

BREMEN2-L

CPU : Intel Arrandale
Chip Set : Intel Ibex Peak(HM55)
GFX : M92-XTX / Park-XT
Remarks : Calpella Platform

Model Name : BREMEN2-L
PBA Name : MAIN
PCB Code : BA41-01285A
BA41-01286A
BA41-01287A
Dev. Step : PR
Revision : 0.9
T.R. Date : 2010.04.25

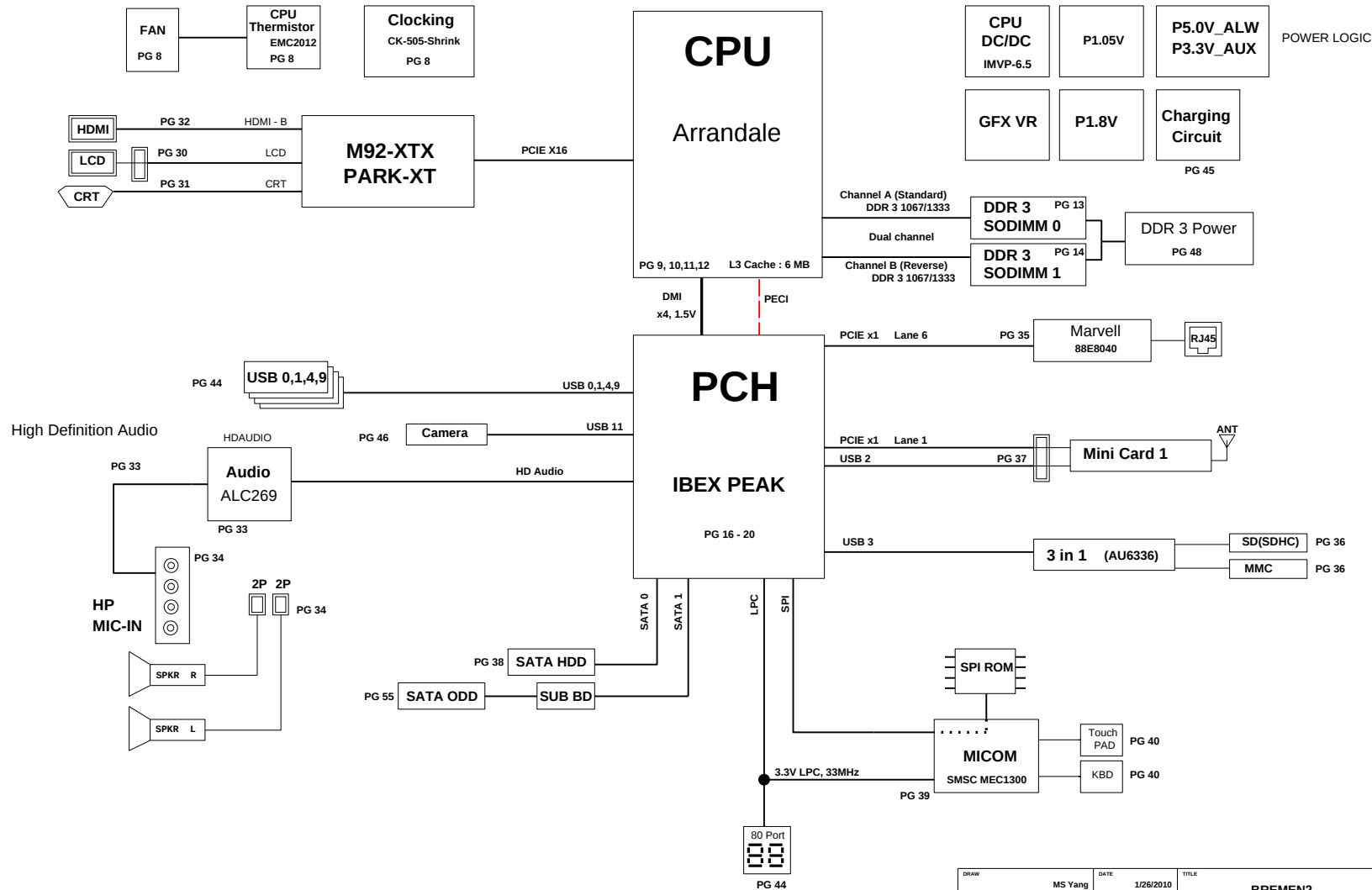
Design	CHECK	APPROVAL
MS Yang	SE Lee	MK Kim

Owner : SEC Mobile R & D Signature : X

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DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2	SAMSUNG
CHECK	SE Lee	REV. STEP	ADV		MAIN	ELECTRONICS
APPROVAL	MK Kim	REV	REV 0.1		COVER	PART NO.
MODULE CODE		LAST EDIT				BA41-
				March 06, 2010 17:48:35 PM	PAGE	1 OF 54

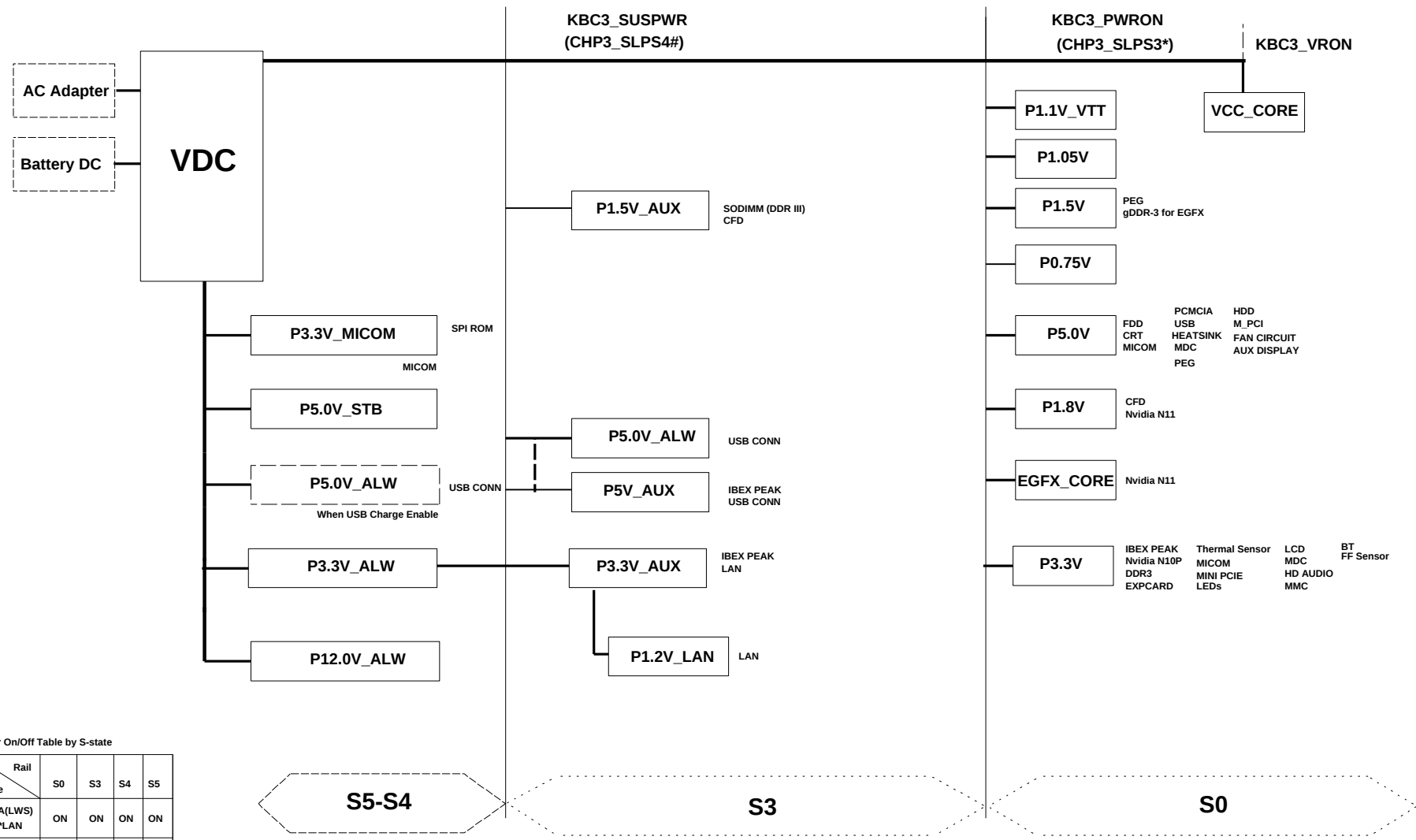
BLOCK DIAGRAM



DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 MAIN	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1		BLOCK DIAGRAM	BA41-
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE 2 OF 54	

POWER DIAGRAM

Rev 0.1



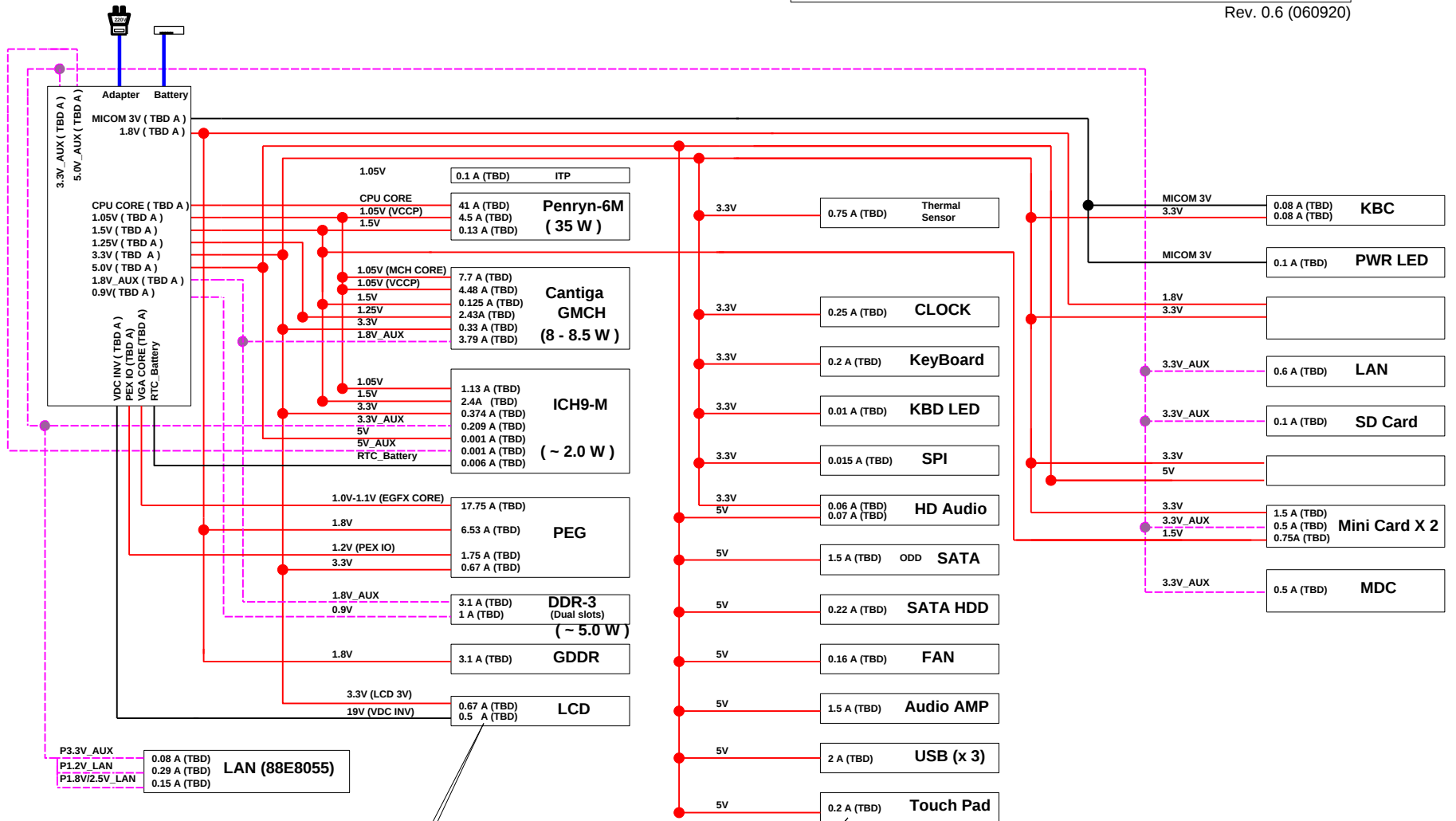
Power On/Off Table by S-state

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



POWER RAILS ANALYSIS

Rev. 0.6 (060920)

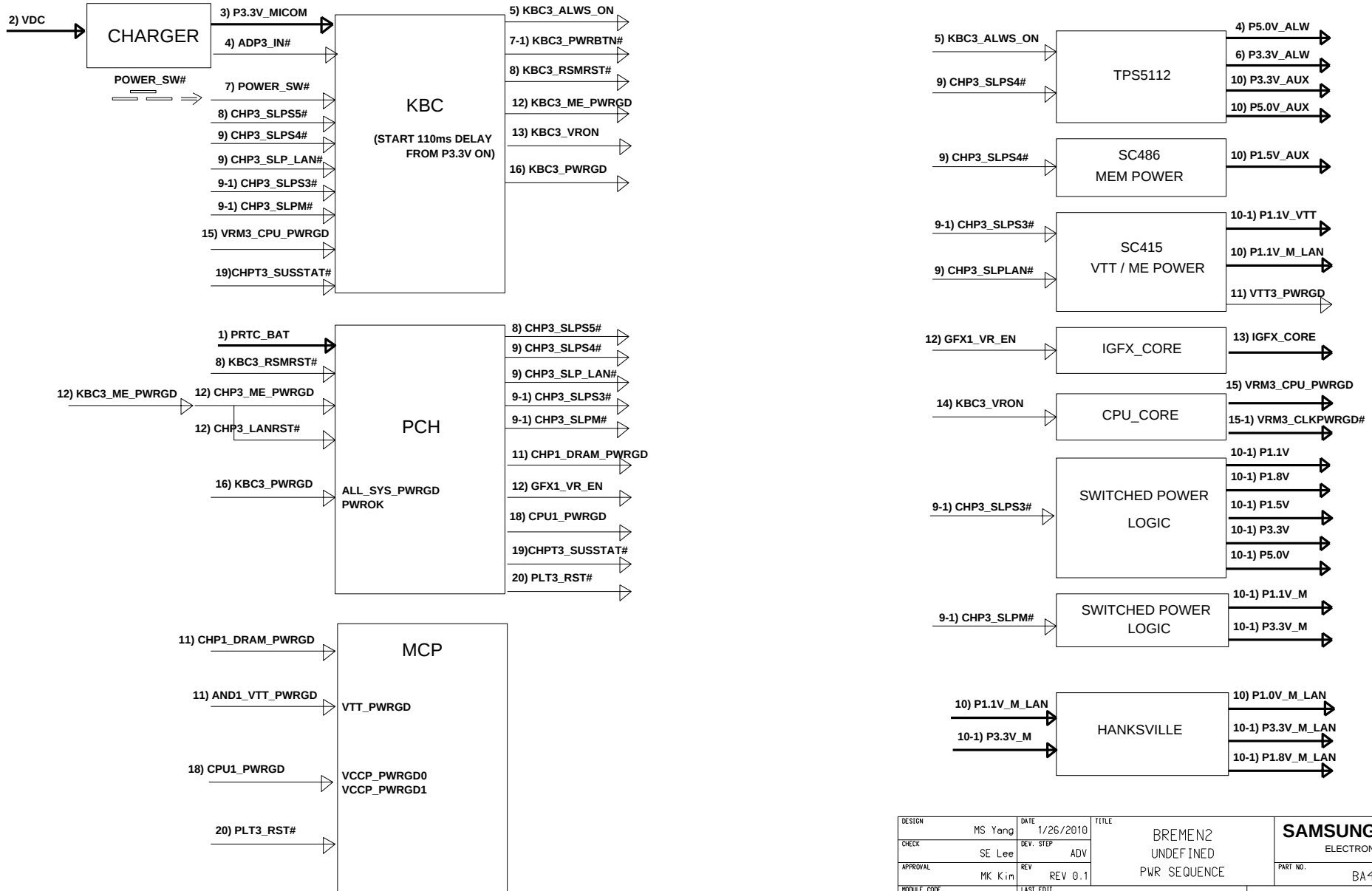


Value by Datasheet/Application notes (Value by measurement)

