

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR REPRODUCE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

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

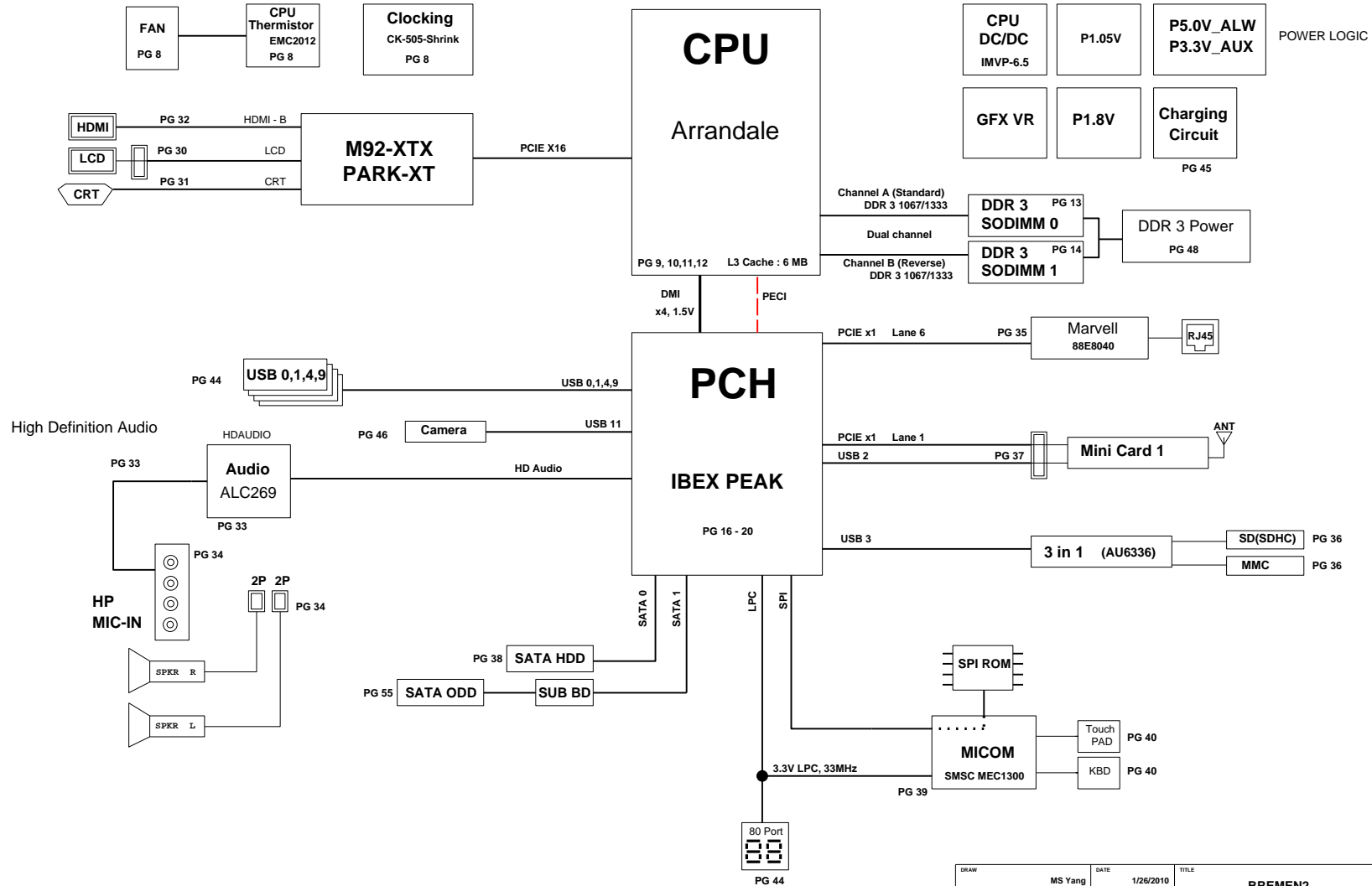
Design	CHECK	APPROVAL
MS Yang	SE Lee	MK Kim

Owner : SEC Mobile R & D Signature : X

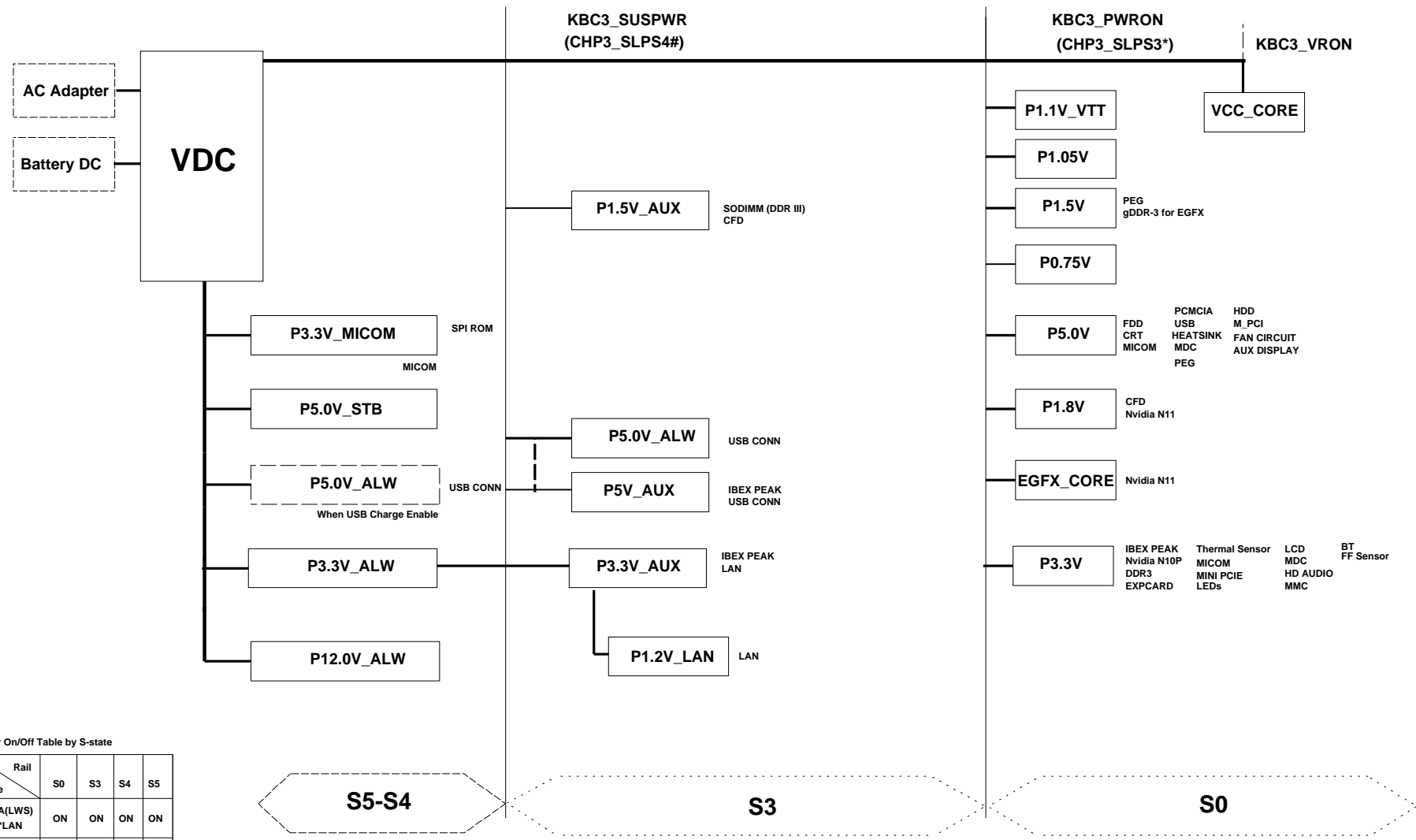
Sheet 1. Cover
Sheet 2-6. Diagram (Block/Power) & Annotations
Sheet 7. Clock Generator -CK505 Shrink Version
Sheet 8. Thermal Sensor & FAN
Sheet 9-12. Arrandale CPU
Sheet 13. DDR3 SODIMM A
Sheet 14. DDR3 SODIMM B
Sheet 15-19. IBEX PEAK
Sheet 20-23. GFx_External_M92-XTX
Sheet 24-27. Graphics_Memory_gDDR3 1g bit
Sheet 28. Graphic Strap
Sheet 29-31. Graphic Interface
Sheet 32-33. High Definition Audio (ALC269Q-GR)
Sheet 34. LAN_Marvell_88E8040
Sheet 35. MultiCard_AU6336 (3 in 1)
Sheet 36. PCIE_Minicard_Slot (Half type only)
Sheet 37. SATA I/F CONN
Sheet 38. MICOM_MEC1300-NU
Sheet 39. Micom Glue Logic
Sheet 40. LED_Switch
Sheet 41. USB Port
Sheet 42. Touchpad LED
Sheet 43. USB Interface
Sheet 44. Charger
Sheet 45. PWR_3V_5V
Sheet 46. PWR_Calpella
Sheet 47. PWR_Memory
Sheet 48. PWR_CPU_VRM
Sheet 49. PWR_GFX_Ext
Sheet 50. PWR_MV_Switched
Sheet 51. PWR_MV_DisCharger
Sheet 52. 2 USB Port & Power S/W SUB B'D
Sheet 53. SATA ODD SUB B'D Battery IF B'D
Sheet 54. EMC Capacitor & ICT Port

DRWN	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 BLOCK DIAGRAM	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	2 OF 54



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	—	—	—

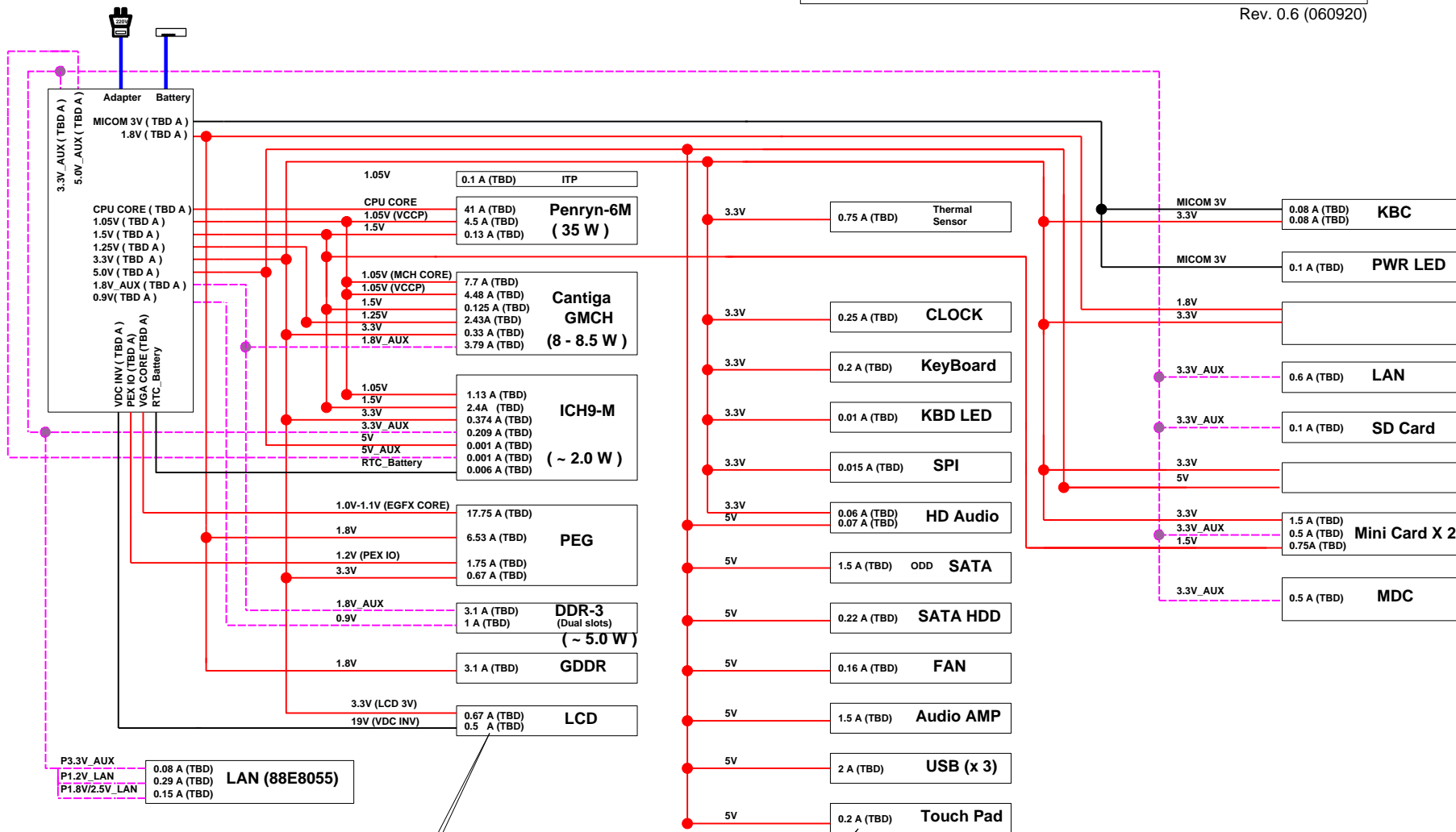


SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

POWER RAILS ANALYSIS

Rev. 0.6 (060920)

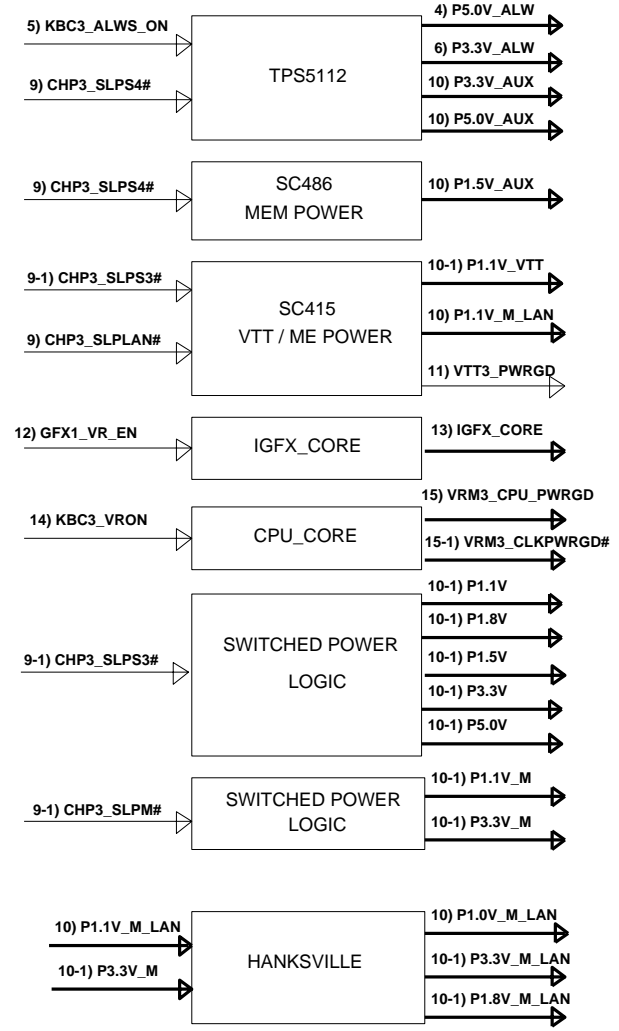
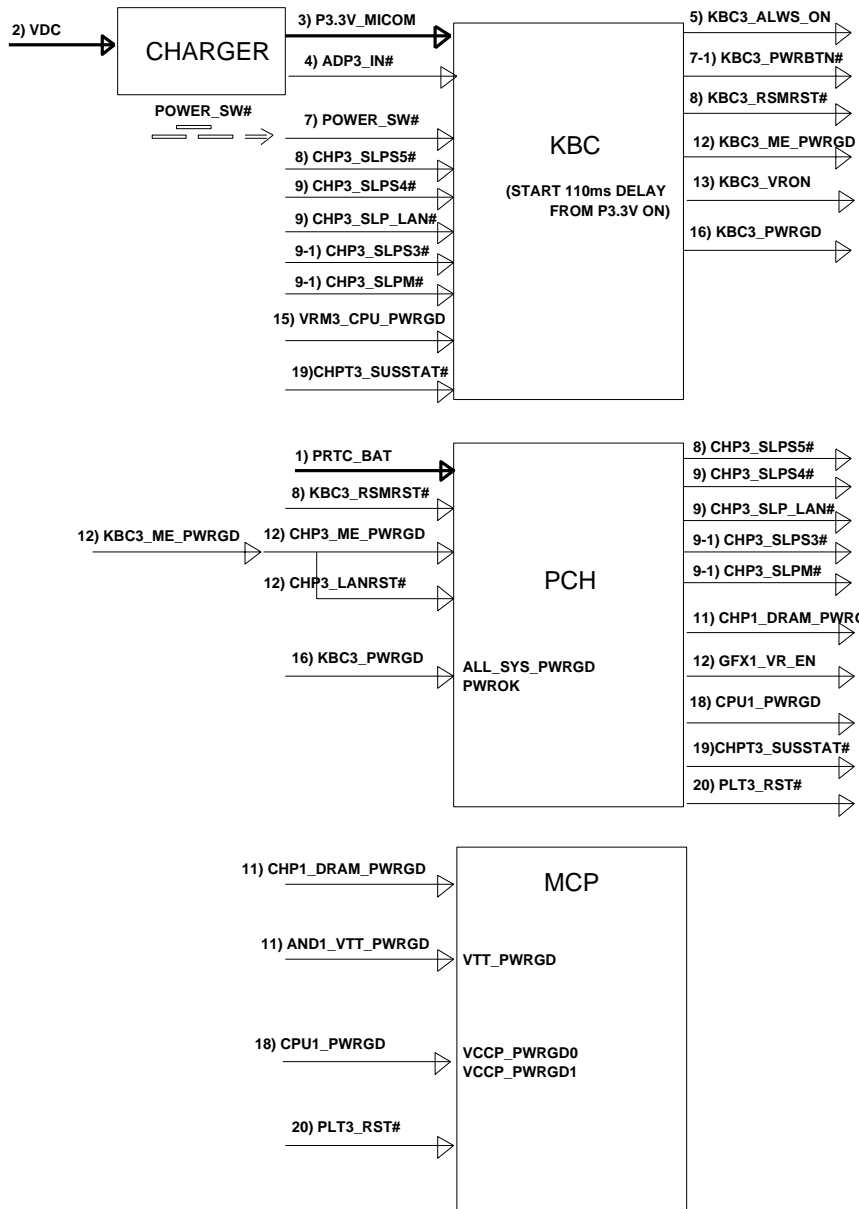


Value by Datasheet/Application notes (Value by measurement)

