

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)

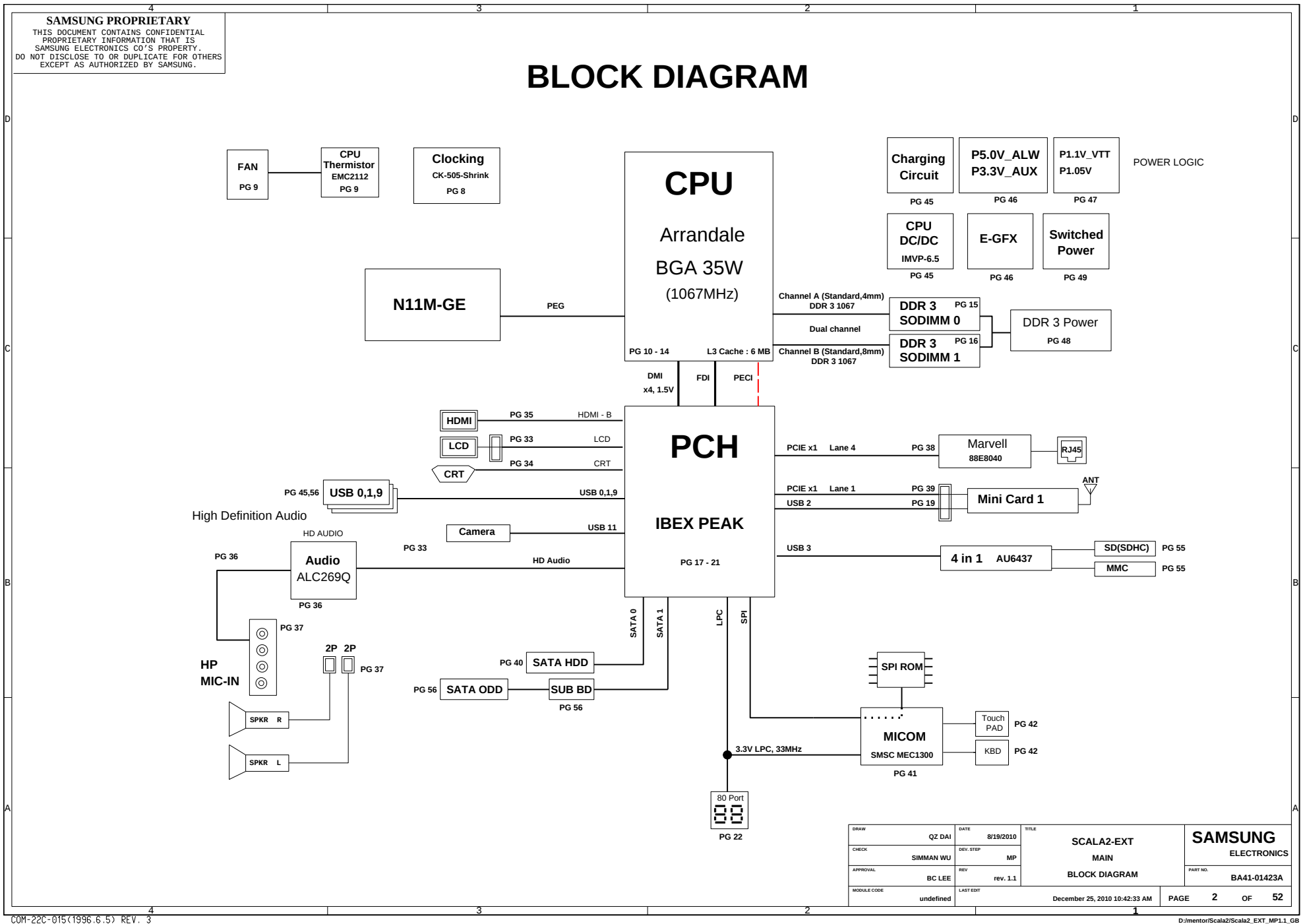
Dev. Step : MP1.1
Revision : 1.1
T.R. Date : 2010.12.10

Design	CHECK	APPROVAL
QZ DAI	SIMMAN WU	BC LEE

Owner : SEC IT Solution N/P LAB Signature : wanni

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sheet52 : Multimedia Sub B'd
sheet53 : MOUNT HOLE
sheet54 : Power - Switched Power 2
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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



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)	S3
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)	S0
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	S0

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		

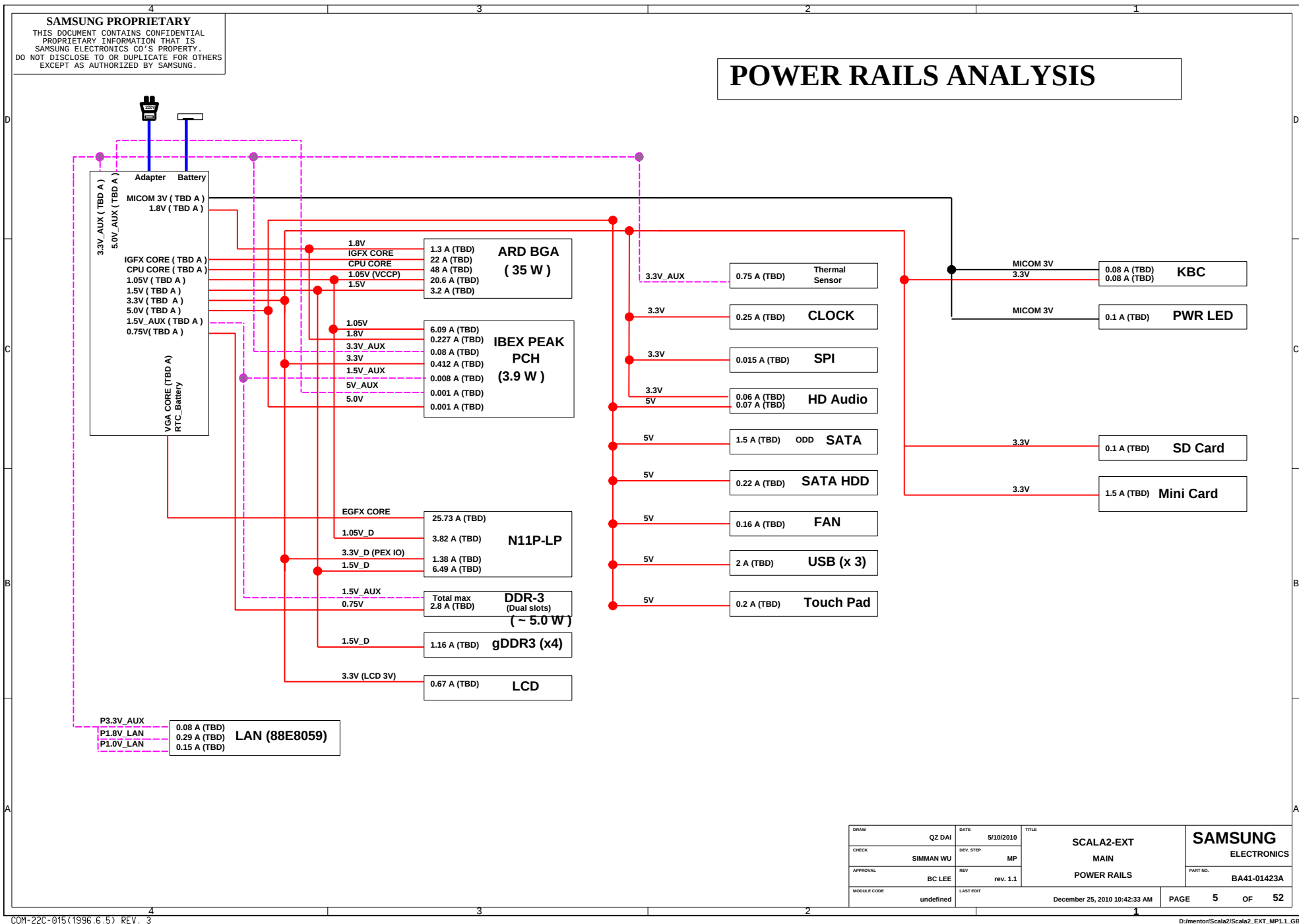
SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	ODD
2	(N/A WITH HM55)
3	(N/A WITH HM55)
4	
5	

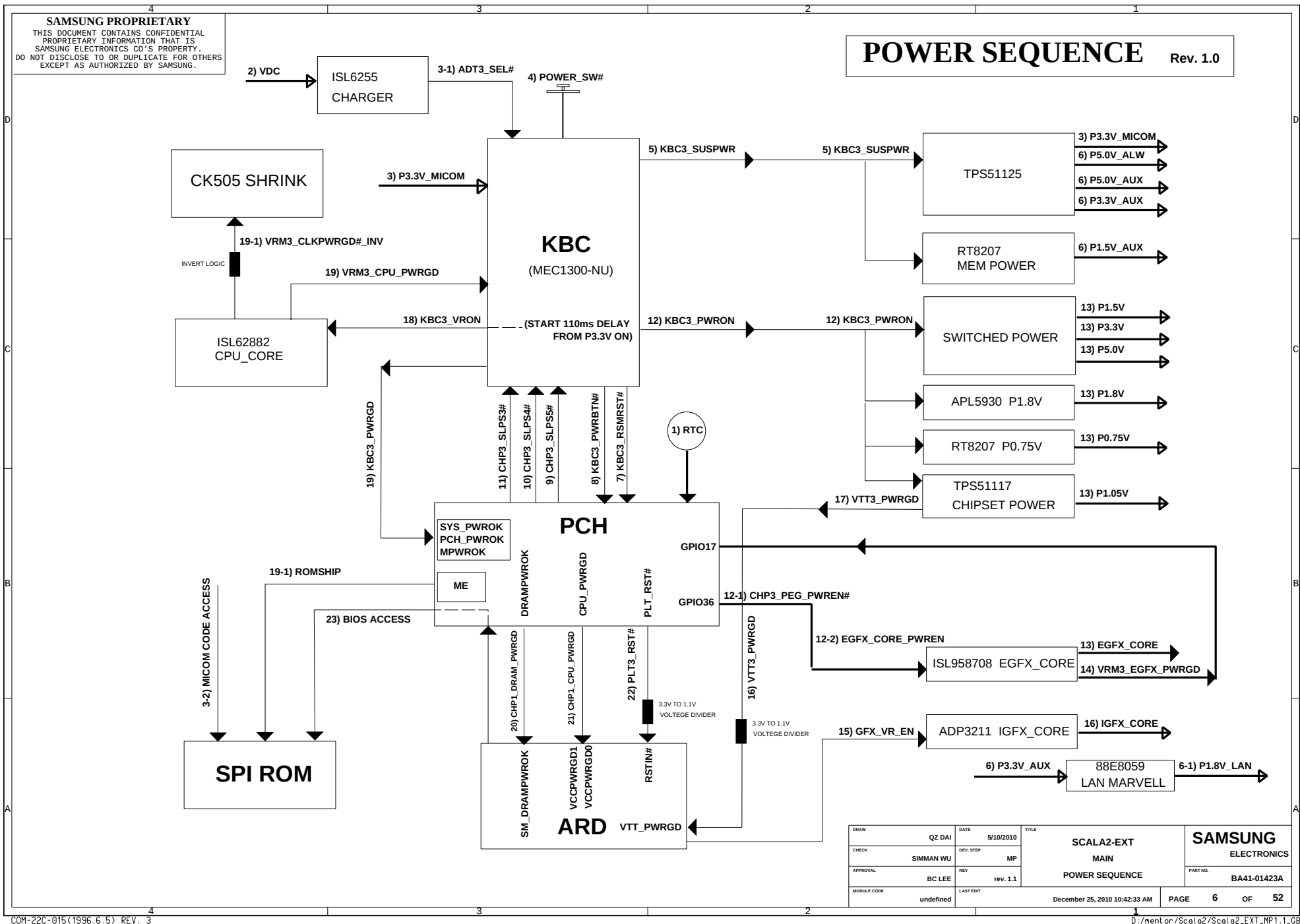
Crystal / Oscillator			
TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	IBEX-PEAK	Real Time Clock
Crystal	14.318MHz	CLOCK-Generator	CK-505
Crystal	25MHz	LAN	Intel LAN

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

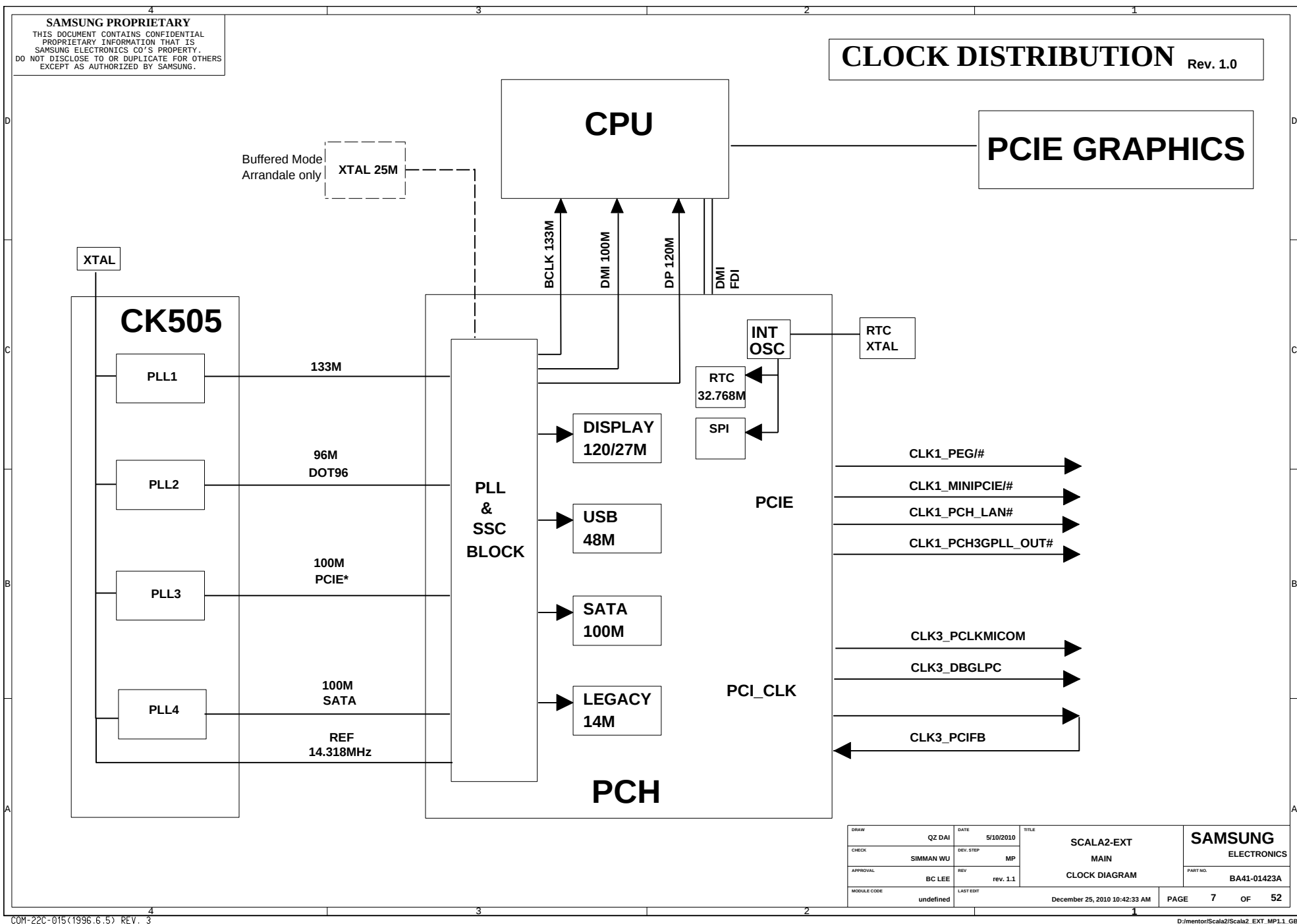
Devices	Address	Hex	Bus
IBEX PEAK	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	Thermal Sensor
SODIMM0	1010 000x	A0h	-
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
CK-505M Shrink(Clock Generator)	1101 001x	D2h	Clock, Unused Clock 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			
CHECK	SIMMAN WU	REV. STEP	MP					
APPROVAL	BC LEE	REV	rev. 1.1	BOARD INFO		PART NO.	BA41-01423A	
MODULE CODE	undefined		LAST EDIT		December 25, 2010 10:42:33 AM		PAGE	3 OF 52





DRAW	QZ DAI	DATE	5/10/2010	TITLE	SCALA2-EXT MAIN POWER SEQUENCE	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	6	OF 52



