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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 : BA41-01XXXXA (GCE)  
                   BA41-01XXXXA (NY)  
                   BA41-01XXXXA (HAN)  
                   BA41-01XXXXA (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>

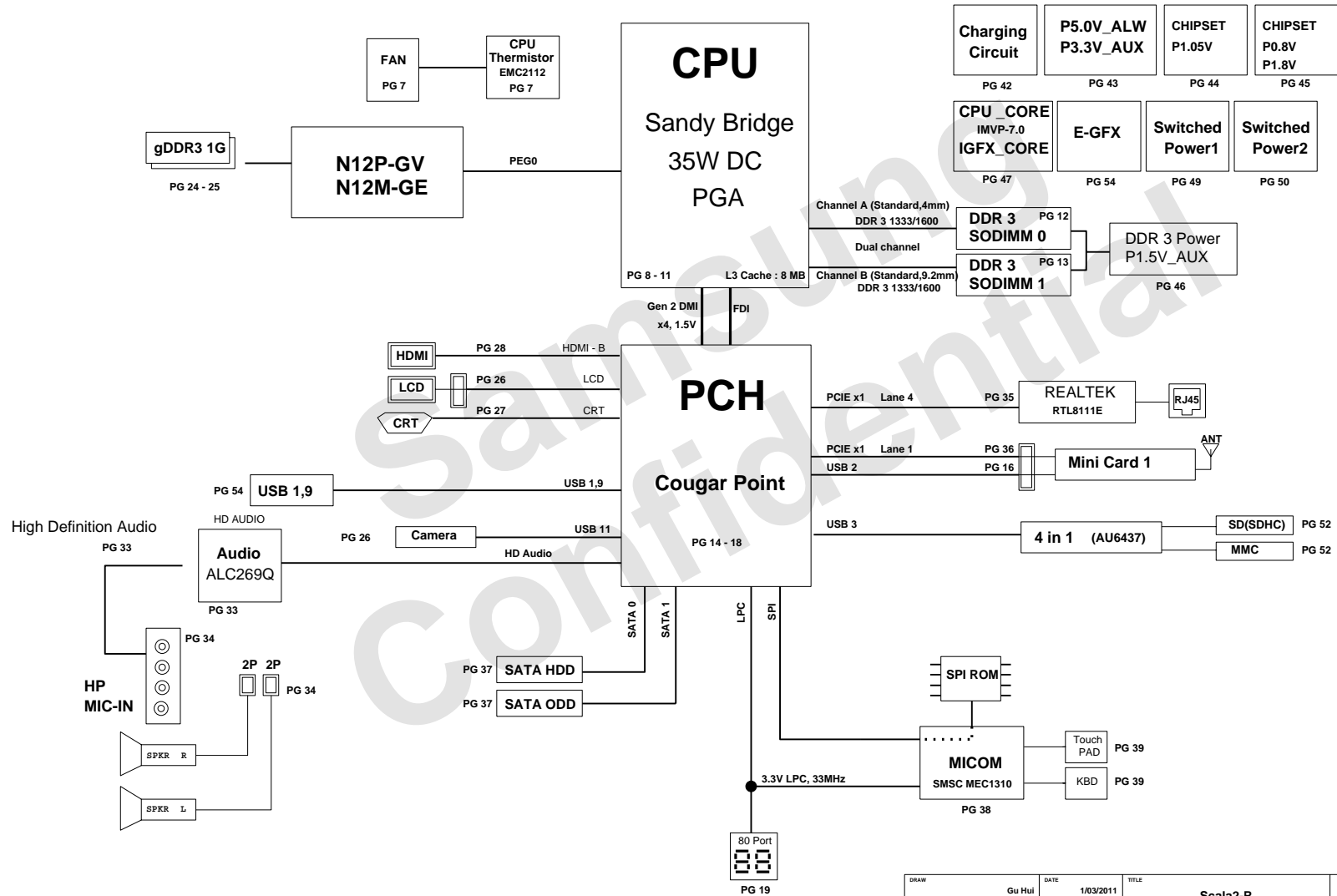
Owner : SRDC PD3

Signature : *GUHUI*

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sheet18 : 80 port	sheet42 : Power - EGFx_CORE
sheet19 : N12P-GV	sheet43 : Power - Switched Power 1
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	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01XXXXA
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		

# BLOCK DIAGRAM



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MAIN	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	<b>S4 - S5</b>
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)	<b>S3</b>
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)	<b>S0</b>
VCC_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT	<b>S0</b>
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		

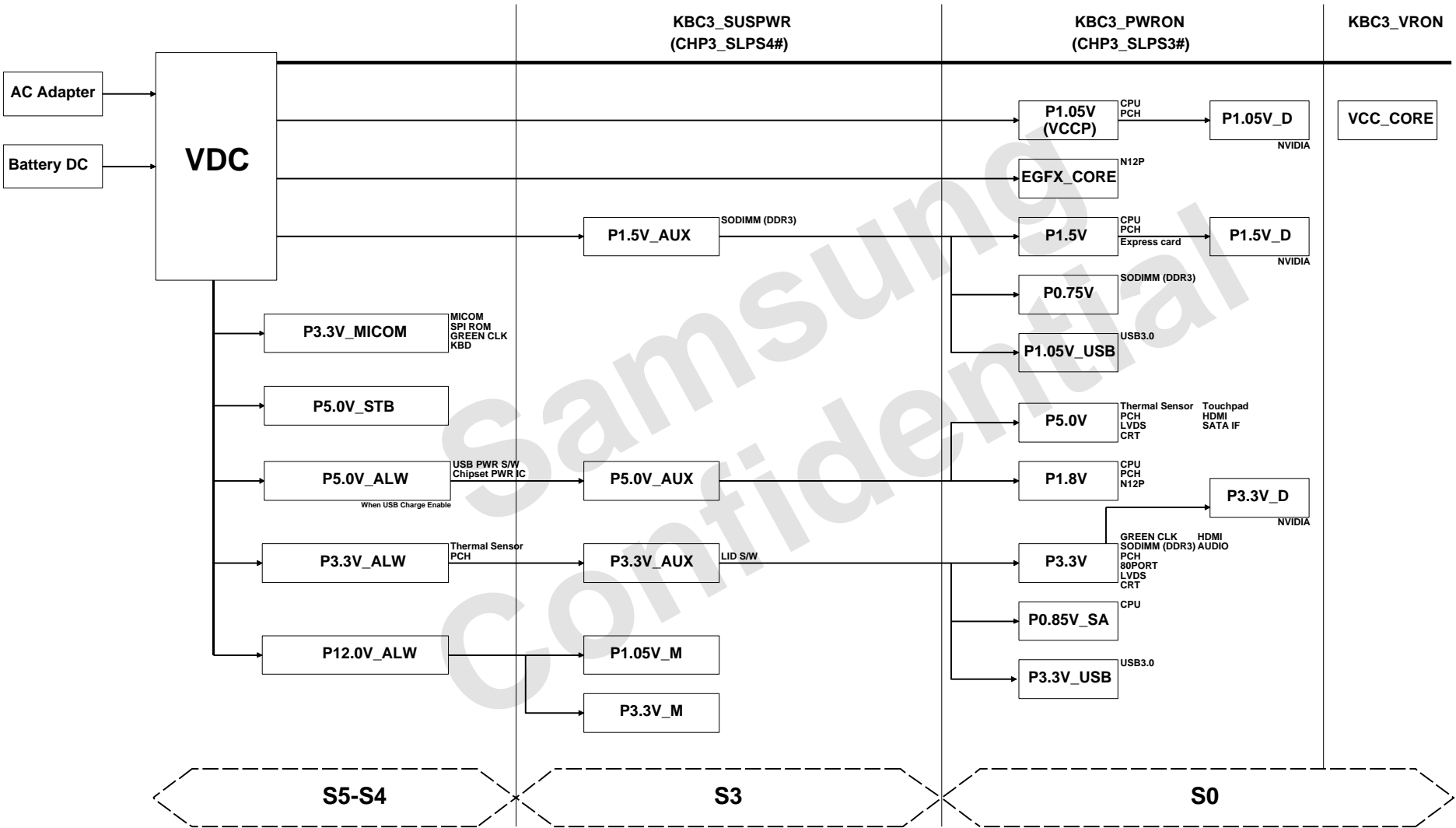
I <sup>2</sup> C / SMB Address			
Devices	Address	Hex	Bus
HM65	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	-
SODIMM0	1010 000x	A0h	Thermal Sensor
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
Thermal Sensor on board	1101 100x	98h	-
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	<b>Scala2-R MAIN BOARD INFO</b>	<b>SAMSUNG ELECTRONICS</b>
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PART NO. BA41-01XXA		
				PAGE	3	OF 48

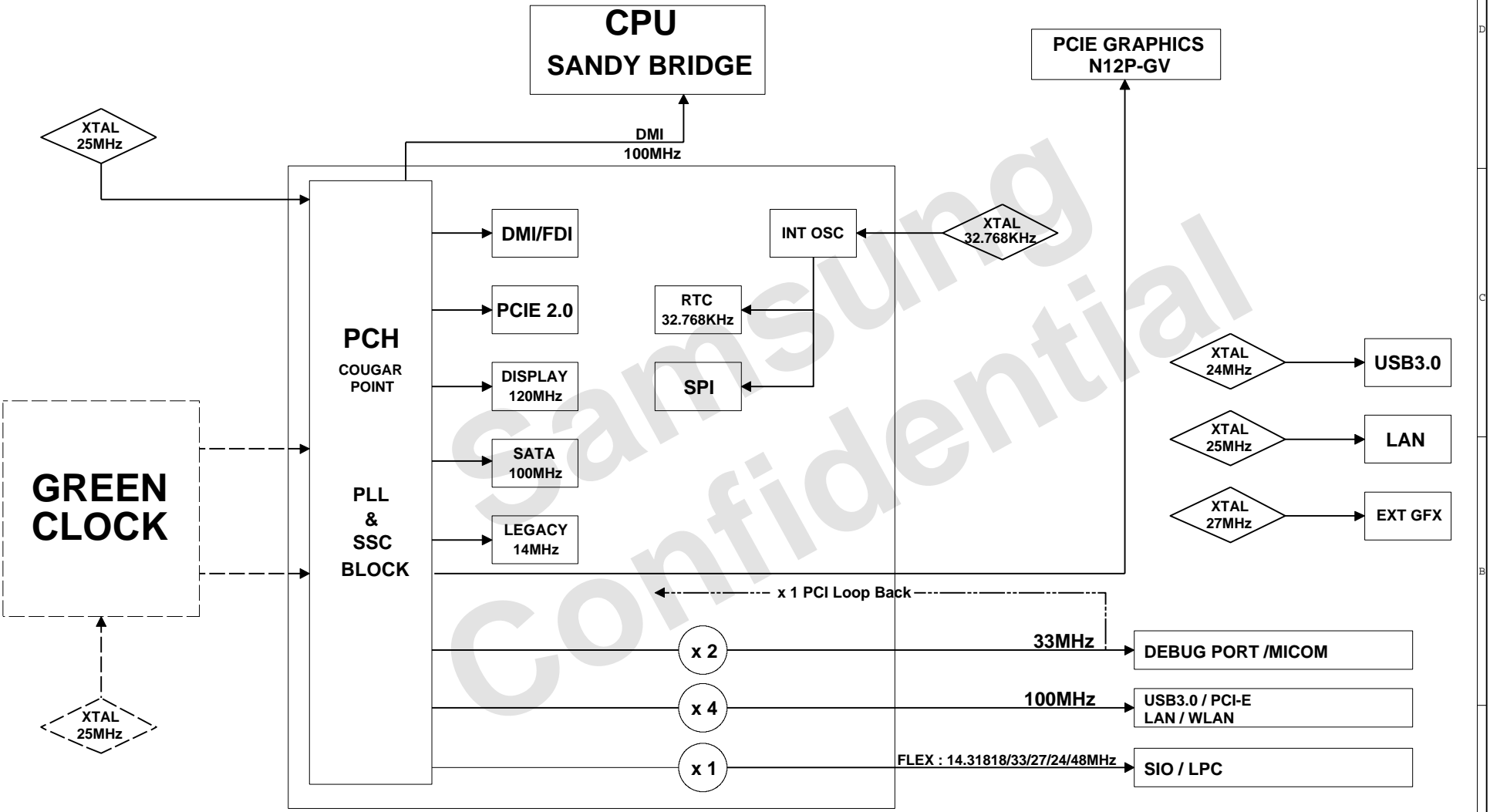
# POWER DIAGRAM

Rev 0.8



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> 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

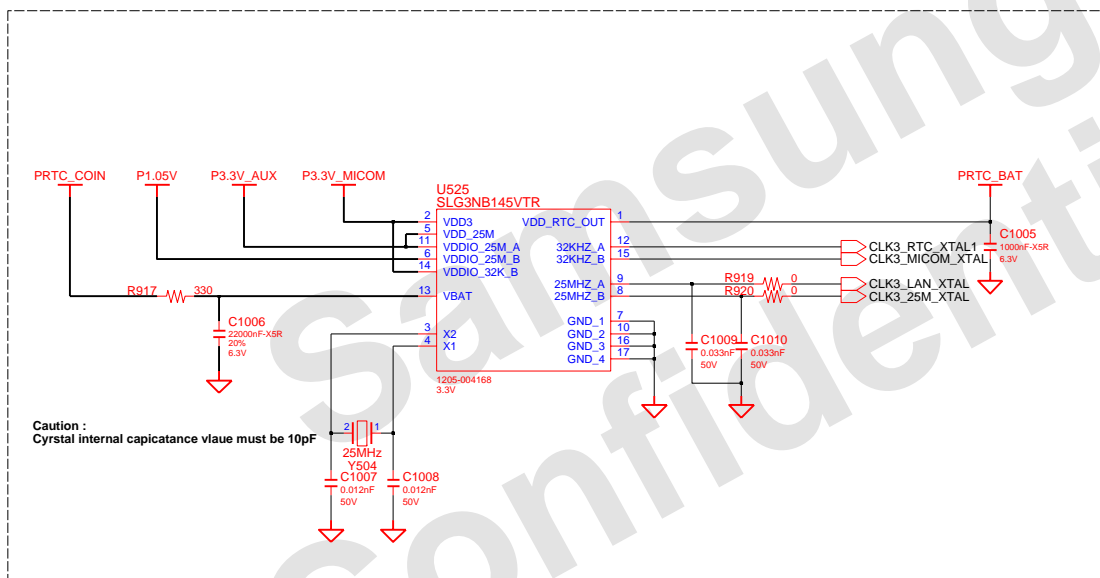
**CLOCK DISTRIBUTION** Rev. 0.8



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

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## CLOCK DISTRIBUTOR

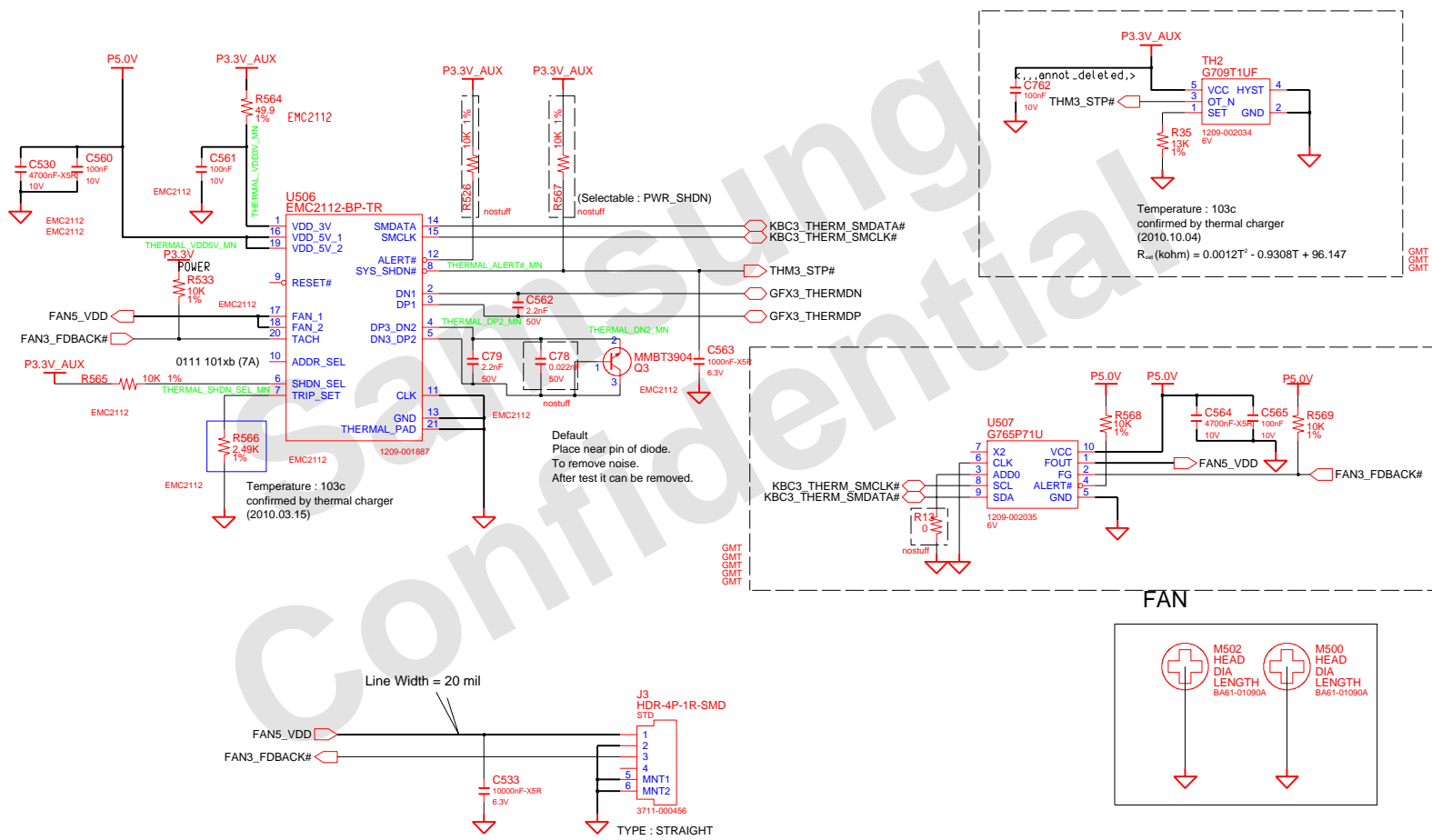


Caution :  
 Crystal internal capacitance value must be 10pF

GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK  
 GREENCLK

ENGINEER	DATE	TITLE	<b>SAMSUNG</b> ELECTRONICS
DESIGNED BY	short_date	SCALA2-R_PV_MAIN	
	DEV. STEP	FDR1	PART NO. BA41-XXXXXX
CHANGED BY	REV	1.0	
PG. CHK	LAST EDIT	last_edit	PAGE 6 OF XX

# THERMAL SENSOR & FAN CONTROL

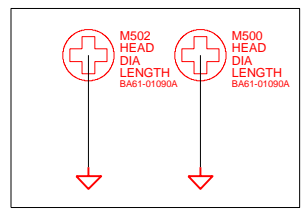


ADDRESS_SEL MODE	
0	0101 111xb
✓ HIGH Z	0111 101xb (7A)
1	0101 110xb

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

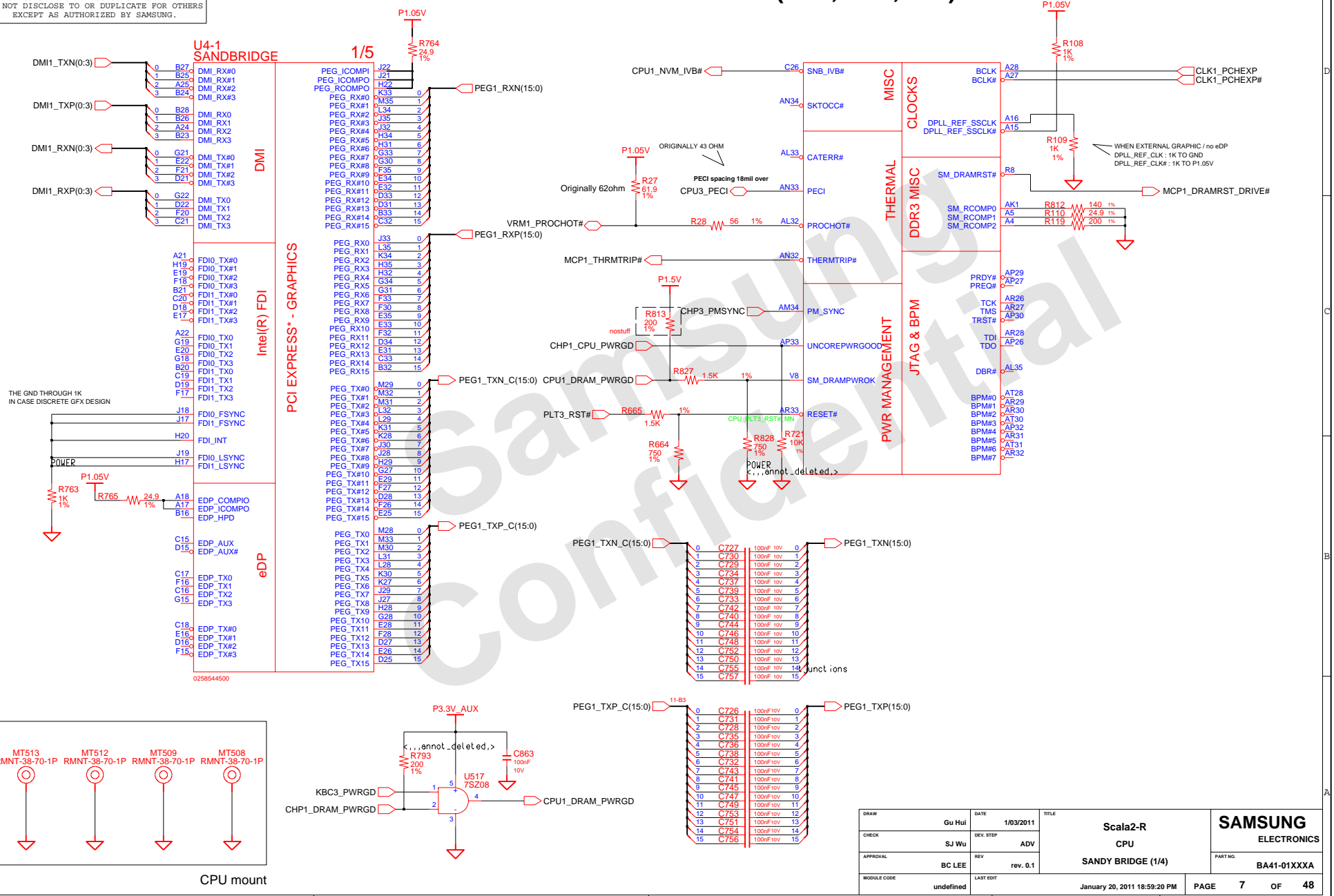
Confidential



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)

