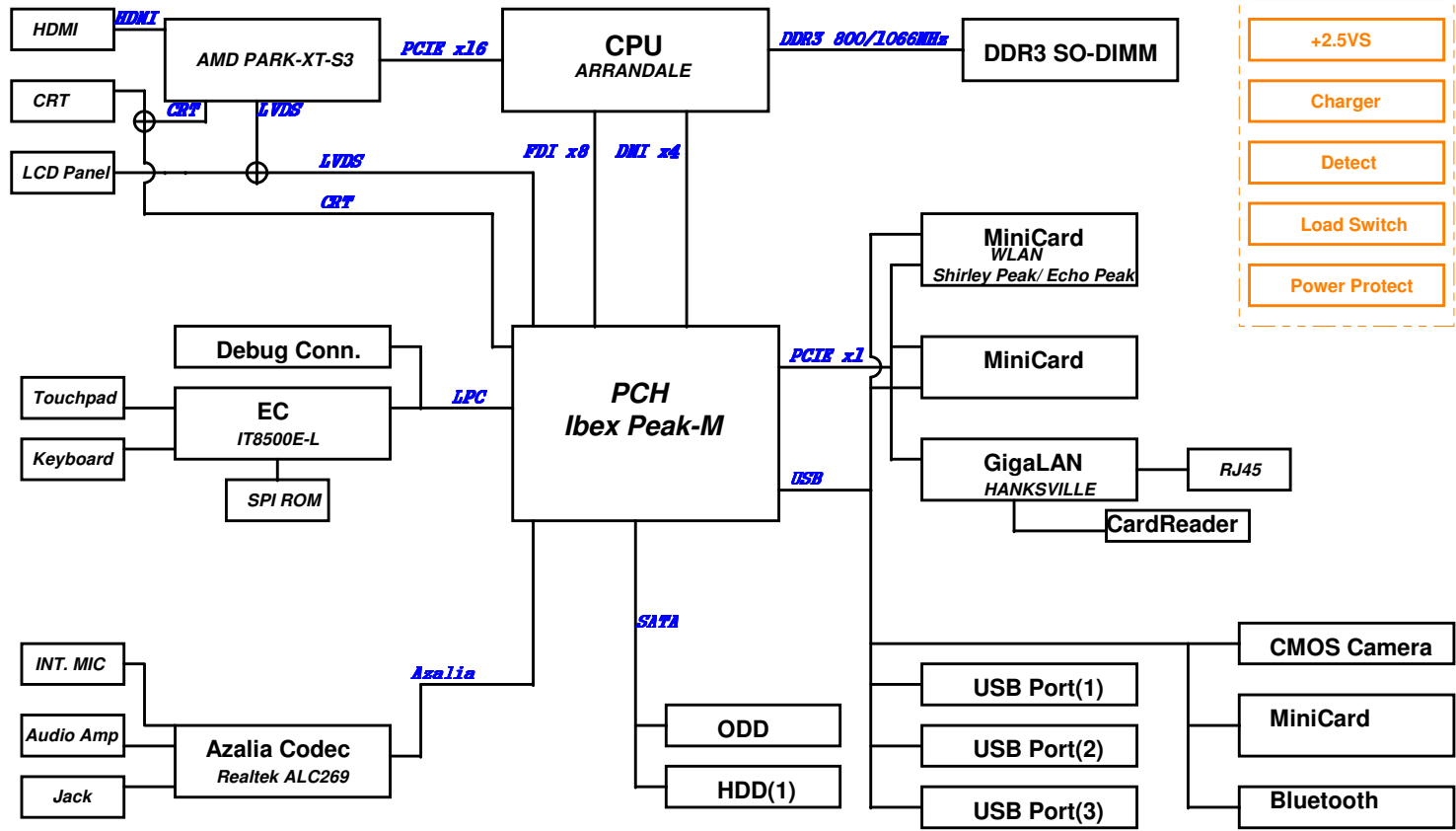


# K42Jr SCHEMATIC Revision 2.0

- Power
- VCORE
- System
- 1.5VS & 1.05VS
- DDR & VTT
- +2.5VS
- Charger
- Detect
- Load Switch
- Power Protect

PAGE	Content
1	Block Diagram
2	System Setting
3	CPU(1)_DMI, PEG, FDI, CLK, MISC
4	CPU(2)_DDR3
5	CPU(3)_CFG, RSVD, GND
6	CPU(4)_PWR
7	CPU(5)_XDP
16	DDR3 SO-DIMM_0
17	DDR3 SO-DIMM_1
18	DDR3 CA_DQ VOLTAGE
19	VID controller
20	PCH_IBEX(1) SATA, IHDA, RTC, LPC
21	PCH_IBEX(2)_PCIE, CLK, SMB, PEG
22	PCH_IBEX(3)_FDI, DMI, SYS PWR
23	PCH_IBEX(4)_DP, LVDS, CRT
24	PCH_IBEX(5)_PCI, NVRAM, USB
25	PCH_IBEX(6) CPU, GPIO, MISC
26	PCH_IBEX(7)_POWER, GND
27	PCH_IBEX(8)_POWER, GND
28	PCH_SPI ROM, OTH
29	CLK_IC93LPR362
30	EC_IT8512(1/2)
31	EC_IT8512(2/2)KB, TP
32	RST_Reset Circuit
33	HANKSVILLE
34	LAN_RJ45
36	CODEC-ALC663
37	AUD_Amp & Jack
38	AUD_FM2010
40	CB_R5C833
41	CB_R5C833
42	CB_4in1 CardReader
43	CB_NewCard
44	BUG_Debug
45	CRT_LCD Panel
46	CRT_D-Sub
47	Display Port
48	TV_HDMI
50	FAN_Fan & Sensor
51	XDD_HDD & ODD
52	USB_USB Port *2
53	MINICARD(WLAN)
56	LED_Indicator
57	DSG_Discharge
60	DC_DC & BAT Conn.
61	BT_Bluetooth
64	TUN_TV Tuner
65	ME_Conn & Skew Hole
66	ESA_ESATA
67	PCH_XDP, ONFI
70	VGA_MXM
71	VGA_LVDS Switch
80	PW_VCORE(MAX17034)
81	PW_SYSTEM(MAX17020)
82	PW_I/O_VTT_CPU&+1.1VM
83	PW_I/O_DDR & VTT& +1.8VS
84	PW_I/O_3VM & ME_+VM_PWEVG
86	PW_+VGF_X_CORE(MAX17028)
88	PW_CHARGER(MAX17015)
90	PW_DETECT
91	PW_LOAD SWITCH
92	PW_PROTECT
93	PW_SIGNAL
94	PW_FLOWCHART

## BLOCK DIAGRAM



**PCH\_IBEX GPIO**

PCH_IBEX GPIO	Use As	Signal Name	Internal & External Pull-up/down	Power
GPIO 00	GPO	-	-	+3VS
GPIO 01	GPO	-	INT TBD	+3VS
GPIO [2:5]	Native	-	EXT PU	+5VS
GPIO 06	GPO	DGPU_HPD_INTR#	INT TBD	+3VS
GPIO 07	GPO	-	INT TBD	+3VS
GPIO 08	GPI	EXT_SMI#	EXT PU & INT PU	+3VSUS
GPIO 09	Native	USB_OC5#	EXT PU	+3VSUS
GPIO 10	Native	USB_OC6#	EXT PU	+3VSUS
GPIO 11	GPI	EXT_SCI#	EXT PU	+3VSUS
GPIO 12	Native	PM_LAYPHY_EN	EXT PU	+3VSUS
GPIO 13	GPO	-	-	+3VSUS
GPIO 14	GPO	CB_SD#	EXT PU(DIODE DNI)	+3VSUS
GPIO 15	GPO	WLAN_ON	INT PD	+3VSUS
GPIO 16	GPO	DGPU_HOLD_RST#	-	+3VS
GPIO 17	GPO	DGPU_PWROK	EXT PD & INT TBD	+3VS
GPIO 18	Native	CLKREQ1#_TV	EXT PU(DNI)/PD	+3VS
GPIO 19	GPO	-	-	+3VS
GPIO 20	Native	CLKREQ2#_WLAN	EXT PU(DNI)/PD	+3VS
GPIO 21	GPO	-	-	+3VS
GPIO 22	GPO	WLAN_LED	EXT PD	+3VS
GPIO 23	Native	LDRQ1#	INT PU	+3VS
GPIO 24	GPO	-	-	+3VSUS
GPIO 25	Native	CLKREQ3#_NEWCARD	EXT PU(DNI)/PD	+3VSUS
GPIO 26	Native	CLKREQ4#	EXT PU (Not used)	+3VSUS
GPIO 27	GPO	-	INT WEAK PU	+3VSUS
GPIO 28	GPO	BT_LED	EXT PD	+3VSUS
GPIO 29	Native	ME_PM_SLP_LAN#	EXT PU(DNI)/PD(DNI)	+3VSUS
GPIO 30	Native	ME_Sus_PwrDnAck	EXT PU	+3VSUS
GPIO 31	Native	ME_AC_PRESENT	EXT PU	+3VSUS
GPIO 32	Native	PM_CLKRUN#	EXT PU	+3VS
GPIO 33	GPO	-	-	+3VS
GPIO 34	Native	STP_PCI#	-	+3VS
GPIO 35	Native	SATA_CLK_REQ#	EXT PU/PD(DNI)	+3VS
GPIO 36	GPO	DGPU_PWR_EN#	EXT PU	+3VS
GPIO 37	GPI	DGPU_PRSN#	EXT PU	+3VS
GPIO 38	GPI	PCB_ID0	EXT PD	+3VS
GPIO 39	GPI	PCB_ID1	EXT PD	+3VS
GPIO 40	Native	USB_OC1#	EXT PU (Not used)	+3VSUS
GPIO 41	Native	USB_OC2#	EXT PU (Not used)	+3VSUS
GPIO 42	Native	USB_OC3#	EXT PU (Not used)	+3VSUS
GPIO 43	Native	USB_OC4#	EXT PU (Not used)	+3VSUS
GPIO 44	Native	CLK_REQ5#	EXT PU (Not used)	+3VSUS
GPIO 45	Native	CLK_REQ6#	EXT PU (Not used)	+3VSUS
GPIO 46	Native	CLK_REQ7#	EXT PU (Not used)	+3VSUS
GPIO 47	Native	CLKREQ_PEG#	EXT PD	+3VSUS
GPIO 48	GPO	-	-	+3VS
GPIO 49	GPO	GPU_RST#	-	+3VS
GPIO 50	Native	PCI_REQ1#	EXT PU (Not used)	+5VS
GPIO 51	Native	PCI_GNT1#	INT PU	+3VS
GPIO 52	GPO	-	-	+5VS
GPIO 53	GPO	-	INT PU	+3VS
GPIO 54	GPO	-	-	+5VS
GPIO 55	GPO	-	INT PU	+3VS
GPIO 56	Native	CLKREQ_GLAN#	EXT PU(DNI)/PD	+3VSUS
GPIO 57	GPO	BT_ON	EXT PU (DIODE)	+3VSUS
GPIO 58	Native	SML1_CLK	EXT PU	+3VSUS
GPIO 59	Native	USB_OC0#	EXT PU (Not used)	+3VSUS
GPIO 60	GPO	-	-	+3VSUS
GPIO 61	Native	PM_SUS_STAT#	-	+3VSUS
GPIO 62	Native	SUS_CLK	-	+3VSUS
GPIO 63	Native	PM_SLP_S5#	-	+3VSUS
GPIO 64	Native	CLK_OUT0	INT TBD	+3VS
GPIO 65	Native	CLK_OUT1	INT TBD	+3VS
GPIO 66	Native	CLK_OUT2	INT TBD	+3VS
GPIO 67	Native	CLK_OUT3	INT TBD	+3VS
GPIO 72	GPO	-	-	+3VSUS
GPIO 73	Native	CLK_REQ0#	EXT PU (Not used)	+3VSUS
GPIO 74	GPO	-	EXT PU (Not used)	+3VSUS
GPIO 75	Native	SML1_DATA	EXT PU	+3VSUS

**EC IT8512**

EC GPIO	Use As	Signal Name
GPA0	0	PWR_LED#
GPA1	0	CHG_LED#
GPA2	-	-
GPA3	-	-
GPA4	0	LCD_BL_PWM
GPA5	0	FAN0_PWM
GPA6	-	-
GPA7	-	-
GPB0	0	SUSC_EC#
GPB1	0	SUSB_EC#
GPB2	-	-
GPB3	IO	SMB0_CLK
GPB4	IO	SMB0_DAT
GPB5	0	A20GATE
GPB6	0	RC_IN#
GPB7	0	PM_RSMRST#
GPC0	-	-
GPC1	IO	SMB1_CLK
GPC2	IO	SMB1_DAT
GPC3	0	PM_PWRBTN#
GPC4	I	AC_IN_OC#
GPC5	-	OP_SD#
GPC6	I	BAT1_IN_OC#
GPC7	I	RFON_SW#
GPD0	-	-
GPD1	I	PM_SUSC#
GPD2	I	BUF_PLT_RST#
GPD3	0	EXT_SCI#
GPD4	0	EXT_SMI#
GPD5	0	LCD_BACKOFF#
GPD6	I	FAN0_TACH
GPD7	-	-
GPE0	0	VSUS_ON
GPE1	0	EGAD (IT8301 Address/Data connect)
GPE2	0	EGCS (IT8301 Cycle Start connect)
GPE3	0	EGCLK (IT8301 Clock connect)
GPE4	I	PWR_SW#
GPE5	-	-
GPE6	I	LID_SW#
GPE7	I	CAP_ACK#
GPFO	-	-
GPF1	-	-
GPF2	I	EXP_GATE#
GPF3	-	-
GPF4	I	TP_CLK
GPF5	IO	TP_DAT
GPF6	0	THRO_CPU
GPF7	-	-
GPFO	-	-
GPB1	I	PM_SUSB#
GPB2	-	-
GPB6	-	-
GPH0	IO	PM_CLKRUN#
GPH1	-	-
GPH2	0	GFX_VR_ON
GPH3	0	BAT_LEARN
GPH4	-	-
GPH5	0	NUM_LED#
GPH6	0	CAP_LED#
GPI0	-	-
GPI1	I	SUS_PWRGD
GPI2	I	ALL_SYSTEM_PWRGD
GPI3	I	VRM_PWRGD
GPI4	I	GFX_VR
GPI5	I	ALS_AD
GPI6	-	-
GPI7	-	-
GPJ0	0	CPU_VRON
GPJ1	0	PM_PWROK
GPJ2	0	VSET_EC
GPJ3	0	ISET_EC
GPJ4	0	TP_LED
GPJ5	-	-

**EC IT8301**

EC GPIO	Use As	Signal Name
GPIO0	I	ME_PM_SLP_M#
GPIO1	I	ME_SusPwrDnAck
GPIO2	-	-
GPIO3	-	-
GPIO4	I	ME_+VM_PWRGD
GPIO5	I	ME_PM_SLP_LAN#
GPIO6	O	ME_AC_PRESENT
GPIO7	-	-
GPIO8	-	-
GPIO9	-	-
GPIO10	-	-
GPIO11	-	-
GPIO12	O	ME_PWROK
GPIO13	-	-
GPIO14	O	ME_SLP_M_EC#
GPIO15	-	-
GPIO16	-	-
GPIO17	-	-
GPIO18	-	-
GPIO19	-	-
GPIO20	-	-
GPIO21	-	-
GPIO22	-	-
GPIO23	-	-
GPIO24	-	-
GPIO25	-	-
GPIO26	-	-
GPIO27	-	-
GPIO28	-	-
GPIO29	-	-
GPIO30	-	-
GPIO31	-	-
GPIO32	-	-
GPIO33	-	-
GPIO34	-	-
GPIO35	-	-
GPIO36	-	-
GPIO37	-	-

**SM\_BUS ADDRESS :**

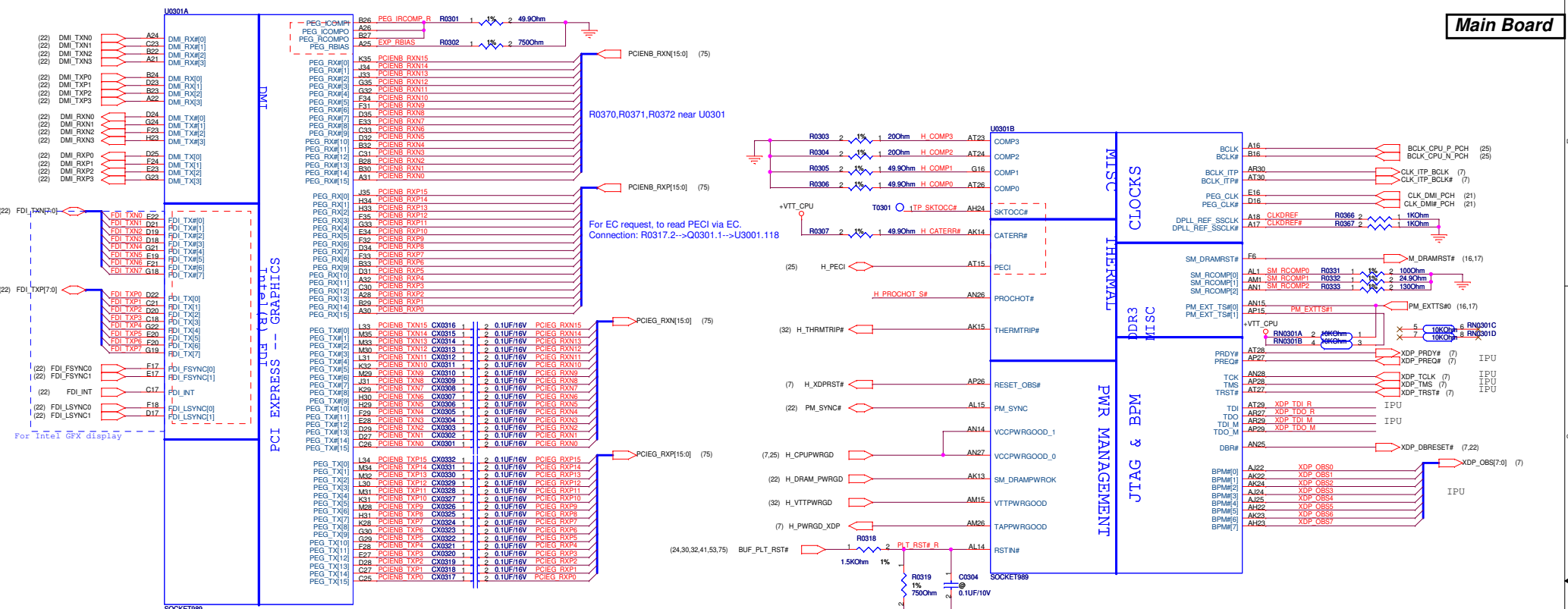
PCH Master	
SM-Bus Device	SM-Bus Address
Clock Generator(IC59LPR362)	1101001x ( D2 )
SO-DIMM 0	1010000x ( A0 )
SO-DIMM 1	1010001x ( A2 )
VID Controller(ASM8272)	0011011x ( 36 )
WiFi/WiMax	N/A
EC Master (SMB1)	
SM-Bus Device	SM-Bus Address
CPU Thermal Sensor(G780)	1001100x ( 98 )
VGA Thermal IC(G781-1)	1001101x ( 9A )

PCIE 1	Minicard TV Tuner
PCIE 2	Minicard WLAN
PCIE 3	Newcard
PCIE 4	-
PCIE 5	ESATA (for pre-E51)
PCIE 6	GLAN
PCIE 7	-
PCIE 8	-

USB 0	USB Port (1)
USB 1	USB Port (2)
USB 2	USB Port (3)
USB 3	USB Port (4)
USB 4	CMOS Camera
USB 5	NewCard
USB 6	Minicard TV Tuner
USB 7	-
USB 8	-
USB 9	WLAN
USB 10	-
USB 11	-
USB 12	Bluetooth
USB 13	Finger Printer

SATA 0	SATA HDD (1)
SATA1	SATA ODD
SATA4	SATA HDD (2)
SATA5	ESATA

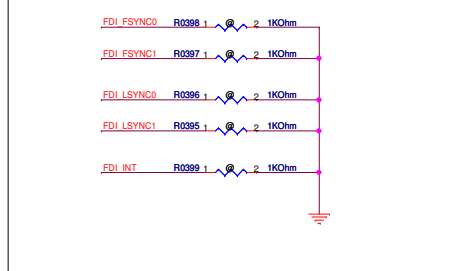
**ASUS** Title : System Setting  
 ASUSTeK COMPUTER INC. N/A Engineer: CH Lin  
 Size C Project Name M60JV Rev 1.01  
 Date: Thursday, November 12, 2009 Sheet 2 of 95



For EC request, to read PECI via EC.  
Connection: R0317.2->Q0301.1->U3001.118

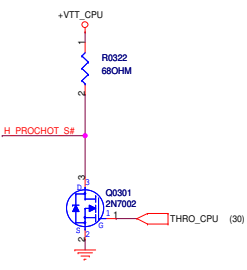
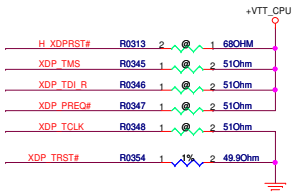
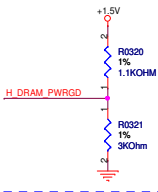
For Intel GFX display

Stuff these resistors for disable IGPU

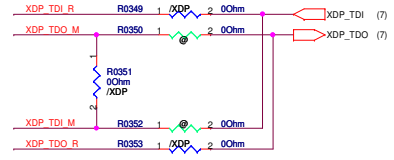


**DRAMPWROK: (WW35 MoW)**  
Choose either one solution: -->Choose solution 2

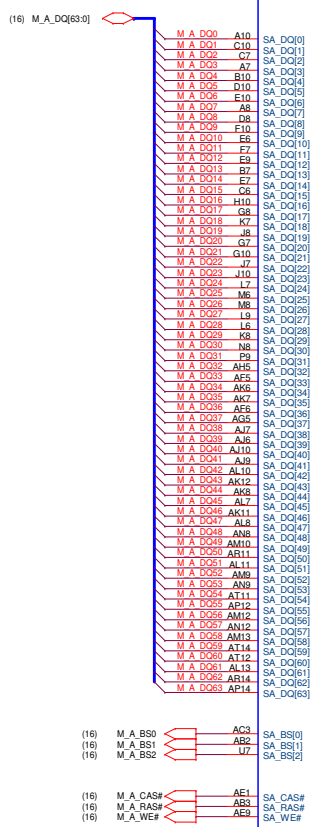
1. This pin should have an external pull-up of 1K Ohms to 10K Ohms to a rail of 1.05/1.1V which is ON in S0-S3
2. Connect this pin through a voltage divider circuit; recommend 4.75K Ohms pull-up to DDR3 Power Rail (VDDQ) of +V1.5U and a 12K Ohms pull-down to ground to convert to processor's VTT level.



**JTAG MAPPING**



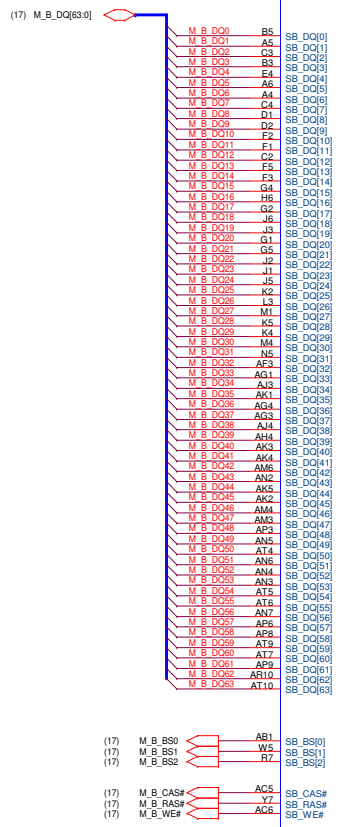
U3001C



DDR SYSTEM MEMORY A

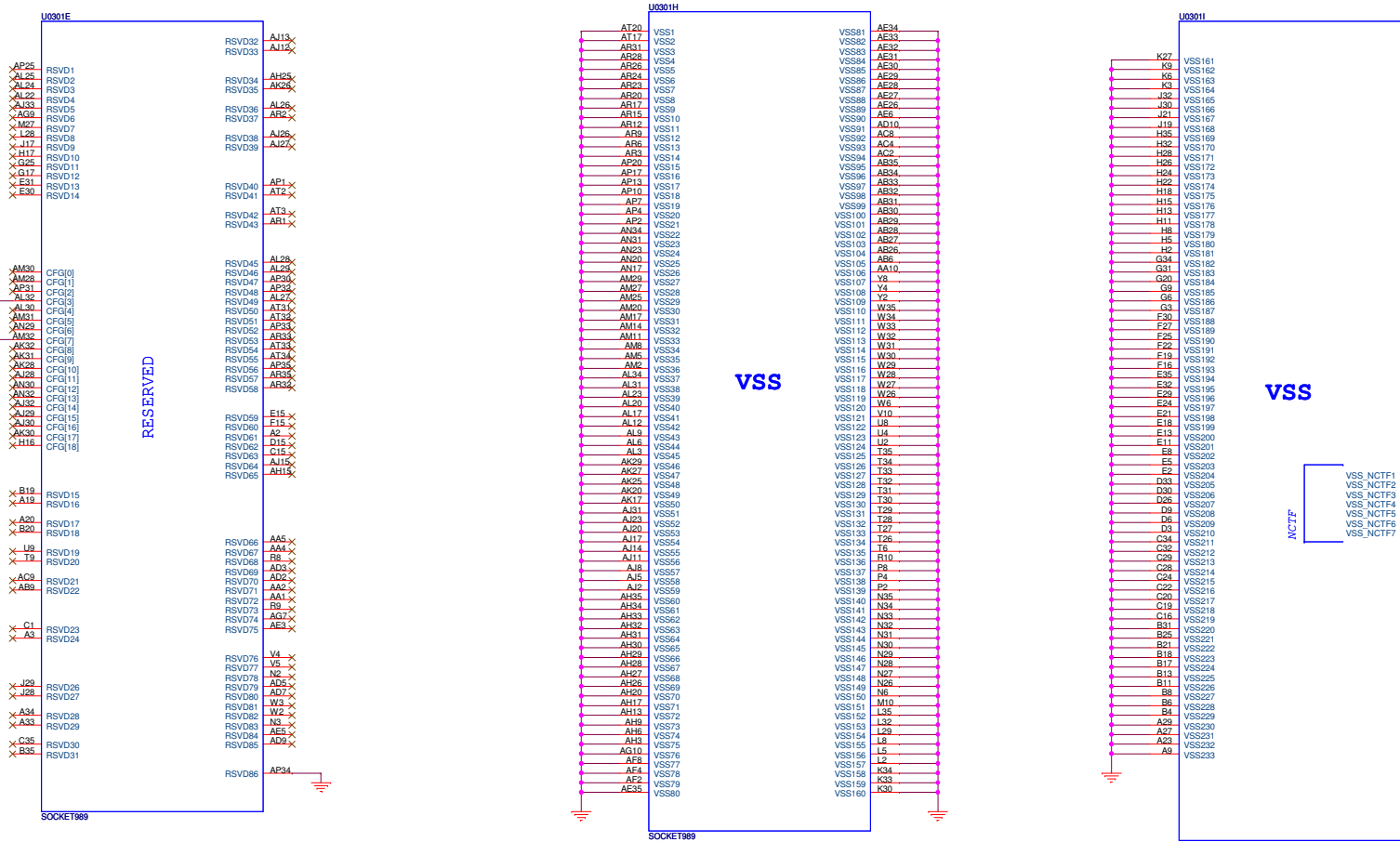
SOCKET989

U3001D



DDR SYSTEM MEMORY - B

SOCKET989



**CFG strapping information:**

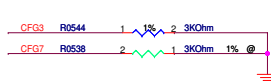
**CFG[1:0]: PCI Express Port Bifurcation:(Clarksfield Only)**  
 - 11 = 1 x 16 PEG (Default)  
 - 10 = 2 x 8 PEG

**CFG[3]: PCIe Static Numbering Lane Reversal.(Arrandale Only)**  
 - 1: Normal Operation (Default)  
 - 0: Lane Numbers Reversed 15 -> 0, 14 -> 1, ...

**CFG[4]: Embedded DisplayPort Detection.(Arrandale Only)**  
 - 1: Disabled - No Physical Display Port attached to Embedded DisplayPort  
 - 0: Enabled - An external Display Port device is connected to the Embedded Display Port

**CFG[7]: Fixed for PCI Express 2.0 I/O specifications.(Clarksfield Only)**  
 - 0: Enabled - Connected to GND with 3.0k Ohm/5% resistor for a common motherboard design (for AUB and CFD), the pull-down resistor should be used. Does not impact Arrandale functionality.  
 - 1: Disabled - Not connected to GND with 3.0k Ohm/5% resistor for a common motherboard design (for AUB and CFD), the pull-down resistor should be used. Does not impact Arrandale functionality.  
**Unmount if Intel has fixed this issue.**

Note: (Auburndale)Hardware Straps are sampled on the asserting edge of VCCPWRGOOD\_0 and VCCPWRGOOD\_1 and latched inside the processor.  
 Note: (Clarksfield)Hardware Straps are sampled after RSTIN# de-assertion.



**CFG strapping information:**

**For Arrandale**

**CFG[2:0]:** Reserved configuration pins. Test points may be placed on these pins on a common motherboard design.

**CFG[3] -** PCI Express\* Static Lane Numbering Reversal. Lane Reversal will be applied across all 16 Lanes.

- 1: No lane reversal
- 0: Reversal

**CFG[4] -** Embedded DisplayPort Detection: This is used to detect the presence of a device on the Embedded DisplayPort.

**CFG[17:5] -** Reserved configuration pins.

**Note:** Hardware straps are sampled on the asserting edge of VCCPWRGOOD\_0 and VCCPWRGOOD\_1 and latched inside the processor.

**For Clarksfield**

**CFG[1:0] -** PCI Express\* Port Bifurcation:

- 11 = 1 x16 PEG
- 10 = 2 x8 PEG

**CFG[2] -** Reserved Configuration pins.

**CFG[3] -** Reserved (Used by Arrandale Pprocessors for PCI Express\* Static Lane Numbering Reversal)

**CFG[11:4] -** Reserved configuration pins.

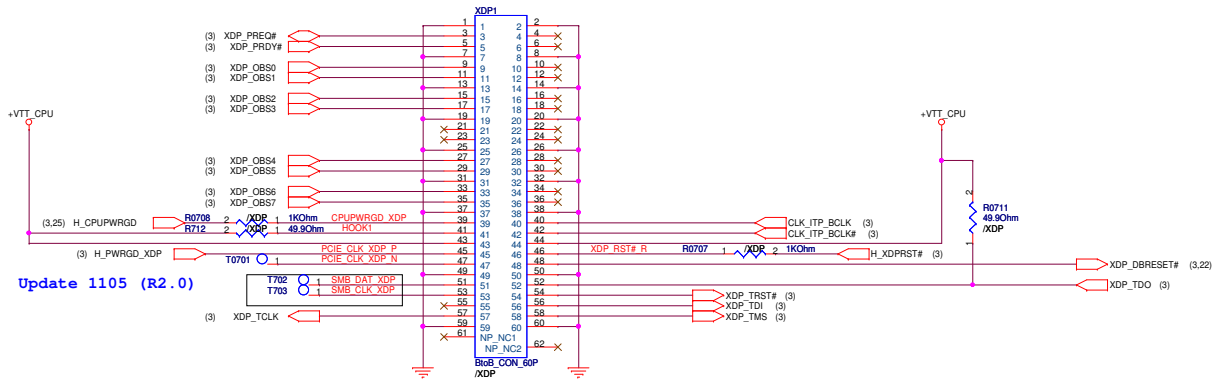
**CFG[12] -** N/A on Clarksfield processors.

