

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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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
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EC SM Bus1 address

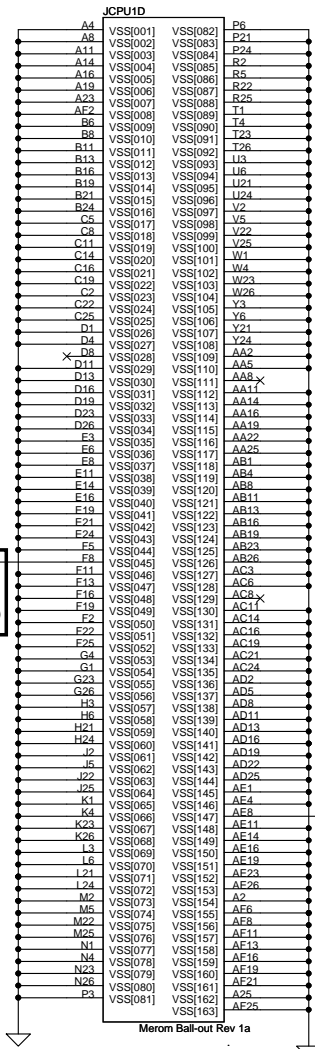
Power	Device	Address
+5VL	EC KB926 C0	
+5VL	Smart Battery	0001 011X b
+5VL	HDMI-CEC	0011 010x b
+5VL	FUN/B (CAP Sensor)	
+3VS	TMA THM Sen ADI ADM1032	1001 100x b

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

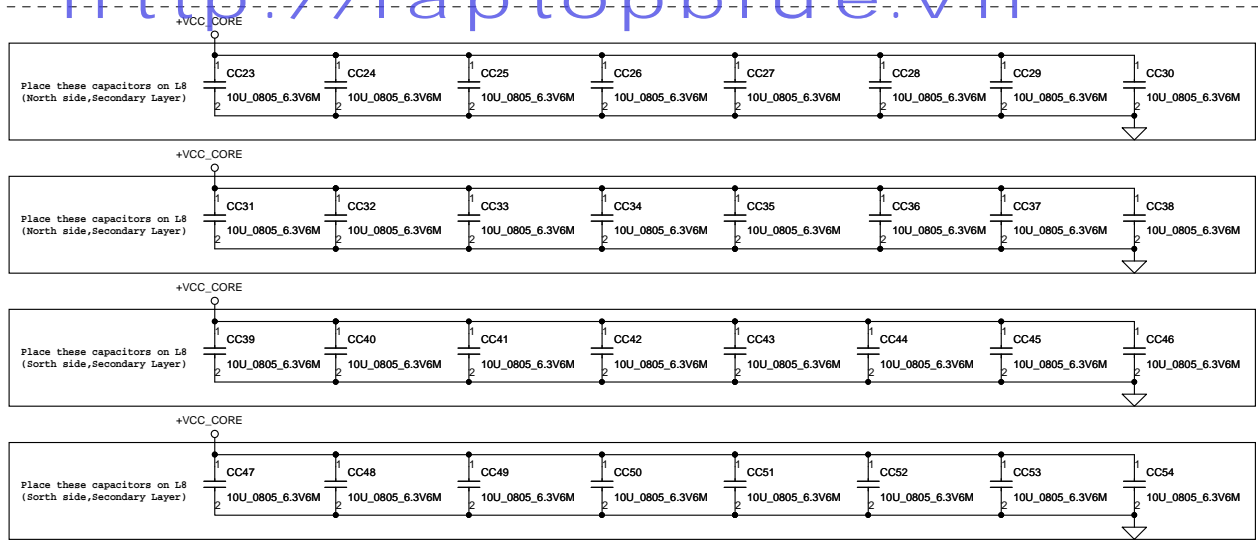
ICH9M SM Bus address

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

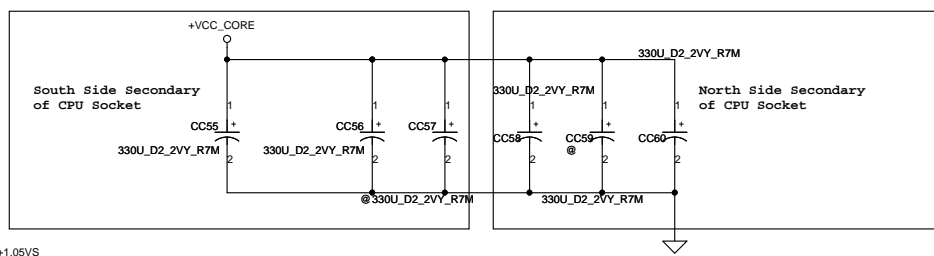


Pin F8
Dual Core: GND (internal)
Quad Core: Floating (internal)

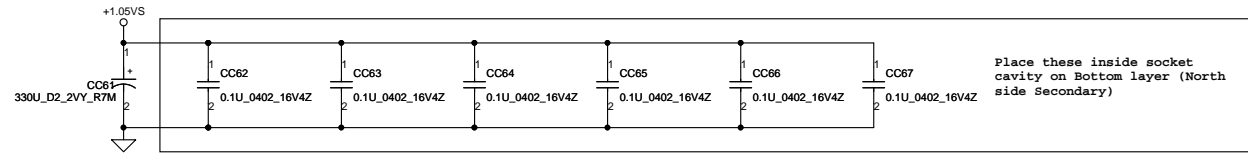
Pin D8,AA8,AC8 and AE8
Reserved for QC

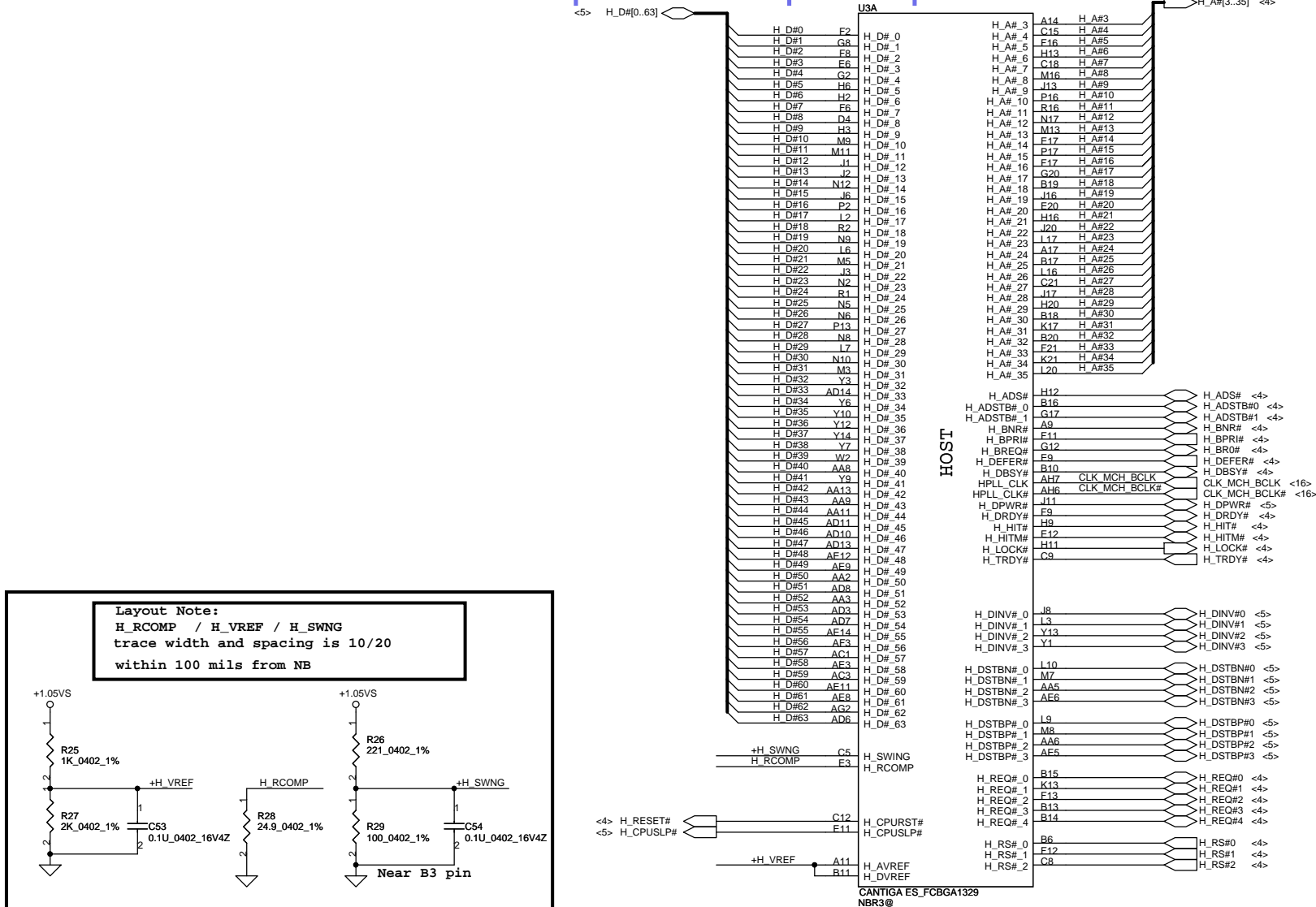


Mid Frequency Decoupling



ESR <= 1.5m ohm
Capacitor > 1980uF
330uF ESR 7m ohm X 6 PCS

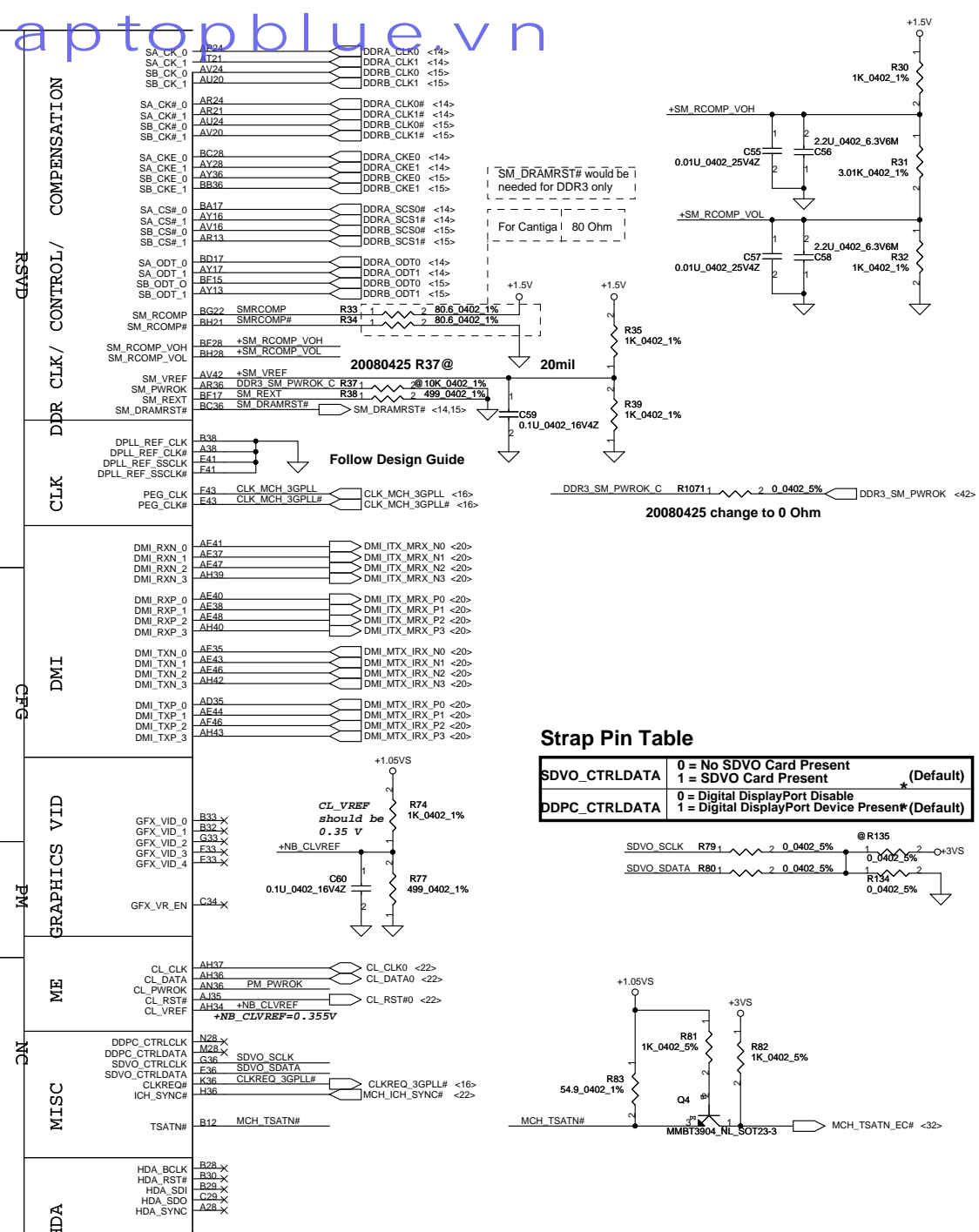
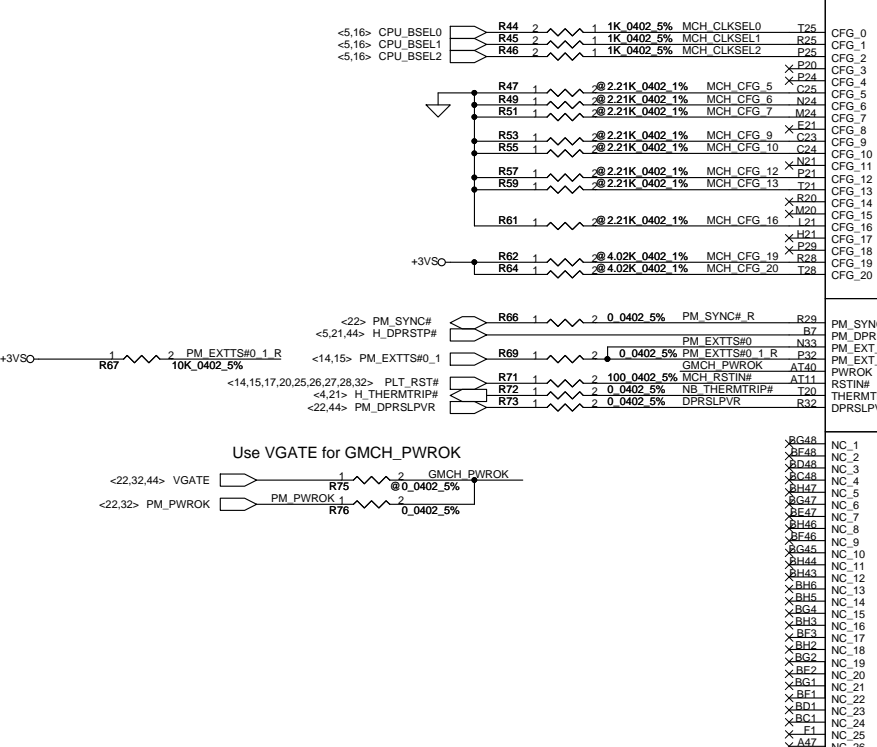




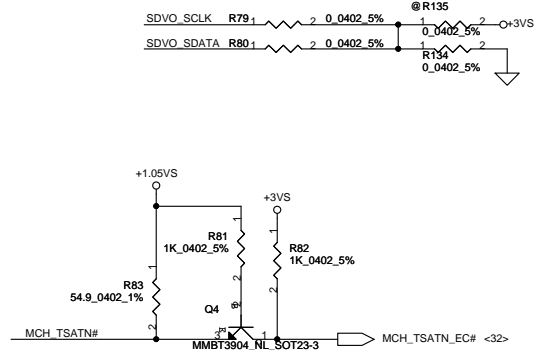
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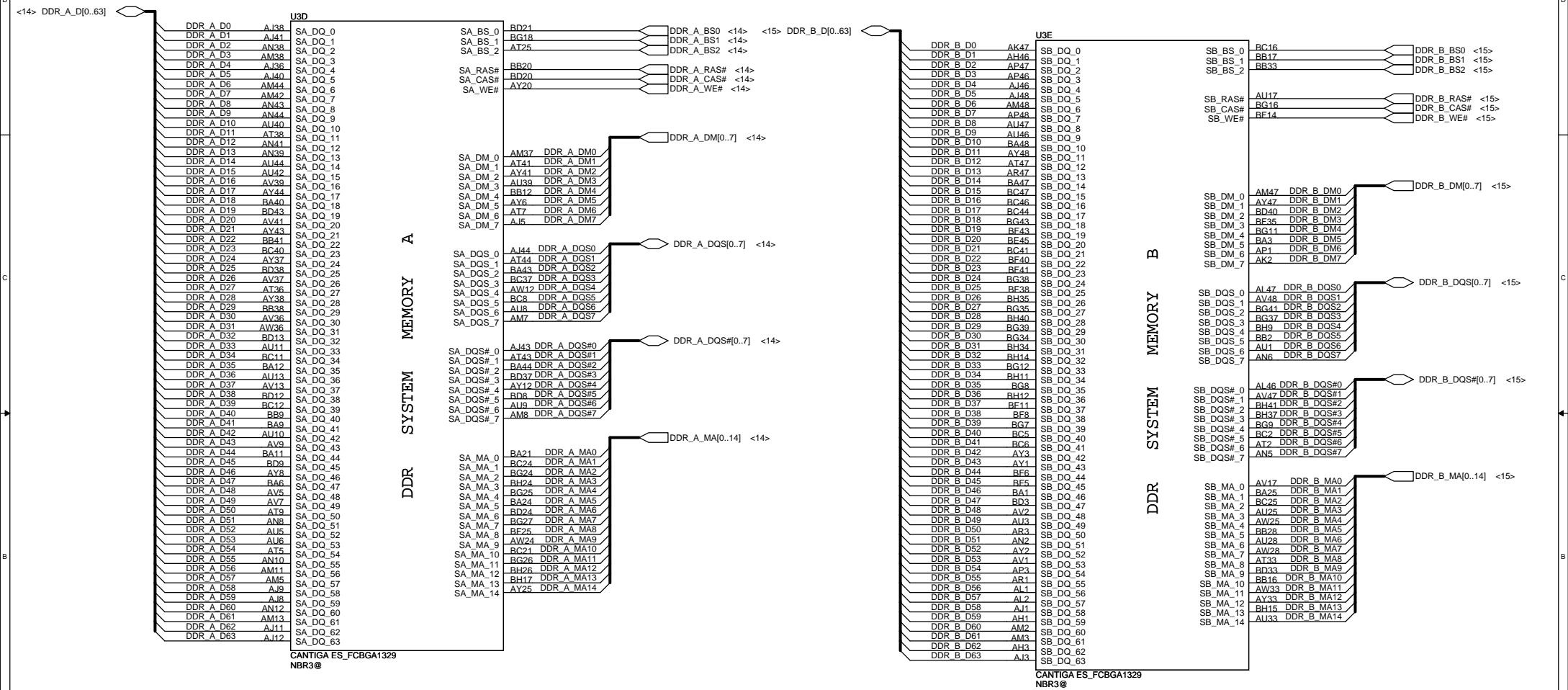
Strap Pin Table

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 disable 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	0 = Only PCIE or SDVO is operational. *(Default)
(PCIE/SDVO select)	1 = PCIE/SDVO are operating simu.