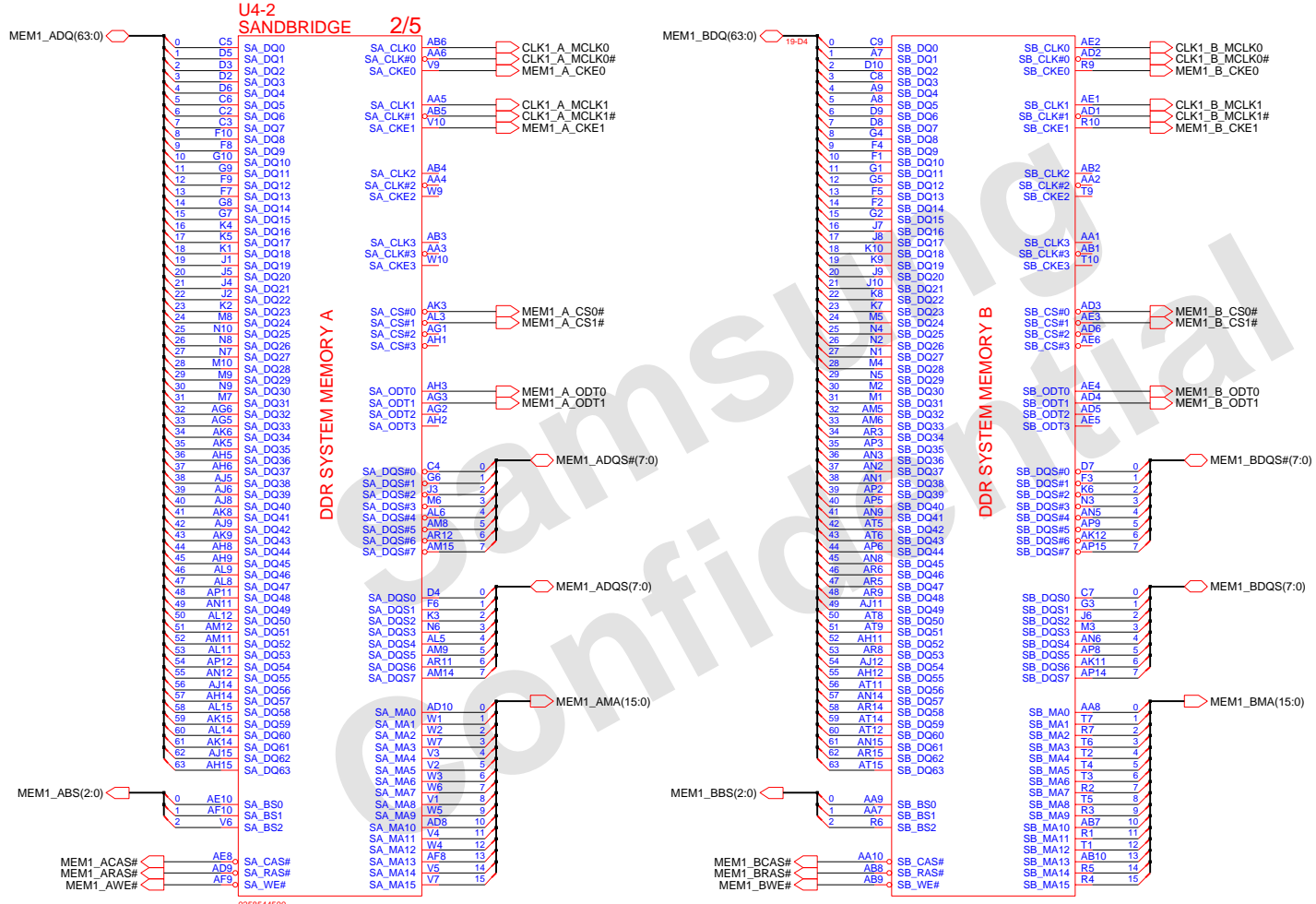


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV		CPU
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (1/4)
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	7 OF 48

<b>SAMSUNG</b>	
ELECTRONICS	
PART NO.	BA41-01XXXX

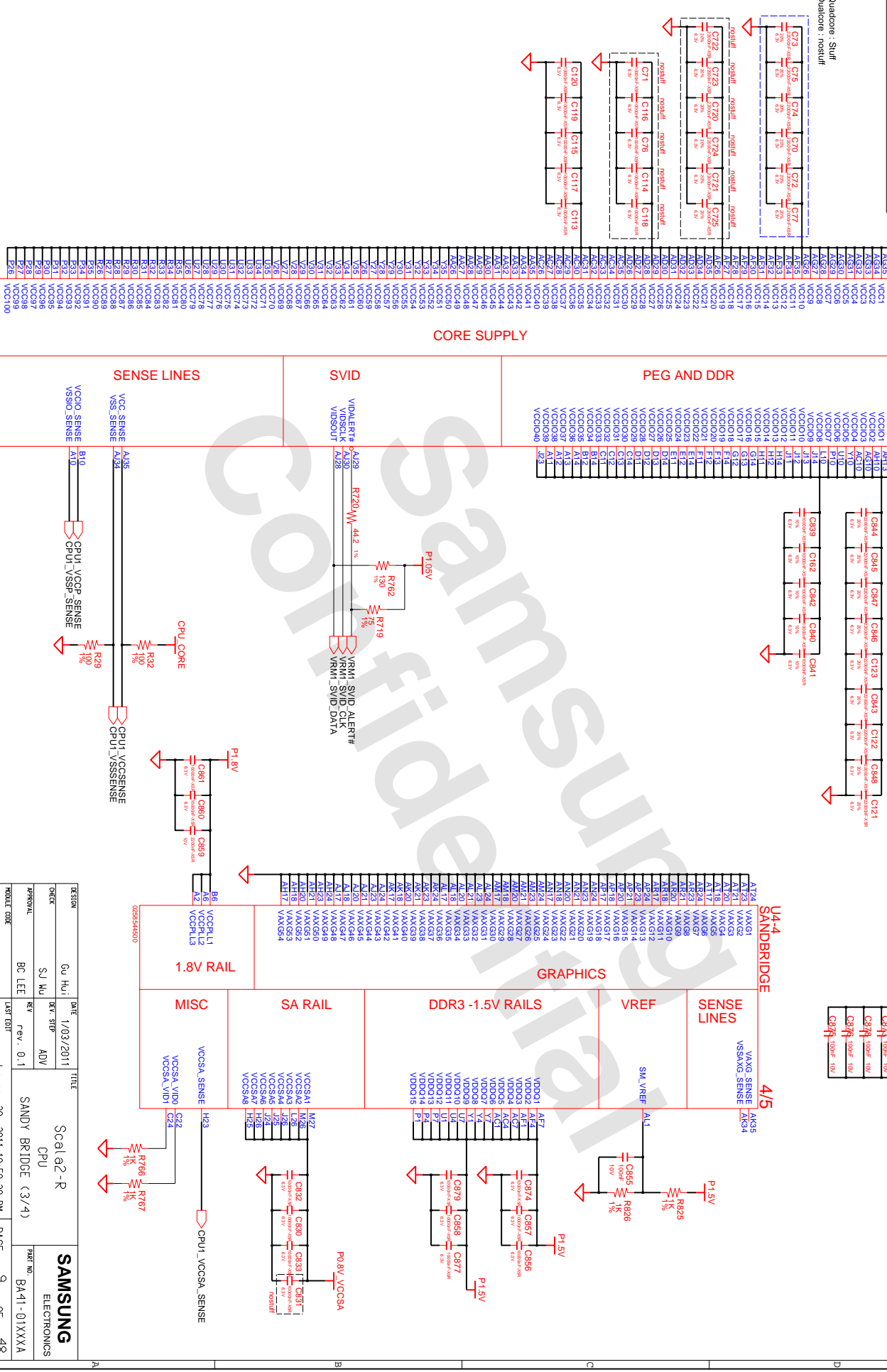


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DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	CPU	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	SANDY BRIDGE (2/4)	BA41-01XXXX	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	8	OF 48

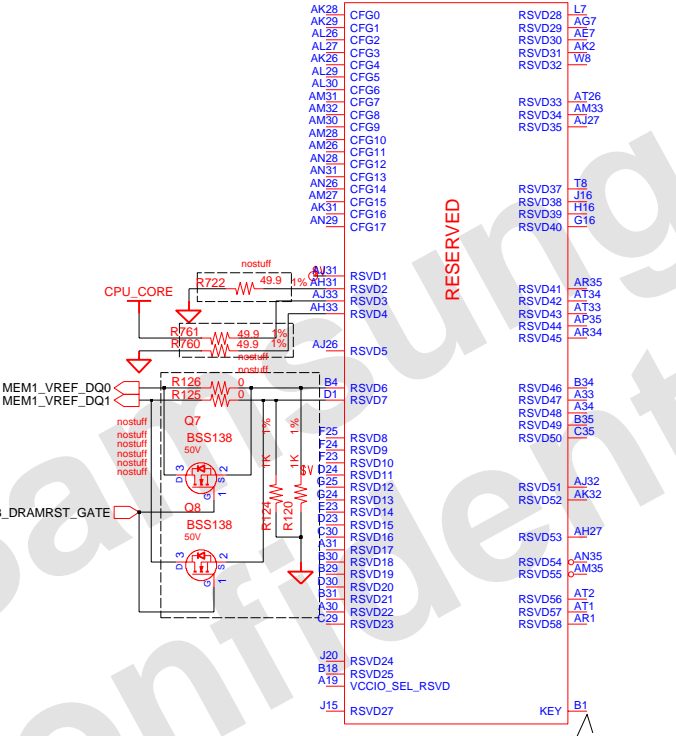


DESIGN	Gu Hu.	DATE	1/03/2011	TITLE	Soc1 g2-R
CHECK	SJ MU	REV. STPB	ADV	CPU	SANDY BRIDGE (3/4)
APPROVAL	BC LEE	REV.	Rev. 0.1		
MODULE CODE		DATE EDIT	January 20, 2011 18:59:20 PM	PAGE	9 OF 48

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**U4-5  
 SANDBRIDGE 5/5**

AT35	VSS1	VSS81	AJ22	T35	VSS161	VSS234	F22
AT32	VSS2	VSS82	AJ19	T34	VSS162	VSS235	F19
AT29	VSS3	VSS83	AJ16	T33	VSS163	VSS236	E30
AT27	VSS4	VSS84	AJ13	T32	VSS164	VSS237	E27
AT25	VSS5	VSS85	AJ10	T31	VSS165	VSS238	E24
AT22	VSS6	VSS86	AJ7	T30	VSS166	VSS239	E21
AT19	VSS7	VSS87	AJ4	T29	VSS167	VSS240	E18
AT16	VSS8	VSS88	AJ1	T28	VSS168	VSS241	E15
AT13	VSS9	VSS89	AJ2	T27	VSS169	VSS242	E13
AT10	VSS10	VSS90	AJ5	T26	VSS170	VSS243	E9
AT7	VSS11	VSS91	AH35	T25	VSS171	VSS244	E13
AT4	VSS12	VSS92	AH34	P8	VSS172	VSS245	E8
AT3	VSS13	VSS93	AH32	P6	VSS173	VSS246	E7
AR25	VSS14	VSS94	AH30	P5	VSS174	VSS247	E6
AR22	VSS15	VSS95	AH29	P3	VSS175	VSS248	E5
AR19	VSS16	VSS96	AH28	P2	VSS176	VSS249	E4
AR16	VSS17	VSS97	AH26	N35	VSS177	VSS250	E3
AR13	VSS18	VSS98	AH25	N34	VSS178	VSS251	E2
AR10	VSS19	VSS99	AH22	N33	VSS179	VSS252	E1
AR7	VSS20	VSS100	AH19	N32	VSS179	VSS252	D35
AR4	VSS21	VSS101	AH16	N31	VSS181	VSS254	D32
AK2	VSS22	VSS102	AH7	N30	VSS182	VSS255	D28
AP34	VSS23	VSS103	AH6	N29	VSS182	VSS255	D26
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	C31
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	AH6	N29	VSS198	VSS271	B11
AN16	VSS39	VSS119	AE27	K35	VSS199	VSS272	B11
AN13	VSS40	VSS120	AE26	K32	VSS200	VSS273	B9
AN10	VSS41	VSS121	AE25	K29	VSS201	VSS274	B8
AN7	VSS42	VSS122	AD7	K26	VSS201	VSS274	B7
AN4	VSS43	VSS123	AE24	J34	VSS202	VSS275	B5
AM39	VSS44	VSS124	AC8	J31	VSS204	VSS277	B3
AM35	VSS45	VSS125	AC6	H30	VSS205	VSS278	B2
AM22	VSS46	VSS126	AC3	H27	VSS206	VSS279	A35
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	G26	VSS225		
AL2	VSS66	VSS146	W34	G26	VSS226		
AK33	VSS67	VSS147	W33	G23	VSS227		
AK30	VSS68	VSS148	W32	G20	VSS228		
AK27	VSS69	VSS149	W31	G17	VSS228		
AK25	VSS70	VSS150	W30	G11	VSS230		
AK22	VSS71	VSS151	W29	F34	VSS231		
AK19	VSS72	VSS152	W28	F31	VSS231		
AK16	VSS73	VSS153	W27	F29	VSS232		
AK13	VSS74	VSS154	W26	F29	VSS232		
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 XRESETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

FOR RPGA SOCKET  
 R5VD59 PIN SHOULD BE LEFT NC

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> 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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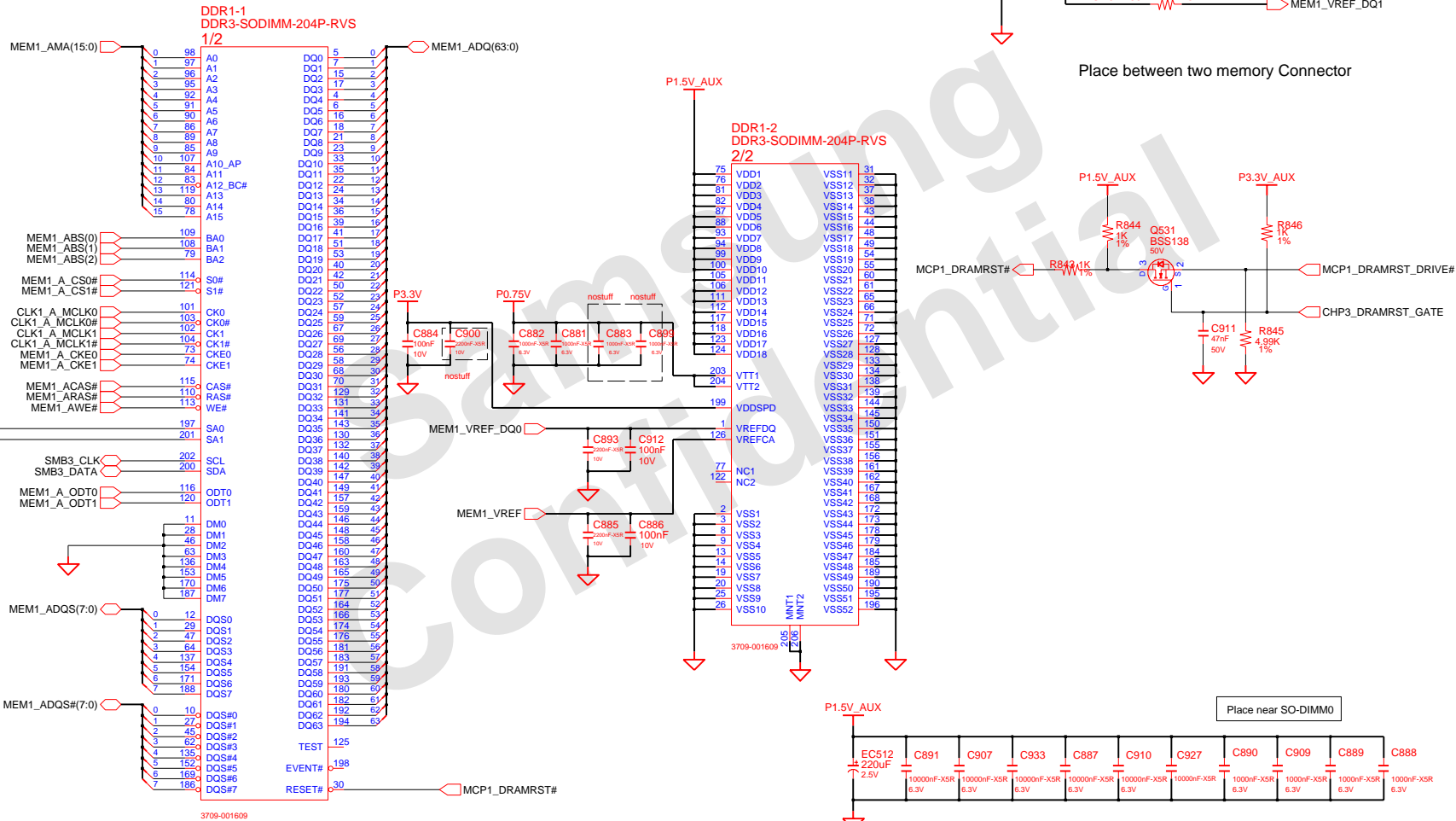
## SO-DIMM#0 : 2nd SO-DIMM

### 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	<b>SAMSUNG</b> 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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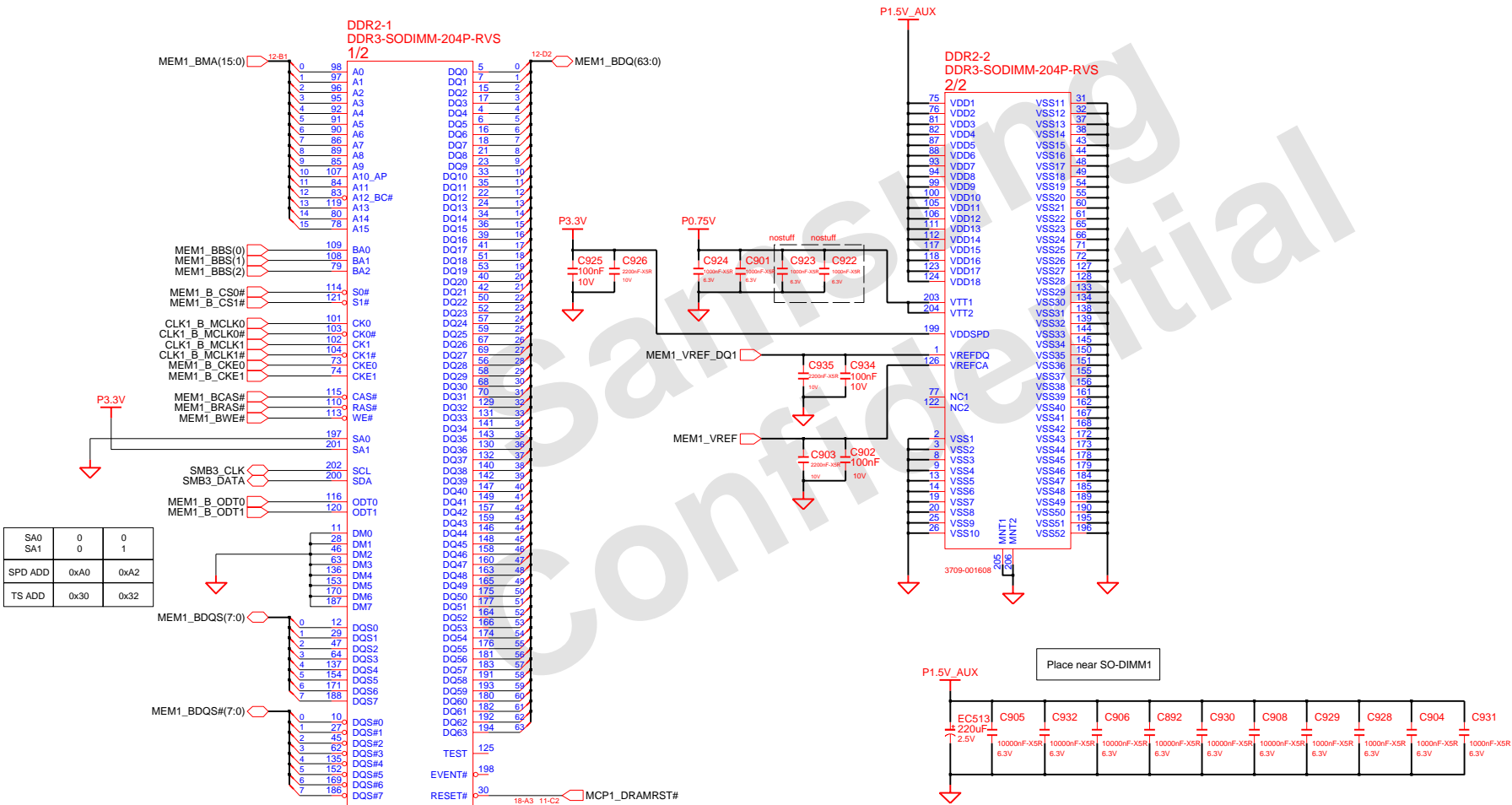
## SO-DIMM#1 : 1st SO-DIMM

### DDR SO-DIMM #1

Height : 4 mm (REVERSE)

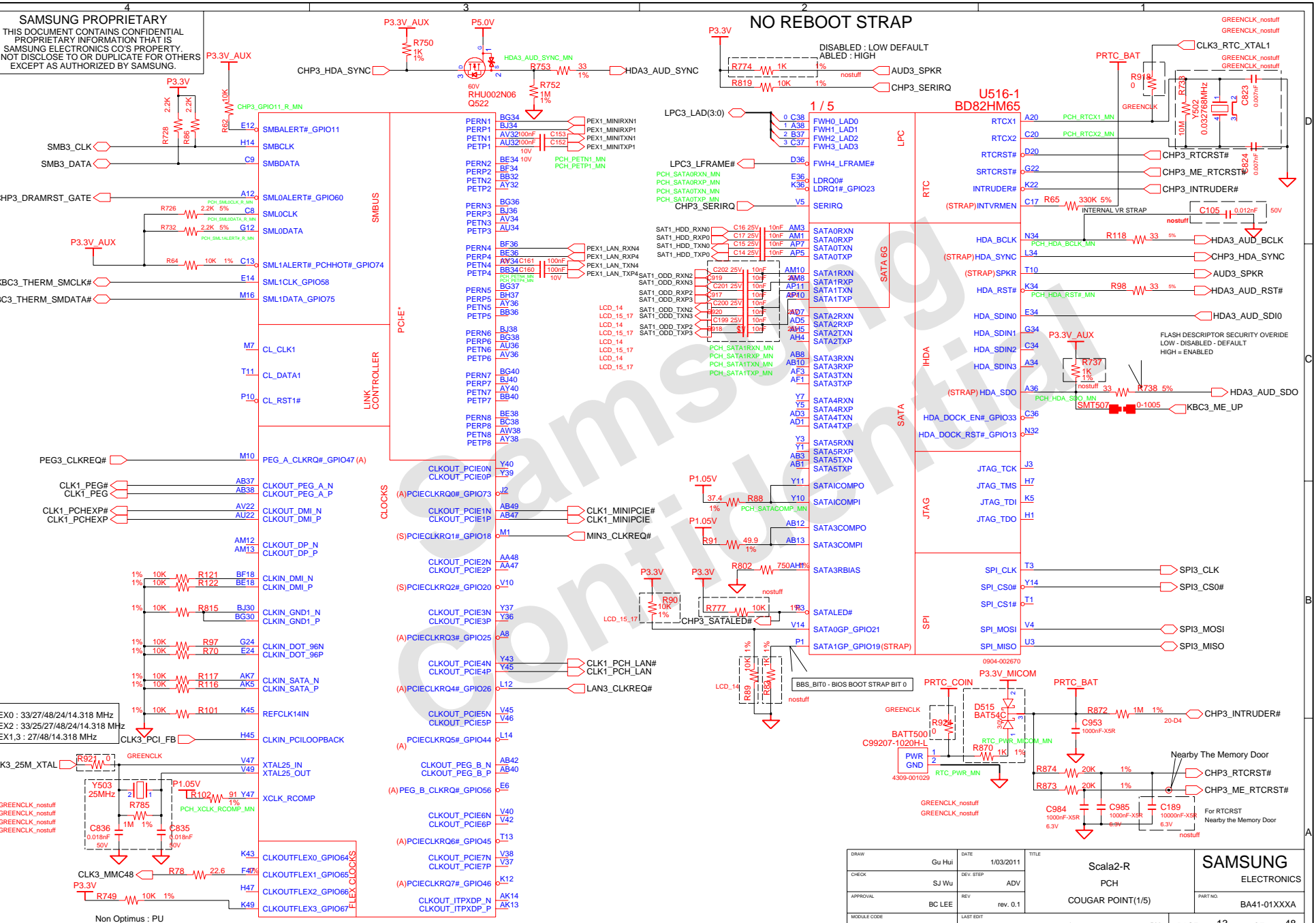
P/N : 3709-001608 (CONCRAFT)