**CFG[17:13] -** Reserved configuration pins.

**Note:** Hardware straps are sampled after RSTIN# de-assertion.



CPU XDP connector



5

4

3

2

1

D

D

C


C

B

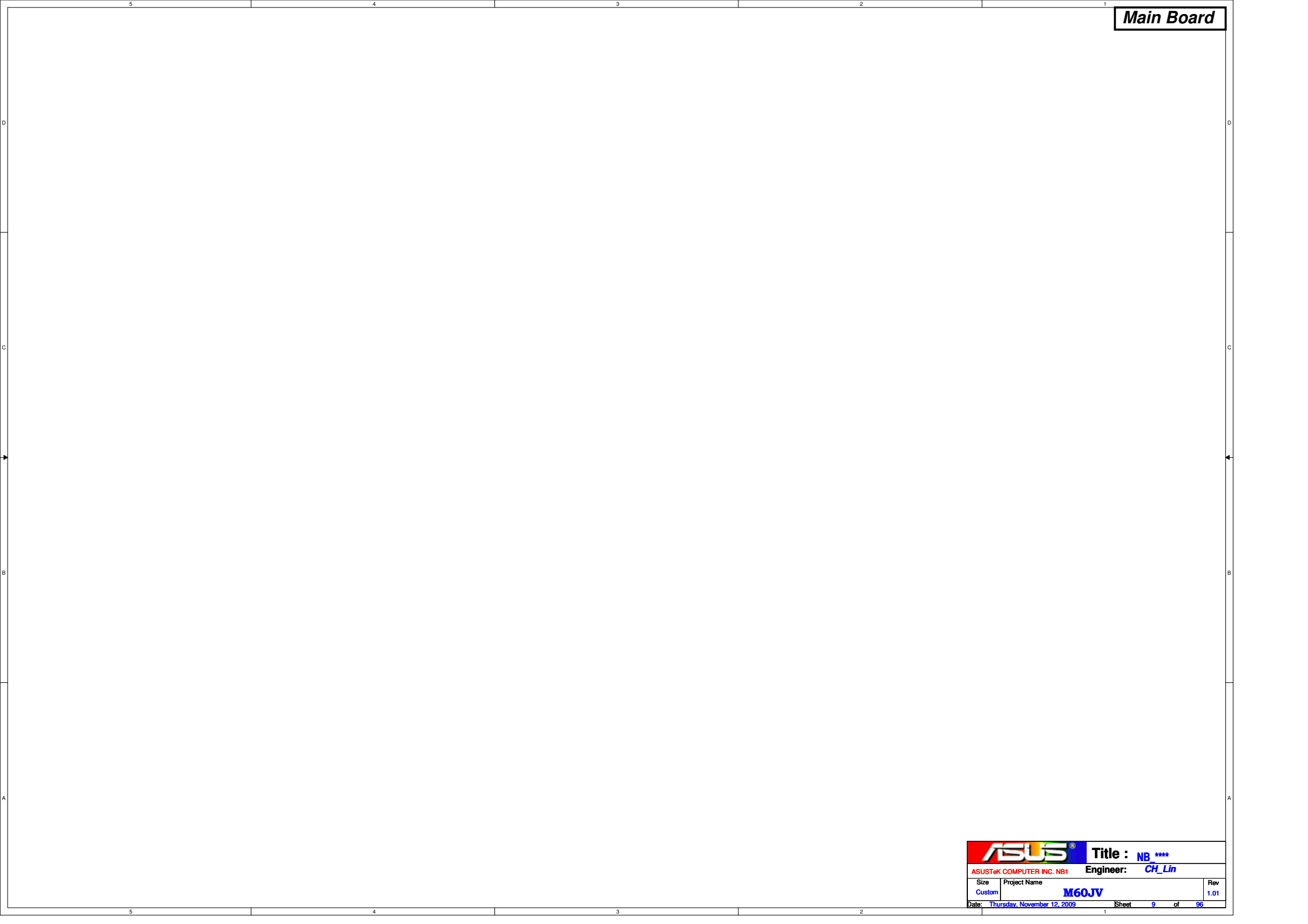
B


A

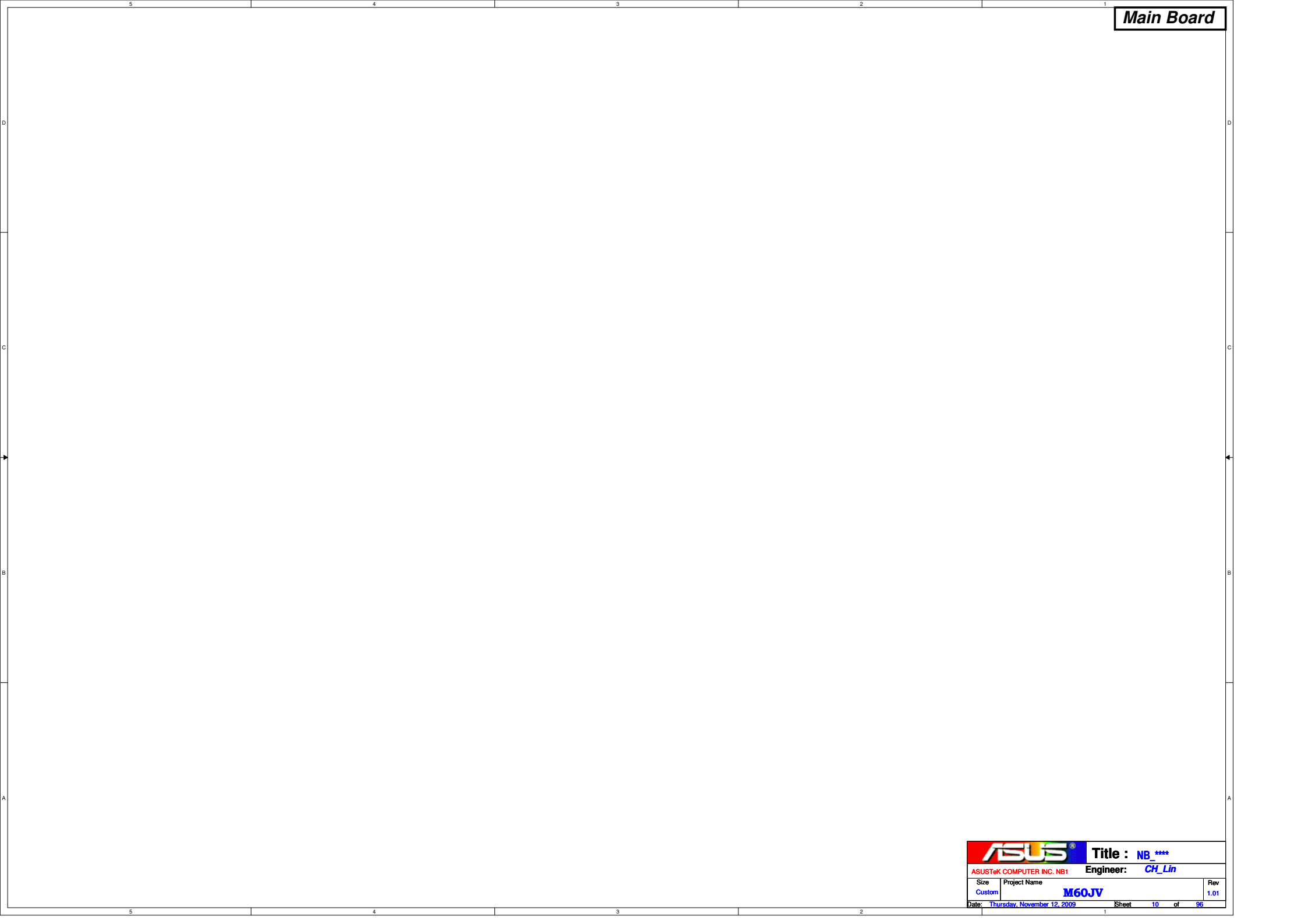
A


		<b>Title :</b> NB ****	
ASUSTeK COMPUTER INC. NB1		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
Custom	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	8 of 96

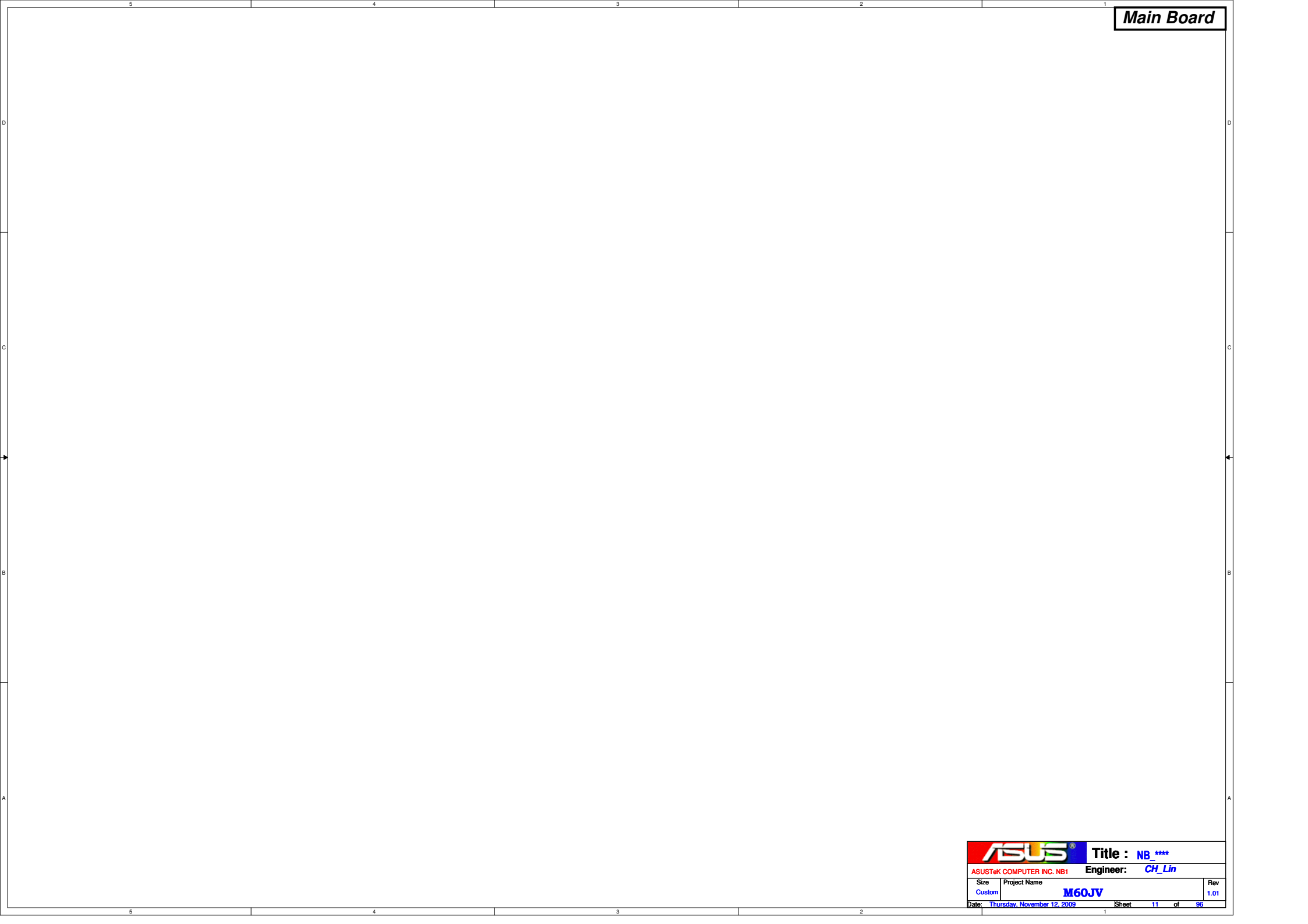





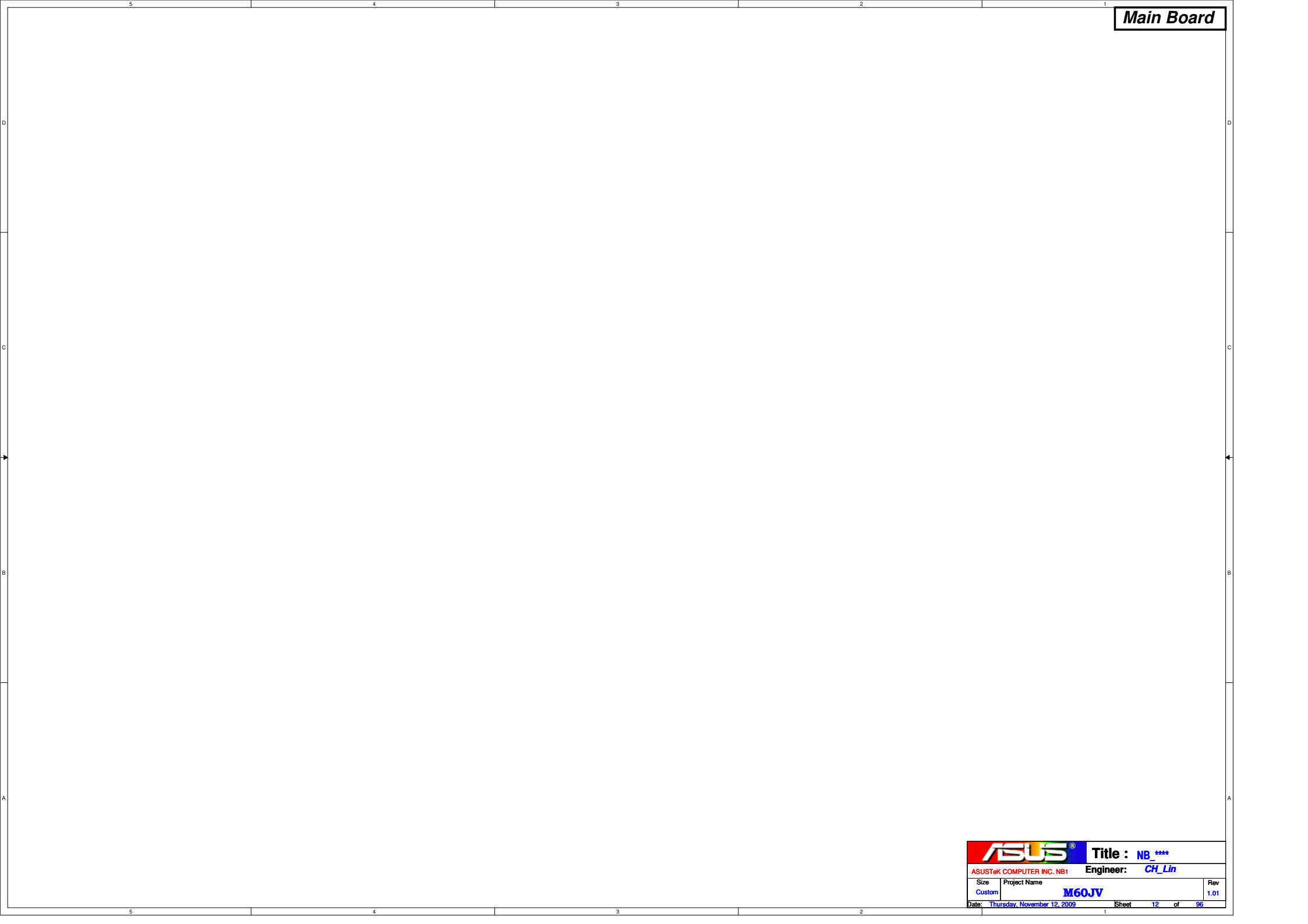
		<b>Title :</b> NB ****	
ASUSTeK COMPUTER INC. NB1		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
Custom	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	9 of 96




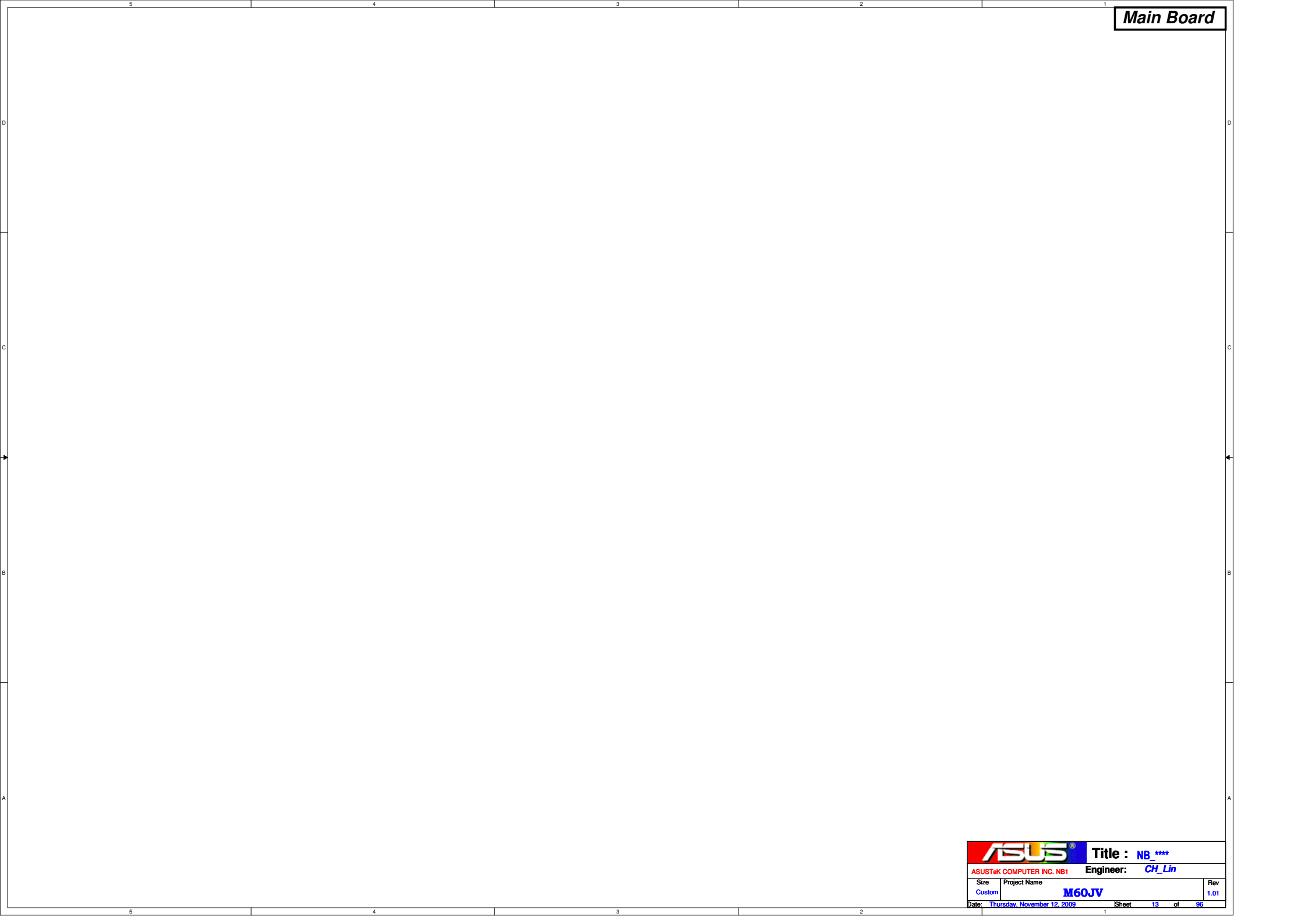
		<b>Title :</b> NB ****	
ASUSTeK COMPUTER INC. NB1		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
Custom	<b>M60JV</b>	1.01	
Date: Thursday, November 12, 2009		Sheet	10 of 96




		<b>Title :</b> NB ****	
ASUSTeK COMPUTER INC. NB1		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
Custom	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	11 of 96



		<b>Title :</b> NB ****	
ASUSTeK COMPUTER INC. NB1		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
Custom	<b>M60JV</b>	1.01	
Date: Thursday, November 12, 2009		Sheet 12 of 96	



		<b>Title :</b> NB ****	
ASUSTeK COMPUTER INC. NB1		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
Custom	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	13 of 96

5

4

3

2

1

D

D

C


C

B

B

A

A

		<b>Title :</b>
ASUSTeK COMPUTER INC. NB6		<b>Engineer:</b> <i>CH_Lin</i>
Size	Project Name	Rev
A	<b>M60JV</b>	1.01
Date: <i>Thursday, November 12, 2009</i>		Sheet <i>14</i> of <i>96</i>

5

4

3

2

1

5

4

3

2

1

D

D

C


C

B

B

A

A

		<b>Title :</b>
ASUSTeK COMPUTER INC. NB6		<b>Engineer:</b> <i>CH_Lin</i>
Size	Project Name	Rev
A	<b>M60JV</b>	1.01
Date: <i>Thursday, November 12, 2009</i>		Sheet <i>15</i> of <i>96</i>

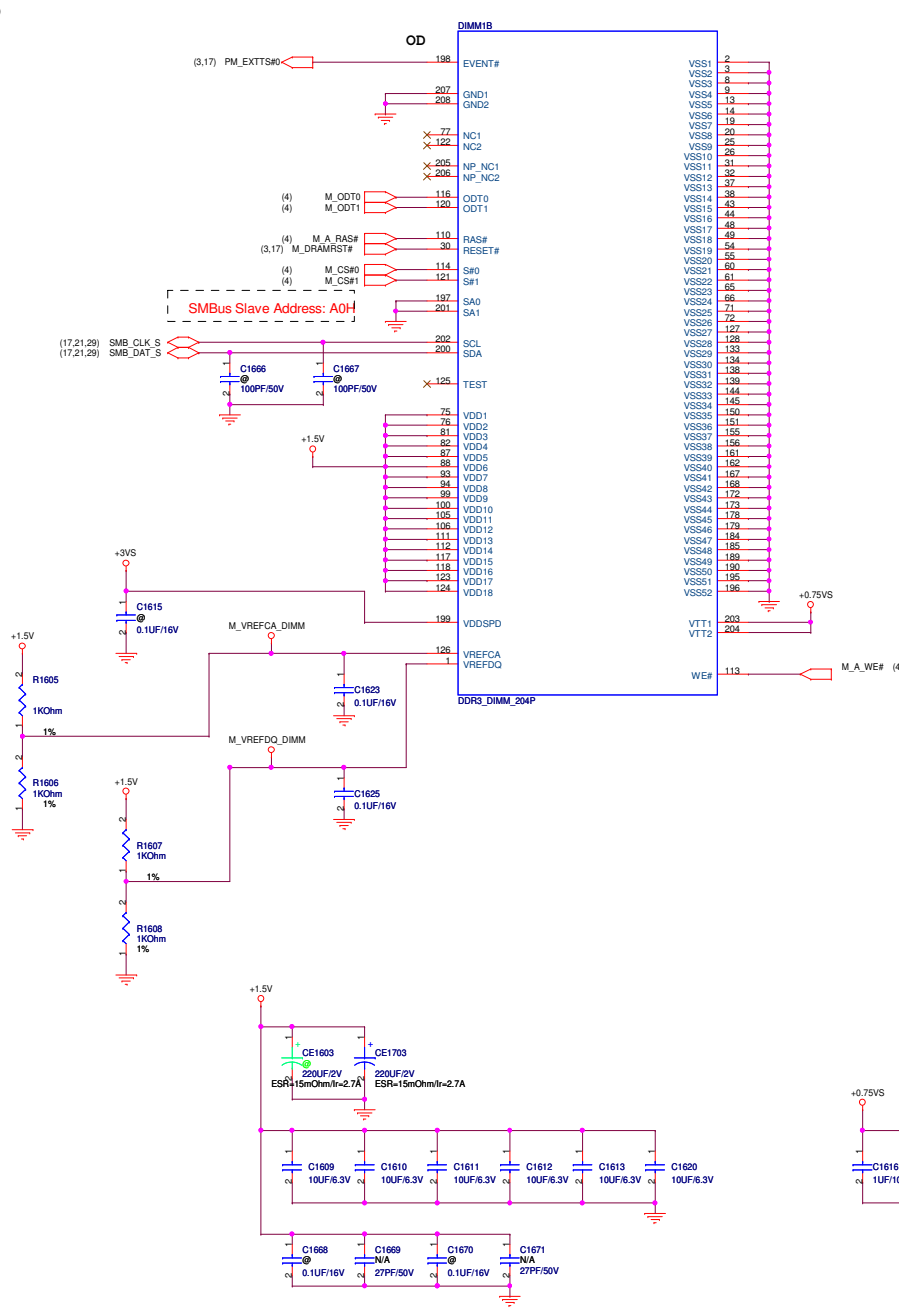
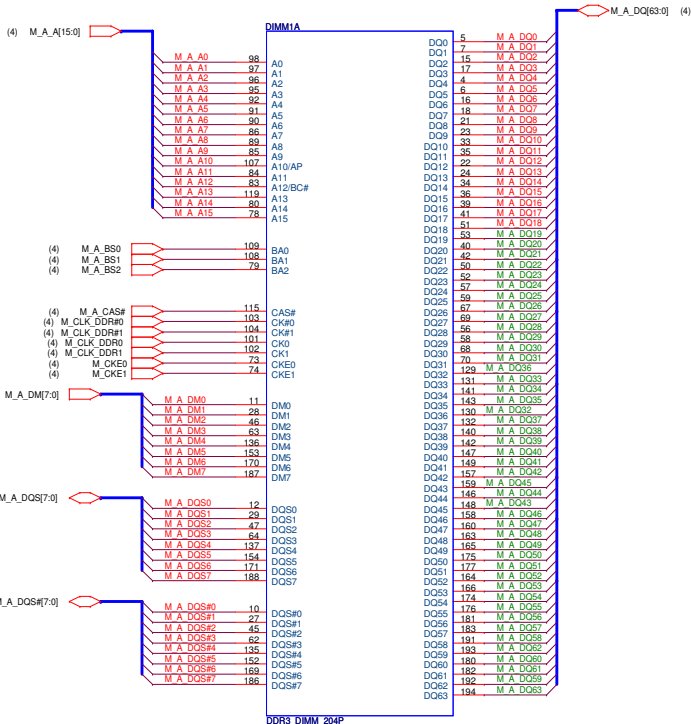
5

4

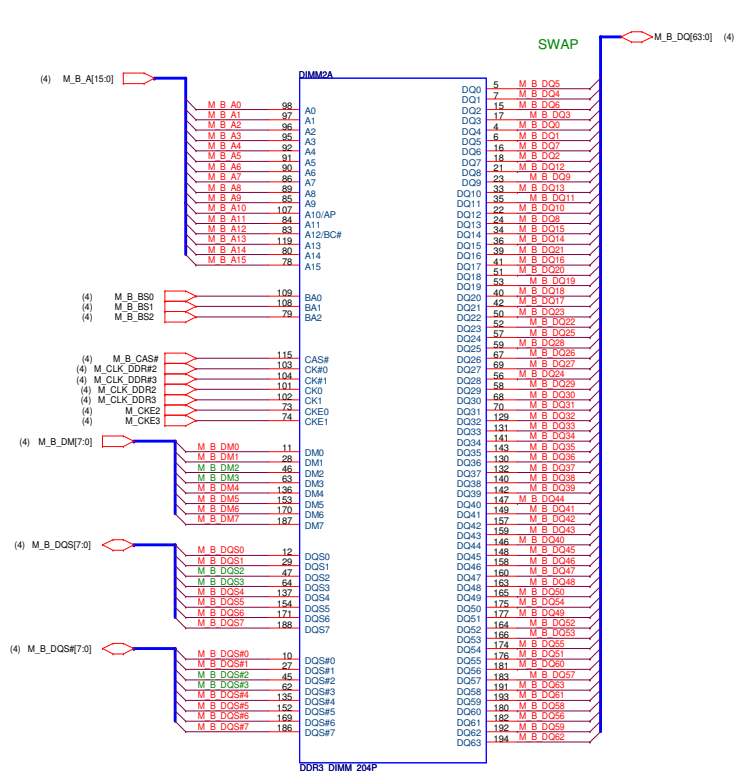
3

2

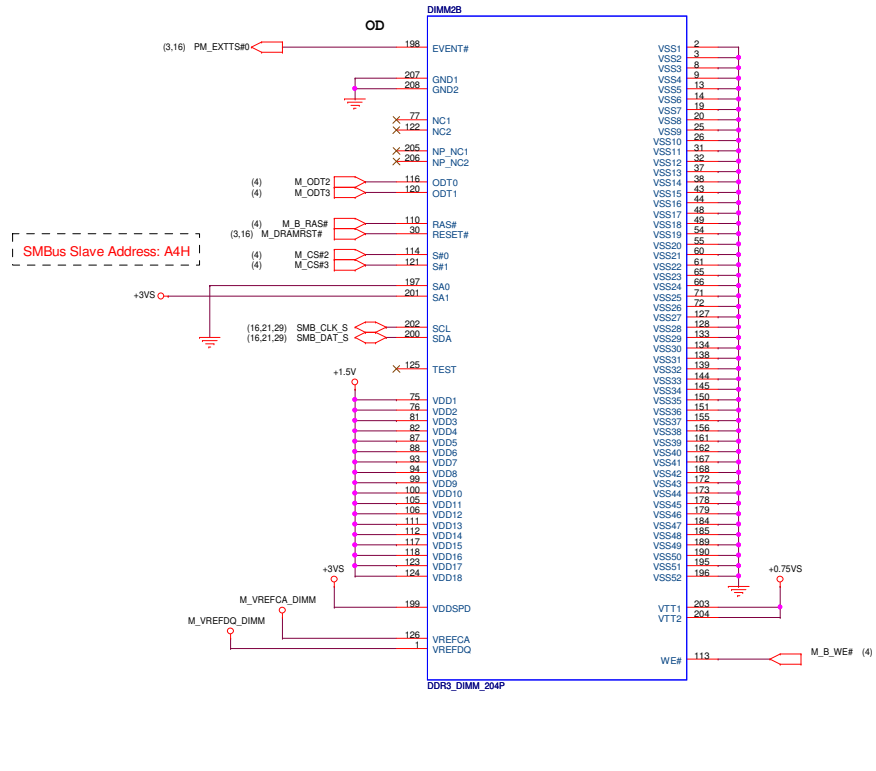
1







STD 5.2mm



SMBus Slave Address: A4H

5

4

3

2

1

D

D

C


C

B

B

A

A

		<b>Title</b> DDR3 CA_DQ VOLTAGE	
ASUSTeK COMPUTER INC. N66		Engineer: CH_Lin	
Size	Project Name	Rev	
C	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	18 of 95

5

4

3

2

1

Table 2-28. Functional Strap Definitions (Sheet 1 of 5)

Signal	Usage	When Sampled	Comment
SPKR	No Reboot	Rising edge of PWROK	The signal has a weak internal pull-down. Note: the internal pull-down is disabled after PLTRST# de-asserts. If the signal is sampled high, this indicates that the system is strapped to the "No Reboot" mode (the PCH will disable the TCO Timer system reboot feature). The status of this strap is readable using the NO_REBOOT bit (Chipset Config Registers: Offset 3410h:bit 5).
INIT3_3V#	Reserved	Rising edge of PWROK	This signal has a weak internal pull up. Note: the internal pull-up is disabled after PLTRST# de-asserts. <b>NOTE:</b> This signal should not be pulled low.
GNT[3]#/GPIO[55]	Top-Block Swap Override	Rising edge of PWROK	The signal has a weak internal pull-up. Note: the internal pull-up is disabled after PCIRST# de-asserts. If the signal is sampled low, this indicates that the system is strapped to the "topblock swap" mode (the PCH inverts A16 for all cycles targeting BIOS space). The status of this strap is readable using the Top Swap bit (Chipset Config Registers: Offset 3414h:bit 0). Note that software will not be able to clear the Top-Swap bit until the system is rebooted without GNT3# being pulled down.
INTVRMEN	Integrated 1.05 V VRM Enable / Disable	Always	Integrated 1.05 V VRMs is enabled when high. <b>NOTE:</b> This signal should always be pulled high.