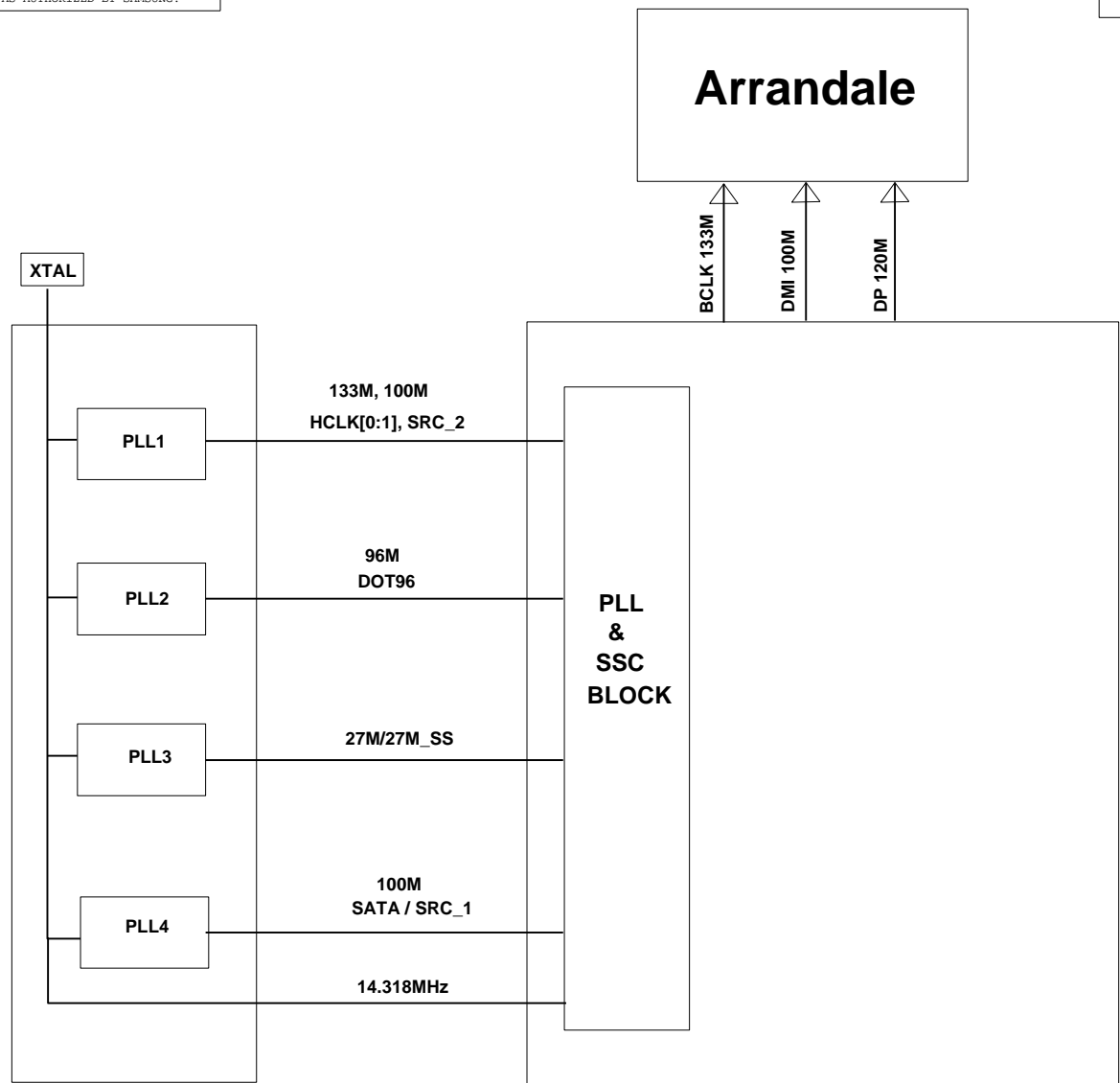
DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 MAIN POWER RAILS	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE 4 OF 54	

PRELIMINARY

POWER SEQUENCE Rev. 0.5



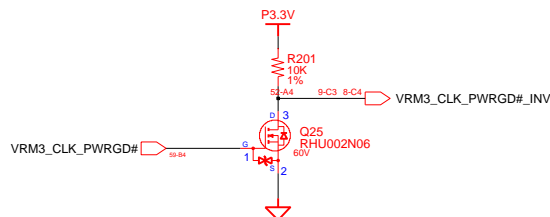
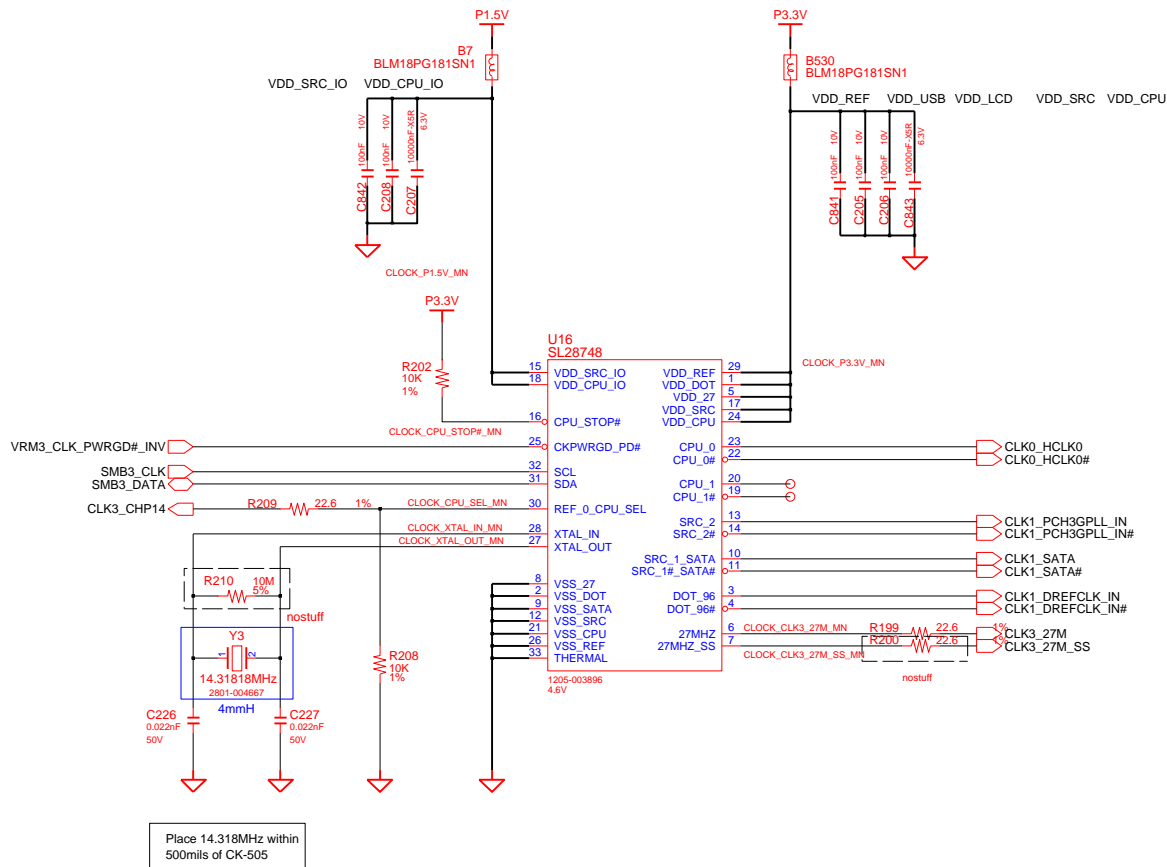
DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 UNDEFINED PWR SEQUENCE	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV			PART NO.
APPROVAL	MK Kin	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	5	OF 54



DRAW	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

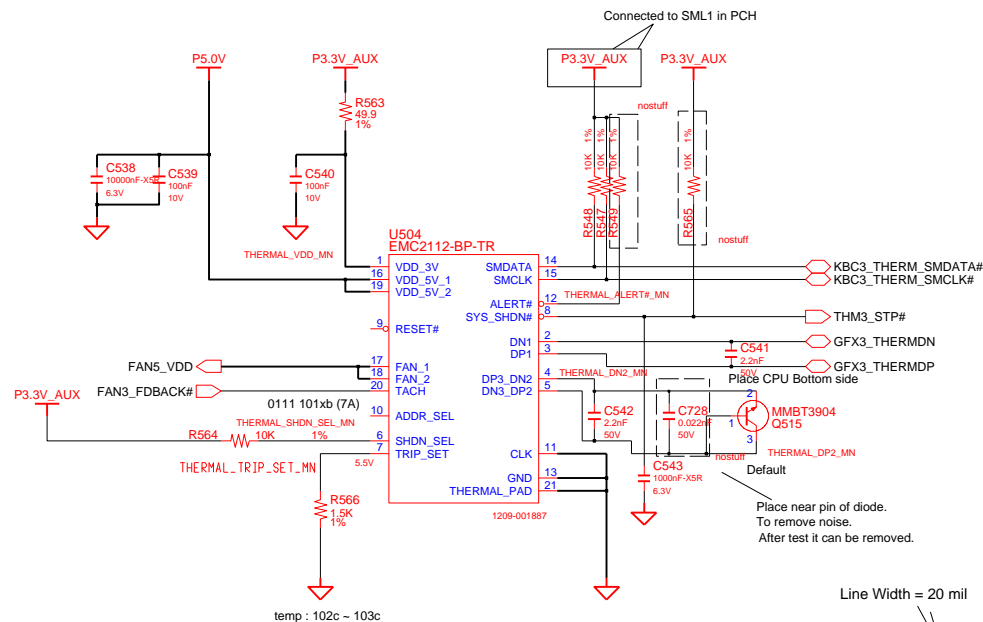
CPU_MODE_SEL

Pin 30	CPU_0	CPU_1
CPU_SEL = 0	133MHz	133MHz



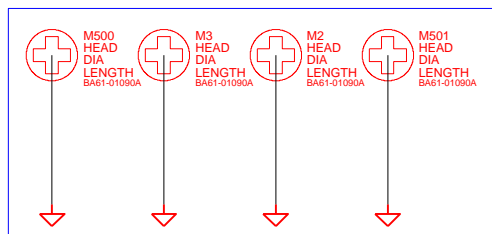
DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 CLOCK CK505-SHRINK	SAMSUNG ELECTRONICS	
CHECK	SE Lee	DEV. STEP	ADV		PART NO.	BA41-
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	undefined		LAST EDIT			

THERMAL SENSOR & FAN CONTROL

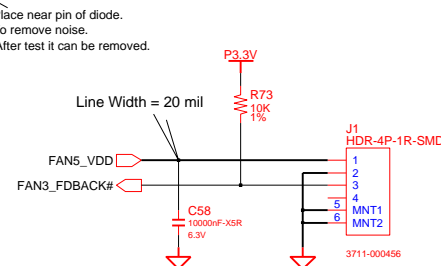


ADDRESSSEL MODE	
0	0101 111xb
✓ HIGH Z	0111 101xb (7A)
1	0101 110xb

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



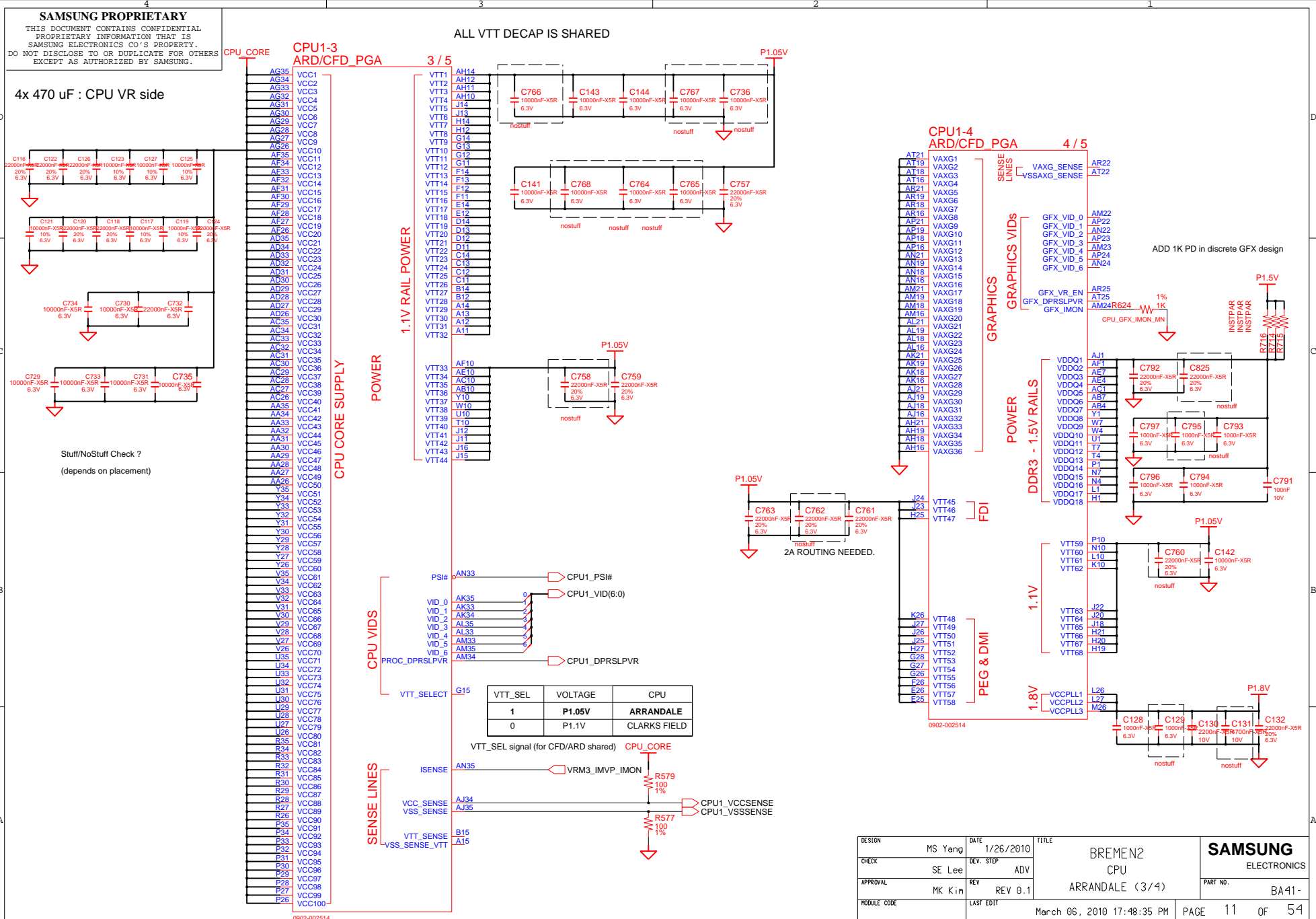
To support heatsink



DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 THERMAL SENSOR THERMAL SENSOR G7923	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV		
APPROVAL	MK Kim	REV	REV 0.1		
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM		
				PAGE	8 OF 54



DRAW	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 CPU ARRANDALE (Z/4)	SAMSUNG ELECTRONICS
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	10 OF 54



SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

CPU1-5
ARD/CFD_PG5 / 5

AT20	VSS1	VSS81	AE34
AT17	VSS2	VSS82	AE33
AR31	VSS3	VSS83	AE32
AR28	VSS4	VSS84	AE31
AR26	VSS5	VSS85	AE30
AR24	VSS6	VSS86	AE29
AR23	VSS7	VSS87	AE28
AR20	VSS8	VSS88	AE27
AR17	VSS9	VSS89	AE26
AR15	VSS10	VSS90	AE25
AR12	VSS11	VSS91	AE24
AR9	VSS12	VSS92	AE23
AR6	VSS13	VSS93	AE22
AR3	VSS14	VSS94	AE21
AP20	VSS15	VSS95	AE20
AP13	VSS16	VSS96	AE19
AP17	VSS17	VSS97	AE18
AP10	VSS18	VSS98	AE17
AP7	VSS19	VSS99	AE16
AP4	VSS20	VSS100	AE15
AP2	VSS21	VSS101	AE14
AN34	VSS22	VSS102	AE13
AN31	VSS23	VSS103	AE12
AN23	VSS24	VSS104	AE11
AN20	VSS25	VSS105	AE10
AN17	VSS26	VSS106	AE9
AM29	VSS27	VSS107	AE8
AM27	VSS28	VSS108	AE7
AM25	VSS29	VSS109	AE6
AM20	VSS30	VSS110	AE5
AM17	VSS31	VSS111	AE4
AM14	VSS32	VSS112	AE3
AM11	VSS33	VSS113	AE2
AM8	VSS34	VSS114	AE1
AM5	VSS35	VSS115	AE0
AM2	VSS36	VSS116	AE-1
AL34	VSS37	VSS117	AE-2
AL31	VSS38	VSS118	AE-3
AL23	VSS39	VSS119	AE-4
AL20	VSS40	VSS120	AE-5
AL17	VSS41	VSS121	AE-6
AL12	VSS42	VSS122	AE-7
AL9	VSS43	VSS123	AE-8
AL6	VSS44	VSS124	AE-9
AL3	VSS45	VSS125	AE-10
AK29	VSS46	VSS126	AE-11
AK27	VSS47	VSS127	AE-12
AK25	VSS48	VSS128	AE-13
AK20	VSS49	VSS129	AE-14
AK17	VSS50	VSS130	AE-15
AJ31	VSS51	VSS131	AE-16
AJ23	VSS52	VSS132	AE-17
AJ20	VSS53	VSS133	AE-18
AJ17	VSS54	VSS134	AE-19
AJ14	VSS55	VSS135	AE-20
AJ11	VSS56	VSS136	AE-21
AJ8	VSS57	VSS137	AE-22
AJ5	VSS58	VSS138	AE-23
AJ2	VSS59	VSS139	AE-24
AH35	VSS60	VSS140	AE-25
AH34	VSS61	VSS141	AE-26
AH33	VSS62	VSS142	AE-27
AH32	VSS63	VSS143	AE-28
AH31	VSS64	VSS144	AE-29
AH30	VSS65	VSS145	AE-30
AH29	VSS66	VSS146	AE-31
AH28	VSS67	VSS147	AE-32
AH27	VSS68	VSS148	AE-33
AH26	VSS69	VSS149	AE-34
AH20	VSS70	VSS150	AE-35
AH17	VSS71	VSS151	AE-36
AH13	VSS72	VSS152	AE-37
AH9	VSS73	VSS153	AE-38
AH6	VSS74	VSS154	AE-39
AH3	VSS75	VSS155	AE-40
AG10	VSS76	VSS156	AE-41
AF9	VSS77	VSS157	AE-42
AF4	VSS78	VSS158	AE-43
AF2	VSS79	VSS159	AE-44
AE35	VSS80	VSS160	AE-45

0902-002514

K27	VSS161	AE34
K9	VSS162	AE33
K6	VSS163	AE32
K3	VSS164	AE31
J32	VSS165	AE30
J30	VSS166	AE29
J21	VSS167	AE28
J19	VSS168	AE27
H35	VSS169	AE26
H32	VSS170	AE25
H28	VSS171	AE24
H26	VSS172	AE23
H24	VSS173	AE22
H22	VSS174	AE21
H18	VSS175	AE20
H13	VSS176	AE19
H11	VSS177	AE18
H8	VSS178	AE17
H5	VSS179	AE16
H2	VSS180	AE15
G34	VSS181	AE14
G31	VSS182	AE13
G20	VSS183	AE12
G9	VSS184	AE11
G6	VSS185	AE10
G3	VSS186	AE9
F30	VSS187	AE8
F27	VSS188	AE7
F25	VSS189	AE6
F22	VSS190	AE5
F19	VSS191	AE4
F16	VSS192	AE3
F13	VSS193	AE2
F11	VSS194	AE1
E32	VSS195	AE0
E29	VSS196	AE-1
E24	VSS197	AE-2
E21	VSS198	AE-3
E16	VSS199	AE-4
E13	VSS200	AE-5
E11	VSS201	AE-6
E8	VSS202	AE-7
E5	VSS203	AE-8
E2	VSS204	AE-9
D33	VSS205	AE-10
D30	VSS206	AE-11
D26	VSS207	AE-12
D9	VSS208	AE-13
D6	VSS209	AE-14
D3	VSS210	AE-15
C34	VSS211	AE-16
C32	VSS212	AE-17
C29	VSS213	AE-18
C28	VSS214	AE-19
C24	VSS215	AE-20
C22	VSS216	AE-21
C20	VSS217	AE-22
C19	VSS218	AE-23
C16	VSS219	AE-24
B31	VSS220	AE-25
B25	VSS221	AE-26
B21	VSS222	AE-27
B16	VSS223	AE-28
B17	VSS224	AE-29
B13	VSS225	AE-30
B11	VSS226	AE-31
B8	VSS227	AE-32
B6	VSS228	AE-33
B4	VSS229	AE-34
A29	VSS230	AE-35
A27	VSS231	AE-36
A23	VSS232	AE-37
A9	VSS233	AE-38