P/N : 3709-001654 (Foxconn)



Drawn	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R SODIMM B	SAMSUNG ELECTRONICS
Check	SJ Wu	DEV. STEP	ADV			
Approval	BC LEE	REV	rev. 0.1		DDR3	PART NO. BA41-01XXXX
Module Code		LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE	12 OF 48

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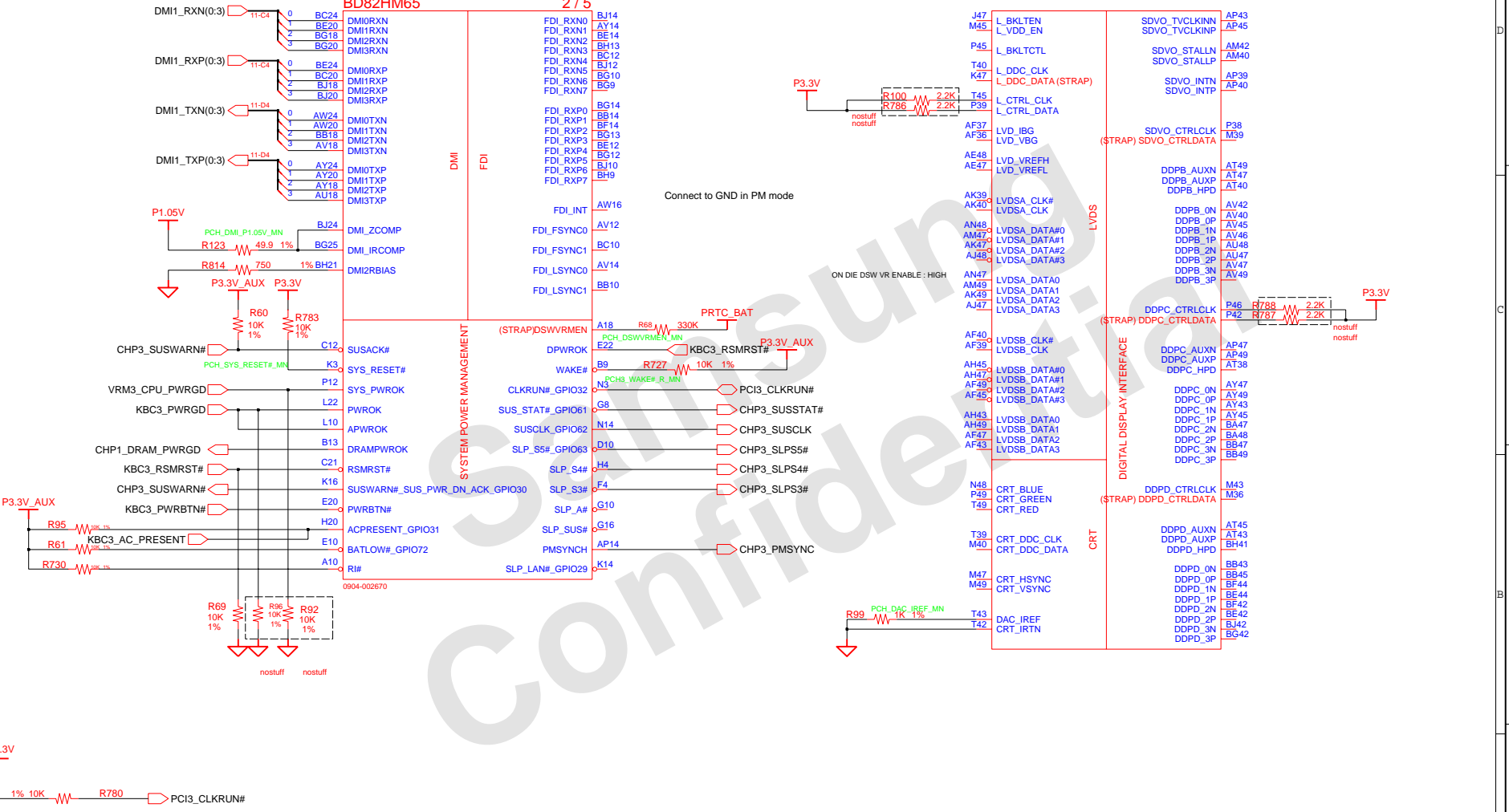


DRAW: Gu Hui CHECK: SJ Wu APPROVAL: BC LEE MODULE CODE:	DATE: 1/03/2011 DEV. STEP: ADV REV: rev. 0.1 LAST EDIT:	TITLE: Scala2-R PCH COUGAR POINT(1/5)	<b>SAMSUNG</b> ELECTRONICS PARTNO: BA41-01XXXX
Non Optimus : PU Optimus : PD		January 20, 2011 18:59:20 PM	PAGE 13 OF 48

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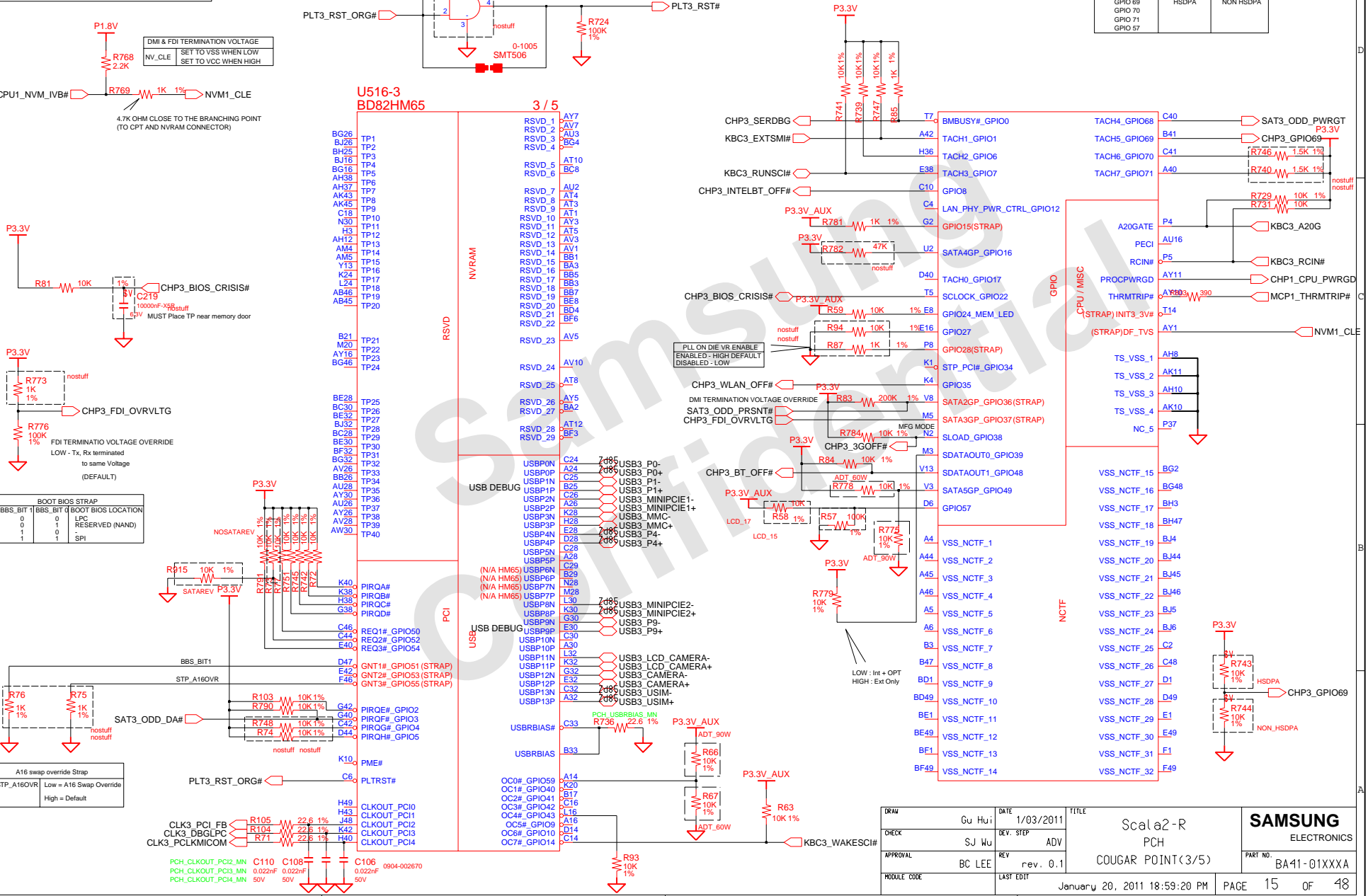
DDI PORT B DETECT	
SDVO_CTRL_DATA	1 PORT B DETECTED 0 PORT B NOT DETECTED

**U516-2  
BD82HM65**



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> 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		

DMI & FDI TERMINATION VOLTAGE  
NV\_CLE SET TO VSS WHEN LOW  
SET TO VCC WHEN HIGH

CPU1\_NVM\_IVB# R769 1K 1% NVM1\_CLE  
4.7K OHM CLOSE TO THE BRANCHING POINT  
(TO CPT AND NVRAM CONNECTOR)

CHP3\_BIOS\_CRISIS#  
1000nF-XB69  
15V MUST Place TP near memory door

CHP3\_FDI\_OVRVLTG  
FDI TERMINATIO VOLTAGE OVERRIDE  
LOW - Tx, Rx terminated  
to same Voltage  
(DEFAULT)

BOOT BIOS STRAP		
BBS_BIT 0	BBS_BIT 1	BOOT BIOS LOCATION
0	0	LPC
0	1	RESERVED (NAND)
1	0	SPI

SATAREV P3.3V  
R915 10K 1%  
R724 10K 1%  
R725 10K 1%  
R726 10K 1%  
R727 10K 1%  
R728 10K 1%  
R729 10K 1%  
R730 10K 1%  
R731 10K 1%  
R732 10K 1%  
R733 10K 1%  
R734 10K 1%  
R735 10K 1%  
R736 10K 1%  
R737 10K 1%  
R738 10K 1%  
R739 10K 1%  
R740 10K 1%  
R741 10K 1%  
R742 10K 1%  
R743 10K 1%  
R744 10K 1%

SAT3\_ODD\_DA# R76 1K 1% R75 1K 1%  
A16 swap override Strap  
TP\_A16OVR Low = A16 Swap Override  
High = Default

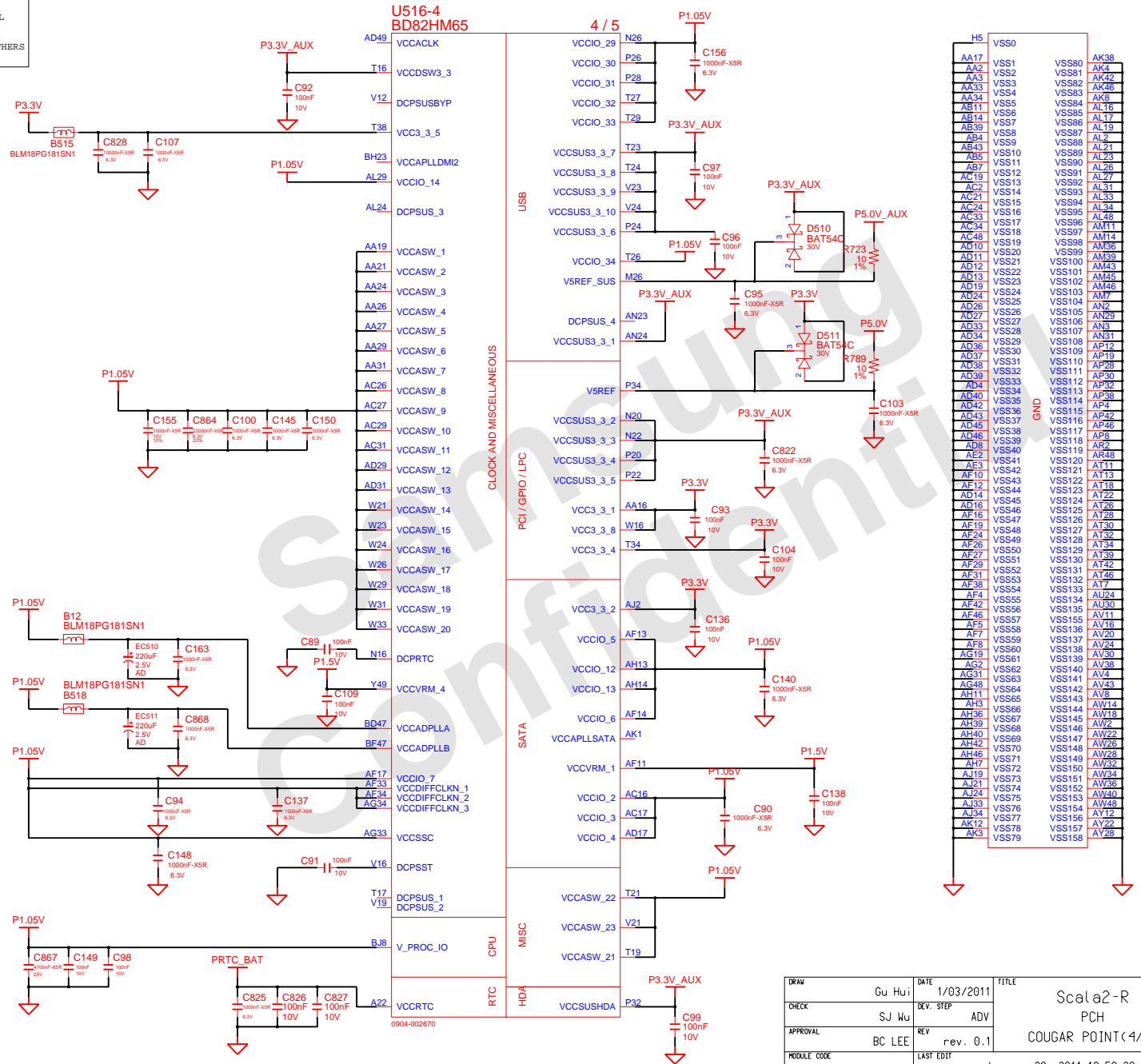
CLK3\_PCI\_FB R105 22.6 1%  
CLK3\_DBG\_LPC R104 22.6 1%  
CLK3\_PCLKMCOM R71 22.6 1%

PCH\_CLKOUT\_P02\_MIN C110 0.022nF  
PCH\_CLKOUT\_P03\_MIN C108 0.022nF  
PCH\_CLKOUT\_P04\_MIN C106 0.022nF

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

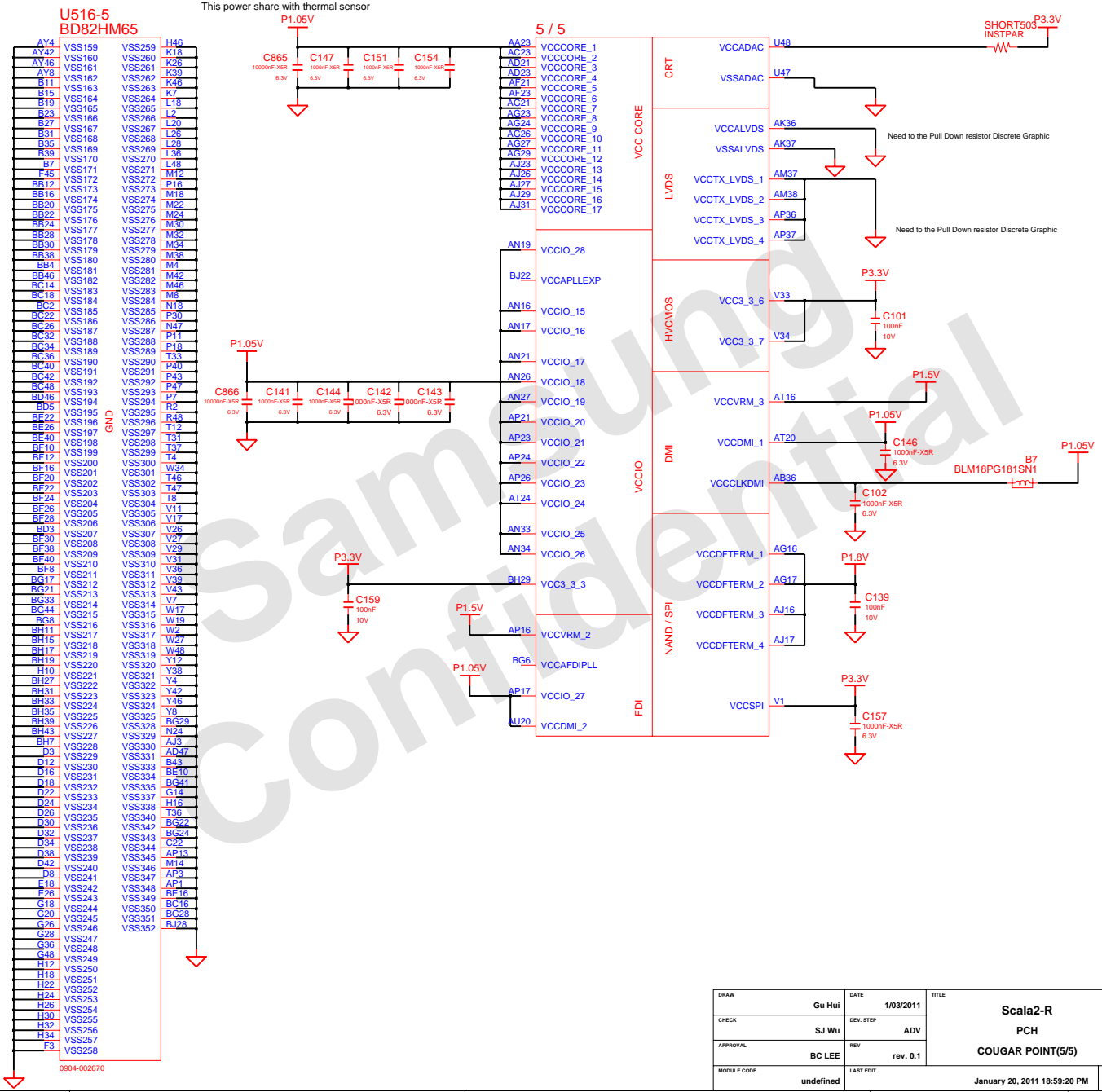


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DRAW	Gu Hu	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(4/5)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM		PAGE 16	OF 60

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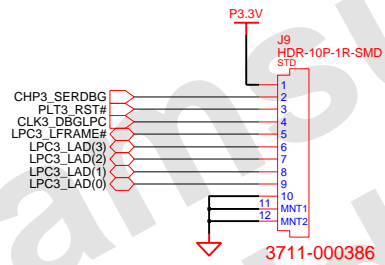
**U516-5 BD82HM65**

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
B49	VSS172	VSS272	M12
BB12	VSS173	VSS273	M18
BB16	VSS174	VSS274	M22
BB20	VSS175	VSS275	M28
BB24	VSS176	VSS276	M30
BB28	VSS177	VSS277	M32
BB30	VSS178	VSS278	M34
BB38	VSS179	VSS279	M38
BB4	VSS180	VSS280	M4
BB46	VSS181	VSS281	M42
BC14	VSS182	VSS282	M46
BC18	VSS183	VSS283	M8
BC22	VSS184	VSS284	N18
BC26	VSS185	VSS285	N40
BC32	VSS186	VSS286	N47
BC34	VSS187	VSS287	P18
BC38	VSS188	VSS288	P18
BC42	VSS189	VSS289	P43
BC48	VSS190	VSS290	P40
BD46	VSS191	VSS291	P43
BE22	VSS192	VSS292	R2
BE26	VSS193	VSS293	R47
BE30	VSS194	VSS294	R2
BE34	VSS195	VSS295	R48
BE38	VSS196	VSS296	T12
BE40	VSS197	VSS297	T12
BF10	VSS198	VSS298	T37
BF12	VSS199	VSS299	T4
BF16	VSS200	VSS300	W34
BF20	VSS201	VSS301	T47
BF22	VSS202	VSS302	T47
BF24	VSS203	VSS303	T8
BF26	VSS204	VSS304	V11
BF28	VSS205	VSS305	V17
BF30	VSS206	VSS306	V17
BF34	VSS207	VSS307	V26
BF38	VSS208	VSS308	V27
BF40	VSS209	VSS309	V29
BF8	VSS210	VSS310	V31
BG17	VSS211	VSS311	V36
BG27	VSS212	VSS312	V43
BG33	VSS213	VSS313	V7
BG44	VSS214	VSS314	W17
BG8	VSS215	VSS315	W19
BH11	VSS216	VSS316	W19
BH15	VSS217	VSS317	W27
BH17	VSS218	VSS318	W46
BH19	VSS219	VSS319	Y38
H10	VSS220	VSS320	Y4
BH27	VSS221	VSS321	Y4
BH31	VSS222	VSS322	Y42
BH33	VSS223	VSS323	Y42
BH35	VSS224	VSS324	Y46
BH39	VSS225	VSS325	Y8
BH43	VSS226	VSS326	Y8
BH7	VSS227	VSS327	YG29
D3	VSS228	VSS328	N24
D12	VSS229	VSS329	AJ3
D16	VSS230	VSS330	AD37
D18	VSS231	VSS331	E43
D22	VSS232	VSS332	BE10
D24	VSS233	VSS333	BG41
D26	VSS234	VSS334	G14
D30	VSS235	VSS335	H18
D32	VSS236	VSS336	T36
D34	VSS237	VSS337	BG22
D38	VSS238	VSS338	BG24
D42	VSS239	VSS339	C22
D8	VSS240	VSS340	AP13
E18	VSS241	VSS341	M14
E26	VSS242	VSS342	AP3
E18	VSS243	VSS343	AP1
G20	VSS244	VSS344	BE16
G26	VSS245	VSS345	BC18
G28	VSS246	VSS346	BG28
G38	VSS247	VSS347	BJ28
G48	VSS248	VSS348	
H12	VSS249	VSS349	
H18	VSS250	VSS350	
H22	VSS251	VSS351	
H24	VSS252	VSS352	
H26	VSS253		
H30	VSS254		
H32	VSS255		
H34	VSS256		
F3	VSS257		
F3	VSS258		

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(5/5)	PART NO. BA41-01XXXX
MODULE CODE	undefined	LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 17 OF 48

