

Compal Confidential

L360ACN M/B

Schematic Document

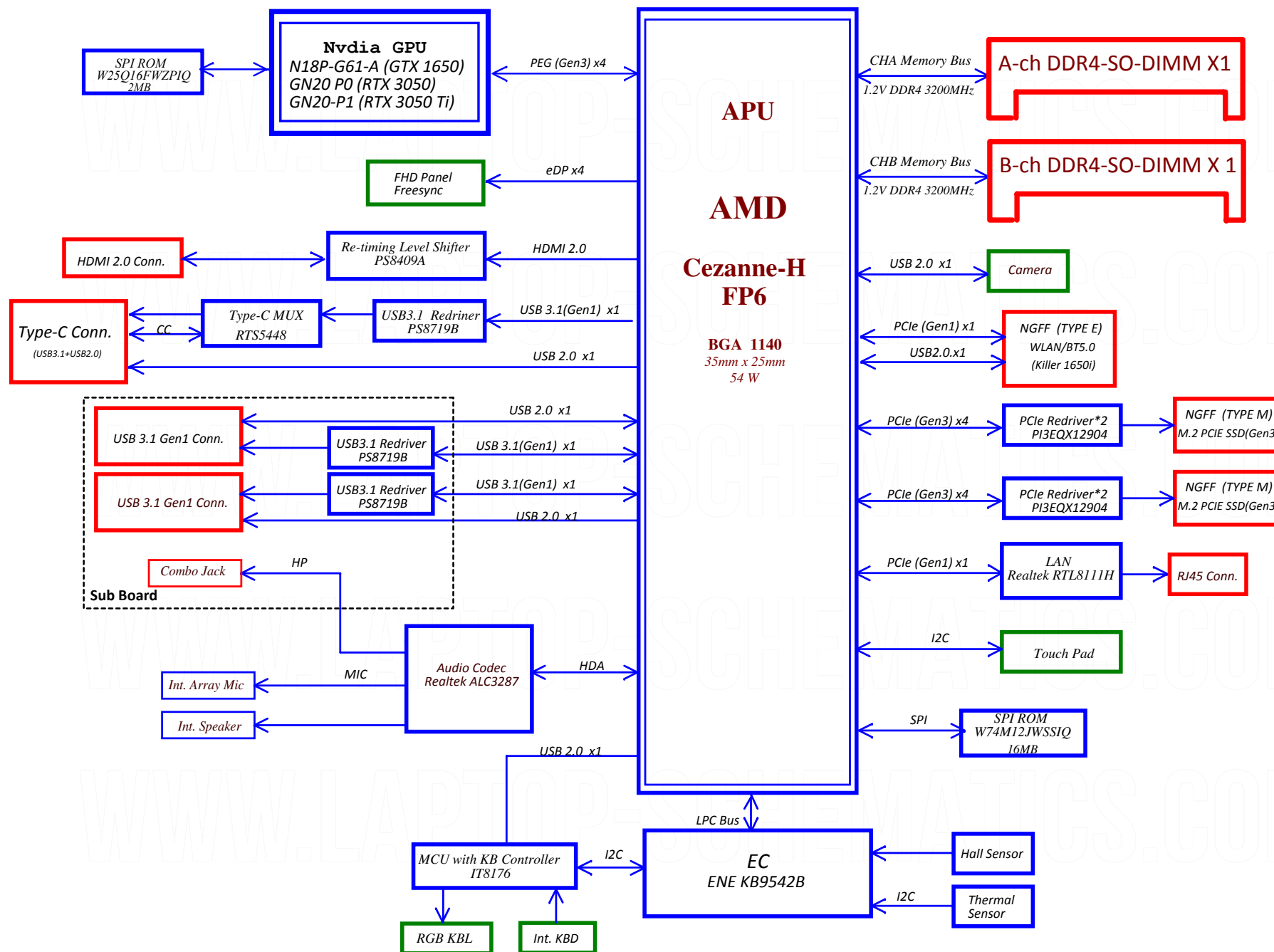
AMD Cezanne Processor with DDR4 SO- DIMM + GN20-P0/P1

2020-09-17

LA-L171P
REV : EVT

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L360 Cezanne-H Block Diagram



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Issued Date	Deciphered Date		<i>Compal Electronics, Inc.</i> Block Diagram	
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Voltage Rails

power plane	State				
		+12. 6VB	+5VALW +3VALW +1. 8VALW +0. 75VALW	+1. 2V +2. 5V	+5VS +3VS +1. 8VS +0. 75VS +0. 6VS +APU_CORE +APU_CORE_SOC
S0		O	O	O	O
S3		O	O	O	X
S5 S4/AC		O	O	X	X
S5 S4/ Battery only		O	X	X	X
S5 S4/AC & Battery don't exist		X	X	X	X

BOM Structure Table

Item	BOM Structure
Memory Down - SDP Package	SDP@
	SDP_CHB@
Memory Down - DDP Package	DDP@
	DDP_CHB@
Channel B Memory Down	CHB@
EMI pop	EMI@
EMI un-pop	@EMI@
ESD pop	ESD@
ESD un-pop	@ESD@
RF pop	RF@
RF un-pop	@RF@
Debug	HDT@
Keyboard BackLight	KBL@
Normal FP	FP@
SLIM_FP	SLIM_FP@
CAMERA POWER CIRCUIT	CAM@
Modern standby	MS@
	NON_MS@
DP Power Switch	DPS1155@
	DPS1113@

USB 2.0 Port Table

Port	External USB Port
0	USB3.1 Type-C
1	USB3.1 Type-A
2	Camera
3	WLAN_BT
4	
5	USB3.1 Type-A
6	IT8176
7	IT8295

DDI Port Table

Port	Lane
0	eDP
1	HDMI
2	
3	

USB 3.0 Port Table

Port	
0	USB3.1 Type-C
1	USB3.1 Type-A
4	
5	USB3.1 Type-A

GPP Port Table

Port	Lane	
0	0	LAN
1	1	WLAN
2	2	
3	3	
4	4	JSSD1
5	5	
6	6	
7	7	
8	8	JSSD2
9	9	
10	10	
11	11	

EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	????	Thermal Sensor (F75303M)	1001_101xb
Charger (ISL89739A)	0x12		

EC SM Bus2 address

EC SM Bus4 address

PCH SM Bus address

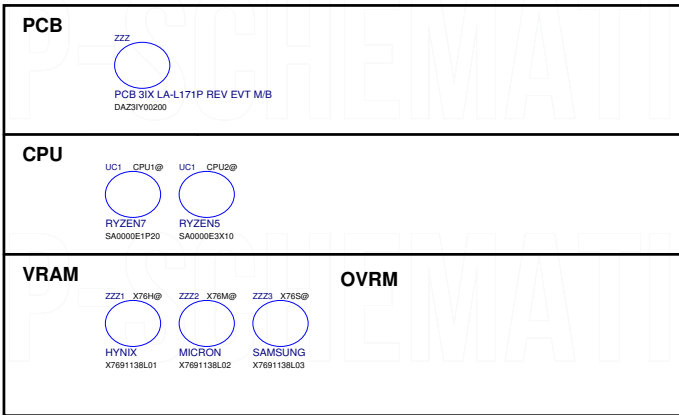
Device	Address	Device	Address
Touch pad			

Device	EC Bus	Slave Address (8 bit)
Battery	1	0x16
Charge	1	0x12
APU	2	0x78
APU Thermal sensor	2	0x98
Thermal sensor	2	0x9A
IT8176	4	0xCC
GPU	2	0x9E

SMBUS Control Table

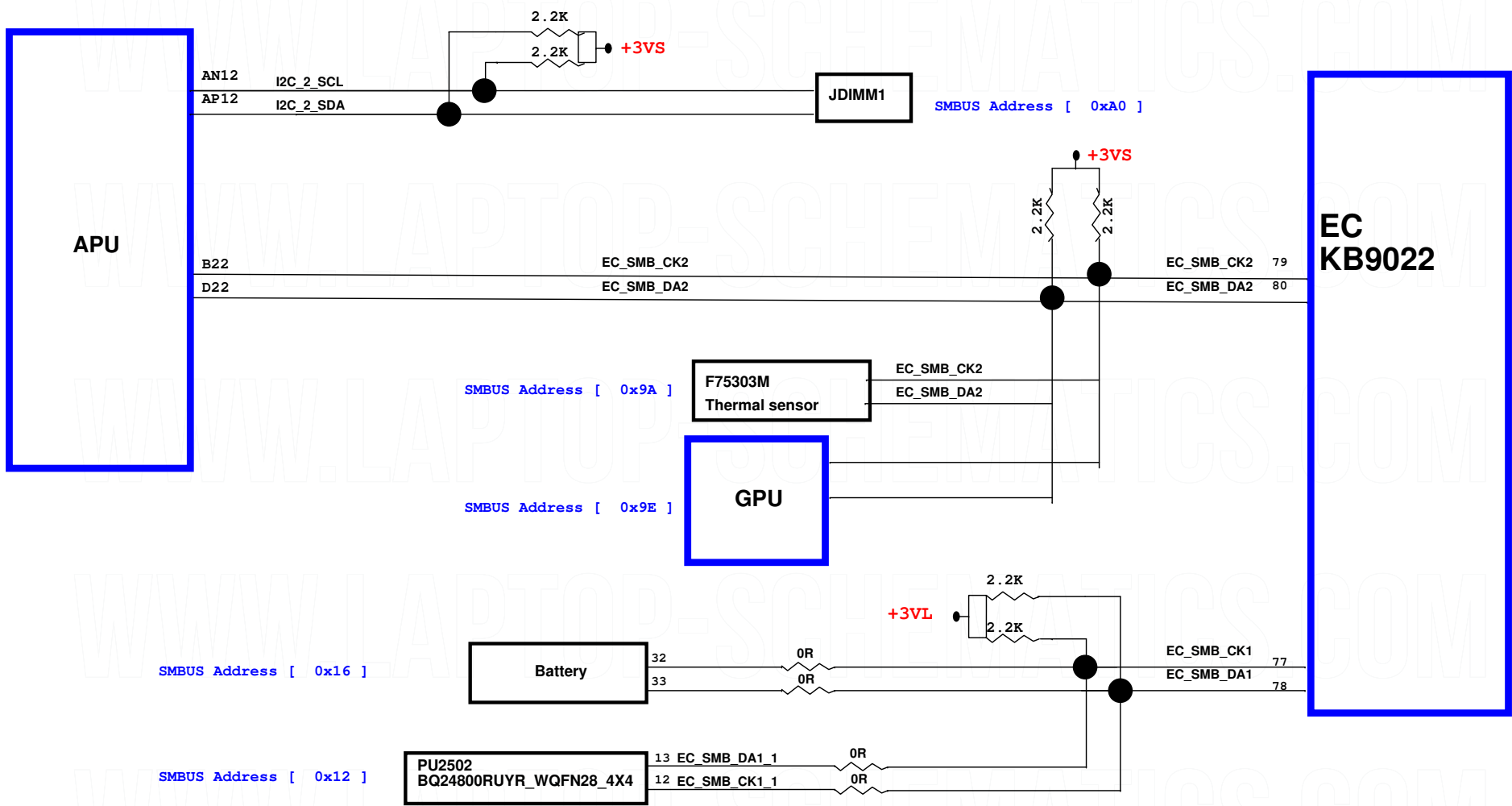
	SOURCE	APU	BATT	CHARGER	KB9022	GPU	Thermal Sensor	IT8176FN
EC_SMB_CK1	KB9022	X	V	V	V	X	X	X
EC_SMB_DA1	+3VL		+3VALW	+19V VIN				
EC_SMB_CK2	KB9022	V	X	X	V	V	V	X
EC_SMB_DA2	+3VS	+3VS			+3VS	+3VS	+3VS	
EC_SMB_CK4	X	X	X	X	X	X	X	V
EC_SMB_DA4								+3VALW_AG

STATE	SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON		HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)		LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)		LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)		LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)		LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF



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SMBus Block Diagram



Title		
<Title> SMBus Block Diagram		
Size	Document Number	Rev
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Power Sequence

Boot

Shut
Down

EC Pin 110 Input

EC Pin 112 Output

AC Plug

EC Pin 114 Input

EC Pin 100 Output

EC Pin 122 Output

EC Pin 123 Input

EC Pin 6 Input

EC Pin 95 Output

EC Pin 116 Output

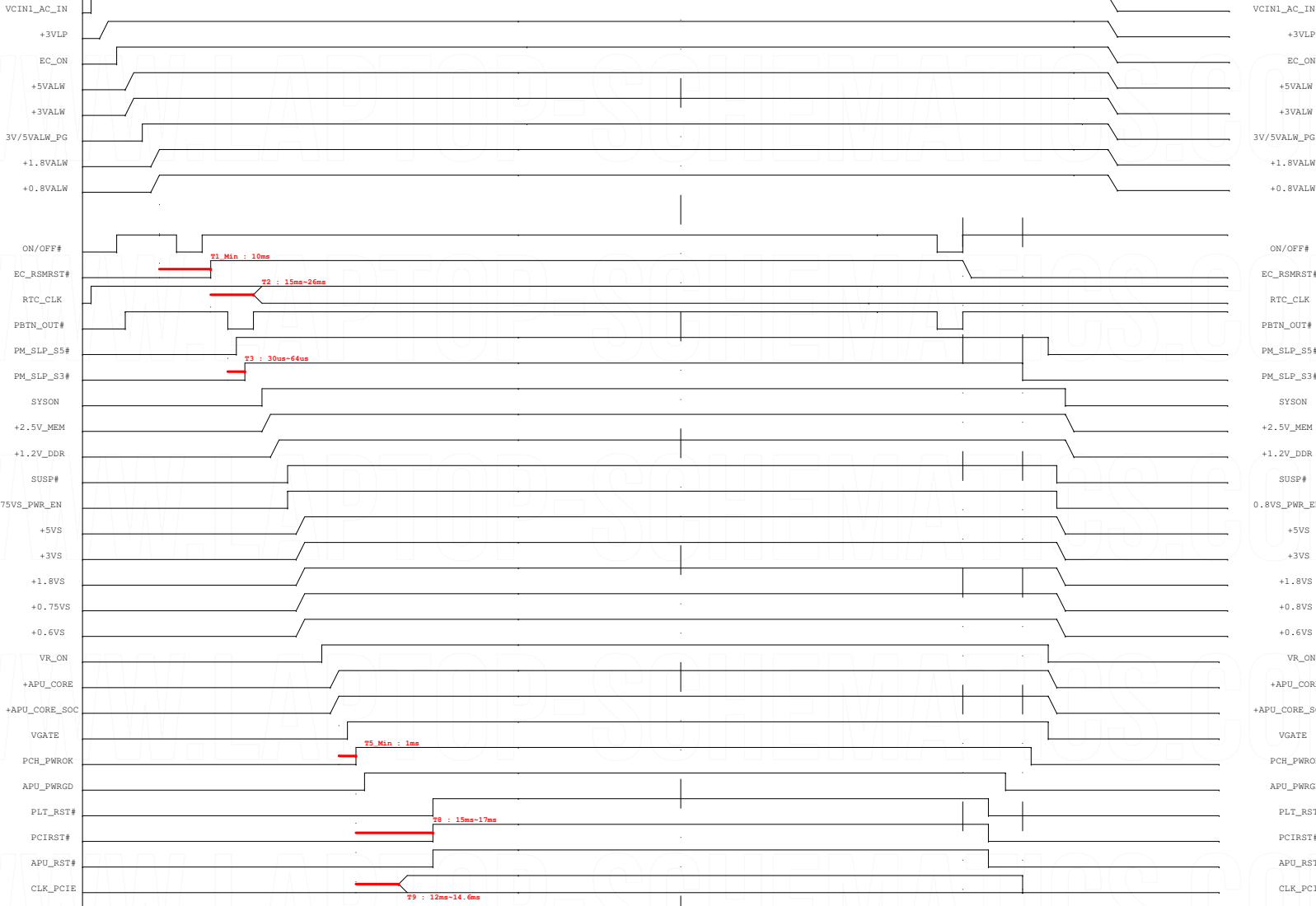
EC Pin 99 Output

EC Pin 121 Output

EC Pin 36 Input

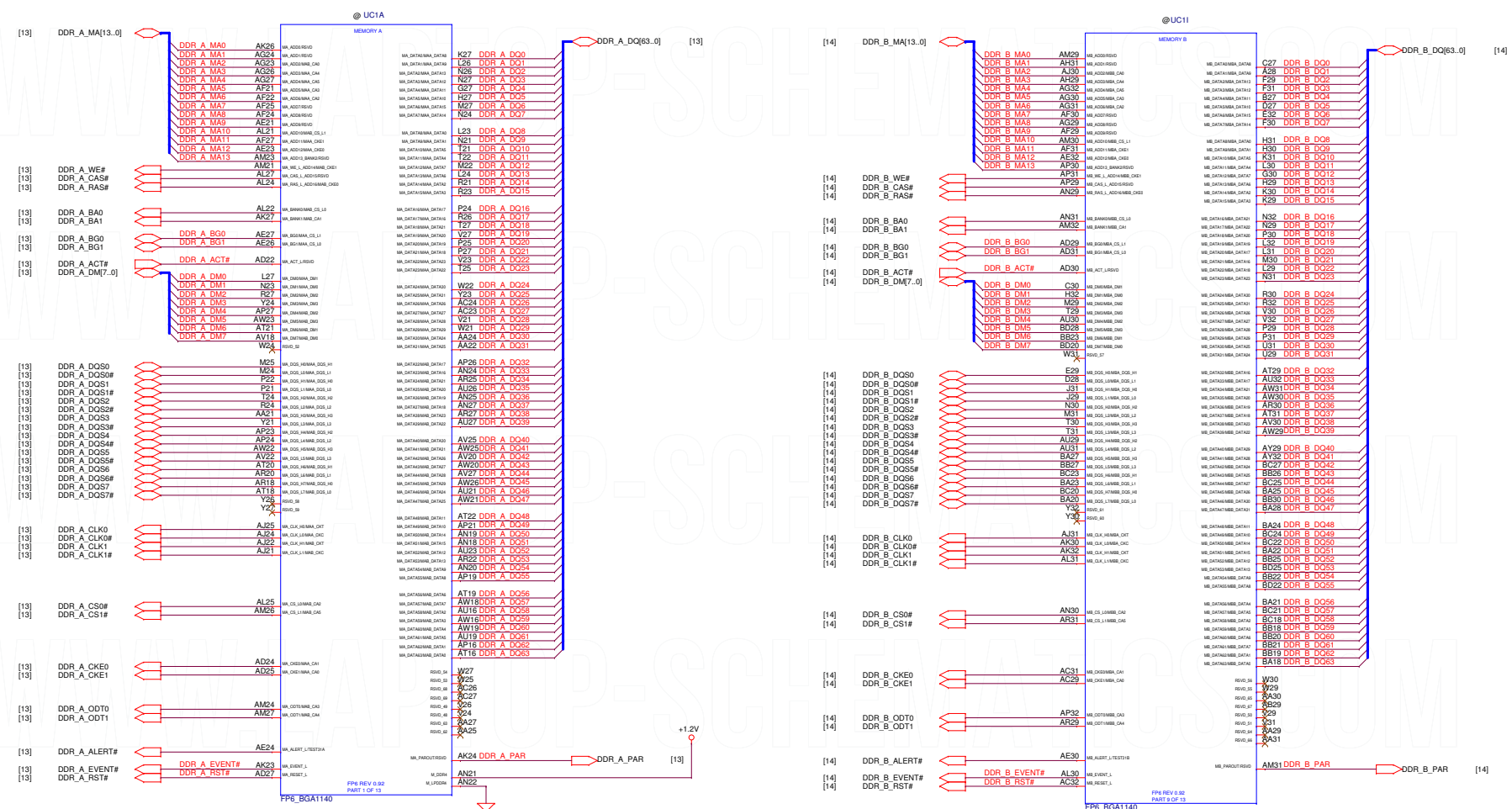
EC Pin 32 Output

EC Pin 13 Input



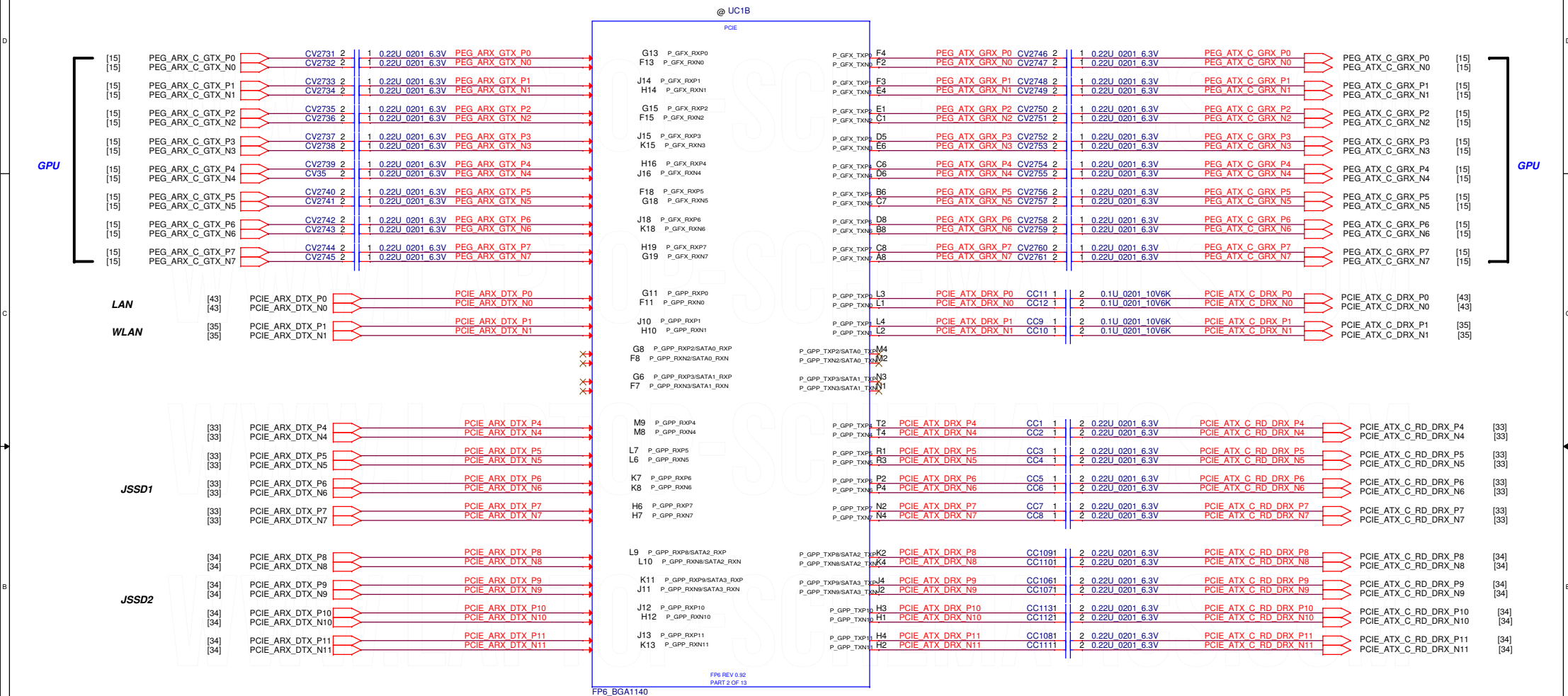
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Main Func = CPU

