

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.

Houston13

CPU : Arrandale SV BGA
Chip Set : Intel HM55(Ibex Peak)
GFX : N11M -GE2-S(small pkg)
Remarks : Calpella Platform

Model Name : Houston 13
PBA Name : MAIN
PCB Code : BA41-xxxxxA
Dev. Step : PVR
Revision : 1.0
T.R. Date : 2010.4.2

- sheet01 : Cover
- sheet02 : Cover
- sheet03 : Cover
- sheet04 : Cover
- sheet05 : Cover
- sheet06 : Cover
- sheet07 : Cover
- sheet08 : CK505-SHRINK
- sheet09 : Thermal Sensor
- sheet10 : MCP
- sheet11 : MCP
- sheet12 : MCP
- sheet13 : MCP
- sheet14 : MCP
- sheet15 : DDR3 SODIMM
- sheet16 : DDR3 SODIMM
- sheet17 : PCH-IbexPeak
- sheet18 : PCH-IbexPeak
- sheet19 : PCH-IbexPeak
- sheet20 : PCH-IbexPeak
- sheet21 : PCH-IbexPeak
- sheet22 : 80 port
- sheet23 : N11M-OP1/GE1
- sheet24 : N11M-OP1/GE1
- sheet25 : N11M-OP1/GE1
- sheet26 : N11M-OP1/GE1 & Strap
- sheet27 : GFX memory
- sheet28 : GFX memory
- sheet29 : LVDS / CAMERA
- sheet30 : CRT

- sheet31 : HDMI
- sheet32 : Audio - ALC269
- sheet33 : Audio - HP/MIC
- sheet34 : LAN
- sheet35 : 2-in-1 card
- sheet36 : WLAN
- sheet37 : SATA interface
- sheet38 : MICOM
- sheet39 : MICOM Glue Logic/TP/TP LED
- sheet40 : LED
- sheet41 : USB connector
- sheet42 : Bluetooth
- sheet43 : Power - charger
- sheet44 : Power - P3.3V_AUX / P5.0V_AUX
- sheet45 : Power - P1.05V
- sheet46 : Power - DDR3
- sheet47 : Power - CPU VRM
- sheet48 : Power - IGFX_CORE
- sheet49 : Power - EGFX_CORE
- sheet50 : Power - Switched Power 1
- sheet51 : Power - Power Discharge
- sheet52 : USB/POWER SW SUB BD
- sheet53 : Power - Switched Power 2
- sheet54 : ICT FREE

Design	CHECK	APPROVAL

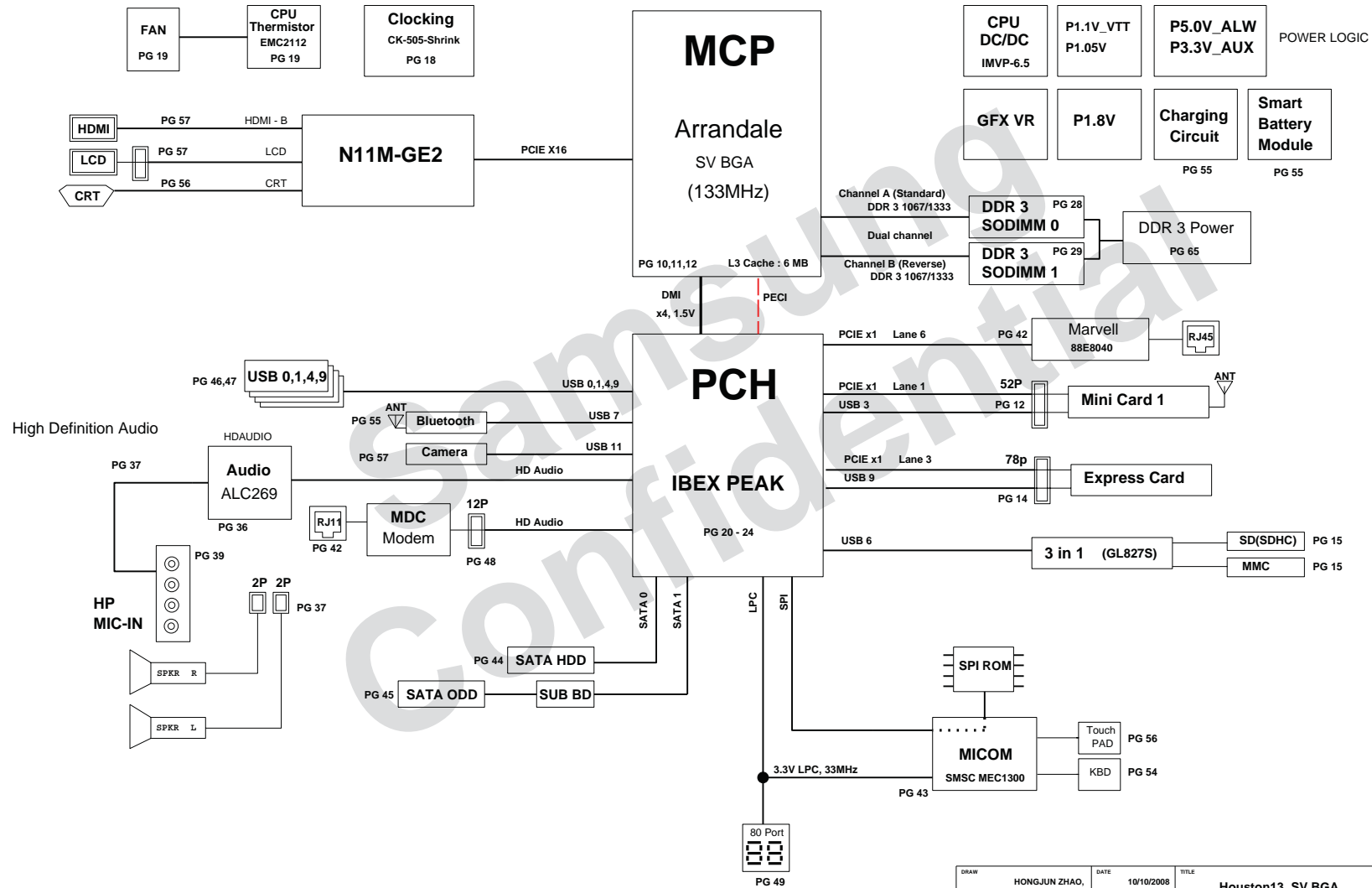
Owner : SEC Mobile R & D Signature : X

<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV.STEP	ADV1		MAIN	
APPROVAL	BC LEE,	REV	1.0		COVER	PART NO. BA41-####A
MODULE CODE		LAST EDIT		January, 16, 2010 4:17:48 PM	PAGE	1 OF 53

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



<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	MAIN	MAIN	
APPROVAL	BC LEE,	REV	1.0	BLOCK DIAGRAM		PART NO. BA41-####A
MODULE CODE		LAST EDIT			January, 16, 2010 4:17:48 PM	PAGE 2 OF 53

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.

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails	Active in	
VDC P3.3V_MICOM P5.0V_ALW P5.0V_STB	Primary DC system power supply (7 to 21V) 3.3V always power rail (for Micom) 5.0V always power rail 5.0V always power rail	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 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) 0.9V power rail for DDR (off in S3-S5)	S0
VCC_CORE EGFX_CORE P1.05V (VCCP) P1.1V_VTT	Core Voltage for CPU Core Voltage for GPU VCC for Clarksfield & IBEX Peak VTT for CLARDSFIELD & IBEX Peak	S0

Crystal / Oscillator			
TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	IBEX-PEAK	Real Time Clock
Crystal	10MHz	MICOM	MEC1308-NU
Crystal	14.318MHz	CLOCK-Generator	CK-505
Crystal	25MHz	LAN	88E8040-A0
Crystal	25MHz	IBEX PEAK	

LCD Pannel Detect (TBD)		
Devices	Resolution	PANNEL_DETECT_0

I ² C / SMB Address			
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	

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	Multi Memory Card Controller	3	NC
3	NC	4	PCIe LAN
4	NC	5	NC
5	NC	6	NC
6	NC	7	NC (N/A WITH HM55)
7	NC	8	NC (N/A WITH HM55)
8	TSP LCD		
9	SYSTEM PORT 9		
10	Bluetooth		
11	Camera		
12	NC		
13	NC		