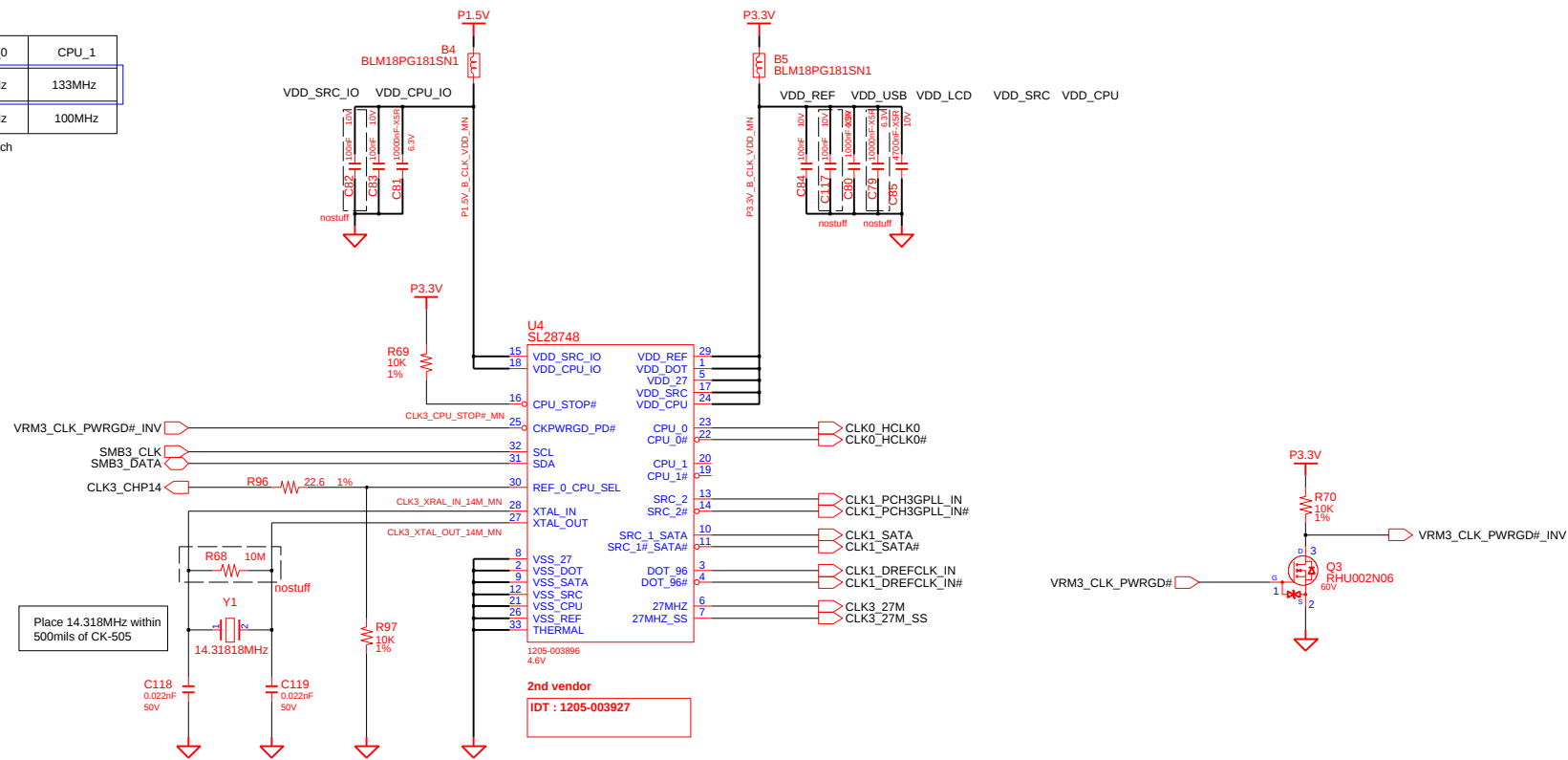
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CK505M SHRINK VERSION

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

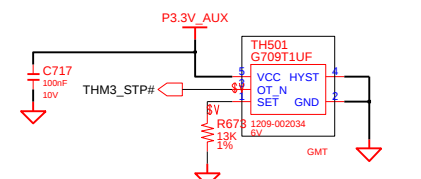
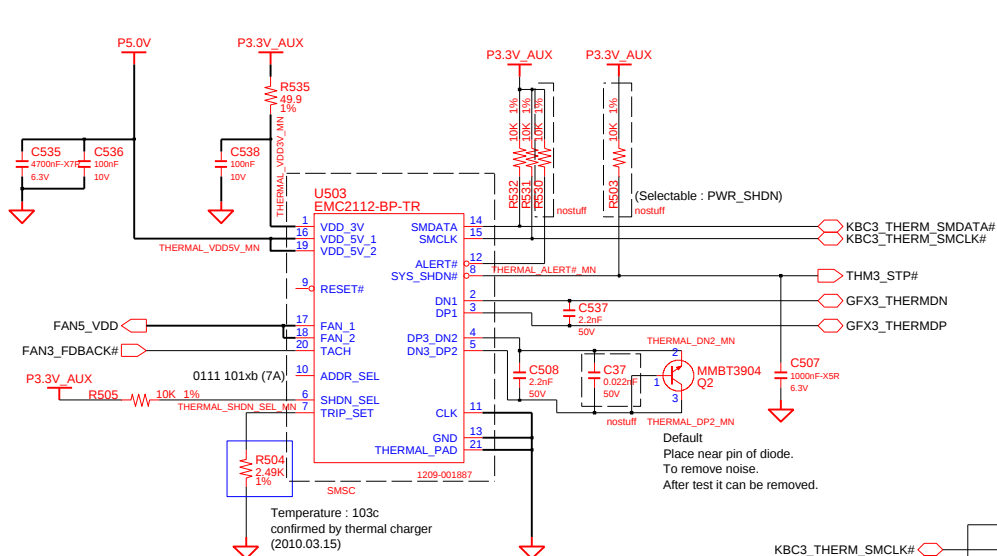


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT CLOCK CK505-SHRINK	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	8	OF 52

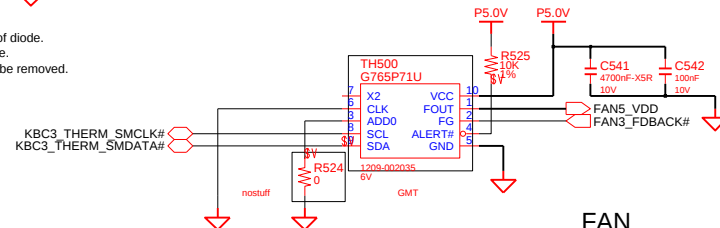
THERMAL SENSOR & FAN CONTROL

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

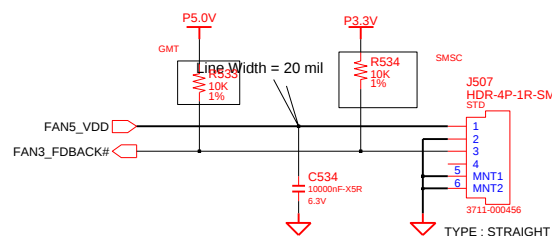
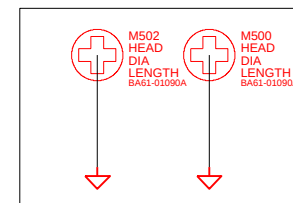
SHDNSEL MODE	
0	INTEL TR MODE
HIGH Z	AMD CPU/DIODE MODE
✓ 1	EXT.DIODE 2 MODE



Temperature : 103c
confirmed by thermal charger
(2010.10.04)
 $R_{th}(kohm) = 0.0012T^2 - 0.9308T + 96.147$

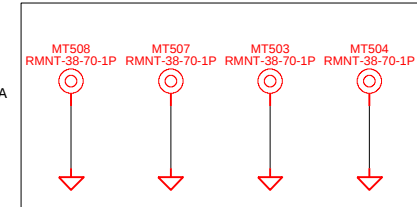


FAN



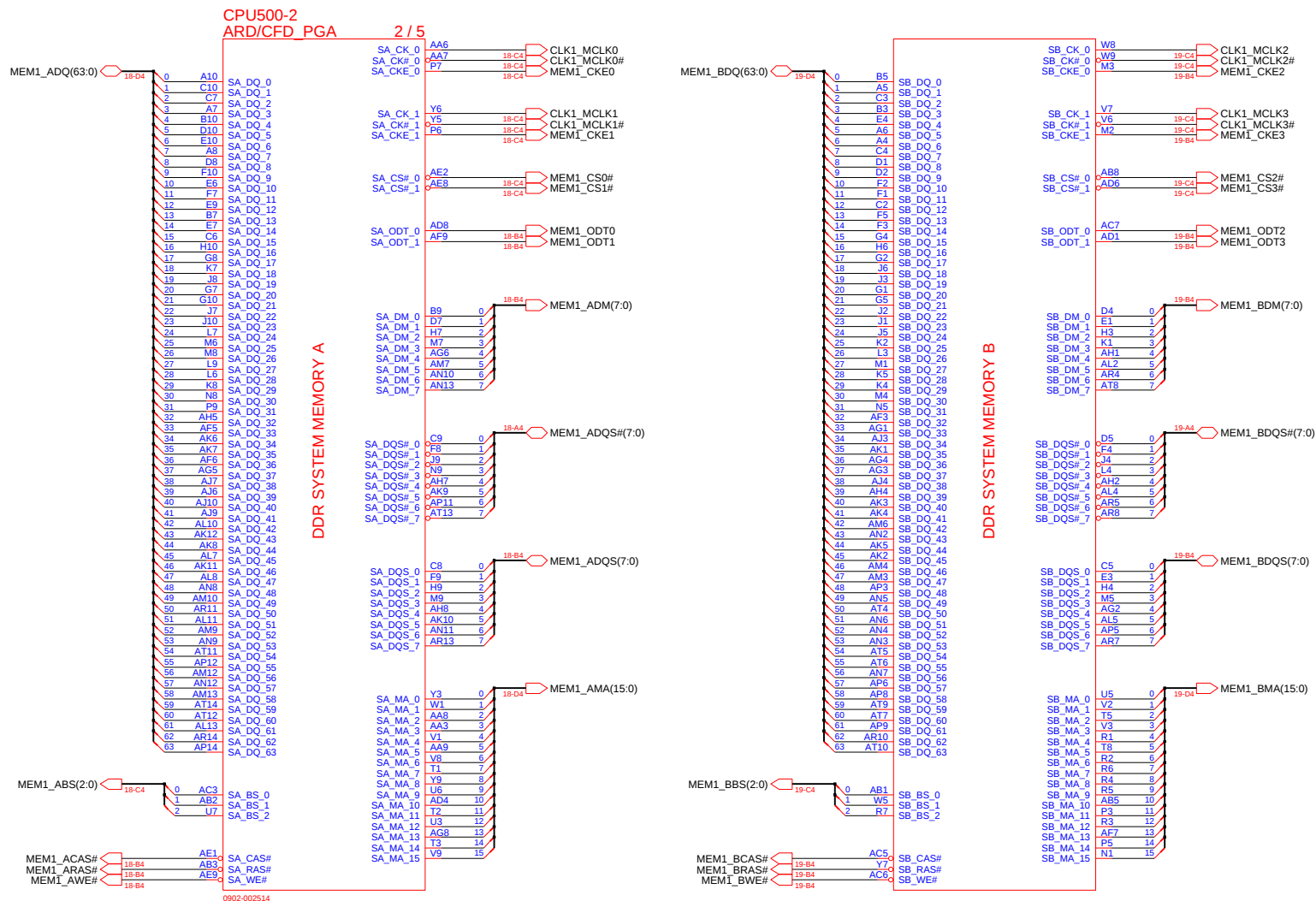
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CHECK	SIMMAN WU	DEV. STEP	MP		THERMAL SENSOR	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		THERMAL SENSOR EMC2112	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
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ARRANDALE PROCESSOR (DMI,PEG, FDI)



DRAW	QZ DAI	DATE	8/19/2010	TITLE SCALA2-EXT CPU BGA CPU (1/5)	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		
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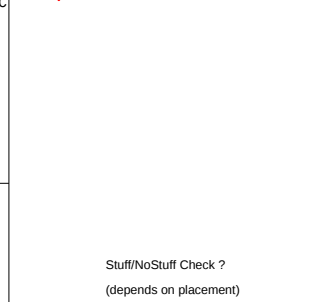
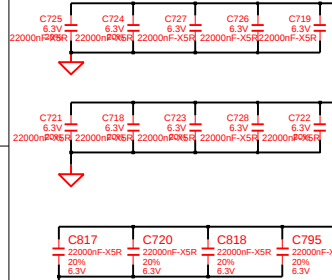
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DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALAA-EXT CPU BGA CPU (2/5)		SAMSUNG ELECTRONICS		
CHECK	SIMMAN WU	DEV. STEP	MP						
APPROVAL	BC LEE	REV	rev. 1.1						
						PART NO.		BA41-01423A	
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14x 22 uF : CPU VR side

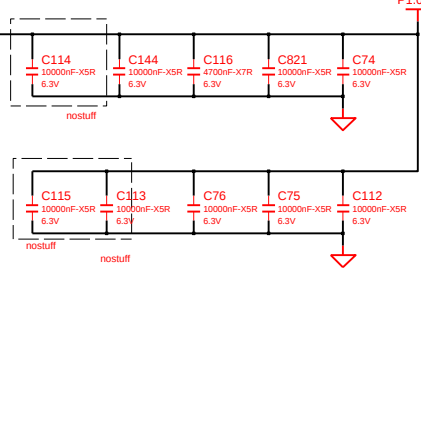


0902-002514

ALL VTT DECAP IS SHARED

CPU CORE
CPU500-3
ARD/CFD PGA

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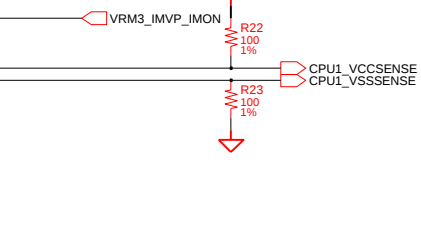
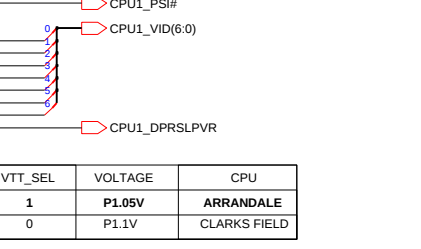
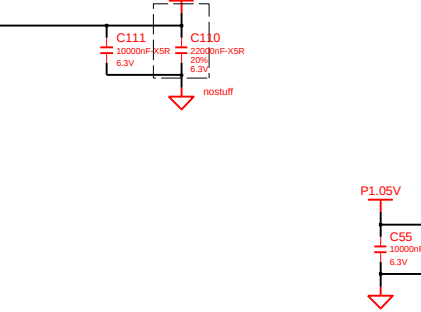
CPU CORE SUPPLY

1.1V RAIL POWER

POWER

CPU VIDS

SENSE LINES

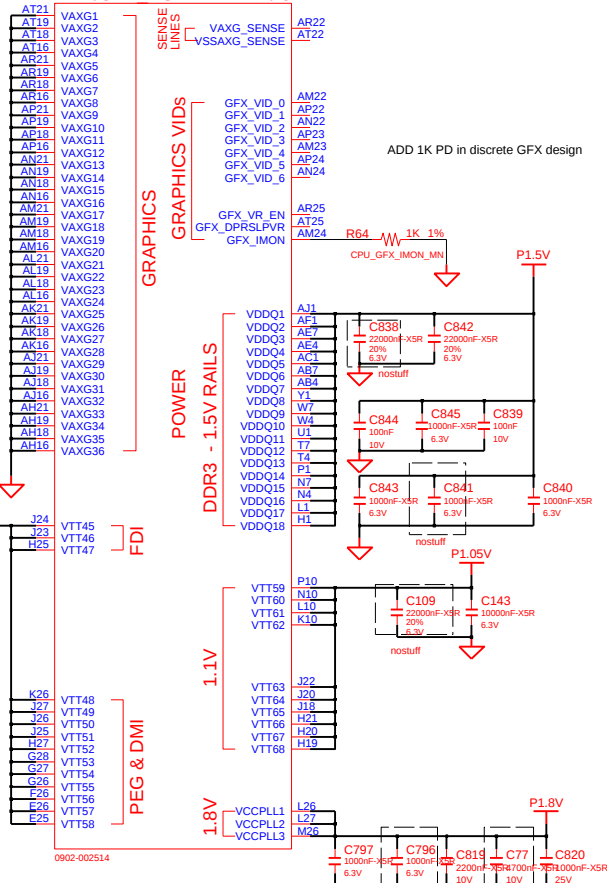


**VTT POWER SELECTION

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

CPU500-4
ARD/CFD PGA

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	1uF	10uF	22uF	330uF
w Proddizer	25 pcs	0 pcs	16 pcs	0 pcs
w/o Proddizer	25 pcs	16 pcs	12 pcs	4 pcs

DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT CPU BGA CPU (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 12 OF 52

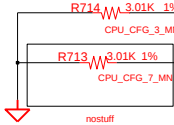
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CPU500-5
ARD/CFD_PG5 / 5

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	AC9
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	AA10
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	W10
AL17	VSS41	VSS121	U8
AL12	VSS42	VSS122	U4
AL9	VSS43	VSS123	U3
AL6	VSS44	VSS124	T35
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	L35
AH9	VSS73	VSS153	L32
AH6	VSS74	VSS154	L29
AH3	VSS75	VSS155	L8
AG10	VSS76	VSS156	L5
AF9	VSS77	VSS157	L2
AF4	VSS78	VSS158	K34
AF2	VSS79	VSS159	K33
AE35	VSS80	VSS160	K30