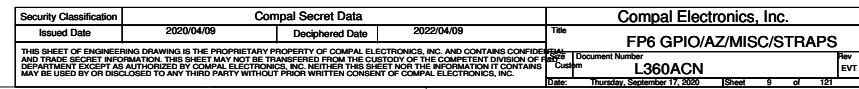


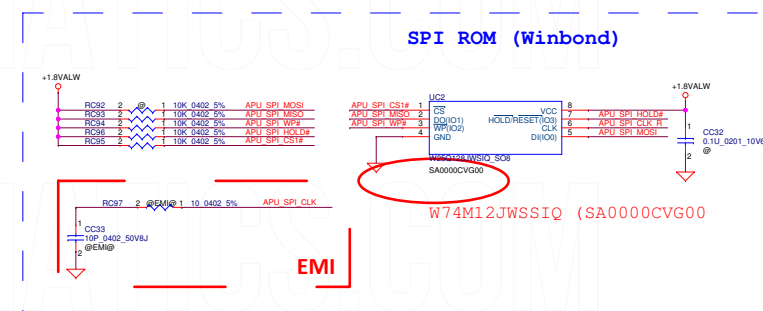
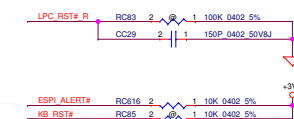
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		Sheet		6 of 121	

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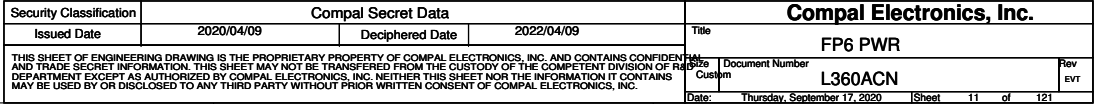


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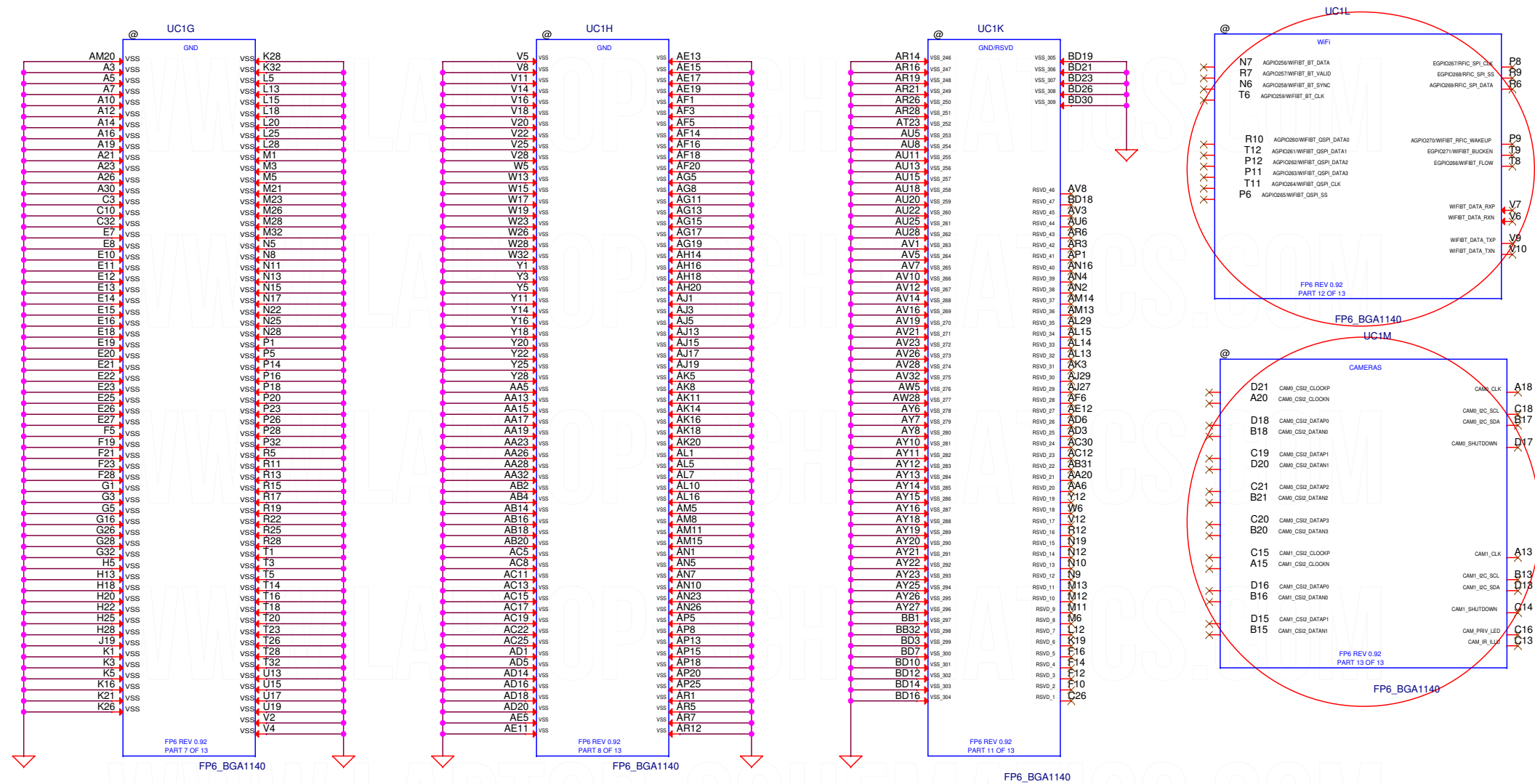




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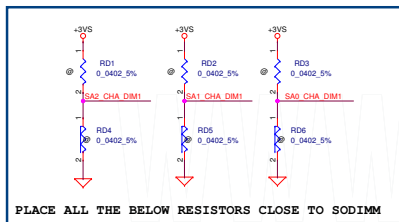


Main Func = CPU



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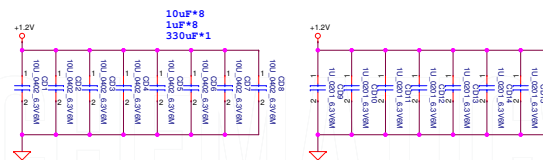
CHANNEL-A



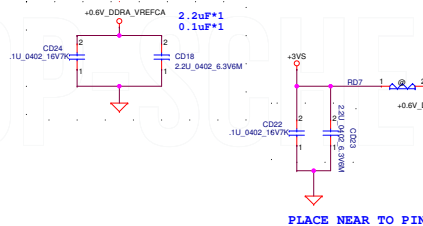
```
SPD ADDRESS FOR CHANNEL A :
WRITE ADDRESS:
READ ADDRESS:
SA0 = 0; SA1 = 0; SA2 = 0.
DDR4 POR OPERATING SPEED: 1867 MT/S
STRETCH GOAL IS 2133 MT/S
```

(4.0 mm)

Layout Note:
Place near JDIMM2

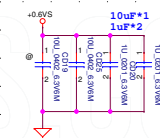


Layout Note:
PLACE THE CAP WITHIN 200 MILS
FROM THE JDIMM2

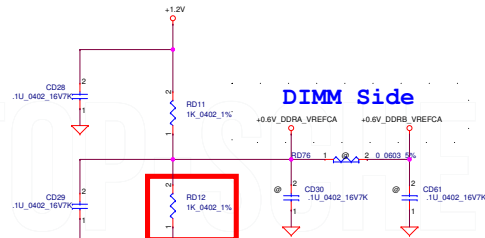
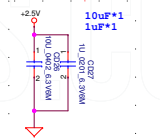


PLACE NEAR TO PIN

Layout Note:
Place near JDIMM2



Layout Note:
Place near JDIMM

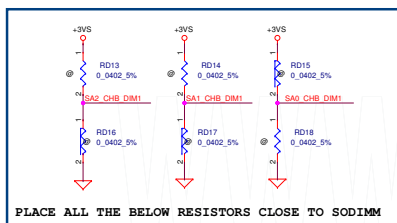


1.5K for ES DDR issue / 1K for QS sample
VREF traces should be at least 20mils wide
20mils spacing to other signals

RESERVE

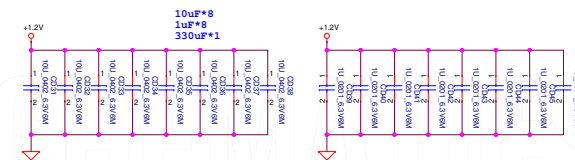
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CHANNEL-B

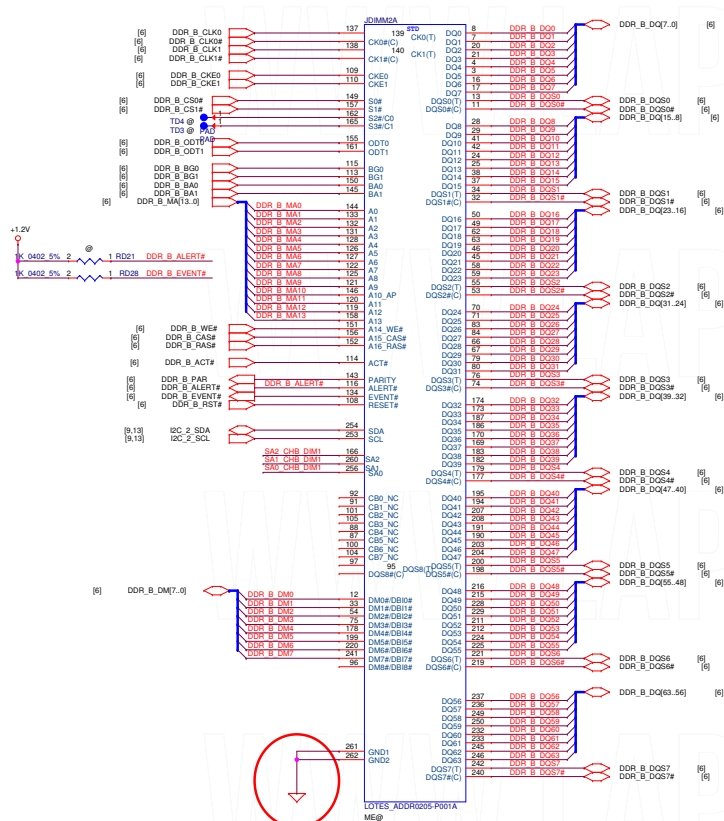


```
SPD ADDRESS FOR CHANNEL B :
WRITE ADDRESS:
READ ADDRESS:
SA0 = 1; SA1 = 0; SA2 = 0.
DDR4 POR OPERATING SPEED: 1867 MT/S
STRETCH GOAL IS 2133 MT/S
```

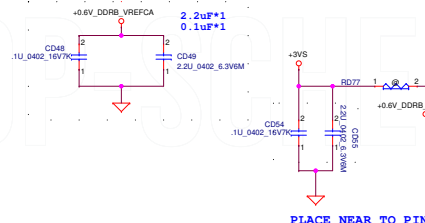
Layout Note:
Place near JDIMM2



(8.0 mm)

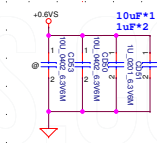


Layout Note:
PLACE THE CAP WITHIN 200 MILS
FROM THE JDIMM2

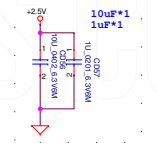


PLACE NEAR TO PIN

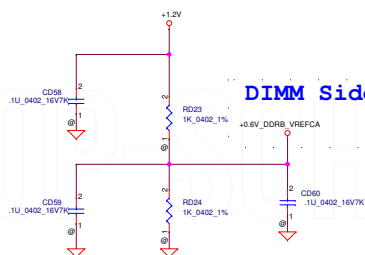
Layout Note:
Place near JDIMM2



Layout Note:
Place near JDIMM



DIMM Side



STANDARD

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GC OFF 1.0 GPU Power ON/OFF

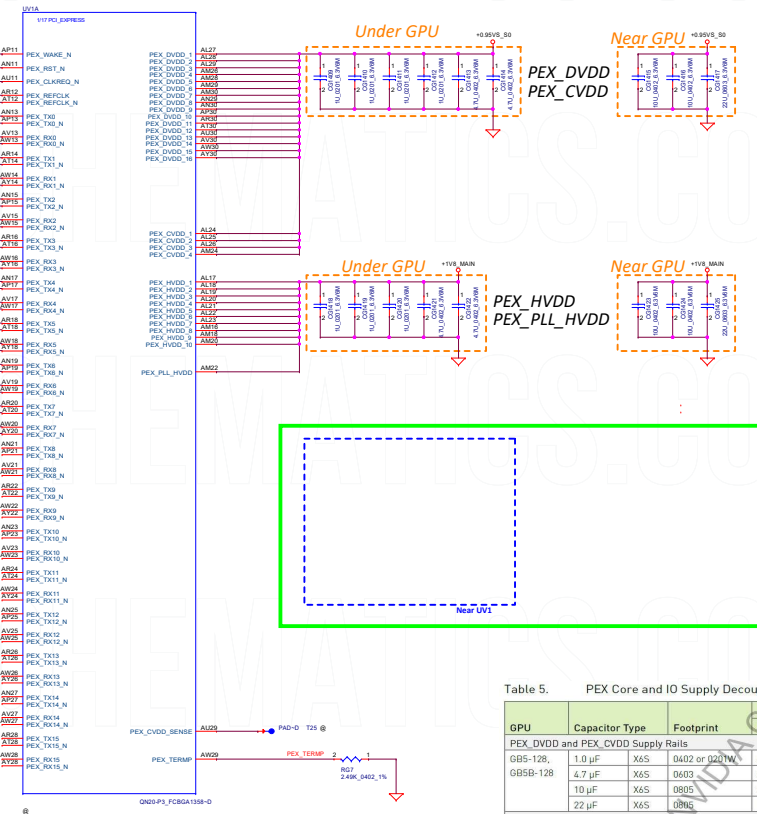
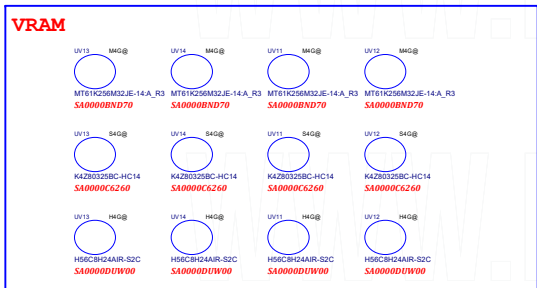
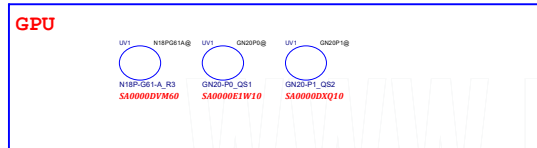
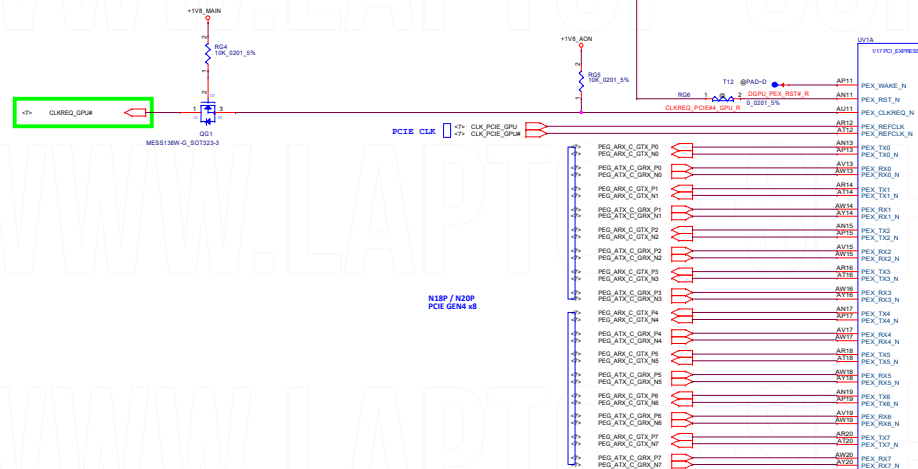
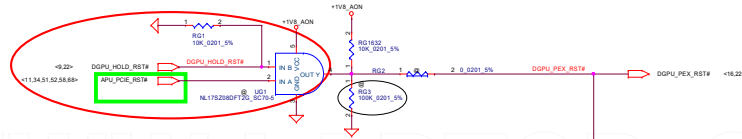
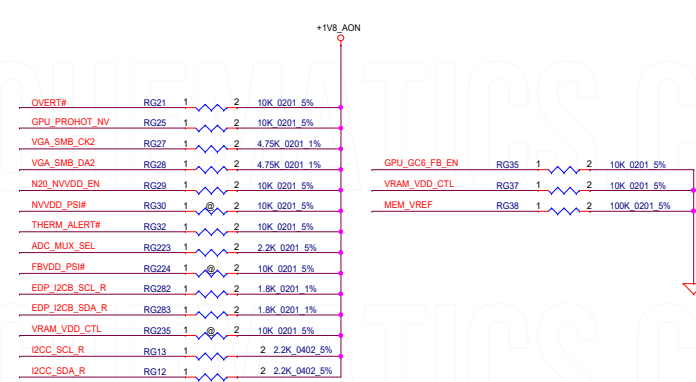
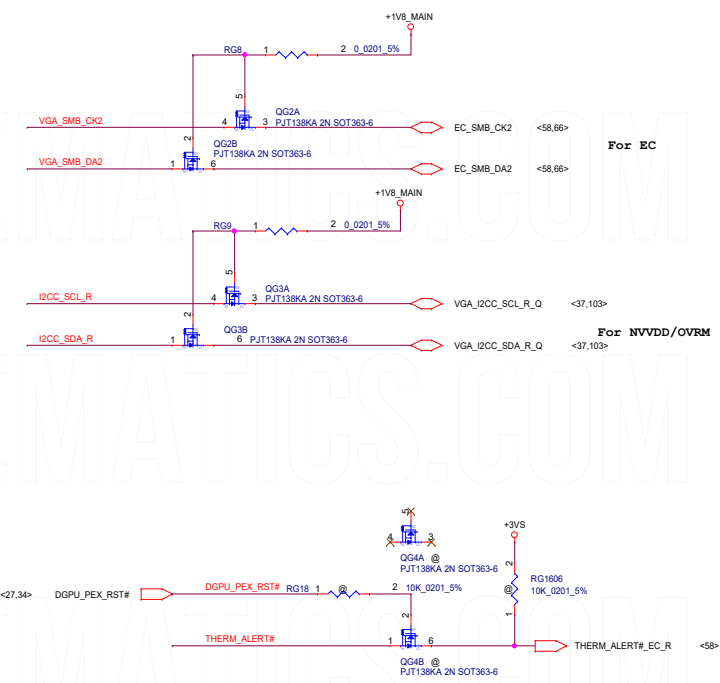
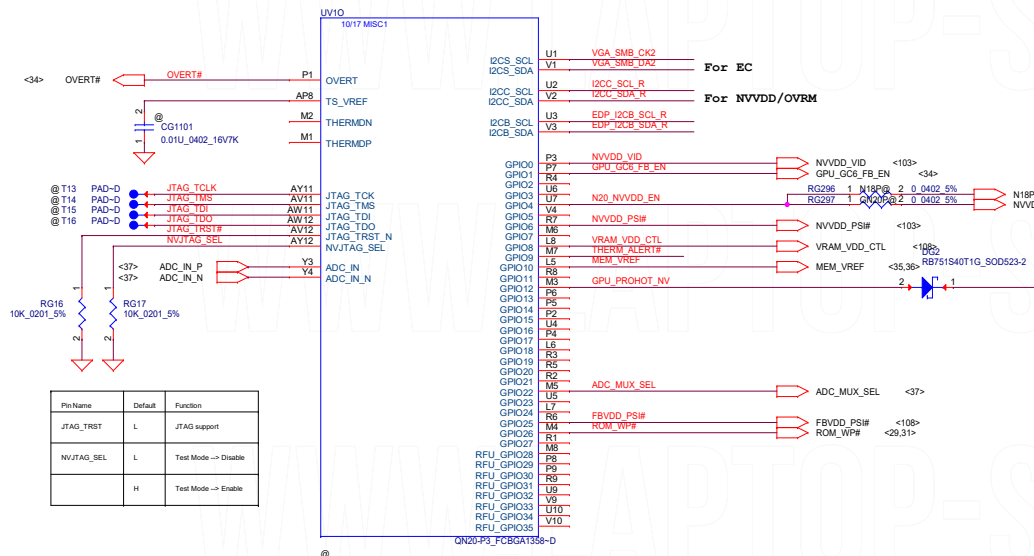
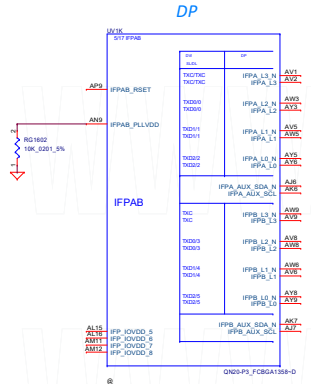


Table 5. PEX Core and IO Supply Decoupling and Filtering

GPU	Capacitor Type	Footprint	Population		Location
			GB5-128	GB5B-128	
PEX_DVDD and PEX_CVDD Supply Rails					
GB5-128, GB5B-128	1.0 µF	X4S	0402 or 0201W	4	Under GPU
	4.7 µF	X4S	0403	2	Under GPU
	10 µF	X4S	0805	2	Near GPU
	22 µF	X4S	0805	1	Near GPU
PEX_HVDD and PEX_PLL_HVDD Supply Rails					
GB5-128, GB5B-128	1.0 µF	X4S	0402 or 0201W	3	Under GPU
	4.7 µF	X4S	0403	2	Under GPU
	10 µF	X4S	0805	2	Near GPU
	22 µF	X4S	0805	1	Near GPU

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Issued Date	2020/7/31	Declassified Date	2020/7/31	Rev	1
				GN20P (1/9) PCIe	
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				Rev	





Memory Density	Allowed Memory Configuration	FBVDD/Q	Vendor	Manufacturer Part Number	Die Revision	Strap	Memory Speed Grade	Date Code	Qual Plan	Status
8 Gb	2Chx256Mx16	1.35V	Samsung	KA280325BC-HC14	C-die	Dx0	14 Gbps	2019	Full	Production candidate
		1.25V	Hynix	H5CBH24AIR-S2C	A-die	Dx2	14 Gbps	N/A	Full	Production candidate
		1.2V	Micron	MT61K256M32JE-14-A	A-die	Dx1	14 Gbps	1940	Full	Production candidate

Notes:
1 Refer to GN20-E GeForce Product Spec for memory voltages and clocks.
2 Before the date code is available, the specialty screened (for 11 Gbps @ 1.2V support) Samsung memory is identified by "SPL" within the inserted before the seven digits in its lot ID.
3 Before the date code is available, the specialty screened (for 11 Gbps @ 1.2V support) Micron memory will include the "DDR4 1.2V @ 11 Gbps" words in the label.
For GN20-E3, the maximum allowable memory case temperature is 95 °C.

