

Compal Confidential

PBJ20 Schematics Document

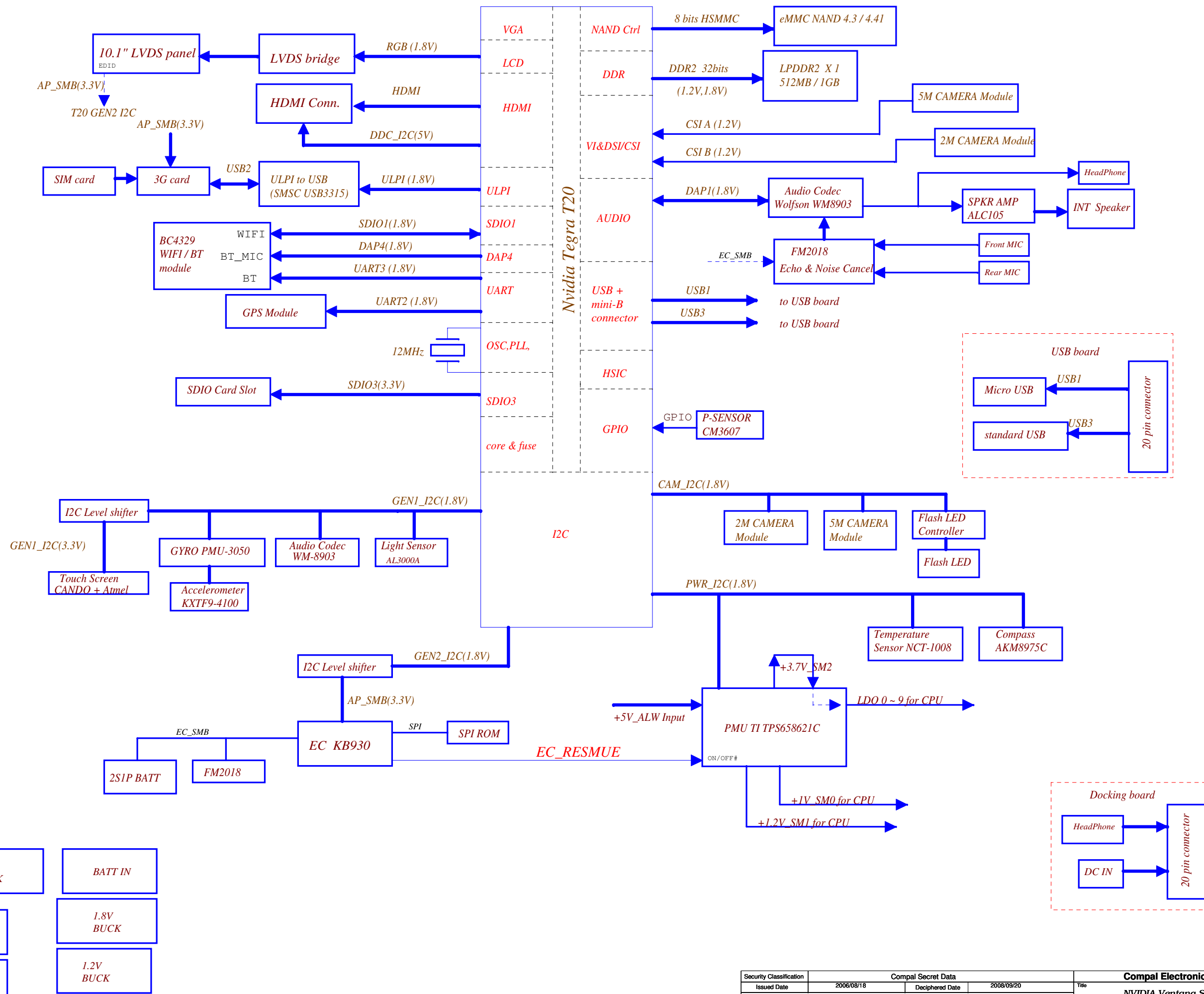
Nvidia(T20) + LPDDRII

2010-10-07

REV: 0.4

Security Classification	Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2011/4/1	Deciphered Date	2008/09/20	Title Cover Page
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PBJ20 system block diagram



Voltage Rails

Power Plane	Description	IDLE	Standby
VIN	Adapter power supply (12V)	ON	ON
B+	AC or battery power rail for power circuit.	ON	ON
+1.2VS_SM0	Core voltage for CPU	ON	ON
+1.0VS_SM1	CPU voltage for CPU	ON	OFF
+1.1VS_LDO1	AVDD_PLL power rail	ON	OFF
+1.2VS_LDO2	T20 RTC power rail	ON	OFF
+1.8VS_LDO4	T20 system power rail	ON	ON
+3.3VS_LDO3	T20 USB power rail	ON	OFF
+2.85VS_LDO5	Core voltage for EMMC	ON	OFF
+2.85VS_LDO6	Core voltage for CAMERA	ON	OFF
+3.3VS_LDO7	T20 HDMI power rail	ON	OFF
+1.8VS_LDO8	T20 HDMI PLL power rail	ON	OFF
+2.85VS_LDO9	T20 DDR RX power rail	ON	ON
+3VALW	3.3V always on power rail	ON	ON
+3VS	3.3V switched power rail for standby mode	ON	OFF
+5VALW	5V always on power rail	ON	ON
+1.8V	1.8V always on power rail	ON	ON
+1.8VS	1.8V switched power rail for standby mode	ON	OFF
+3.3VS_RTC	RTC power	ON	ON

STATE	SIGNAL	EC_SYS_STANDBY#	EN_VDD_+1.8VS_S3	EN_VDD_3V3	EN_VDD_1V8
Full ON		High	High	High	High
Standby		High	High	High	High

PWR_I2C address

Device	Address
PMU	0110 100X b
E-Compass	
Temperature sensor	1001 100X b

CAM_I2C address

Device	Address
CAMERA 5M	0110 110X b
CAMERA 1.3M	1001 000X b
LED FLASH	

GEN1_I2C

Device	Address
Audio Codec	1001 010xb
Light sensor	0100 010xb
Gyro	1101 000xb

TS_I2C

Device	Address
Touch Panel	0100 110xb

GEN2_I2C

Device	Address

AP_SMB

Device	Address
PANEL EDID	
3G Card	
EC	

EC_SMB

Device	Address
Echo Cancellation	1011 111xb
BATT	

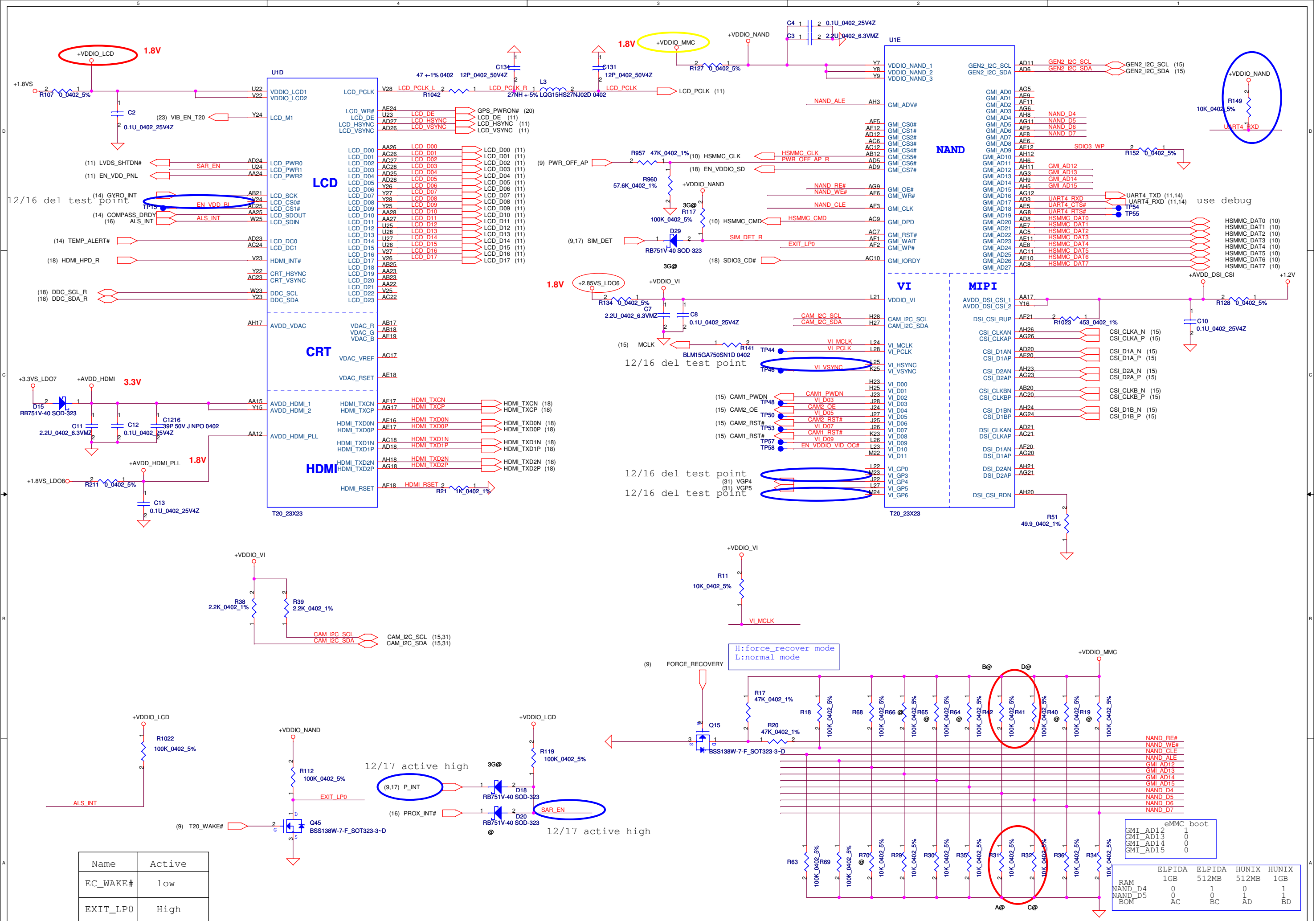
AP_SMB

Device	Address
G-sensor	0000 1111 b

DDC_I2C

Device	Address
HDMI EDID	1010 000xb

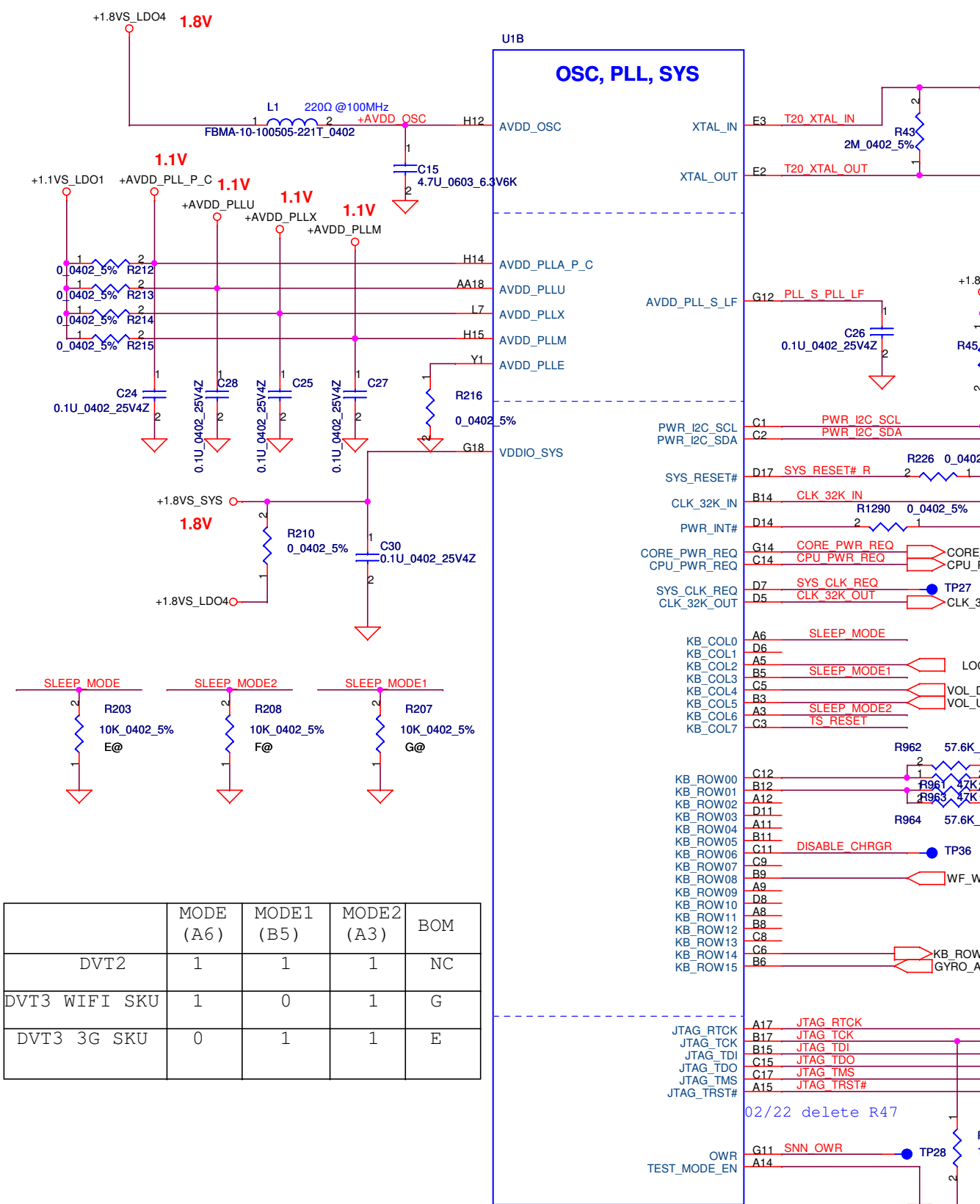
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				Size Custom	Document Number
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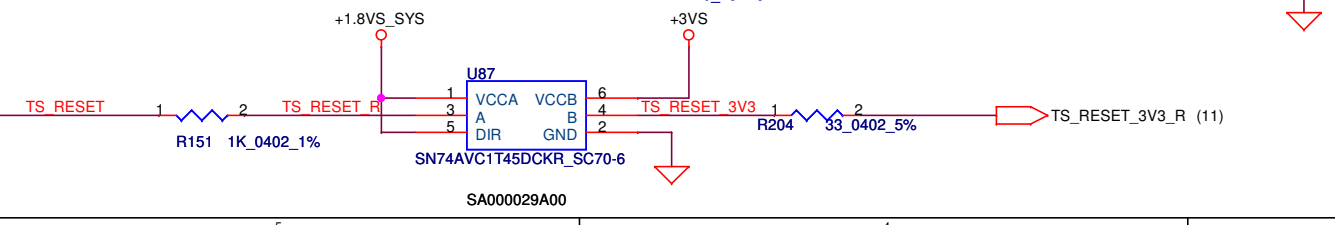
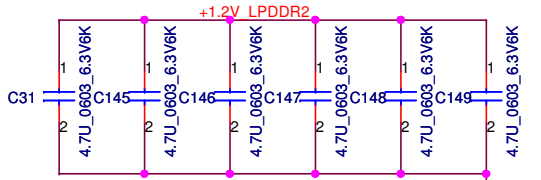
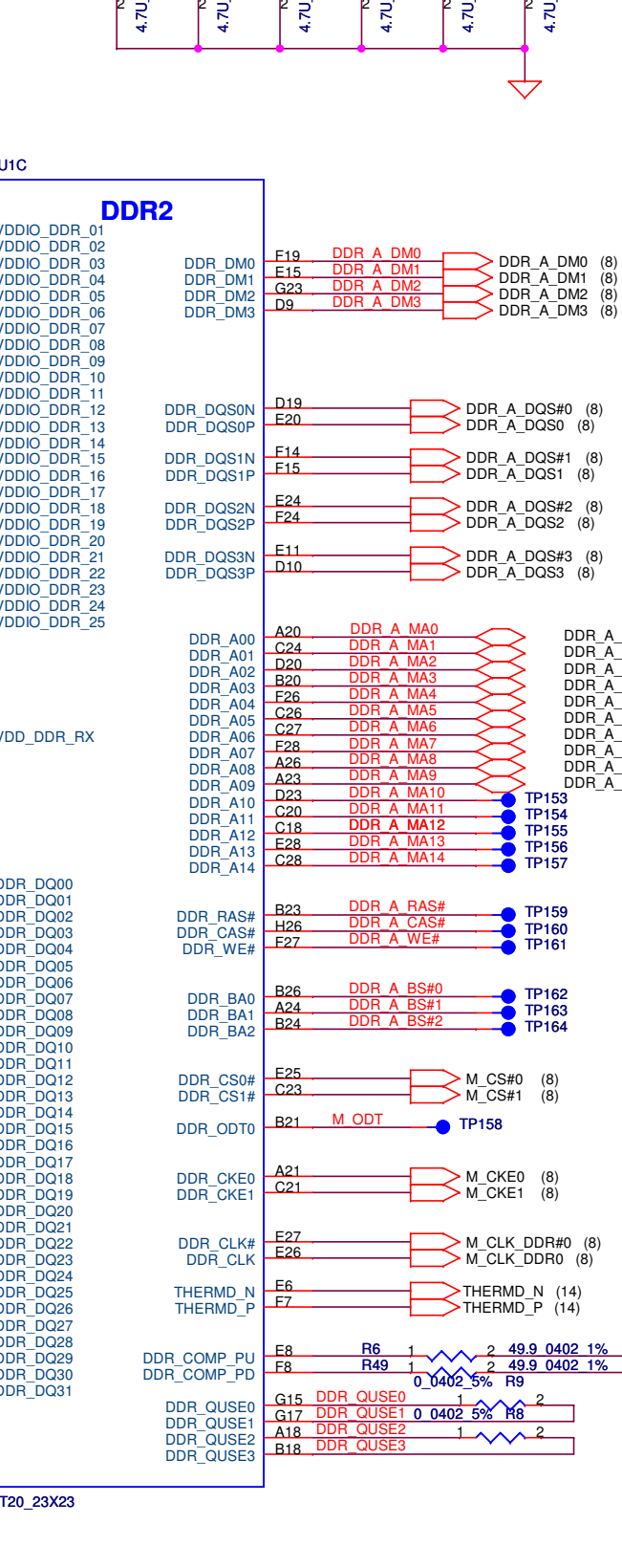
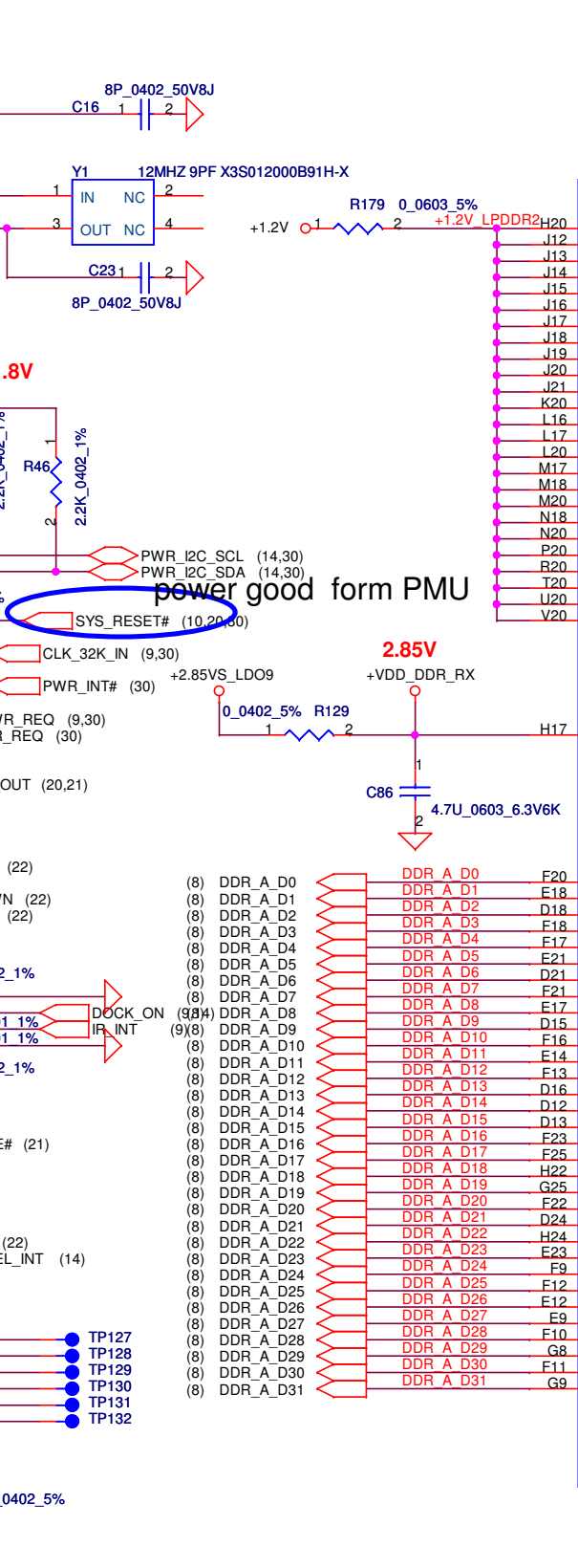
Name	Active
EC_WAKE#	low
EXIT_LP0	High

eMMC boot				
GMI_AD12	1	0	0	0
GMI_AD13	0	1	0	1
GMI_AD14	0	0	1	1
GMI_AD15	0	0	1	0

	ELPIDA	ELPIDA	HUNIX	HUNIX
RAM	1GB	512MB	512MB	1GB
NAND_D4	0	1	0	1
NAND_D5	0	0	1	1
BOEM	AC	BC	AD	BD

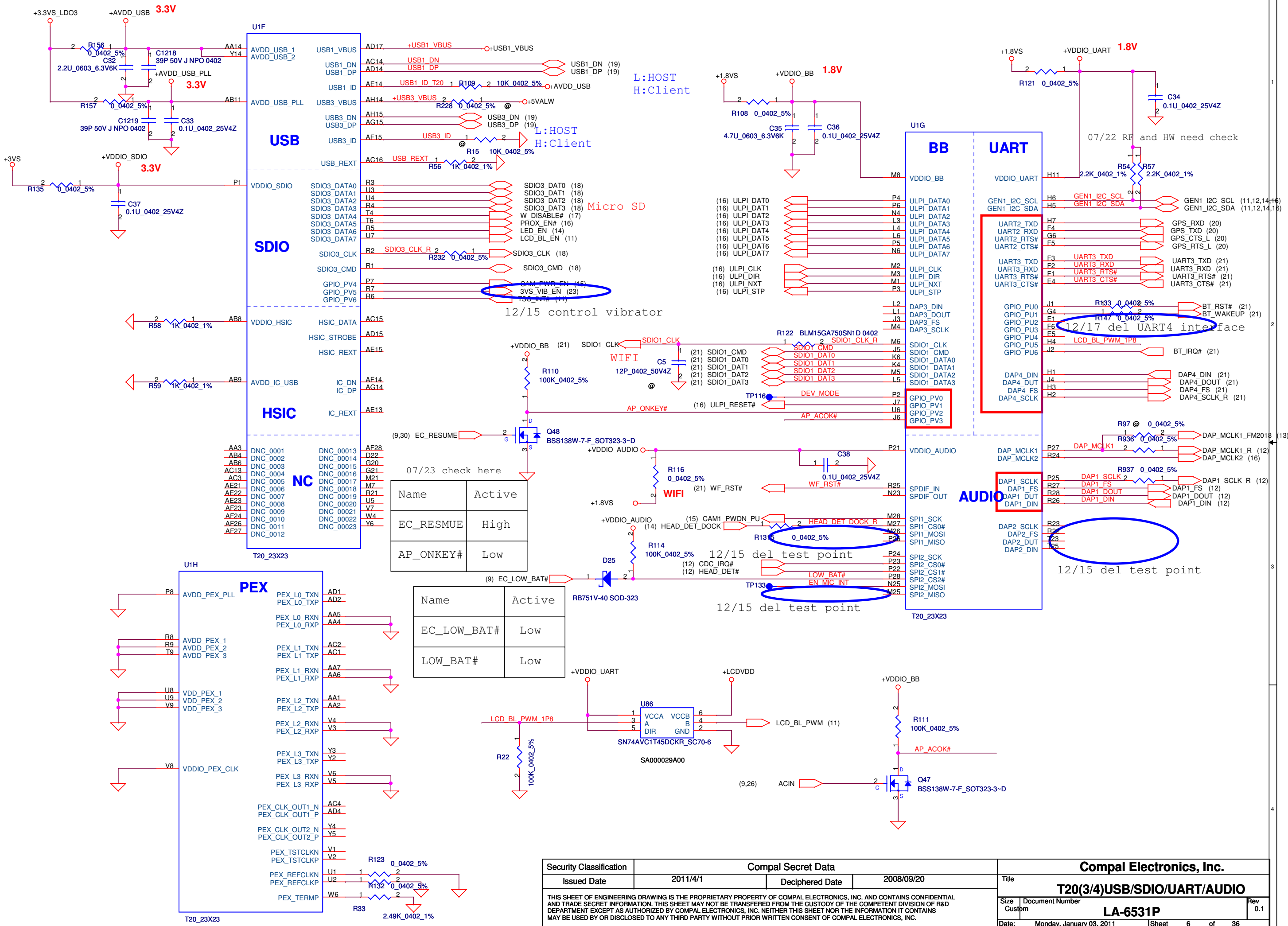


	MODE (A6)	MODE1 (B5)	MODE2 (A3)	BOM
DVT2	1	1	1	NC
DVT3 WIFI SKU	1	0	1	G
DVT3 3G SKU	0	1	1	E



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Title		
T20(2/4)OSC/PLL/SYS/DDR		
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USB

