

Compal confidential

KSRAA LA-4471P Schematics Document Mobile Penryn uFCPGA with Cantiga + ICH9M core logic

2008-06-12

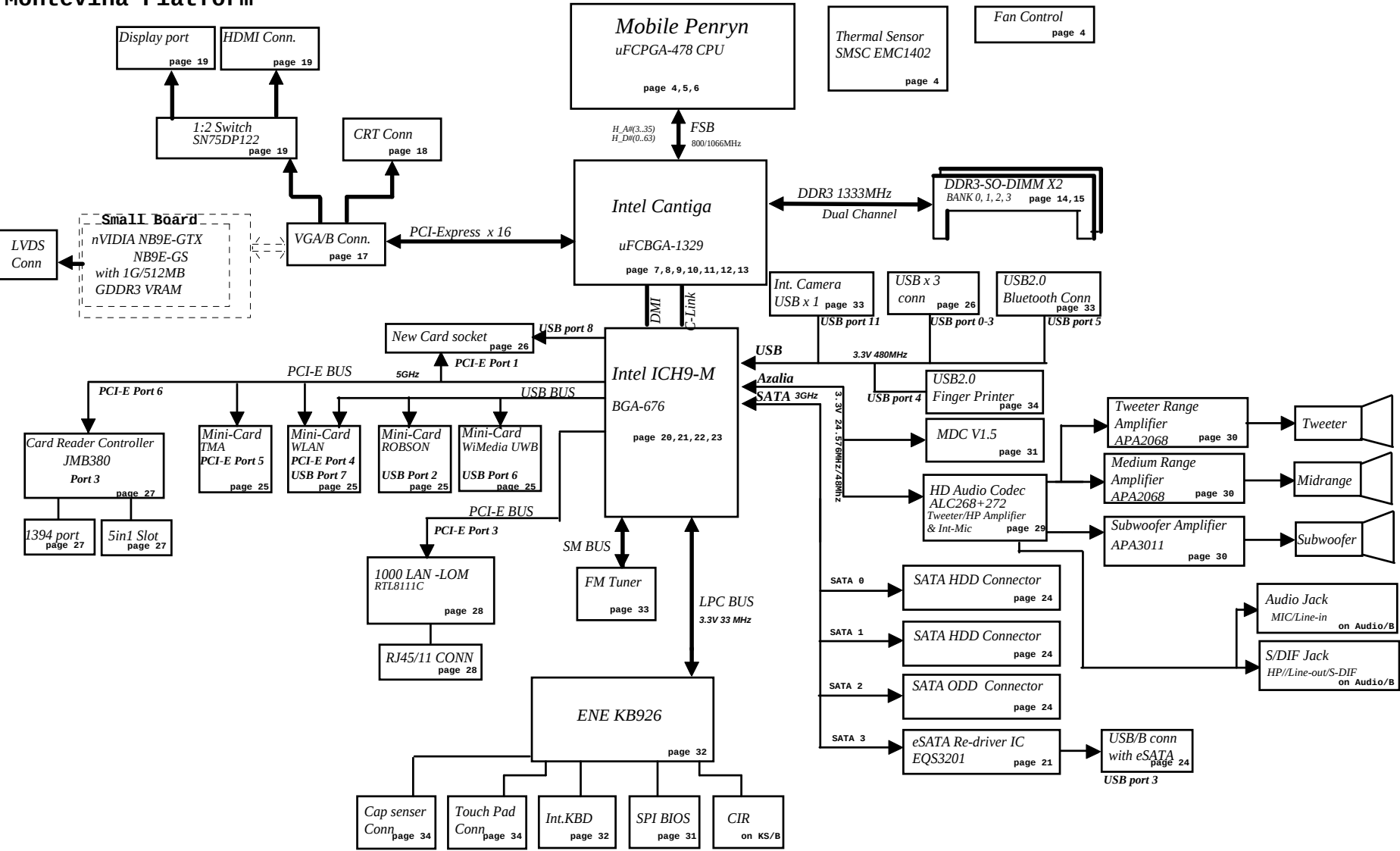
REV:1.0

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Model : KSRAA
File Name : LA-4471P

Montevina Platform



KSRAA Sub-board
VGA/B LS-4471P NB9E-GTX LS-4302P NB9E-GS
Power/B 1 Button+2LED LS-4305P
KS/B KS+CIR+LogoLED LS-4306P
FP/B LS-4307P
LED/B 8 LED+Lid LS-430BP
Cap Sense/B 9 BOT+LED LS-430CP
Audio/B MIC+S/DIF+VR LS-430DP
TP_LED/B 5 LED for TP COVER LS-430EP
FM Tuner/B FM Tuner+wirless con LS-430EP
RTC BAT. page 38
Power On/Off CKT. page 35
DC/DC Interface CKT. page 37, 38
Charger Page 40
Power Circuit DC/DC Page 38-45

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Voltage Rails

Power Plane	Description	S1	S3	S5	G3
VIN	Adapter power supply (19V)	ON	ON	ON	OFF
B+	AC or battery power rail for power circuit.	ON	ON	ON	ON
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF	OFF
+0.75VS	0.9V switched power rail for DDR terminator	ON	OFF	OFF	OFF
+1.05VS	1.05V switched power rail	ON	OFF	OFF	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF	OFF
+1.5V	1.5V power rail for DDR	ON	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON	OFF
+3VL	3.3V always on power rail	ON	ON	ON	ON
+3V_SB	3.3V power rail for LAN	ON	ON	OFF	OFF
+3V_LAN	3.3V power rail for LAN	ON	ON	OFF	OFF
+3V_WLAN	3.3V power rail for LAN	ON	ON	OFF	OFF
+3VS	3.3V switched power rail	ON	OFF	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON	OFF
+5VL	5V always on power rail	ON	ON	ON	ON
+5V_SB	5V power rail for SB	ON	ON	OFF	OFF
+5VS	5V switched power rail	ON	OFF	OFF	OFF
+VSB	VSb always on power rail	ON	ON	ON	OFF
+RTCVCC	RTC power	ON	ON	ON	ON

External PCI Devices

Device	IDSEL#	REQ#/GNT#	Interrupts
--------	--------	-----------	------------

EC SM Bus1 address

Power	Device	Address
+5VL	EC KB926 C0	
+5VL	Smart Battery	0001 011x b
+5VL	HDMI-CEC	0011 010x b
+5VL	FUN/B (CAP Sensor)	
+3VS	TMA THM Sen ADI ADM1032	1001 100x b

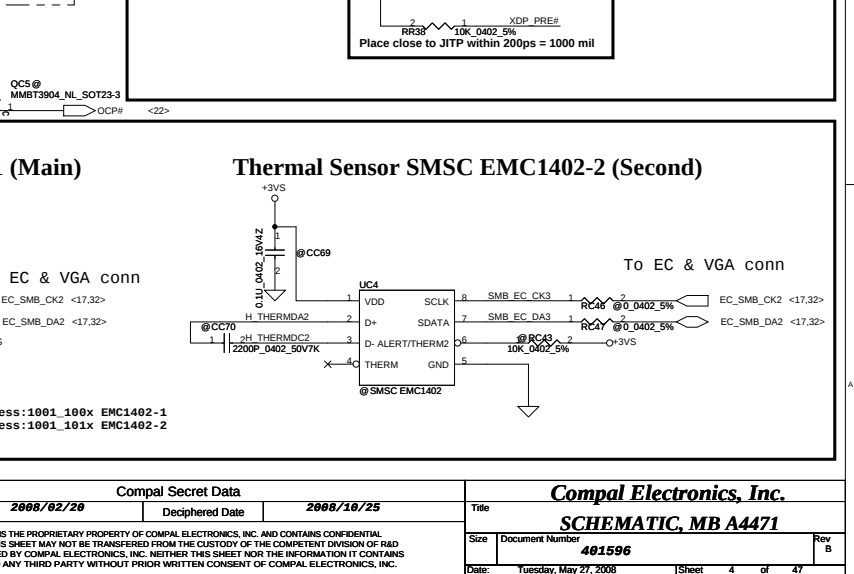
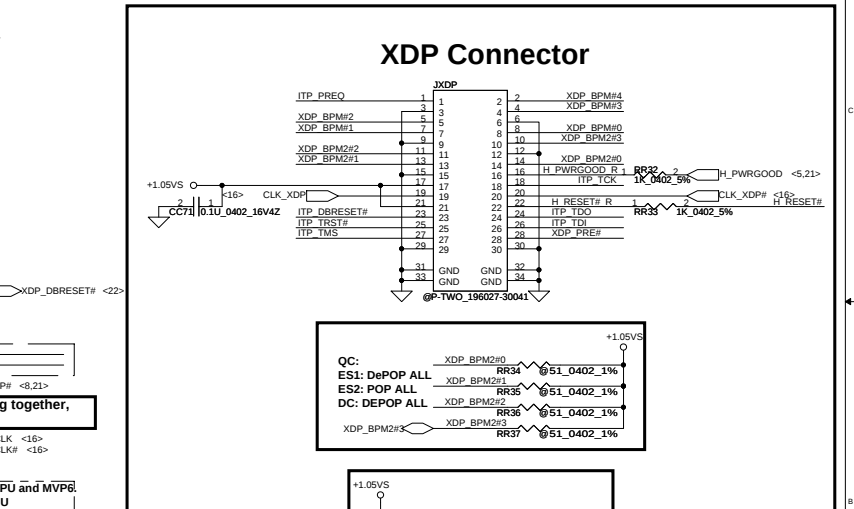
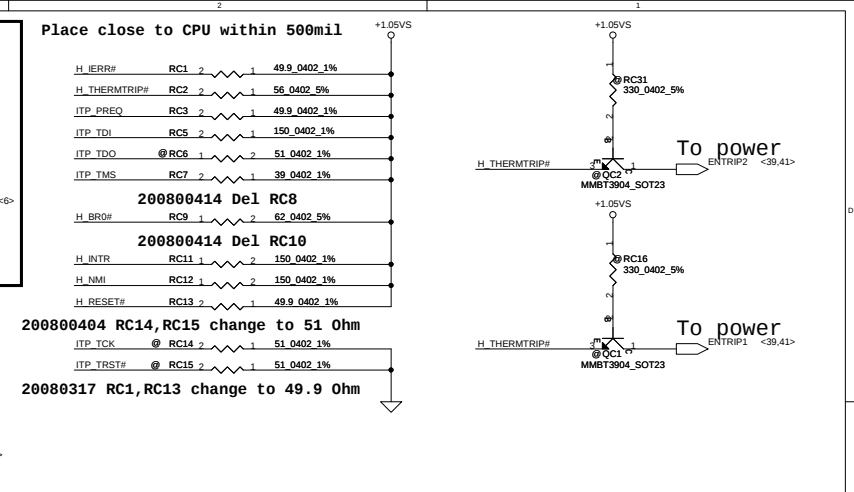
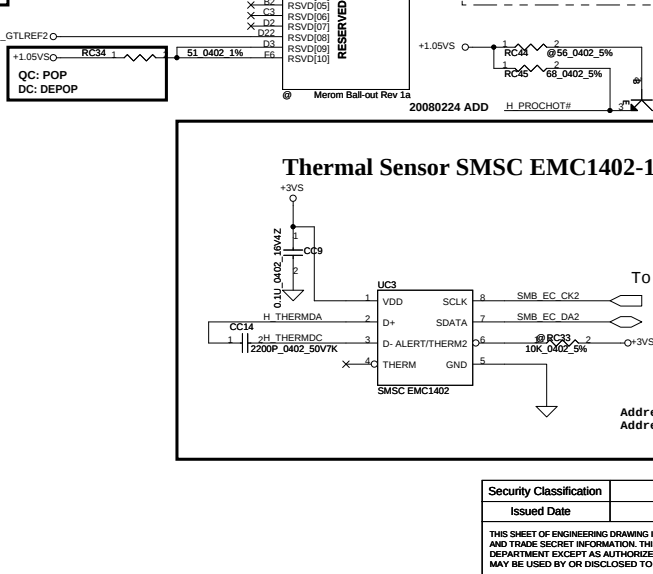
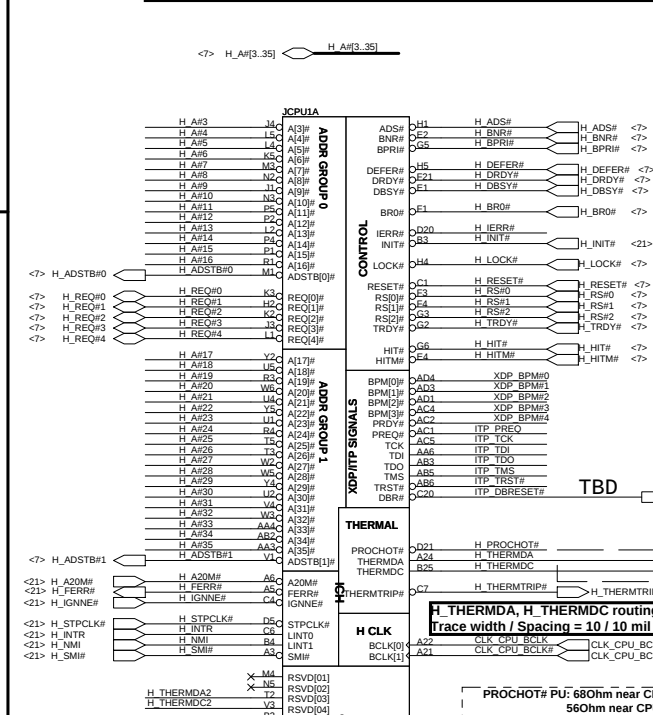
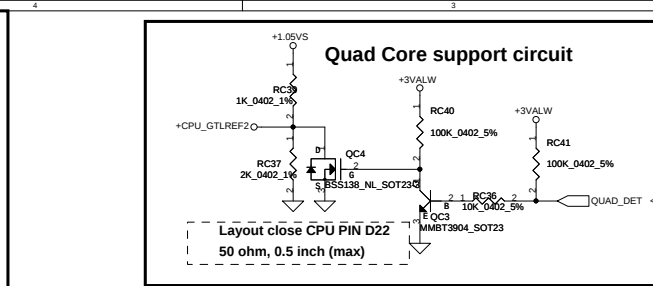
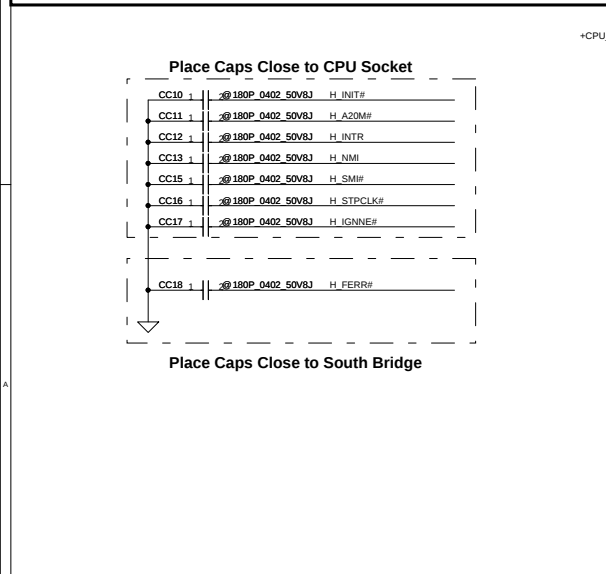
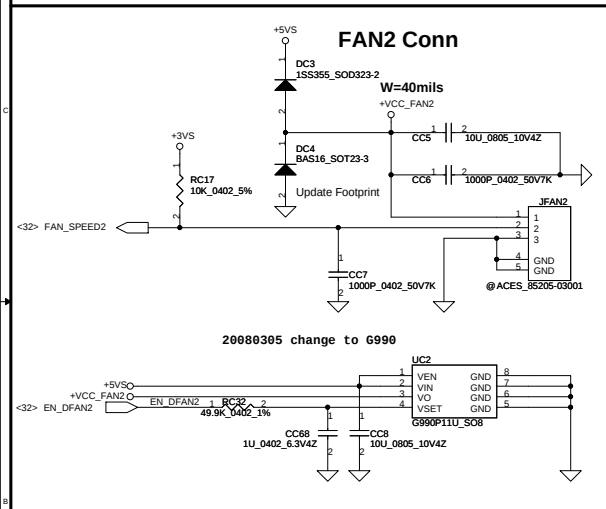
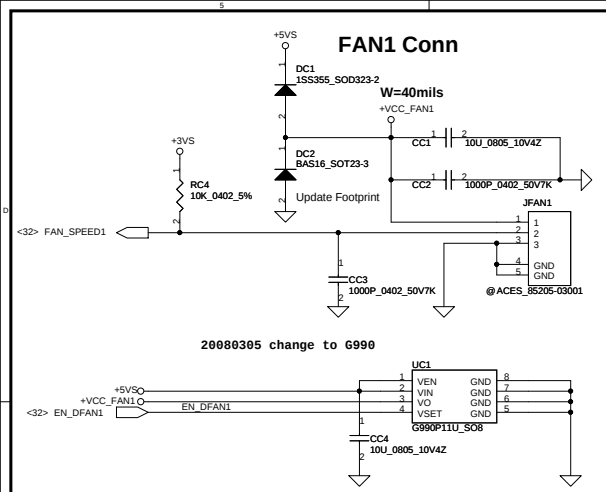
EC SM Bus2 address

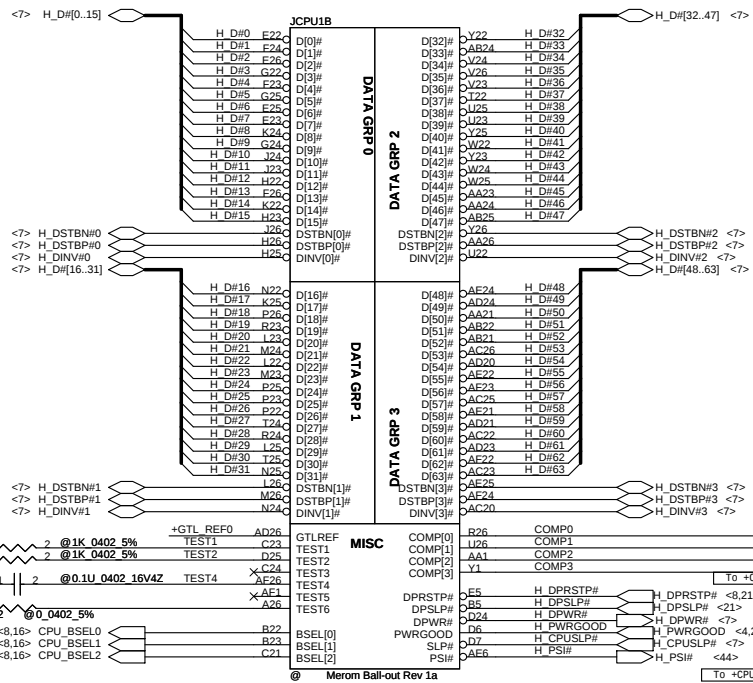
Power	Device	Address
+3VS	EC KB926 C0	
+3VS	CPU THM Sen SMSC EMC1402-1-ACZL-TR	1001 100x b
+3VS	CPU THM Sen SMSC EMC1402-2-ACZL-TR	1001 101x b
+3VS	VGA THM Sen ADI ADM1032	1001 100x b

ICH9M SM Bus address

Power	Device	Address
+3V_SB	ICH9M	
+3VS	Clock Generator (SLG8SP556V)	1101 001xb
+3VS	DDR DIMM0	1001 000xb
+3VS	DDR DIMM1	1001 010xb
+3VS	Express	
+3VS	FM Module	Vertical I2C

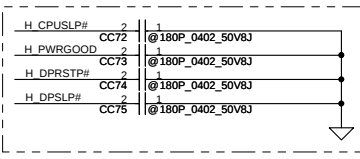
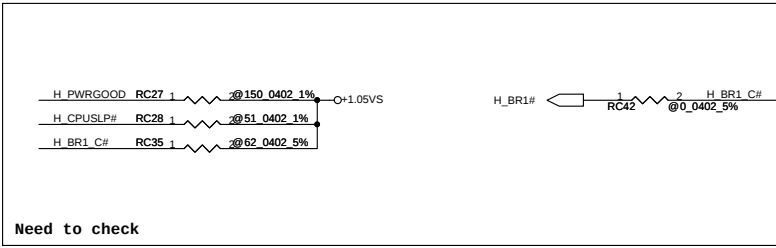
STATE \ SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#		
Full ON	HIGH	HIGH	HIGH	HIGH		
S1(Power On Suspend)	LOW	HIGH	HIGH	HIGH		
S3 (Suspend to RAM)	LOW	LOW	HIGH	HIGH		
S4 (Suspend to Disk)	LOW	LOW	LOW	HIGH		
S5 (Soft OFF)	LOW	LOW	LOW	LOW		
G3	LOW	LOW	LOW	LOW		





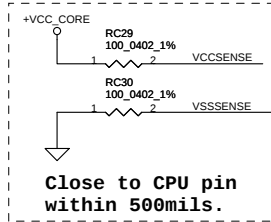
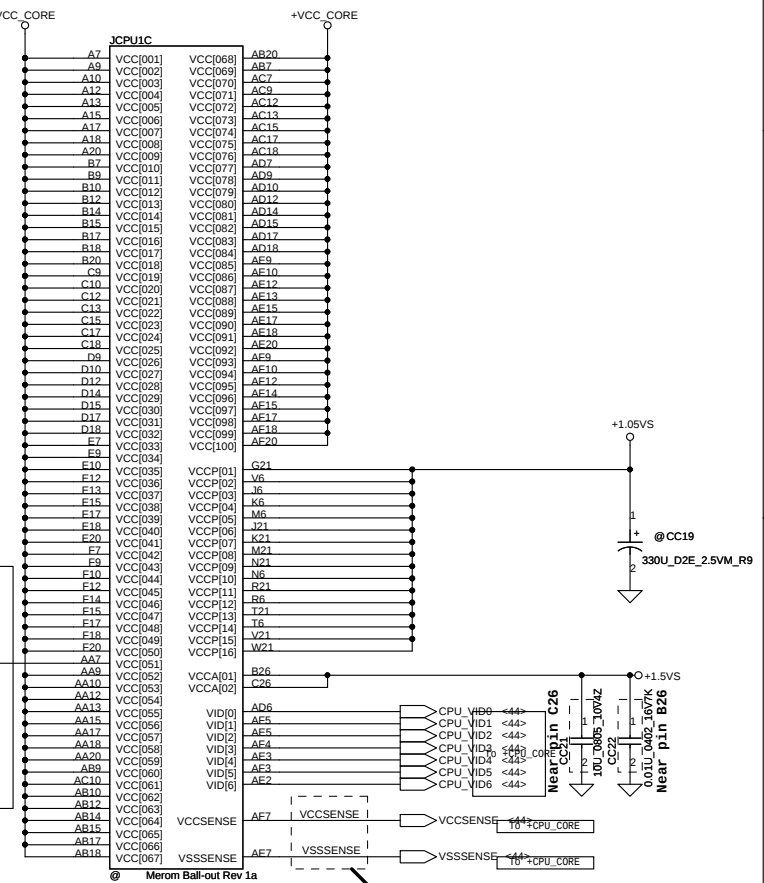
Resistor placed within 0.5" of CPU pin. Trace should be at least 25 mils away from any other toggling signal. COMP[0,2] trace width is 18 mils. COMP[1,3] trace width is 4 mils.

