



# Compal Confidential

## ISKAE LA-3661P Schematics Document

Intel Yonah/Merom with 945GM/943GML/940GML+ DDRII + ICH7M

2006-12-22

REV: 0.1

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Model : ISKAE

File Name : LA-3661P

NAPA Platform

Fan Control  
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Yonah/Merom

uFCPGA-479 CPU

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Thermal Sensor  
ADM1032ARM

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Clock Generator  
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CRT & TV-out  
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Dual Channel

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Azalia 3.3V 24.576MHz/48Mhz

SATA/II 1.5GHz/3G

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ALC861

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AMP & Audio Jack & Int-MIC

SPK/JP-AMP: APA2056

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CardBus Controller  
TI PC18412

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Slot 0

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1394 port

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5in1 Slot

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LPC BUS  
3.3V 33 MHz

ENE KB910

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Touch Pad

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Int.KBD

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BIOS

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LED

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RTC CKT.

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Power On/Off CKT.

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DC/DC Interface CKT.

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Power Circuit DC/DC

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ISKAE Sub-board

SW/B

LS-3482P Rev1

CRT/B

LS-3483P Rev1

USB/B

LS-3484P Rev1

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Block Diagram

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## Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	NA	NA	NA
B+	AC or battery power rail for power circuit.	NA	NA	NA
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+0.9VS	0.9V switched power rail for DDR terminator	ON	OFF	OFF
+VCCP	1.05V switched power rail	ON	OFF	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8V	1.8V power rail for DDR	ON	ON	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+2.5VS	2.5V switched power rail	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+3VS	3.3V switched power rail	ON	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON*
+5VS	5V switched power rail	ON	OFF	OFF
+VSB	+VSB always on power rail	ON	ON	ON*
+RTCVCC	RTC power	ON	ON	ON

Note : ON\* means that this power plane is ON only with AC power available, otherwise it is OFF.

## External PCI Devices

DEVICE	PCI Device ID	IDSEL #	REQ/GNT #	PIRQ
1394	D0	AD20	2	A,B,C
CARD BUS	D4	AD20	2	A,B,C
5IN1	D4	AD20	2	A,B,C

## KB910 I2C / SMBUS ADDRESSING

DEVICE	HEX	ADDRESS
SM1 24C16	A0H	1 0 1 0 0 0 0 X b
SM1 SMART BATTERY	16H	0 0 0 1 0 1 1 X b
SM2 ADM0132	98H	1 0 0 1 1 0 0 X b
CPU THERMAL MONITOR		

## ICH7-M SM Bus address

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

## Board ID / SKU ID Table for AD channel

Vcc	3.3V +/- 5%			
Ra	100K +/- 5%			
Board ID	Rb	VAD_BID min	VAD_BID typ	VAD_BID max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 V
6	200K +/- 5%	1.935 V	2.200 V	2.341 V
7	NC	2.500 V	3.300 V	3.300 V

## BOARD ID Table

Board ID	PCB Revision
0	0.1
1	
2	
3	
4	
5	
6	
7	

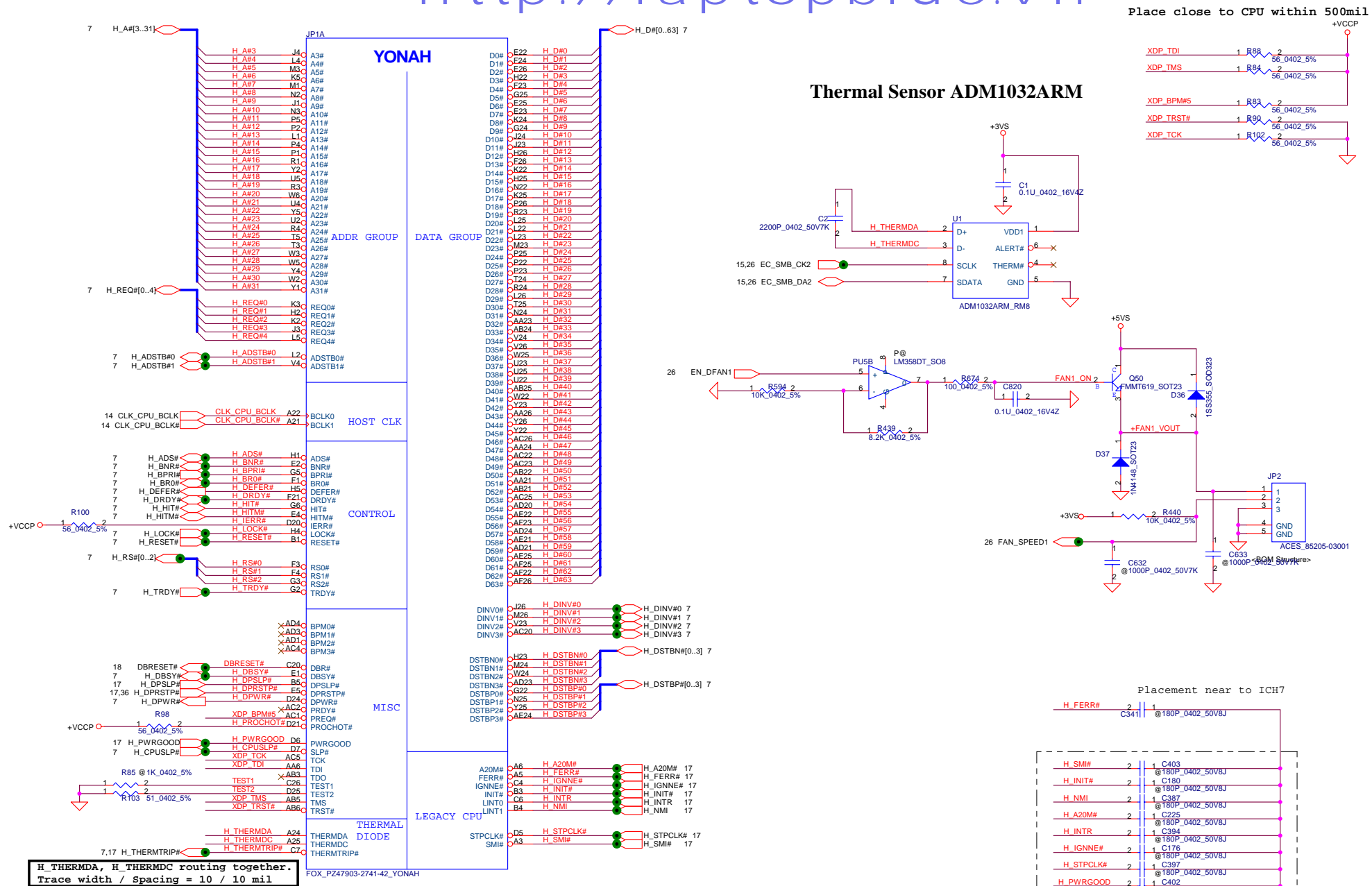
## SKU ID Table

SKU ID	SKU
0	10 (10E)
1	10C
2	10G
3	10GC
4	10J (10EJ)
5	10CJ
6	10GJ
7	10GCJ

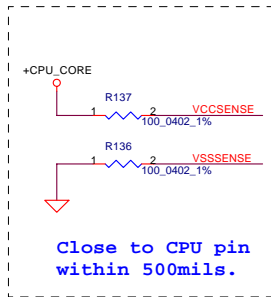
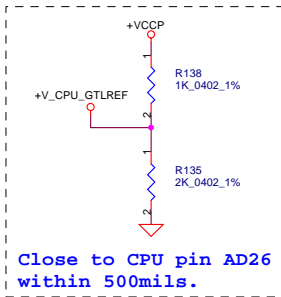
## BTO Option Table

BTO Item	BOM Structure
NEW CARD	NEWCARD@
LAN	100M@ 1000M@
WLAN	KS@
NB	GM@ PM@
BT	BT@
MIC	MIC@
CIR	CIR@
FINGER PRINT	FP@
5IN1	5IN1@
CAMERA	CAMERA@
PCMCIA	PCMCIA@
MDC	MDC@

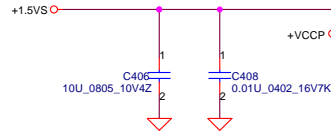
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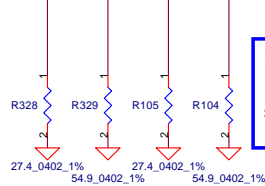
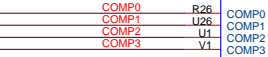
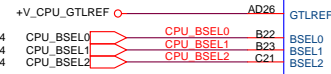
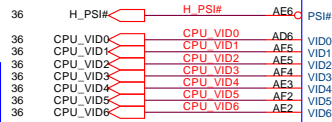
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Issued Date	2006/10/31	Deciphered Date	2009/11/13	Title <b>Yonah CPU in mFCPGA479</b>		
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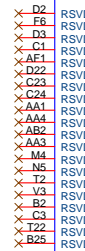
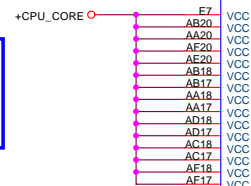
Length match within 25 mils  
The trace width 18 mils space  
7 mils



CPU_BSEL	CPU_BSEL2	CPU_BSEL1	CPU_BSEL0
133	0	0	1
166	0	1	1

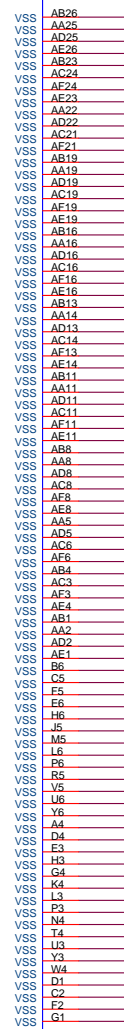


Resistor placed within  
0.5" of CPU pin. Trace  
should be at least 25  
mils away from any  
other toggling signal.

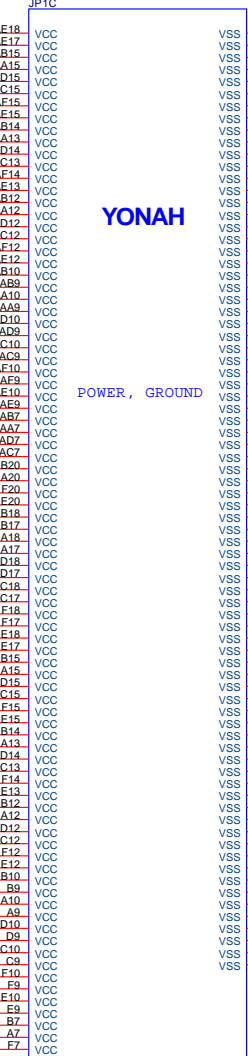


YONAH

POWER, GROUND, RESERVED SIGNALS AND NC

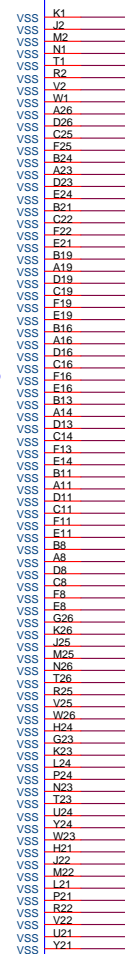


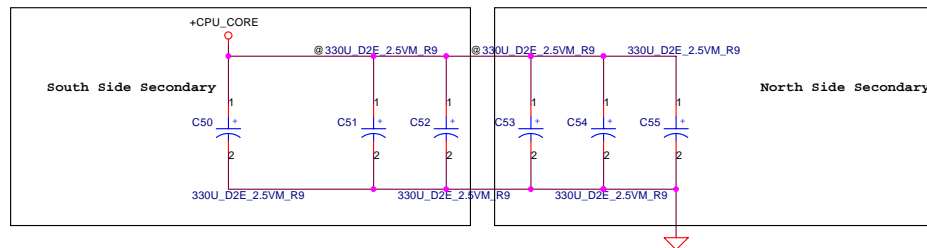
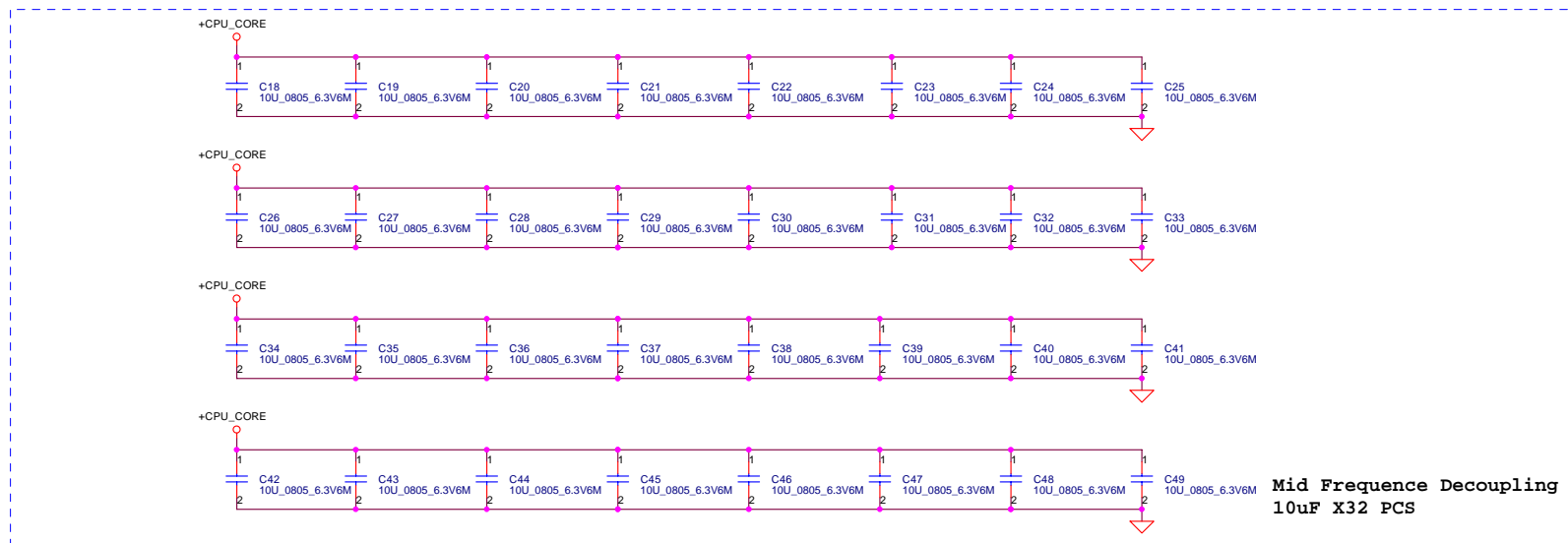
+CPU\_CORE