SDIO

HSIC

PEX

L:HOST
H:Client

L:HOST
H:Client

Micro SD

12/15 control vibrator

WIFI

WIFI

WIFI

WIFI

WIFI

WIFI

WIFI

WIFI

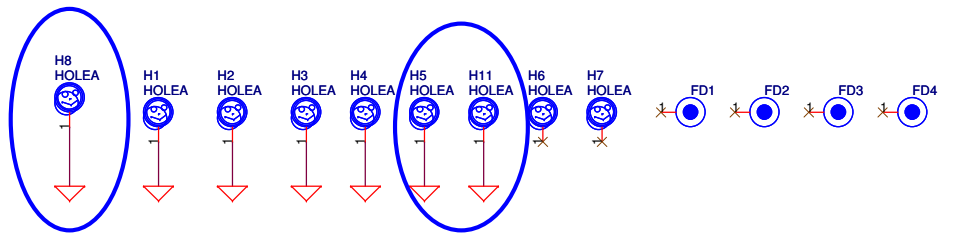
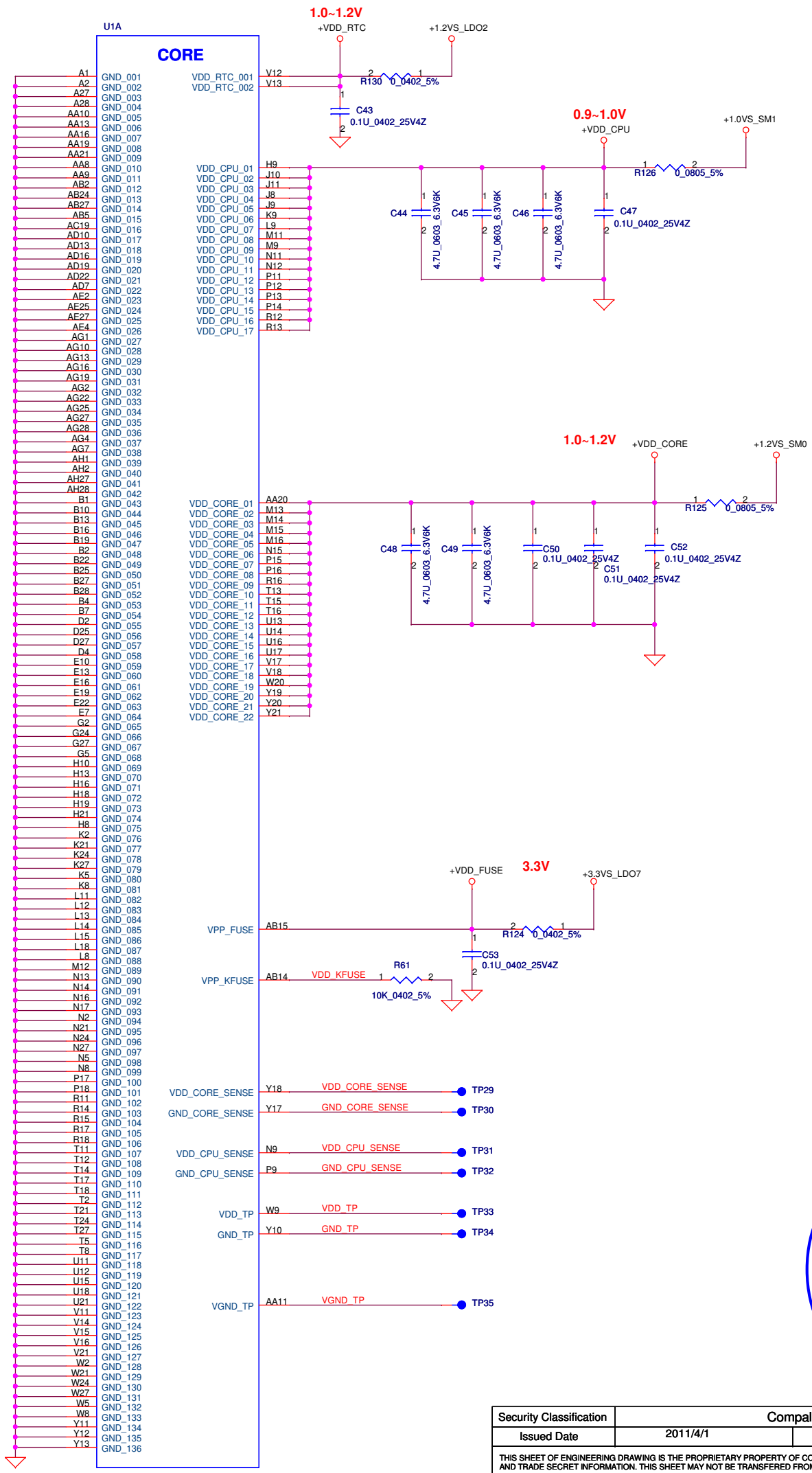
WIFI

WIFI

Name	Active
EC_RESUME	High
AP_ONKEY#	Low

Name	Active
EC_LOW_BAT#	Low
LOW_BAT#	Low

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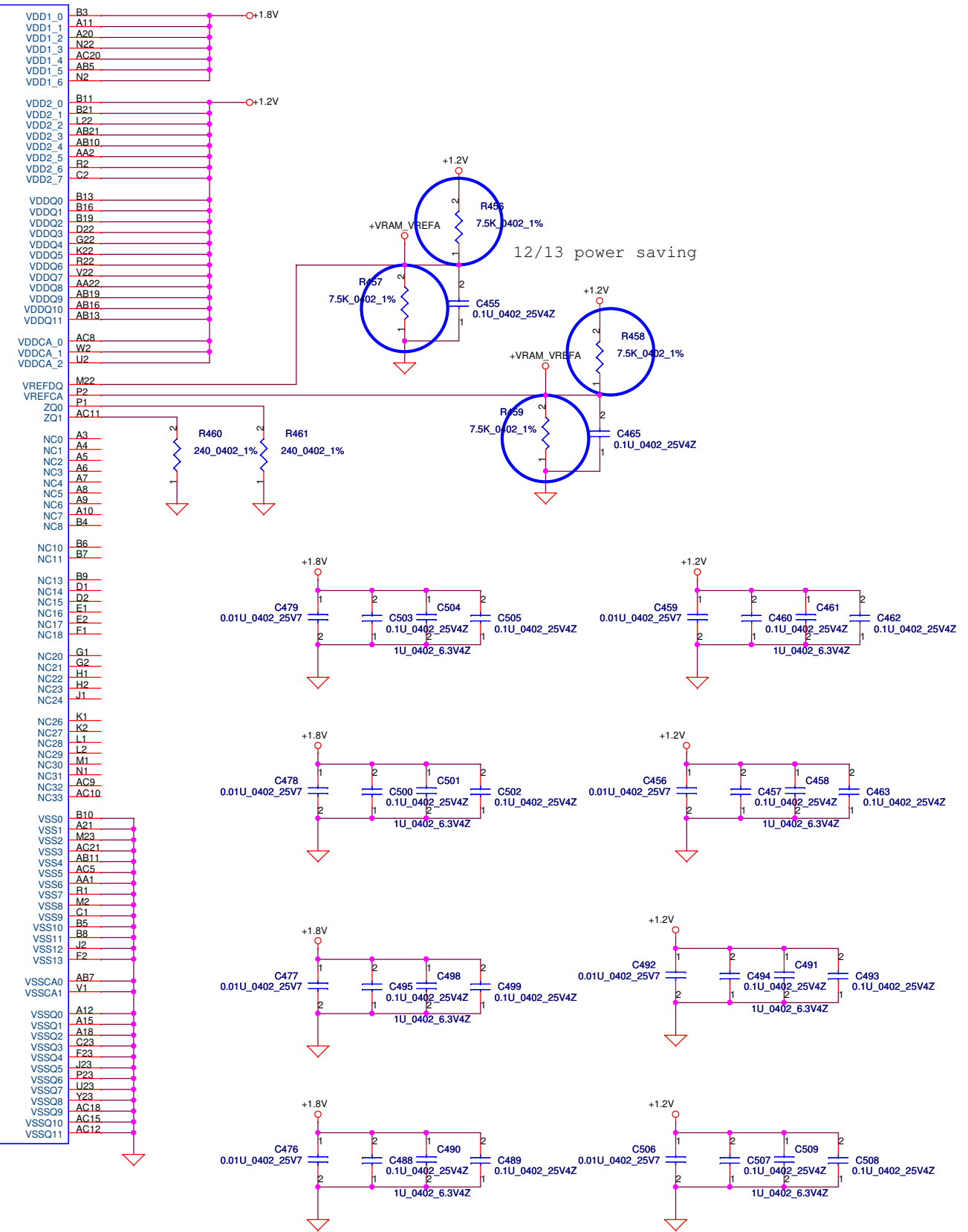


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Size	Document Number	Rev	0.1	
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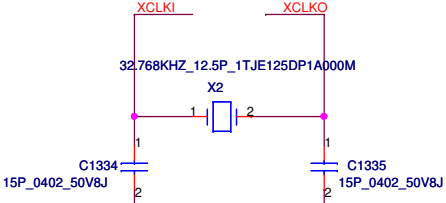
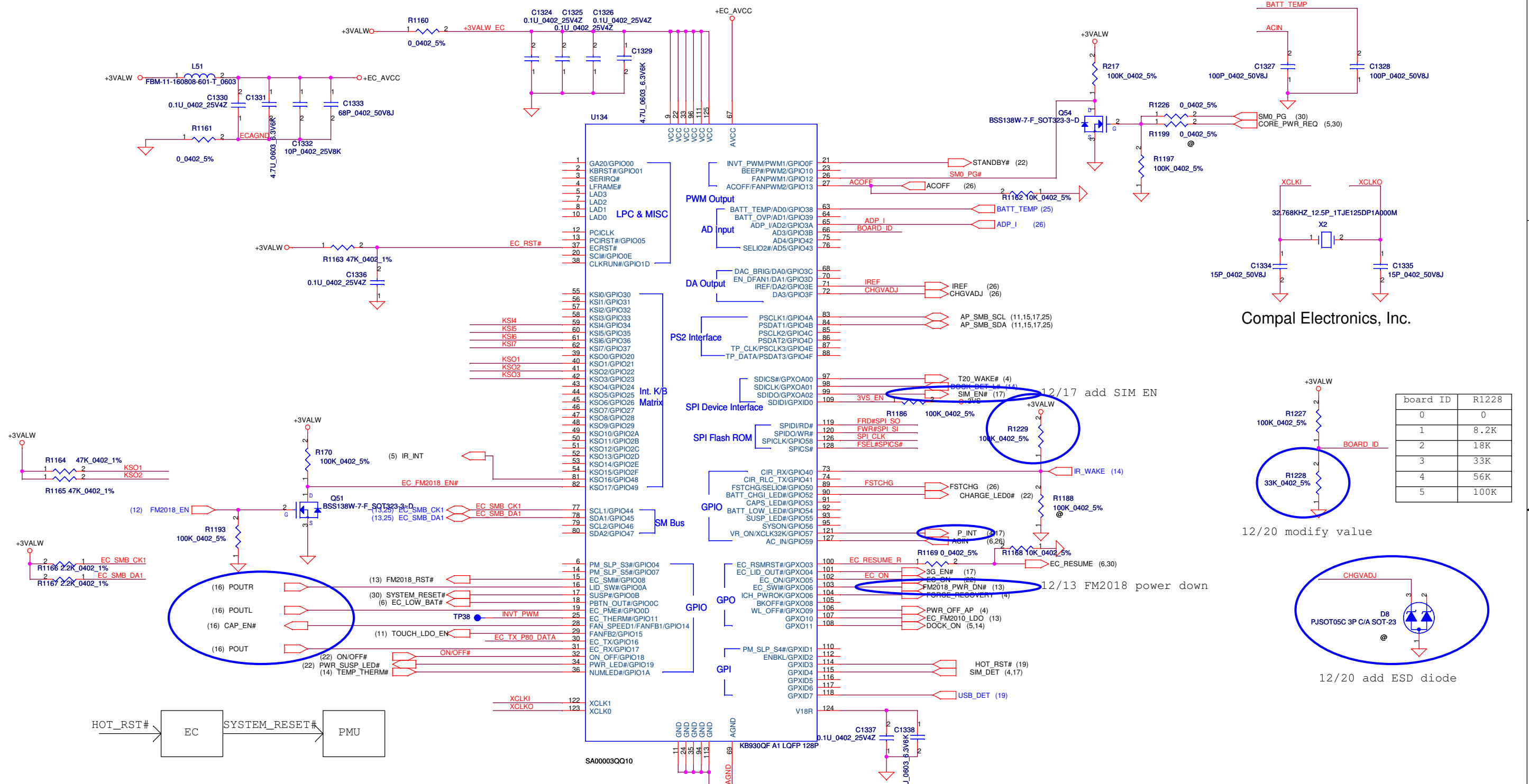
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(5) DDR_A_MA7	DDR_A_MA7	U1	CA7
(5) DDR_A_MA6	DDR_A_MA6	V2	CA6
(5) DDR_A_MA5	DDR_A_MA5	W1	CA5
(5) DDR_A_MA4	DDR_A_MA4	AB9	CA4
(5) DDR_A_MA3	DDR_A_MA3	AB8	CA3
(5) DDR_A_MA2	DDR_A_MA2	AC7	CA2
(5) DDR_A_MA1	DDR_A_MA1	AB6	CA1
(5) DDR_A_MA0	DDR_A_MA0	AC6	CA0
(5) M_CS#0	M_CS#0	AB3	CS0#
(5) M_CS#1	M_CS#1	AB4	CS1#
(5) M_CLK_DDR0	M_CLK_DDR0	Y2	CK
(5) M_CLK_DDR#0	M_CLK_DDR#0	Y1	CK#
(5) M_CKE0	M_CKE0	AC4	CKE0
(5) M_CKE1	M_CKE1	AC4	CKE1
(5) DDR_A_DQS3	DDR_A_DQS3	B18	DQS3
(5) DDR_A_DQS#3	DDR_A_DQS#3	A19	DQS3#
(5) DDR_A_DQS2	DDR_A_DQS2	AB18	DQS2
(5) DDR_A_DQS#2	DDR_A_DQS#2	AC19	DQS2#
(5) DDR_A_DQS1	DDR_A_DQS1	J22	DQS1
(5) DDR_A_DQS#1	DDR_A_DQS#1	K23	DQS1#
(5) DDR_A_DQS0	DDR_A_DQS0	R23	DQS0
(5) DDR_A_DQS#0	DDR_A_DQS#0	P22	DQS0#
(5) DDR_A_DM3	DDR_A_DM3	B20	DM3
(5) DDR_A_DM2	DDR_A_DM2	AB20	DM2
(5) DDR_A_DM1	DDR_A_DM1	L23	DM1
(5) DDR_A_DM0	DDR_A_DM0	N23	DM0
(5) DDR_A_D31	DDR_A_D31	B12	DQ31
(5) DDR_A_D30	DDR_A_D30	A13	DQ30
(5) DDR_A_D29	DDR_A_D29	A14	DQ29
(5) DDR_A_D28	DDR_A_D28	B14	DQ28
(5) DDR_A_D27	DDR_A_D27	B15	DQ27
(5) DDR_A_D26	DDR_A_D26	A16	DQ26
(5) DDR_A_D25	DDR_A_D25	A17	DQ25
(5) DDR_A_D24	DDR_A_D24	B17	DQ24
(5) DDR_A_D23	DDR_A_D23	AC17	DQ23
(5) DDR_A_D22	DDR_A_D22	AB17	DQ22
(5) DDR_A_D21	DDR_A_D21	AC16	DQ21
(5) DDR_A_D20	DDR_A_D20	AB15	DQ20
(5) DDR_A_D19	DDR_A_D19	AC14	DQ19
(5) DDR_A_D18	DDR_A_D18	AB14	DQ18
(5) DDR_A_D17	DDR_A_D17	AC13	DQ17
(5) DDR_A_D16	DDR_A_D16	AB12	DQ16
(5) DDR_A_D15	DDR_A_D15	C22	DQ15
(5) DDR_A_D14	DDR_A_D14	D23	DQ14
(5) DDR_A_D13	DDR_A_D13	E23	DQ13
(5) DDR_A_D12	DDR_A_D12	E22	DQ12
(5) DDR_A_D11	DDR_A_D11	F22	DQ11
(5) DDR_A_D10	DDR_A_D10	H23	DQ10
(5) DDR_A_D9	DDR_A_D9	H22	DQ9
(5) DDR_A_D8	DDR_A_D8	H22	DQ8
(5) DDR_A_D7	DDR_A_D7	T23	DQ7
(5) DDR_A_D6	DDR_A_D6	T22	DQ6
(5) DDR_A_D5	DDR_A_D5	U22	DQ5
(5) DDR_A_D4	DDR_A_D4	V23	DQ4
(5) DDR_A_D3	DDR_A_D3	W23	DQ3
(5) DDR_A_D2	DDR_A_D2	W22	DQ2
(5) DDR_A_D1	DDR_A_D1	Y22	DQ1
(5) DDR_A_D0	DDR_A_D0	AA23	DQ0

A1	DNU0
A2	DNU1
A23	DNU2
B1	DNU3
B2	DNU4
B22	DNU5
B23	DNU6
AB1	DNU7
AB2	DNU8
AB22	DNU9
AB23	DNU10
AC1	DNU11
AC2	DNU12
AC22	DNU13
AC23	DNU14
	DNU15

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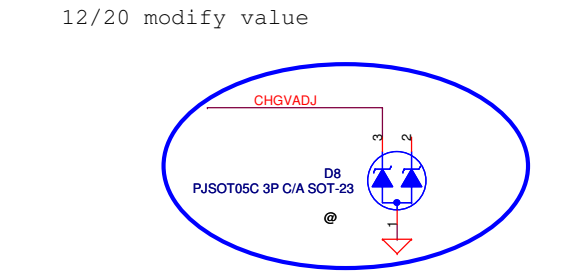


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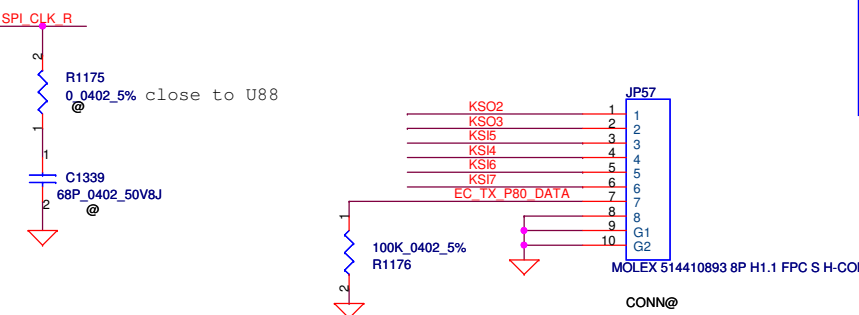
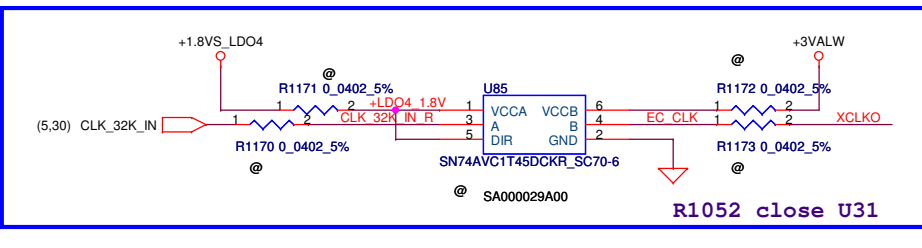
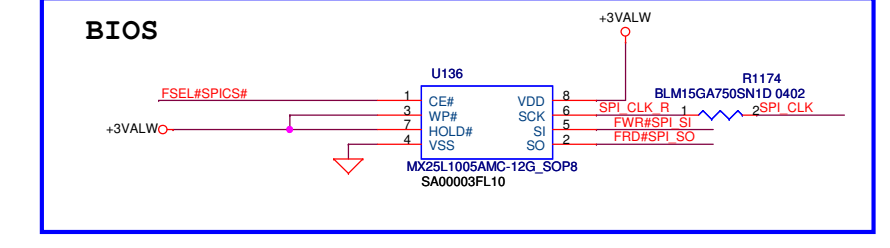
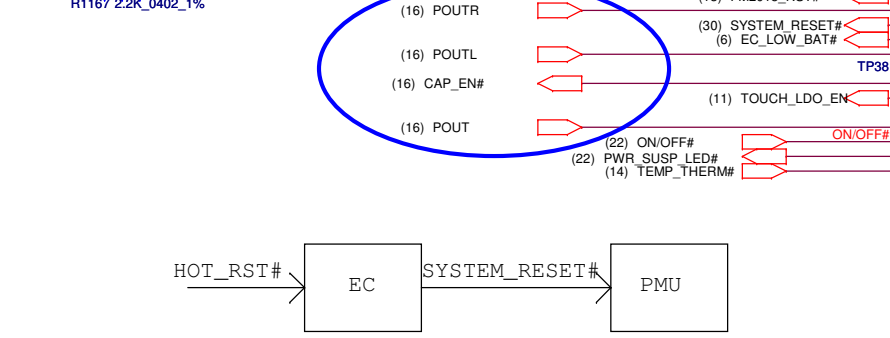
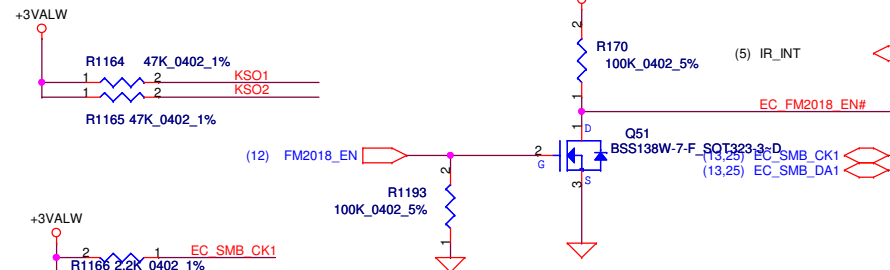


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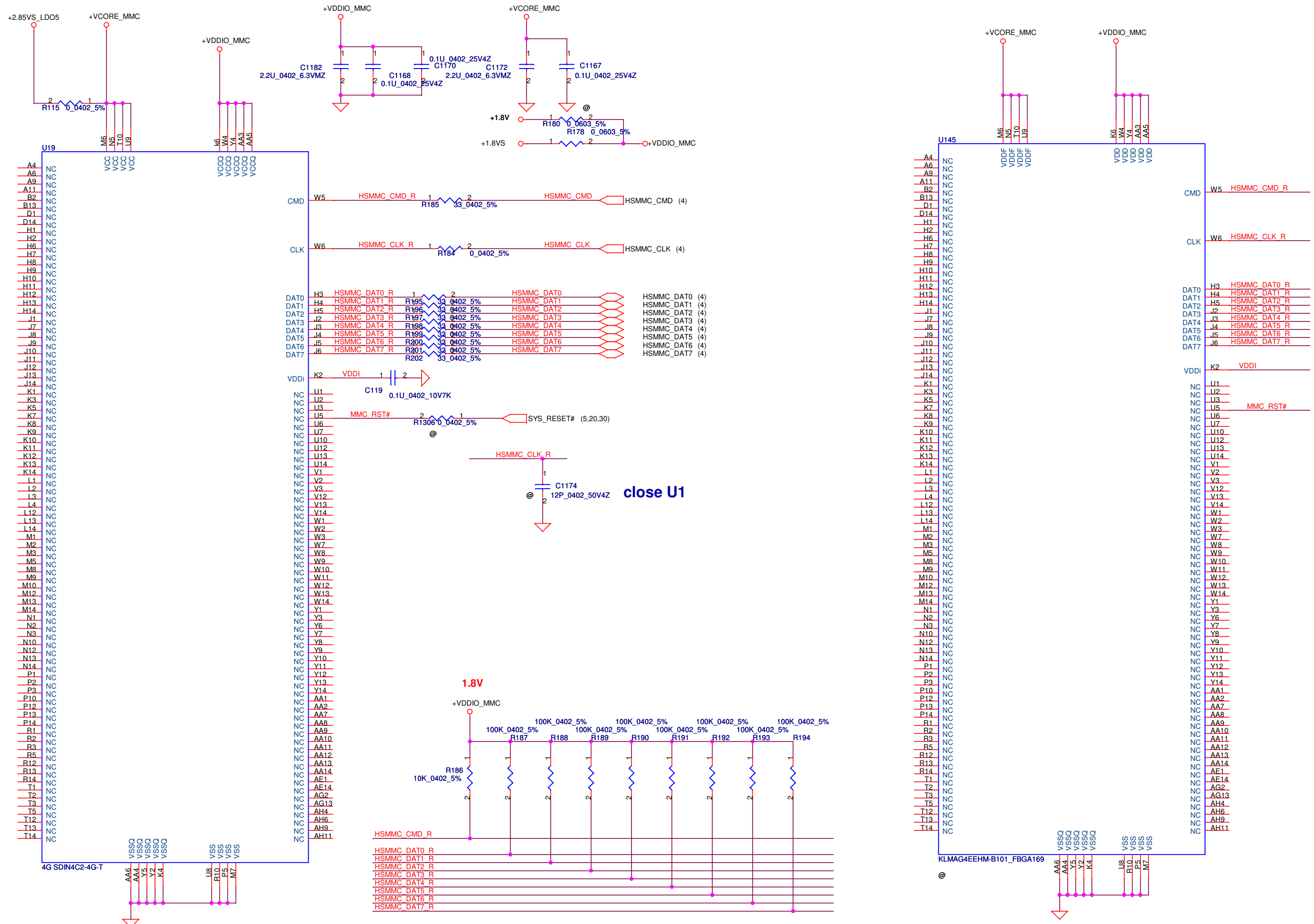
board ID	R1228
0	0
1	8.2K
2	18K
3	33K
4	56K
5	100K



