

Compal confidential

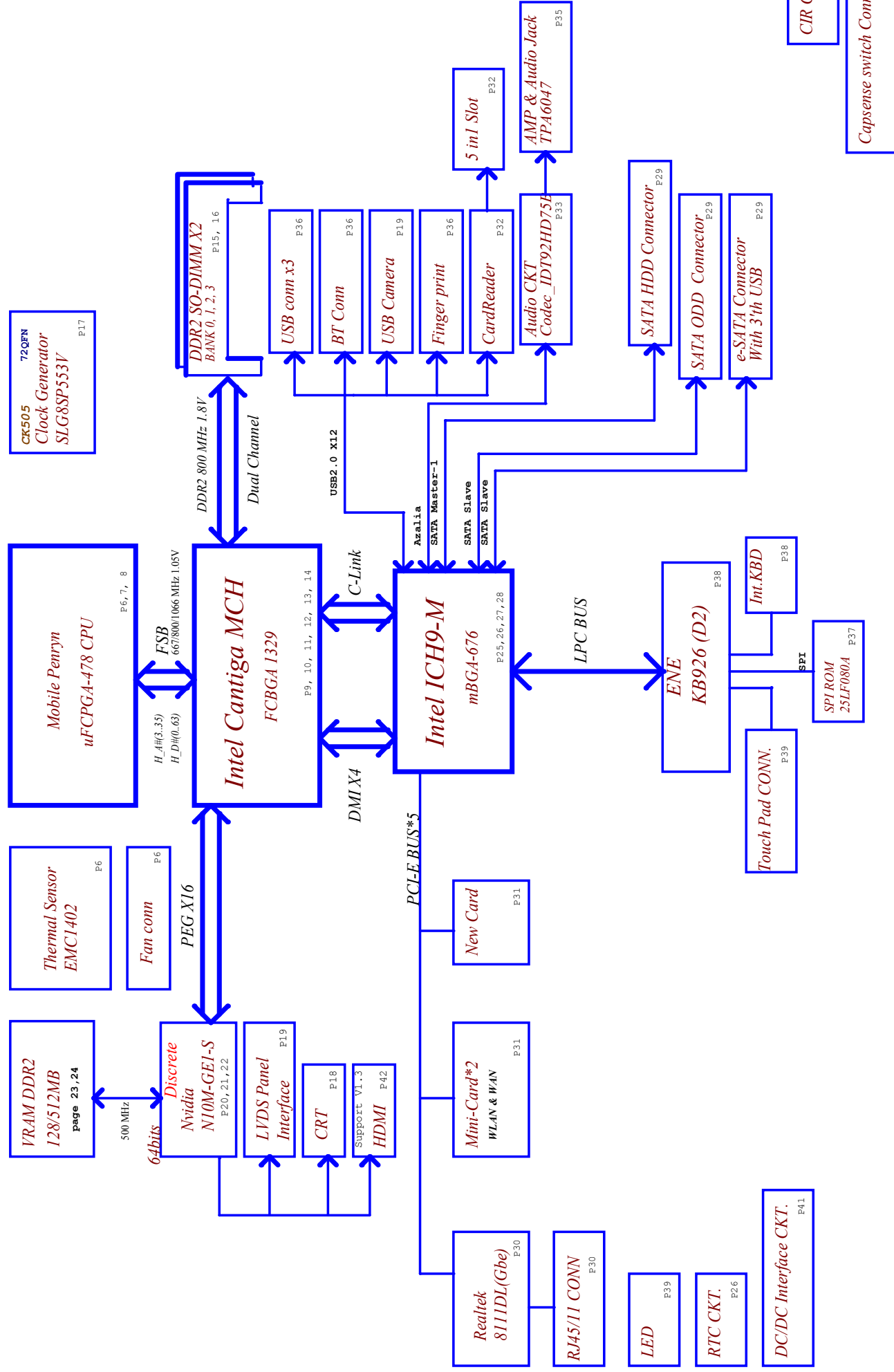
Schematics Document

Mobile Penryn uFCPGA with Intel
Cantiga_PM+ICH9-M core logic

2009-02-13

REV : 1.0

Security Classification		Compal Secret Data		Title	
Issued Date		Deciphered Date		2008/12/10	
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Size		Document Number		Cover Sheet	
Custom		L4-4731P R144 discrete		Rev	
0.1		0.1		Sheet	
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Voltage Rails

X MEANS ON

O MEANS OFF

power plane State	+B	+5VALW +3VALW	+1.8V	+5VS +3VS +1.5VS +0.9V +VCCP +CPU_CORE +2.5VS +1.8VS +NVVDD +PCIE
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

BOM

NB	SA00002JJ80	R1	FRU
NB	SA00002JJ80	R3	
SB	SA00002JH50	R1	FRU
SB	SA00002JHB0	R3	

Symbol Note :



USB assignment:

- USB-0 Right side(with ESATA)
- USB-1 Left side
- USB-2 Left side
- USB-3 Dock
- USB-4 Camera
- USB-5 WLAN
- USB-6 Bluetooth
- USB-7 Finger Printer
- USB-8 MiniCard(WWAN/TV)
- USB-9 Express card
- USB-10 X
- USB-11 X

PCIe assignment:

- PCIe-1 TV tuner/WWAN/Robeson
- PCIe-2 X
- PCIe-3 WLAN
- PCIe-4 GLAN (Marvell)
- PCIe-6 New Card

SMBUS Control Table

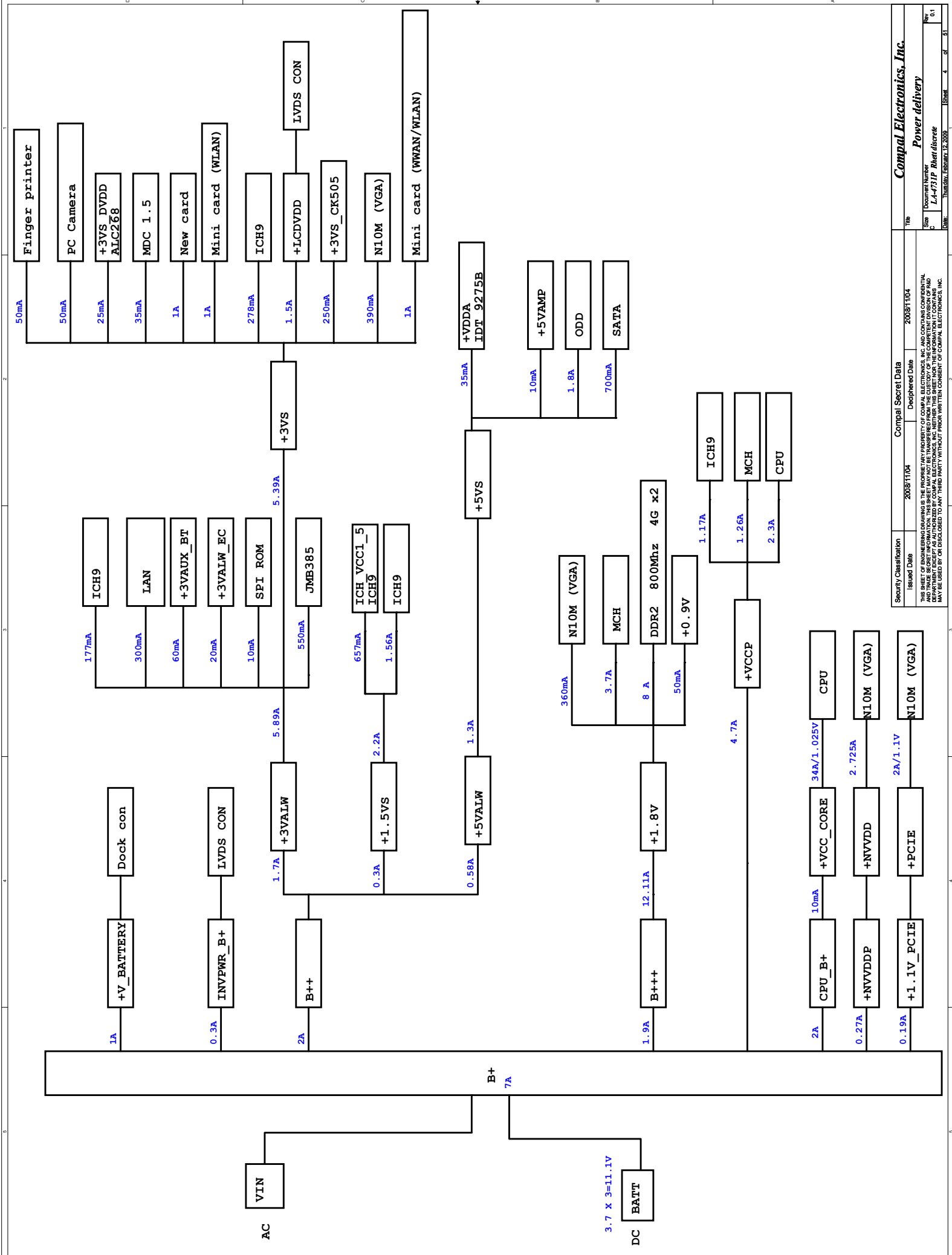
	SOURCE	INVERTER	BATT	SERIAL EEPROM	Thermal Sensor	SODIMM	CLK CHIP	MINI CARD	Sensor board	N10M Thermal Sensor	N10M	G-sensor
SMB_EC_CK1	KB926	X	V	V	X	X	X	X	V	X	X	X
SMB_EC_DA1												
SMB_EC_CK2	KB926	X	X	X	V	X	X	X	X	V	V	X
SMB_EC_DA2												
ICH_SMBCLK	ICH9	X	X	X	X	V	V	V	X	X	X	V
ICH_SMBDATA												

NB9M SMBUS Control Table

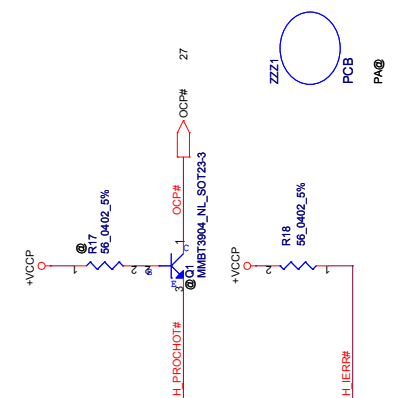
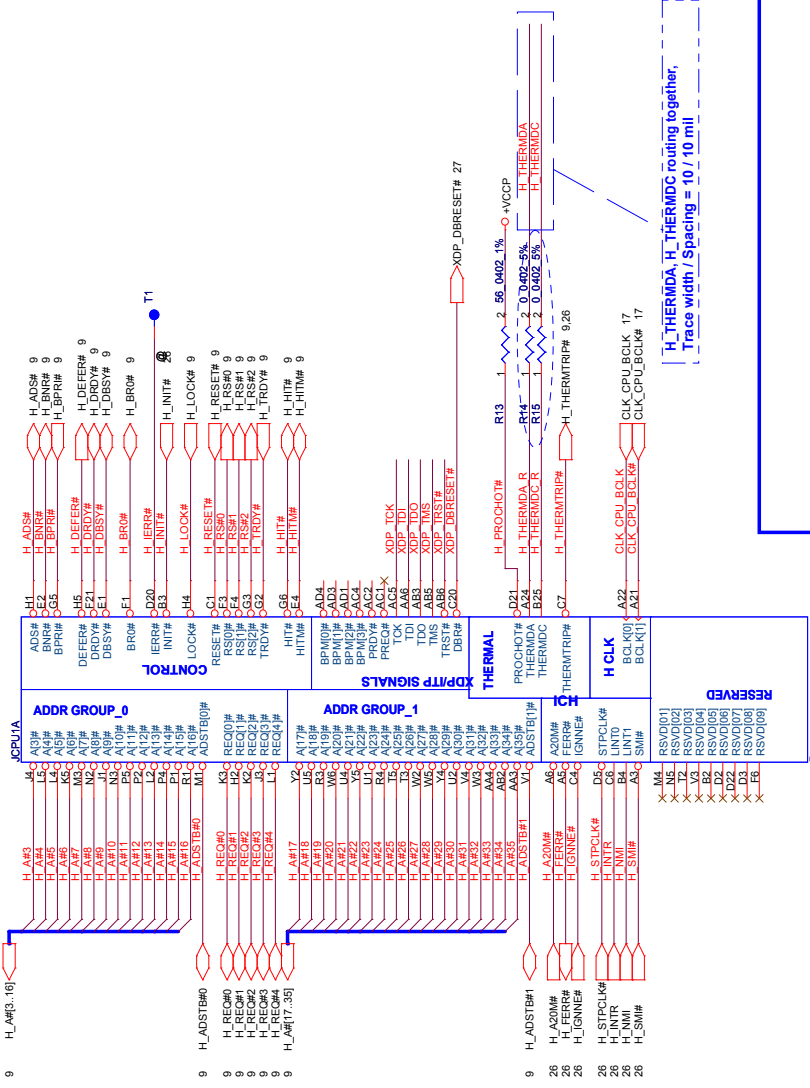
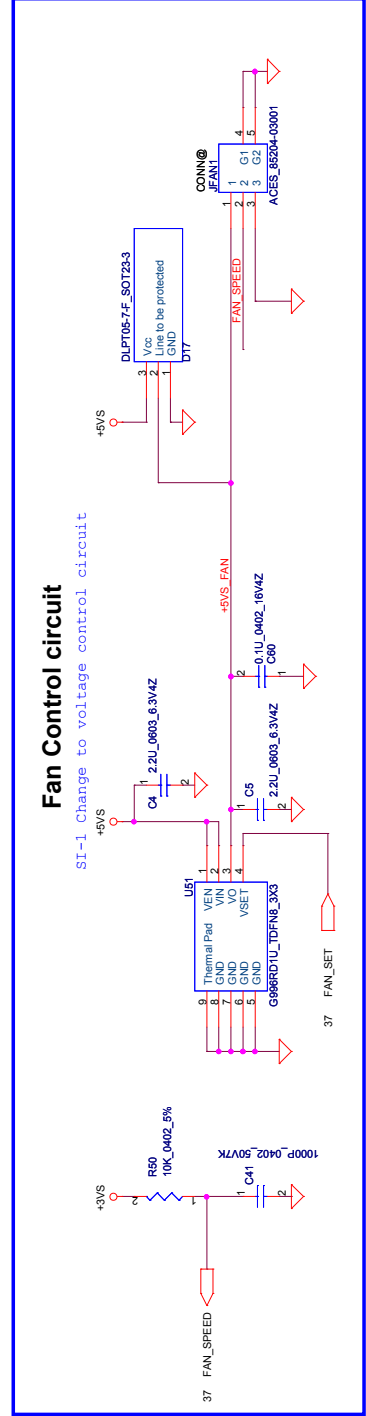
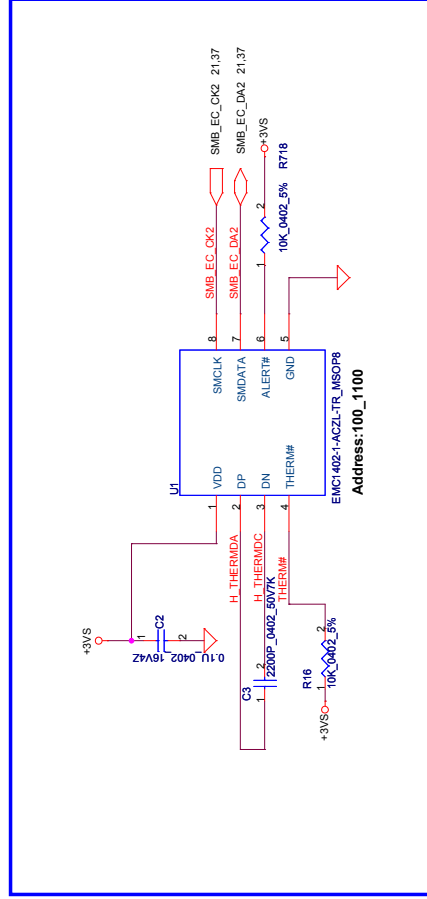
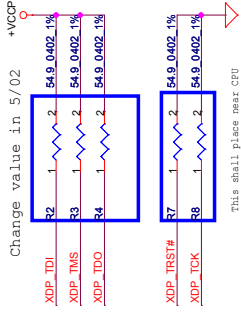
	SOURCE	LVDS	CRT	HDMI	HDCP
DDC2_DATA	N10M	V	X	X	X
DDC2_CLK	N10M	X	V	X	X
3VDDGDA	N10M	X	X	X	X
3VDDCCL	N10M	X	X	V	X
HDMI2AT_VGA	N10M	X	X	X	X
HDMICLK_VGA	N10M	X	X	X	X
HDCP_SDA	N10M	X	X	X	V
HDCP_SCL	N10M	X	X	X	V

I2C / SMBUS ADDRESSING

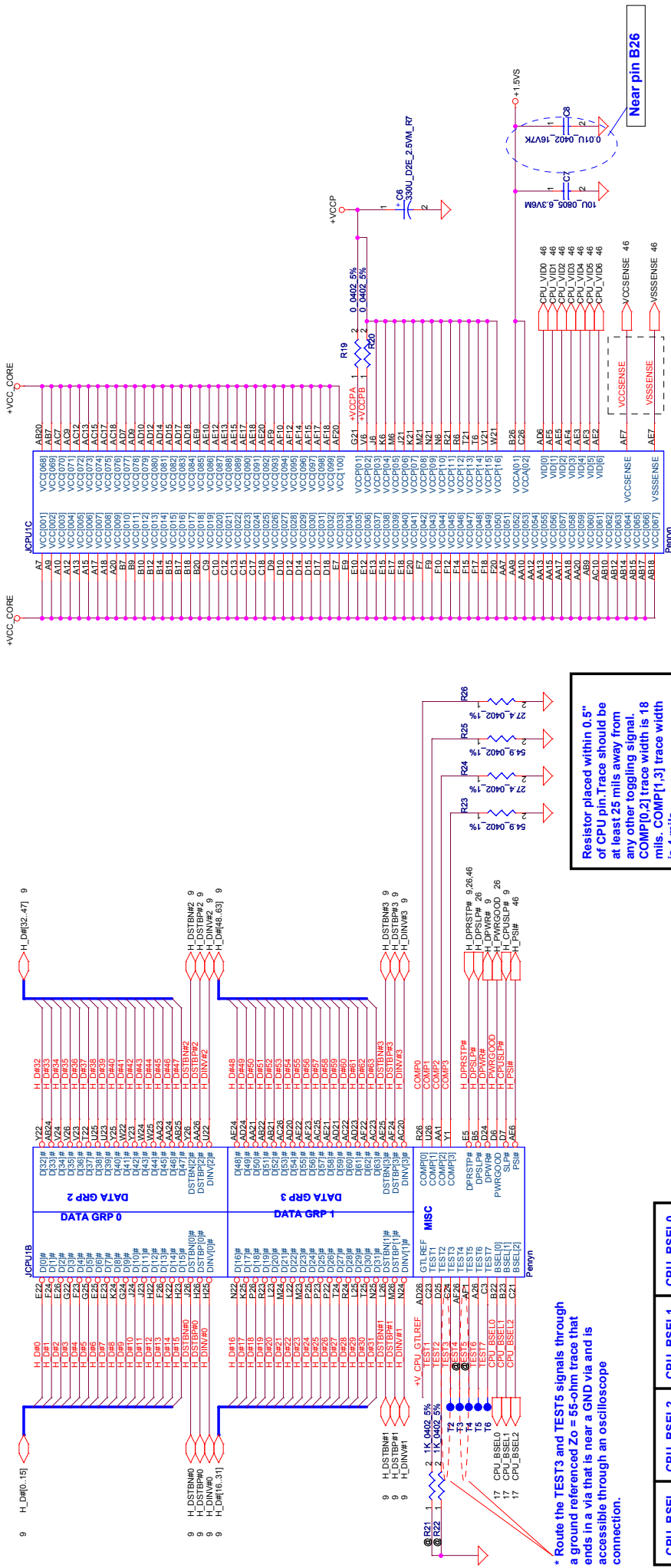
DEVICE	HEX	ADDRESS
DDR SO-DIMM 0	A0	1 0 1 0 0 0 0 0
DDR SO-DIMM 1	A4	1 0 1 0 0 1 0 0
CLOCK GENERATOR (EXT.)	D2	1 1 0 1 0 0 1 0