YONAH

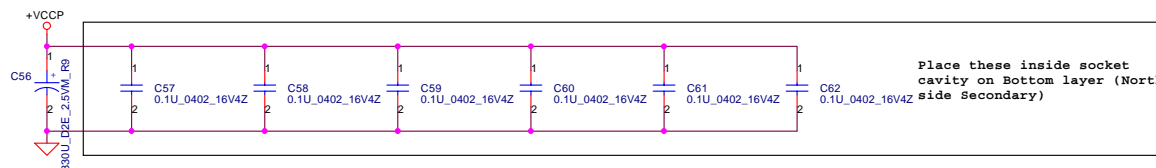
POWER, GROUND



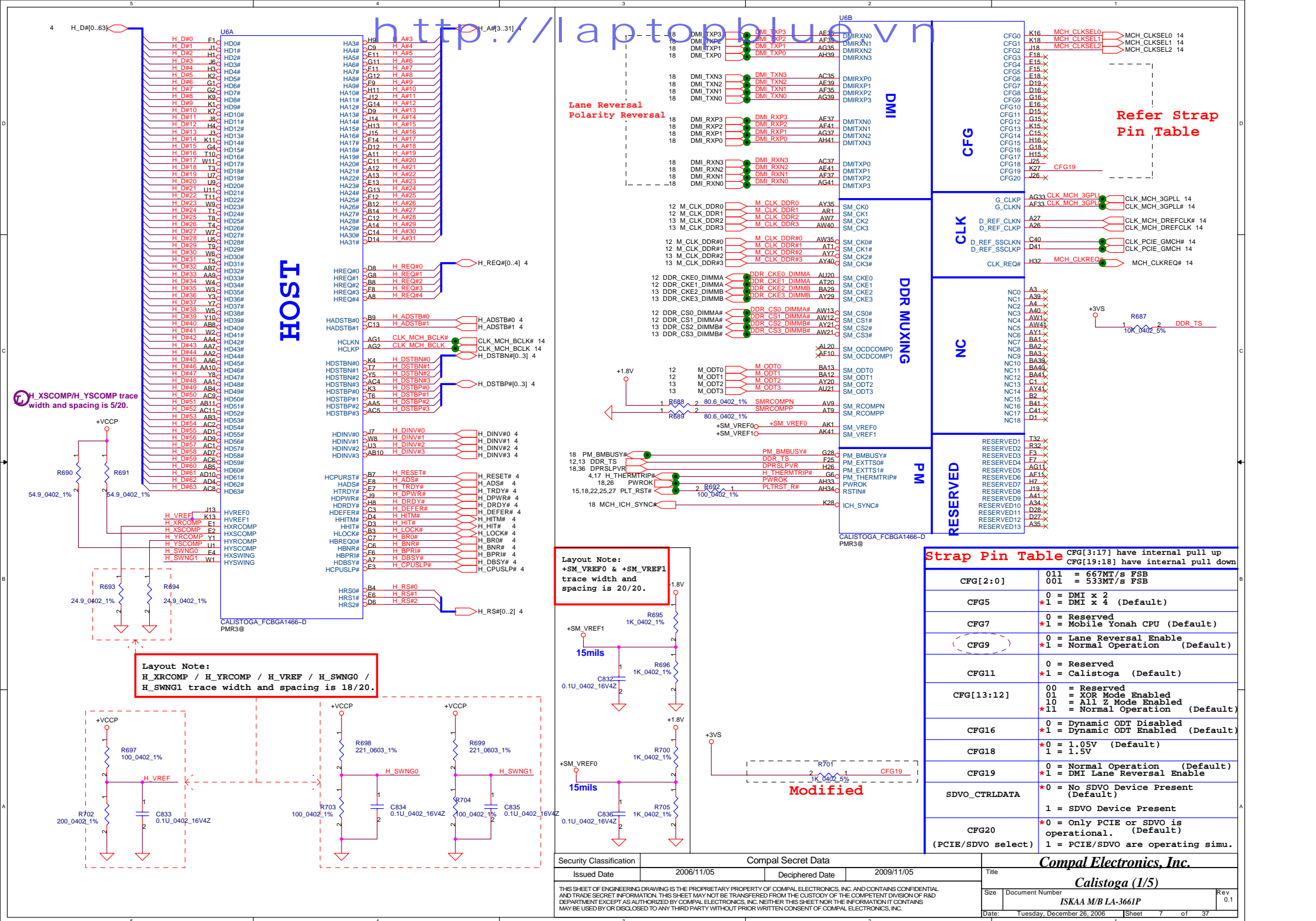


ESR <= 1.5m ohm  
Capacitor > 1980uF

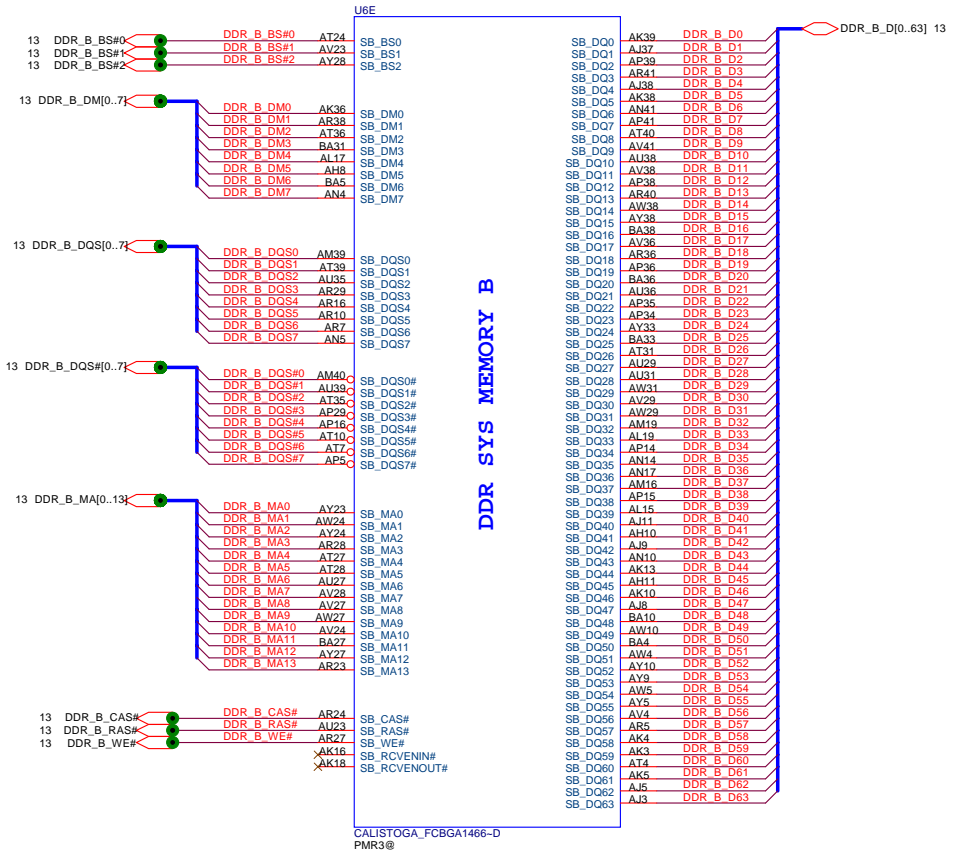
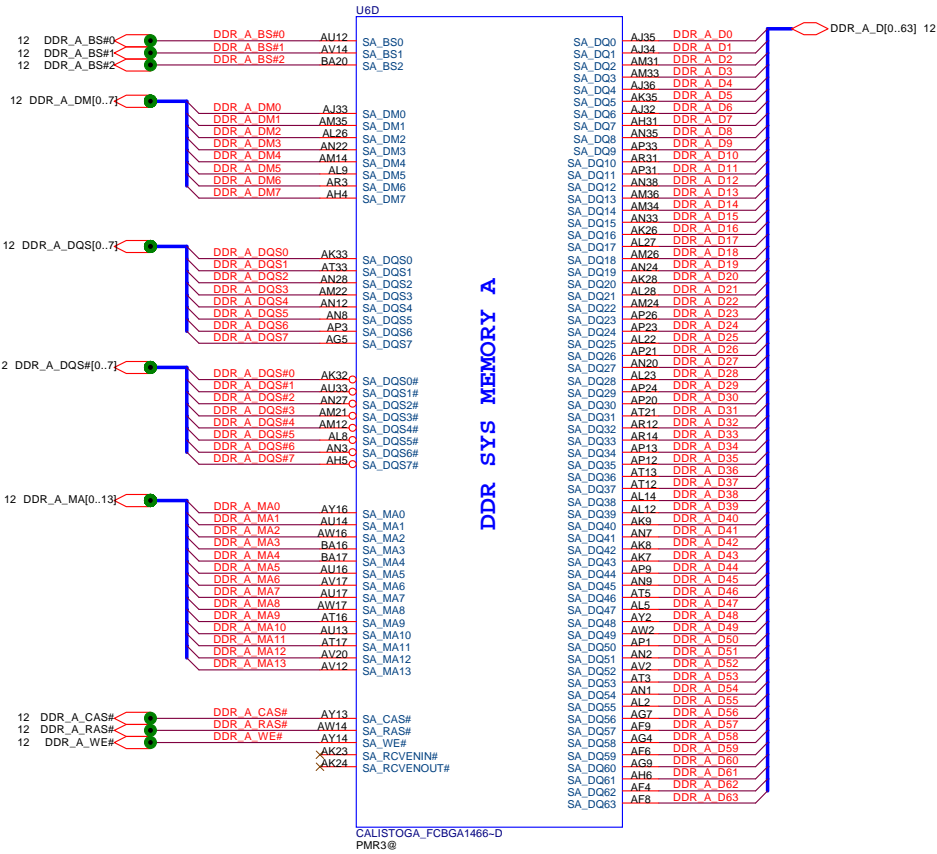
330uF ESR 9m ohm X 6 PCS



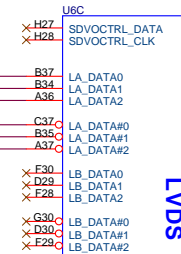
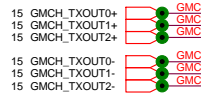
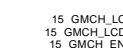
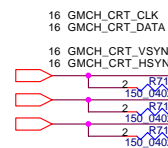
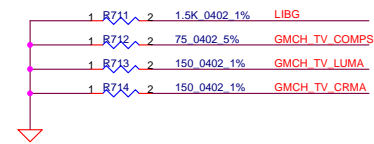
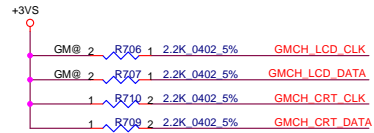
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LVDS

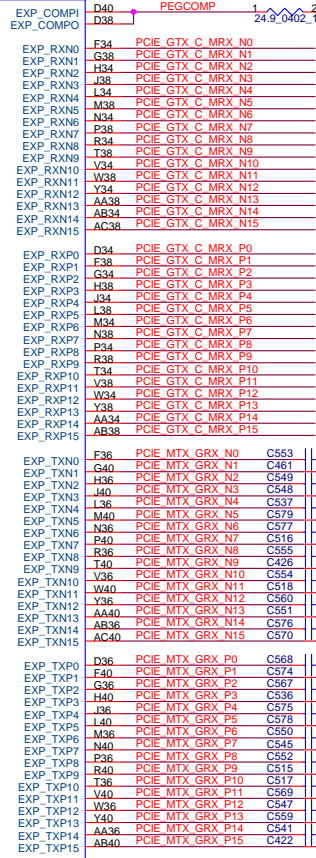
TV

CRT

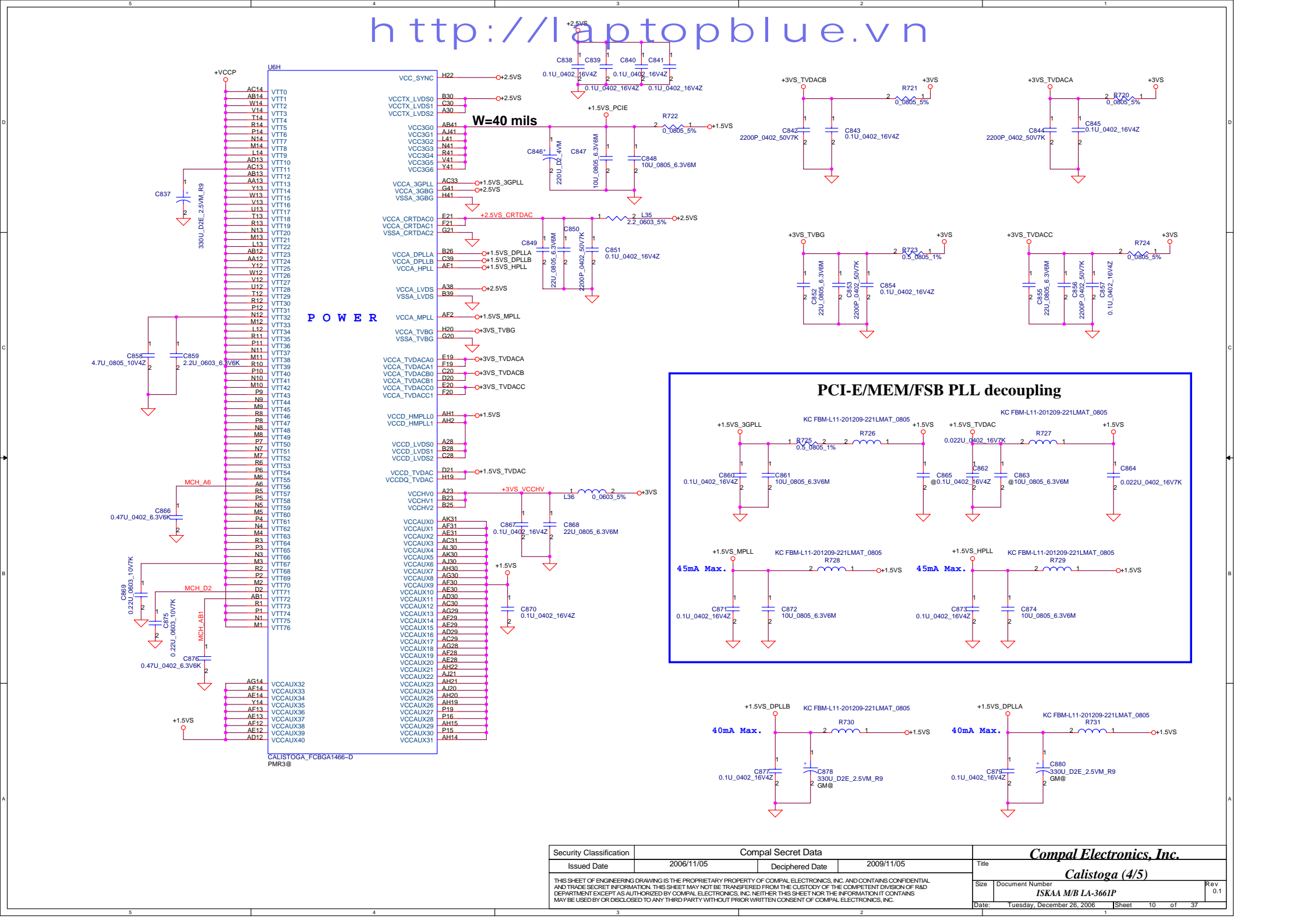
CALISTOGA\_FCBGA1466-D

PMR3@

PEGCOMP trace width and spacing is 18/25 mils.