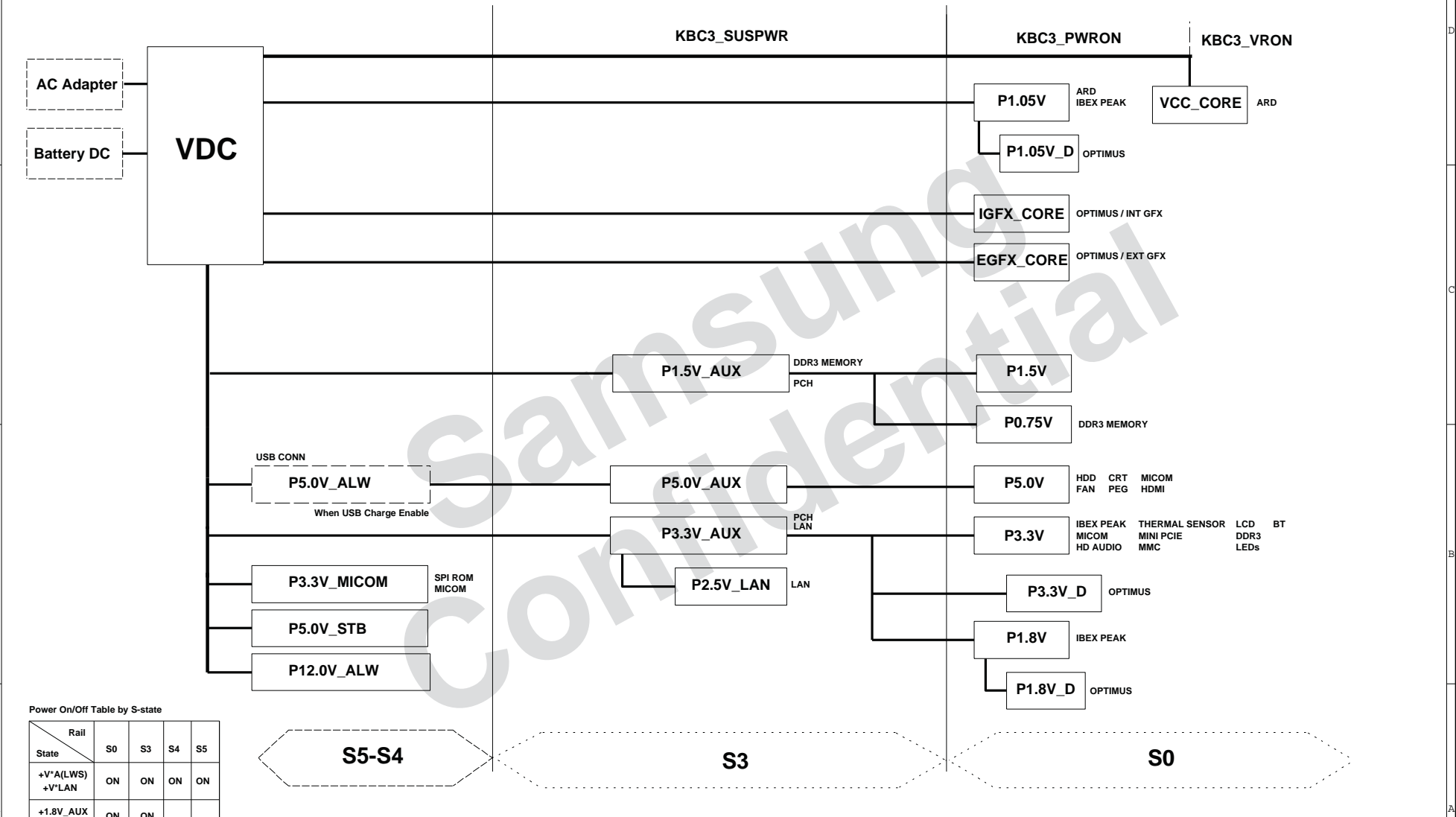
SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	ODD
2	(N/A WITH HM55)
3	(N/A WITH HM55)
4	e-SATA
5	

<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		MAIN	
APPROVAL	BC LEE,	REV	1.0		BOARD INFORMATION	
MODULE CODE		LAST EDIT				
				January, 16, 2010 4:24:12 PM	PAGE	3 OF 53

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 DIAGRAM Rev 0.1



Power On/Off Table by S-state

Rail	S0	S3	S4	S5
+V*(LWS) +V*LAN	ON	ON	ON	ON
+1.8V_AUX +0.9V	ON	ON	—	—
+V*AUX	ON	ON	—	—
+V	ON	—	—	—
+V* (CORE)	ON	—	—	—

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	MAIN	MAIN	
APPROVAL	BC LEE,	REV	1.0	POWER DIAGRAM	PAGE	4 OF 53
MODULE CODE		LAST EDIT	January, 16, 2010 4:24:56 PM			

<http://hobi-elektronika.net>

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

Rev. 0.6 (060920)

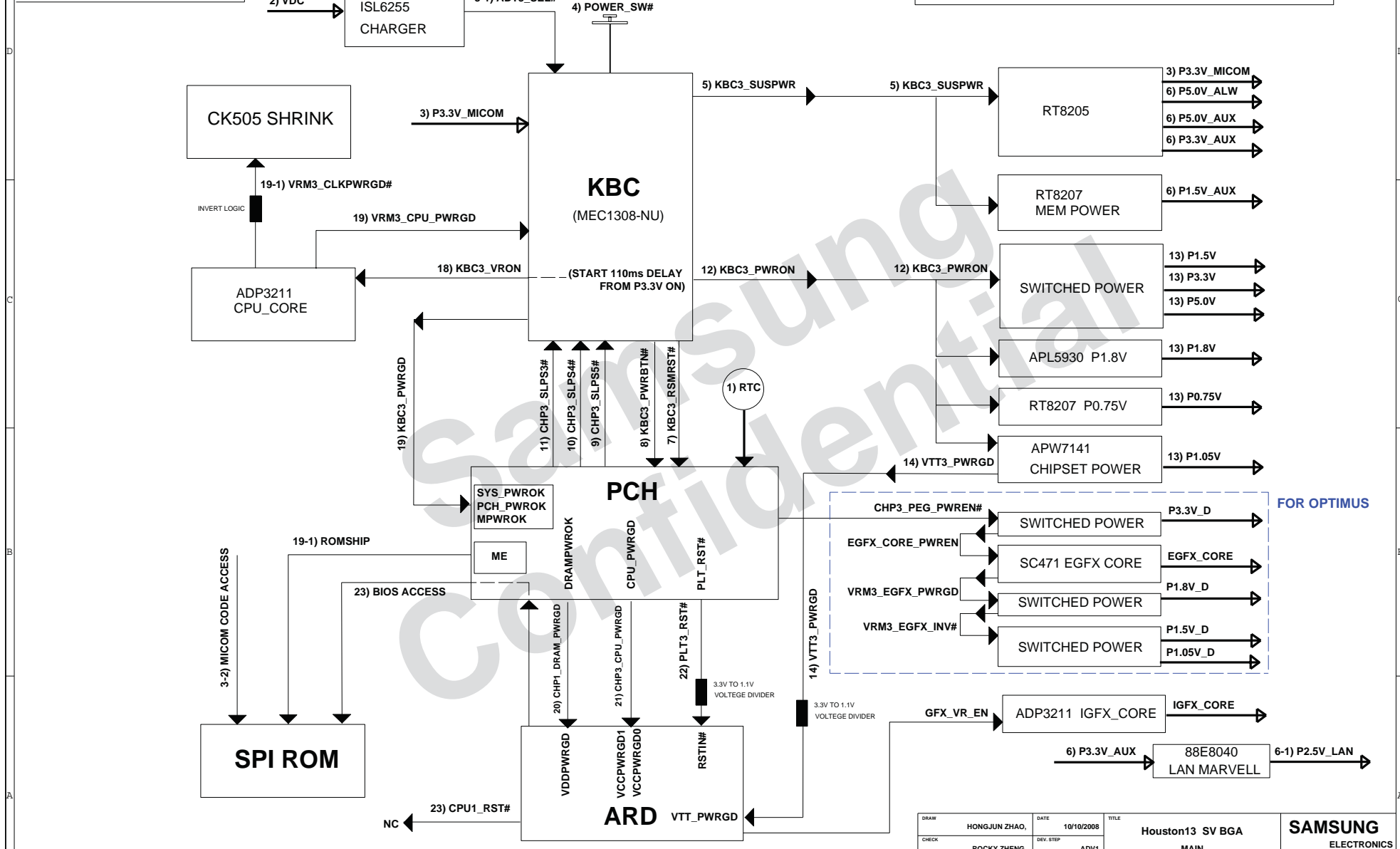
Samsung
 Confidential

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	MAIN		
APPROVAL	BC LEE,	REV	1.0	COVER		PART NO. BA41-####A
MODULE CODE		LAST EDIT	January, 16, 2010 4:27:06 PM	PAGE	5	OF 53

<http://hobi-elektronika.net>

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 SEQUENCE Rev. 0.5

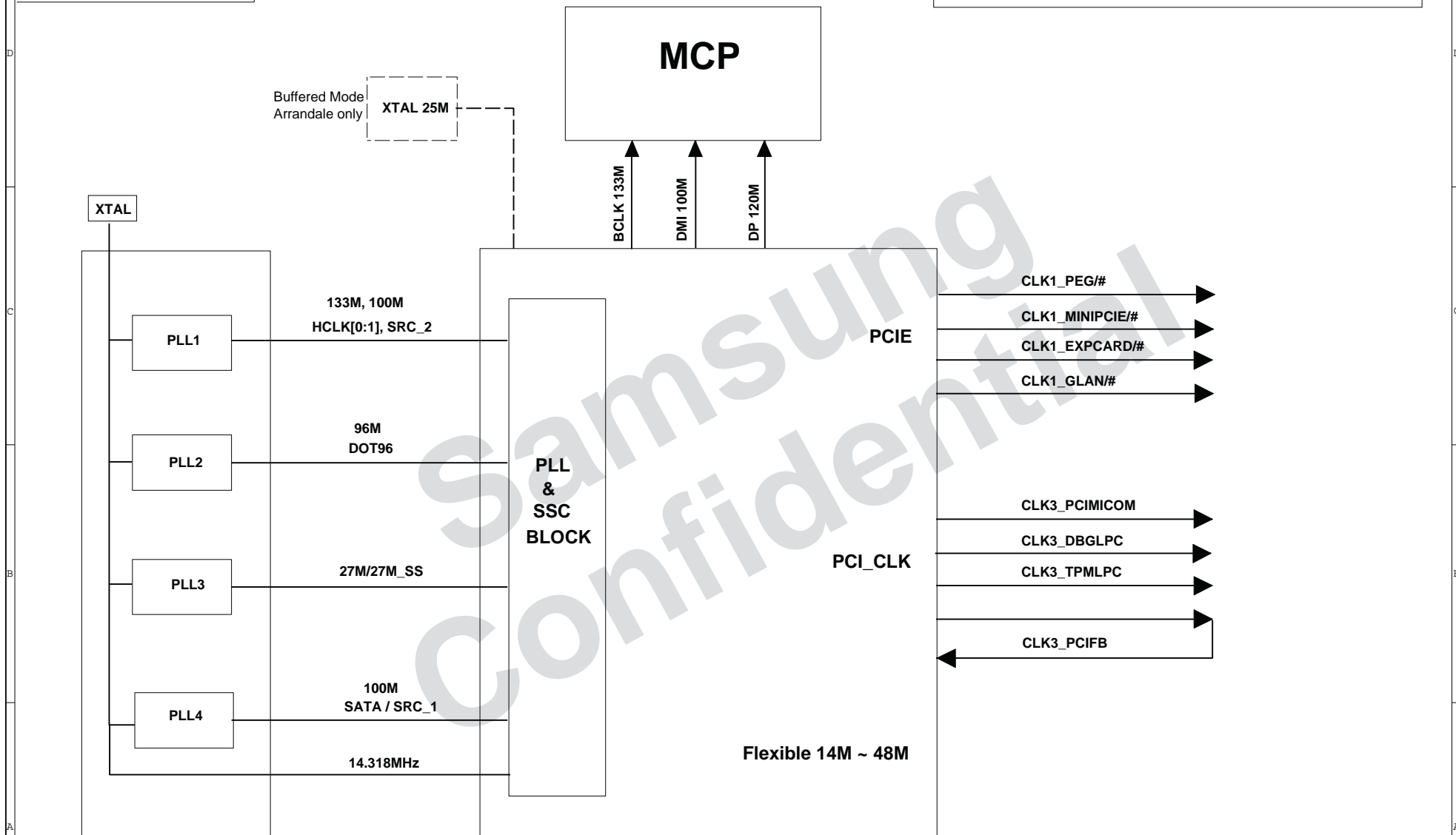


<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		MAIN	
APPROVAL	BC LEE,	REV	1.0		POWER SEQUENCE	PART NO. BA41-####A
MODULE CODE		LAST EDIT			January, 16, 2010 4:28:57 PM	PAGE 6 OF 53

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.