K27	VSS161	AE34
K9	VSS162	AE33
K6	VSS163	AE32
K3	VSS164	AE31
J32	VSS165	AE30
J30	VSS166	AE29
J21	VSS167	AE28
J19	VSS168	AE27
H35	VSS169	AE26
H32	VSS170	AE6
H28	VSS171	AD10
H26	VSS172	AC9
H24	VSS173	AC2
H22	VSS174	AC1
H18	VSS175	AB35
H15	VSS176	AB34
H13	VSS177	AB33
H11	VSS178	AB32
H8	VSS179	AB31
H5	VSS180	AB30
H2	VSS181	AB29
G34	VSS182	AB28
G31	VSS183	AB27
G20	VSS184	AB26
G9	VSS185	AB25
G6	VSS186	AA10
G3	VSS187	Y8
F30	VSS188	Y4
F27	VSS189	Y2
F25	VSS190	W35
F22	VSS191	W34
F19	VSS192	W33
F16	VSS193	W32
E35	VSS194	W31
E32	VSS195	W30
E29	VSS196	W29
E24	VSS197	W28
E21	VSS198	W27
E18	VSS199	W26
E13	VSS200	W10
E11	VSS201	U8
E8	VSS202	U4
E5	VSS203	U3
E2	VSS204	T35
D33	VSS205	T34
D30	VSS206	T33
D26	VSS207	T32
D9	VSS208	T31
D6	VSS209	T30
D3	VSS210	T29
C34	VSS211	T28
C32	VSS212	T27
C29	VSS213	T26
C28	VSS214	T6
C24	VSS215	R10
C22	VSS216	P8
C20	VSS217	P4
C19	VSS218	P2
C16	VSS219	N35
B31	VSS220	N34
B25	VSS221	N33
B21	VSS222	N32
B18	VSS223	N31
B17	VSS224	N30
B13	VSS225	N29
B11	VSS226	N28
B8	VSS227	N27
B6	VSS228	N26
B4	VSS229	N25
A29	VSS230	N6
A27	VSS231	M10
A23	VSS232	L35
A9	VSS233	L32

NCTF
AT35
AT1
AR34
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	RSVD4	RSVD35	AK26
A93	RSVD5	RSVD36	AL26
AG9	RSVD6	RSVD37	AR2
M27	RSVD7	RSVD38	AJ26
L28	RSVD8	RSVD39	AJ27
H17	SA_DIMM_VREFDQ		
G25	SB_DIMM_VREFDQ		
G17	RSVD11		
E31	RSVD12	RSVD_NCTF_40	AP1
E30	RSVD13	RSVD_NCTF_41	AT2
	RSVD14	RSVD_NCTF_42	AT3
		RSVD_NCTF_43	AR1
AM30	CFG_0	RSVD45	AL28
AM28	CFG_1	RSVD46	AL29
AP31	CFG_2	RSVD47	AP30
AL32	CFG_3	RSVD48	AP32
AL30	CFG_4	RSVD49	AL27
AM31	CFG_5	RSVD50	AT31
AM29	CFG_6	RSVD51	AP23
AM32	CFG_7	RSVD52	AR33
AK32	CFG_8	RSVD53	AT33
AK31	CFG_9	RSVD_NCTF_54	AT34
AK28	CFG_10	RSVD_NCTF_55	AR35
AJ28	CFG_11	RSVD_NCTF_56	AR35
AN30	CFG_12	RSVD_NCTF_57	AR32
AN32	CFG_13	RSVD58	
AJ32	CFG_14		
AJ29	CFG_15	RSVD_TP_59	E15
AJ30	CFG_16	RSVD_TP_60	F15
AK30	CFG_17	KEY	A2
H16	RSVD_TP_86	RSVD62	D15
		RSVD63	C15
		RSVD64	AJ15
		RSVD65	AH15
B19	RSVD15		
A19	RSVD16		
A20	RSVD17		
B20	RSVD18		
U9	RSVD19	RSVD_TP_66	AA5
T9	RSVD20	RSVD_TP_67	AA4
		RSVD_TP_68	R8
AC9	RSVD21	RSVD_TP_69	AD3
AB9	RSVD22	RSVD_TP_70	AD2
		RSVD_TP_71	AA2
		RSVD_TP_72	AA1
		RSVD_TP_73	R9
		RSVD_TP_74	AG7
C1	RSVD_NCTF_23	RSVD_TP_75	AE3
A3	RSVD_NCTF_24		
		RSVD_TP_76	V4
		RSVD_TP_77	V5
		RSVD_TP_78	N2
		RSVD_TP_79	N2
J29	RSVD26	RSVD_TP_80	AD5
J28	RSVD27	RSVD_TP_81	AD7
		RSVD_TP_82	W3
A34	RSVD_NCTF_28	RSVD_TP_83	W2
A33	RSVD_NCTF_29	RSVD_TP_84	N3
		RSVD_TP_85	AE5
C35	RSVD_NCTF_30		AD9
B35	RSVD_NCTF_31		

(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

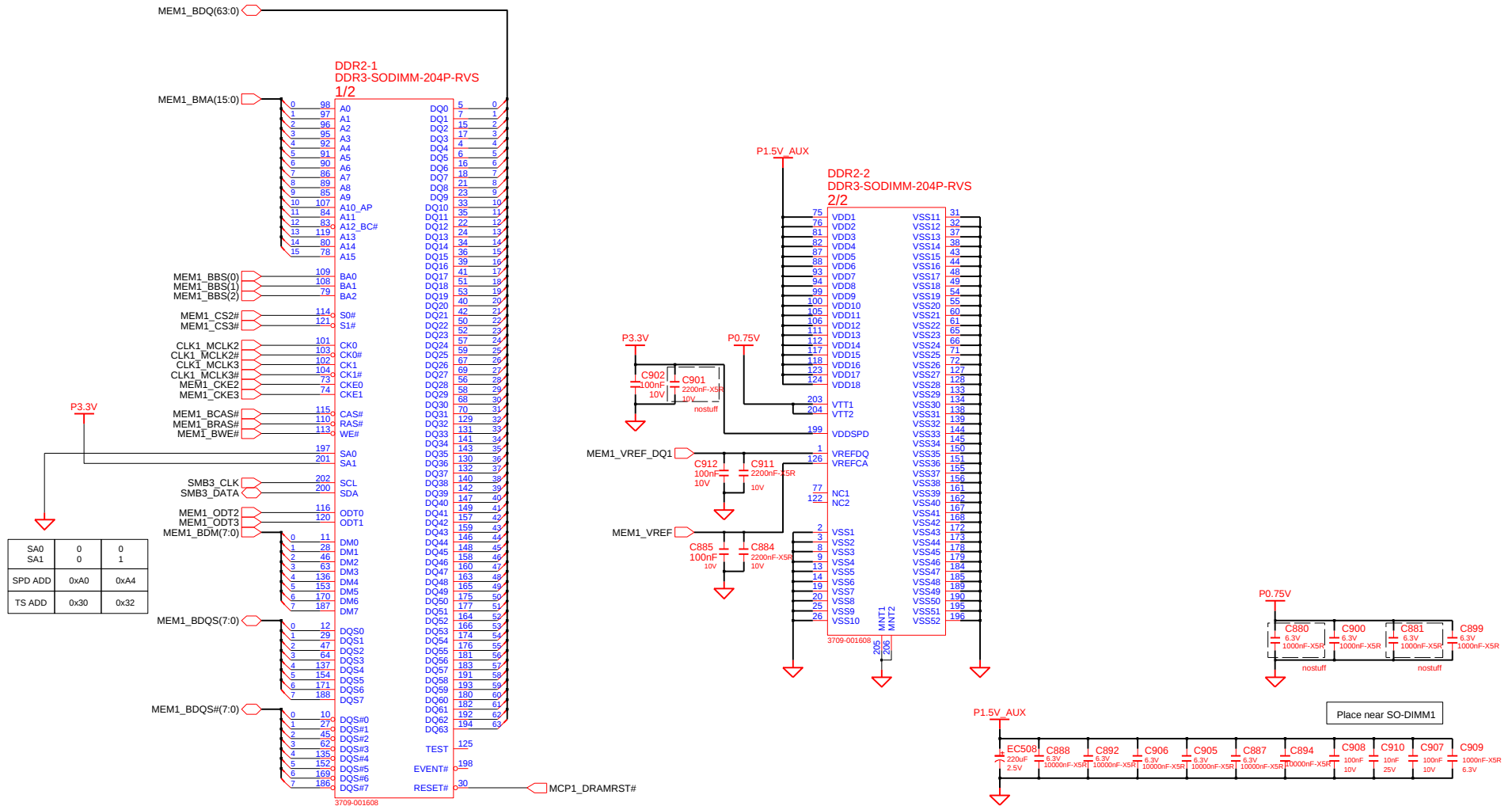
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DDR SO-DIMM #1

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 EDIT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 14 OF 52

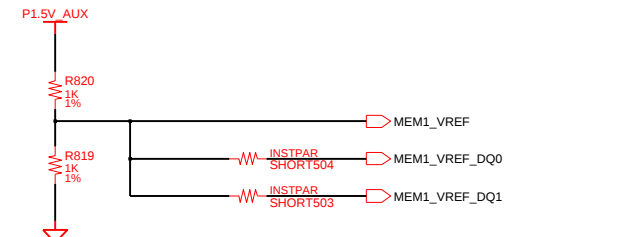
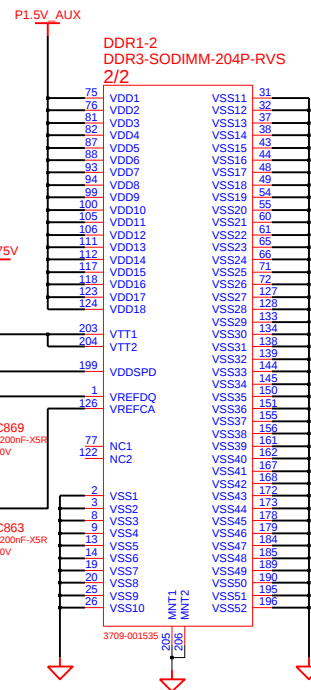
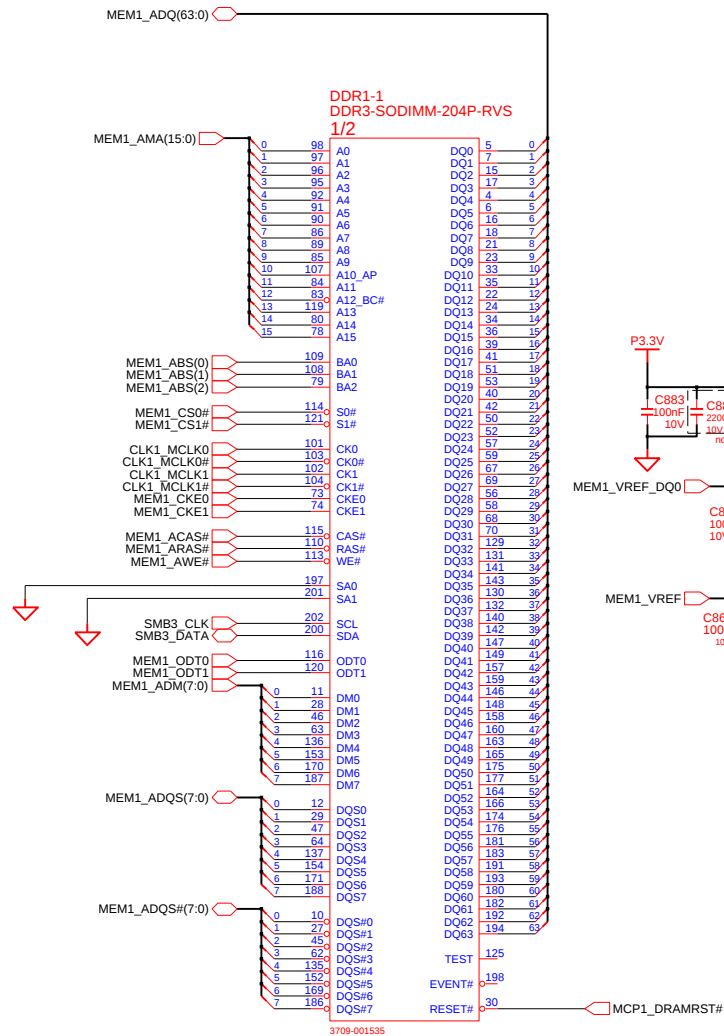
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DDR SO-DIMM #0

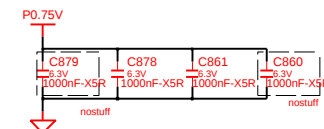
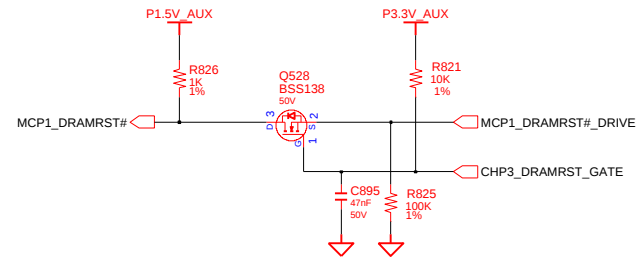
Height : 8 mm (STANDARD)

P/N : 3709-001615 (FOXCONN)

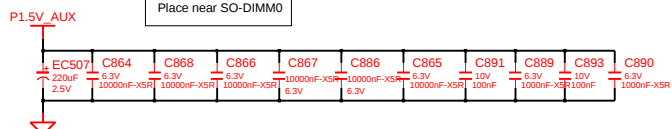
P/N : 3709-001622 (CONCRAFT)