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								L4-4731P	Whet discrete	0.1
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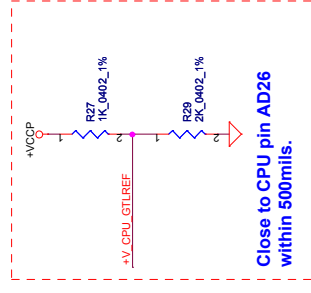
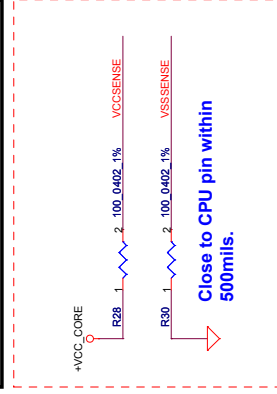


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Size	Document Number	Rev	0.1
Custom	LA-471P R1att discrete		
Date	Model	Version	16_2009
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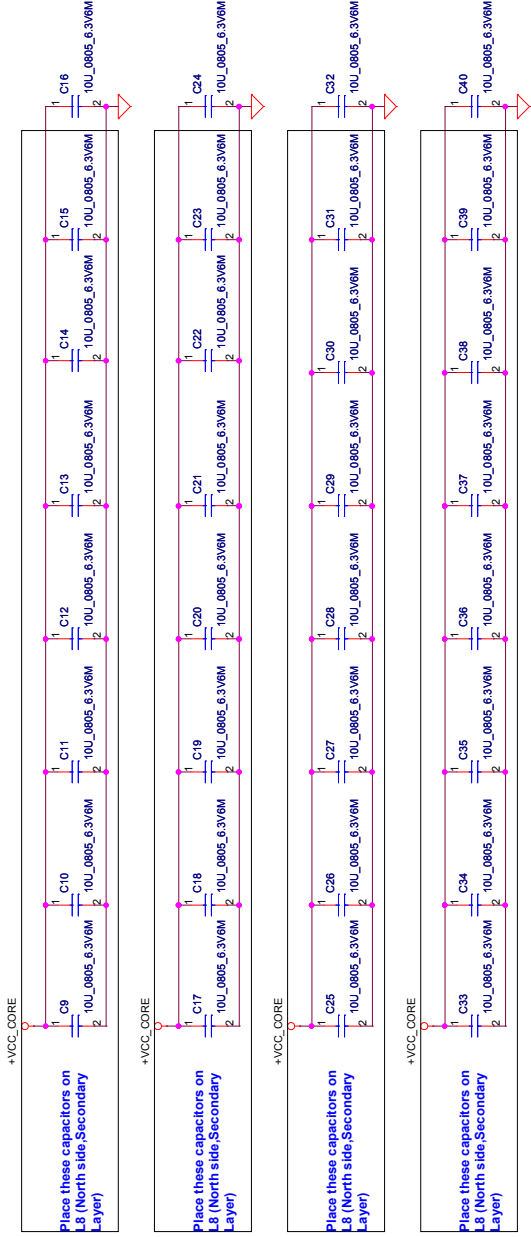


CPU_BSEL	CPU_BSEL2	CPU_BSEL1	CPU_BSEL0
166	0	1	1
200	0	1	0
266	0	0	0

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

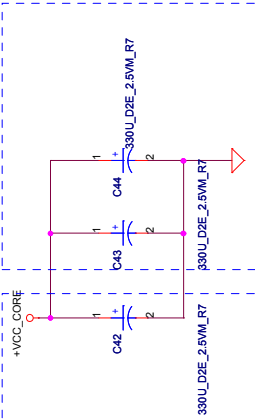


Resistor placed within 0.5" of CPU pin. Trace should be at least 25 mils away from any other toggling signal. COMP[0.2] trace width is 18 mils. COMP[1.3] trace width is 4 mils.

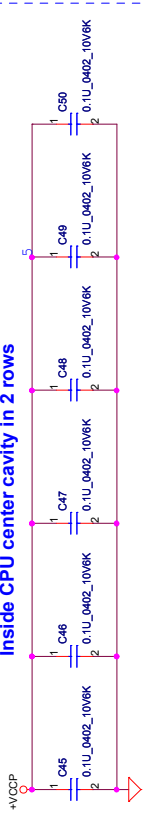


Mid Frequency Decoupling

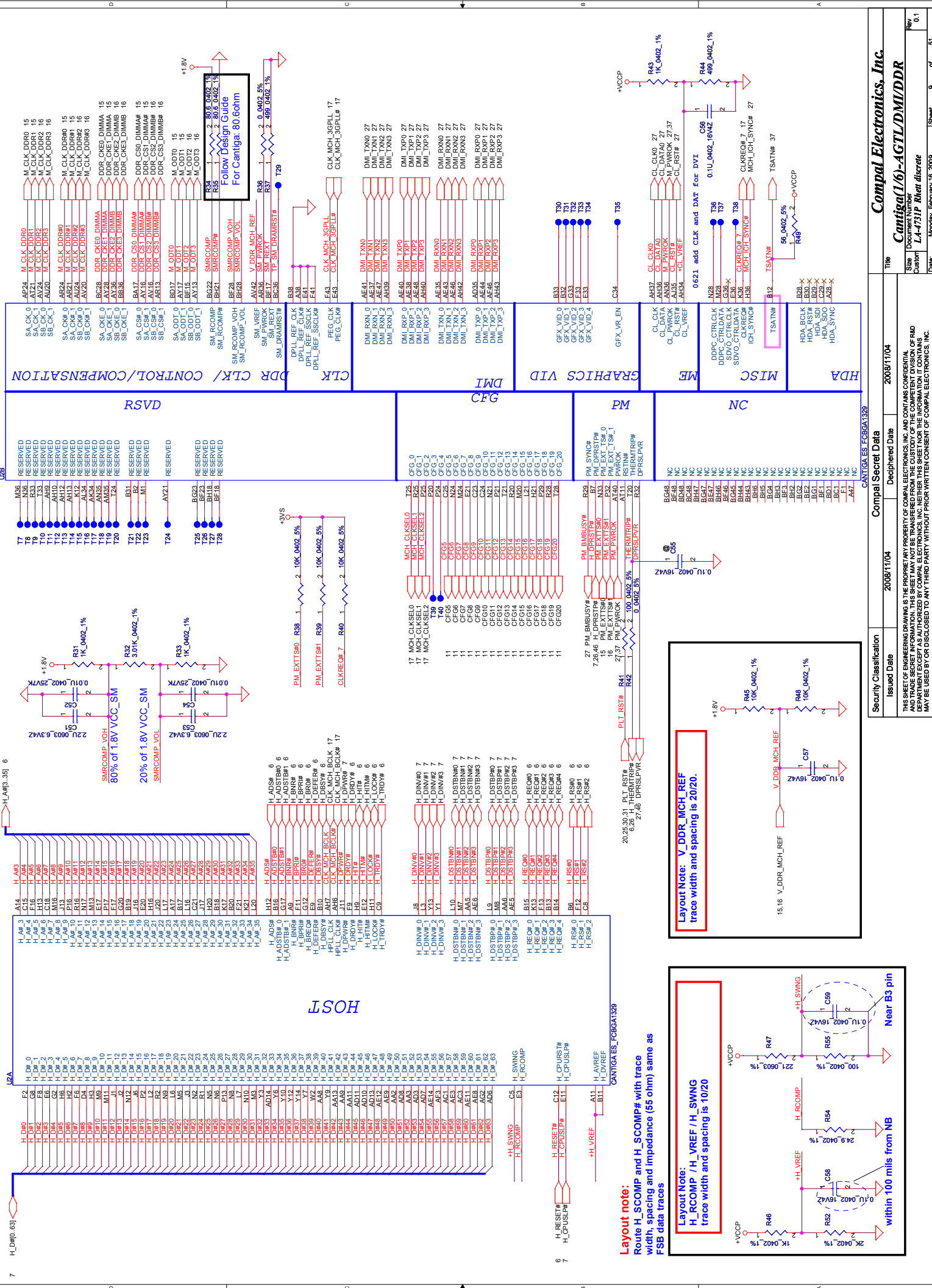
ESR <= 1.5m ohm
Capacitor > 1980uF



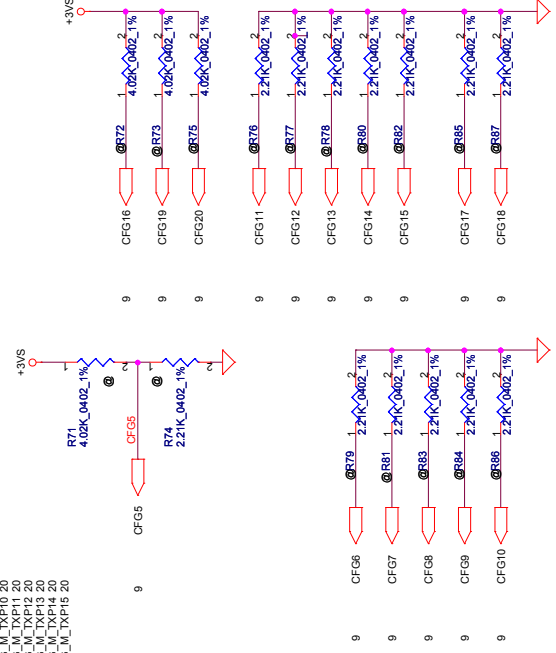
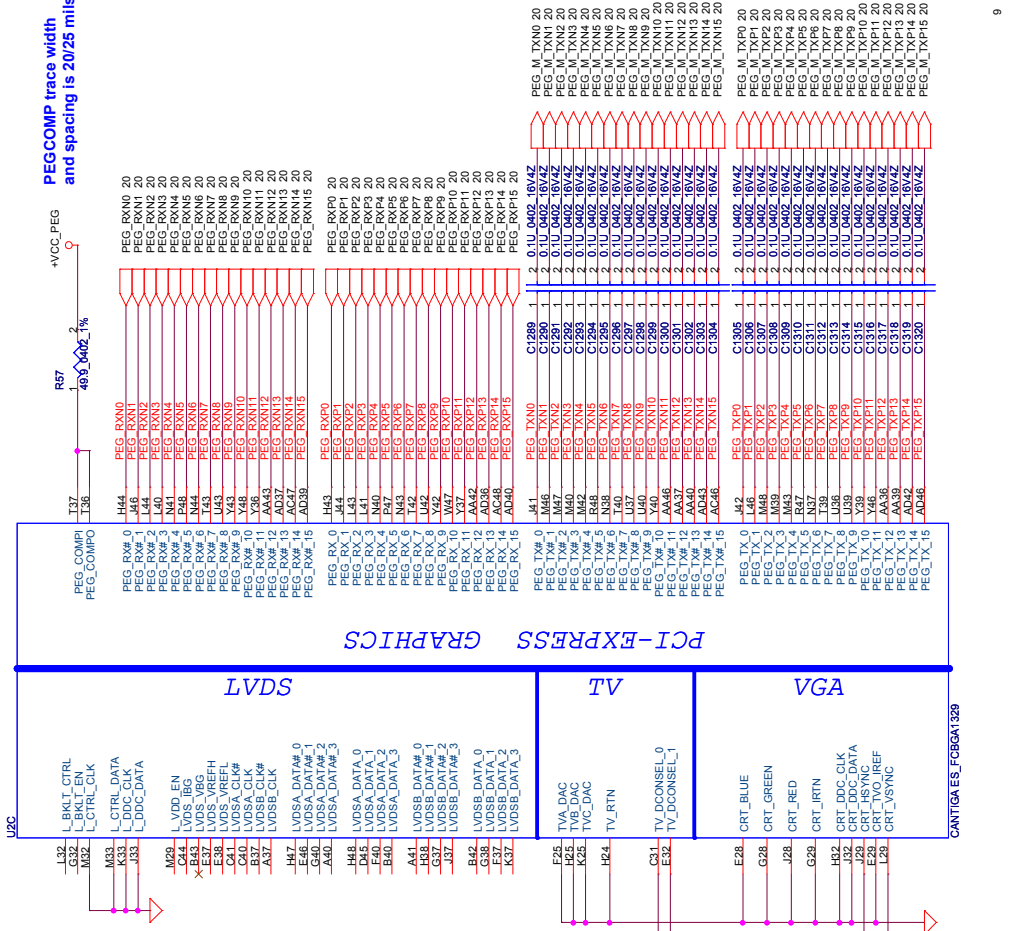
Inside CPU center cavity in 2 rows



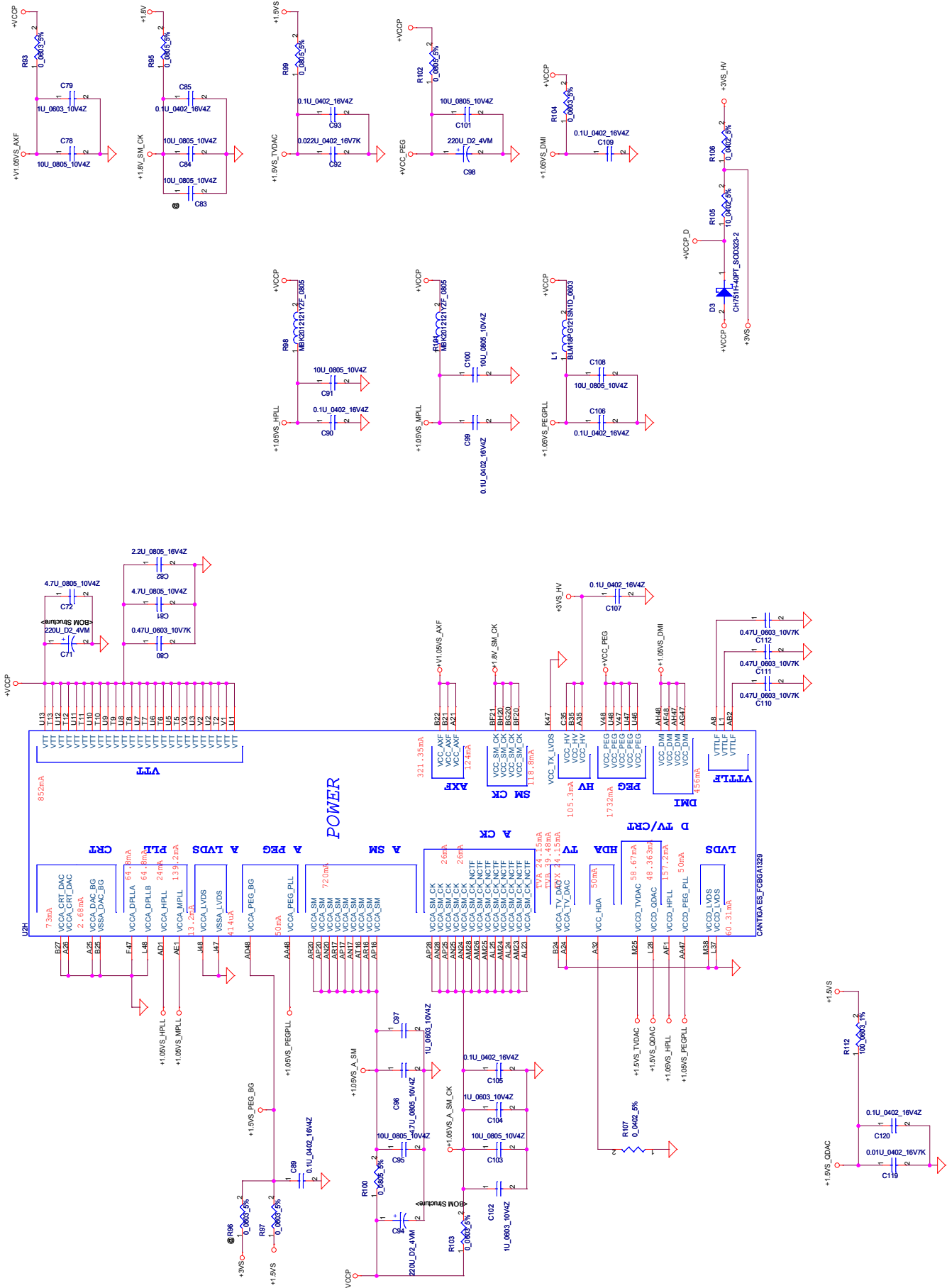
Security Classification			Compal Secret Data			Title		
Issued Date	2008/11/04	Deciphered Date	2008/11/04	Penryn(3/3)-AGTL+ITP-XDP			Size	Rev
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Doc#	THURSDAY, FEBRUARY 12, 2009	1	Sheet	8	of	51		