CLOCK DISTRIBUTION Rev. 0.1



<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	MAIN	MAIN	
APPROVAL	BC LEE,	REV	1.0	CLOCK DIAGRAM	PART NO.	BA41-####A
MODULE CODE		LAST EDIT	January, 16, 2010 4:30:04 PM	PAGE	7	OF 53

SAMSUNG PROPRIETARY

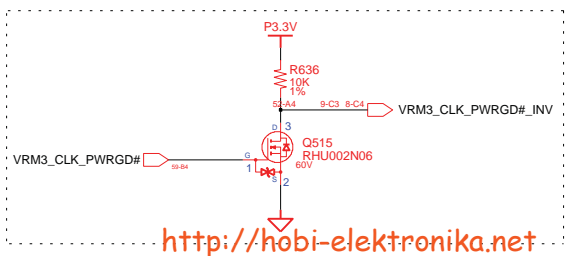
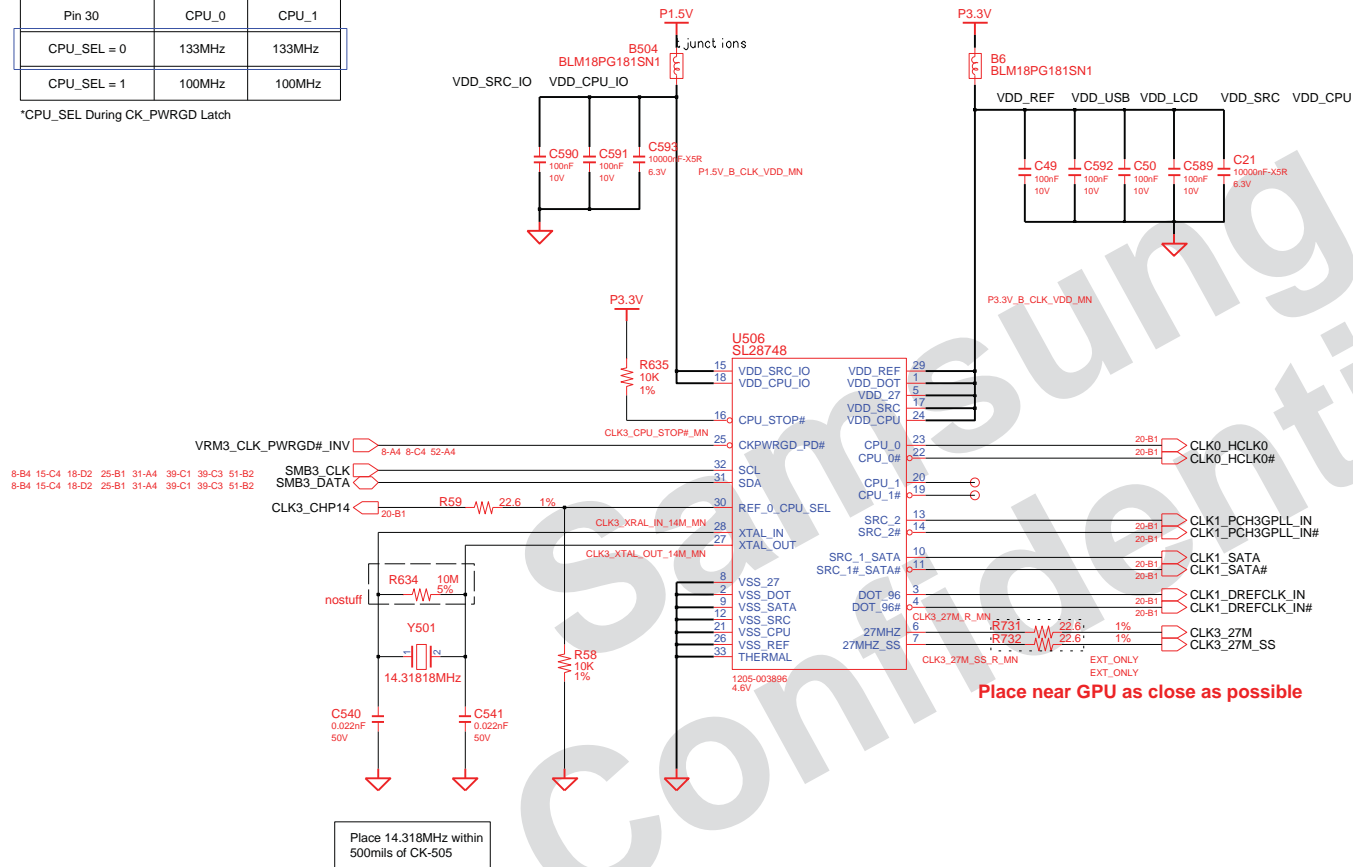
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.

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



DRAW	HONGJUN ZHAO,	DATE	10/10/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV.STEP	ADV1		CLOCK	
APPROVAL	BC LEE,	REV	1.0		CK505 SHRINK	PART NO. BA41-####A
MODULE CODE		LAST EDIT				
				January, 16, 2010 4:31:36 PM	PAGE	8 OF 53

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

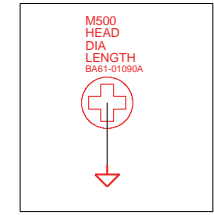
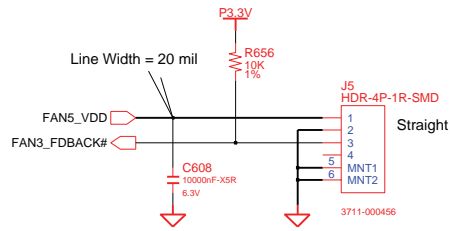
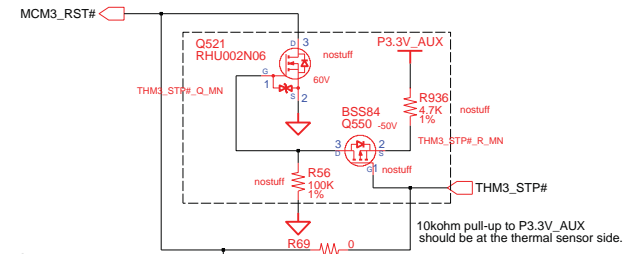
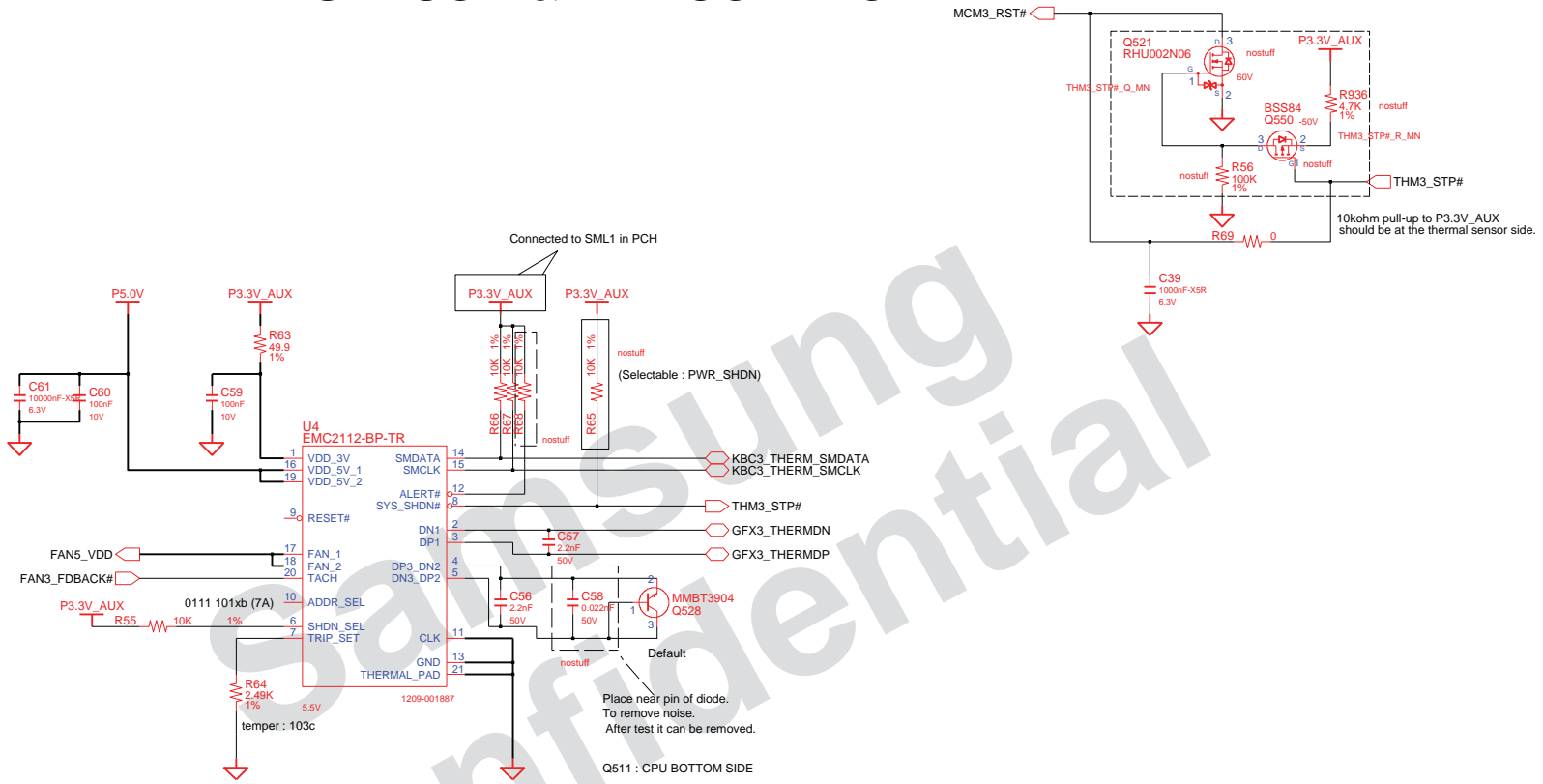
MICOM RESET

