

SAMSUNG PROPRIETARY

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

SCALA2-EXT

CPU : Arrandale PGA
Chip Set : Intel Ibex Peak
GFX : N11M
Remarks : Calpella Platform

Model Name : SCALA2-EXT
PBA Name : MAIN
PCB Code : BA41-01424A (GCE)
BA41-01423A (NY)
BA41-01425A (HAN)
Dev. Step : MP1.1
Revision : 1.1
T.R. Date : 2010.12.10

Design	CHECK	APPROVAL
<i>QZ DAI</i>	<i>SIMMAN WU</i>	<i>BC LEE</i>

■ Owner : SEC IT Solution N/P LAB Signature : wannu

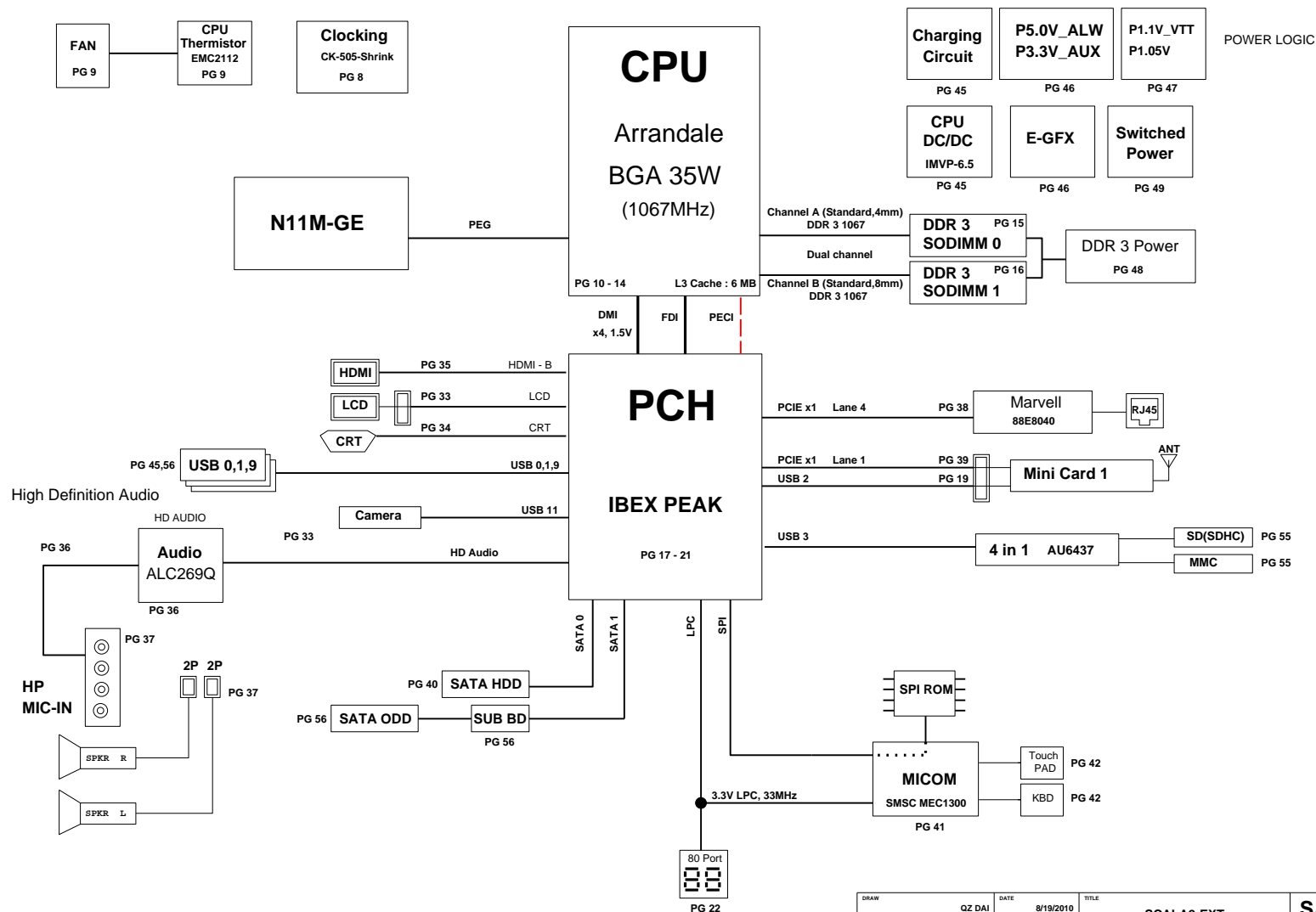
sheet01 : Cover
sheet02 : BLOCK DIAGRAM
sheet03 : BOARD INFORMATION
sheet04 : POWER DIAGRAM
sheet05 : POWER RAILS
sheet06 : POWER SEQUENCE
sheet07 : CLOCK DISTRIBUTION
sheet08 : CK505-SHRINK
sheet09 : Thermal Sensor
sheet10 : CPU
sheet11 : CPU
sheet12 : CPU
sheet13 : CPU
sheet14 : DDR3 SODIMM #0
sheet15 : DDR3 SODIMM #1
sheet16 : PCH-IbexPeak
sheet17 : PCH-IbexPeak
sheet18 : PCH-IbexPeak
sheet19 : PCH-IbexPeak
sheet20 : PCH-IbexPeak
sheet21 : 80 port
sheet22 : N11X-GE2/GE1
sheet23 : N11X-GE2/GE1
sheet24 : N11X-GE2/GE1
sheet25 : N11X-GE2/GE1
sheet26 : GFX memory
sheet27 : GFX memory
sheet28 : LVDS / CAMERA
sheet29 : CRT
sheet30 : HDMI

sheet31 : Audio - ALC269
sheet32 : Audio - HP/MIC WOOFER(2.1CH)
sheet33 : LAN (Realtek 8111E)
sheet34 : WLAN
sheet35 : SATA interface
sheet36 : MICOM / BIOS
sheet37 : MICOM Glue Logic (KBD / TP)
sheet38 : USB connector Bluetooth
sheet39 : SUB B'D connector
sheet40 : Power - charger
sheet41 : Power - P3.3V_AUX / P5.0V_AUX
sheet42 : Power - P1.05V (Chipset Power)
sheet43 : Power - DDR3
sheet44 : Power - CPU VRM
sheet45 : Power - IGFX_CORE
sheet46 : Power - EGFX_CORE
sheet47 : Power - Switched Power 1
sheet48 : Power - Power Discharge
sheet49 : USB/POWER SW SUB BD
sheet50 : 3-in-1 card (GL823) & LED SUB BOARD
sheet51 : ODD Sub B'd / Battery Sub B'd(for 15")
sheet52 : Multimedia Sub B'd
sheet53 : MOUNT HOLE
sheet54 : Power - Switched Power 2
sheet55 : Power - VCCSA

DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	MAIN		ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1	COVER		PART NO. BA41-01423A
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	1	OF 52

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

BLOCK DIAGRAM



DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT MAIN BLOCK DIAGRAM	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE	undefined	LAST EDIT				
				December 25, 2010 10:42:33 AM	PAGE 2 OF 52	

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails		Active in
VDC P12.0V_ALW P3.3V_MICOM P5.0V_ALW P5.0V_STB	Primary DC system power supply (7 to 21V) 12.0V always power rail 3.3V always power rail (for Micom) 5.0V always power rail 5.0V always power rail	S4 - S5
P5.0V_AUX P3.3V_AUX P1.5V_AUX	5.0V switched on power rail (off in S4-S5) 3.3V switched on power rail (off in S4-S5) 1.5V power rail for DDR (off in S4-S5)	
P5.0V P3.3V P1.8V P1.5V P1.05V P0.75V	5.0V switched power rail (off in S3-S5) 3.3V switched power rail (off in S3-S5) 1.8V switched power rail (off in S3-S5) 1.5V switched power rail (off in S3-S5) 1.05V power rail for chipset (off in S3-S5) 0.9V power rail for DDR (off in S3-S5)	
VCC_CORE IGFX_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for IGFX Core Voltage for GPU VCC for Arrandale & IBEX Peak	

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

SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	ODD
2	(N/A WITH HM55)
3	(N/A WITH HM55)
4	
5	

Crystal / Oscillator			
TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	IBEX-PEAK	Real Time Clock
Crystal	14.318MHz	CLOCK-Generator	CK-505
Crystal	25MHz	LAN	Intel LAN

LCD Pannel Detect		
Devices	Resolution	PANNEL_DETECT_0
LTN140AT17	HD(1366x768)	SEC3250

I ² C / SMB Address			
Devices	Address	Hex	Bus
IBEX PEAK	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	
SODIMM0	1010 000x	A0h	Thermal Sensor
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
CK-505M Shrink(Clock Generator)	1101 001x	D2h	Clock, Unused Clock Output Disable
Thermal Sensor on board	1101 100x	98h	
Power thermal management TS	1101 011x	96h	

DRAW	QZ DAI	DATE	8/19/2010	TITLE SCALA2-EXT MAIN BOARD INFO	SAMSUNG ELECTRONICS PART NO. BA41-01423A
CHECK	SIMMAN WU	DEV. STEP	MP		
APPROVAL	BC LEE	REV	rev. 1.1		
MODULE CODE	undefined	LAST EDIT	December 25, 2010 10:42:33 AM		
			PAGE	3	OF 52

Power On/Off Table by S-state

Rail \ State	S0	S3	S4	S5
+V*A(LWS) +V*LAN	ON	ON	ON	ON
+V*ALX	ON	ON		

Power Rail Diagram

The diagram illustrates the power distribution from the VDC (Voltage Detector Controller) to various system components across three S-states: S5-S4, S3, and S0.

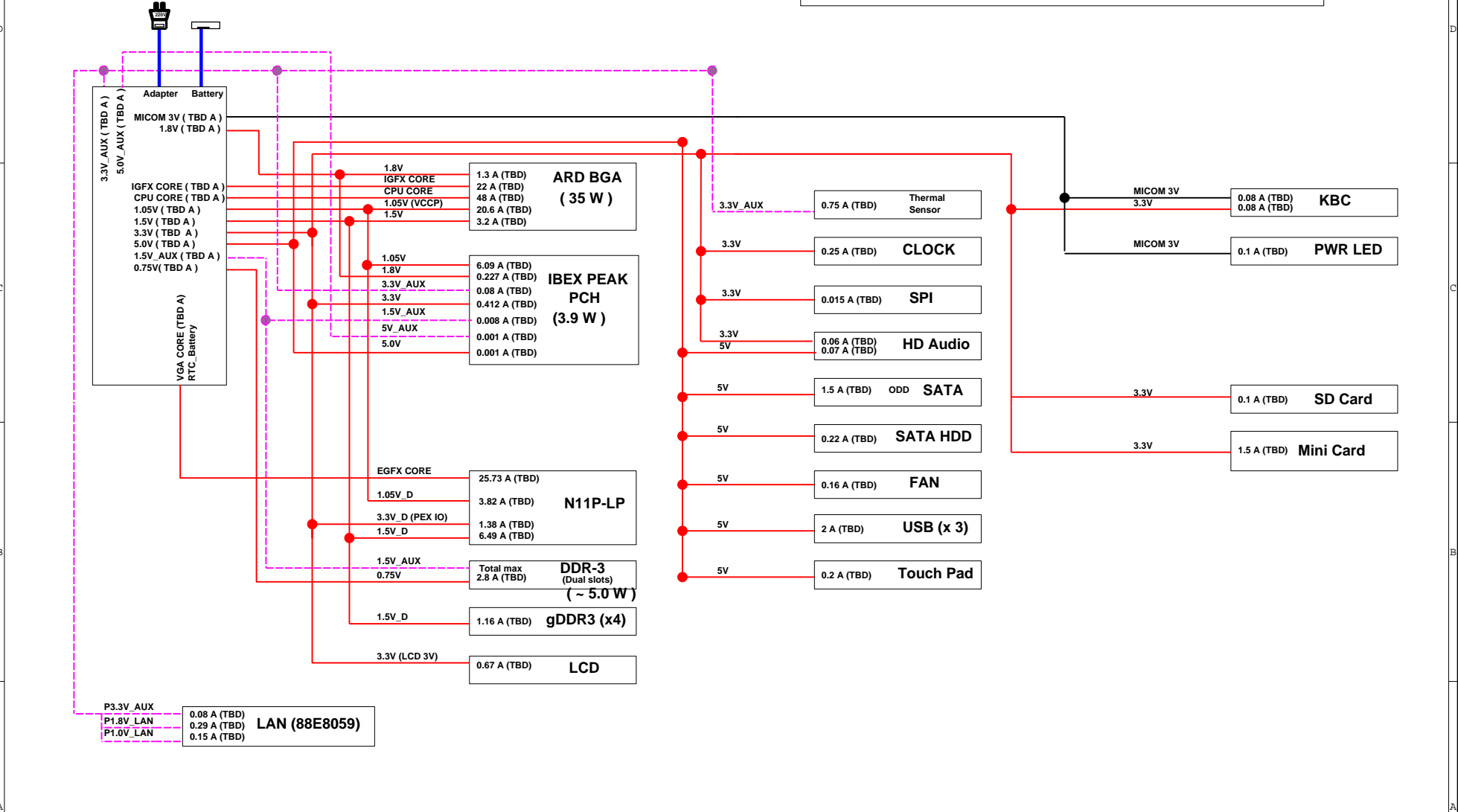
- VDC (Voltage Detector Controller):** Receives input from the AC Adapter and Battery DC.
- S5-S4 State:**
 - P1.05V:** Connected to KBC3_SUSPWR and KBC3_PWRON. Feeds VCC_CORE (ARD) and P1.05V_D (NVIDIA OPTIMUS).
 - IGFX_CORE:** Connected to KBC3_PWRON. Feeds INT GFX.
 - EGFX_CORE:** Connected to KBC3_PWRON. Feeds EXT GFX (Nvidia N11P).
 - P1.5V_AUX:** Connected to KBC3_PWRON. Feeds DDR3 MEMORY and PCH.
 - P5.0V_AUX:** Connected to KBC3_PWRON. Feeds HDD, CRT, MICOM, FAN, PEG, and HDMI.
 - P3.3V_AUX:** Connected to KBC3_PWRON. Feeds IBEX PEAK, MICOM, HD AUDIO, THERMAL SENSOR, MINI PCIE, MMC, LCD, BT, DDR3, and LEDs.
 - P3.3V_MICOM:** Connected to SPI ROM and MICOM.
 - P5.0V_STB:** Connected to SPI ROM and MICOM.
 - P12.0V_ALW:** Connected to SPI ROM and MICOM.
- S3 State:**
 - P1.5V:** Connected to KBC3_PWRON. Feeds gDDR-3 for EGFX and P1.5V_D (NVIDIA OPTIMUS).
 - P0.75V:** Connected to KBC3_PWRON. Feeds DDR3 MEMORY.
 - P1.8V_LAN:** Connected to LAN.
 - P1.8V:** Connected to KBC3_PWRON. Feeds IBEX PEAK and Nvidia n11P.
- S0 State:**
 - P3.3V_D:** Connected to KBC3_PWRON. Feeds NVIDIA OPTIMUS.

Rail State	S0	S3	S4	S5
+V*A(LWS) +V*LAN	ON	ON	ON	ON
+V*AUX	ON	ON	—	—
+V	ON	—	—	—
+V* (CORE)	ON	—	—	—

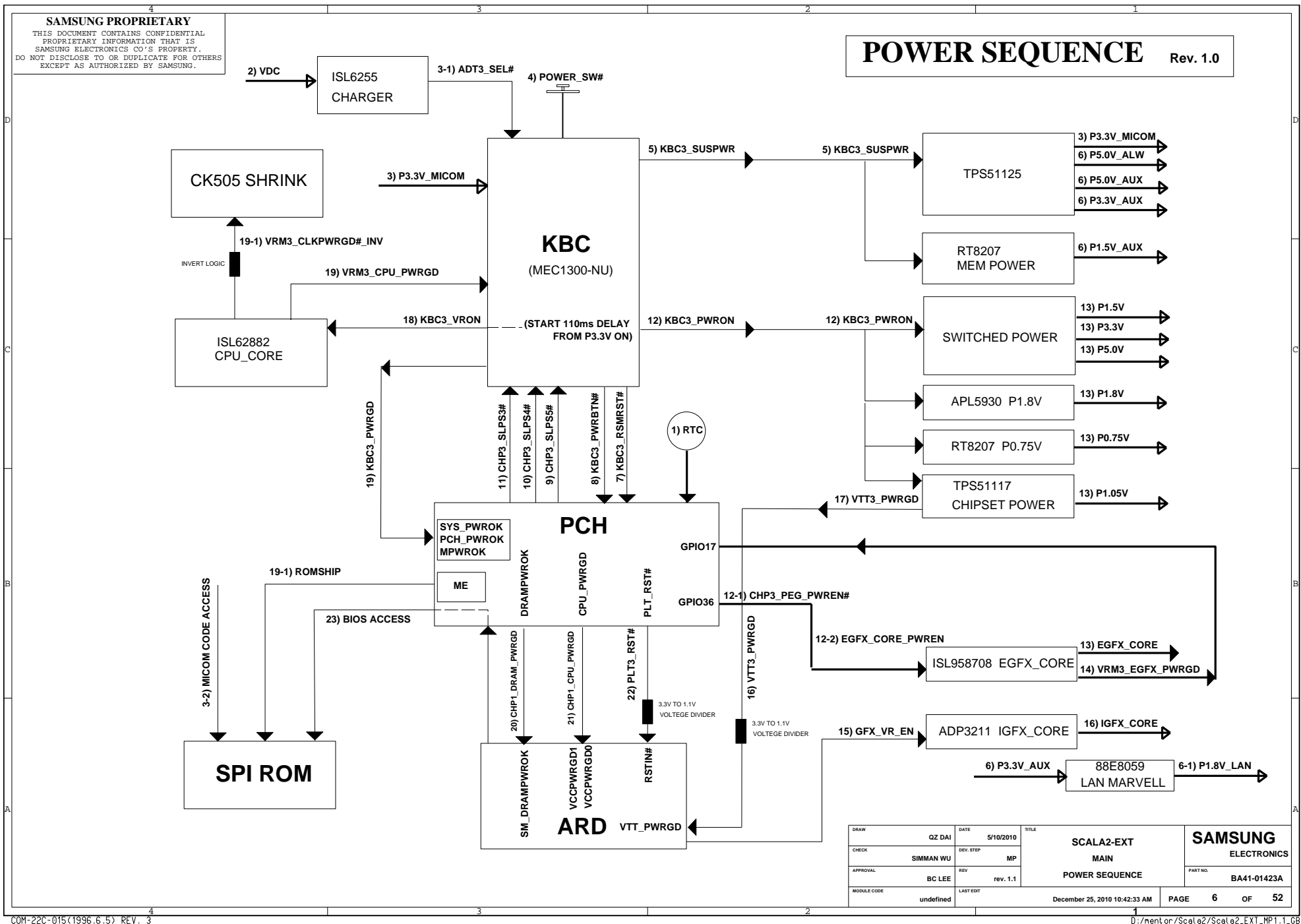
DRAW	QZ DAI	DATE	5/10/2010	SCALA2-EXT MAIN POWER DIAGRAM		SAMSUNG ELECTRONICS			
CHECK	SIMMAN WU	DEV. STEP	MP						
APPROVAL	BC LEE	REV	rev. 1.1	PART NO. BA41-01423A					
MODULE CODE	undefined	LAST EDIT							
				December 25, 2010 10:42:33 AM		PAGE	4	OF	52

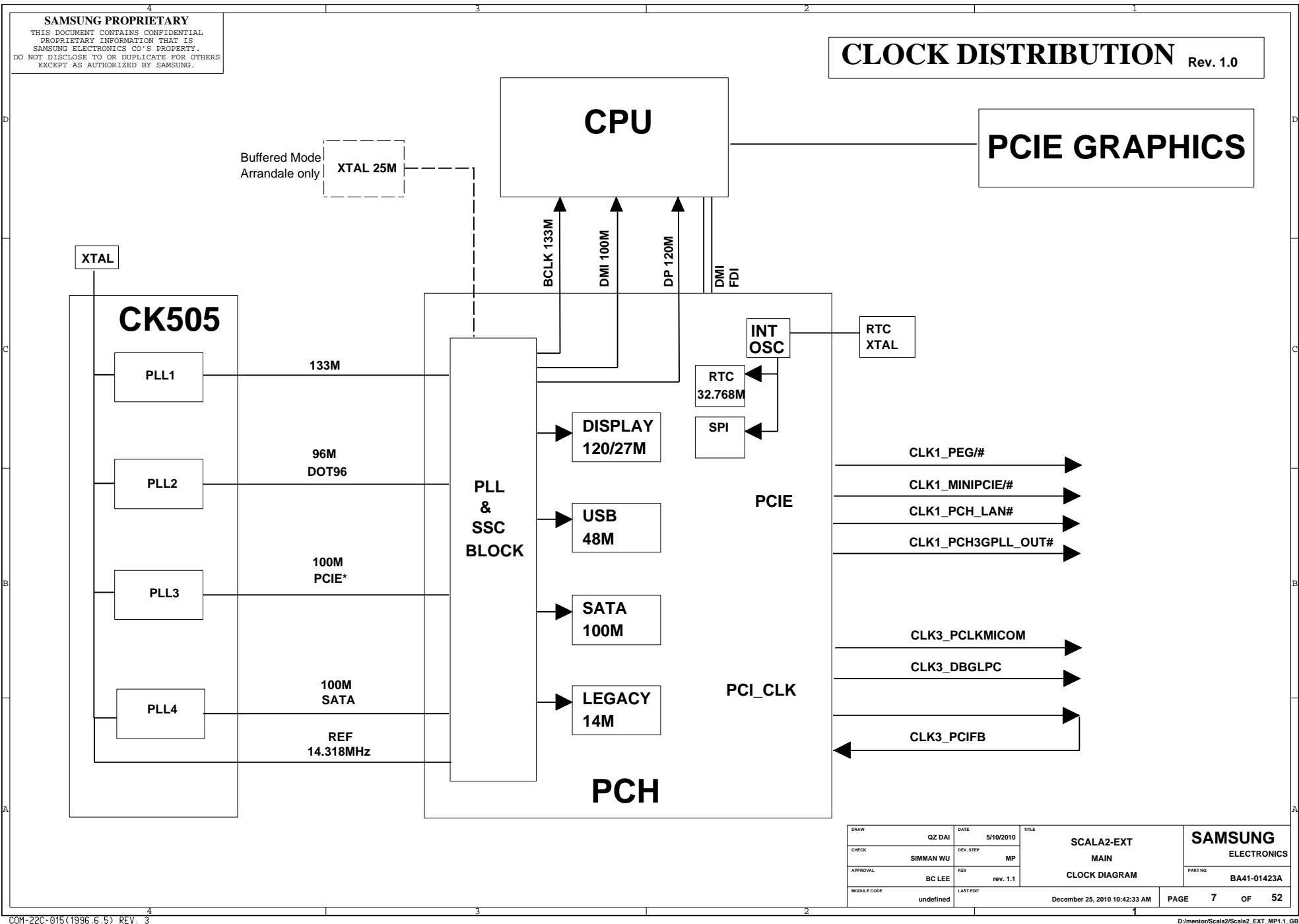
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