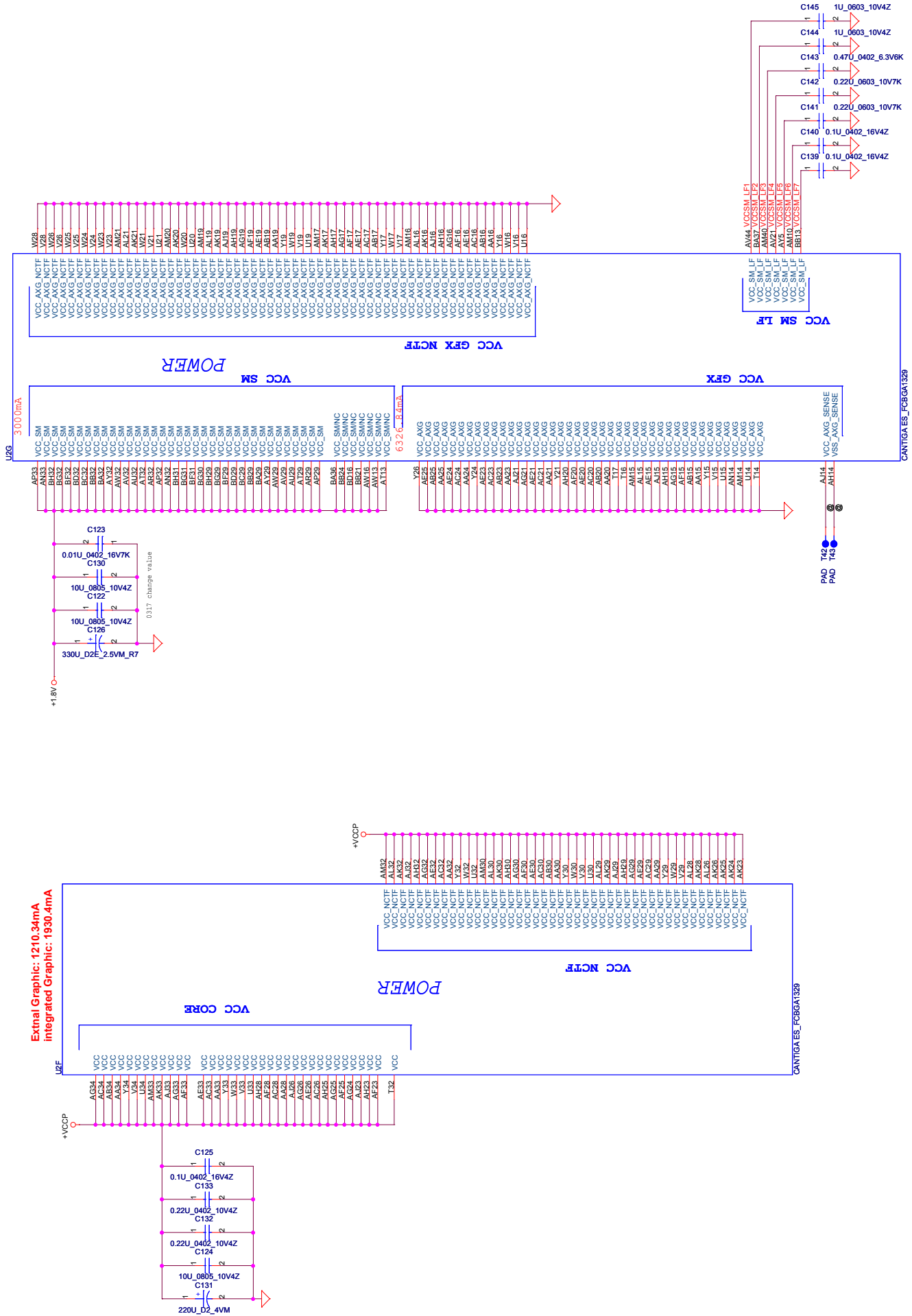
CFG[2:0] FSB Freq select	000 = FSB 1066MHz 010 = FSB 800MHz 011 = FSB 667MHz Others = Reserved
CFG[4:3]	Reserved
CFG5 (DMI select)	0 = DMI x 2 1 = DMI x 4 *
CFG6	0 = The ITPM Host Interface is enable 1 = The ITPM Host Interface is disable *
CFG7 (Intel Management Engine Crypto strap)	0 = (T)LSchipper suite with no confidentiality 1 = (T)LSchipper suite with confidentiality *
CFG8	Reserved
CFG9 (PCIe Graphics Lane Reversal)	0 = Reverse Lane, 15->0, 14->1 1 = Normal Operation, Lane Number in order *
CFG10 (PCIe Lookback enable)	0 = Enable 1 = Disable *
CFG11	Reserved
CFG[13:12] (XOR/ALLZ)	00 = Reserved 01 = XOR Mode Enabled 10 = XOR Mode Disabled 11 = Normal Operation (Default) *
CFG[15:14]	Reserved
CFG16 (FSB Dynamic ODT)	0 = Disabled 1 = Enabled *
CFG[18:17]	Reserved
CFG19 (DMI Lane Reversal)	0 = Normal Operation (Lane number in Order) * 1 = Reverse Lane
CFG20 (PCIe/SDVO concurrent)	0 = Only PCIe or SDVO is operational. * 1 = PCIe/SDVO are operating simultaneouly.



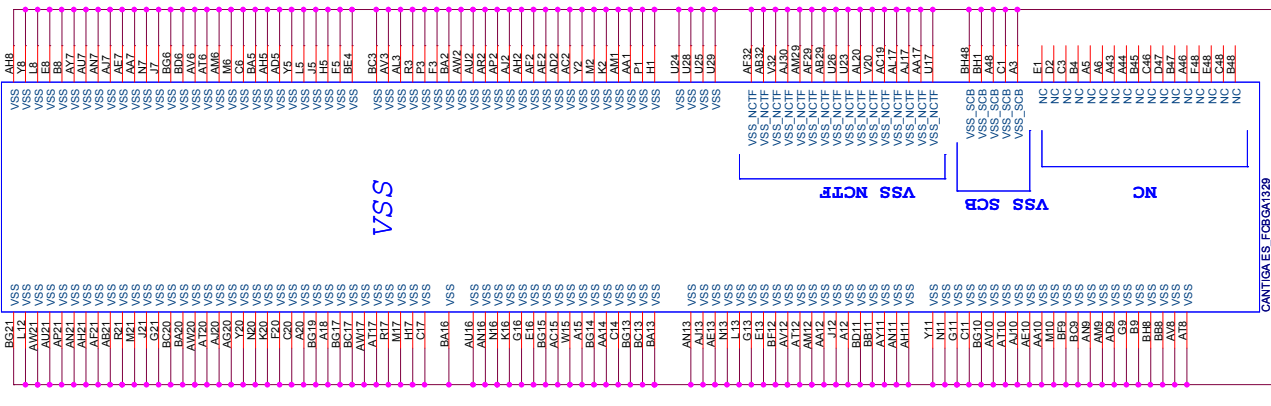
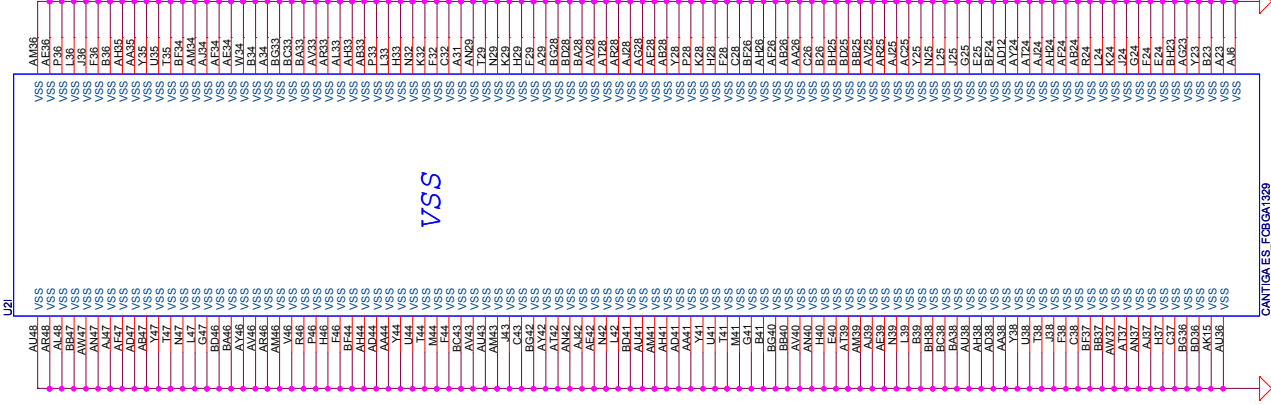
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Size		Document Number	Rev	
L4-4731P		L4-4731P	0.1	
Date		Part Name	Date	
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Cantiga(3/6)-VGA/LVDS/TV Compul Electronics, Inc.				



External Graphic: 1210.34mA
Integrated Graphic: 1930.4mA



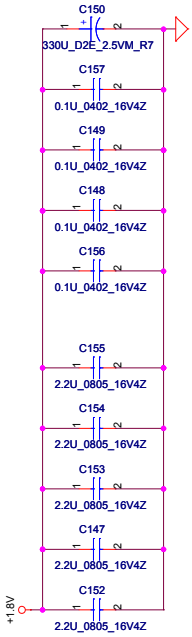
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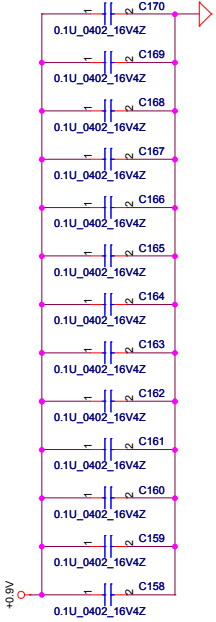
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Cantiga(6/6)-PWR/GND		Size	Document Number	Rev	
		Custom	L4-731P Riser discrete		0.1
		Date:	Monday, February 16, 2009	Sheet	14 of 51

- 10 DDR_A_DQS#(0..7)
- 10 DDR_A_DQ0..63
- 10 DDR_A_DM0(0..7)
- 10 DDR_A_DQS(0..7)
- 10 DDR_A_MA0(0..14)

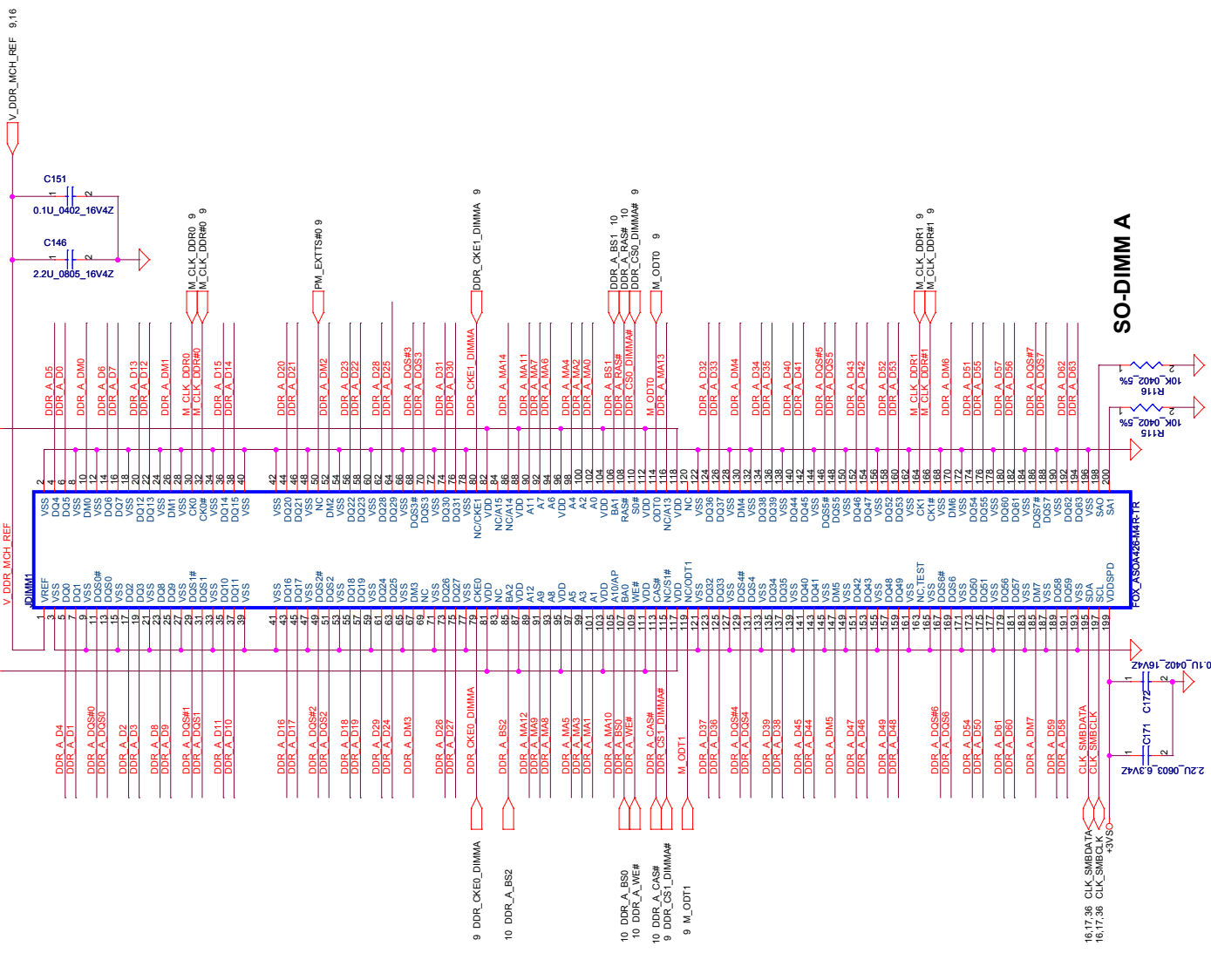
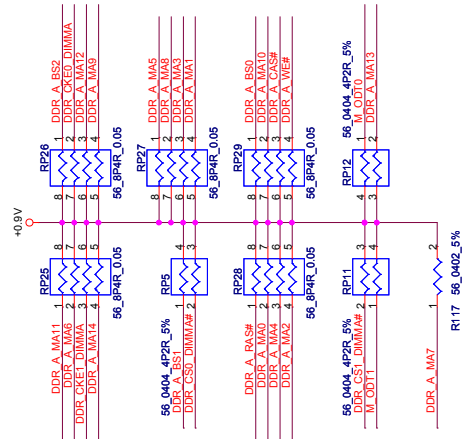
Layout Note:
Place near JP3



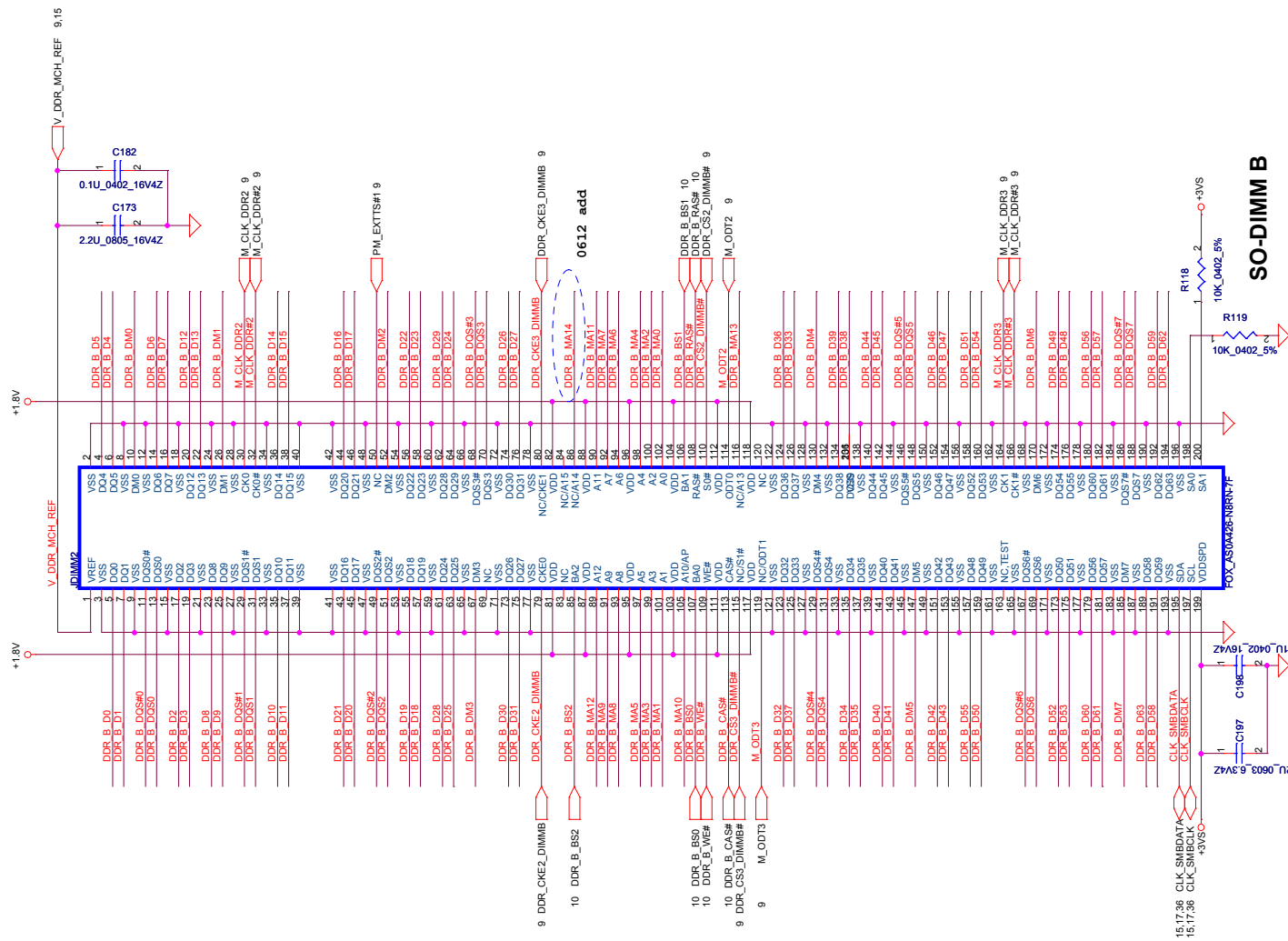
Layout Note:
Place one cap close to every 2 pulldown resistors terminated to +0.9VS



Layout Note:
Place these resistor closely JP3, all trace length Max=1.5"

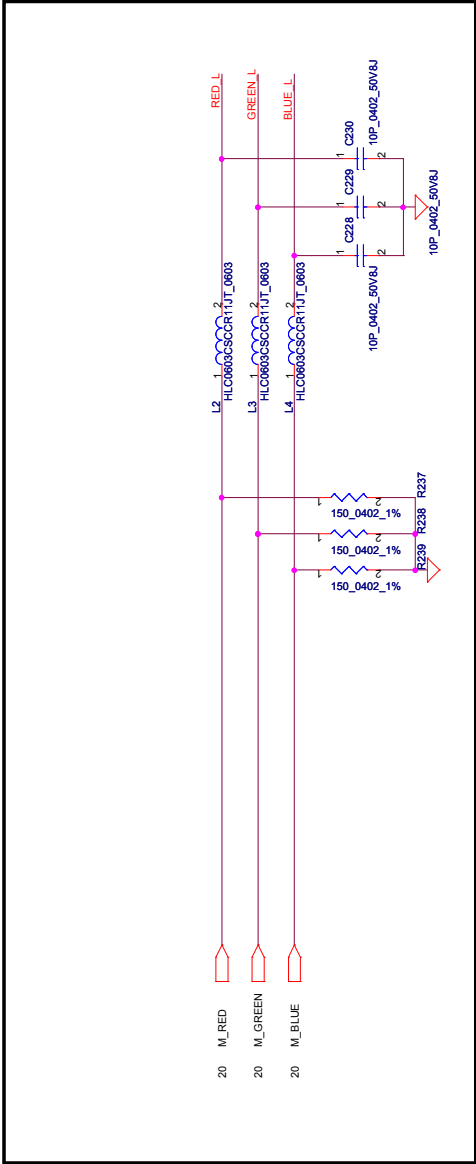
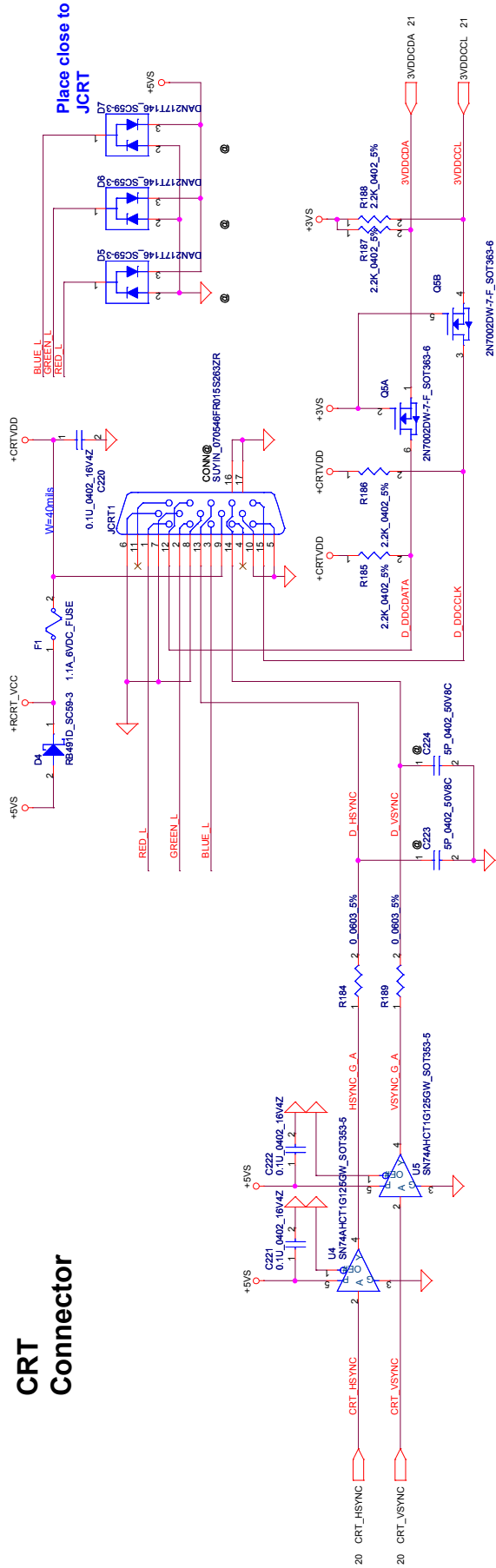


