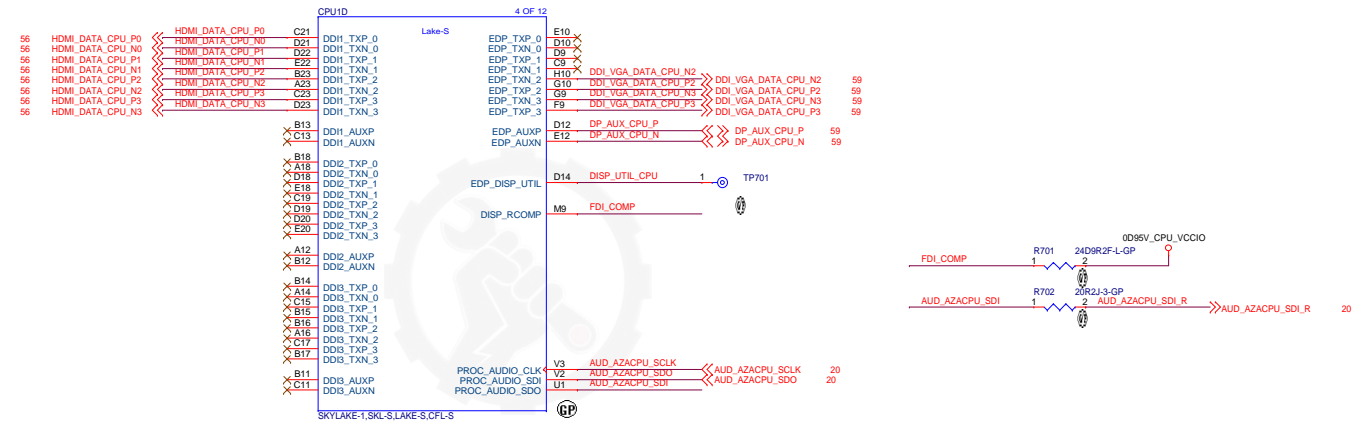


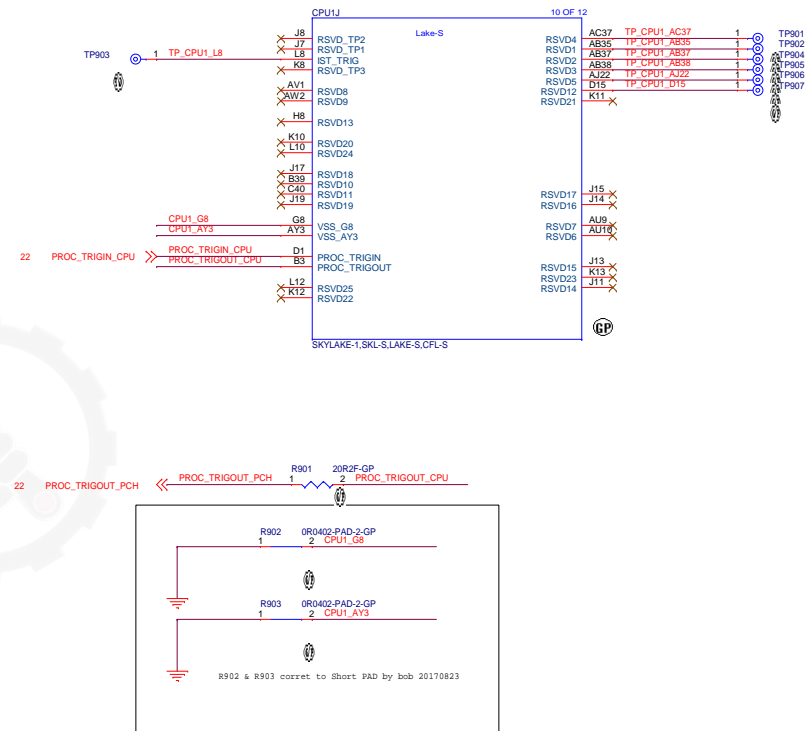
Signal Name	Description	Dir.	Buffer Type	Link Type	Availability
CFG[19:0]	<p>Configuration Signals: The CFG signals have a default value of '1' if not terminated on the board. Refer to the appropriate platform design guide for pull-down recommendations when a logic low is desired.</p> <p>Intel recommends placing test points on the board for CFG pins.</p> <ul style="list-style-type: none"> CFG[0]: Stall reset sequence after PCU PLL lock until de-asserted: <ul style="list-style-type: none"> 1 = (Default) Normal Operation; No stall. 0 = Stall. CFG[1]: Reserved configuration lane. CFG[2]: PCI Express* Static x16 Lane Numbering Reversal. <ul style="list-style-type: none"> 1 = Normal operation 0 = Lane numbers reversed. CFG[3]: Reserved configuration lane. CFG[4]: eDP enable: <ul style="list-style-type: none"> 1 = Disabled. 0 = Enabled. CFG[6:5]: PCI Express* Bifurcation <ul style="list-style-type: none"> 00 = 1 x8, 2 x4 PCI Express* 01 = reserved 10 = 2 x8 PCI Express* 11 = 1 x16 PCI Express* CFG[7]: PEG Training: <ul style="list-style-type: none"> 1 = (default) PEG Train immediately following RESET# de assertion. 0 = PEG Wait for BIOS for training. CFG[19:8]: Reserved configuration lanes. 	I/O	GTL	SE	All processor lines. CFG[2], CFG[6:5] and CFG[7] are relevant for H and S-processor line only and test point may be placed on the board for them.

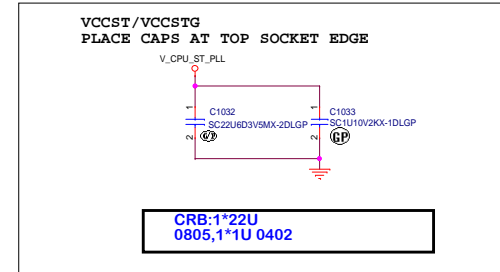
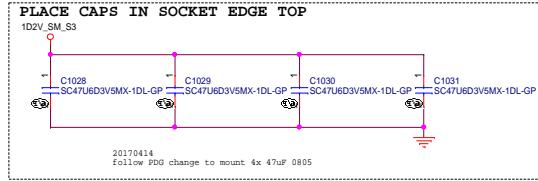
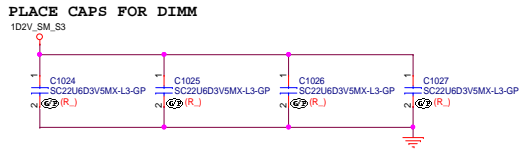
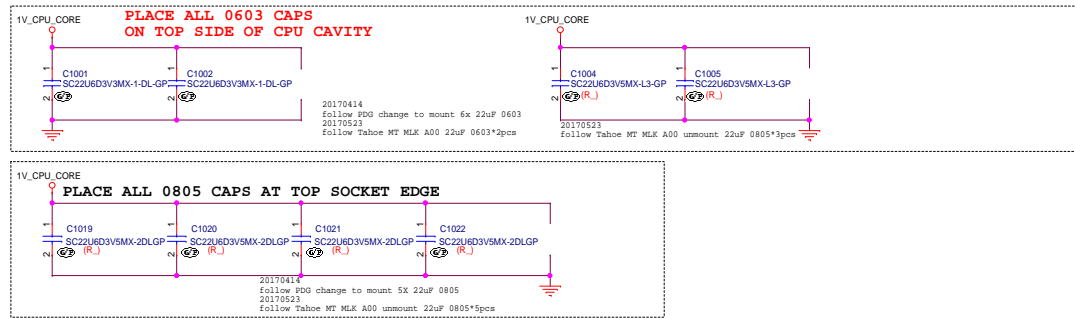
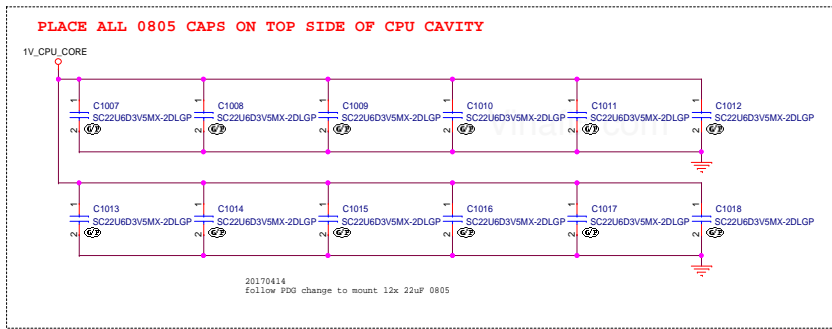




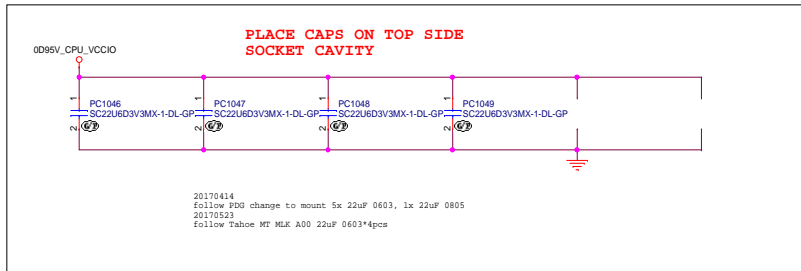
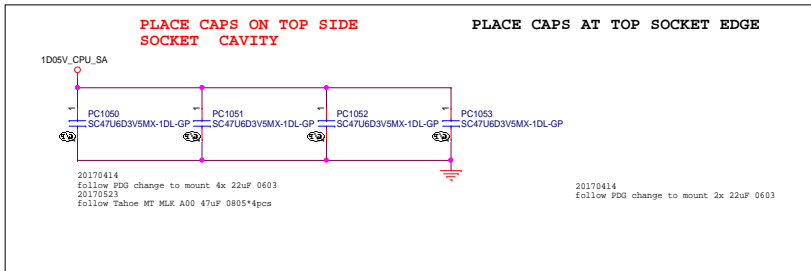
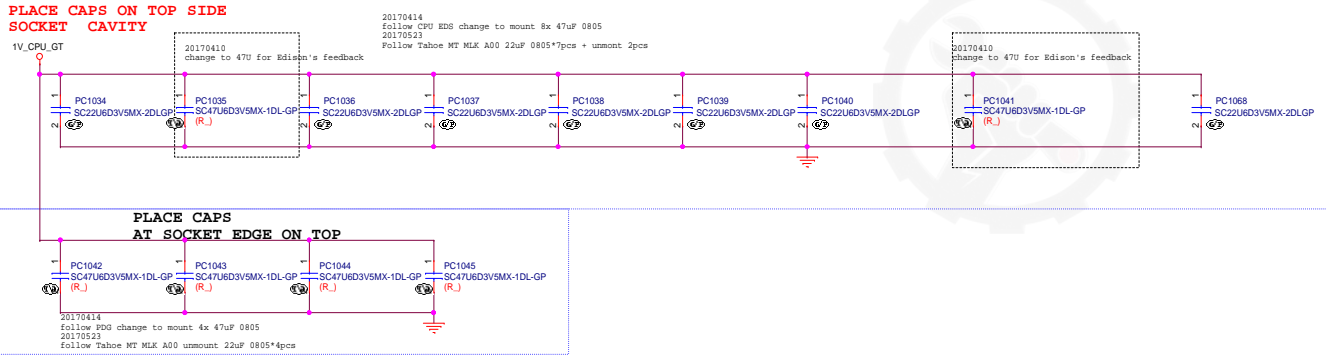


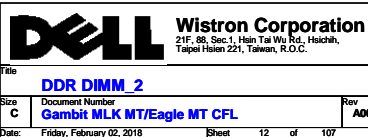






Follow D9 22uF*7 2017/08/23





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A	Gambit MLK MT/Eagle MT CFL	A00
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Size

A

Document Number

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Rev

A00

Date: Friday, February 02, 2018

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TP1501 1 TP_VSS_AL37

20170406
USB charger function is removed
net CNV_CLK_BK1 @ pin Y47
net PCH_CHAR_CTL3 @ pin AA45 is removed

20170519
remove test point for layout

20170406
change to single 32MB SPI ROM
remove SPI_CS_PCH_N2
change SPI_CS_PCH_N1 to TFM
20170605
according to PDD, change SPI_CS_PCH_N2 to TFM
remove SPI_CS_PCH_N1

20170515
remove the net L_BAR_DET_N
VGA_CABLE_DET_N 59
W46
W45

20170519
remove test point for layout

20170519
remove test point for layout

20170519
remove test point for layout

20170519
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20170519
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20170519
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20170515
remove the net L_BAR_DET_N
VGA_CABLE_DET_N 59
R1502 10KR2J-3-GP
R1503 10KR2J-3-GP

20170519
remove test point for layout

20170519
remove test point for layout

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20170519
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20170413
change to on board power switch
remove the net PP_CLK_DET @ pin BF8
20170420
add the net PP_CLK_DET back for SFF

20170413
change to on board power switch
remove the net PP_CLK_DET @ pin BF8
20170420
add the net PP_CLK_DET back for SFF

20170407
SDO change to 3D3V_S0
net PCH_SD_PWR_EN @ pin BB20 is removed

20170407
SDO change to 3D3V_S0
net PCH_SD_PWR_EN @ pin BB20 is removed

20170407
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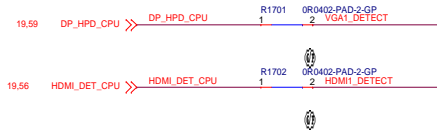
20170407
SDO change to 3D3V_S0
net PCH_SD_PWR_EN @ pin BB20 is removed

20170413
change to on board power switch
remove the net PP_CLK_DET @ pin BF8
20170420
add the net PP_CLK_DET back for SFF

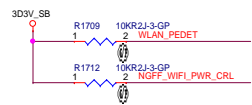
20170413
change to on board power switch
remove the net PP_CLK_DET @ pin BF8
20170420
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File PCH (SPI/UART/I2C)
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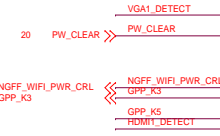


20170413
change to on board power switch
remove the net CHASSIS_ID_0 @ pin L47
20170420
add the net CHASSIS_ID_0 back for SFP



20170426
change to HSD

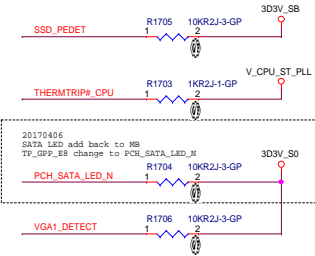
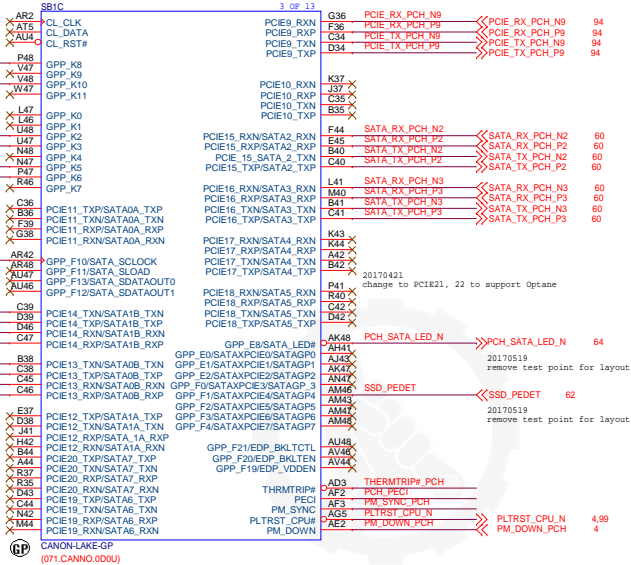
20170418
PW_CLEAR change from GPP_K9 to GPP_K10 to follow D9 Bison
PCH_RST_GPD change from GPP_K10 to GPP_P23 to follow D9 Bison



20170426
change to HSD

20170426
change to HSD

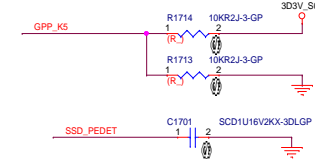
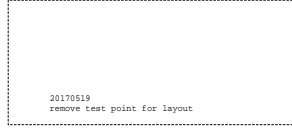
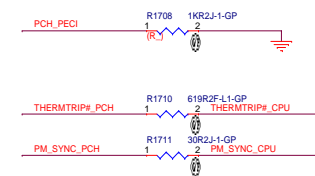
20170421
change to PCI823, 24 to support Optane