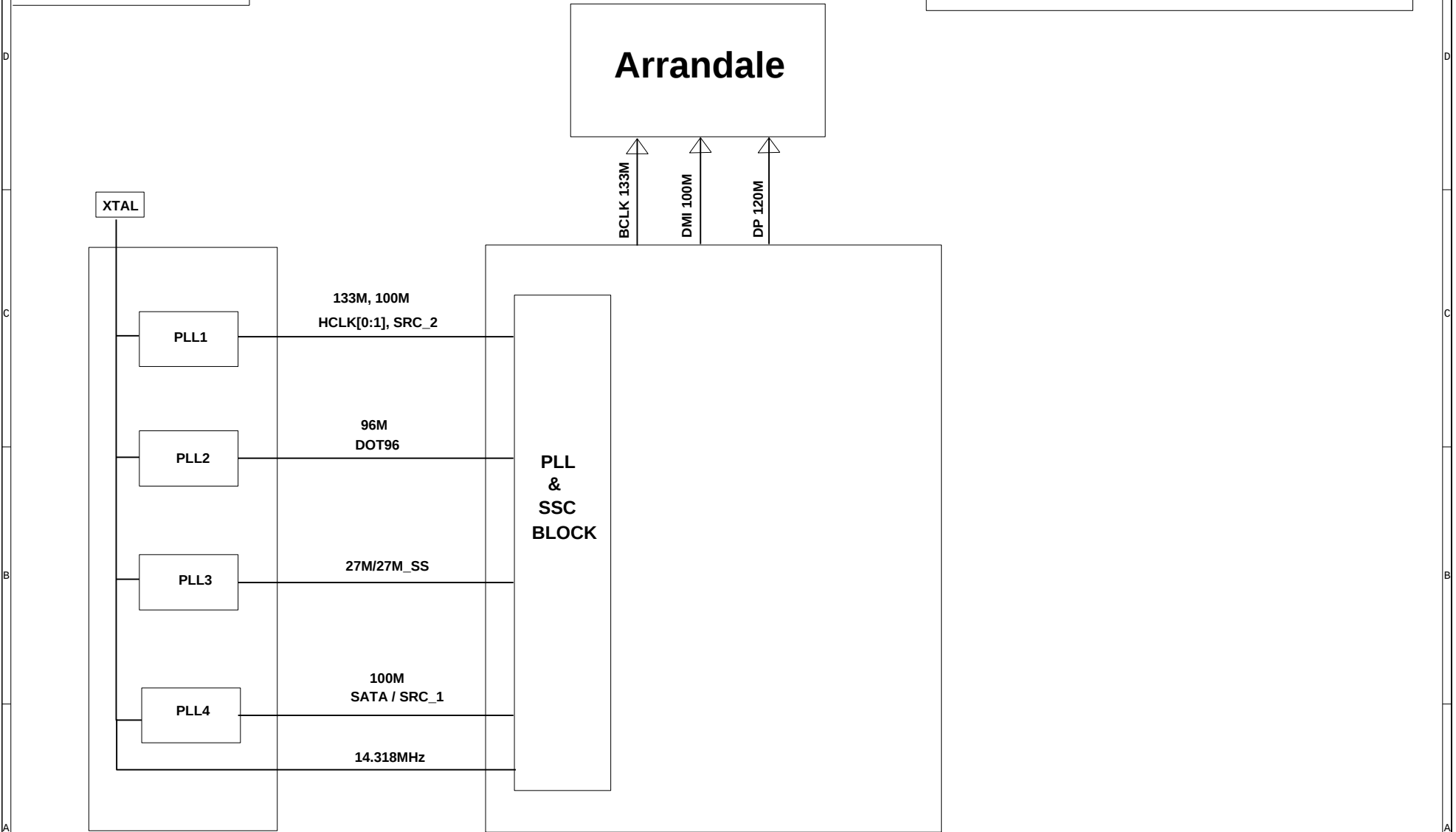
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CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	4	OF 54

PRELIMINARY

POWER SEQUENCE Rev. 0.5



DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 UNDEFINED PWR SEQUENCE	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV			PART NO.
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MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	5	OF 54

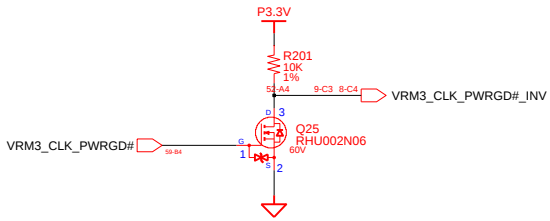
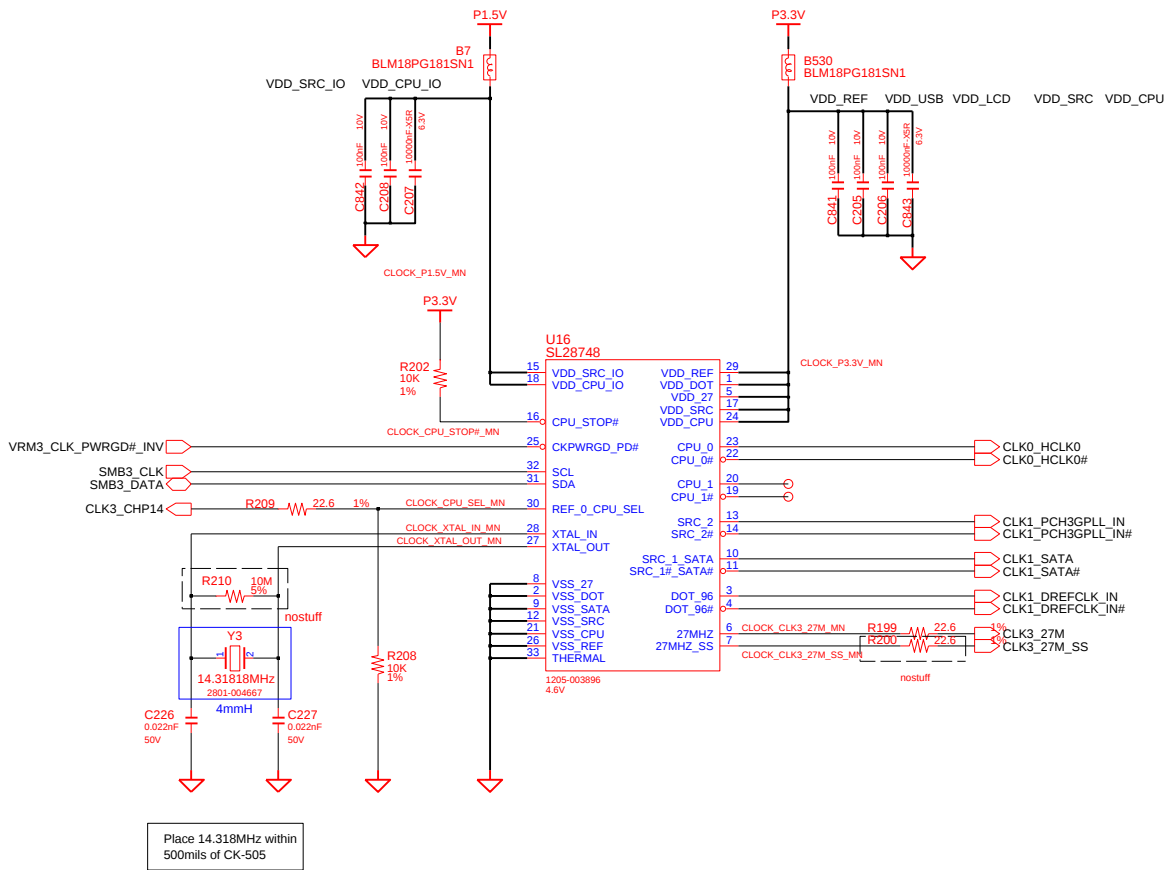


DRAWN	MS Yang	DATE	1/26/2010	BREMEN2 MAIN CLOCK DIAGRAM		SAMSUNG ELECTRONICS PART NO. BA41-	
CHECK	SE Lee	DEV. STEP	ADV				
APPROVAL	MK Kim	REV	REV 0.1				
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM		PAGE	6 OF 54

CK505M SHRINK VERSION

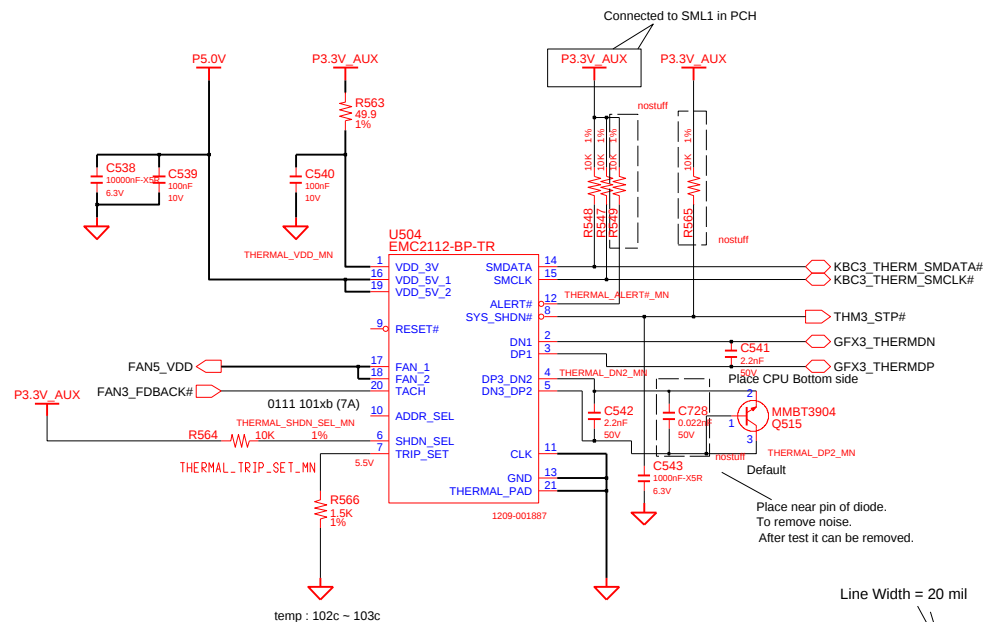
CPU_MODE SEL

Pin 30	CPU_0	CPU_1
CPU_SEL = 0	133MHz	133MHz



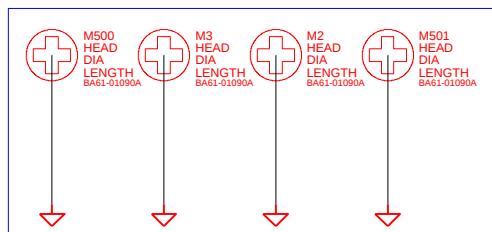
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APPROVAL	MK Kim	REV	REV 0.1					
				PART NO.	BA41-			
MODULE CODE	undefined	LAST EDIT			March 06, 2010 17:48:35 PM	PAGE	7	OF 54

THERMAL SENSOR & FAN CONTROL

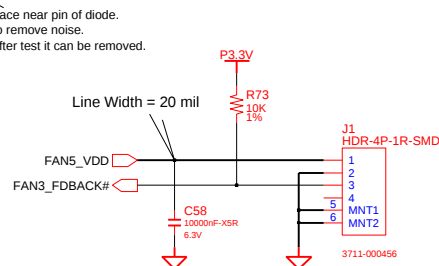


ADDRESSSEL MODE	
0	0101 111xb
✓ HIGH Z	0111 101xb (7A)
1	0101 110xb

SHDN_SEL MODE	
0 HIGH Z	INTEL TR MODE AMD CPU/DIODE MODE
✓ 1	EXT.DIODE 2 MODE



To support heatsink



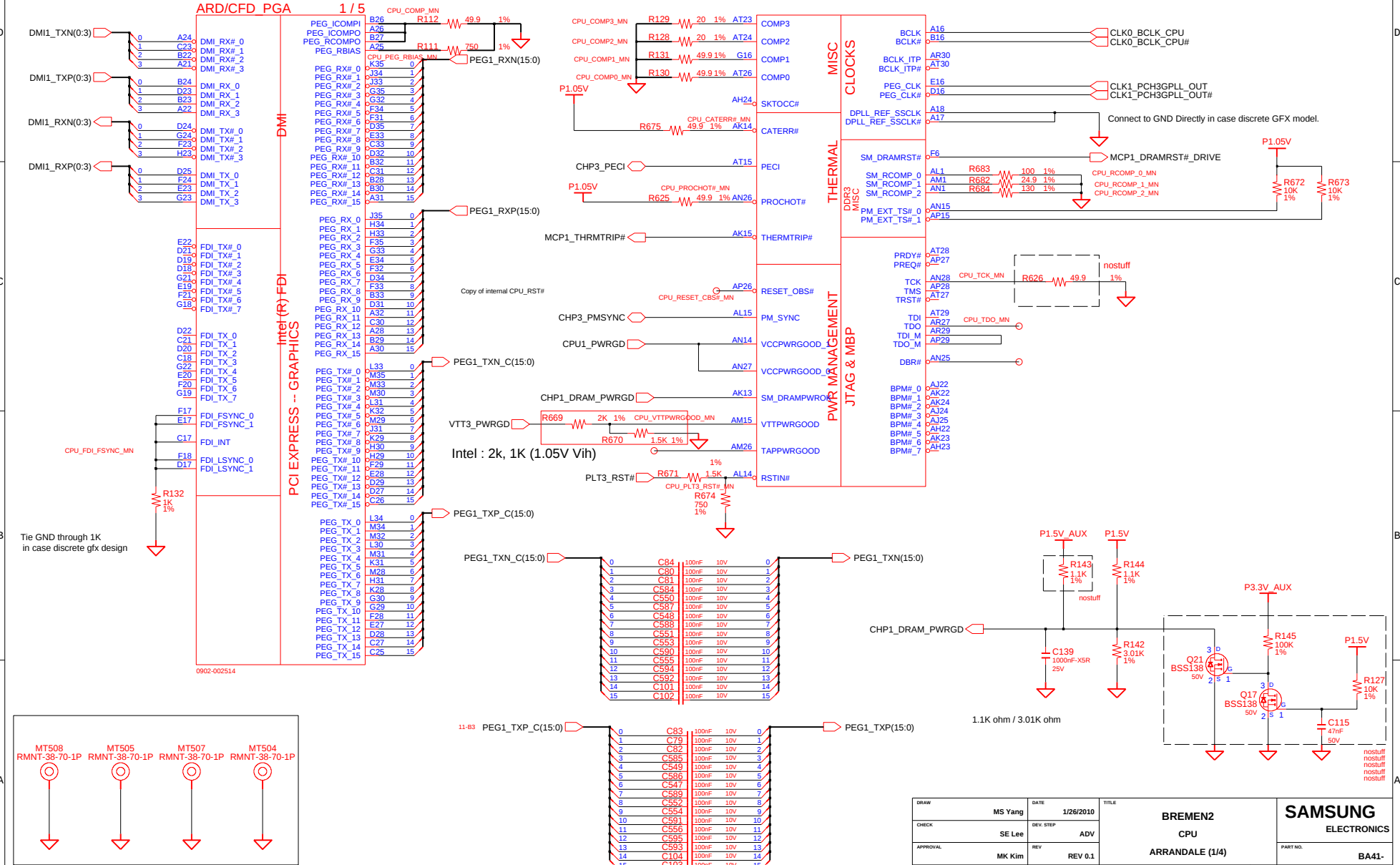
DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 THERMAL SENSOR THERMAL SENSOR G7923	SAMSUNG ELECTRONICS			
CHECK	SE Lee	DEV. STEP	ADV		PART NO.	BA41-		
APPROVAL	MK Kim	REV	REV 0.1					
MODULE CODE	undefined		LAST EDIT					March 06, 2010 17:48:35 PM
					PAGE	8	OF	54

ARRANDALE PROCESSOR (DMI,PEG, FDI)

CPU1-1

ARD/CFD PGA

1 / 5



0902-002514

CPU mount

DATE	12/26/2010	TITLE	BREMEN2	SAMSUNG ELECTRONICS
CHECK	SE Lee	ADV	CPU	
APPROVAL	MK Kim	REV 0.1	ARRANDALE (1/4)	PART NO.
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	BA41-
PAGE	9	OF	54	



Stuff/NoStuff Check ?
(depends on placement)

