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# BONN-E/BONN-C

CPU : Intel Penryn  
 Chip Set : PM45 & ICH9M  
 Graphic : M96/M92/gDDR3 1g bit  
 Remarks : Montevina Platform

Model Name : BONN-E/BONN-C  
 PBA Name : MAIN  
 PCB Code : GCE : BA41-01060A  
                   NAN : BA41-01061A  
                   HAN : BA41-01062A  
 Dev. Step : MP  
 Revision : 1.0  
 T.R. Date : 2009.04.11

Design	CHECK	APPROVAL

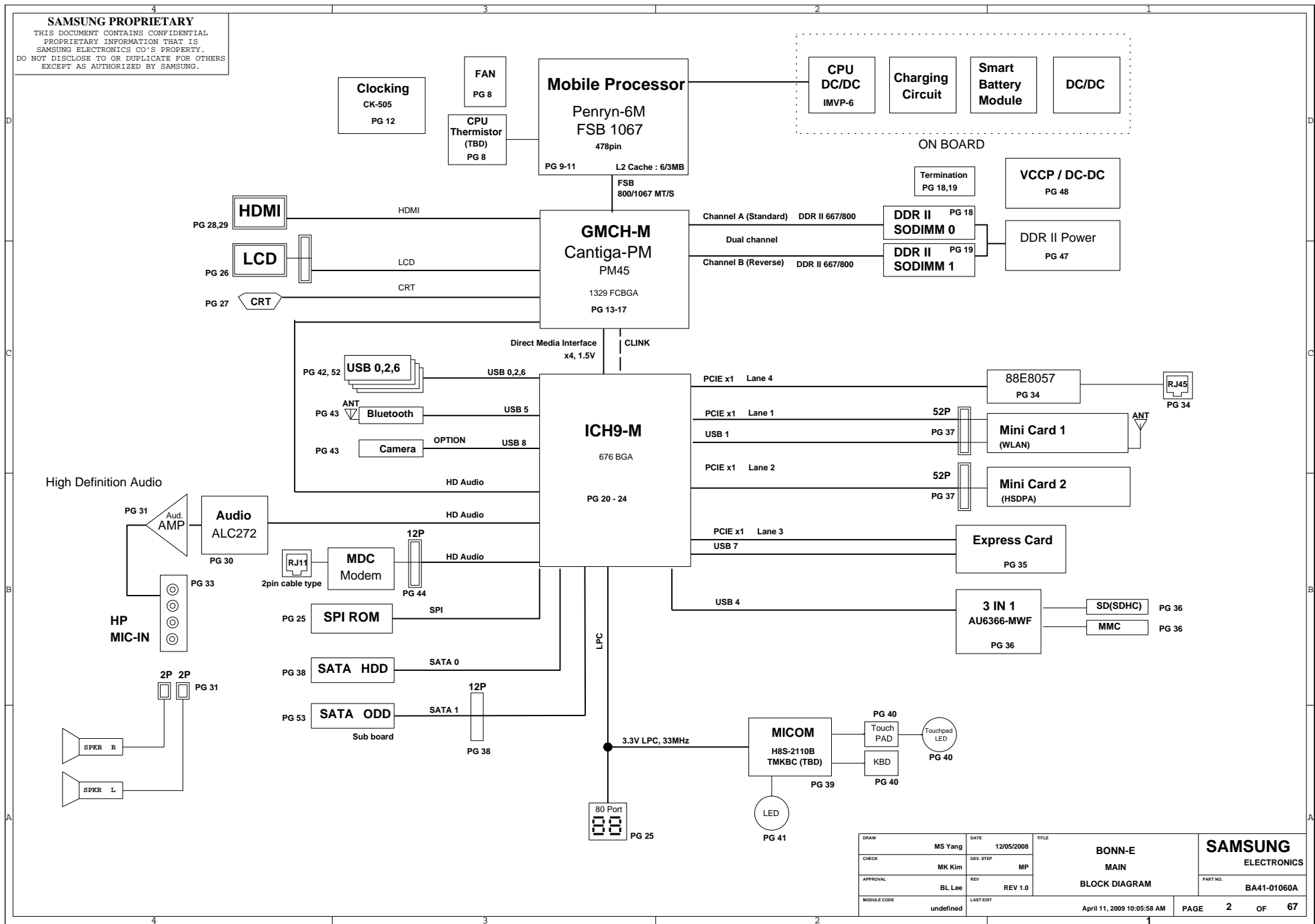
Owner : SEC Mobile R & D      Signature : X

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DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E MAIN COVER	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	PART NO.		
APPROVAL	BL Lee	REV	REV 1.0	BA41-01060A		
MODULE CODE		LAST EDIT	April 11, 2009 10:05:58 AM		PAGE	1 OF 67

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CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		BLOCK DIAGRAM	PART NO. BA41-01060A
MODULE CODE	undefined	LAST EDIT				
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**BOARD INFORMATION**

**SCHEMATIC ANNOTATIONS AND BOARD INFORMATION**

Devices	IDSEL#	REQ/GNT#	Interrupts
Cardbus	AD25	3	A,B,C
USB	AD29(internal)	-	USB2.0 #0 (USB0) : A USB2.0 #1 (USB1) : D USB2.0 #2 (USB4) : C USB2.0 #3 (USB5) : E USB2.0 #4 (EHCI) : H
Hub to PCI	AD30(internal)	-	-
LPC bridge/IDE/AC97/SMBUS	AD31(internal)	-	B
Internal MAC	AD24(internal)	-	E
AC Link	-	-	B
GLAN	-	-	F

Crystal / Oscillator			
TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	ICH8-M	Real Time Clock
Crystal	10MHz	MICOM	HD64F2169/2160
Crystal	14.318MHz	CLOCK-Generator	CK-505
Crystal	25MHz	LAN	Intel LAN

Voltage Rails	
VDC	Primary DC system power supply (7 to 21V)
VCC_CORE	Core Voltage for CPU
GFX_CORE	Core Voltage for GPU
P1.05V (VCCP)	VTT for CPU, Crestline & ICH8-M
P3.3V_MICOM	3.3V always power rail (for Micom)
P1.5V	1.5V switched power rail (off in S3-S5)
P1.8V	1.8V switched power rail (off in S3-S5)
P1.8V_AUX	1.8V power rail for DDR (off in S4-S5)
P0.9V	0.9V power rail for DDR (off in S3-S5)
P3.3V	3.3V switched power rail (off in S3-S5)
P3.3V_AUX	3.3V switched on power rail (off in S4-S5)
P5.0V	5.0V switched power rail (off in S3-S5)
P5.0V_AUX	5.0V switched on power rail (off in S4-S5)
P5.0V_ALW	5.0V always power rail

LCD Panel Detect (TBD)		
Devices	Resolution	PANNEL_DETECT_0

I <sup>2</sup> C / SMB Address			
Devices	Address	Hex	Bus
ICH8-m	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	Thermal Sensor
SODIMM0	1010 000x	A0h	-
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
CK-505M (Clock Generator)	1101 001x	D2h	Clock, Unused Clock Output Disable

USB PORT Assign		PCI Express Assign	
PORT #	ASSIGNED TO	PORT #	ASSIGNED TO
0	SYSTEM PORT 0	0	NC
1	SYSTEM PORT 1	1	Mini Card 1 (WLAN)
2	SYSTEM PORT 2	2	NC
3	NC	3	LOM
4	NC	4	Mini Card 2 (ROBSON or DVB-T)
5	Bluetooth	5	NC
6	Mini PCI Express 2		
7	Camera		
8	NC		
9	NC		

**REVISION HISTORY**

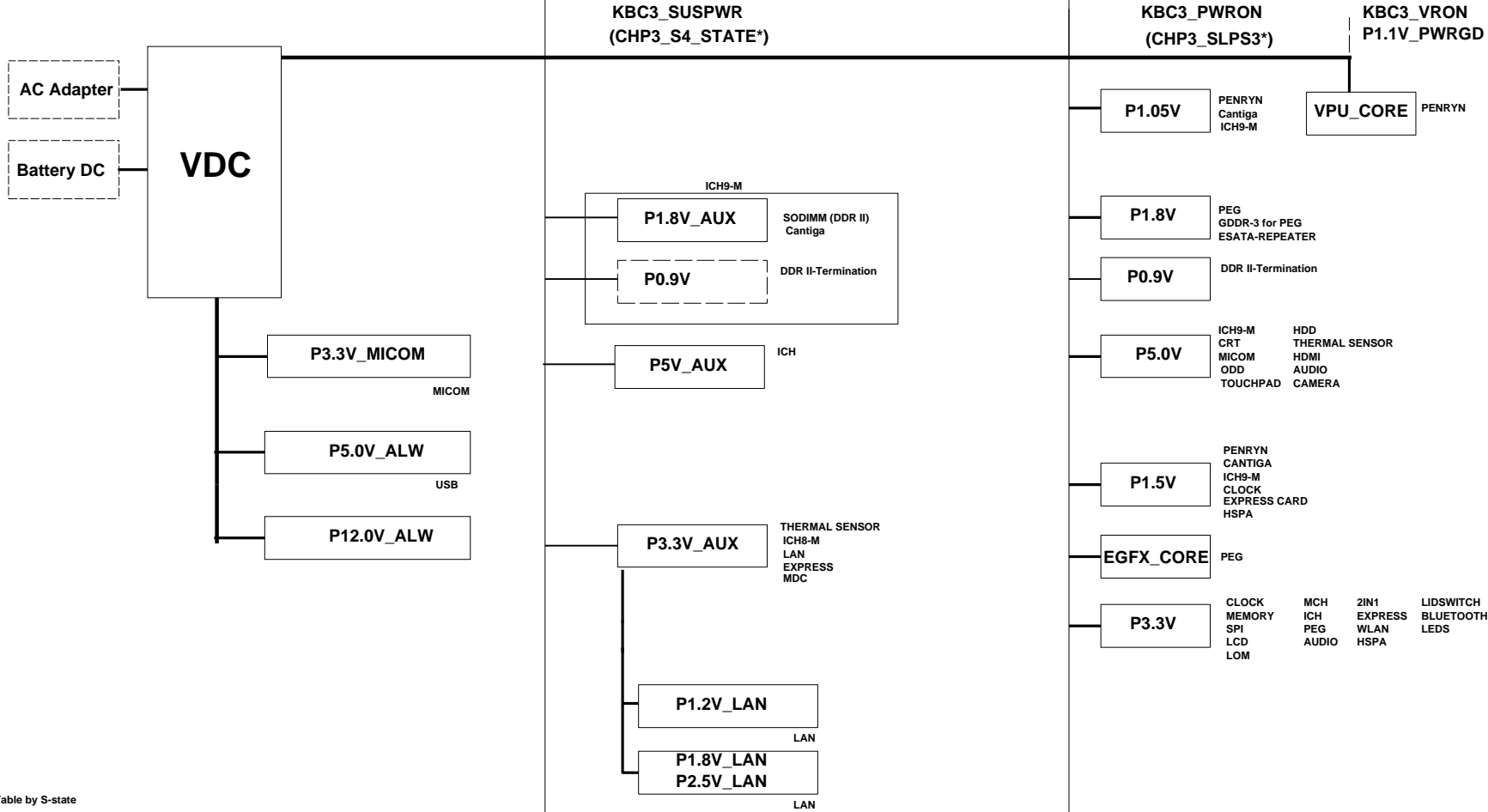
See rev notes for more information.

DRAWN	MS Yang	DATE	12/05/2008	TITLE	BONN-E MAIN BOARD INFO	SAMSUNG ELECTRONICS	
CHECK	MK Kim	DEV. STEP	MP	PART NO.			BA41-01060A
APPROVAL	BL Lee	REV	REV 1.0				
MODULE CODE	undefined	LAST EDIT					
				April 11, 2009 10:05:58 AM	PAGE	3 OF 67	

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# POWER DIAGRAM



Power On/Off Table by S-state

Rail \ State	S0	S3	S4	S5
+V*A(LWS)	ON	ON	ON	ON
+V*LAN	ON	ON	—	—
+1.8V_AUX +0.9V	ON	ON	—	—
+V*AUX	ON	ON	—	—
+V	ON	—	—	—
+V* (CORE)	ON	—	—	—



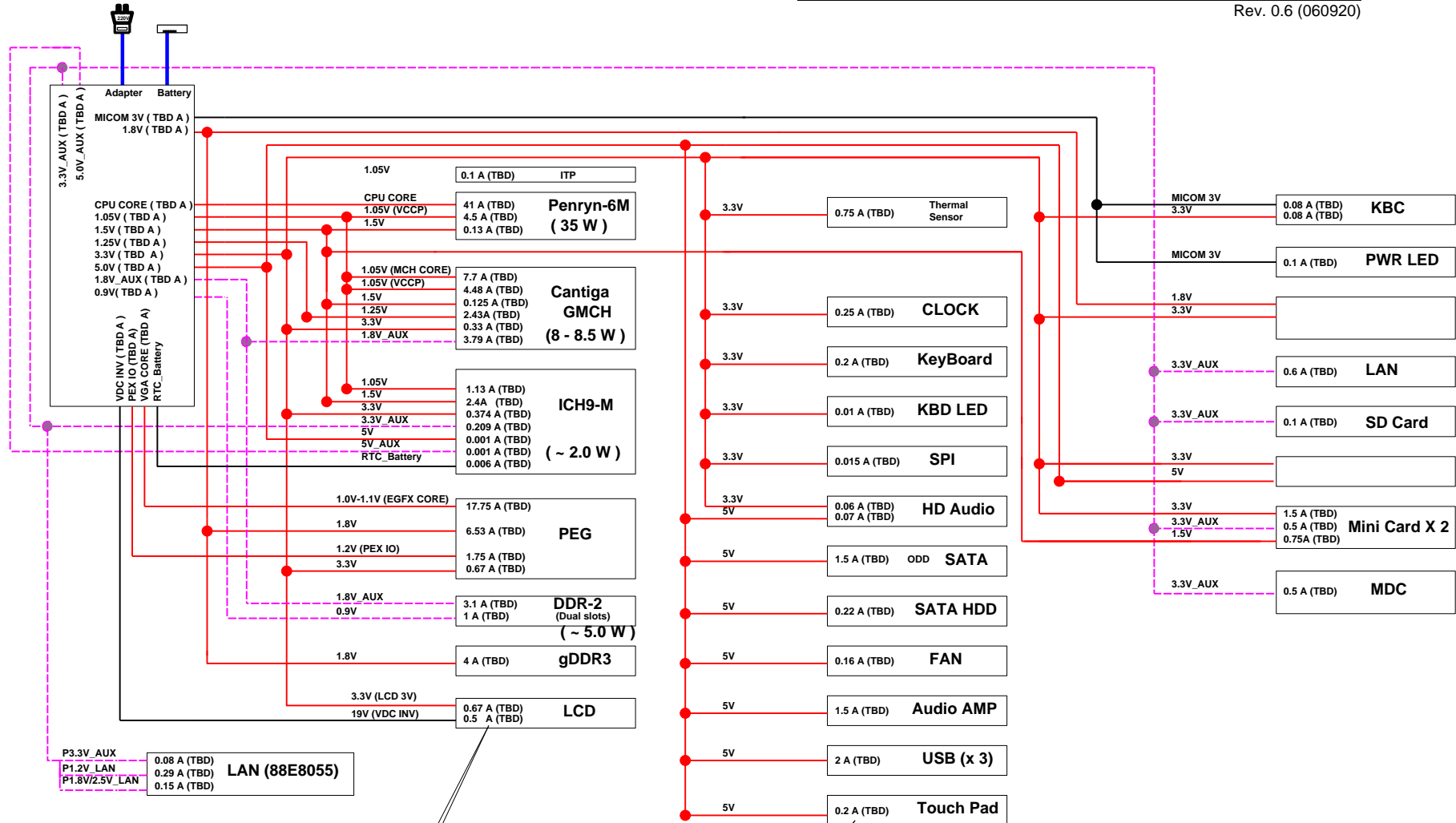
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CHECK	MK Kim	DEV. STEP	MP	POWER DIAGRAM	PART NO.	
APPROVAL	BL Lee	REV	REV 1.0		BA41-01060A	
MODULE CODE	undefined	LAST EDIT	April 11, 2009 10:05:58 AM	PAGE	4	OF 67

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# POWER RAILS ANALYSIS

Rev. 0.6 (060920)



Value by Datasheet/Application notes (Value by measurement)

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E MAIN POWER RAILS	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01060A
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	5 OF 67

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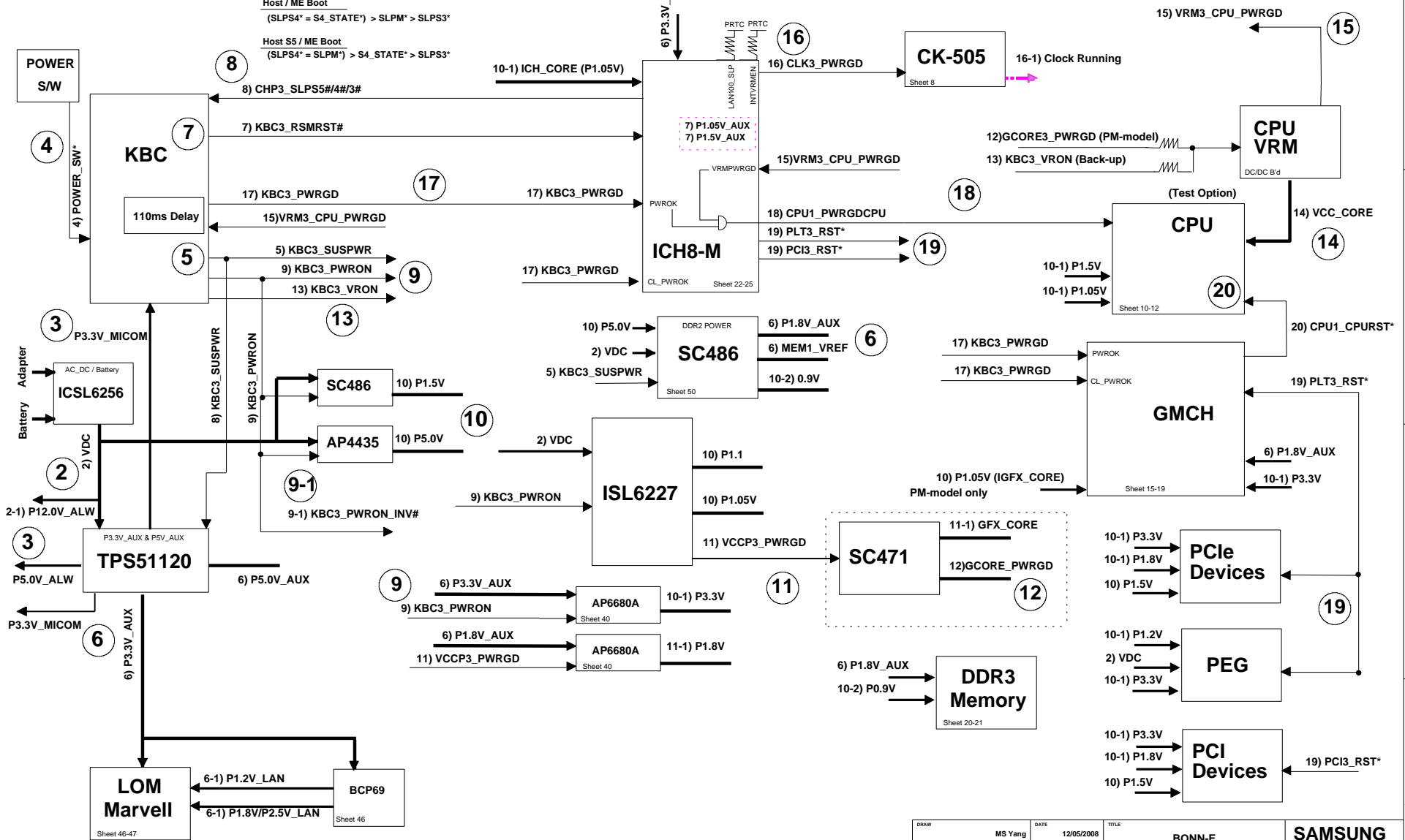
**Host Boot / ME Off**  
 (SLPS4\* = S4\_STATE\*) > (SLPM\* = SLPS3\*)  
 M-1) KBC3\_DDR\_PWRON (TBD) = 8) KBC3\_SUSPWR  
 M-2) KBC3\_ME\_PWRON = 15) KBC3\_PWRON

**Host / ME Boot**  
 (SLPS4\* = S4\_STATE\*) > SLPM\* > SLPS3\*

**Host S5 / ME Boot**  
 (SLPS4\* = SLPM\*) > S4\_STATE\* > SLPS3\*

# POWER SEQUENCE

Rev. 0.7

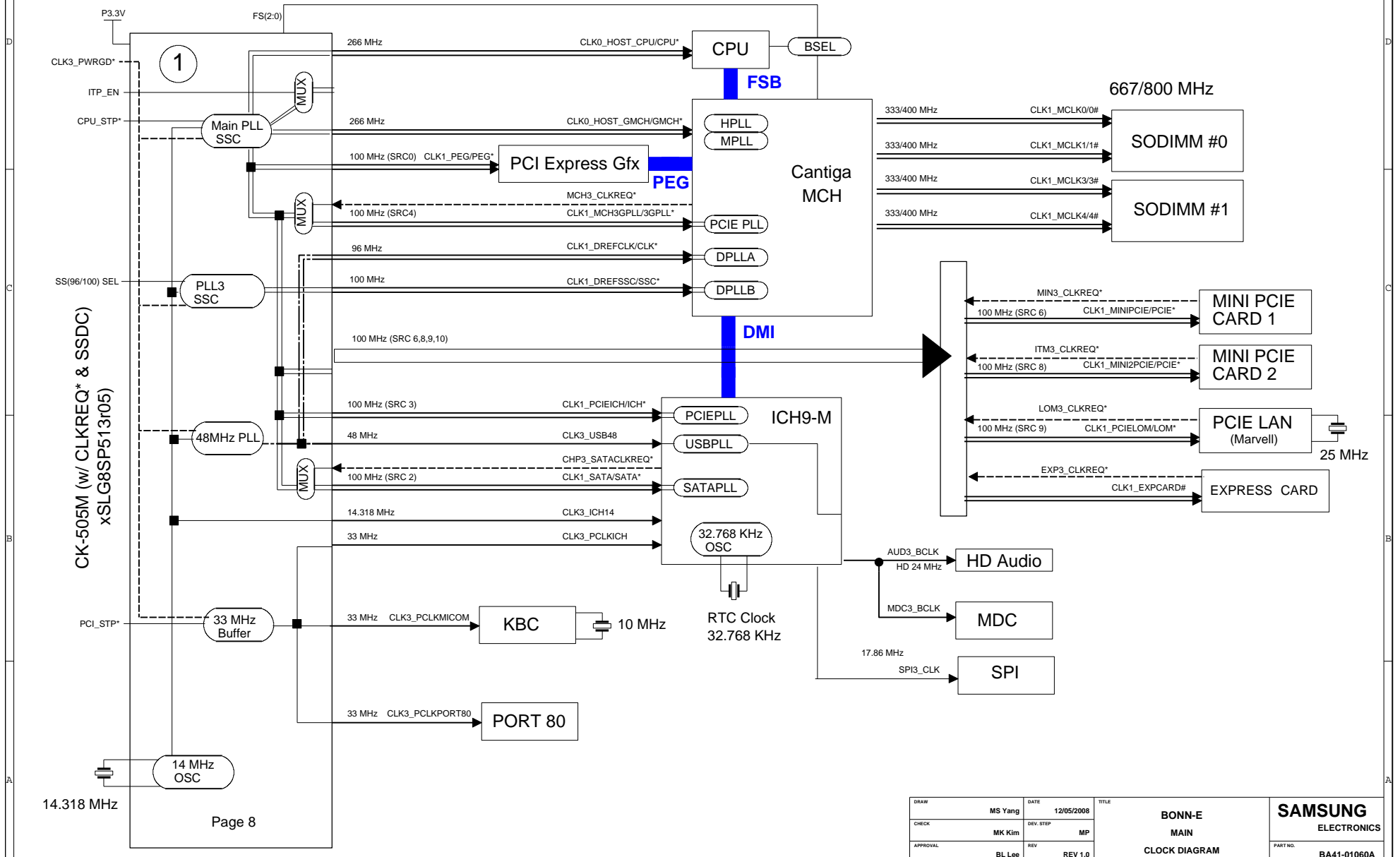


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CHECK	MK Kim	DEV. STEP	MP	POWER SEQUENCE	PART NO.	
APPROVAL	BL Lee	REV	REV 1.0		BA41-01060A	
MODULE CODE	undefined	LAST EDIT		April 11, 2009 10:05:58 AM	PAGE 6 OF 67	

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# CLOCK DISTRIBUTION Rev. 0.1



14.318 MHz

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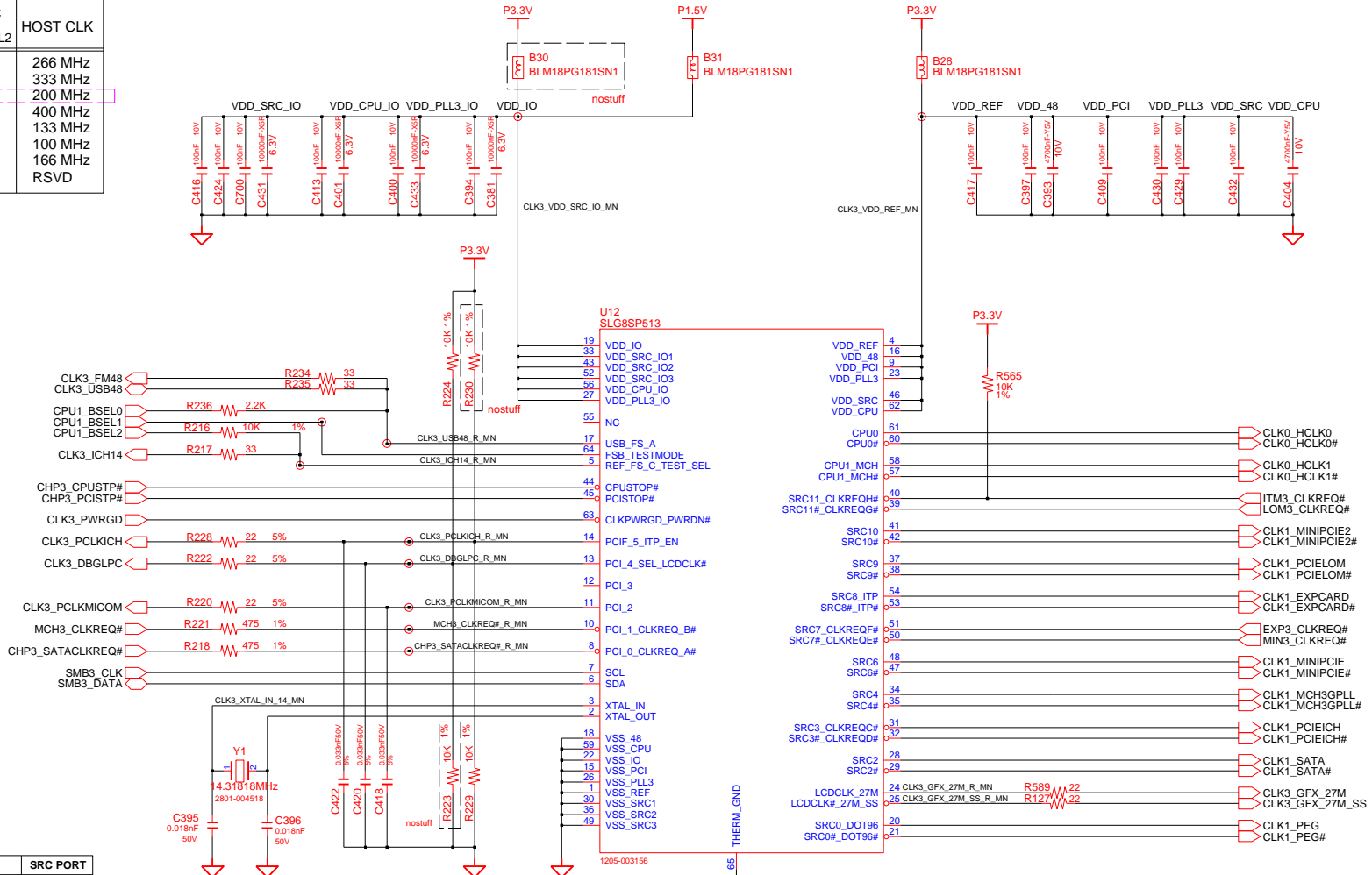
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CHECK	MK Kim	DEV. STEP	MP	CLOCK DIAGRAM	PART NO.	
APPROVAL	BL Lee	REV	REV 1.0		BA41-01060A	
MODULE CODE	undefined	LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	7 OF 67

# CK505M

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FSA	FSB	FSC	HOST CLK
BSEL0	BSEL1	BSEL2	
0	0	0	266 MHz
0	0	1	333 MHz
0	1	0	200 MHz
0	1	1	400 MHz
1	0	0	133 MHz
1	0	1	100 MHz
1	1	0	166 MHz
1	1	1	RSVD



Place 14.318MHz within 500mils of CK-505

This part is 64pin QFN package.

