

Samsung
 NP-RV420, NP-RV520, NP-RV720

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- 01609A (GCE)
 BA41- 01608A (NY)
 BA41- 01610A (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>

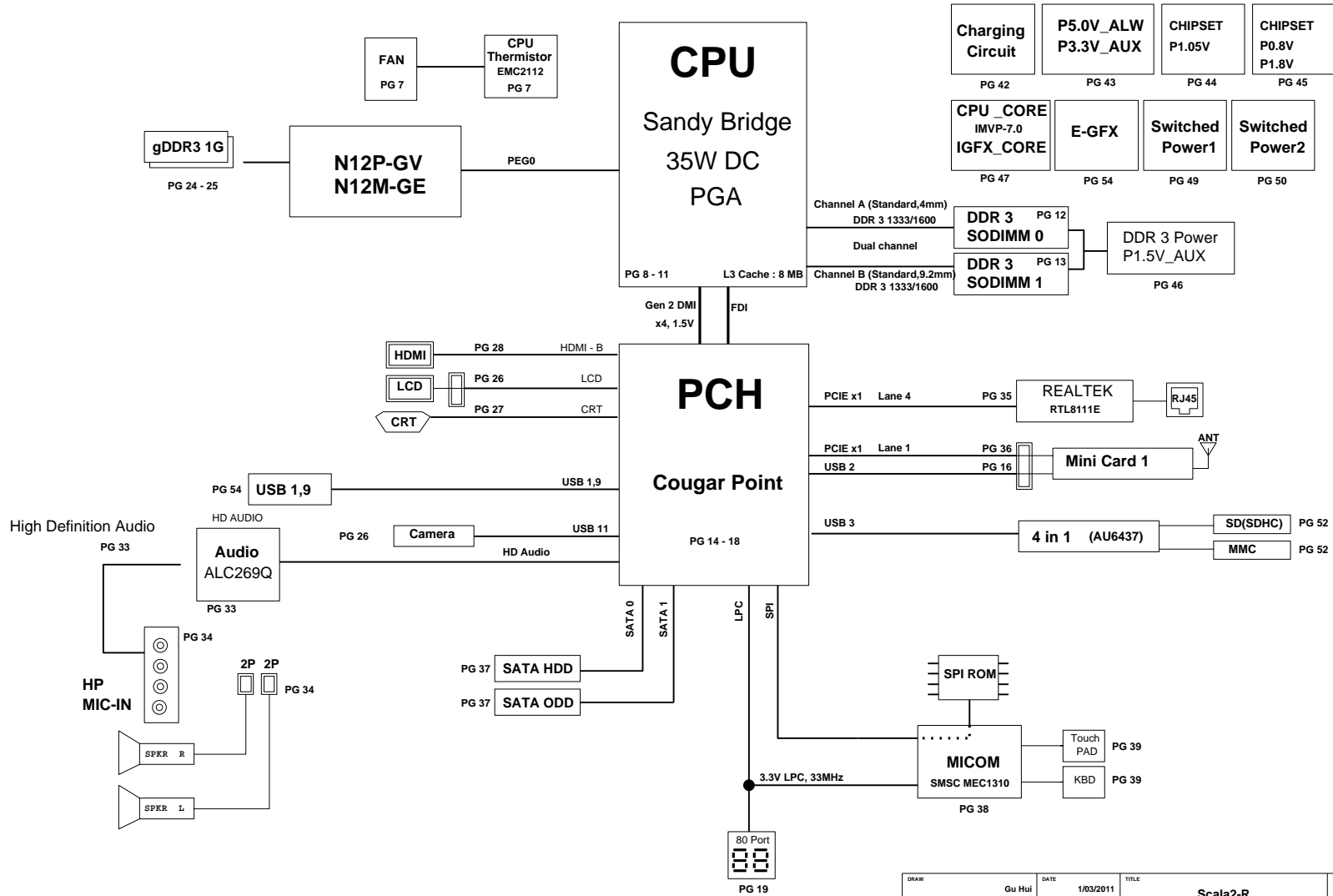
Owner : SRDC PD3

Signature : *GUHUI*

- | | |
|------------------------------|--|
| sheet01 : Cover | sheet25 : LVDS/CAMERA |
| sheet02 : BLOCK DIAGRAM | sheet26 : CRT |
| sheet03 : BOARD INFORMATION | sheet27 : HDMI |
| sheet04 : POWER DIAGRAM | sheet28 : Audio - ALC269 |
| sheet05 : CLOCK DISTRIBUTION | sheet29 : Audio - HP/MIC |
| sheet06 : Thermal Sensor | sheet30 : LAN (Realtek RTL8111E) |
| sheet07 : CPU | sheet31 : WLAN |
| sheet08 : CPU | sheet32 : SATA interface |
| sheet09 : CPU | sheet33 : MICOM / BIOS |
| sheet10 : CPU | sheet34 : MICOM Glue Logic (KBD / TP) |
| sheet11 : DDR3 SODIMM #0 | sheet35 : USB connector |
| sheet12 : DDR3 SODIMM #1 | sheet36 : Power - charger |
| sheet13 : PCH-CougarPoint | sheet37 : Power - P3.3V_AUX / P5.0V_AUX |
| sheet14 : PCH-CougarPoint | sheet38 : Power - P1.05V (Chipset Power) |
| sheet15 : PCH-CougarPoint | sheet39 : Power - P0.8V (Chipset Power) |
| sheet16 : PCH-CougarPoint | sheet40 : Power - DDR3 |
| sheet17 : PCH-CougarPoint | sheet41 : Power - CPU VRM |
| 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	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	COVER		PART NO. BA41-01XXXXA
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	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	BLOCK DIAGRAM	PART NO.	BA41-01XXXXA
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	Primary DC system power supply (7 to 21V)	S4 - S5
P3.3V_MICOM	3.3V always power rail (for Micom)	
P5.0V_STB	5.0V always power rail	
P5.0V_ALW	5.0V always power rail	
P3.3V_ALW	3.3V always power rail	
P12.0V_ALW	12.0V always power rail	
P5.0V_AUX	5.0V switched on power rail (off in S4-S5)	S3
P3.3V_AUX	3.3V switched on power rail (off in S4-S5)	
P1.5V_AUX	1.5V power rail for DDR3 (off in S4-S5)	
P5.0V	5.0V switched power rail (off in S3-S5)	S0
P3.3V	3.3V switched power rail (off in S3-S5)	
P1.8V	1.8V switched power rail (off in S3-S5)	
P1.5V	1.5V switched power rail (off in S3-S5)	
P0.75V	0.75V power rail for DDR3 (off in S3-S5)	
P0.8V	0.8V switched power rail (off in S3-S5)	
VCC_CORE	Core Voltage for CPU	S0
EGFX_CORE	Core Voltage for GPU	
P1.05V (VCCP)	VCC for COUGARPOINT	
P3.3V_D	3.3V discrete power rail for N12X	
P1.5V_D	1.5V discrete power rail for N12X	
P1.05V_D	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 Panel Detect (TBD)

Devices	Resolution	PANNEL_DETECT_0

I²C / SMB Address

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

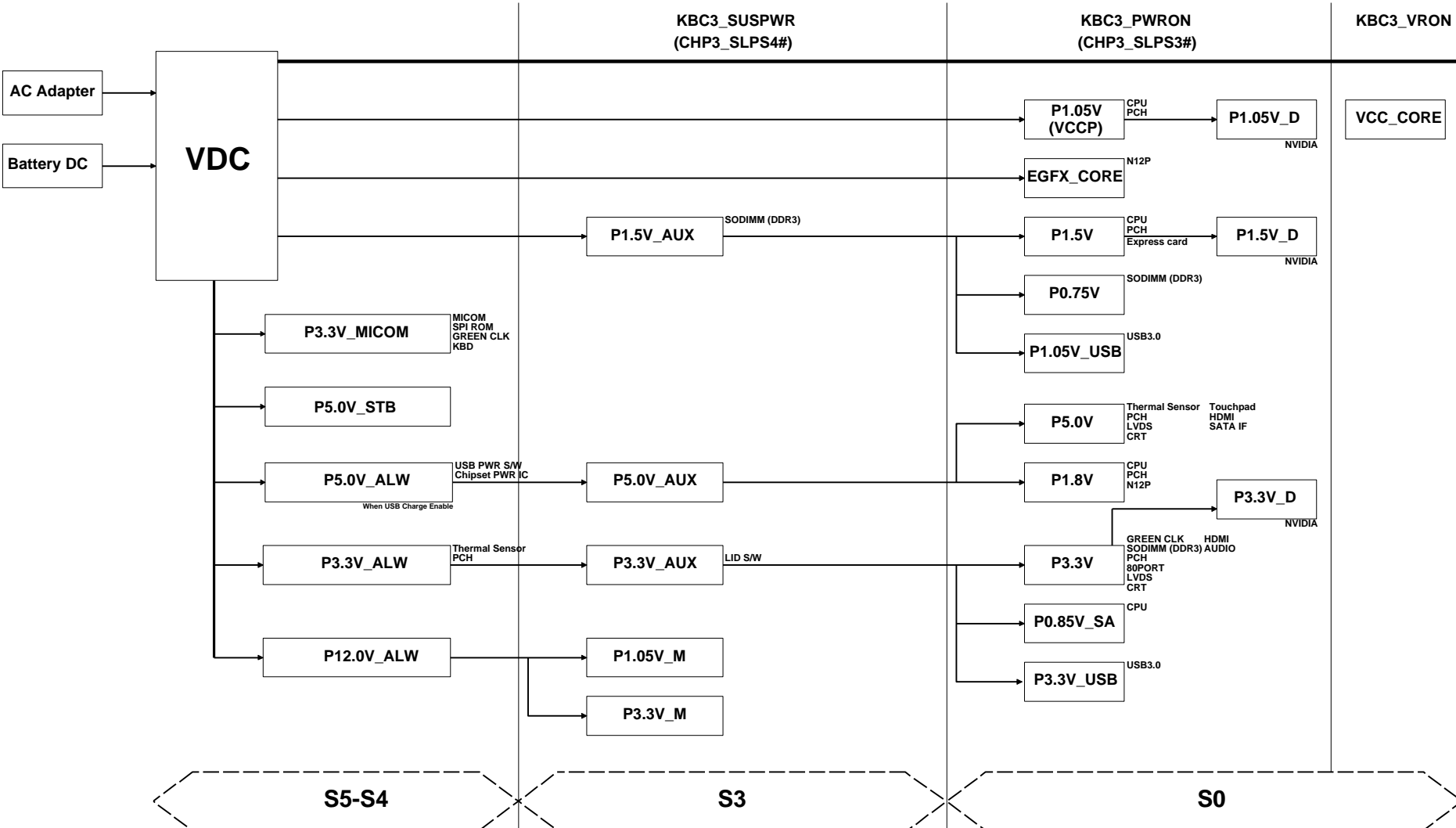
USB PORT Assign		PCI Express Assign	
PORT #	ASSIGNED TO	PORT #	ASSIGNED TO
0	NC	1	Mini Card 1 (WLAN)
1	SYSTEM PORT 0	2	NC
2	Mini PCI Express	3	NC
3	Multi Memory Card Controller	4	LAN CONTROLLER
4	NC	5	USB 3.0
5	NC	6	NC
6	NC (N/A WITH HM55)	7	NC
7	NC (N/A WITH HM55)	8	NC
8	Camera		
9	SYSTEM PORT 1		
10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

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 <small>PART NO.</small> BA41-01XXXXA	
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	3	OF	48

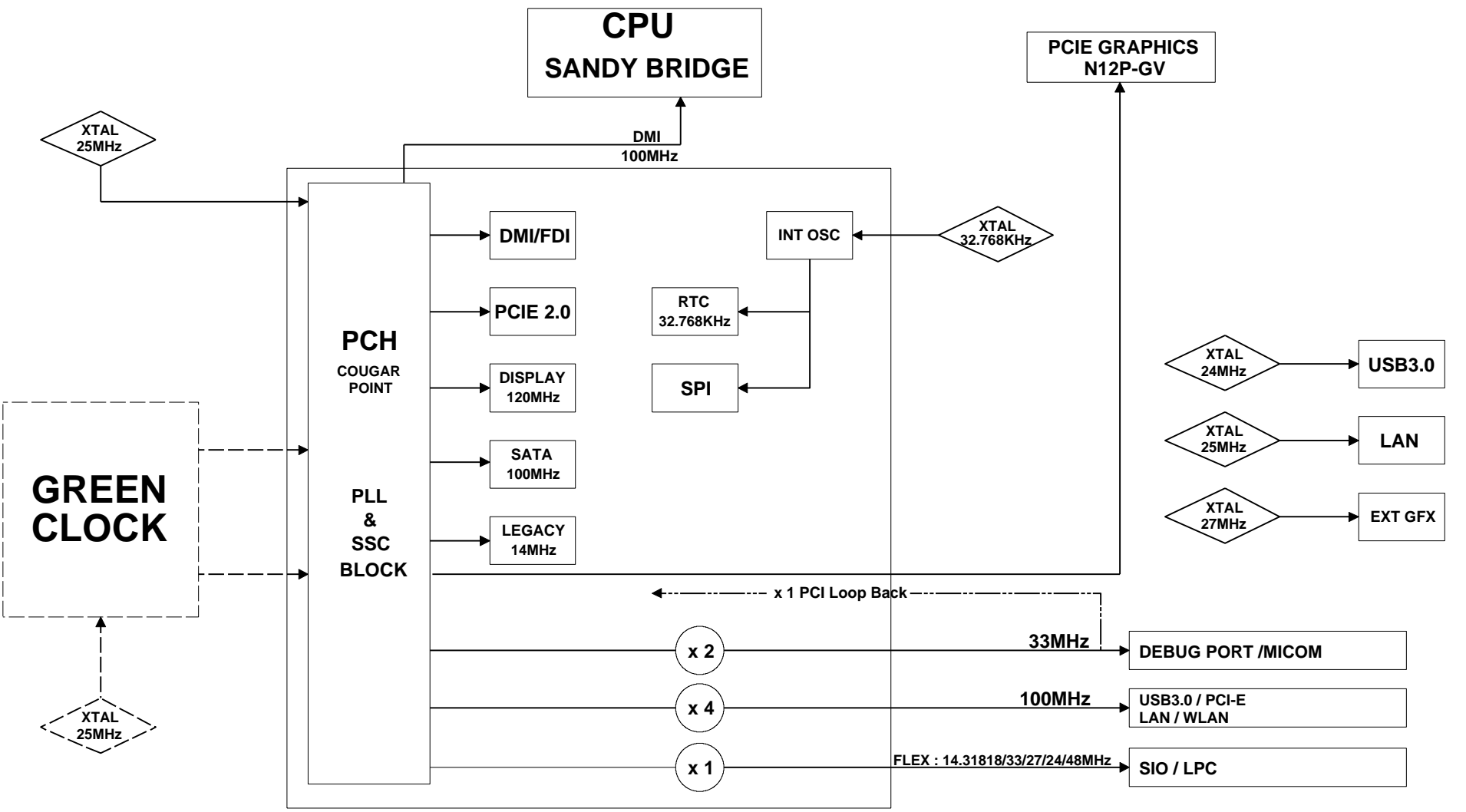
POWER DIAGRAM

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.	BA41-01XXXX
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	4	OF 48

CLOCK DISTRIBUTION Rev. 0.8

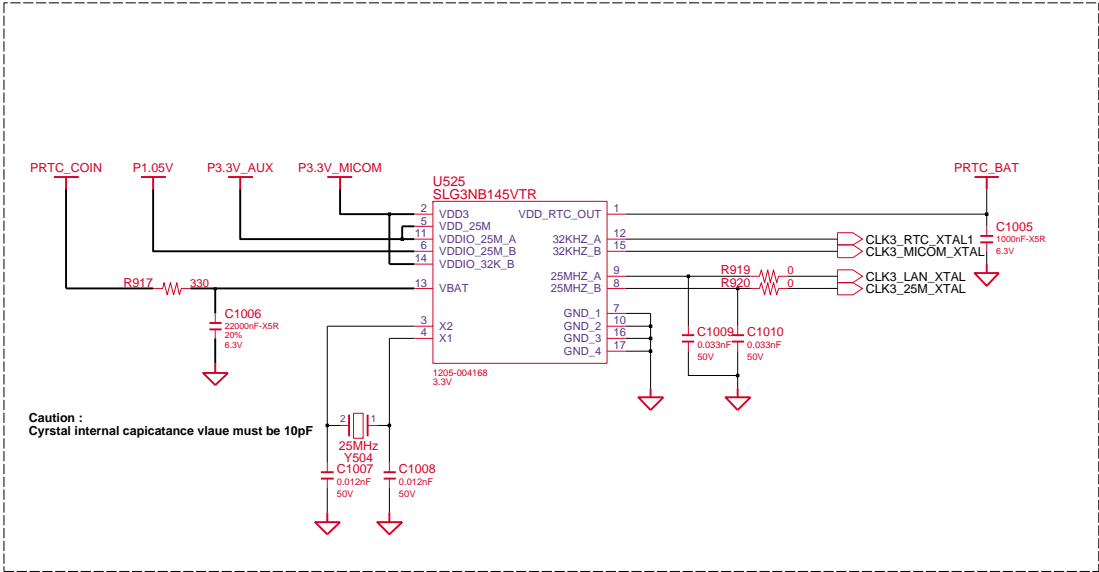


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R MAIN	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	CLOCK DIAGRAM	PART NO. BA41-01XXXX	
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	5 OF 48

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CLOCK DISTIBUTOR



Caution :
Crystal internal capacitance vlaue must be 10pF

GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK

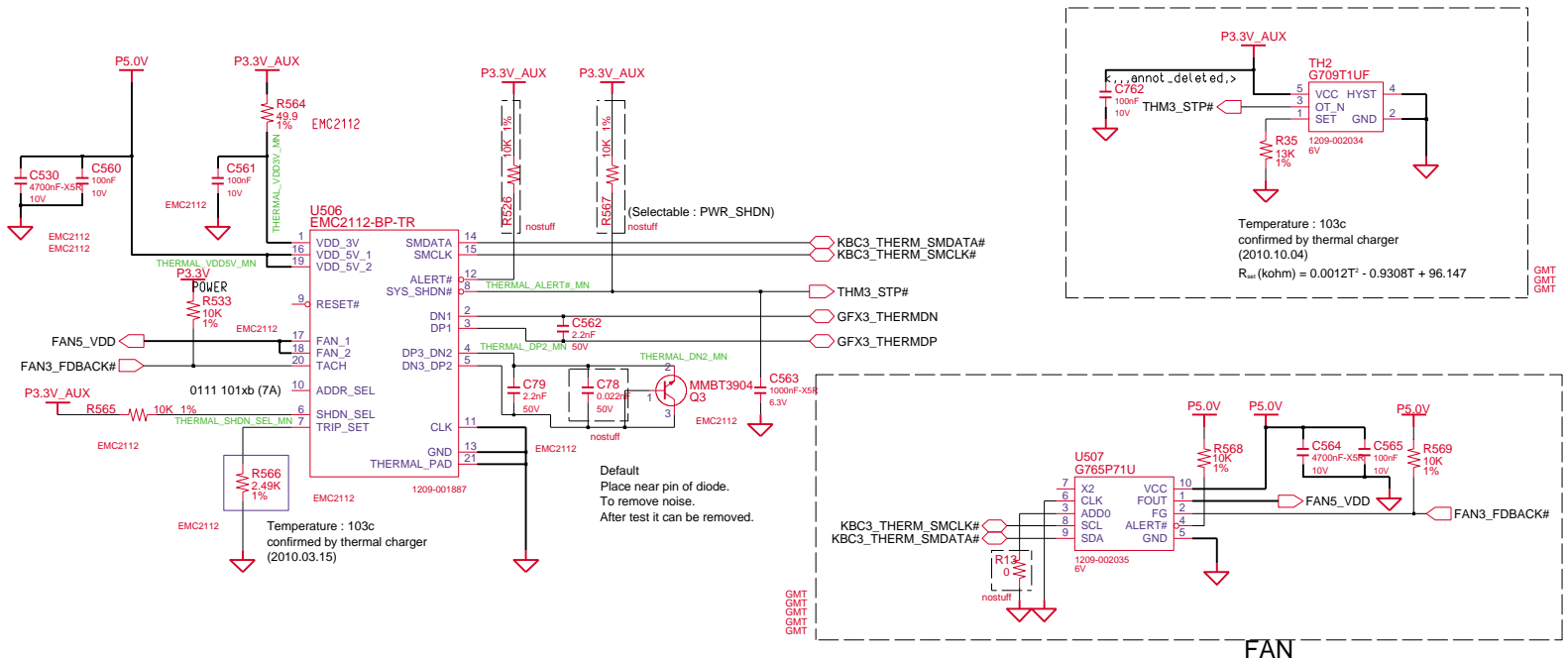
ENGINEER	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXX
DESIGNED BY	short_date	SCALA2-R_PV_MAIN	
CHANGED BY	REV	Module Name	
PPG: CHK	LAST EDIT	1.0	
		last_edit	PAGE 6 OF XX

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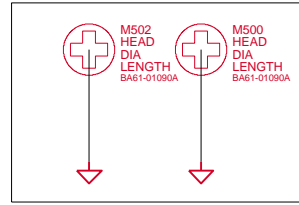
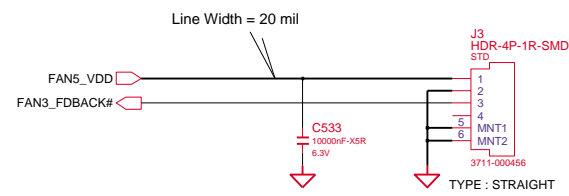
THERMAL SENSOR & FAN CONTROL

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



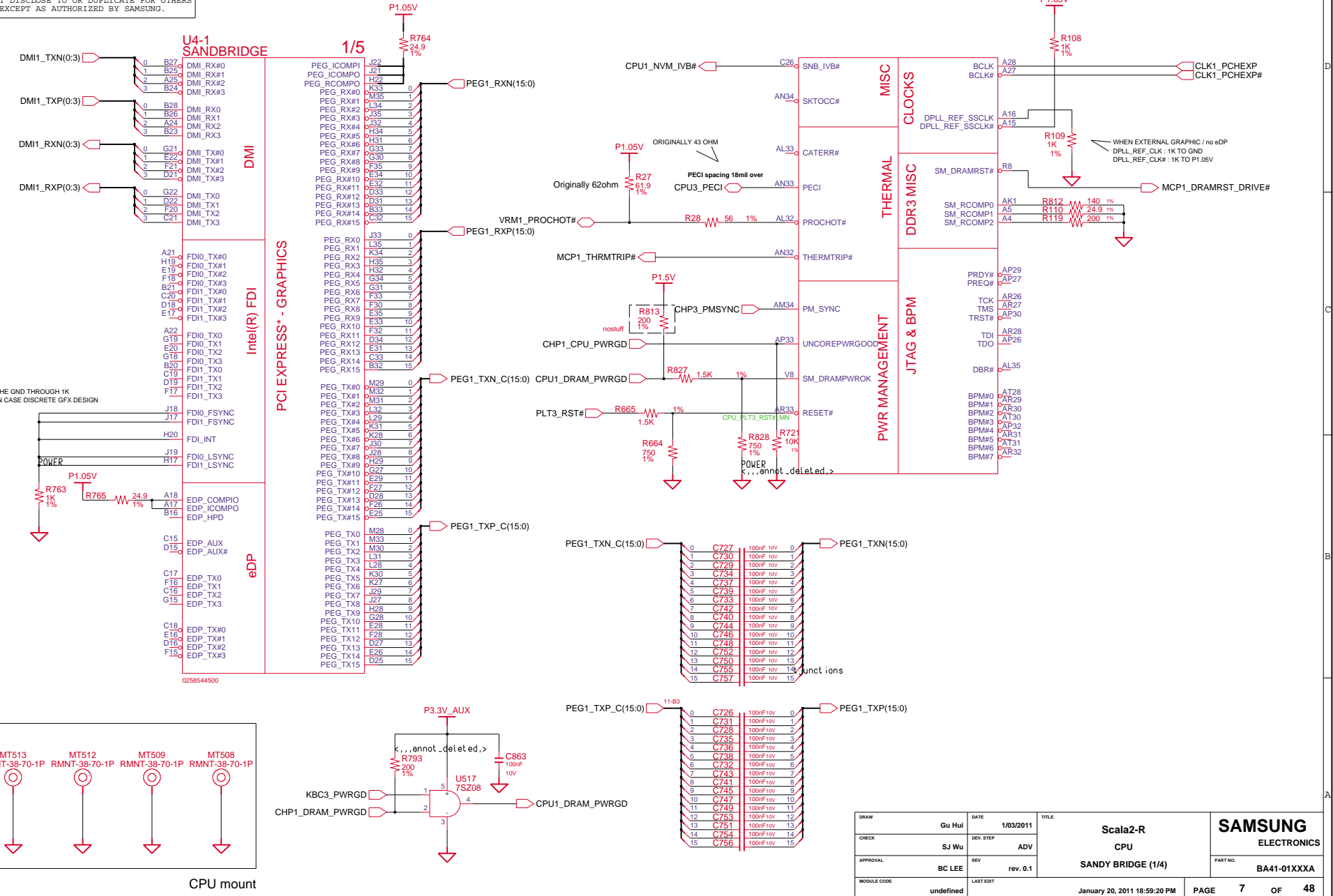
Default
Place near pin of diode.
To remove noise.
After test it can be removed.