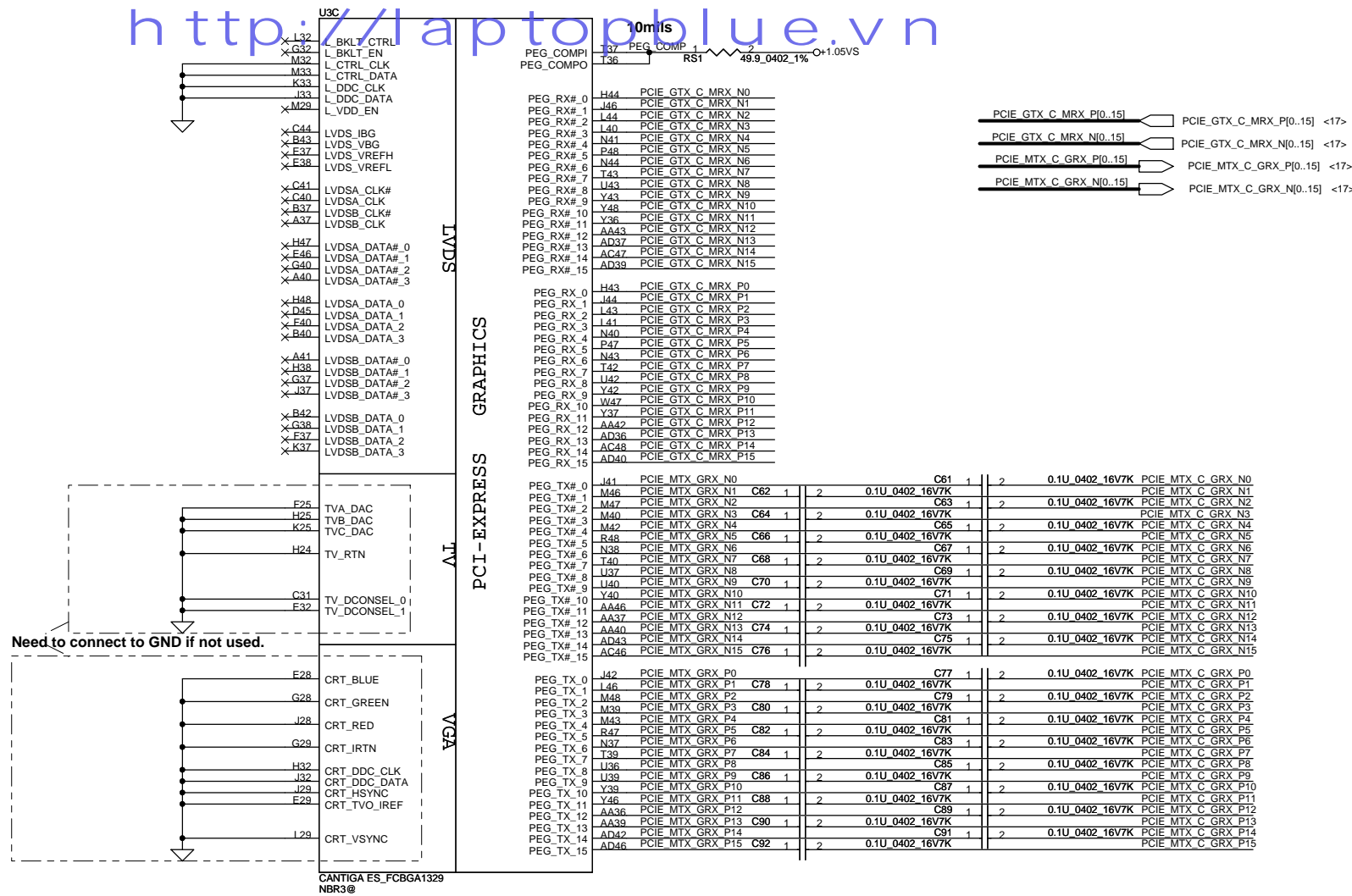
Strap Pin Table	
SDVO_CTRLDATA	0 = No SDVO Card Present 1 = SDVO Card Present <div style="text-align: right;">* (Default)</div>
DDPC_CTRLDATA	0 = Digital DisplayPort Disable 1 = Digital DisplayPort Device Present* (Default)

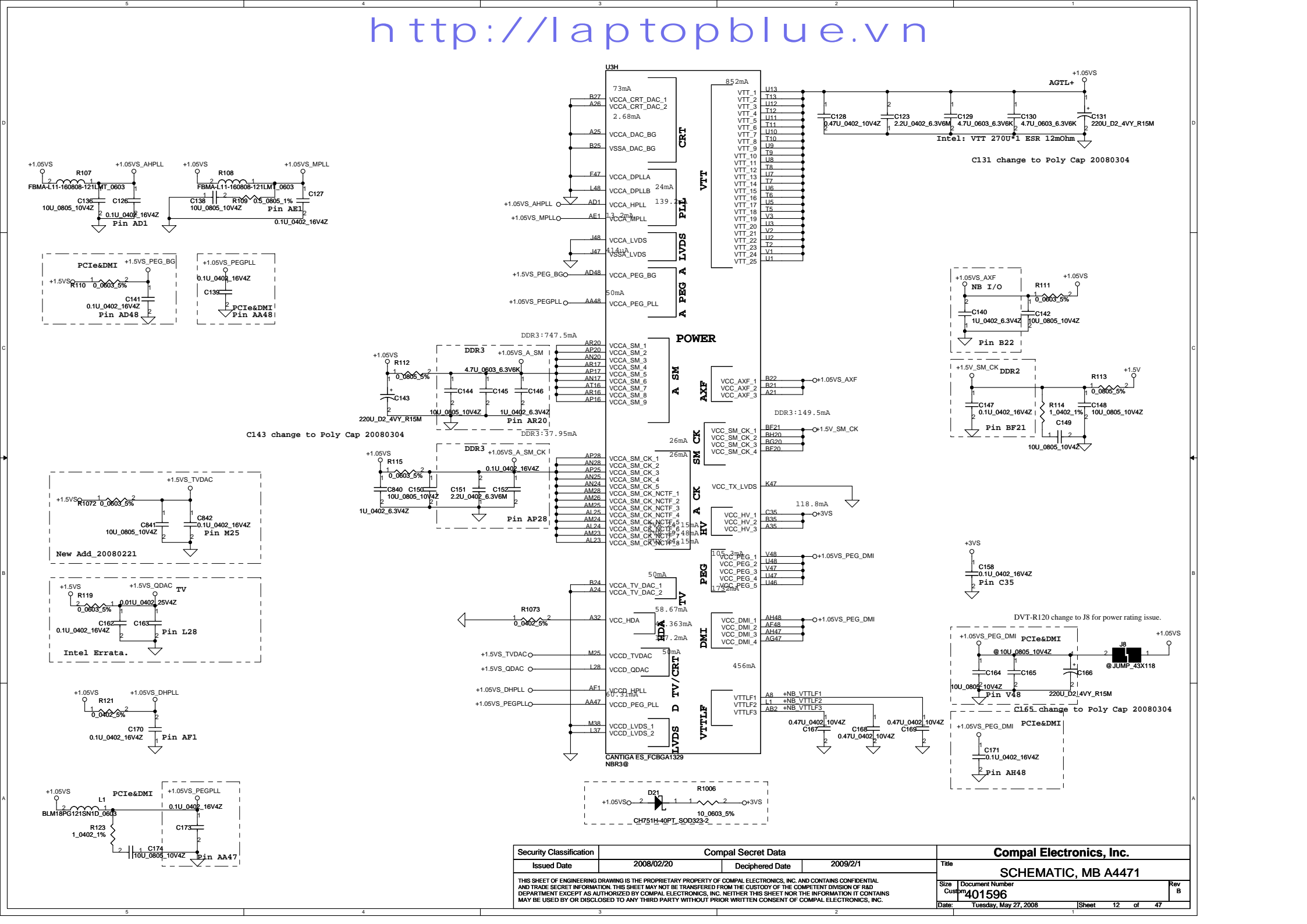




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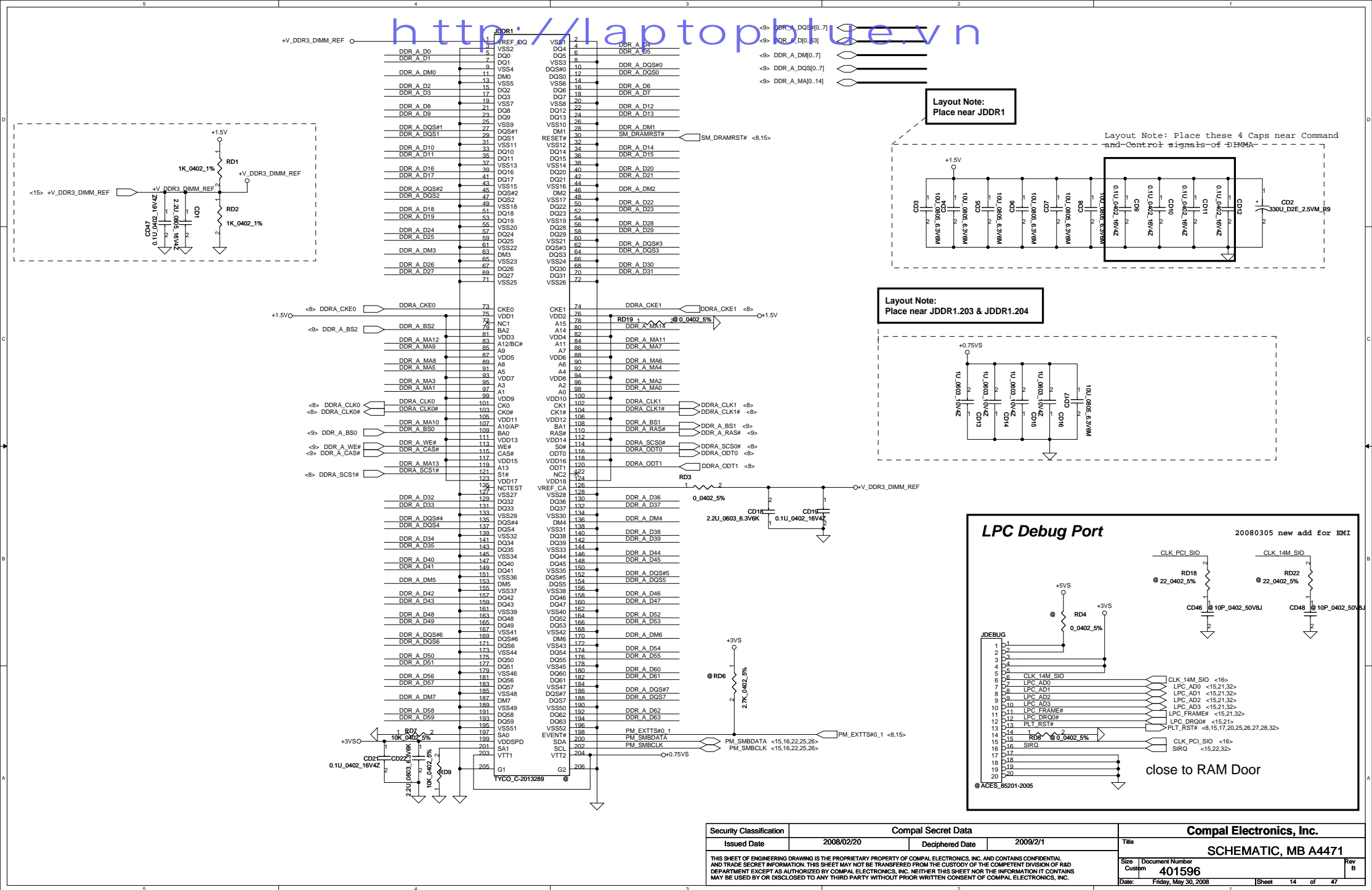
L_DDC_DATA
0 = LFP Disable * (Default)
1 = LFP Card Present; PCIE disable



[illegible]



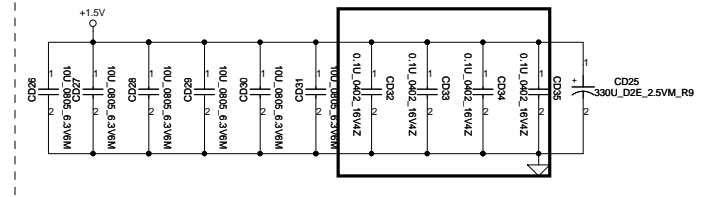
A vertical bar is divided into four segments labeled A, B, C, and D from bottom to top. An arrow points to the boundary between segments B and C.



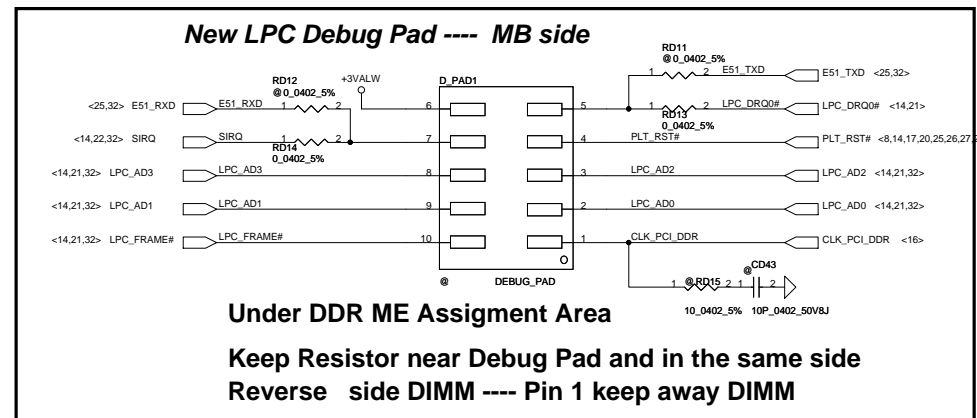
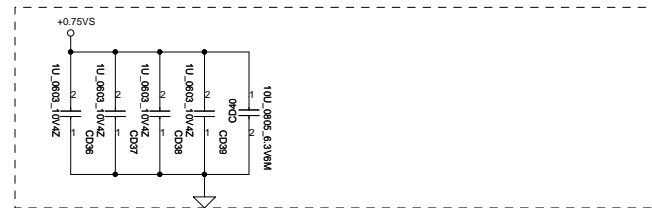
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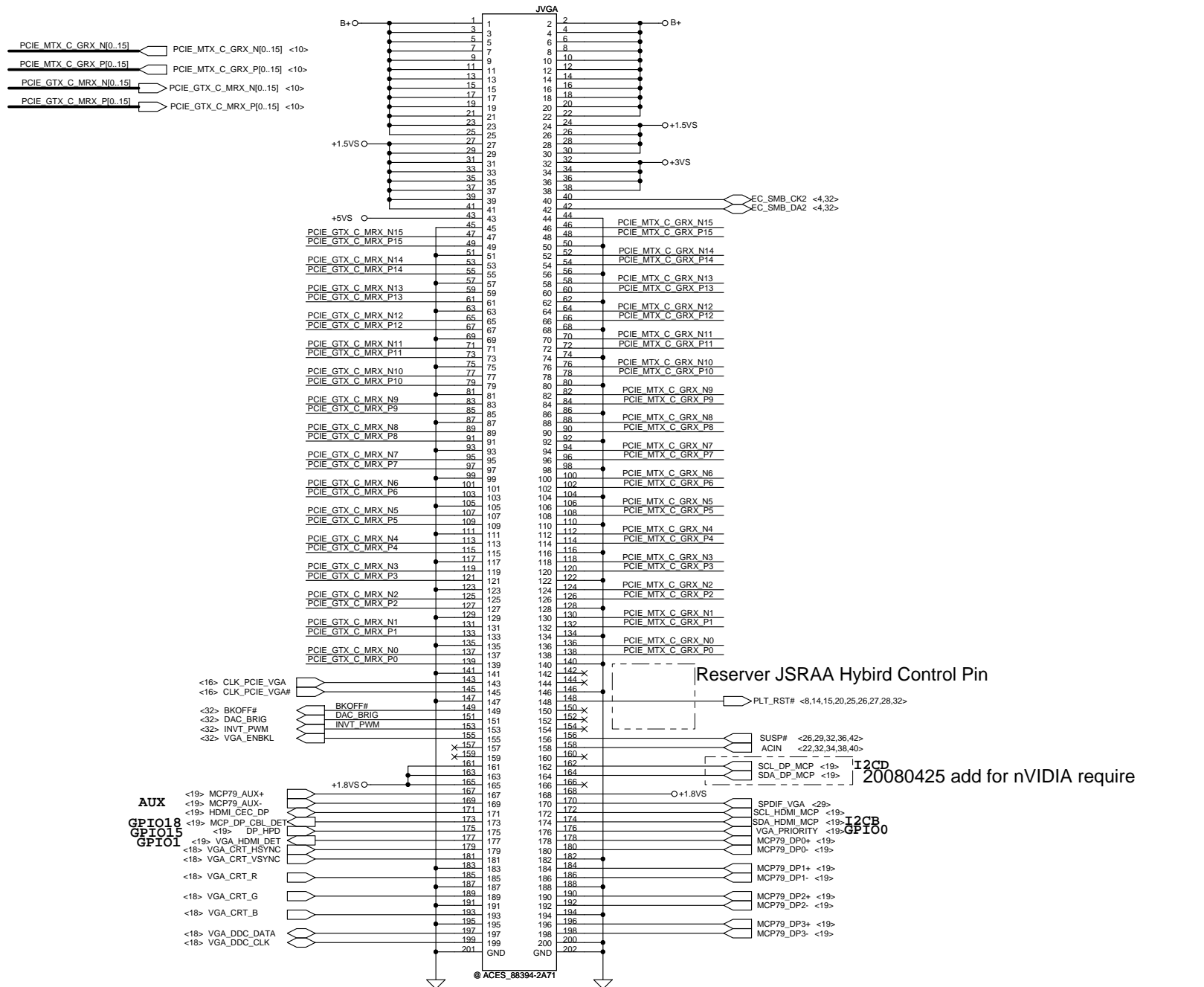
Layout Note: Place these 4 Caps near Command and Control signals of DIMMA



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



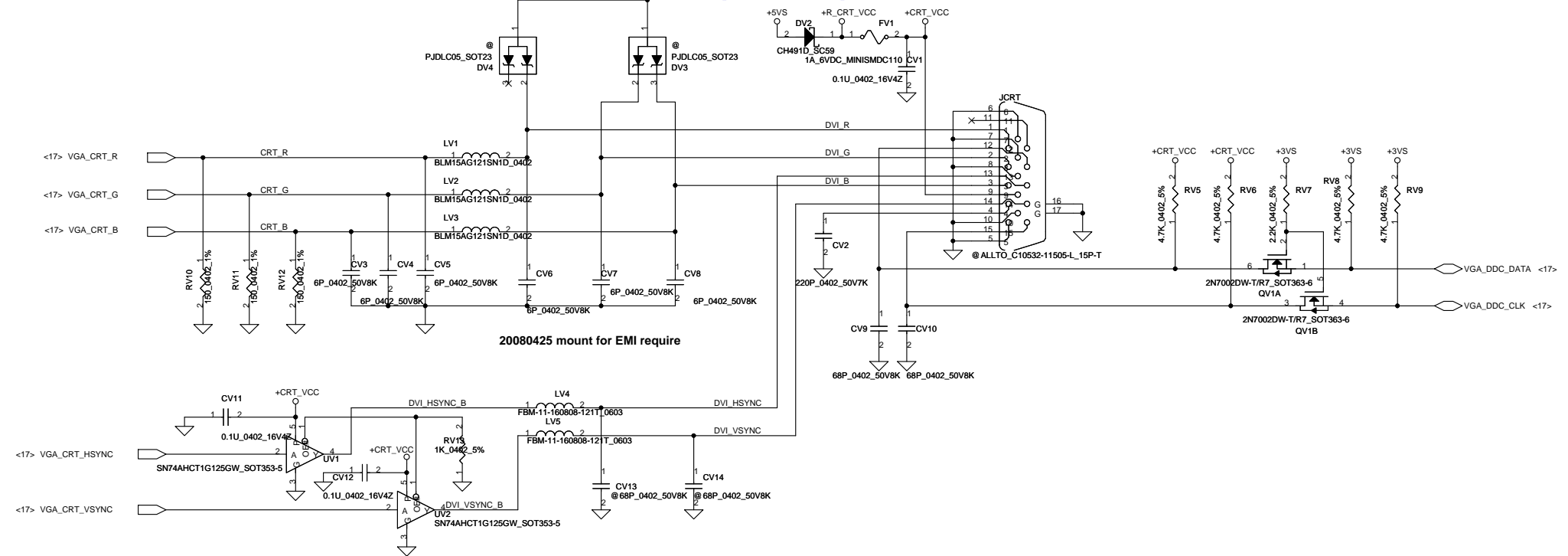
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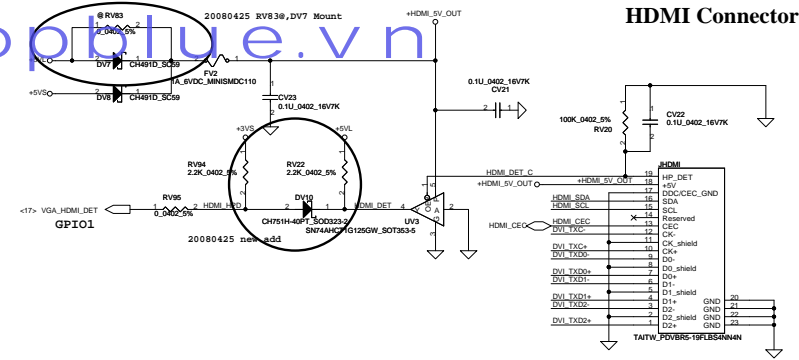