ALL VTT DECAP IS SHARED

CPU1-3
ARD/CFD PGA

3 / 5

P1.05V

CPU1-4
ARD/CFD PGA

4 / 5

ADD 1K PD in discrete GFX design

GRAPHICS

POWER
1.5V RAILS

1.1V

PEG & DMI

8V

0902-002514

VTT_SEL	VOLTAGE	CPU
1	P1.05V	ARRANDALE
0	P1.1V	CLARKS FIELD

VTT SEL signal (for CFD/ARD shared) CPU CORE

CPU CORE

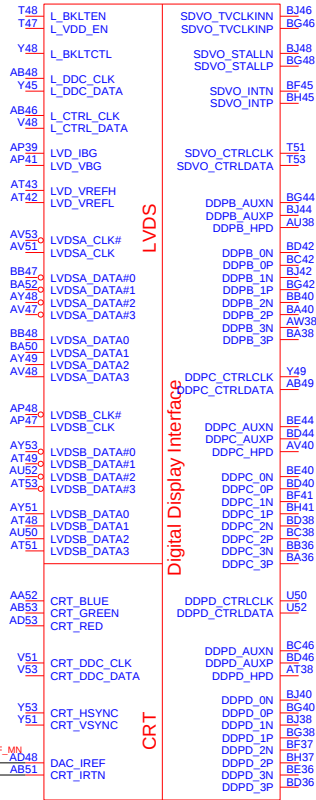
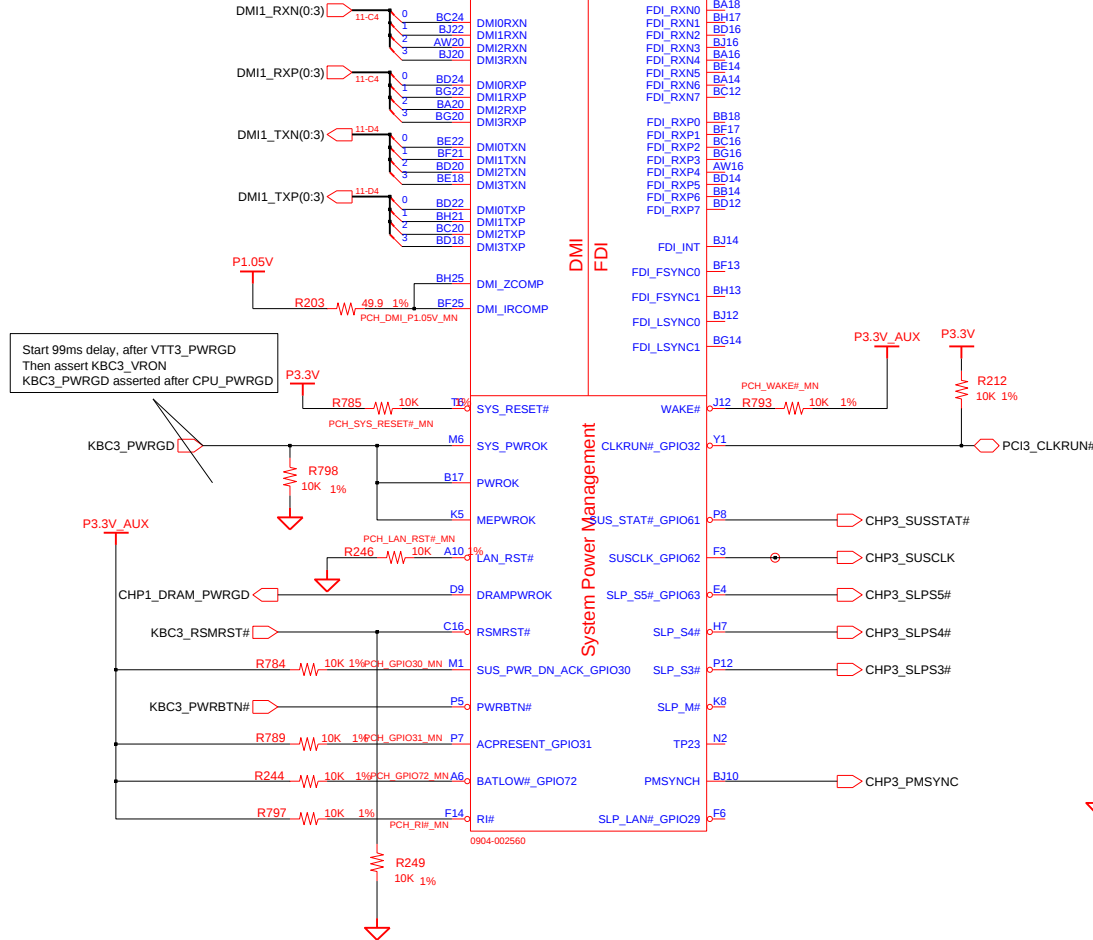
MON |

DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 CPU	SAMSUNG ELECTRONICS
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APPROVAL	MK Kin	REV	REV 0.1			
MODULE CODE	LAST EDIT					
					ARRANGE (3/4)	PART NO. BA41-



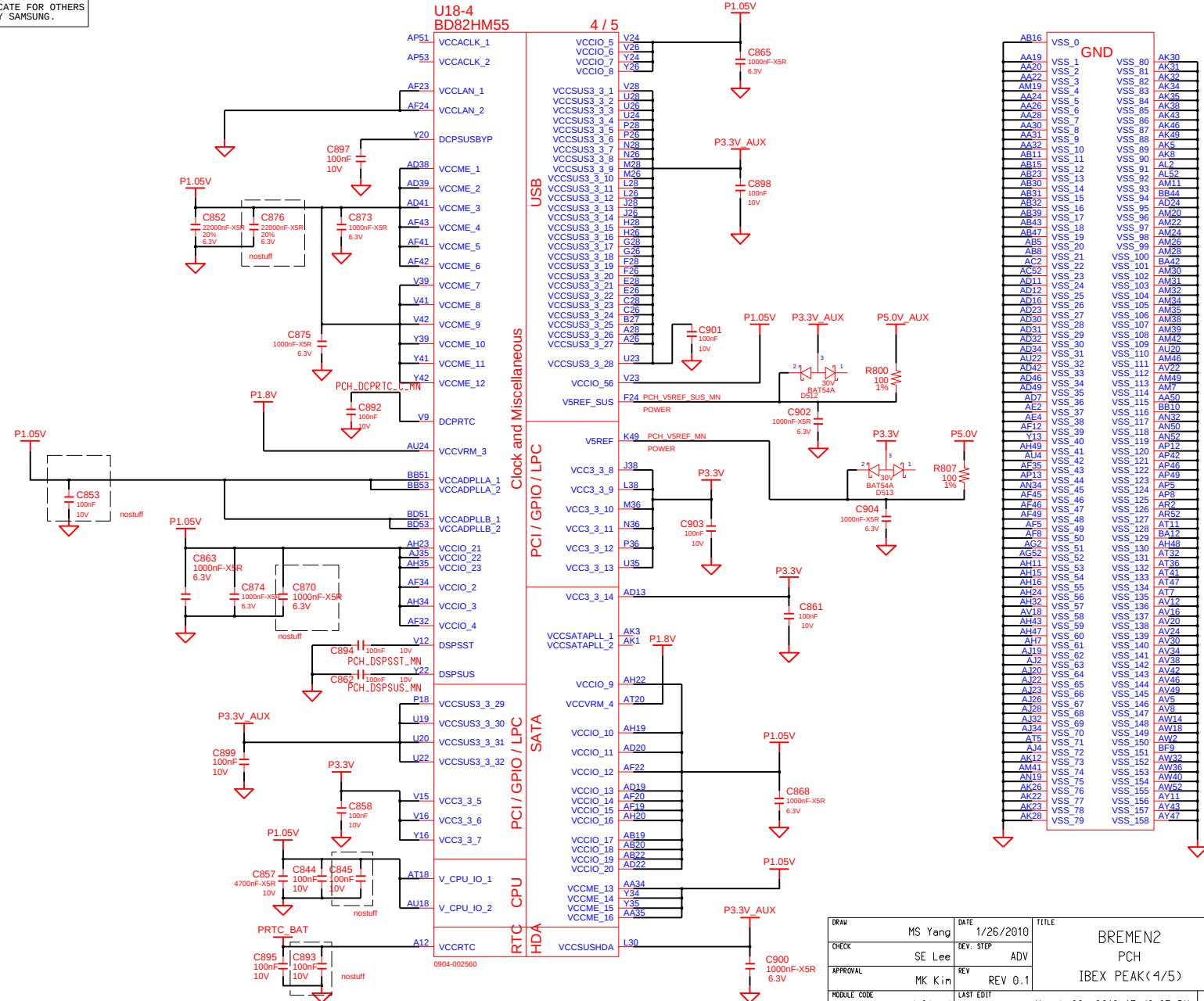
U18-2
BD82HM55

2 / 5



DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 PCH IBEX PEAK(2/5)	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE		LAST EDIT				
March 06, 2010 17:48:35 PM						PAGE 16 OF 54

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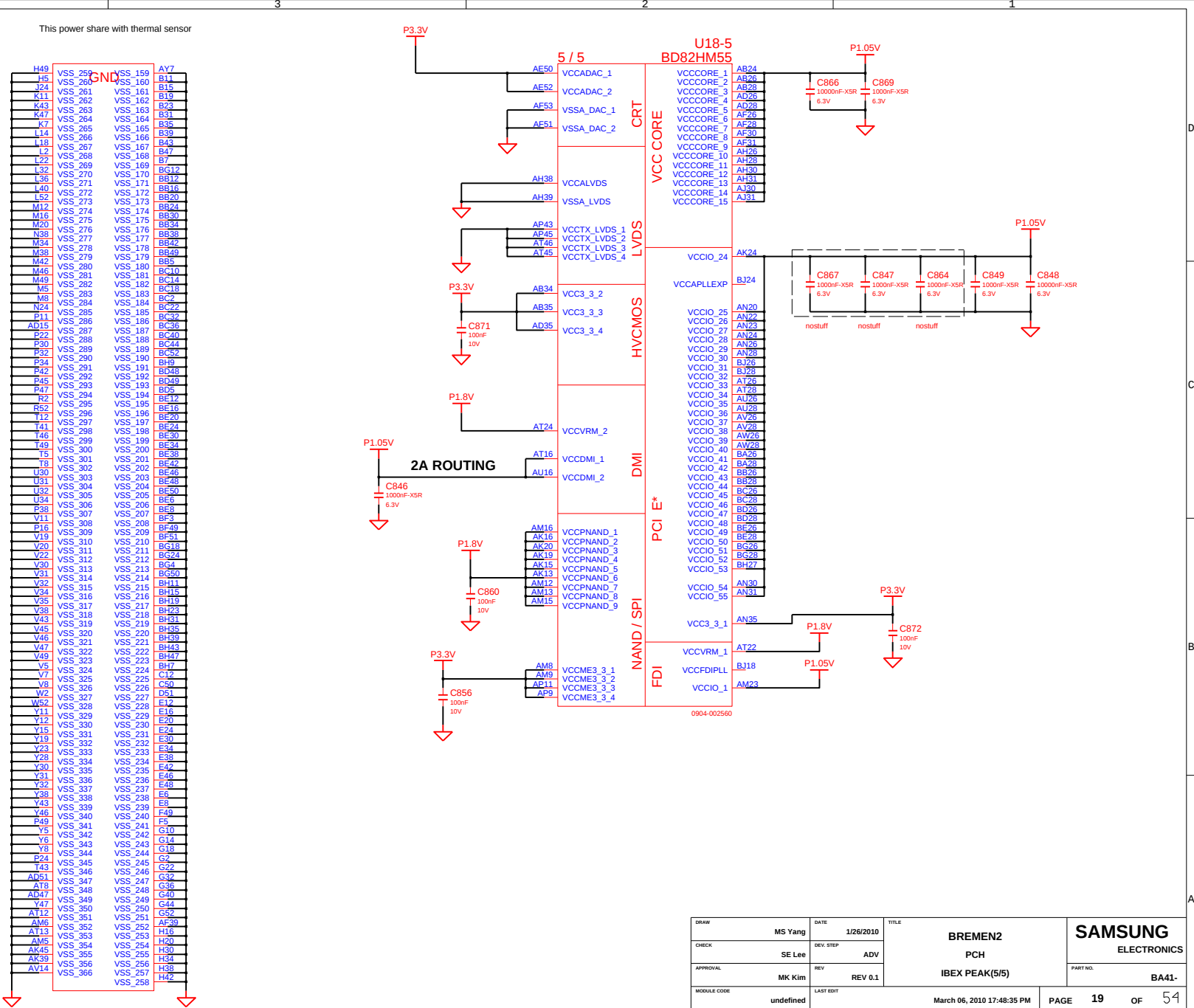
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CHECK	SE Lee	DEV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1		PART NO.	BA41-
MODULE CODE	undefined	LAST EDIT			March 06, 2010 17:48:35 PM	PAGE 18 OF 601

