

- 61_POWER-ON SEQ.
62_POWER_Discharge
63_POWER_VCCGFX
64_POWER_+1.8V
65_History



ICH9-M GPIO		Use As	Signal Name	Power
	GPIO 00	Native	PM_SYNC#	+3VS
	GPIO 01	GPI	GP_INT#	+3VS
	GPIO [2:5]	GPO	Hybrid Graphic Ctrl.	+3VS
	GPIO 06	GPI	HDMI_HPD	+3VS
	GPIO 07	GPO	Hybrid Graphic Ctrl.	+3VS
	GPIO 08	GPI	EXT_SMI#	+3VSUS
	GPIO 09	Native	(PD GND)	+3VSUS
	GPIO 10	Native	--	+3VSUS
	GPIO 11	GPI	SMBALERT# (PU +3VSUS)	+3VSUS
	GPIO 12	GPI	EXT_SCI#	+3VSUS
	GPIO 13	GPO	--	+3VSUS
	GPIO 14	Native	AC_OK	+3VSUS
	GPIO 15	Native	STP_PCI#	+3VSUS
	GPIO 16	Native	PM DPRSLPVR	+3VS
	GPIO 17	GPO	--	+3VS
	GPIO 18	GPO	--	+3VS
	GPIO 19	GPO	BT_LED	+3VS
	GPIO 20	GPI	--	+3VS
	GPIO 21	GPO	WLAN_LED	+3VS
	GPIO 22	GPI	(PU +3VS)	+3VS
	GPIO 23	Native	LPC_DRQ1#	+3VS
	GPIO 24	GPO	MXMPWR_ON#	+3VSUS
	GPIO 25	Native	STP_CPU#	+3VSUS
	GPIO 26	Native	PM_S4_STATE#	+3VSUS
	GPIO 27	GPO	--	+3VSUS
	GPIO 28	GPO	--	+3VSUS
	GPIO 29	Native	USB_OC5#	+3VSUS
	GPIO 30	Native	USB_OC6#	+3VSUS
	GPIO 31	Native	USB_OC7#	+3VSUS
	GPIO 32	Native	PM_CLKRUN#	+3VS
	GPIO 33	GPO	--	+3VS
	GPIO 34	Native	--	+3VS
	GPIO 35	Native	--	+3VS
	GPIO 36	GPO	WLAN_ON	+3VS
	GPIO 37	GPO	BT_ON	+3VS
	GPIO 38	GPI	--	+3VS
	GPIO 39	GPI	--	+3VS
	GPIO 40	Native	USB_OC1#	+3VSUS
	GPIO 41	Native	USB_OC2#	+3VSUS
	GPIO 42	Native	USB_OC3#	+3VSUS
	GPIO 43	Native	USB_OC4#	+3VSUS
	GPIO 44	Native	USB_OC8#	+3VSUS
	GPIO 45	Native	USB_OC9#	+3VSUS
	GPIO 46	Native	USB_OC10#	+3VSUS
	GPIO 47	Native	USB_OC11#	+3VSUS
	GPIO 48	GPO	--	+3VS
	GPIO 49	GPO	--	+3VS
	GPIO 50	Native	PCI_REQ#1 (PU +3VS)	+3VS
	GPIO 51	Native	PCI_GNT#1	+3VS
	GPIO 52	Native	PCI_REQ#2 (PU +3VS)	+3VS
	GPIO 53	Native	PCI_GNT#2	+3VS
	GPIO 54	Native	PCI_REQ#3 (PU +3VS)	+3VS
	GPIO 55	Native	PCI_GNT#3	+3VS
	GPIO 56	GPI	(PU +3VSUS)	+3VSUS
	GPIO 57	GPI	(PU +3VSUS)	+3VSUS
	GPIO 58	Native	SPI_CS#1	+3VSUS
	GPIO 59	Native	USB_OC0#	+3VSUS
	GPIO 60	Native	LINKALERT# (PU +3VSUS)	+3VSUS

GPIO 02	GPO	MXMPWR_ON# (RESERVED)	For LCD/CRT Signal Switch
GPIO 24	GPO	MXMPWR_ON#	
GPIO 03	GPO	MXMRST#	
GPIO 04	GPO	dGPU_DDC_SEL#	
GPIO 05	GPO	dGPU_IMG_SEL#	
GPIO 06	GPI	HDMI_HPD	For HDMI DDC Signal Switch, HDMI Hot Plug Detection
GPIO 07	GPO	dGPU_DDC_ALT_SEL#	

2008/02/28

PCI Device	IDSEL#	REQ/GNT#	Interrupts
1394	AD17	0	INTA
CARD READER	AD17	0	INTB

SM-Bus Device	SM-Bus Address
Clock Generator	1101001x (D2)
SO-DIMM 0	1010000x (A0)
SO-DIMM 1	1010001x (A2)
CPU Thermal Sensor	1001110x (98)
MXM Thermal Sensor	(0x9A or 0x9E)
GPIO Extender (for OV)	0100110x (48)
HDMI DDC	

2008/01/14

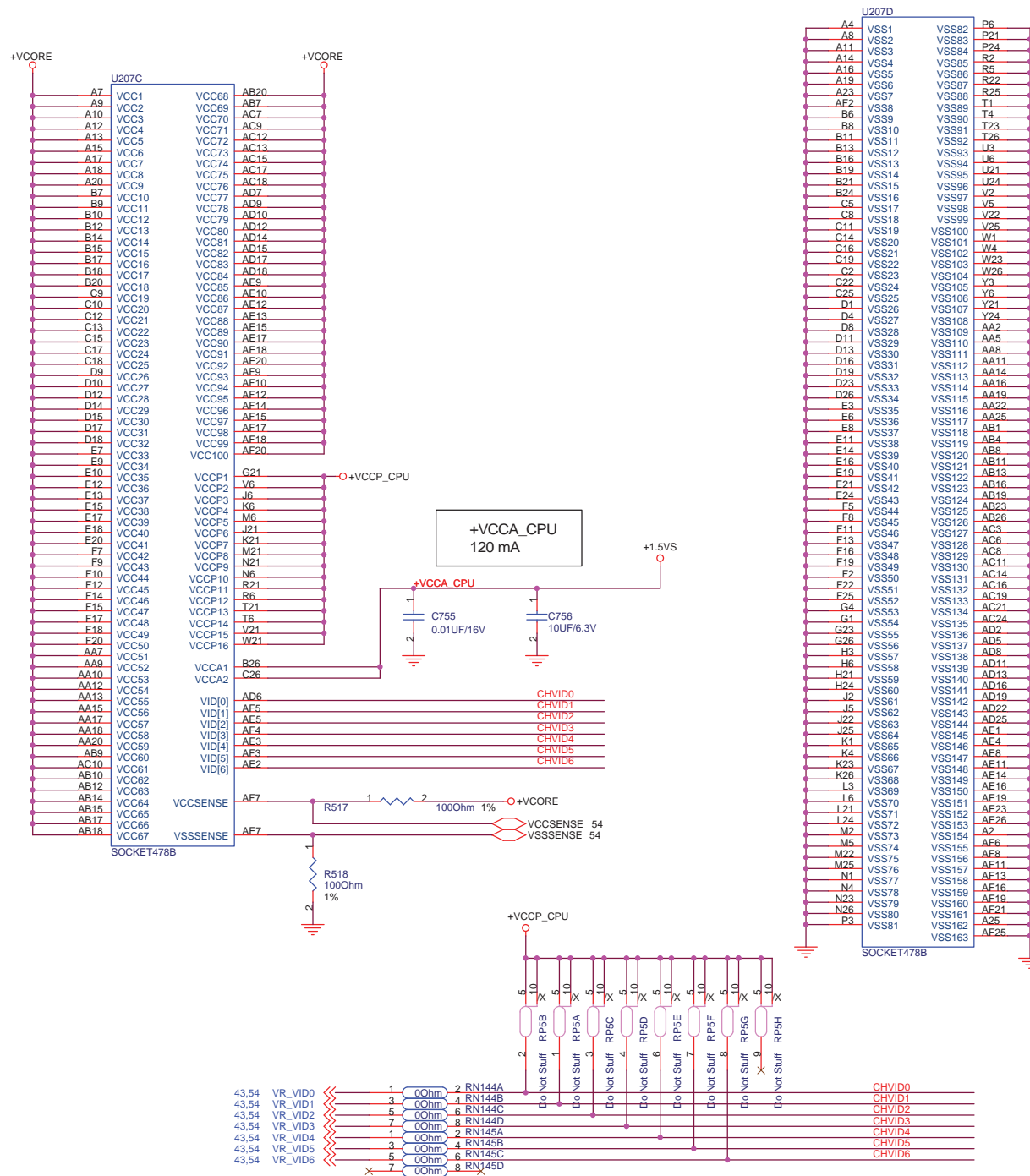
GM45 QS(B2) 02G010021410

PM45 QS(B2) 02G010022500

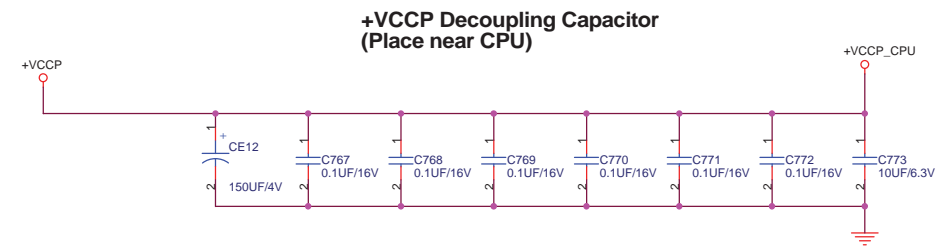
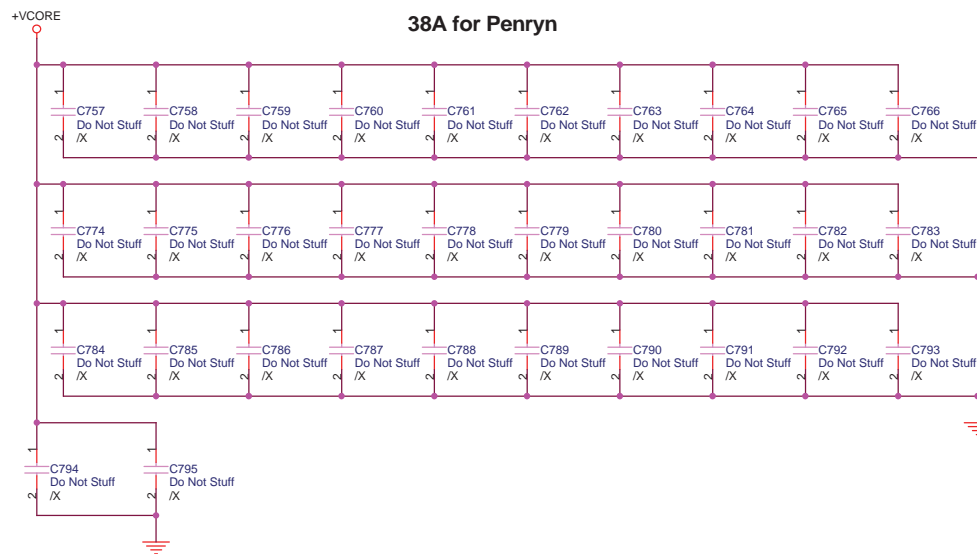
ICH9M-B(A3) 02G010015340

0414_1209

ASUS		Title : System Setting	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	2 of 66



0414_1209



Decoupling guide from Intel

VCORE	22uF/10V r 10uF	* 32pcs
	330uF/2V	* 6pcs
VCCP	0.1uF	* 6pcs
	150uF	* 1pcs ?
	10uF	* 1pcs ?

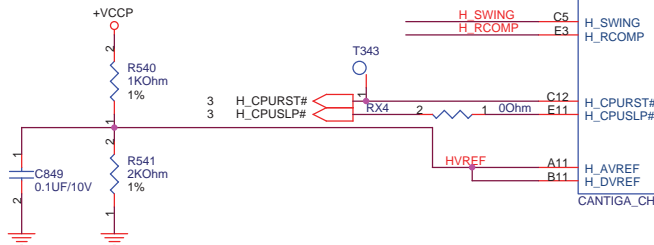
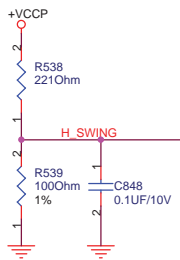
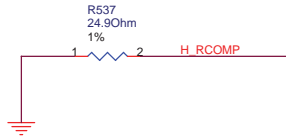
+VCORE Mid-Frequency Capacitor

Intel: 22UF *32
F3S: 10UF *16
A7S: 10UF *1011/17
V1V: ?

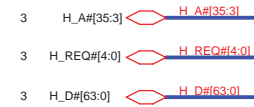
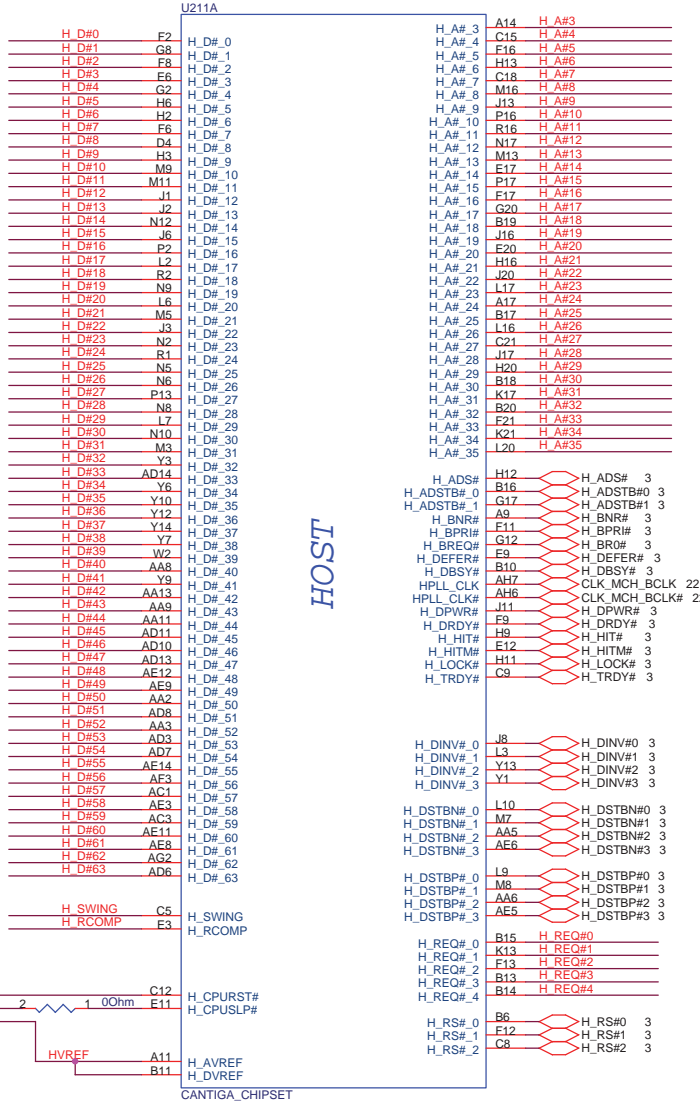
+VCCP Decoupling Capacitor

Intel: 270UF *1, 0.1UF *6
F3S: 100UF *1, 0.1UF *4
V1V: ?

0414_1209

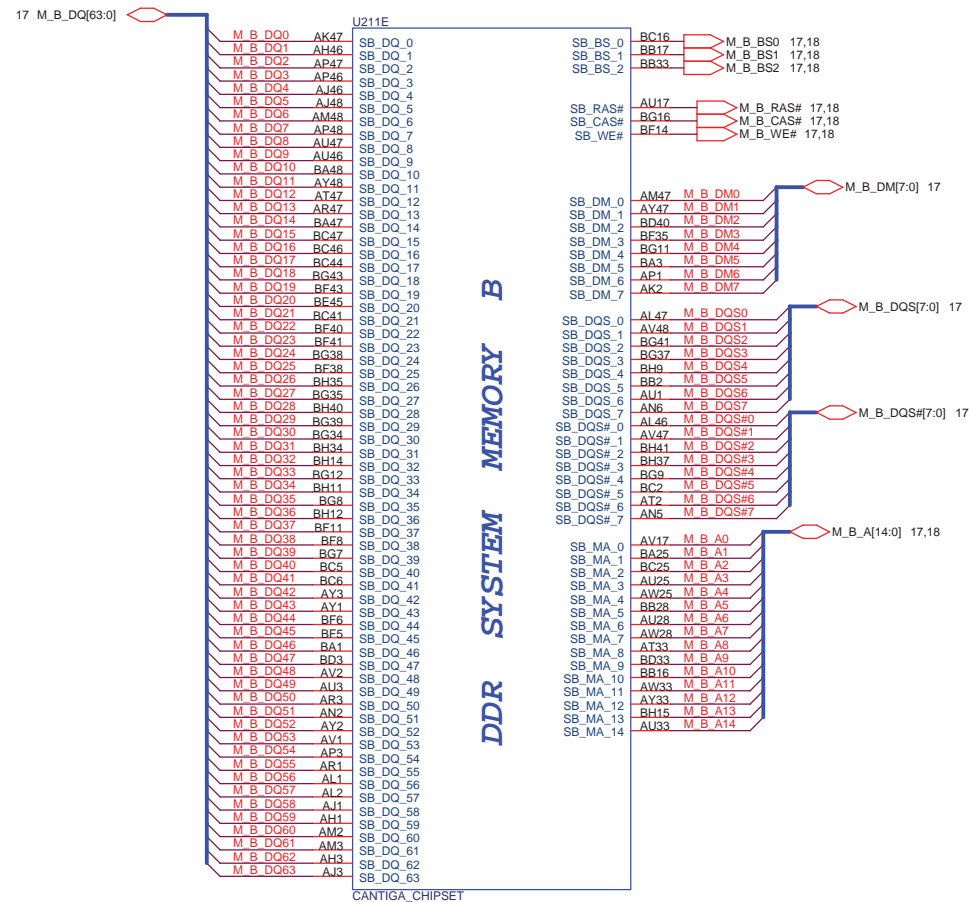
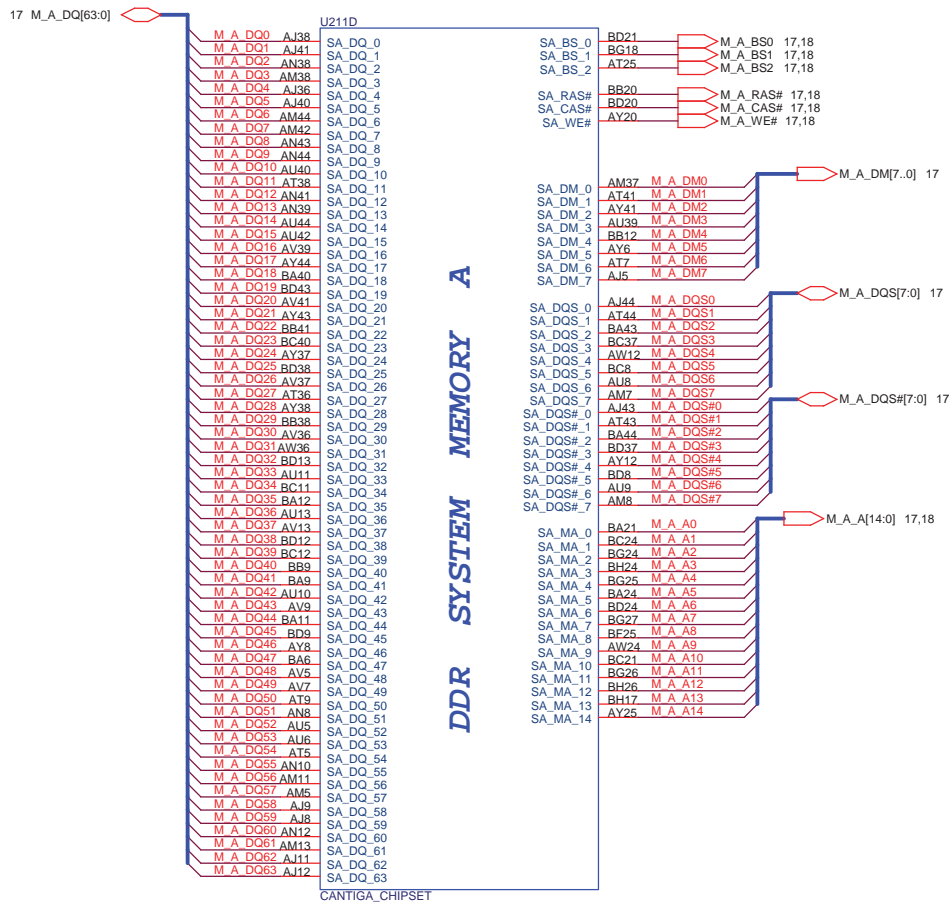