IDT : 1205-003159  
SL : 1205-003533

CLK REQ	DEVICE	SRC PORT
CLK REQ A	SATA	SRC2
CLK REQ B	GMCH	SRC4
CLK REQ E	MINI CARD	SRC6
CLK REQ F	EXP3_CLKREQ#	SRC8

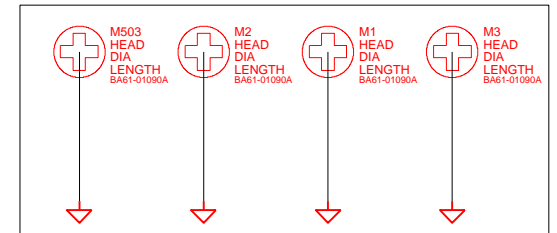
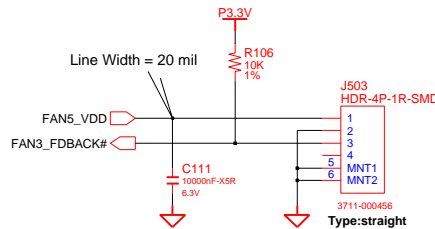
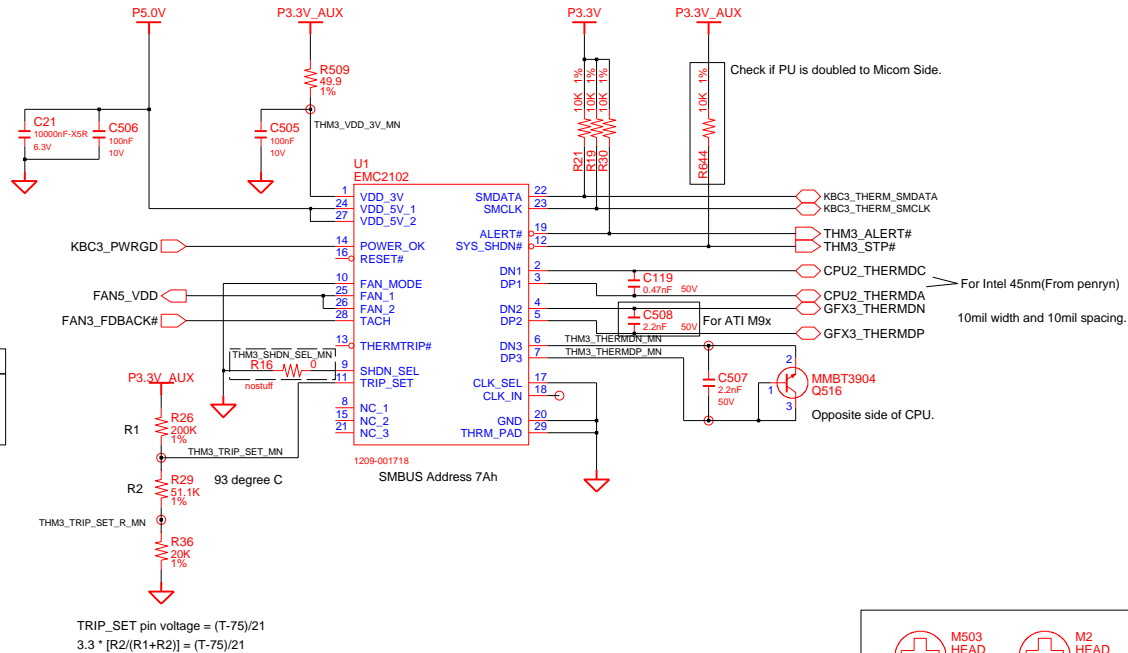
SEL_LCDCLK*	Pin 20/21	Pin 24/25
LOW	DOT_96/DOT_96#	PEG_CLK/PEG_CLK#
HIGH	SRC_0/SRC_0#	27M & 27M_SS

DRAW	MS Yang	DATE	12/05/2008	TITLE	SAMSUNG ELECTRONICS	
CHECK	MK Kim <td>DEV. STEP</td> <td>MP <td>BONN-E</td> <td colspan="2">PART NO. BA41-01060A</td> </td>	DEV. STEP	MP <td>BONN-E</td> <td colspan="2">PART NO. BA41-01060A</td>	BONN-E	PART NO. BA41-01060A	
APPROVAL	BL Lee <td>REV</td> <td>REV 1.0</td> <td>MAIN_CLOCK_CIRCUIT</td> <td colspan="2">CK_Clock_505M</td>	REV	REV 1.0	MAIN_CLOCK_CIRCUIT	CK_Clock_505M	
MODULE CODE	undefined	LAST EDIT			April 11, 2009 10:05:58 AM	PAGE 8 OF 67

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# THERMAL SENSOR & FAN CONTROL

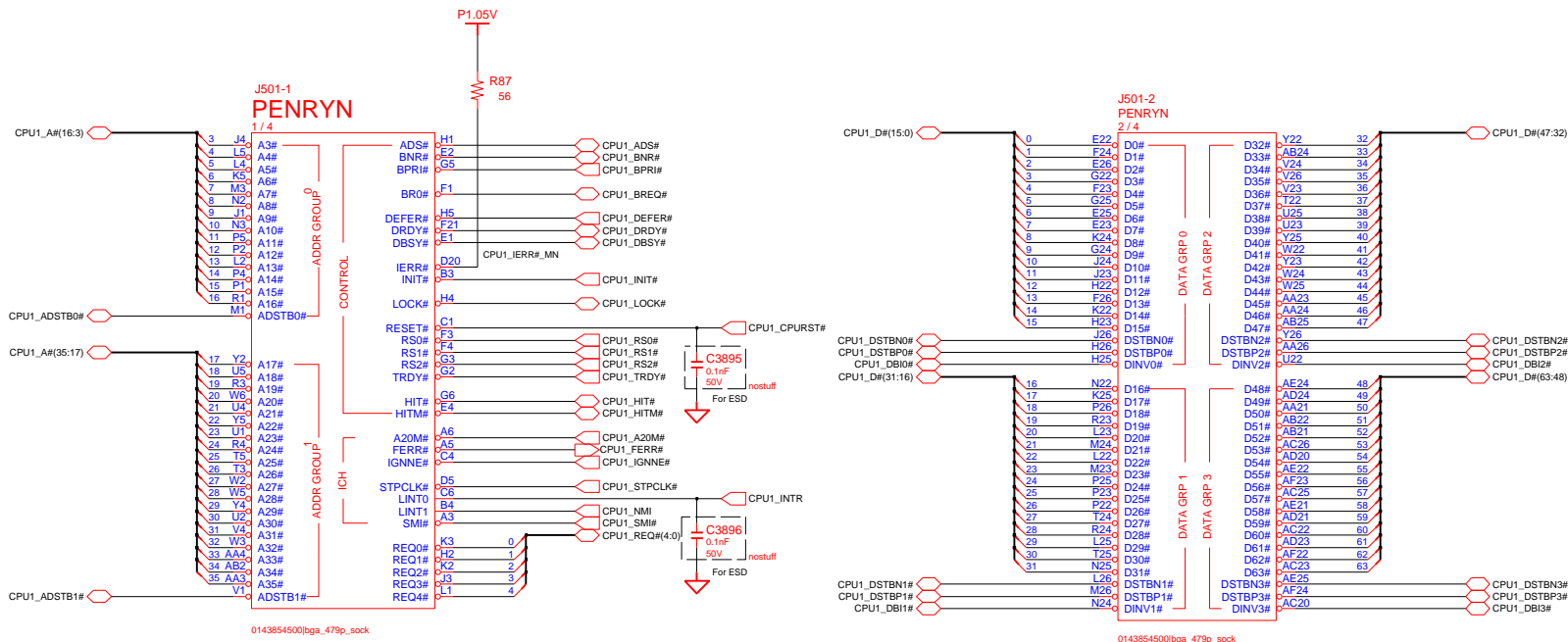


To support heatsink

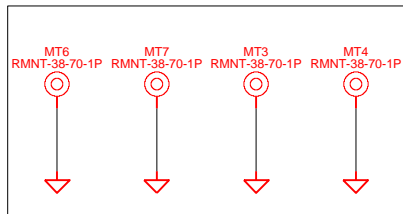
DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	THERMAL SENSOR		
APPROVAL	BL Lee	REV	REV 1.0	THERMAL SENSOR EMC2102		PART NO. BA41-01060A
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM		PAGE 9 OF 67

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**CPU Socket : 3704-001153**

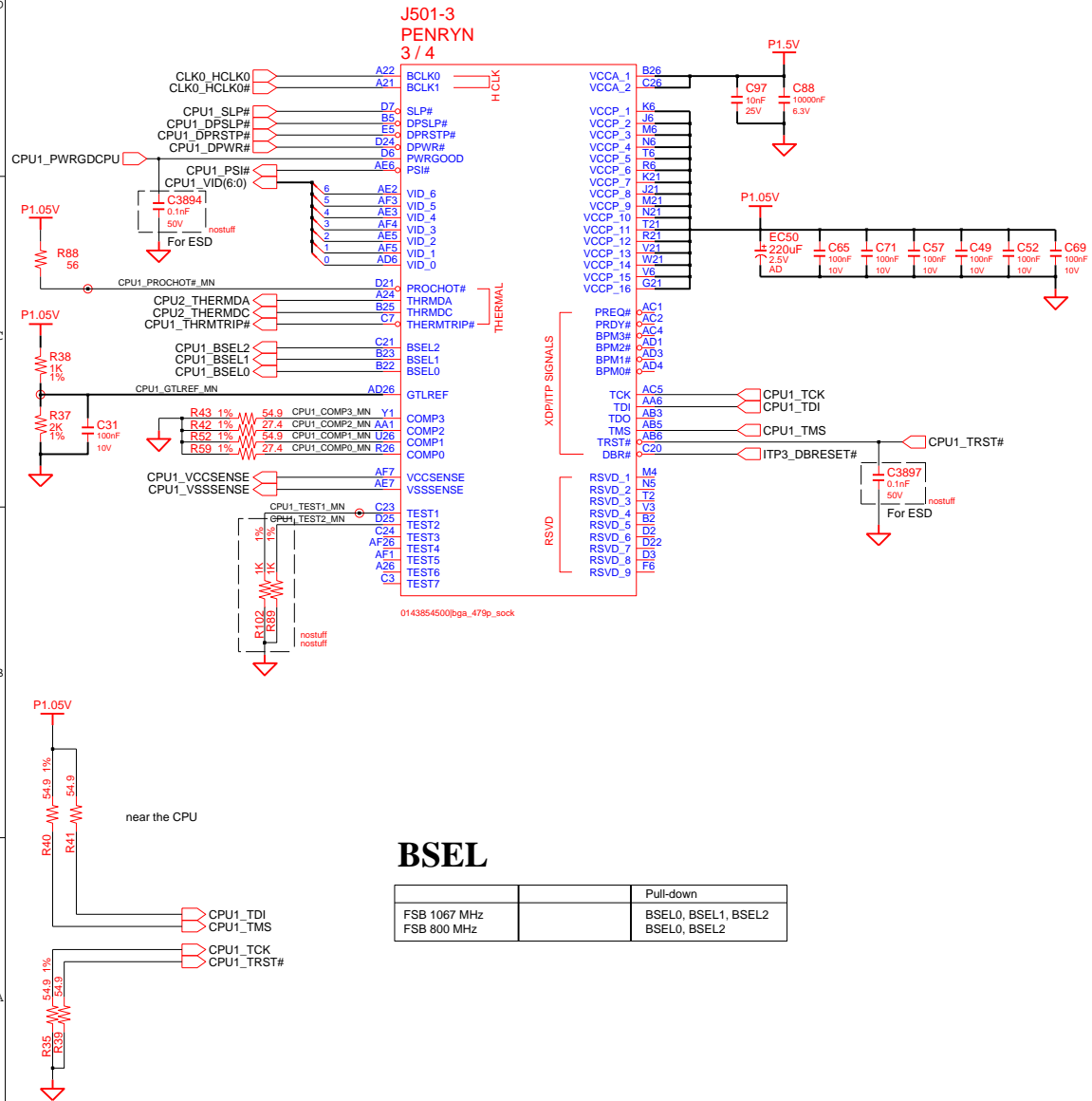


CPU mount

DRAW	MS Yang	DATE	12/05/2008	TITLE	<b>BONN-E</b> <b>CPU</b> <b>PENRYN (1/3)</b>	<b>SAMSUNG</b> <b>ELECTRONICS</b>
CHECK	MK Kim	REV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	10 OF 67

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**CPU Core Voltage Table** IMVP-6

Active Mode		Active/Deeper Sleep Dual Mode Region		Deeper Sleep/Extended Deeper Sleep Dual Mode Region	
VID(6:0)	Voltage	VID(6:0)	Voltage	VID(6:0)	Voltage
0 0 0 0 0 0 0	1.5000 V	0 1 0 1 0 0 0	1.0000 V	1 0 1 0 0 0 1	0.4875 V
0 0 0 0 0 0 1	1.4875 V	0 1 0 1 0 0 1	0.9875 V	1 0 1 0 0 1 0	0.4750 V
0 0 0 0 0 1 0	1.4750 V	0 1 0 1 0 1 0	0.9750 V	1 0 1 0 0 1 1	0.4625 V
0 0 0 0 0 1 1	1.4625 V	0 1 0 1 0 1 1	0.9625 V	1 0 1 0 1 0 0	0.4500 V
0 0 0 0 1 0 0	1.4500 V	0 1 0 1 1 0 0	0.9500 V	1 0 1 0 1 0 1	0.4375 V
0 0 0 0 1 0 1	1.4375 V	0 1 0 1 1 0 1	0.9375 V	1 0 1 0 1 1 0	0.4250 V
0 0 0 0 1 1 0	1.4250 V	0 1 0 1 1 1 0	0.9250 V	1 0 1 1 0 1 1	0.4125 V
0 0 0 0 1 1 1	1.4125 V	0 1 0 1 1 1 1	0.9125 V	1 0 1 1 1 0 0	0.4000 V
0 0 0 1 0 0 0	1.4000 V	0 1 1 0 0 0 0	0.9000 V	1 0 1 1 1 0 1	0.3875 V
0 0 0 1 0 0 1	1.3875 V	0 1 1 0 0 0 1	0.8875 V	1 0 1 1 1 0 1 0	0.3750 V
0 0 0 1 0 1 0	1.3750 V	0 1 1 0 0 1 0	0.8750 V	1 0 1 1 1 0 1 1	0.3625 V
0 0 0 1 0 1 1	1.3625 V	0 1 1 0 1 0 0	0.8625 V	1 0 1 1 1 1 0 0	0.3500 V
0 0 0 1 1 0 0	1.3500 V	0 1 1 0 1 0 1	0.8500 V	1 0 1 1 1 1 0 1	0.3375 V
0 0 0 1 1 0 1	1.3375 V	0 1 1 0 1 1 0	0.8375 V	1 0 1 1 1 1 1 0	0.3250 V
0 0 0 1 1 1 0	1.3250 V	0 1 1 1 0 1 0	0.8250 V	1 0 1 1 1 1 1 1	0.3125 V
0 0 0 1 1 1 1	1.3125 V	0 1 1 1 0 1 1	0.8125 V	1 1 0 0 0 0 0 0	0.3000 V
0 0 1 0 0 0 0	1.3000 V	0 1 1 1 0 1 1 0	0.8000 V	1 1 0 0 0 0 0 1	0.2875 V
0 0 1 0 0 0 1	1.2875 V	0 1 1 1 0 0 0 1	0.7875 V	1 1 0 0 0 1 0 0	0.2750 V
0 0 1 0 0 1 0	1.2750 V	0 1 1 1 0 1 0 0	0.7750 V	1 1 0 0 0 1 0 1	0.2625 V
0 0 1 0 0 1 1	1.2625 V	0 1 1 1 1 0 0 1	0.7625 V	1 1 0 0 0 1 1 0	0.2500 V
0 0 1 0 1 0 0	1.2500 V	0 1 1 1 1 0 1 0	0.7500 V	1 1 0 0 1 0 0 0	0.2375 V
0 0 1 0 1 0 1	1.2375 V	0 1 1 1 1 0 1 1	0.7375 V	1 1 0 0 1 0 0 1	0.2250 V
0 0 1 0 1 1 0	1.2250 V	0 1 1 1 1 1 0 0	0.7250 V	1 1 0 0 1 0 1 0	0.2125 V
0 0 1 0 1 1 1	1.2125 V	0 1 1 1 1 1 0 1	0.7125 V	1 1 0 0 1 0 1 1	0.2000 V
0 0 1 1 0 0 0	1.2000 V	1 0 0 0 0 0 0 0	0.7000 V	1 1 0 1 0 0 0 0	0.1875 V
0 0 1 1 0 0 1	1.1875 V	1 0 0 0 0 0 0 1	0.6875 V	1 1 0 1 0 0 0 1	0.1750 V
0 0 1 1 0 1 0	1.1750 V	1 0 0 0 0 0 1 0	0.6750 V	1 1 0 1 0 0 1 0	0.1625 V
0 0 1 1 0 1 1	1.1625 V	1 0 0 0 0 0 1 1	0.6625 V	1 1 0 1 0 1 0 0	0.1500 V
0 0 1 1 1 0 0	1.1500 V	1 0 0 0 0 1 0 0	0.6500 V	1 1 0 1 0 1 0 1	0.1375 V
0 0 1 1 1 0 1	1.1375 V	1 0 0 0 0 1 0 1	0.6375 V	1 1 0 1 0 1 1 0	0.1250 V
0 0 1 1 1 1 0	1.1250 V	1 0 0 0 0 1 1 0	0.6250 V	1 1 0 1 0 1 1 1	0.1125 V
0 0 1 1 1 1 1	1.1125 V	1 0 0 0 1 0 0 0	0.6125 V	1 1 1 0 0 0 0 0	0.1000 V
0 1 0 0 0 0 0	1.1000 V	1 0 0 0 1 0 0 1	0.6000 V	1 1 1 0 0 0 0 1	0.0875 V
0 1 0 0 0 0 1	1.0875 V	1 0 0 0 1 0 1 0	0.5875 V	1 1 1 0 0 0 1 0	0.0750 V
0 1 0 0 0 1 0	1.0750 V	1 0 0 0 1 0 1 1	0.5750 V	1 1 1 0 0 1 0 0	0.0625 V
0 1 0 0 0 1 1	1.0625 V	1 0 0 0 1 1 0 0	0.5625 V	1 1 1 0 0 1 0 1	0.0500 V
0 1 0 0 1 0 0	1.0500 V	1 0 0 0 1 1 0 1	0.5500 V	1 1 1 0 0 1 1 0	0.0375 V
0 1 0 0 1 0 1	1.0375 V	1 0 0 0 1 1 0 1	0.5375 V	1 1 1 0 1 0 0 0	0.0250 V
0 1 0 0 1 1 0	1.0250 V	1 0 0 0 1 1 1 0	0.5250 V	1 1 1 0 1 0 0 1	0.0125 V
0 1 0 0 1 1 1	1.0125 V	1 0 0 1 0 0 0 0	0.5125 V	1 1 1 1 0 0 0 0	0.0000 V
0 1 0 0 1 1 1	1.0125 V	1 0 0 1 0 0 0 1	0.5000 V	1 1 1 1 0 0 0 1	0.0000 V
				1 1 1 1 0 0 1 0	0.0000 V
				1 1 1 1 0 0 1 1	0.0000 V
				1 1 1 1 1 0 0 0	0.0000 V
				1 1 1 1 1 0 0 1	0.0000 V
				1 1 1 1 1 0 1 0	0.0000 V
				1 1 1 1 1 0 1 1	0.0000 V
				1 1 1 1 1 1 0 0	0.0000 V
				1 1 1 1 1 1 0 1	0.0000 V
				1 1 1 1 1 1 1 0	0.0000 V
				1 1 1 1 1 1 1 1	0.0000 V
				1 1 1 1 1 1 1 1	0.0000 V

GTLREF : Keep the Voltage divider within 0.5" of the first GTLREF0 pin with Zo=55ohm trace. Minimize coupling of any switching signals to this net.

COMP0,2(COMP1,3) should be connected with Zo=27.4ohm(55ohm) trace shorter than 1/2" to their respective Banias socket pins.

GND test points within 100mil of the VCC/VSSense at the end of the line. Route the VCC/VSSense as a Zo=55ohm traces with equal length. Observe 3:1 spacing b/w VCC/VSSense lines and 25mil away (preferred 50mil) from any other signal. And GND via 100mil away from each of the VCC/VSS test point vias.

\*Yonah Processor (2.33 GHz / 800 MHz : TBD)

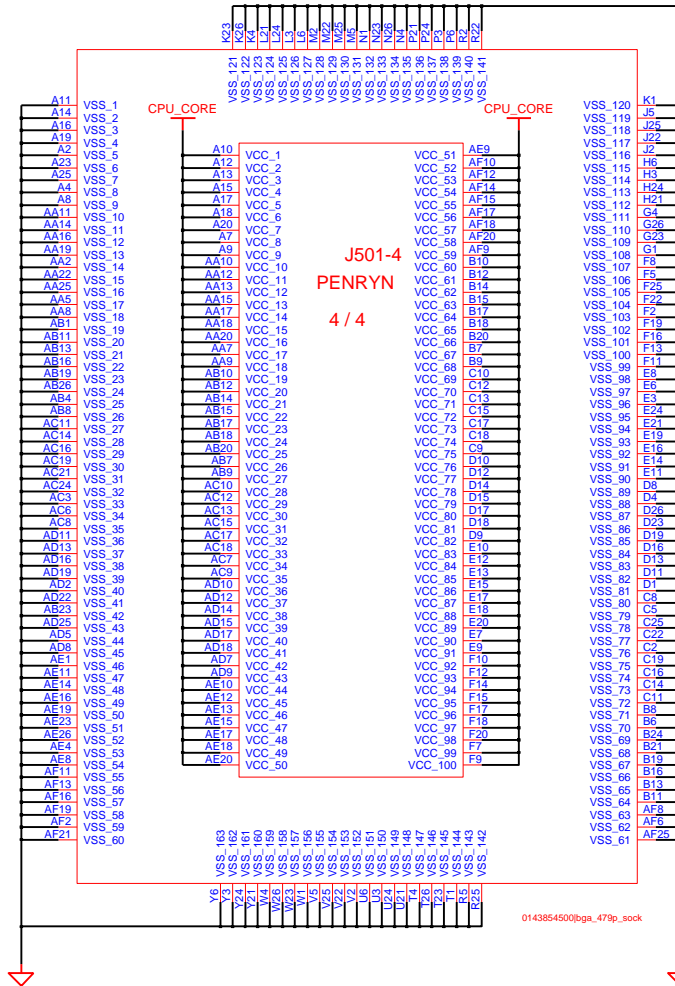
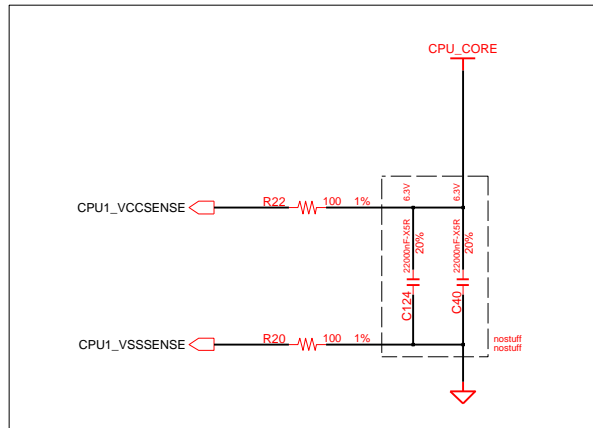
**BSEL**

		Pull-down
FSB 1067 MHz		BSEL0, BSEL1, BSEL2
FSB 800 MHz		BSEL0, BSEL2

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E CPU	SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP		PENRYN (2/3)	
APPROVAL	BL Lee	REV	REV 1.0			PART NO.
MODULE CODE	undefined	LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	11 OF 67

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DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	CPU		
APPROVAL	BL Lee	REV	REV 1.0	PENRYN (3/3)	PART NO.	BA41-01060A
MODULE CODE	undefined	LAST EDIT			April 11, 2009 10:05:58 AM	PAGE 12 OF 67

**SAMSUNG PROPRIETARY**

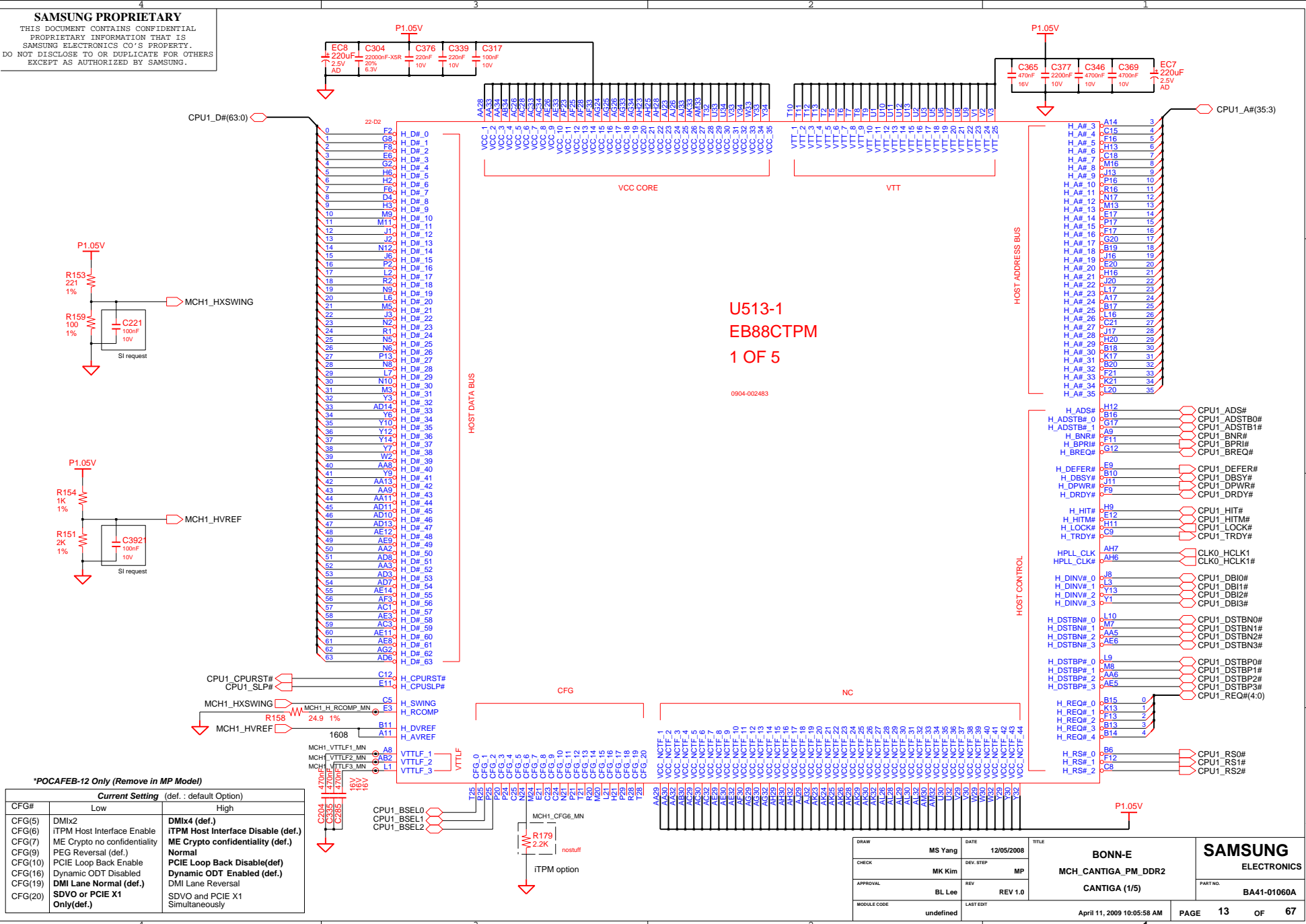
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D

C

B

A



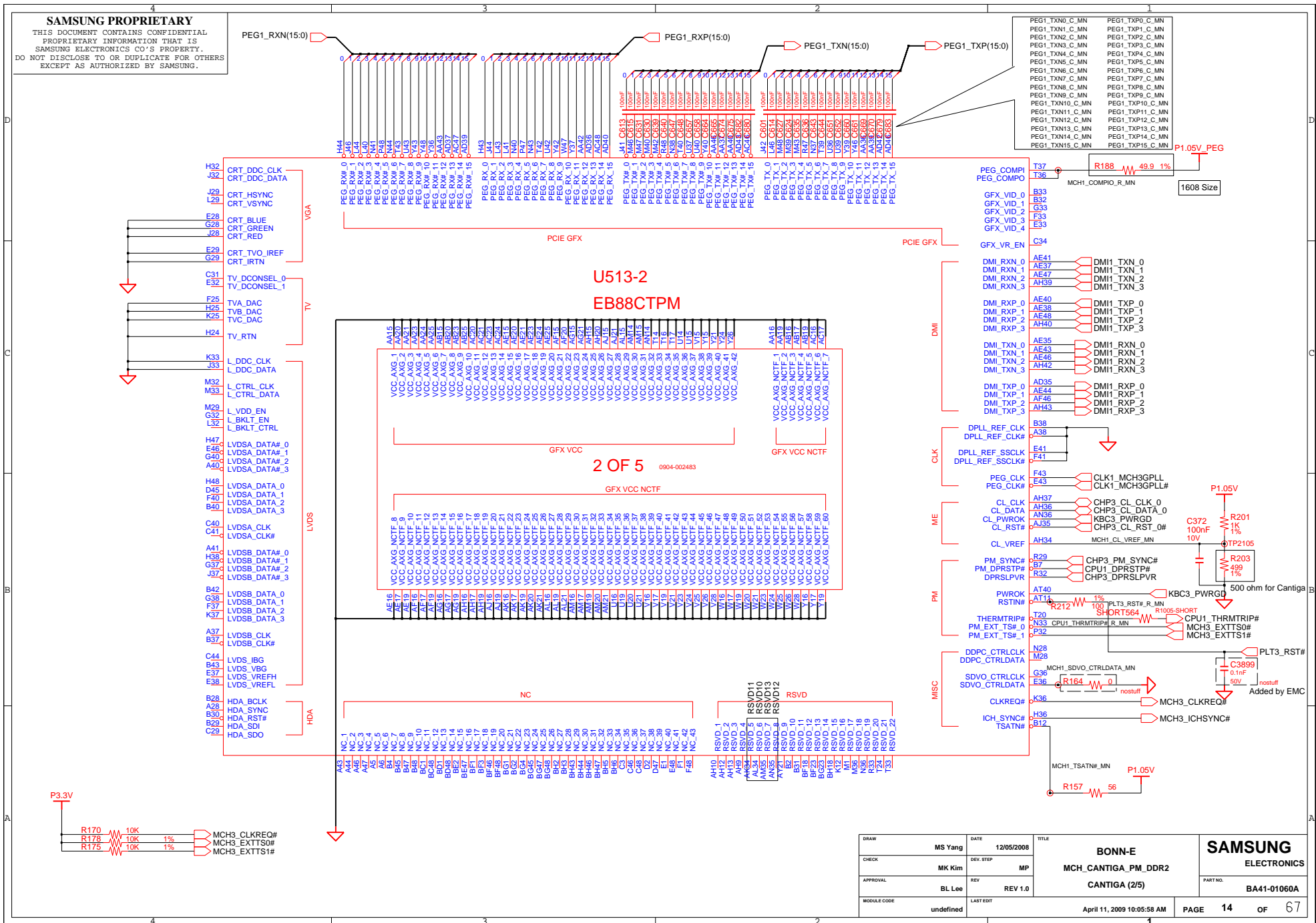
**\*POCAFEB-12 Only (Remove in MP Model)**

CFG#	Current Setting (def.: default Option)	Low	High
CFG(5)	DMIx2		DMIx4 (def.)
CFG(6)	ITPM Host Interface Enable		ITPM Host Interface Disable (def.)
CFG(7)	ME Crypto no confidentiality		ME Crypto confidentiality (def.)
CFG(9)	PEG Reversal (def.)		Normal
CFG(10)	PCIe Loop Back Enable		PCIe Loop Back Disable(def.)
CFG(16)	Dynamic ODT Disabled		Dynamic ODT Enabled (def.)
CFG(19)	DMI Lane Normal (def.)		DMI Lane Reversal
CFG(20)	SDVO or PCIe X1 Only(def.)		SDVO and PCIe X1 Simultaneously

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	<b>SAMSUNG</b> ELECTRONICS
CHECK		REV. STEP	MP	MCH_CANTIGA_PM_DDR2	PART NO.	
APPROVAL	MK Kim	REV	REV 1.0	CANTIGA (1/5)	BA41-01060A	
MODULE CODE	undefined	LAST EDIT		April 11, 2009 10:05:58 AM	PAGE 13 OF 67	

**SAMSUNG PROPRIETARY**

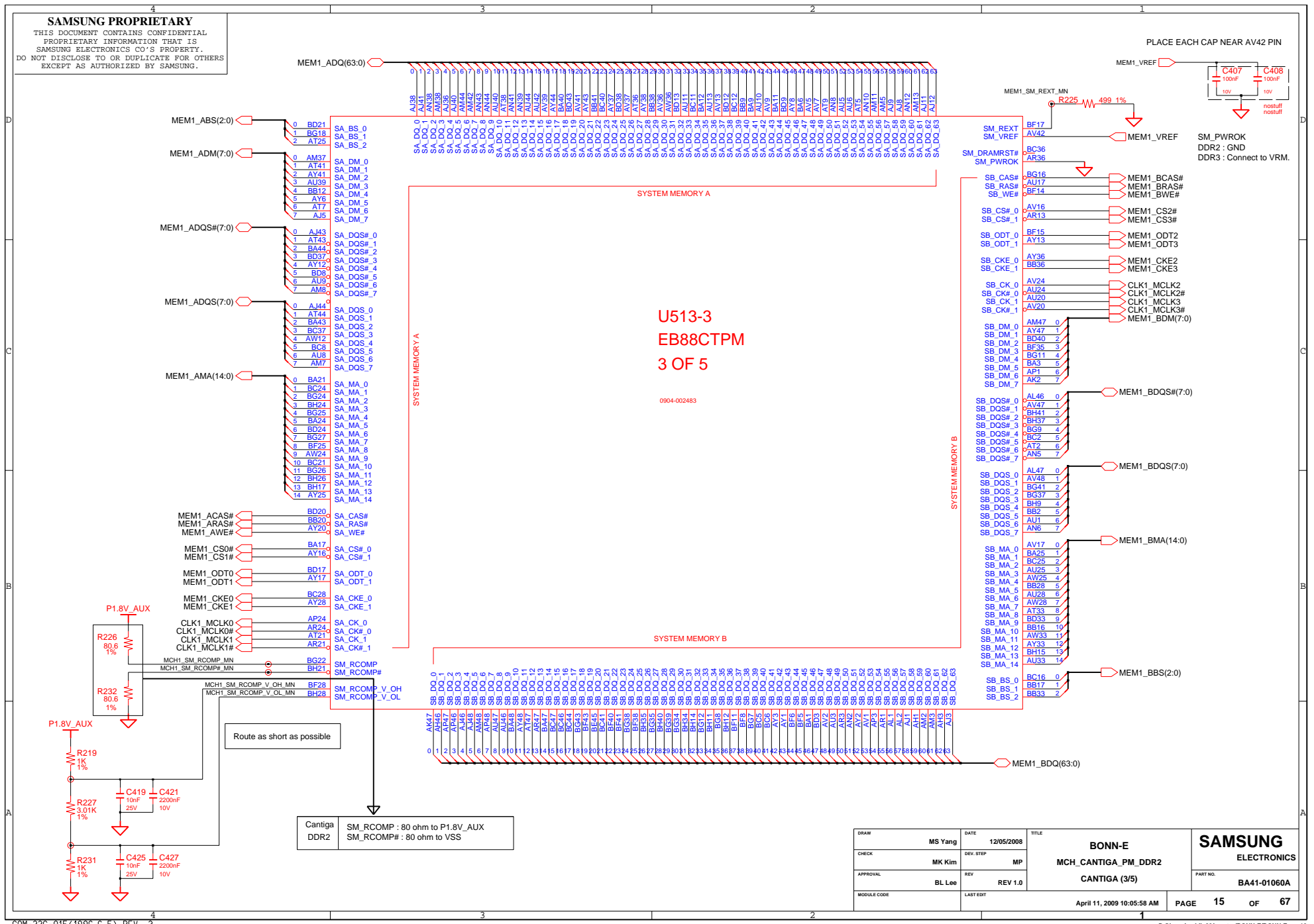
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PLACE EACH CAP NEAR AV42 PIN



MEM1\_ADD(63:0) 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

MEM1\_ABS(2:0) 0 BD21 SA\_BS\_0  
1 BG18 SA\_BS\_1  
2 AT25 SA\_BS\_2

MEM1\_ADM(7:0) 0 AM37 SA\_DM\_0  
1 AT41 SA\_DM\_1  
2 AY41 SA\_DM\_2  
3 AU39 SA\_DM\_3  
4 BB12 SA\_DM\_4  
5 AY6 SA\_DM\_5  
6 AT7 SA\_DM\_6  
7 AJ5 SA\_DM\_7

MEM1\_AQDS#(7:0) 0 AJ43 SA\_DQS#\_0  
1 AT43 SA\_DQS#\_1  
2 BA44 SA\_DQS#\_2  
3 BD37 SA\_DQS#\_3  
4 AY12 SA\_DQS#\_4  
5 BD3 SA\_DQS#\_5  
6 AU9 SA\_DQS#\_6  
7 AM8 SA\_DQS#\_7

MEM1\_AQOS(7:0) 0 AJ44 SA\_DQS\_0  
1 AT44 SA\_DQS\_1  
2 BA43 SA\_DQS\_2  
3 BC37 SA\_DQS\_3  
4 AW12 SA\_DQS\_4  
5 BC8 SA\_DQS\_5  
6 AU8 SA\_DQS\_6  
7 AM7 SA\_DQS\_7