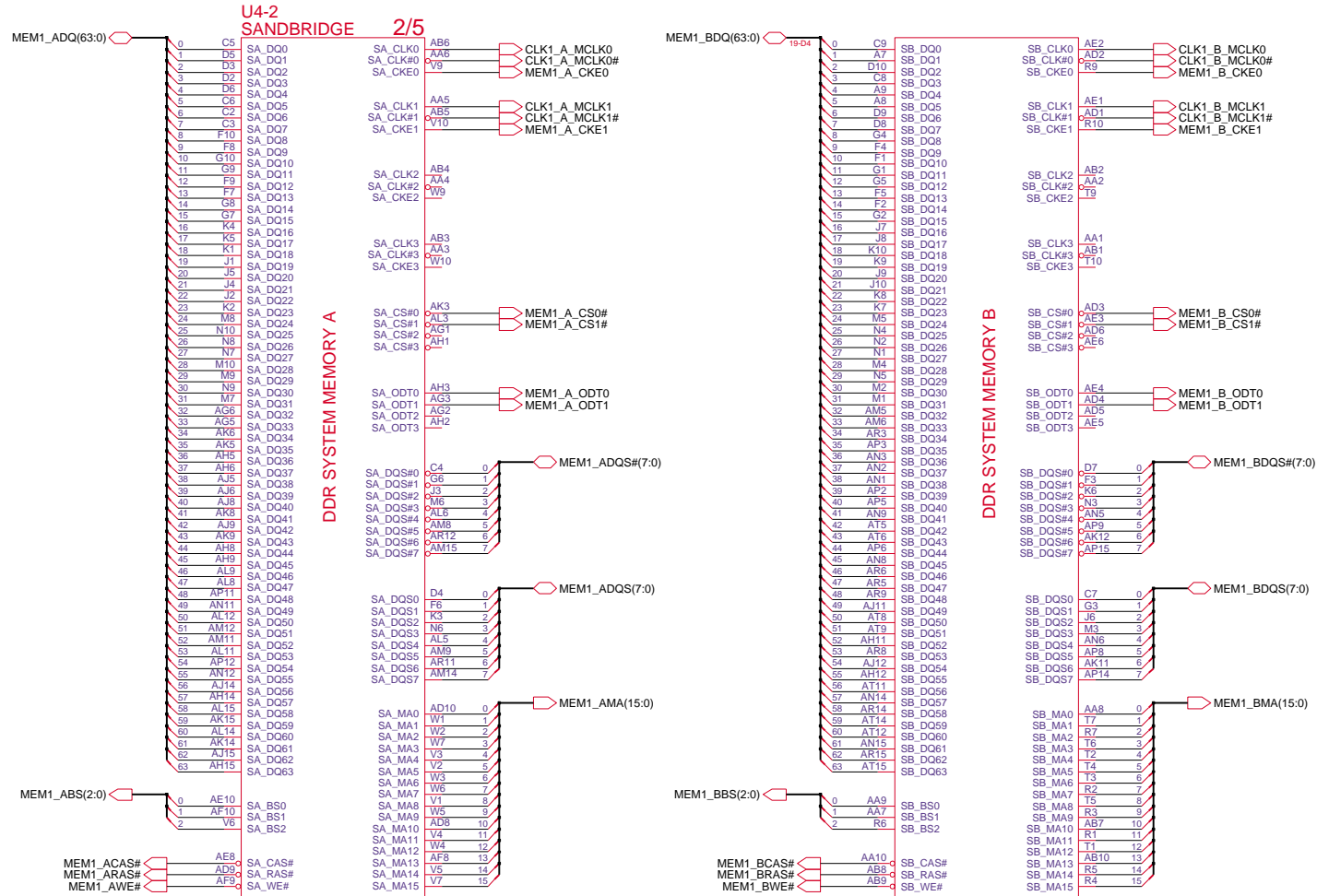
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CHECK	SJ Wu	DEV. STEP	ADV		THERMAL SENSOR	
APPROVAL	BC LEE	REV	rev. 0.1		THERMAL SENSOR EMC2112	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 6 OF 48

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SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	CPU	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	SANDY BRIDGE (1/4)	BA41-01XXXX	
MODULE CODE	undefined	LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	7 OF 48

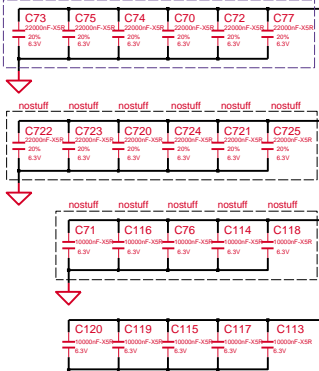


0258544500

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R CPU	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
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	8 OF 48

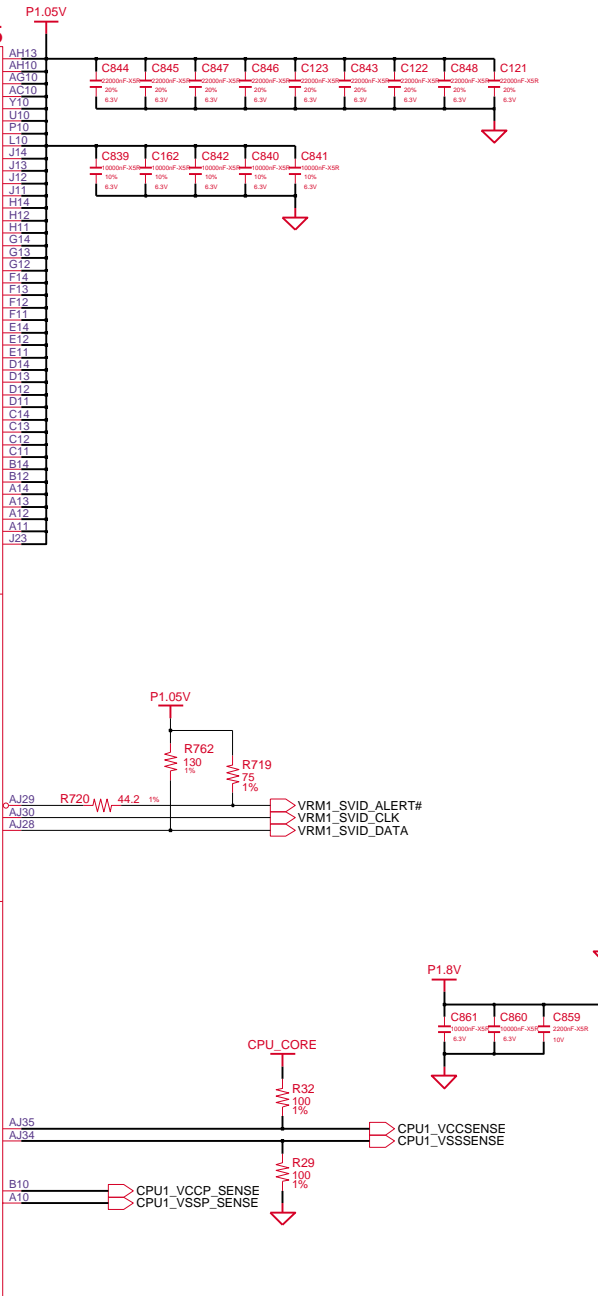
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Quadcore : Stuft
 Dualcore : nostuff



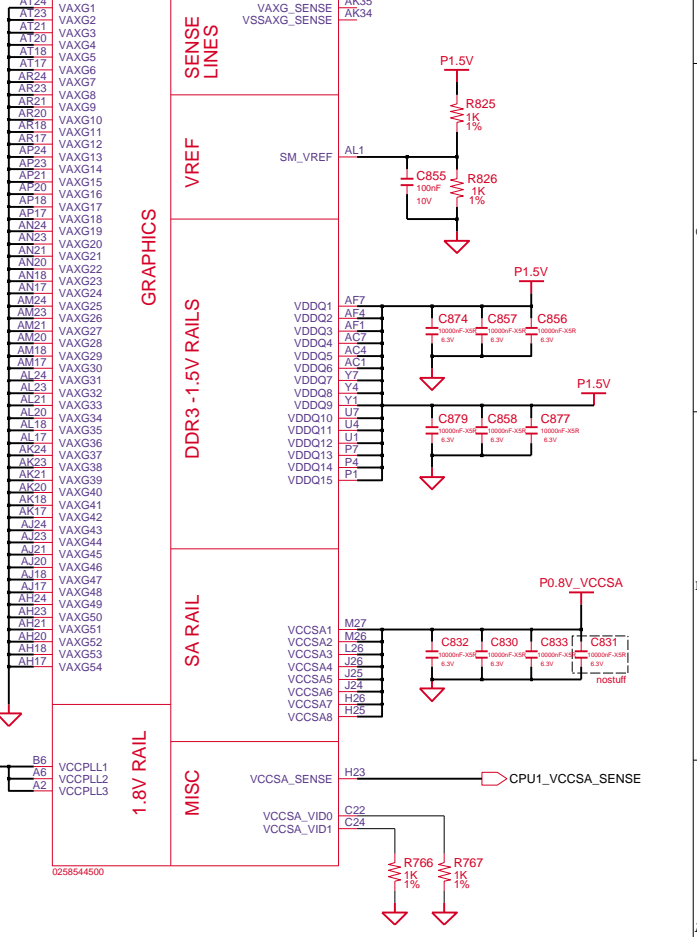
CPU CORE U4-3 SANDBRIDGE 3/5

- AG35 VCC1
- AG34 VCC2
- AG33 VCC3
- AG32 VCC4
- AG31 VCC5
- AG30 VCC6
- AG29 VCC7
- AG28 VCC8
- AG27 VCC9
- AG26 VCC10
- AF35 VCC11
- AF34 VCC12
- AF33 VCC13
- AF32 VCC14
- AF31 VCC15
- AF30 VCC16
- AF29 VCC17
- AF28 VCC18
- AF27 VCC19
- AD35 VCC20
- AD34 VCC21
- AD33 VCC22
- AD32 VCC23
- AD31 VCC24
- AD30 VCC25
- AD29 VCC26
- AD28 VCC27
- AD27 VCC28
- AD26 VCC29
- AC35 VCC30
- AC34 VCC31
- AC33 VCC32
- AC32 VCC33
- AC31 VCC34
- AC30 VCC35
- AC29 VCC36
- AC28 VCC37
- AC27 VCC38
- AC26 VCC39
- AA35 VCC40
- AA34 VCC41
- AA33 VCC42
- AA32 VCC43
- AA31 VCC44
- AA30 VCC45
- AA29 VCC46
- AA28 VCC47
- AA27 VCC48
- AA26 VCC49
- Y34 VCC50
- Y34 VCC51
- Y33 VCC52
- Y32 VCC53
- Y31 VCC54
- Y30 VCC55
- Y29 VCC56
- Y28 VCC57
- Y27 VCC58
- Y26 VCC59
- Y25 VCC60
- Y34 VCC61
- Y33 VCC62
- Y32 VCC63
- Y31 VCC64
- Y30 VCC65
- Y29 VCC66
- Y28 VCC67
- Y27 VCC68
- Y26 VCC69
- Y25 VCC70
- Y24 VCC71
- Y24 VCC72
- Y23 VCC73
- Y22 VCC74
- Y21 VCC75
- Y20 VCC76
- Y19 VCC77
- Y18 VCC78
- Y17 VCC79
- Y16 VCC80
- R35 VCC81
- R34 VCC82
- R33 VCC83
- R32 VCC84
- R31 VCC85
- R30 VCC86
- R29 VCC87
- R28 VCC88
- R27 VCC89
- R26 VCC90
- R25 VCC91
- R24 VCC92
- R23 VCC93
- R22 VCC94
- R21 VCC95
- R20 VCC96
- R19 VCC97
- R18 VCC98
- R17 VCC99
- R16 VCC100



U4-4 SANDBRIDGE 4/5

- AT24 VAXG1
- AT23 VAXG2
- AT21 VAXG3
- VAXG4
- AT17 VAXG5
- AR24 VAXG6
- VAXG7
- VAXG8
- AR23 VAXG9
- VAXG10
- VAXG11
- VAXG12
- AP24 VAXG13
- AP23 VAXG14
- AP21 VAXG15
- AP20 VAXG16
- AP18 VAXG17
- AP17 VAXG18
- VAXG19
- AN21 VAXG20
- VAXG21
- AN20 VAXG22
- VAXG23
- AM24 VAXG24
- VAXG25
- AM23 VAXG26
- VAXG27
- AM18 VAXG28
- AM17 VAXG29
- VAXG30
- AL24 VAXG31
- AL23 VAXG32
- AL21 VAXG33
- AL20 VAXG34
- VAXG35
- AL17 VAXG36
- VAXG37
- VAXG38
- VAXG39
- AK23 VAXG40
- AK18 VAXG41
- AK15 VAXG42
- AJ24 VAXG43
- AJ23 VAXG44
- AJ21 VAXG45
- VAXG46
- AJ20 VAXG47
- AH24 VAXG48
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- AH21 VAXG50
- VAXG51
- VAXG52
- AH18 VAXG53
- VAXG54

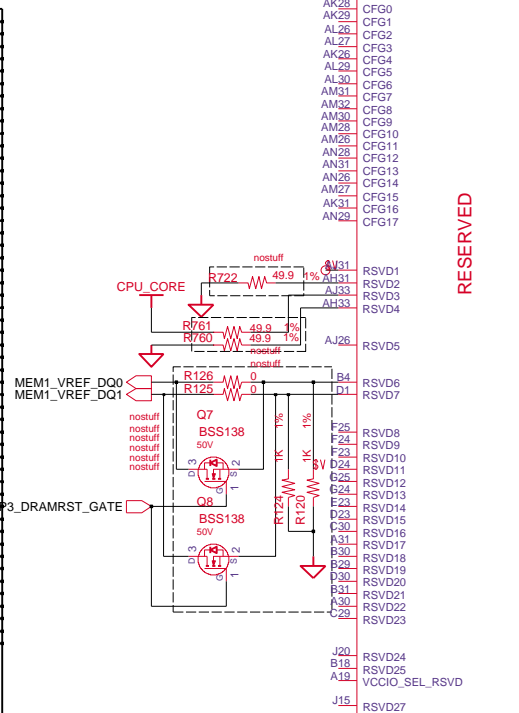


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scal a2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	REV. STEP	ADV		CPU	
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (3/4)	PART NO. BA11-01XXXX
MODULE CODE		LAST EDIT				PAGE 9 OF 48

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**U4-5
 SANDBRIDGE 5/5**

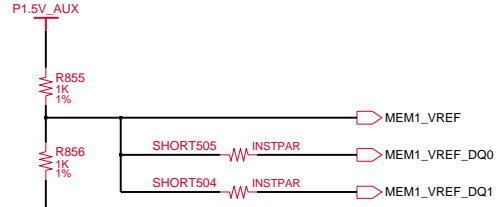
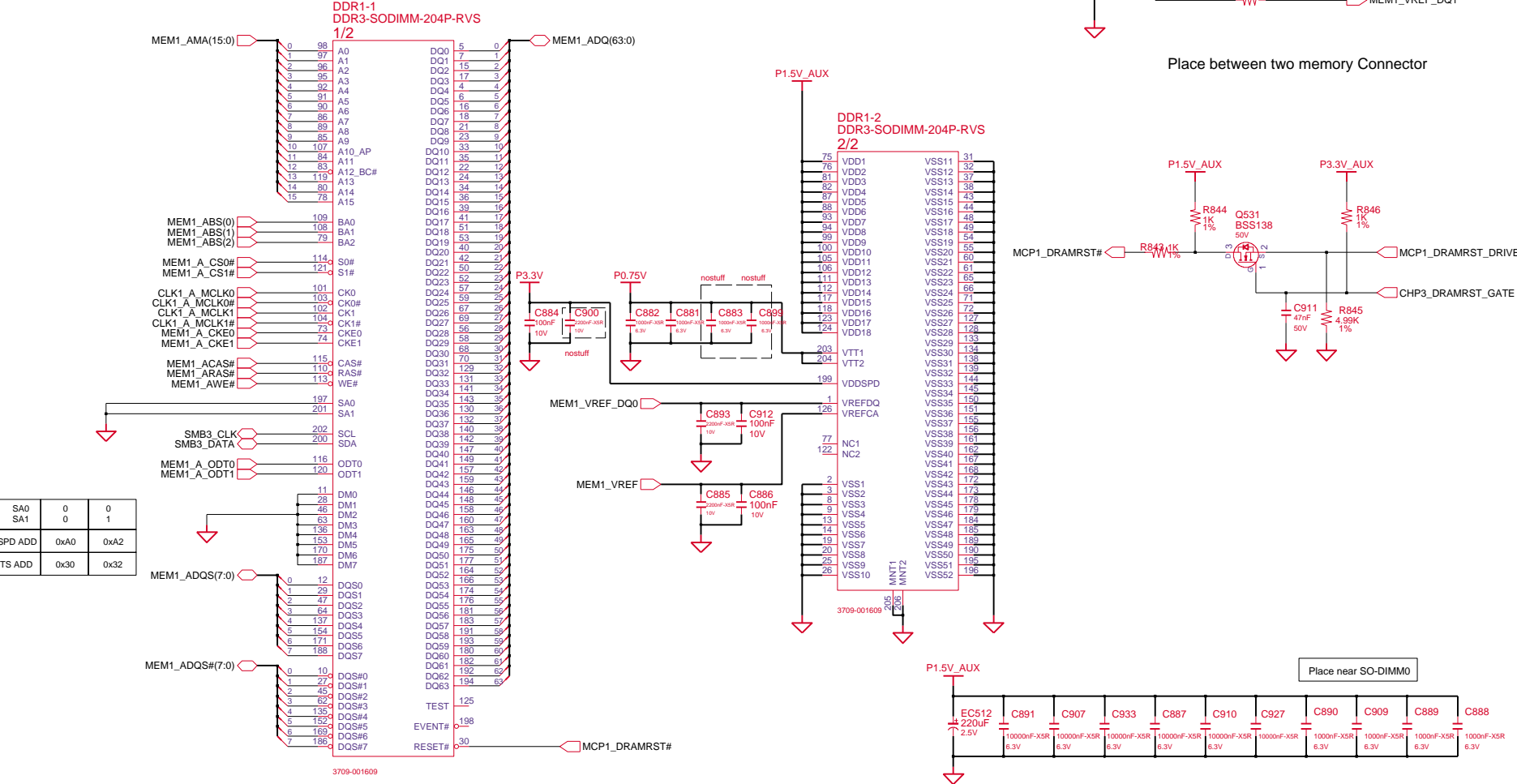
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AT32	VSS2	VSS82	AJ19	T34	VSS162	F19	AK29
AT29	VSS3	VSS83	AJ16	T33	VSS163	E30	AK26
AT27	VSS4	VSS84	AJ13	T32	VSS164	E27	AK27
AT25	VSS5	VSS85	AJ10	T31	VSS165	E24	AK28
AT22	VSS6	VSS86	AJ7	T30	VSS166	E21	AK29
AT19	VSS7	VSS87	AJ4	T29	VSS167	E18	AK30
AT16	VSS8	VSS88	AJ3	T28	VSS167	E15	AK31
AT13	VSS9	VSS89	AJ2	T27	VSS168	E13	AK31
AT10	VSS10	VSS90	AH35	T26	VSS169	E10	AK28
AT7	VSS11	VSS91	AH34	P8	VSS170	E9	AM31
AT4	VSS12	VSS92	AH30	P6	VSS171	E8	AM32
AT3	VSS13	VSS93	AH29	P5	VSS172	E7	AM33
AR35	VSS14	VSS94	AH29	P4	VSS173	E6	AM28
AR22	VSS15	VSS95	AH28	P2	VSS174	E5	AM28
AR19	VSS16	VSS96	AH25	N3	VSS175	E4	AM28
AR16	VSS17	VSS97	AH22	N3	VSS176	E3	AM28
AR13	VSS18	VSS98	AH19	N3	VSS177	E2	AM28
AR10	VSS19	VSS99	AH19	N3	VSS178	E1	AM28
AR7	VSS20	VSS100	AH16	N3	VSS179	D35	AM28
AR4	VSS21	VSS101	AH7	N29	VSS180	D32	AM28
AR2	VSS22	VSS102	AH7	N27	VSS181	D28	AM28
AP34	VSS23	VSS103	AG8	N27	VSS182	D26	AM28
AP31	VSS24	VSS104	AG8	N26	VSS183	D20	AM28
AP28	VSS25	VSS105	AG8	N26	VSS184	D17	AM28
AP25	VSS26	VSS106	AG4	N26	VSS186	C34	AM28
AP22	VSS27	VSS107	AF6	N26	VSS187	C28	AM28
AP19	VSS28	VSS108	AF6	N26	VSS188	C27	AM28
AP16	VSS29	VSS109	AF3	N26	VSS189	C26	AM28
AP13	VSS30	VSS110	AF2	N26	VSS190	C23	AM28
AP10	VSS31	VSS111	AF2	N26	VSS191	C10	AM28
AP4	VSS32	VSS112	AE35	L6	VSS192	C1	AM28
AP1	VSS33	VSS113	AE32	L5	VSS193	B22	AM28
AN30	VSS34	VSS114	AE32	L4	VSS194	B17	AM28
AN27	VSS35	VSS115	AE31	L4	VSS195	B19	AM28
AN25	VSS36	VSS116	AE29	L2	VSS196	B15	AM28
AN22	VSS37	VSS117	AE28	L1	VSS197	B13	AM28
AN19	VSS38	VSS118	AE27	K35	VSS198	B11	AM28
AN16	VSS39	VSS119	AE26	K32	VSS199	B9	AM28
AN13	VSS40	VSS120	AD7	K29	VSS200	B8	AM28
AN10	VSS41	VSS121	AD7	K29	VSS201	B7	AM28
AN7	VSS42	VSS122	AD7	J34	VSS202	B5	AM28
AN4	VSS43	VSS123	AC8	J31	VSS203	B3	AM28
AM29	VSS44	VSS124	AC8	H33	VSS204	B2	AM28
AM25	VSS45	VSS125	AC5	H30	VSS205	A35	AM28
AM19	VSS46	VSS126	AC5	H27	VSS206	A32	AM28
AM16	VSS47	VSS127	AC2	H24	VSS207	A29	AM28
AM13	VSS48	VSS128	AC2	H21	VSS208	A28	AM28
AM10	VSS49	VSS129	AB35	H18	VSS209	A23	AM28
AM7	VSS50	VSS130	AB33	H15	VSS210	A20	AM28
AM4	VSS51	VSS131	AB32	H13	VSS211	A18	AM28
AM3	VSS52	VSS132	AB31	H10	VSS212	A15	AM28
AM2	VSS53	VSS133	AB30	H9	VSS213	A15	AM28
AM1	VSS54	VSS134	AB29	H8	VSS214	A15	AM28
AL34	VSS55	VSS135	AB28	H7	VSS215	A15	AM28
AL31	VSS56	VSS136	AB27	H6	VSS216	A15	AM28
AL28	VSS57	VSS137	AB26	H5	VSS217	A15	AM28
AL25	VSS58	VSS138	Y8	H4	VSS218	A15	AM28
AL22	VSS59	VSS139	Y8	H3	VSS219	A15	AM28
AL19	VSS60	VSS140	Y6	H2	VSS220	A15	AM28
AL16	VSS61	VSS141	Y6	H1	VSS221	A15	AM28
AL13	VSS62	VSS142	Y5	V3	VSS222	A15	AM28
AL10	VSS63	VSS143	Y2	G32	VSS223	A15	AM28
AL7	VSS64	VSS144	W35	G29	VSS224	A15	AM28
AL4	VSS65	VSS145	W34	G26	VSS225	A15	AM28
AK33	VSS66	VSS146	W32	G20	VSS226	A15	AM28
AK30	VSS67	VSS147	W31	G17	VSS227	A15	AM28
AK27	VSS68	VSS148	W28	E31	VSS228	A15	AM28
AK25	VSS69	VSS149	W27	E28	VSS229	A15	AM28
AK22	VSS70	VSS150	W27	E27	VSS230	A15	AM28
AK19	VSS71	VSS151	W26	E26	VSS231	A15	AM28
AK16	VSS72	VSS152	W26	E25	VSS232	A15	AM28
AK13	VSS73	VSS153	W26	E24	VSS233	A15	AM28
AK10	VSS74	VSS154	W26	E23		A15	AM28
AK7	VSS75	VSS155	W26	E22		A15	AM28
AK4	VSS76	VSS156	W26	E21		A15	AM28
AJ25	VSS77	VSS157	W26	E20		A15	AM28
	VSS78	VSS158	W26	E19		A15	AM28
	VSS79	VSS159	W26	E18		A15	AM28
	VSS80	VSS160	W26	E17		A15	AM28