POWER RAILS ANALYSIS



DRAW	QZ DAI	DATE	5/10/2010	TITLE	SCALA2-EXT MAIN POWER RAILS	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE	undefined	LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	5	OF 52





SAMSUNG PROPRIETARY

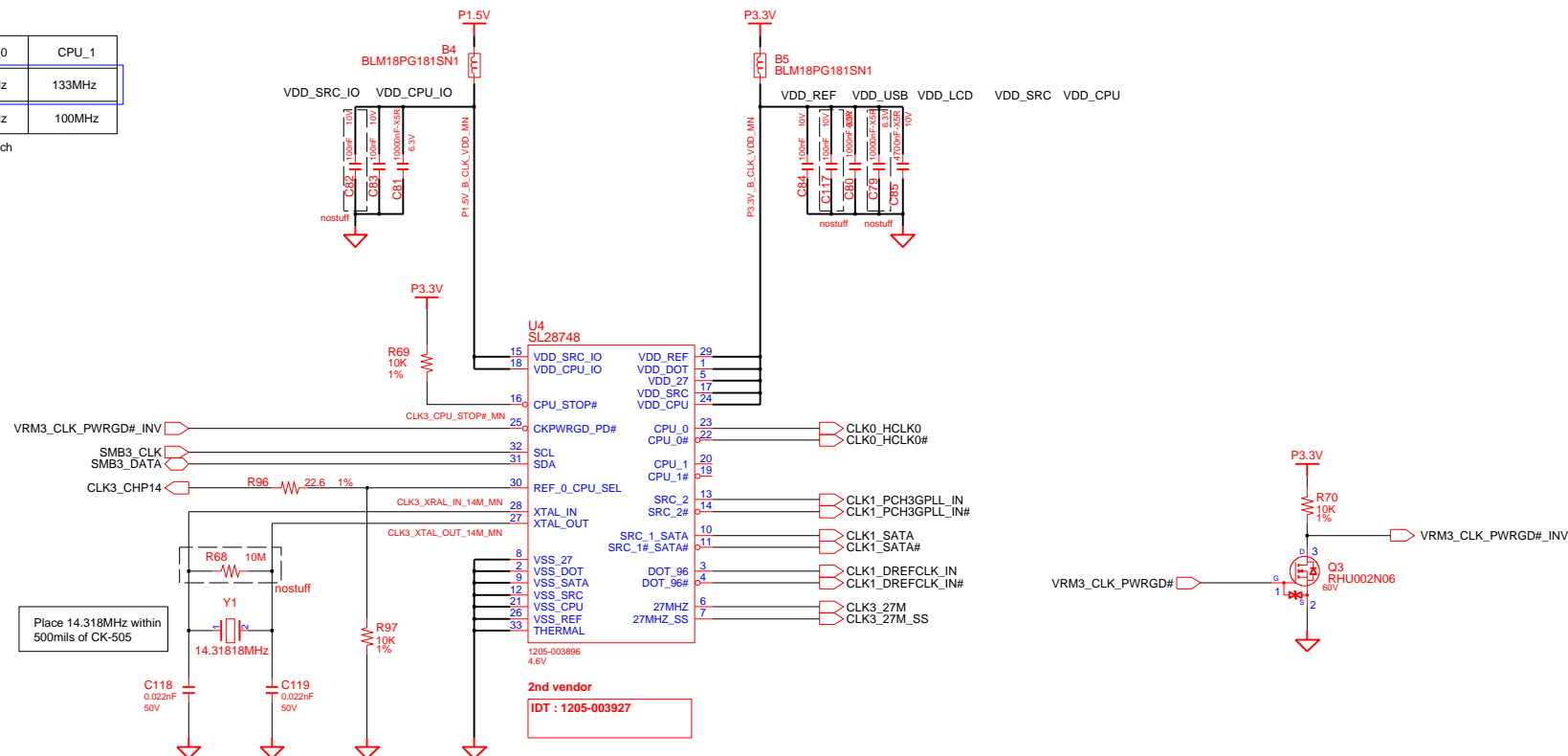
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

CK505M SHRINK VERSION

CPU_MODE SEL

Pin 30	CPU_0	CPU_1
CPU_SEL = 0	133MHz	133MHz
CPU_SEL = 1	100MHz	100MHz

*CPU_SEL During CK_PWRGD Latch



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT CLOCK CK505-SHRINK	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	8	OF 52

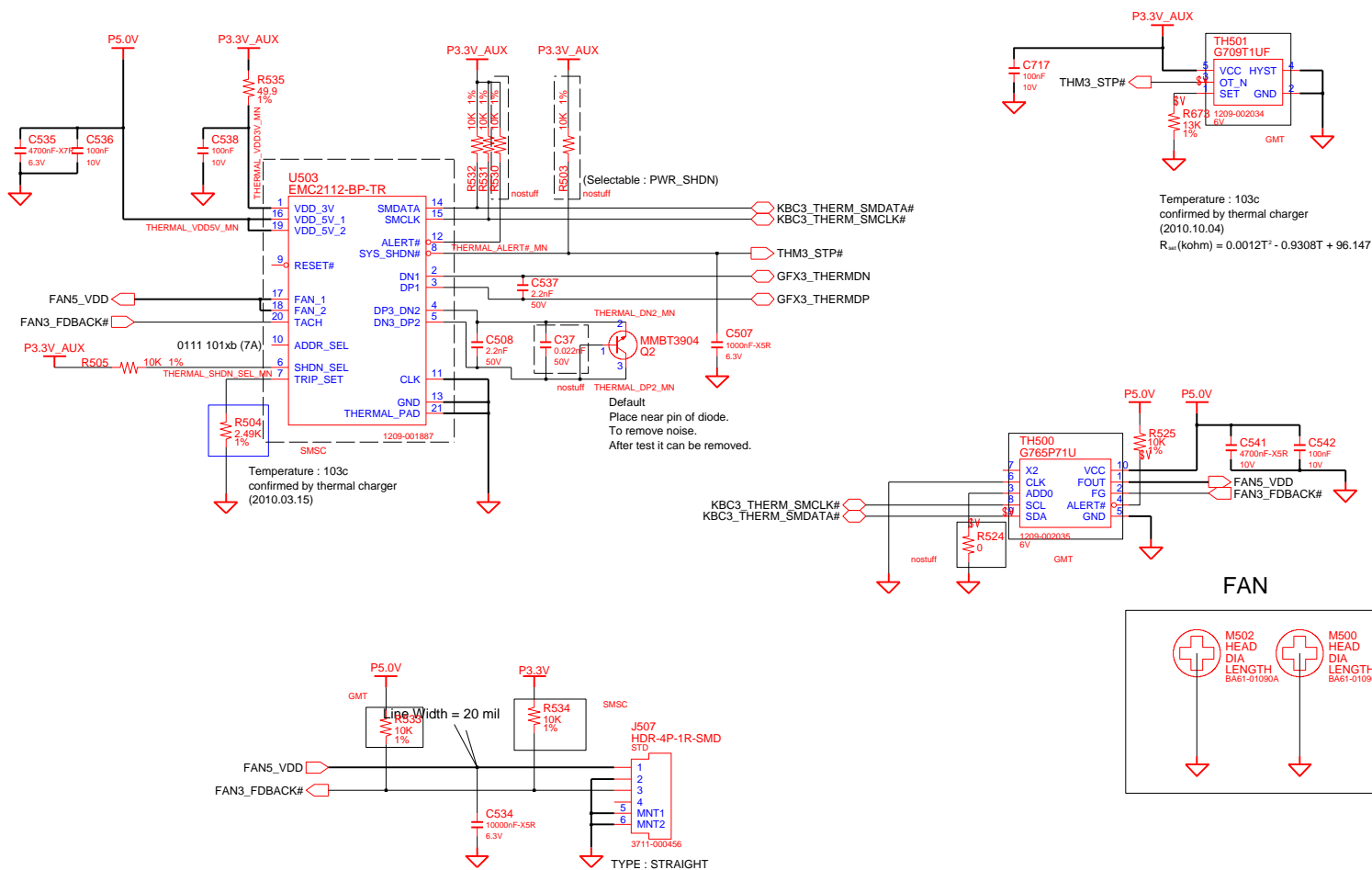
SAMSUNG PROPRIETARY

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

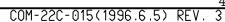
THERMAL SENSOR & FAN CONTROL

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

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



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT THERMAL SENSOR	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1		THERMAL SENSOR EMC2112	
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 9 OF 52	




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



DDR SYSTEM MEMORY A

DDR SYSTEM MEMORY B

DRAW	QZ DAI	DATE	8/19/2010	SCALA2-EXT CPU BGA CPU (2/5)			
CHECK	SIMMAN WU	DEV. STEP	MP				
APPROVAL	BC LEE	REV	REV. 1.1			PART NO.	BA41-01423A
MODULE CODE	undefined	LAST EDIT		December 25, 2010 10:42:33 AM		PAGE	11 OF 52

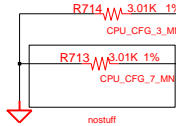
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

CPU500-5
ARD/CFD_PG#5 / 5

AT20	VSS1	VSS81	AE34
AT17	VSS2	VSS82	AE33
AR31	VSS3	VSS83	AE32
AR28	VSS4	VSS84	AE31
AR26	VSS5	VSS85	AE30
AR24	VSS6	VSS86	AE29
AR23	VSS7	VSS87	AE28
AR20	VSS8	VSS88	AE27
AR17	VSS9	VSS89	AE26
AR15	VSS10	VSS90	AE6
AR12	VSS11	VSS91	AD10
AR9	VSS12	VSS92	AC3
AR6	VSS13	VSS93	AC2
AR3	VSS14	VSS94	AC1
AP20	VSS15	VSS95	AB35
AP17	VSS16	VSS96	AB34
AP13	VSS17	VSS97	AB33
AP10	VSS18	VSS98	AB32
AP7	VSS19	VSS99	AB31
AP4	VSS20	VSS100	AB30
AP2	VSS21	VSS101	AB29
AN34	VSS22	VSS102	AB28
AN31	VSS23	VSS103	AB27
AN23	VSS24	VSS104	AB26
AN20	VSS25	VSS105	AB25
AN17	VSS26	VSS106	AB24
AM29	VSS27	VSS107	Y8
AM27	VSS28	VSS108	Y4
AM25	VSS29	VSS109	Y2
AM20	VSS30	VSS110	W35
AM17	VSS31	VSS111	W34
AM14	VSS32	VSS112	W33
AM11	VSS33	VSS113	W32
AM8	VSS34	VSS114	W31
AM5	VSS35	VSS115	W30
AM2	VSS36	VSS116	W29
AL34	VSS37	VSS117	W28
AL31	VSS38	VSS118	W27
AL23	VSS39	VSS119	W26
AL20	VSS40	VSS120	W25
AL17	VSS41	VSS121	W24
AL12	VSS42	VSS122	U8
AL9	VSS43	VSS123	U4
AL3	VSS44	VSS124	U2
AK29	VSS45	VSS125	T34
AK27	VSS46	VSS126	T33
AK25	VSS47	VSS127	T32
AK20	VSS48	VSS128	T31
AK17	VSS49	VSS129	T30
AJ31	VSS50	VSS130	T29
AJ23	VSS51	VSS131	T28
AJ20	VSS52	VSS132	T27
AJ17	VSS53	VSS133	T26
AJ14	VSS54	VSS134	T6
AJ11	VSS55	VSS135	R10
AJ8	VSS56	VSS136	P8
AJ5	VSS57	VSS137	P4
AJ2	VSS58	VSS138	P2
AH35	VSS59	VSS139	N35
AH34	VSS60	VSS140	N34
AH33	VSS61	VSS141	N33
AH32	VSS62	VSS142	N32
AH31	VSS63	VSS143	N31
AH30	VSS64	VSS144	N30
AH29	VSS65	VSS145	N29
AH28	VSS66	VSS146	N28
AH27	VSS67	VSS147	N27
AH26	VSS68	VSS148	N26
AH25	VSS69	VSS149	N25
AH20	VSS70	VSS150	N6
AH17	VSS71	VSS151	M10
AH13	VSS72	VSS152	L32
AH9	VSS73	VSS153	L29
AH6	VSS74	VSS154	L8
AH3	VSS75	VSS155	L5
AG10	VSS76	VSS156	L2
AF8	VSS77	VSS157	K34
AF4	VSS78	VSS158	K33
AF2	VSS79	VSS159	K32
AE35	VSS80	VSS160	K30

K27	VSS161	VSS1
K9	VSS162	VSS2
K6	VSS163	VSS3
K3	VSS164	VSS4
J32	VSS165	VSS5
J30	VSS166	VSS6
J21	VSS167	VSS7
J19	VSS168	VSS8
H35	VSS169	VSS9
H32	VSS170	VSS10
H28	VSS171	VSS11
H26	VSS172	VSS12
H24	VSS173	VSS13
H22	VSS174	VSS14
H18	VSS175	VSS15
H15	VSS176	VSS16
H13	VSS177	VSS17
H11	VSS178	VSS18
H8	VSS179	VSS19
H5	VSS180	VSS20
H2	VSS181	VSS21
G34	VSS182	VSS22
G31	VSS183	VSS23
G20	VSS184	VSS24
G9	VSS185	VSS25
G6	VSS186	VSS26
G3	VSS187	VSS27
F30	VSS188	VSS28
F27	VSS189	VSS29
F25	VSS190	VSS30
F22	VSS191	VSS31
F19	VSS192	VSS32
F16	VSS193	VSS33
E35	VSS194	VSS34
E32	VSS195	VSS35
E29	VSS196	VSS36
E24	VSS197	VSS37
E21	VSS198	VSS38
E18	VSS199	VSS39
E13	VSS200	VSS40
E11	VSS201	VSS41
E8	VSS202	VSS42
E5	VSS203	VSS43
E2	VSS204	VSS44
D33	VSS205	VSS45
D30	VSS206	VSS46
D26	VSS207	VSS47
D9	VSS208	VSS48
D6	VSS209	VSS49
D3	VSS210	VSS50
C34	VSS211	VSS51
C32	VSS212	VSS52
C29	VSS213	VSS53
C28	VSS214	VSS54
C24	VSS215	VSS55
C22	VSS216	VSS56
C20	VSS217	VSS57
C19	VSS218	VSS58
C16	VSS219	VSS59
B31	VSS220	VSS60
B25	VSS221	VSS61
B21	VSS222	VSS62
B18	VSS223	VSS63
B17	VSS224	VSS64
B13	VSS225	VSS65
B11	VSS226	VSS66
B8	VSS227	VSS67
B6	VSS228	VSS68
B4	VSS229	VSS69
A29	VSS230	VSS70
A27	VSS231	VSS71
A23	VSS232	VSS72
A9	VSS233	VSS73

NCTF
AT35
AT1
AR34
B34
B2
B1
A35
VSS_NCTF1
VSS_NCTF2
VSS_NCTF3
VSS_NCTF4
VSS_NCTF5
VSS_NCTF6
VSS_NCTF7



AP25	RSVD1	RSVD32	AJ13
AL25	RSVD2	RSVD33	AJ12
AL24	RSVD3	RSVD34	AH25
AL22	RSVD6	RSVD35	AK26
AJ33	RSVD4	RSVD36	AL26
AG9	RSVD5	RSVD37	AR2
M27	RSVD6	RSVD38	AJ26
L28	RSVD7	RSVD39	AJ27
H17	RSVD8	RSVD40	AP1
H17	SA_DIMM_VREFDQ	RSVD41	AT2
G25	SB_DIMM_VREFDQ	RSVD42	AT3
G17	RSVD11	RSVD43	AR1
E31	RSVD12	RSVD44	AL28
E30	RSVD13	RSVD45	AL29
	RSVD14	RSVD46	AP30
	CFG_0	RSVD47	AP32
	CFG_1	RSVD48	AL27
	CFG_2	RSVD49	AT31
	CFG_3	RSVD50	AT32
	CFG_4	RSVD51	AP33
	CFG_5	RSVD52	AR33
	CFG_6	RSVD53	AT33
	CFG_7	RSVD54	AT34
	CFG_8	RSVD55	AP35
	CFG_9	RSVD56	AR35
	CFG_10	RSVD57	AR32
	CFG_11	RSVD58	
	CFG_12	RSVD59	E15
	CFG_13	RSVD60	F15
	CFG_14	RSVD61	A2
	CFG_15	RSVD62	D15
	CFG_16	RSVD63	C15
	CFG_17	RSVD64	AJ15
	RSVD_TP_86	RSVD65	AH15
	RSVD15	RSVD66	
B19	RSVD16	RSVD67	AA5
A19	RSVD17	RSVD68	AA4
A20	RSVD18	RSVD69	R8
B20	RSVD19	RSVD70	AD3
U9	RSVD20	RSVD71	AD2
T9	RSVD21	RSVD72	AA2
AC9	RSVD22	RSVD73	AA1
AB9	RSVD23	RSVD74	R9
	RSVD24	RSVD75	AG7
	RSVD25	RSVD76	AE3
	RSVD26	RSVD77	V4
	RSVD27	RSVD78	V5
	RSVD28	RSVD79	N2
	RSVD29	RSVD80	AD5
	RSVD30	RSVD81	AD7
	RSVD31	RSVD82	W3
	RSVD32	RSVD83	W2
	RSVD33	RSVD84	N3
	RSVD34	RSVD85	AE5
	RSVD35	RSVD86	AD9
	RSVD36	RSVD87	AP34
	RSVD37	RSVD88	
	RSVD38	RSVD89	
	RSVD39	RSVD90	
	RSVD40	RSVD91	
	RSVD41	RSVD92	
	RSVD42	RSVD93	
	RSVD43	RSVD94	
	RSVD44	RSVD95	
	RSVD45	RSVD96	
	RSVD46	RSVD97	
	RSVD47	RSVD98	
	RSVD48	RSVD99	
	RSVD49	RSVD100	

(VSS) RSVD86

CFG Straps for Processor

PCI Express Configuration Select	
CFG0	1 : Single PEG 0 : Bifunction enabled
PCI Express Static Lane Reversal	
CFG3	1 : Normal operation 0 : Lane Reversed
Display Port Presence	
CFG4	1 : Disabled - No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP
PCIe 2.0 SUPPORT	
CFG7	1 : Normal operation 0 : PCIe2.0 Jitter support

DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		CPU	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		BGA CPU (4/5)	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 13 OF 52

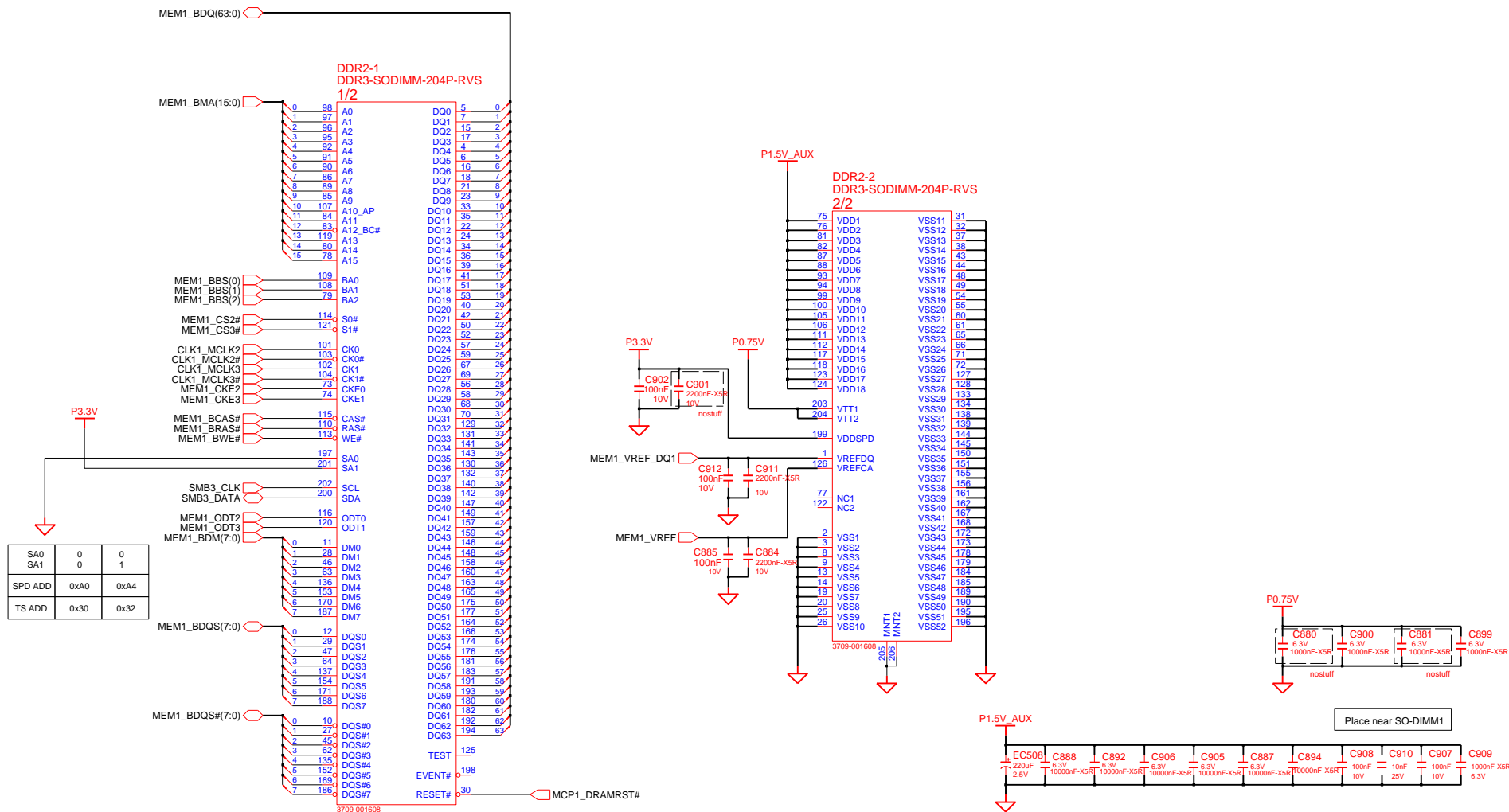
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