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**POWER**

**PCI-E/MEM/FSB PLL decoupling**

**45mA Max.**

**40mA Max.**

**40mA Max.**

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**Calistoga (4/5)**

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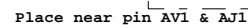
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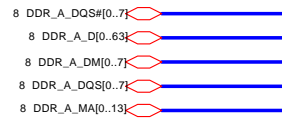
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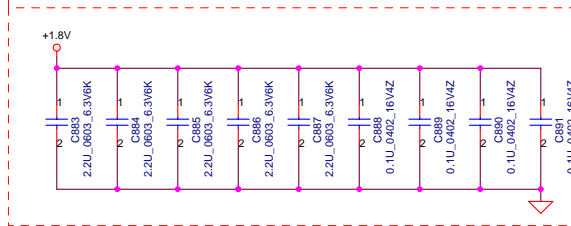
**GND**



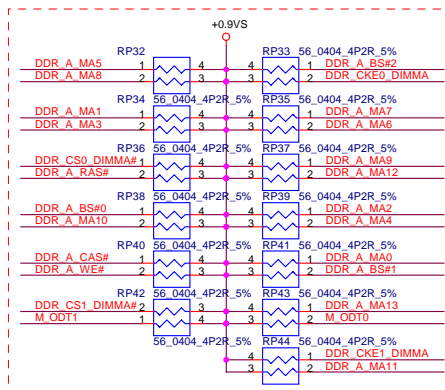
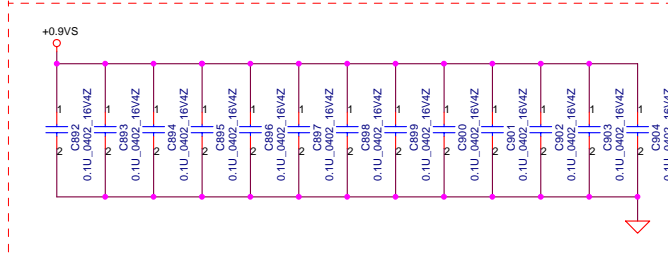
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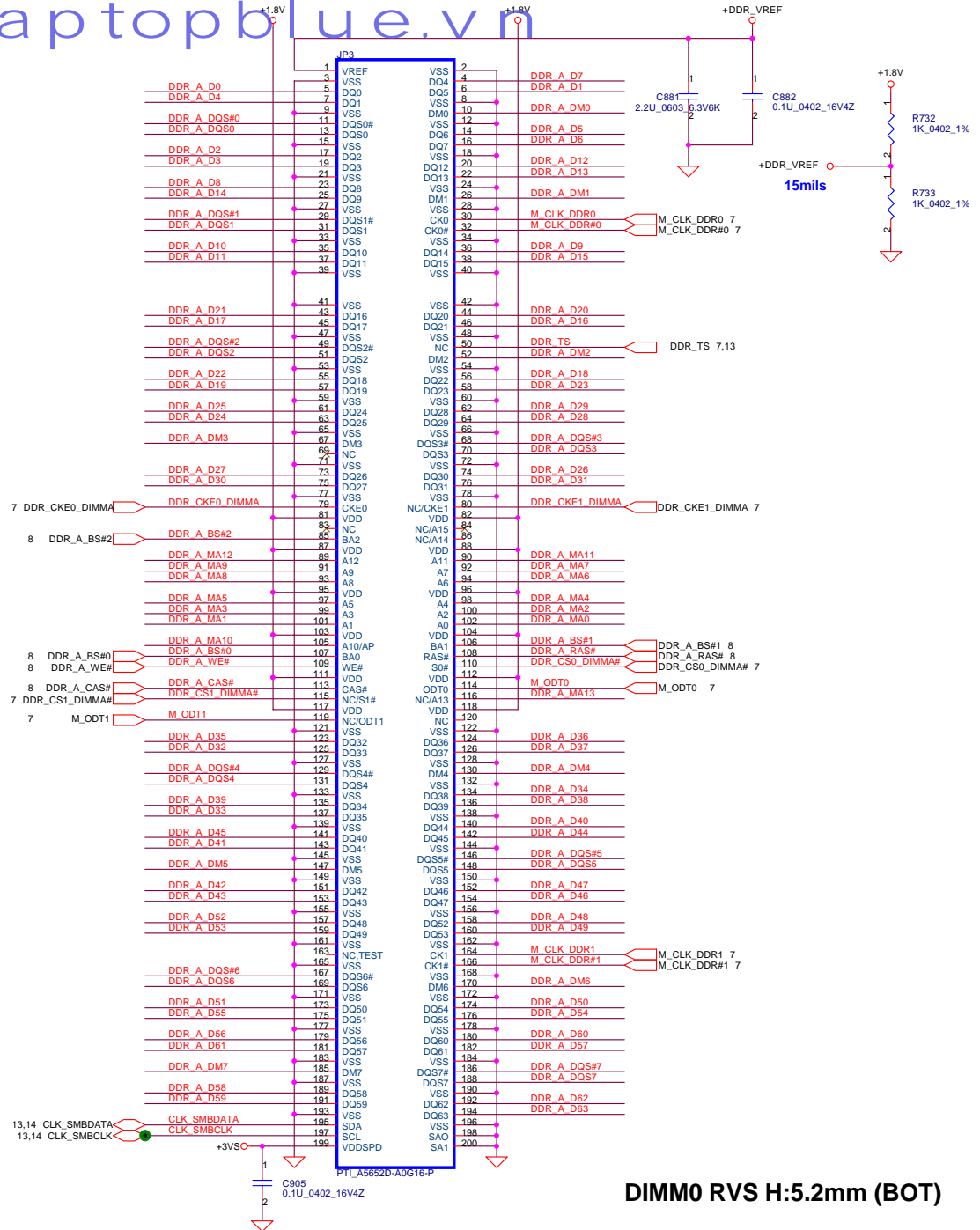
**Layout Note:**  
Place near JP27



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



**Layout Note:**  
Place these resistor closely JP27, all trace length Max=1.5"



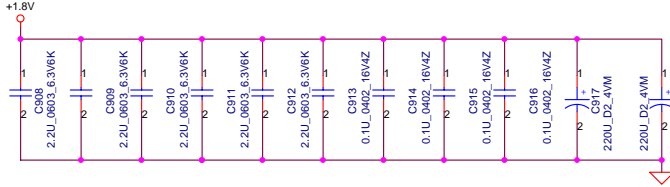
**DIMM0 RVS H:5.2mm (BOT)**

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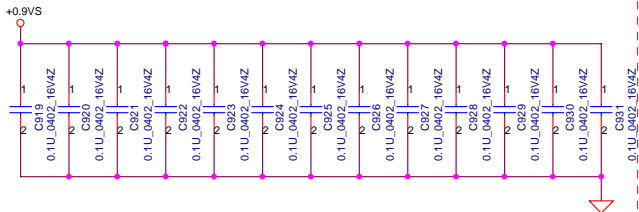
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8 DDR\_B\_DQS#[0..7]  
8 DDR\_B\_D[0..63]  
8 DDR\_B\_DM[0..7]  
8 DDR\_B\_DQS[0..7]  
8 DDR\_B\_MA[0..13]

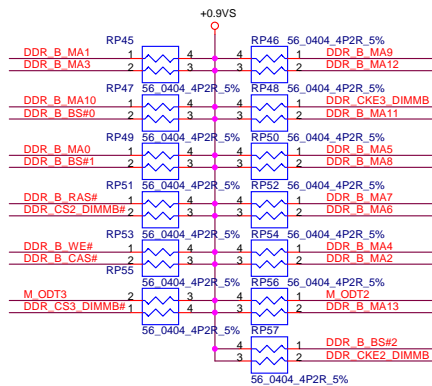
Layout Note:  
Place near JP26



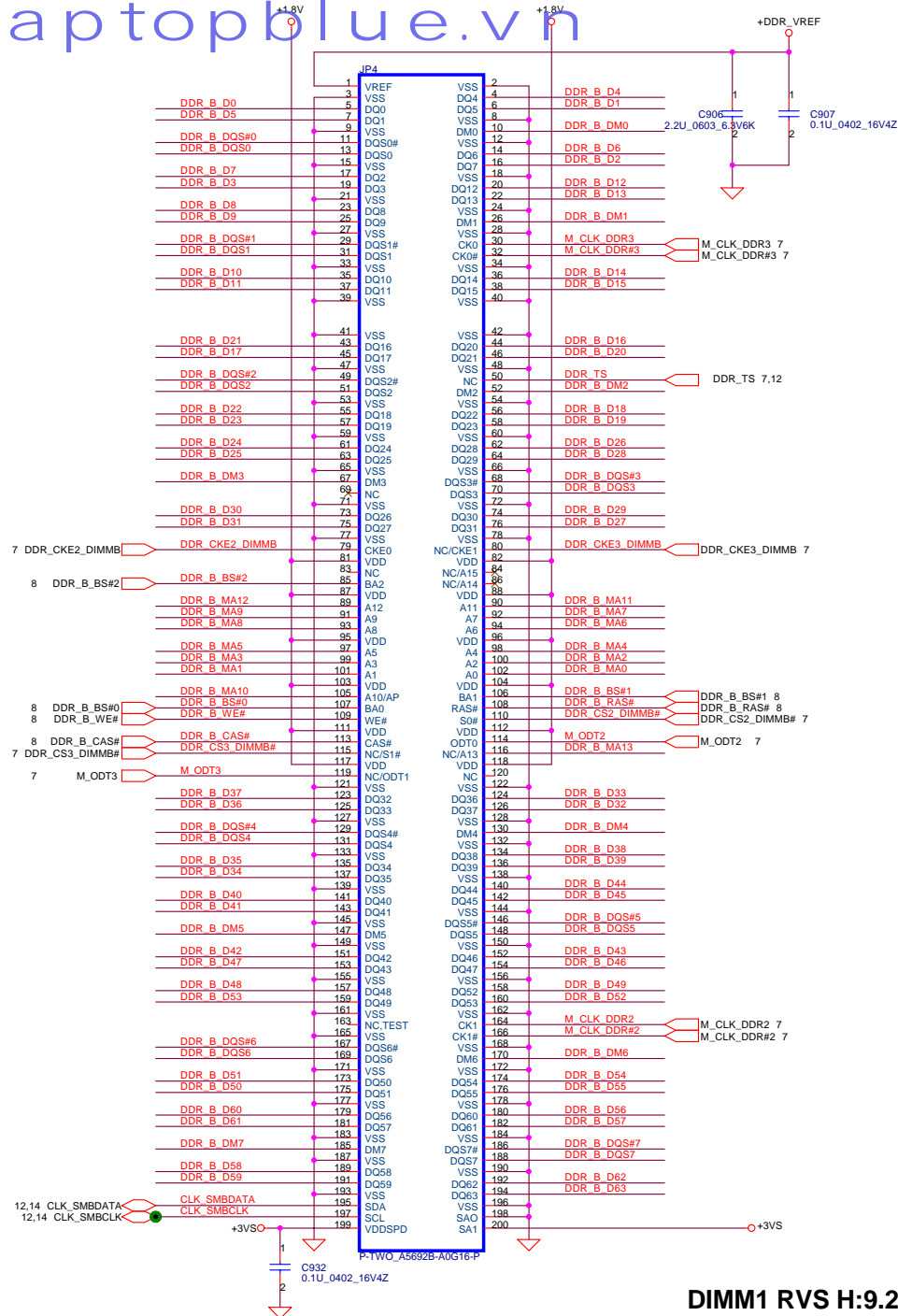
Layout Note:  
Place one cap close to every 2 pullup resistors terminated to +0.9VS



Layout Note:  
Place these resistor closely JP26, all trace length Max=1.5"



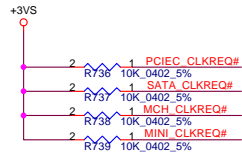
http://laptopblue.vn



DIMM1 RVS H:9.2mm (BOT)

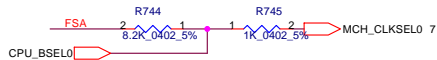
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								DDRII-SODIMM SLOT2			
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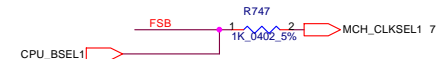


FSLC CLKSEL2	FSLB CLKSEL1	FSLA CLKSEL0	CPU MHz	SRC MHz	PCI MHz
0	0	1	133	100	33.3
0	1	1	166	100	33.3

## FSA

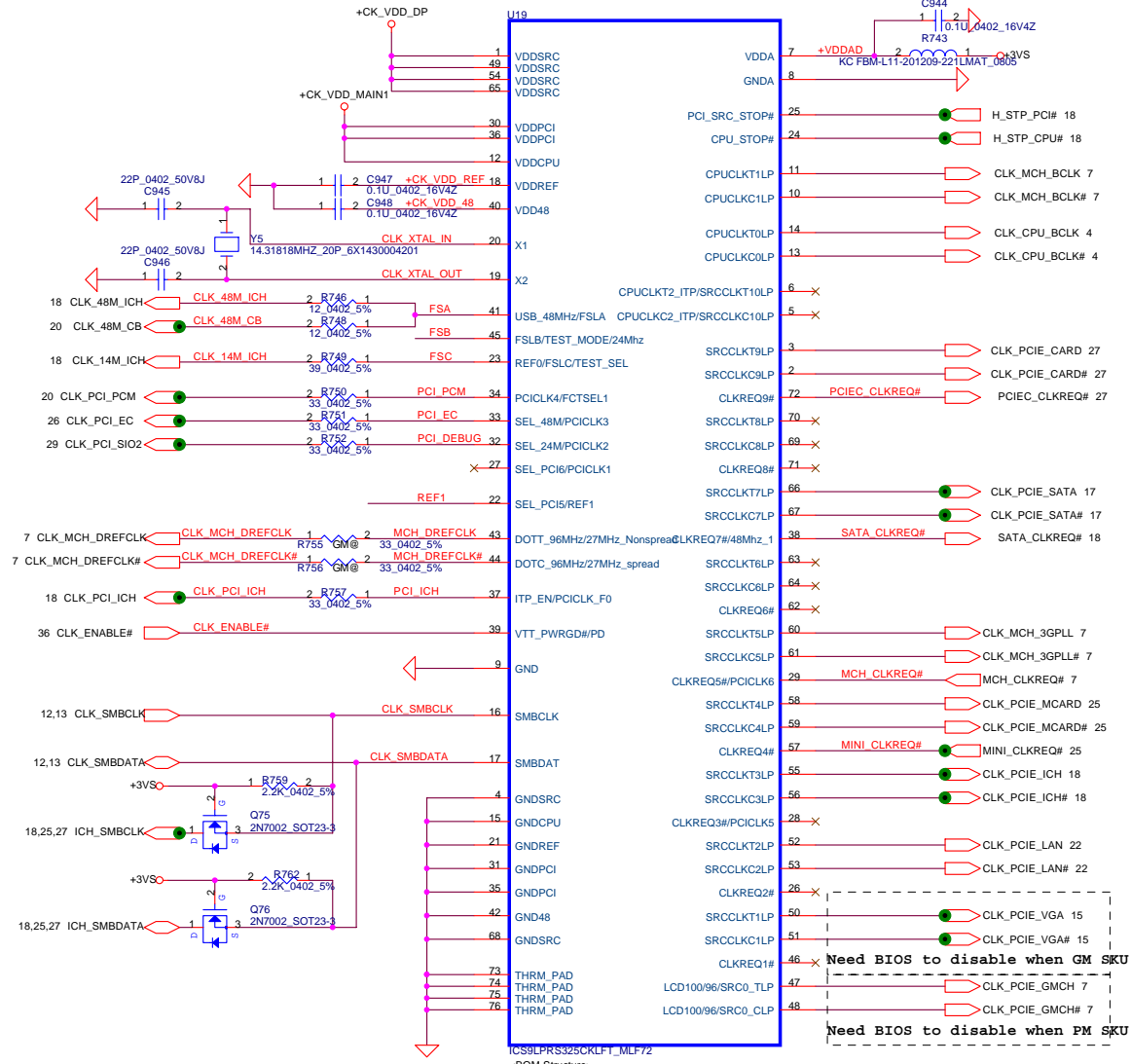
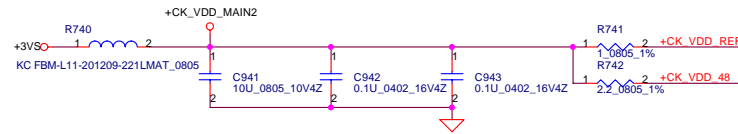
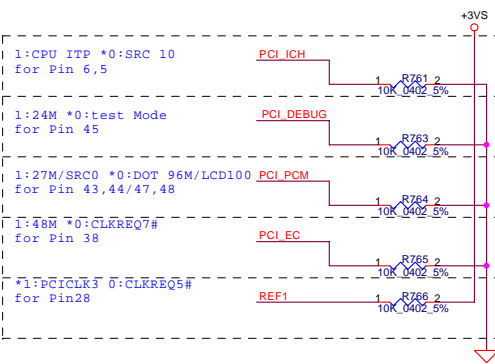
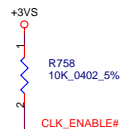
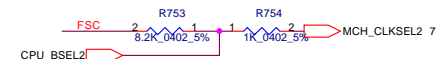


