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Scala2-R

CPU : Sandy Bridge PGA
 Chip Set : Intel Cougar Point
 GFX : N12P-GV/N12M-GE
 Remarks : Huron River Platform

Model Name : Scala2-R
 PBA Name : MAIN
 PCB Code : BA41-01XXXX (GCE)
 BA41-01XXXX (NY)
 BA41-01XXXX (HAN)
 BA41-01XXXX (GBM)
 Dev. Step : ADV
 Revision : 0.1
 T.R. Date : 2011.01.20

Design	CHECK	APPROVAL
<i>GU HUI</i>	<i>SJ WU</i>	<i>BC LEE</i>

Owner : SRDC PD3

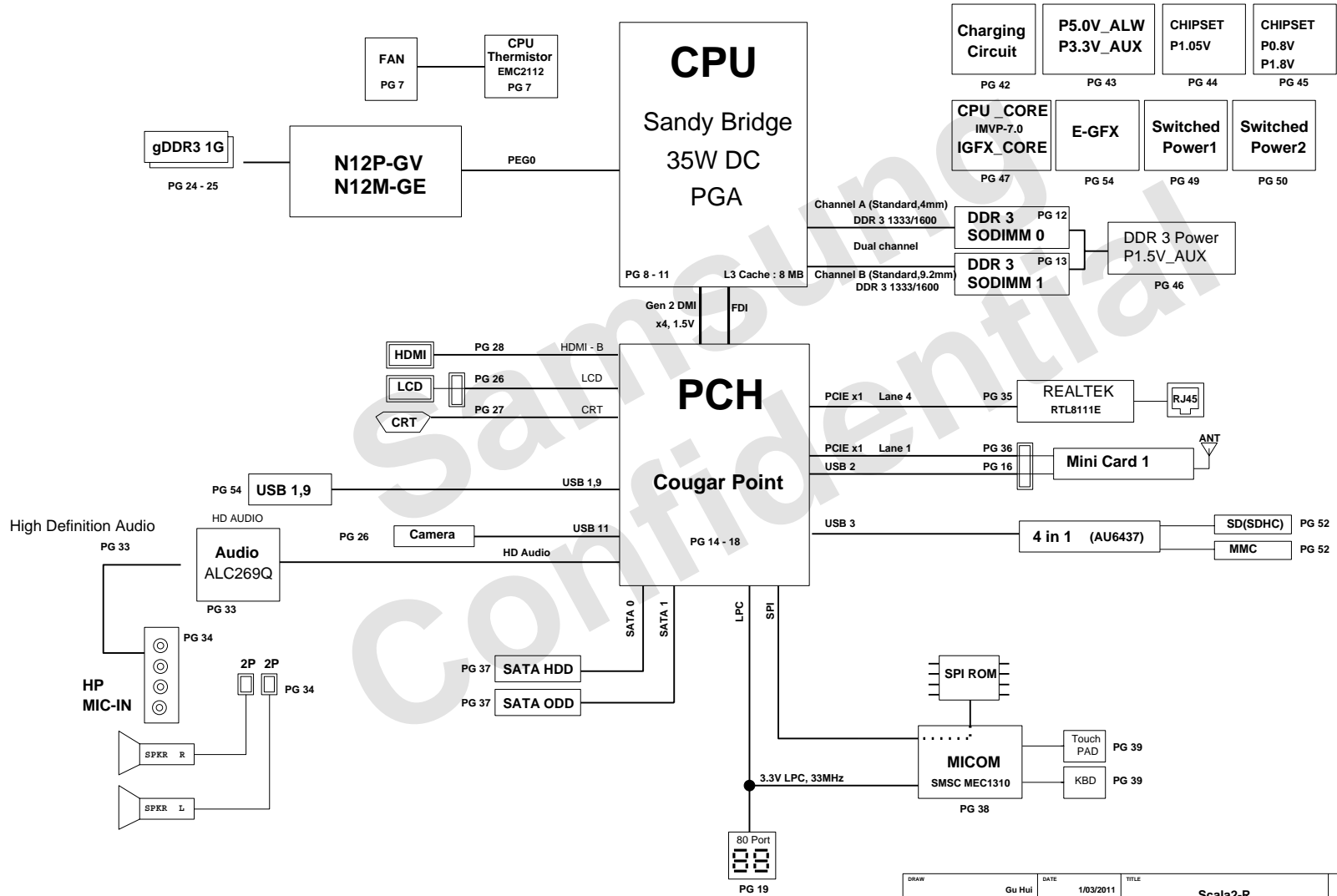
Signature : *GUHUI*

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sheet14 : PCH-CougarPoint	sheet38 : Power - P1.05V (Chipset Power)
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sheet18 : 80 port	sheet42 : Power - EGFx_CORE
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sheet20 : N12P-GV	sheet44 : Power - Switched Power 2
sheet21 : N12P-GV	sheet45 : Power - Power Discharge
sheet22 : N12P-GV	sheet46 : 3-in-1 card (AU6437)
sheet23 : GFX memory	sheet47 : Touchpad & LED
sheet24 : GFX memory	sheet48 : Mount Hole

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	COVER		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE 1 OF 48		

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BLOCK DIAGRAM



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	BLOCK DIAGRAM	PART NO.	BA41-01XXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	2	OF 48

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BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails		Active in
VDC P3.3V_MICOM P5.0V_STB P5.0V_ALW P3.3V_ALW P12.0V_ALW	Primary DC system power supply (7 to 21V) 3.3V always power rail (for Micom) 5.0V always power rail 5.0V always power rail 3.3V always power rail 12.0V always power rail	S4 - S5
P5.0V_AUX P3.3V_AUX P1.5V_AUX	5.0V switched on power rail (off in S4-S5) 3.3V switched on power rail (off in S4-S5) 1.5V power rail for DDR3 (off in S4-S5)	S3
P5.0V P3.3V P1.8V P1.5V P0.75V P0.8V	5.0V switched power rail (off in S3-S5) 3.3V switched power rail (off in S3-S5) 1.8V switched power rail (off in S3-S5) 1.5V switched power rail (off in S3-S5) 0.75V power rail for DDR3 (off in S3-S5) 0.8V switched power rail (off in S3-S5)	S0
VCC_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT	S0
P3.3V_D P1.5V_D P1.05V_D	3.3V discrete power rail for N12X 1.5V discrete power rail for N12X 1.05V discrete power rail for N12X	

Crystal / Oscillator			
TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	HM65	Real Time Clock
Crystal	25MHz	LAN	Intel LAN
Crystal	24MHz	USB 3.0	
Crystal	25MHz	HM65	INTEL
Crystal	27MHz	N12P-LP	NVIDIA

LCD Pannel Detect (TBD)		
Devices	Resolution	PANNEL_DETECT_0

USB PORT Assign		PCI Express Assign	
PORT #	ASSIGNED TO	PORT #	ASSIGNED TO
0	NC	1	Mini Card 1 (WLAN)
1	SYSTEM PORT 0	2	NC
2	Mini PCI Express	3	NC
3	Multi Memory Card Controller	4	LAN CONTROLLER
4	NC	5	USB 3.0
5	NC	6	NC
6	NC (N/A WITH HM55)	7	NC
7	NC (N/A WITH HM55)	8	NC
8	Camera		
9	SYSTEM PORT 1		
10	NC		
11	Camera(LCD Cable)		
12	NC		
13	NC		

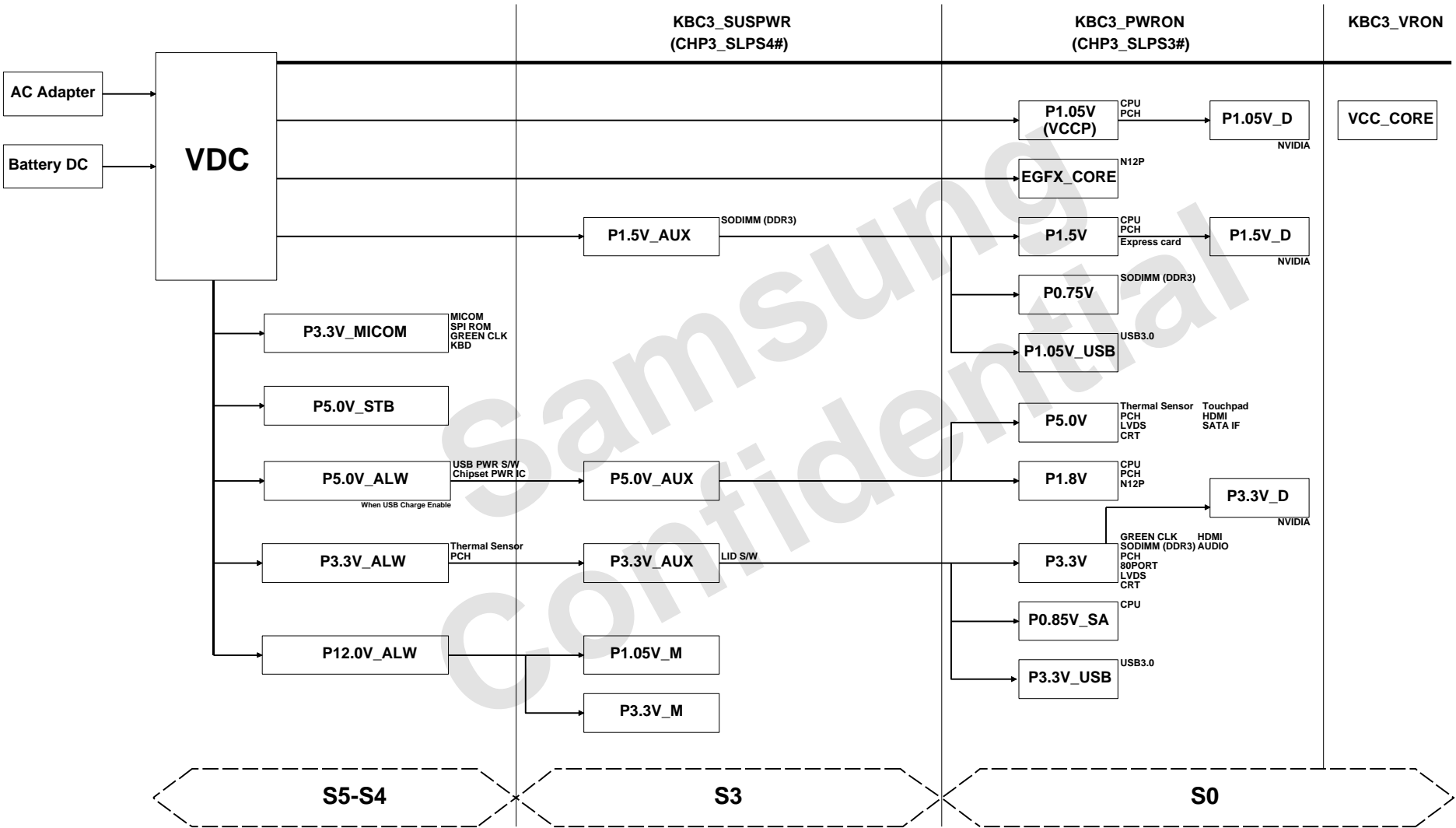
I ² C / SMB Address			
Devices	Address	Hex	Bus
HM65	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	-
SODIMM0	1010 000x	A0h	Thermal Sensor
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
Thermal Sensor on board	1101 100x	98h	-
Power thermal management TS	1101 011x	96h	-

SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	ODD
2	(N/A WITH HM65)
3	(N/A WITH HM65)
4	
5	

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R MAIN BOARD INFO	SAMSUNG ELECTRONICS	
CHECK	SJ Wu	DEV. STEP	ADV	PART NO.			BA41-01XXA
APPROVAL	BC LEE	REV	rev. 0.1				
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE			3 OF 48

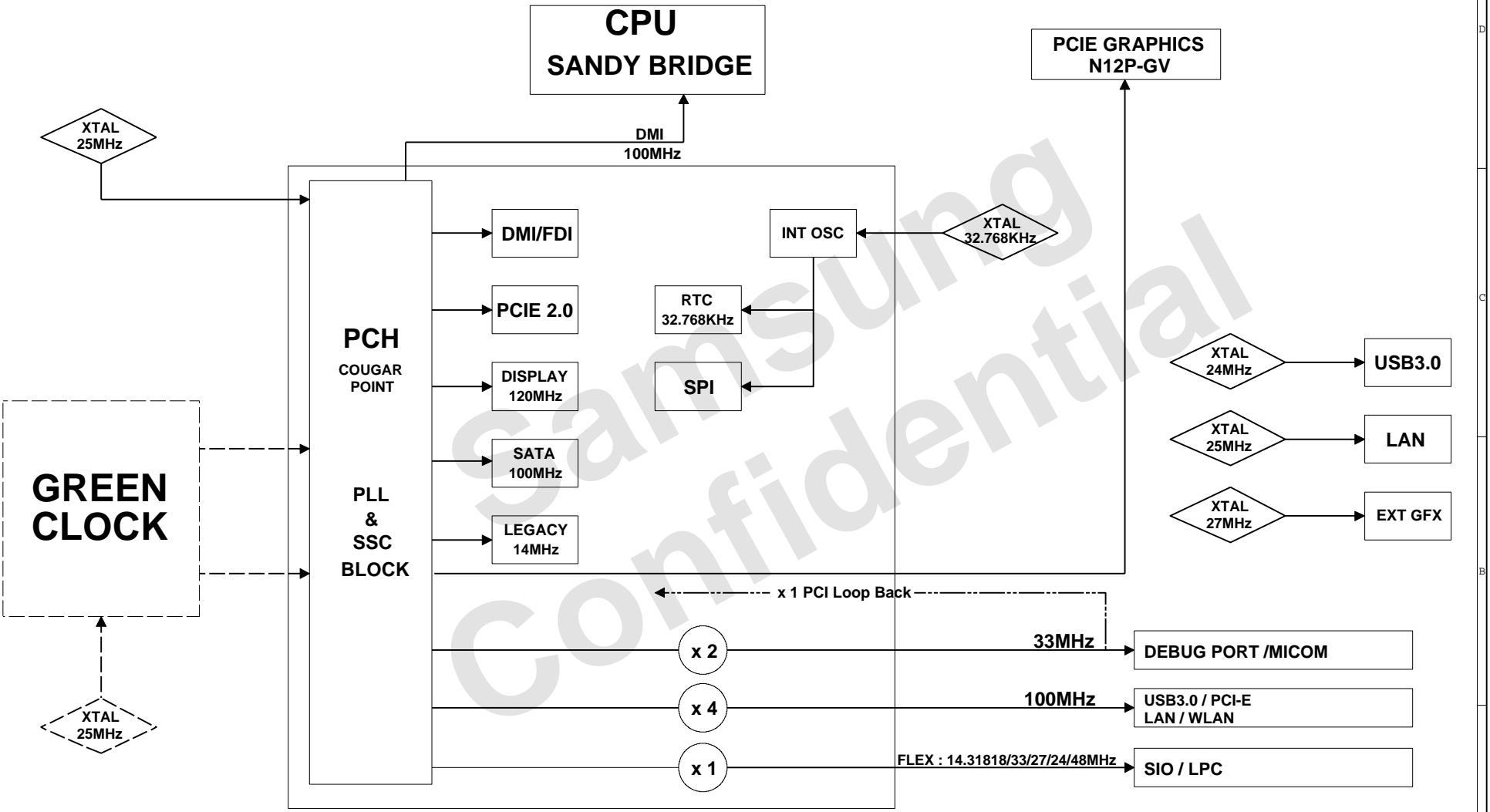
POWER DIAGRAM

Rev 0.8



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		MAIN	
APPROVAL	BC LEE	REV	rev. 0.1		POWER DIAGRAM	PART NO. BA41-01XXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM			PAGE 4 OF 48

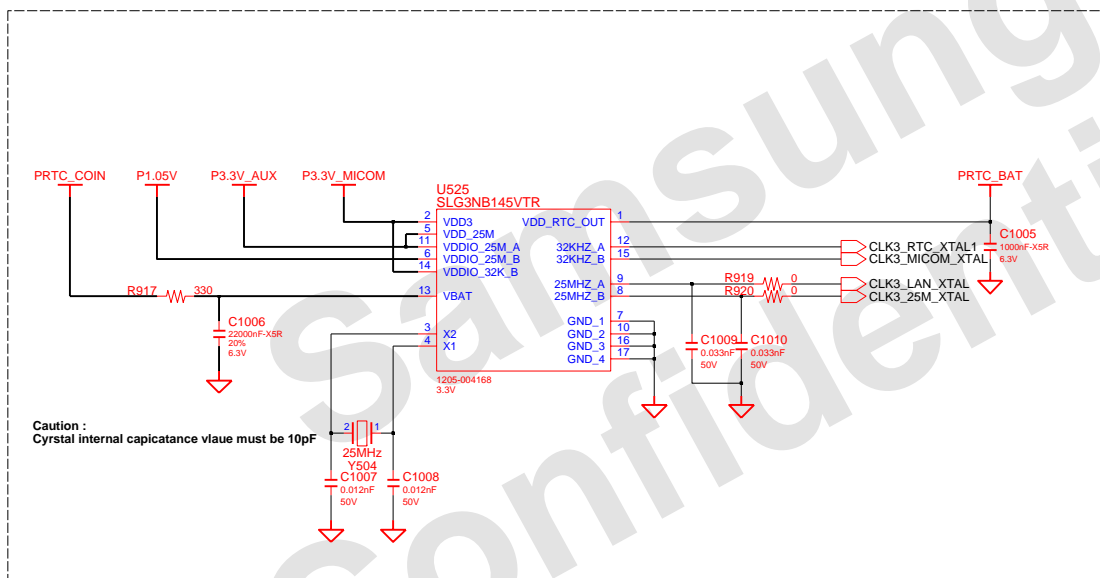
CLOCK DISTRIBUTION Rev. 0.8



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	CLOCK DIAGRAM	PART NO.	BA41-01XXXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	5	OF 48

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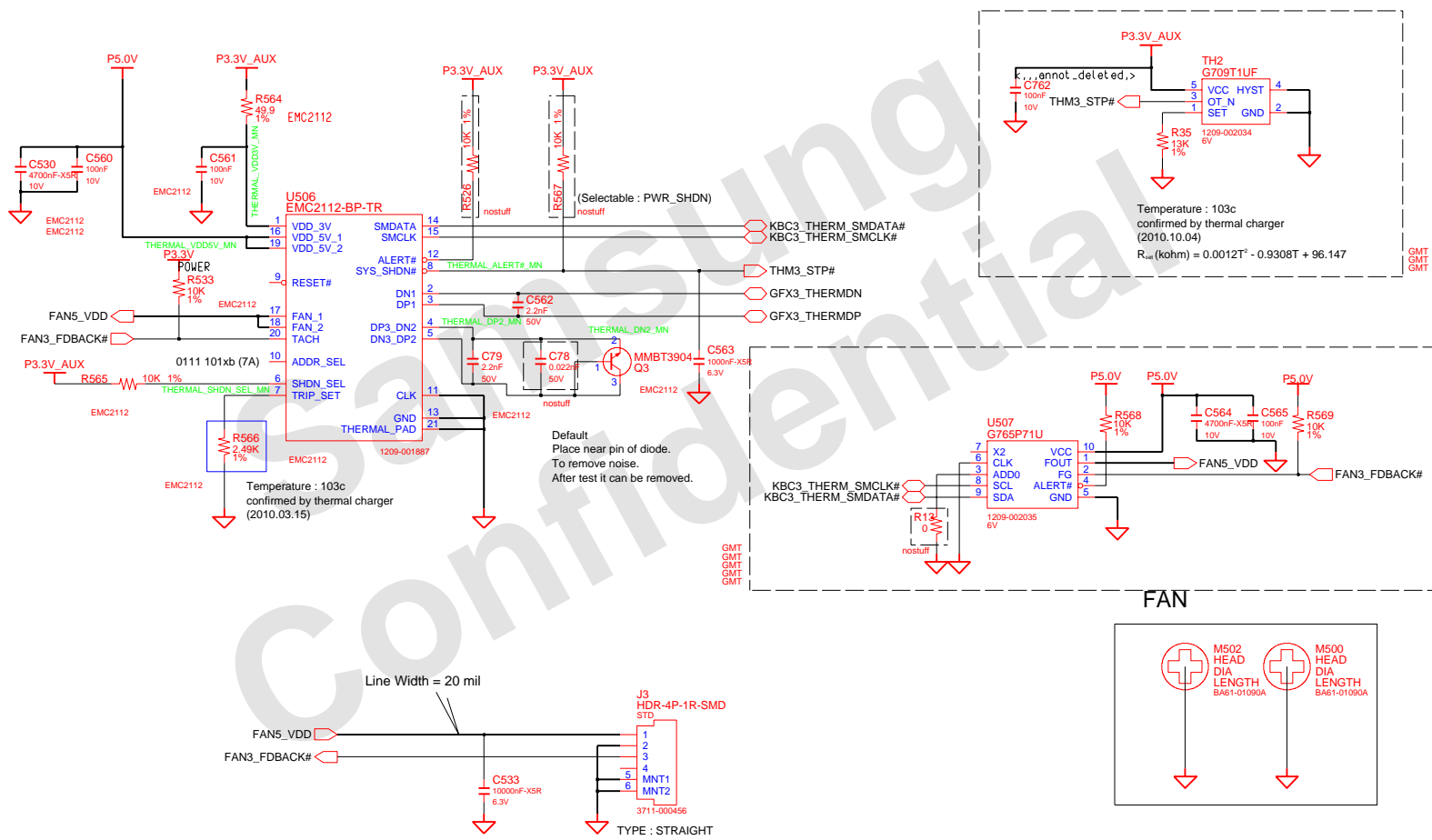
CLOCK DISTRIBUTOR



GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK

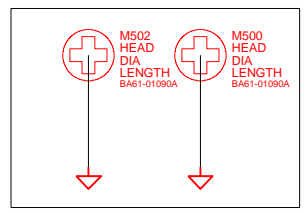
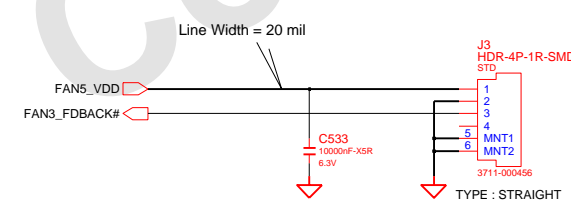
ENGINEER	DATE	TITLE	SAMSUNG ELECTRONICS
DESIGNED BY	short_date	SCALA2-R_PV_MAIN	
	DEV. STEP	Module Name	PART NO. BA41-XXXXXX
CHANGED BY	REV	1.0	
PG. CHK	LAST EDIT	last_edit	PAGE 6 OF XX

THERMAL SENSOR & FAN CONTROL



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

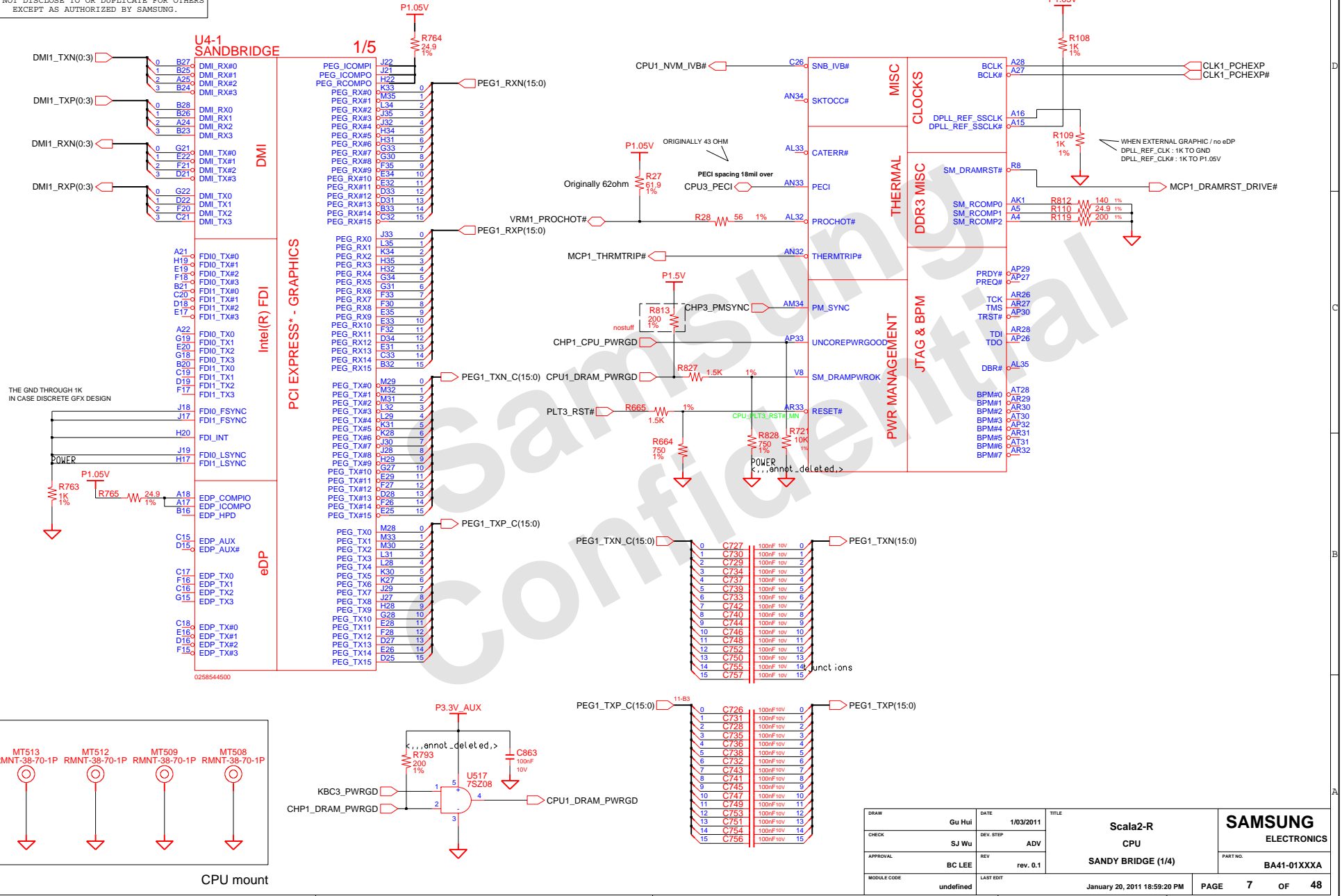
SHDN_SEL MODE	
0	INTEL TR MODE
✓ HIGH Z	AMD CPU/DIODE MODE
1	EXT.DIODE 2 MODE



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		THERMAL SENSOR	
APPROVAL	BC LEE	REV	rev. 0.1		THERMAL SENSOR EMC2112	PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 6 OF 48