MEM1\_AMA(14:0) 0 BA21 SA\_MA\_0  
1 BC34 SA\_MA\_1  
2 BC24 SA\_MA\_2  
3 BH24 SA\_MA\_3  
4 BG25 SA\_MA\_4  
5 BA24 SA\_MA\_5  
6 DD24 SA\_MA\_6  
7 BC27 SA\_MA\_7  
8 BF25 SA\_MA\_8  
9 AW24 SA\_MA\_9  
10 BC21 SA\_MA\_10  
11 EG26 SA\_MA\_11  
12 BH26 SA\_MA\_12  
13 BH17 SA\_MA\_13  
14 AY25 SA\_MA\_14

SA\_BS\_0 SA\_BS\_1 SA\_BS\_2 SA\_DM\_0 SA\_DM\_1 SA\_DM\_2 SA\_DM\_3 SA\_DM\_4 SA\_DM\_5 SA\_DM\_6 SA\_DM\_7 SA\_DQS#\_0 SA\_DQS#\_1 SA\_DQS#\_2 SA\_DQS#\_3 SA\_DQS#\_4 SA\_DQS#\_5 SA\_DQS#\_6 SA\_DQS#\_7 SA\_MA\_0 SA\_MA\_1 SA\_MA\_2 SA\_MA\_3 SA\_MA\_4 SA\_MA\_5 SA\_MA\_6 SA\_MA\_7 SA\_MA\_8 SA\_MA\_9 SA\_MA\_10 SA\_MA\_11 SA\_MA\_12 SA\_MA\_13 SA\_MA\_14 SA\_CAS# SA\_RAS# SA\_WE# SA\_CS#\_0 SA\_CS#\_1 SA\_ODT\_0 SA\_ODT\_1 SA\_CKE\_0 SA\_CKE\_1 SA\_CK\_0 SA\_CK\_1 SA\_CK\_2 SA\_CK\_3 SA\_CK\_4 SA\_CK\_5 SA\_CK\_6 SA\_CK\_7 SA\_CK\_8 SA\_CK\_9 SA\_CK\_10 SA\_CK\_11 SA\_CK\_12 SA\_CK\_13 SA\_CK\_14 SA\_CK\_15 SA\_CK\_16 SA\_CK\_17 SA\_CK\_18 SA\_CK\_19 SA\_CK\_20 SA\_CK\_21 SA\_CK\_22 SA\_CK\_23 SA\_CK\_24 SA\_CK\_25 SA\_CK\_26 SA\_CK\_27 SA\_CK\_28 SA\_CK\_29 SA\_CK\_30 SA\_CK\_31 SA\_CK\_32 SA\_CK\_33 SA\_CK\_34 SA\_CK\_35 SA\_CK\_36 SA\_CK\_37 SA\_CK\_38 SA\_CK\_39 SA\_CK\_40 SA\_CK\_41 SA\_CK\_42 SA\_CK\_43 SA\_CK\_44 SA\_CK\_45 SA\_CK\_46 SA\_CK\_47 SA\_CK\_48 SA\_CK\_49 SA\_CK\_50 SA\_CK\_51 SA\_CK\_52 SA\_CK\_53 SA\_CK\_54 SA\_CK\_55 SA\_CK\_56 SA\_CK\_57 SA\_CK\_58 SA\_CK\_59 SA\_CK\_60 SA\_CK\_61 SA\_CK\_62 SA\_CK\_63

MEM1\_VREF MEM1\_BCAS# MEM1\_BRAS# MEM1\_BWE# MEM1\_CS2# MEM1\_CS3# MEM1\_ODT2 MEM1\_ODT3 MEM1\_CKE2 MEM1\_CKE3 CLK1\_MCLK2# CLK1\_MCLK3# CLK1\_MCLK3# MEM1\_BDM(7:0) MEM1\_BDQS#(7:0) MEM1\_BDQS(7:0) MEM1\_BMA(14:0) MEM1\_BBS(2:0)

SM\_REXT BF17  
SM\_VREF AV42  
SM\_DRAMRST# BC36  
SM\_PWROK AR36

SB\_CASH# BG16  
SB\_RASH# AU17  
SB\_WE# BF14  
SB\_CS#\_0 AV16  
SB\_CS#\_1 AR13  
SB\_ODT\_0 BF15  
SB\_ODT\_1 AY13  
SB\_CKE\_0 AY36  
SB\_CKE\_1 BB36  
SB\_CK\_0 AV24  
SB\_CK#\_0 AU24  
SB\_CK#\_1 AU20  
SB\_CK#\_2 AV20  
SB\_DM\_0 AM47\_0  
SB\_DM\_1 AY47\_1  
SB\_DM\_2 BD40\_2  
SB\_DM\_3 BF35\_3  
SB\_DM\_4 BG11\_4  
SB\_DM\_5 BA3\_5  
SB\_DM\_6 AP1\_6  
SB\_DM\_7 AK2\_7  
SB\_DQS#\_0 AL46\_0  
SB\_DQS#\_1 AV47\_1  
SB\_DQS#\_2 BH41\_2  
SB\_DQS#\_3 BH37\_3  
SB\_DQS#\_4 BC2\_4  
SB\_DQS#\_5 AT2\_6  
SB\_DQS#\_6 AN5\_7  
SB\_DQS#\_7 AN5\_7  
SB\_DOS\_0 AL47\_0  
SB\_DOS\_1 AV48\_1  
SB\_DOS\_2 BG41\_2  
SB\_DOS\_3 BG37\_3  
SB\_DOS\_4 BH9\_4  
SB\_DOS\_5 BB2\_5  
SB\_DOS\_6 AU1\_6  
SB\_DOS\_7 AN6\_7  
SB\_MA\_0 AV17\_0  
SB\_MA\_1 BA25\_1  
SB\_MA\_2 BC25\_2  
SB\_MA\_3 AU25\_3  
SB\_MA\_4 AW25\_4  
SB\_MA\_5 BB28\_5  
SB\_MA\_6 AU28\_6  
SB\_MA\_7 AW28\_7  
SB\_MA\_8 AT33\_8  
SB\_MA\_9 BD33\_9  
SB\_MA\_10 BB16\_10  
SB\_MA\_11 AW33\_11  
SB\_MA\_12 AY33\_12  
SB\_MA\_13 BH15\_13  
SB\_MA\_14 AU33\_14  
SB\_BS\_0 BC16\_0  
SB\_BS\_1 BB17\_1  
SB\_BS\_2 BB33\_2

SYSTEM MEMORY A  
U513-3  
EB88CTPM  
3 OF 5  
0904-002483

SYSTEM MEMORY B

Route as short as possible

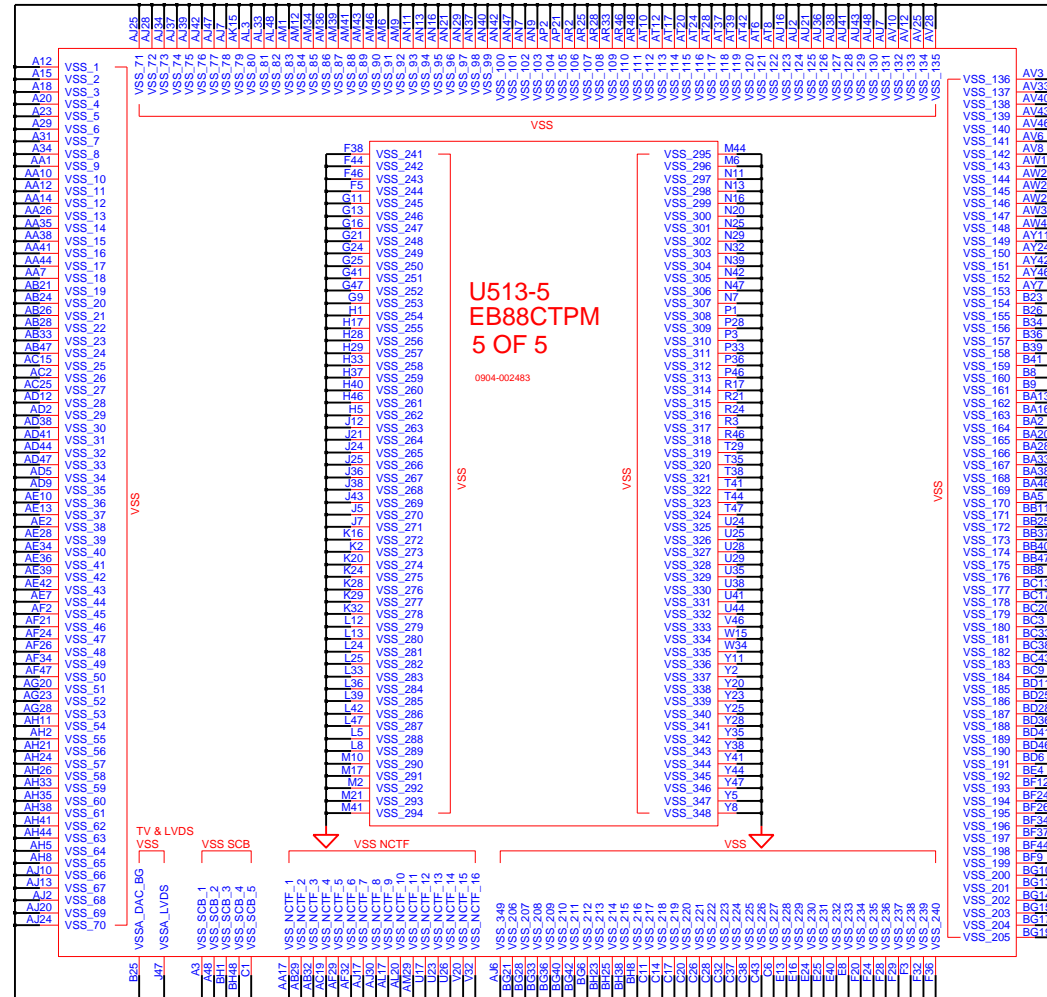
Cantiga  
DDR2 SM\_RCOMP : 80 ohm to P1.8V\_AUX  
SM\_RCOMP# : 80 ohm to VSS

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK		REV. STEP	MP	MCH_CANTIGA_PM_DDR2	PART NO.	
APPROVAL	MK Kim	REV	REV 1.0	CANTIGA (3/5)	BA41-01060A	
MODULE CODE	BL Lee	LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	15 OF 67



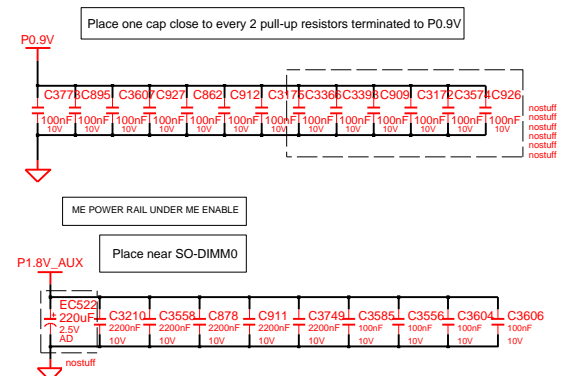
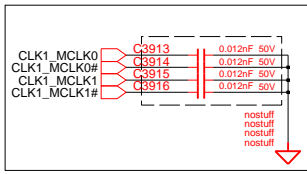
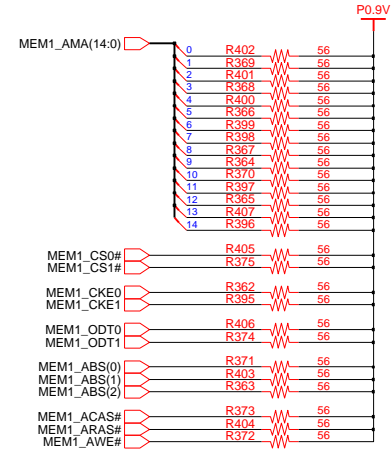
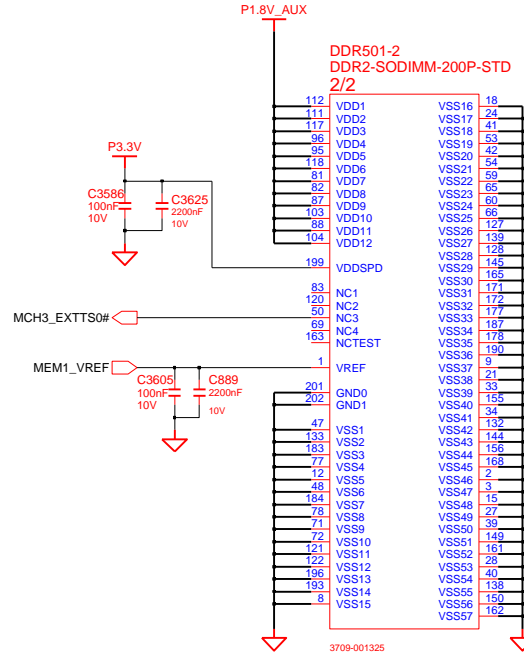
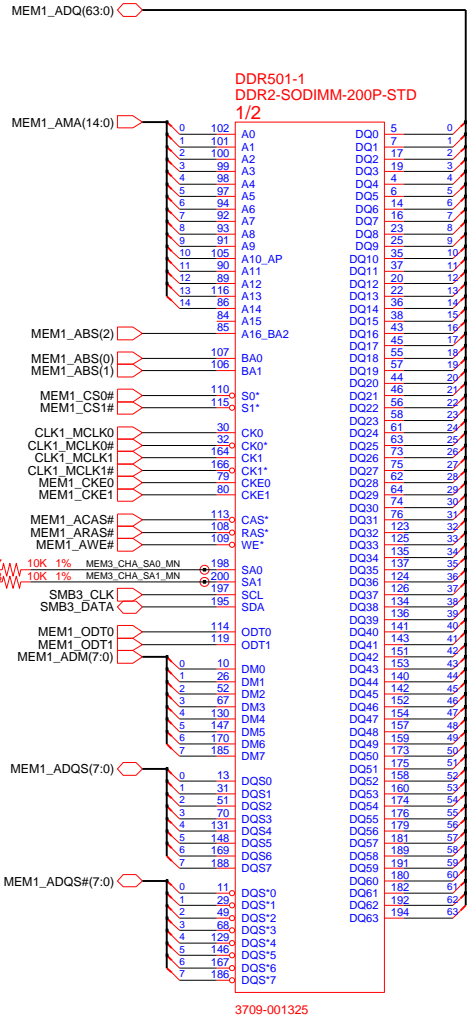
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DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E MCH_CANTIGA_PM_DDR2		SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	CANTIGA (5/5)		PART NO.	
APPROVAL	BL Lee	REV	REV 1.0			BA41-01060A	
MODULE CODE		LAST EDIT					
April 11, 2009 10:05:58 AM							PAGE 17 OF 67

**DDR SO-DIMM #0**



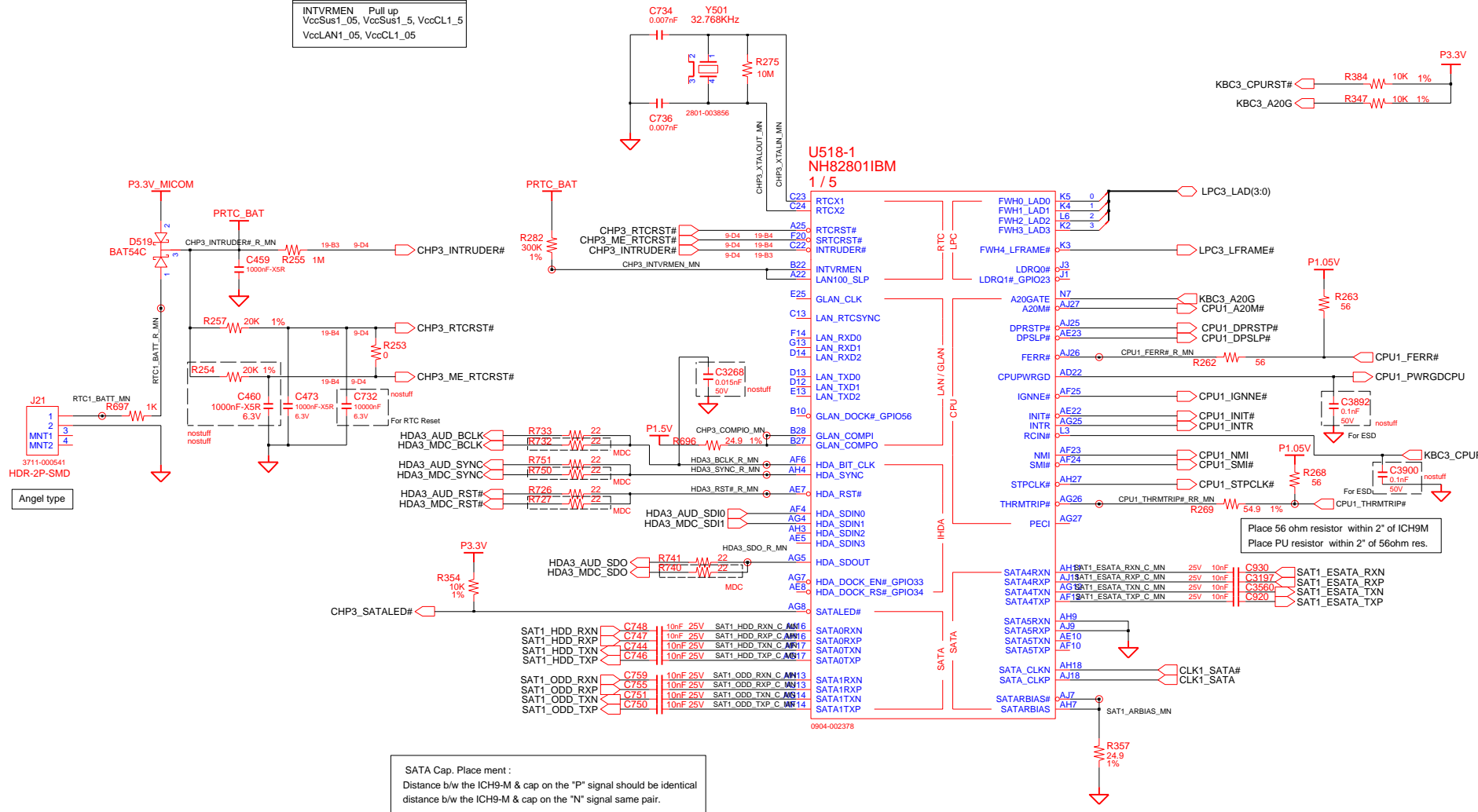
DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E SODIMM_DDR2	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01060A
CHECK	MK Kim	DEV. STEP	MP		SODIMM_DDR2 #1	
APPROVAL	BL Lee	REV	REV 1.0			
MODULE CODE		LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	18 OF 67



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Internal VR Strap	
INTVRMEN	Pull up
VccSus1_05, VccSus1_5, VccCL1_5	
VccLAN1_05, VccCL1_05	

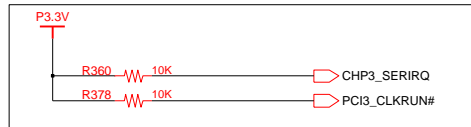


DRAWN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG	
CHECK	MK Kim	REV. STEP	MP		ICH_9M_B	ELECTRONICS	
APPROVAL	BL Lee	REV	REV 1.0		ICH9-M (1/5)	PART NO.	
MODULE CODE		LAST EDIT				BA41-01060A	
						April 11, 2009 10:05:58 AM	PAGE 20 OF 67

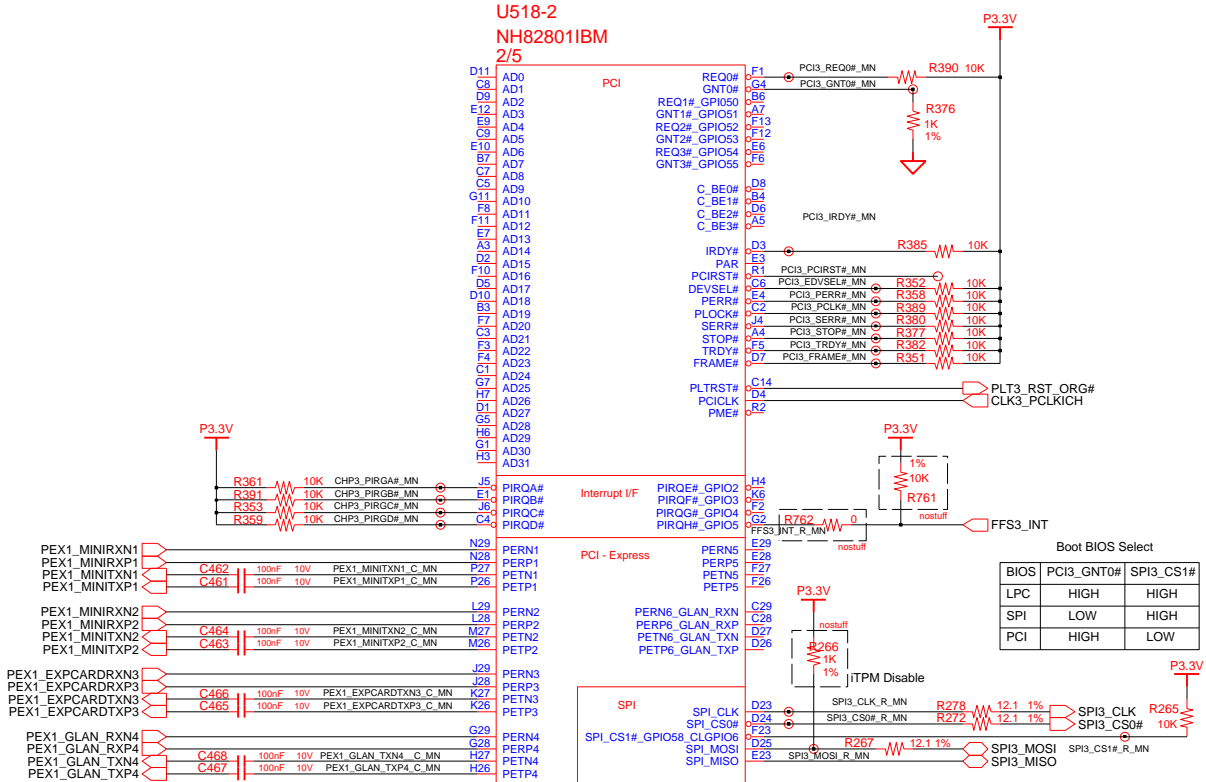
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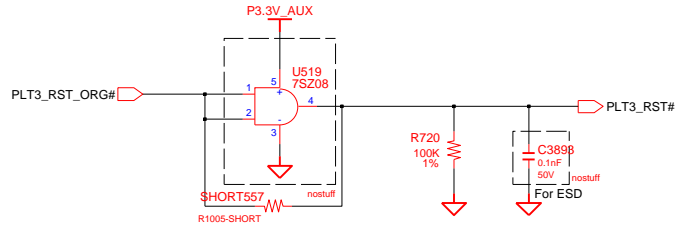
**U518-2  
NH82801IBM  
2/5**



LPC option ; These are used with LPC



AC caps : PCIe need to be within 250mils of the driver  
Resistor for Test : Place Stuffing Option to minimize stubs

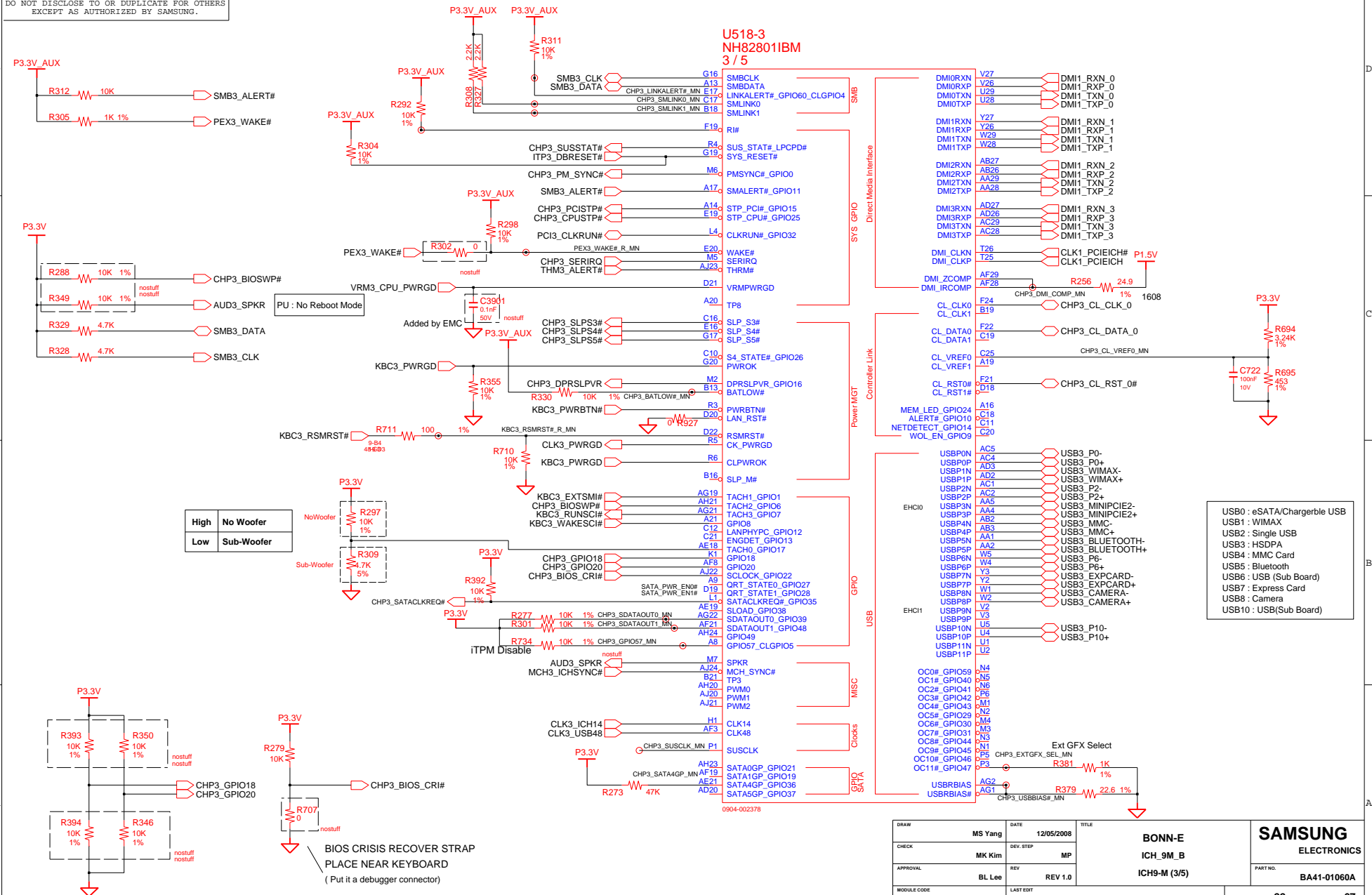


DRAWN	MS Yang	DATE	12/05/2008	TITLE	
CHECK		REV. STEP	MP	BONN-E	
APPROVAL	MK Kim	REV	REV 1.0	ICH_9M_B	
MODULE CODE	undefined	LAST EDIT		ICH9-M (Z/5)	
				PART NO.	BA41-01060A
				DATE	April 11, 2009 10:05:58 AM
				PAGE	21 OF 67

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**U518-3  
NH828011BM  
3 / 5**



High	No Woofer
Low	Sub-Woofer

BIOS CRISIS RECOVER STRAP  
PLACE NEAR KEYBOARD  
(Put it a debugger connector)

- USB0 : eSATA/Chargerble USB
- USB1 : WIMAX
- USB2 : Single USB
- USB3 : HSDPA
- USB4 : MMC Card
- USB5 : Bluetooth
- USB6 : USB (Sub Board)
- USB7 : Express Card
- USB8 : Camera
- USB10 : USB(Sub Board)

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E
CHECK	MK Kim	REV. STEP	MP		ICH_9M_B
APPROVAL	BL Lee	REV	REV 1.0		ICH9-M (3/5)
MODULE CODE		LAST EDIT			PART NO. BA41-01060A
				April 11, 2009 10:05:58 AM	PAGE 22 OF 67

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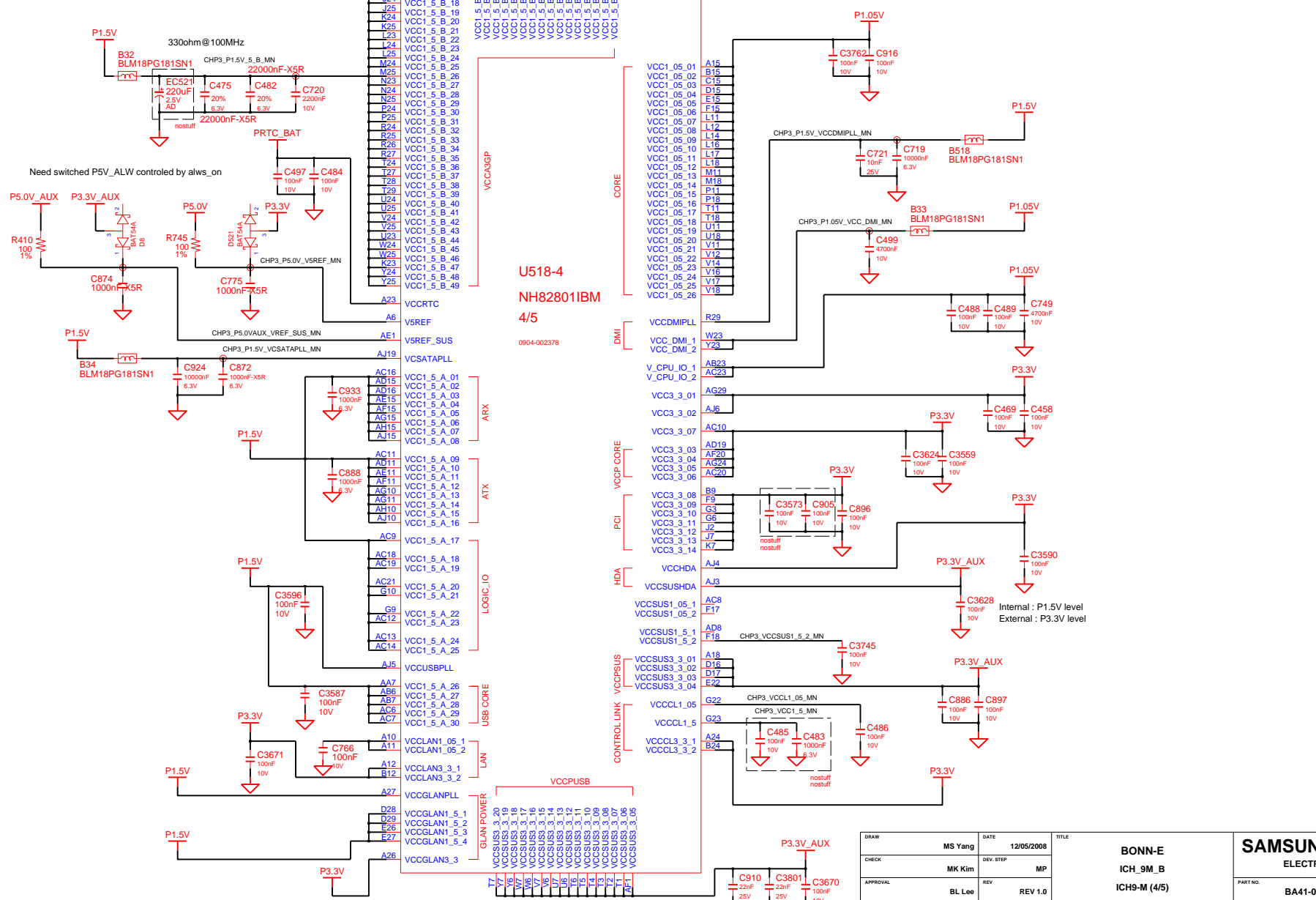
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D  
C  
B  
A