## FSB



## FSC

(Fixed at low)



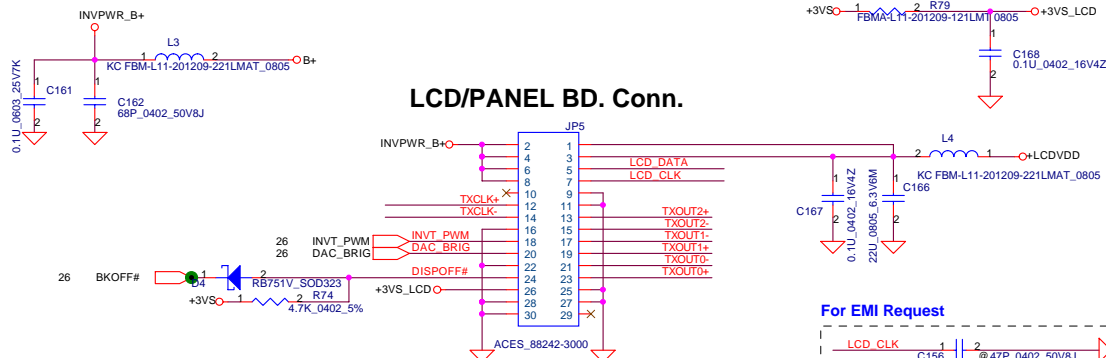
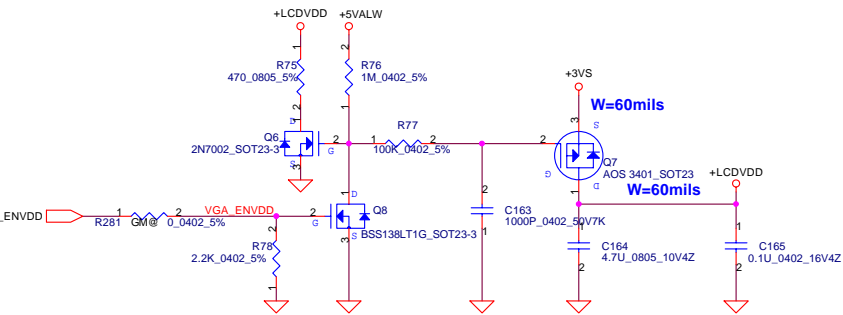
Security Classification			Compal Secret Data		Title	
Issued Date	2006/11/05	Deciphered Date	2009/11/05		Size	Document Number
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				Date: Thursday, December 28, 2006 Sheet 14 of 37		

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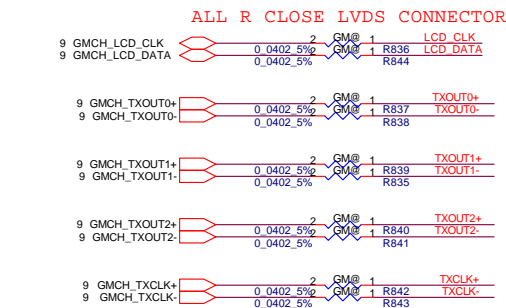
Clock generator

ISKAA M/B LA-3661P

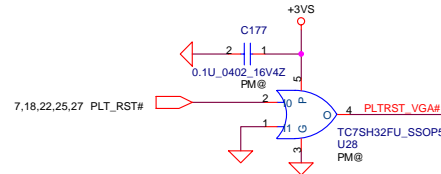
## LCD POWER CIRCUIT



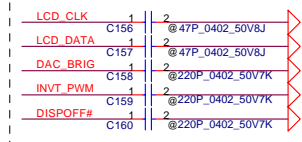
**LCD/PANEL BD. Conn.**



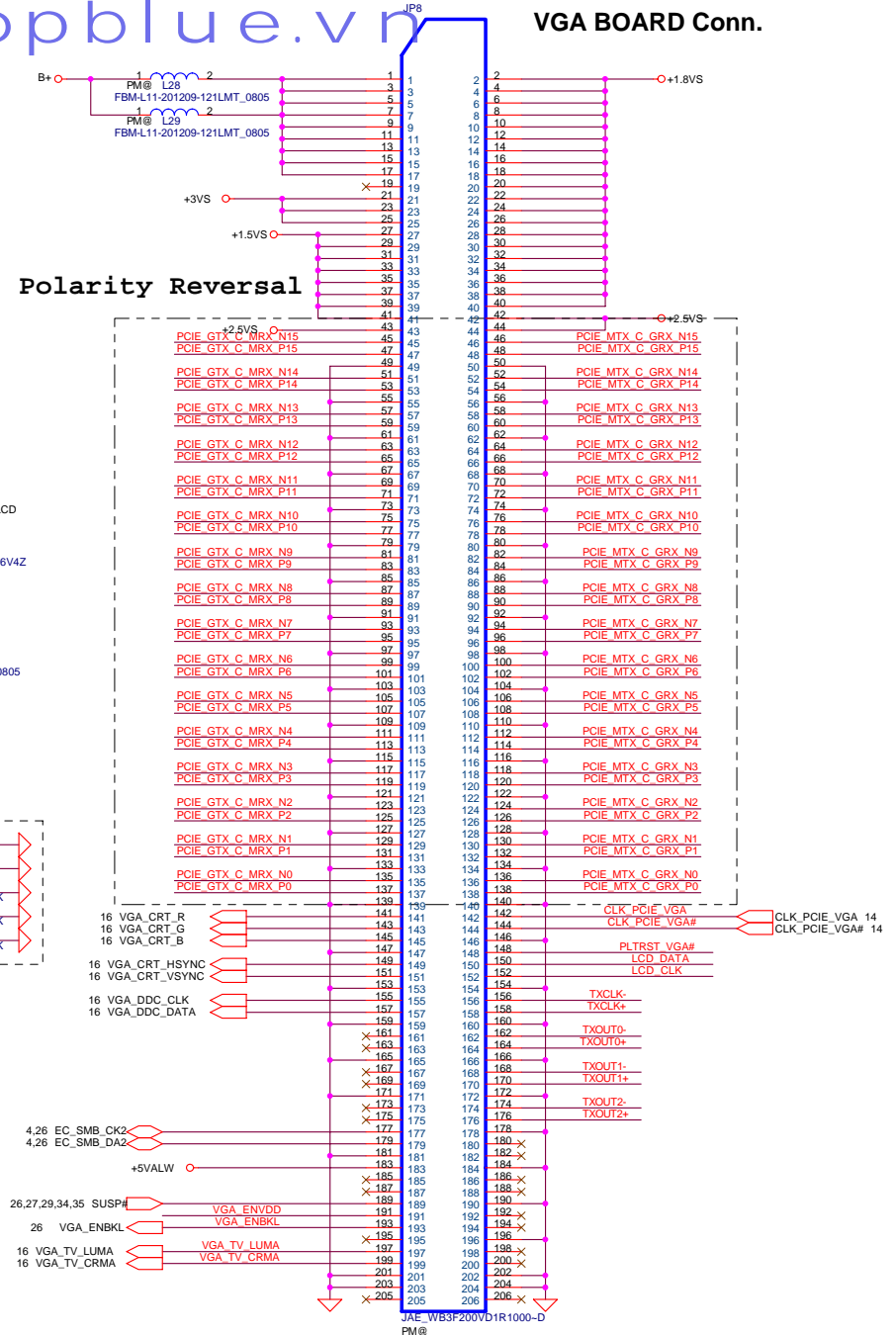
ALL R CLOSE LVDS CONNECTOR



**For EMI Request**



## Polarity Reversal



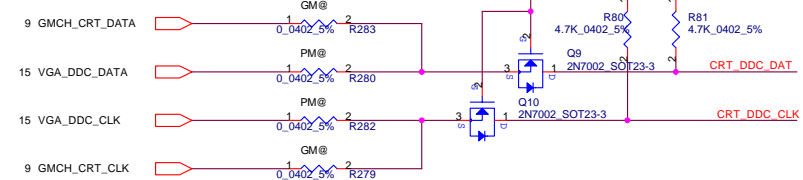
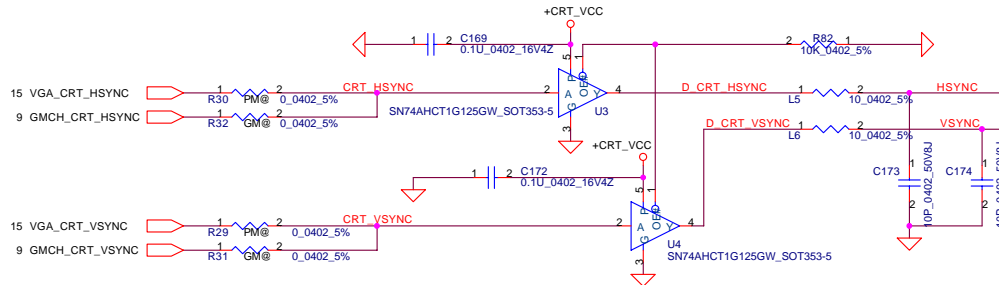
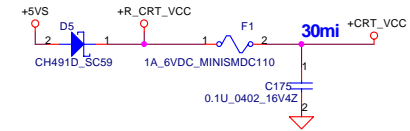
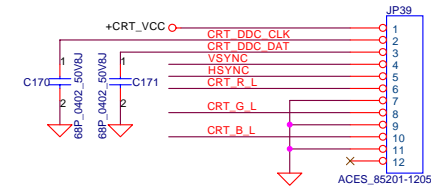
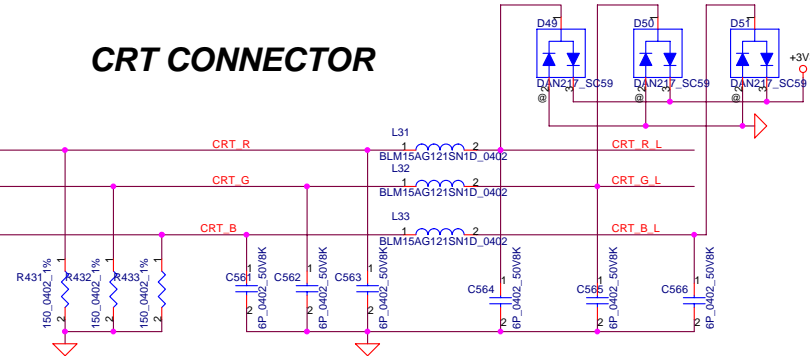
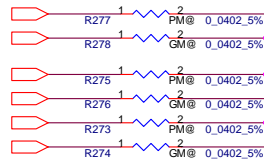
## VGA BOARD Conn.

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					LA-3481P	0.2
				Date:	Thursday, December 28, 2006	Sheet



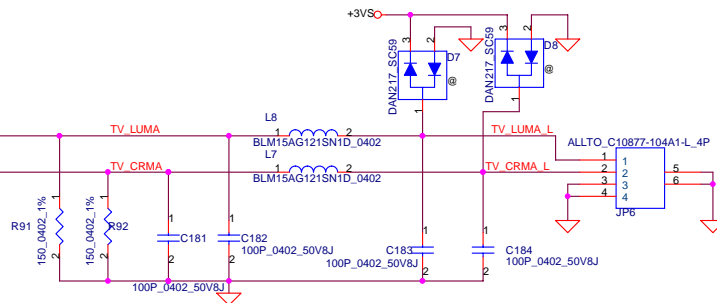
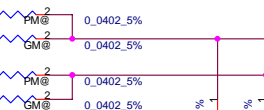
## CRT CONNECTOR

15 VGA\_CRT\_R  
9 GMCH\_CRT\_R  
15 VGA\_CRT\_G  
9 GMCH\_CRT\_G  
15 VGA\_CRT\_B  
9 GMCH\_CRT\_B



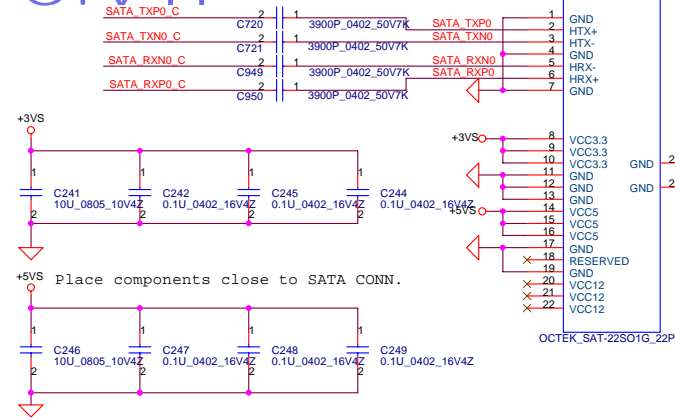
## TV-OUT Conn.