Table 2-28. Functional Strap Definitions (Sheet 2 of 5)

Signal	Usage	When Sampled	Comment															
GNT1# / GPIO51	Boot BIOS Strap bit [1] BBS[1]	Rising edge of PWROK	This signal has a weak internal pull-up. Note that the internal pull-up is disabled after PCIRST# de-asserts. This field determines the destination of accesses to the BIOS memory range. Also, controllable using Boot BIOS Destination bit (Chipset Config Registers: Offset 3410h:bit 11). This strap is used in conjunction with Boot BIOS Destination Selection 0 strap. <table border="1"> <thead> <tr> <th>Bit11</th> <th>Bit 10</th> <th>Boot BIOS Destination</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Reserved</td> </tr> <tr> <td>1</td> <td>0</td> <td>PCI</td> </tr> <tr> <td>1</td> <td>1</td> <td>SPI</td> </tr> <tr> <td>0</td> <td>0</td> <td>LPC</td> </tr> </tbody> </table> <b>NOTE:</b> If option 00 LPC is selected, BIOS may still be placed on LPC; however, all platforms with the PCH require SPI flash connected directly to the PCH SPI bus with a valid descriptor in order to boot. <b>NOTE:</b> Booting to PCI is intended for debug/testing only. Boot BIOS Destination Select to LPC/PCI by functional strap or using Boot BIOS Destination Bit will not affect SPI accesses initiated by Intel® Management Engine or Integrated GbE LAN.	Bit11	Bit 10	Boot BIOS Destination	0	1	Reserved	1	0	PCI	1	1	SPI	0	0	LPC
Bit11	Bit 10	Boot BIOS Destination																
0	1	Reserved																
1	0	PCI																
1	1	SPI																
0	0	LPC																

Table 2-28. Functional Strap Definitions (Sheet 5 of 5)

Signal	Usage	When Sampled	Comment
SDVO_CTRLDA TA	Digital Display Port (Port B)	Rising Edge of PWROK	This signal has a weak internal pull-down. Note that the weak internal pull-down is disabled after PLTRST# de-asserts. Port B is enabled when sampled high. When sampled low Port B is Disabled.
DDPC_CTRLDA TA	Digital Display Port (Port C)	Rising Edge of PWROK	This signal has a weak internal pull-down. Note that the weak internal pull-down is disabled after PLTRST# de-asserts. Port C is enabled when sampled high. When sampled low Port C is Disabled.
DDPD_CTRLDA TA	Digital Display Port (Port D)	Rising Edge of PWROK	This signal has a weak internal pull-down. Note that the weak internal pull-down is disabled after PLTRST# de-asserts. Port D is enabled when sampled high. When sampled low Port D is Disabled.

Table 2-28. Functional Strap Definitions (Sheet 3 of 5)

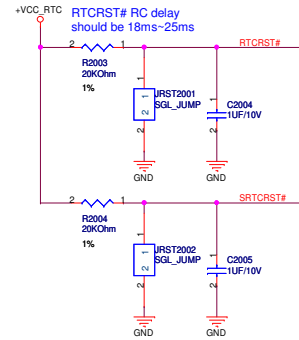
Signal	Usage	When Sampled	Comment															
GNT[0]#	Boot BIOS Strap bit [0] BBS[0]	Rising edge of PWROK	This Signal has a weak internal pull-up. Note that the internal pull-up is disabled after PCIRST# de-asserts. This field determines the destination of accesses to the BIOS memory range. Also, controllable using Boot BIOS Destination bit (Chipset Config Registers: Offset 3410h:bit 10). This strap is used in conjunction with Boot BIOS Destination Selection 1 strap. <table border="1"> <thead> <tr> <th>Bit11</th> <th>Bit 10</th> <th>Boot BIOS Destination</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Reserved</td> </tr> <tr> <td>1</td> <td>0</td> <td>PCI</td> </tr> <tr> <td>1</td> <td>1</td> <td>SPI</td> </tr> <tr> <td>0</td> <td>0</td> <td>LPC</td> </tr> </tbody> </table> <b>NOTE:</b> If option 00 LPC is selected, BIOS may still be placed on LPC; however, all platforms with the PCH require SPI flash connected directly to the PCH's SPI bus with a valid descriptor in order to boot. <b>NOTE:</b> Booting to PCI is intended for debug/testing only. Boot BIOS Destination Select to LPC/PCI by functional strap or using Boot BIOS Destination Bit will not affect SPI accesses initiated by Management Engine or Integrated GbE LAN.	Bit11	Bit 10	Boot BIOS Destination	0	1	Reserved	1	0	PCI	1	1	SPI	0	0	LPC
Bit11	Bit 10	Boot BIOS Destination																
0	1	Reserved																
1	0	PCI																
1	1	SPI																
0	0	LPC																
GNT2# / GPIO53	ESI Security (Server Only)	Rising edge of PWROK	This Signal has a weak internal pull-up. Note that the internal pull-up is disabled after PCIRST# de-asserts. Tying this strap low configures DMI for ESI compatible operation. <b>NOTE:</b> ESI compatible mode is for server platforms only. This signal should not be pulled low for desktop and mobile.															
NV_ALE	Reserved	Rising edge of PWROK	This signal has a weak internal pull down. <b>NOTE:</b> This signal should not be pulled high.															

Table 2-28. Functional Strap Definitions (Sheet 4 of 5)

Signal	Usage	When Sampled	Comment
HDA_DOCK_EN#/GPIO[33]	Flash Descriptor Security Override/ ME Debug Mode	Rising edge of PWROK	Signal has a weak internal pull-up. If strap is sampled high, the security measures defined in the Flash Descriptor will be in effect (default). If sampled low, the Flash Descriptor Security will be overridden. This strap should only be asserted low using external pull down in manufacturing/debug environments ONLY. <b>NOTE:</b> Asserting the GPIO33 low on the rising edge of PWROK will also halt Intel® Management Engine after chipset bringup and disable runtime Intel® Management Engine features. This is a debug mode and must not be asserted after manufacturing/debug.
SP1_MOSI	TPM Functionality Disable	Rising edge of MEPWROK	This signal has a weak internal pull-down resistor. This signal must be sampled low.
NV_CLE	DMI Termination Voltage	Rising edge of PWROK	This signal has a weak internal pull-down.
HDA_SDO	Reserved	Rising edge of RSMRST#	This signal has a weak internal pull down. <b>NOTE:</b> This signal should not be pulled high.
GPIO8	Reserved	Rising edge of RSMRST#	This signal has a weak internal pull up. Note that the weak internal pull-up is disabled after RSMRST# de-asserts. <b>NOTE:</b> This signal should not be pulled low.
GPIO27	Reserved	Rising edge of RSMRST# pin	<b>This signal should be left as a No Connect.</b>
HDA_SYNC	On-Die PLL Voltage Regulator Voltage Select	Rising edge of RSMRST# pin	This signal has a weak internal pull down. On-Die PLL VR is supplied by 1.5 V when sampled high; 1.8 V when sampled low.
GPIO15	Reserved	Rising edge of RSMRST# pin	Low = Intel® Management Engine Crypto Transport Layer Security (TLS) cipher suite with no confidentiality High = Intel® Management Engine Crypto TLS cipher suite with confidentiality This signal has a weak internal pull down. <b>NOTE:</b> A strong pull up may be needed for GPIO functionality.
L_DDC_DATA	LVDS	Rising Edge of PWROK	This signal has a weak internal pull-down. Note that the weak internal pull-down is disabled after PLTRST# de-asserts. LVDS is enabled when sampled high. When sampled low LVDS is Disabled.

Request by CSC for CMOS clear function

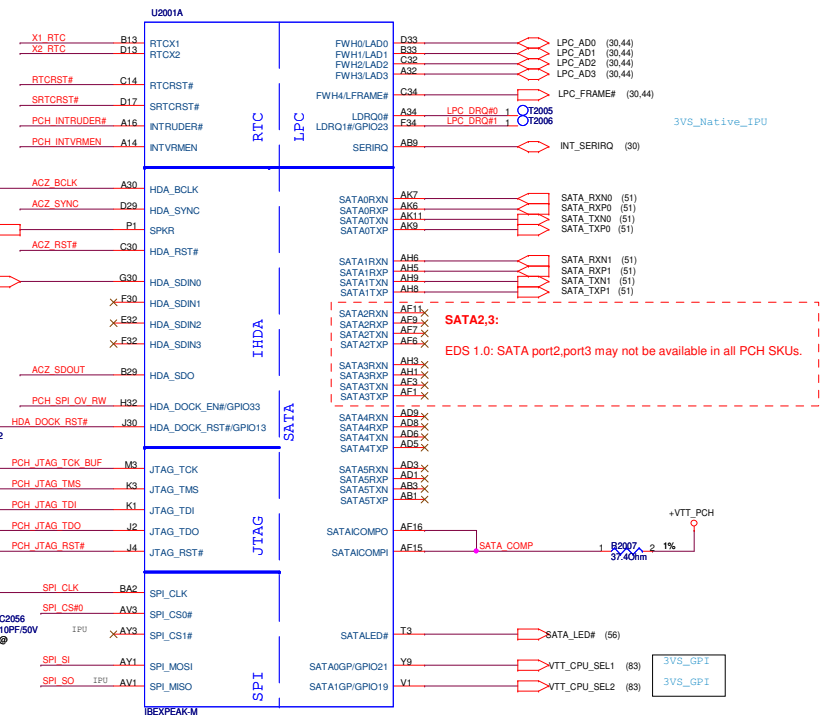
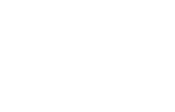
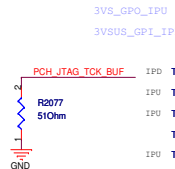
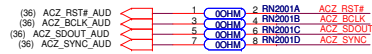
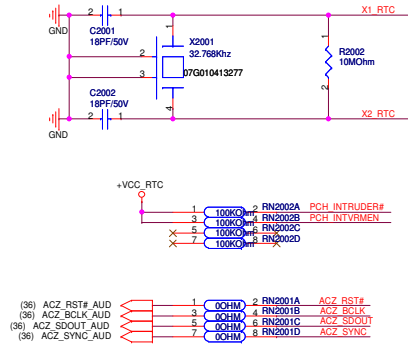
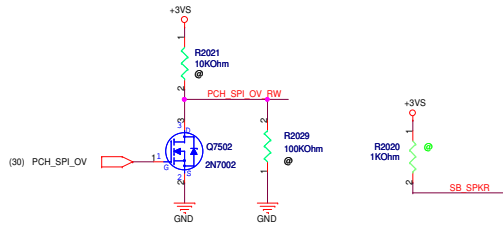
CMOS Settings		JNST2001		TPM Settings		JRST2002	
Clear CMOS	Shunt	Clear ME RTC Registers	Shunt	Clear ME RTC Registers	Shunt	Clear ME RTC Registers	Shunt
Keep CMOS	Open (Default)	Keep ME RTC Registers	Open (Default)	Keep ME RTC Registers	Open (Default)	Keep ME RTC Registers	Open (Default)



DG2\_0 P297  
**RTCRST# and SRTCST# can not be shorted together**

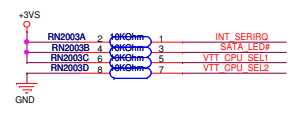
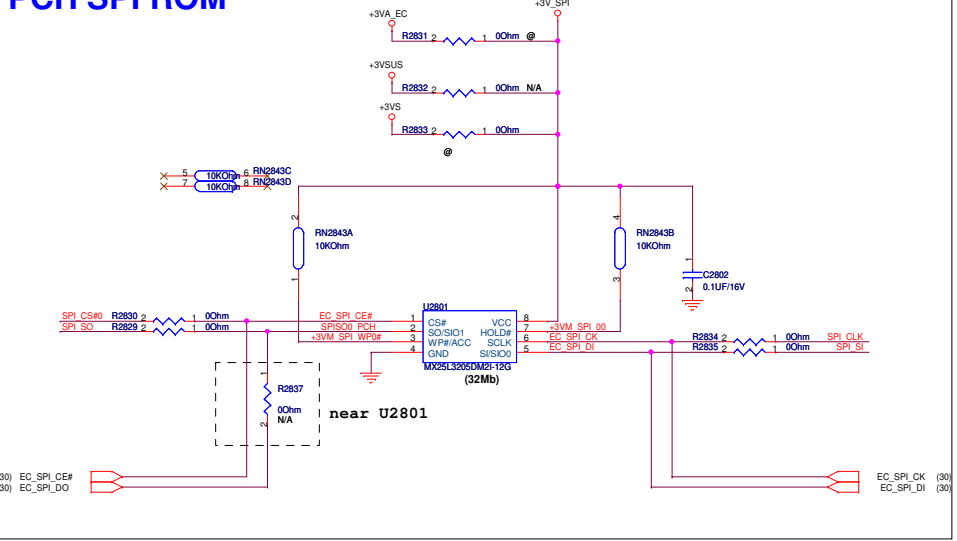
**Strap information:**

	B	L
ACZ_SYNC: Select VCCVRR 1.5V or 1.8V (IPU)	1.5V	1.8V
SB_SPKR: No reboot strap (IPU)	No reboot	Disable No reboot
PCH_SPI_OV_RW: (IPU)	No Flash ME FW	Flash ME FW
SPI_SI: IIPM strap. (IPU)	Enable	Disable
PCH_INTVRMEN: Integrated 1.05 V VRR Enable /Disable	Enable	Disable



**SATA2,3:**  
 EDS 1.0: SATA port2,port3 may not be available in all PCH SKUs.

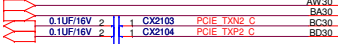
**PCH SPI ROM**



Update 1105 (R2.0)

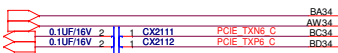
**PCIE2: WLAN**

- (53) PCIE\_RX2\_WLAN
- (53) PCIE\_RXP2\_WLAN
- (53) PCIE\_TX2\_WLAN
- (53) PCIE\_TXP2\_WLAN



**PCIE5: LAN**

- (41) PCIE\_RX\_LAN\_N
- (41) PCIE\_RX\_LAN\_P
- (41) PCIE\_TX\_LAN\_N
- (41) PCIE\_TX\_LAN\_P



**PCIE7,8:**  
EDS 1.0; port7,port8 may not be available in all PCH SKUs.

3VSUS\_Native\_IPU CLK\_REQ0#

3VS\_Native CLK\_REQ1#

- (53) CLK\_PCIE\_WLAN# PCH
- (53) CLK\_PCIE\_WLAN# PCH
- (53) CLKREQ2\_WLAN#

CLK\_REQ2# 3VSUS\_Native

CLK\_REQ3# 3VSUS\_Native

CLK\_REQ4# 3VSUS\_Native

CLK\_REQ5# 3VSUS\_Native

CLK\_PCIE\_GLAN#

CLK\_PCIE\_LAN\_P

CLK\_PCIE\_LAN\_N

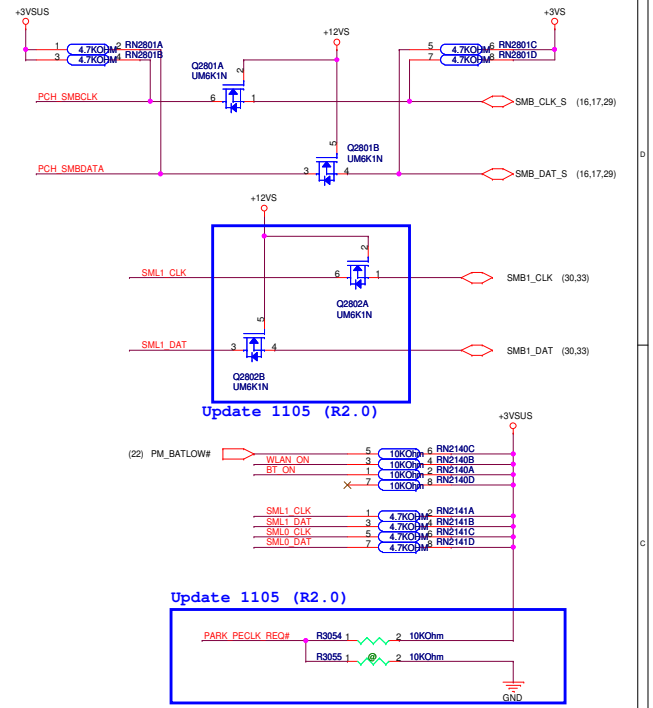
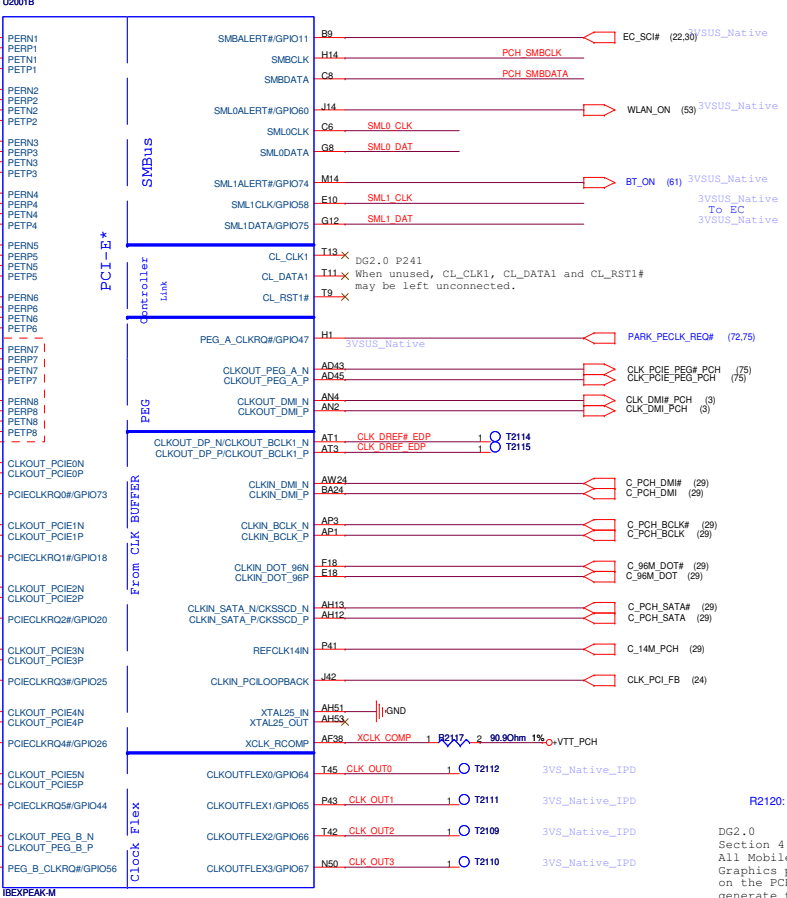
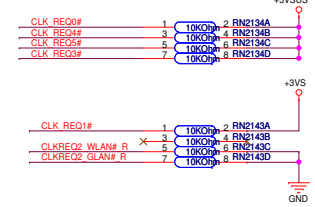
CLK\_REQ1#

CLKREQ2\_WLAN# R

CLKREQ2\_GLAN# R

Note: Place these resistors near to PCIe Slots

**PCH CLKREQ Setting:**  
Not connected to device.



If not use crystal, please change C1201 to 0 Ohm

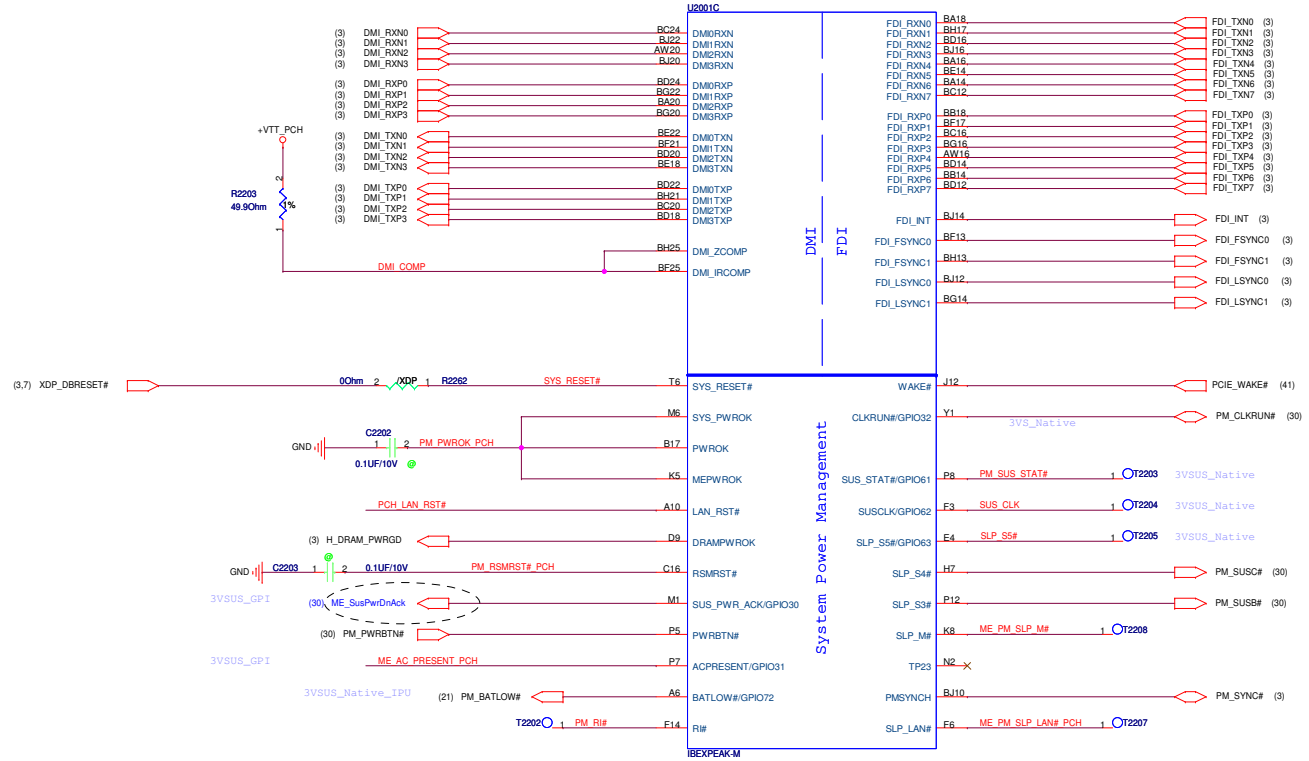
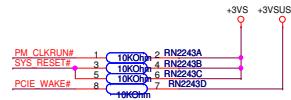
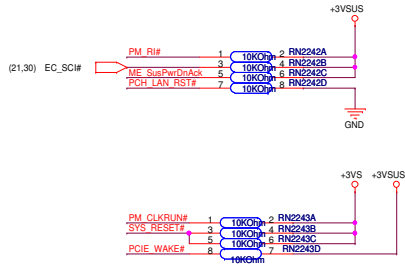
R2120: For Xtal measurement

DG2.0  
Section 4.2.4.1: Added 25-MHz Crystal routing guideline. All Mobile Intel S Series Chipset-based Integrated Graphics platforms are required to use a 25-MHz crystal on the PCH XTAL25\_IN/OUT to enable the PCH to generate the display clocks. Display Clock generation is integrated into the PCH.

Integrated Graphics platforms that implement DVI/DP/HDMI/e-DP are required to use Display Clock Integration (DCI) (25M crystal to generate PCI display clocks) to improve signal integrity and mitigate risk of electrical compliance and associated functional failures

WW35 Update: Integrated Graphics platforms that use onlyLVDS and/or VGA Displays may use Buffer Through Mode (BTM) and leave 25-MHz crystal and RC components unstaffed

pre-ES1 not support  
Reversal Feature



R1.1,item L15

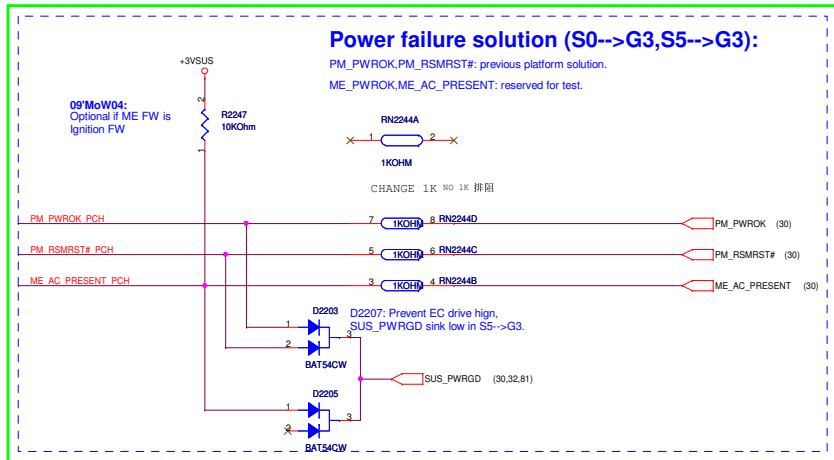


Table 112. Intel ME-EC Interaction Signal List with and without M3 Support

Signal Name	Platform with M3 Support (e.g., Intel® AMT)	Platform without M3 Support (e.g., Intel® ME Ignition Firmware)
SUS_PWR_DN_ACK (GPIO30)	Required	Required
ACPRESENT (GPIO31)	Required	Required <b>Note:</b> Optional if Intel ME FW is Intel® ME Ignition Firmware
SLP_M#	Required	Optional (Tie to SLP_S3#) <b>Note:</b> If SLP_S3# is not routed from PCH to EC, then SLP_M# becomes required from Intel® ME-EC perspective.
SLP_S3#	Optional	Required <b>Note:</b> If SLP_M# is routed from PCH to EC, then SLP_S3# can be optional from Intel ME-EC perspective

**NOTE:** Optional means that these signals are optional from Intel ME-EC interaction point of view. However, they are platform critical signals and are still required to be routed on the platform.

ME Ignition Firmware is for 2MB SPI core, only PM55 can support on it.

EDID_DAT_PCH	1	47KOHM	RN2344A
EDID_CLK_PCH	3	47KOHM	RN2344B
L_CTRL_DATA	5	47KOHM	RN2344C
L_CTRL_CLK	7	47KOHM	RN2344D

**LVDS Disable: (For discrete graphic)**

1. NC:  
 LVDSA\_DATA [3:0], LVDSA\_DATA# [3:0],  
 LVDSA\_CLK, LVDSA\_CLK#, LVDSB\_DATA [3:0],  
 LVDSB\_DATA# [3:0], LVDSB\_CLK, LVDSB\_CLK#  
 L\_VDD\_EN, L\_BKLTEN, L\_BKLTCTL, LVD\_VREFH  
 LVD\_VREFL, LVD\_IBG, LVD\_VBG

2. Connected to GND:  
 VccALVDS, VccTX\_LVDS

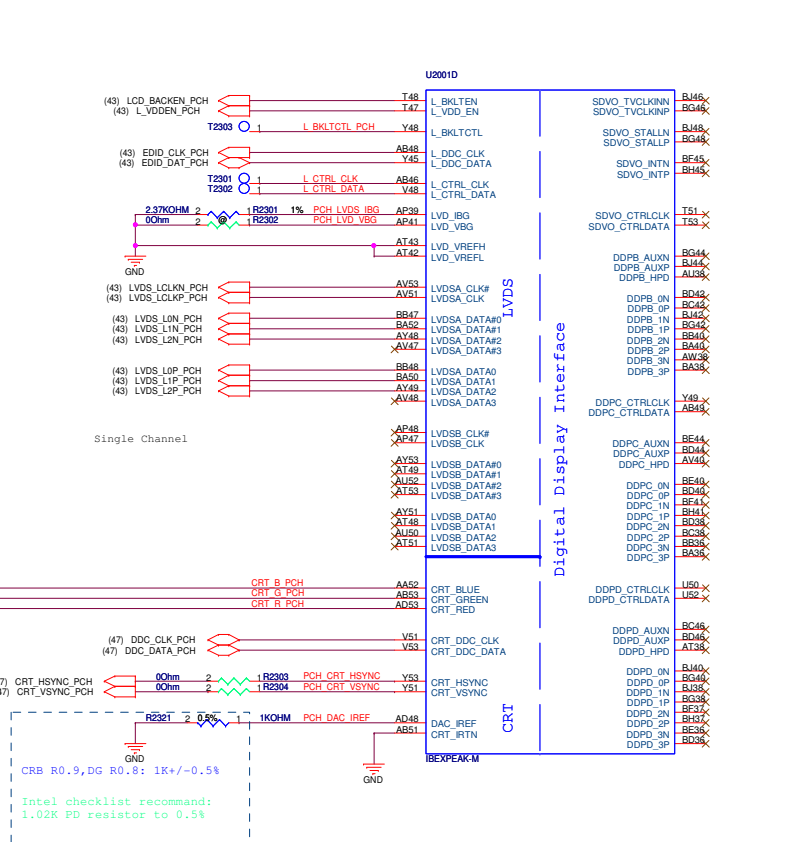
**CRT Disable: (For discrete graphic)**

1. NC:  
 CRT\_RED, CRT\_GREEN, CRT\_BLUE  
 CRT\_HSYNC, CRT\_VSYNC

2. 1-kΩ ±0.5% pull-down to GND:  
 DAC\_IREF

3. Connected to GND:  
 CRT\_ITRN

4. Connect to +V3.3:  
 VCCADAC



U2001E

- XH40 AD0
- XN44 AD1
- XC44 AD2
- XA38 AD3
- XC36 AD4
- XJ34 AD5
- XN45 AD6
- XN46 AD7
- XE36 AD8
- XH48 AD9
- XE40 AD10
- XC40 AD11
- XM48 AD12
- XM45 AD13
- XM40 AD14
- XM43 AD15
- XJ36 AD16
- XJ39 AD17
- XK48 AD18
- XK46 AD19
- XK42 AD20
- XM51 AD21
- XJ42 AD22
- XJ42 AD23
- XK41 AD24
- XL44 AD25
- XF42 AD26
- XJ40 AD27
- XN46 AD28
- XF44 AD29
- XM47 AD30
- XM36 AD31
- XJ30 C:BE0#
- XG42 C:BE1#
- XH47 C:BE2#
- XG34 C:BE3#

NVRAM

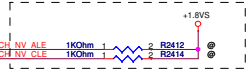
PCI

USB

- NV\_CE#0 AV3
- NV\_CE#1 B11
- NV\_CE#2 AE16
- NV\_CE#3 BDB
- NV\_DQS0 AV3
- NV\_DQS1 BDB
- NV\_DQ0NV\_I00 AP7
- NV\_DQ1NV\_I01 AT6
- NV\_DQ2NV\_I02 AT6
- NV\_DQ3NV\_I03 BBT
- NV\_DQ4NV\_I04 BBT
- NV\_DQ5NV\_I05 AV3
- NV\_DQ6NV\_I06 BBE
- NV\_DQ7NV\_I07 BA4
- NV\_DQ8NV\_I08 BBE
- NV\_DQ9NV\_I09 BBE
- NV\_DQ10NV\_I10 BBE
- NV\_DQ11NV\_I11 BBE
- NV\_DQ12NV\_I12 BBE
- NV\_DQ13NV\_I13 BBE
- NV\_DQ14NV\_I14 BBE
- NV\_DQ15NV\_I15 BBE
- NV\_ALE NV\_ALE
- NV\_CLE NV\_CLE
- NV\_RCOMP AV2
- NV\_RB# AV7
- NV\_WR#\_RE# AV8
- NV\_WR#\_RFB# AV8
- NV\_WE#\_CK0 AV11
- NV\_WE#\_CK1 BEE

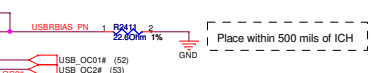
Strap information:

	H	L
PCIAV_ALE# Strap Intel Anti-Theft Technology HDD Data Protection Enable	Enable	Disable
PCIALE# Strap DMI Termination Voltage		



NV\_ALE: Strap Intel Anti-Theft Technology HDD Data Protection Enable. (H: enable)  
 NV\_CLE: Strap DMI Termination voltage

K82JR	Recommend settings
0	USB port
1	USB port
2	USB port
3	
4	WiFi/WiMax
5	
6	
7	
8	
9	Camera
10	
11	
12	BT (1.1)
13	



Place within 500 mils of ICH

3VSUS\_Native [9,10,14,40,41,42,43,59]

DGPU\_SELECT#

(43,47) DGPU\_SELECT#

SVS\_Native[50,52,54]

SVS\_Native\_IPU [51,53,55]

SVS\_GPI [2,3,4,5]

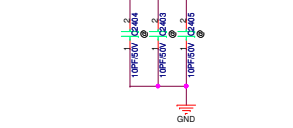
PCI\_PME#: Internal PU to suspend plane.  
 change to PCI\_CLK4 to sync ICS364

IPU T2407

(21) CLK\_PCI\_FB

(30) CLK\_KBPC1\_PCH

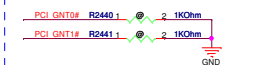
(44) CLK\_DEBUG



GNT0#,GNT1#: Boot BIOS Strap.

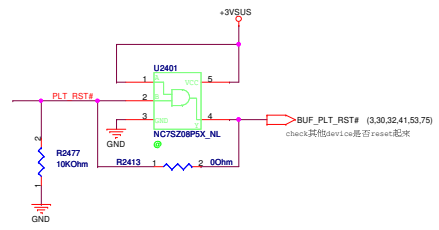
Boot BIOS Strap		
PCI_GNT0#	PCI_GNT0#	Boot BIOS Location
0	0	LPC
0	1	PCI
1	0	Reserved
1	1	SPI (PCH)

Sampled on rising edge of PWROK.