Place between two memory Connector

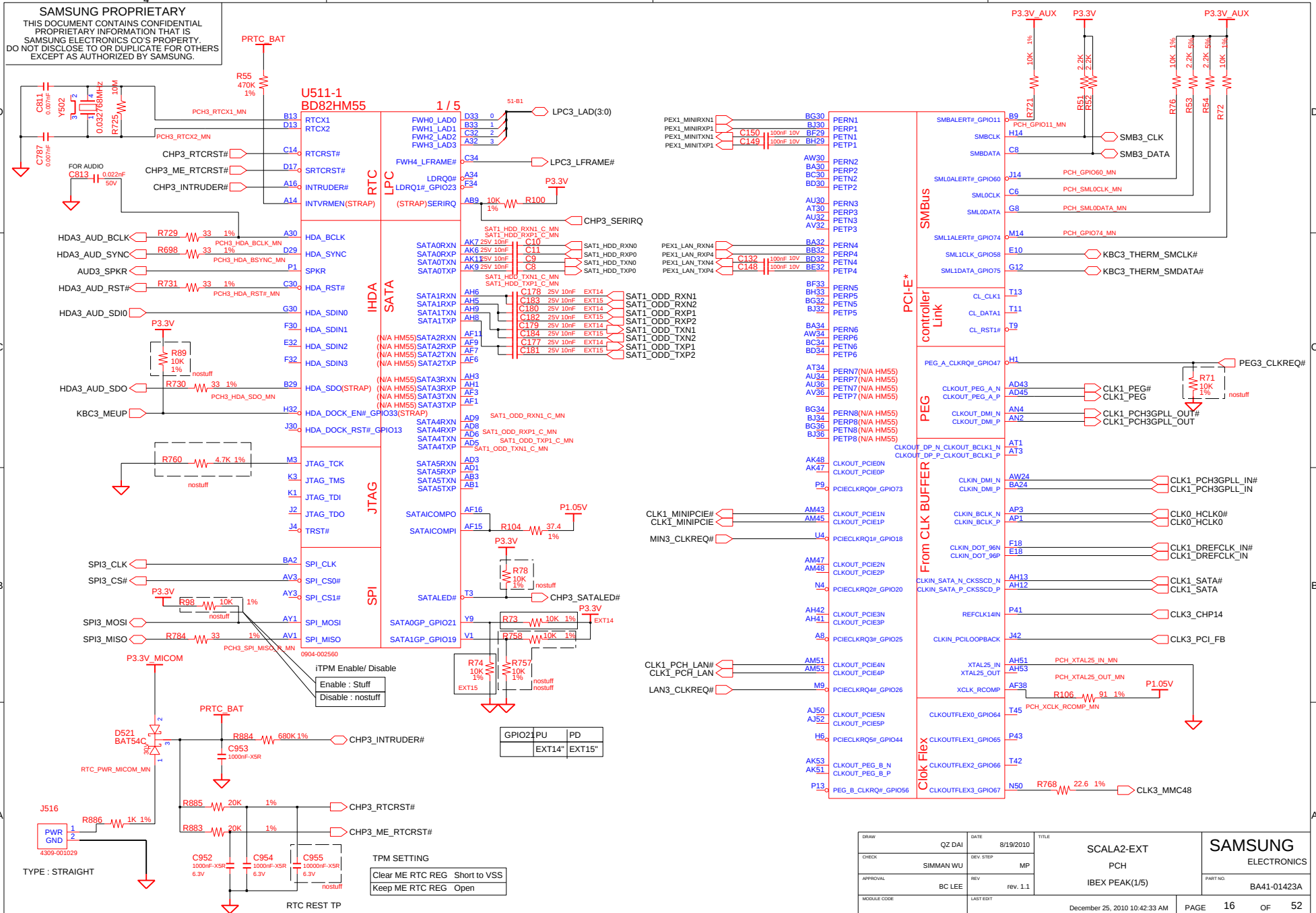


Place near SO-DIMM0



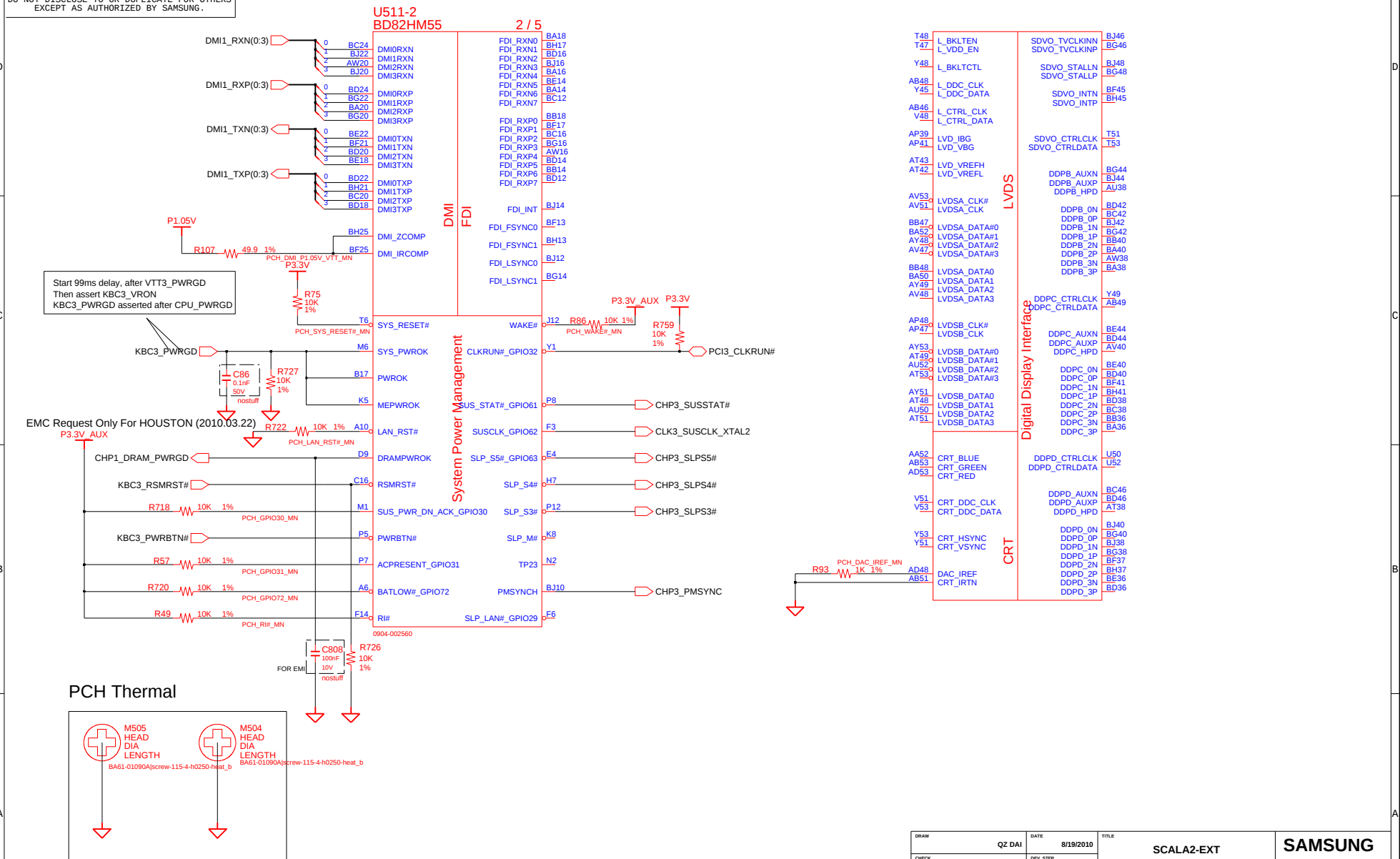
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CHECK	SIMMAN WU	DEV. STEP	MP		SODIMM B	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		DDR3	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 15 OF 52

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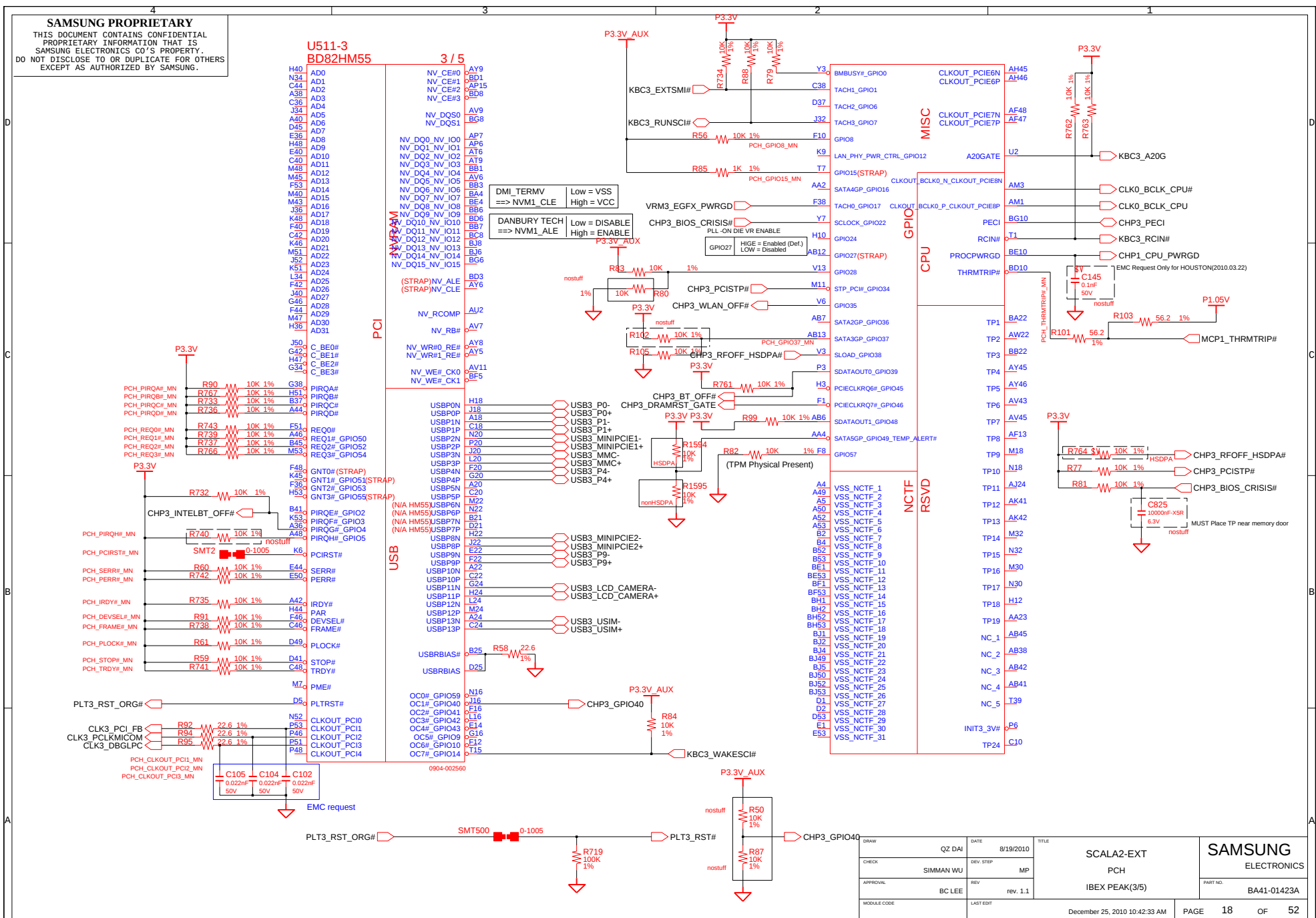


DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT PCH IBEX PEAK(1/5)	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM		PAGE 16 OF 52

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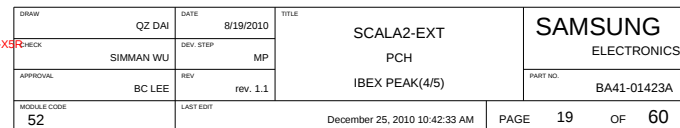


DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	PCH	PCH	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1	IBEX PEAK(2/5)	PART NO.	BA41-01423A
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE	17 OF 52

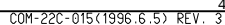


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VTT_SEL	VOLTAGE	CPU
1	P1.05V	ARRANDALE
0	P1.1V	CLARKS FIELD

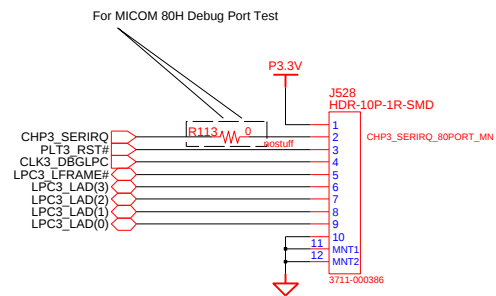


A



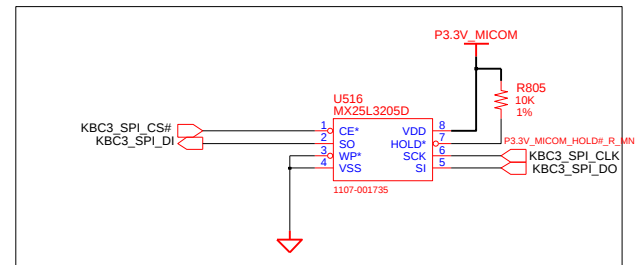
D:/mentor/Scala2/Scala2_EXT_MP1.1_GB

80H PORT DEBUG



BE CAUTION SPI ROM SIZE!!

SPI_ROM_SOCKET



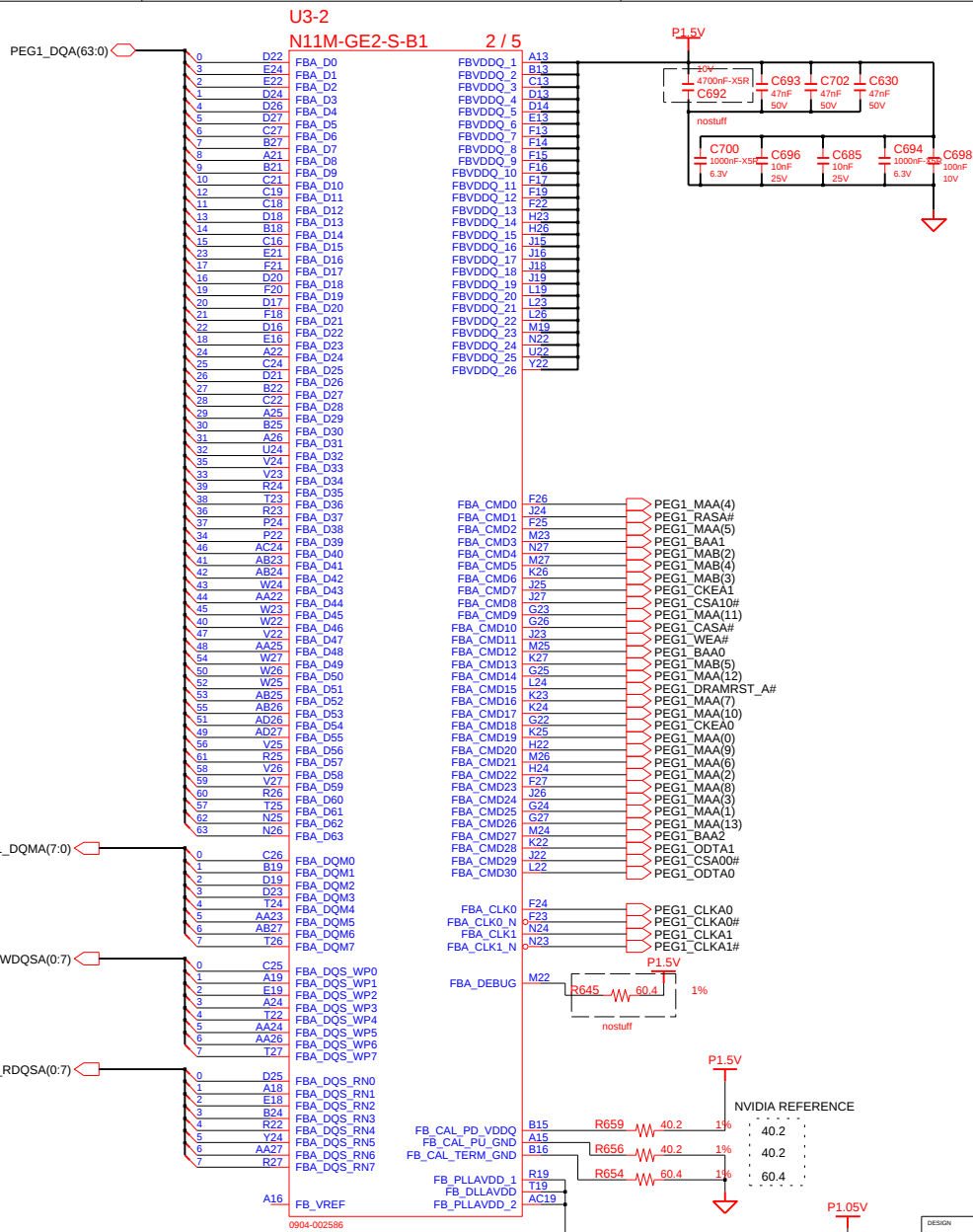
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT DEBUG PORT 80H DECODER	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	21	OF 52

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CMD MODE A

DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		N11X_40NM(2/5)	ELECTRONICS
APPROVAL	BC LEE	REV	REV. 1.1		N11X_40NM(2/5)	PART NO. BA41-01423A
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 23	OF 52

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U3-3
N11M-GE2-S-B1 3 / 5

POWER

- P3.3V: BLM18PG181SN1, C58, C56, C57, C60, C59, C61, C62, C63, C64, C65, C66, C778, C779, C780, C803, C783, C782, C781, C804, B513
- P1.05V: B1, B3, B512
- P1.8V: B3

DATA

- IFPA_TXD0_N, IFPA_TXD0, IFPA_TXD1_N, IFPA_TXD1, IFPA_TXD2_N, IFPA_TXD2, IFPA_TXD3_N, IFPA_TXD3, IFPB_TXD4_N, IFPB_TXD4, IFPB_TXD5_N, IFPB_TXD5, IFPB_TXD6_N, IFPB_TXD6, IFPB_TXD7_N, IFPB_TXD7, IFPA_TXC_N, IFPA_TXC, IFPB_TXC_N, IFPB_TXC
- IFPB_PLLVDD, IFPB_RSET, IFPA_IOVDD, IFPB_IOVDD, IFPC_L3_N, IFPC_L3, IFPC_L2_N, IFPC_L2, IFPC_L1_N, IFPC_L1, IFPC_L0_N, IFPC_L0, IFPD_L3_N, IFPD_L3, IFPD_L2_N, IFPD_L2, IFPD_L1_N, IFPD_L1, IFPD_L0_N, IFPD_L0, IFPE_PLLVDD, IFPE_RSET, IFPE_AUX_I2CY_SDA_N, IFPE_AUX_I2CY_SCL, IFPE_AUX_I2CW_SDA_N, IFPE_AUX_I2CW_SCL
- IFPB_TXD3_N_MN, IFPB_TXD3_MN, IFPB_TXD7_N_MN, IFPB_TXD7_MN

CLOCK

- IFPB_PLLVDD, IFPB_RSET, IFPA_IOVDD, IFPB_IOVDD, IFPC_L3_N, IFPC_L3, IFPC_L2_N, IFPC_L2, IFPC_L1_N, IFPC_L1, IFPC_L0_N, IFPC_L0, IFPD_L3_N, IFPD_L3, IFPD_L2_N, IFPD_L2, IFPD_L1_N, IFPD_L1, IFPD_L0_N, IFPD_L0, IFPE_PLLVDD, IFPE_RSET, IFPE_AUX_I2CY_SDA_N, IFPE_AUX_I2CY_SCL, IFPE_AUX_I2CW_SDA_N, IFPE_AUX_I2CW_SCL

NEAR TO HDMI CONN

- PEG3_TX2P_HDMI, PEG3_TX2N_HDMI, PEG3_TX1P_HDMI, PEG3_TX1N_HDMI, PEG3_TX0P_HDMI, PEG3_TX0N_HDMI, PEG3_TXCP_HDMI, PEG3_TXCN_HDMI, PEG3_TXCN_HDMI_MN, PEG3_TXCP_HDMI_MN, PEG3_TX0N_HDMI_MN, PEG3_TX0P_HDMI_MN, PEG3_TX1N_HDMI_MN, PEG3_TX1P_HDMI_MN, PEG3_TX2N_HDMI_MN, PEG3_TX2P_HDMI_MN
- R787, R788, R810, R786, R791, R790, R793, R792, Q522, RHU002N06

REVISION HISTORY

REV	DESCRIPTION	DATE
1.1	Initial Release	8/19/2010

DESIGN QZ DAI
CHECK SIMMAN WU
APPROVAL BC LEE
MODULE CODE

DATE 8/19/2010
DEV. STEP MP
REV rev. 1.1
LAST EDIT

TITLE SCALA2-EXT
N11X_40NM(3/5)
N11X_40NM(3/5)