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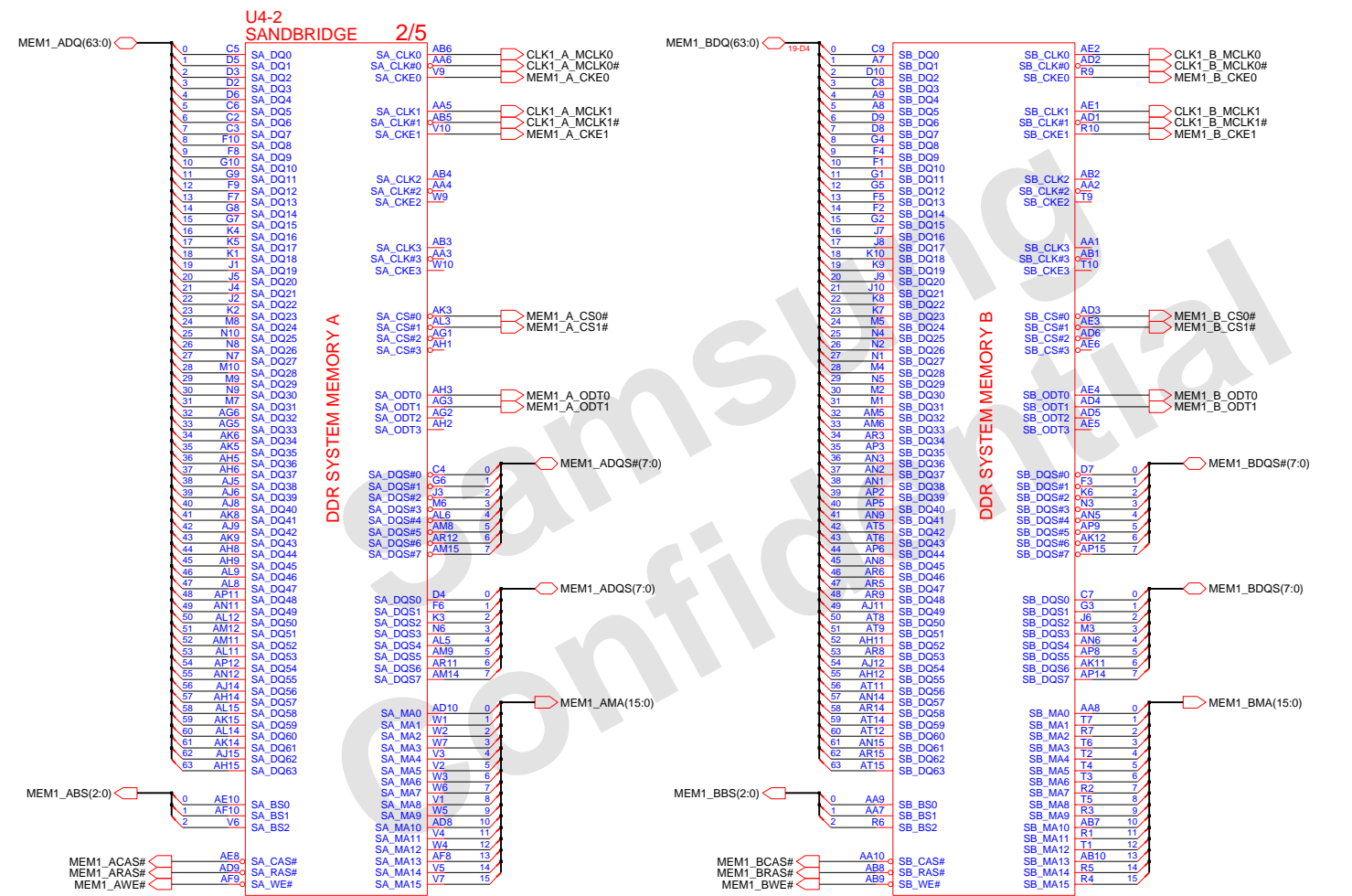
SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV		CPU
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (1/4)
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	7 OF 48

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ELECTRONICS	
PART NO.	BA41-01XXXXA

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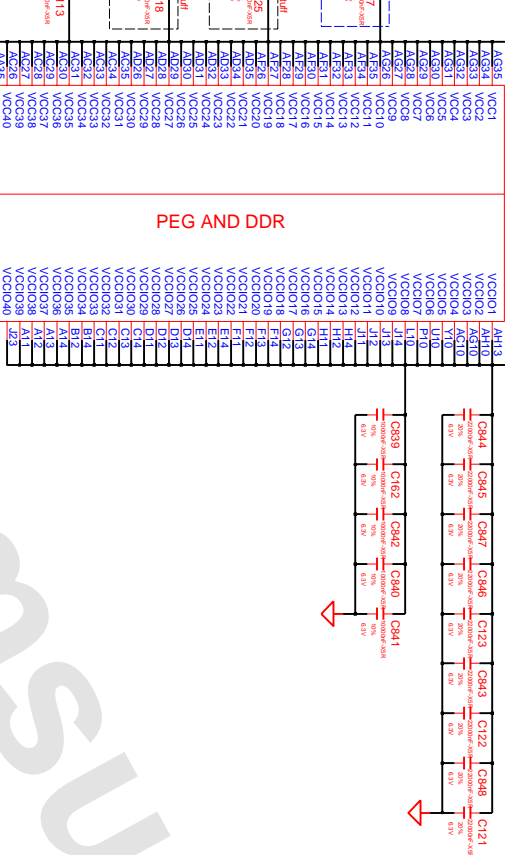
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CHECK	SJ Wu	DEV. STEP	ADV		CPU	
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (2/4)	PART NO. BA41-01XXXX
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM			PAGE 8 OF 48

CPU CORE U4-3

SANDBRIDGE

3/5

P1.05V

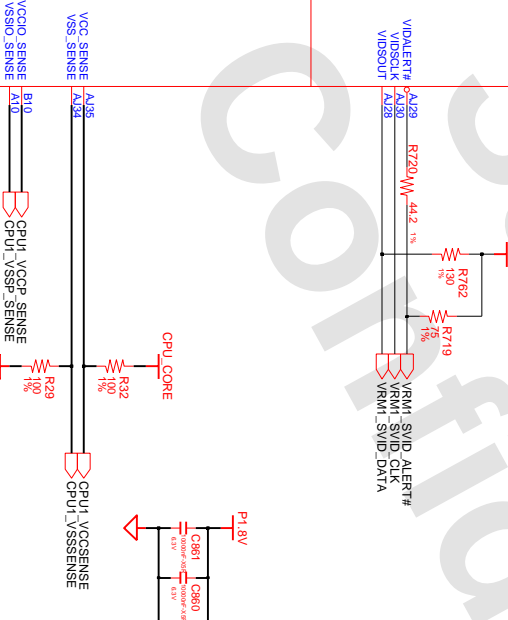


CORE SUPPLY

PEG AND DDR

SVID

SENSE LINES



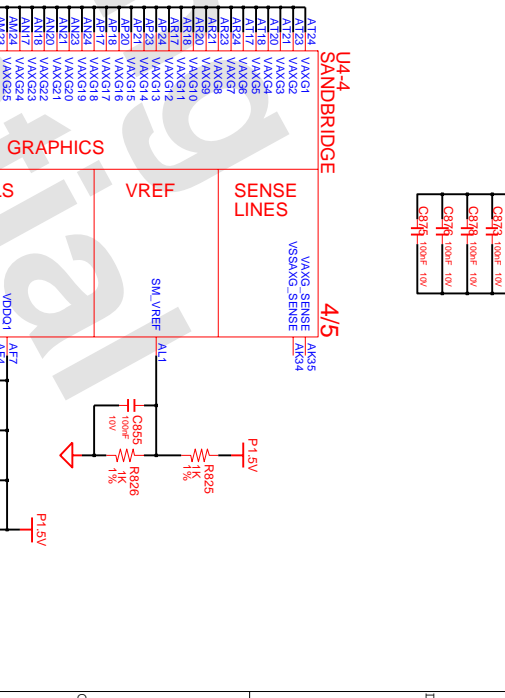
U4-4

SANDBRIDGE

4/5

P1.5V

P1.5V_AUX



SENSE LINES

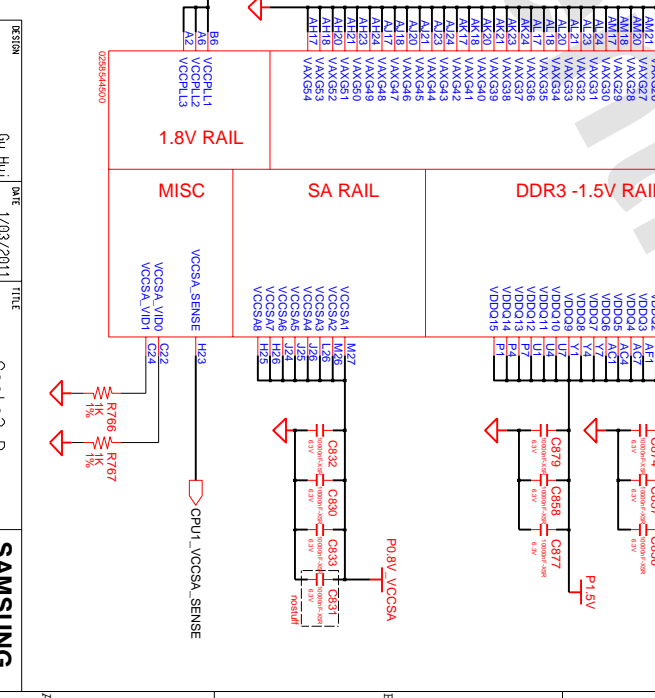
VREF

DDR3 -1.5V RAILS

SA RAIL

MISC

GRAPHICS



REVISE	DATE	TITLE	REVISE	DATE	TITLE
DESIGN	01/03/2011	Soc1 q2-R	REV. STIP	ADV	SANDY BRIDGE (3/4)
CHECK	SJ MU	CPU	REV. STIP	ADV	CPU
APPROVAL	BC LEE	SANDY BRIDGE (3/4)	REV. STIP	ADV	SANDY BRIDGE (3/4)
MODULE CODE	January 20, 2011 18:59:20 PM		REV. STIP	ADV	

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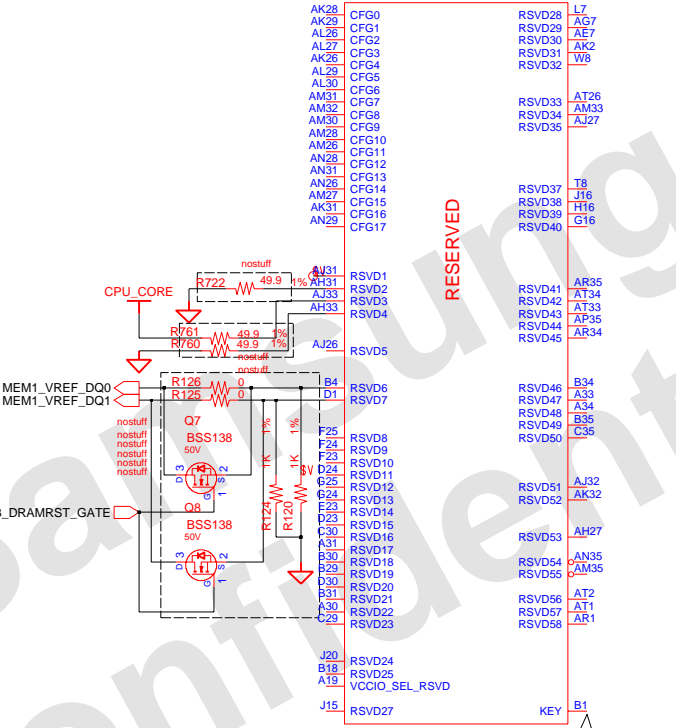
PART NO. BA-41-01XXXXA

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**U4-5
 SANDBRIDGE 5/5**

AT35	VSS1	VSS81	AJ22	T35	VSS161	VSS234	F22	AK28	CFG0	RSVD28	L7
AT32	VSS2	VSS82	AJ19	T34	VSS162	VSS235	F19	AK29	CFG1	RSVD29	AG7
AT29	VSS3	VSS83	AJ16	T33	VSS163	VSS236	E30	AL26	CFG2	RSVD30	AE7
AT27	VSS4	VSS84	AJ13	T32	VSS164	VSS237	E27	AL27	CFG3	RSVD31	AK2
AT25	VSS5	VSS85	AJ10	T31	VSS165	VSS238	E24	AK25	CFG4	RSVD32	W8
AT22	VSS6	VSS86	AJ7	T30	VSS166	VSS239	E21	AL29	CFG5		
AT19	VSS7	VSS87	AJ4	T29	VSS167	VSS240	E18	AL30	CFG6		
AT16	VSS8	VSS88	AJ3	T28	VSS168	VSS241	E15	AM31	CFG7	RSVD33	AT26
AT13	VSS9	VSS89	AJ2	T27	VSS169	VSS242	E13	AM32	CFG8	RSVD34	AM33
AT10	VSS10	VSS90	AJ2	T26	VSS170	VSS243	E9	AM30	CFG8	RSVD35	AJ27
AT7	VSS11	VSS91	AH35	P9	VSS171	VSS244	E8	AM28	CFG9		
AT4	VSS12	VSS92	AH34	P8	VSS172	VSS245	E8	AM26	CFG10		
AT3	VSS13	VSS93	AH32	P6	VSS173	VSS246	E7	AM28	CFG12		
AR25	VSS14	VSS94	AH30	P5	VSS174	VSS247	E6	AN28	CFG11		
AR22	VSS15	VSS95	AH29	P3	VSS174	VSS247	E5	AN26	CFG13		
AR19	VSS16	VSS96	AH28	P2	VSS175	VSS248	E4	AM27	CFG14	RSVD37	T8
AR16	VSS17	VSS97	AH26	N35	VSS176	VSS249	E3	AK31	CFG15	RSVD38	J16
AR13	VSS18	VSS98	AH25	N34	VSS177	VSS250	E2	AK31	CFG16	RSVD39	H16
AR10	VSS19	VSS99	AH22	N33	VSS178	VSS251	E1	AN29	CFG17	RSVD40	IG16
AR7	VSS20	VSS100	AH19	N32	VSS179	VSS252	D36				
AR4	VSS21	VSS101	AH16	N31	VSS181	VSS254	D32				
AP34	VSS22	VSS102	AH7	N30	VSS182	VSS255	D28				
AP31	VSS23	VSS103	AG9	N28	VSS183	VSS256	D20				
AP28	VSS24	VSS104	AG8	N27	VSS184	VSS257	D17				
AP25	VSS25	VSS105	AG9	N26	VSS186	VSS259	C34				
AP22	VSS26	VSS106	AG4	N26	VSS186	VSS259	C34				
AP19	VSS27	VSS107	AF5	L33	VSS187	VSS260	C28				
AP16	VSS28	VSS108	AF3	L30	VSS188	VSS261	C27				
AP13	VSS29	VSS109	AF2	L27	VSS189	VSS262	C25				
AP10	VSS30	VSS110	AF2	L27	VSS190	VSS263	C25				
AP7	VSS31	VSS111	AE35	L9	VSS191	VSS264	C23				
AP4	VSS32	VSS112	AE34	L8	VSS192	VSS265	C10				
AP1	VSS33	VSS113	AE33	L6	VSS192	VSS265	C1				
AN30	VSS34	VSS114	AE32	L5	VSS193	VSS266	B22				
AN27	VSS35	VSS115	AE31	L4	VSS194	VSS267	B2				
AN25	VSS36	VSS116	AE29	L2	VSS196	VSS269	B15				
AN22	VSS37	VSS117	AE28	L1	VSS197	VSS270	B13				
AN19	VSS38	VSS118	AH0	N29	VSS198	VSS271	D26				
AN16	VSS39	VSS119	AE27	K35	VSS199	VSS272	B11				
AN13	VSS40	VSS120	AE26	K32	VSS200	VSS273	B9				
AN10	VSS41	VSS121	AD7	K26	VSS201	VSS274	B7				
AN7	VSS42	VSS122	AE26	J34	VSS202	VSS275	B5				
AN4	VSS43	VSS123	AE25	J33	VSS203	VSS276	B5				
AM39	VSS44	VSS124	AC8	J31	VSS204	VSS277	B3				
AM35	VSS45	VSS125	AC6	H30	VSS205	VSS278	B2				
AM22	VSS46	VSS126	AC3	H27	VSS206	VSS279	A32				
AM19	VSS47	VSS127	AC2	H24	VSS207	VSS280	A32				
AM16	VSS48	VSS128	AC2	H24	VSS208	VSS281	A29				
AM13	VSS49	VSS129	AB35	H21	VSS209	VSS282	A26				
AM10	VSS50	VSS130	AB34	H18	VSS210	VSS283	A23				
AM7	VSS51	VSS131	AB33	H15	VSS210	VSS283	A20				
AM4	VSS52	VSS132	AB32	H13	VSS211	VSS284	A3				
AM2	VSS53	VSS133	AB31	H10	VSS212	VSS285	A3				
AM1	VSS54	VSS134	AB30	H9	VSS213						
AL34	VSS55	VSS135	AB29	H8	VSS214						
AL31	VSS56	VSS136	AB28	H7	VSS215						
AL28	VSS57	VSS137	AB27	H6	VSS216						
AL25	VSS58	VSS138	AB26	H5	VSS217						
AL22	VSS59	VSS139	Y9	H4	VSS218						
AL19	VSS60	VSS140	Y8	H3	VSS219						
AL16	VSS61	VSS141	Y6	H2	VSS221						
AL13	VSS62	VSS142	Y5	H1	VSS222						
AL10	VSS63	VSS143	Y2	G32	VSS223						
AL7	VSS64	VSS144	W35	G29	VSS224						
AL4	VSS65	VSS145	W34	G29	VSS225						
AL2	VSS66	VSS146	W34	G26	VSS226						
AK33	VSS67	VSS147	W33	G23	VSS227						
AK30	VSS68	VSS148	W31	G20	VSS228						
AK27	VSS69	VSS149	G17	G17	VSS229						
AK25	VSS70	VSS150	W30	G11	VSS230						
AK22	VSS71	VSS151	W29	F34	VSS231						
AK19	VSS72	VSS152	W28	F31	VSS232						
AK16	VSS73	VSS153	W27	F29	VSS233						
AK13	VSS74	VSS154	W26	F29	VSS233						
AK10	VSS75	VSS155	U9								
AK7	VSS76	VSS156	U8								
AK4	VSS77	VSS157	U6								
AL25	VSS78	VSS158	U5								
	VSS79	VSS159	U3								
	VSS80	VSS160	U2								



CFG Straps for Processor

PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X	
CFG2	1 : (DEFAULT) NORMAL OPERATION 0 : LANE REVERSED
PCIe PORT BIFURCACTION STRAPS	
CFG{6:5}	11 : (DEFAULT) X16 - DEVICE 1 FUNCTIONS 1 AND 2 DISABLED 10 : X8, X8 - DEVICE 1 FUNCTION 1 ENABLED - FUNCTION 2 DISABLED 01 : RESERVED - (DEVICE 1 FUNCTION 1 DISABLED - FUNCTION 2 ENABLED) 00 : X8, X4, X4 - DEVICE 1 FUNCTIONS 1 AND 2 ENABLED
Display Port Presence	
CFG4	1 : Disabled 0 : No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP)
PEG DEFER TRAINING	
CFG7	1 : (DEFAULT) PEG TRAIN IMMEDIATELY FOLLOWING XRES/SETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

FOR RPGA SOCKET
 RSVD59 PIN SHOULD BE LEFT NC

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		CPU	
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (4/4)	PART NO. BA41-01XXXXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	10	OF 48

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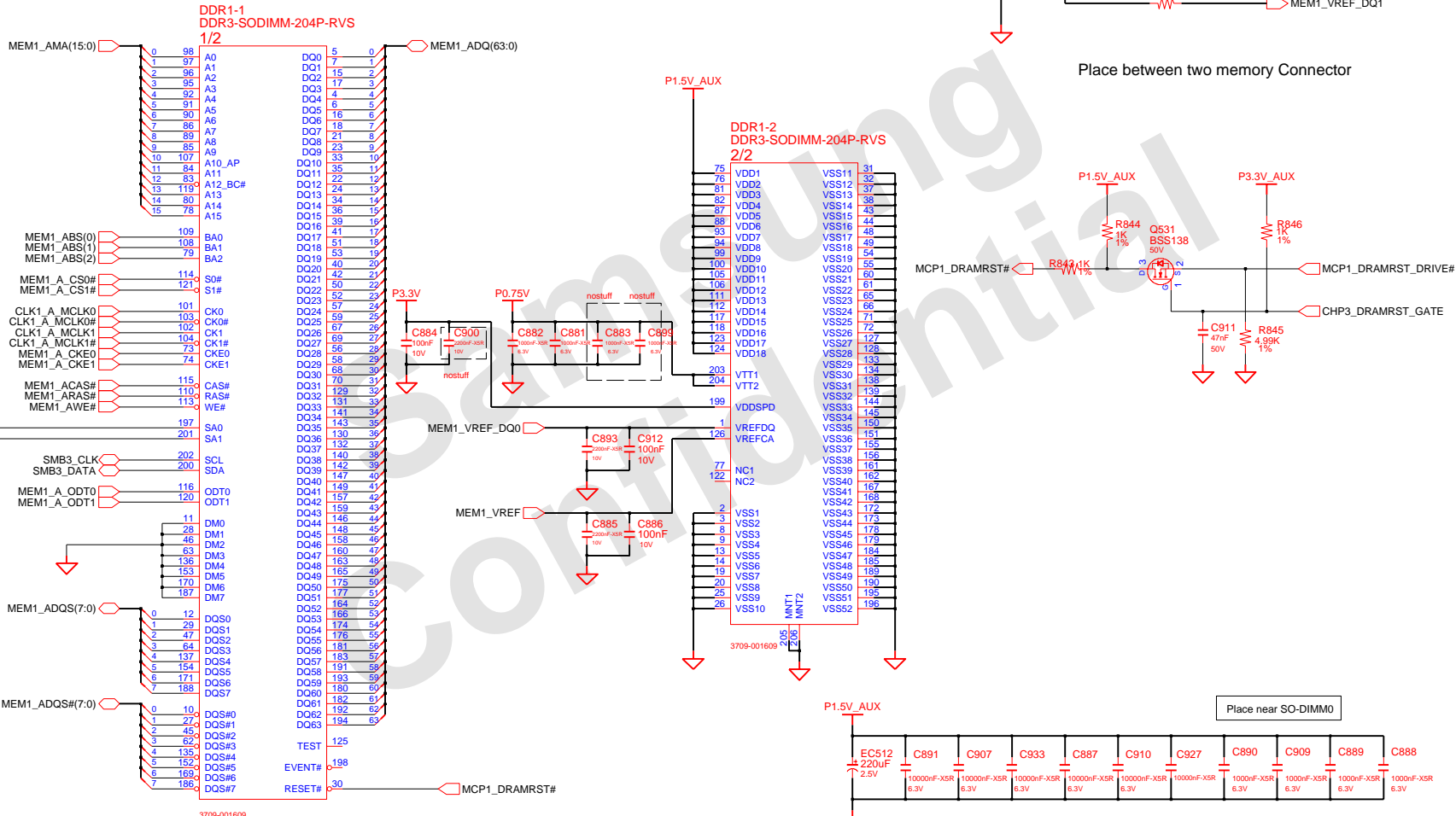
SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001609 (CONCRAFT)