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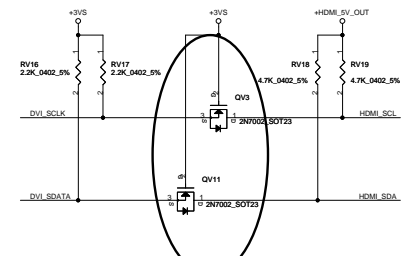
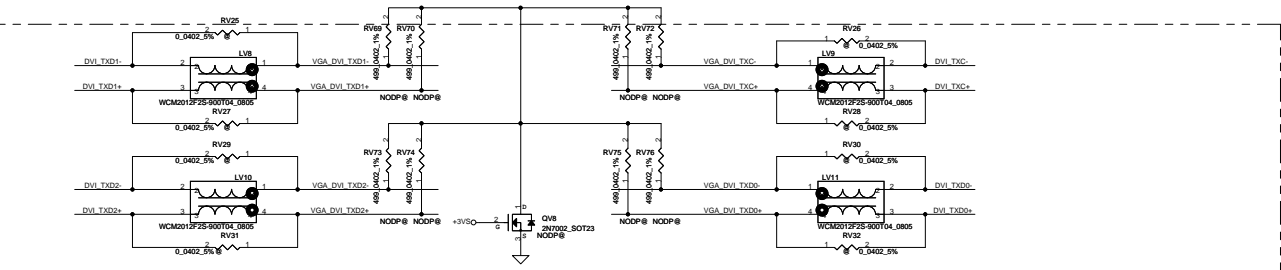
CRT CONNECTOR

http://laptopblue.vn

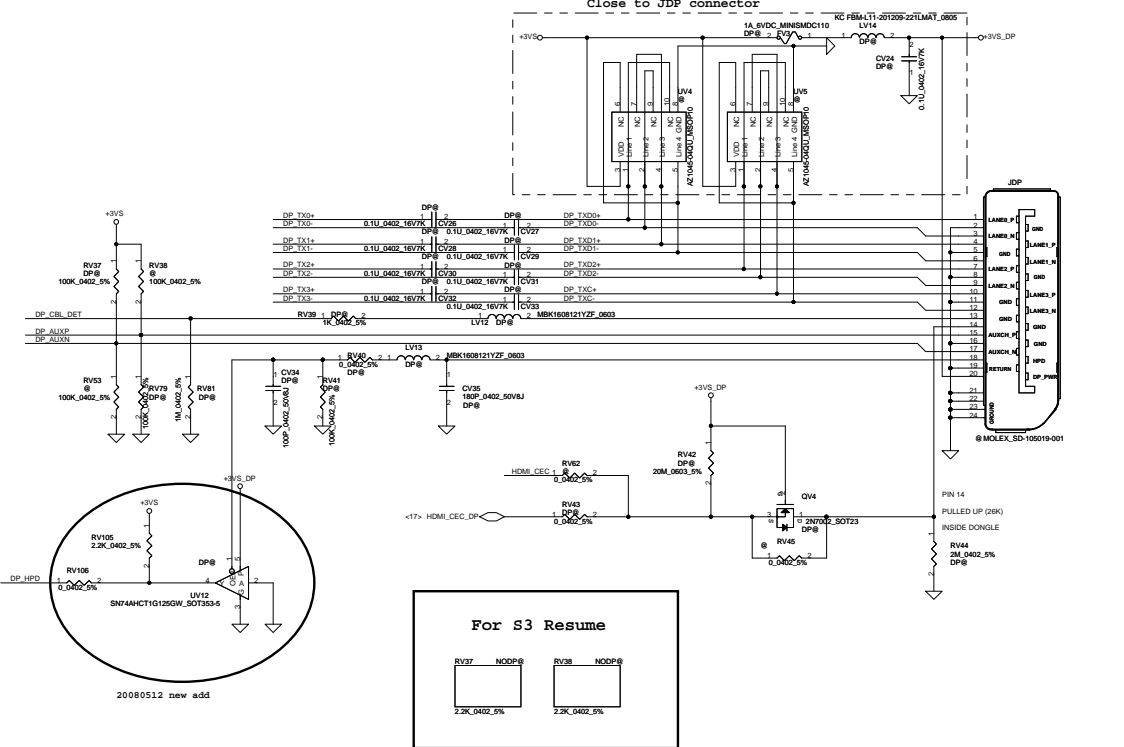
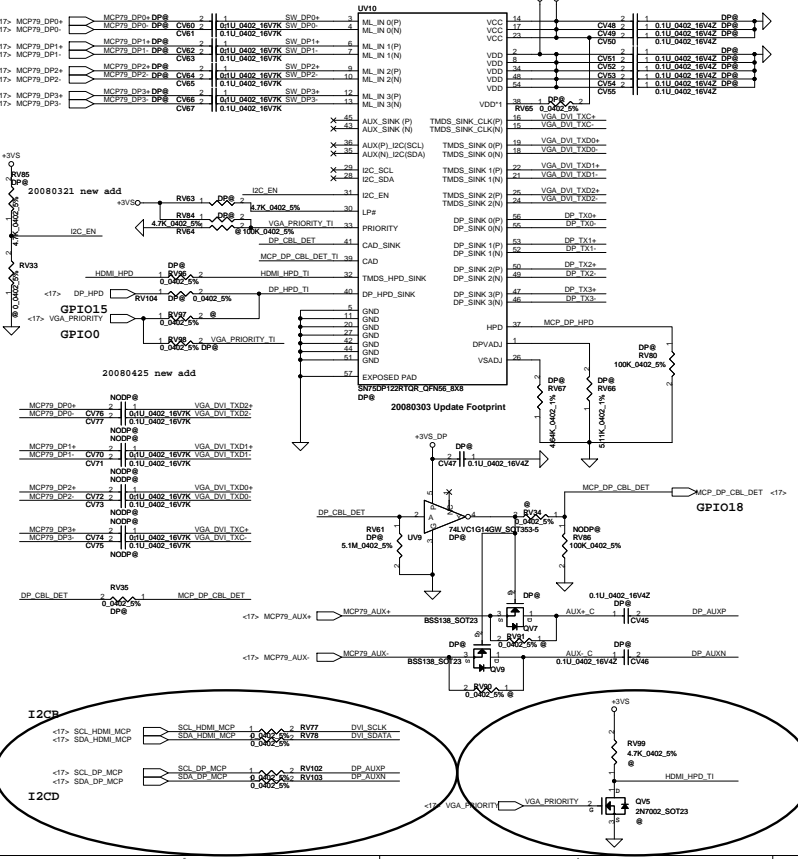




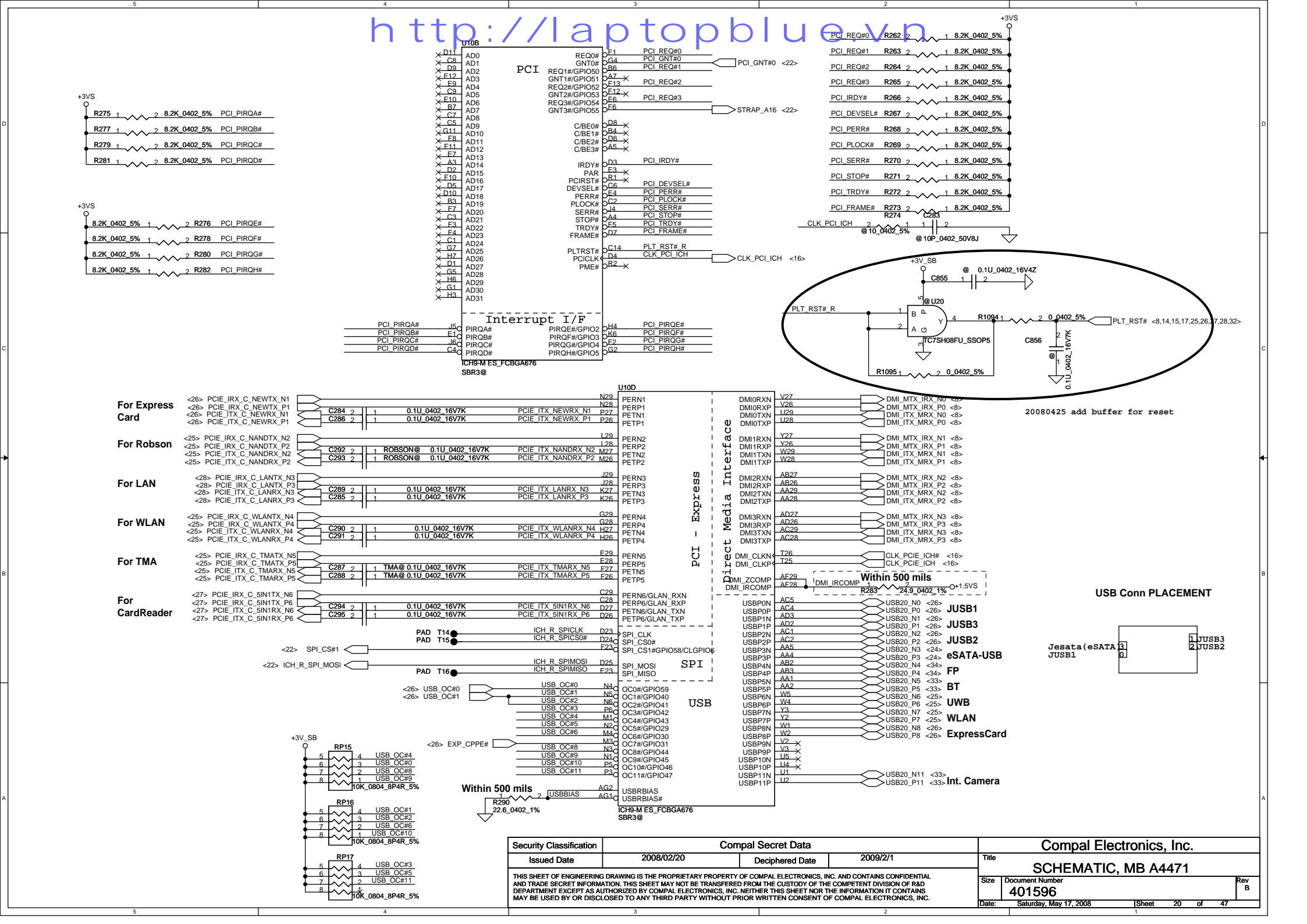
Close to JHDMI connector

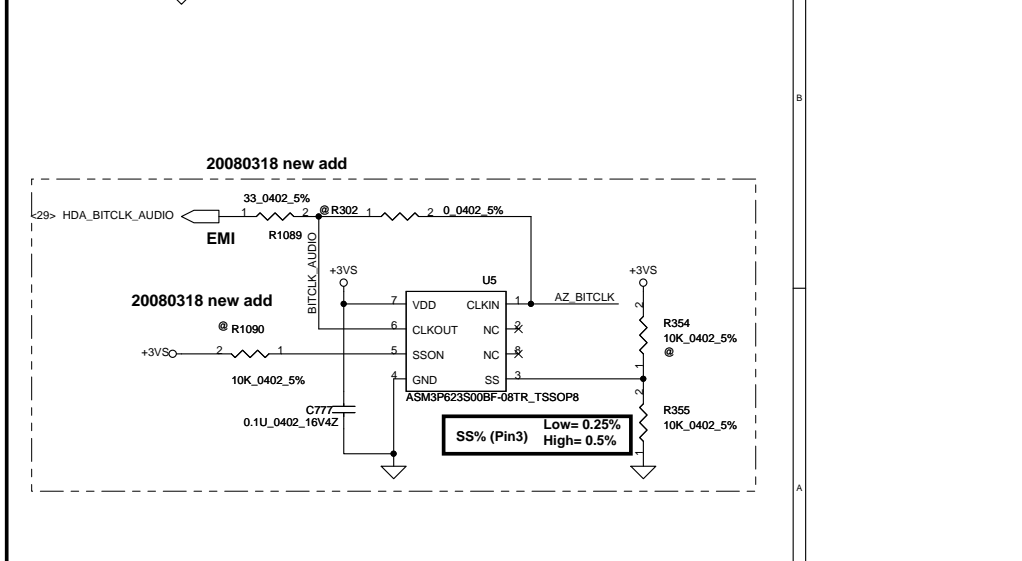
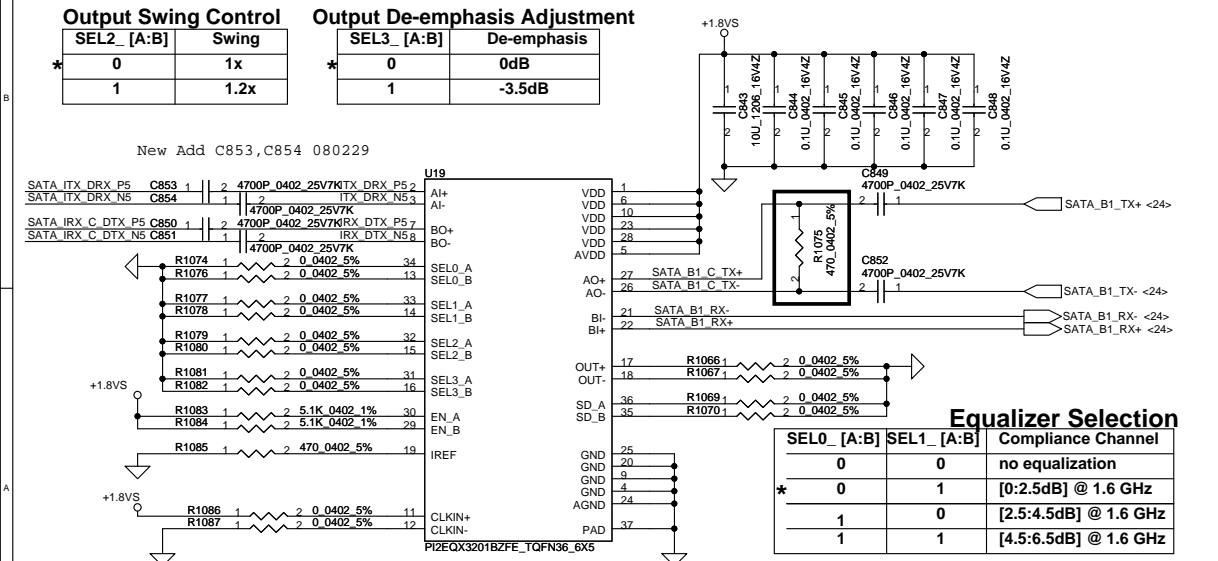
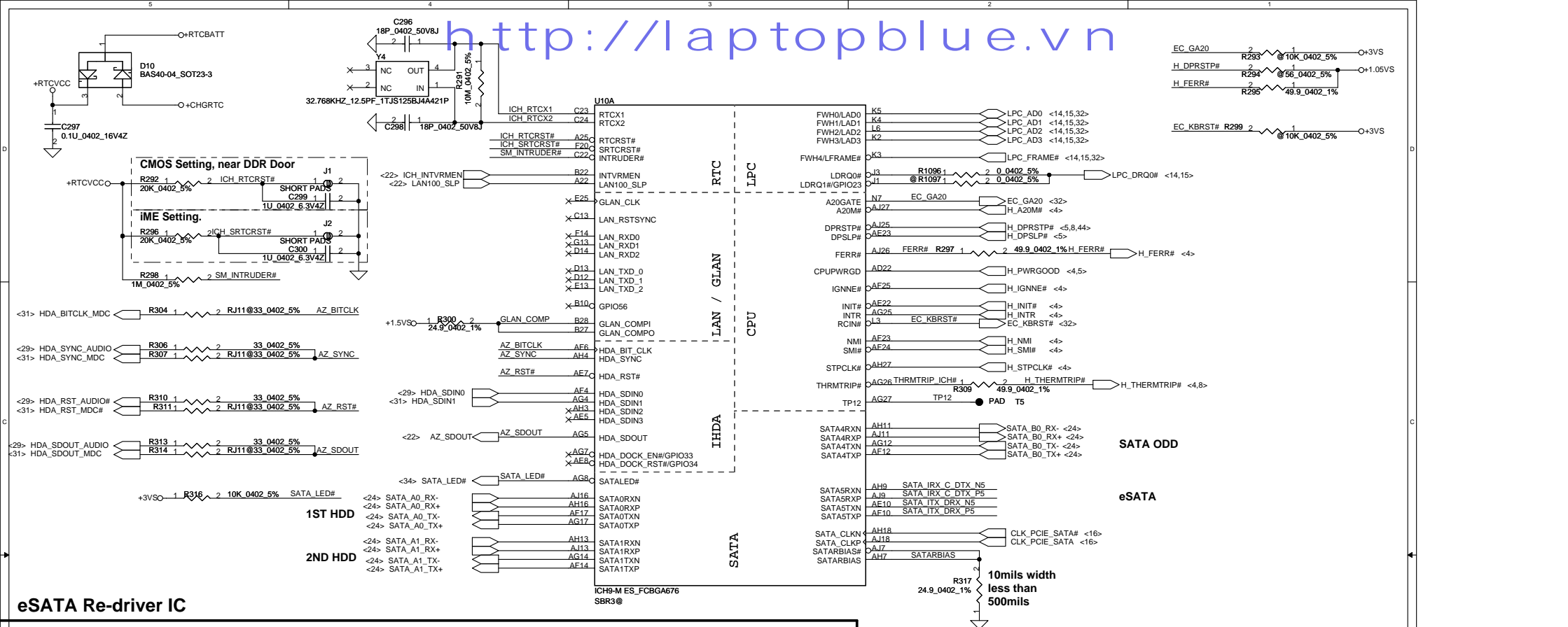


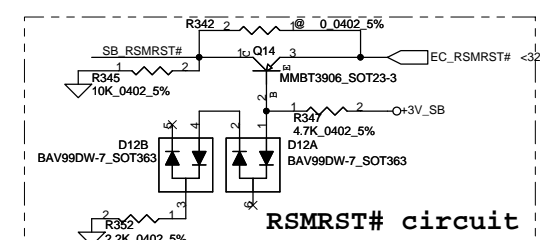
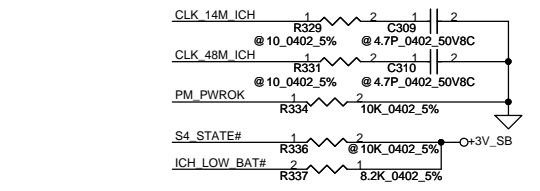
DisplayPort Connector



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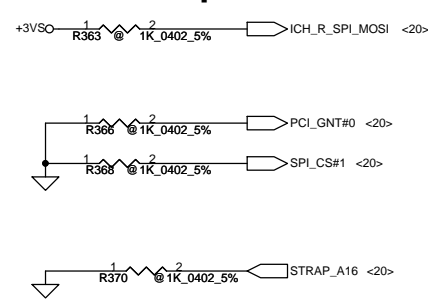




DMI Termination Voltage	
GPIO49	Low= Desktop used High= Mobile* (Internal pull-up)
iTPM Physical Presence	
CLGPIO5	Assert = iTPM Physical Presence Enable De-assert = iTPM disable **Only used in iAMT w/ME Firmware
GPIO57	Desktop Platform used only

SUS_PWR_ACK	Mobile Platform used only
GPIO10	Desktop Platform used only

ICH9M Strap Pin

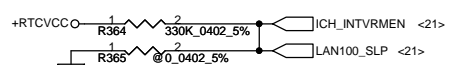


Internal TPM Strap		
SPI_MOSI	Low= Disable*	High= iTPM enable by MCH strap

Boot BIOS Strap		
PCI_GNT#0	SPI_CS#1	Boot BIOS Loaction
0	1	SPI
1	0	PCI
1	1	LPC* (Default)

A16 Swap Override Strap	
PCI_GNT#3	Low= A16 swap override Enable High= Default* (Internal pull-up)

Flash Descriptor Security Override Strap	
GPIO33	Low= Descriptor Security override High= Default* (Internal pull-up)



Internal VR Enable Strap (Internal VR for VccSus1.05, VccSus1.5, VccCL1.5)	
ICH_INTVRMEN	Low = Internal VR Disabled High = Internal VR Enabled(Default)

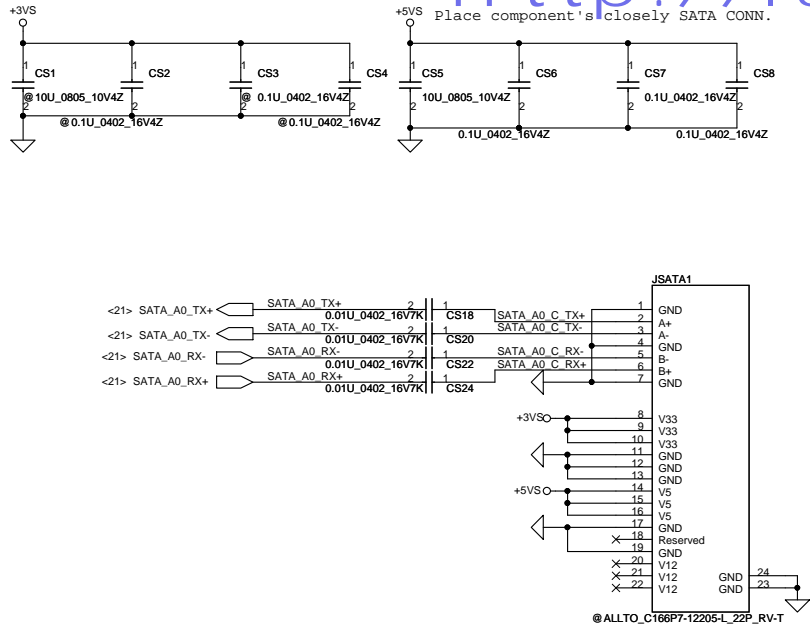
ICH9M LAN100 SLP Strap (Internal VR for VccLAN1.05 and VccCL1.05)	
ICH_LAN100_SLP	Low = Internal VR Disabled High = Internal VR Enabled(Default)

XOR Chain Entrance Strap		
ICH_TP3	HDA_SDOUT	Description
0	0	RSVD
0	1	Enter XOR Chain
1	0	Normal Operation (Default)
1	1	Set PCIe port config bit 1