15 VGA\_TV\_LUMA  
9 GMCH\_TV\_LUMA  
15 VGA\_TV\_CRMA  
9 GMCH\_TV\_CRMA

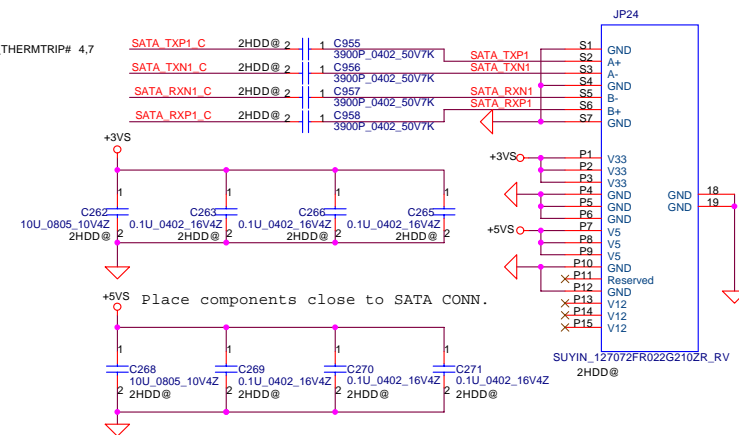


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				Rev	
				0.1	
				Date: Thursday, December 28, 2006	
				Sheet 16 of 37	

## 1st SATA HDD CONN

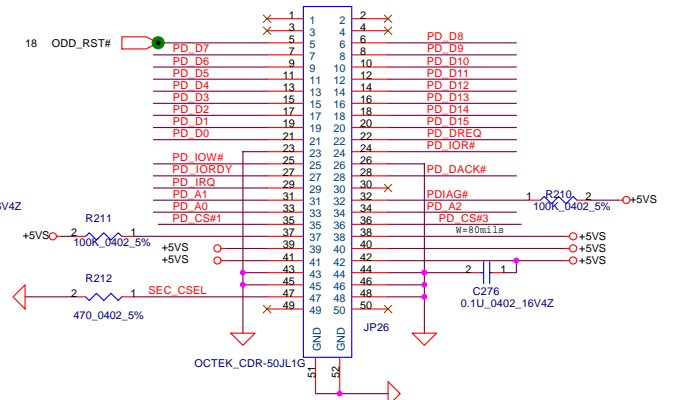
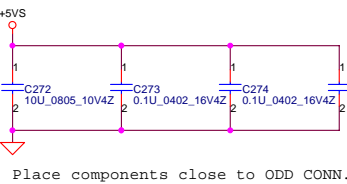
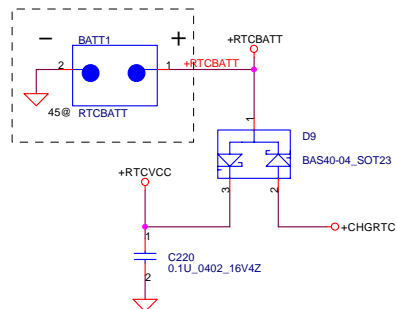


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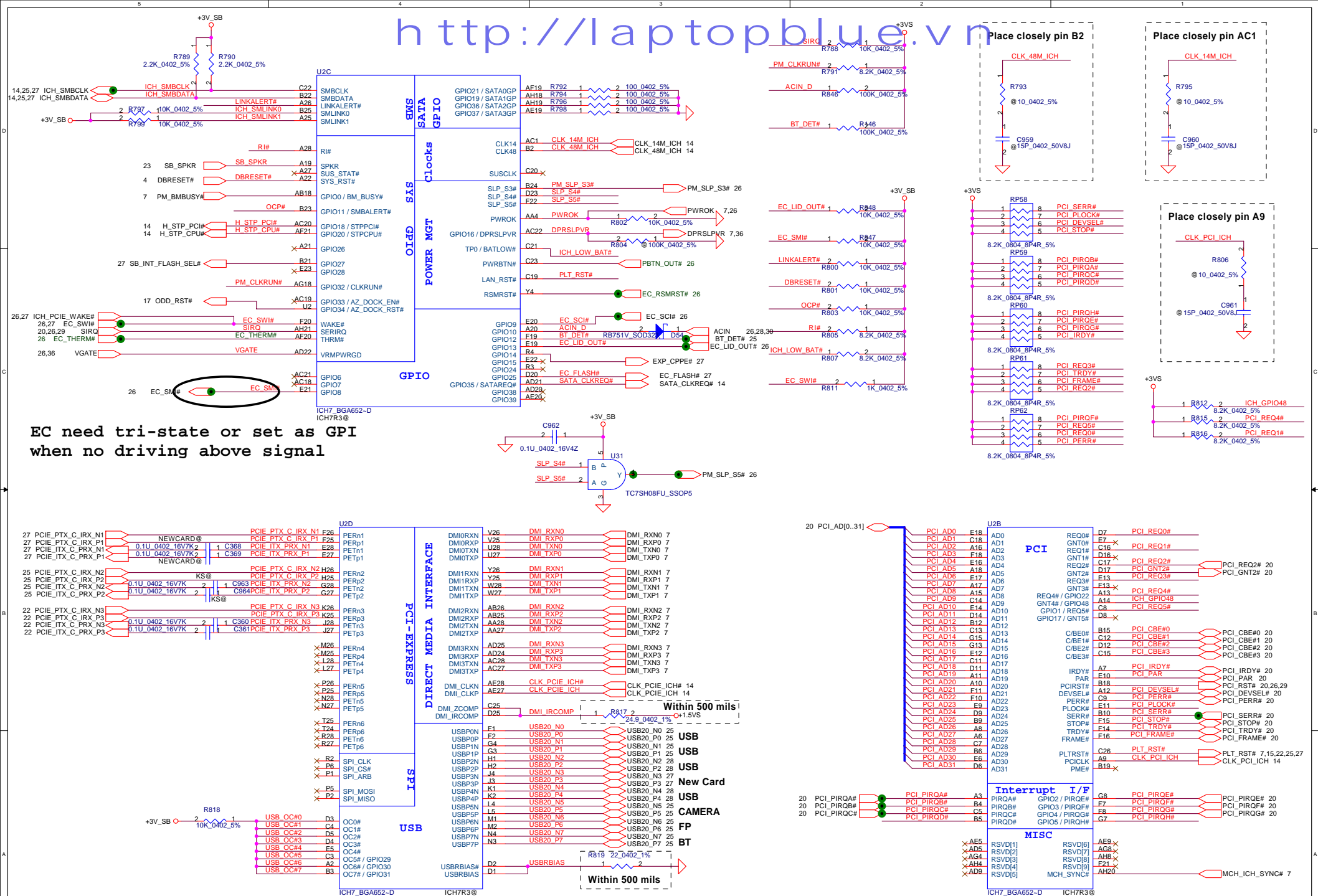


## RTC Battery

- Layout Note:**
- Under BATT1 battery Body, no Trace no Via
  - BATT1 +- PIN keep out 80mil from other component ,trace and via

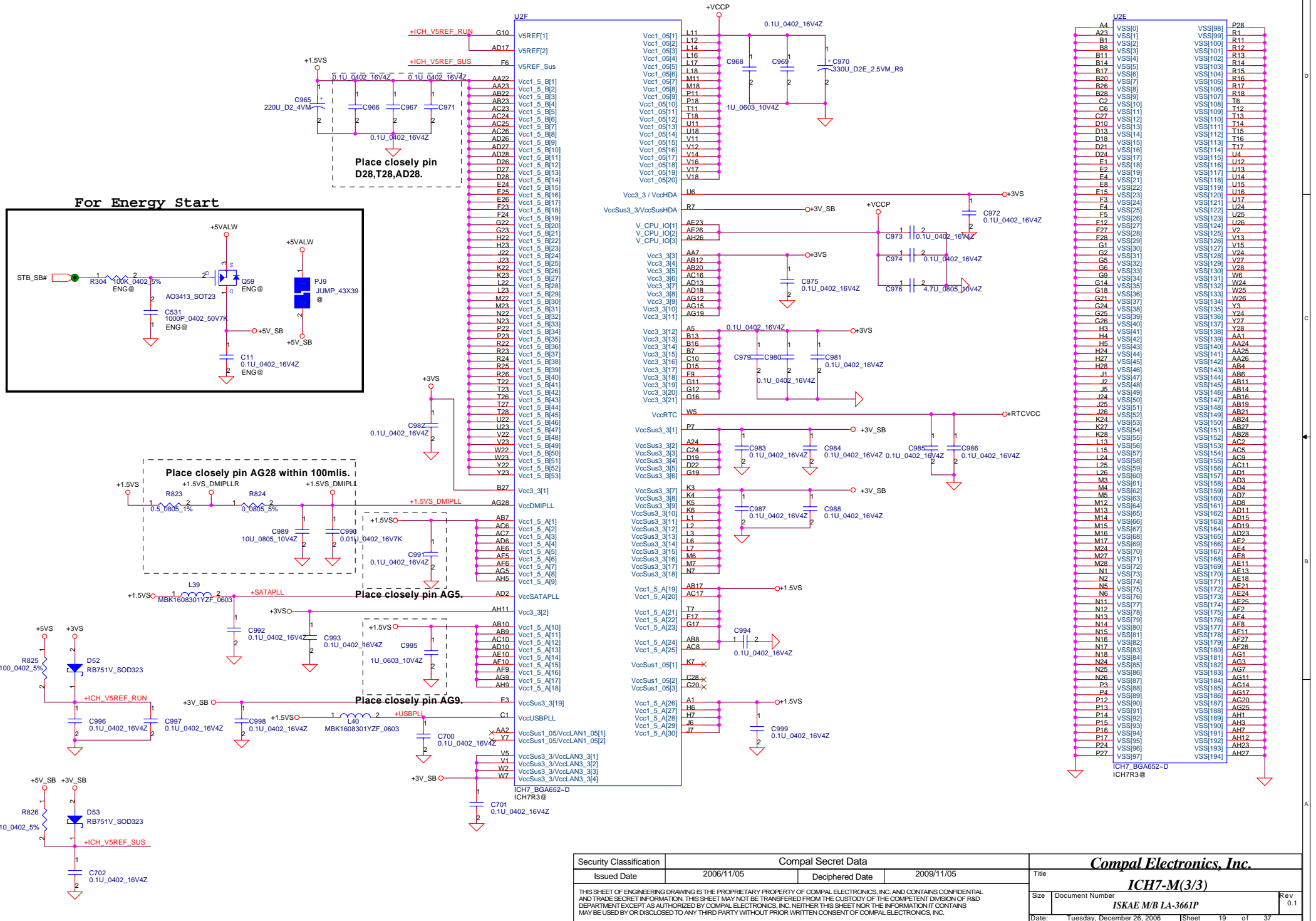


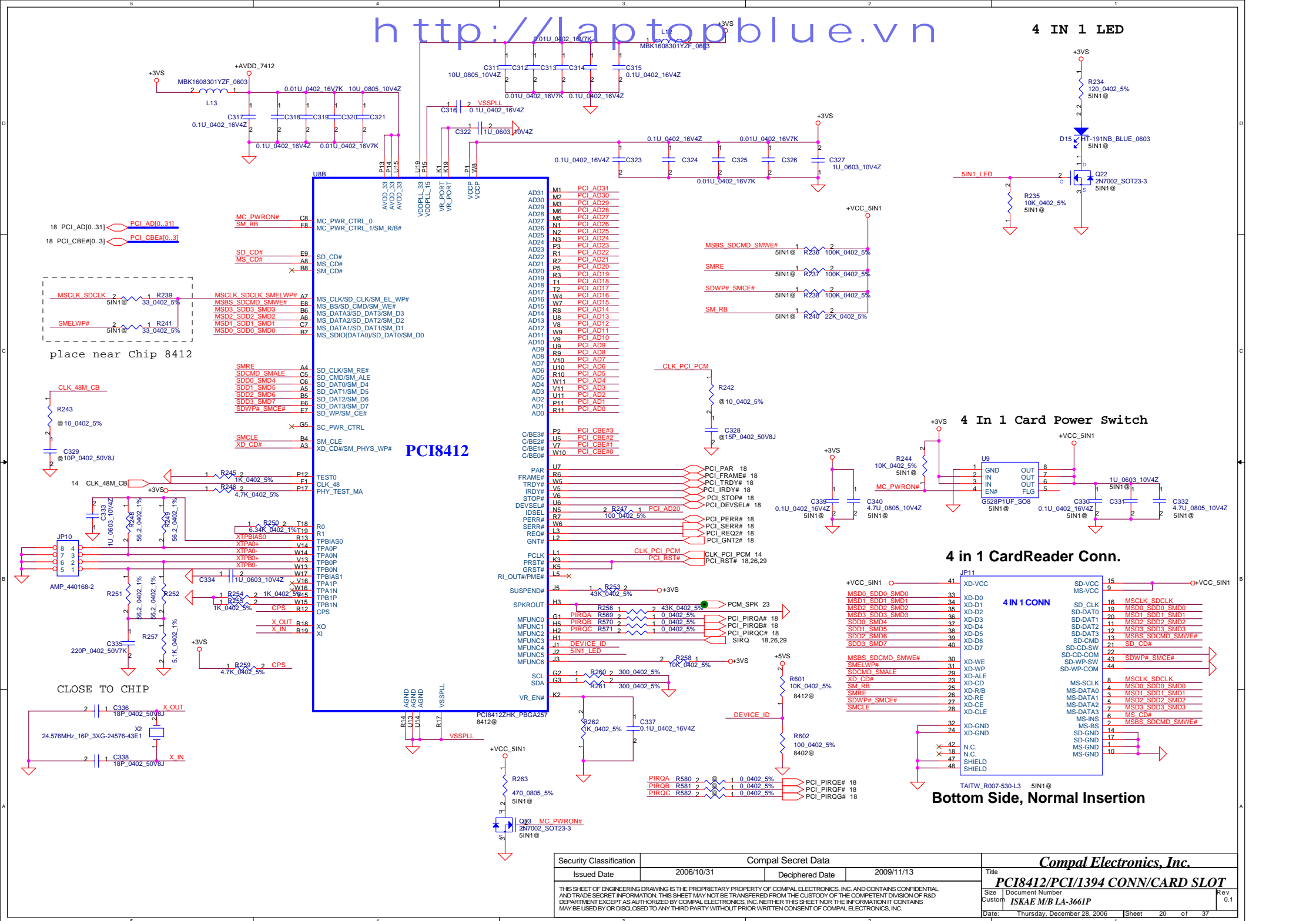
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								Size	Document Number			Rev
									ISKAE M/B LA-3661P			0.1
Date:		Tuesday, December 26, 2006			Sheet		17		of 37			



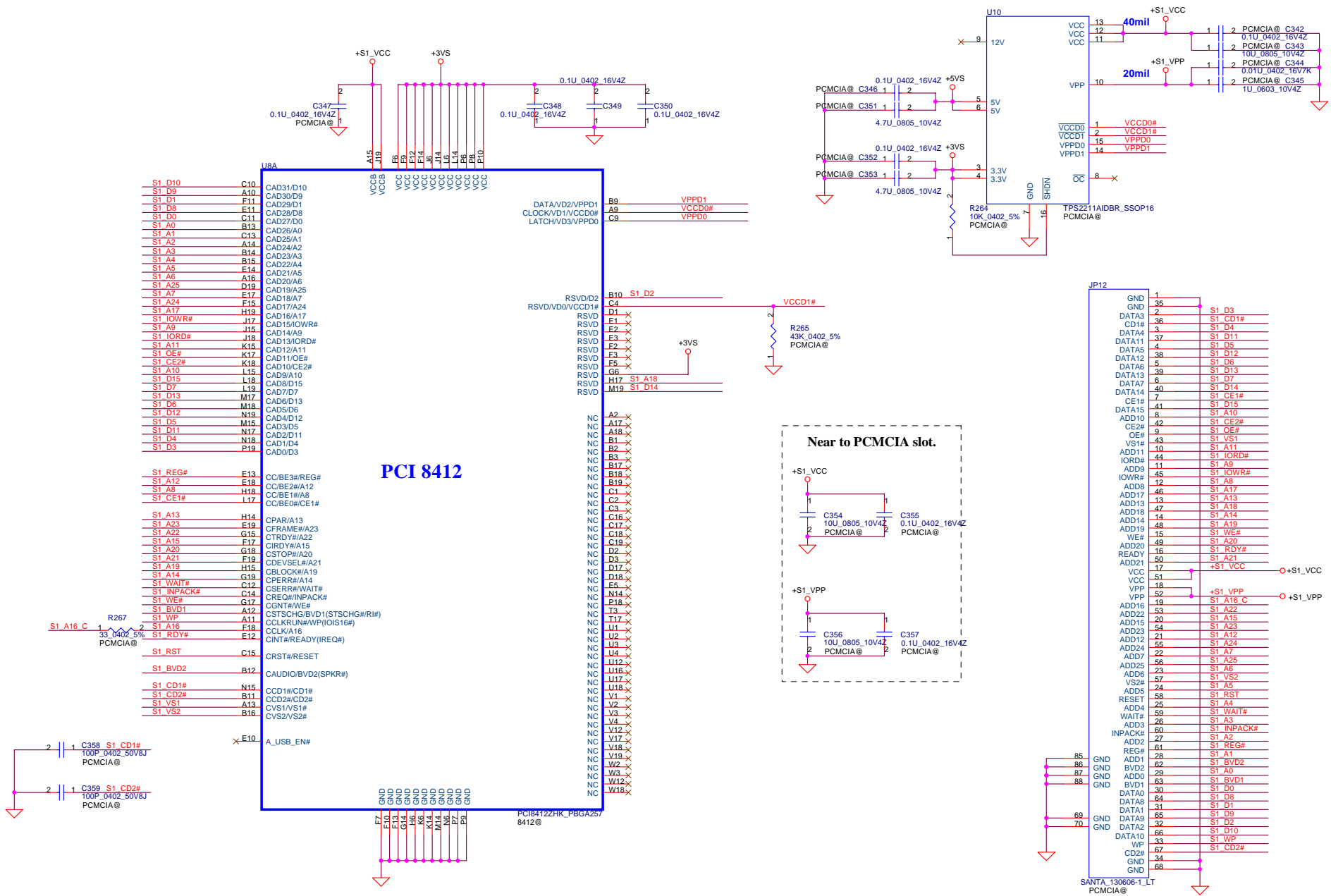
EC need tri-state or set as GPI  
when no driving above signal