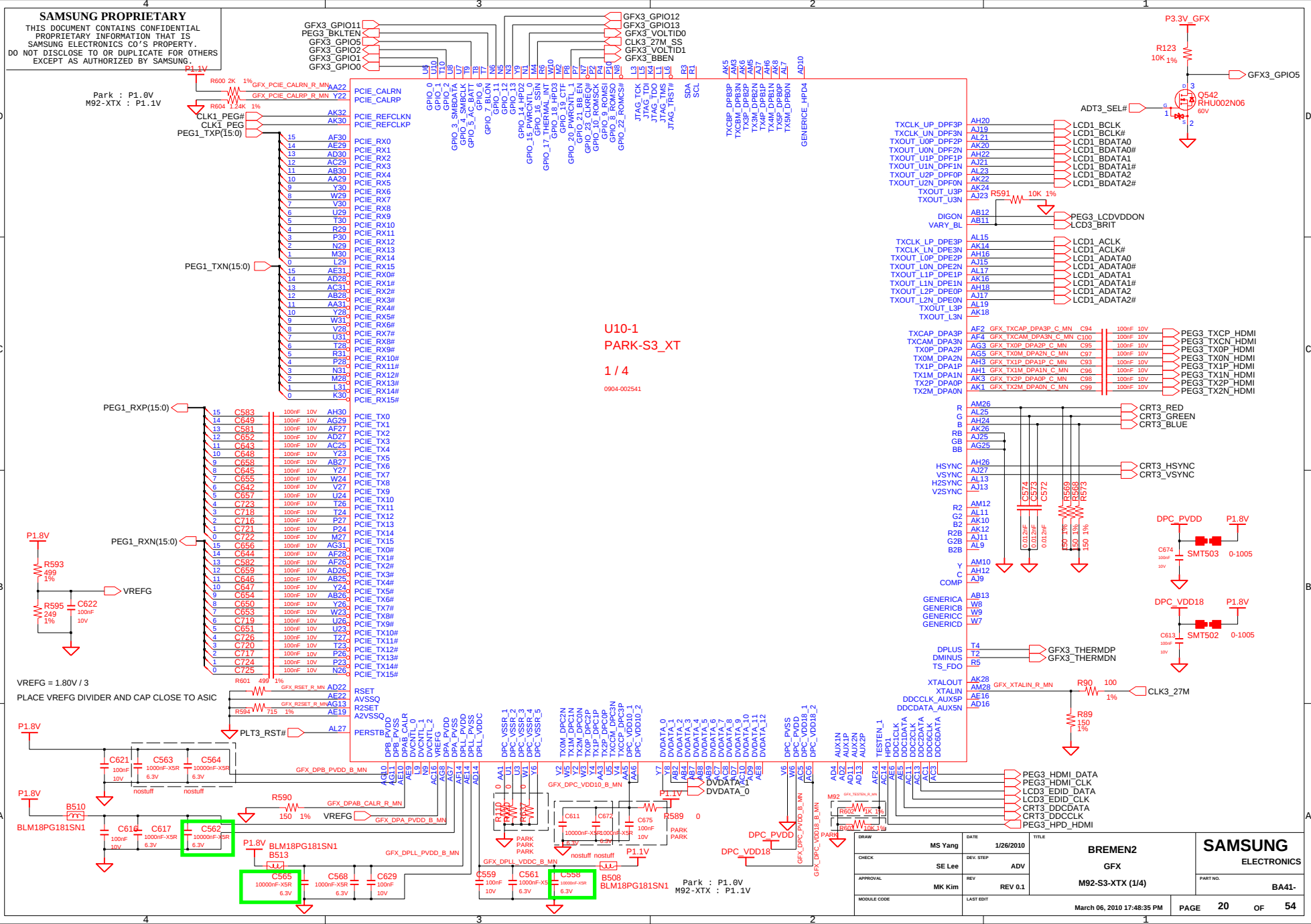
D

C

B

A

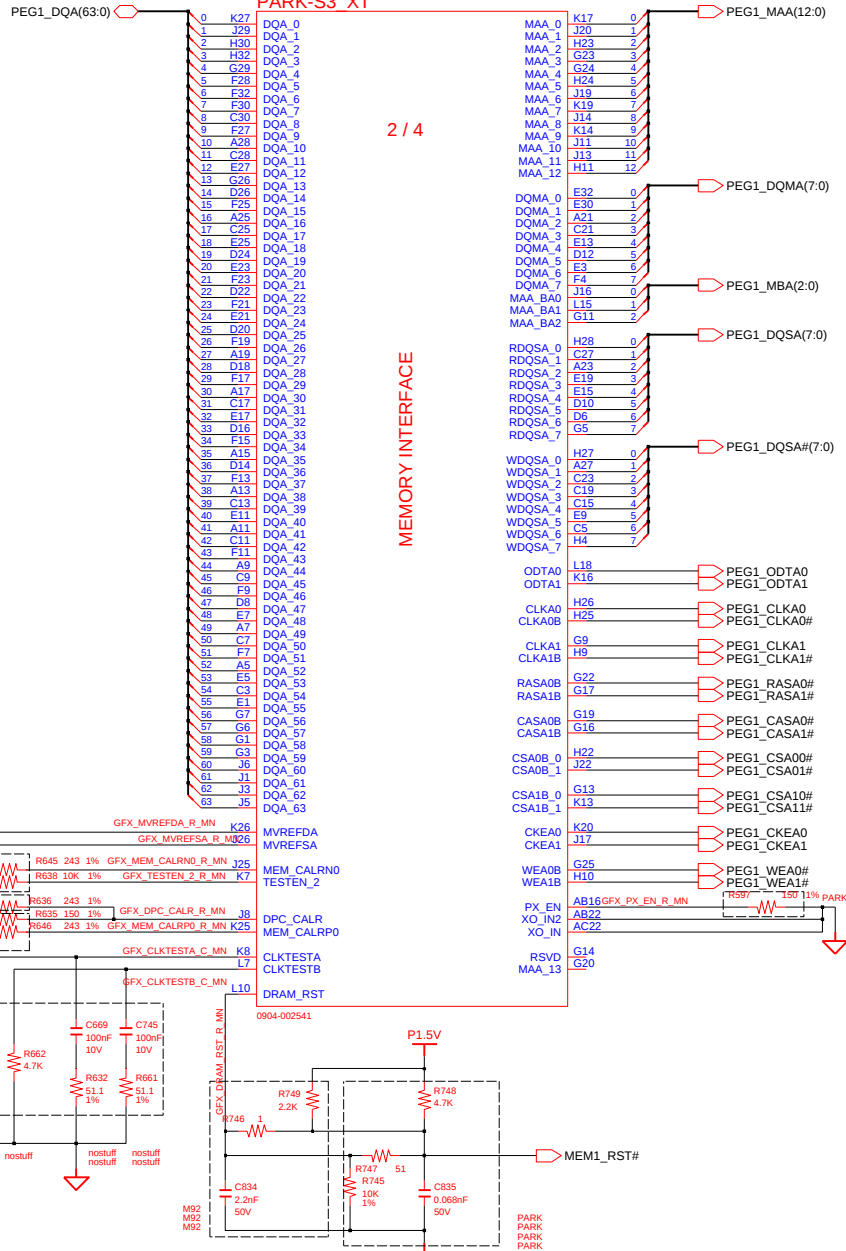




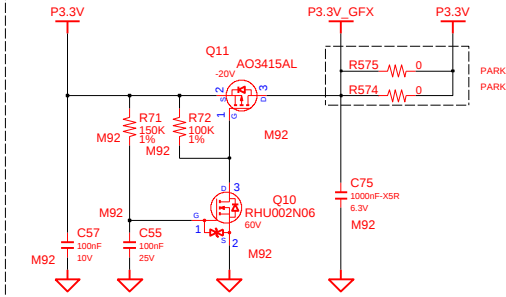
U10-2
PARK-S3_XT

2 / 4

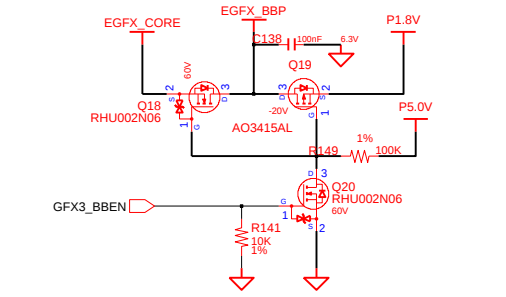
MEMORY INTERFACE



P3.3V_GFX CONTROL CIRCUIT FOR M92



BACK BIAS LOGIC FOR M92



DATE	1/26/2010	TITLE	BREMEN2 GFX M92-S3-XTX (2/4)	SAMSUNG ELECTRONICS
CHECK	MS Yang	REV. STEP	ADV	PART NO.
APPROVAL	SE Lee	REV	REV 0.1	BA41-
MODULE CODE	MK Kim	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE 21 OF 54

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Park : P1.0V
M92-XTX : P1.1V

P1.1V
B517
BLM18PG181SN1

P1.8V
B509
BLM18PG181SN1

P1.8V

BLM18PG181SN1
B520

P1.8V

C624
10000nF-XSR
6.3V

C604
10000nF-XSR
6.3V

P1.5V

BLM18PG181SN1
B529

C76
10000nF-XSR
6.3V

C78
10000nF-XSR
6.3V

C77
100nF
10V

EGFX_CORE

P1.1V
B527
BLM18PG181SN1

Park : P1.0V
M92-XTX : P1.1V

C747
10000nF-XSR
6.3V

C748
100nF
10V

EGFX_CORE

P1.8V
B521
BLM18PG181SN1

C676
10000nF-XSR
6.3V

C746
100nF
10V

C684
10000nF-XSR
6.3V

C685
100nF
10V

R598
150

AF10

0904-002541

U10-3

PARK-S3 XT

MEM I/O
H13
H16
H19
J10
J23
J24
J39
K10
K23
K24
K9
L11
L12
L13
L14
L20
L21
L22
VDDR1_1
VDDR1_2
VDDR1_3
VDDR1_4
VDDR1_5
VDDR1_6
VDDR1_7
VDDR1_8
VDDR1_9
VDDR1_10
VDDR1_11
VDDR1_12
VDDR1_13
VDDR1_14
VDDR1_15
VDDR1_16
VDDR1_17

AG20
AG21
AG15
AG16
AF16
AF17
AF22
AG22
DPE_VDD10_1
DPE_VDD10_2
DPE_VDD18_1
DPE_VDD18_2
DPF_VDD18_1
DPF_VDD18_2
DPF_VDD10_1
DPF_VDD10_2

LEVEL
TRANSLATION
VDD_CT_1
VDD_CT_2
VDD_CT_3
VDD_CT_4

I/O
VDDR3_1
VDDR3_2
VDDR3_3
VDDR3_4

DVCLK
VDDR4_1
VDDR4_2
VDDR4_3

NC_1
NC_2
NC_3
NC_4

MEM CLK
NC_VDDRHA
NC_VSSRHA

BIF_VDDC_1
BIF_VDDC_2

PLL
PCIE_PVDD
MPV18

SPV18
SPV10
SPVSS

BACK BIAS
NC_BBP_1
NC_BBP_2

DPEF_CALR

3 / 4

POWER

PCIE

DAC

AVDD

A2VDD

A2VDDQ

VDD1DI

VDD2DI

THEM

TSVDD

CORE

VDDC_1

VDDC_2

VDDC_3

VDDC_4

VDDC_5

VDDC_6

VDDC_7

VDDC_8

VDDC_9

VDDC_10

VDDC_11

VDDC_12

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VDDC_230

VDDC_231

VDDC_232

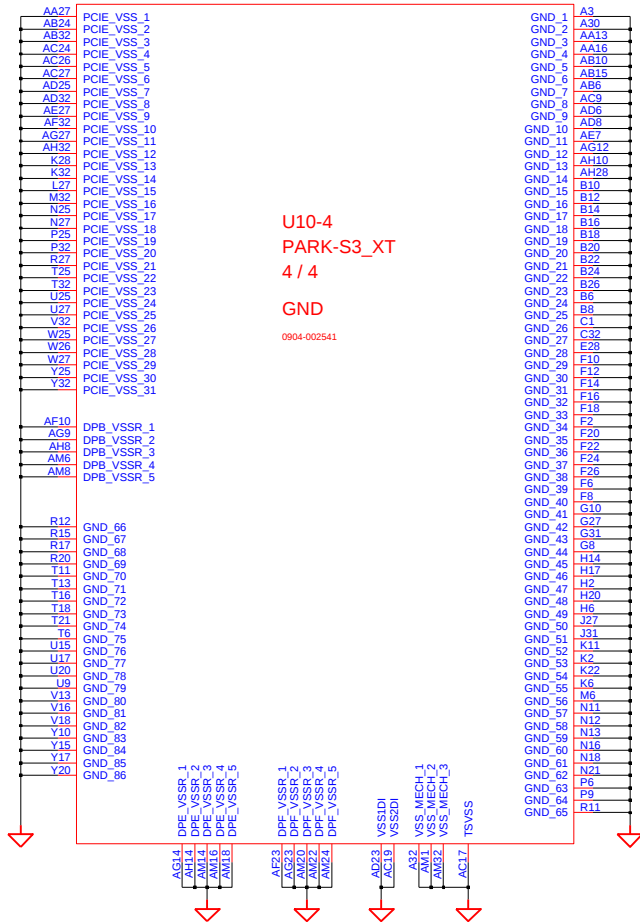
VDDC_233

VDDC_234

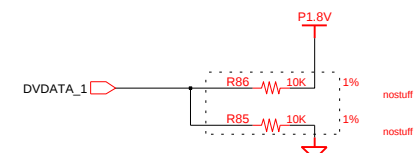
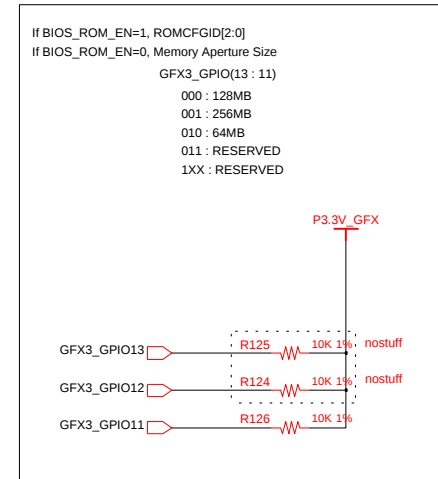
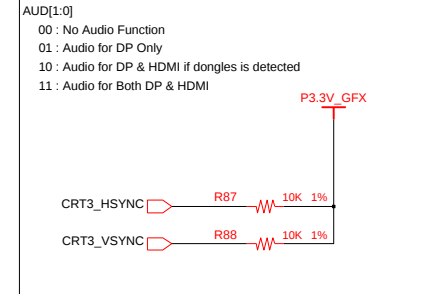
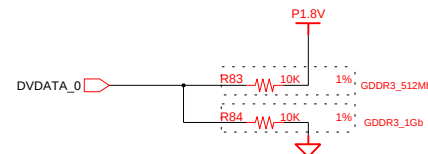
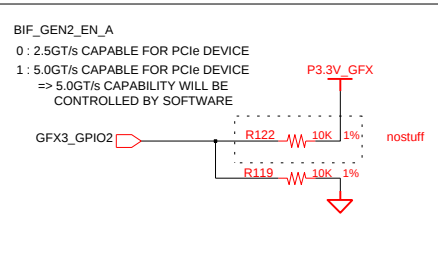
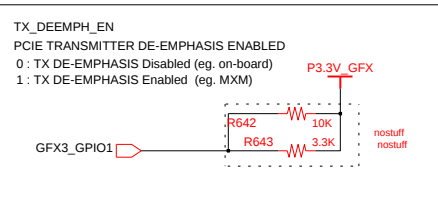
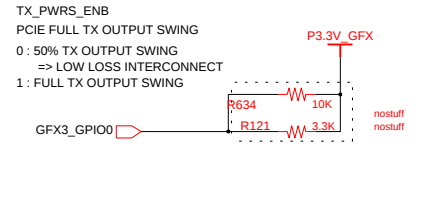
VDDC_235

VDDC_236

VDDC_237

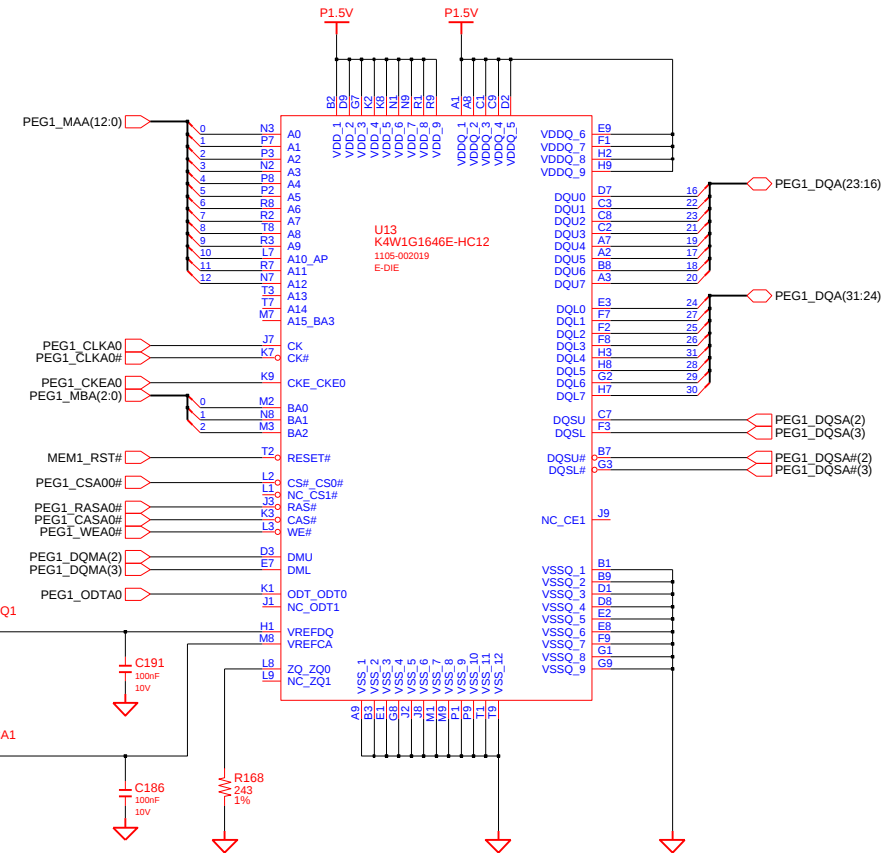
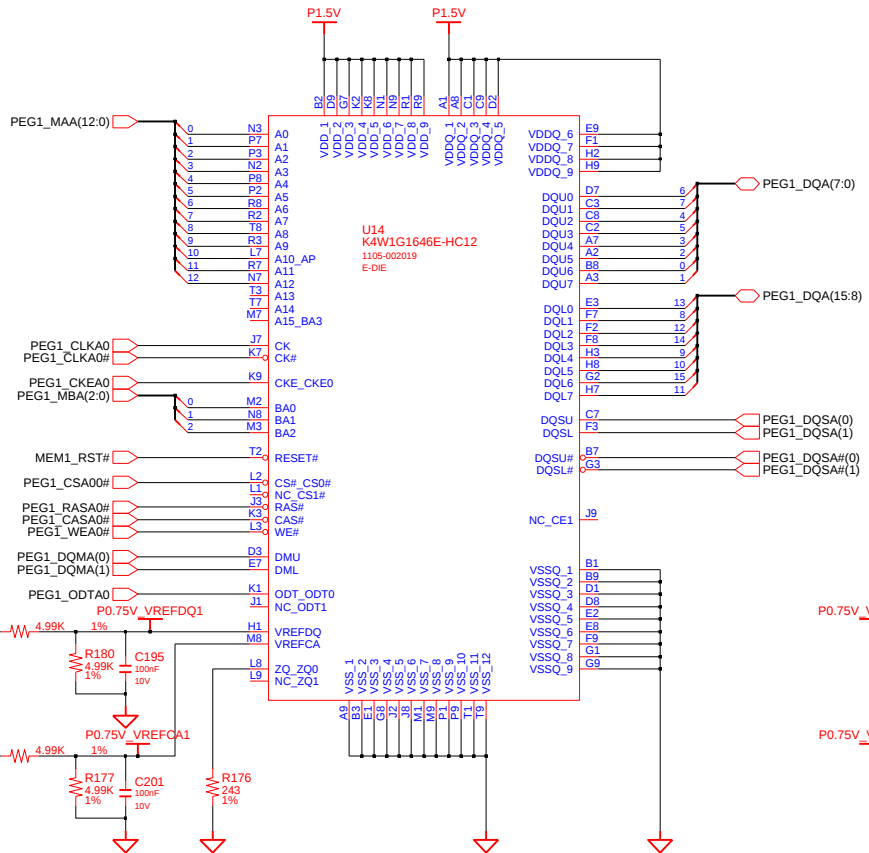


PARK-S3 Straps

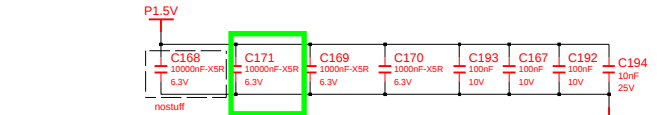


DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 GFX	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1		M92-S3-XTX (4/4)	BA41-
MODULE CODE		LAST EDIT			March 06, 2010 17:48:35 PM	PAGE 23 OF 54

RANK0 Lower Data

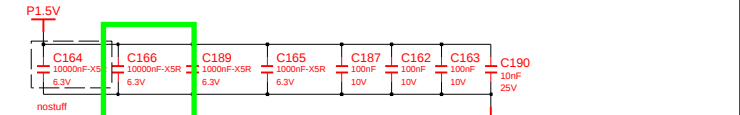
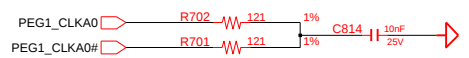