QDDR6 VRAM	Strap2	Strap1	Strap0	RAMCFG
Samsung , KA280325BC-HC14	L	L	L	0x03
Micron , MT61K256M32JE-14-A	L	L	H	0x11
Hynix , H5CBH24AIR-S2C	L	H	L	0x2

Samsung	<input type="checkbox"/> RG1603 X7E S@ 100K_0201_1%	<input type="checkbox"/> RG1603 X7E S@ 100K_0201_1%	<input type="checkbox"/> RG1603 X7E S@ 100K_0201_1%
Micron	<input type="checkbox"/> RG1603 X7E M@ 100K_0201_1%	<input type="checkbox"/> RG1603 X7E M@ 100K_0201_1%	<input type="checkbox"/> RG1603 X7E M@ 100K_0201_1%
Hynix	<input type="checkbox"/> RG1603 X7E M@ 100K_0201_1%	<input type="checkbox"/> RG1603 X7E M@ 100K_0201_1%	<input type="checkbox"/> RG1603 X7E M@ 100K_0201_1%

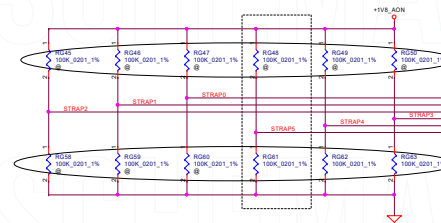


Table 11.4 FS_OVERT* Strap Enablement

Strap Pins see Note			FS_OVERT* Function
ROM_SO	ROM_SI	ROM_SCLK	
L	L	L	FS_OVERT* function ENABLED
L	L	H	FS_OVERT* function DISABLED (Reserved; do not configure)
all other configurations			(Invalid; do not configure)

Note that configurations other than the two listed in Table 11.4 must be avoided, as otherwise damage to strap inputs may result.

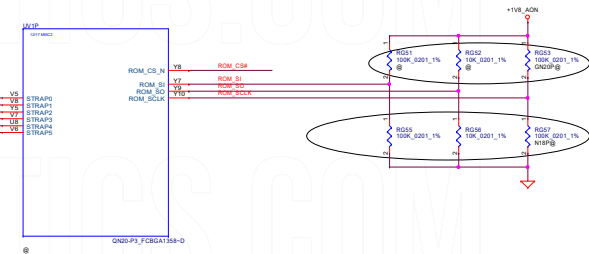
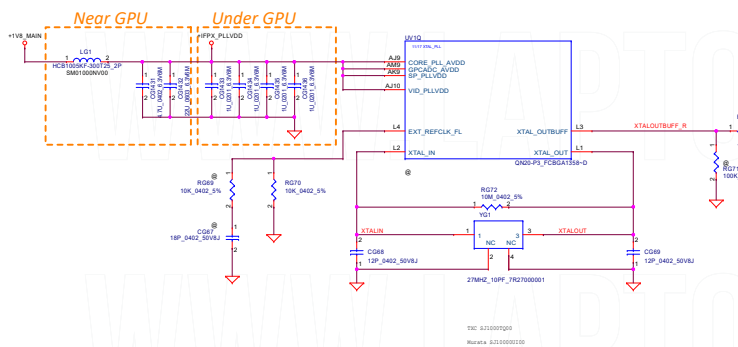
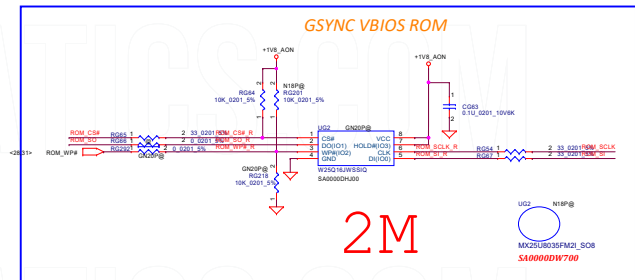
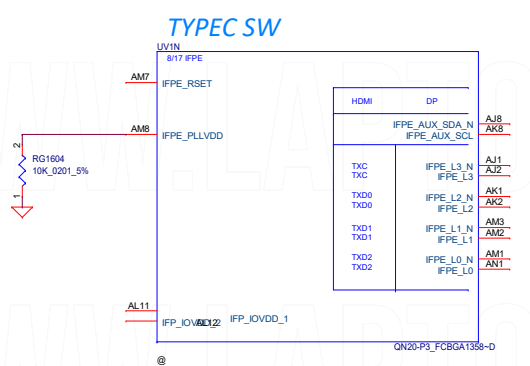
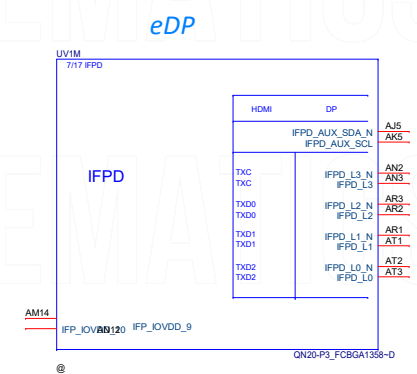
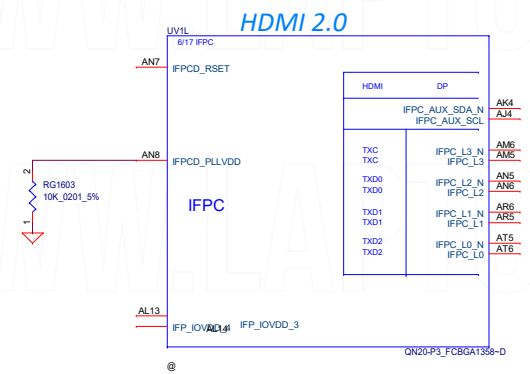


Table 9.3 RAMCFG

Strap Pins see Note			RAMCFG Setting Number
STRAP2	STRAP1	STRAP0	See Memory RVL for memory configs corresponding to these numbers
L	L	L	0 (0x0000)
L	L	H	1 (0x0001)
L	H	L	2 (0x0002)
L	H	H	3 (0x0003)
H	L	L	4 (0x0004)
H	L	H	5 (0x0005)
H	H	L	6 (0x0006)
H	H	H	7 (0x0007)
L	L	M	8 (0x0008)
L	M	L	9 (0x0009)
L	M	H	10 (0x000A)
L	H	M	11 (0x000B)
M	L	L	12 (0x000C)
M	L	H	13 (0x000D)
M	H	L	14 (0x000E)
M	H	H	15 (0x000F)



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Place under GPU

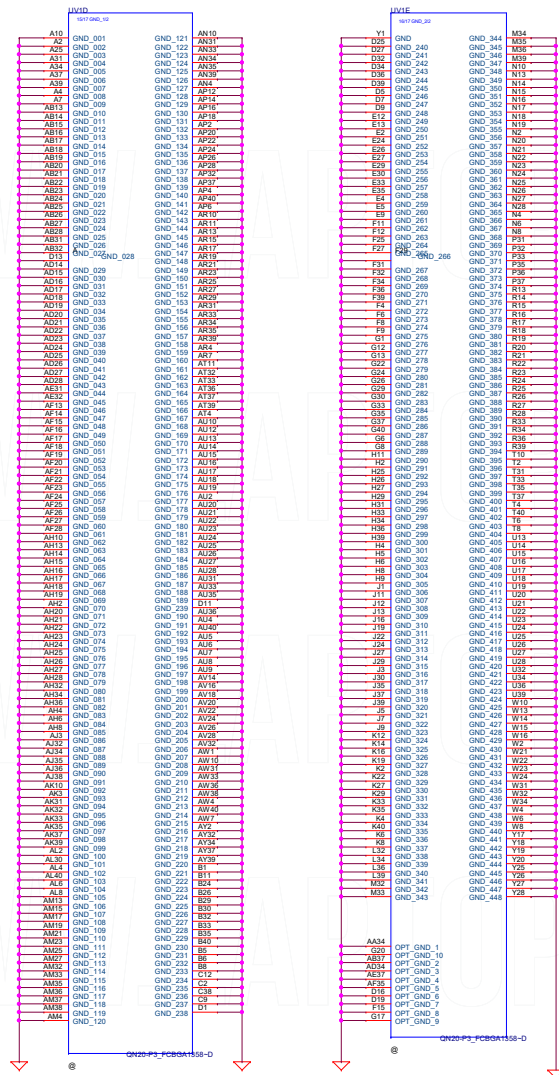
10UF_0603 X 4 pcs

Place near GPU

22UF_0603 X 5 pcs

10UF 0603 X 2 pcs

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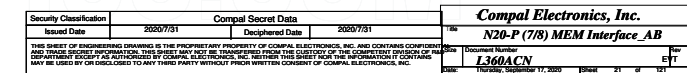


Figure 3.3 GPU Power Up Sequencing for NVVDD/MSVDD merged rail

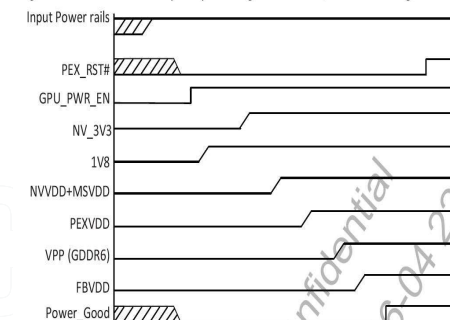


Figure 3.4 GPU Power down Sequencing for NWDD/MSVDD merged rail

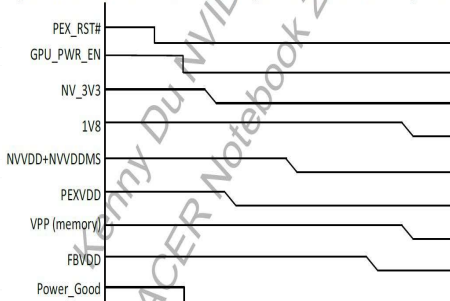
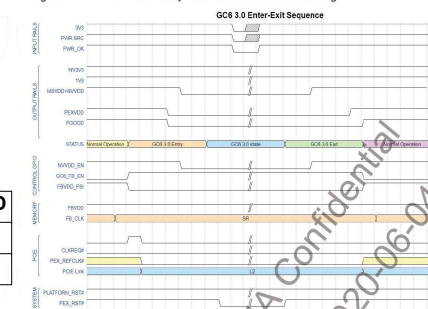
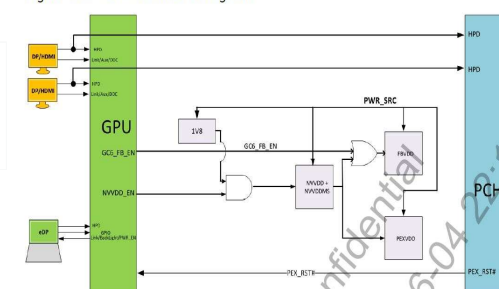


Figure 4.10 GC6 3.0 Entry and Exit Detailed Timing

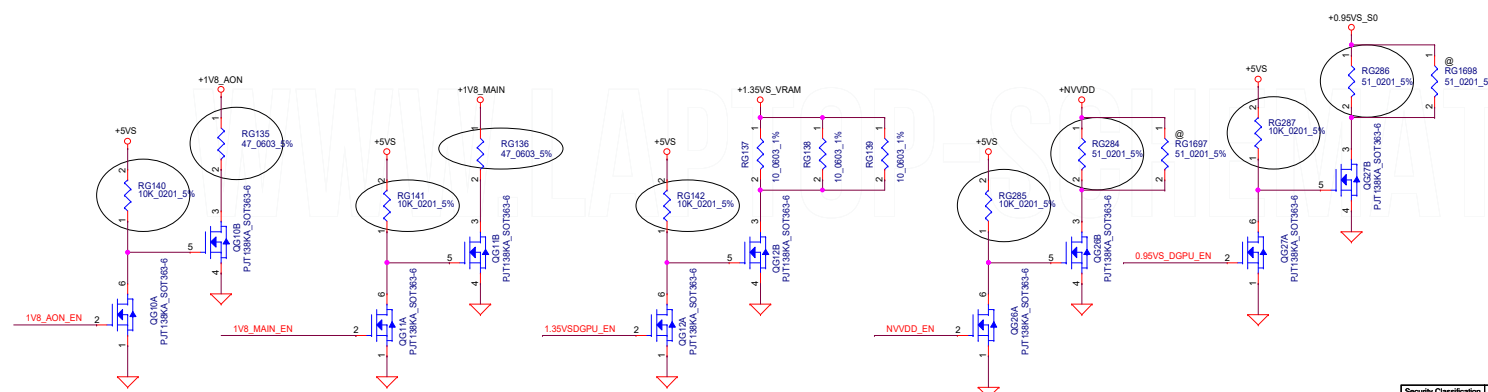
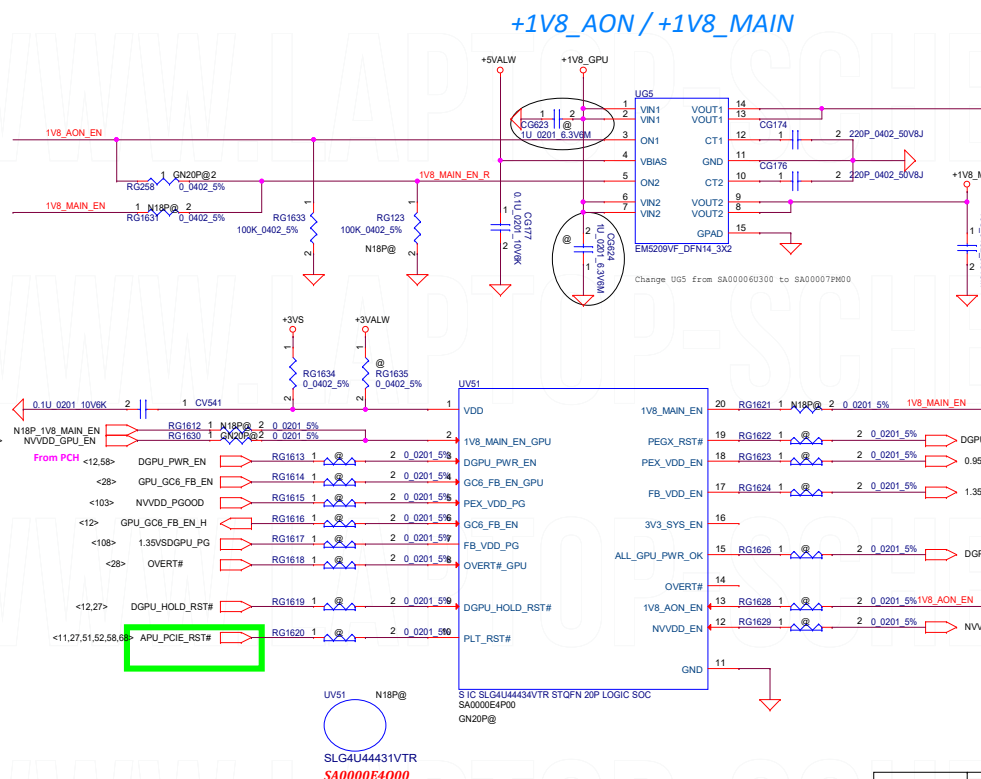


	1V8	NVDD	PEXVDD	VPP	FBVD
GC6 3.0	ON	OFF	OFF	ON	ON
GC-OFF	OFF	OFF	OFF	OFF	OFF

Figure 4.8 GC6 3.0 Block Diagram



N20E(8/8) MEM Interface_CL



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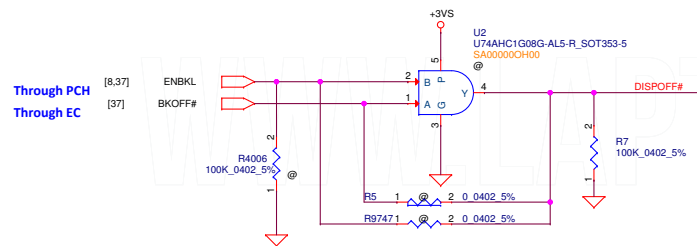
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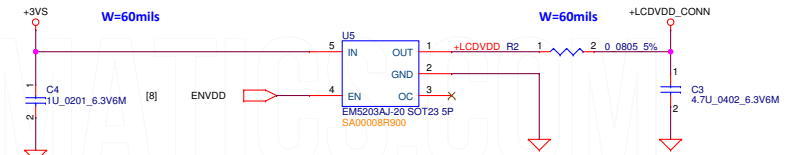
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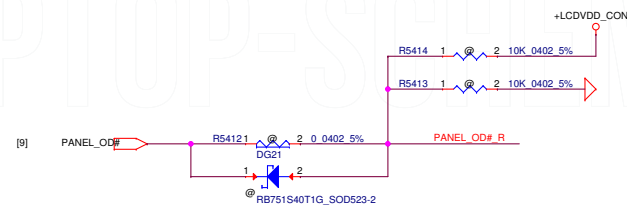
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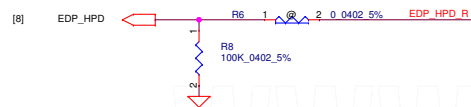
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eDP CONNECTOR



HOT PLUG DETECT



CAMERA POWER CIRCUIT

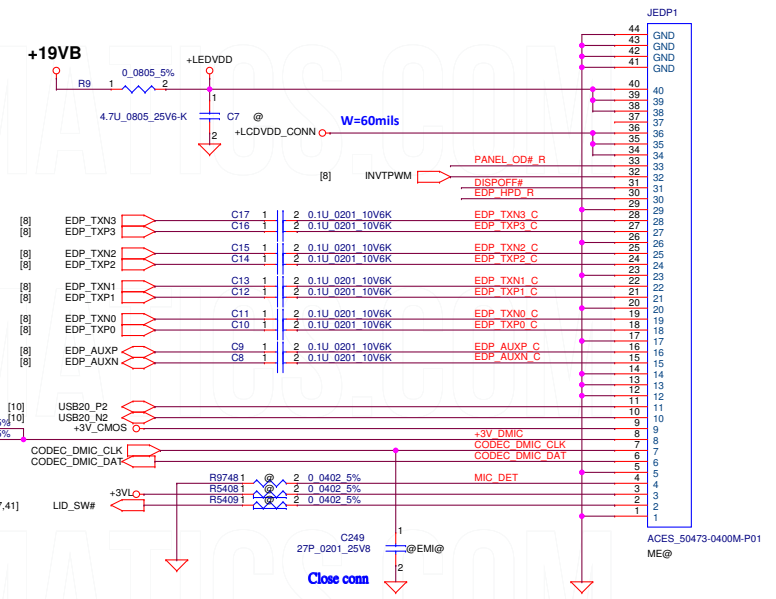
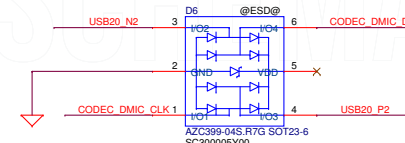