- H25 VCC1\_5\_B\_17
- J24 VCC1\_5\_B\_18
- K24 VCC1\_5\_B\_19
- K25 VCC1\_5\_B\_20
- L23 VCC1\_5\_B\_21
- L24 VCC1\_5\_B\_22
- L25 VCC1\_5\_B\_23
- M24 VCC1\_5\_B\_24
- M25 VCC1\_5\_B\_25
- N23 VCC1\_5\_B\_26
- N24 VCC1\_5\_B\_27
- N25 VCC1\_5\_B\_28
- P24 VCC1\_5\_B\_29
- P25 VCC1\_5\_B\_30
- R24 VCC1\_5\_B\_31
- R25 VCC1\_5\_B\_32
- R26 VCC1\_5\_B\_33
- R27 VCC1\_5\_B\_34
- T24 VCC1\_5\_B\_35
- T25 VCC1\_5\_B\_36
- T26 VCC1\_5\_B\_37
- T27 VCC1\_5\_B\_38
- T28 VCC1\_5\_B\_39
- T29 VCC1\_5\_B\_40
- U24 VCC1\_5\_B\_41
- U25 VCC1\_5\_B\_42
- U26 VCC1\_5\_B\_43
- U27 VCC1\_5\_B\_44
- W24 VCC1\_5\_B\_45
- W25 VCC1\_5\_B\_46
- W26 VCC1\_5\_B\_47
- Y24 VCC1\_5\_B\_48
- Y25 VCC1\_5\_B\_49
- A23 VCCRTC
- A6 V5REF
- AE1 V5REF\_SUS
- AJ19 VCSATAPLL
- AC16 VCC1\_5\_A\_01
- AD16 VCC1\_5\_A\_02
- AE15 VCC1\_5\_A\_03
- AF15 VCC1\_5\_A\_04
- AG15 VCC1\_5\_A\_05
- AH15 VCC1\_5\_A\_06
- AJ15 VCC1\_5\_A\_07
- AC11 VCC1\_5\_A\_09
- AD11 VCC1\_5\_A\_10
- AE11 VCC1\_5\_A\_11
- AF11 VCC1\_5\_A\_12
- AG10 VCC1\_5\_A\_13
- AH10 VCC1\_5\_A\_14
- AJ10 VCC1\_5\_A\_15
- AC9 VCC1\_5\_A\_16
- AC18 VCC1\_5\_A\_18
- AC19 VCC1\_5\_A\_19
- AC21 VCC1\_5\_A\_20
- G10 VCC1\_5\_A\_21
- G9 VCC1\_5\_A\_22
- AC12 VCC1\_5\_A\_23
- AC13 VCC1\_5\_A\_24
- AC14 VCC1\_5\_A\_25
- AJ5 VCCUSBPLL
- AA7 VCC1\_5\_A\_26
- AB6 VCC1\_5\_A\_27
- AC6 VCC1\_5\_A\_28
- AC7 VCC1\_5\_A\_29
- AC7 VCC1\_5\_A\_30
- A10 VCLLAN1\_05\_1
- A11 VCLLAN1\_05\_2
- A12 VCLLAN3\_3\_1
- B12 VCLLAN3\_3\_2
- A27 VCCGLANPLL
- D28 VCCGLAN1\_5\_1
- D29 VCCGLAN1\_5\_2
- E26 VCCGLAN1\_5\_3
- E27 VCCGLAN1\_5\_4
- A26 VCCGLAN3\_3
- TZ VCCSUS3\_3\_20
- W7 VCCSUS3\_3\_19
- W6 VCCSUS3\_3\_17
- W5 VCCSUS3\_3\_16
- W4 VCCSUS3\_3\_15
- W3 VCCSUS3\_3\_14
- U6 VCCSUS3\_3\_13
- U5 VCCSUS3\_3\_12
- U4 VCCSUS3\_3\_11
- U3 VCCSUS3\_3\_10
- U2 VCCSUS3\_3\_09
- T3 VCCSUS3\_3\_08
- T2 VCCSUS3\_3\_07
- T1 VCCSUS3\_3\_06
- AF1 VCCSUS3\_3\_05

CORE  
DMI  
VCCP CORE  
PCI  
HDA  
LOGIC\_IO  
VCCPUSB  
CONTROLINK  
VCCPUSB

U518-4  
NH828011BM  
4/5  
0904-002378



DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E ICH_9M_B	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01060A
CHECK	MK Kim	REV. STEP	MP	REV	ICH9-M (4/5)	
APPROVAL	BL Lee	REV	REV 1.0	LAST EDIT	April 11, 2009 10:05:58 AM	
MODULE CODE					PAGE 23 OF 67	

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AA26	VSS_001	VSS_106	N14	
AA27	VSS_002	VSS_107	N15	
AA28	VSS_003	VSS_108	N16	
AA6	VSS_004	VSS_109	N17	
AB1	VSS_005	VSS_110	N18	
AA23	VSS_006	VSS_111	N26	
AB28	VSS_007	VSS_112	N27	
AB29	VSS_008	VSS_113	P12	
AB4	VSS_009	VSS_114	P13	
AB5	VSS_010	VSS_115	P14	
AC17	VSS_011	VSS_116	P15	
AC26	VSS_012	VSS_117	P16	
AC27	VSS_013	VSS_118	P17	
AC3	VSS_014	VSS_119	P2	
AD1	VSS_015	VSS_120	P23	
AD10	VSS_016	VSS_121	P28	
AD12	VSS_017	VSS_122	P29	
AD13	VSS_018	VSS_123	P4	
AD14	VSS_019	VSS_124	P7	
AD17	VSS_020	VSS_125	R11	
AD18	VSS_021	VSS_126	R12	
AD21	VSS_022	VSS_127	R13	
AD28	VSS_023	VSS_128	R14	
AD29	VSS_024	VSS_129	R15	
AD4	VSS_025	VSS_130	R16	
AD5	VSS_026	VSS_131	R17	
AD6	VSS_027	VSS_132	R18	
AD7	VSS_028	VSS_133	R28	
AD9	VSS_029		T12	
AE12	VSS_030		T13	
AE13	VSS_031		T14	
AE14	VSS_032		T15	
AE16	VSS_033		T16	
AE17	VSS_034		T17	
AE2	VSS_035		T23	
AE20	VSS_036		U3	
AE21	VSS_037		B26	
AE3	VSS_038		U12	
AE4	VSS_039		U13	
AE6	VSS_040		U14	
AE9	VSS_041		U15	
AF13	VSS_042		U17	
AF16	VSS_043		AD23	
AF18	VSS_044		U26	
AF22	VSS_045		U27	
AF26	VSS_046		U3	
AF27	VSS_047		V1	
AF5	VSS_048		V13	
AF7	VSS_049		V15	
AF9	VSS_050		V23	
AG13	VSS_051		V28	
AG16	VSS_052		V29	
AG18	VSS_053		V4	
AG20	VSS_054		V5	
AG23	VSS_055		W26	
AG3	VSS_056		W27	
AG6	VSS_057		W3	
AG9	VSS_058		Y1	
AH12	VSS_059		Y28	
AH14	VSS_060		Y29	
AH17	VSS_061		Y4	
AH19	VSS_062		Y5	
AH2	VSS_063		AG28	
AH22	VSS_064		AH6	
AH26	VSS_065		AF2	
AH28	VSS_066		B25	
AH5	VSS_067			
AH8	VSS_068		VSS_NCTF_01	A1
AJ12	VSS_069		VSS_NCTF_02	A2
AJ14	VSS_070		VSS_NCTF_03	A28
AJ17	VSS_071		VSS_NCTF_04	A29
AJ8	VSS_072		VSS_NCTF_05	AH1
B11	VSS_073		VSS_NCTF_06	AH23
B14	VSS_074		VSS_NCTF_07	AJ1
B17	VSS_075		VSS_NCTF_08	AJ2
B2	VSS_076		VSS_NCTF_09	AJ28
B20	VSS_078		VSS_NCTF_10	AJ29
			VSS_NCTF_11	B1
			VSS_NCTF_12	B29

GND

U518-5  
 NH82801BM  
 5/5

0904-002378

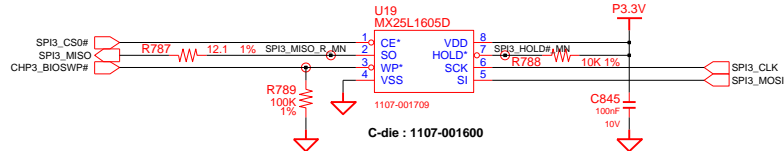
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APPROVAL	BL Lee	REV	REV 1.0	ICH9-M (5/5)		
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	24 OF 67

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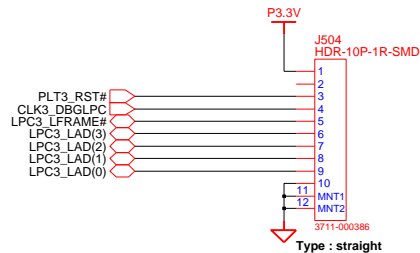
# SPI\_BIOS\_ROM

16MBit



02	VERIFY REAL MODE	66	CONFIGURE ADVANCE CACHE REG.
03	DISABLE NMI	6A	DISPLAY EXTERNAL CACHE SIZE
04	GET CPU TYPE	6C	DISPLAY SHADOW MESSAGE
06	INIT. SYSTEM H/W	6E	DISPLAY NON-DISPOSABLE SEGMENT
08	INIT. CHIPSET REG.	70	DISPLAY ERROR MESSAGE
09	SET IN POST LAG	72	CHECK FOR CONFIGURATION ERROR
0A	INIT CPU REG	74	TEST REAL-TIME CLOCK
0B	CPU CACHE ON	76	CHECK FOR KEYBOARD ERROR
0C	INIT CACHE TO POST	7C	SETUP HARDWARE INTERRUPT VECTOR
0E	INIT I/O VALUE	7E	TEST COPROCESSOR IF PRESENT
0F	ENABLE THE L-BUS IDE	80	DISABLE ON-BOARD I/O PORT
10	INIT. POWER MANAGER	82	DETECT AND INSTALL EXT RS232C
11	LOAD ALTERNATE REG.	84	DETECT AND INSTALL EXT PARALLEL
13	PCI BUS MASTER RESET	86	RE-INIT. ON-BOARD I/O PORT
		88	INIT. BIOS DATA ROM
	WITH INITIAL POST VALUE	8A	INIT. EXTENDED BIOS DATA AREA
14	INIT. KEYBOARD CONTROLLER	8C	INIT. FDD CONTROLLER
16	CHECK CHECKSUM	9A	SHADOW OPTION ROMS
18	8254 TIMER INIT.	9C	SETUP POWER MANAGEMENT
1A	8237 DMA CONTROLLER INIT.	9E	ENABLE HW INTERRUPT
1C	RESET INTERRUPT CONTROLLER	A0	SET TIME OF DAY
20	TEST DRAM REFRESH	A4	INIT. TYPOMATIC RATE
22	TEST 8742 KEYBOARD CONTROLLER	A8	ERASE F2 PROMPT
24	SET ES SEGMENT REG. TO 4GB	AA	SCAN FOR F2 KEY STROKE
26	ENABLE A20	AC	ENTER SETUP
28	AUTO SIZING DRAM	AE	CLEAR IN POST FLAG
32	COMPUTE THE CPU SPEED	B0	CHECK FOR ERRORS
34	TEST CMOS RAM	B2	POST DONE-PREPARE TO BOOT O/S
38	SHADOW SYSTEM BIOS ROM	B4	ONE BEEP
3A	AUTO SIZING CACHE	B6	ENABLE PASSWORD (OPTION)
3C	CONFIGURE ADVANCED CHIPSET REG.	B7	ACPI INIT
3D	LOAD ALTER REG. WITH CMOS VALUE	BA	DMI INIT
42	INIT. INTERRUPT VECTOR	BE	CLEAR SCREEN
44	INIT. BIOS INTERRUPT	C0	TRY BOOT WITH INT19
46	CHECK ROM COPYRIGHT NOTICE	D0	INTERRUPT HANDLER ERROR
47	INIT. I20 SUPPORT IF INSTALLED	D2	UNKNOWN INTERRUPT ERROR
48	CHECK VIDEO CONFIGURE AGAINST CMOS	D4	PENDING INTERRUPT ERROR
49	INIT. PCI BUS AND DEVICE	D6	SHUTDOWN ERROR
4A	INIT. ALL VIDEO BIOS ROM	D8	SHUTDOWN ERROR
4C	SHADOW VIDEO BIOS ROM	DA	EXTENDED BLOCK MOVE
50	DISPLAY CPU TYPE AND SPEED	DC	SHUTDOWN 10
52	TEST KEYBOARD	89	ENABLE NMI
54	SET KEYCLICK IF ENABLED	90	INIT. HDD CONTROLLER
56	ENABLE KEYBOARD	91	INIT. LOCAL BUS HDD CONTROLLER
58	TEST FOR UNEXPECTED INTERRUPTS	92	JUMP TO USER PATCH 2
5A	DISPLAY *PRESS * SETUP*	94	DISABLE A20 ADDRESS LINE
5C	TEST RAM BETWEEN 512K AND 640K	96	CLEAR HUGE ES SEGMENT REG.
60	TEST EXTENDED MEMORY	98	SEARCH FOR OPTION ROMS
62	TEST EXTENDED MEMORY ADDRESS LINE		
64	JUMP TO USER PATCH 1		

## 80H DECODER CONNECTOR



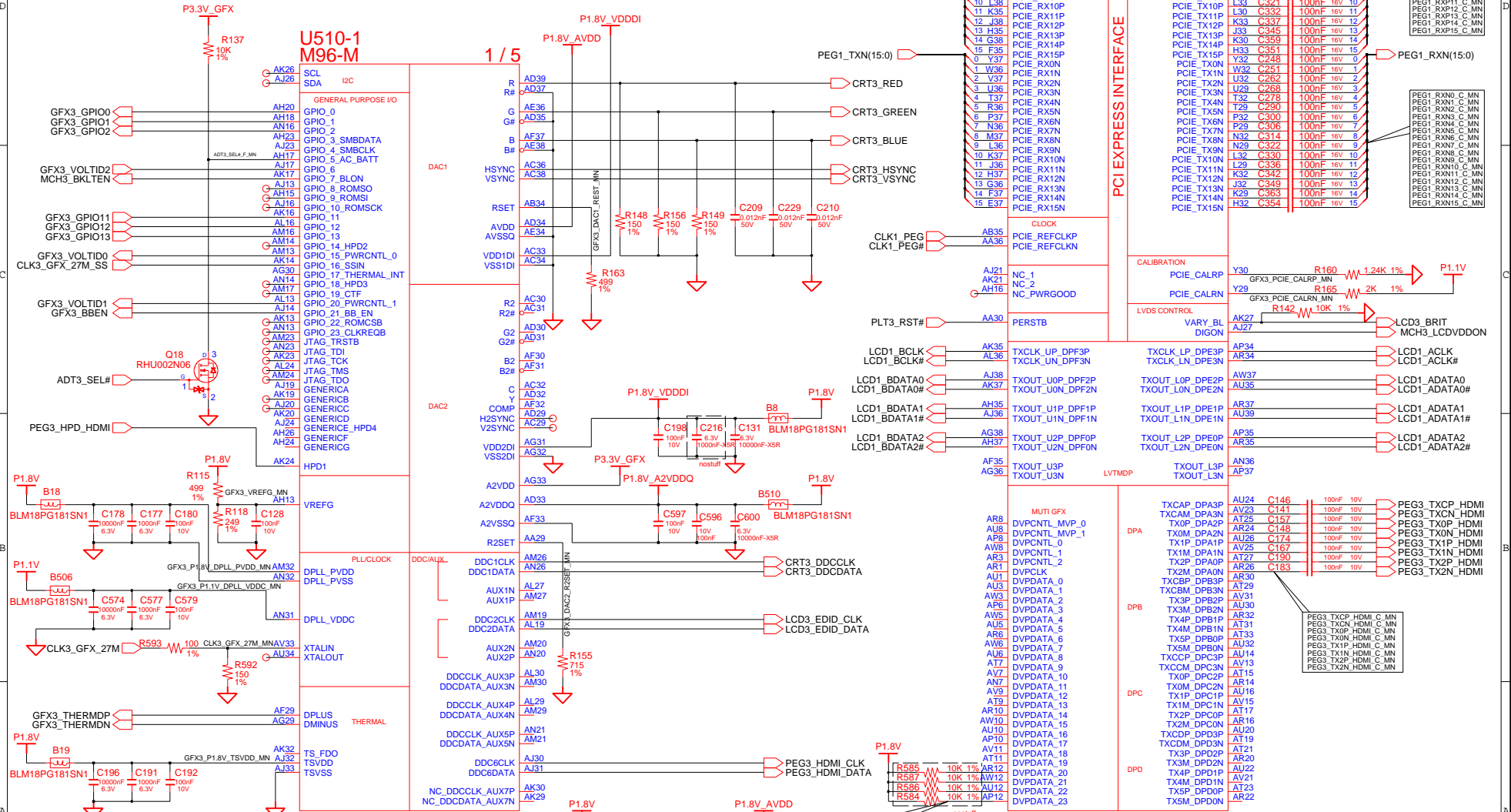
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CHECK	MK Kim	DEV. STEP	MP	BONN-E	PART NO. BA41-01060A	
APPROVAL	BL Lee	REV	REV 1.0	SPI_BIOS_ROM	PAGE 25 OF 67	
MODULE CODE		LAST EDIT		SPI_BIOS_ROM	April 11, 2009 10:05:58 AM	

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GF3X_SCL_MN	GF3X_JTAG_TRSTB_MN
GF3X_SDA_MN	GF3X_JTAG_TCK_MN
GF3X_GPI08_MN	GF3X_JTAG_TMS_MN
GF3X_GPI09_MN	GF3X_JTAG_TDO_MN
GF3X_GPI010_MN	GF3X_GENERICB_MN
GF3X_GPI014_MN	GF3X_GENERICC_MN
GF3X_GPI018_MN	GF3X_XTALOUT_MN
GF3X_GPI019_MN	GF3X_H2SYNC_MN
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M9X\_TP NET NAME



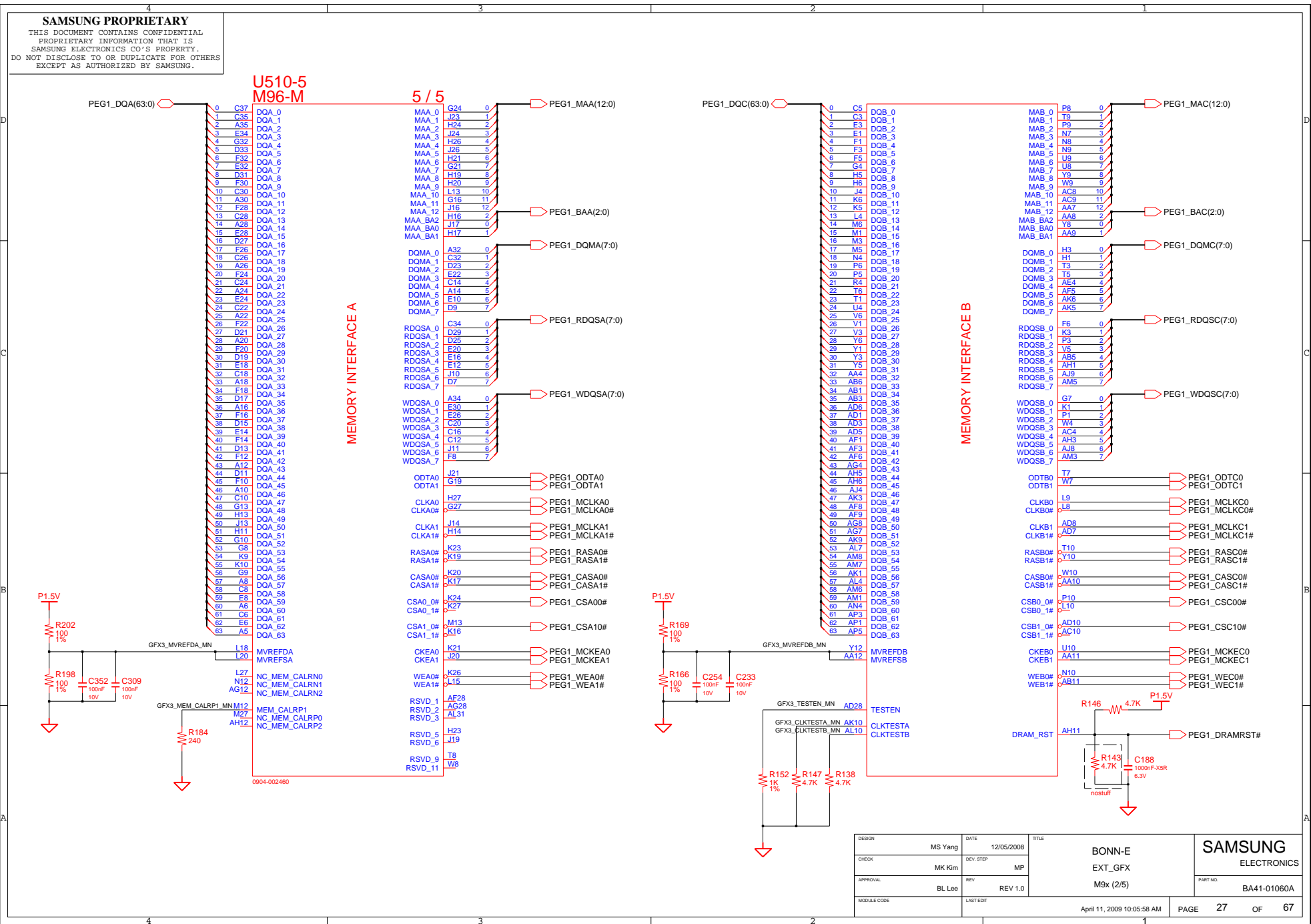
M92-LP : 0904-002461

GF3X_DVPPDATA_20_MN	notstuff
GF3X_DVPPDATA_21_MN	notstuff
GF3X_DVPPDATA_22_MN	notstuff
GF3X_DVPPDATA_23_MN	notstuff

DRAWN	MS Yang	DATE	12/05/2008	TITLE	BONN-E
CHECK	MK Kim	DEV. STEP	MP		EXT_GFX
APPROVAL	BL Lee	REV	REV 1.0		M9X (1/5)
MODULE CODE		LAST EDIT			

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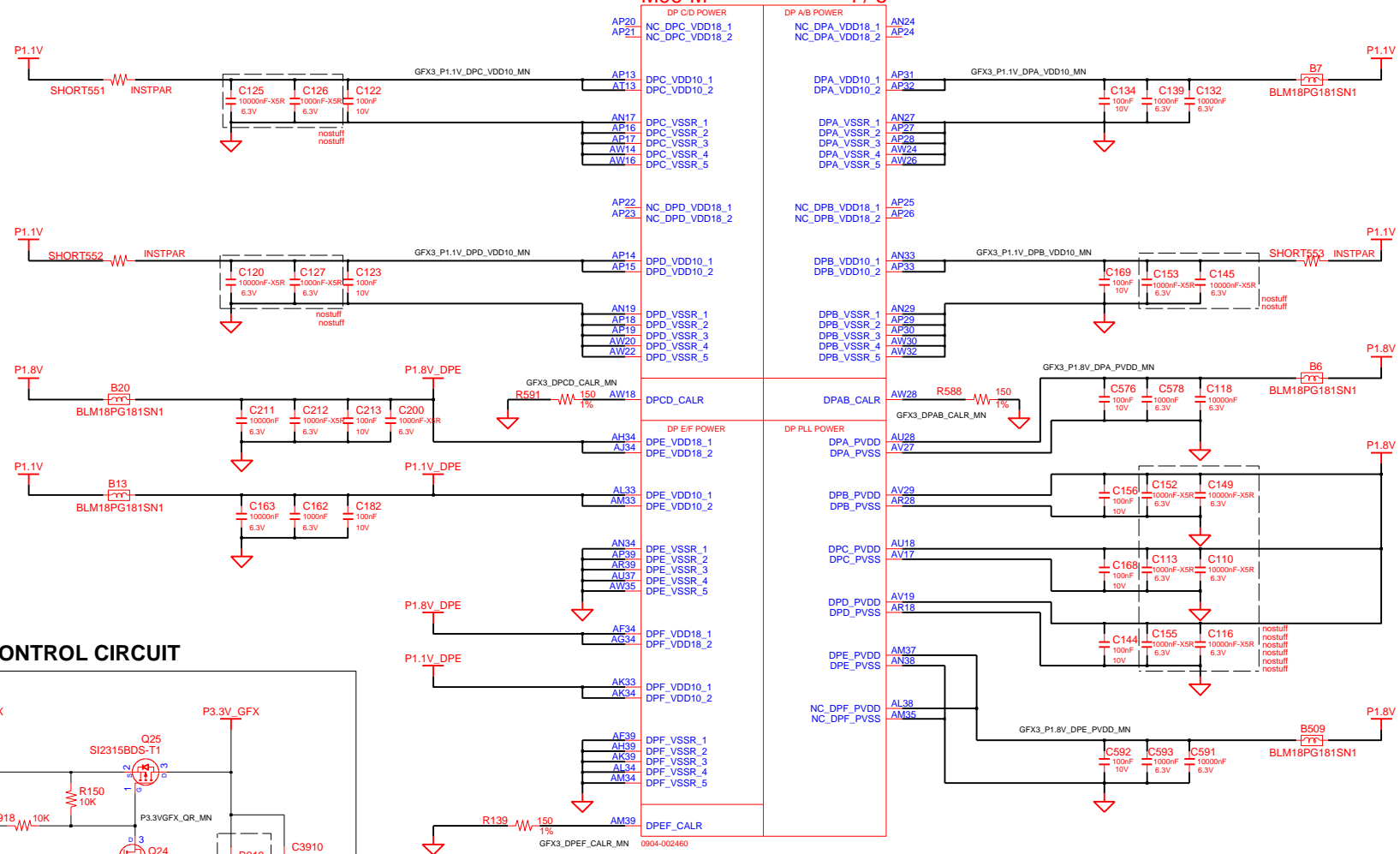


**SAMSUNG PROPRIETARY**

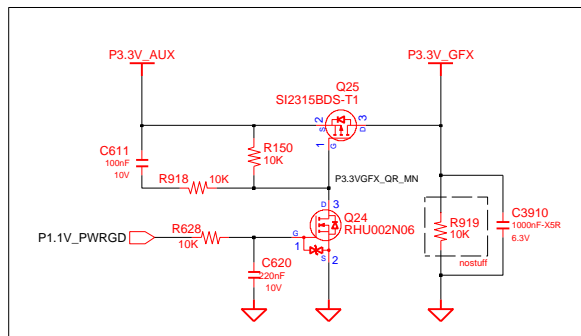
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**U510-4  
M96-M**

4 / 5



**P3.3V\_GFX CONTROL CIRCUIT**

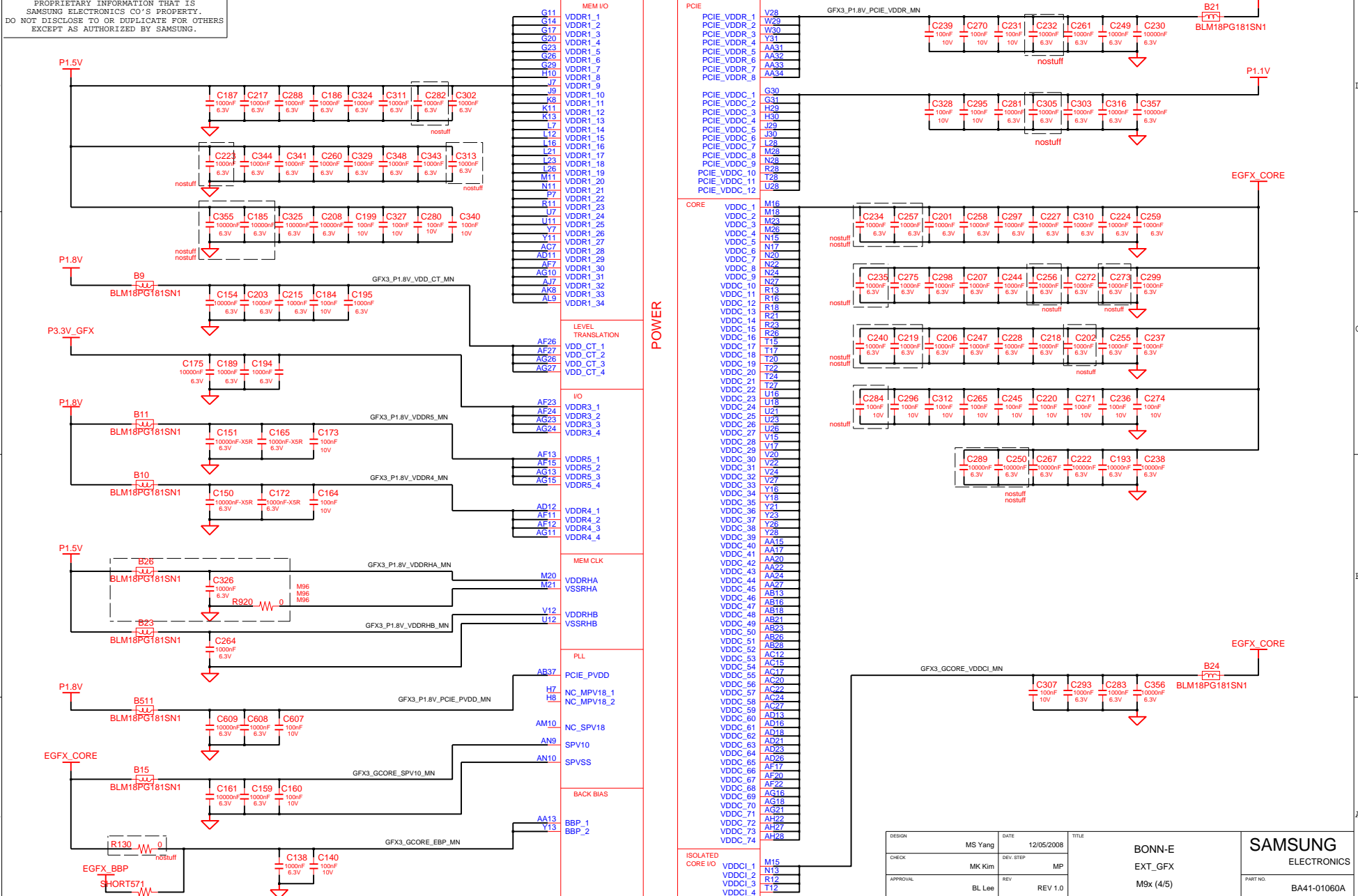


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APPROVAL	BL Lee	REV	REV 1.0	MODULE CODE		PART NO. BA41-01060A
DESIGN		DATE		TITLE		
CHECK		DEV. STEP		APPROVAL		
APPROVAL		REV		MODULE CODE		
DESIGN		DATE		TITLE		
CHECK		DEV. STEP		APPROVAL		
APPROVAL		REV		MODULE CODE		
DESIGN		DATE		TITLE		
CHECK		DEV. STEP		APPROVAL		
APPROVAL		REV		MODULE CODE		

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**M96-M U510-3 3/5**



Back Bias Voltage

0904-002460

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E EXT_GFX	SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP		PART NO.	
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MODULE CODE		LAST EDIT				

**SAMSUNG PROPRIETARY**

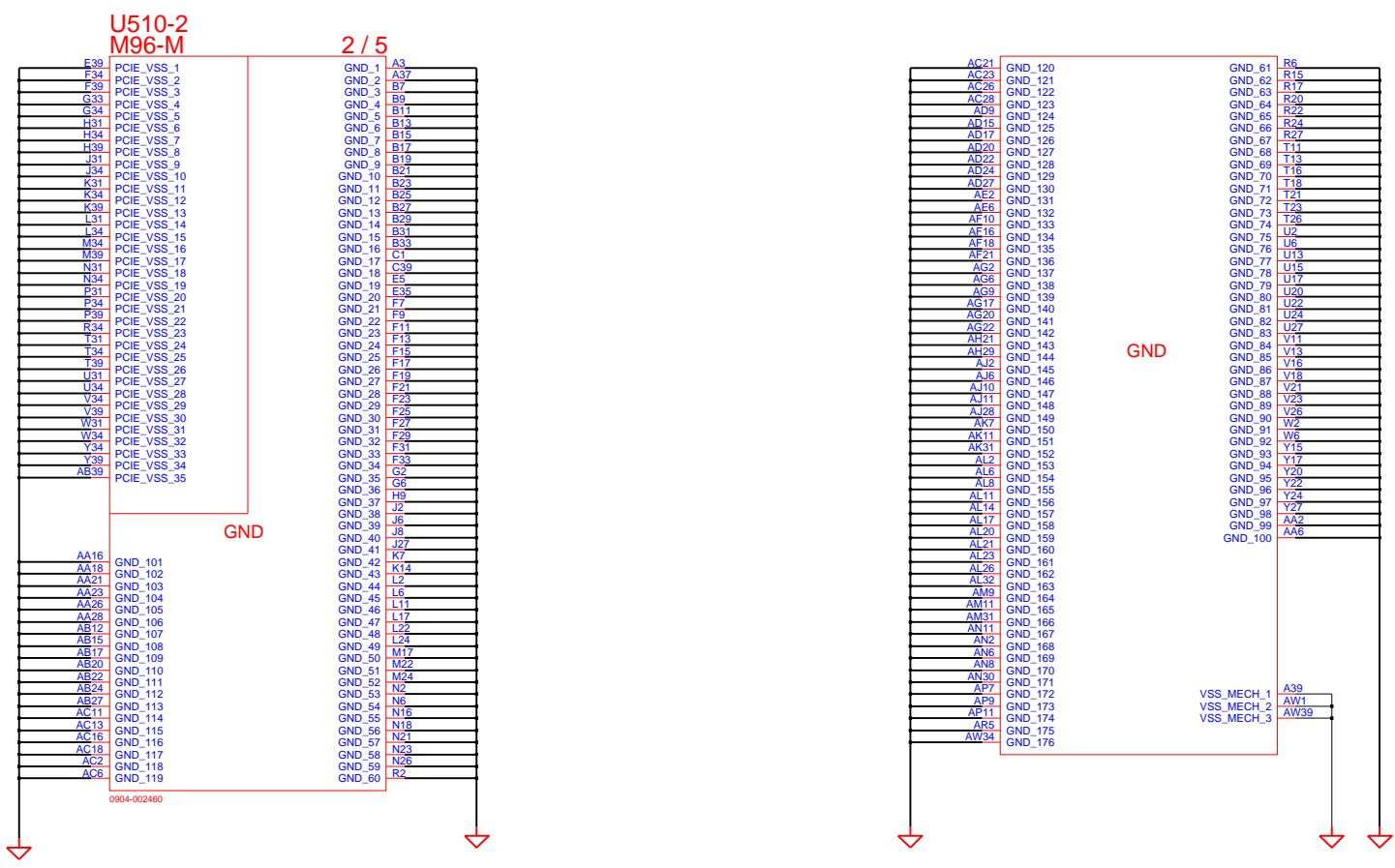
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D

