

# Half Penny Bridge 13.3

# Compal Confidential

Schematic Document

Cantiga + ICH9

2009 / 06 / 01    Rev:1.0 (A00)

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Symbol Note :

 : means Digital Ground

 : means Analog Ground

@ : means just reserve , no build  
CONN@: connect  
VGA@: discrete component  
UMA@: uma component  
TPM@: TPM compoent

<div>power plane</div> <div>State</div>	+B	+5VALW  +3VALW	+1.8V	+5VS +3VS +1.5VS +0.9V +VCCP +CPU_CORE  +VGA_CORE +1.8VS +1.1VS +0.9VGA
S0	O	O	O	O
S1	O	O	O	O
S3	O	O	O	X
S5 S4/AC	O	O	X	X
S5 S4/ Battery only	O	X	X	X
S5 S4/AC & Battery don't exist	X	X	X	X

PCI EXPRESS	DESTINATION
Lane 1	NA
Lane 2	GLAN RTL8111DL
Lane 3	MINI CARD-2 WLAN
Lane 4	EXPRESS CARD
Lane 5	CARD READER OZ888
Lane 6	NA

SATA	DESTINATION
Lane 0	HDD
Lane 1	ODD
Lane 4	NA
Lane 5	NA

SMBUS Control Table

	SOURCE	INVERTER	BATT	SERIAL EEPROM	THERMAL SENSOR (CPU)	SODIMM	CLK CHIP	MINI CARD	LCD
SMB_EC_CK1 SMB_EC_DA1	KB926	X	V	V	X	X	X	X	X
SMB_EC_CK2 SMB_EC_DA2	KB926	X	X	X	V	X	X	X	X
SMB_CK_CLK1 SMB_CK_DAT1	ICH9	X	X	X	X	V	V	X	X
LCD_CLK LCD_DAT	Cantiga	X	X	X	X	X	X	X	V

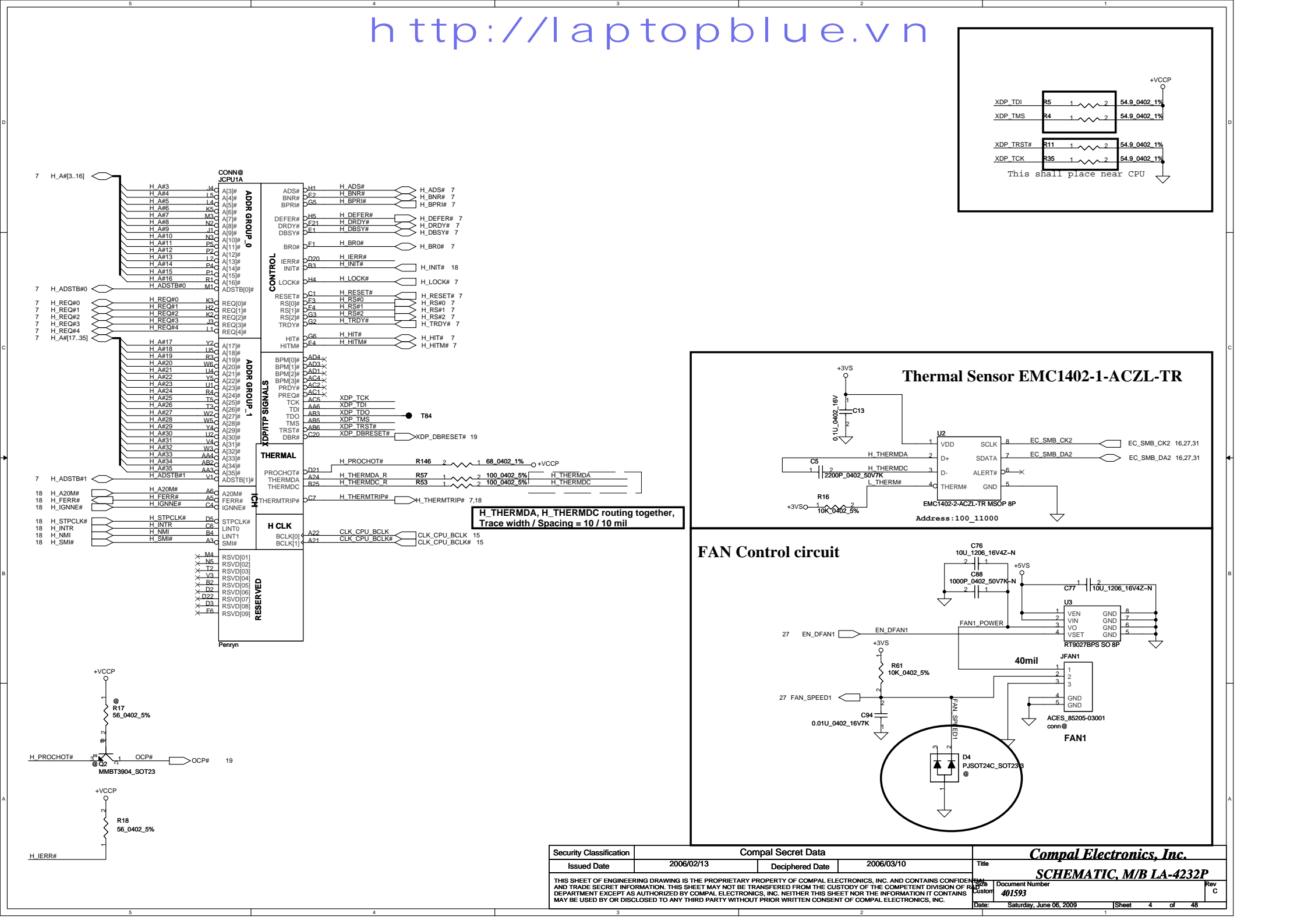
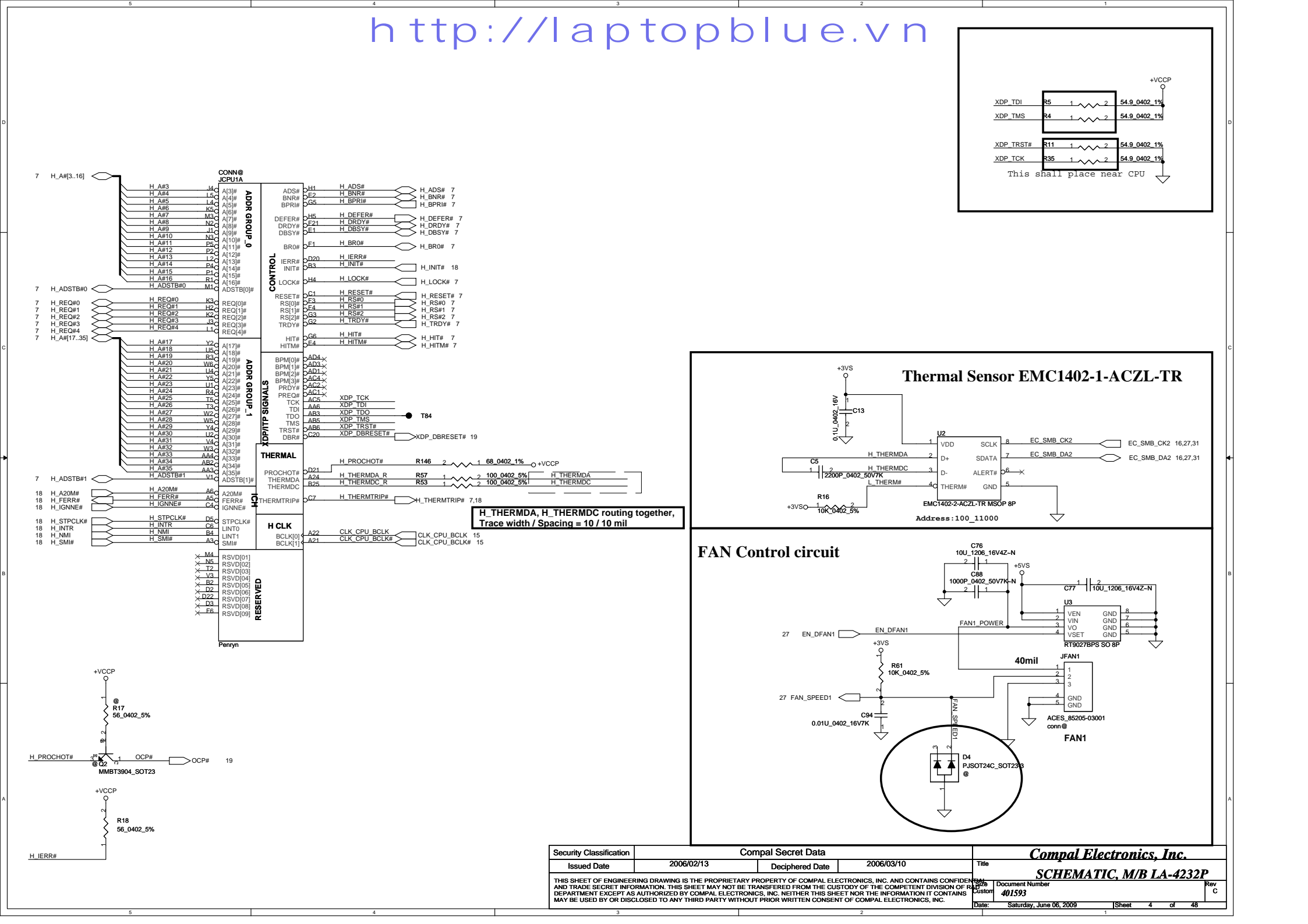
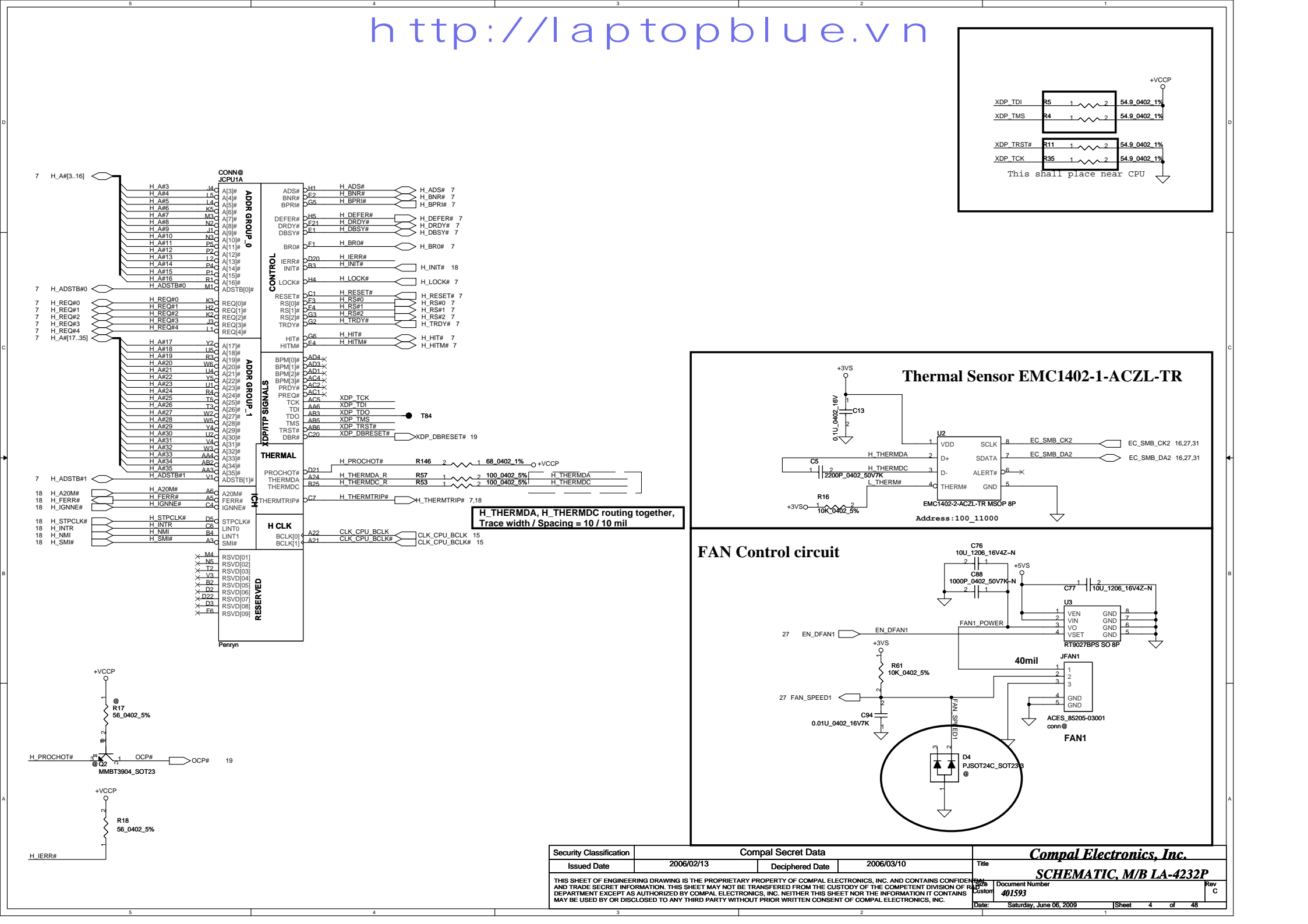
I2C / SMBUS ADDRESSING

DEVICE	HEX	ADDRESS
DDR SO-DIMM 0	A0	1 0 1 0 0 0 0 0
DDR SO-DIMM 1	A4	1 0 1 0 0 1 0 0
CLOCK GENERATOR (EXT.)	D2	1 1 0 1 0 0 1 0

ICH9-M	USB PORT#	DESTINATION
	0	JUSBP1
	1	CAMERA
	2	JUSBP3(SINGLE)
	3	Felica
	4	Blue Tooth
	5	Finger Printer
	6	JMINI2-WLAN
	7	Express card
	8	JUSBP3(DUEL TOP)
	9	JUSBP3(DUEL BOTTOM)
	10	NA
	11	NA

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# http://laptopblue.vn

XDP TDI R5 1 2 54.9\_0402\_1%  
XDP TMS R4 1 2 54.9\_0402\_1%  
XDP TRST# R11 1 2 54.9\_0402\_1%  
XDP TCK R35 1 2 54.9\_0402\_1%

This shall place near CPU

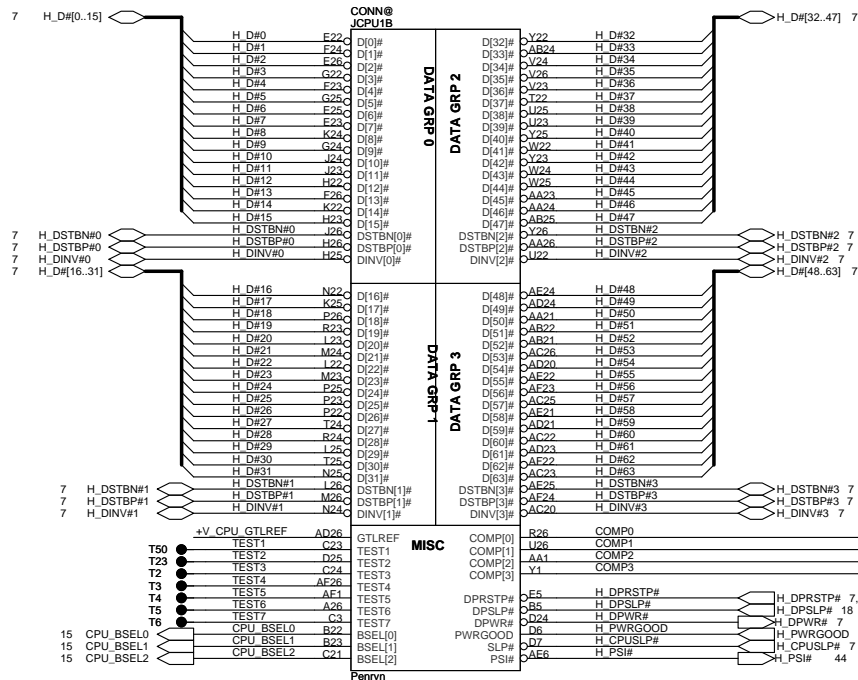
H\_THERMDA, H\_THERMDC routing together,  
Trace width / Spacing = 10 / 10 mil

### FAN Control circuit

### Thermal Sensor EMC1402-1-ACZL-TR

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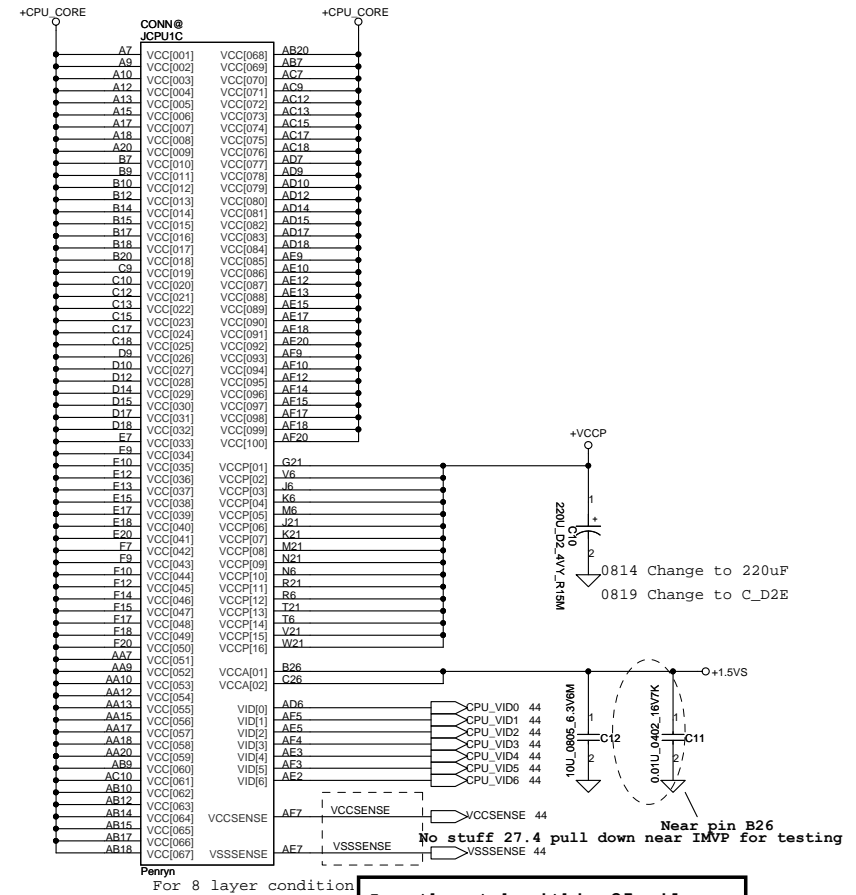
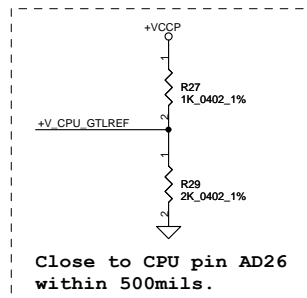




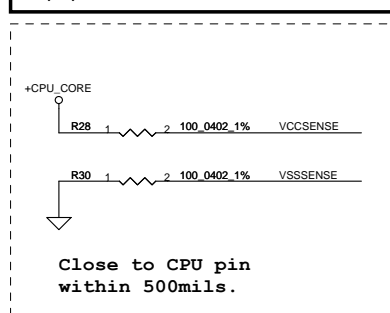
layout note: Rout H\_DPRSTP# from ICH9 to IMVP6 then to GMCH & CPU  
 layout note: Route TEST3 & TEST5 traces on ground referenced layer to the TPs

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

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 21 mils. COMP[1,3] trace width is 5



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

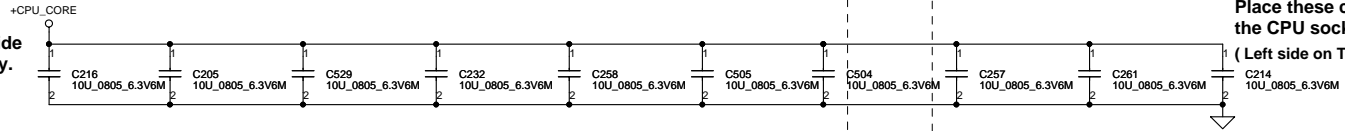




# High Frequency Decoupling

10uF 0805 X5R -> 85 degree.