CPU_BSEL	CPU_BSEL2	CPU_BSEL1	CPU_BSEL0
166	0	1	1
200	0	1	0
266	0	0	0

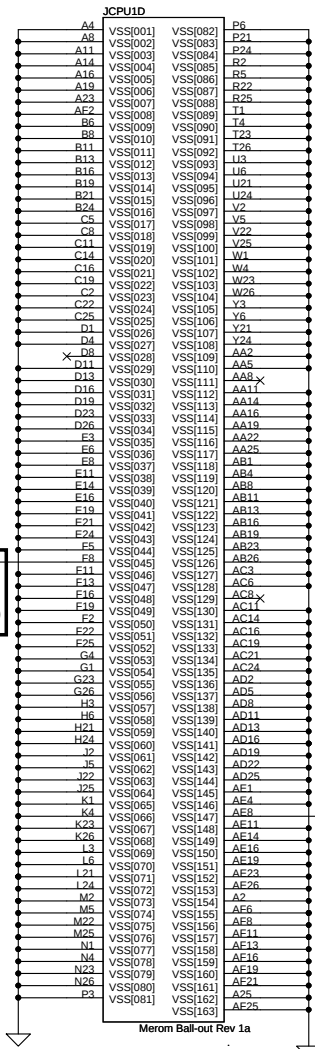


20080317 new add

Reserve for debug close to CPU

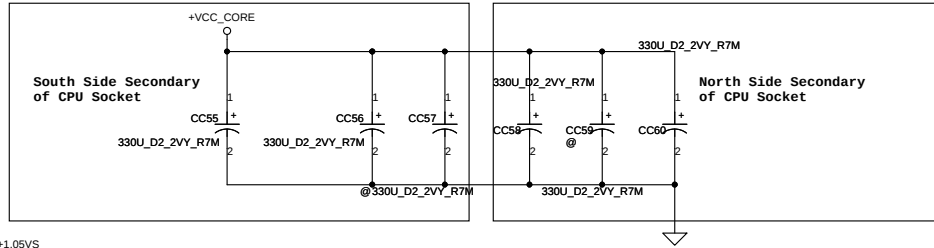
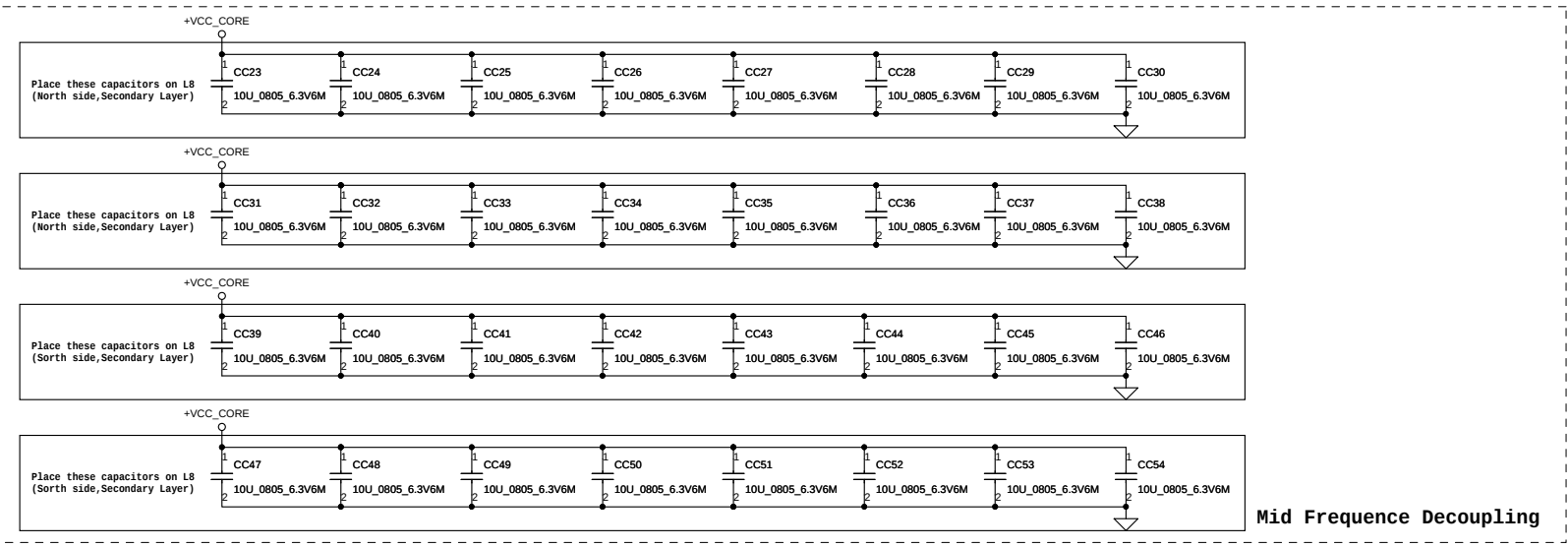


Length match within 25 mils. The trace width/space/other is 20/7/25.



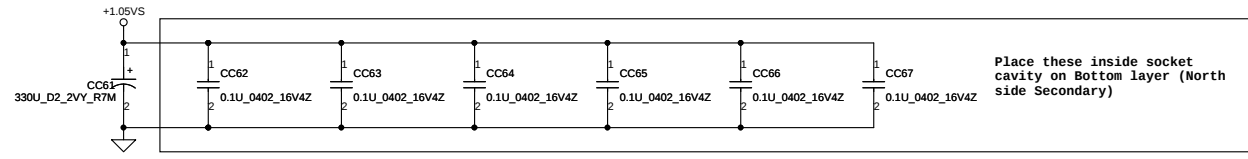
Pin F8
Dual Core: GND (internal)
Quad Core: Floating (internal)

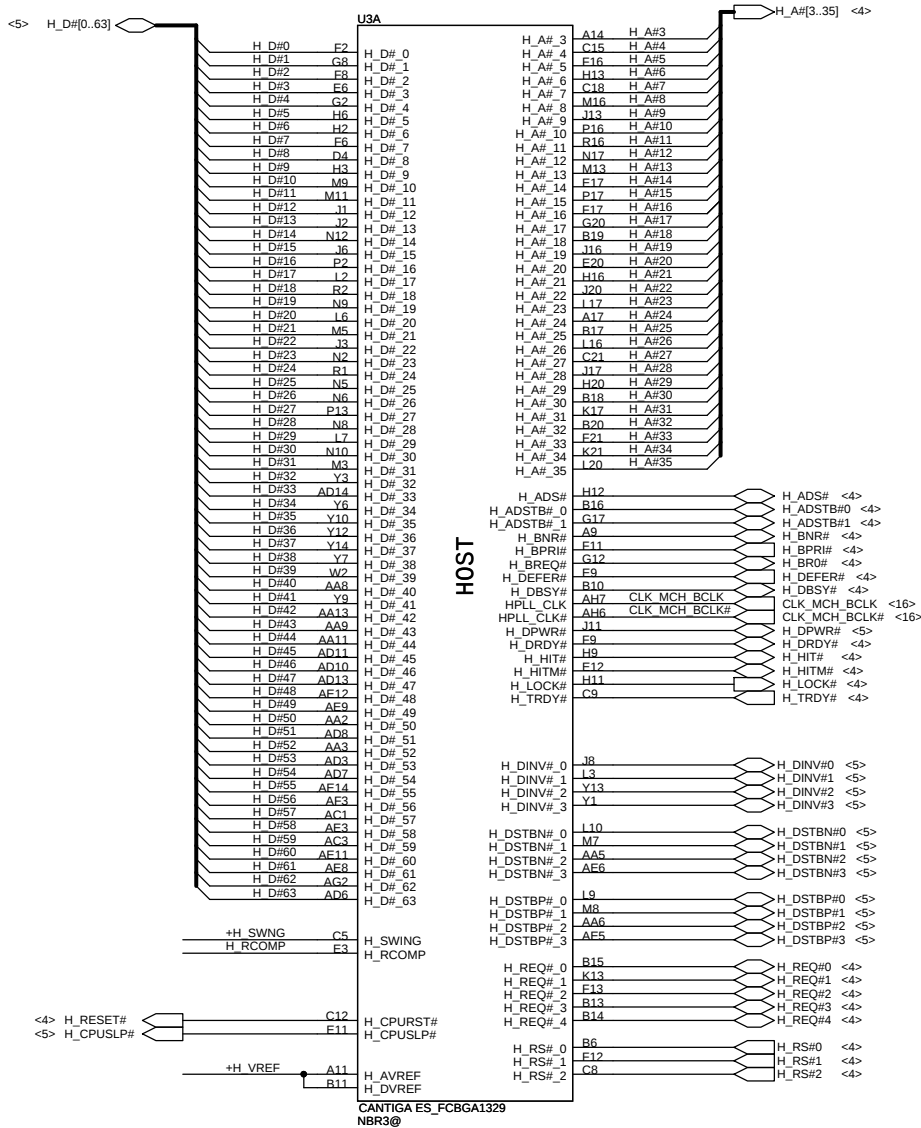
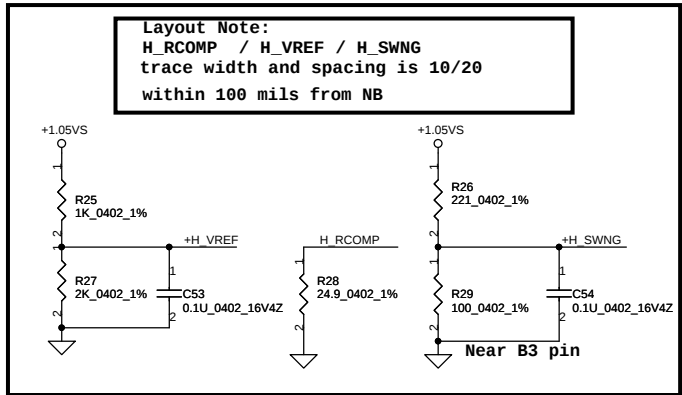
Pin D8,AA8,AC8 and AE8
Reserved for QC



ESR <= 1.5m ohm
Capacitor > 1980uF

330uF ESR 7m ohm X 6 PCS

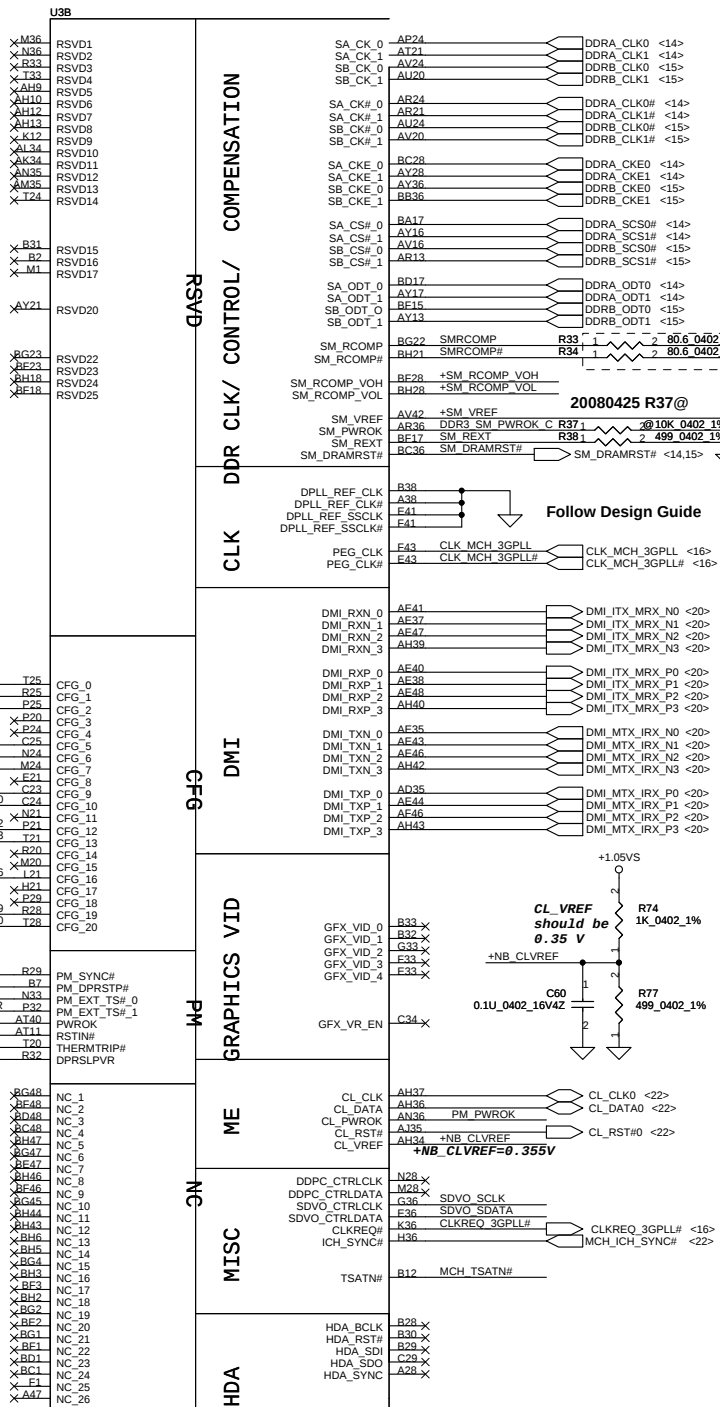
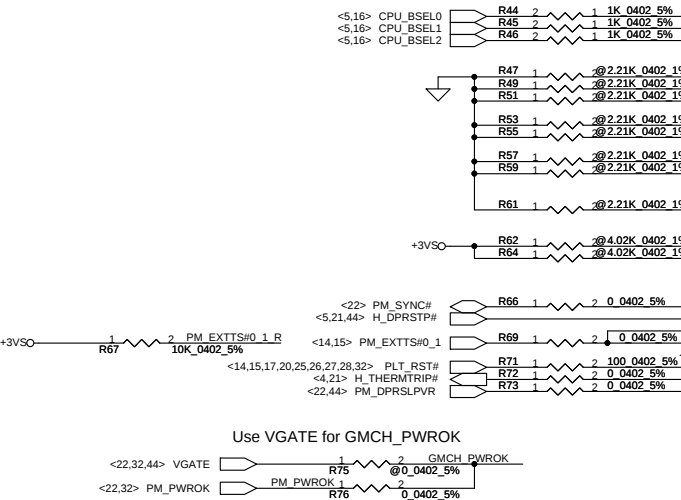


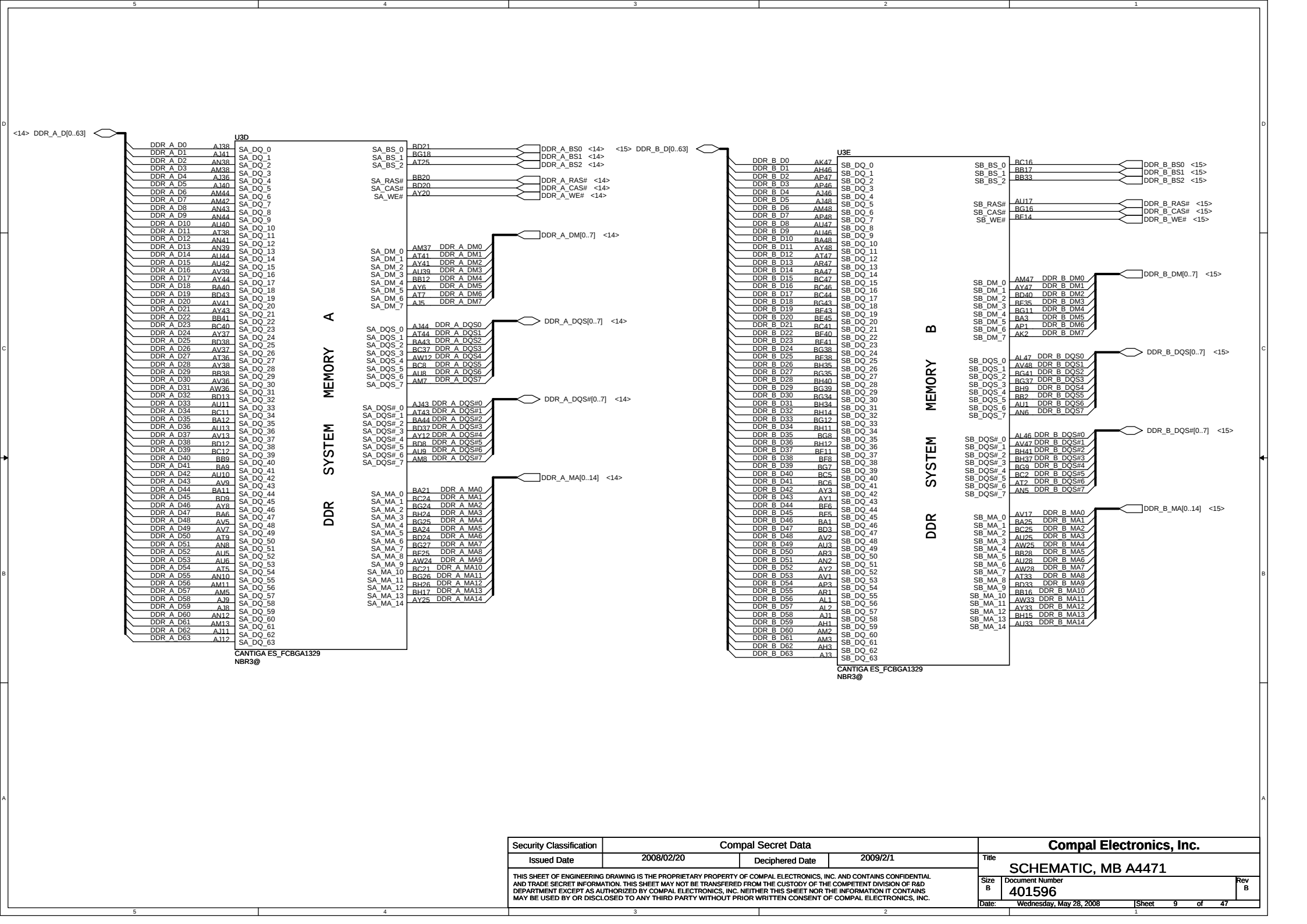


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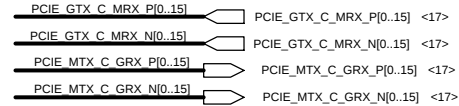
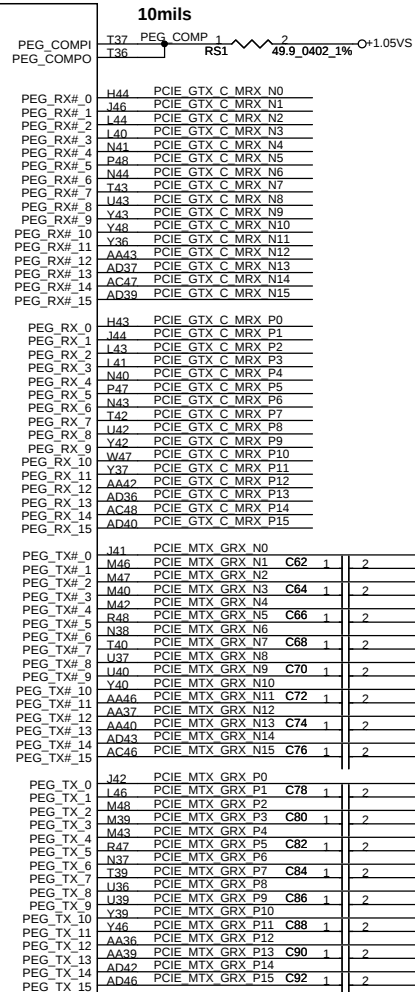
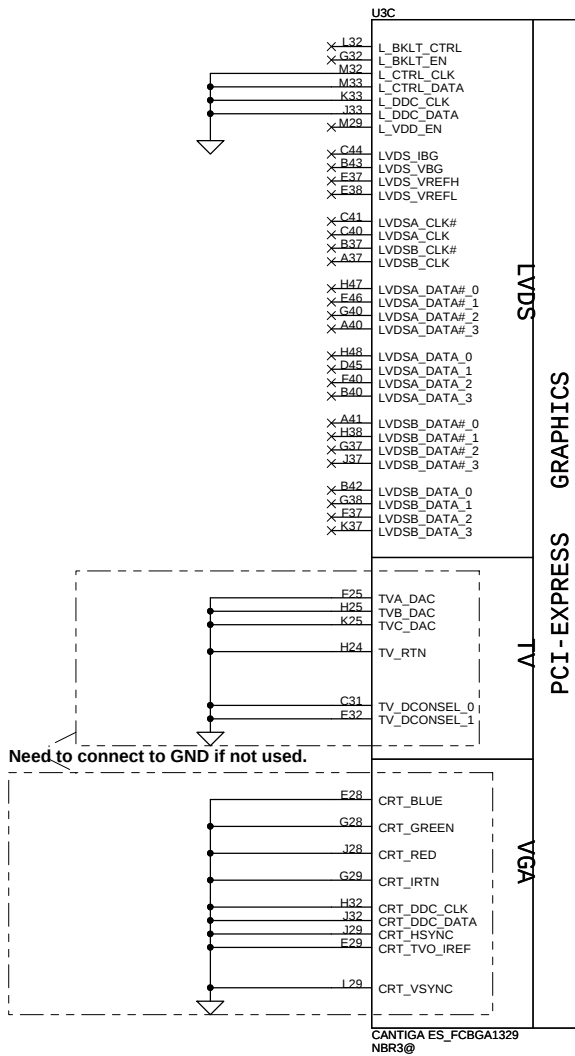
Strap Pin Table

CFG[2:0]	011 = FSB667 010 = FSB800 000 = FSB1067
CFG5	0 = DMI x 2 1 = DMI x 4 *(Default)
CFG6	0 = iTPM Host Interface is enabled*(Default) - can support disble by SW. 1 = iTPM Host Interface is Disabled
CFG7	0 = Intel Management Engine Crypto Transport Layer Security (TLS) cipher suite with no confidentiality 1 = Intel Management Engine Crypto TLS cipher suite with confidentiality *(Default)
CFG9	0 = Lane Reversal Enable 1 = Normal Operation *(Default)
CFG10	0 = PCIe Loopback Enable 1 = Disable *(Default)
CFG[13:12]	01 = All Z Mode Enabled 00 = Reserved 10 = XOR Mode Enabled 11 = Normal Operation *(Default)
CFG16	0 = Dynamic ODT Disabled 1 = Dynamic ODT Enabled *(Default)
CFG19	0 = Normal Operation *(Default) 1 = DMI Lane Reversal Enable
CFG20 (PCIE/SDVO select)	0 = Only PCIE or SDVO is operational. *(Default) 1 = PCIE/SDVO are operating simu.