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Title		Size	Rev
Compal Electronics, Inc.		Document Number	0.1
DDR1-SODIMM SLOT1		Custom	L4-731P R14t discrete
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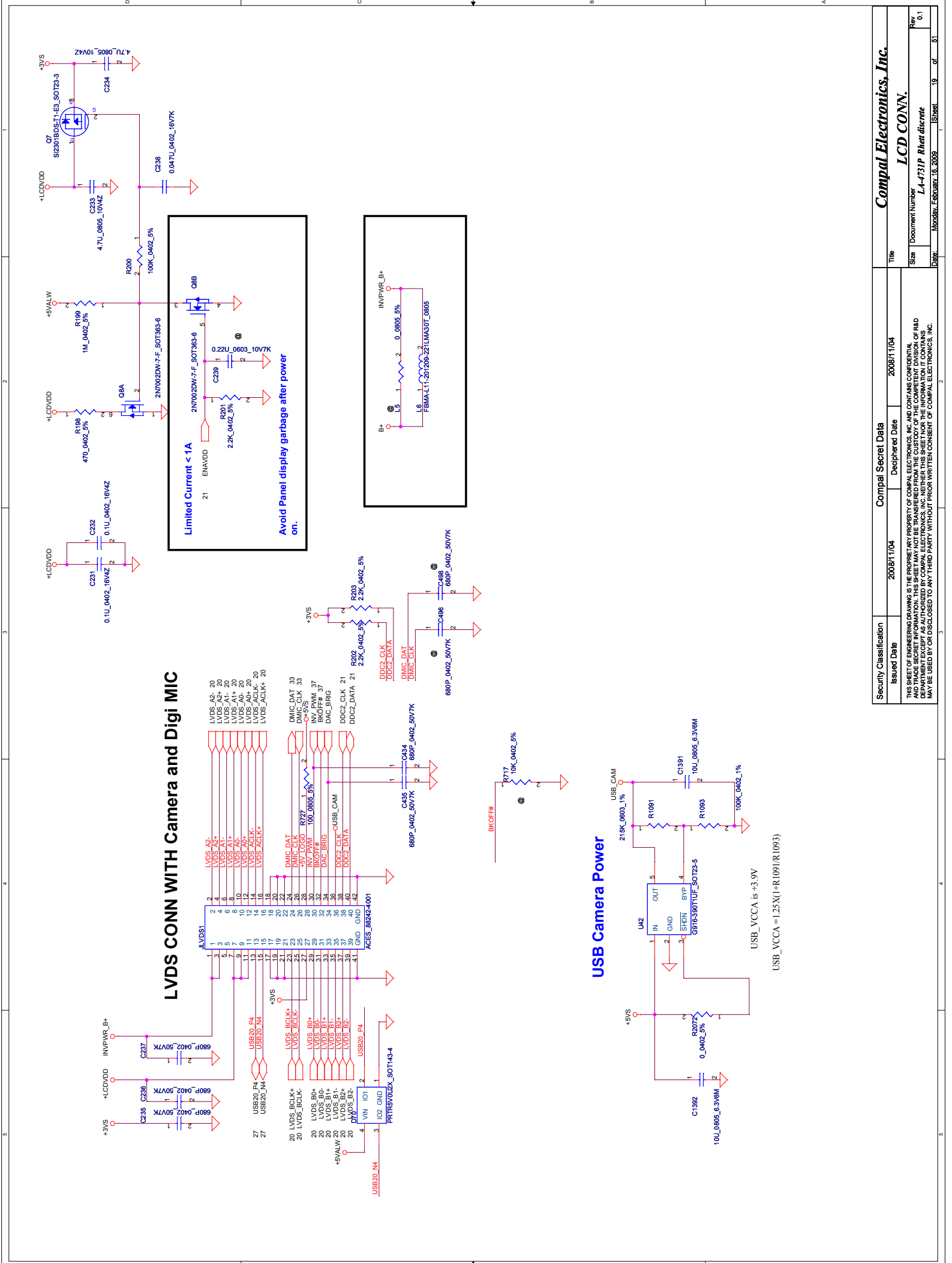
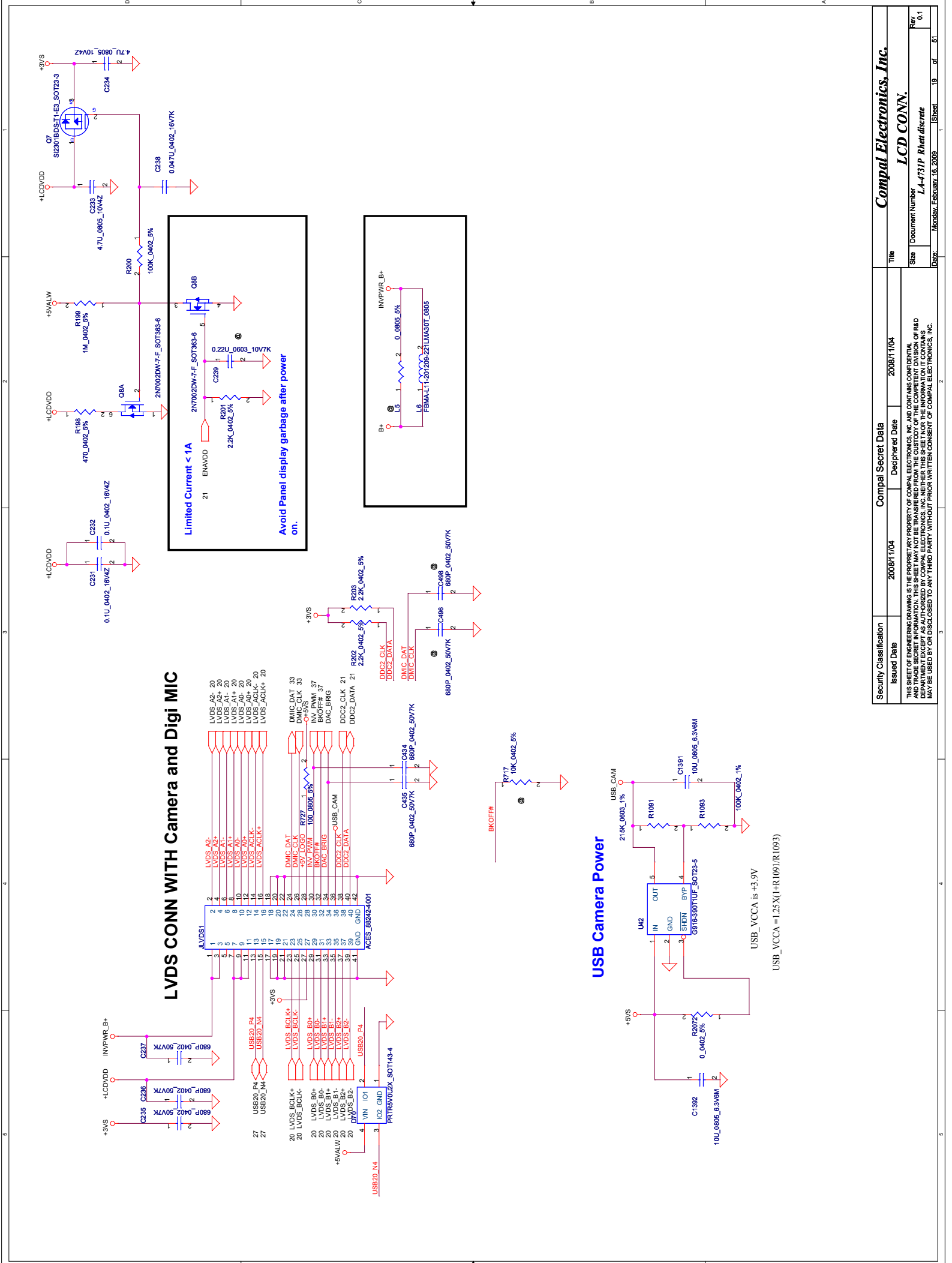
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Title		Compal Electronics, Inc. DDR1-SODIMM SLOT2 Document Number LA-4731P Rhet discrete						
Size	Rev 0-1							
Part No.	Model No. E82000-16 2000 Sheet 16 of 21							

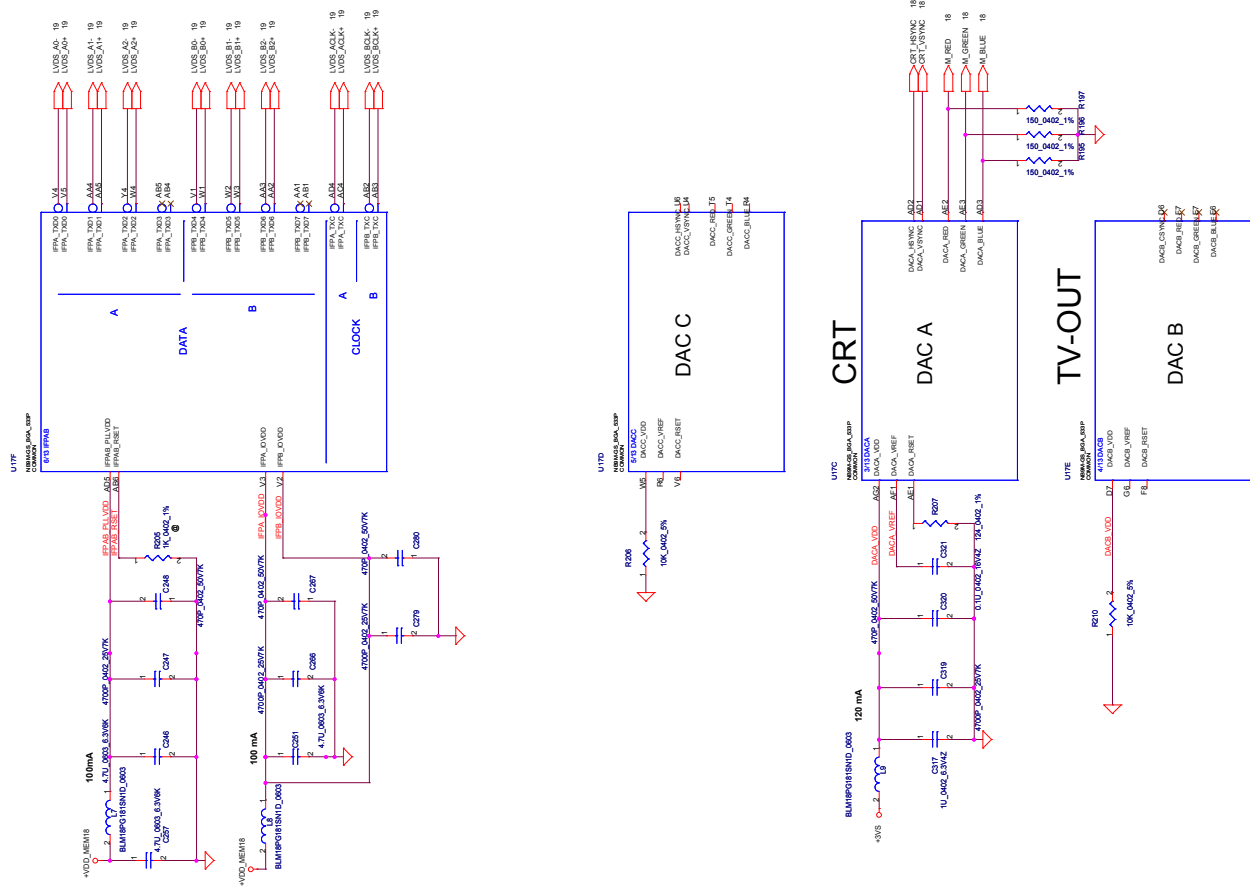
CRT Connector



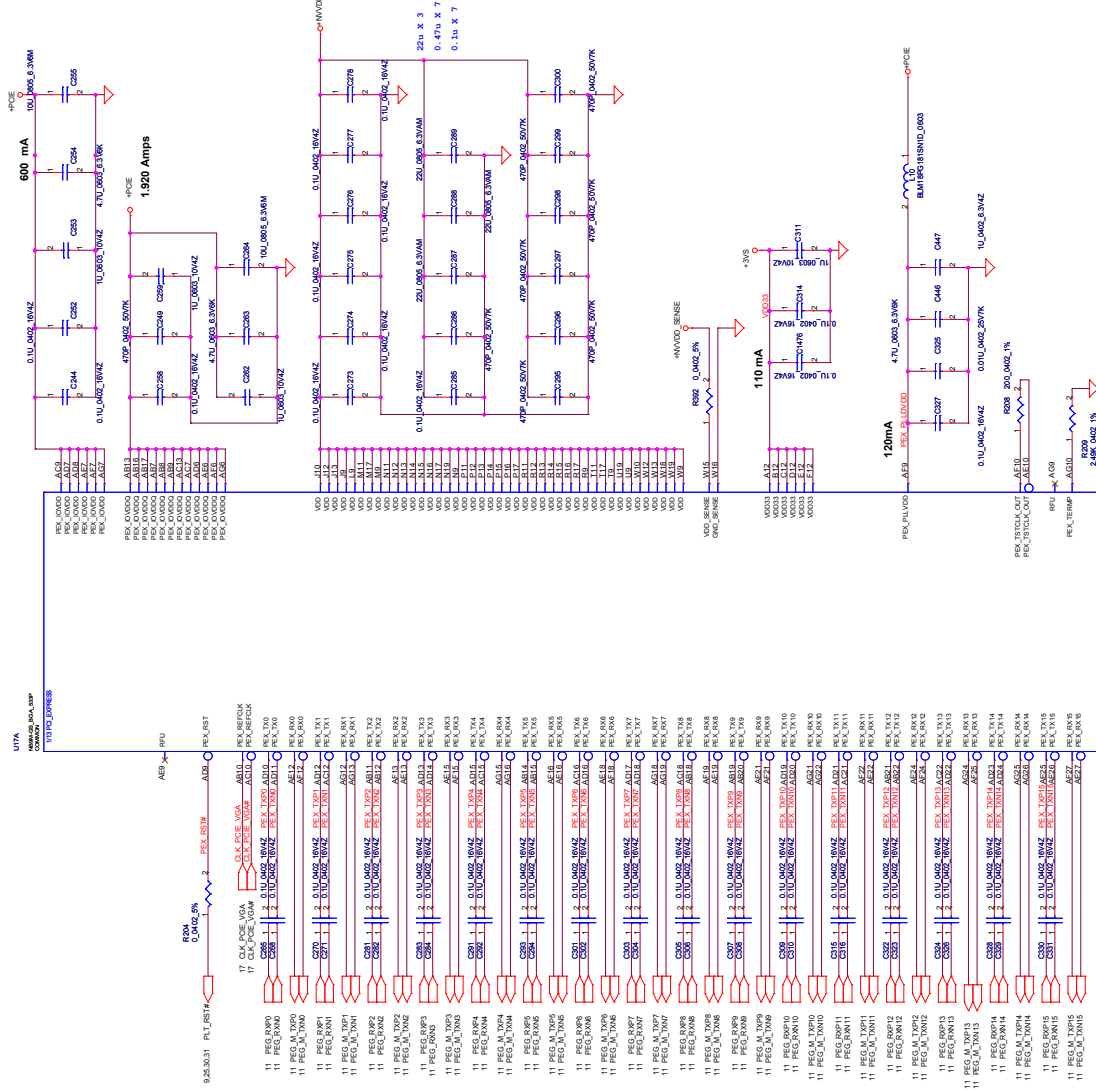
Compal Secret Data				Title	
Security Classification	2008/11/04	Deciphered Date	2008/11/04	CRT Connector	
Issued Date	2008/11/04	Deciphered Date	2008/11/04	Size	Document Number
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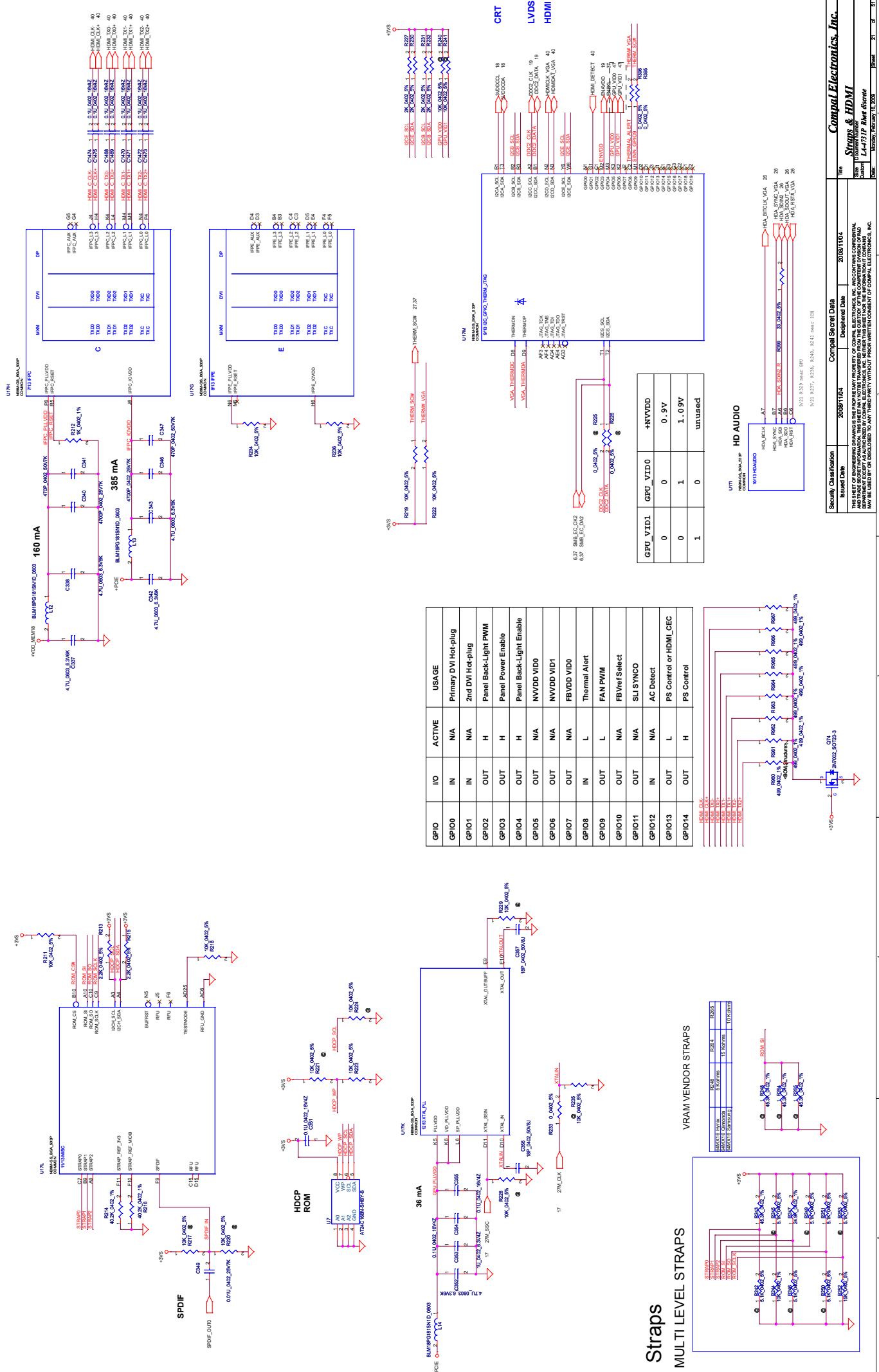
LVDS & DAC Interface