C166 - -> 1000nF, 1608 2203 - 006348



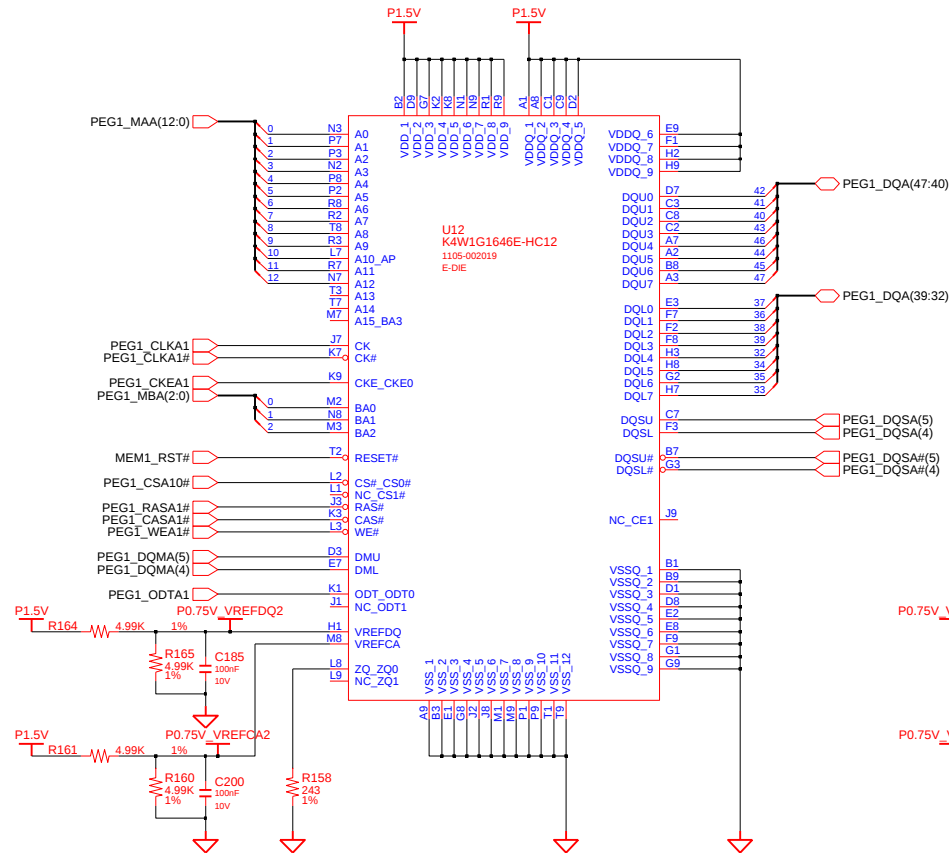
C171 - -> 1000nF, 1608 2203 - 006348

Place near memory component

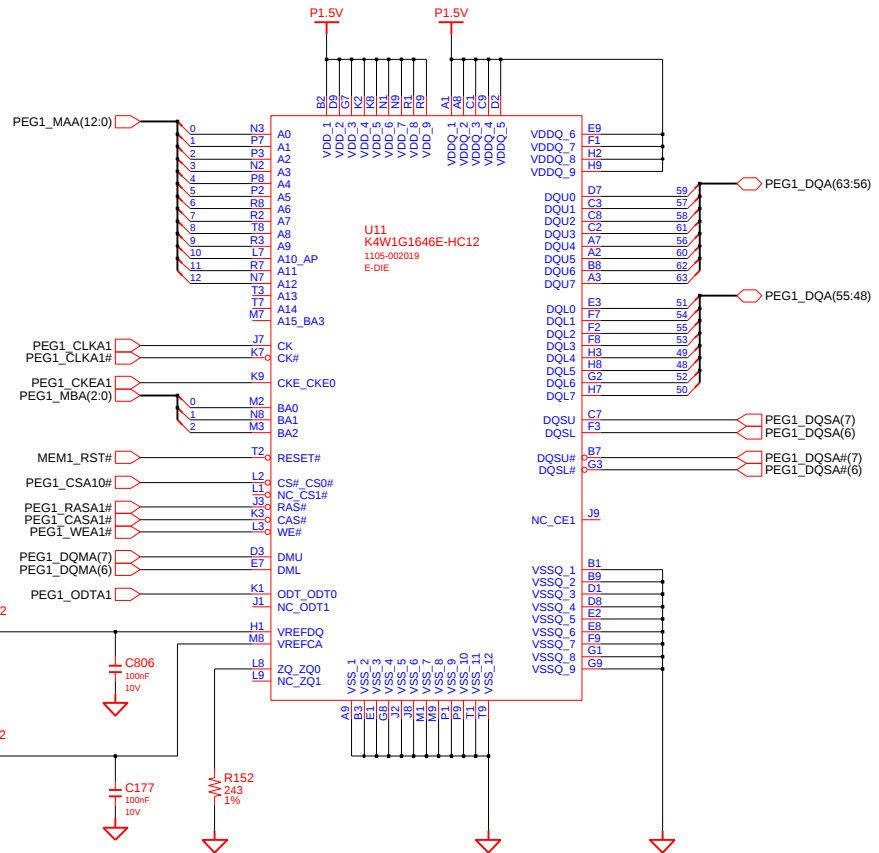
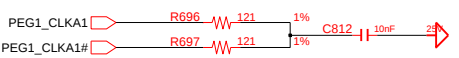
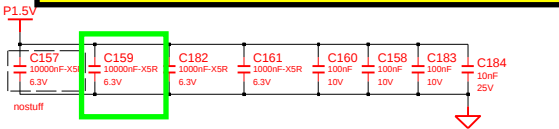


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 EXT_GFX	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV	REV	GDDR3 (1/4)	
APPROVAL	MK Kin	REV	0.1	LAST EDIT		
MODULE CODE						
March 06, 2010 17:48:35 PM						PAGE 24 OF 54

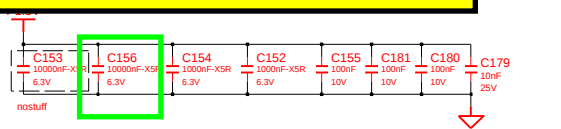
RANK0 Upper Data



C159 - - -> 1000nF, 1608 2203 - 006348

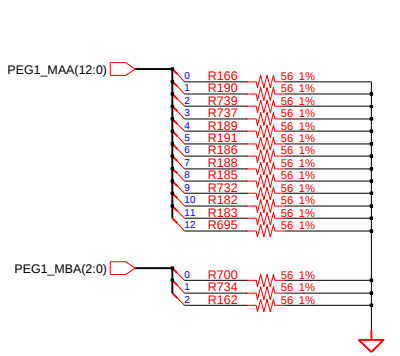
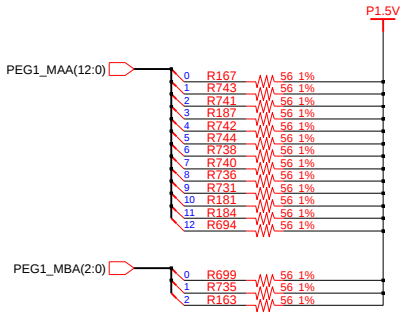
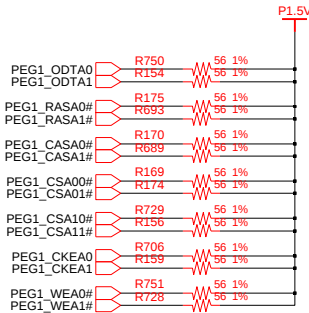
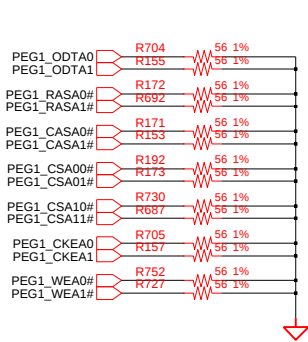


C156 - - -> 1000nF, 1608 2203 - 006348

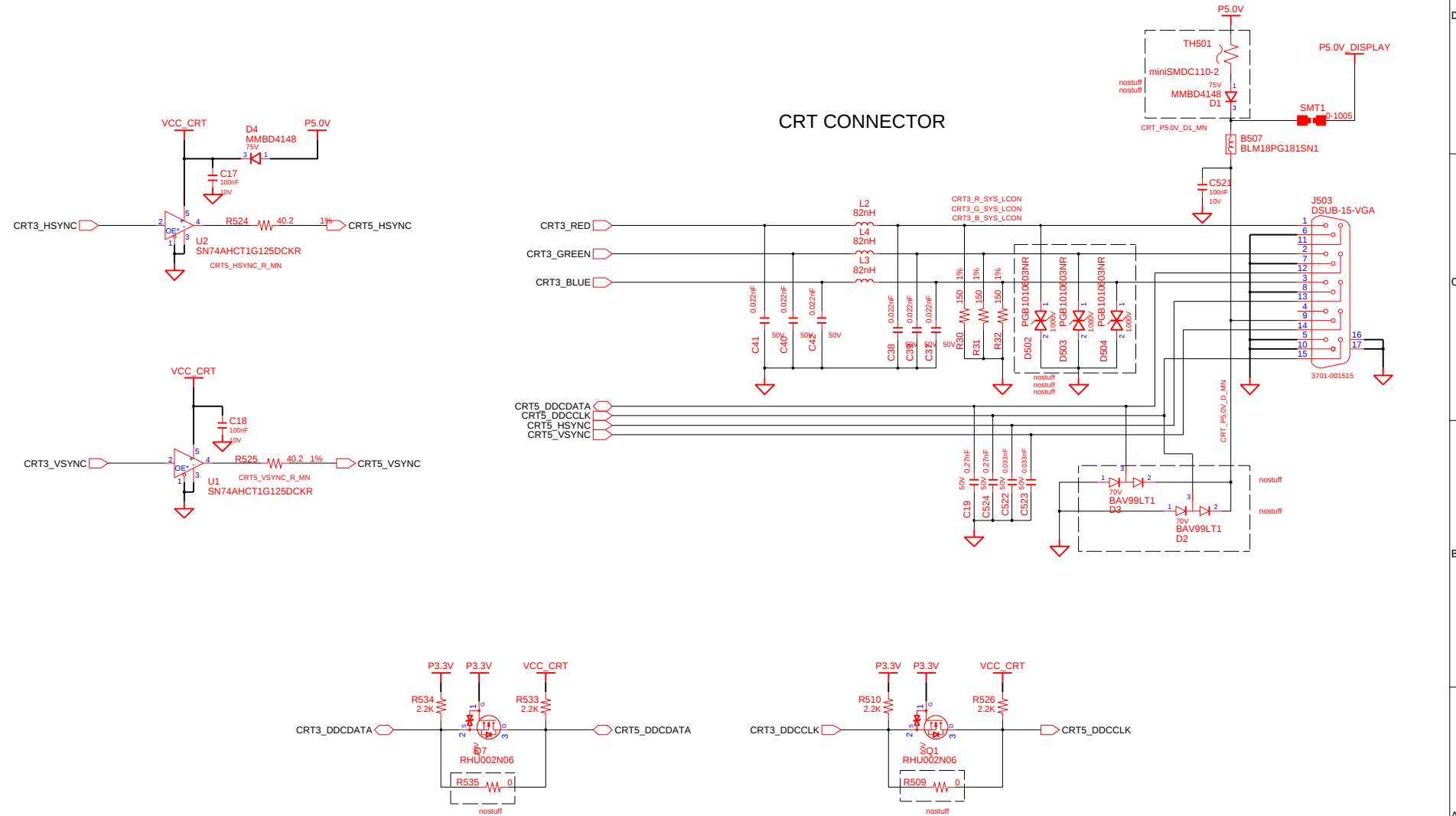


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 EXT_GFX	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV	REV	GDDR3 (2/4)	
APPROVAL	MK Kin	REV	REV 0.1	LAST EDIT		
MODULE CODE						
March 06, 2010 17:48:35 PM						PAGE 25 OF 54

DUAL RANK Terminations



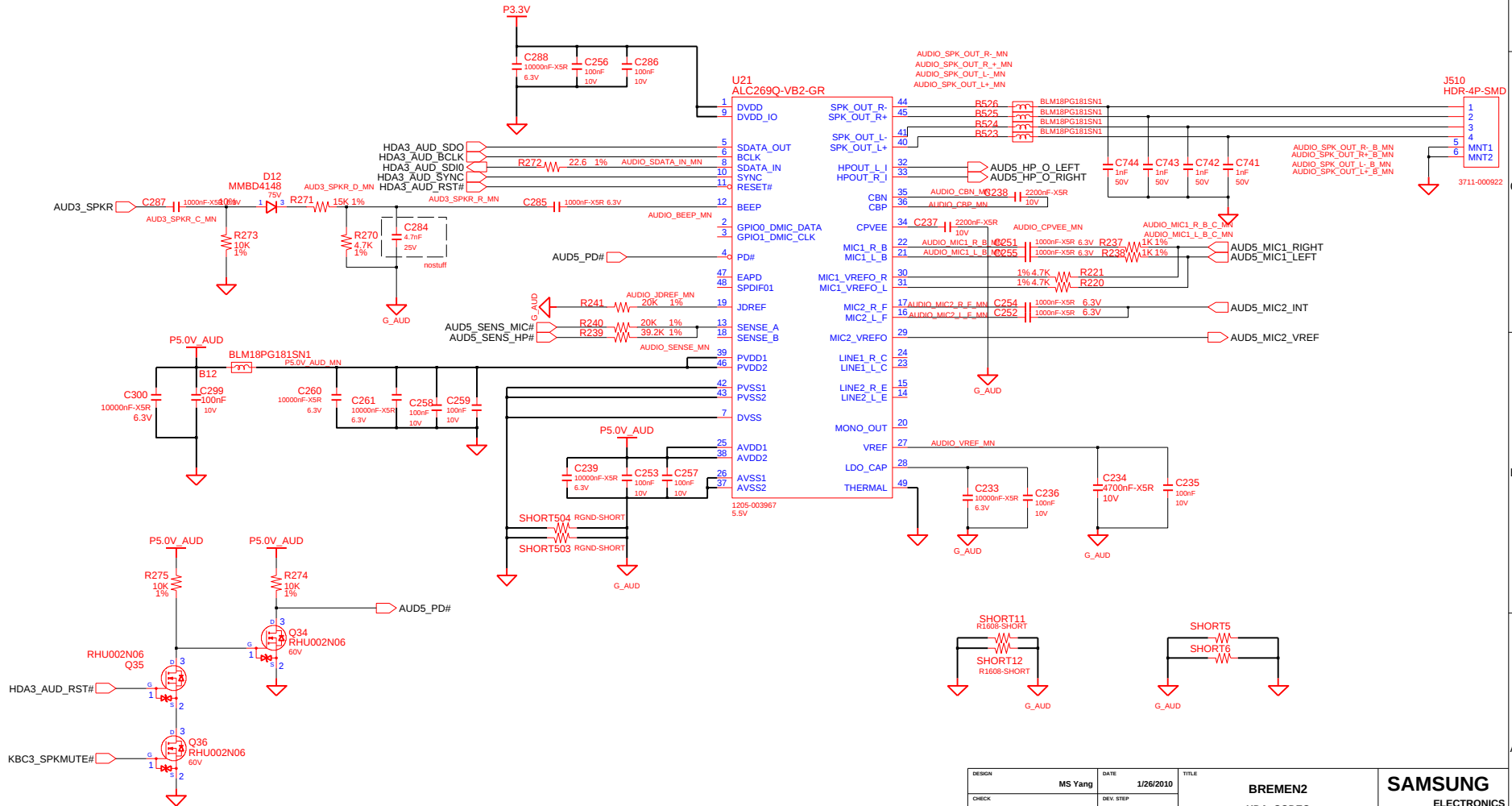
CRT



DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 GRAPHICS_IF	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE		LAST EDIT				
March 06, 2010 17:48:35 PM						PAGE 30 OF 54