P/N : 3709-001656 (Foxconn)



SA0	0	0	1
SA1	0	0	1
SPD ADD	0xA0	0xA2	
TS ADD	0x30	0x32	

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R SODIMM A DDR3	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	11	OF 48

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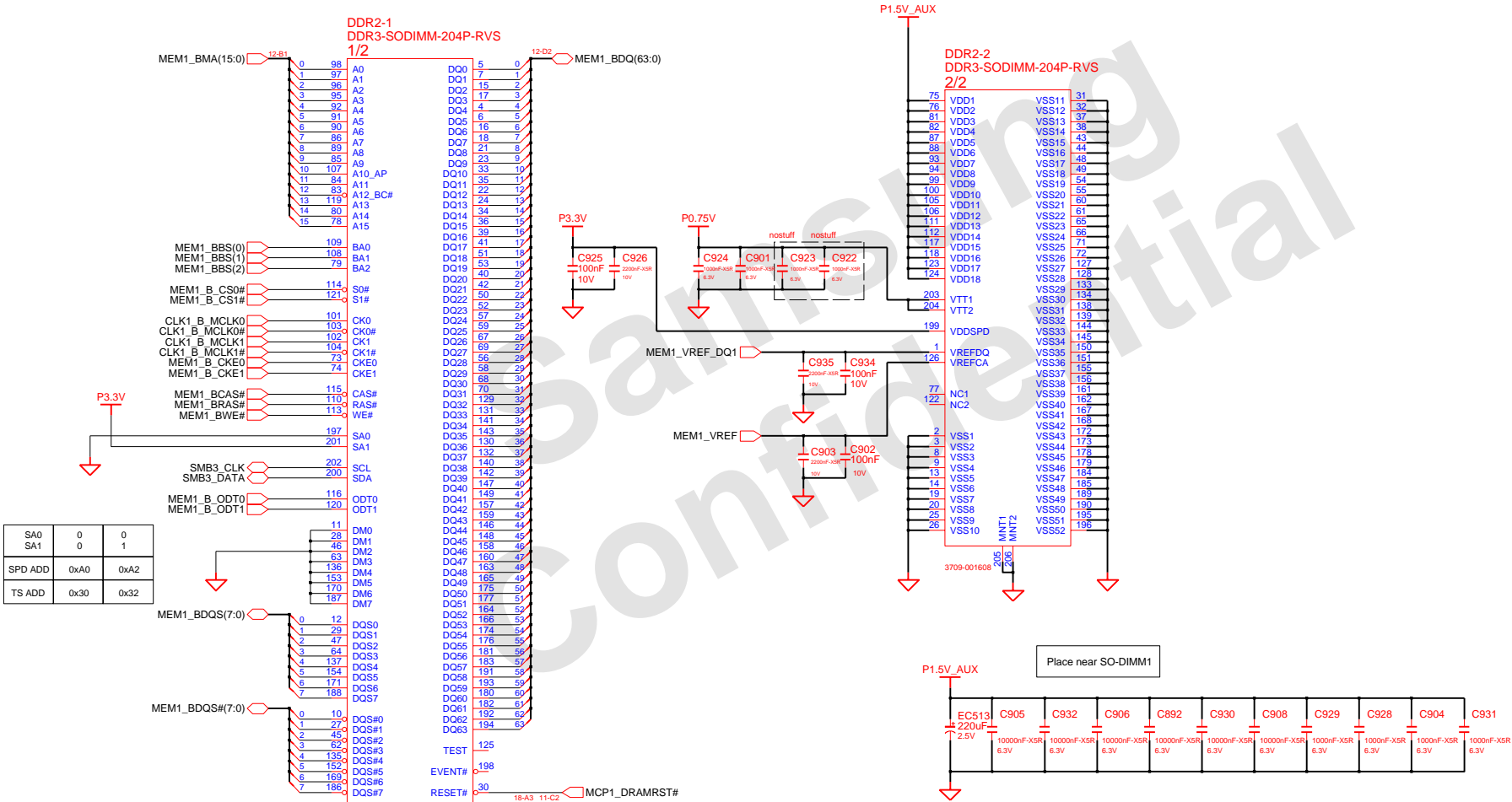
SO-DIMM#1 : 1st SO-DIMM

DDR SO-DIMM #1

Height : 4 mm (REVERSE)

P/N : 3709-001608 (CONCRAFT)

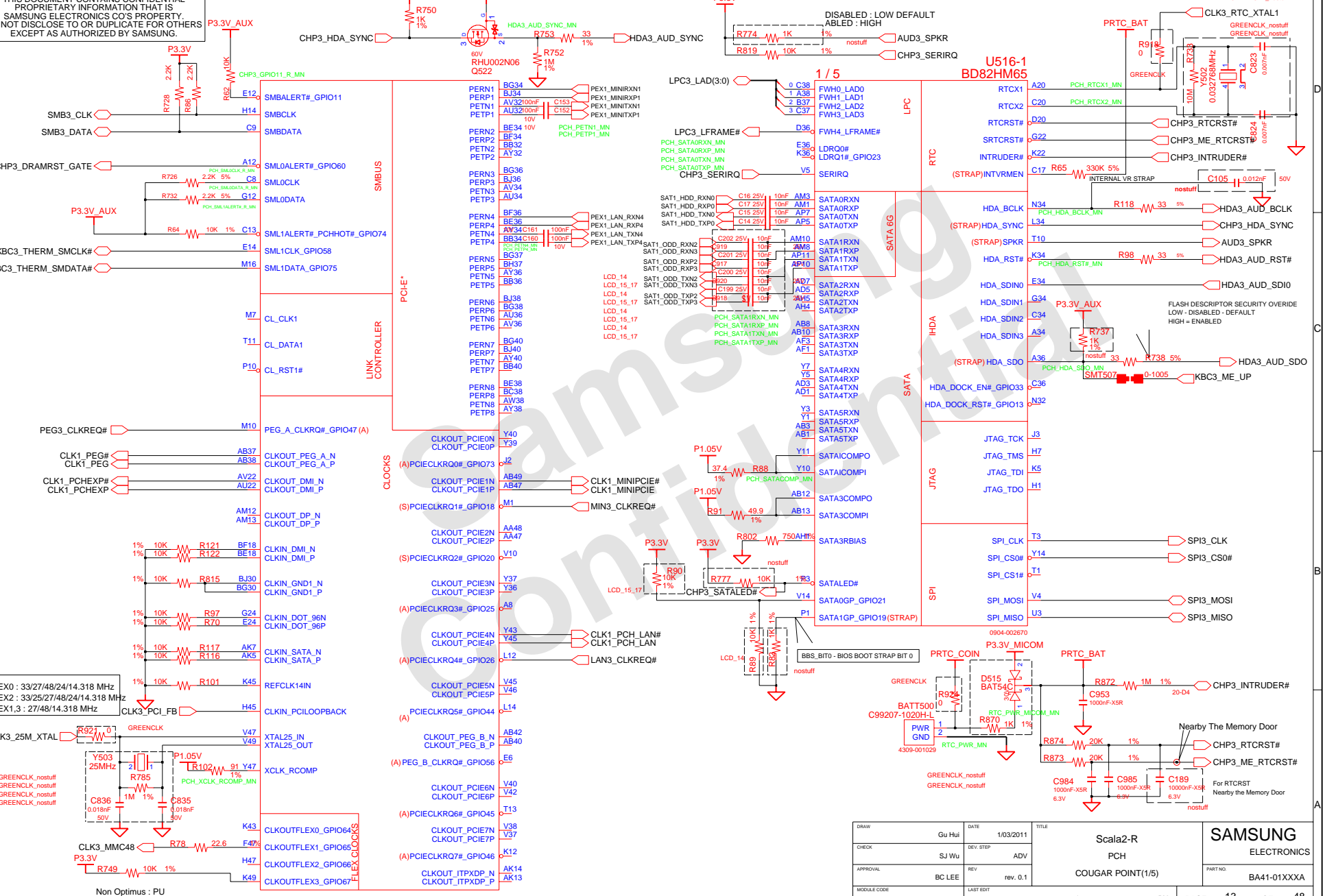
P/N : 3709-001654 (Foxconn)



Drawn	Gu Hui	Date	1/03/2011	Title	Scala2-R SODIMM B DDR3	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
Check	SJ Wu	Dev. Step	ADV			
Approval	BC LEE	Rev.	rev. 0.1			
Module Code		Last Edit	January 20, 2011 18:59:20 PM			
PAGE 12 OF 48						

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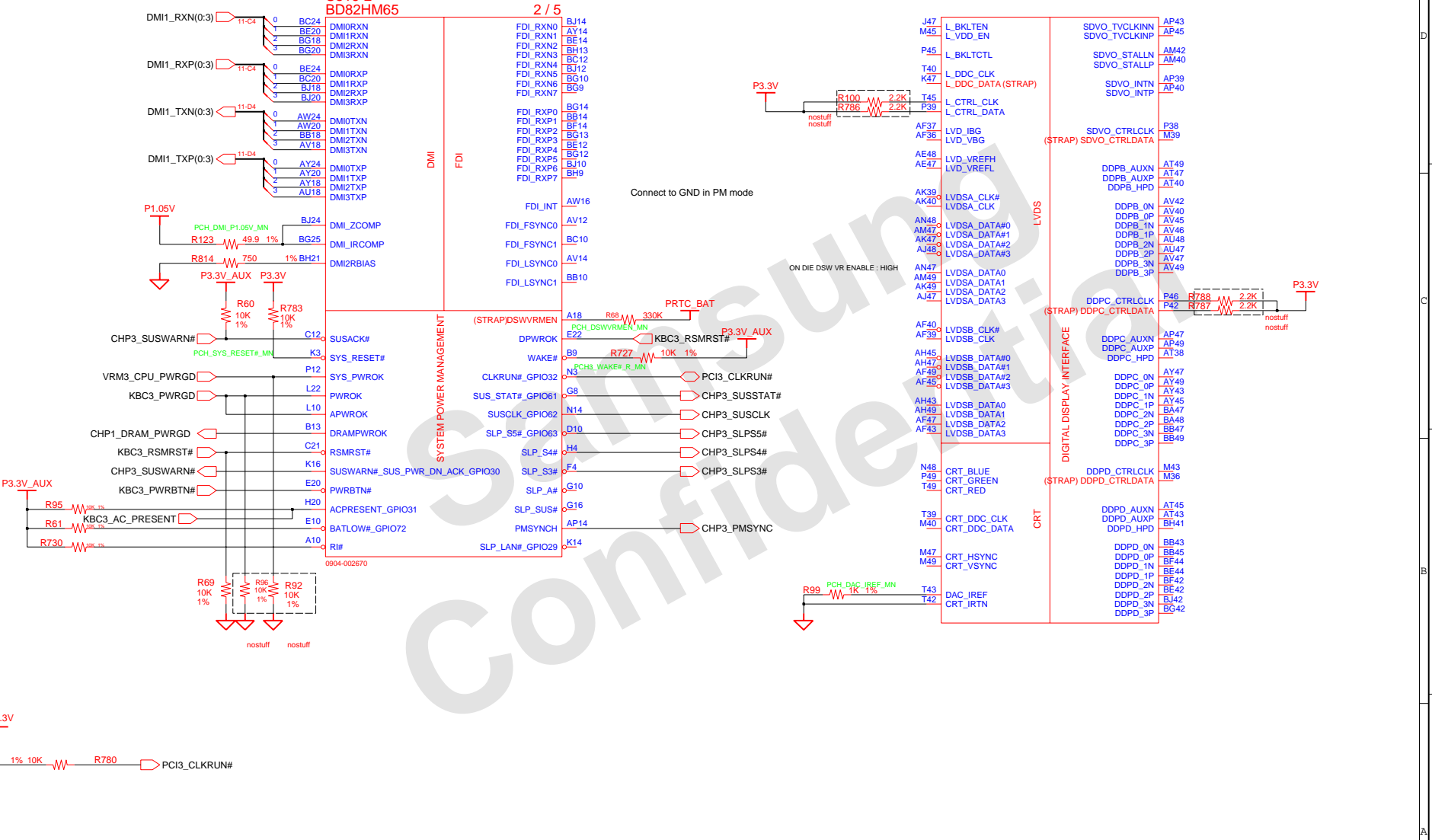
NO REBOOT STRAP



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(1/5)	PARTNO. BA41-01XXXX
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 13 OF 48

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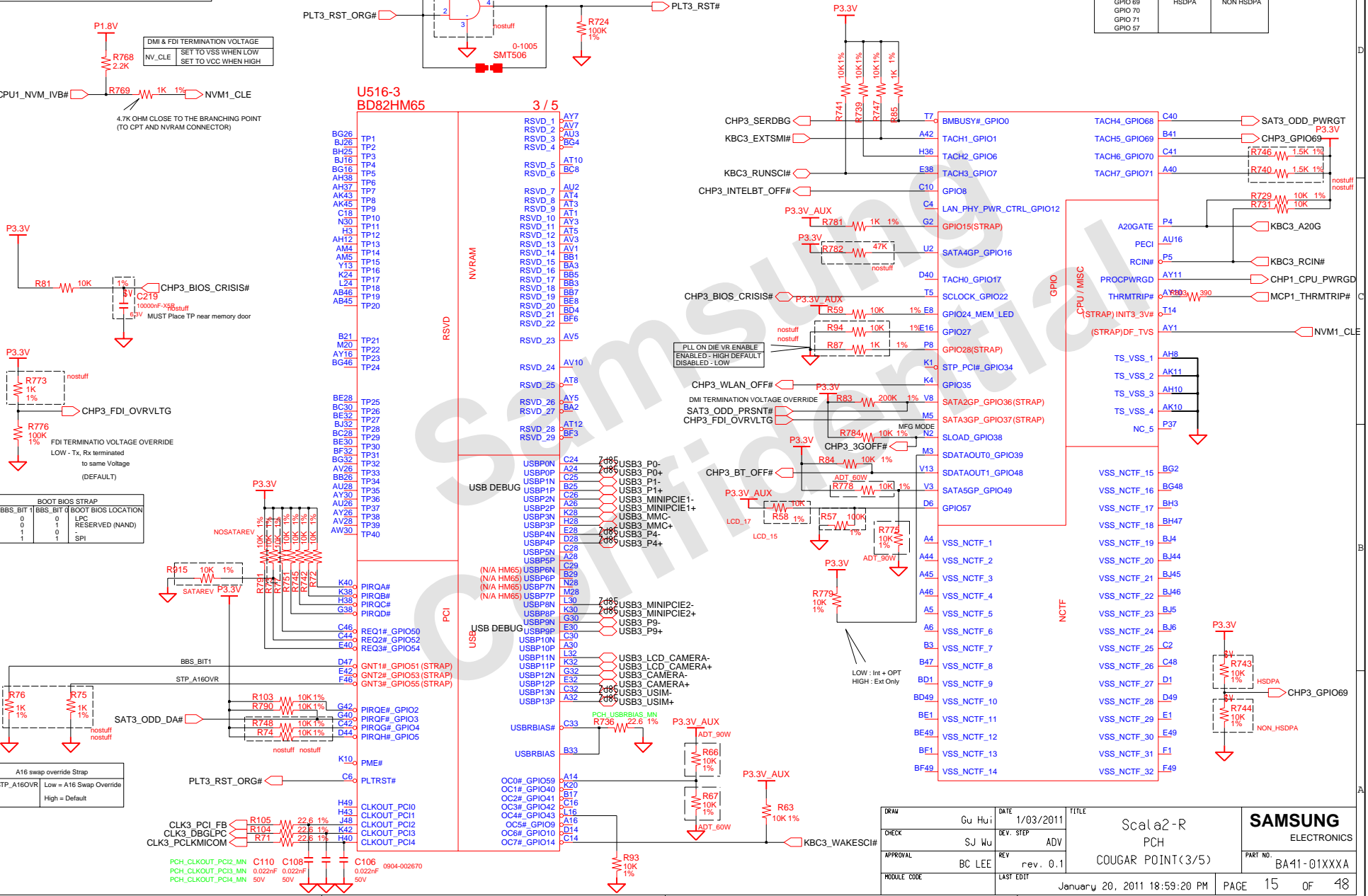
**U516-2
 BD82HM65**



DDI PORT B DETECT	
SDVO_CTRL_DATA	1 PORT B DETECTED 0 PORT B NOT DETECTED

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(2/5)	PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 14 OF 48

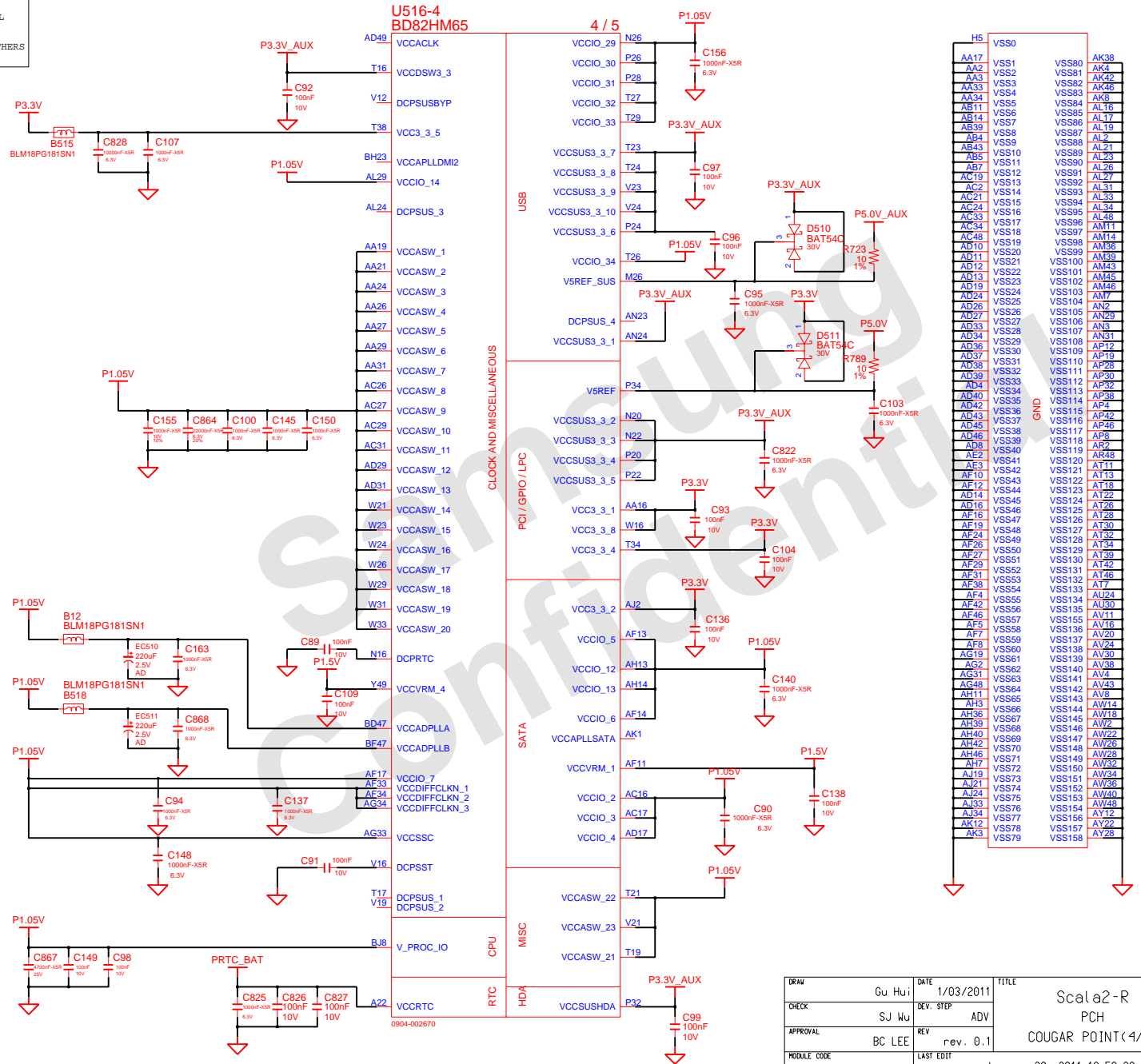
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GPIO	PU	PD
GPIO 39	EXT ONLY	INT + OPT
GPIO 69	HSDPA	NON HSDPA
GPIO 70		
GPIO 71		
GPIO 57		

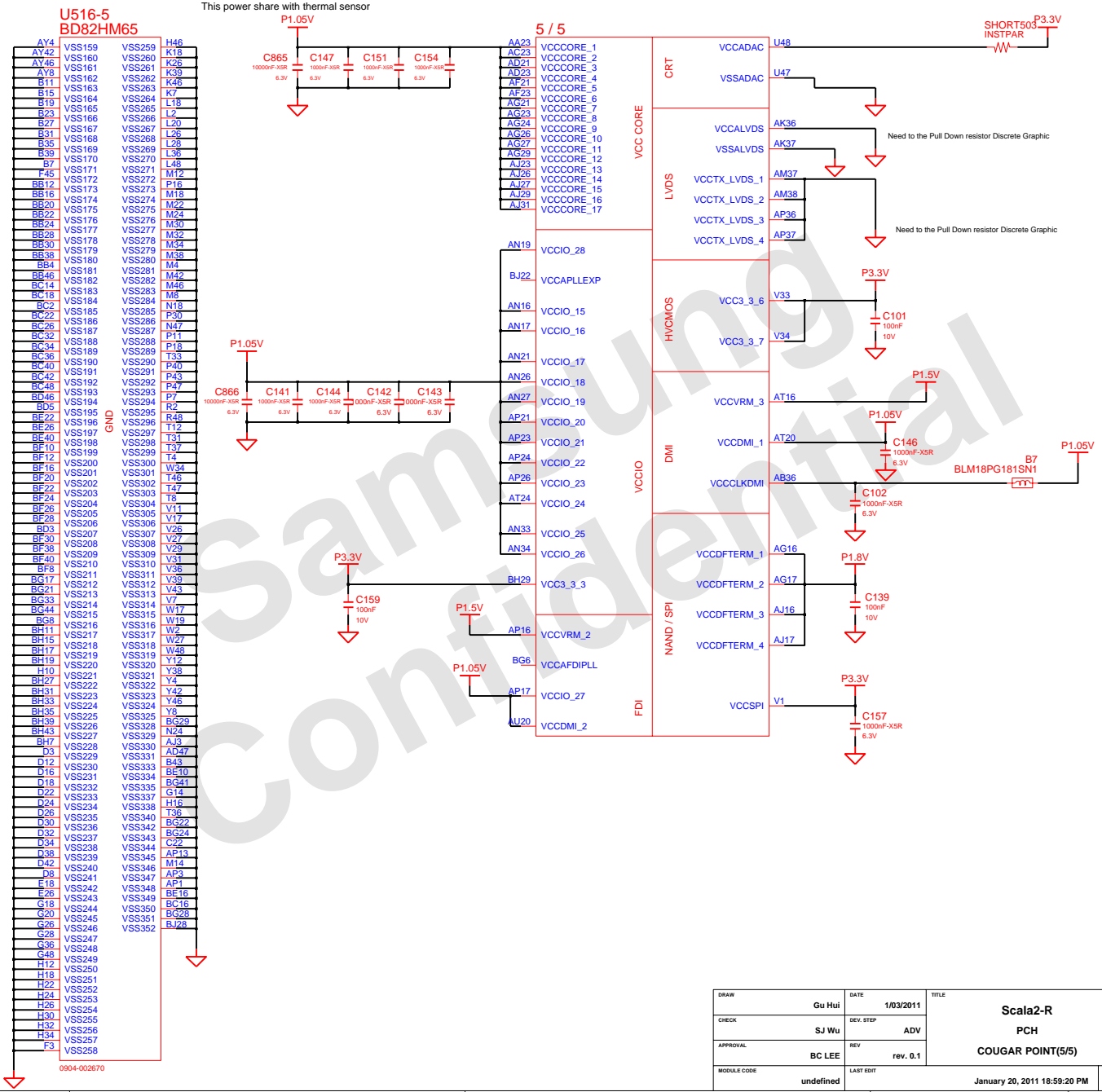
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	Scala2-R	PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(3/5)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM			PAGE 15 OF 48

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DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(4/5)	PART NO. BA41-01XXXXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM		PAGE	16 OF 60