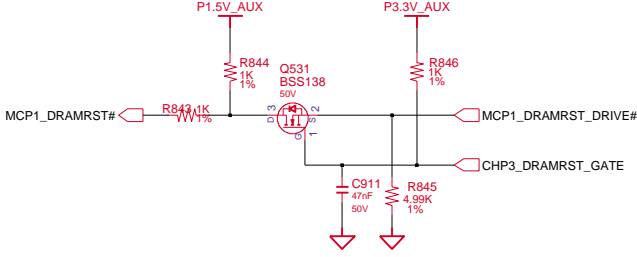
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SO-DIMM#0 : 2nd SO-DIMM

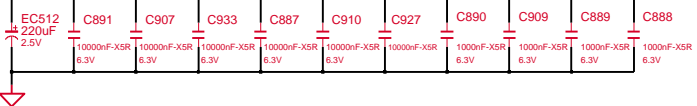
DDR SO-DIMM #0
 Height : 9.2 mm (REVERSE)
 P/N : 3709-001609 (CONCRAFT)
 P/N : 3709-001656 (Foxconn)



Place between two memory Connector



Place near SO-DIMM0

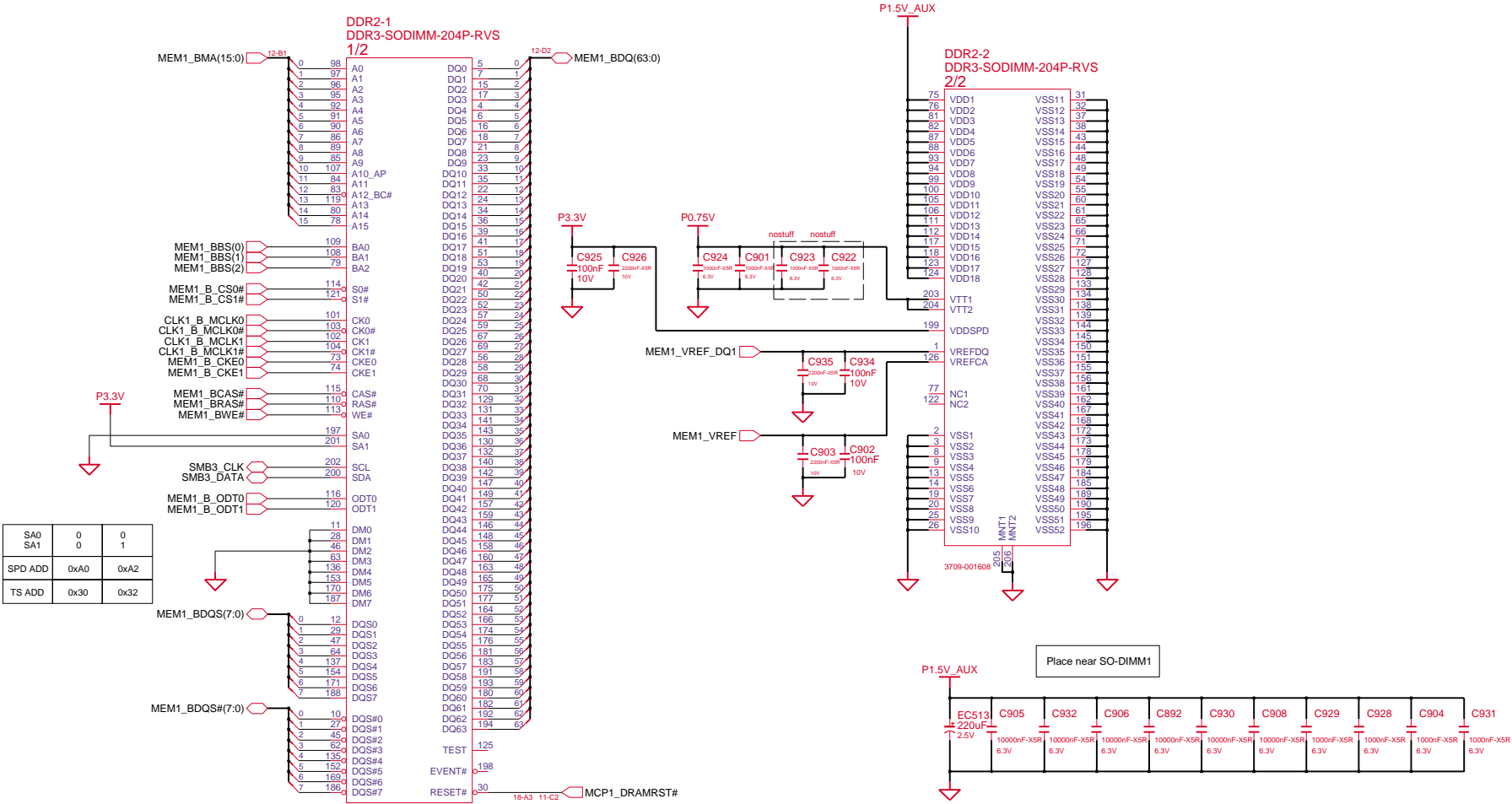


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R SODIMM A	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
CHECK	SJ Wu	DEV_STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE	11 OF 48

SO-DIMM#1 : 1st SO-DIMM

DDR SO-DIMM #1

Height : 4 mm (REVERSE)
 P/N : 3709-001608 (CONCRAFT)
 P/N : 3709-001654 (Foxconn)

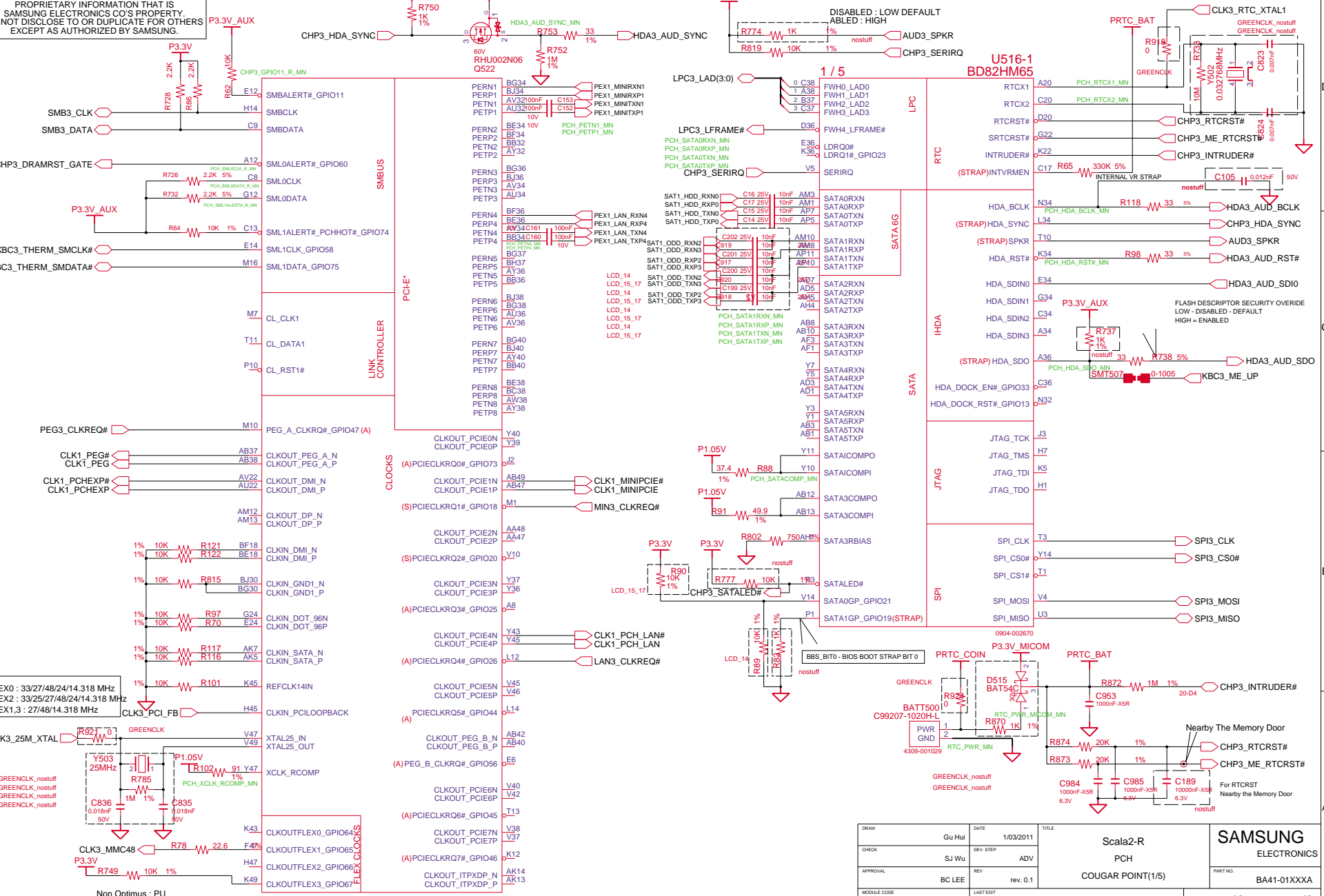


3709-001608

DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV		SODIMM B	
APPROVAL	BC LEE	REV	rev. 0.1		DDR3	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				PAGE 12 OF 48
				January 20, 2011 18:59:20 PM	PAGE 12 OF 48	

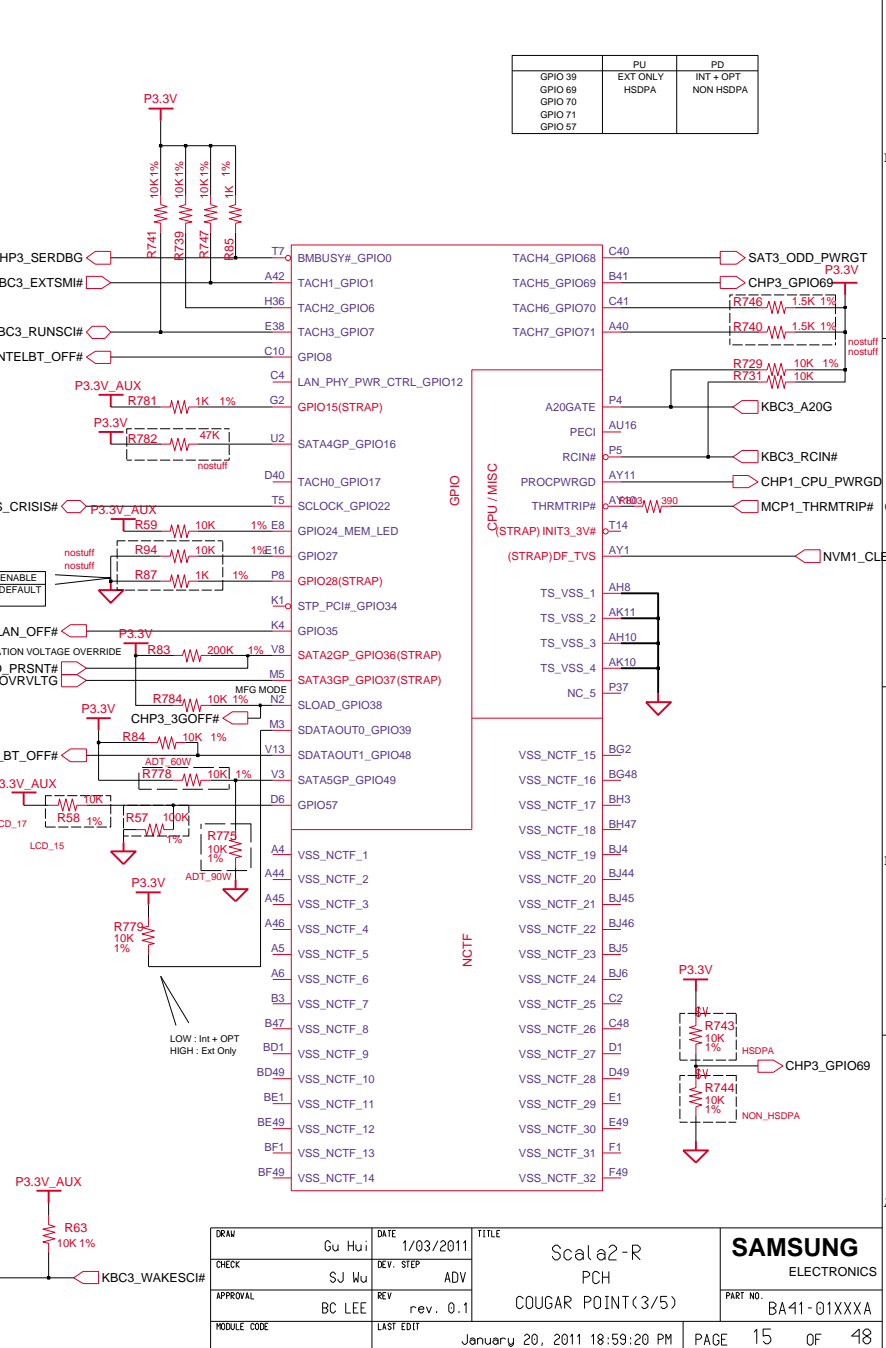
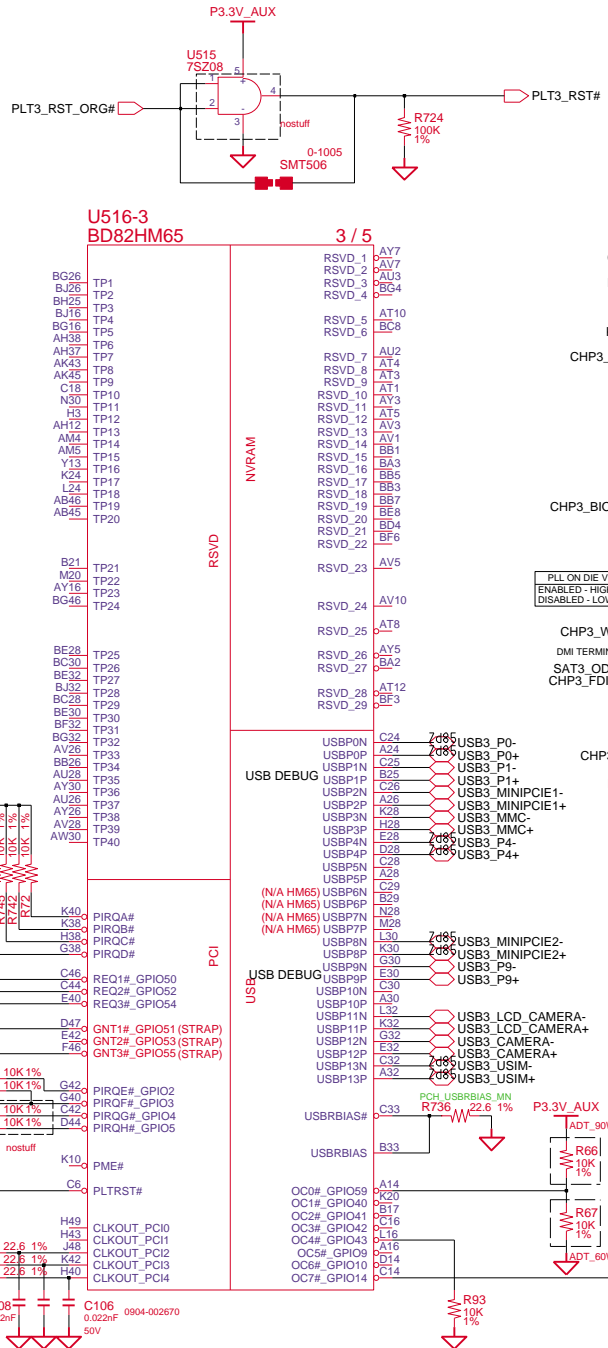
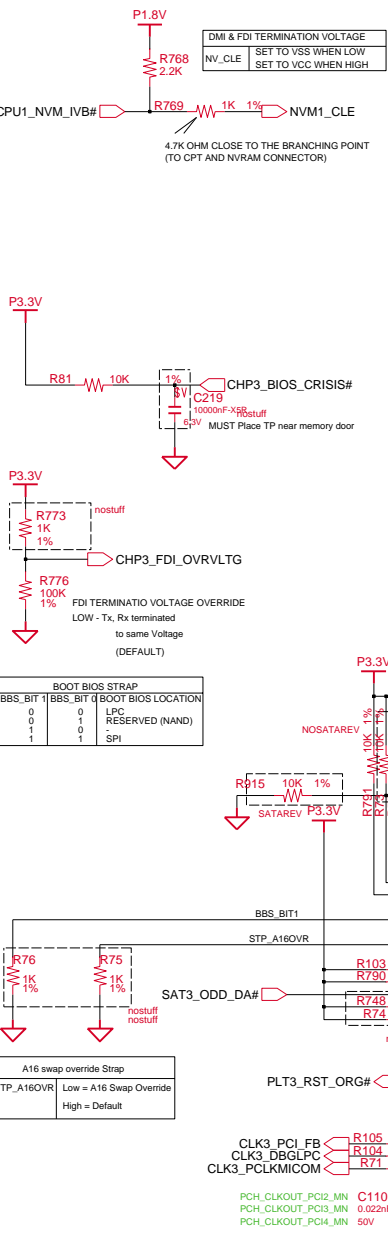
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NO REBOOT STRAP



DRAW	DATE	TITLE	SAMSUNG ELECTRONICS
Gu Hui	1/03/2011	Scala2-R	
CHECK	DEV STEP	ADV	PART NO. BA41-01XXXXA
SJ Wu			
APPROVAL	REV	rev. 0.1	PAGE 13 OF 48
BC LEE			
MODULE CODE	LAST EDIT		January 20, 2011 18:59:20 PM

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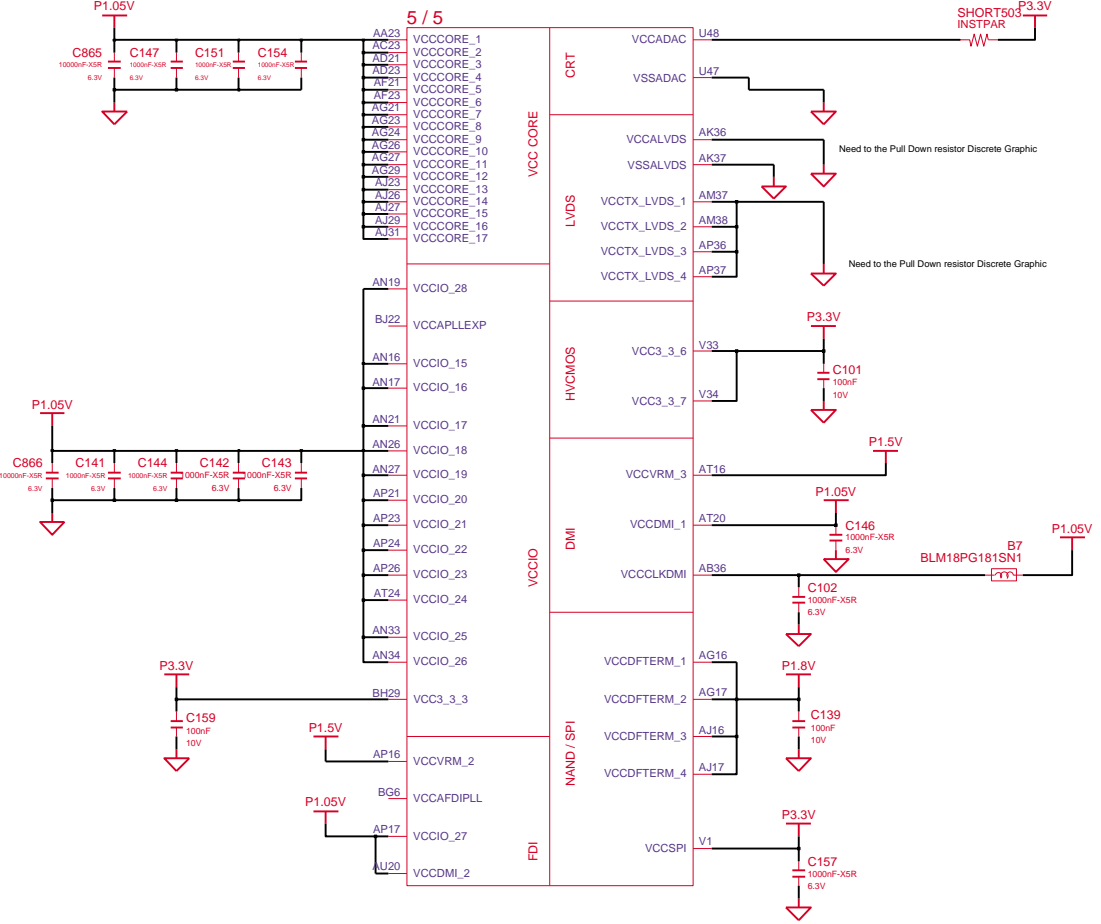