12/20 add ESD diode



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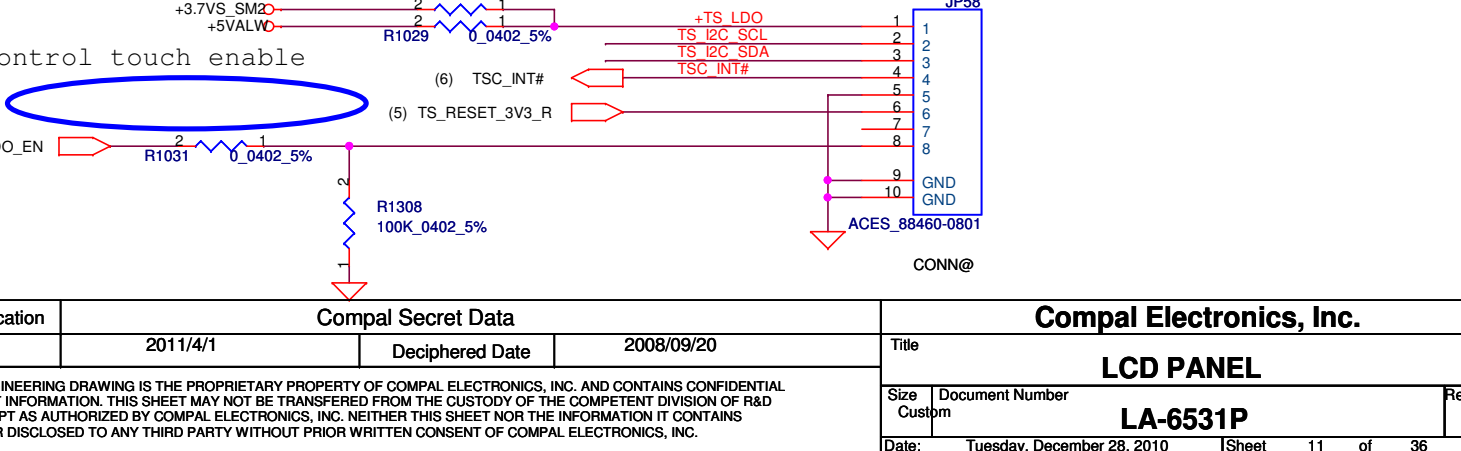
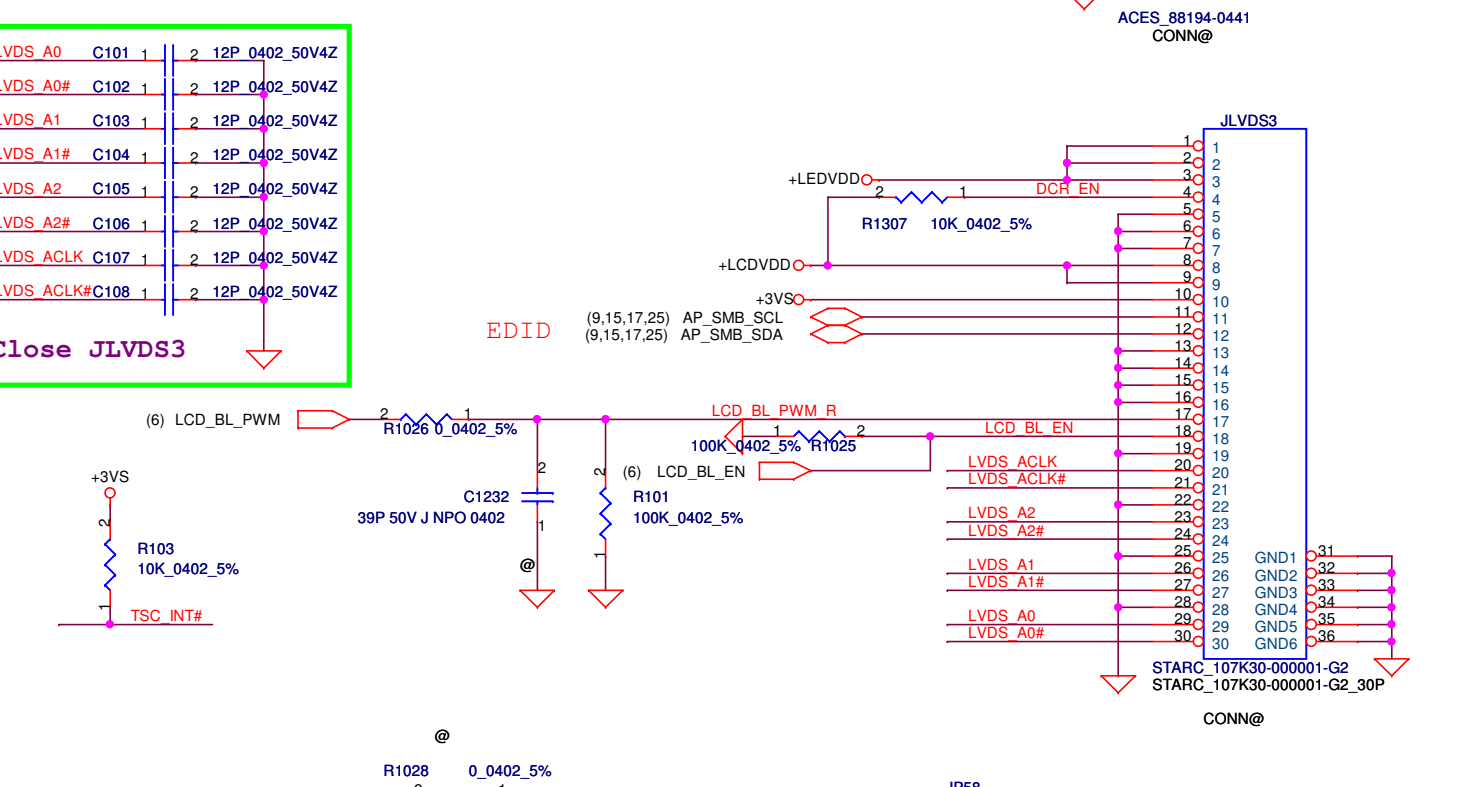
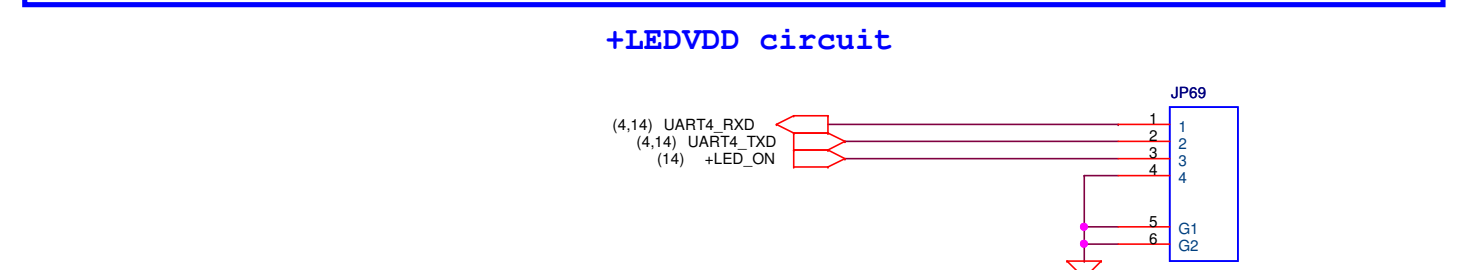
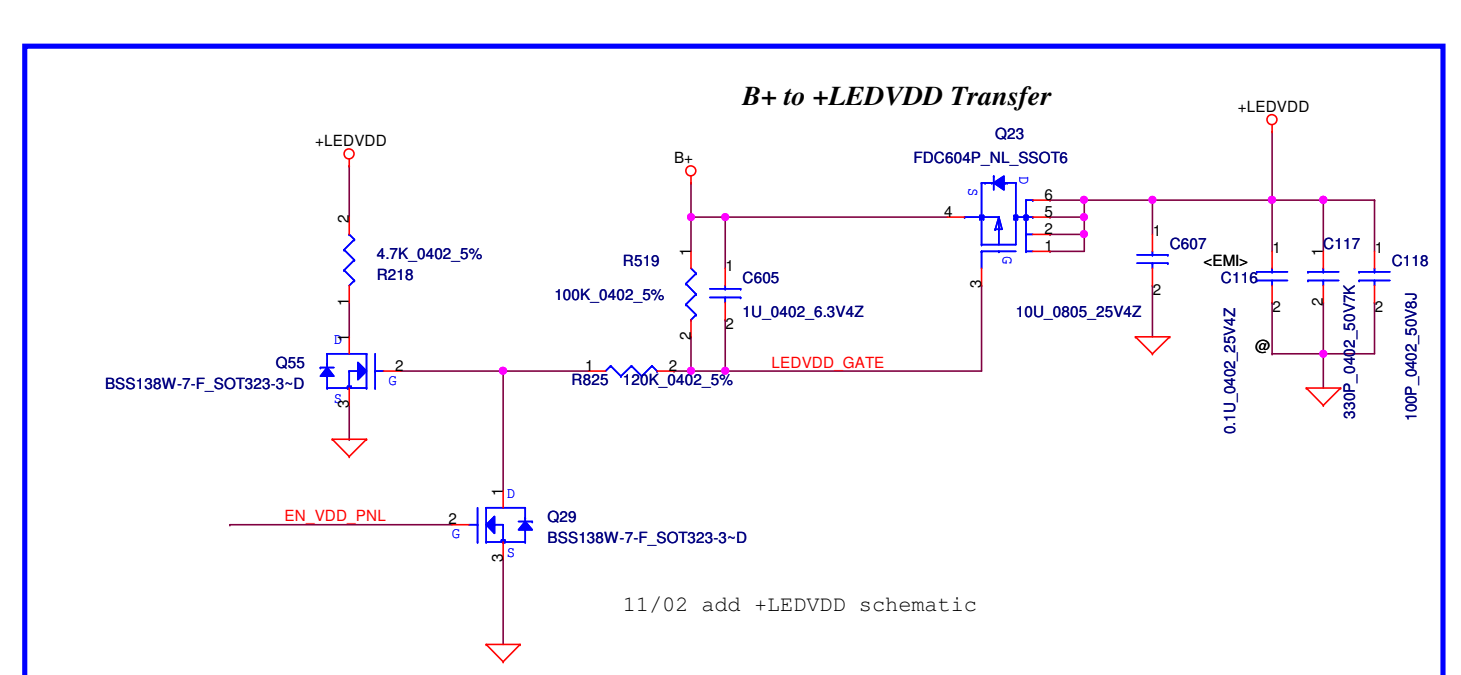
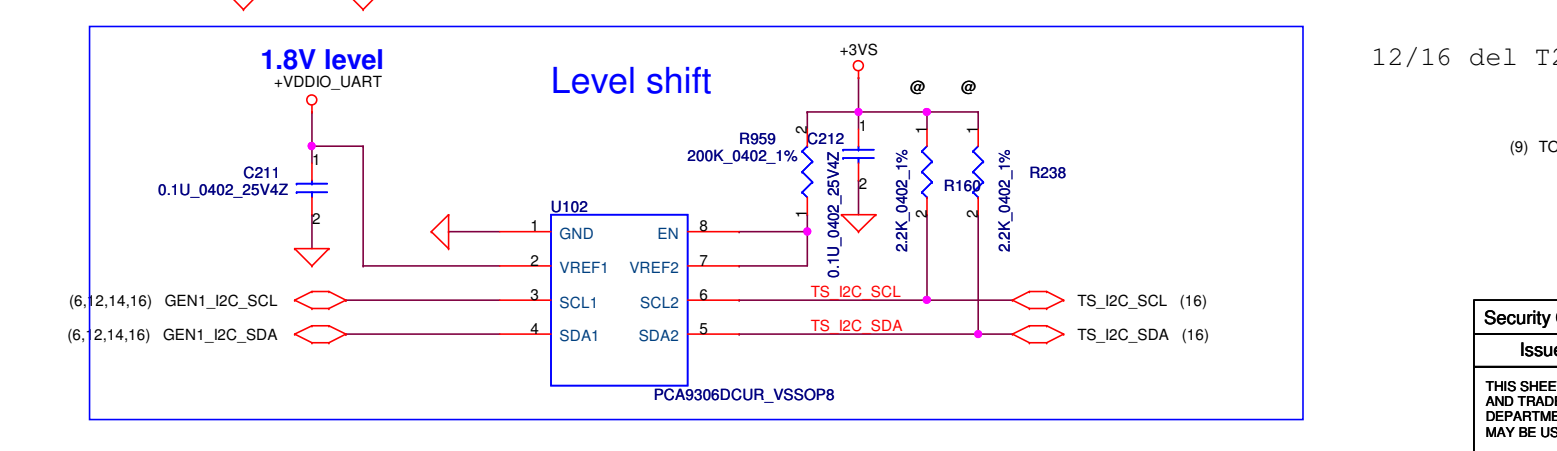
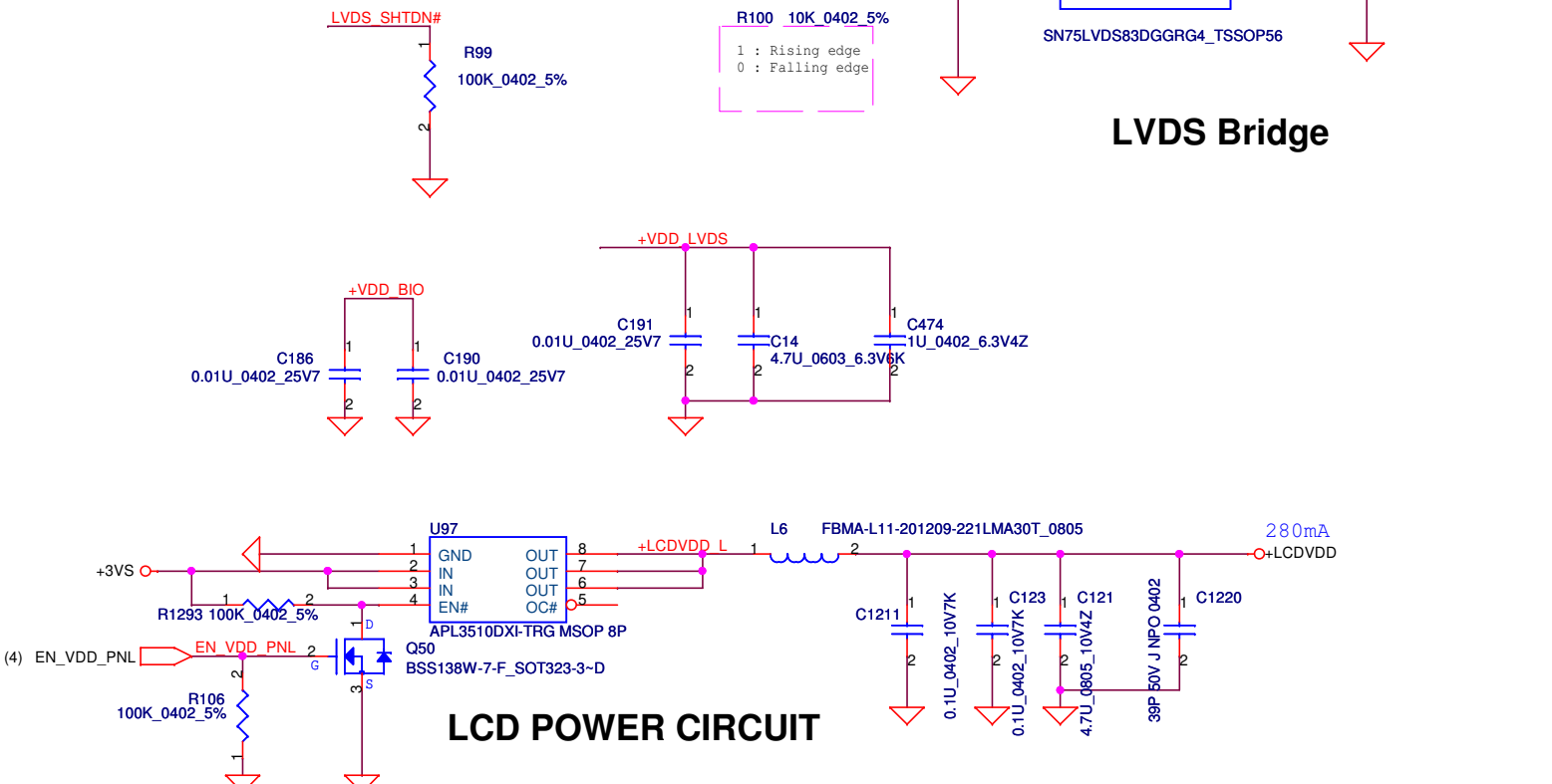
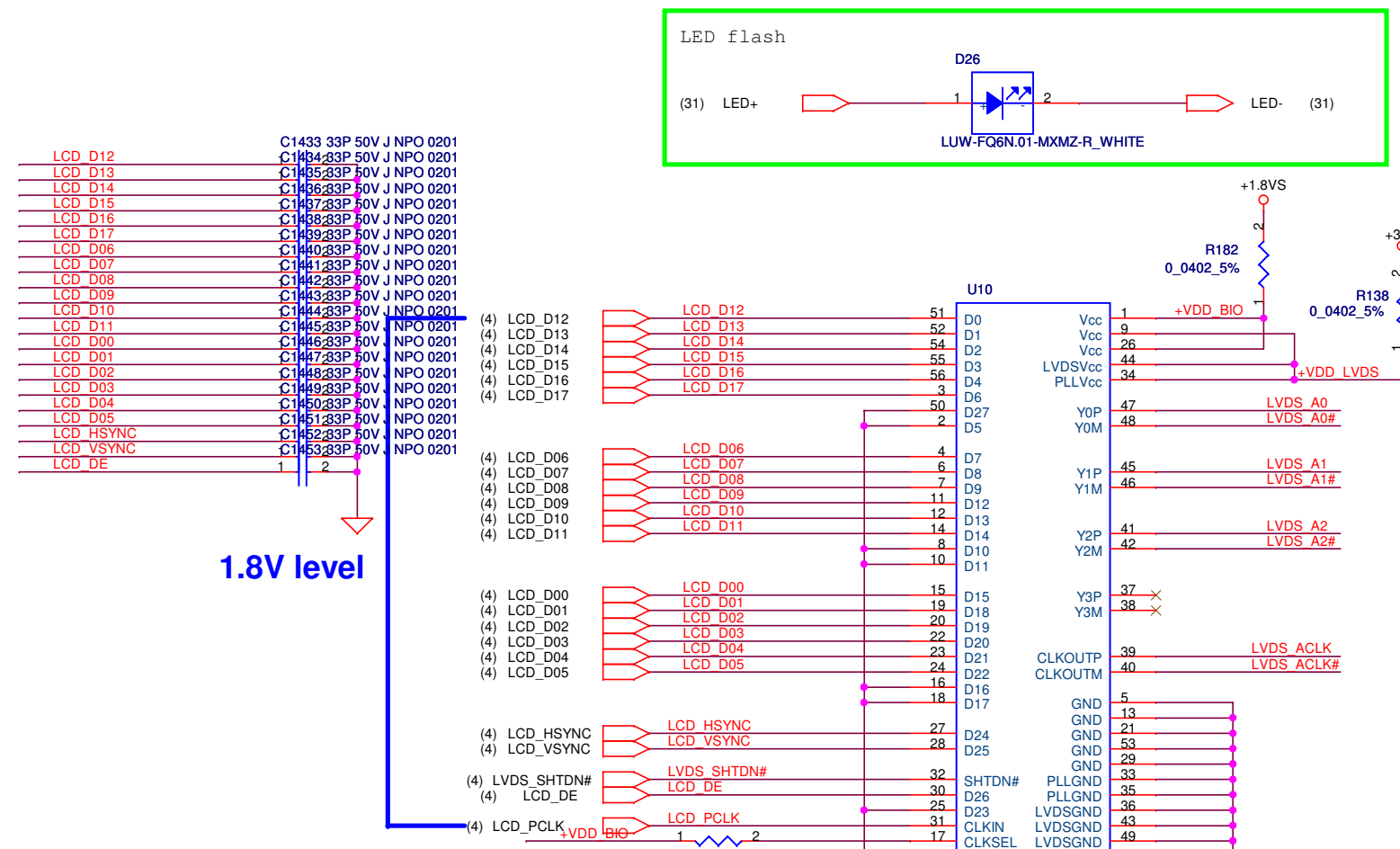


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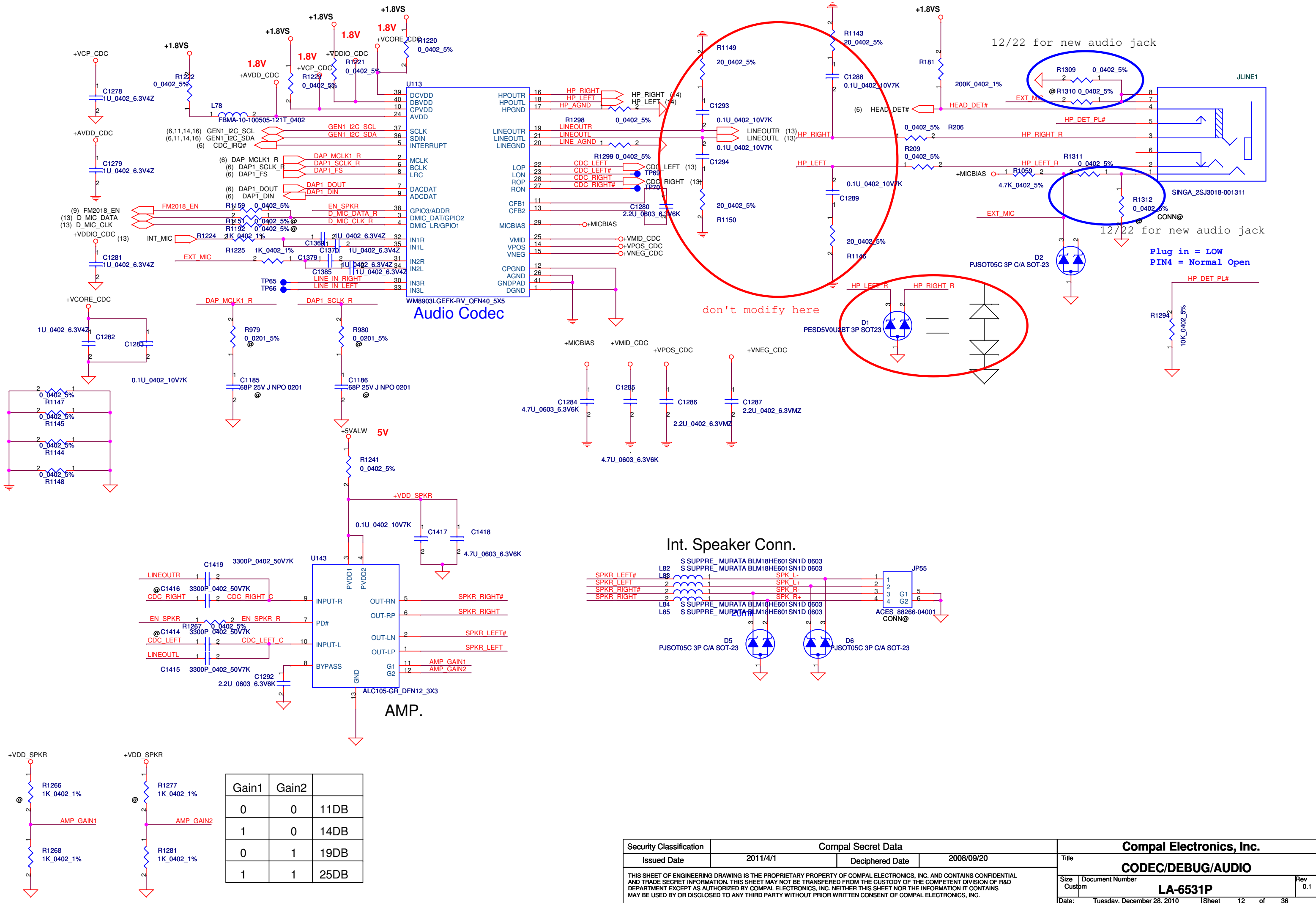
Compal Electronics, Inc.

EMMC

LA-6531P



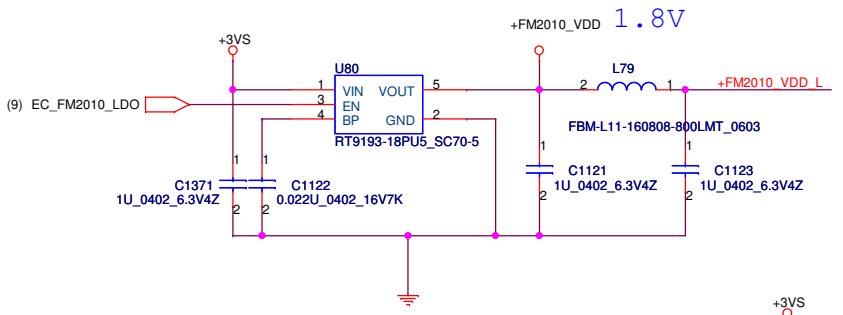
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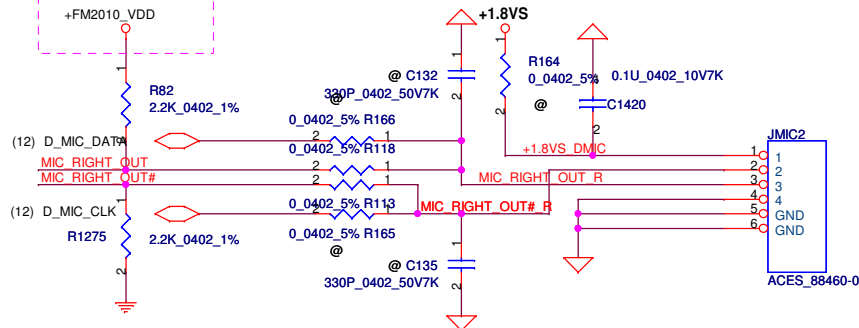
Gain1	Gain2	Gain
0	0	11DB
1	0	14DB
0	1	19DB
1	1	25DB

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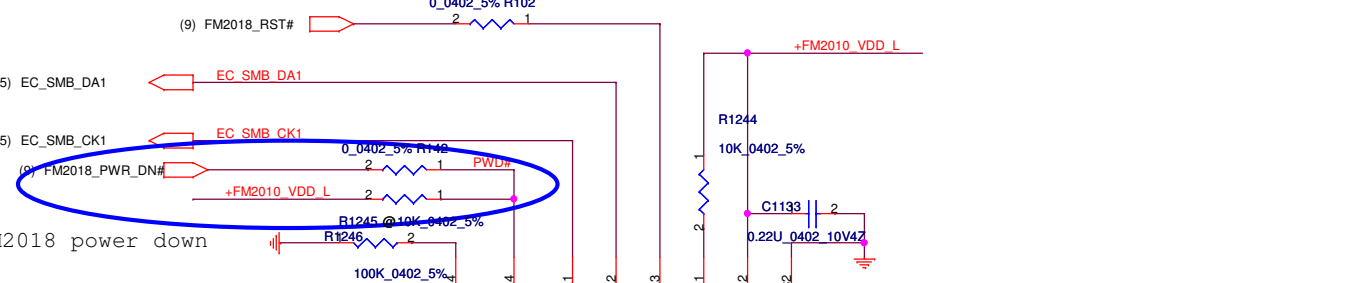
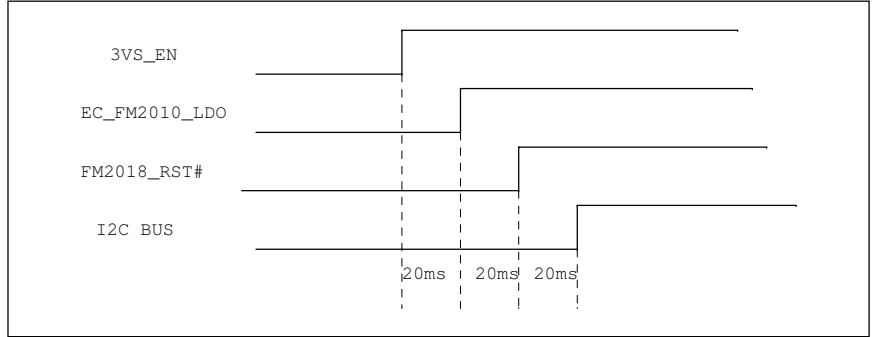
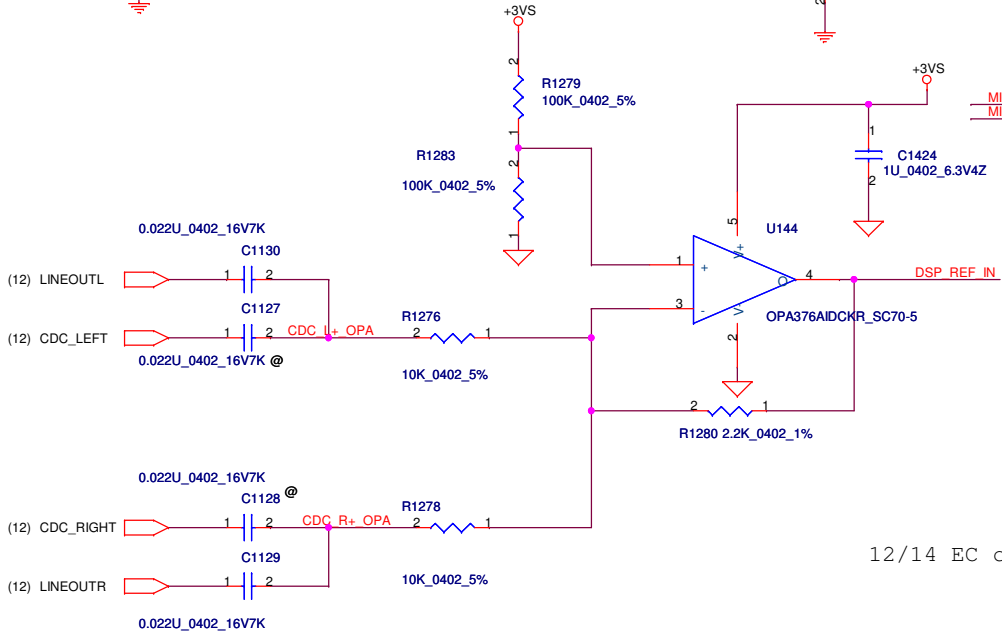
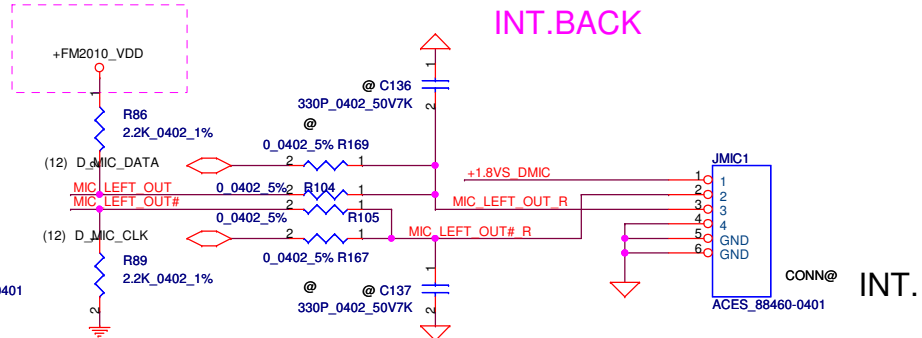
INT. MIC