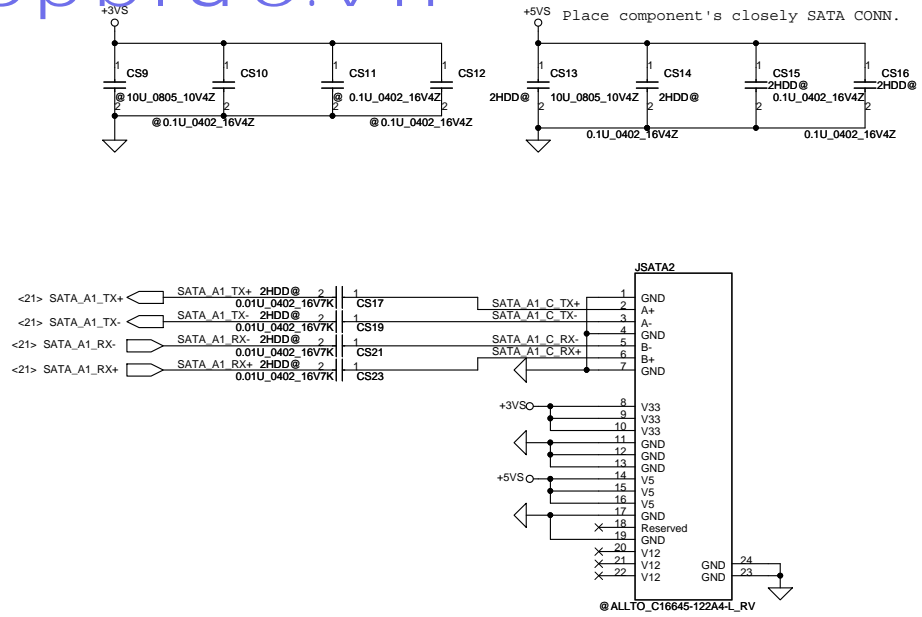
No Reboot Strap SB_SPKR	
Low= Default*	High= "No Reboot"

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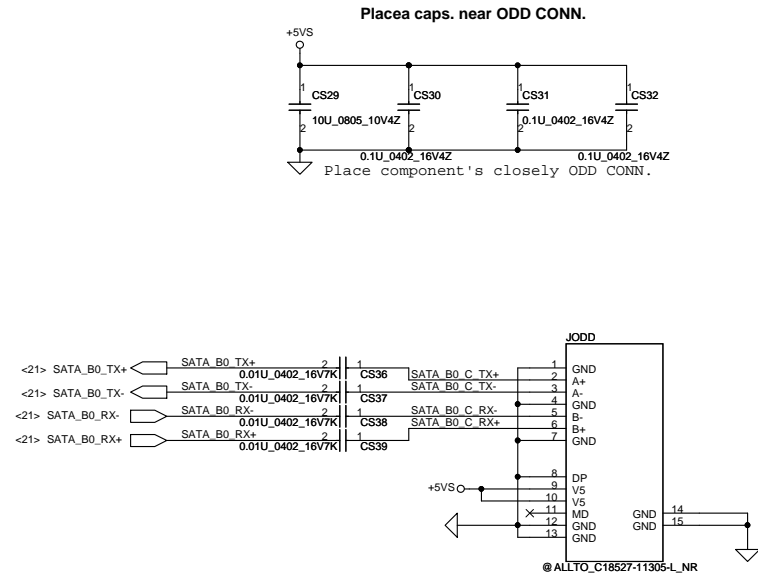
SATA Main HDD Conn.(11.8mm)



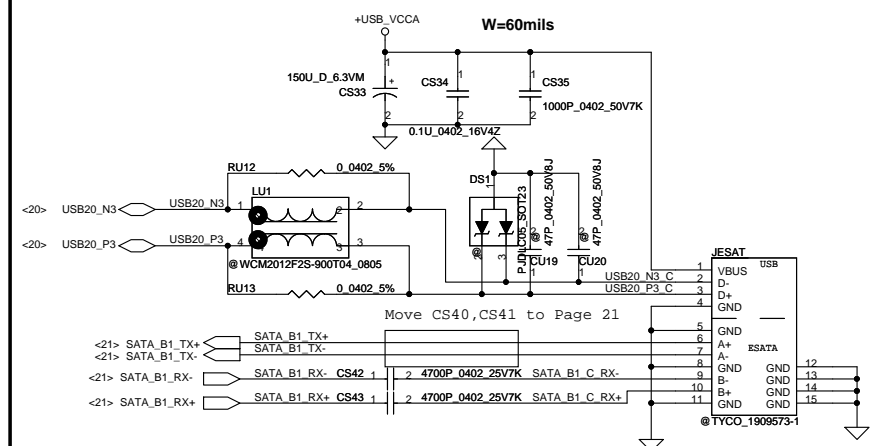
SATA 2nd HDD Conn.(5.2mm)



SATA ODD CONN

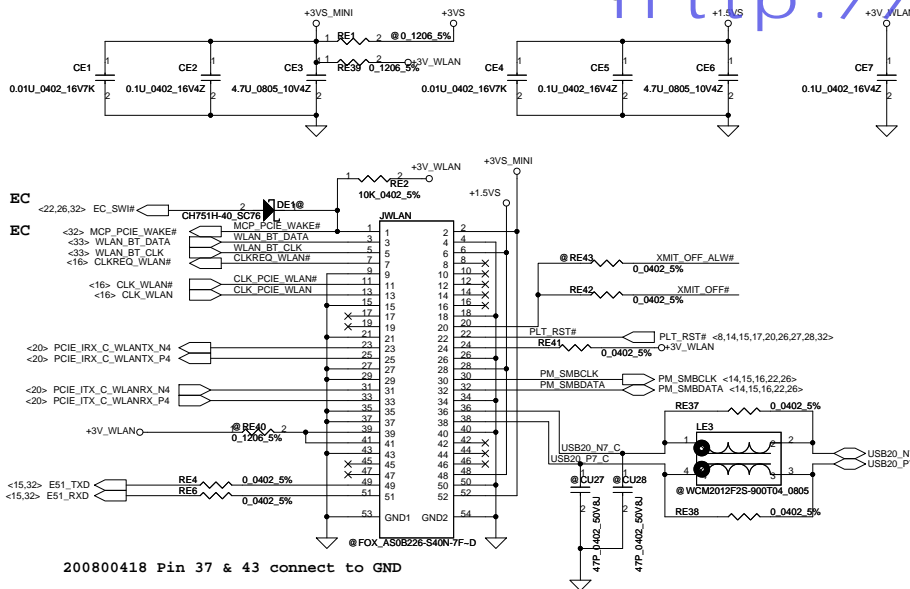


eSATA + USB CONN

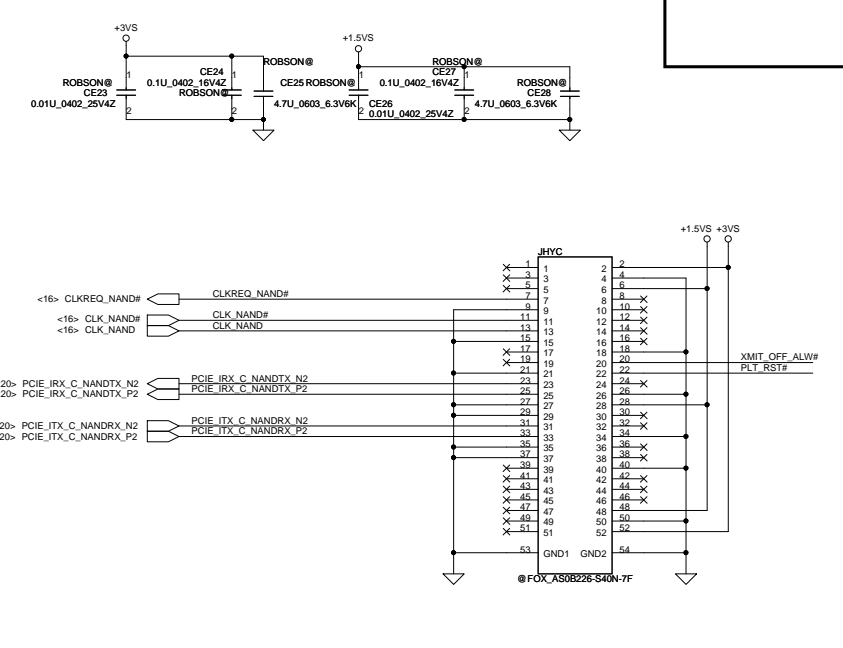


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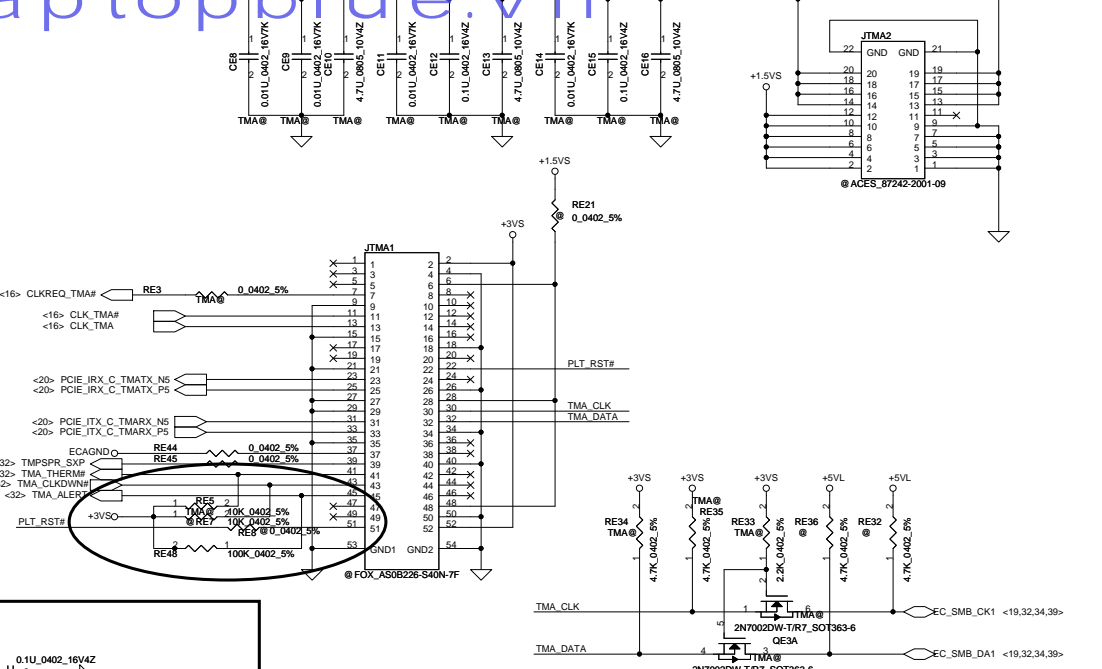
Mini-Express Card for WLAN