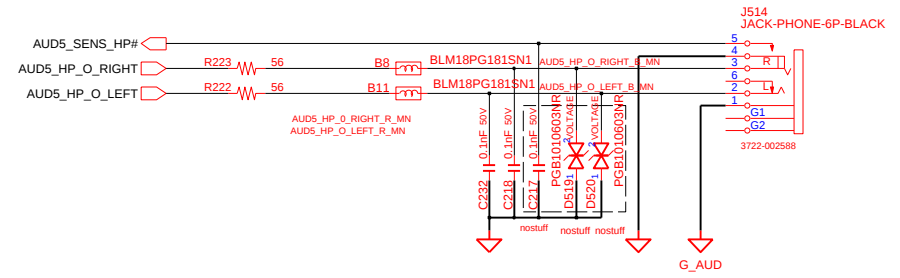
HD AUDIO

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

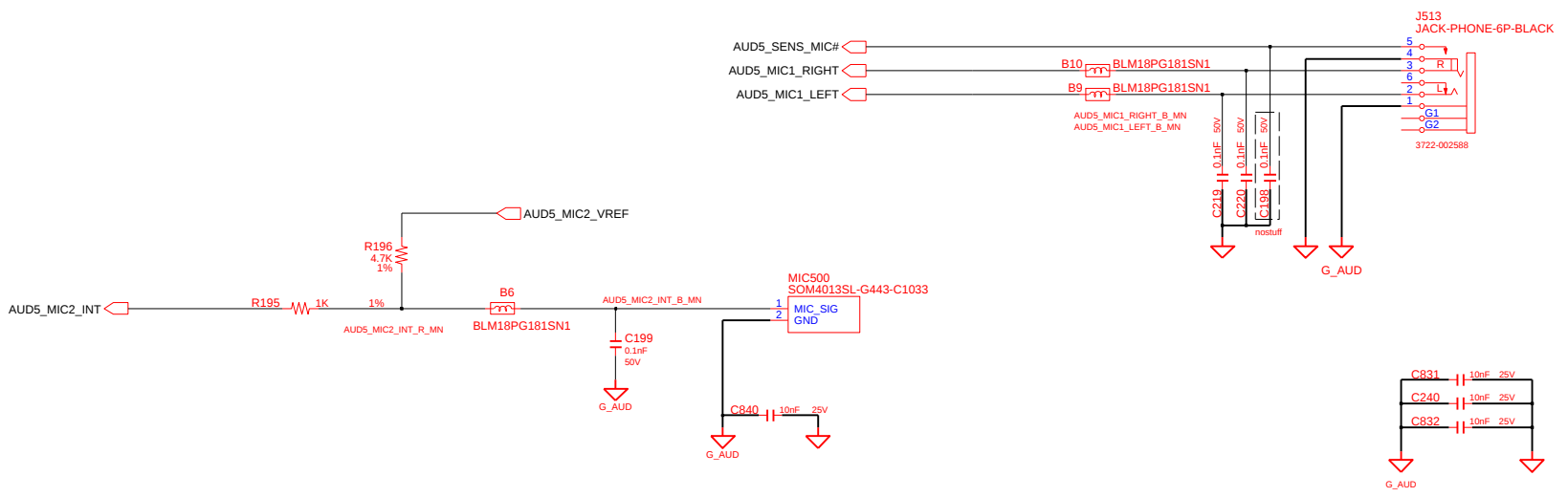


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 HDA_CODEC	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	REV	REV	REV 0.1			
MODULE CODE	undefined	LAST EDIT				
March 06, 2010 17:48:35 PM						PAGE 32 OF 54

HEADPHONE(BLACK)

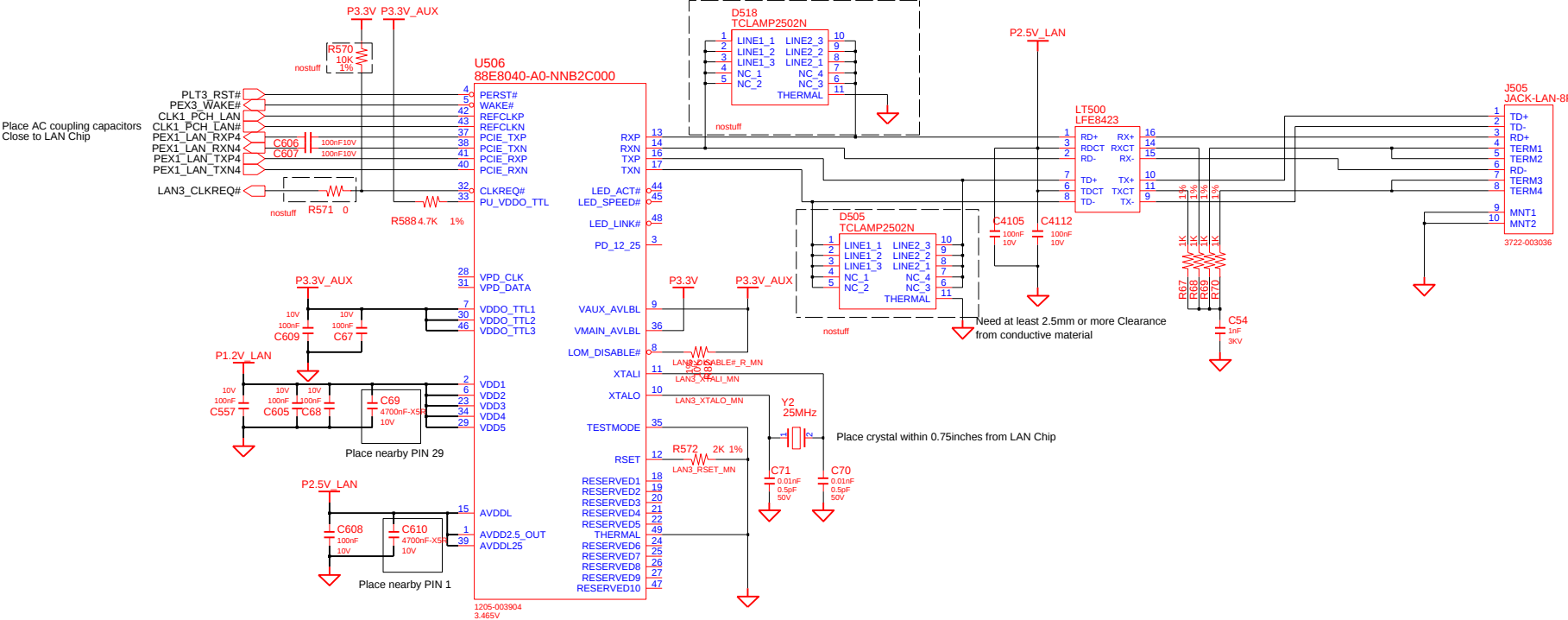


MIC JACK(BLACK)



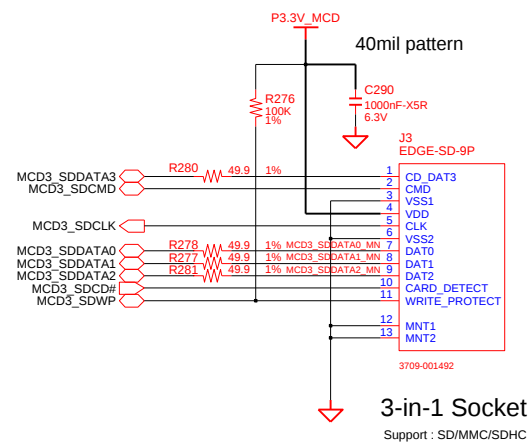
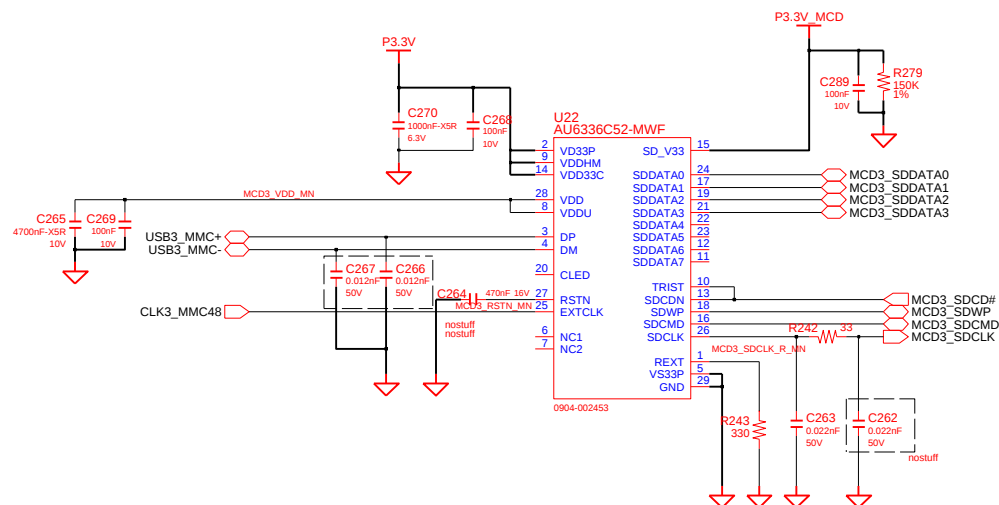
DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 HDA_CODEC AUDIO JACK	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	33	OF 54

LAN Controller (88E8040)



DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 LAN LAN_Marvell_88E8040	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
				PART NO.	BA41-	
MODULE CODE	undefined	LAST EDIT			March 06, 2010 17:48:35 PM	PAGE 34 OF 54

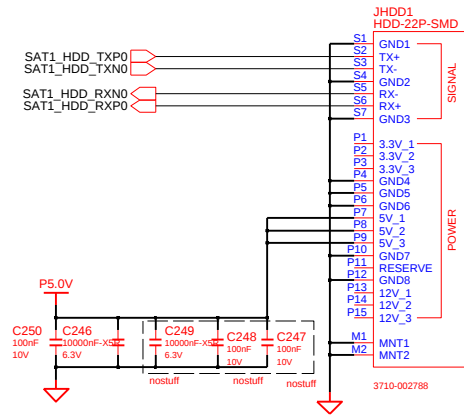
3 IN 1 CARD (AU6336)



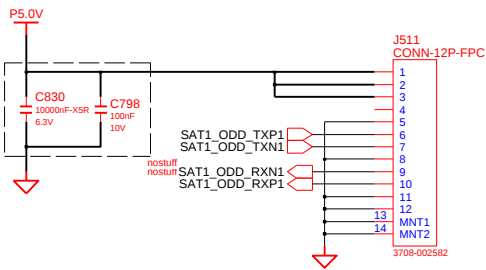
DESIGN	MS Yang	DATE	8/11/2009	BREMEN2 MULTICARD 3 IN 1 CARD(GL827S)	SAMSUNG ELECTRONICS	
CHECK	SE Lee	DEV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1		PART NO.	BA41-
MODULE CODE	LAST EDIT				March 06, 2010 17:48:35 PM	PAGE 35 OF 54

SATA I/F CONN

SATA HDD CONN



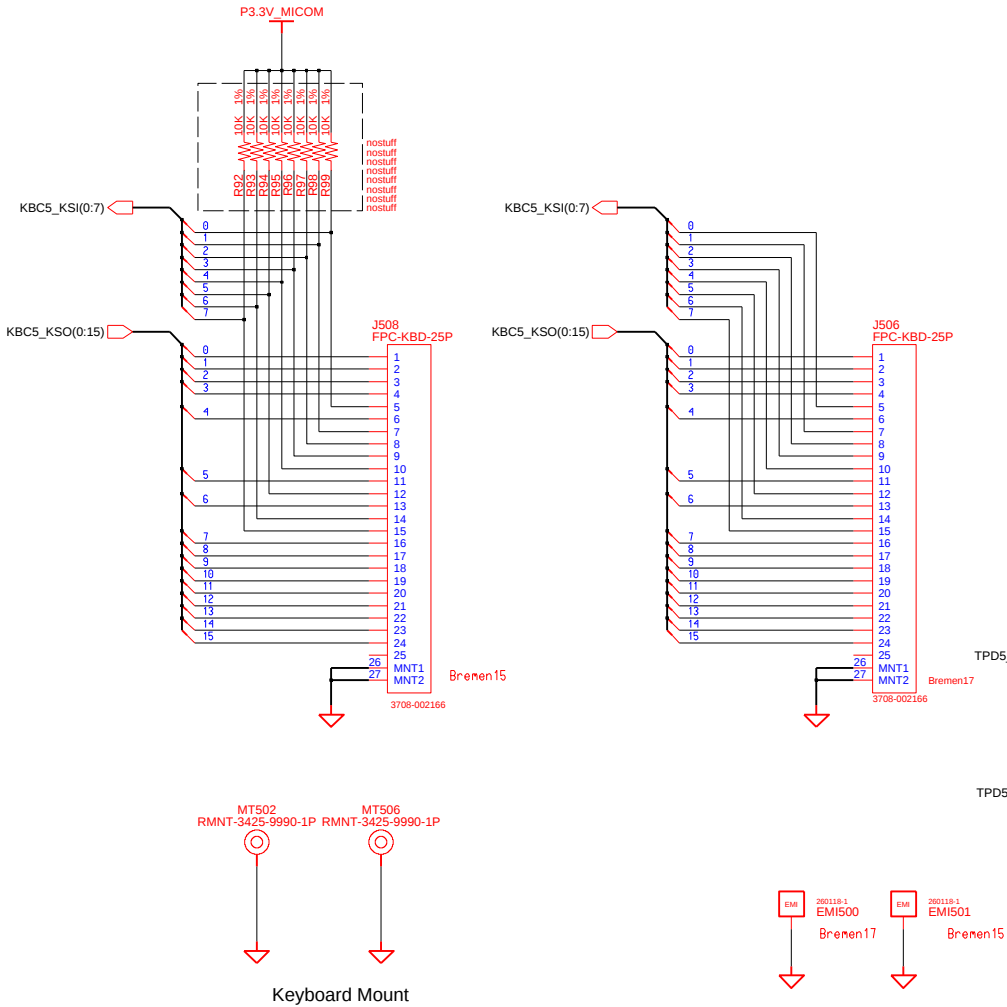
MAIN TO SUB SATA ODD CONN



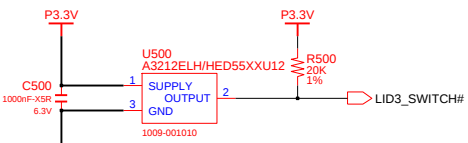
DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 SATA_DEVICES HDD & ODD SUB CONNECTOR	PART NO.	BA41-
CHECK	SE Lee	DEV. STEP	ADV	REV	REV 0.1	PAGE	37
APPROVAL	MK Kim	LAST EDIT	March 06, 2010 17:48:35 PM	OF	54		
MODULE CODE	undefined						

Micom Glue Logic

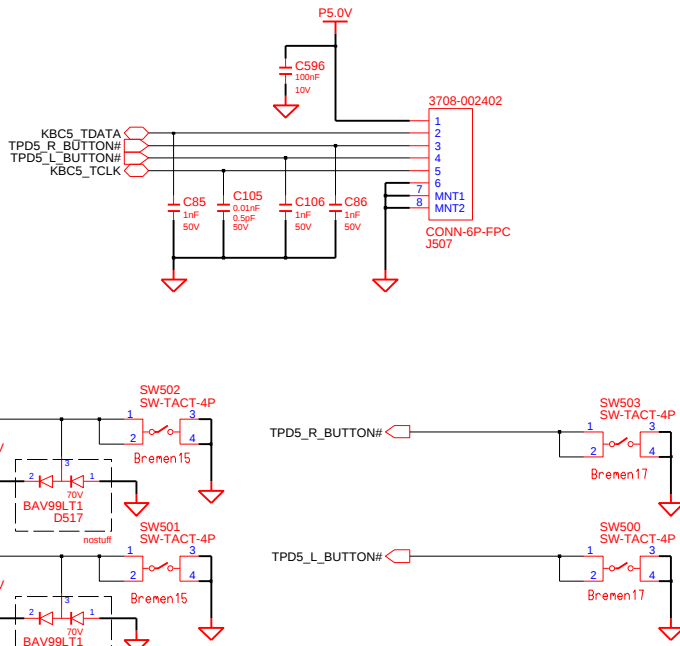
KEYBOARD



LID_SWITCH

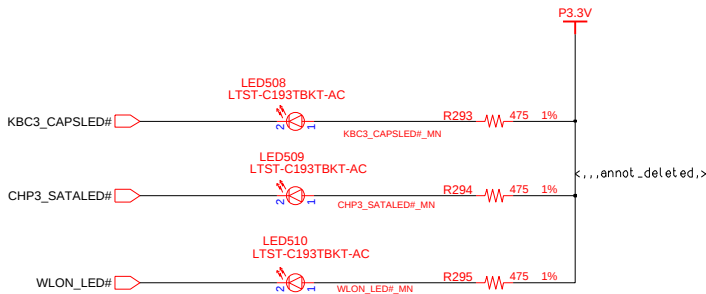


TOUCHPAD

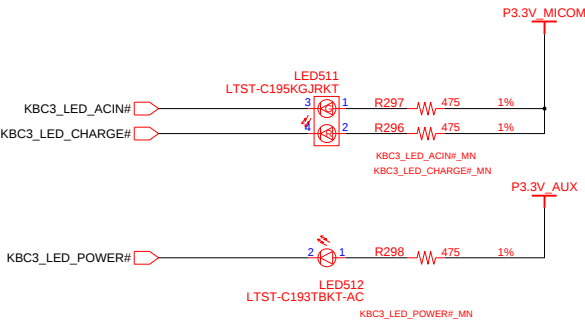


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 MICOM GLUE LOGIC KETBOARD & TOUCHPAD	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV	REV	REV 0.1	PART NO. BA41-
APPROVAL	MK Kim	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	39	OF 54
MODULE CODE	undefined					