SAMSUNG ELECTRONICS
PART NO. BA41-01423A

December 25, 2010 10:42:33 AM
PAGE 24 OF 52

MM MI	DESIGN	QZ DAI	DATE	8/19/2010	SCALAZ-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

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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

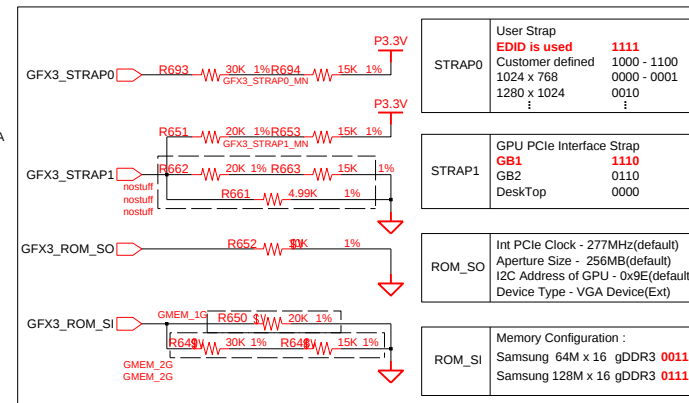
Strap option	Bit 3	Bit 2	Bit 1	Bit 0
ROM_SO	XCLK 417	FB_0_BAR_SIZE	SMB_ALT_ADDR	VGA_DEVICE
ROM_SCLK	DEVID[4]	VENID	CLK_CFG	PLL_TERM
ROM_SI	RAMCFG[3]	RAMCFG[2]	RAMCFG[1]	RAMCFG[0]
STRAP2	DEVID[3]	DEVID[2]	DEVID[1]	DEVID[0]
STRAP1	PADCFG[3]	PADCFG[2]	PADCFG[1]	PADCFG[0]
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
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

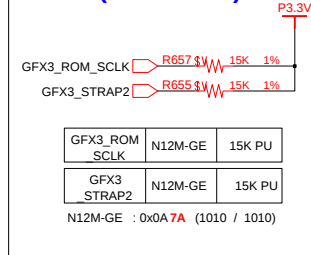
U3-5
N11M-GE2-S-B1

5 / 5

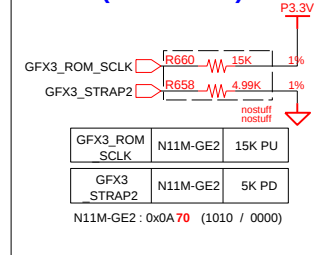
Function Straps



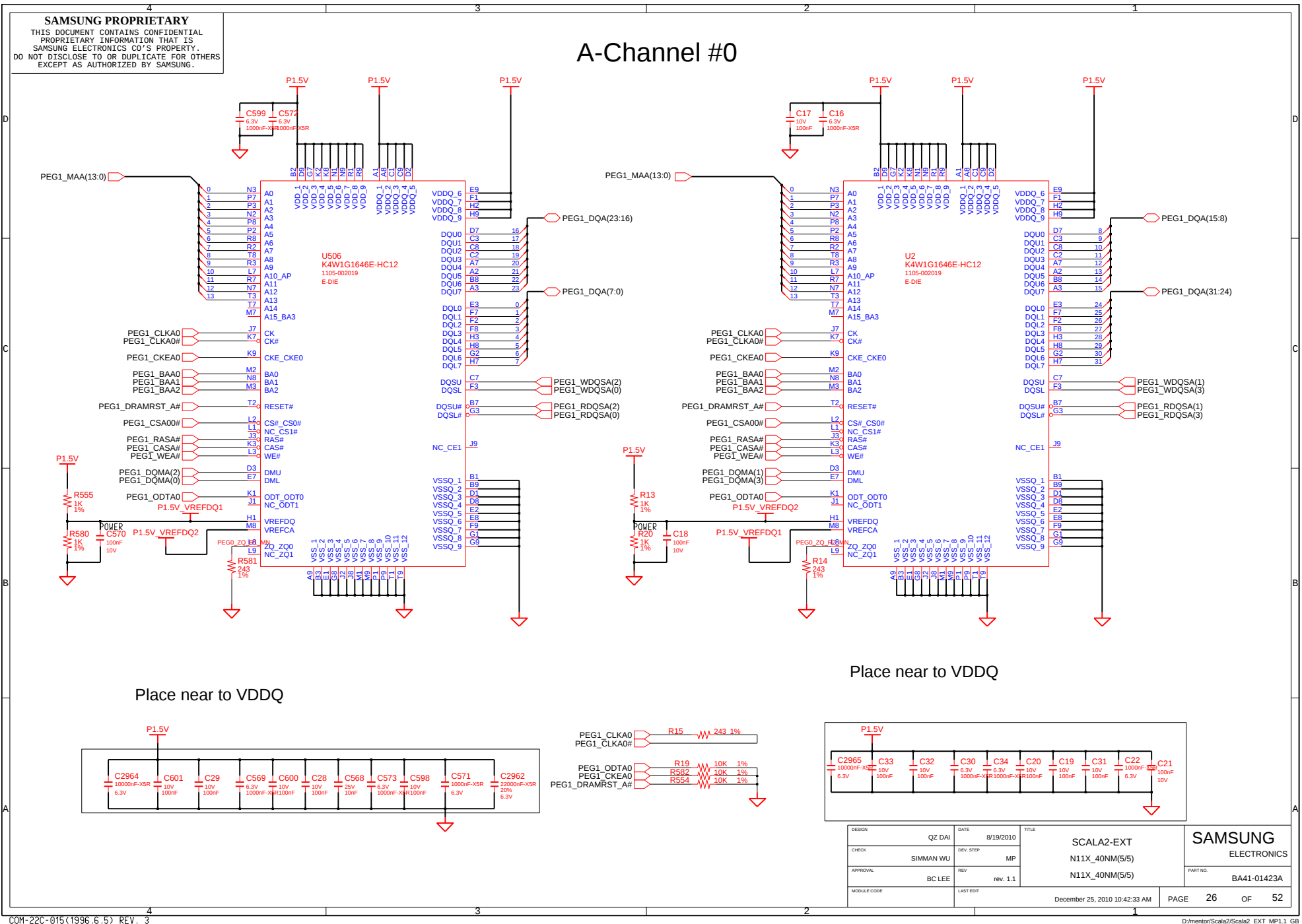
Chip Select Straps (N12M-GB1)



Chip Select Straps (N11M-GB1)

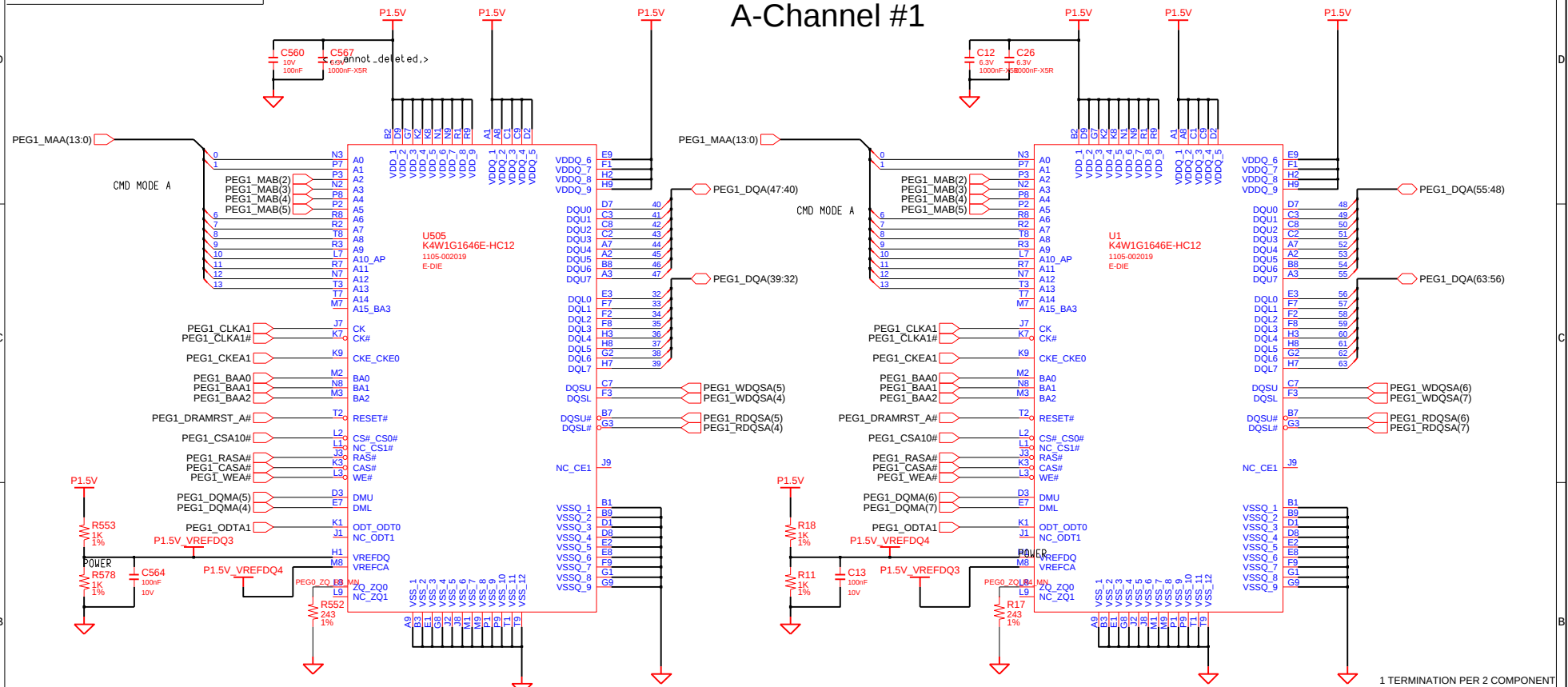


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		N11X_40NM(4/5)	ELECTRONICS
APPROVAL	BC LEE	REV	REV. 1.1		N11X_40NM(4/5)	PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
December 25, 2010 10:42:33 AM						PAGE 25 OF 52



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A-Channel #1



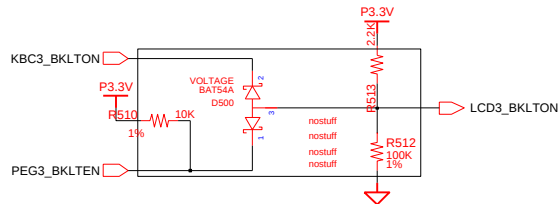
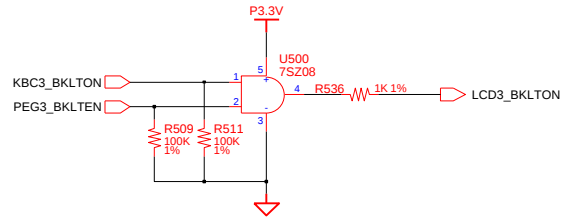
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CHECK	SIMMAN WU	DEV. STEP	MP		GRAPHIC_MEM A#0	
APPROVAL	BC LEE	REV	rev. 1.1		GRAPHIC_MEM A#0	
MODULE CODE		LAST EDIT				
December 25, 2010 10:42:33 AM						PAGE 27 OF 52

LVDS LOGIC

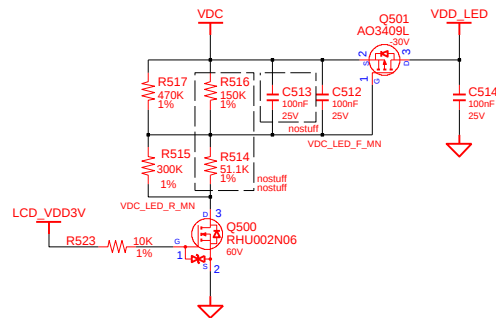
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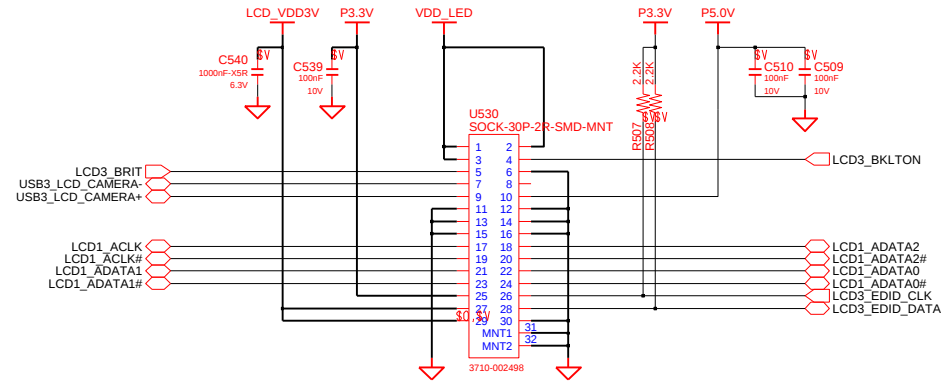
Backlight On



LED Power

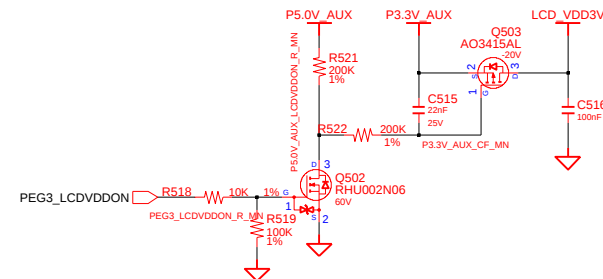


LCD Connector + CAMERA



TYPE: ANGLE

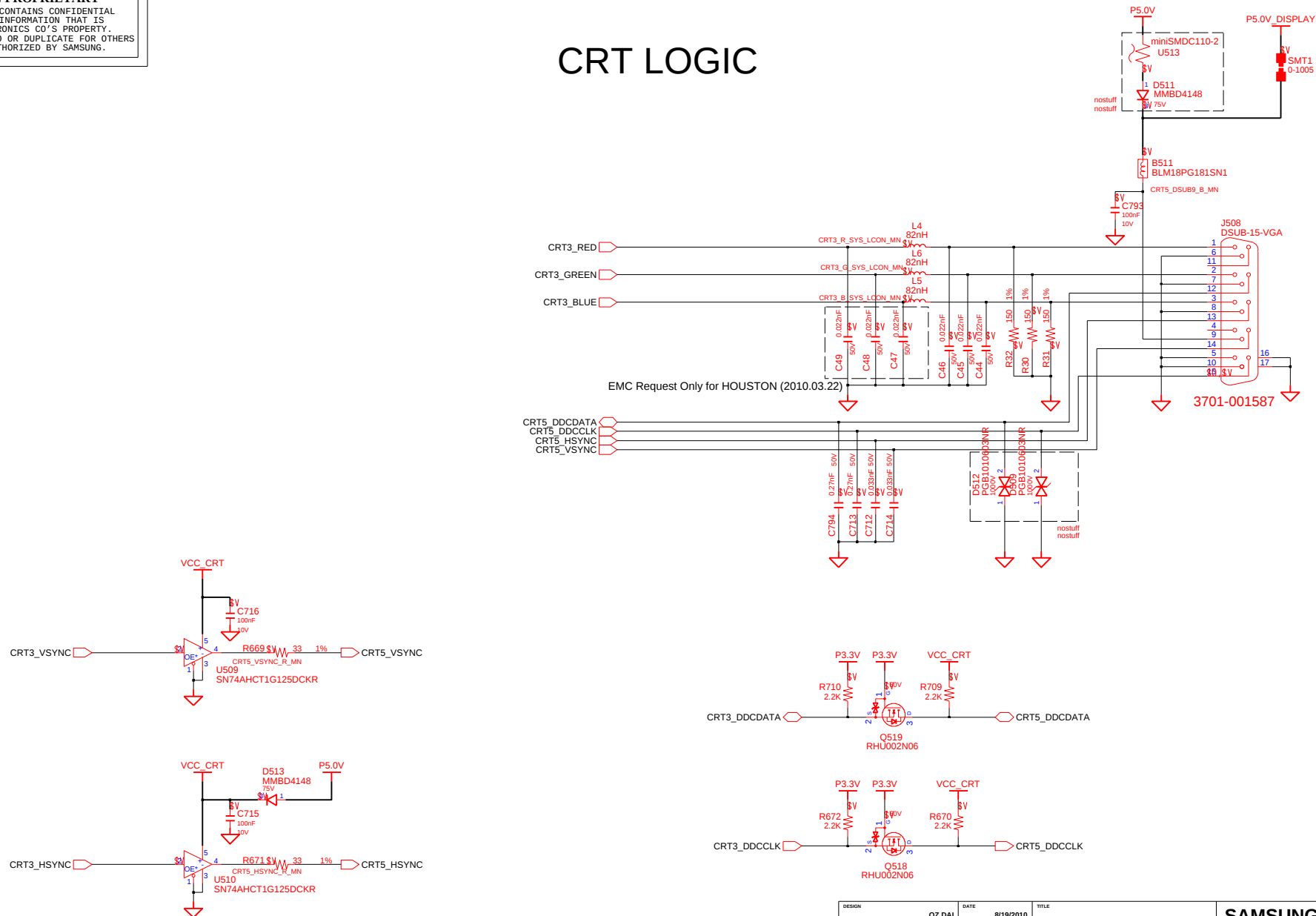
LCD Power



DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 1.1	LVDS		
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	28	OF 52