DDR SO-DIMM #1

Height : 4 mm (STANDARD)

P/N : 3709-001560 (FOXCONN)

P/N : 3709-001607 (CONCRAFT)



DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		SODIMM A	ELECTRONICS
APPROVAL	BC LEE	REV	REV. 1.1		DDR3	PART NO.
MODULE CODE		LAST ENT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 14 OF 52

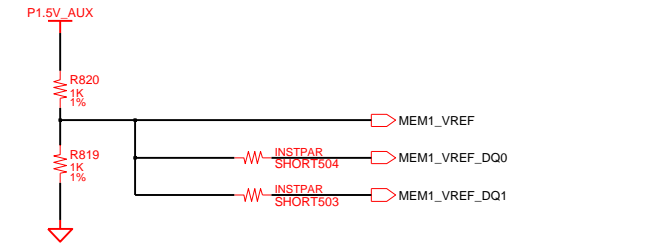
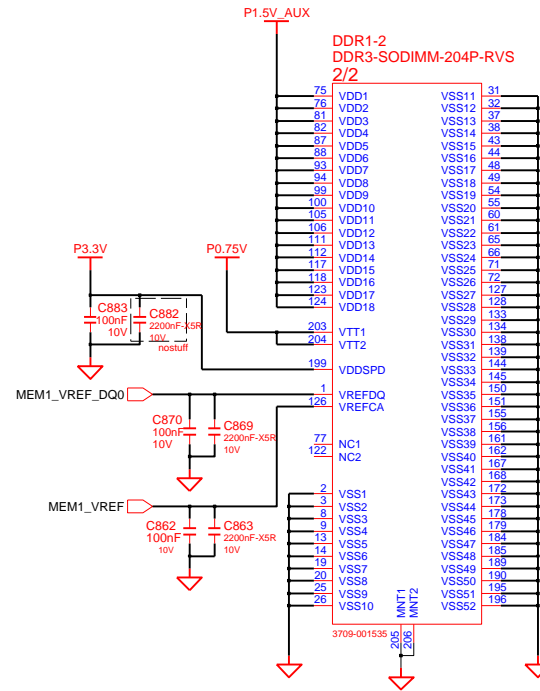
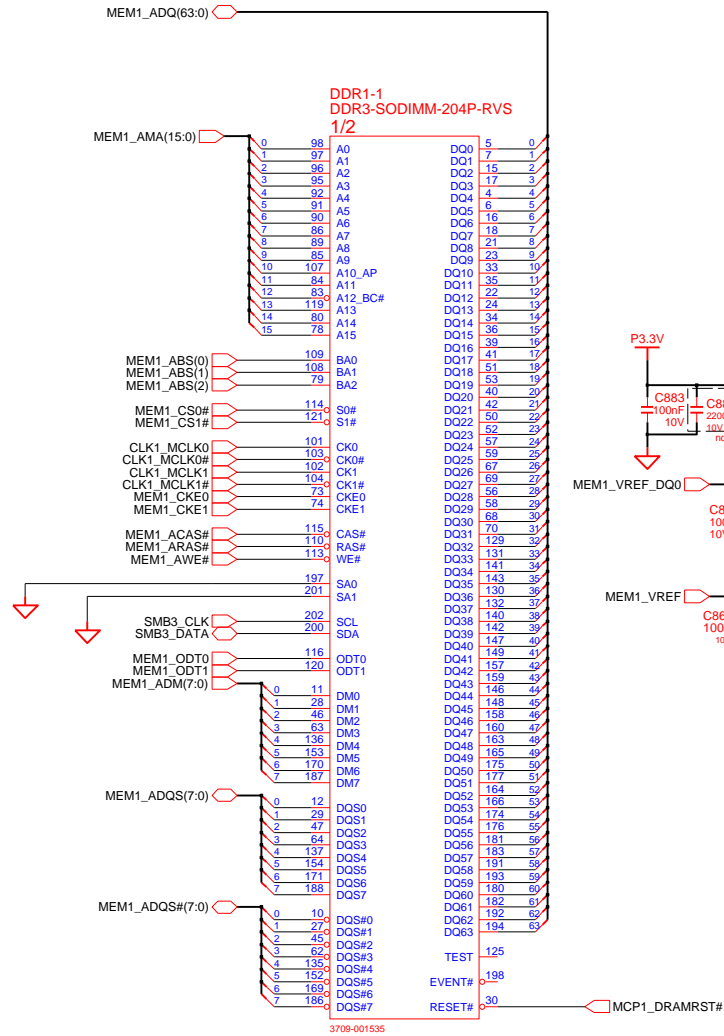
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

DDR SO-DIMM #0

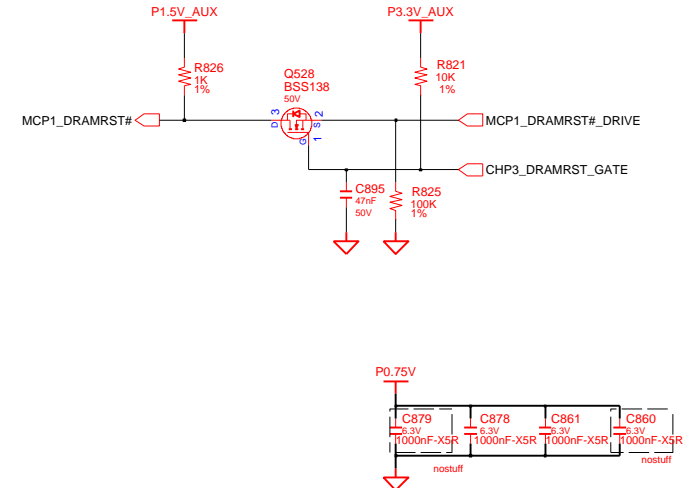
Height : 8 mm (STANDARD)

P/N : 3709-001615 (FOXCONN)

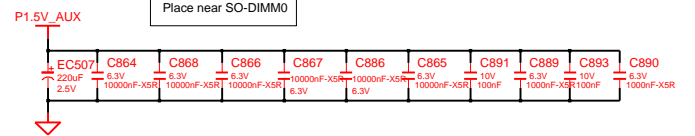
P/N : 3709-001622 (CONCRAFT)



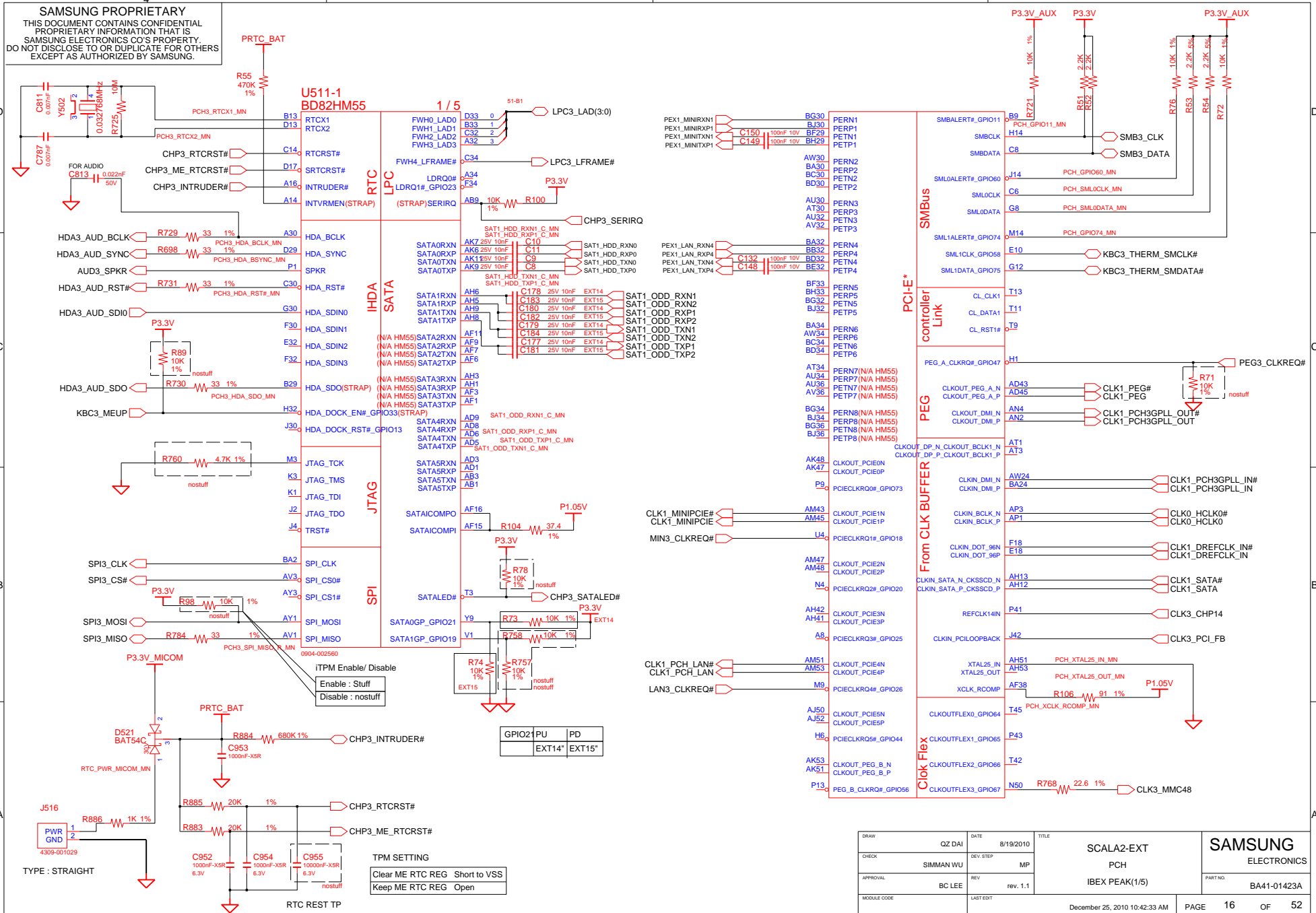
Place between two memory Connector



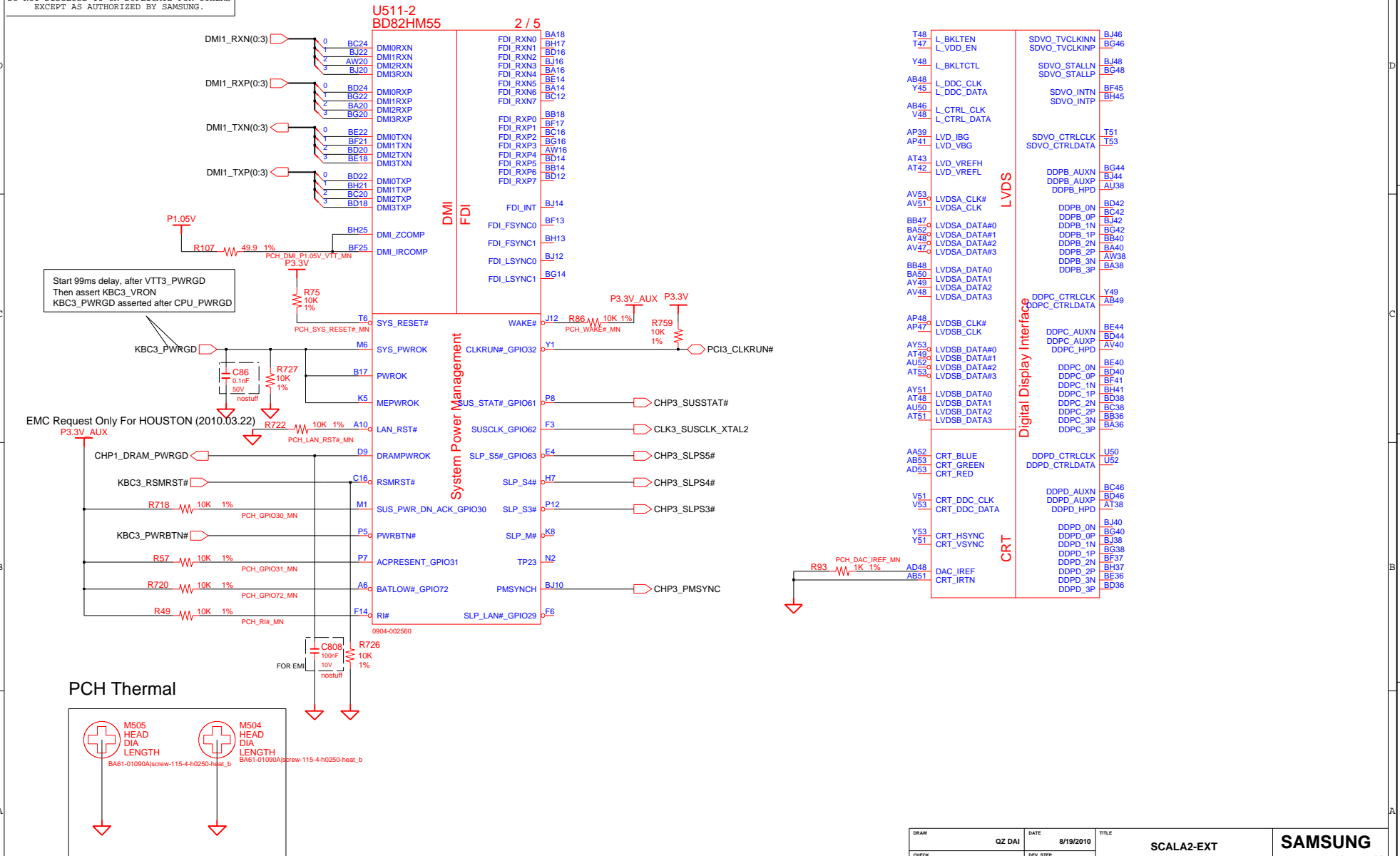
Place near SO-DIMM0



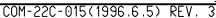
DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		SODIMM B	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		DDR3	PART NO.
MODULE CODE		LAST ENT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 15 OF 52



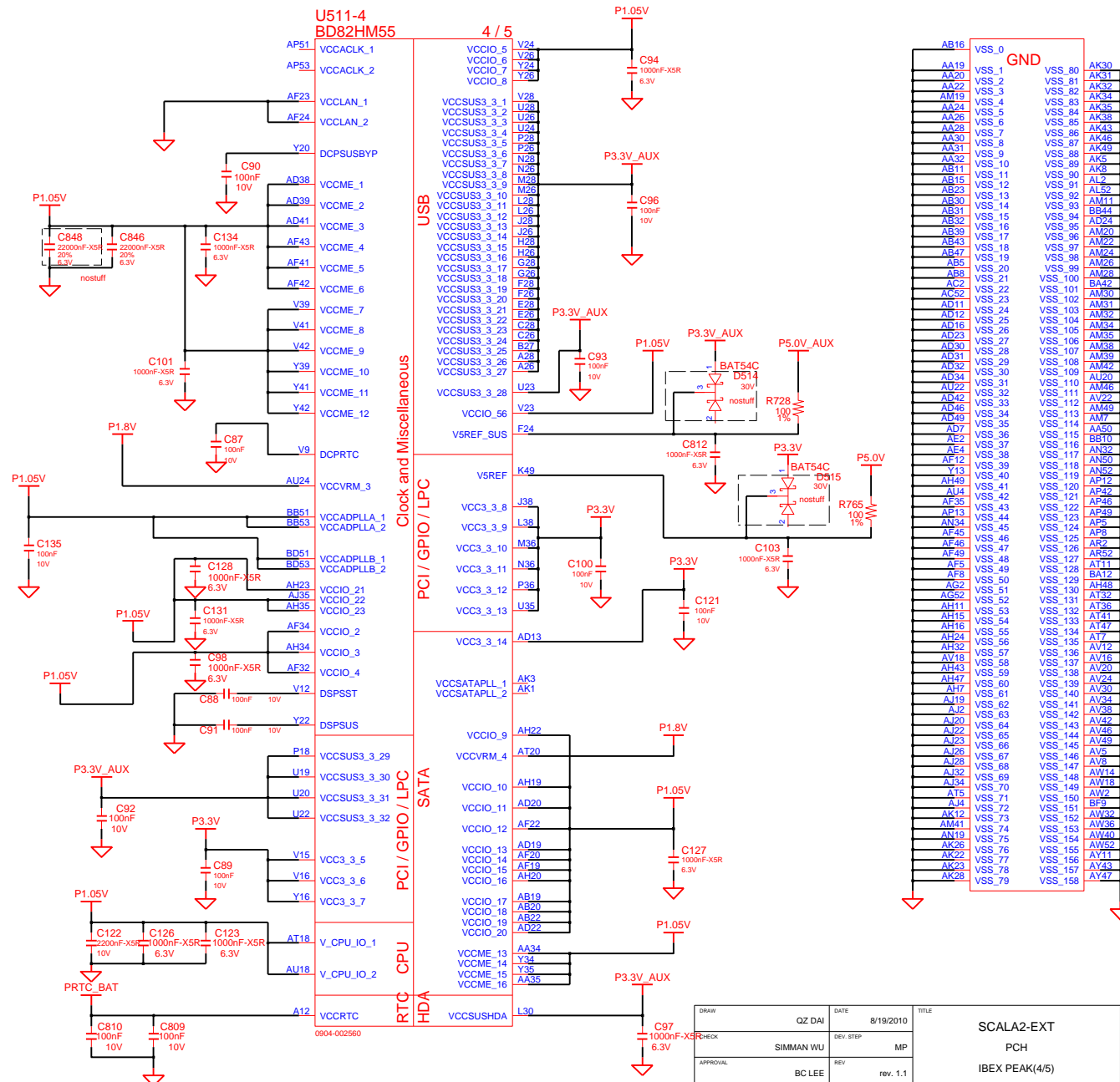
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	PCH	ELECTRONICS	
APPROVAL	BC LEE	REV	rev. 1.1	IBEX PEAK(2/5)	PART NO.	BA41-01423A
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE	17 OF 52



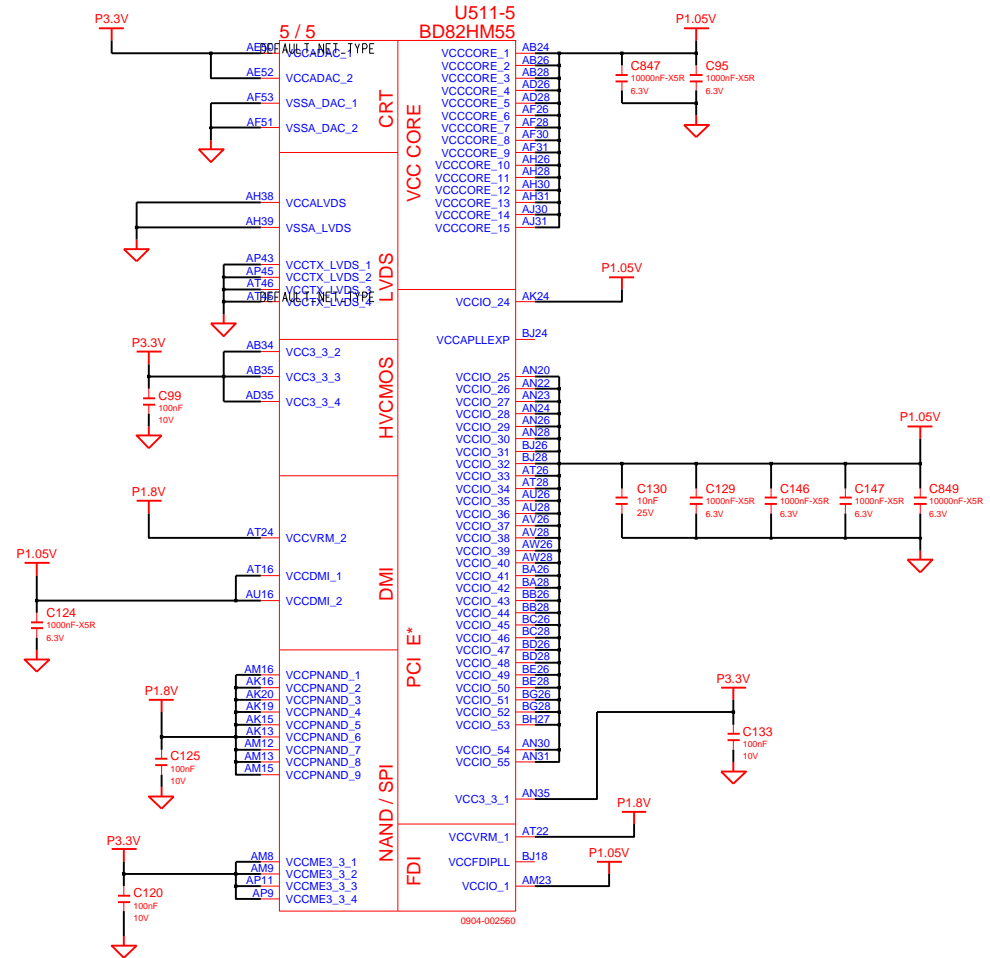
VTT_SEL	VOLTAGE	CPU
1	P1.05V	ARRANDALE
0	P1.1V	CLARKS FIELD



DRAW	QZ DAI	DATE	8/19/2010	TITLE SCALA2-EXT PCH IBEX PEAK(4/5)	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP		
APPROVAL	BC LEE	REV	REV. 1.1		
PART NO.					
MODULE CODE				BA41-01423A	
52	LAST EDIT			December 25, 2010 10:42:33 AM	PAGE 19 OF 60