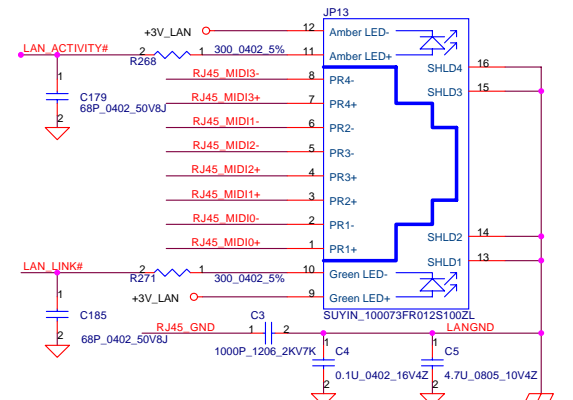
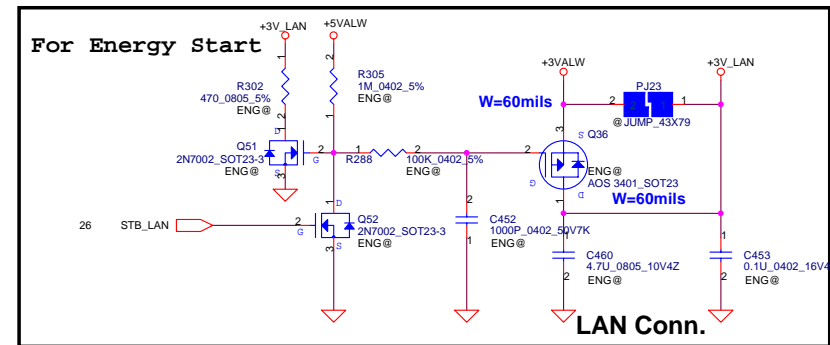
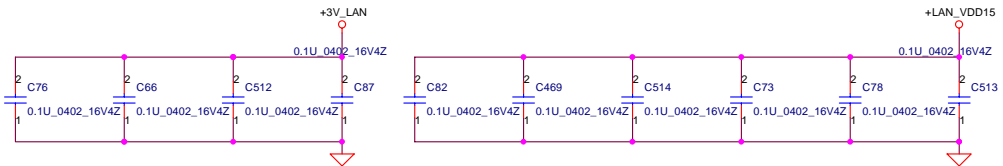
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Issued Date		2006/11/05	Deciphered Date		2009/11/05	Title					
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						Size	Document Number				Rev
						<b>ISKAE M/B LA-3661P</b>					0.1
Date:		Tuesday, December 26, 2006		Sheet	18	of 37					



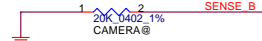
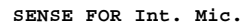
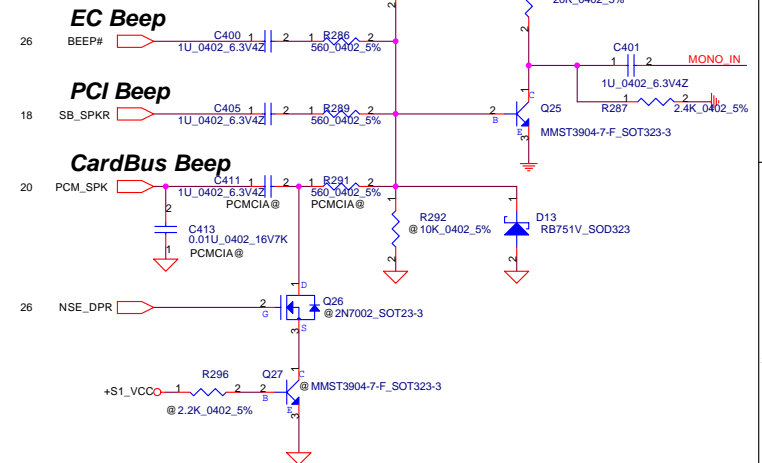




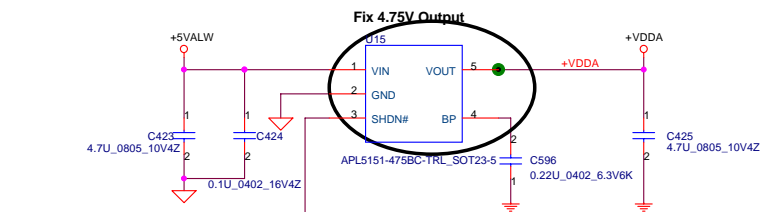




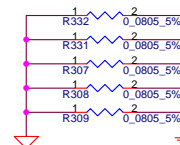




Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)

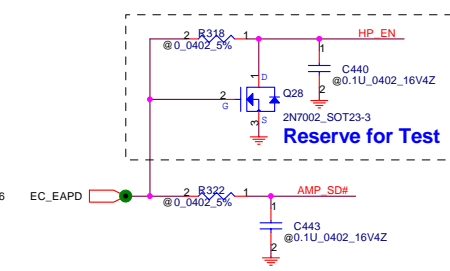


### *Moat Bridge*

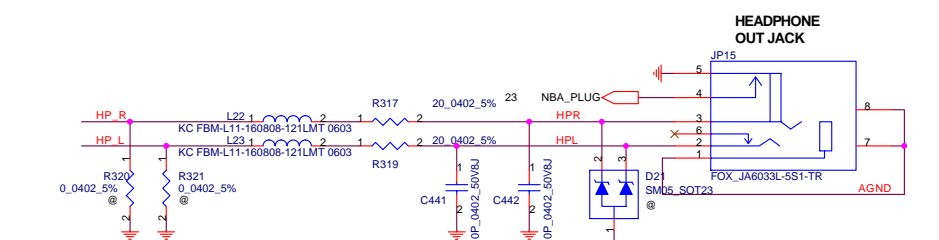


Security Classification		Compal Secret Data		Compal Electronics, Inc.					
Issued Date		2006/10/31	Deciphered Date		2009/11/13		Title	HD Audio Codec ALC268	
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						Cust	ISKAE MB LA-3661P		0.1
						Date:		Thursday, December 28, 2006	

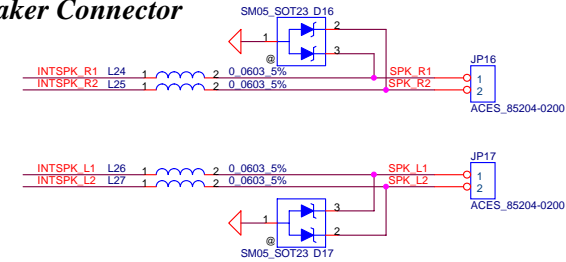
APA2056 SPK/HP Amplifier



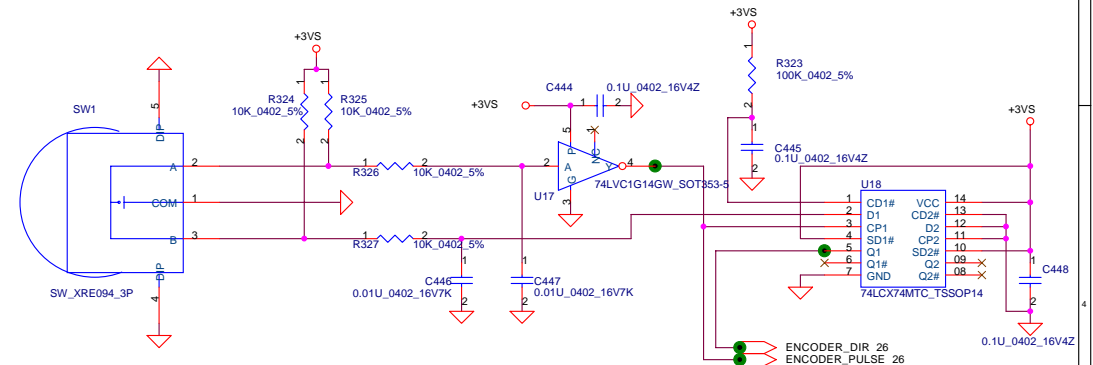
IN\_A Gain = 10dB (Internal Speaker)  
IN\_H Gain = 0dB (Headphone)



### *Right Speaker Connector*

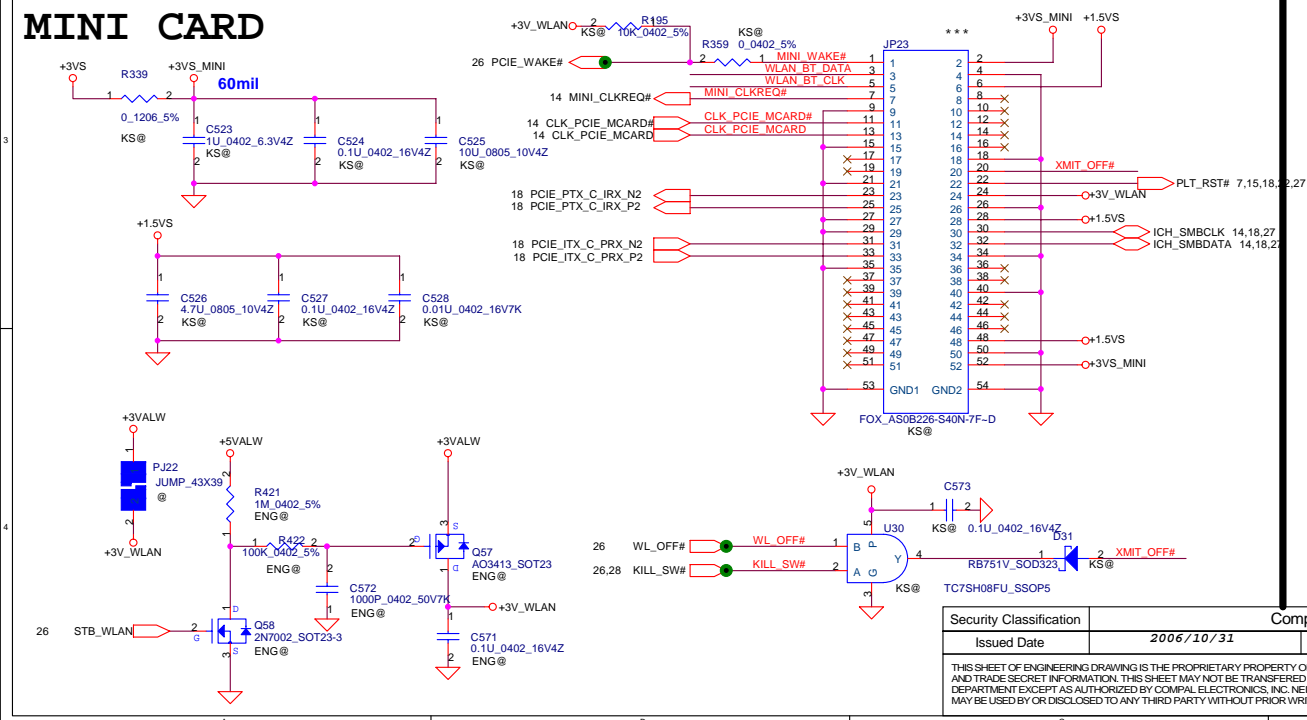
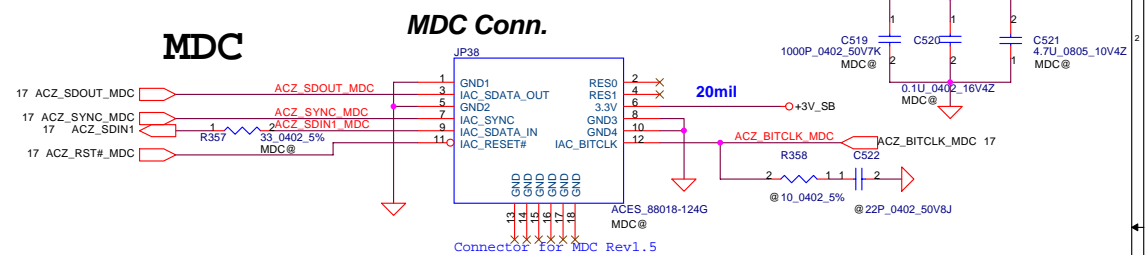
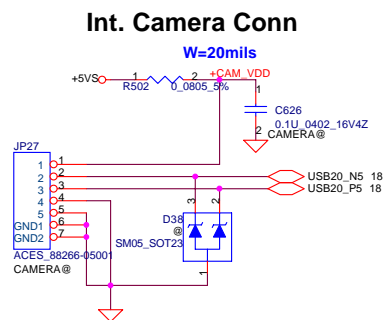
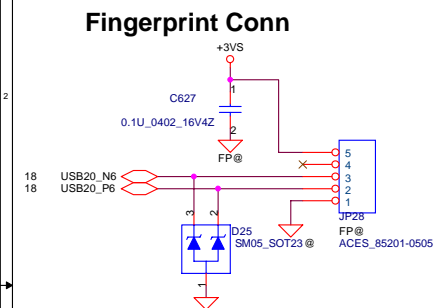
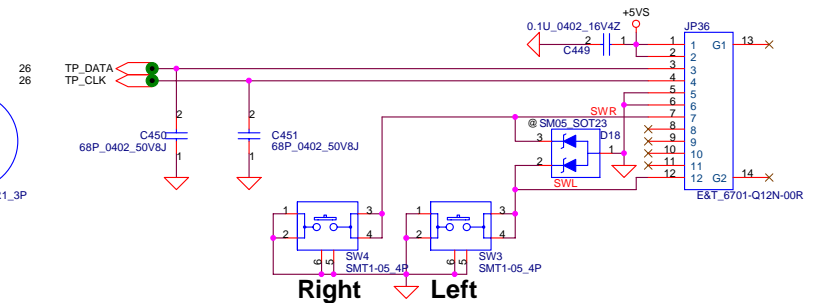
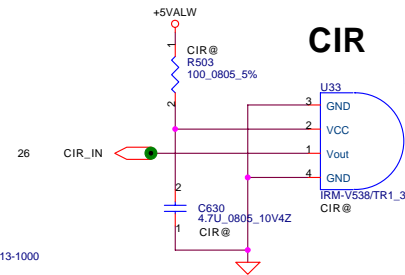
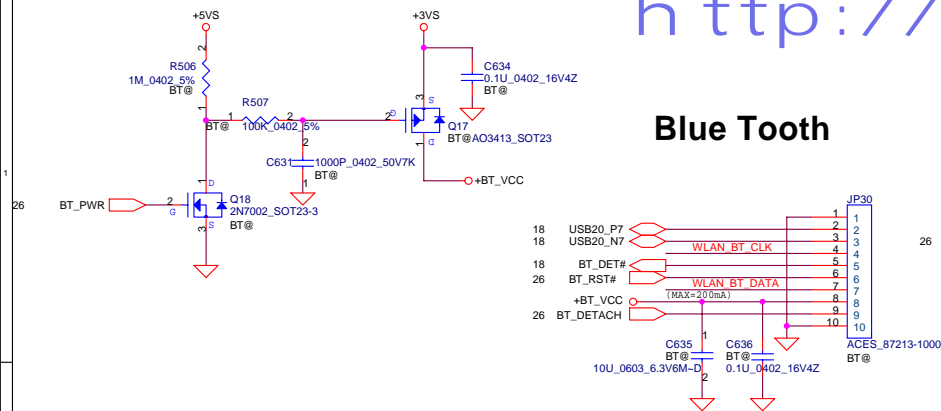