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**U516-5
BD82HM65**

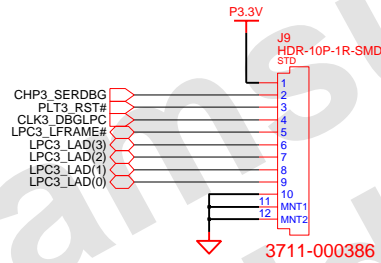
This power share with thermal sensor

5 / 5

AY4	VSS159	VSS259	H46
AY42	VSS160	VSS260	K18
AY46	VSS161	VSS261	K26
AY8	VSS162	VSS262	K39
B11	VSS163	VSS263	K46
B15	VSS163	VSS263	K7
B19	VSS164	VSS264	L18
B23	VSS165	VSS265	L2
B27	VSS166	VSS266	L20
B31	VSS167	VSS267	L26
B35	VSS168	VSS268	L28
B39	VSS169	VSS269	L36
B43	VSS170	VSS270	L36
B47	VSS171	VSS271	L48
B51	VSS172	VSS272	M12
B55	VSS173	VSS273	M18
B59	VSS174	VSS274	M22
B63	VSS175	VSS275	M28
B67	VSS176	VSS276	M30
B71	VSS177	VSS277	M32
B75	VSS178	VSS278	M34
B79	VSS179	VSS279	M38
B83	VSS180	VSS280	M4
B87	VSS181	VSS281	M42
B91	VSS182	VSS282	M46
B95	VSS183	VSS283	M8
BC14	VSS184	VSS284	N18
BC18	VSS185	VSS285	N40
BC22	VSS186	VSS286	N47
BC26	VSS187	VSS287	P18
BC30	VSS188	VSS288	P18
BC34	VSS189	VSS289	P43
BC38	VSS190	VSS290	P40
BC42	VSS191	VSS291	P43
BC46	VSS192	VSS292	P43
BC50	VSS193	VSS293	P47
BC54	VSS194	VSS294	R2
BC58	VSS195	VSS295	R48
BD0	VSS196	VSS296	T12
BE22	VSS197	VSS297	T12
BE26	VSS198	VSS298	T37
BE30	VSS199	VSS299	T4
BE34	VSS200	VSS300	W34
BE38	VSS201	VSS301	T47
BE42	VSS202	VSS302	T47
BE46	VSS203	VSS303	T8
BE50	VSS204	VSS304	V11
BE54	VSS205	VSS305	V26
BE58	VSS206	VSS306	V27
BF0	VSS207	VSS307	V27
BF04	VSS208	VSS308	V29
BF08	VSS209	VSS309	V31
BF12	VSS210	VSS310	V31
BF16	VSS211	VSS311	V36
BF20	VSS212	VSS312	V43
BF24	VSS213	VSS313	V7
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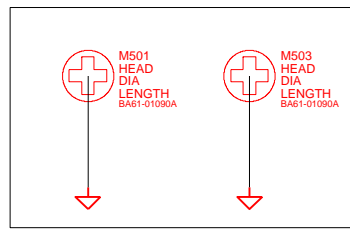
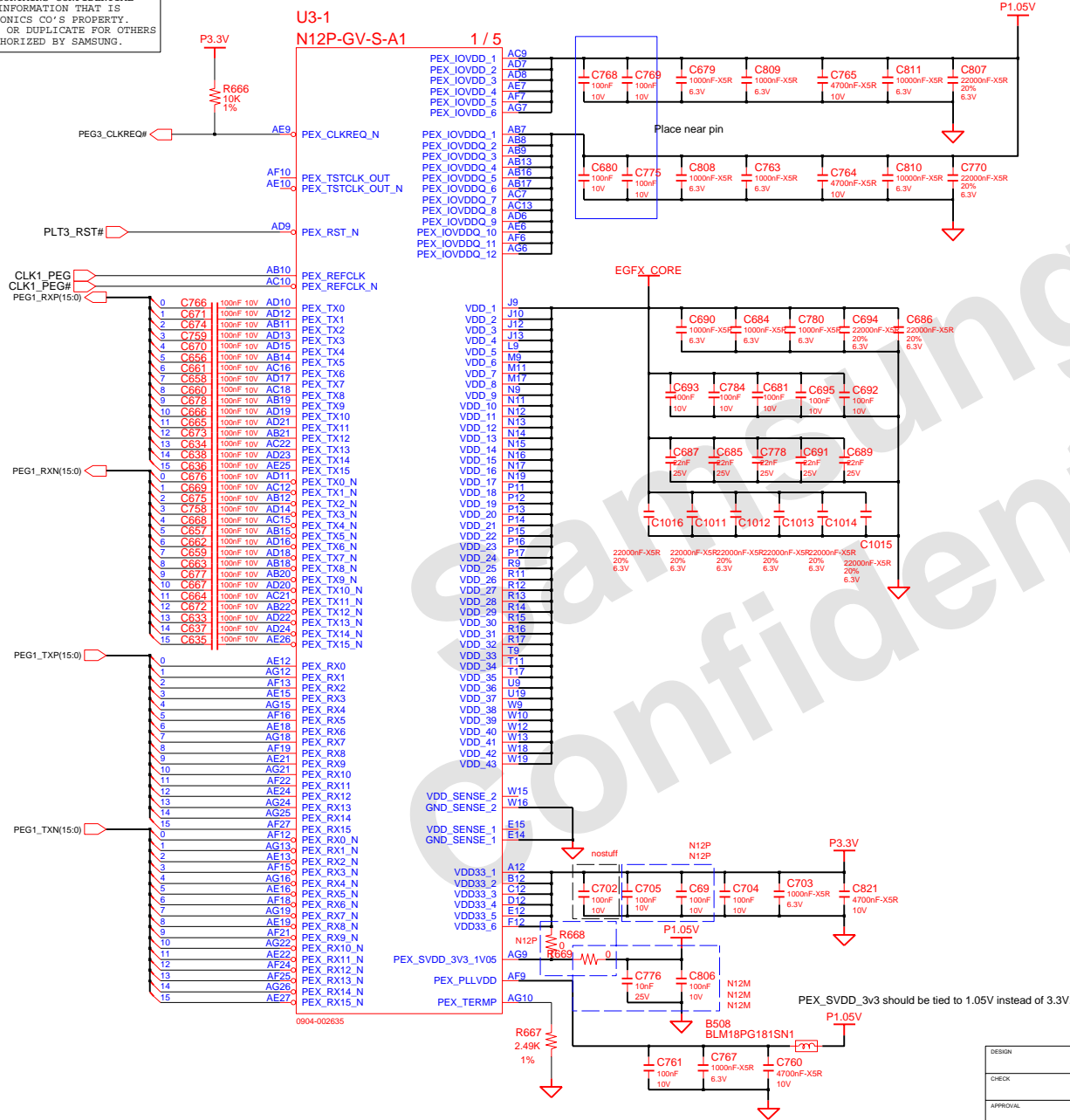
80H PORT DEBUG



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DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R DEBUG PORT 80H DECODER	SAMSUNG ELECTRONICS	
CHECK	SJ Wu	DEV. STEP	ADV	PART NO.			BA41-01XXXA
APPROVAL	BC LEE	REV	rev. 0.1	PAGE			18 OF 48
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM				

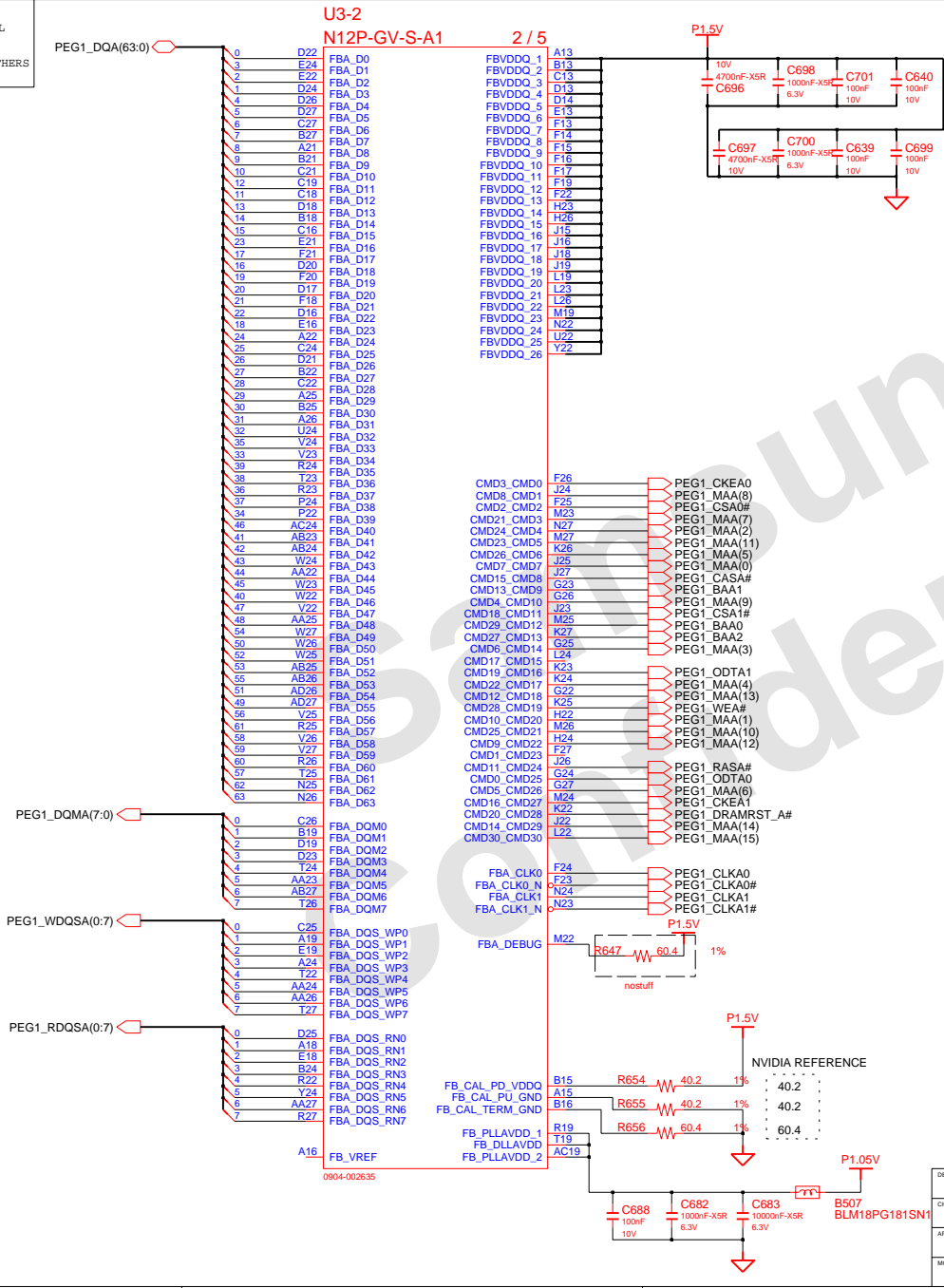
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Graphic PEM

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		N12P_40NM(1/4)	
APPROVAL	BC LEE	REV	rev. 0.1		N12P_40NM(1/4)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	19	OF 48

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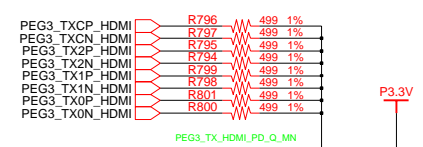
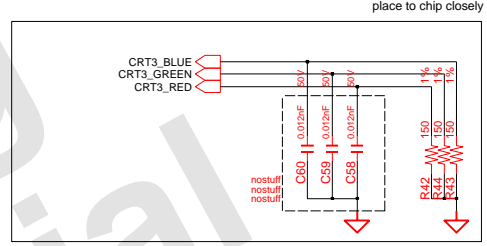
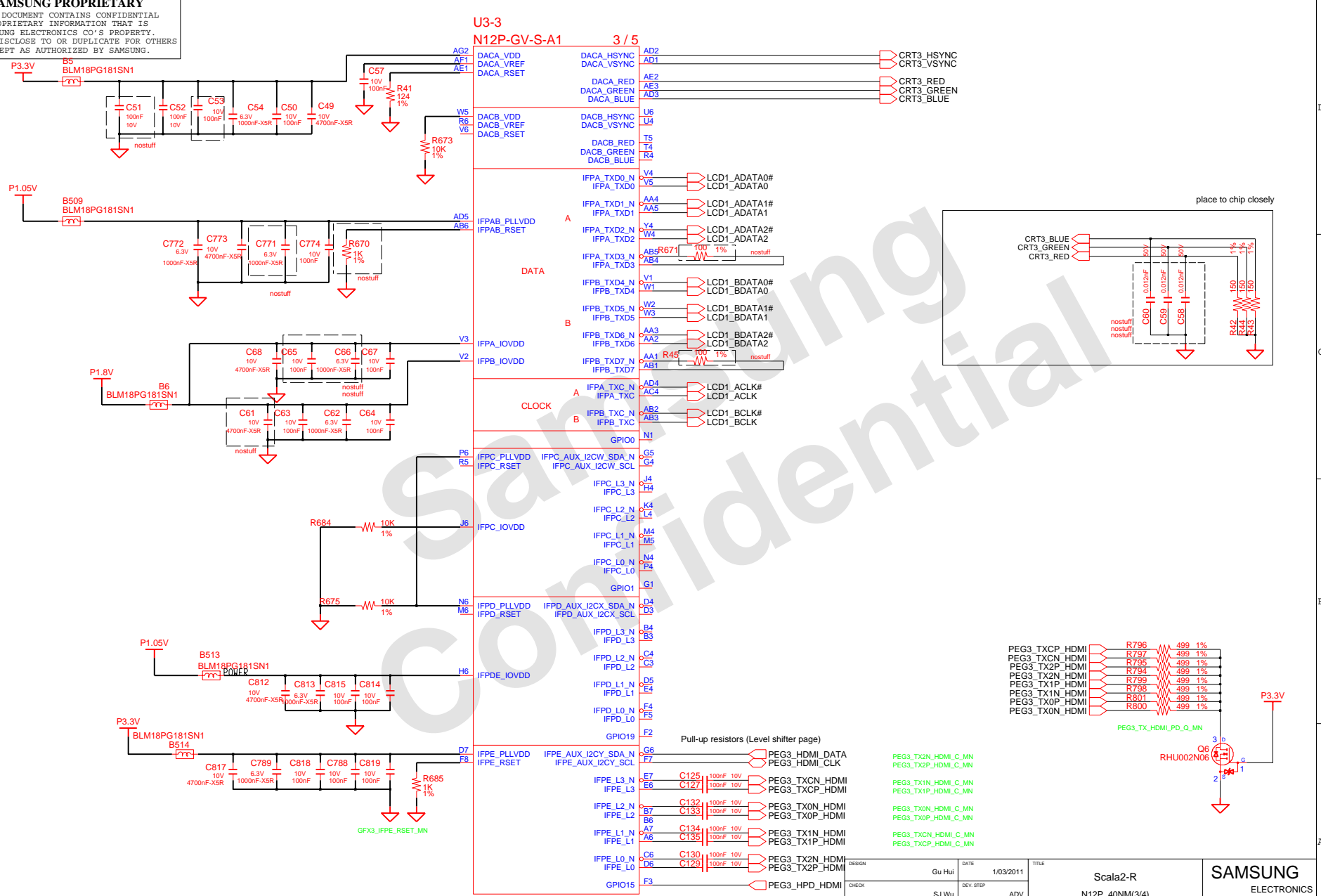


N12M-GE : CMD MODE C
 N12P-GV : CMD MODE E

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		N12P_40NM(2/4)	
APPROVAL	BC LEE	REV	rev. 0.1		N12P_40NM(2/4)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				PAGE 20 OF 48

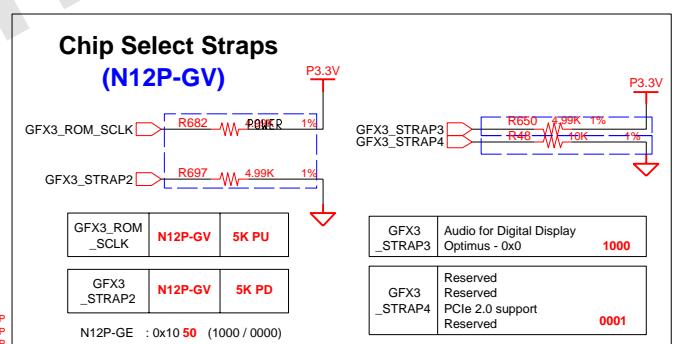
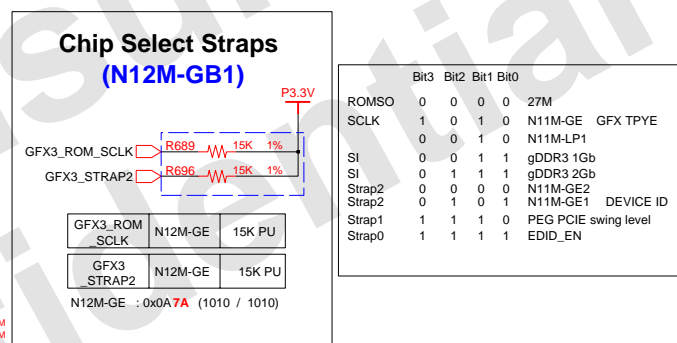
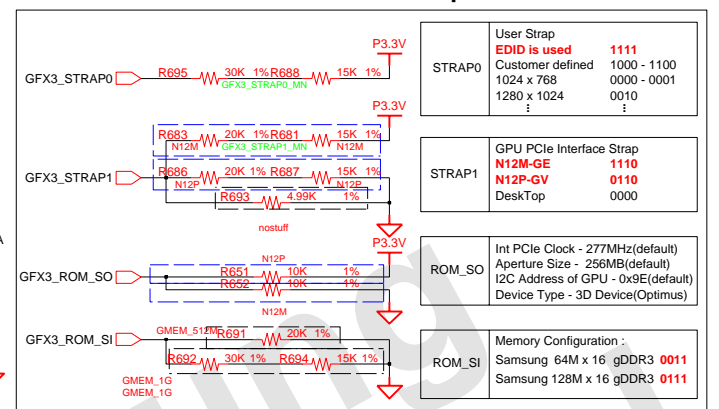
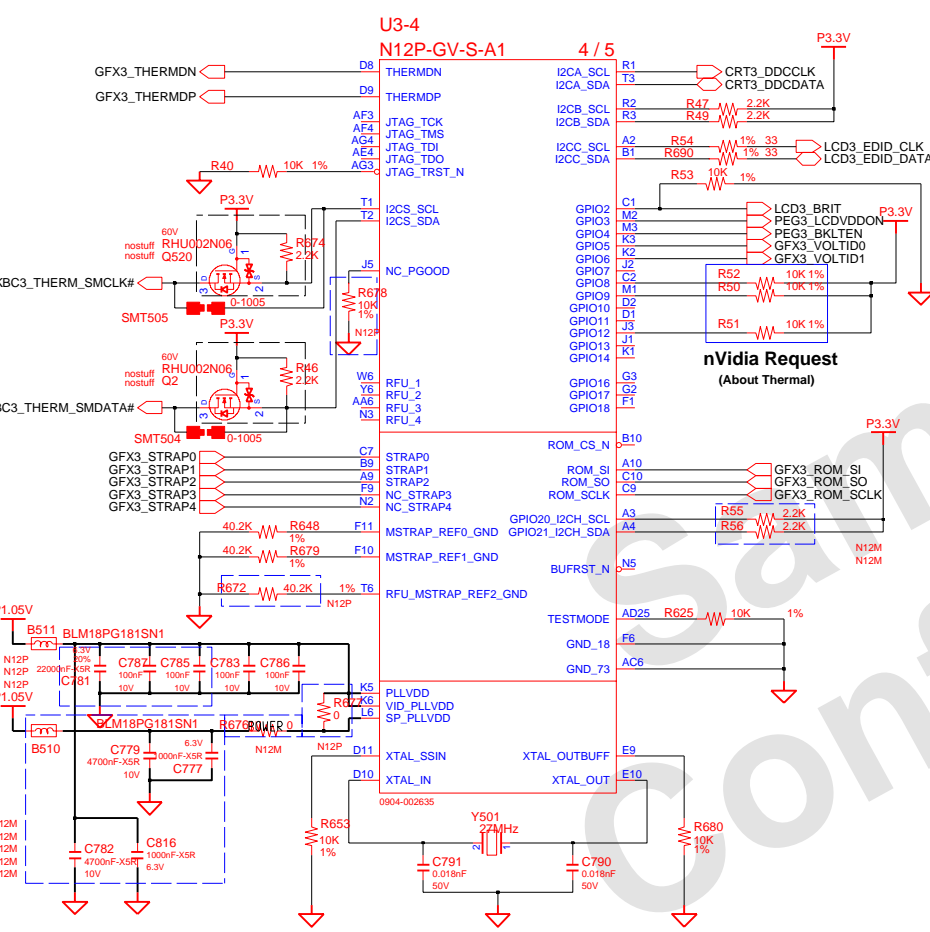
January 20, 2011 18:59:20 PM

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DESIGN	DATE	TITLE	SAMSUNG ELECTRONICS	
Gu Hui	1/03/2011	Scala2-R	PARTNO BA41-01XXXX	
SJ Wu	ADV	N12P_40NM(3/4)		
BC LEE	rev. 0.1	N12P_40NM(3/4)		
MODULE CODE	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	21 OF 48

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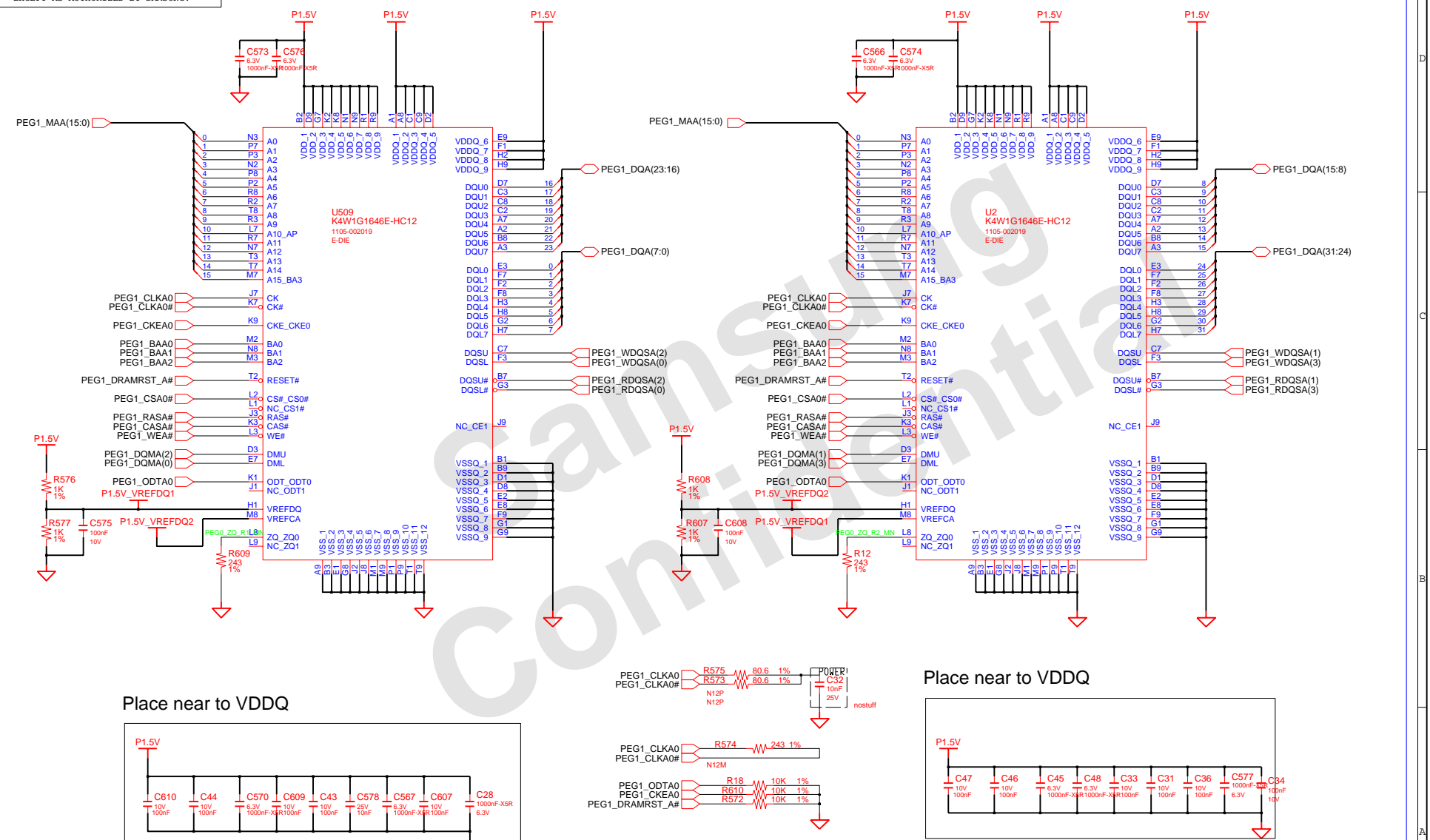
U3-5 N12P-GV-S-A1