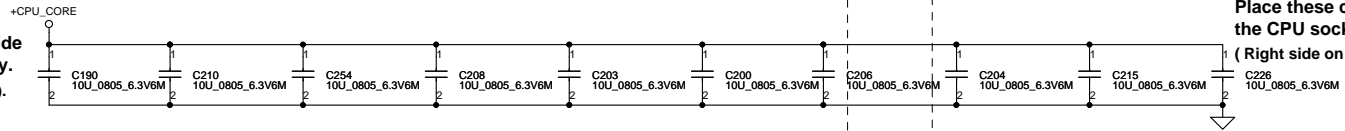
Place these caps inside the CPU socket cavity. ( Left side on Top ).



Place these caps inside the CPU socket.

( Left side on Top ).

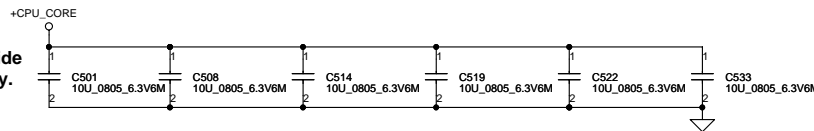
Place these caps inside the CPU socket cavity. ( Right side on Top side ).



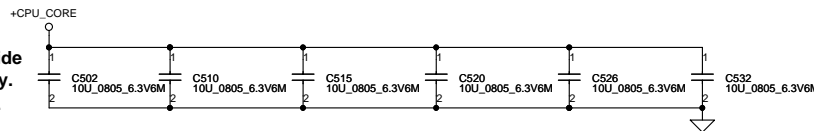
Place these caps inside the CPU socket.

( Right side on Top ).

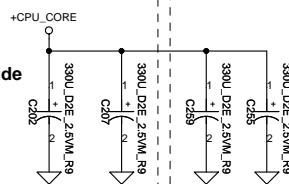
Place these caps inside the CPU socket cavity. ( Left side on Bottom ).



Place these caps inside the CPU socket cavity. ( Right side on Bottom ).



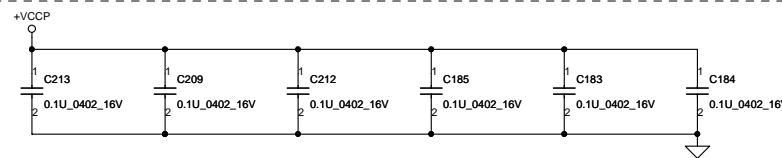
Place these caps inside the CPU socket. ( Left side on Top ).



Place these caps inside the CPU socket. ( Right side on Top side ).

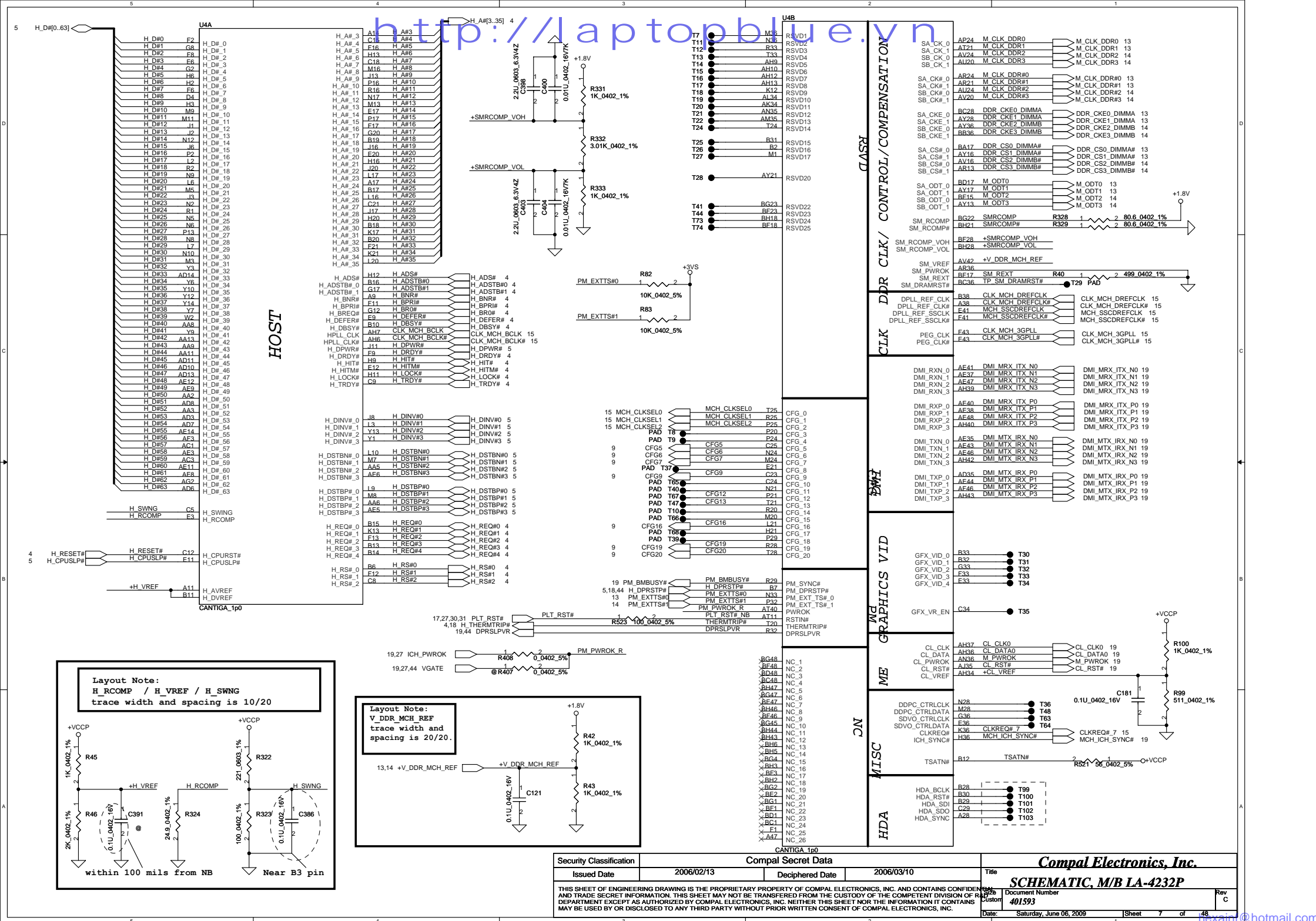
ESR <= 1.5m ohm  
Capacitor > 880 uF

Penryn

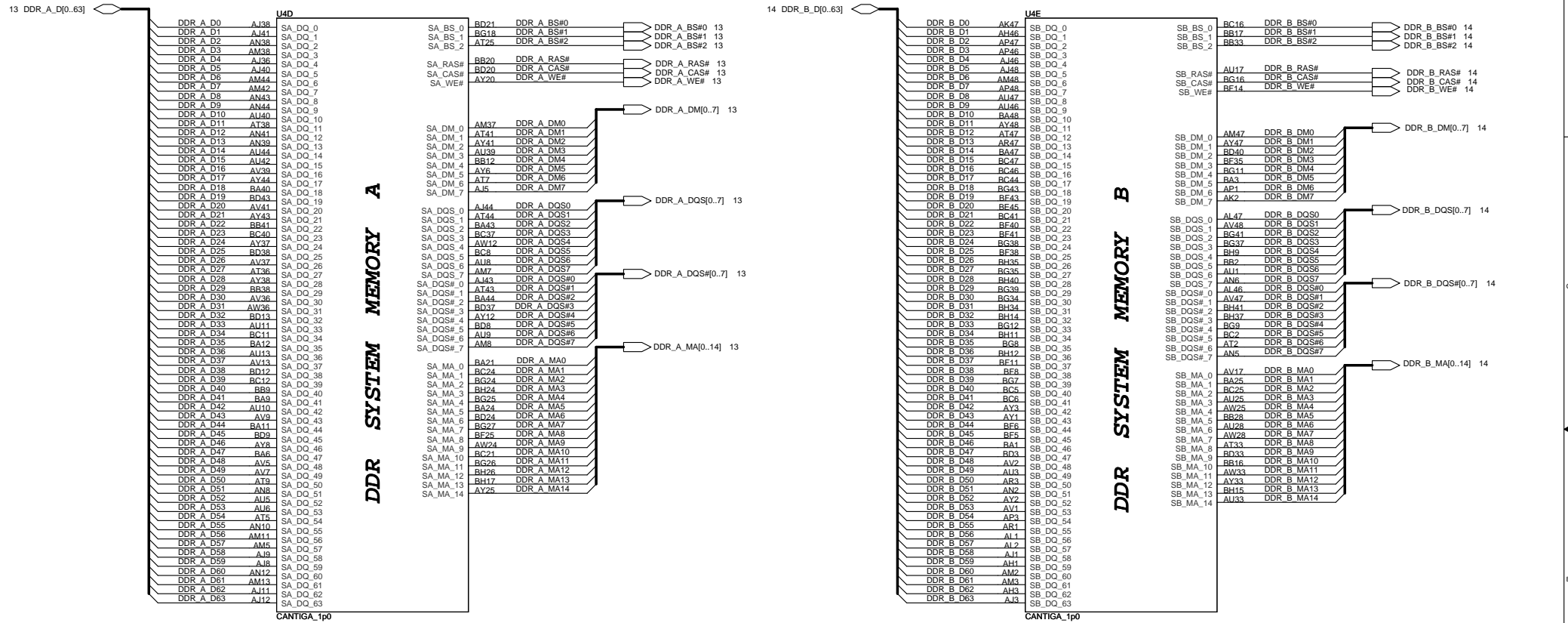


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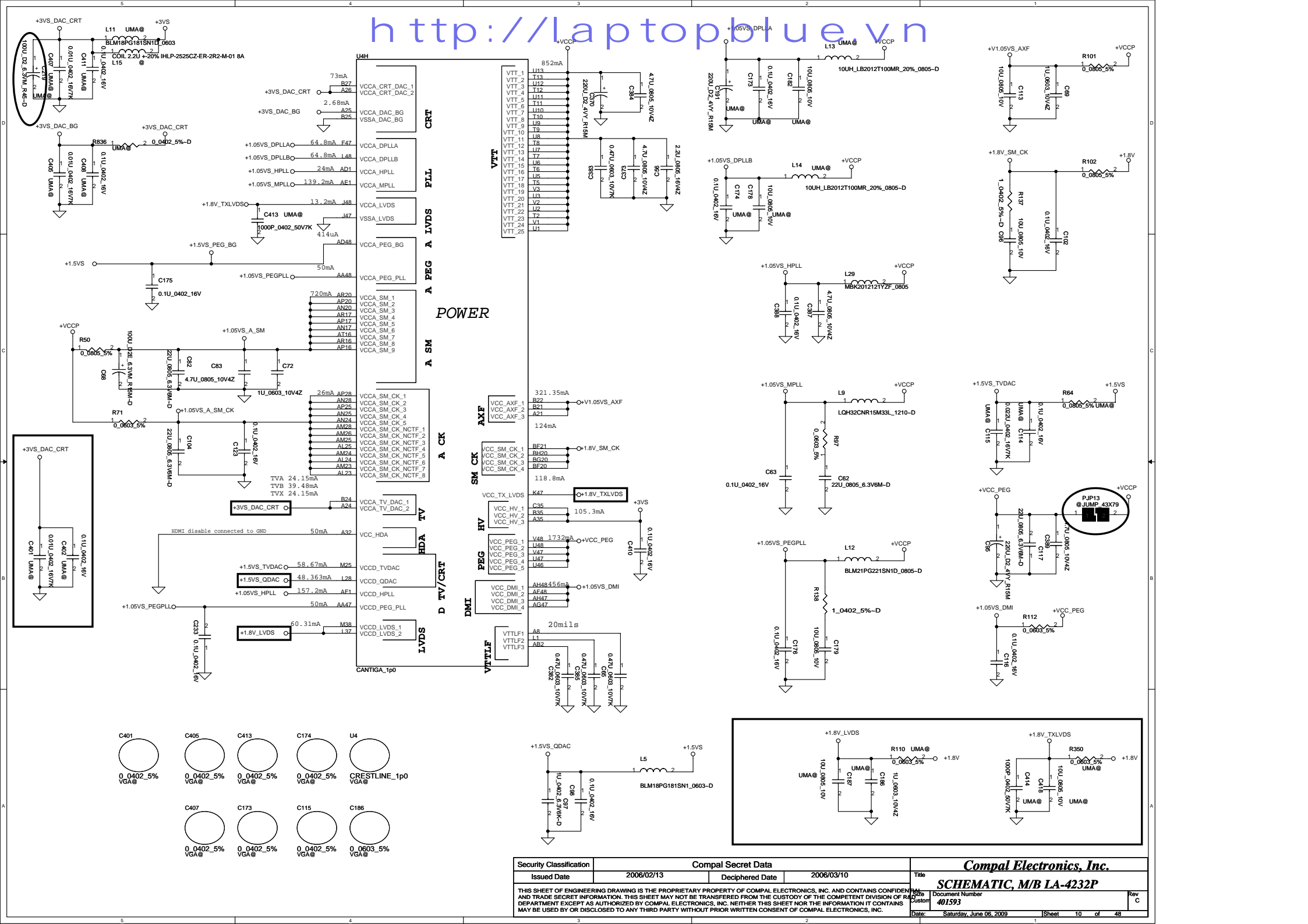












**POWER**

**CRT**

**PLL**

**LVDS**

**A PEG**

**A SM**

**A CK**

**TV**

**HDA**

**D TV/CRT**

**LVDS**

Part Number	Quantity	Description
C401	1	0.0402_5% VGA@
C405	1	0.0402_5% VGA@
C413	1	0.0402_5% VGA@
C174	1	0.0402_5% VGA@
U4	1	CRESTLINE_1p0 VGA@
C407	1	0.0402_5% VGA@
C173	1	0.0402_5% VGA@
C115	1	0.0402_5% VGA@
C186	1	0.0603_5% VGA@

