

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)
 BA41-01XXXA (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 |

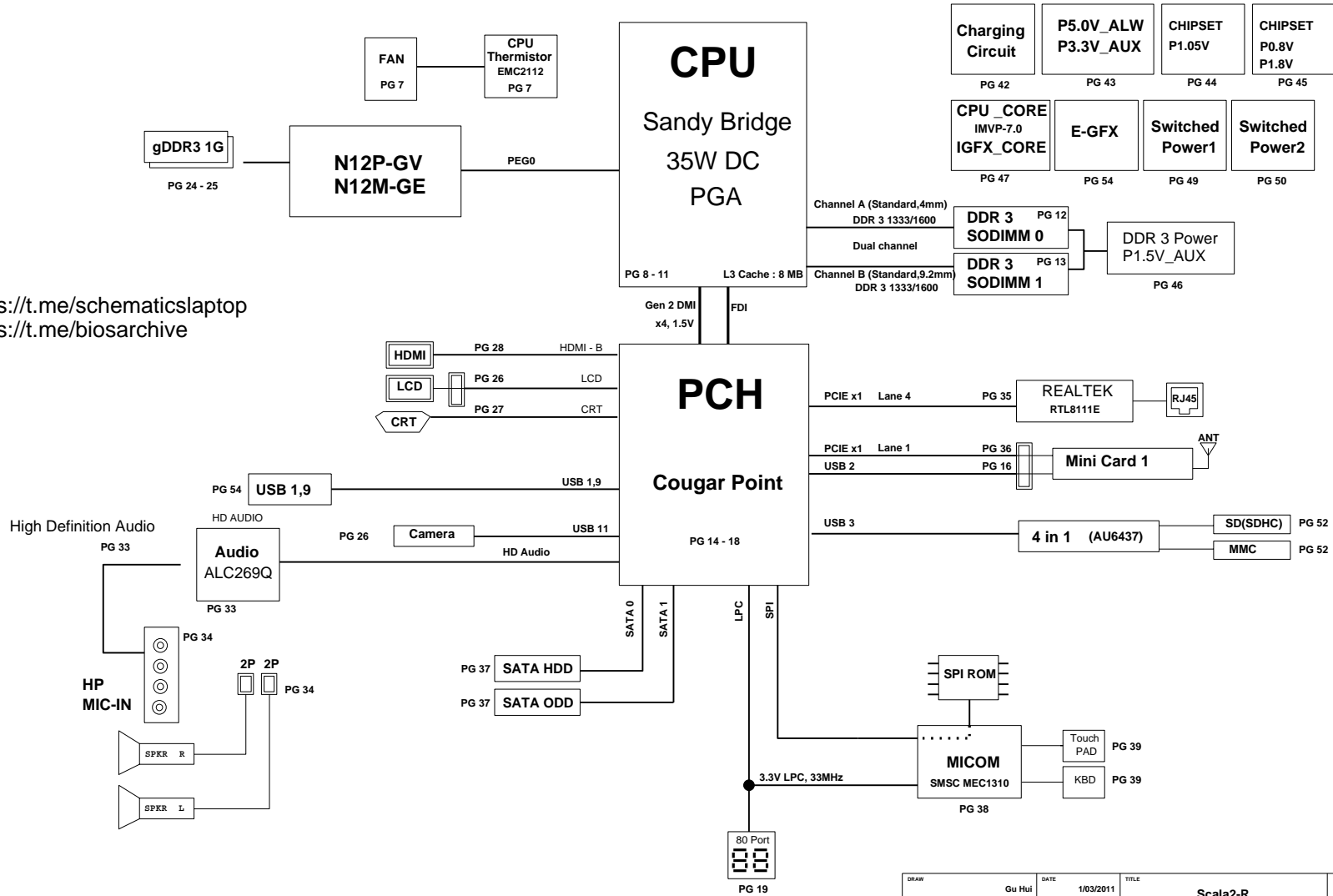
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BA41-02243A

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. BA41-01XXXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	1	OF 48

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BLOCK DIAGRAM



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CHECK	SJ Wu	DEV. STEP	ADV	MAIN	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	BLOCK DIAGRAM	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 Pannel Detect (TBD)		
Devices	Resolution	PANNEL_DETECT_0

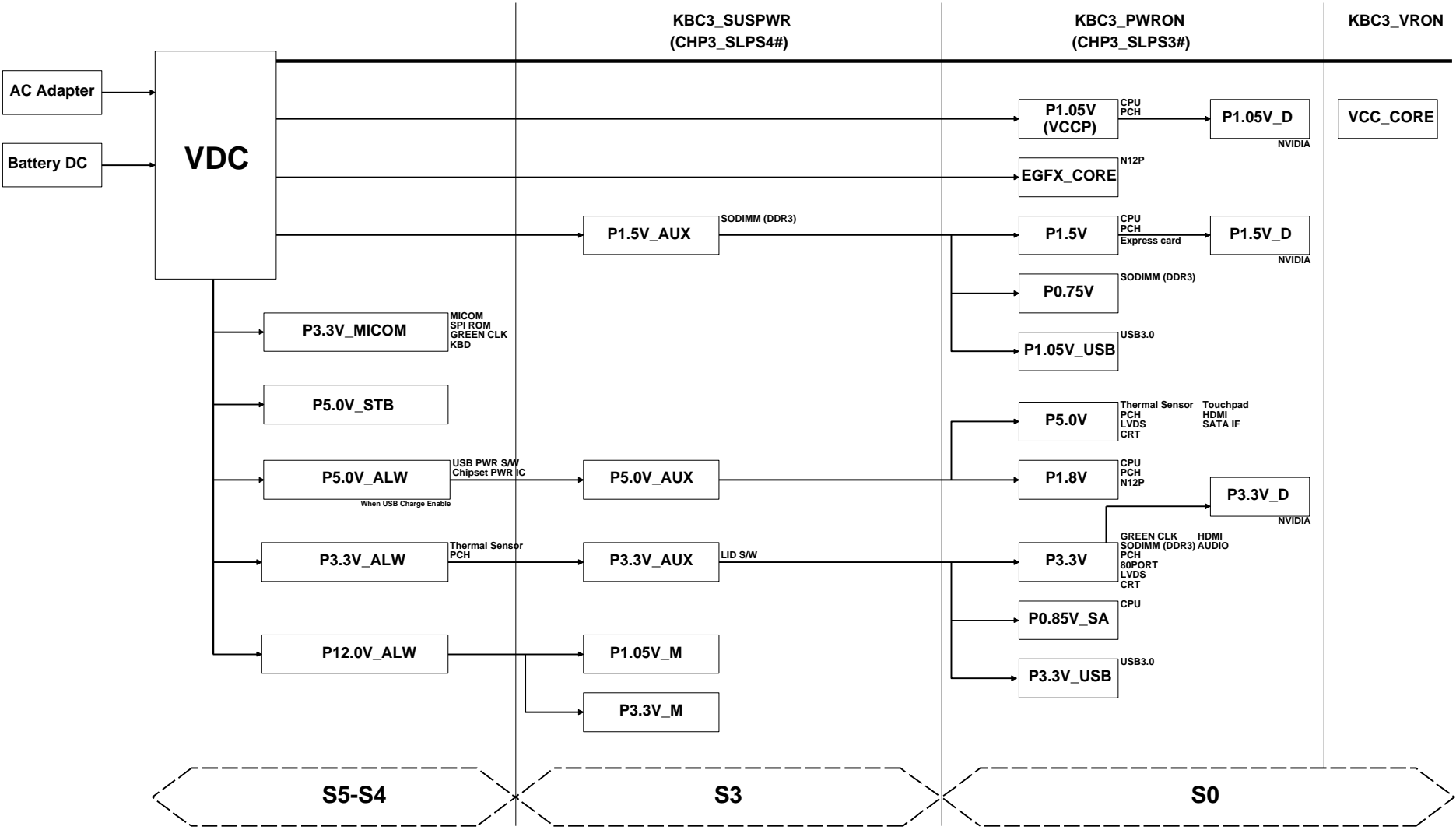
I ² C / SMB Address			
Devices	Address	Hex	Bus
HM65	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	Thermal Sensor
SODIMM0	1010 000x	A0h	-
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
Thermal Sensor on board	1101 100x	98h	
Power thermal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

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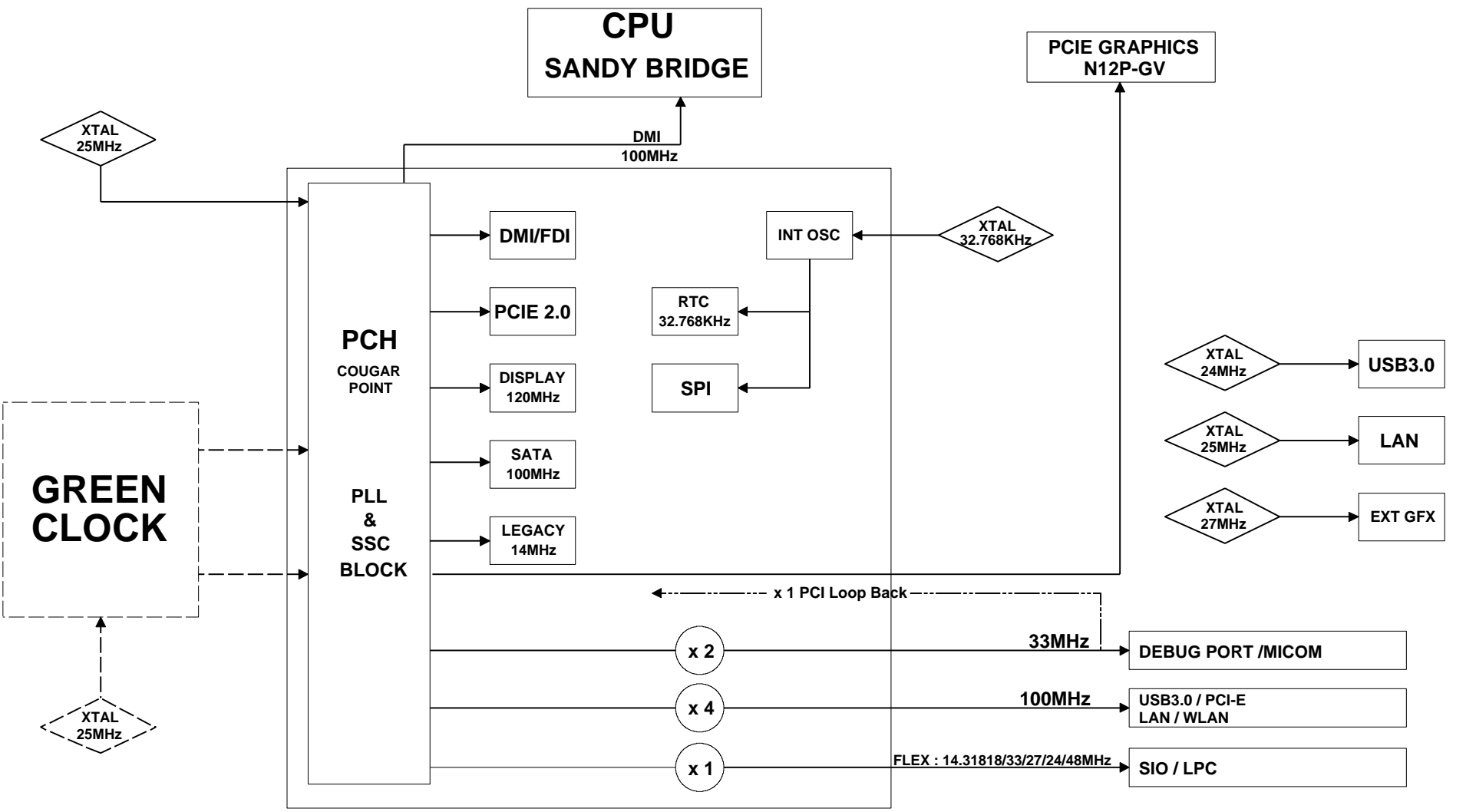
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CHECK	SJ Wu	DEV. STEP	ADV		MAIN	
APPROVAL	BC LEE	REV	rev. 0.1		BOARD INFO	
MODULE CODE	undefined	LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 3 OF 48



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CHECK	SJ Wu	DEV. STEP	ADV	MAIN	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	POWER DIAGRAM	BA41-01XXXX	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	4 OF 48	

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CLOCK DISTRIBUTION Rev. 0.8



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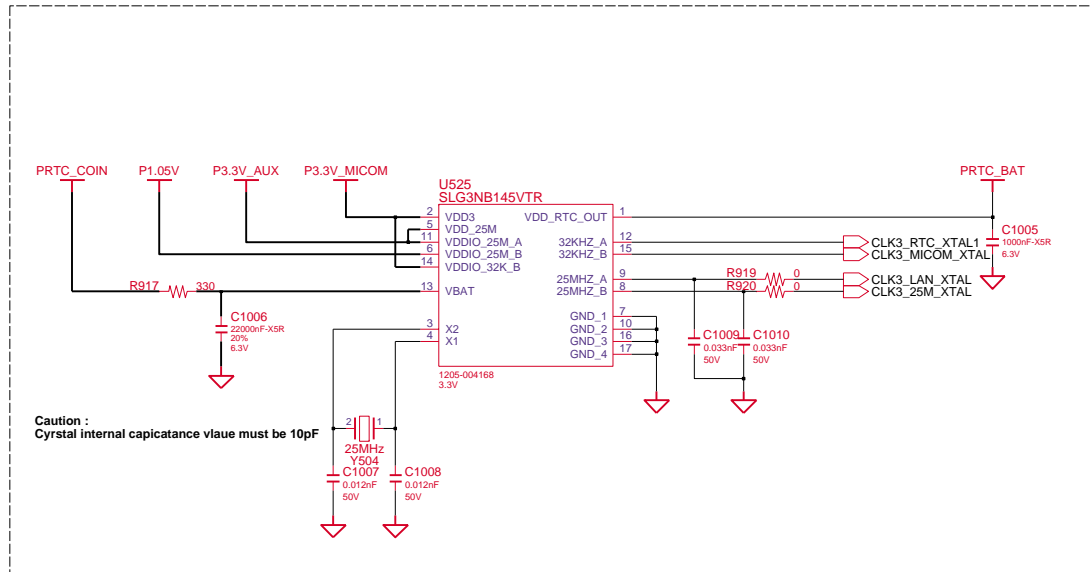
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CHECK	SJ Wu	DEV. STEP	ADV	CLOCK DIAGRAM	PART NO. BA41-01XXXXA	
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 5 OF 48	

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CLOCK DISTRIBUTOR



Caution :
 Crystal internal capacitance value must be 10pF

GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK
 GREENCLK

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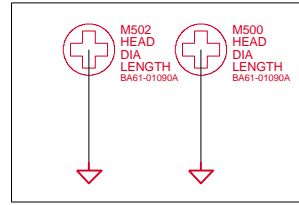
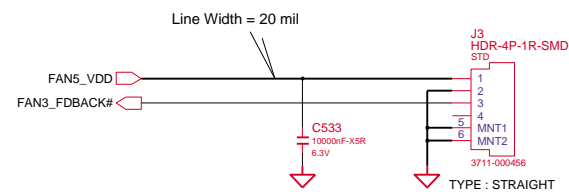
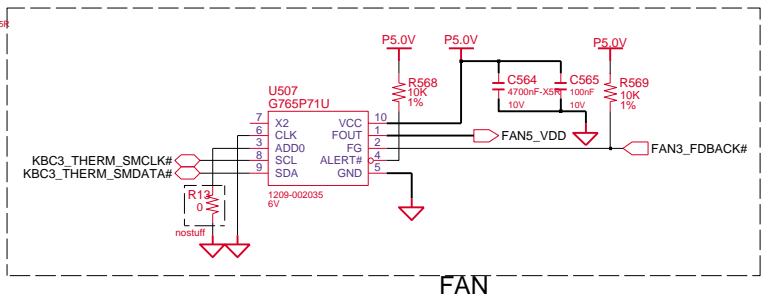
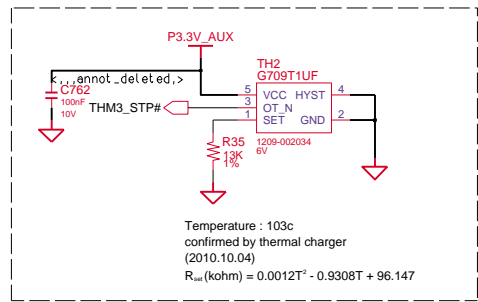
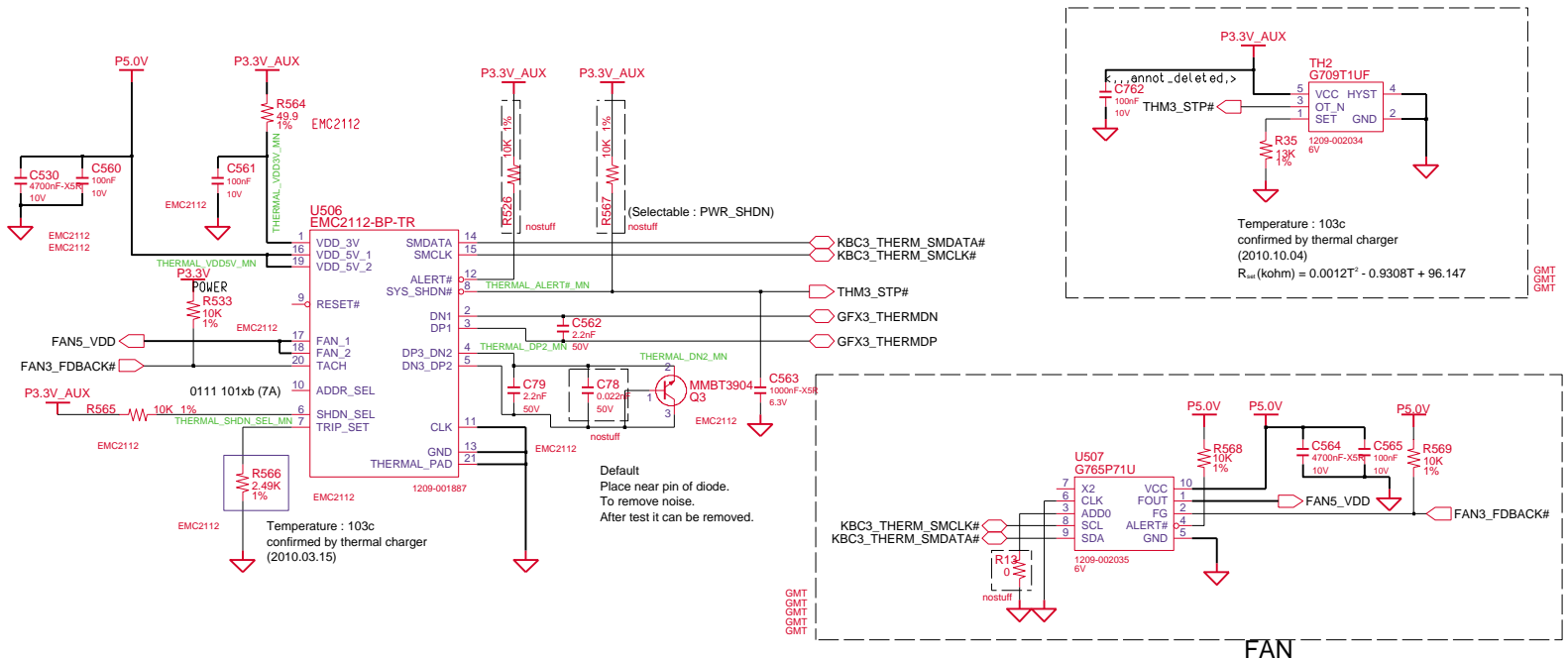
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ENGINEER	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXX
DESIGNED BY	short_date	SCALA2-R_PV_MAIN	
CHANGED BY	REV. STEP	FDR1	
PPG: CHK	REV	1.0	
LAST EDIT	last_edit	PAGE 6 OF XX	

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



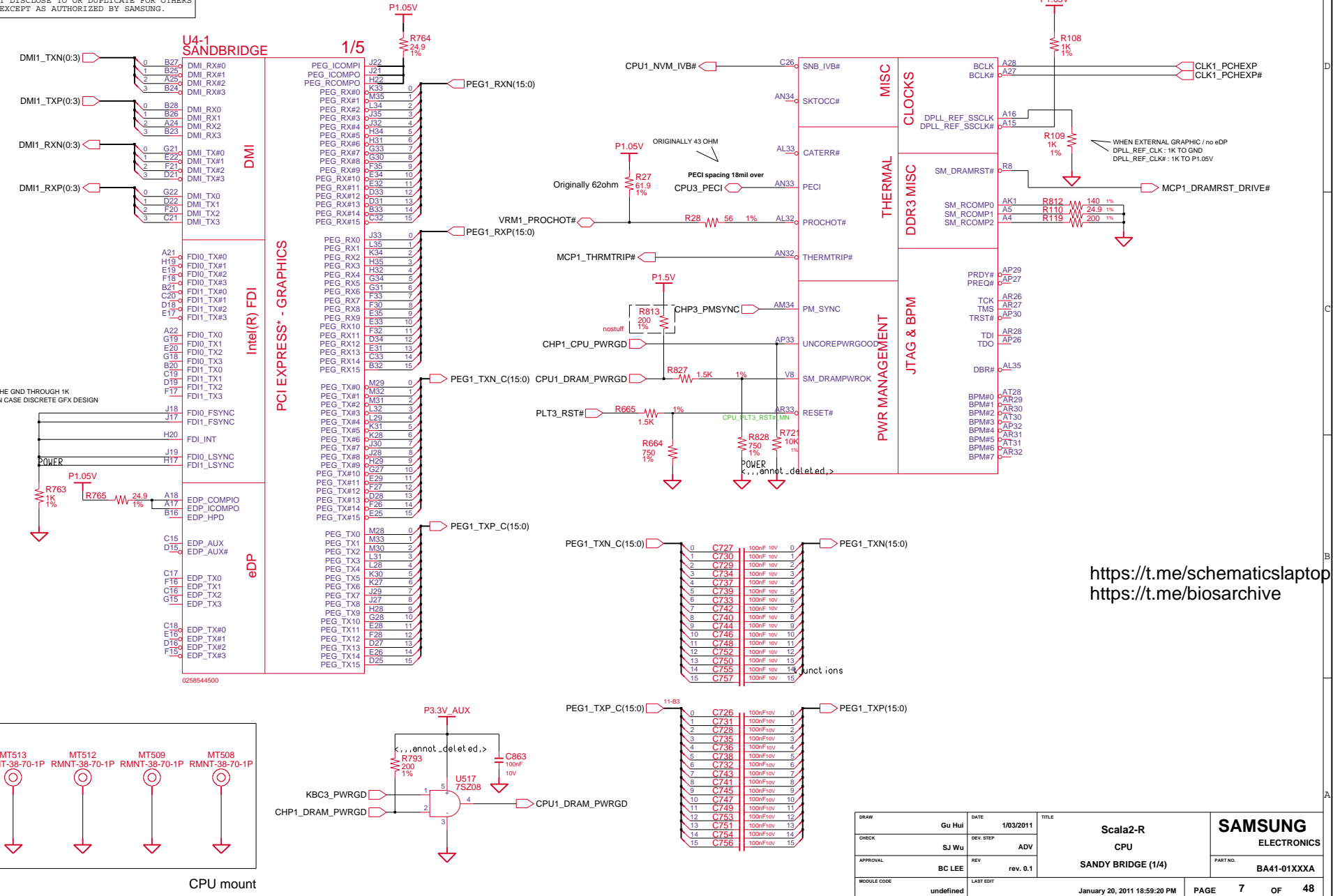
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CHECK	SJ Wu	DEV. STEP	ADV		THERMAL SENSOR	
APPROVAL	BC LEE	REV	rev. 0.1		THERMAL SENSOR EMC2112	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				