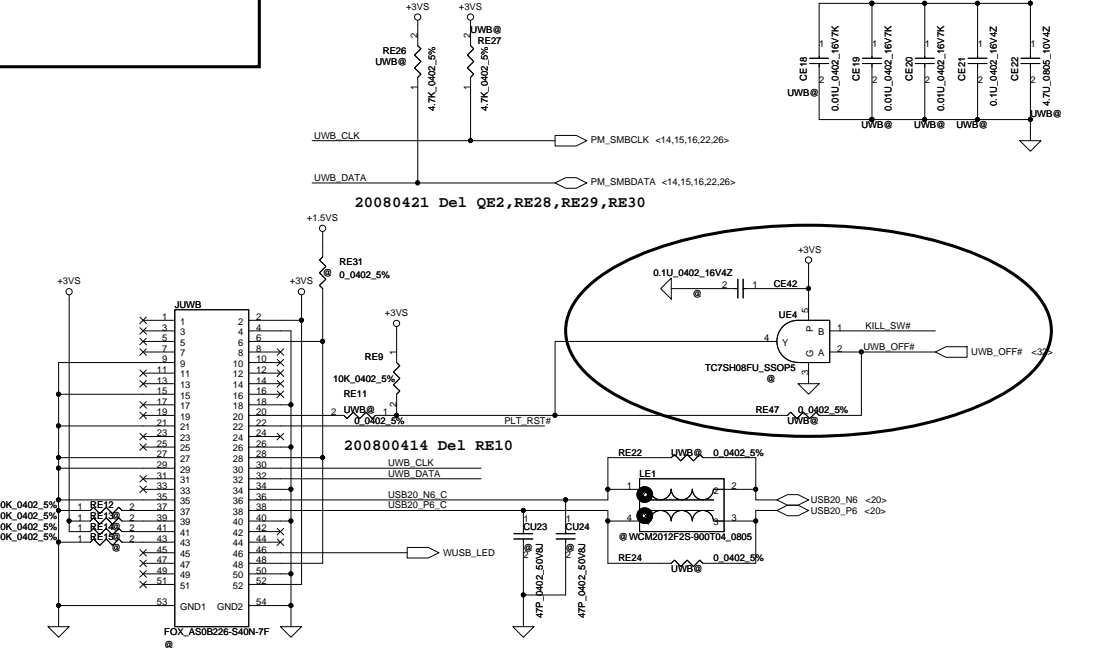
ROBSON



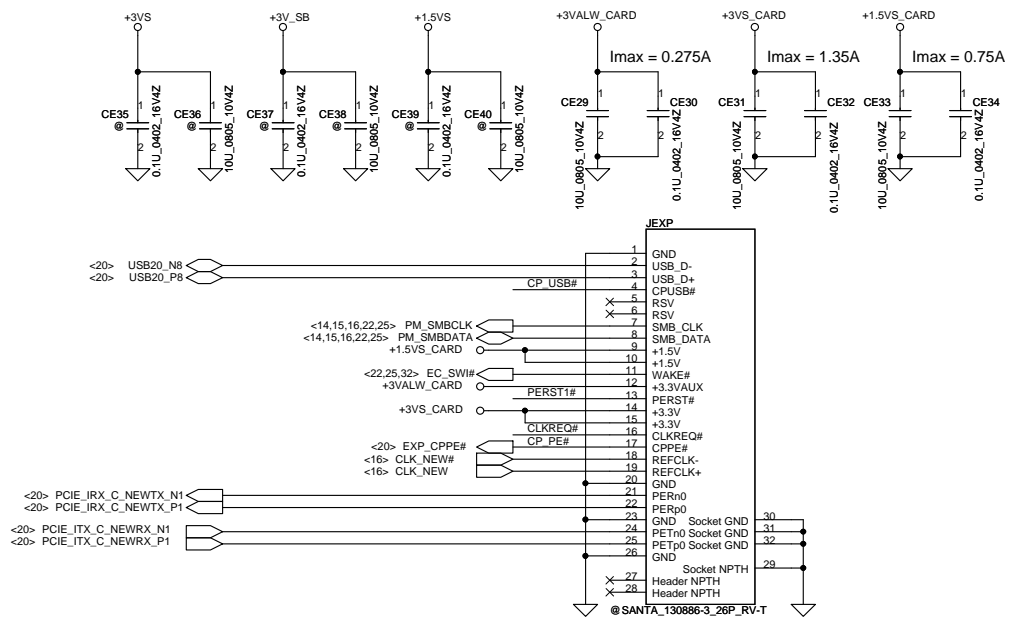
TMA mini Card



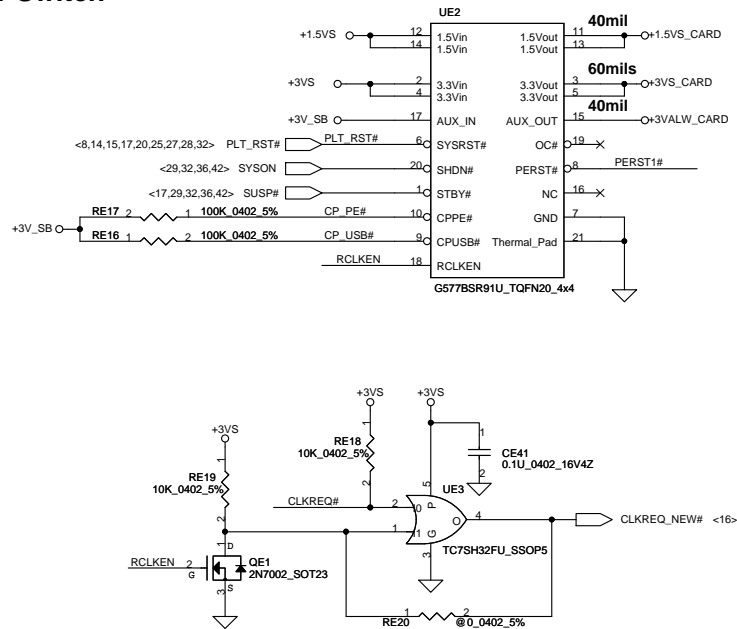
UWB mini Card



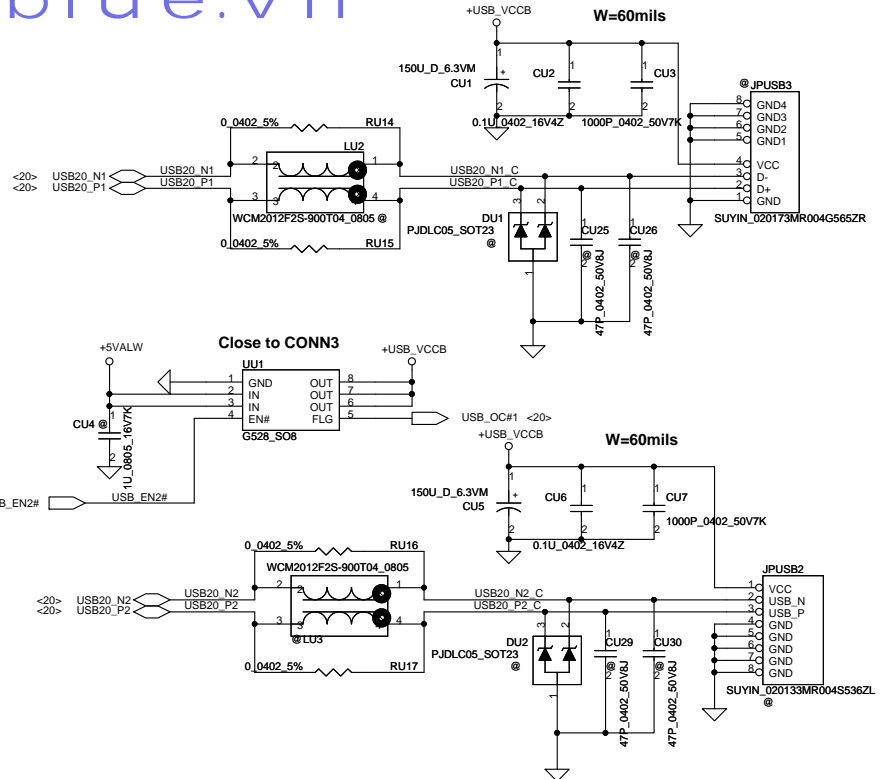
New Card Interface



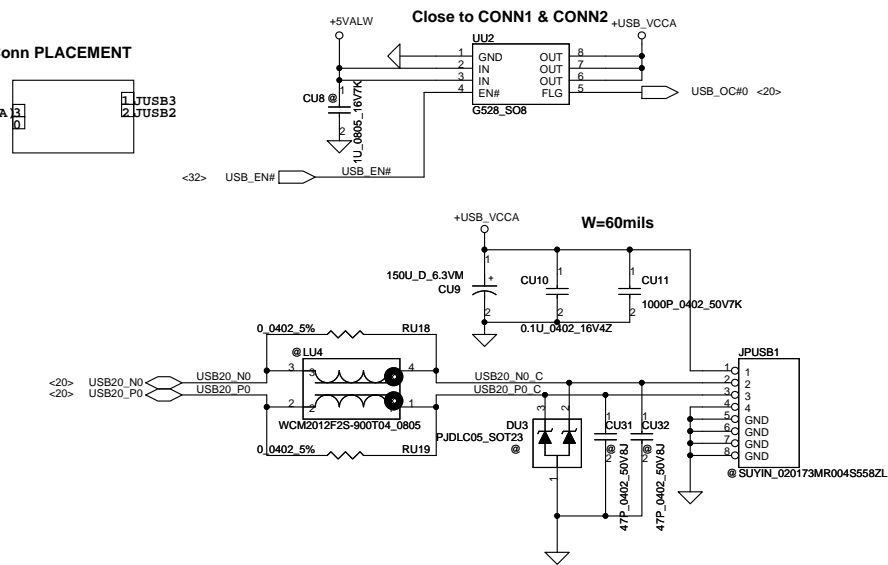
New Card Power Switch



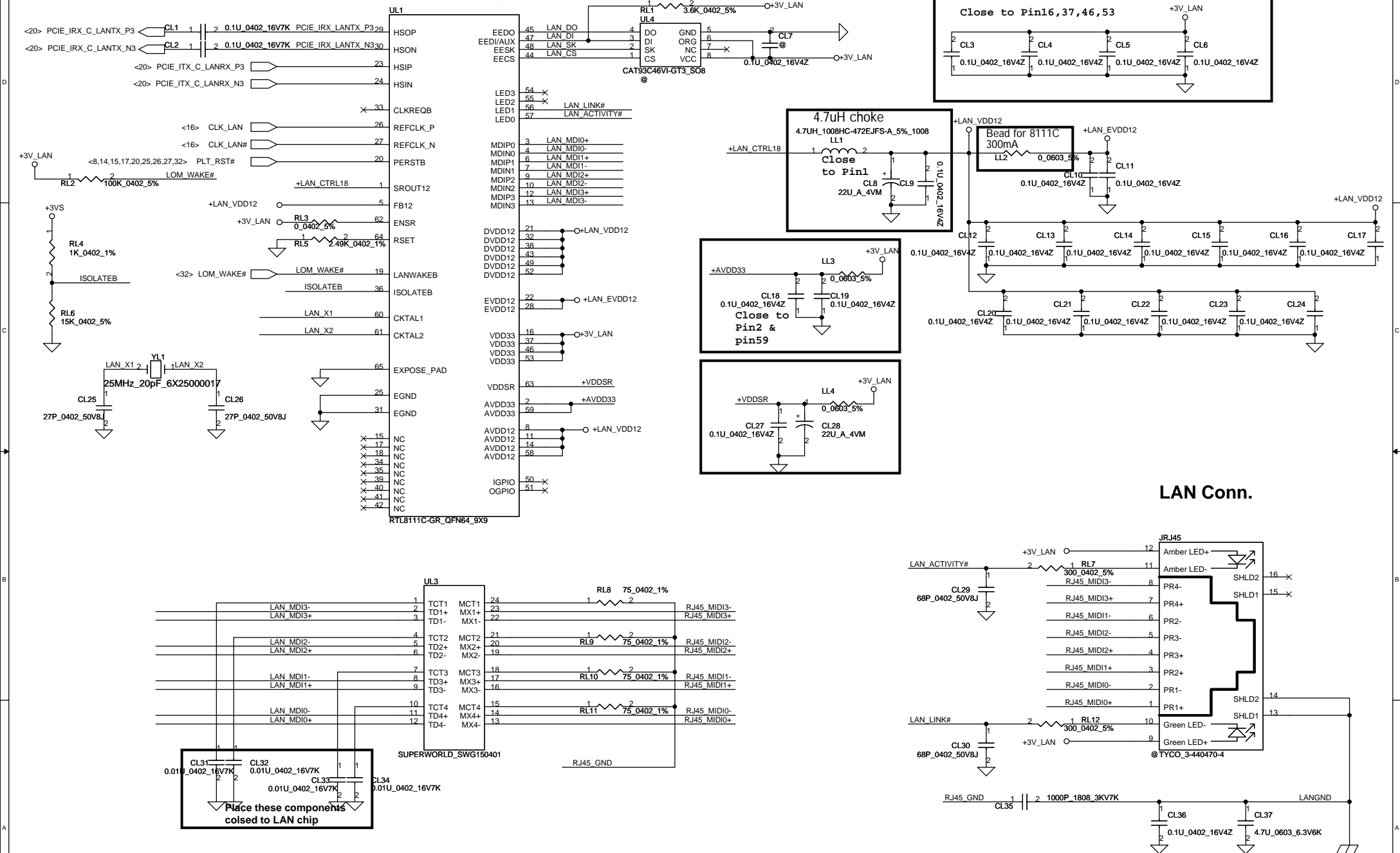
USB Interface



USB Conn PLACEMENT



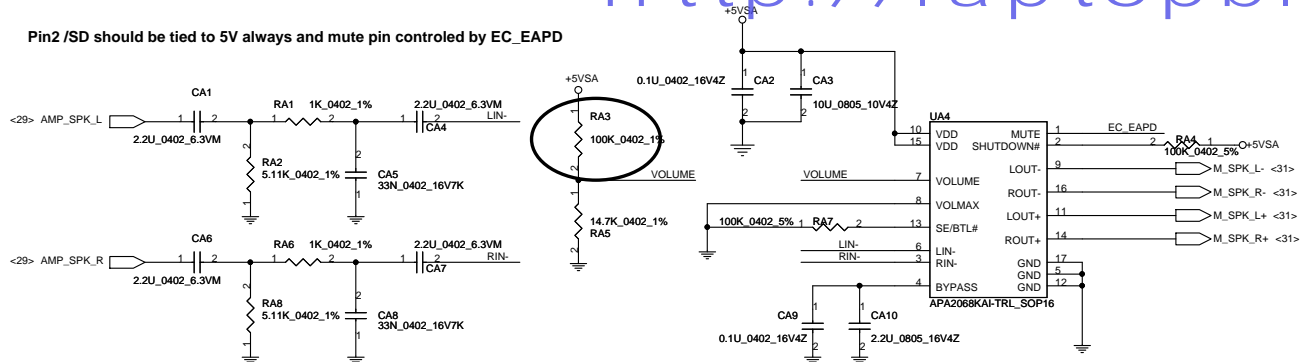
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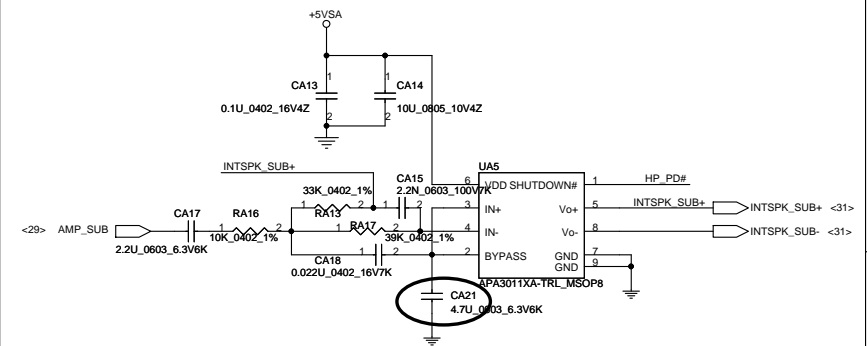
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					401596
				Date:	Wednesday, June 04, 2008
				Sheet	28 of 47
				Rev	B

APA2068 Medium Range Amplifier

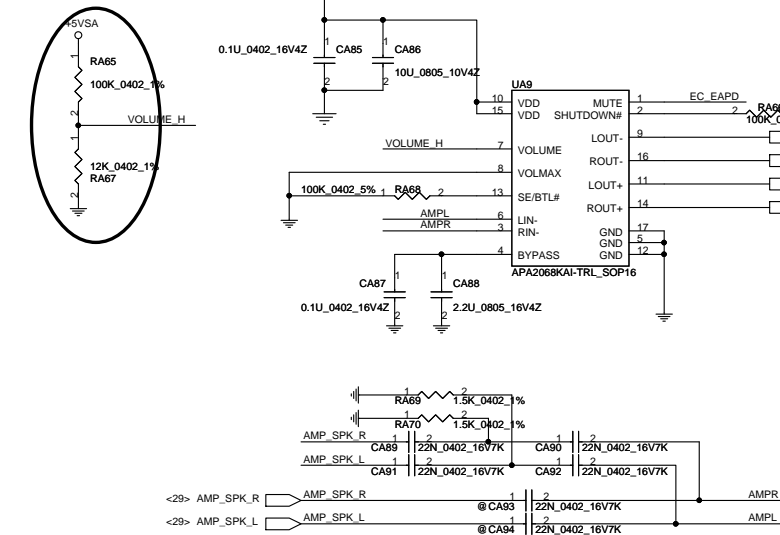
Pin2 /SD should be tied to 5V always and mute pin controlled by EC_EAPD



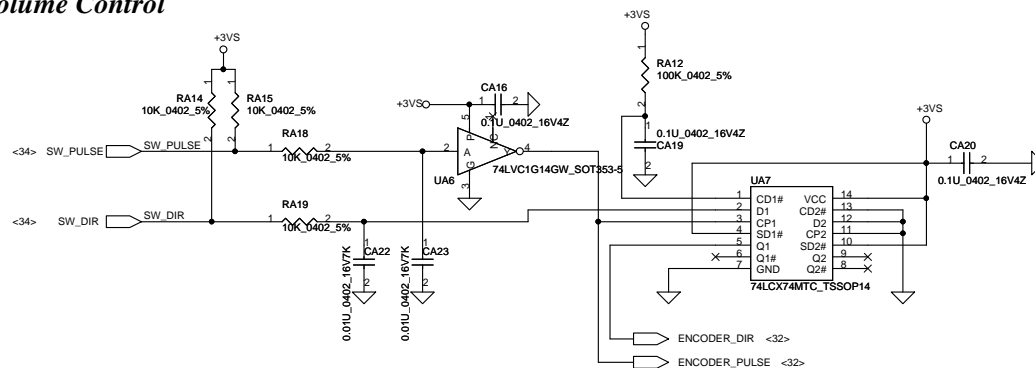
APA3011 Subwoofer Amplifier



APA2068 Tweeter Range Amplifier



Volume Control



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				Document Number 401596	
				Date: Monday, June 30, 2008	Sheet 30 of 47

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Tweeter Conn.

Close to Codec All SPK Trace need keep 30 mil wide

<30> H_SPK_R+
<30> H_SPK_R- LA1 1 2 HLMA-160808-39NKT HSPK R+
LA2 1 2 HLMA-160808-39NKT HSPK R- @ ACES_85204-0200
DA1 1 2 3 @ PJDLC05_SOT23

<30> H_SPK_L+
<30> H_SPK_L- LA5 1 2 HLMA-160808-39NKT HSPK L+
LA6 1 2 HLMA-160808-39NKT HSPK L- @ ACES_85204-0200
DA3 1 2 3 @ PJDLC05_SOT23

Medium SPK Conn.

20080424 DA4, DA5 mount for EMI

<30> M_SPK_R+
<30> M_SPK_R- LA7 1 2 HLMA-160808-39NKT MSPK R+
LA8 1 2 HLMA-160808-39NKT MSPK R- @ ACES_85204-0200
DA4 1 2 3 PJDLC05_SOT23

<30> M_SPK_L+
<30> M_SPK_L- LA9 1 2 HLMA-160808-39NKT MSPK L+
LA10 1 2 HLMA-160808-39NKT MSPK L- @ ACES_85204-0200
DA5 1 2 3 PJDLC05_SOT23

Sub-woofer Conn.

<30> INTSPK_SUB+
<30> INTSPK_SUB- LA11 1 2 HLMA-160808-39NKT SPK SUB+
LA12 1 2 HLMA-160808-39NKT SPK SUB- @ ACES_85204-0200
DA6 1 2 3 @ PJDLC05_SOT23

MDC Conn.

JRJ11

1	GND1	RES0	2	RA73	0	0402_5%
3	IAC_SDOUT_MDC	RES1	4	X		
5	HDA_SYNC_MDC	3.3V	6			+3V_SB
7	IAC_SYNC	GND2	8			
9	IAC_SDIN1	GND3	10			
11	MDC_RESET#	IAC_RESET#	12			
13		GND4				
14		GND5				
15		GND6				
16		GND7				
17		GND8				
18		GND9				

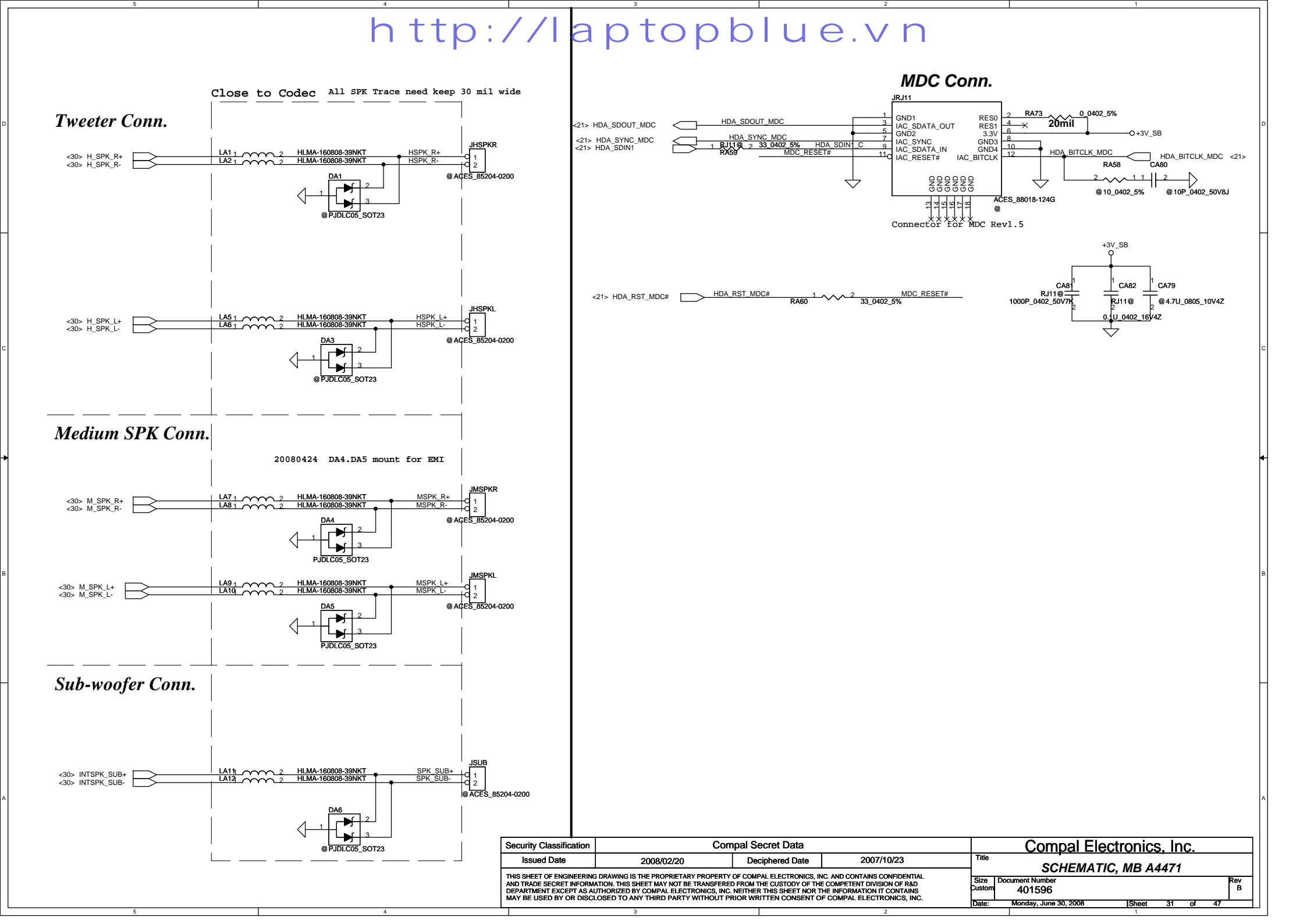
ACES_88018-124G @

Connector for MDC Rev1.5

<21> HDA_RST_MDC# HDA_RST_MDC# RA60 33_0402_5% MDC RESET#

HDA_BITCLK_MDC <21>
HDA_BITCLK_MDC RA58 CA80 @ 10P_0402_50V8J

+3V_SB
CA81 RJ11@ CA82 CA79
1000P_0402_50V7K 11U@ @ 4.7U_0805_10V4Z
0.1U_0402_16V4Z



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Tweeter Conn.

Close to Codec All SPK Trace need keep 30 mil wide

<30> H_SPK_R+
<30> H_SPK_R-

<30> H_SPK_L+
<30> H_SPK_L-

Medium SPK Conn.

20080424 DA4,DA5 mount for EMI

<30> M_SPK_R+
<30> M_SPK_R-

<30> M_SPK_L+
<30> M_SPK_L-

Sub-woofer Conn.

<30> INTSPK_SUB+
<30> INTSPK_SUB-

MDC Conn.

<21> HDA_SDOOUT_MDC
<21> HDA_SYNC_MDC
<21> HDA_SDIN1
<21> HDA_RST_MDC#

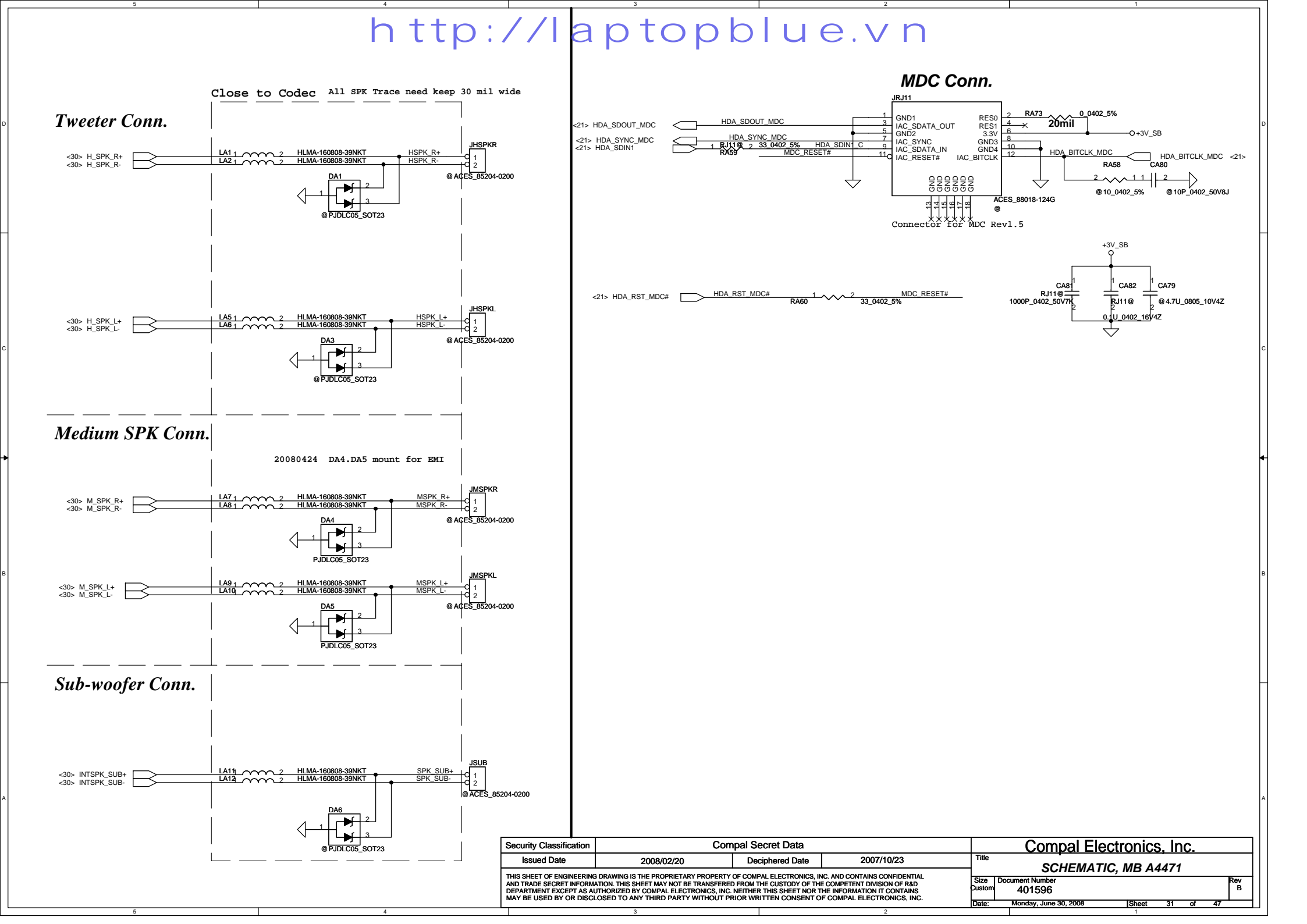
Connector for MDC Rev1.5

+3V_SB

RJ11@

CA81 @ 1000P_0402_50V7K
CA82 @ 10_0402_5%
CA79 @ 4.7U_0805_10V4Z

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Tweeter Conn.

Close to Codec All SPK Trace need keep 30 mil wide

<30> H_SPK_R+
<30> H_SPK_R-

<30> H_SPK_L+
<30> H_SPK_L-

Medium SPK Conn.

20080424 DA4,DA5 mount for EMI

<30> M_SPK_R+
<30> M_SPK_R-

<30> M_SPK_L+
<30> M_SPK_L-

Sub-woofer Conn.