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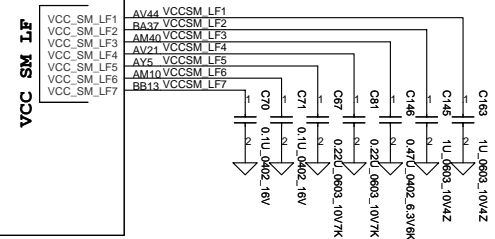
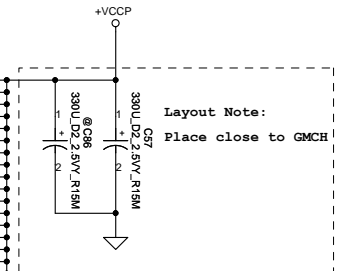
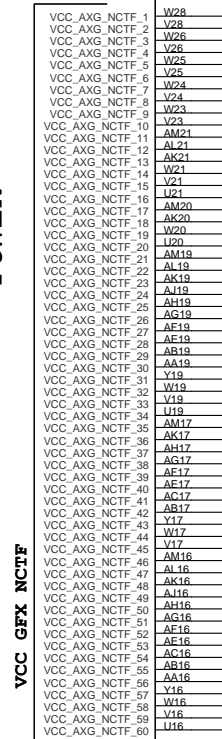
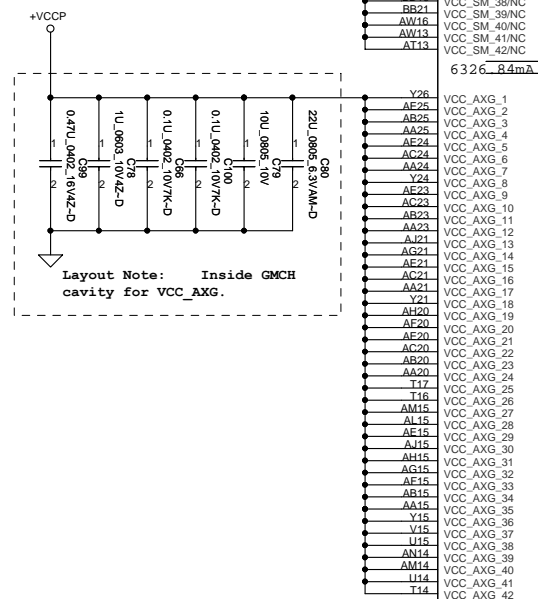
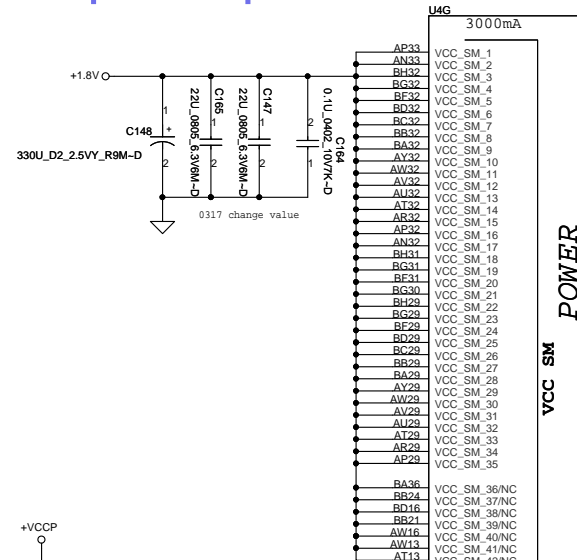
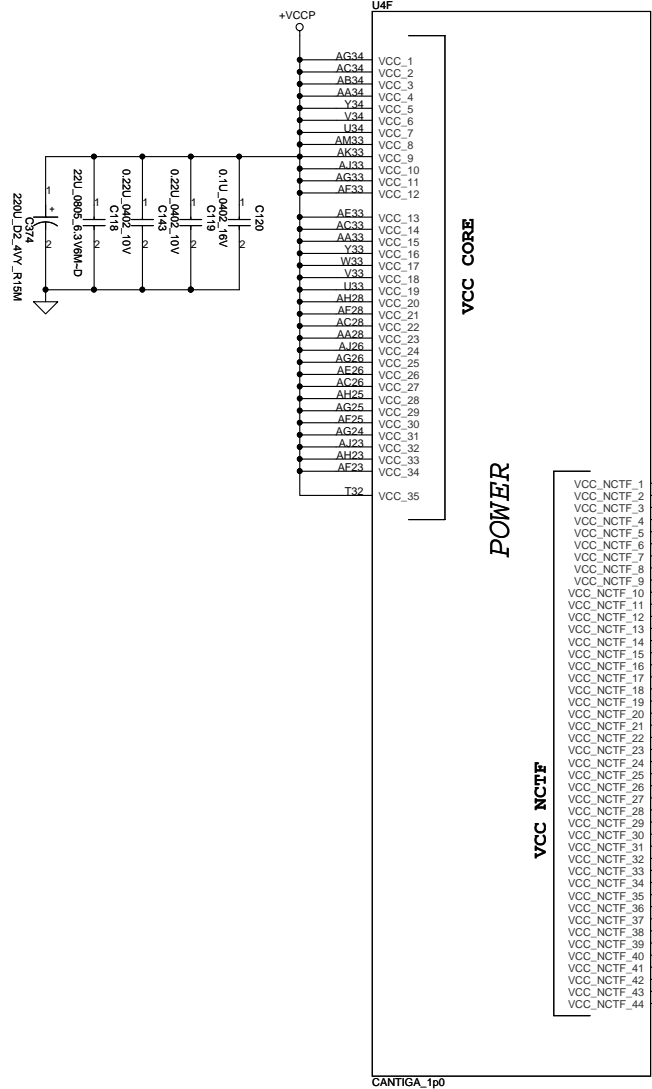
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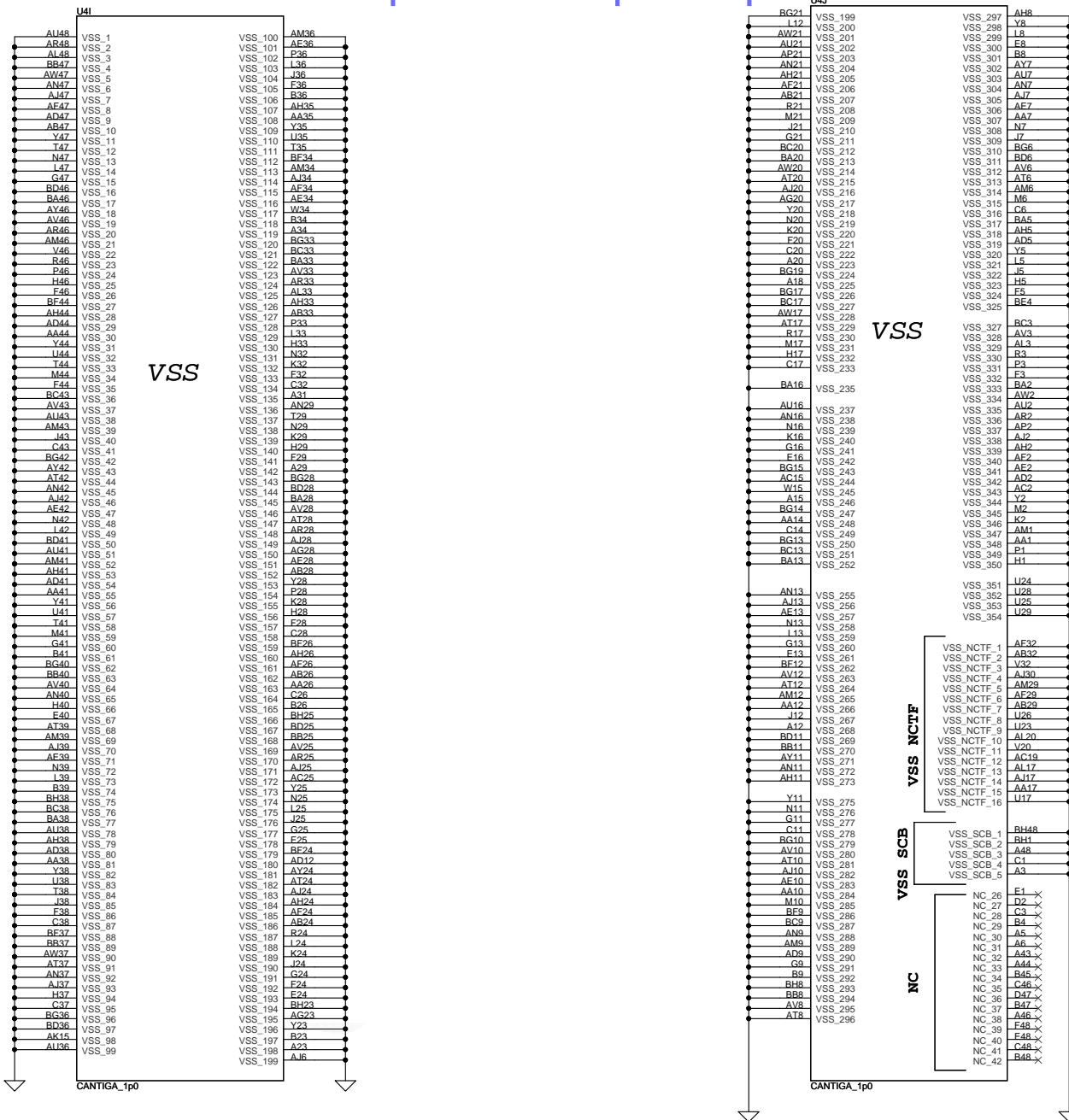


Extnal Graphic: 1210.34mA  
integrated Graphic: 1930.4mA



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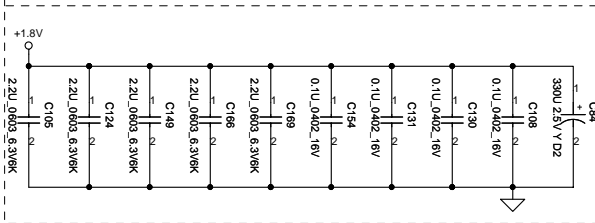
http://laptopblue.vr

JDM12

Close to VREF pins

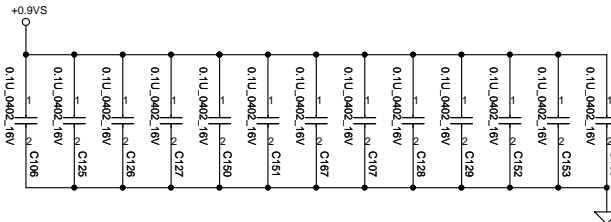


**Layout Note:**  
Place near JDIM1

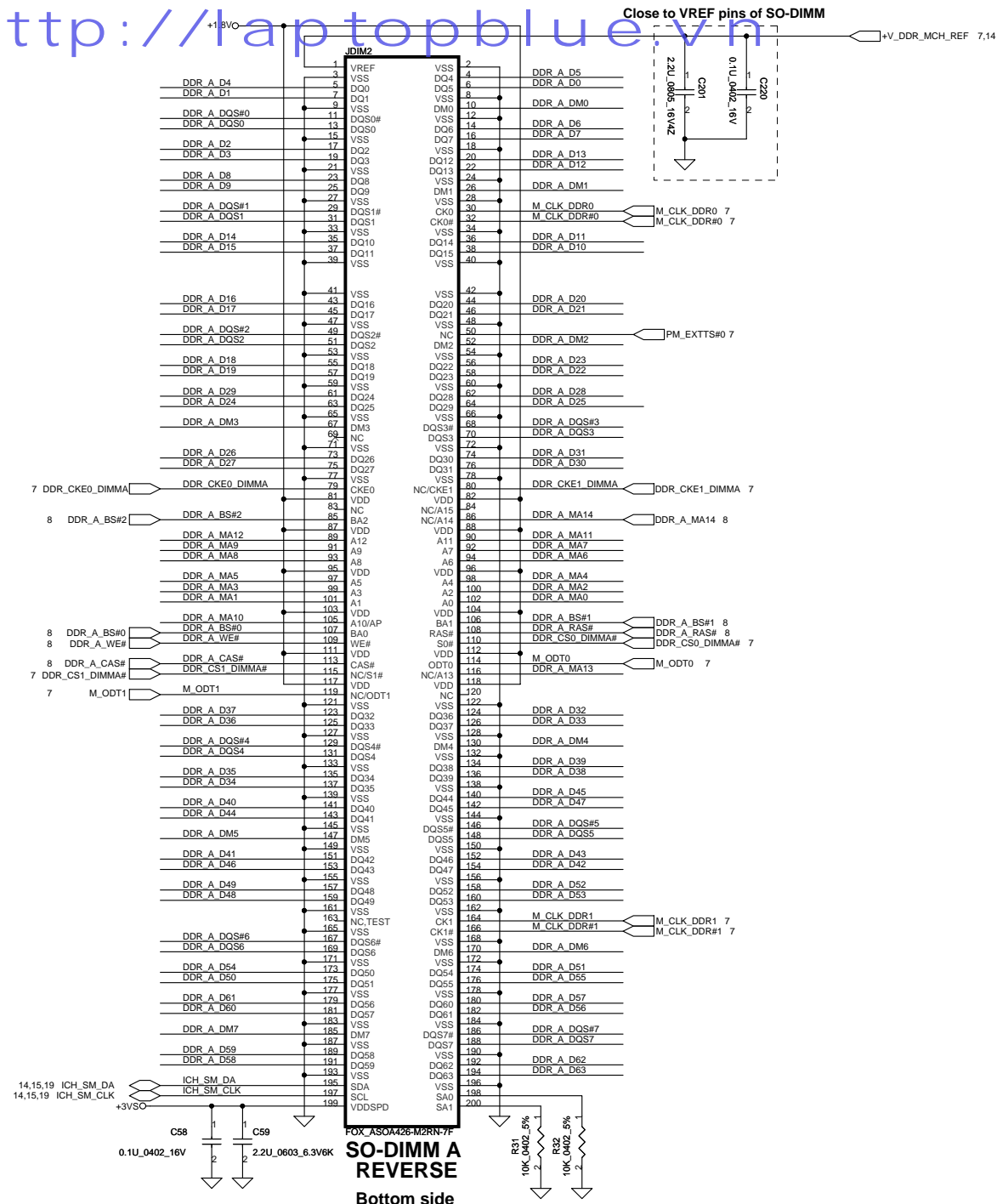
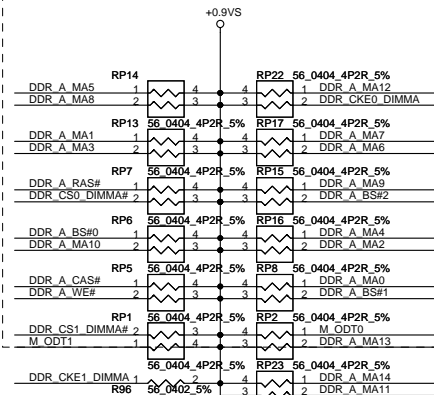


**Layout Note:**

**Place one cap close to every 2 pullup resistors terminated to +0.9V**



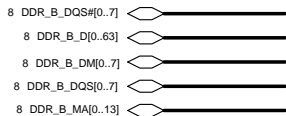
**Layout Note:**  
Place these resistors  
closely JP41, all  
trace length Max=1.



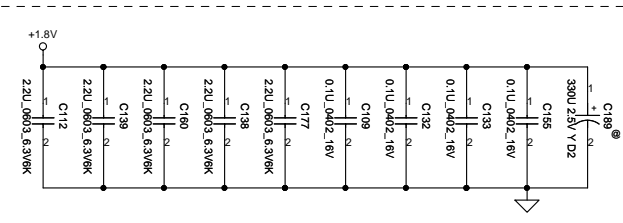
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hexainf@hotmail.com

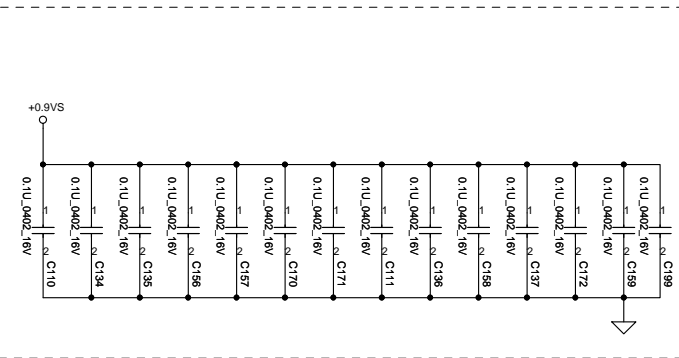




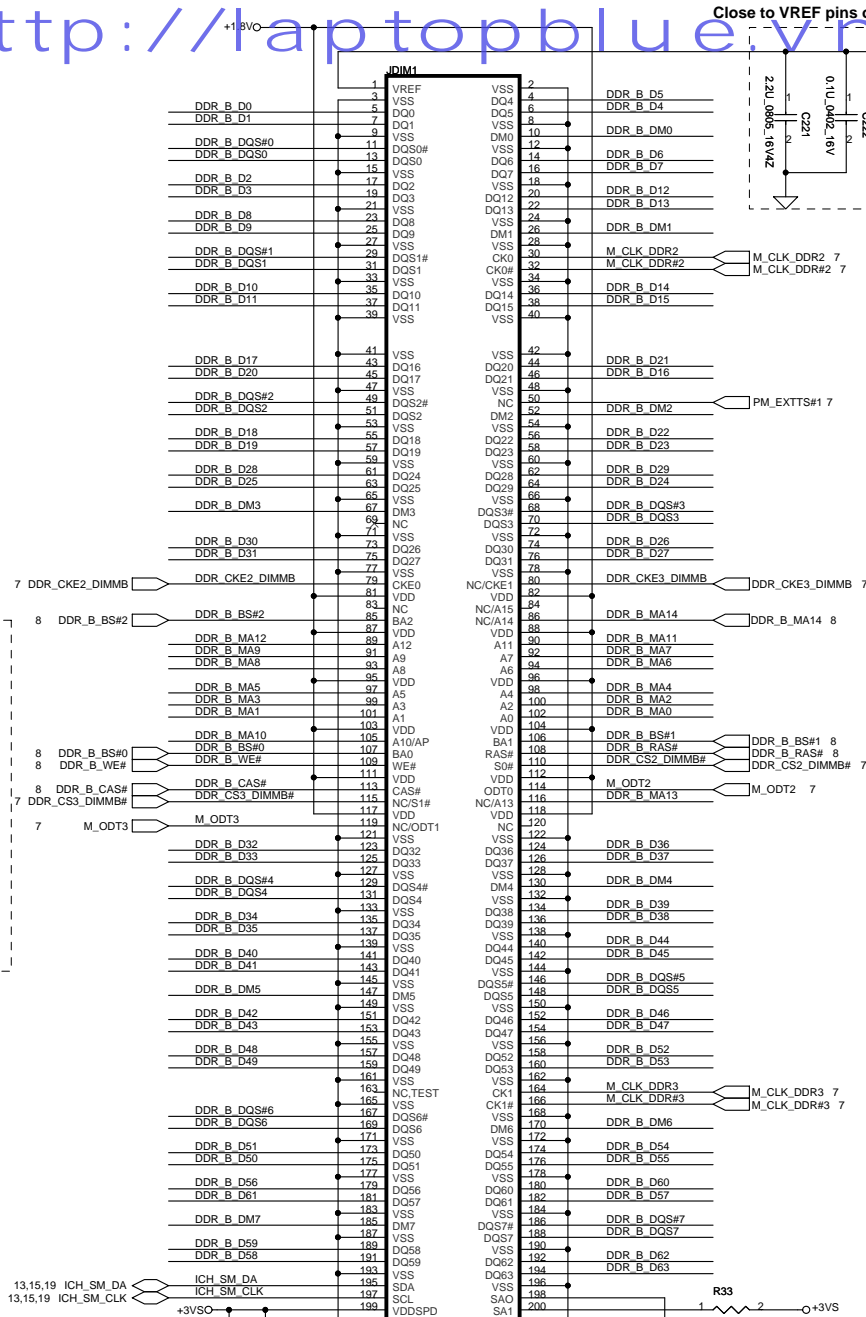
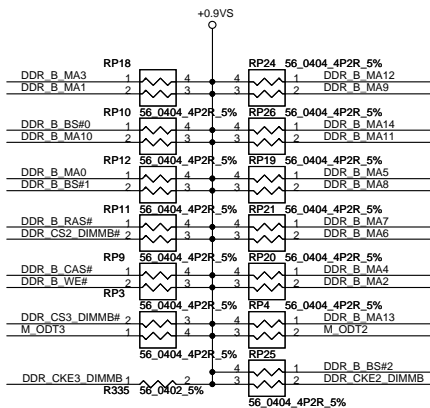
Layout Note:  
Place near JDIM2