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CRT LOGIC

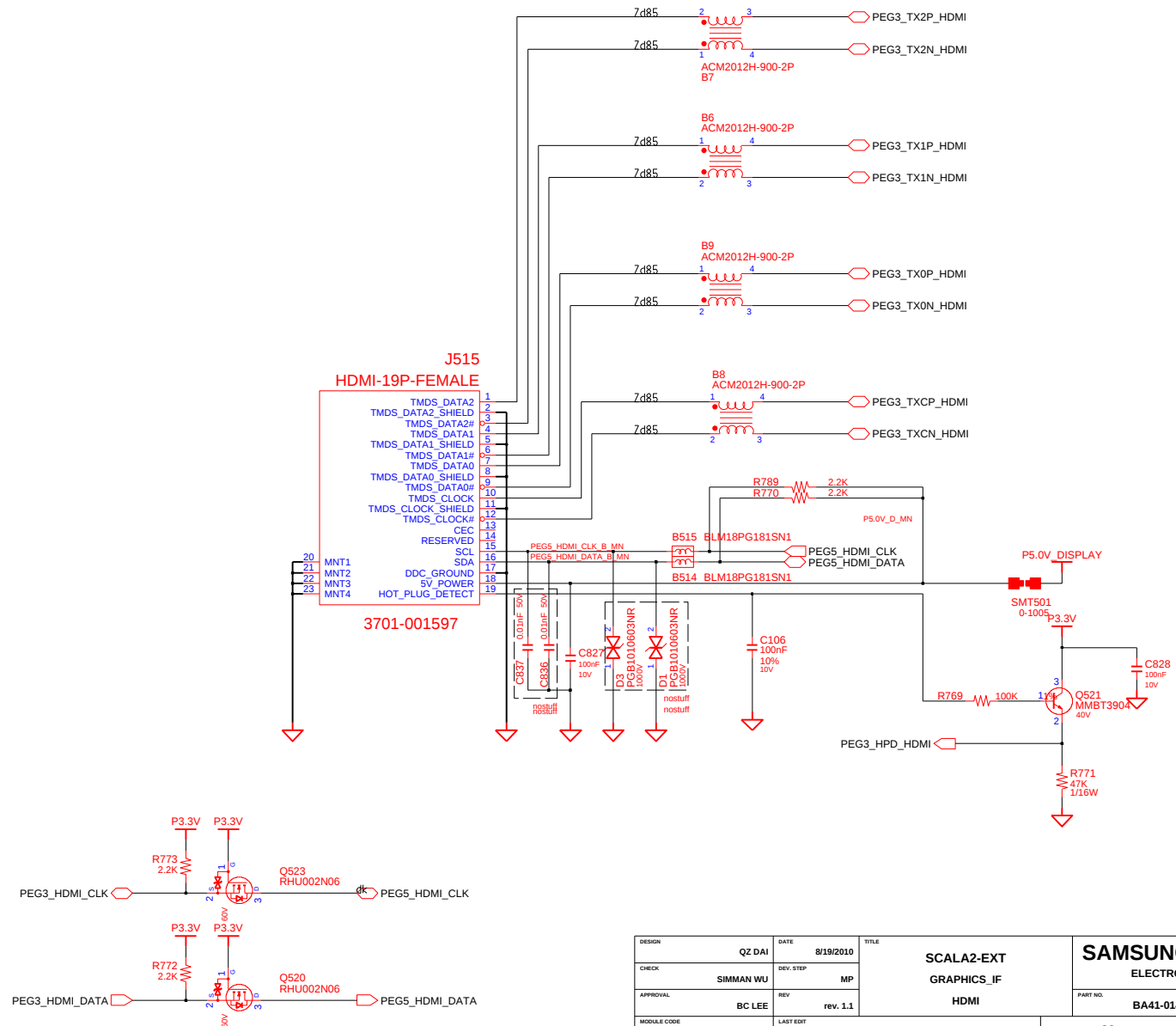


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 1.1	CRT		
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 29 OF 52	PART NO. BA41-01423A

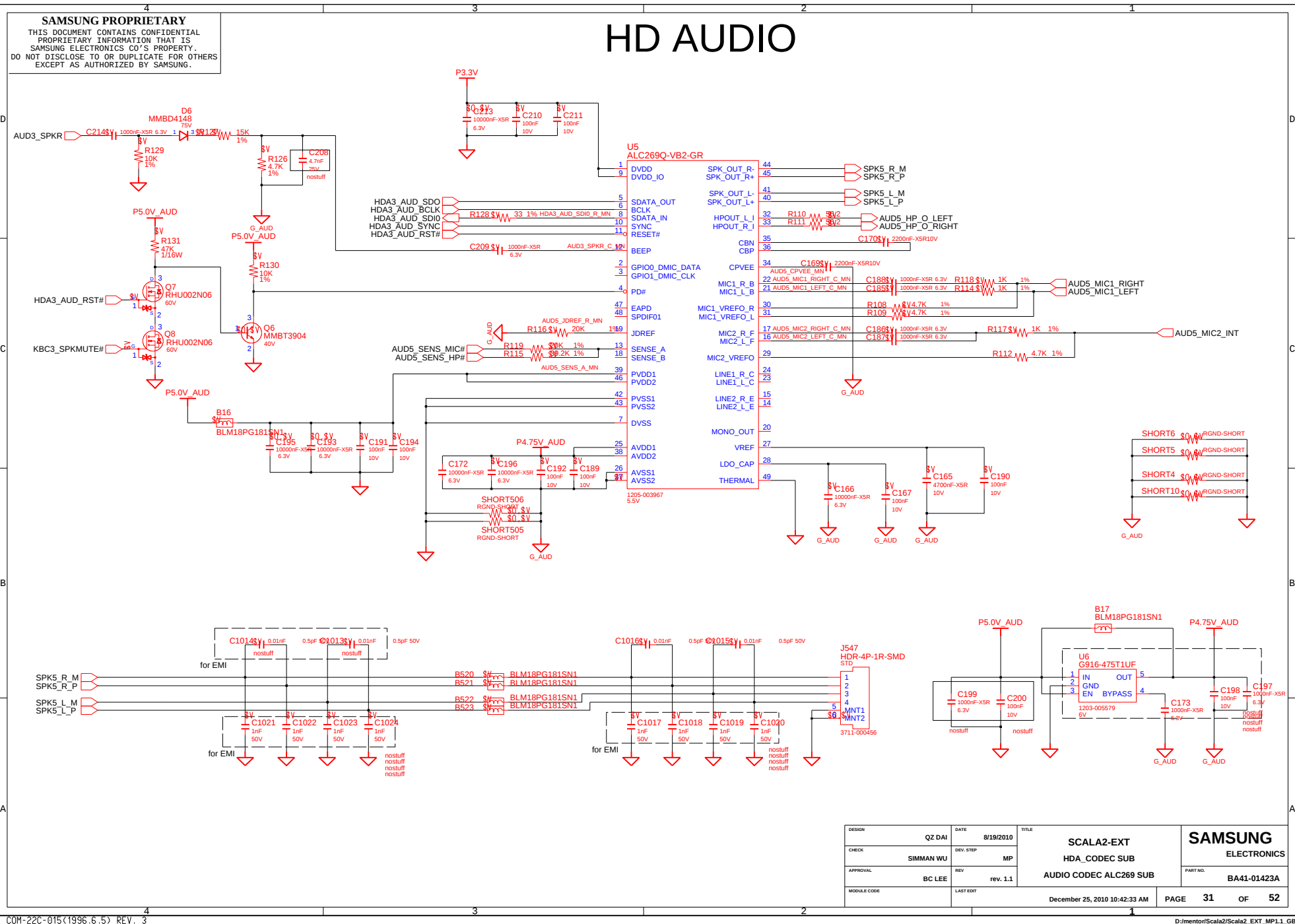
HDMI Graphic

After checking, Houston need to use CMC for each signal.

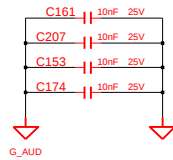
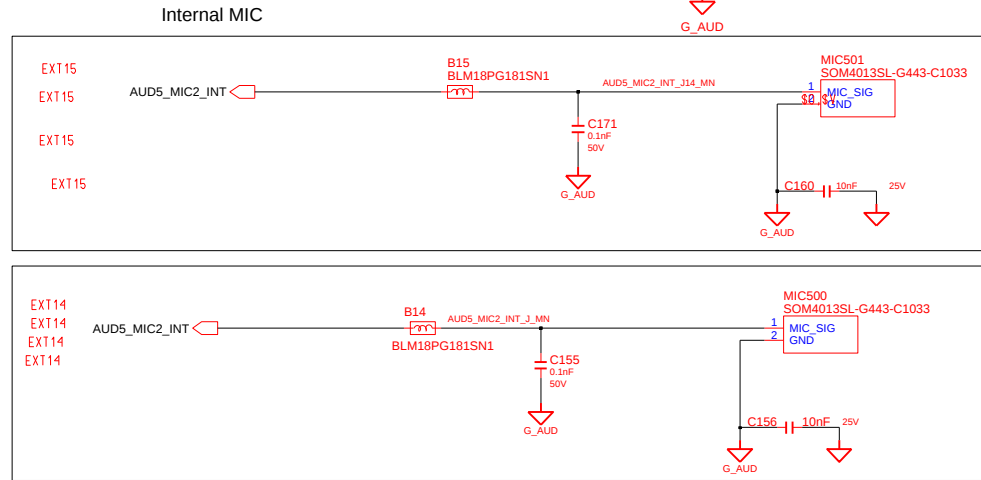
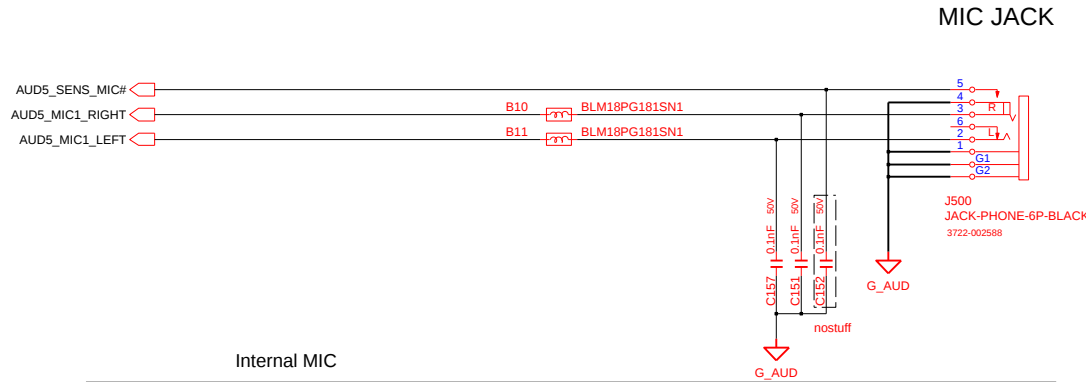
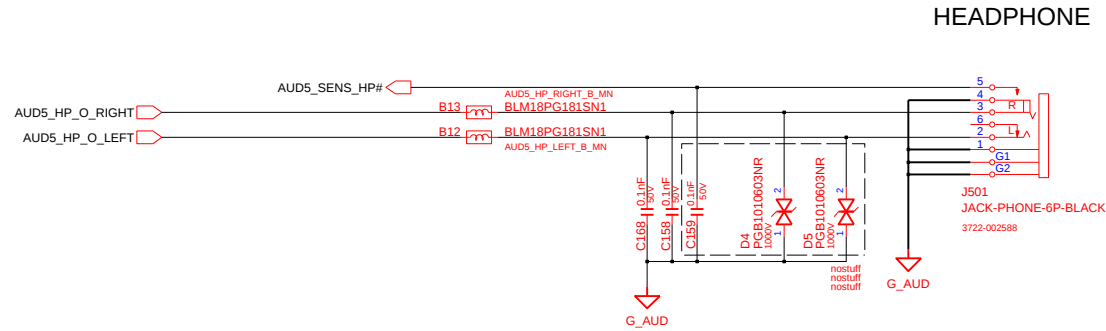
(EMC request at 2010.04.15)



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



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

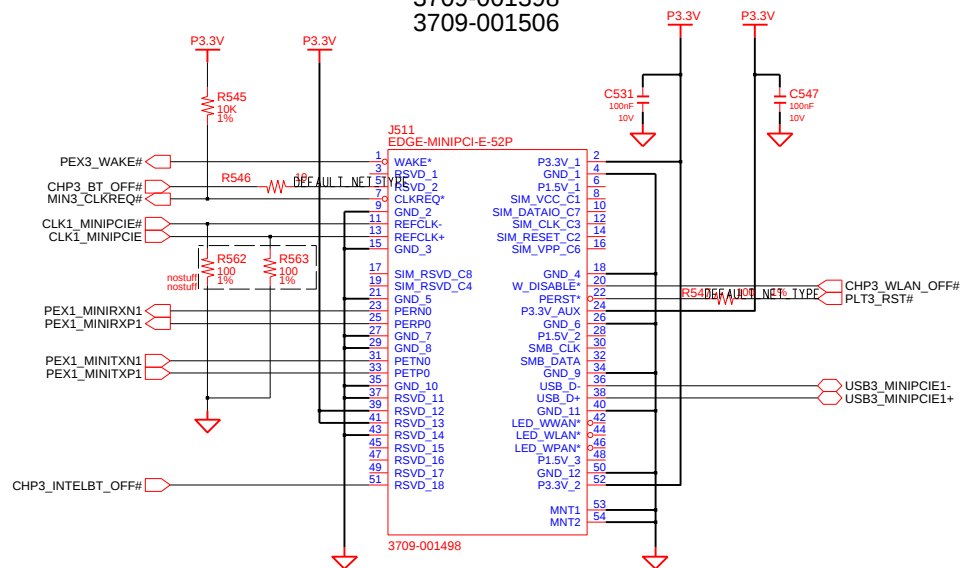
A

Reatek RTL8111E

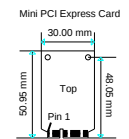
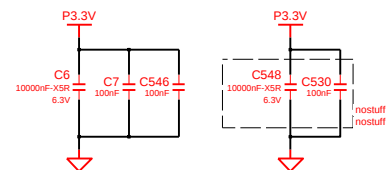
D:/mentor/Scala2/Scala2_EXT_MP1.1_GB

WLAN
Height : 7.0mm

3709-001398
3709-001506



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



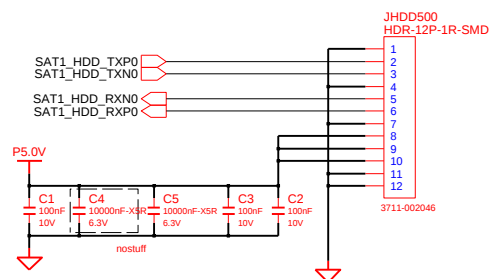
Odd Pins : Top side
Even Pins : Bottom Side

DESIGN	QZ DAI	DATE	8/19/2010	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

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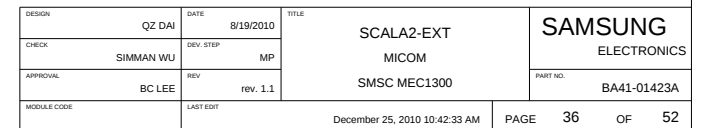
SATA HDD CONN

Cable Connector Type

[illegible]