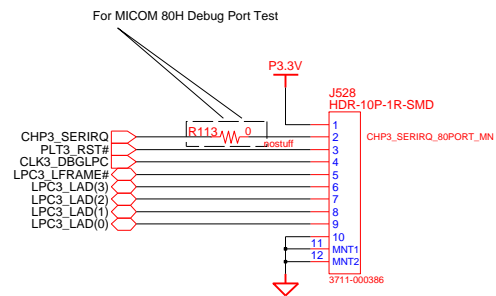
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

H49	VSS_255	VSS_159	AV7
H5	VSS_261	VSS_160	B11
J24	VSS_261	VSS_161	B15
K11	VSS_262	VSS_162	B19
K43	VSS_263	VSS_163	B23
K47	VSS_263	VSS_163	B31
K7	VSS_264	VSS_164	B35
L14	VSS_265	VSS_165	B39
L18	VSS_266	VSS_166	B43
L2	VSS_267	VSS_167	B47
L22	VSS_268	VSS_168	B51
L32	VSS_269	VSS_169	B55
L36	VSS_270	VSS_170	B59
L40	VSS_271	VSS_171	B63
L52	VSS_272	VSS_172	B67
M12	VSS_273	VSS_173	B71
M16	VSS_274	VSS_174	B75
M20	VSS_275	VSS_175	B79
N38	VSS_276	VSS_176	B83
M34	VSS_277	VSS_177	B87
M38	VSS_278	VSS_178	B91
M42	VSS_279	VSS_179	B95
M46	VSS_280	VSS_180	BC10
M49	VSS_281	VSS_181	BC14
M5	VSS_282	VSS_182	BC18
M8	VSS_283	VSS_183	BC22
N24	VSS_284	VSS_184	BC26
P11	VSS_285	VSS_185	BC30
AD15	VSS_286	VSS_186	BC34
P22	VSS_287	VSS_187	BC38
P30	VSS_288	VSS_188	BC42
P32	VSS_289	VSS_189	BC46
P34	VSS_290	VSS_190	BC50
P42	VSS_291	VSS_191	BC54
P45	VSS_292	VSS_192	BC58
P47	VSS_293	VSS_193	BC62
K2	VSS_294	VSS_194	BC66
R52	VSS_295	VSS_195	BC70
T12	VSS_296	VSS_196	BC74
T41	VSS_297	VSS_197	BC78
T46	VSS_298	VSS_198	BC82
T49	VSS_299	VSS_199	BC86
T5	VSS_300	VSS_200	BC90
T8	VSS_301	VSS_201	BC94
U30	VSS_302	VSS_202	BC98
U31	VSS_303	VSS_203	BC102
U32	VSS_304	VSS_204	BC106
U34	VSS_305	VSS_205	BC110
P38	VSS_306	VSS_206	BC114
V11	VSS_307	VSS_207	BC118
P16	VSS_308	VSS_208	BC122
V19	VSS_309	VSS_209	BC126
V20	VSS_310	VSS_210	BC130
V22	VSS_311	VSS_211	BC134
V30	VSS_312	VSS_212	BC138
V31	VSS_313	VSS_213	BC142
V32	VSS_314	VSS_214	BC146
V34	VSS_315	VSS_215	BC150
V35	VSS_316	VSS_216	BC154
V38	VSS_317	VSS_217	BC158
V43	VSS_318	VSS_218	BC162
V45	VSS_319	VSS_219	BC166
V46	VSS_320	VSS_220	BC170
V47	VSS_321	VSS_221	BC174
V49	VSS_322	VSS_222	BC178
V5	VSS_323	VSS_223	BC182
V7	VSS_324	VSS_224	BC186
V7	VSS_325	VSS_225	BC190
V8	VSS_326	VSS_226	BC194
W2	VSS_327	VSS_227	BC198
W52	VSS_328	VSS_228	BC202
Y11	VSS_329	VSS_229	BC206
Y12	VSS_330	VSS_230	BC210
Y15	VSS_331	VSS_231	BC214
Y19	VSS_332	VSS_232	BC218
Y23	VSS_333	VSS_233	BC222
Y28	VSS_334	VSS_234	BC226
Y30	VSS_335	VSS_235	BC230
Y31	VSS_336	VSS_236	BC234
Y32	VSS_337	VSS_237	BC238
Y38	VSS_338	VSS_238	BC242
Y43	VSS_339	VSS_239	BC246
Y46	VSS_340	VSS_240	BC250
P49	VSS_341	VSS_241	BC254
Y5	VSS_342	VSS_242	BC258
Y6	VSS_343	VSS_243	BC262
Y8	VSS_344	VSS_244	BC266
P24	VSS_345	VSS_245	BC270
T43	VSS_346	VSS_246	BC274
AD51	VSS_347	VSS_247	BC278
AT8	VSS_348	VSS_248	BC282
AD47	VSS_349	VSS_249	BC286
Y47	VSS_350	VSS_250	BC290
AT12	VSS_351	VSS_251	BC294
AM6	VSS_352	VSS_252	BC298
AT13	VSS_353	VSS_253	BC302
AM5	VSS_354	VSS_254	BC306
AK45	VSS_355	VSS_255	BC310
AK39	VSS_356	VSS_256	BC314
AV14	VSS_357	VSS_257	BC318
	VSS_358	VSS_258	BC322



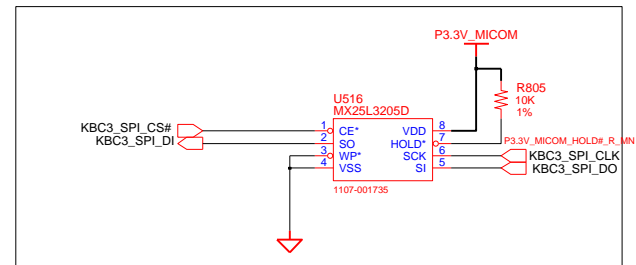
DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP		PCH	
APPROVAL	BC LEE	REV	rev. 1.1		IBEX PEAK(5/5)	
MODULE CODE	undefined	LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	20	OF 52

80H PORT DEBUG



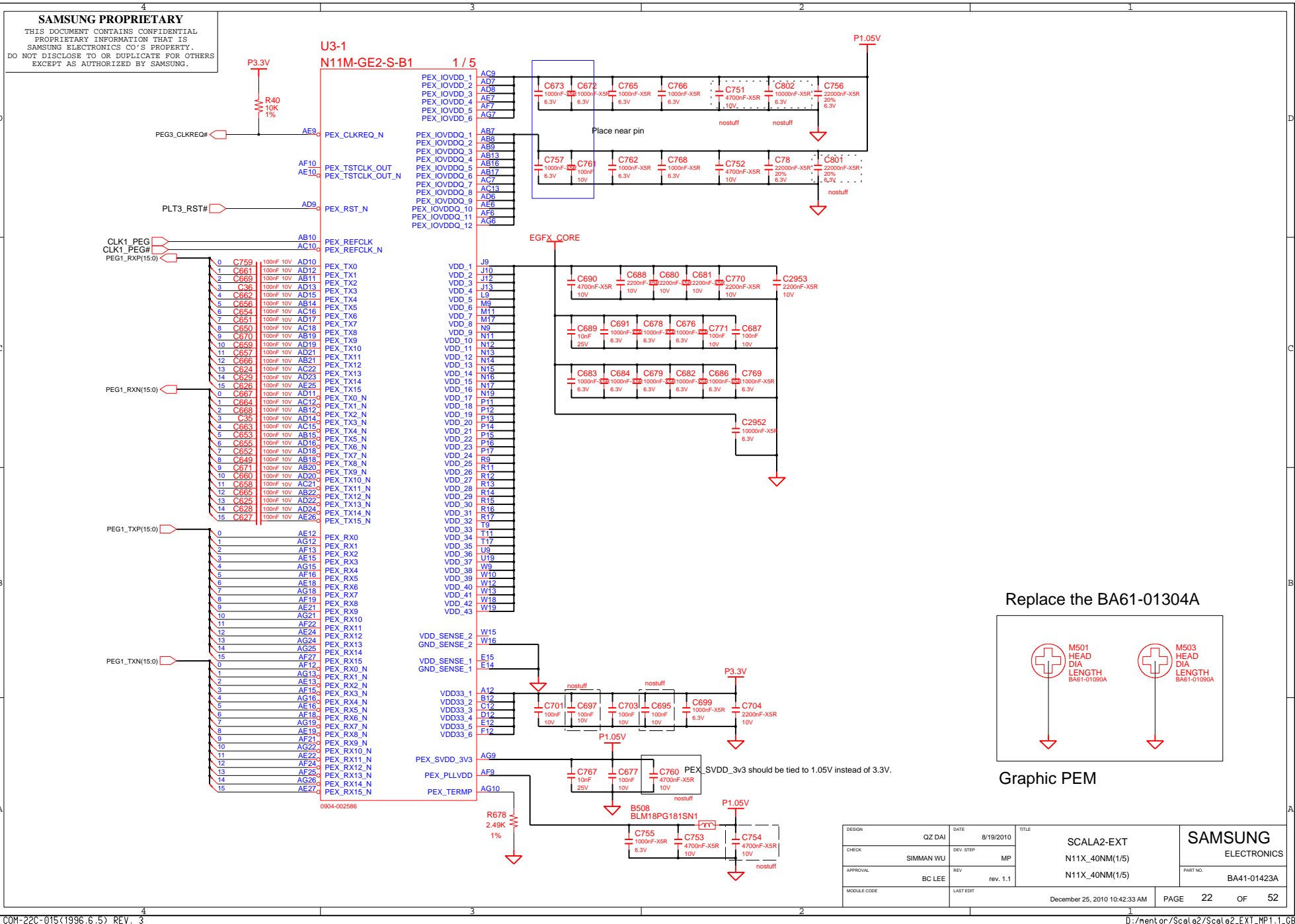
BE CAUTION SPI ROM SIZE!!

SPI_ROM_SOCKET



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALAZ-EXT DEBUG PORT 80H DECODER	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	21	OF 52

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



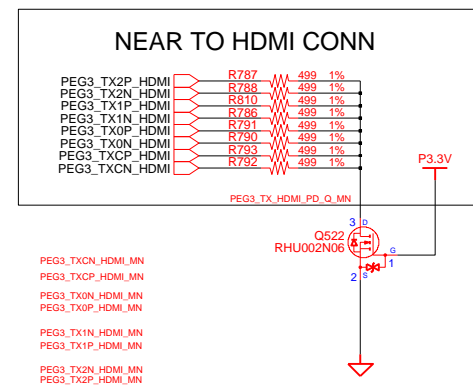
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		N11X_40NM(1/5)	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		N11X_40NM(1/5)	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
				December 25, 2010 10:42:33 AM	PAGE	22 OF 52

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



COM-22C-015(1996.6.5) REV. 3

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



DESIGN	QZ DAI	DATE	8/19/2010	SCALA2-EXT N11X_40NM(3/5) N11X_40NM(3/5)	SAMSUNG ELECTRONICS				
CHECK	SIMMAN WU	DEV. STEP	MP						
APPROVAL	BC LEE	REV	rev. 1.1						
PART NO.							BA41-01423A		
MODULE CODE		LAST EDIT			December 25, 2010 10:42:33 AM	PAGE	24	OF	52

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

Pin	Description	Activate
GPIO(0)	General Purpose	NC
GPIO(1)	HPD-C	NC
GPIO(2)	LCD0_BL_PWM	High
GPIO(3)	LCD0_VDD	High
GPIO(4)	LCD0_BL_EN	High
GPIO(5)	GPU VID0	00 0.8V 10 0.95V
GPIO(6)	GPU VID1	01 0.85V 11 1.03V
GPIO(7)	GPU VID2	NC
GPIO(8)	OVERT	LOW
GPIO(9)	ALERT	NC
GPIO(10)	MEM_VREF	NC
GPIO(11)	SLI_SYNC	NC
GPIO(12)	PWR_LEVEL	NC
GPIO(13)	MEM_VID	NC
GPIO(14)	PWR_CTRL1	NC
GPIO(15)	HPD-E	High
GPIO(16)	FAN_PWM	NC
GPIO(17)	Reserved	NC
GPIO(18)	Reserved	NC
GPIO(19)	HPD-D	NC

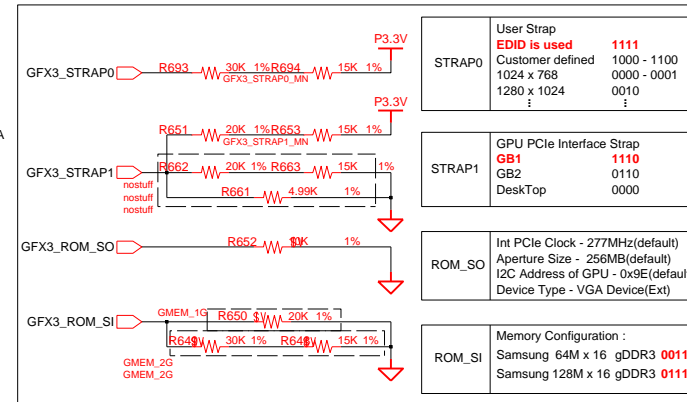
Strap option	Bit 3	Bit 2	Bit 1	Bit 0
ROM_SO	XCLK_417	FB_0_BAR_SIZE	SMB_ALT_ADDR	VGA_DEVICE
ROM_SCLK	DEVID[4]	VENID	CLK_CFG	PLL_TERM
ROM_SI	RAMCFG[3]	RAMCFG[2]	RAMCFG[1]	RAMCFG[0]
STRAP2	DEVID[3]	DEVID[2]	DEVID[1]	DEVID[0]
STRAP1	PADCFG[3]	PADCFG[2]	PADCFG[1]	PADCFG[0]
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
Resistor value	PU to VDD	PD to GND	XCLK417 = 0 27MHz	
5K ohm	1000	0000	RAM CFG (SEC)	
10 Kohm	1001	0001	0011 gDDR3 1Gb	
15K ohm	1010	0010	USER[3:0]=1111 for EDID	
20K ohm	1011	0011	PADCFG[3:0]=0110 for NB	
25K ohm	1100	0100		
30K ohm	1101	0101		
35K ohm	1110	0110		
45K ohm	1111	0111		

	Bit3	Bit2	Bit1	Bit0
ROMSO	0	0	0	0
SCLK	1	0	1	0
SI	0	0	1	1
SI	0	1	1	1
Strap2	0	0	0	0
Strap2	0	1	0	1
Strap1	1	1	1	0
Strap0	1	1	1	1

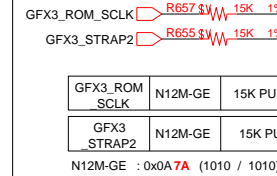
U3-5
N11M-GE2-S-B1

5 / 5

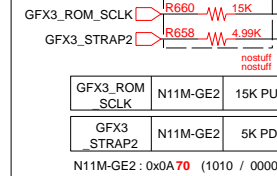
Function Straps



Chip Select Straps (N12M-GB1)



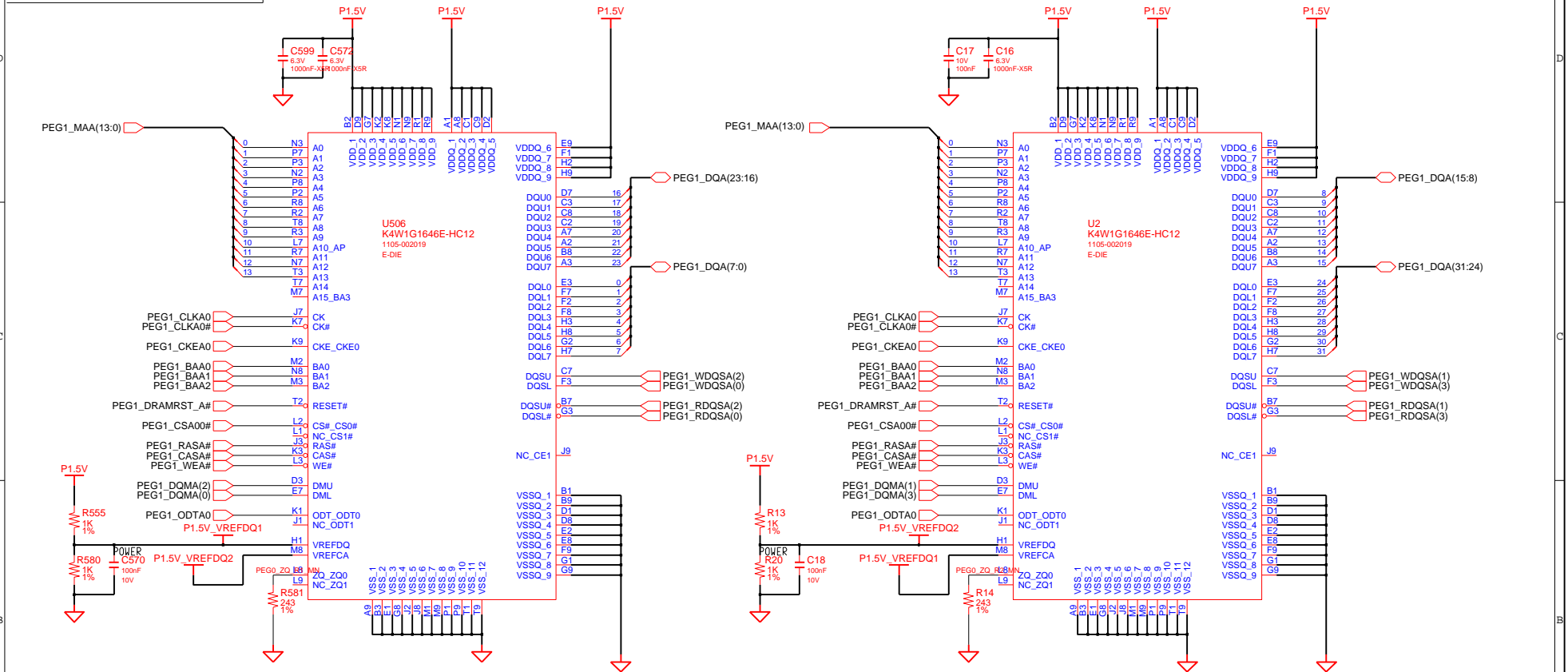
Chip Select Straps (N11M-GB1)



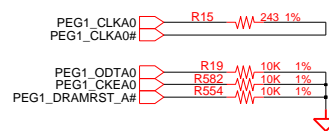
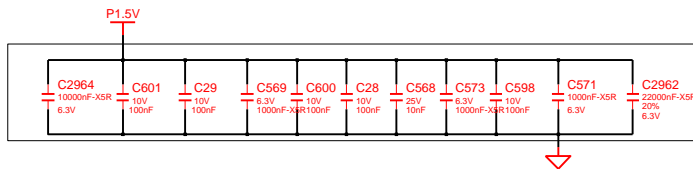
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		N11X_40NM(4/5)	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		N11X_40NM(4/5)	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 25 OF 52

A-Channel #0

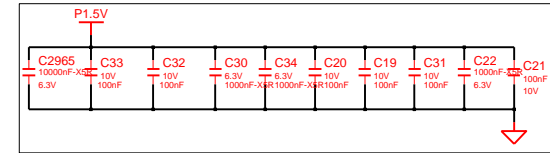
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.