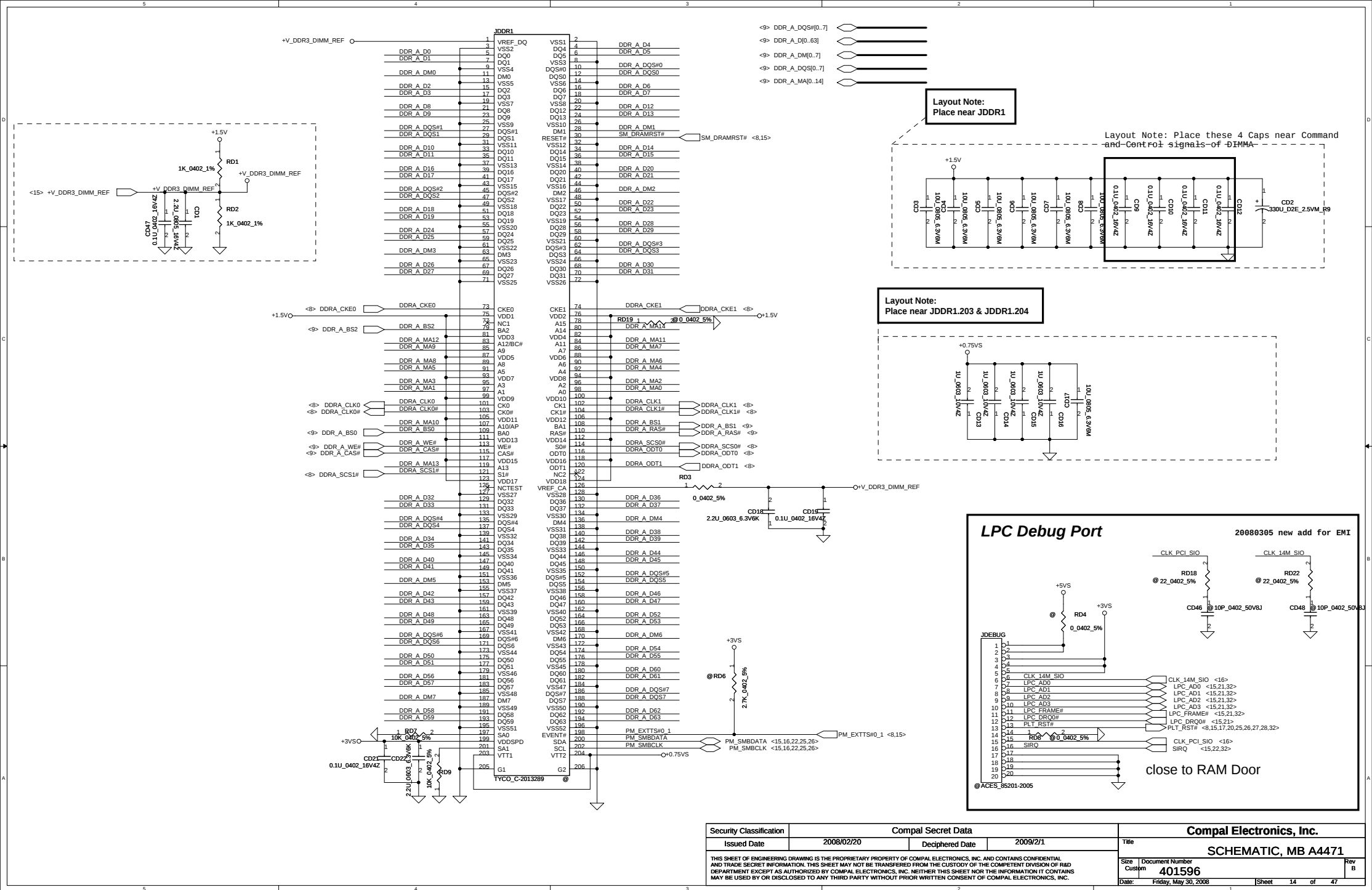


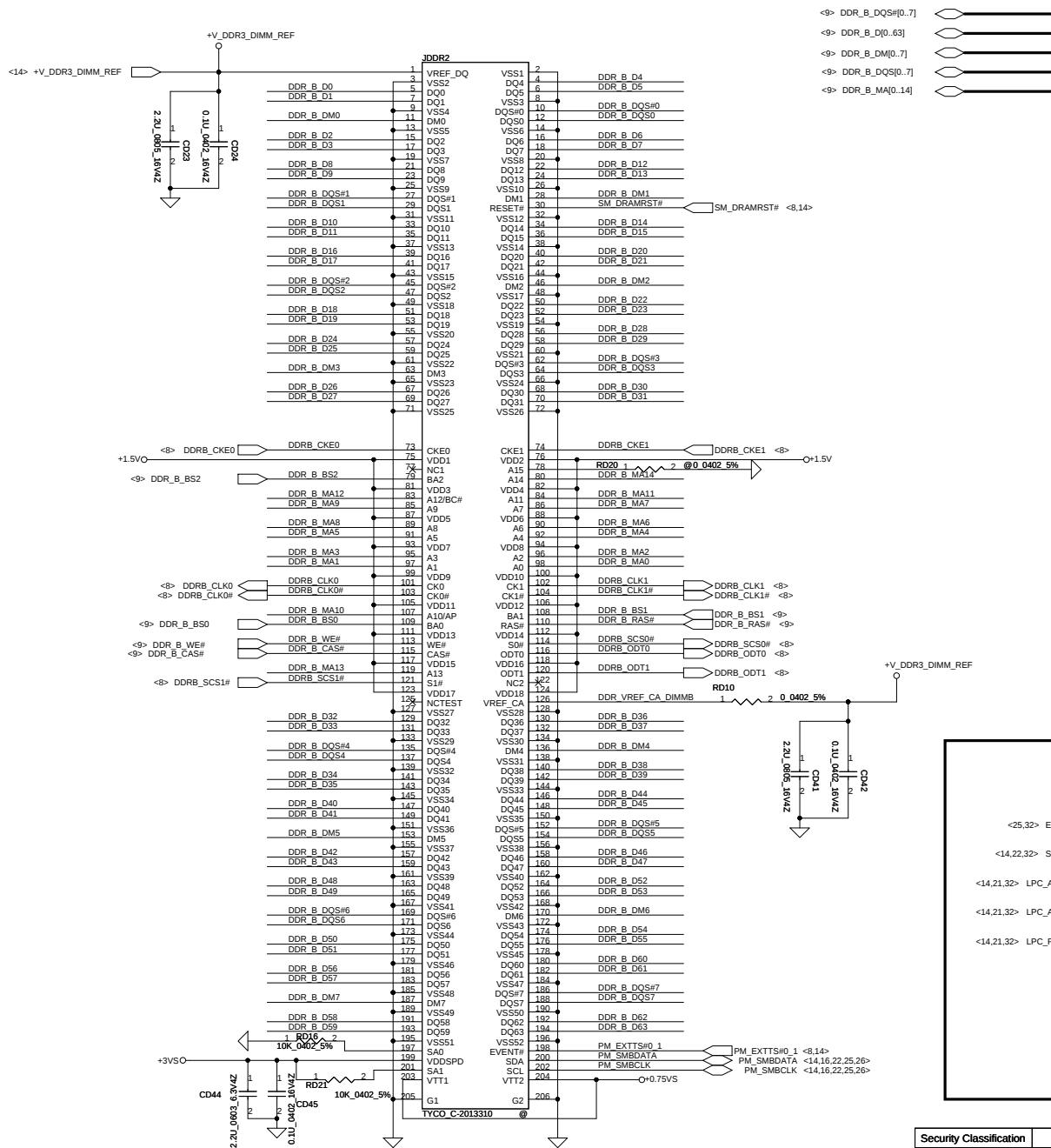
L_DDC_DATA
0 = LFP Disable * (Default)
1 = LFP Card Present; PCIe disable



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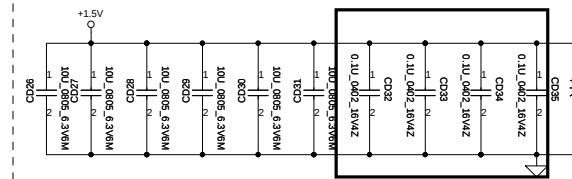




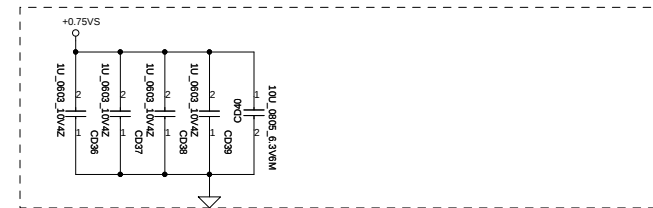
- <9> DDR_B_DQS#0[0..7]
- <9> DDR_B_DQ[0..63]
- <9> DDR_B_DM[0..7]
- <9> DDR_B_DQS[0..7]
- <9> DDR_B_MA[0..14]

Layout Note:
Place near JDDR2

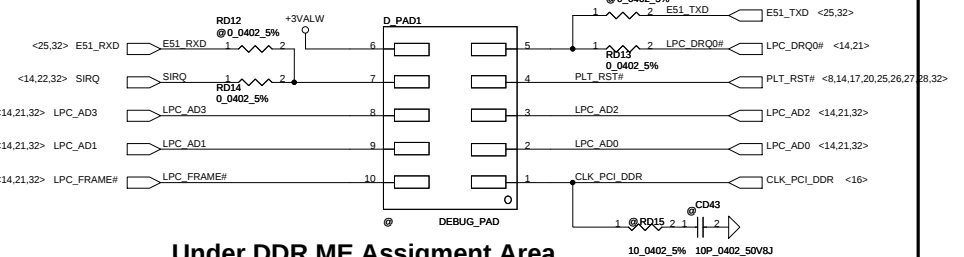
Layout Note: Place these 4 Caps near Command and Control signals of DIMMA



Layout Note:
Place near JDDR2.203 & JDDR2.204



New LPC Debug Pad ---- MB side

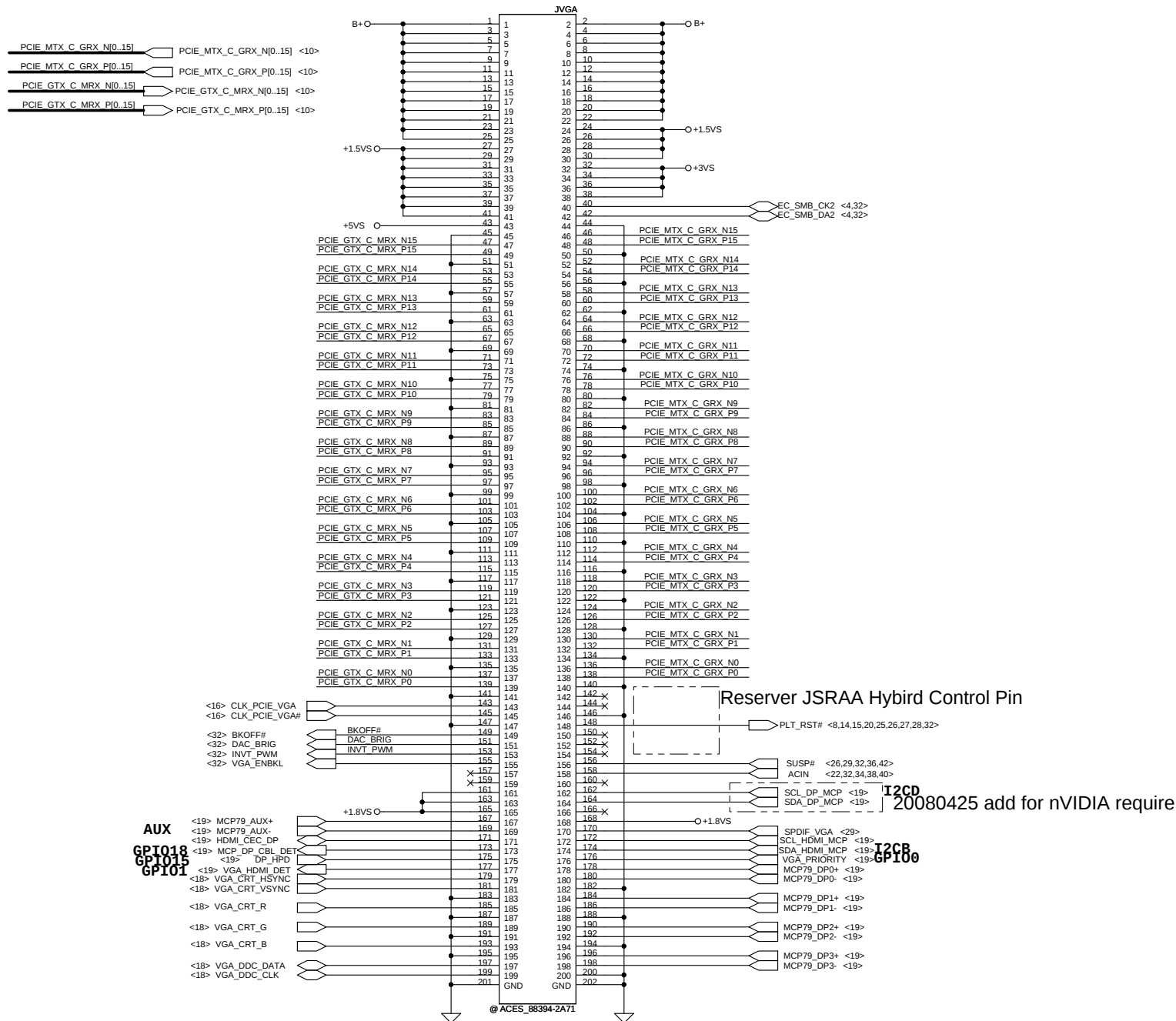


Under DDR ME Assignment Area

Keep Resistor near Debug Pad and in the same side
Reverse side DIMM ---- Pin 1 keep away DIMM

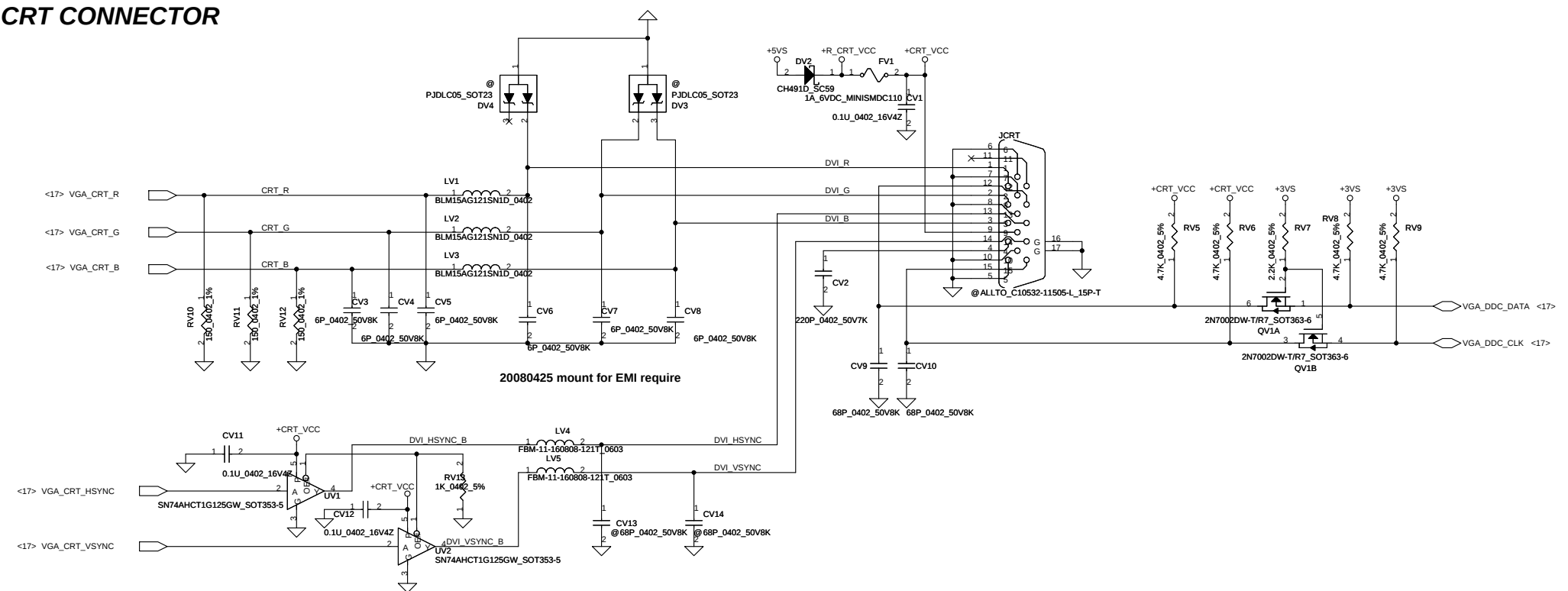
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VGA BOARD Conn.



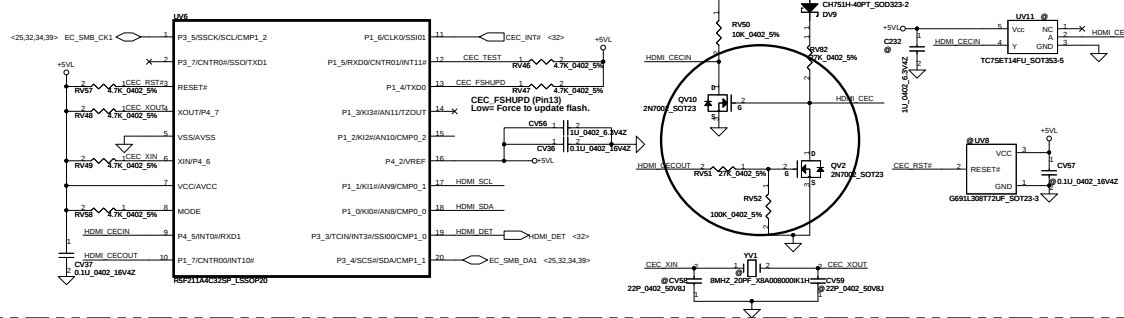
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CRT CONNECTOR

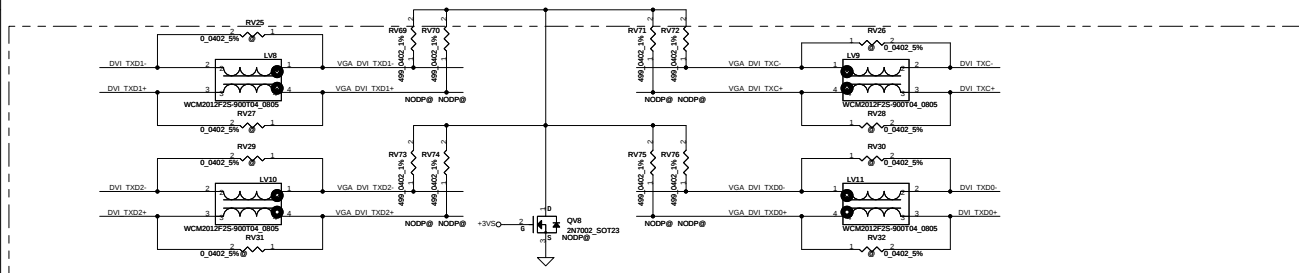


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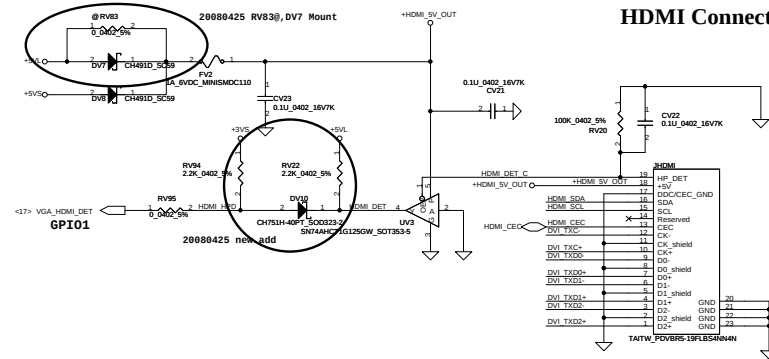
HDMI CEC Controller



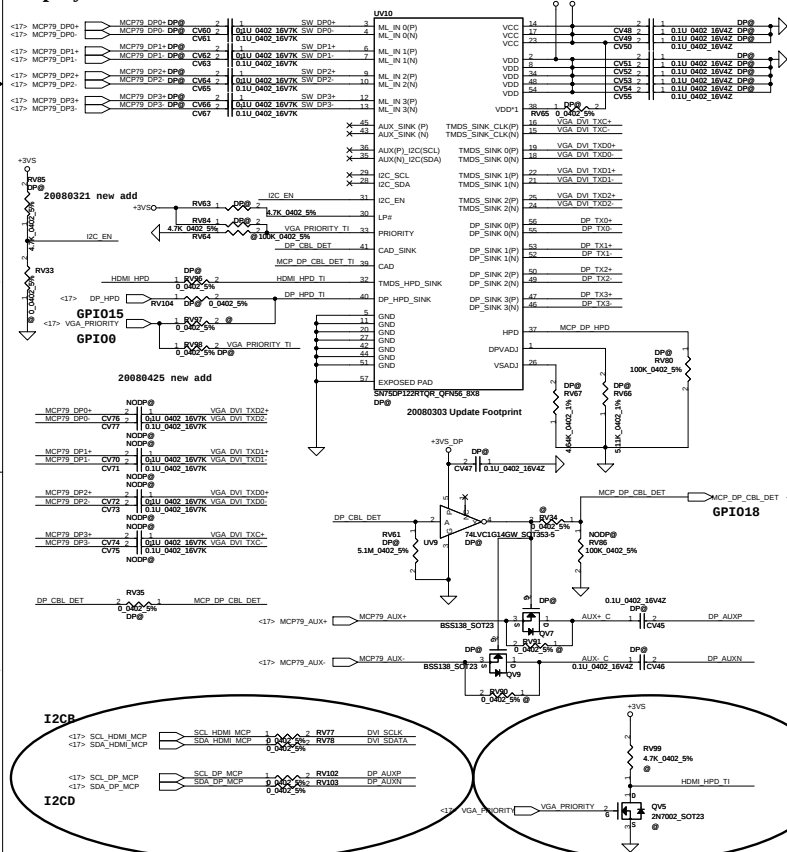
Close to JHDMI connector



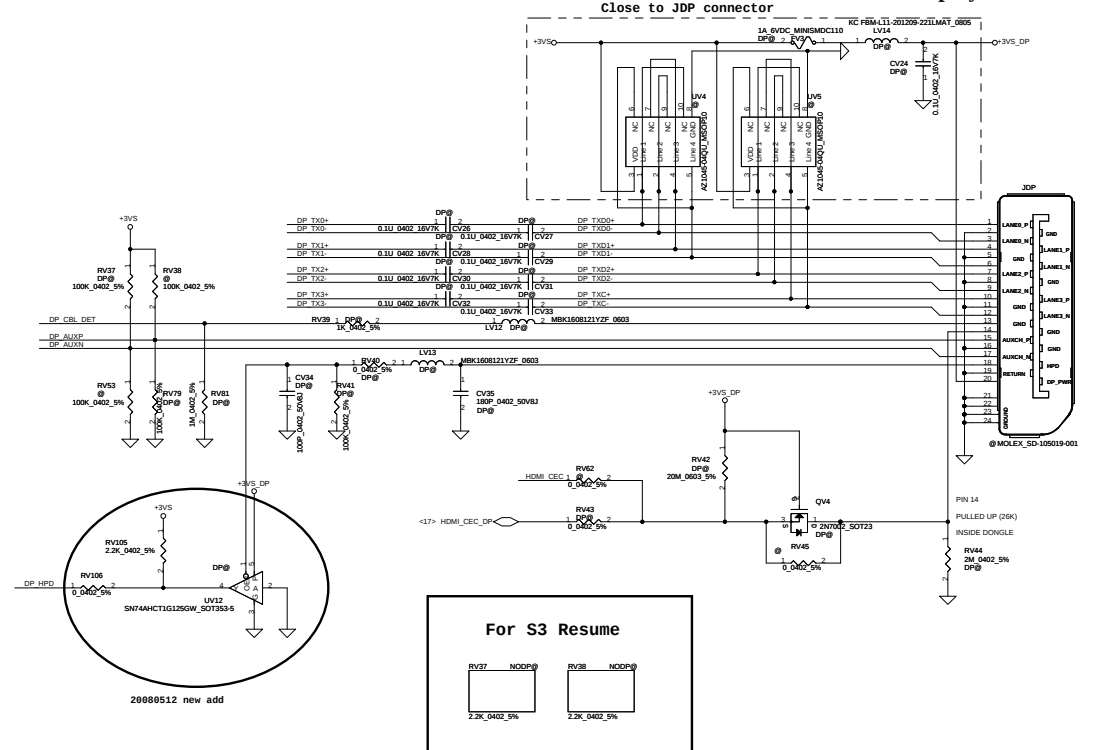
HDMI Connector



DisplayPort/TMD5 1:2 Switch/Translator

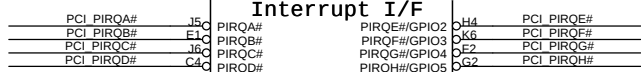
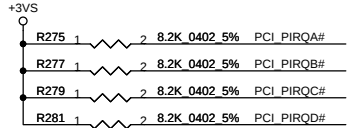


DisplayPort Connector



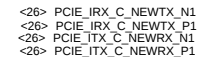
For S3 Resume

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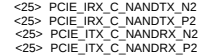