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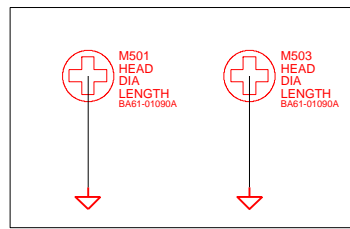
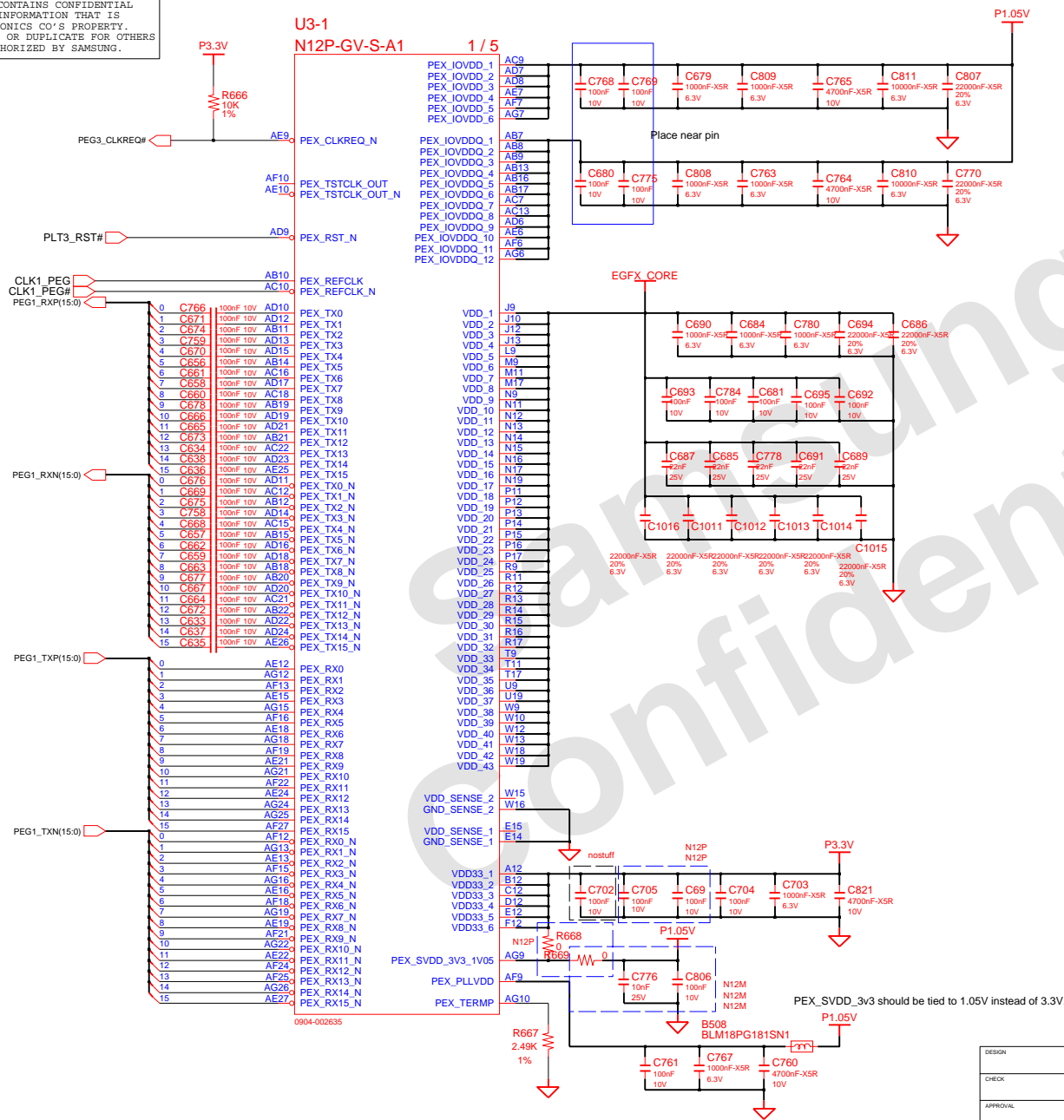
# 80H PORT DEBUG



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Confidential

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R DEBUG PORT 80H DECODER	<b>SAMSUNG</b> 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				

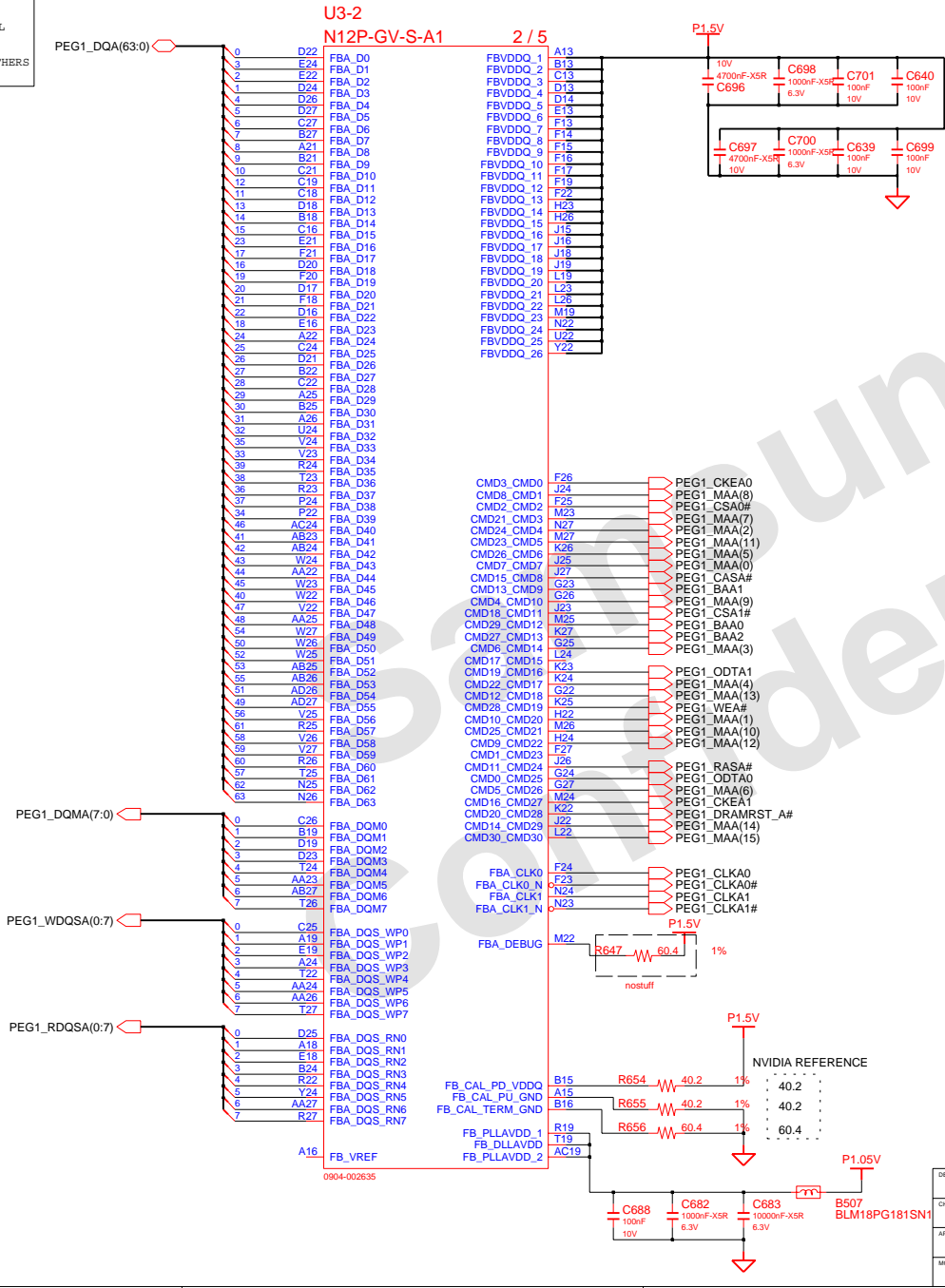
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Graphic PEM

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				PAGE 19 OF 48

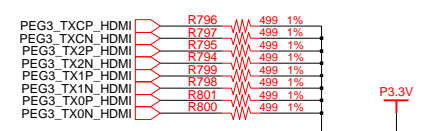
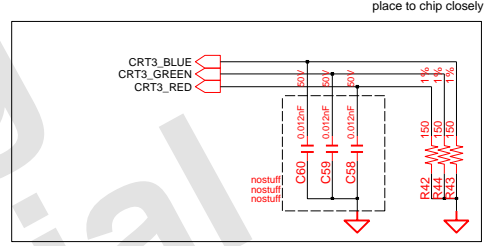
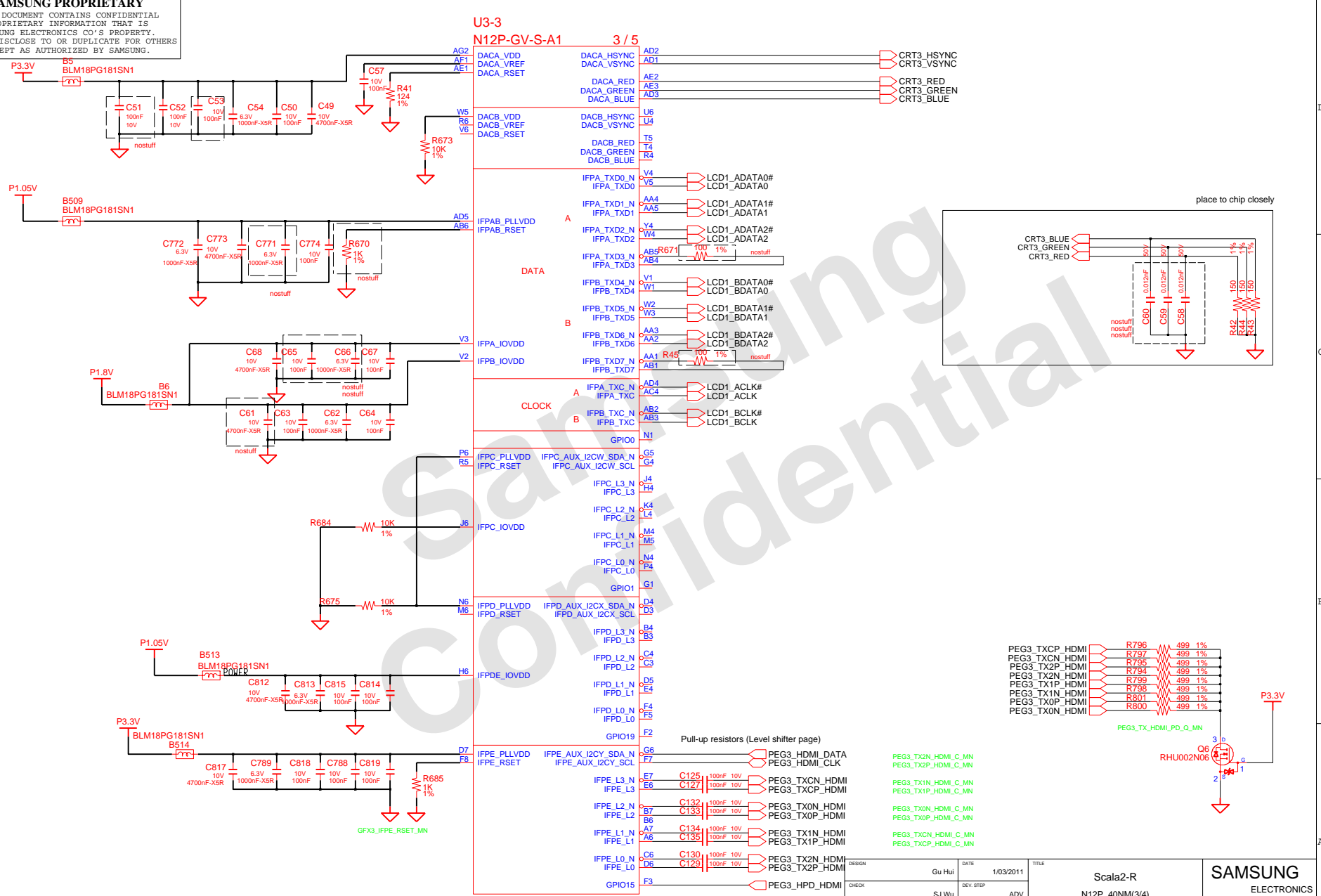
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N12M-GE : CMD MODE C  
 N12P-GV : CMD MODE E

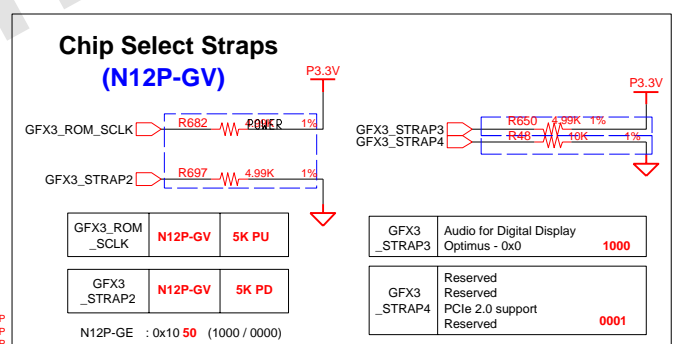
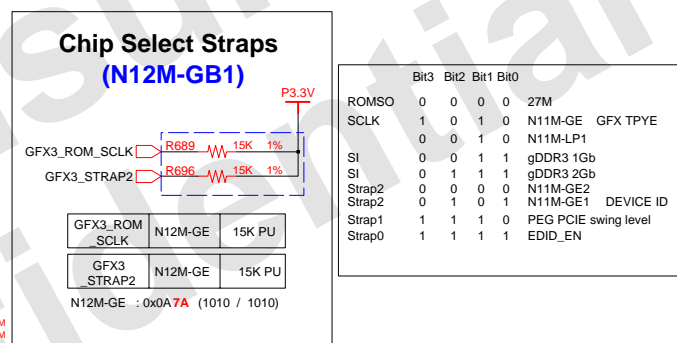
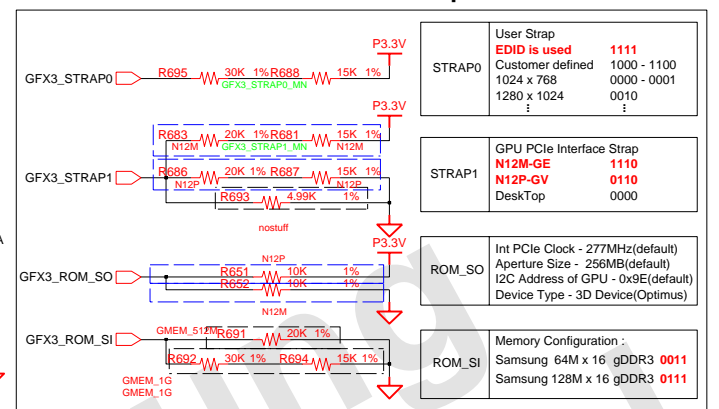
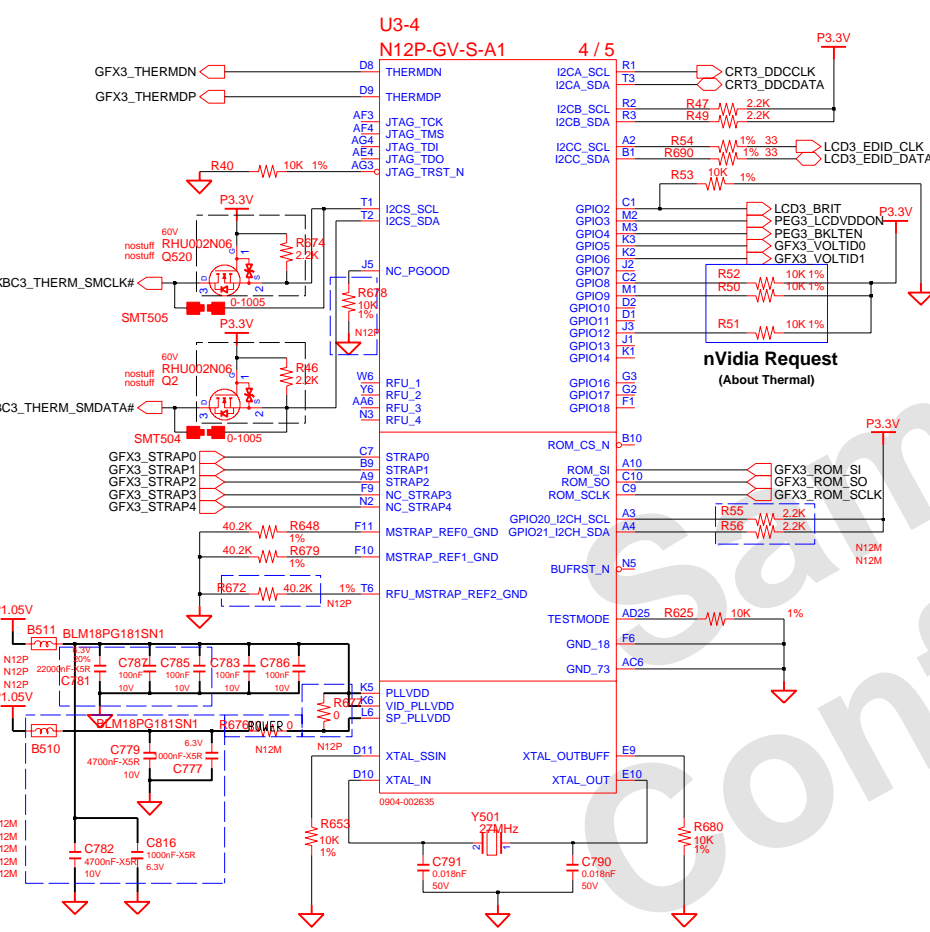
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV	N12P_40NM(2/4)	<b>SAMSUNG</b> ELECTRONICS PARTNO BA41-01XXXX
APPROVAL	BC LEE	REV	rev. 0.1	N12P_40NM(2/4)	
MODULE CODE		LAST EDIT			
January 20, 2011 18:59:20 PM PAGE 20 OF 48					

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DESIGN	DATE	TITLE	<b>SAMSUNG</b> ELECTRONICS PARTNO BA41-01XXXX PAGE 21 OF 48
Gu Hui	1/03/2011	Scala2-R	
SJ Wu	DEV_STEP	N12P_40NM(3/4)	
BC LEE	REV	N12P_40NM(3/4)	
	LAST_EDIT	January 20, 2011 18:59:20 PM	

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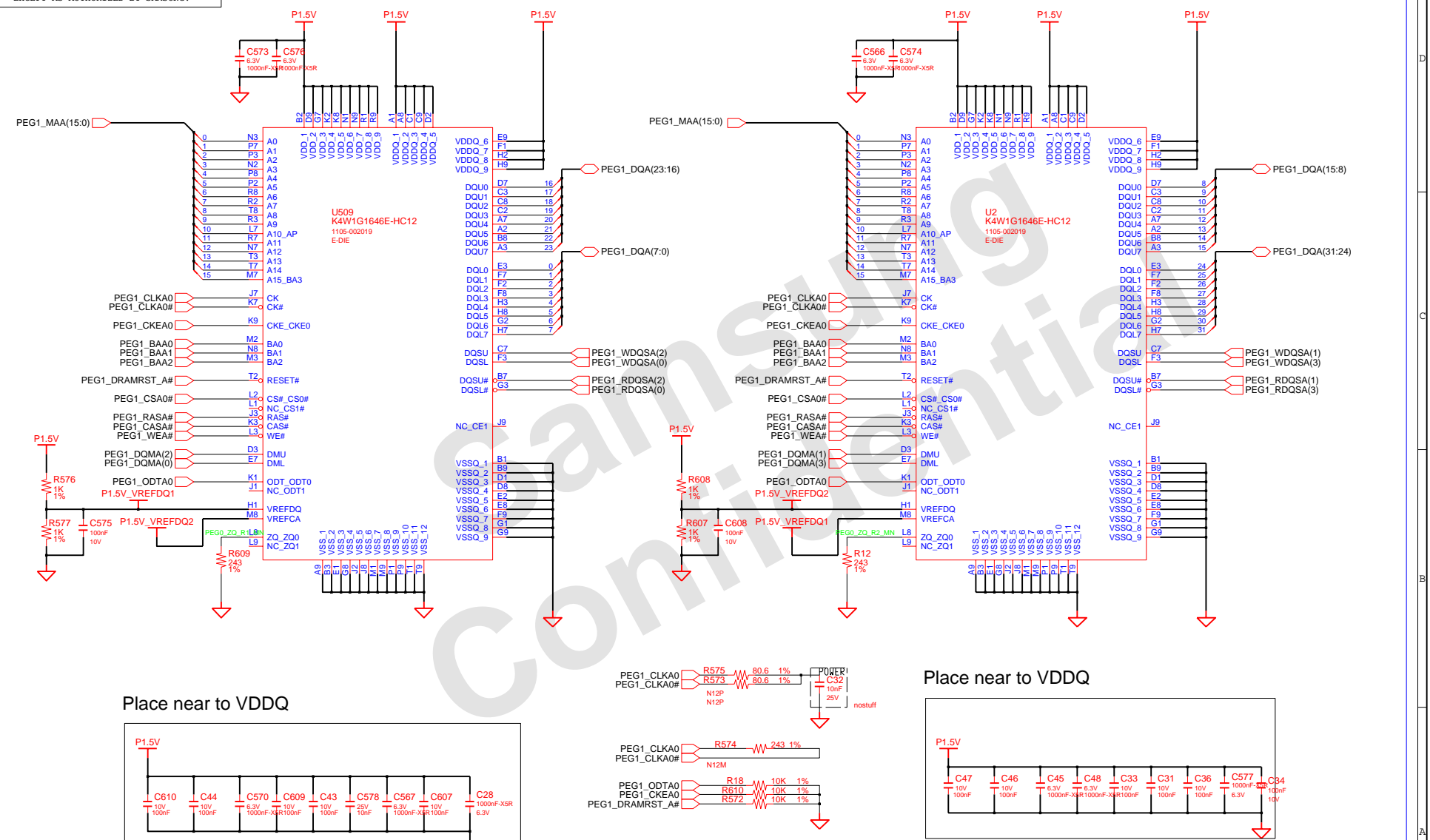
**U3-5 N12P-GV-S-A1**

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		
P26	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		
W14	GND_64		
W17	GND_65		
Y2	GND_66		
Y5	GND_67		
Y23	GND_68		
Y26	GND_69		
Y70	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		

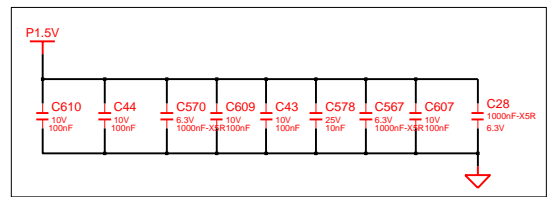
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		N12M_40NM(4/4)	
APPROVAL	BC LEE	REV	rev. 0.1		N12P_40NM(4/4)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 22 OF 48

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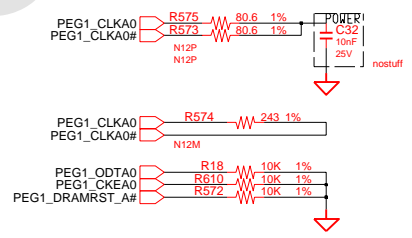
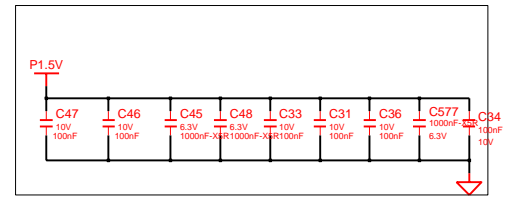
# A-Channel #0