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

TRIP_SET Resistor Setting (60 ~ 122 C)	
60	0.0
✓ 95	1500
96	1580
97	1690
98	1820
99	1960
100	2050
101	2210
102	2370
103	2550
104	2740
105	2940
122	49900

$V_Trip = (T_Trip - T_Min) / 80$
 V_TRIP : TRIP_SET Voltage
 T_Min : Minimum Temperature



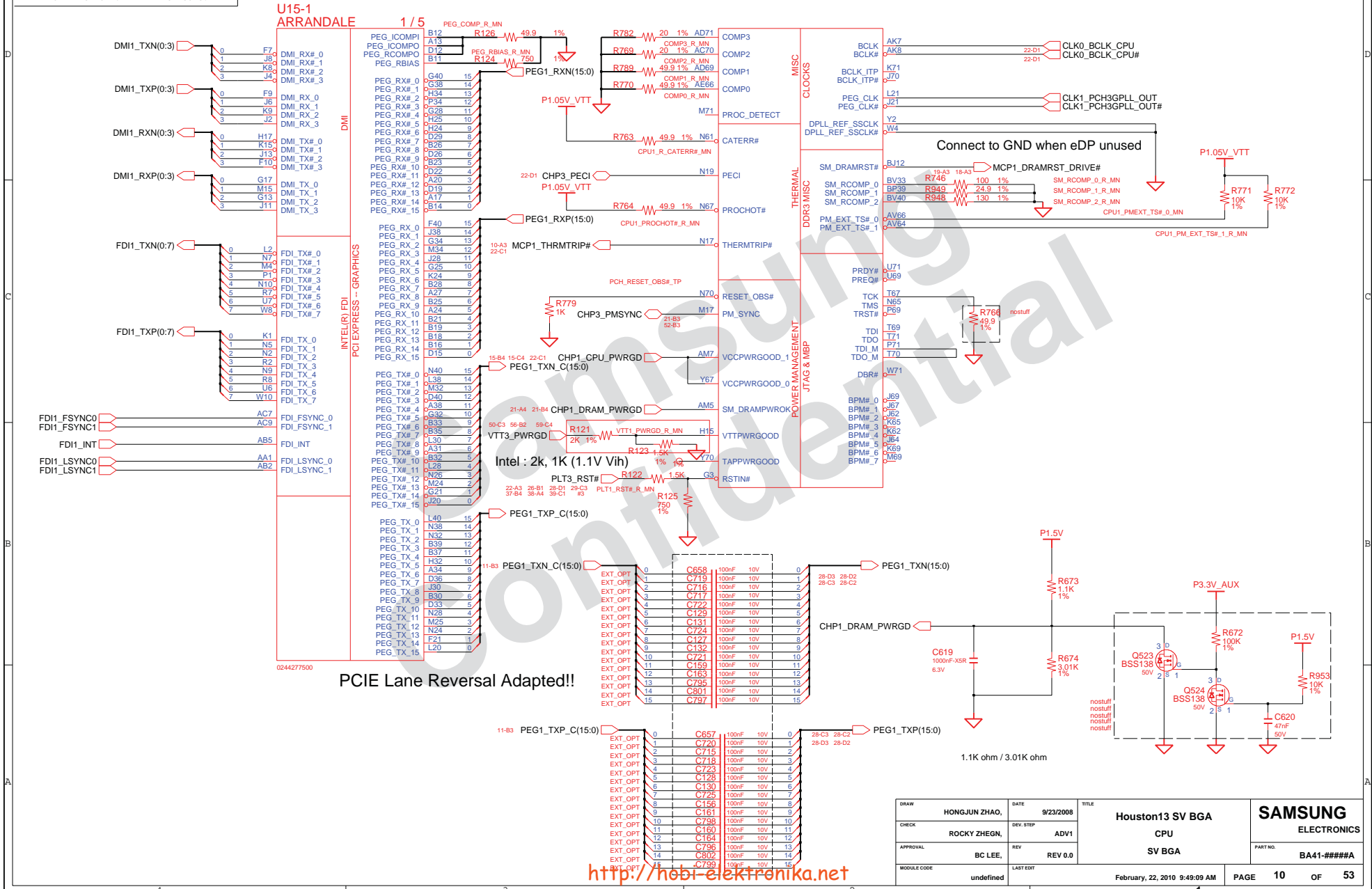
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV.STEP	ADV1		THERMAL SENSOR	
APPROVAL	BC LEE,	REV	REV 0.0		THERMAL SENSOR EMC2112	PART NO. BA41-####A
MODULE CODE	undefined	LAST EDIT			February, 22, 2010 9:47:19 AM	PAGE 9 OF 53

<http://hobi-elektronika.net>

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.

ARRANDALE/CLARKSFIELD PROCESSOR (DMI,PEG, FDI)

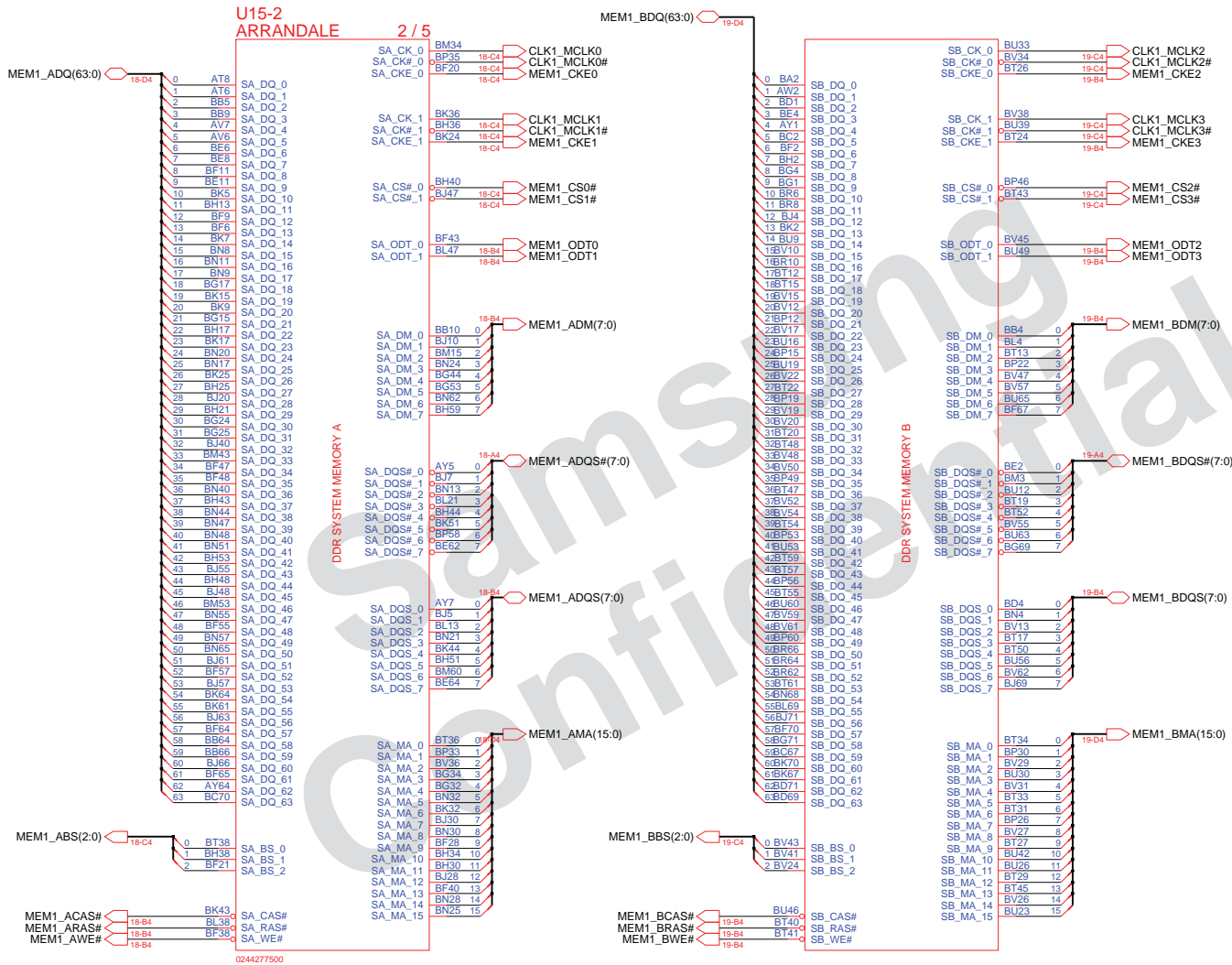


DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHEGN,	DEV. STEP	ADV1		CPU	
APPROVAL	BC LEE,	REV	REV 0.0		SV BGA	PART NO. BA41-####A
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 9:49:09 AM	PAGE	10	OF 53

<http://nobi-elektronika.net>

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.



0244277500

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHEGN,	DEV. STEP	ADV1		CPU	
APPROVAL	BC LEE,	REV	REV 0.0		SV BGA	PART NO.
MODULE CODE	undefined	LAST EDIT		February, 22, 2010 9:50:02 AM	PAGE	11 OF 53

<http://hobi-elektronika.net>

SAMSUNG PROPRIETARY

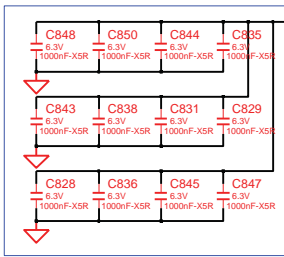
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.