### Volume Control

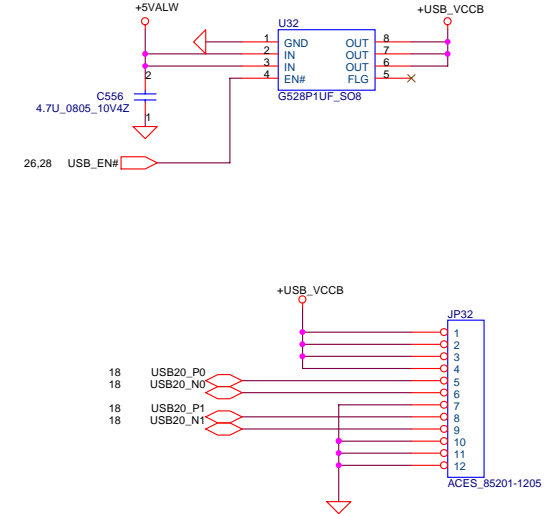


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				Custlbrm	ISKAE MB LA-3661P	0.1
				Date:	Thursday, December 28, 2006	Sheet 24 of 37

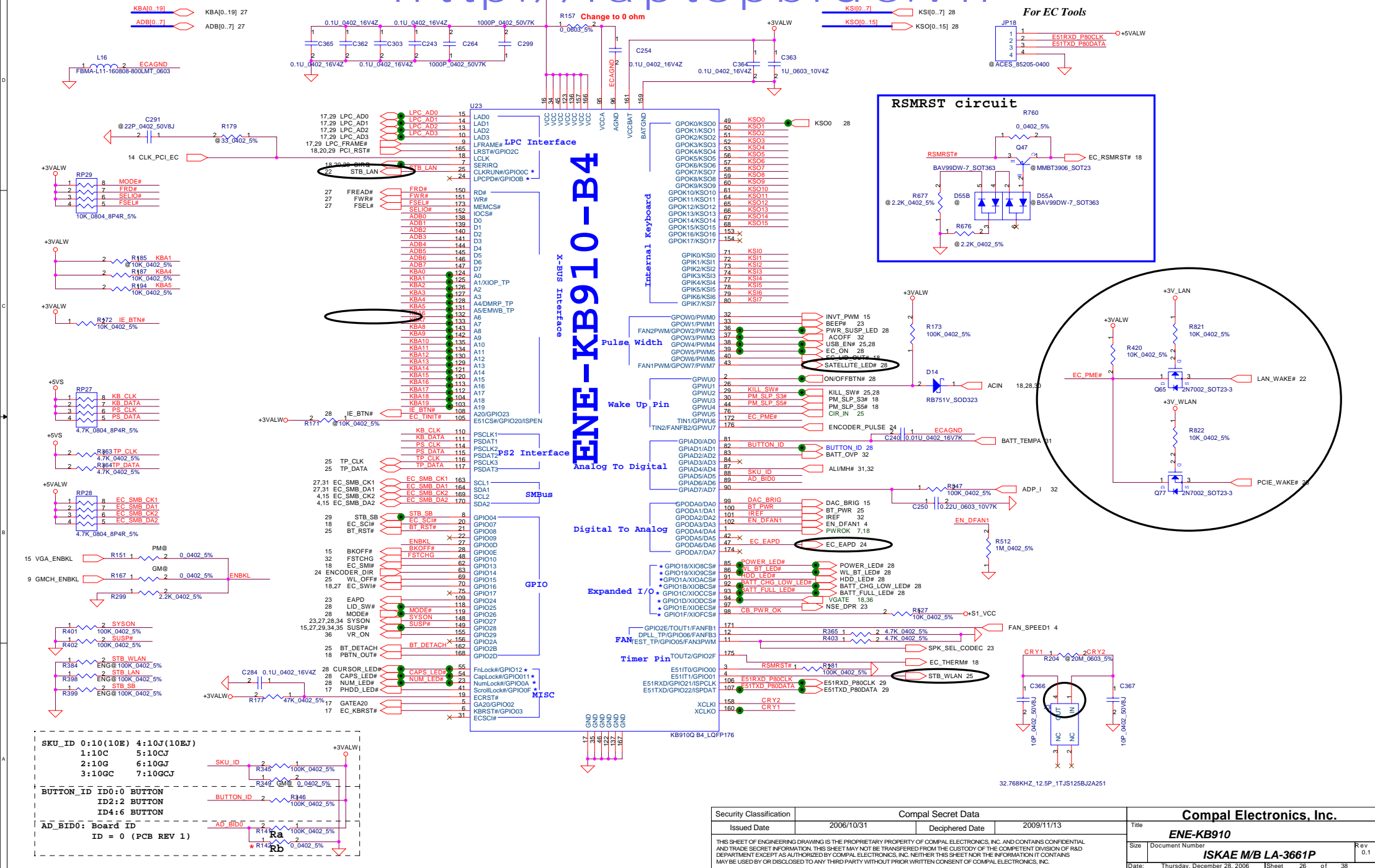
**TP CONN.**

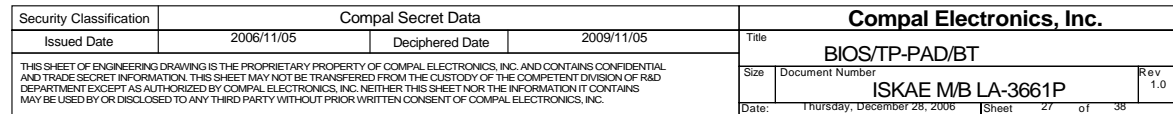


## USB Board Connector



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				Date: Thursday, December 28, 2006	Sheet 25 of 37

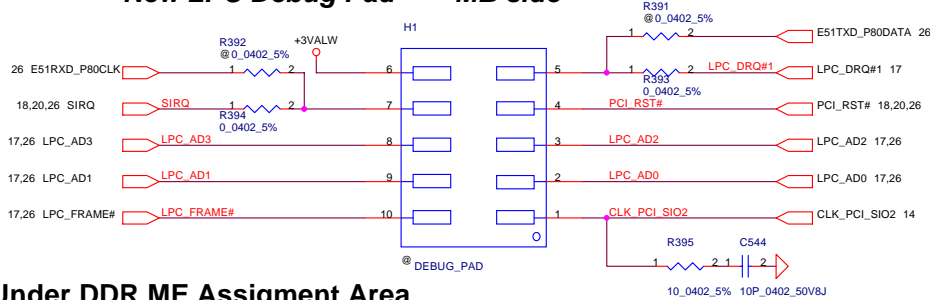






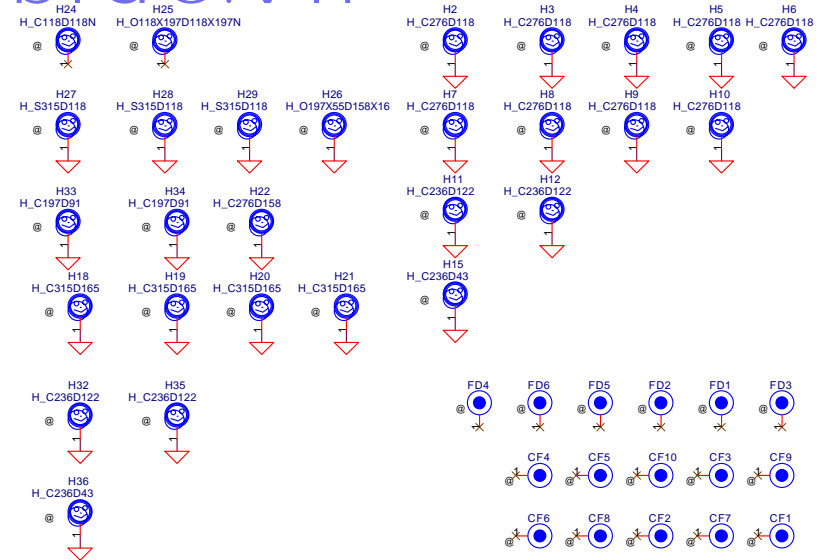
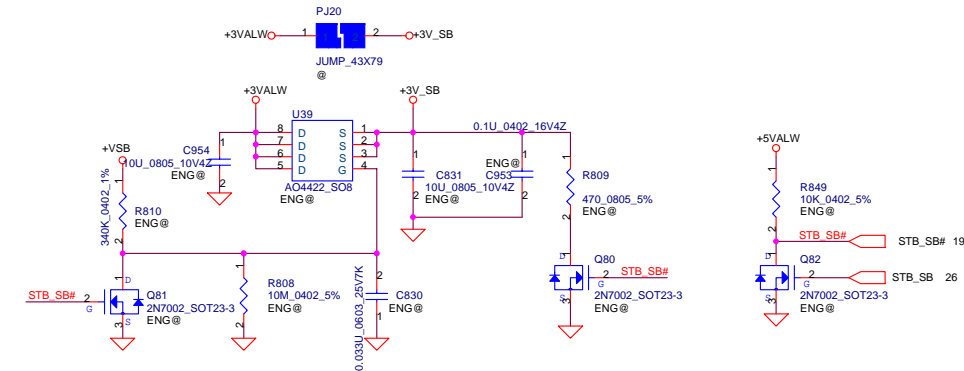