Place near to VDDQ



Place near to VDDQ

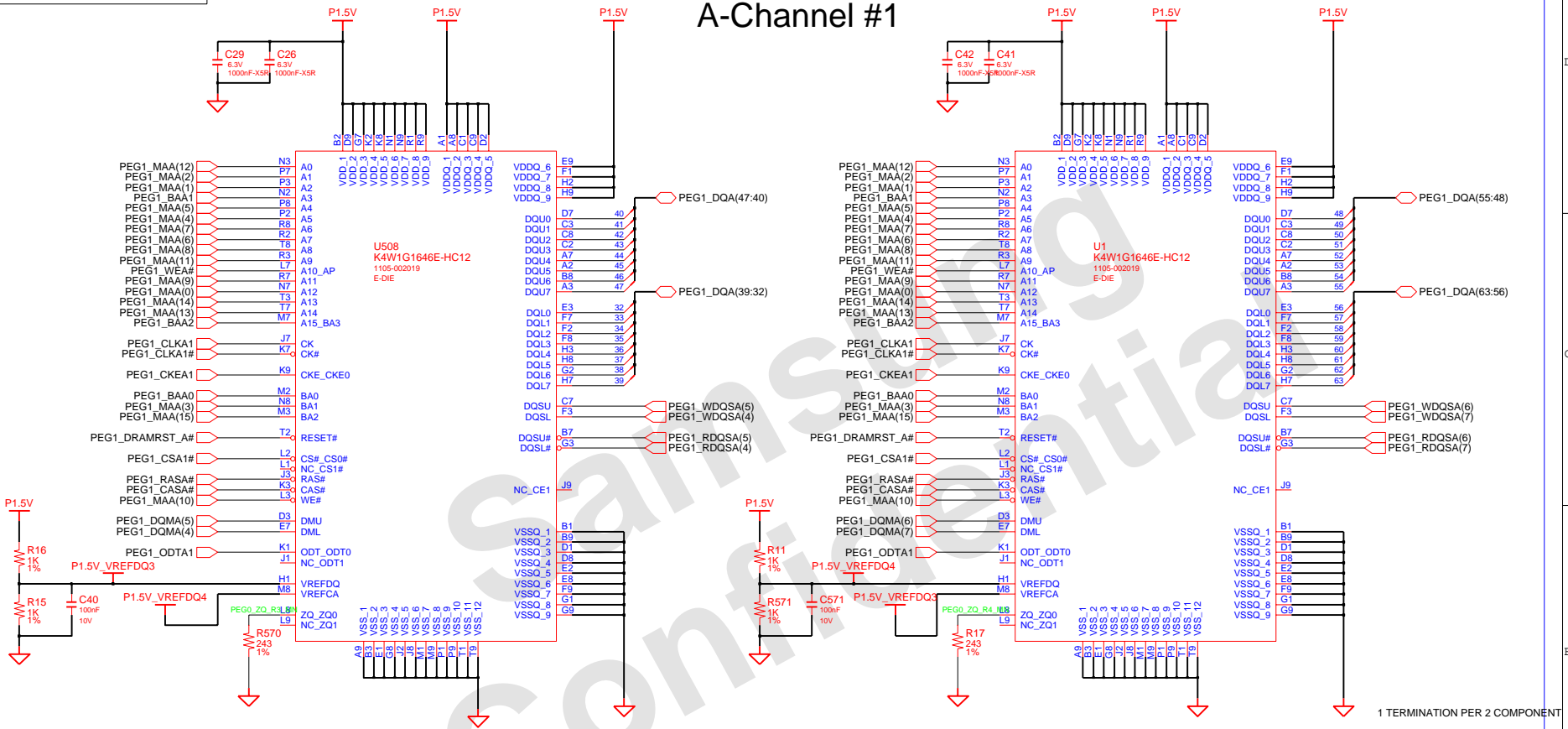


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHIC_MEM A#0		
APPROVAL	BC LEE	REV	rev. 0.1	GRAPHIC_MEM A#0		PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	23 OF 48



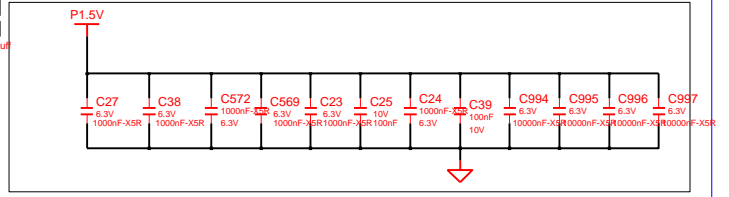
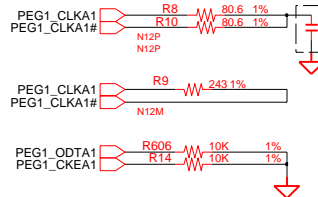
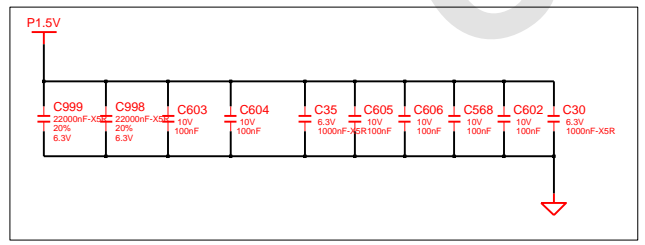
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# A-Channel #1



Place near to VDDQ

Place near to VDDQ

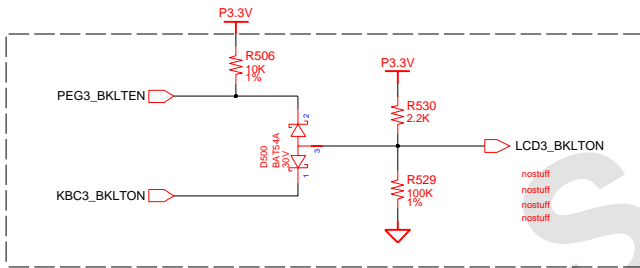
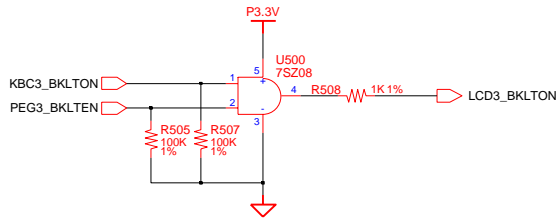


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHIC_MEM A#1	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	GRAPHIC_MEM A#1	BA41-01XXA	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	24 OF 48

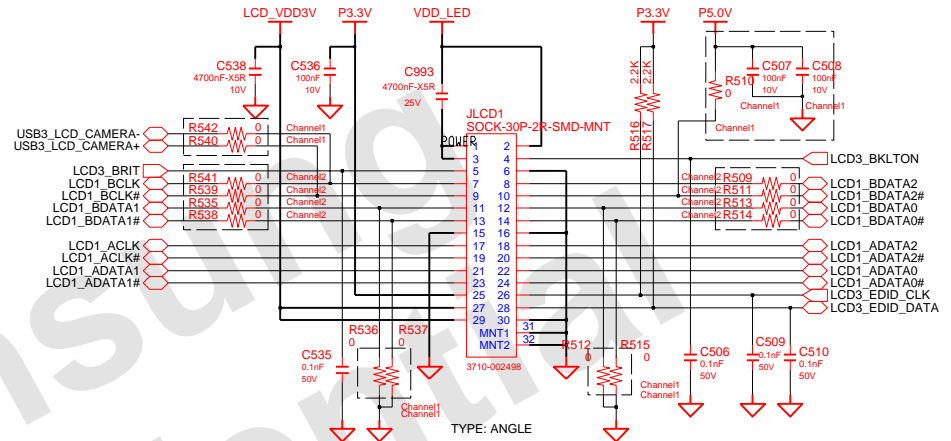
# LVDS LOGIC

## 1Ch. LCD Connector + CAMERA

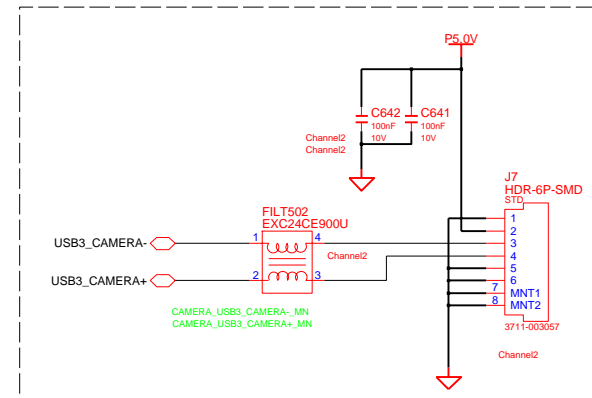
### Backlight On



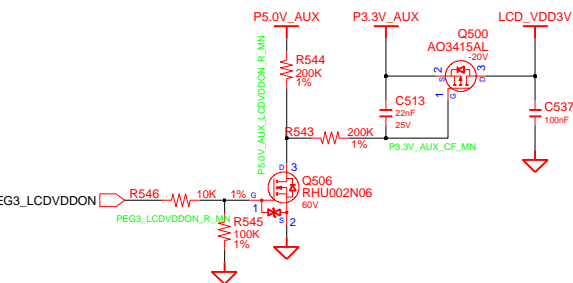
NOTE : Place R20 close to connector to minimize stub



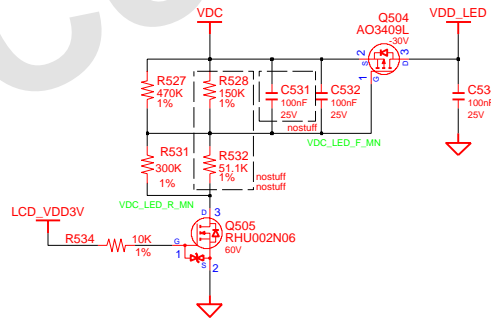
### CAMERA CONN FOR 2ch LVDS



### LCD Power



### LED Power

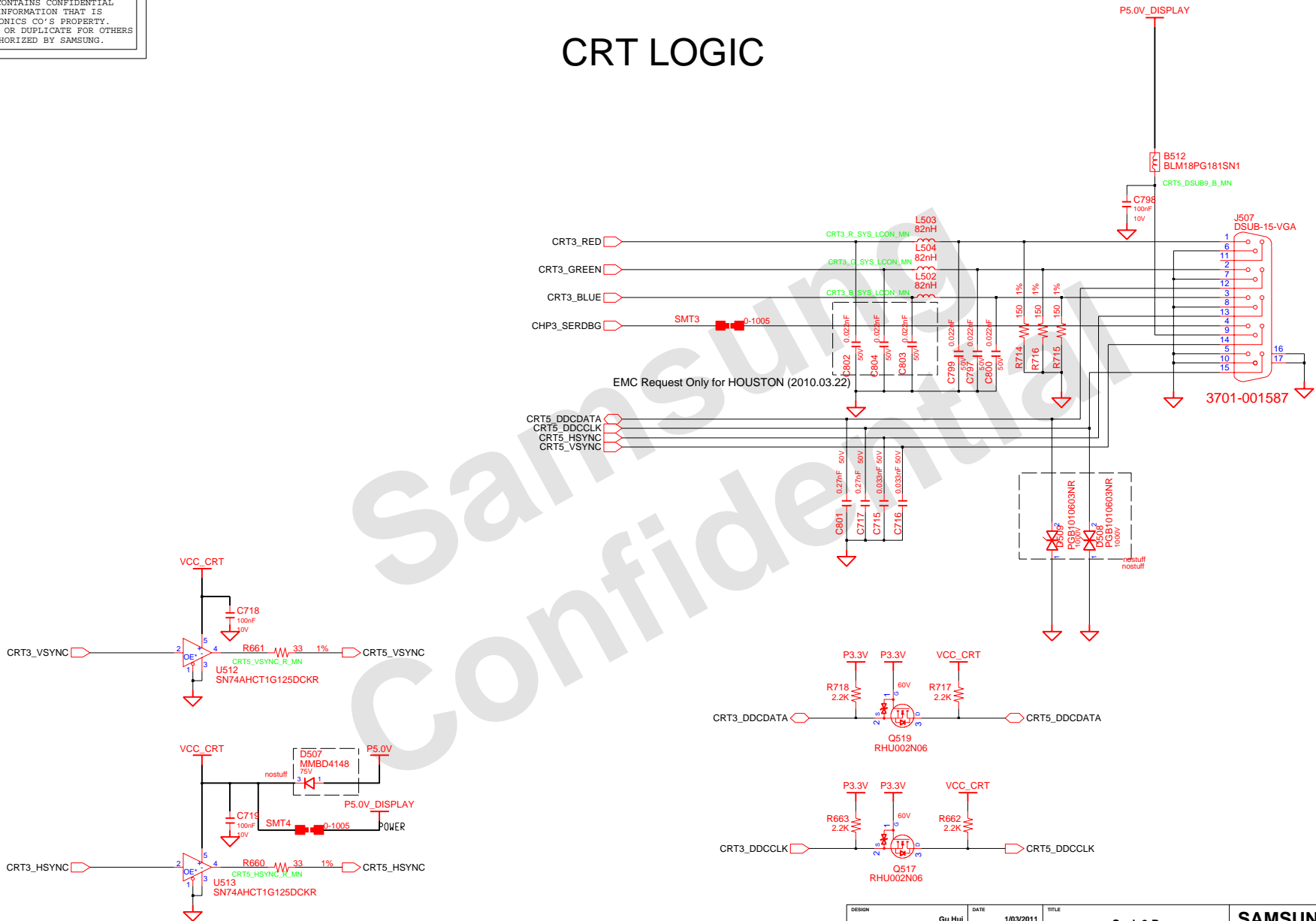


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF	
APPROVAL	BC LEE	REV	rev. 0.1	LVDS	
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	25 OF 48

**SAMSUNG**  
 ELECTRONICS  
 PART NO.  
 BA41-01XXXXA

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# CRT LOGIC

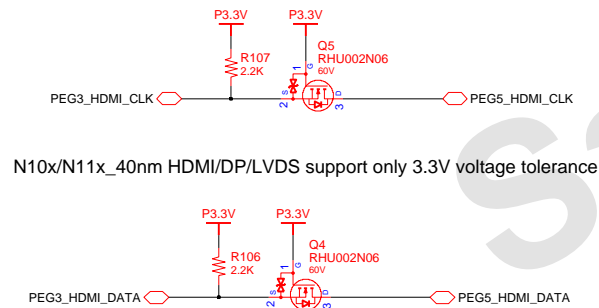


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R GRAPHICS_IF CRT	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 26 OF 48	

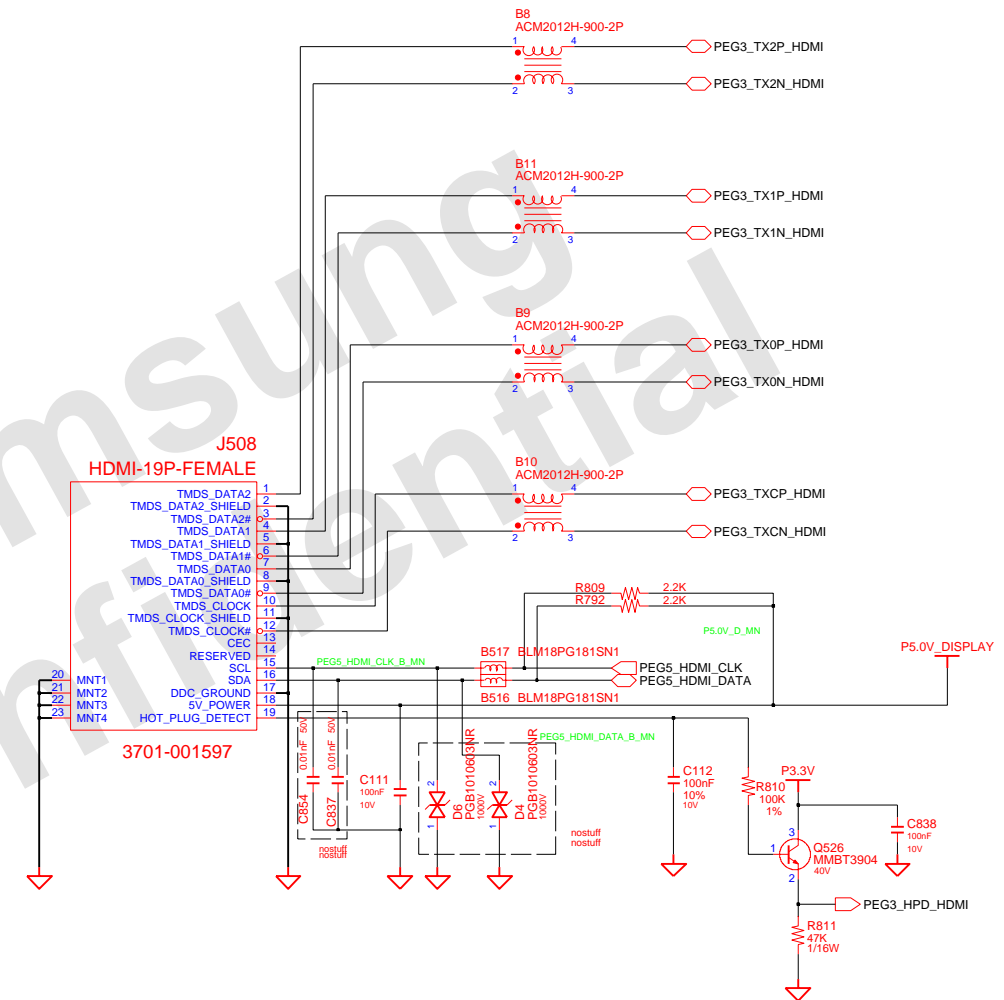
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# HDMI Graphic

FOR HDMI VERIFICATION TEST



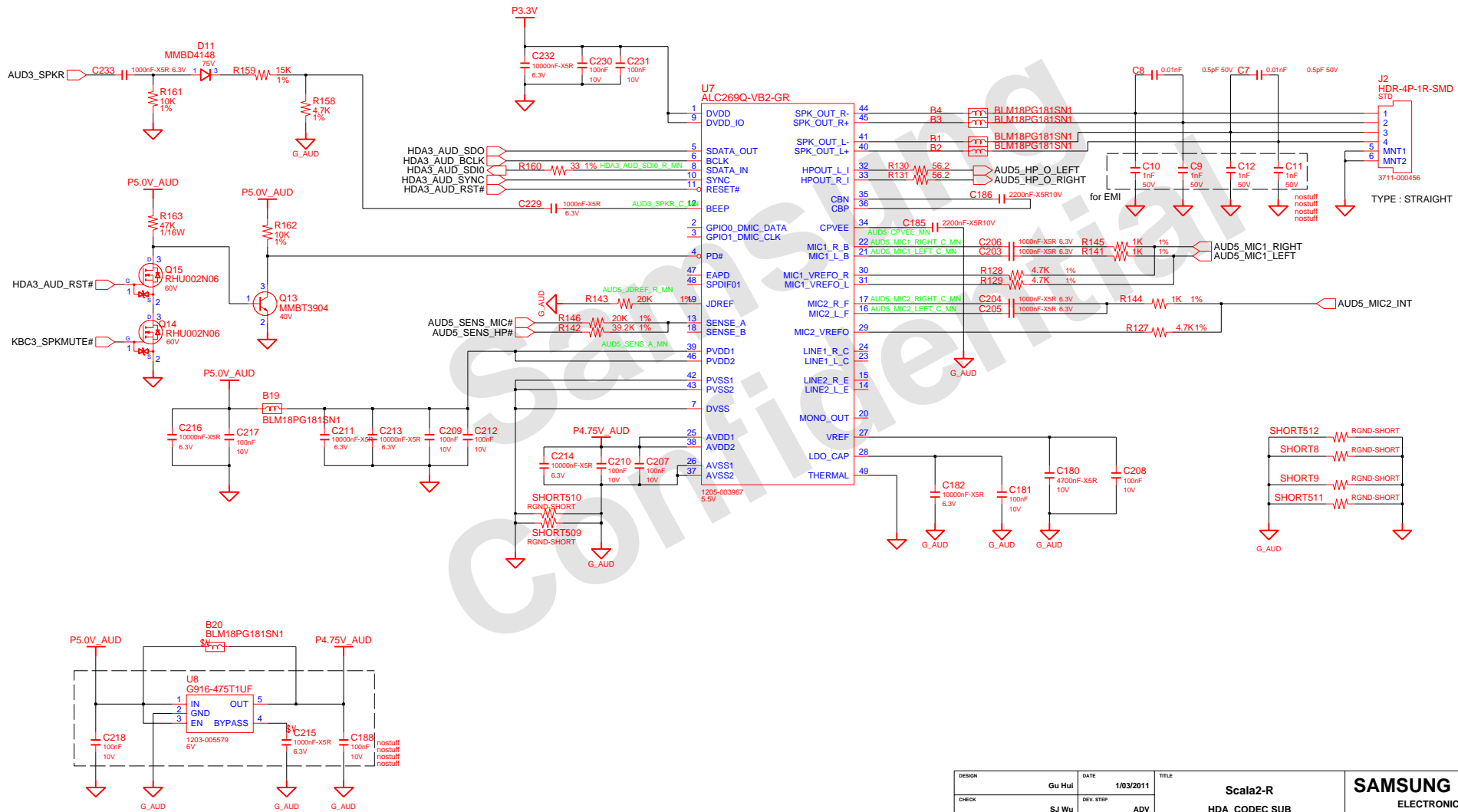
N10x/N11x\_40nm HDMI/DP/LVDS support only 3.3V voltage tolerance



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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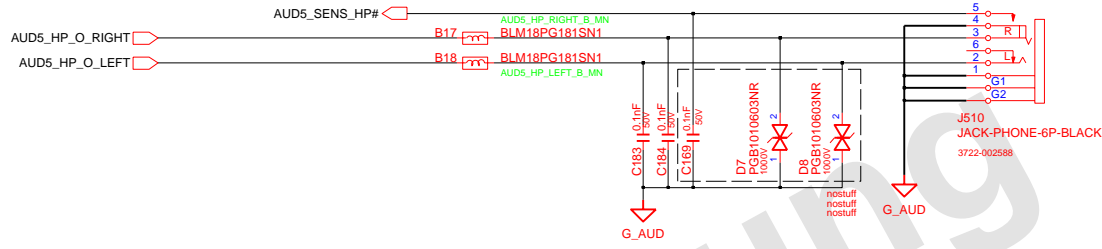
# HD AUDIO



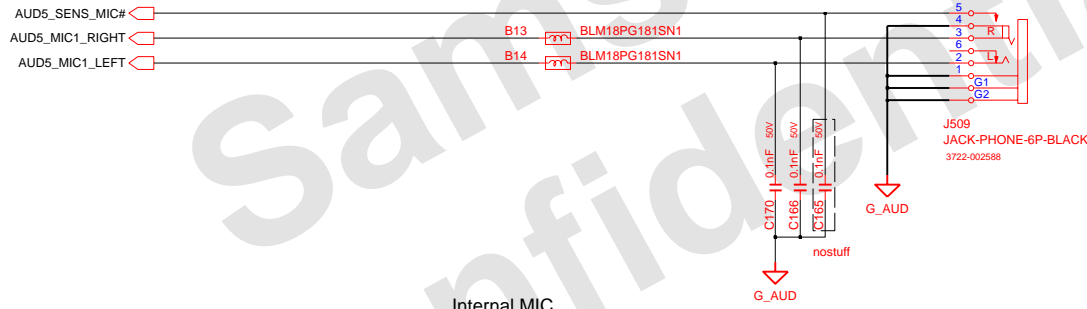
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R HDA_CODEC SUB AUDIO CODEC ALC269 SUB	<b>SAMSUNG</b> ELECTRONICS PART NO. <b>BA41-01XXXXA</b>
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE 28 OF 48	