ALL VTT DECAP IS SHARED

****VTT POWER SELECTION**

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

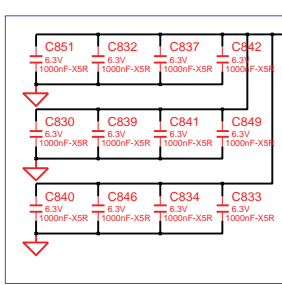
Charger : PI



U15-3 ARRANDALE3/5 CPU_CORE

BD55	VCAPA_1	VCC_1	AF57
BD51	VCAPA_2	VCC_2	AF55
BD49	VCAPA_3	VCC_3	AF53
BB56	VCAPA_4	VCC_4	AF51
BB54	VCAPA_5	VCC_5	AF50
BB48	VCAPA_6	VCC_6	AF48
AY53	VCAPA_7	VCC_7	AF46
AY50	VCAPA_8	VCC_8	AF44
AW57	VCAPA_9	VCC_9	AF42
AW53	VCAPA_10	VCC_10	AF41
AW50	VCAPA_11	VCC_11	AD55
AL55	VCAPA_12	VCC_12	AD51
AL50	VCAPA_13	VCC_13	AD48
AK50	VCAPA_14	VCC_14	AD44
AK50	VCAPA_15	VCC_15	AD41
AR48	VCAPA_16	VCC_16	AB55
AN50	VCAPA_17	VCC_17	AB51
AN57	VCAPA_18	VCC_18	AB48
AN53	VCAPA_19	VCC_19	AB44
AL57	VCAPA_20	VCC_20	AA55
AL53	VCAPA_21	VCC_21	AA51
AL50	VCAPA_22	VCC_22	AA48
AK50	VCAPA_23	VCC_23	AA44
AK50	VCAPA_24	VCC_24	AA41
AK50	VCAPA_25	VCC_25	WS55
AK50	VCAPA_26	VCC_26	WS51
AK50	VCAPA_27	VCC_27	WS48
		VCC_28	W48
		VCC_29	W44
		VCC_30	W41
		VCC_31	U55
		VCC_32	U51
		VCC_33	U48
		VCC_34	U44
		VCC_35	U41
		VCC_36	R55
		VCC_37	R51
		VCC_38	R48
		VCC_39	R44
		VCC_40	R41
		VCC_41	P60
		VCC_42	N55
		VCC_43	N51
		VCC_44	N48
		VCC_45	N44
		VCC_46	N42
		VCC_47	M60
		VCC_48	M44
		VCC_49	L55
		VCC_50	K60
		VCC_51	K61
		VCC_52	K44
		VCC_53	J55
		VCC_54	H60
		VCC_55	H44
		VCC_56	G55
		VCC_57	G60
		VCC_58	F55
		VCC_59	F44
		VCC_60	G51
		VCC_61	G44
		VCC_62	F55
		VCC_63	E60
		VCC_64	E57
		VCC_65	E53
		VCC_66	E46
		VCC_67	E42
		VCC_68	D59
		VCC_69	D57
		VCC_70	D54
		VCC_71	D52
		VCC_72	D50
		VCC_73	D48
		VCC_74	D47
		VCC_75	D45
		VCC_76	D43
		VCC_77	D43
		VCC_78	B56
		VCC_79	B53
		VCC_80	B49
		VCC_81	B49
		VCC_82	B46
		VCC_83	B46
		VCC_84	B42
		VCC_85	A57
		VCC_86	A54
		VCC_87	A50
		VCC_88	A47
		VCC_89	A43

Charger : PI



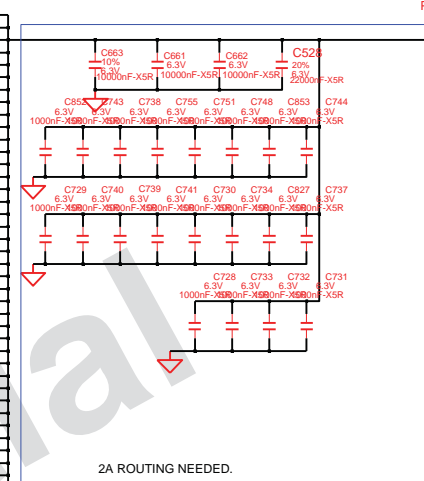
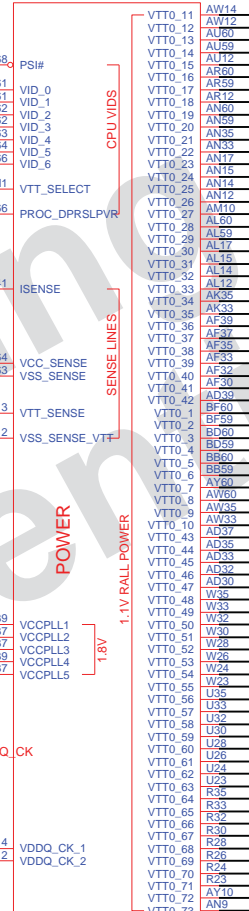
POWER

BD44	VCAP1_1	VCC_44	N44
BD41	VCAP1_2	VCC_45	N42
BD37	VCAP1_3	VCC_46	M60
BB44	VCAP1_4	VCC_47	M44
BB41	VCAP1_5	VCC_48	M44
BB37	VCAP1_6	VCC_49	L55
AY46	VCAP1_7	VCC_50	K60
AY42	VCAP1_8	VCC_51	K61
AY39	VCAP1_9	VCC_52	K44
AW46	VCAP1_10	VCC_53	J55
AW42	VCAP1_11	VCC_54	H60
AW39	VCAP1_12	VCC_55	H44
AL44	VCAP1_13	VCC_56	G55
AL41	VCAP1_14	VCC_57	G60
AL37	VCAP1_15	VCC_58	F55
AR44	VCAP1_16	VCC_59	F44
AR41	VCAP1_17	VCC_60	G51
AN47	VCAP1_18	VCC_61	G44
AN46	VCAP1_19	VCC_62	F55
AN42	VCAP1_20	VCC_63	E60
AN39	VCAP1_21	VCC_64	E57
AL46	VCAP1_22	VCC_65	E53
AL42	VCAP1_23	VCC_66	E46
AL39	VCAP1_24	VCC_67	E42
AK46	VCAP1_25	VCC_68	D59
AK42	VCAP1_26	VCC_69	D57
AK39	VCAP1_27	VCC_70	D54
		VCC_71	D52
		VCC_72	D50
		VCC_73	D48
		VCC_74	D47
		VCC_75	D45
		VCC_76	D43
		VCC_77	D43
		VCC_78	B56
		VCC_79	B53
		VCC_80	B49
		VCC_81	B49
		VCC_82	B46
		VCC_83	B46
		VCC_84	B42
		VCC_85	A57
		VCC_86	A54
		VCC_87	A50
		VCC_88	A47
		VCC_89	A43

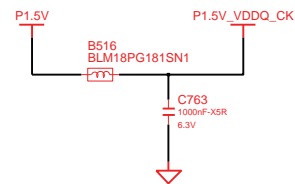
12 22uF Place inside cavity of the socket
7 10uF Under cavity of the socket
9 10uF Between inductor and s0cket on top layer

Charger : PI

<http://hobi-elektronika.net>



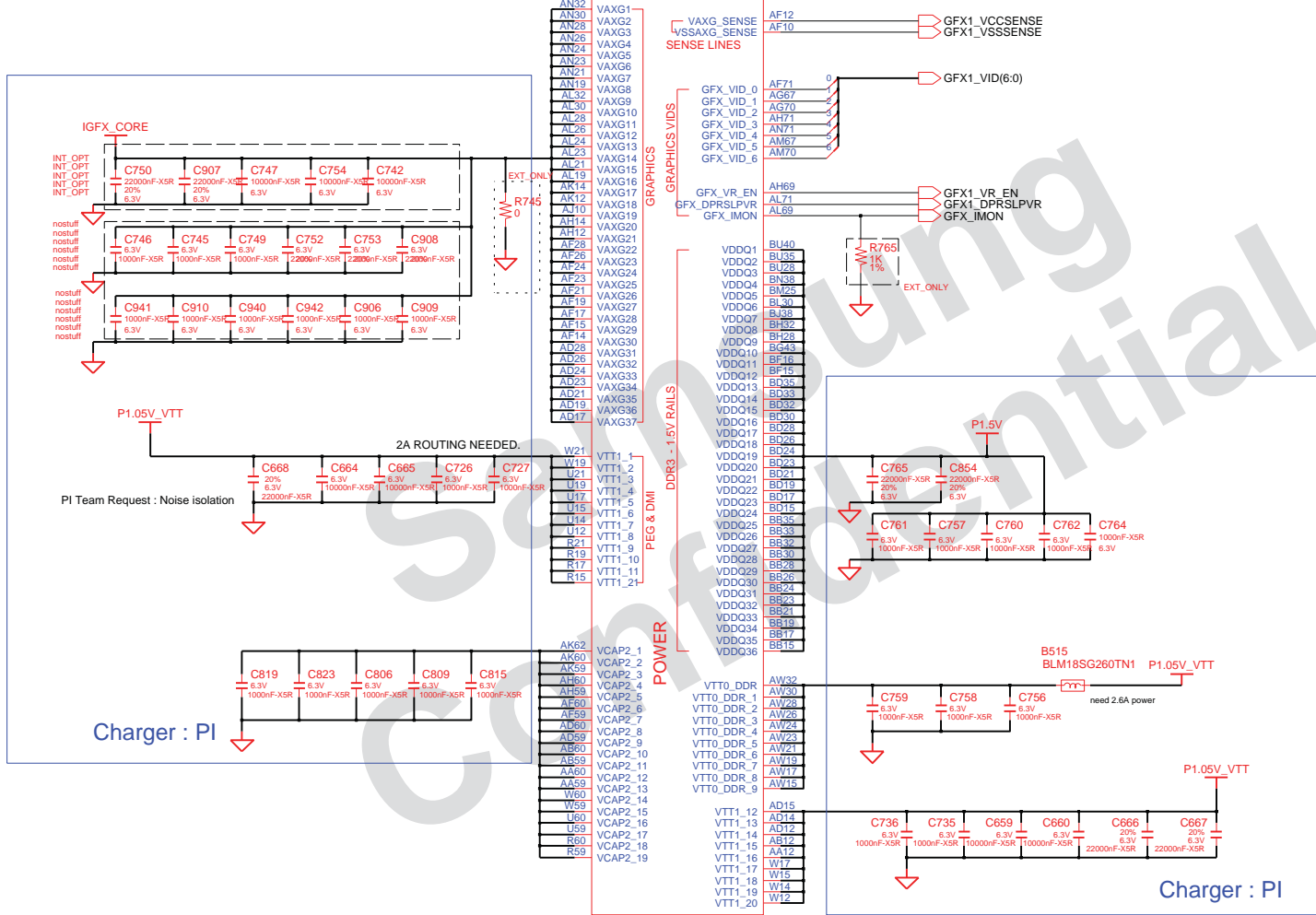
Charger : PI



DESIGN	HONGJUN ZHAO,	DATE	6/26/2009	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHEGN,	DEV. STEP	ADV1		CPU	
APPROVAL	BC LEE,	REV	REV 0.0		SV BGA	PART NO. BA41-#####A
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 9:50:54 AM	PAGE	12	OF 53

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.