January 20, 2011 18:59:20 PM PAGE 6 OF 48

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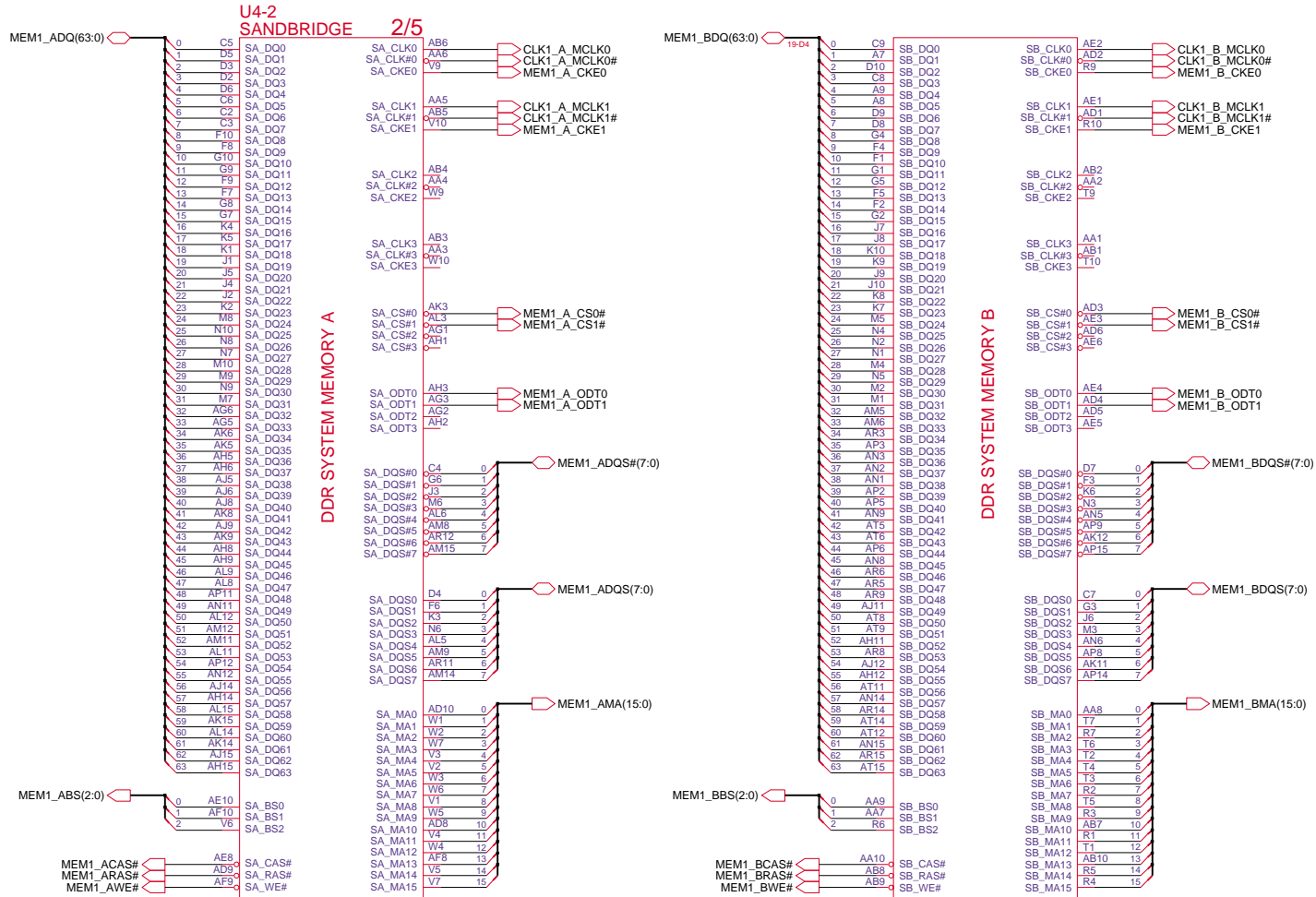
SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)



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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

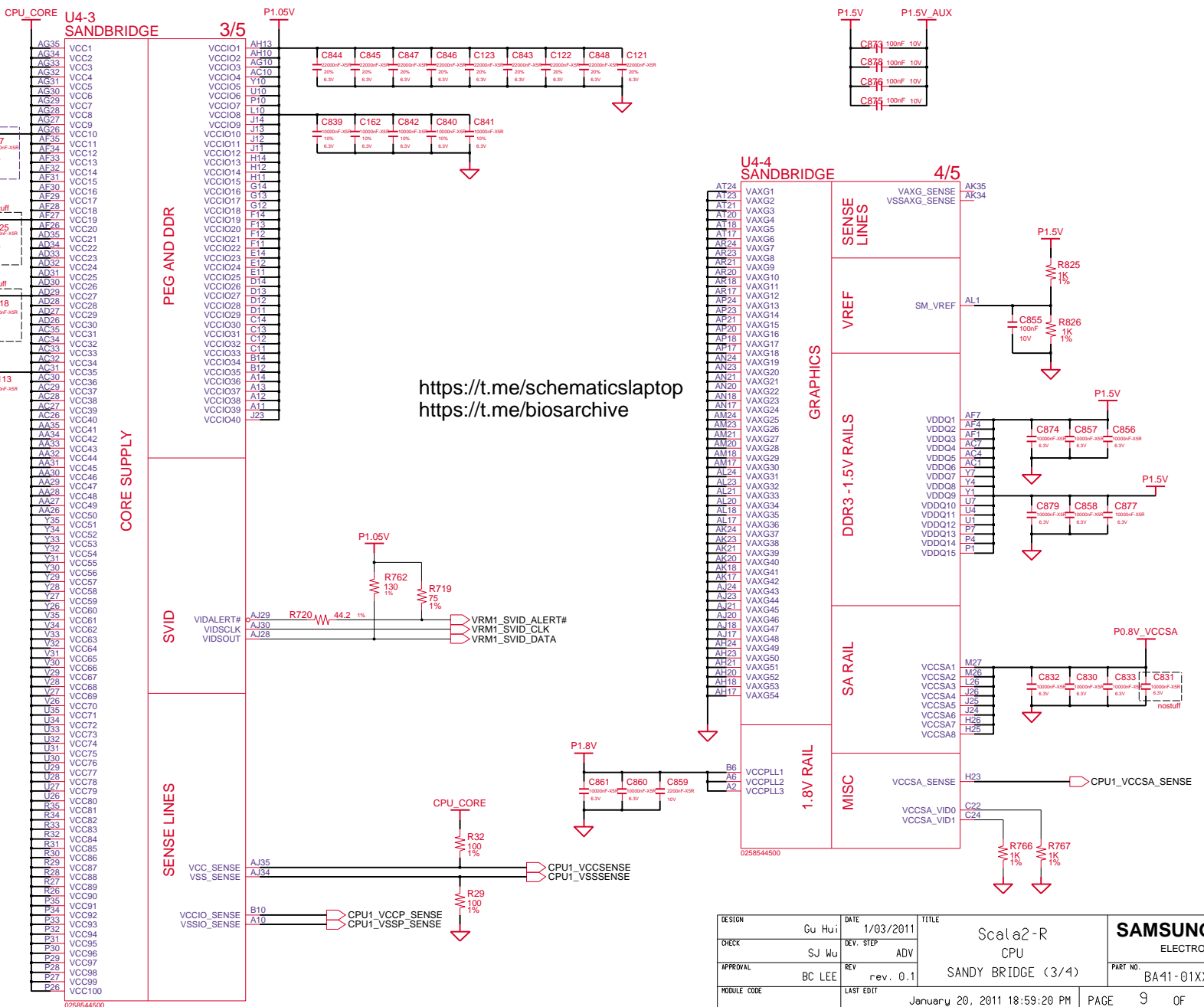
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DRAW	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-01XXXXA
Gu Hui	1/03/2011	Scala2-R	
SJ Wu	ADV	CPU	
BC LEE	rev. 0.1	SANDY BRIDGE (2/4)	
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PAGE 8 OF 48

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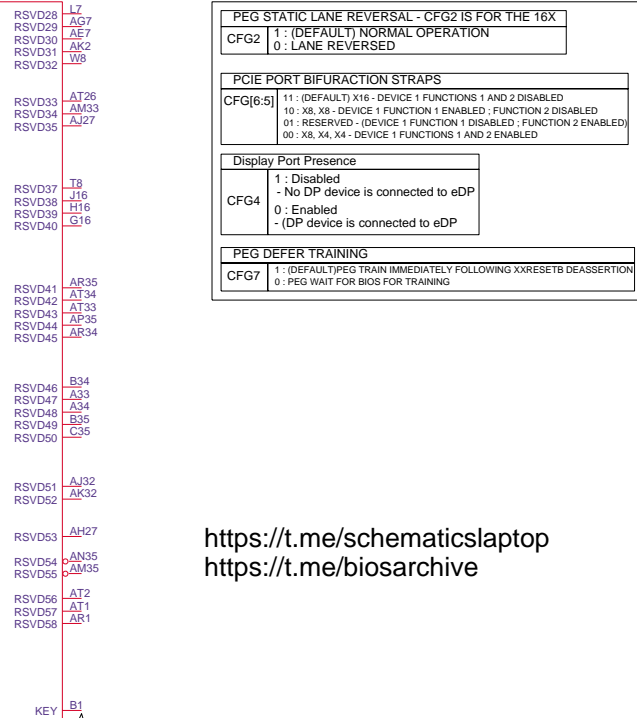
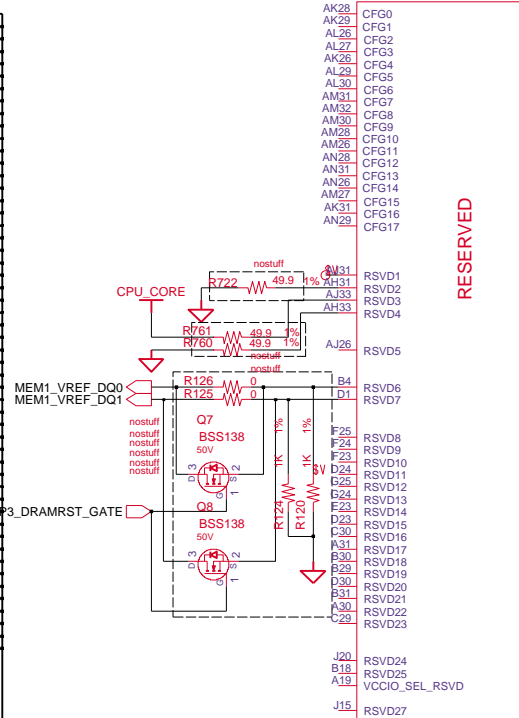
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CHECK	SJ Wu	REV. STEP	ADV		CPU	
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (3/4)	PART NO.
MODULE CODE		LAST EDIT				BA11-01XXXX
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U4-5 SANDBRIDGE 5/5

AT35	VSS1	VSS81	AJ22	T35	VSS161	F22	AK28	CFG0	RSVD28	LZ
AT32	VSS2	VSS82	AJ19	T33	VSS162	F19	AK29	CFG1	RSVD29	AG7
AT29	VSS3	VSS83	AJ16	T33	VSS163	E30	AL26	CFG2	RSVD30	AE7
AT27	VSS4	VSS84	AJ13	T32	VSS164	E27	AL27	CFG3	RSVD31	AK2
AT25	VSS5	VSS85	AJ10	T31	VSS165	E24	AK25	CFG4	RSVD32	W8
AT22	VSS5	VSS85	AJ7	T30	VSS165	E21	AK26	CFG4		
AT19	VSS6	VSS86	AJ4	T29	VSS166	E18	AL28	CFG5		
VSS7	VSS7	VSS87	AJ1	T26	VSS167	E15	AM31	CFG5		
AT16	VSS8	VSS88	AJ3	T28	VSS168	E15	AM30	CFG6	RSVD33	AT26
AT13	VSS9	VSS89	AJ2	T27	VSS169	E13	AM32	CFG6	RSVD34	AM33
AT10	VSS10	VSS90	AH35	T26	VSS170	E10	AM33	CFG7	RSVD35	AJ27
AT7	VSS11	VSS91	AH34	T26	VSS171	E8	AM28	CFG8		
AT4	VSS12	VSS92	AH32	T26	VSS172	E7	AM26	CFG9		
AT3	VSS13	VSS93	AH30	T26	VSS173	E5	AM29	CFG10		
AR55	VSS14	VSS94	AH29	T26	VSS174	E5	AM27	CFG11		
AR22	VSS15	VSS95	AH28	T26	VSS175	E4	AM27	CFG12		
AR19	VSS16	VSS96	AH27	T26	VSS176	E3	AM27	CFG14	RSVD37	J18
AR16	VSS17	VSS97	AH26	T26	VSS177	E2	AK31	CFG15	RSVD38	H16
AR13	VSS18	VSS98	AH25	T26	VSS178	E1	AN29	CFG16	RSVD39	G16
AR10	VSS19	VSS99	AH24	T26	VSS179	D35		CFG17	RSVD40	
AR7	VSS20	VSS100	AH22	T26	VSS180	D32				
AR4	VSS21	VSS101	AH16	T26	VSS181	D29				
AR2	VSS22	VSS102	AH7	T26	VSS182	D28				
AP34	VSS23	VSS103	AG9	T26	VSS183	D26				
AP31	VSS24	VSS104	AG8	T27	VSS184	D17				
AP28	VSS25	VSS105	AG7	T27	VSS185	D17				
AP25	VSS26	VSS106	AG4	T26	VSS186	C34				
AP22	VSS27	VSS107	AF6	T26	VSS187	C28				
AP19	VSS28	VSS108	AF5	T26	VSS188	C27				
AP16	VSS29	VSS109	AF3	T26	VSS189	C25				
AP13	VSS30	VSS110	AF2	T27	VSS190	C23				
AP10	VSS31	VSS111	AF1	T29	VSS191	C10				
AP7	VSS32	VSS112	AE34	T29	VSS192	C1				
AP4	VSS33	VSS113	AE33	T29	VSS193	B22				
AP1	VSS34	VSS114	AE32	T29	VSS194	B17				
AN30	VSS35	VSS115	AE31	T29	VSS195	B19				
AN27	VSS36	VSS116	AE29	T29	VSS196	B15				
AN25	VSS37	VSS117	AE28	T29	VSS197	B13				
AN22	VSS38	VSS118	AH1	T29	VSS198	B17				
AN19	VSS39	VSS119	AE27	T29	VSS199	B11				
AN16	VSS40	VSS120	AE26	T29	VSS200	B9				
AN13	VSS41	VSS121	AD7	T29	VSS201	B7				
AN10	VSS42	VSS122	AD6	T29	VSS202	B5				
AN7	VSS43	VSS123	AD9	T29	VSS203	B3				
AN4	VSS44	VSS124	AC8	T29	VSS204	B2				
AM29	VSS45	VSS125	AC6	T29	VSS205	A35				
AM25	VSS46	VSS126	AC5	T27	VSS206	A32				
AM22	VSS47	VSS127	AC3	T27	VSS207	A30				
AM19	VSS48	VSS128	AC2	T24	VSS208	A29				
AM16	VSS49	VSS129	AB35	T21	VSS209	A28				
AM13	VSS50	VSS130	AB34	T18	VSS210	A23				
AM10	VSS51	VSS131	AB33	H15	VSS211	A20				
AM7	VSS52	VSS132	AB32	H13	VSS212	A3				
AM4	VSS53	VSS133	AB31	H10	VSS213					
AM3	VSS54	VSS134	AB30	H9	VSS214					
AM2	VSS55	VSS135	AB29	H8	VSS215					
AM1	VSS56	VSS136	AB28	H7	VSS216					
AL34	VSS57	VSS137	AB27	H6	VSS217					
AL31	VSS58	VSS138	AB26	H5	VSS218					
AL28	VSS59	VSS139	Y8	H4	VSS219					
AL25	VSS60	VSS140	Y8	H3	VSS220					
AL22	VSS61	VSS141	Y6	H2	VSS221					
AL19	VSS62	VSS142	Y5	H1	VSS222					
AL16	VSS63	VSS143	Y3	G35	VSS223					
AL13	VSS64	VSS144	Y2	G32	VSS224					
AL10	VSS65	VSS145	W35	G29	VSS225					
AL7	VSS66	VSS146	W34	G26	VSS226					
AL4	VSS67	VSS147	W33	G23	VSS227					
AL2	VSS68	VSS148	W32	G20	VSS228					
AK33	VSS69	VSS149	W31	G17	VSS229					
AK30	VSS70	VSS150	W30	G11	VSS230					
AK27	VSS71	VSS151	W29	F34	VSS231					
AK25	VSS72	VSS152	W28	F31	VSS232					
AK19	VSS73	VSS153	W27	F29	VSS233					
AK16	VSS74	VSS154	W26							
AK13	VSS75	VSS155	U9							
AK10	VSS76	VSS156	U8							
AK7	VSS77	VSS157	U6							
AK4	VSS78	VSS158	U5							
AK25	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 BIFURCATION 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 - 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 XXRESETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

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FOR RPGA SOCKET
RSVD59 PIN SHOULD BE LEFT NC

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 (4/4)	PART NO.	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	BA11-01XXXX	
				PAGE	10	OF 48

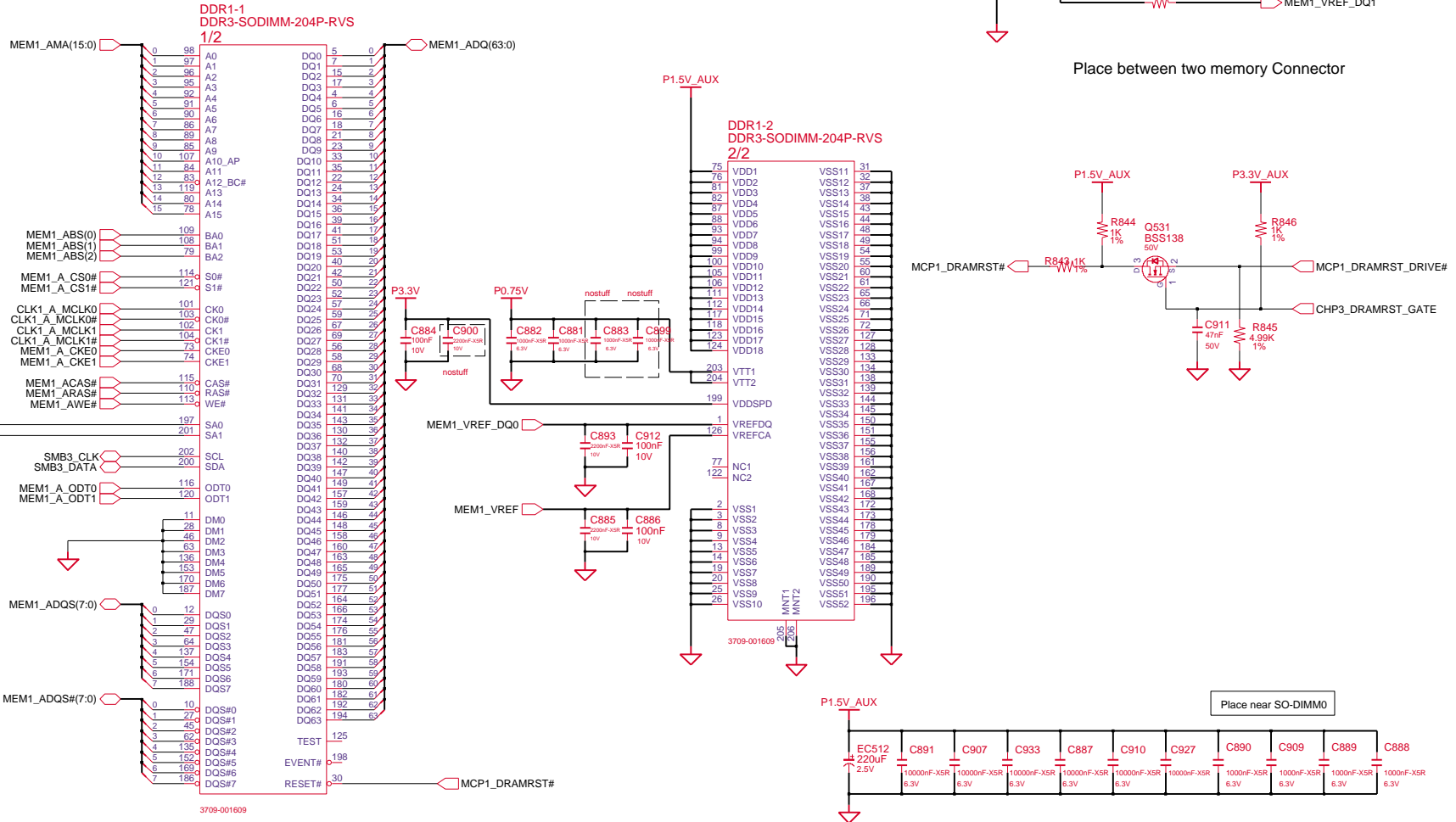
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SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)
 P/N : 3709-001609 (CONCRAFT)
 P/N : 3709-001656 (Foxconn)