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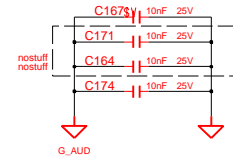
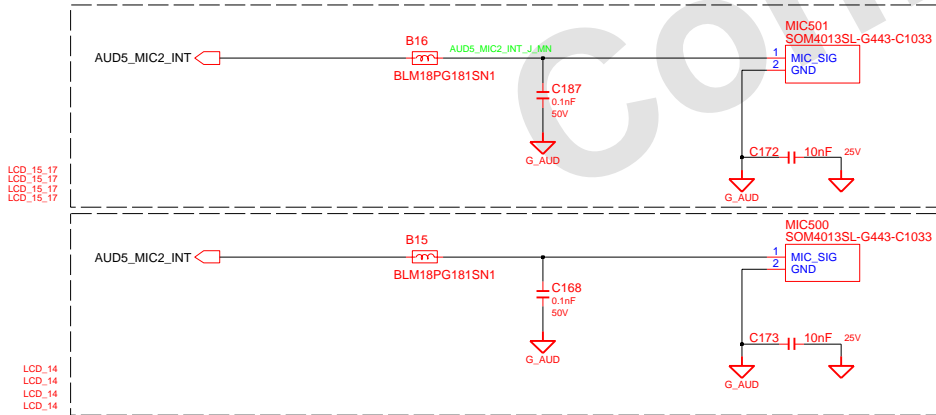
### HEADPHONE



### MIC JACK



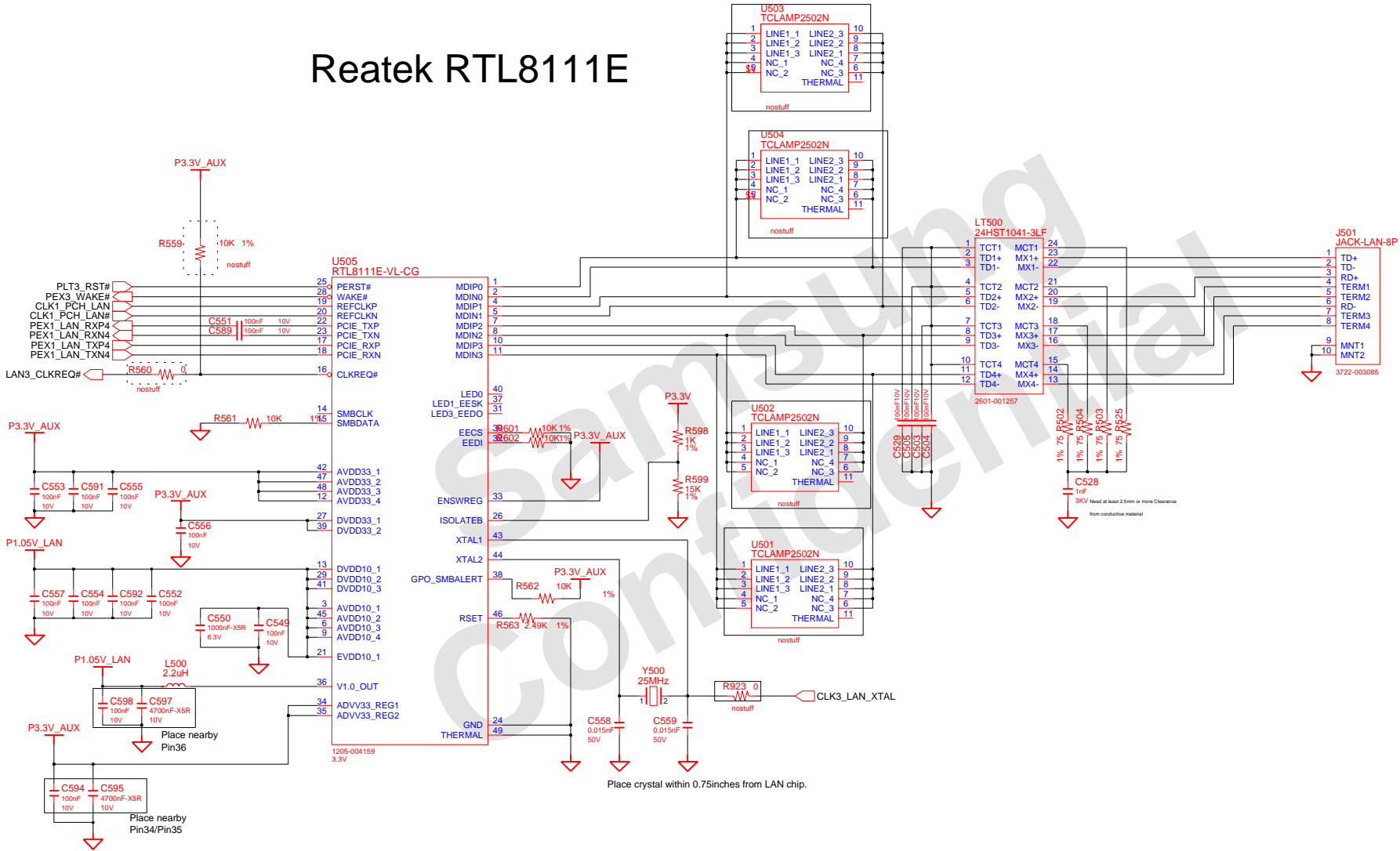
### Internal MIC



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

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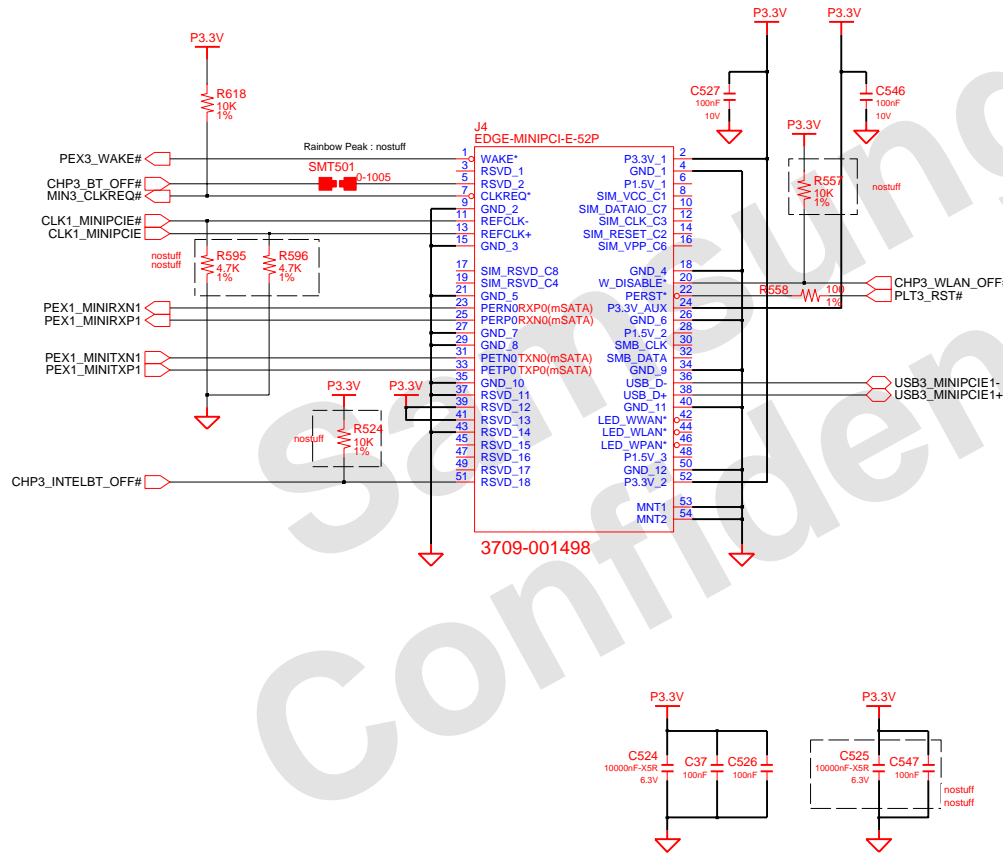
# Reatek RTL8111E



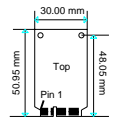
Place crystal within 0.75inches from LAN chip.

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R LAN LAN_Reatek_RTL8111	<b>SAMSUNG</b> 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	30 OF 48	

# WLAN, 4mm



Mini PCI Express Card



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R MINI_PCIE_CONN	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			
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

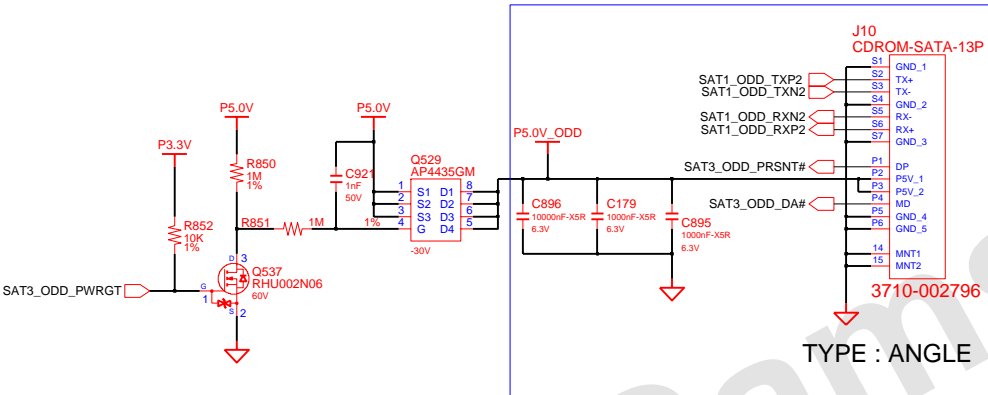


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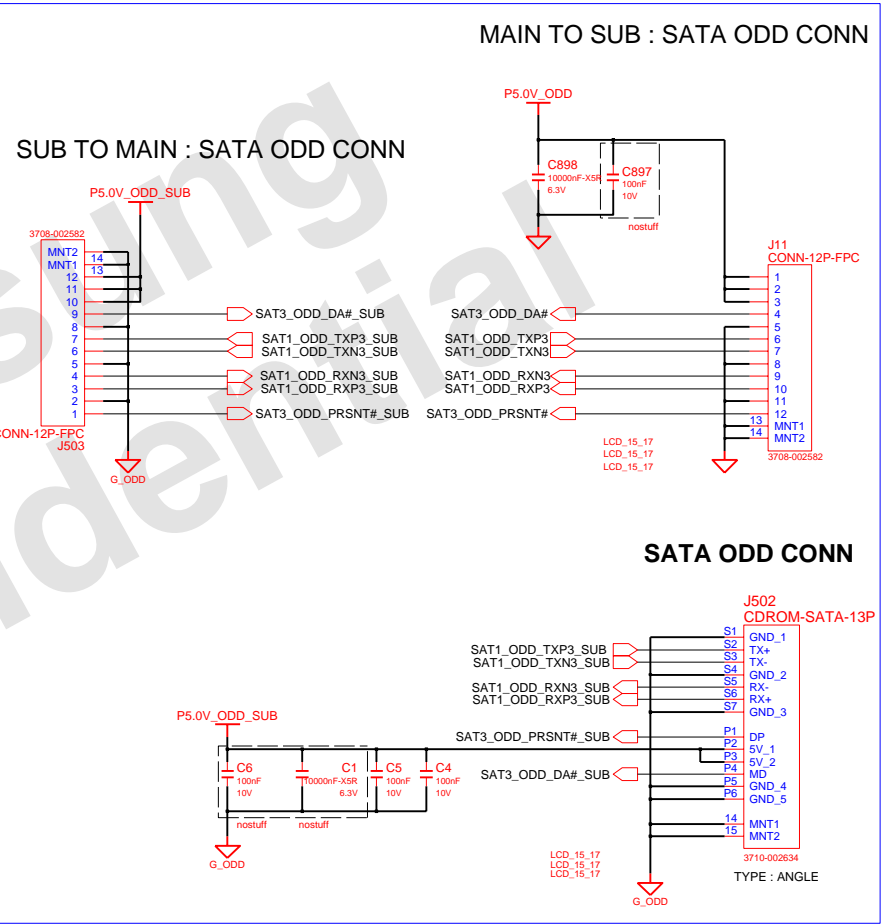
# SATA I/F CONN

## SATA ODD CONN

15.6" / 17.3"



TYPE : ANGLE

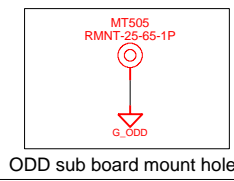
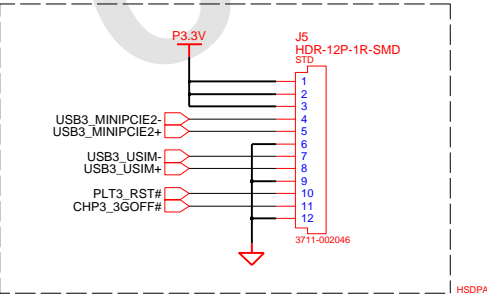
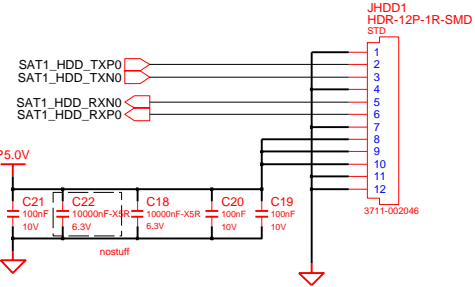


## SATA ODD CONN

## SATA HDD CONN

## MAIN to HSDPA SUB

Cable Connector Type



ODD sub board mount hole

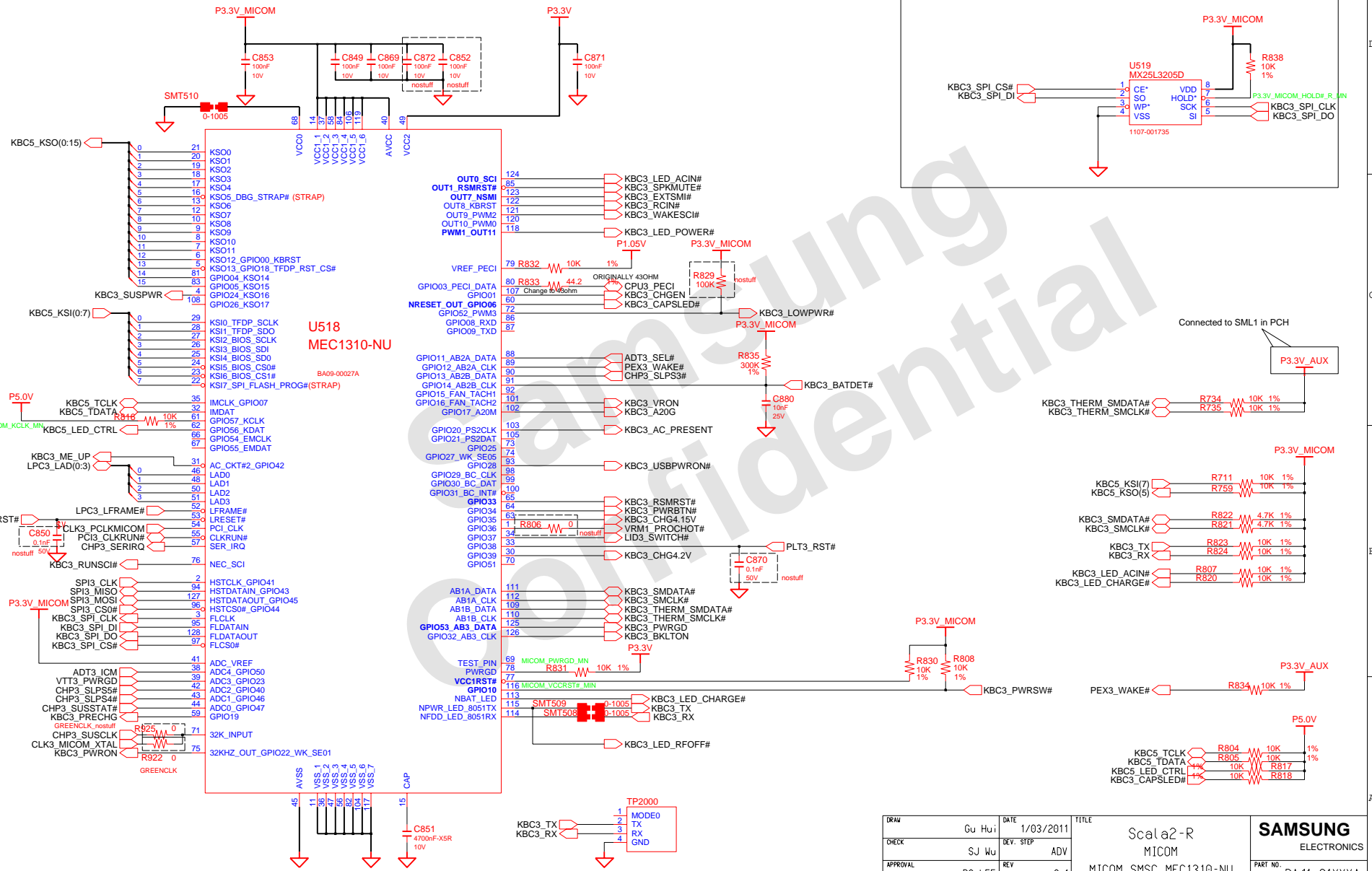
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	SATA DEVICES		
APPROVAL	BC LEE	REV	rev. 0.1	SATA I/F Conn		PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	32 OF 48

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# MAIN BOARD (MICOM)

BE CAUTION SPI ROM SIZE!!

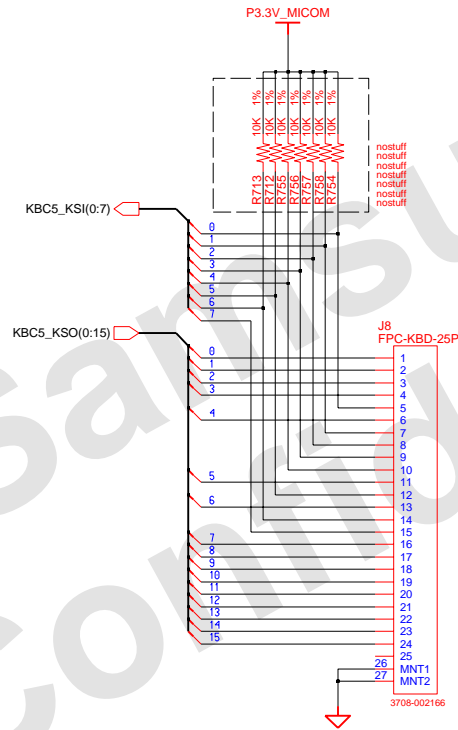
SPI\_ROM\_SOCKET



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

# Micom Glue Logic

## KEYBOARD

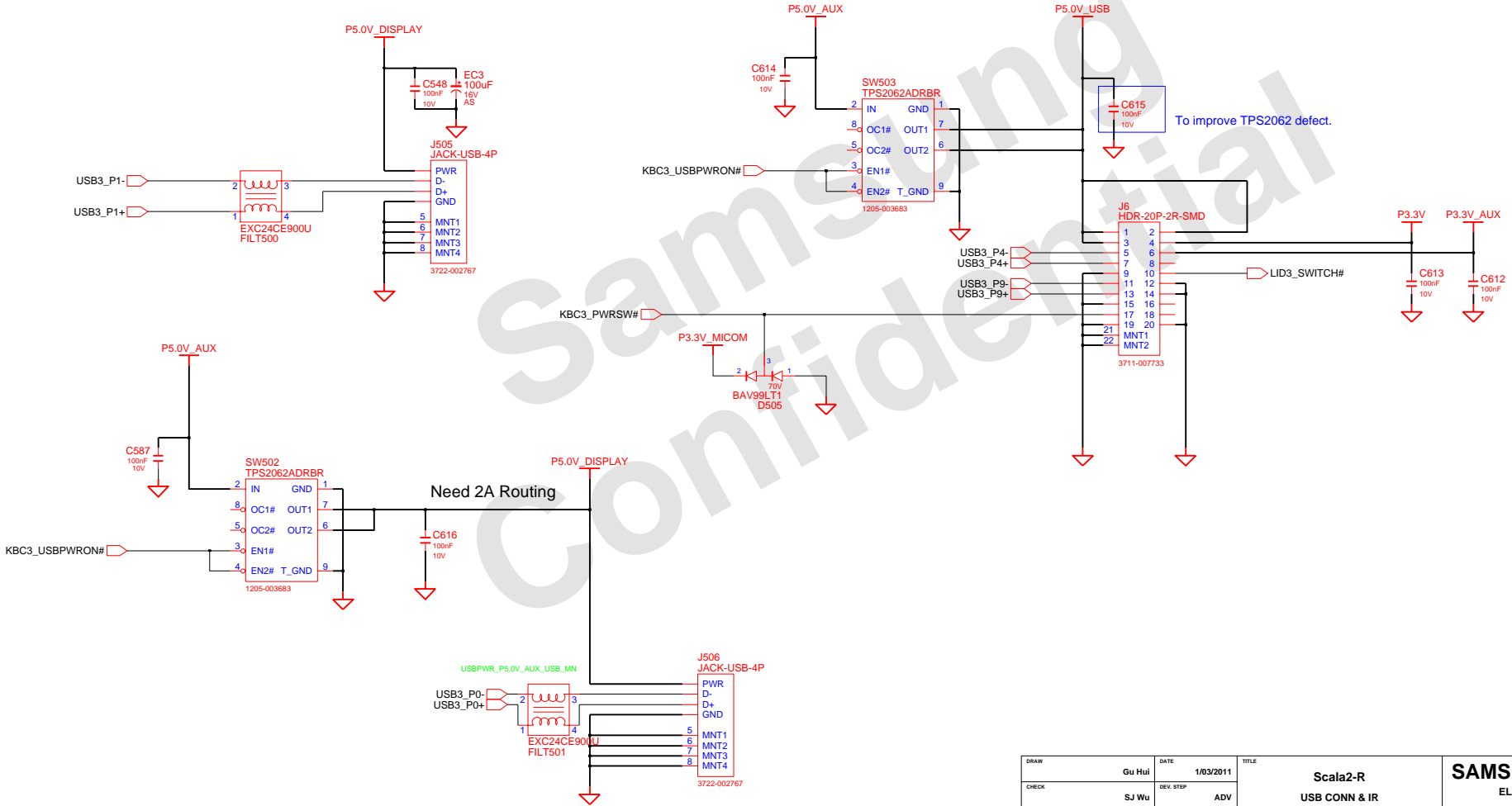


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MICOM GLUE LOGIC		
APPROVAL	BC LEE	REV	rev. 0.1	MICOM GLUE LOGIC		PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	34 OF 48

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# POWER S/W SUB B'D CONNECTOR