NCTF

VSS_NCTF1

VSS_NCTF2

VSS_NCTF3

VSS_NCTF4

VSS_NCTF5

VSS_NCTF6

VSS_NCTF7

AT35

AT1

AR34

B34

B2

B1

A35

VSS_NCTF7

AP25	RSVD1	RSVD32	AJ13
AL25	RSVD2	RSVD33	AJ12
AL24	RSVD3		
AL22	RSVD4	RSVD34	AH25
AJ33	RSVD5	RSVD35	AK26
AG9	RSVD6	RSVD36	AL26
M27	RSVD7	RSVD_NCTF_37	AR2
L28	RSVD8	RSVD38	AJ26
J17	SA_DIMM_VREFDQ	RSVD39	AJ27
H17	SB_DIMM_VREFDQ		
G25	RSVD11		
G17	RSVD12	RSVD_NCTF_40	AP1
E31	RSVD13	RSVD_NCTF_41	AT2
E30	RSVD14	RSVD_NCTF_42	AT3
		RSVD_NCTF_43	AR1
AM30	CFG_0	RSVD45	AL28
AM28	CFG_1	RSVD46	AL29
AP31	CFG_2	RSVD47	AP30
AL32	CFG_3	RSVD48	AP32
AL30	CFG_4	RSVD49	AL27
AM31	CFG_5	RSVD50	AT32
AM29	CFG_6	RSVD51	AP33
AM32	CFG_7	RSVD52	AR33
AK32	CFG_8	RSVD_NCTF_54	AT33
AK31	CFG_9	RSVD_NCTF_55	AT34
AK28	CFG_10	RSVD_NCTF_56	AP35
AJ28	CFG_11	RSVD_NCTF_57	AR35
AN30	CFG_12	RSVD58	AR32
AN32	CFG_13		
AJ32	CFG_14		
AJ29	CFG_15	RSVD_TP_59	E15
AJ30	CFG_16	RSVD_TP_60	F15
AK30	CFG_17	KEY	A2
H16	RSVD_TP_86	RSVD62	D15
		RSVD63	C15
B19	RSVD15	RSVD64	AJ15
A19	RSVD16	RSVD65	AH15
A20	RSVD17		
B20	RSVD18		
U9	RSVD19	RSVD_TP_66	AA5
T9	RSVD20	RSVD_TP_67	AA4
AC9	RSVD21	RSVD_TP_68	R8
AB9	RSVD22	RSVD_TP_69	AD3
		RSVD_TP_70	AD2
		RSVD_TP_71	AA1
		RSVD_TP_72	R9
		RSVD_TP_73	AG7
		RSVD_TP_74	AE3
		RSVD_TP_75	
		RSVD_TP_76	V4
		RSVD_TP_77	V5
		RSVD_TP_78	N2
J29	RSVD26	RSVD_TP_79	AD5
J28	RSVD27	RSVD_TP_80	AD7
		RSVD_TP_81	W3
A34	RSVD_NCTF_28	RSVD_TP_82	W2
A33	RSVD_NCTF_29	RSVD_TP_83	N3
		RSVD_TP_84	AE5
C35	RSVD_NCTF_30	RSVD_TP_85	AD9
B35	RSVD_NCTF_31		
	(VSS) RSVD86	AP34	

RESERVED

1% 3.01K R623
CPU_CFG_7_MNCRB is NC
EDS/DG is GND recommend

CFG Straps for Processor

PCI Express Configuration Select	
CFG0	1 : Single PEG 0 : Bifunction enabled

PCI Express Static Lane Reversal	
CFG3	1 : Normal operation 0 : Lane Reversed

Display Port Presence	
CFG4	1 : Disabled - No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP)

PCIE 2.0 SUPPORT	
CFG7	1 : Normal operation 0 : PCIE2.0 Jitter support

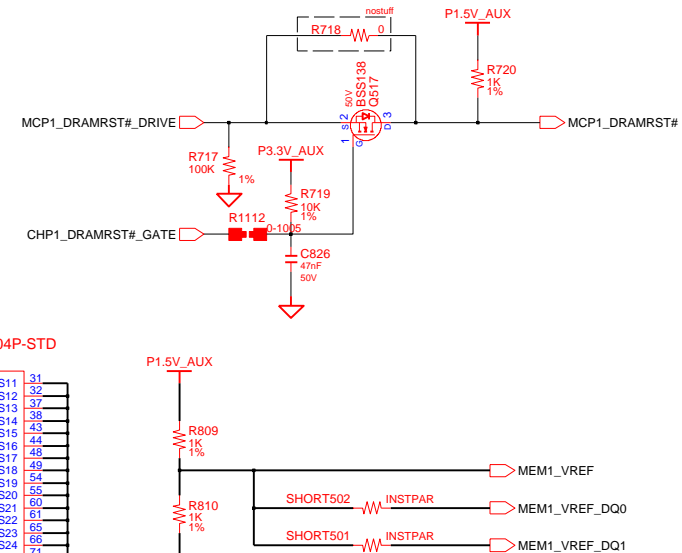
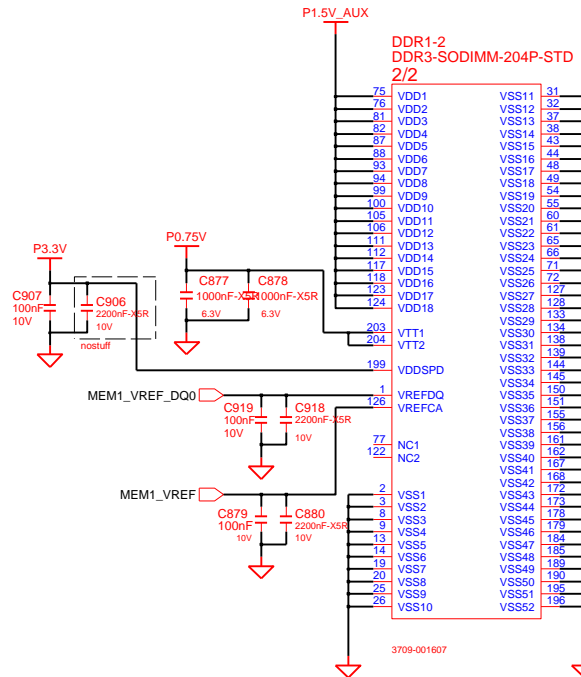
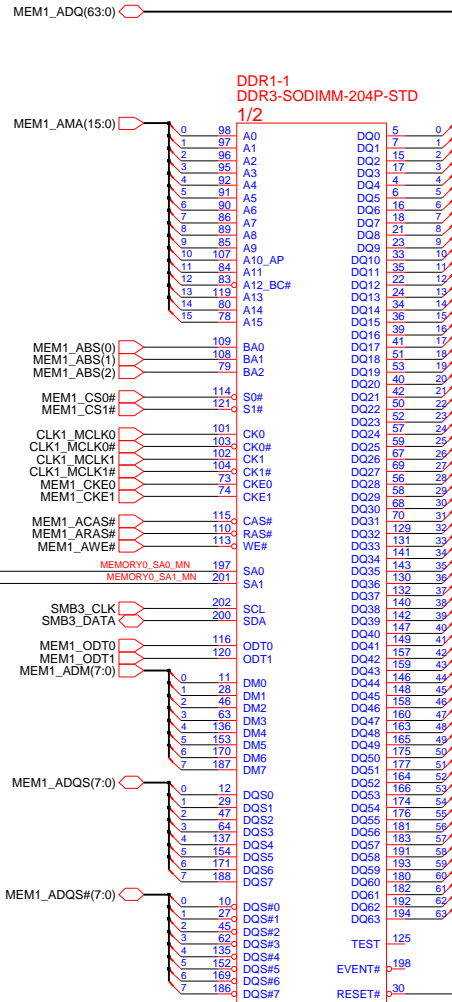
DRAW	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 CPU		SAMSUNG ELECTRONICS	
CHECK	SE Lee	REV. STEP	ADV		ARRANDALE (4/4)		PART NO.	BA41-
APPROVAL	REV	REV	REV 0.1					
MODULE CODE	undefined	LAST EDIT			March 06, 2010 17:48:35 PM		PAGE	12 OF 54

DDR SO-DIMM #0

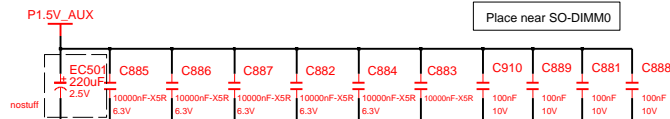
Height : 4 mm (STANDARD)

P/N : 3709-001532 (Molex)

P/N : 3709-001560 (Foxconn)



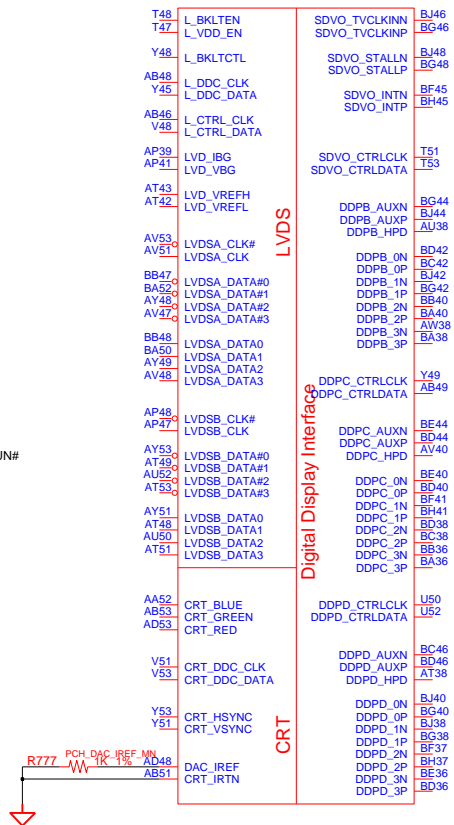
Place near SO-DIMM



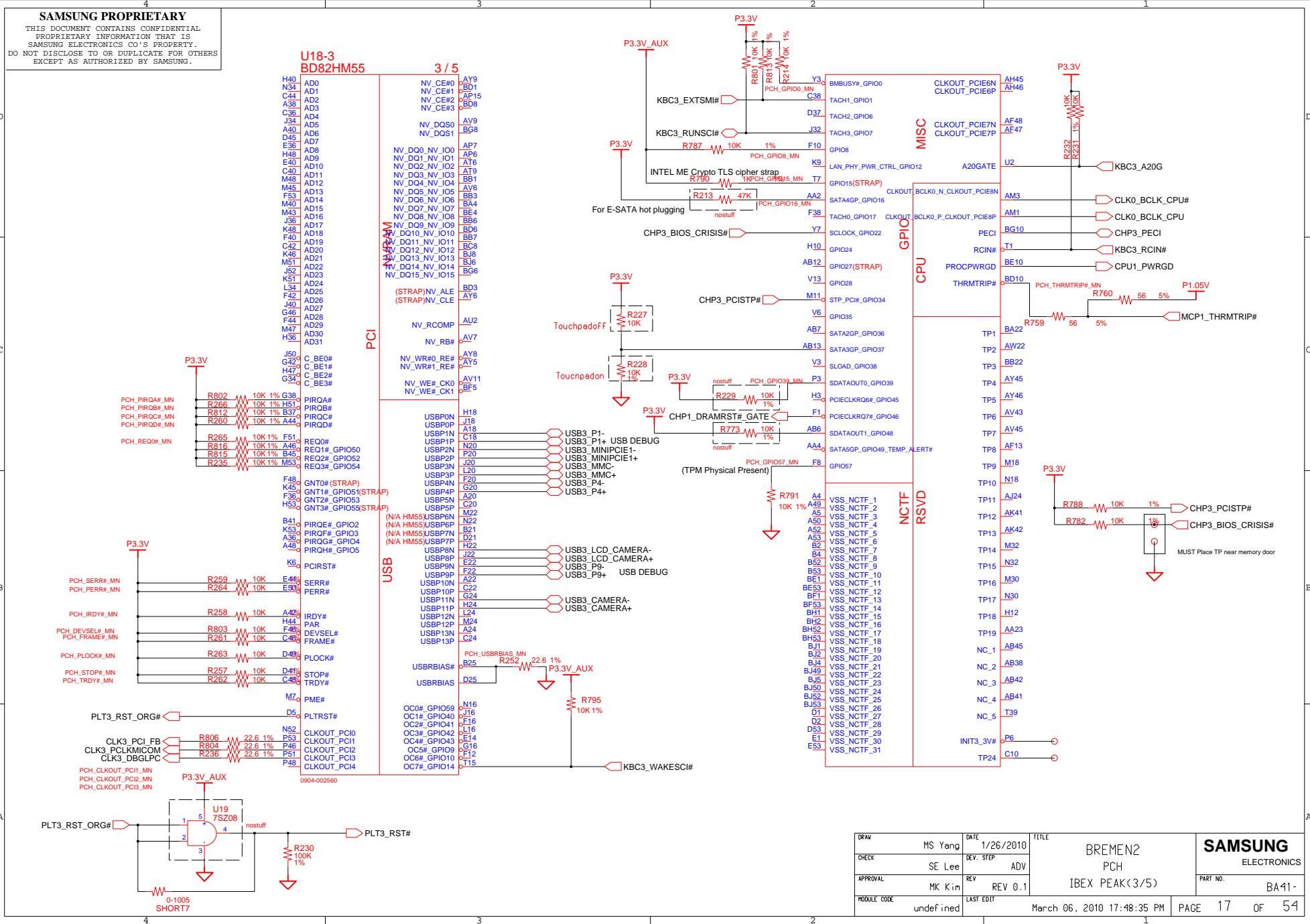
DRAW	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 SODIMM A DDR3	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV			PART NO. BA41-
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE	13 OF 54

[illegible]

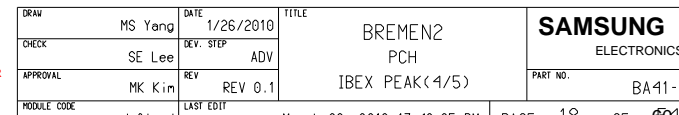
DRAW	MS Yang	DATE	1/26/2010	TITLE BREMEN2 PCH IBEX PEAK(1/5)	SAMSUNG ELECTRONICS					
CHECK	SE Lee	DEV. STEP	ADV		PART NO.	BA41-				
APPROVAL	MK Kim	REV	REV 0.1							
MODULE CODE		undefined		LAST EDIT		March 06, 2010 17:48:35 PM	PAGE	15	OF	54



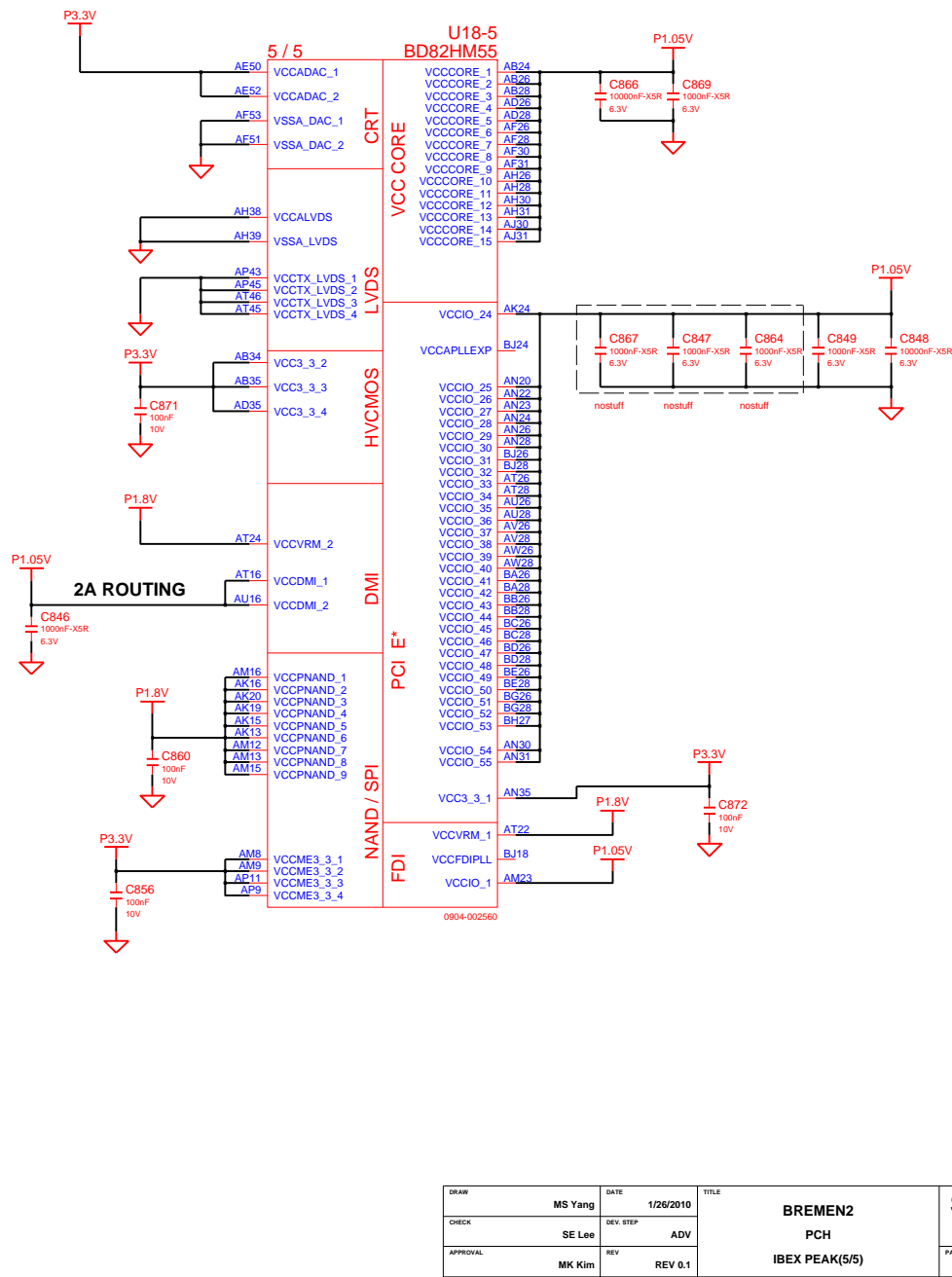
DRAW	MS Yang	DATE	1/26/2010	<div style="text-align: center;"> BREMEN2 PCH IBEX PEAK(2/5) </div>	<div style="text-align: center;"> SAMSUNG ELECTRONICS </div>	
CHECK	SE Lee	DEV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1		PART NO.	BA41-
MODULE CODE	LAST EDIT				March 06, 2010 17:48:35 PM	PAGE 16 OF 54




SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.