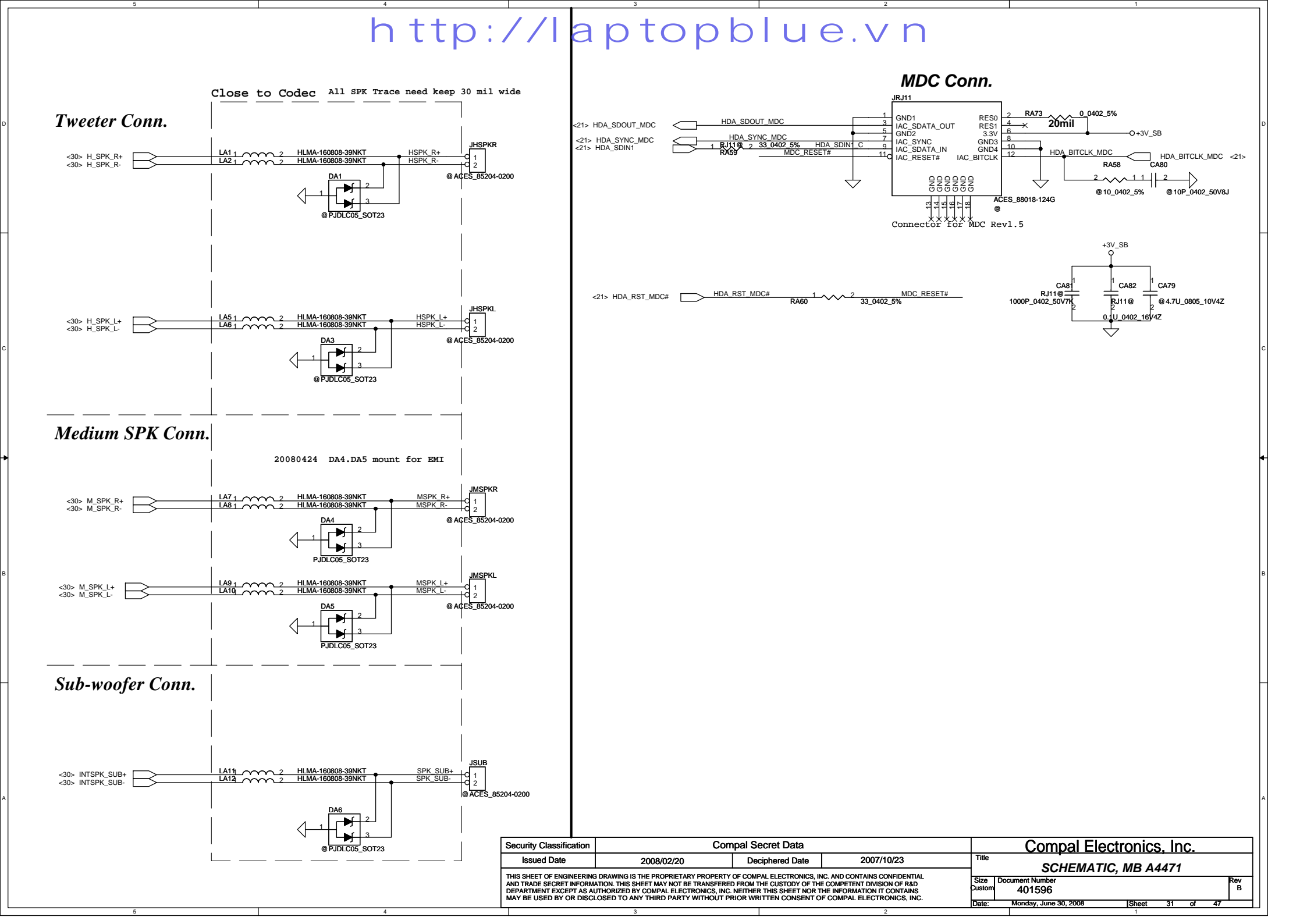
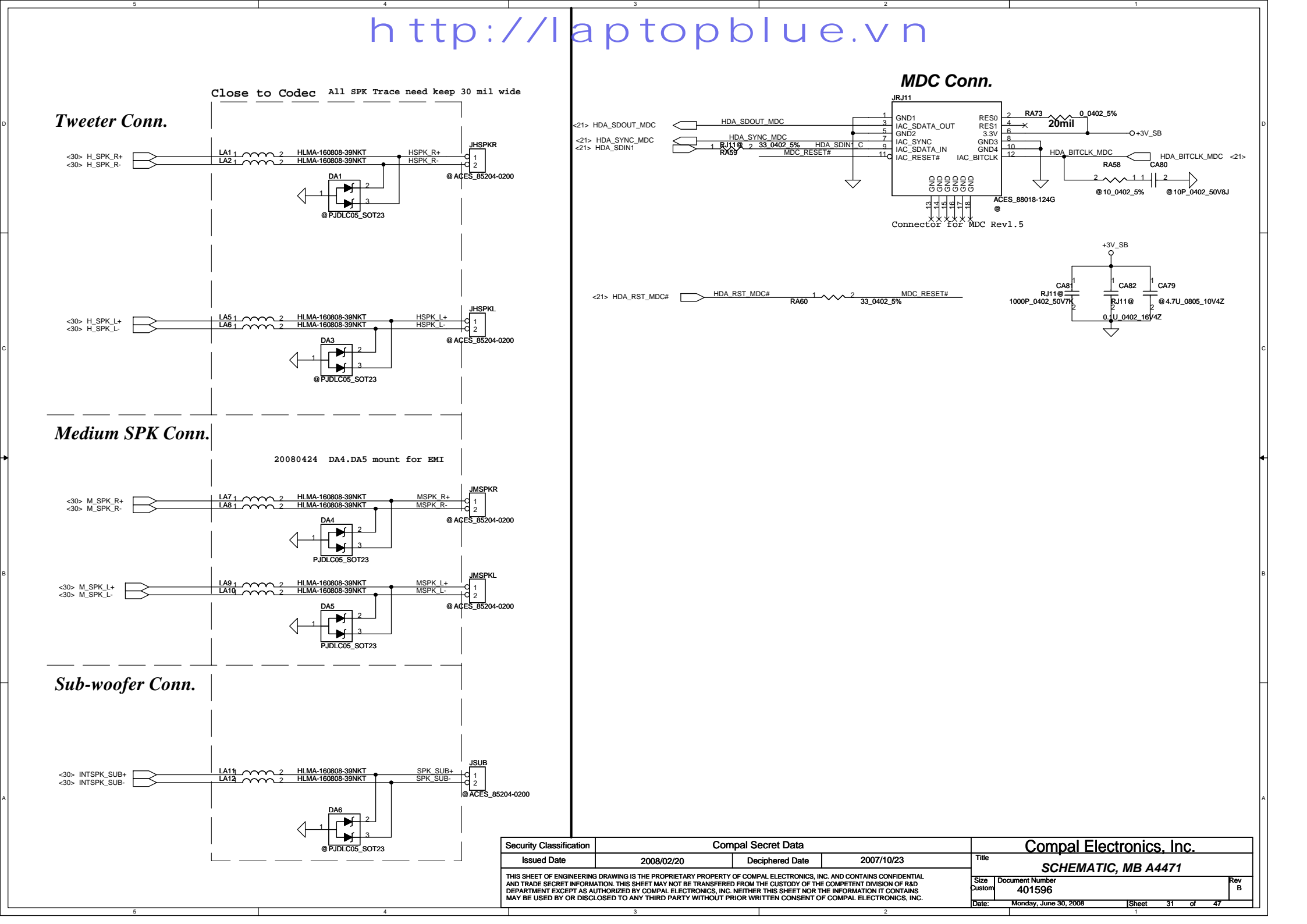
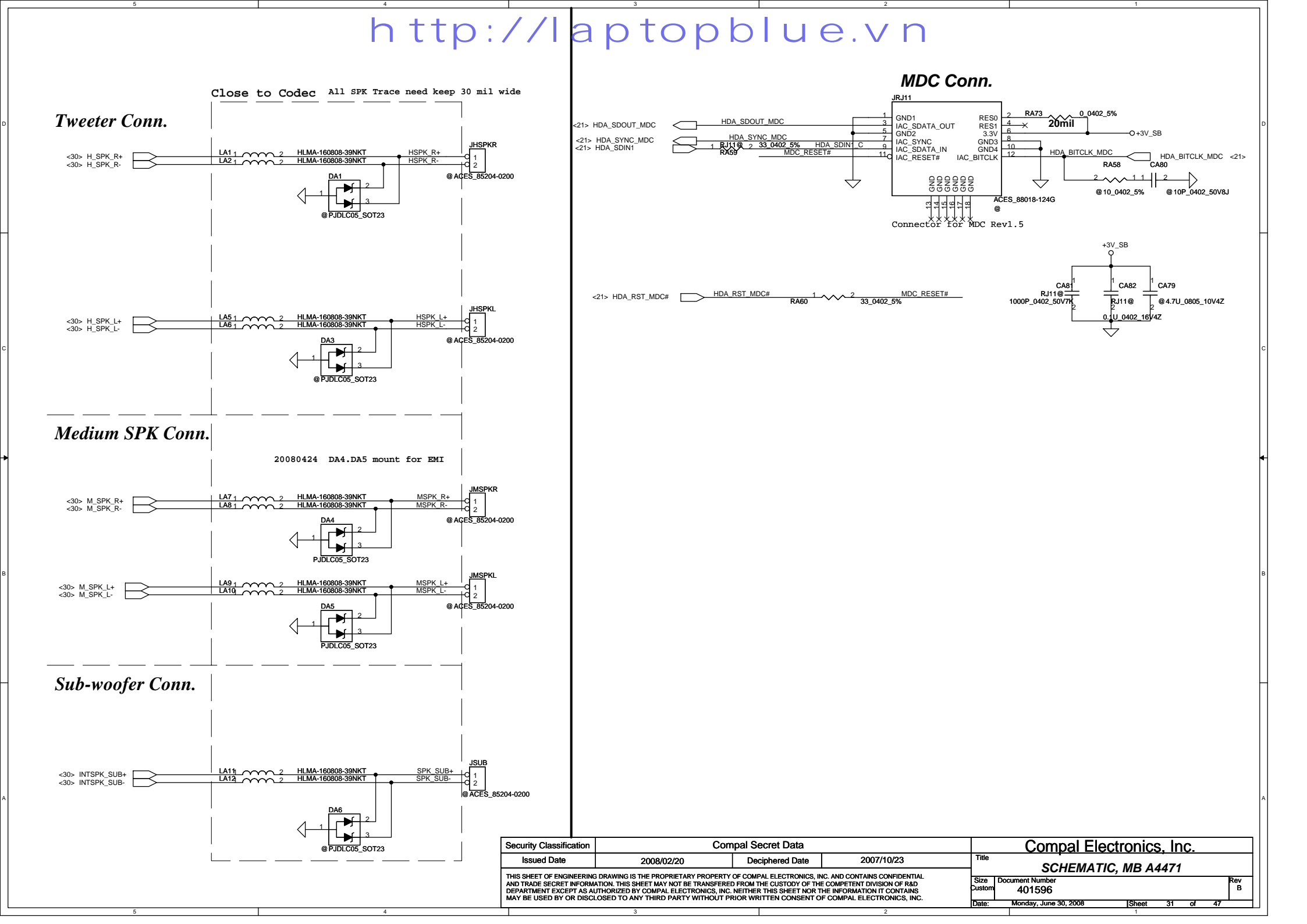
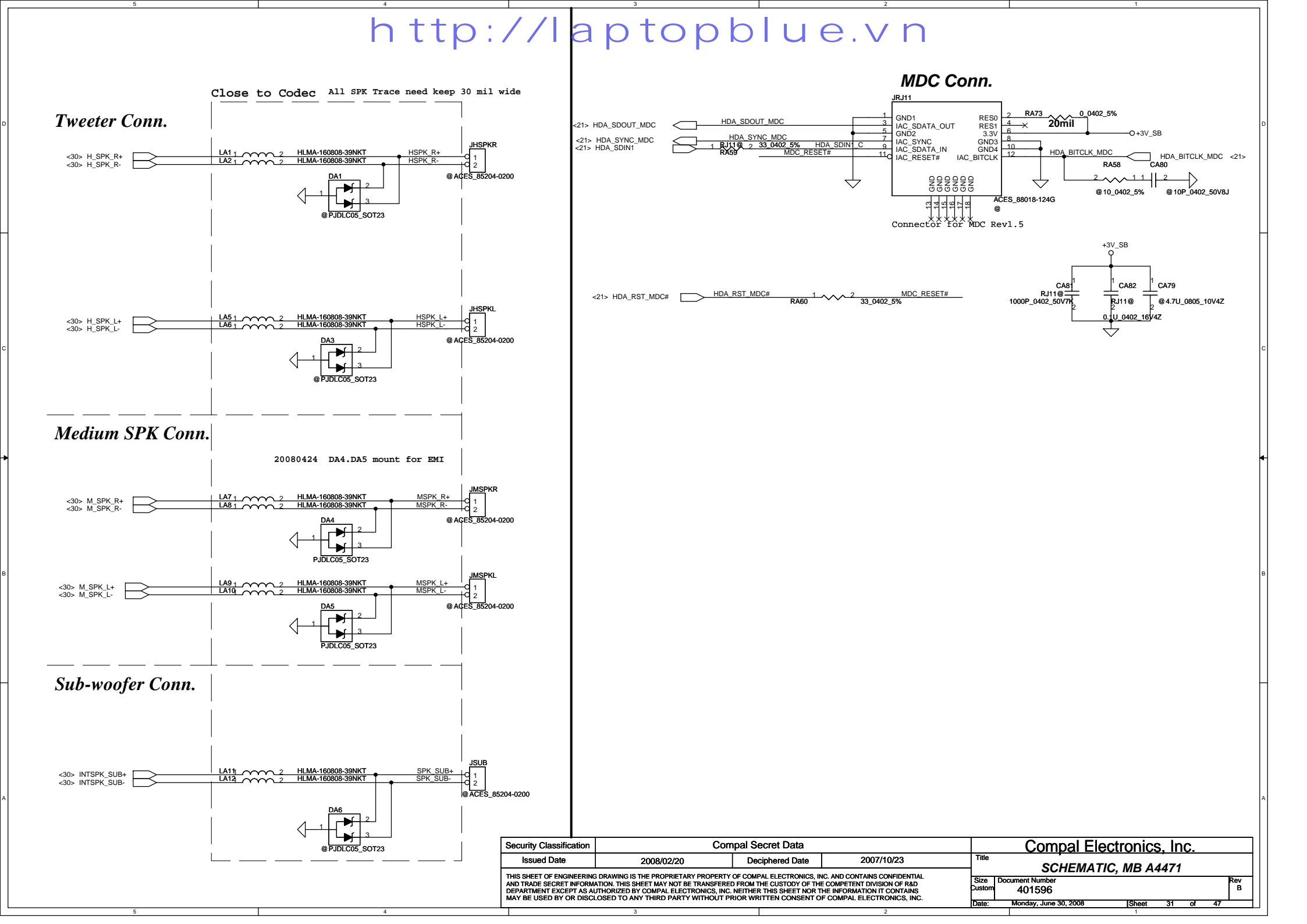
<30> INTSPK_SUB+
<30> INTSPK_SUB-

MDC Conn.

<21> HDA_SDOOUT_MDC
<21> HDA_SYNC_MDC
<21> HDA_SDIN1
<21> HDA_RST_MDC#

Connector for MDC Rev1.5

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				Date:	Monday, June 30, 2008
				Sheet	31 of 47

[illegible]

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Tweeter Conn.

Close to Codec All SPK Trace need keep 30 mil wide

<30> H_SPK_R+
<30> H_SPK_R- LA1 1 2 HLMA-160808-39NKT HSPKR R+
LA2 1 2 HLMA-160808-39NKT HSPKR R- @ ACES_85204-0200
DA1 1 2 3 @ PJDLC05_SOT23

<30> H_SPK_L+
<30> H_SPK_L- LA5 1 2 HLMA-160808-39NKT HSPKL L+
LA6 1 2 HLMA-160808-39NKT HSPKL L- @ ACES_85204-0200
DA3 1 2 3 @ PJDLC05_SOT23

Medium SPK Conn.

20080424 DA4, DA5 mount for EMI

<30> M_SPK_R+
<30> M_SPK_R- LA7 1 2 HLMA-160808-39NKT MSPKR R+
LA8 1 2 HLMA-160808-39NKT MSPKR R- @ ACES_85204-0200
DA4 1 2 3 PJDLC05_SOT23

<30> M_SPK_L+
<30> M_SPK_L- LA9 1 2 HLMA-160808-39NKT MSPKL L+
LA10 1 2 HLMA-160808-39NKT MSPKL L- @ ACES_85204-0200
DA5 1 2 3 PJDLC05_SOT23

Sub-woofer Conn.

<30> INTSPK_SUB+
<30> INTSPK_SUB- LA11 1 2 HLMA-160808-39NKT SPK SUB+
LA12 1 2 HLMA-160808-39NKT SPK SUB- @ ACES_85204-0200
DA6 1 2 3 @ PJDLC05_SOT23

MDC Conn.

JRJ11

1	GND1	RES0	2	RA73	0	0402_5%
3	IAC_SDOUT_MDC	RES1	4	X		
5	HDA_SYNC_MDC	3.3V	6			+3V_SB
7	IAC_SYNC	GND2	8			
9	IAC_SDIN1	GND3	10			
11	MDC_RESET#	IAC_RESET#	12			
13		GND4				
14		GND5				
15		GND6				
16		GND7				
17		GND8				
18		GND9				

ACES_88018-124G @

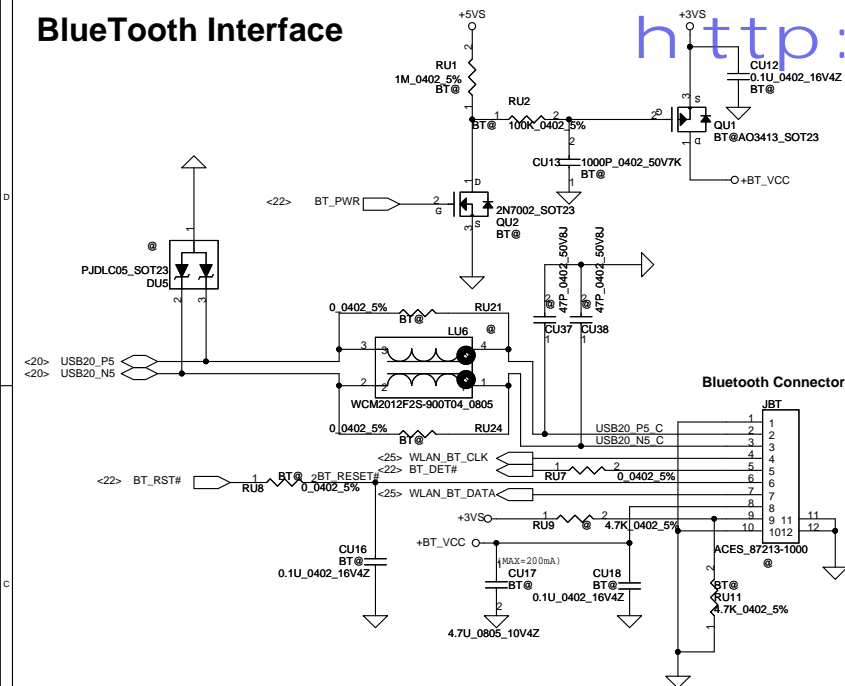
Connector for MDC Rev1.5

<21> HDA_RST_MDC# HDA_RST_MDC# RA60 33_0402_5% MDC RESET#

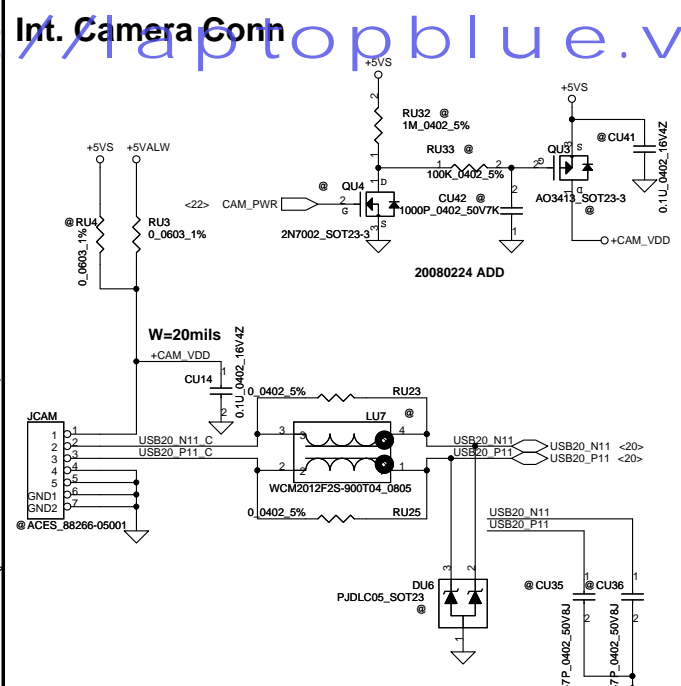
HDA_BITCLK_MDC <21>
HDA_BITCLK_MDC RA58 CA80 @ 10P_0402_50V8J