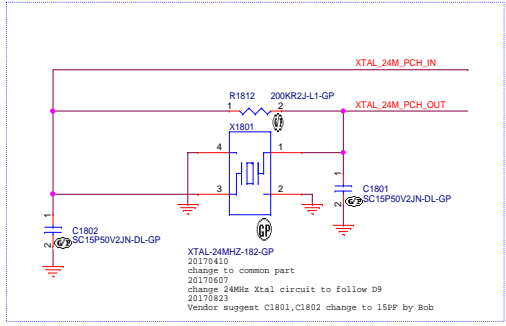
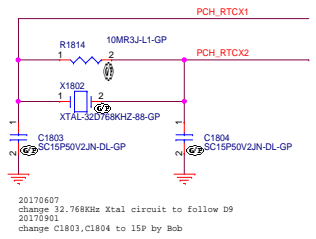
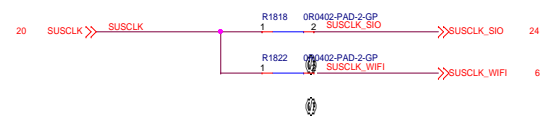
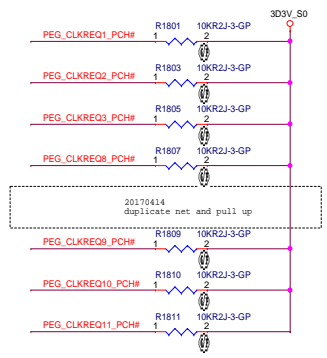
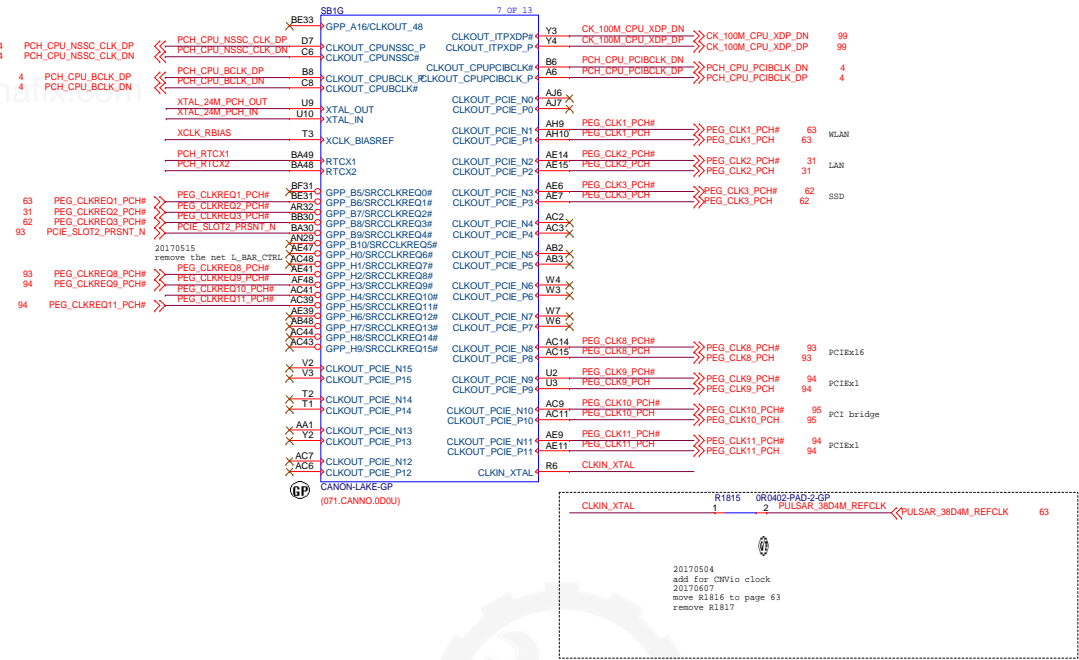
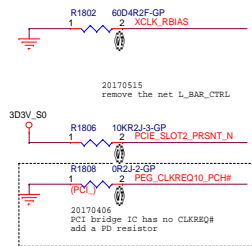


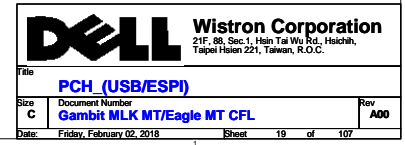
PCIEx1 slot

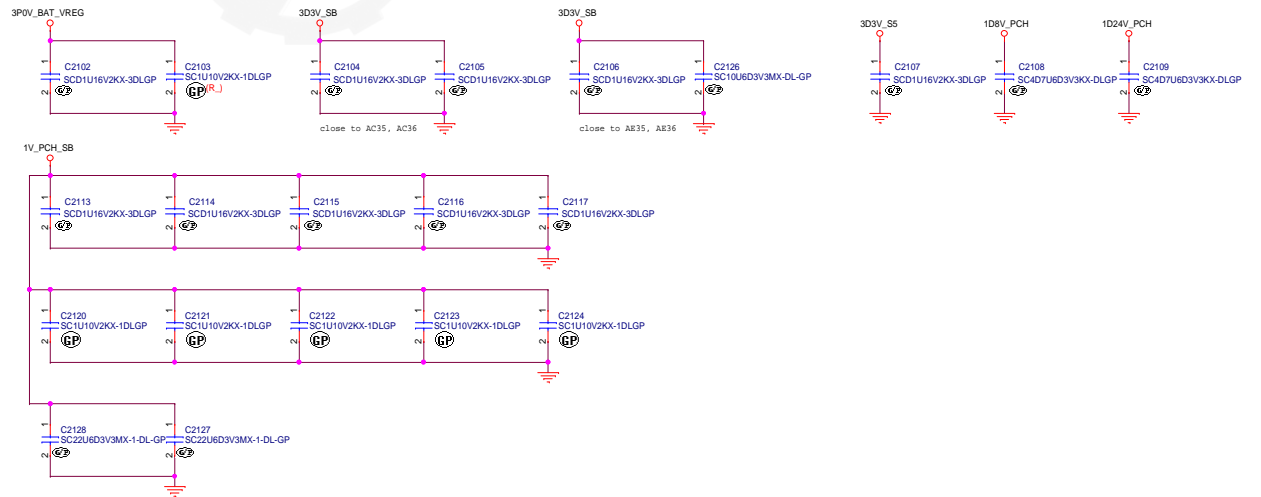
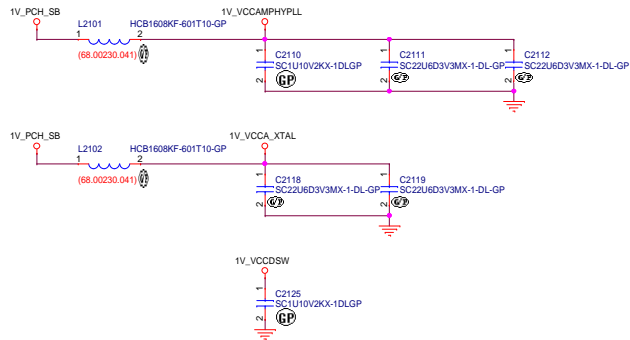
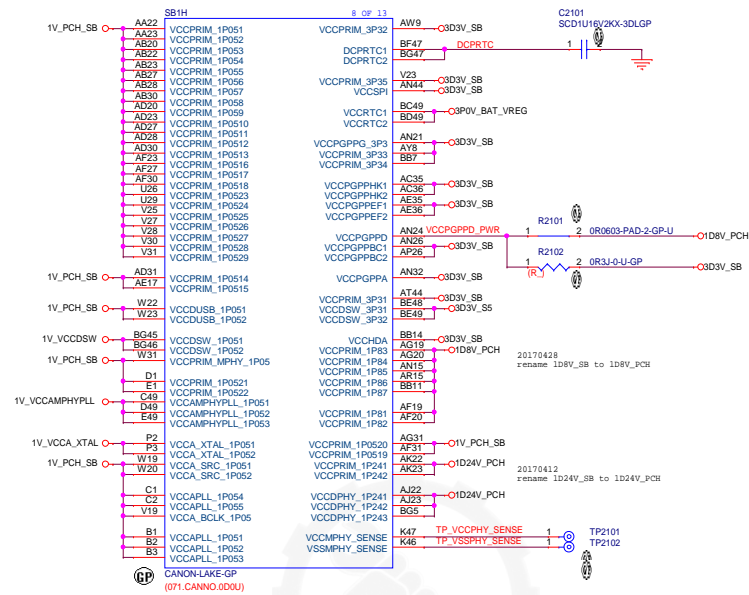
20170426
change to ODD

HSD3





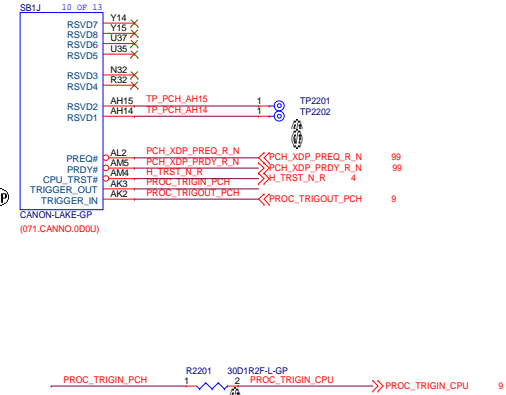


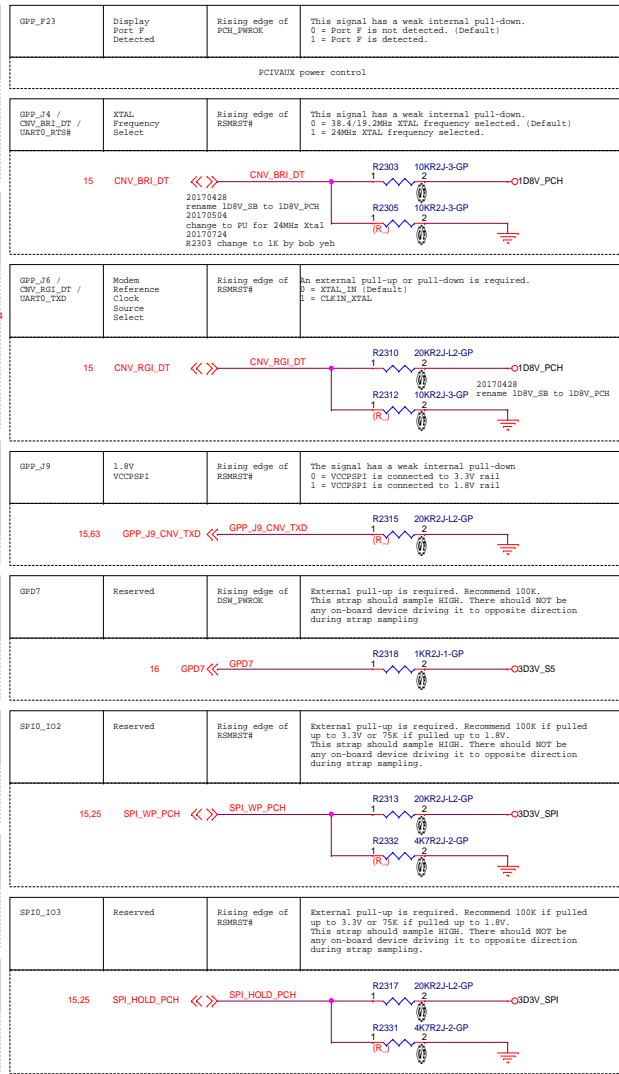
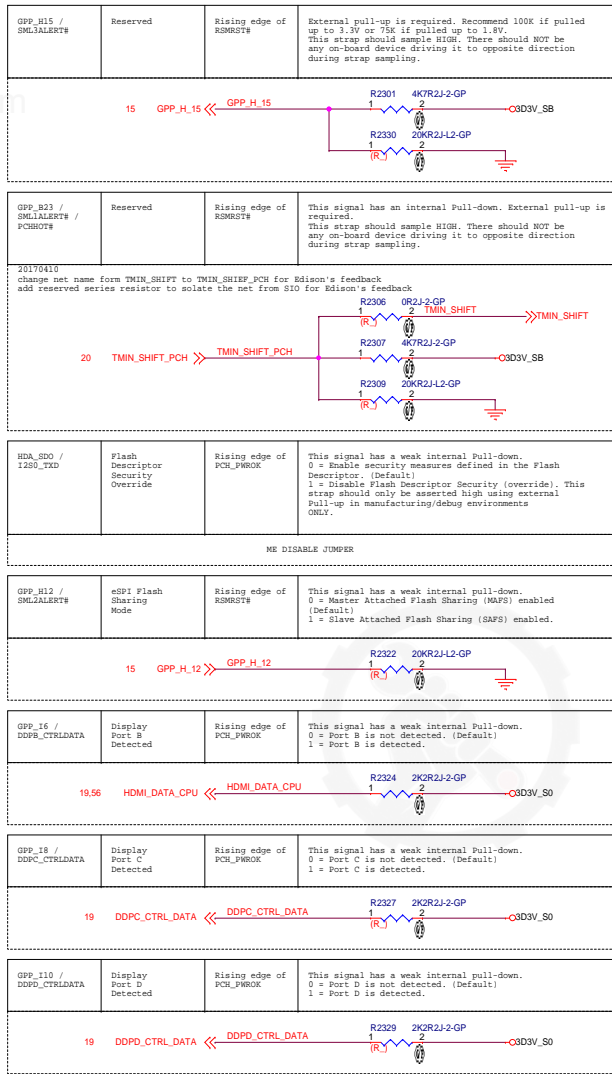
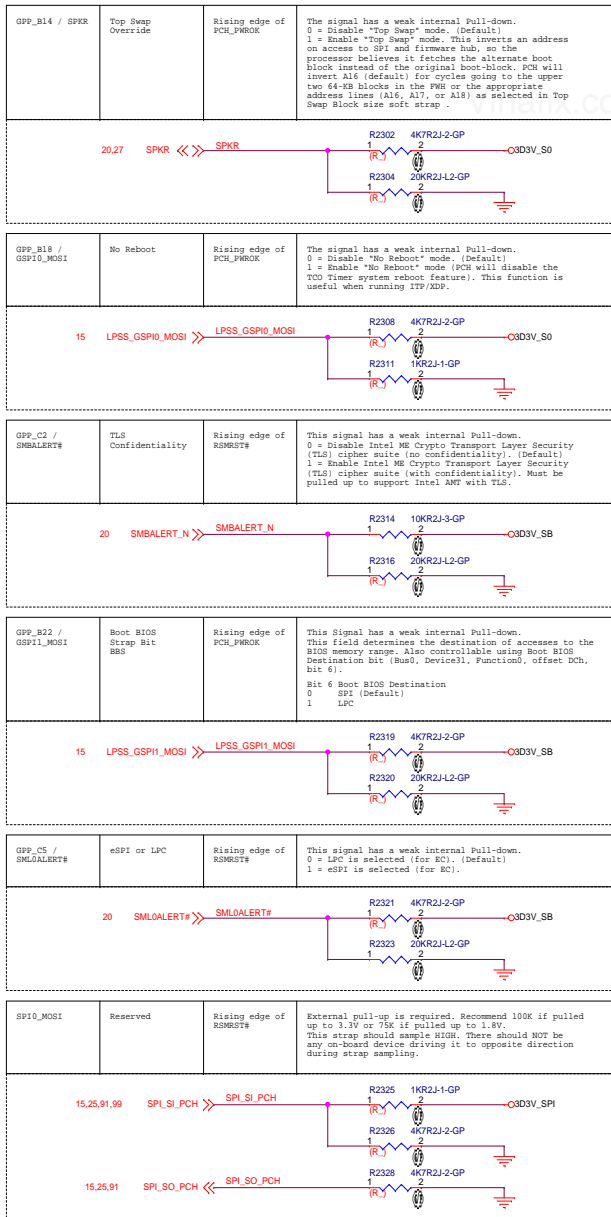


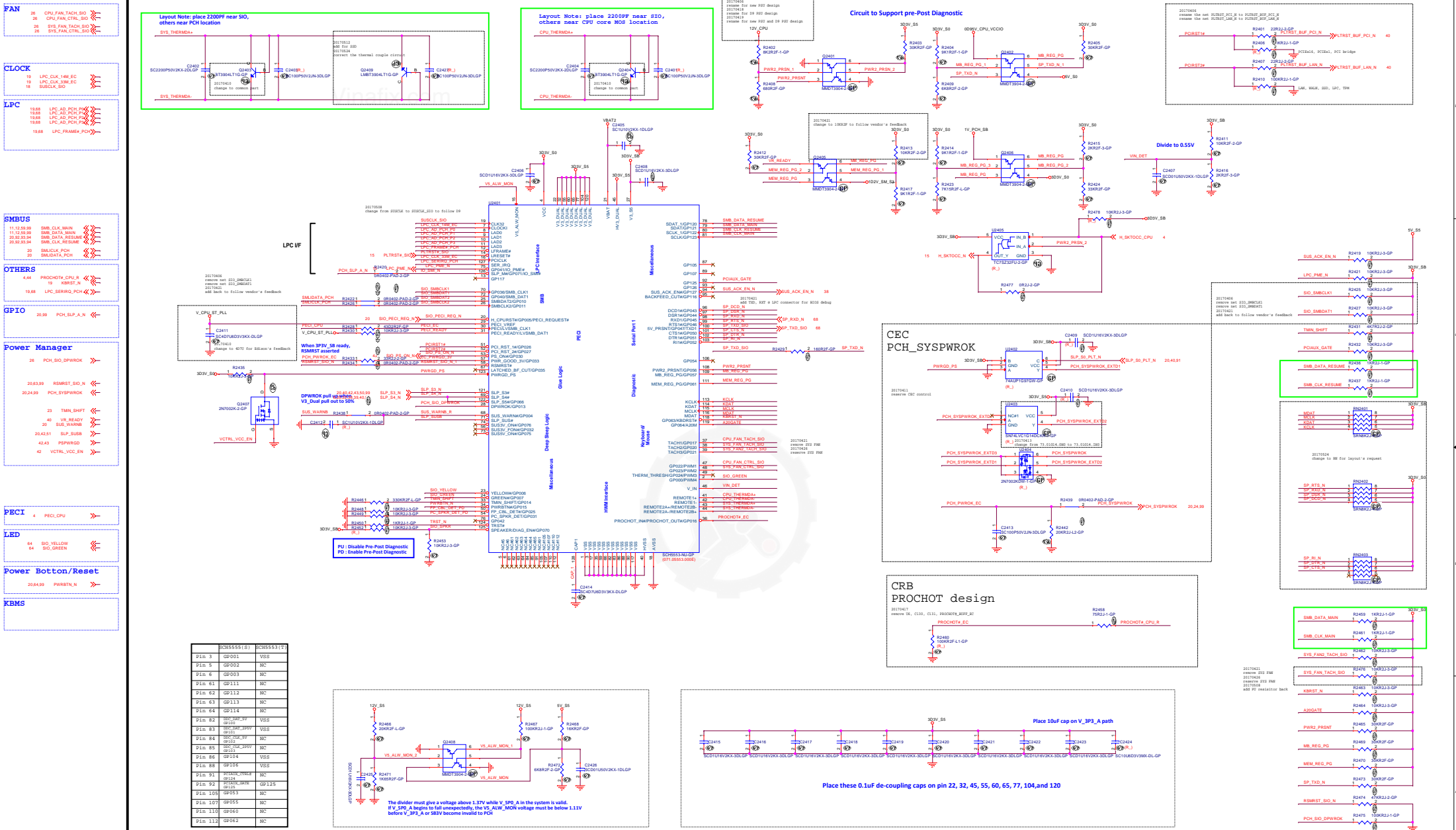
SB11	9 OF 13	AL12
A2	VSS_1	VSS_73
A28	VSS_2	VSS_74
A3	VSS_3	VSS_75
A33	VSS_4	VSS_76
A37	VSS_5	VSS_77
A4	VSS_6	VSS_78
A45	VSS_7	VSS_79
A46	VSS_8	VSS_80
A47	VSS_9	VSS_81
A48	VSS_10	VSS_82
A5	VSS_11	VSS_83
A8	VSS_12	VSS_84
AA19	VSS_13	VSS_85
AA20	VSS_14	VSS_86
AA25	VSS_15	VSS_87
AA27	VSS_16	VSS_88
AA28	VSS_17	VSS_89
AA30	VSS_18	VSS_90
AA31	VSS_19	VSS_91
AA40	VSS_20	VSS_92
AA5	VSS_21	VSS_93
AB19	VSS_22	VSS_94
AB25	VSS_23	VSS_95
AB31	VSS_24	VSS_96
AC12	VSS_25	VSS_97
AC17	VSS_26	VSS_98
AC33	VSS_27	VSS_99
AC38	VSS_28	VSS_100
AC4	VSS_29	VSS_101
AC46	VSS_30	VSS_102
AD1	VSS_31	VSS_103
AD19	VSS_32	VSS_104
AD2	VSS_33	VSS_105
AD22	VSS_34	VSS_106
AD25	VSS_35	VSS_107
AD49	VSS_36	VSS_108
AE12	VSS_37	VSS_109
AE33	VSS_38	VSS_110
AE38	VSS_39	VSS_111
AE4	VSS_40	VSS_112
AF22	VSS_41	VSS_113
AF26	VSS_42	VSS_114
AF28	VSS_43	VSS_115
AG1	VSS_44	VSS_116
AG22	VSS_45	VSS_117
AG23	VSS_46	VSS_118
AG25	VSS_47	VSS_119
AG27	VSS_48	VSS_120
AG28	VSS_49	VSS_121
AG30	VSS_50	VSS_122
AG49	VSS_51	VSS_123
AH12	VSS_52	VSS_124
AH17	VSS_53	VSS_125
AH33	VSS_54	VSS_126
AH38	VSS_55	VSS_127
AJ19	VSS_56	VSS_128
AJ20	VSS_57	VSS_129
AJ25	VSS_58	VSS_130
AJ27	VSS_59	VSS_131
AJ28	VSS_60	VSS_132
AJ30	VSS_61	VSS_133
AJ31	VSS_62	VSS_134
AK19	VSS_63	VSS_135
AK20	VSS_64	VSS_136
AK25	VSS_65	VSS_137
AK27	VSS_66	VSS_138
AK28	VSS_67	VSS_139
AK30	VSS_68	VSS_140
AK31	VSS_69	VSS_141
AK4	VSS_70	VSS_142
AK4	VSS_71	VSS_143
AK46	VSS_72	VSS_144