H49	V55	259	GND	V55	158	A17
H5	V55	260		V55	160	B1
J24	V53	261		V55	161	B15
K1	V53	262		V55	162	B2
K47	V53	263		V55	163	B3
K5	V55	264		V55	164	B23
K7	V55	265		V55	165	B35
L14	V55	266		V55	166	B39
L15	V55	267		V55	167	B47
L2	V55	268		V55	168	B7
L22	V55	269		V55	169	BG12
L32	V55	270		V55	170	B17
L40	V55	271		V55	171	B116
L52	V55	272		V55	172	B120
M12	V55	273		V55	173	B124
M16	V55	274		V55	174	B135
M20	V55	275		V55	175	B139
N35	V55	276		V55	176	B139
N34	V55	277		V55	177	B442
N38	V55	278		V55	178	B449
N45	V55	279		V55	179	B45
N46	V55	280		V55	180	BC10
M49	V55	281		V55	181	BC14
M5	V55	282		V55	182	BC22
M6	V55	283		V55	183	BC18
M11	V55	284		V55	184	BC22
N24	V55	285		V55	185	BC38
AD15	V55	286		V55	186	BC38
F20	V55	287		V55	187	BC41
P32	V55	288		V55	188	B52
P34	V55	289		V55	189	B59
P42	V55	290		V55	190	B048
P43	V55	291		V55	191	B24
P47	V55	292		V55	192	B49
R2	V55	293		V55	193	B05
R24	V55	294		V55	194	BE12
R52	V55	295		V55	195	BE16
L12	V55	296		V55	196	BE20
L46	V55	297		V55	197	BE30
L49	V55	298		V55	198	BE34
T8	V55	299		V55	199	BE38
U30	V55	300		V55	200	BE45
U31	V55	301		V55	201	BE46
U32	V55	302		V55	202	BE50
P38	V55	303		V55	203	BE54
Y11	V55	304		V55	204	BF3
P16	V55	305		V55	205	BF3
Y19	V55	306		V55	206	BF49
Z22	V55	307		V55	207	BF51
Z23	V55	308		V55	208	BG18
U30	V55	309		V55	209	BG24
U31	V55	310		V55	210	BG4
V32	V55	311		V55	211	BG50
V34	V55	312		V55	212	BH15
V35	V55	313		V55	213	BH16
V36	V55	314		V55	214	BH23
V37	V55	315		V55	215	BH35
V38	V55	316		V55	216	BH43
V39	V55	317		V55	217	BH47
V40	V55	318		V55	218	C12
V41	V55	319		V55	219	C50
V42	V55	320		V55	220	D61
V43	V55	321		V55	221	E12
V44	V55	322		V55	222	E16
V45	V55	323		V55	223	E20
V46	V55	324		V55	224	E24
V47	V55	325		V55	225	E34
V48	V55	326		V55	226	E38
W2	V55	327		V55	227	E42
W52	V55	328		V55	228	E46
Y11	V55	329		V55	229	E46
Y15	V55	330		V55	230	E6
Y16	V55	331		V55	231	F49
Y17	V55	332		V55	232	F8
Y20	V55	333		V55	233	F10
Y25	V55	334		V55	234	G14
Y26	V55	335		V55	235	G18
Y27	V55	336		V55	236	G2</

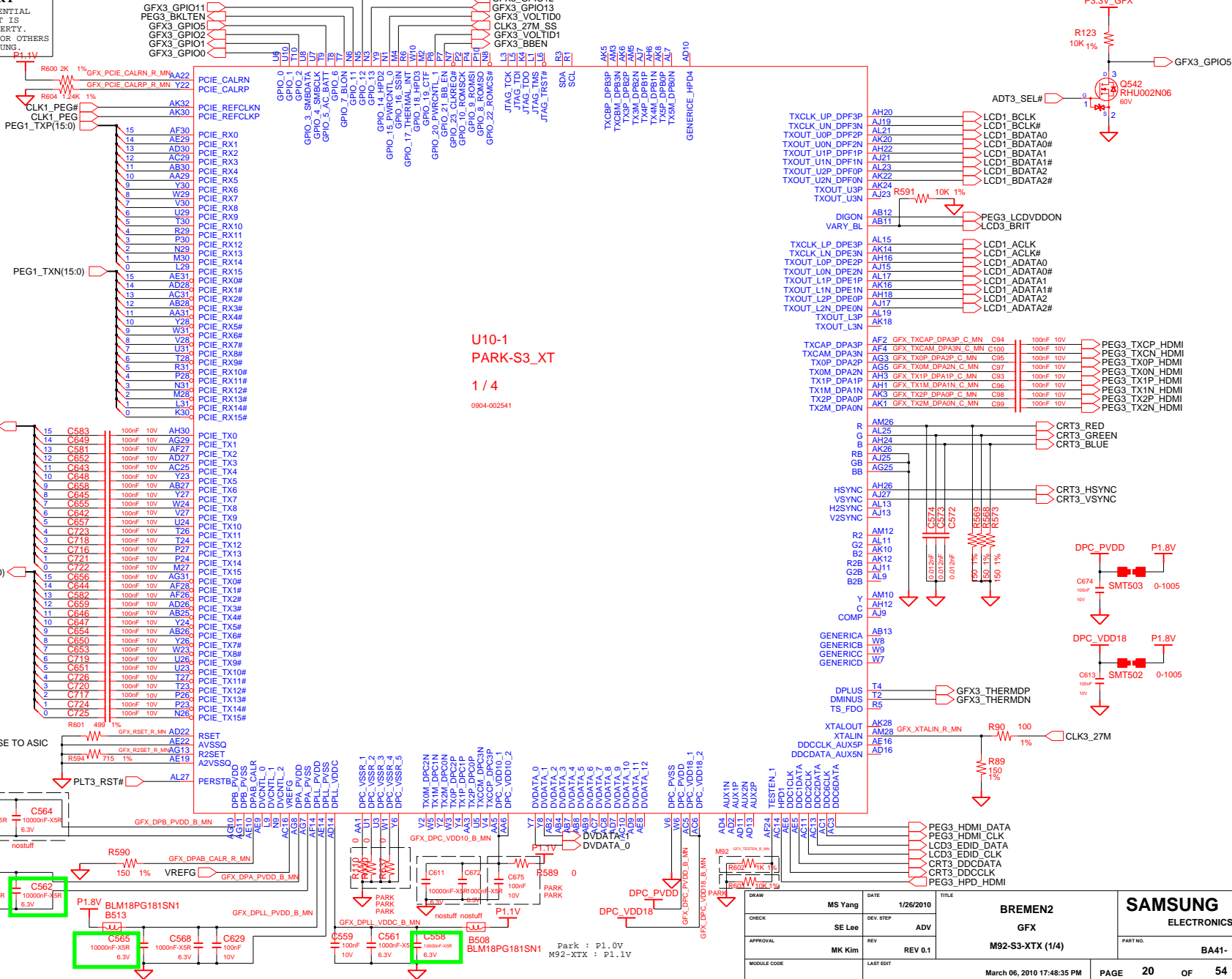


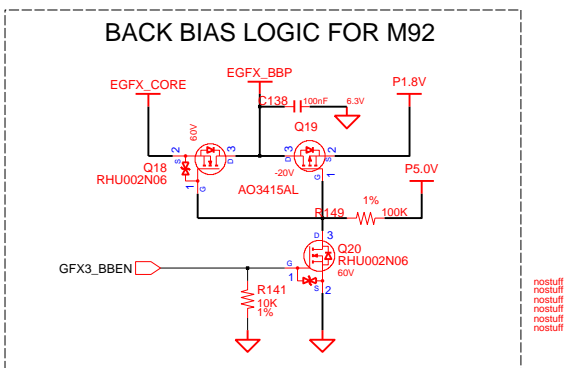
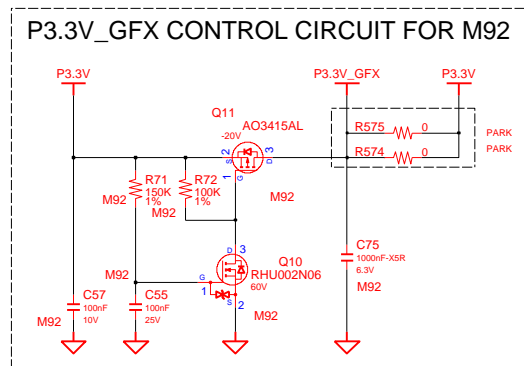
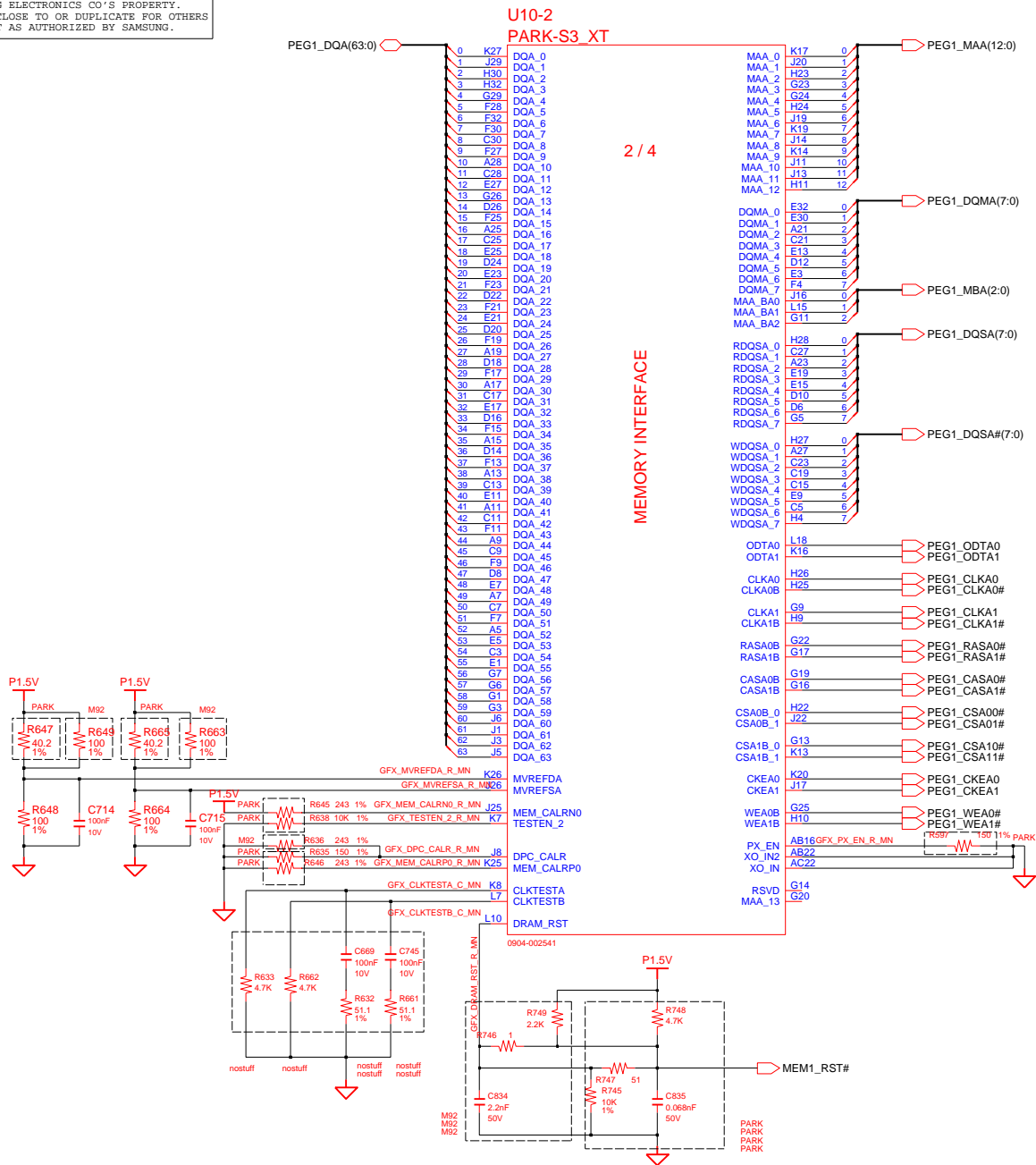
DRAW	MS Yang	DATE	1/26/2010	BREMEN2 PCH IBEX PEAK(5/5)			
CHECK	SE Lee	DEV. STEP	ADV				
APPROVAL	MK Kim	REV	REV 0.1				
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM				
				PAGE	19	OF	54

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

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

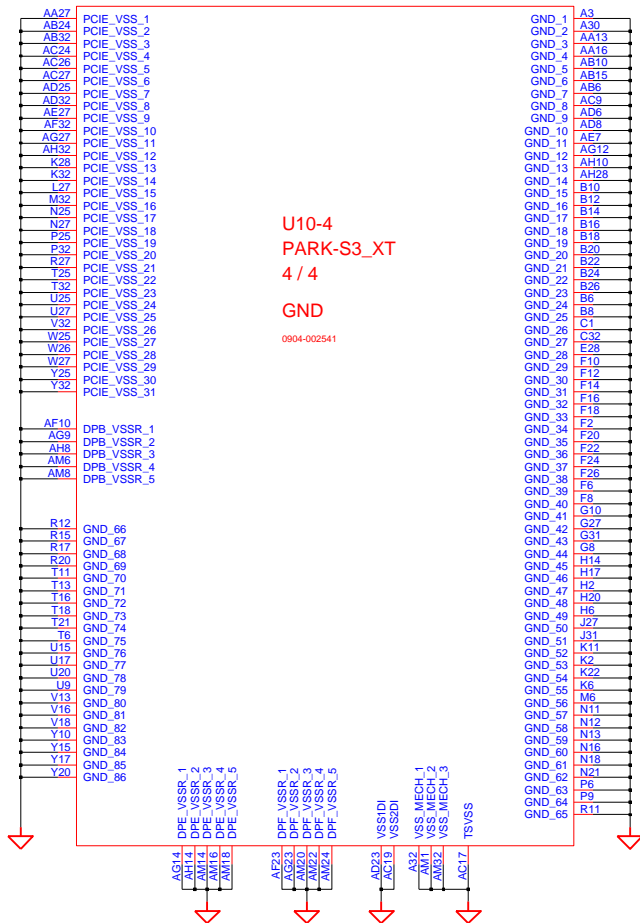




DRAW		DATE	1/26/2010	BREMEN2 GFx M92-S3-XTX (2/4)		SAMSUNG ELECTRONICS	
CHECK		DEV. STEP	ADV				
APPROVAL		REV	REV 0.1				
MK Kim				PART NO.		BA41-	
MODULE CODE		LAST EDIT		March 06, 2010 17:48:35 PM		PAGE	21 OF 54

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.



PARK-S3 Straps

TX_PWRS_ENB

PCIE FULL TX OUTPUT SWING

0 : 50% TX OUTPUT SWING

=> LOW LOSS INTERCONNECT

1 : FULL TX OUTPUT SWING

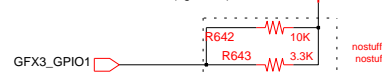


TX_DEEMPH_EN

PCIE TRANSMITTER DE-EMPHASIS ENABLED

0 : TX DE-EMPHASIS Disabled (eg. on-board)

1 : TX DE-EMPHASIS Enabled (eg. MXM)



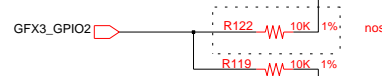
BIF_GEN2_EN_A

0 : 2.5GT/s CAPABLE FOR PCIe DEVICE

1 : 5.0GT/s CAPABLE FOR PCIe DEVICE

=> 5.0GT/s CAPABILITY WILL BE

CONTROLLED BY SOFTWARE



DVDATA_0



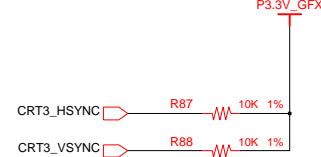
AUD[1:0]

00 : No Audio Function

01 : Audio for DP Only

10 : Audio for DP & HDMI if dongles is detected

11 : Audio for Both DP & HDMI



If BIOS_ROM_EN=1, ROMCFGID[2:0]

If BIOS_ROM_EN=0, Memory Aperture Size

GFX3_GPIO(13 : 11)

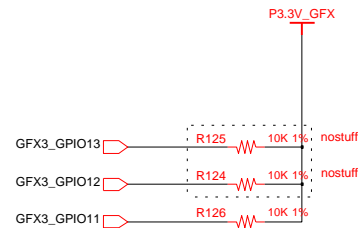
000 : 128MB

001 : 256MB

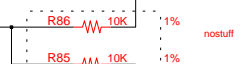
010 : 64MB

011 : RESERVED

1XX : RESERVED

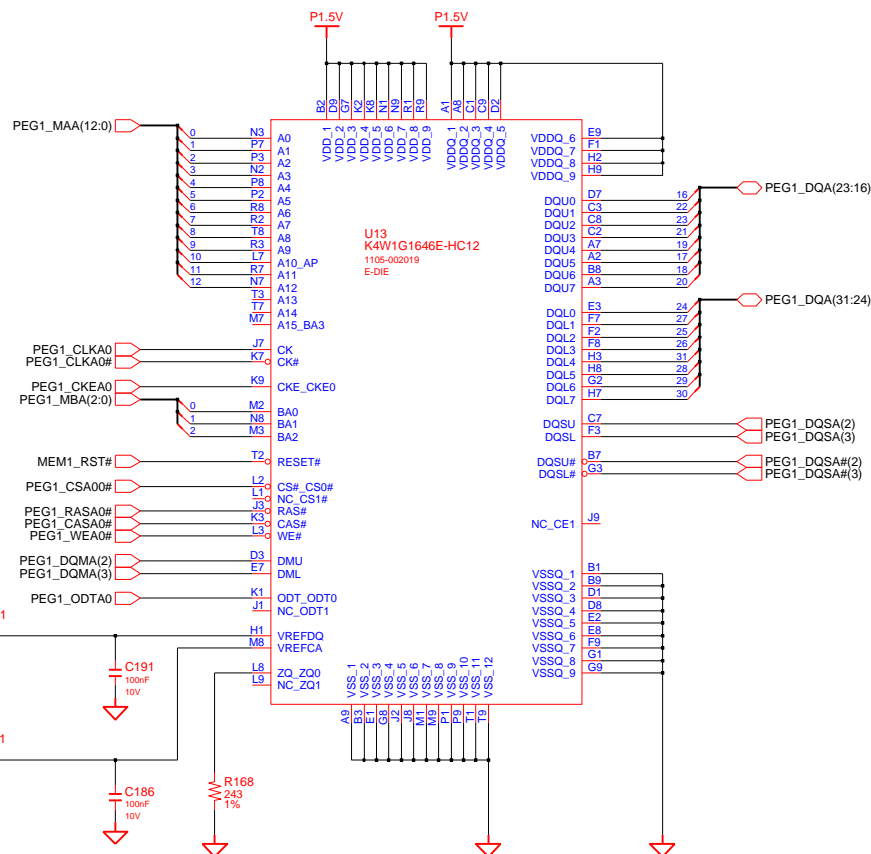


DVDATA_1

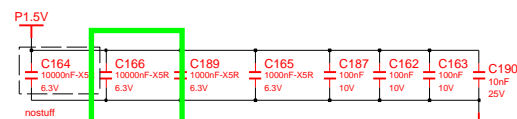



DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 GFX	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV			PART NO.
APPROVAL	MK Kim	REV	REV 0.1		M92-S3-XTX (4/4)	BA41-
MODULE CODE		LAST EDIT				
				March 06, 2010 17:48:35 PM	PAGE	23 OF 54