DMIC

Camera

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LID

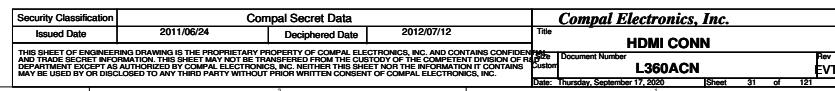


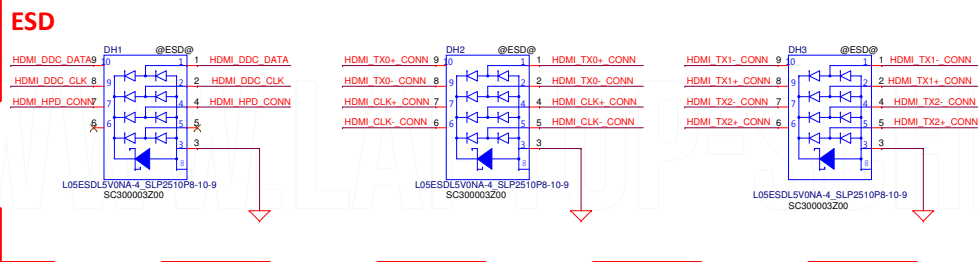
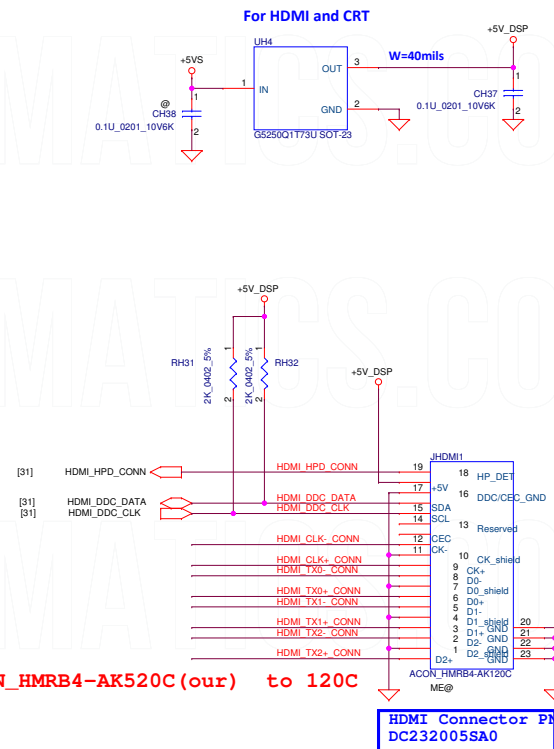
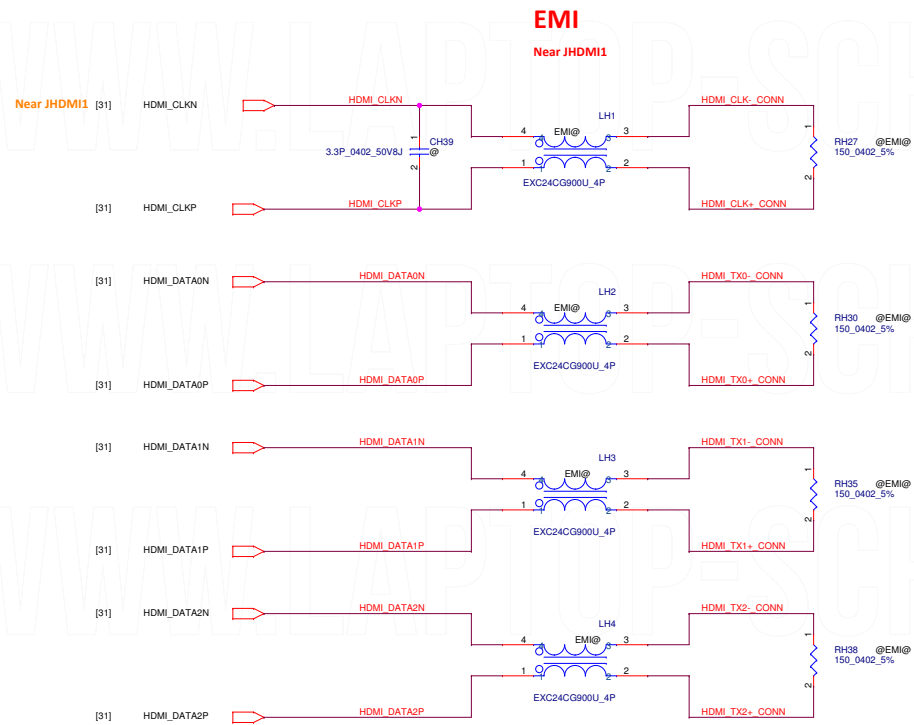
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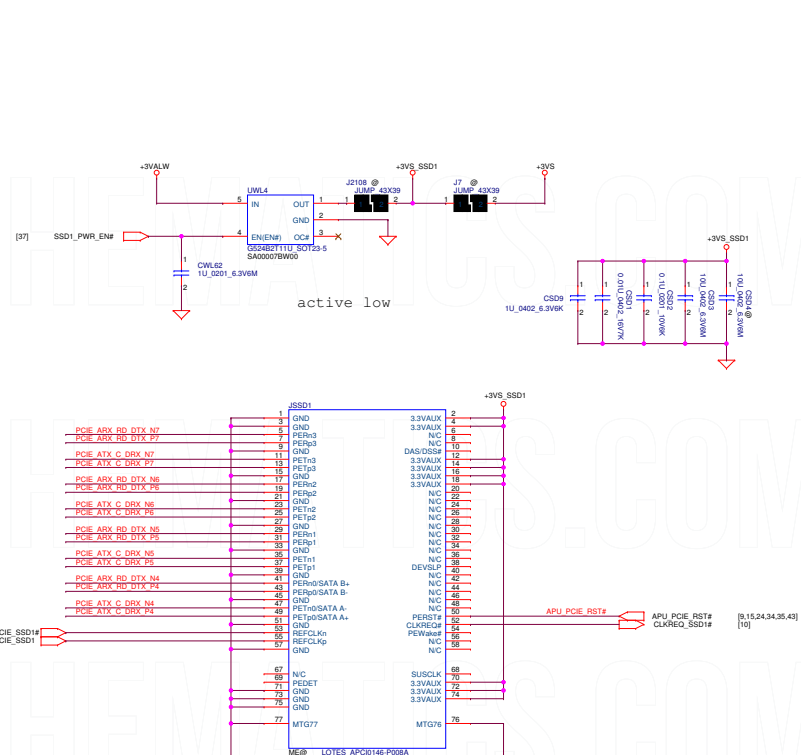
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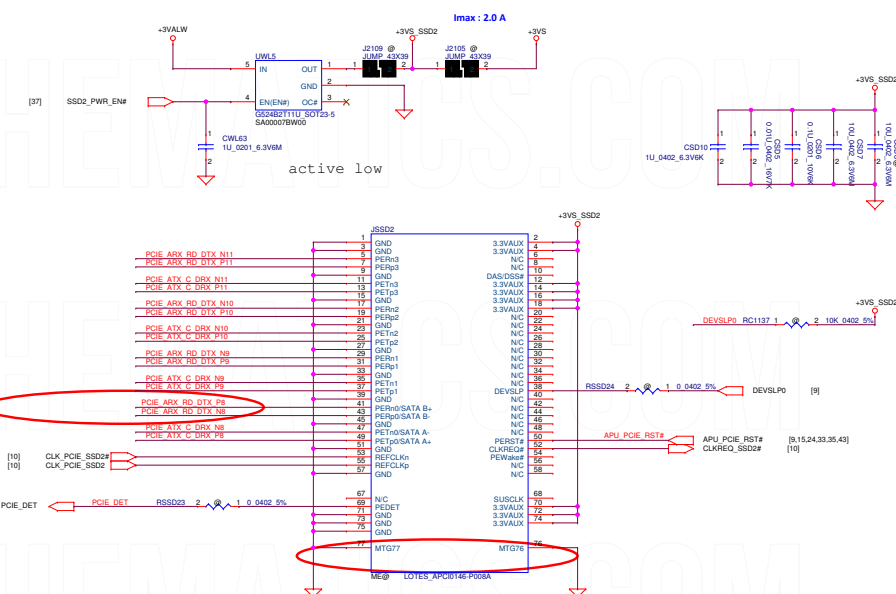
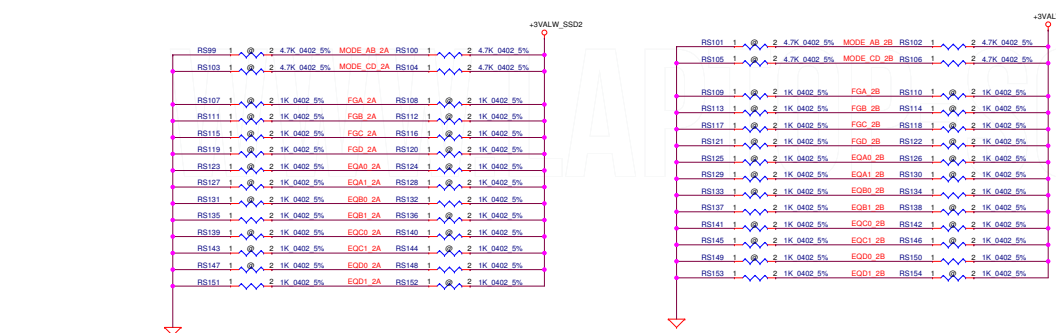
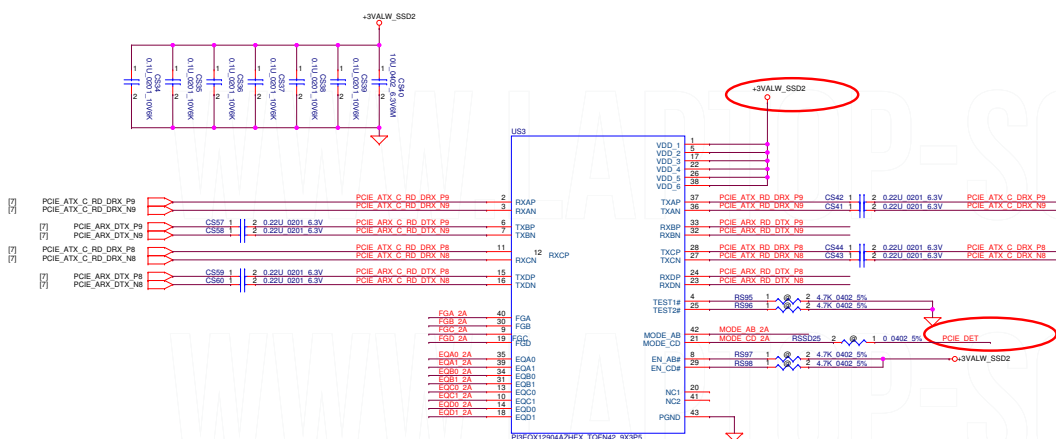
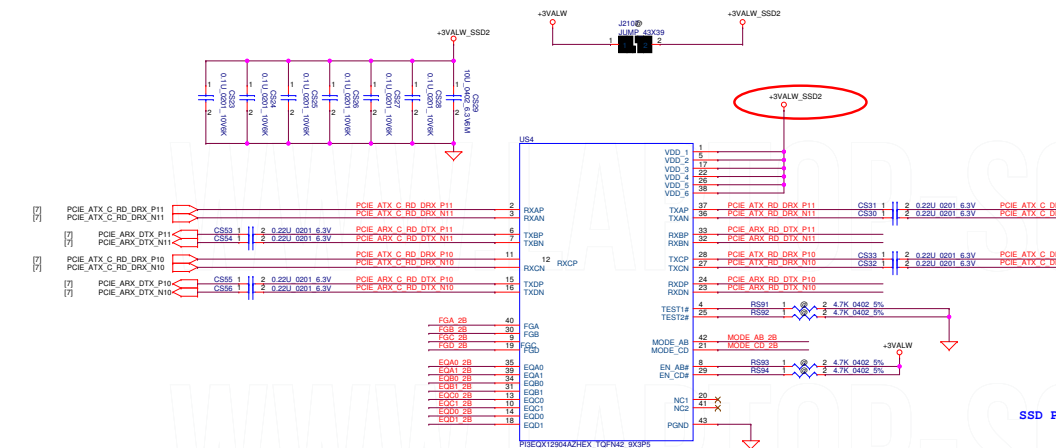


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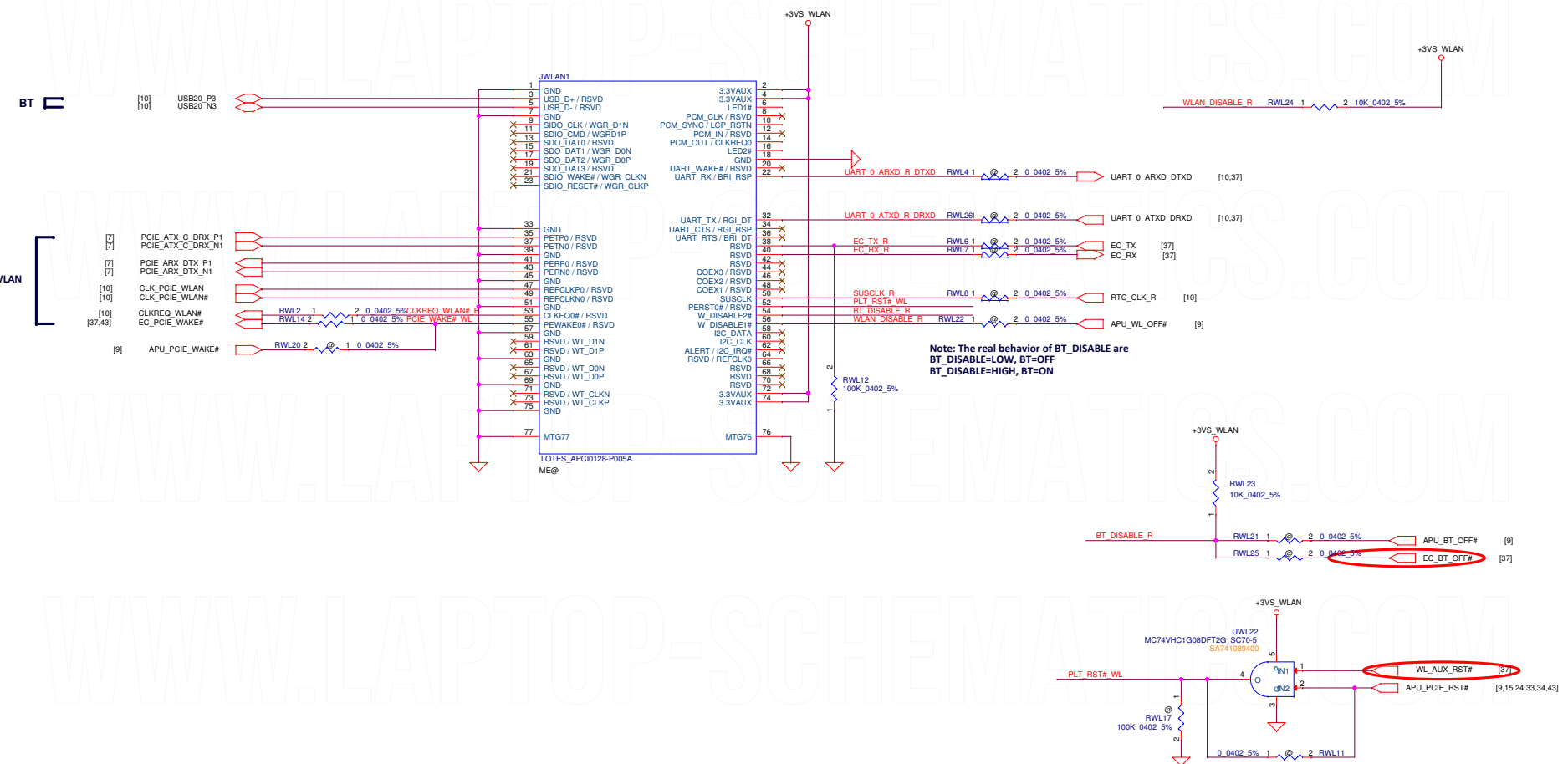
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SSD_2242 (TYPE M)



PEDET	Module Type
0	SATA
1	PCIe

NGFF - WLAN / BT CONNECTOR (KEY-E)



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SPEAK 4 ohm : 40MIL
SPEAK 8 ohm : 20MILW=40mils
W=40milsCombo Jack
(Normal Open)

+5VS --> +5VDDA_CODEC

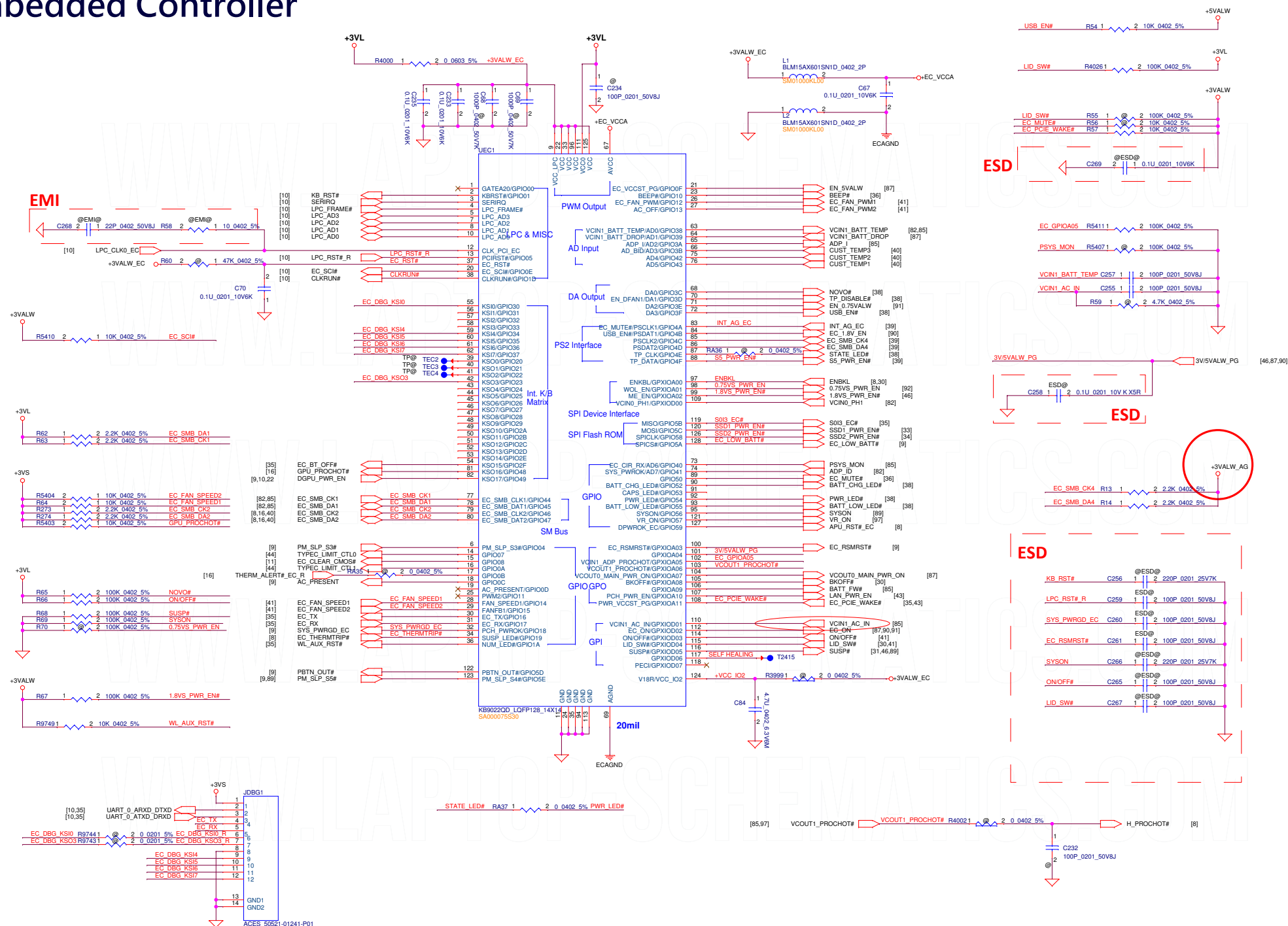
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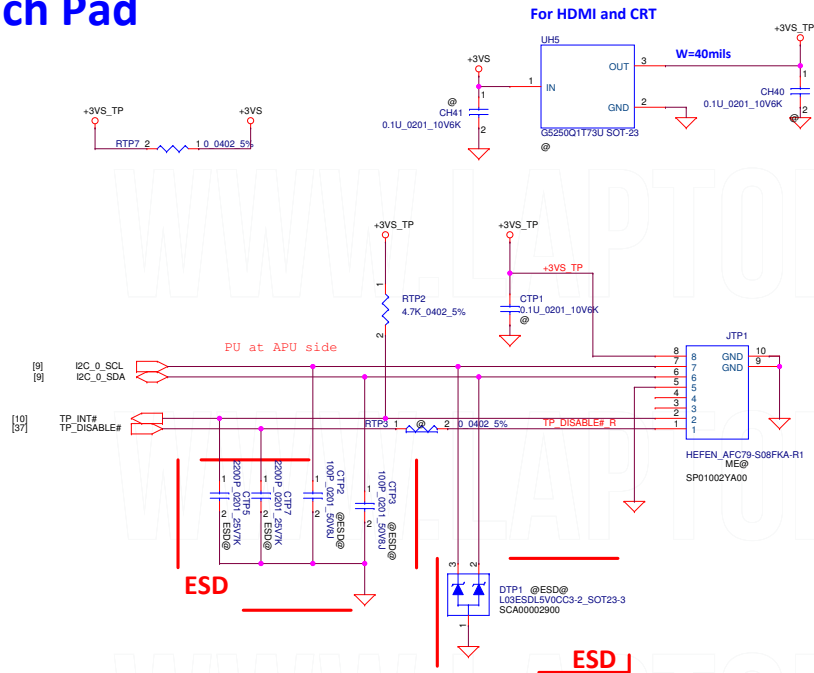
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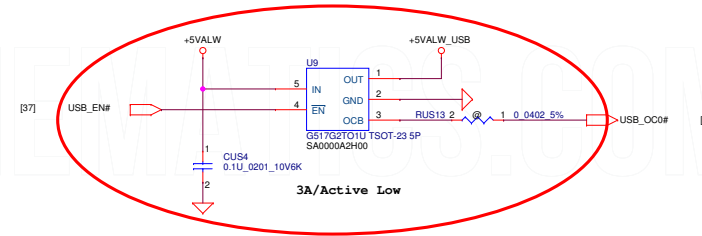
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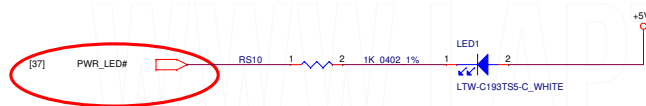