Cap 0.1uF within 100 mils from GMCH



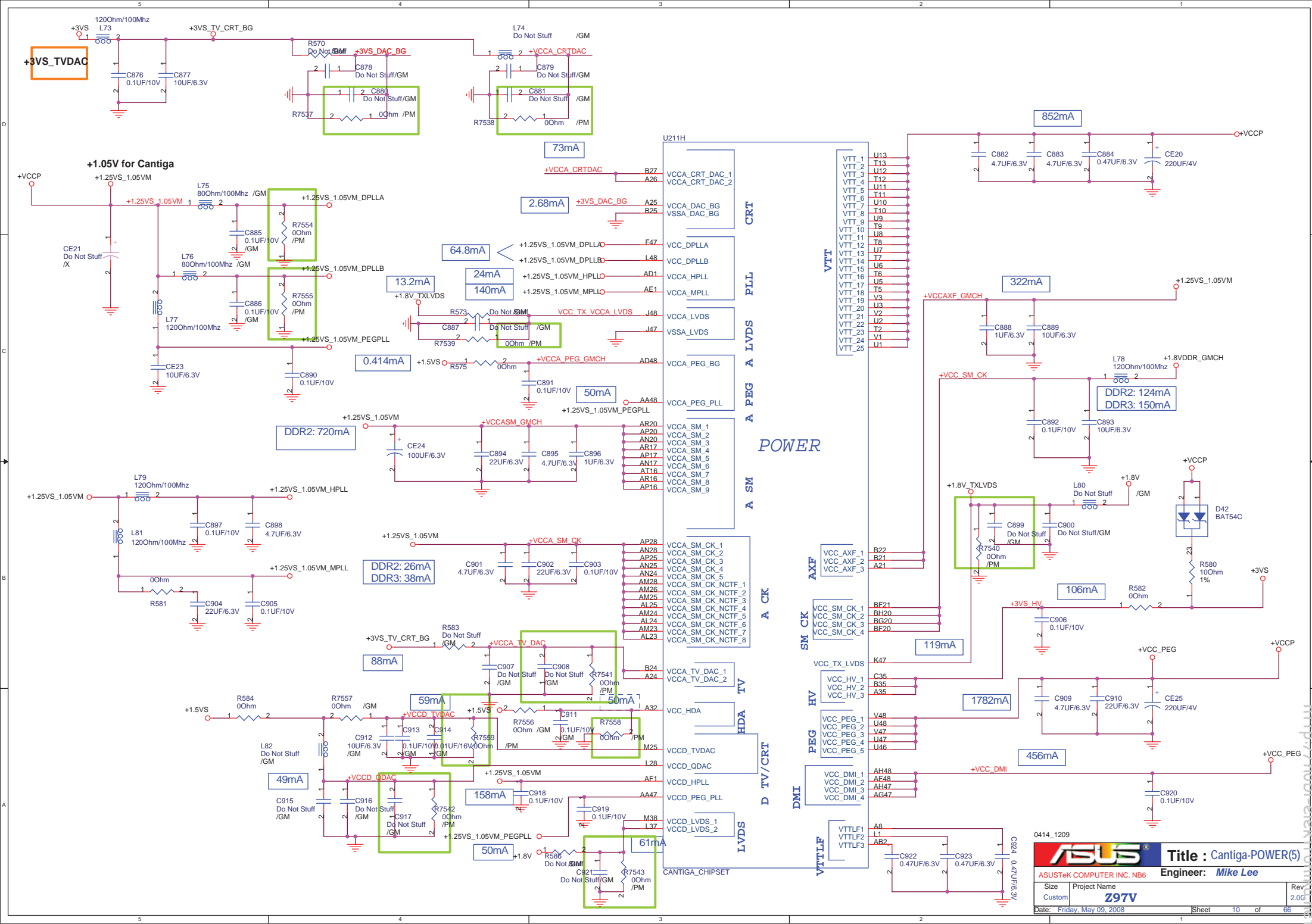
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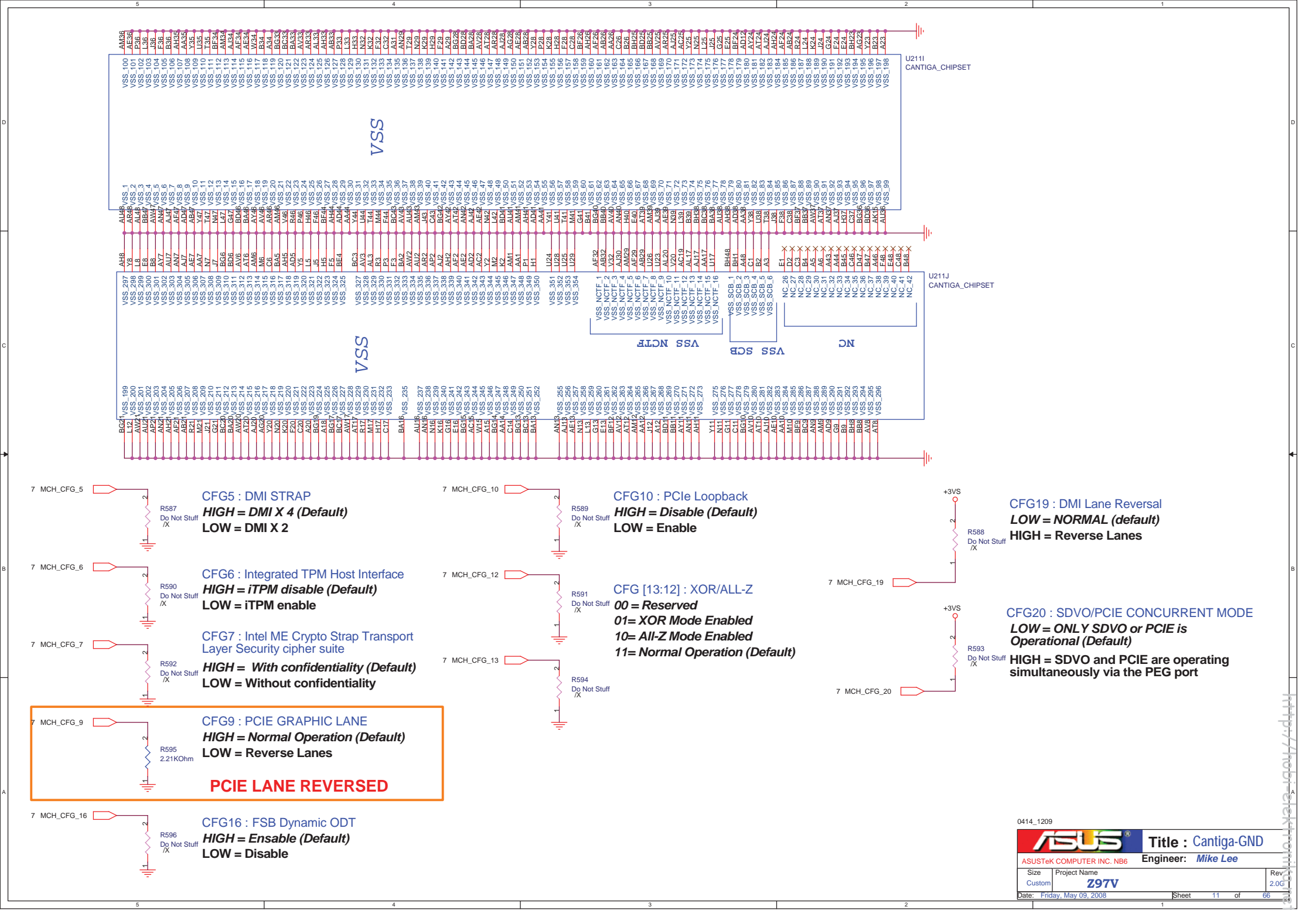




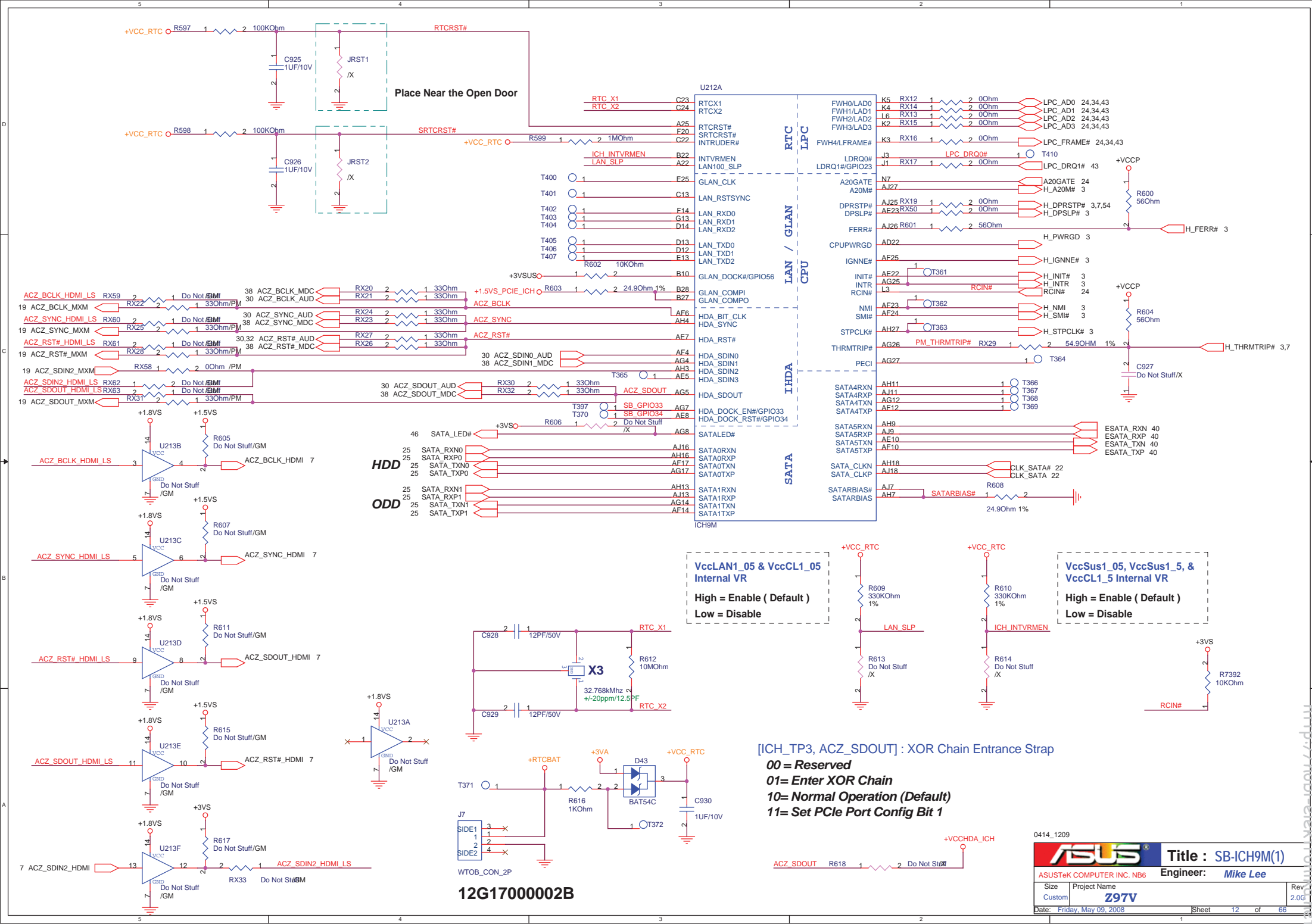
0414_1209

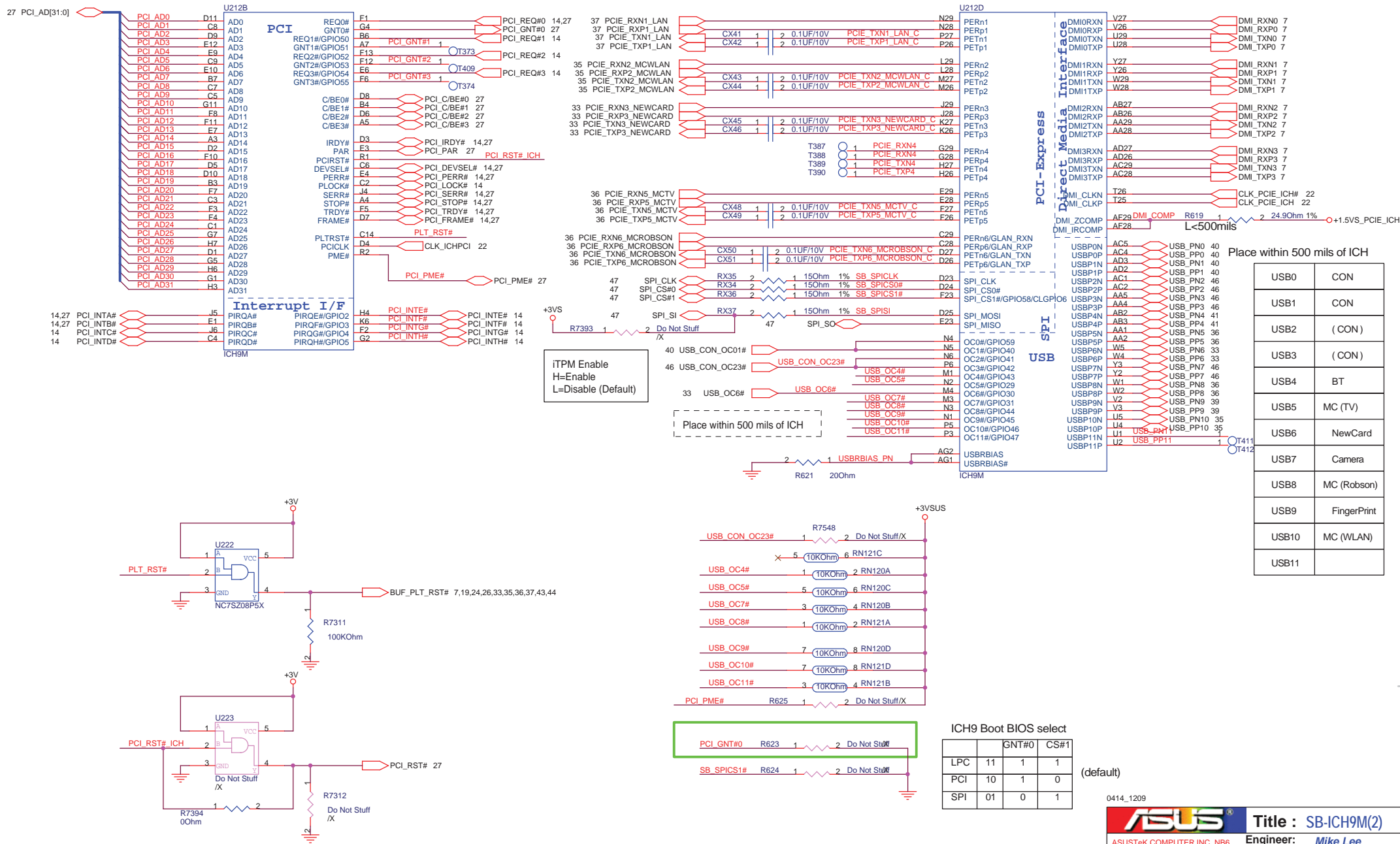






0414_1209





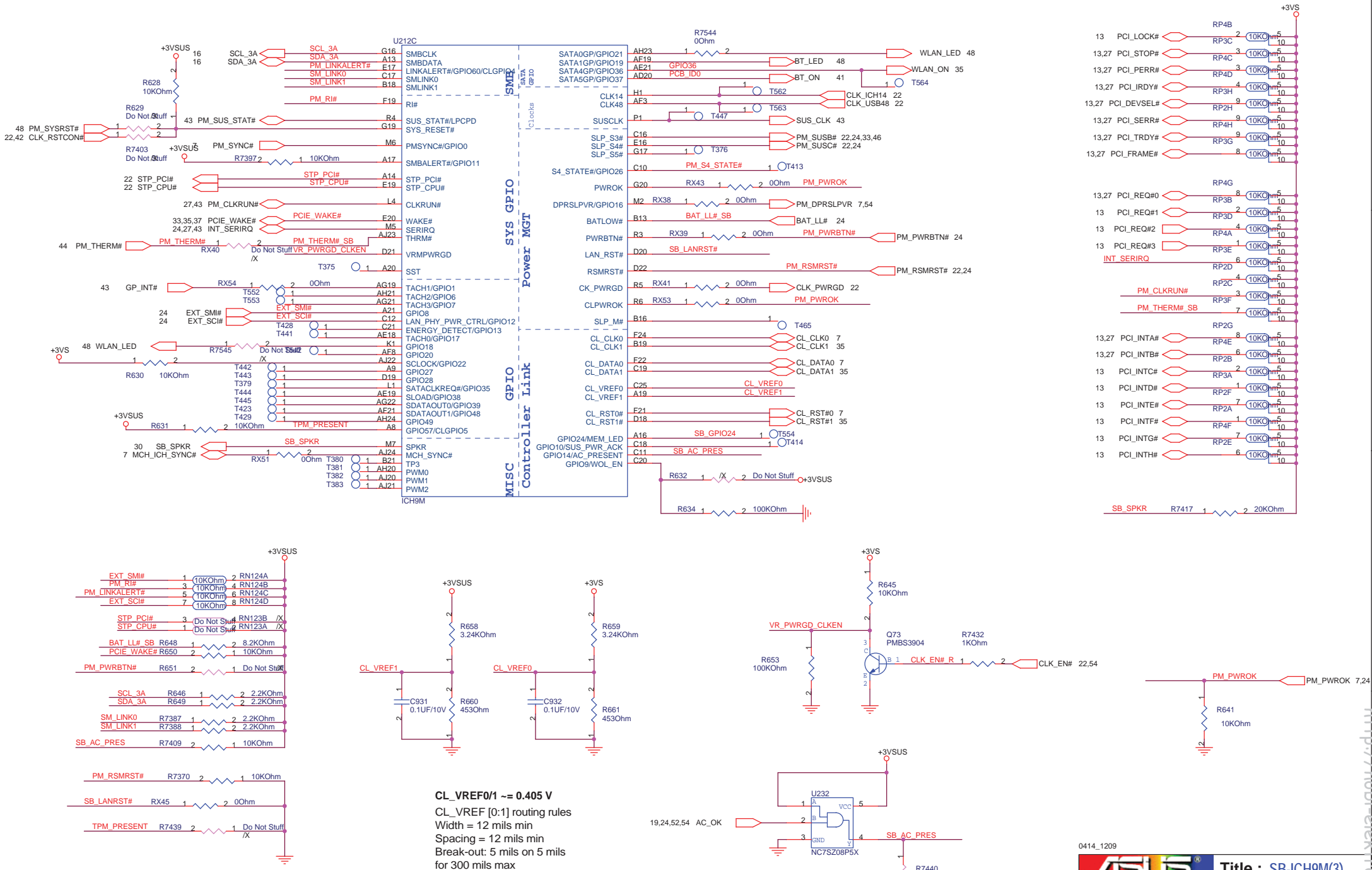
0414_1209

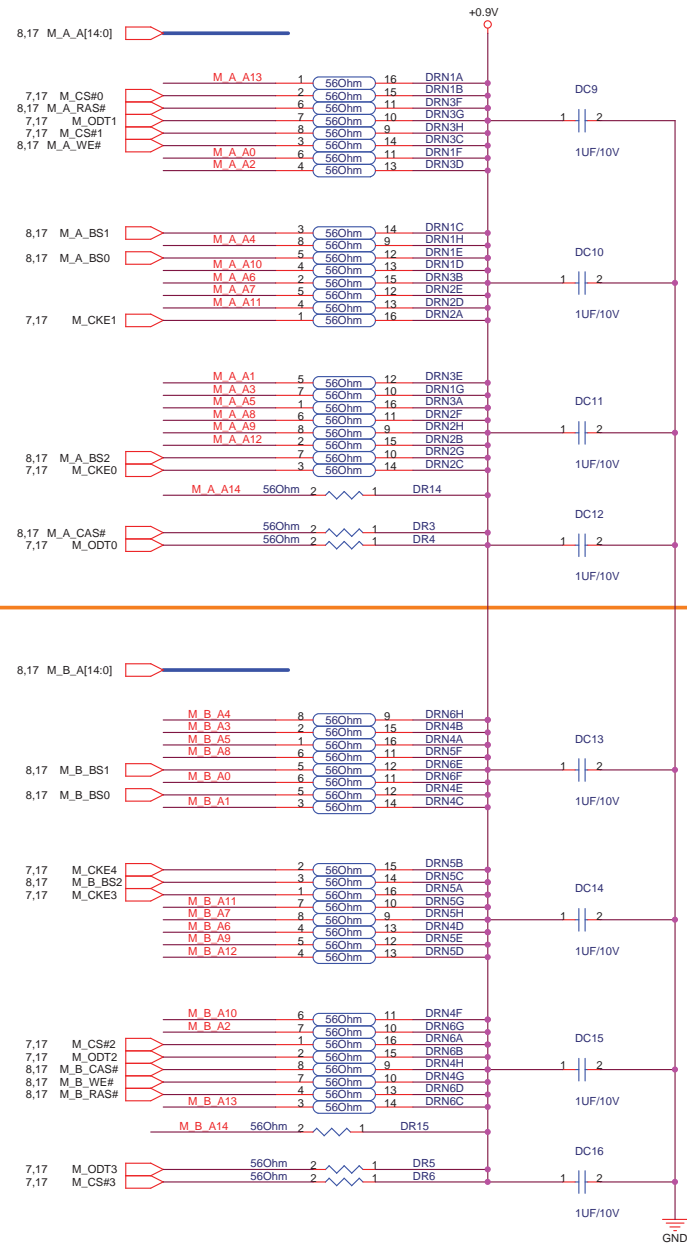
ASUS Title : SB-ICH9M(2)

ASUSTek COMPUTER INC. NB6 Engineer: Mike Lee

Size Project Name
Custom 297V Rev 2.0C

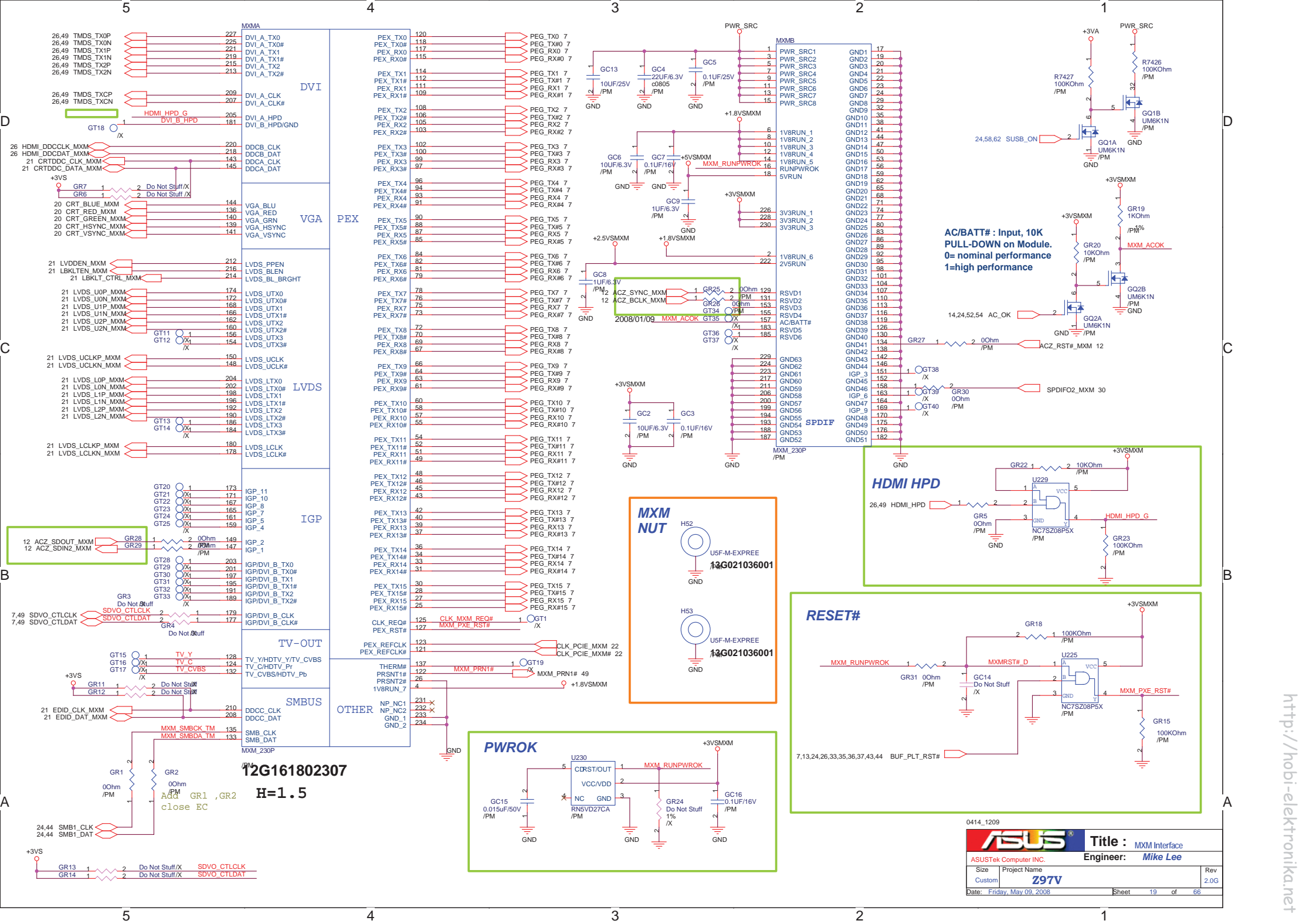
Date: Friday, May 09, 2008 Sheet 13 of 66