SB1L	12 OF 13	M24
BG3	VSS_145	VSS_196
BG33	VSS_146	VSS_197
BG37	VSS_147	VSS_198
BG4	VSS_148	VSS_199
BG48	VSS_149	VSS_200
C12	VSS_150	VSS_201
C25	VSS_151	VSS_202
C30	VSS_152	VSS_203
C4	VSS_153	VSS_204
C48	VSS_154	VSS_205
C5	VSS_155	VSS_206
D12	VSS_156	VSS_207
D16	VSS_157	VSS_208
D17	VSS_158	VSS_209
D30	VSS_159	VSS_210
D33	VSS_160	VSS_211
E10	VSS_161	VSS_212
E13	VSS_162	VSS_213
E15	VSS_163	VSS_214
E17	VSS_164	VSS_215
E19	VSS_165	VSS_216
E22	VSS_166	VSS_217
E24	VSS_167	VSS_218
E26	VSS_168	VSS_219
E31	VSS_169	VSS_220
E33	VSS_170	VSS_221
E35	VSS_171	VSS_222
E40	VSS_172	VSS_223
E42	VSS_173	VSS_224
E8	VSS_174	VSS_225
F41	VSS_175	VSS_226
F43	VSS_176	VSS_227
F47	VSS_177	VSS_228
G44	VSS_178	VSS_229
G6	VSS_179	VSS_230
H8	VSS_180	VSS_231
J10	VSS_181	VSS_232
J26	VSS_182	VSS_233
J29	VSS_183	VSS_234
J4	VSS_184	VSS_235
J40	VSS_185	VSS_236
J46	VSS_186	VSS_237
J47	VSS_187	VSS_238
J48	VSS_188	VSS_239
J9	VSS_189	VSS_240
K11	VSS_190	VSS_241
K39	VSS_191	VSS_242
M15	VSS_192	VSS_243
M18	VSS_193	VSS_244
M21	VSS_194	VSS_245
	VSS_195	VSS_246

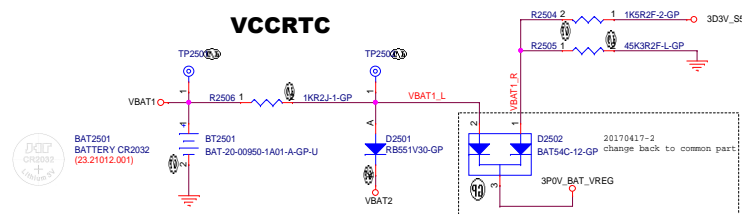
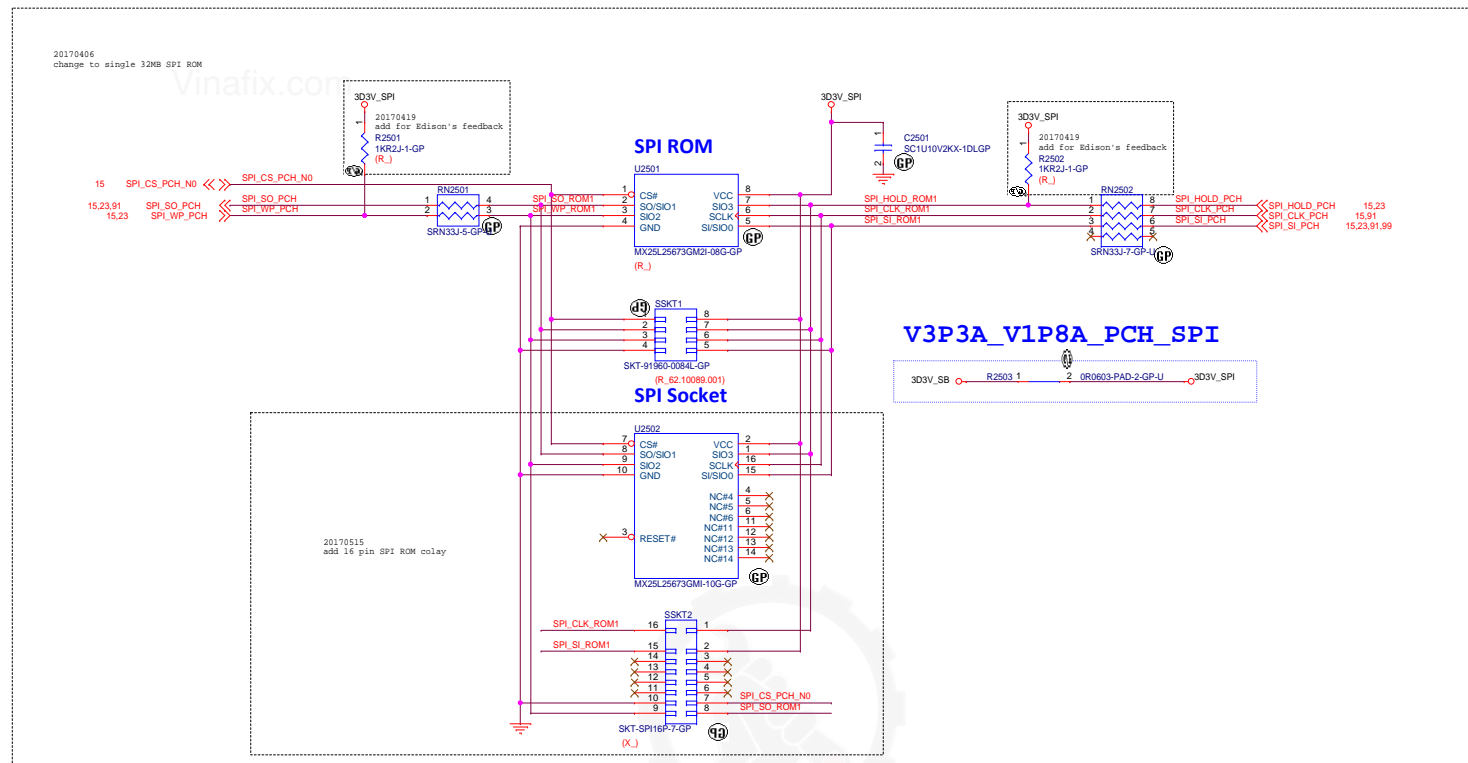
CANON-LAKE-GP
(071.CANNO.000U)



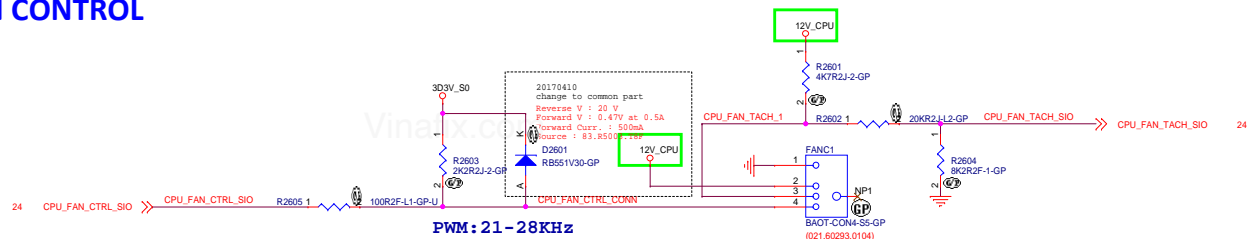




Pin	Signal	Notes
Pin 3	GP001	V8B
Pin 5	GP002	NC
Pin 6	GP003	NC
Pin 61	GP111	NC
Pin 62	GP112	NC
Pin 63	GP113	NC
Pin 64	GP114	NC
Pin 82	GP100-3V	V8B
Pin 83	GP100-3V	V8B
Pin 84	GP100-3V	V8B
Pin 85	GP100-3V	V8B
Pin 86	GP104	V8B
Pin 88	GP106	V8B
Pin 91	GP108	NC
Pin 92	GP109	GP125
Pin 105	GP153	NC
Pin 107	GP155	NC
Pin 110	GP160	NC
Pin 112	GP162	NC

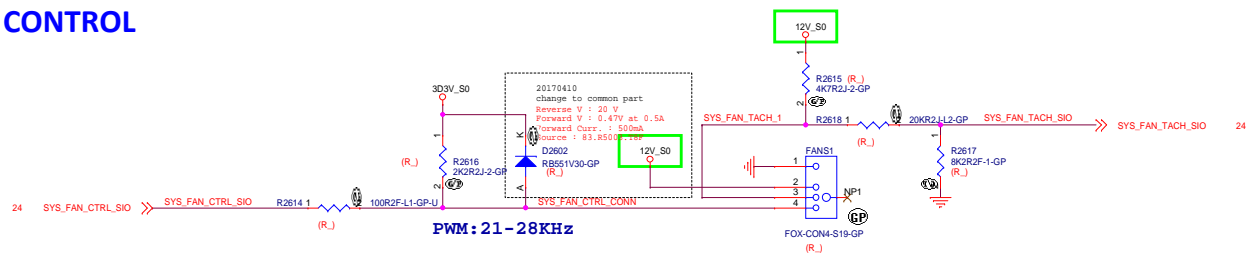


CPU FAN CONTROL



SYS FAN CONTROL

```
20170421
remove SYS FAN
20170426
reserve SYS FAN
```

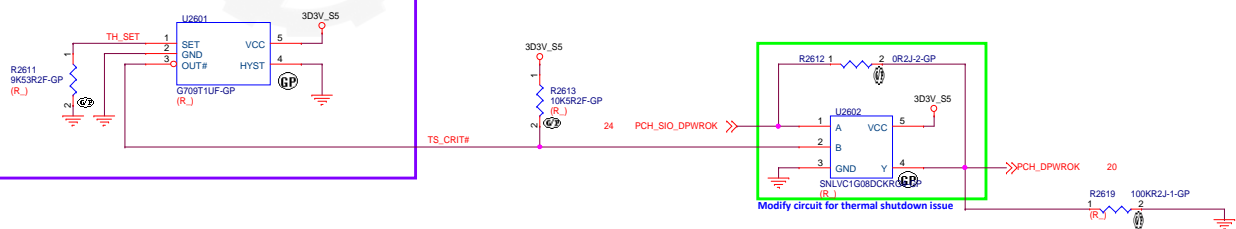


Thermal sensor G709

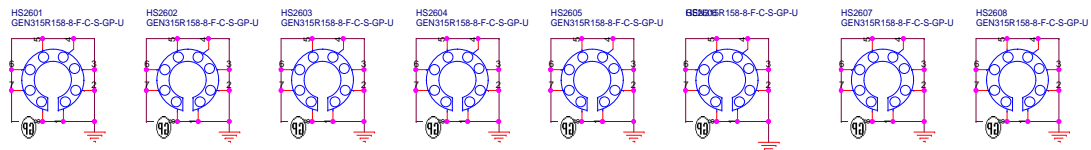
20170413
change thermal shut down solution

$$R_{\text{SET}} \text{ (k}\Omega\text{)} = 0.0012T^2 - 0.9308T + 96.147$$

Temp.=	108 °C				
RSET=	9.6174 Kohm				
		G709			
HYST =	VCC	Hysterisis is 10°C			
HYST =	GND	Hysterisis is 2°C			



20170524
recall the symbol of the screw holes



	PCB2601 MAIN PCB (348.0A202.001C)
348.0A202.001C	GLOBALB
348.0A203.001C	VICTORY
348.0A204.001C	GECS



M2601
MYLAR
(R_)



LBL2601
LABEL
(40.3EQ13.011)

LAN ID :
G0004050000

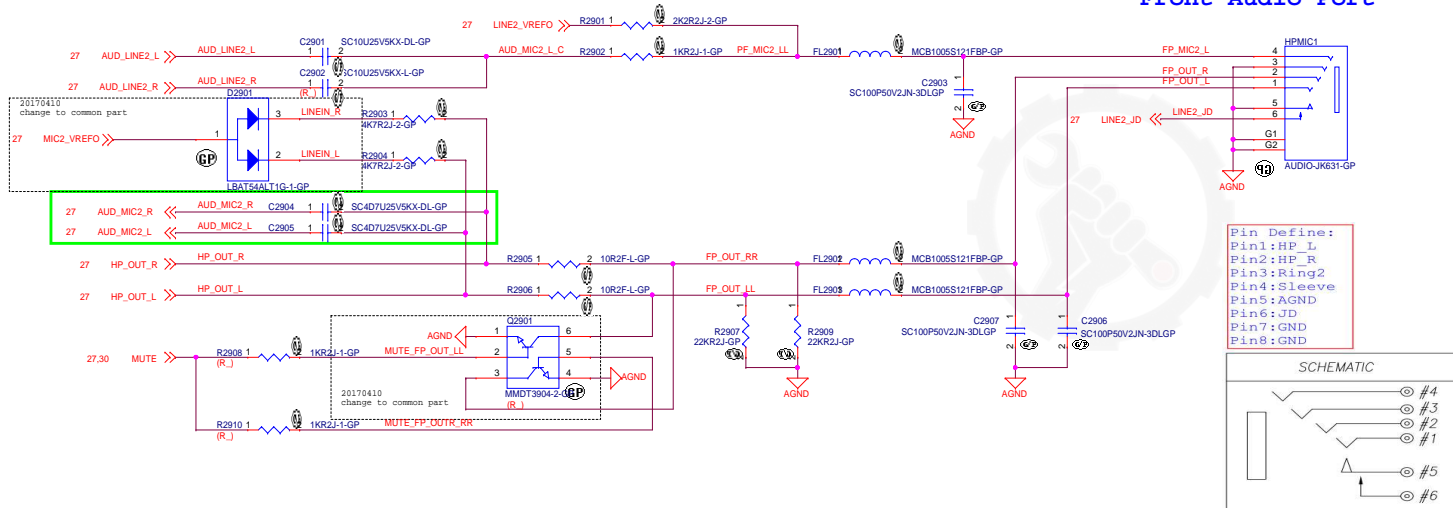


LBL2602
LABEL
(45.3E702.001)