**U15-4
 ARRANDALE 4 / 5**



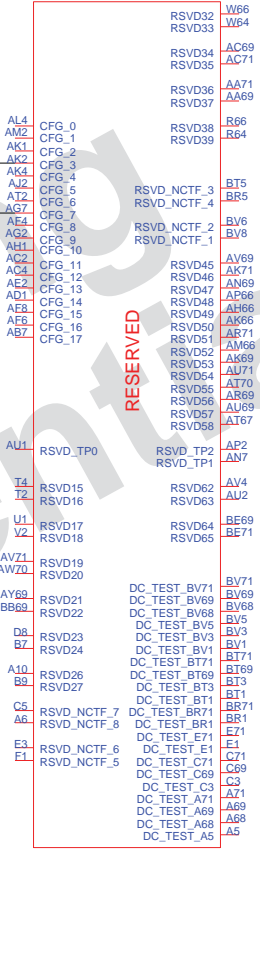
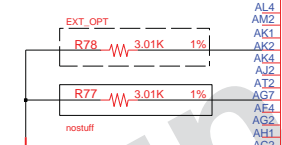
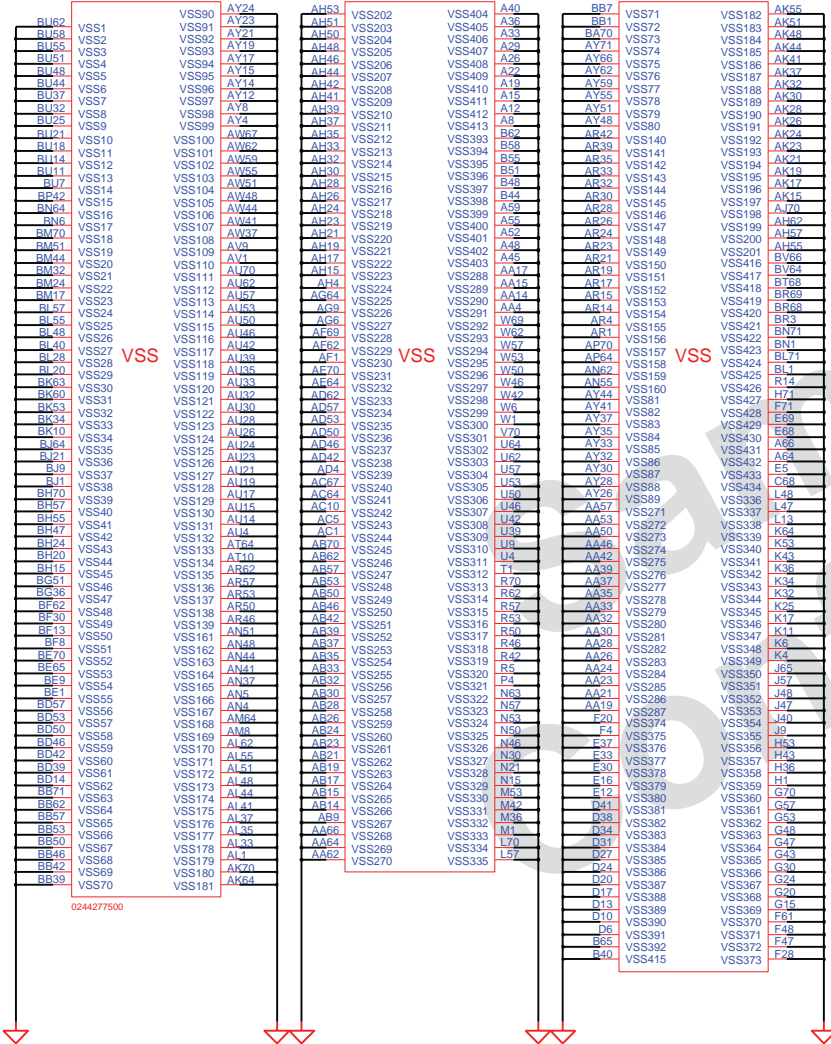
0244277500

DESIGN	HONGJUN ZHAO,	DATE	8/19/2009	TITLE	Houston13 SV BGA CPU SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1			
APPROVAL	BC LEE,	REV	REV 0.0			
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 9:51:40 AM	PAGE		

<http://hobi-elektronika.net>

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.

**U15-5
 ARRANDALE5 / 5**



RESERVED

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

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Honston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		CPU	
APPROVAL	BC LEE,	REV	REV 0.0		SV BGA	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 9:52:25 AM	PAGE	14 OF 53	

<http://hobi-elektronika.net>

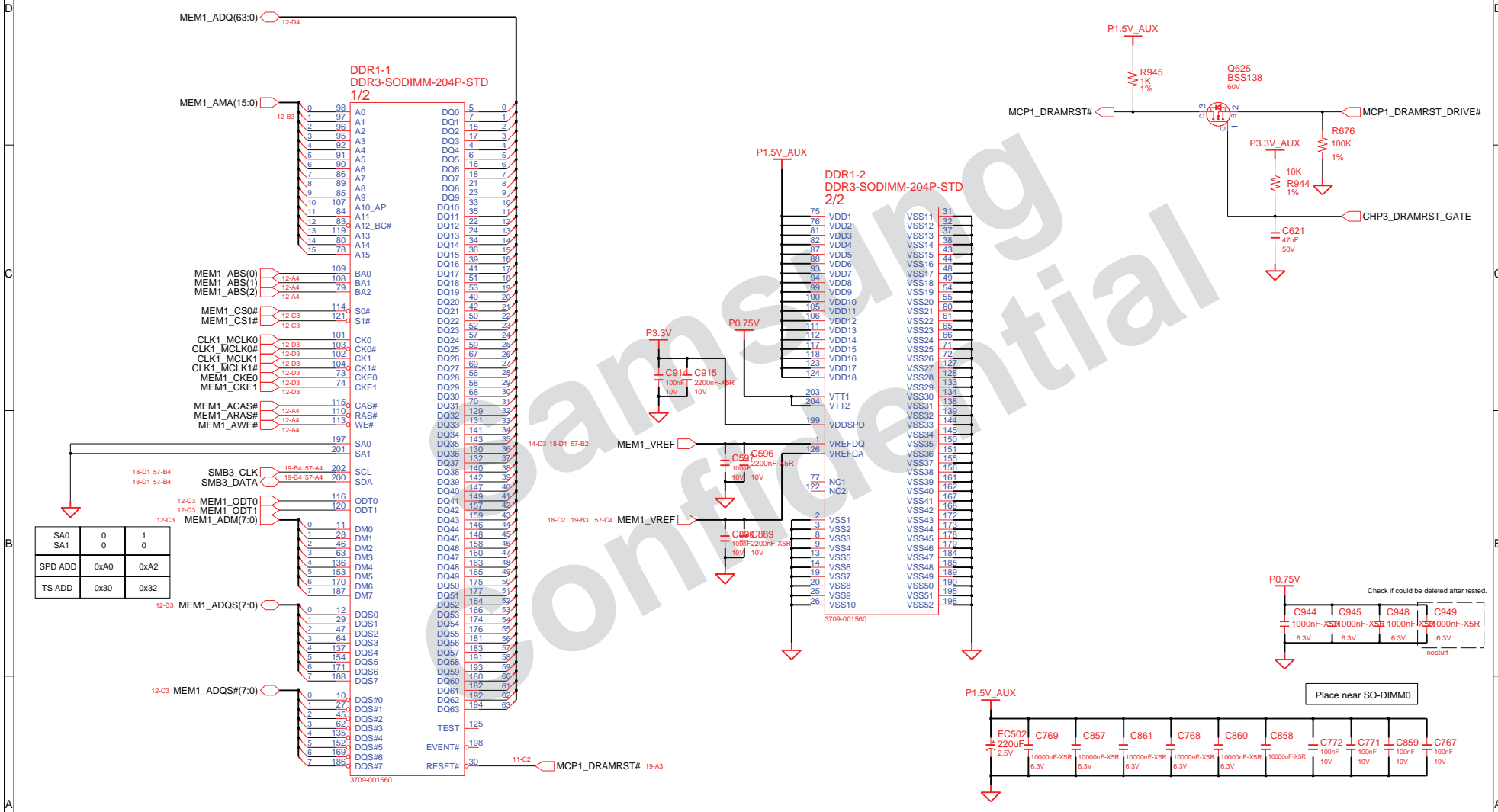
SAMSUNG PROPRIETARY
 THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

DDR SO-DIMM #0

Height : 4 mm (STANDARD)

P/N : 3709-001532 (Molex)

P/N : 3709-001560 (Foxconn)



SA0	0	1
SA1	0	0
SPD ADD	0xA0	0xA2
TS ADD	0x30	0x32

Check if could be deleted after tested.
 C944 1000nF-XSR 6.3V
 C945 1000nF-XSR 6.3V
 C948 1000nF-XSR 6.3V
 C949 1000nF-XSR 6.3V
 no-stuff