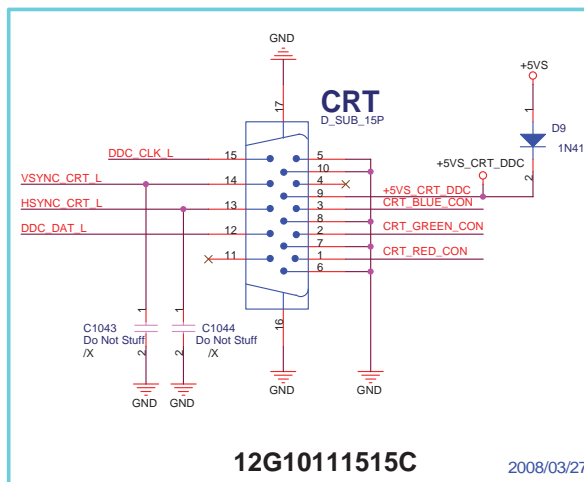
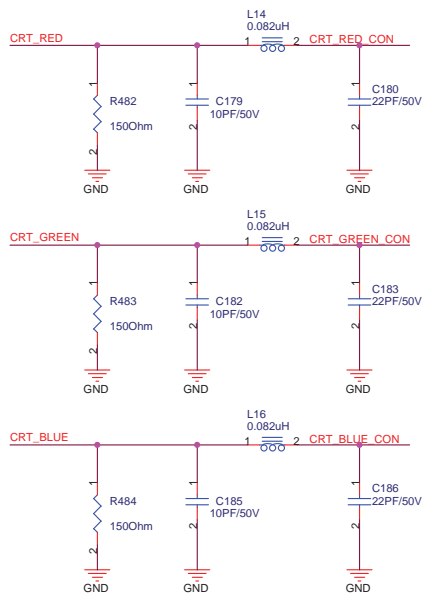




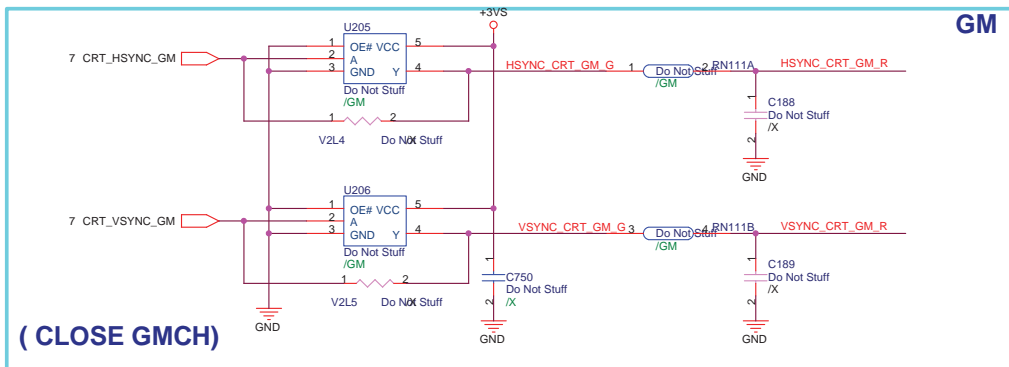
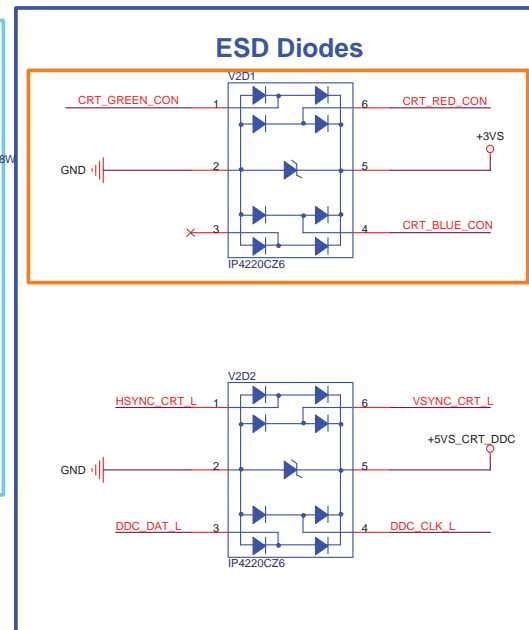
0414_1209

ASUS		Title : DDR2 TERMINATION	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size Custom	Project Name Z97V	Rev 2.0G	
Date: Friday, May 09, 2008	Sheet	18	of 66

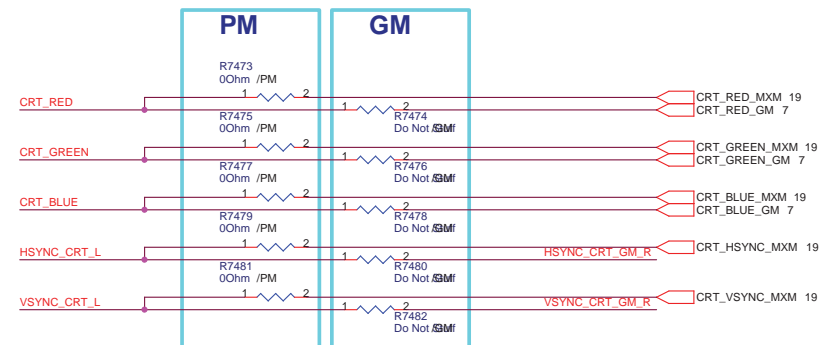
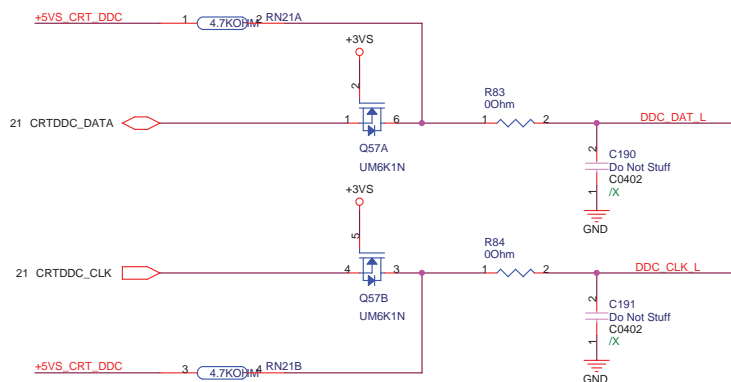




12G10111515C
CRT Connector



(CLOSE GMCH)

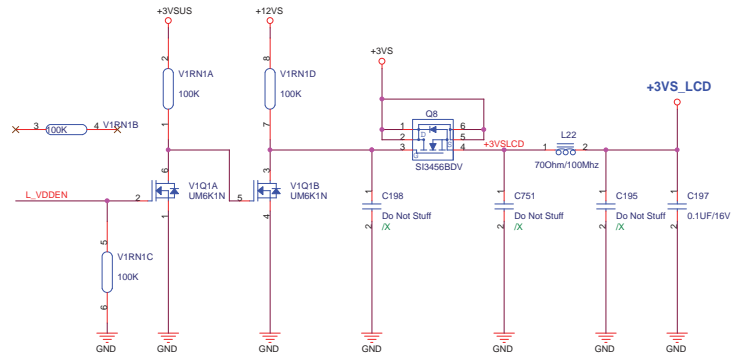


0414_1209

ASUS		Title : CRT Conn & MUX	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet 20 of 66	

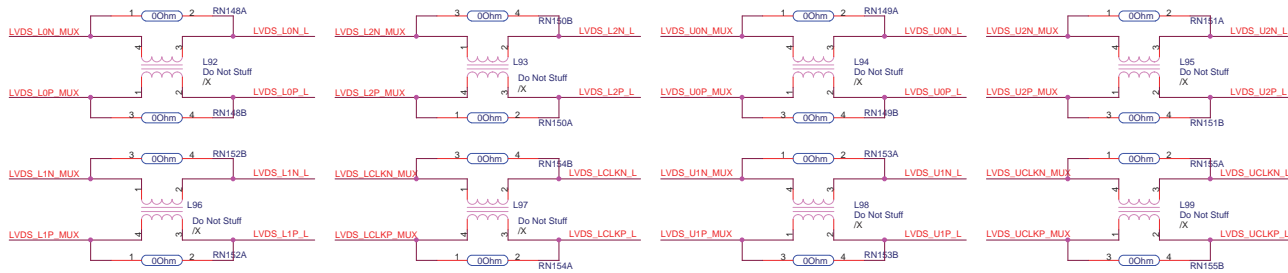
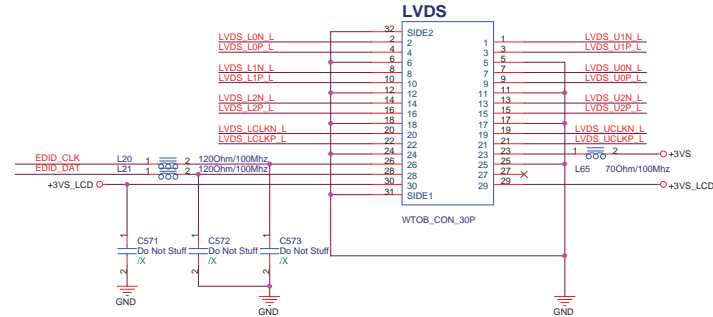
LCD Power

3-3.6V S0-S1M:410 mA(500 mA Max.)

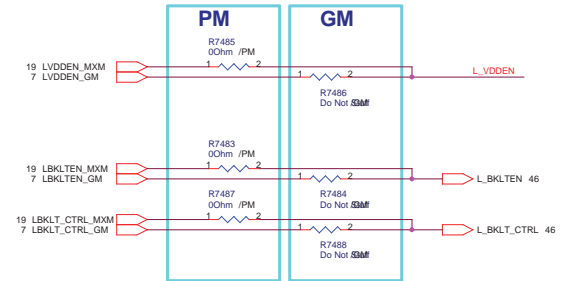


LCD LVDS Connector

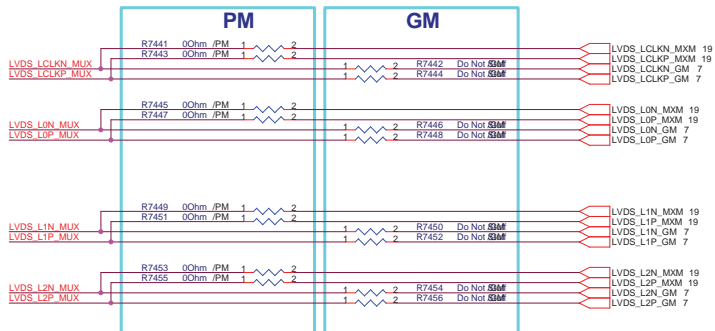
Cable Requirement:
Impedance: 100 ohm +/- 10%
Length Mismatch <= 10 mils
Twisted Pair(Not Ribbon)
Maximum Length <= 16"



LCD VCC / BL SIGNAL



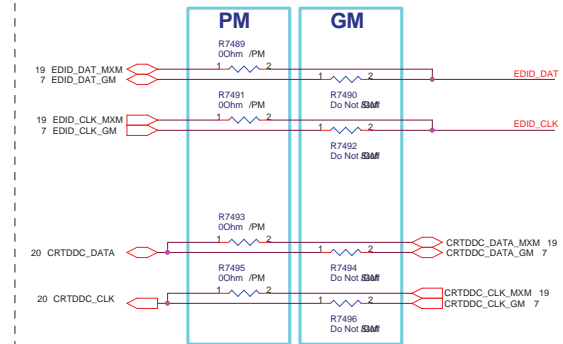
LCD IMAGE SIGNAL



LOWER CHANNEL

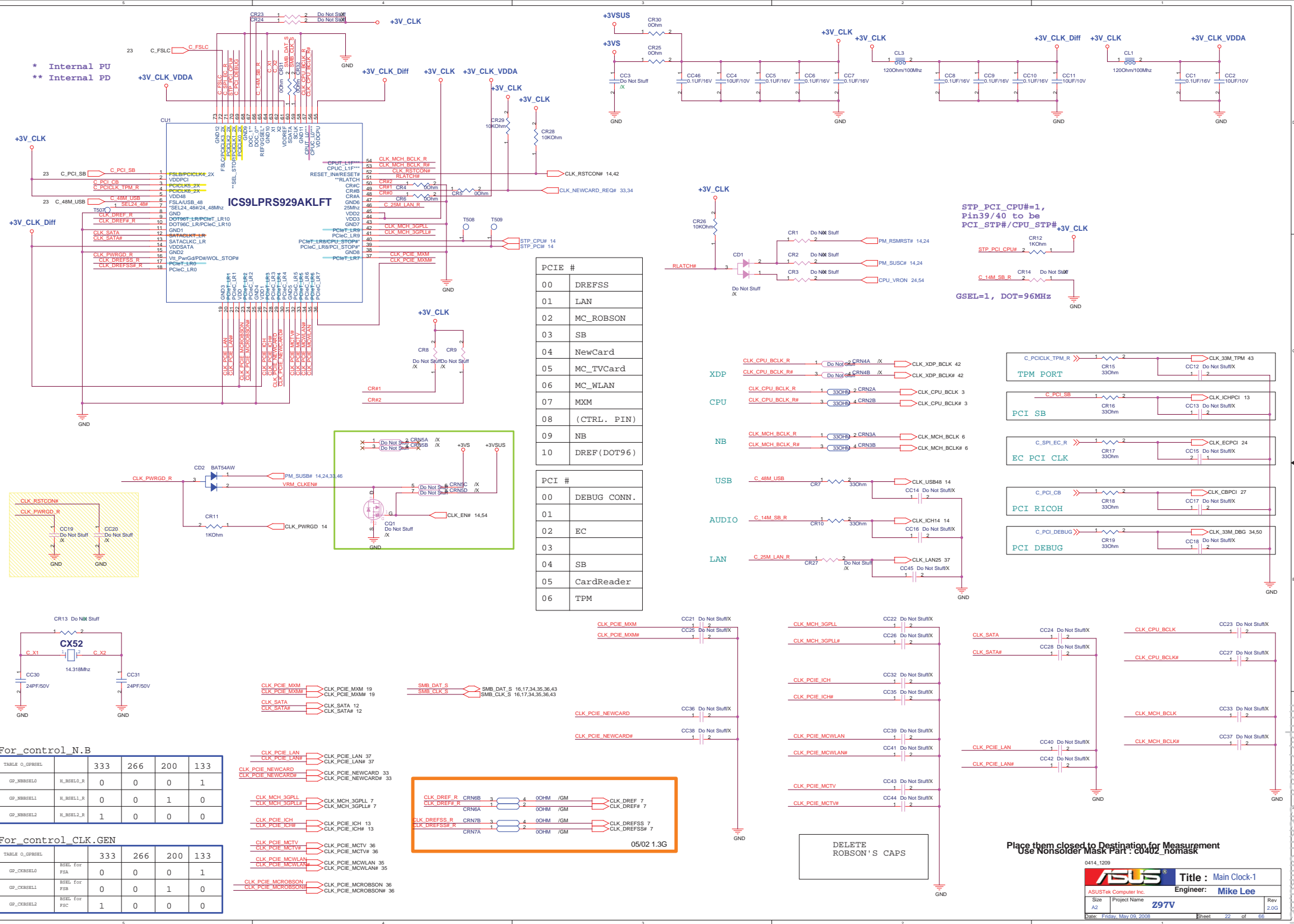
UPPER CHANNEL

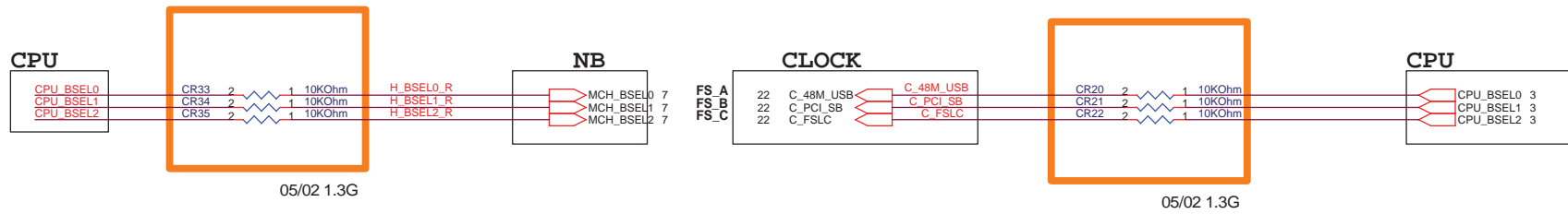
LCD EDID / CRT DDC SIGNAL



0414_1209

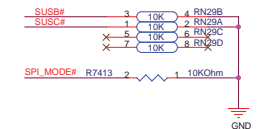
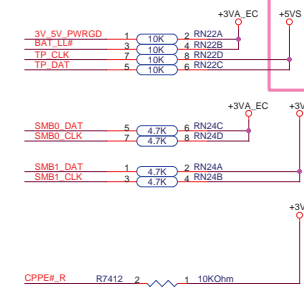
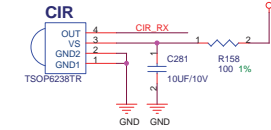
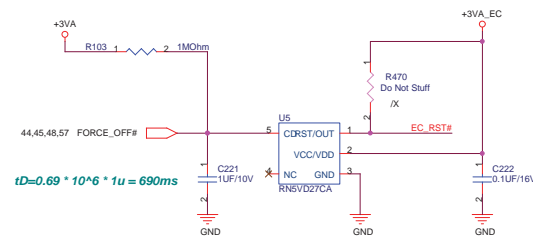
ASUS		Title : LVDS Conn & MUX.	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
C	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet 21 of 66	





CLK Trapped by CPU's BSEL

HBSEL2	HBSEL1	HBSEL0	FSB
0	0	1	133MHz
0	1	0	200MHz
0	0	0	266MHz
1	0	0	333MHz

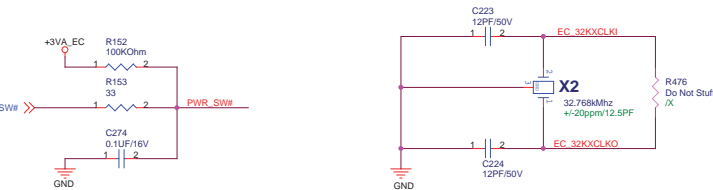


STRAPPING TP_SPI (GPXOA00)

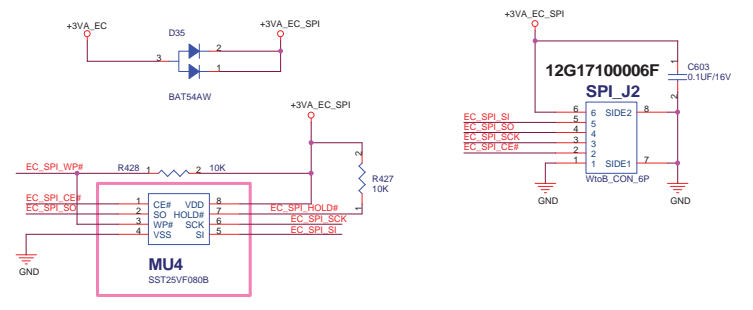
TP_SPI: SPI flash mode

0: select SPI flash mode (need external pull-low)

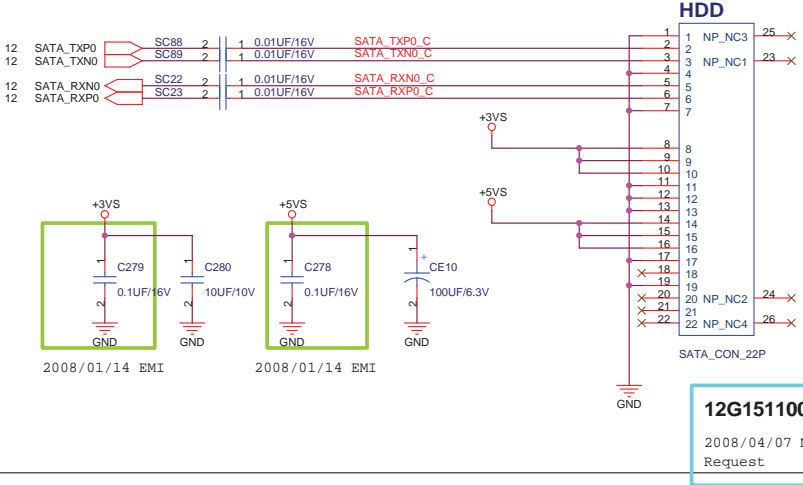
1: select ISA flash mode (Power-On Default)



SPI Flash ROM



SATA HDD Connector



SATA ODD Connector

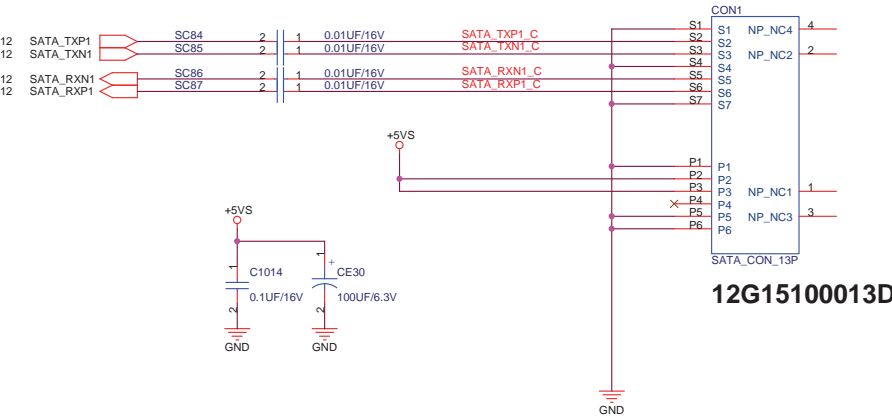
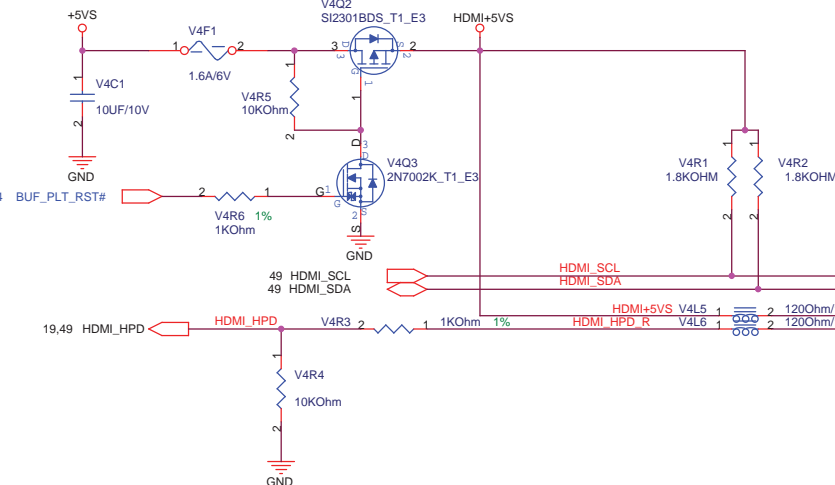
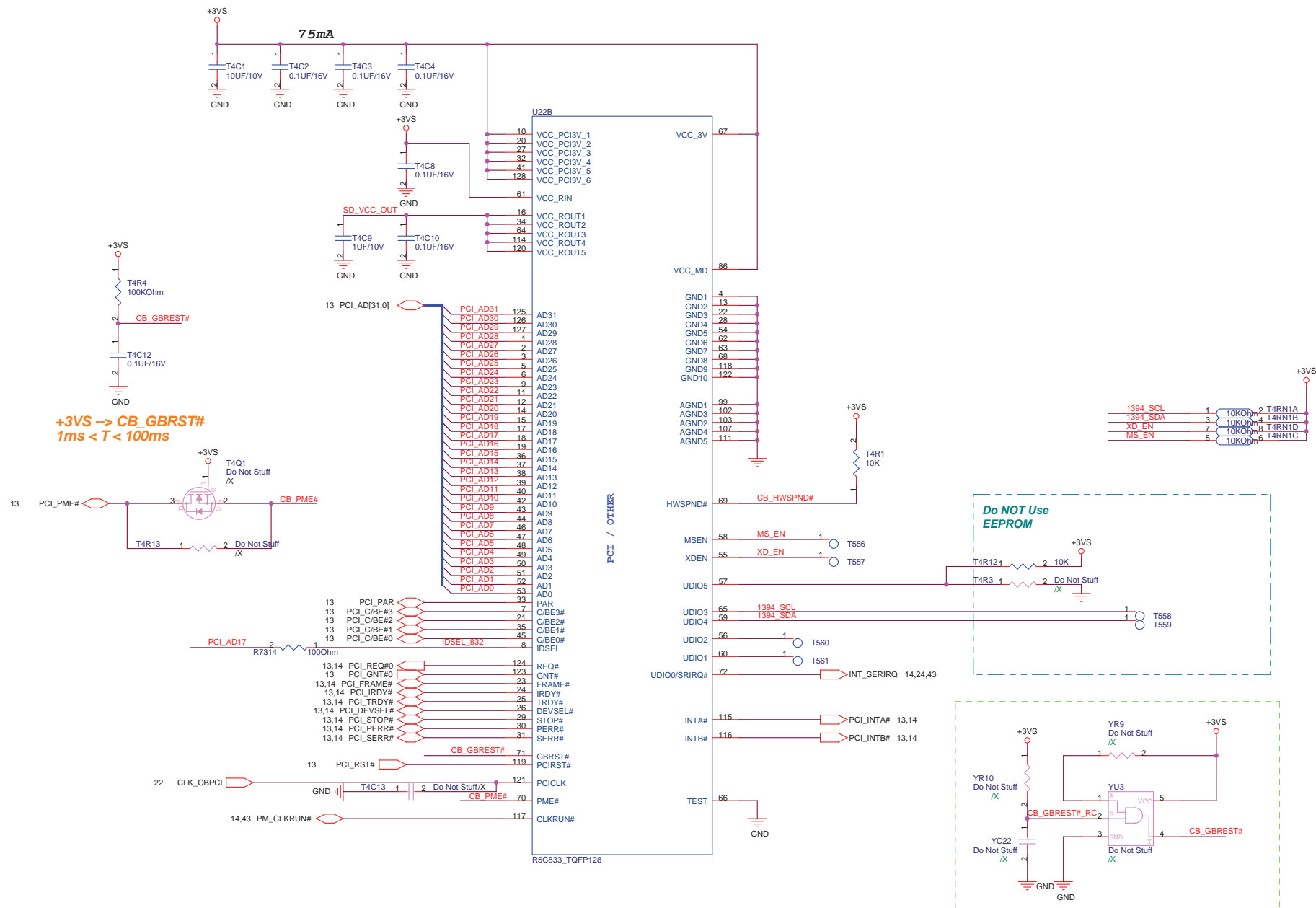


Figure 1 is a schematic diagram of the 10GbE PHY, showing four differential signal paths. Each path consists of a driver, a transformer, and a receiver.