C

B

A



U510-2  
M96-M

2 / 5

GND

0904-002460

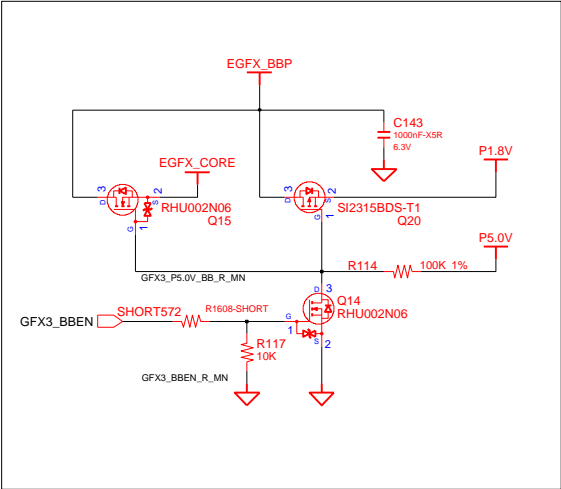
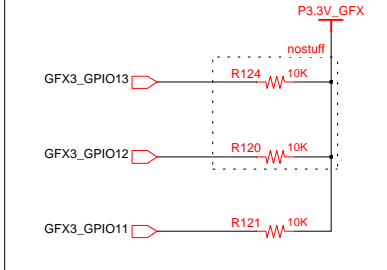
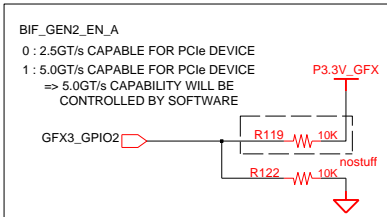
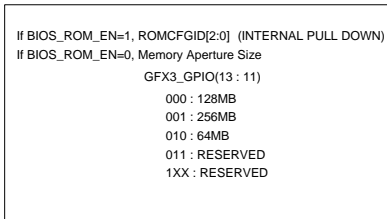
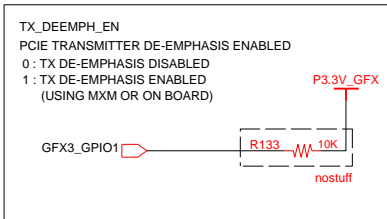
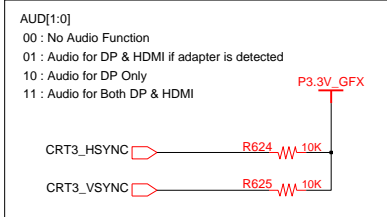
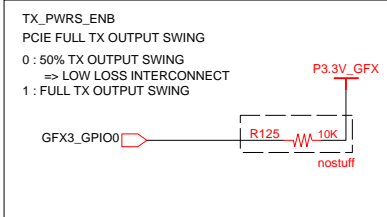
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APPROVAL	BL Lee	REV	REV 1.0	M9x (5/5)	BA41-01060A	
MODULE CODE		LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	30 OF 67

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**M9X STRAPS**

**BACK BIAS LOGIC**

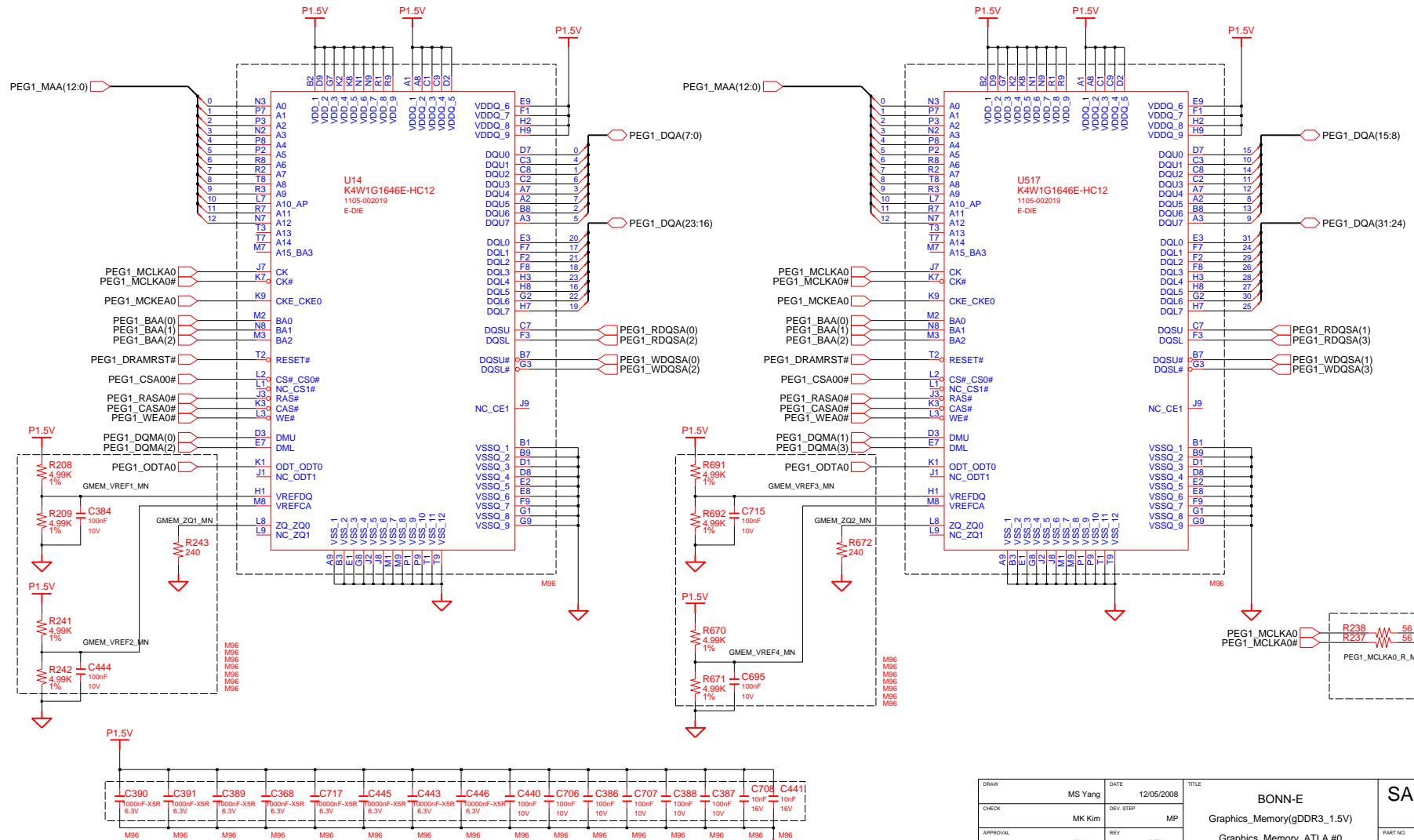


DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E EXT_GFX	SAMSUNG ELECTRONICS	
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APPROVAL	BL Lee	REV	REV 1.0		M9x Straps & PU	PART NO.	
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM		BA41-01060A	
						PAGE	31 OF 67

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# A-Channel #0

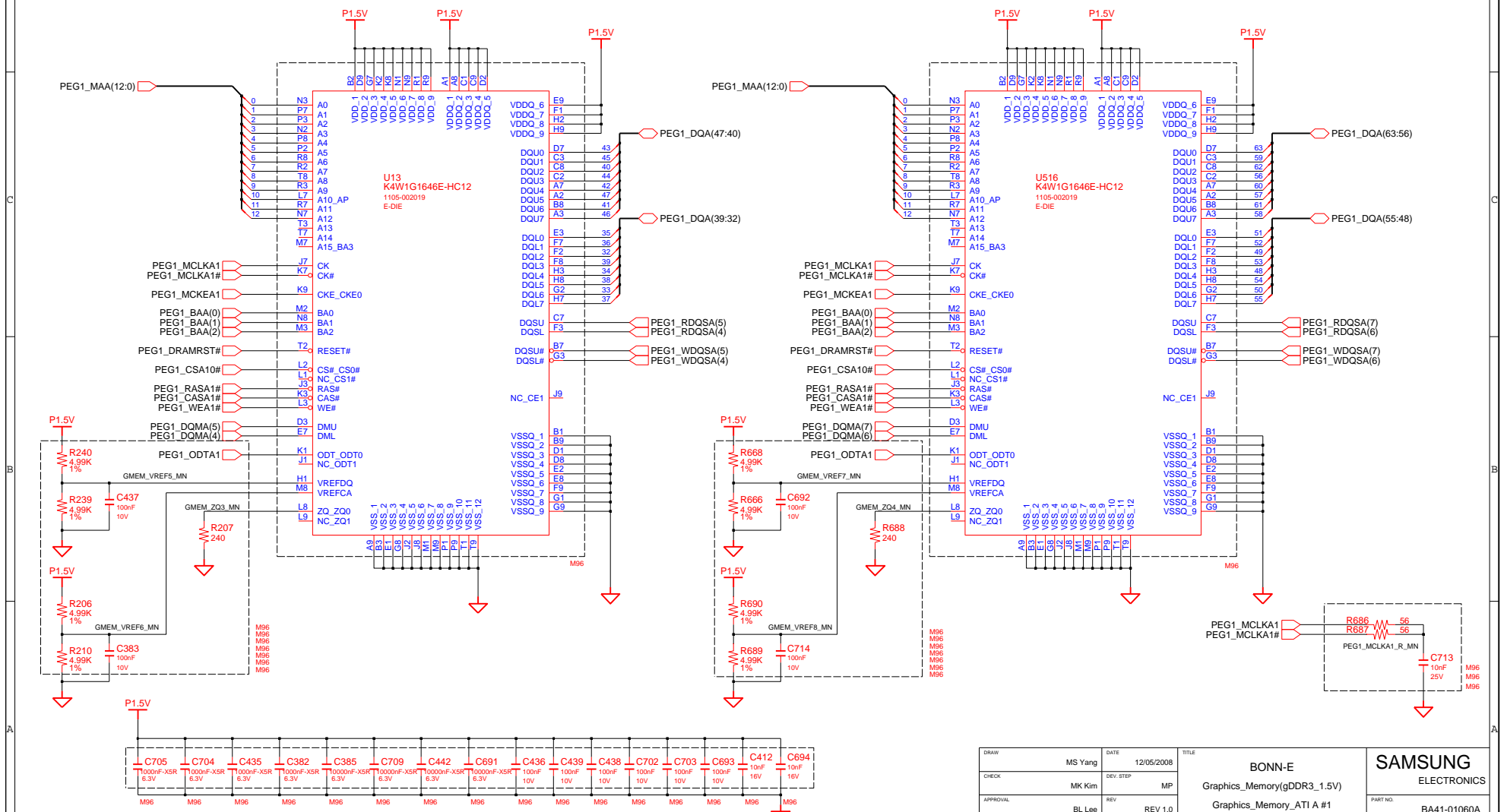


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APPROVAL	BL Lee	REV	REV 1.0	Graphics_Memory_ATI A #0		
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM		
				PAGE	32	OF 67

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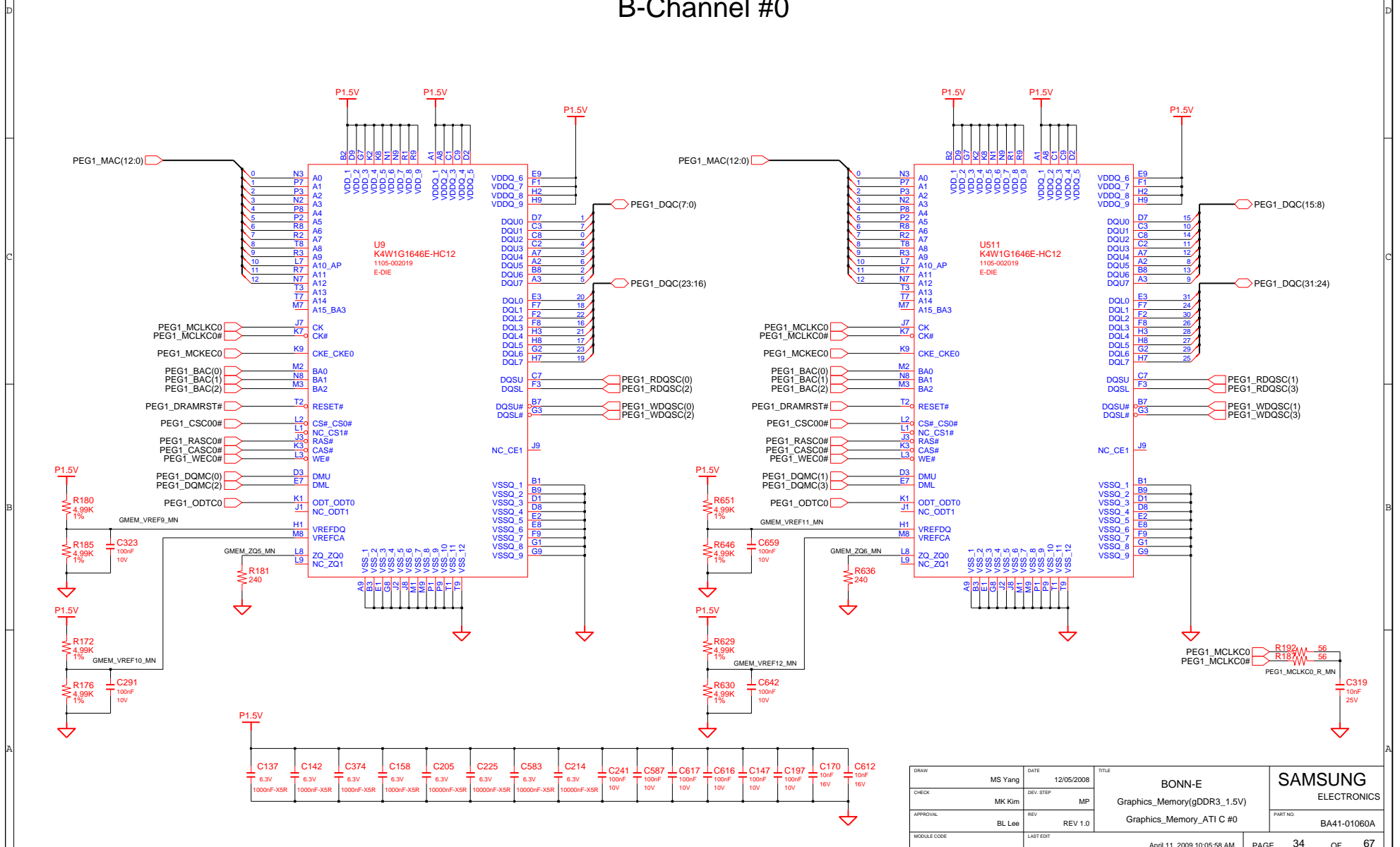
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APPROVAL	BL Lee	REV	REV 1.0	Graphics_Memory_ATI A #1		PART NO. BA41-01060A
MODULE CODE		LAST EDIT				DATE Apr 11, 2009 10:05:58 AM
						PAGE 33 OF 67

# B-Channel #0

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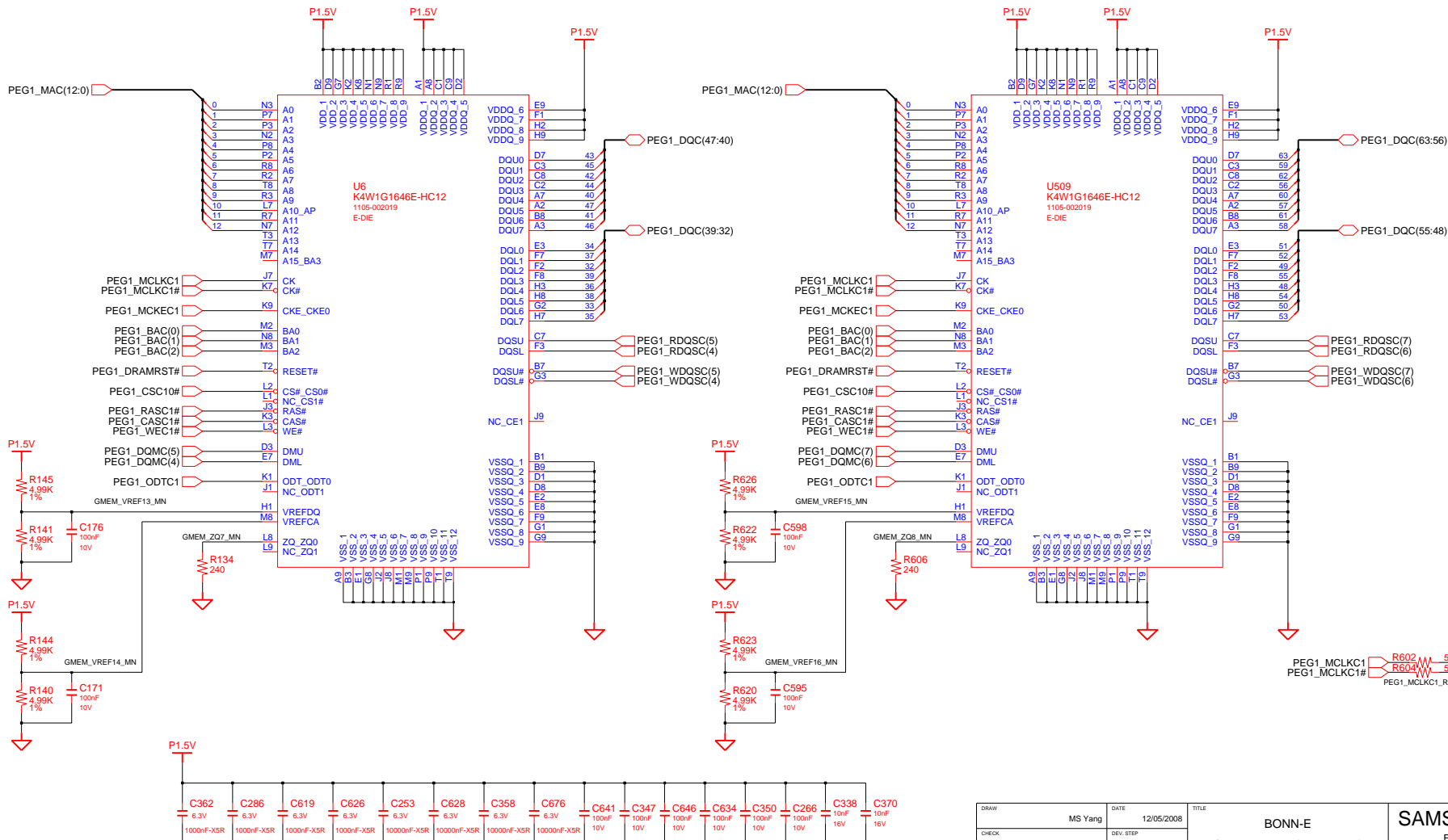


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MODULE CODE		LAST EDIT				BA41-01060A	
						DATE	Apr 11, 2009 10:05:58 AM
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# B-Channel #1



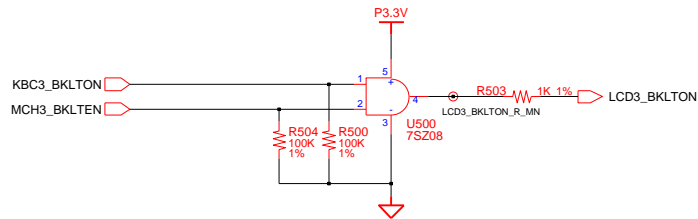
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APPROVAL	BL Lee	REV	REV 1.0	Graphics_Memory_ATI C #1		PART NO.
MODULE CODE		LAST EDIT				BA41-01060A
						April 11, 2009 10:05:58 AM
						PAGE 35 OF 67

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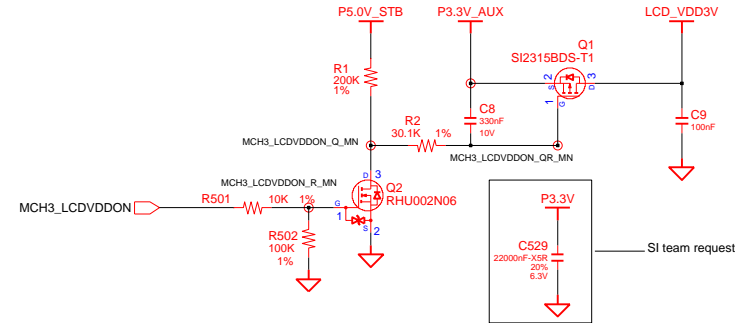
# LVDS

## Backlight On

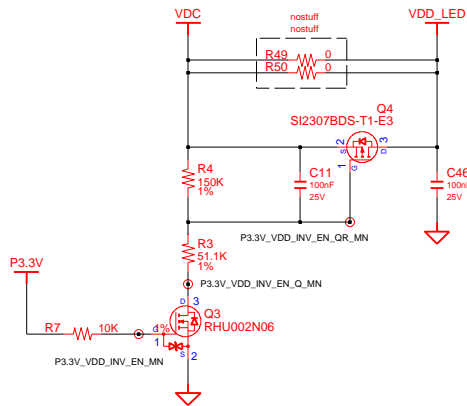


## LCD Power

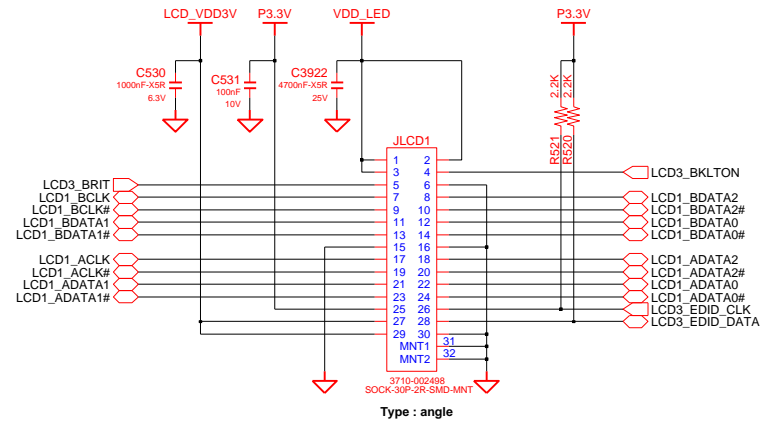
EBL Purpose



## LED Power



## 2Ch. LCD Connector



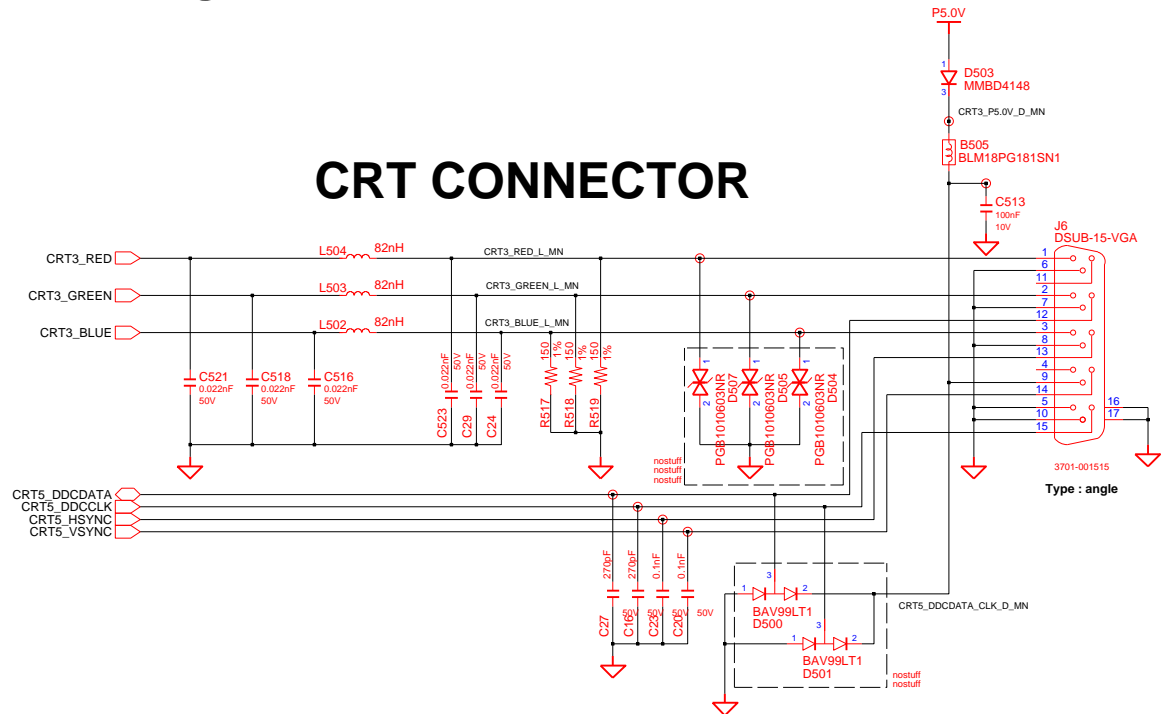
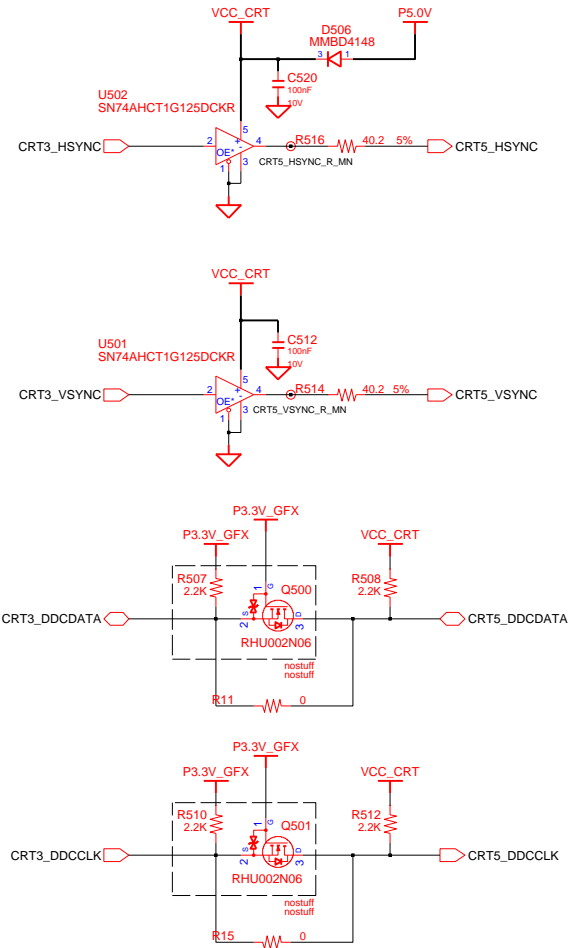
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MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	36 OF 67

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# CRT

## CRT CONNECTOR



Type : angle

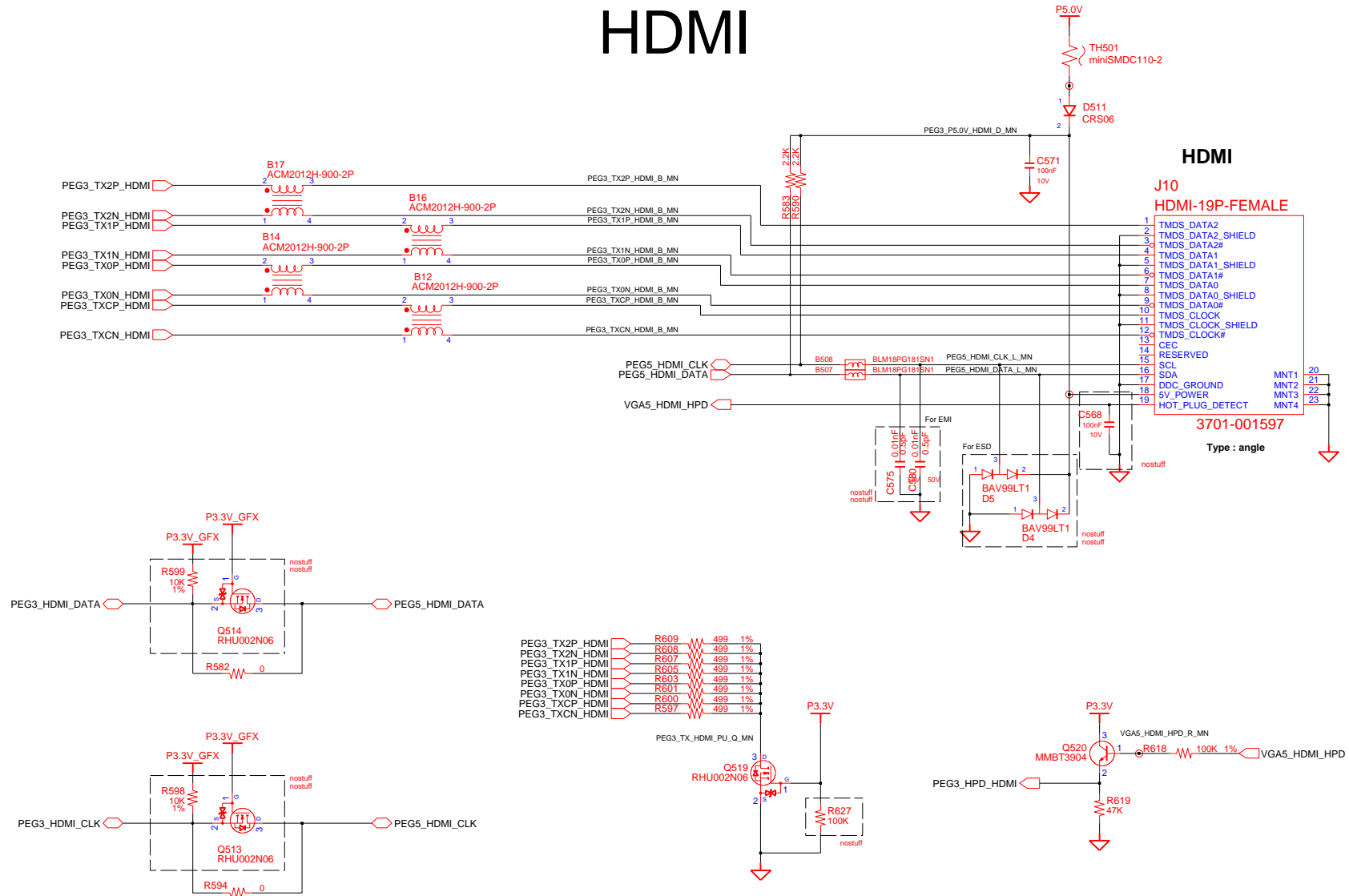
Check "CRT3\_DDCCLK/DATA" Voltage Level  
2N06 Can be replaced with SM6K2

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E GRAPHICS_IF CRT	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			PART NO. BA41-01060A
APPROVAL	BL Lee	REV	REV 1.0			
MODULE CODE		LAST EDIT				
April 11, 2009 10:05:58 AM						PAGE 37 OF 67

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# HDMI



- PEG3\_TX2P\_HDMI R609 499 1%
- PEG3\_TX2N\_HDMI R608 499 1%
- PEG3\_TX1P\_HDMI R607 499 1%
- PEG3\_TX1N\_HDMI R605 499 1%
- PEG3\_TX0P\_HDMI R603 499 1%
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- PEG3\_TXCP\_HDMI R600 499 1%
- PEG3\_TXCN\_HDMI R597 499 1%

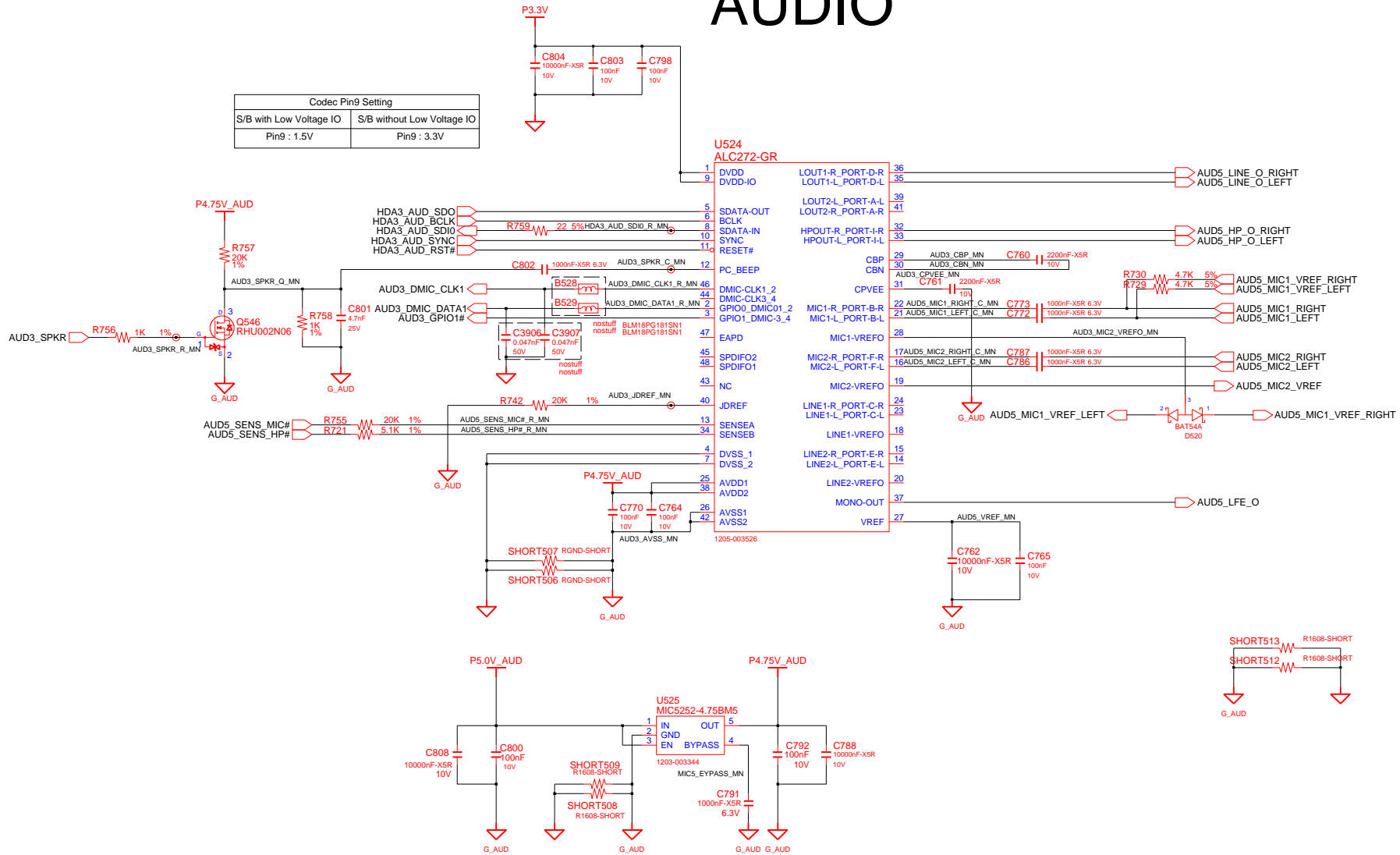
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APPROVAL	BL Lee	REV	REV 1.0			BA41-01060A	
MODULE CODE		LAST EDIT					
April 11, 2009 10:05:58 AM							PAGE 38 OF 67