PEG Interface

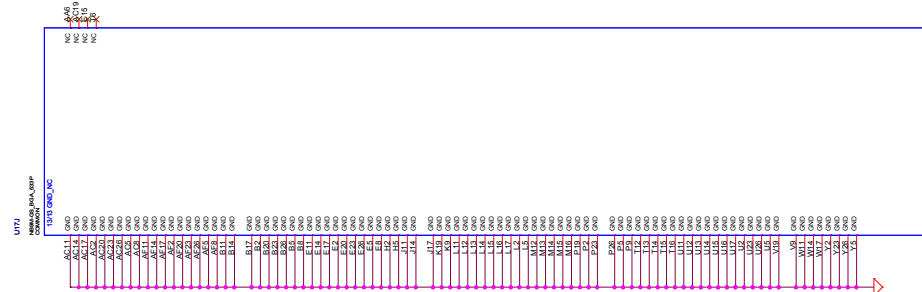
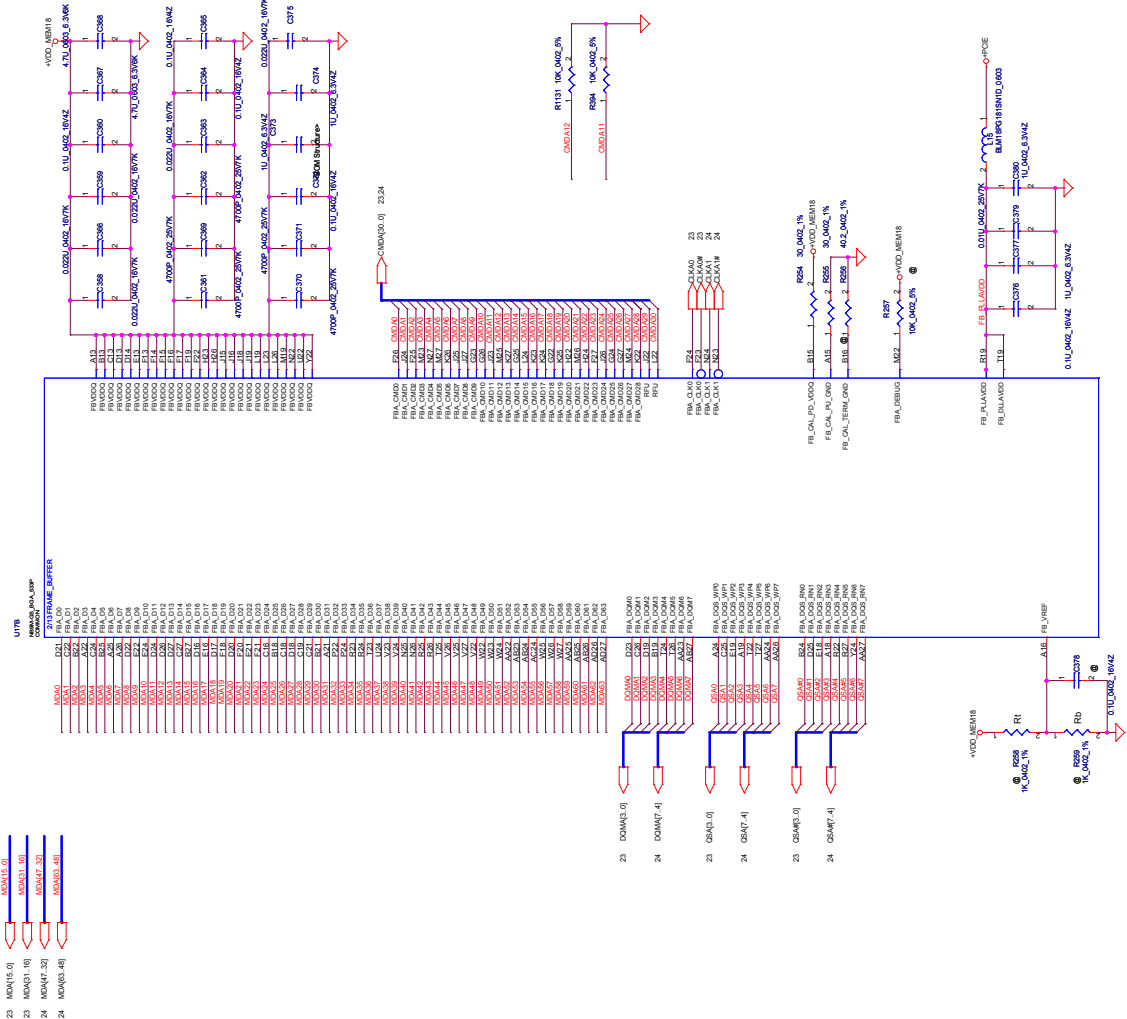
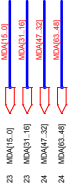


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PEG & LVDS & DAC				
Rev 1.0				
Date: 11/04/08				
By: 11/04/08				
Checked: 11/04/08				
Approved: 11/04/08				



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Straps & HDMI		L4-711P Rset Brevet	
Rev		0.1	
Date		2008/07/16/2008	

VRAM Interface

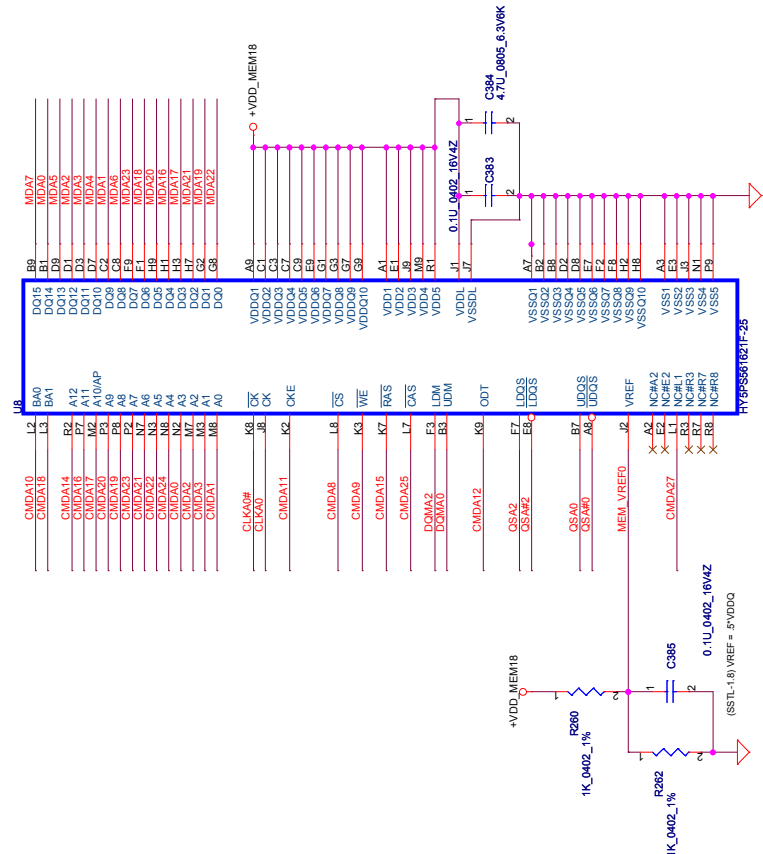
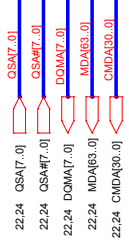


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Rev	1	Revision Number	1	Rev	1
Date	2008/11/04	Date	2008/11/04	Date	2008/11/04

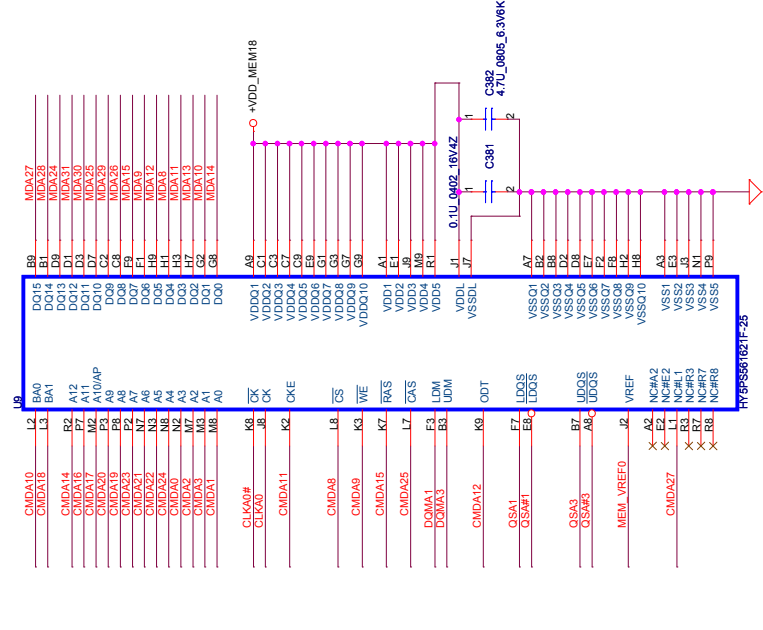
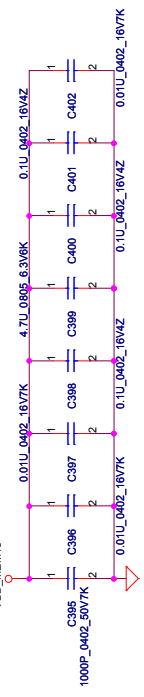
VRAM DDR2 chips (256MB & 512MB)

32Mx16 DDR2 400MHz *4==>256MB

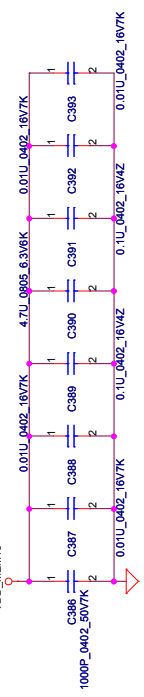
64Mx16 DDR2 400MHz*4==>512MB



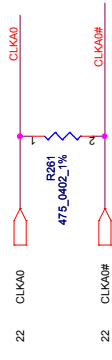
DDR2 BGA MEMORY



DDR2 BGA MEMORY



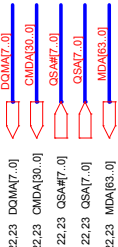
Address	0..31	32..63
CMD0	A3	
CMD1	A0	A0
CMD2	A2	
CMD3	A1	A1
CMD4		A3
CMD5		A4
CMD6		A5
CMD7		
CMD8	CS#	CS#
CMD9	WE#	WE#
CMD10	BA0	BA0
CMD11	CKE	CKE
CMD12	ODT	ODT
CMD13		
CMD14	A12	A12
CMD15	RAS#	RAS#
CMD16	A11	A11
CMD17	A10	A10
CMD18	BA1	BA1
CMD19	A8	A8
CMD20	A9	A9
CMD21	A6	A6
CMD22	A5	A5
CMD23	A7	A7
CMD24	A4	A4
CMD25	CAS#	CAS#
CMD26	A13	A13
CMD27	BA2	BA2
CMD28		
CMD29		
CMD30		



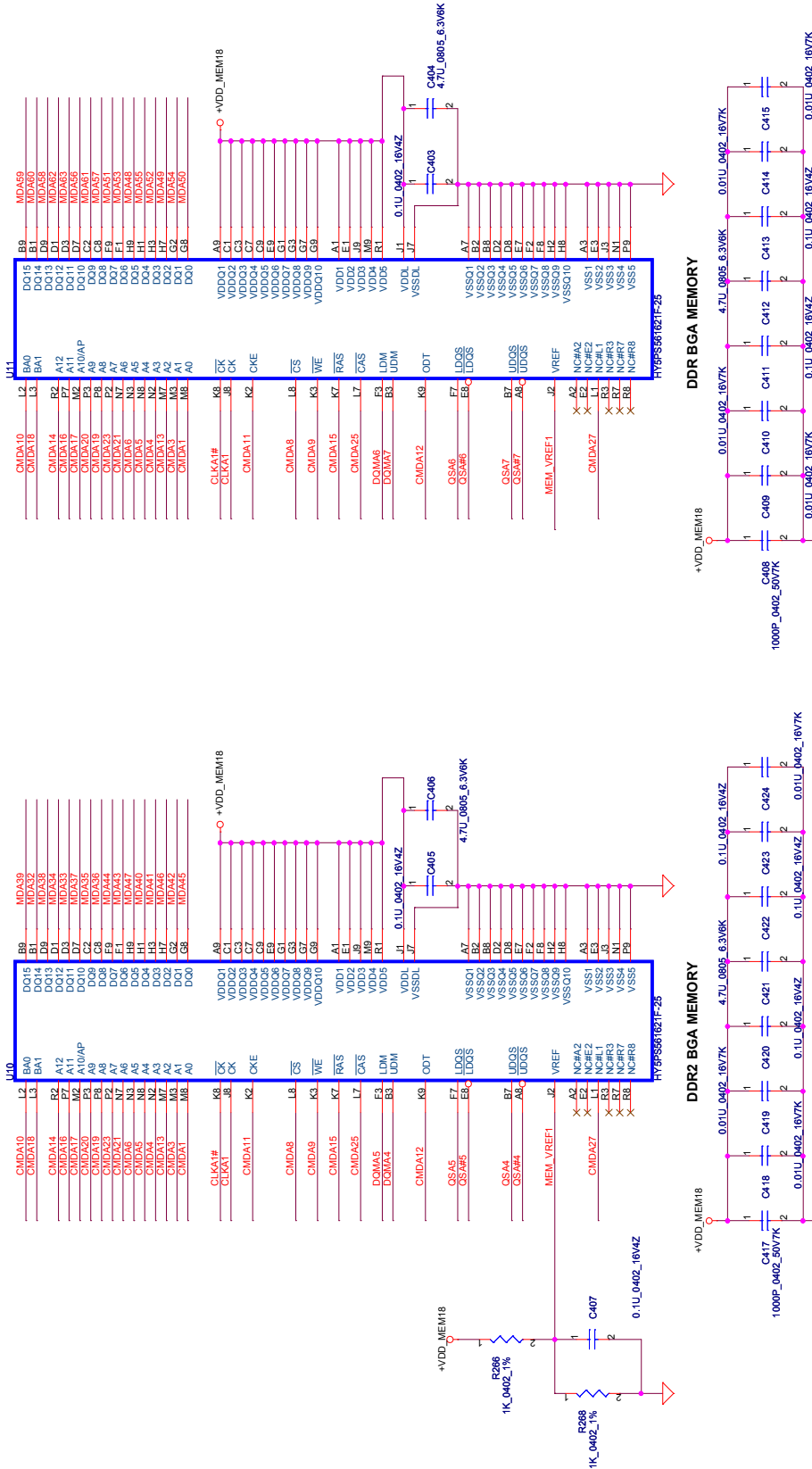
VRAM DDR2 chips (256MB & 512MB)

32Mx16 DDR2 400MHz *4==>256MB

64Mx16 DDR2 400MHz*4==>512MB



Address	DATA Bus
CMD0	A3
CMD1	A0
CMD2	A2
CMD3	A1
CMD4	A3
CMD5	A4
CMD6	A5
CMD7	
CMD8	CS#
CMD9	WE#
CMD10	BA0
CMD11	CKE
CMD12	ODT
CMD13	
CMD14	A12
CMD15	RAS#
CMD16	A11
CMD17	A10
CMD18	BA1
CMD19	A8
CMD20	A9
CMD21	A6
CMD22	A5
CMD23	A7
CMD24	A4
CMD25	CAS#
CMD26	A13
CMD27	BA2
CMD28	
CMD29	
CMD30	



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Size	Document Number	Rev	
0.1	CHANNEL A EXT. 256M_2	0.1	
Date	Monday, February 18, 2009	Sheet	8 of 16

Compal Electronics, Inc.