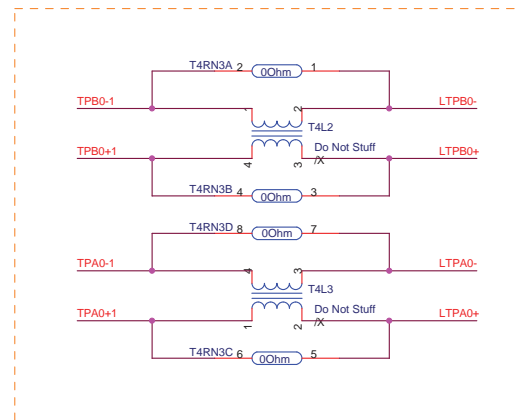
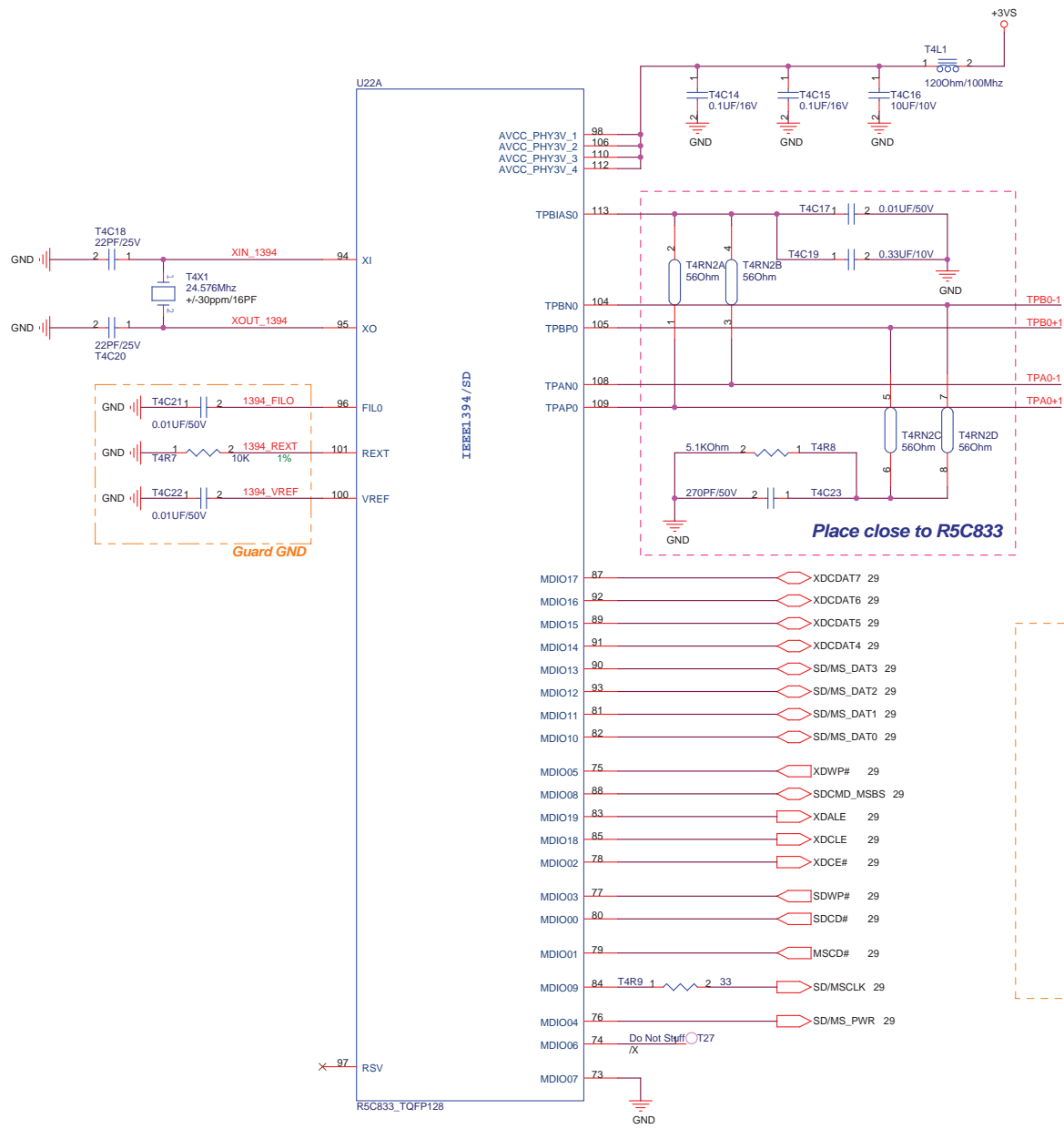
- Path 1 (TX2P/TX2N):** Driver RN165A (pins 2, 1, 0Ohm) connected to transformer V4L1 (90Ohm/100Mhz /X). Receiver RN165B (pins 4, 3, 0Ohm) outputs TX2P L and TX2N L.
- Path 2 (TX1P/TX1N):** Driver RN166A (pins 2, 1, 0Ohm) connected to transformer V4L2 (90Ohm/100Mhz /X). Receiver RN166B (pins 4, 3, 0Ohm) outputs TX1P L and TX1N L.
- Path 3 (TX0P/TX0N):** Driver RN167A (pins 2, 1, 0Ohm) connected to transformer V4L3 (90Ohm/100Mhz /X). Receiver RN167B (pins 4, 3, 0Ohm) outputs TX0P L and TX0N L.
- Path 4 (TXCP/TXCN):** Driver RN168A (pins 2, 1, 0Ohm) connected to transformer V4L4 (90Ohm/100Mhz /X). Receiver RN168B (pins 4, 3, 0Ohm) outputs TXCP L and TXCN L.

The diagram also shows input signals for each path: 19,49 TMDS_TX2P, 19,49 TMDS_TX2N, 19,49 TMDS_TX1P, 19,49 TMDS_TX1N, 19,49 TMDS_TX0P, 19,49 TMDS_TX0N, 19,49 TMDS_TXCP, and 19,49 TMDS_TXCN.

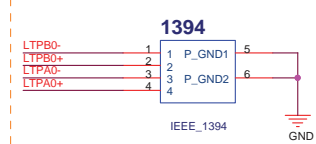




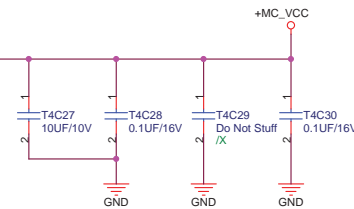
0414_1209

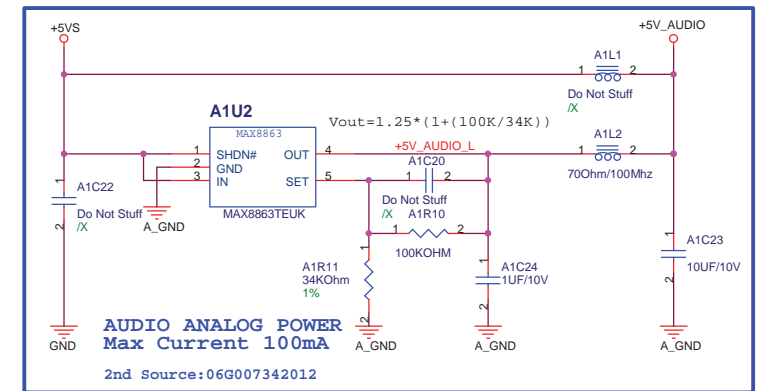
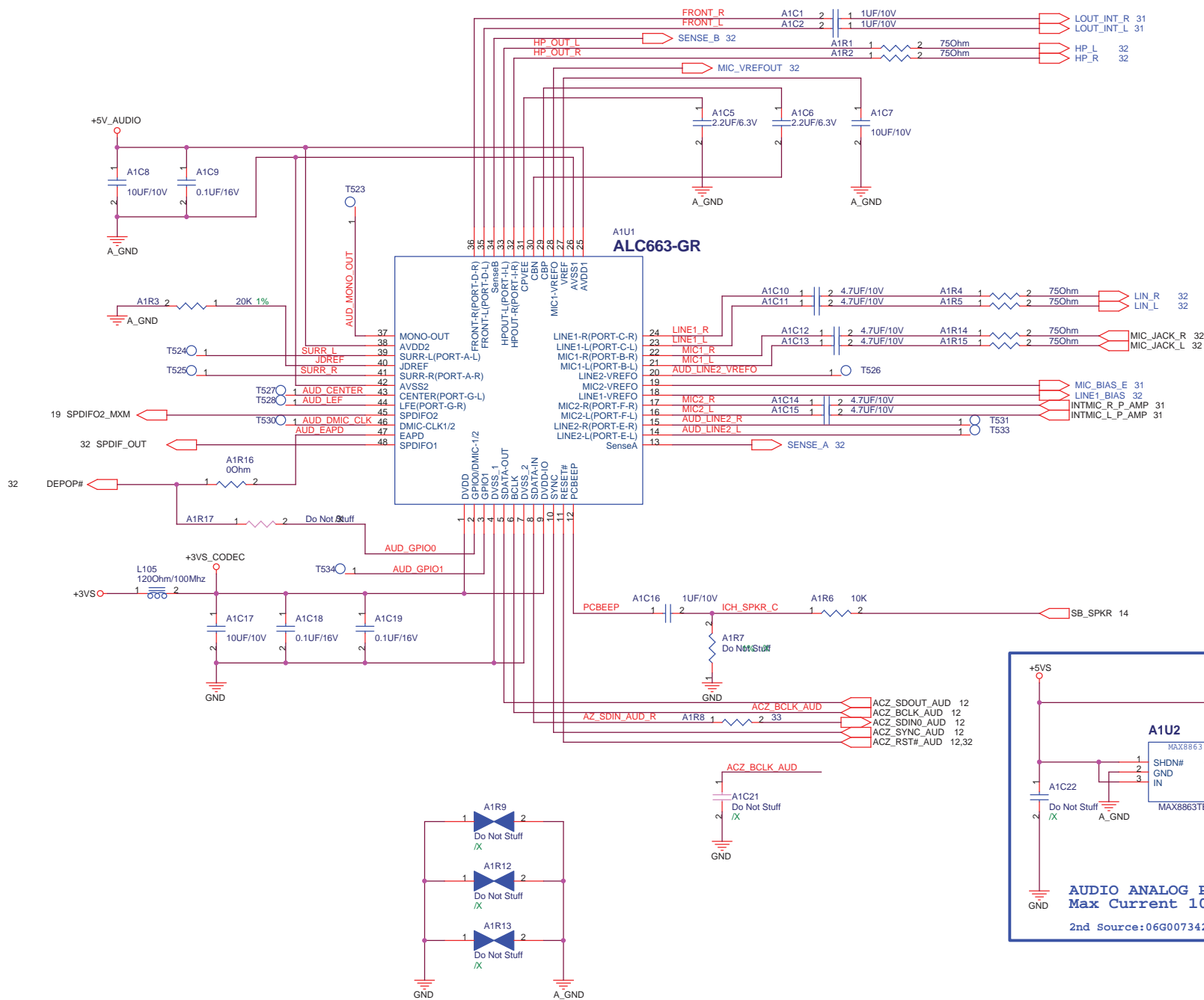


IEEE 1394 Connector

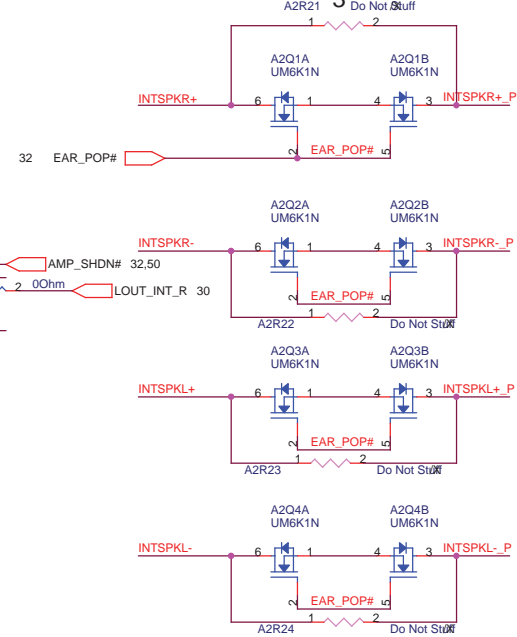
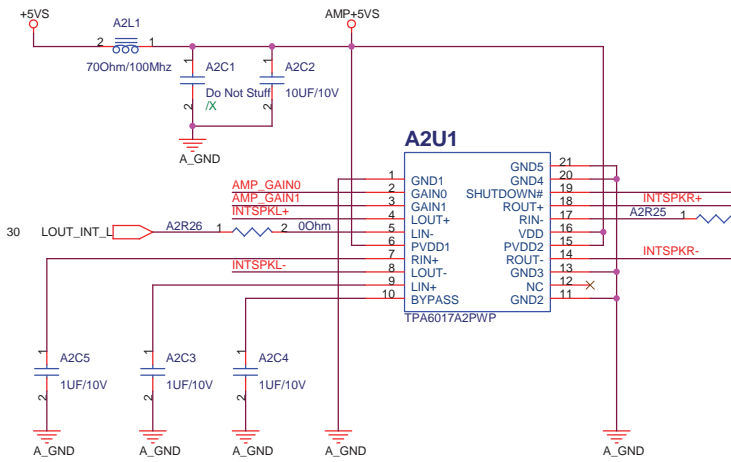


0414_1209



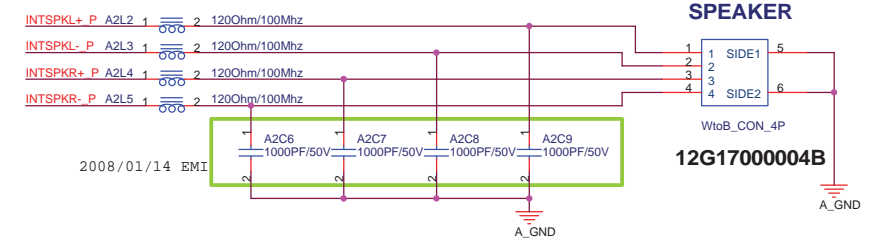
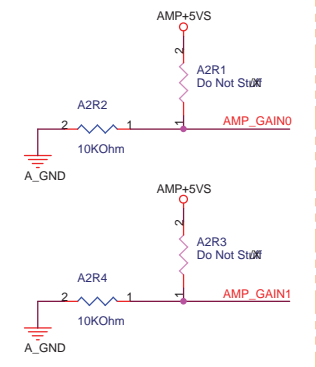


Audio Amp.



GAIN Control

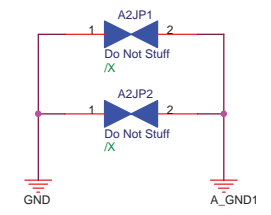
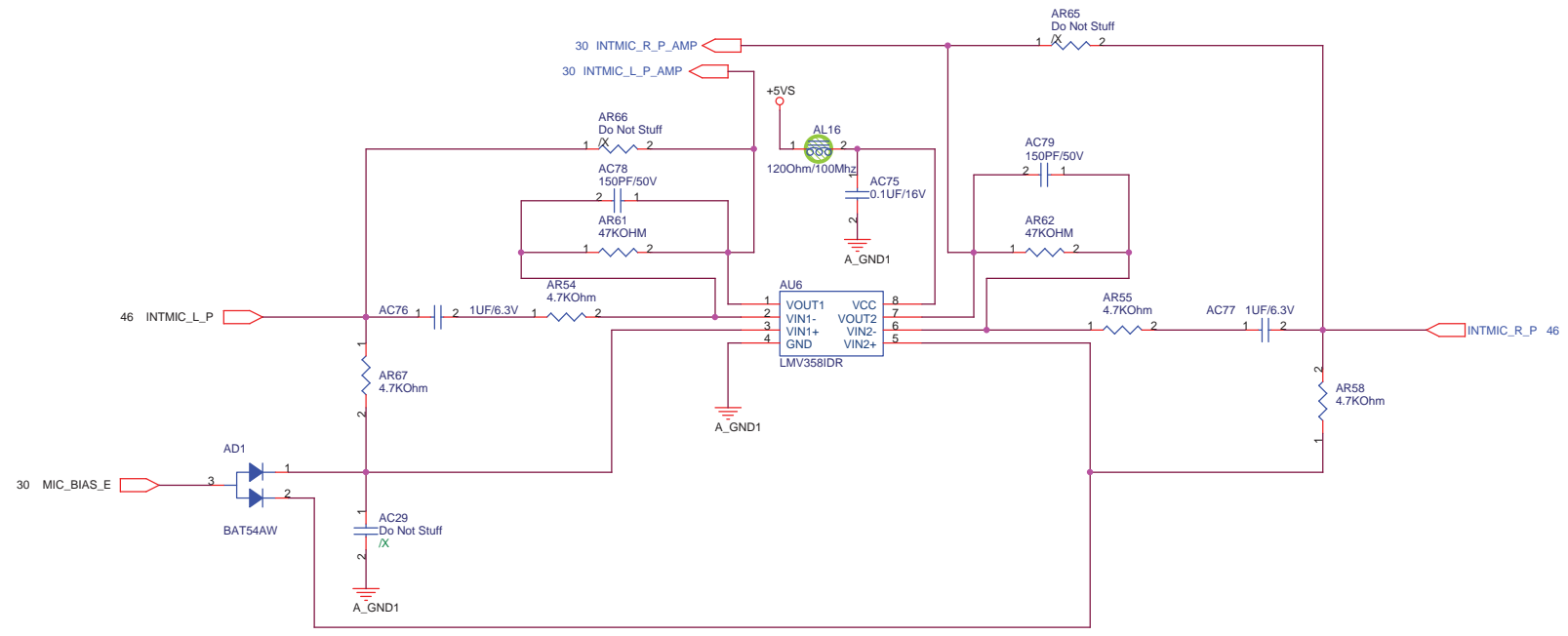
GAIN1	GAIN0	
0	0	6db
1	0	10db
0	1	15.6db
1	1	21.6db

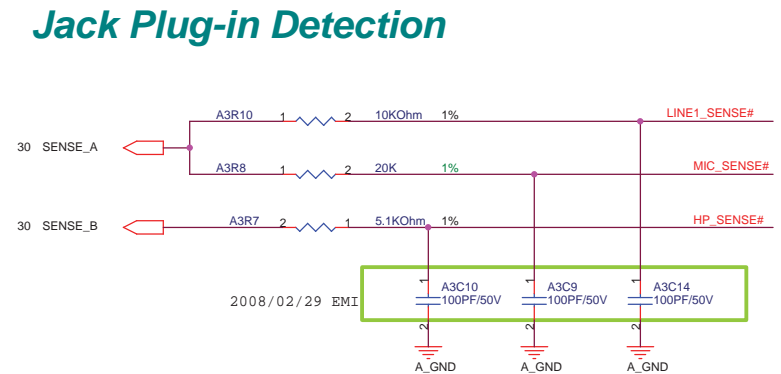
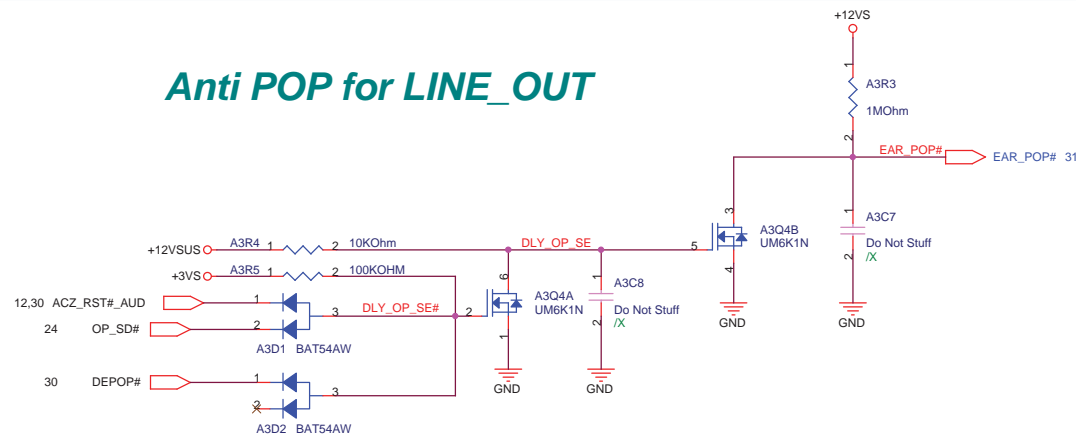
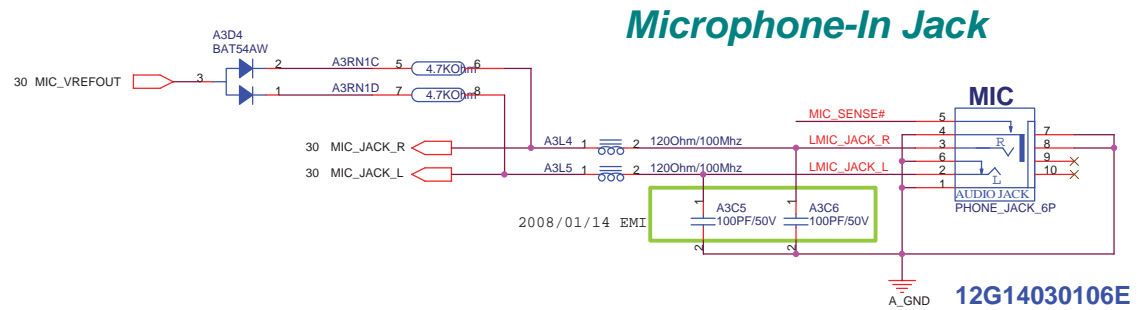
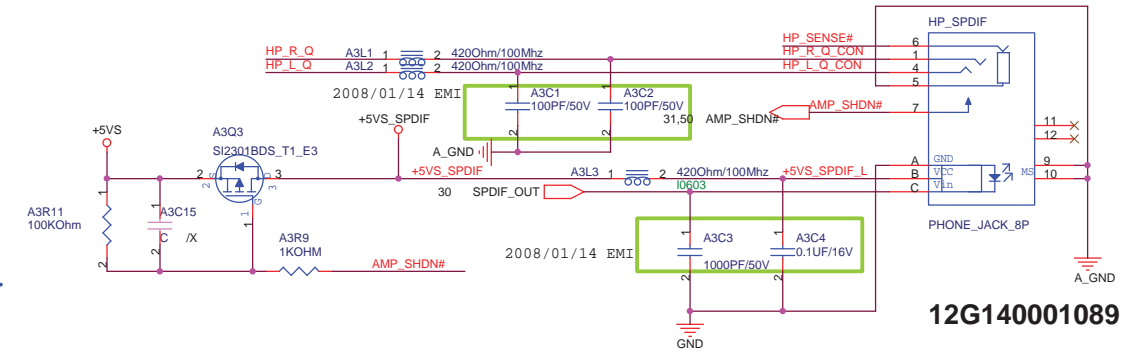
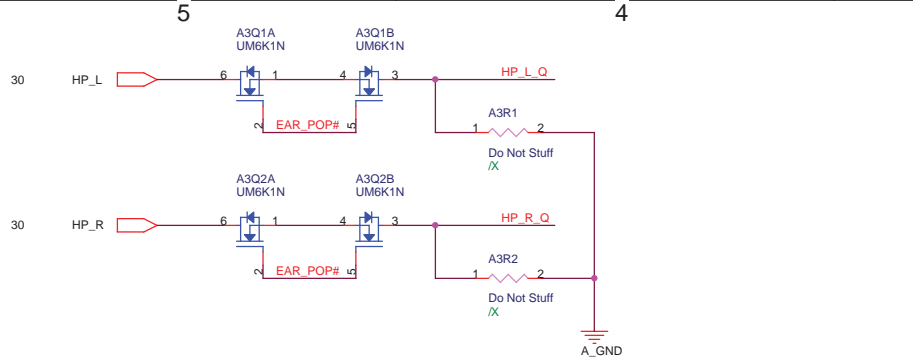