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**U516-5
 BD82HM65**

AY4	VSS159	VSS259	H46
AY42	VSS160	VSS260	K26
AY46	VSS161	VSS261	K26
AY8	VSS162	VSS262	K39
B11	VSS163	VSS263	K46
B15	VSS164	VSS264	L18
B19	VSS165	VSS265	L18
B23	VSS166	VSS266	L2
B27	VSS167	VSS267	L20
B31	VSS168	VSS268	L26
B35	VSS169	VSS269	L28
B39	VSS170	VSS270	L36
B7	VSS171	VSS271	L48
45	VSS172	VSS272	M12
BB12	VSS173	VSS273	M18
BB16	VSS174	VSS274	M18
BB20	VSS175	VSS275	M22
BB22	VSS176	VSS276	M24
BB24	VSS177	VSS277	M32
BB28	VSS178	VSS278	M32
BB30	VSS179	VSS279	M34
BB38	VSS180	VSS280	M38
BB4	VSS181	VSS281	M4
BB46	VSS182	VSS282	M46
BC14	VSS183	VSS283	M46
BC18	VSS184	VSS284	M8
BC	VSS185	VSS285	N18
BC22	VSS186	VSS286	N47
BC26	VSS187	VSS287	P20
BC32	VSS188	VSS288	P11
BC34	VSS189	VSS289	P13
BC36	VSS190	VSS290	P40
BC40	VSS191	VSS291	P43
BC42	VSS192	VSS292	P47
BC48	VSS193	VSS293	P47
BC46	VSS194	VSS294	P7
BD5	VSS195	VSS295	R2
BE22	VSS196	VSS296	R48
BE26	VSS197	VSS297	T12
BE40	VSS198	VSS298	T31
BF10	VSS199	VSS299	T37
BF12	VSS200	VSS300	T4
BF16	VSS201	VSS301	W34
BF20	VSS202	VSS302	T46
BF22	VSS203	VSS303	T47
BF24	VSS204	VSS304	T8
BF26	VSS205	VSS305	V11
BF28	VSS206	VSS306	V17
BD3	VSS207	VSS307	V26
BF30	VSS208	VSS308	V27
BF38	VSS209	VSS309	V29
BF40	VSS210	VSS310	V31
BF8	VSS211	VSS311	V36
BE17	VSS212	VSS312	V39
BG21	VSS213	VSS313	V43
BG33	VSS214	VSS314	V7
BG44	VSS215	VSS315	W17
B38	VSS216	VSS316	W19
BH11	VSS217	VSS317	W2
BH15	VSS218	VSS318	W27
BH17	VSS219	VSS319	W45
BH19	VSS220	VSS320	Y12
H10	VSS221	VSS321	Y38
BH27	VSS222	VSS322	Y4
BH31	VSS223	VSS323	Y42
BH33	VSS224	VSS324	Y46
BH35	VSS225	VSS325	Y8
BH39	VSS226	VSS326	BG29
BH43	VSS227	VSS327	N24
BH7	VSS228	VSS328	AJ3
D3	VSS229	VSS329	AD47
D12	VSS230	VSS330	B43
D16	VSS231	VSS331	BE10
D18	VSS232	VSS332	BG41
D22	VSS233	VSS333	BG44
D24	VSS234	VSS334	G14
D26	VSS235	VSS335	H16
D30	VSS236	VSS336	I36
D32	VSS237	VSS337	BG22
D34	VSS238	VSS338	BG24
D36	VSS239	VSS339	C22
D42	VSS240	VSS340	AP13
D8	VSS241	VSS341	M14
E18	VSS242	VSS342	AP3
E26	VSS243	VSS343	AP1
G18	VSS244	VSS344	BE16
G20	VSS245	VSS345	BC16
G26	VSS246	VSS346	BG28
G28	VSS247	VSS347	BJ28
G36	VSS248	VSS348	
G48	VSS249	VSS349	
H12	VSS250	VSS350	
H16	VSS251	VSS351	
H22	VSS252	VSS352	
H24	VSS253	VSS353	
H26	VSS254	VSS354	
H30	VSS255	VSS355	
H32	VSS256	VSS356	
H34	VSS257	VSS357	
F3	VSS258	VSS358	

This power share with thermal sensor

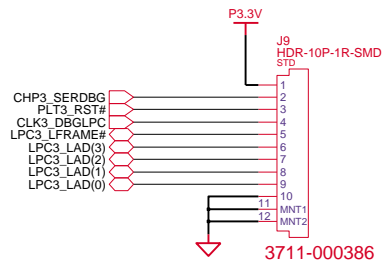


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(5/5)	PART NO. BA41-01XXXX
MODULE CODE	undefined	LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 17 OF 48

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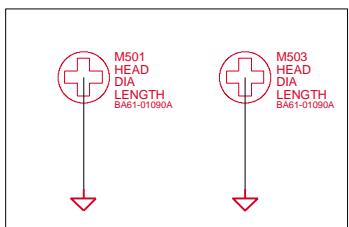
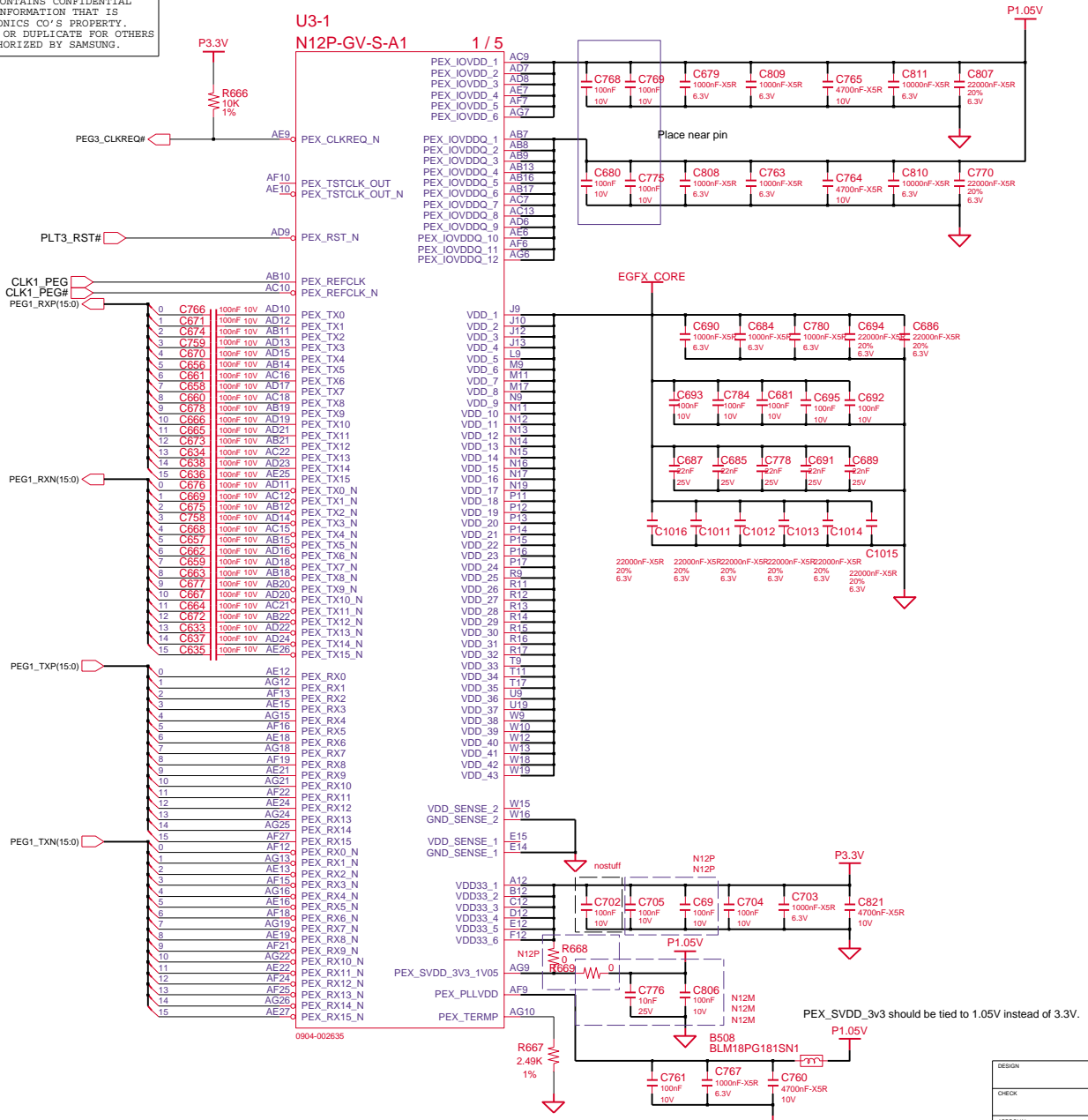
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80H PORT DEBUG



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R DEBUG PORT 80H DECODER	
CHECK	SJ Wu	REV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE 18 OF 48		
					PART NO.	BA11-01XXXX

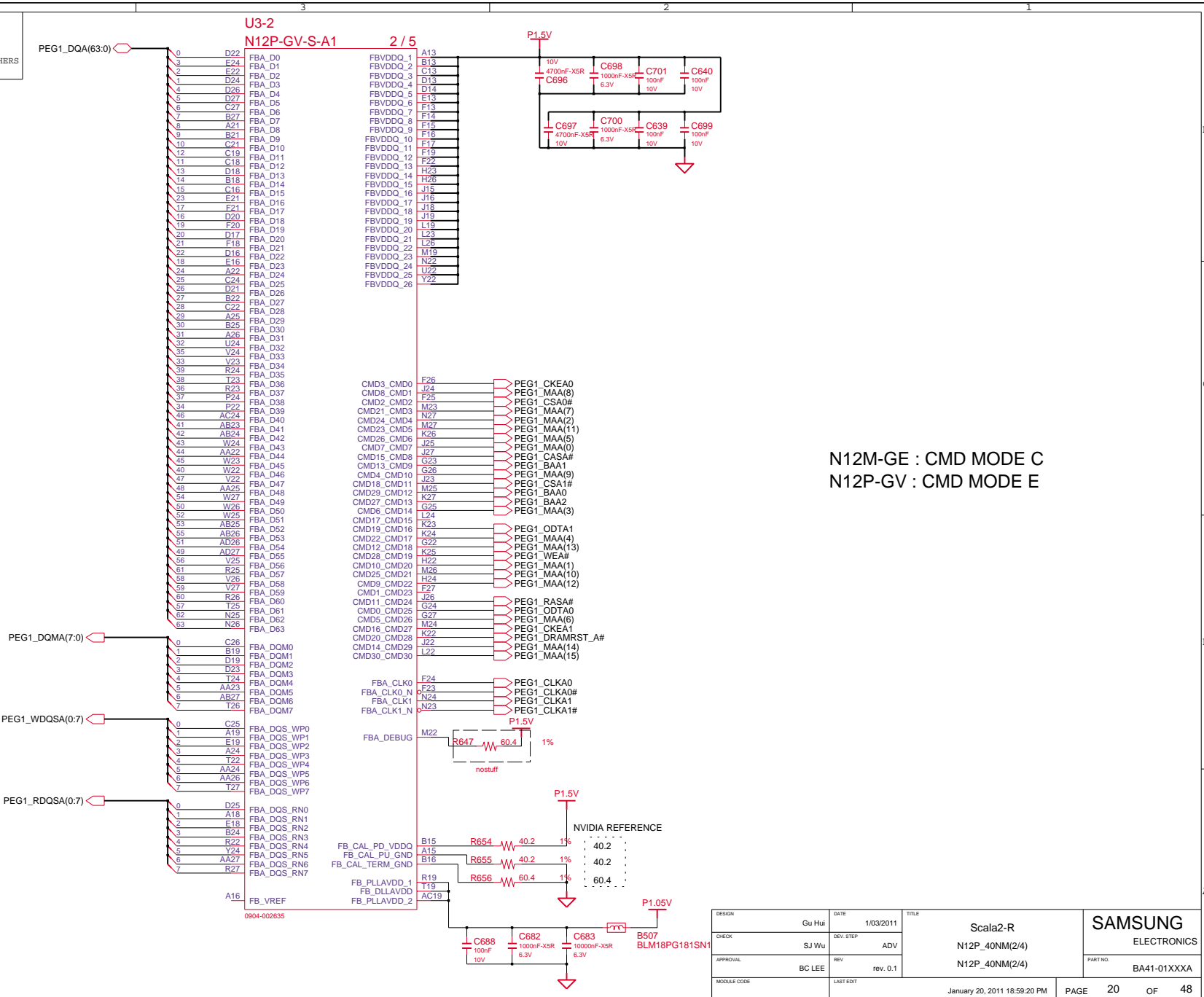
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Graphic PEM

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 EXT		January 20, 2011 18:59:20 PM	PAGE	19 OF 48

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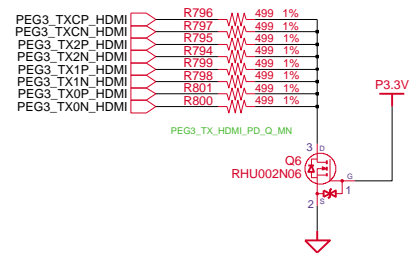
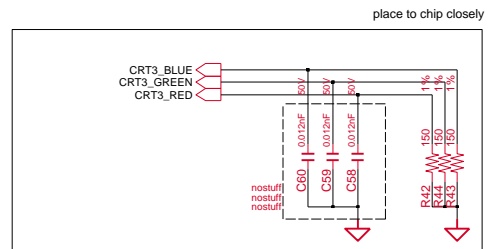
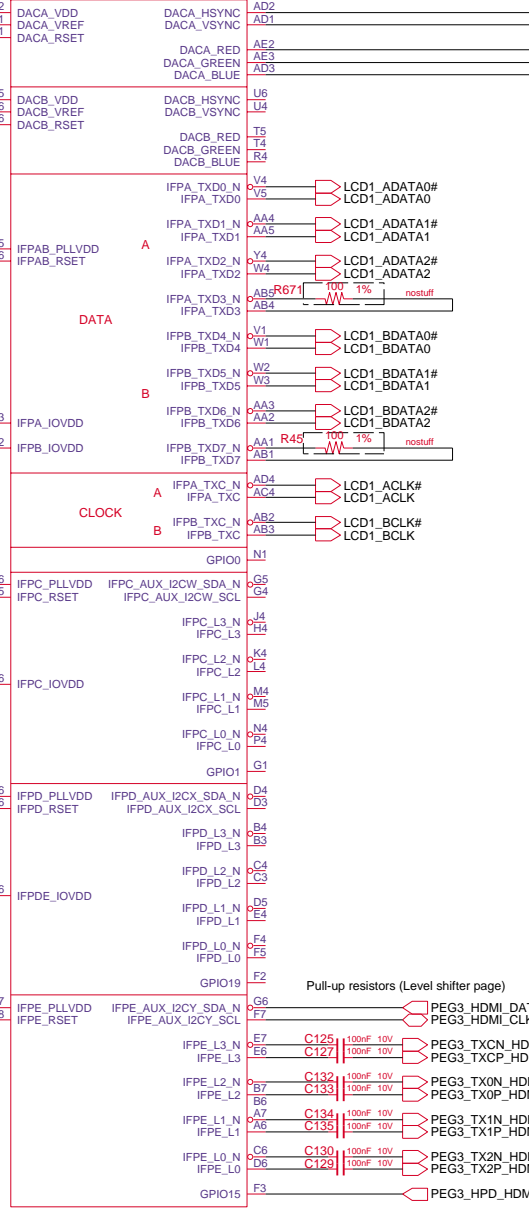
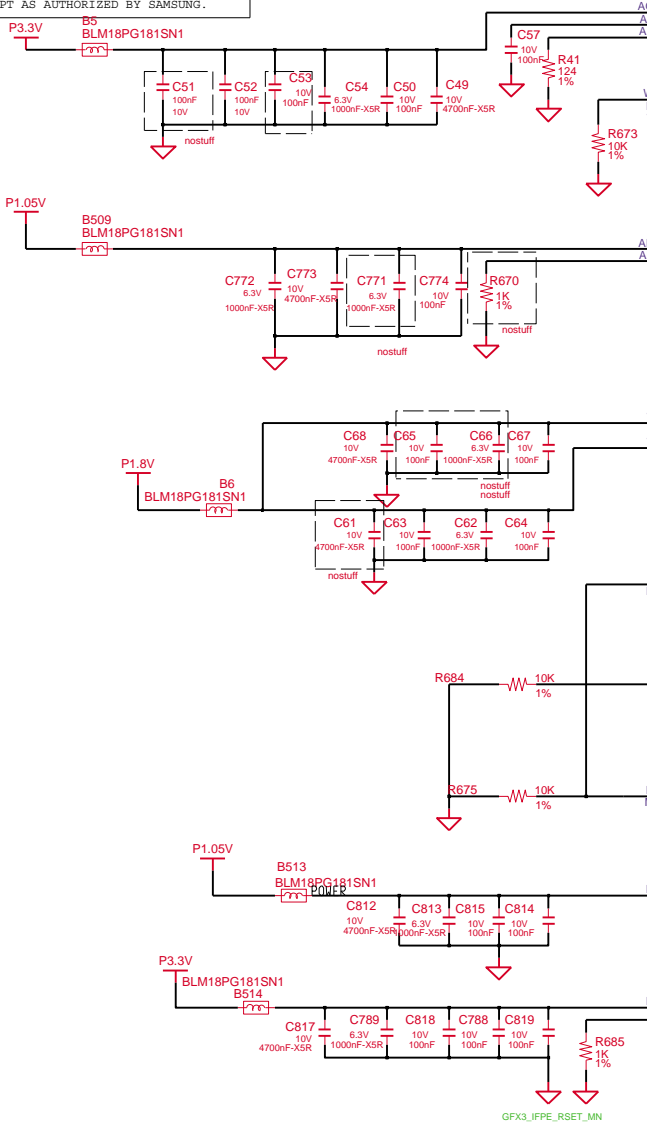


N12M-GE : CMD MODE C
 N12P-GV : CMD MODE E

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R		SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV	N12P_40NM(2/4)		PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	N12P_40NM(2/4)		BA41-01XXXXA	
MODULE CODE		LAST EXT		January 20, 2011 18:59:20 PM	PAGE	20	OF 48

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**U3-3
 N12P-GV-S-A1 3 / 5**



Pull-up resistors (Level shifter page)

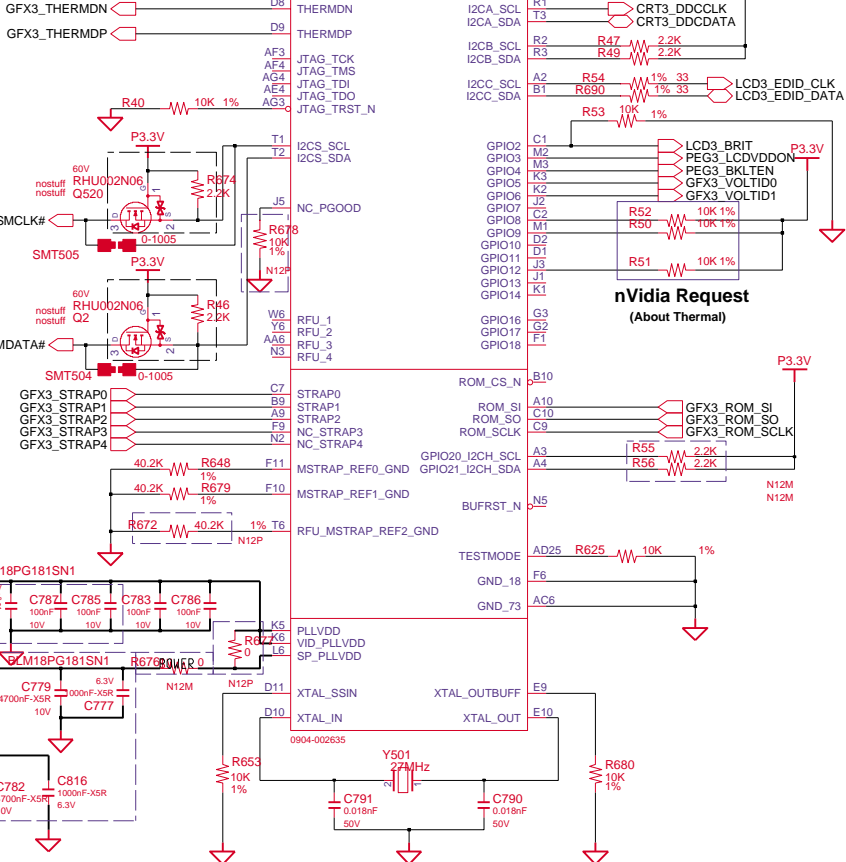
- PEG3_TX2N_HDMI_C_MN
- PEG3_TX2P_HDMI_C_MN
- PEG3_TX1N_HDMI_C_MN
- PEG3_TX1P_HDMI_C_MN
- PEG3_TX0N_HDMI_C_MN
- PEG3_TX0P_HDMI_C_MN
- PEG3_TXCN_HDMI_C_MN
- PEG3_TXCP_HDMI_C_MN

0904-002635

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

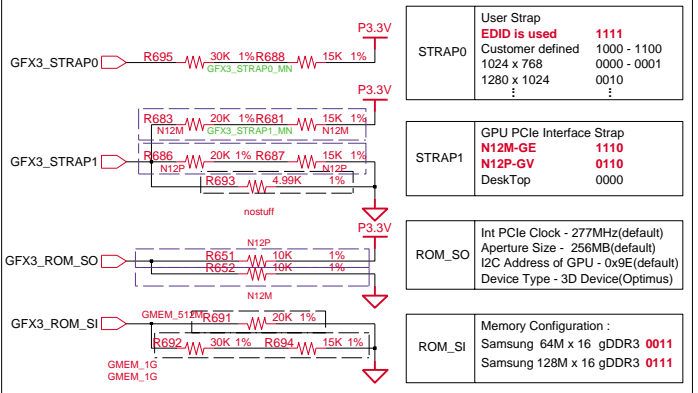
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**U3-4
N12P-GV-S-A1**