CHANNEL A EXT. 256M_2

Document Number

Rev

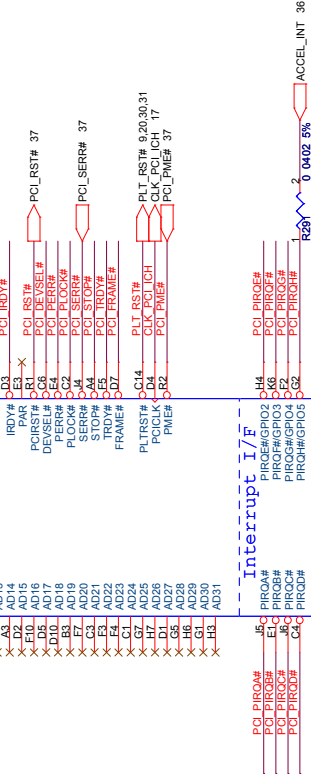
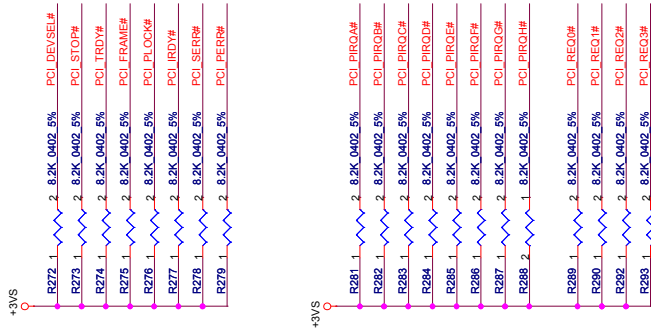
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Date

Monday, February 18, 2009

Sheet

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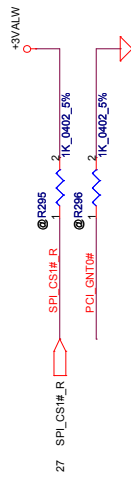


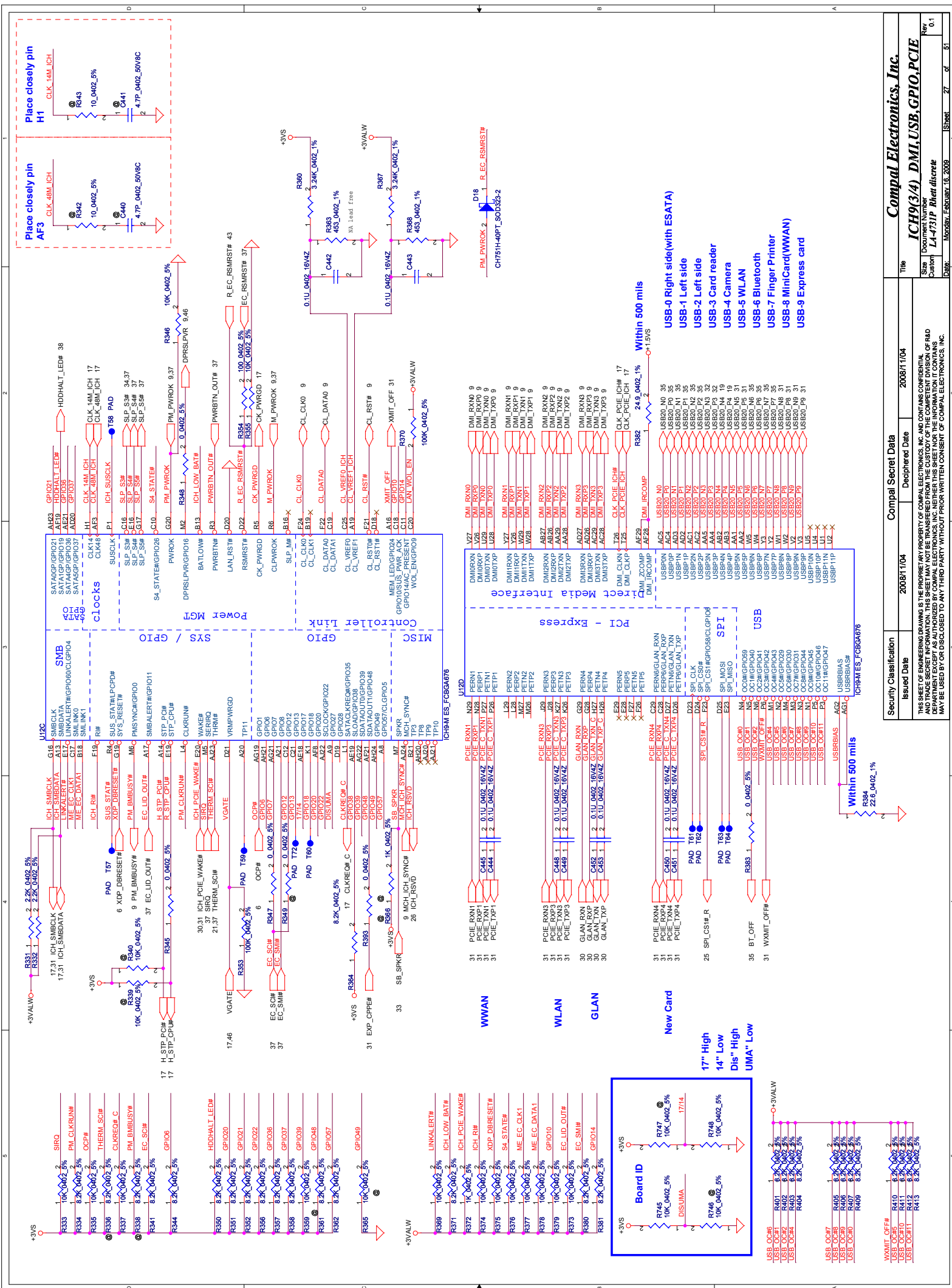
A16 swap override Strap

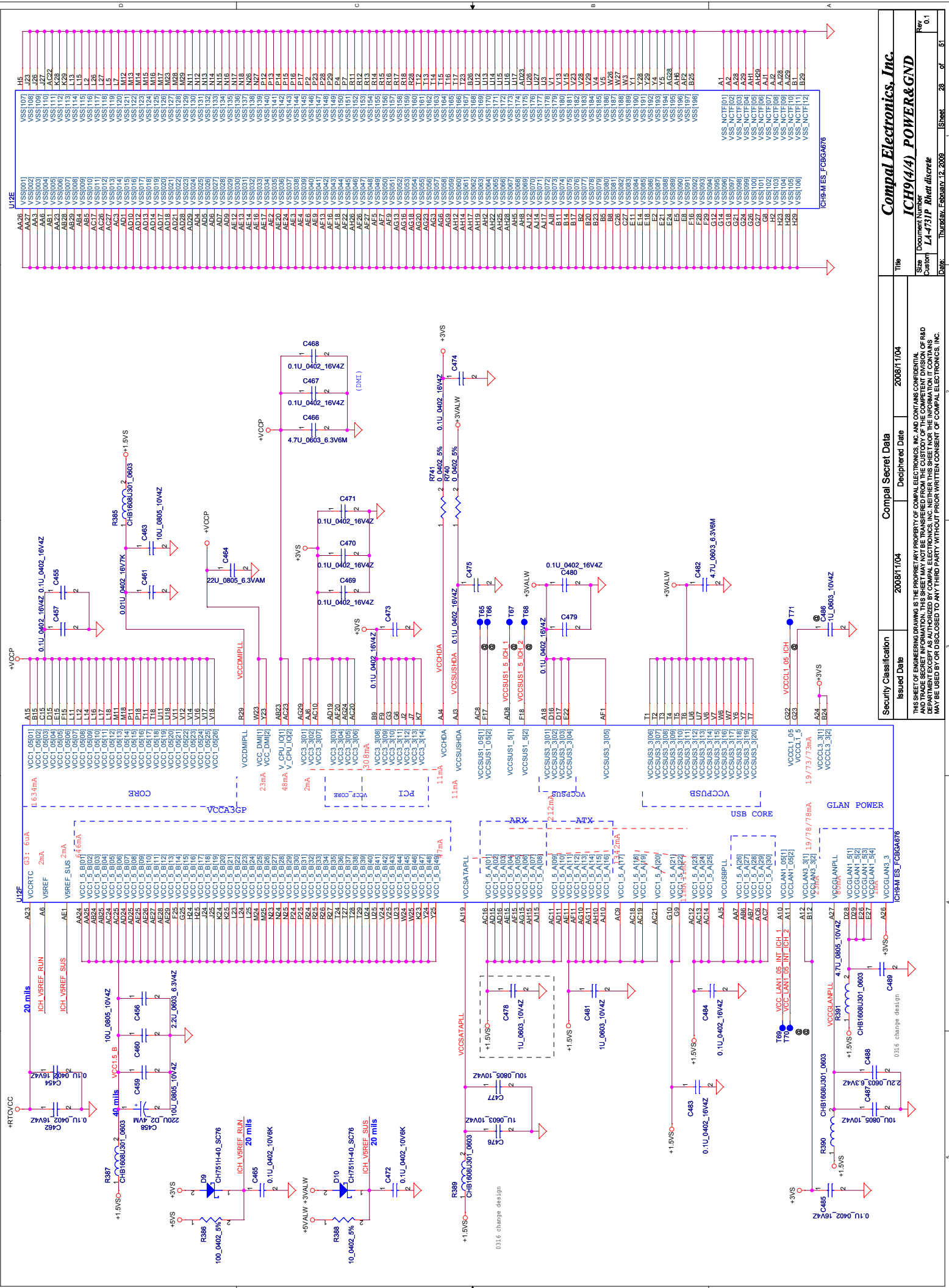
Low= A16 swap override Enable
High= Default *



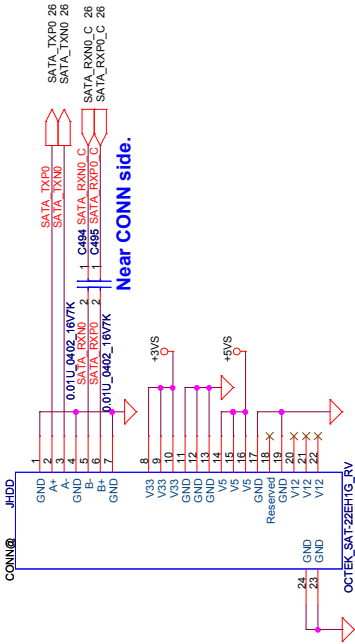
Boot BIOS Strap		
PCI_GNT0#	SPI_CS#1	Boot BIOS Location
0	1	SPI
1	0	PCI
1	1	LPC *



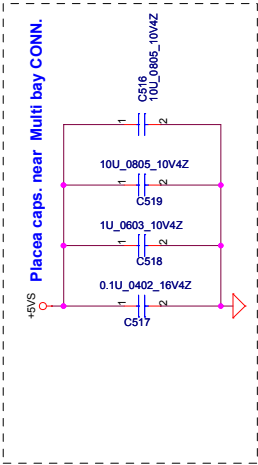
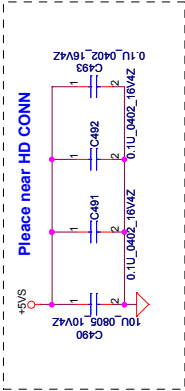
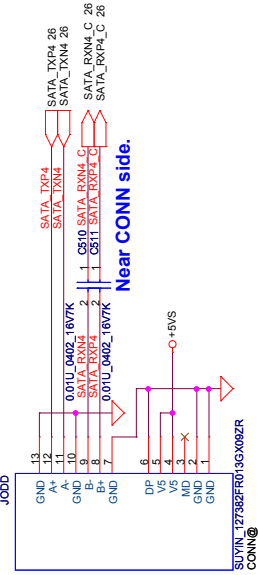




HDD Connector

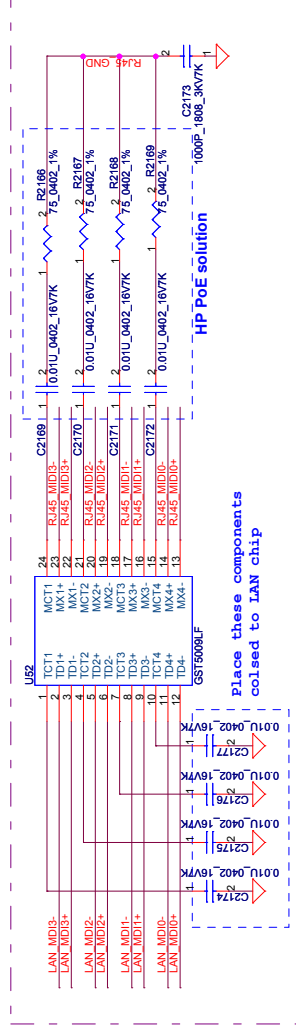
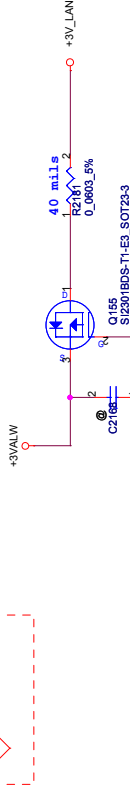
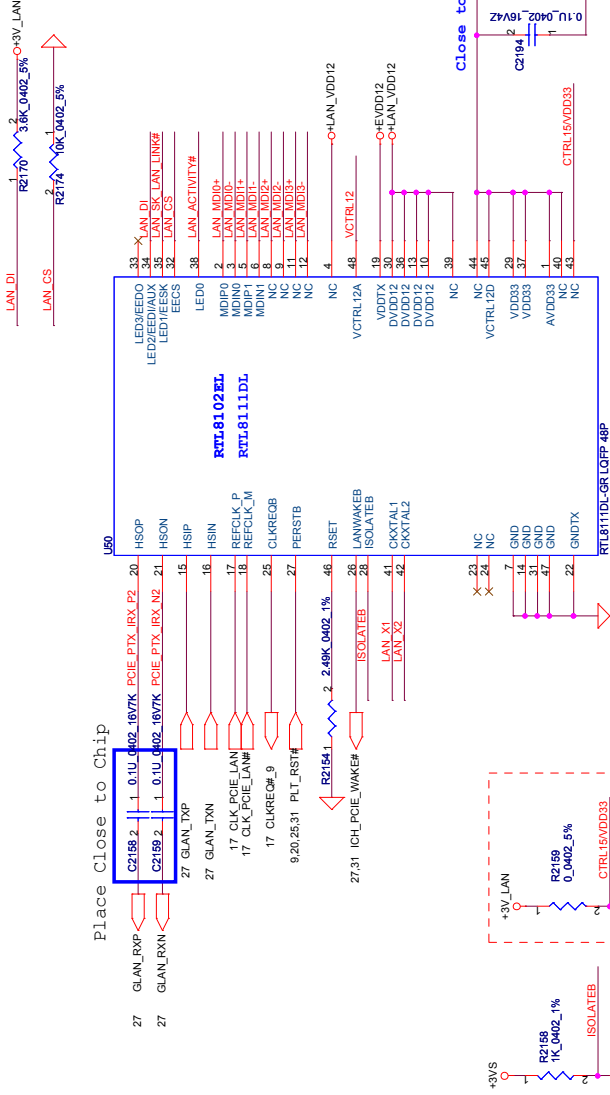
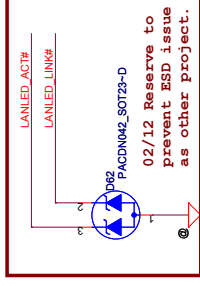
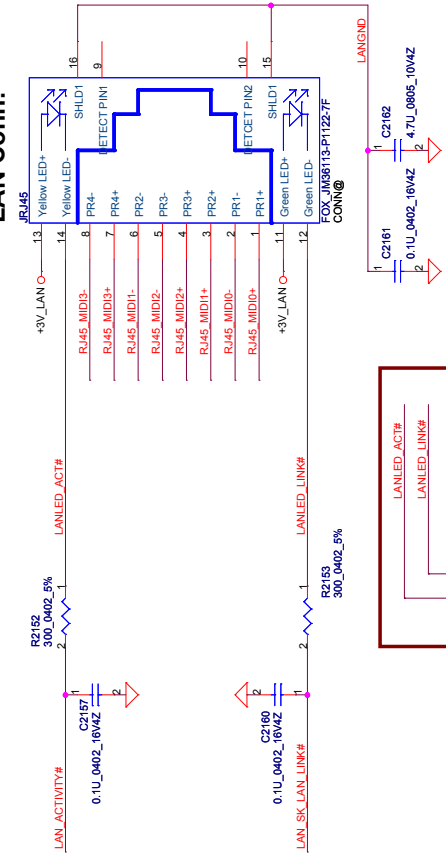


CD-ROM Connector



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					Custom L4-4731P Rev1 discrete 0.1
					Date Modified 16/2009 1 Sheet 28 of 51

LAN Conn.



Close to Pin45, 44

Close to Pin40 for 8111DL

Close to Pin48

Close to Pin10, 13, 30, 36

Close to Pin1, 37, 29

Close to Pin19

Close to Pin48

Close to Pin48

Close to Pin48

Close to Pin48

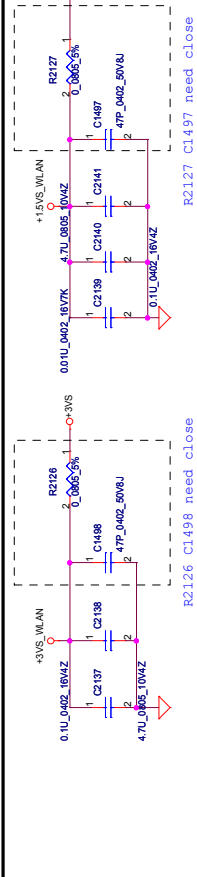
Close to Pin48

Note 1: The Trace length between L1 and 8111DL's Pin 1 must be within 0.5 cm. C262 and C263 to L1 must be within 0.5cm. Refer to Layout guide for more detail.

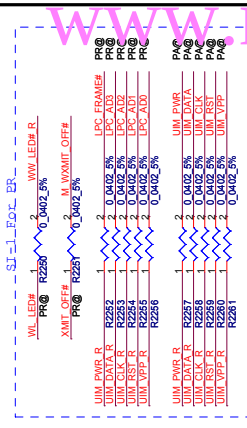
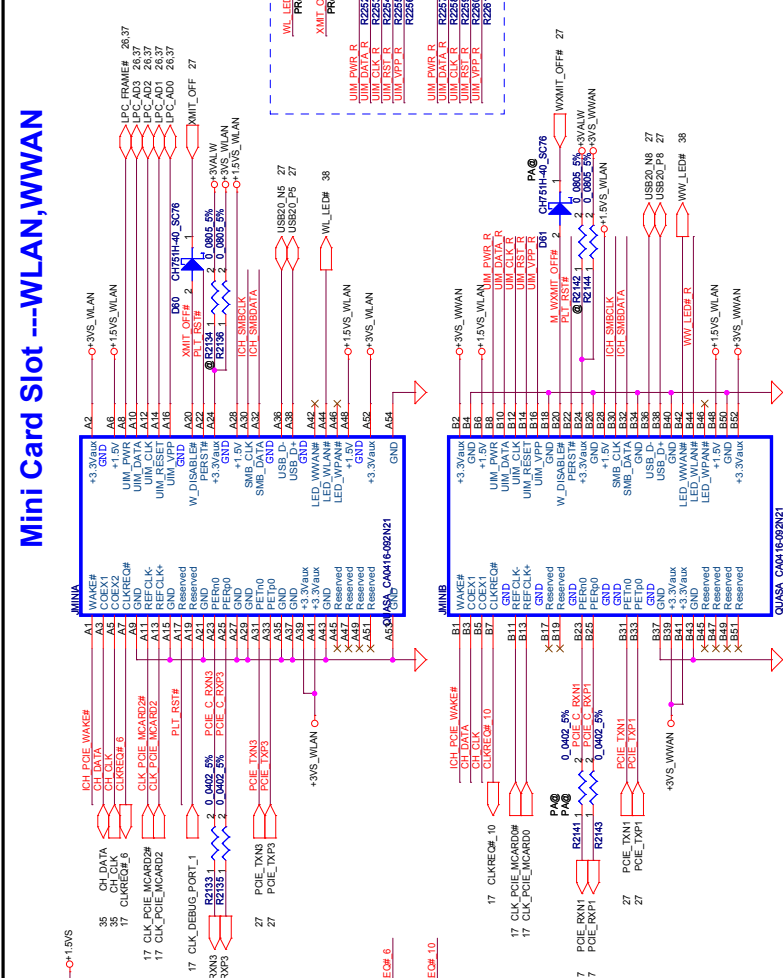
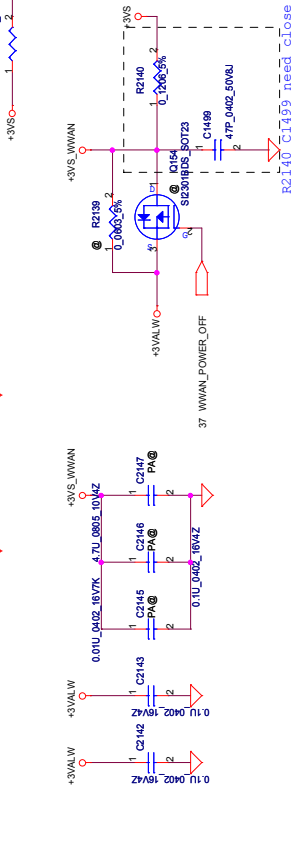
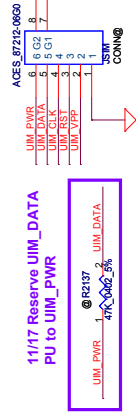
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Issued Date	2008/1/10/4	Deciphered Date	2008/1/10/4
Compal Secret Data			
Title			
Realtek 8111DL Oiga_LAN			
Size	Document Number	Rev	0.1
Quantity	LA-4731P	Revit	disclose
Date	Monday, February 18, 2009	Sheet	30 of 51

Compal Electronics, Inc.