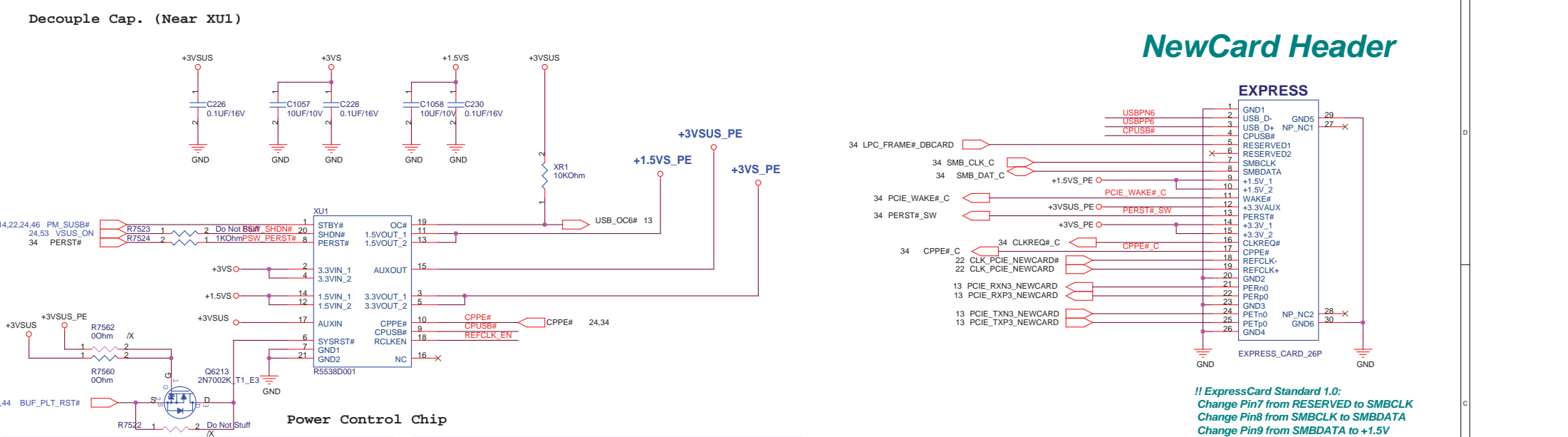
Internal MIC Amp.

FL = 33.86kHz, FH = 22.5kHz

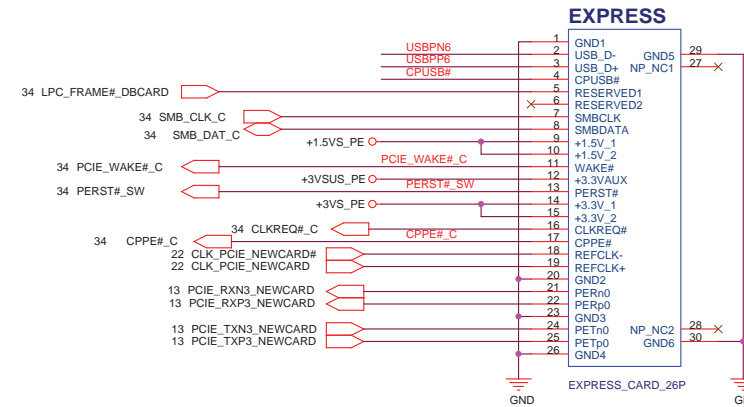
Place Near INTMIC Connector





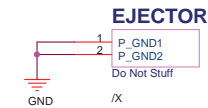


NewCard Header



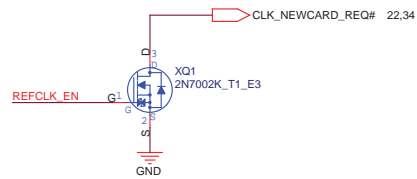
!! ExpressCard Standard 1.0:
Change Pin7 from RESERVED to SMBCLK
Change Pin8 from SMBCLK to SMBDATA
Change Pin9 from SMBDATA to +1.5V

NewCard Ejector

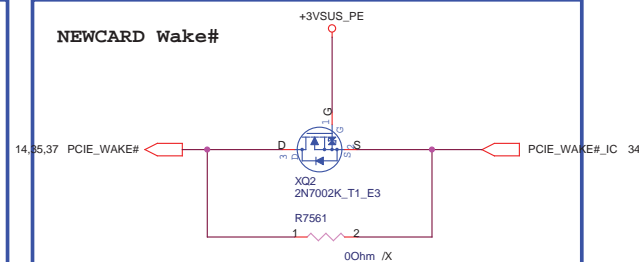


Do Not Stuff

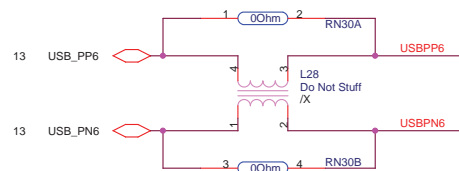
NEWCARD CLK Request



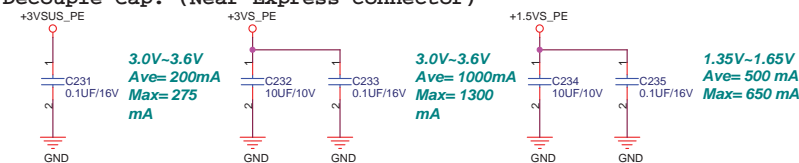
NEWCARD Wake#



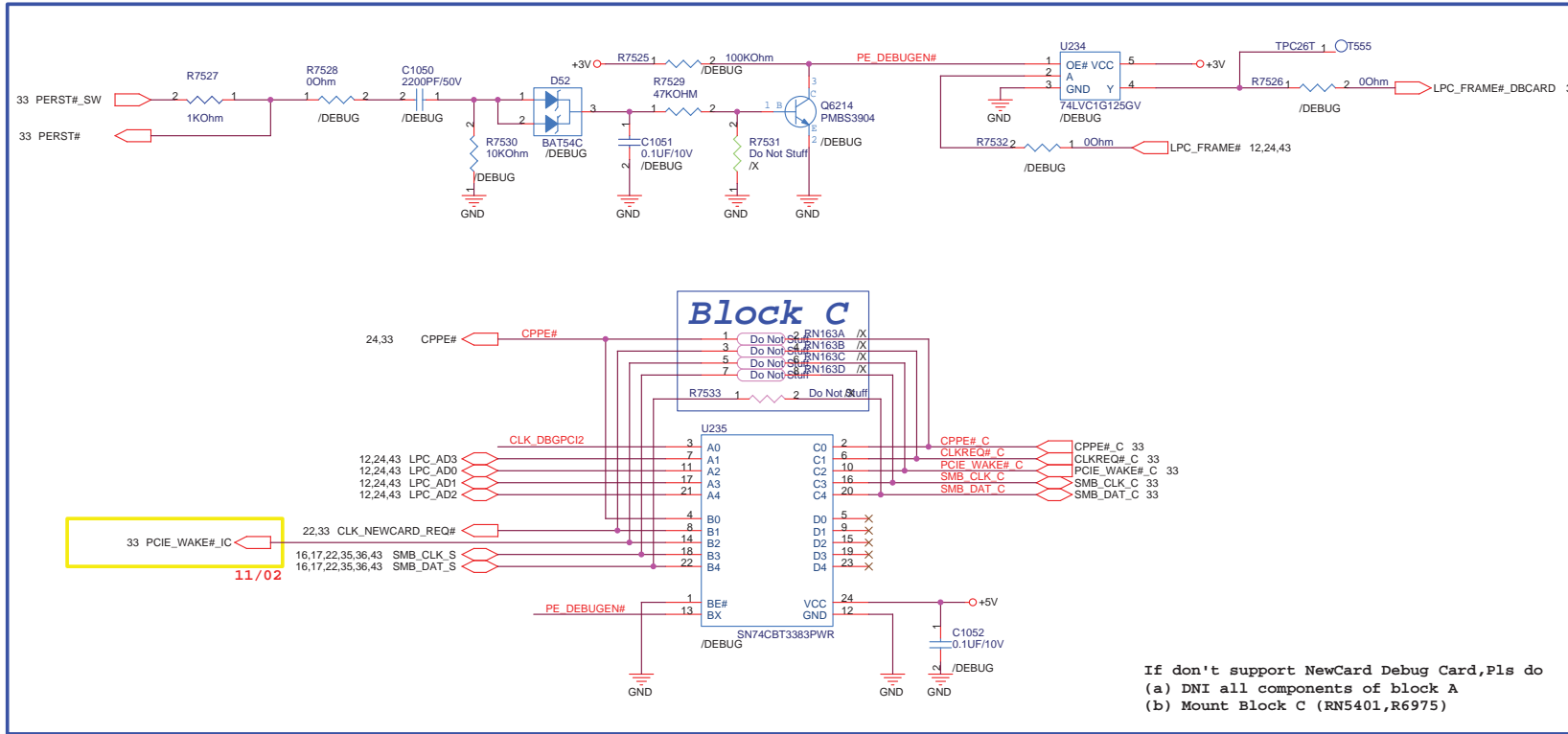
USB CHOKE FOR EMI



Decouple Cap. (Near Express connector)



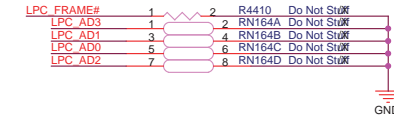
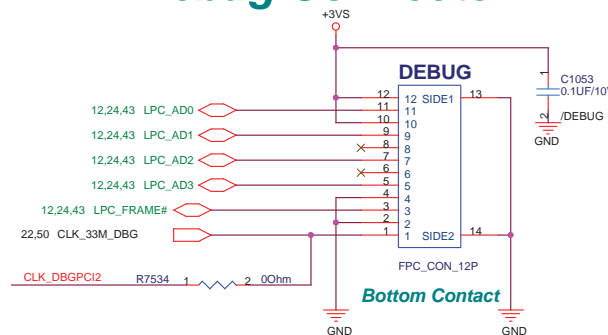
Block A



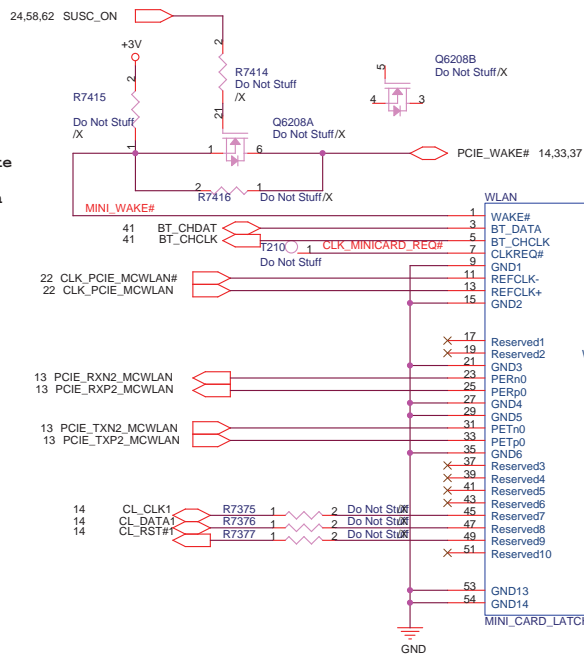
Debug Connector

For PCMCIA Debug Card

If support NewCard Debug Card,
Pls don't mount all
components.

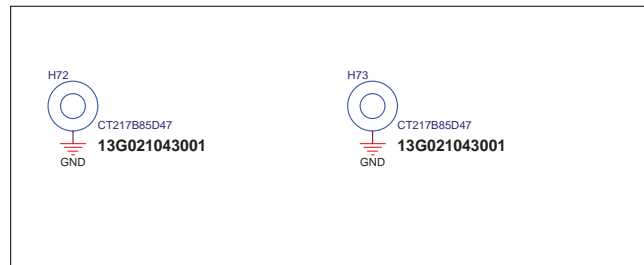
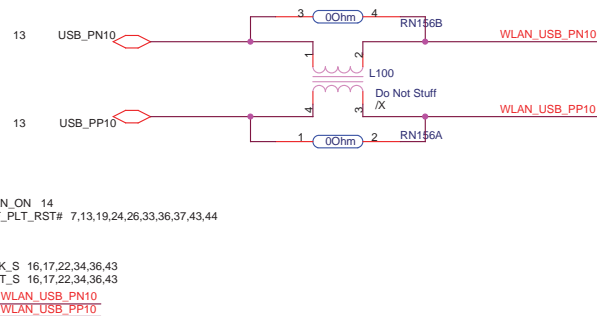


PCIE Wake
system
function

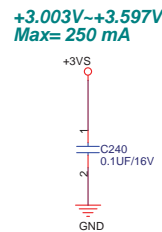
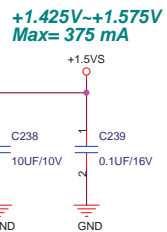
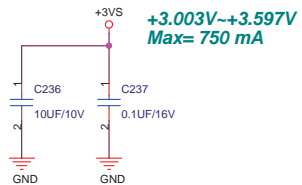


12G030000523

H = 5.75mm



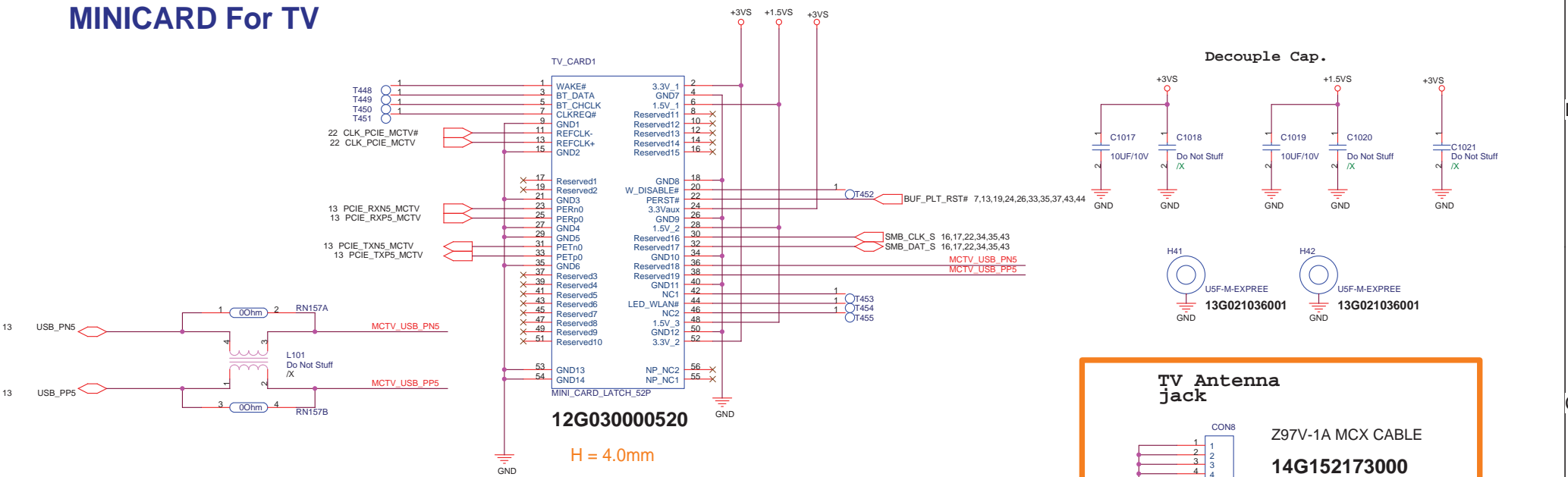
Decouple Cap. (Near WLAN)



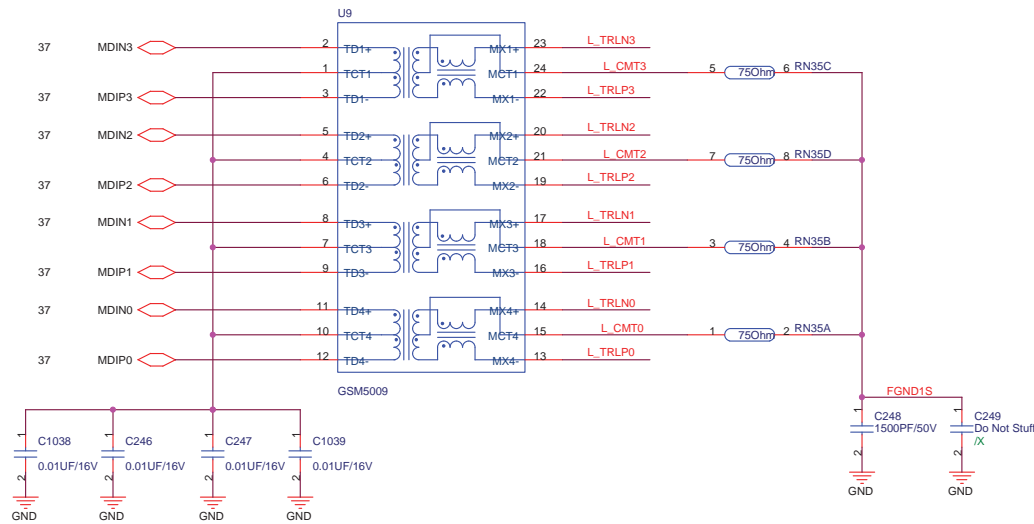
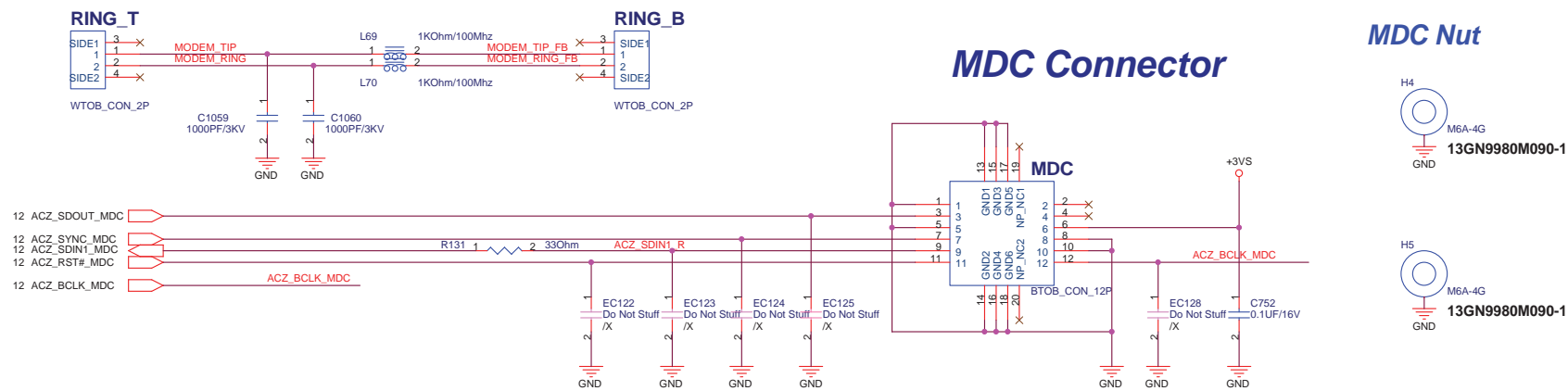
0414_1209

ASUS		Title : MINICARD-1	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	35 of 66

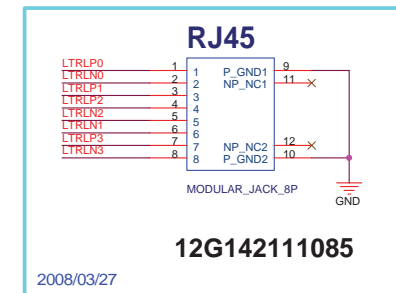
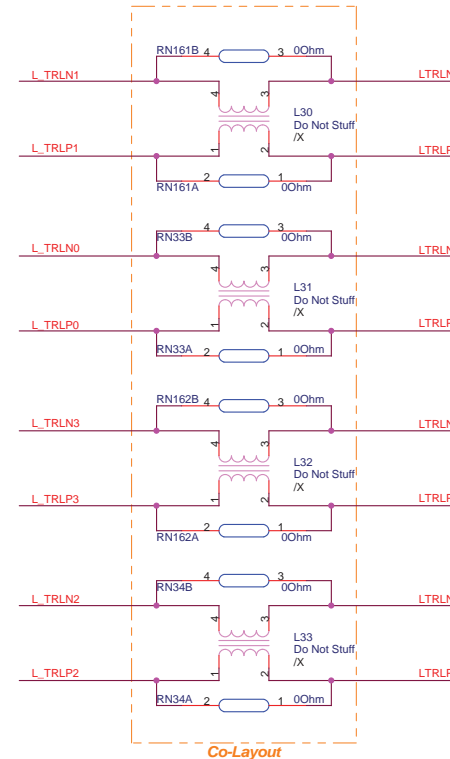
MINICARD For TV