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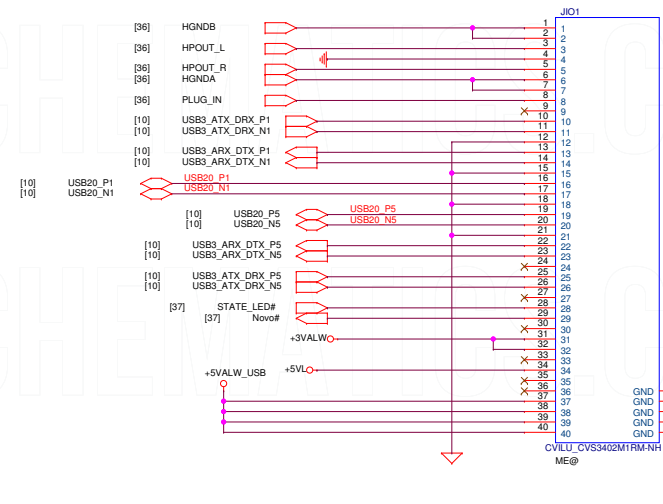
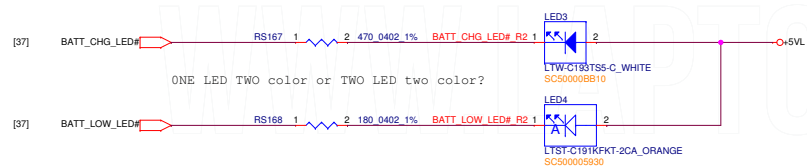
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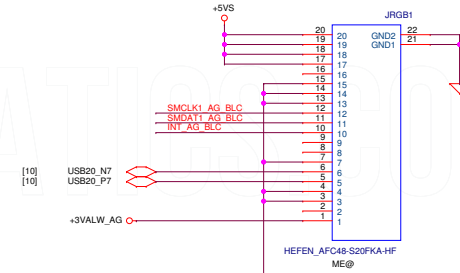
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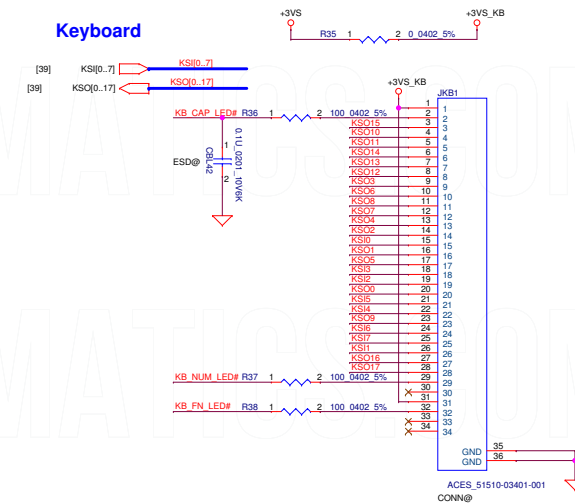
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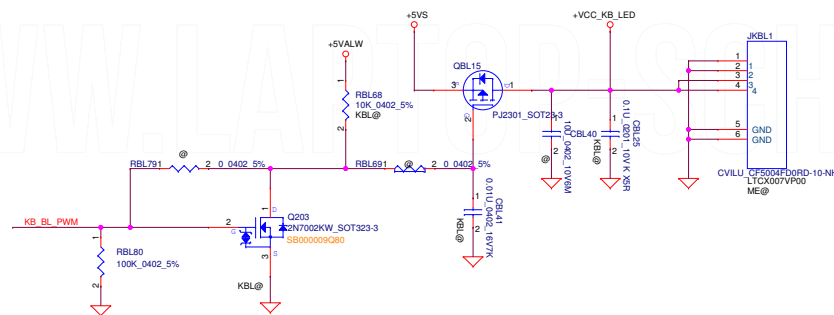
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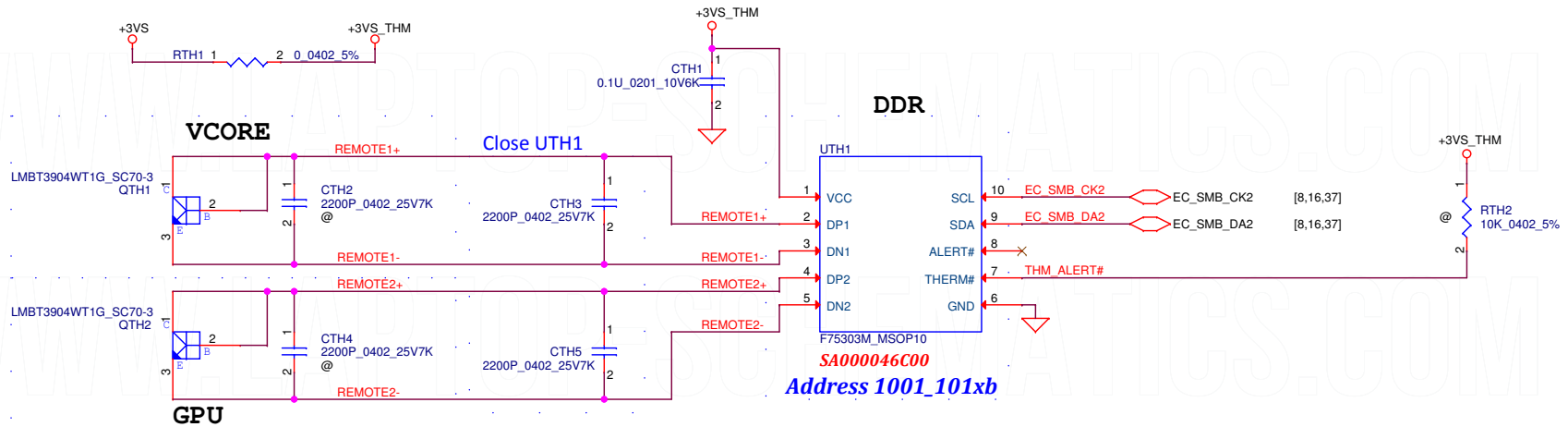


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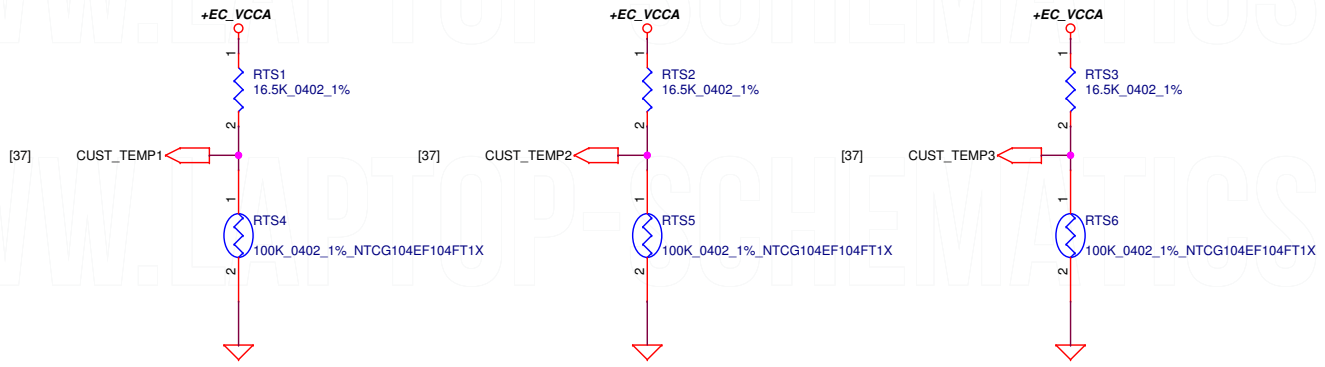


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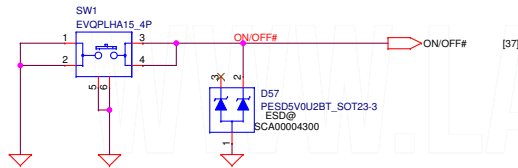
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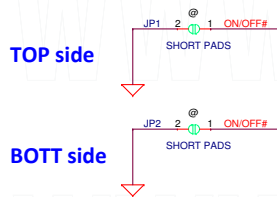


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Power Button

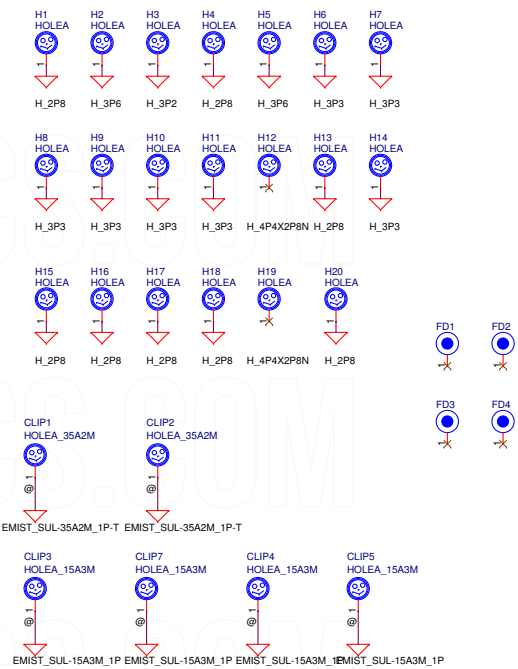


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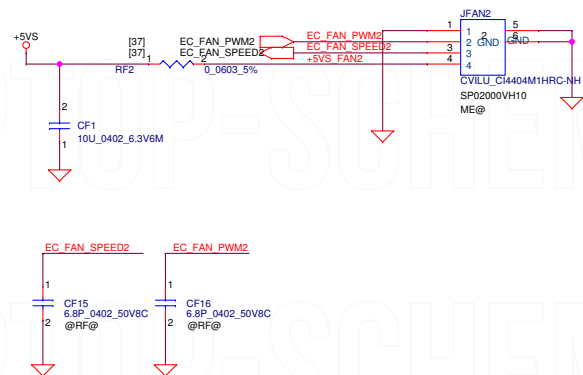
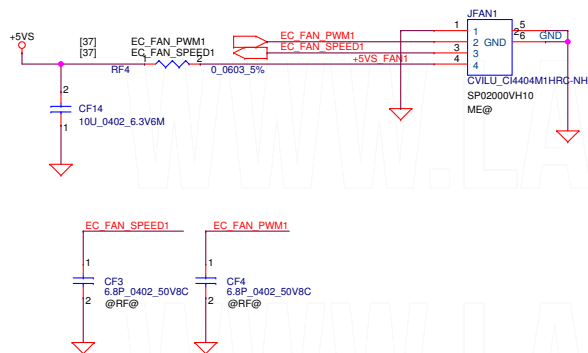
LID

SCREW



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FAN



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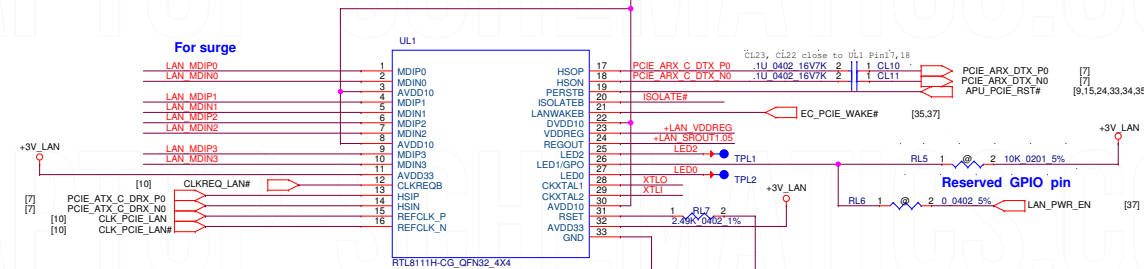
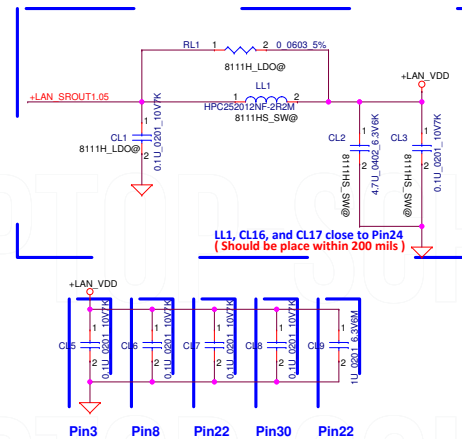
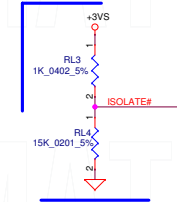
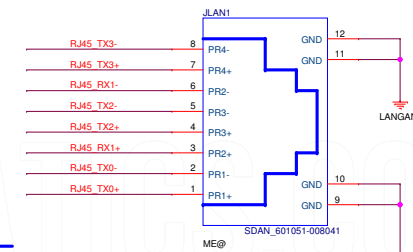
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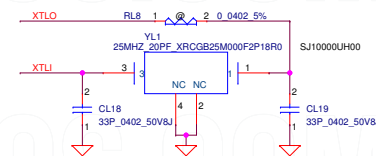
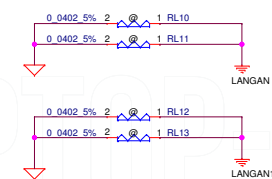
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RJ-45 CONN.

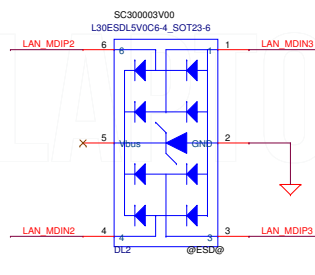
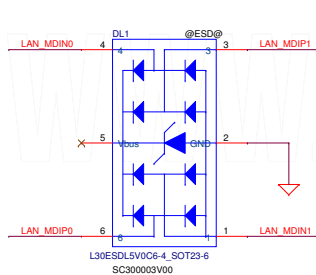
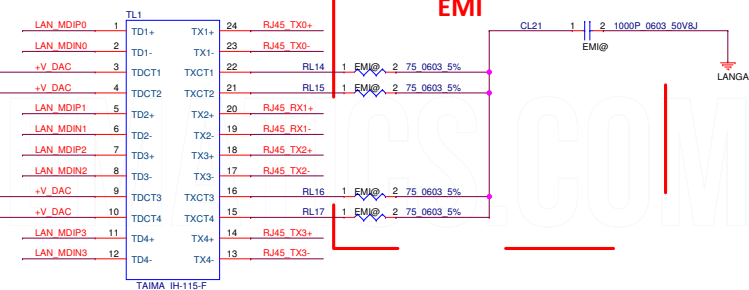
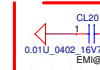


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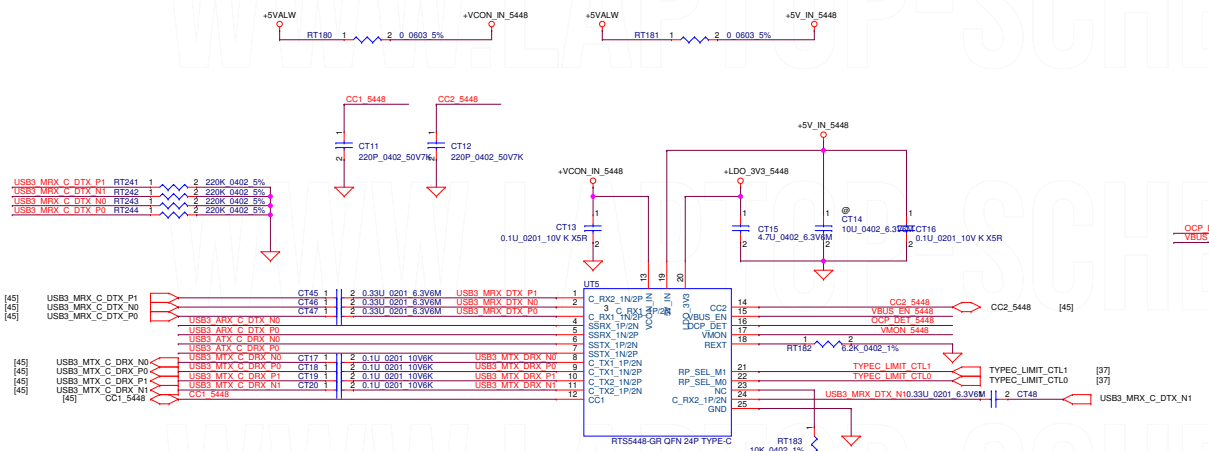
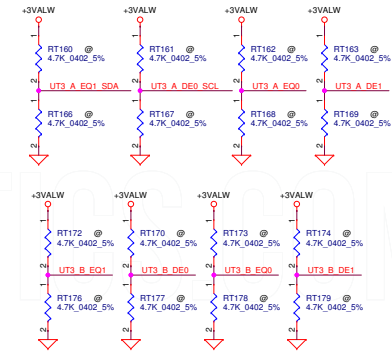
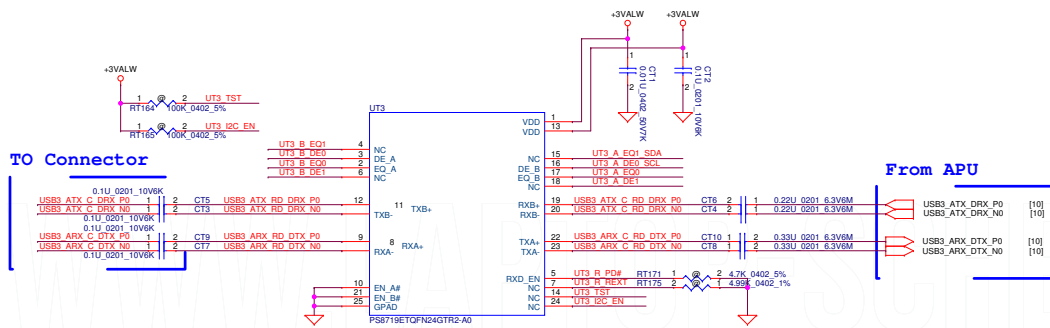


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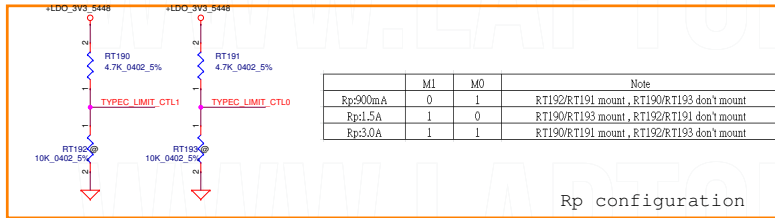


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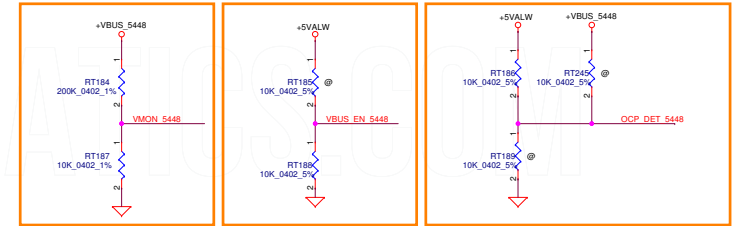
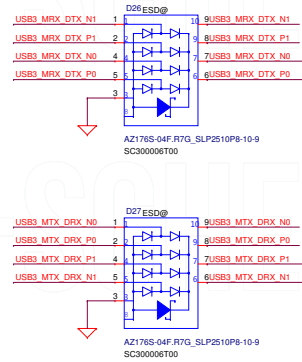
Change to SILEROY power Switch_06058

AMD spec require CAP



	M1	M0	Note
Rp:900mA	0	1	RT192/RT191 mount, RT190/RT193 don't mount
Rp:1.5A	1	0	RT190/RT193 mount, RT192/RT191 don't mount
Rp:3.0A	1	1	RT190/RT191 mount, RT192/RT193 don't mount