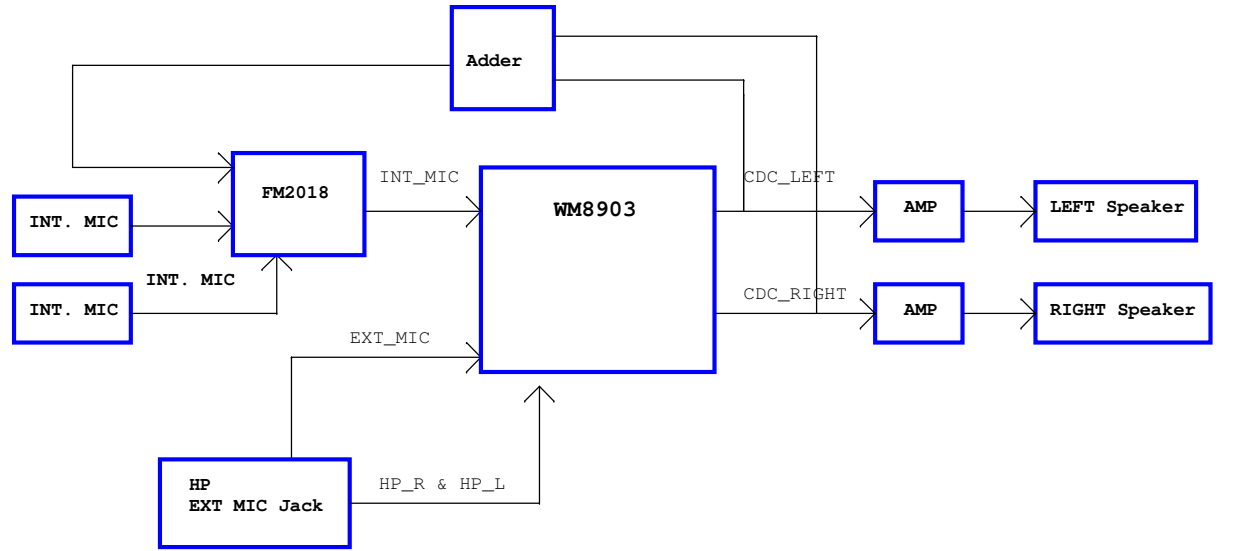
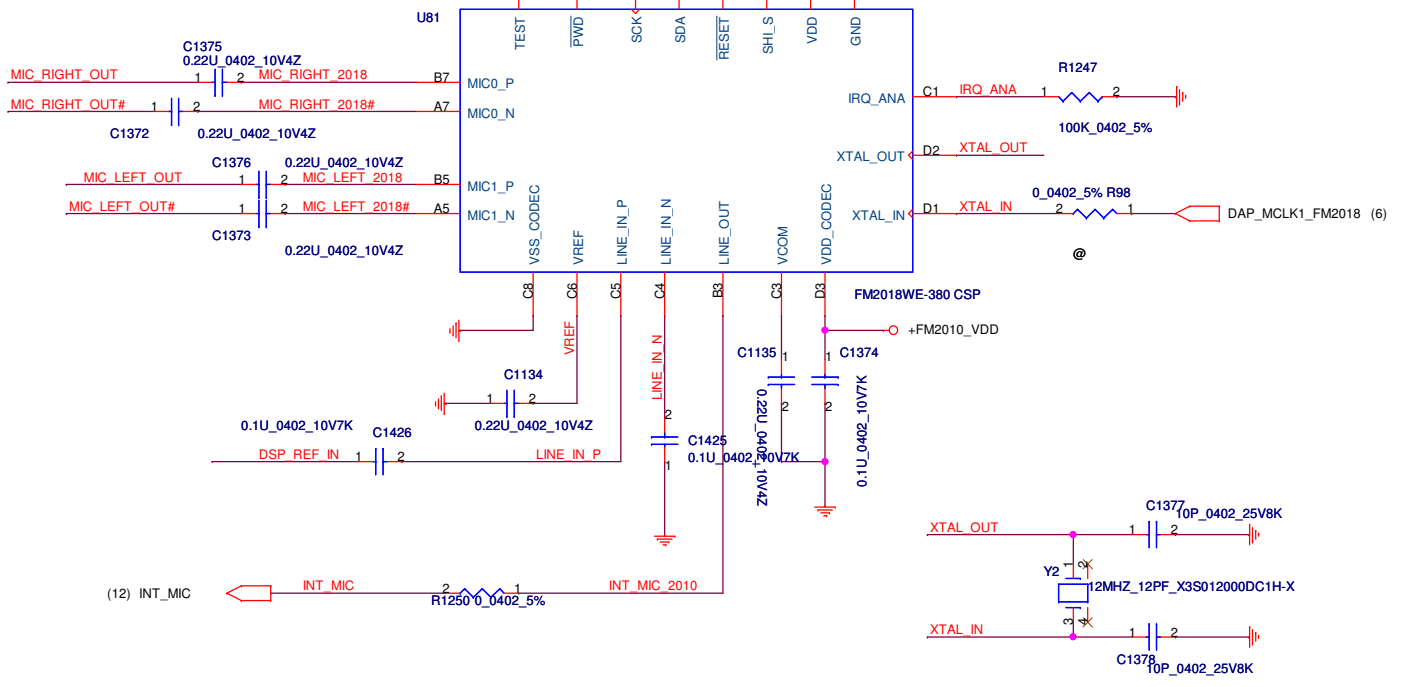
INT. FRONT



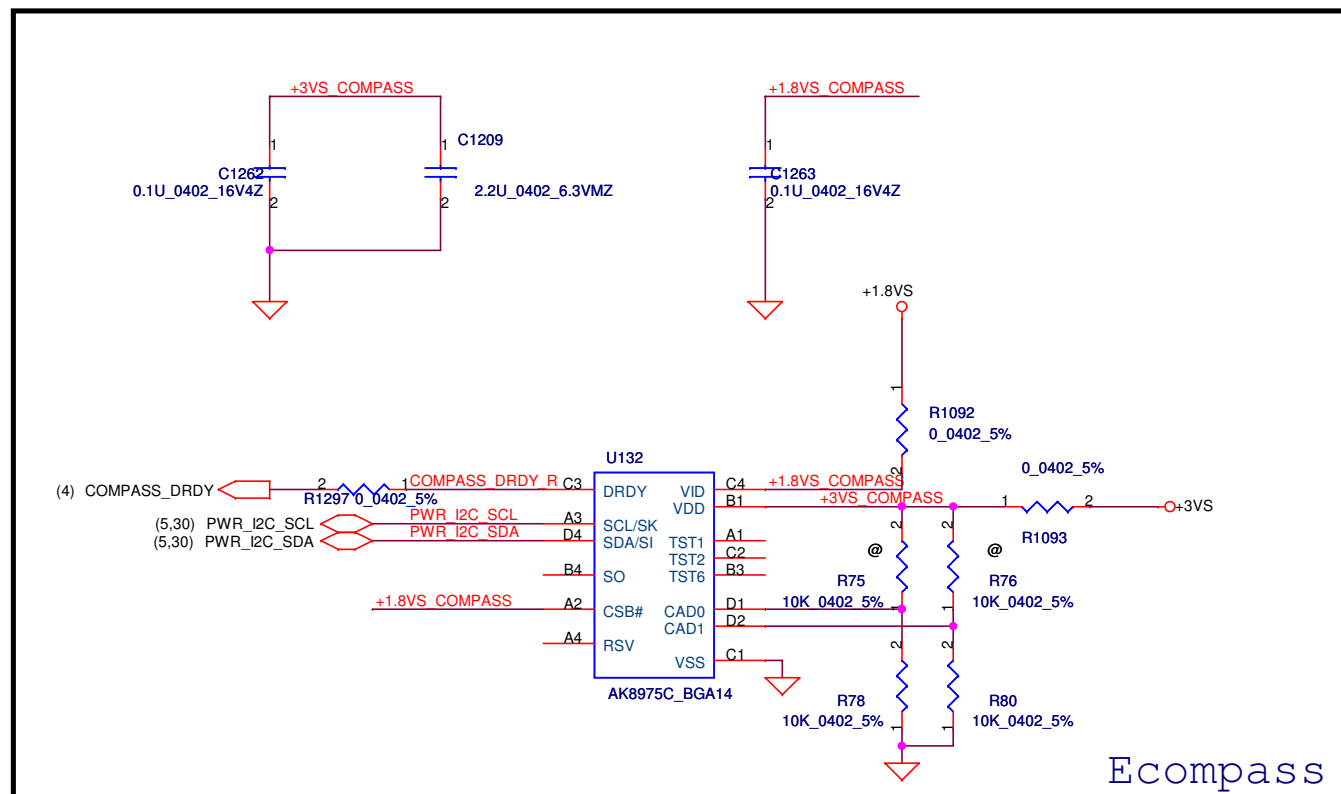
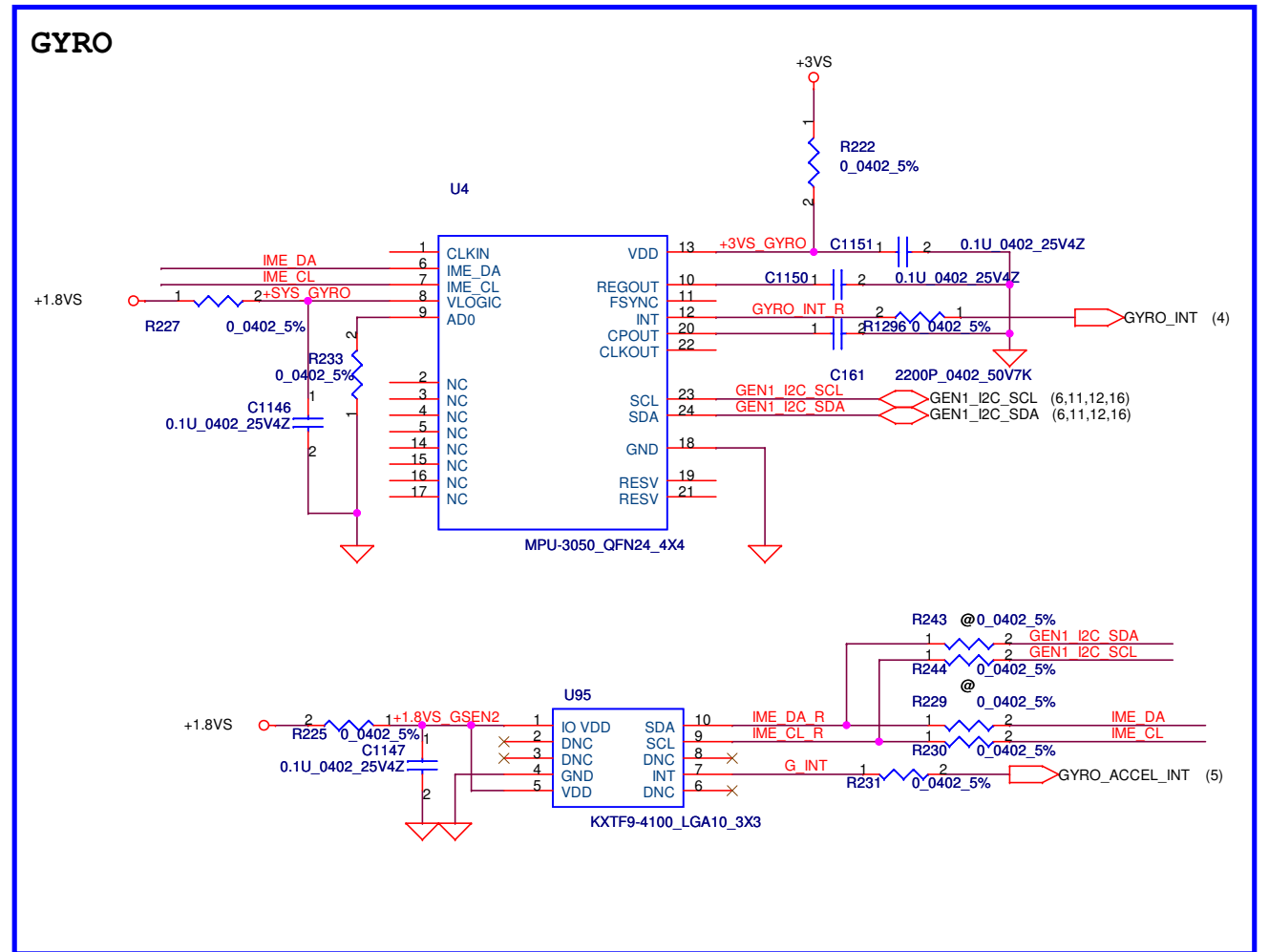
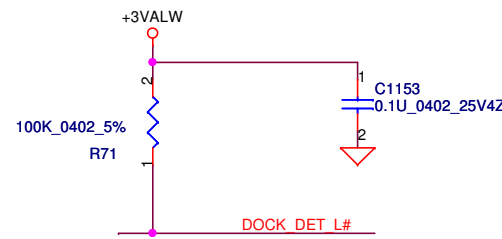
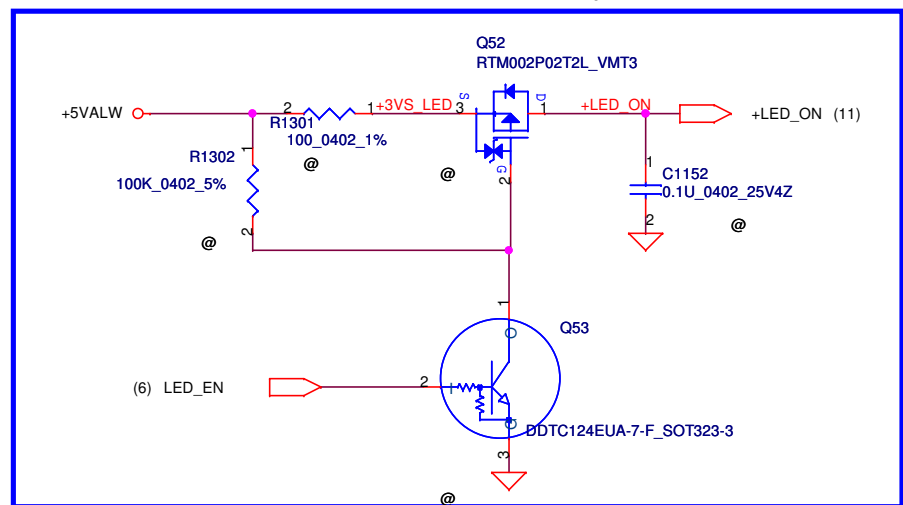
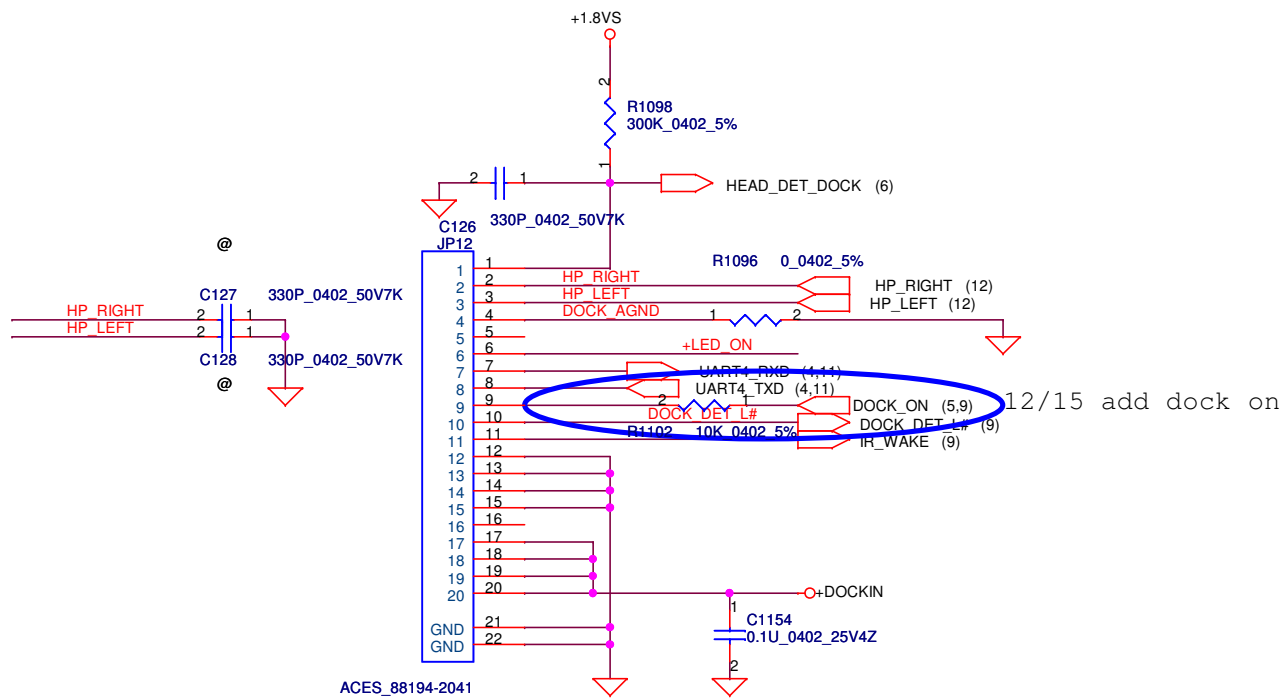
INT. BACK



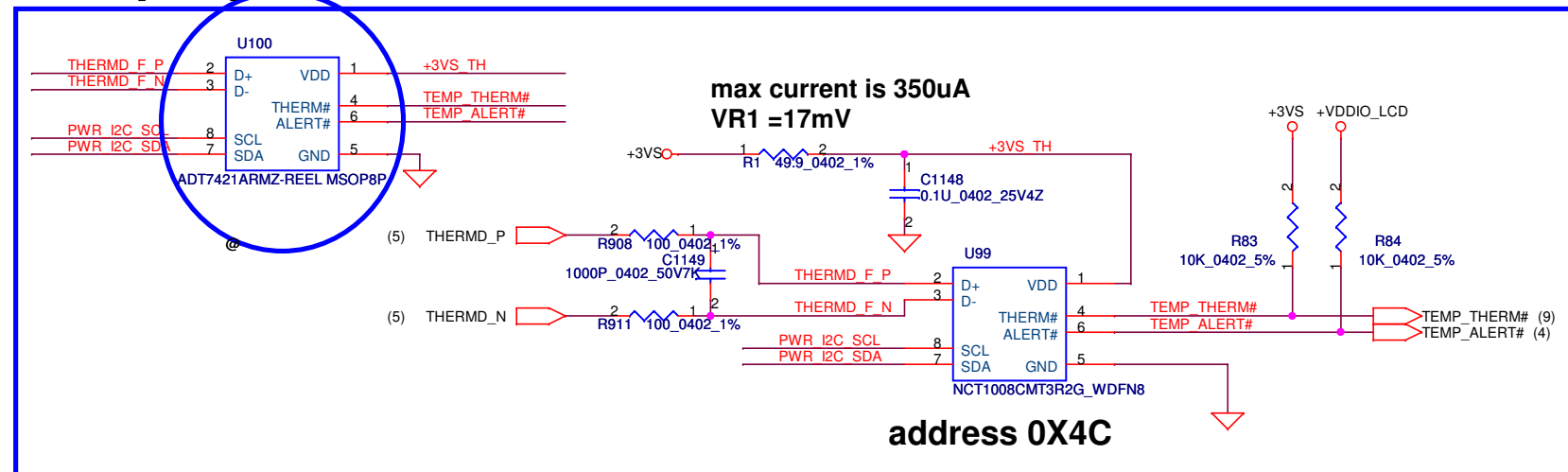
12/14 EC control FM2018 power down



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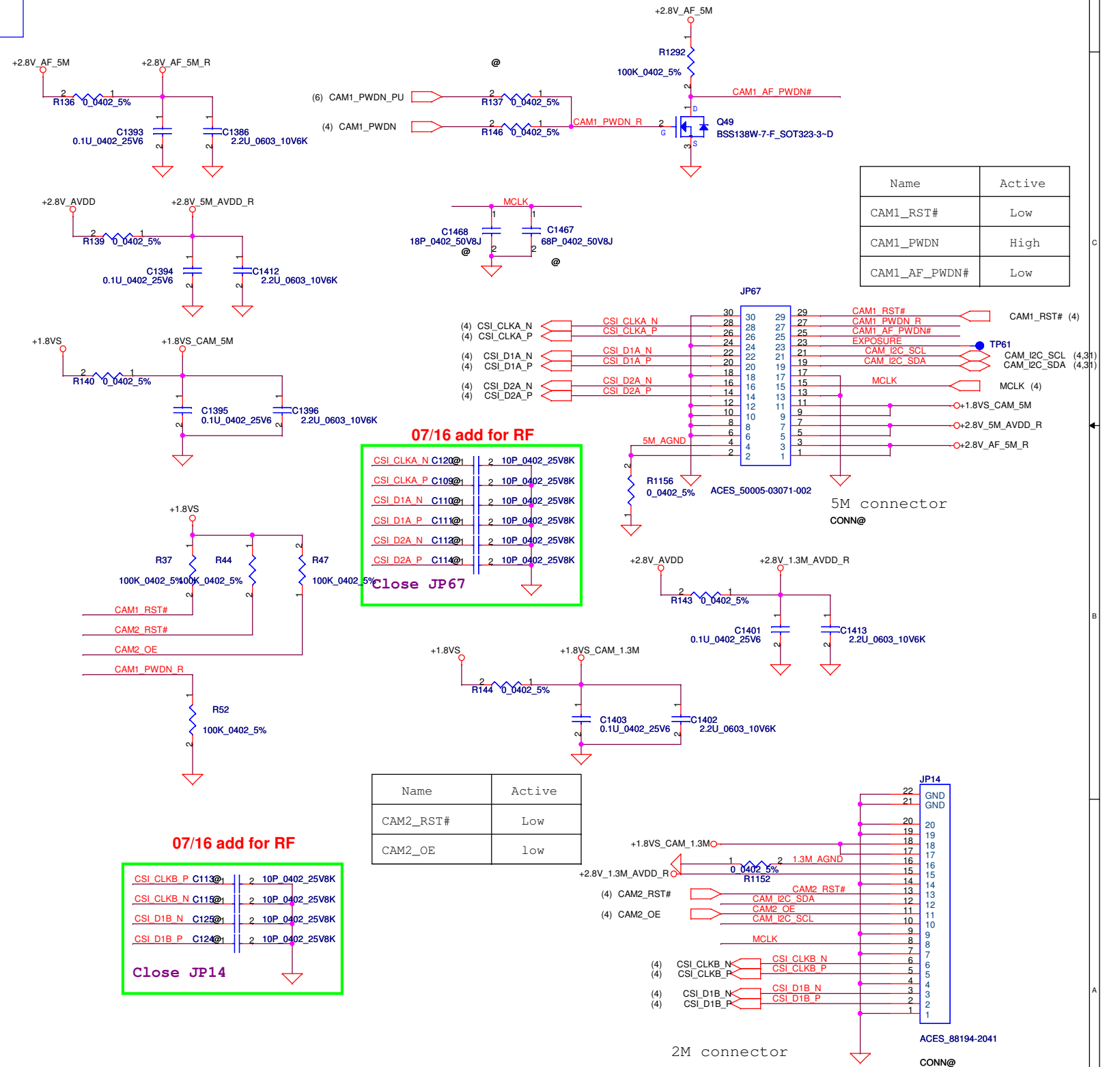
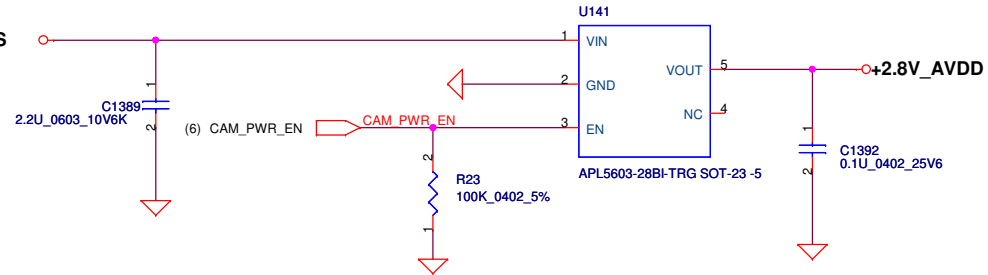
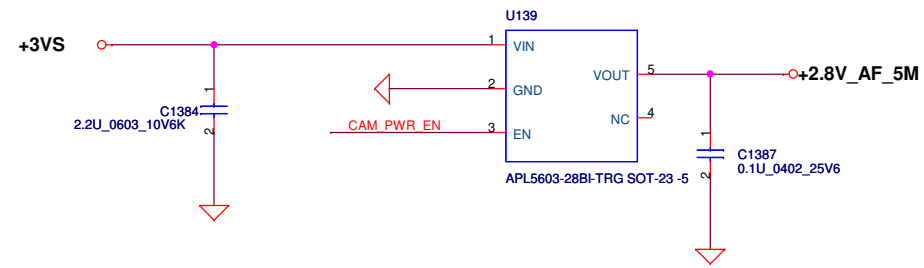
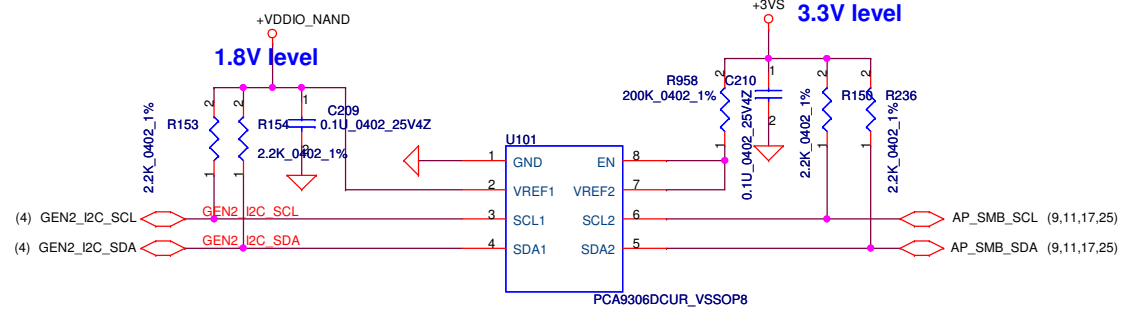