place near memory component

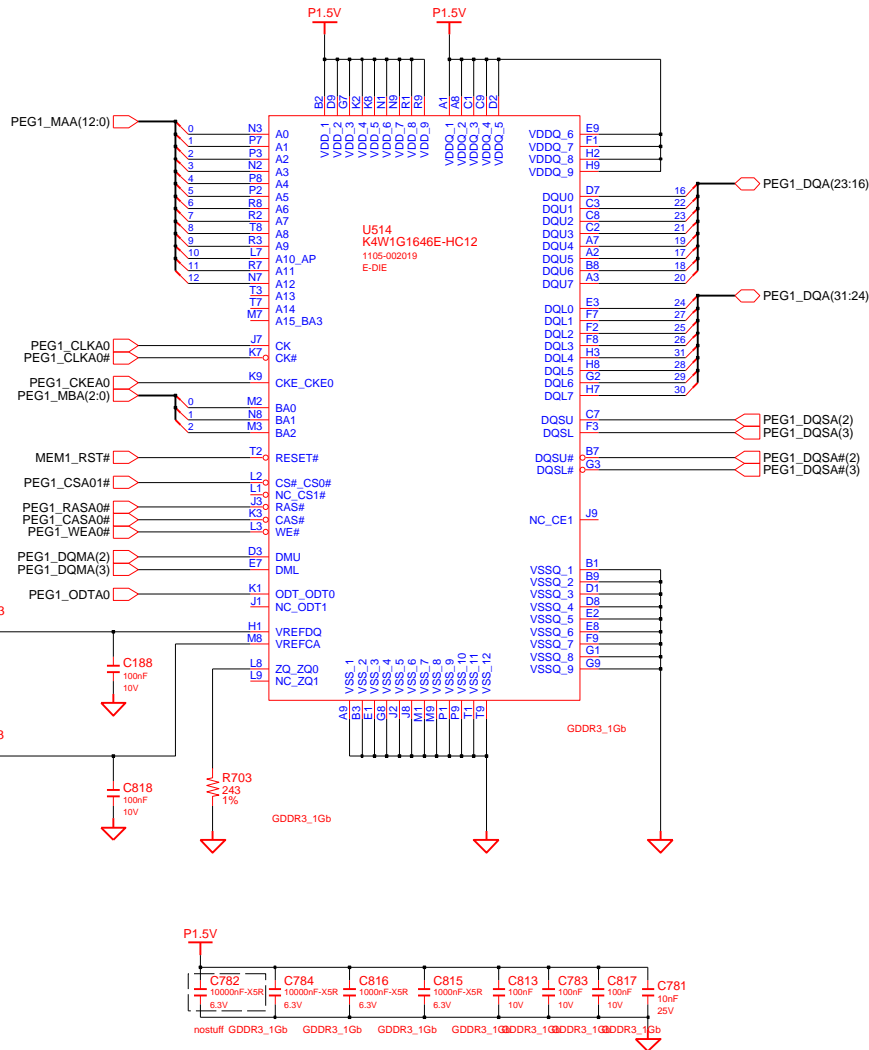


C171 - - > 1000nF, 1608 2203 - 006348



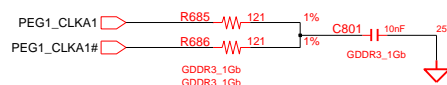
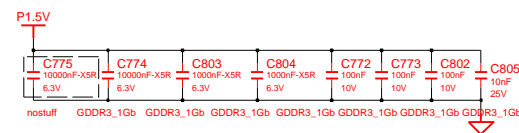
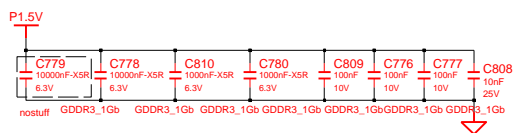
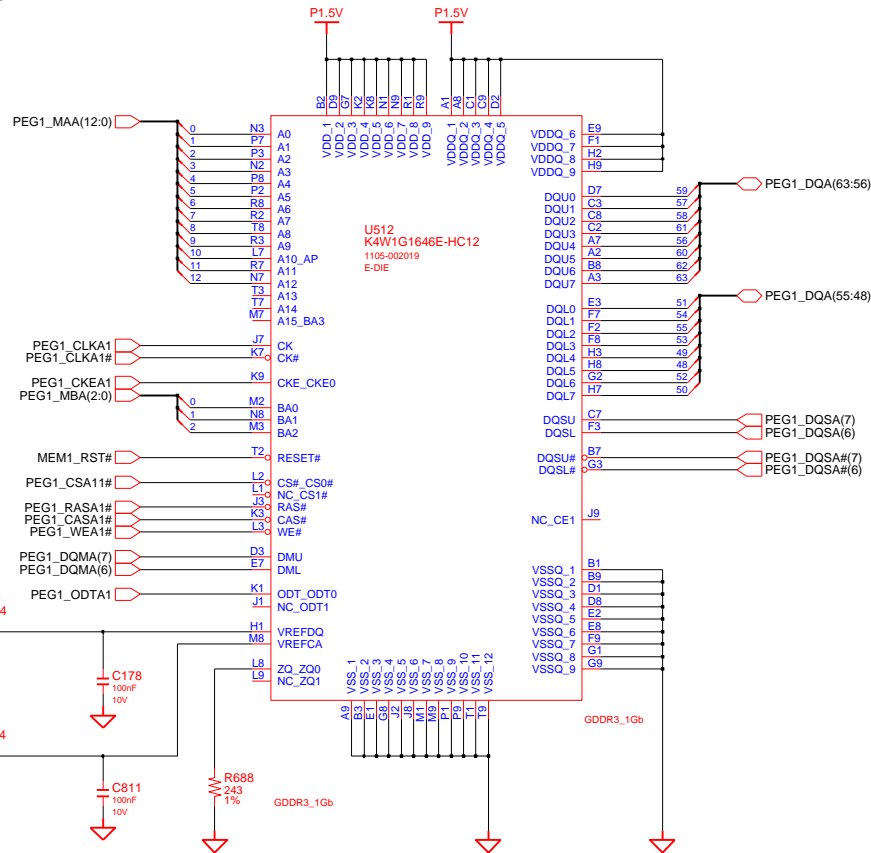
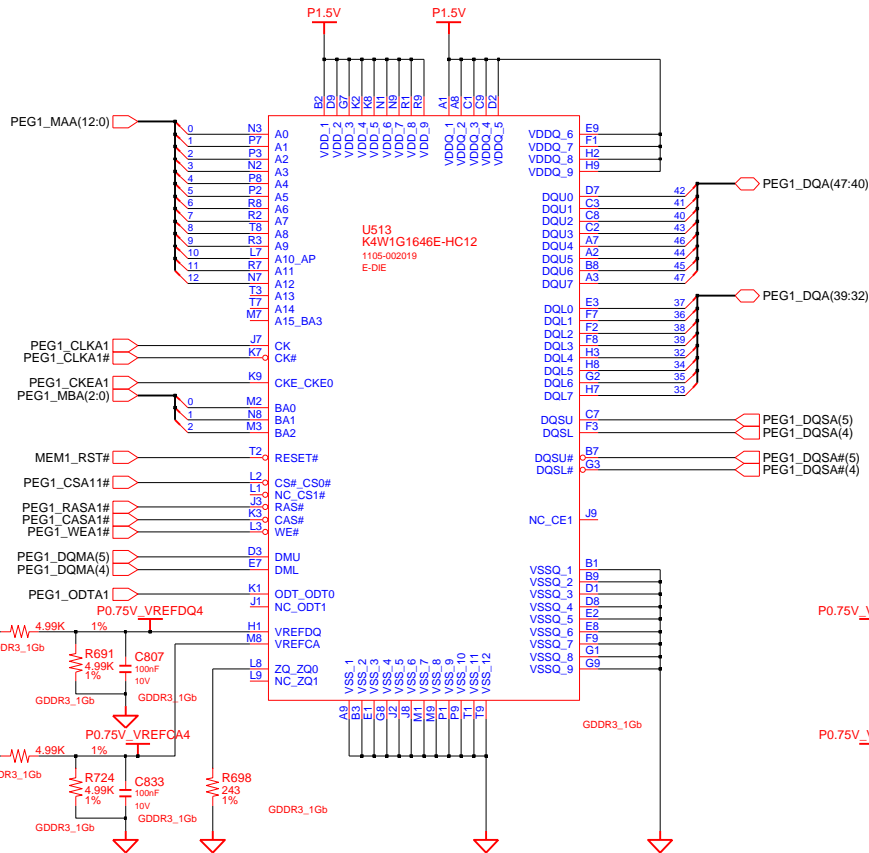
DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 EXT_GFX			
CHECK	SE Lee	DEV. STEP	ADV					
APPROVAL	REV	REV 0.1	GDDR3 (1/4)				PART NO.	BA41-
MODULE CODE	LAST EDIT							

RANK1 Lower Data



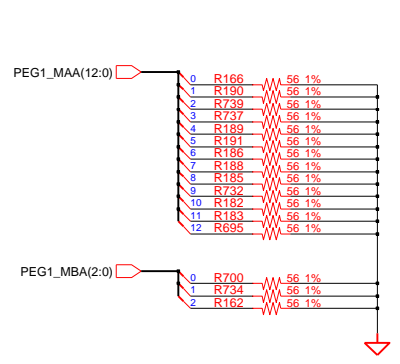
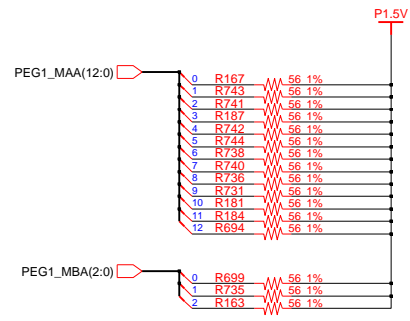
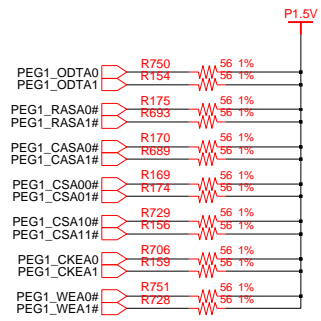
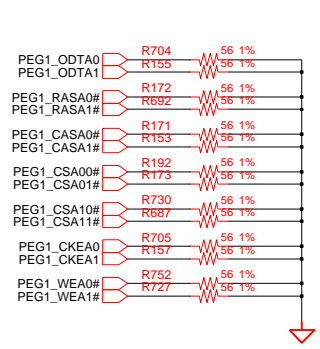
DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 EXT_GFX GDDR3 (3/4)	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV		
APPROVAL	MK Kim	REV	REV 0.1		
MODULE CODE	LAST EDIT				

RANK1 Upper Data

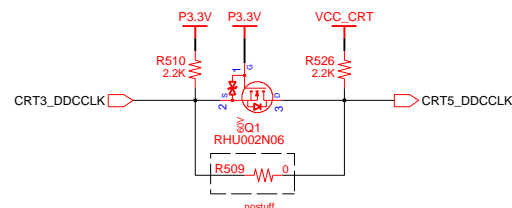
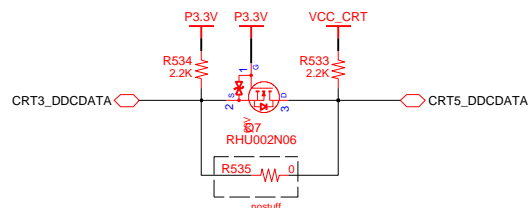
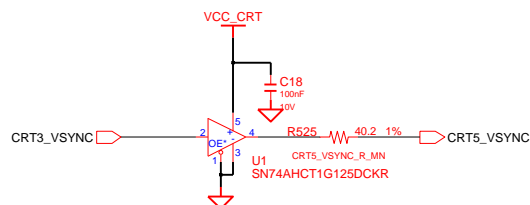
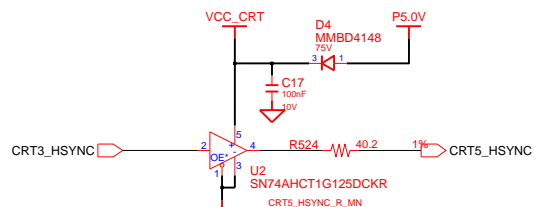


DESIGN	MS Yang	DATE	1/26/2010	TITLE BREMEN2 EXT_GF_X GDDR3 (4/4)	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV		
APPROVAL	MK Kim	REV	REV 0.1		
MODULE CODE	LAST EDIT		March 06, 2010 17:48:35 PM		
					PART NO. BA41-

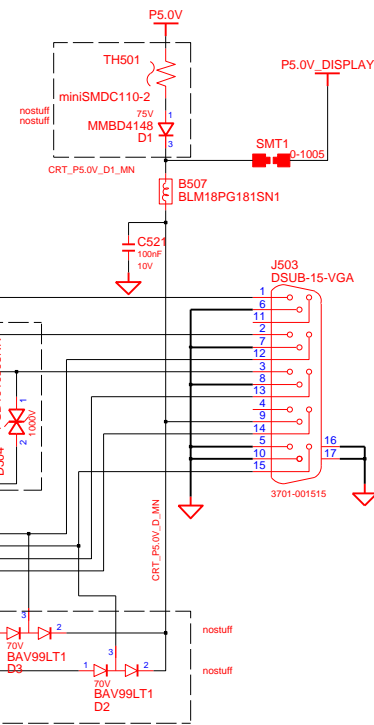
DUAL RANK Terminations



CRT



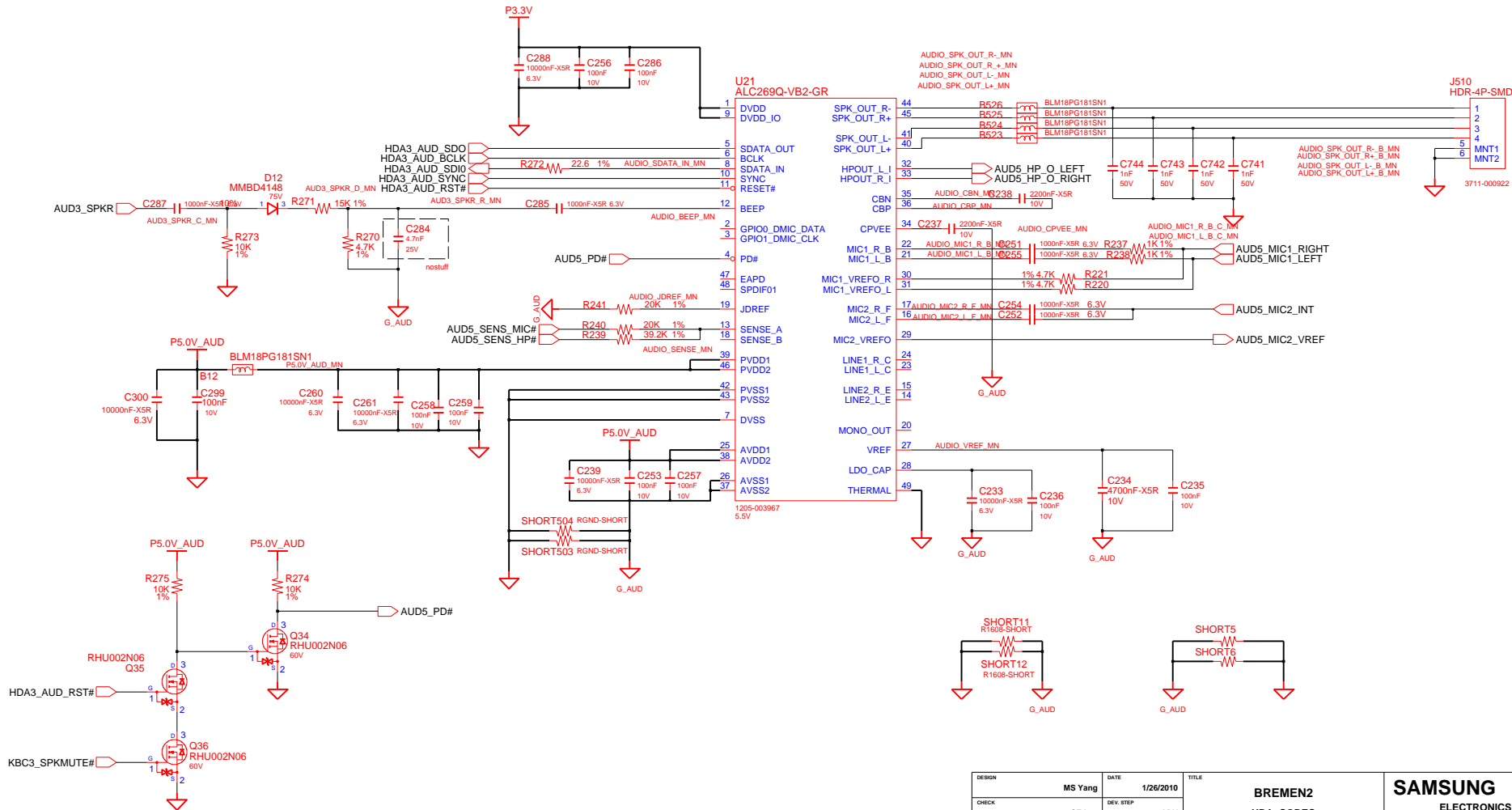
CRT CONNECTOR



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

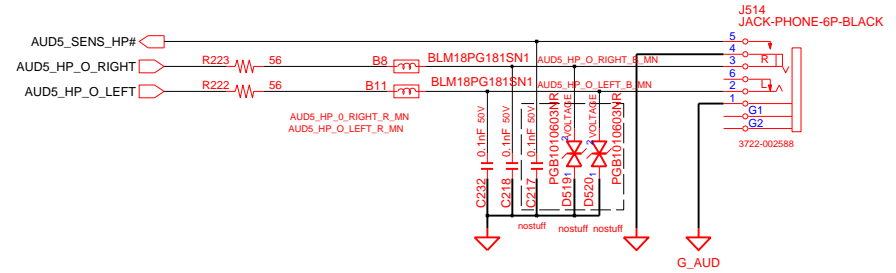
HD AUDIO

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

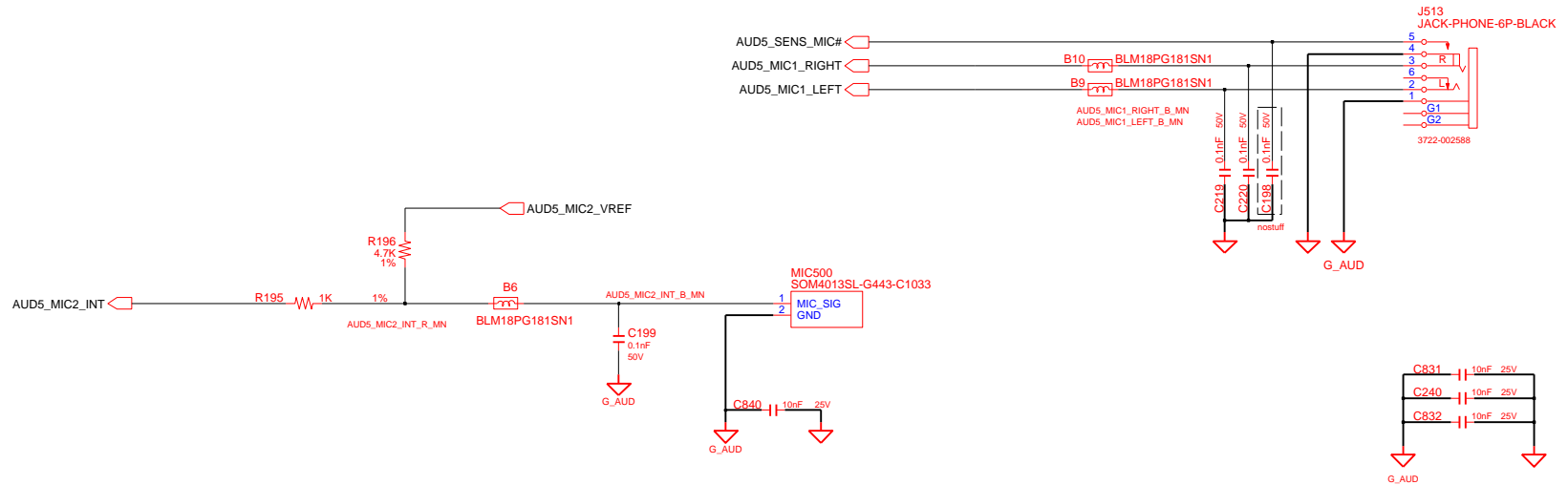


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 HDA_CODEC	SAMSUNG ELECTRONICS
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	undefined	LAST EDIT				
March 06, 2010 17:48:35 PM						PAGE 32 OF 54