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

SO-DIMM#1 : 1st SO-DIMM

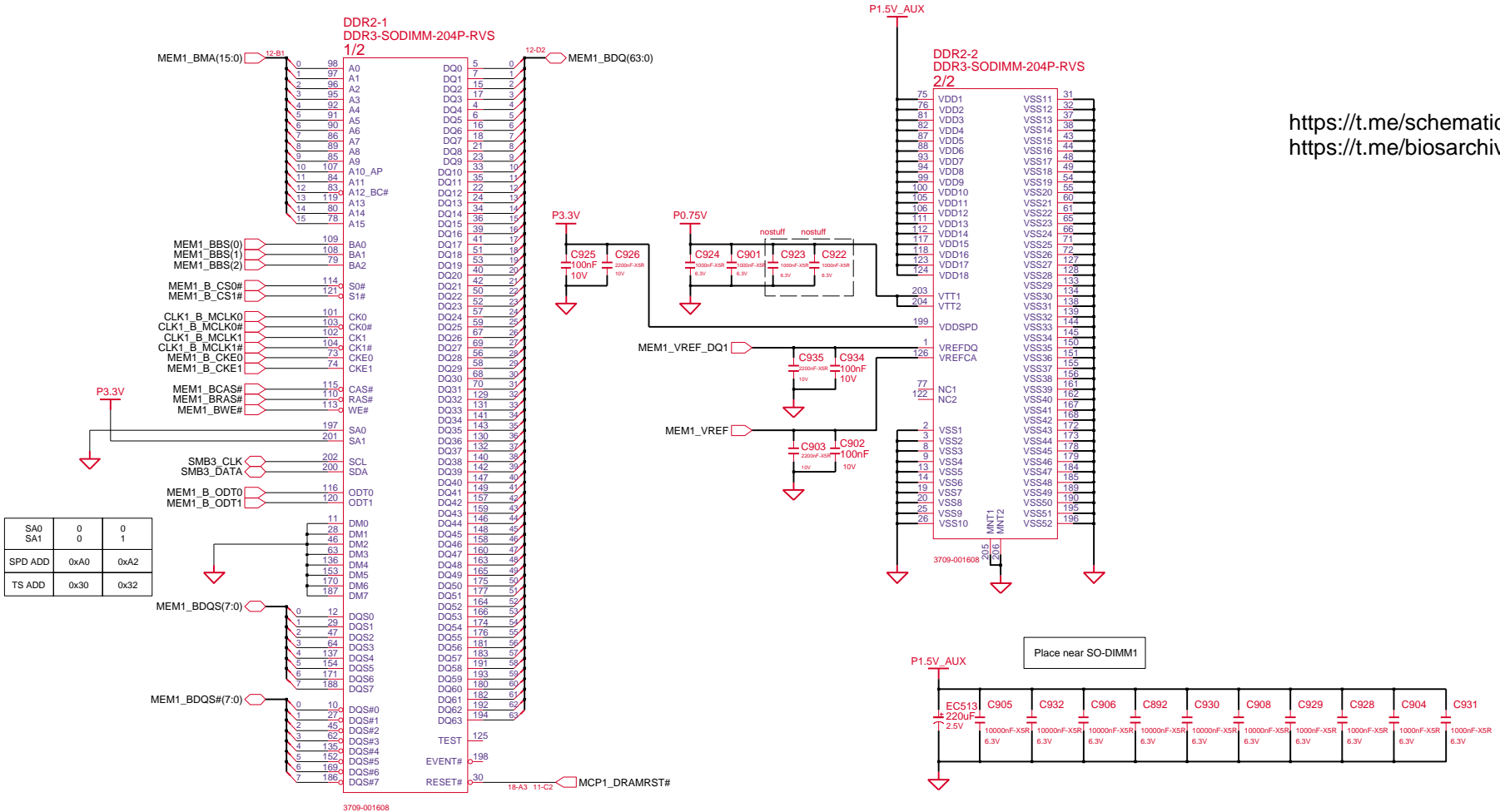
DDR SO-DIMM #1

Height : 4 mm (REVERSE)

P/N : 3709-001608 (CONCRAFT)

P/N : 3709-001654 (Foxconn)

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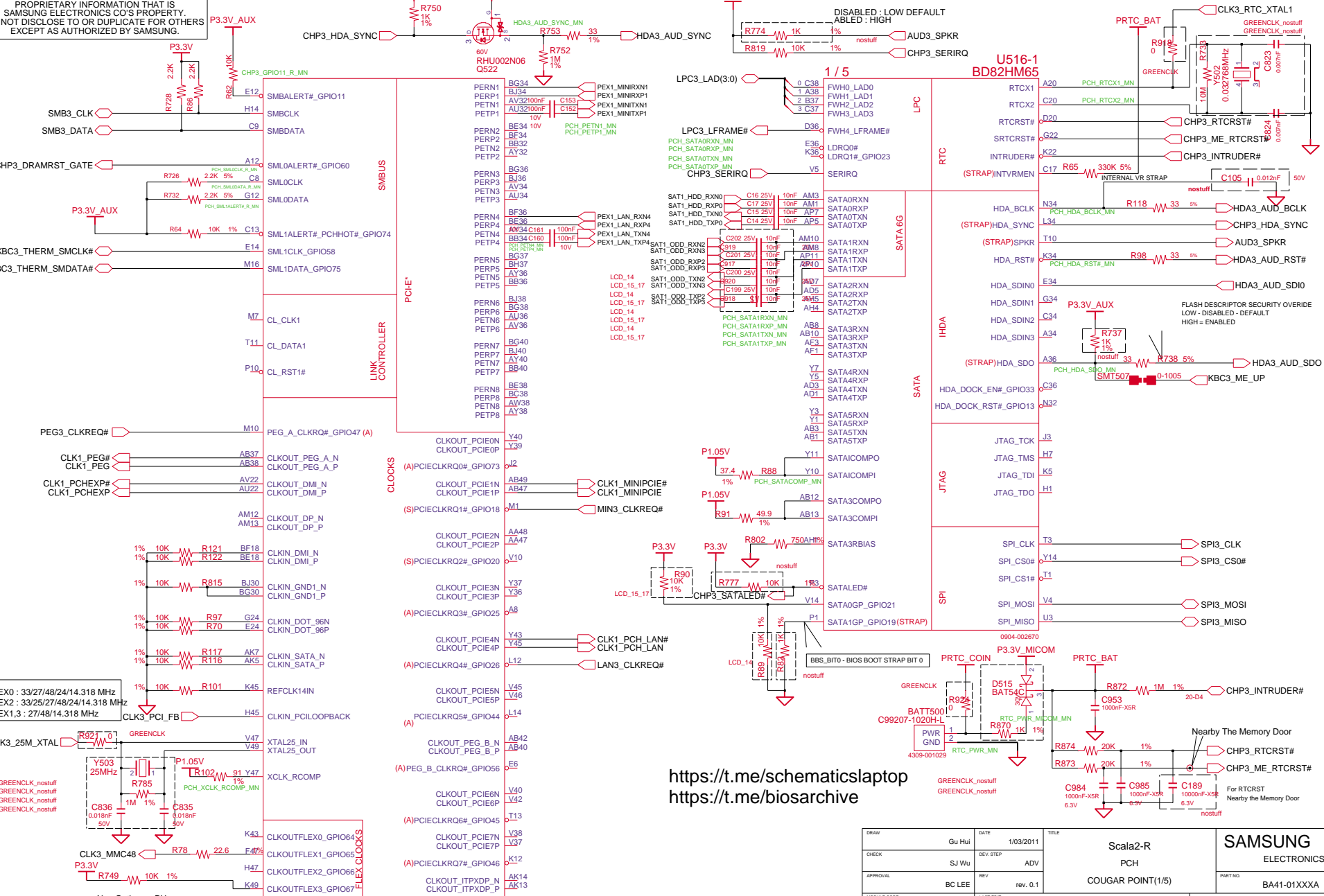


3709-001608

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	

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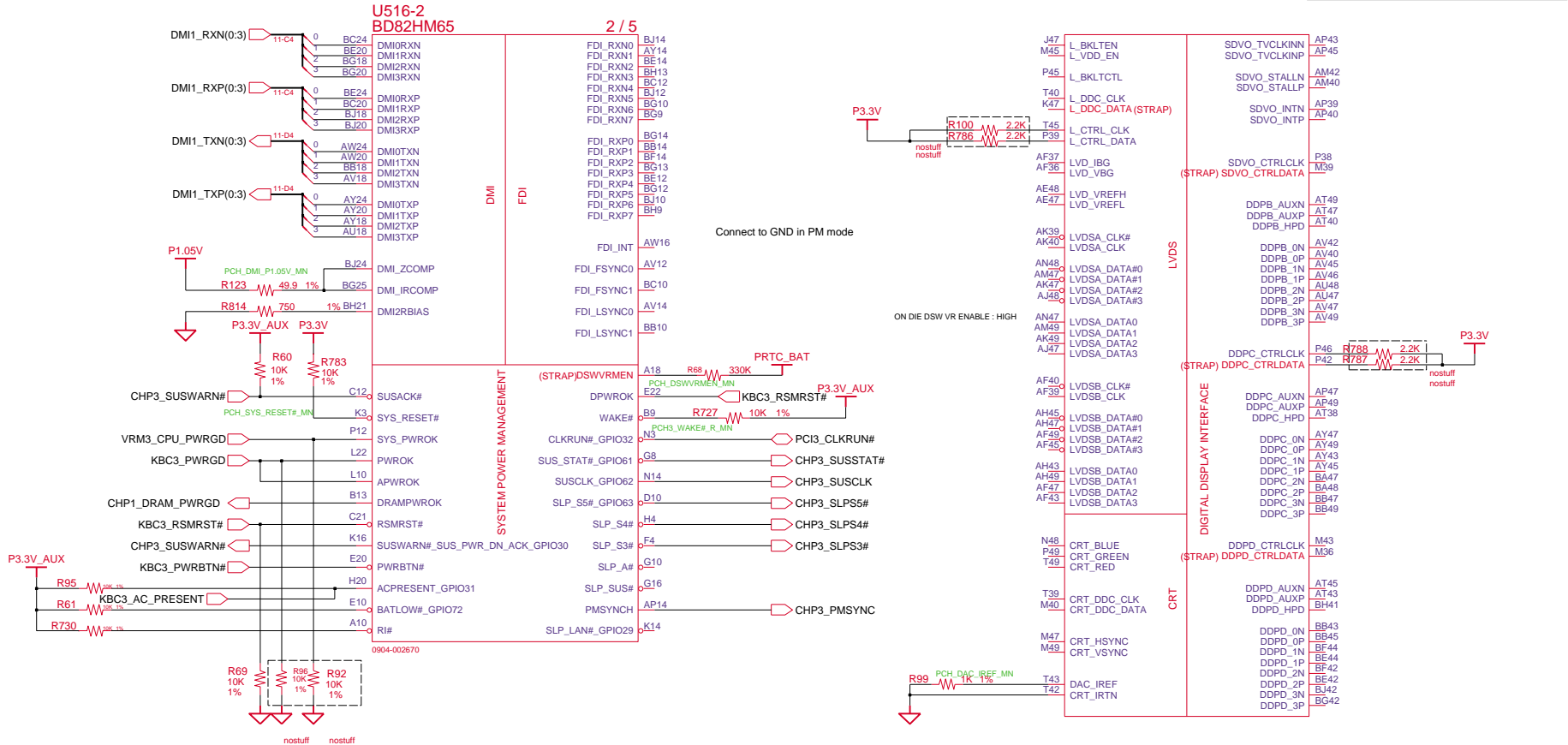
NO REBOOT STRAP



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DRAW	DATE	TITLE	SAMSUNG ELECTRONICS	
Gu Hui	1/03/2011	Scala2-R	PART NO. BA41-01XXXX	
CHK	DEV STEP	PCH	PAGE 13 OF 48	
SJ Wu	ADV	COUGAR POINT(1/5)		
BC LEE	REV. 0.1			
MODULE CODE	LAST EDIT			
		January 20, 2011 18:59:20 PM		

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



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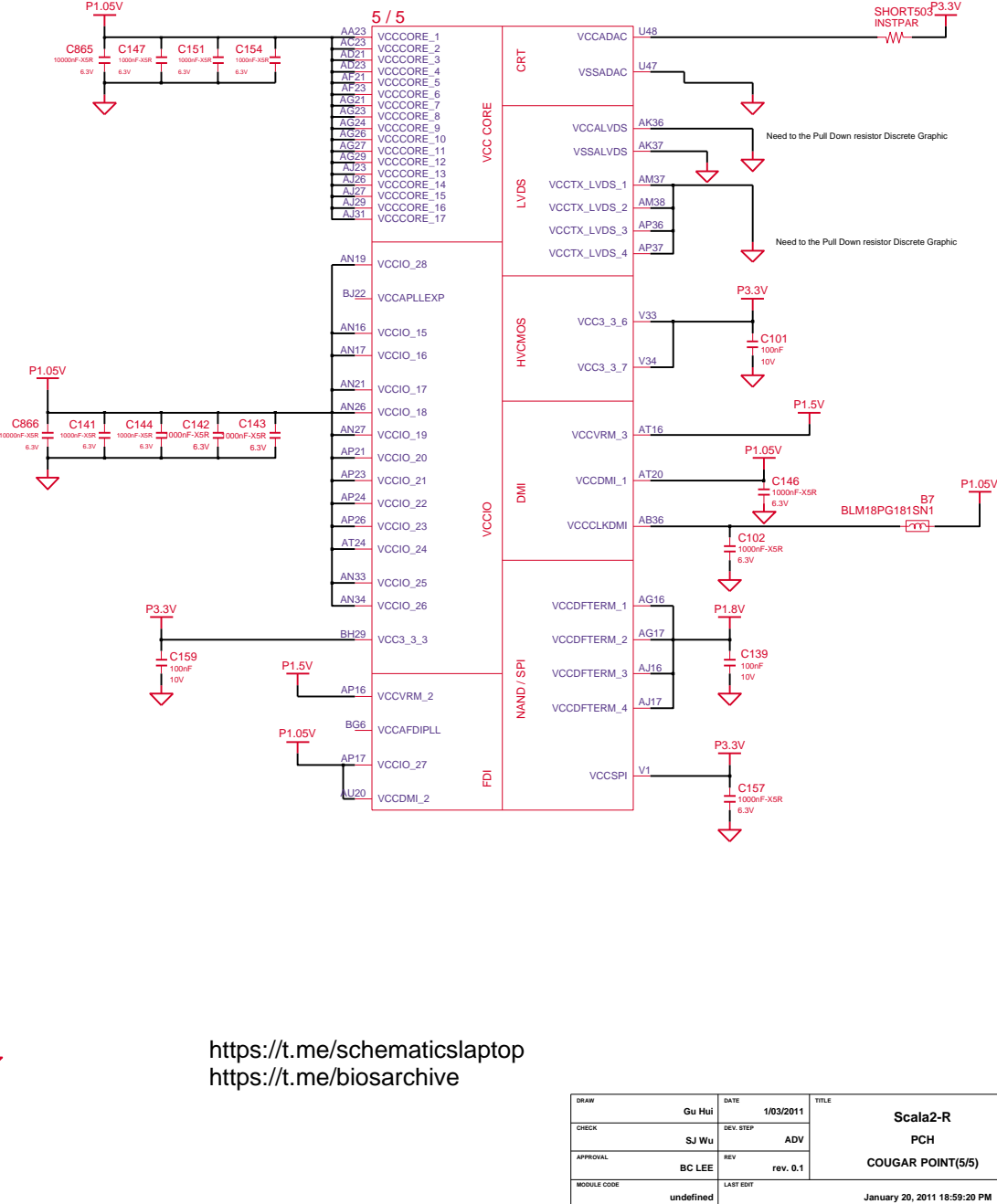
DRAW	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
Gu Hui	1/03/2011	Scala2-R	
SJ Wu	ADV	PCH	
BC LEE	rev. 0.1	COUGAR POINT(2/5)	

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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	K7
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
F45	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	M42
BC14	VSS183	VSS283	M46
BC18	VSS184	VSS284	M8
BC	VSS185	VSS285	N18
BC22	VSS186	VSS286	N40
BC26	VSS187	VSS287	N47
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	P47
BD5	VSS195	VSS295	R2
BE22	VSS196	VSS296	R48
BE26	VSS197	VSS297	T12
BE40	VSS198	VSS298	T37
BF10	VSS199	VSS299	T4
BF12	VSS200	VSS300	W34
BF16	VSS201	VSS301	T47
BF20	VSS202	VSS302	T46
BF22	VSS203	VSS303	T8
BF24	VSS204	VSS304	V11
BF26	VSS205	VSS305	V17
BF28	VSS206	VSS306	V26
BD3	VSS207	VSS307	V27
BF30	VSS208	VSS308	V29
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	BG41
D24	VSS234	VSS334	G14
D26	VSS235	VSS335	H16
D30	VSS236	VSS336	T36
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



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DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		PCH	
APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(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

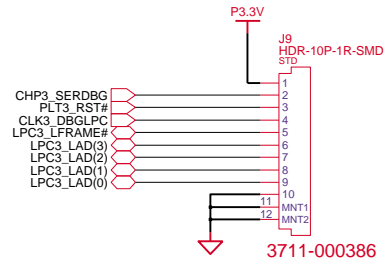
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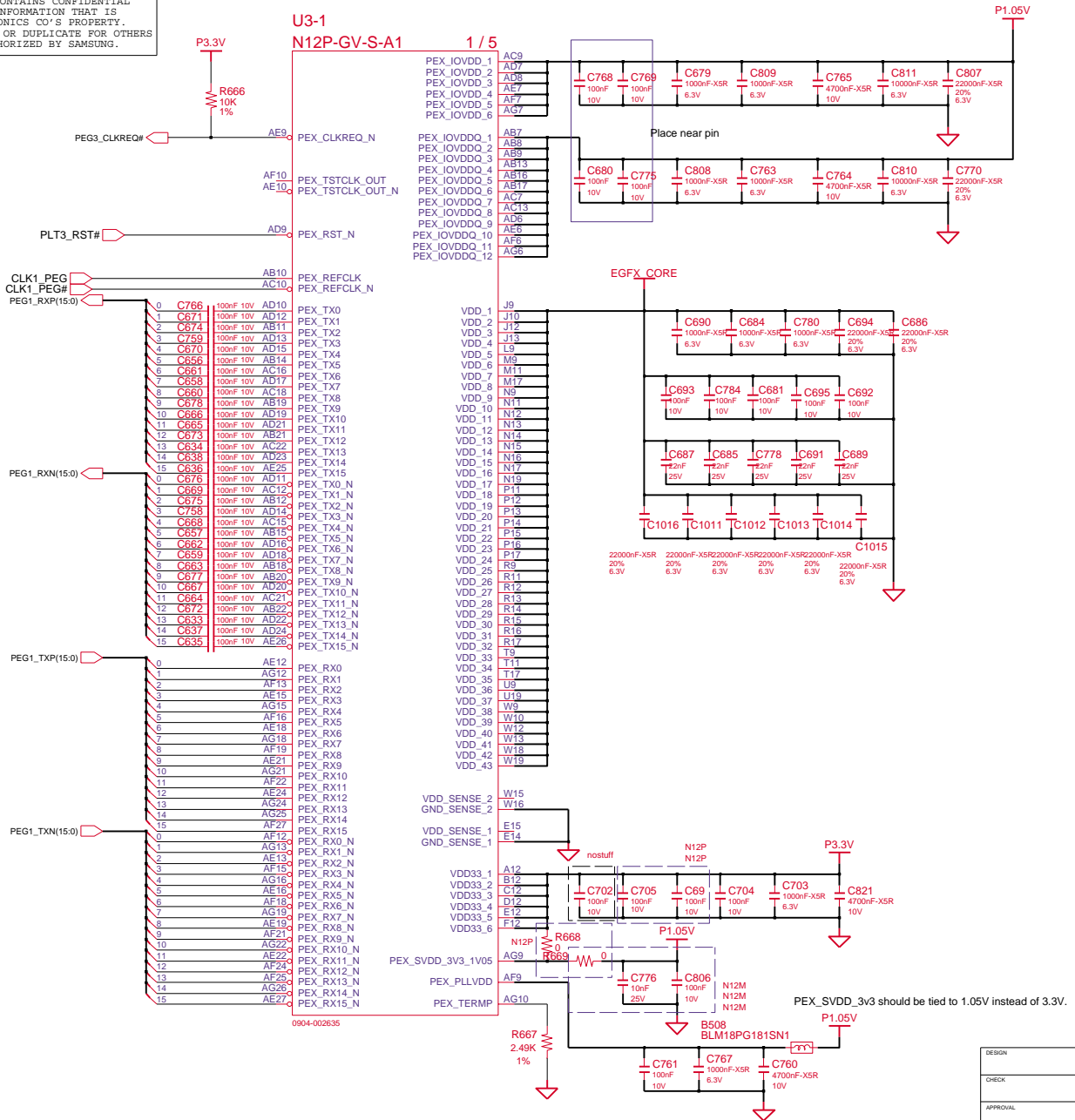
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DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	DEBUG PORT	80H DECODER	
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA11-01XXXXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	18	OF 48