Place near SO-DIMMO

EC502 220uF 2.5V
 C769 1000nF-XSR 6.3V
 C857 1000nF-XSR 6.3V
 C861 1000nF-XSR 6.3V
 C768 1000nF-XSR 6.3V
 C860 1000nF-XSR 6.3V
 C858 1000nF-XSR 6.3V
 C772 100nF 10V
 C771 100nF 10V
 C859 100nF 10V
 C767 100nF 10V

DRAW	HONGJUN ZHAO,	DATE	2/27/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		SODIMM A	
APPROVAL	BC LEE,	REV	REV 0.0		DDR3	PART NO. BA41-####A
MODULE CODE	undefined	LAST ENT	February, 22, 2010 9:55:33 AM	PAGE	15	OF 53

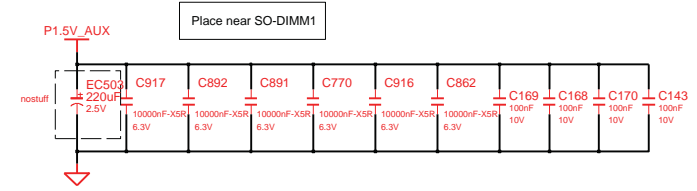
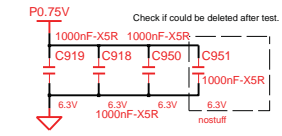
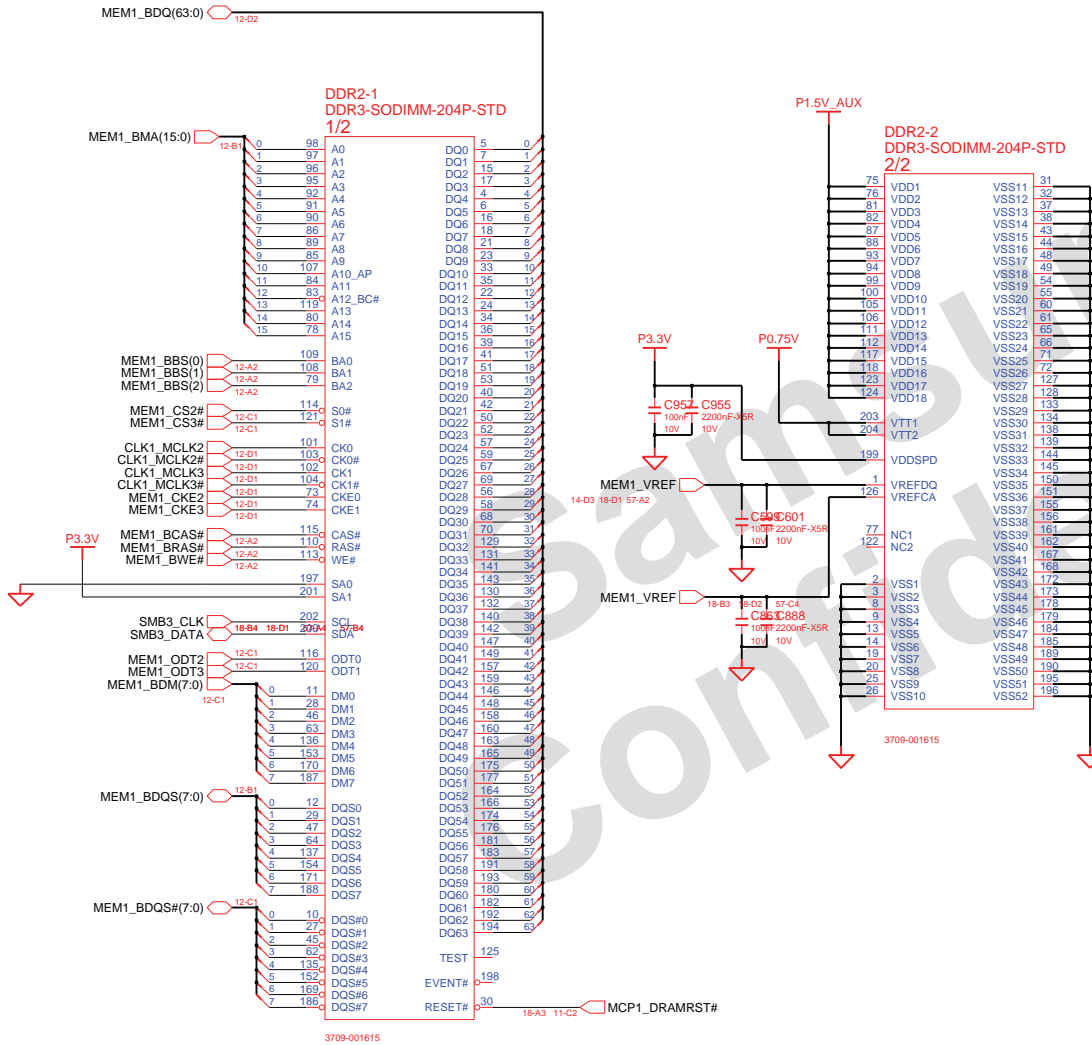
<http://hobi-elektronika.net>

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 : 9 mm

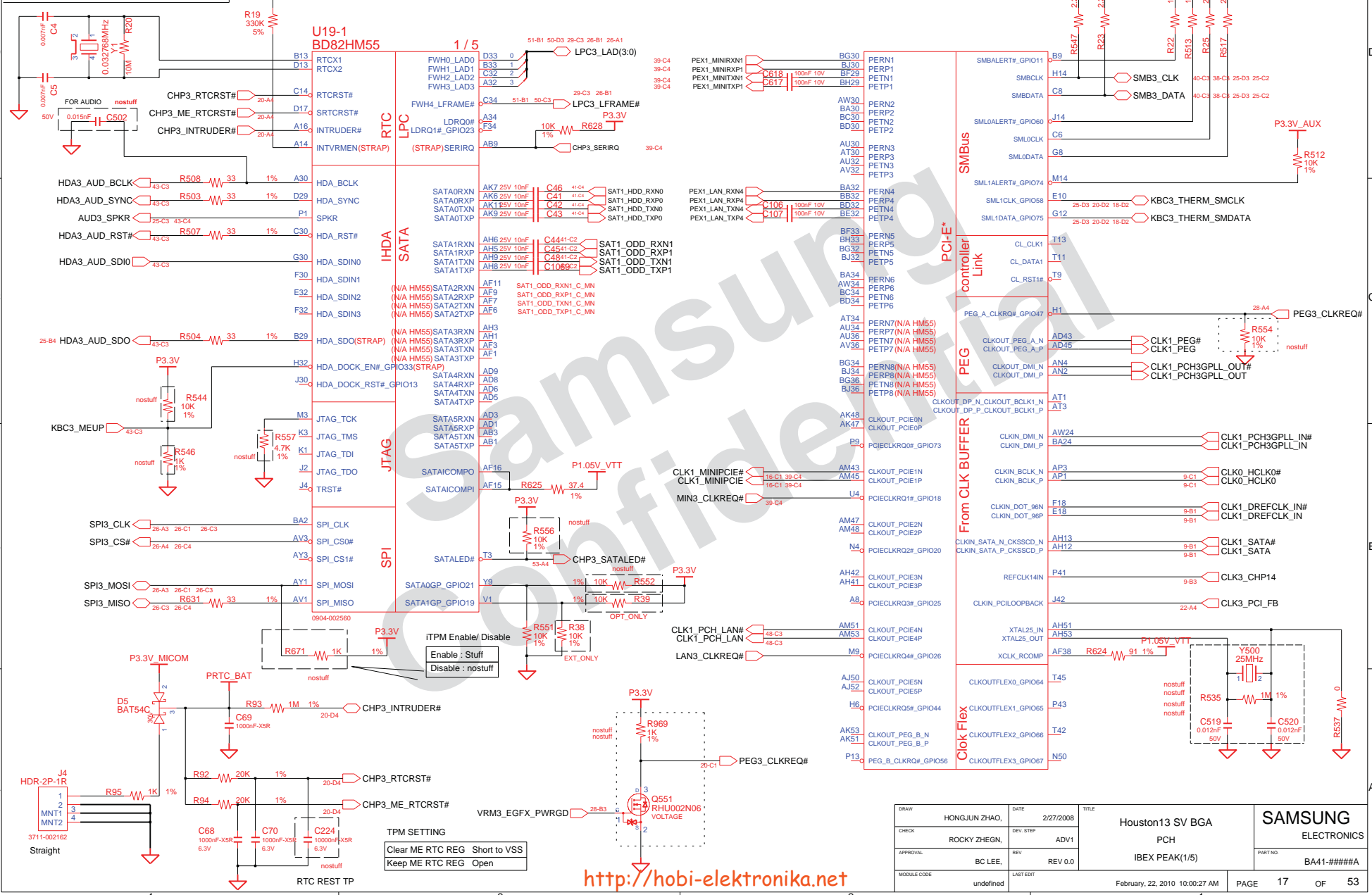
P/N : 3709-001559 (Foxconn)



DRAW	HONGJUN ZHAO,	DATE	2/27/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHEGN,	DEV. STEP	ADV1		SODIMM B	
APPROVAL	BC LEE,	REV	REV 0.0		DDR3	PART NO. BA41-####A
MODULE CODE	undefined	LAST ENT	February, 22, 2010 9:57:27 AM	PAGE	16	OF 53