20170412
remove internal speaker amp



Front Audio Port



4-pin 3.5mm Headset Connector Pinout

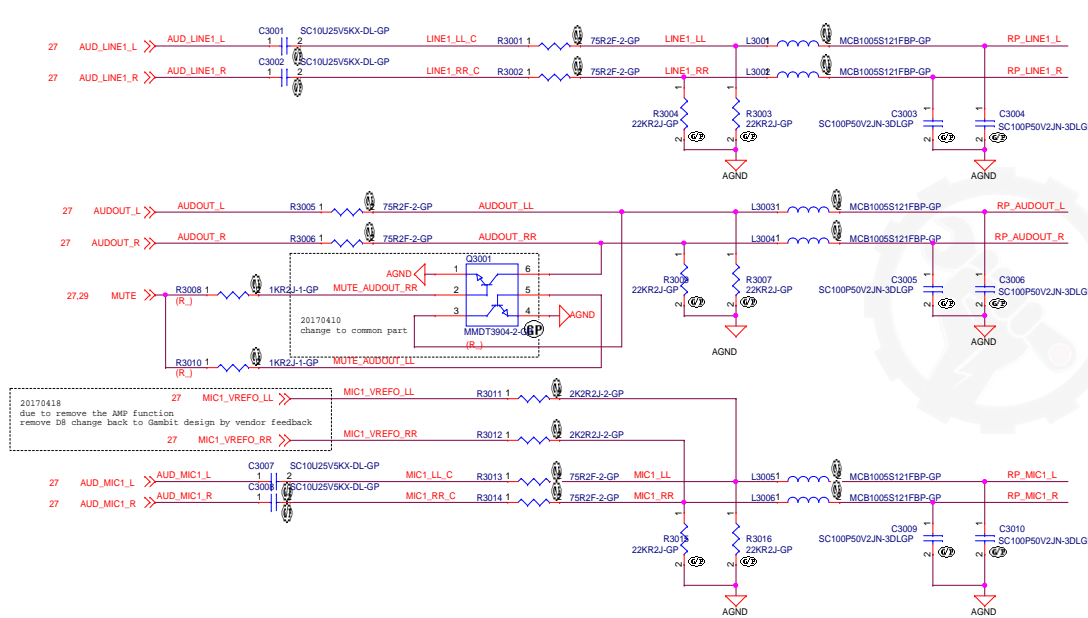


Nokia, Lenovo mobile

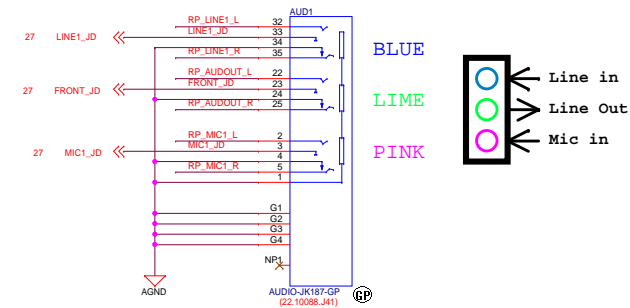
Pin Number	Pin Name	Description
1	Tip	Left Audio Out
2	Ring-1	Right Audio Out
3	Ring-2	Microphone
4	Sleeve	Ground / Common

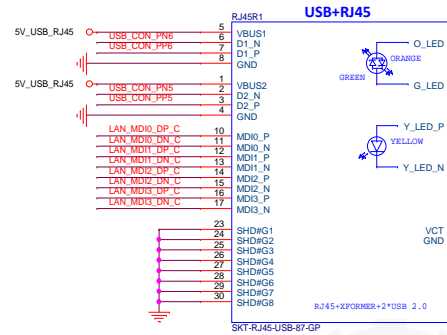
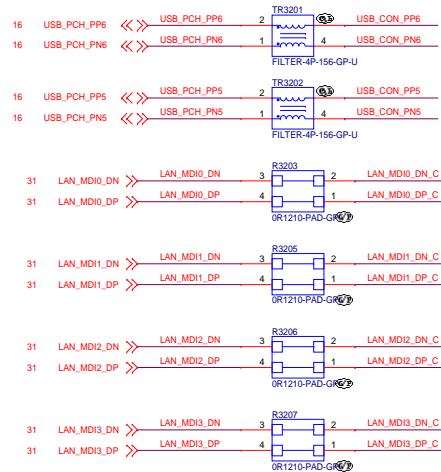
iPhone, Samsung, Blackberry, HTC

Pin Number	Pin Name	Description
1	Tip	Left Audio Out
2	Ring-1	Right Audio Out
3	Ring-2	Ground / Common
4	Sleeve	Microphone

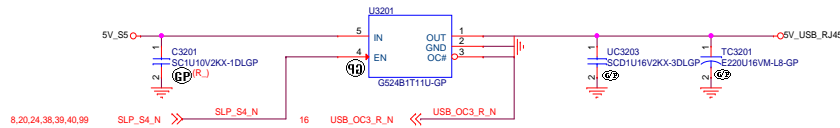
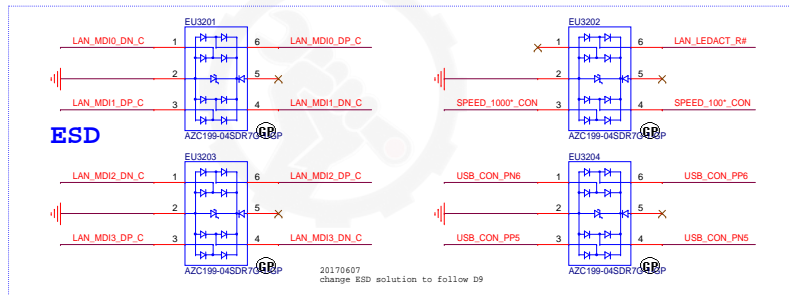


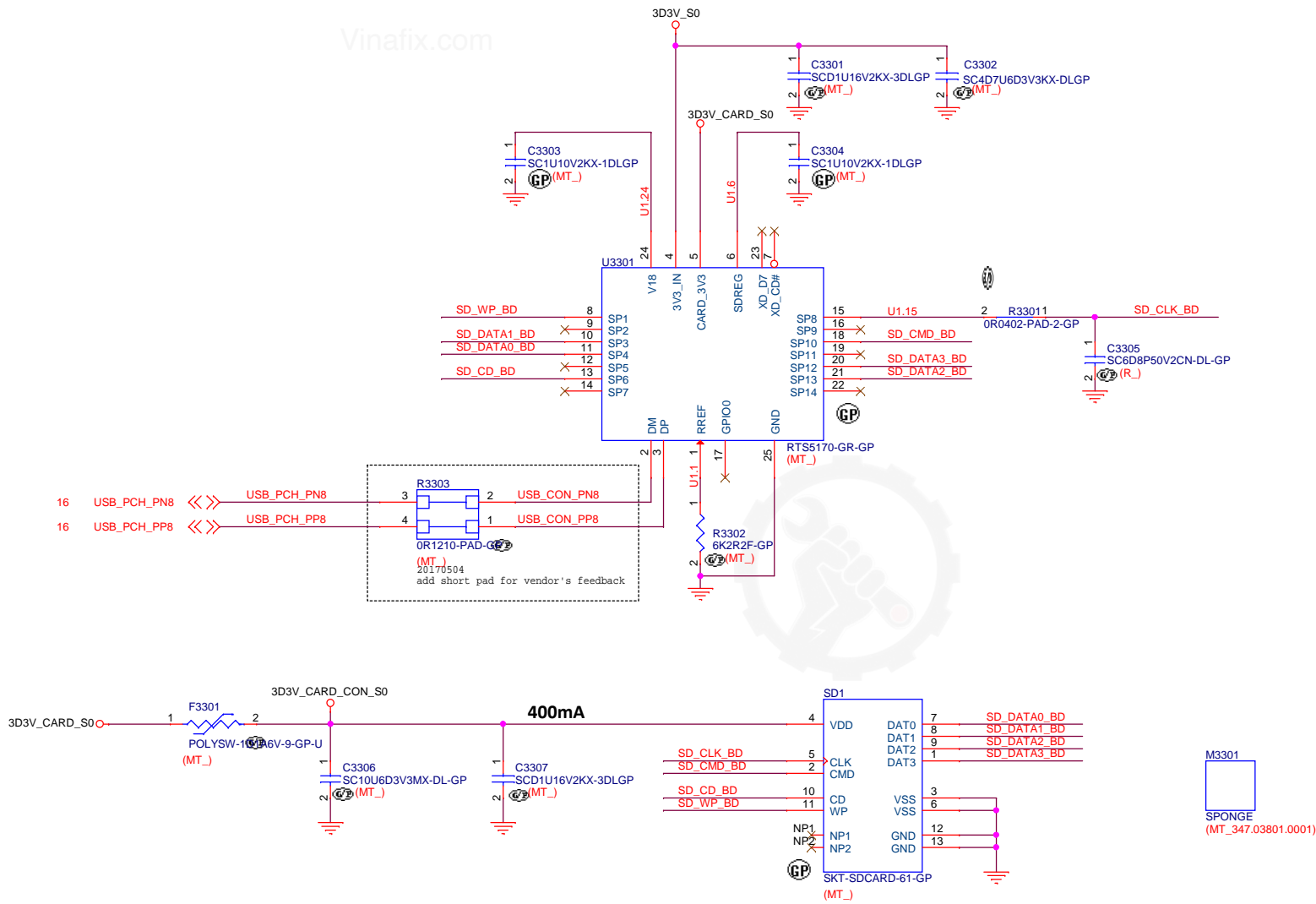
Rear Audio Port





	Giga	100M	10M
Link	Orange	Green	Green
Act	Blink	Blink	Blink





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Reserved		
Size	Document Number	Rev
B	Gambit MLK MT/Eagle MT CFL	A00
Date:	Friday, February 02, 2018	Sheet 35 of 107

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Title Reserved			
Size B	Document Number Gambit MLK MT/Eagle MT CFL		Rev A00
Date:	Friday, February 02, 2018	Sheet	36 of 107

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Size

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Document Number

Gambit MLK MT/Eagle MT CFL

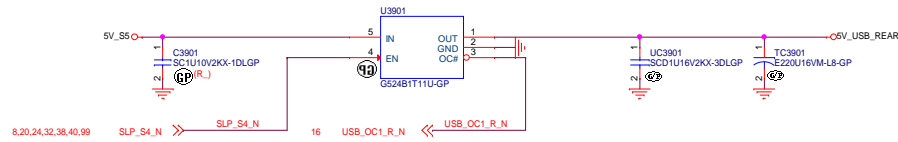
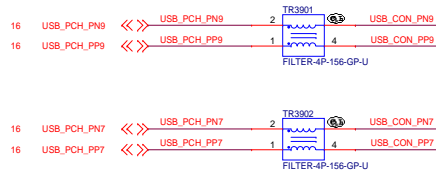
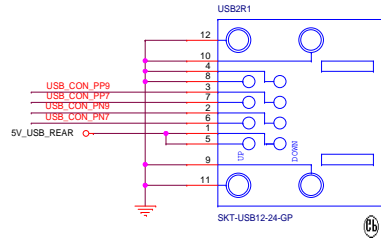
Rev

A00

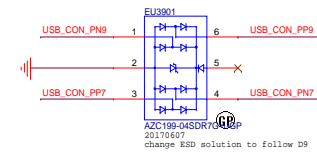
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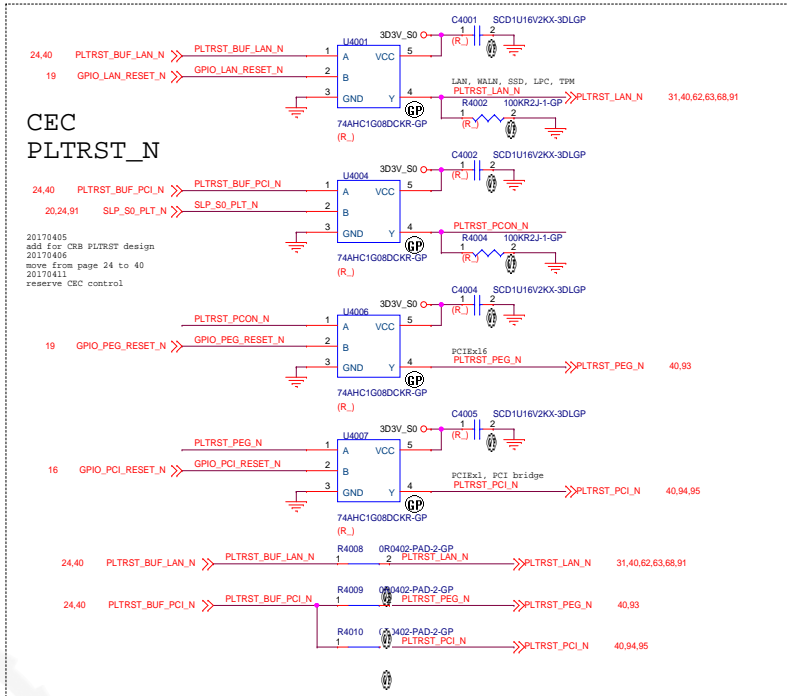
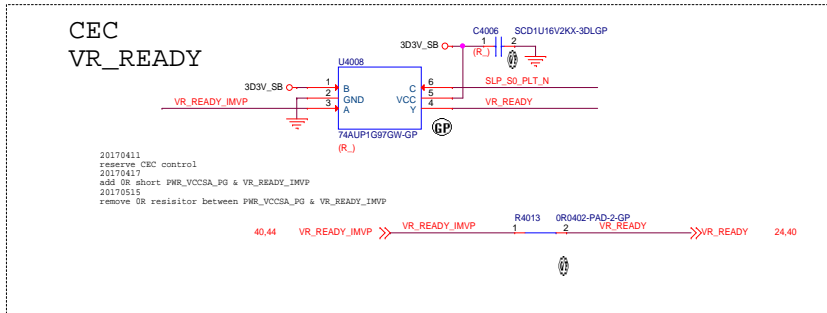
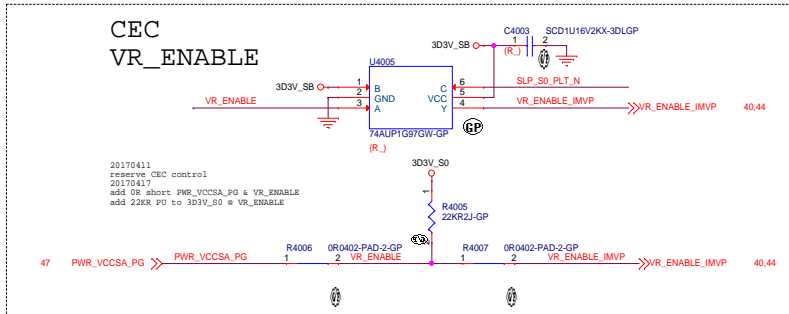
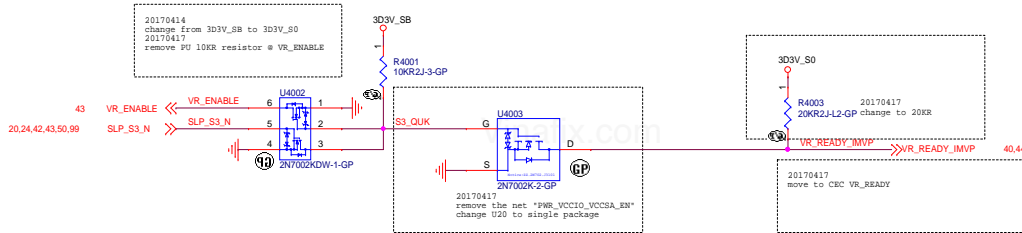
Sheet 37 of 107





ESD





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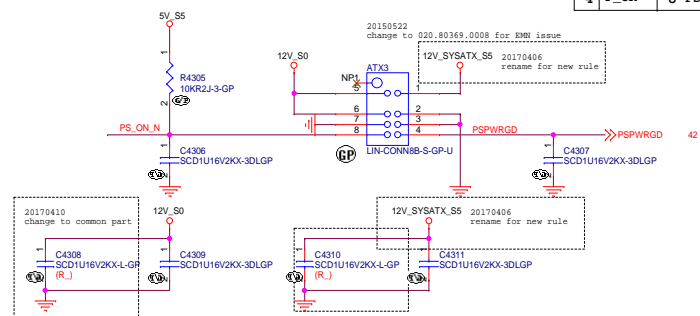
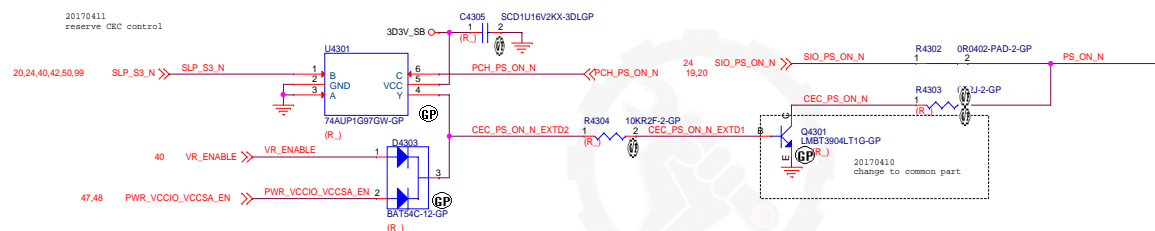
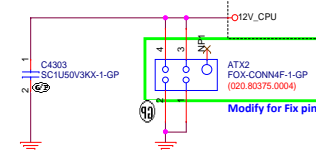
Gambit MLK MT/Eagle MT CFL