Rp configuration

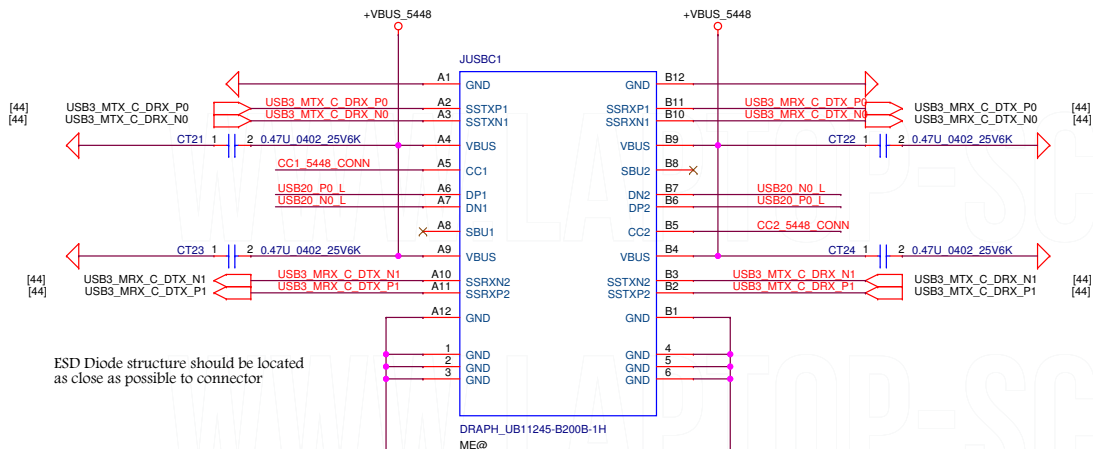


For C_VBUS power switch enable pin

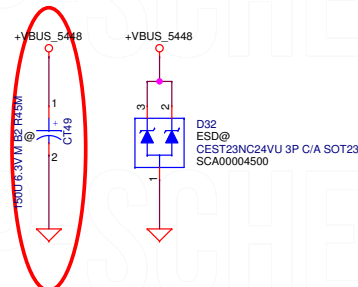
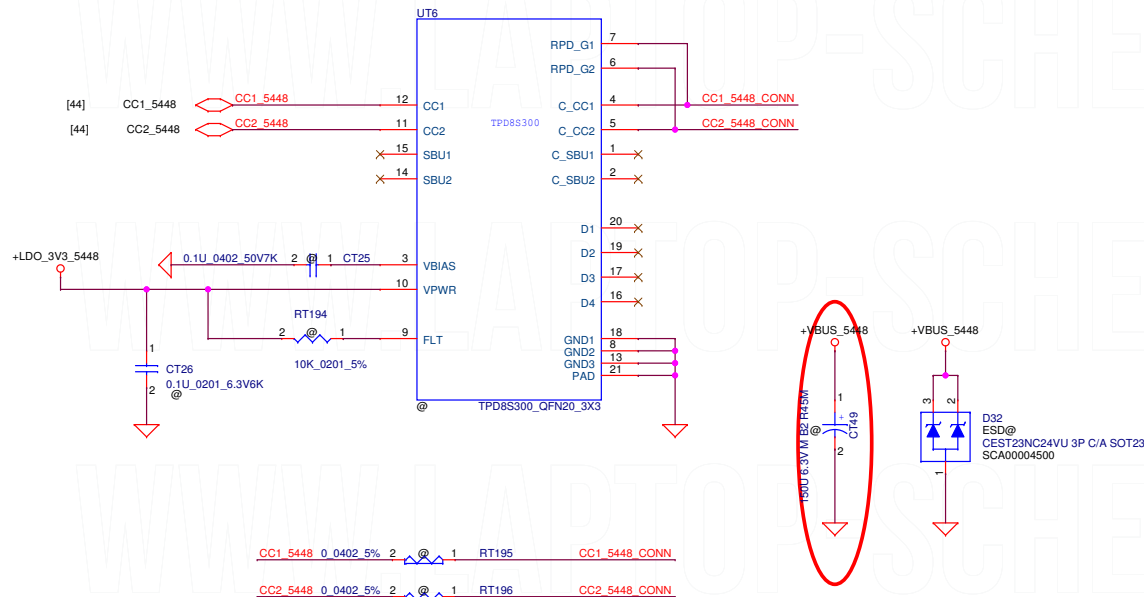
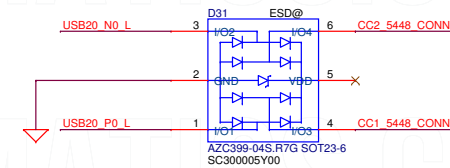
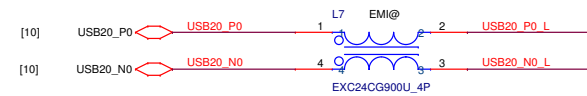
For C_VBUS power switch enable pin

Power switch enable pin	Note
Low Active	RT188/RT185 mount
High Active	RT188 mount, RT185 don't mount
Power switch OCP pin	Note
Low Active	RT189/RT186 mount
High Active	RT189 mount, RT186 don't mount

DRAPH_UB11245-B200B-1H_24P-S change to -T

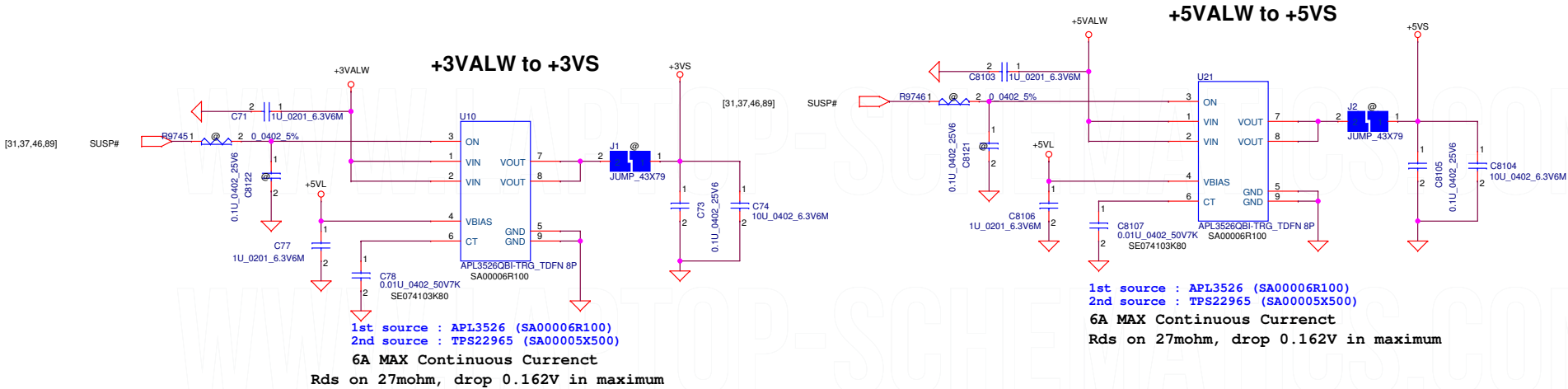


CONN FROM L360ACN
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TMP DC231703291

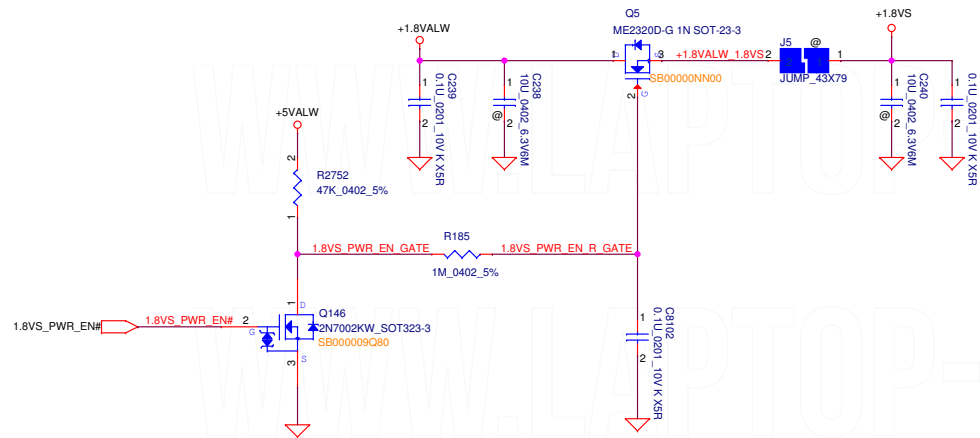


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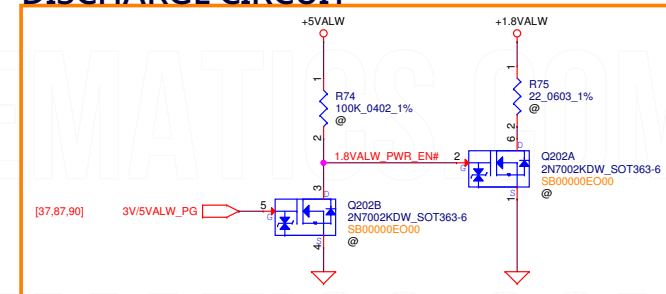
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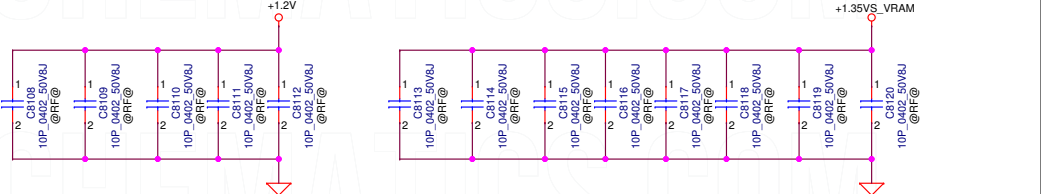
+1.8VALW to +1.8VS / +0.75VALW to +0.75VS



DISCHARGE CIRCUIT



RF



+1.8VALW Discharge Circuit (Reserved)

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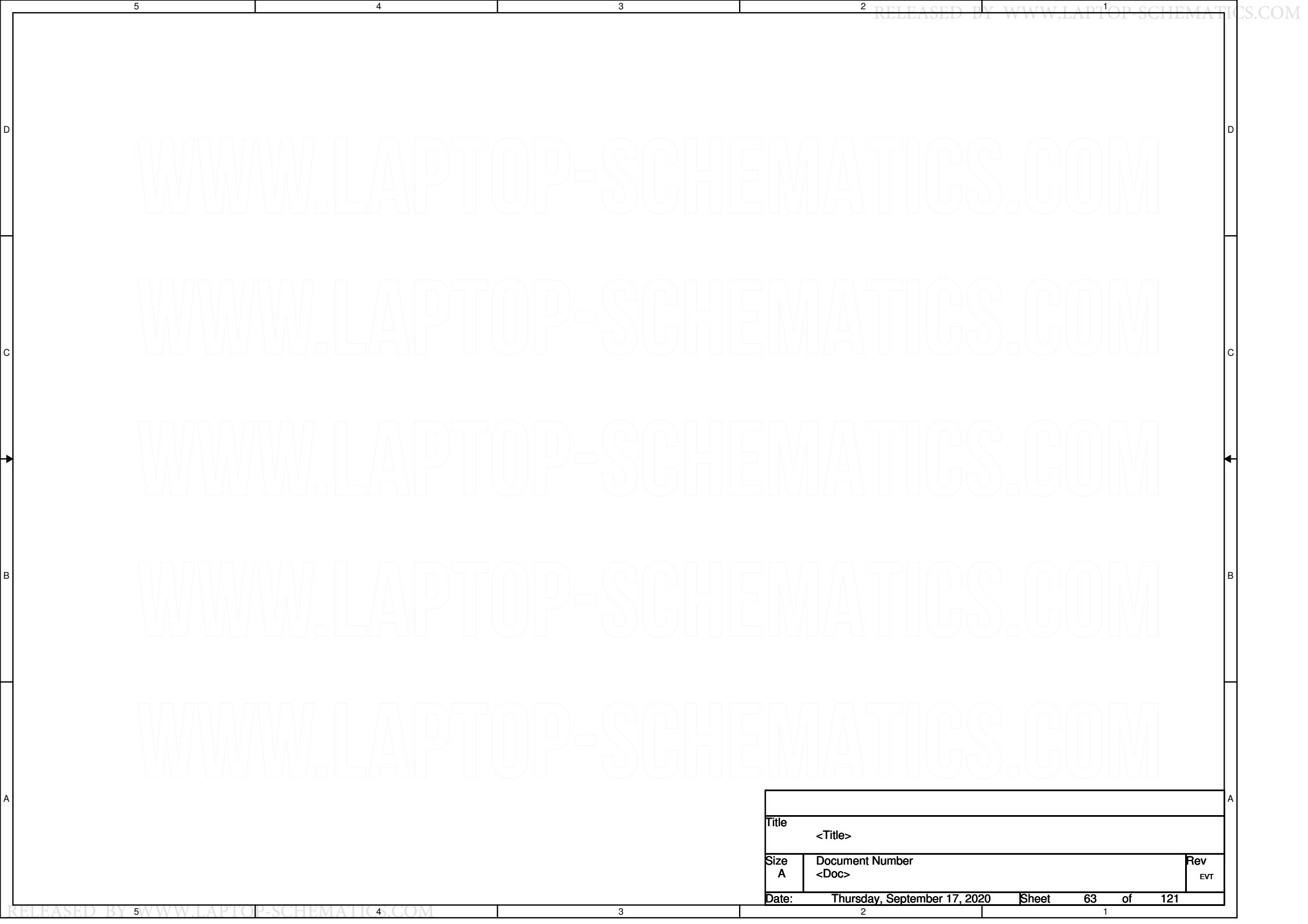
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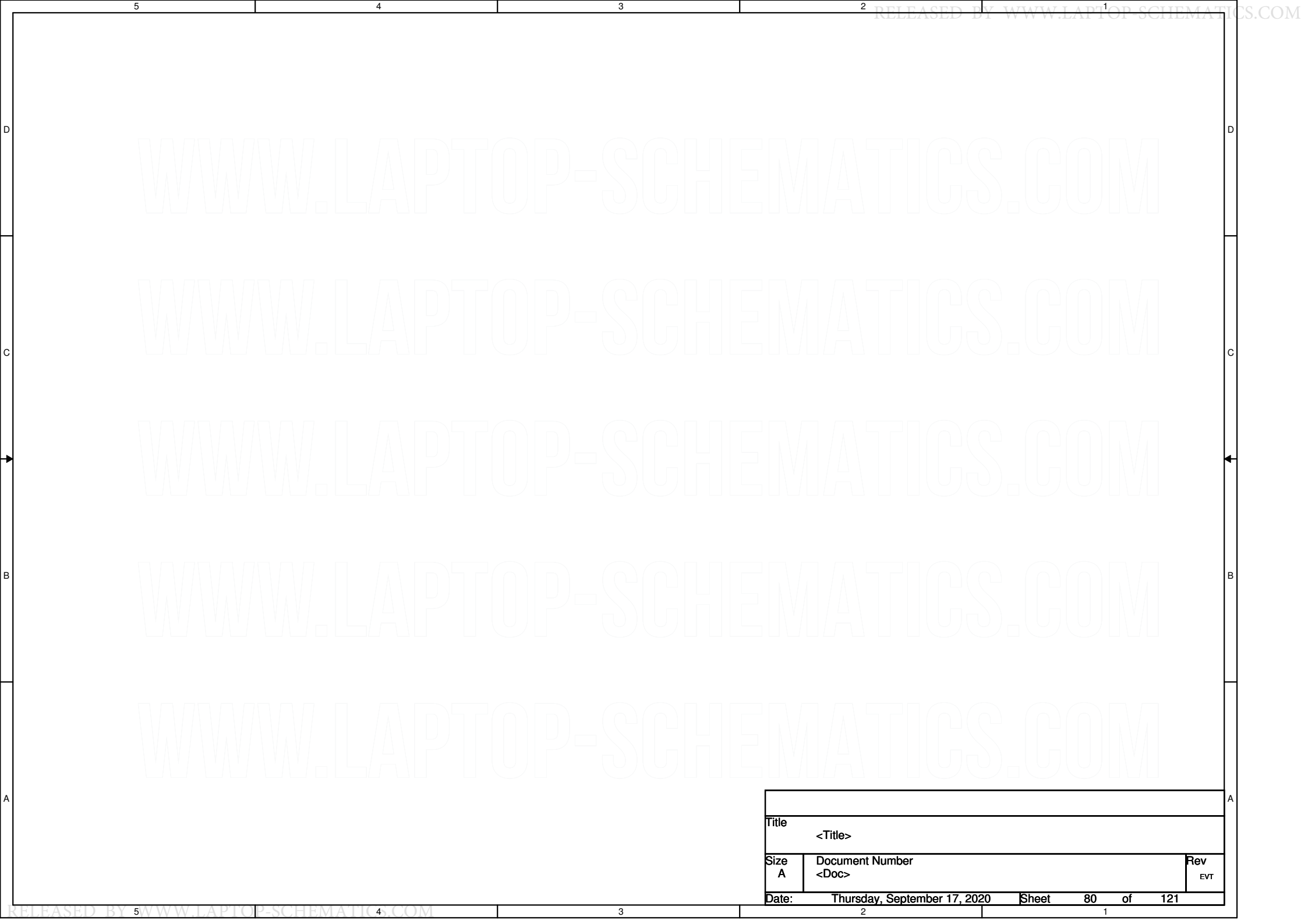
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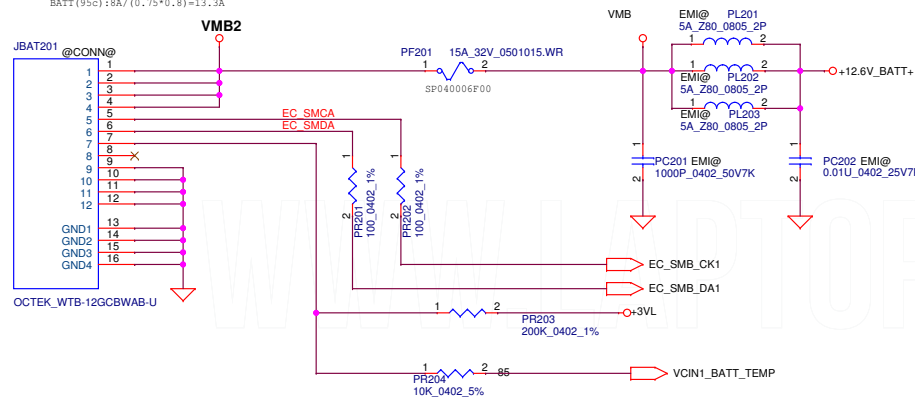
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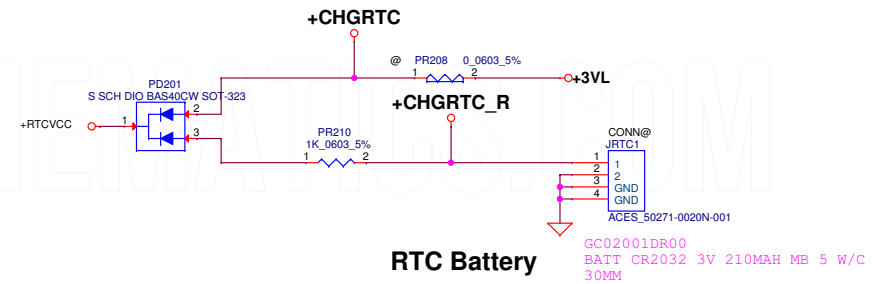
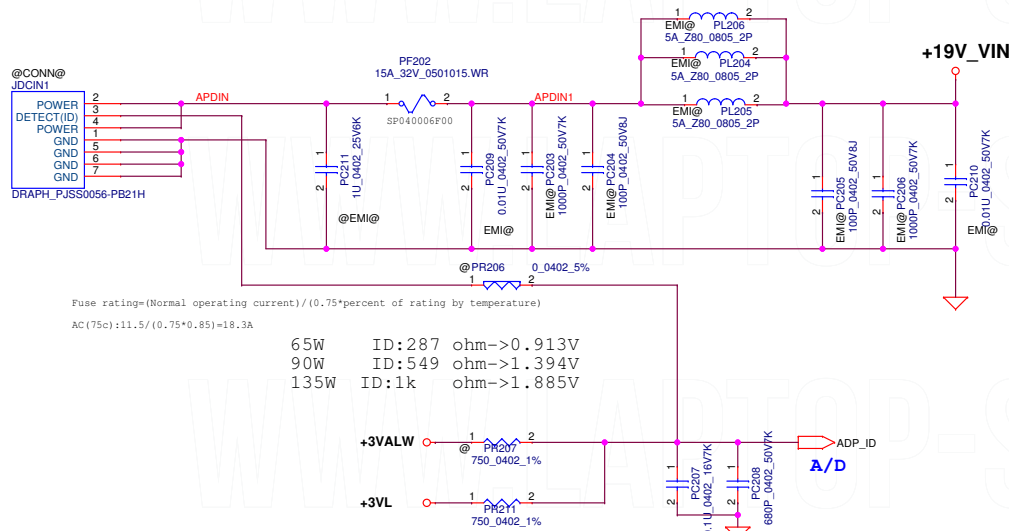
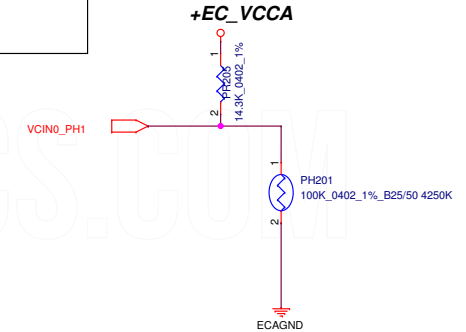
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Fuse rating=(Normal operating current)/(0.75*percent of rating by temperature)
BATT(95c):8A/(0.75*0.8)=13.3A



PH201 under CPU bottom side :
CPU thermal protection at 97 +-3 degree C
Recovery at 59 +-3 degree C



Fuse rating=(Normal operating current)/(0.75*percent of rating by temperature)
AC(75c):11.5/(0.75*0.85)=18.3A