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# AUDIO

Codec Pin9 Setting	
S/B with Low Voltage IO	S/B without Low Voltage IO
Pin9 : 1.5V	Pin9 : 3.3V

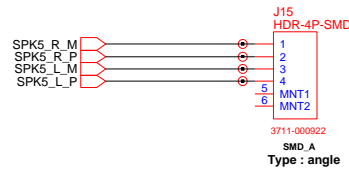
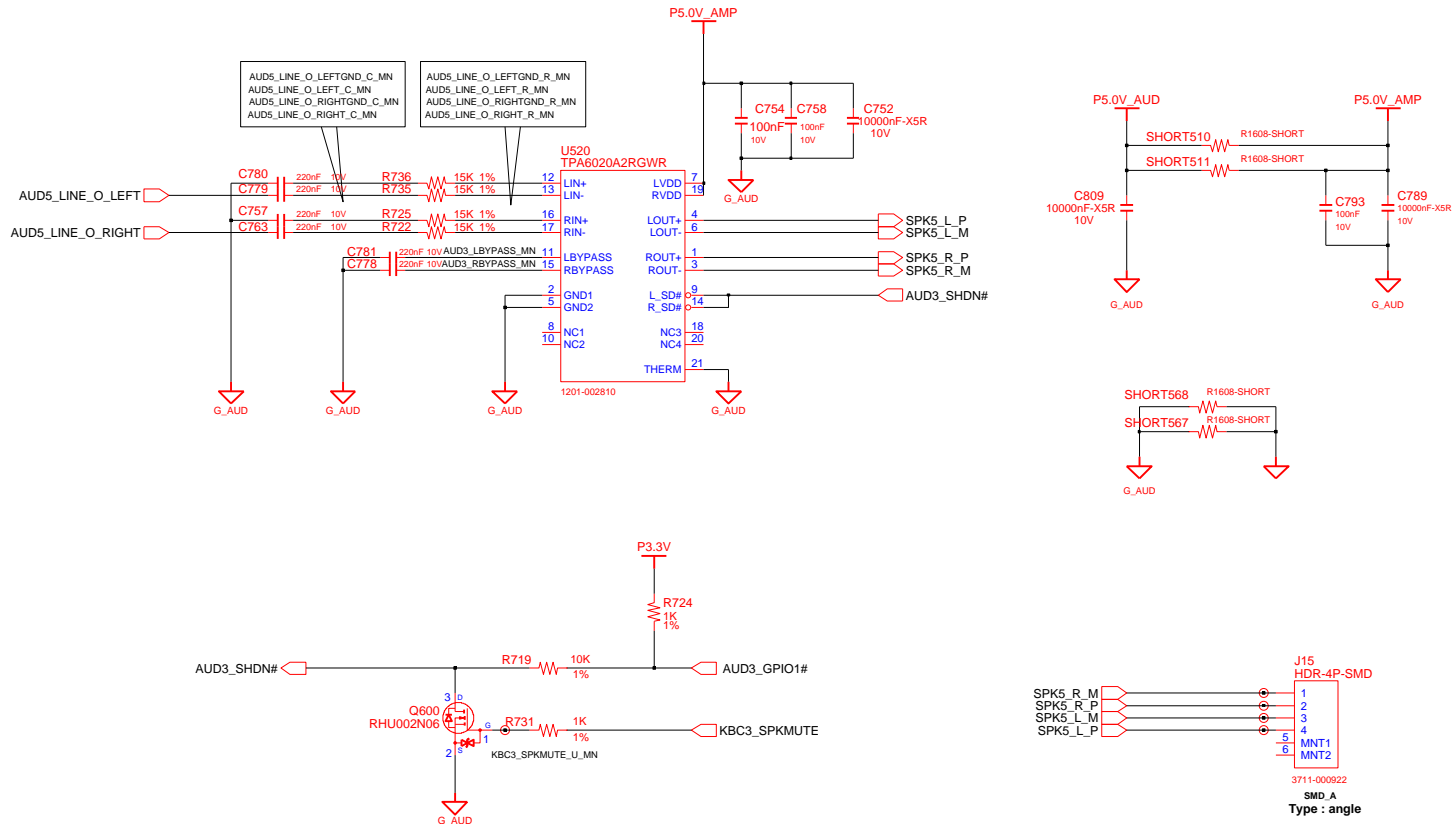


GMT : 1203-005579

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E HDA_CODEC	SAMSUNG ELECTRONICS
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APPROVAL	BL Lee	REV	REV 1.0		PART NO.	BA41-01060A
MODULE CODE		LAST EDIT			April 11, 2009 10:05:58 AM	PAGE 39 OF 67

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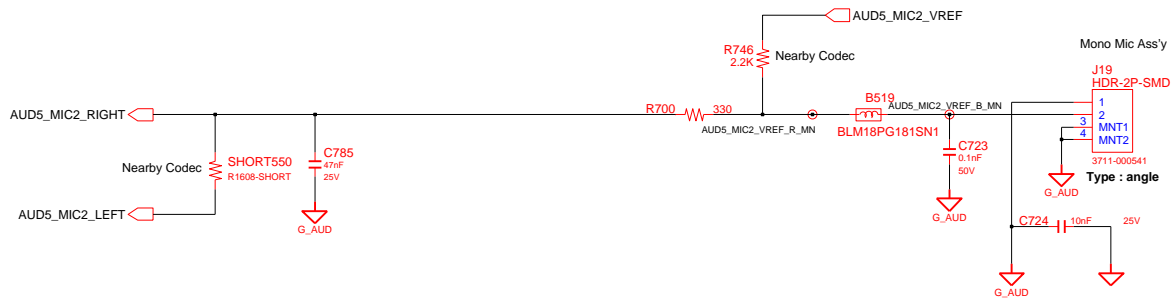
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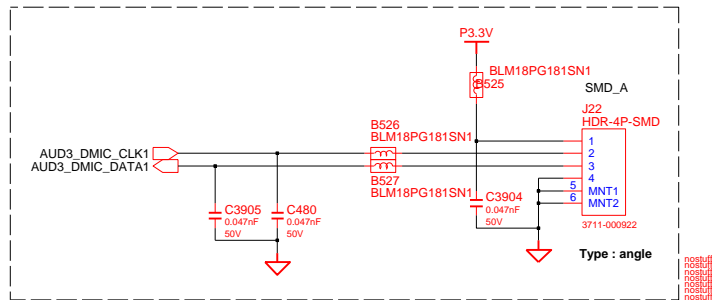
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MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	40 OF 67

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**Digital MIC CONNECTOR**

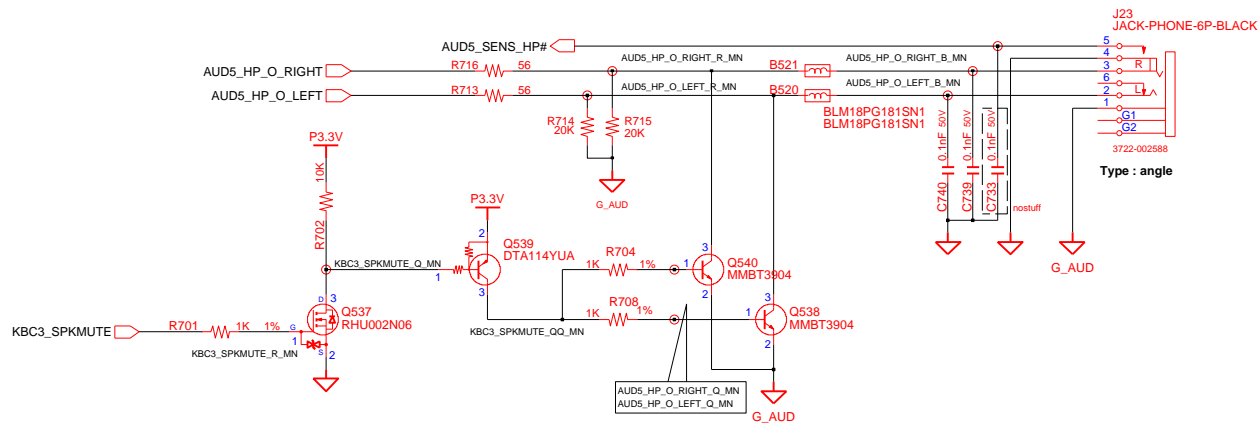


DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	HDA_CODEC		
APPROVAL	BL Lee	REV	REV 1.0	MIC AMP LMV358	PART NO.	BA41-01060A
MODULE CODE		LAST EDIT	April 11, 2009 10:05:58 AM		PAGE	41 OF 67

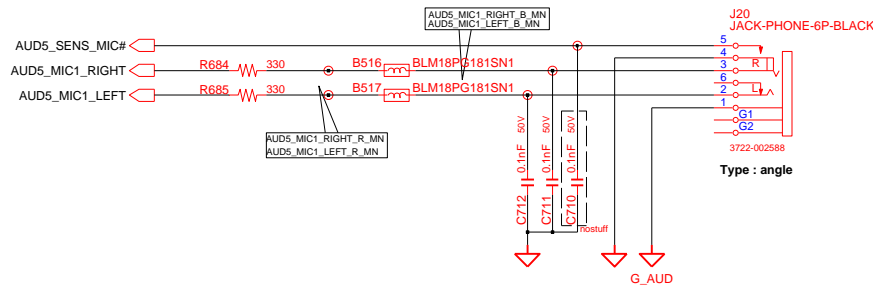
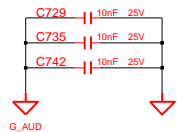
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**HEADPHONE(BLACK)**



**MIC JACK(BLACK)**

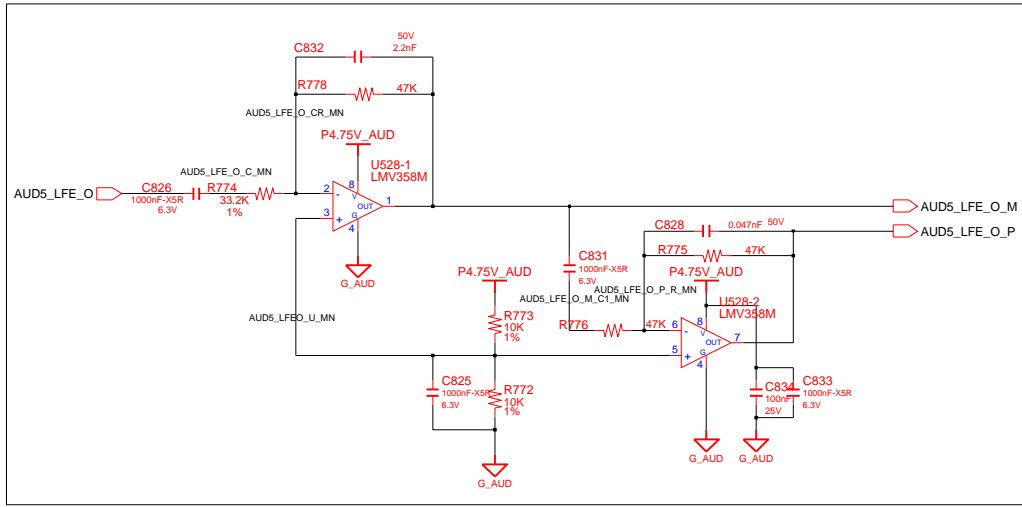


DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E HDA_CODEC	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0	H/P JACK AND MIC JACK		PART NO.
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM		BA41-01060A
						PAGE 42 OF 67

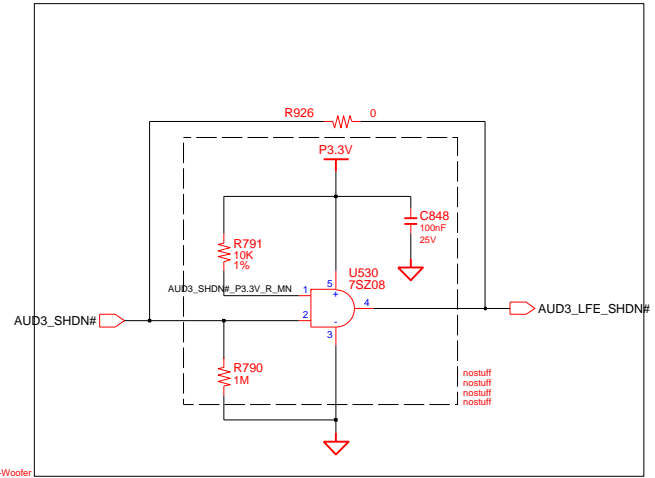
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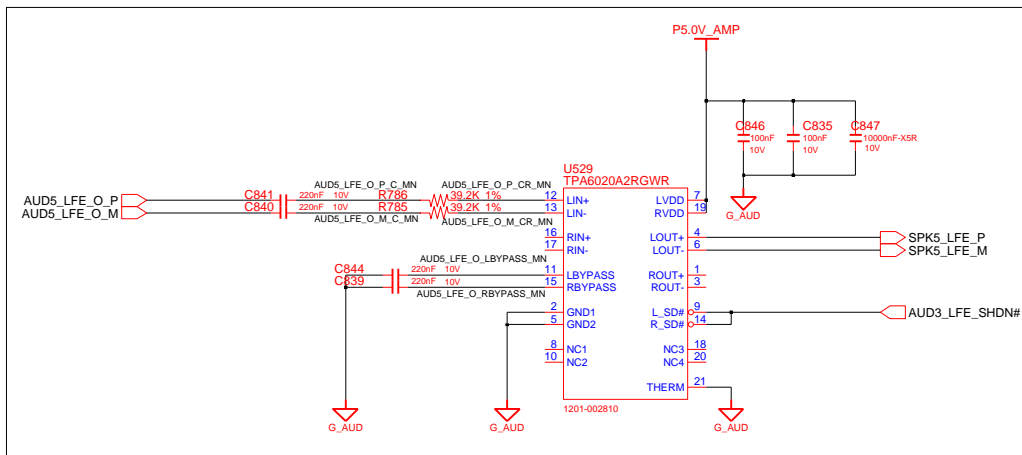
# SUB-WOOFER



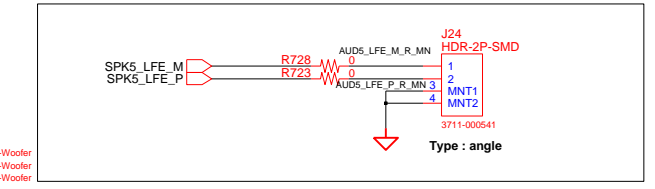
Sub-Woofers  
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Sub-Woofers



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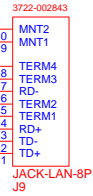
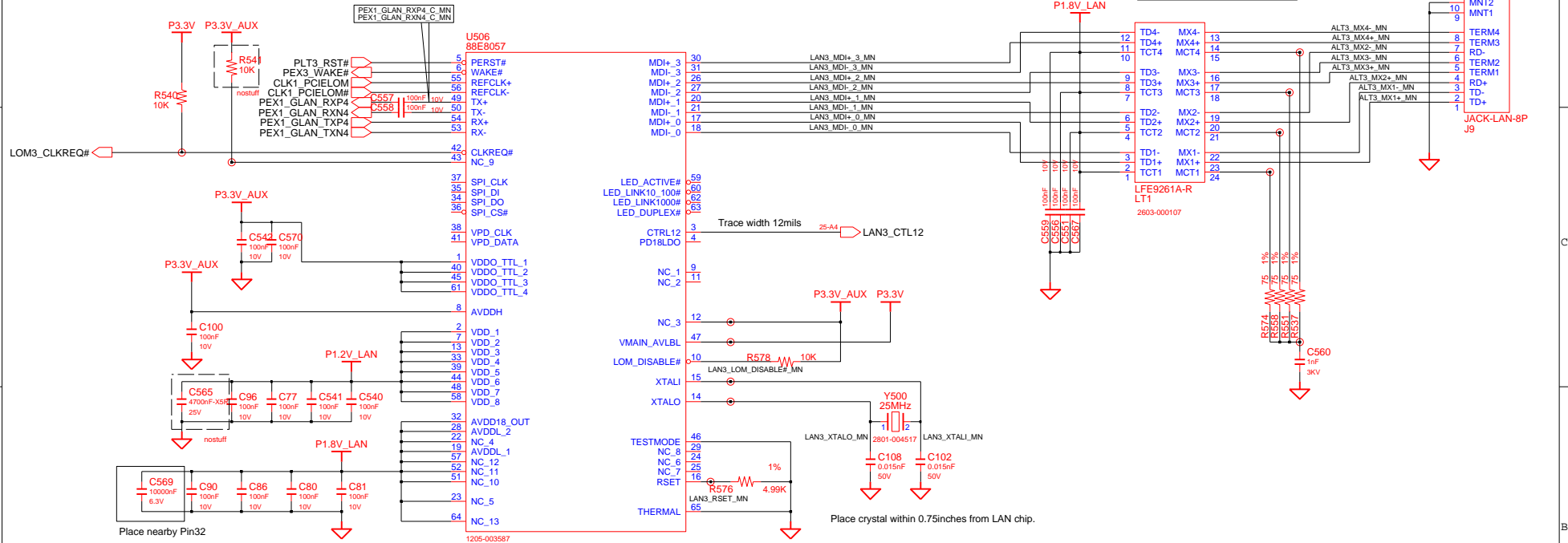
DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E HDA_CODEC SUB-WOOFER	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01060A
CHECK	MK Kim	REV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0			
MODULE CODE		LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	43 OF 67

**SAMSUNG PROPRIETARY**

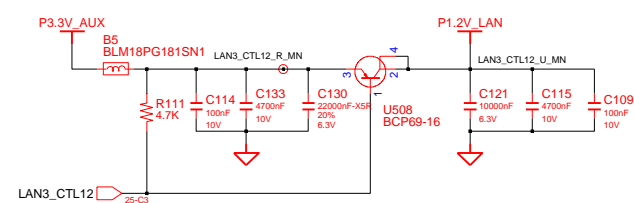
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**ALT BOM**

LFE9261A-R LAN3214-50  
2603-000107 2603-000110



Place crystal within 0.75inches from LAN chip.



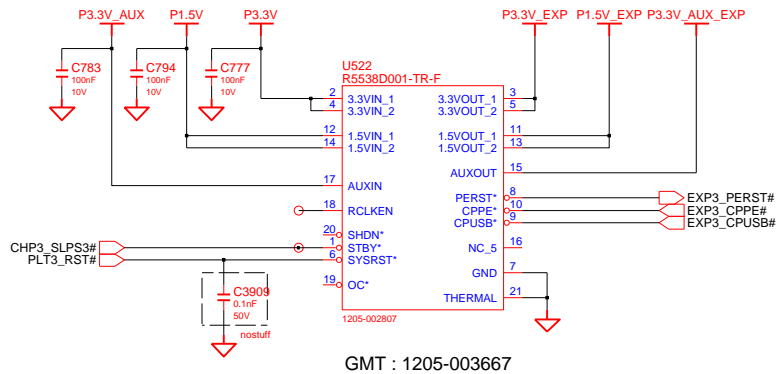
DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E LAN	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	LAN_MARVELL_8057		
APPROVAL	BL Lee	REV	REV 1.0	PART NO. BA41-01060A		PAGE 44 OF 67
MODULE CODE	LAST EDIT		April 11, 2009 10:05:58 AM			

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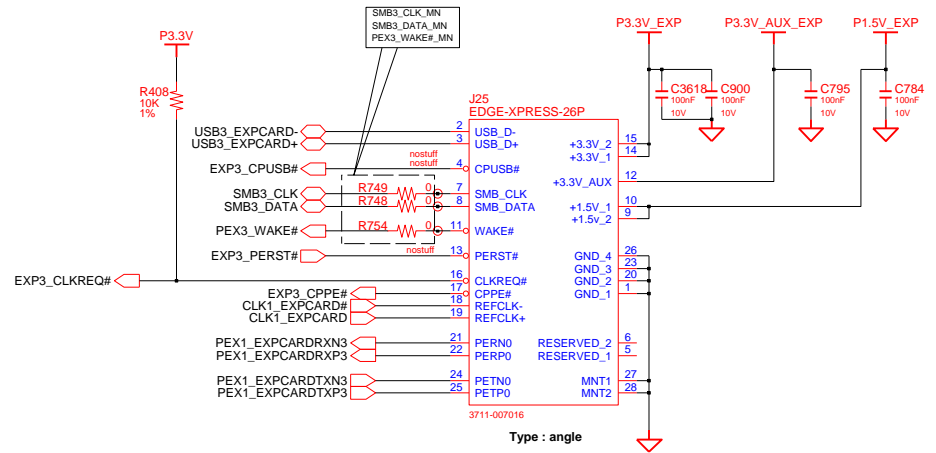
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# Express Card

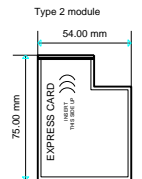
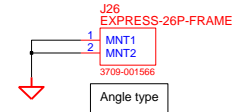
## Express Card Power Switch



GMT : 1205-003667



## TYPE - II



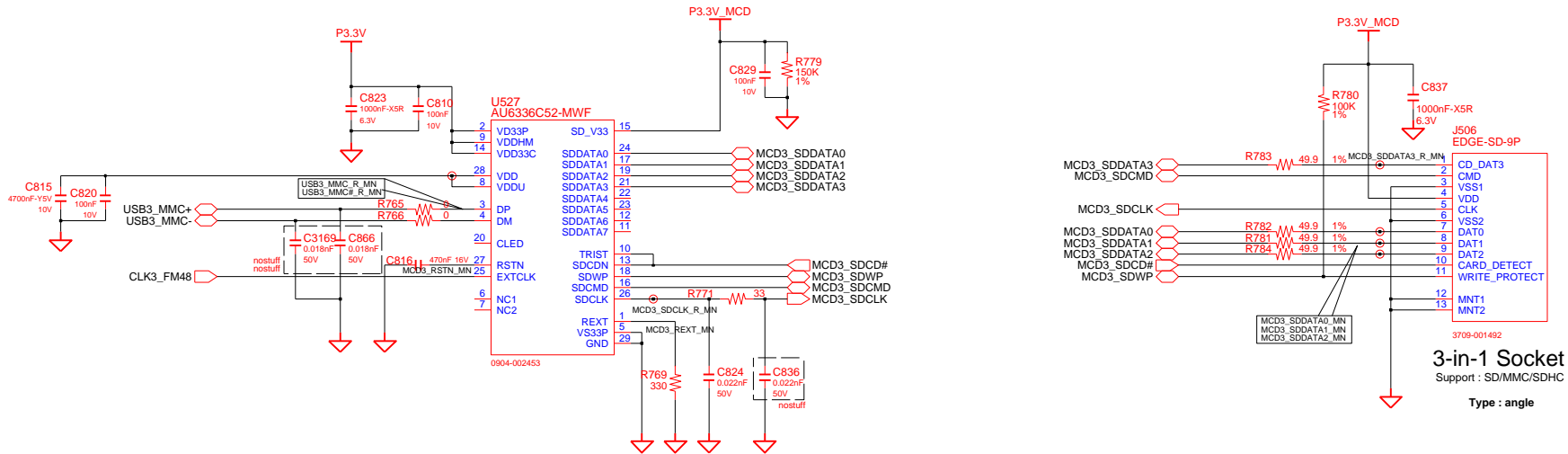
54.00 mm W  
X  
75.00 mm L  
X  
5.00 mm H

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	EXPRESS CARD	EXPRESS CARD	
APPROVAL	BL Lee	REV	REV 1.0			PART NO. BA41-01060A
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	45 OF 67

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# 3 IN 1 CARD (AU6336)



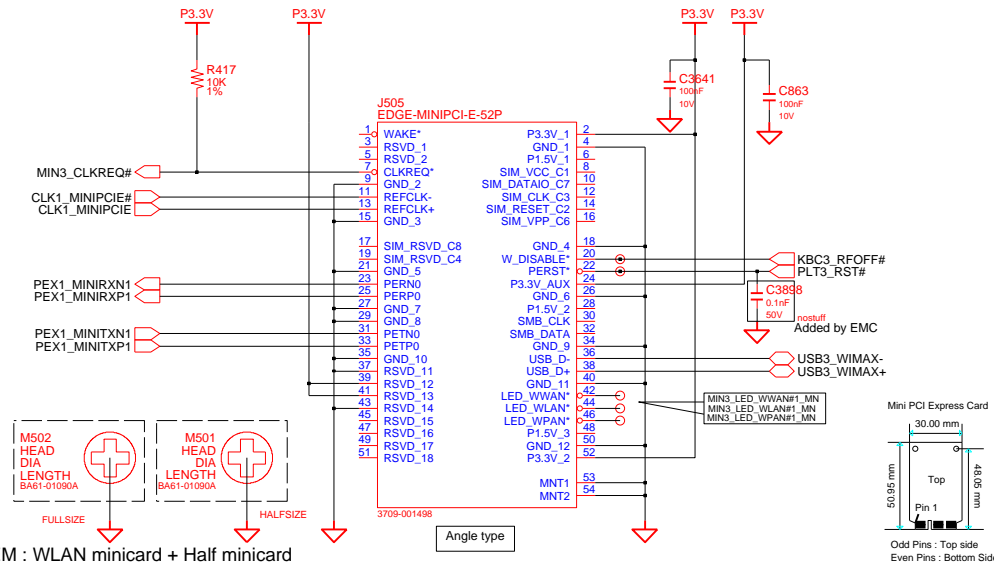
**3-in-1 Socket**  
Support : SD/MMC/SDHC  
Type : angle

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E MULTICARD 2 IN 1 CARD	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	PART NO.		
APPROVAL	BL Lee	REV	REV 1.0	April 11, 2009 10:05:58 AM		
MODULE CODE	LAST EDIT		PAGE		46	OF 67

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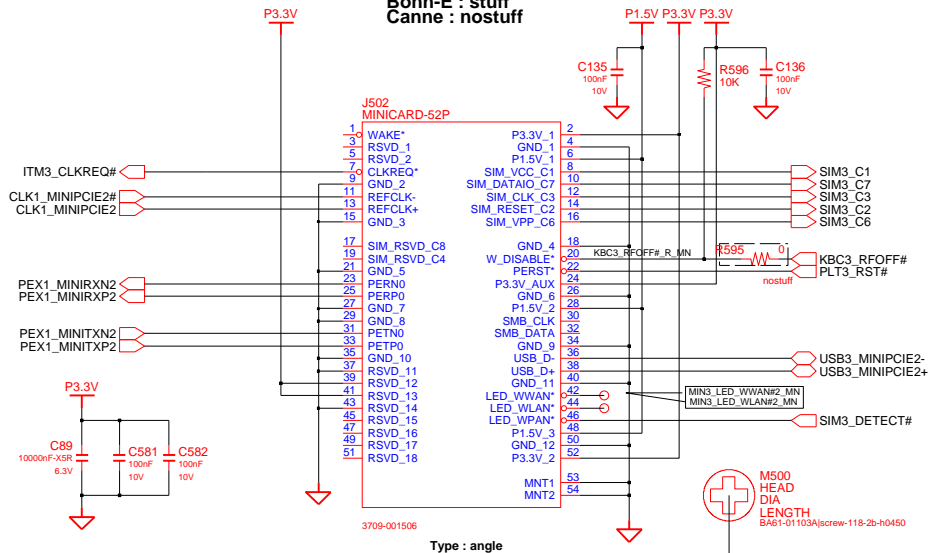
# WLAN, 4mm



PEM : WLAN minicard + Half minicard

# HSDPA, 7mm

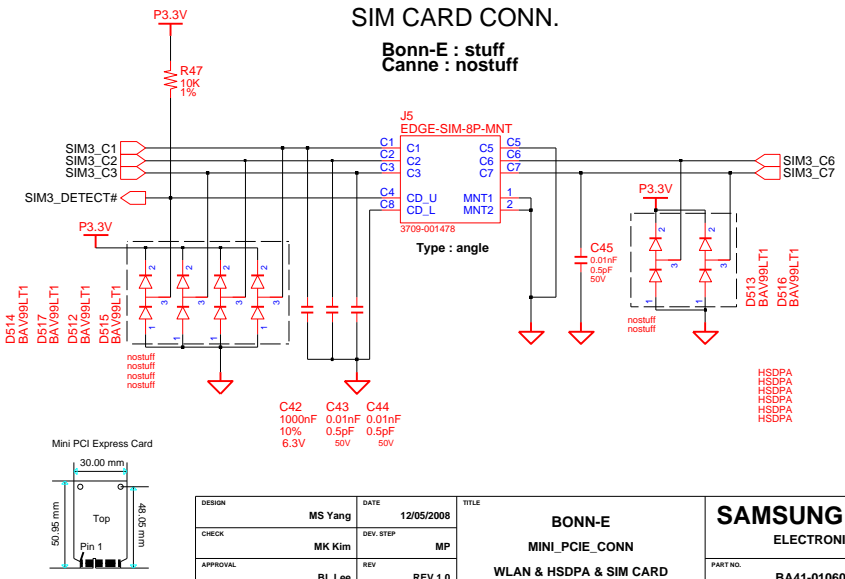
Bonn-E : stuff  
Canne : nostuff



Type : angle

# SIM CARD CONN.

Bonn-E : stuff  
Canne : nostuff



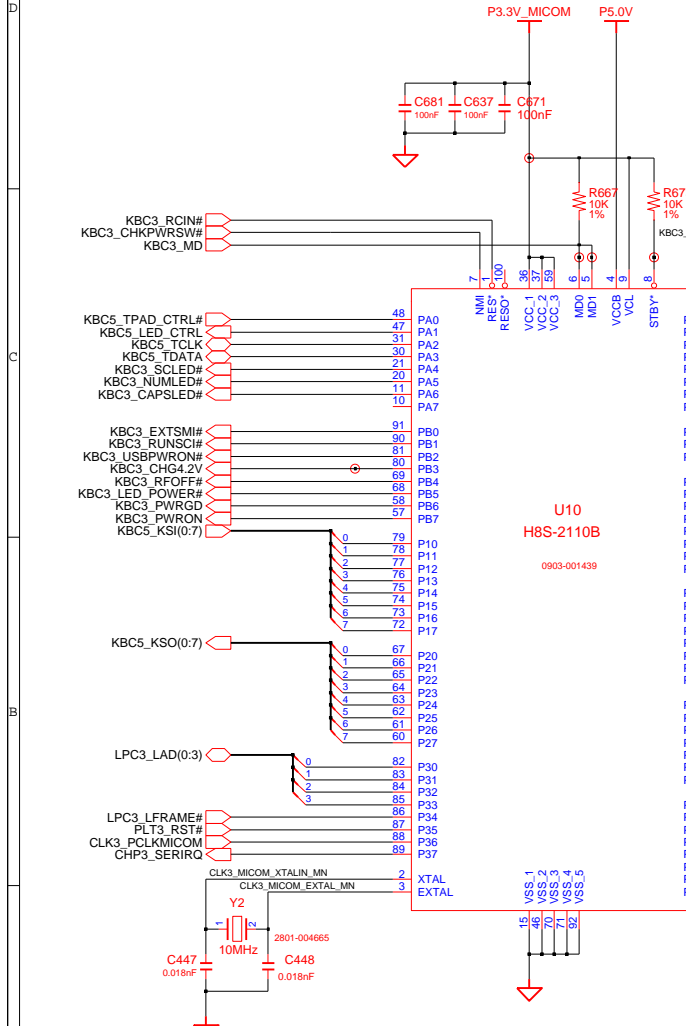
Type : angle

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E MINI_PCIE_CONN		SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	WLAN & HSDPA & SIM CARD		PART NO.	
APPROVAL	BL Lee	REV	REV 1.0	Last Edit		BA41-01060A	PAGE 47 OF 67
MODULE CODE	LAST EDIT		April 11, 2009 10:05:58 AM		PAGE 47 OF 67		



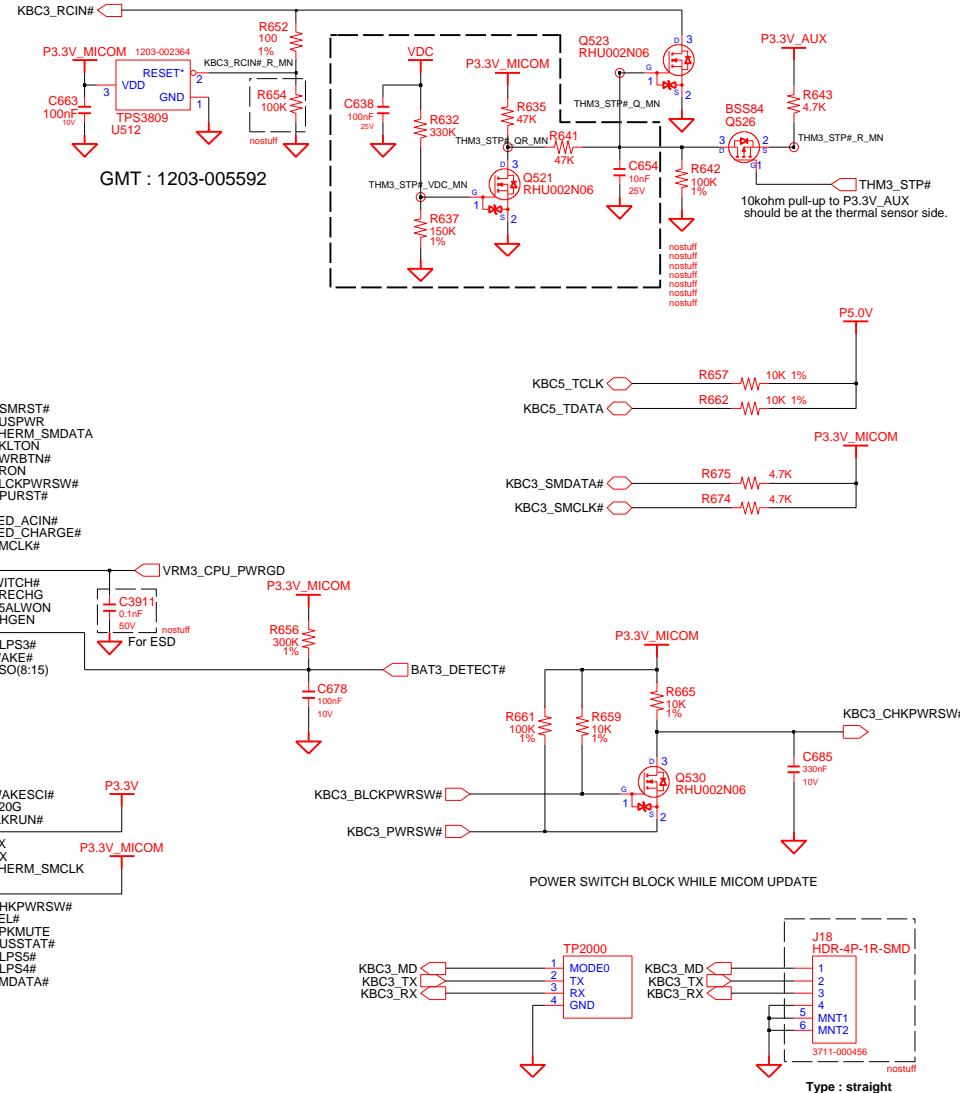
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**MICOM Crisis Update**  
 Condition: P90=P91=P92=High(MICOM\_P3V)  
 MD0=MD1=Low(0V)  
 Serial Port: P84 & P85

**MICOM RESET**



GMT : 1203-005592

10kohm pull-up to P3.3V\_AUX should be at the thermal sensor side.