B2	GND_1	NC_1	C15
B5	GND_2	NC_2	D15
B8	GND_3		
B11	GND_4		
B14	GND_5		
B17	GND_6		
B20	GND_7		
B23	GND_8		
B26	GND_9		
E2	GND_10		
E5	GND_11		
E8	GND_12		
E11	GND_13		
E17	GND_14		
E20	GND_15		
E23	GND_16		
E26	GND_17		
H2	GND_18		
H5	GND_19		
J1	GND_20		
J11	GND_21		
J14	GND_22		
J17	GND_23		
K9	GND_24		
K19	GND_25		
L2	GND_26		
L5	GND_27		
L11	GND_28		
L12	GND_29		
L13	GND_30		
L14	GND_31		
L15	GND_32		
L16	GND_33		
L17	GND_34		
M12	GND_35		
M13	GND_36		
M14	GND_37		
M15	GND_38		
M16	GND_39		
P2	GND_40		
P9	GND_41		
P19	GND_42		
P23	GND_43		
Q2	GND_44		
T12	GND_45		
T13	GND_46		
T14	GND_47		
T15	GND_48		
T16	GND_49		
U2	GND_50		
U5	GND_51		
U11	GND_52		
U12	GND_53		
U13	GND_54		
U14	GND_55		
U15	GND_56		
U16	GND_57		
U17	GND_58		
U23	GND_59		
U26	GND_60		
U29	GND_61		
V9	GND_62		
W11	GND_63		
W12	GND_64		
W14	GND_65		
W17	GND_66		
Y2	GND_67		
Y5	GND_68		
Y23	GND_69		
Y26	GND_70		
AC2	GND_71		
AC5	GND_72		
AC8	GND_73		
AC11	GND_74		
AC14	GND_75		
AC17	GND_76		
AC20	GND_77		
AC23	GND_78		
AC26	GND_79		
AF2	GND_80		
AF2	GND_81		
AF5	GND_82		
AF8	GND_83		
AF11	GND_84		
AF14	GND_85		
AF17	GND_86		
AF20	GND_87		
AF23	GND_88		
AF26	GND_89		

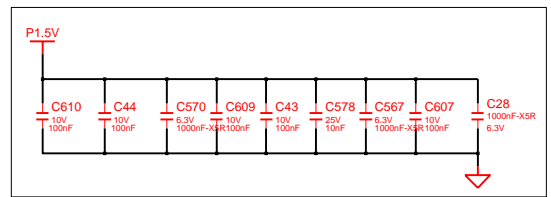
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		N12M_40NM(4/4)	
APPROVAL	BC LEE	REV	rev. 0.1		N12P_40NM(4/4)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 22 OF 48

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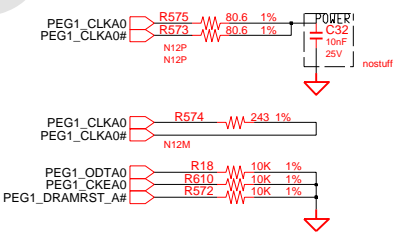
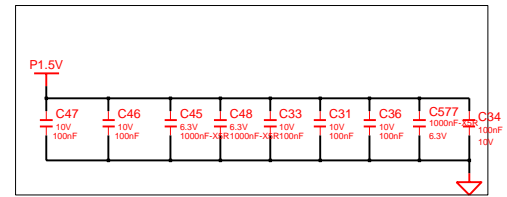
A-Channel #0



Place near to VDDQ



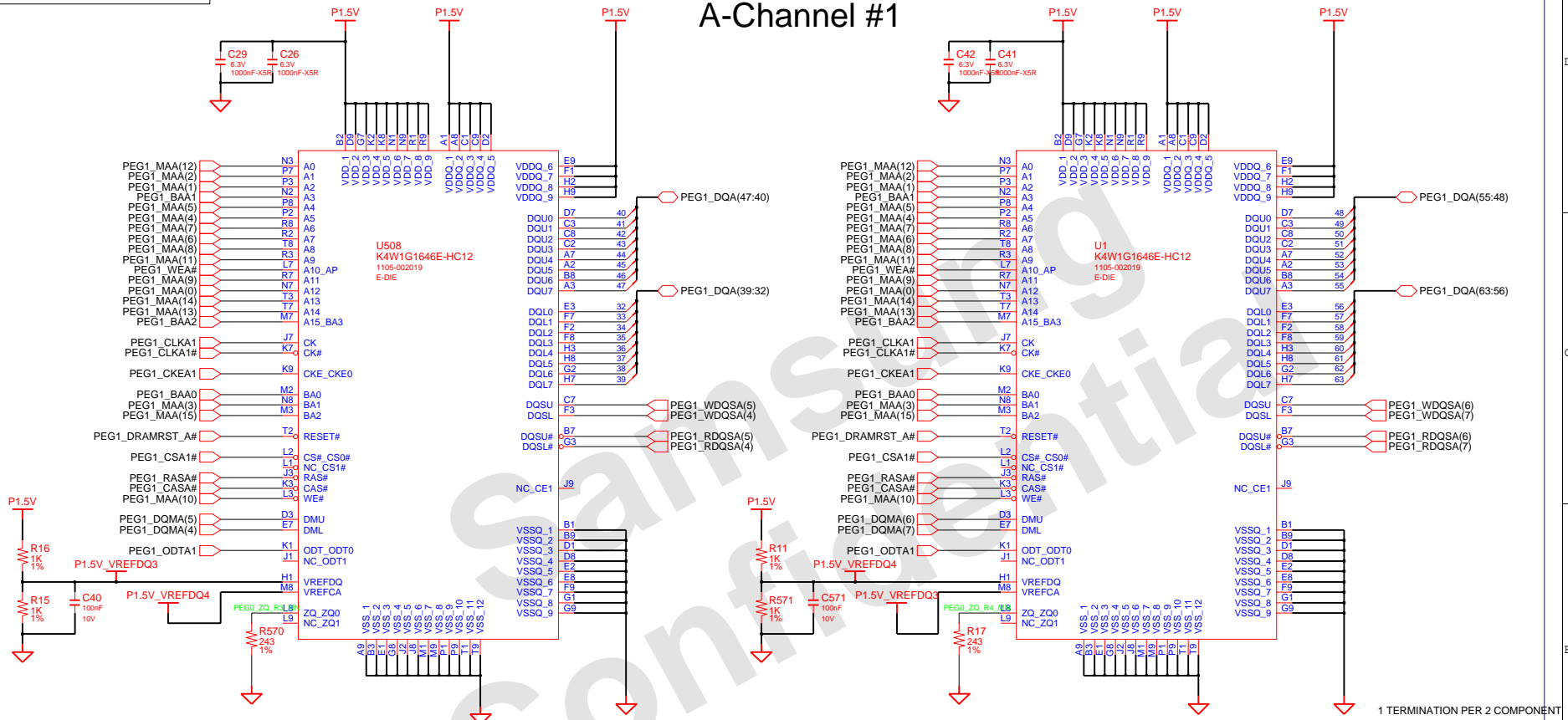
Place near to VDDQ



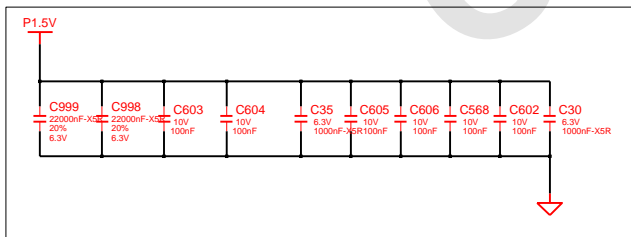
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		GRAPHIC_MEM A#0	
APPROVAL	BC LEE	REV	rev. 0.1		GRAPHIC_MEM A#0	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				PAGE 23 OF 48

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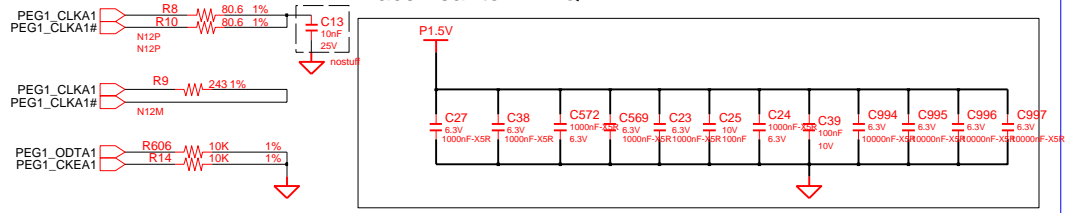
A-Channel #1



Place near to VDDQ



Place near to VDDQ

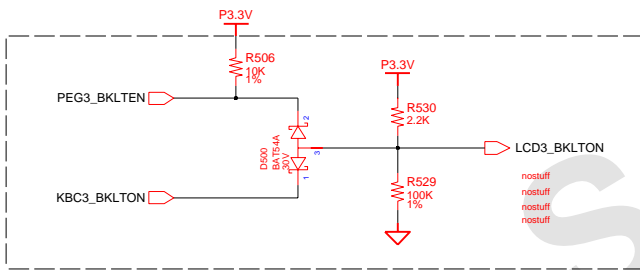
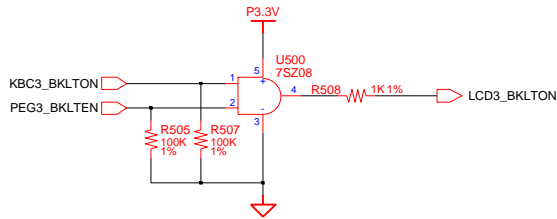


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHIC_MEM A#1	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	GRAPHIC_MEM A#1	BA41-01XXA	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	24 OF 48

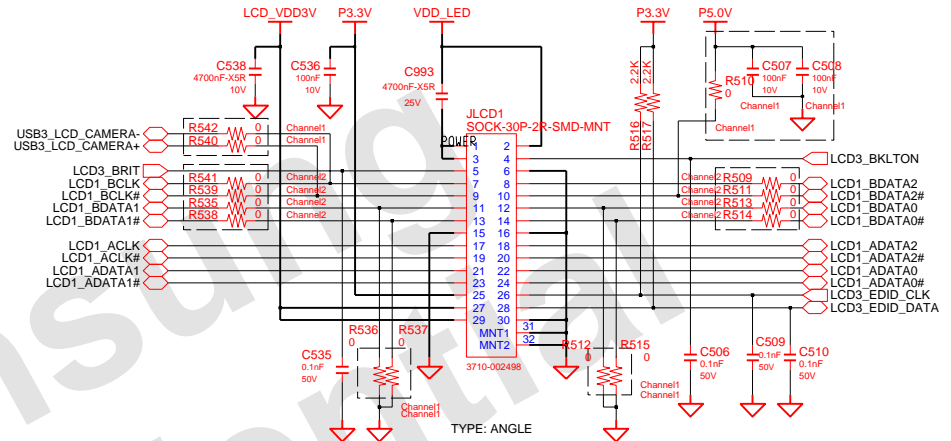
LVDS LOGIC

1Ch. LCD Connector + CAMERA

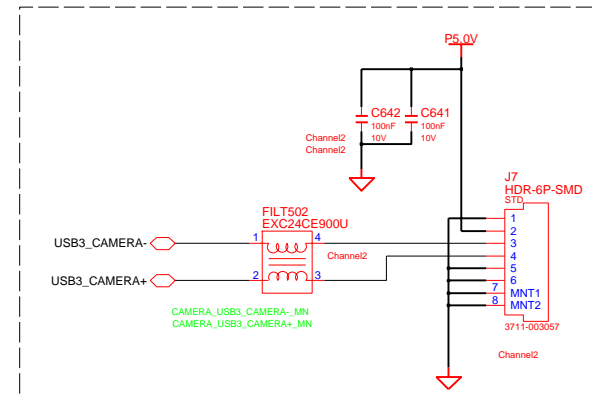
Backlight On



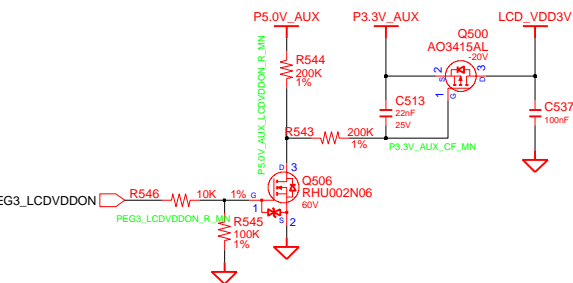
NOTE : Place R20 close to connector to minimize stub



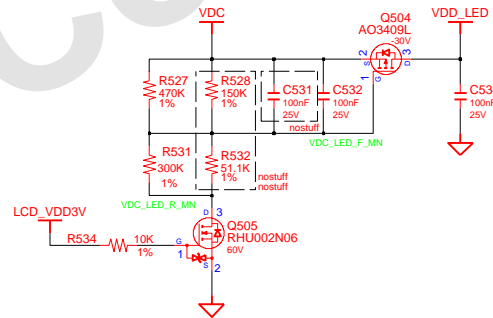
CAMERA CONN FOR 2ch LVDS



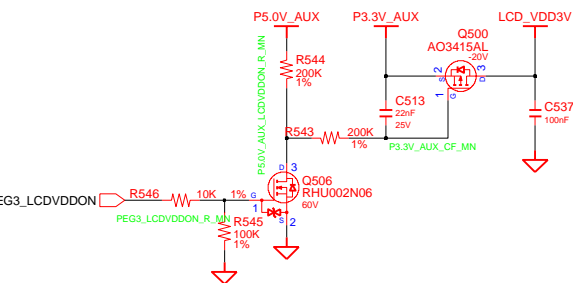
LCD Power



LED Power



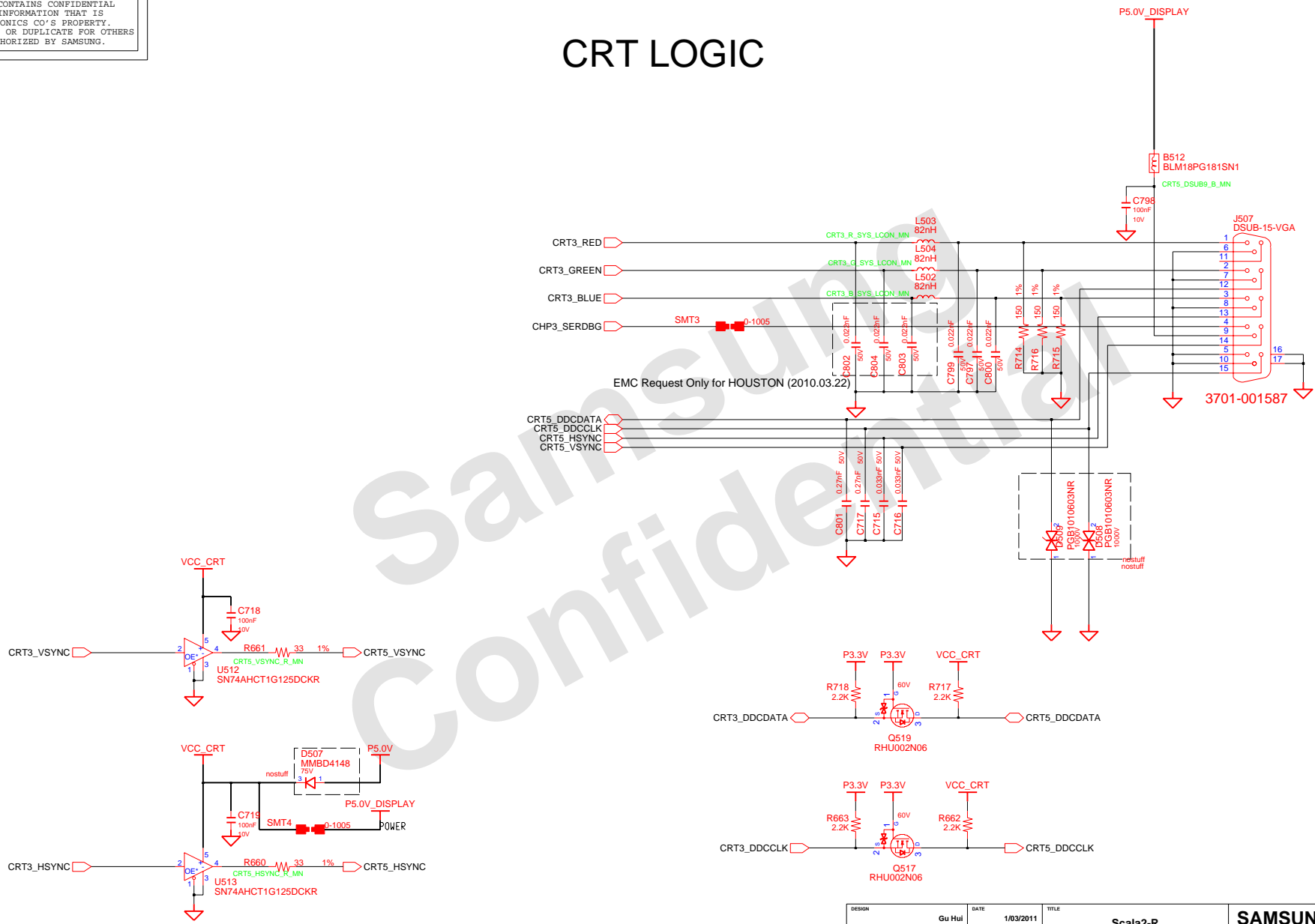
LCD Power



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	LVDS		PART NO. BA41-01XXXXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 25 OF 48

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CRT LOGIC

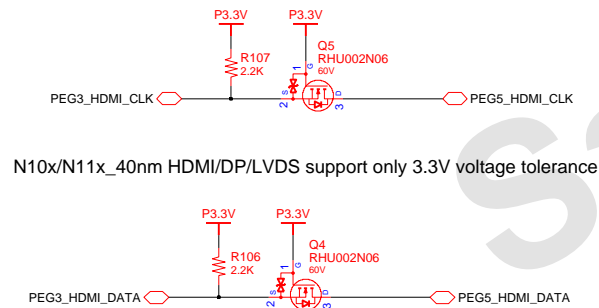


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	CRT		PART NO. BA41-01XXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	26 OF 48

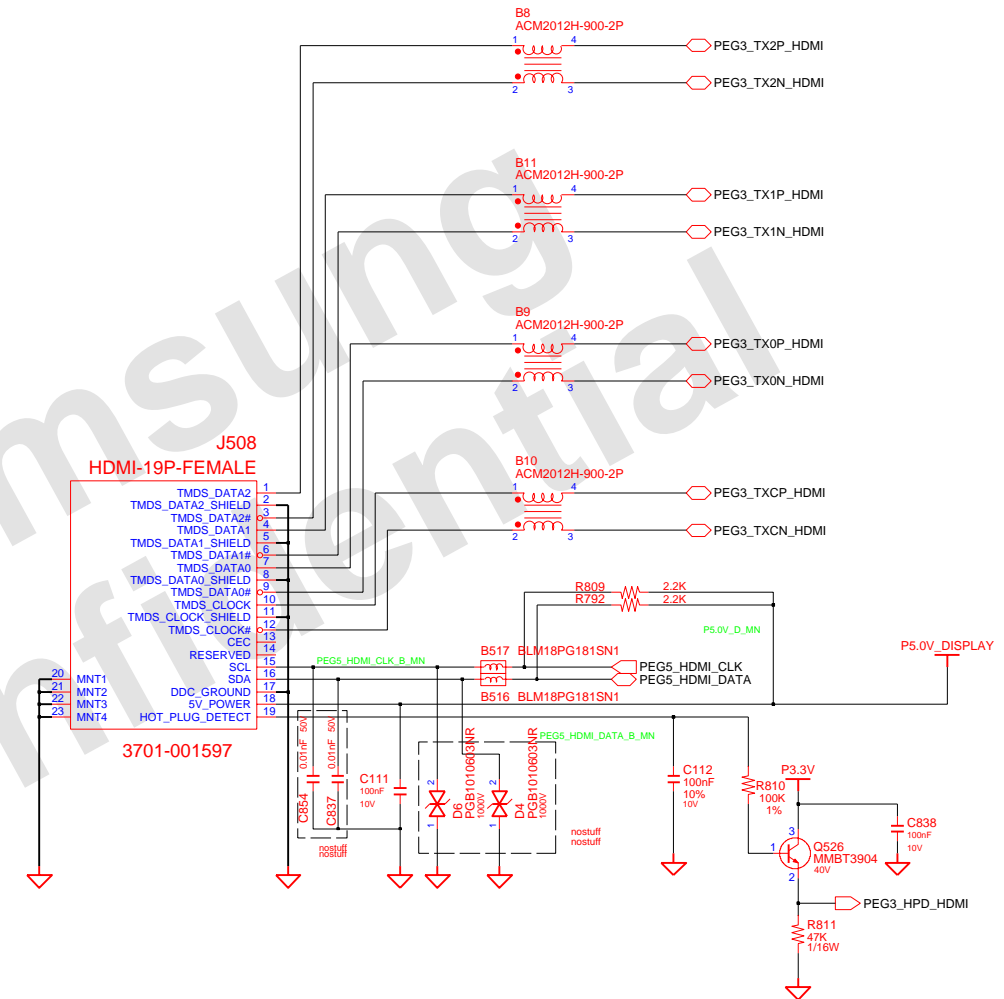
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HDMI Graphic

FOR HDMI VERIFICATION TEST



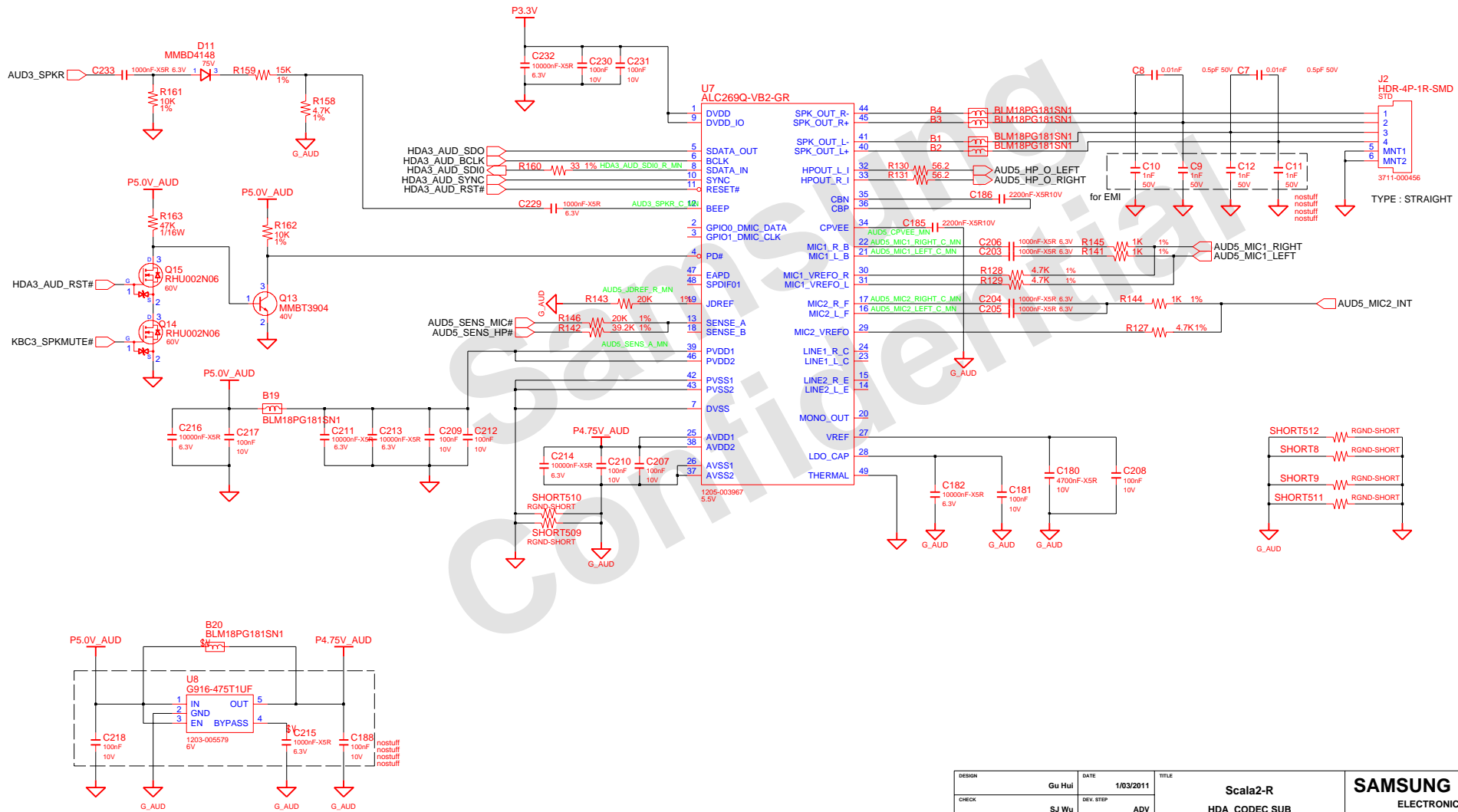
N10x/N11x_40nm HDMI/DP/LVDS support only 3.3V voltage tolerance



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	HDMI		PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	27	OF 48