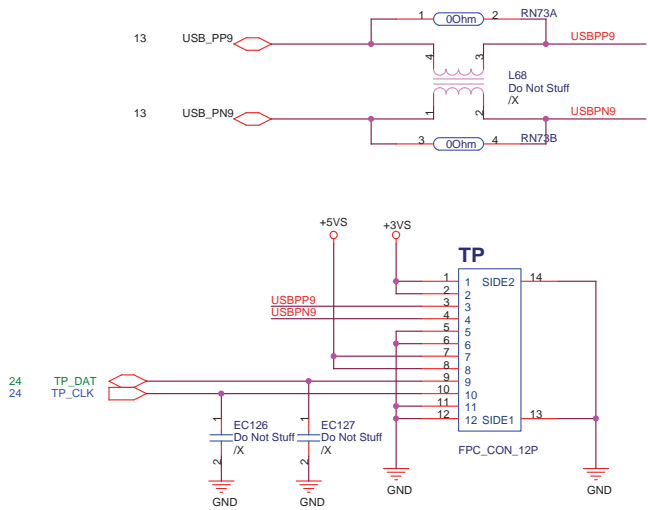




Giga LAN Transformer

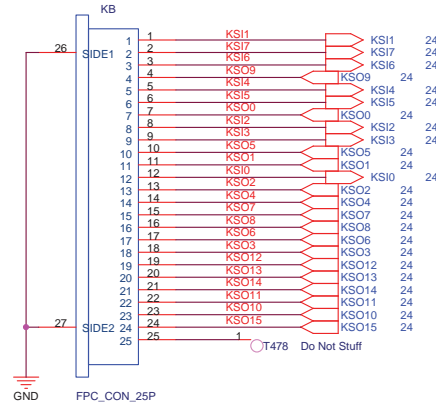


0414_1209



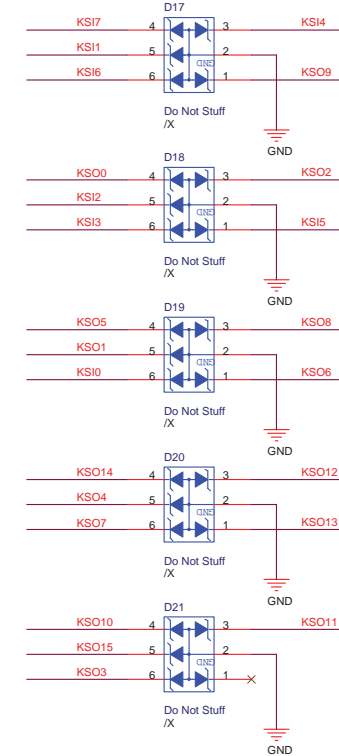
Fingerprint & TouchPad Connector

Keyboard Connector



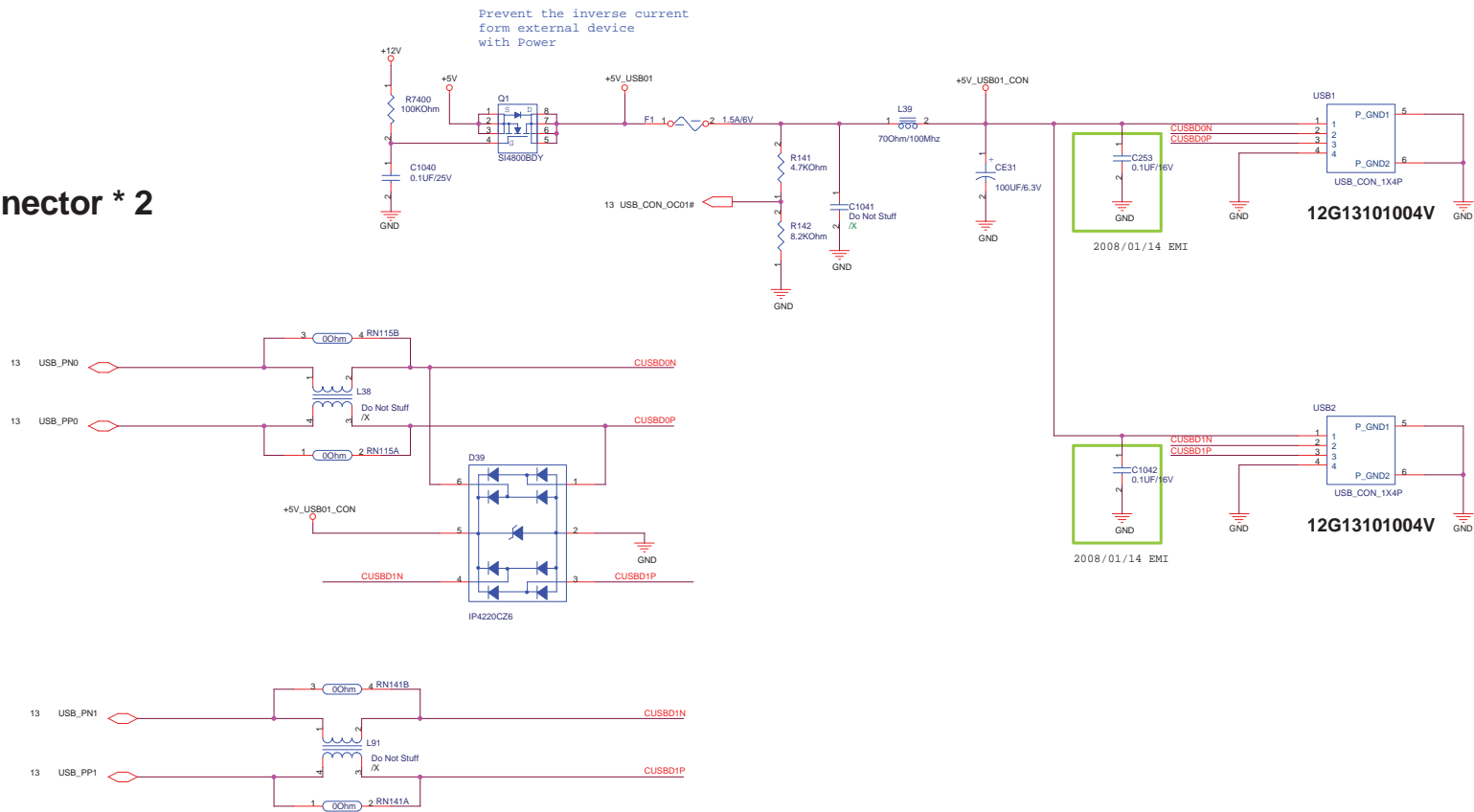
12G182002502

FOR EMI/ESD

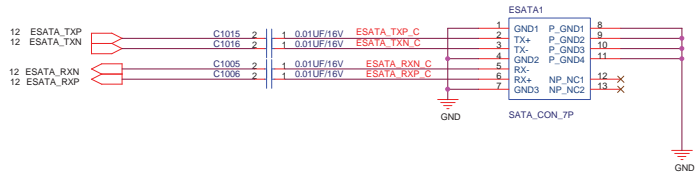


0414_1209

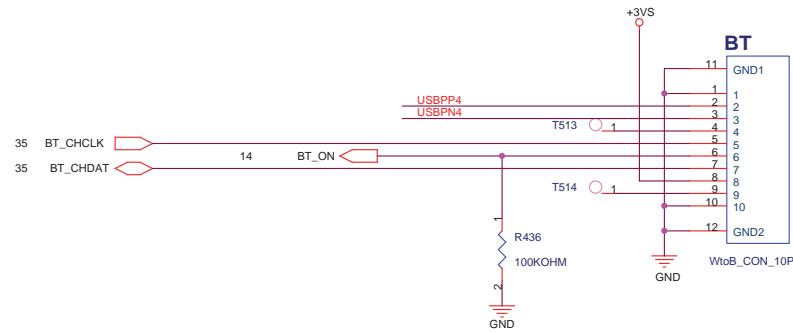
USB Connector * 2



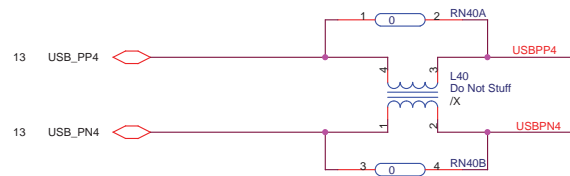
ESATA Connector



Bluetooth Connector



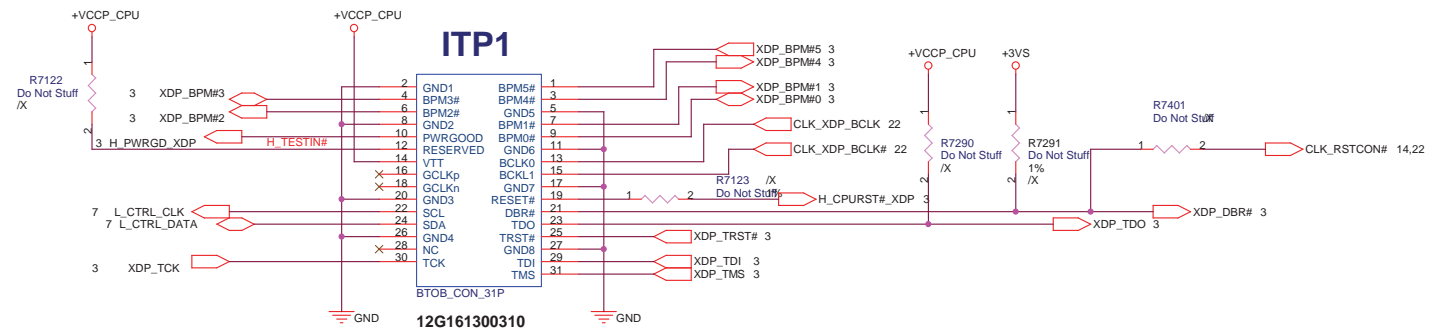
BT_OFF# : (connect to GPO, push-pull, default High)
 0 => BT Disabled
 1 => BT Enabled



0414_1209

ASUS		Title : Bluetooth Conn.	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	41 of 66

ITP



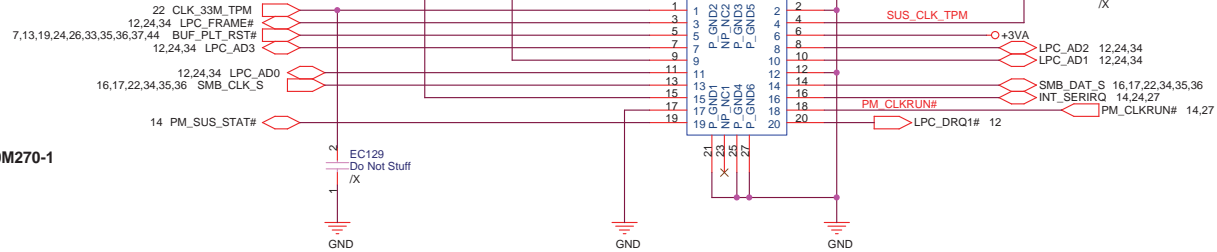
0414_1209

ASUS		Title : Debug Connector	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	42 of 66

TPM Nut



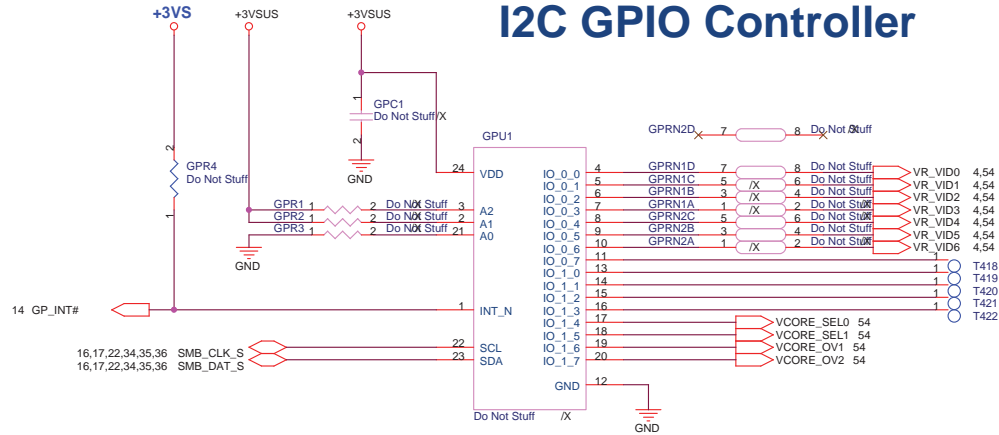
13GN7510M270-1



Pin 6: +3VA
Pin 13: SMB_CLK
Pin 14: SMB_DAT

TPM Module Connector

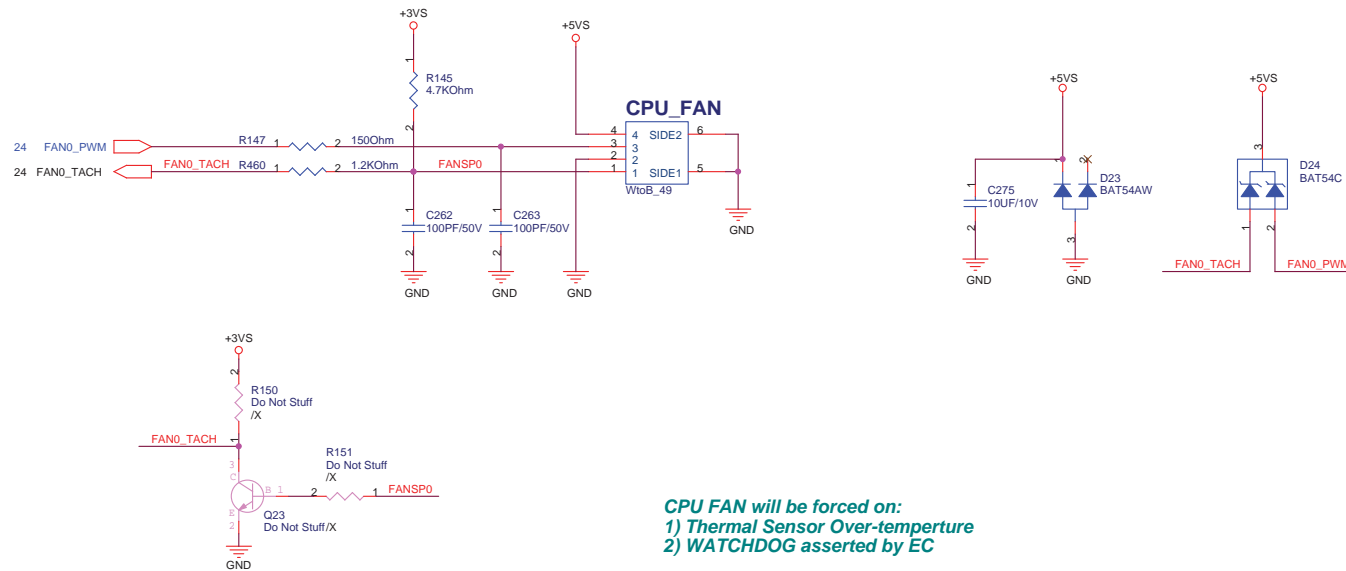
I2C GPIO Controller



0414_1209

		Title : TPM Connector	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size Custom	Project Name Z97V		Rev 2.0G
Date: Friday, May 09, 2008		Sheet 43 of 66	

CPU Fan Connector

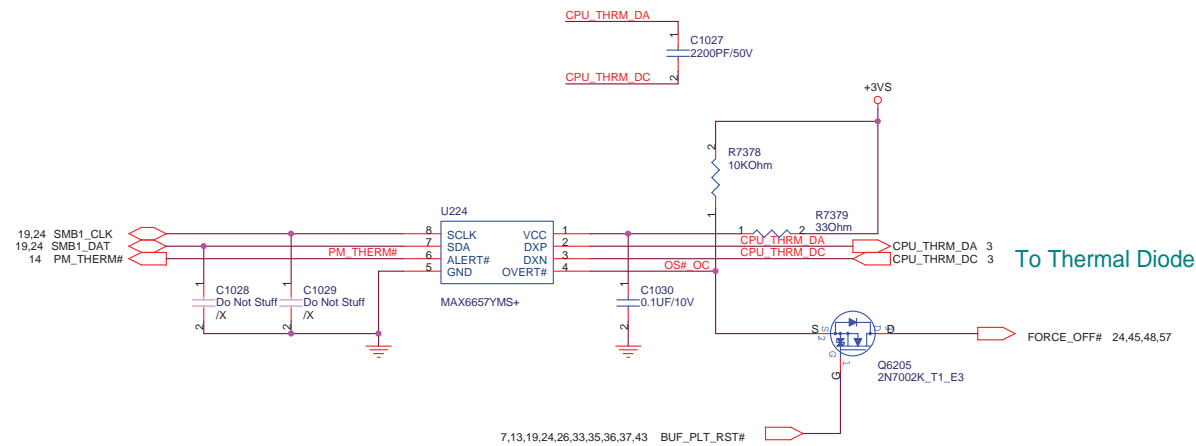


Route H_THERMDA and H_THERMDC in the same layer

15 mils
GND
10 mils
H_THERMDA(10 mils)
10 mils
H_THERMDC(10 mils)
10 mils
GND
15 mils
OTHER SIGNALS
Avoid FSB,Power

CPU FAN will be forced on:
1) Thermal Sensor Over-temperature
2) WATCHDOG asserted by EC