+3V_SB
CA81 RJ11@ CA82 CA79
1000P_0402_50V7K 11U @ 4.7U_0805_10V4Z
0.1U_0402_16V4Z

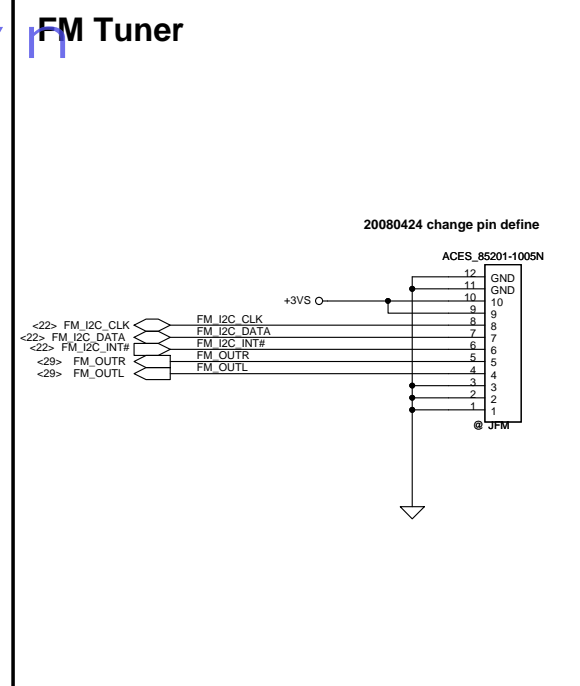
Bluetooth Interface



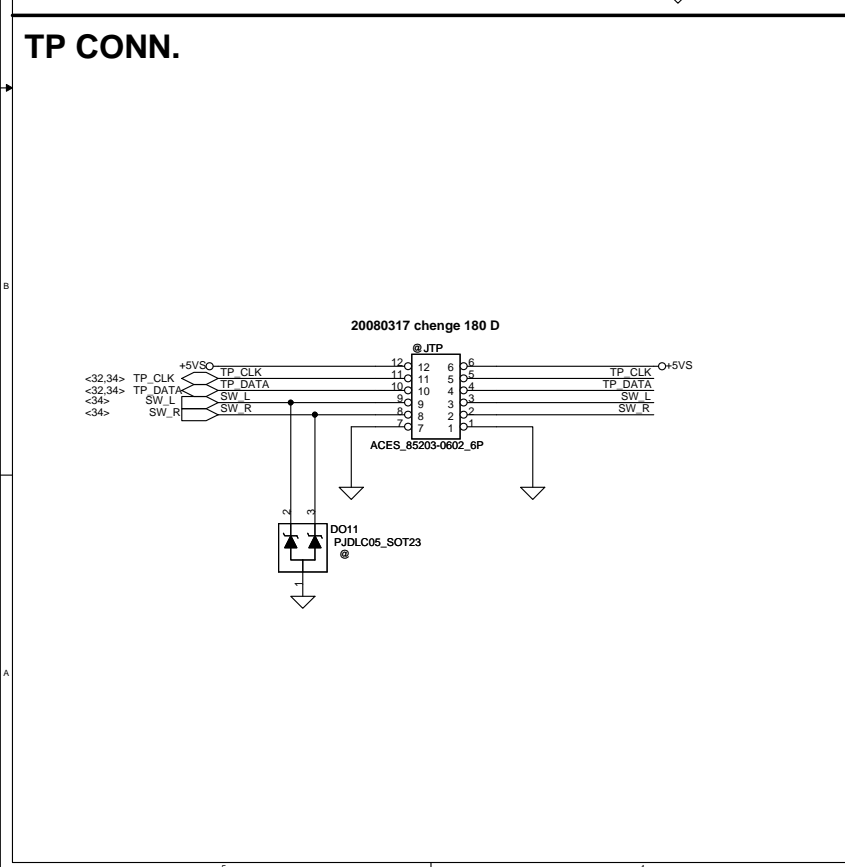
Int. Camera Conn



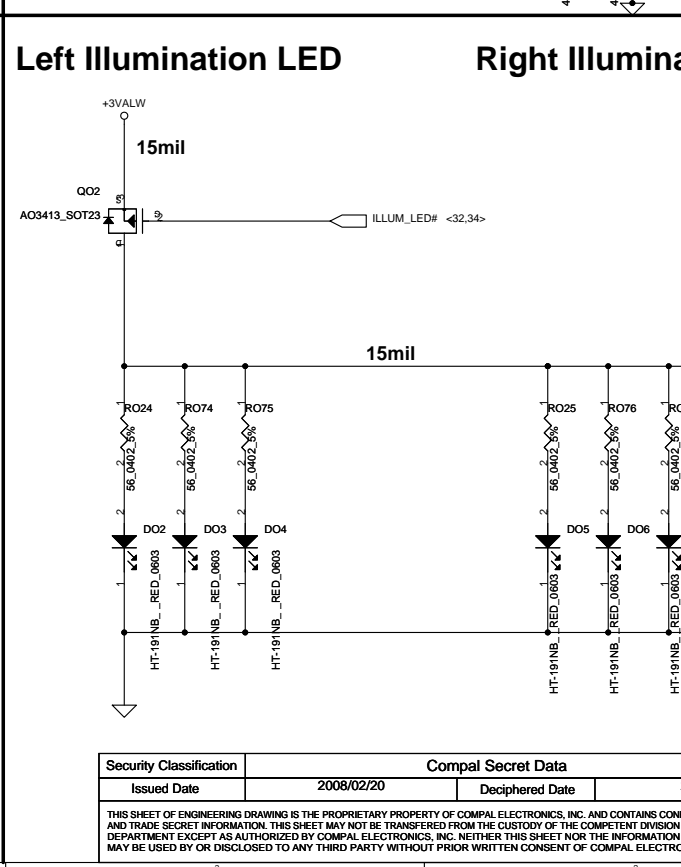
FM Tuner



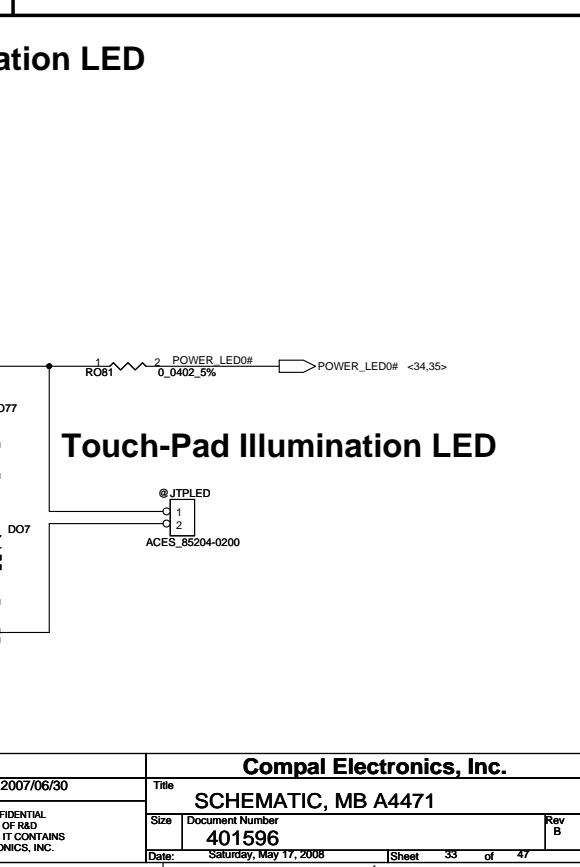
TP CONN.



Left Illumination LED

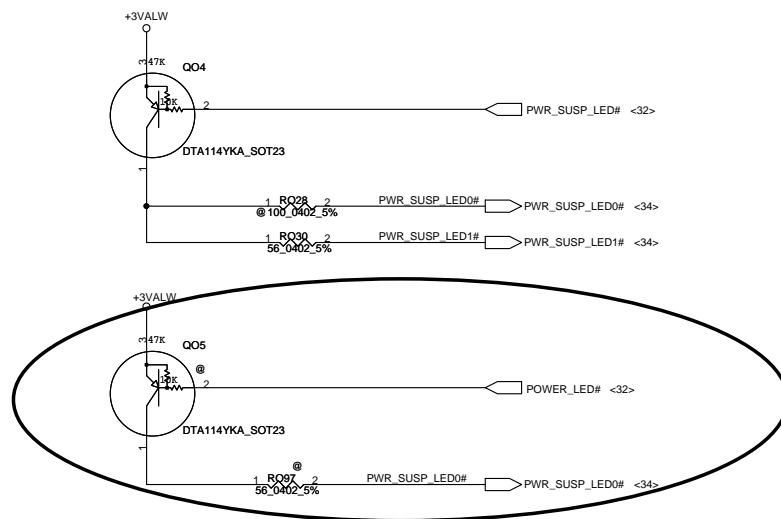


Right Illumination LED

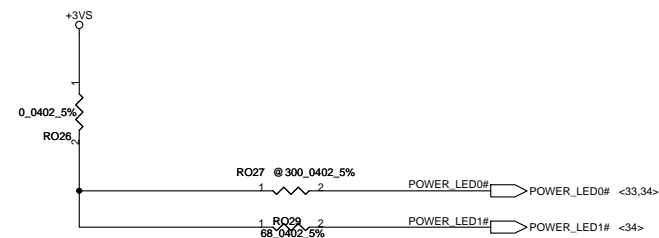


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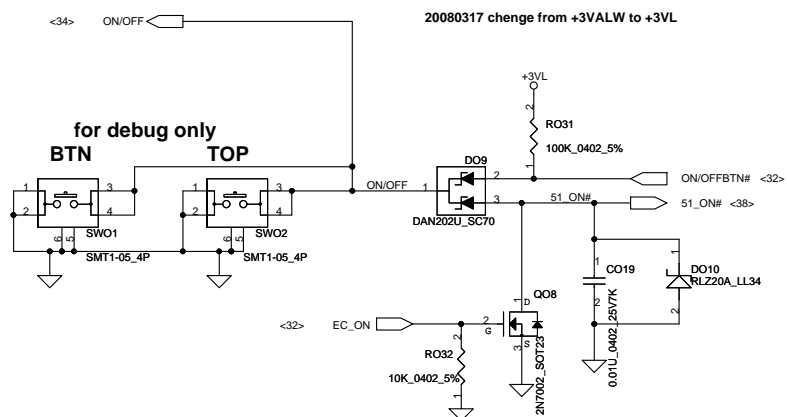
Power Suspend LED



Power on LED

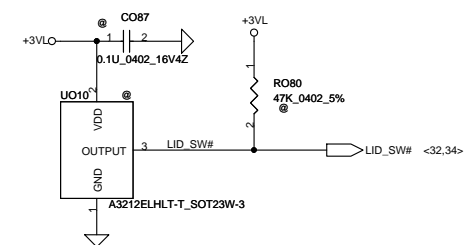


ON/OFF BUTTON



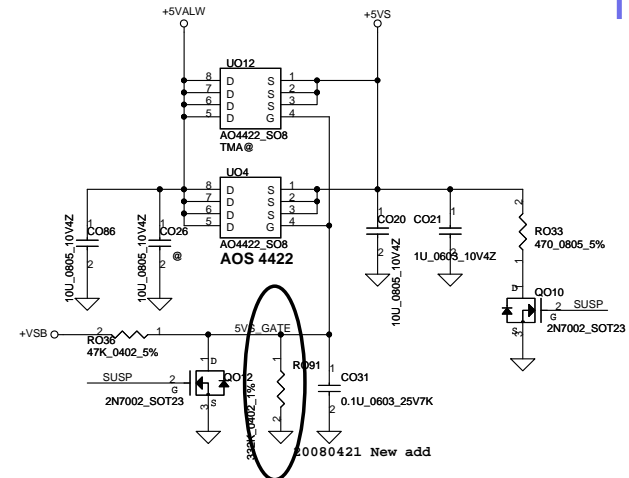
Lid SW

Change LID Switch to LED/B for S3 Issue

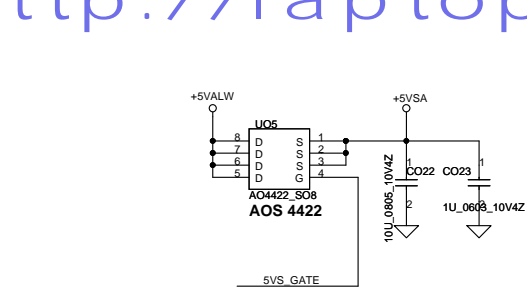


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				Date:	Thursday, June 12, 2008
				Sheet	35 of 47
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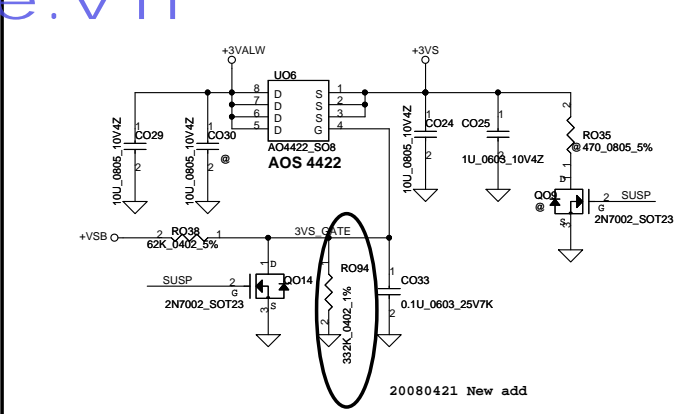
+5VALW TO +5VS



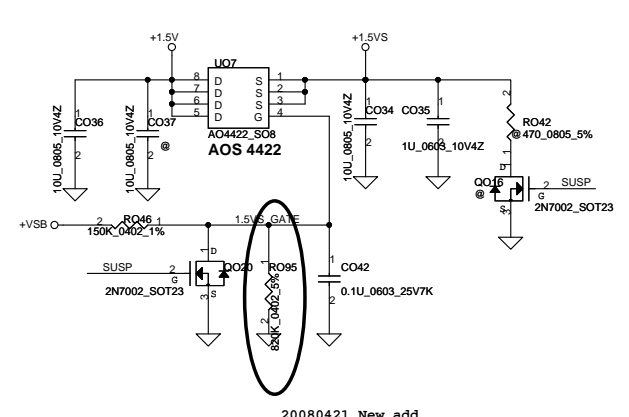
+5VALW TO +5VSA (For Amp)



+3VALW TO +3VS

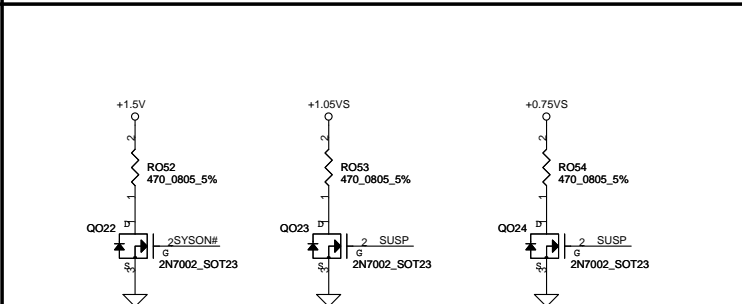
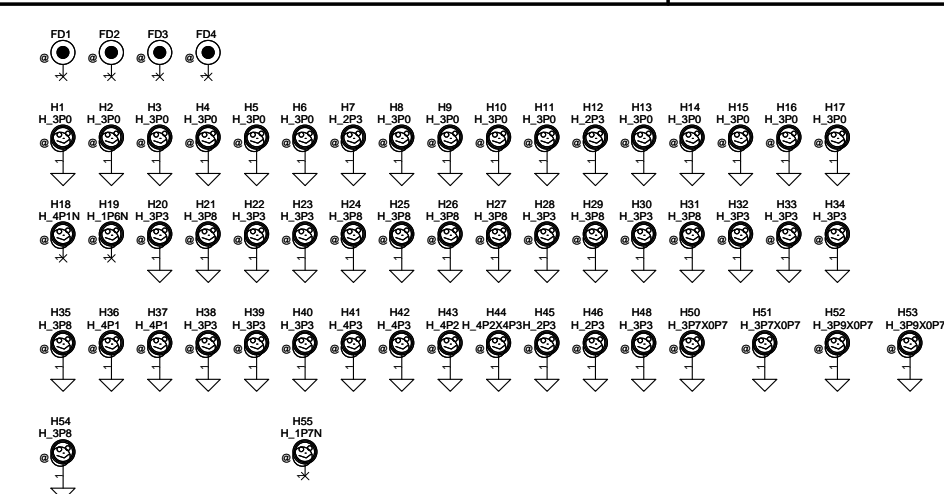
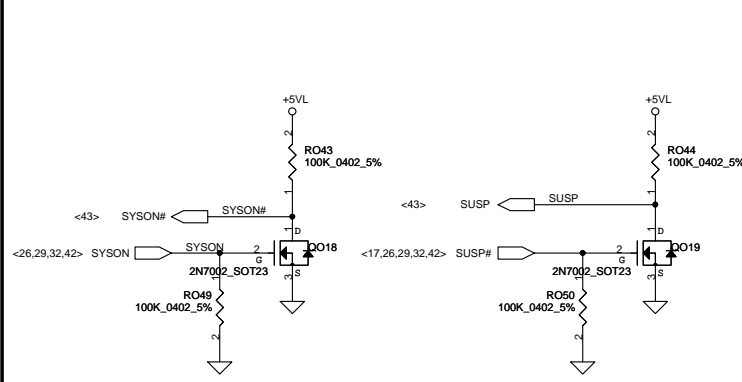


+1.5V to +1.5VS

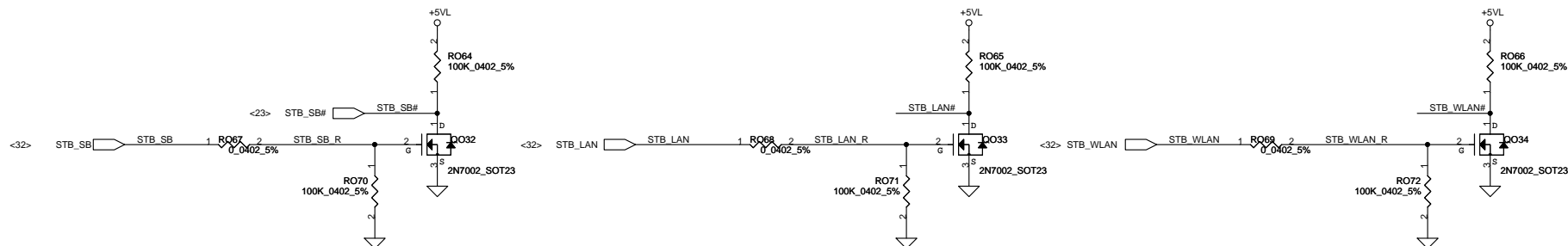
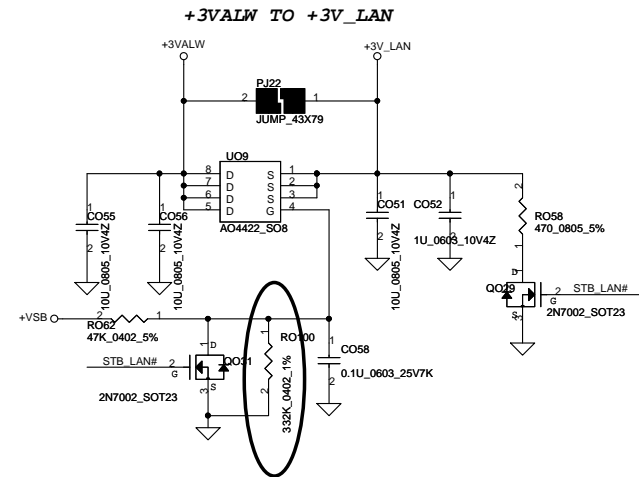


+1.1VALW to +1.1VS

20080305 del 1.1V switch



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				Size	Document Number
				401596	Rev B
				Date	Friday, June 13, 2008
				Sheet	36 of 47

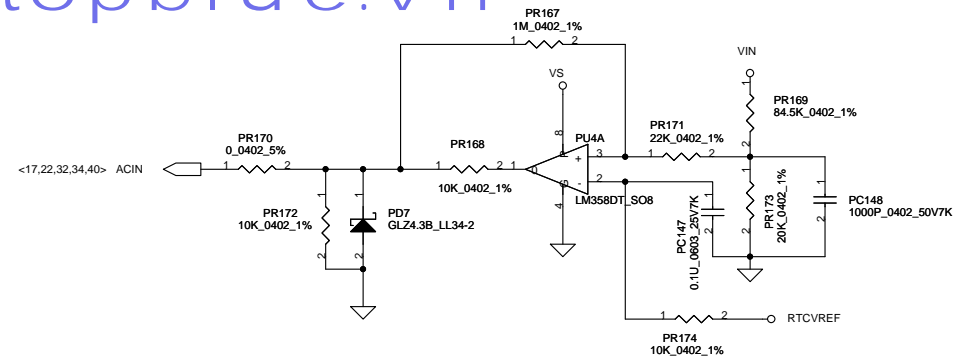
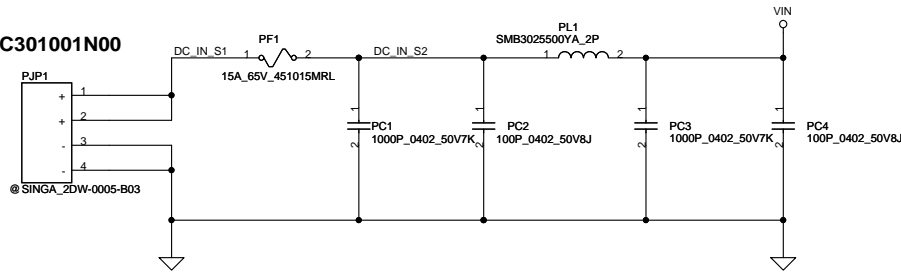


The schematic diagram illustrates the power management circuit for the MB A4471, specifically the +3VALW TO +3V_WLAN section. The circuit is divided into three main functional blocks, each featuring a voltage divider, a diode, and a MOSFET.