POWER SWITCH BLOCK WHILE MICOM UPDATE

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E MICOM		SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	MICOM_Renesas2110_100p		PART NO.	
APPROVAL	BL Lee	REV	REV 1.0	MICOM_Renesas2110_100p		BA41-01060A	
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM		PAGE	49 OF 67

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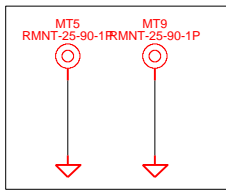
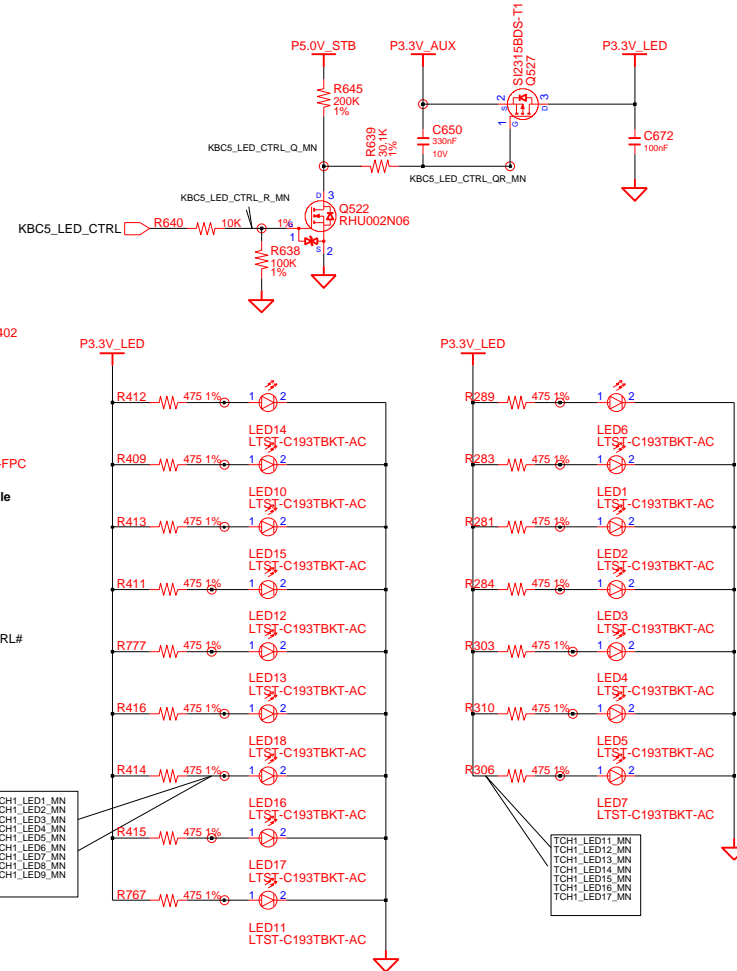
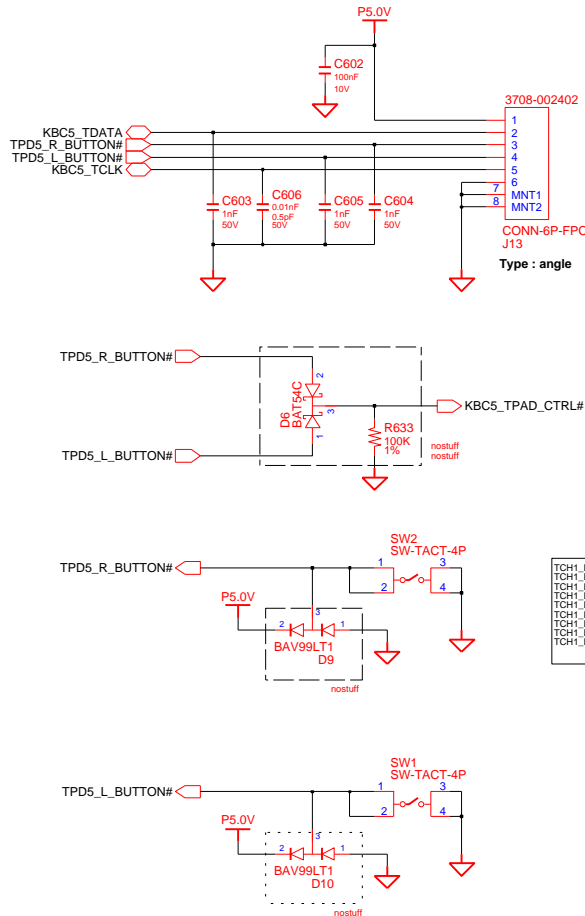
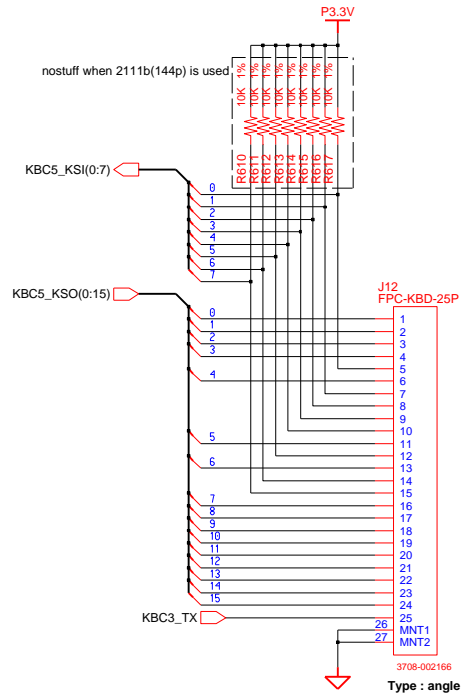
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# Micom Glue Logic

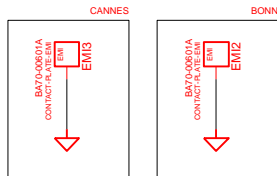
## TOUCHPAD LED

## KEYBOARD

## TOUCHPAD



Keyboard Mount



Contact to Touchpad

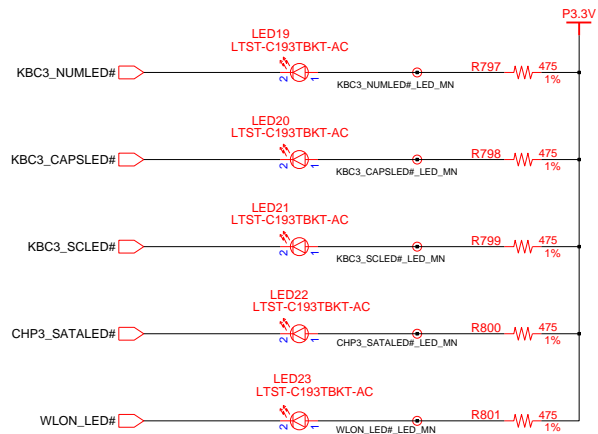
Contact to Touchpad

DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E		SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP	MICOM GLUE LOGIC		PART NO.	
APPROVAL	BL Lee	REV	REV 1.0	KEYBOARD & TOUCHPAD		BA41-01060A	
MODULE CODE		LAST EDIT				April 11, 2009 10:05:58 AM	PAGE 50 OF 67

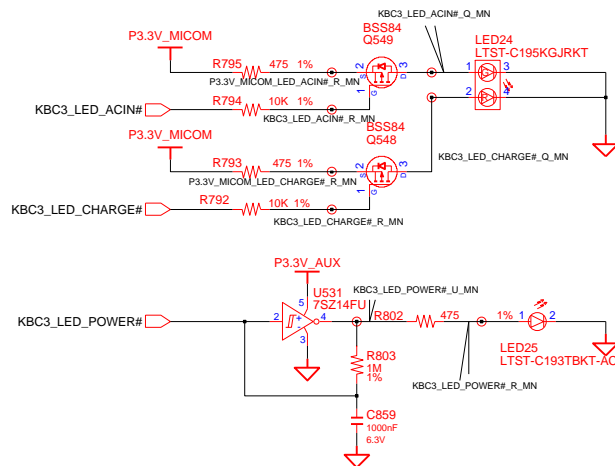
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## FUNCTION KEY LED



## ADAPTERIN/CHARGING LED

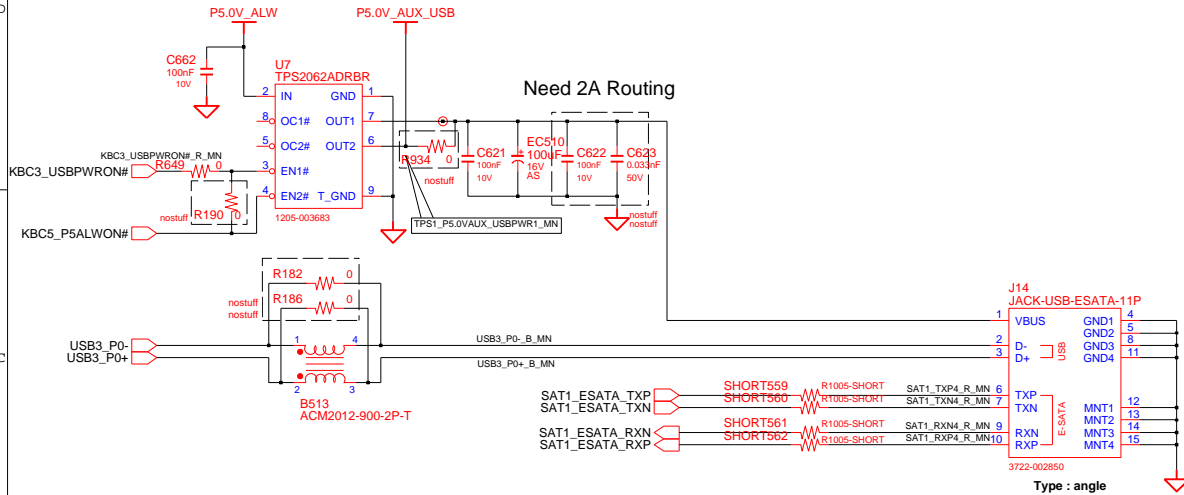


DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	LED_SWITCH	LED_SWITCH	
APPROVAL	BL Lee	REV	REV 1.0	LED_SWITCH	LED_SWITCH	PART NO. BA41-01060A
MODULE CODE		LAST EDIT	April 11, 2009 10:05:58 AM		PAGE	51 OF 67

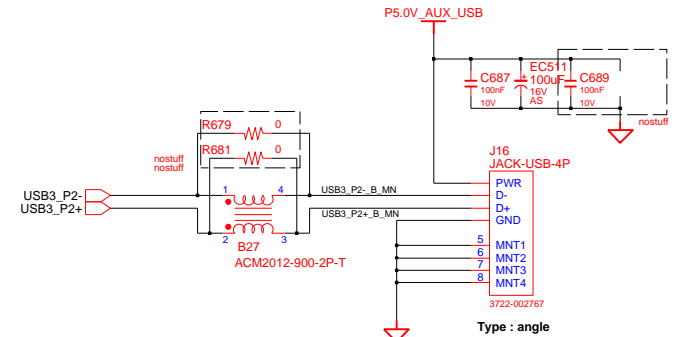
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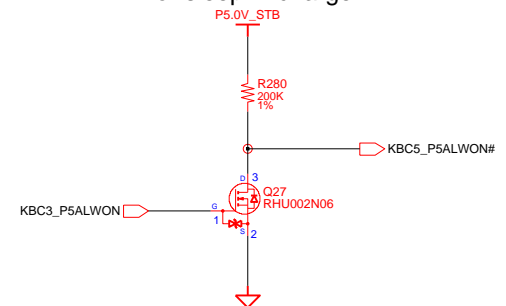
# USB + eSATA CONNECTOR



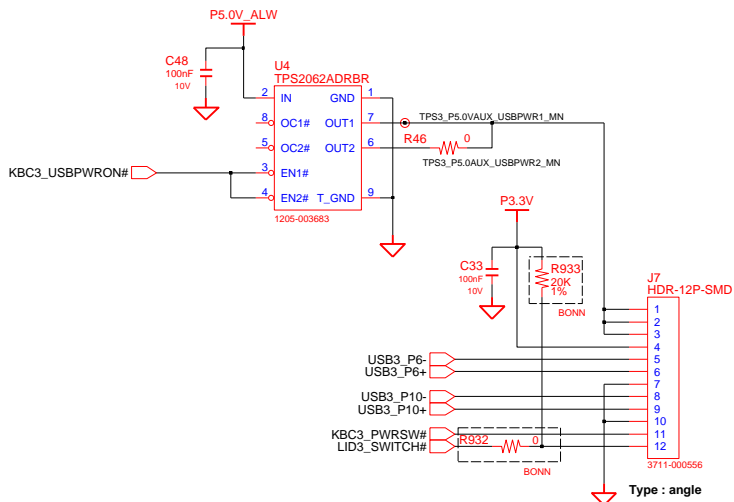
# USB Single connector



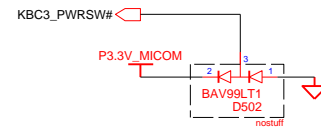
for sleep in charge



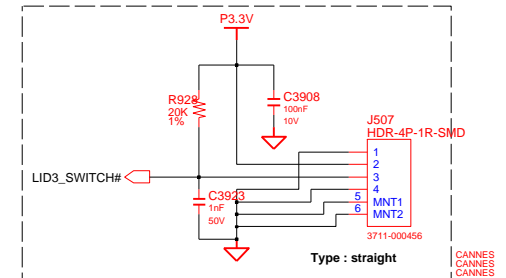
# USB SUB B'D CONNECTOR



PLACE CLOSE TO USB SUB B'D Connector



# LID SWITCH for Canne



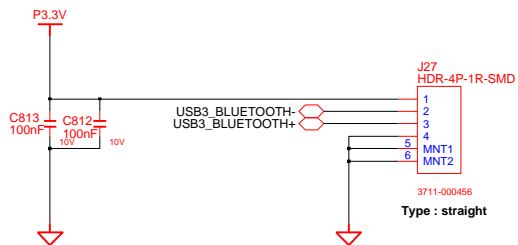
DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	USB_CONN	PART NO.	
APPROVAL	BL Lee	REV	REV 1.0	USB & eSATA	BA41-01060A	
MODULE CODE		LAST EDIT				
				April 11, 2009 10:05:58 AM	PAGE	52 OF 67

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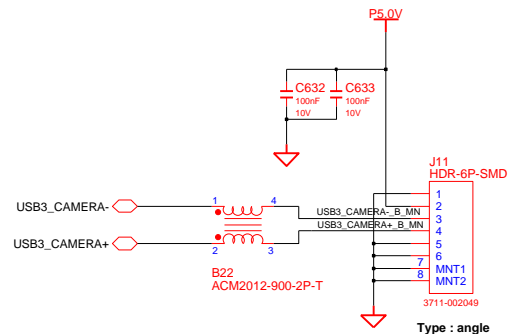
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# USB I/F Devices

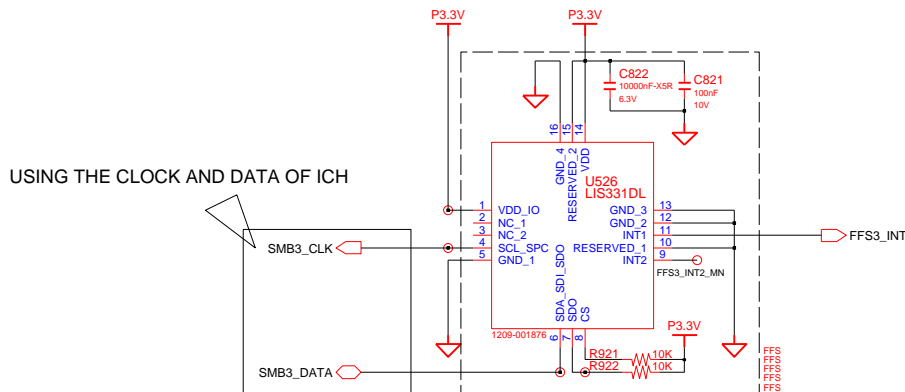
## Bluetooth Interface



## CAMERA



## Free Fall Sensor

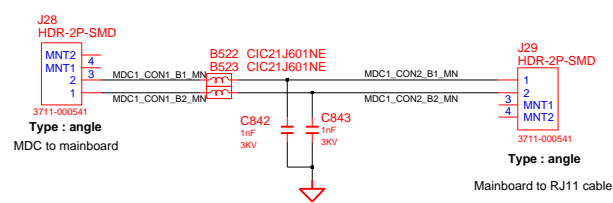
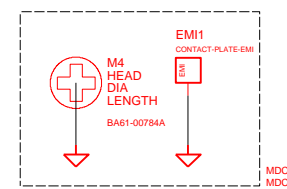
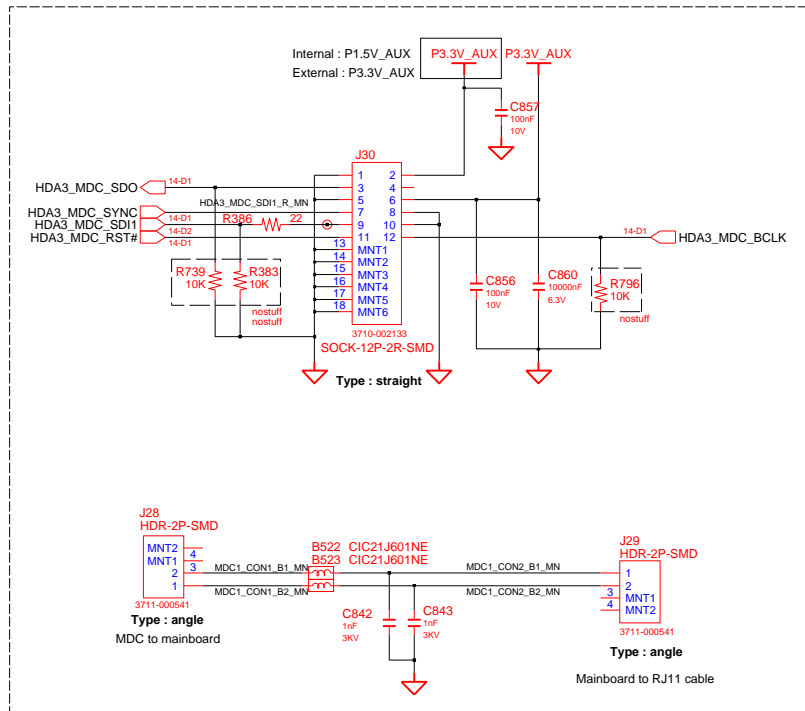


DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E USB_DEVICES BLUETOOTH & CAMERA	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		PART NO.	BA41-01060A
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	53 OF 67

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# MDC connector

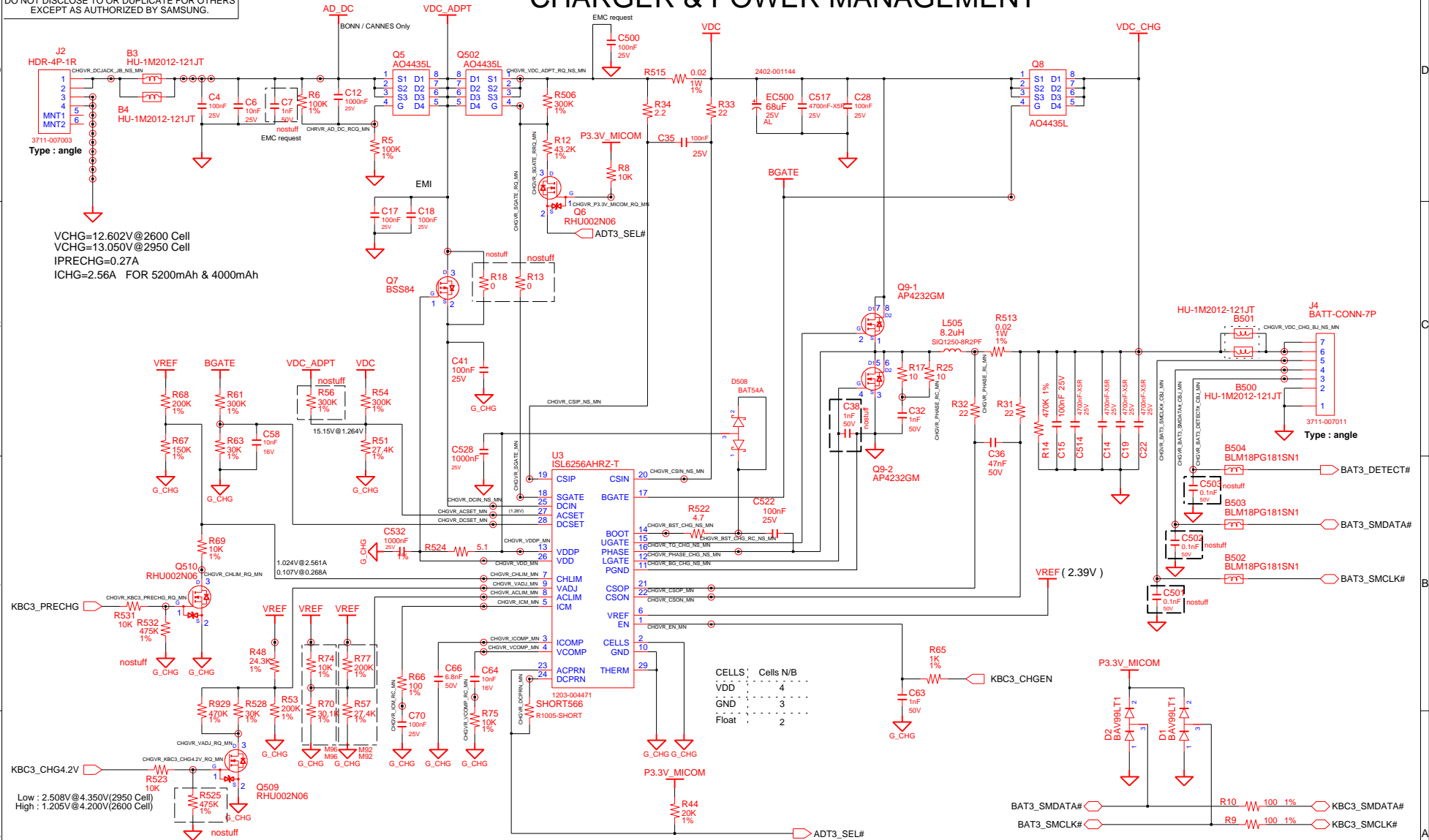


MDC  
MDC  
MDC  
MDC  
MDC  
MDC  
MDC  
MDC  
MDC  
MDC

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	MDC CONNECTOR	MDC CONNECTOR	
APPROVAL	BL Lee	REV	REV 1.0			PART NO. BA41-01060A
MODULE CODE	undefined	LAST EDIT		April 11, 2009 10:05:58 AM	PAGE	54 OF 67

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# CHARGER & POWER MANAGEMENT



VCHG=12.602V@2600 Cell  
 VCHG=13.050V@2950 Cell  
 IPRECHG=0.27A  
 ICHG=2.56A FOR 5200mAh & 4000mAh

KBC3\_PRECHG  
 KBC3\_CHG4.2V  
 Low : 2.508V@4.350V(2950 Cell)  
 High : 1.205V@4.200V(2600 Cell)

Adapter configuration			
60W / 3.03A / 96%		90W / 4.32A / 91.2%	
Value	SEC Code	Value	SEC Code
Rtop	200K	2007-007334	10K
Rbot	27.4K	2007-007274	30.1K
			2007-002910

CELLS: Cells N/B  
 VDD : 4  
 GND : 3  
 Float : 2

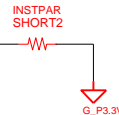
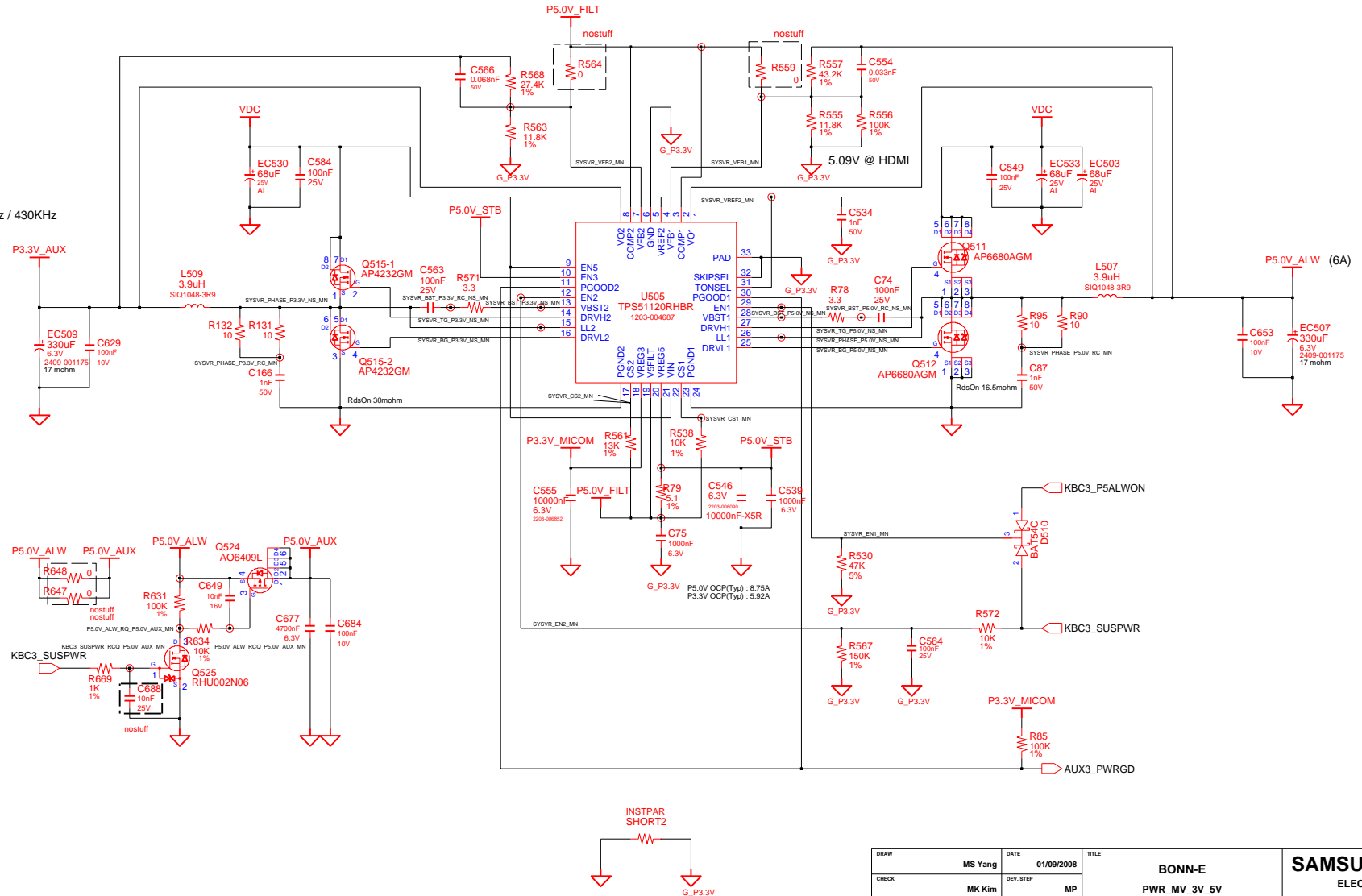
DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	PWR_MV_Charger		
APPROVAL	BL Lee	REV	REV 1.0	CHARGER (ISL6256)		PART NO.
MODULE CODE	undefined	LAST EXT		April 11, 2009 10:05:58 AM		BA41-01060A
						PAGE 55 OF 67

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# P3.3V\_AUX & P5.0V\_AUX

TONSEL VREF2  
5V / 3.3V : 280KHz / 430KHz  
(4A)

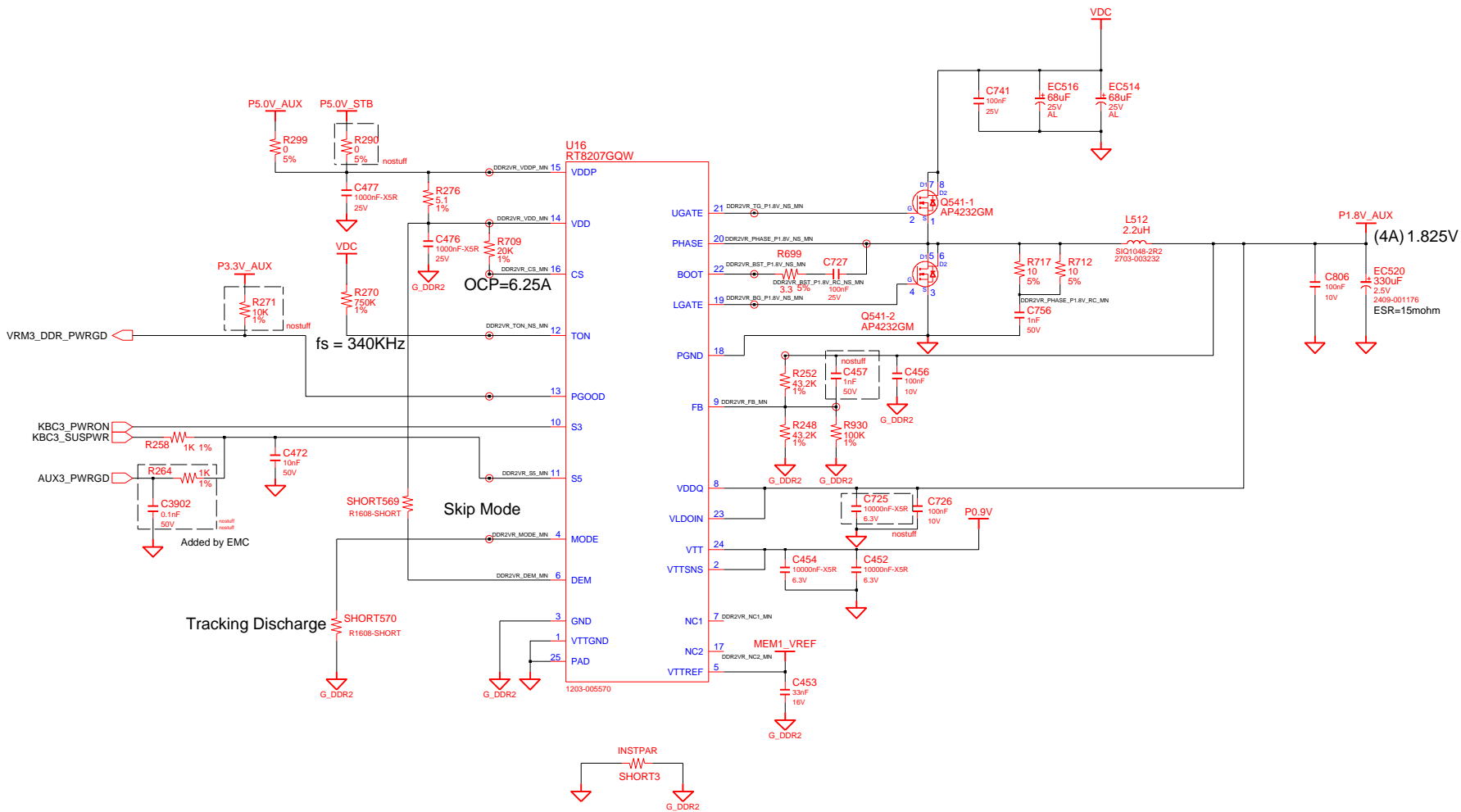


DRAW	MS Yang	DATE	01/09/2008	TITLE	BONN-E PWR_MV_3V_SV P3.3V_AUX / P5.0V_AUX	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		PART NO.	BA41-01060A
MODULE CODE	undefined	LAST EDIT			DATE	April 11, 2009 10:05:58 AM
					PAGE	56 OF 67