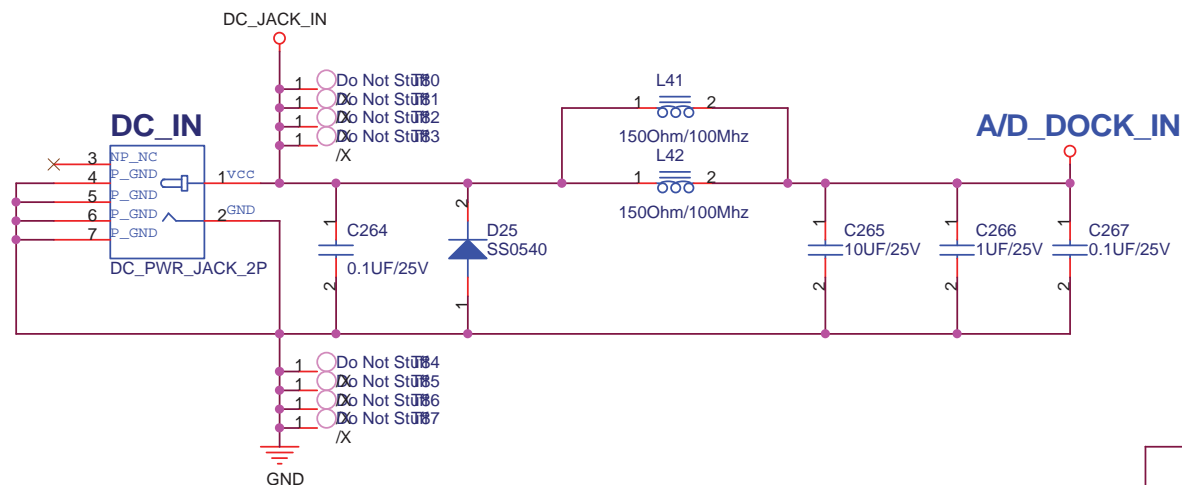
CPU Thermal Sensor



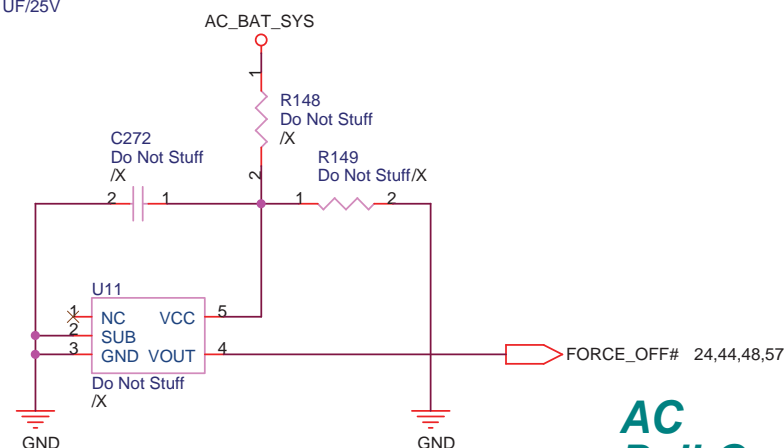
To Thermal Diode

SM Bus Address fix at:
1001 100x (98), Resolution : +/- 1 degree
0414_1209

DC-IN Connector

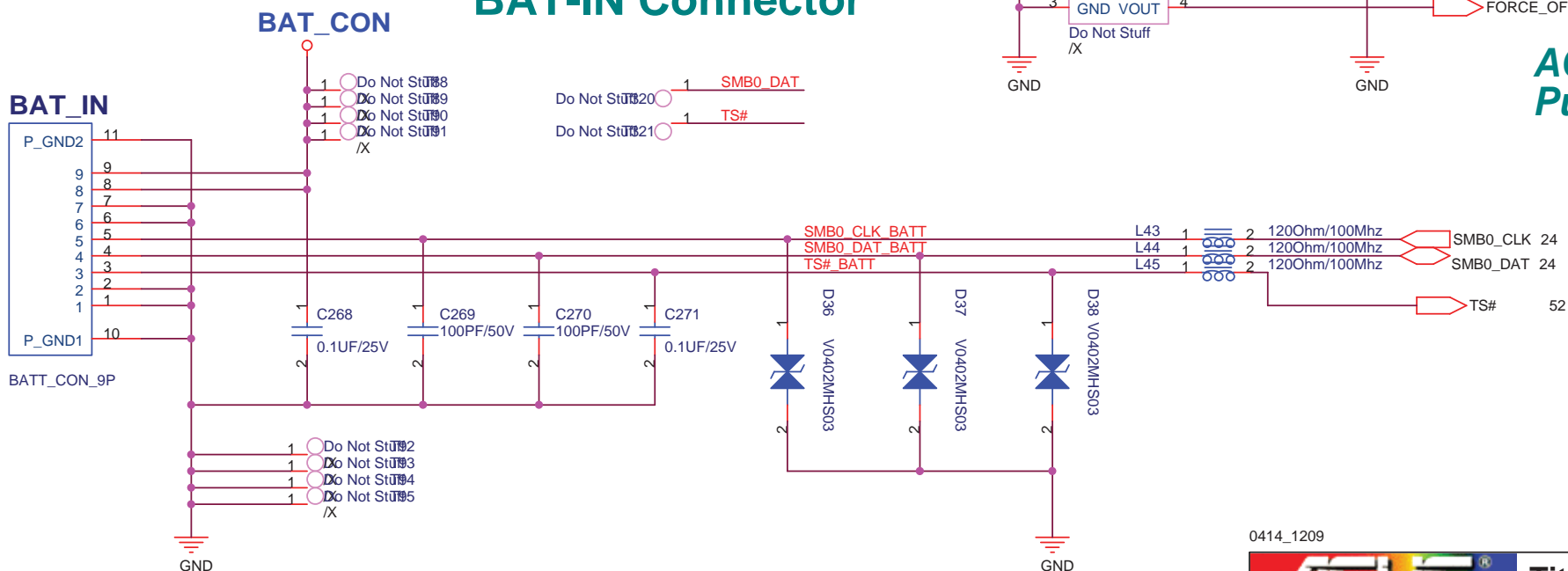


Without Battery & Pull out Adapter



AC Pull-Out

BAT-IN Connector



0414_1209



Title : DC IN & BAT IN

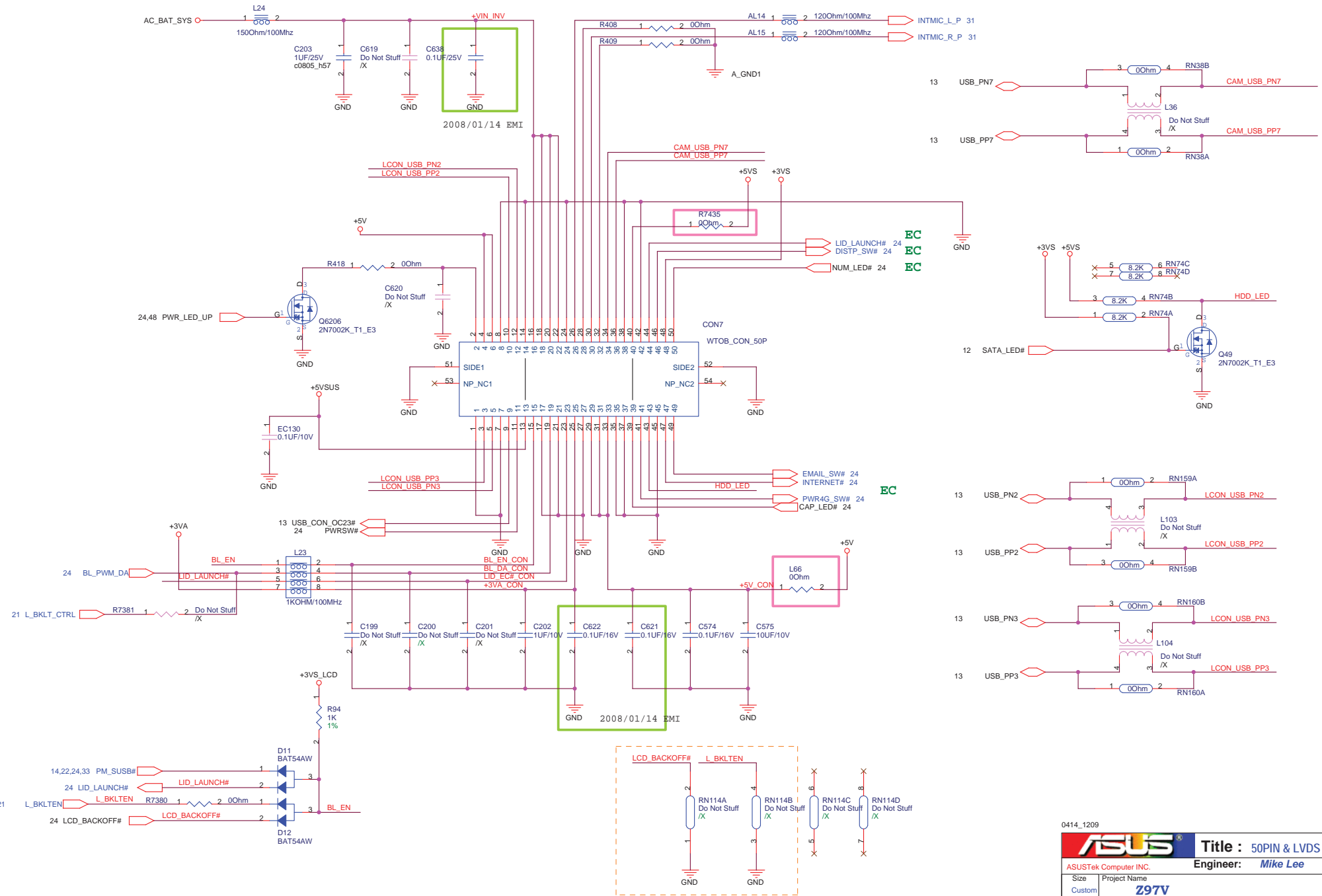
ASUSTek Computer INC.

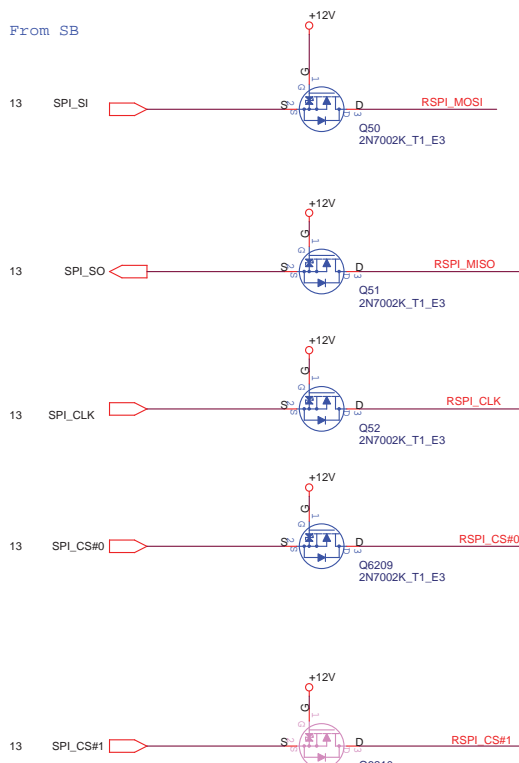
Engineer: *Tony Kao*

Size A4	Project Name Z97V	Rev 2.0G
Date: Friday, May 09, 2008		Sheet 45 of 66

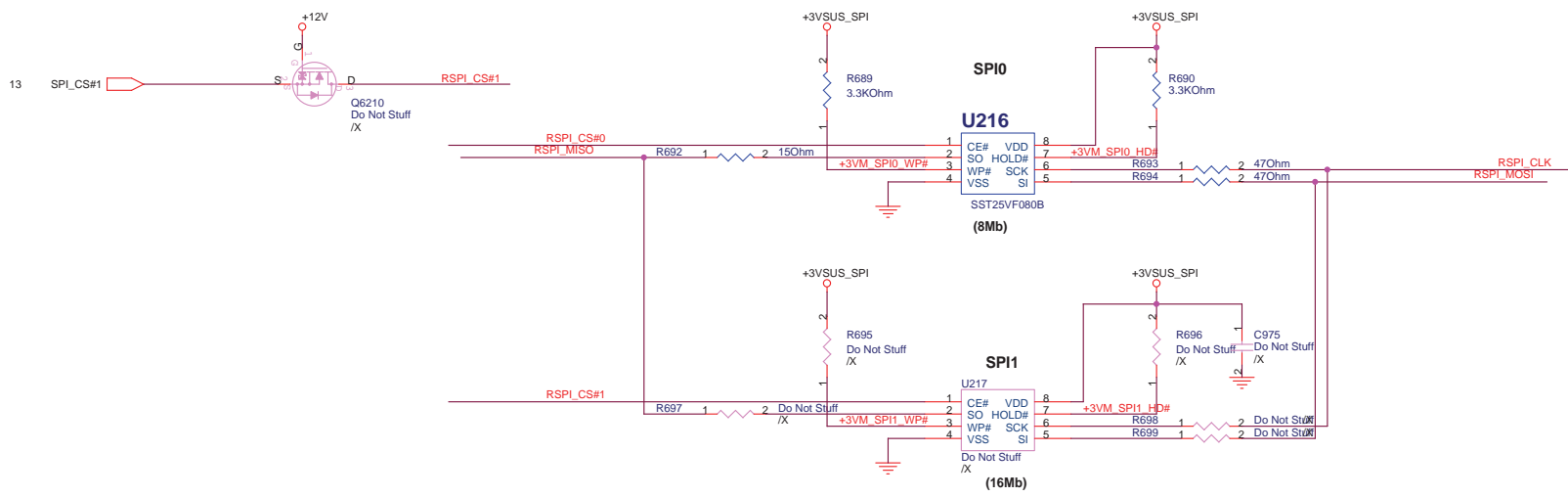
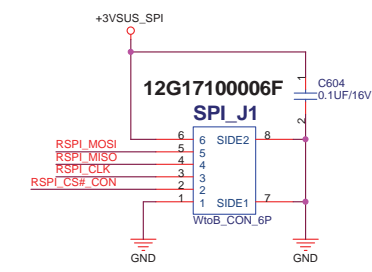
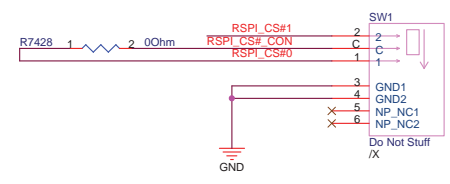
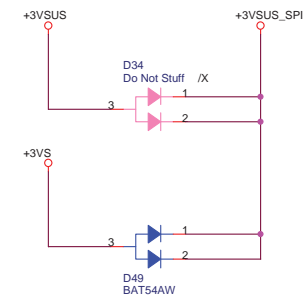
LCD Backlight Control

INVERTER Connector



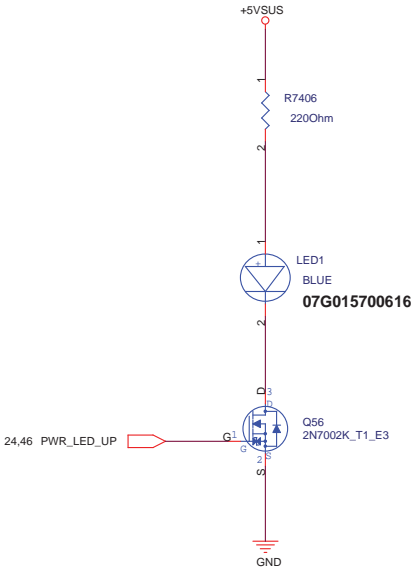


PROGRAMMING SELECT	Stuff SW1 (R7428 NU)		Stuff R7428 (SW1 NU)
	P1	P2	
PROGRAM SPI 0	ON	OFF	V
PROGRAM SPI 1	OFF	ON	X

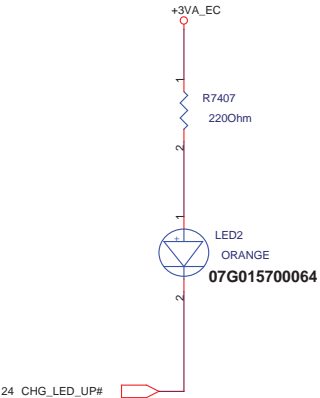


LED

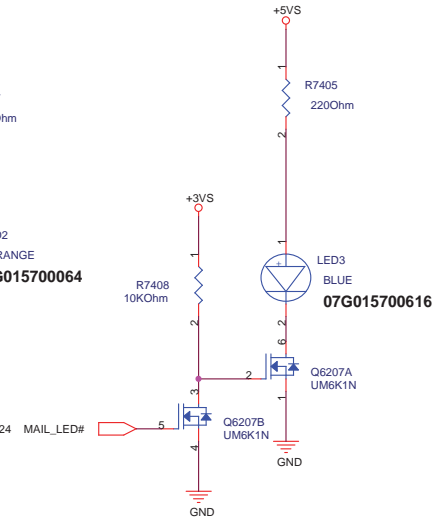
POWER LED



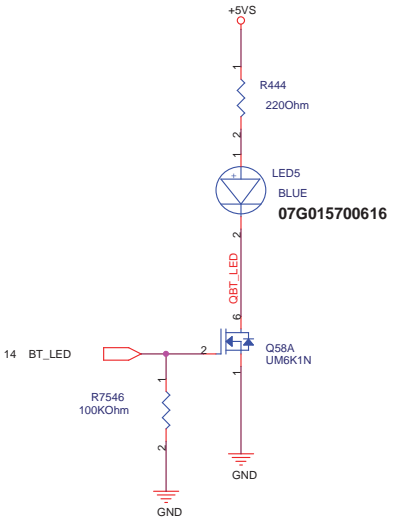
BATTERY LED



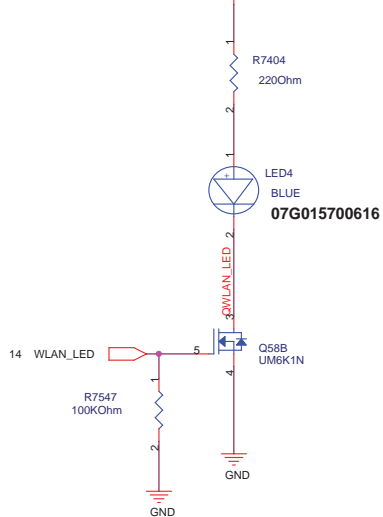
EMAIL LED



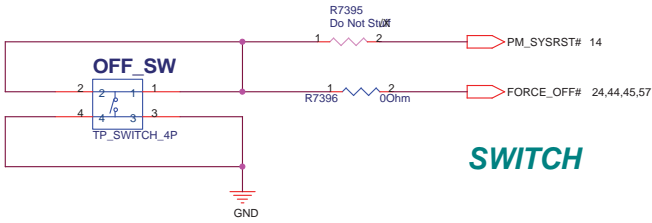
Bluetooth LED



Wireless LED

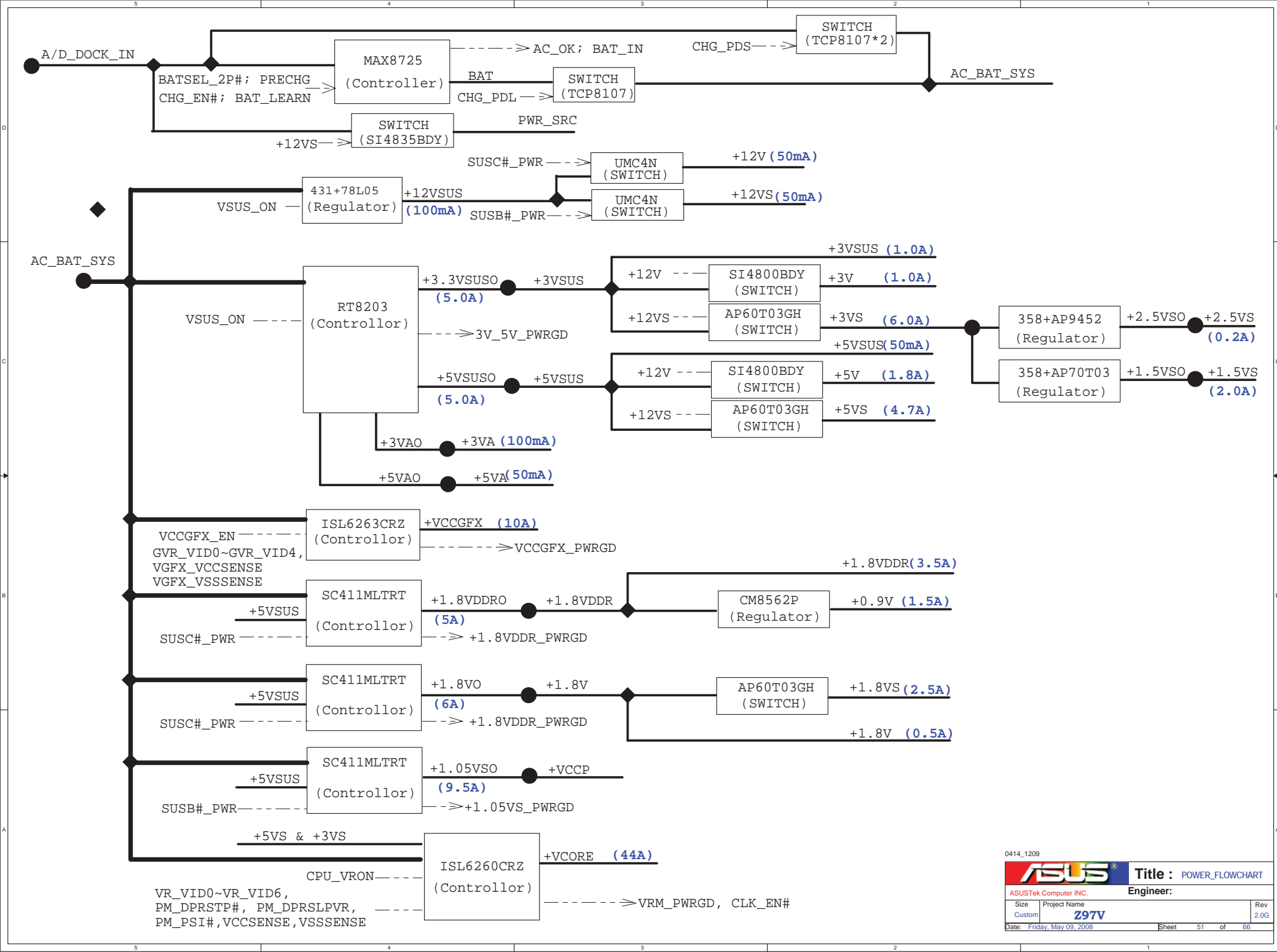


RESET SWITCH



SWITCH





0414_1209

ASUS		Title : POWER_FLOWCHART	
ASUSTek Computer INC.		Engineer:	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	51 of 66

Setting the Adapter Input Current Limit

Adapter lin(max) = $[0.075V/Rsense(ADIN)] \cdot [VCLS/VREF]$
 $VCLS = 2.865V$

Adaptor Max. Current :

PR807=20K PR812 = 178K; Ilimit = 4.5A; 90W
 PR807=27K PR812 = 47K; Ilimit = 3.5A; 65W

Setting the Charge Voltage

$V_{batt} = Cell * \{ V_{ref} + [(VCTL - 1.8V) / 9.52] \}$
 $VCTL = 1.588V \Rightarrow V_{batt} = 4.2V$

Setting the Charge Current

Charge Current $I_{chg} = [0.075V/Rsense(CHG)] \cdot [VICTL/3.6V]$
 $Rsense(CHG) = 15m\Omega$

Pre-Charging Mode :

Precharging current = 126mA
 $Victl = 0.0909V$

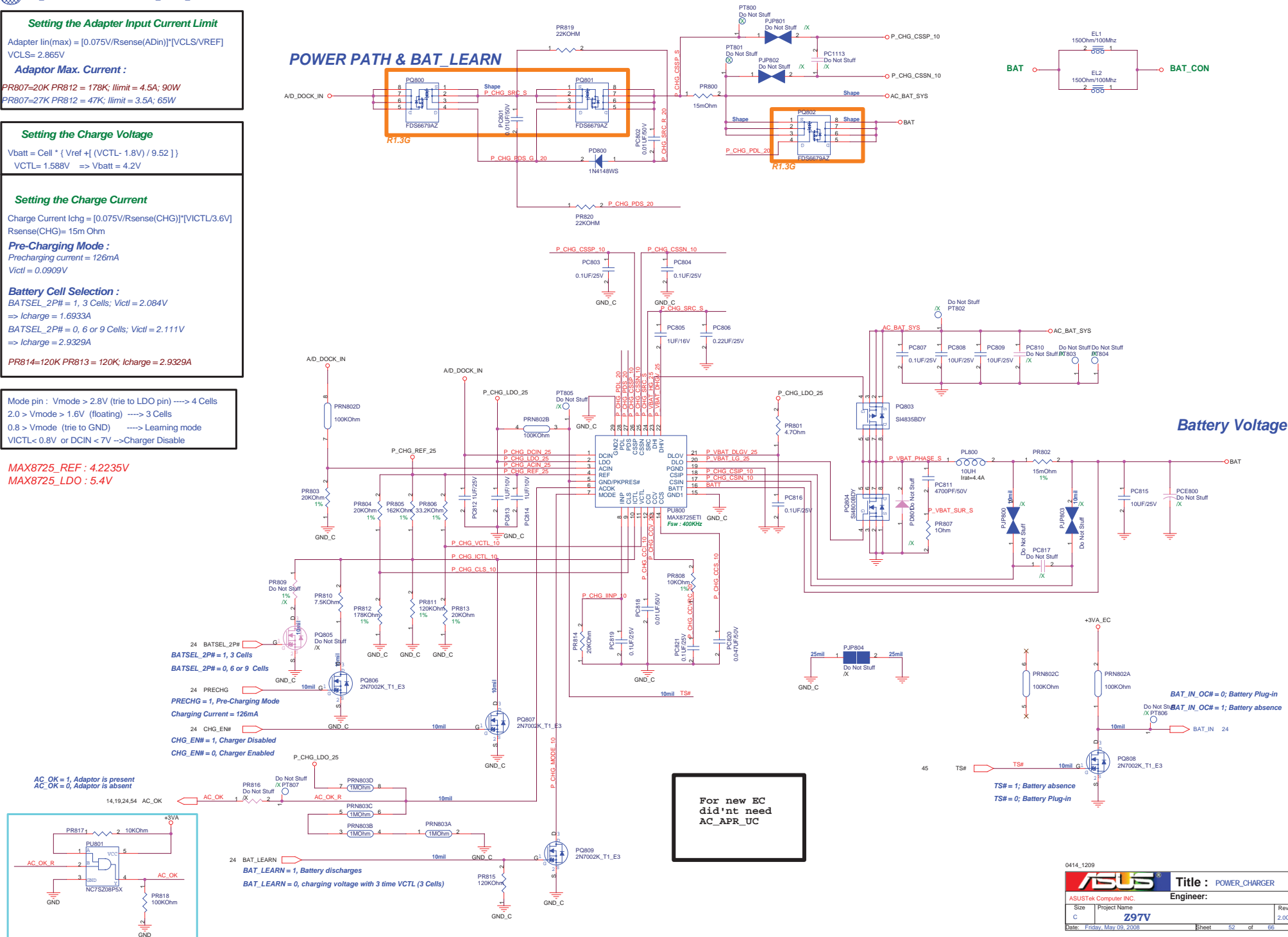
Battery Cell Selection :

BATSEL_2P# = 1, 3 Cells; $Victl = 2.084V$
 $\Rightarrow I_{charge} = 1.6933A$
 BATSEL_2P# = 0, 6 or 9 Cells; $Victl = 2.111V$
 $\Rightarrow I_{charge} = 2.9329A$