+3VALW TO +3V_SB Section:

- Input:** +3VALW
- Output:** +3V_SB
- Components:** P120 (JUMP_43X79), U08 (AO4422_S08), AO4422, RO55 (470_0805_5%), CO46, CO47, CO44, CO45, CO48, RO56 (47K_0402_5%), STB_SB#, 2N7002_SOT23, Q027 (Si34568DV-T1-E3_TSOP6), Q028 (2N7002_SOT23), Q029 (2N7002_SOT23), Q030 (2N7002_SOT23), Q031 (2N7002_SOT23), Q032 (2N7002_SOT23), Q033 (2N7002_SOT23), Q034 (2N7002_SOT23), Q035 (2N7002_SOT23), Q036 (2N7002_SOT23), Q037 (2N7002_SOT23), Q038 (2N7002_SOT23), Q039 (2N7002_SOT23), Q040 (2N7002_SOT23), Q041 (2N7002_SOT23), Q042 (2N7002_SOT23), Q043 (2N7002_SOT23), Q044 (2N7002_SOT23), Q045 (2N7002_SOT23), Q046 (2N7002_SOT23), Q047 (2N7002_SOT23), Q048 (2N7002_SOT23), Q049 (2N7002_SOT23), Q050 (2N7002_SOT23), Q051 (2N7002_SOT23), Q052 (2N7002_SOT23), Q053 (2N7002_SOT23), Q054 (2N7002_SOT23), Q055 (2N7002_SOT23), Q056 (2N7002_SOT23), Q057 (2N7002_SOT23), Q058 (2N7002_SOT23), Q059 (2N7002_SOT23), Q060 (2N7002_SOT23), Q061 (2N7002_SOT23), Q062 (2N7002_SOT23), Q063 (2N7002_SOT23), Q064 (2N7002_SOT23), Q065 (2N7002_SOT23), Q066 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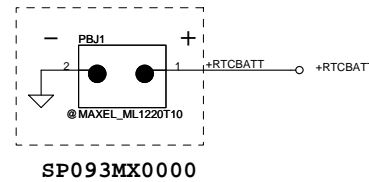
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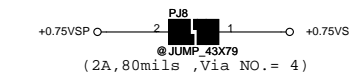
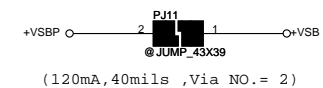
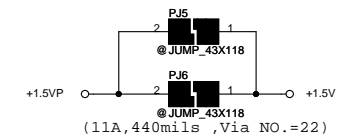
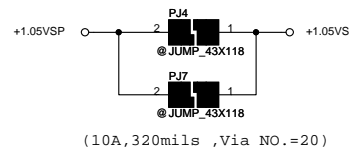
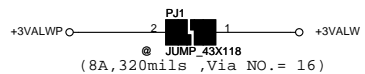
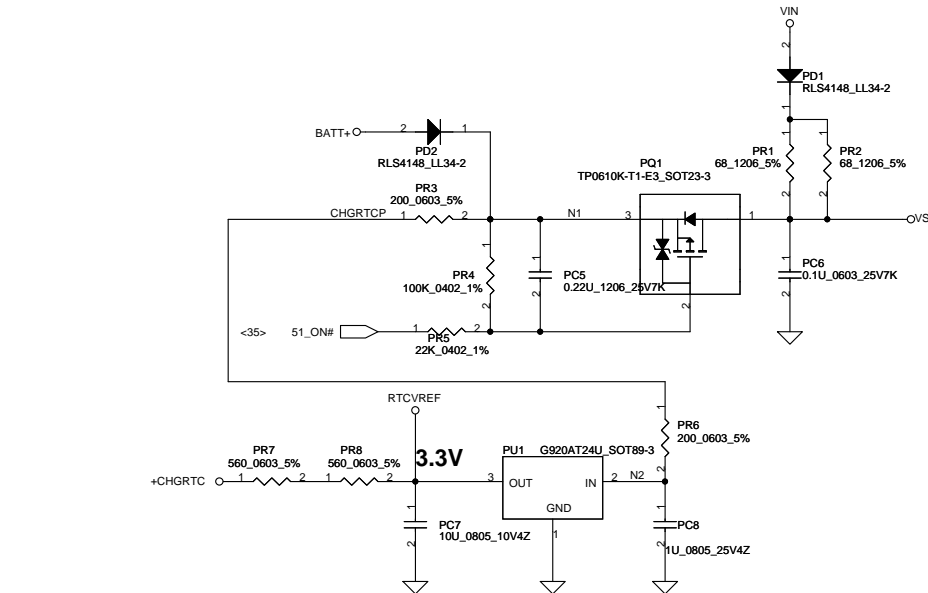
Vin Detector

High 18.384 17.901 17.430
Low 17.728 17.257 16.976

RTC Battery



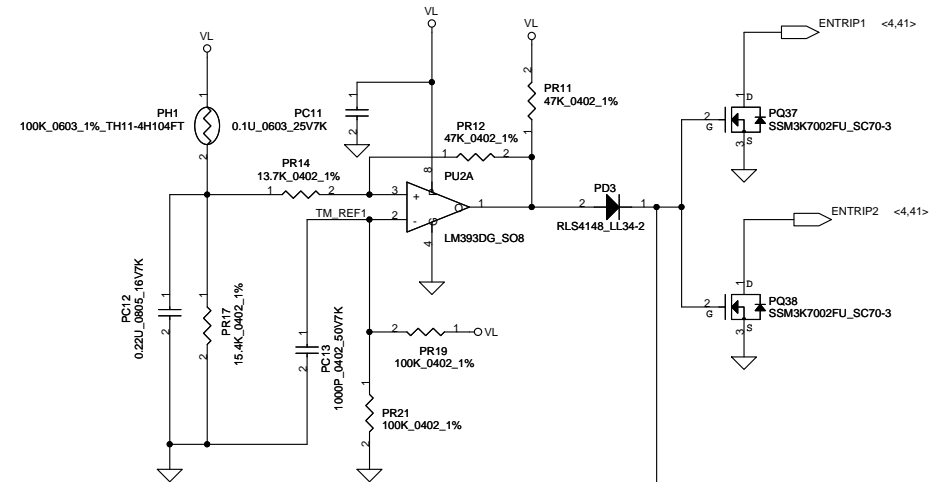
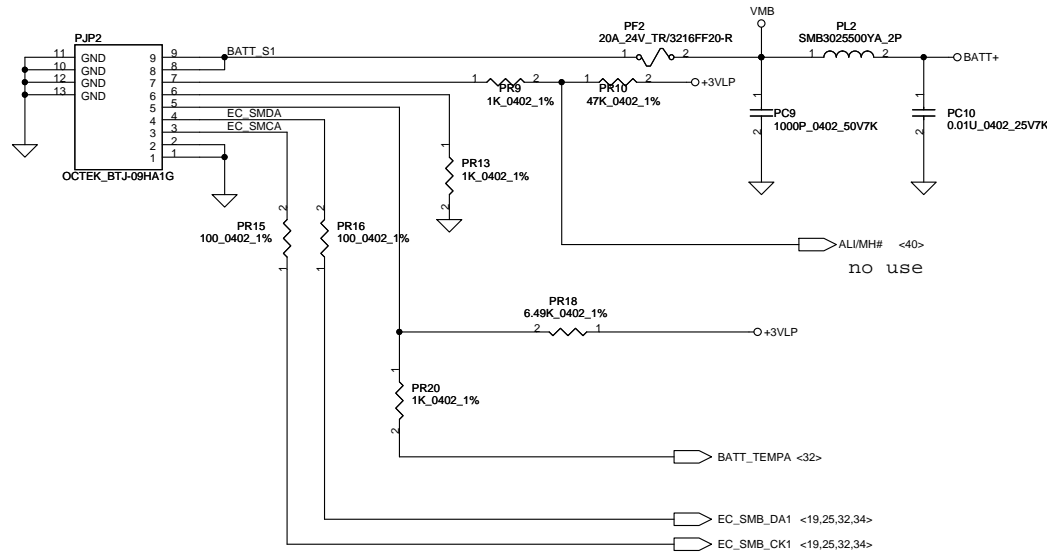
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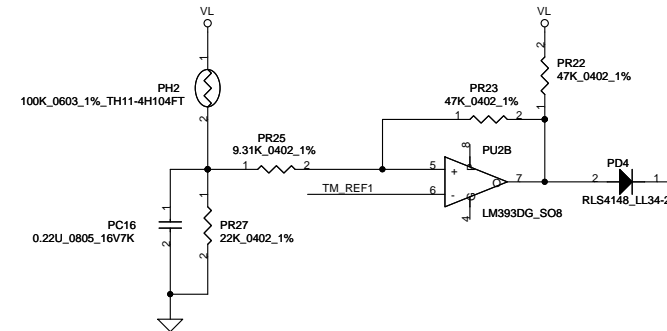
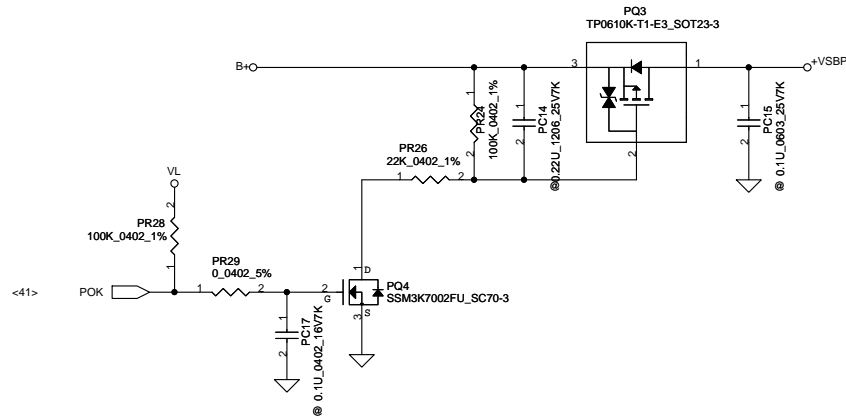
PH1 under CPU botten side :

CPU thermal protection at 92 degree C
Recovery at 56 degree C



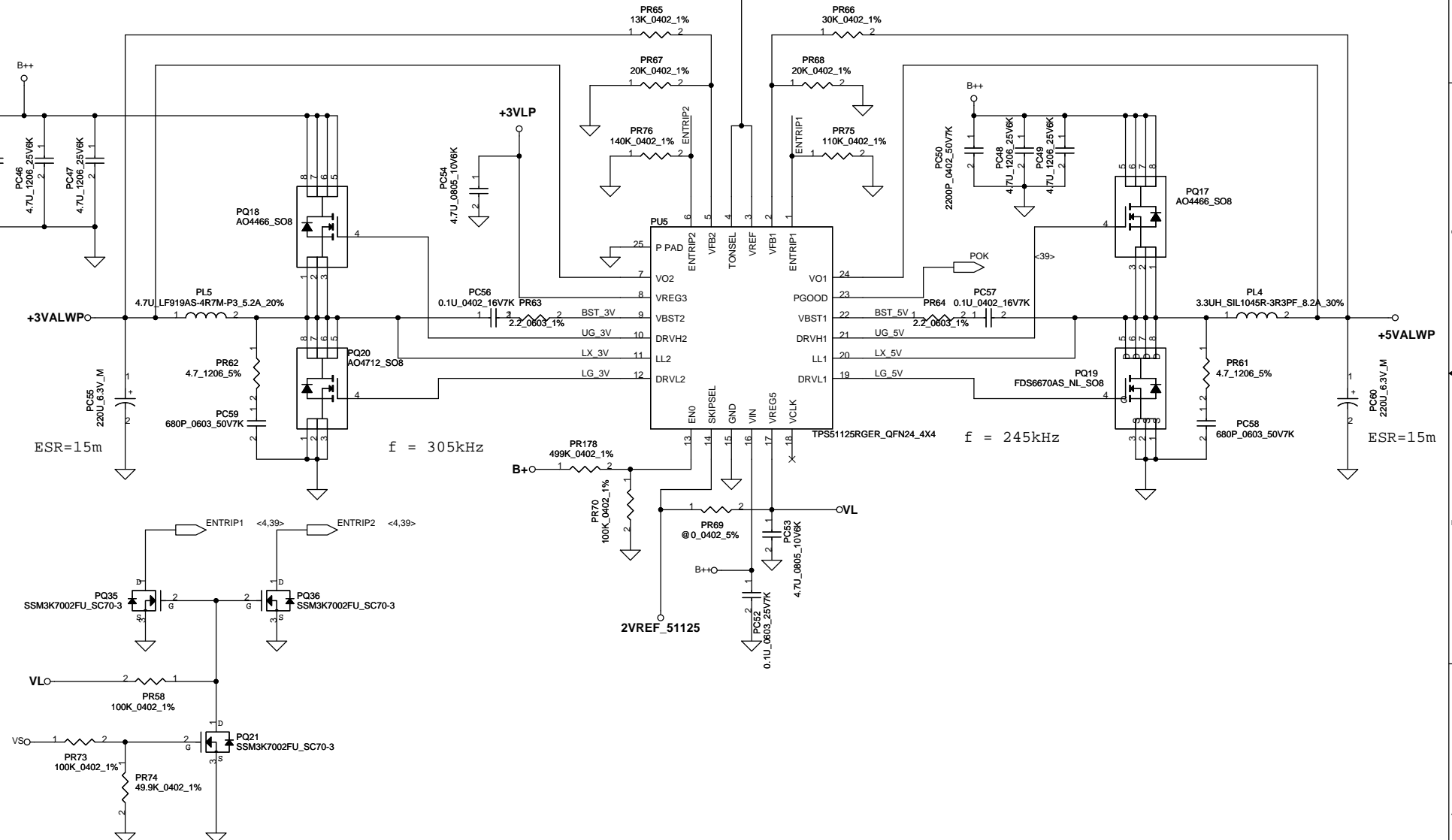
PH2 near main Battery CONN :

BAT. thermal protection at 79 degree C
Recovery at 47 degree C



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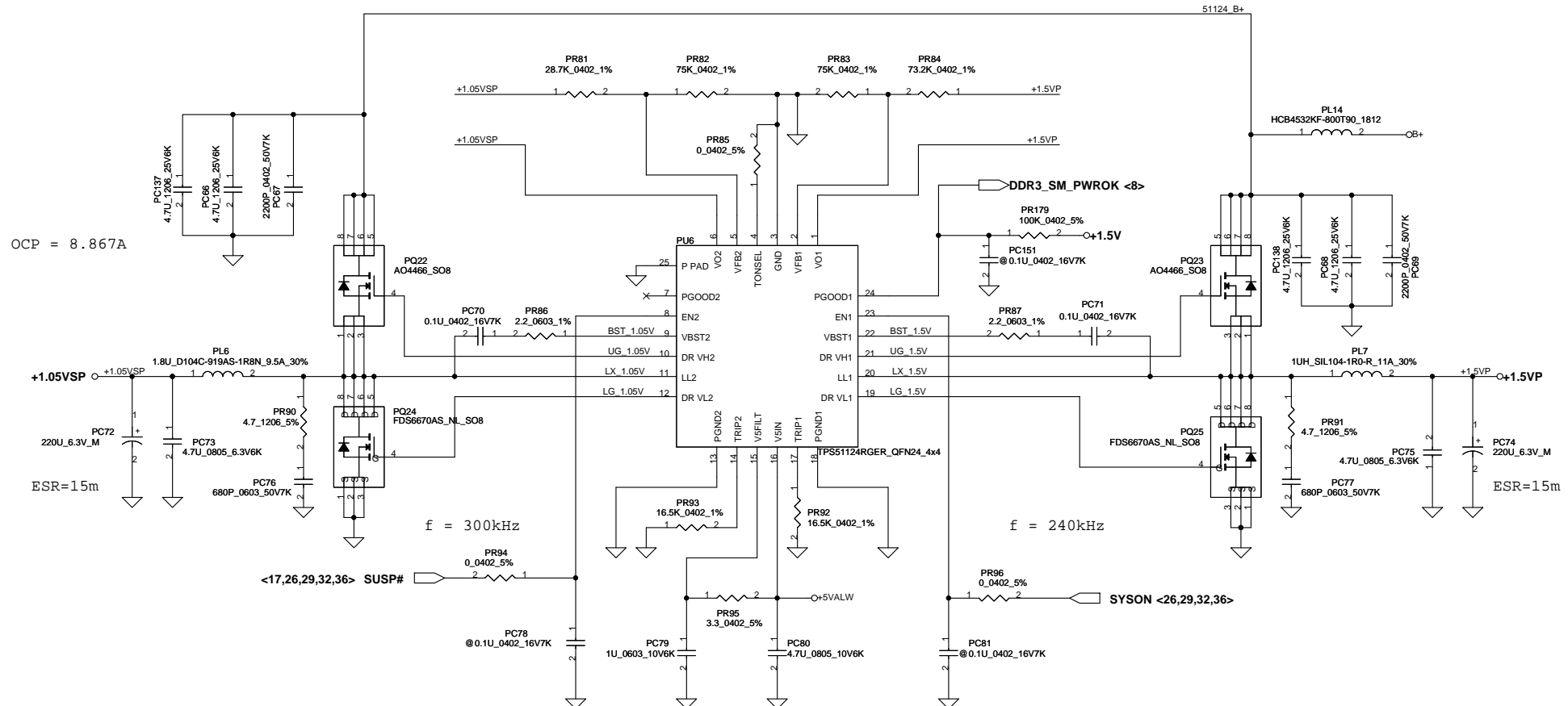
Frequency different	
RT8205C 300KHZ/375KHZ	TPS51125 245KHZ/305KHZ
OCP calculation method different	
RT8205C Rtrip*Itrip/10	TPS51125 (Rtrip*Itrip/9)-24mV
GND pad need add via to ground	
Add pull high resistor to +3VLP on pin13	

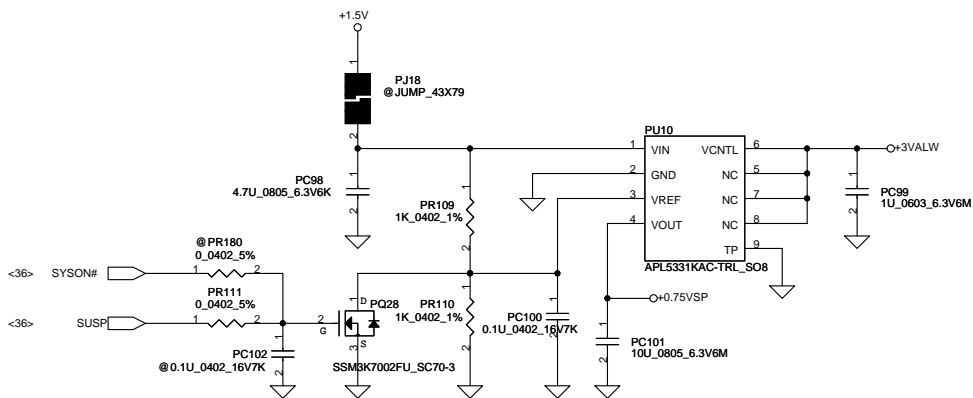
$$\text{OCP} = 7.94\text{A}$$


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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.)

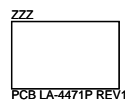
KSRAA LA-4471P SCHEMATIC CHANGE LIST
REVISION CHANGE: 0.1 TO 0.2

Rev 0.1 to 0.2

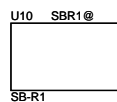
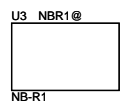
NO	PAGE	MODIFICATION LIST	PURPOSE
1	4	Del RC8	Repeat
2	4	Del RC10	Repeat
3	14	RD6 @	For Boot
4	32	RO20 @	For Boot
5	25	Del RE10	For Boot
6	32	Add Pin 66 LOM_WAKE# to LAN IC	For LAN WAKE UP
7	32	Add TMPSPR_SXP pull up +3VS	For EC
8	36	Add FAN NPTH hole H55	For ME require
9	36	Change H54 size to 3P8	For ME require
10	36	Add RO91.RO94.RO95	For PE require
11	32	Change Pin 16 to UWB_OFF#,RO96 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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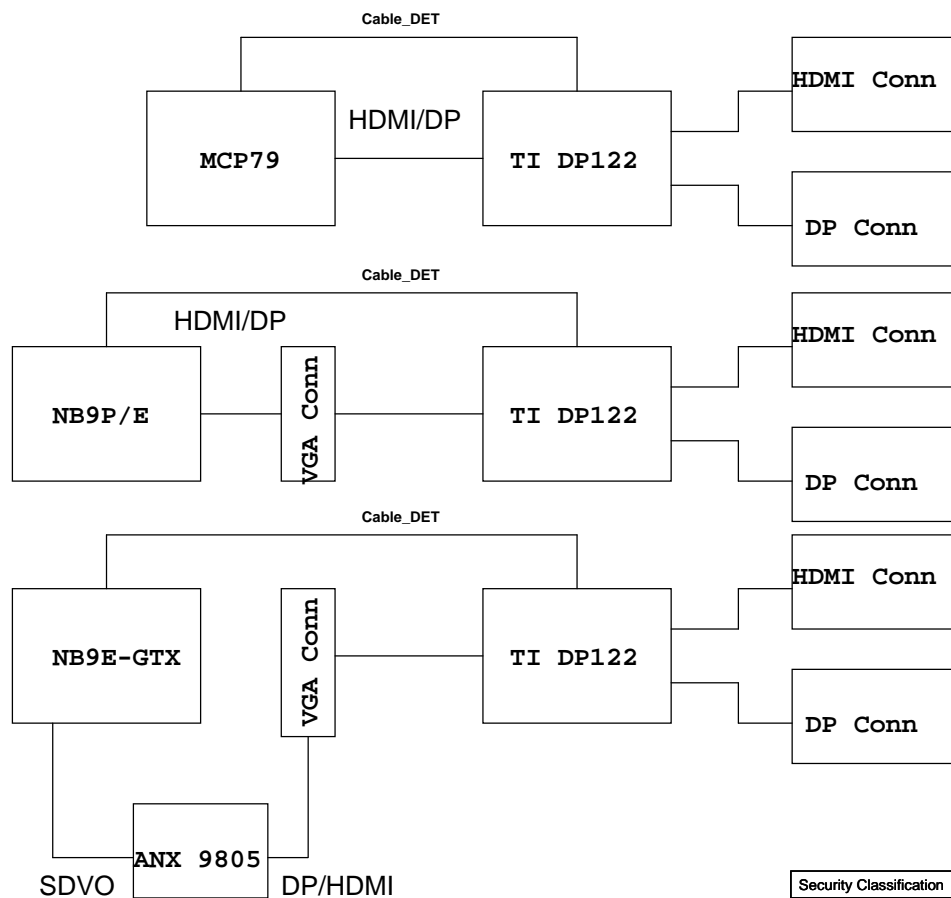
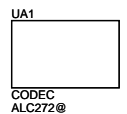
PCB



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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