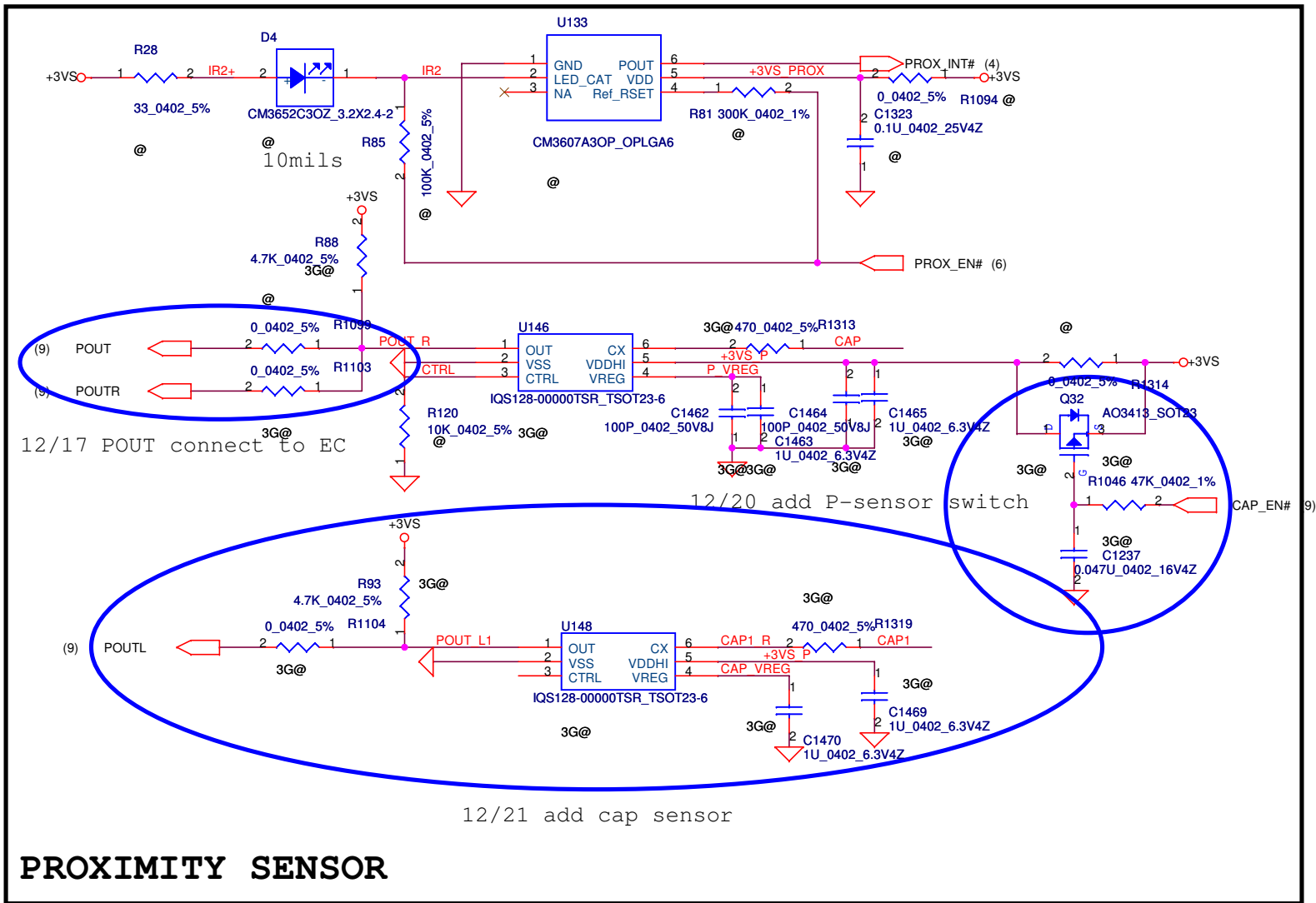
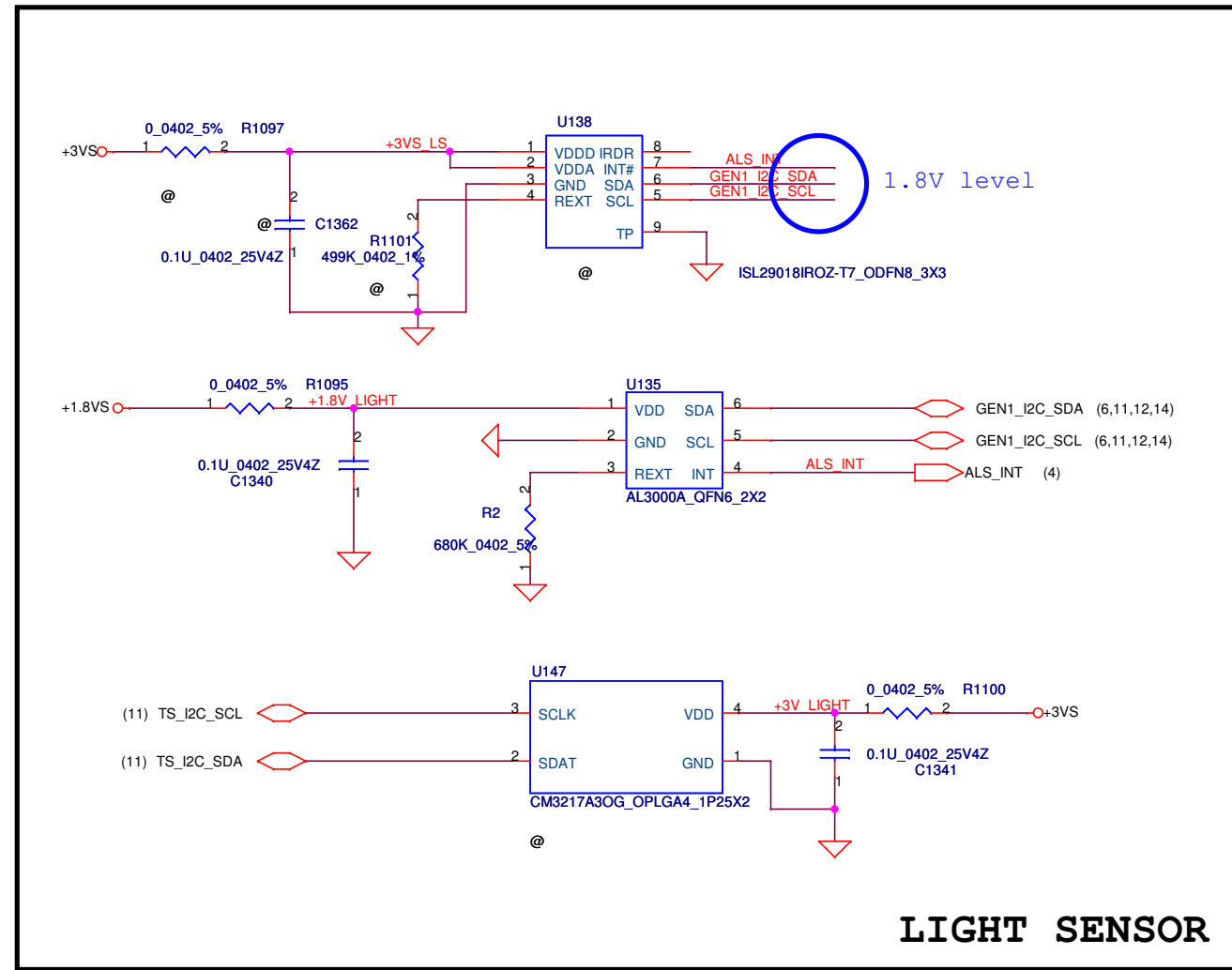
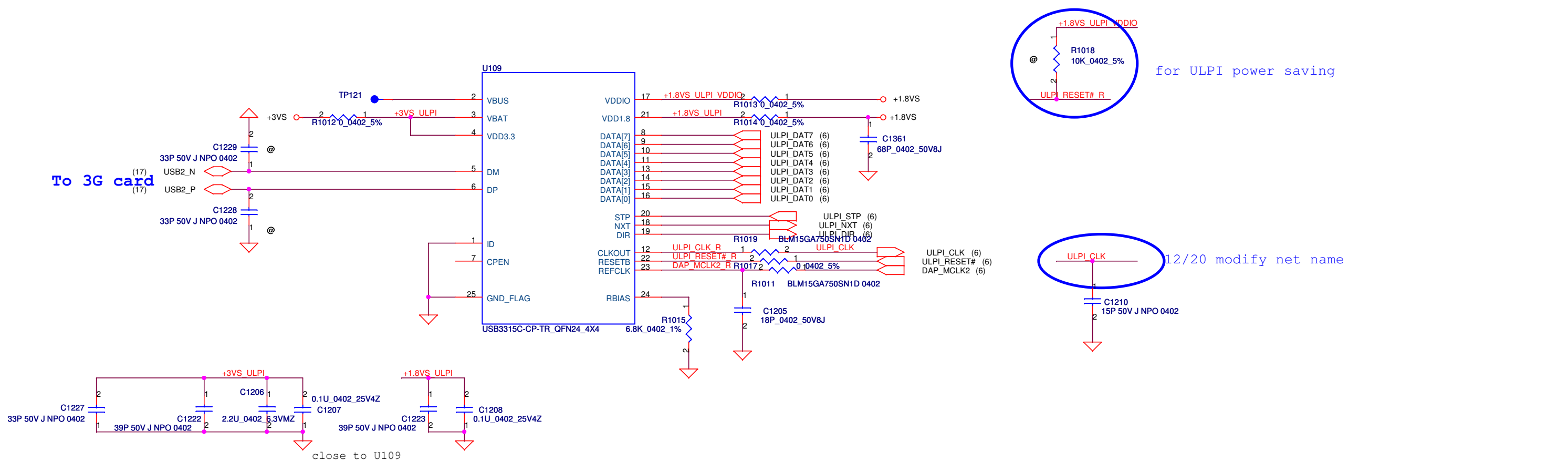
12/17 modify footprint ADT7461ARMZ-REEL7_MSOP8-S



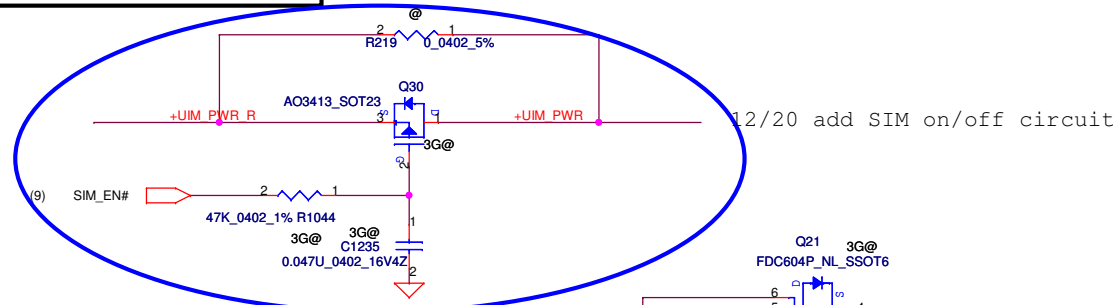
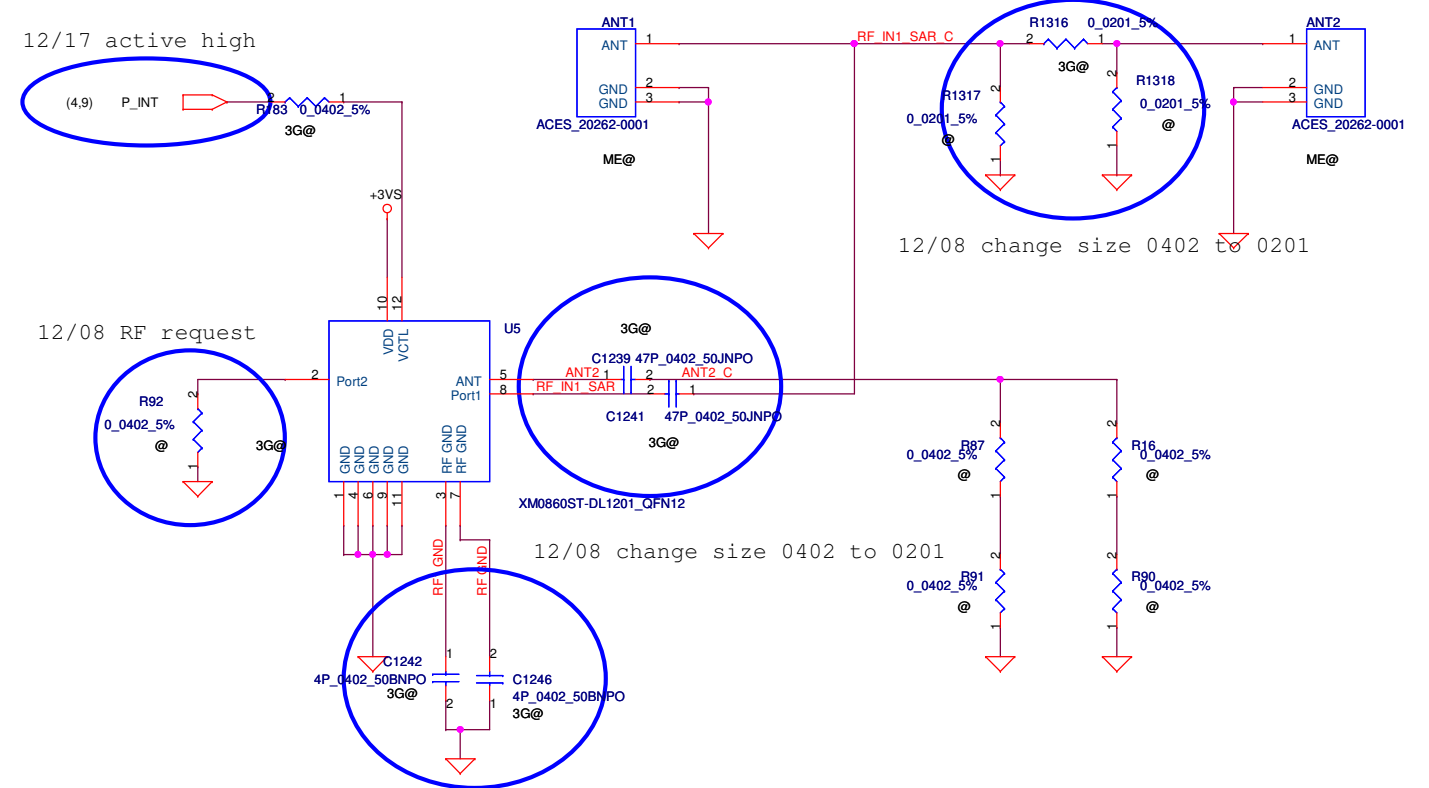
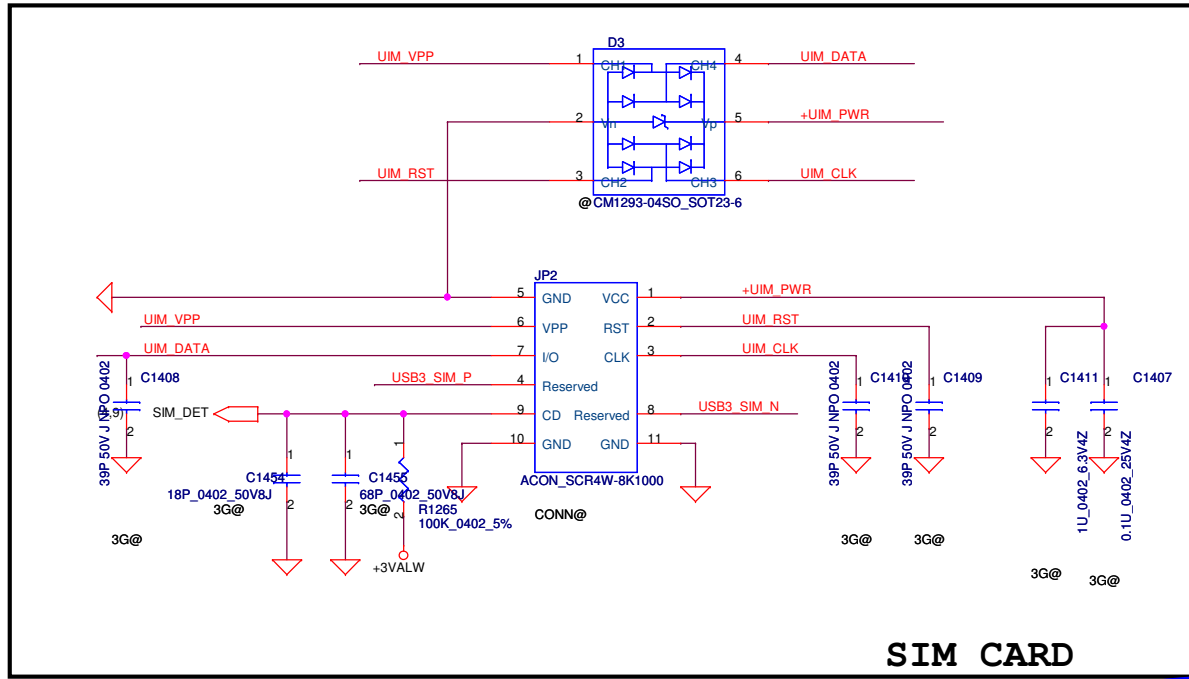
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Level shift

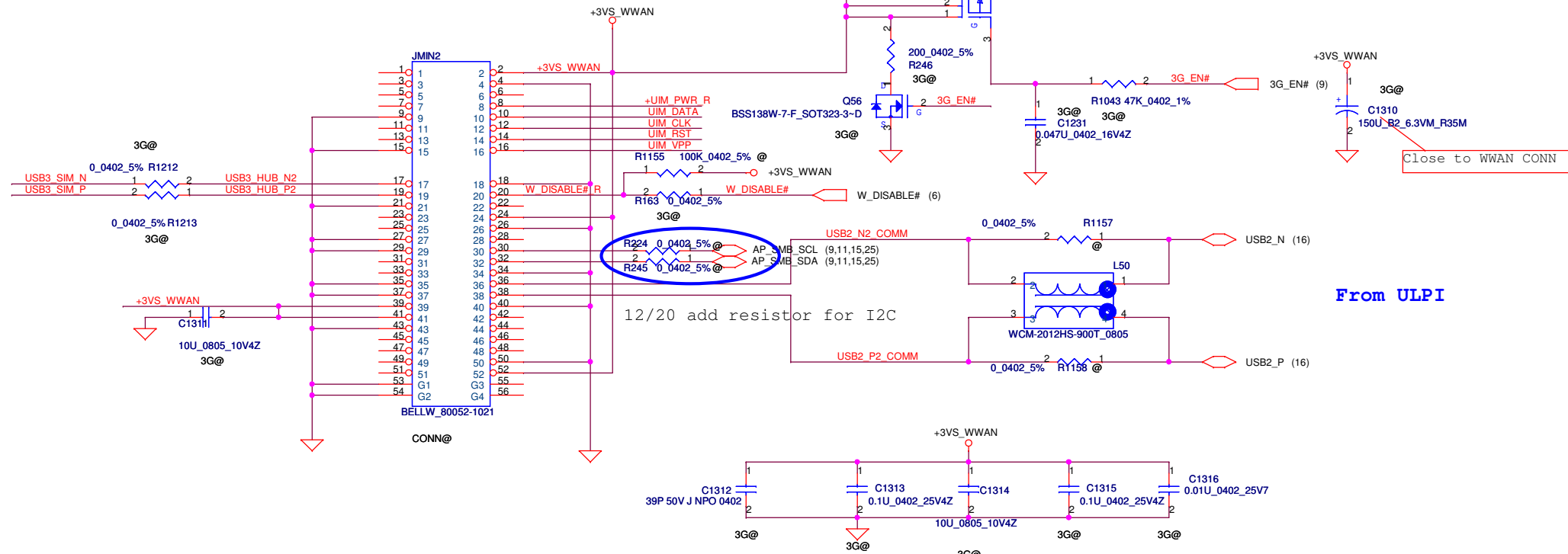




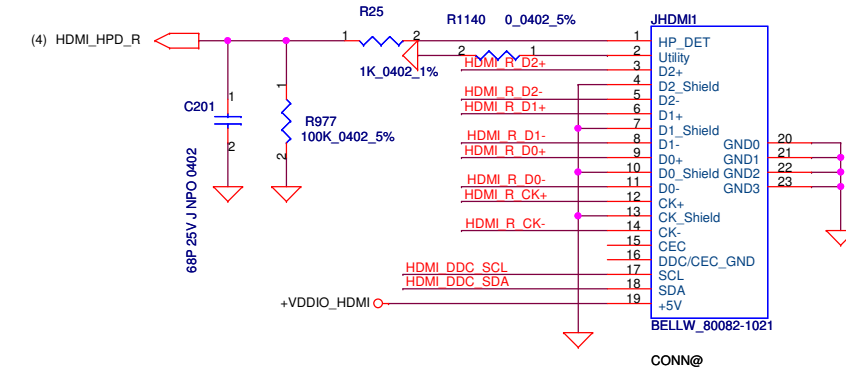
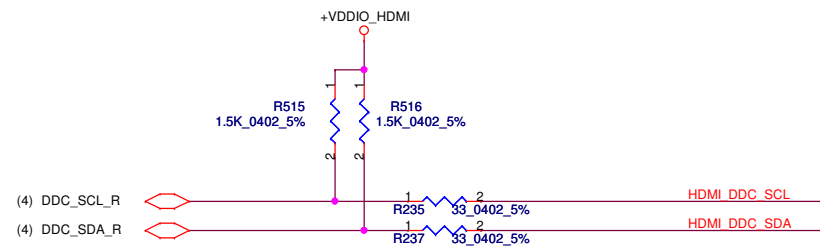
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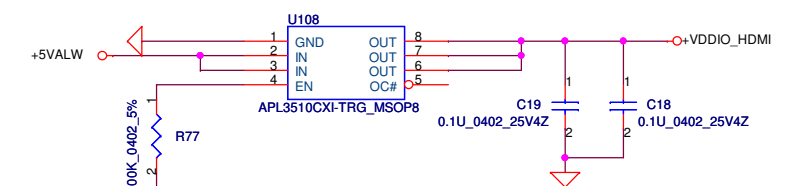
Mini-Express Card for WWAN



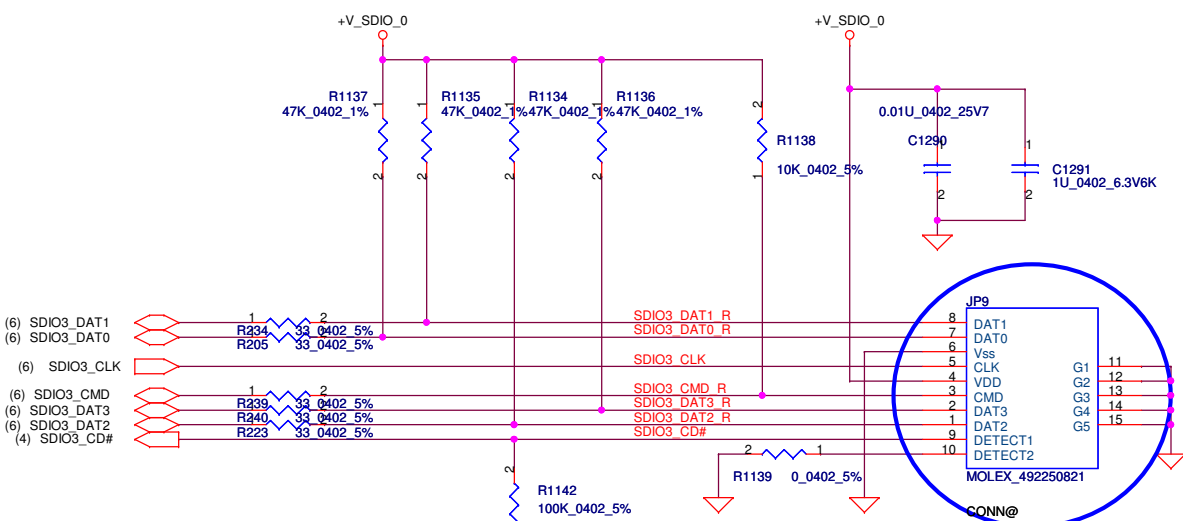
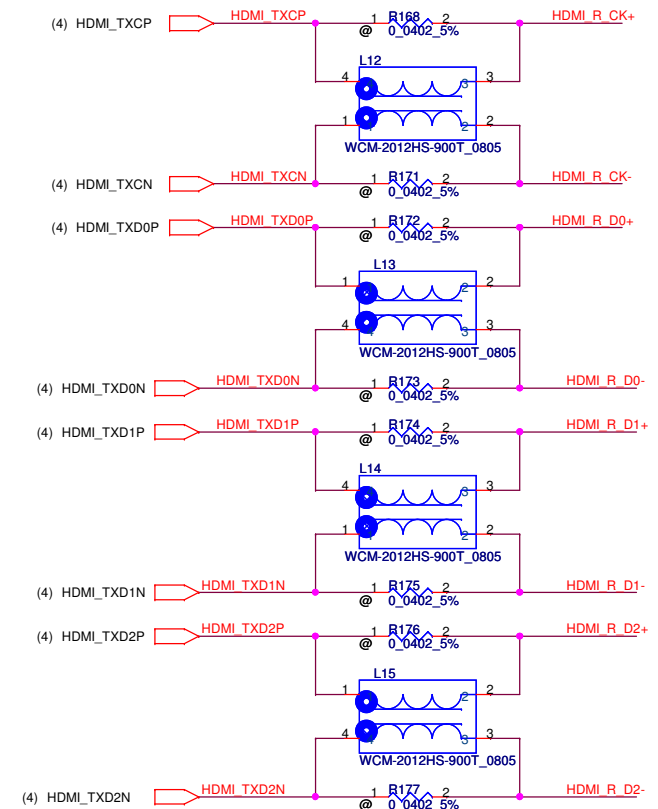
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Title	3G card			
Size C	Document Number	LA-6531P		Rev 0.1
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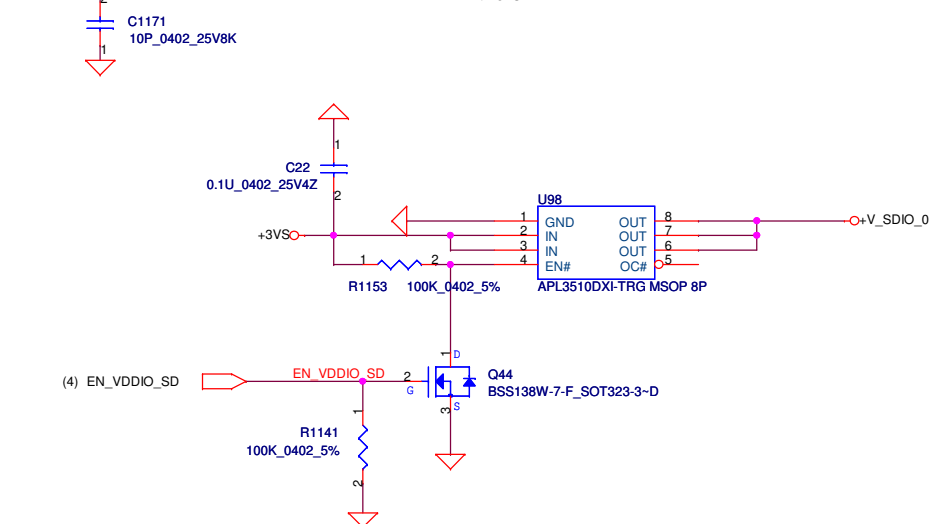
HDMI Type D Connector