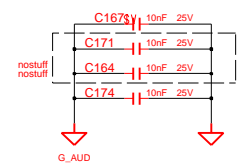
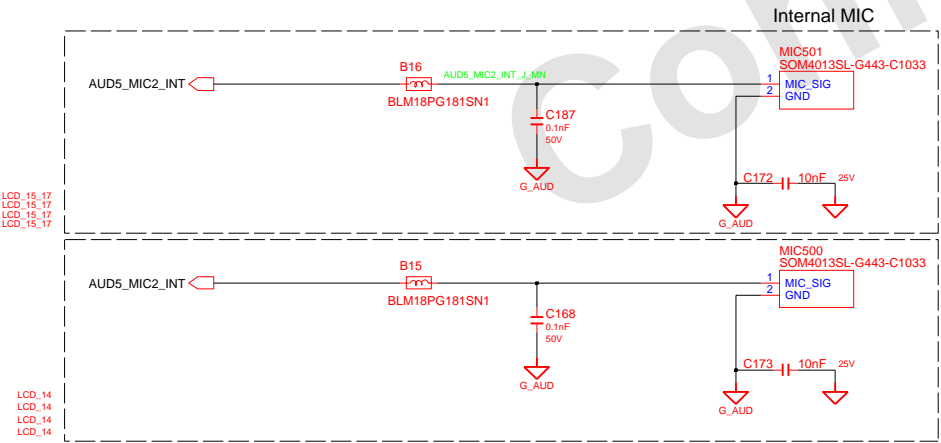
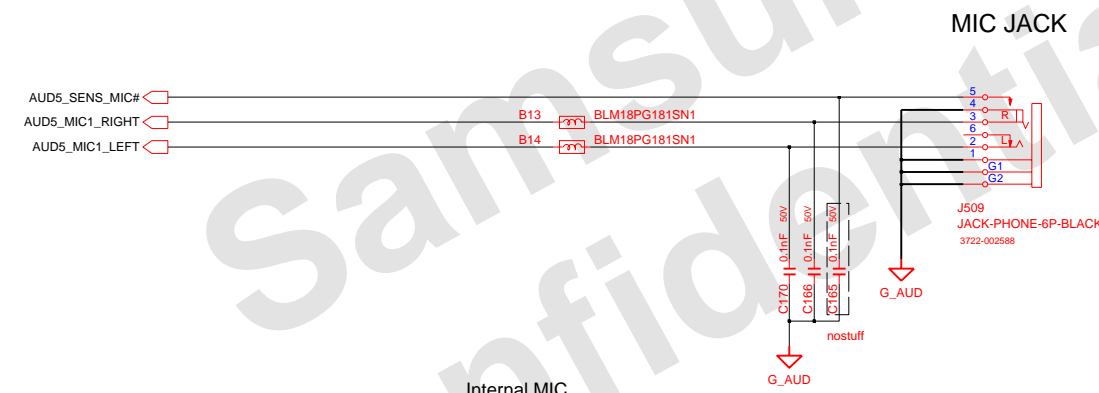
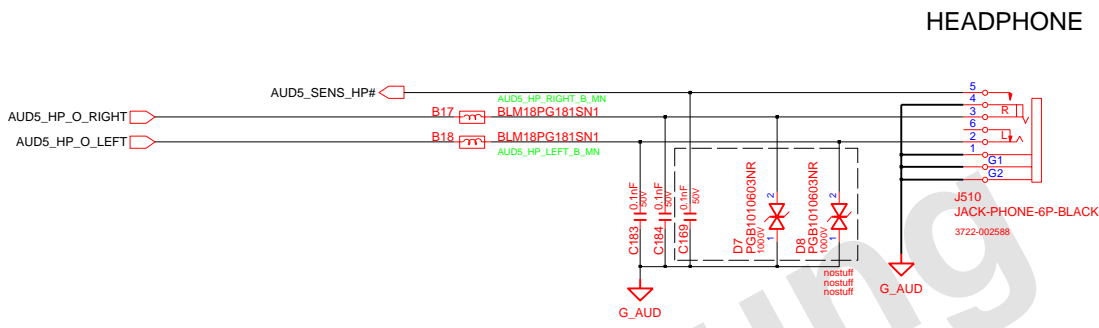
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HD AUDIO



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R HDA_CODEC SUB AUDIO CODEC ALC269 SUB	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE 28 OF 48	

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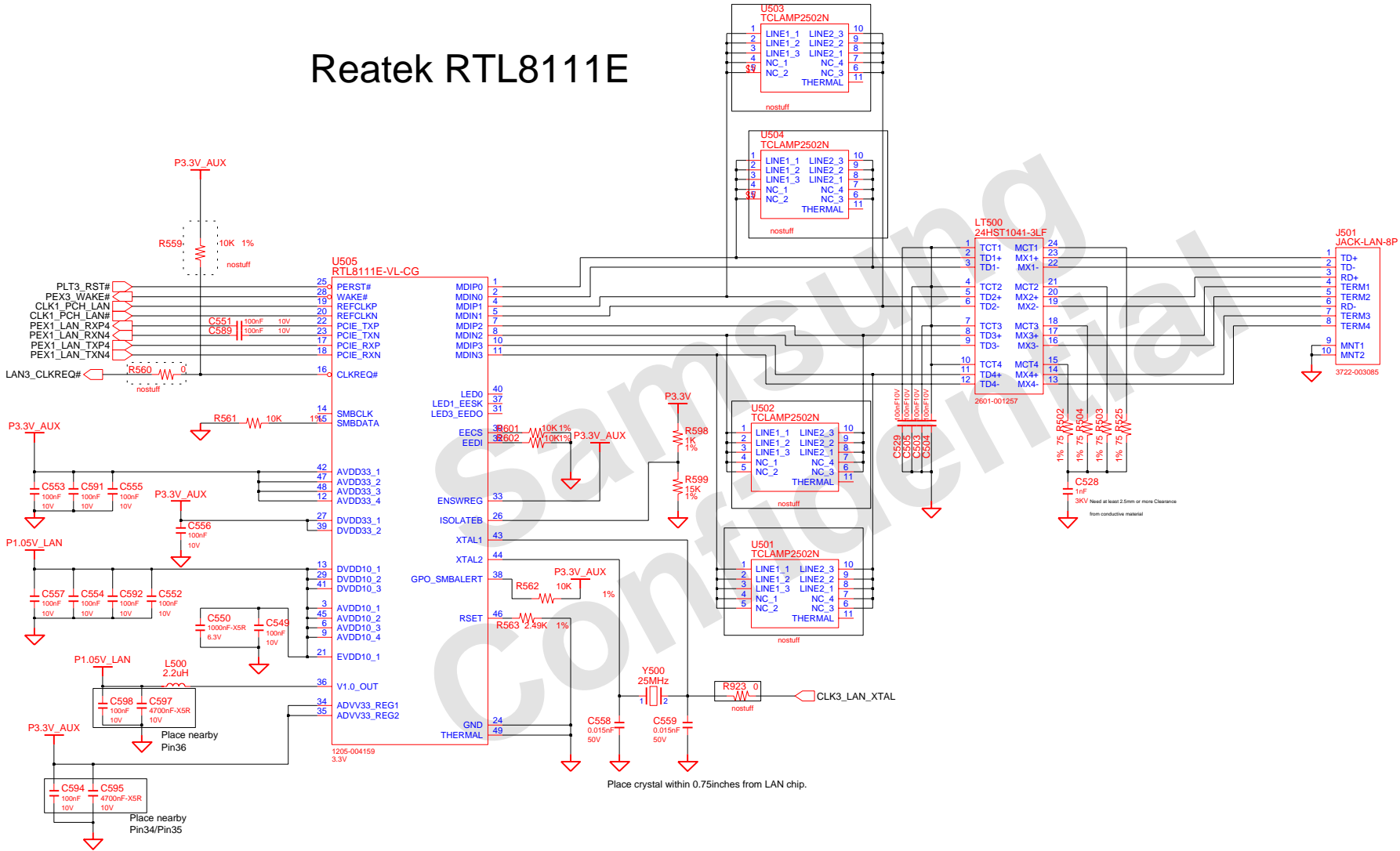
LCD_15_17
 LCD_15_17
 LCD_15_17
 LCD_15_17

LCD_14
 LCD_14
 LCD_14
 LCD_14

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS PART NO. BA41-01XXA
CHECK	SJ Wu	DEV. STEP	ADV	HDA_CODEC & LED SUB		
APPROVAL	BC LEE	REV	rev. 0.1	AUDIO JACK & LED SUB		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	29 OF 48	

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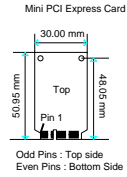
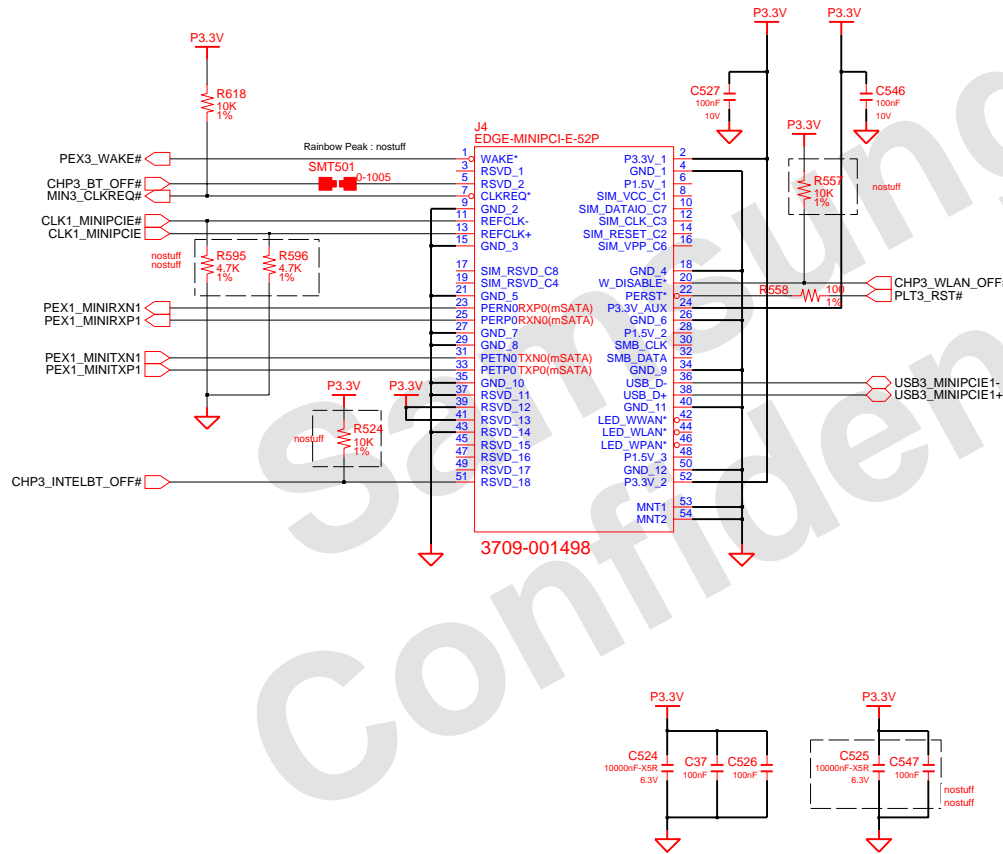
Reatek RTL8111E



Place crystal within 0.75inches from LAN chip.

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R LAN LAN_Reatek_RTL8111
CHECK	SJ Wu	DEV. STEP	ADV	SAMSUNG ELECTRONICS	
APPROVAL	BC LEE	REV	rev. 0.1		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	30 OF 48

WLAN, 4mm



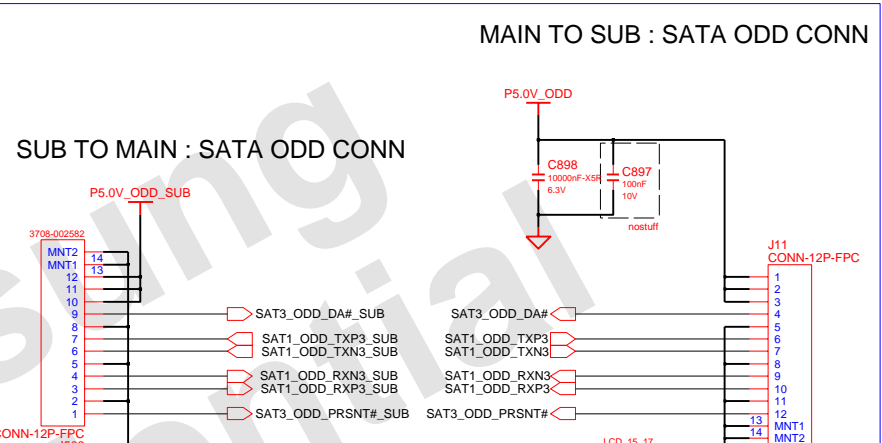
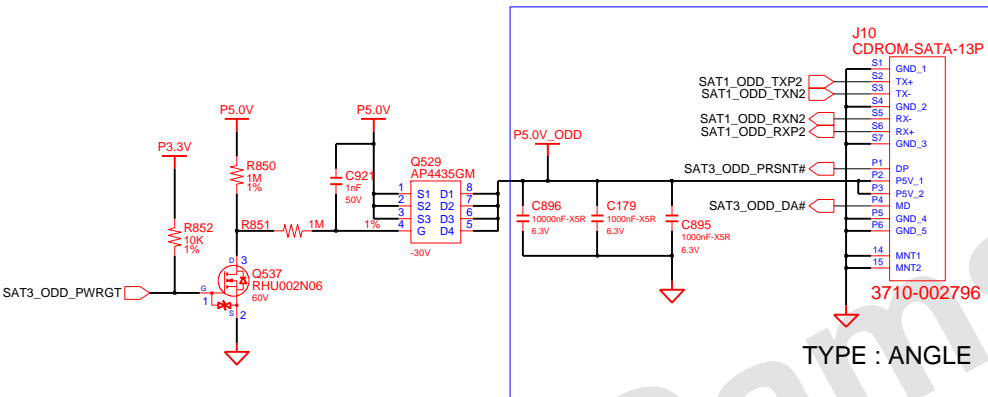
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MINI_PCIE_CONN		
APPROVAL	BC LEE	REV	rev. 0.1	WLAN		PART NO. BA41-01XXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 31 OF 48

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SATA I/F CONN

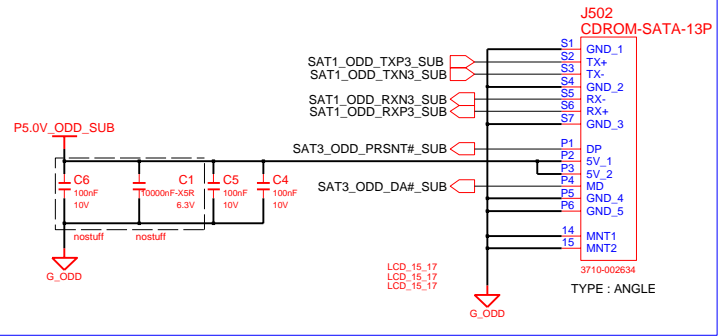
SATA ODD CONN

15.6" / 17.3"



TYPE : ANGLE
 LCD_14
 LCD_14
 LCD_14

SATA ODD CONN

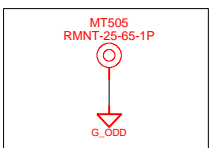
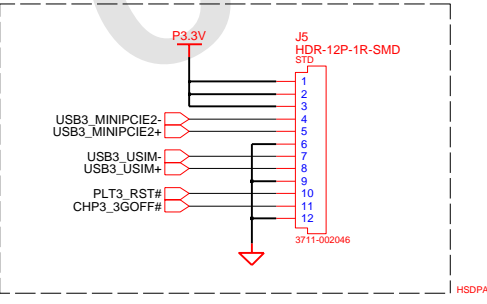
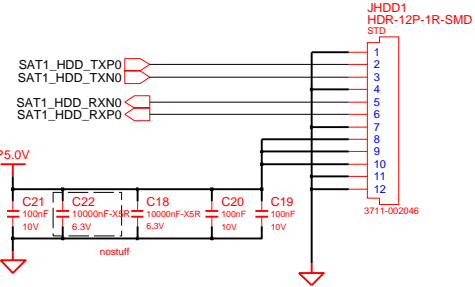


TYPE : ANGLE
 LCD_15,17
 LCD_15,17
 LCD_15,17

SATA HDD CONN

MAIN to HSDPA SUB

Cable Connector Type



ODD sub board mount hole

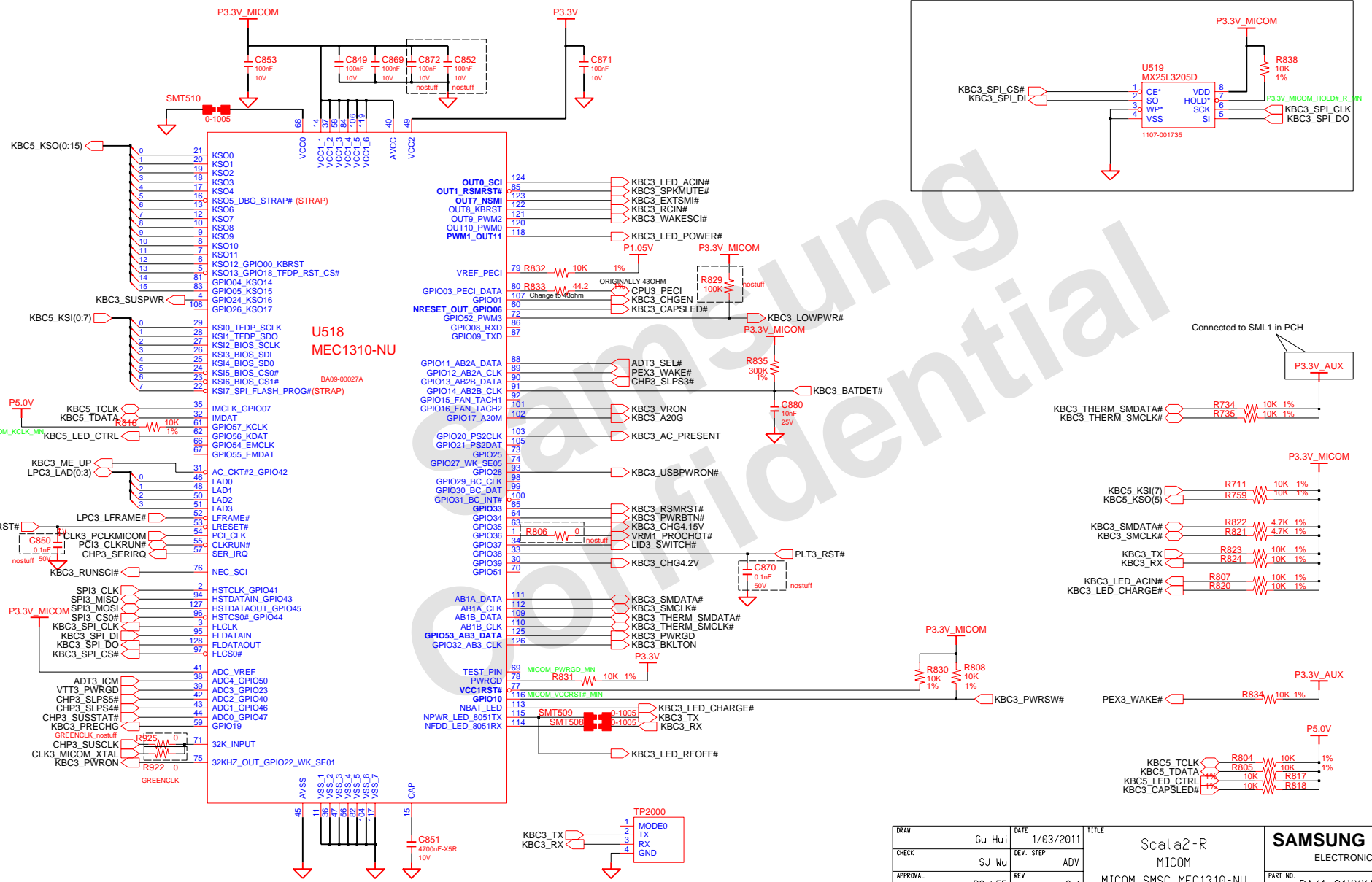
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	SATA DEVICES		
APPROVAL	BC LEE	REV	rev. 0.1	SATA I/F Conn		PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	32 OF 48

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MAIN BOARD (MICOM)

BE CAUTION SPI ROM SIZE!!

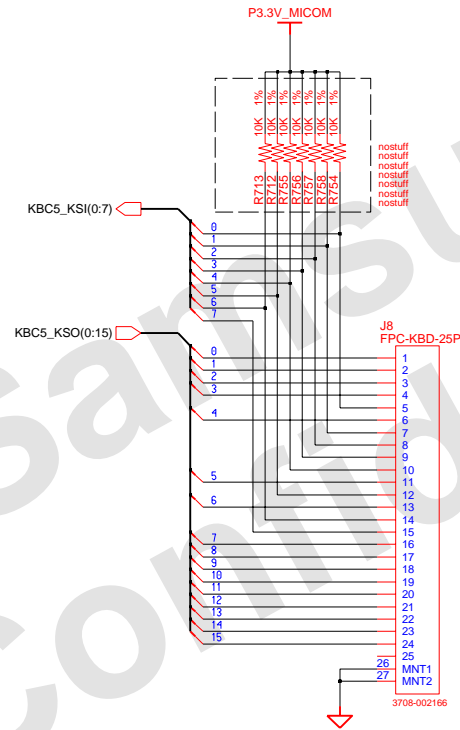
SPI_ROM_SOCKET



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R MICOM	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MICOM_SMSC_MEC1310-NU		
APPROVAL	BC LEE	REV	rev. 0.1	PART NO. BA41-01XXXXA		PAGE 33 OF 48
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM			

Micom Glue Logic

KEYBOARD

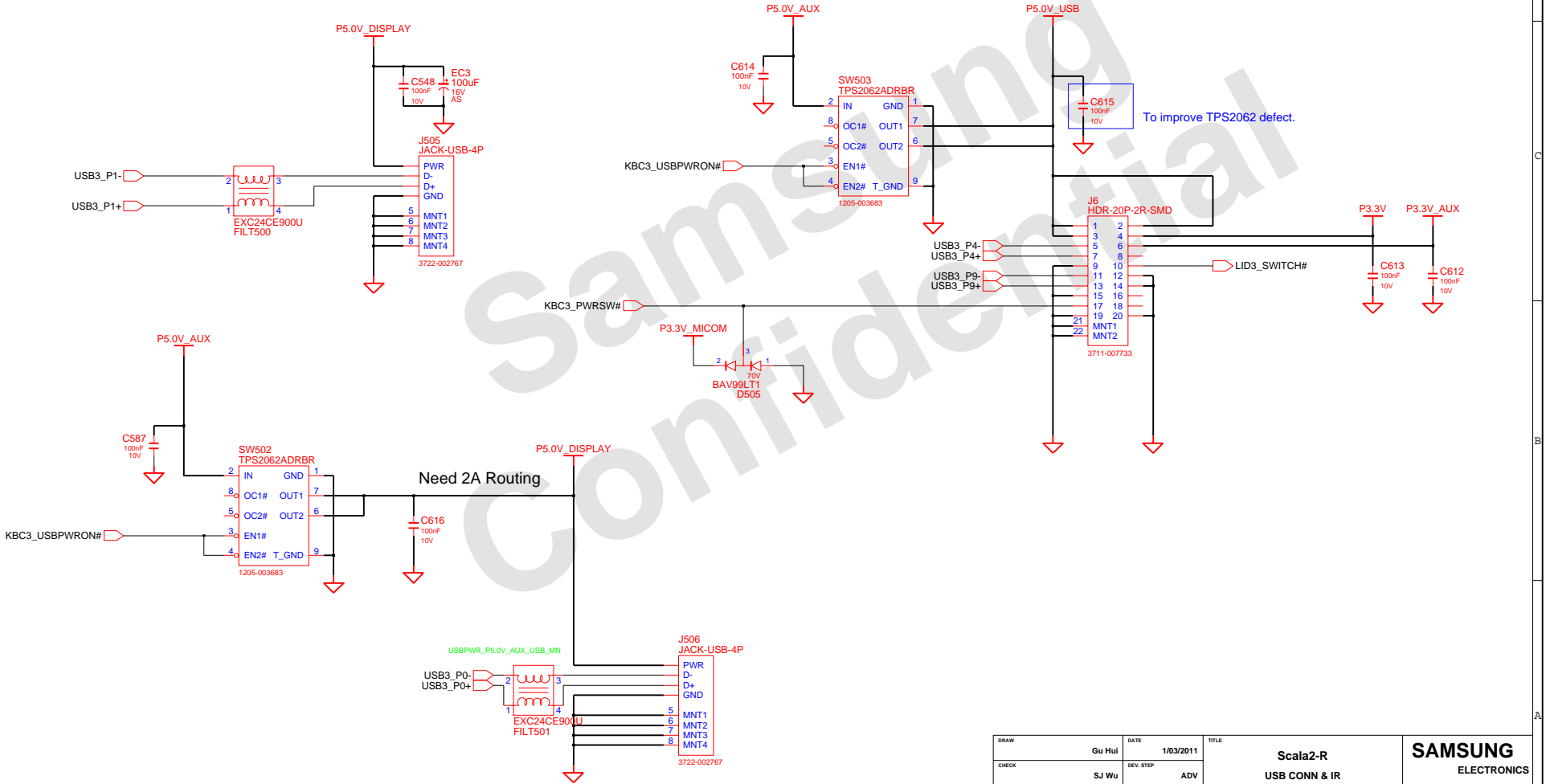


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MICOM GLUE LOGIC		
APPROVAL	BC LEE	REV	rev. 0.1	MICOM GLUE LOGIC		PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 34	OF 48