Layout Note:  
Place one cap close to every 2 pullup  
resistors terminated to +0.9VS



Layout Note:  
Place these resistor  
closely JP42.all  
trace length Max=1.5"

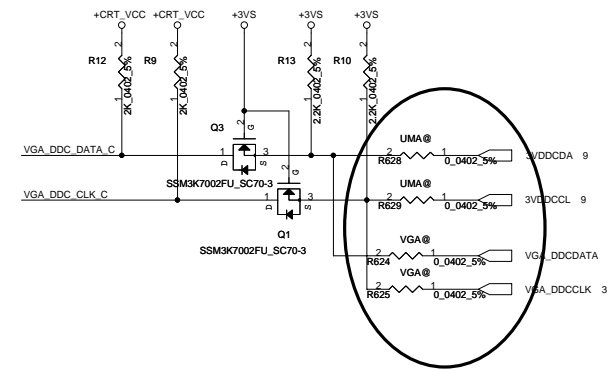




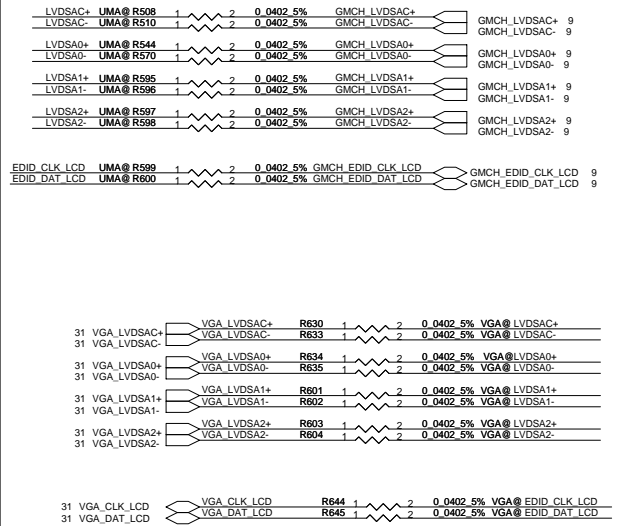




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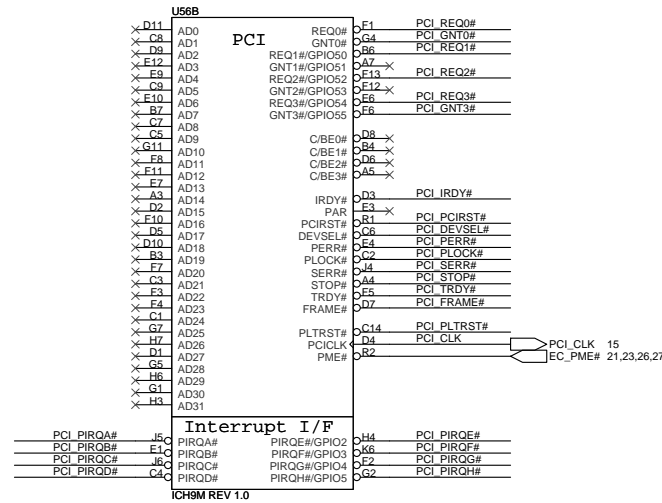
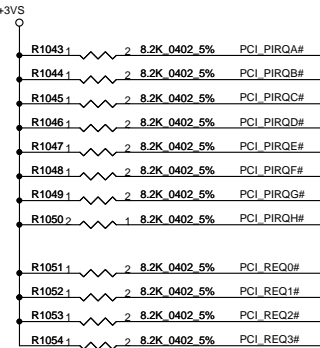
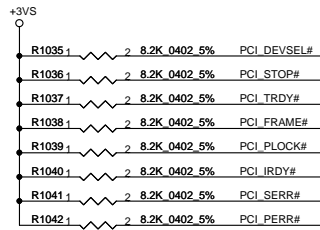


**W=60mils**

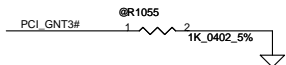


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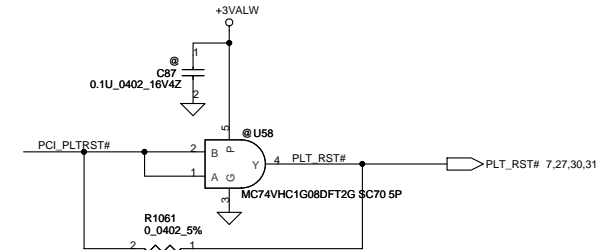
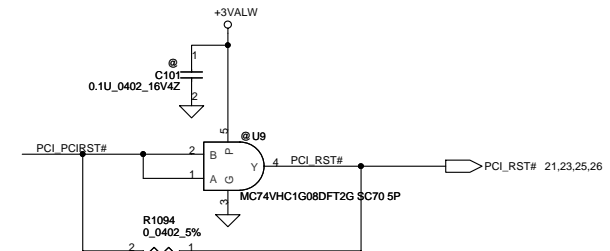
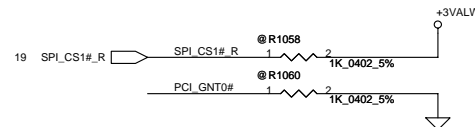




A16 swap override Strap	
PCI_GNT3#	Low= A16 swap override Enable High= Default *

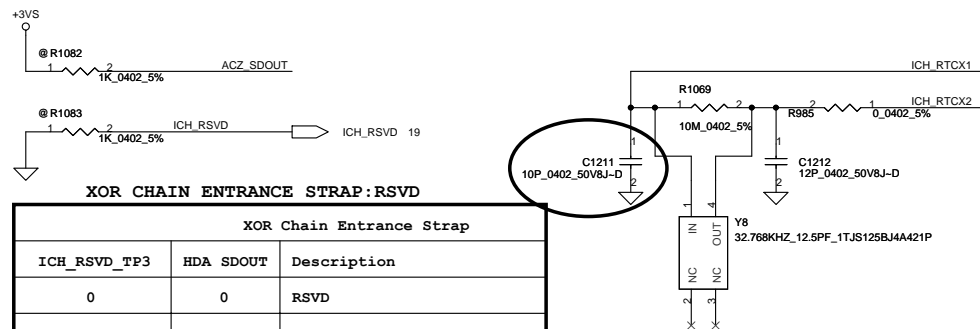
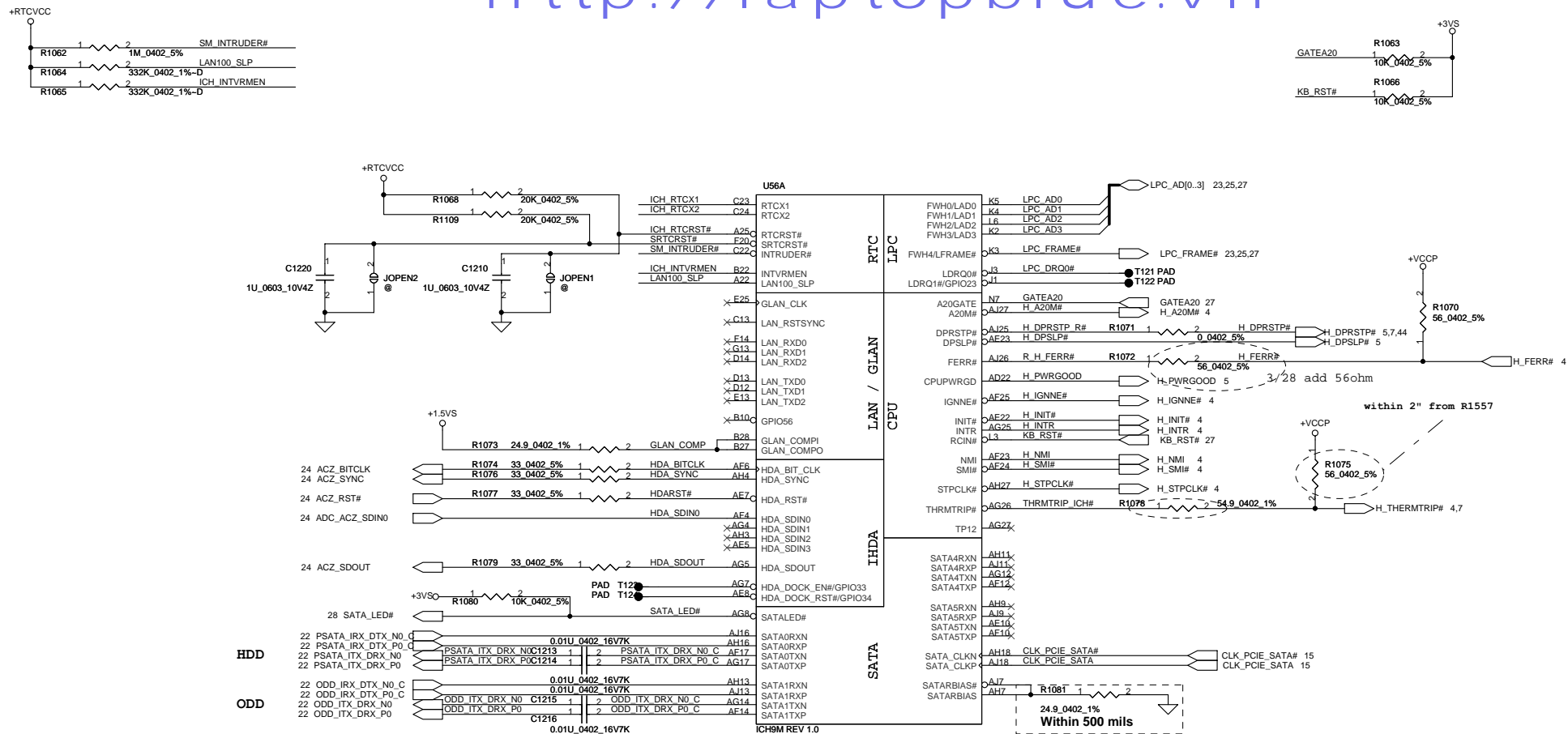


Boot BIOS Strap		
PCI_GNT0#	SPI_CS#1	Boot BIOS Location
0	1	SPI
1	0	PCI
1	1	LPC *





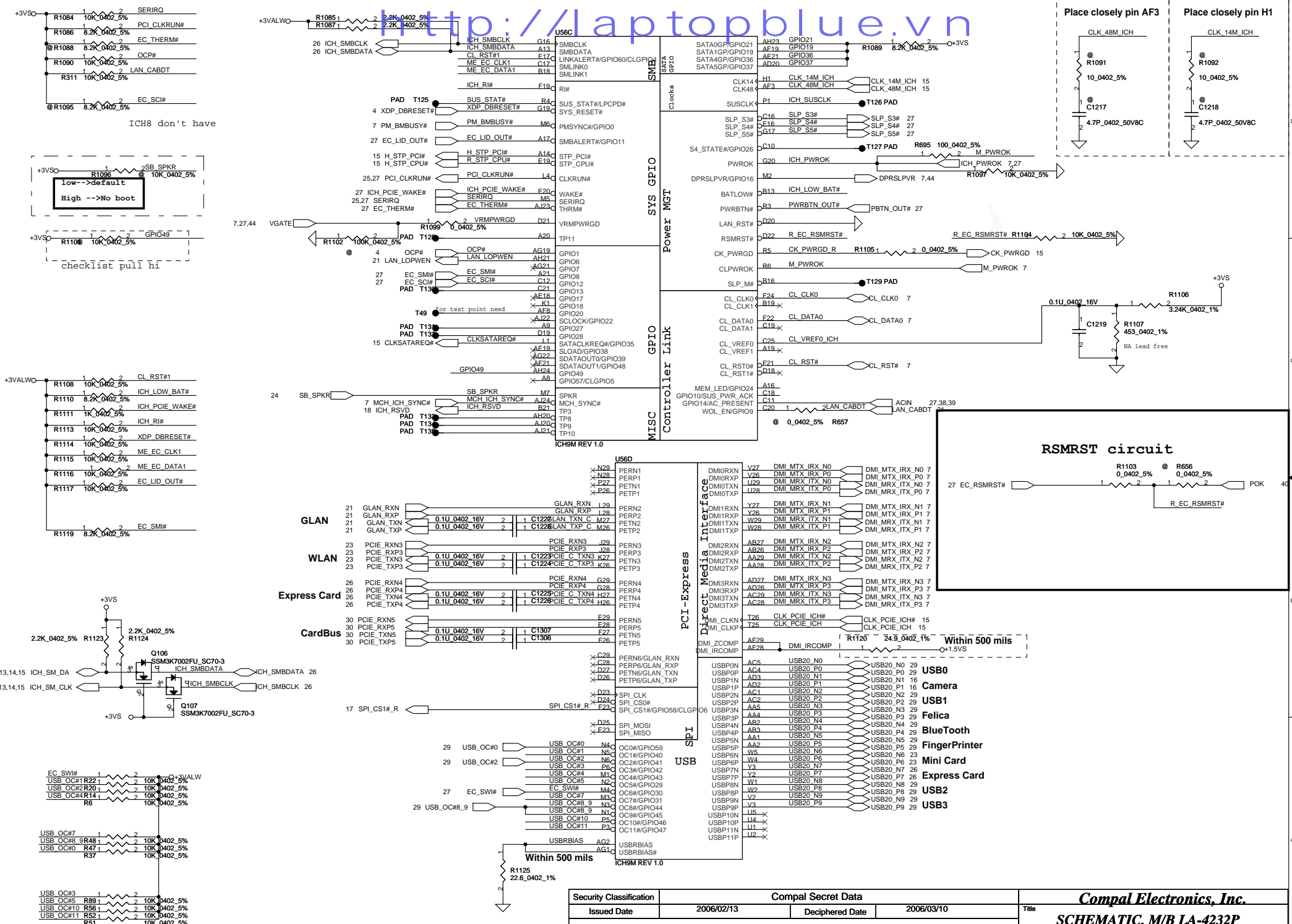
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XOR Chain Entrance Strap		
ICH_RSVD_TP3	HDA SDOUT	Description
0	0	RSVD
0	1	Enter XOR Chain
1	0	Normal Operation (Default)
1	1	Set PCIE port config bit 1