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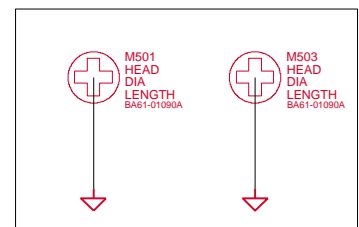
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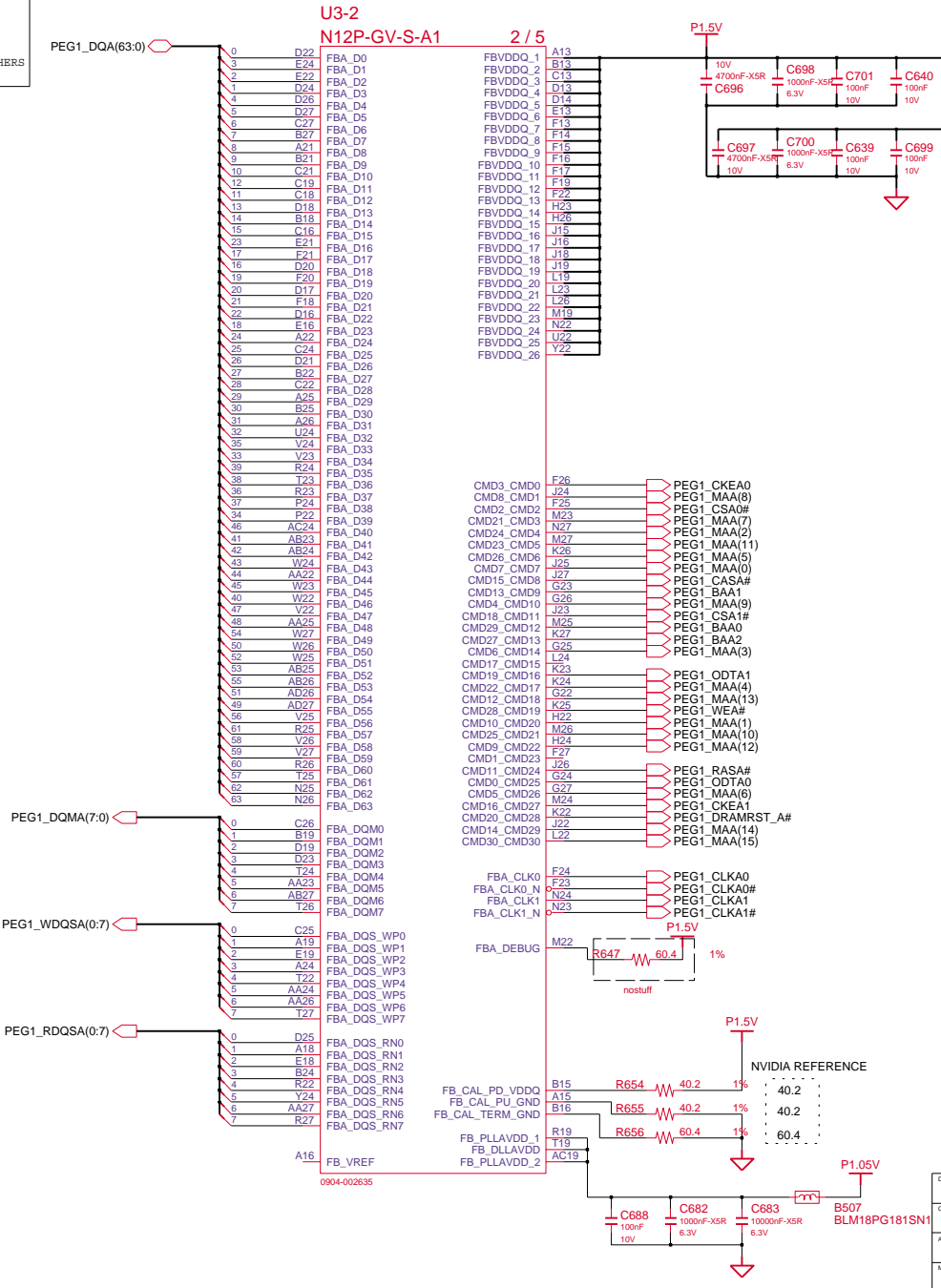
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Graphic PEM

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. BA41-01XXXXA	
MODULE CODE		LAST EDIT				January 20, 2011 18:59:20 PM	
						PAGE	19
						OF	48

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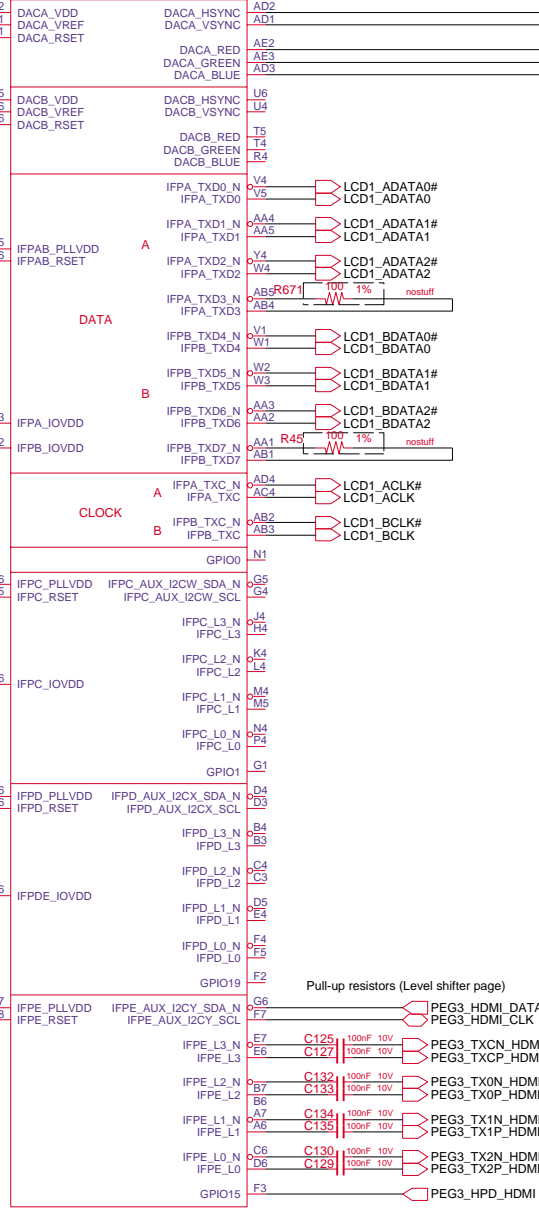
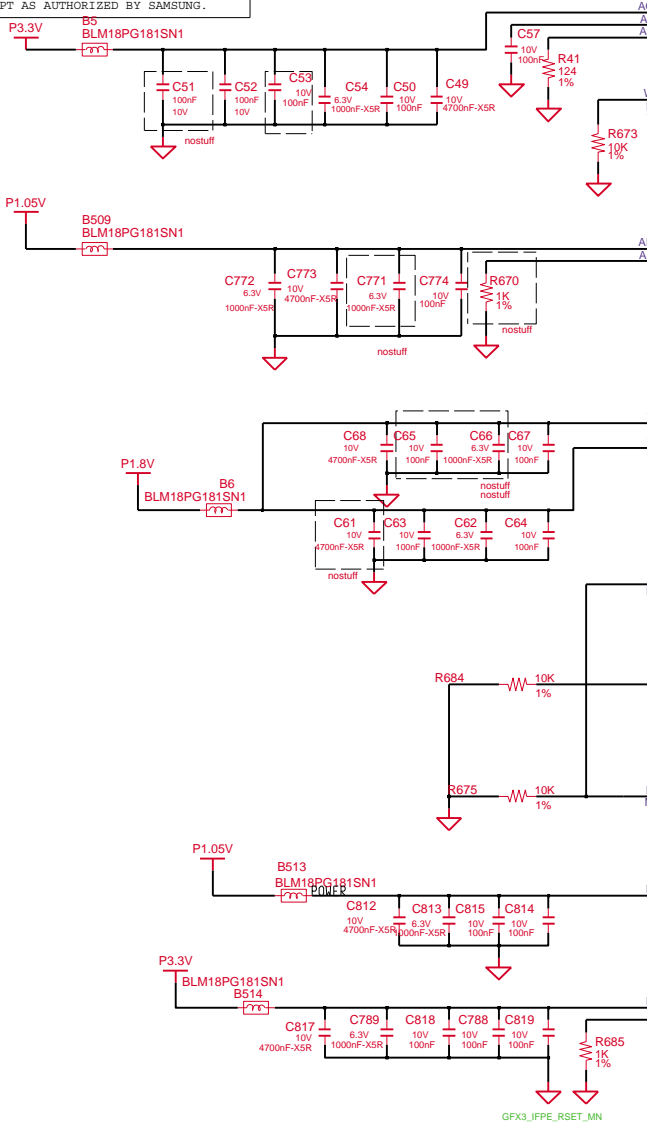
<https://t.me/schematicsLaptop>
<https://t.me/biosarchive>

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

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

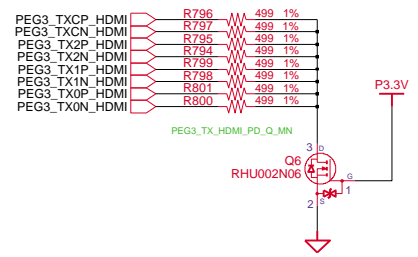
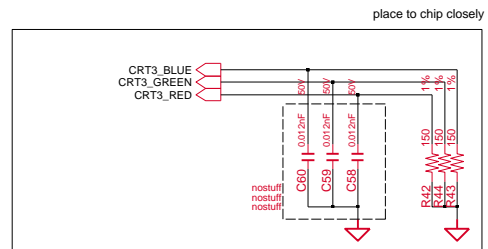
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**U3-3
 N12P-GV-S-A1 3 / 5**



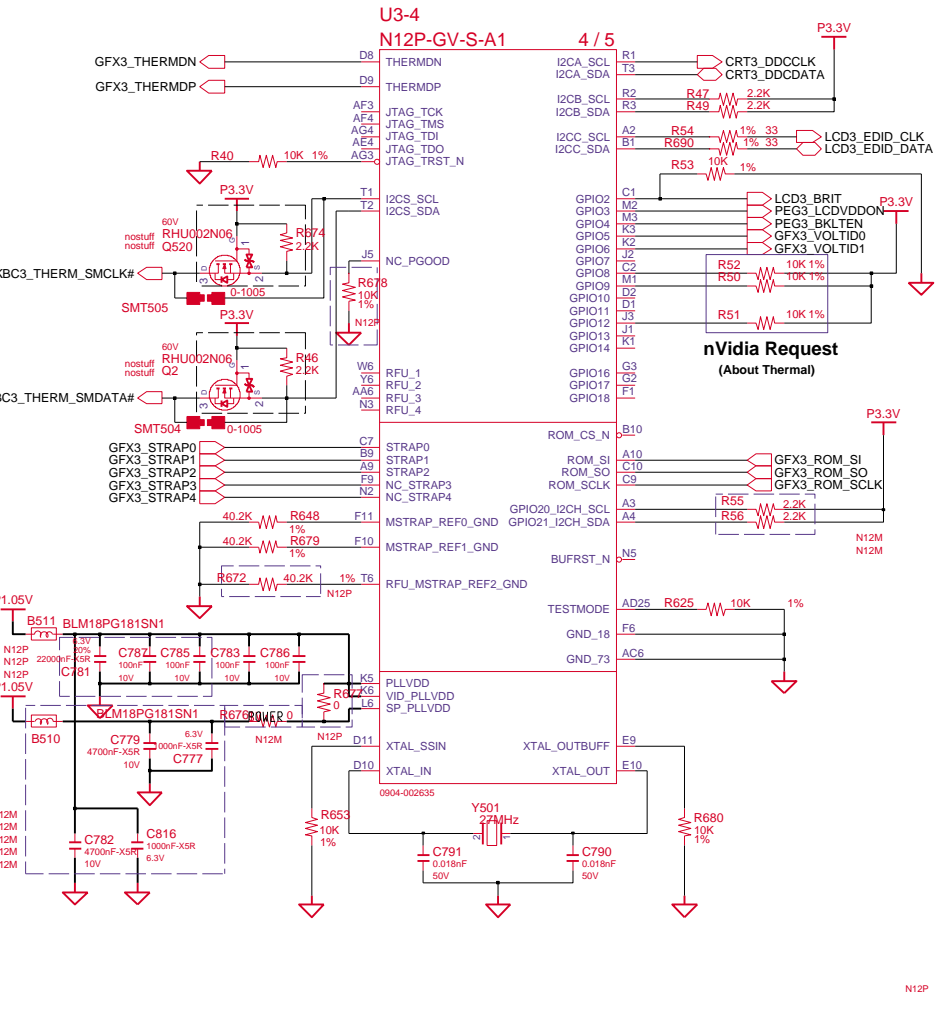
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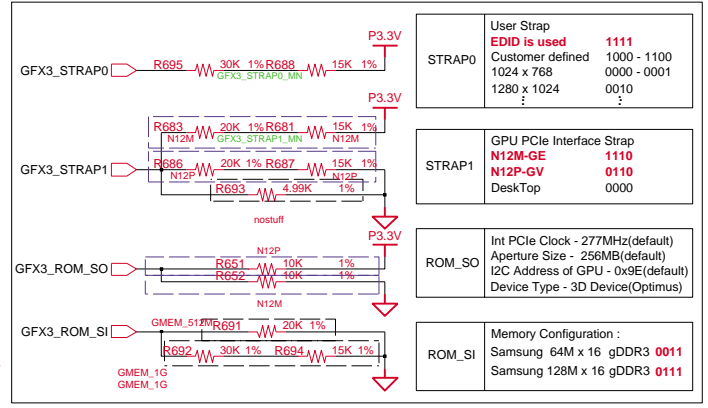
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Gu Hui	1/03/2011	Scala2-R	
SJ Wu	ADV	N12P_40NM(3/4)	
BC LEE	rev. 0.1	N12P_40NM(3/4)	
LAST EDIT		January 20, 2011 18:59:20 PM	
CHECK	DEV_STEP		PAGE 21 OF 48
APPROVAL	REV		
MODULE CODE	LAST EDIT		

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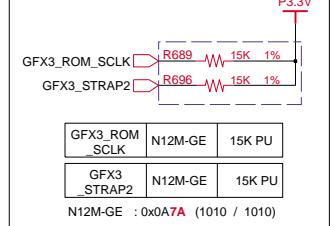
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Function Straps



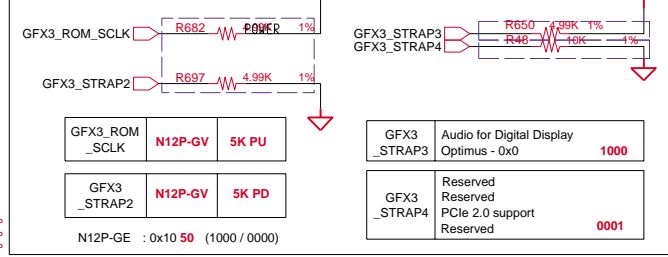
STRAP0	User Strap	1111
	EDID is used	1000 - 1100
	Customer defined	0000 - 0001
	1024 x 768	0000 - 0001
	1280 x 1024	0010
	:	:
STRAP1	GPU PCIe Interface Strap	1110
	N12M-GE	0110
	N12P-GV	0000
	DeskTop	0000
ROM_SO	Int PCIe Clock - 277MHz(default)	
	Aperture Size - 256MB(default)	
	I2C Address of GPU - 0x9E(default)	
	Device Type - 3D Device(Optimus)	
ROM_SI	Memory Configuration :	
	Samsung 64M x 16 gDDR3	0011
	Samsung 128M x 16 gDDR3	0111

Chip Select Straps (N12M-GB1)



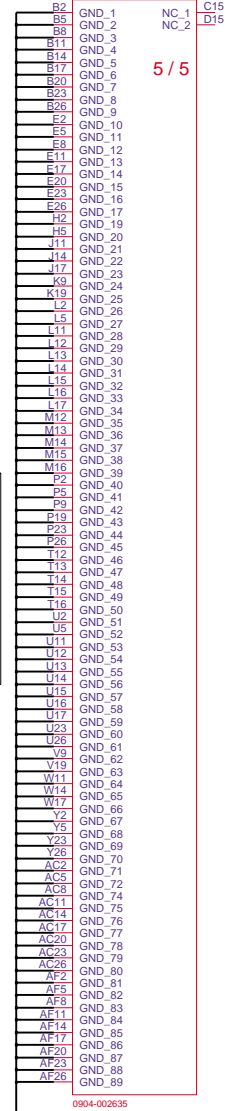
	Bit3	Bit2	Bit1	Bit0	
ROMSO	0	0	0	0	27M
SCLK	1	0	1	0	N11M-GE GFX TPYE
SI	0	0	1	0	N11M-LP1
Strap2	0	1	1	1	gDDR3 1Gb
Strap2	0	1	0	1	gDDR3 2Gb
Strap1	0	0	0	0	N11M-GE2
Strap2	0	1	0	1	N11M-GE1 DEVICE ID
Strap1	1	1	1	0	PEG PCIe swing level
Strap0	1	1	1	1	EDID_EN

Chip Select Straps (N12P-GV)



GFX3_ROM_SCLK	N12P-GV	5K PU
GFX3_STRAP2	N12P-GV	5K PD
GFX3_STRAP3	Audio for Digital Display Optimus - 0x0	1000
GFX3_STRAP4	Reserved Reserved Reserved Reserved	0001

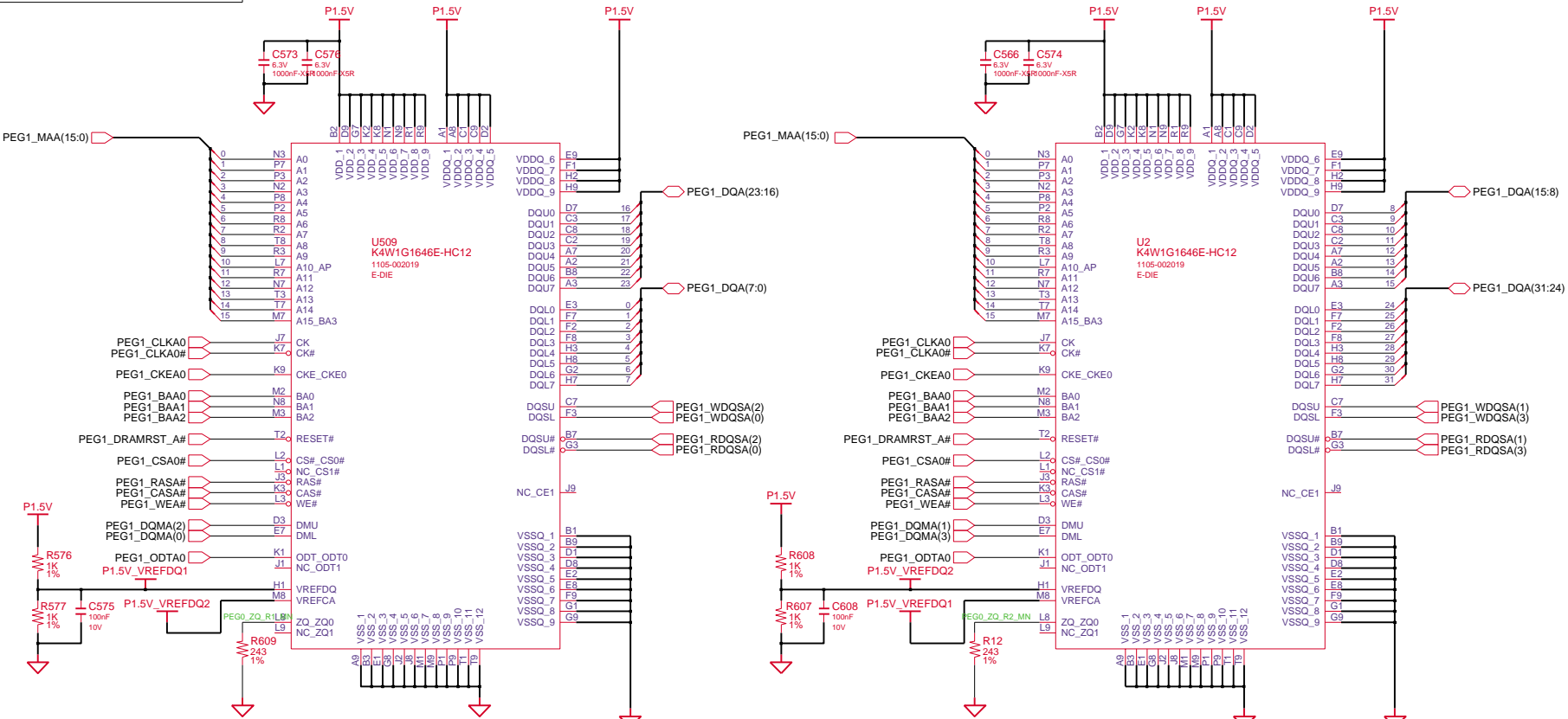
U3-5 N12P-GV-S-A1



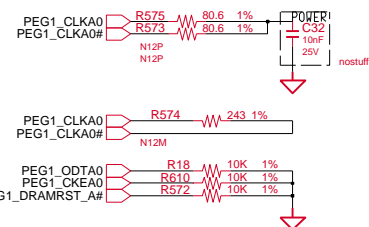
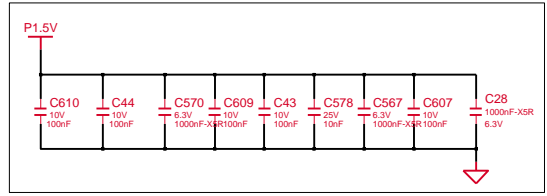
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CHECK	SJ Wu	DEV_STEP	ADV		N12M_40NM(4/4)	
APPROVAL	BC LEE	REV	rev. 0.1		N12P_40NM(4/4)	
MODULE CODE		LAST EDIT				
January 20, 2011 18:59:20 PM						PAGE 22 OF 48

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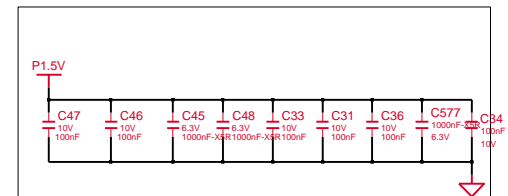
A-Channel #0