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POWER S/W SUB B'D CONNECTOR

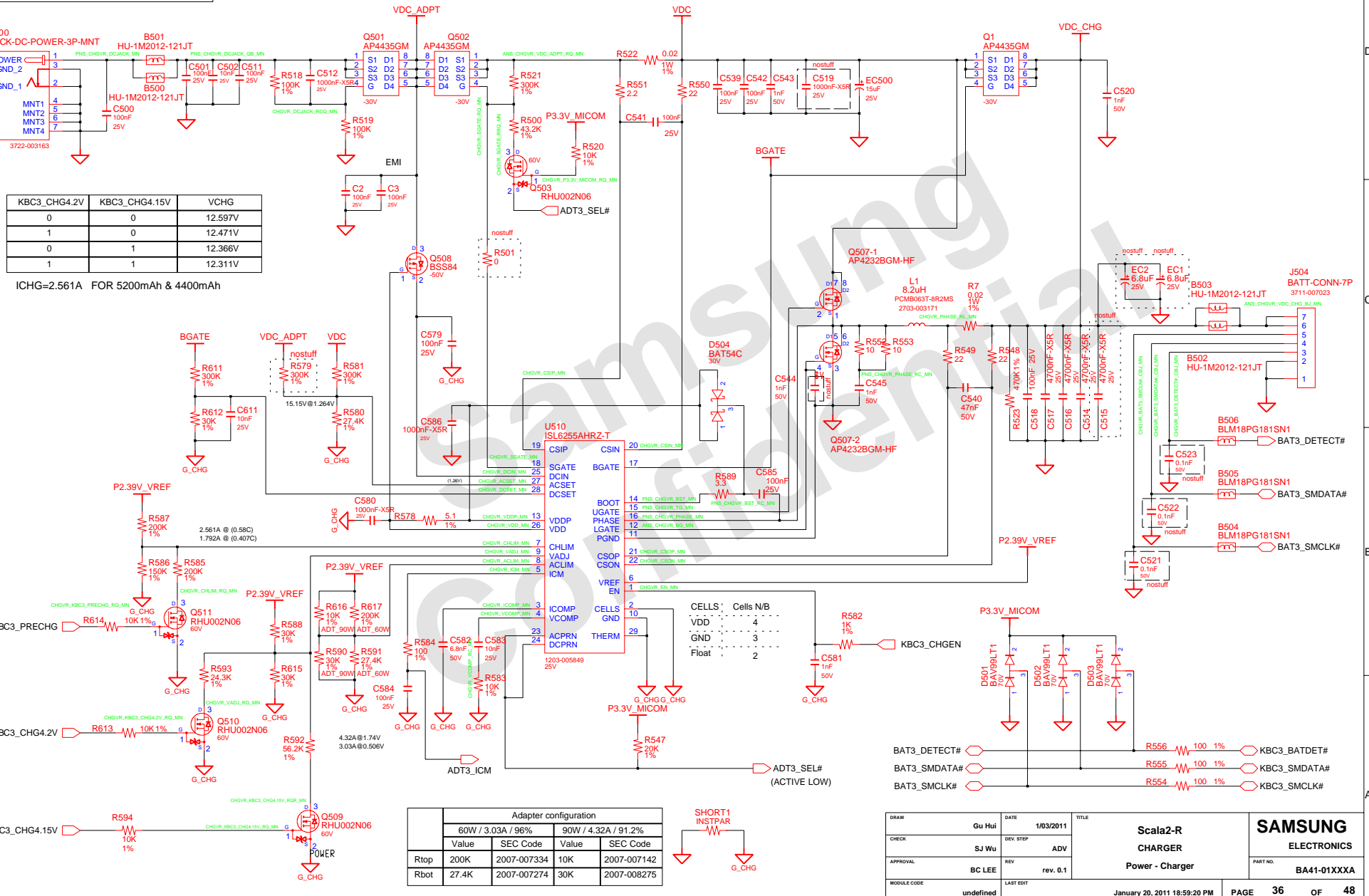
MAIN to SUB



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	USB CONN & IR	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	USB & IR	BA41-01XXA	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 35 OF 48	

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CHARGER & POWER MANAGEMENT



KBC3_CHG4.2V	KBC3_CHG4.15V	VCHG
0	0	12.597V
1	0	12.471V
0	1	12.366V
1	1	12.311V

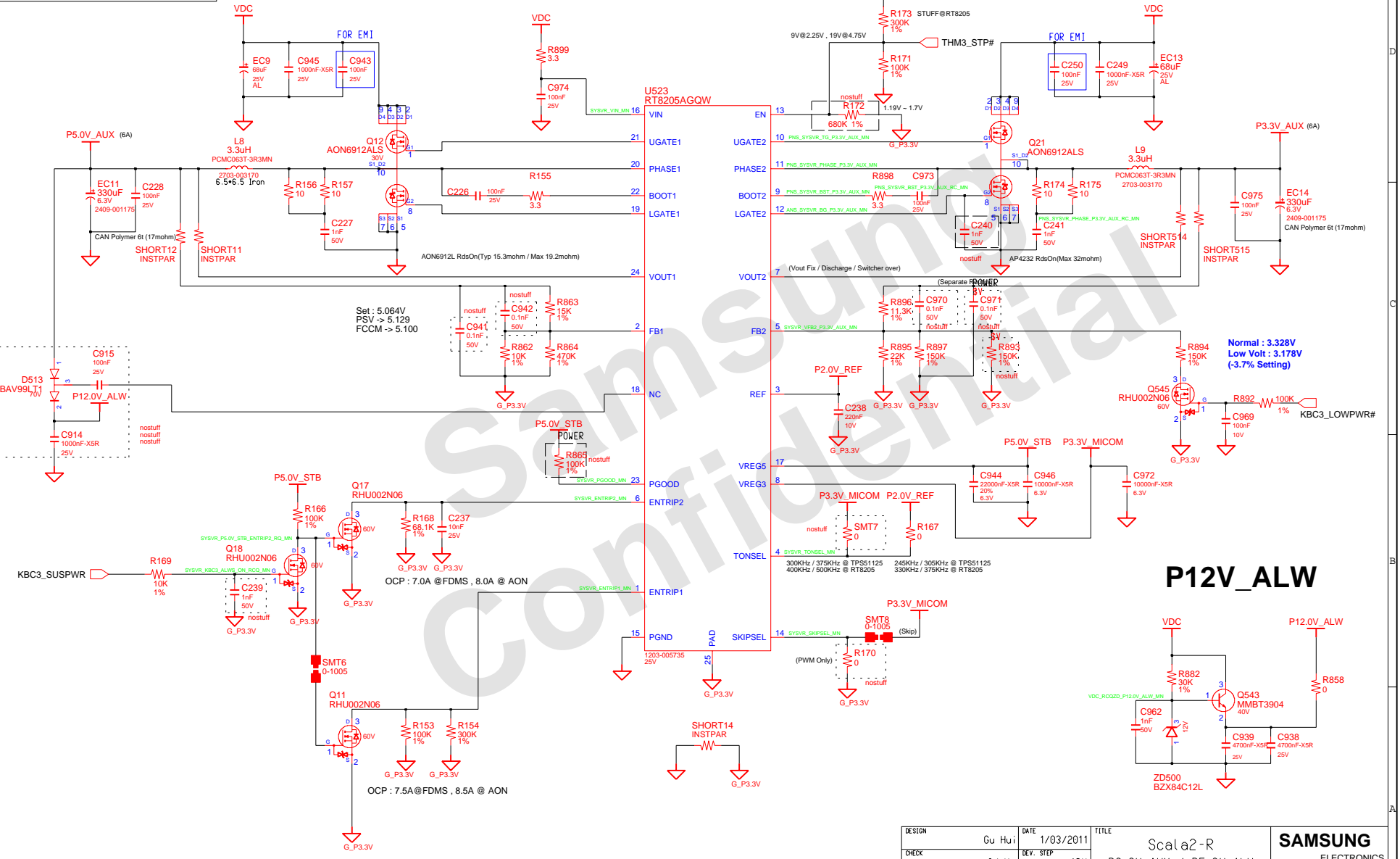
ICHG=2.561A FOR 5200mAh & 4400mAh

Adapter configuration				
60W / 3.03A / 96%		90W / 4.32A / 91.2%		
Value	SEC Code	Value	SEC Code	
Rtop	200K	2007-007334	10K	2007-007142
Rbot	27.4K	2007-007274	30K	2007-008275

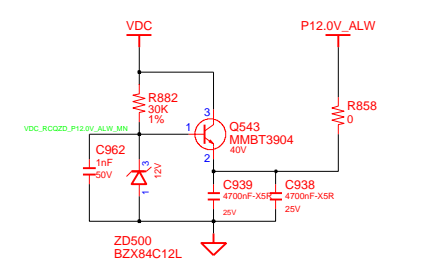
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV	CHARGER	Power - Charger	
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXX
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	36	OF 48

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P3.3V_AUX & P5.0V_AUX

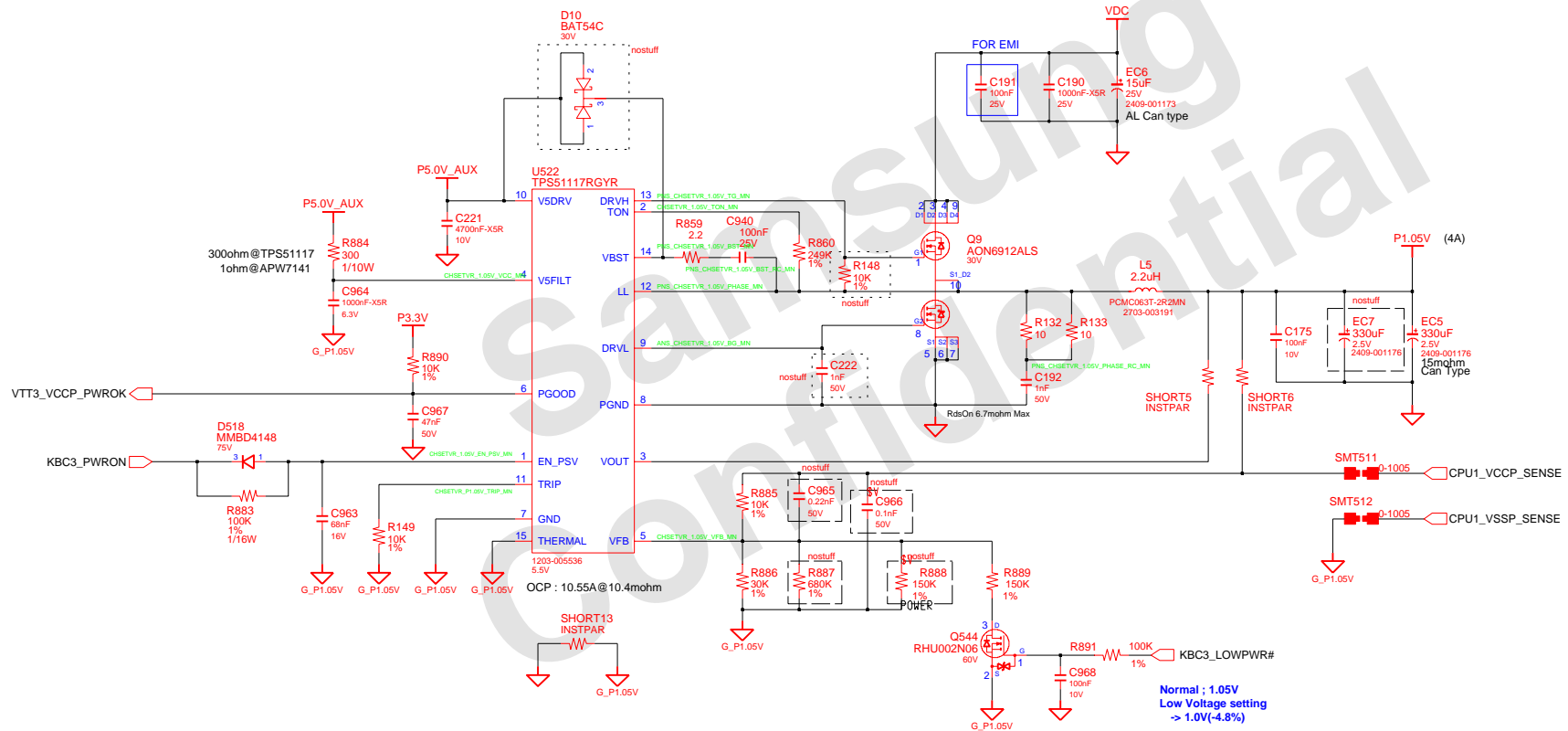


P12V_ALW



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS PART NO. BA41-01XXXXA
CHECK	SJ Wu	DEV. STEP	ADV	P3.3V_AUX / P5.0V_AUX		
APPROVAL	BC LEE	REV	rev. 0.1	P3.3V_AUX / P5.0V_AUX		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	37 OF 48	

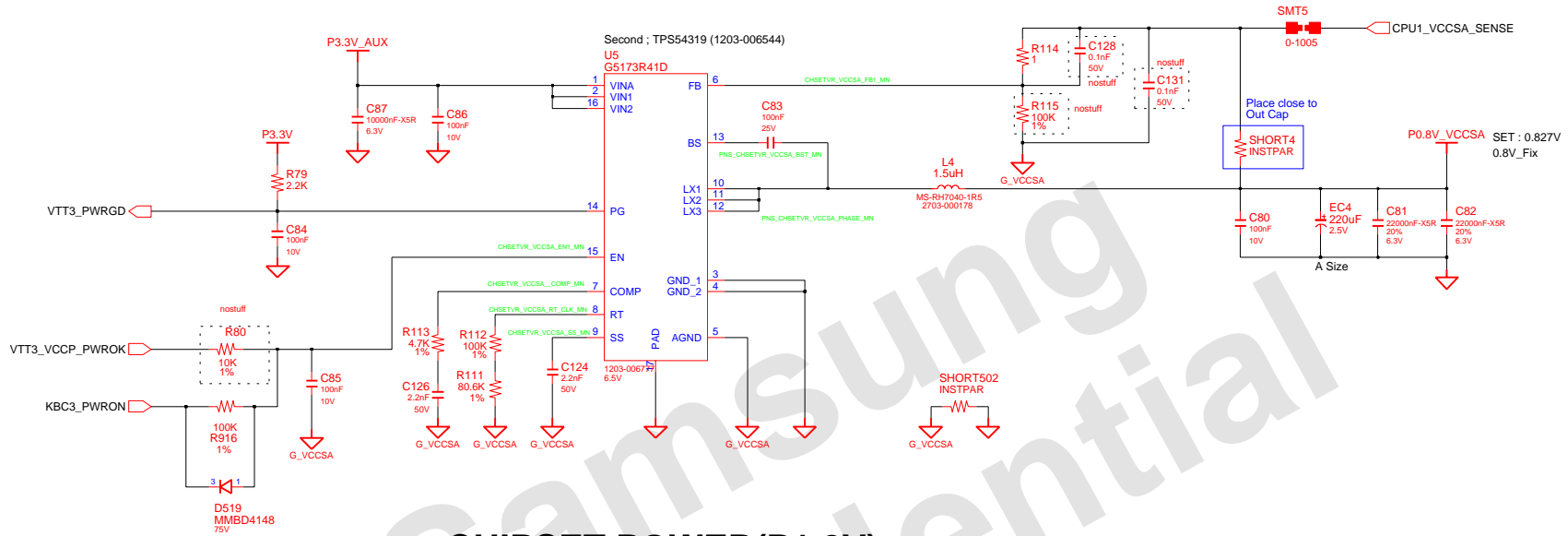
CHIPSET POWER(P1.05V)



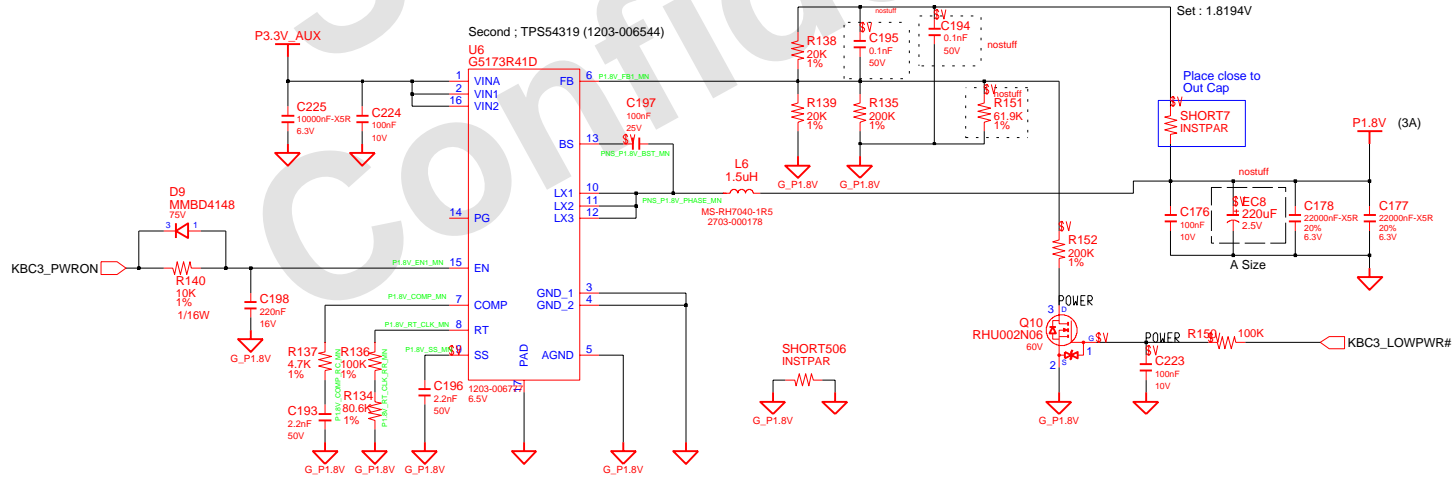
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R P1.05V P1.05V(Chipset Power)	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXX
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	38	OF 48

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CHIPSET POWER(VCCSA)



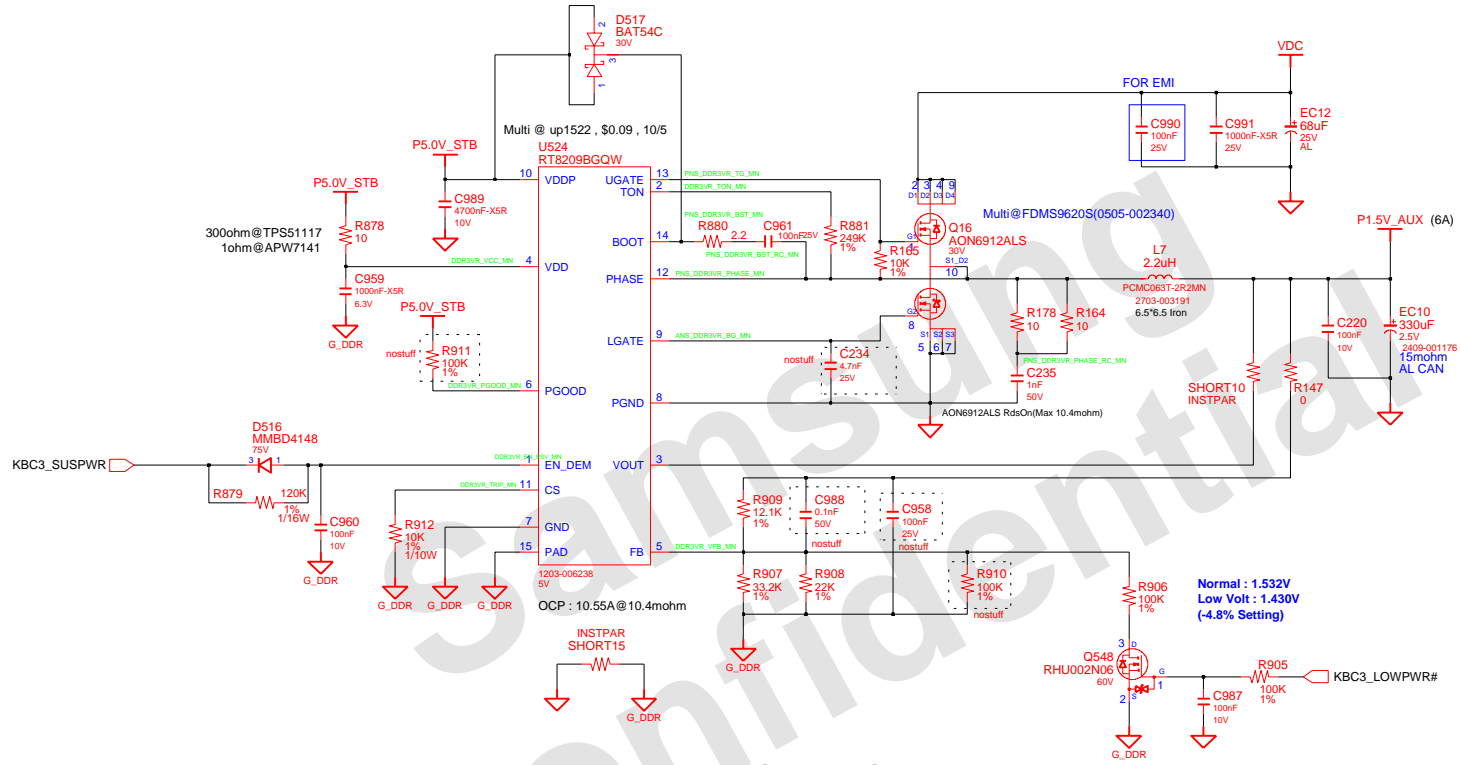
CHIPSET POWER(P1.8V)



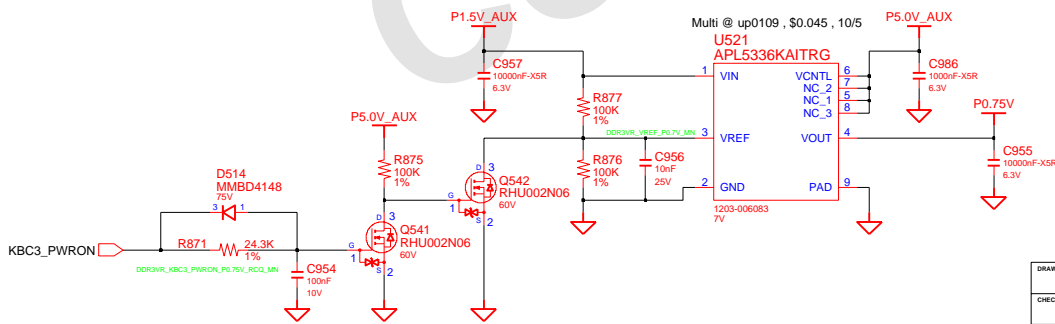
DESIGN	Gu Hu	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		P1.1V_VTT	
APPROVAL	BC LEE	REV	rev. 0.1		P0.8V(Chipset Power)	PART NO. BA41-01XXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	39	OF 48