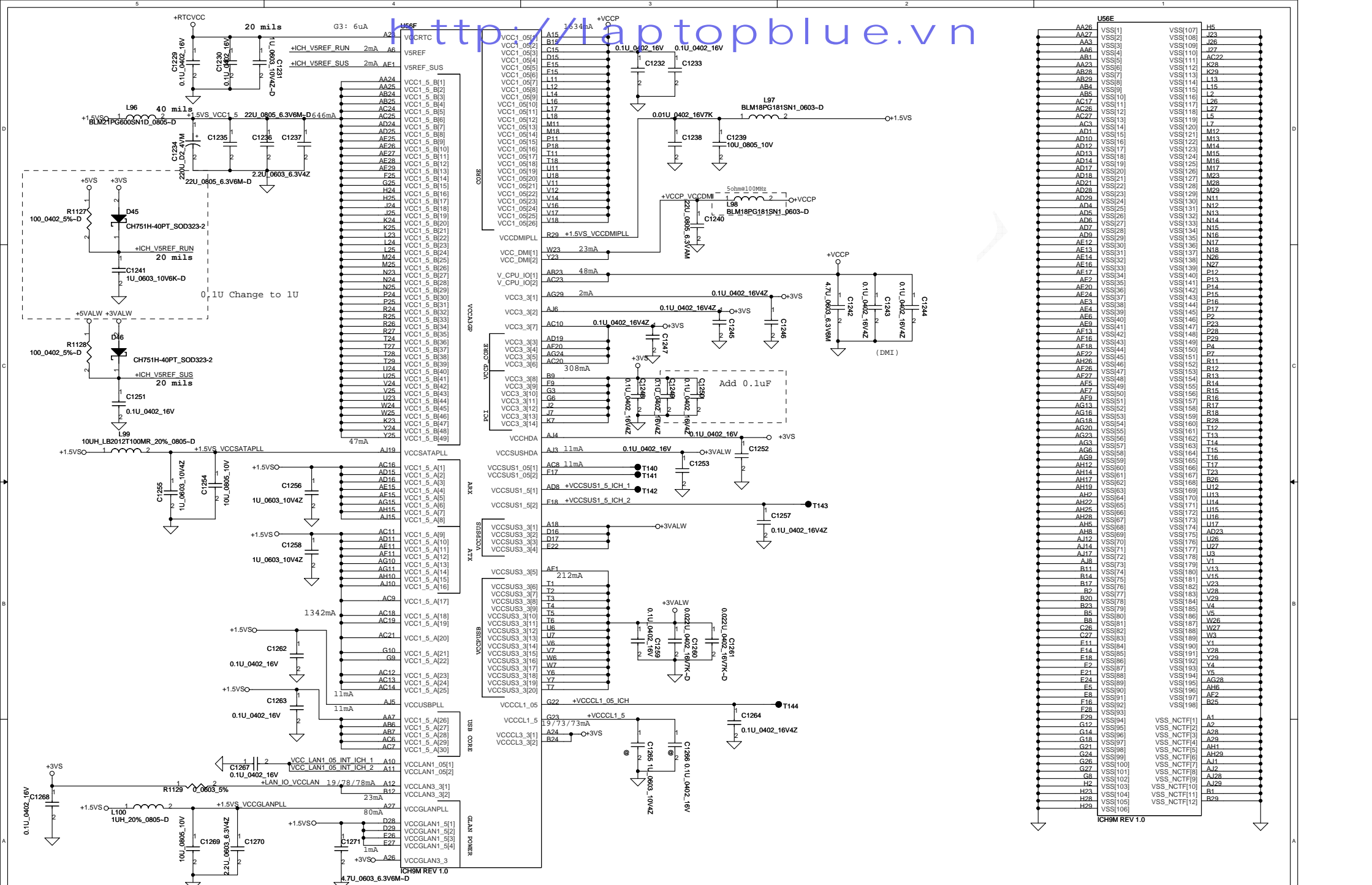
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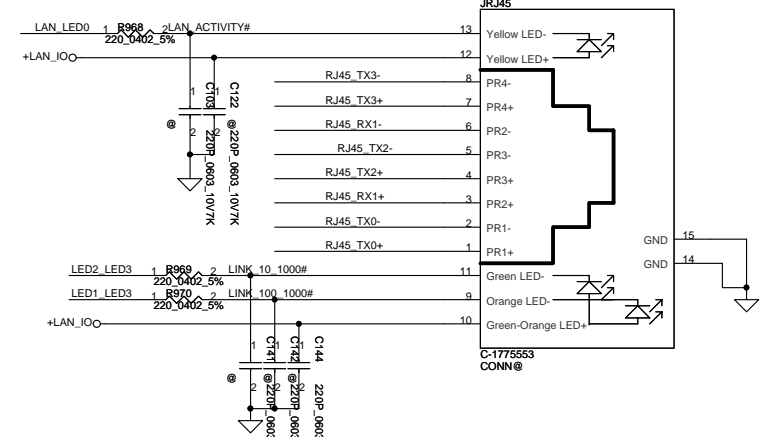
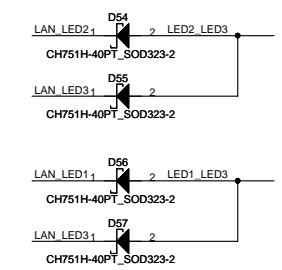
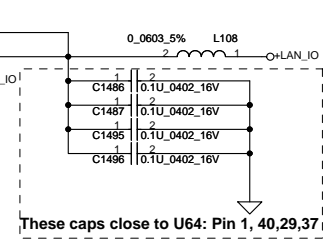
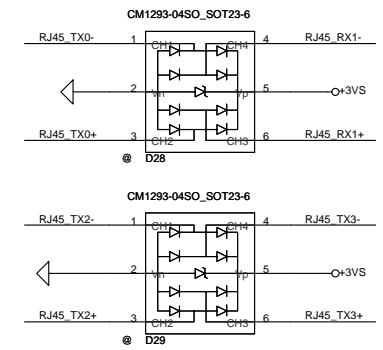
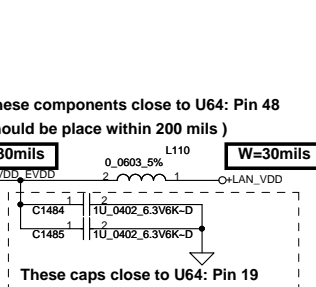
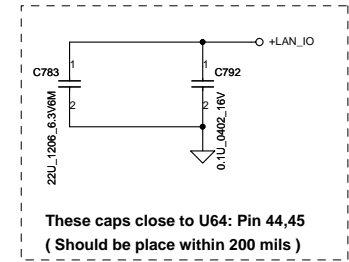
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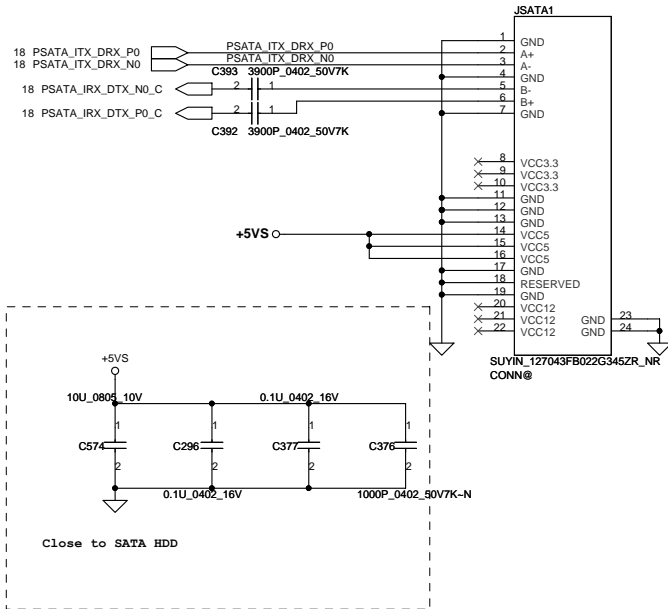




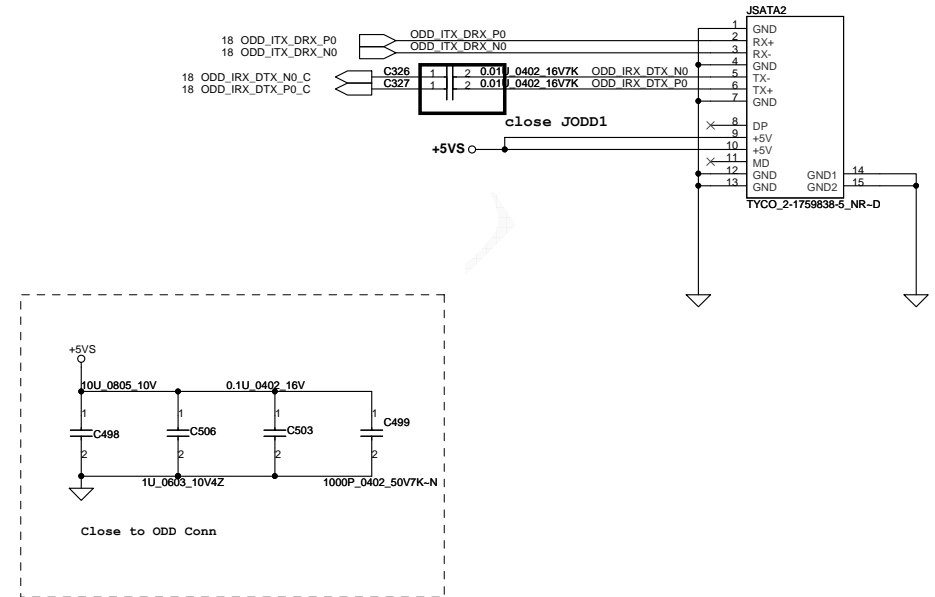
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nexasinf@hotmail.com



## SATA HDD CONN



## SATA ODD CONN

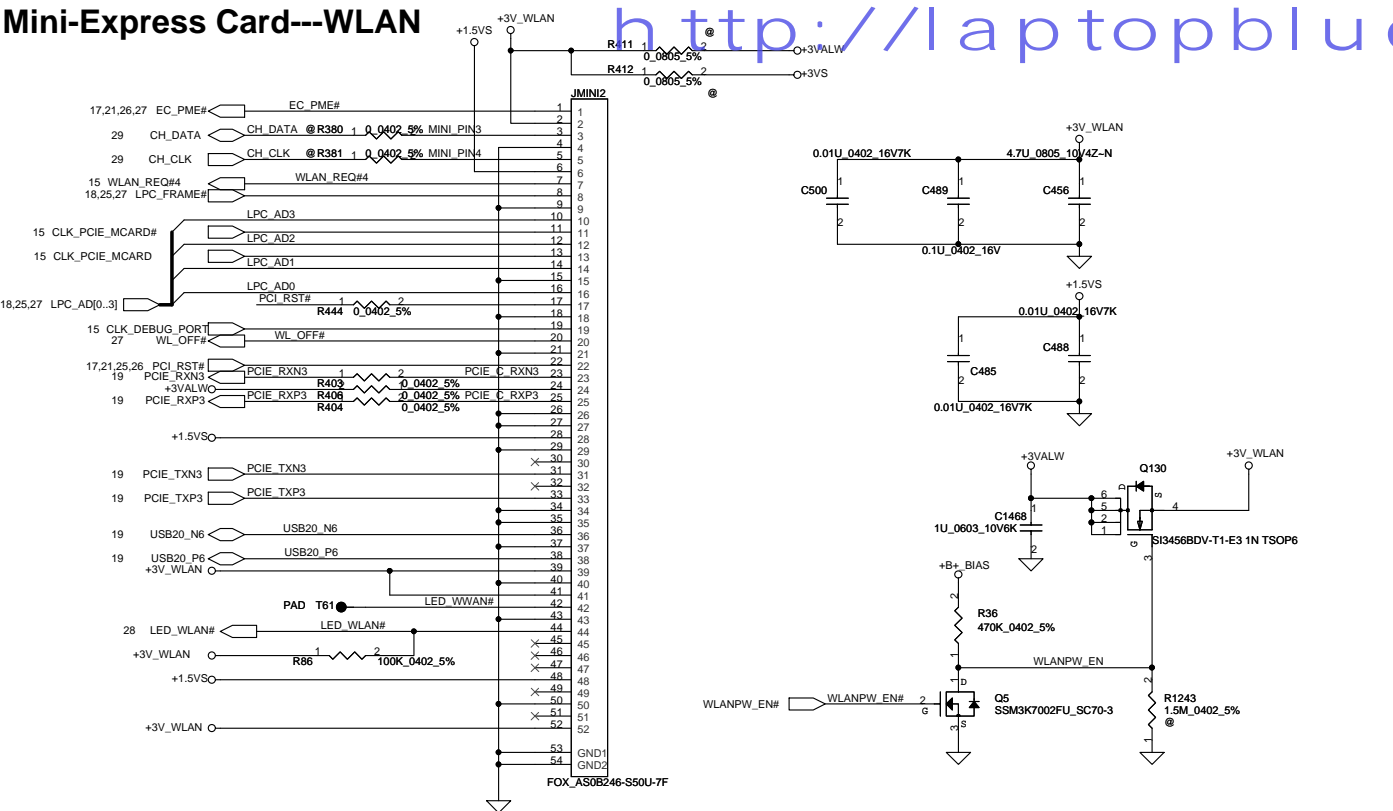


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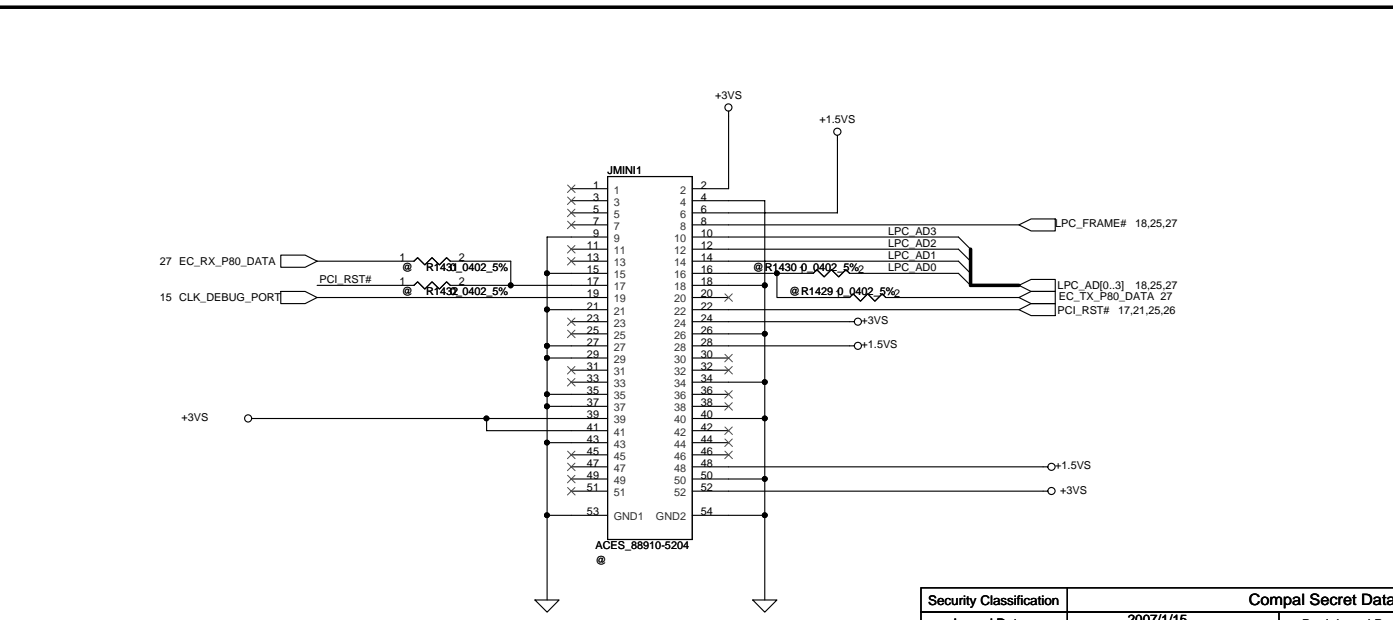
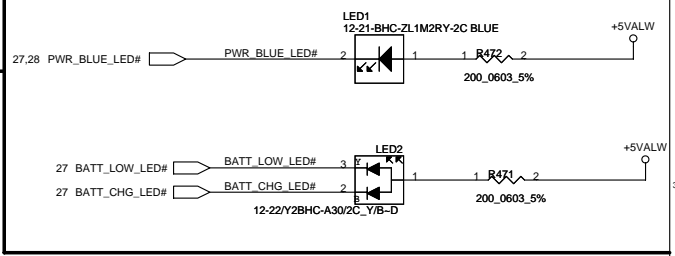


Mini-Express Card---WLAN

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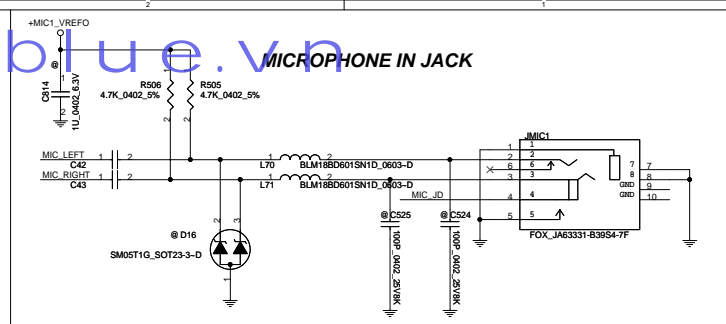


Power status (Left)



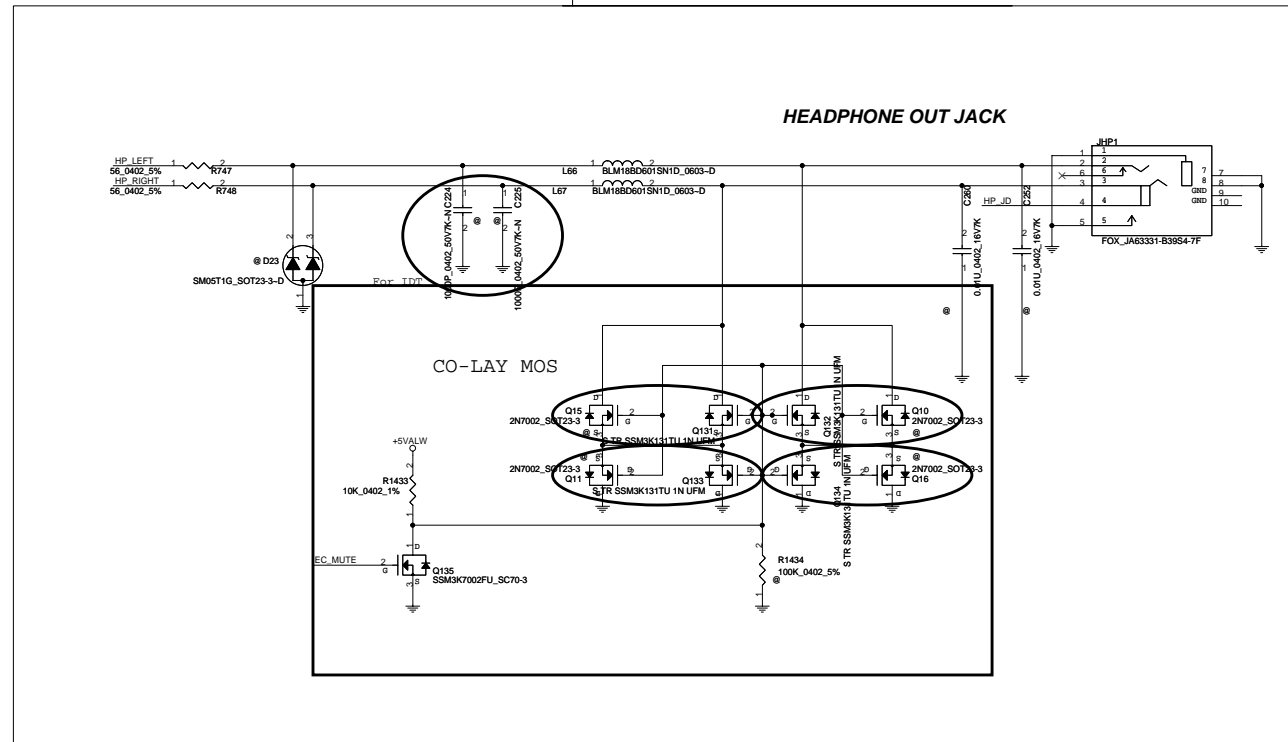
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### Speaker Connector

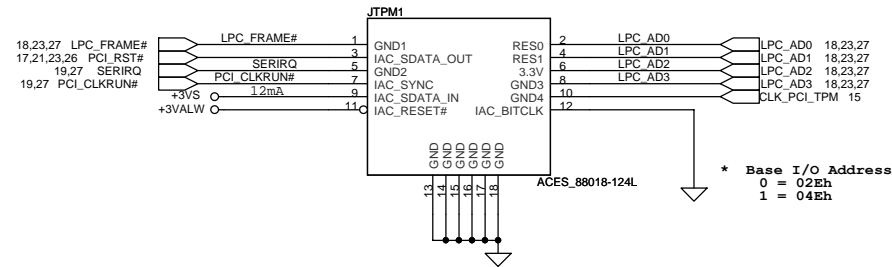
The schematic diagram illustrates the electrical connection for a speaker. The signal path starts from a source labeled **@ D12**, passes through a diode component **SM05T1G\_SOT23-3-D**, and then through two capacitors, **C23** and **C35**, both specified as **100pF\_0402\_25V08K**. The signal then reaches the speaker component **JSPK2**, which is labeled with **SPKR L1** and **SPKR L2**. The speaker is connected to a ground plane, which is also connected to the ground of the diode and capacitors. The diagram is labeled with **ACES\_88266-0200** at the bottom.