65W ID:287 ohm->0.913V
90W ID:549 ohm->1.394V
135W ID:1k ohm->1.885V

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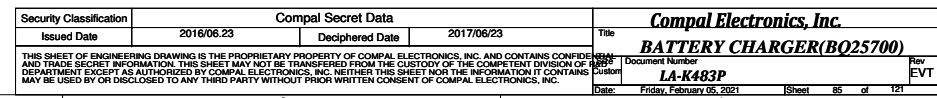
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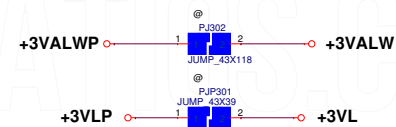
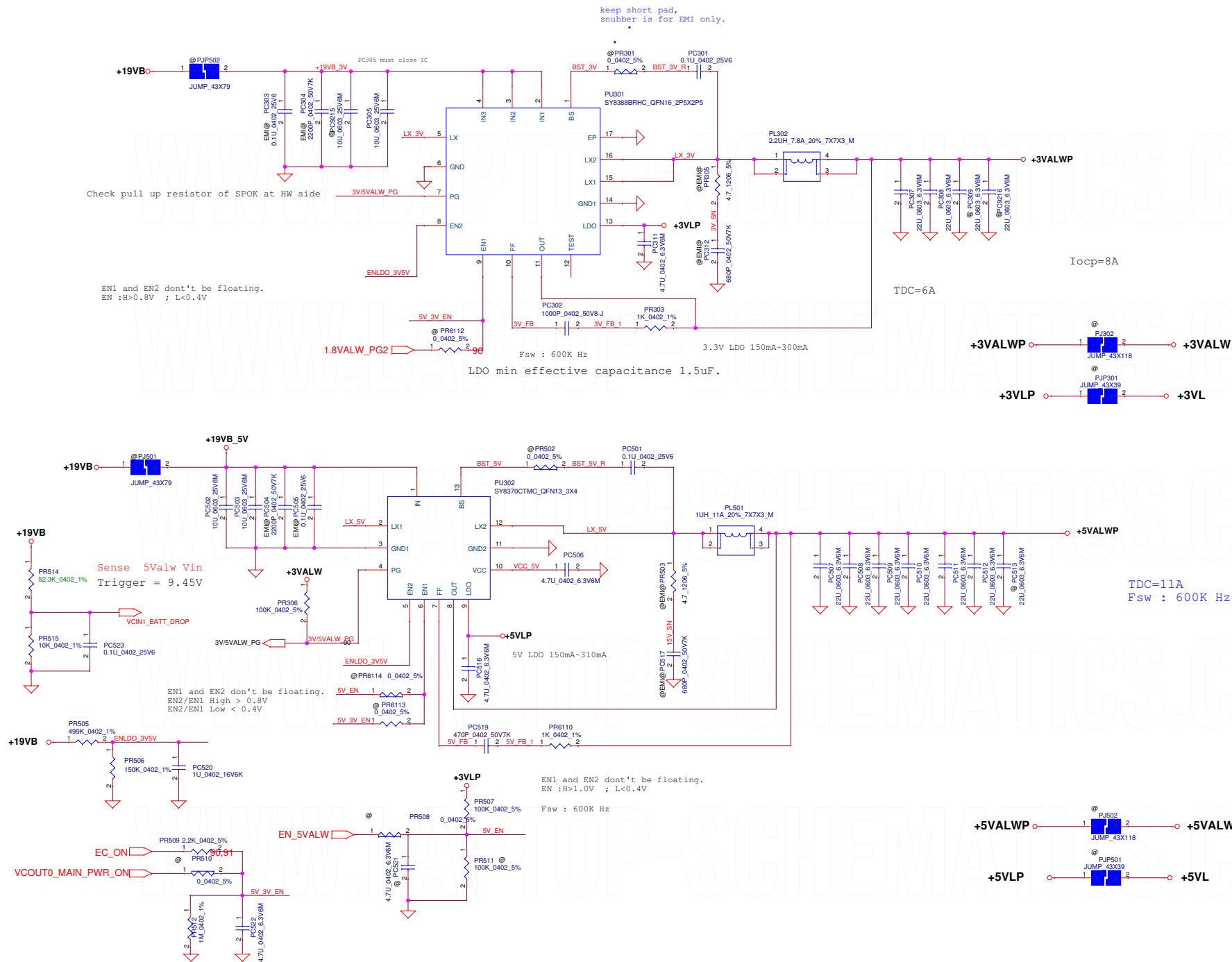
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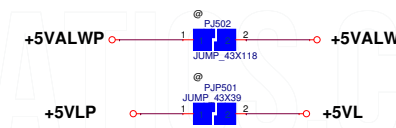
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TDC=11A
Fsw : 600K Hz



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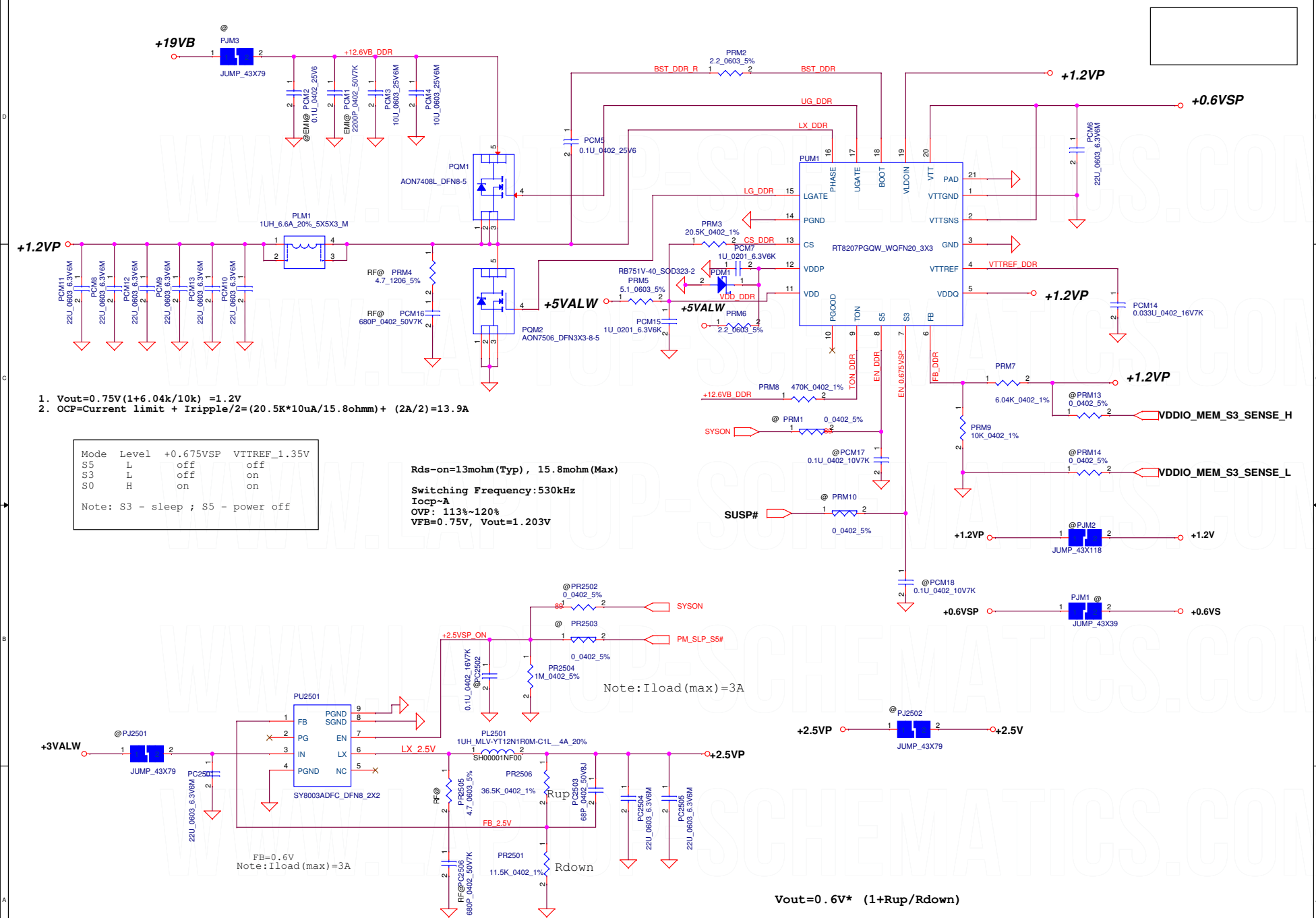
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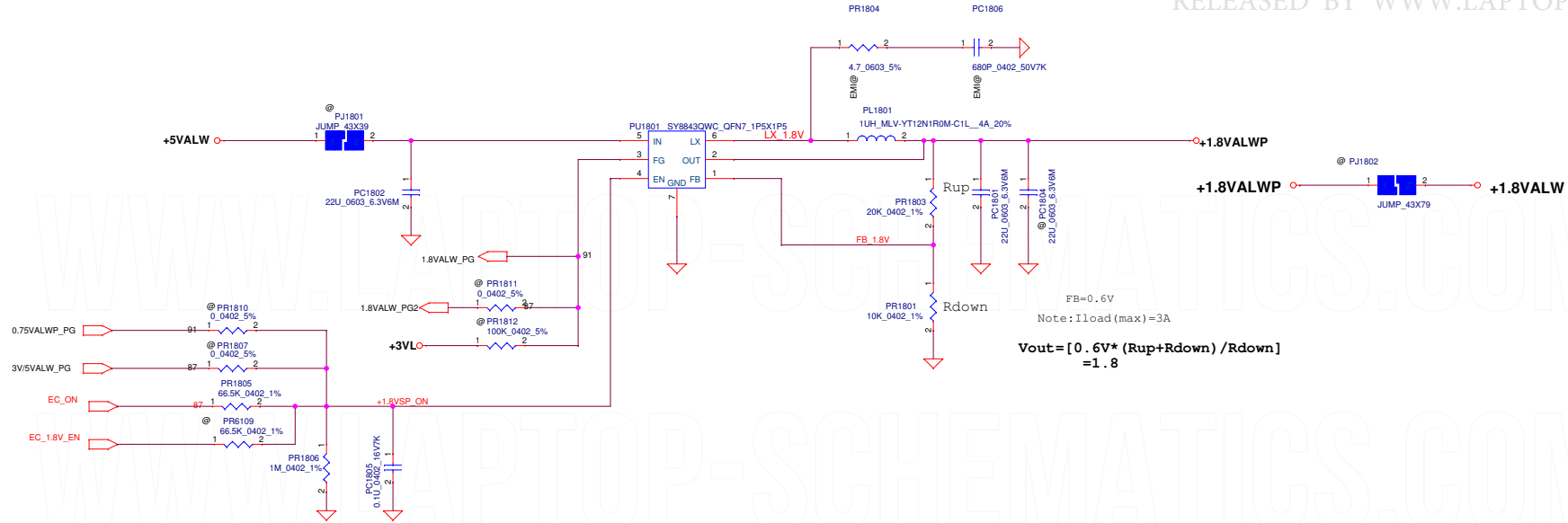
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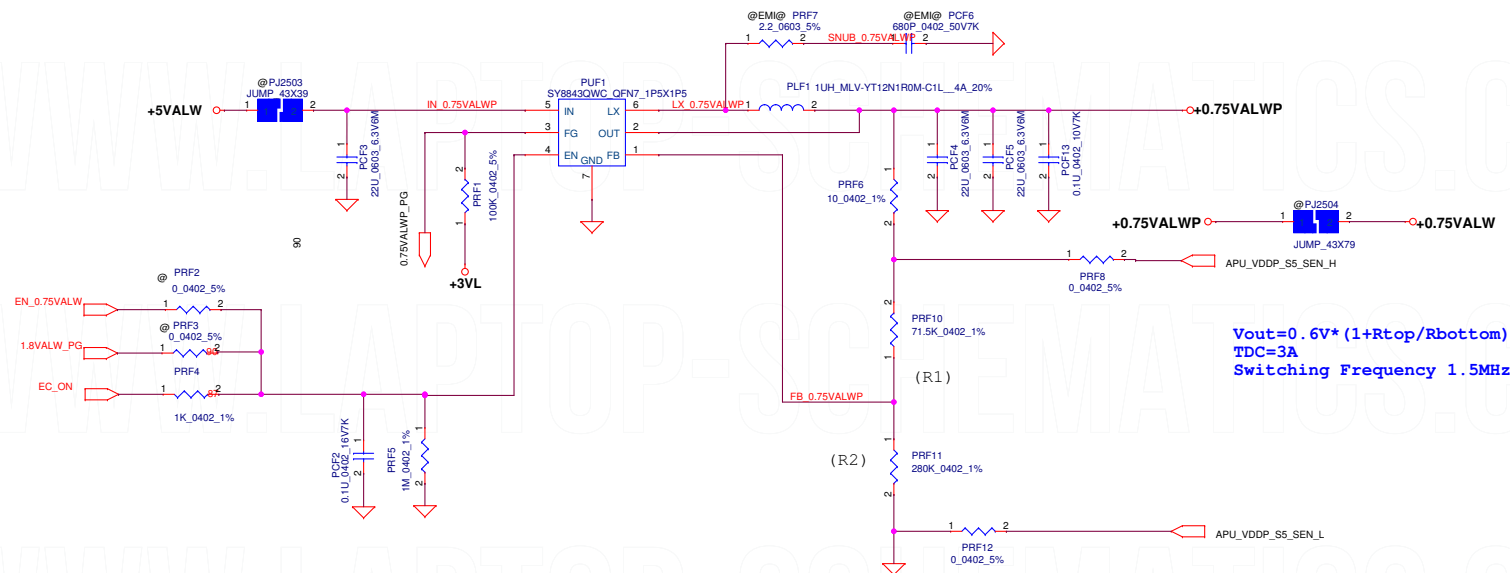


Note:
 When design $V_{in} = 5V$, please stuff snubber
 to prevent V_{in} damage

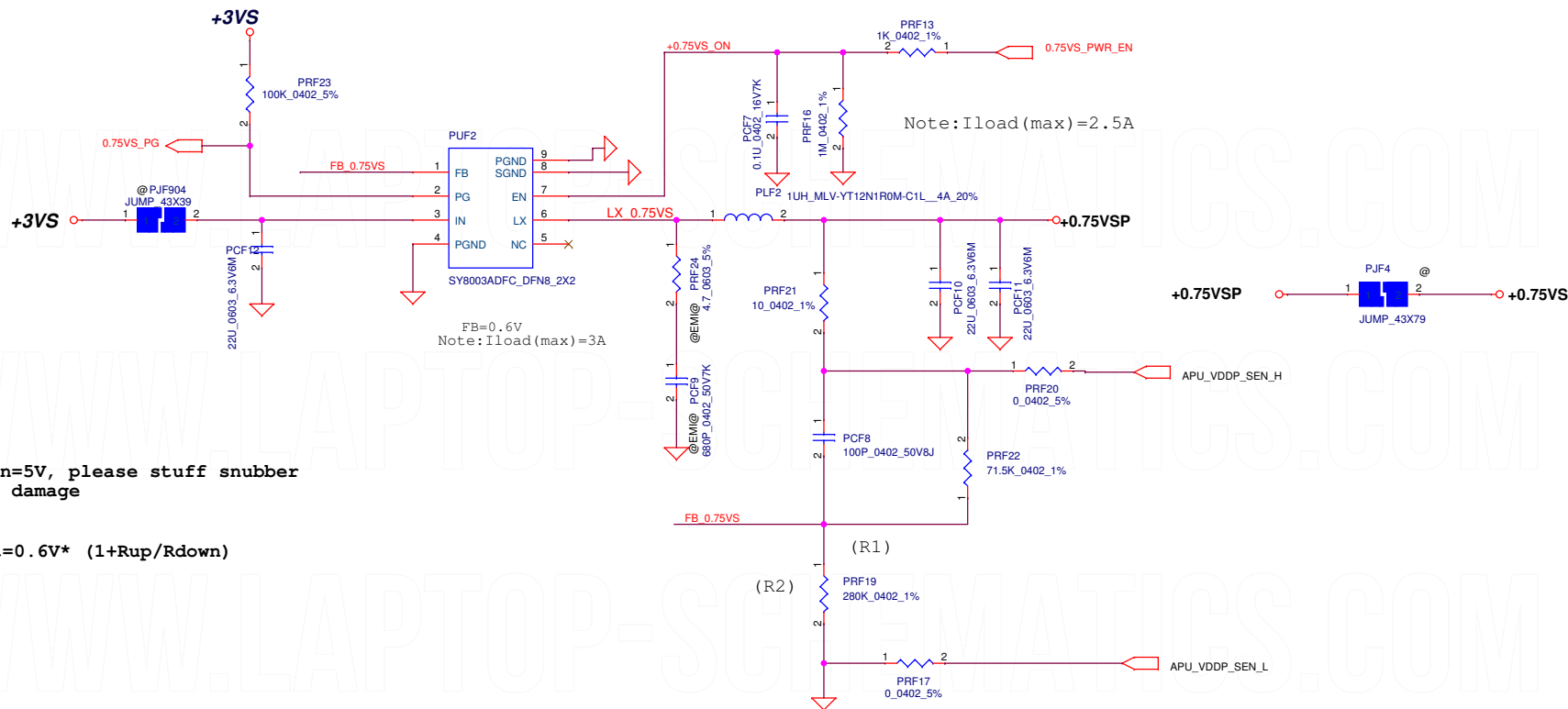
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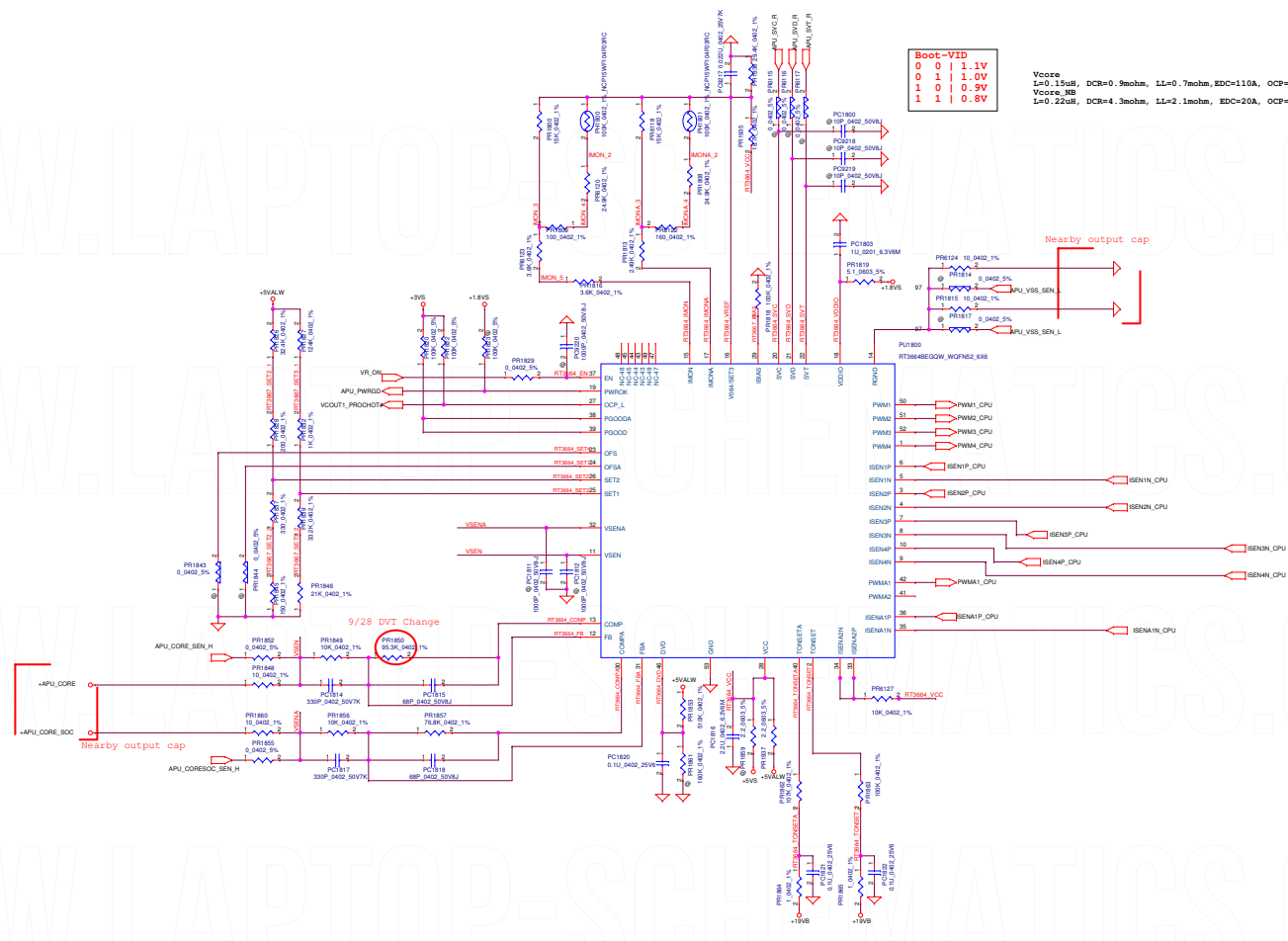
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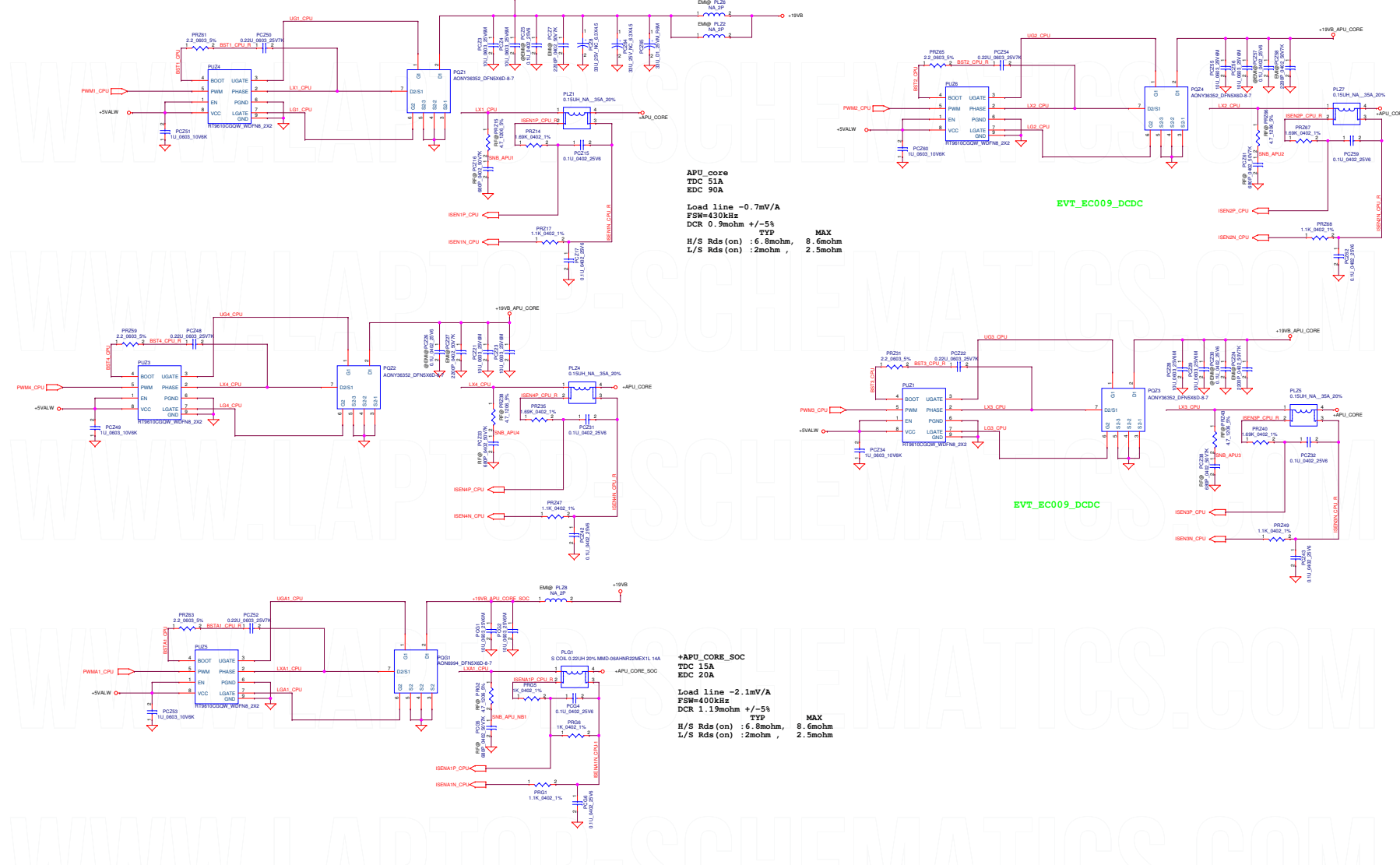
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SDV_EC004_DCDC