Rev

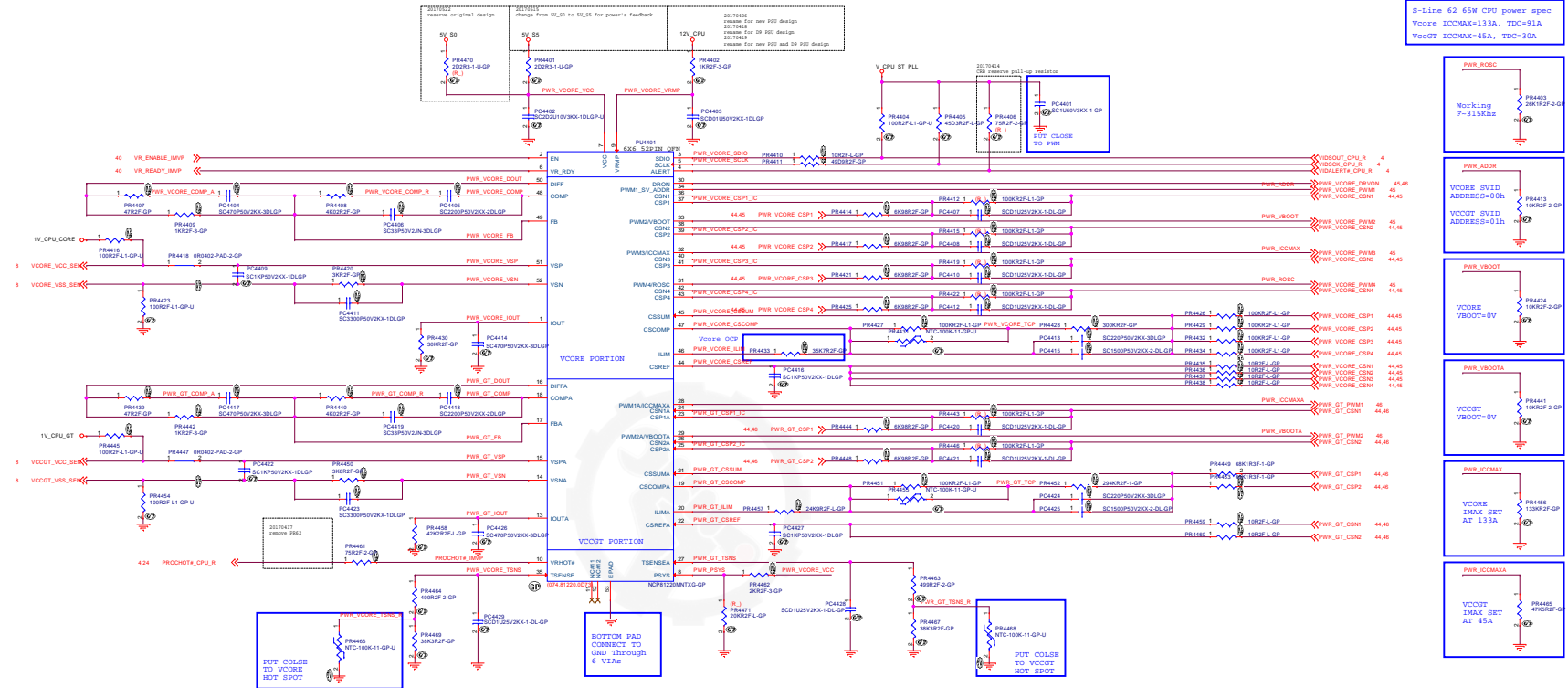
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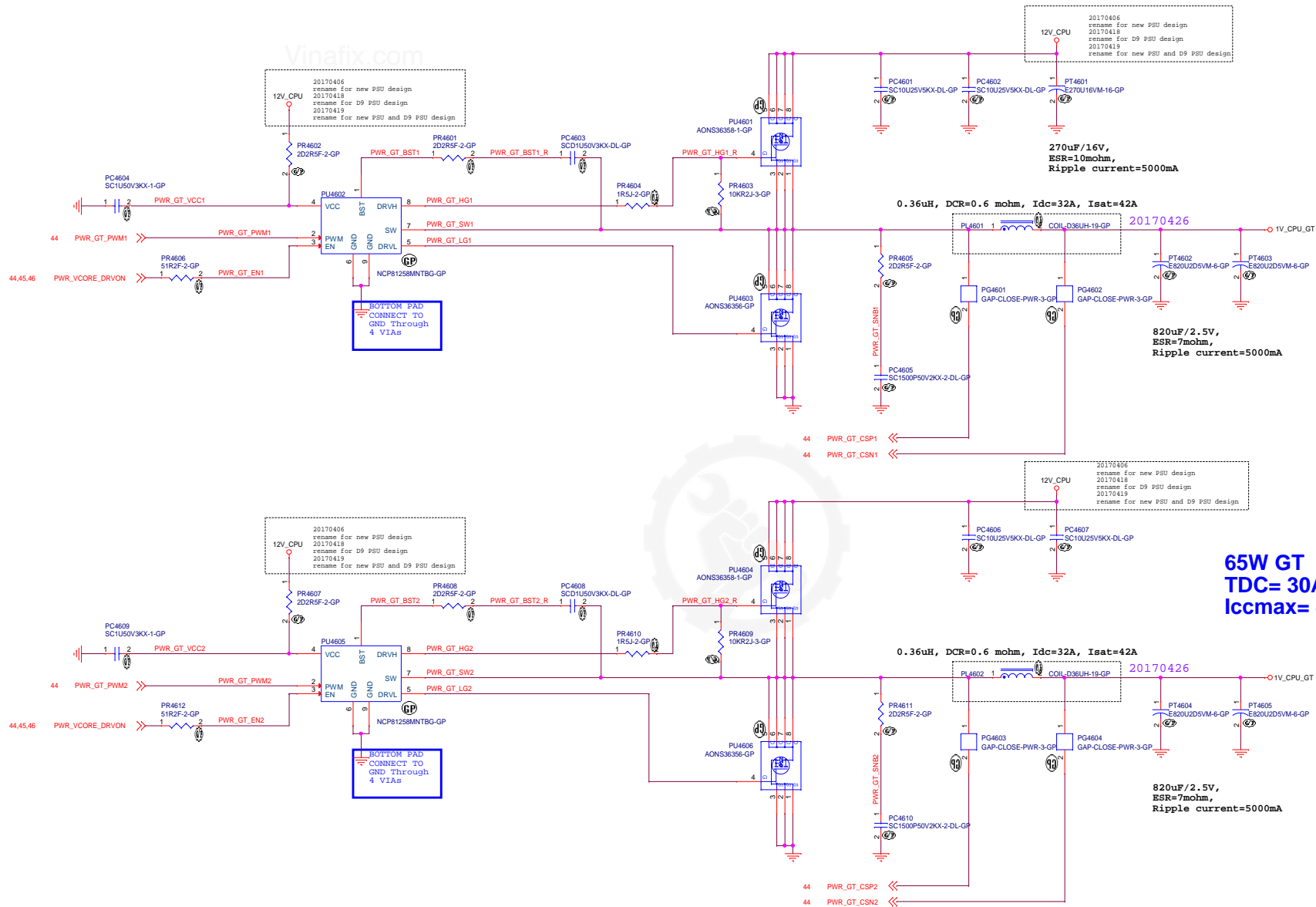
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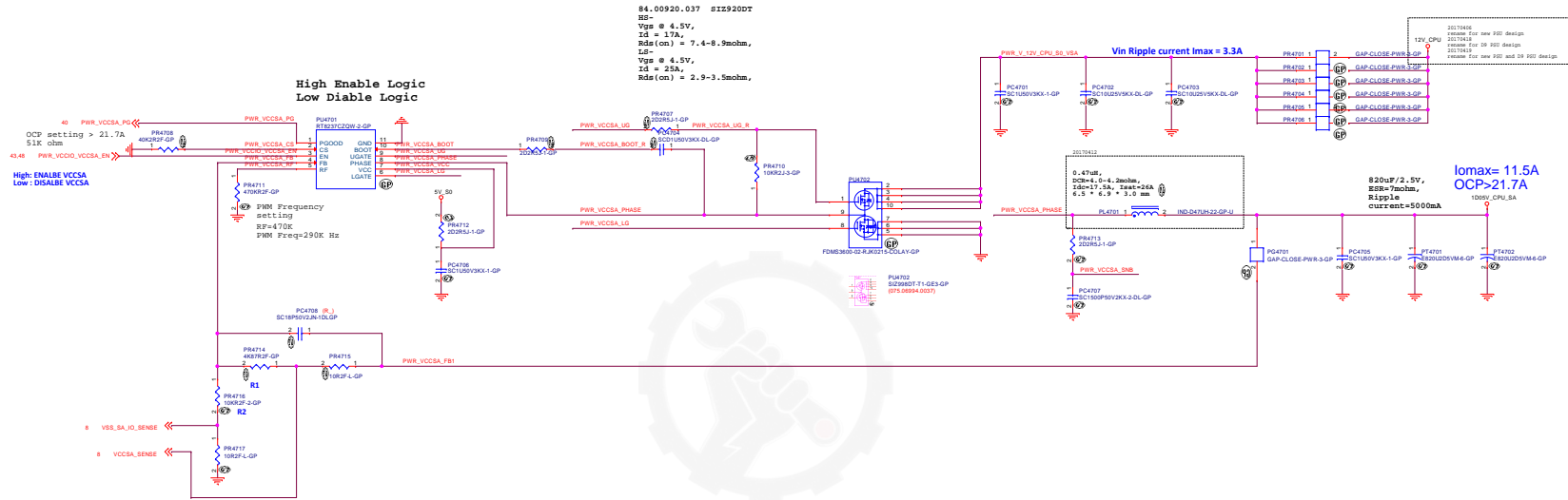
Sheet 41 of 107

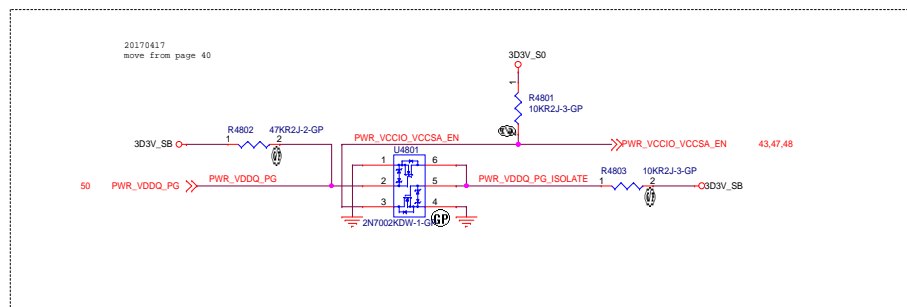
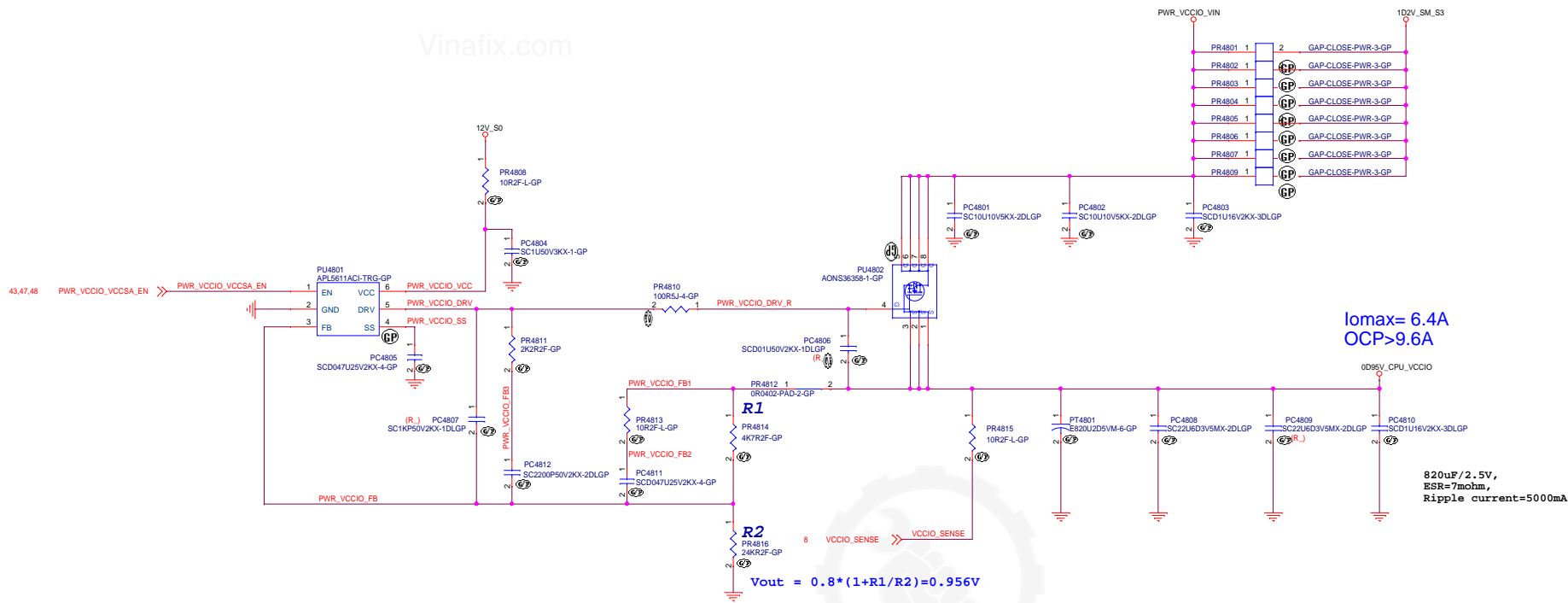


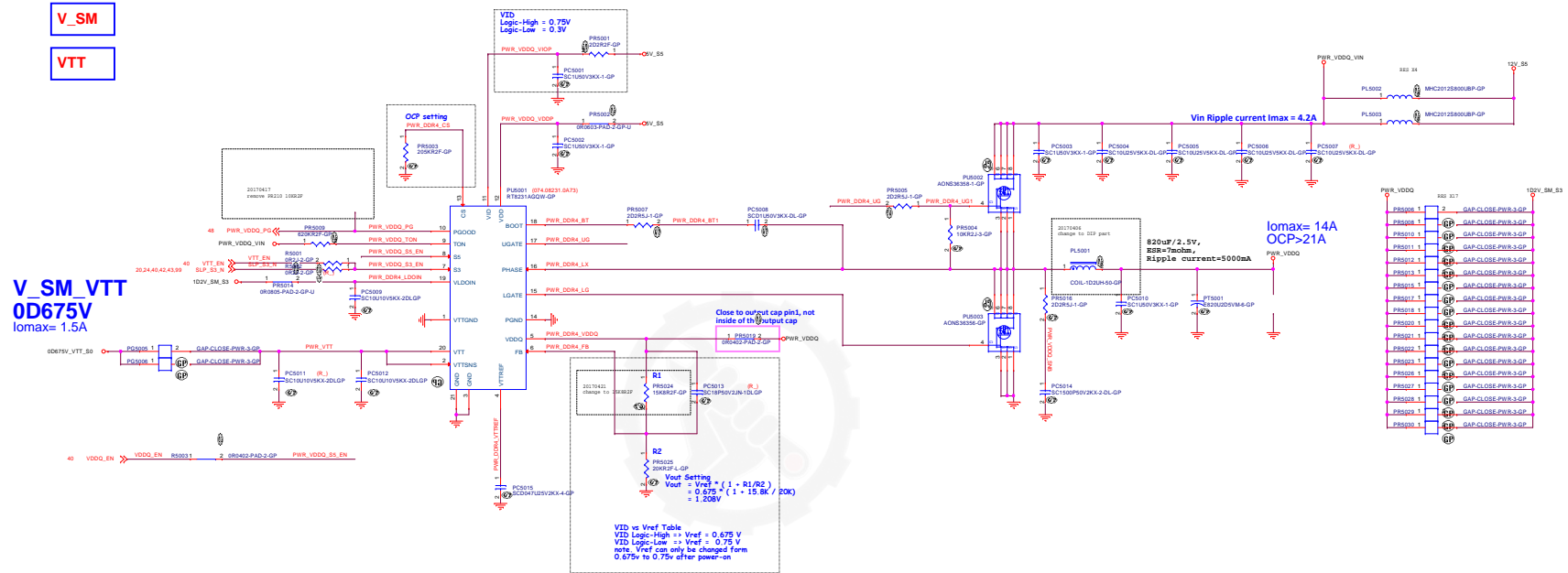
Intel Coffeelake IMVP8 POWER CKT - S-LINE 62 95W 4+2 PHASE