ICH9-M ES_FCBGA676
SBR3@

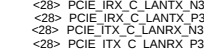
For Express Card



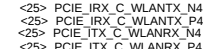
For Robson



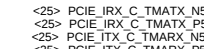
For LAN



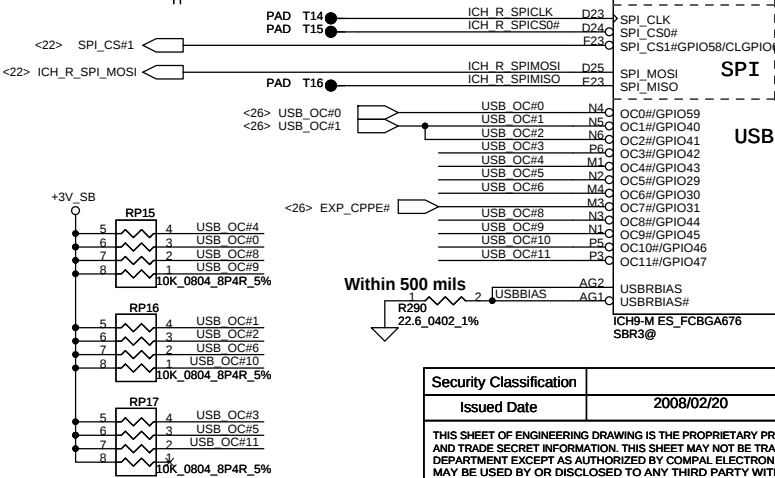
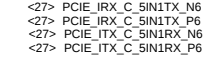
For WLAN



For TMA



For CardReader

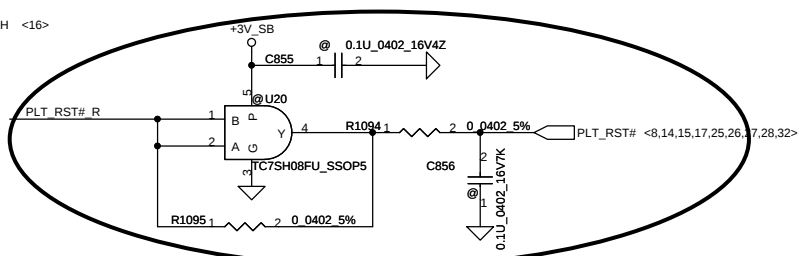
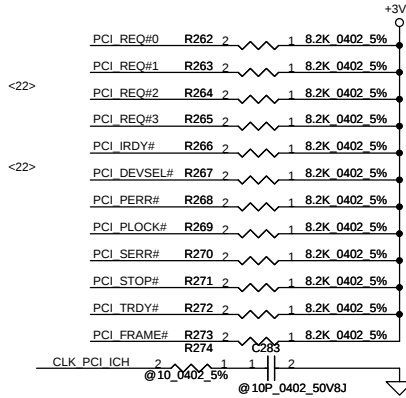


PCI - Express

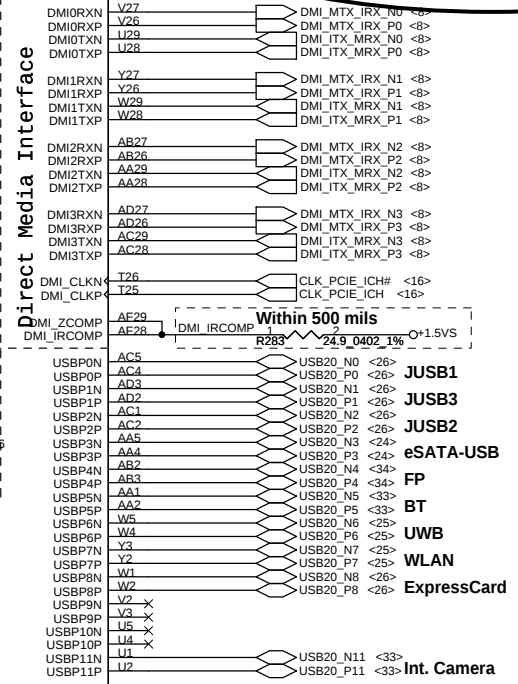
Direct Media Interface

SPI

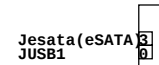
USB



20080425 add buffer for reset



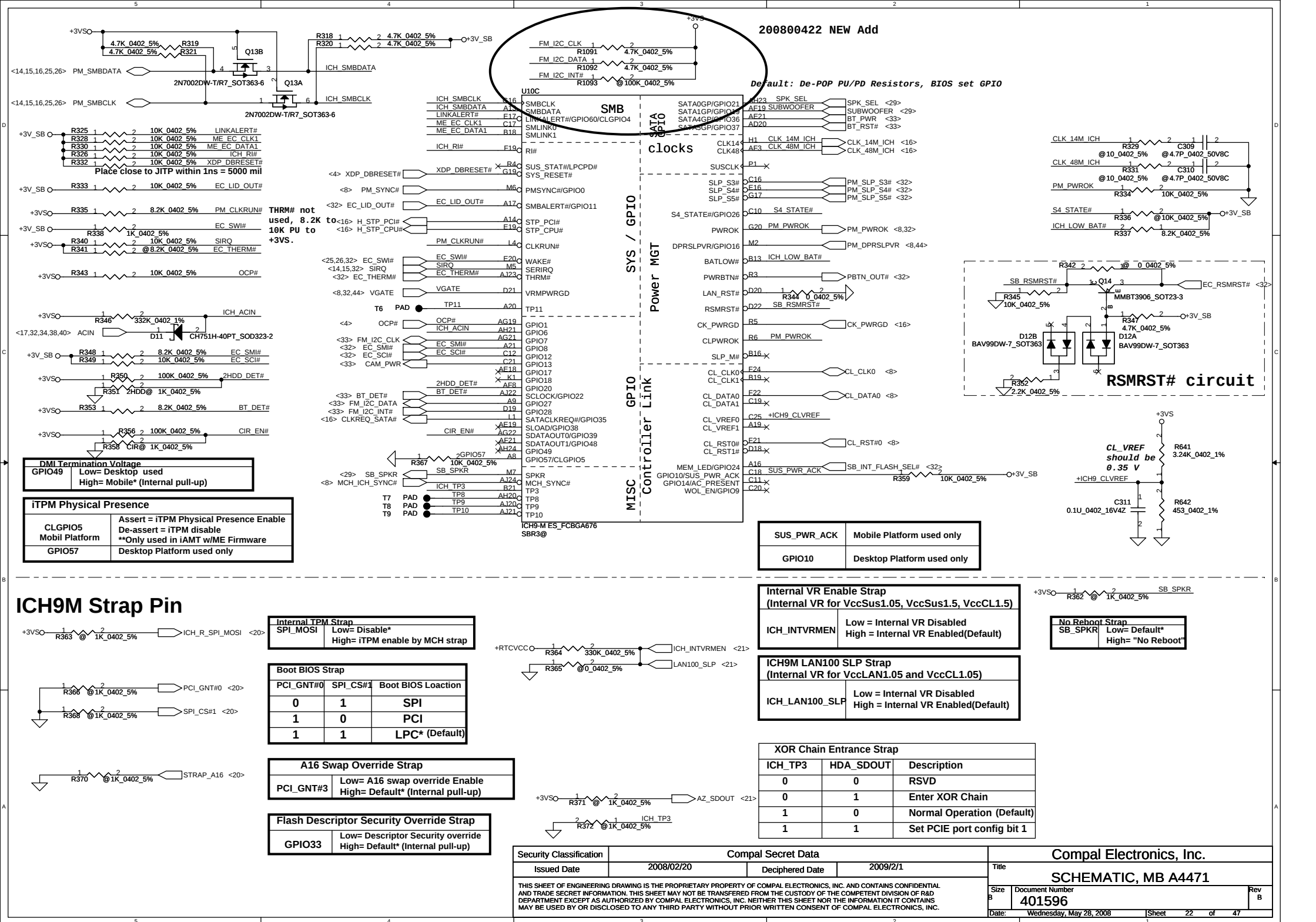
USB Conn PLACEMENT

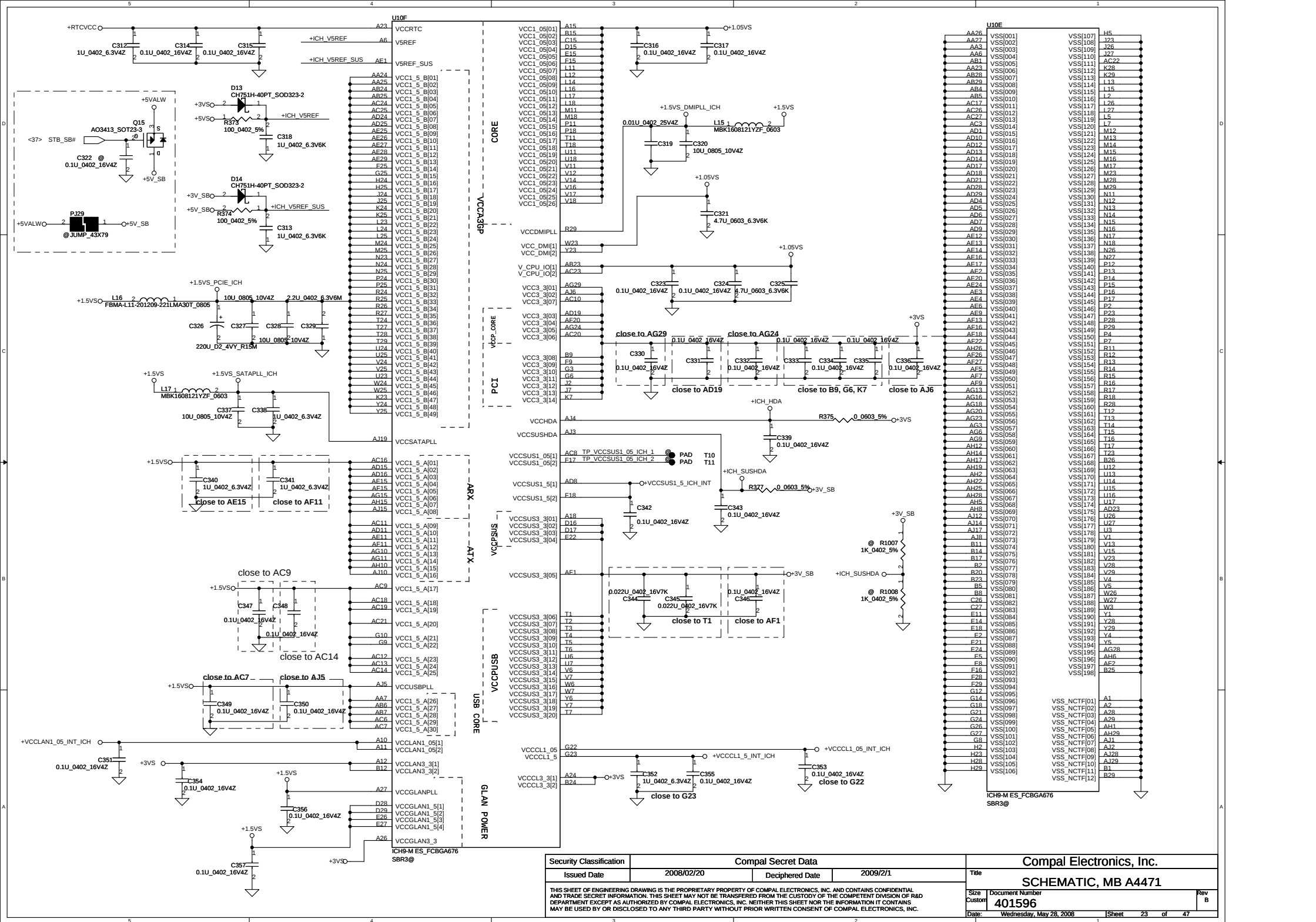


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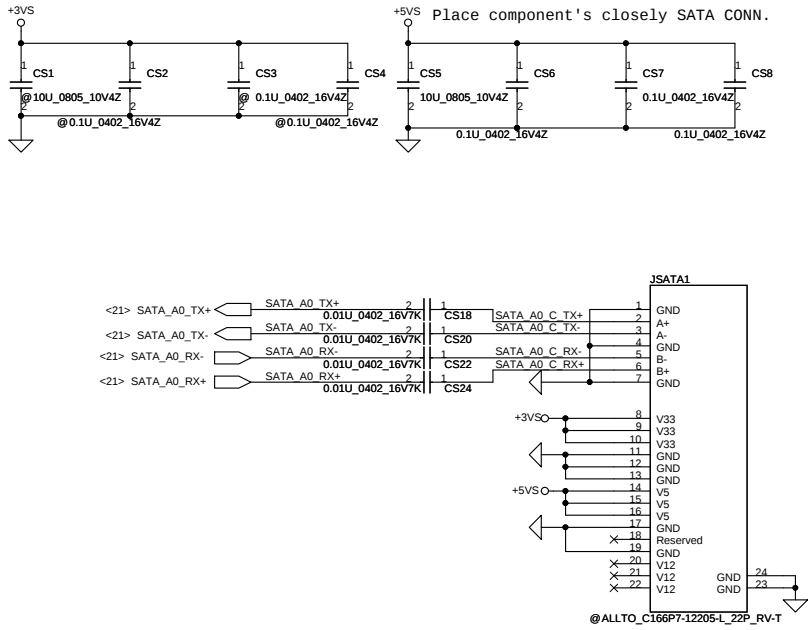


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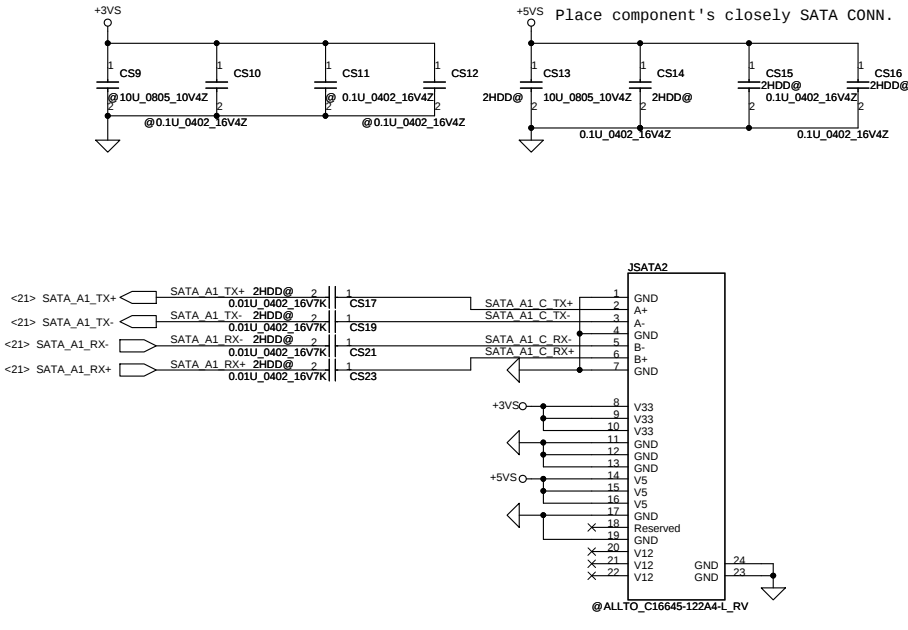




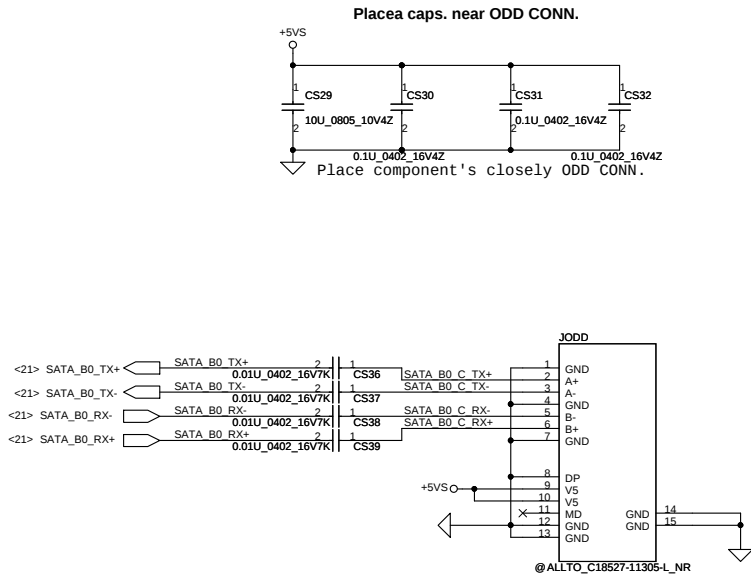
SATA Main HDD Conn.(11.8mm)



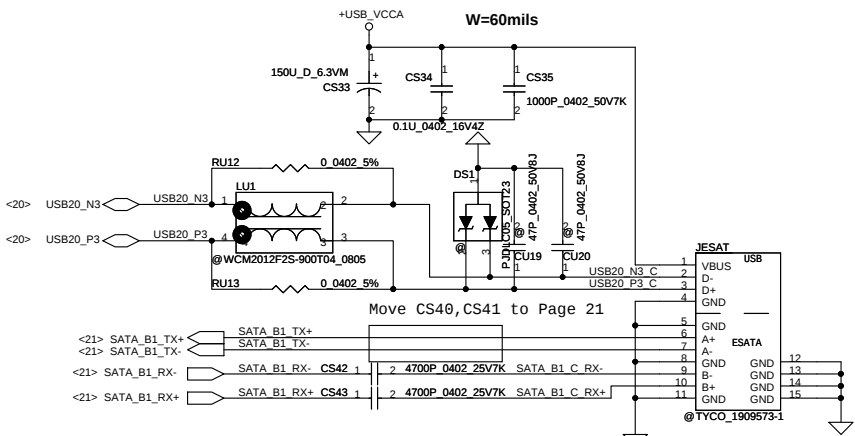
SATA 2 nd HDD Conn.(5.2mm)



SATA ODD CONN

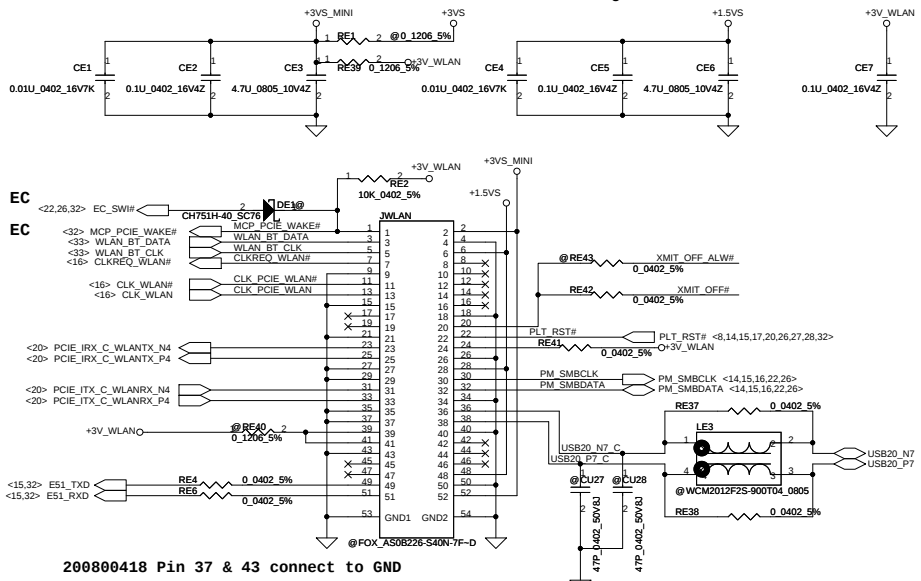


eSATA + USB CONN

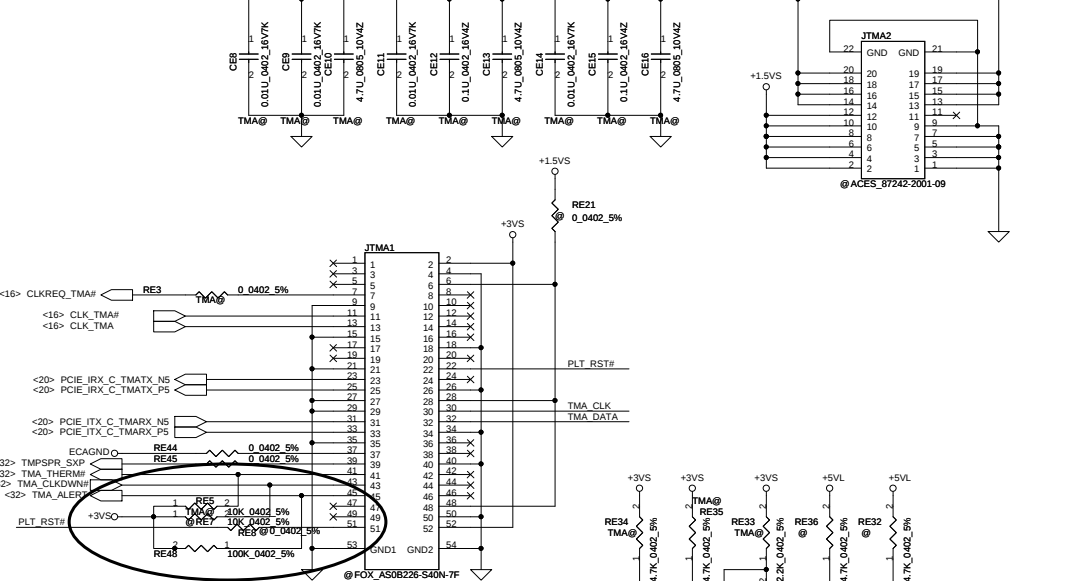


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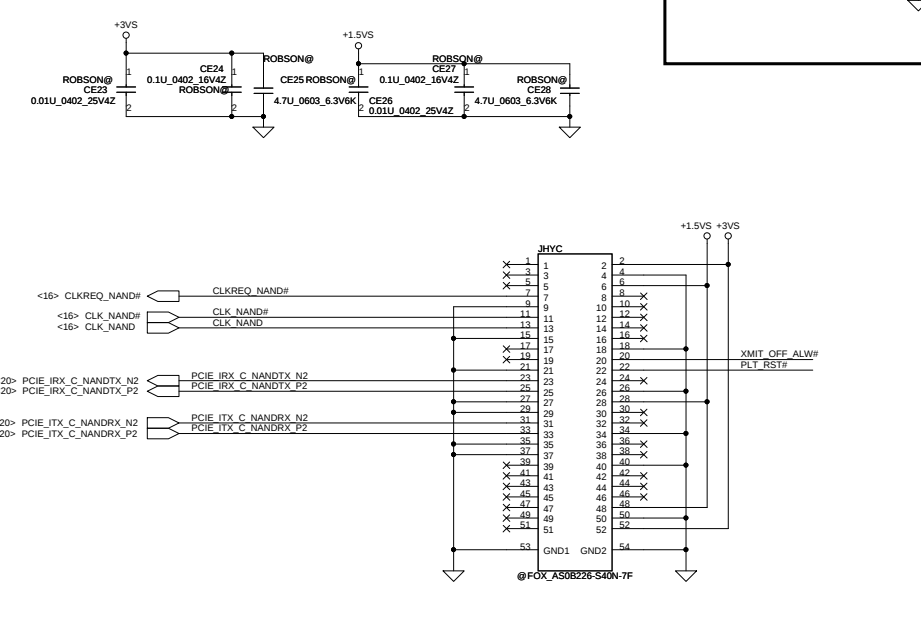
Mini-Express Card for WLAN 200800418 RE1 change to @ RE39 change to Mount