PR814=120K PR813 = 120K; $I_{charge} = 2.9329A$

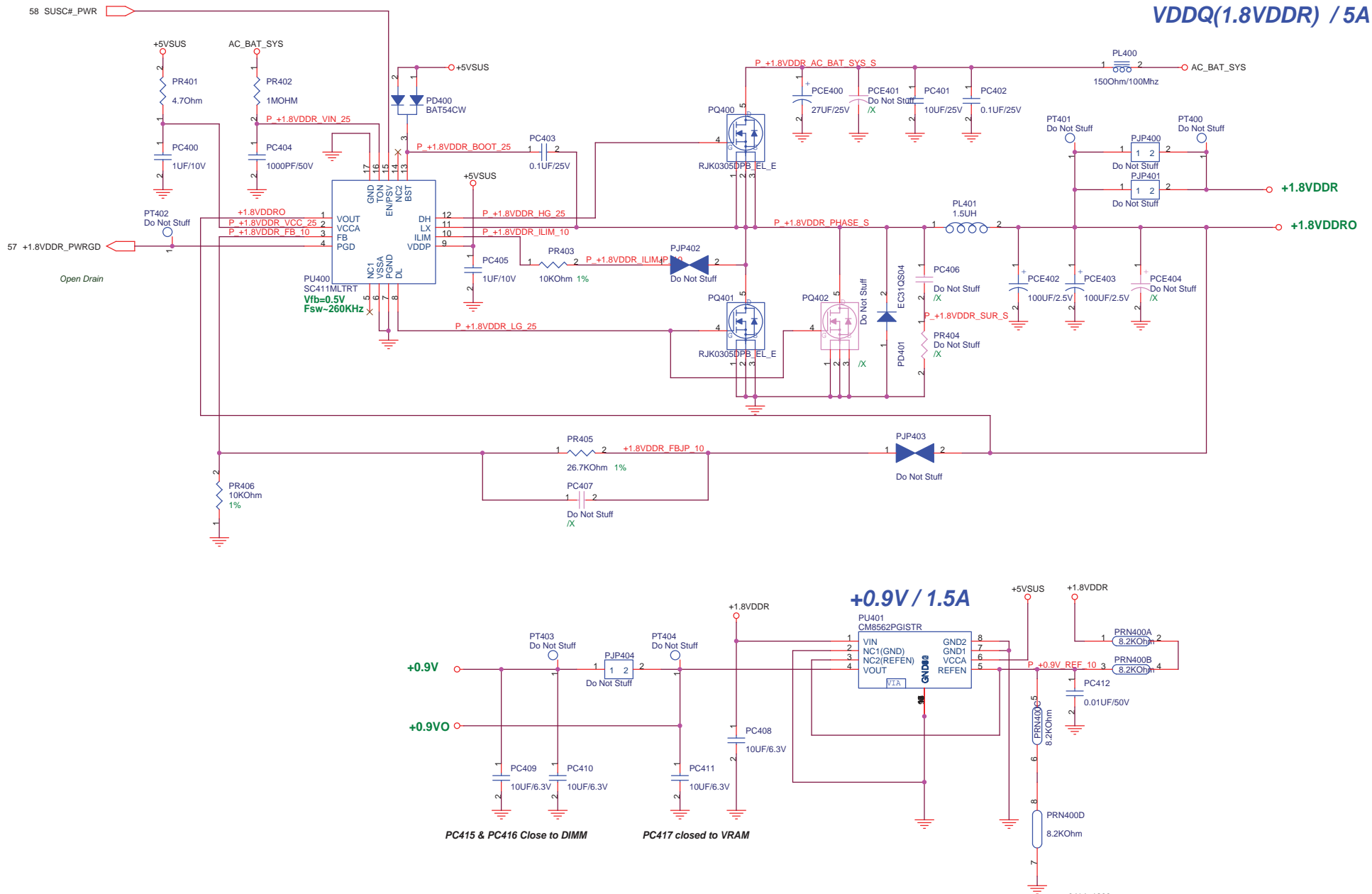
Mode pin : $V_{mode} > 2.8V$ (try to LDO pin) \rightarrow 4 Cells
 $2.0 > V_{mode} > 1.6V$ (floating) \rightarrow 3 Cells
 $0.8 > V_{mode}$ (try to GND) \rightarrow Learning mode
 $VICTL < 0.8V$ or $DCIN < 7V \rightarrow$ Charger Disable

MAX8725_REF : 4.2235V
 MAX8725_LDO : 5.4V

POWER PATH & BAT_LEARN

0414_1209

ASUS		Title : POWER_CHARGER	
ASUSTek Computer INC.		Engineer:	
Size	Project Name	Rev	
C	297V	2.0G	
Date: Friday, May 09, 2008		Sheet 52 of 66	




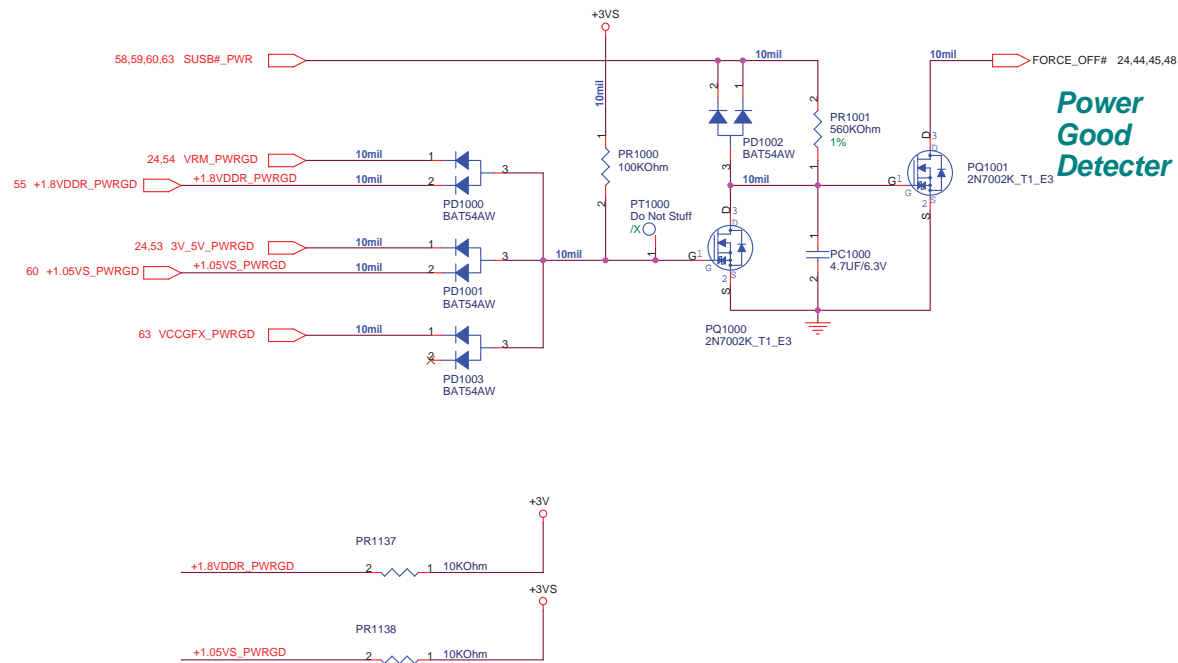
0414_1209

ASUS		Title :	
<OrgName>		Engineer:	
Size	Project Name	Rev	
A3		2.0G	
Date: Friday, May 09, 2008	Sheet	55	of 66

BLANK

0414_1209

		Title : POWER_I/O_+3VA & +2.5V	
ASUSTek Computer INC.		Engineer:	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	56 of 66



0414_1209

ASUS		Title : POWER_PROTECT	
ASUSTek Computer INC.		Engineer:	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	57 of 66

The schematic diagram illustrates the AC input section of the power supply. The input signal, labeled **AC_BAT_SYS**, is connected to a network of components. A capacitor **PC902** (0.1uF/25V) is connected to ground. A resistor **PR900** (100KOhm) is connected to the input. A MOSFET **PQ900** (Si4835BDY) is connected to the input. A resistor **PR901** (100KOhm) is connected to ground. A MOSFET **PQ902** (2N7002K_T1_E3) is connected to ground. A resistor **PR909** (10KOhm) is connected to the input. A resistor **PR922** (100KOhm) is connected to ground. The diagram includes labels for components and their values, as well as warnings like "Do Not Stuff" and "Do Not Stuff Do Not Stuff".

For MXM Only

(0.5A)

R1.3G

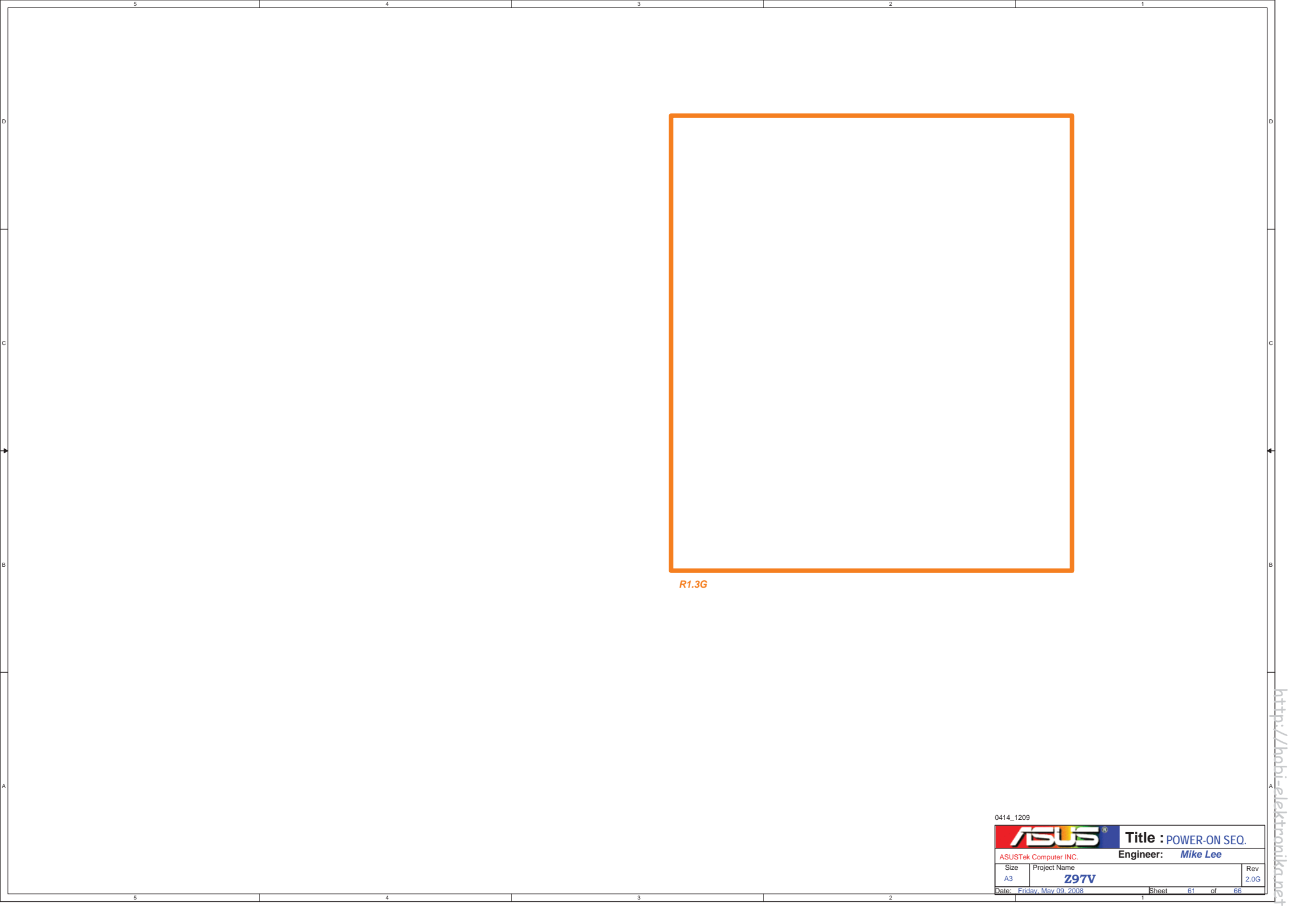
R1.3G

2008/02/25

The schematic diagram illustrates the power supply section of the PCB, featuring three input rails: +3VSUS, +5VSUS, and +12VSUS. Each rail is connected to a MOSFET driver circuit. The +3VSUS rail is connected to a Si4800BDY MOSFET driver, which drives a 100KOhm resistor (PR902) and a 0.01UF/50V capacitor (PC903). The +5VSUS rail is connected to another Si4800BDY MOSFET driver, which drives a 100KOhm resistor (PR904) and a 0.01UF/50V capacitor (PC905). The +12VSUS rail is connected to a PQ905 UMC4N MOSFET driver, which drives a 100KOhm resistor (PR906) and a 10mF capacitor (SUSC# PWR). The output rails are labeled 1.0A, 1.8A, and 0.05A.


[illegible]Rev
2.0G

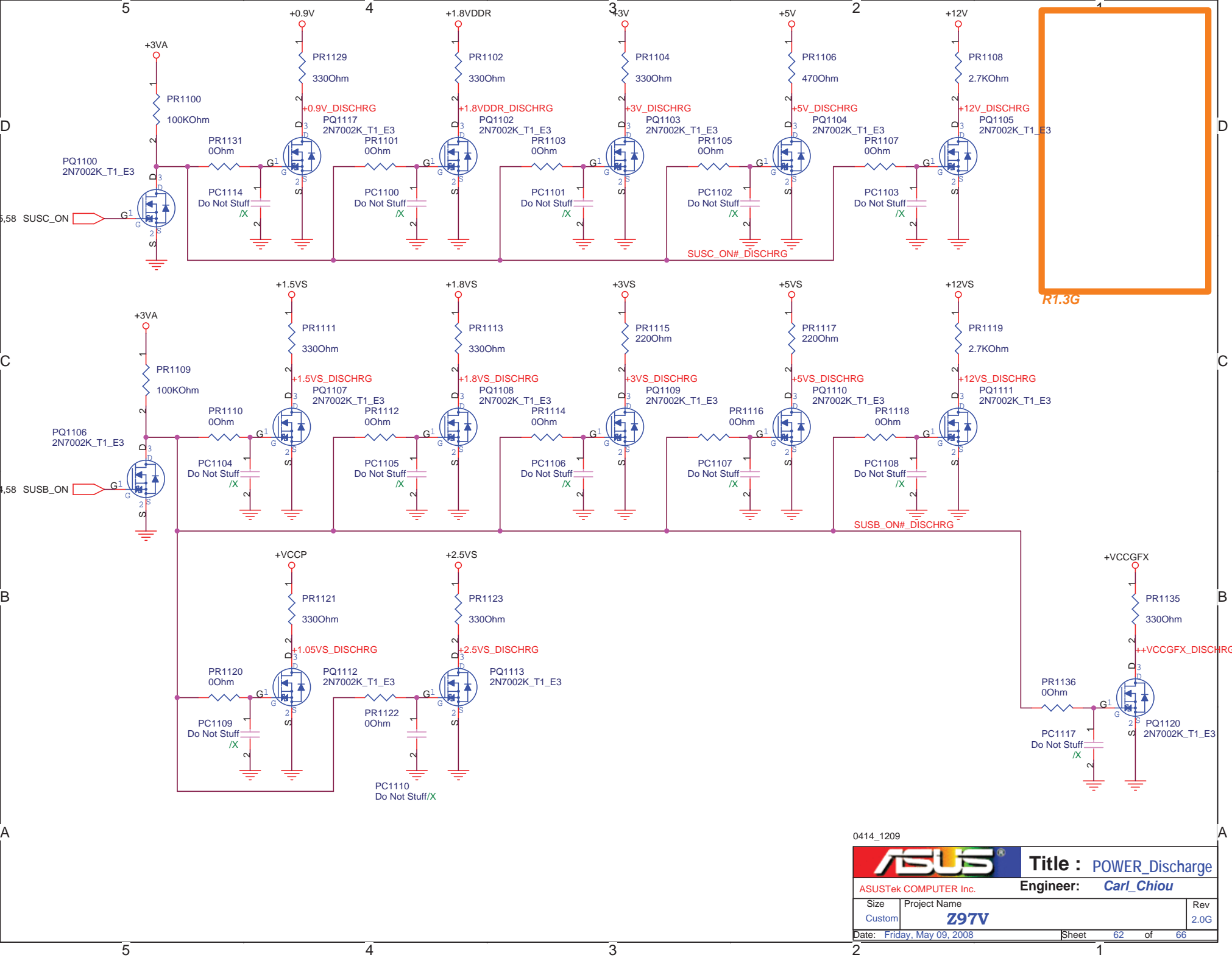
Sheet 58 of 66



R1.3G

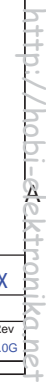
0414_1209

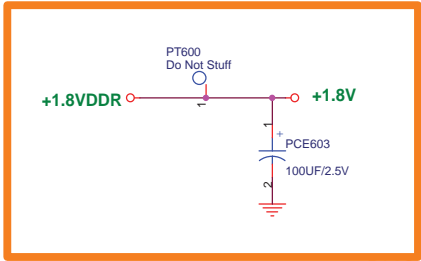
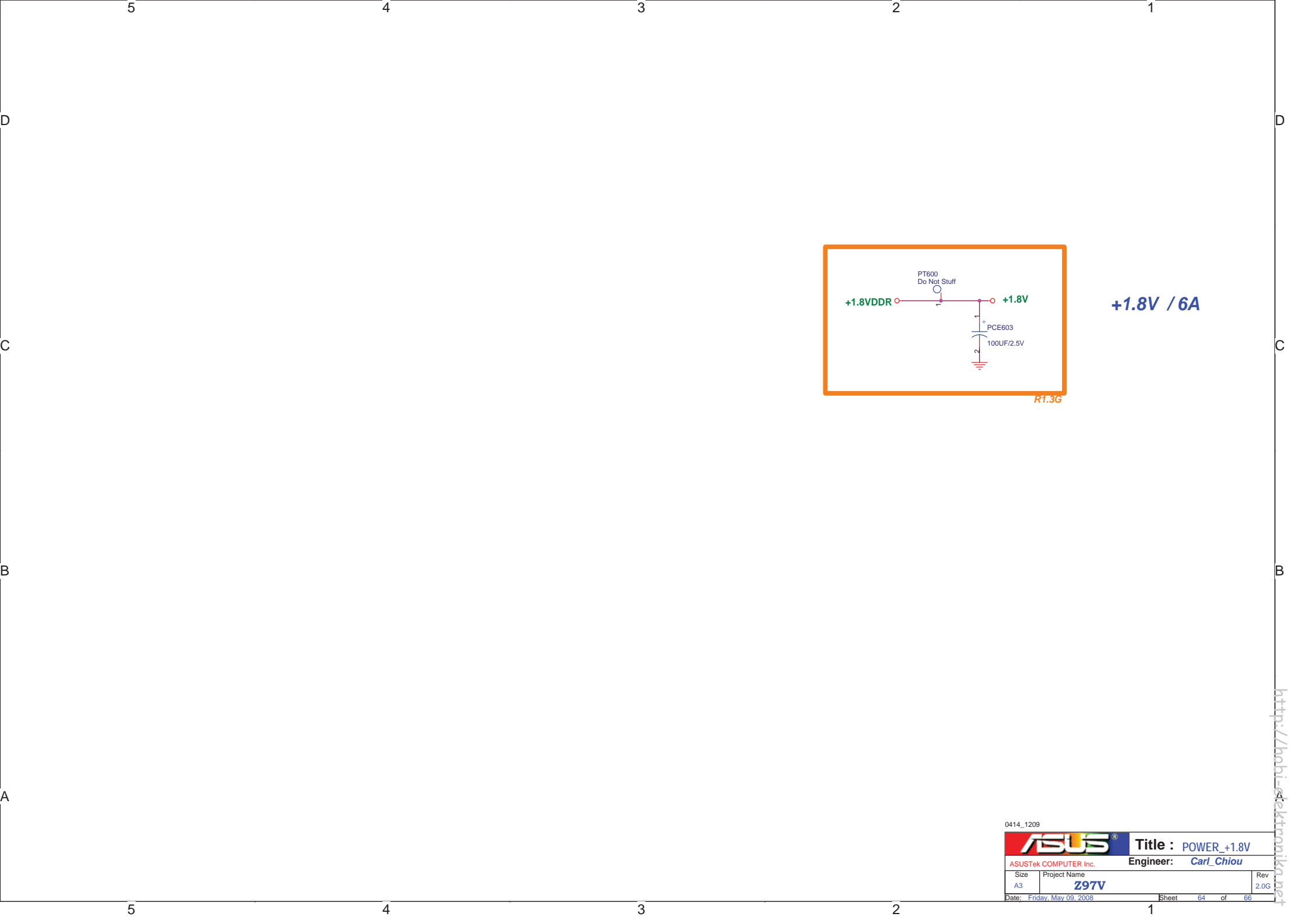
		Title : POWER-ON SEQ.	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name		Rev
A3	Z97V		2.0G
Date: Friday, May 09, 2008		Sheet	61 of 66



0414_1209

		Title : POWER_Discharge	
ASUSTek COMPUTER Inc.		Engineer: Carl_Chio	
Size	Project Name	Rev	
Custom	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	62 of 66



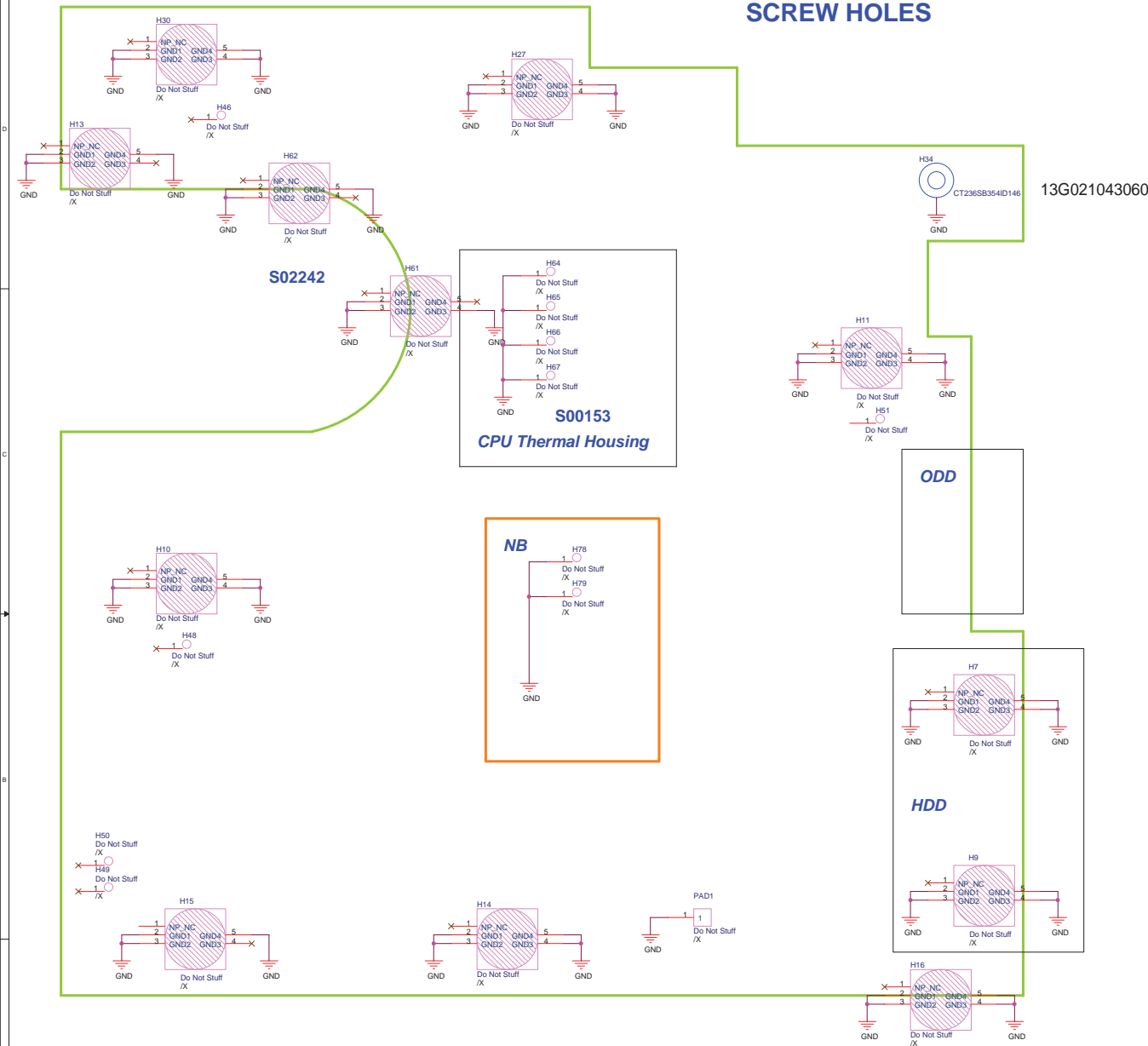


+1.8V / 6A

R1.3G

0414_1209		Title : POWER_+1.8V	
ASUS		Engineer: Carl_Chiou	
Size	Project Name	Rev	
A3	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet	64 of 66

SCREW HOLES



0414_1209

ASUS		Title : Screw Hole	
ASUSTek Computer INC.		Engineer: Mike Lee	
Size	Project Name	Rev	
C	Z97V	2.0G	
Date: Friday, May 09, 2008		Sheet 65 of 66	

0414_1209			
Title History			
Size C	Document Number Z97V		Rev 2.0G
Date:	Friday, May 09, 2008	Sheet	66 of 66