## New LPC Debug Pad ---- MB side

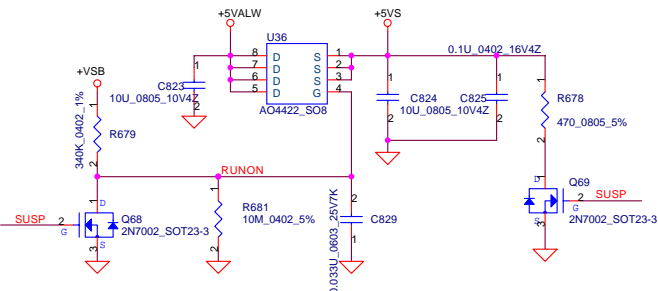


## Under DDR ME Assignment Area

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

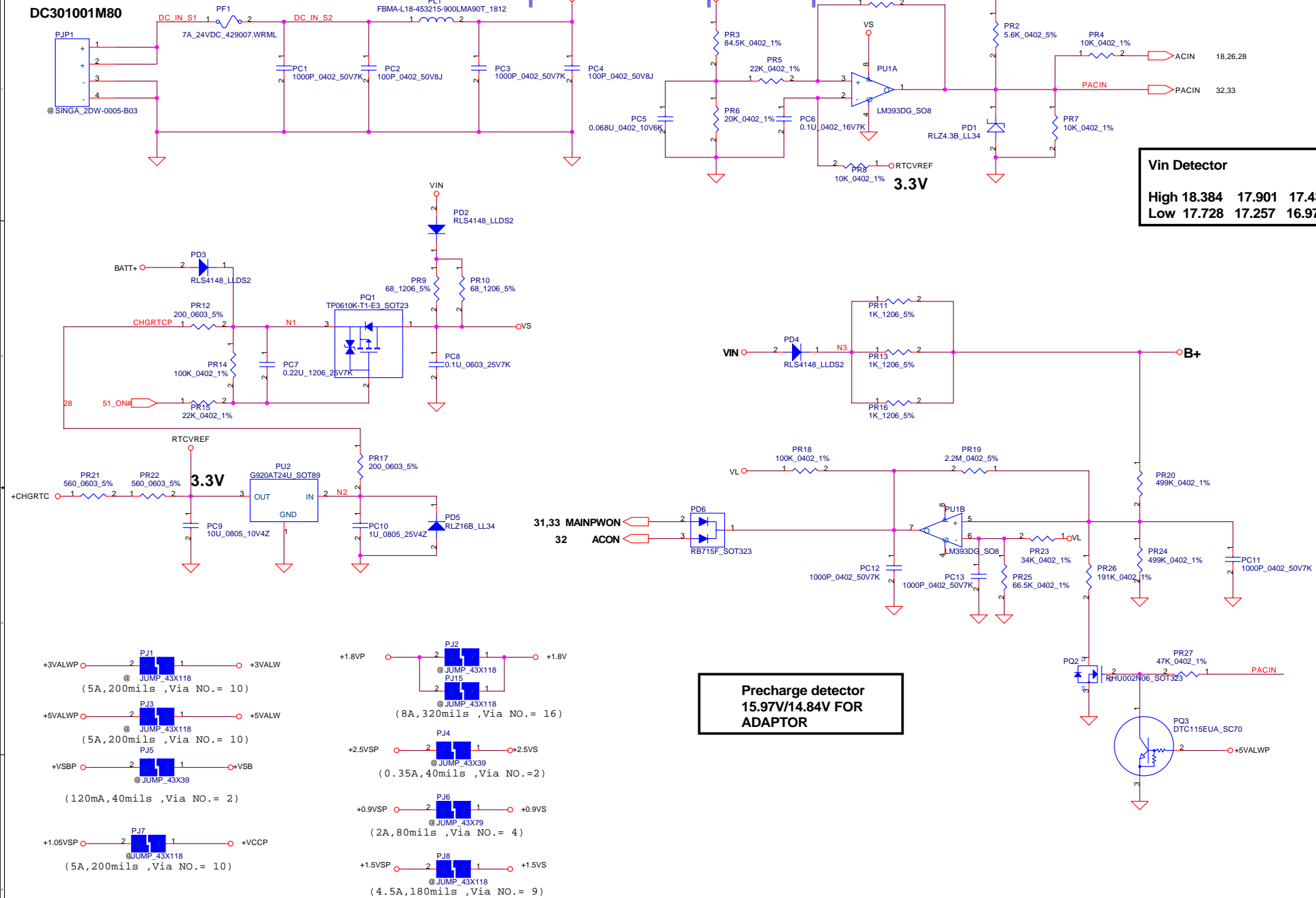


## +5VALW to +5VS Transfer





# DC301001M80



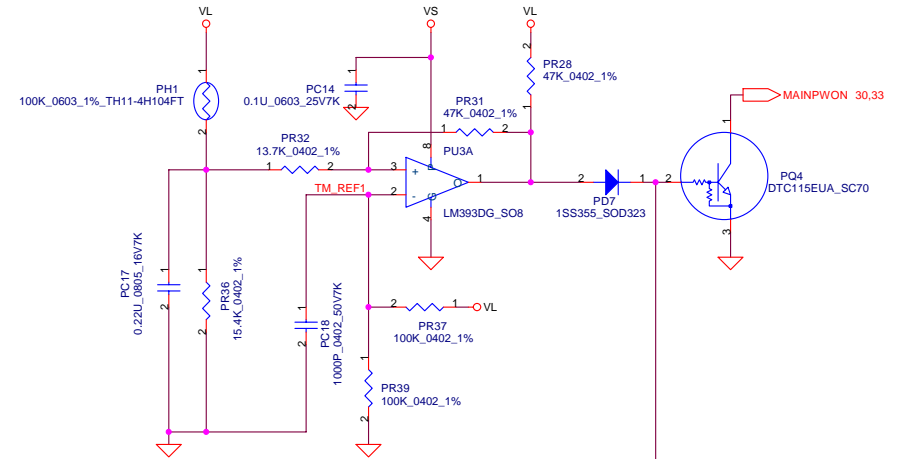
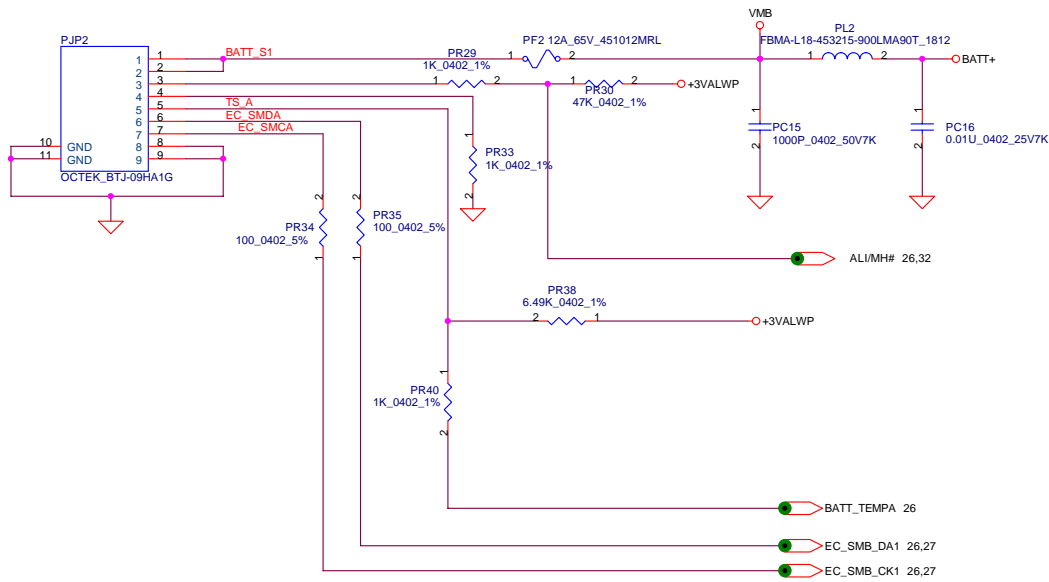
**Vin Detector**  
 High 18.384 17.901 17.430  
 Low 17.728 17.257 16.976

**Precharge detector**  
 15.97V/14.84V FOR  
 ADAPTOR

PH1 under CPU bottom side :

CPU thermal protection at 87 degree C

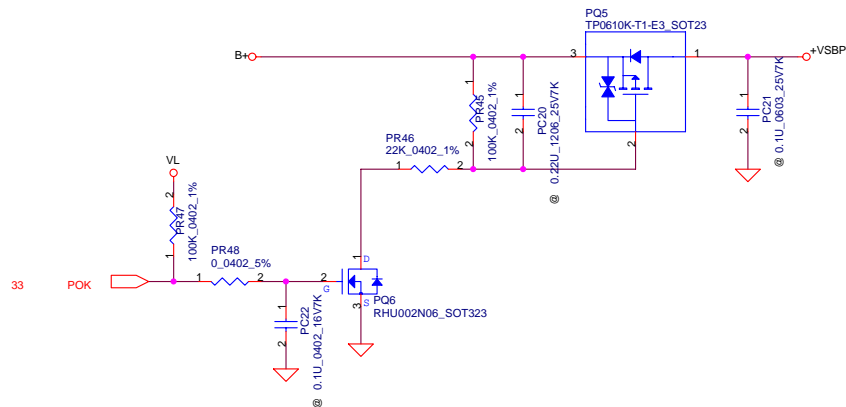
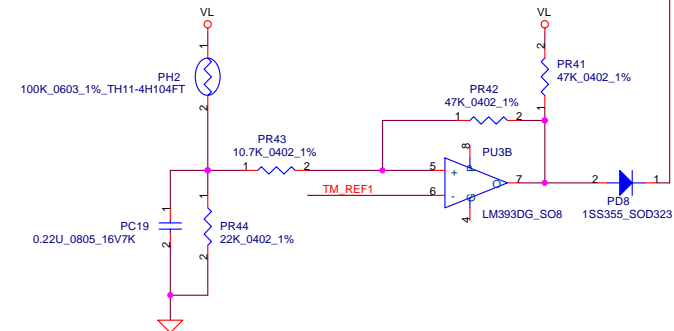
Recovery at 48 degree C



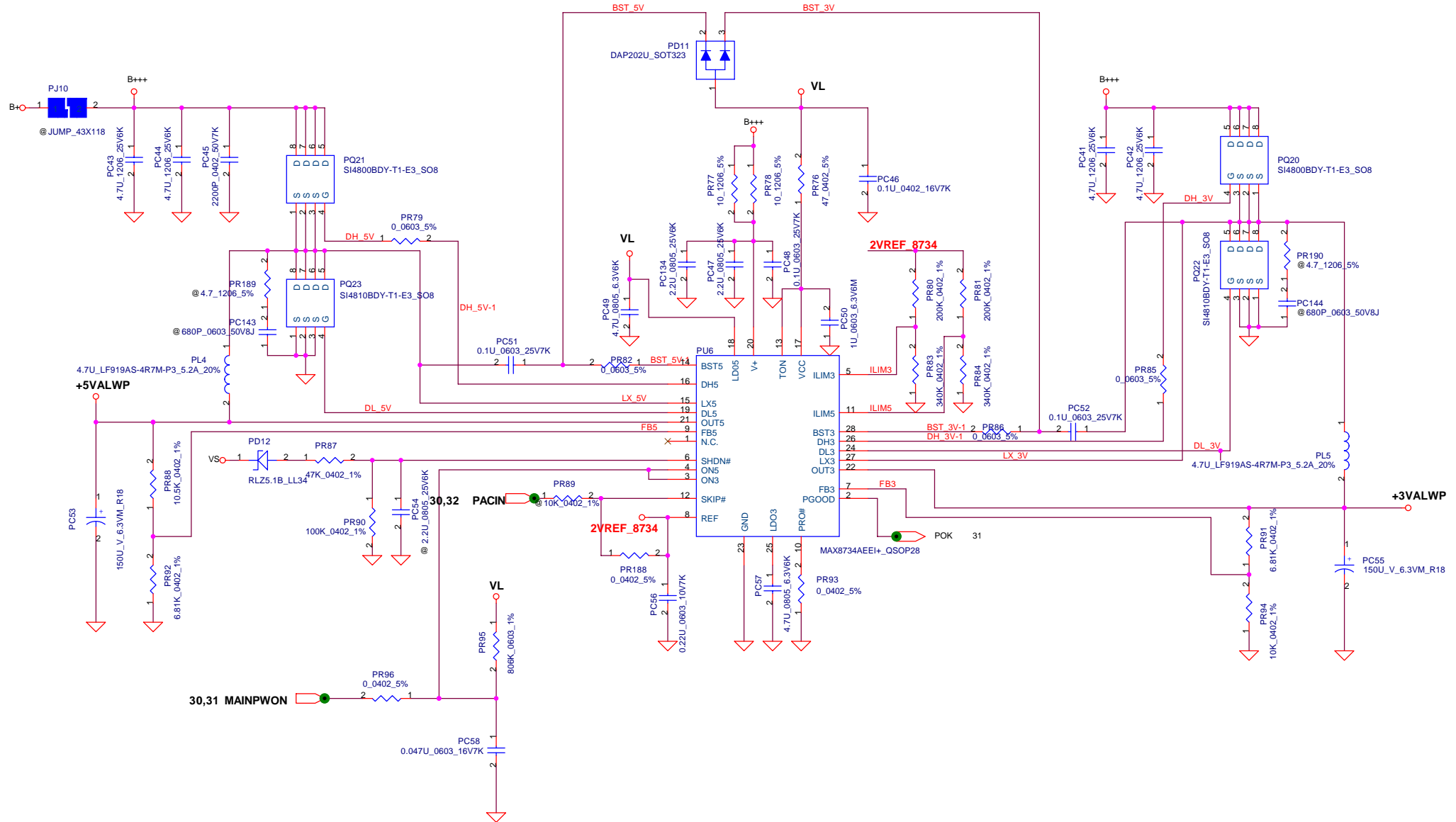
PH2 near main Battery CONN :

BAT. thermal protection at 79 degree C

Recovery at 45 degree C



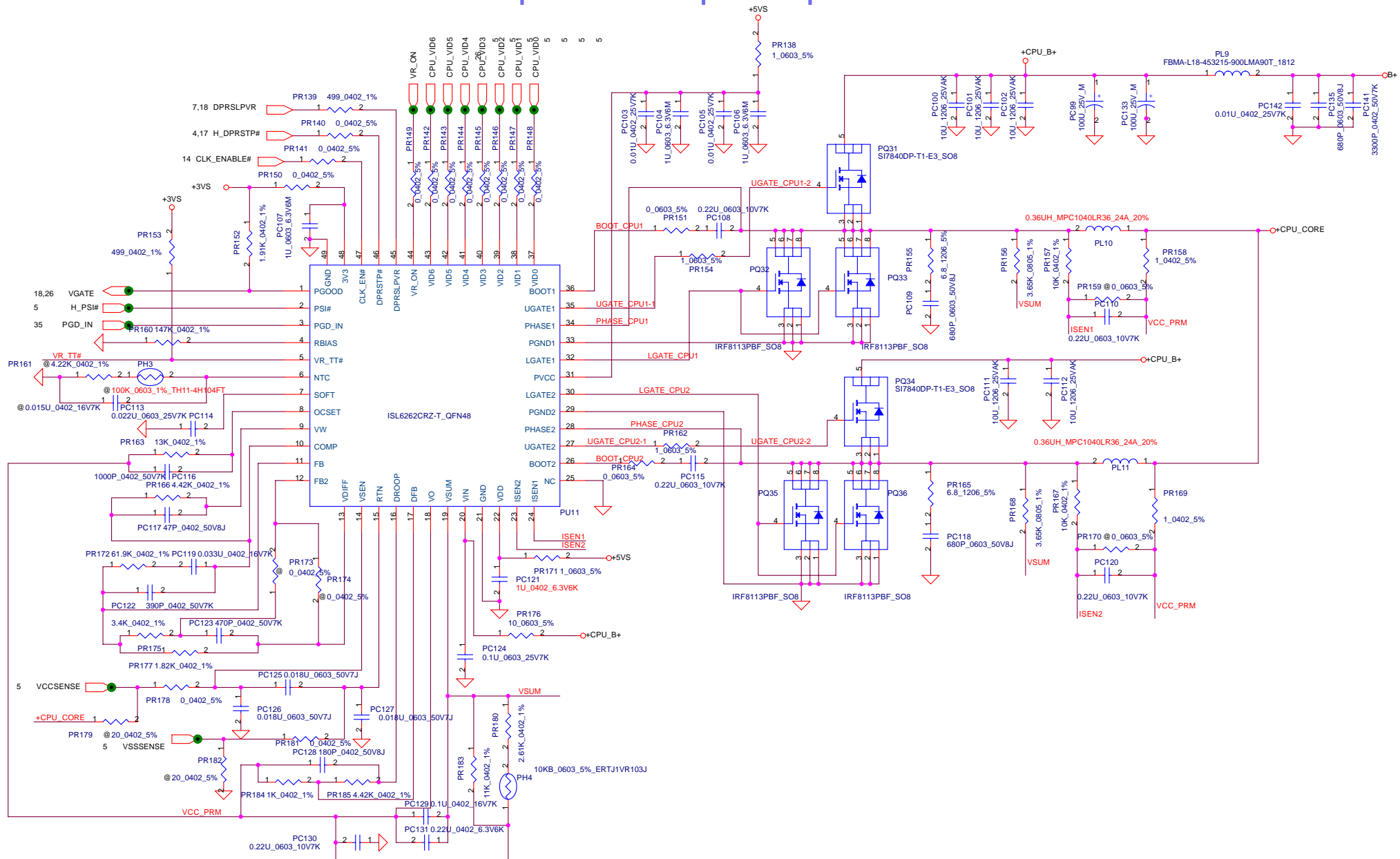




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Size		Document Number		Rev	
Custom		IAKAA M/BLA-3401P		0.0	
Date:		Tuesday, December 26, 2006		Sheet 33 of 38	







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Size	Custom	Document Number		Rev	
				0.0	
Date:	Tuesday, December 26, 2006	Sheet	36	of 38	



POWER PIR LIST

pageReason for changeModify list

http://laptopblue.vn

DVT

35	Change +1.05V PWM IC	Change PU8 to ISL6269A(SA00000GU80), add PR122 (0ohm, SD013000080)
36	For EMI team request to add snubber and gate resistor	Add snuber PR155,PR165(6.8ohm_SD011680B80), PC109,PC118(680p_SE024681J80) and gate resistor PR154,PR162(1ohm_SD013100B80)
	Modify the CUP CORE load line and compensation	Change PC103 to 0.022u(SE076223K80), PC104 to 2.2u(SE107225K80), PR185 to 4.42K(SD000004J80), PC129 to 0.1u(SE076104K80, add PC126 (0.018U_SE025183J80), delete PC105 and PC106

31	Modify the CPU OTP point from 84 degC to 87 degC for thermal team request	Change PR36 from 22K to 20K(SD034200280)
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PVT

32,34,35,36	For EMI team request to add bead to reduce board band	Add PL12,PL13,PL14(SM010020720);PC137,PC138,PC139(330p_SE074331K80);PC140(680p_SE074681K80);PC141(3300p_SE074332K80)
33	Reduce the power consumption on S3/S4	Add PR188(0_0402_5%) and unpop PR89
36	Solve the high frequency noise.	Change PC99 from 100U to 220U(SF22004M210)

Pre-MP

36	For EMI solution	Add PC142 (0.01u_0402)
36	PC99 was interfere with logic low so change to small size	Change PC99 from 220U to 100U and add PC143,PC144(68U_25V).

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LAN



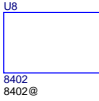
TRANSFORMER



PCB



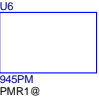
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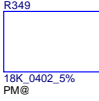
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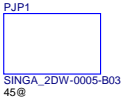
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