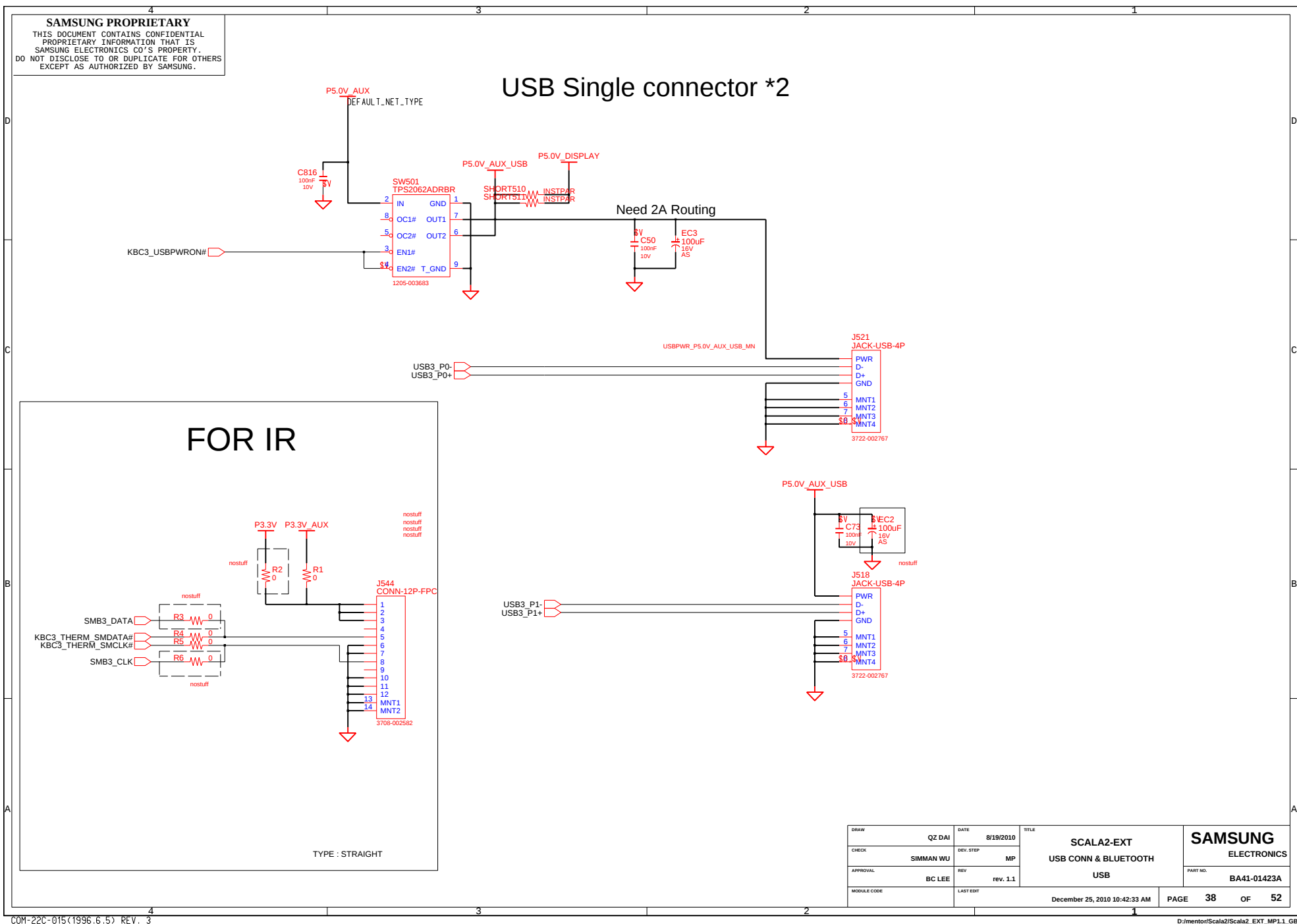
DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG ELECTRONICS		
CHECK	SIMMAN WU	DEV. STEP	MP					
APPROVAL	BC LEE	REV	rev. 1.1					
MODULE CODE	LAST EDIT							
December 25, 2010 10:42:33 AM					PAGE	35	OF	52

MAIN BOARD (MICOM)



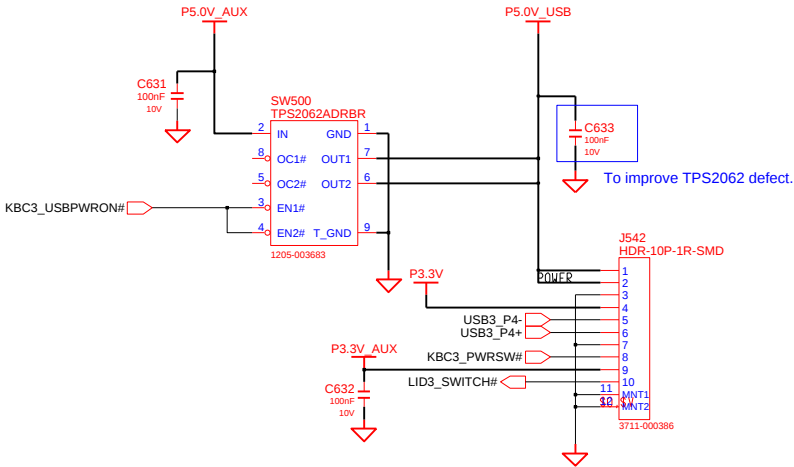
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BD:/mentor/Scale2/Scale2_EXT_MP1.1_GB

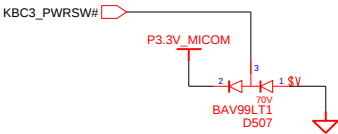
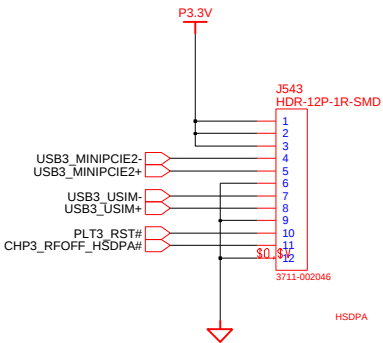


POWER S/W SUB B'D CONNECTOR

MAIN to SUB

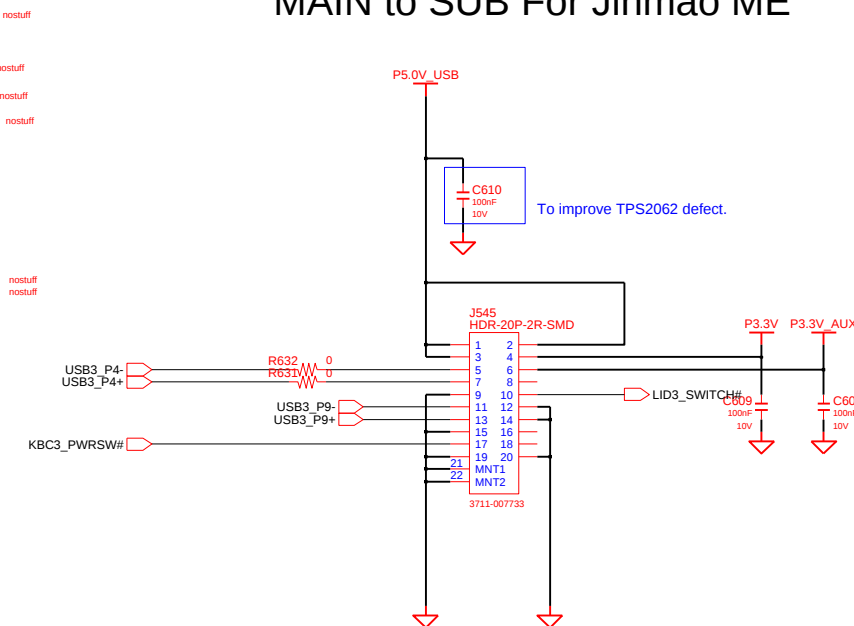


HSPA MAIN TO SUB CONN



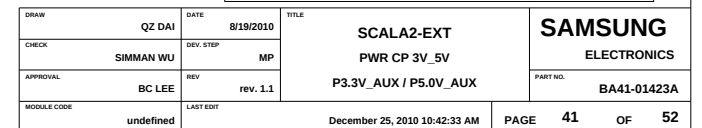
POWER S/W SUB B'D CONNECTOR

MAIN to SUB For Jinmao ME

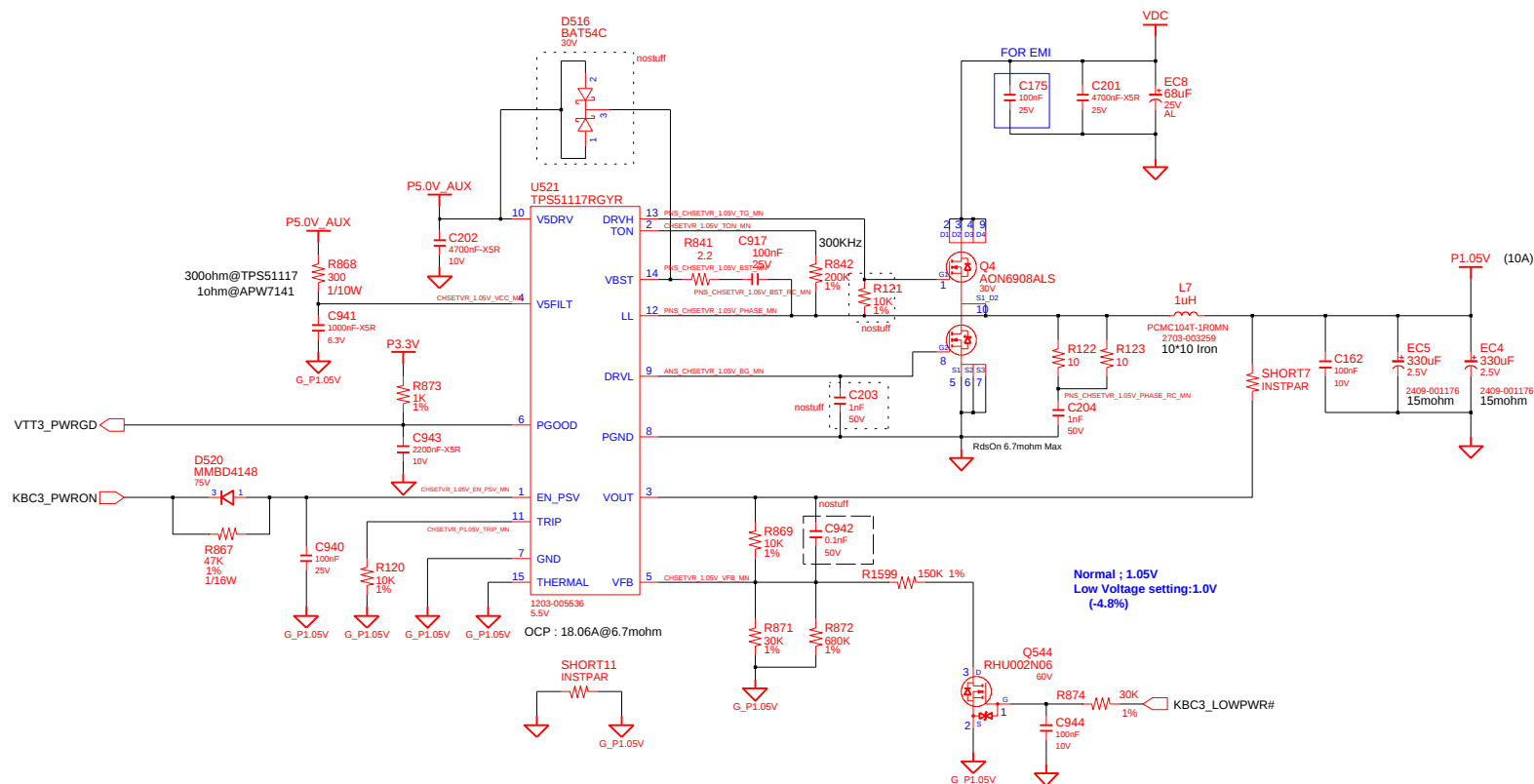


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP	USB_CONN	USB CONNECTOR	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1			PART NO.
MODULE CODE		LAST EDIT				BA41-01423A
				December 25, 2010 10:42:33 AM	PAGE	39 OF 52

P3.3V_AUX & P5.0V_AUX

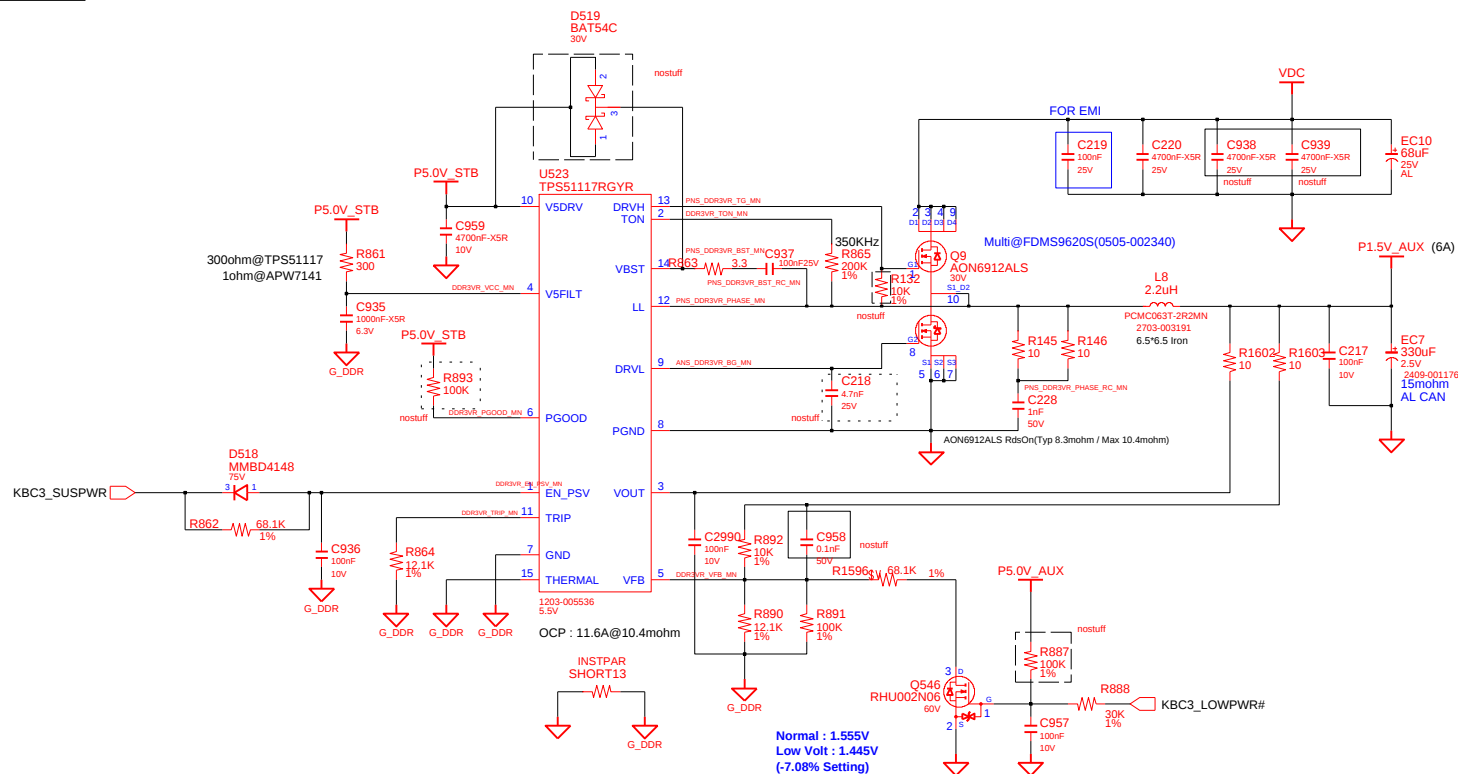


CHIPSET POWER(P1.05V)

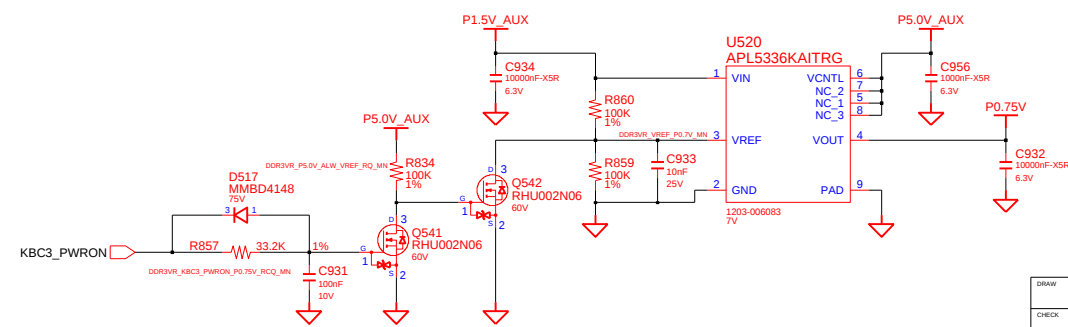


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT	SAMSUNG
CHECK	SIMMAN WU	DEV. STEP	MP		P1.05V	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 1.1		TI TPS51117R	PART NO.
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM			BA41-01423A
				PAGE	42	OF 52

DDR3 Power



DDR3 VTT(0.75V)



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

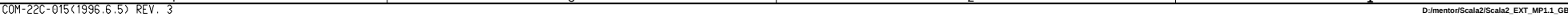
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CPU1_VID(0)
CPU1_VID(1)
CPU1_VID(2)
CPU1_VID(3)
CPU1_VID(4)
CPU1_VID(5)
CPU1_VID(6)