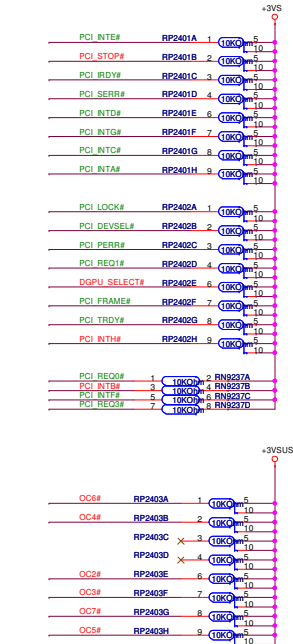
GNT3#: A16 swap override Strap/ Top-Block swap override jumper

Low=Enabled A16 swap override/  
 Top-Block swap override  
 High=Default

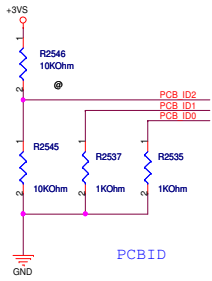


BUF\_PLT\_RST# (3,30,32,41,53,75)

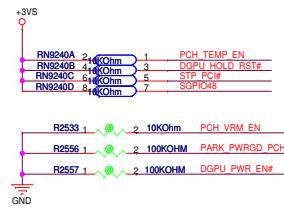
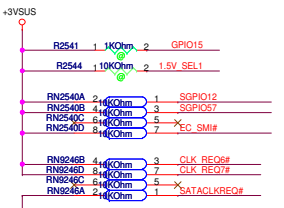
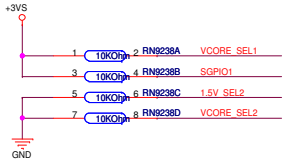
check 其他 device 是否 reset 配合





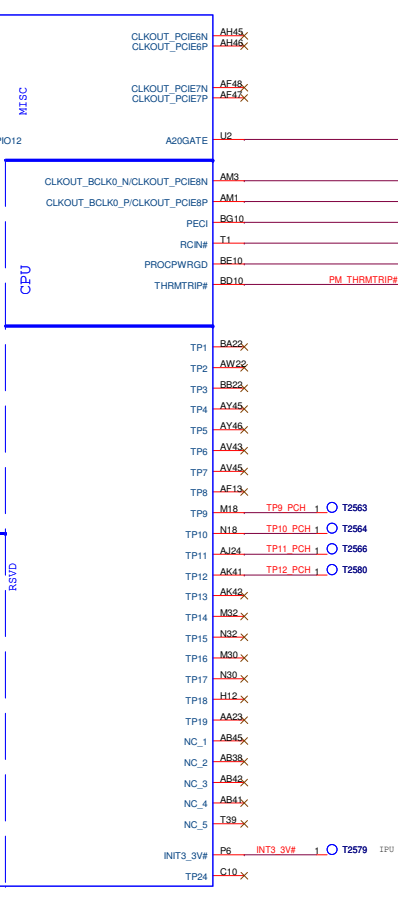
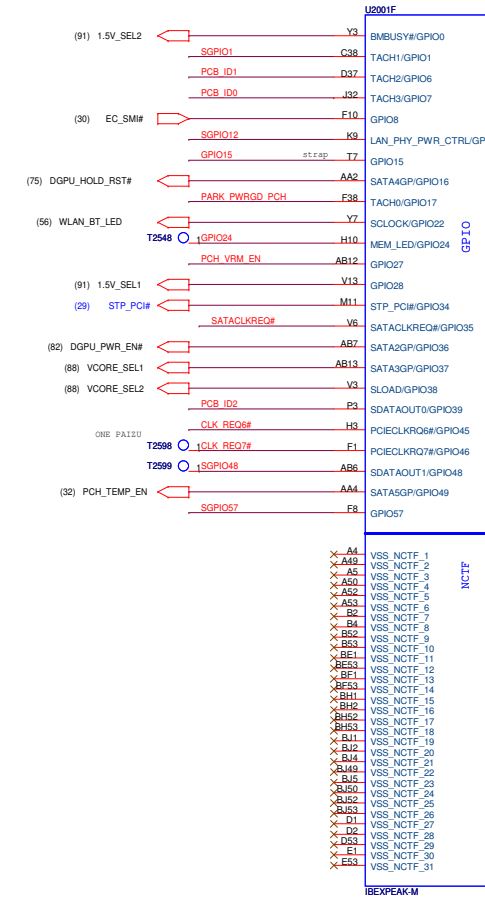


All GPIOs are reset to the default state by CP9h reset except GPIO24.  
 GPIO 27: Enable VCCVRM\_Low=disable. Default internal pull up.

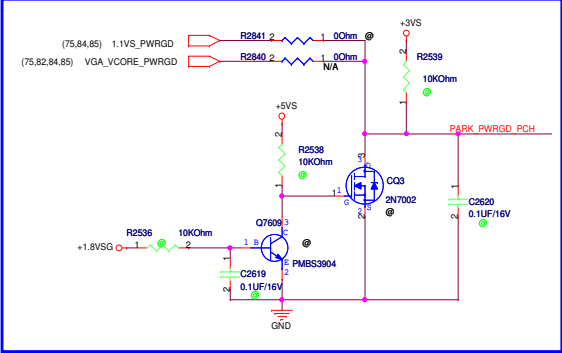


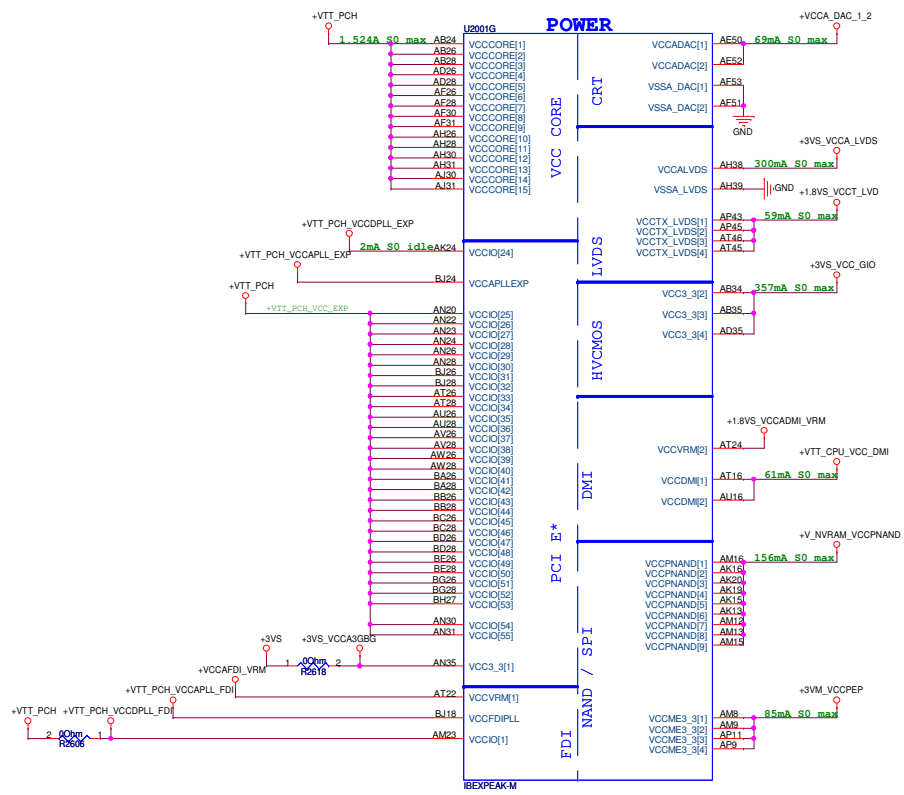
POWER按照提供的default值調節電壓

- 3VS\_GPI
- 3VS\_GPI\_IPU
- 3VS\_GPI\_IPU
- 3VS\_GPI\_IPU
- 3VSUS\_GPO\_TPU
- 3VSUS\_GPI
- 3VSUS\_GPO\_TPD
- 3VS\_GPI
- 3VS\_GPI\_IPU
- 3VS\_GPI
- 3VSUS\_GPO
- 3VSUS\_GPO\_TPU
- 3VSUS\_GPI\_TPU
- 3VS\_GPI
- 3VS\_GPI
- 3VS\_GPI
- 3VS\_GPI
- 3VSUS\_Native\_TPU
- 3VSUS\_Native
- 3VS\_GPI
- 3VS\_GPI
- 3VSUS\_GPI
- ONE PAIZU
- (32) PCH\_TEMP\_EN

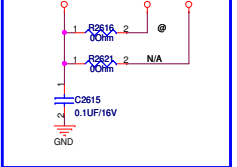
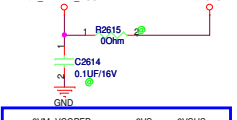
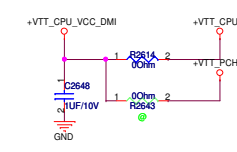
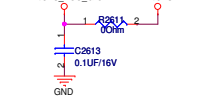
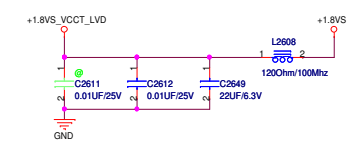
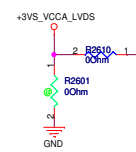
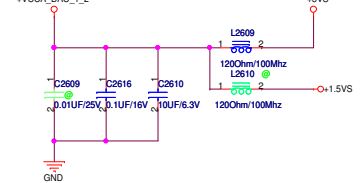
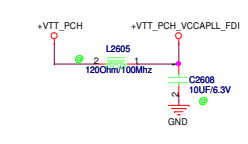
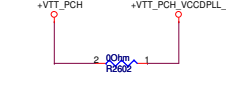
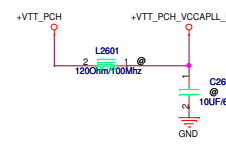
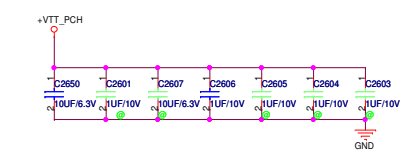
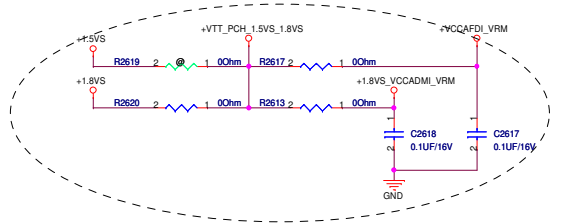


Update 1109, R2.0

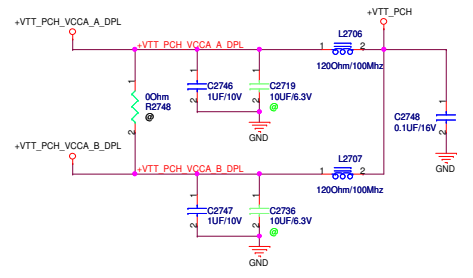
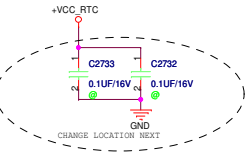
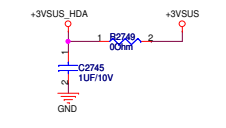
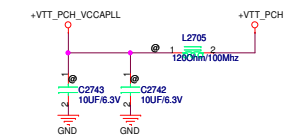
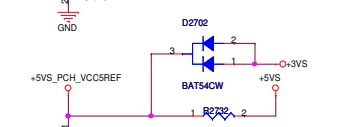
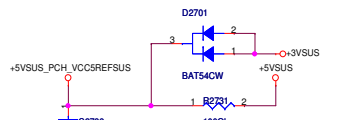
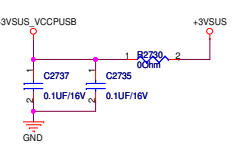
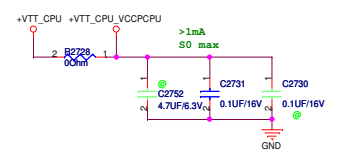
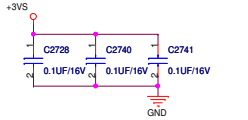
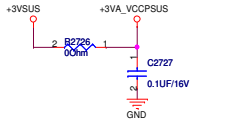
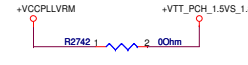
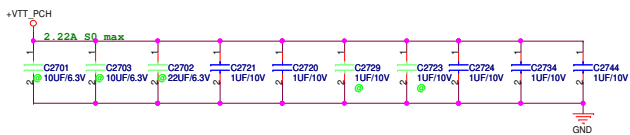
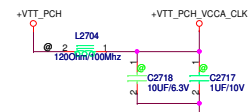
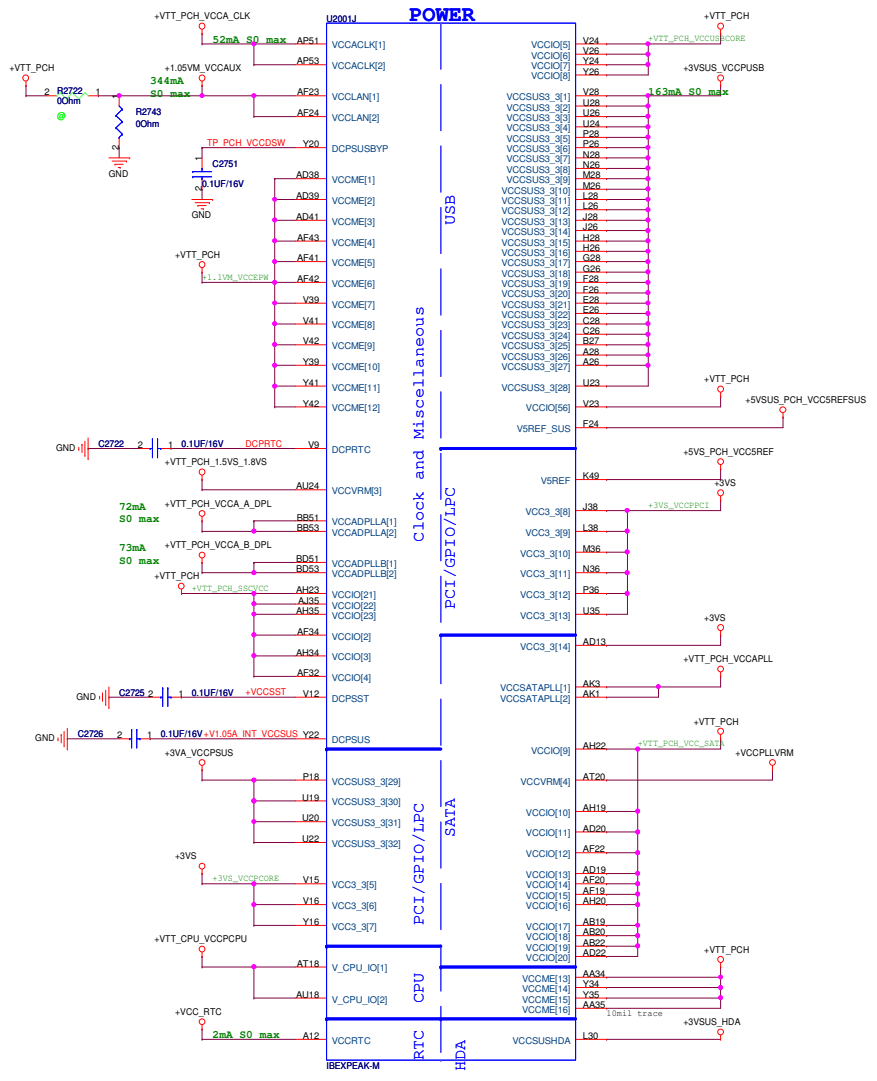


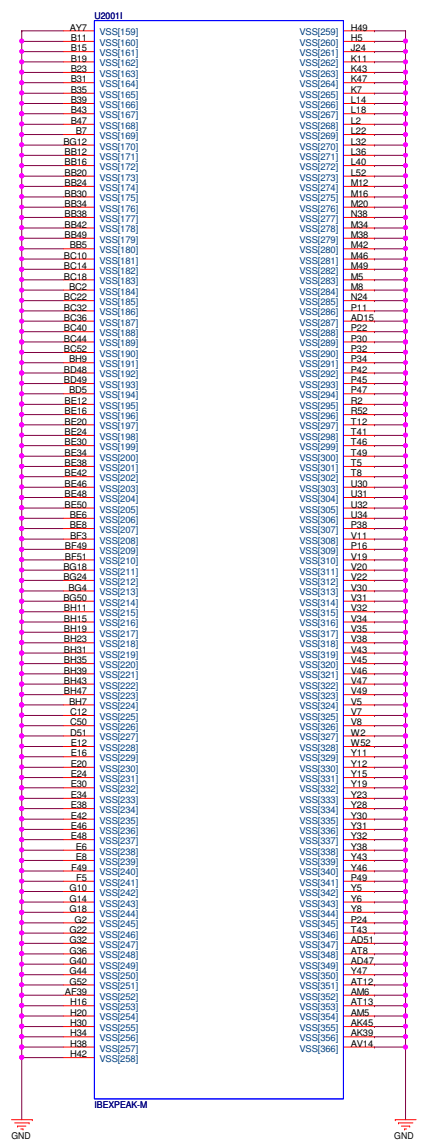
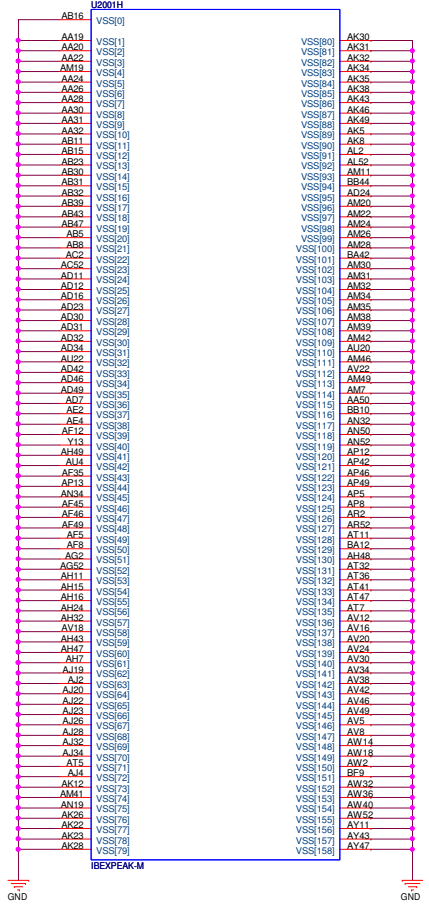


HDA\_SYNC: Select VCCVRM 1.5V or 1.8V (IPD)  
 Low: 1.8V  
 High: 1.5V



Update 1105 (R2.0)

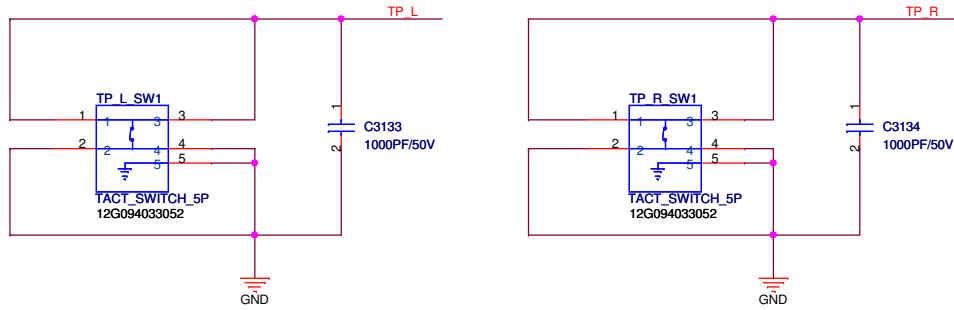




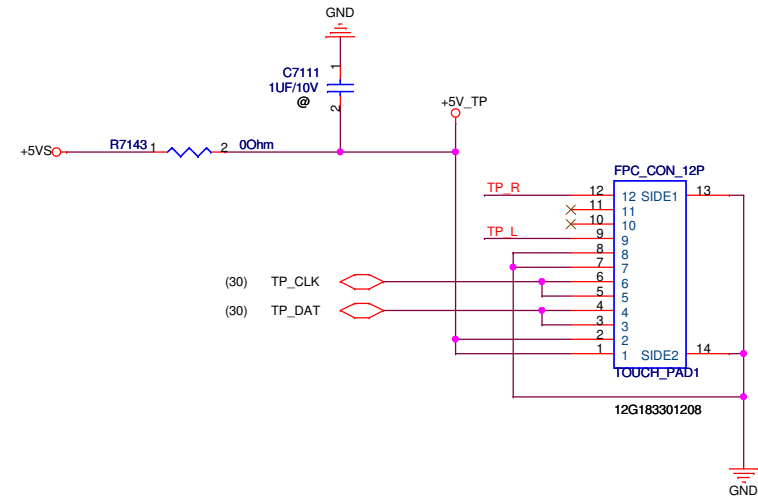




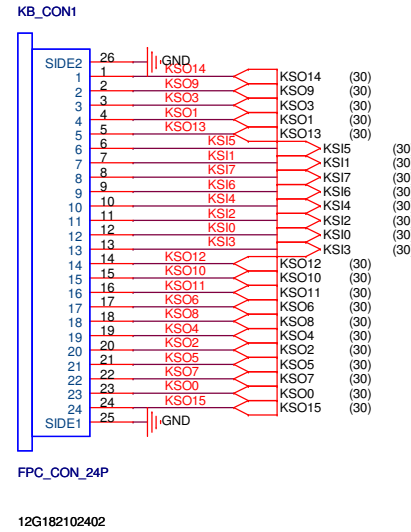
# TouchPad



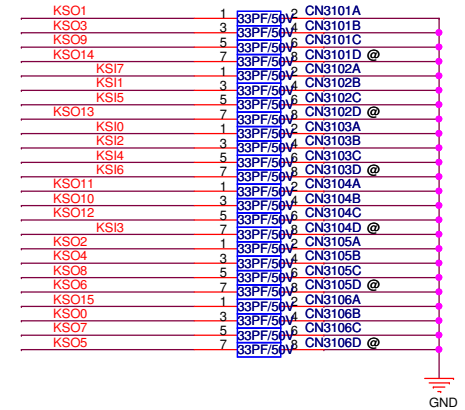
1.0 EMI test need mount C3133 and C3134



# Keyboard Connector



EMI Request

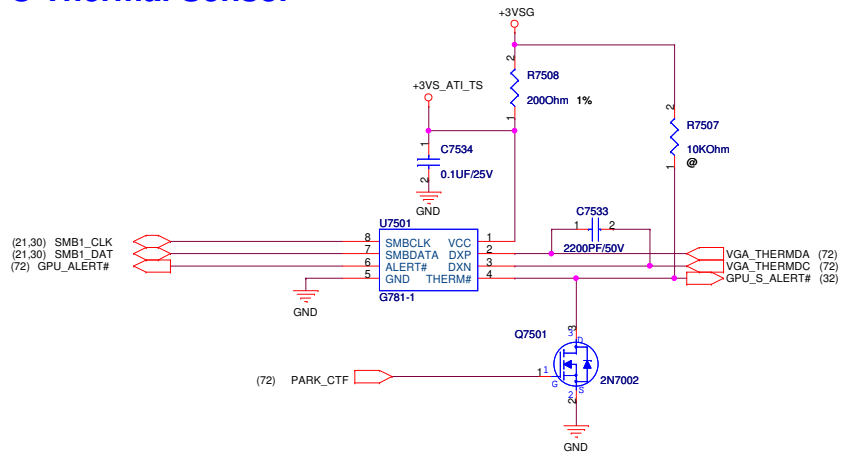


<Variant Name>

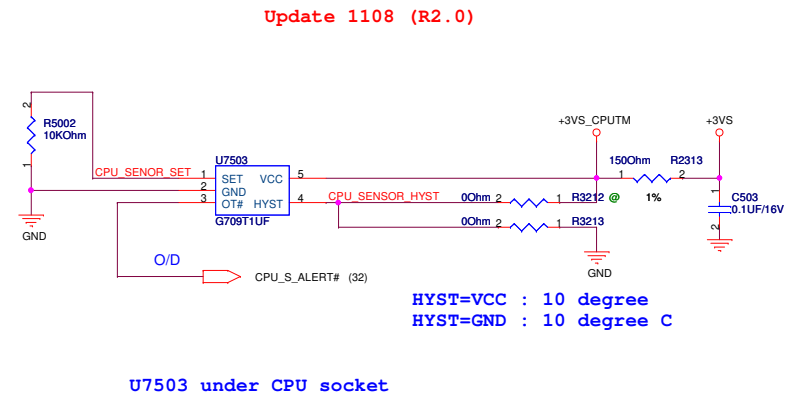




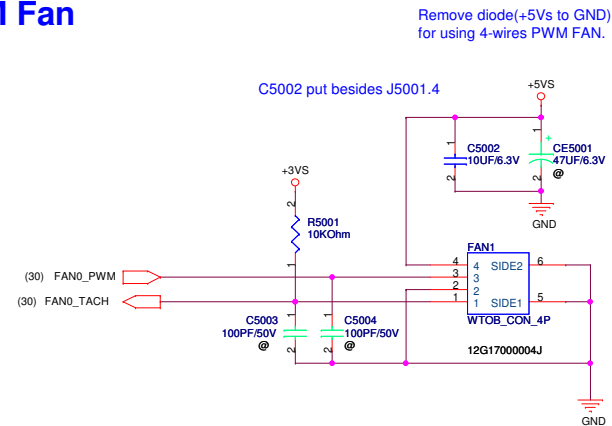
## GPU Thermal Sensor



## CPU Thermal Sensor




## PWM Fan

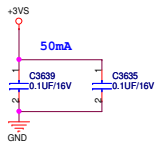


移至 USB BOARD

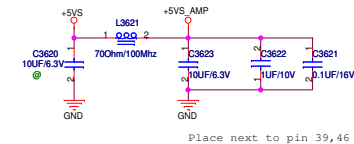
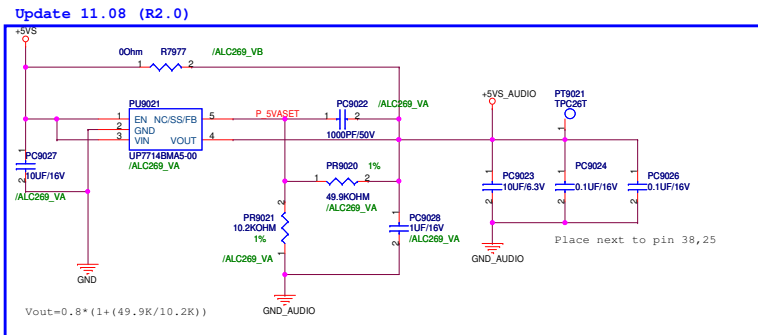
<Variant Name>

		<b>Title :</b> 8131
ASUSTeK COMPUTER INC		<b>Engineer:</b>
Size Custom	Project Name <b>LAN Design IP</b>	Rev 108
Date: <b>Thursday, November 12, 2009</b>		Sheet 34 of 96

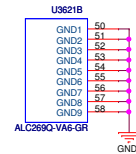




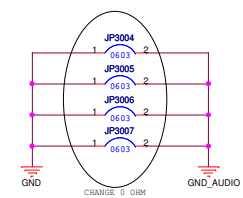
Close to pin1,9



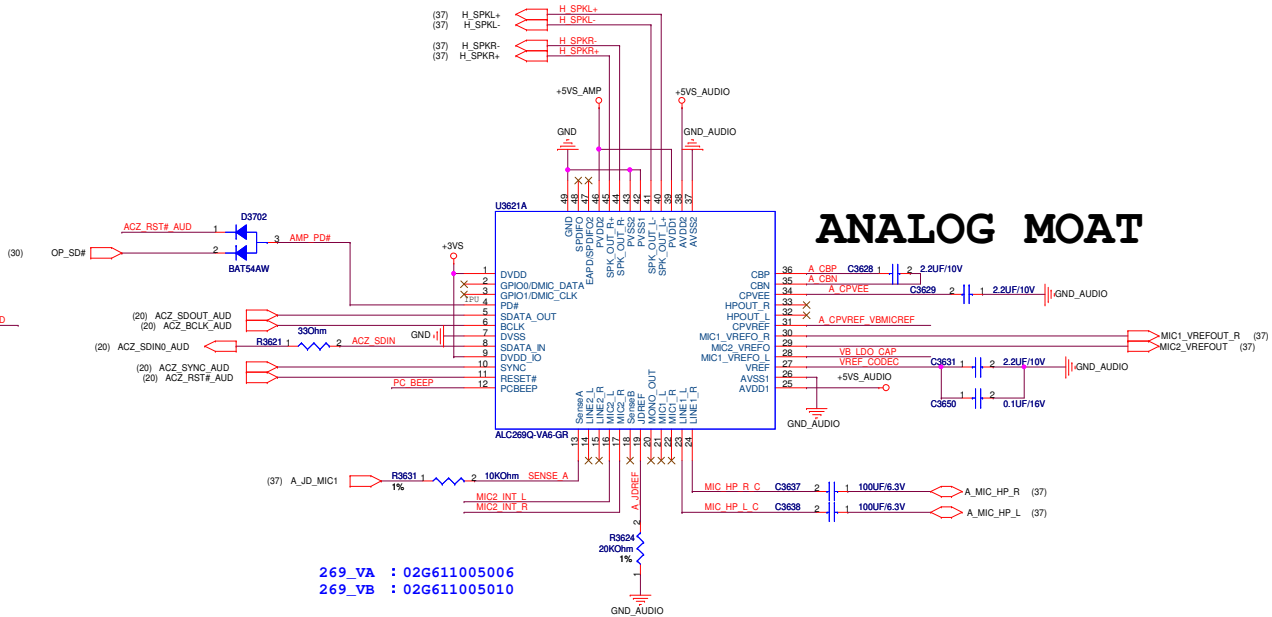
Place next to pin 39,46



For EMI

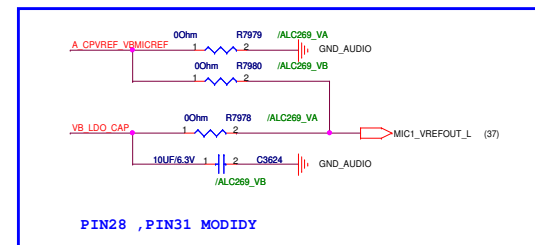


# ANALOG MOAT



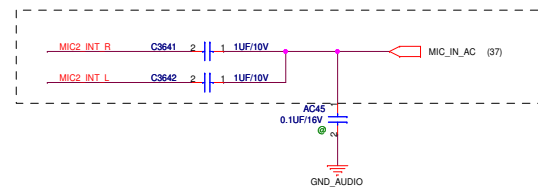
269\_VA : 02G611005006  
269\_VB : 02G611005010

Update 11.08 (R2.0)