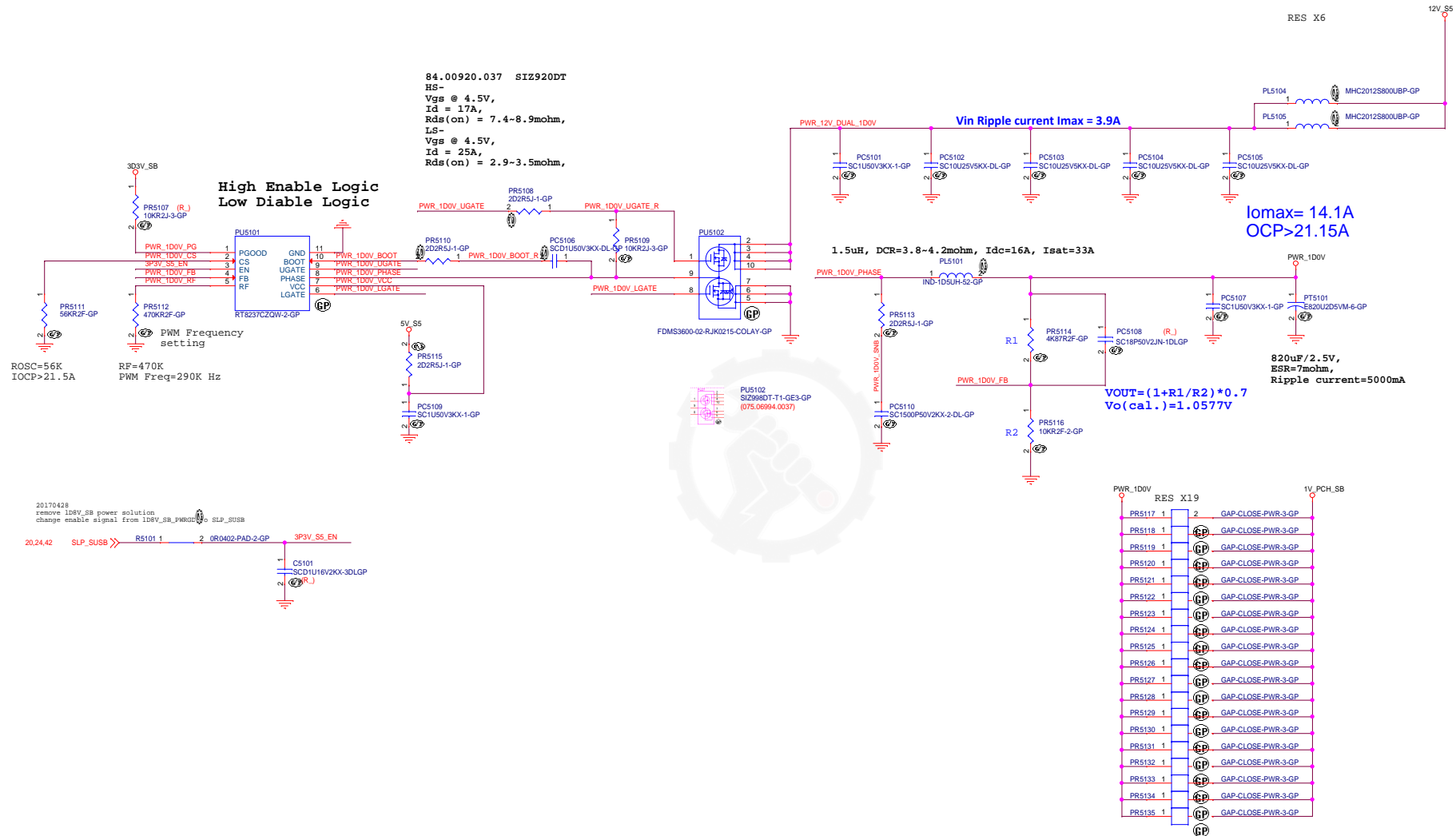


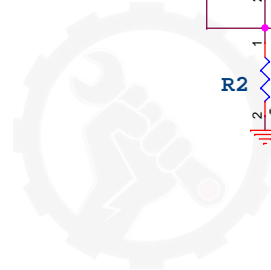


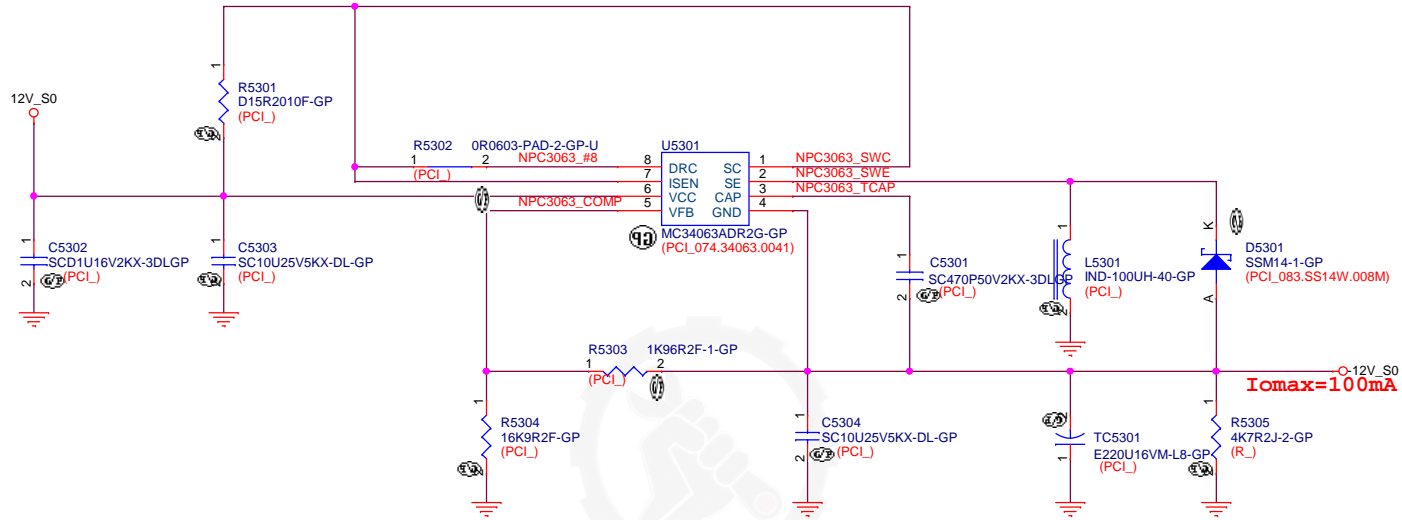












20170428
remove 1D8V_SB power solution

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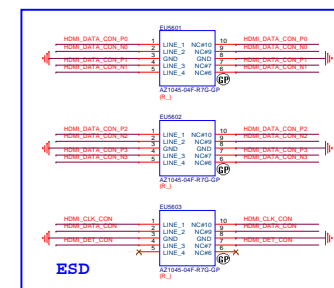
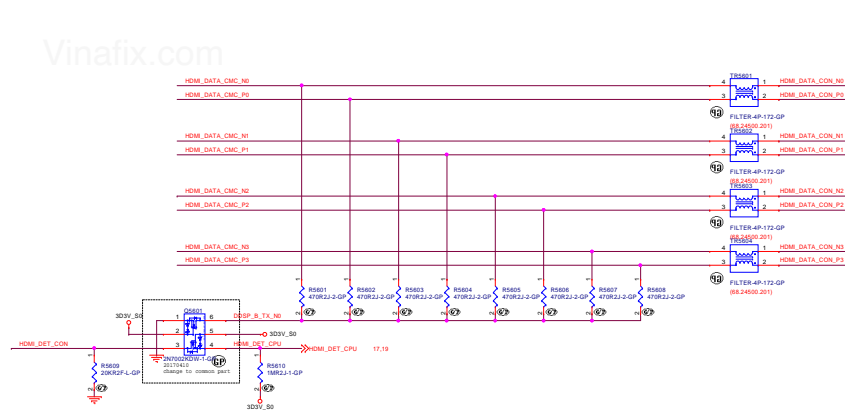
20170412
remove 1D24V_SB power solution



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20170419
remove IPOC circuit





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Rev

A00

Date: Friday, February 02, 2018

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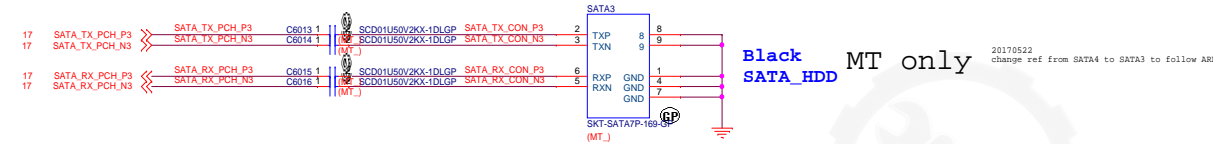
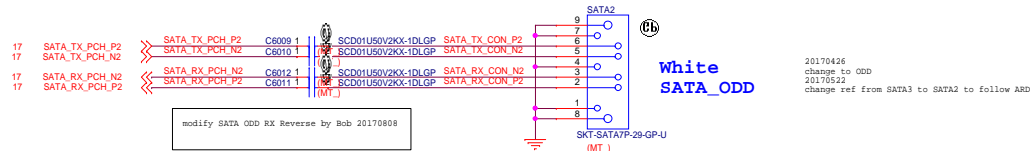
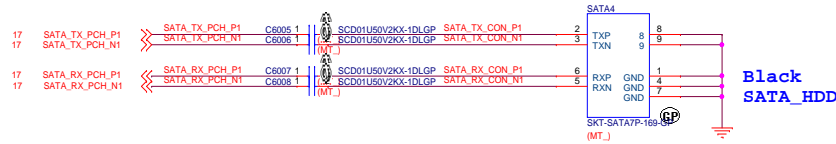
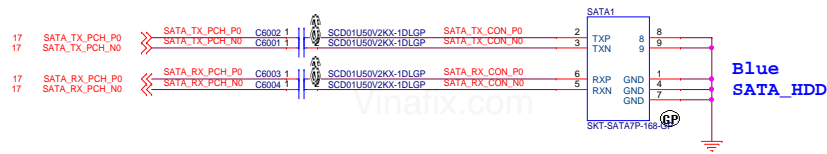
Gambit MLK MT/Eagle MT CFL

Rev

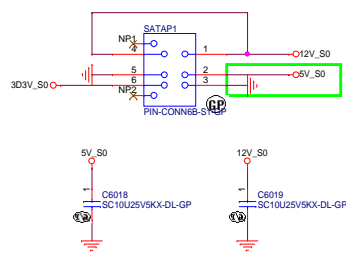
A00

Date: Friday, February 02, 2018

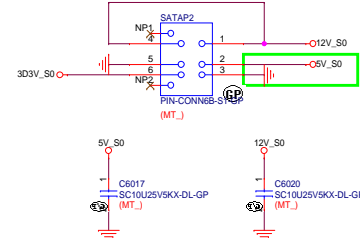
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3.5" SATA HDD POWER CONNECTOR



2.5" SATA HDD POWER CONNECTOR MT only



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Document Number

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Rev

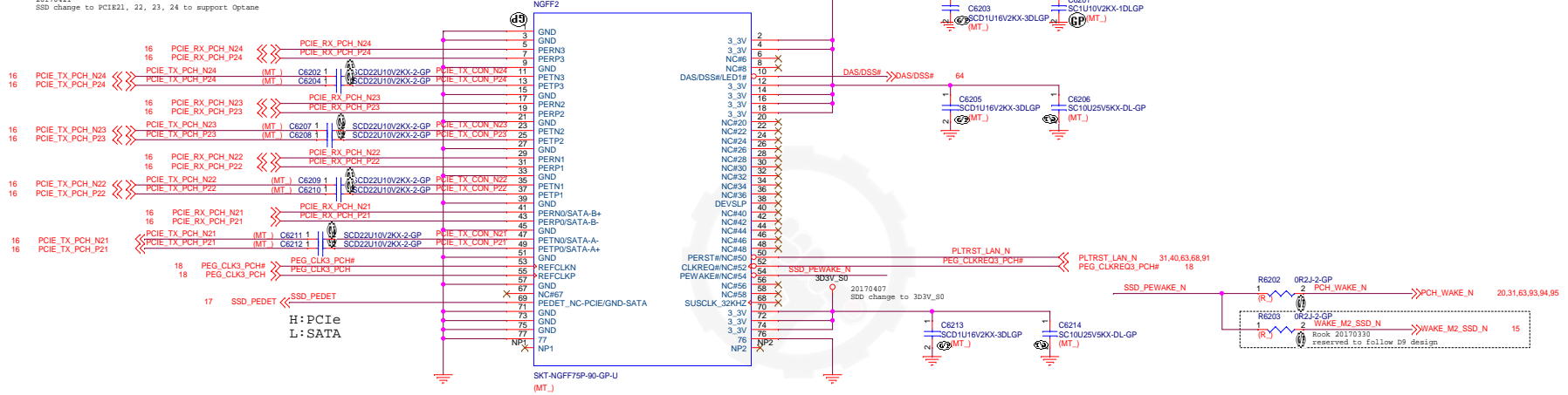
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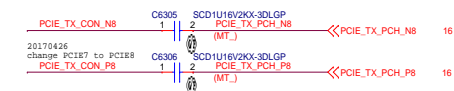
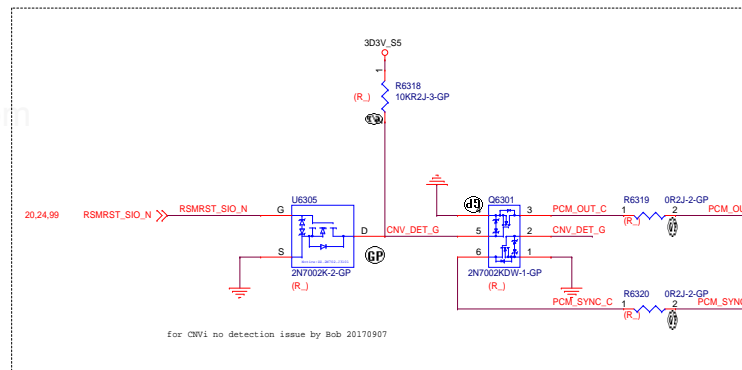
Date: Friday, February 02, 2018

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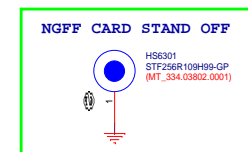
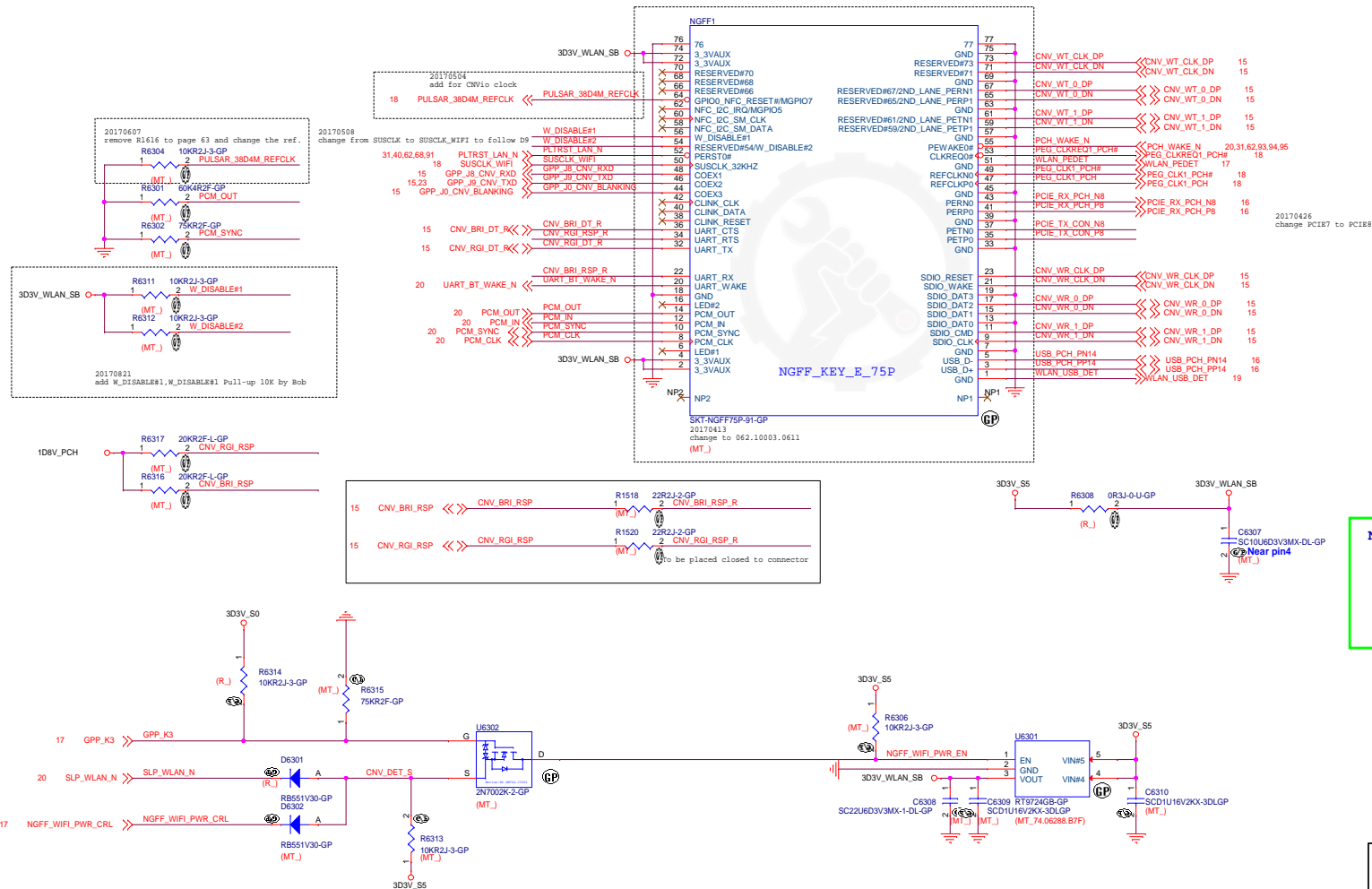
NGFF(M Key)

20170421
SSD change to PCIe21, 22, 23, 24 to support Optane





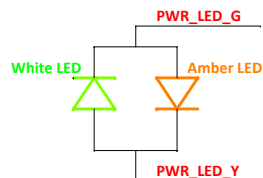
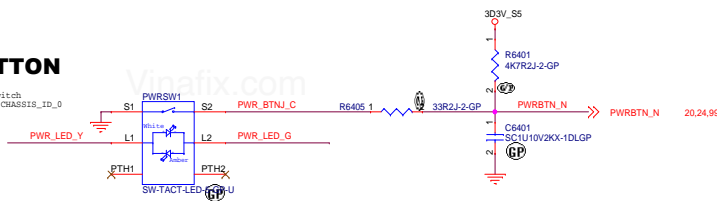
H: 4.2mm



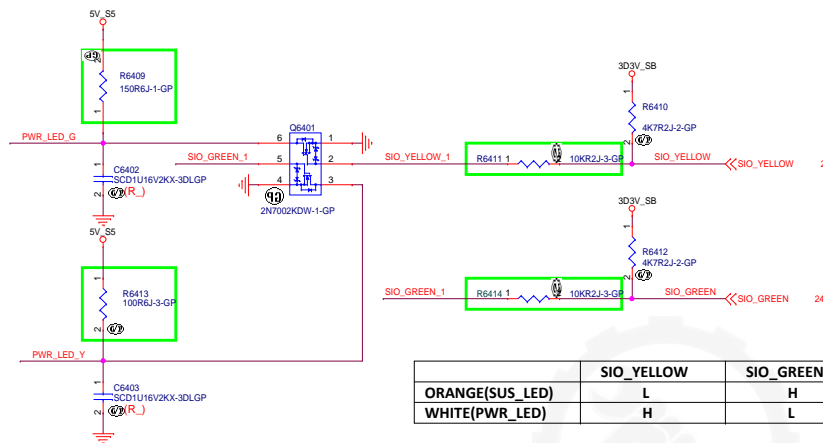
MT only

POWER BUTTON

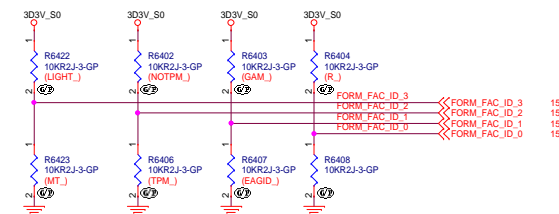
20170413
change to on board power switch
remove the net PP_CBL_DFT, CRASIS18_ID_0



S0	White
S3	White(blinking)
S4/S5	LED off
No Post	Amber
Failure to Post	Amber(blinking)