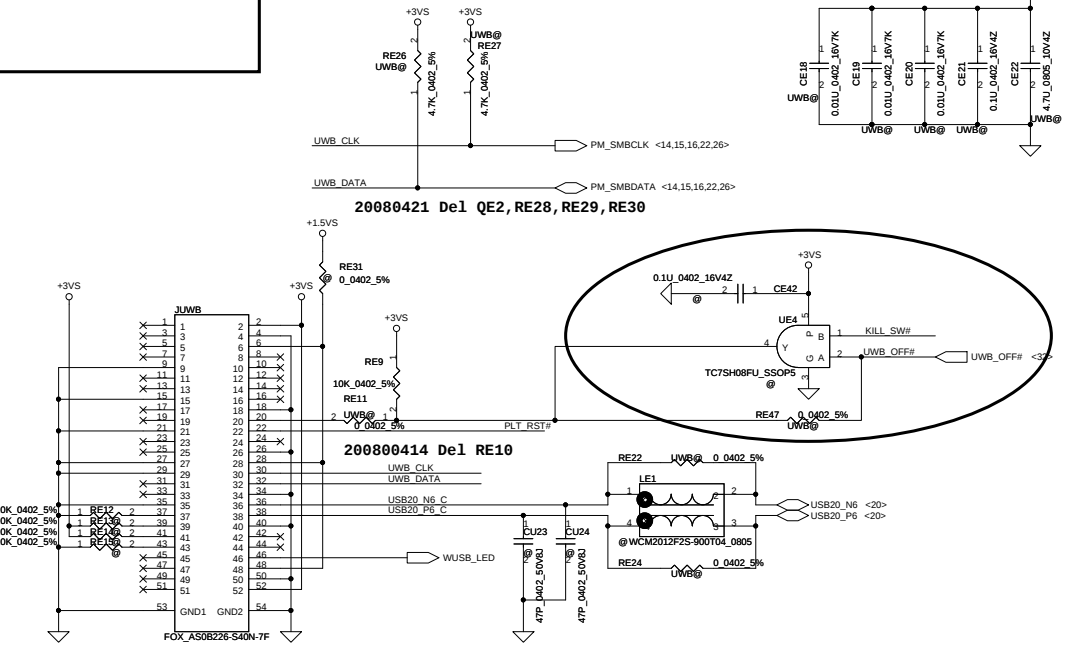
TMA mini Card



ROBSON

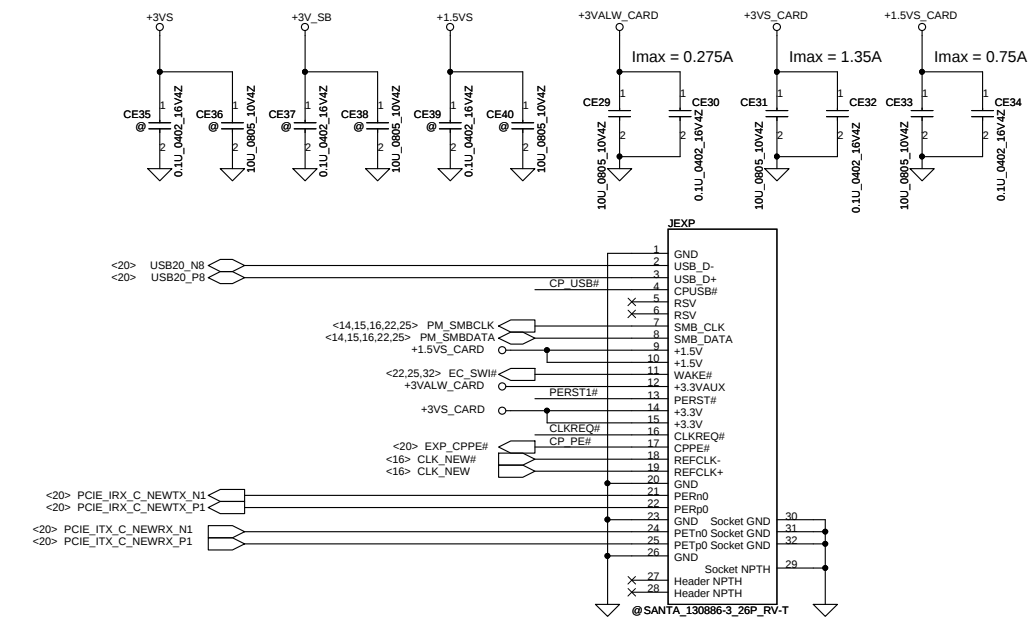


UWB mini Card

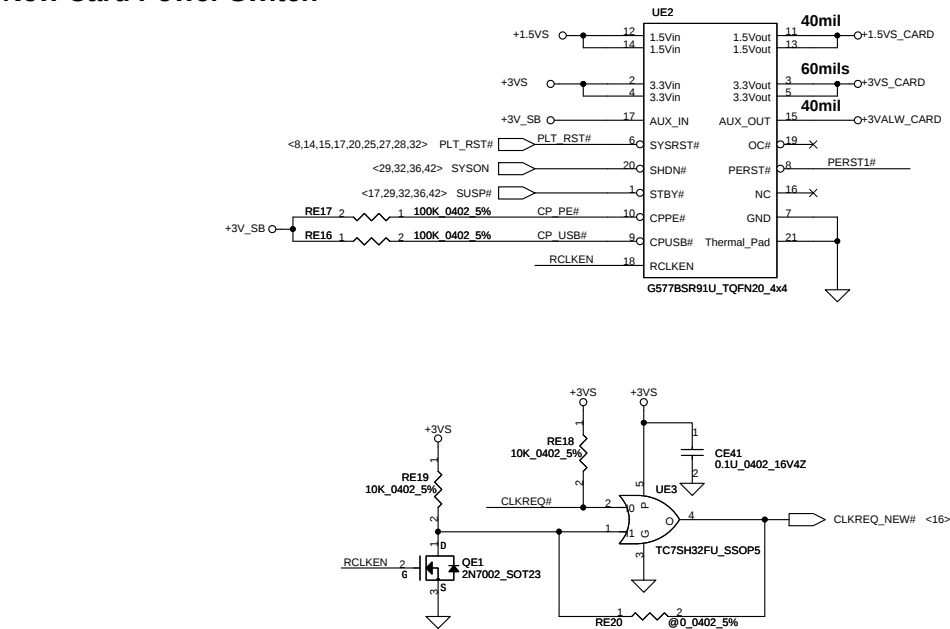


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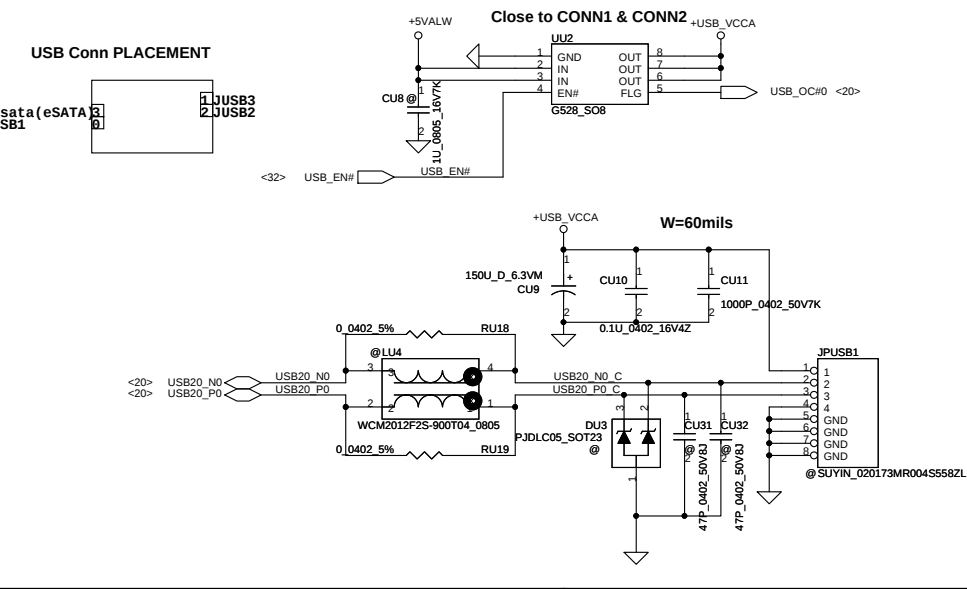
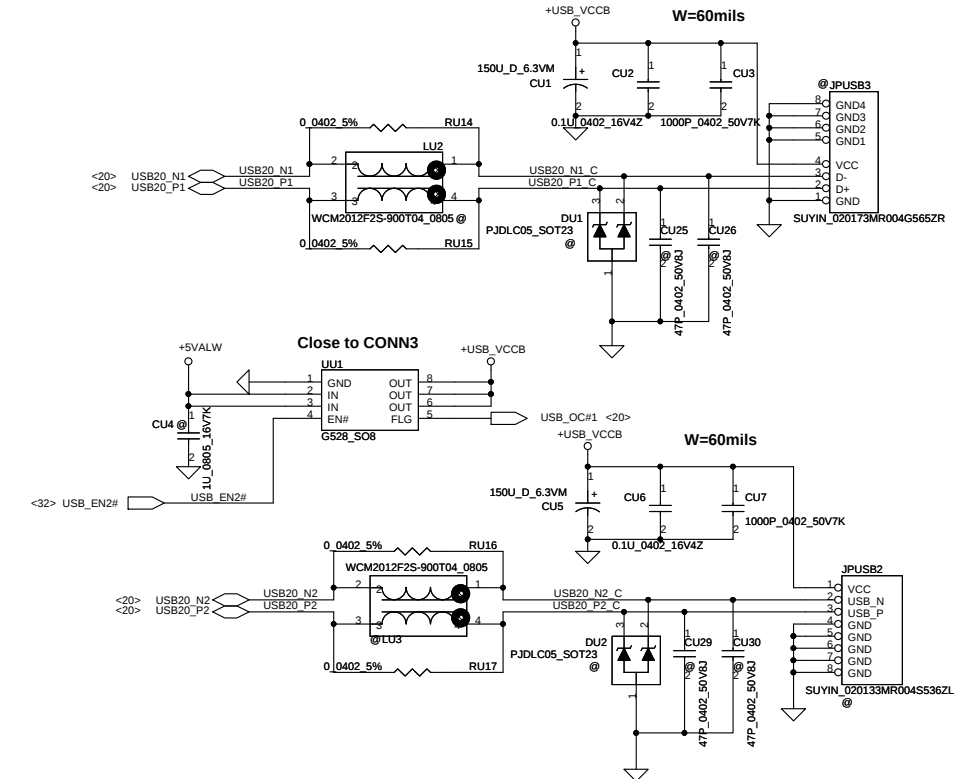
New Card Interface



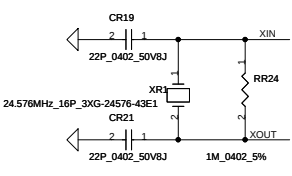
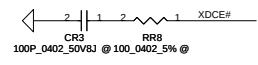
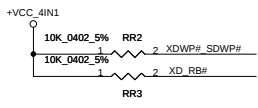
New Card Power Switch



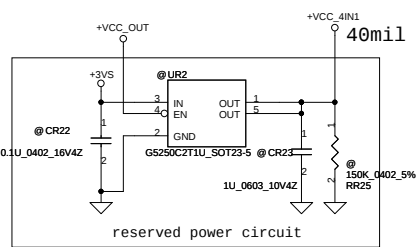
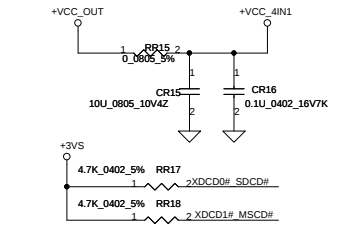
USB Interface



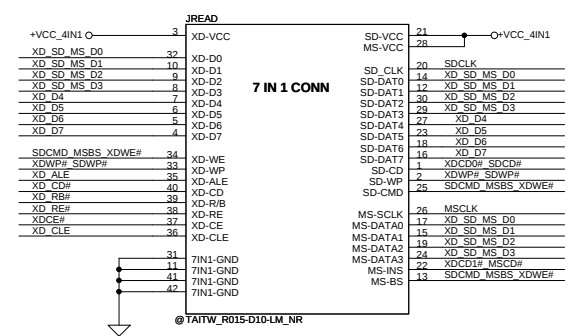
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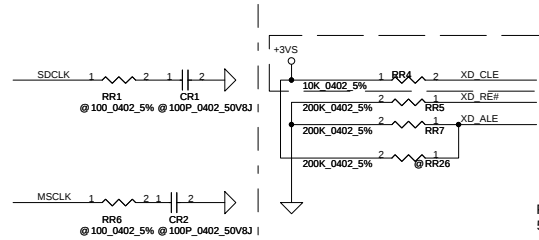
Use 0603 type and over 20 mils trace width on both side



Card Reader Connector



Strap pin for JMicro

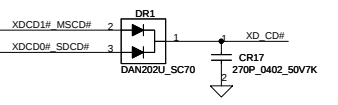
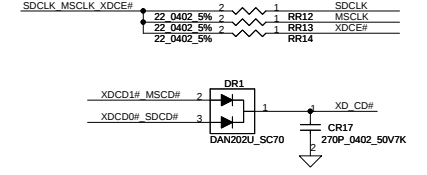


Strapping setting

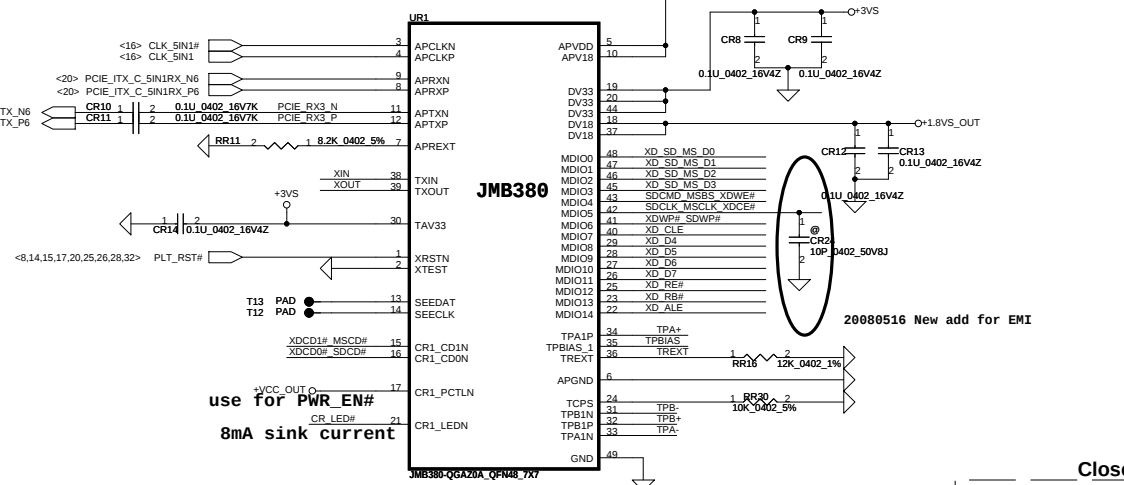
Pin name	Description	
	High	low
MDIO7	on-board★	add-in card
MDIO12	+VCC_OUT high active	+VCC_OUT low active★
MDIO14	CR_LED high active★	CR_LED low active

P.S CR1_PCTLN aslo can out 3V with 250mA for 5IN1 using.(MDIO12 can't be seted after MP IC)

Change RR12, RR13 and RR14 to Bead for EMI

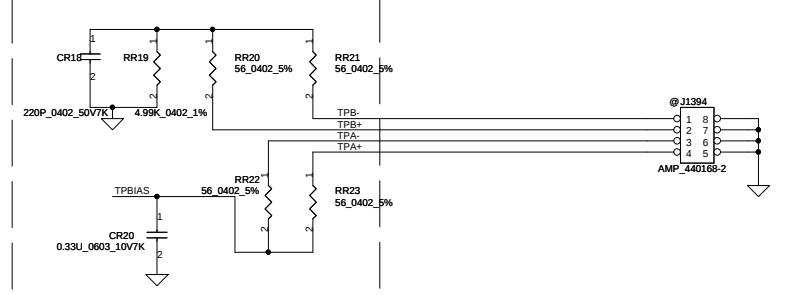


Power Circuit



use for PWR_EN#
8mA sink current

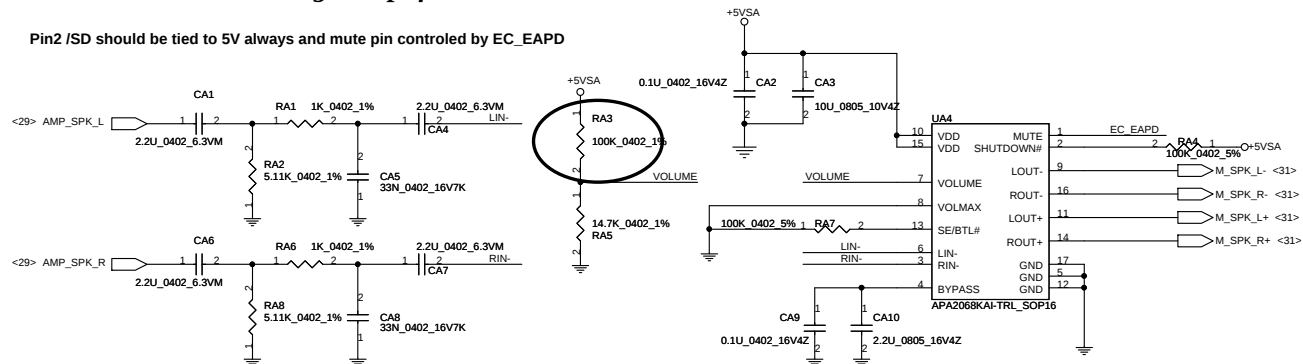
Close to Chip



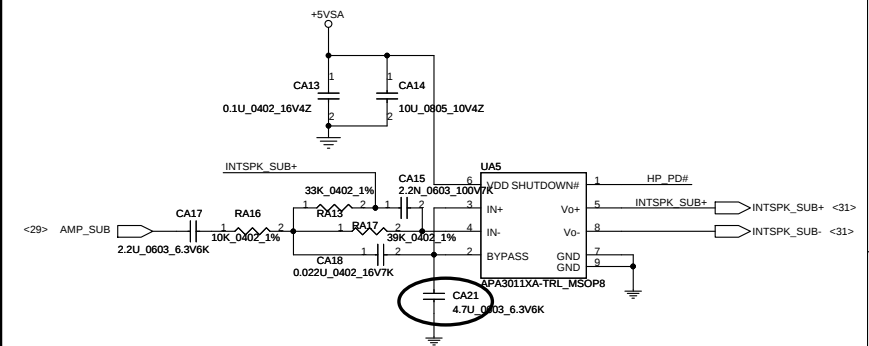
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APA2068 Medium Range Amplifier

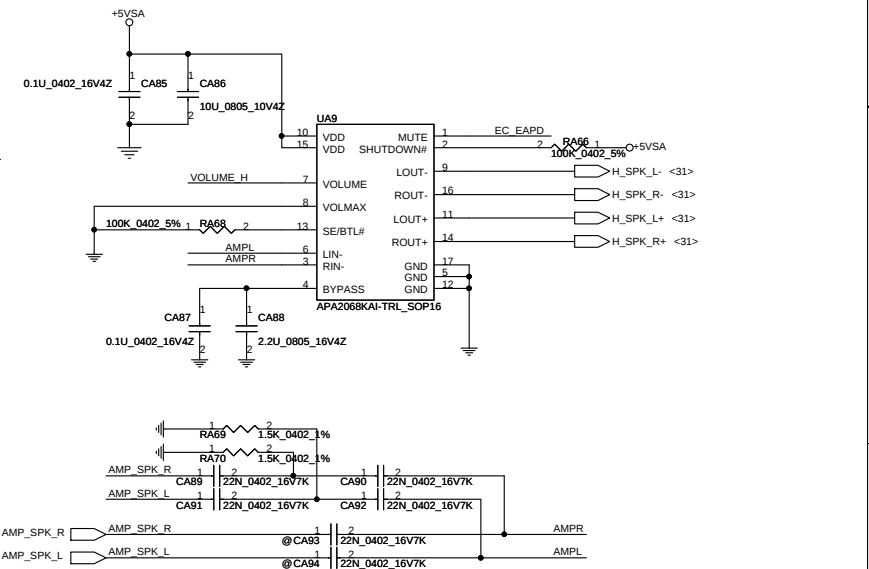
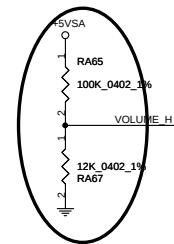
Pin2 /SD should be tied to 5V always and mute pin controlled by EC_EAPD



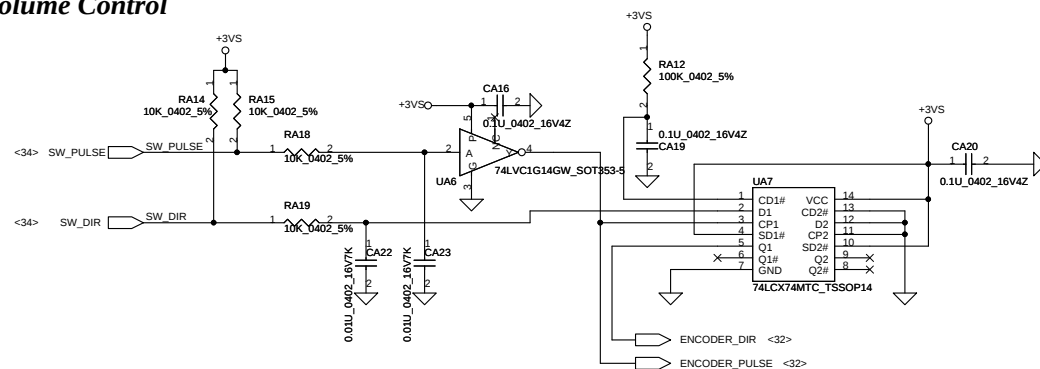
APA3011 Subwoofer Amplifier



APA2068 Tweeter Range Amplifier

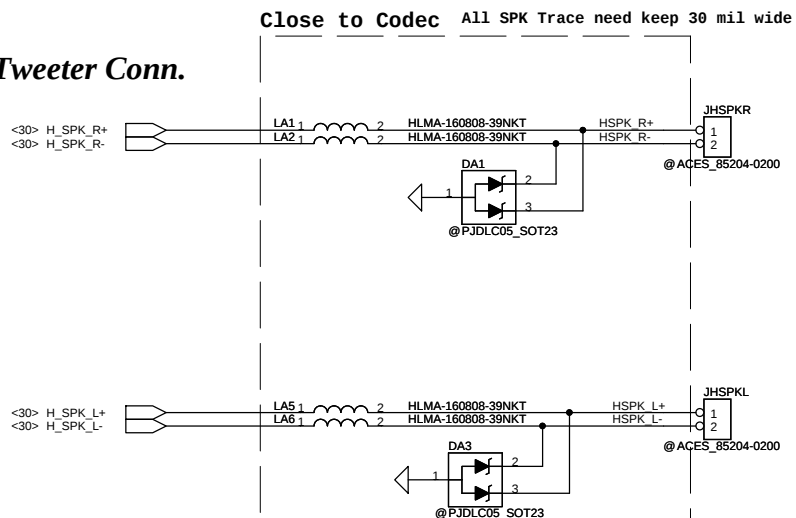


Volume Control

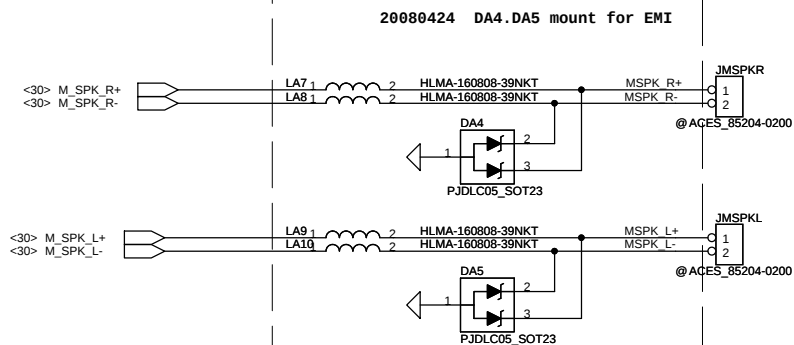


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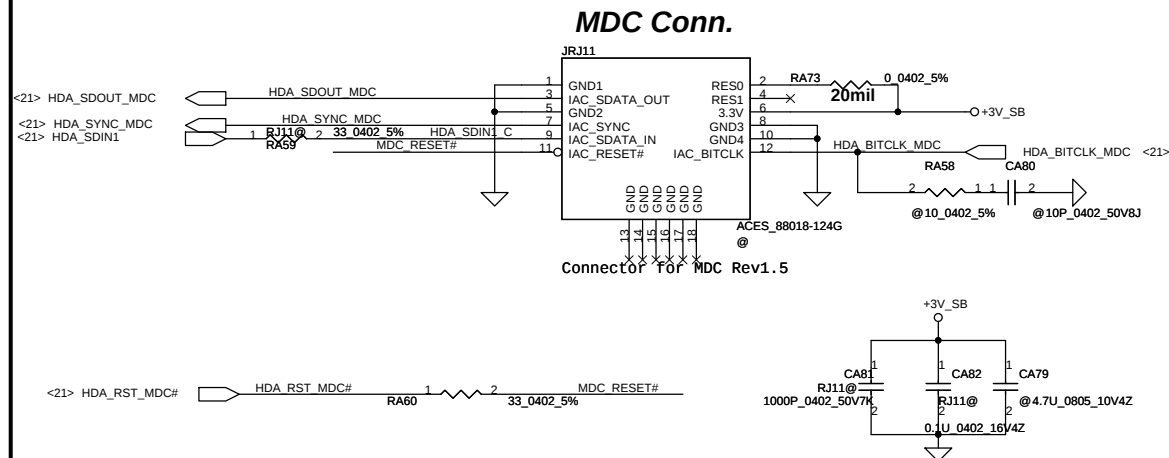
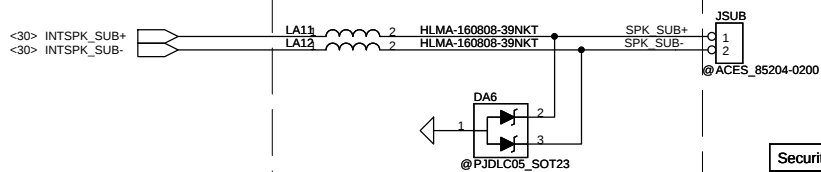
Tweeter Conn.