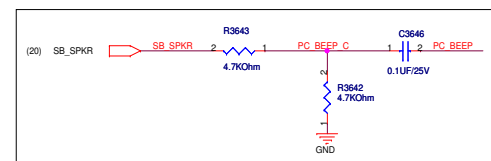


PIN28 , PIN31 MODIFY

## INTERNAL MIC

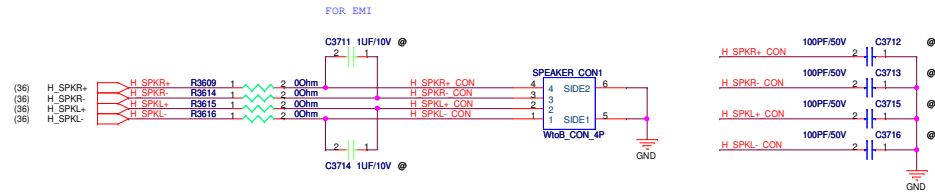


## PC BEEP

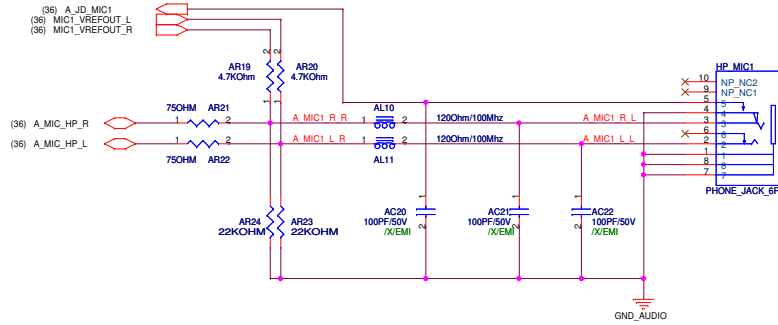


<-Variant Name>

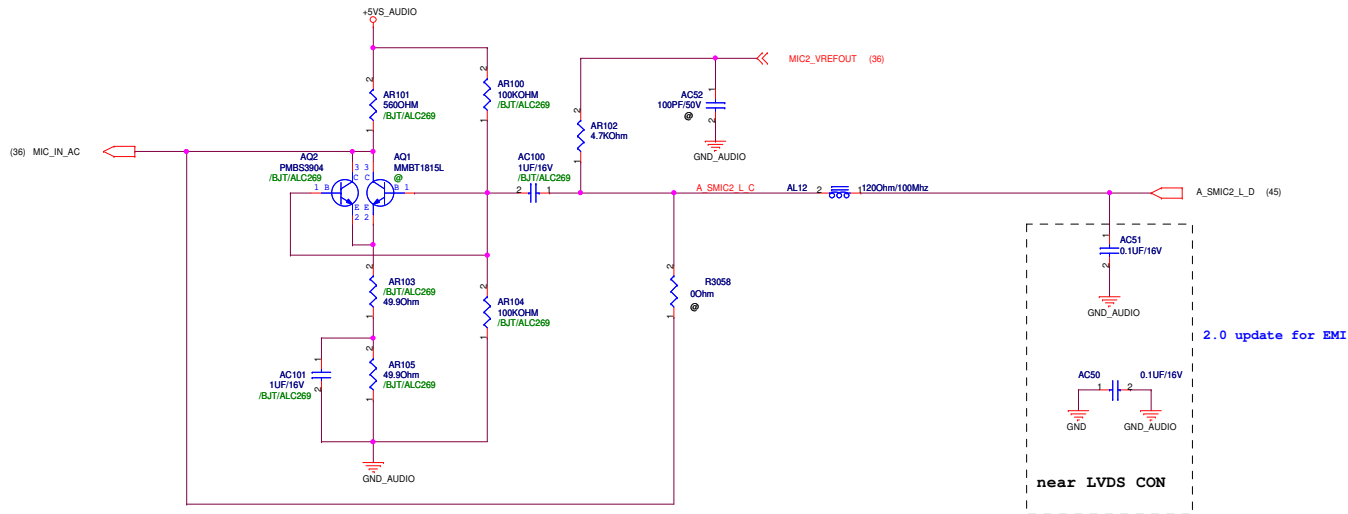
# SPEAKER



# HP and MIC

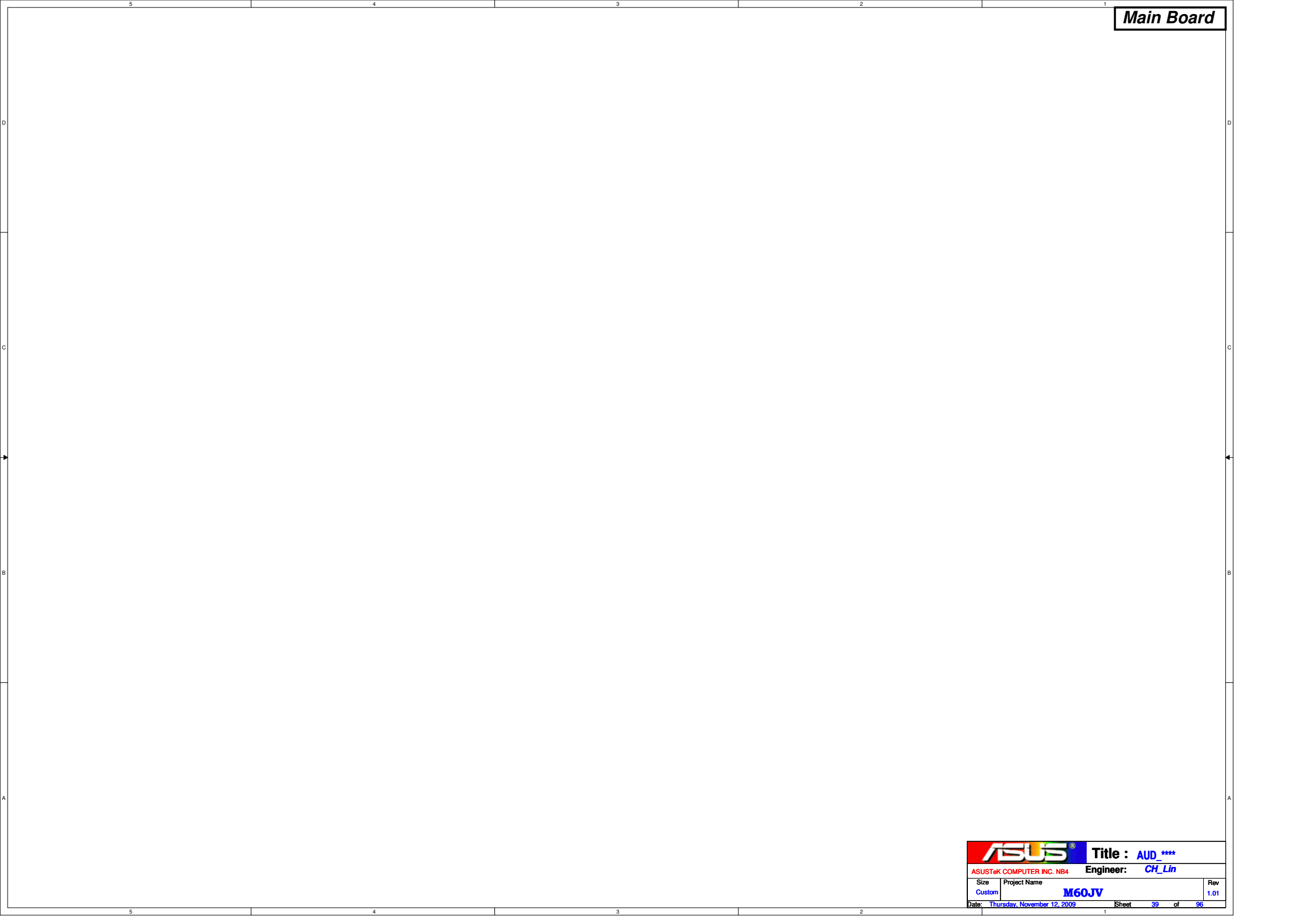



# Internal MIC and AMP



**Main Board**

		<b>Title :</b> AUD_FM2010
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin
Size	Project Name	Rev
C	<b>M60JV</b>	1.01
Date: Thursday, November 12, 2009		Sheet 38 of 95



		<b>Title : AUD ****</b>	
ASUSTeK COMPUTER INC. NB4		<b>Engineer: CH_Lin</b>	
Size	Project Name	Rev	
Custom	<b>M60JV</b>	1.01	
Date: Thursday, November 12, 2009		Sheet	39 of 96

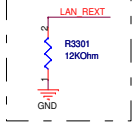
Card Insert: Pin.10 and Pin.12 are Shorted.  
Card not Insert: Pin.10 and Pin.12 are Opened.  
Write Protect: Pin.11 and Pin.12 are Opened.  
Write Enable: Pin.11 and Pin.12 are Shorted.

<Variant Name>

		<b>Title :</b> AU6433D53-GLF	
ASUSTek Computer Inc.		<b>Engineer:</b> Fehling_Wang	
Size	Project Name	Rev	
A3	1008P Card Reader	1.0G	
Date:	Thursday, November 12, 2009	Sheet	40 of 96

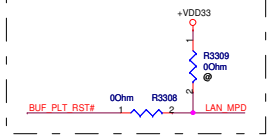


**Reference Resistance**

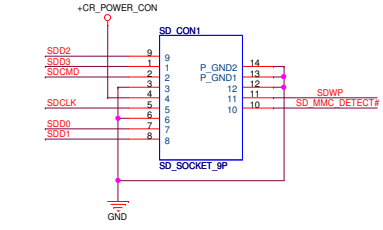
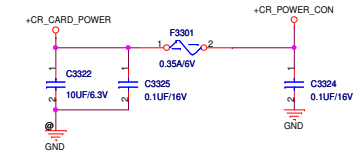
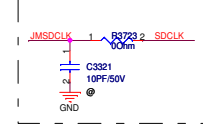
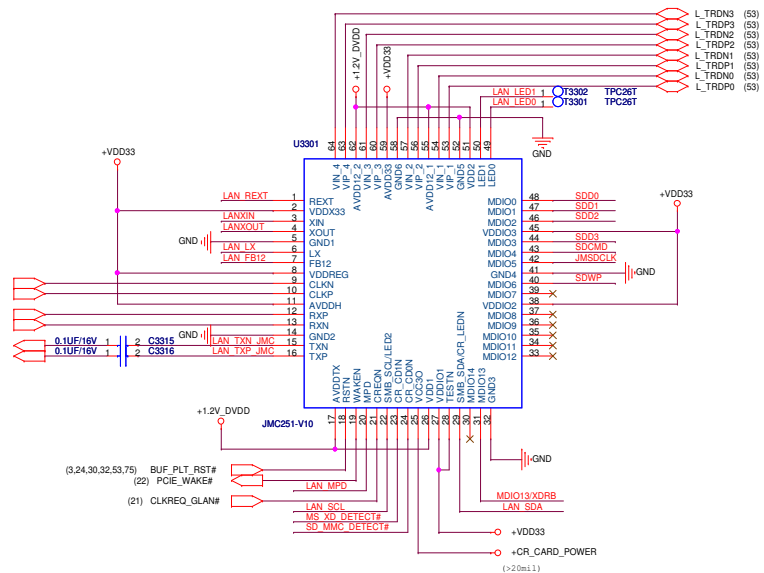


**D3E Enable/Disable**

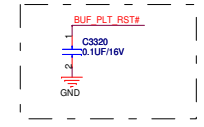
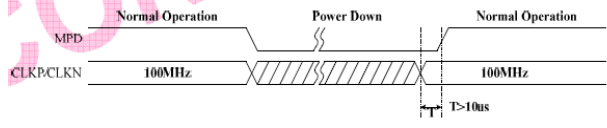
R3309	R3308	D3E
Unmount	Mount	Enable
Mount	Unmount	Disable



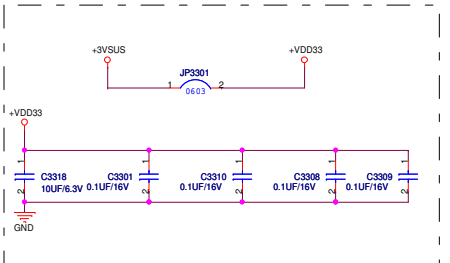
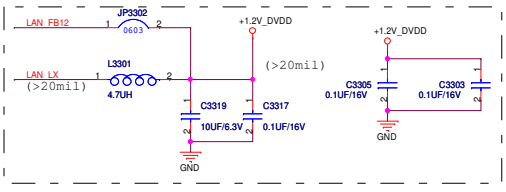
- (21) PCH\_C\_LAN\_N
- (21) PCH\_C\_LAN\_P
- (21) POE\_TX\_LAN\_P
- (21) POE\_TX\_LAN\_N
- (21) POE\_RX\_LAN\_N
- (21) POE\_RX\_LAN\_P



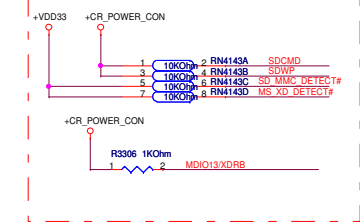
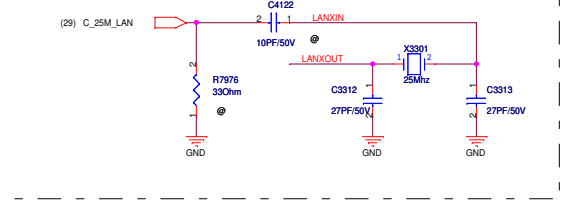
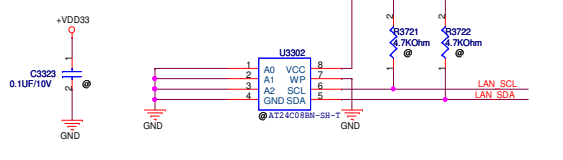
Card Insert: Pin.10 and Pin.12 are Shorted.  
 Card not Insert: Pin.10 and Pin.12 are Opened.  
 Write Protect: Pin.11 and Pin.12 are Opened.  
 Write Enable: Pin.11 and Pin.12 are Shorted.



**Switch Regulator**



**Serial EEPROM**



5

4

3

2

1

D

D

C


C

B

B

A

A

		<b>Title :</b> LAN RJ45	
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> James1_Wu	
Size	Project Name	Rev	
Custom	M52J	1.3	
Date: Thursday, November 12, 2009		Sheet	42 of 99

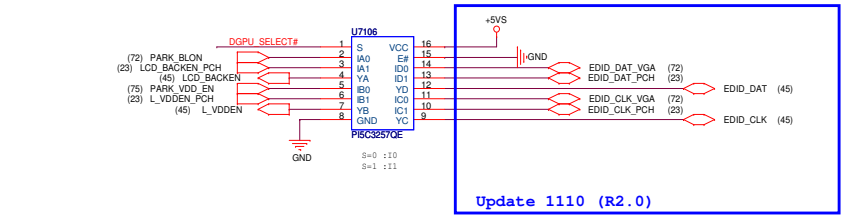
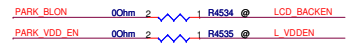
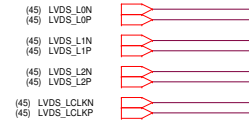
5

4

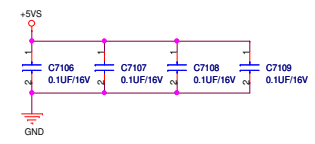
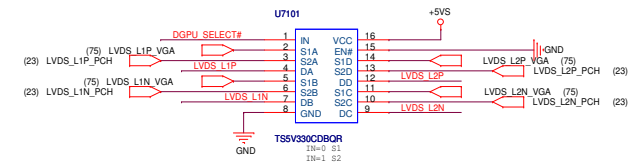
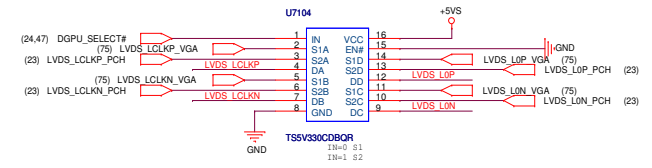
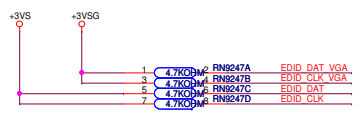
3

2

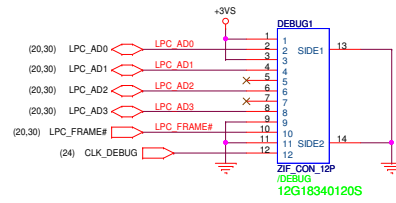
1

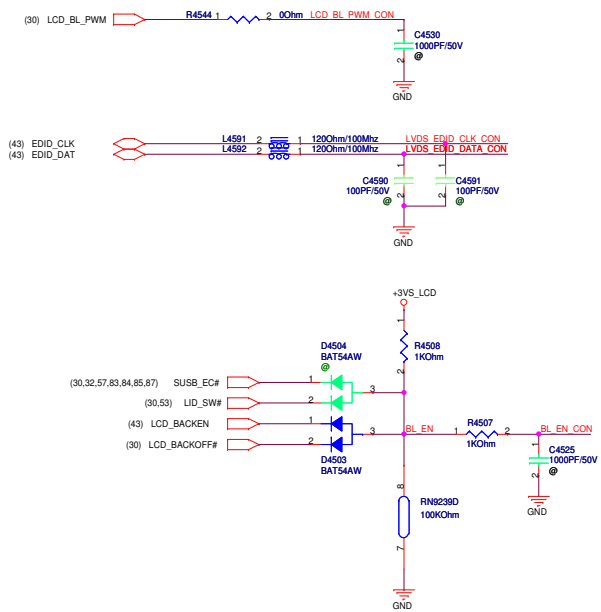
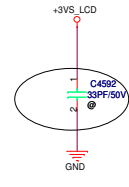
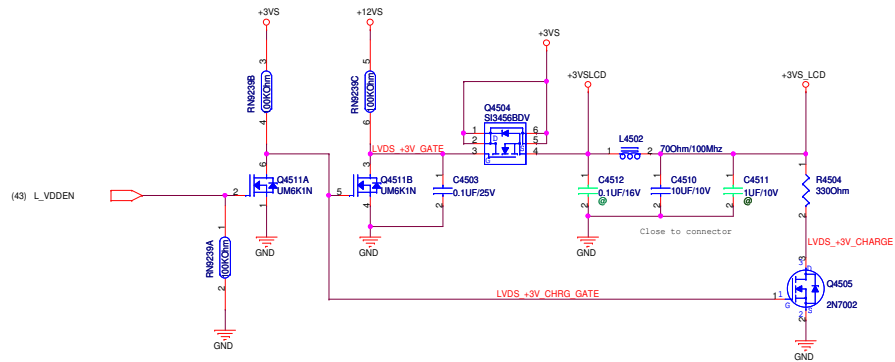


Update 1110 (R2.0)

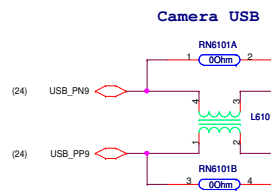
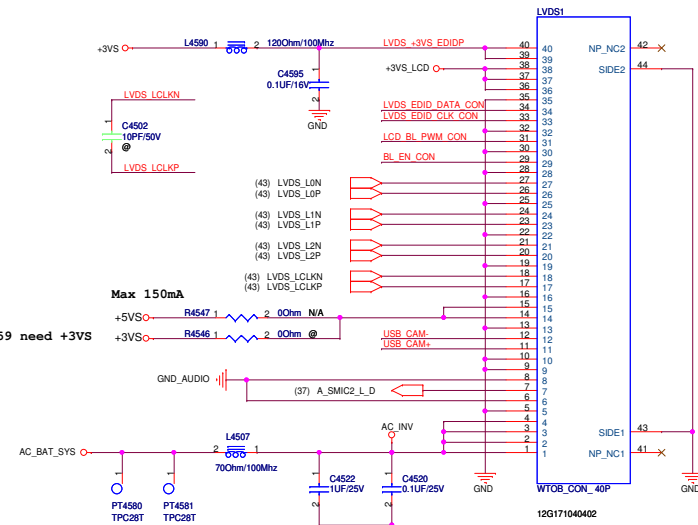


LPC Debug Port

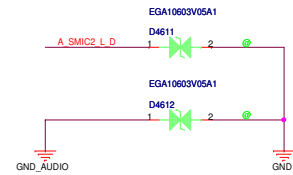
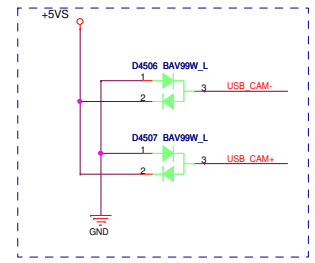


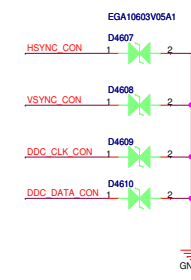
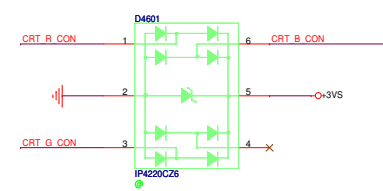
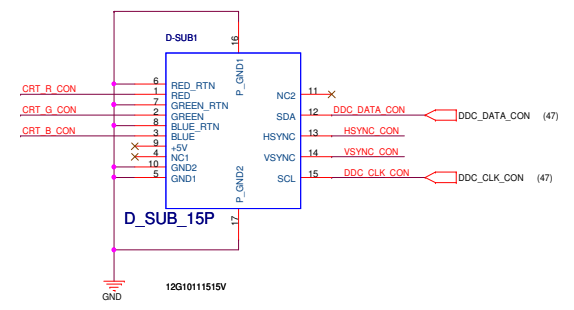
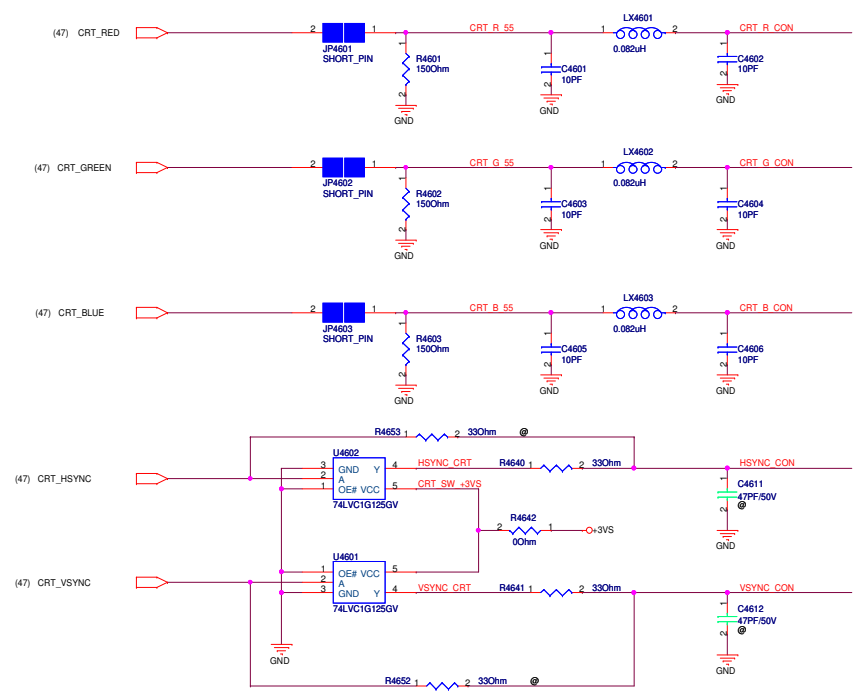


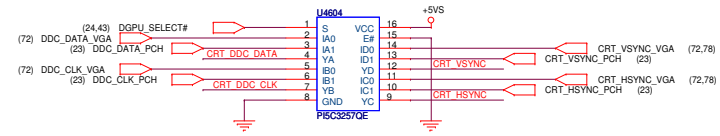
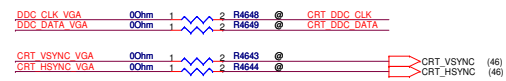
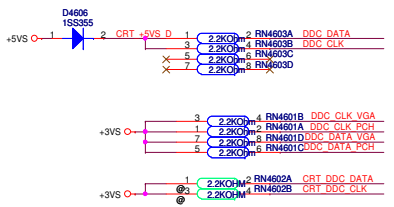
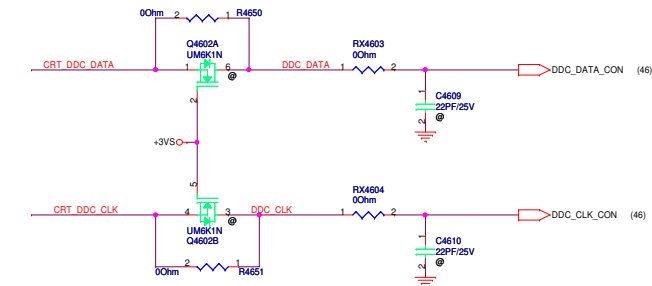
CNF9059 need +3VS



1.0 EMI test need mount D4506 and D4507

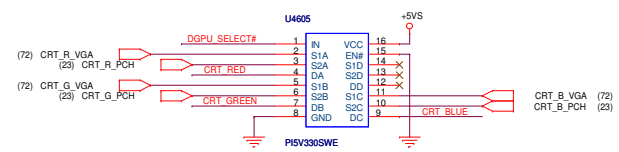






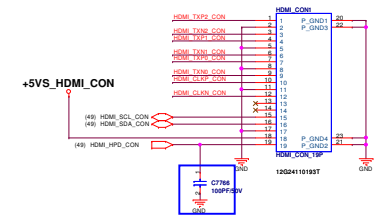
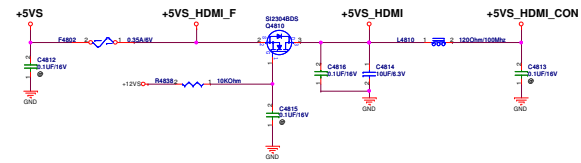
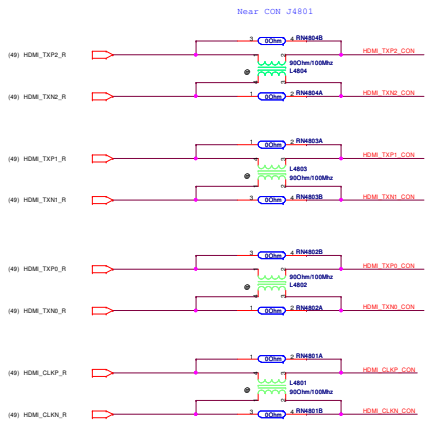
change pin define  
A0 TO A1

**S=0 for VGA output**  
**S=1 for PCH output**

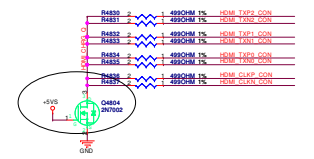


PI5V330SWE bandwidth=570MHz  
PCH analog RAMDAC=350MHz.  
(2048x1536 with 32bit color at 75Hz)

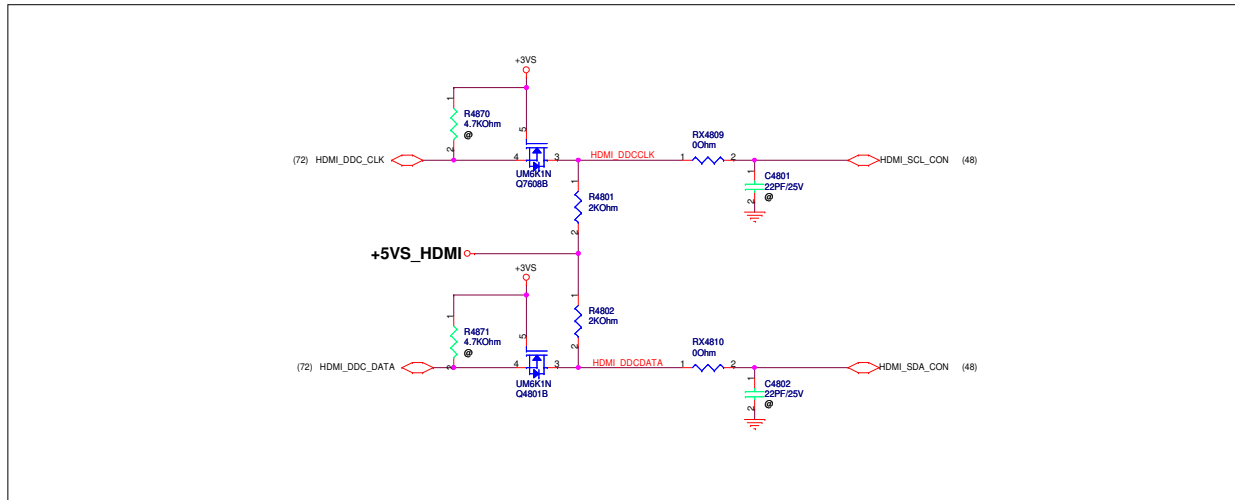
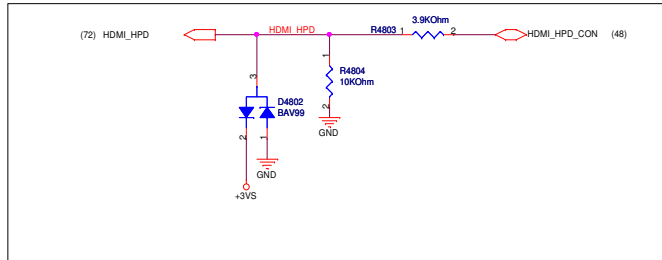
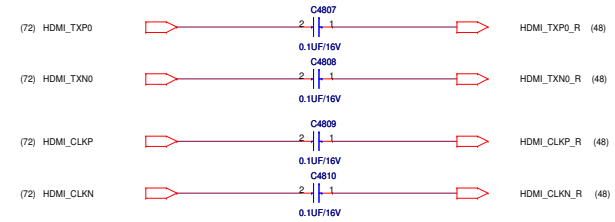
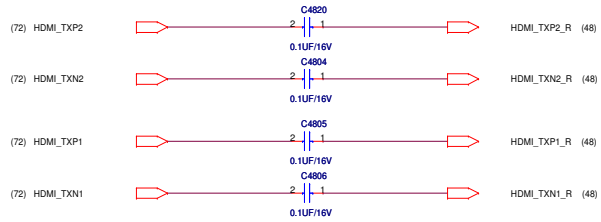
**S=0 for VGA output**  
**S=1 for PCH output**




Update 1108 (2.0) EMI Add



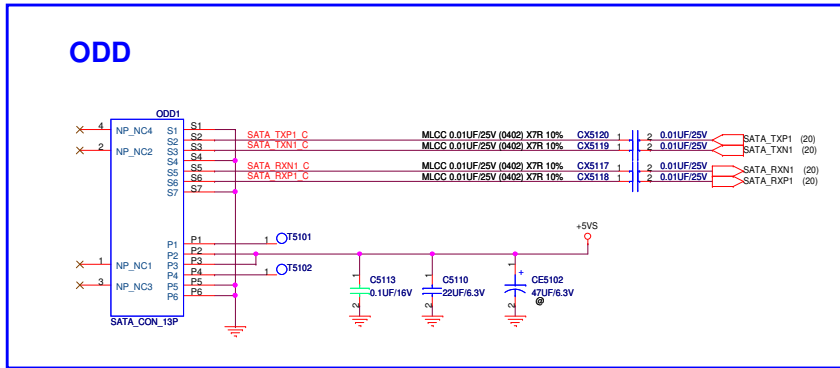




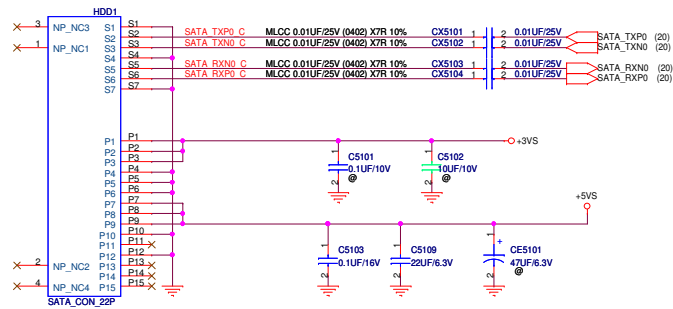
**Main Board**

		<b>Title :</b> FAN_Fan & Sensor
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin
Size	Project Name	Rev
C	<b>M60JV</b>	1.01
Date: Thursday, November 12, 2009		Sheet 50 of 95

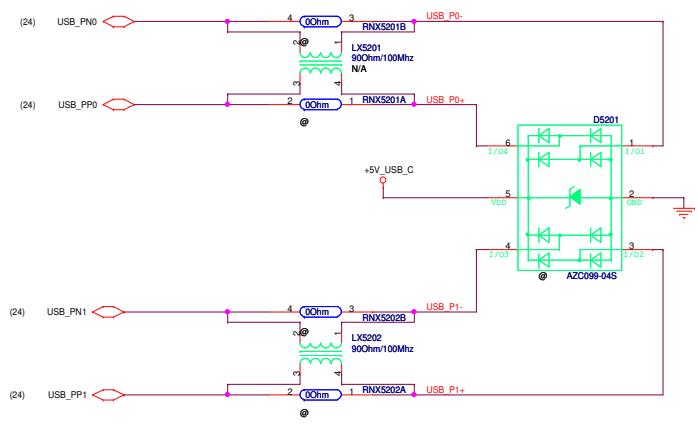
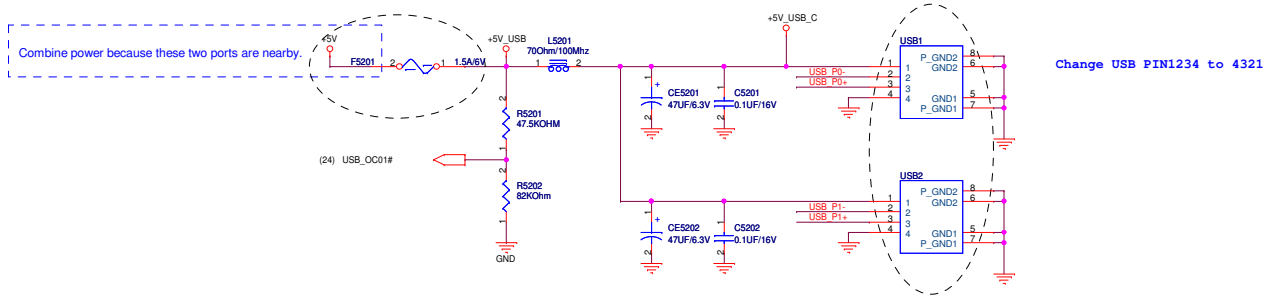
### ODD