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DDR3 Power



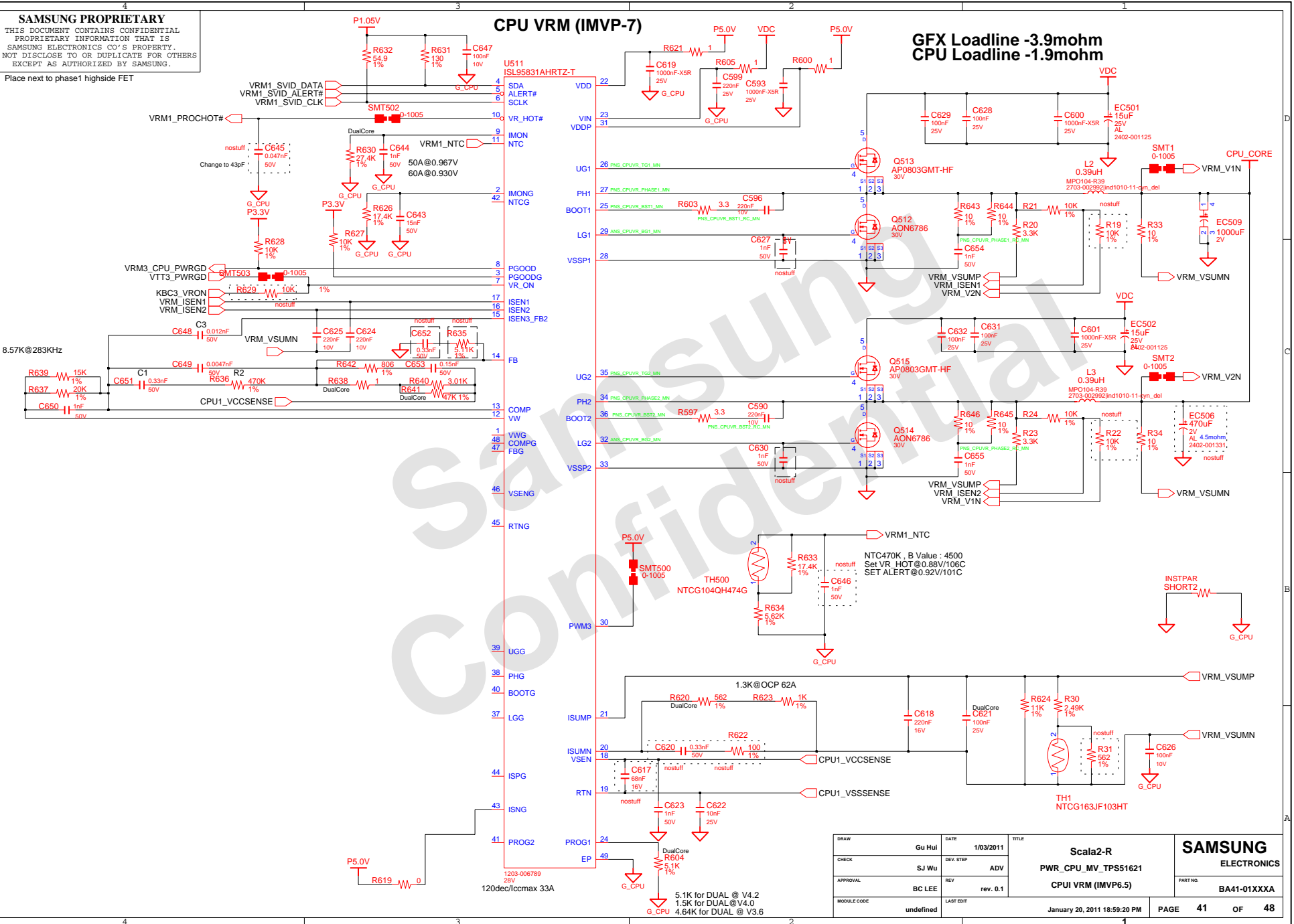
DDR3 VTT(0.75V)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PWR_MEMORY	
APPROVAL	BC LEE	REV	rev. 0.1		DDR3 POWER	BA41-01XXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	40	OF 48

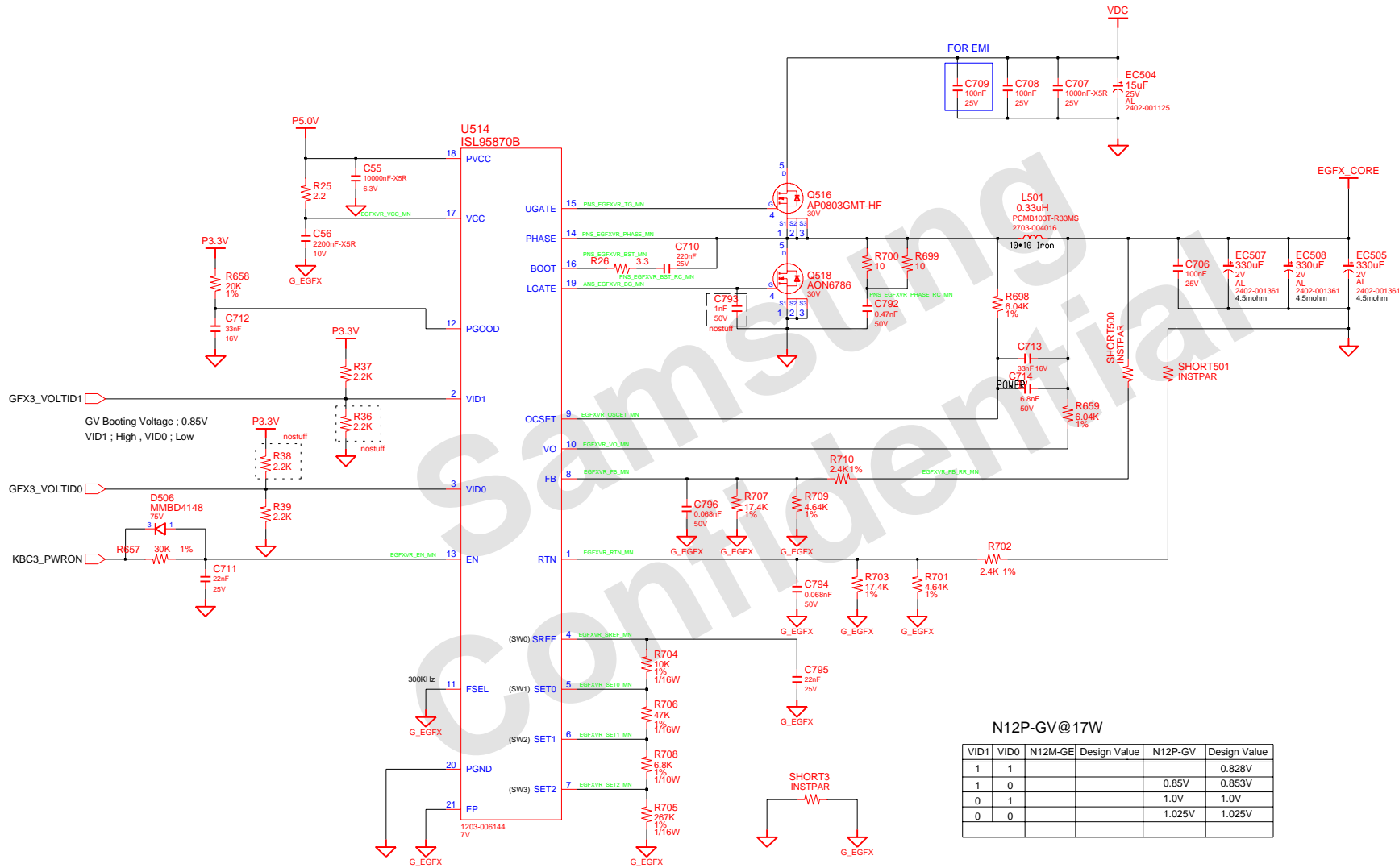
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Place next to phase1 highside FET



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV		PWR_CPU_MV_TPS51621
APPROVAL	BC LEE	REV	rev. 0.1		CPU1 VRM (IMVP6.5)
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	41 OF 48

External GFX Core Power



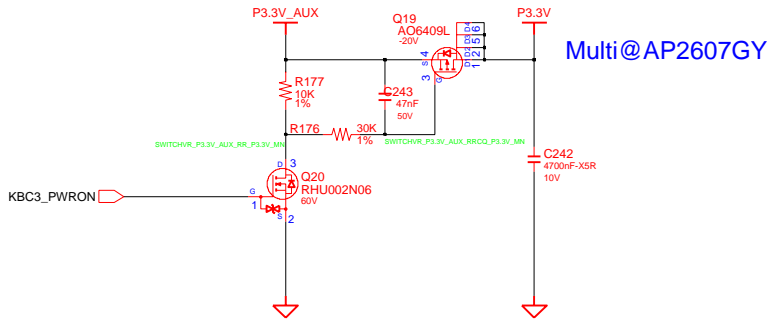
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV		PWR_MV_SWITCHED
APPROVAL	BC LEE	REV	rev. 0.1		Power-EGFX_CORE
MODULE CODE		LAST EDIT			
				January 20, 2011 18:59:20 PM	PAGE 42 OF 48

SAMSUNG
 ELECTRONICS
 PART NO. BA41-01XXXA

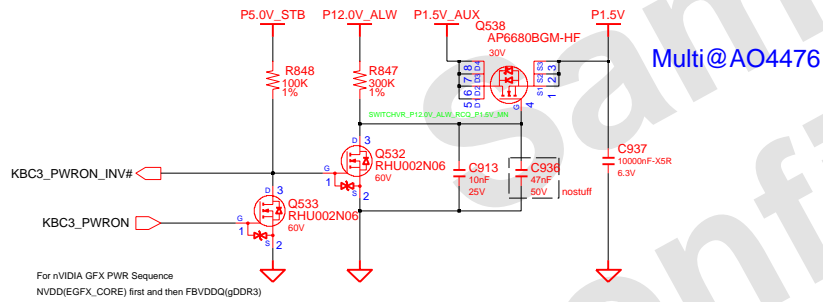
Switched Power

P5.0V -> P3.3V -> EGFX_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.8V_VCCSA -> CPU_CORE

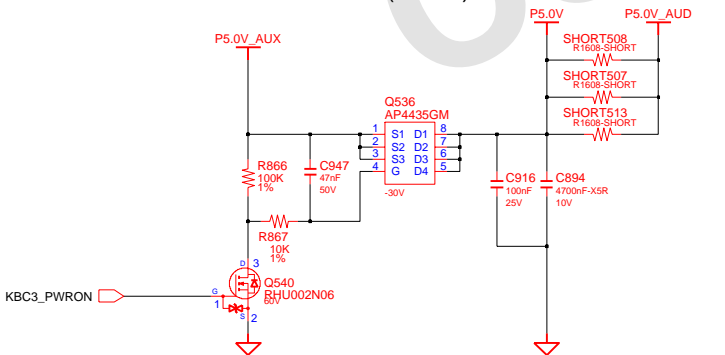
Switched Power On (P3.3V)



Switched Power On (P1.5V)



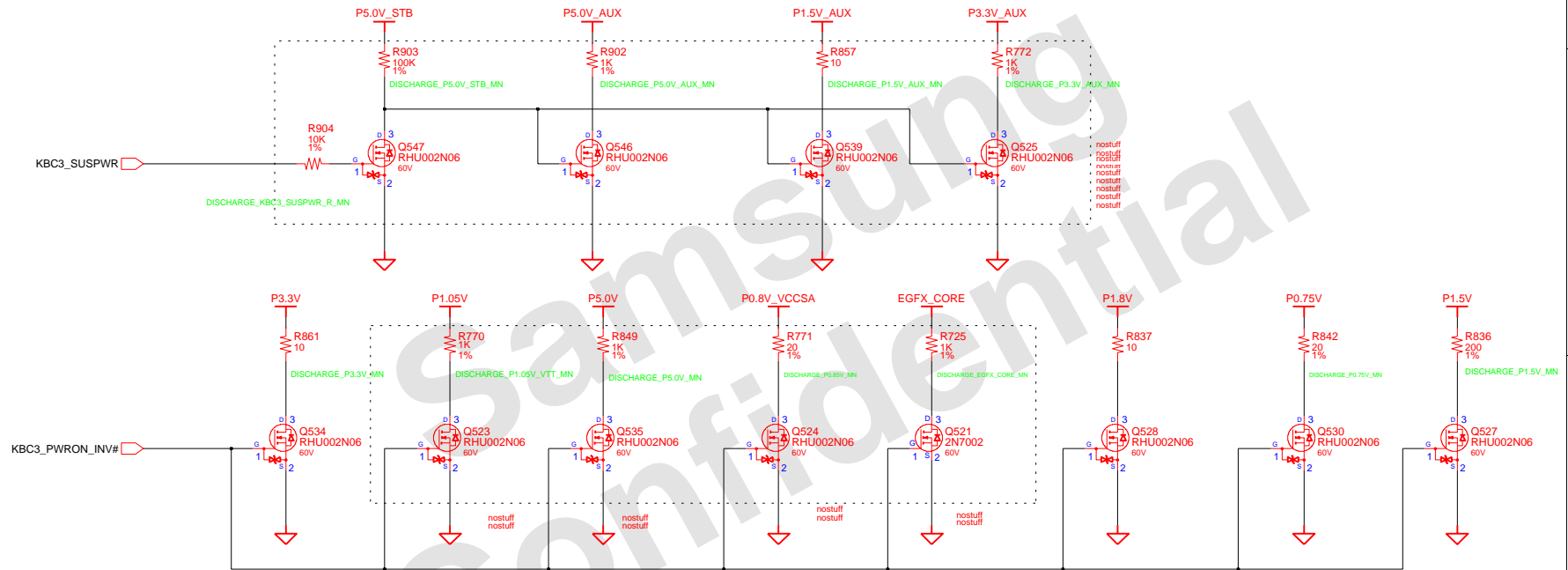
Switched Power On (P5.0V)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	PWR_MV_DISCHARGER	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	SWITCHED POWER	BA41-01XXA	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	43	OF 48

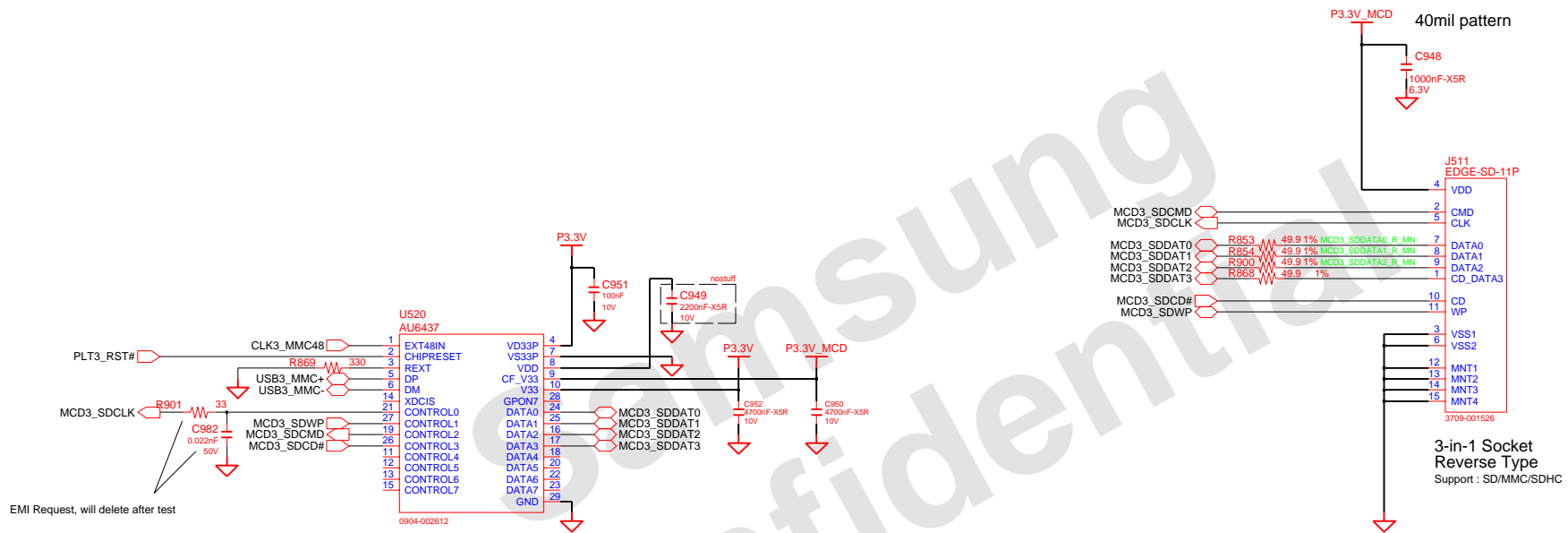
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POWER DISCHARGER



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R SUB BOARD1 Power Discharger	SAMSUNG ELECTRONICS PART NO. BA41-01XXXA
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE 45 OF 48		

AU6437 (4-in-1)

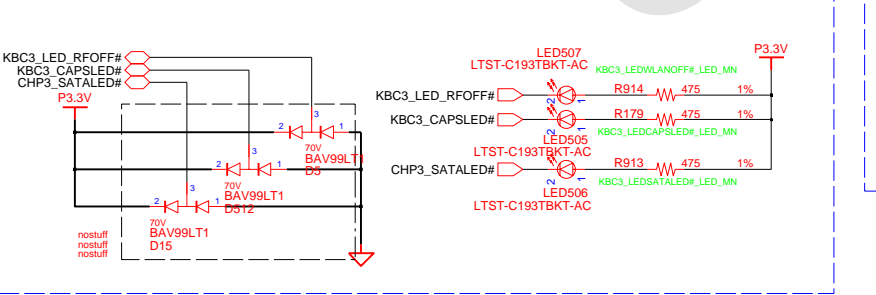
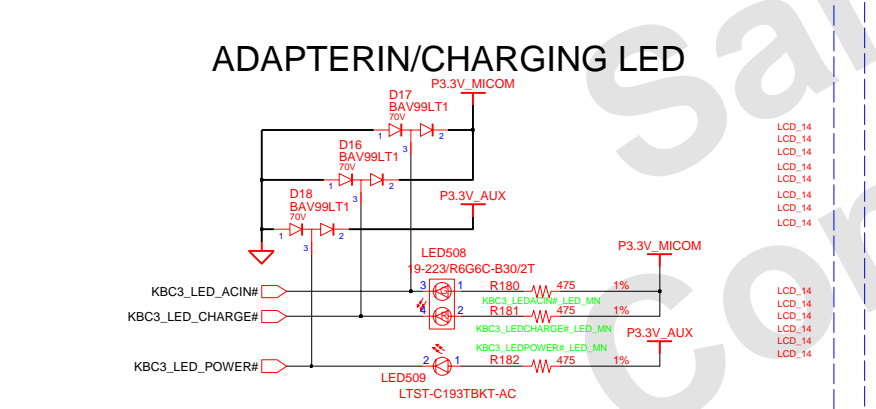
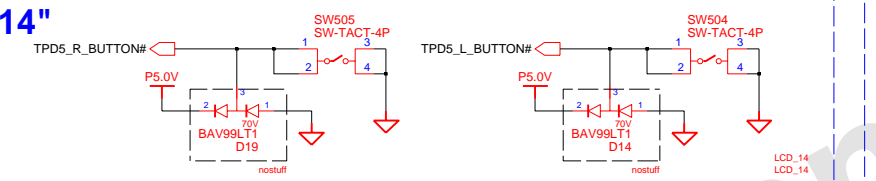
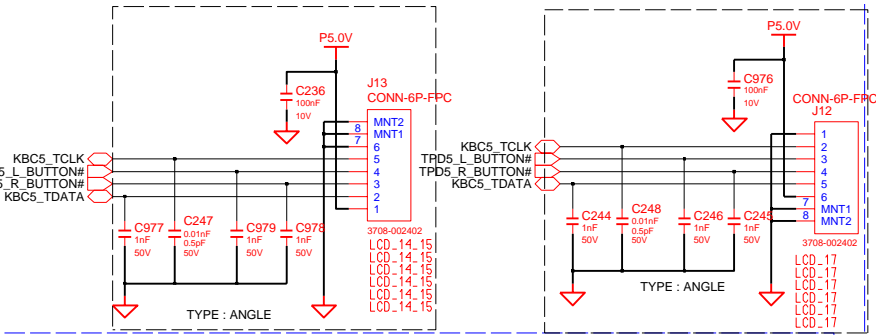


Confidential

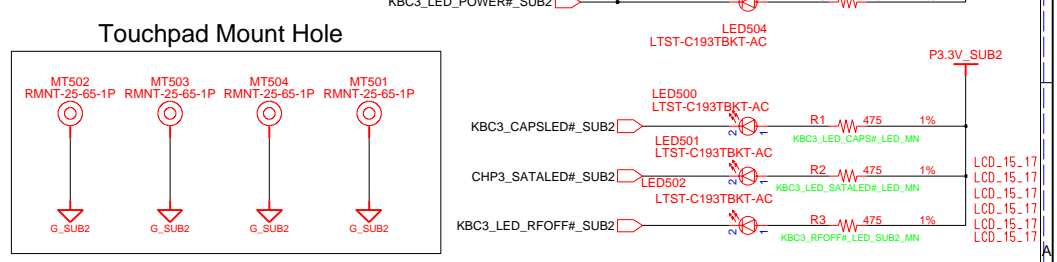
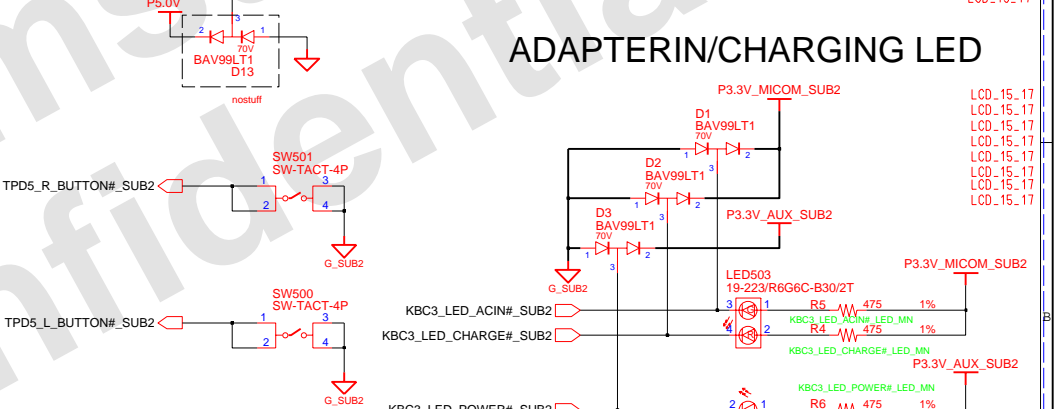
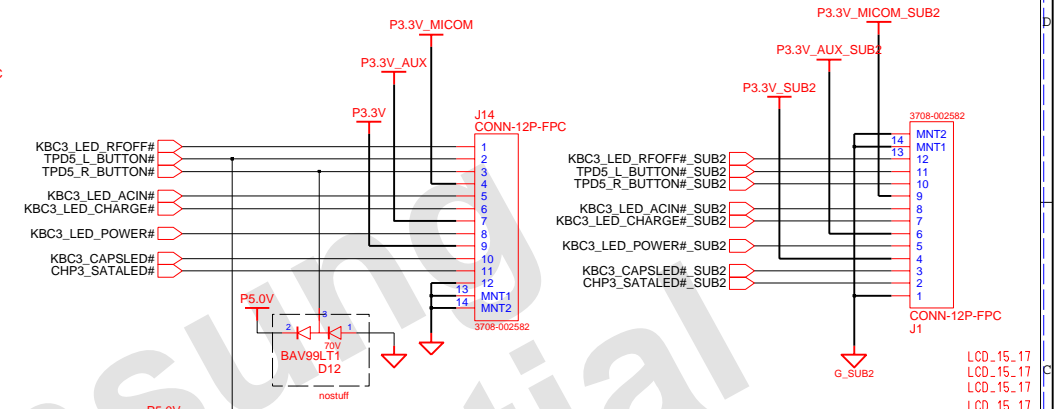
DESIGN	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	ADV	AU 6437	AU 6437	
APPROVAL	BL LEE	REV	rev. 0.3		AU 6437	PART NO. BA41-01XXA
MODULE CODE		LAST EDIT		January 18, 2011 08:10:20 AM	PAGE	46 OF 48

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TOUCHPAD



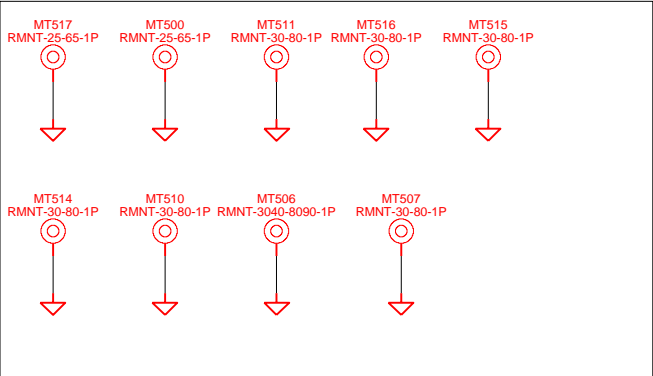
15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



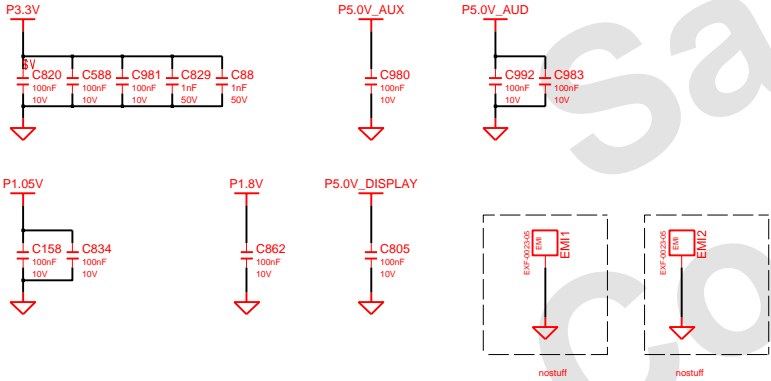
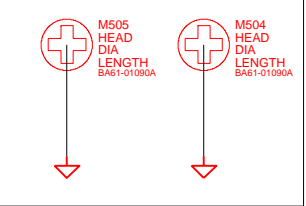
DRAW	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	ADV	Touchpad	Touchpad	
APPROVAL	BL LEE	REV	rev. 0.3			PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT			January 18, 2011 08:10:20 AM	PAGE 47 OF 48

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Mainboard Mount ((25-65)X2EA, (30-80)X7EA)



PCH Thermal



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DESIGN	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	ADV	MNT hole		
APPROVAL	BL LEE	REV	rev. 0.3	MNT hole		PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT	January 18, 2011 08:10:20 AM	PAGE	48	OF 48