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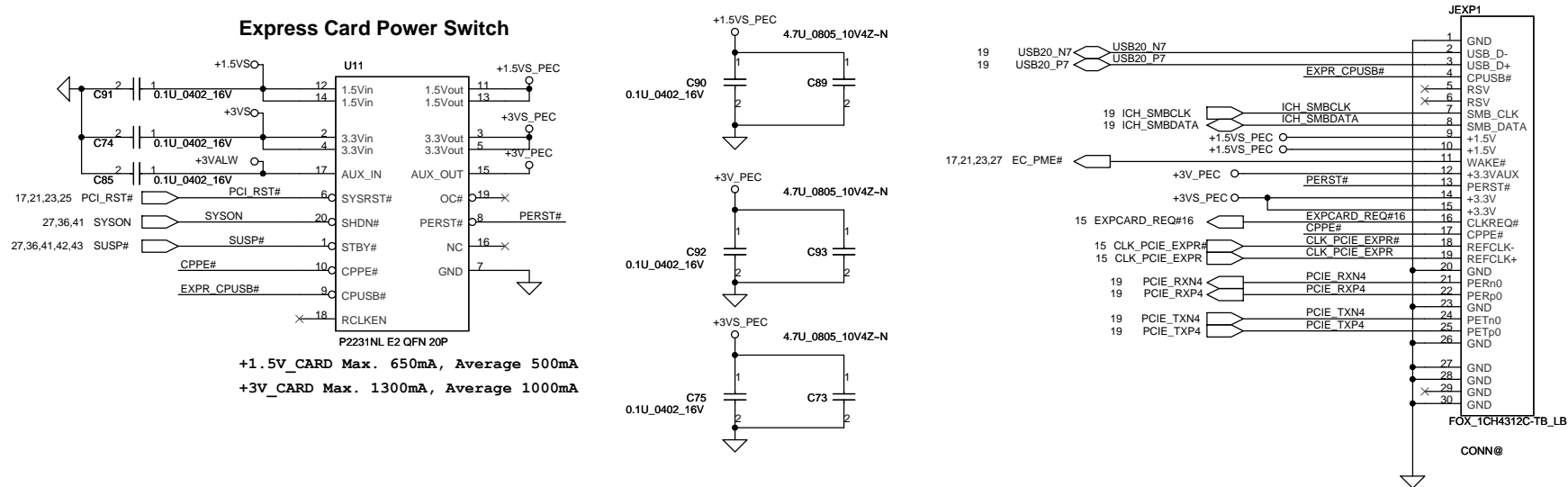


# TPM 1.2



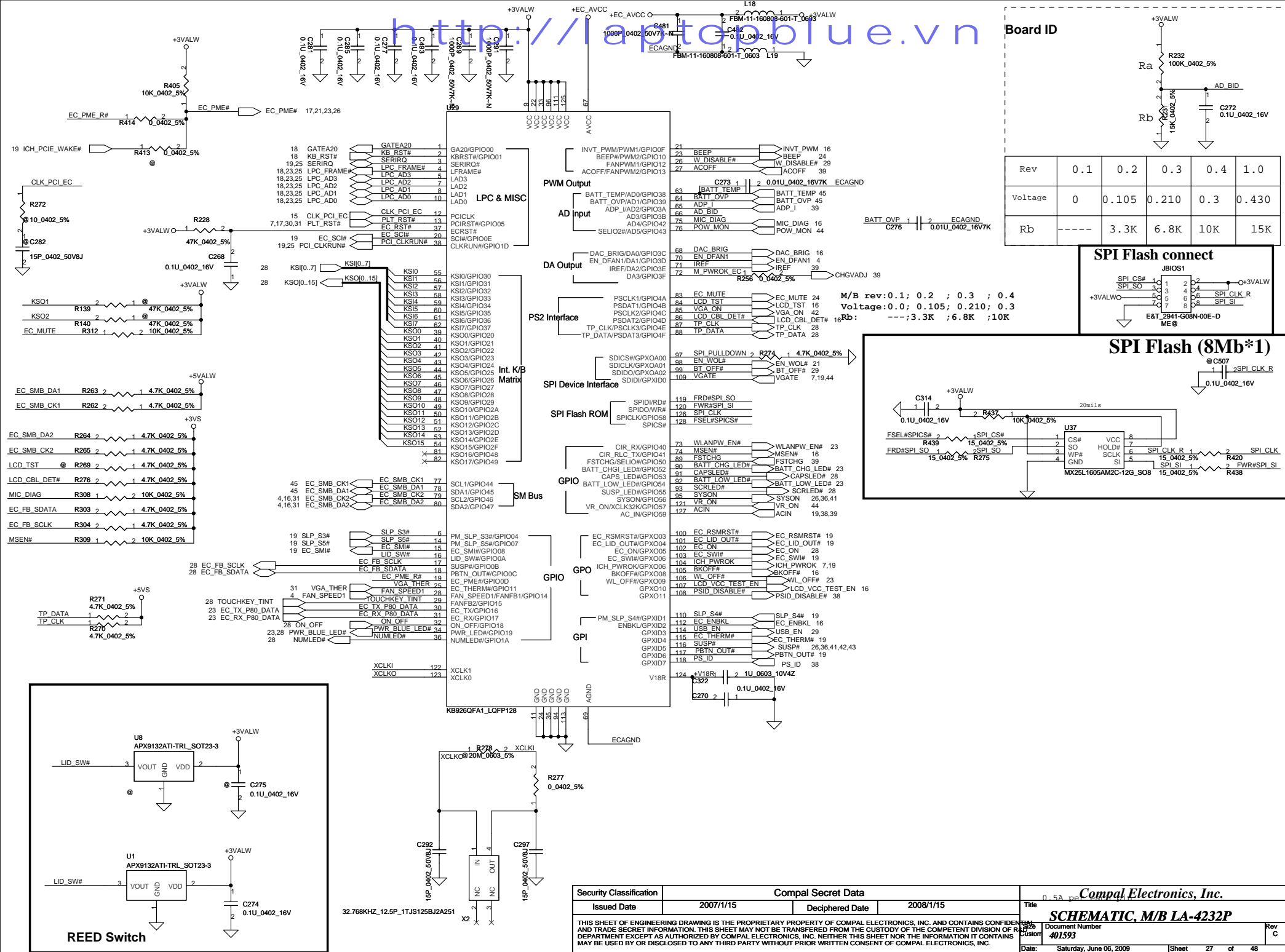
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### Power Button

The schematic diagram illustrates the Power Button circuit. It features a +3VALW supply connected to a 100K\_0402\_5% resistor (R297). The other end of R297 is connected to pin 2 of a CHN202UPT SC-70 component (D15). Pin 1 of D15 is connected to the PWR\_ON-OFF\_BTN# input. Pin 3 of D15 is connected to a MOSFET (Q26, SSM3K7002FU\_SC70-3). The MOSFET's gate is connected to a 4.7K\_0402\_5% resistor (R296) and a 0\_0402\_5% resistor (R291). The MOSFET's source is connected to ground (G), and its drain is connected to a 1000P\_0402\_50V7K-N capacitor (C313) and a diode (D13, RL220A\_LL34). The MOSFET's drain is also connected to the 51ON# output (pin 38) and the ON\_OFF# output (pin 27). The MOSFET's body is connected to ground (G).

**Adjustable Output**

R901

RT9198-33PBR SOT-23 5P

10K\_0603\_1%

1uF 0402 6.3V47Z

C250

U54

SHDN# BP

GND VIN VOUT

+5V

+3V5\_FUN

**INT. KBD CONN.**

**Pin 1** KS10

**Pin 2** KS11

**Pin 3** KS12

**Pin 4** KS13

**Pin 5** KS14

**Pin 6** KS15

**Pin 7** KS16

**Pin 8** KS17

**Pin 9** KS00

**Pin 10** KS01

**Pin 11** KSO2

**Pin 12** KSO3

**Pin 13** KSO4

**Pin 14** KSO5

**Pin 15** KSO6

**Pin 16** KSO7

**Pin 17** KSO8

**Pin 18** KSO9

**Pin 19** KSO10

**Pin 20** KSO11

**Pin 21** KSO12

**Pin 22** KSO13

**Pin 23** KSO14

**Pin 24** KSO15

**Pin 25** X25

**Pin 26** X26

**Pin 27** GND1

**Pin 28** GND2

**ACES\_88514-2601**

KSO8 @ C449	100P_0402_25V8K	KSI7 @ C235	100P_0402_25V8K
KSI3 @ C239	100P_0402_25V8K	KSI6 @ C236	100P_0402_25V8K
KSO9 @ C249	100P_0402_25V8K	KSI5 @ C237	100P_0402_25V8K
KSI2 @ C240	100P_0402_25V8K	KSO0 @ C441	100P_0402_25V8K
KSI1 @ C241	100P_0402_25V8K	KSO1 @ C442	100P_0402_25V8K
KSO10 @ C248	100P_0402_25V8K	KSO2 @ C443	100P_0402_25V8K
KSO11 @ C247	100P_0402_25V8K	KSI4 @ C238	100P_0402_25V8K
KSI0 @ C242	100P_0402_25V8K	KSO3 @ C444	100P_0402_25V8K
KSO12 @ C246	100P_0402_25V8K	KSO4 @ C445	100P_0402_25V8K
KSO13 @ C245	100P_0402_25V8K	KSO5 @ C446	100P_0402_25V8K
KSO14 @ C244	100P_0402_25V8K	KSO6 @ C447	100P_0402_25V8K
KSO15 @ C243	100P_0402_25V8K	KSO7 @ C448	100P_0402_25V8K

For EMI

For ENR

27 EC\_FB\_DATA  
27 EC\_FB\_SCLK

R611  
SUPPRE\_KC FBMA-11-100505-801T 0402

R612  
SUPPRE\_KC FBMA-11-100505-801T 0402

23 LED\_WLAN#

29 BLUETOOTH\_LED#

23,27 PWR\_BLUE\_LED#

27 NUMLED#

27 CAPSLED#

27 SCRLED#

+3V\_WLW

+3V\_FUN

R860  
@ 0.0603, 5%

R622  
0.0402 5%

R606  
0.0402 5%

C324 4.7U 0603\_6.3V

JFN1

ACES\_88512-1641

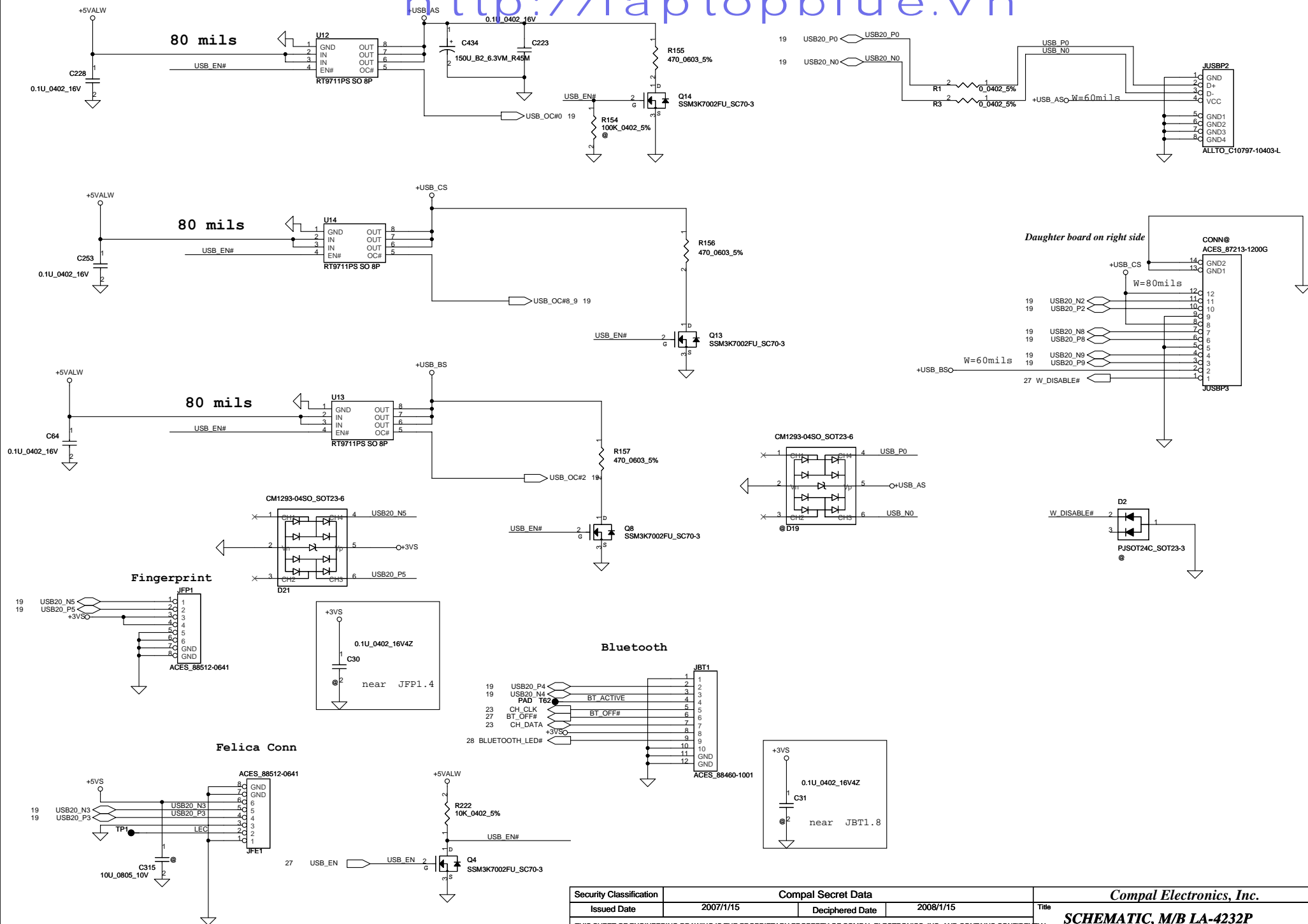
D58  
PJSOT24C\_SOT23-3

C29 1.0U 0402\_16V4Z

C39 22P 0402\_50V6J

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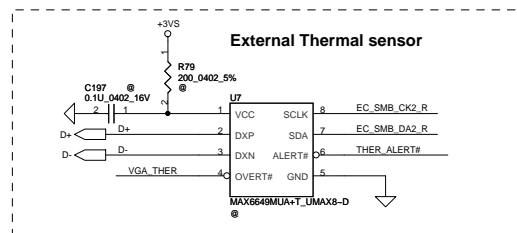
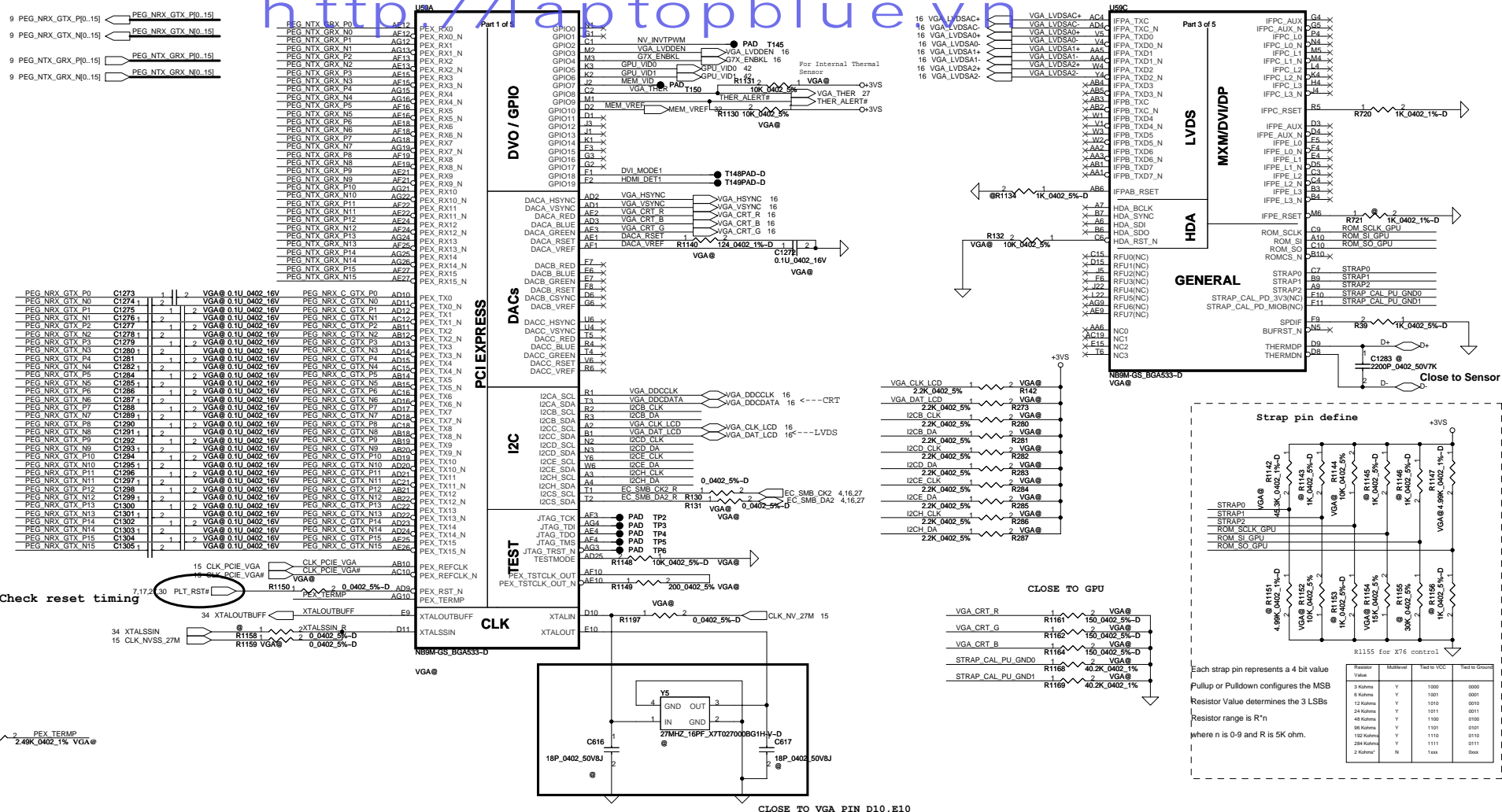