CPU1 DPRSLPV

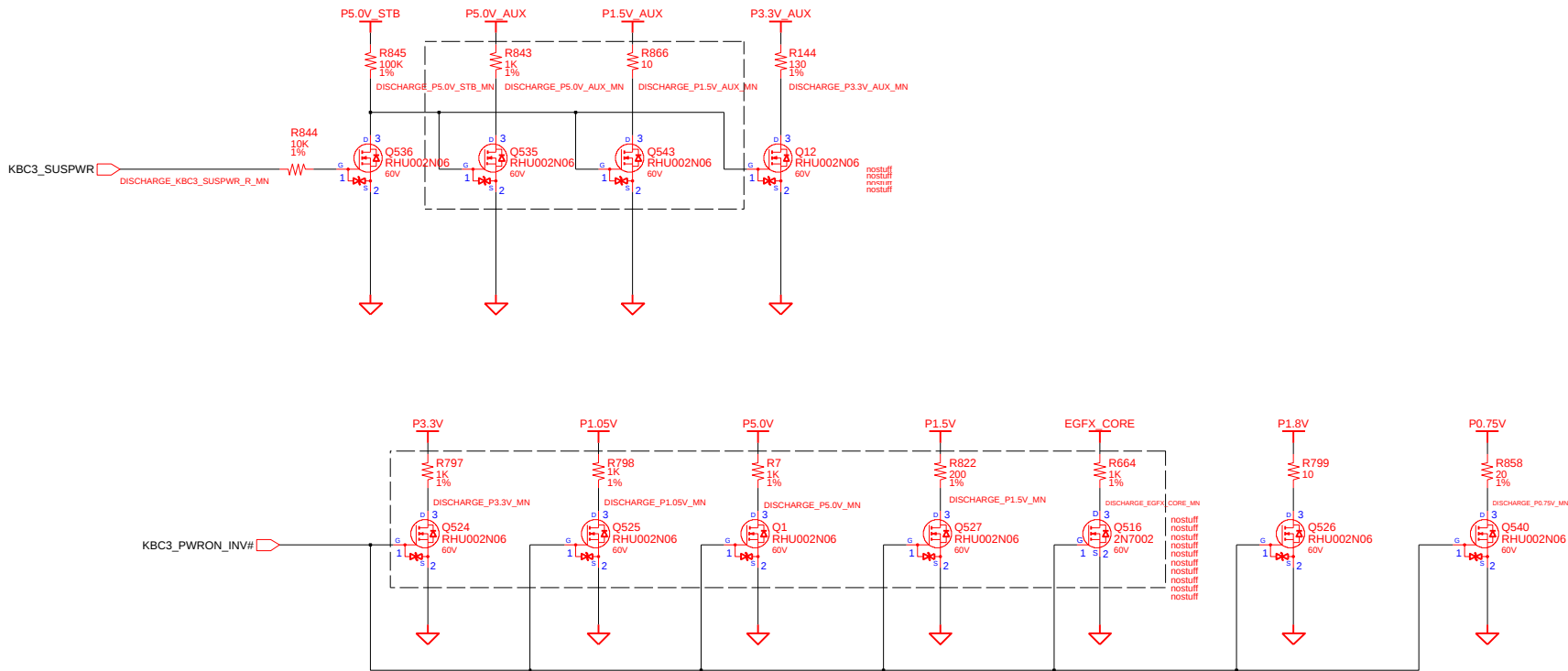
1

U508
ISL62882HRTZ-T

D:/mentor/Scala2/Scala2_EXT_MP1.1_GB

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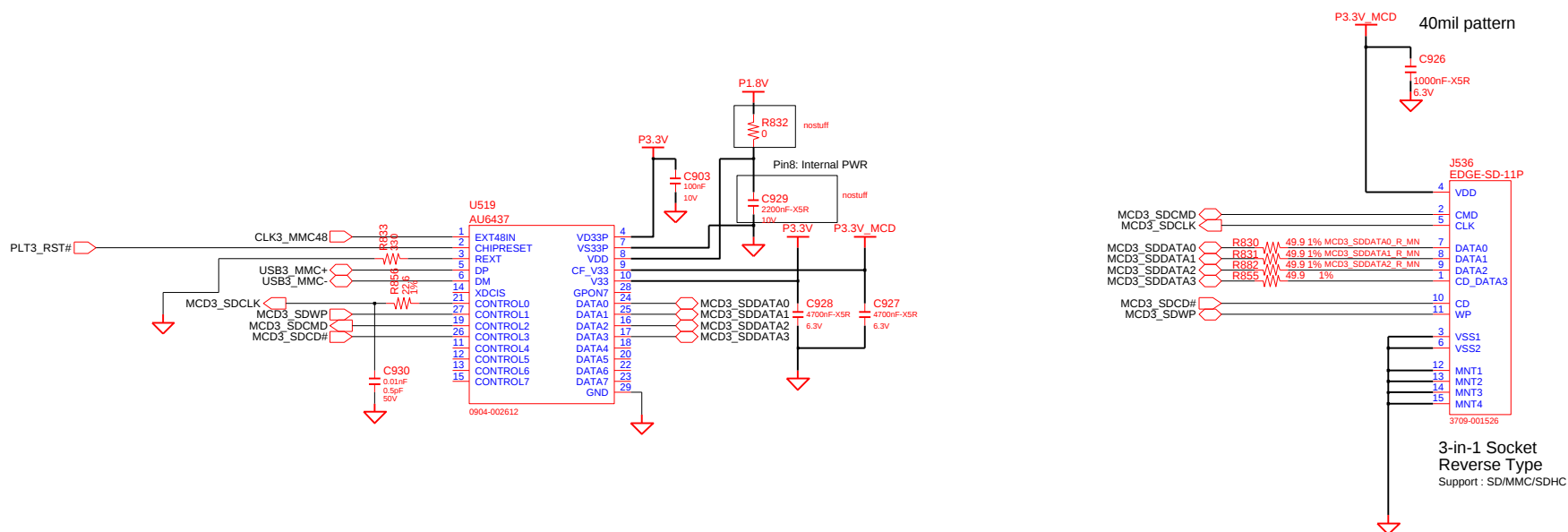
POWER DISCHARGER



DRAW	QZ DAI	DATE	8/19/2010	TITLE SCALA2-EXT PWR_MV_DISCHARGER DISCHARGING LOGIC	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	47 OF 52

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3 IN 1 CARD (AU6437)

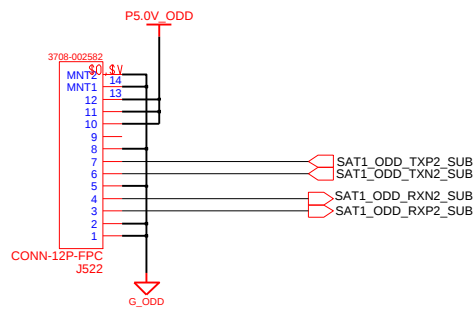


DESIGN	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT SUB BOARD2	SAMSUNG ELECTRONICS		
CHECK	SIMMAN WU	DEV. STEP	MP					
APPROVAL	BC LEE	REV	rev. 1.1					
MODULE CODE	LAST EDIT							
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SATA ODD SUB BOARD

15.6"

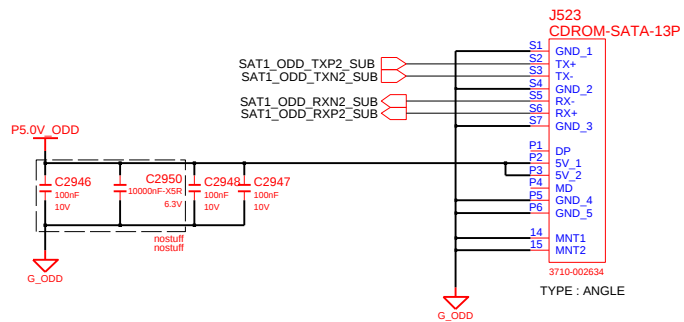
SUB TO MAIN : SATA ODD CONN



EXT15
EXT15
EXT15

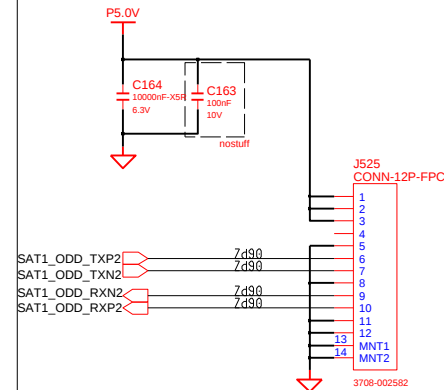
EXT15

SATA ODD CONN



TYPE : ANGLE

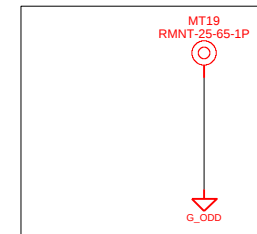
MAIN TO SUB : SATA ODD CONN



EXT15

EXT15

EXT15

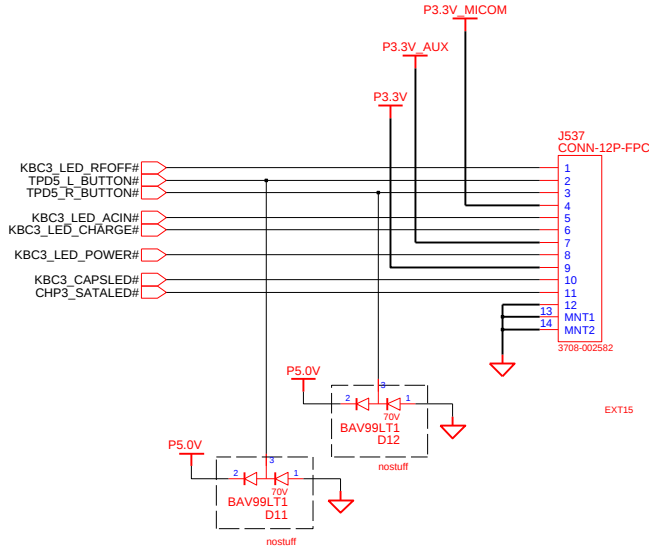


ODD sub board mount hole

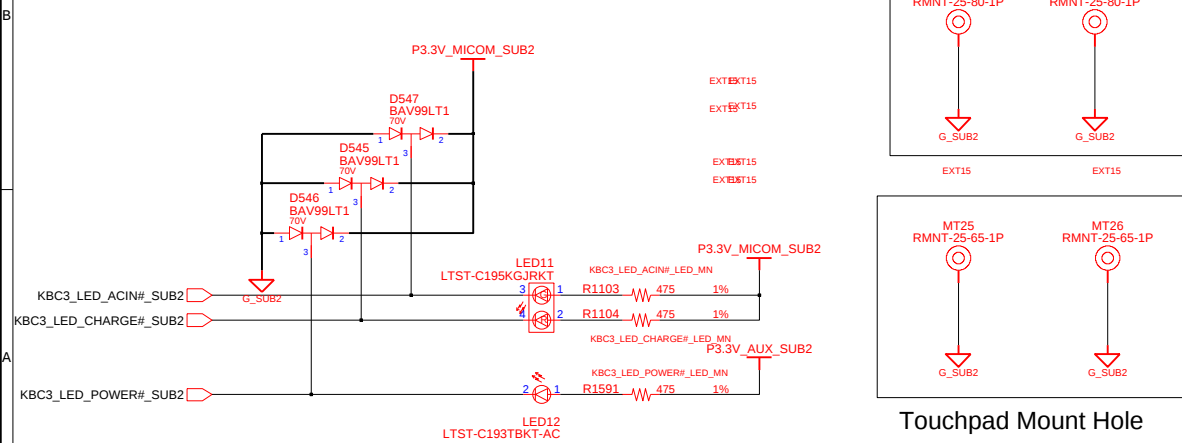
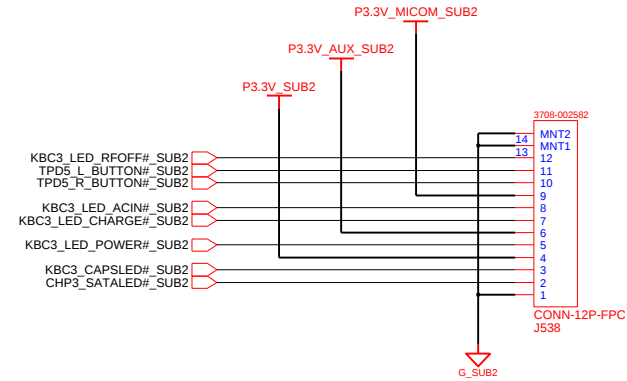
DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT SUB BOARD3 ODD SUB	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT		December 25, 2010 10:42:33 AM	PAGE 49 OF 52	

15.6"

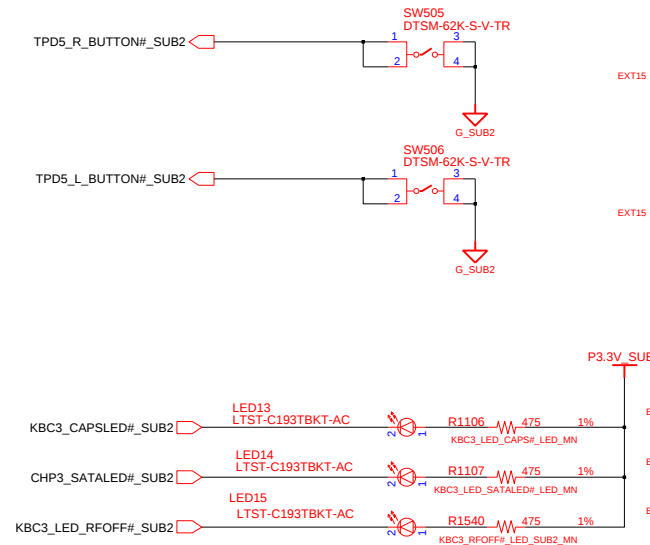
TOUCHPAD MAIN TO SUB



TOUCHPAD SUB TO MAIN

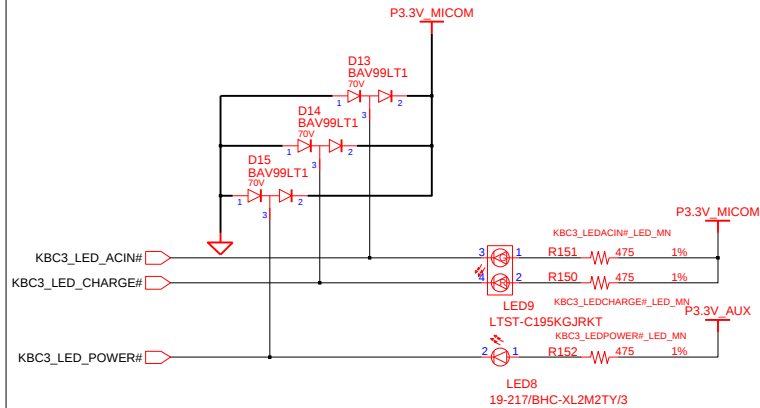


Touchpad Mount Hole

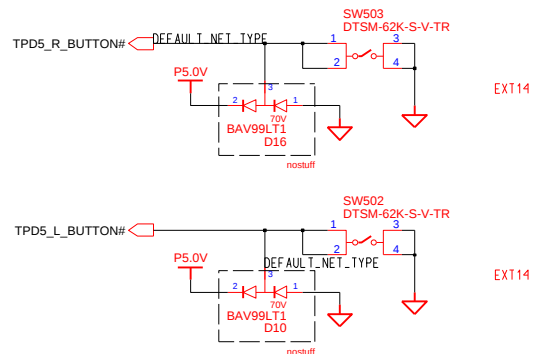


DRAW	QZ DAI	DATE	8/19/2010	TITLE	SCALA2-EXT SUB BOARD4 MULTIMEDIA SUB	SAMSUNG ELECTRONICS
CHECK	SIMMAN WU	DEV. STEP	MP			PART NO. BA41-01423A
APPROVAL	BC LEE	REV	rev. 1.1			
MODULE CODE		LAST EDIT	December 25, 2010 10:42:33 AM	PAGE	50	OF 52

ADAPTERIN/CHARGING LED



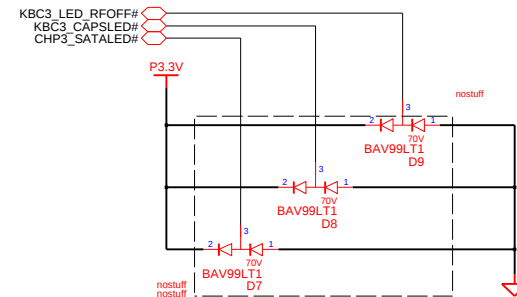
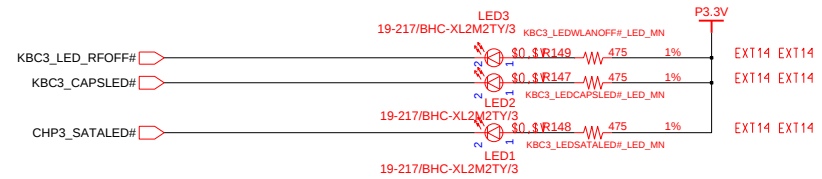
EXT14
EXT14 EXT14
EXT14 EXT14
EXT14 EXT14
EXT14



EXT14

EXT14

ADAPTERIN/CHARGING LED



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

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Figure 1: Schematic diagram of the test setup. The diagram shows two rows of four test points each. The top row contains MT512, MT506, MT510, and MT510. The bottom row contains MT509, MT505, MT501, and MT502. Each test point is represented by a red circle with a red dot in the center. A red line connects each test point to a red triangle below it. The labels for each test point are: MT512, RMNT-25-65-1P; MT506, RMNT-25-65-1P; MT510, RMNT-30-80-1P; MT510, RMNT-30-80-1P; MT509, RMNT-30-80-1P; MT505, RMNT-30-80-1P; MT501, RMNT-30-80-1P; MT502, RMNT-30-80-1P. The voltage for each test point is indicated by a red '\$V' symbol: \$0.5V for MT512, MT506, MT510, and MT510; \$V for MT509, MT505, MT501, and MT502.

DRAW	QZ DAI	DATE	5/10/2010	SCALA2-EXT Switched PWR 2 FOR OPTIMUS PWR	SAMSUNG ELECTRONICS			
CHECK	SIMMAN WU	DEV. STEP	MP		PART NO.	BA41-01423A		
APPROVAL	BC LEE	REV	rev. 1.1					
MODULE CODE	LAST EDIT							