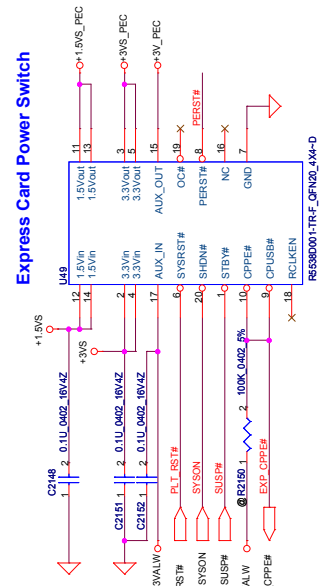
Mini Card Slot ---WLAN,WWAN



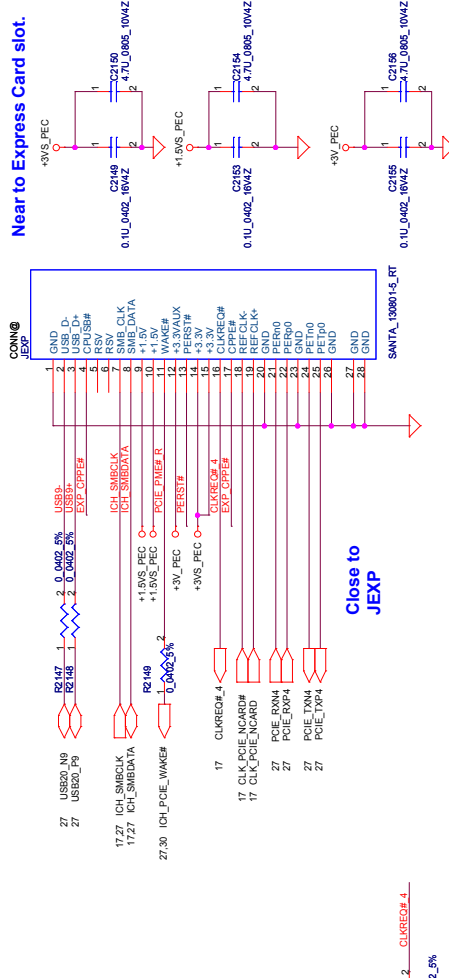
SIM card Connector



New Card

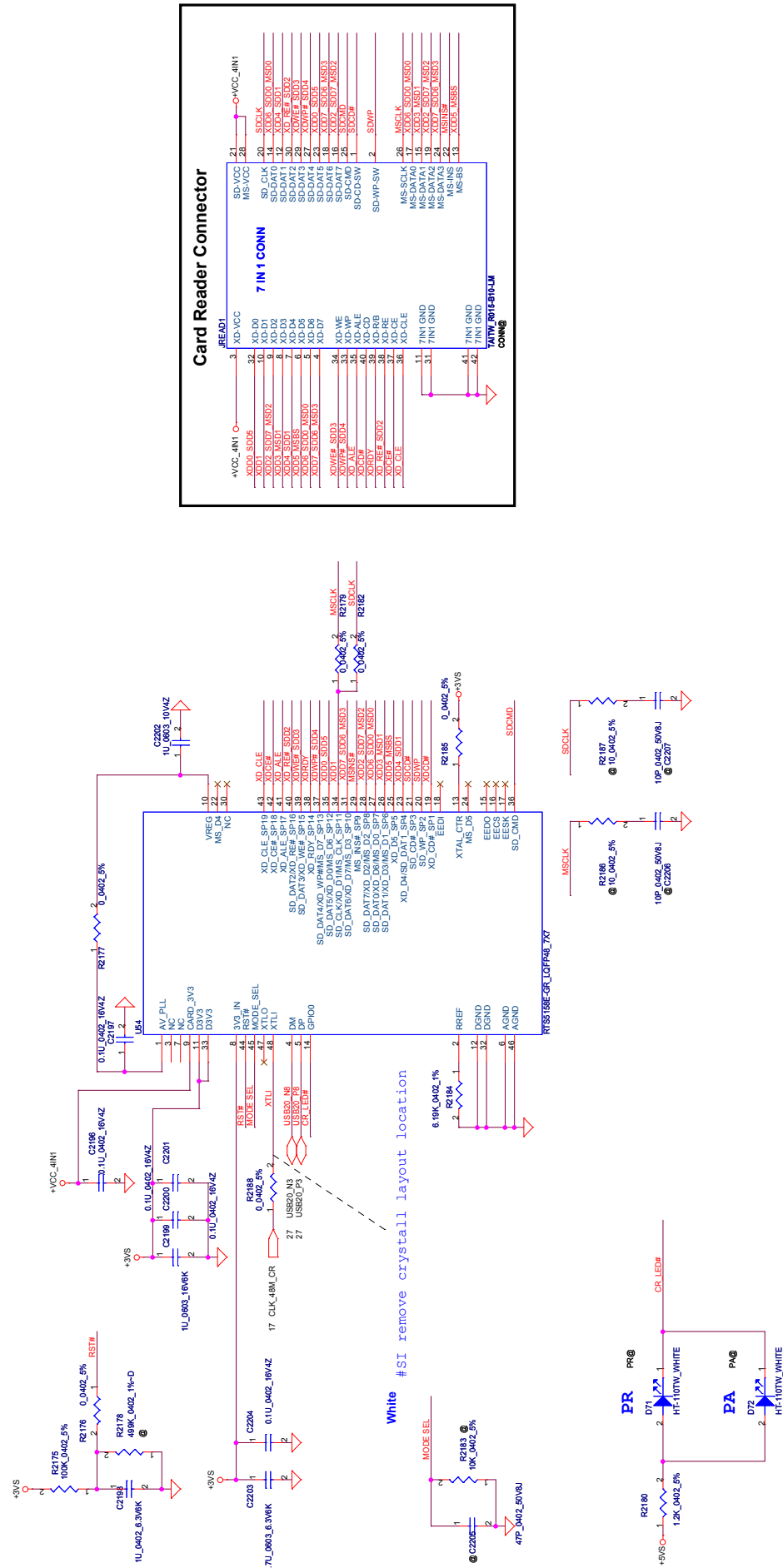


**internal pull high to 3.3Vaux-in
EC need setting at Hi-Z & output Low**

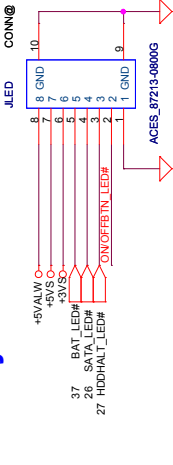


Near to Express Card slot.

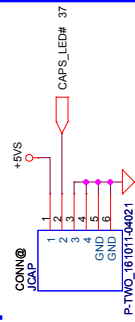
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			Size		Document Number L4-4731P R1ett discrete	
			Rev		0.1	



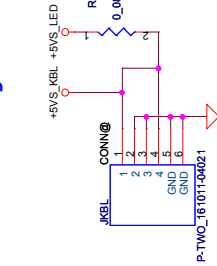
System LED Conn



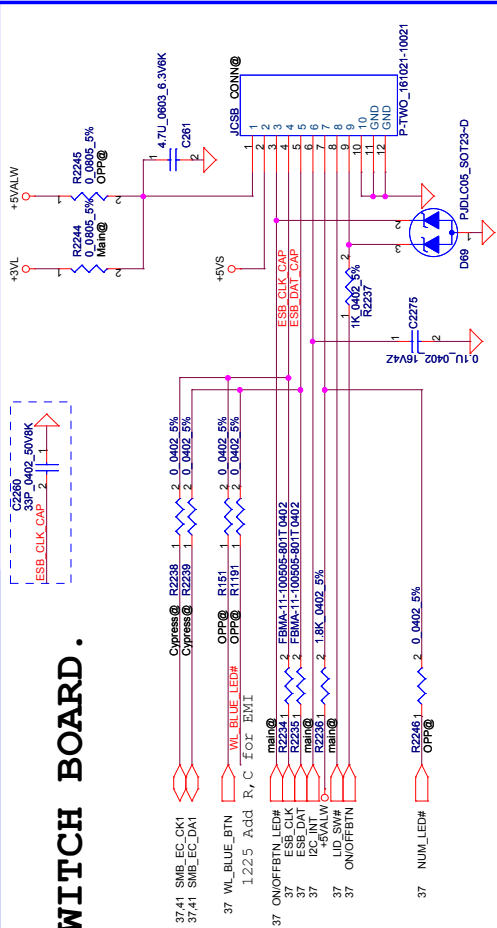
Caps-Lock Conn



Keyboard backlight Conn

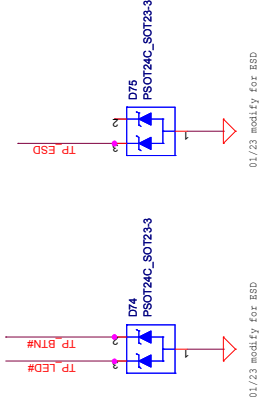
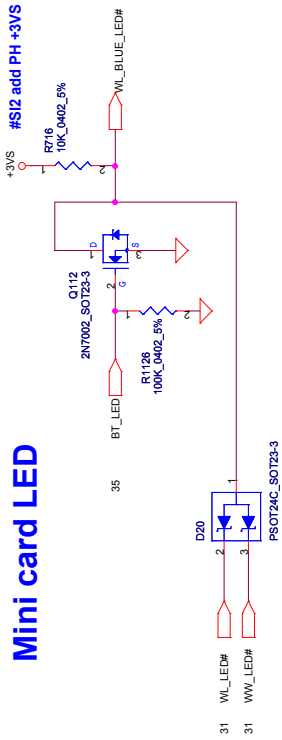


SWITCH BOARD.

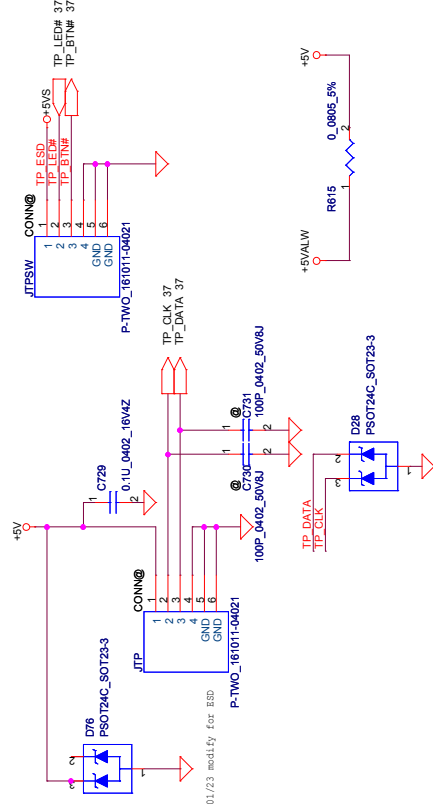


01/23 modify for ESD

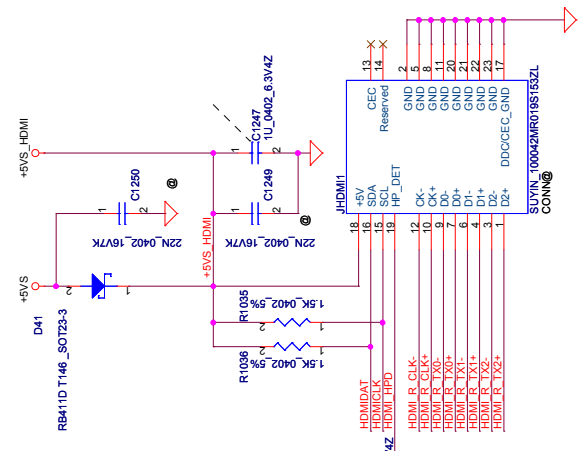
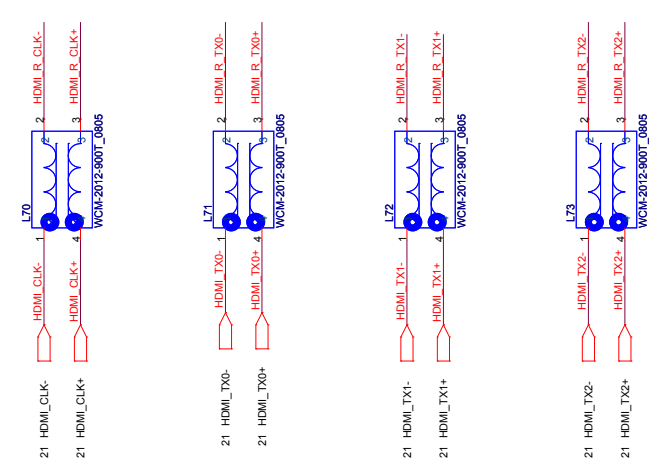
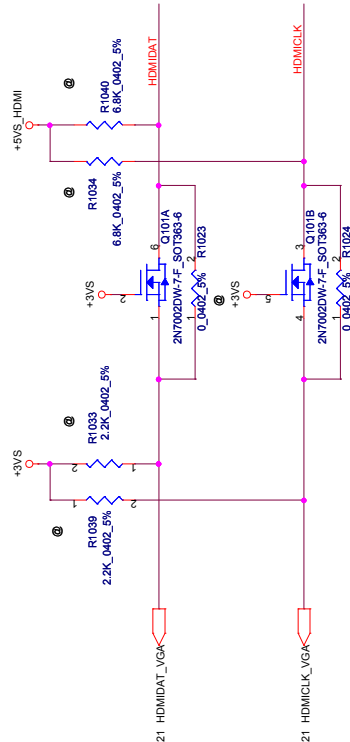
Mini card LED



T/P Board (Inculde T/P_ON/OFF)



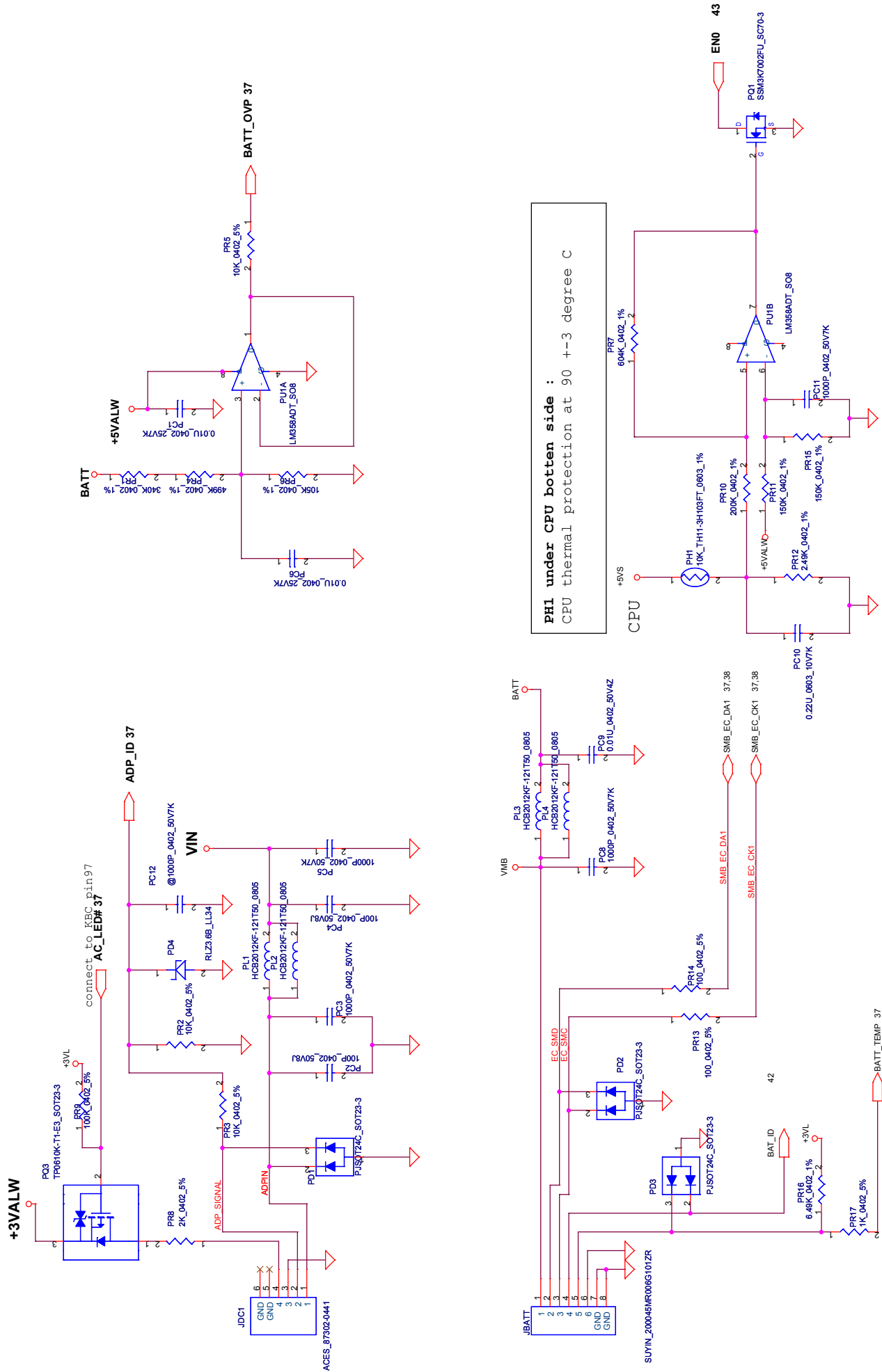
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HDMI Connector

for HDMI certification

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				Rev	0.1
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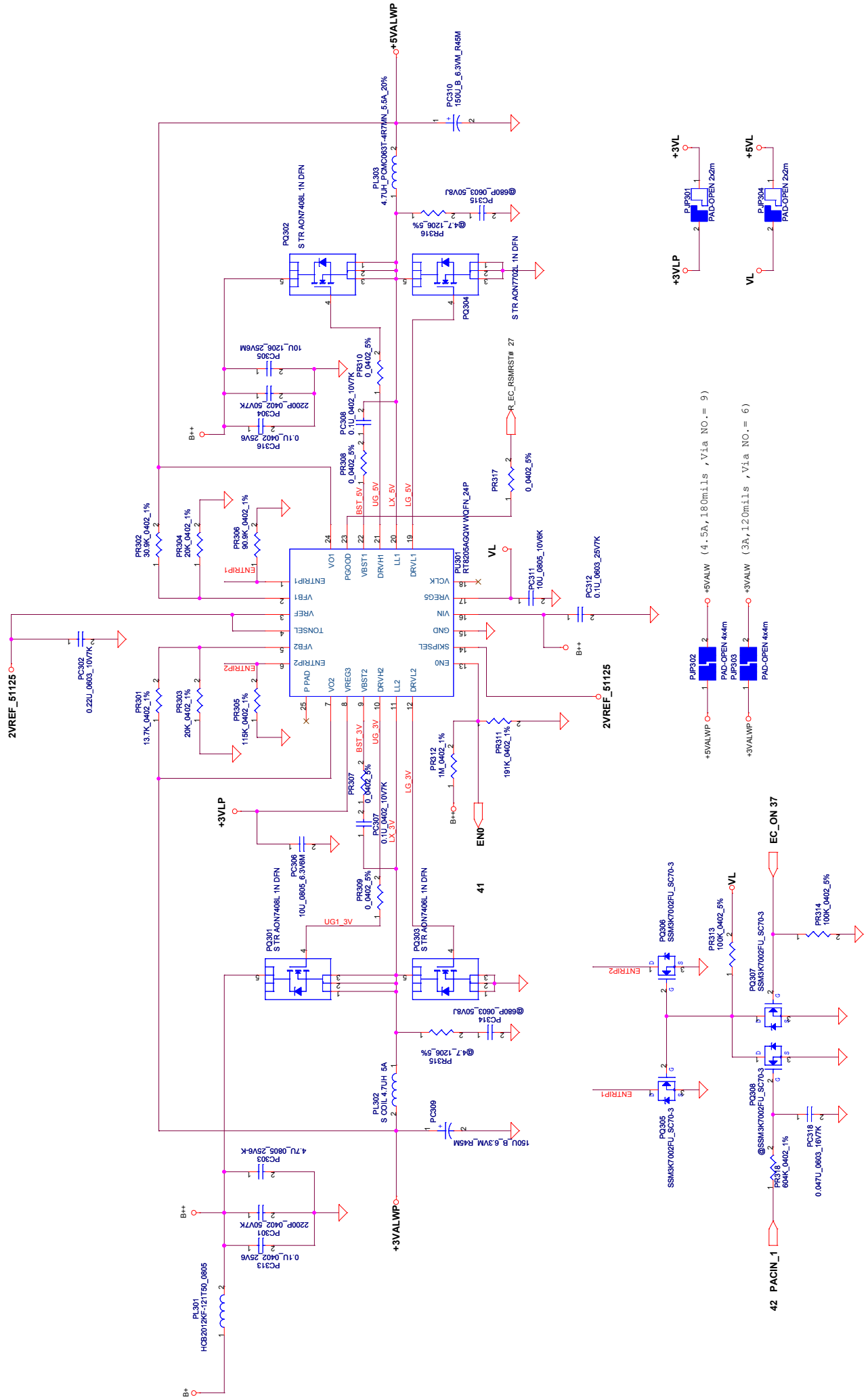