FUNCTION KEY LED

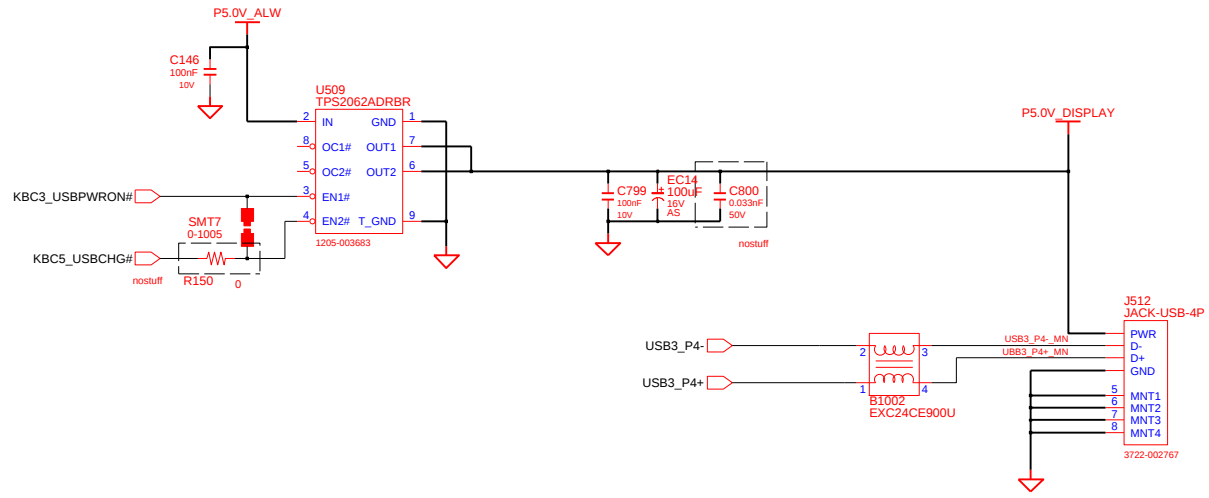


ADAPTERIN/CHARGING LED

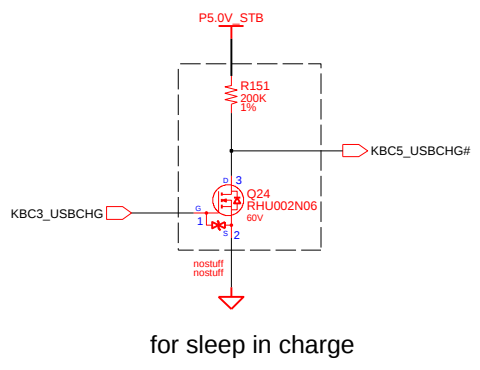
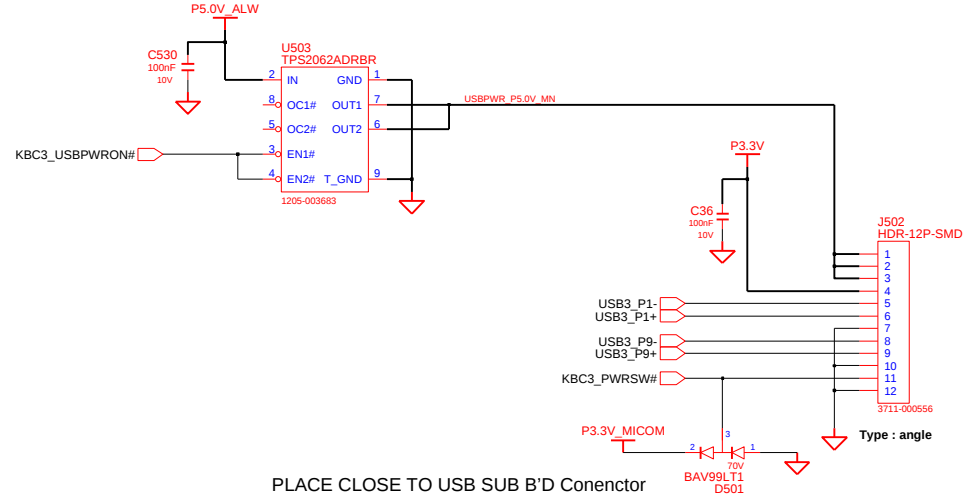


DRAW	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 LED_SWITCH LED_SWITCH	SAMSUNG ELECTRONICS			
CHECK	SE Lee	DEV. STEP	ADV						
APPROVAL	MK Kim	REV	REV 0.1						
						PART NO.	BA41-		
MODULE CODE		LAST EDIT			March 06, 2010 17:48:35 PM	PAGE	40	OF	54

USB Single connector



USB SUB B'D CONNECTOR

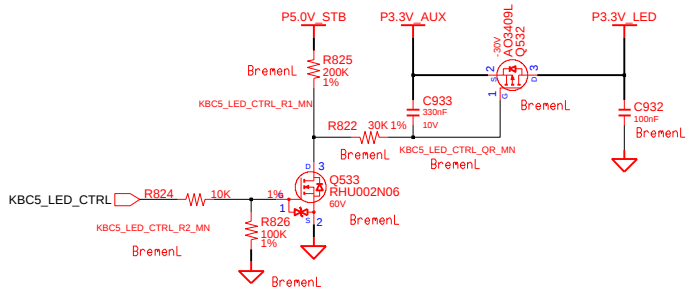
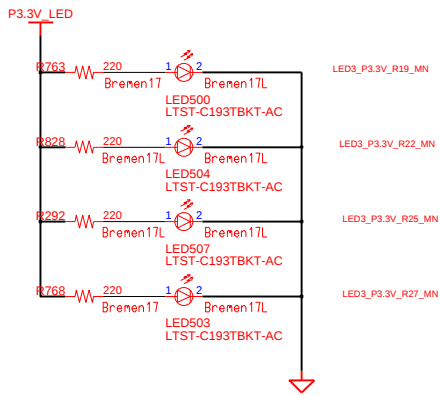
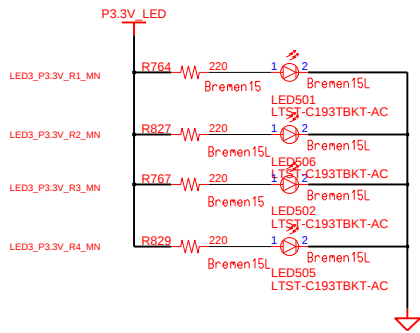


for sleep in charge

PLACE CLOSE TO USB SUB B'D Conenctor

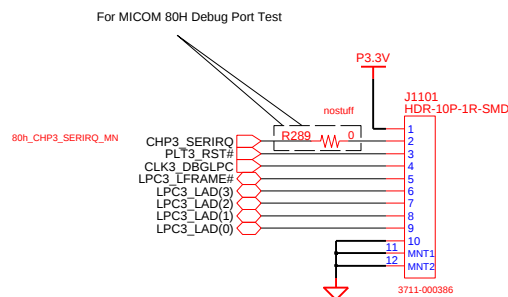
DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 USB_CONN	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1		Single USB	PART NO. BA41-
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	41	OF 54

Touchpad LED

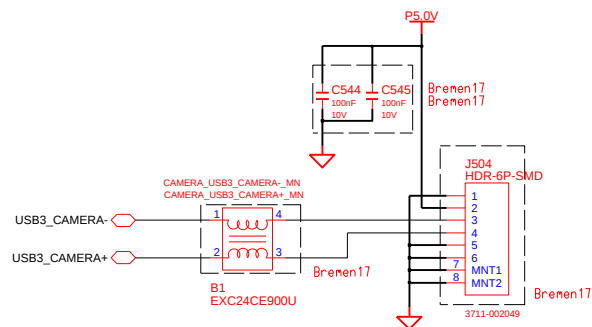


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 TOUCHPAD LED TOUCHPAD LED	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE		LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	42	OF 54

80h PORT DEBUG

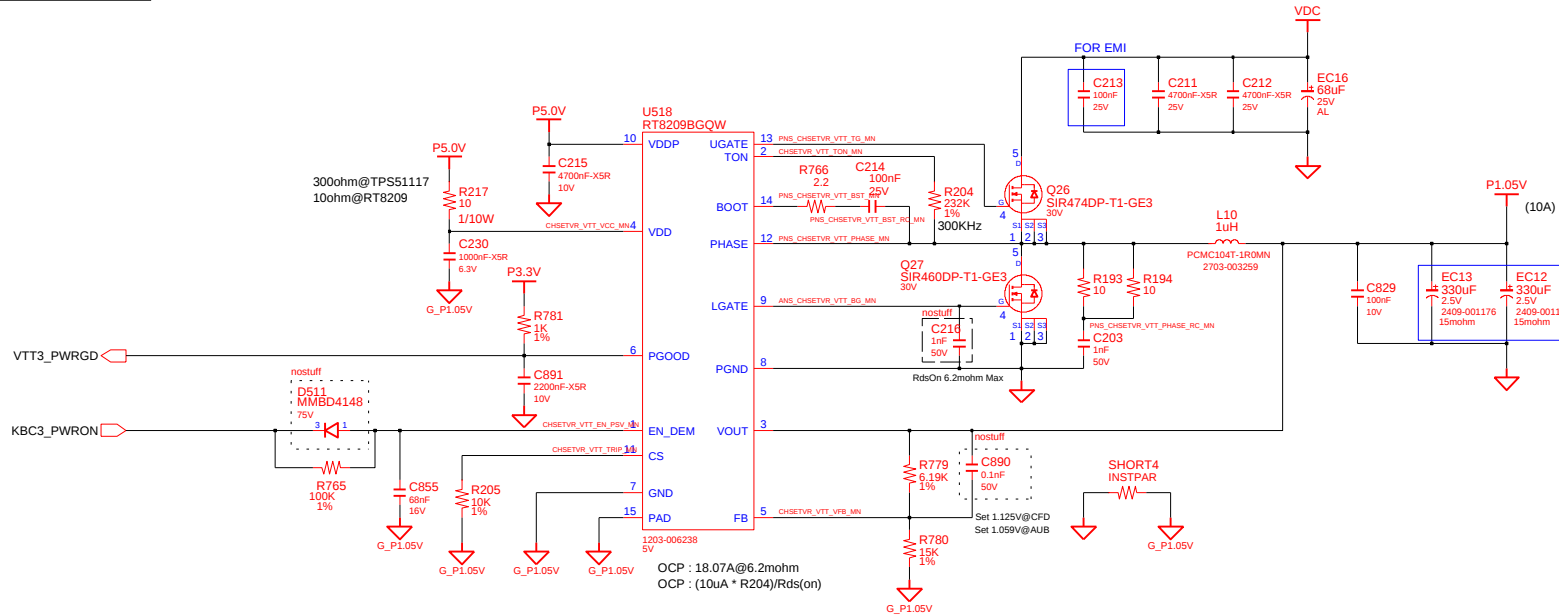


CAMERA (17Inch)

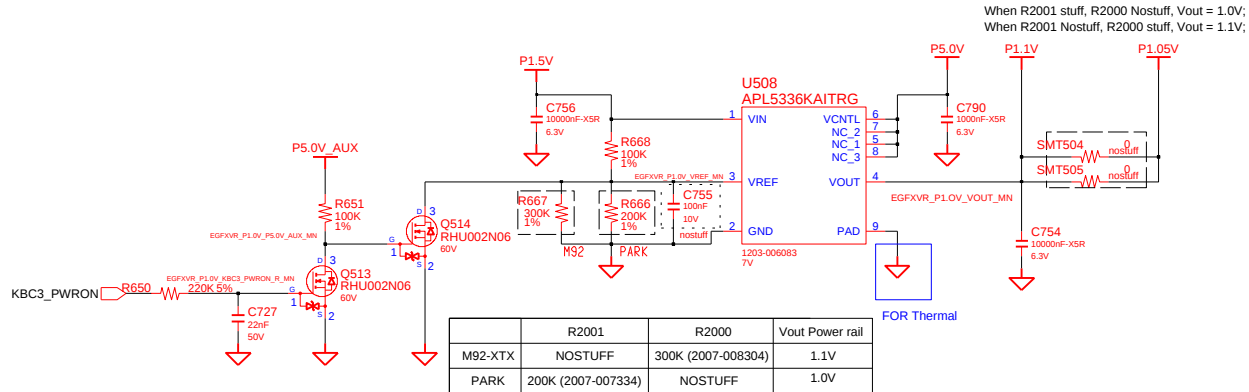


DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 USB_DEVICES CAMERA	SAMSUNG ELECTRONICS			
CHECK	SE Lee	DEV. STEP	ADV					
APPROVAL	MK Kim	REV	REV 0.1				PART NO.	BA41-
MODULE CODE	undefined		LAST EDIT				March 06, 2010 17:48:35 PM	
				PAGE	43	OF 54		

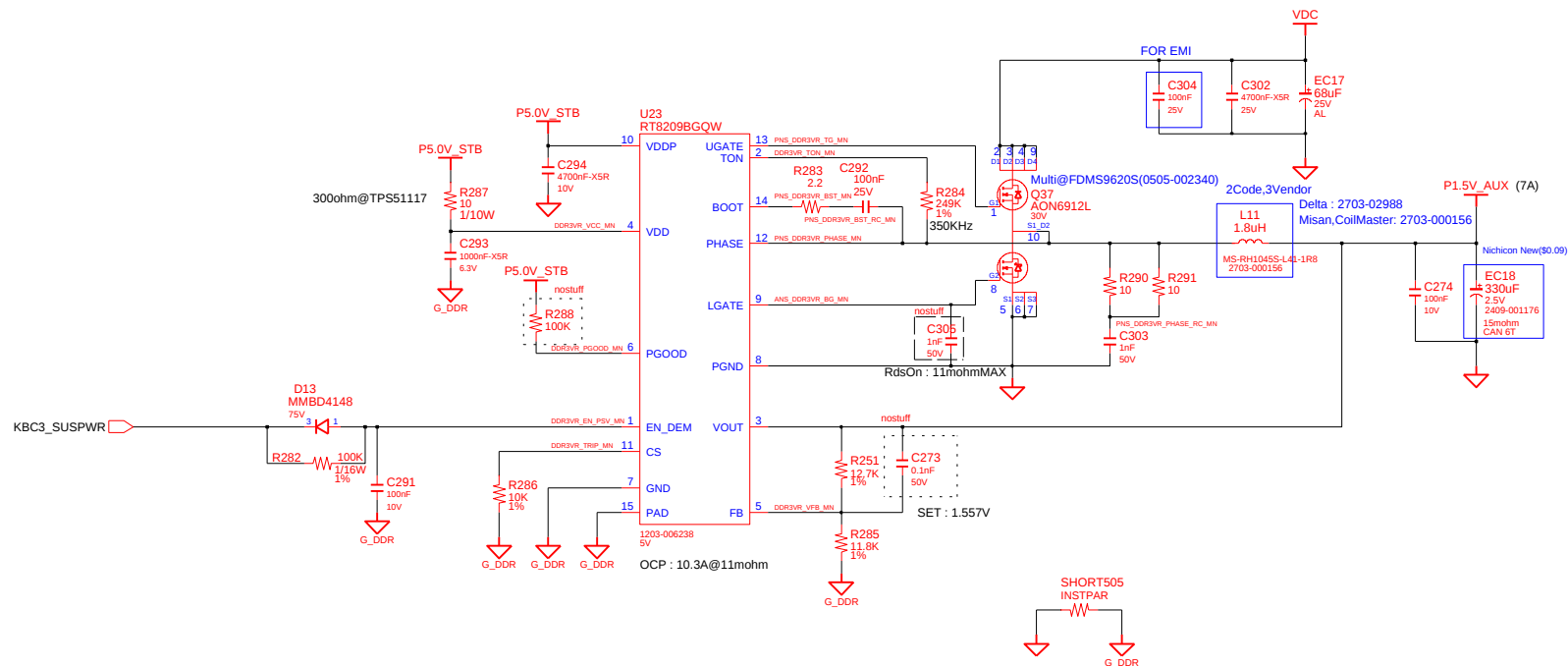
CHIPSET POWER(P1.05V)



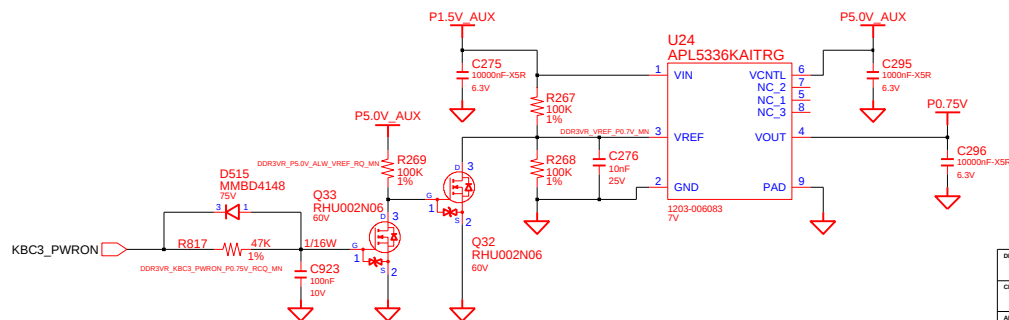
P1.1V



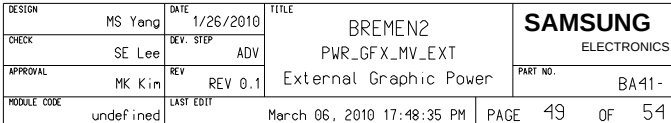
DDR3 Power



DDR3 VTT(0.75V)