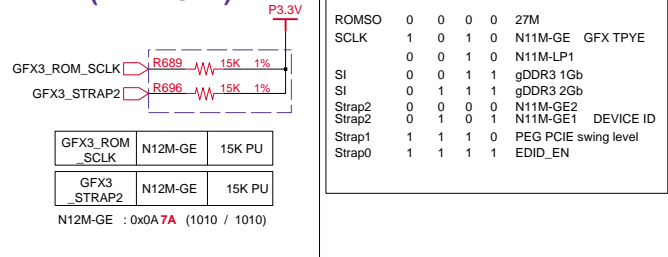


**nVidia Request
(About Thermal)**

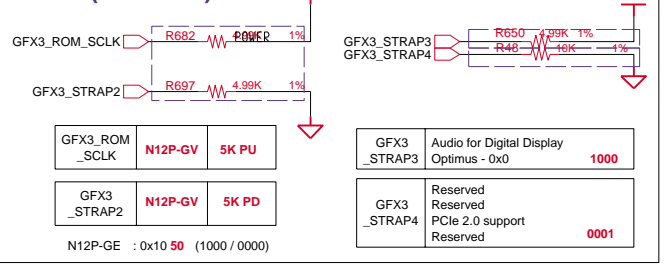
Function Straps



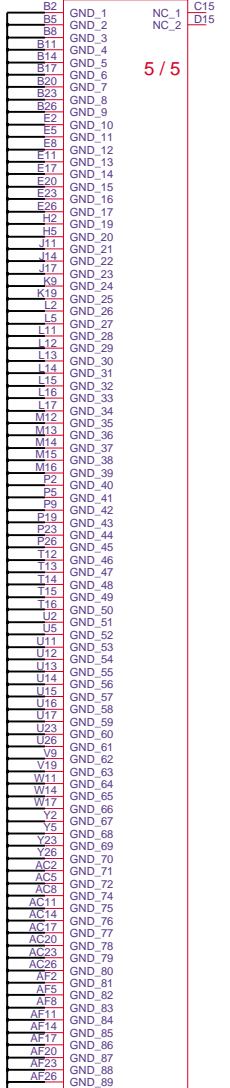
**Chip Select Straps
(N12M-GB1)**



**Chip Select Straps
(N12P-GV)**



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

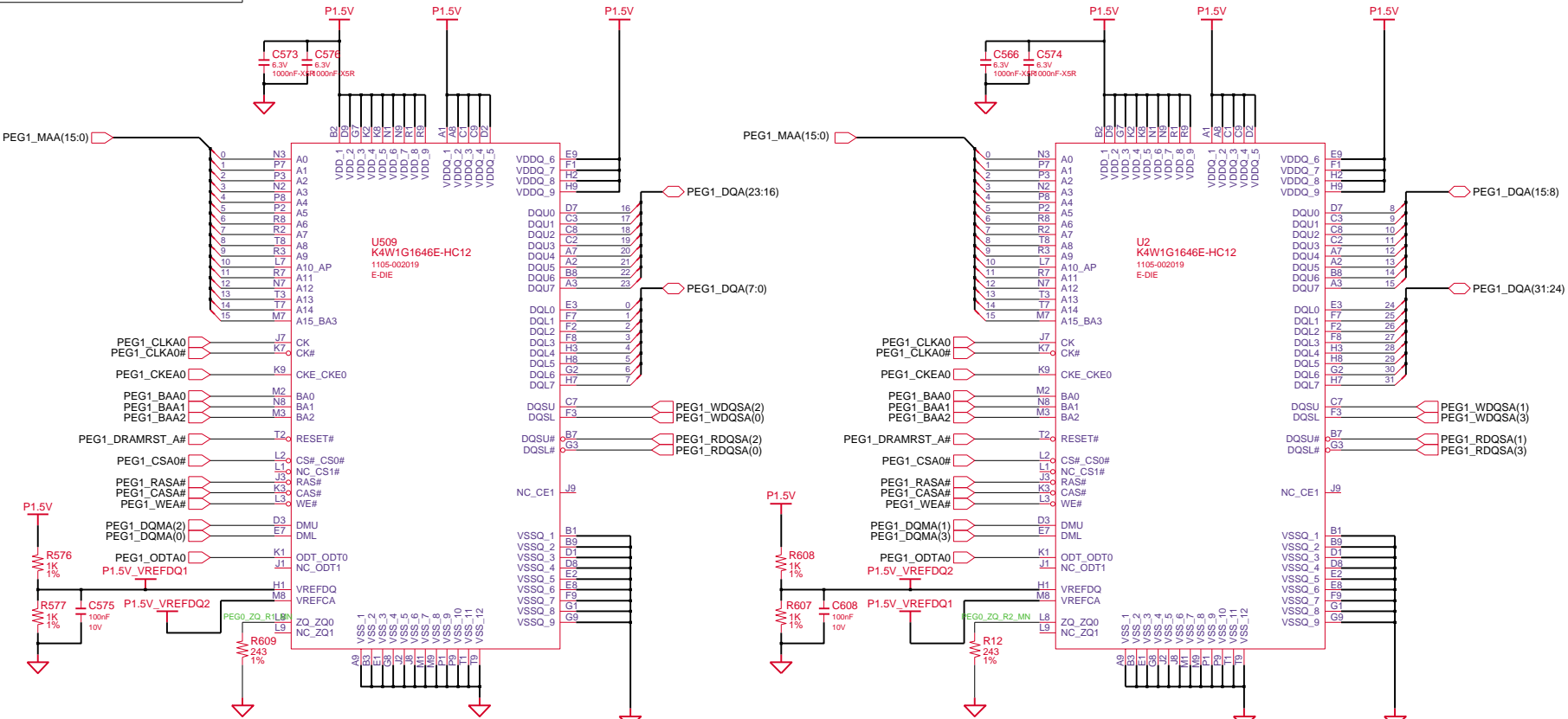


5 / 5

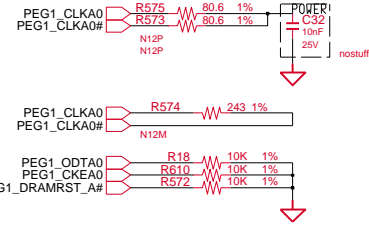
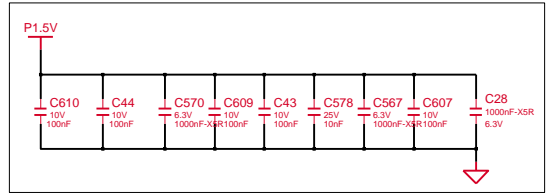
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV		N12M_40NM(4/4)	
APPROVAL	BC LEE	REV	rev. 0.1		N12P_40NM(4/4)	
MODULE CODE		LAST EST				
January 20, 2011 18:59:20 PM						PAGE 22 OF 48

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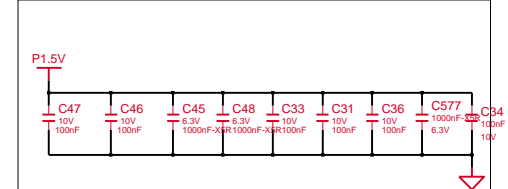
A-Channel #0



Place near to VDDQ



Place near to VDDQ

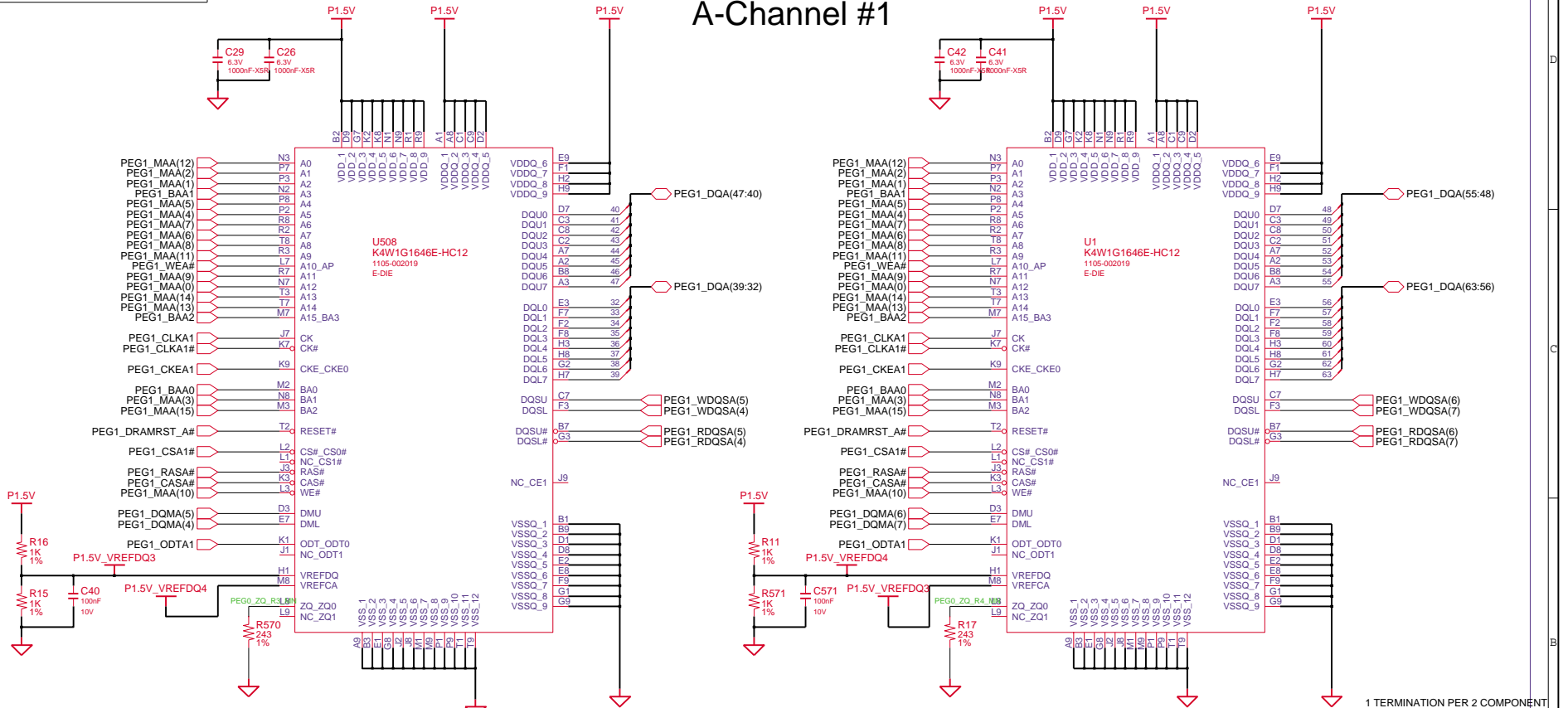


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV		GRAPHIC_MEM A#0	
APPROVAL	BC LEE	REV	rev. 0.1		GRAPHIC_MEM A#0	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				January 20, 2011 18:59:20 PM
						PAGE 23 OF 48

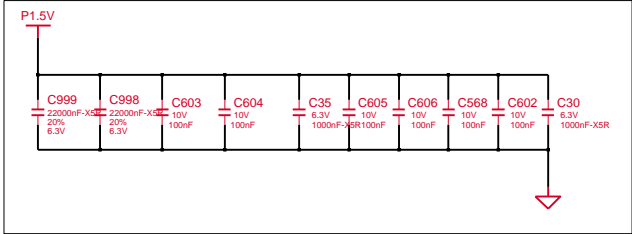
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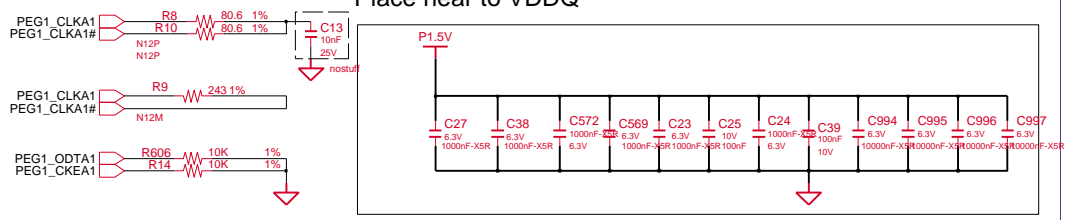
A-Channel #1



Place near to VDDQ



Place near to VDDQ



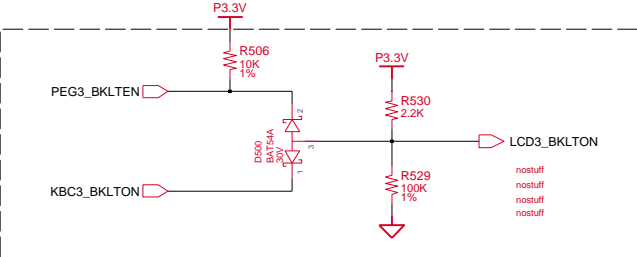
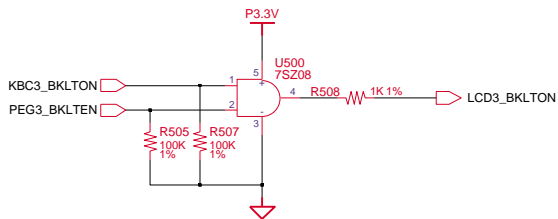
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R
CHECK	SJ Wu	DEV_STEP	ADV		GRAPHIC_MEM A#1
APPROVAL	BC LEE	REV	rev. 0.1		GRAPHIC_MEM A#1
MODULE CODE		LAST EDIT			

SAMSUNG	
ELECTRONICS	
PART NO.	BA41-01XXXXA
DATE	January 20, 2011 18:59:20 PM
PAGE	24 OF 48

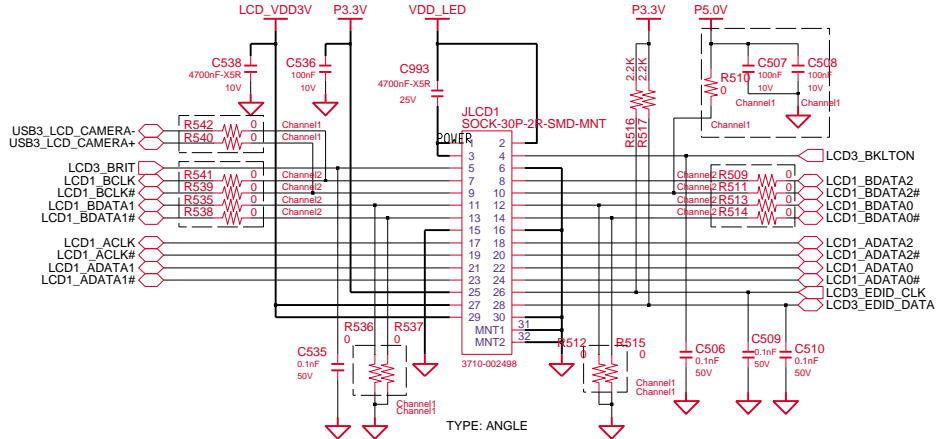
LVDS LOGIC

1Ch. LCD Connector + CAMERA

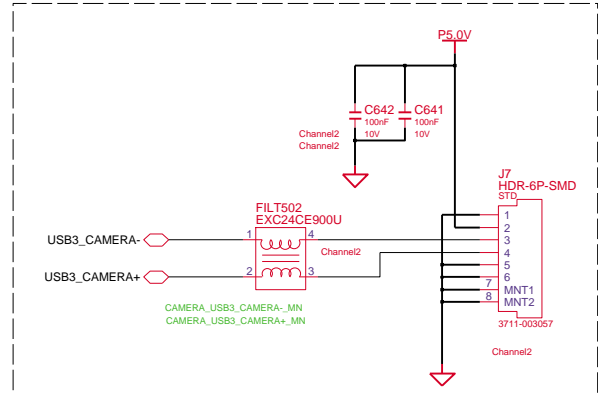
Backlight On



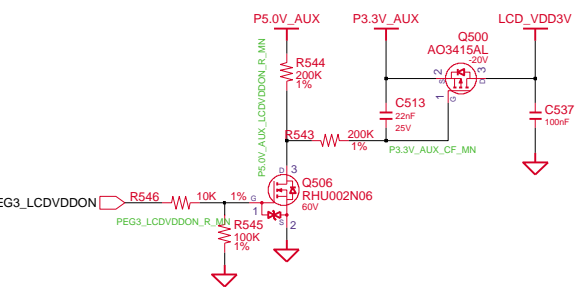
NOTE : Place R20 close to connector to minimize stub



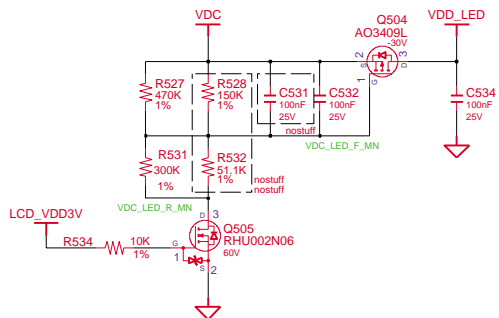
CAMERA CONN FOR 2ch LVDS



LCD Power



LED Power

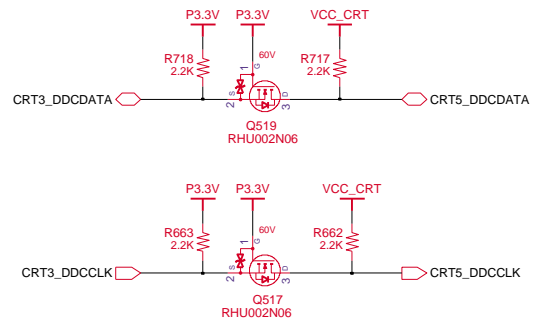
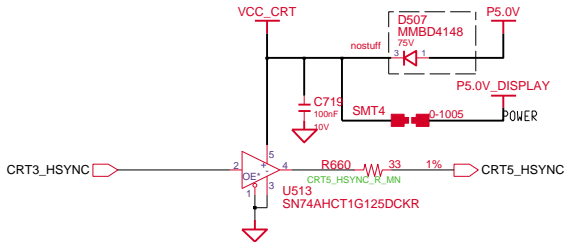
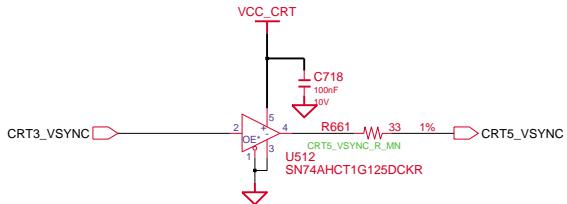
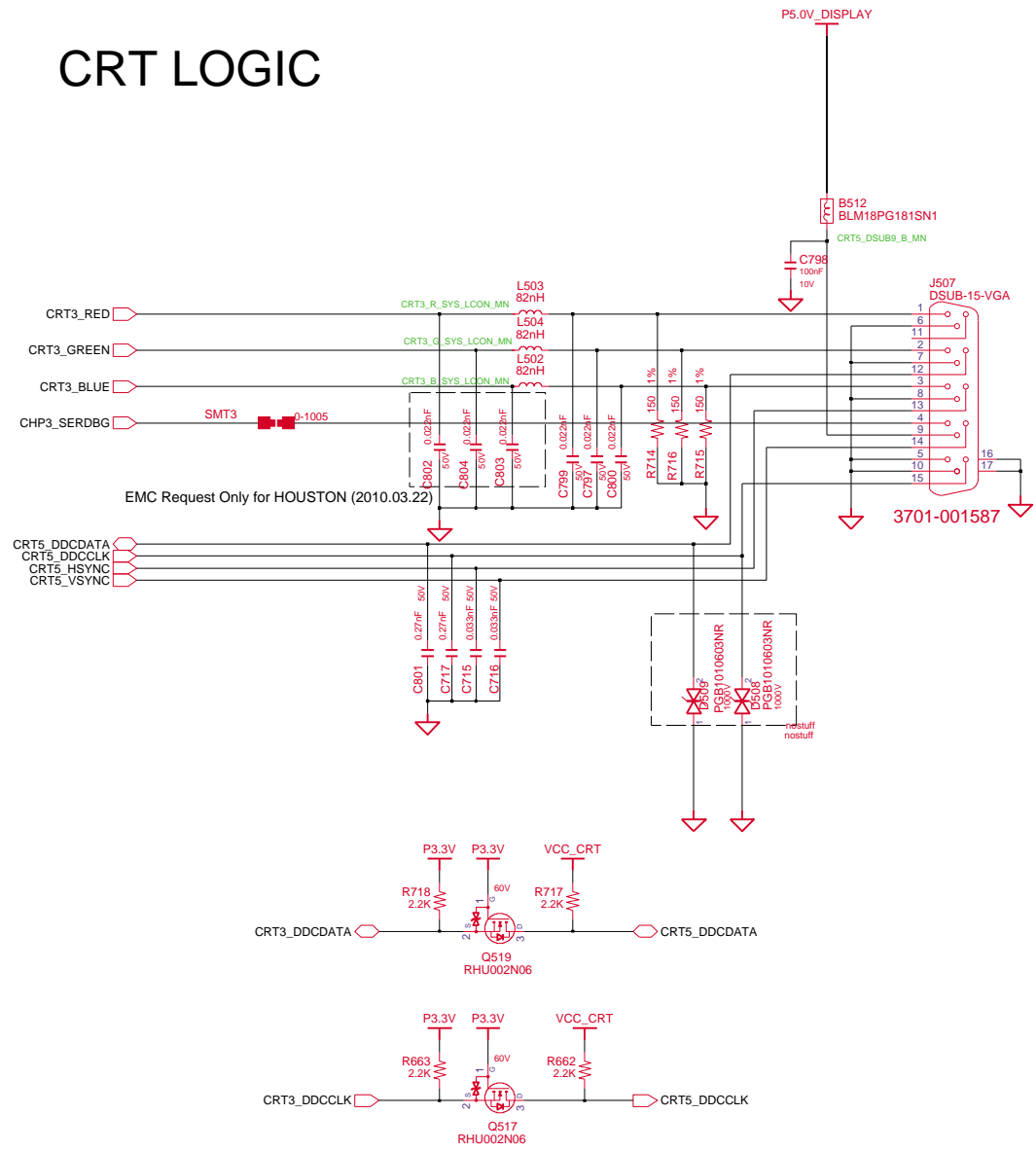


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	LVDS		PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM		PAGE 25 OF 48

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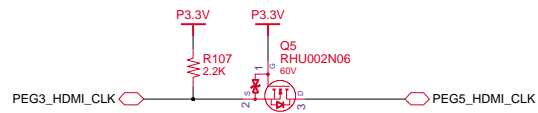
CRT LOGIC



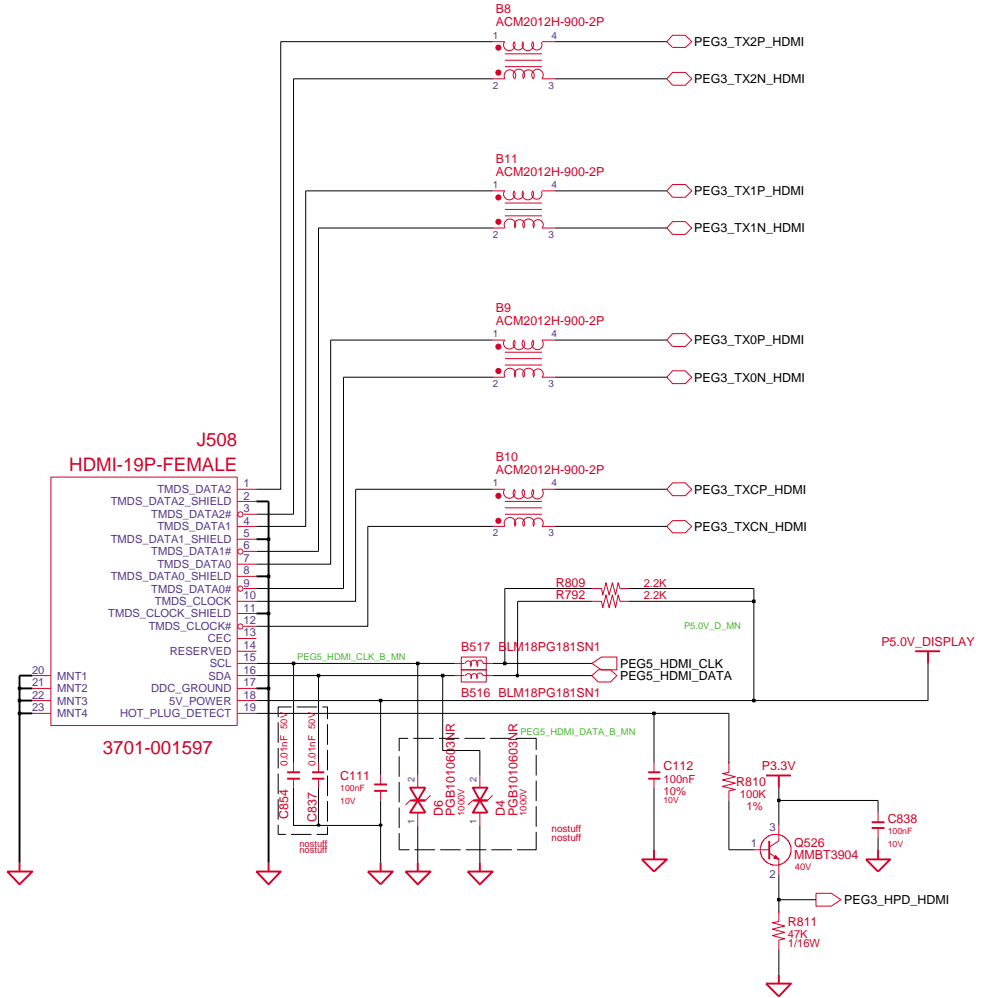
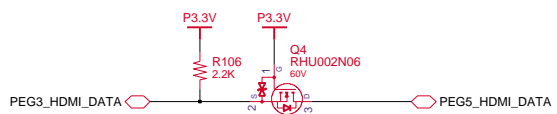
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	CRT	PART NO.	BA41-01XXXX
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 26 OF 48