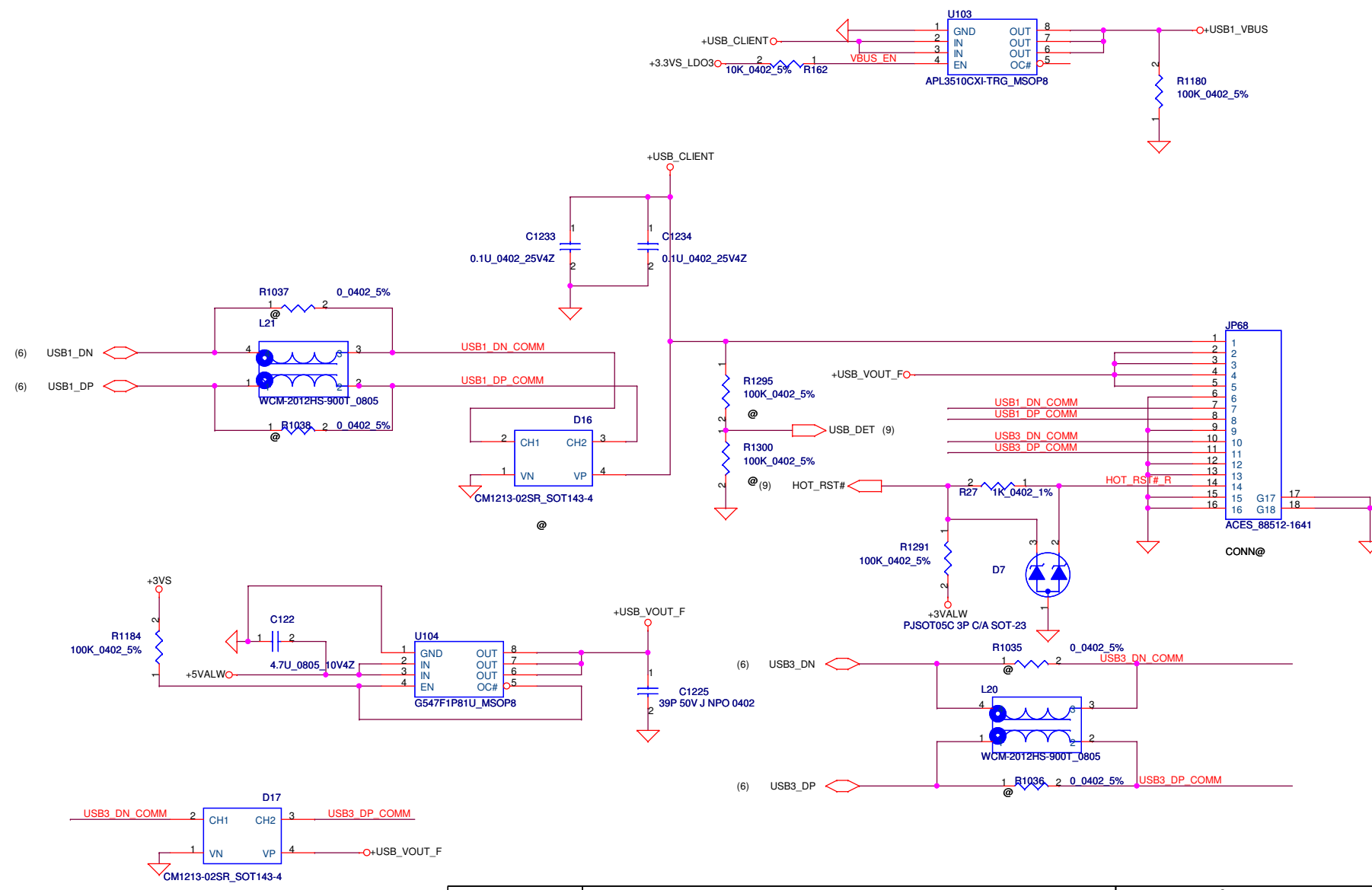
07/23 pull high



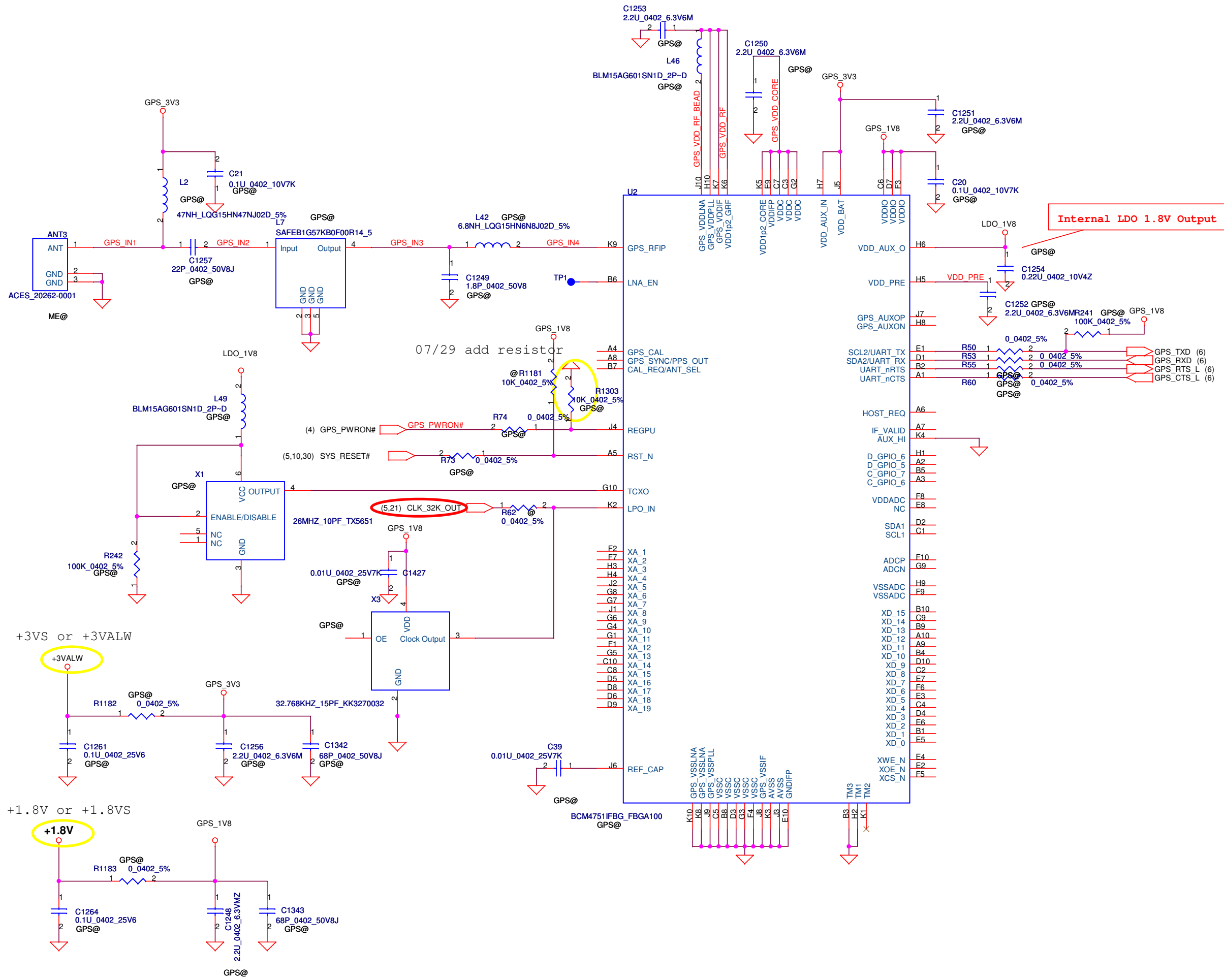
12/20 modify footprint



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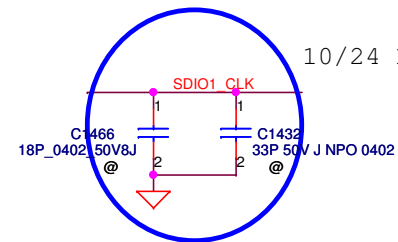


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Size	Document Number	Rev		
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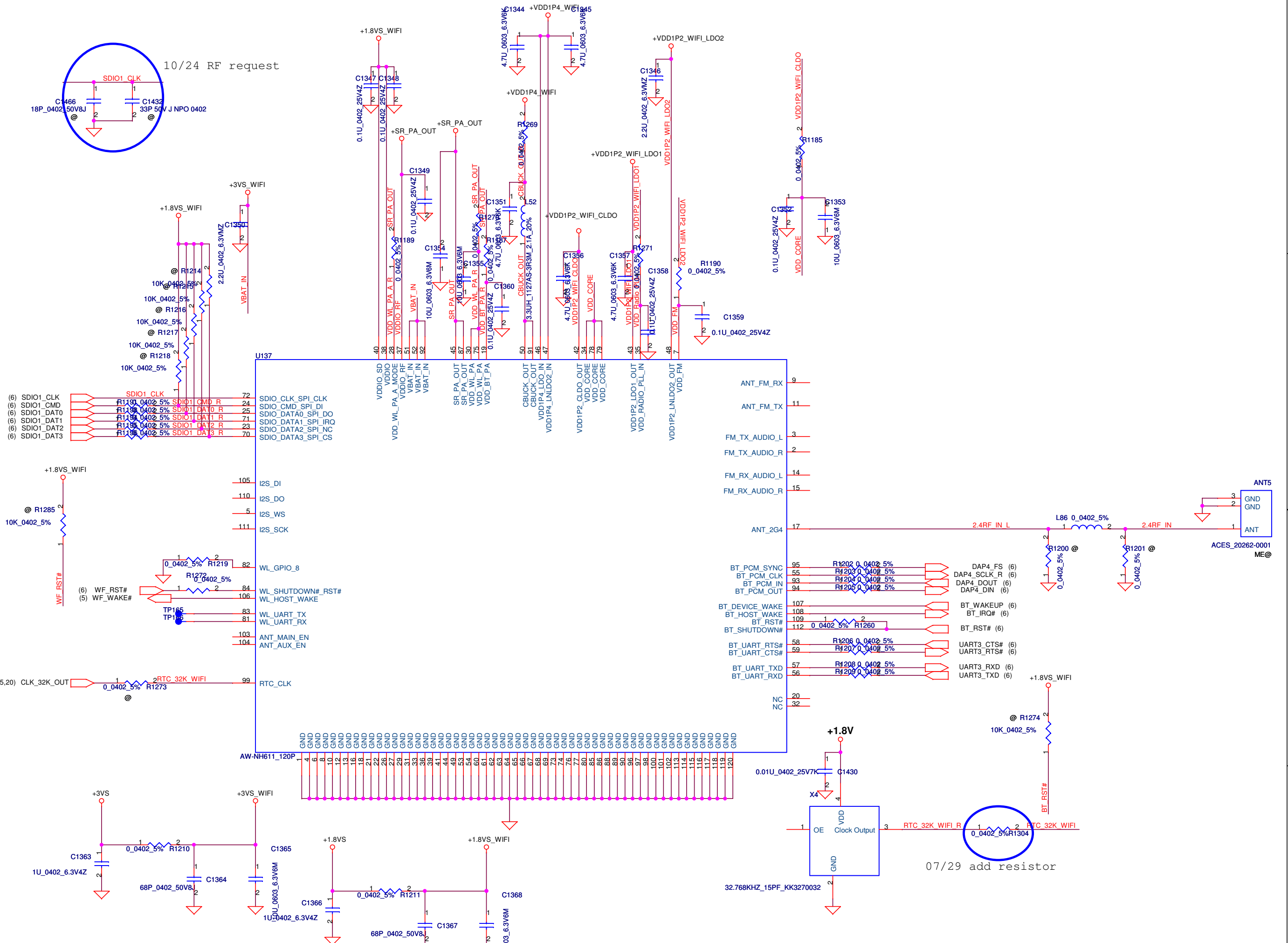


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				Size	Document Number
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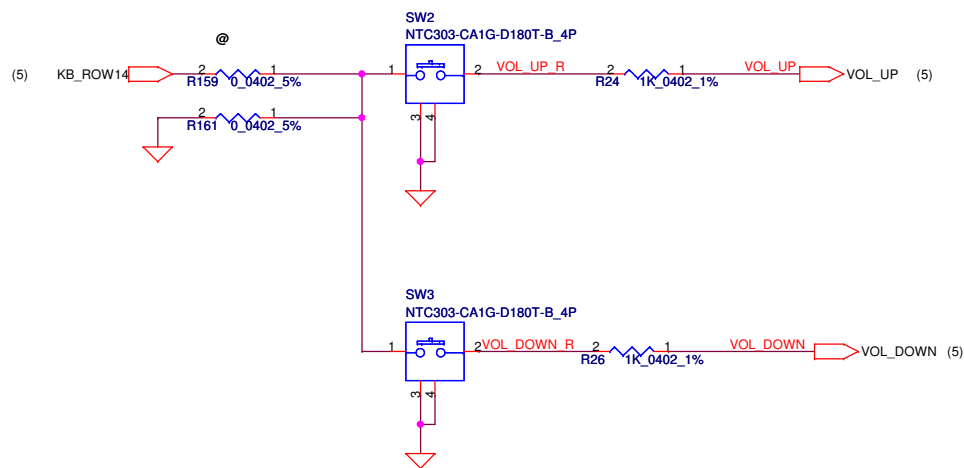
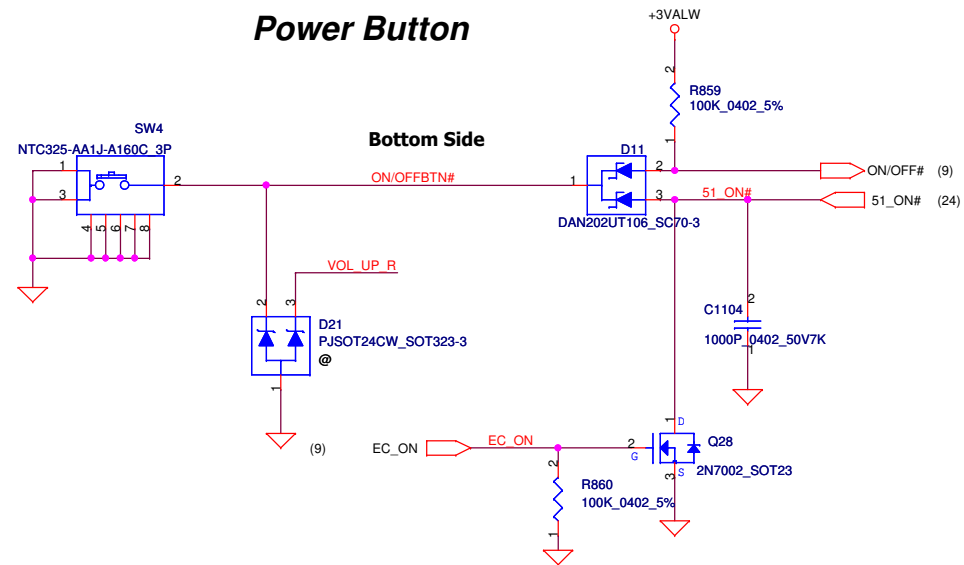


10/24 RF request

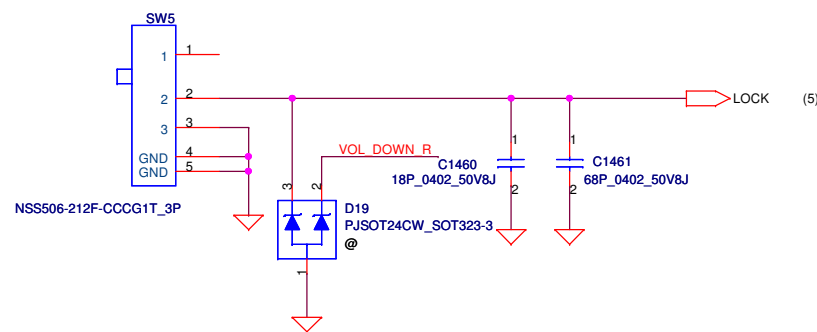
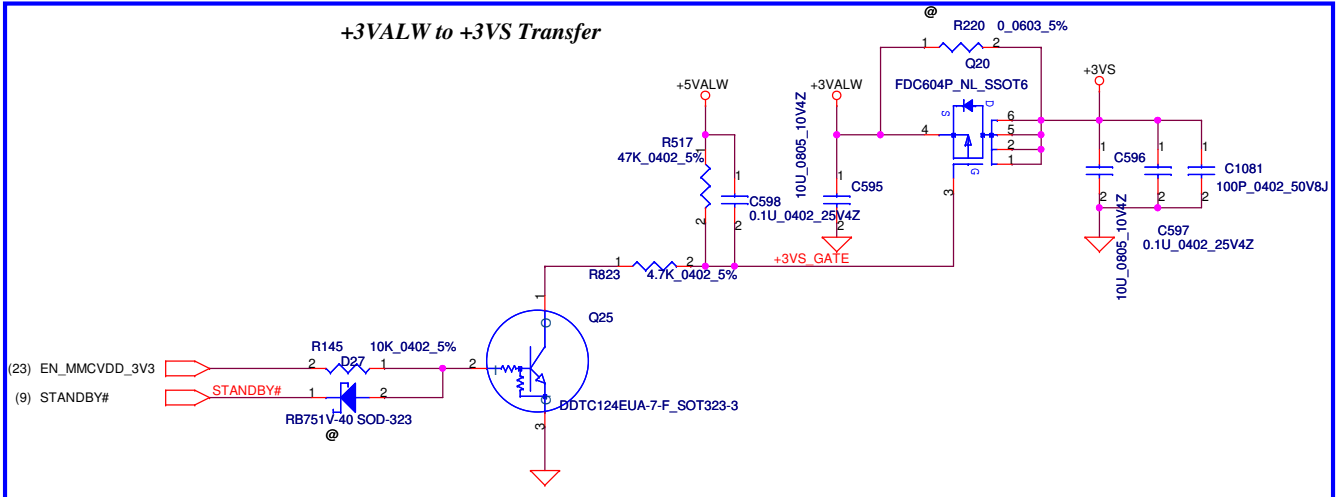


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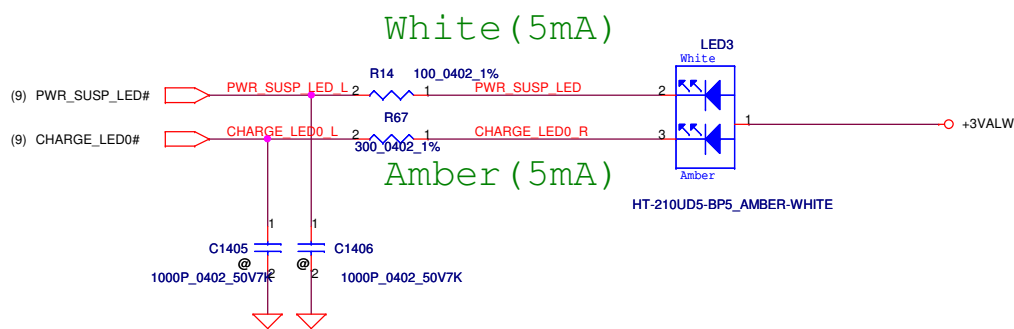
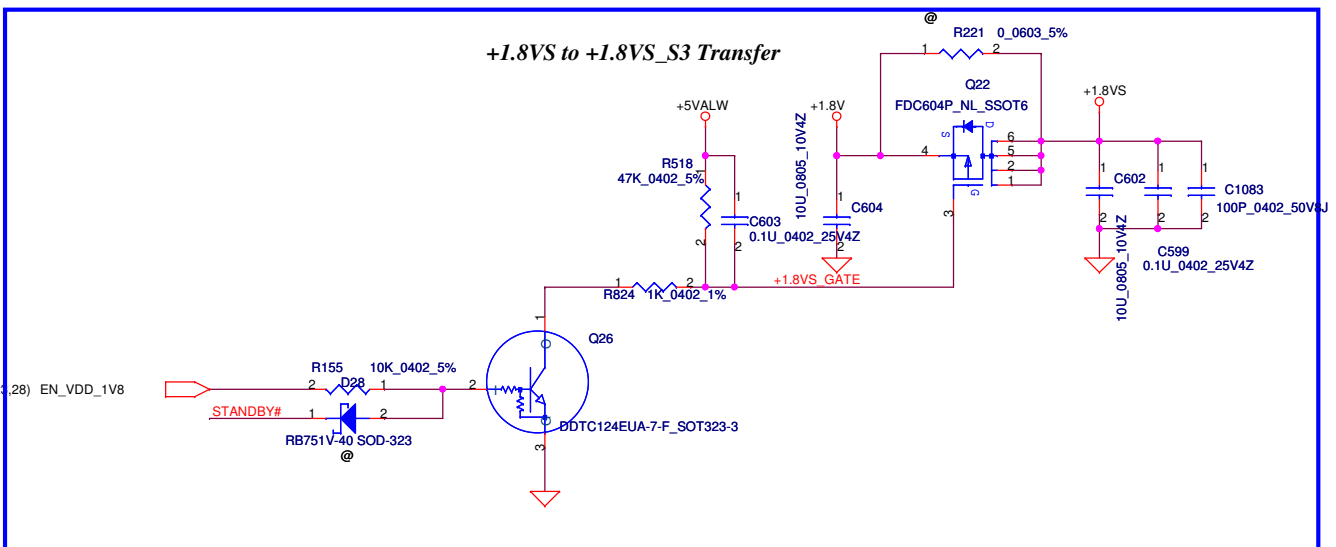
Power Button



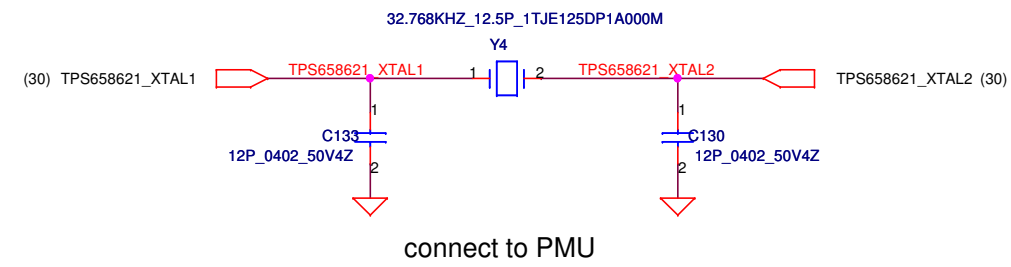
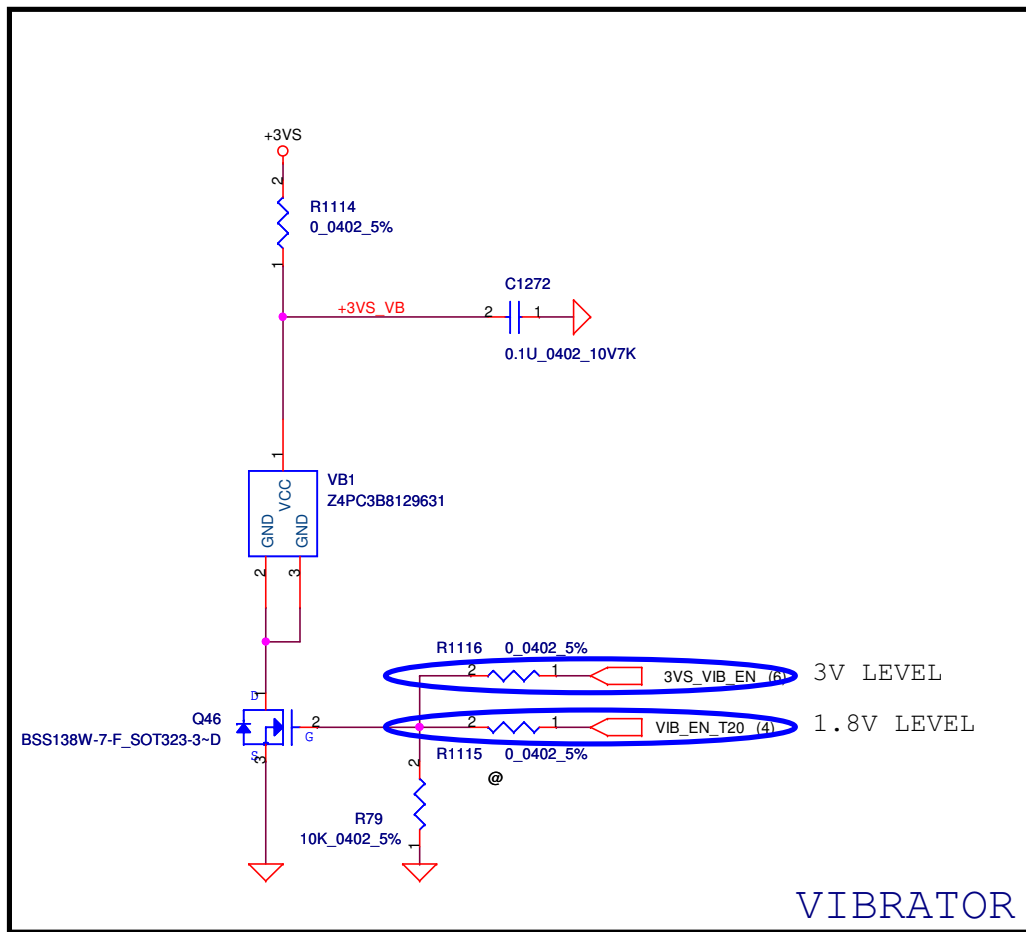
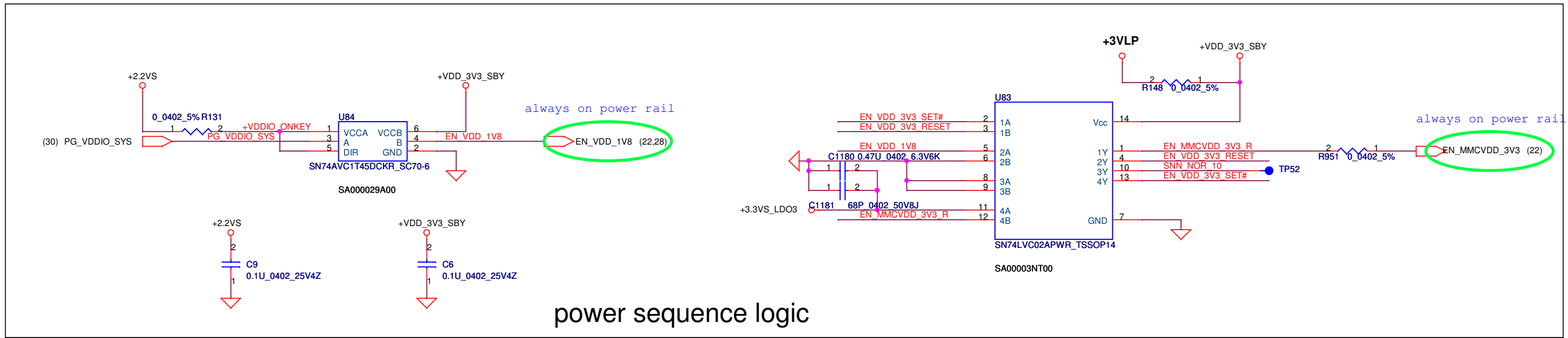
+3VALW to +3VS Transfer