Place near to VDDQ

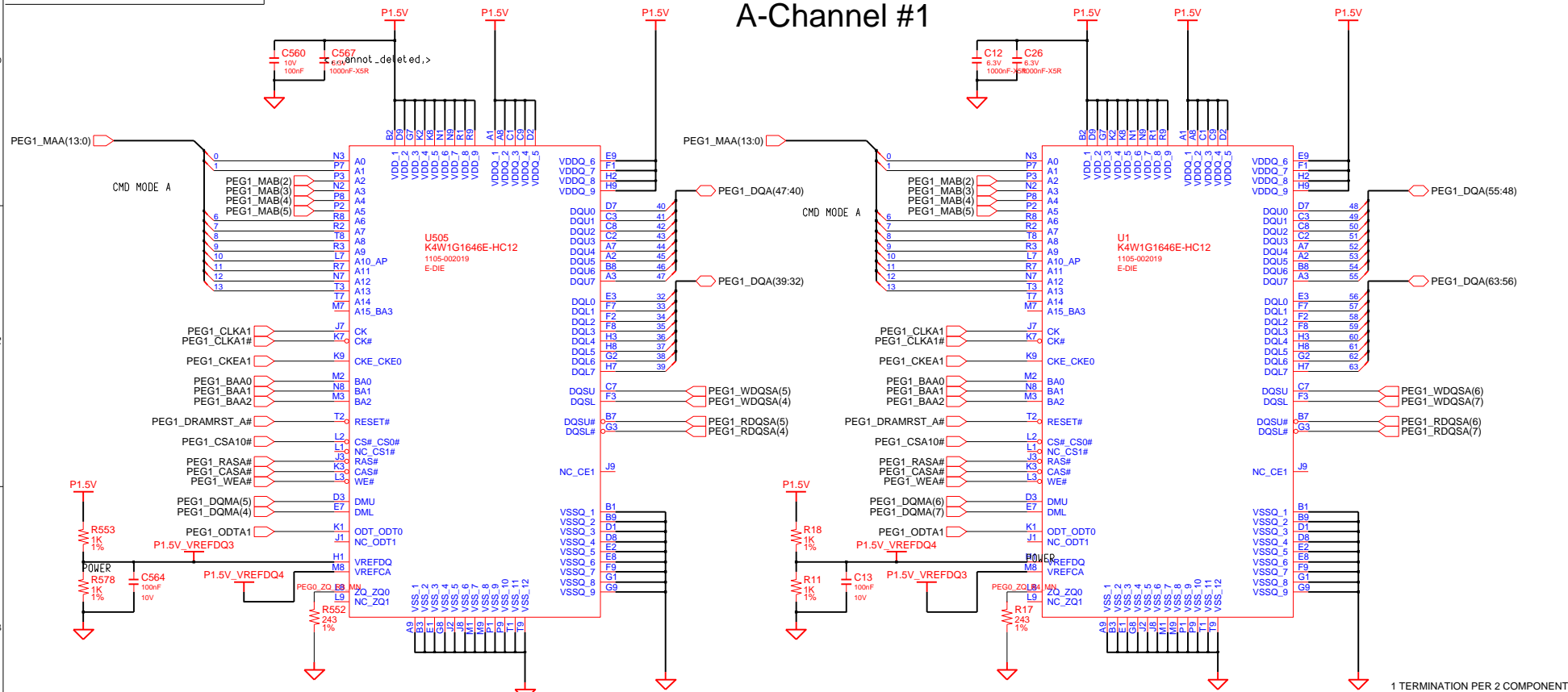


Place near to VDDQ

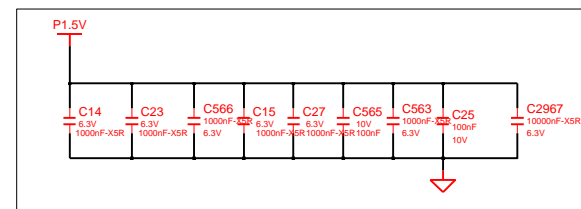
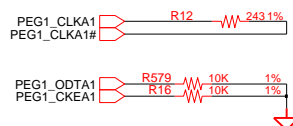
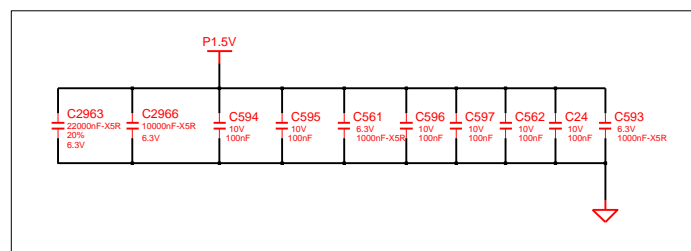



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP		N11X_40NM(5/5)	
APPROVAL	BC LEE	REV	rev. 1.1		N11X_40NM(5/5)	
MODULE CODE		LAST EDIT				
December 25, 2010 10:42:33 AM						PAGE 26 OF 52

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



Place near to VDDQ



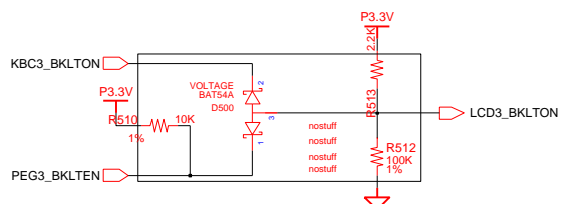
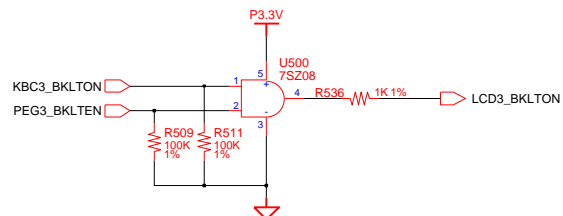
DESIGN	QZ DAI	DATE	8/19/2010	TITLE SCALA2-EXT GRAPHIC_MEM A#0 GRAPHIC_MEM A#0	
CHECK	SIMMAN WU	DEV. STEP	MP		
APPROVAL	BC LEE	REV	rev. 1.1		
MODULE CODE				December 25, 2010 10:42:33 AM	PAGE 27 OF 52

SAMSUNG PROPRIETARY

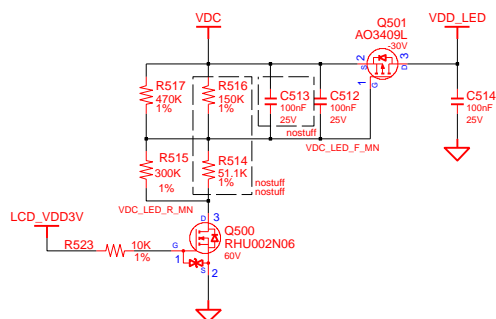
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

LVDS LOGIC

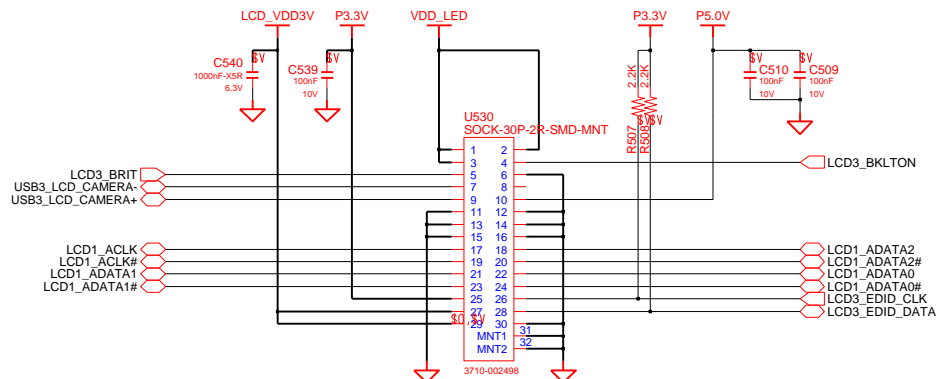
Backlight On



LED Power

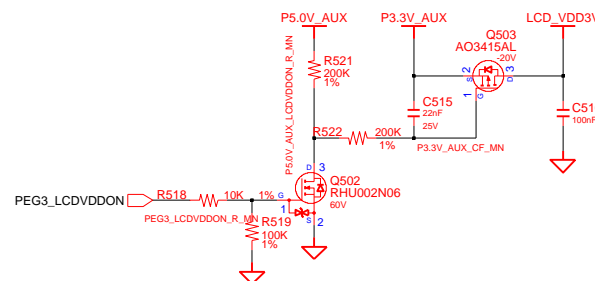


LCD Connector + CAMERA



TYPE: ANGLE

LCD Power

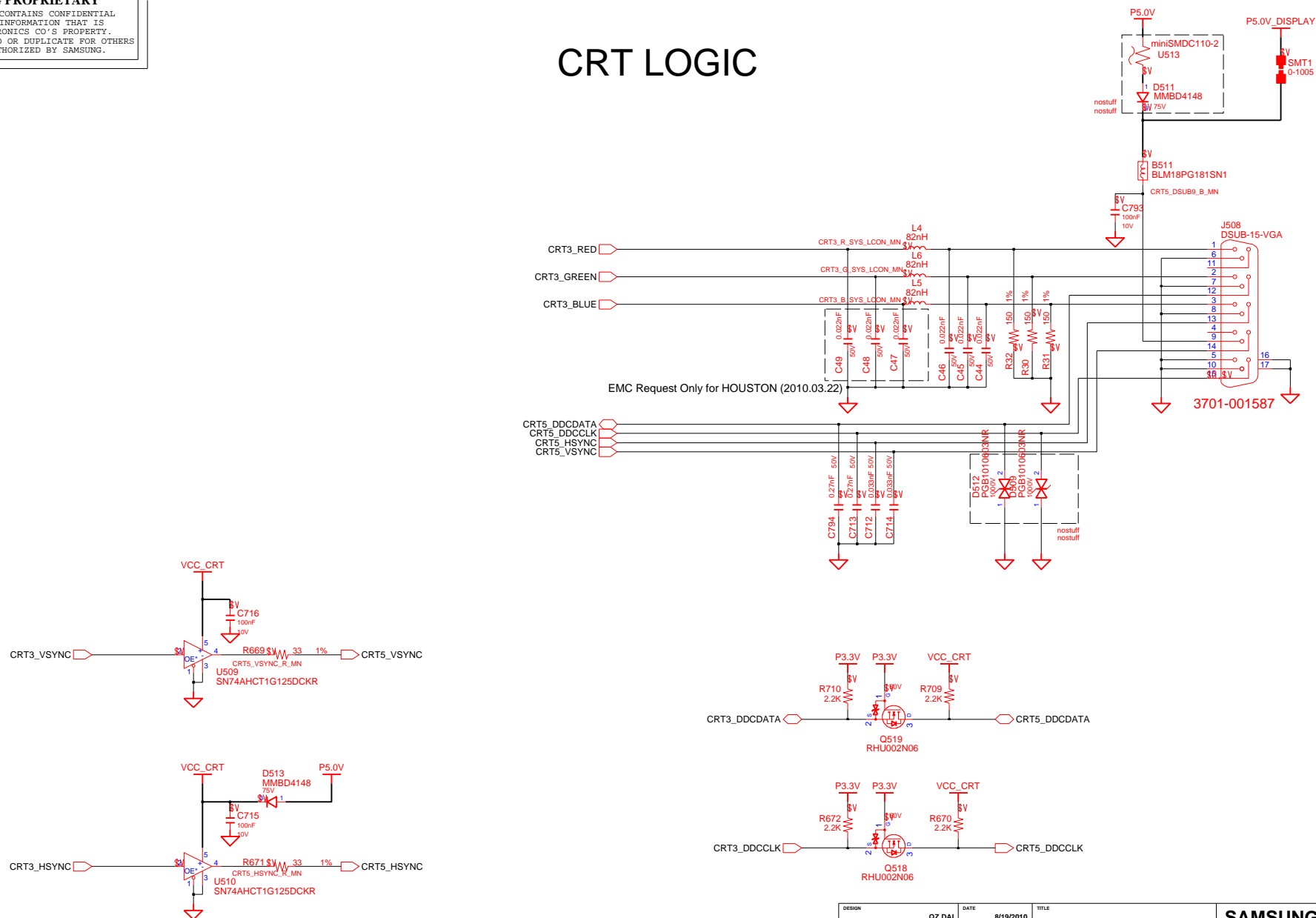


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	GRAPHICS_IF	ELECTRONICS	
APPROVAL	BC LEE	REV	rev. 1.1	LVDS	PART NO.	BA41-01423A
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE	28 OF 52

SAMSUNG PROPRIETARY

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

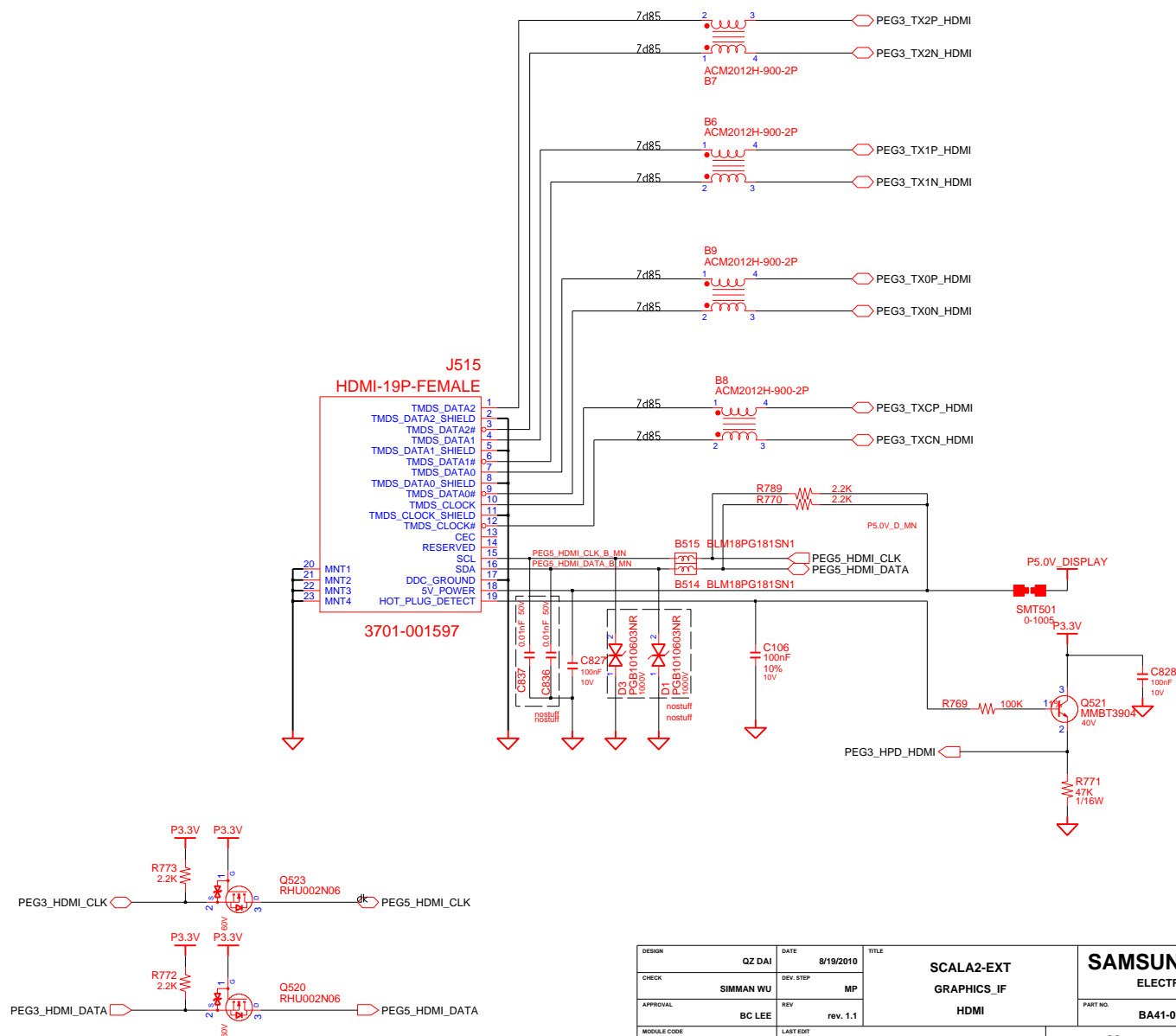
CRT LOGIC



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		GRAPHICS_IF	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		CRT	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
				December 25, 2010 10:42:33 AM	PAGE	29 OF 52

HDMI Graphic

After checking, Houston need to use CMC for each signal.
(EMC request at 2010.04.15)



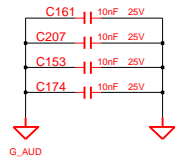
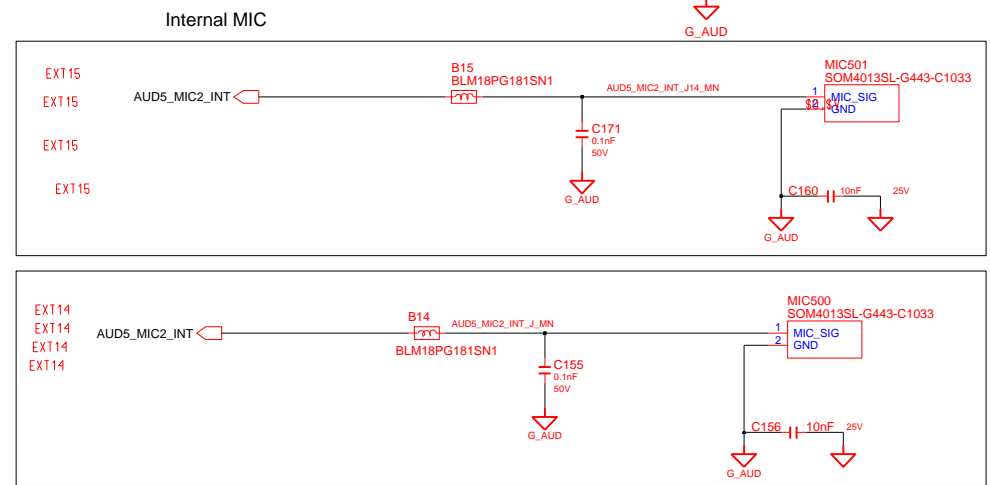
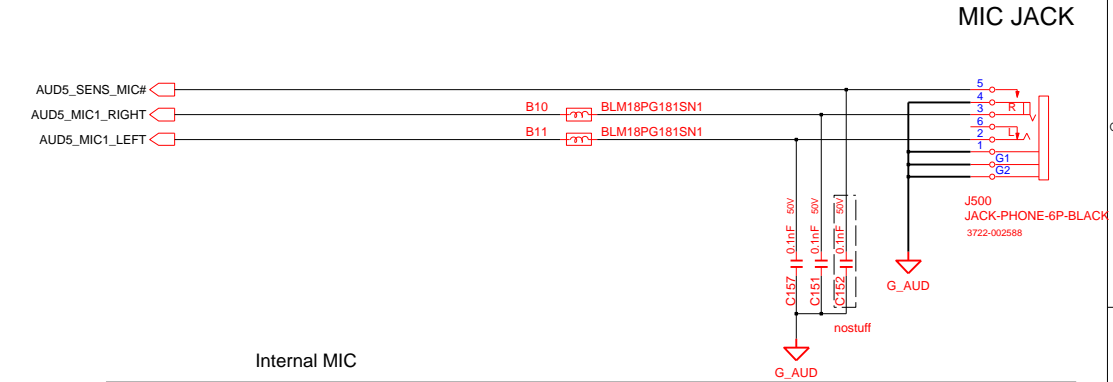
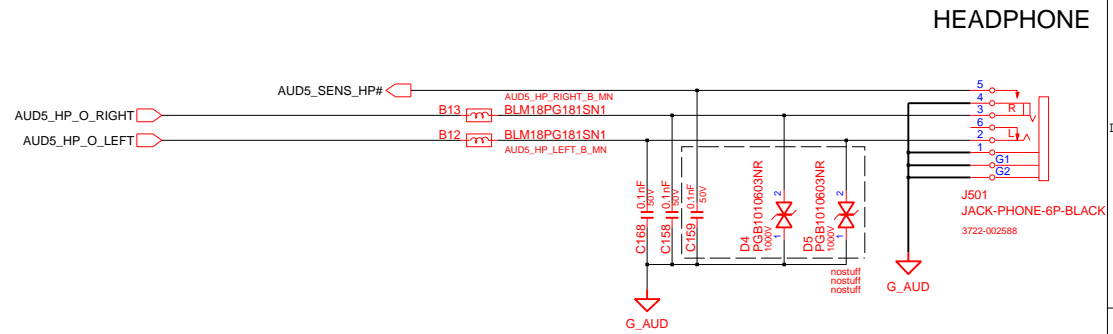
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	GRAPHICS_IF	ELECTRONICS	
APPROVAL	BC LEE	REV	rev. 1.1	HDMI	PART NO.	BA41-01423A
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	30	OF 52

HD AUDIO

EXCEPT AS AUTHORIZED BY SAMSUNG.