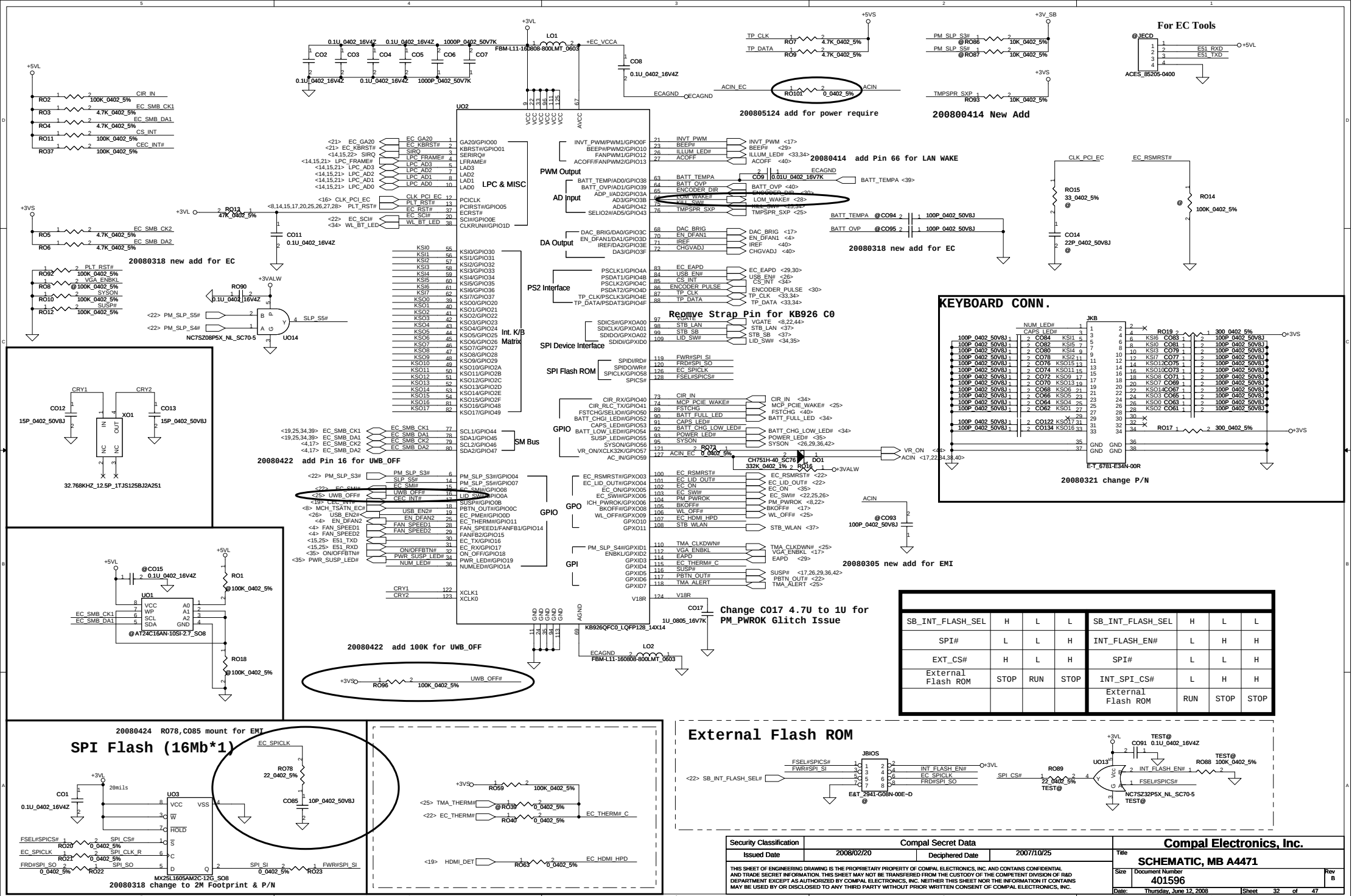
Medium SPK Conn.



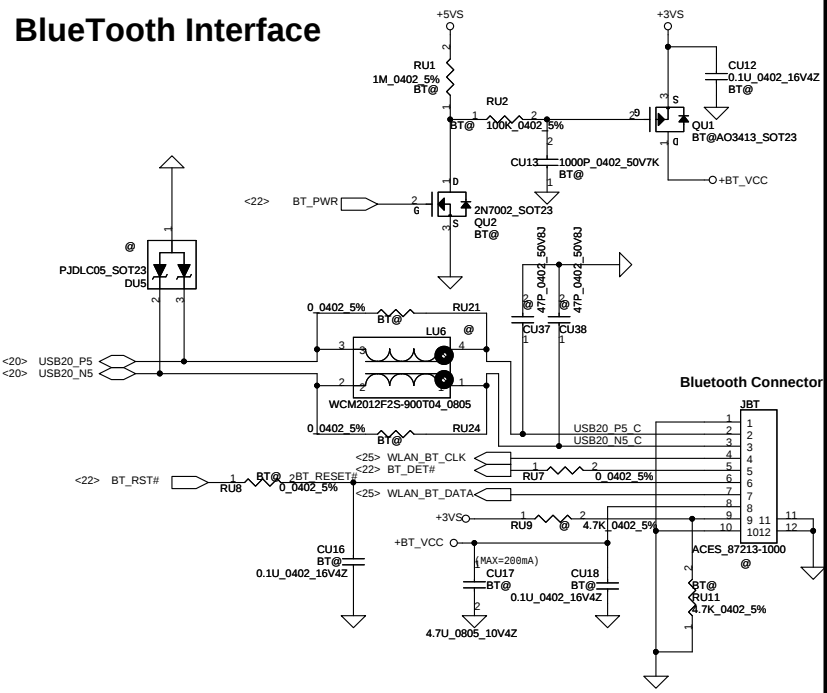
Sub-woofer Conn.



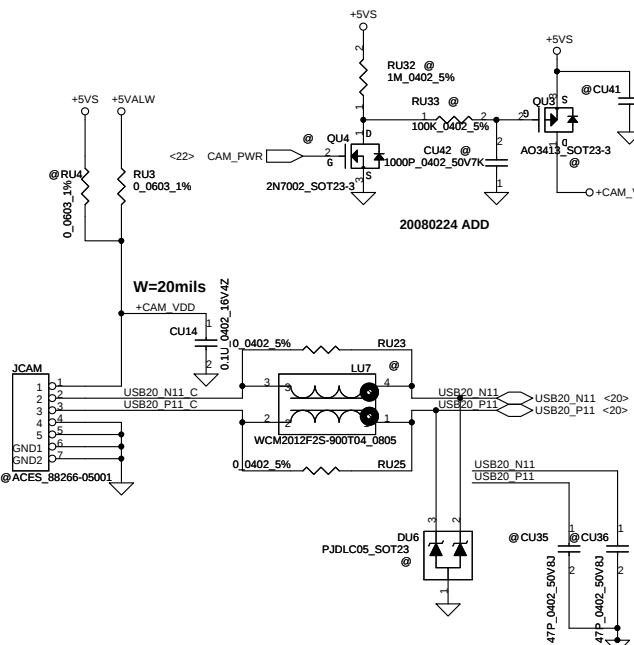
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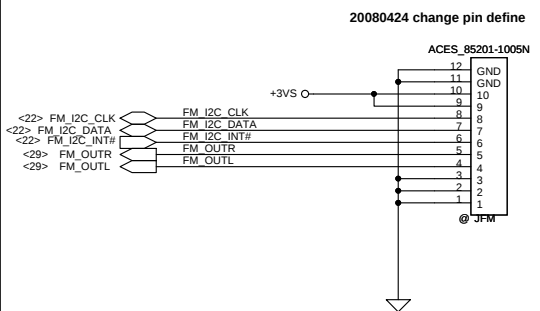
BlueTooth Interface



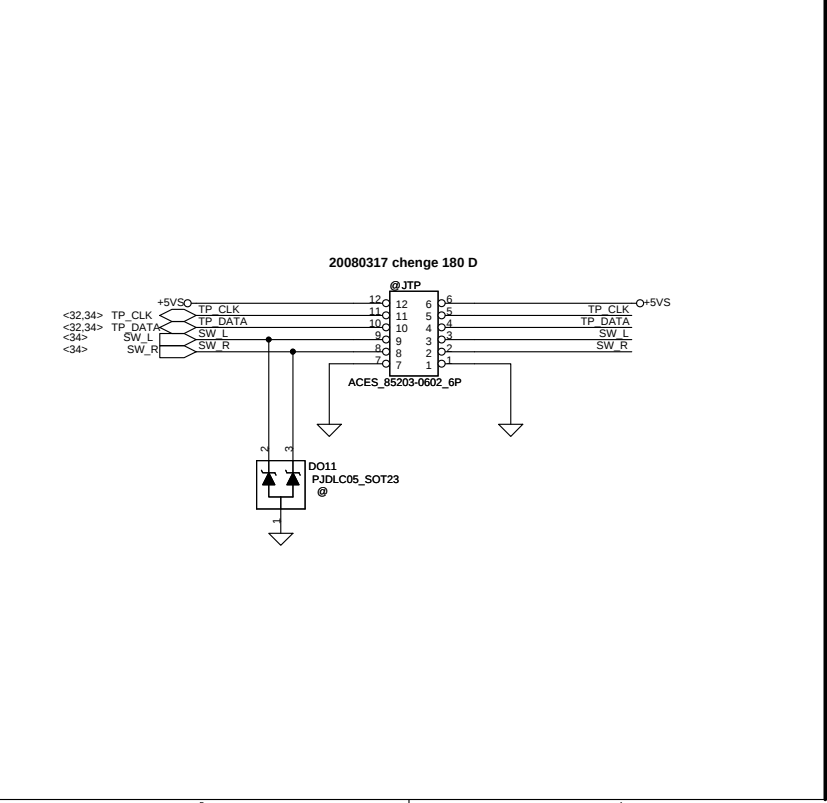
Int. Camera Conn



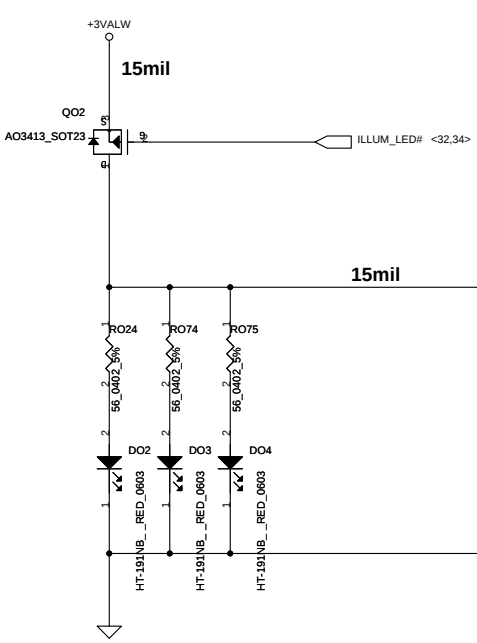
FM Tuner



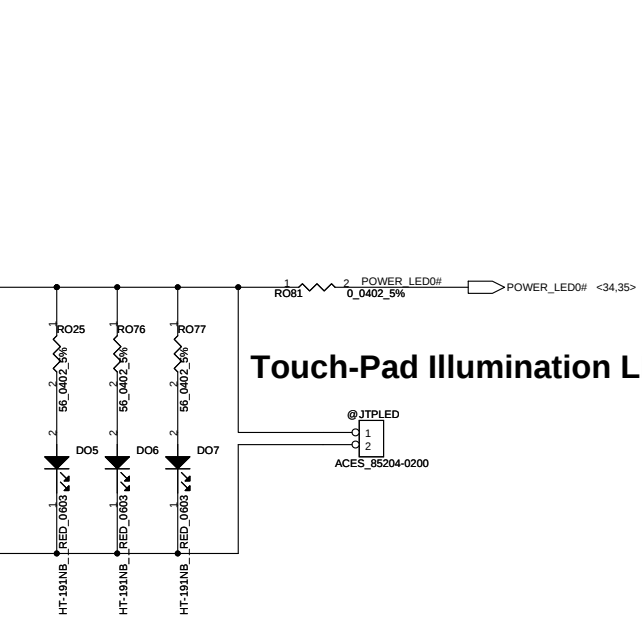
TP CONN.



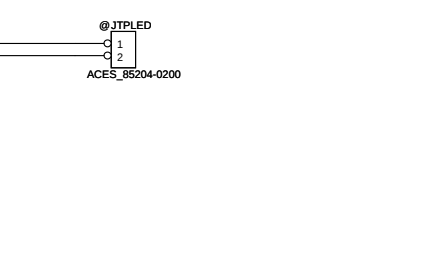
Left Illumination LED



Right Illumination LED



Touch-Pad Illumination LED



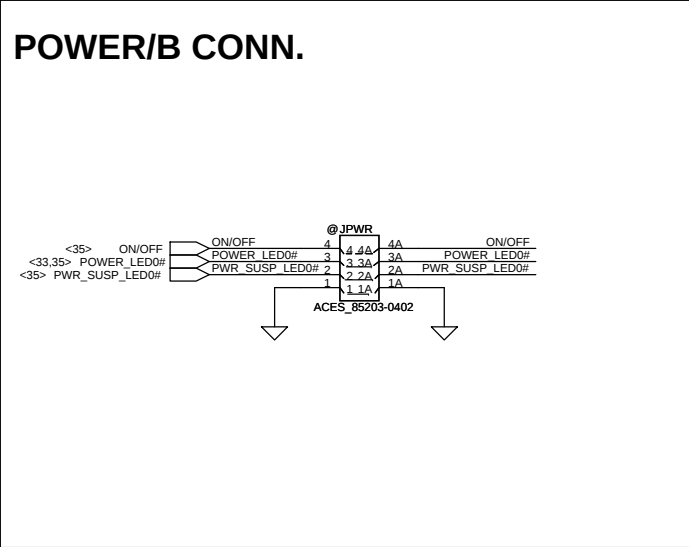
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POWER/B CONN.

The diagram illustrates the power and bus connections for the ACES_85203-0402 component. It shows three input signals on the left: <35> ON/OFF, <33,35> POWER_LED0#, and <35> PWR_SUSP_LED0#. These signals are connected to a central component labeled @JPWR. The component has four pins: 4, 3, 2, and 1. The connections are as follows:

- Pin 4: ON/OFF
- Pin 3: POWER_LED0#
- Pin 2: PWR_SUSP_LED0#
- Pin 1: PWR_SUSP_LED0#

The component is connected to a power source labeled ACES_85203-0402. The power source has two output lines: 4A and 3A. The 4A line is connected to the 4 pin of the component, and the 3A line is connected to the 3 pin. The 2A and 1A lines are also shown but not connected to the component.



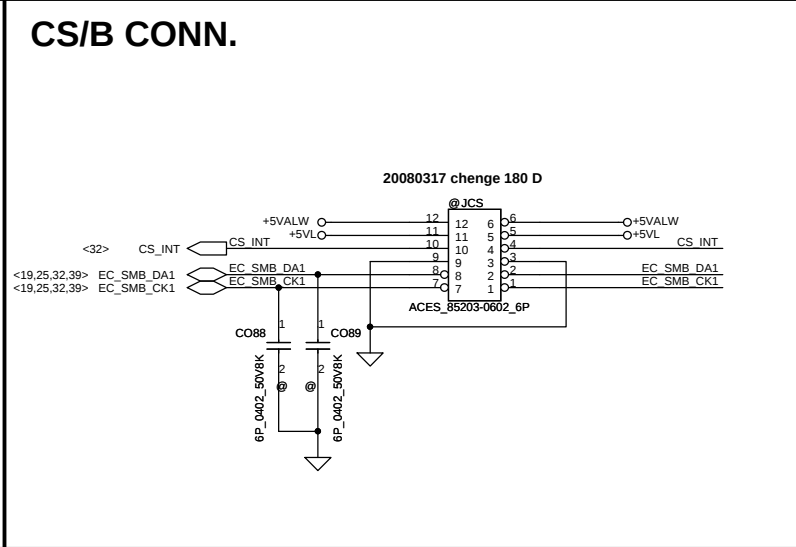
CS/B CONN.

20080317 change 180 D

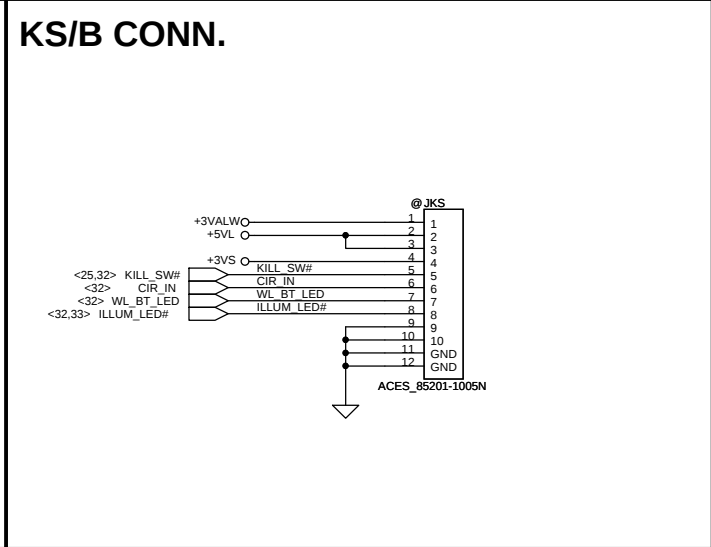
The diagram illustrates the CS/B connection for the ACES_85203-0602_6P connector. The connector is labeled @JCS and has pins 1 through 12. The connections are as follows:

- Pin 12:** +5VALW
- Pin 11:** +5VL
- Pin 10:** CS_INT
- Pin 9:** EC_SMB_DA1
- Pin 8:** EC_SMB_CK1
- Pin 7:** EC_SMB_CK1
- Pin 6:** +5VALW
- Pin 5:** +5VL
- Pin 4:** CS_INT
- Pin 3:** EC_SMB_DA1
- Pin 2:** EC_SMB_CK1
- Pin 1:** EC_SMB_CK1

The diagram also shows the connection of the CS_INT signal to the CS_INT pin of the connector. The EC_SMB_DA1 and EC_SMB_CK1 signals are connected to the corresponding pins of the connector. The power supply connections for +5VALW and +5VL are shown. The ground connections for CO88 and CO89 are also indicated.



KS/B CONN.

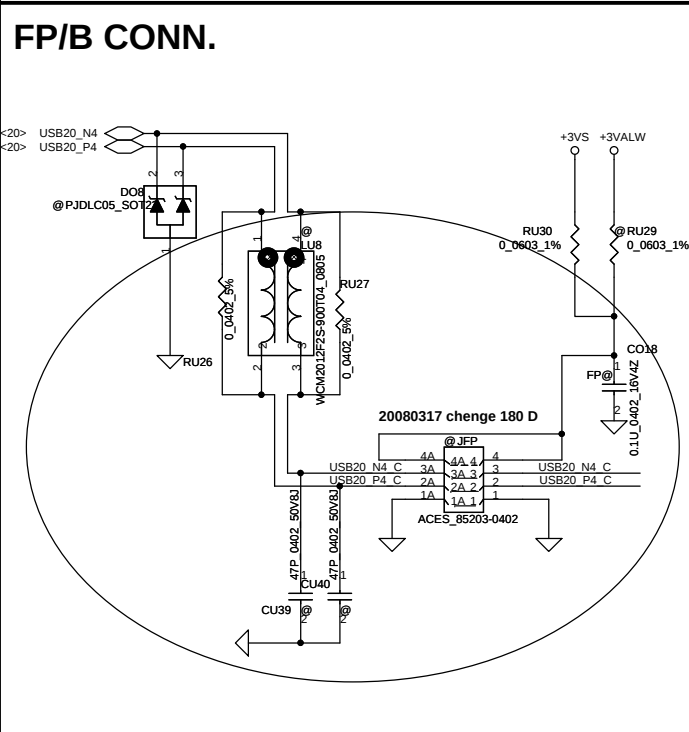


FP/B CONN.

The schematic diagram illustrates the electrical connections for the FP/B CONN. The circuit includes the following components and connections:

- Inputs:** USB20_N4 and USB20_P4 are connected to the top of the circuit.
- Diodes:** A diode labeled @PJDLCO5_SOT23 is connected to the inputs. Another diode is connected to the output of the 20080317 change 180 D component.
- Resistors:**
 - RU26 (0.0402_5%) is connected to the inputs.
 - RU27 (0.0402_5%) is connected to the inputs.
 - RU30 (0.0603_1%) and RU29 (0.0603_1%) are connected to the +3VS and +3VALW inputs.
- Capacitors:**
 - CU39 (47P 0402_50V/8J) and CU40 (47P 0402_50V/8J) are connected to the inputs.
 - CO38 (0.1U 0402_16V/4Z) is connected to the output.
- ICs:**
 - WCM2012FS-900T04_0805 is a transformer-like component.
 - 20080317 change 180 D is a component with multiple pins.
 - ACES_85203-0402 is a component with multiple pins.
- Other Components:**
 - CU39 and CU40 are capacitors.
 - CO38 is a capacitor.

The diagram shows a complex network of connections between these components, with various labels indicating pin numbers and component values.

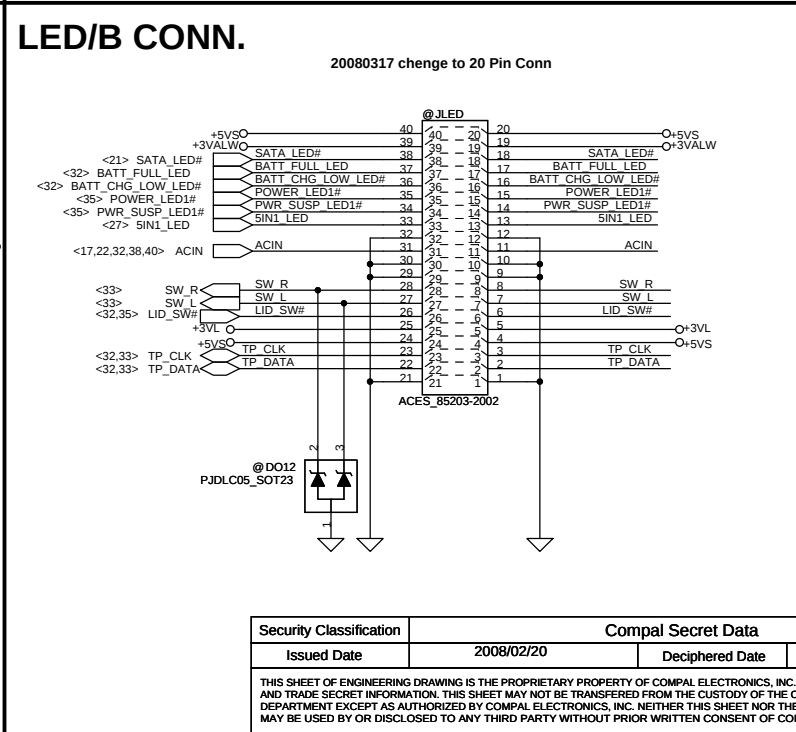


LED/B CONN.