	SIO_YELLOW	SIO_GREEN
ORANGE(SUS_LED)	L	H
WHITE(PWR_LED)	H	L



SKU ID

Type	ID_3	ID_2	ID_1	ID_0
Gambit MLK MT w/o TPM IC	0	1	1	0
Eagle MT w/ TPM IC	0	0	0	0
Eagle MT w/o TPM IC	0	1	0	0
Gambit MLK SFF w/o TPM IC	X	1	1	1
Eagle SFF w/ TPM IC	X	0	0	1
Eagle SFF w/o TPM IC	X	1	0	1
Eagle Light w/o TPM IC,M2,PCIe	1	1	0	0

Chassis ID

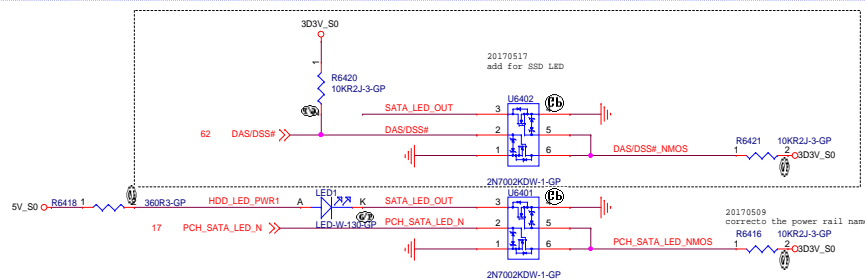
ID_0	Chassis	CY18 (CFL)	CY16 (KBL)
0	Vostro	Eagle	Tahoe MLK
1	Inspiron	Gambit MLK	Gambit

Power switch cable select

SFF only

POWER BUTTON

20170419
add back for SFF
20170424
remove circuit for MT



SFF only

20170410
change to mounted
20170424
remove circuit for MT

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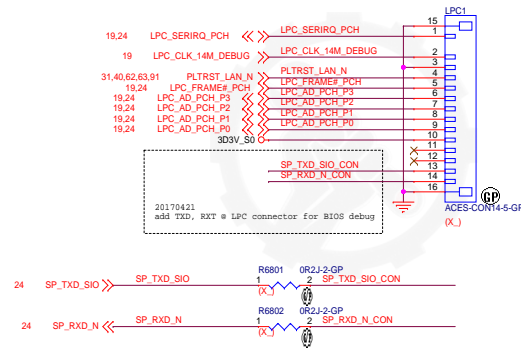
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LPC DEBUG PORT

20170504
change to standard LPC debug connector



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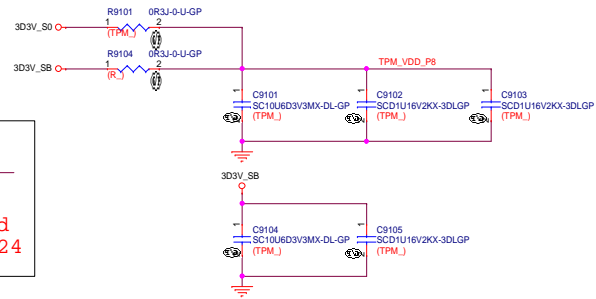
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Rev

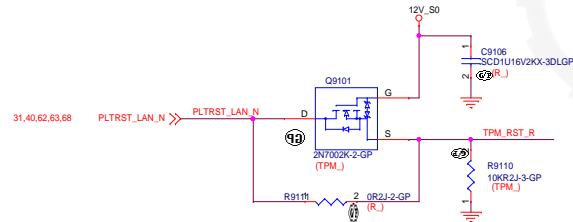
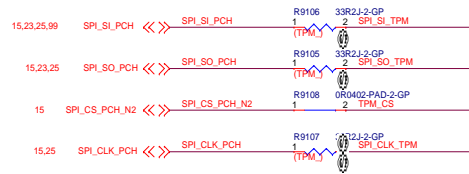
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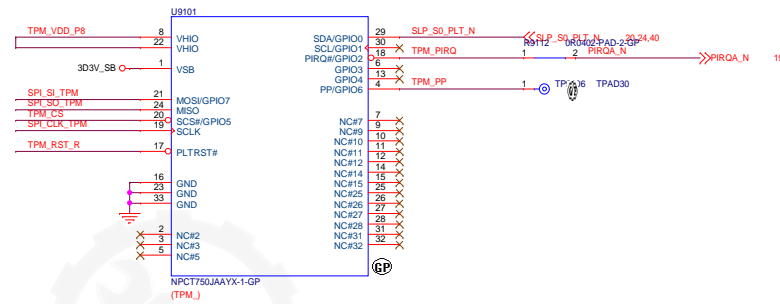
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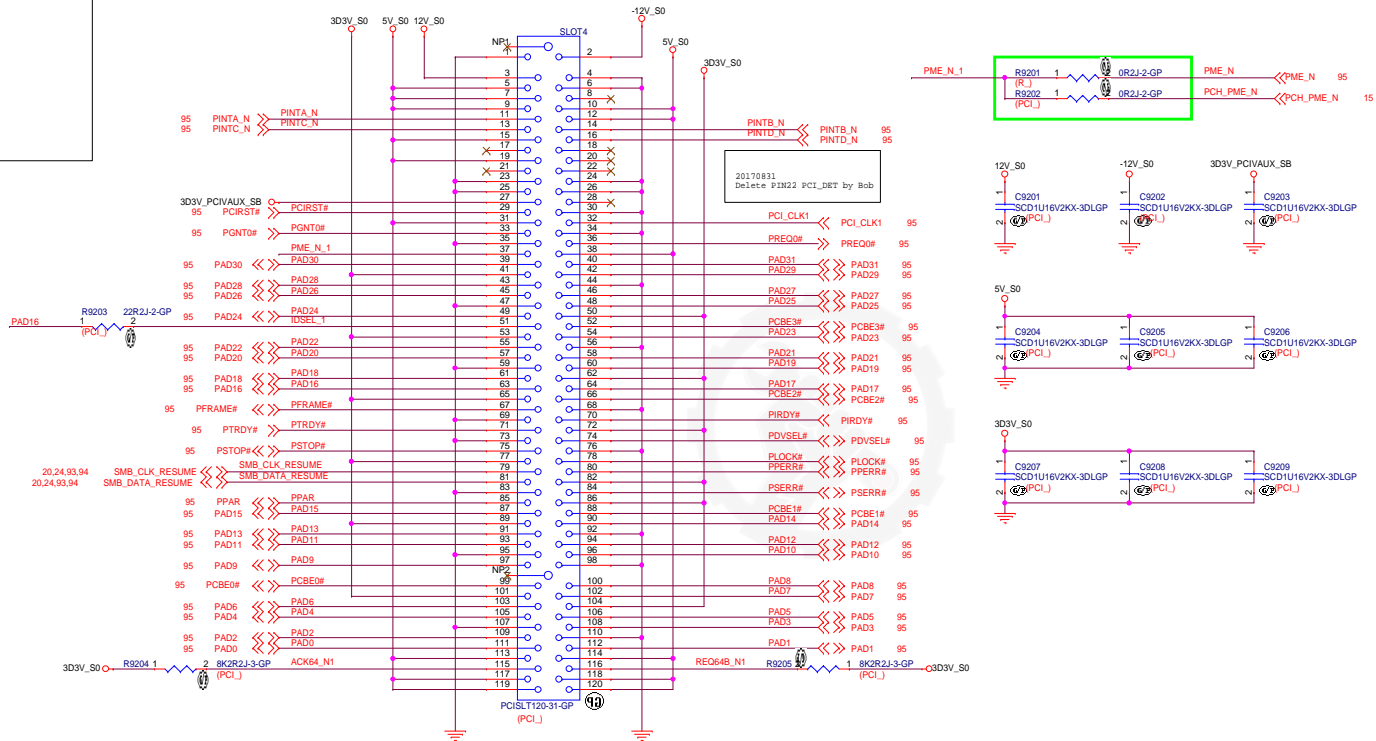
R9113 X01 have to add
modfiy by bob 20170724

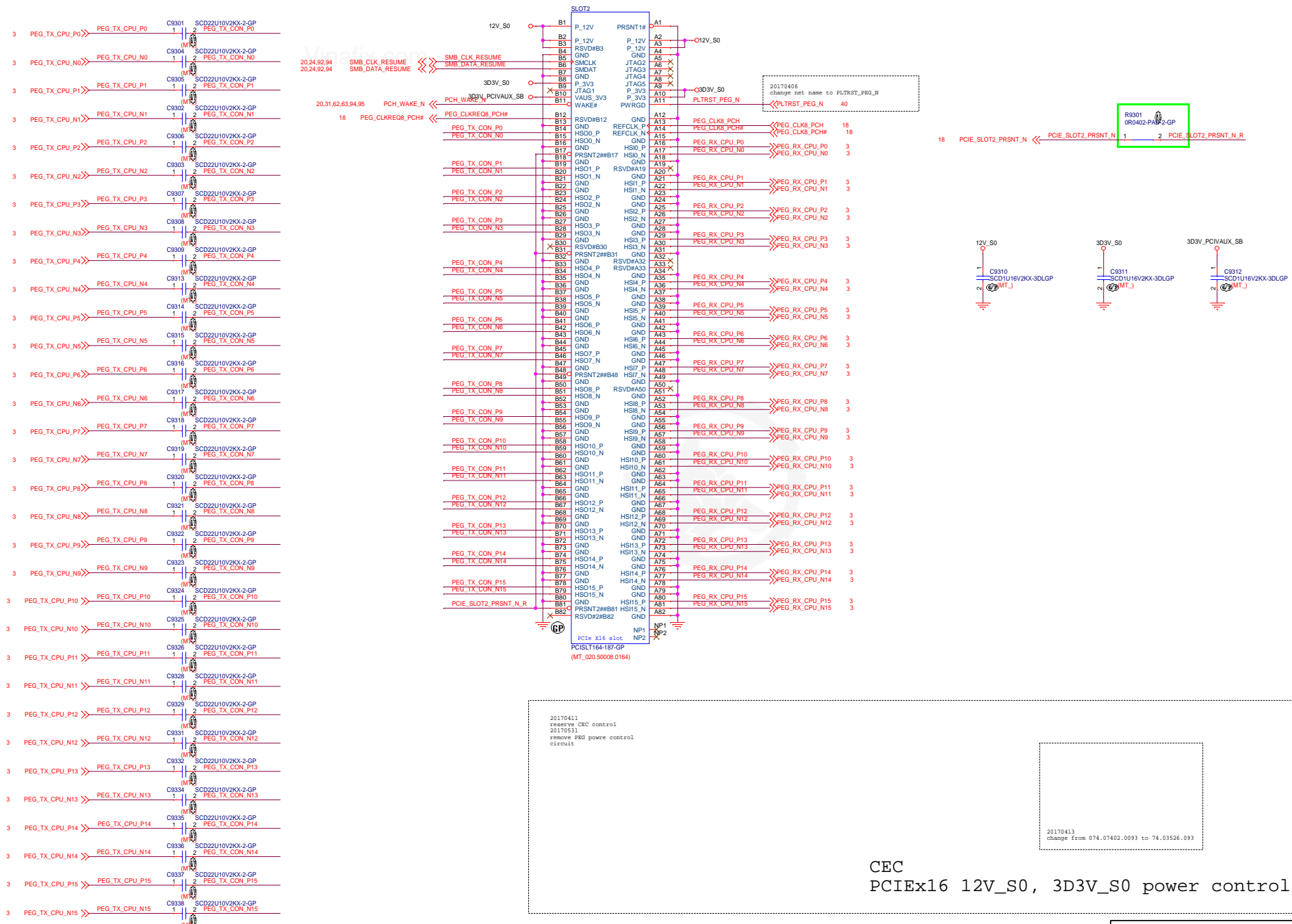


Nuvoton TPM

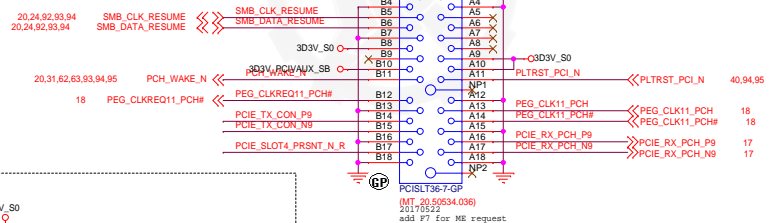
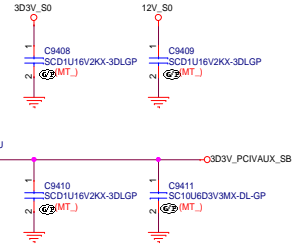
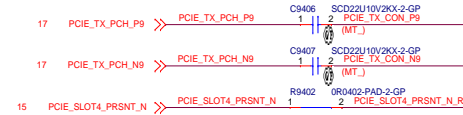
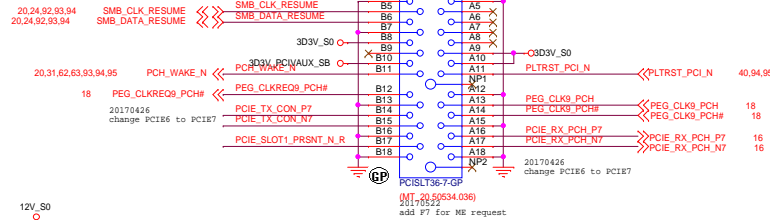
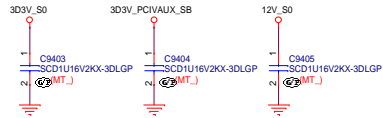
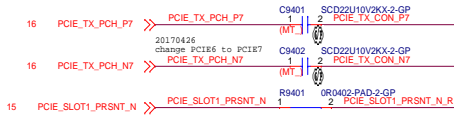


20170821
add PCI_DET Pull-up 10K by Bob
20170831
Delete PCI_DET Pull-up 10K by Bob





CEC
PCIEx16 12V_S0, 3D3V_S0 power control



CEC
PCIVAU_X power control

92 PINTA_N
 92 PINTB_N
 92 PINTC_N
 92 PINTD_N

 92 PCIRST#
 92 PGNT0#

 92 PREQ0#

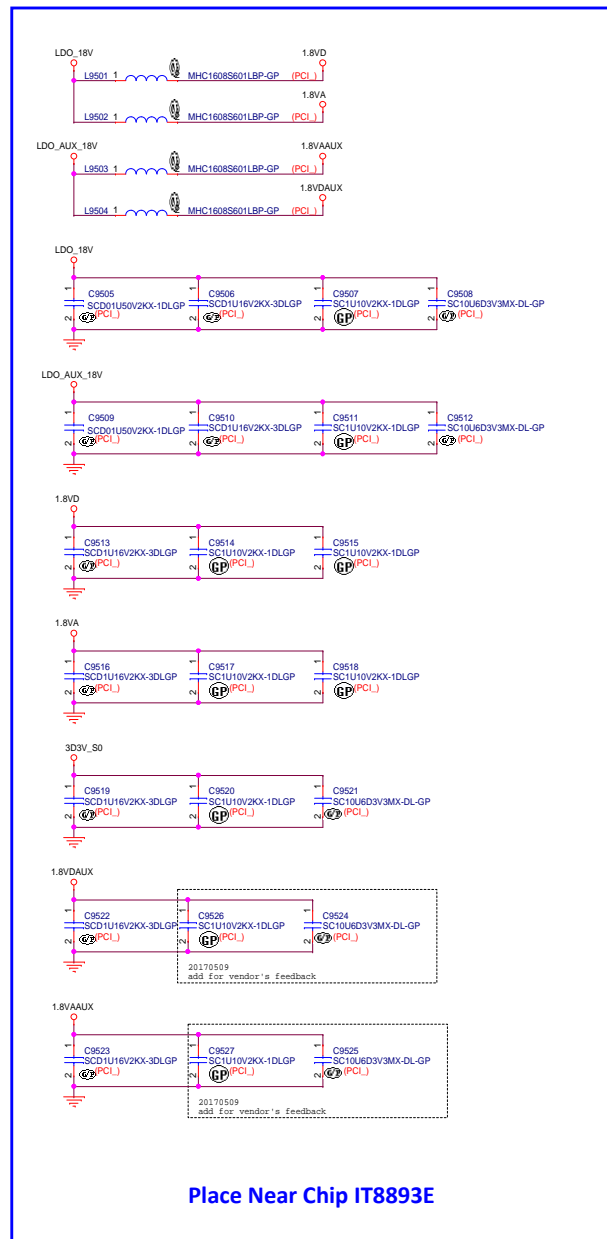
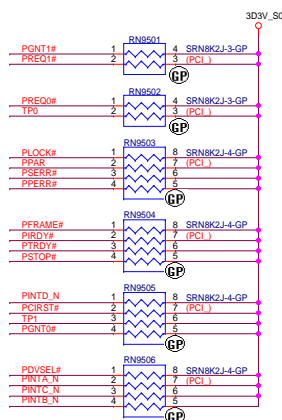
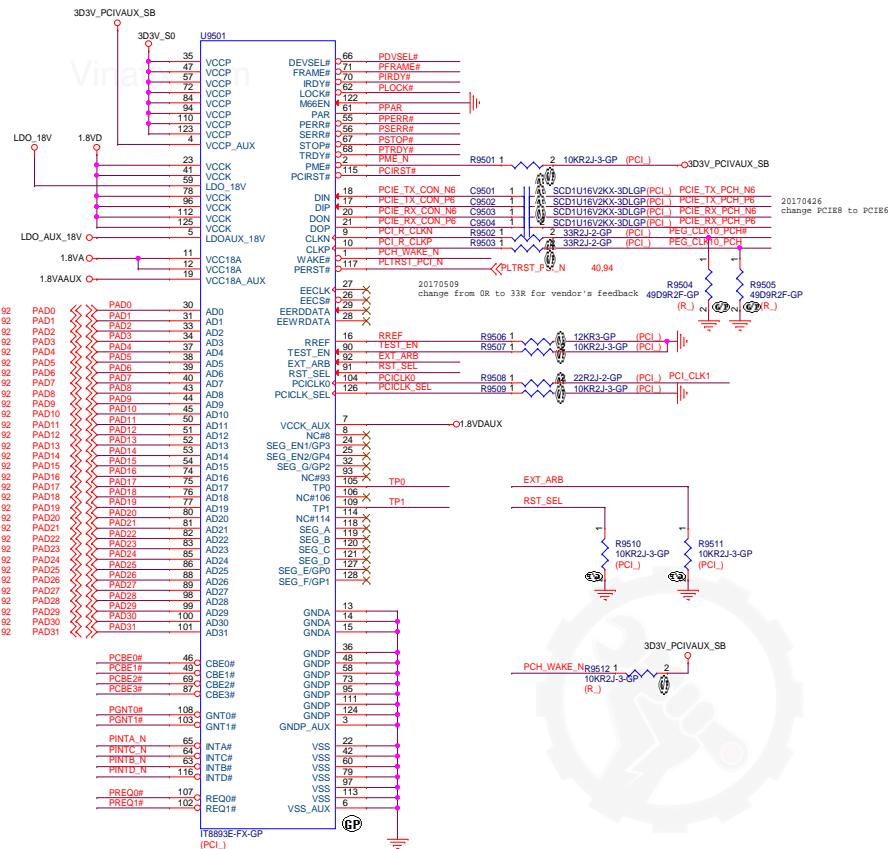
 92 PME_N
 92 PCI_CLK1