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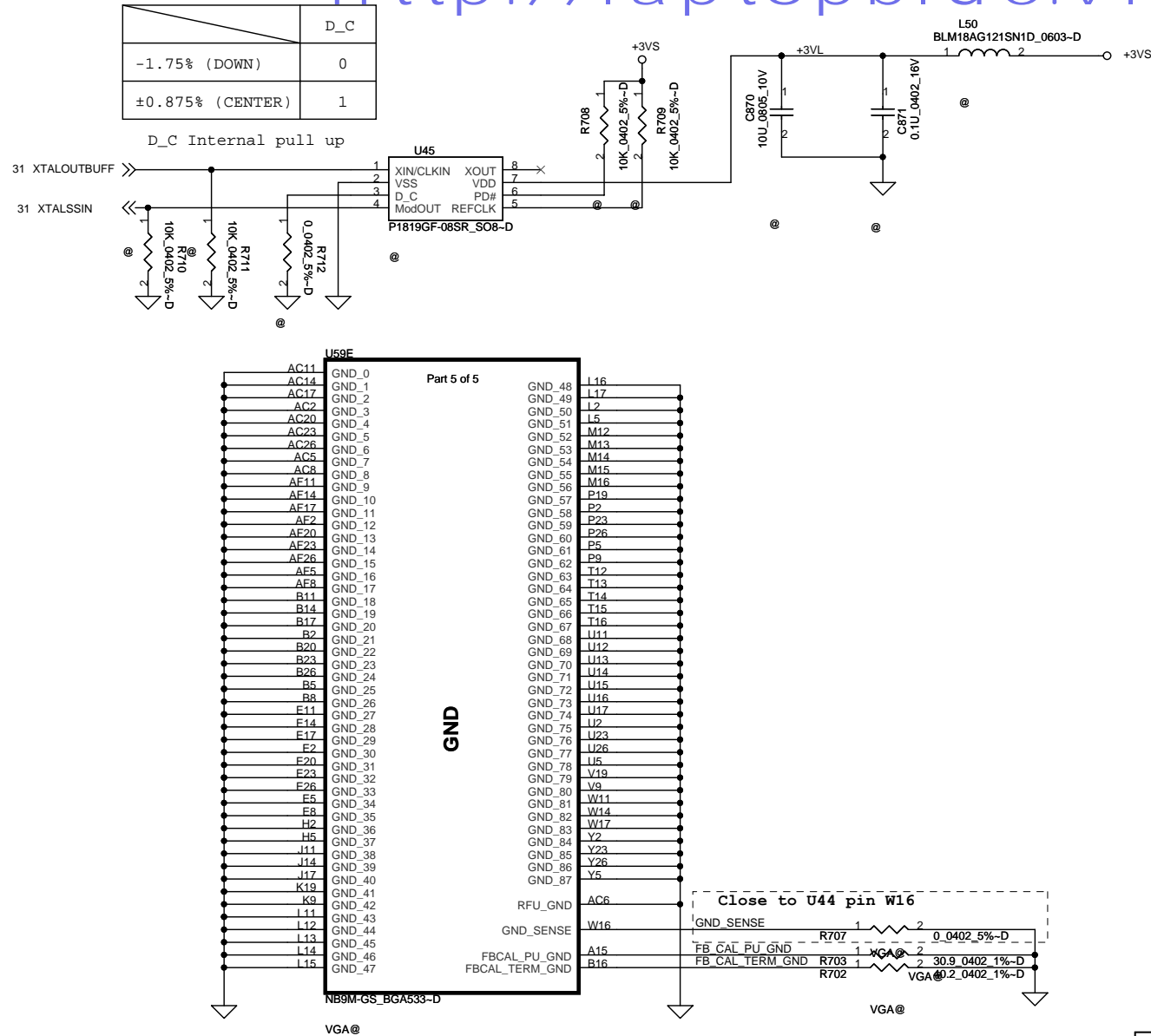












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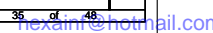
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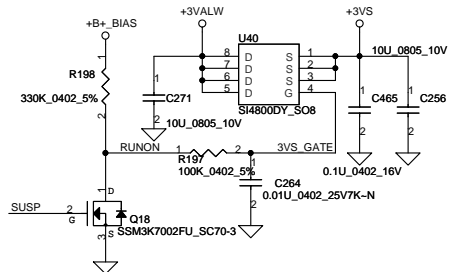
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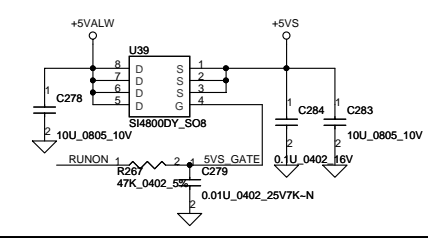




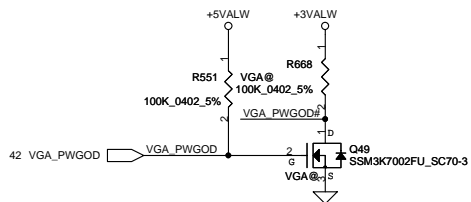
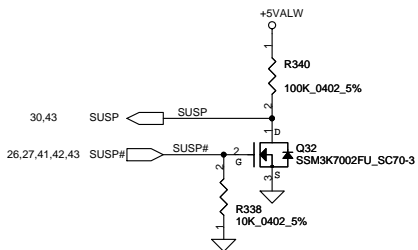
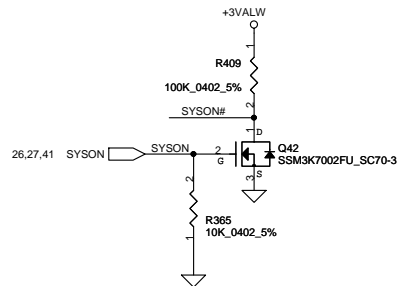
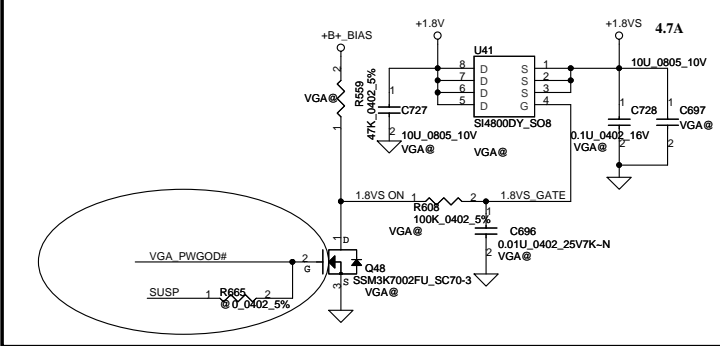
+3VALW to +3VS Transfer



+5VALW to +5VS Transfer

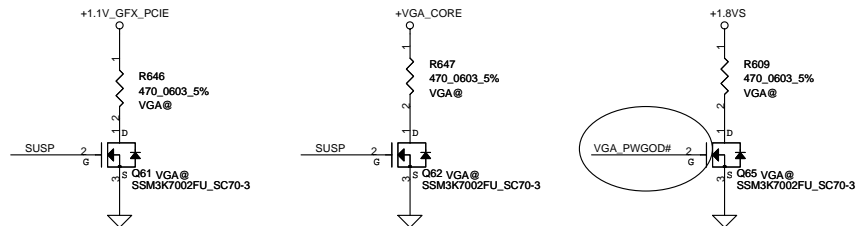


+1.8V to +1.8VS Transfer

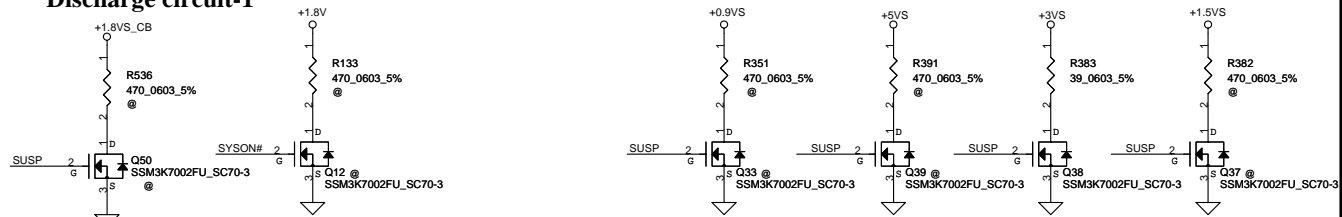


SYSON -> SUSP# -> VGA\_ON->VGA\_PWGOD

VGA Discharge circuit



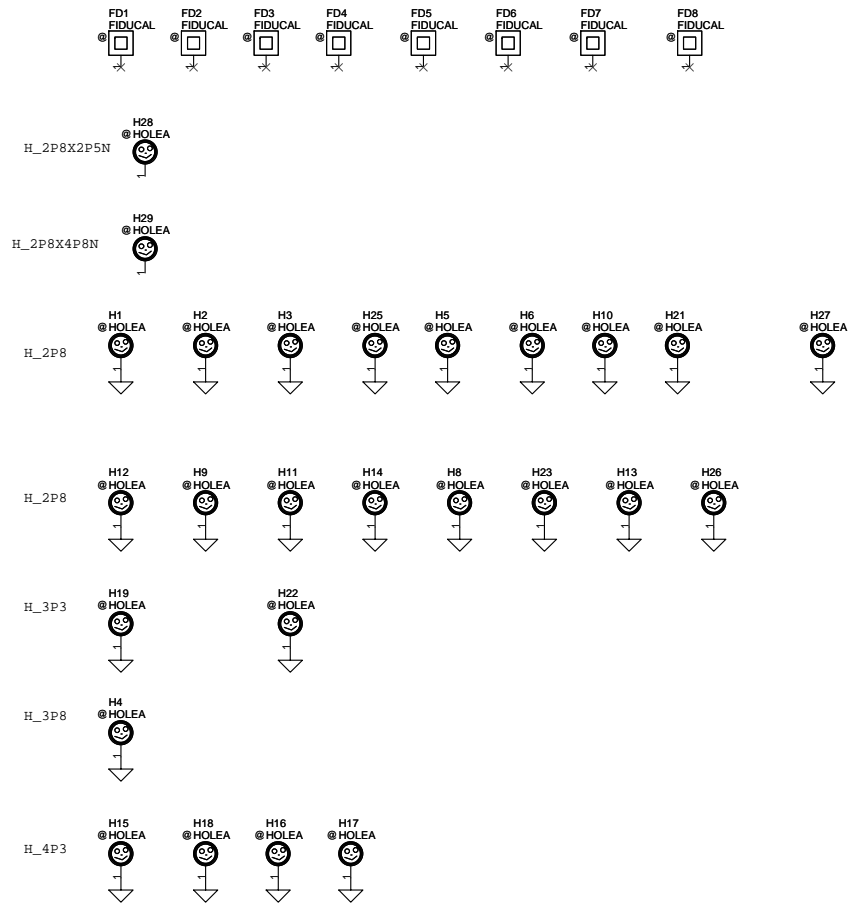
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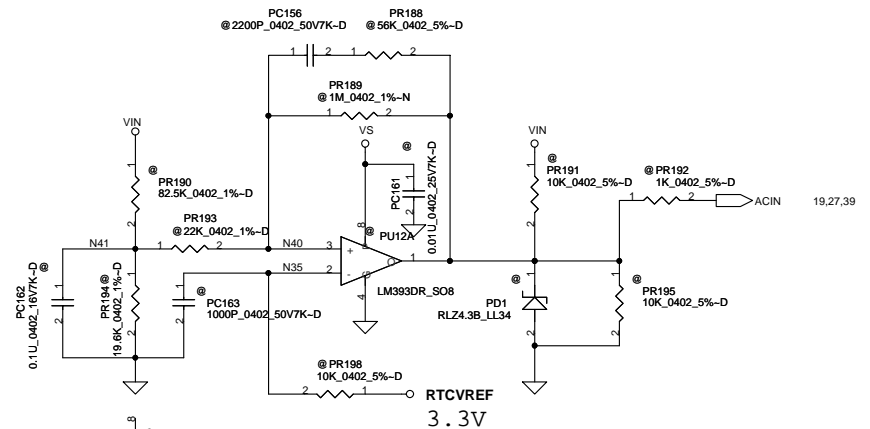
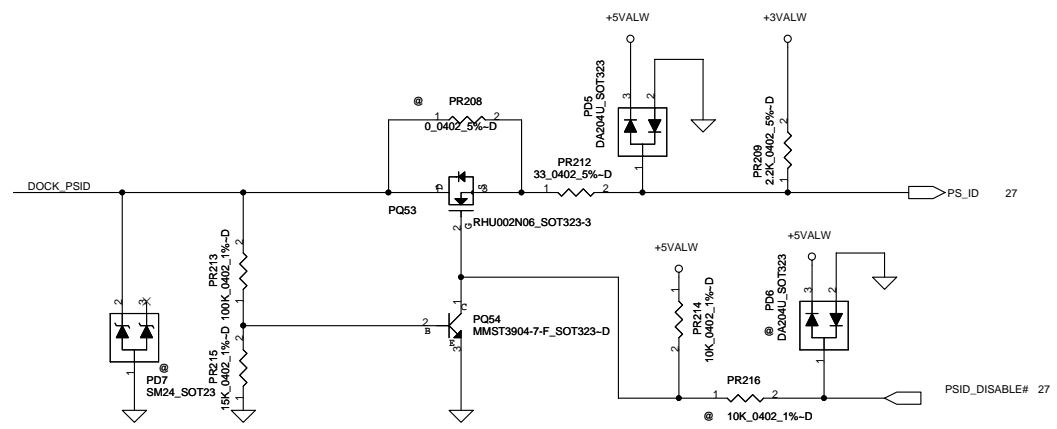


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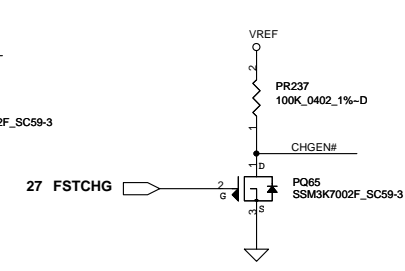
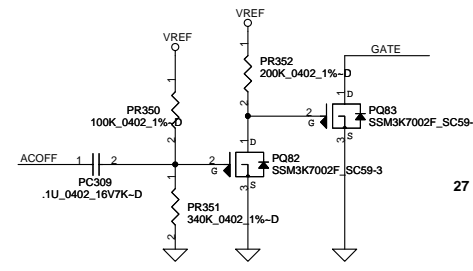
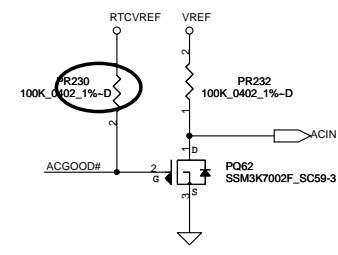
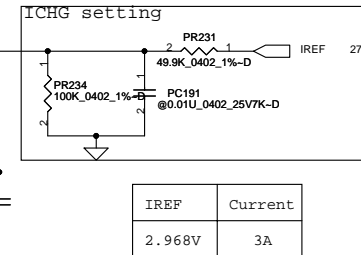
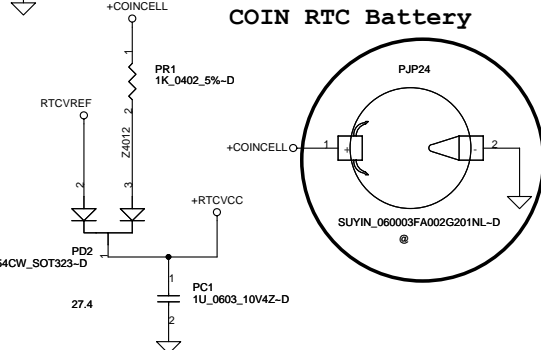
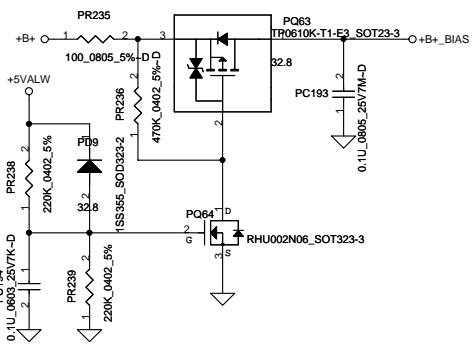
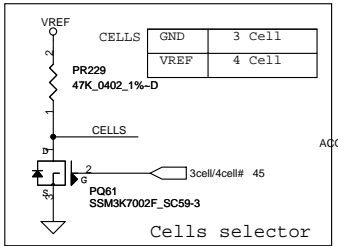