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2007/05/29		2008/05/29		Rev	
2007/05/29		2008/05/29		0.1	
2007/05/29		2008/05/29		Montevina Consumer Discrete	
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DC Connector/CPU OTP

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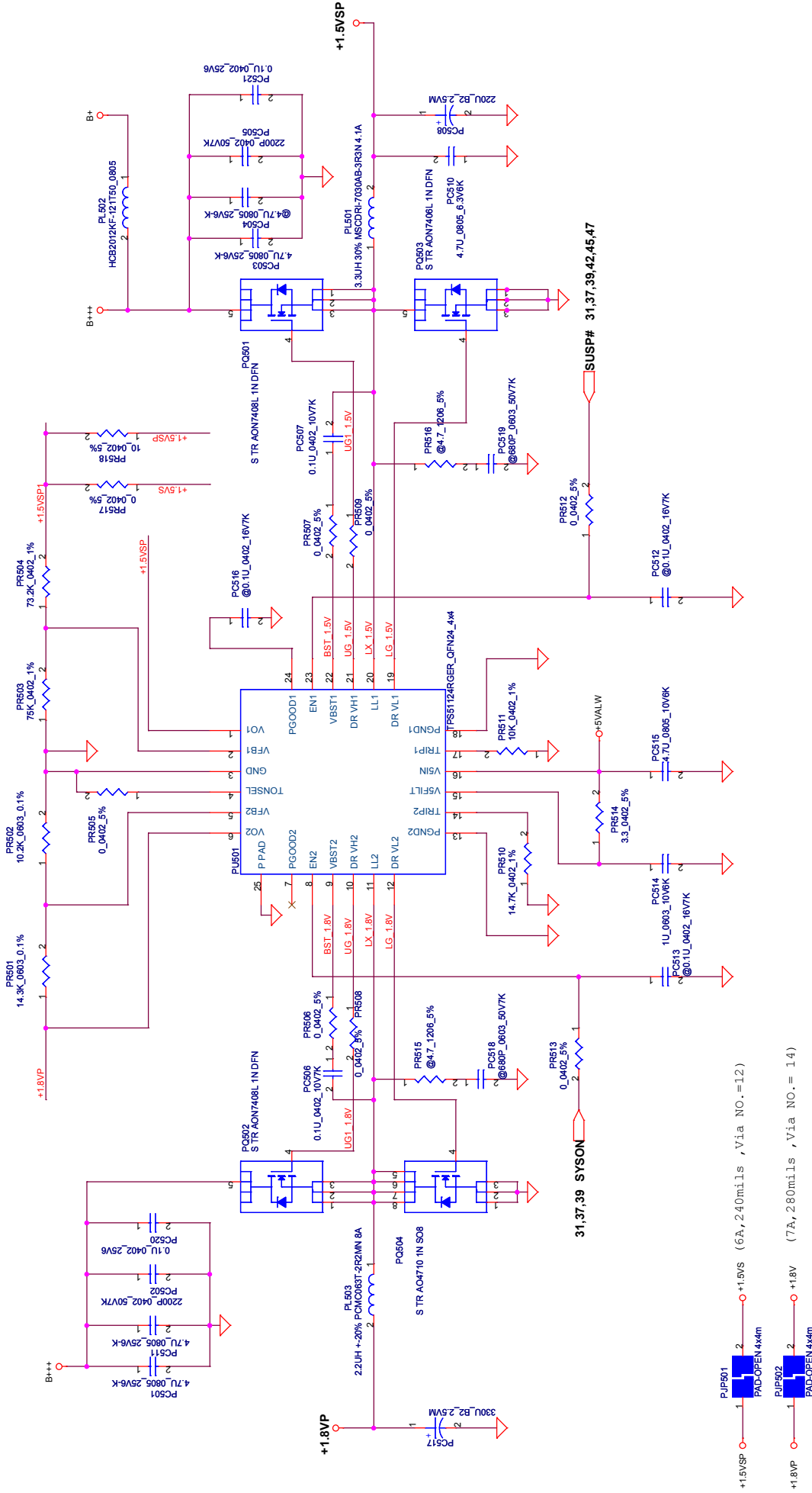
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				Custom	L4-4481P
				Rev	0.1
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Compal Electronics, Inc.

3.3V ALWP/5V ALWP

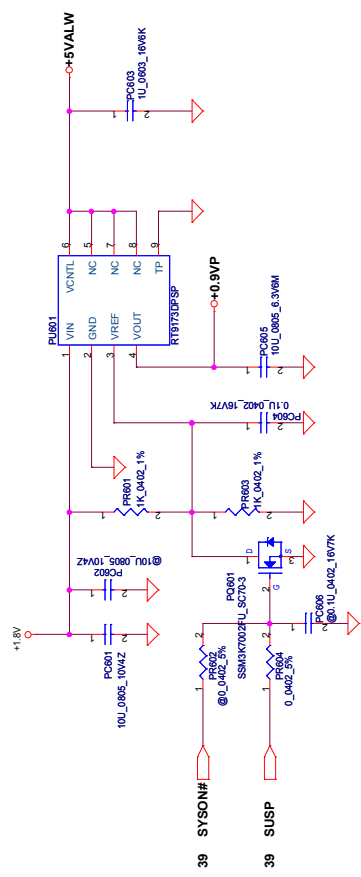
L4-4481P

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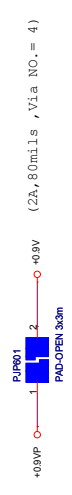
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								1.5VSP/1.8VP			
								Montevina Consumer Discrete			
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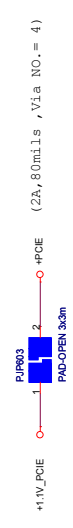


39 SYSONH

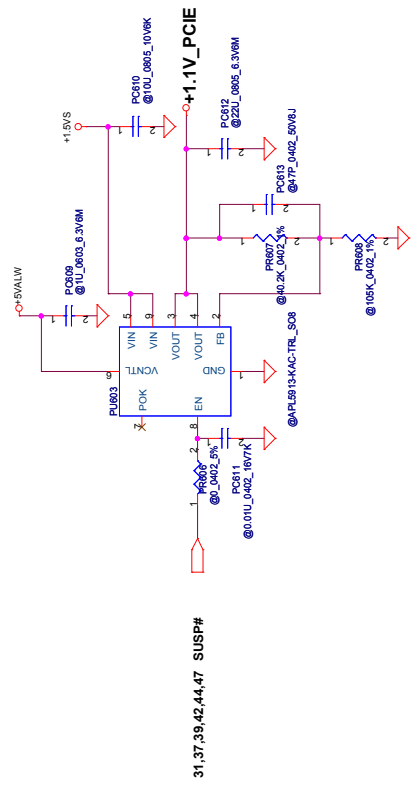
39 SUSP



(2A, 80mils, Via NO. = 4)



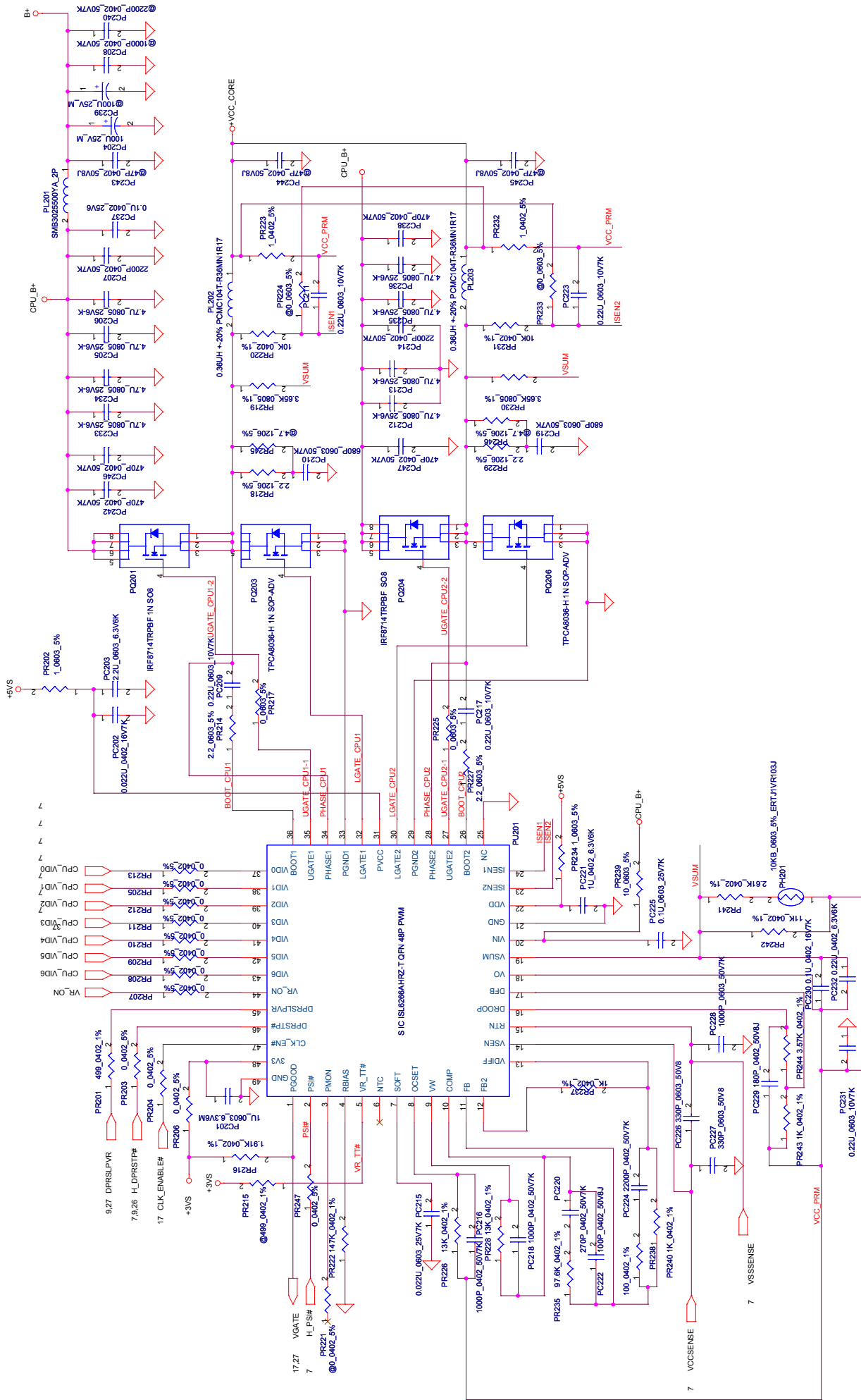
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31,37,39,42,44,47 SUSP#

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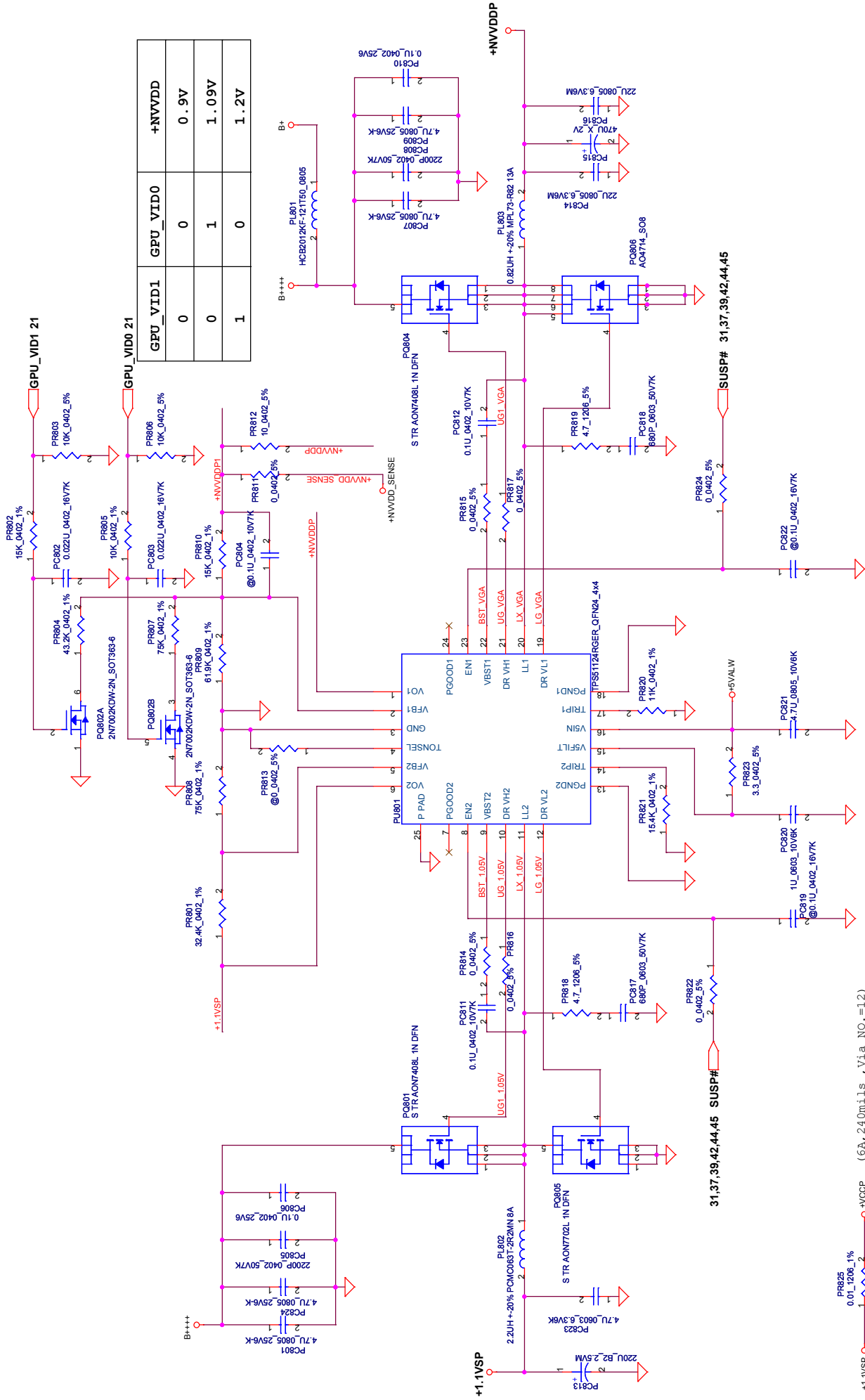


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+CPU_CORE

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+1.05V VCCP/VGA CORE

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+1.05V VCCP/NGA CORE

Rev 0.1

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Item	Fixed Issue (Reason for change)	PAGE	Modify List	Date	Phase
1	CardReader clock issue	17	Using USB_0 for CLK_48K_CR	2008/10/08	SI-1
2	Debug Card issue	31	Connect PLT_RST# to JP7.A17	2008/10/08	SI-1
3	delete VGA external thermal sensor layout location for layout space limitation	29	Del U6,C348,C350	2008/10/08	SI-1
4	Add Audio board	34	Add AUDIO connector for audio board	2008/10/08	SI-1
5	delete VGA JTAG for layou space limitation	29	Delete T47,T48,T49,T50,T51	2008/10/08	SI-1
6	Cap board issue	38	Change Cap board power rail to +3VL	2008/10/08	SI-1
7	Change JFPR to 6 pin connector	35	change JFPR	2008/10/08	SI-1
8	Change FAN control circuit to voltage control	6	Add U51,D17,R50,C41	2008/10/08	SI-1
9	Delete HDA SSC	26	Remove U44 for layout spacing	2008/10/08	SI-1
10	For PR mini card connector	31	Add R2252 -- R2261	2008/10/08	SI-1
11	PA/PR CardReader LED	32	D72 for PA, D71 for PR	2008/10/08	SI-1
12	EMI request	33	Change R2205 to L76	2008/10/08	SI-1
13	change MIC to 2pin and add SPK connector	34		2008/10/08	SI-1
14	Speaker L & R reverse	34		2008/11/20	SI-2
15	JFPR change to 4 pin	40	Add U58,C2265	2008/11/20	SI-2
16	add buffer on detect pin for certification item 7-12	34		2008/11/20	SI-2
17	Bom Error [Bug: BT led fail]	38	Change D20's Part number to SCA00000G00	2008/12/10	PV
18	Realtek suggest us to change Cap value	30	Change C2193 value from 0.1uF to 1uF	2008/12/10	PV
19	Slove WVLAN Noise : Add Cap X4 [to GND]	26	C499 and C2130 default mount, Add C2266 and C2267 [12 PF]	2008/12/10	PV
20	Slove WVLAN Noise:Add Cap,change R191val	37	Add C2268 [22PF] on R191.2 to GND and R191 change to 47 ohm	2008/12/10	PV
21	Slove WVLAN Noise:C356,C357 default mou	21	C356 and C357 default mount	2008/12/10	PV
22	Slove SMT issue	37	Change U30 FOOTPRINT [fromKB926QFA1 LQFP128_14X14 change to ECE5028-NU VTQFP128_14X14]		PV
23	Slove SMT issue	37	Change JKB FOOTPRINT [from ACES_85202-24051_24P change to ACES_85202-24051_24P-S]	2008/12/10	PV
24	Slove ESD issue	26	ADD C2269 [0.1uF] on BAT1.1 trace (pin 1)	2008/12/17	PV
25	Slove ESD issue	33	Add one Diode [D73] on MIC_EXTR, MIC_EXTL (near chip side)	2008/12/17	PV
26	Slove ESD issue	33	Change cap value [C2270,C2271,C2272,C2273] to 0.1uF	2008/12/17	PV
27	Slove Audio issue	34	Change cap value to 2.2uF [C2239,C2240]	2008/12/17	PV
28	Slove non-RoHS Part	30	Change C2157,C2160,C2215 and C2217 Part number [from SE070104Z00 to SE070104Z80]	2008/12/17	PV

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