HEADPHONE(BLACK)



MIC JACK(BLACK)

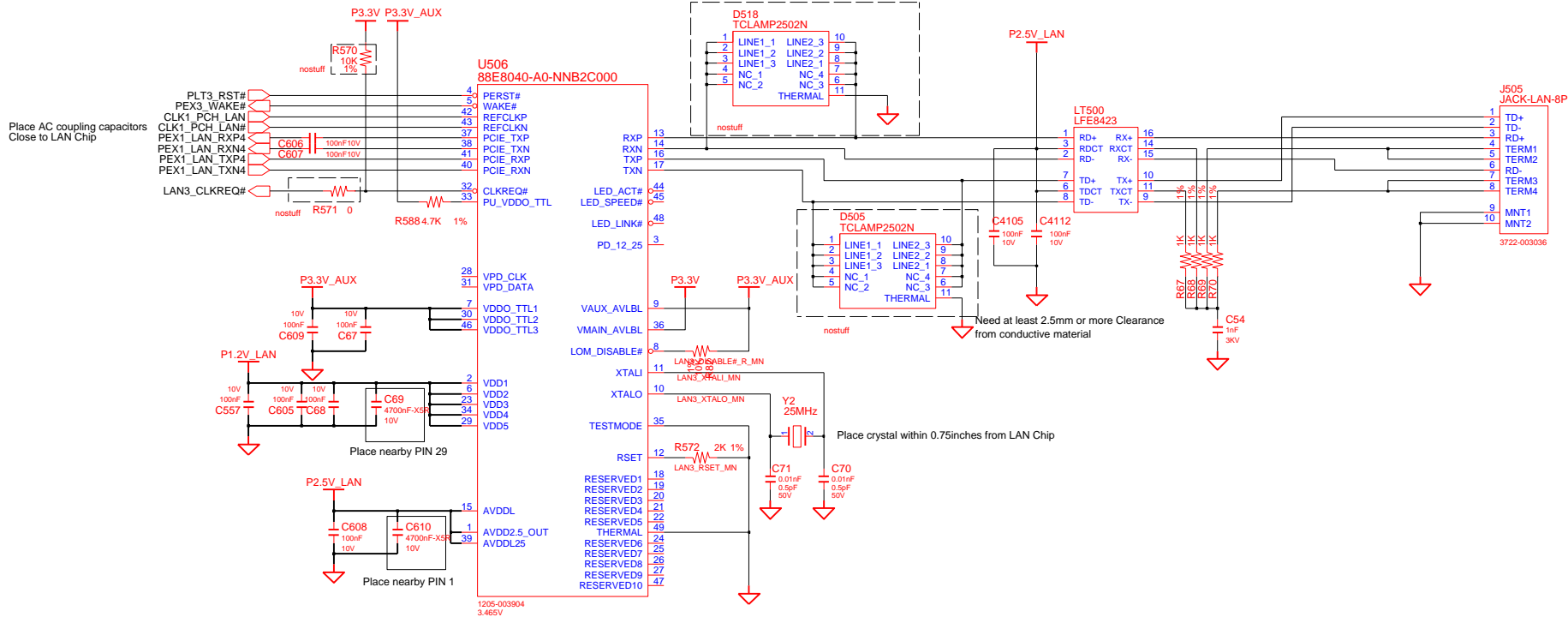


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 HDA_CODEC AUDIO JACK	SAMSUNG ELECTRONICS PART NO. BA41-
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	33 OF 54	

SAMSUNG PROPRIETARY

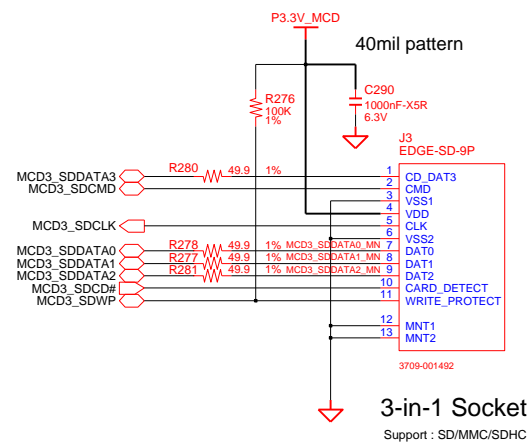
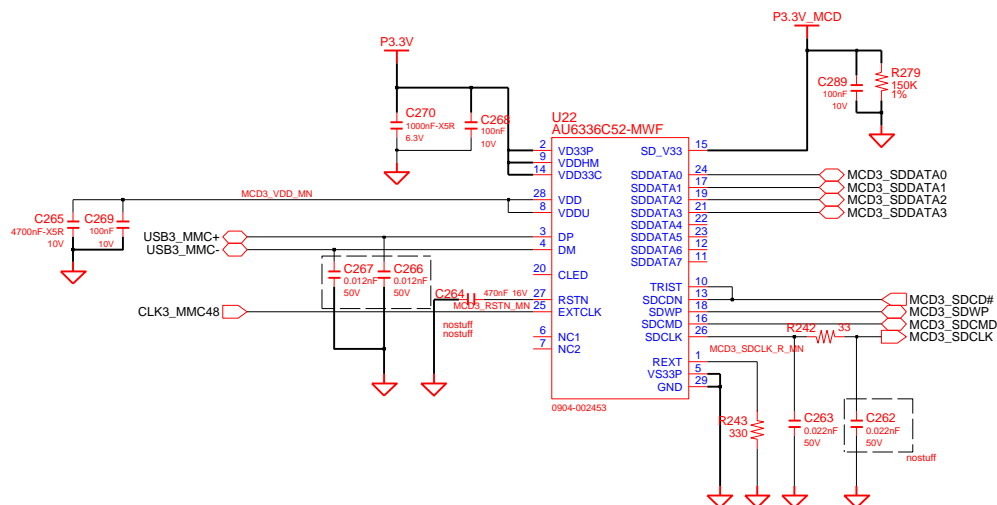
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

LAN Controller (88E8040)



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

3 IN 1 CARD (AU6336)



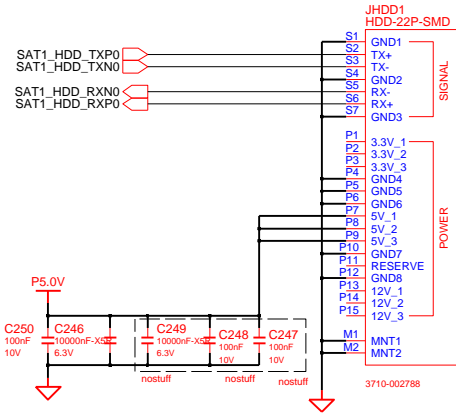
DESIGN	MS Yang	DATE	8/11/2009	BREMEN2 MULTICARD 3 IN 1 CARD(GL827S)	PART NO.	SAMSUNG ELECTRONICS BA41-
CHECK	SE Lee	DEV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	LAST EDIT		March 06, 2010 17:48:35 PM			



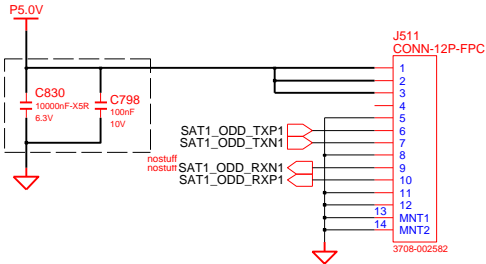
DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 MINI_PCIE_CONN WLAN	SAMSUNG ELECTRONICS		
CHECK	SE Lee	DEV. STEP	ADV		PART NO.	BA41-	
APPROVAL	MK Kim	REV	REV 0.1				
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM				

SATA I/F CONN

SATA HDD CONN

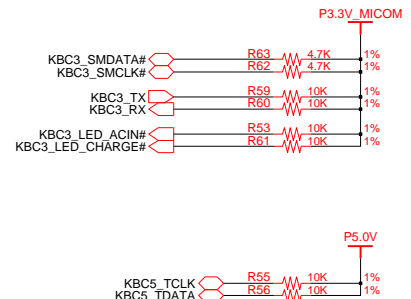


MAIN TO SUB SATA ODD CONN



DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 SATA_DEVICES HDD & ODD SUB CONNECTOR	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. 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 37	OF 54

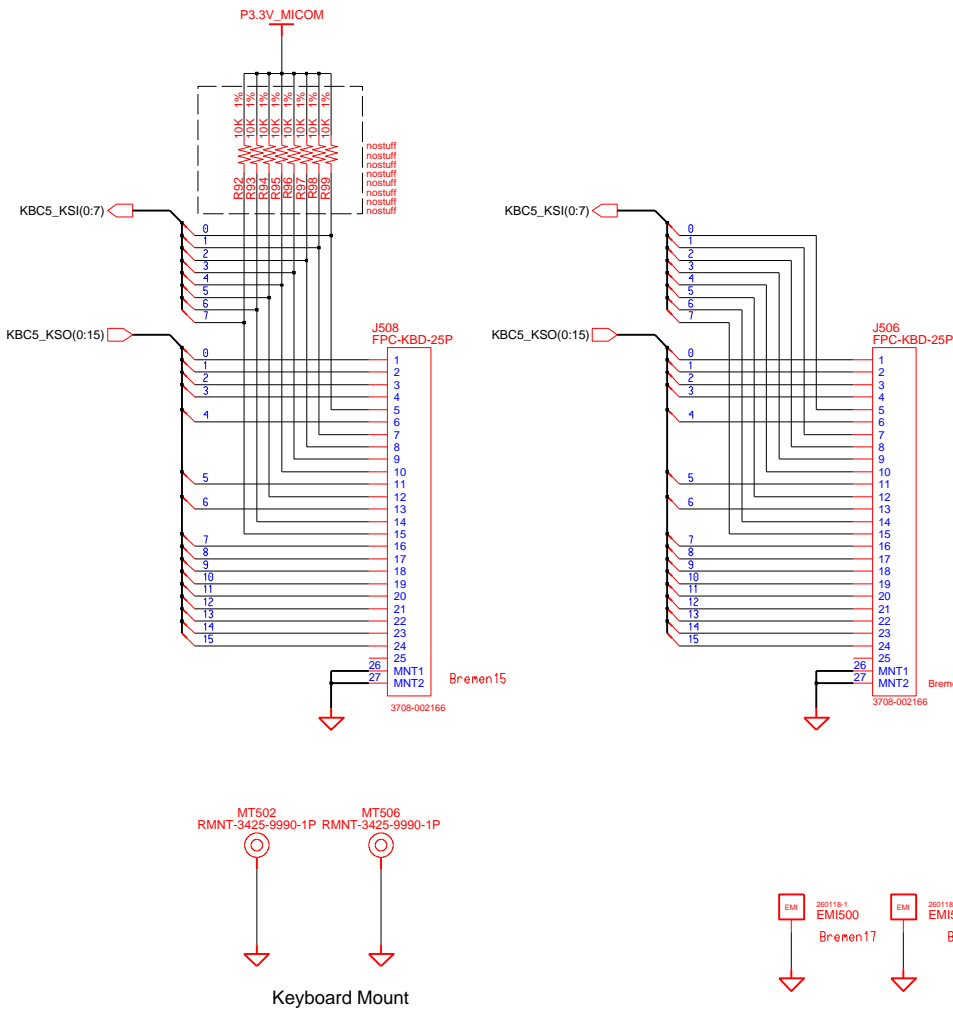
Power off logic



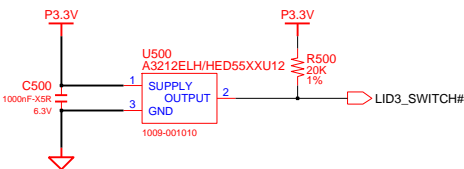
DRAW	MS Yang	DATE	1/26/2010	TITLE BREMEN2 MICON MICON_SMSC-MEC1300		SAMSUNG ELECTRONICS	
CHECK	SE Lee	DEV. STEP	ADV				
APPROVAL	MK Kim	REV	REV 0.1				
MODULE CODE	LAST EDIT			March 06, 2010 17:48:35 PM		PAGE	38 OF 54

Micom Glue Logic

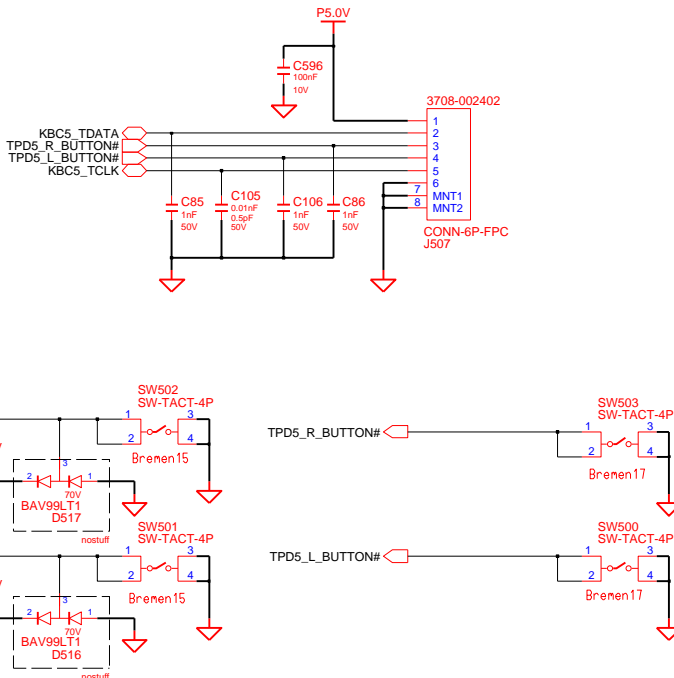
KEYBOARD



LID_SWITCH

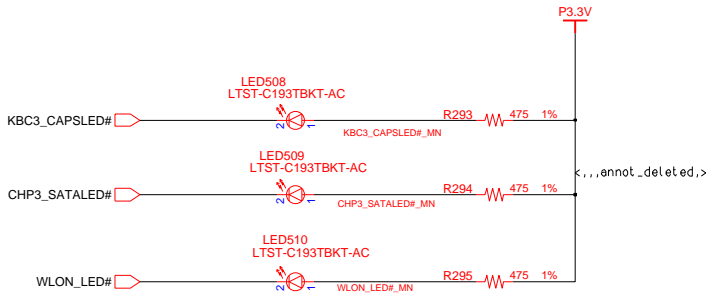


TOUCHPAD

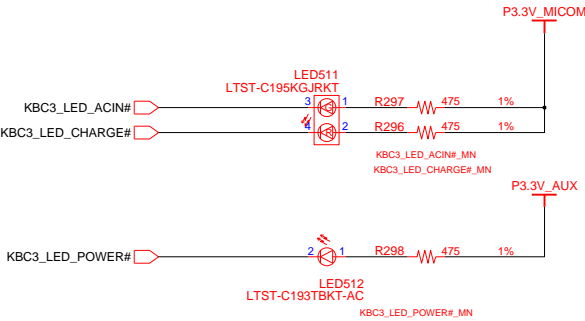


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 MICOM GLUE LOGIC KEYBOARD & TOUCHPAD	SAMSUNG ELECTRONICS PART NO. BA41-
CHECK	SE Lee	REV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1			
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	39 OF 54	

FUNCTION KEY LED

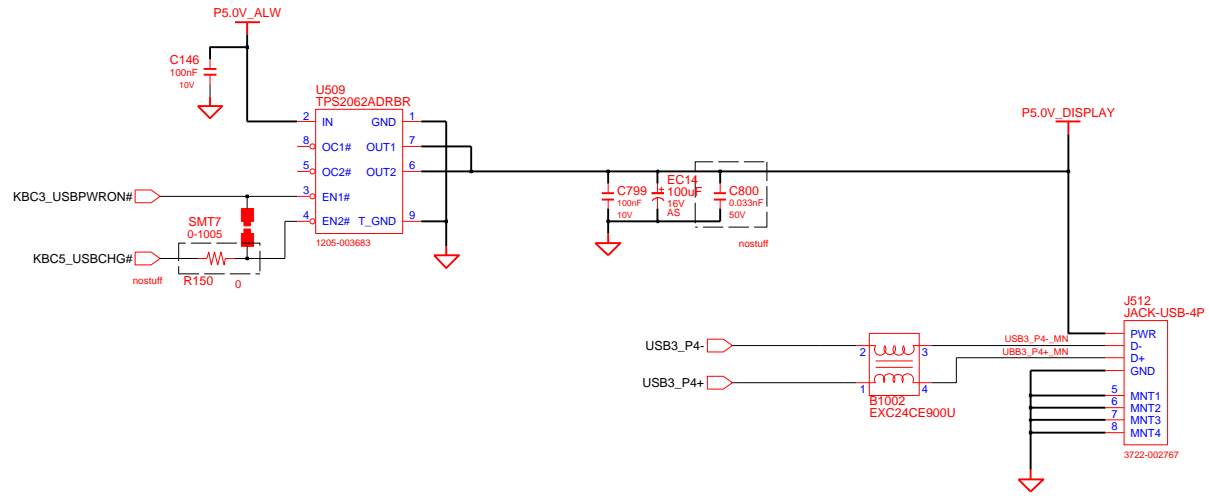


ADAPTERIN/CHARGING LED

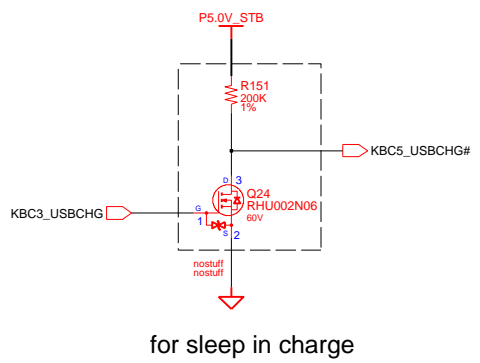
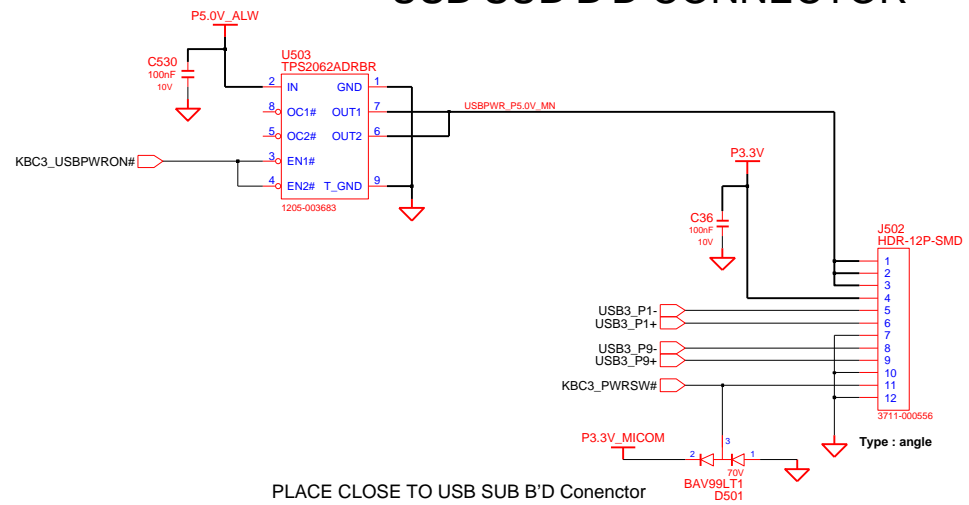