Place near to VDDQ



Place near to VDDQ

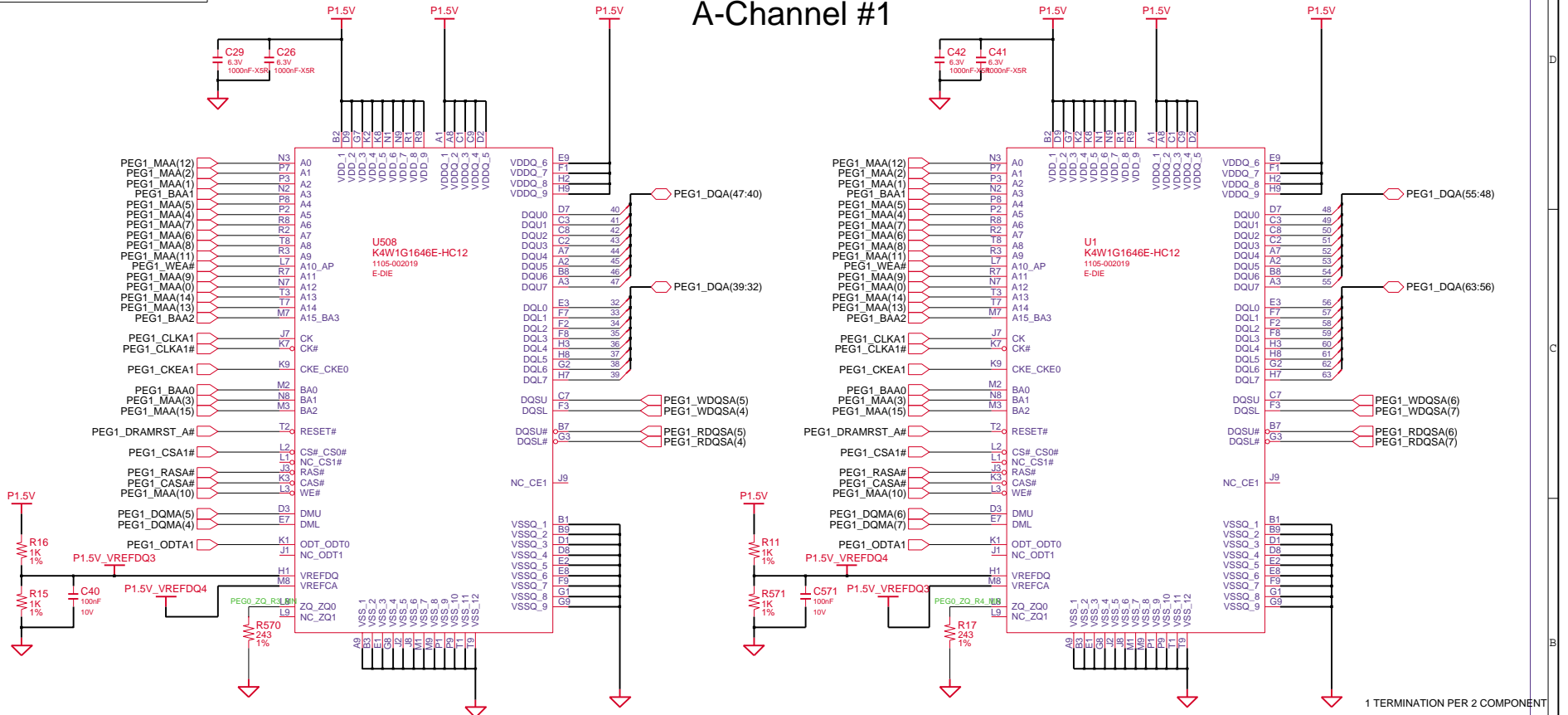


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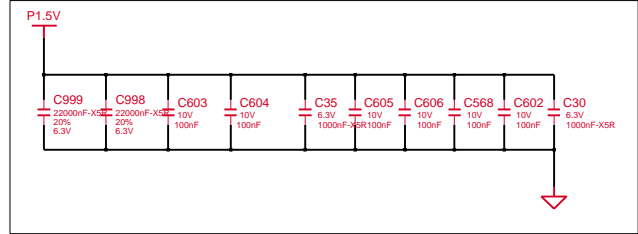
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CHECK	SJ Wu	DEV. STEP	ADV		GRAPHIC_MEM A#0				
APPROVAL	BC LEE	REV	rev. 0.1		GRAPHIC_MEM A#0	PART NO. BA41-01XXXX			
MODULE CODE		LAST EDIT				January 20, 2011 18:59:20 PM			
						PAGE	23	OF	48

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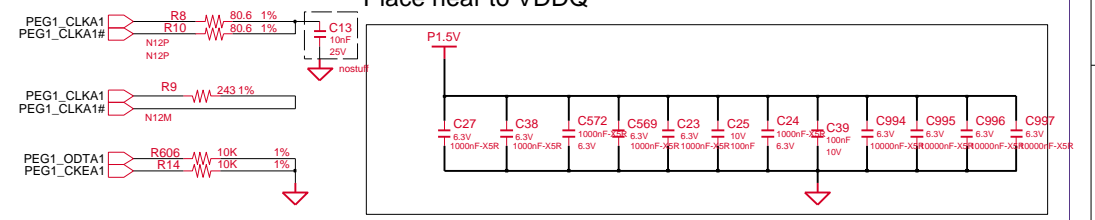
A-Channel #1



Place near to VDDQ



Place near to VDDQ



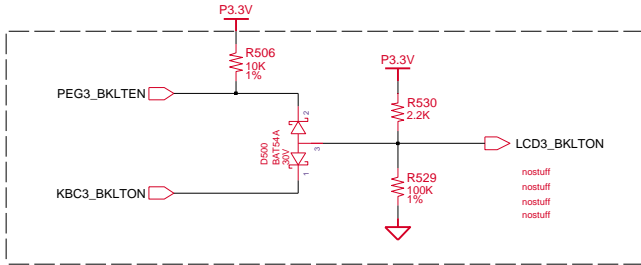
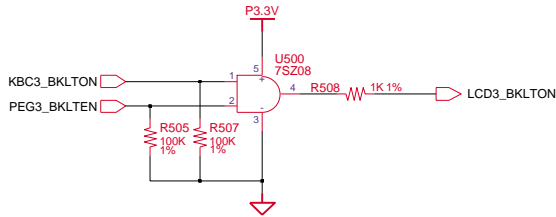
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DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS	
CHECK	SJ Wu	DEV STEP	ADV		GRAPHIC_MEM A#1		
APPROVAL	BC LEE	REV	rev. 0.1		GRAPHIC_MEM A#1	PART NO. BA41-01XXXXA	
MODULE CODE		LAST EDIT				January 20, 2011 18:59:20 PM	
						PAGE	24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

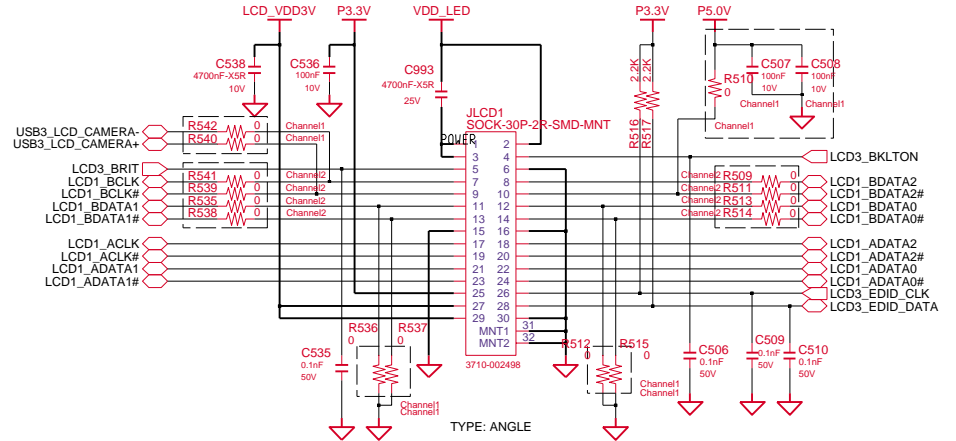
LVDS LOGIC

1Ch. LCD Connector + CAMERA

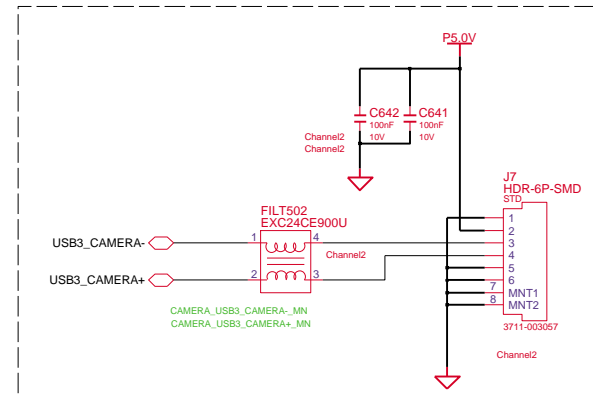
Backlight On



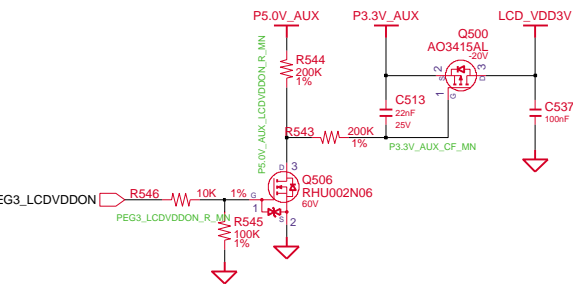
NOTE : Place R20 close to connector to minimize stub



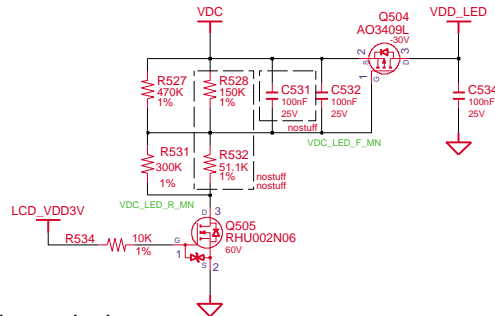
CAMERA CONN FOR 2ch LVDS



LCD Power



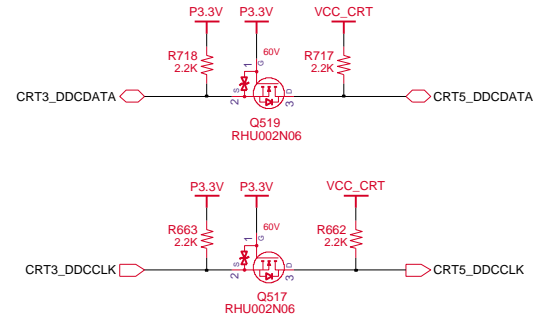
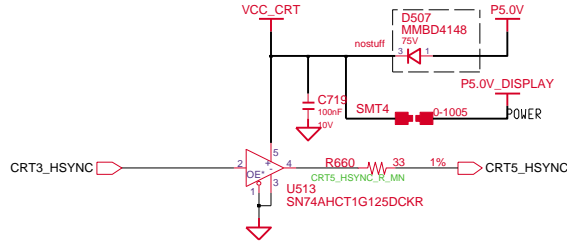
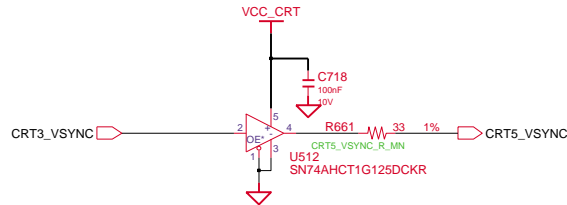
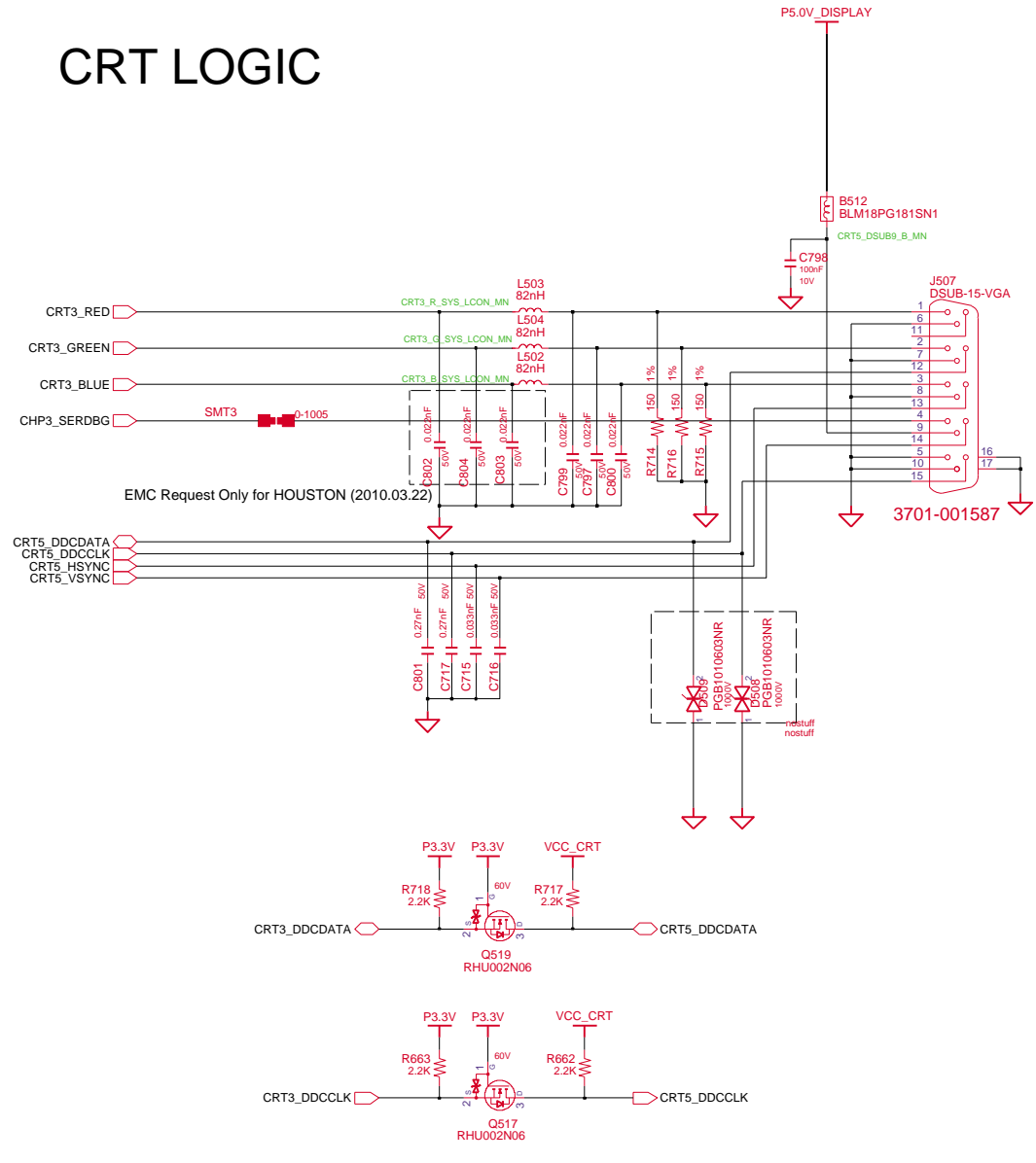
LED Power



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	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				PAGE 25 OF 48
				January 20, 2011 18:59:20 PM		

CRT LOGIC

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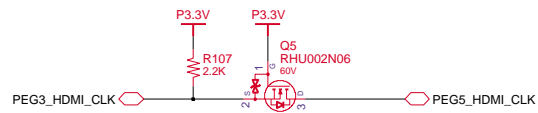


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R GRAPHICS_IF	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX January 20, 2011 18:59:20 PM PAGE 26 OF 48
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT				

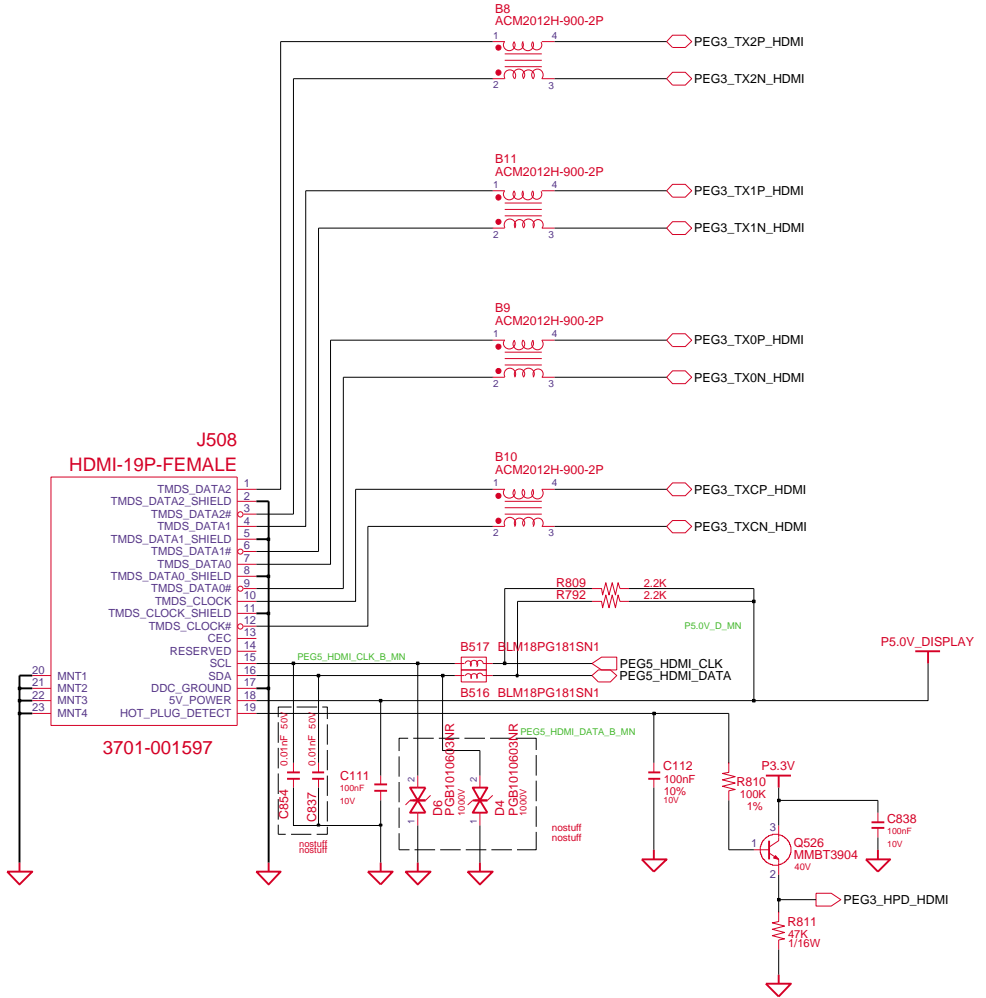
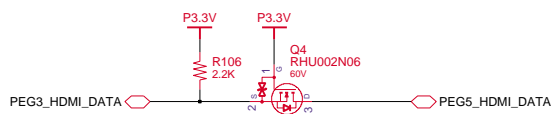
HDMI Graphic

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<https://t.me/biosarchive>

FOR HDMI VERIFICATION TEST



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

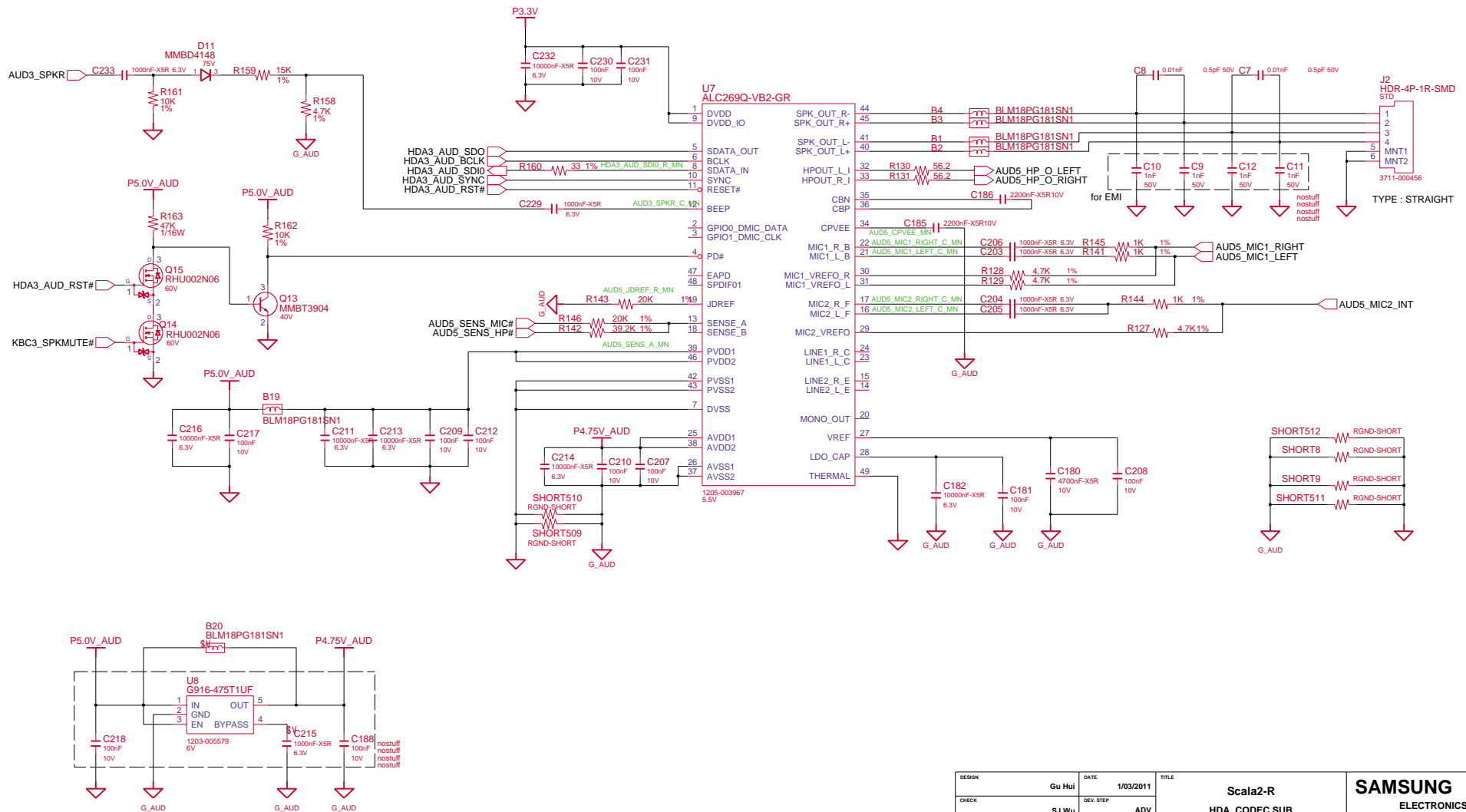


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<https://t.me/biosarchive>

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



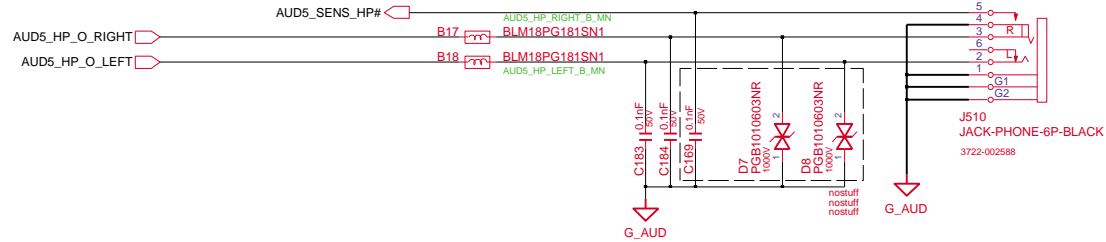
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CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT				
					AUDIO CODEC ALC269 SUB	
					AUDIO CODEC ALC269 SUB	
					January 20, 2011 18:59:20 PM	PAGE 28 OF 48