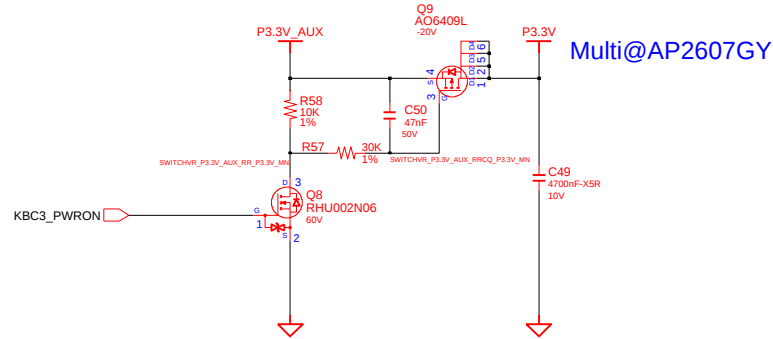


DRAW	MS Yang	DATE	1/26/2010	BREMEN2 PWR MEMORY DDR3 POWER	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV		
APPROVAL	MK Kim	REV	REV 0.1		
MODULE CODE		LAST EDIT			
undefined				March 06, 2010 17:48:35 PM	PAGE 47 OF 54

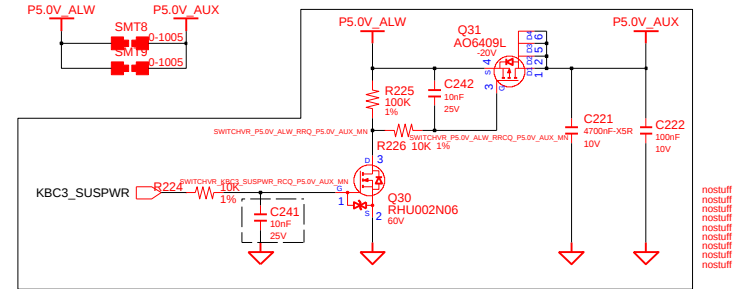


Switched Power

Switched Power On (P3.3V)

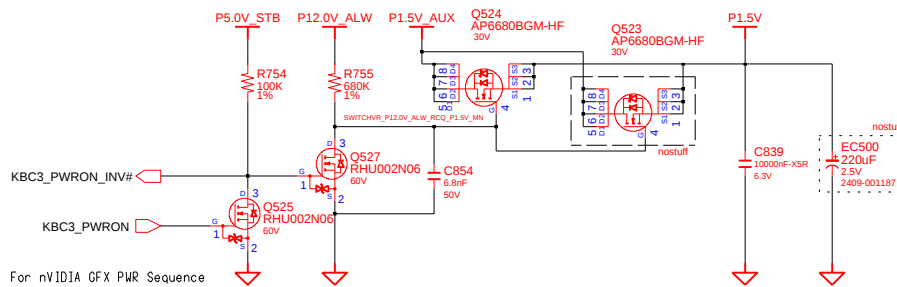


Sleep'n Charger



Switched Power On (P1.5V)

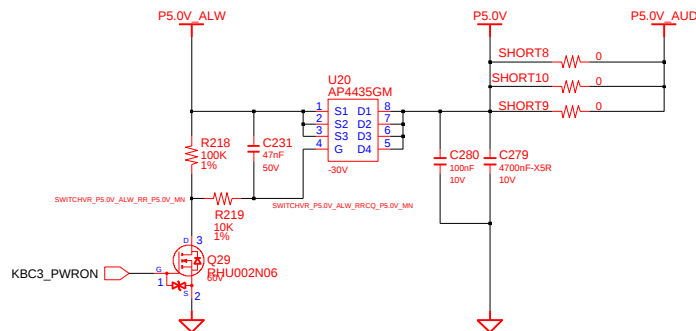
Multi@AO4476L



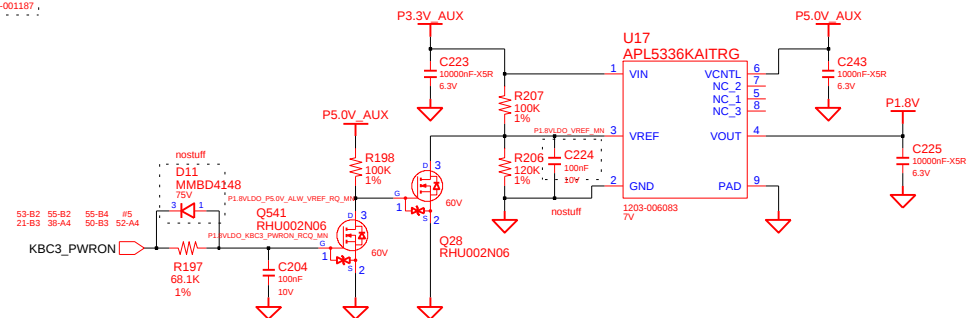
For nVIDIA GFX PWR Sequence
NVDD<EGFX_CORE> first and then FBVDD0<qDDR3>

Switched Power On (P5.0V)

Multi@Si4435DDY

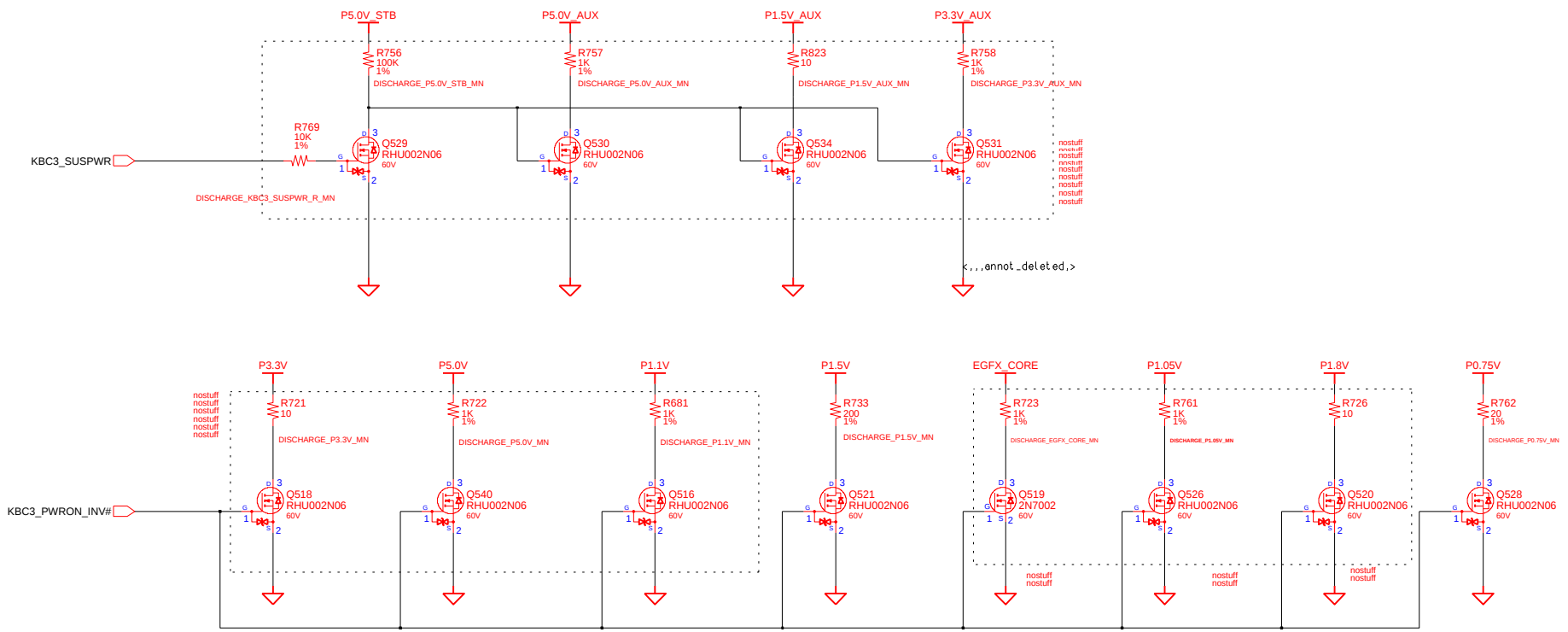


P1.8V(LDO)



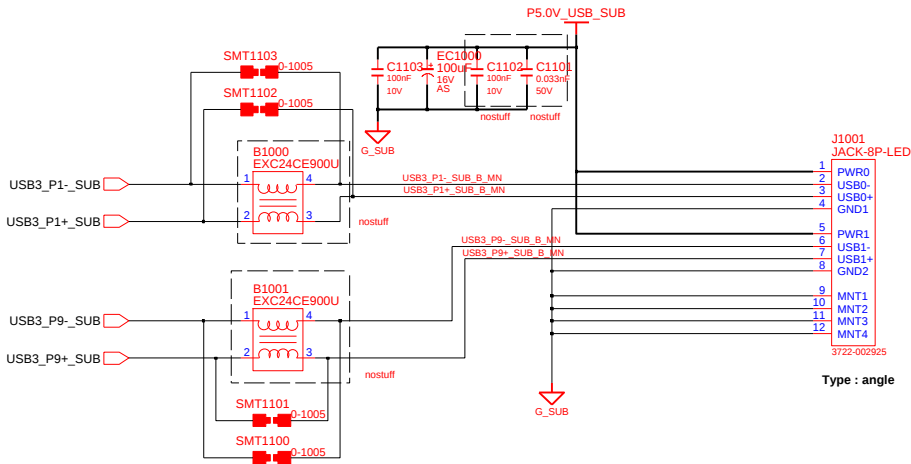
DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2	SAMSUNG
CHECK	SE Lee	REV. STEP	ADV	PWR_MV_SWITCHED		ELECTRONICS
APPROVAL	REV	REV	REV 0.1	SWITCHED POWER	PART NO.	BA41-
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE	50
					OF	54

POWER DISCHARGER

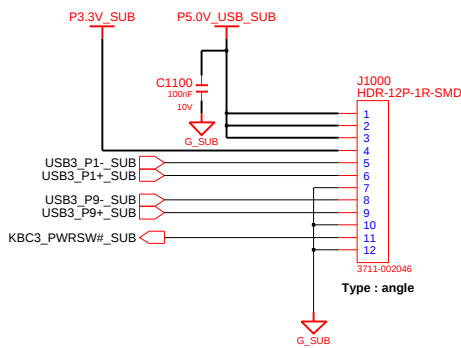


DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 PWR_MV_DISCHARGER	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV	DISCHARGING LOGIC	PART NO.	
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE	51 OF 54

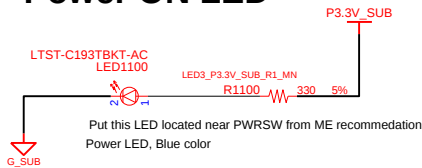
2 USB PORT & POWER S/W SUB B'D



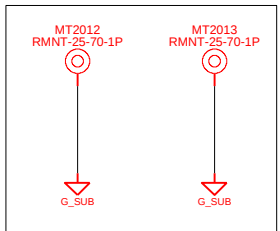
SUB TO MAIN USB CONN



Power ON LED



Power Button



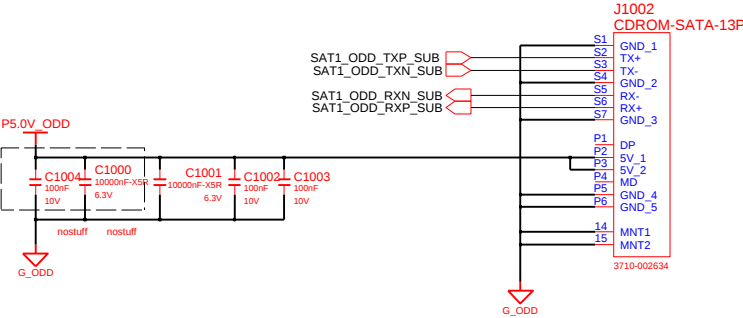
USB sub board mount hole

DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 SUB BOARD1 2 USB & POWER SW	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE 52 OF 54	

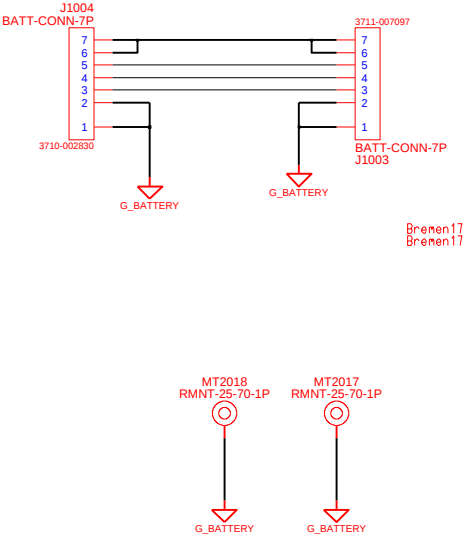
SATA ODD SUB BOARD

SATA ODD SUB BOARD

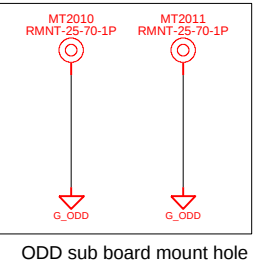
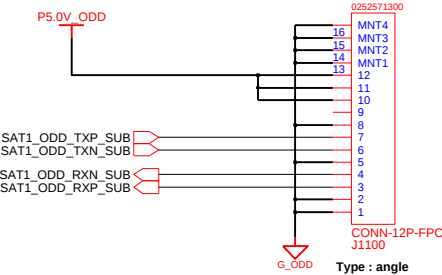
SATA ODD CONN



17" BATTERY SUBBOARD

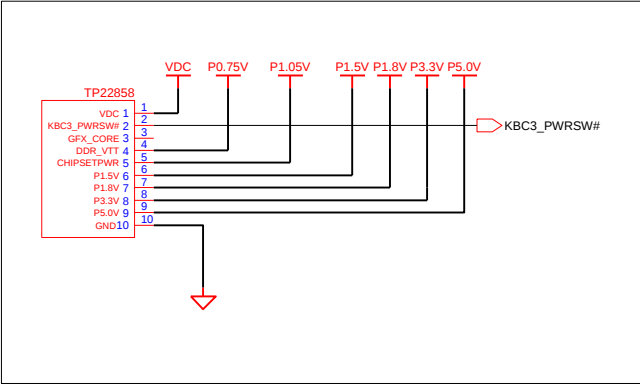


SUB TO MAIN SATA ODD CONN

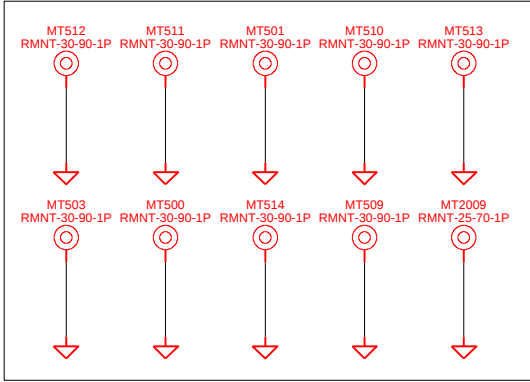


DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 SUB BOARD2 SATA ODD SUB BOARD	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	53	OF 54

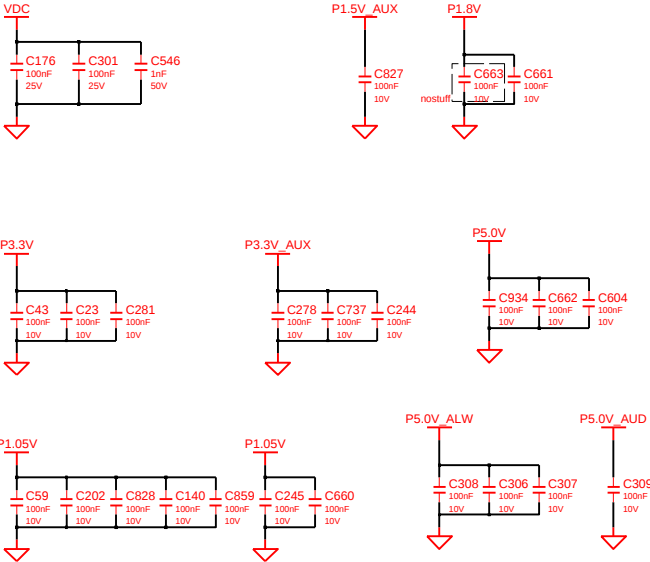
ICT PORT



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



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



DRAW	MS Yang	DATE	1/26/2010	TITLE	BREMEN2	SAMSUNG
CHECK	SE Lee	REV. STEP	ADV	ICT PORT	ICT PORT	ELECTRONICS
APPROVAL	MK Kim	REV	REV 0.1	ICT PORT	PART NO.	BA41-
MODULE CODE		LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	54	OF 54