**SAMSUNG PROPRIETARY**

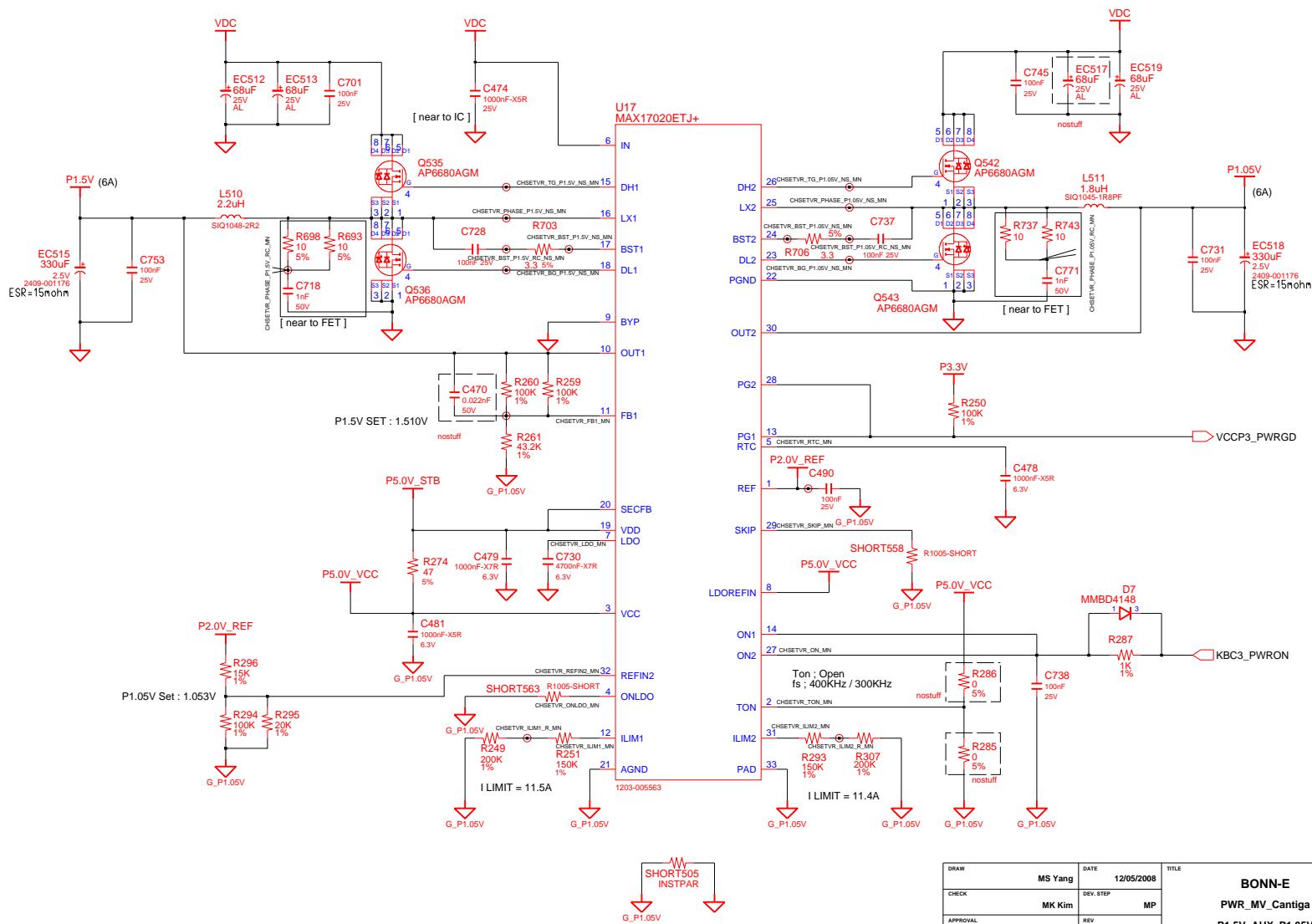
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# DDR2 Power



DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E PWR_MEMORY DDR2 POWER	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		PART NO.	BA41-01060A
MODULE CODE	undefined	LAST EDIT	April 11, 2009 10:05:58 AM	PAGE	57	OF 67

# CHIPSET POWER(P1.5V & P1.05V)



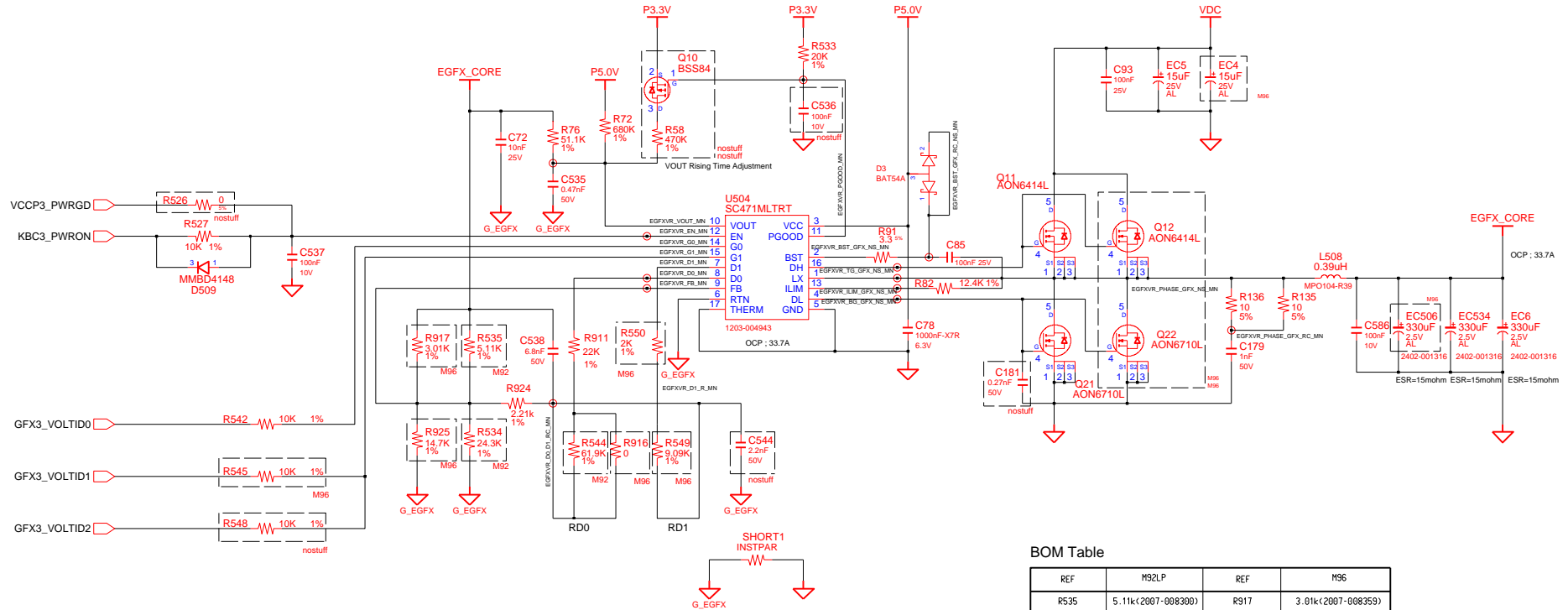
DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E PWR_MV_Cantiga P1.5V_AUX, P1.05V	SAMSUNG ELECTRONICS
CHECK	MK Kim	REV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		PART NO.	BA41-01060A
MODULE CODE	undefined	LAST EXT			April 11, 2009 10:05:58 AM	PAGE 58 OF 67



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# Ext. GFX Core Power [Semtech]



**Power Table (by AMD Power Play)**

Condition	GFX3_VOLTID2	GFX3_VOLTID1	GFX3_VOLTID0	M92-M2 LP		GFX3_VOLTID2	GFX3_VOLTID1	GFX3_VOLTID0	M96	
				Spec	Calculated				Spec	Measured
High Performance	Reserved	Reserved	1	0.95V	0.953V	Reserved	1	1	1.15V	1.139V
UVD	Reserved	Reserved	1	0.95V	0.953V	Reserved	1	0	1.10V	1.073V
Battery - Dual Display	Reserved	Reserved	1	0.95V	0.953V	Reserved	0	1	1.00V	0.997V
Battery - Single Display	Reserved	Reserved	0	0.90V	0.908V	Reserved	0	0	0.90V	0.904V

**BOM Table**

REF	M92LP	REF	M96
R535	5.11k(2007-008300)	R917	3.01k(2007-008359)
R534	24.3k(2007-007237)	R925	14.7k(2007-007521)
R544	61.9k(2007-002991)	R916	0(2007-000070)
R550	nostuff	R550	2k(2007-000669)
R549	nostuff	R549	9.09k(2007-007445)
R545	nostuff	R545	10k(2007-007142)
Q12	nostuff	Q12	AON6414L(0505-000280)
EC506	nostuff	EC506	330uF(2402-001316)

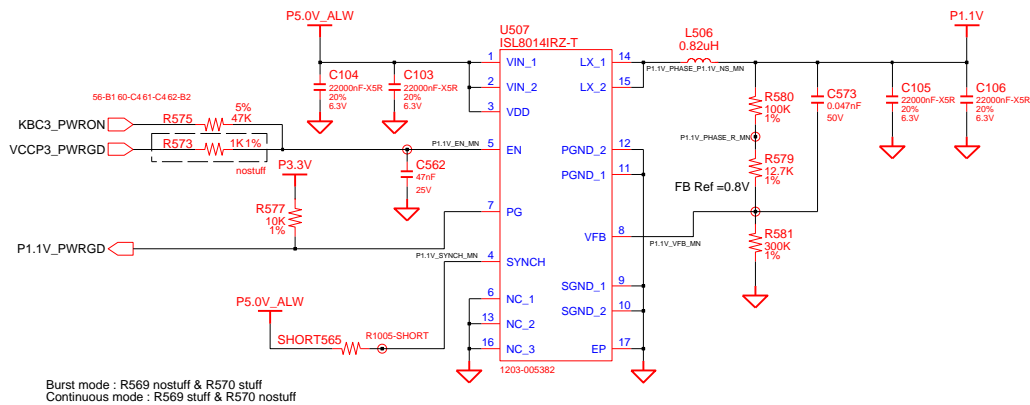
DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E GFX_POWER	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	EXT. GFX VDDC (SC471M)	PART NO.	
APPROVAL	BL Lee	REV	REV 1.0			
MODULE CODE		LAST EDIT				

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# P1.1V

## P1.1V(External Gfx)



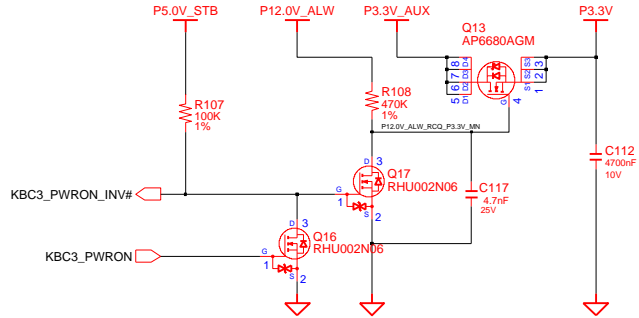
DRAWN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP		PWR_MV_Switched	
APPROVAL	BL Lee	REV	REV 1.0		P1.1V	PART NO.
MODULE CODE		LAST EDIT				BA41-01060A
					April 11, 2009 10:05:58 AM	PAGE 61 OF 67

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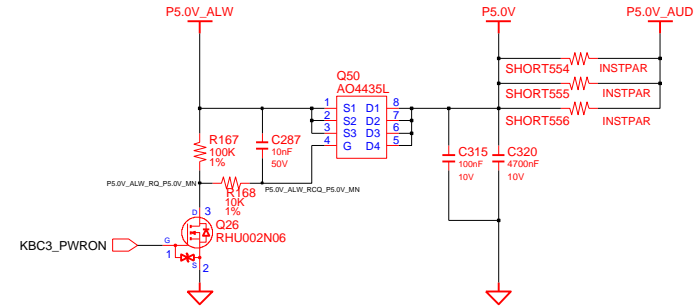
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# Switched Power

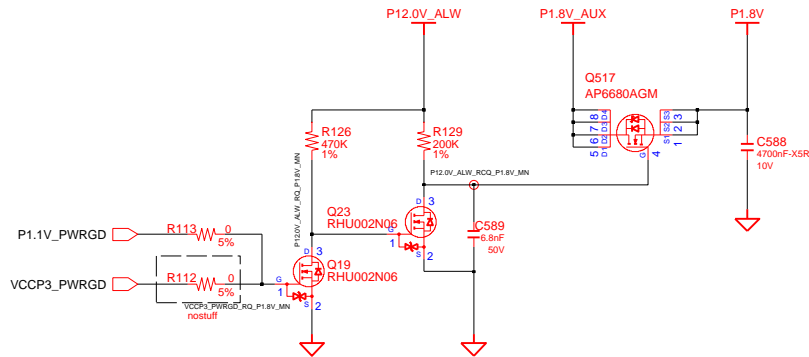
Switched Power On (P3.3V)



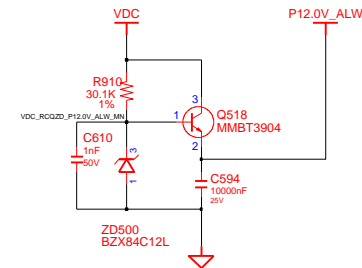
Switched Power On (P5.0V)



Switched Power On (P1.8V)



P12.0V\_ALW

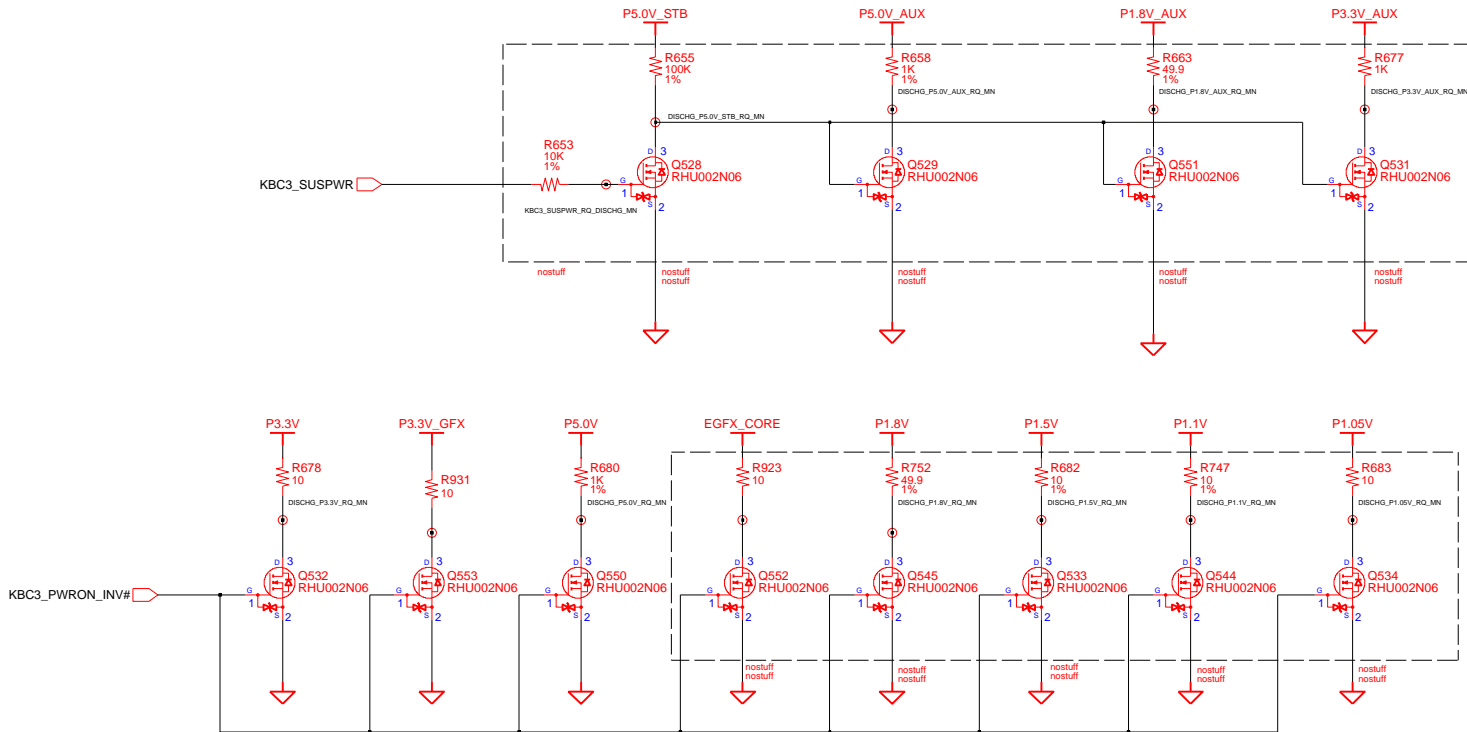


DRAWN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	PWR_MV_SWITCHED		
APPROVAL	BL Lee	REV	REV 1.0	SWITCHED POWER		PART NO.
MODULE CODE		LAST EDIT		April 11, 2009 10:05:58 AM		BA41-01060A
						PAGE 62 OF 67

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# POWER DISCHARGER

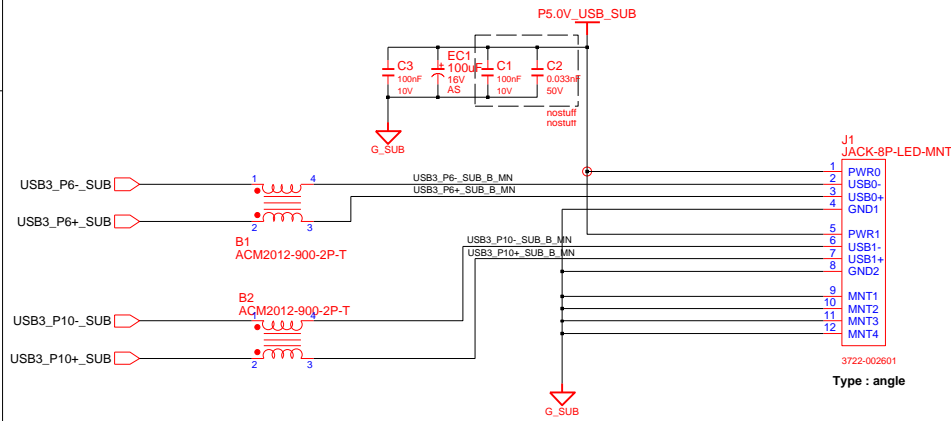


DRAWN	MS Yang	DATE	12/05/2008	TITLE	BONN-E	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	PWR_MV_DISCHARGER		
APPROVAL	BL Lee	REV	REV 1.0	DISCHARGING LOGIC		PART NO.
MODULE CODE	undefined	LAST EDIT	April 11, 2009 10:05:58 AM	PAGE	63	OF 67

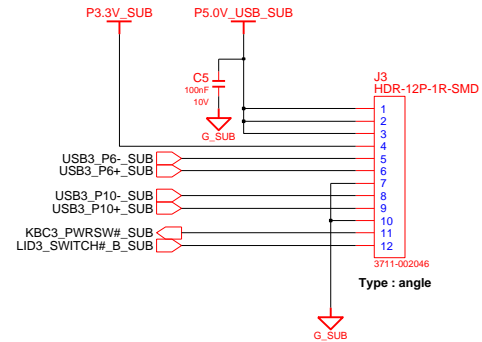
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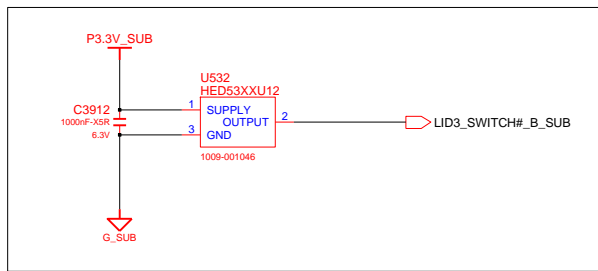
# 2 USB PORT & POWER S/W SUB B'D



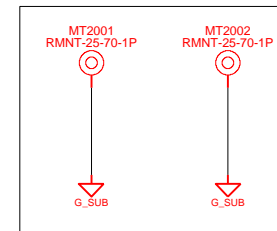
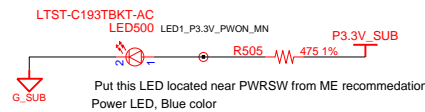
## SUB TO MAIN USB CONN



## LID\_SWITCH (Bonn only)

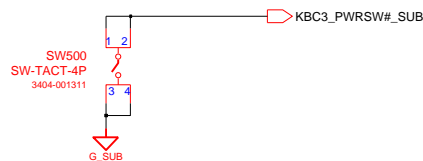


## Power ON LED



USB sub board mount hole

## Power Switch Button



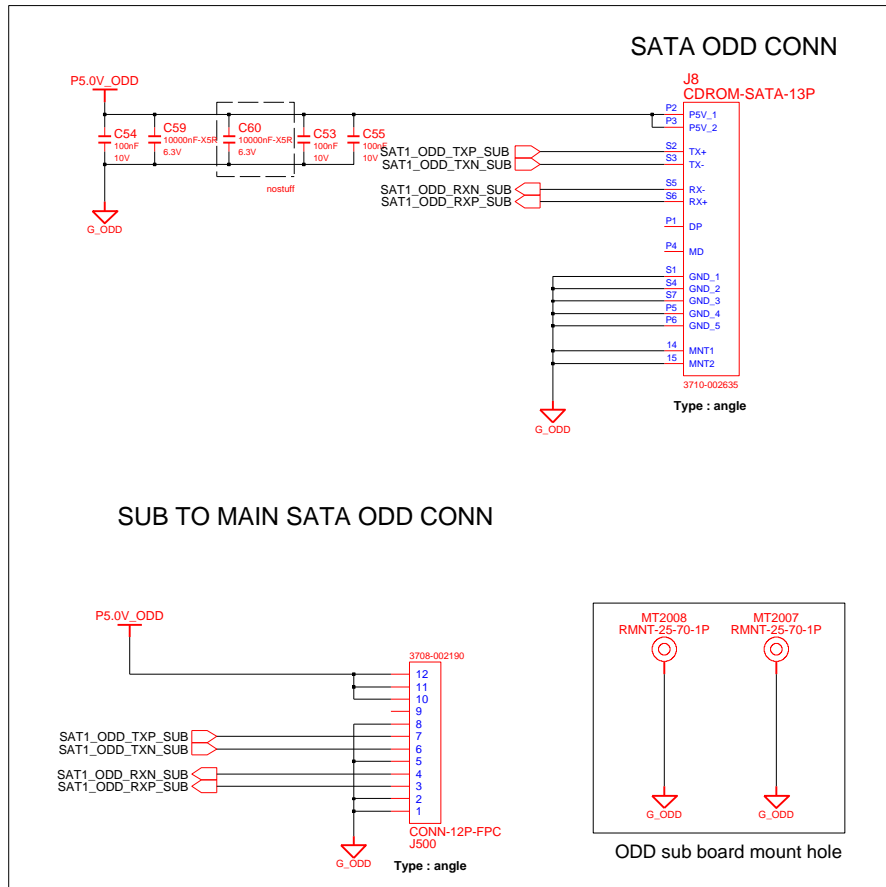
DESIGN	MS Yang	DATE	12/05/2008	TITLE	BONN-E SUB BOARD1	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		2 USB & POWER SW	PART NO. BA41-01060A
MODULE CODE		LAST EDIT			April 11, 2009 10:05:58 AM	PAGE 64 OF 67

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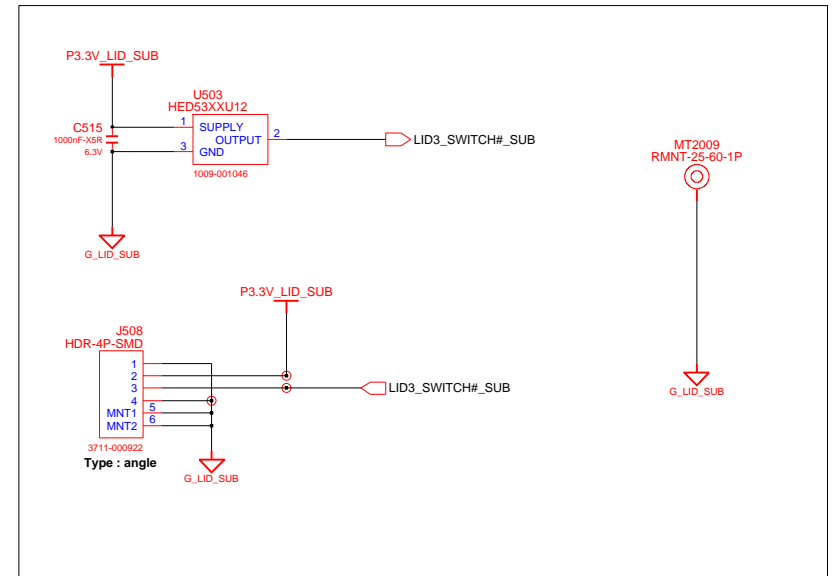
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# SATA ODD & LID SW SUB BOARD

## SATA ODD SUB BOARD



## LID SWITCH SUB BOARD (Canne only)



Bonn : nostuff  
Cannes : stuff

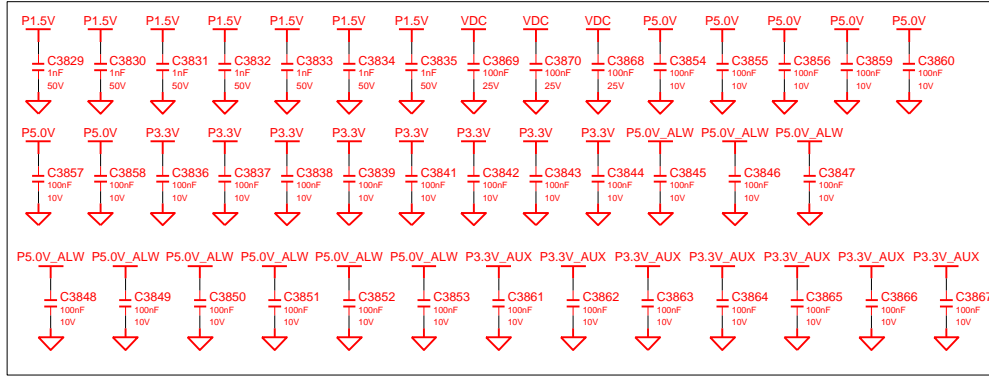
CANNES  
CANNES  
CANNES

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E SUB BOARD2	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP			
APPROVAL	BL Lee	REV	REV 1.0		SATA ODD SUB BOARD	PART NO. BA41-01060A
MODULE CODE	undefined	LAST EDIT	April 11, 2009 10:05:58 AM	PAGE	65	OF 67

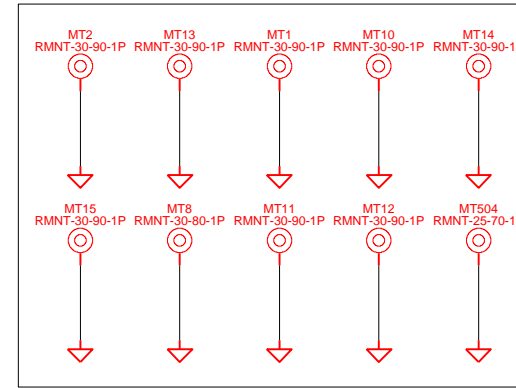
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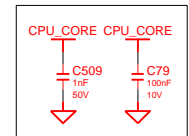
**Mainboard Mount ((30,80)x9), (30,90)x9), (25,70)x1))**



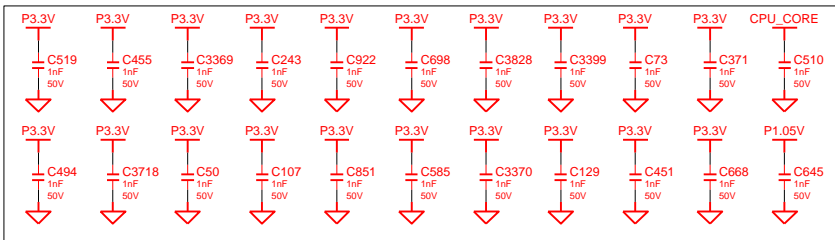
Add for EMC , 2009.01.06



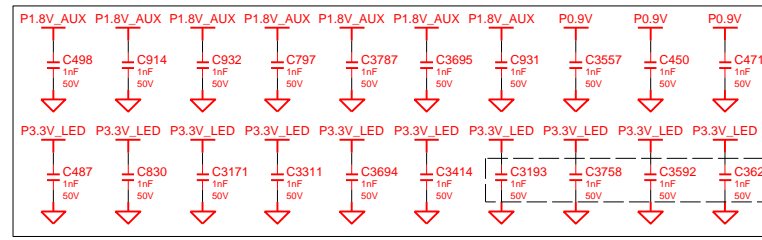
Top : (30,80) x 9  
Bot : (30,90) x 9



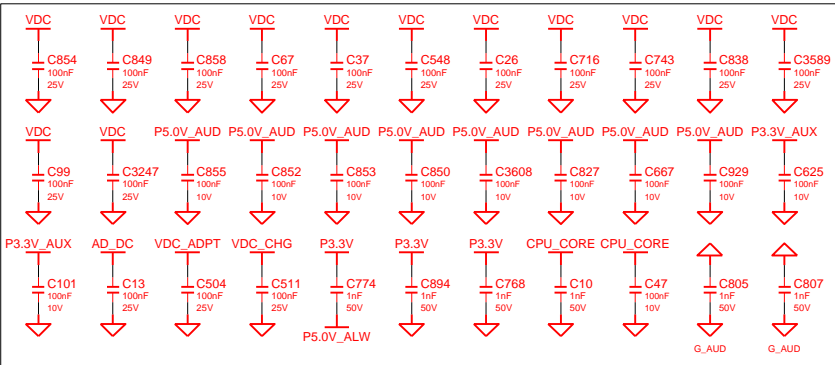
Add for EMC (Top), 2008.11.19



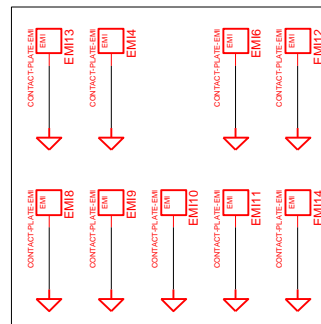
Add for EMC (5th Layer), 2008.11.19



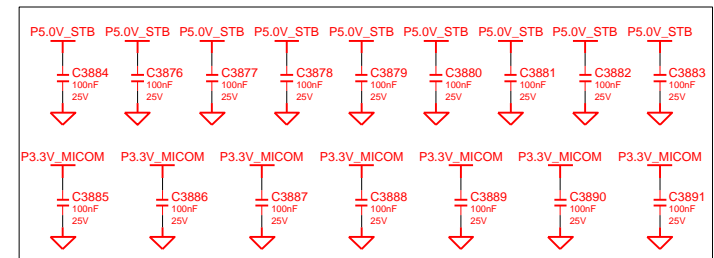
Add for EMC (Bottom), 2008.11.19



Add for EMC (Bottom), 2008.11.19



Add for EMC , 2009.01.07



Add for EMC , 2009.02.02

DRAW	MS Yang	DATE	12/05/2008	TITLE	BONN-E	SAMSUNG ELECTRONICS
CHECK	MK Kim	DEV. STEP	MP	ICT PORT	ICT PORT	
APPROVAL	BL Lee	REV	REV 1.0	PART NO.	BA41-01060A	
MODULE CODE		LAST EDIT		DATE	Apr 11, 2009 10:05:58 AM	PAGE 66 OF 67



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