HDMI Graphic

FOR HDMI VERIFICATION TEST



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

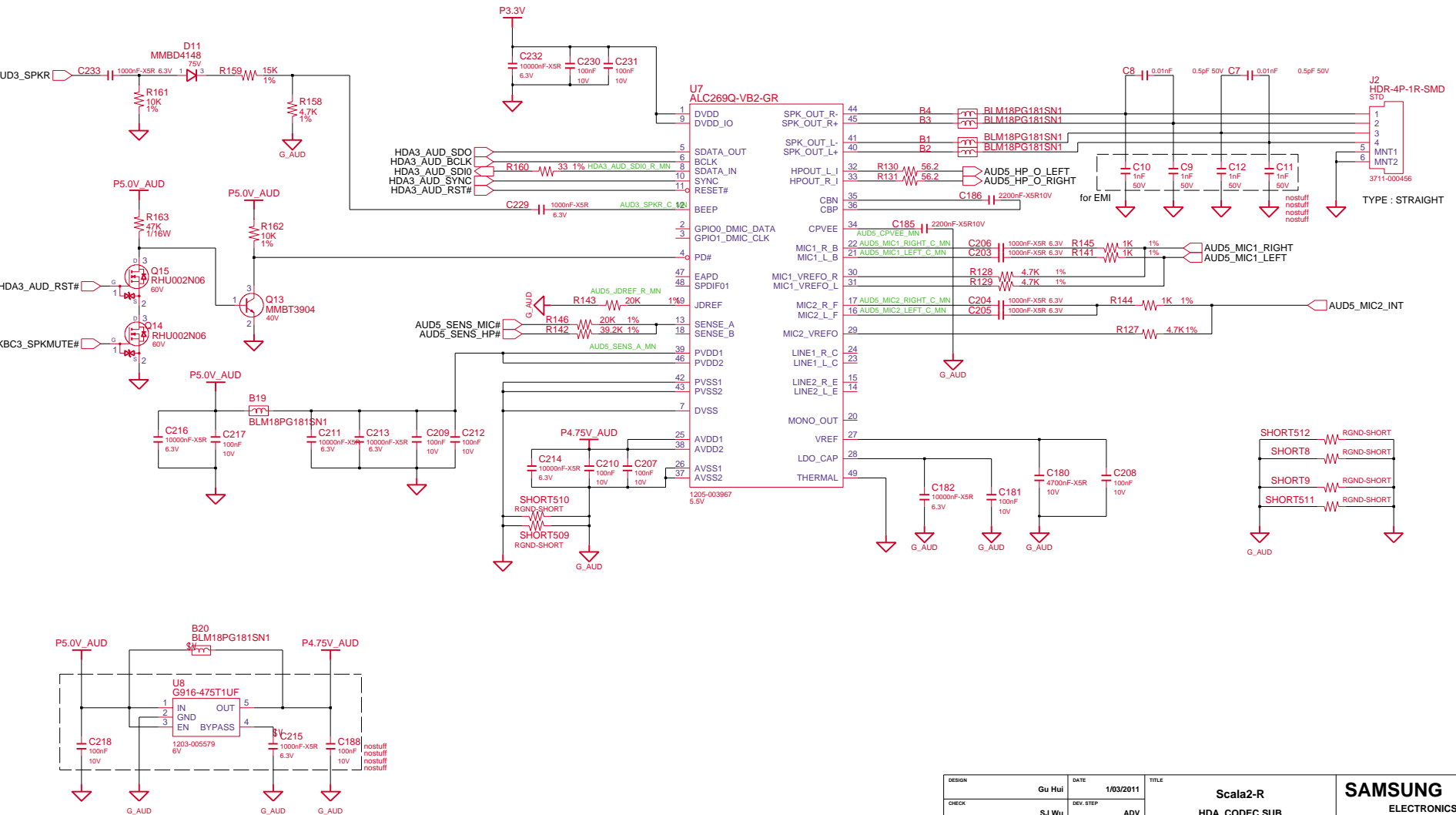


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	HDMI	PART NO.	BA41-01XXXXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 27 OF 48

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HD AUDIO

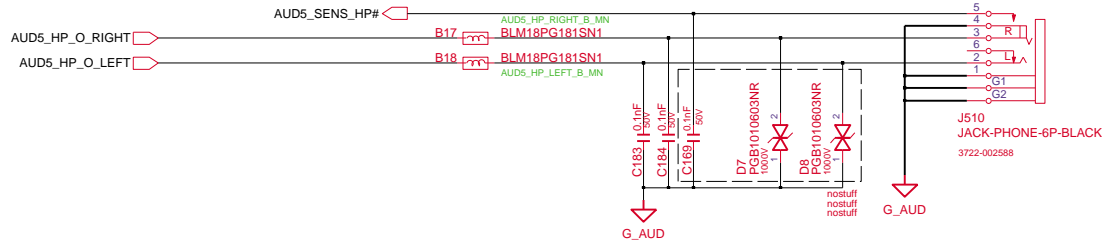


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT				
					HDA_CODEC SUB AUDIO CODEC ALC269 SUB	
					January 20, 2011 18:59:20 PM PAGE 28 OF 48	

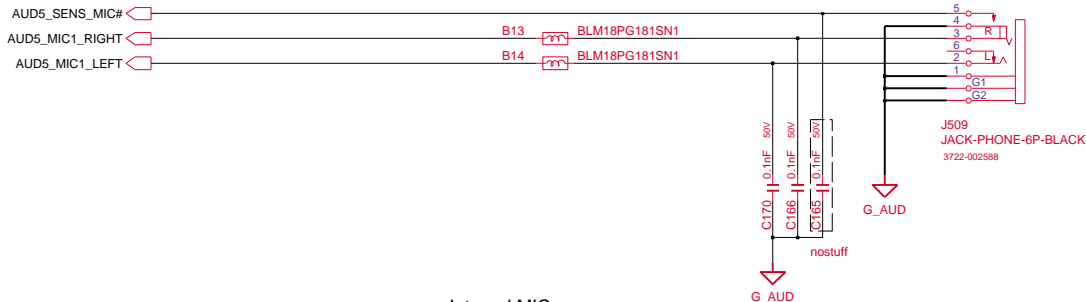
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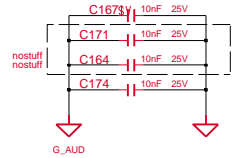
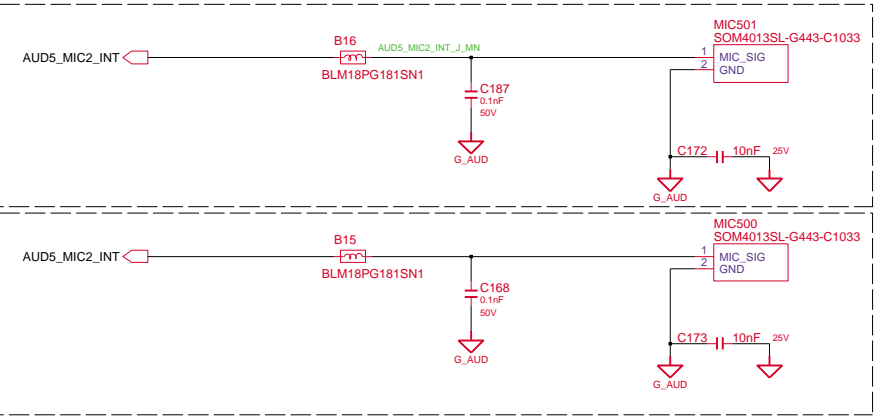
HEADPHONE



MIC JACK



Internal MIC

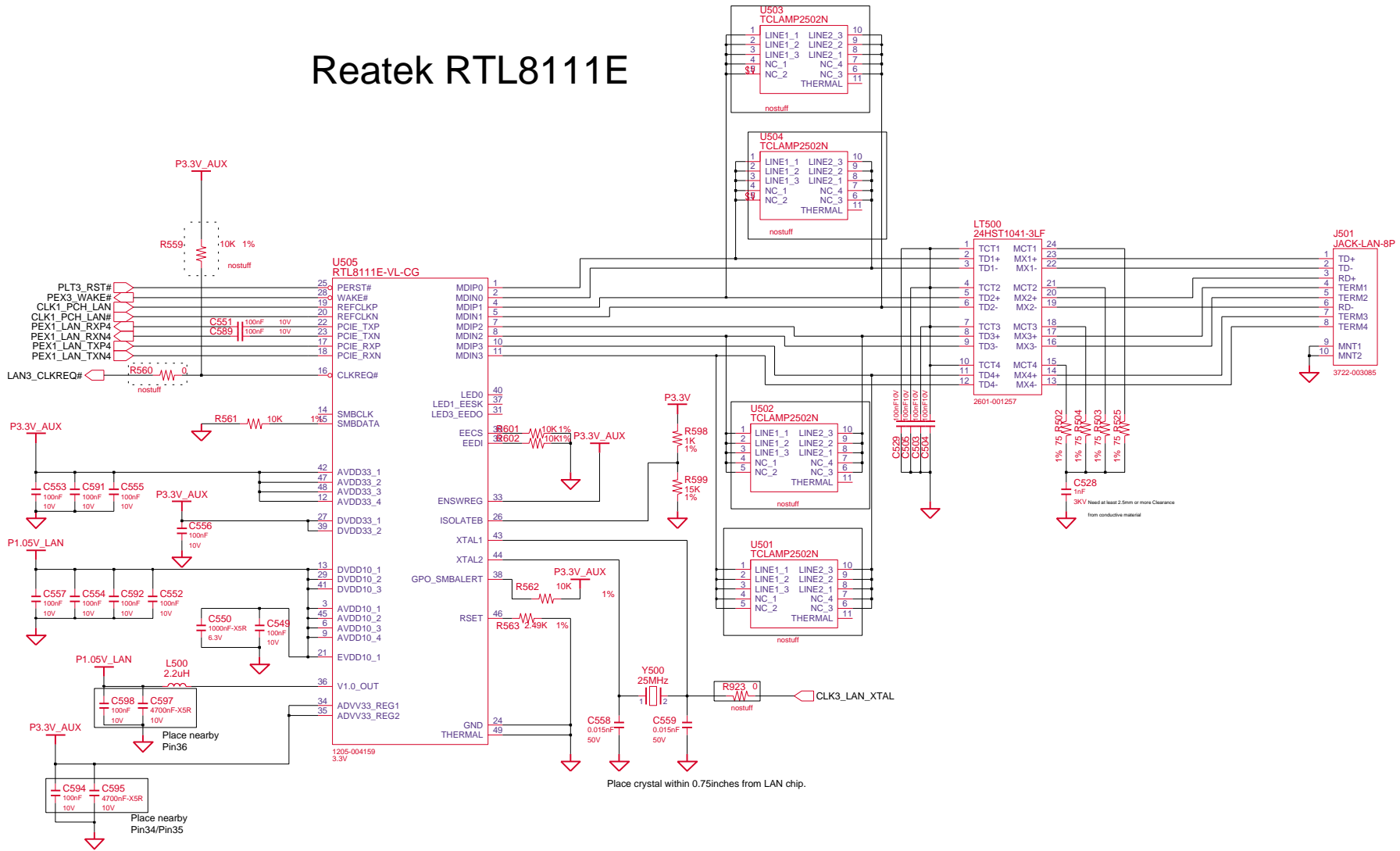


LCD_15_17
LCD_15_17
LCD_15_17
LCD_15_17

LCD_14
LCD_14
LCD_14
LCD_14

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

Reatek RTL8111E



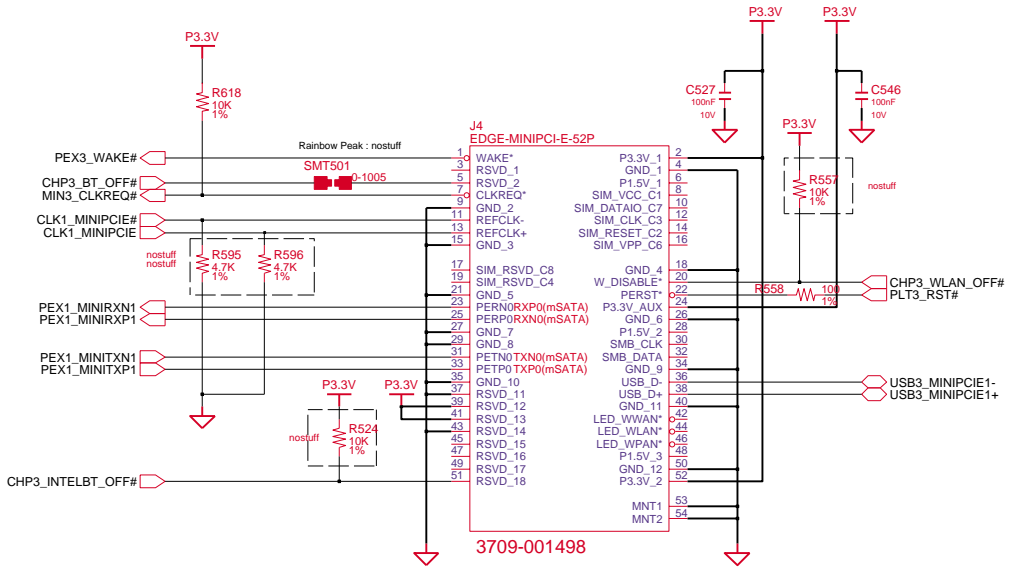
Place crystal within 0.75inches from LAN chip.

DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		LAN	
APPROVAL	BC LEE	REV	rev. 0.1		LAN_Reatek_RTL8111	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				

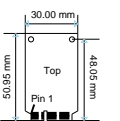
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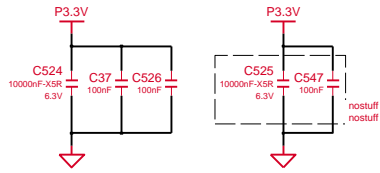
WLAN, 4mm



Mini PCI Express Card



Odd Pins : Top side
Even Pins : Bottom Side

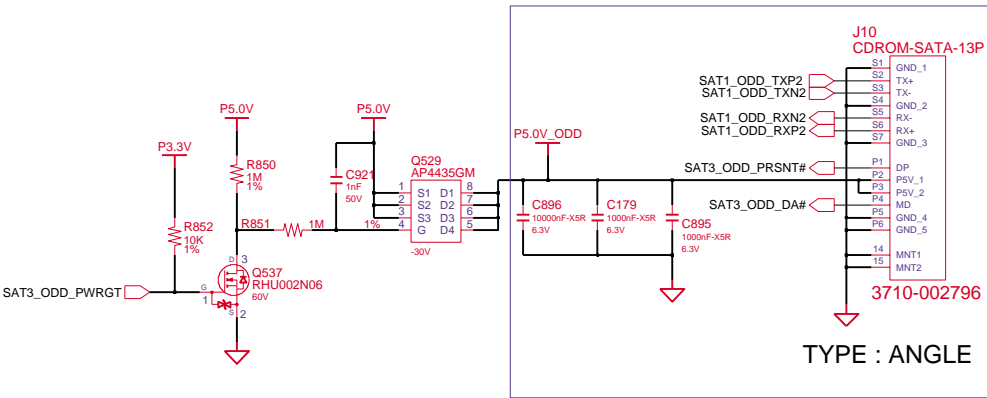


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX			
CHECK	SJ Wu	DEV. STEP	ADV	MINI_PCIE_CONN					
APPROVAL	BC LEE	REV	rev. 0.1	WLAN					
MODULE CODE		LAST EDIT							
January 20, 2011 18:59:20 PM						PAGE	31	OF	48

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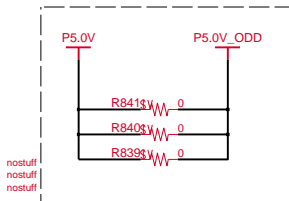
SATA I/F CONN

SATA ODD CONN



TYPE : ANGLE

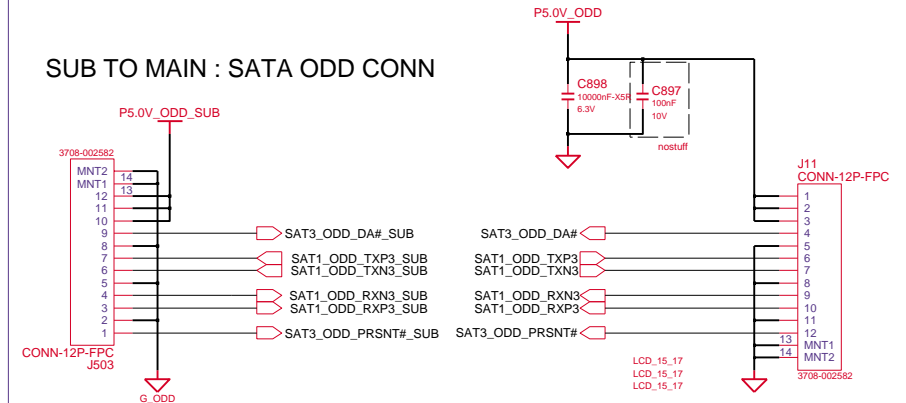
LCD_14
 LCD_14
 LCD_14
 LCD_14



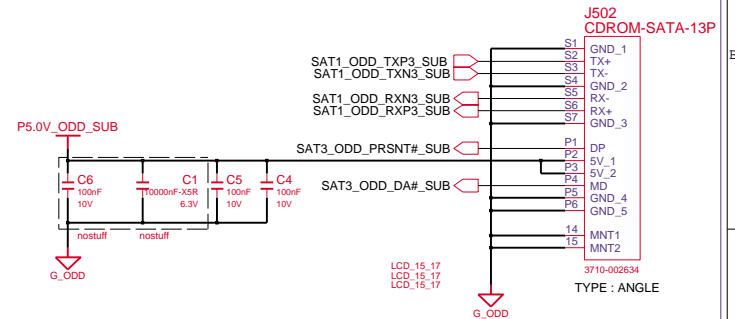
15.6" / 17.3"

MAIN TO SUB : SATA ODD CONN

SUB TO MAIN : SATA ODD CONN



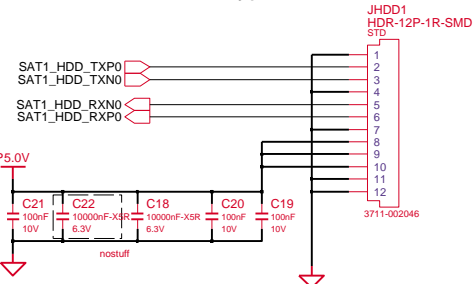
SATA ODD CONN



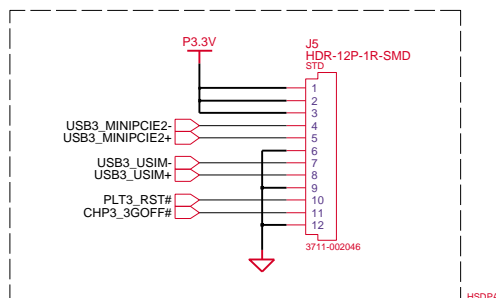
TYPE : ANGLE

SATA HDD CONN

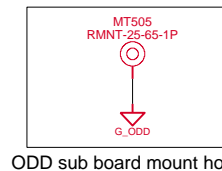
Cable Connector Type



MAIN to HSDPA SUB



HSDPA



ODD sub board mount hole

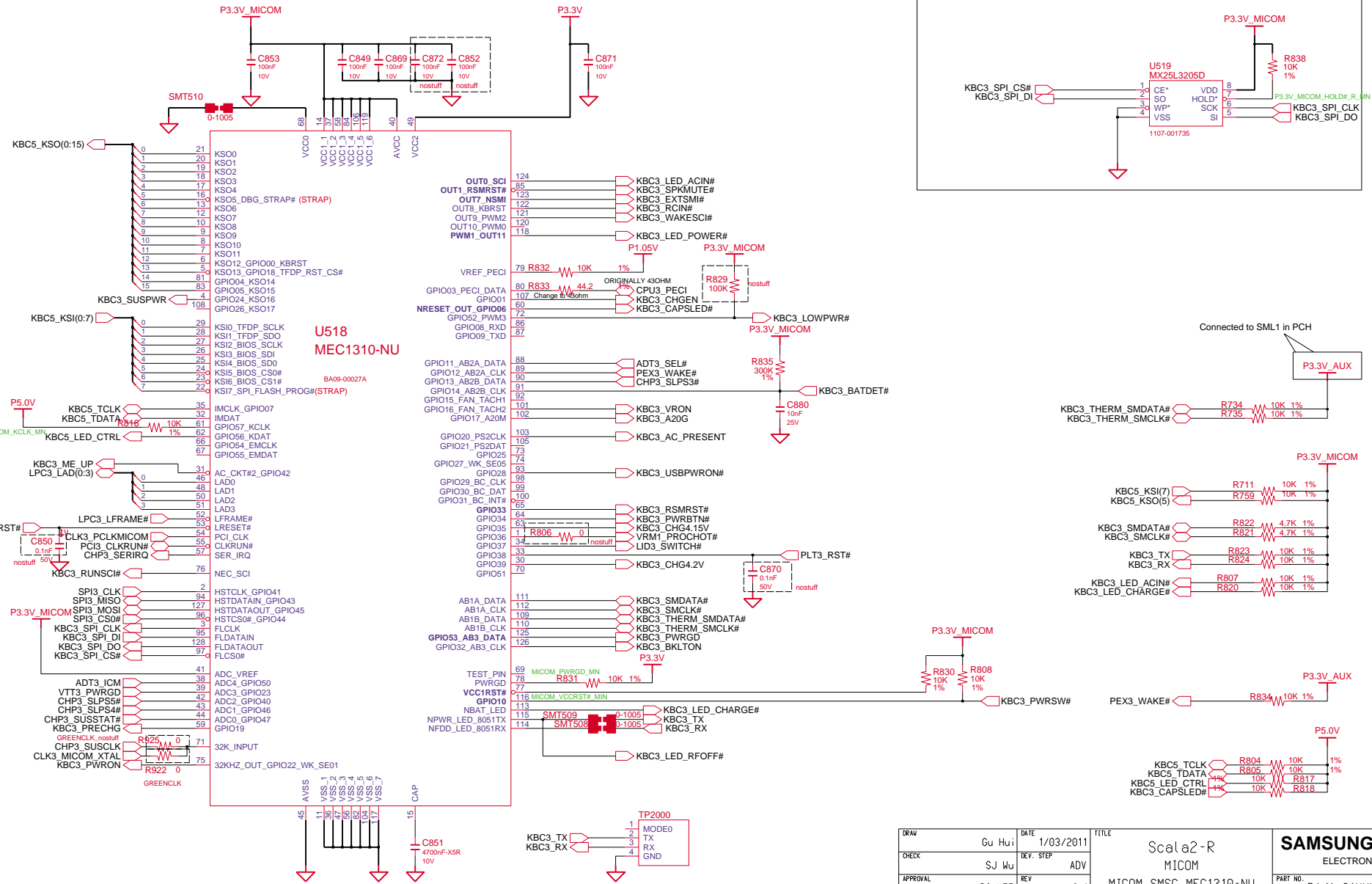
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS			
CHECK	SJ Wu	DEV_STEP	ADV		SATA_DEVICES				
APPROVAL	BC LEE	REV	rev. 0.1		SATA I/F Conn	PART NO. BA41-01XXXX			
MODULE CODE		LAST EDIT				January 20, 2011 18:59:20 PM			
						PAGE	32	OF	48

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MAIN BOARD (MICOM)

BE CAUTION SPI ROM SIZE!!