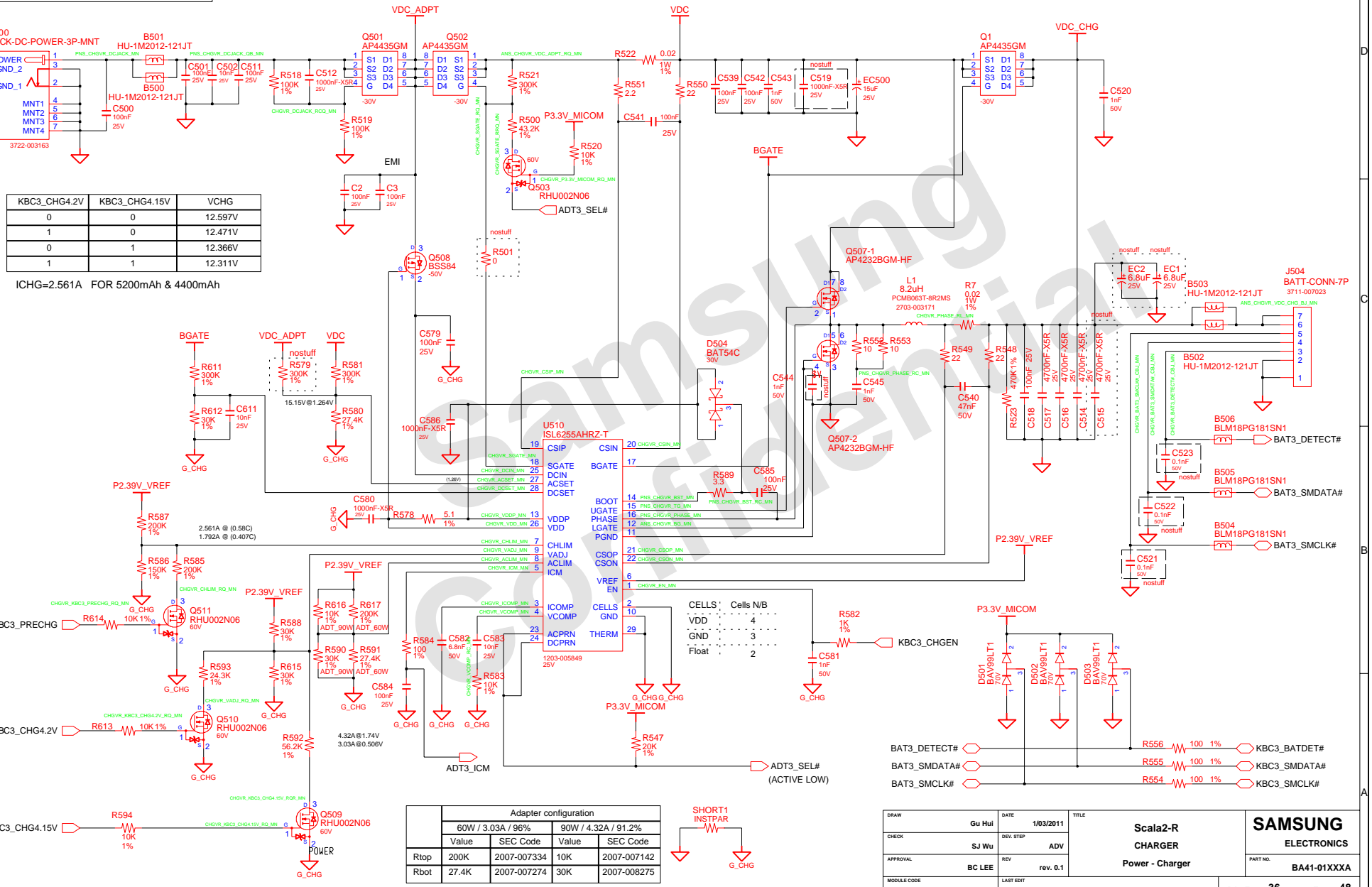
## MAIN to SUB



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

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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

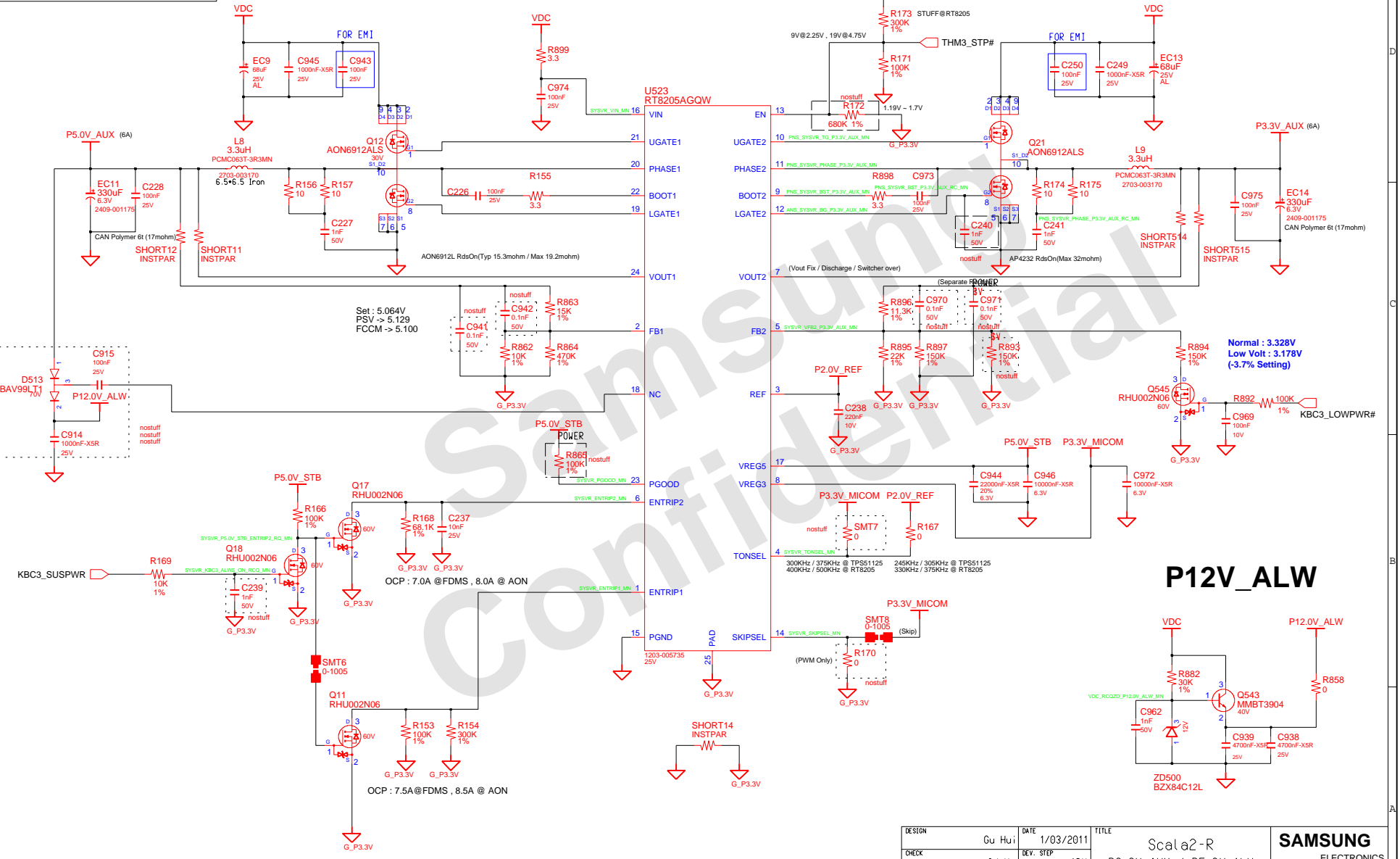
Adapter configuration			
60W / 3.03A / 96%		90W / 4.32A / 91.2%	
Value	SEC Code	Value	SEC Code
Rtop	200K 2007-007334	10K 2007-007142	
Rbot	27.4K 2007-007274	30K 2007-008275	

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV. STEP	ADV		CHARGER
APPROVAL	BC LEE	REV	rev. 0.1		Power - Charger
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	36 OF 48

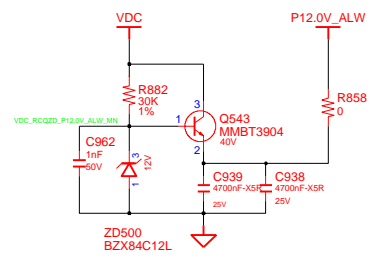
**SAMSUNG**  
 ELECTRONICS  
 PART NO.  
**BA41-01XXXXA**

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

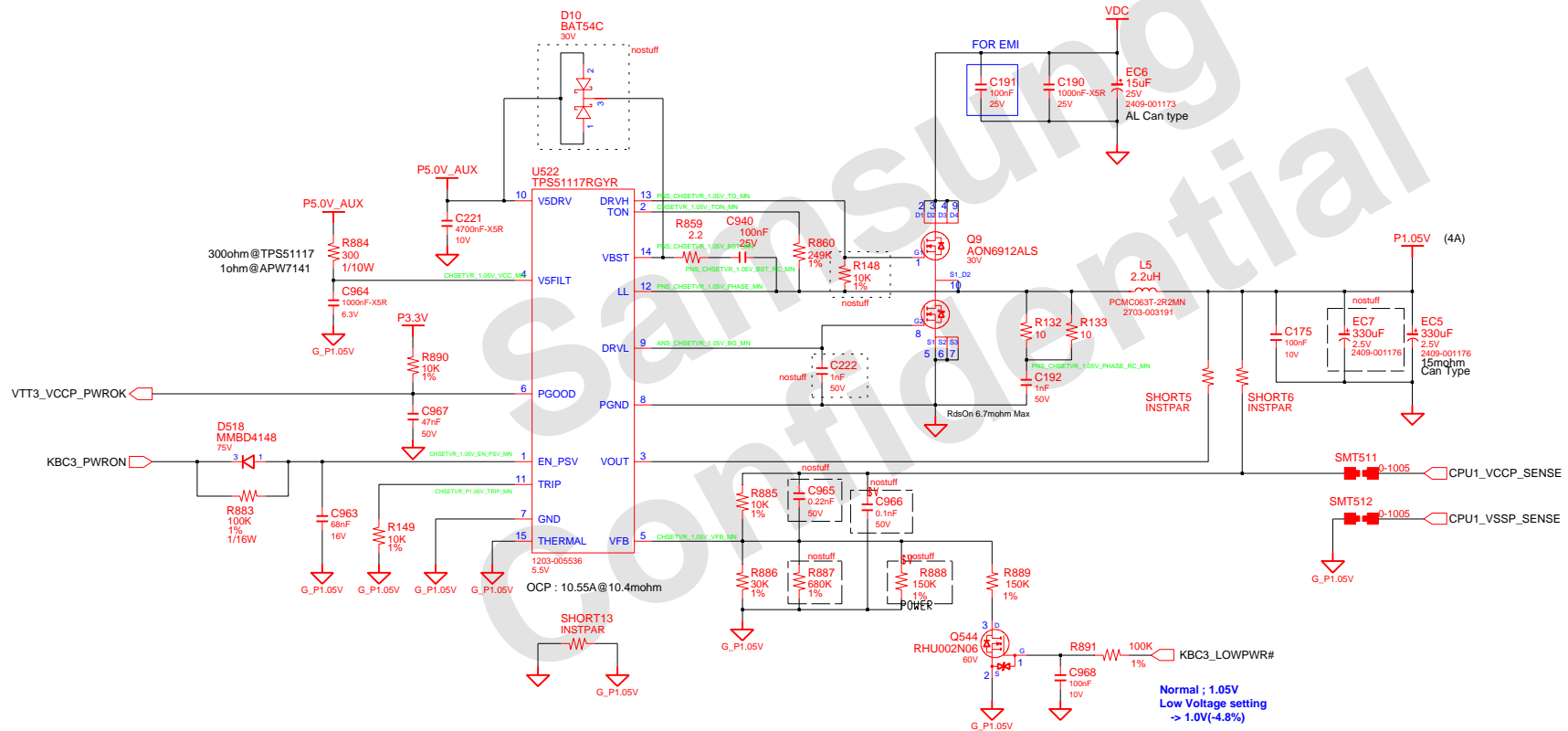


## P12V\_ALW



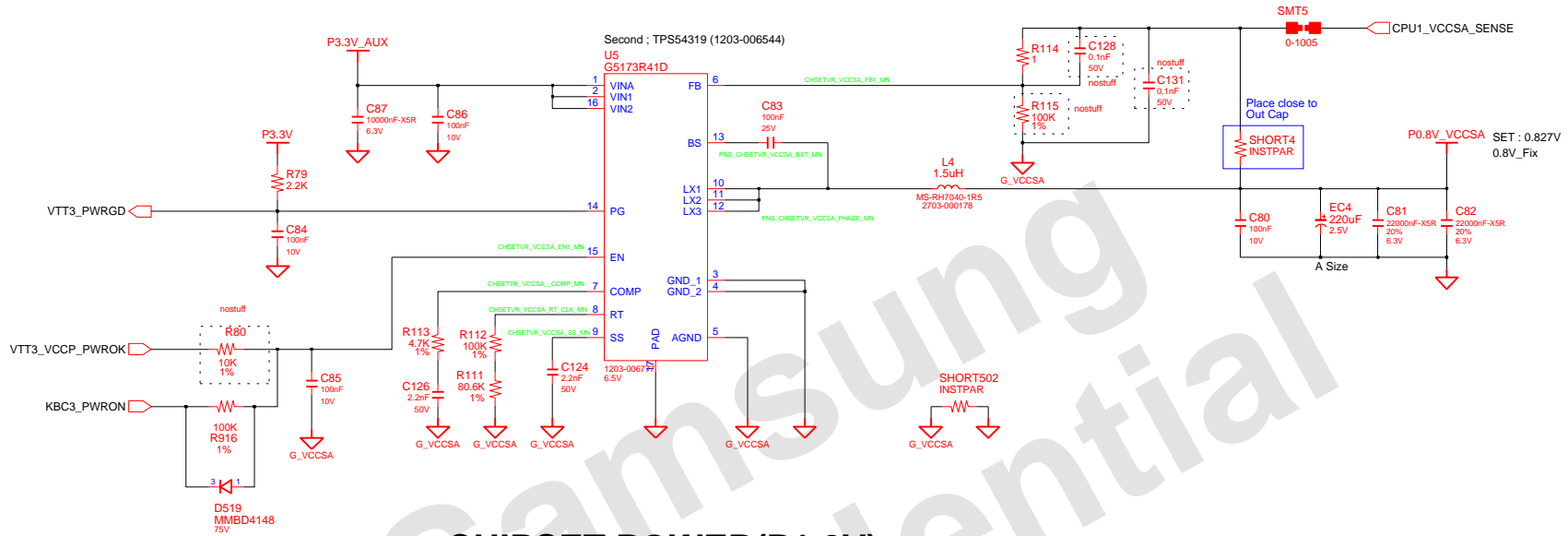
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01XXXXA
CHECK	SJ Wu	DEV. STEP	ADV	P3.3V_AUX / P5.0V_ALW		
APPROVAL	BC LEE	REV	rev. 0.1	P3.3V_AUX / P5.0V_AUX		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	37 OF 48	
D:\ment\or\Scala2_R\Scala2_R_Ext_ADV_T10119_MA1N						

# CHIPSET POWER(P1.05V)

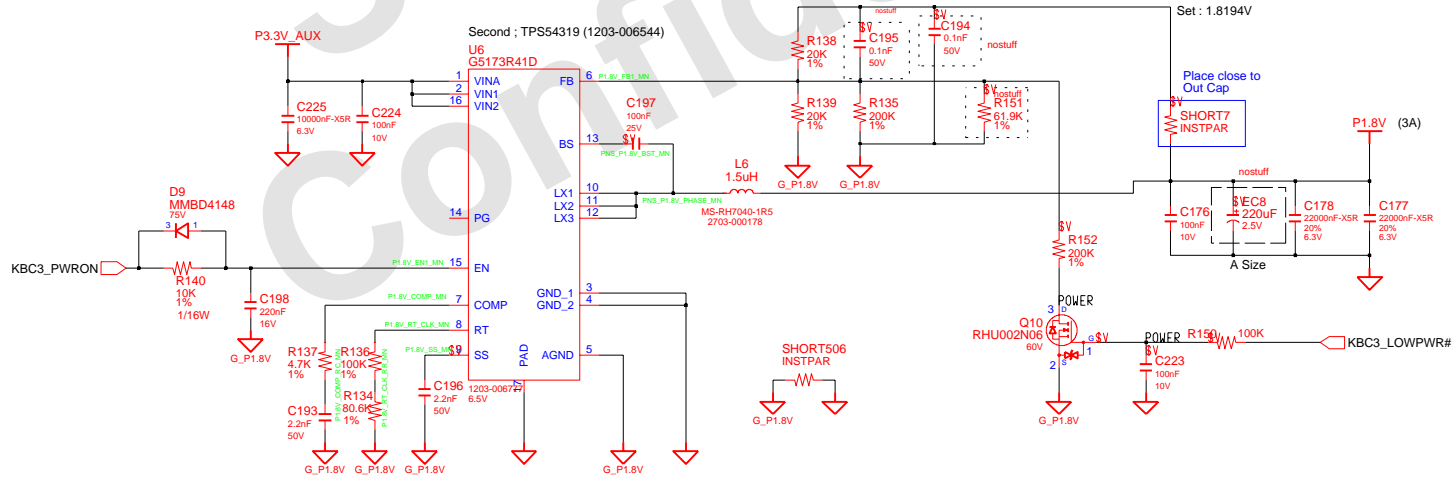


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R P1.05V	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	P1.05V(Chipset Power)		
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	38	OF 48

# CHIPSET POWER(VCCSA)



# CHIPSET POWER(P1.8V)

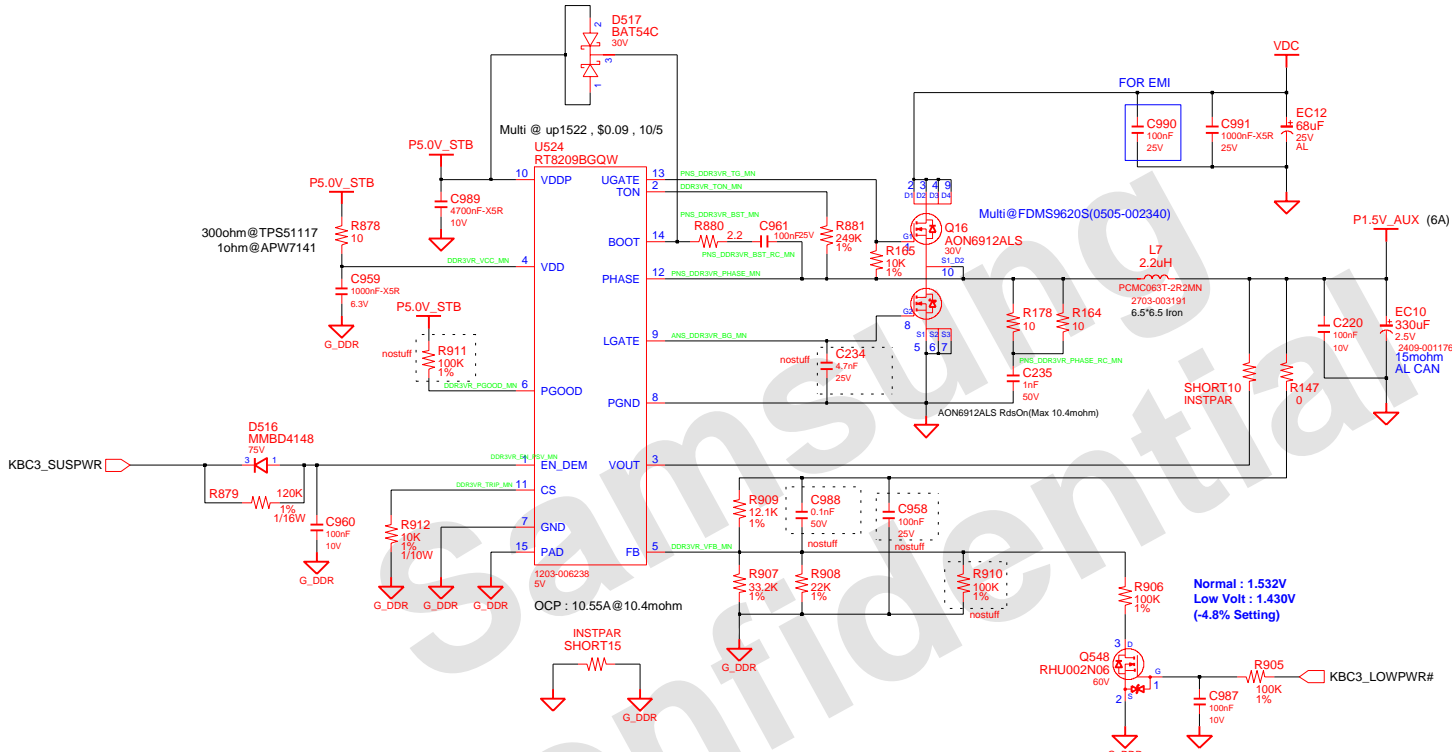


DESIGN	Gu Hu	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		P1.1V_VTT	
APPROVAL	BC LEE	REV	rev. 0.1		P0.8V(Chipset Power)	PART NO. BA41-01XXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM			PAGE 39 OF 48

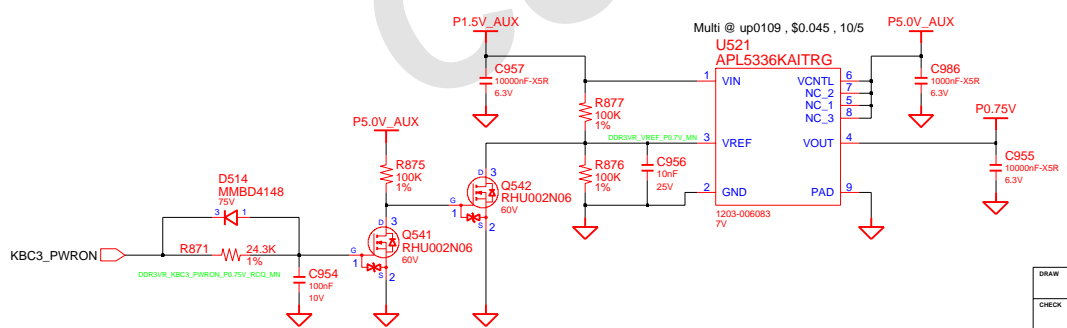


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# DDR3 Power



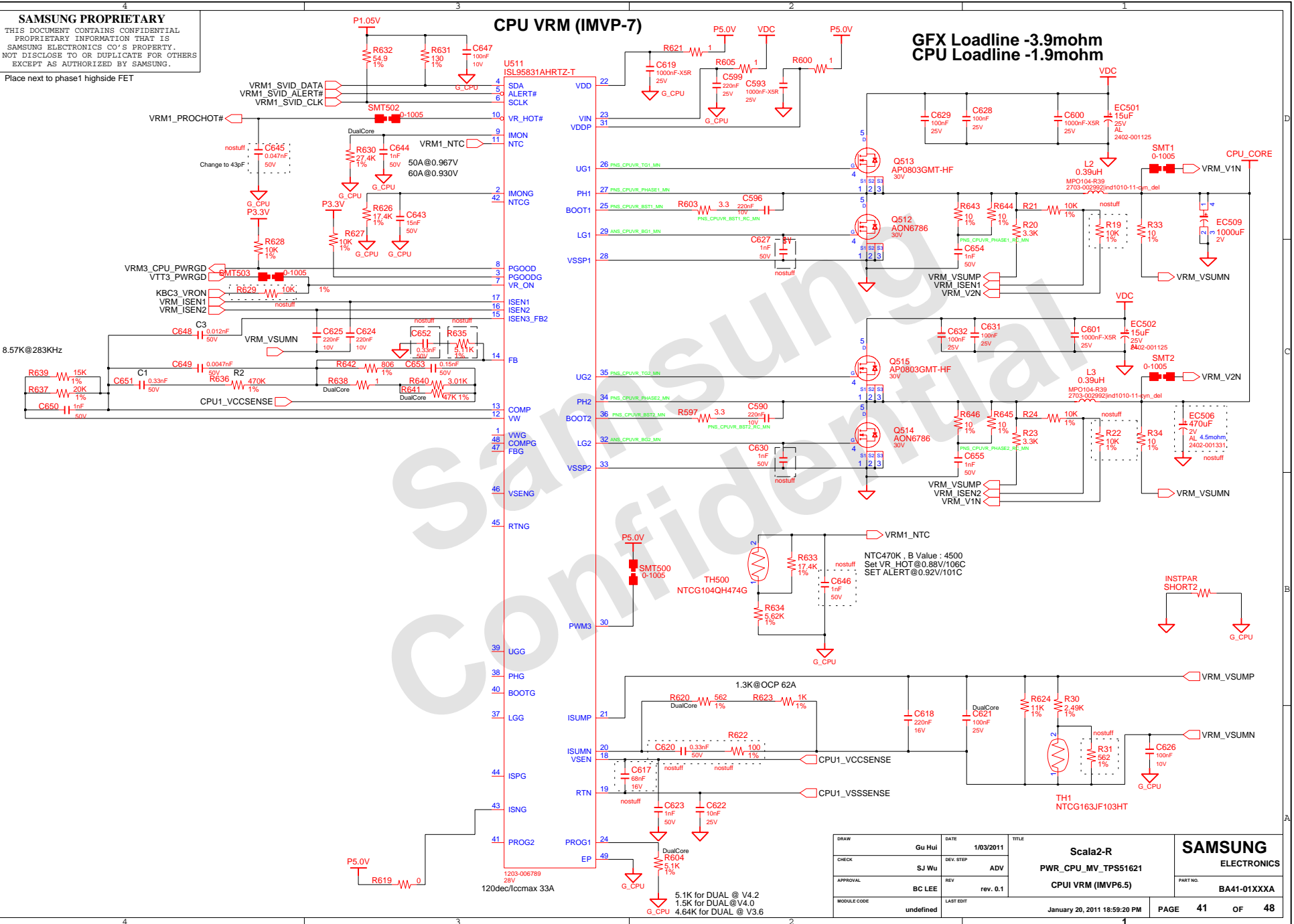
# DDR3 VTT(0.75V)