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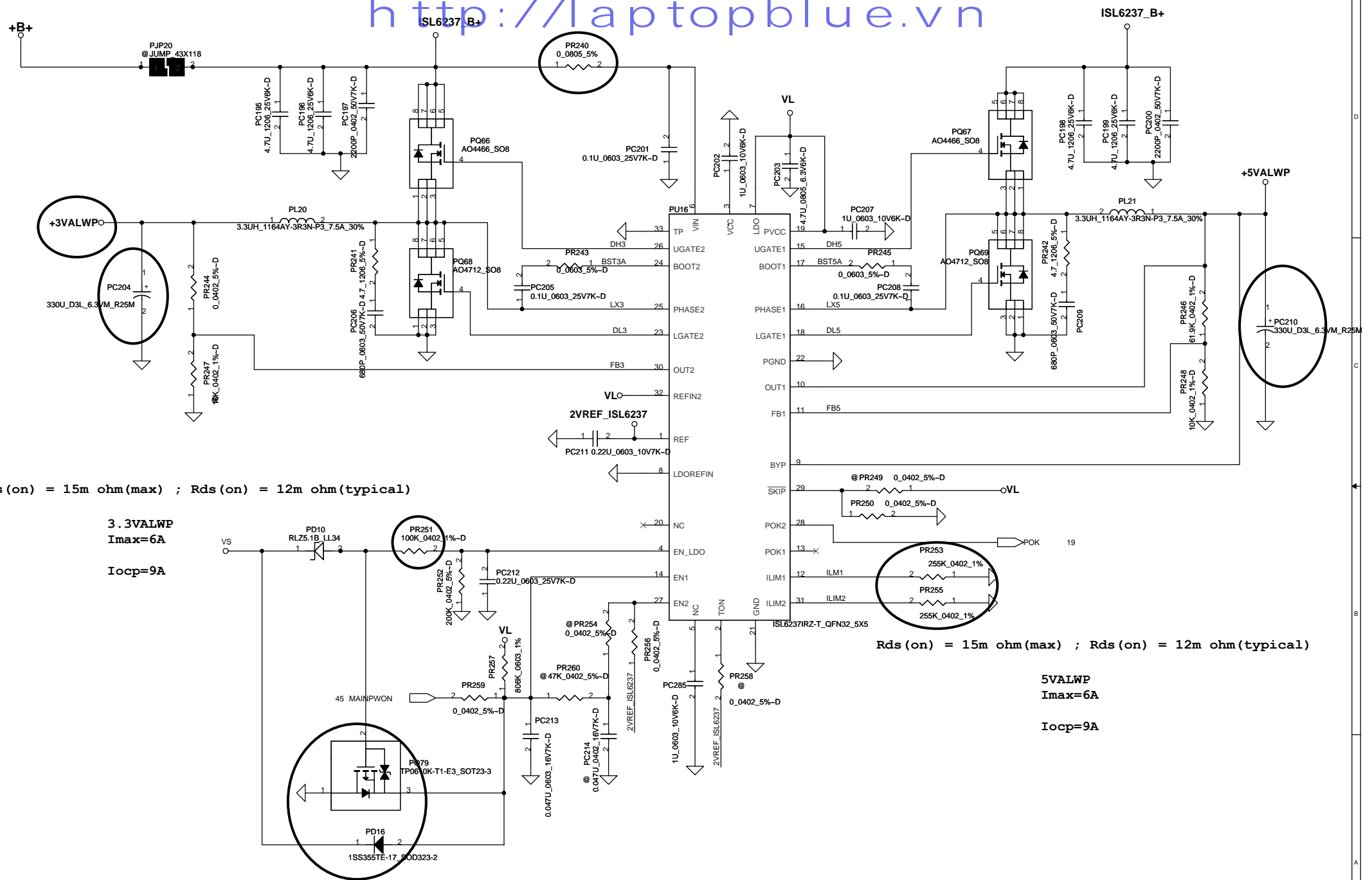
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90W adapter  
 $I_{charge} = (V_{srst}/V_{vdac}) * (0.1/PR222) = 3.3A$   
 $I_{adapter} = (V_{acset}/V_{vdac}) * (0.1/PR217) = 3.1A$   
Input OVP : 22.3V  
Input UVP : 16.98V  
Fsw : 300KHz



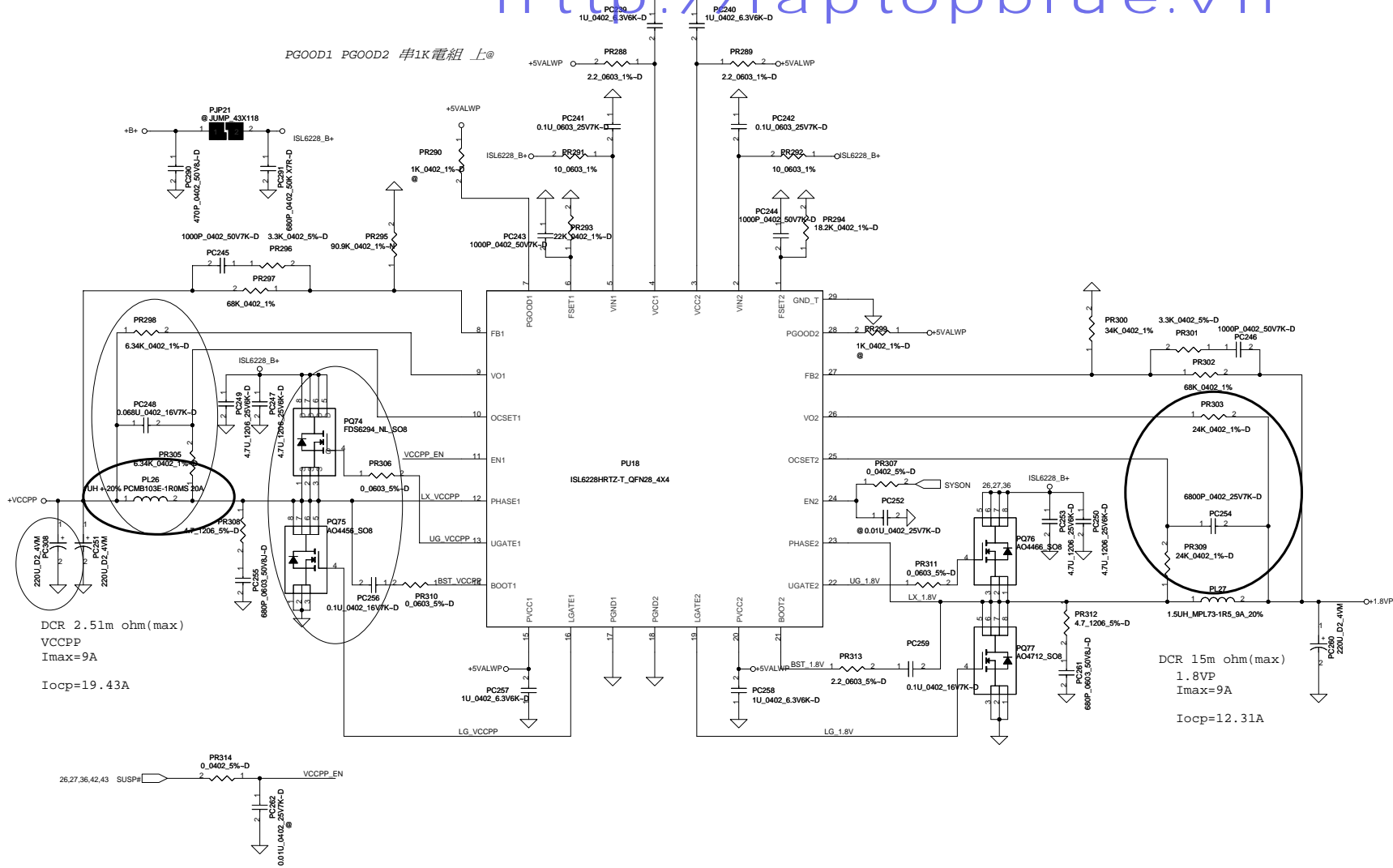




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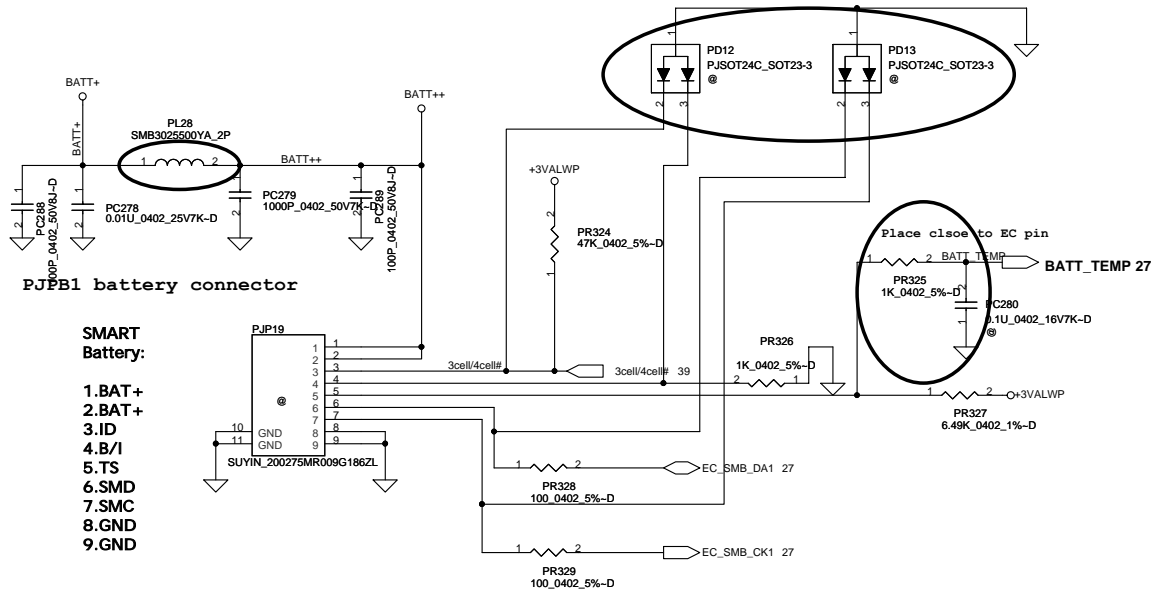








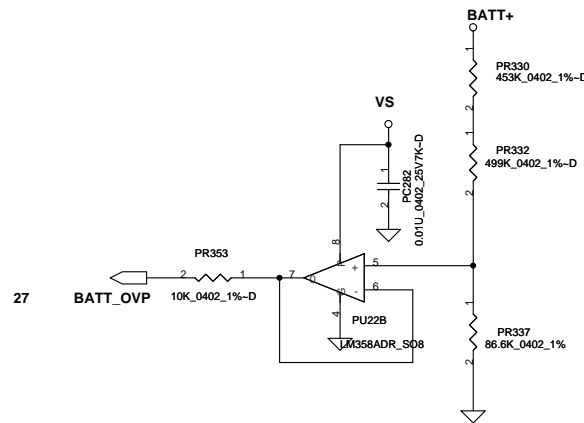




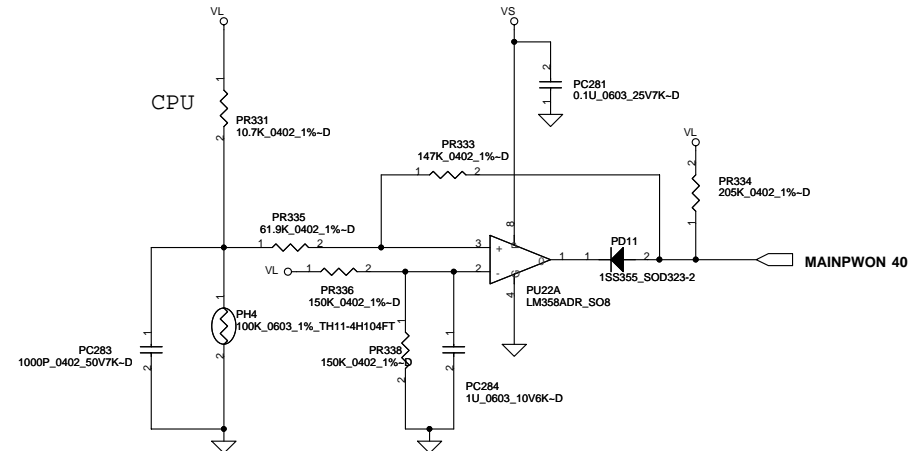
## Battery Connect/OTP

### CPU

**PH1 under CPU bottom side :**  
CPU thermal protection at 90 +-3 degree C  
Recovery at 50 +-3 degree C



LI-3S : 13.5V---BATT-OVP=1.5V  
BATT-OVP=0.111\*BATT+



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Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
1	29	P29-EC KB926/REED SW/TPM1.2	07/10/30	compal	board rev update to 0.2	R231 change to 15K & R232 pop	0.2
2	40	P40-OZ129_Card Reader/1394	07/10/30	compal	CardBus vendor change	CardBus R5C833 change to OZ129	0.2
3	29	P29-EC KB926/REED SW/TPM1.2	07/10/30	compal	Change pull up resistance	Change EC pin17,18 pull up to 4.7Kohm	0.2
4	29	P29-EC KB926/REED SW/TPM1.2	07/10/30	compal	Need pull up	NET MIC_DIAG pull up R to 10Kohm 3VS	0.2
5	13,14	DDR2 SODIMM-I,II Socket	07/10/30	compal	Change Capacitance	Change C84,C189 to SGA00002680 330U	0.2
6	29	P29-EC KB926/REED SW/TPM1.2	07/10/30	compal	EC update rev	EC change to 926C	0.2
7	28	P28-Express card	07/10/30	compal	Express card can't detect	POWER IC(U11) ADD PIN10 CPUSB# PIN9 EXPR_CPUSB#S	0.2
8	32	P32-USB/ Bluetooth/ FP/ Felica	07/10/30	compal	Bluetooth can't detect	BLUETOOTH CONN USB+- change	0.2
9	42	P42-Screws	07/10/30	compal	FIDUCAL no enough	ADD FIDUCAL*4	0.2
10	41	P41-DC/DC Interface	07/10/30	compal	Need pull down	SYSON pull down 10K ohm	0.2
11	41	P41-DC/DC Interface	07/11/12	compal	USB can't detect	SUSP change to 5VALW(Q32)	0.2
12	06	P06-Merom(3/3)-GND/Bypass	07/11/12	compal	Change CPU High Freqeunce Decoupling Capacitance	C195 change to C1150-C1181	0.2
13	41	P41-DC/DC Interface	07/11/13	compal	+1.8VS Discharge error	+1.8VS Discharge circuit Q65 net change to VGA_PWGOD#	0.2
14	41	P41-DC/DC Interface	07/11/16	compal	Delete	Remove SIM card connector	0.2
15	42	P42-Screws	07/11/16	compal	Change Holea size	Change Holea size 2.5 to 2.8, change 3.5 to 3.8	0.2
16	31	P31-PWR_OK/ BTN/ KB / TouchPad	07/11/21	compal	Change Touch PAD/B connector	Touch PAD/B connector change net	0.2
17	15	P15-CRT Conn.& LCD Conn.	07/11/21	compal	Add LCD control pin	Add LCD control pin LCD_CBL_DET# & LCD_TST & LCD_VCC_TEST_EN	0.2
18	20	P20-ICH9(4/4)_POWER&GND	08/04/22	compal	+5VS & +3VS have leakage	Change VCCCL3[1] [2] & VCCLAN3_3[1] [2] power source to +LAN_IO	
19	20	P09-Cantiga(3/6)-VGA/LVDS/TV	08/04/22	compal	Can't boot to OS	Add BOM Structure @	
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Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
1	41	1.8VP/+VCCPP	08/10/22	COMPAL	adjust +VCCP OCP set	Change PC248 from 0.033u to 0.068u	0.2
2	42	1.5VSP/+VGA_CORE	08/10/22	COMPAL	ripple voltage fail	Change PC227 from SF22001M300 to SGA20221150	0.2
3	42	1.5VSP/+VGA_CORE	08/10/22	COMPAL	convenient test	Add PR304	0.2
4	44	CPU_CORE	08/10/22	COMPAL	load line fail	Change PR187 from 2.21K to 3.24K	0.2
5	38	DCIN / Precharge	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
6	39	Charger	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
7	40	+3VALWP/+5VALWP	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
8	41	1.8VP/+VCCPP	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
9	42	1.5VSP/+VGA_CORE	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
10	43	+0.9VSP/+1.1V_GFX_PCIEP	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
11	44	CPU_CORE	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
12	45	BATTERY CONN	08/10/22	COMPAL	modify MLCC part number	change part number N0 to 8L	0.2
13	40	+3VALWP/+5VALWP	08/10/24	COMPAL	boost choke current rating	change PL20 PL21 from SH000006380 to SH00000AY00	0.2
14	45	BATTERY CONN	08/10/30	COMPAL	delete diode for EMD request	del PD14 PD15	0.2
15	45	BATTERY CONN	08/10/30	COMPAL	change diode for EMD request	change PD12 PD13 from SC1A204U00L to SCA00000E00	0.2
16	39	Charger	08/10/31	COMPAL	design modify	add PR372 PR373	0.2
17	41	1.8VP/+VCCPP	08/11/03	COMPAL	dynamic fail	change PC233 from SGA20221150 to SGA00001U80	0.2
18	44	CPU_CORE	08/12/08	COMPAL	cost down	change PUL1 from SA00001HU80 to SA000031W00 and interrelated components	0.3
19	38	DCIN / Precharge	08/12/08	COMPAL	common circuit design modify	change PR203 from 33 to 68 and add PR204 to 68	0.3
20	39	Charger	08/12/08	COMPAL	vendor FAE suggest	change PR272 PR339 from 1 to 3.3	0.3
21	38	DCIN / Precharge	08/12/08	COMPAL	design modify	change PL17 from SM010018880 to SM010008E10	0.3
22	45	BATTERY CONN	08/12/08	COMPAL	design modify	change PL28 from SM010018210 to SM010008E10	0.3
23	39	Charger	08/12/15	COMPAL	change component for EMD request	change PJP15 to PL19 SM010016410	0.3
24	39	Charger	08/12/15	COMPAL	add capacitor for EMD request	add PC274 0.1u	0.3
25	42	1.5VSP/+VGA_CORE	09/01/19	COMPAL	adjust VGA_CORE OCP set	change PQ72 from SB00000CG00 to SB562940080	0.4
26						change PQ73 from SB00000AJ00 to SB000003W00	0.4
27						change PL24 from SH000008700 to SH000005400	0.4
28						change PR276 PR282 from 24K to 19.6K	0.4
29						change PC230 from 0.022u to 6800p	0.4
30					consumption adjust	change PR269 from 3.3K to 2.2K	0.4
31	44	CPU_CORE	09/01/19	COMPAL	vendor FAE suggest	add PC141 330p	0.4
32	45	BATTERY CONN	09/02/18	COMPAL	delete diode for ESD request	del PD12 PD13	0.4

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