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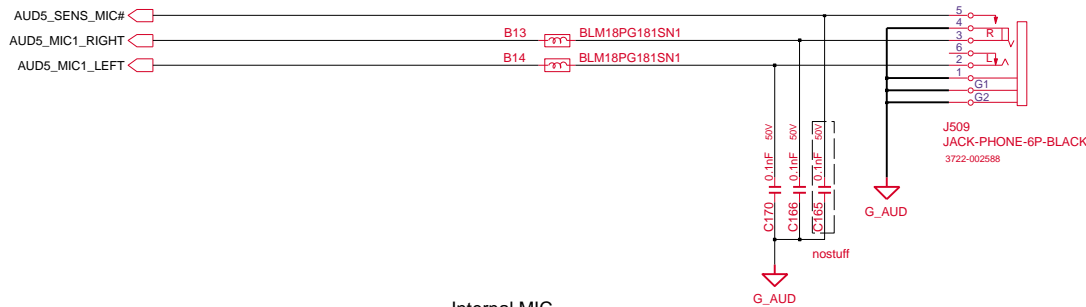
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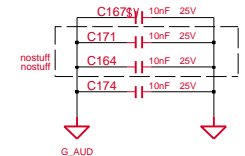
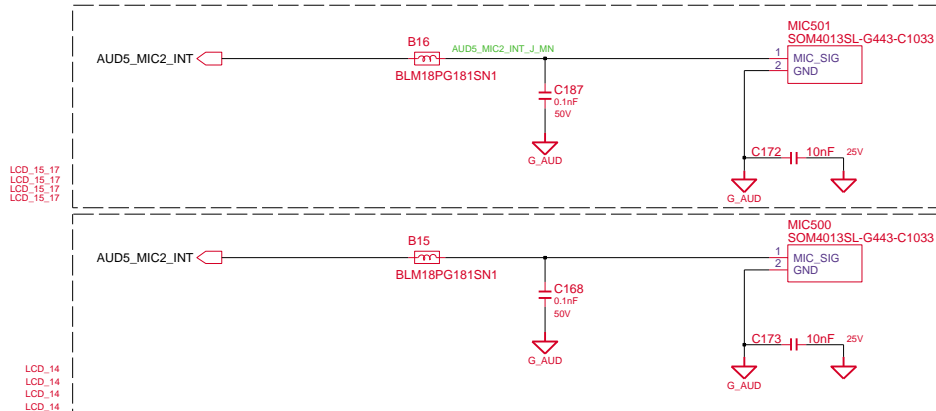
HEADPHONE



MIC JACK



Internal MIC

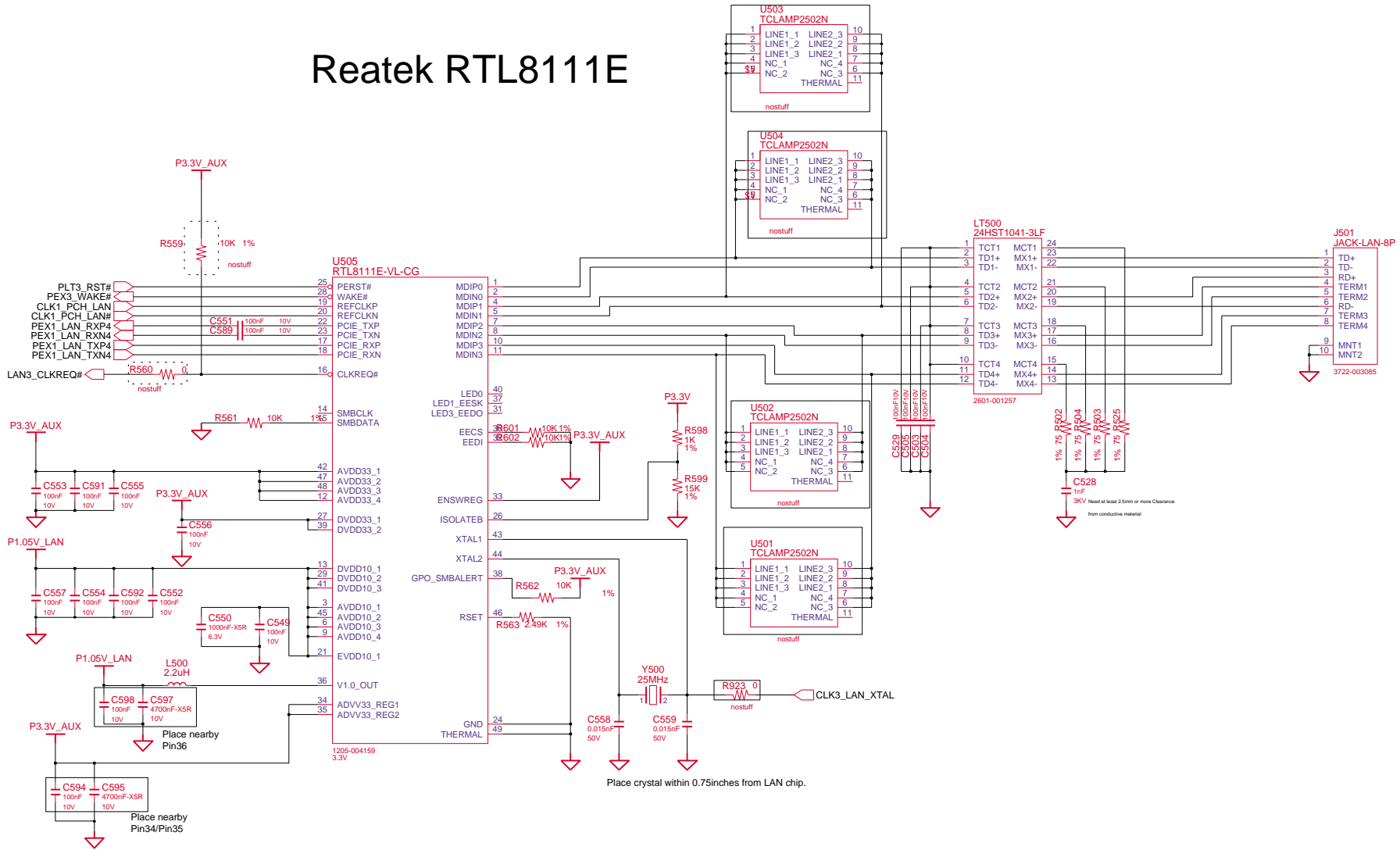


LCD_15_17
 LCD_15_17
 LCD_15_17

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		
APPROVAL	BC LEE	REV	rev. 0.1	AUDIO JACK & LED SUB		PART NO. BA41-01XXXXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM		PAGE 29 OF 48

Reatek RTL8111E



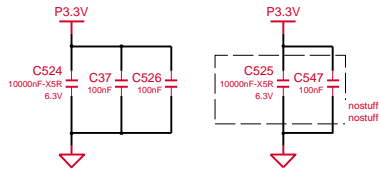
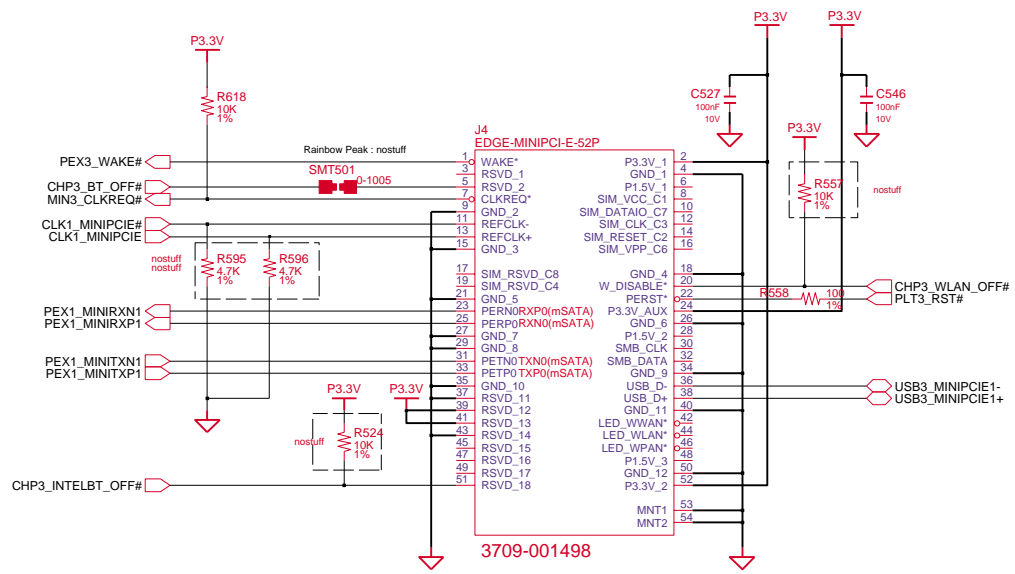
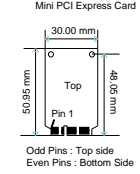
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		LAN	
APPROVAL	BC LEE	REV	rev. 0.1		LAN_Reatek_RTL8111	PART NO. BA41-01XXXX
MODULE CODE		LAST EDIT				
					January 20, 2011 18:59:20 PM	PAGE 30 OF 48

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WLAN, 4mm



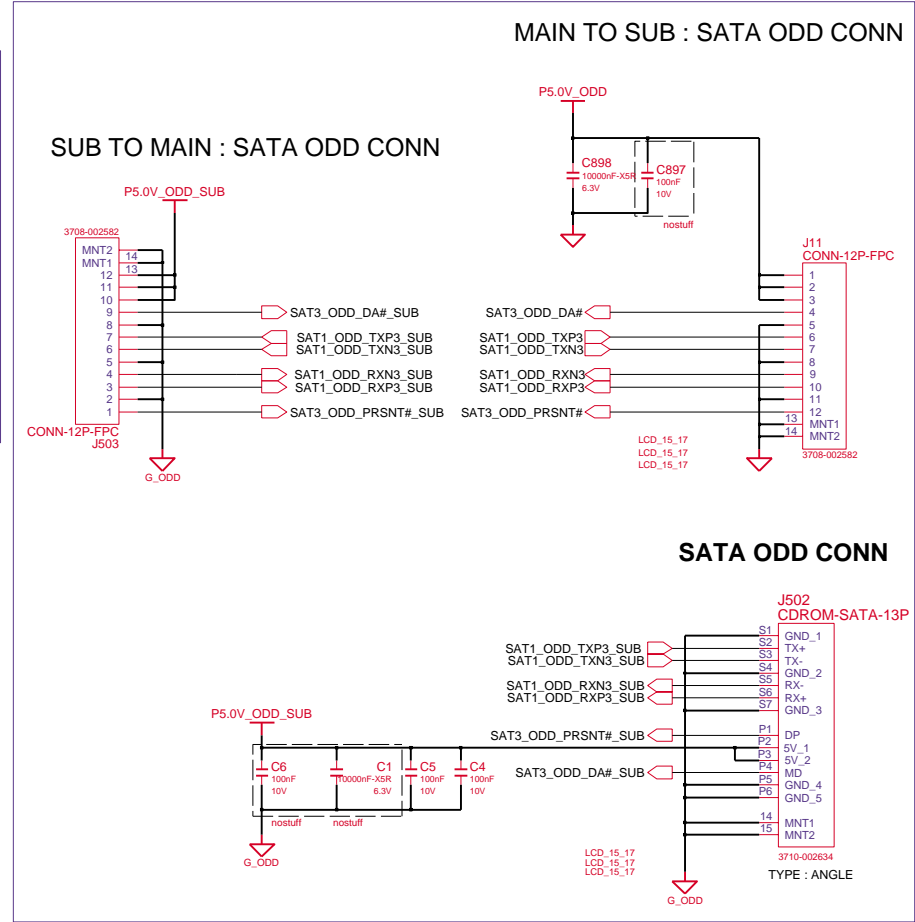
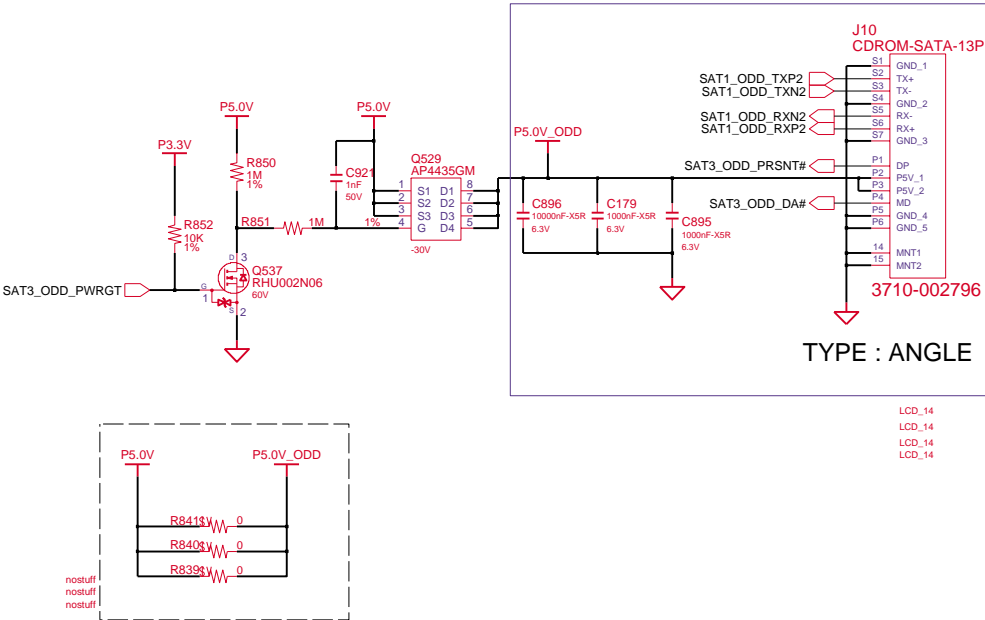
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MINI_PCIE_CONN	PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	WLAN	BA41-01XXXXA	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	31 OF 48

SATA I/F CONN

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<https://t.me/biosarchive>

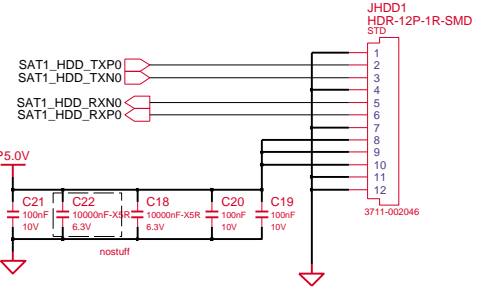
15.6" / 17.3"

SATA ODD CONN

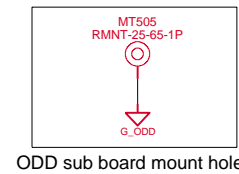
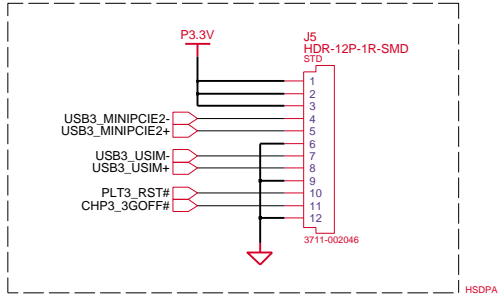


SATA HDD CONN

Cable Connector Type



MAIN to HSDPA SUB



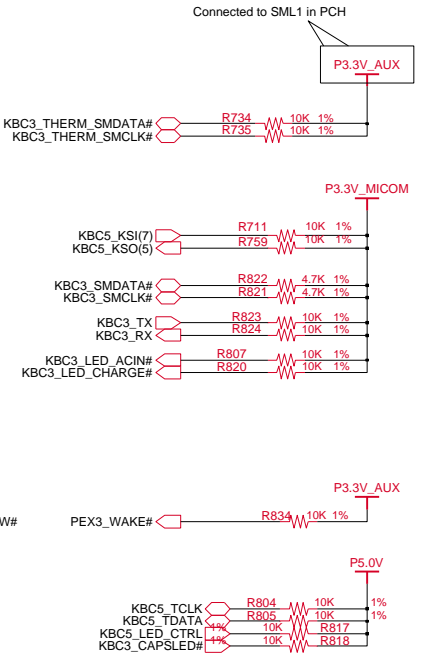
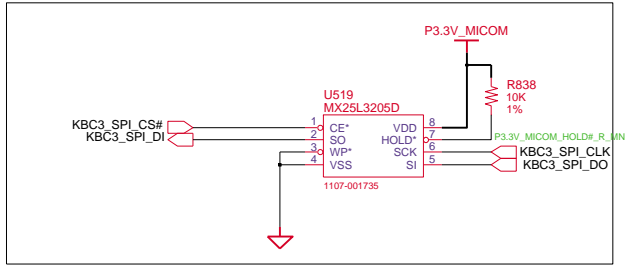
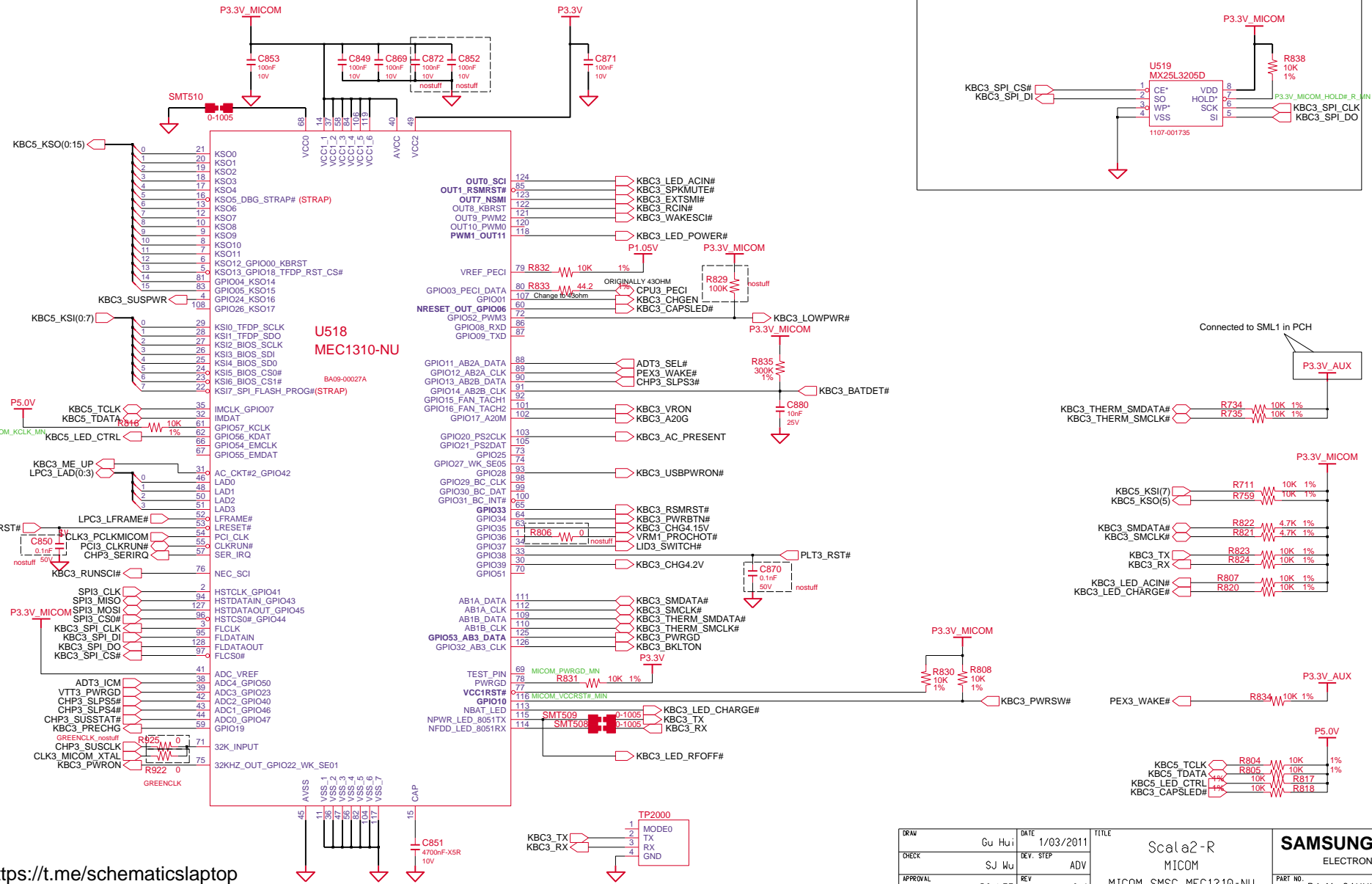
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	SATA_DEVICES		
APPROVAL	BC LEE	REV	rev. 0.1	SATA I/F Conn	PART NO.	BA41-01XXXX
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 32 OF 48

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MAIN BOARD (MICOM)

BE CAUTION SPI ROM SIZE!!