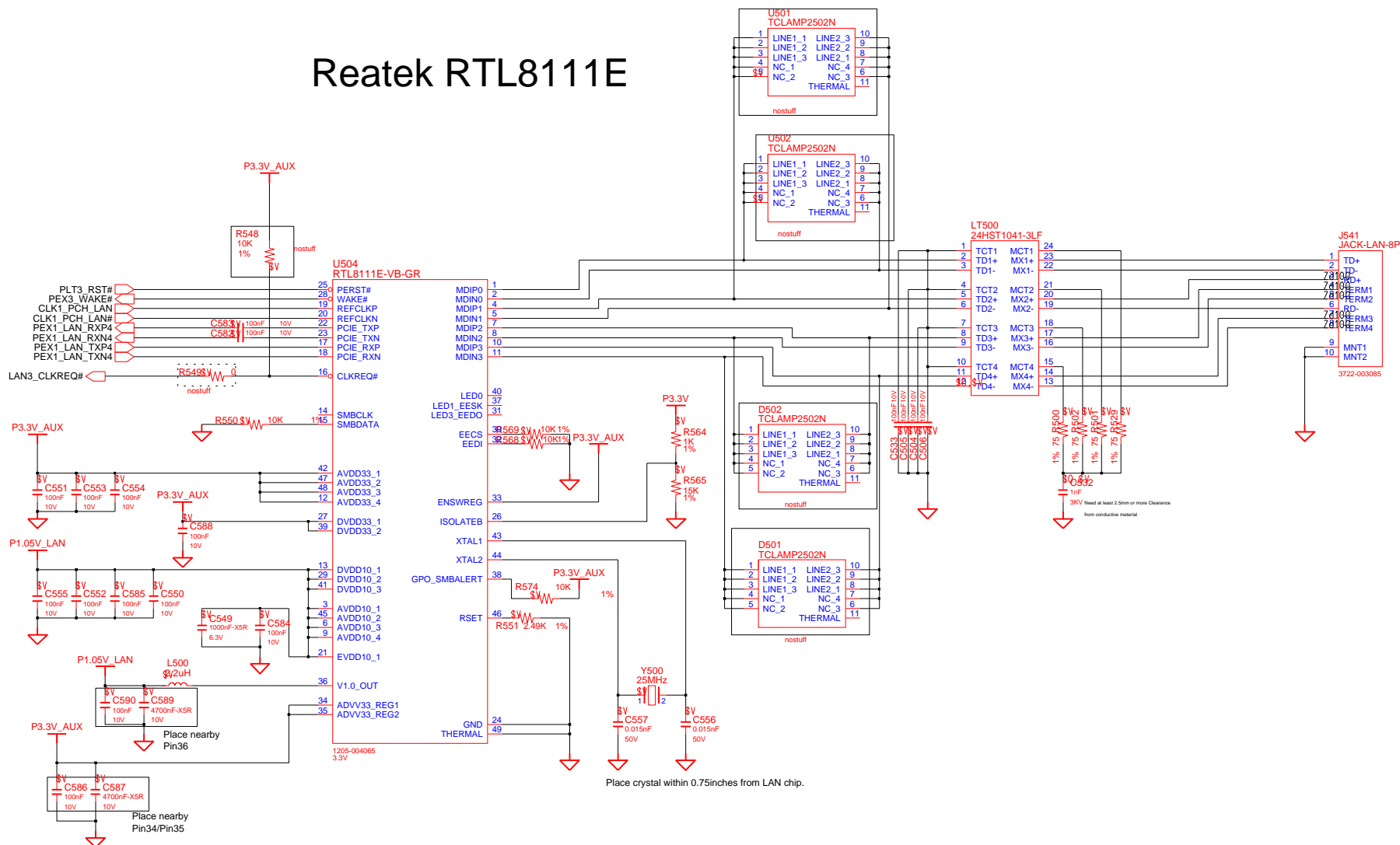
COM-22C-015(1996.6.5) REV. 3


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



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS PART NO. BA41-01423A
CHECK	SIMMAN WU	DEV. STEP	MP		HDA_CODEC & LED SUB	
APPROVAL	BC LEE	REV	rev. 1.1		AUDIO JACK & LED SUB	
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	32 OF 52	

Reatek RTL8111E



DESIGN	QZ DAI	DATE	8/19/2010	SCALA2-EXT LAN			
CHECK	SIMMAN WU	DEV. STEP	MP				
APPROVAL	BC LEE	REV	rev., 1.1	LAN_Realtek_RTL8111		PART NO.	BA41-01423A
MODULE CODE	LAST EDIT			December 25, 2010 10:42:33 AM		PAGE	33 OF 52

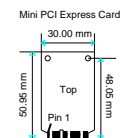
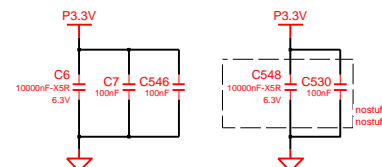
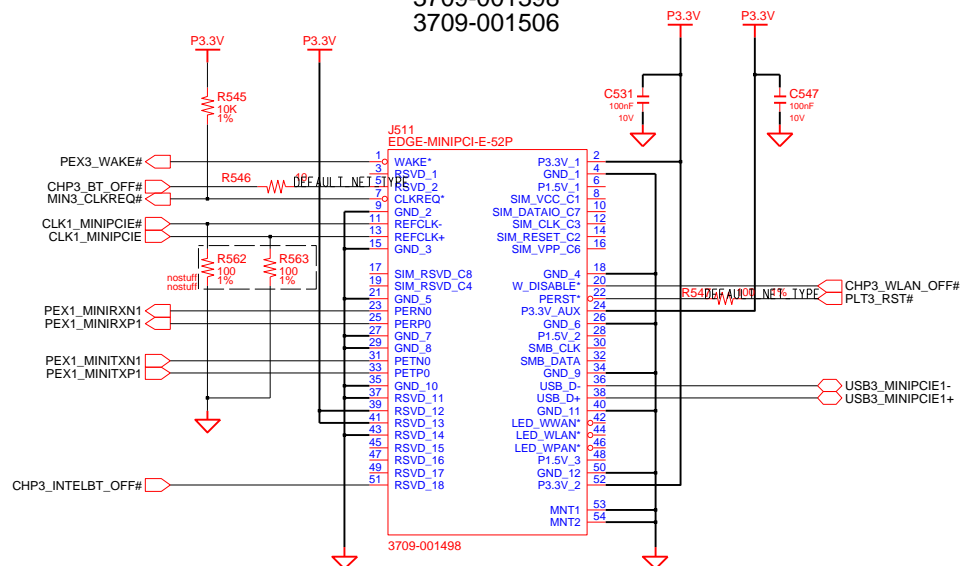
SAMSUNG PROPRIETARY

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

WLAN Height : 7.0mm

3709-001398
3709-001506

AMT 6.0 : P3.3V = P3.3V_ALW (Check?)
wake-up pull-up power rail ?
Puma Peak -WiFi (AMT 6.0)
Kilmer Peak - WiFi/WiMax



Odd Pins : Top side
Even Pins : Bottom Side

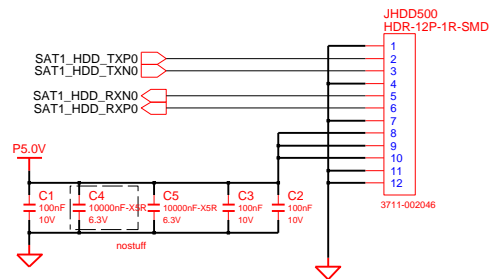
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT MULTICARD 3 IN 1 CARD(GL827S)	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 34 OF 52	

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

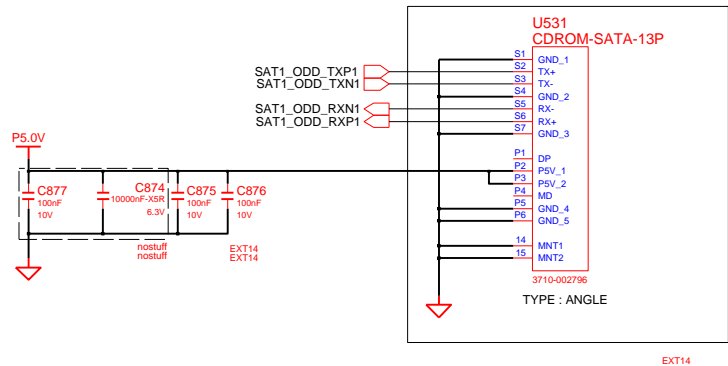
SATA I/F CONN

SATA HDD CONN

Cable Connector Type

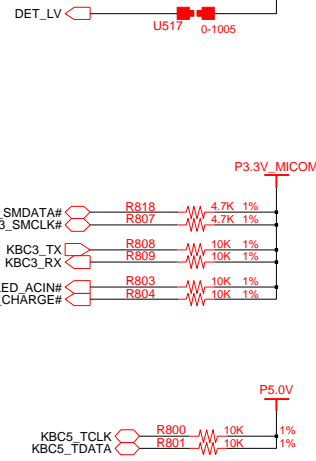


SATA ODD CONN



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	SATA I/F		ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1	SATA I/F		PART NO.
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM			BA41-01423A
				PAGE	35	OF 52

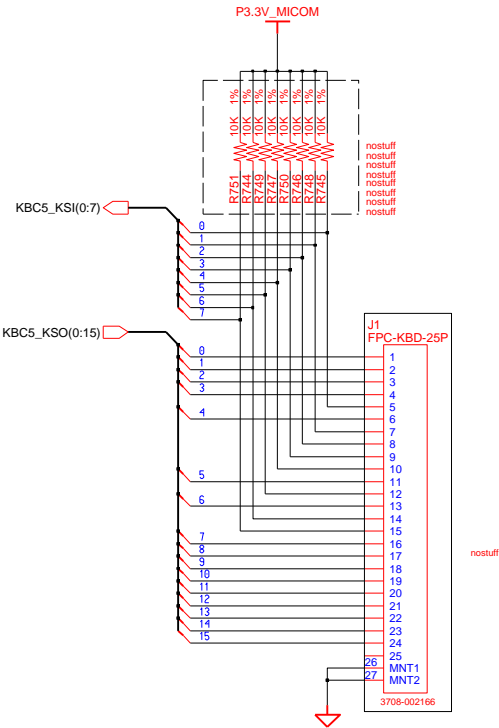
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.



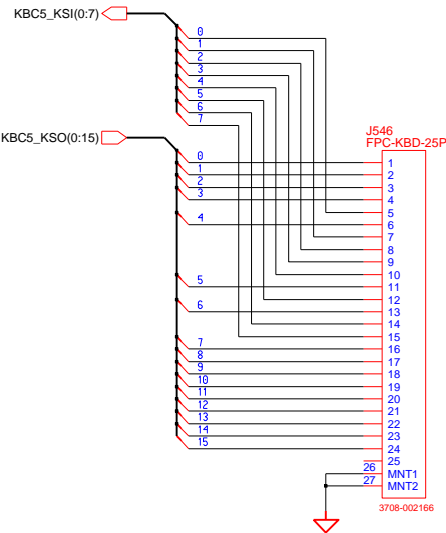
DESIGN	QZ DAI	DATE	8/19/2010	TITLE SCA2-EXT MICOM SMSC MEC1300	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP		
APPROVAL	BC LEE	REV	rev. 1.1		
MODULE CODE				December 25, 2010 10:42:33 AM PAGE 36 OF 52	PART NO. BA41-01423A

Micom Glue Logic

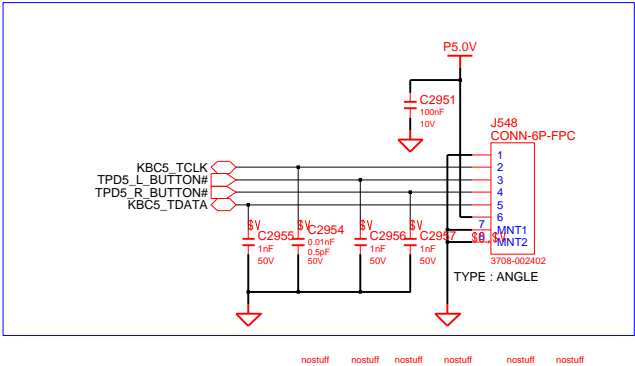
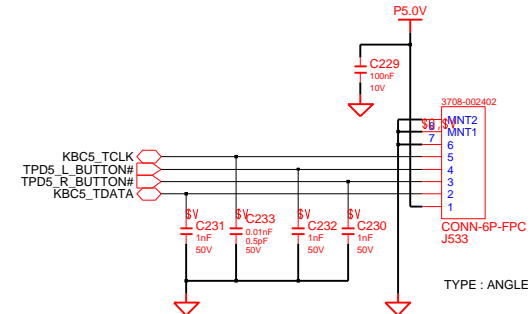
KEYBOARD on TOP



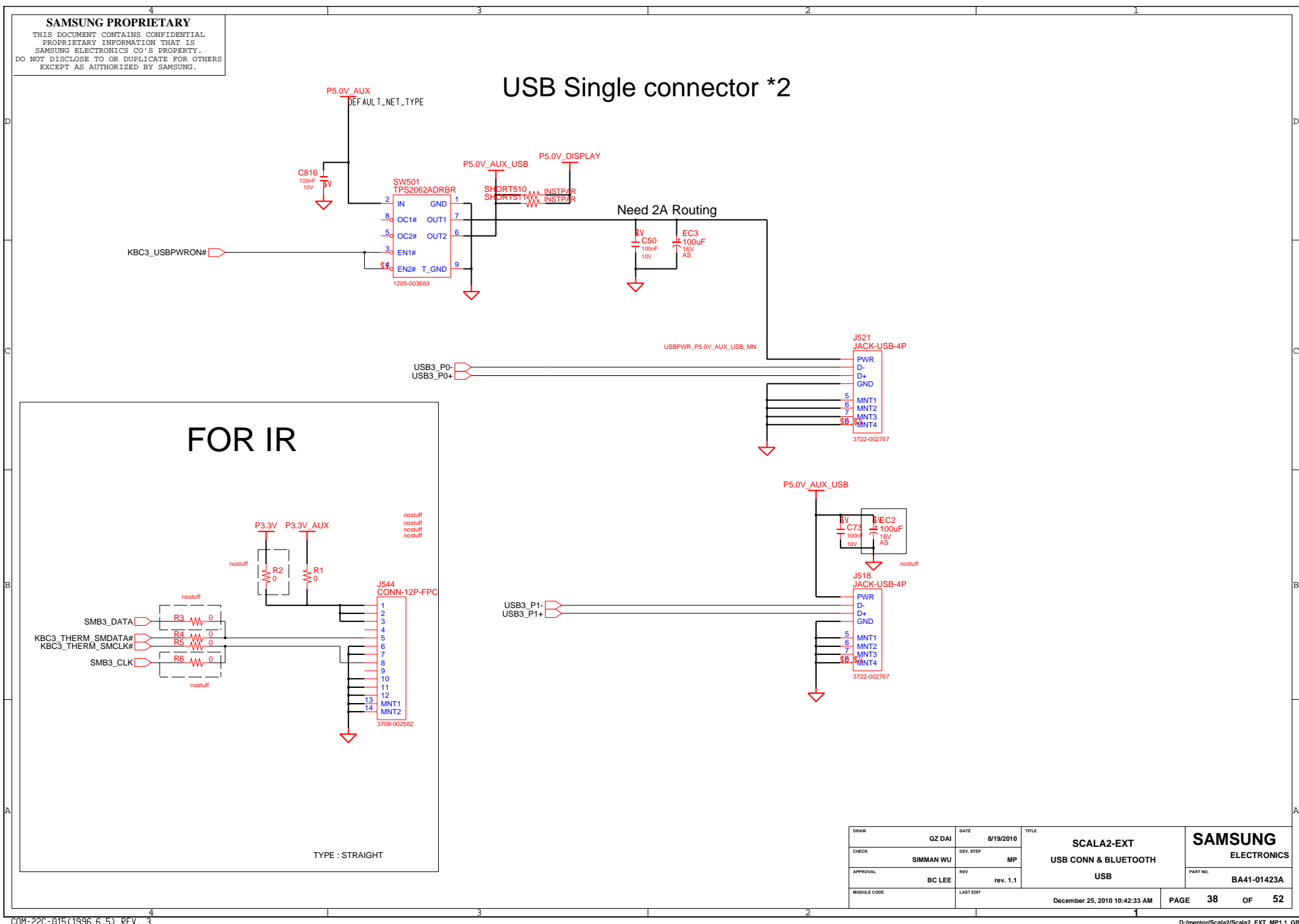
KEYBOARD on Bottom



TOUCHPAD



DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		MICOM GLUE LOGIC	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		MICOM GLUE LOGIC	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
				December 25, 2010 10:42:33 AM	PAGE	37 OF 52

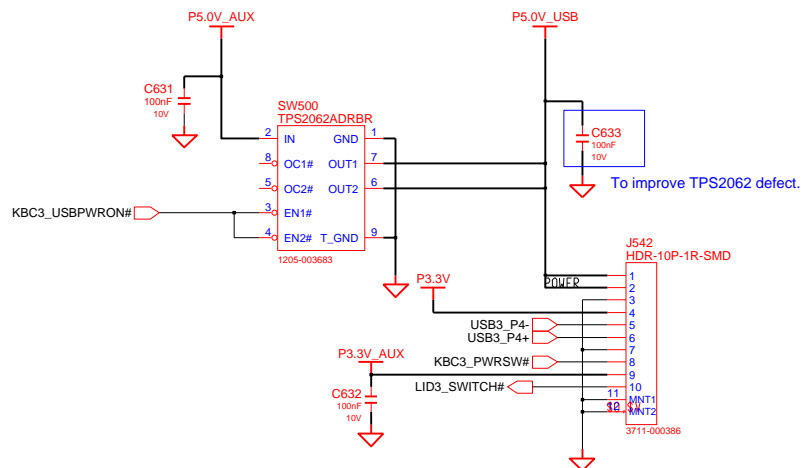


SAMSUNG PROPRIETARY

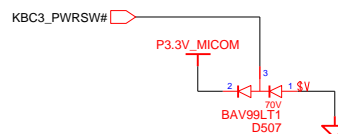
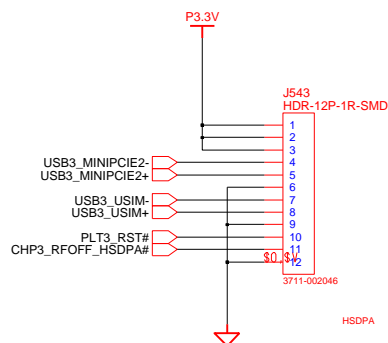
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

POWER S/W SUB B'D CONNECTOR

MAIN to SUB

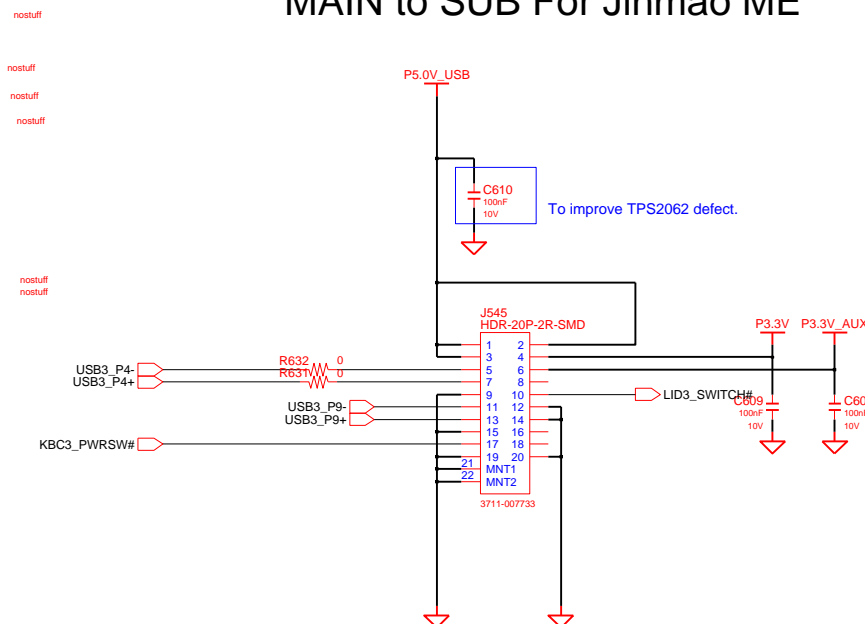


HSPA MAIN TO SUB CONN



POWER S/W SUB B'D CONNECTOR

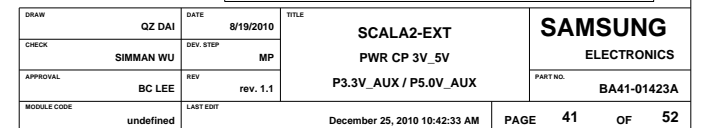
MAIN to SUB For Jinmao ME



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT USB_CONN	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1		USB CONNECTOR	
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 39 OF 52	