DRAW	MS Yang	DATE	1/26/2010	BREMEN2 LED_SWITCH LED_SWITCH		SAMSUNG ELECTRONICS PART NO. BA41-	
CHECK	SE Lee	DEV. STEP	ADV				
APPROVAL	MK Kim	REV	REV 0.1				
MODULE CODE	LAST EDIT			March 06, 2010 17:48:35 PM		PAGE 40	OF 54

USB Single connector



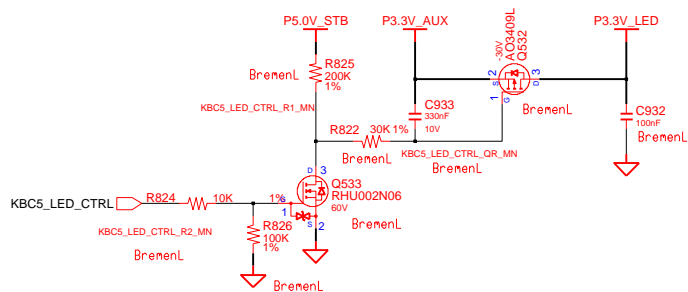
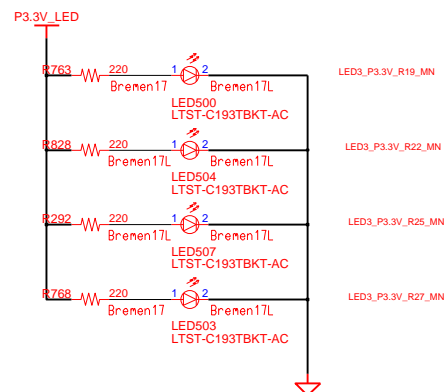
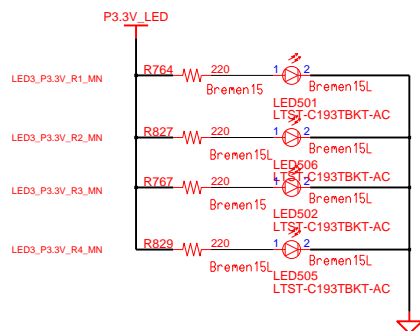
USB SUB B'D CONNECTOR



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	REV	Single USB	PART NO. BA41-
APPROVAL	MK Kim	REV	REV 0.1	LAST EDIT	March 06, 2010 17:48:35 PM	OF 54
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	41	OF 54

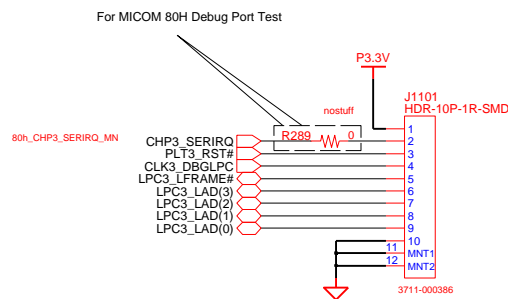
Touchpad LED



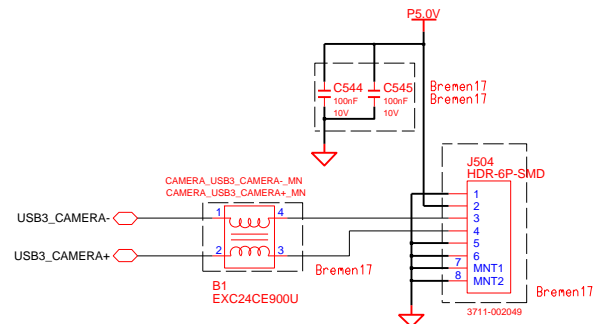
DESIGN	MS Yang	DATE	1/26/2010	BREMEN2 TOUCHPAD LED TOUCHPAD LED	SAMSUNG ELECTRONICS		
CHECK	SE Lee	DEV. STEP	ADV				
APPROVAL	MK Kim	REV	REV 0.1				
MODULE CODE	LAST EDIT		March 06, 2010 17:48:35 PM				
				PAGE	42	OF	54

USB I/F Devices

80h PORT DEBUG

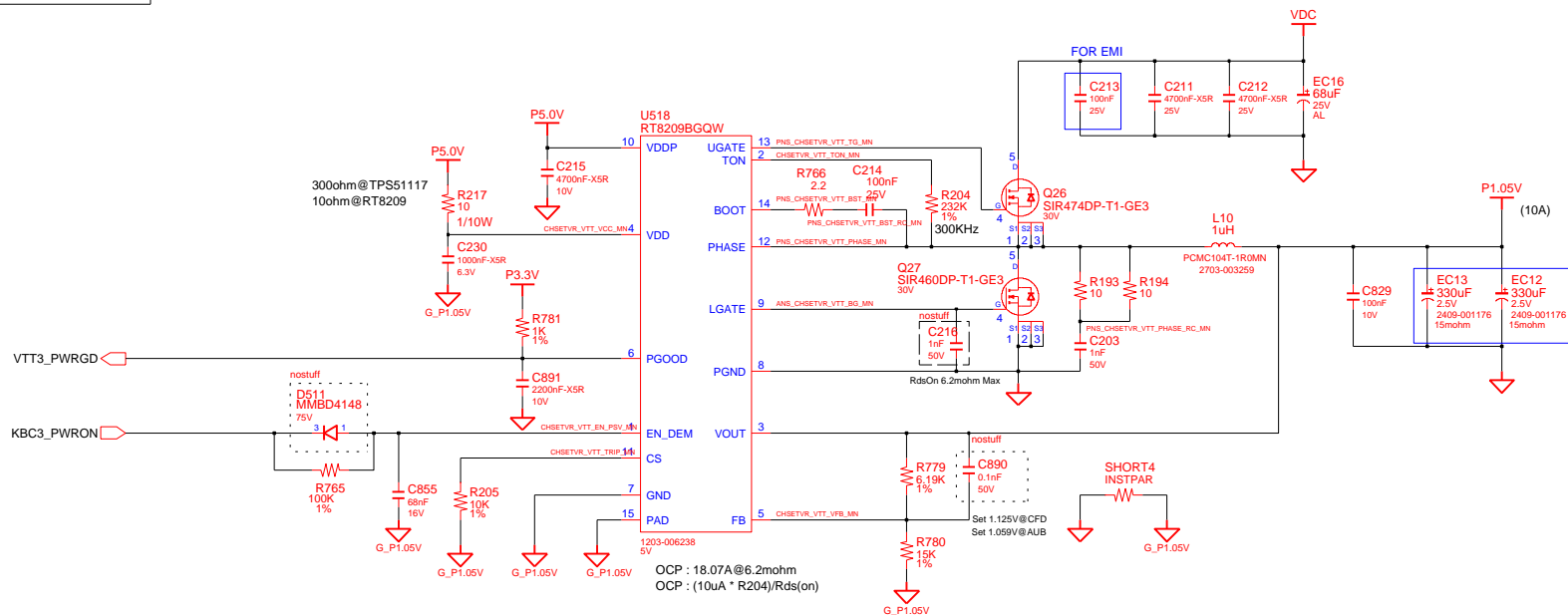


CAMERA (17Inch)

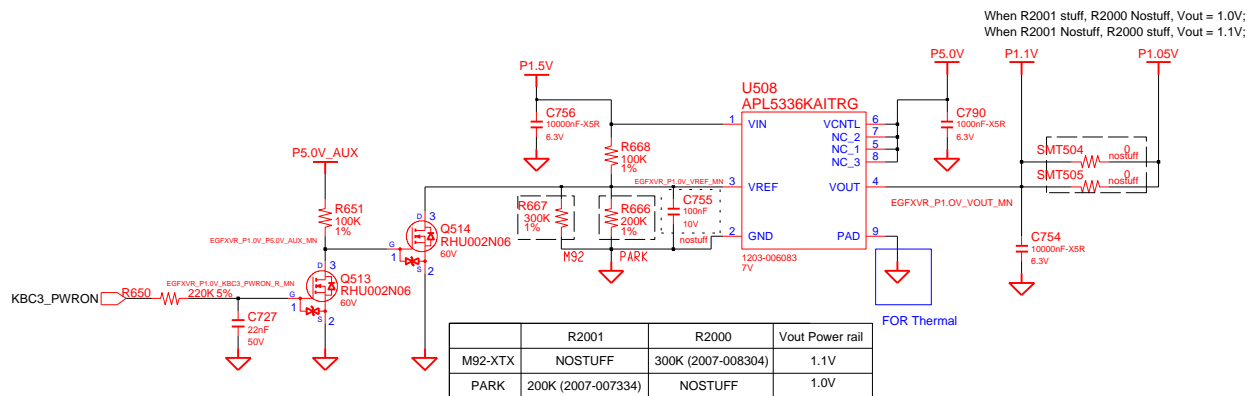


DESIGN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 USB_DEVICES	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV			
APPROVAL	MK Kim	REV	REV 0.1		CAMERA	PART NO. BA41-
MODULE CODE	undefined	LAST EDIT		March 06, 2010 17:48:35 PM	PAGE 43 OF 54	

CHIPSET POWER(P1.05V)



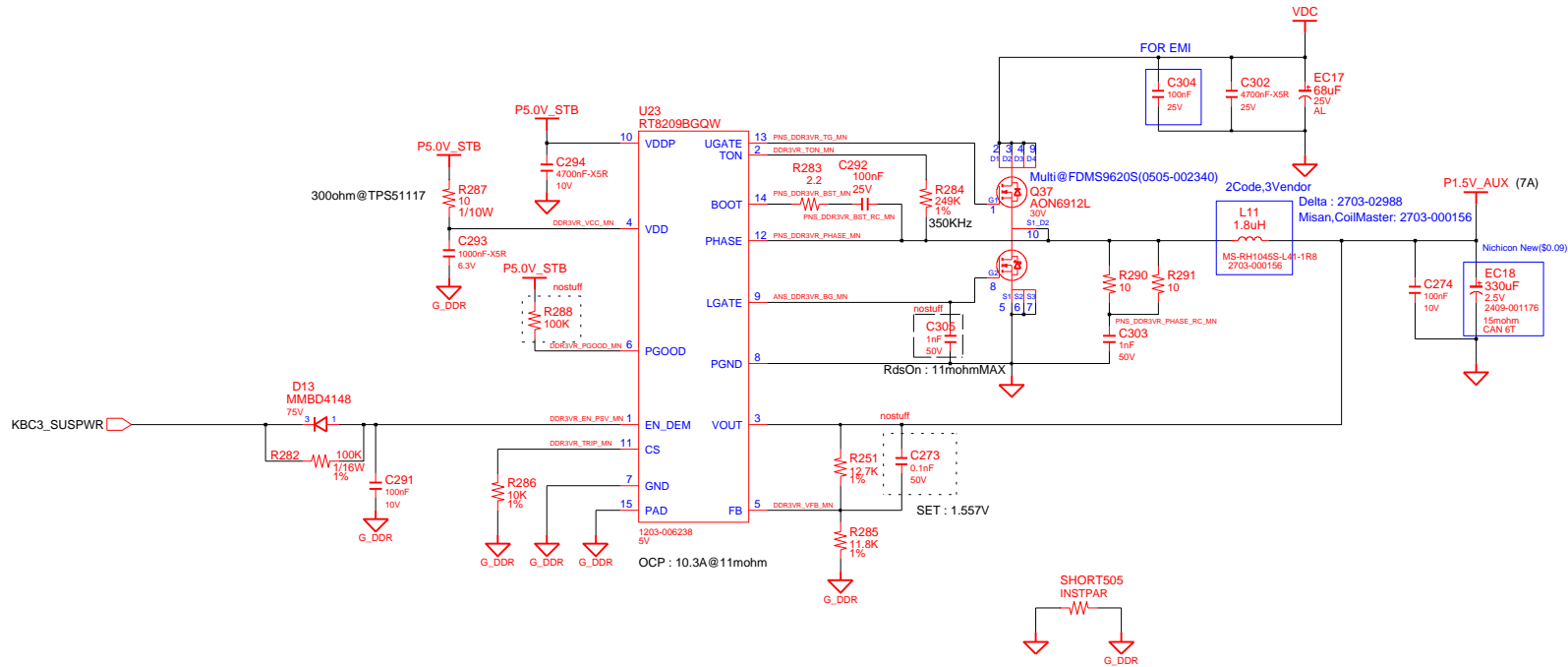
P1.1V



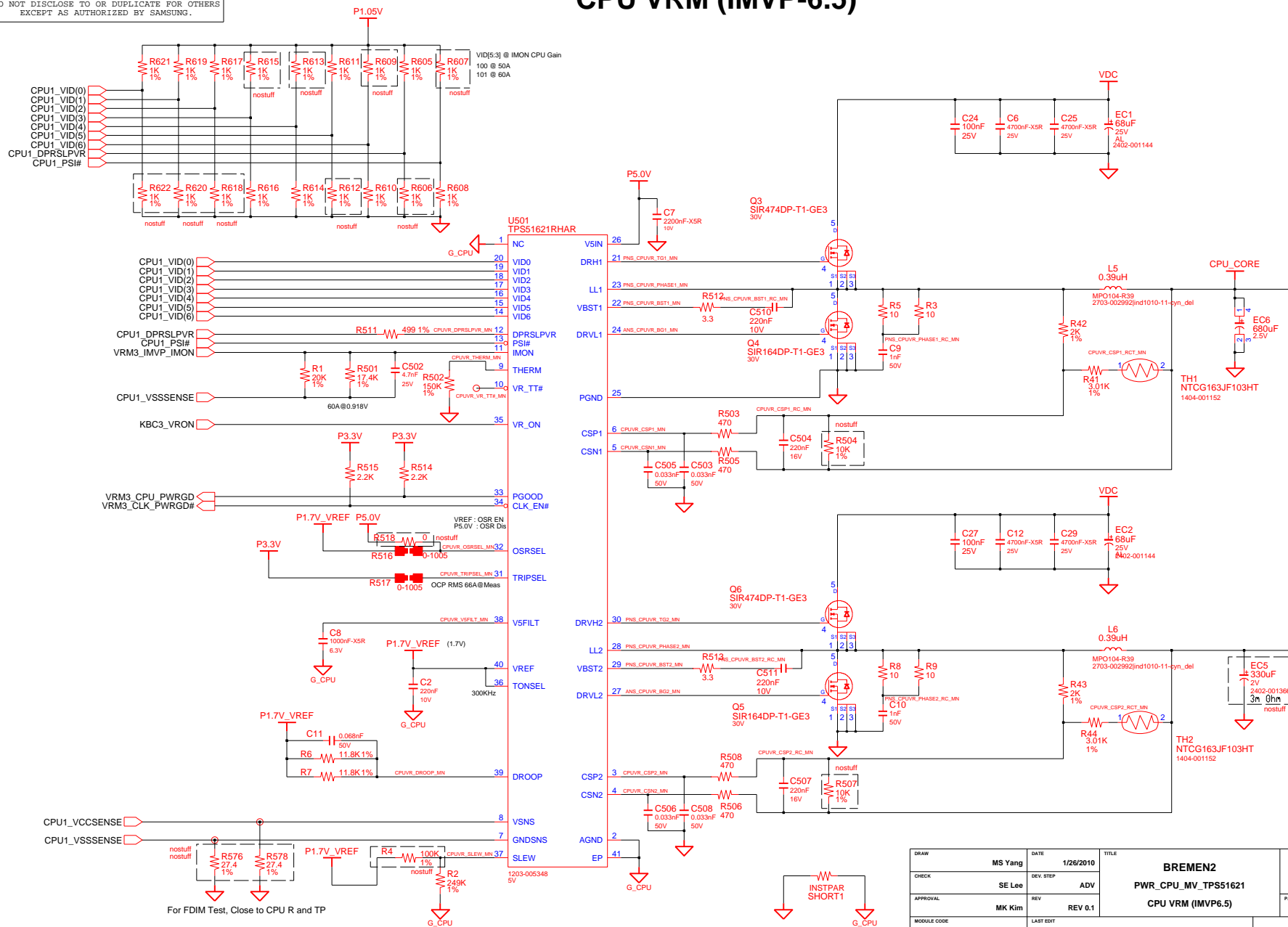
	R2001	R2000	Vout Power rail
M92-XTX	NOSTUFF	300K (2007-008304)	1.1V
PARK	200K (2007-007334)	NOSTUFF	1.0V

DESIGN	MS Yang	DATE	1/26/2010	TITLE BREMEN2 Chipset Power Chipset Power (P1.05VTT)	SAMSUNG ELECTRONICS
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	46 OF 54