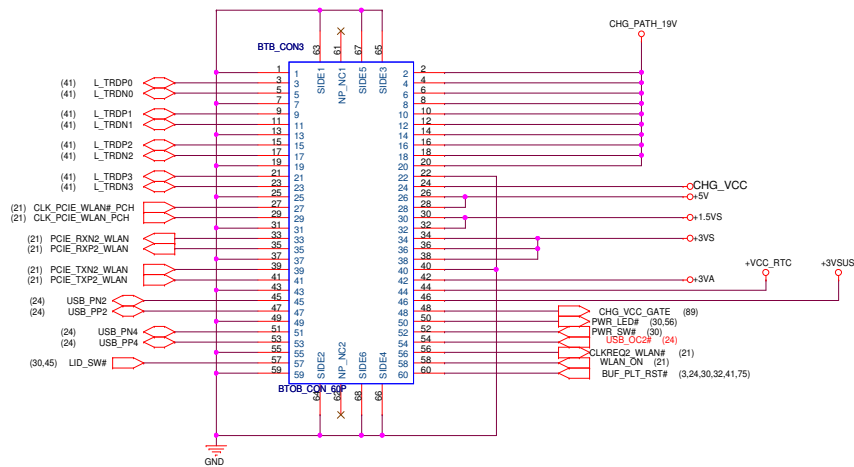


### HDD (1st)




USB ports

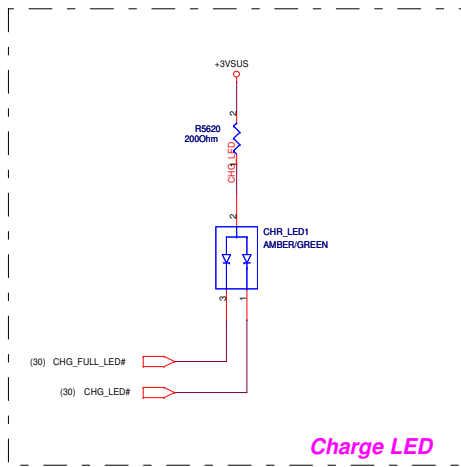




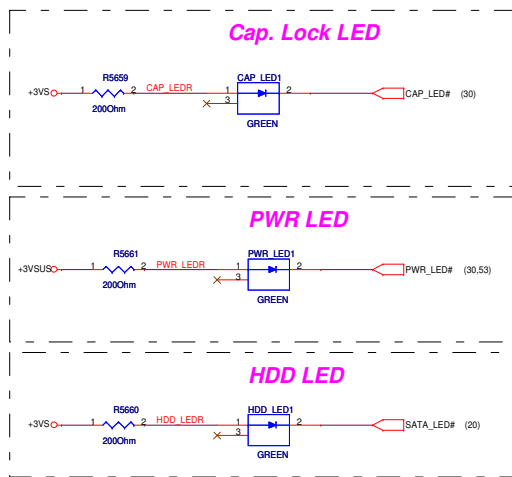


**Main Board**

		<b>Title :</b> S10 ****
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin
Size C	Project Name <b>M60JV</b>	Rev 1.01
Date: Thursday, November 12, 2009		Sheet 55 of 96



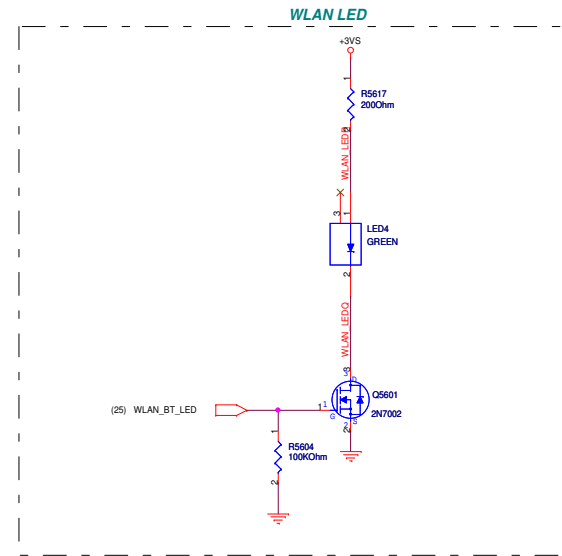
Charge LED



Cap. Lock LED

PWR LED

HDD LED

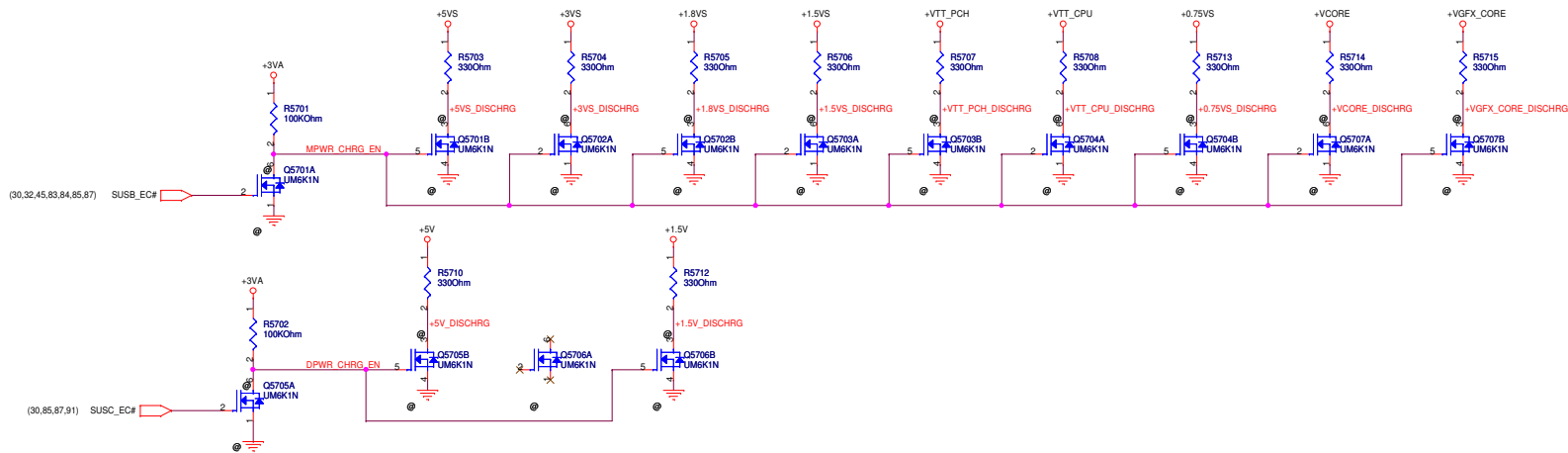


WLAN LED

Change LED part number



Remove +2.5Vs is for ATI GFX

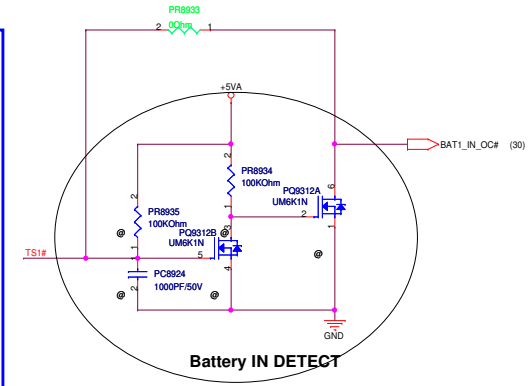
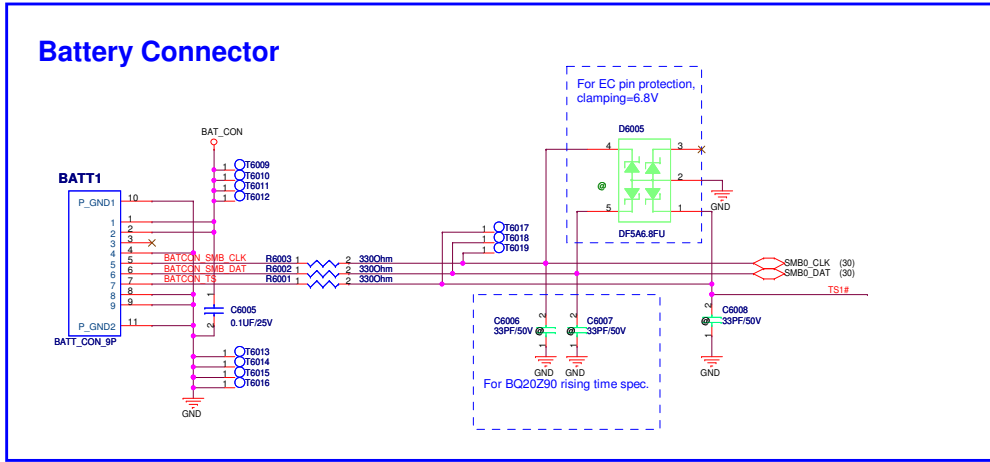


**Main Board**

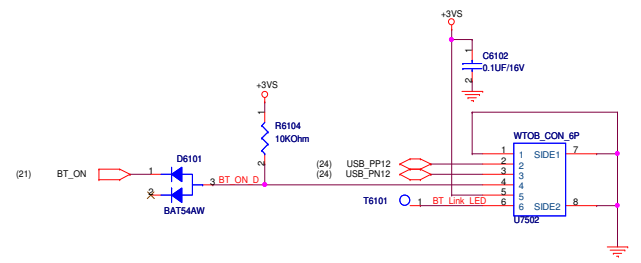
		<b>Title : PCI ****</b>	
ASUSTeK COMPUTER INC. NB4		Engineer: <i>CH_Lin</i>	
Size	Project Name	Rev	
C	<b>M60JV</b>	1.01	
Date: <i>Thursday, November 12, 2009</i>		Sheet	56 of 95

**Main Board**

		<b>Title :</b> DJ ****	
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
C	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	59 of 95



# BLUETOOTH



**Main Board**

		<b>Title :</b> TPM_****	
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
C	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	62 of 95

**Main Board**

		<b>Title :</b> FP_FP Conn	
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
C	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	63 of 95

5

4

3

2

1

D

D

C


C

B

B

A

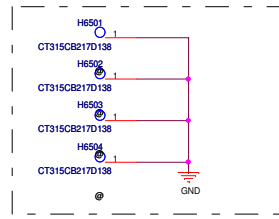
A

		<b>Title :</b> TUN_TV Tuner	
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b> CH_Lin	
Size	Project Name	Rev	
C	M60JV	1.01	
Date: Thursday, November 12, 2009		Sheet	64 of 95

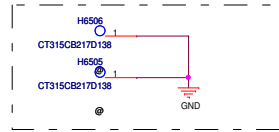


# Main Board

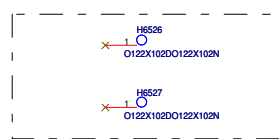
For CPU



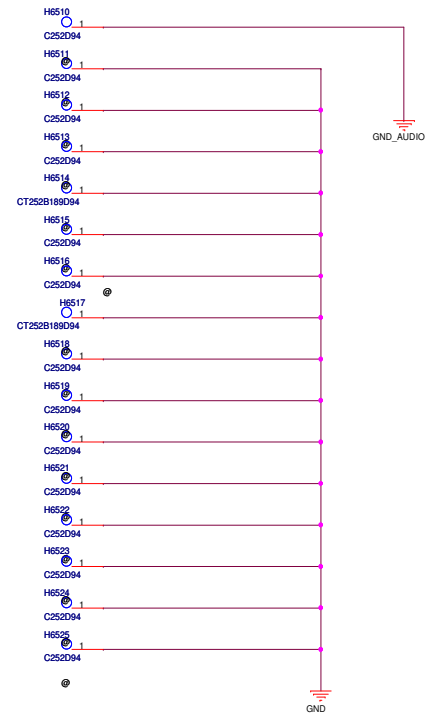
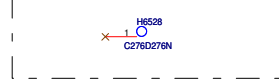
For GPU

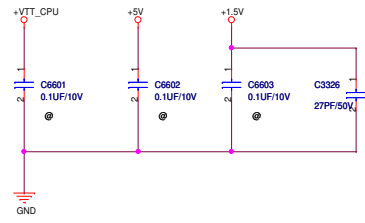


For 橢圓定位孔



HHD 呼吸孔





5

4

3

2

1

D

D

C


C

B

B

A

A

		<b>Title :PCH_XDP, ONFI</b>	
ASUSTeK COMPUTER INC. NB4		Engineer <b>Lin</b>	
Size	Project Name	Rev	
C	<b>M60JV</b>	1.01	
Date: <b>Thursday, November 12, 2009</b>		Sheet	67 of 96

5

4

3

2

1

D

D

C

C

B

B

A

A

		<b>Title :OTH_LCM</b>	
ASUSTeK COMPUTER INC. NB4		Engineer: <i>CH_Lin</i>	
Size	Project Name	Rev	
C	<b>M60JV</b>	1.01	
Date: <i>Thursday, November 12, 2009</i>		Sheet	68 of 96

5

4

3

2

1

D

D

C


C

B

B

A

A

		<b>Title :OTH_GAME-LED*****</b>	
ASUSTeK COMPUTER INC. NB4		Engineer: <i>CH_Lin</i>	
Size	Project Name	Rev	
C	<b>M60JV</b>	1.01	
Date: <i>Thursday, November 12, 2009</i>		Sheet	69 of 96

5

4

3

2

1

D

D

C

C

B

B

A

A

		<b>Title :</b>	
ASUSTeK COMPUTER INC. NB4		<b>Engineer:</b>	
Size	Project Name	Rev	
Custom	<b>M60JV</b>	1.01	
Date: Thursday, November 12, 2009		Sheet	70 of 96

5

4

3

2

1

		<b>Title :</b>	
ASUSTEK COMPUTER INC. NB4		<b>Engineer:</b>	
Size	Project Name	Rev	
C	M60JV	1.01	
Date:	Thursday, November 12, 2009	Sheet	71 of 96

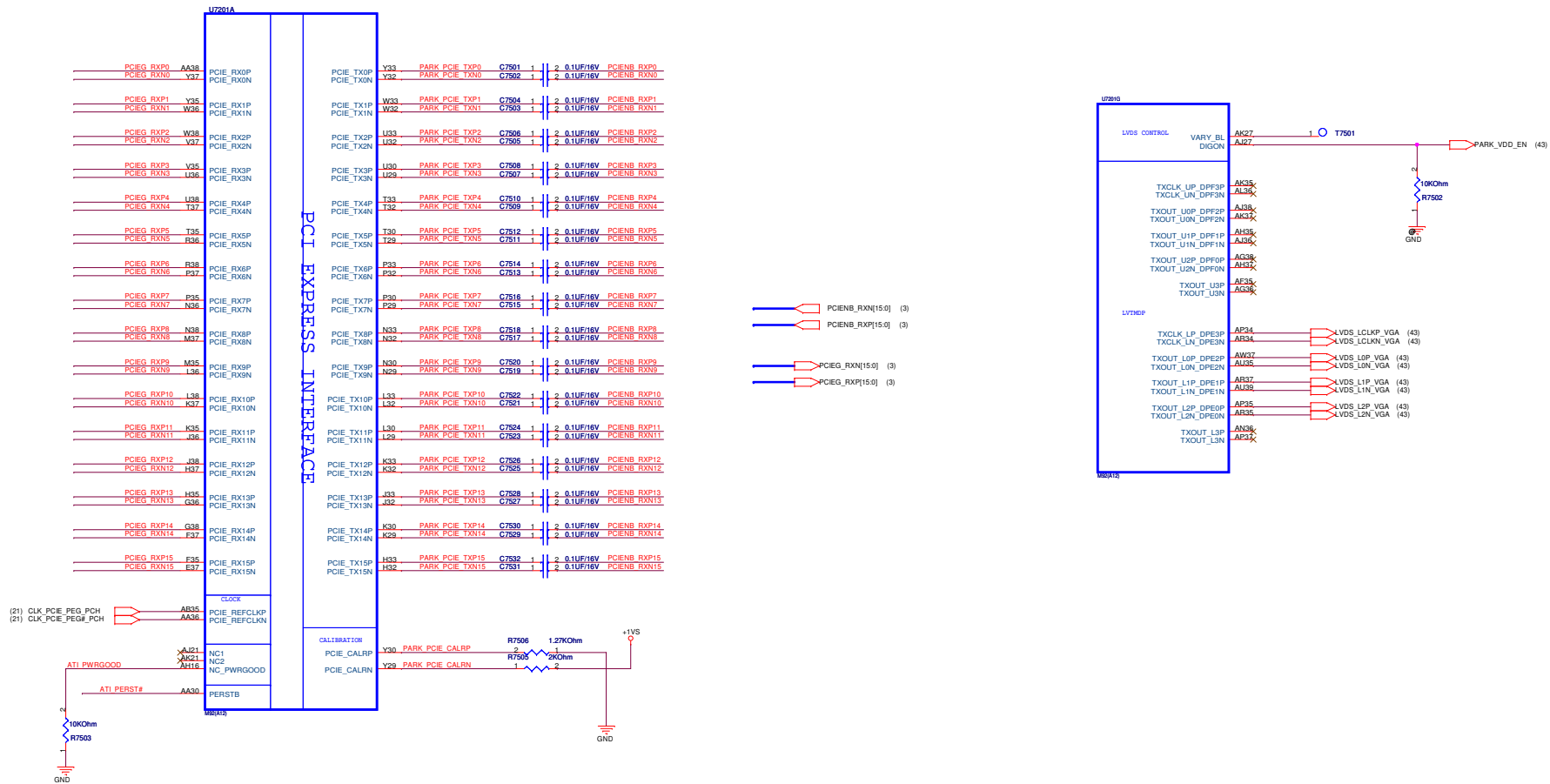




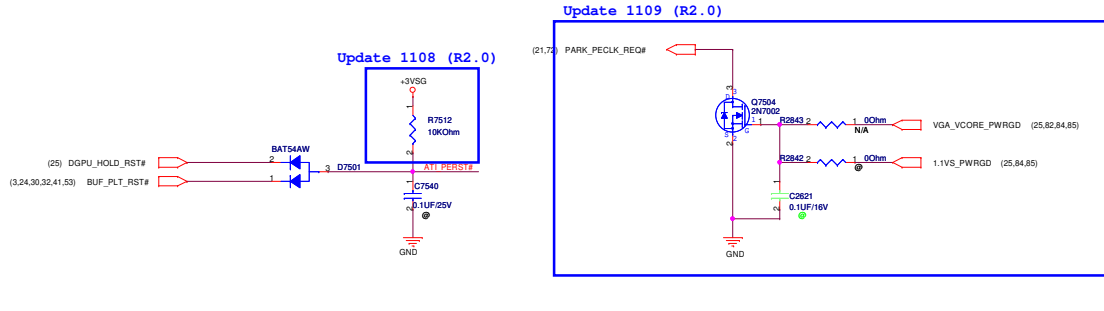




# PCI EXPRESS

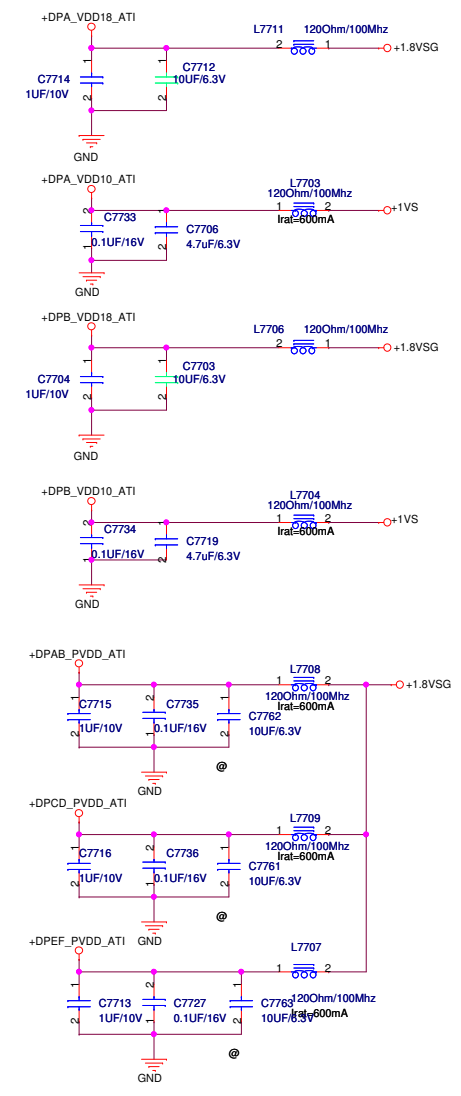
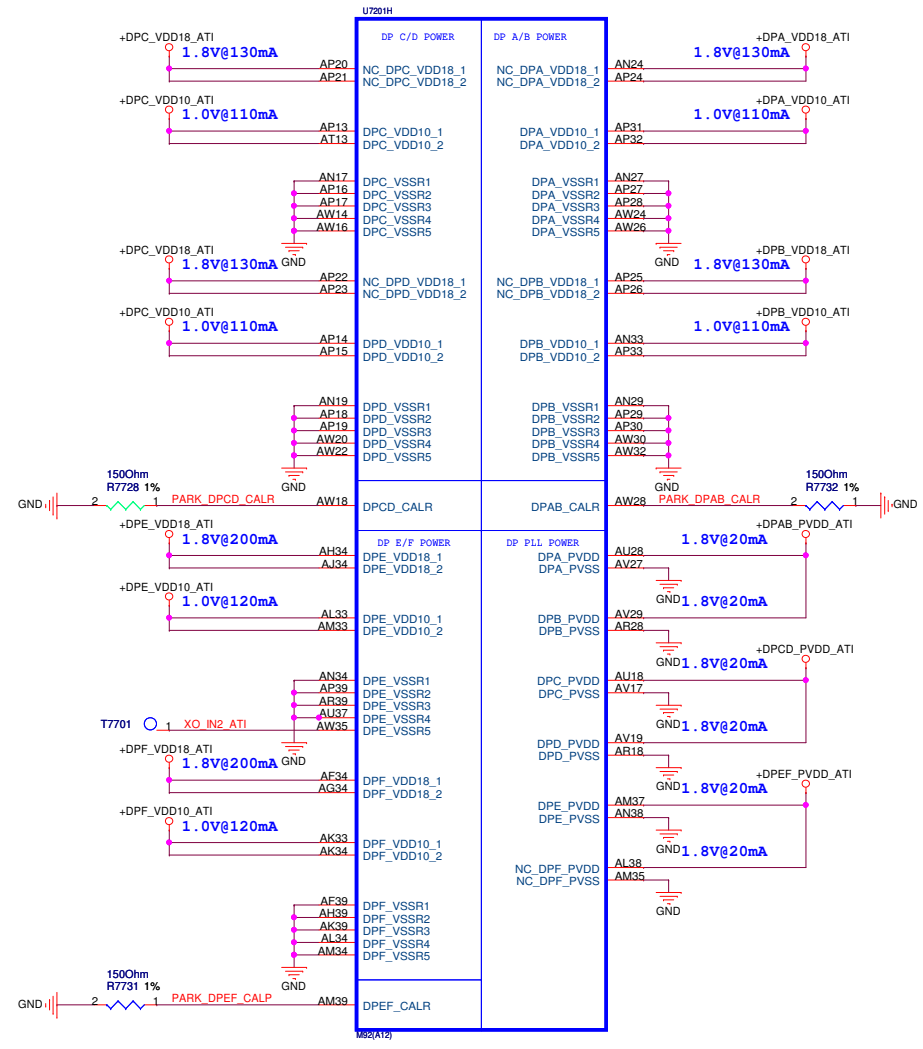
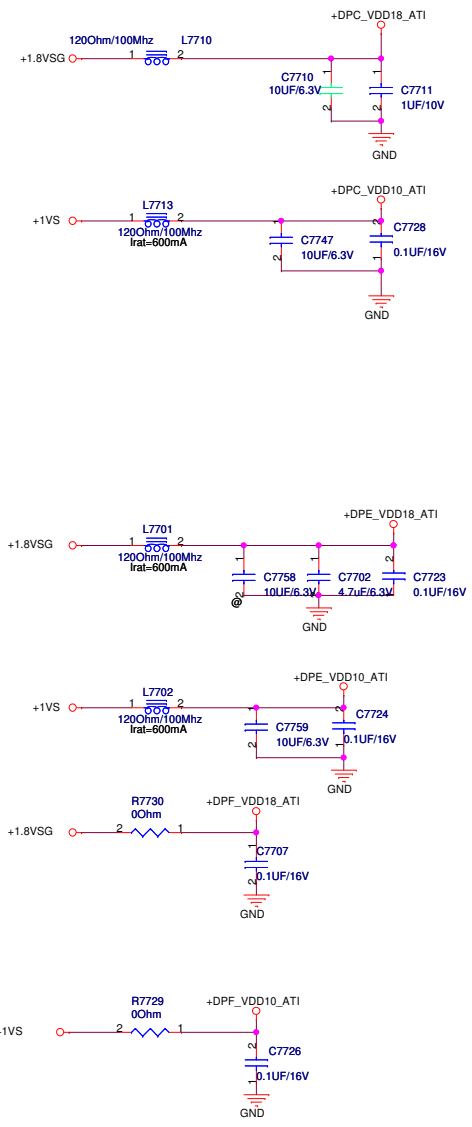


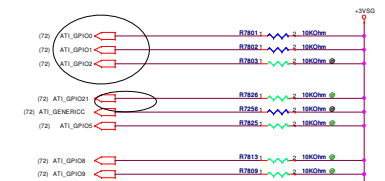
For switchable graphic





DPE: LVDS  
 DPB: HDMI  
 DAC1: CRT





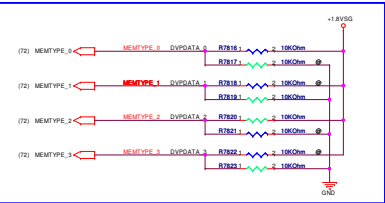
Memory Size:



Audio function:



Memory Type:



Dual Rank DDR3 1GB need AMD check pull low or high for following DDR3 VRAM  
 03G15163820 DDR3 64M\*16-1.2 FBGA-96 SAMSUNG/K4W1G1646E-HC12  
 03G151638421 DDR3 64M\*16-1.2 FBGA-96 HYNIX/H5TQ1G638FR-12C

Memory ID Board Straps				
Vendor	DVFDATA3.2.1.0	ID	DDR Memory Type	Channel Size
Infineon (Gimonda)	0000	0	32M*16 (D54M)	2-Channel (M09-M02)
	0001	1	32M*16 (D13M)	2-Channel
	0010	2	48M*16 (D13M)	2-Channel (M09-M02)
Samsung	0000	0	48M*16 (D13M)	2-Channel (M09-M02)
	0100	8	48M*16 (D15)	2-Channel (M09-M02)
	0110	6	32M*16 (D54M)	2-Channel (M09-M02)
	0111	7	32M*16 (D13M)	2-Channel
	1000	9	32M*16 (D13M)	2-Channel
Hynix	1001	0	32M*16 (D13M)	2-Channel
	1010	10	48M*16 (D13M)	2-Channel (M09-M02)
	1101	11	48M*16 (D15)	2-Channel (M09-M02)
	1102	12	72M	2-Channel (M09-M02)
Epicada	1101	13	72M	2-Channel (M09-M02)
	1110	14	48M*16 (D15)	2-Channel (M09-M02)

Memory ID Board Straps				
Vendor	DVFDATA3.2.1.0	ID	DDR Memory Type	Channel Size
Gimonda	0000	0	32M*16 (D54M)	2-Channel
	0001	1	32M*16 (D13M)	2-Channel dual-link
	0010	2	48M*16 (D13M)	2-Channel
Samsung	0100	8	48M*16 (D13M)	2-Channel
	0110	6	32M*16 (D54M)	2-Channel
	0111	7	32M*16 (D13M)	2-Channel
	1000	9	32M*16 (D13M)	2-Channel
	1001	0	32M*16 (D13M)	2-Channel dual-link
Hynix	1010	10	48M*16 (D13M)	2-Channel
	1101	11	48M*16 (D15)	2-Channel dual-link
	1102	12	72M	2-Channel
	1110	14	48M*16 (D15)	2-Channel dual-link

TX_PWRB_ENB	GPIO_0	Transmitter Power Savings Enable 0: 50% Tx output swing Note: This setting can only be used if the PCIe bus design meets the "Low Loss Interconnect" requirements (see the PCI Express -- Mobile Graphics Low-Power Addendum.) 1: Full Tx output swing.	0 (Internal pull-down)	0 (If the PCIe bus design meets the "Low Loss Interconnect" requirements) Otherwise: 1: Must be pulled to 3.3 V at reset using ~3-K (5%) resistor
TX_DEEMPH_EN	GPIO_1	PCI Express Transmitter De-emphasis Enable 0: Tx de-emphasis disabled. Note: This setting can only be used if the PCIe bus design meets the "Low Loss Interconnect" requirements (see the PCI Express -- Mobile Graphics Low-Power Addendum.) 1: Tx de-emphasis enabled.	0 (Internal pull-down)	0 (If the PCIe bus design meets the "Low Loss Interconnect" requirements) Otherwise: 1: Must be pulled to 3.3 V at reset using ~3-K (5%) resistor (e.g. MCM and add-in boards)
BIF_GEN2_EN_A	GPIO_2	0 = Advertises the PCIe device as 2.5 GT/s capable at power-on. 1 = Advertises the PCIe device as 5.0 GT/s capable at power-on. Note: This pin strap should be pulled to high (GPIO_2 = 1) when performing PCI Express electrical compliance testing at 5 GT/s using a CDB (compliance base board).	0 (Internal pull-down)	0 5.0 GT/s capability will be controlled by software.
VGA_DIS	GPIO_9_ROMSI	VGA Disable determines whether or not the card will be recognized as the system's VOA controller (via the SUBCLASS field in the PCI configuration space): 0: VOA Controller capacity enabled 1: The device will not be recognized as the system's VOA controller	0 (Internal pull-down)	0 Do not populate. Provide pad with option to pull to 3.3 V (VDDR3).
CONFIG[2] CONFIG[1] CONFIG[0]	GPIO_13 GPIO_12 GPIO_11	(a) If BIOS_ROM_EN = 1, then Config[2:0] defines the ROM type. See "ROM Configurations" on page 3-33. (b) If BIOS_ROM_EN = 0, then Config[2:0] defines the primary memory aperture size. See "Primary Memory Aperture size requested at PCI Configuration" on page 3-33	0 (Internal pull-down)	Design dependent. See description for more information.