The schematic diagram illustrates the internal circuitry of the SCAL2-EXT CHARGER (ISL6255A). It features a power management section with a DC-DC converter (Q504, AONT403) and a battery charger section (Q507, AONT403). The control logic is centered around the U507 ISL6255AHRZ-T IC, which manages the charging process. The diagram includes various components such as resistors (R), capacitors (C), diodes (D), and integrated circuits (IC). Key components include the J540 JACK-DC-POWER-3P-MNT, B501 HU-1M2012-121JT, Q504 AONT403 VOLTAGE, Q505 AONT403 VOLTAGE, Q507 AONT403 VOLTAGE, U507 ISL6255AHRZ-T, Q508-1 AP4232BGM-HF, Q508-2 AP4232BGM-HF, Q509 BSS84 50V, Q510 RHU002N06, Q511 RHU002N06, Q512 RHU002N06, Q513 RHU002N06, Q514 RHU002N06, Q515 RHU002N06, Q516 RHU002N06, Q517 RHU002N06, Q518 RHU002N06, Q519 RHU002N06, Q520 RHU002N06, Q521 RHU002N06, Q522 RHU002N06, Q523 RHU002N06, Q524 RHU002N06, Q525 RHU002N06, Q526 RHU002N06, Q527 RHU002N06, Q528 RHU002N06, Q529 RHU002N06, Q530 RHU002N06, Q531 RHU002N06, Q532 RHU002N06, Q533 RHU002N06, Q534 RHU002N06, Q535 RHU002N06, Q536 RHU002N06, Q537 RHU002N06, Q538 RHU002N06, Q539 RHU002N06, Q540 RHU002N06, Q541 RHU002N06, Q542 RHU002N06, Q543 RHU002N06, Q544 RHU002N06, Q545 RHU002N06, Q546 RHU002N06, Q547 RHU002N06, Q548 RHU002N06, Q549 RHU002N06, Q550 RHU002N06, Q551 RHU002N06, Q552 RHU002N06, Q553 RHU002N06, Q554 RHU002N06, Q555 RHU002N06, Q556 RHU002N06, Q557 RHU002N06, Q558 RHU002N06, Q559 RHU002N06, Q560 RHU002N06, Q561 RHU002N06, Q562 RHU002N06, Q563 RHU002N06, Q564 RHU002N06, Q565 RHU002N06, Q566 RHU002N06, Q567 RHU002N06, Q568 RHU002N06, Q569 RHU002N06, Q570 RHU002N06, Q571 RHU002N06, Q572 RHU002N06, Q573 RHU002N06, Q574 RHU002N06, Q575 RHU002N06, Q576 RHU002N06, Q577 RHU002N06, Q578 RHU002N06, Q579 RHU002N06, Q580 RHU002N06, Q581 RHU002N06, Q582 RHU002N06, Q583 RHU002N06, Q584 RHU002N06, Q585 RHU002N06, Q586 RHU002N06, Q587 RHU002N06, Q588 RHU002N06, Q589 RHU002N06, Q590 RHU002N06, Q591 RHU002N06, Q592 RHU002N06, Q593 RHU002N06, Q594 RHU002N06, Q595 RHU002N06, Q596 RHU002N06, Q597 RHU002N06, Q598 RHU002N06, Q599 RHU002N06, Q600 RHU002N06, Q601 RHU002N06, Q602 RHU002N06, Q603 RHU002N06, Q604 RHU002N06, Q605 RHU002N06, Q606 RHU002N06, Q607 RHU002N06, Q608 RHU002N06, Q609 RHU002N06, Q610 RHU002N06, Q611 RHU002N06, Q612 RHU002N06, Q613 RHU002N06, Q614 RHU002N06, Q615 RHU002N06, Q616 RHU002N06, Q617 RHU002N06, Q618 RHU002N06, Q619 RHU002N06, Q620 RHU002N06, Q621 RHU002N06, Q622 RHU002N06, Q623 RHU002N06, Q624 RHU002N06, Q625 RHU002N06, Q626 RHU002N06, Q627 RHU002N06, Q628 RHU002N06, Q629 RHU002N06, Q630 RHU002N06, Q631 RHU002N06, Q632 RHU002N06, Q633 RHU002N06, Q634 RHU002N06, Q635 RHU002N06, Q636 RHU002N06, Q637 RHU002N06, Q638 RHU002N06, Q639 RHU002N06, Q640 RHU002N06, Q641 RHU002N06, Q642 RHU002N06, Q643 RHU002N06, Q644 RHU002N06, Q645 RHU002N06, Q646 RHU002N06, Q647 RHU002N06, Q648 RHU002N06, Q649 RHU002N06, Q650 RHU002N06, Q651 RHU002N06, Q652 RHU002N06, Q653 RHU002N06, Q654 RHU002N06, Q655 RHU002N06, Q656 RHU002N06, Q657 RHU002N06, Q658 RHU002N06, Q659 RHU002N06, Q660 RHU002N06, Q661 RHU002N06, Q662 RHU002N06, Q663 RHU002N06, Q664 RHU002N06, Q665 RHU002N06, Q666 RHU002N06, Q667 RHU002N06, Q668 RHU002N06, Q669 RHU002N06, Q670 RHU002N06, Q671 RHU002N06, Q672 RHU002N06, Q673 RHU002N06, Q674 RHU002N06, Q675 RHU002N06, Q676 RHU002N06, Q677 RHU002N06, Q678 RHU002N06, Q679 RHU002N06, Q680 RHU002N06, Q681 RHU002N06, Q682 RHU002N06, Q683 RHU002N06, Q684 RHU002N06, Q685 RHU002N06, Q686 RHU002N06, Q687 RHU002N06, Q688 RHU002N06, Q689 RHU002N06, Q690 RHU002N06, Q691 RHU002N06, Q692 RHU002N06, Q693 RHU002N06, Q694 RHU002N06, Q695 RHU002N06, Q696 RHU002N06, Q697 RHU002N06, Q698 RHU002N06, Q699 RHU002N06, Q700 RHU002N06, Q701 RHU002N06, Q702 RHU002N06, Q703 RHU002N06, Q704 RHU002N06, Q705 RHU002N06, Q706 RHU002N06, Q707 RHU002N06, Q708 RHU002N06, Q709 RHU002N06, Q710 RHU002N06, Q711 RHU002N06, Q712 RHU002N06, Q713 RHU002N06, Q714 RHU002N06, Q715 RHU002N06, Q716 RHU002N06, Q717 RHU002N06, Q718 RHU002N06, Q719 RHU002N06, Q720 RHU002N06, Q721 RHU002N06, Q722 RHU002N06, Q723 RHU002N06, Q724 RHU002N06, Q725 RHU002N06, Q726 RHU002N06, Q727 RHU002N06, Q728 RHU002N06, Q729 RHU002N06, Q730 RHU002N06, Q731 RHU002N06, Q732 RHU002N06, Q733 RHU002N06, Q734 RHU002N06, Q735 RHU002N06, Q736 RHU002N06, Q737 RHU002N06, Q738 RHU002N06, Q739 RHU002N06, Q740 RHU002N06, Q741 RHU002N06, Q742 RHU002N06, Q743 RHU002N06, Q744 RHU002N06, Q745 RHU002N06, Q746 RHU002N06, Q747 RHU002N06, Q748 RHU002N06, Q749 RHU002N06, Q750 RHU002N06, Q751 RHU002N06, Q752 RHU002N06, Q753 RHU002N06, Q754 RHU002N06, Q755 RHU002N06, Q756 RHU002N06, Q757 RHU002N06, Q758 RHU002N06, Q759 RHU002N06, Q760 RHU002N06, Q761 RHU002N06, Q762 RHU002N06, Q763 RHU002N06, Q764 RHU002N06, Q765 RHU002N06, Q766 RHU002N06, Q767 RHU002N06, Q768 RHU002N06, Q769 RHU002N06, Q770 RHU002N06, Q771 RHU002N06, Q772 RHU002N06, Q773 RHU002N06, Q774 RHU002N06, Q775 RHU002N06, Q776 RHU002N06, Q777 RHU002N06, Q778 RHU002N06, Q779 RHU002N06, Q780 RHU002N06, Q781 RHU002N06, Q782 RHU002N06, Q783 RHU002N06, Q784 RHU002N06, Q785 RHU002N06, Q786 RHU002N06, Q787 RHU002N06, Q788 RHU002N06, Q789 RHU002N06, Q790 RHU002N06, Q791 RHU002N06, Q792 RHU002N06, Q793 RHU002N06, Q794 RHU002N06, Q795 RHU002N06, Q796 RHU002N06, Q797 RHU002N06, Q798 RHU002N06, Q799 RHU002N06, Q800 RHU002N06, Q801 RHU002N06, Q

P3.3V_AUX & P5.0V_AUX



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

CHIPSET POWER(P1.05V)

CHIPSET POWER(P1.05V)

The schematic illustrates the power supply for the P1.05V (10A) output. Key components and connections include:

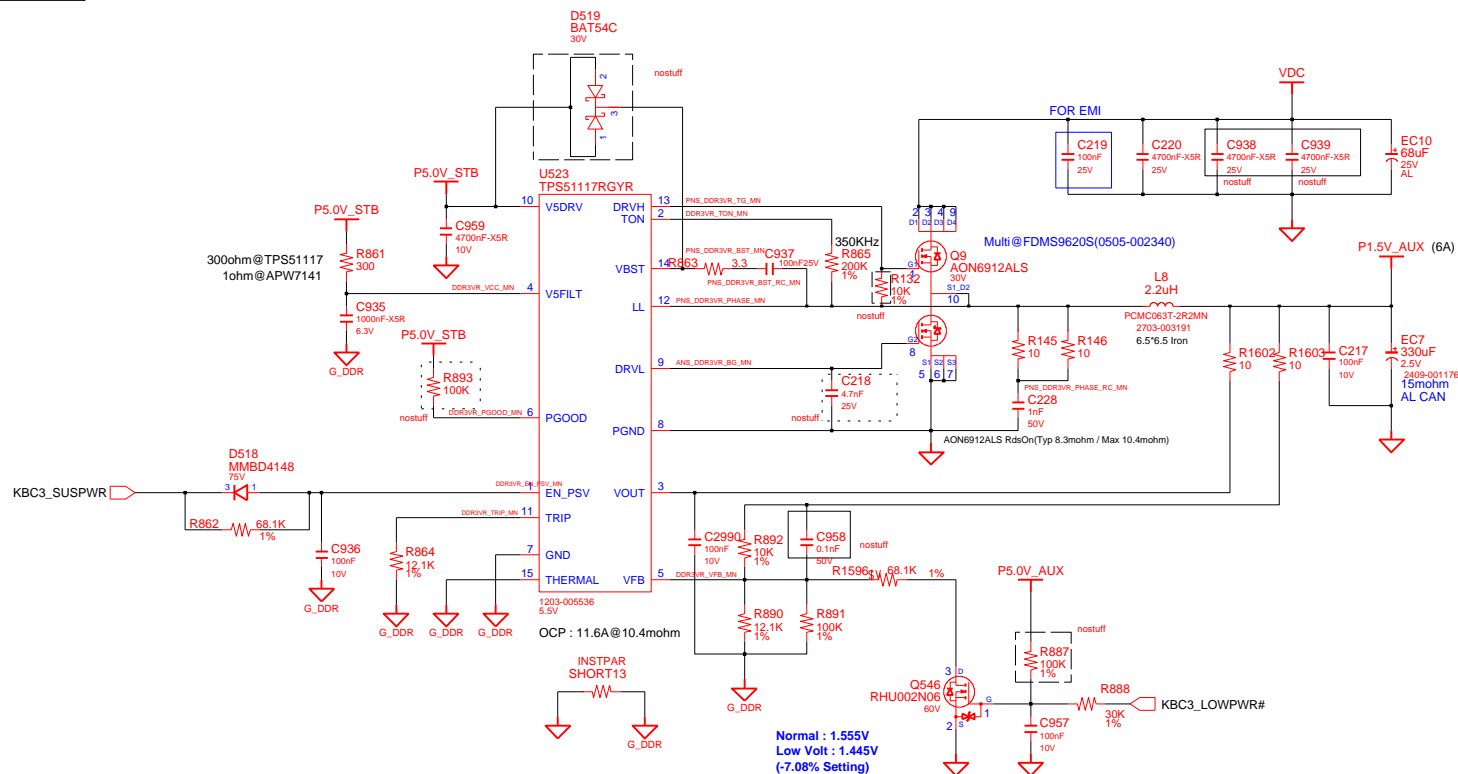
- Input Section:** P5.0V_AUX is connected to the converter input. A 300ohm@TPS51117 and 1ohm@APW7141 network is present. A 5.0V input is also shown with a 75V MMBD4148 diode (D520).
- DC-DC Converter (U521 TPS51117RGYR):**
 - Pin 10 (V5DRV) is connected to the 5.0V input.
 - Pin 13 (PMS_CHSETVR_1.05V_TG_MN) is connected to the output.
 - Pin 14 (PMS_CHSETVR_1.05V_TON_MN) is connected to the output.
 - Pin 12 (PMS_CHSETVR_1.05V_PHASE_MN) is connected to the output.
 - Pin 9 (AMS_CHSETVR_1.05V_BQ_MN) is connected to the output.
 - Pin 8 (PGND) is connected to ground.
 - Pin 3 (VOUT) is connected to the output.
 - Pin 5 (CHSETVR_1.05V_VFB_MN) is connected to the output.
 - Pin 11 (CHSETVR_P1.05V_TRIP_MN) is connected to the output.
 - Pin 7 (GND) is connected to ground.
 - Pin 15 (THERMAL) is connected to the output.
- Output Section:** The output is regulated to 1.05V (10A). It includes a 100nF capacitor (C941), a 100nF capacitor (C943), a 100nF capacitor (C940), a 100nF capacitor (C942), and a 100nF capacitor (C944). The output is also connected to a 100nF capacitor (C175) and a 100nF capacitor (C201).
- Protection and Monitoring:**
 - OCP:** Overcurrent Protection is set at 18.06A @ 6.7mohm.
 - THERMAL:** Thermal shutdown is set at 1203-005536 5.5V.
 - SHORT11:** A short circuit protection point is indicated.
- Other Components:**
 - EC8:** 68uF 25V AL capacitor.
 - EC5:** 330uF 2.5V capacitor.
 - EC4:** 330uF 2.5V capacitor.
 - EC3:** 330uF 2.5V capacitor.
 - EC2:** 330uF 2.5V capacitor.
 - EC1:** 330uF 2.5V capacitor.
 - EC0:** 330uF 2.5V capacitor.

**Normal ; 1.05V
Low Voltage setting:1.0V
(~4.8%)**

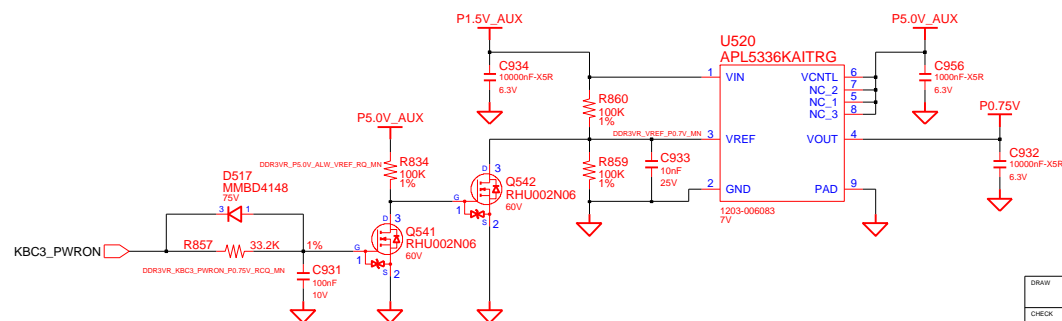
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT P1.05V TI TPS51117R	SAMSUNG ELECTRONICS		
CHECK	SIMMAN WU	REV. STEP	MP					
APPROVAL	BC LEE	REV	rev. 1.1			PART NO.	BA41-01423A	
MODULE CODE	LAST EDIT		December 25, 2010 10:42:33 AM			PAGE	42	OF 52

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

DDR3 Power



DDR3 VTT(0.75V)

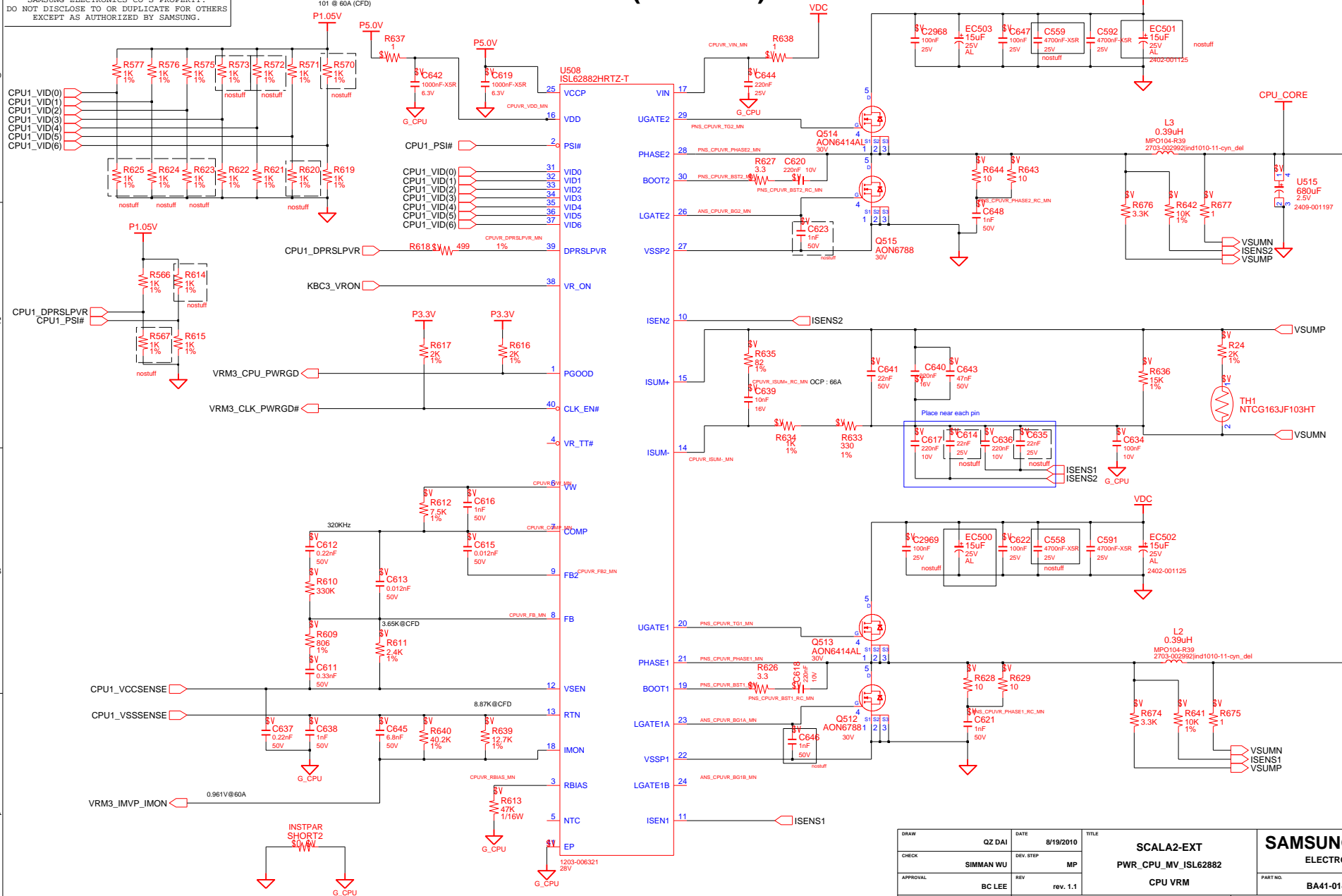


DRAW	QZ DAI	DATE	8/19/2010	TITLE SCALA2-EXT PWR MEMORY		SAMSUNG ELECTRONICS	
CHECK	SIMMAN WU	DEV. STEP	MP				
APPROVAL	BC LEE	REV	rev. 1.1	RT8207		PART NO.	BA41-01423A
MODULE CODE	undefined	LAST EDIT			December 25, 2010 10:42:33 AM	PAGE	43 OF 52

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

VID[5:3] @ IMON CPU Gain
100 @ 50A (ARD)
101 @ 60A (CFD)

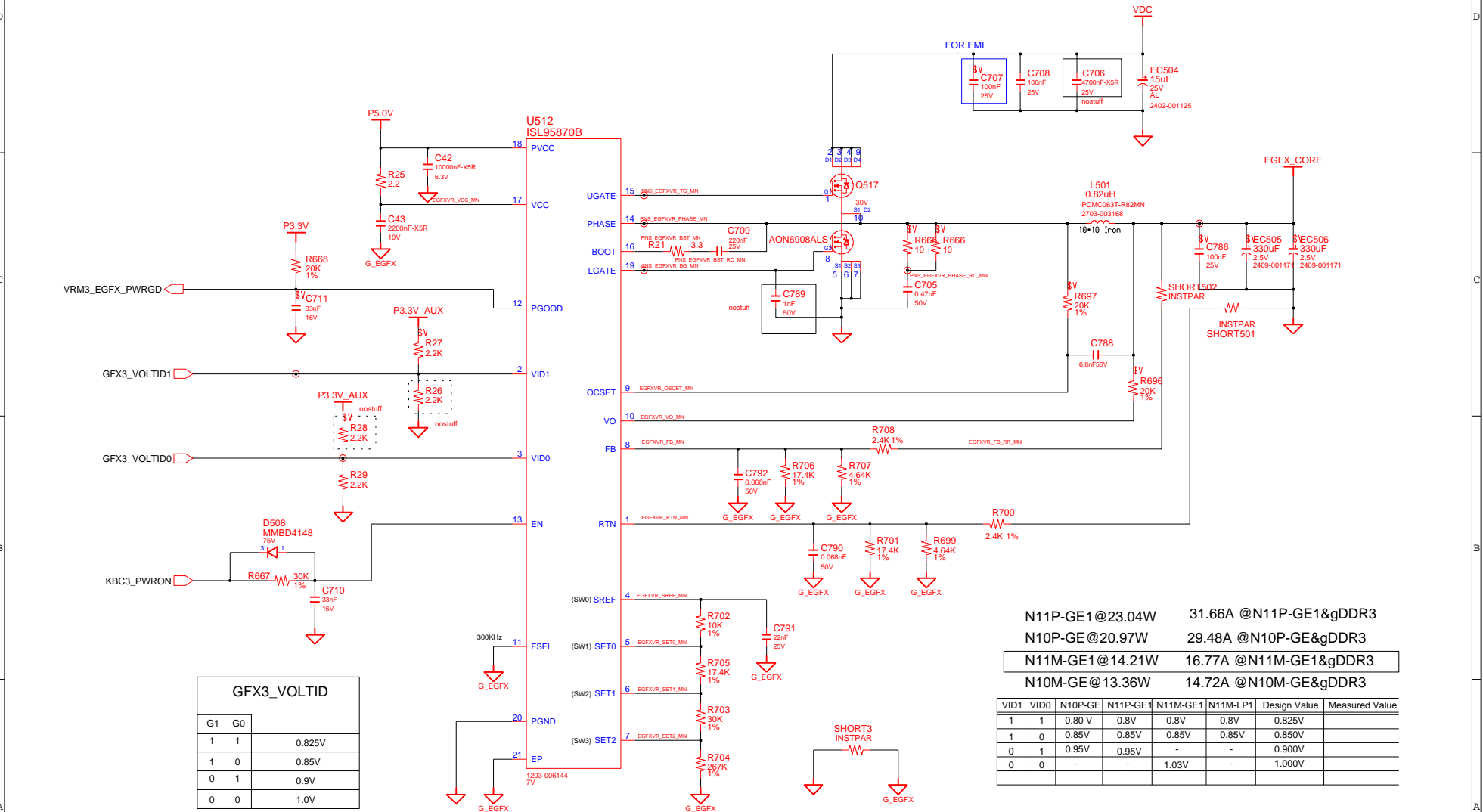
CPU VRM (IMVP-6.5)



DRAW	QZ DAI	DATE	8/19/2010	TITLE		<div style="text-align: center;"> SCALA2-EXT SAMSUNG ELECTRONICS </div>	
CHECK	SIMMAN WU	DEV. STEP	MP	PWR_CPU_MV_ISL62882			
APPROVAL	BC LEE	REV	rev., 1.1	CPU VRM		PART NO.	BA41-01423A
MODULE CODE		undefined		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 44 OF 52