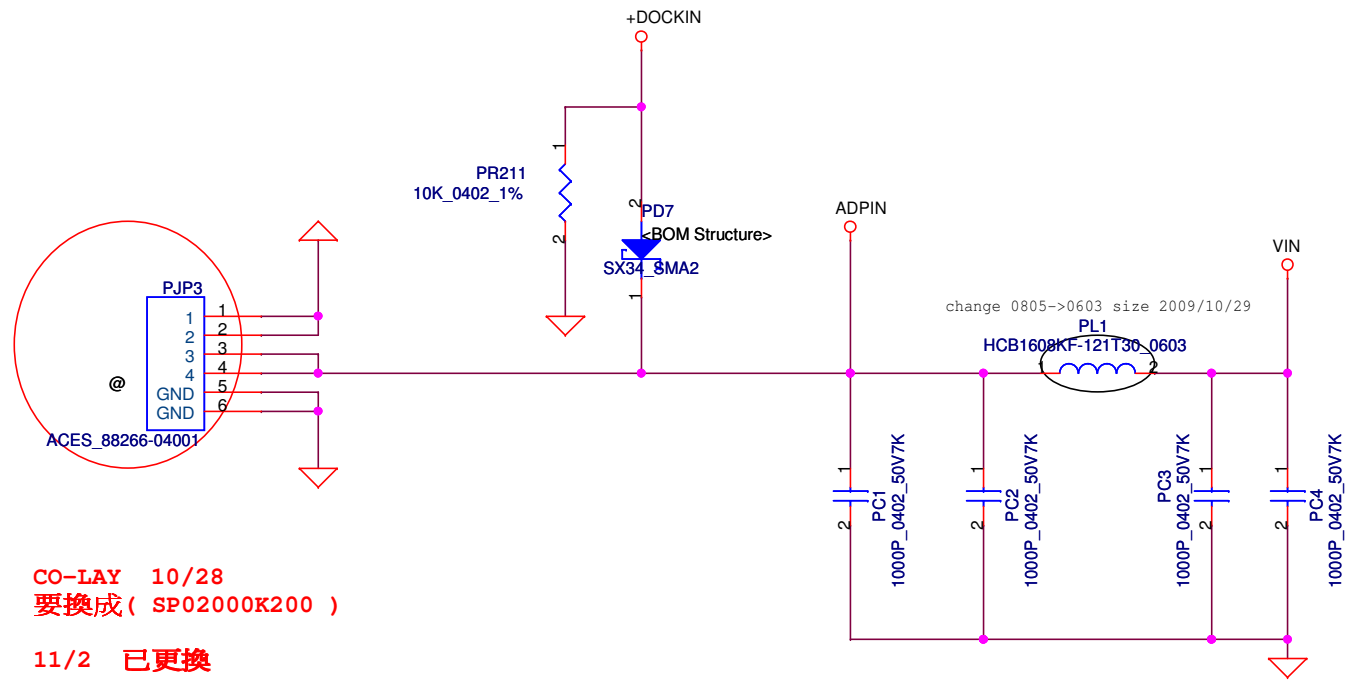
+1.8VS to +1.8VS_S3 Transfer



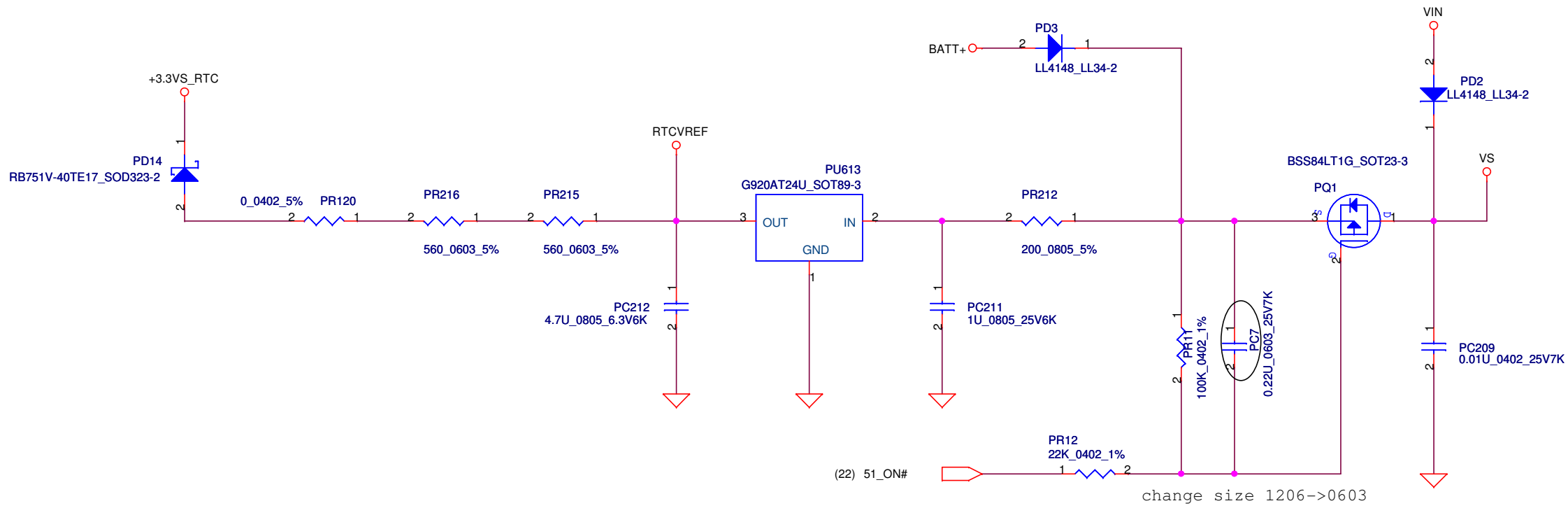
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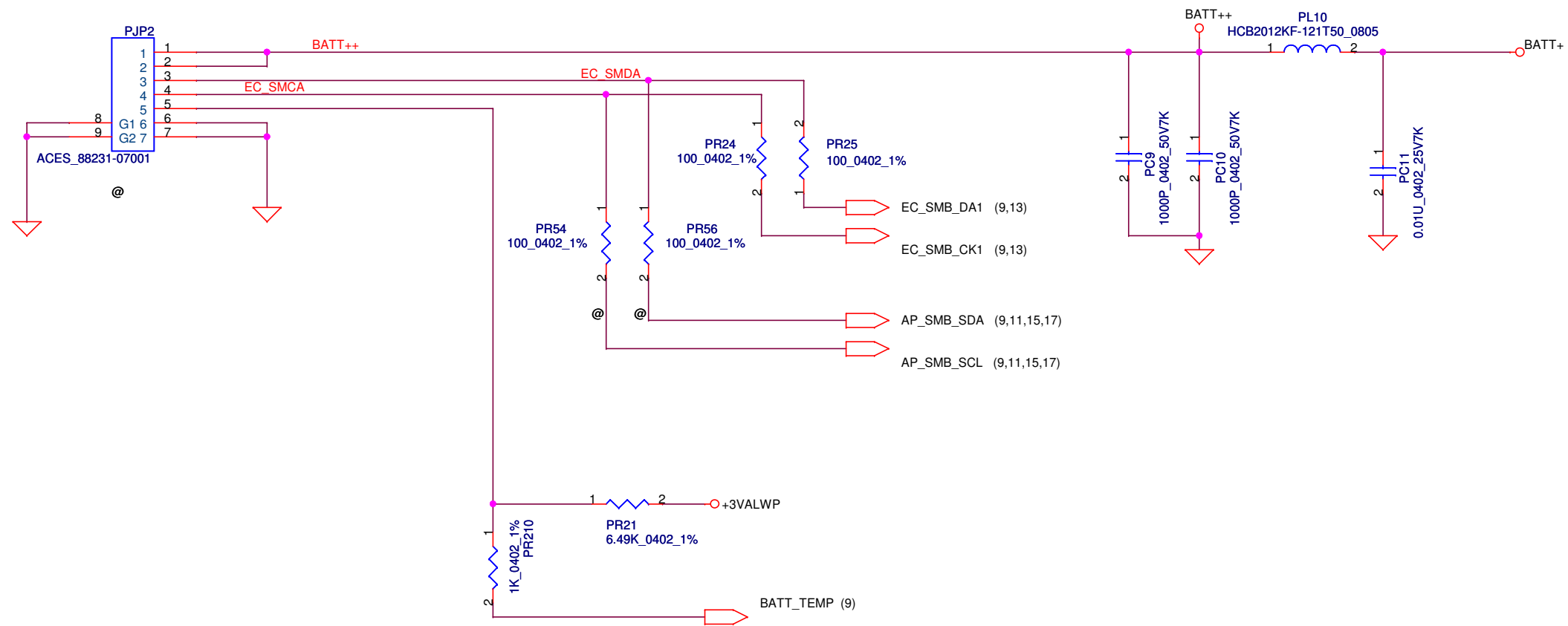
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				Size Custom
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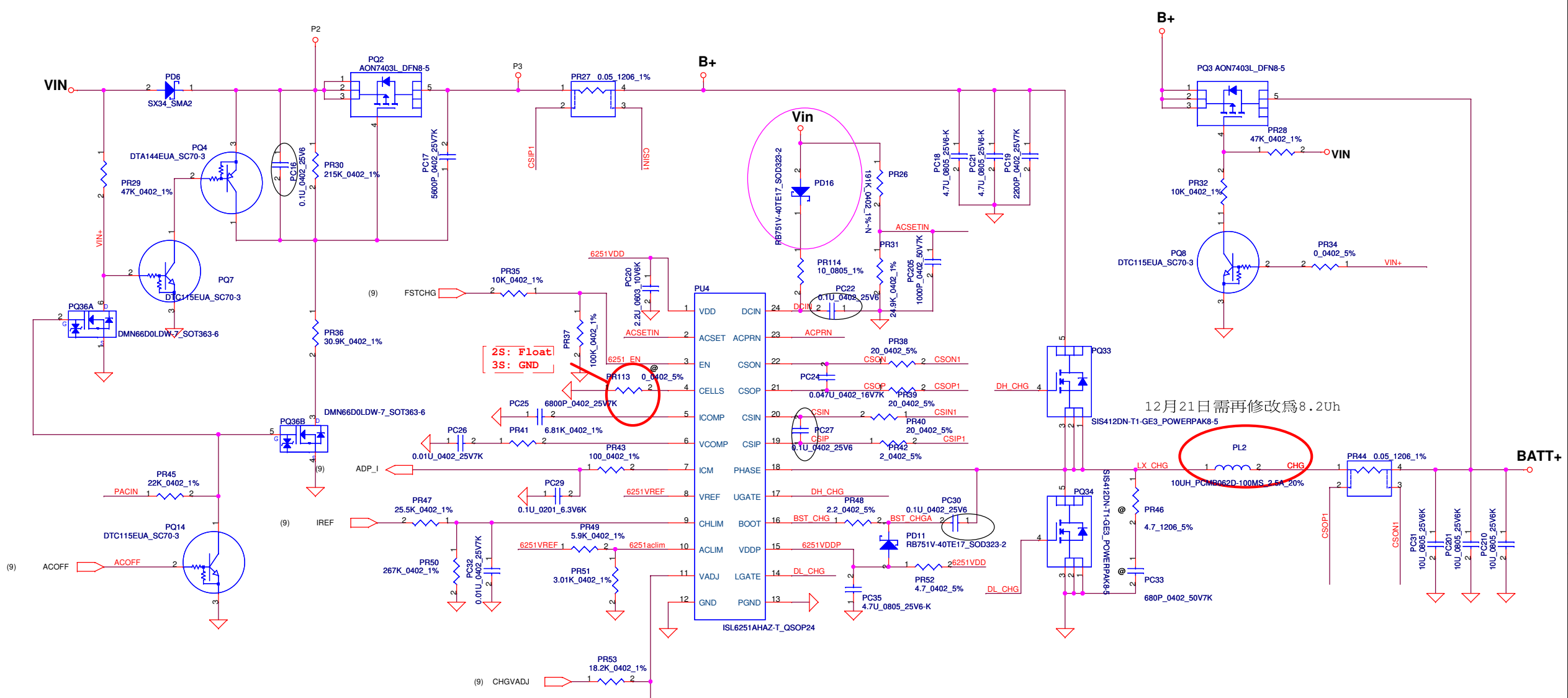
CO-LAY 10/28
 要換成(SP02000K200)
 11/2 已更換



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				Size Custom
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12月21日需再修改為8.2Uh

I_{ada}=0~1.5A (18W) , CP --> 15.3W

CP mode
 $V_{aclim} = 2.39 * (20K / 152K) / (24.9K / 152K + 20K / 152K) = 1.0812V$
 $I_{input} = (1/0.05) * ((0.05 * V_{aclim}) / 2.39 + 0.05) = 1.4524$

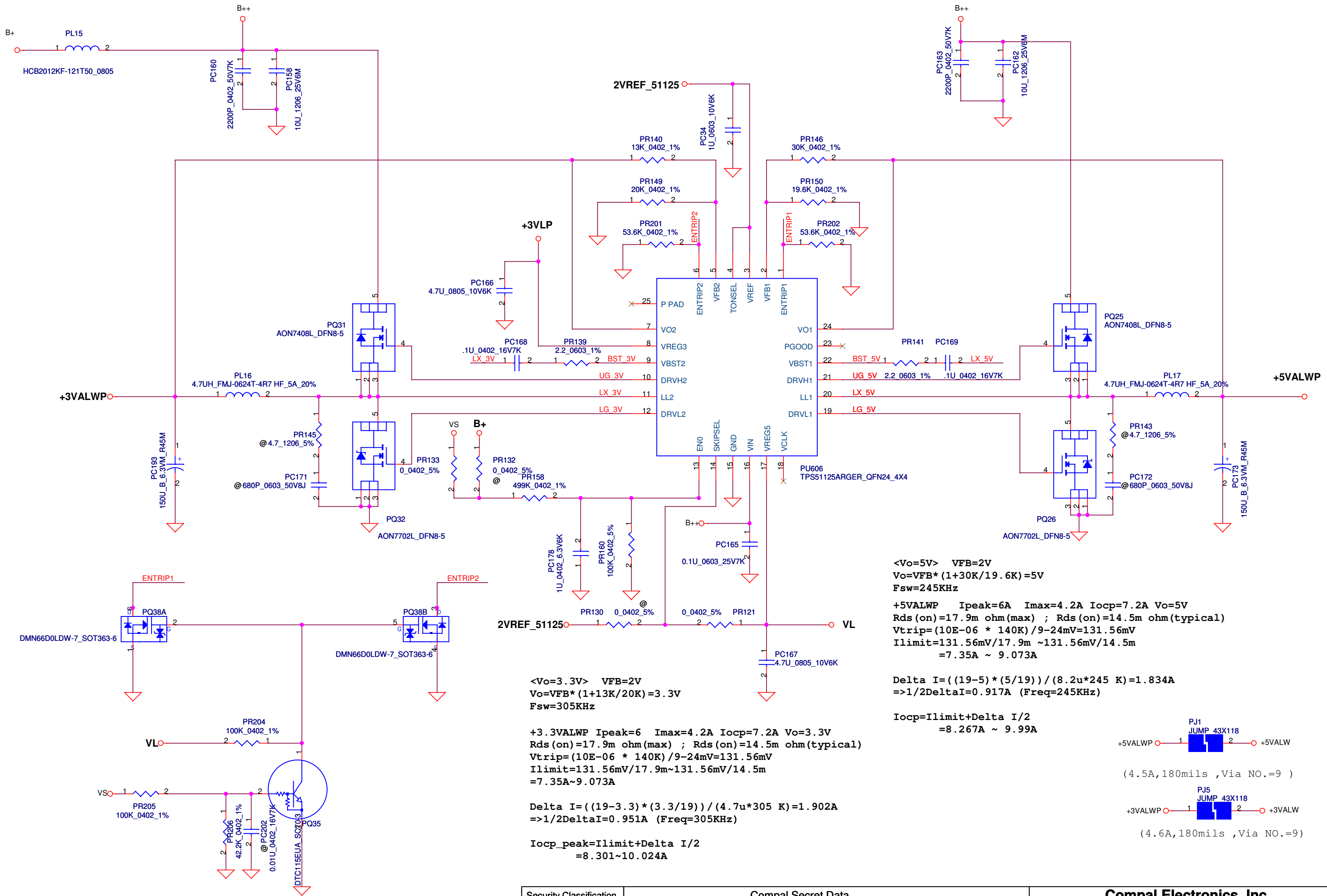
CC=0.25~1.58A
 $I_{charge} = 0.165 / 0.05 * V_{chlim} / 3.3$
 $I_{REF} = 1.57 * I_{charge}$
 $I_{REF} = 0.7856V \sim 3.3V$
 $3.3V \implies 2.1A$

CHGVADJ	Per Cell
H	4.35V
L	3.99V

CHGVADJ	CV mode
0V	4V
1.885V	4.2V
3.3V	4.35V

BATT Type	Charging Voltage (0x15)	CV mode
Normal 2S LI-ON Cells	8400mV	8.4V

Vin Detector
High 11.358V
Low 11.003V



<Vo=5V> VFB=2V
 $V_o = VFB * (1 + 30K / 19.6K) = 5V$
 $F_{sw} = 245KHz$

+5VALWP Ipeak=6A Imax=4.2A Iocp=7.2A Vo=5V
 $R_{ds(on)} = 17.9m\ \Omega(max)$; $R_{ds(on)} = 14.5m\ \Omega(typical)$
 $V_{trip} = (10E-06 * 140K) / 9 - 24mV = 131.56mV$
 $I_{limit} = 131.56mV / 17.9m \sim 131.56mV / 14.5m$
 $= 7.35A \sim 9.073A$

$\Delta I = ((19-5) * (5/19)) / (8.2u * 245\ K) = 1.834A$
 $\Rightarrow 1/2 \Delta I = 0.917A$ (Freq=245KHz)

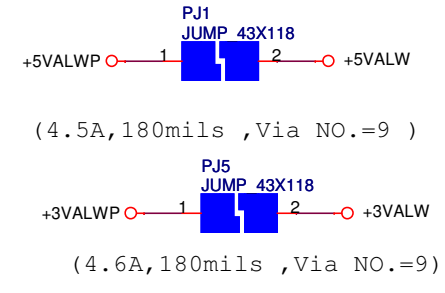
$I_{ocp} = I_{limit} + \Delta I / 2$
 $= 8.267A \sim 9.99A$

<Vo=3.3V> VFB=2V
 $V_o = VFB * (1 + 13K / 20K) = 3.3V$
 $F_{sw} = 305KHz$

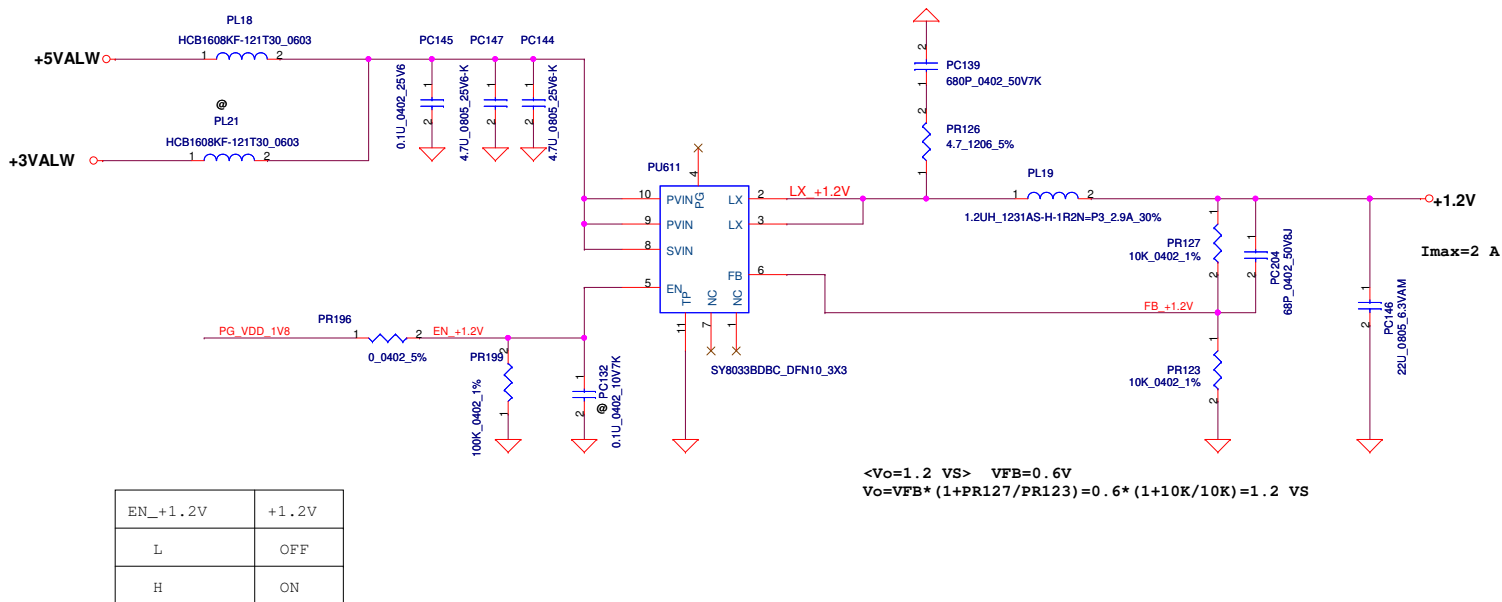
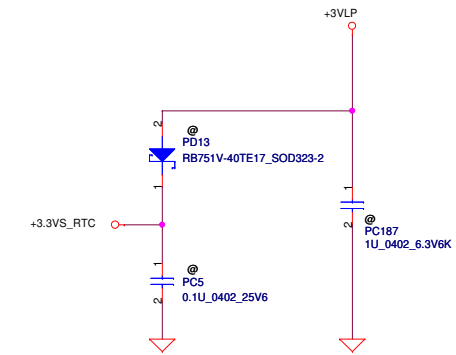
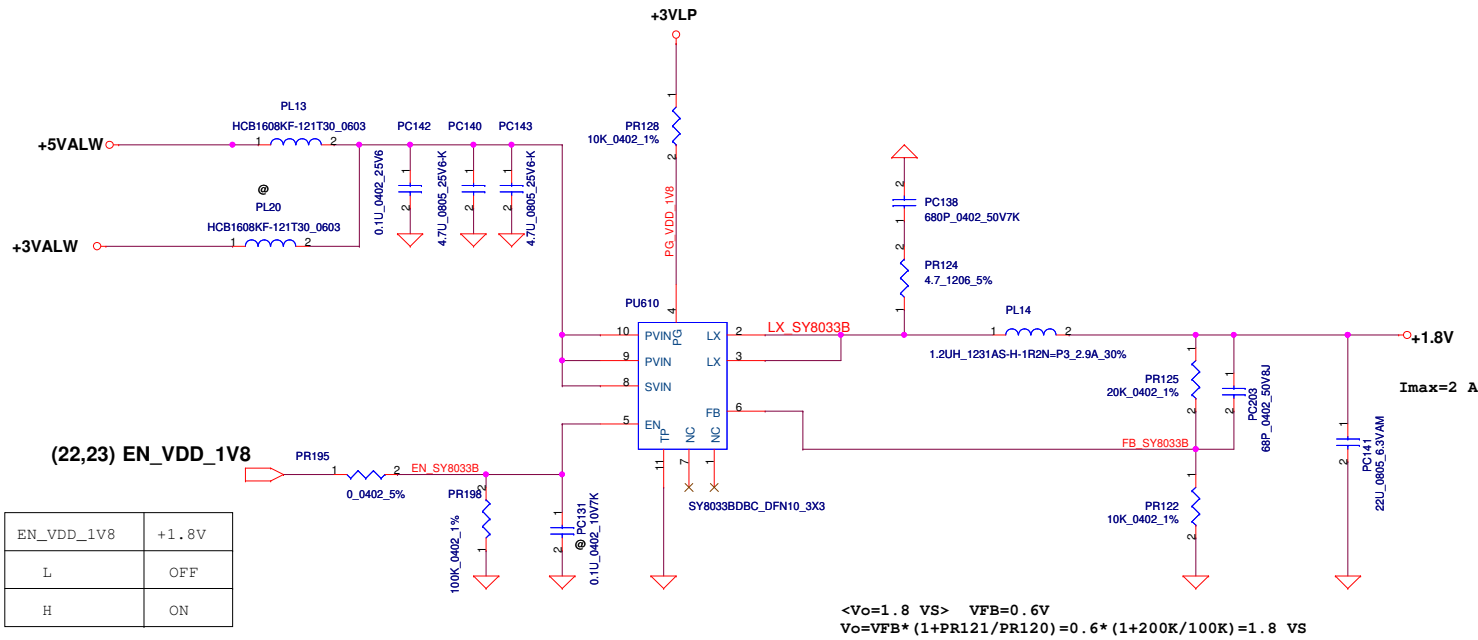
+3.3VALWP Ipeak=6 Imax=4.2A Iocp=7.2A Vo=3.3V
 $R_{ds(on)} = 17.9m\ \Omega(max)$; $R_{ds(on)} = 14.5m\ \Omega(typical)$
 $V_{trip} = (10E-06 * 140K) / 9 - 24mV = 131.56mV$
 $I_{limit} = 131.56mV / 17.9m \sim 131.56mV / 14.5m$
 $= 7.35A \sim 9.073A$