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	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	40 OF 48	

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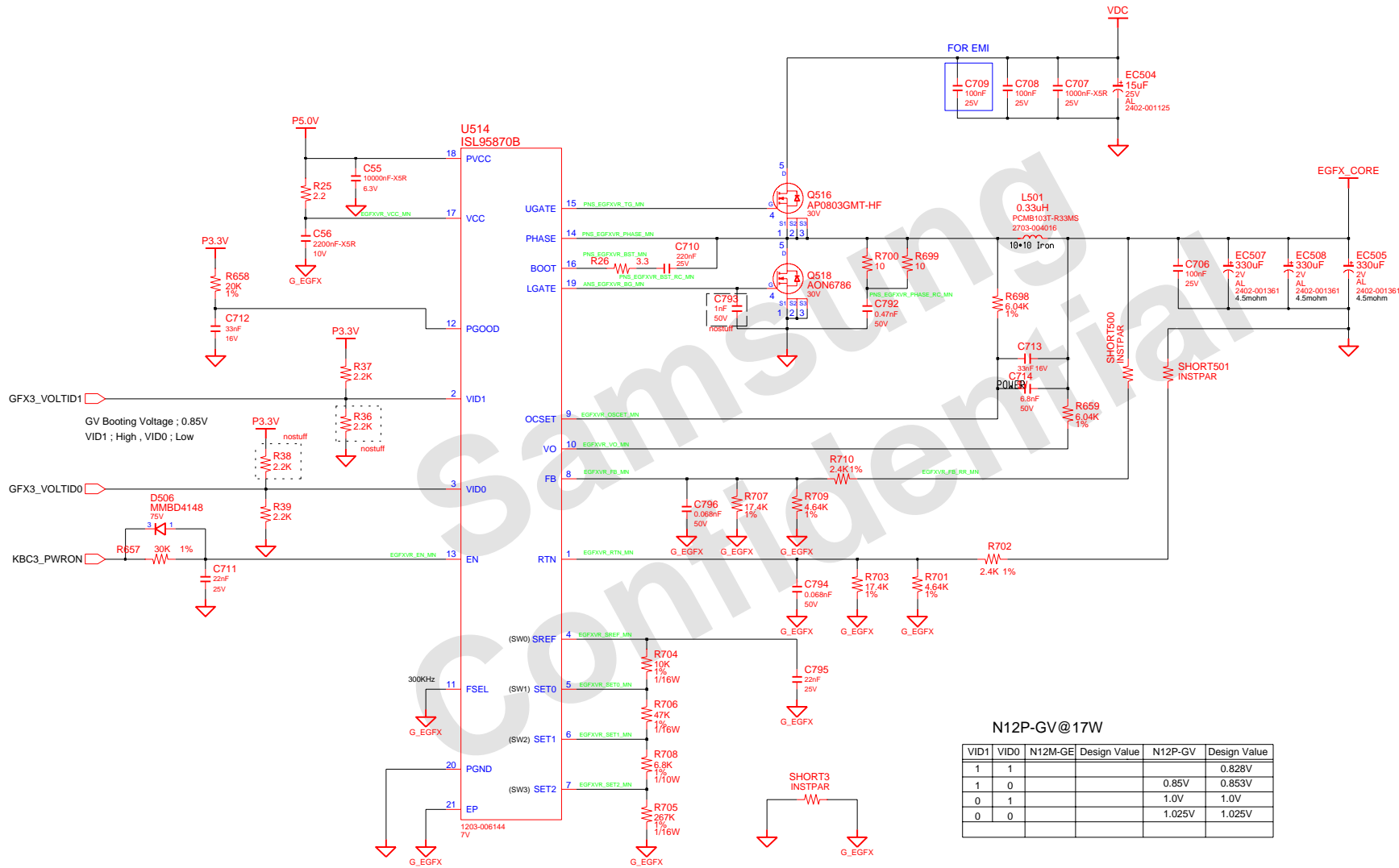
Place next to phase1 highside FET



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

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## External GFX Core Power

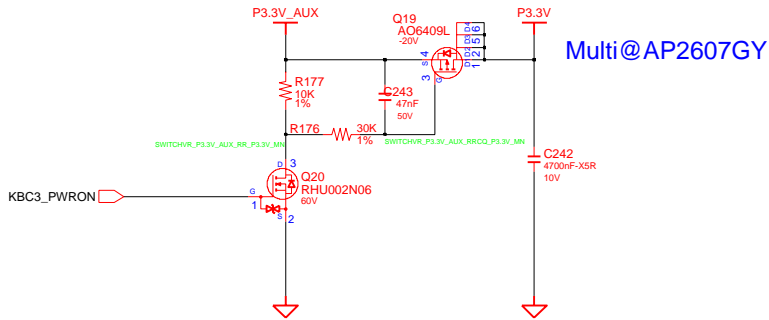


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PWR_MV_SWITCHED	
APPROVAL	BC LEE	REV	rev. 0.1		Power-EGFX_CORE	PART NO. BA41-01XXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 42 OF 48

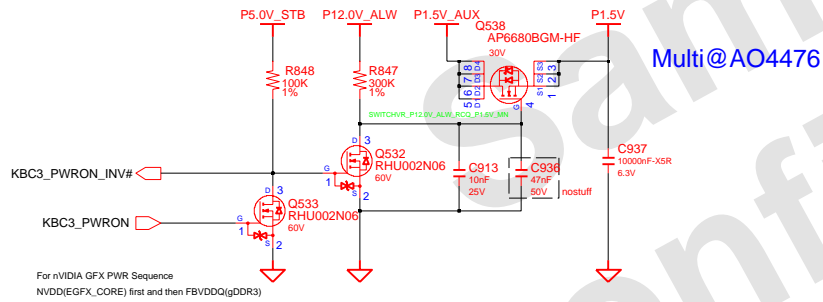
# Switched Power

P5.0V -> P3.3V -> EGFX\_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.8V\_VCCSA -> CPU\_CORE

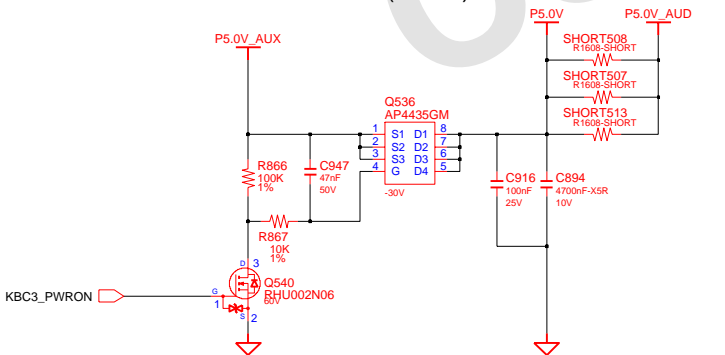
## Switched Power On (P3.3V)



## Switched Power On (P1.5V)



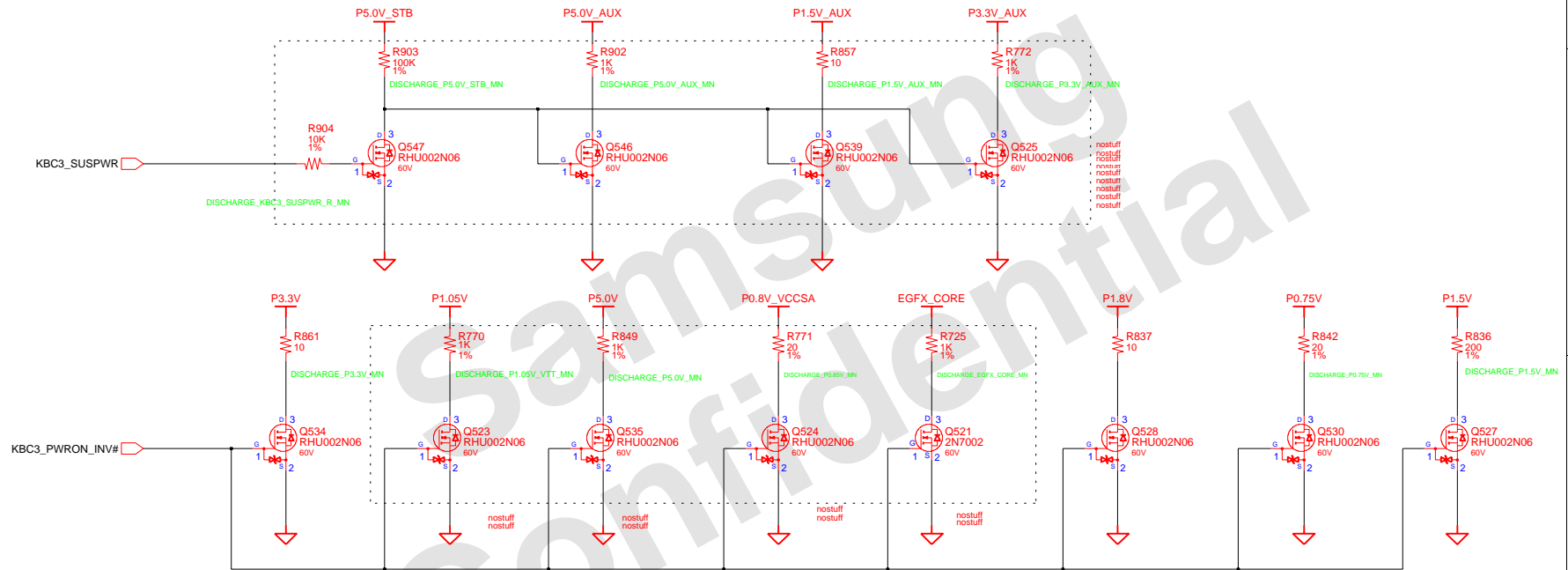
## Switched Power On (P5.0V)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> 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

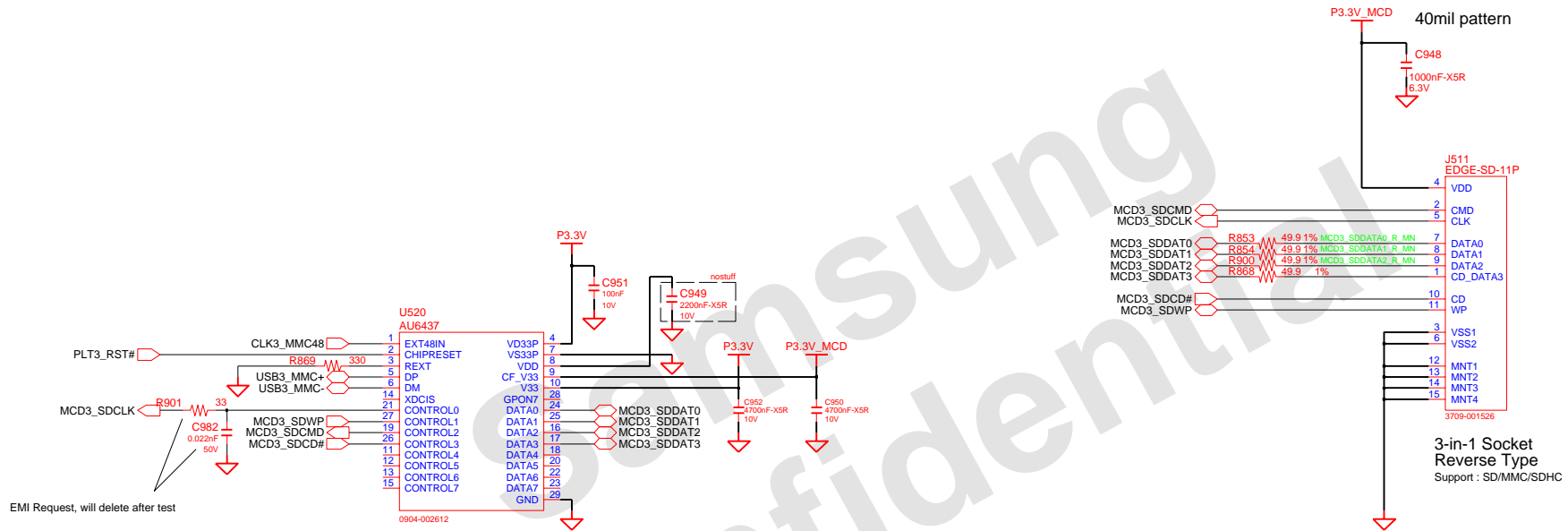
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# POWER DISCHARGER



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

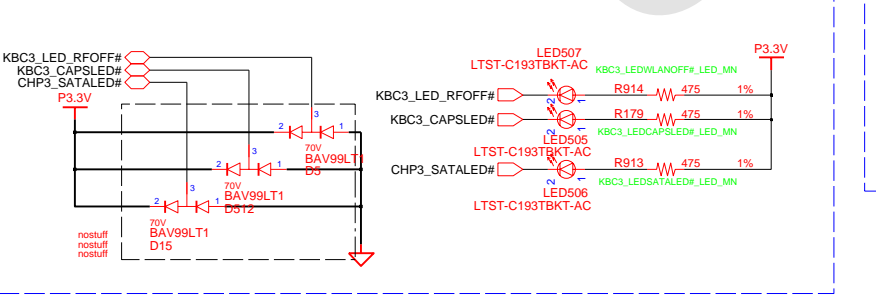
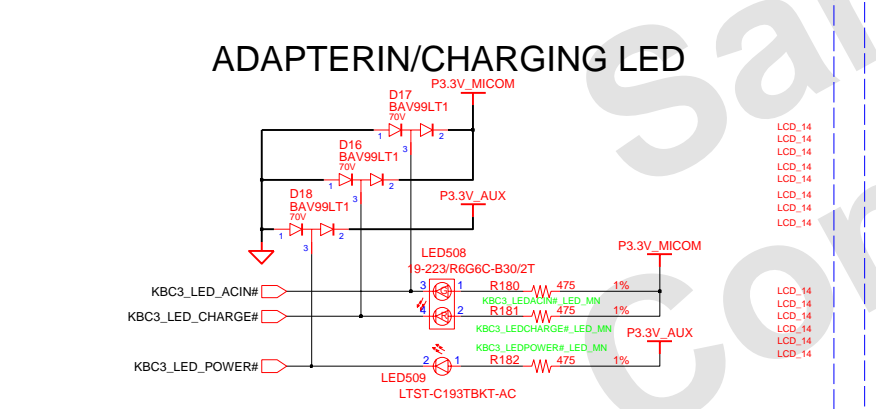
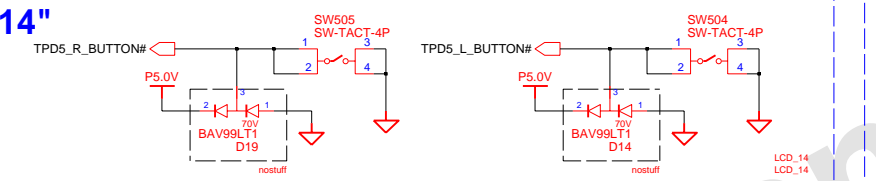
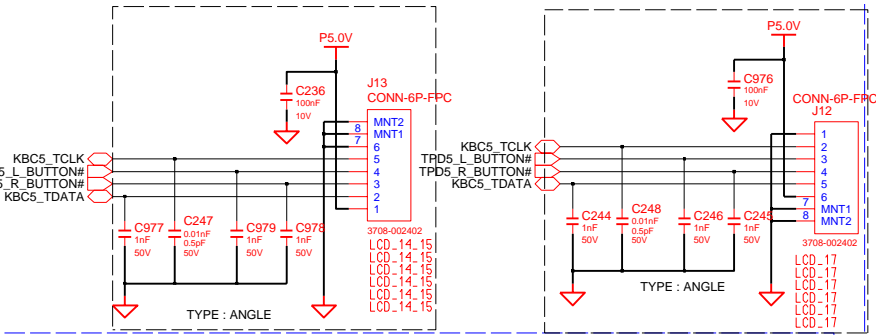
# AU6437 (4-in-1)



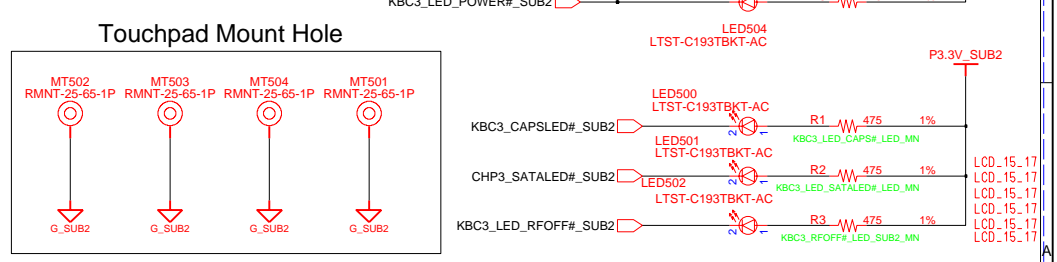
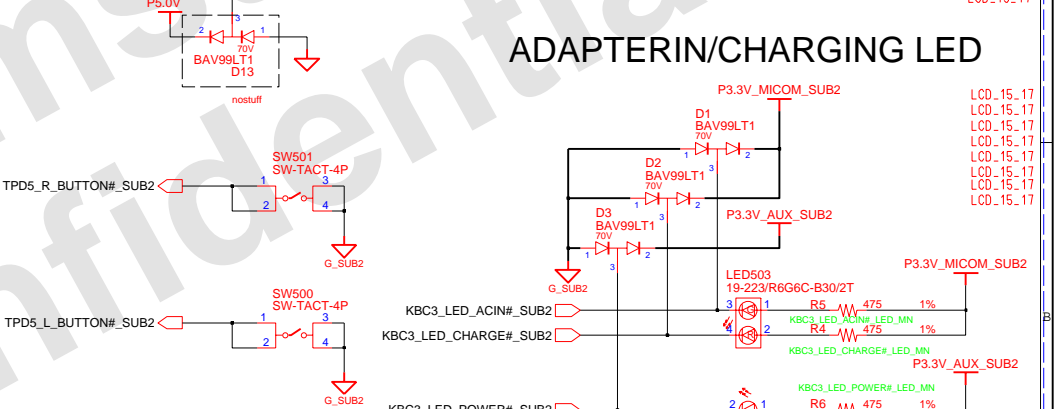
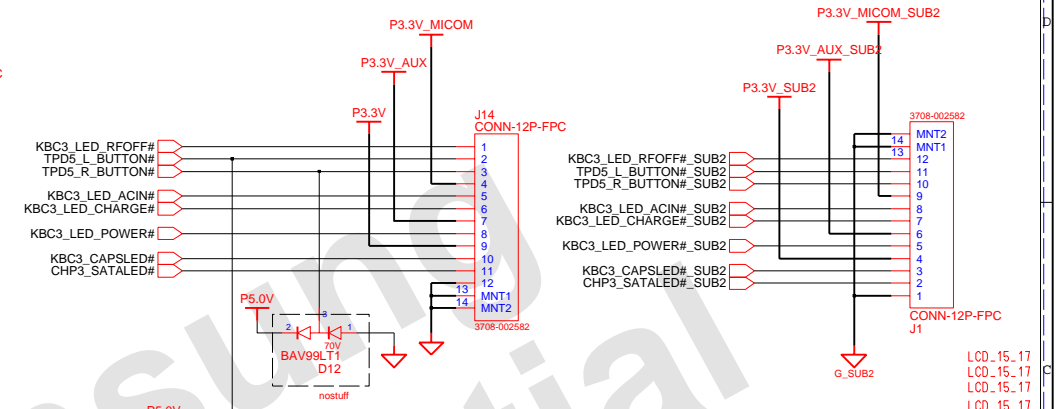
DESIGN	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	<b>SAMSUNG</b> ELECTRONICS PART NO. <b>BA41-01XXA</b>
CHECK	MK KIM	DEV. STEP	ADV		AU 6437	
APPROVAL	BL LEE	REV	rev. 0.3		AU 6437	
MODULE CODE		LAST EDIT				
				January 18, 2011 08:10:20 AM	PAGE	46 OF 48

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## TOUCHPAD



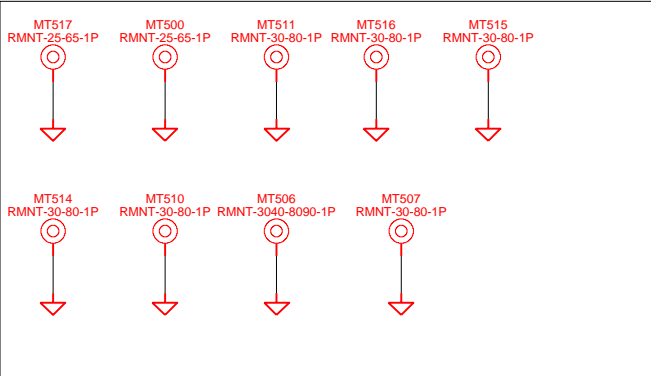
## 15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



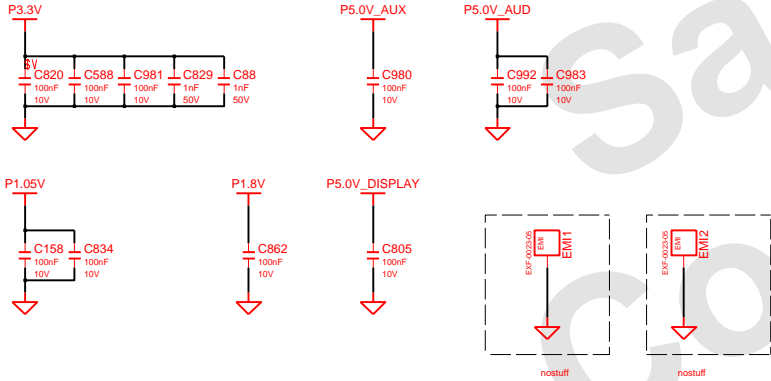
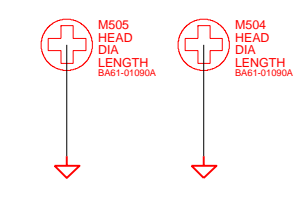
DRAW	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R Touchpad	<b>SAMSUNG</b> ELECTRONICS	
CHECK	MK KIM	DEV. STEP	ADV		Touchpad		
APPROVAL	BL LEE	REV	rev. 0.3		Touchpad	PART NO. BA41-01XXXX	
MODULE CODE		LAST EDIT				January 18, 2011 08:10:20 AM	
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**Mainboard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