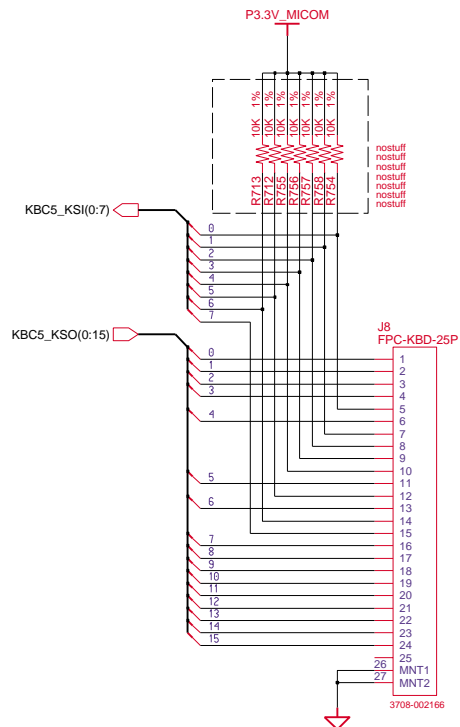
SPI_ROM_SOCKET



DRAW	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA11-01XXXXA
CHECK	1/03/2011	Scala2-R MICOM	
APPROVAL	REV. STEP	MICOM_SMSC_MEC1310-NU	
MODULE CODE	REV	rev. 0.1	
	LAST EDIT		

Micom Glue Logic

KEYBOARD



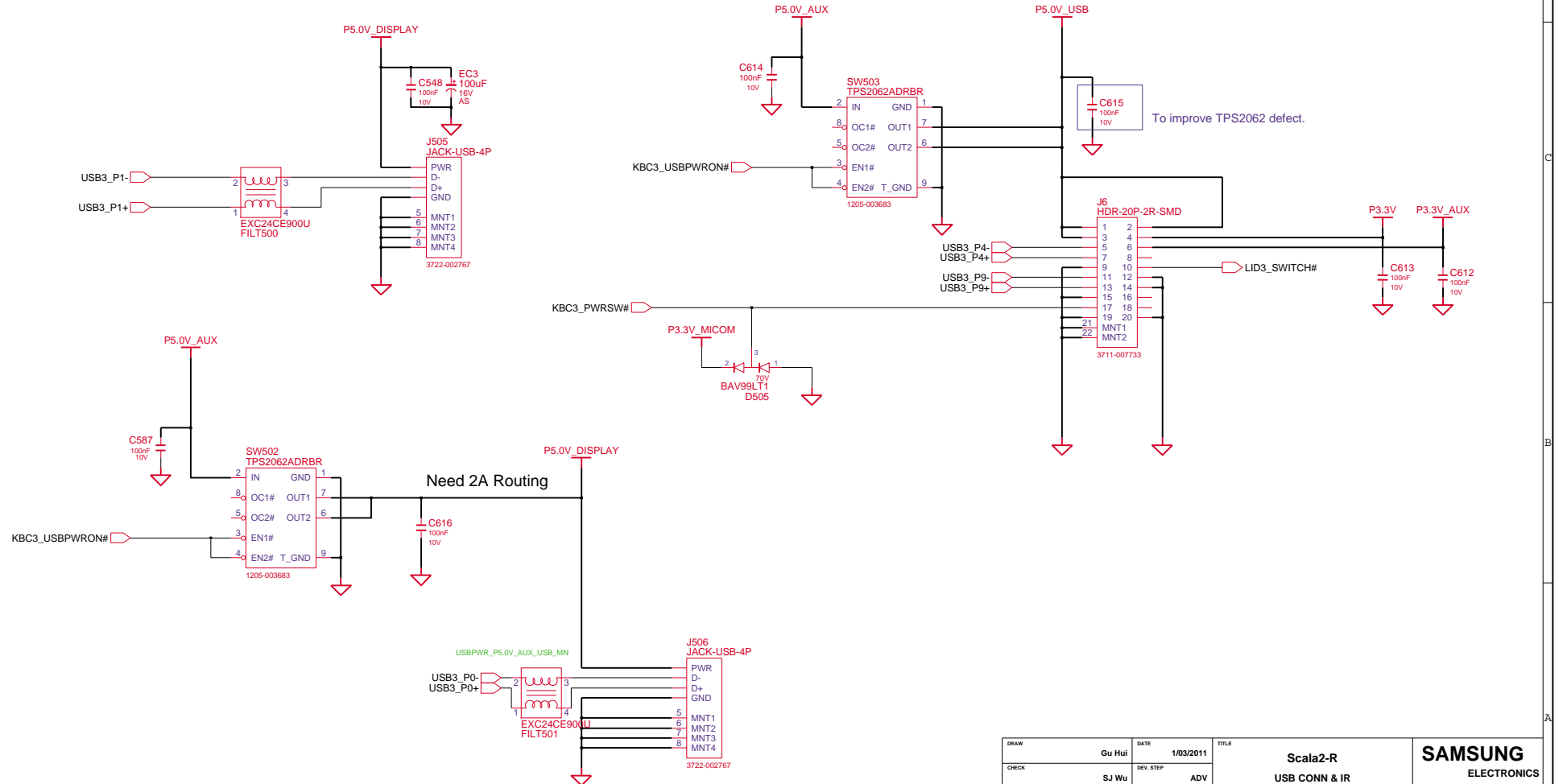
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV	MICOM GLUE LOGIC		
APPROVAL	BC LEE	REV	rev. 0.1	MICOM GLUE LOGIC	PART NO.	BA41-01XXXXA
MODULE CODE		LAST EXT		January 20, 2011 18:59:20 PM	PAGE	34 OF 48

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POWER S/W SUB B'D CONNECTOR

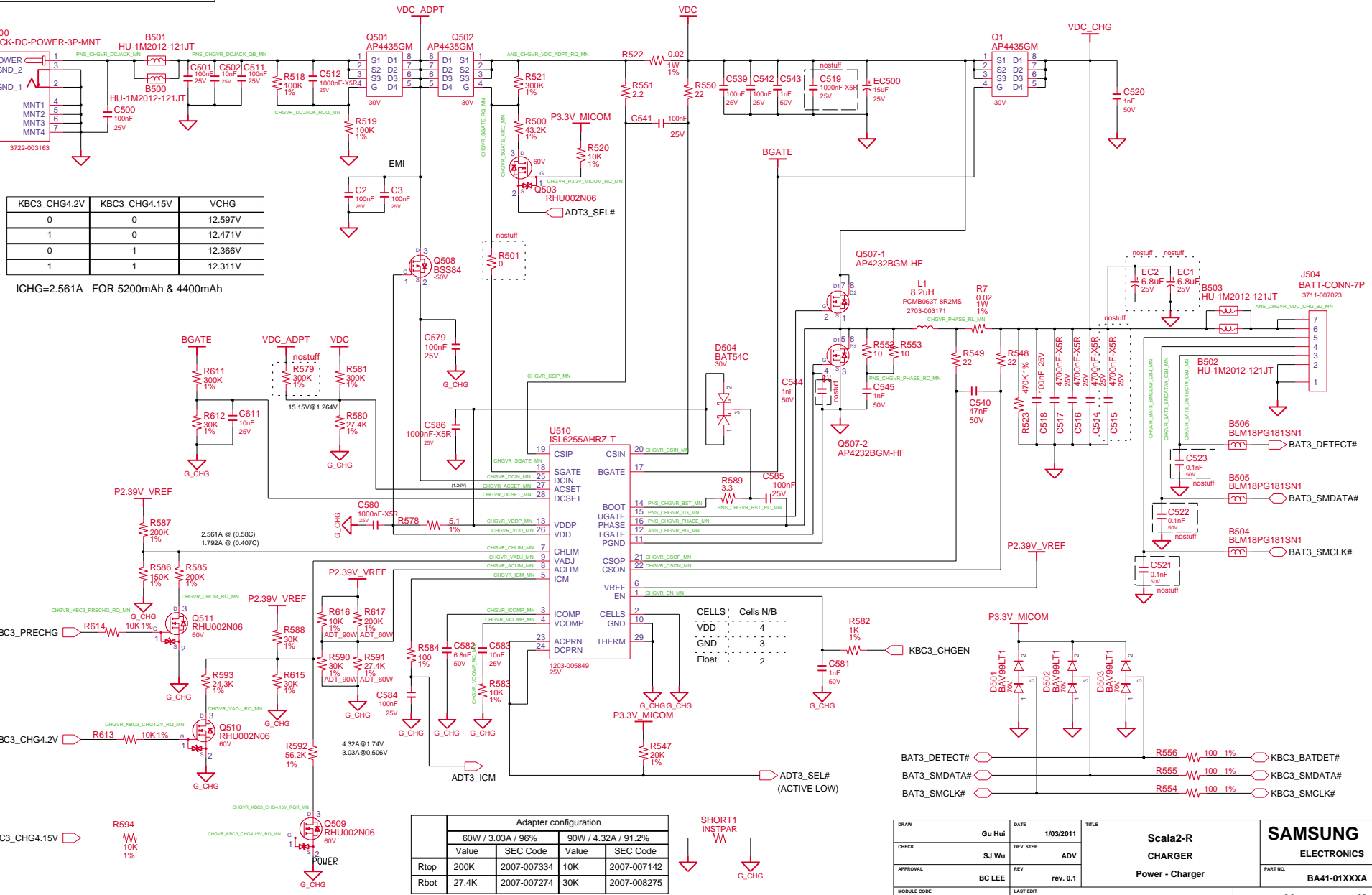
MAIN to SUB



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

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CHARGER & POWER MANAGEMENT



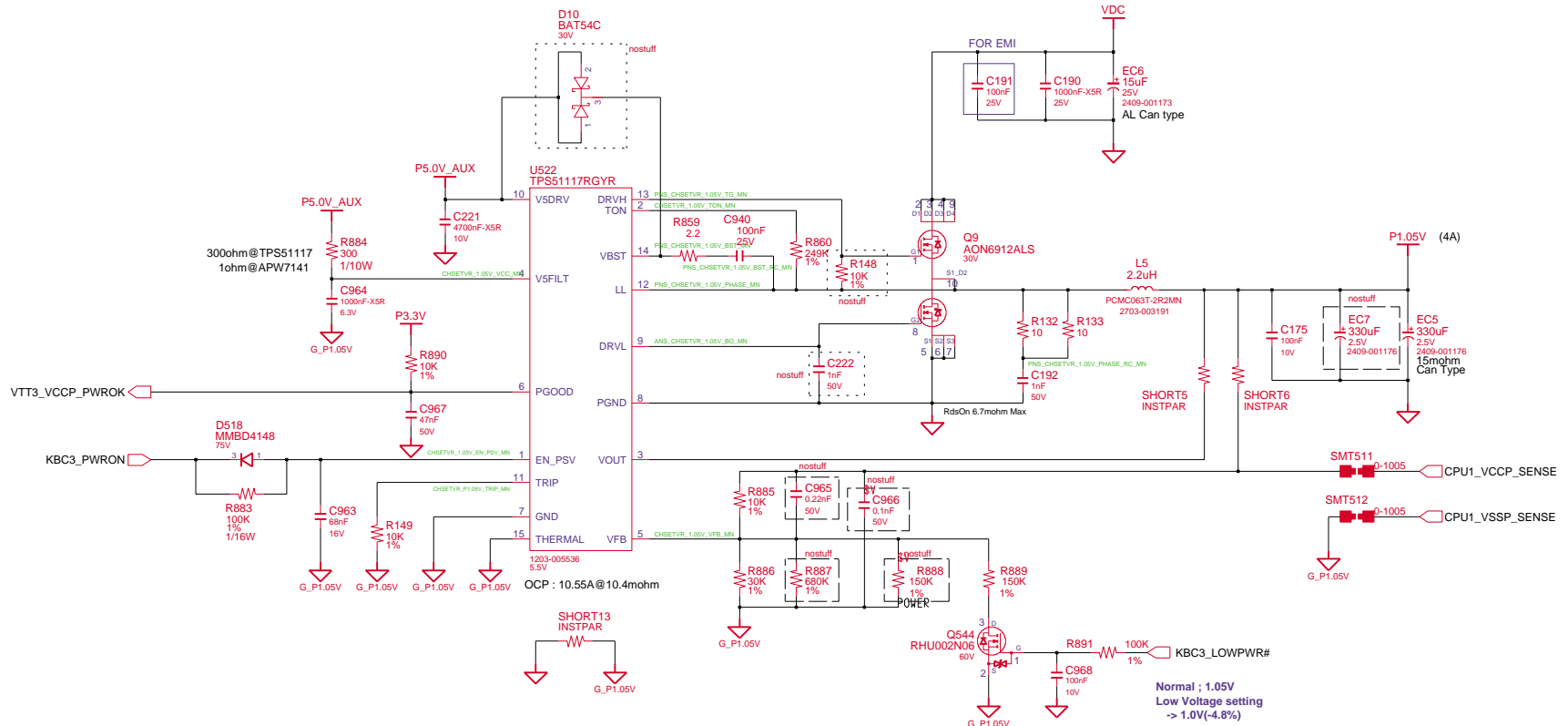
KBC3_CHG4.2V	KBC3_CHG4.15V	VCHG
0	0	12.597V
1	0	12.471V
0	1	12.366V
1	1	12.311V

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

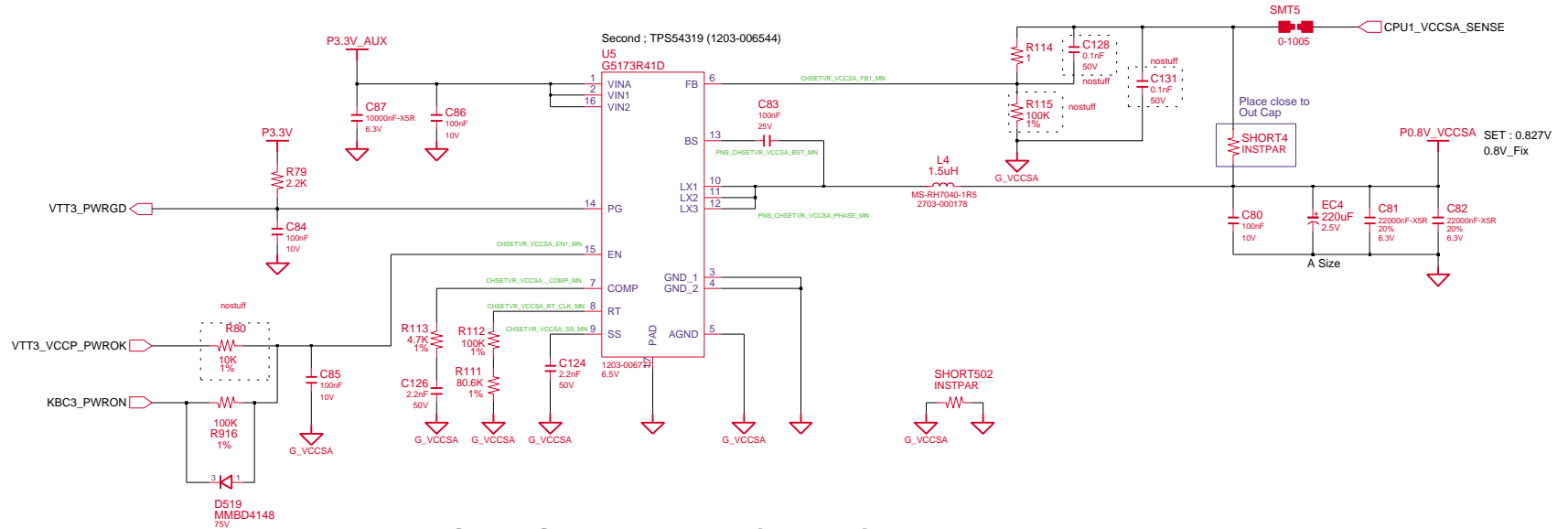
CHIPSET POWER(P1.05V)



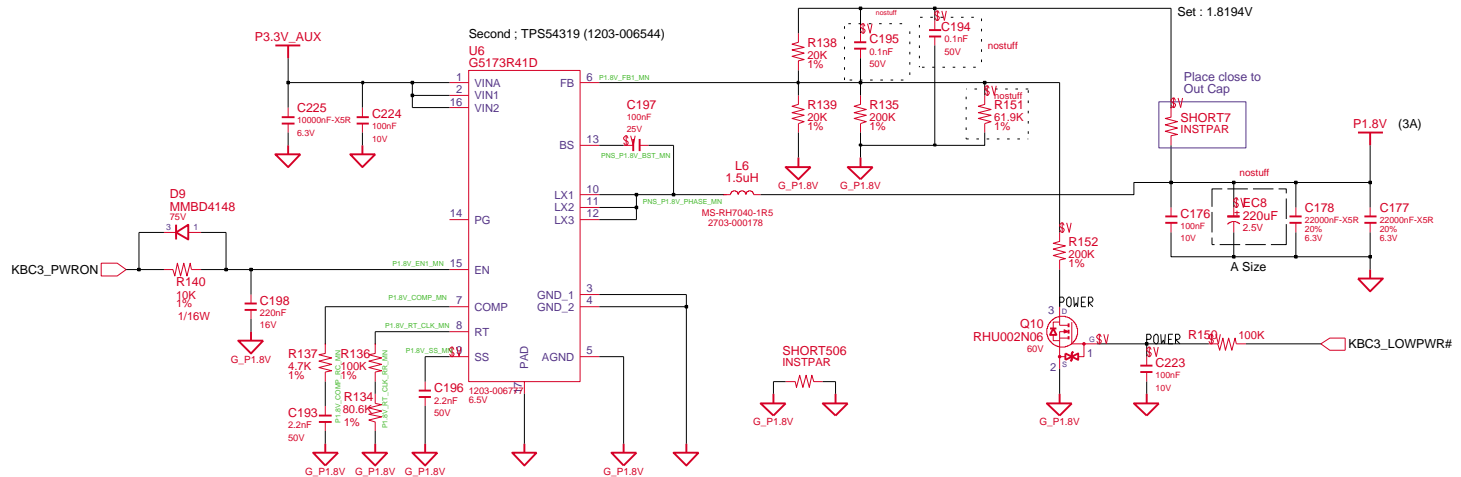
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	REV. STEP	ADV	P1.05V(Chipset Power)		
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXX
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	38	OF 48

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CHIPSET POWER(VCCSA)



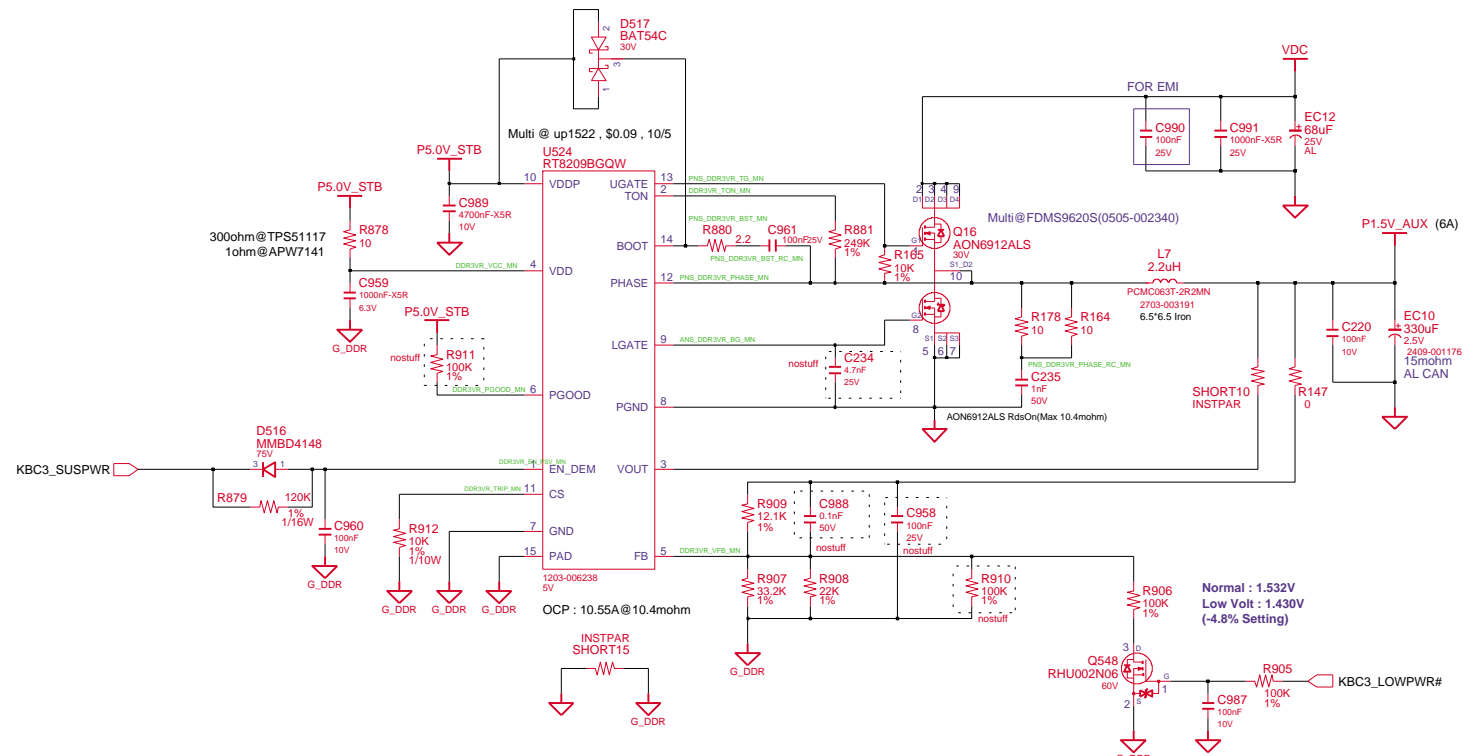
CHIPSET POWER(P1.8V)



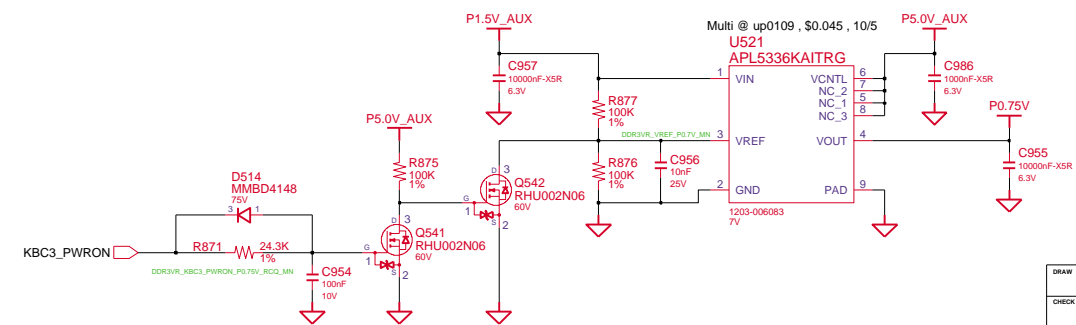
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		P1.1V_VTT	
APPROVAL	BC LEE	REV	rev. 0.1		P0.8V(Chipset Power)	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				

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DDR3 Power



DDR3 VTT(0.75V)