DDR3 Power

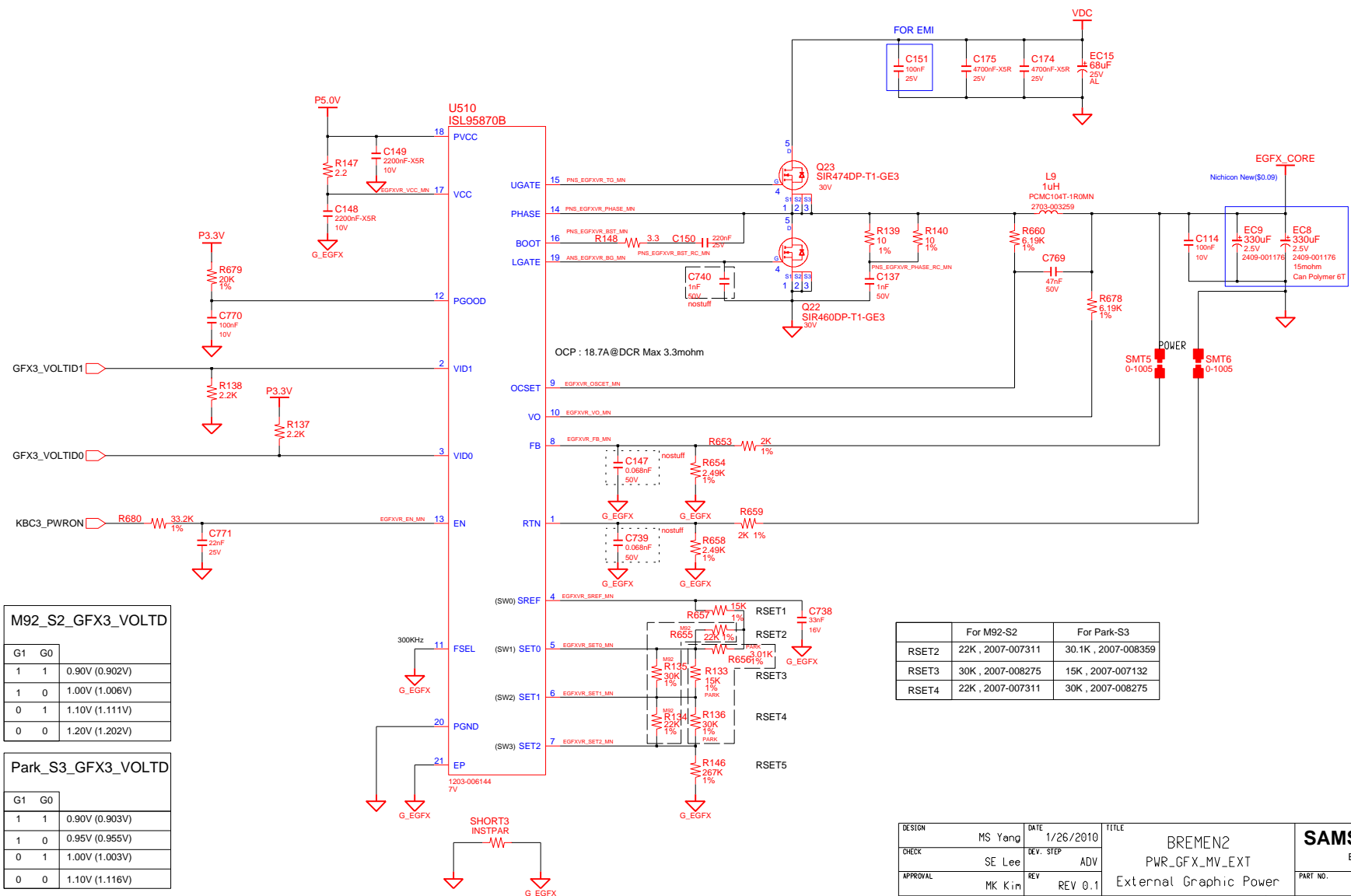


CPU VRM (IMVP-6.5)



DRAW	MS Yang	DATE	1/26/2010	BREMEN2 PWR_CPU_MV_TPS51621 CPU VRM (IMPV6.5)	SAMSUNG ELECTRONICS	PART NO.	BA41-
CHECK	SE Lee	DEV. STEP	ADV				
APPROVAL		REV	REV 0.1				
MODULE CODE	MK Kim	LAST EDIT					

Graphic Core Power



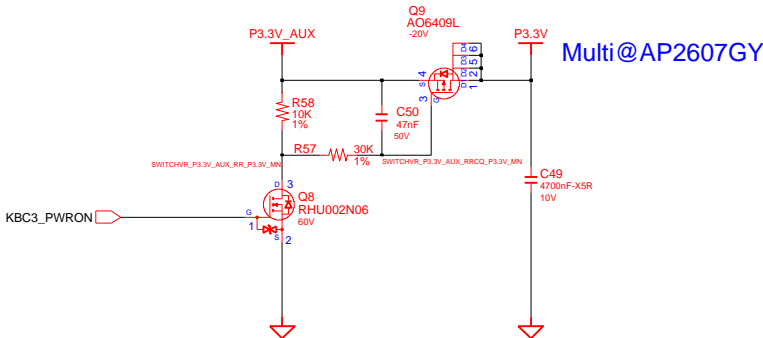
M92_S2_GFX3_VOLTID	
G1	G0
1	1
1	0
0	1
0	0

Park_S3_GFX3_VOLTID	
G1	G0
1	1
1	0
0	1
0	0

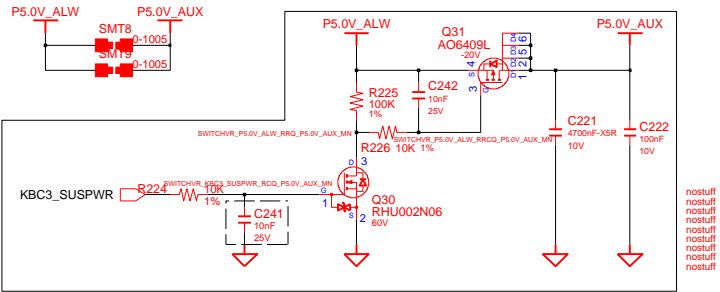
	For M92-S2	For Park-S3
RSET2	22K, 2007-007311	30.1K, 2007-008359
RSET3	30K, 2007-008275	15K, 2007-007132
RSET4	22K, 2007-007311	30K, 2007-008275

Switched Power

Switched Power On (P3.3V)

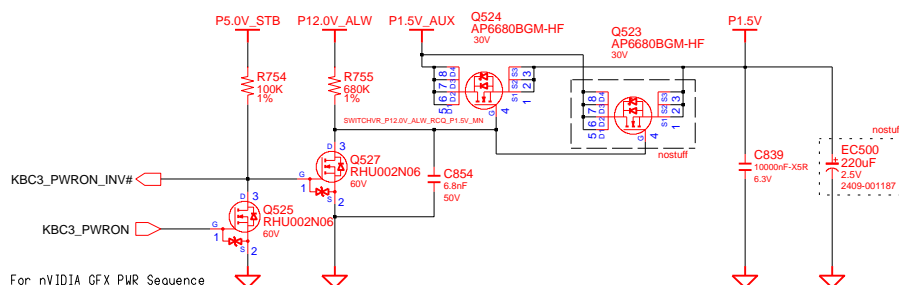


Sleep'n Charger



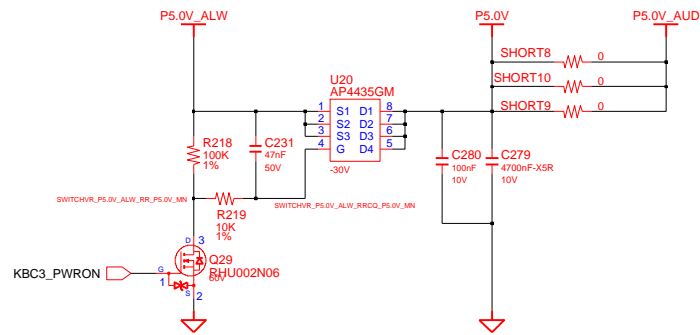
Switched Power On (P1.5V)

Multi@AO4476L

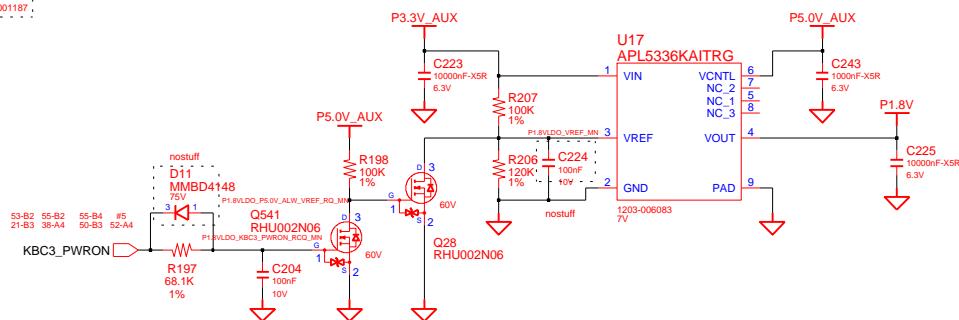


Switched Power On (P5.0V)

Multi@Si4435DDY

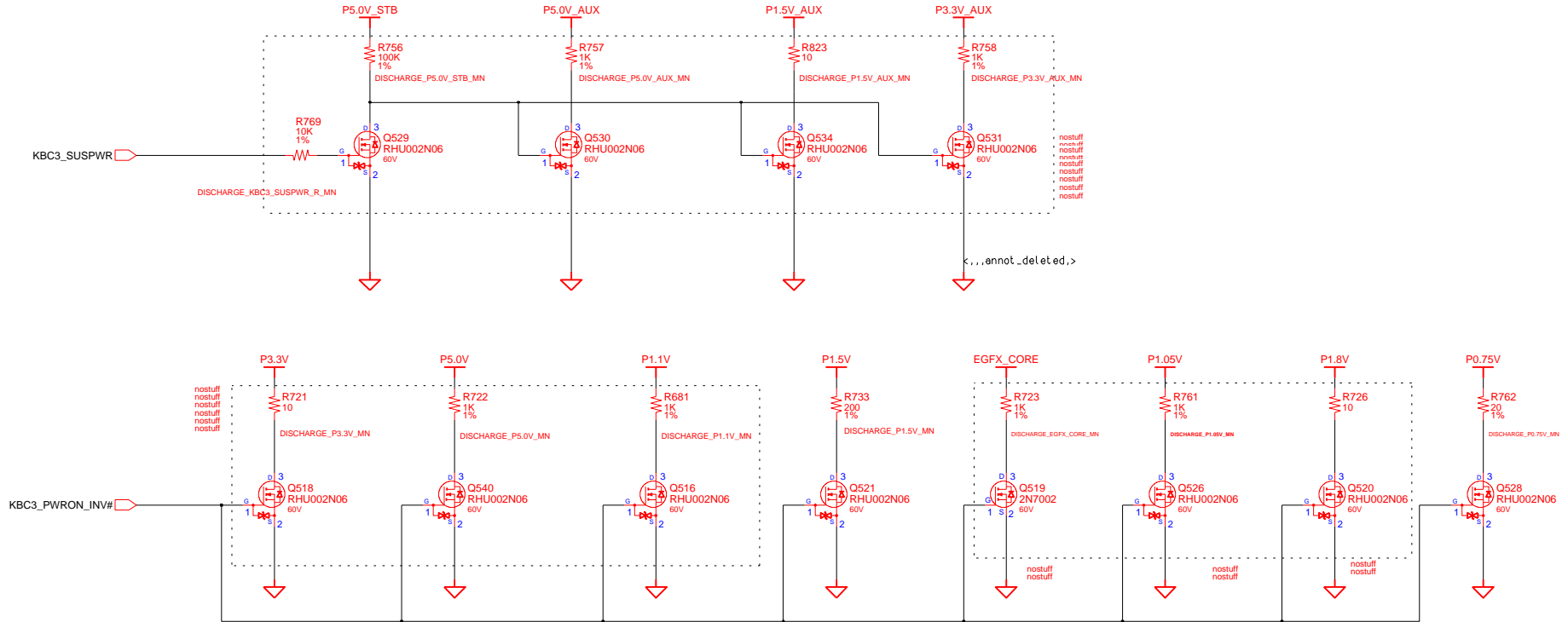


P1.8V(LDO)



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

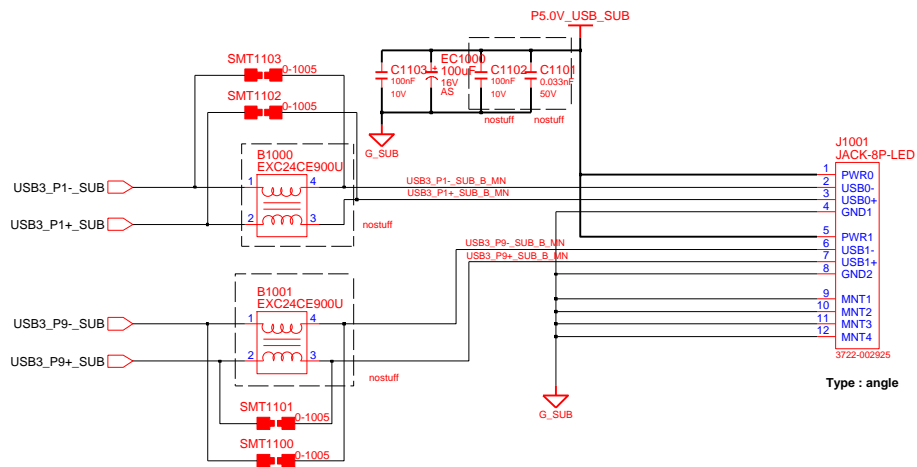
POWER DISCHARGER



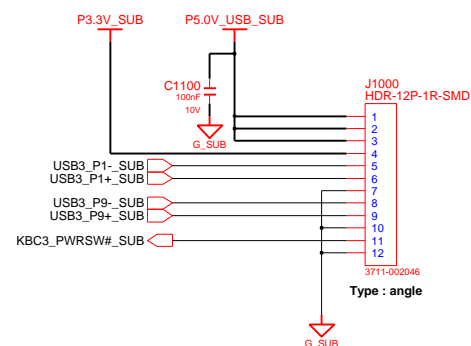
DRAWN	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 PWR_MV_DISCHARGER	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV	DISCHARGING LOGIC	PART NO.	
APPROVAL	MK Kim	REV	REV 0.1			BA41-
MODULE CODE	undefined	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	51	OF 54

THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

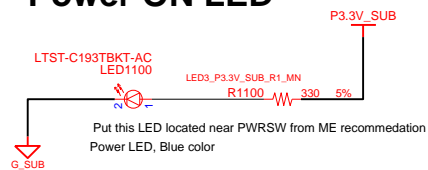
2 USB PORT & POWER S/W SUB B'D



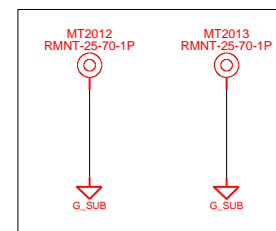
SUB TO MAIN USB CONN




Power ON LED



Power Button



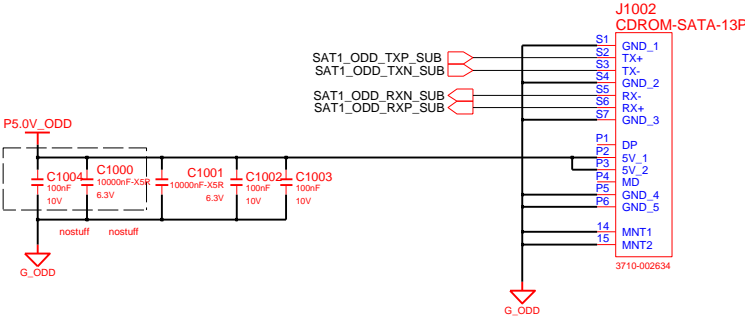
USB sub board mount hole

DESIGN	MS Yang	DATE	1/26/2010	TITLE BREMEN2 SUB BOARD1 2 USB & POWER SW				
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	52	OF	54

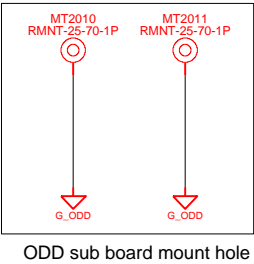
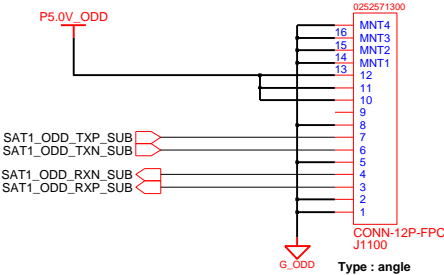
SATA ODD SUB BOARD

SATA ODD SUB BOARD

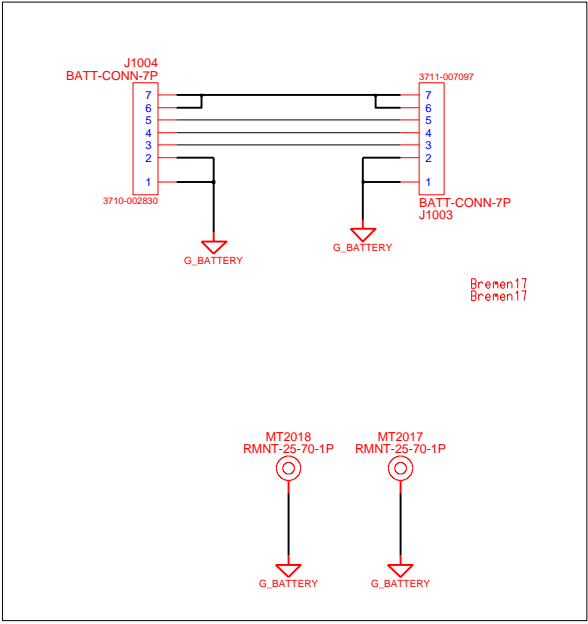
SATA ODD CONN



SUB TO MAIN SATA ODD CONN

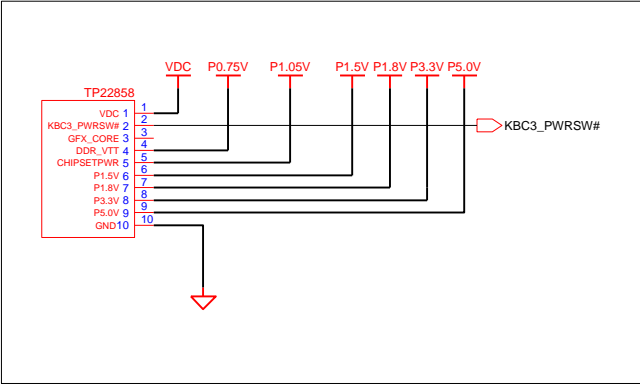


17" BATTERY SUBBOARD

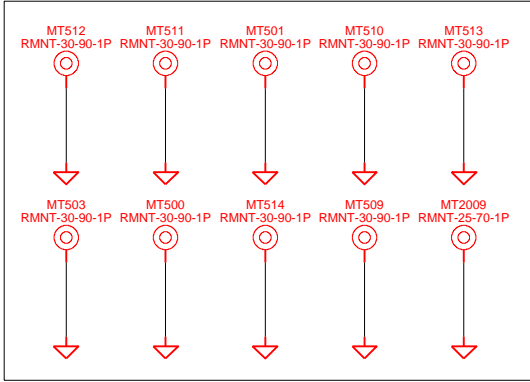


DRAW	MS Yang	DATE	1/26/2010	TITLE	BREMEN2 SUB BOARD2 SATA ODD SUB BOARD	SAMSUNG ELECTRONICS
CHECK	SE Lee	DEV. STEP	ADV	REV	REV 0.1	PART NO. BA41-
APPROVAL	MK Kim	LAST EDIT	March 06, 2010 17:48:35 PM	PAGE	53	OF 54
MODULE CODE	undefined					

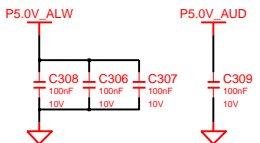
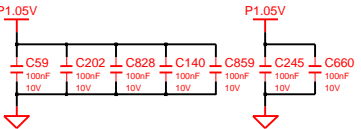
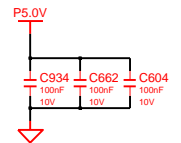
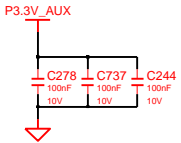
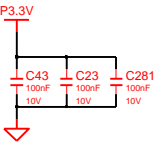
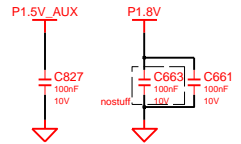
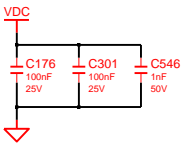
ICT PORT



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

www.s-manuals.com