SPI_ROM_SOCKET

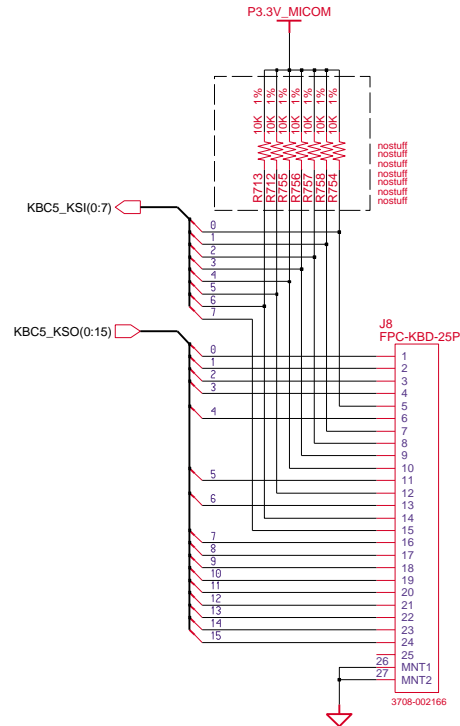


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS PART NO. BA11-01XXXXA
CHECK	SJ Wu	REV. STEP	ADV	MICOM		
APPROVAL	BC LEE	REV	rev. 0.1	MICOM_SMSC_MEC1310-NU		
MODULE CODE		LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE	33 OF 48

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Micom Glue Logic

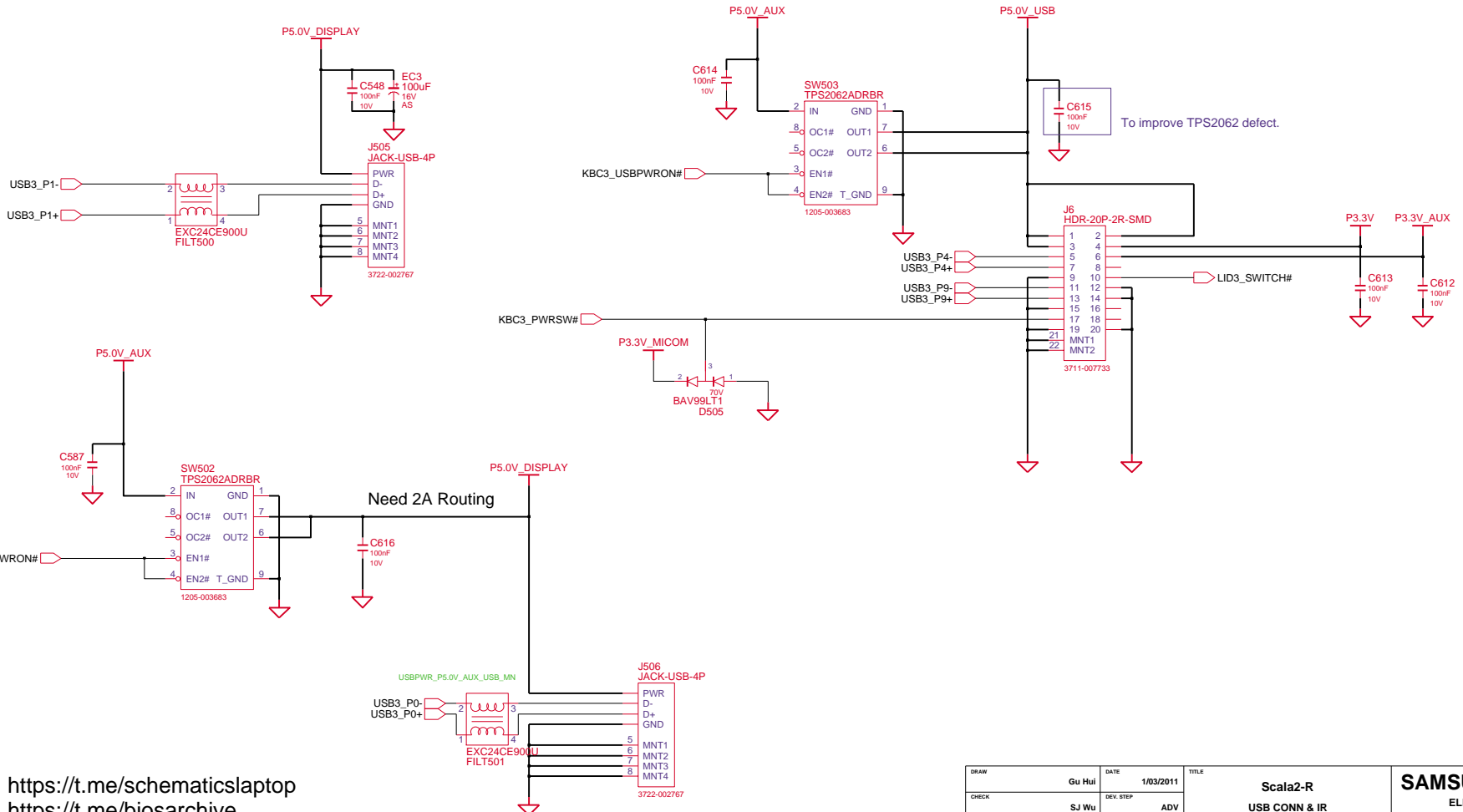
KEYBOARD



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. BA41-01XXXX
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM		PAGE 34 OF 48

POWER SW SUB B'D CONNECTOR

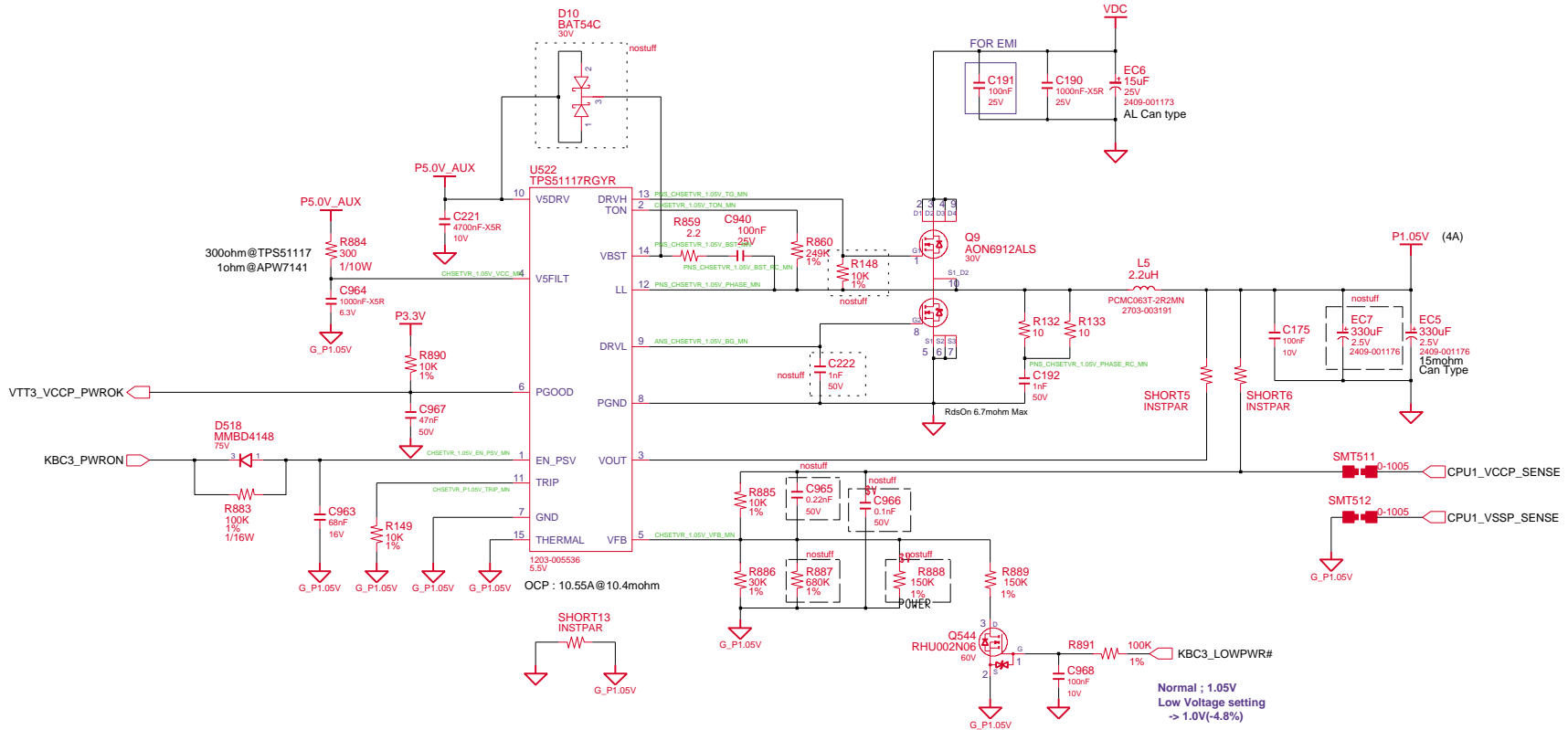
MAIN to SUB



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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. BA41-01XXXXA
MODULE CODE	LAST EDIT	January 20, 2011 18:59:20 PM		PAGE	35	OF 48

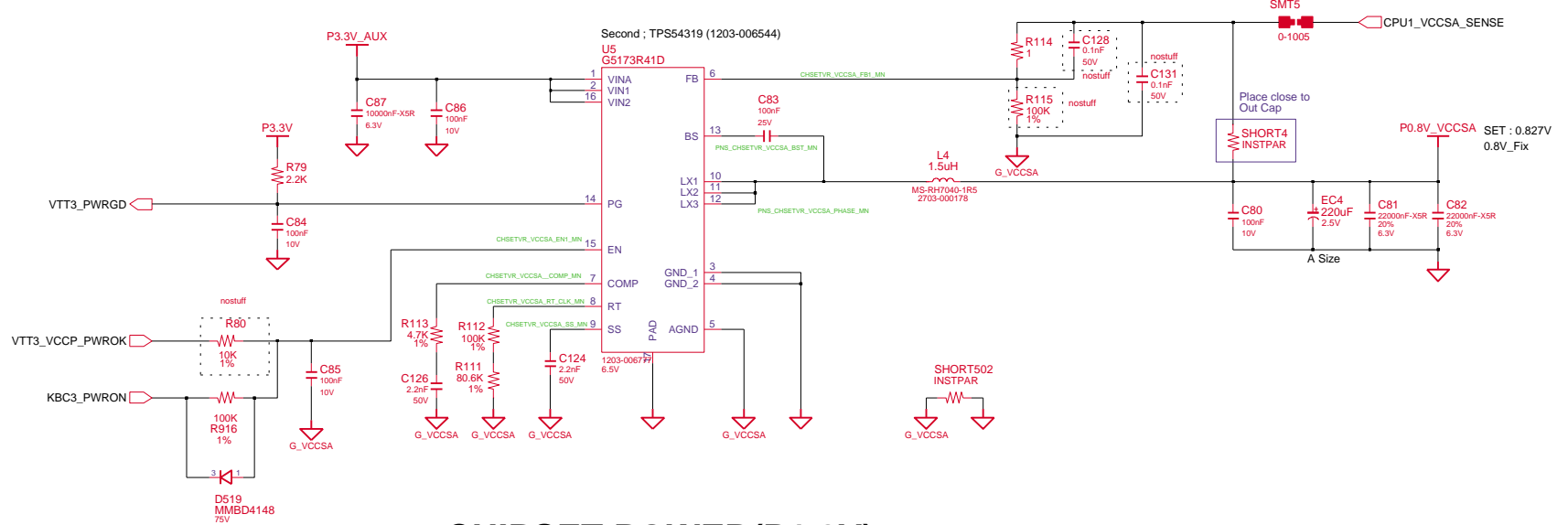
CHIPSET POWER(P1.05V)



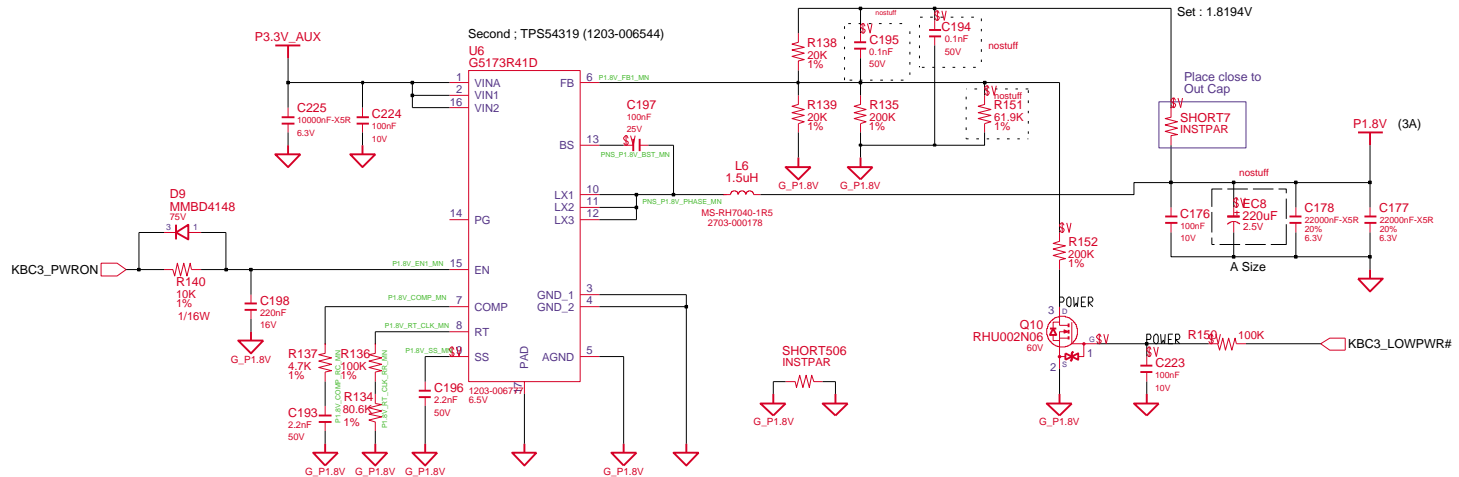
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scal a2-R P1.05V	SAMSUNG ELECTRONICS PART NO. BA41-01XXXX
CHECK	SJ Wu	REV. STEP	ADV	P1.05V(Chipset Power)		
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	38 OF 48	

CHIPSET POWER(VCCSA)

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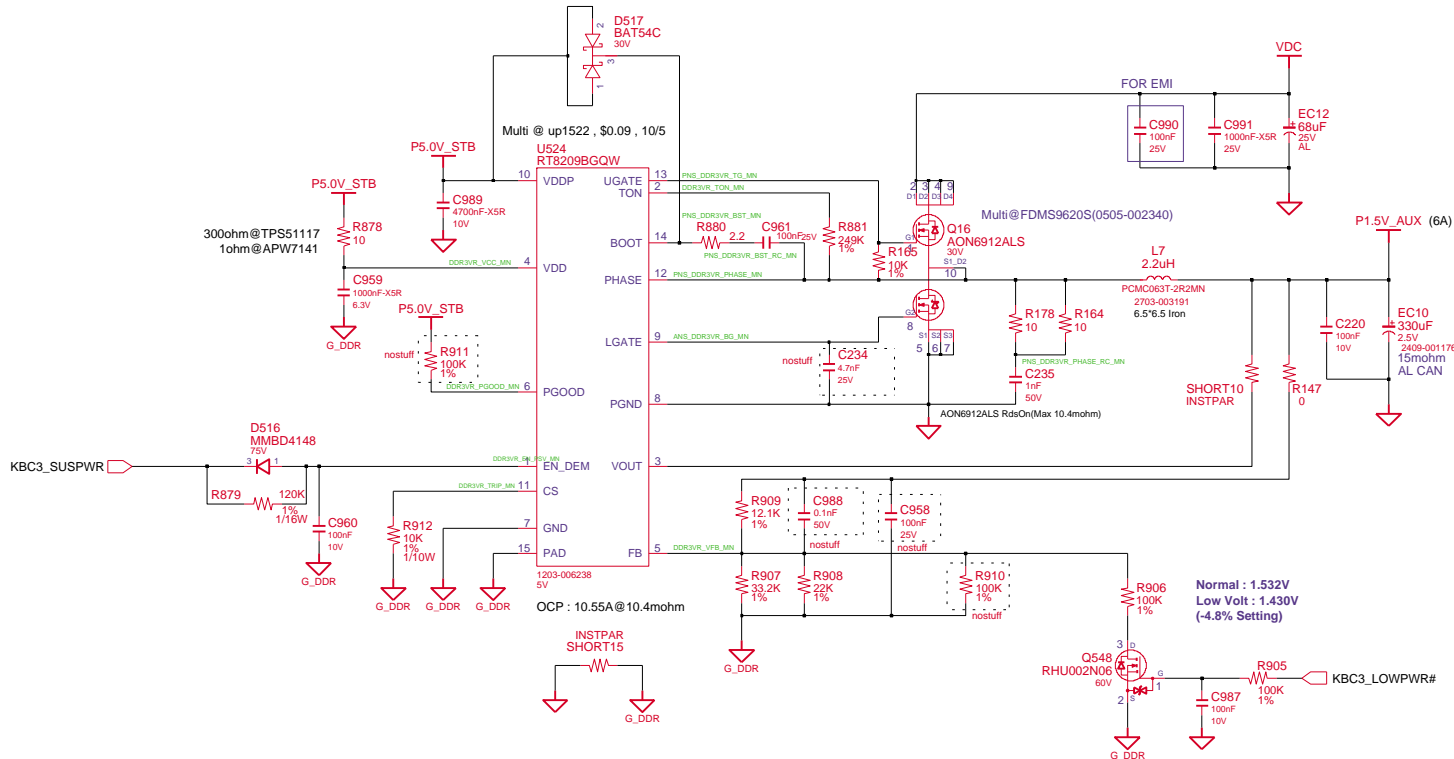
CHIPSET POWER(P1.8V)



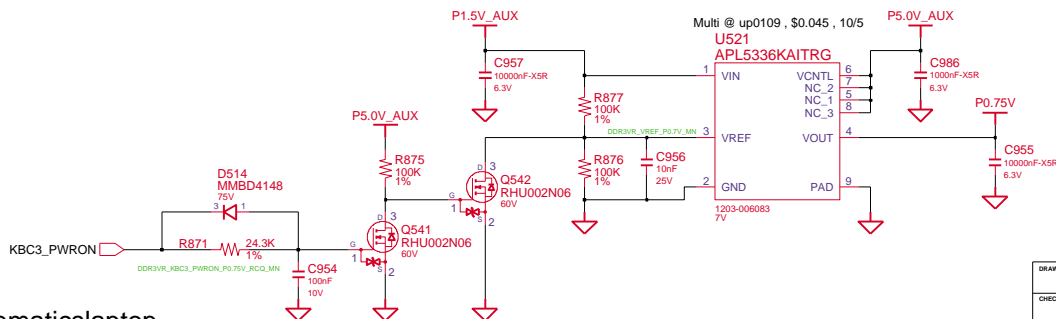
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	REV. STEP	ADV		P1.1V_VTT	
APPROVAL	BC LEE	REV	rev. 0.1		P0.8V(Chipset Power)	PART NO.
MODULE CODE		LAST EDIT				BA41-01XXXX
				January 20, 2011 18:59:20 PM	PAGE	39 OF 48

DDR3 Power

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DDR3 VTT(0.75V)



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

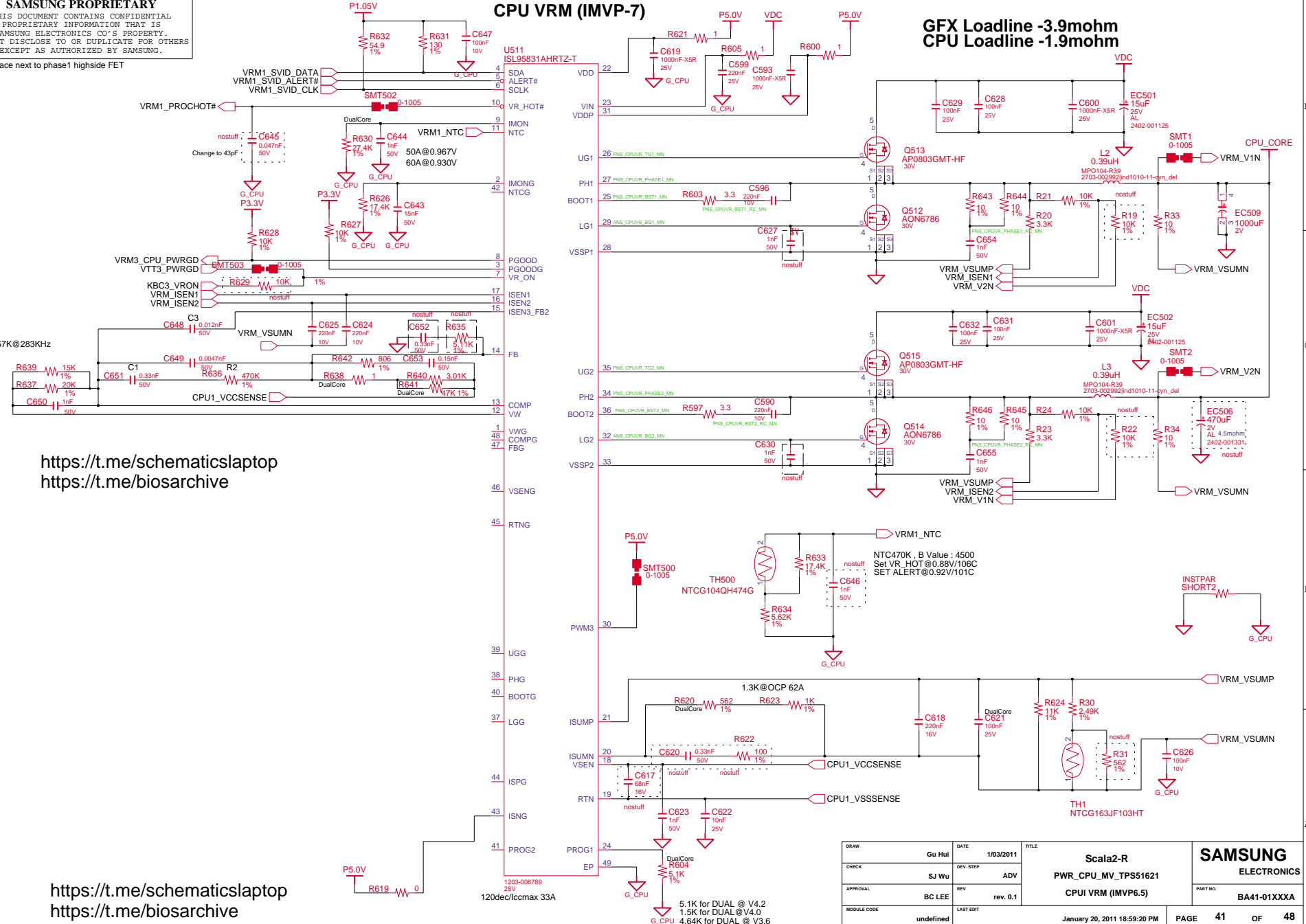
<https://t.me/schematicslaptop>
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Place next to phase1 highside FET