20080317 change to 20 Pin Conn

Pinout diagram for LED/B CONN. showing connections for 20 pins. The diagram is divided into two sections: pins 1-10 on the left and pins 11-20 on the right. Pin 1 is labeled <21> SATA_LED#, pin 2 is <32> BATT_FULL_LED, pin 3 is <32> BATT_CHG_LOW_LED#, pin 4 is <35> POWER_LED1#, pin 5 is <35> PWR_SUSP_LED1#, pin 6 is <27> SIN1_LED, pin 7 is ACIN, pin 8 is SW_R, pin 9 is SW_L, pin 10 is LID_SW#. Pin 11 is +5VSO, pin 12 is +3VALWO, pin 13 is SATA_LED#, pin 14 is BATT_FULL_LED, pin 15 is BATT_CHG_LOW_LED#, pin 16 is POWER_LED1#, pin 17 is PWR_SUSP_LED1#, pin 18 is SIN1_LED, pin 19 is ACIN, pin 20 is SW_R. Pin 21 is SW_L, pin 22 is LID_SW#, pin 23 is +3VL_O, pin 24 is +5VSO, pin 25 is TP_CLK, pin 26 is TP_DATA, pin 27 is TP_CLK, pin 28 is TP_DATA, pin 29 is TP_CLK, pin 30 is TP_DATA, pin 31 is TP_CLK, pin 32 is TP_DATA, pin 33 is TP_CLK, pin 34 is TP_DATA, pin 35 is TP_CLK, pin 36 is TP_DATA, pin 37 is TP_CLK, pin 38 is TP_DATA, pin 39 is TP_CLK, pin 40 is TP_DATA. The diagram also shows connections for +5V, +3VALW, +3VL, +5VS, and TP_CLK. A note at the bottom states: '20080317 change to 20 Pin Conn'.

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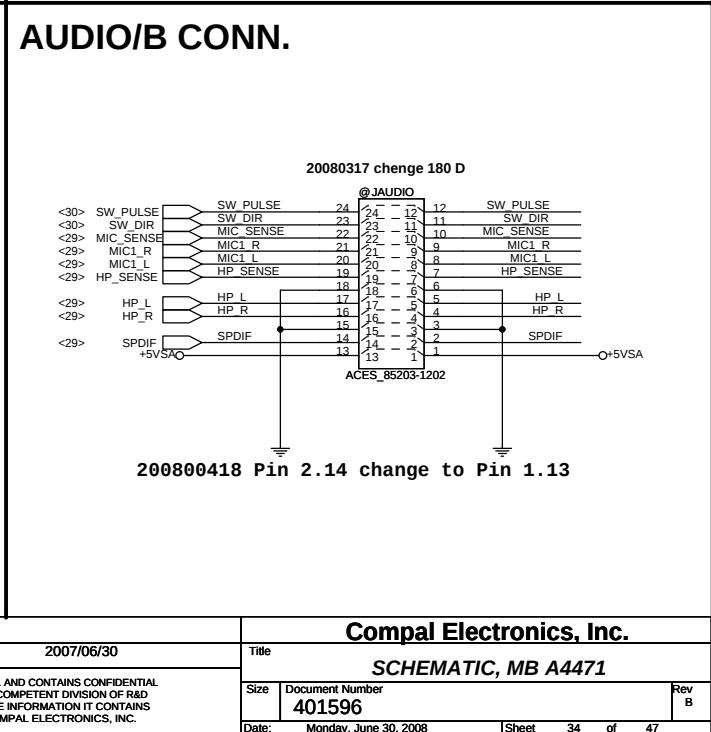
AUDIO/B CONN.

20080317 chenge 180 D

@AUDIO

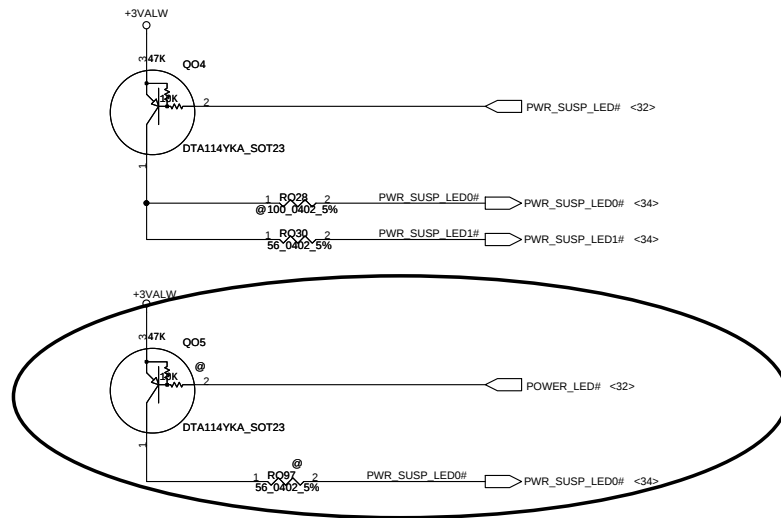
200800418 Pin 2.14 change to Pin 1.13

2007/06/30		Title		Compal Electronics, Inc.	
		Size		Schematic, MB A4471	
AND CONTAINS CONFIDENTIAL COMPETENT DIVISION OF R&D E INFORMATION IT CONTAINS MPAL ELECTRONICS, INC.		Document Number		Rev B	
		401596			
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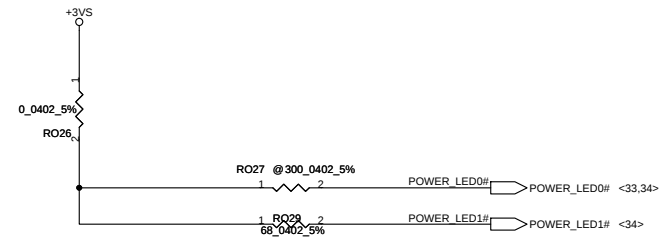


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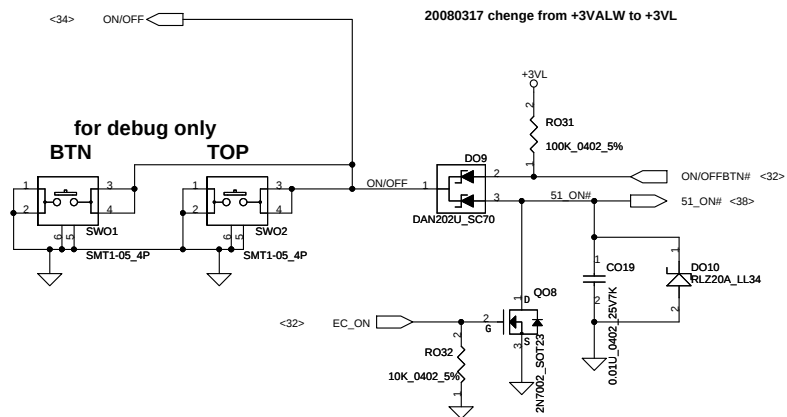
Power Suspend LED



Power on LED

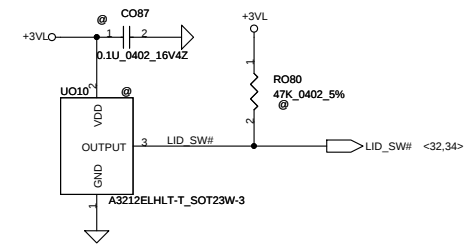


ON/OFF BUTTON



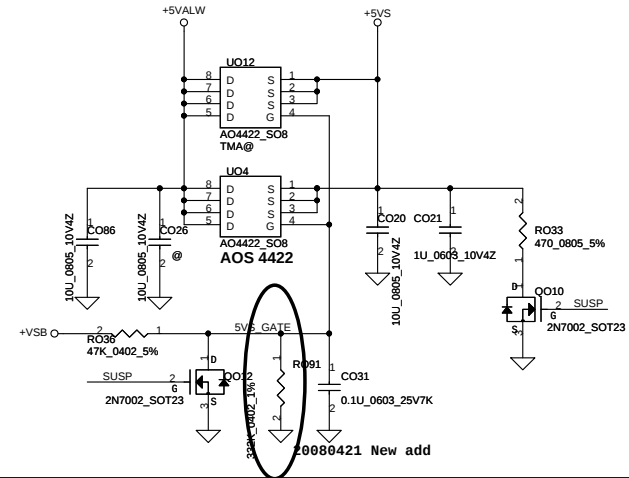
Lid SW

Change LID Switch to LED/B for S3 Issue

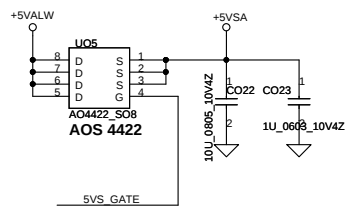


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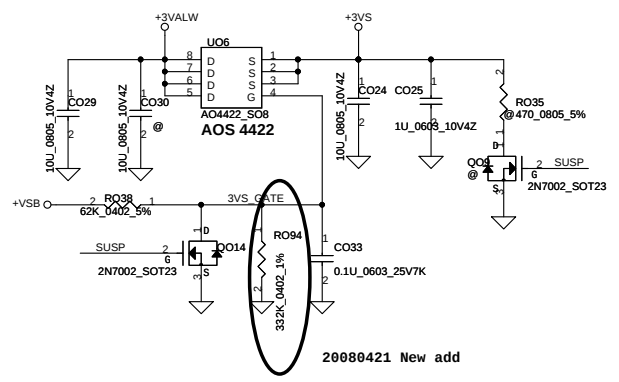
+5VALW TO +5VS



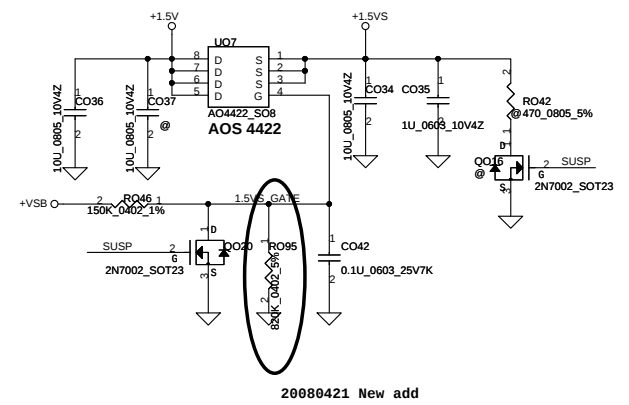
+5VALW TO +5VSA (For Amp)



+3VALW TO +3VS

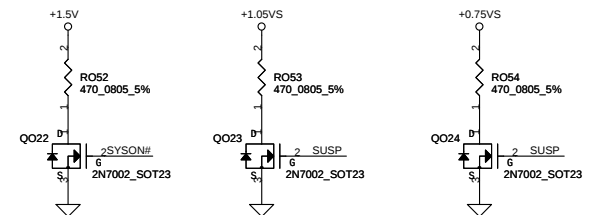
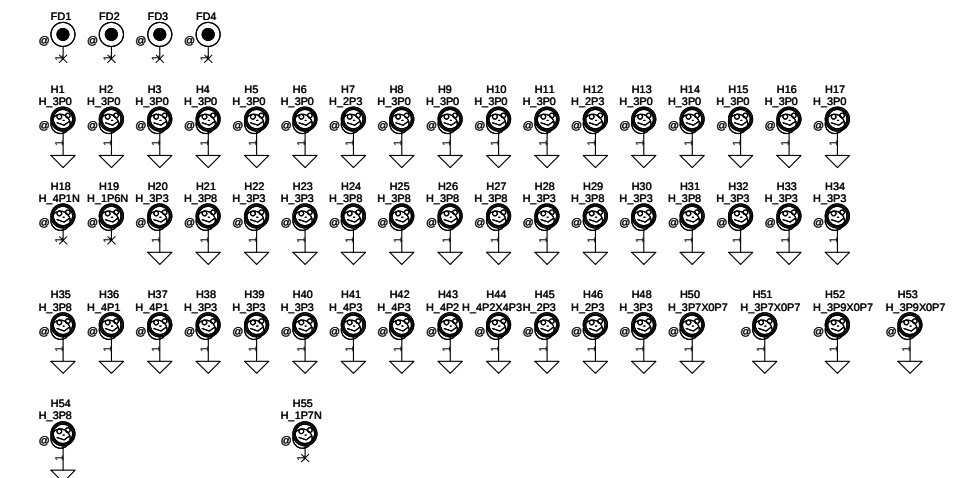
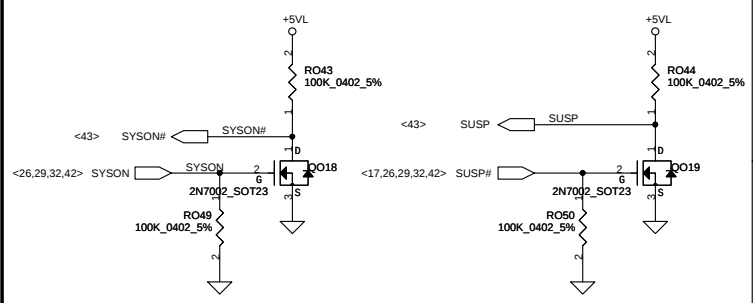


+1.5V to +1.5VS



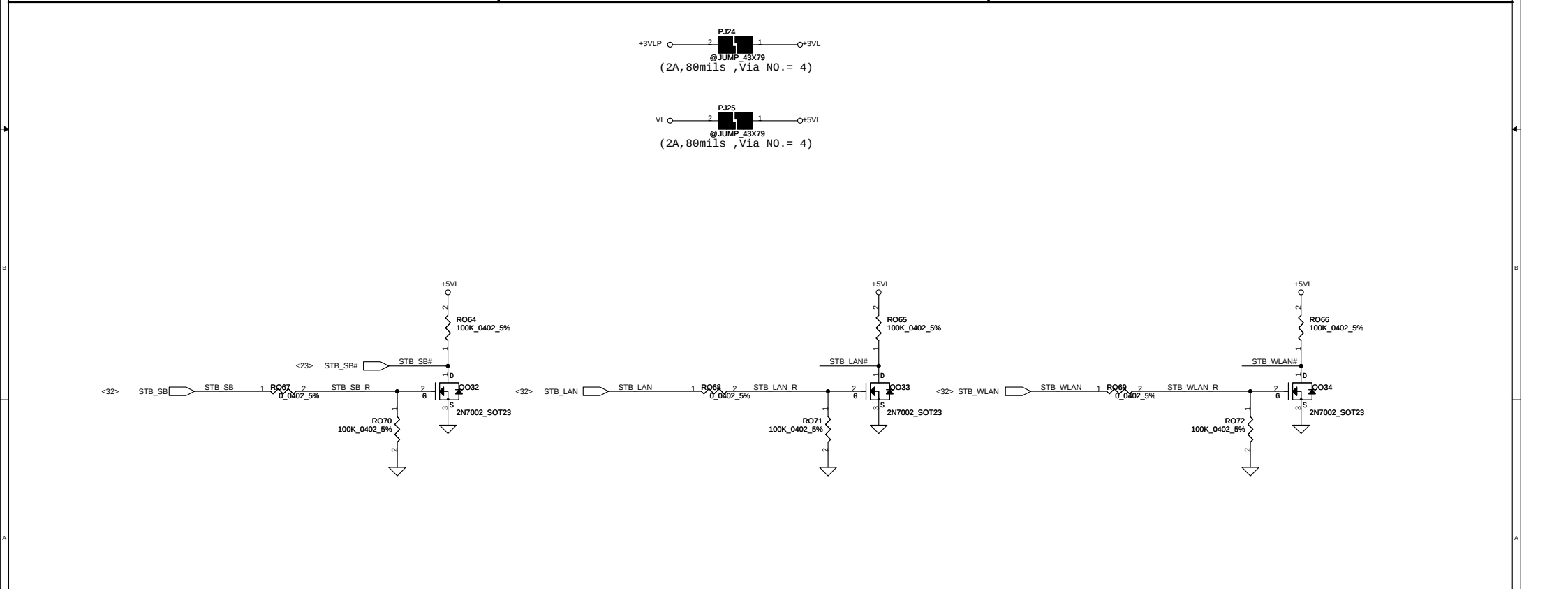
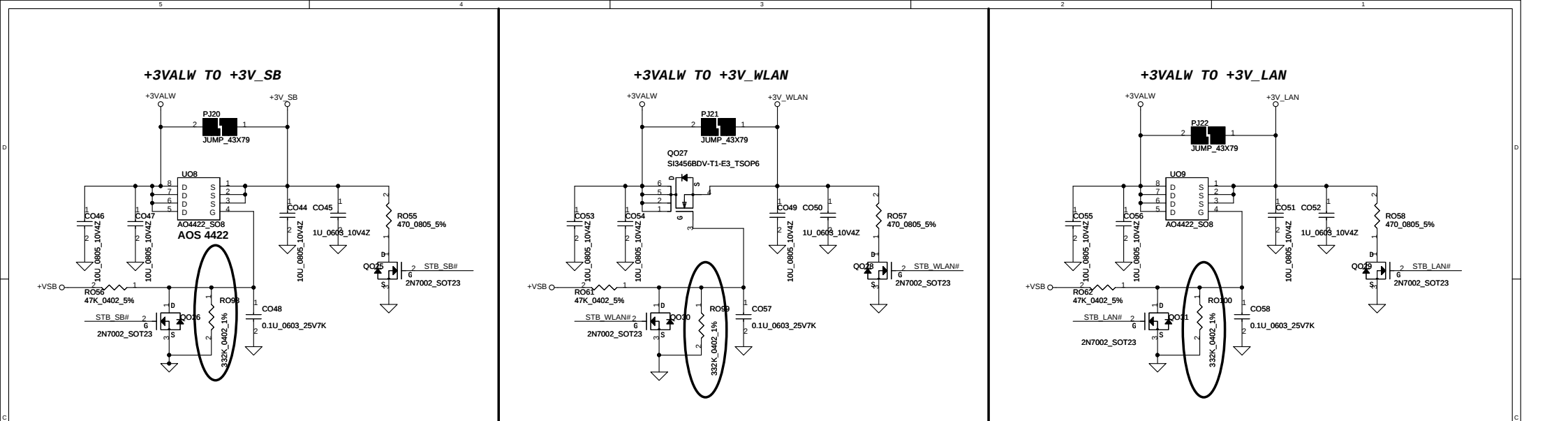
+1.1VALW to +1.1VS

20080305 del 1.1V switch



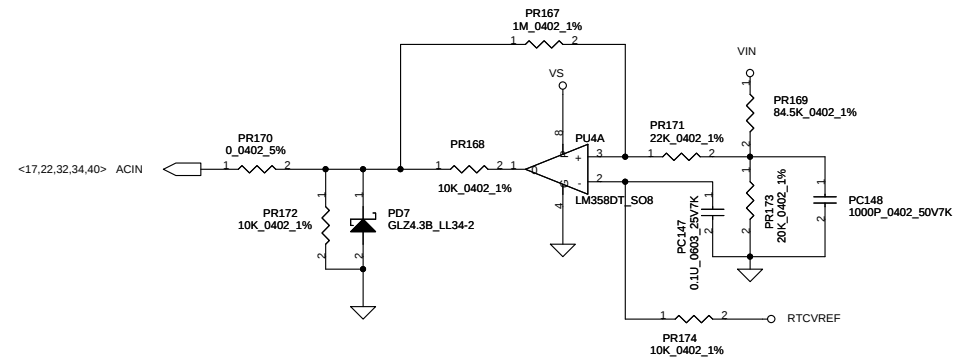
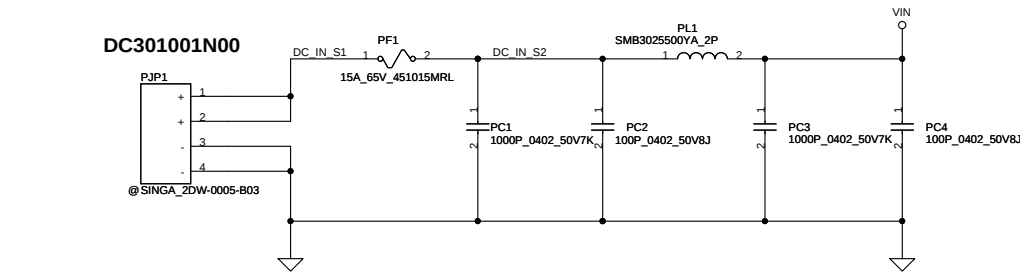
20080307 new add for Thermal 20080421 new add for Thermal FAN