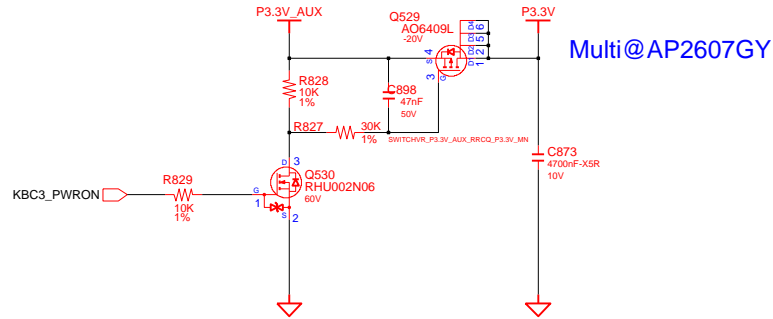
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

External GFX Core Power

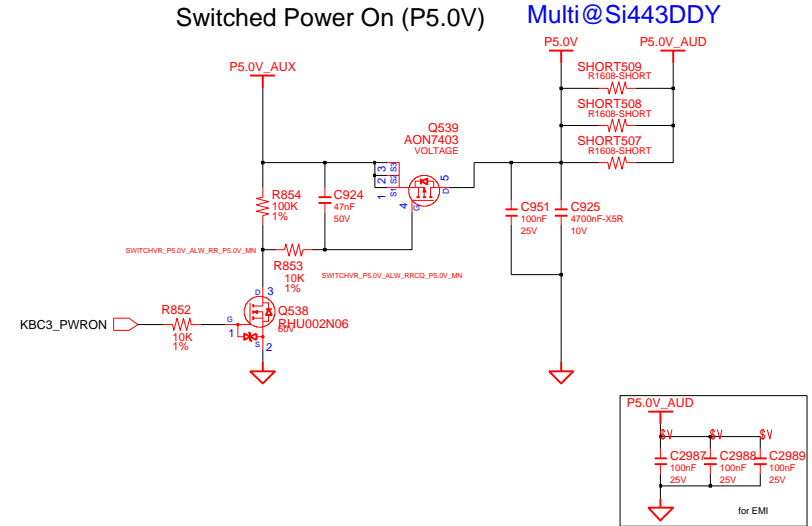


Switched Power

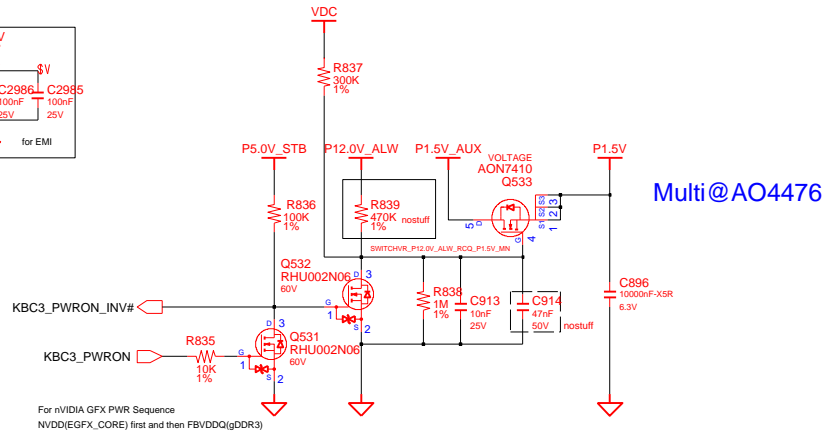
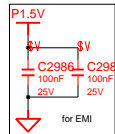
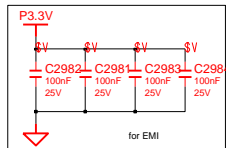
Switched Power On (P3.3V)



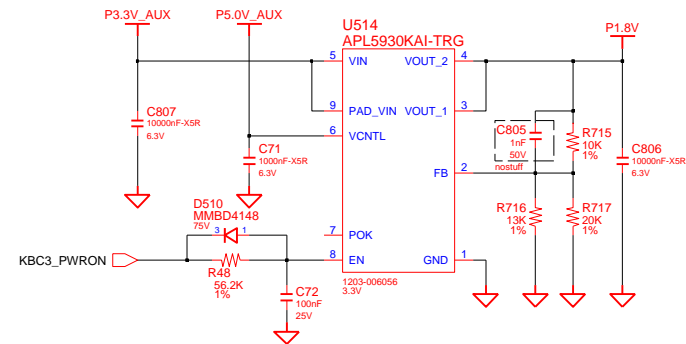
Switched Power On (P5.0V)



Switched Power On (P1.5V)



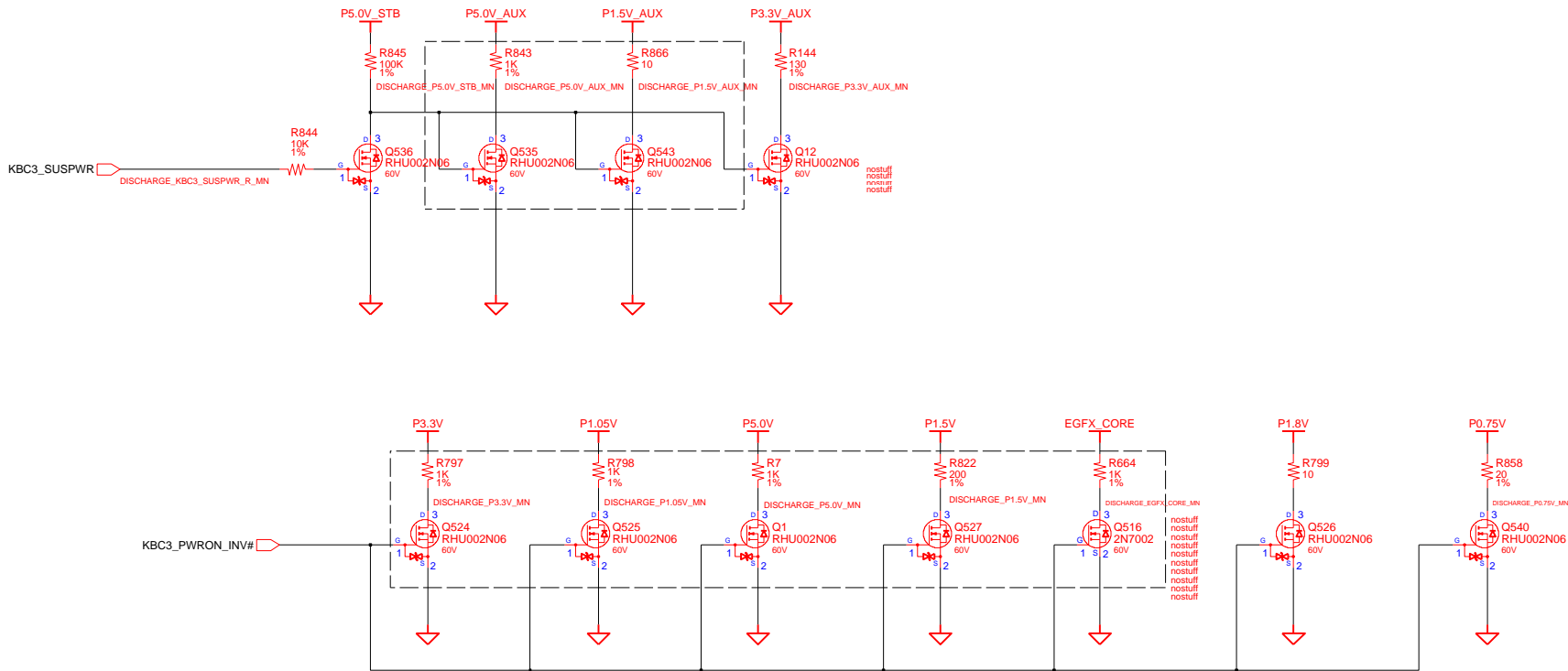
P1.8V(LDO)



DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		PWR_MV_SWITCHED	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		SWITCHED POWER	PART NO. BA41-01423A
MODULE CODE		LAST EDIT			December 25, 2010 10:42:33 AM	PAGE 46 OF 52

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

POWER DISCHARGER

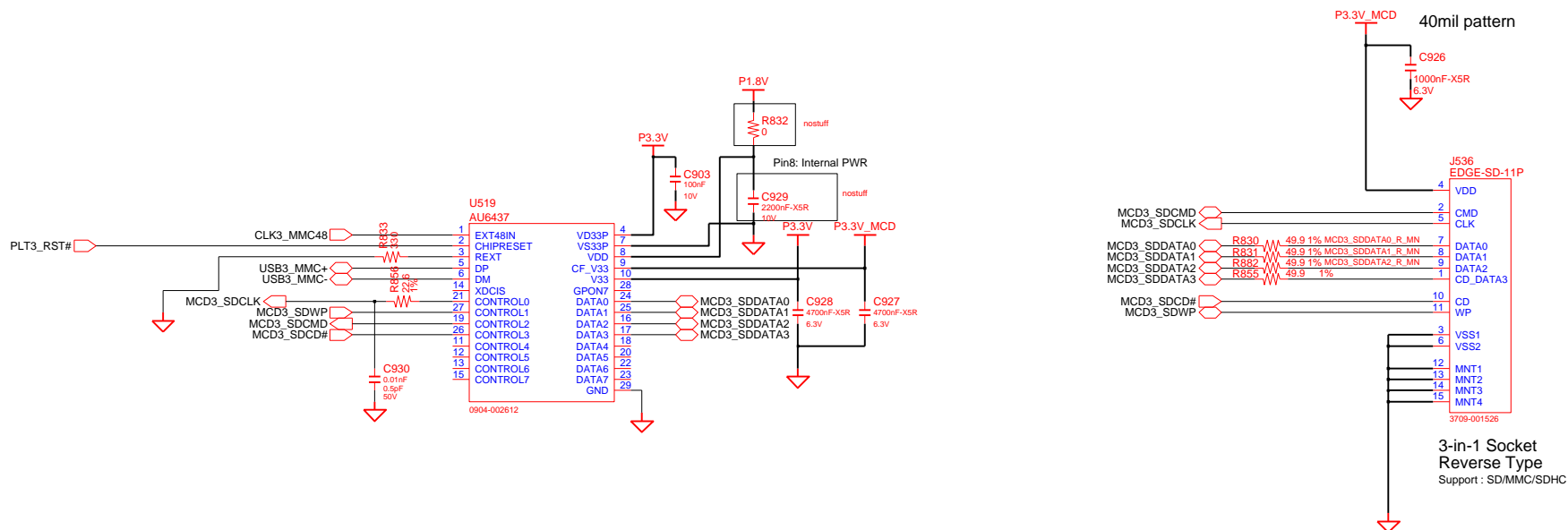


DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	PWR_MV_DISCHARGER	DISCHARGING LOGIC	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1			PART NO.
MODULE CODE	undefined	LAST EDIT	December 25, 2010 10:42:33 AM			BA41-01423A
				PAGE	47	OF 52

SAMSUNG PROPRIETARY

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

3 IN 1 CARD (AU6437)

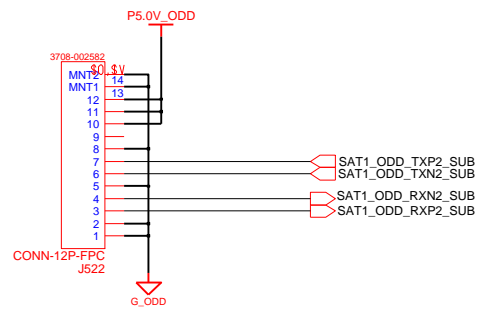


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT SUB BOARD2 3 in 1 SUB	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	48	OF 52

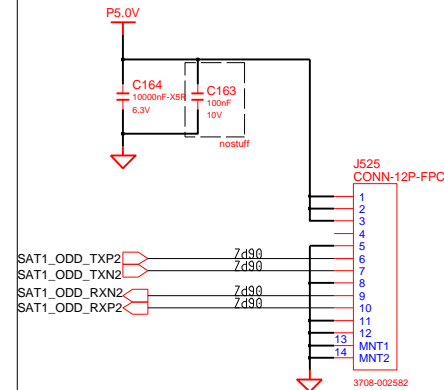
SATA ODD SUB BOARD

15.6"

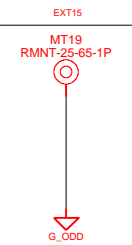
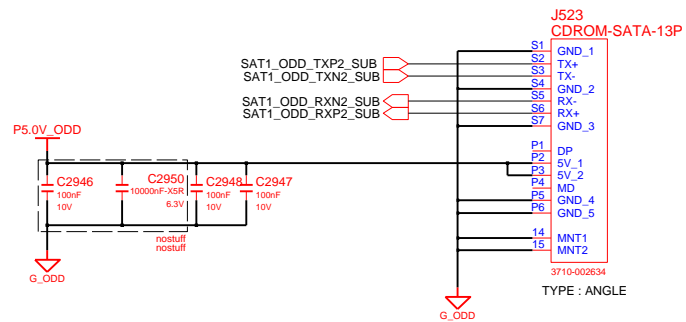
SUB TO MAIN : SATA ODD CONN



MAIN TO SUB : SATA ODD CONN



SATA ODD CONN



ODD sub board mount hole

DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT SUB BOARD3 ODD SUB	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 49 OF 52	

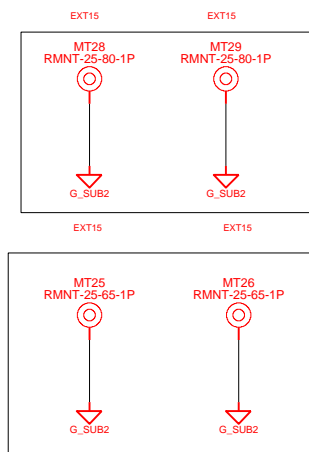
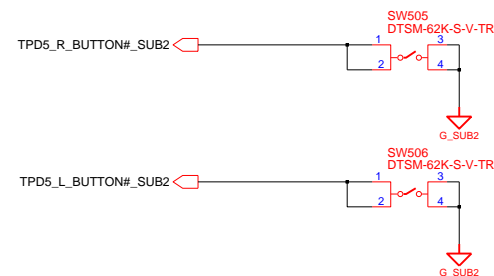
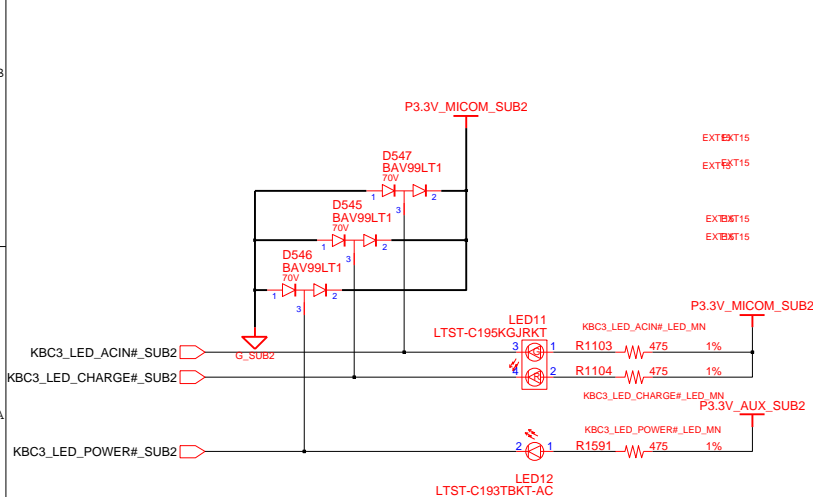
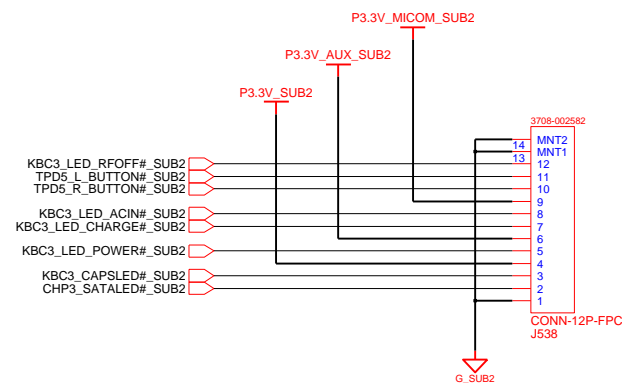
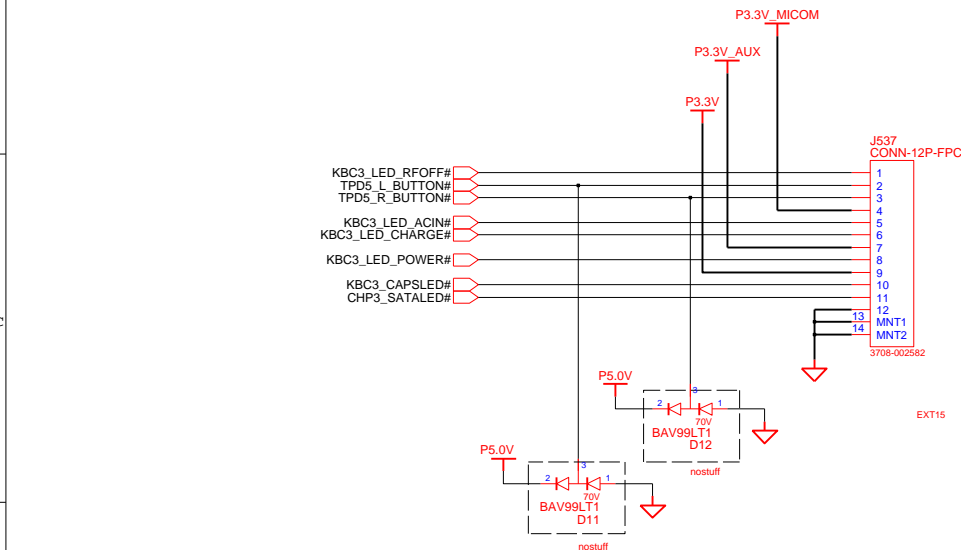
SAMSUNG PROPRIETARY

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

15.6"

TOUCHPAD MAIN TO SUB

TOUCHPAD SUB TO MAIN



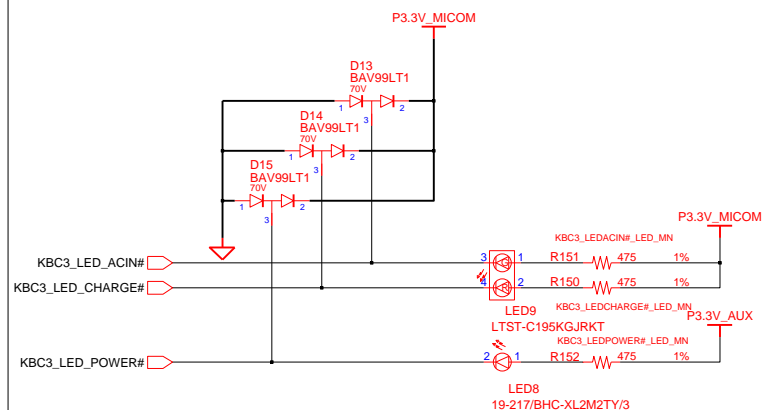
Touchpad Mount Hole

DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT SUB BOARD4 MULTIMEDIA SUB	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT				
December 25, 2010 10:42:33 AM						PAGE 50 OF 52

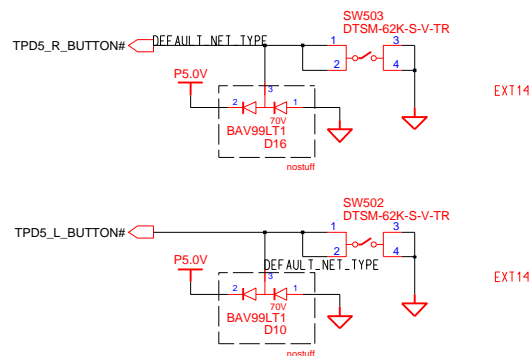
SAMSUNG PROPRIETARY

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

ADAPTERIN/CHARGING LED



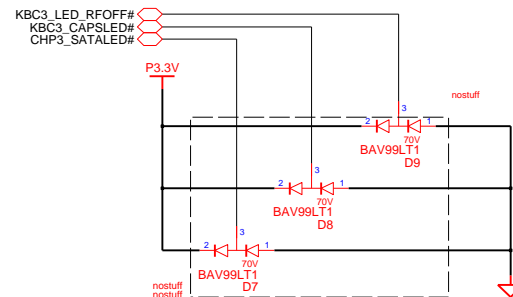
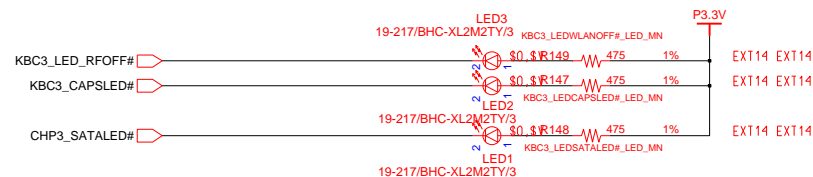
EXT14
EXT14 EXT14
EXT14 EXT14
EXT14 EXT14
EXT14



EXT14

EXT14

ADAPTERIN/CHARGING LED



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP		MNT hole	
APPROVAL	BC LEE	REV	rev. 1.1		MNT hole	
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 51 OF 52	PART NO. BA41-01423A

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

Figure 1: Schematic diagram of the test setup. The diagram shows two rows of test components connected to ground. The top row includes MT512, MT506, MT510, MT506, and MT510, each with an RMNT-25-65-1P or RMNT-30-80-1P component. The bottom row includes MT509, MT505, MT501, and MT502, each with an RMNT-30-80-1P component. All components are connected to a common ground symbol.

DRAW	QZ DAI	DATE	5/10/2010	TITLE	SCALA2-EXT Switched PWR 2 FOR OPTIMUS PWR		SAMSUNG		
CHECK	SIMMAN WU	REV. STEP	MP				ELECTRONICS		
APPROVAL	BC LEE	REV	REV. 1.1				PART NO.	BA41-01423A	
MODULE CODE	LAST EDIT						December 25, 2010 10:42:33 AM		PAGE