BIOS_ROM_EN	GPIO_22_ROMCSB	Enable external BIOS ROM device 0 - Disable external BIOS ROM device 1 - Enable external BIOS ROM device Note that when an external BIOS ROM device is used, GPIO_22_ROMCSB also connects to the ROM device's chip select (active low)	0 (Internal pull-down)	Design dependent. See description for more information.
AUD[1] AUD[0]	H2SYNC V2SYNC	AUD[1:0] 00 - No audio function. 01 - Audio for DisplayPort only. 10 - Audio for DisplayPort and HDMI if dongle is detected. 11 - Audio for both DisplayPort and HDMI. HDMI must only be enabled on systems that are legally entitled. It is the responsibility of the system designer to ensure that the system is entitled to support this feature.	0 (Internal pull-down)	Design dependent. See description for more information.
VIP_DEVICE_STRAP_EN	V2SYNC	VIP Device Strap Enable indicates to the software driver that it should try to sense whether or not a VIP device is connected on the VIP Host interface. 0 - Driver would ignore the value sampled on VHAD_0 during reset 1 - Driver would use the value sampled at reset from VHAD_0 to determine whether or not a VIP slave device (e.g. Theater chip) is connected (0 = 0 indicates yes, 1 indicates no). According to the VIP 1.1 standard, VHAD_0 is tied high, and VIP slave devices are required to drive this signal low during reset. This scheme allows for a VIP device to be connected to the graphics adapter via a daughter card. Note: If the strap is needed, it must be placed between the ball and the V2SYNC output buffer. This output buffer prevents monitors from affecting the value at reset.	0 (Internal pull-down)	Design dependent. See description for more information.
RESERVED	H2SYNC	Internal use only. THIS PAD HAS AN INTERNAL PULL-DOWN AND MUST BE 0 V AT RESET. The pad may be left unconnected, however, if it is connected to additional logic on the board, the logic must not allow this signal to be driven or pulled to any value except GND at reset.	0 (Internal pull-down)	Do not populate. Provide pad with option to pull to 3.3 V (VDDR3).
RESERVED	GPIO_8_ROMSO GPIO_21_BB_EN	Internal use only. THESE PADS HAVE INTERNAL PULL-DOWNS AND MUST BE 0 V AT RESET. These pads may be left unconnected, however, if they are connected to additional logic on the board, the logic must not allow these signals to be driven or pulled to any value except GND at reset.	0 (Internal pull-down)	No PAD required. Ensure that no logic conflicts with these signals during Reset.

64 MB	010
32 MB	011
512 MB	Not Supported
1 GB	Not Supported
2 GB	Not Supported
4 GB	Not Supported

POWERPLAY Interface				
Pin Name	Type	P/D/P/U	Description	
GPIO_5_AC_BATT	I/O	PC-reset	GPIO_5_AC_BATT is an optional input which allows the system to request a fast power reduction by setting GPIO_5_AC_BATT to low (0V). The resulting state transition may disturb the display momentarily.  Power reductions that are less time critical should use the standard software methods only in order to prevent display disturbances.	
GPIO_6 GPIO_15_PWRCTL_0 GPIO_16_SSN GPIO_20_PWRCTL_1	I/O 3.3 V VDDR3	PC-reset	Voltage control signals for the core VDDC and VDDCI. At Reset, these signals will be inputs with weak internal pull-down resistors. VBIOS can define all voltage control signals to be either 3.3V or open drain outputs (all signals must be the same type). The output state (high/low) of these signals is programmable for each PlayPlay state. (Optional) Voltage control signal for memory voltage regulator. Note that this signal must be low (0 V) at reset (failure to do so will prevent booting).	
GPIO_21_BB_EN	I/O			

CONFIGURATION STRAPS			
ALLOW FOR PULLUP PADS FOR THESE STRAPS AND IF THESE GPIOs ARE USED, THEY MUST NOT CONFLICT DURING RESET			
STRAPS	PIN	DESCRIPTION OF DEFAULT SETTINGS	RECOMMENDED SETTINGS 0 - DO NOT INSTALL RESISTOR 1 - INSTALL IN RESISTOR X - DESIGN DEPENDENT N - NOT APPLICABLE
TX_PWRB_ENB	GPIO0	PCI FULL TX OUTPUT SWING	X
TX_DEEMPH_EN	GPIO1	PCI TRANSMITTER DE-EMPHASIS ENABLED	X
RESERVED BF_VGA_DIS RESERVED	GPIO8 GPIO23 GPIO21	RESERVED VGA ENABLED RESERVED	0 0 0
BIOS_ROM_EN	GPIO_22_ROMCSB	ENABLE EXTERNAL BIOS ROM	X
ROMDFQ20	GPIO(3:11)	SERIAL ROM TYPE OR MEMORY APERTURE SIZE SELECT	X X X
VIP_DEVICE_STRAP_ENA	V2SYNC	IGNORE VIP DEVICE STRAPS	X
RSDI RSDI AUD[1] AUD[0]	H2SYNC V2SYNC H2RVC V2RVC	SEE DATABOOK FOR DETAIL SEE DATABOOK FOR DETAIL	0 0 X X
AMD RESERVED CONFIGURATION STRAPS			
ALLOW FOR PULLUP PADS FOR THESE STRAPS AND IF THESE GPIOs ARE USED, THEY MUST NOT CONFLICT DURING RESET			
H2SYNC	GENERICC	GPIO2	GPIO1

5

4

3

2

1

D

D

C

C

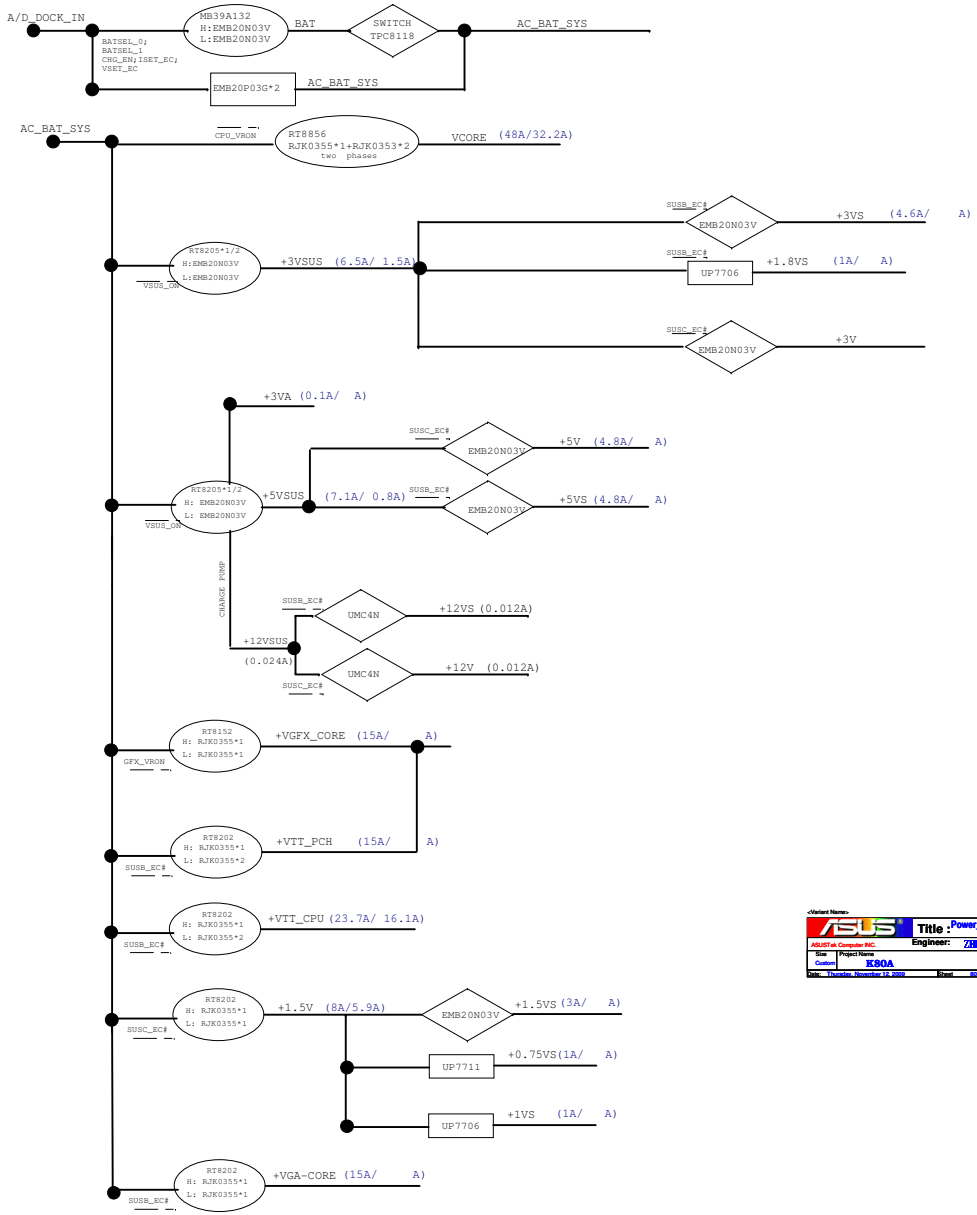
B

B

A

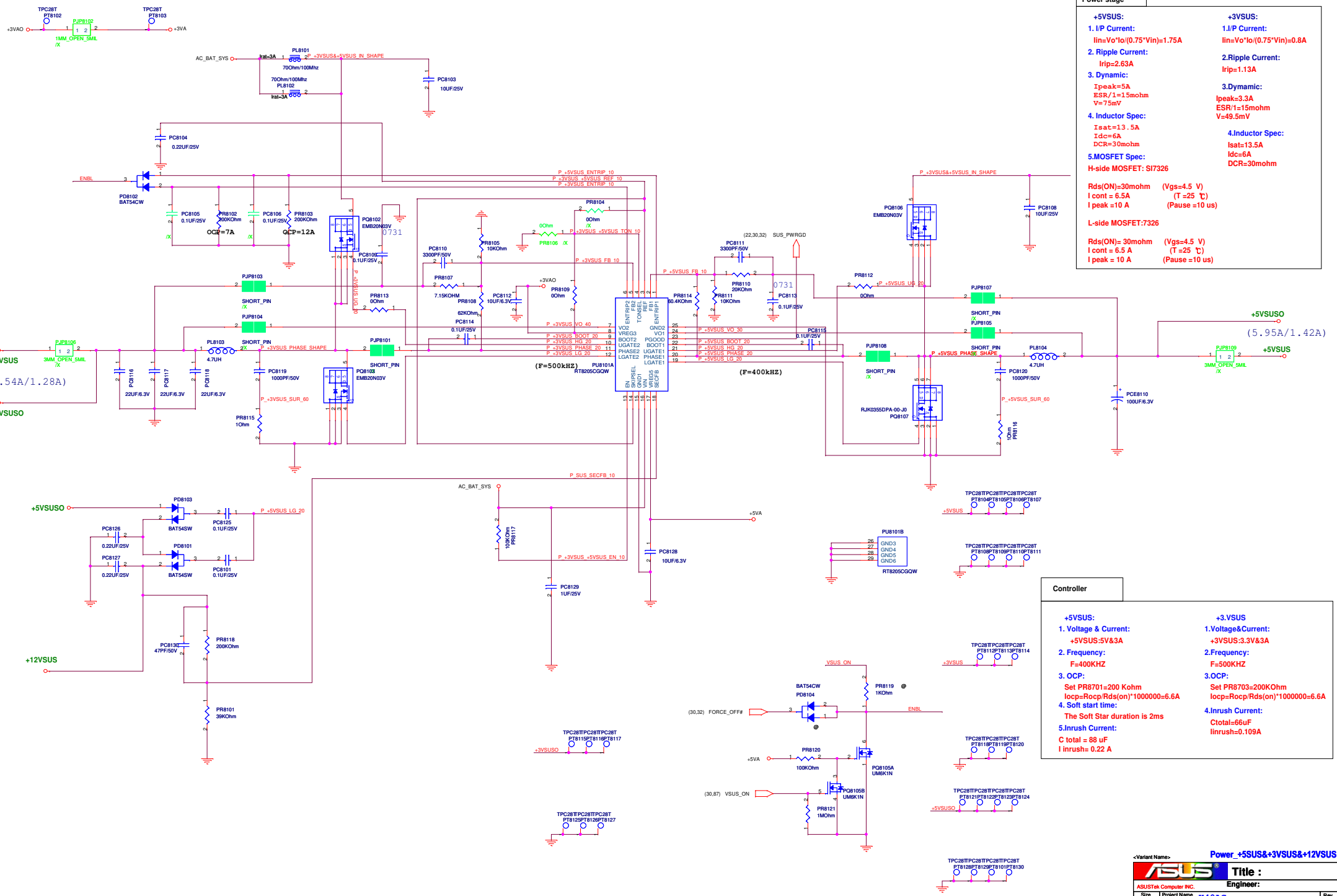
A

		<b>Title :</b> VGA_M96_STRAP	
ASUSTeK COMPUTER INC. NB4		Engineer: Leon	
Size	Project Name	Rev	
A3	<b>K52Jr</b>	1.0	
Date: Thursday, November 12, 2009		Sheet	79 of 99



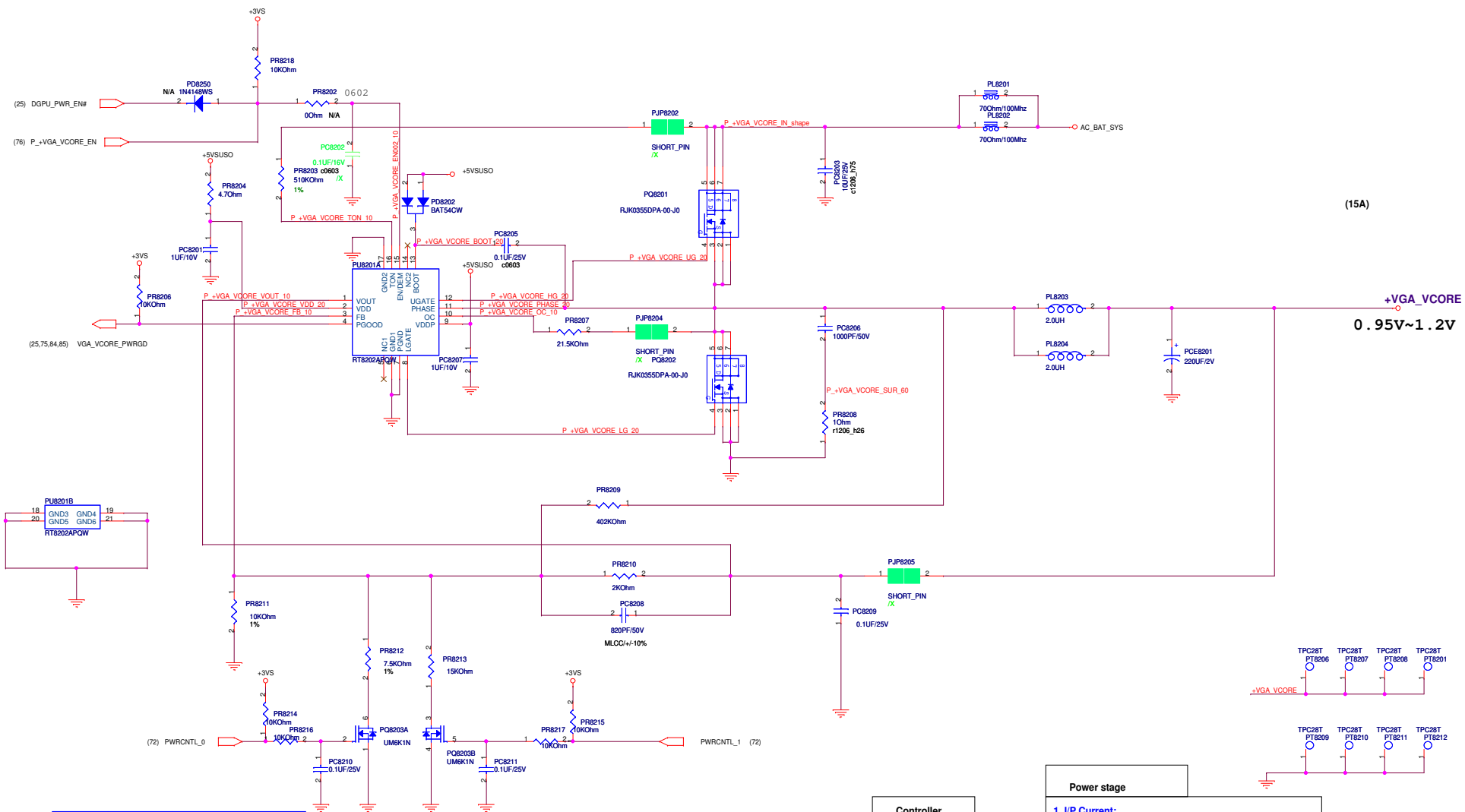
ASUS Title: Power Flow  
 Project Name: Z98-K10M-L1U  
 Engineer: Z98-K10M-L1U  
 Date: 2014-10-20  
 Version: 1.0





Power stage	
<b>+5VSUS:</b>	<b>+3VSUS:</b>
1. I/P Current: $I_{in} = V_o / I_o (0.75 \cdot V_{in}) = 1.75A$	1. I/P Current: $I_{in} = V_o / I_o (0.75 \cdot V_{in}) = 0.8A$
2. Ripple Current: $I_{rip} = 2.63A$	2. Ripple Current: $I_{rip} = 1.13A$
3. Dynamic: $I_{peak} = 5A$ $ESR / L = 1.5mohm$ $V = 75mV$	3. Dynamic: $I_{peak} = 3.3A$ $ESR / L = 15mohm$ $V = 49.5mV$
4. Inductor Spec: $I_{sat} = 13.5A$ $I_{dc} = 6A$ $DCR = 30mohm$	4. Inductor Spec: $I_{sat} = 13.5A$ $I_{dc} = 6A$ $DCR = 30mohm$
5. MOSFET Spec: H-side MOSFET: SI7326 L-side MOSFET: 7326	
$R_{ds(ON)} = 30mohm$ $I_{cont} = 6.5A$ $I_{peak} = 10A$	$(V_{gs} = 4.5V)$ $(T = 25^\circ C)$ $(Pause = 10us)$
$R_{ds(ON)} = 30mohm$ $I_{cont} = 6.5A$ $I_{peak} = 10A$	$(V_{gs} = 4.5V)$ $(T = 25^\circ C)$ $(Pause = 10us)$

Controller	
<b>+5VSUS:</b>	<b>+3VSUS</b>
1. Voltage & Current: <b>+5VSUS: 5V &amp; 3A</b>	1. Voltage & Current: <b>+3VSUS: 3.3V &amp; 3A</b>
2. Frequency: $F = 400KHZ$	2. Frequency: $F = 500KHZ$
3. OCP: Set PR8701 = 200Kohm $I_{ocp} = R_{ocp} / R_{ds(on)} * 1000000 = 6.6A$	3. OCP: Set PR8703 = 200Kohm $I_{ocp} = R_{ocp} / R_{ds(on)} * 1000000 = 6.6A$
4. Soft start time: The Soft Star duration is 2ms	4. Inrush Current: $C_{total} = 66uF$ $I_{inrush} = 0.109A$
5. Inrush Current: $C_{total} = 88uF$ $I_{inrush} = 0.22A$	



(15A)

+VGA\_VCORE  
0.95V~1.2V

PWRCNTL_0	PWRCNTL_1	VGA_VCORE	
0	0	0.9	-5%
0	1	1.0	Normal
1	0	1.1	+5%
1	1	1.2	+10%

**Controller**

1. Voltage & Current:  
+1.2VSUS: 16A

2. Frequency:  
Ton=3.85p\*RT(on)/Vin-05=0.3us  
Frequency=Vout/(Vin\*Ton)=500KHZ

Set PR8107=21.5kohm  
loop=Rocp\*20/Rds(on)=26A

4. Soft start time:  
Soft-Star duration is 1.35ms

5. Inrush Current:  
C total =220uF  
I inrush=0.163A

**Power stage**

1. I/P Current:  
I in = Vo\*Io/( 0.75 \* Vin) =0.85A

2. Ripple Current:  
Iripple=3.74A

3.ripple voltage:  
Ipeak=(vin-vo)\*D/(L\*Fsw)=2.07A  
DCR=3.3mohm  
V=6.831mV

4. Inductor Spec: 3. OCP:  
Isat=25A  
Idc=15.5A  
DCR=5.5mohm

5. MOSFET Spec:  
H-side and L-side MOSFET:  
Rds(on)=16.5mOhm (Vgs=4.5V)  
Icont=30A (T=25)  
Ipeak=120A (Pause<10us)

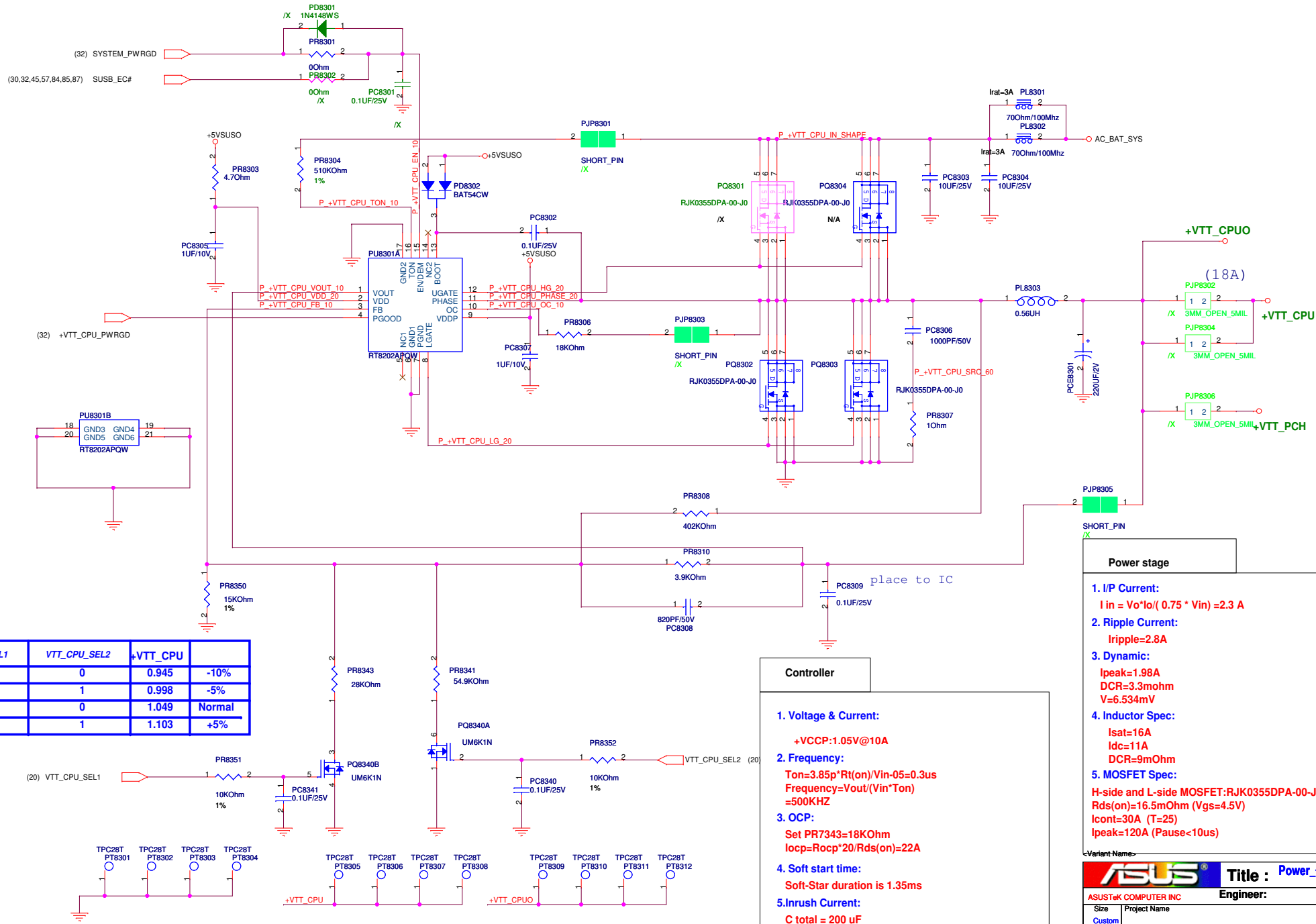
<Variant Name>

**ASUS** Title : Power\_+VGA\_VCORE

ASUSTek COMPUTER INC Engineer:

Size	Project Name	Rev
C	Oemga	1.0

Date: Thursday, November 12, 2009 Sheet 82 of 1



VTT_CPU_SEL1	VTT_CPU_SEL2	+VTT_CPU	
0	0	0.945	-10%
0	1	0.998	-5%
1	0	1.049	Normal
1	1	1.103	+5%

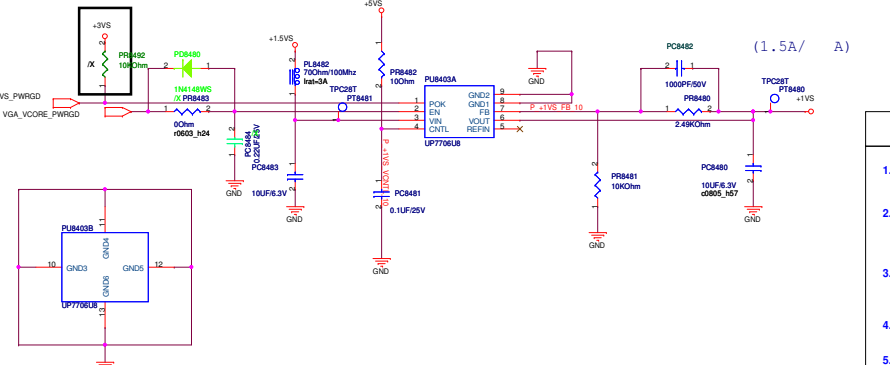
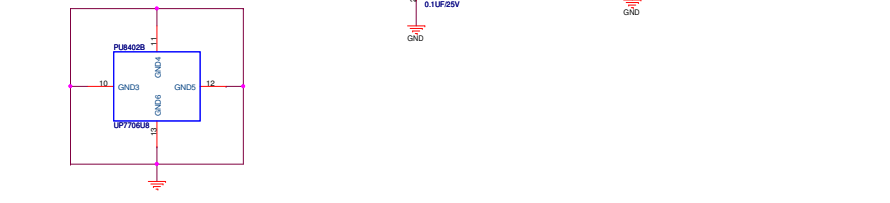
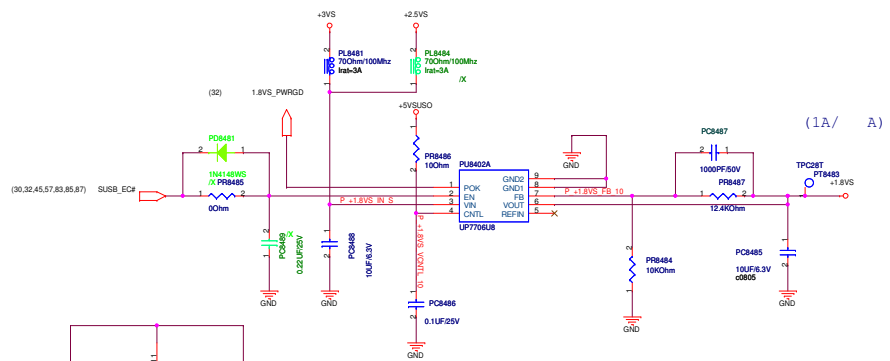
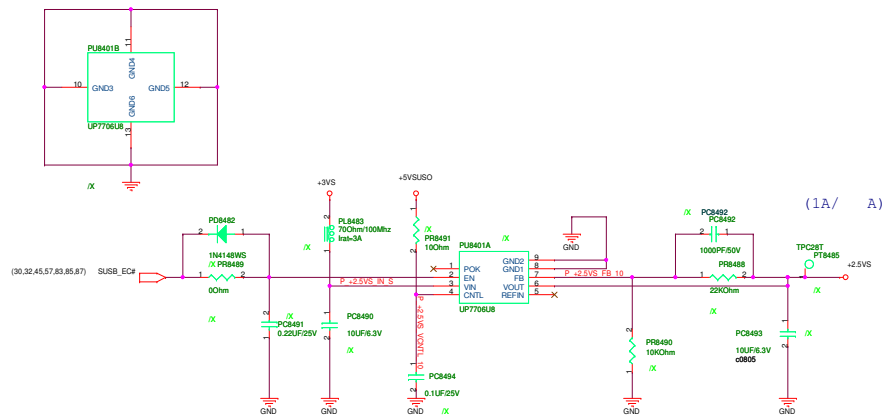
**Controller**

- Voltage & Current:**  
+VCCP: 1.05V@10A
- Frequency:**  
Ton=3.85p\*Rt(on)/Vin-05=0.3us  
Frequency=Vout/(Vin\*Ton)=500KHZ
- OCP:**  
Set PR7343=18KOhm  
Iocp=Rocp\*20/Rds(on)=22A
- Soft start time:**  
Soft-Star duration is 1.35ms
- Inrush Current:**  
C total = 200 uF  
I inrush= 0.16 A

**Power stage**

- I/P Current:**  
I in = Vo\*Io/( 0.75 \* Vin) =2.3 A
- Ripple Current:**  
Iripple=2.8A
- Dynamic:**  
Ipeak=1.98A  
DCR=3.3mohm  
V=6.534mV
- Inductor Spec:**  
Isat=16A  
Idc=11A  
DCR=9mOhm
- MOSFET Spec:**  
H-side and L-side MOSFET:RJK0355DPA-00-JO WPAK  
Rds(on)=16.5mOhm (Vgs=4.5V)  
Icont=30A (T=25)  
Ipeak=120A (Pause<10us)

ASUS  
**Title : Power\_+VCCP**  
 ASUSTeK COMPUTER INC  
 Engineer:  
 Size Project Name Rev 1.0  
 Custom  
 Date: Thursday, November 12, 2009 Sheet 83 of 1



**Controller**

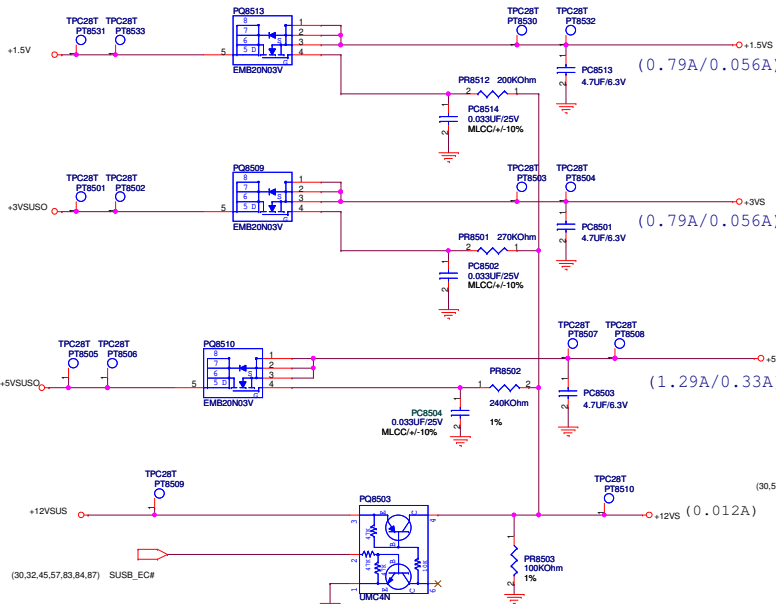
- Voltage & Current:**  
+1.8V/+1.8V&12A
- Frequency:**  
 $T_{on} = 3.85 \mu s \cdot R_{t(on)} \cdot V_o / V_{in} - 0.5$   
Frequency =  $V_{out} / (V_{in} \cdot T_{on})$   
= 500KHZ
- OCP:**  
Set PR7343=18kohm  
 $I_{ocp} = R_{ocp} \cdot 20 / R_{ds(on)}$   
= 20 \* 1.5 / 16.5 = 26A
- Soft start time:**  
Soft-Start duration is 1.35ms
- Inrush Current:**  
C total = 100uF  
inrush = 0.133A