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				401596	Rev B
				Date	Wednesday, June 04, 2008
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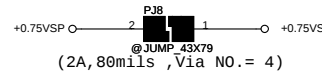
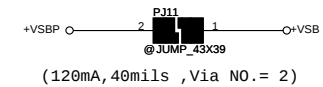
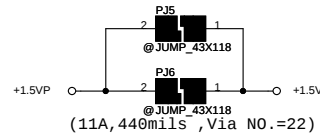
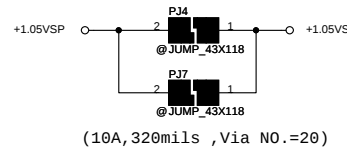
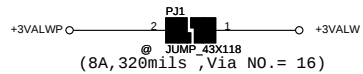
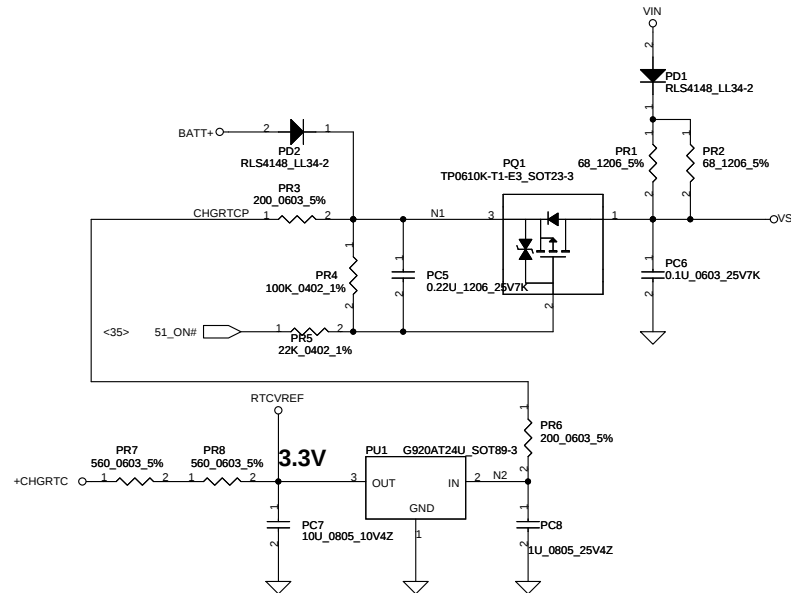
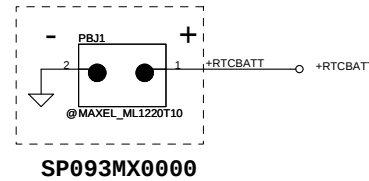
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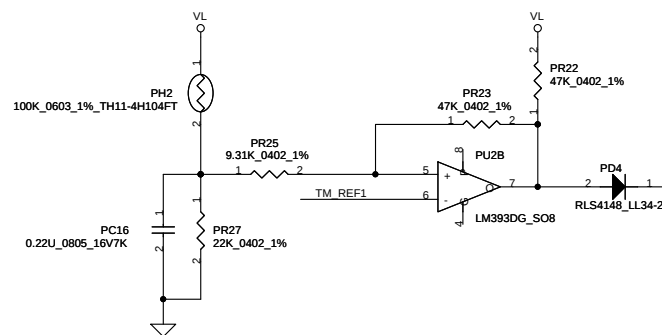
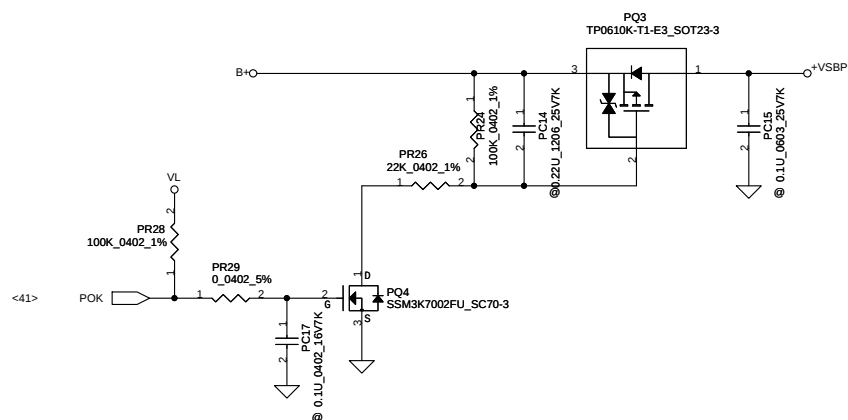
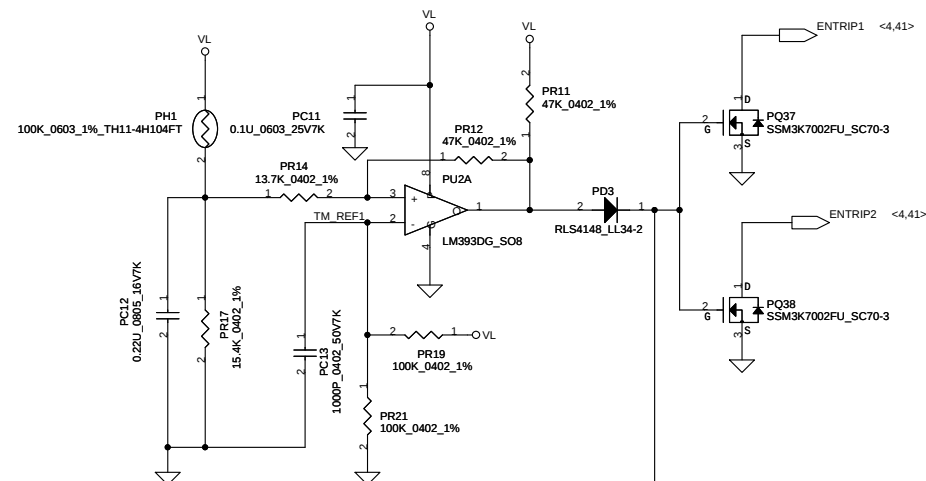
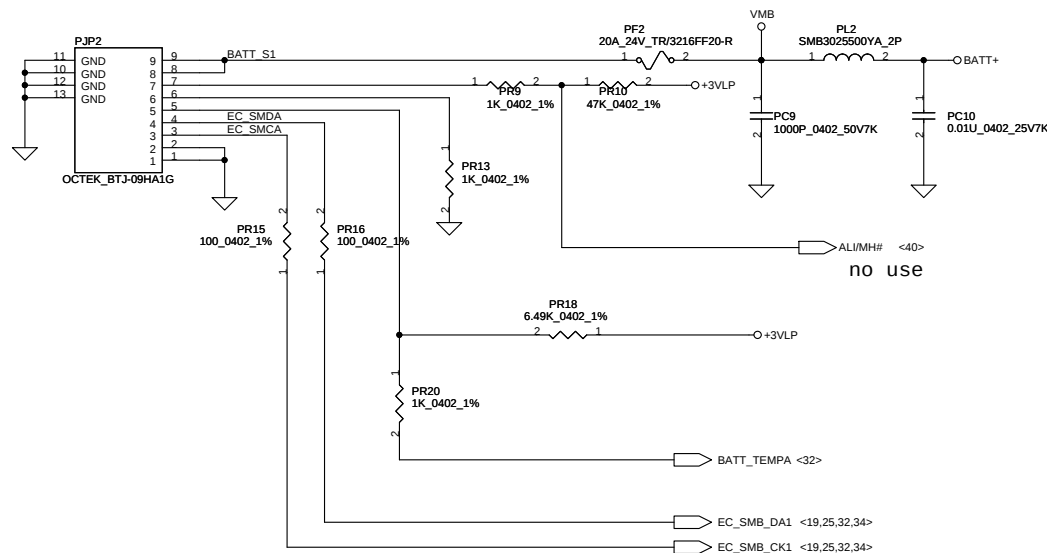
Vin Detector

High 18.384 17.901 17.430
Low 17.728 17.257 16.976

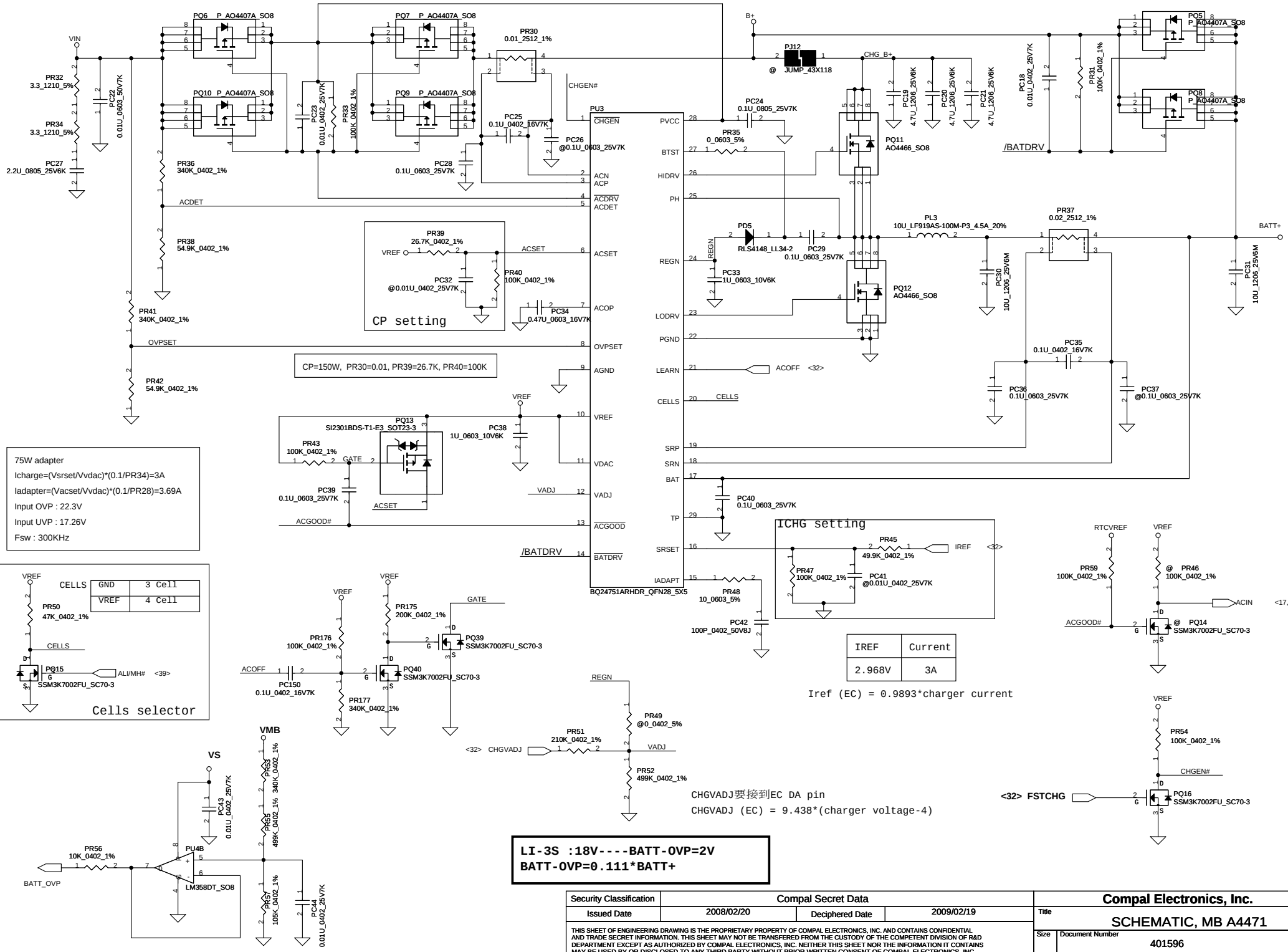
RTC Battery



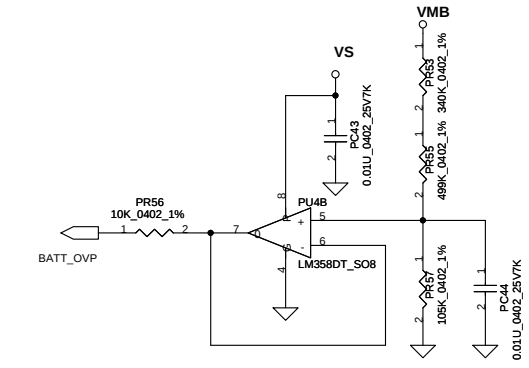
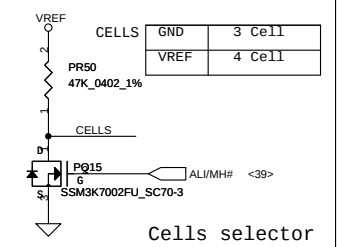
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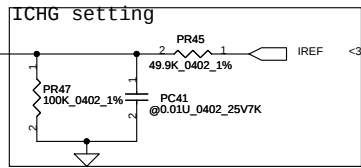
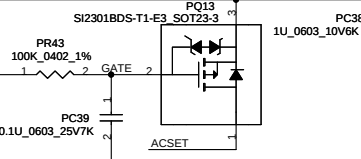
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75W adapter
 $I_{charge} = (V_{srset}/V_{vdac}) * (0.1/PR34) = 3A$
 $I_{adapter} = (V_{acset}/V_{vdac}) * (0.1/PR28) = 3.69A$
Input OVP : 22.3V
Input UVP : 17.26V
Fsw : 300KHz



CP=150W, PR30=0.01, PR39=26.7K, PR40=100K



IREF	Current
2.968V	3A

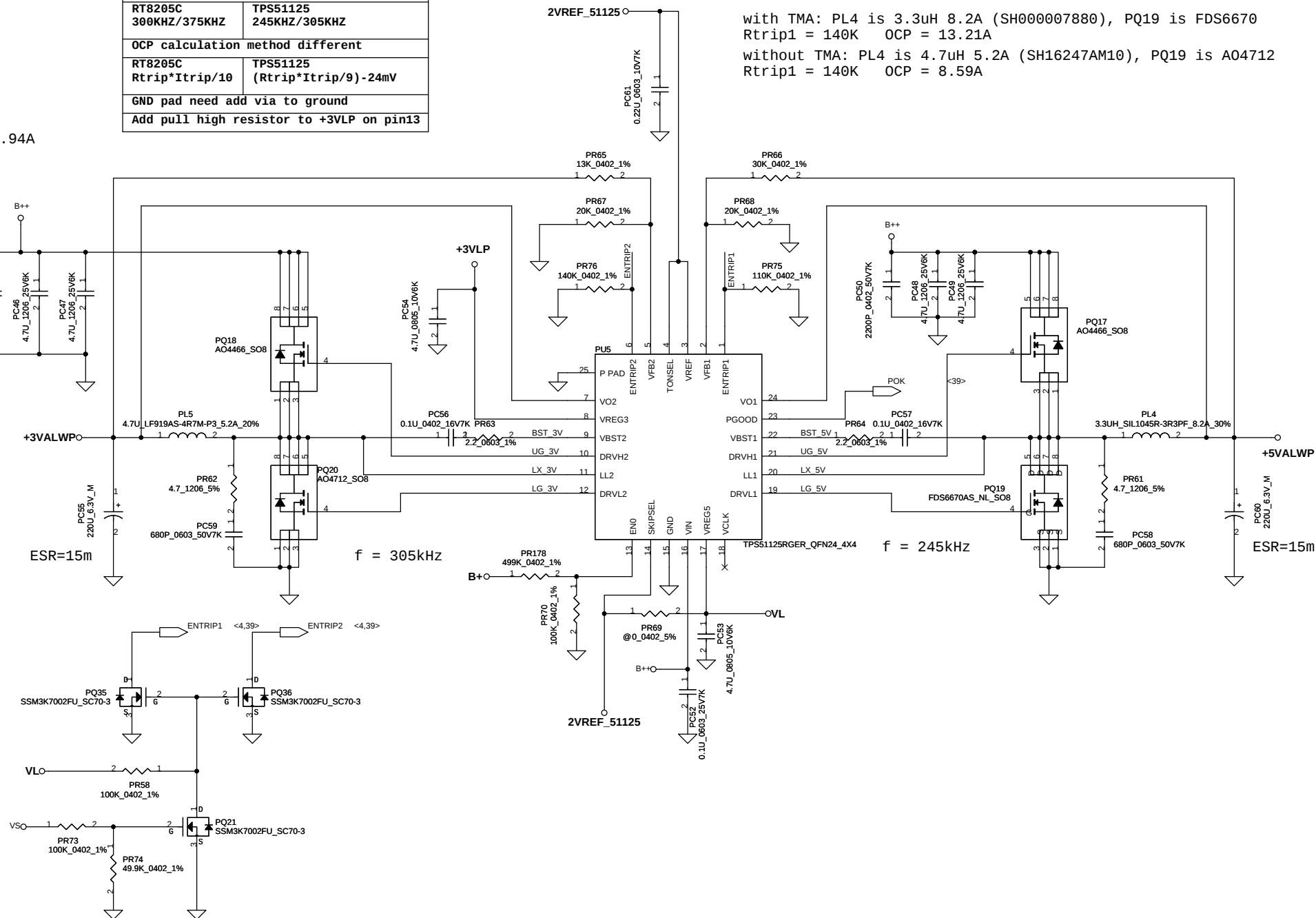
Iref (EC) = 0.9893*charger current

LI-3S :18V----BATT-OVP=2V
BATT-OVP=0.111*BATT+

Frequency different	
RT8205C 300KHZ/375KHZ	TPS51125 245KHZ/305KHZ
OCP calculation method different	
RT8205C Rtrip*Itrip/10	TPS51125 (Rtrip*Itrip/9)-24mV
GND pad need add via to ground	
Add pull high resistor to +3VLP on pin13	

OCP = 7.94A

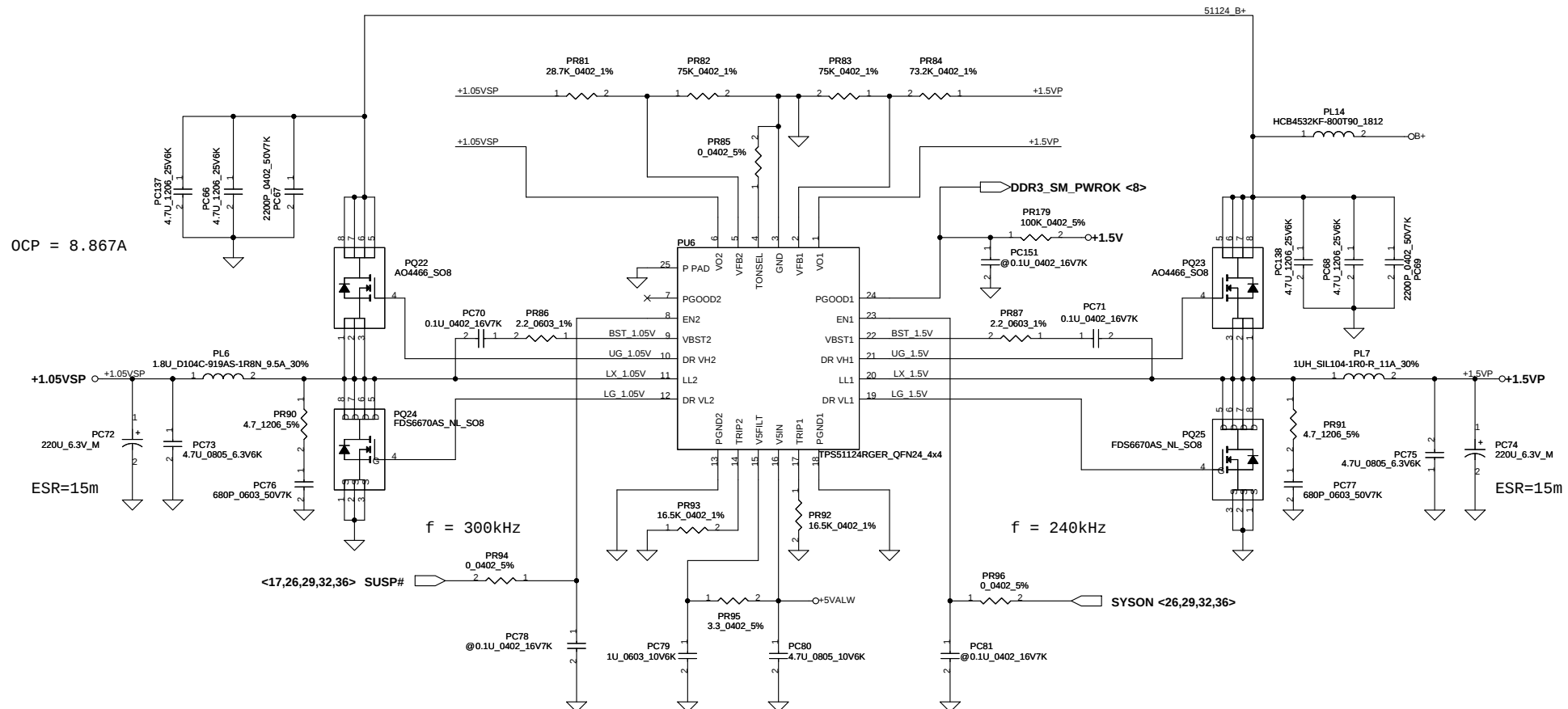
with TMA: PL4 is 3.3uH 8.2A (SH000007880), PQ19 is FDS6670
Rtrip1 = 140K OCP = 13.21A
without TMA: PL4 is 4.7uH 5.2A (SH16247AM10), PQ19 is A04712
Rtrip1 = 140K OCP = 8.59A



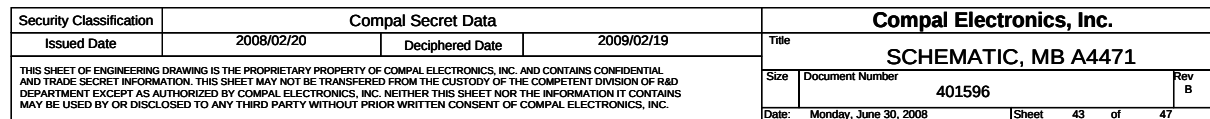
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with TMA: PL7 is 1uH 11A (SH000009080), PQ25 is FDS6670
Rtrip1 = 16.5K OCP = 15.31A

without TMA: PL7 is 1uH 11A (SH000009080), PQ25 is AO4712
Rtrip1 = 16.5K OCP = 10.826A



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HW4 Product Improvement Record (P.I.R.)

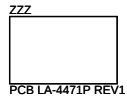
KSRAA LA-4471P SCHEMATIC CHANGE LIST
REVISION CHANGE: 0.1 TO 0.2

Rev 0.1 to 0.2

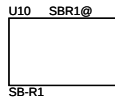
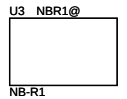
NO	PAGE	MODIFICATION LIST	PURPOSE
1	4	Del RC8	Repeat
2	4	Del RC10	Repeat
3	14	RD6 @	For Boot
4	32	R020 @	For Boot
5	25	Del RE10	For Boot
6	32	Add Pin 66 LOM_WAKE# to LAN IC	For LAN WAKE UP
7	32	Add TMPSPR_SXP pull up +3VS	For EC
8	36	Add FAN NPTH hole H55	For ME require
9	36	Change H54 size to 3P8	For ME require
10	36	Add R091.R094.R095	For PE require
11	32	Change Pin 16 to UWB_OFF#,R096 100K Ohm pull high	For A51 require
12	17	Add JVGA Pin161 to 1.8VS	For +1.8VS drop concern
13	22	Add R1091,R1092,R1093	For FM tuner SMBUS pull high
14	19	Del UV12,UV13,CV69,CV68	For A51 require
15	19	RV83 @. DV7 Mount	For A51 require
16	19	Add DV10,RV94,RV95,RV96,RV97,RV98	For DP function
17	17	Add Pin 164.Pin162	For DP function
18	14	RD19@	
19	15	RD20@	
19	36	Add RA74, RA75	For DP function

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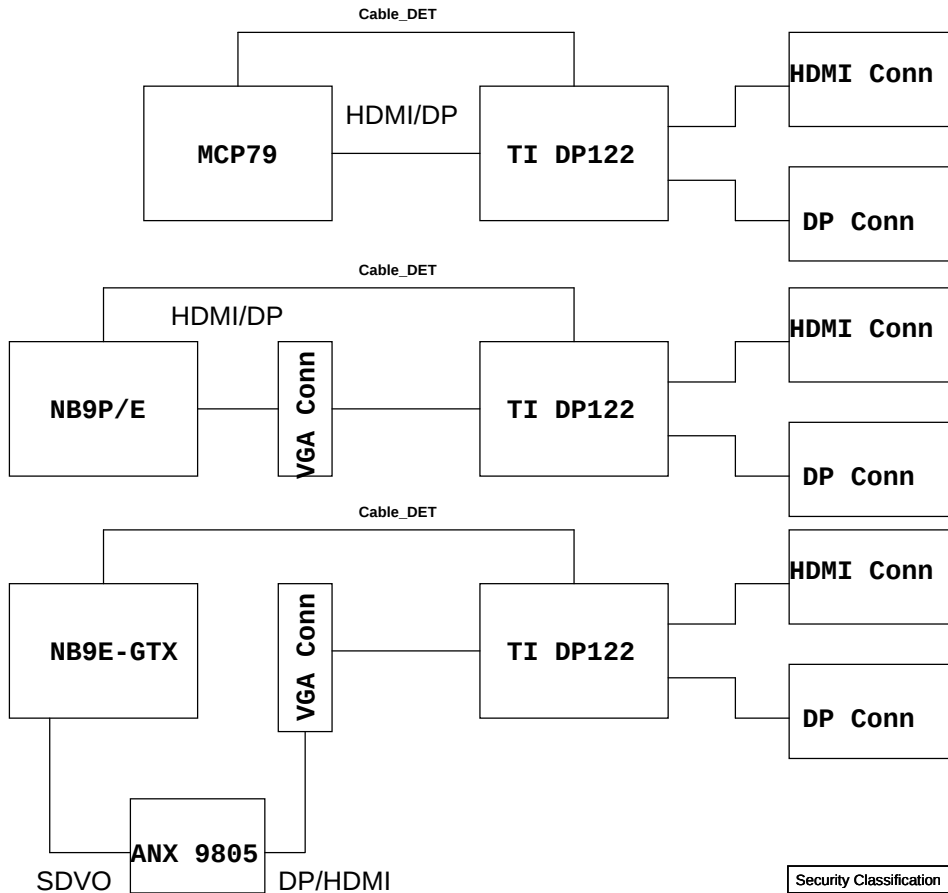
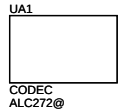
PCB



CHIPSET (R1)



CODEC



BOM Description

Define	Function
ALC272@	ALC272-CODEC
ALC268@	ALC268-CODEC
RJ11@	MODEM
CIR@	CIR function.
TMA@	Toshiba Media Accelerator
UWB@	Wireless USB
FP@	FINGER PRINT
2HDD@	Second Hard Disk
BT@	Blue Tooth
ROBSON@	ROBSON Board
TEST@	Test circuit
NODP@	Remove Display port
DP@	Display port
NBR3@	North Bridge R3
NBR1@	North Bridge R1
SBR3@	South Bridge R3
SBR1@	South Bridge R1

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Predator power block diagram