$\Delta I = ((19-3.3) * (3.3/19)) / (4.7u * 305\ K) = 1.902A$
 $\Rightarrow 1/2 \Delta I = 0.951A$ (Freq=305KHz)

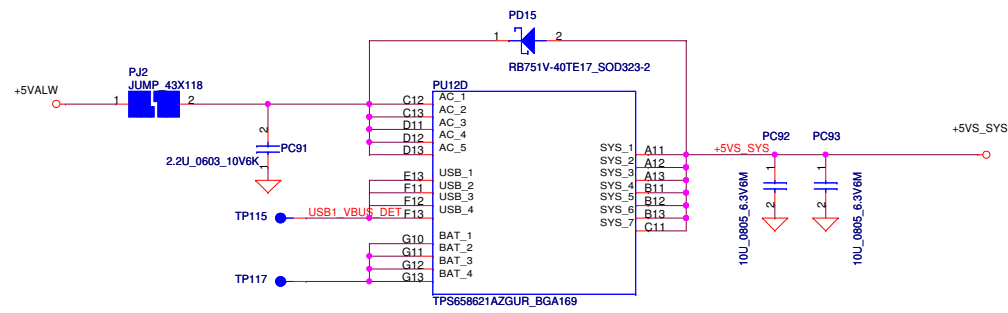
$I_{ocp_peak} = I_{limit} + \Delta I / 2$
 $= 8.301 \sim 10.024A$



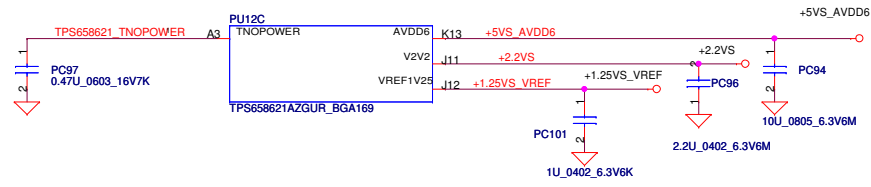
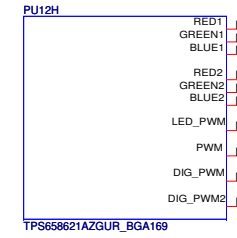
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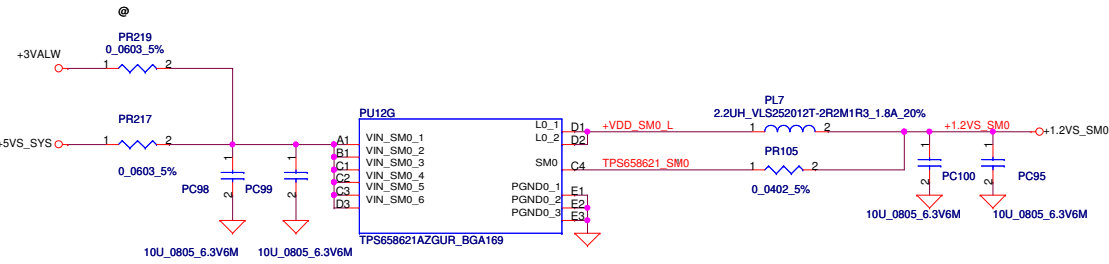
+VDD_SYS=5V
MAX current=1A



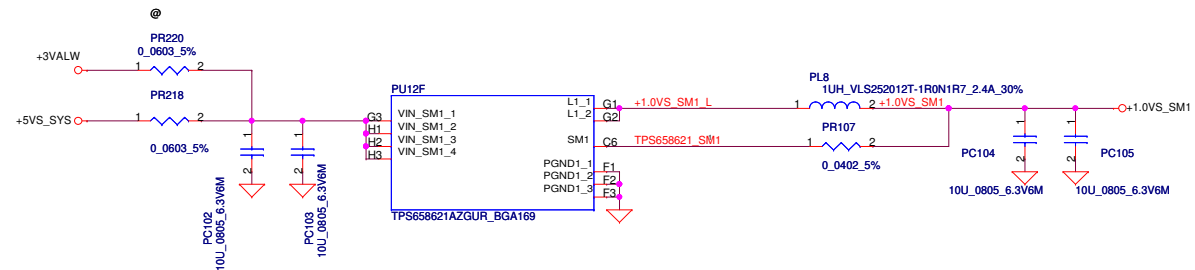
+VDD_AVDD6 =5V
MAX current=0.01A

+VDD_V2V2 =2.2V
MAX current=0.025A

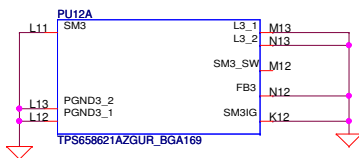
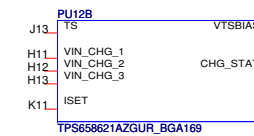
+VDD_VREF1V25 =1.25V
MAX current=0.01A



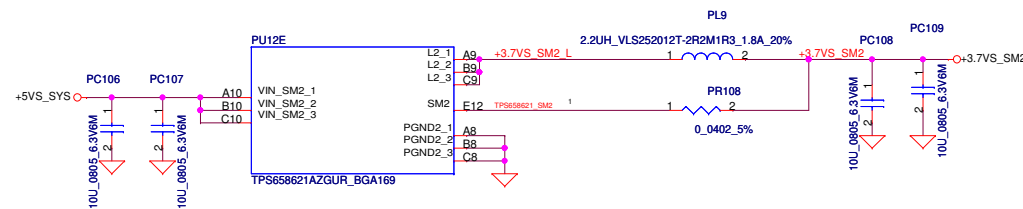
+VDD_SMO=1.2V
MAX current=0.6A



+VDD_SM1=1V
MAX current=1.5A



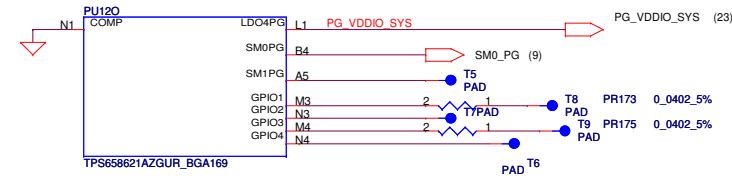
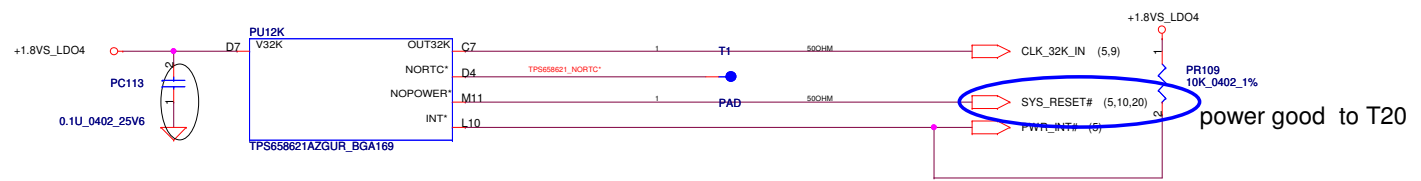
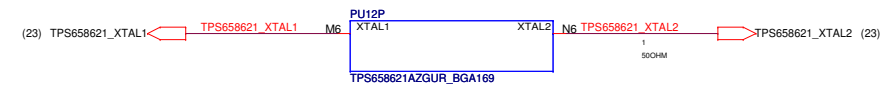
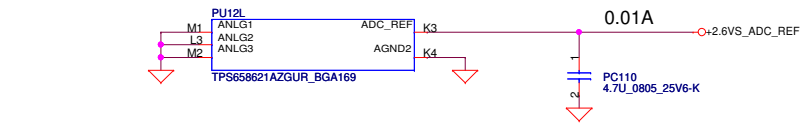
BOOST Converter



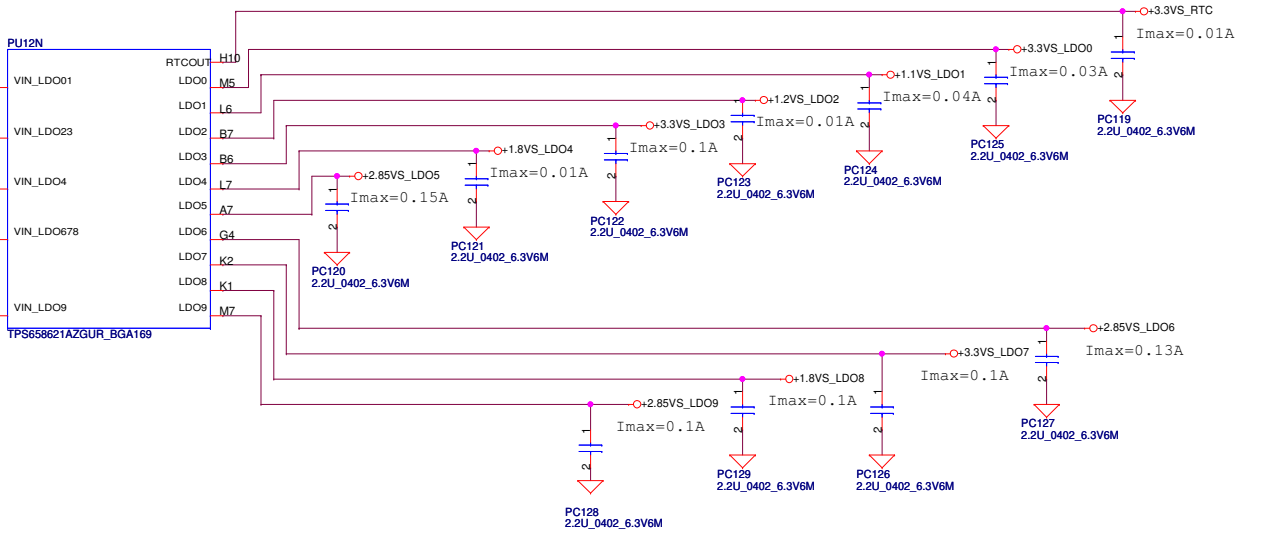
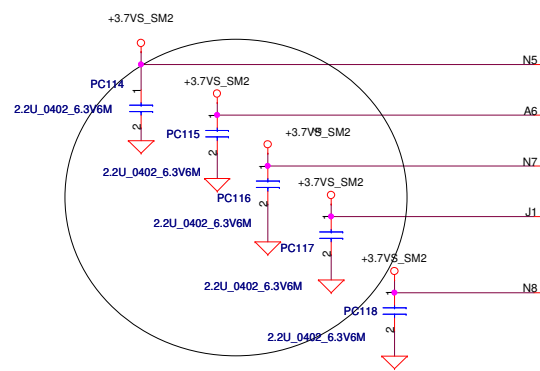
+VDD_SM2=3.7V
MAX current=0.75A

PMU #1

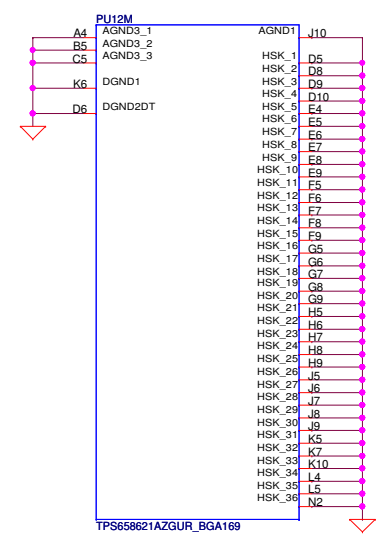
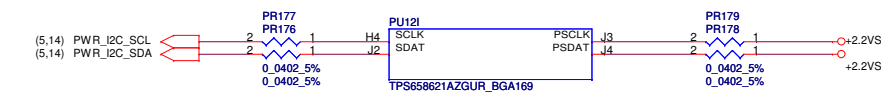
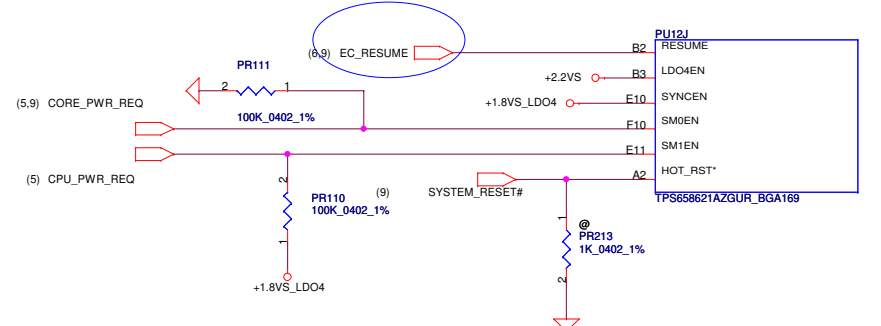
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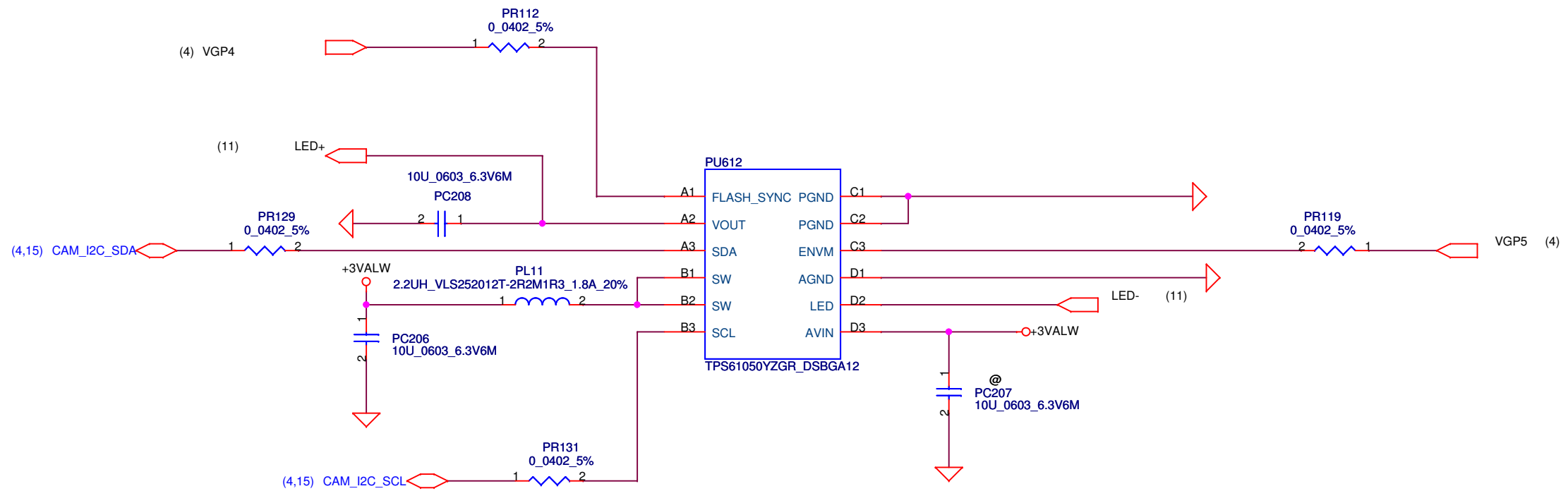


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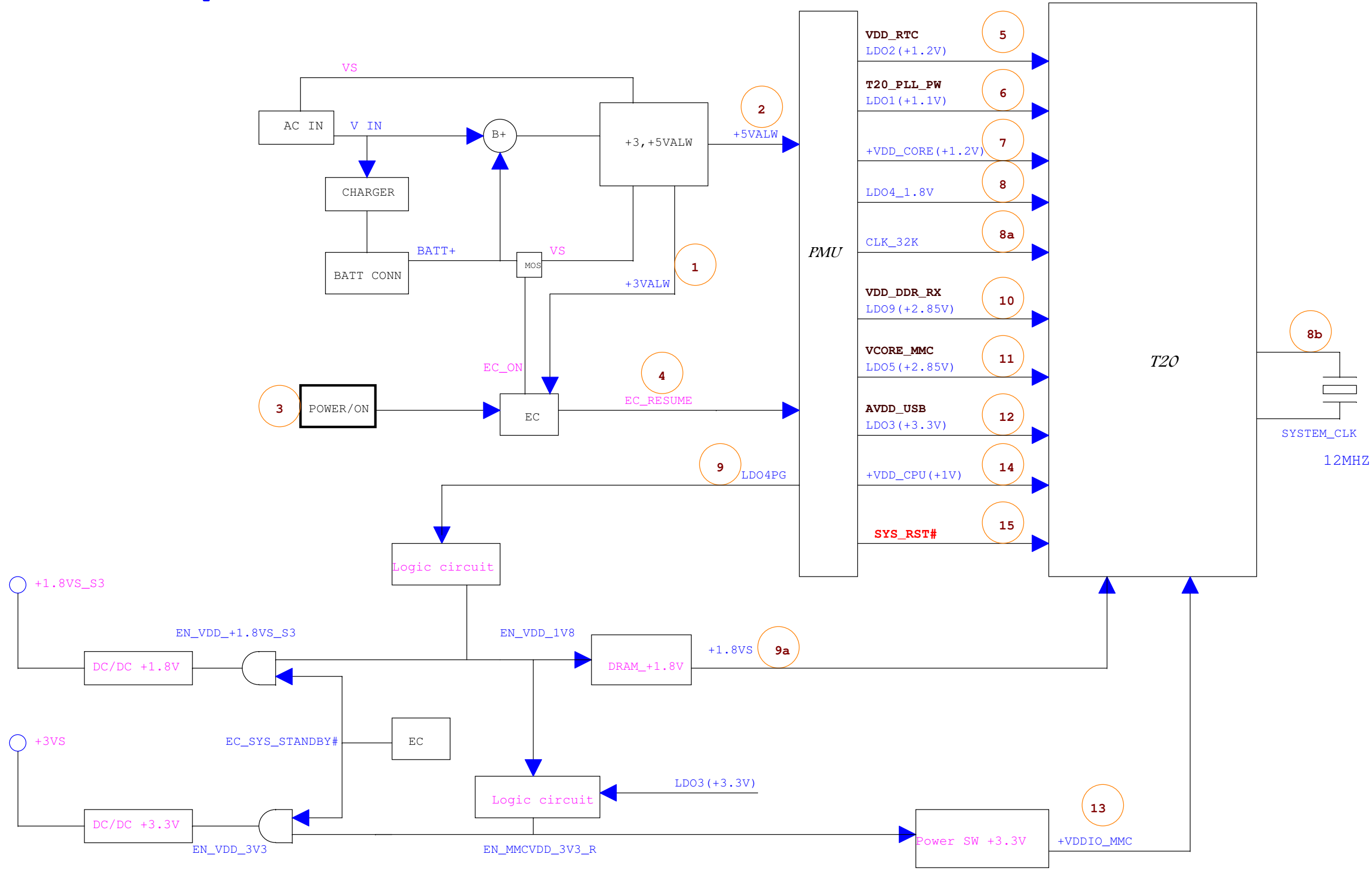
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				Size A3	Document Number	Rev 0.2
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PBJ20 Power Sequence Flow Chart

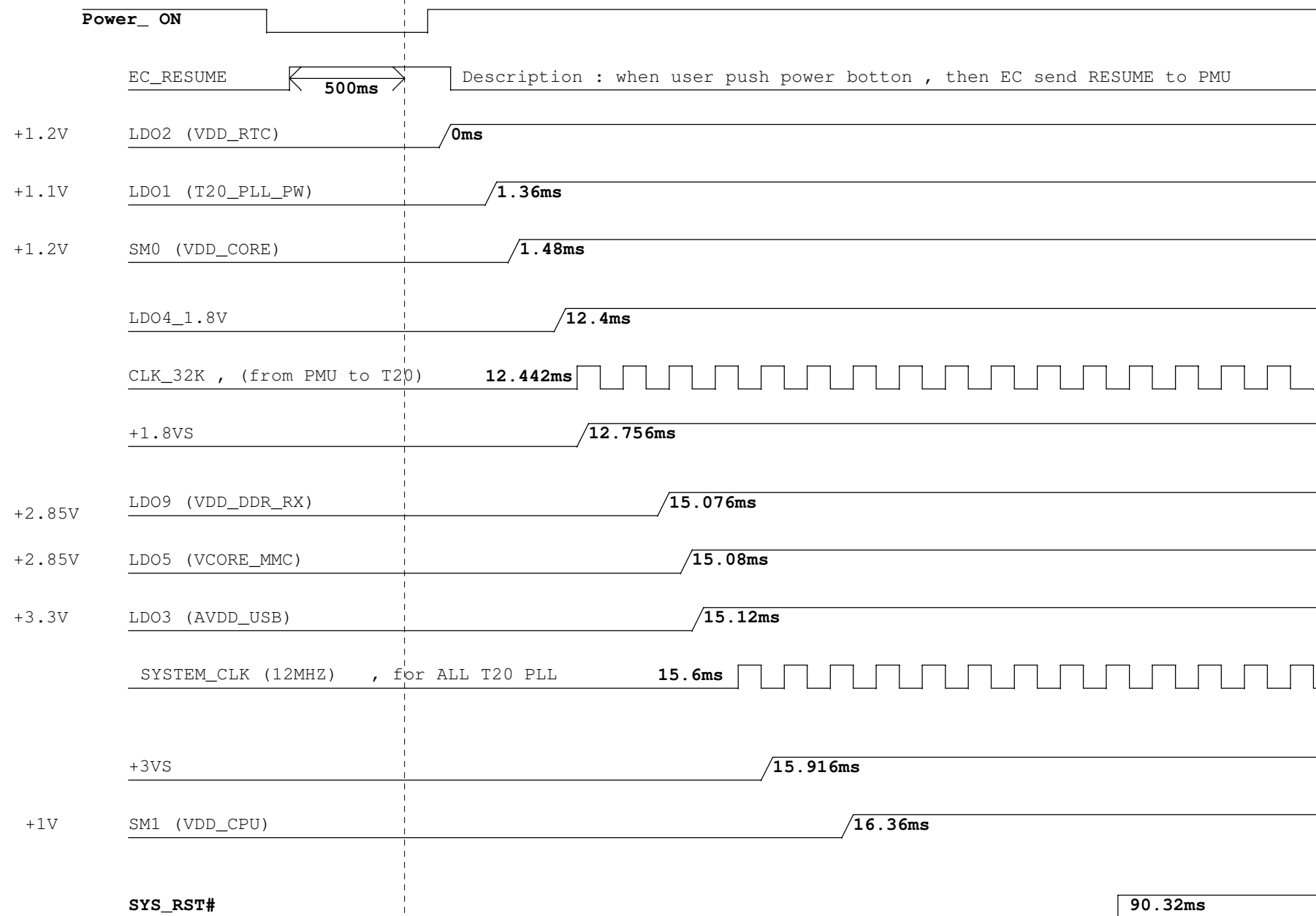


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				Document Number
				Rev
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NV Power Diagram

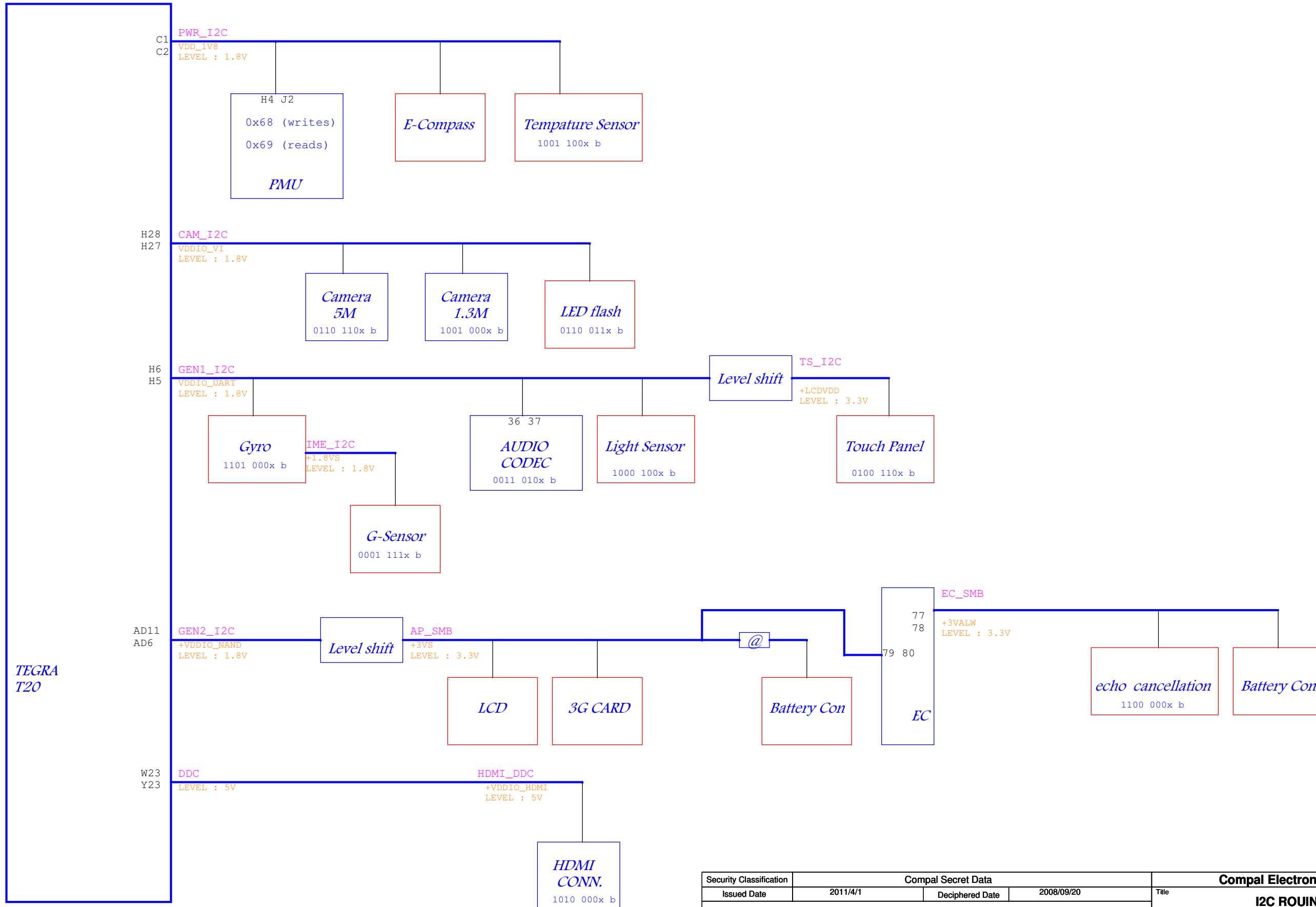
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PBJ20 I2C Routing



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Size	Document Number	Rev		0.1
C	LA-6531P			
Date:	Wednesday, November 17, 2010	Sheet	34	of 36

Version change list (P.I.R. List)

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1							
2							
3							
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5							
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				Size
C	LA-6531P	0.2		
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Version change list (P.I.R. List)

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1		增加控制CAMERA的GPIO	A		add CAM1_PWDN, CAM2_OE, CAM2_RST#, CAM1_RST#	08/29	DVT
2		修改EC firmware pin define	A		add KSI4, KSI5, KSI6, KSI7	08/29	DVT
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				Size Custom	Document Number
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