**Power stage**

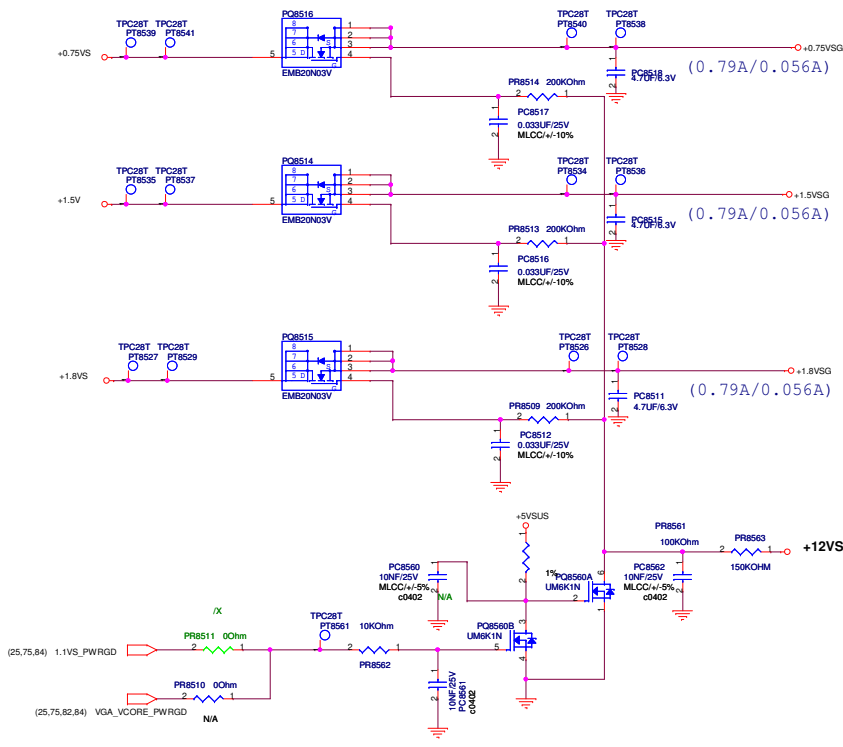
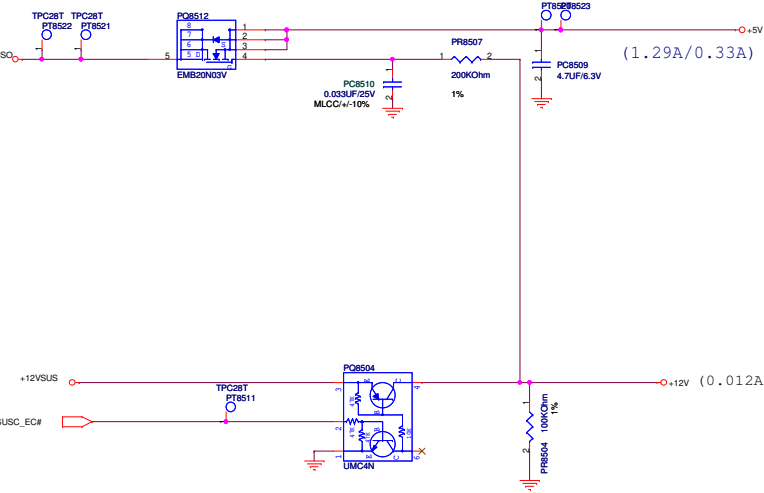
- IP Current:**  
 $I_{in} = V_o / I_o (0.8 \cdot V_{in}) = 0.947A$
- Ripple Current:**  
Iripple = 2.342A
- Ripple Voltage:**  
 $I_{peak} = (v_{in} - v_o) \cdot D / (L \cdot F_{sw}) = 3.25A$   
DCR = 3.3mohm  
V = 10.75mV
- Inductor Spec:**  
Isat = 36A  
I<sub>dc</sub> = 18A  
DCR = 3.3mohm
- MOSFET Spec:**  
H-side and L-side MOSFET:  
R<sub>ds(on)</sub> = 16.5mohm (V<sub>gs</sub> = 4.5V)  
I<sub>cont</sub> = 30A (T = 25)  
I<sub>peak</sub> = 120A (Pause < 10us)

ASUS  
ASUSTek COMPUTER INC  
Title: Power +1.8V&+0.9V  
Engineer:  
Size: Custom  
Date: Thursday, November 18, 2009  
Sheet: 84 of 1  
Rev: 1.0

SUSB#\_PWR POWER



SUSC#\_PWR POWER



5

4

3

2

1

D

D

C

C


B

B

A

A

<Variant Name>

		Title: <b>Power_good_detector</b>	
ASUSTek COMPUTER INC		Engineer:	
Size	Project Name	Rev	
Custom		1.0	
Date: <b>Thursday, November 12, 2009</b>		Sheet	86 of 1

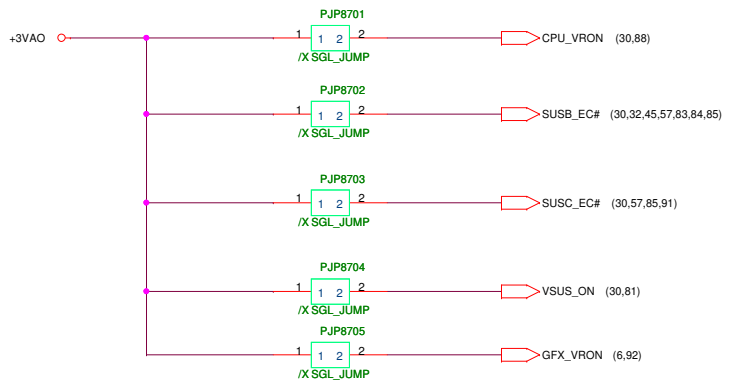
5

4


3

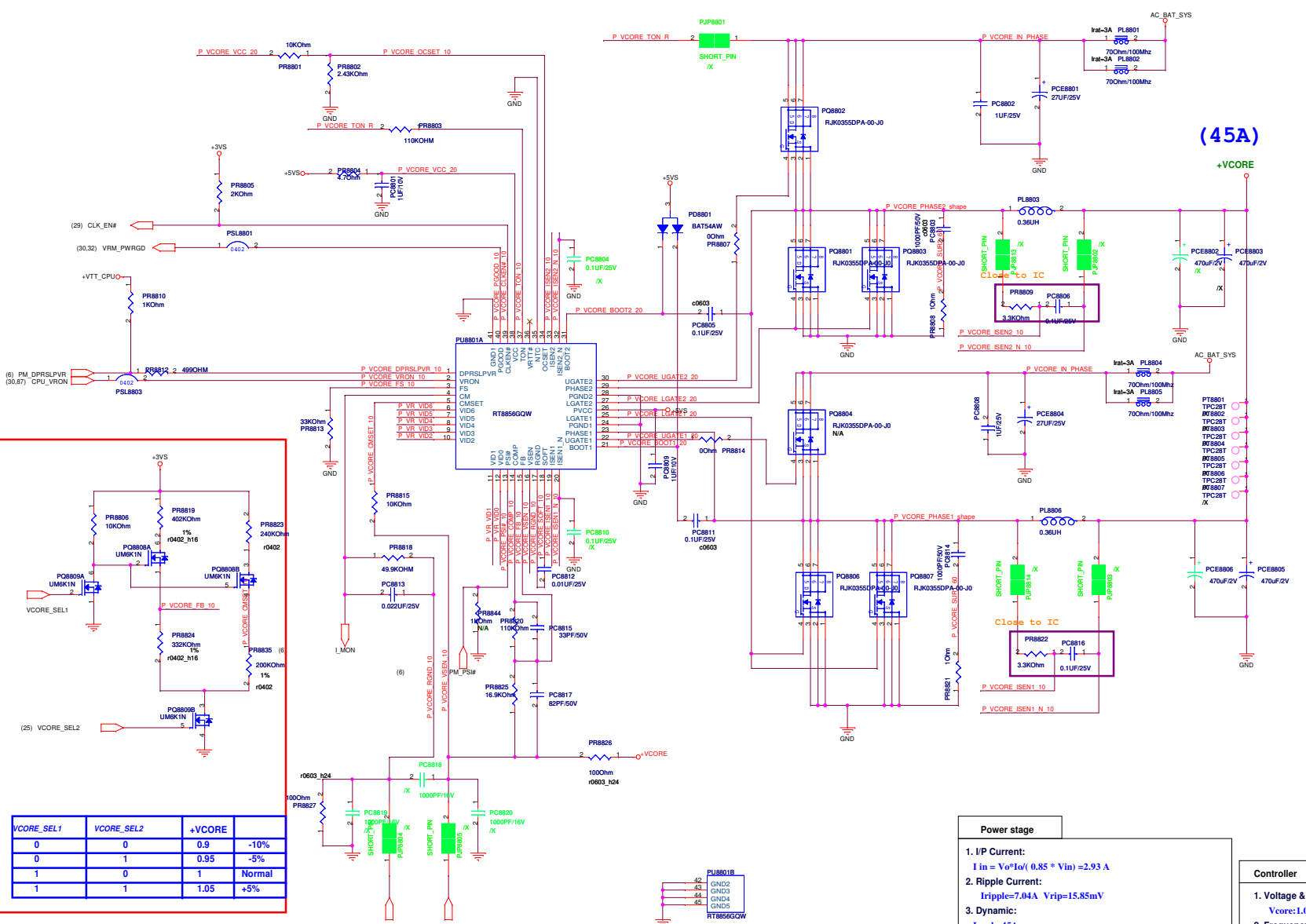
2

1

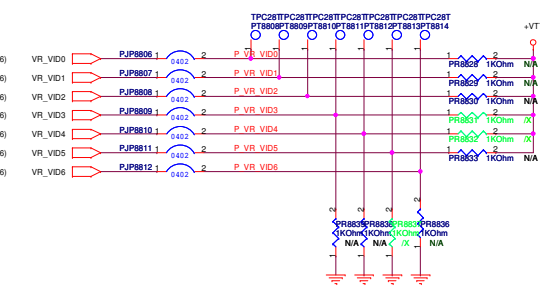


<Variant Name>

		<b>Title : Power_for_test</b>
ASUSTeK COMPUTER INC		<b>Engineer:</b>
Size	Project Name	Rev
Custom		1.0
Date: Thursday, November 12, 2009	Sheet	87 of 1



VCORE_SEL1	VCORE_SEL2	+VCORE	
0	0	0.9	-10%
0	1	0.95	-5%
1	0	1	Normal
1	1	1.05	+5%



CPU SKU	Ic_CORE-MAX Maximum CPU Core Current	Icp (IMON=300 mV min) [A]	CPU Gain Setting Set on Platform Via CSC Lines	Equivalent Gain [mΩ]
Feature disabled			000	
59A<sup>C</sup> Icp_CORE max 520 A	30	010	011	45.0
29A<sup>C</sup> Icp_CORE max 520 A	30	010	010	30.0
30A<sup>C</sup> Icp_CORE max 540 A	40	011	011	22.5
40A<sup>C</sup> Icp_CORE max 550 A	50	100	100	18.0
50A<sup>C</sup> Icp_CORE max 560 A	60	101	101	15.0
60A<sup>C</sup> Icp_CORE max 570 A	70	110	110	12.9
70A<sup>C</sup> Icp_CORE max 590 A	90	111	111	10.0

- VID[2:0] "Reserved" - default VID[2:0]='111' - option to change default should be provided on the motherboard.
- VID[5:3] will be used to provide IMON gain setting to CPU during CSC (see Section 5).
- VID[6] "Reserved" - default VID [6]='0' - option to change default should be provided on the motherboard.
- DPRSLPVR will be used to identify type of CPU core VR controller. DPRSLPVR='1' for IMVP-6.5-compliant controller.
- PSI# - "Reserved" - default PSI#='0' - option to change default should be provided on the motherboard.

### Power stage

- I/P Current:**  
 $I_{in} = V_o \cdot I_o / (0.85 \cdot V_{in}) = 2.93 \text{ A}$
- Ripple Current:**  
 $I_{ripple} = 7.04 \text{ A}$      $V_{rip} = 15.85 \text{ mV}$
- Dynamic:**  
 $I_{peak} = 45 \text{ A}$   
 $ESR = 2.25 \text{ mΩ}$   
 $V = 91.1 \text{ mV}$
- Inductor Spec:**  
 $I_{dc} = 38.8 \text{ A}$   
 $I_{temp} = 32.5 \text{ A}$   
 $DCR = 1.1 \text{ mΩ}$
- MOSFET Spec:**  
 H-side MOSFET: RJK0355    L-side MOSFET: RJK0353  
 $R_{ds(on)} = 16.5 \text{ mΩ}$  (Vgs=4.5V)     $R_{ds(on)} = 7.6 \text{ mΩ}$  (Vgs=4.5V)  
 $I_{cont} = 30 \text{ A}$  (T=25)     $I_{cont} = 35 \text{ A}$  (T=25)  
 $I_{peak} = 120 \text{ A}$  (Pause<100s)     $I_{peak} = 140 \text{ A}$  (Pause<100s)
- CPU MLCC: 16\*10uF**

### Controller

- Voltage & Current:**  
 $V_{core} = 1.05 \text{ V}/45 \text{ A}$
- Frequency:**  
 $CCM: F_{sw} = 300 \cdot 33 / R_{FS} = 300 \text{ KHZ}$
- OCP:**  
 $V_{ocet} = 25 \cdot I_{lim} \cdot R_{sense}$   
 $I_{lim} = 35.5 \cdot 2 = 71 \text{ A}$
- Slew rate:**  
 $Slewrate = I_{ss} / PC7810 = 100 \text{ uA} / 10 \text{ nF} = 10 \text{ mV/uS}$
- Inrush Current:**  
 $C_{total} = 880 \text{ nF}$   
 $I_{inrush} = 0.154 \text{ A}$
- Droop Resistance:**  
 $R_{droop} = R1 / R2 \cdot 10 \cdot R_{sense} = 2 \text{ mΩ}$

<Variant Name>

**ASUS** Title: **POWER\_VCORE**

ASUSTek Computer INC. Engineer: **Lirny\_li**

Size	Project Name	Rev
Custom	<b>K82</b>	1.0


Date: Thursday, November 12, 2009 Sheet 88 of 1

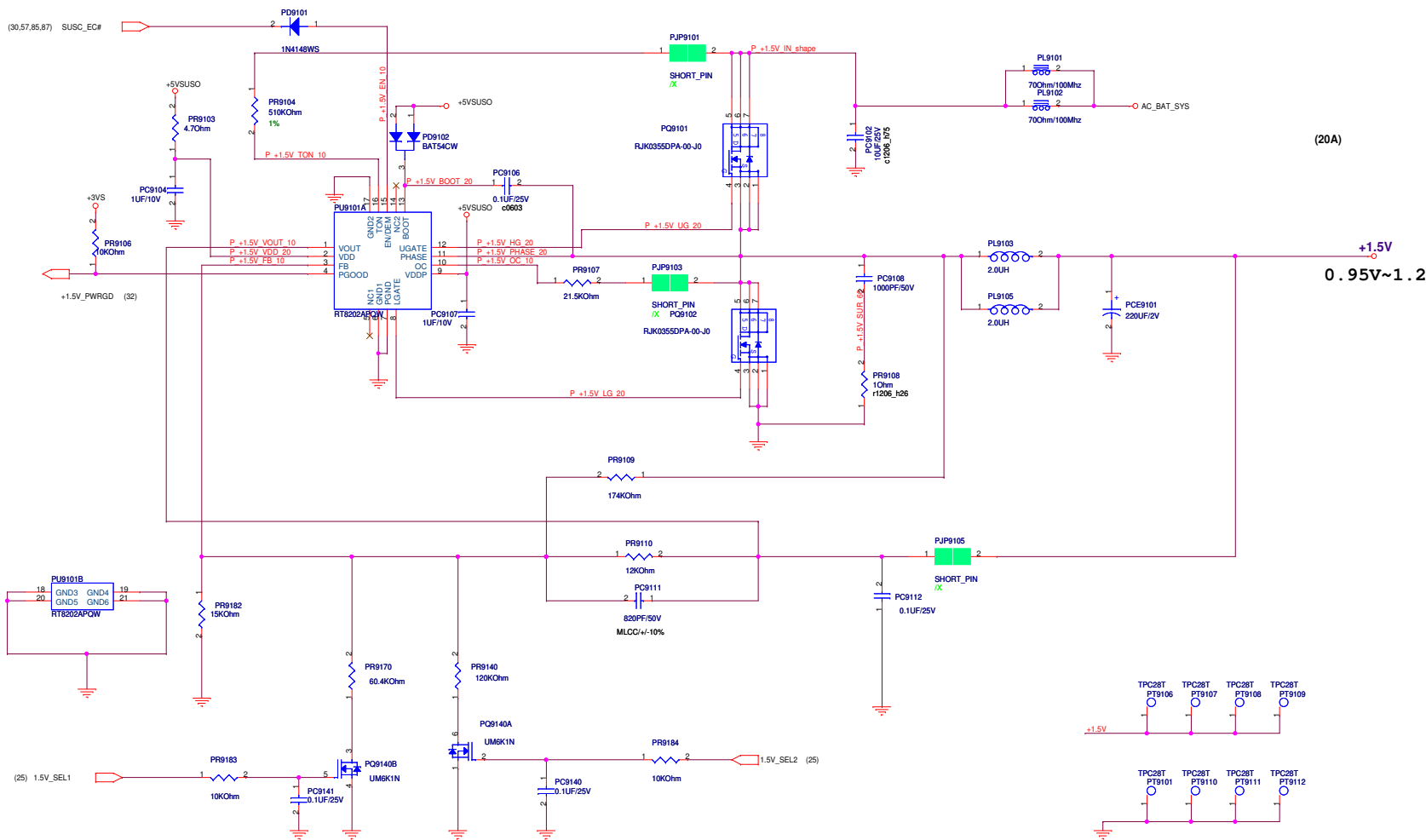




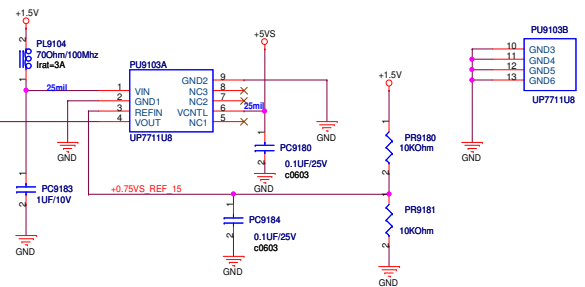


<Variant Name>

		<b>Title : Power_Charger</b>	
ASUSTek Computer INC.		Engineer: <i>Limy_H</i>	
Size	Project Name		Rev
A3	<b>F83T</b>		2.1G
Date: Thursday, November 12, 2009		Sheet	90 of 1



**0.75VS / 0.5A**



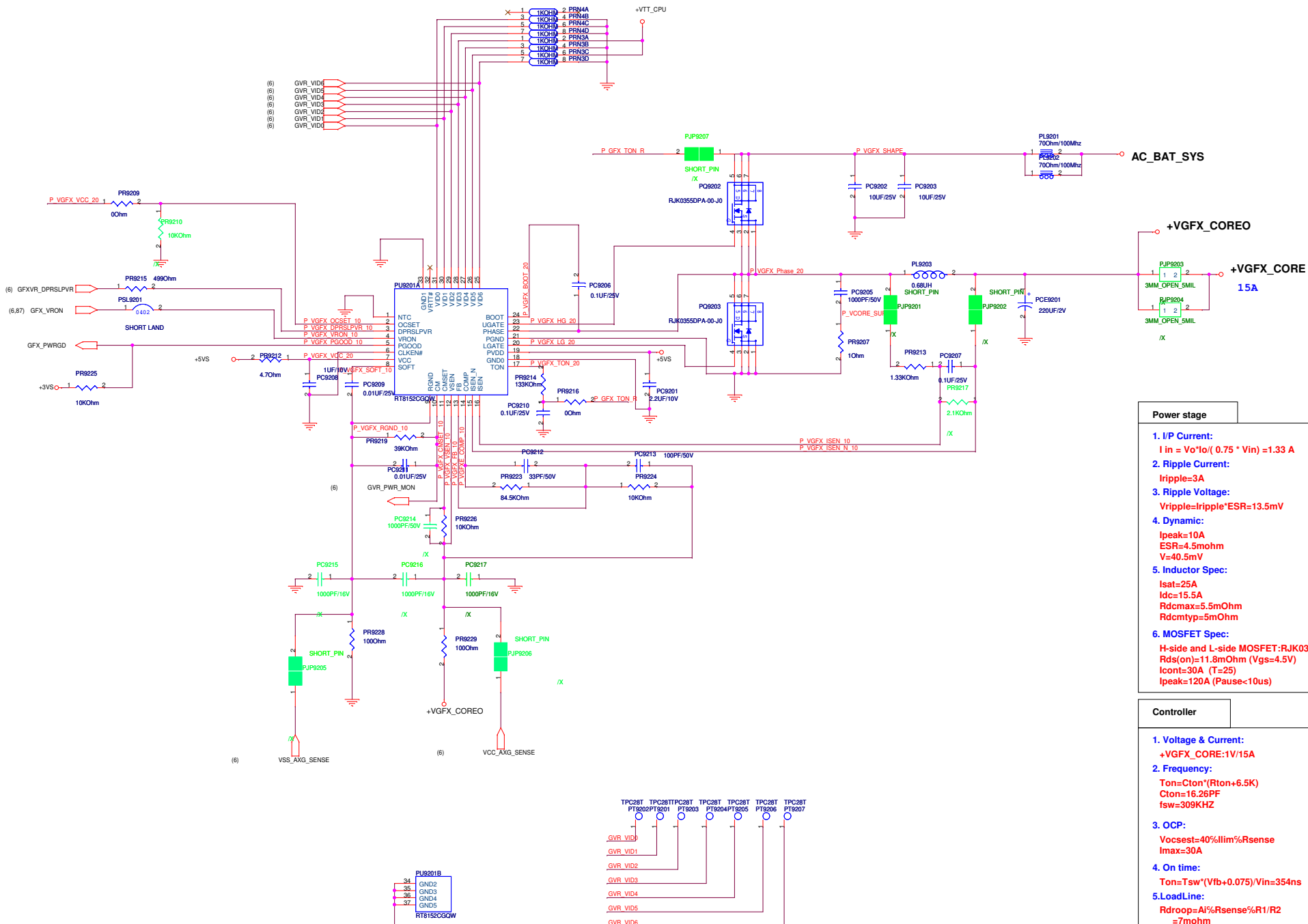
1.5V_SEL1	1.5V_SEL2	+1.5V	
0	0	1.35	-10%
0	1	1.425	-5%
1	0	1.5	Normal
1	1	1.575	+5%

**Controller**

- Voltage & Current:**  
+1.2VSUS: 16A
- Frequency:**  
Ton=3.85p\*RI(on)/Vin-05=0.3us  
Frequency=Vout/(Vin\*Ton)=500KHZ
- OCp:**  
Set PR8107=21.5kohm  
Iocp=Rocp\*20/Rds(on)=26A
- Soft start time:**  
Soft-Star duration is 1.35ms
- Inrush Current:**  
C total =220uF  
I inrush=0.163A

**Power stage**

- I/P Current:**  
I in = Vo\*Io/( 0.75 \* Vin) =0.85A
- Ripple Current:**  
Iripple=3.74A
- ripple voltage:**  
Ipeak=(vin-vo)\*D/(L\*Fsw)=2.07A  
DCR=3.3mohm  
V=6.831mV
- Inductor Spec:**  
Isat=25A  
I dc=15.5A  
DCR=5.5mohm
- MOSFET Spec:**  
H-side and L-side MOSFET:  
Rds(on)=16.5mOhm (Vgs=4.5V)  
Icont=30A (T=25)  
Ipeak=120A (Pause<10us)



- Power stage**
- I/P Current:**  
 $I_{in} = V_o/I_o / (0.75 * V_{in}) = 1.33 A$
  - Ripple Current:**  
 $I_{ripple} = 3A$
  - Ripple Voltage:**  
 $V_{ripple} = I_{ripple} * ESR = 13.5mV$
  - Dynamic:**  
 $I_{peak} = 10A$   
 $ESR = 4.5mohm$   
 $V = 40.5mV$
  - Inductor Spec:**  
 $I_{sat} = 25A$   
 $I_{dc} = 15.5A$   
 $R_{dcmax} = 5.5mOhm$   
 $R_{dcmtyp} = 5mOhm$
  - MOSFET Spec:**  
 H-side and L-side MOSFET: RJK0355  
 $R_{ds(on)} = 11.8mOhm$  ( $V_{gs} = 4.5V$ )  
 $I_{cont} = 30A$  ( $T = 25$ )  
 $I_{peak} = 120A$  (Pause < 10us)

- Controller**
- Voltage & Current:**  
 $+V_{GFX\_CORE} = 1V/15A$
  - Frequency:**  
 $T_{on} = C_{ton} * (R_{ton} + 6.5K)$   
 $C_{ton} = 16.26PF$   
 $f_{sw} = 309KHZ$
  - OCP:**  
 $V_{ocset} = 40% I_{lim} * R_{sense}$   
 $I_{max} = 30A$
  - On time:**  
 $T_{on} = T_{sw} * (V_{fb} + 0.075) / V_{in} = 354ns$
  - Load Line:**  
 $R_{droop} = A_i * R_{sense} * R1/R2$   
 $= 7mohm$

5

4

3

2

1

D

D

C

C


B

B

A

A

<Variant Name>

		<b>Title :</b> Power_+VCCP	
ASUSTeK COMPUTER INC		<b>Engineer:</b>	
Size	Project Name	Rev	
C		1.0	
Date: Thursday, November 12, 2009 Sheet 88 of 1			

5

4

3

2

1

D

D

C

C

B

B

A

A

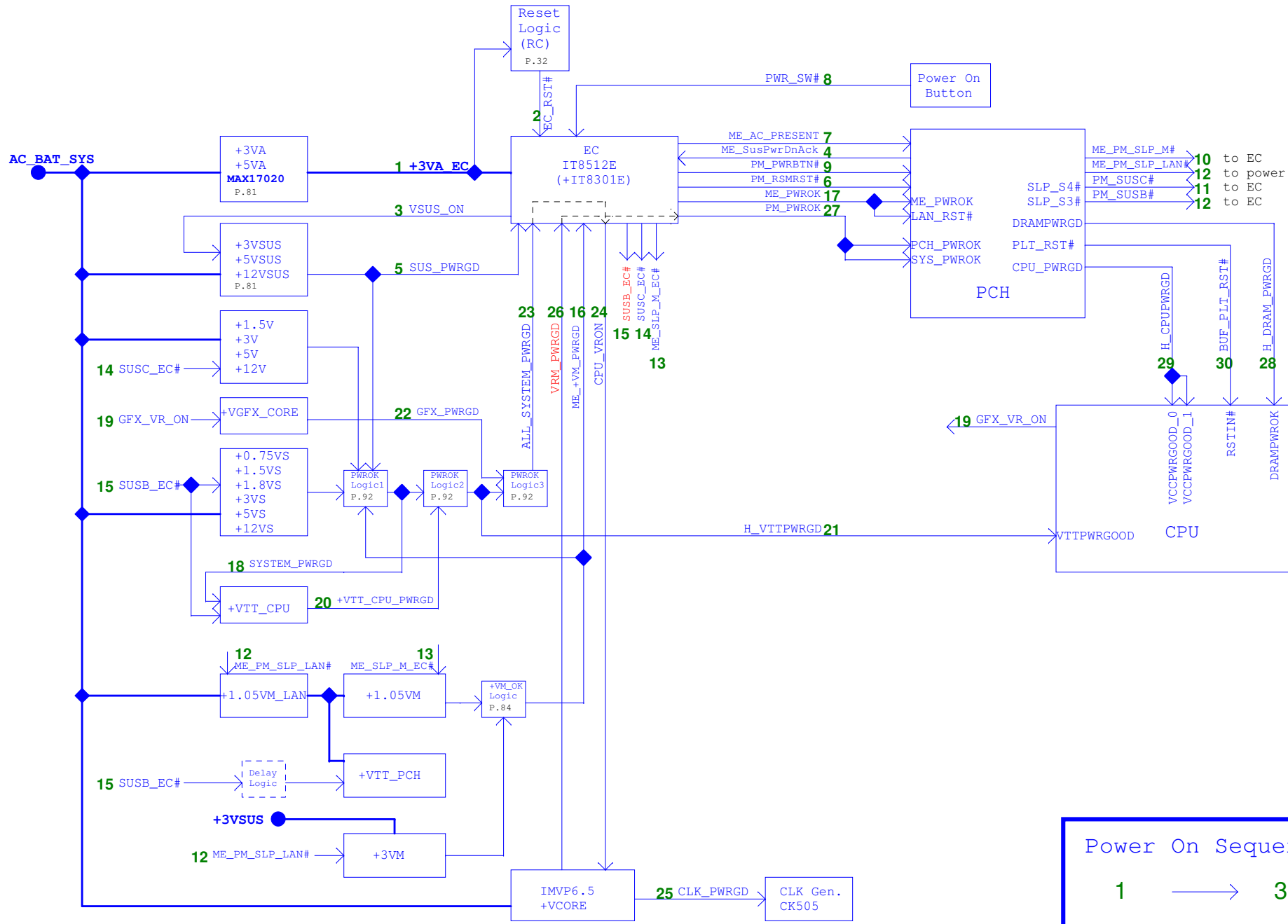
<Variant Name>



Title : Power\_VCCP

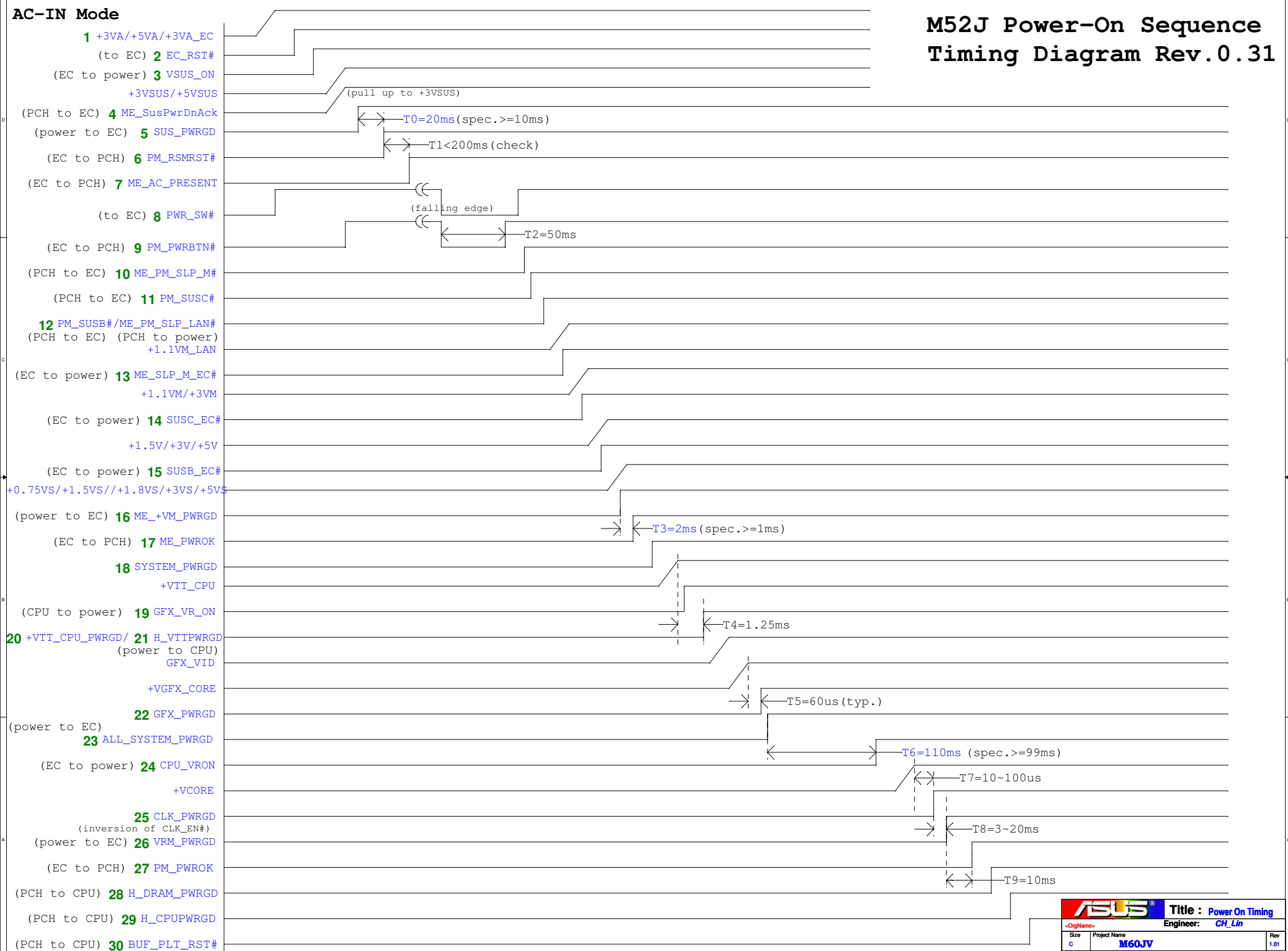
ASUSTeK COMPUTER INC Engineer:

Size	Project Name	Rev
A3		1.0



Power On Sequence  
1 → 30

# M52J Power-On Sequence Timing Diagram Rev.0.31





# M52J Power-On Sequence Timing Diagram Rev.0.31

## DC-IN Mode