EVT_EC009_DCDC

EVT_EC009_DCDC

APU_core
TDC 51A
EDC 90A
Load line -0.7mV/A
FSW=430kHz
DCR 0.9mohm +/-5%
H/S Rds (on) : 6.8mohm, MAX 8.6mohm
L/S Rds (on) : 2mohm, 2.5mohm

+APU_CORE_SOC
TDC 15A
EDC 20A
Load line -2.1mV/A
FSW=400kHz
DCR 1.19mohm +/-5%
H/S Rds (on) : 6.8mohm, MAX 8.6mohm
L/S Rds (on) : 2mohm, 2.5mohm

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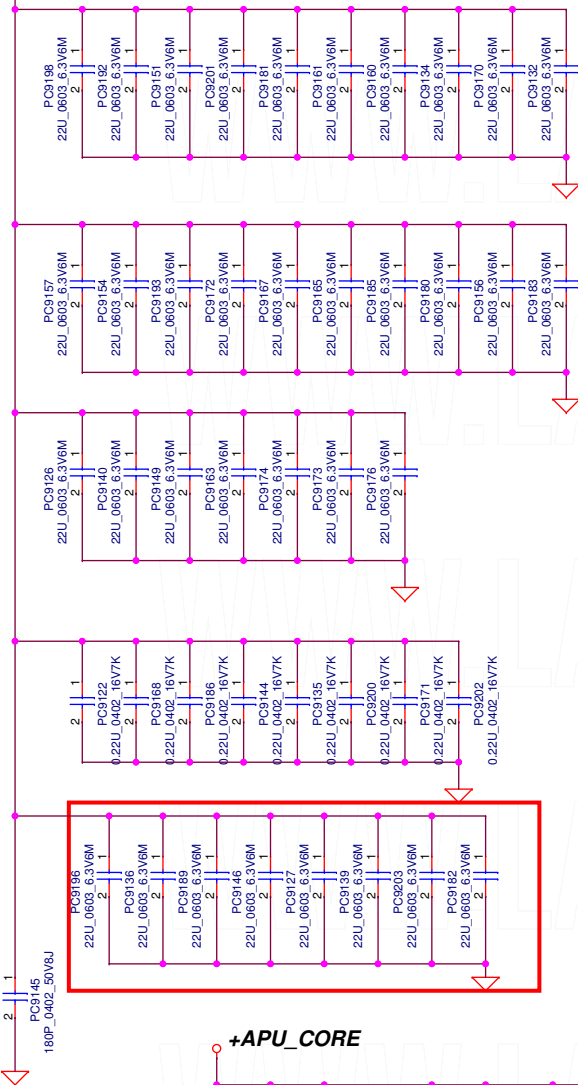
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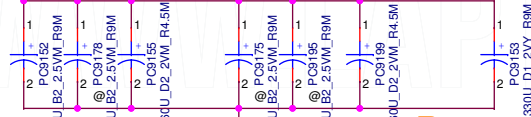
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+APU_CORE

+APU_CORE



+APU_CORE



SIV_EC002_DCDC
SIV_EC003_DCDC
SIV_EC007_DCDC

Under CPU

Bot

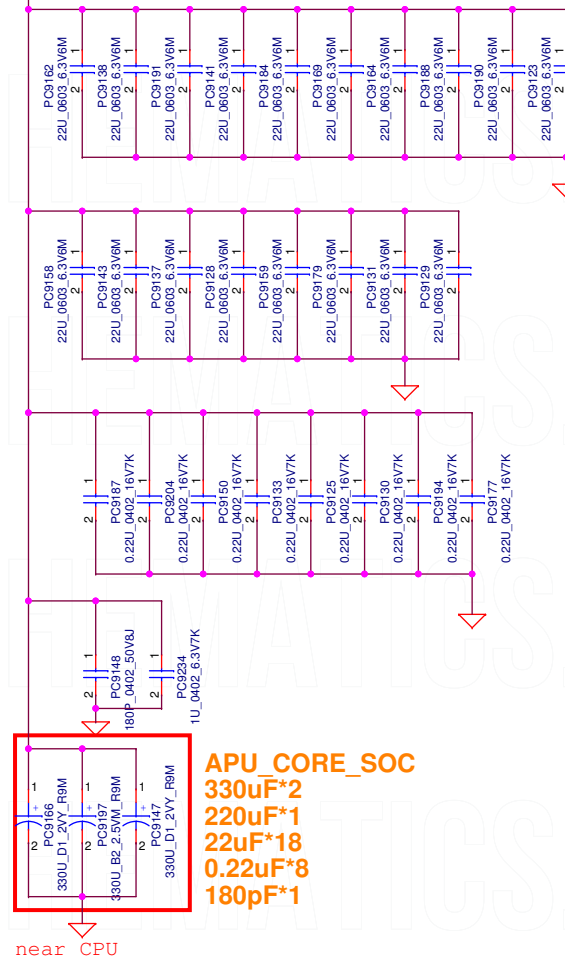
Under CPU

330u is common part SGA00009S00

APU CORE
330uF*5 220uF *4
22uF*27
0.22uF*8
180pF*1

+APU_CORE_SOC

+APU_CORE_SOC



near CPU

330u is common part SGA00009S00

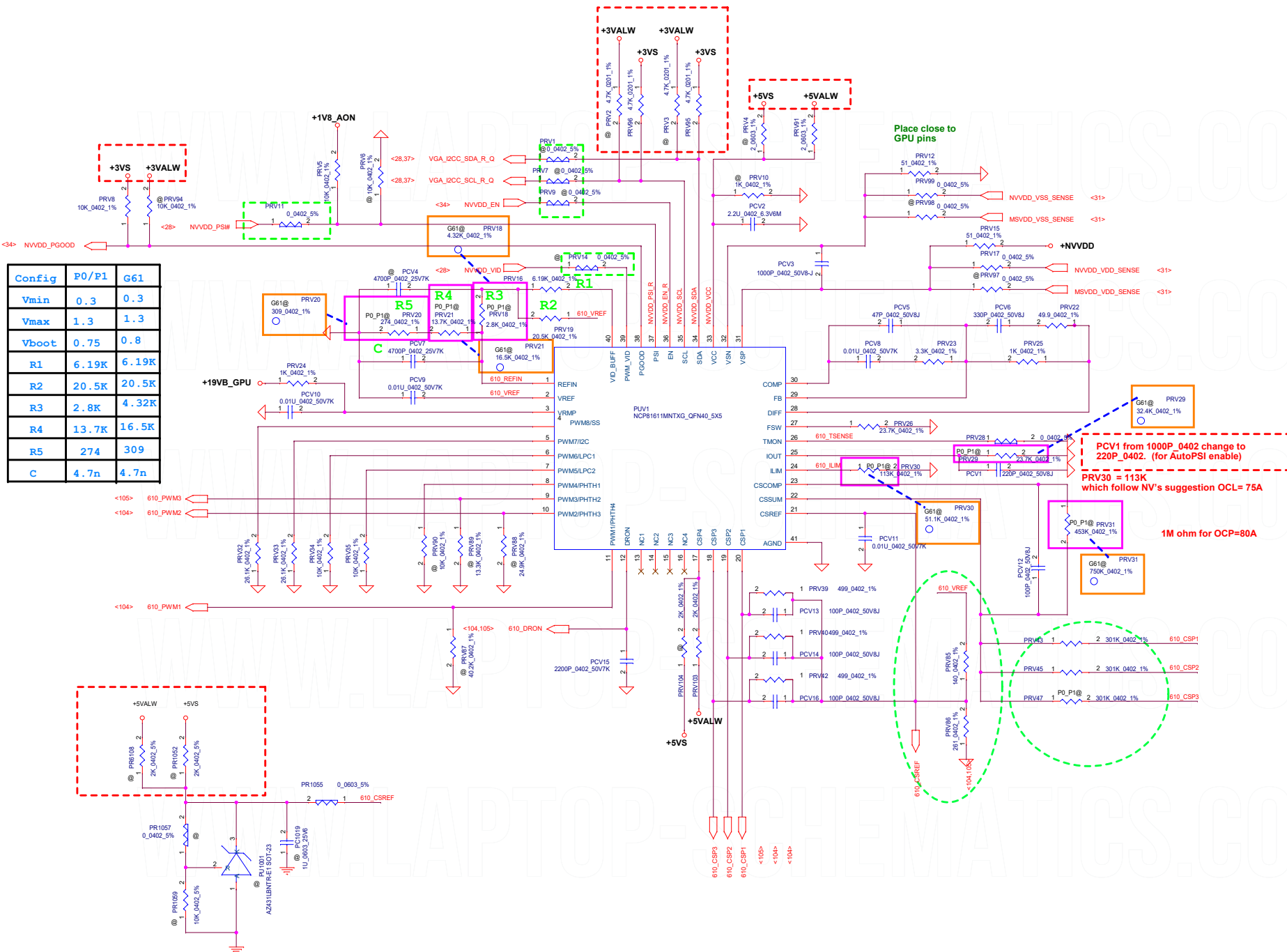
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220uF*1
22uF*18
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180pF*1

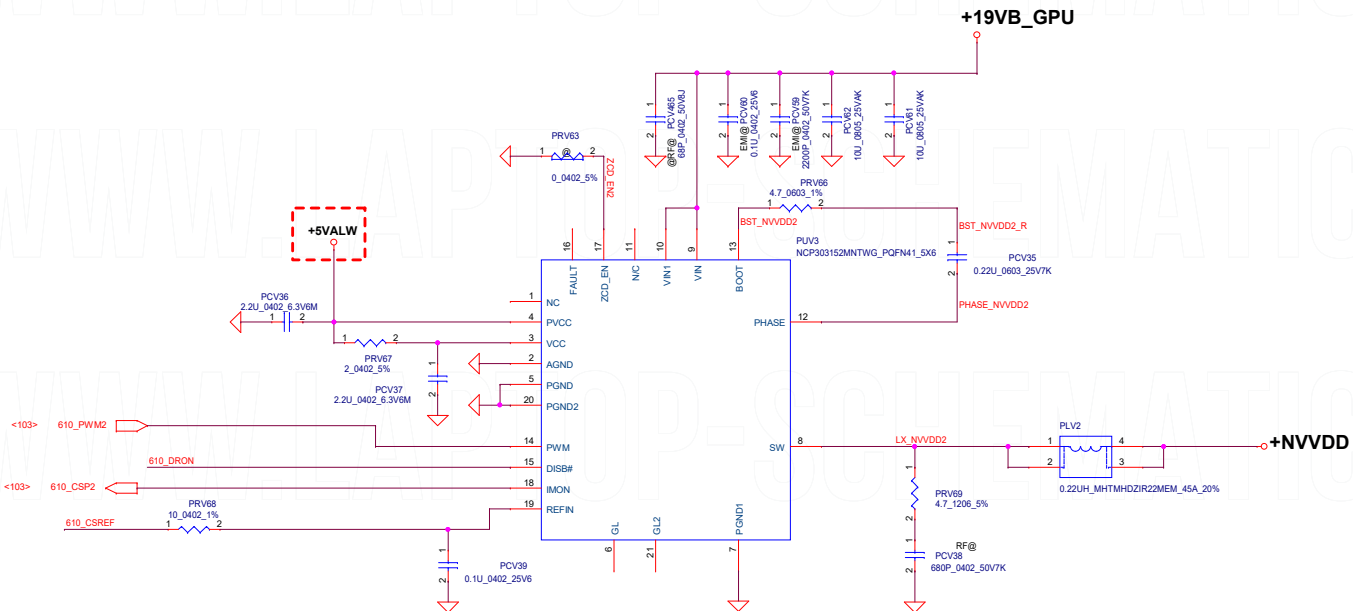
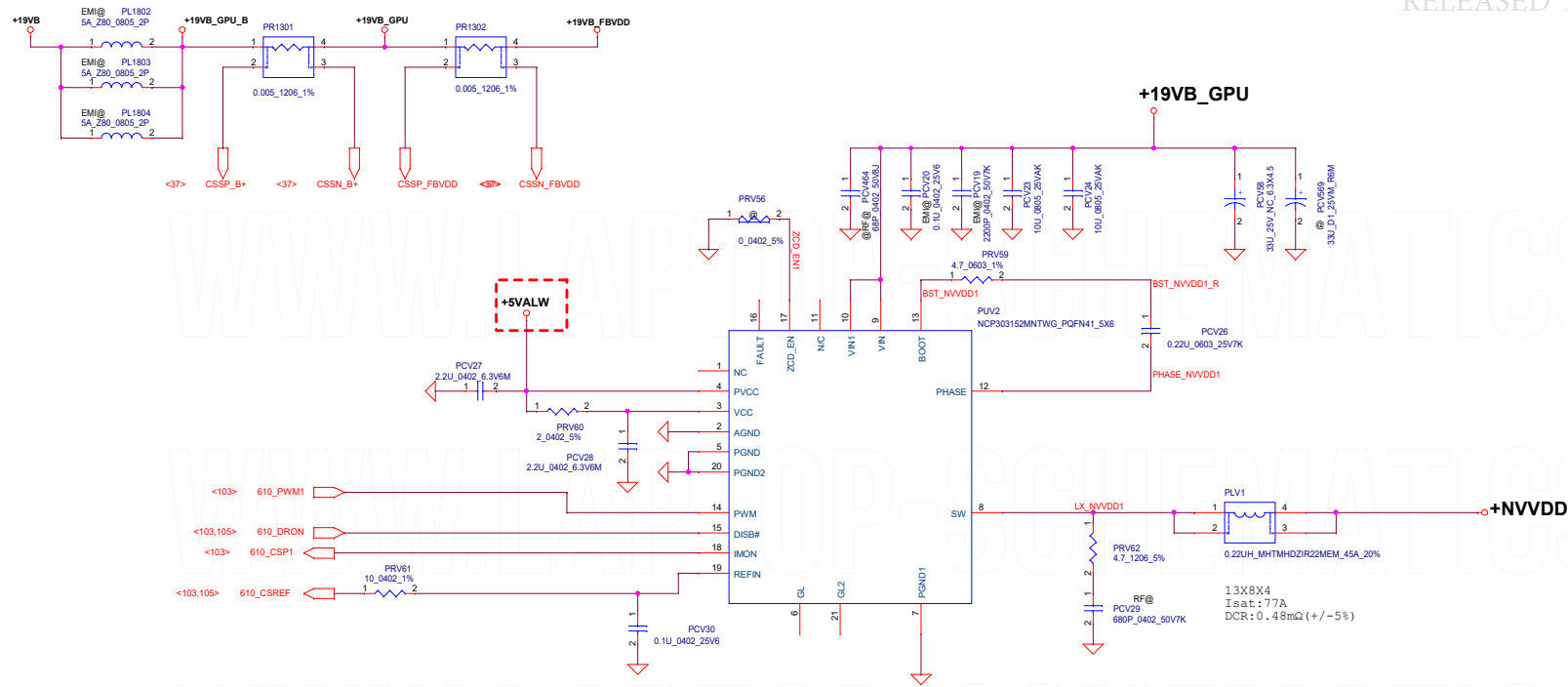
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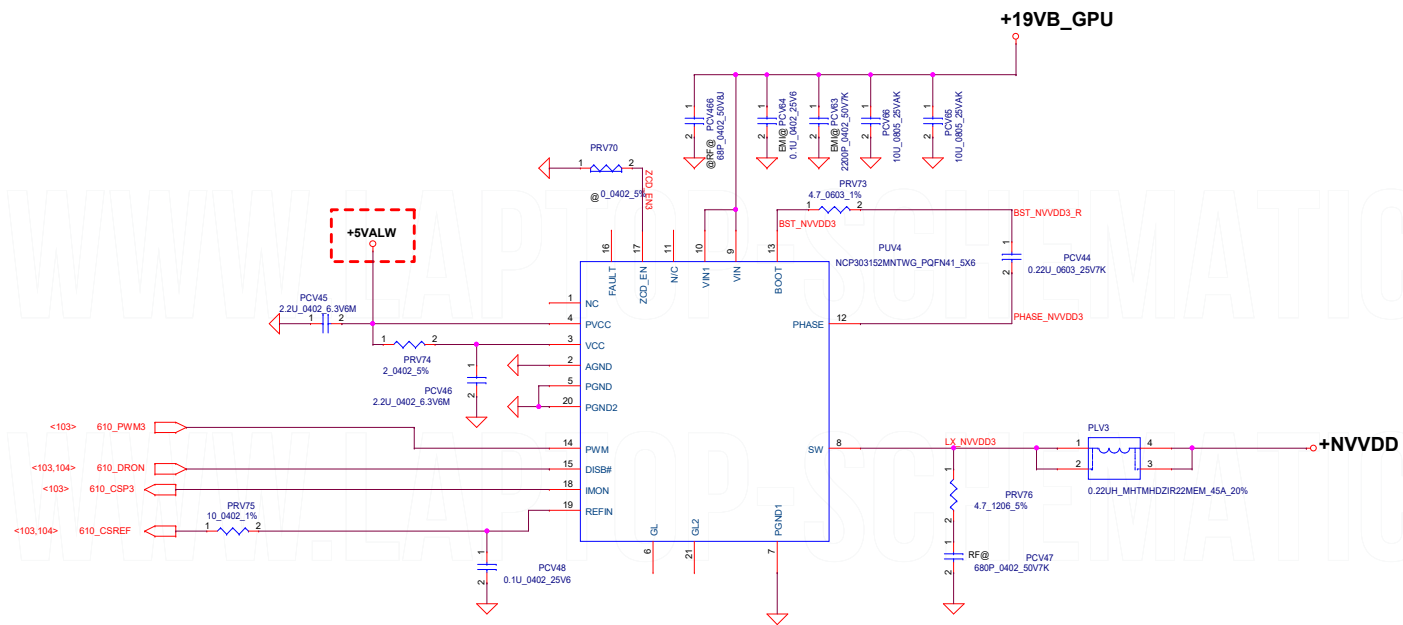
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Config	P0/P1	G61
Vmin	0.3	0.3
Vmax	1.3	1.3
Vboot	0.75	0.8
R1	6.19K	6.19K
R2	20.5K	20.5K
R3	2.8K	4.32K
R4	13.7K	16.5K
R5	274	309
C	4.7n	4.7n





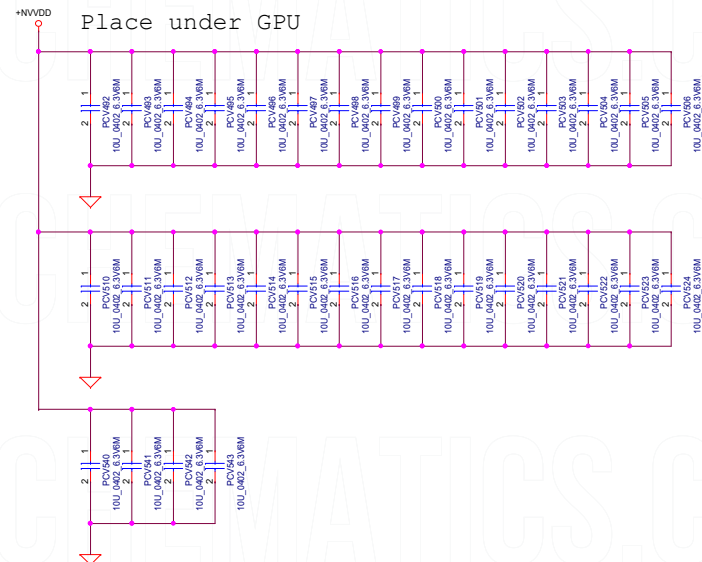
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Samsung & Micron VRAM
When, VRAM_VDD_CTL=High
Vboot=1.25V
When, VRAM_VDD_CTL=Low
Vboot=1.2V

PSI=0.79V
When the voltage is
between 0.7V to 0.88V,
the device will operate into
1 phase force CCM

MOSFET: DFN 5X6E
H/S Rds (on) : 5.2mohm (Typ) , 7mohm (Max)
L/S Rds (on) : 0.8mohm (Typ) , 1.05mohm (Max)

+19VB_FBVDD

+1.35VSDGPU
N18P-G62
TDC 17.2A
Peak Current 18.4A
OCP current 30A
fsw=400kHz

+1.35VS_VRAM

$$OCP = [(10\mu A * 76.8k) / (12 / 1.8m) + (12A / 2)] * 1\text{phase} = 41.5A$$

$$V_{out} = 2V * (14k / (14k + 9.31k)) = 1.2012V$$

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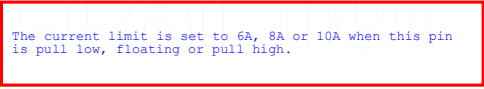
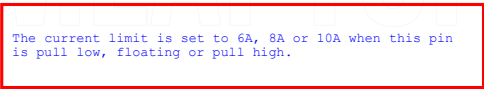
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