CPU VRM (IMVP-7)

GFX Loadline -3.9mohm
CPU Loadline -1.9mohm



8.57K@283KHz

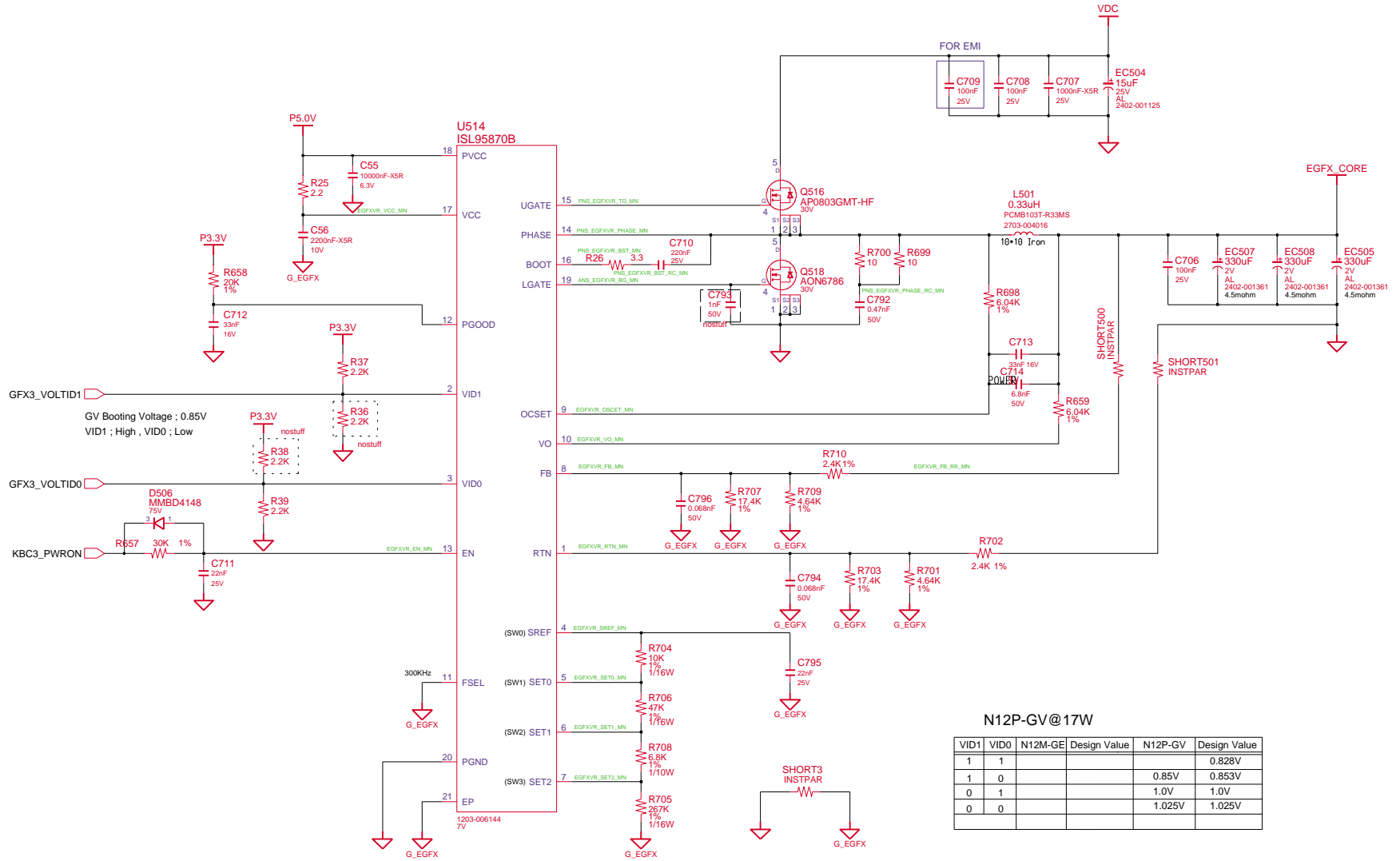
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DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R		SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	PWR_CPU_MV_TPS51621		PART NO.	
APPROVAL	BC LEE	REV	rev. 0.1	CPU1 VRM (IMVP6.5)		BA41-01XXXX	
MODULE CODE	undefined	LAST EDIT		January 20, 2011 18:59:20 PM	PAGE	41	OF 48

External GFX Core Power

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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	

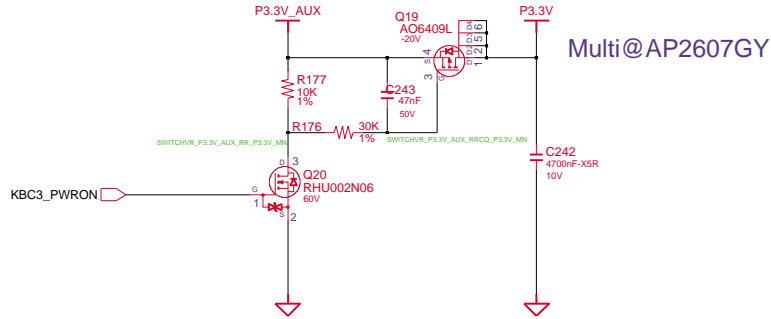
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<https://t.me/biosarchive>

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

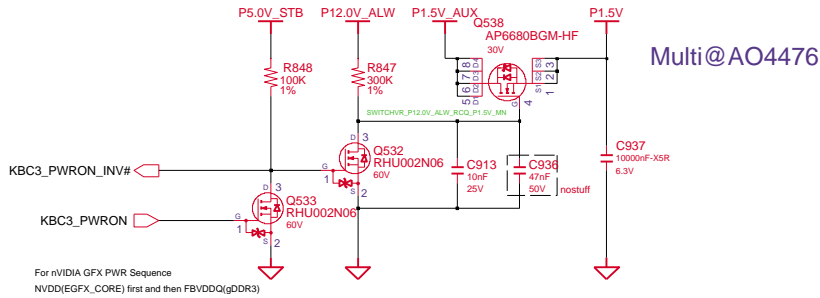
P5.0V -> P3.3V -> EGFX_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.8V_VCCSA -> CPU_CORE

Switched Power On (P3.3V)

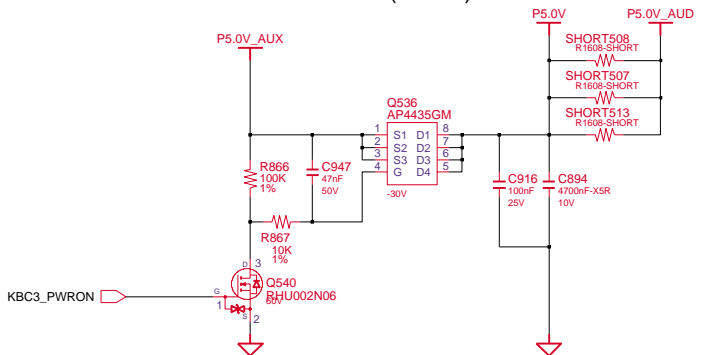


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Switched Power On (P1.5V)



Switched Power On (P5.0V)

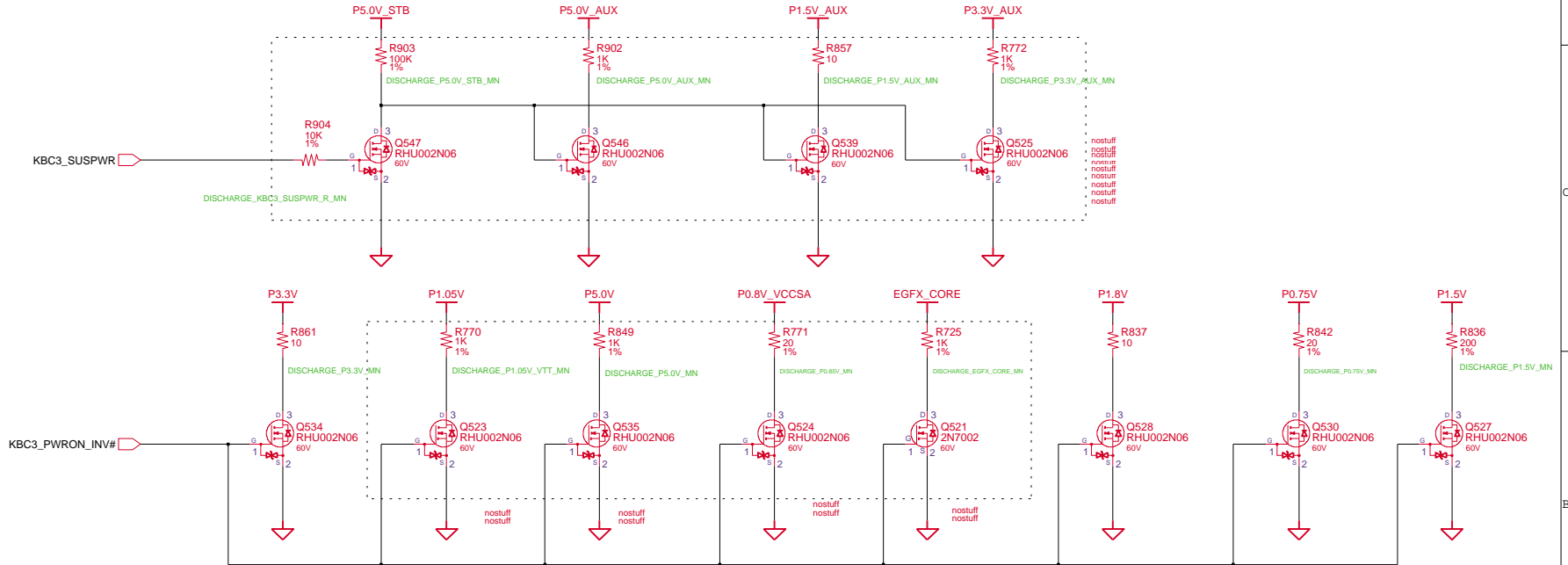


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<https://t.me/biosarchive>

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

POWER DISCHARGER

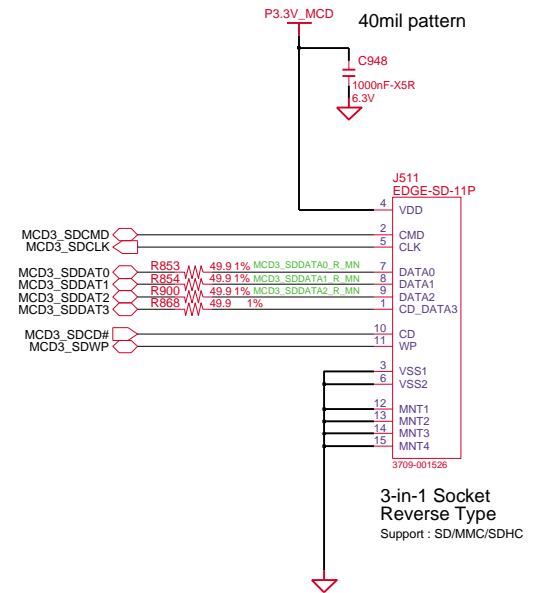
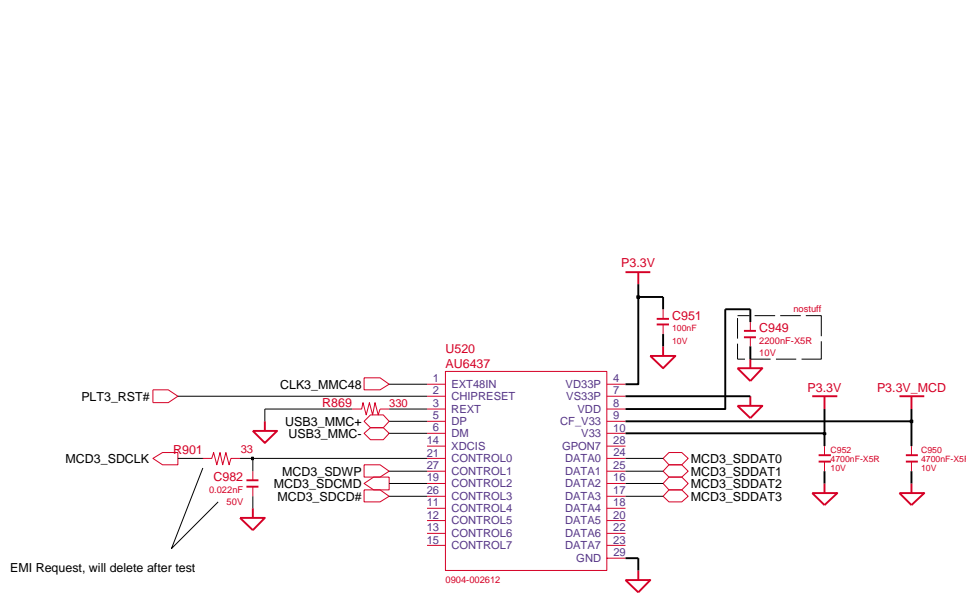
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<https://t.me/biosarchive>



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

AU6437 (4-in-1)

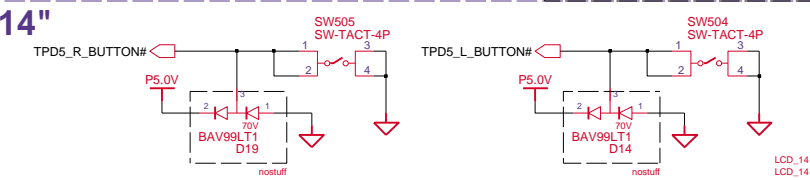
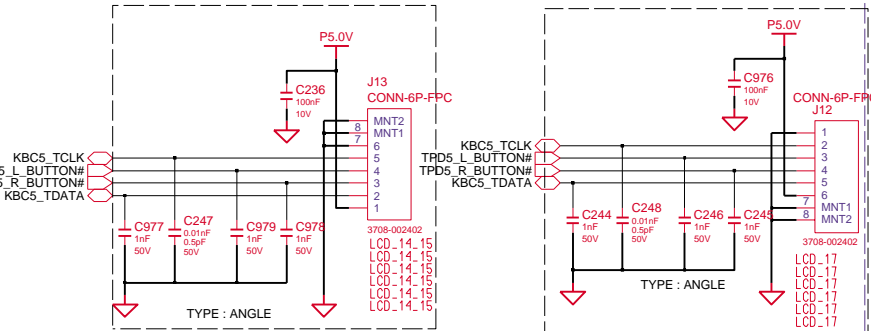


<https://t.me/schematics-laptop>
<https://t.me/biosarchive>

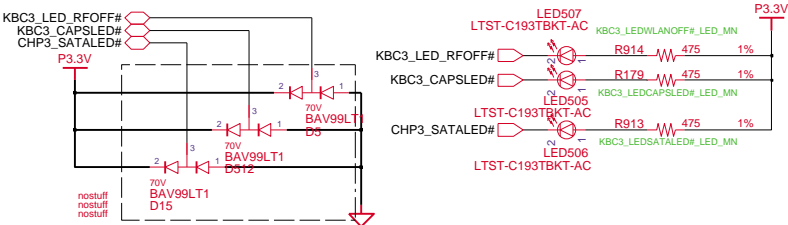
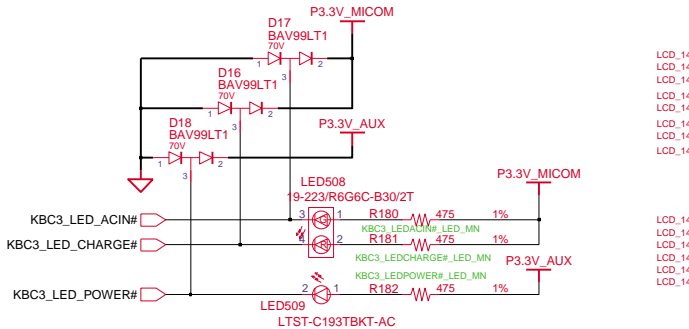
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CHECK	MK KIM	DEV. STEP	ADV		AU 6437	
APPROVAL	BL LEE	REV	rev. 0.3		AU 6437	
MODULE CODE		LAST EDIT				
					January 18, 2011 08:10:20 AM	PAGE 46 OF 48

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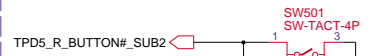
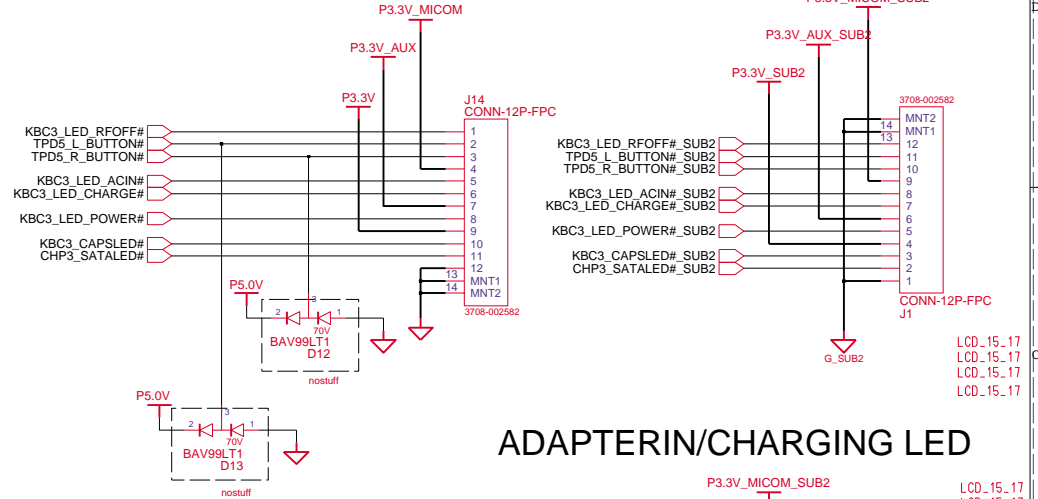
TOUCHPAD



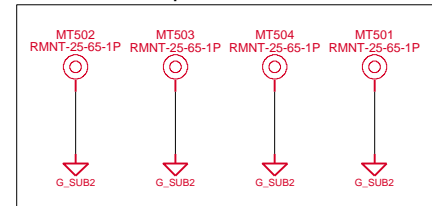
ADAPTERIN/CHARGING LED



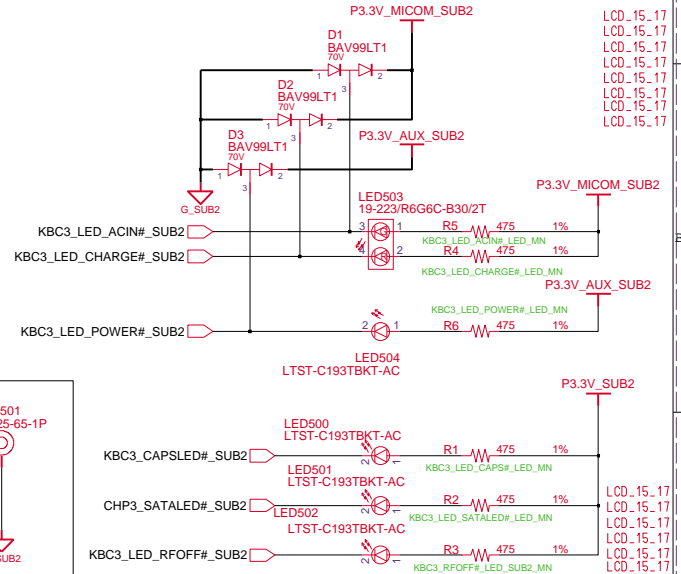
15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



Touchpad Mount Hole



ADAPTERIN/CHARGING LED



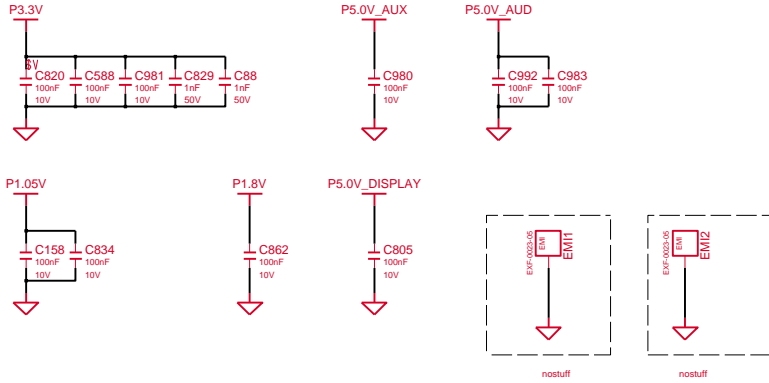
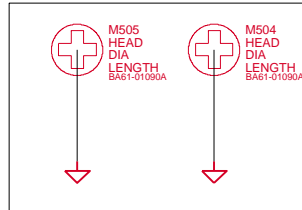
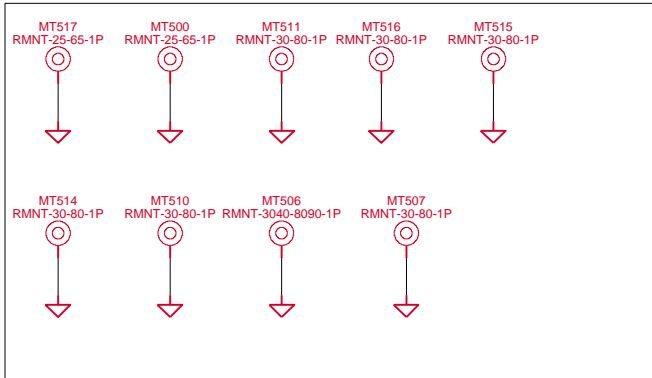
<https://t.me/schematicsaptop>
<https://t.me/biosarchive>

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. BA41-01XXXXA
MODULE CODE		LAST EDIT				January 18, 2011 08:10:20 AM
						47 OF 48

<https://t.me/schematicsdesktop>
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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. BA41-01XXXXA
MODULE CODE		LAST EDIT			January 18, 2011 08:10:20 AM	PAGE 48 OF 48