 92 PFRAME#
 92 PRTDY#
 92 PSTOP#
 92 PDVSEL#
 92 PLOCK#
 92 PPAR#
 92 PPERR#
 92 PSERR#

 16 PCIE_RX_PCH_N6
 16 PCIE_RX_PCH_P6
 16 PCIE_TX_PCH_N6
 16 PCIE_TX_PCH_P6
 18 PEG_CLK10_PCH#
 18 PEG_CLK10_PCH#

 92 PCBE0#
 92 PCBE1#
 92 PCBE2#
 92 PCBE3#

 20,31,62,63,93,94 PCH_WAKE#



Place Near Chip IT8893E

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Title **PCI Bridge (IT8893E)**
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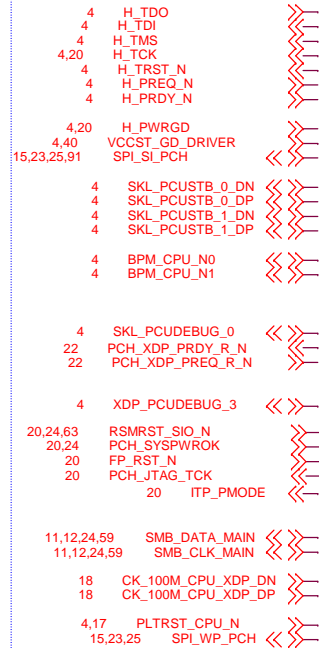
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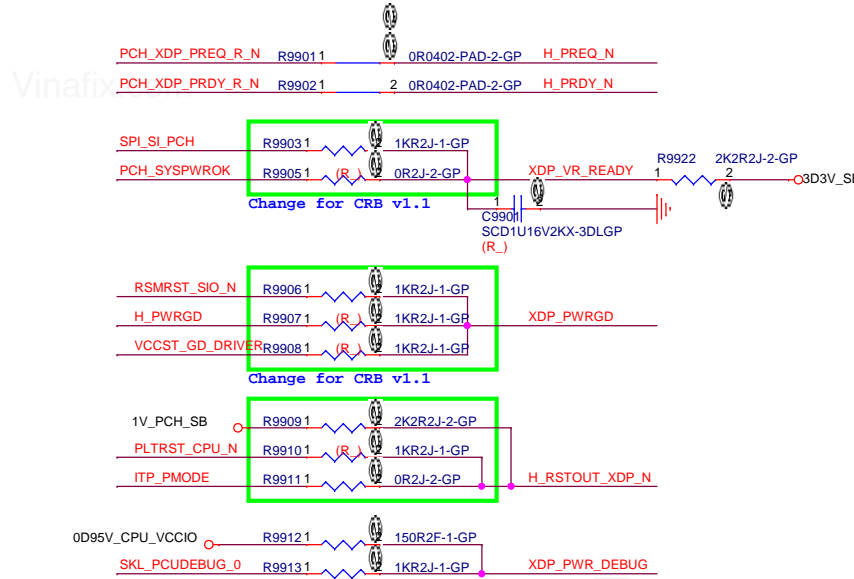
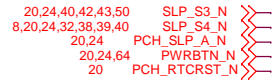
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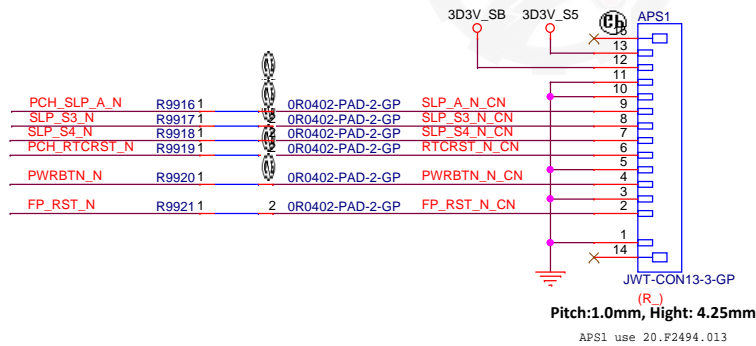
XDP for CPU



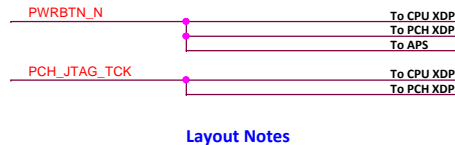
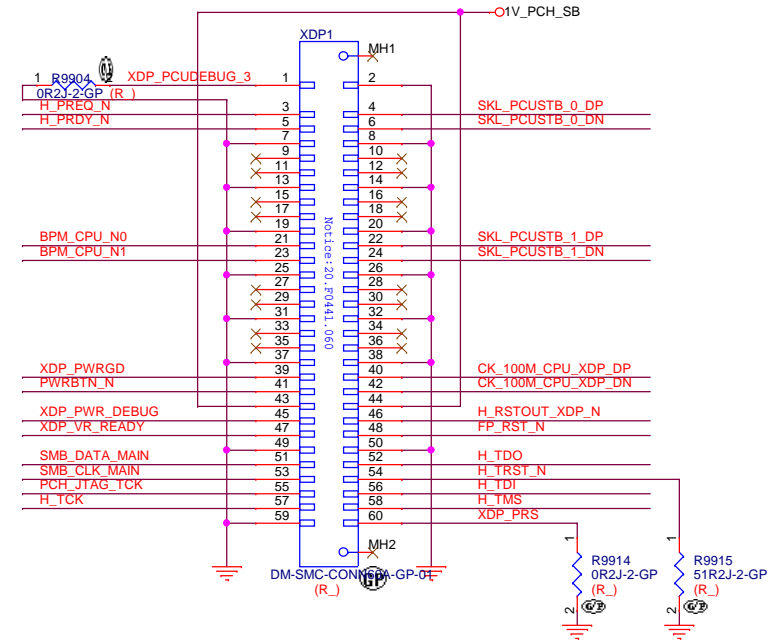
APS DEBUG



APS CONNECTOR



XDP for CPU



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XDP&ITP		
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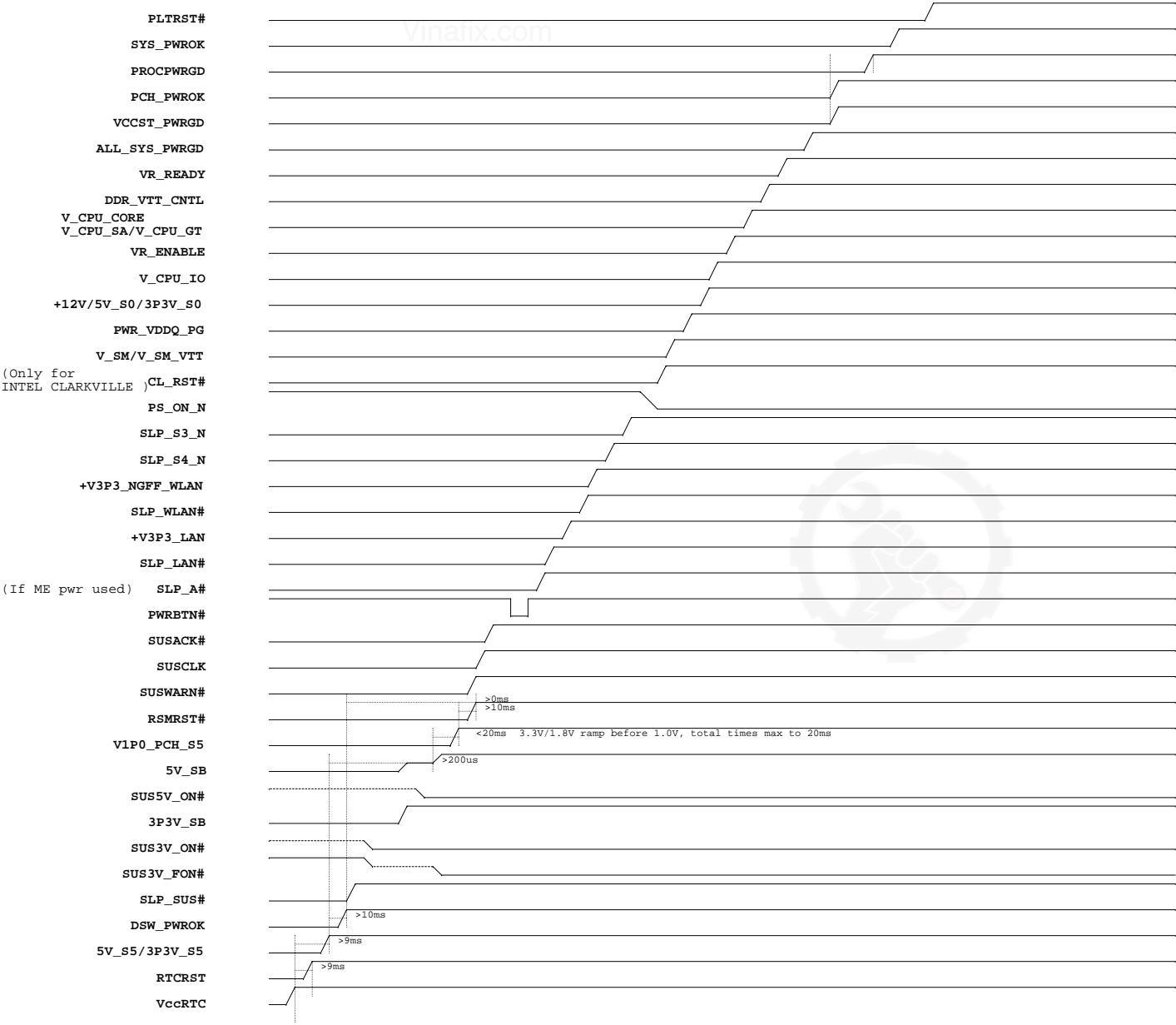
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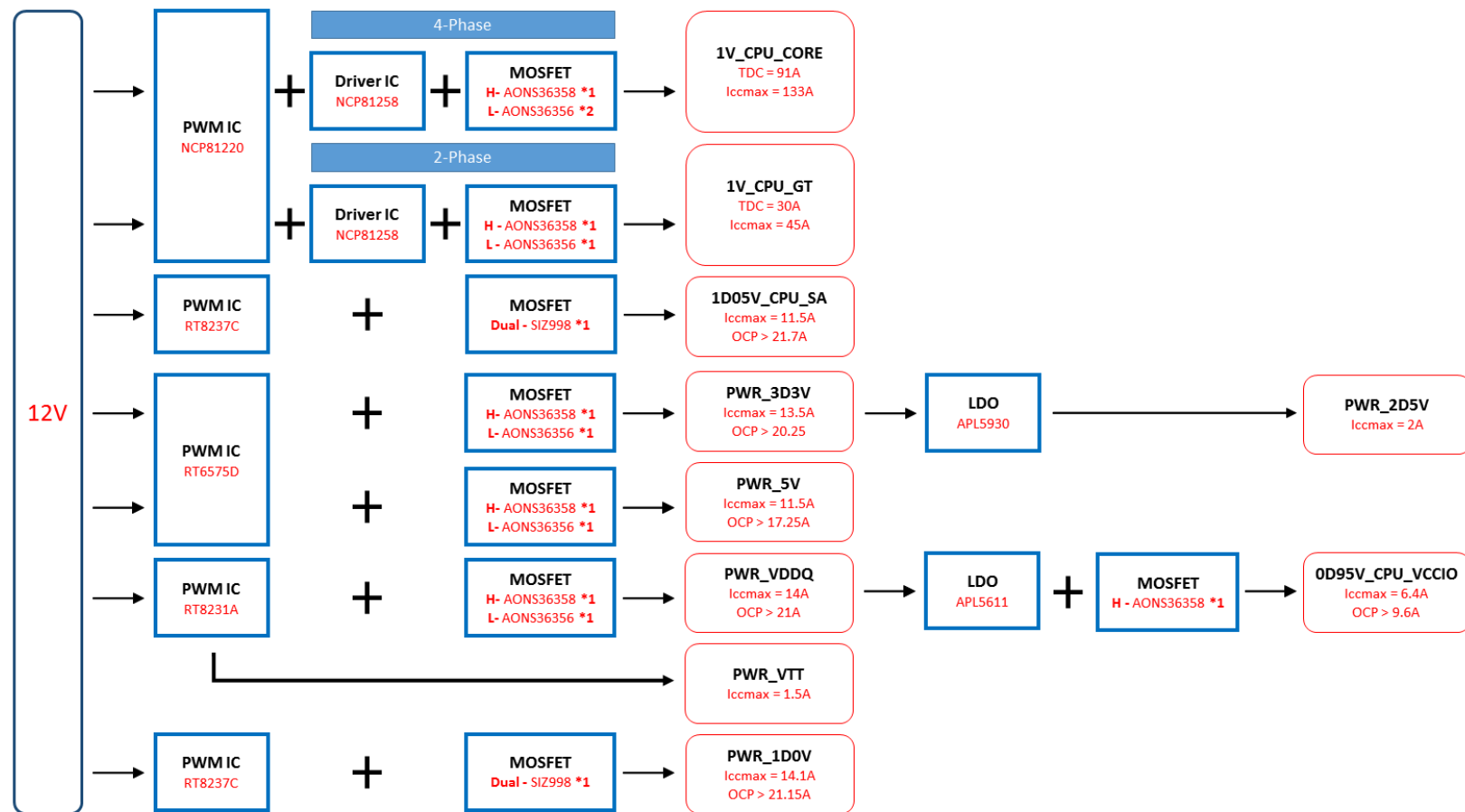
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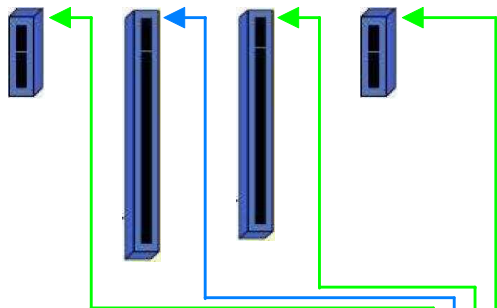
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POWER ON SEQUENCE





SLOT4 SLOT3 SLOT2 SLOT1



INTEL
Kaby Lake-S
(65W 4C + GT2)

SKT H4 LGA1151
42.5 mm x 42.5 mm



Channel A

2133MHz/2400MHz

DDR4 DIMM
Unbuffered 8GB

Channel B

2133MHz/2400MHz

DDR4 DIMM
Unbuffered 8GB

INTEL PCH
Skylake
PCH-H

FCBGA 837PIN
23 mm x 23 mm



	Name	Type	SSC Capable	Description
	CLKOUT_ITPXPDP_P CLKOUT_ITPXPDP_N	O	Yes	Differential ITP Debug Clock: 100 MHz differential output to processor XDP/ITP connector on the platform
1	CLKOUT_CPUNSSC_P CLKOUT_CPUNSSC_N	O	No	Unfiltered Clock from Crystal to CPU: 24 MHz differential re-buffered crystal reference clock to the processor
2	CLKOUT_CPUPCIBCLK_P CLKOUT_CPUPCIBCLK_N	O	Yes	Differential PCIe* Reference Clock to CPU: 100 MHz PCIe* 3.0 specification compliant differential PCIe* reference clock to the processor
3	CLKOUT_CPUBCLK_P CLKOUT_CPUBCLK_N	O	Yes	Differential Clock to CPU: 100 MHz differential core reference clock to the processor
	CLKOUT_SRC_P[15:0] CLKOUT_SRC_N[15:0]	O	Yes	PCI Express* Clock Output: 100 MHz PCIe* 3.0 specification compliant differential output clocks to PCIe* devices
	CLKOUT_LPC[1:0]	O	No	LPC Clock Outputs: Single-Ended 24 MHz output to various single load connectors/devices
	CLKOUT_48	O	No	48 Clock Output (SKL-H Server Only): Single-Ended 48 MHz output to Server BMC devices
	SRCLCKRQ#[15:0]	I/O	N/A	Clock Request: Clock request signals for PCIe* 100 MHz differential clocks
	XTAL24_IN	I	N/A	Crystal Input: Input connection for 24 MHz crystal to PCH oscillator circuit
	XTAL24_OUT	O	N/A	Crystal Output: Output connection for 24 MHz crystal to PCH oscillator circuit

100MHz

Realtek Lan
RTL8111H

25MHz

100MHz

CPU XDP

PCH XDP

100MHz

ITE IT8893E

33MHz

100MHz

NGFF

24MHz

LPC 80 Port

24MHz

SIO
SMSC SCH5553

24MHz

24MHz

32.768KHz

32.768KHz

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