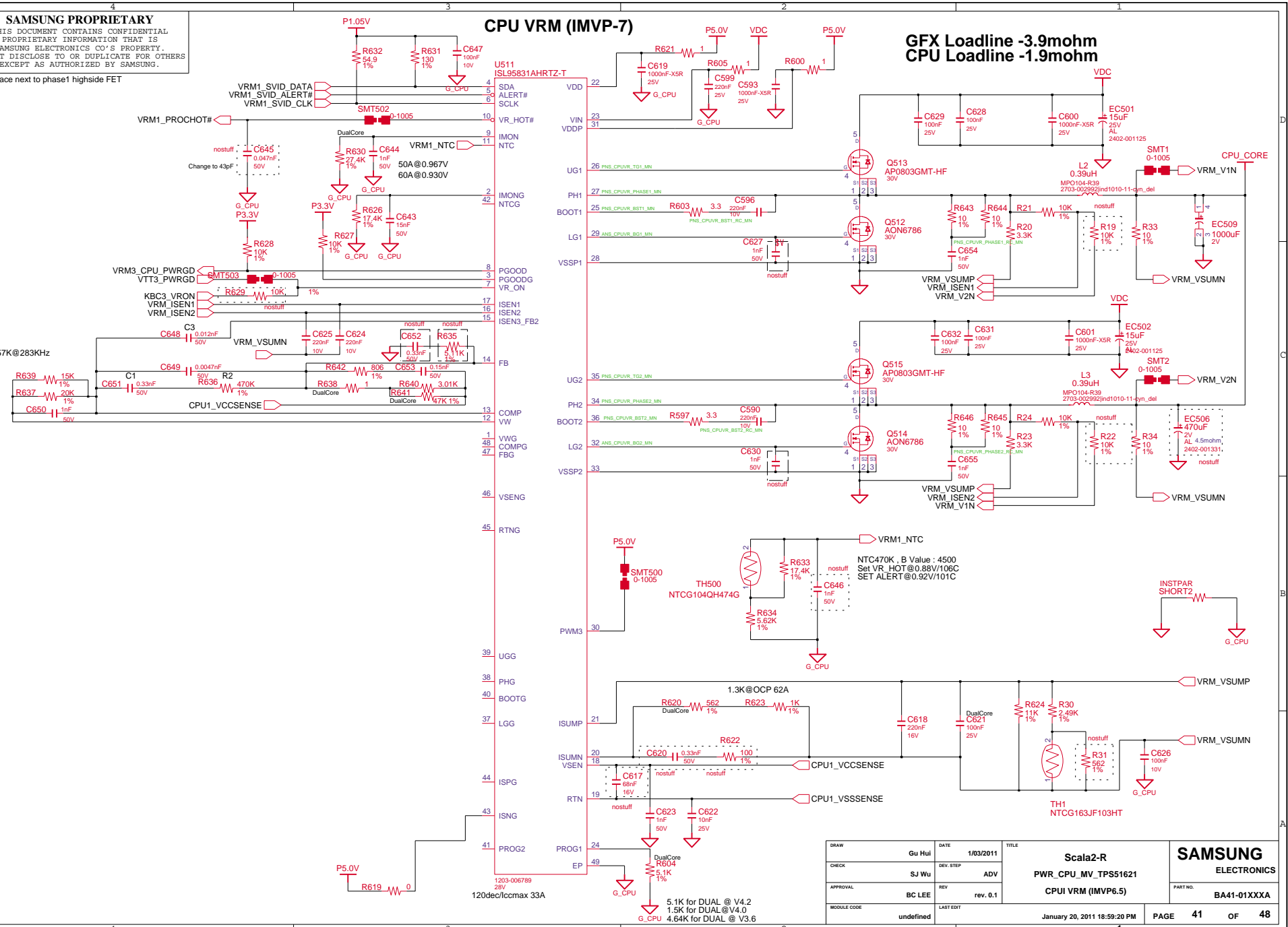
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R PWR_MEMORY DDR3 POWER	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV_STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1		PART NO.	BA41-01XXXX
MODULE CODE	undefined	LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 40 OF 48

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Place next to phase1 highside FET

CPU VRM (IMVP-7)

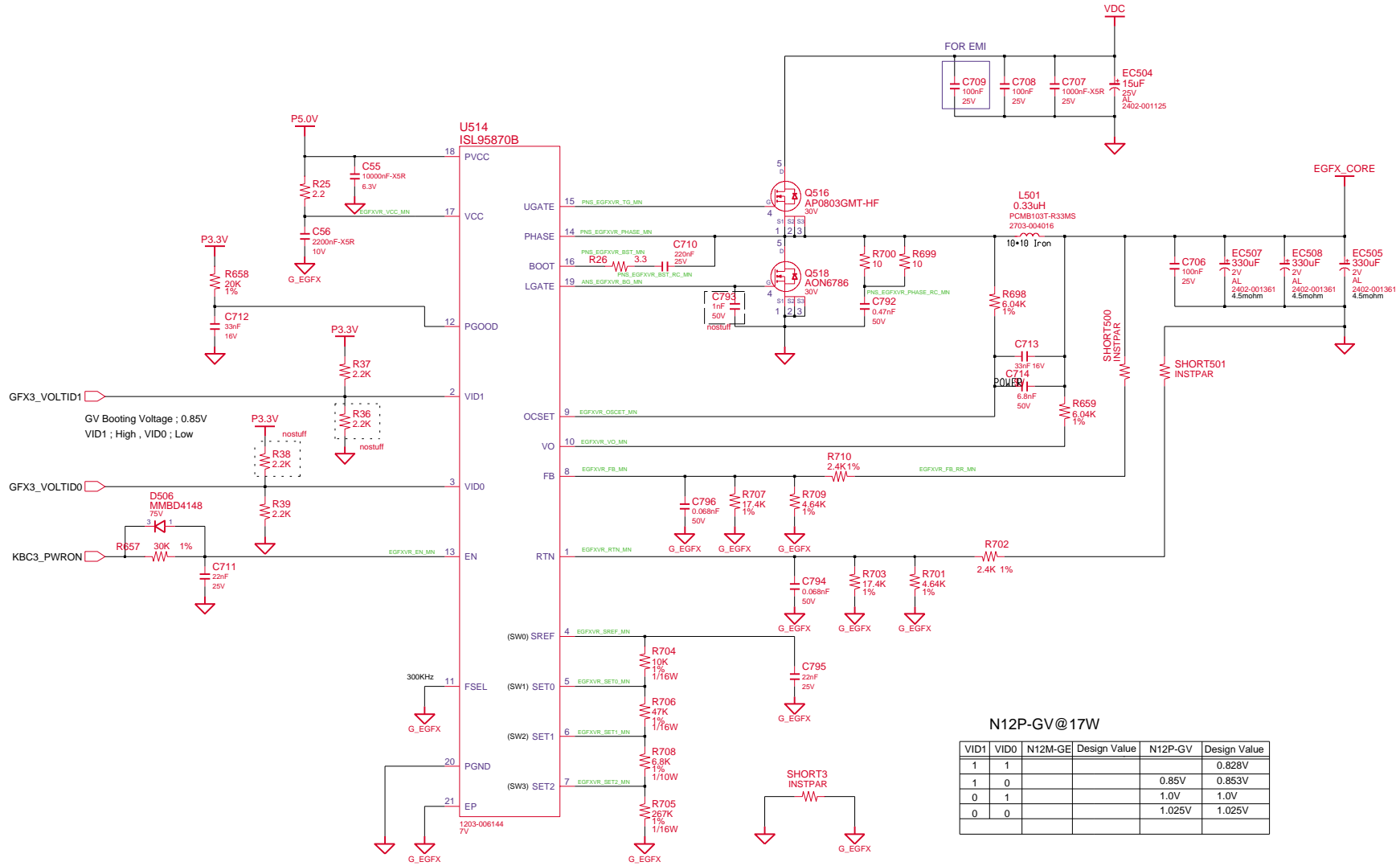
GFX Loadline -3.9mohm
CPU Loadline -1.9mohm



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
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	

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External GFX Core Power



N12P-GV@17W

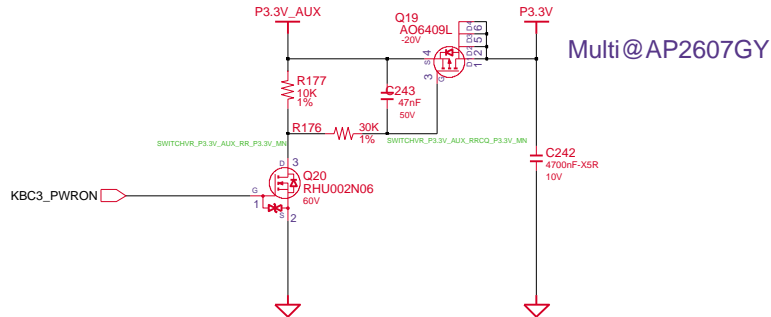
VID1	VID0	N12M-GE	Design Value	N12P-GV	Design Value
1	1			0.828V	
1	0			0.85V	0.853V
0	1			1.0V	1.0V
0	0			1.025V	1.025V

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		
MODULE CODE		LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE	42 OF 48

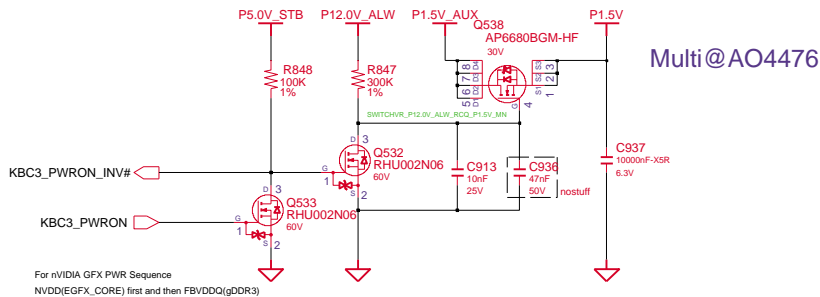
Switched Power

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

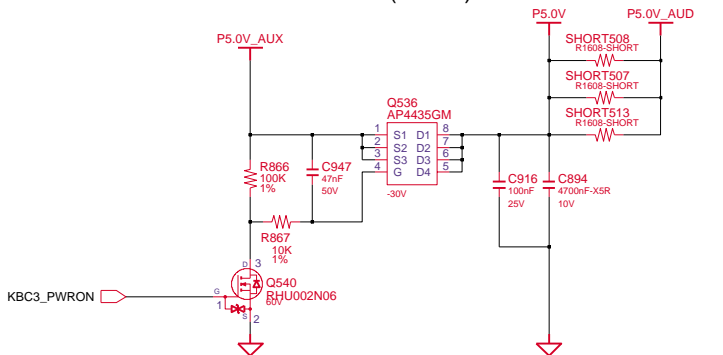
Switched Power On (P3.3V)



Switched Power On (P1.5V)

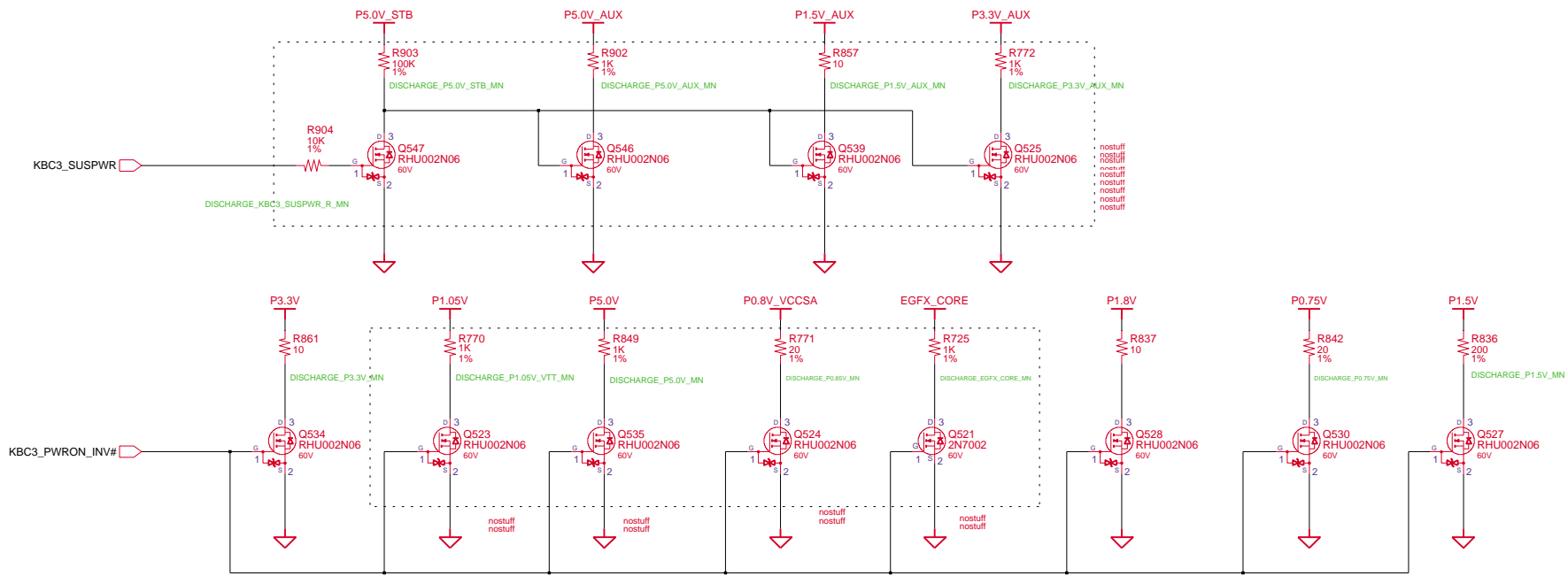


Switched Power On (P5.0V)



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

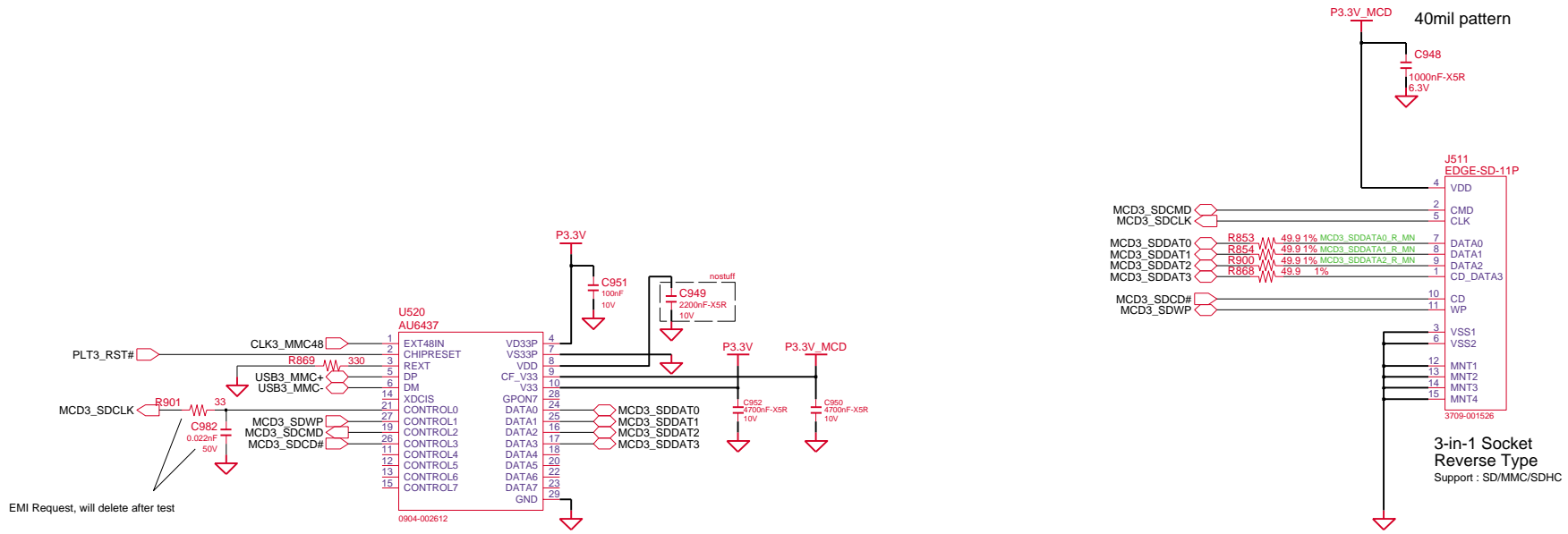
POWER DISCHARGER



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R SUB BOARD1 Power Discharger	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	45	OF	48

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AU6437 (4-in-1)



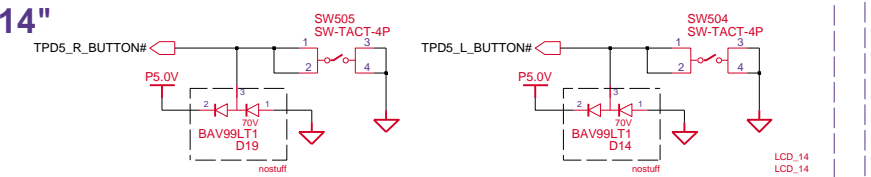
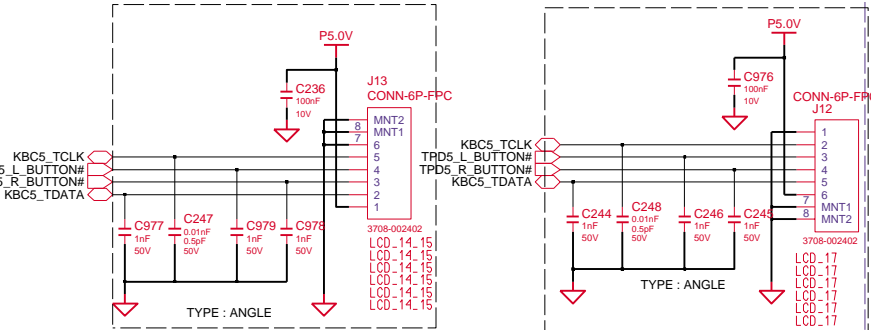
EMI Request, will delete after test

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

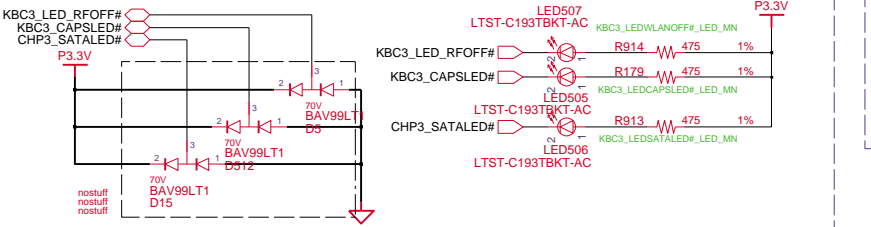
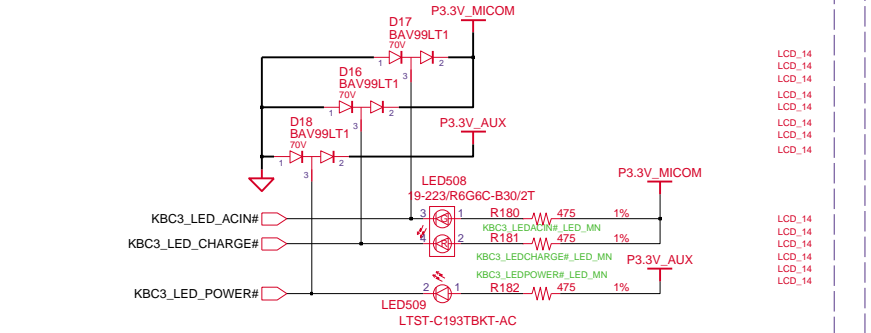
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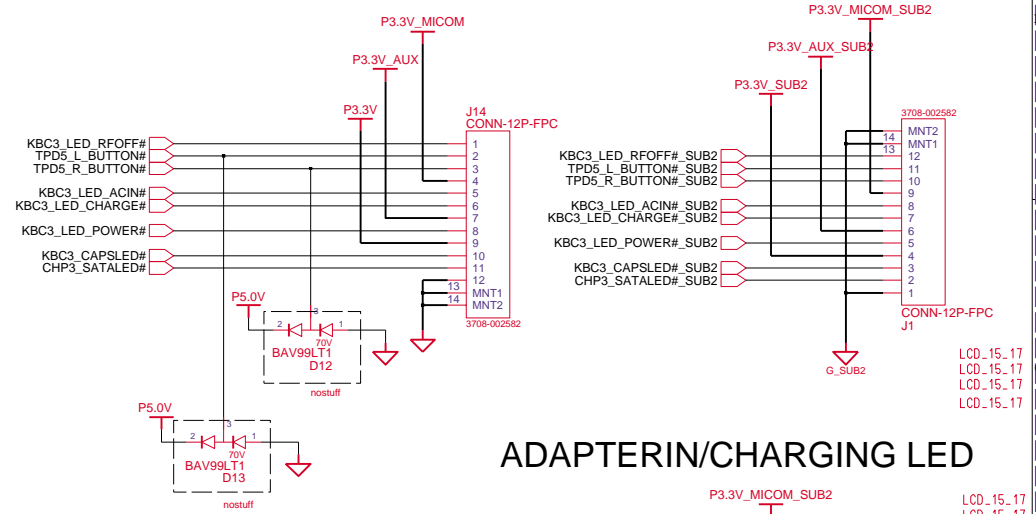
TOUCHPAD



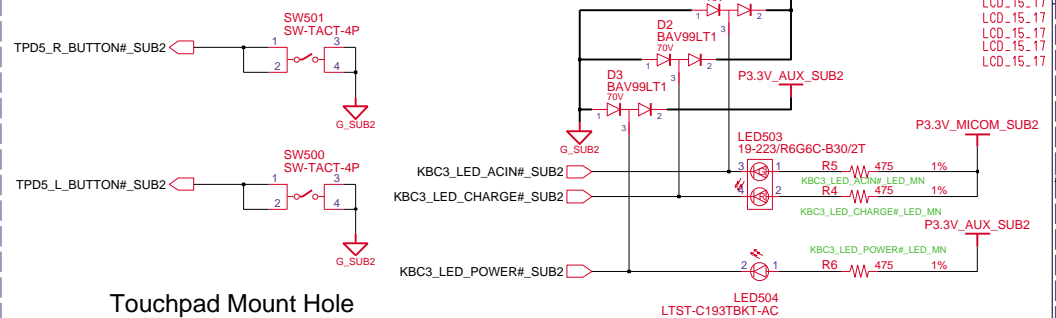
ADAPTERIN/CHARGING LED



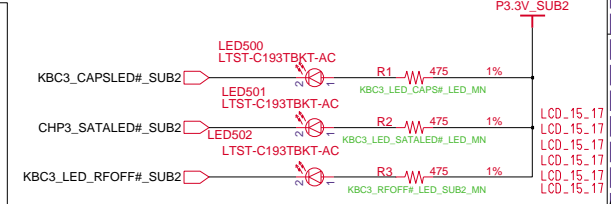
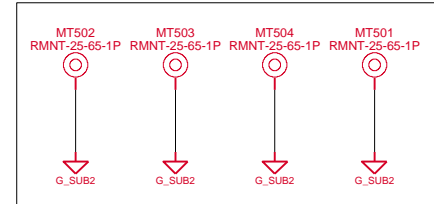
15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



ADAPTERIN/CHARGING LED

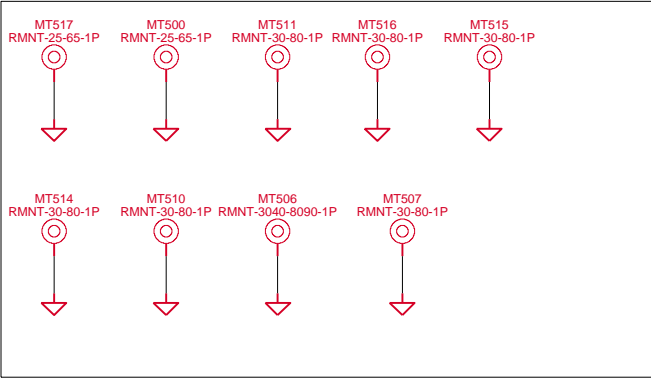


Touchpad Mount Hole

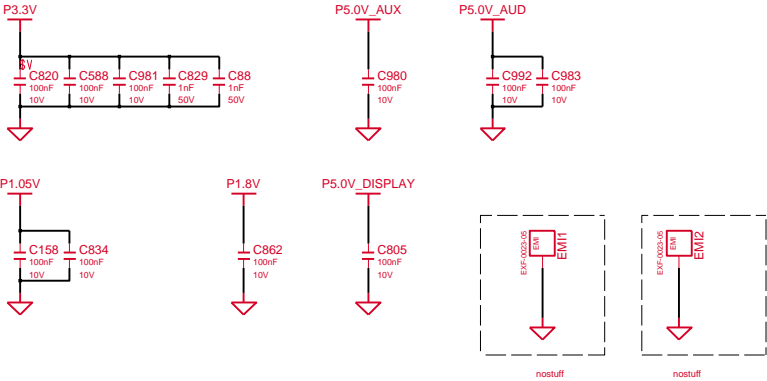
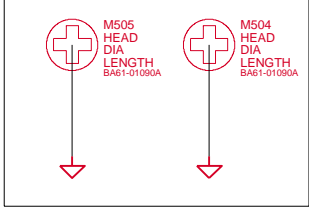


DRAW	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R Touchpad	SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	ADV				
APPROVAL	BL LEE	REV	rev. 0.3			PART NO.	
MODULE CODE		LAST EDIT				BA41-01XXXX	
						January 18, 2011 08:10:20 AM	47 OF 48

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



PCH Thermal



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