<http://hobi-elektronika.net>

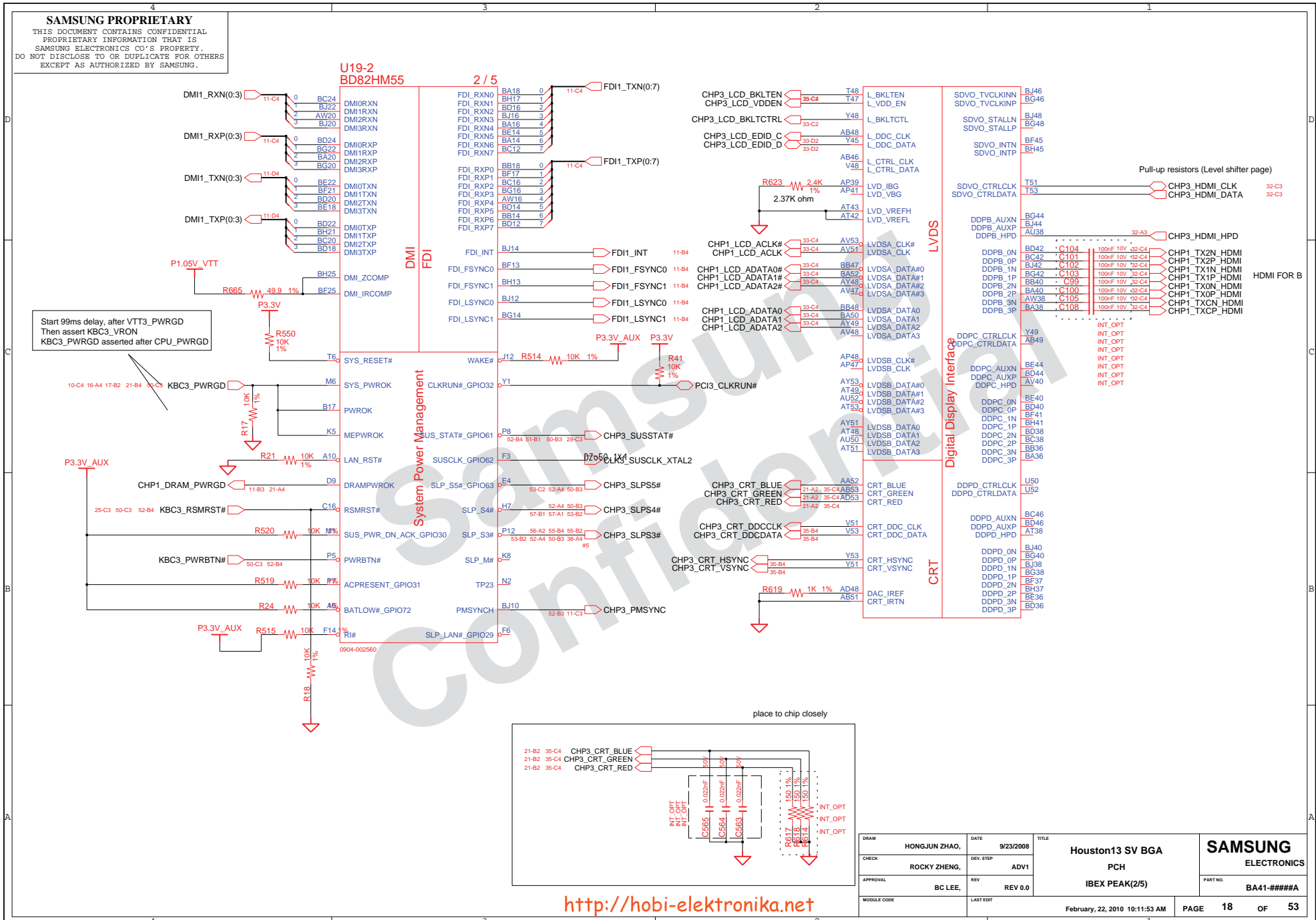
SAMSUNG PROPRIETARY
 THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	HONGJUN ZHAO,	DATE	2/27/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHEGN,	DEV. STEP	ADV1	PCH	PART NO.	
APPROVAL	BC LEE,	REV	REV 0.0	IBEX PEAK(1/5)	BA41-####A	
MODULE CODE	undefined	LAST ENT	February, 22, 2010 10:00:27 AM	PAGE	17 OF 53	

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.



<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		PCH	
APPROVAL	BC LEE,	REV	REV 0.0		IBEX PEAK(2/5)	
MODULE CODE		LAST EDIT		February, 22, 2010 10:11:53 AM	PAGE 18 OF 53	

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.

U19-3 BD82HM55 3/5

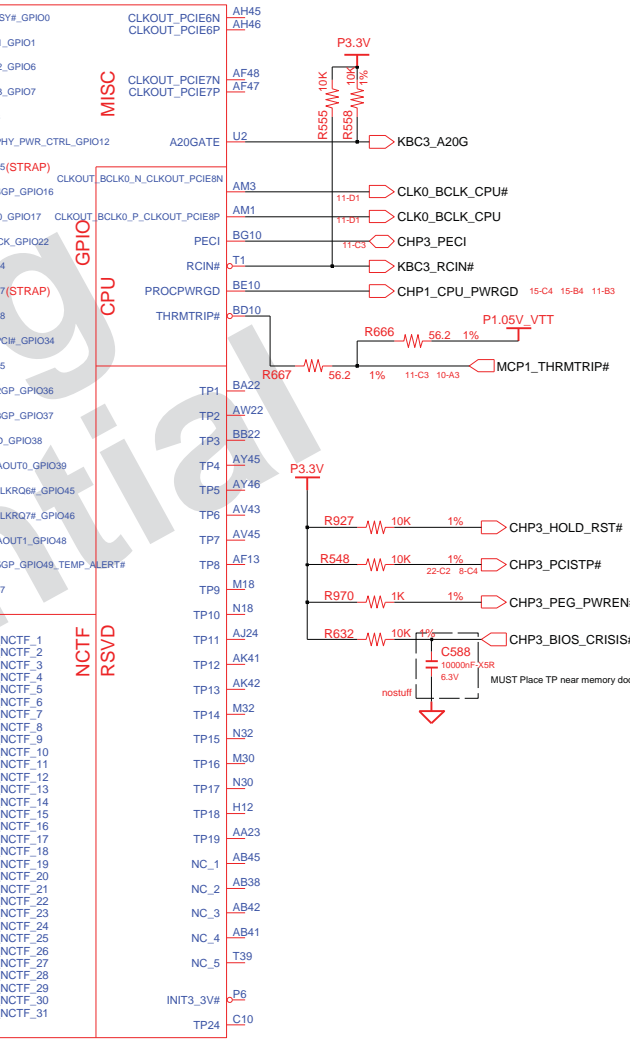
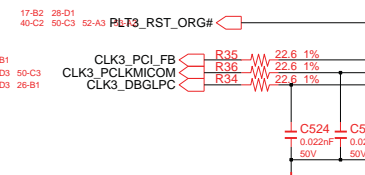
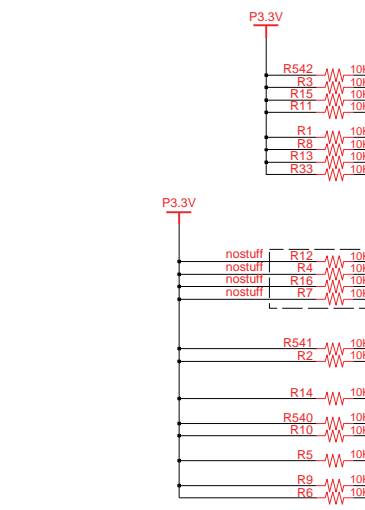
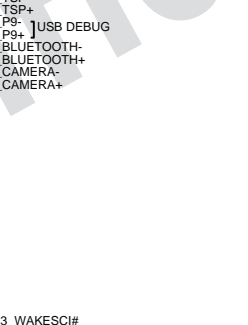
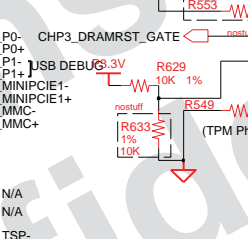
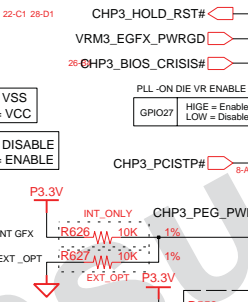
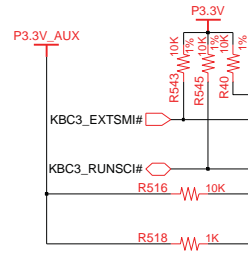
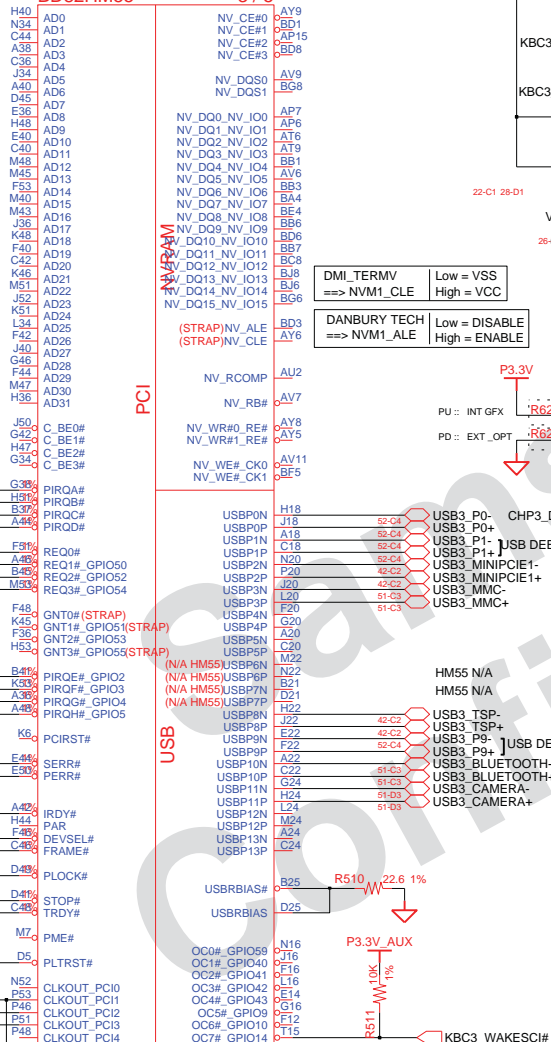


Table with 4 columns: DRAW, CHECK, APPROVAL, MODULE CODE, DATE, DEV. STEP, REV, LAST EDIT, TITLE, PART NO., and PAGE. Includes drawing details for HONGJUN ZHAO, ROCKY ZHENG, BC LEE, and drawing title Houston13 SV BGA PCH IBEX PEAK(3/5).

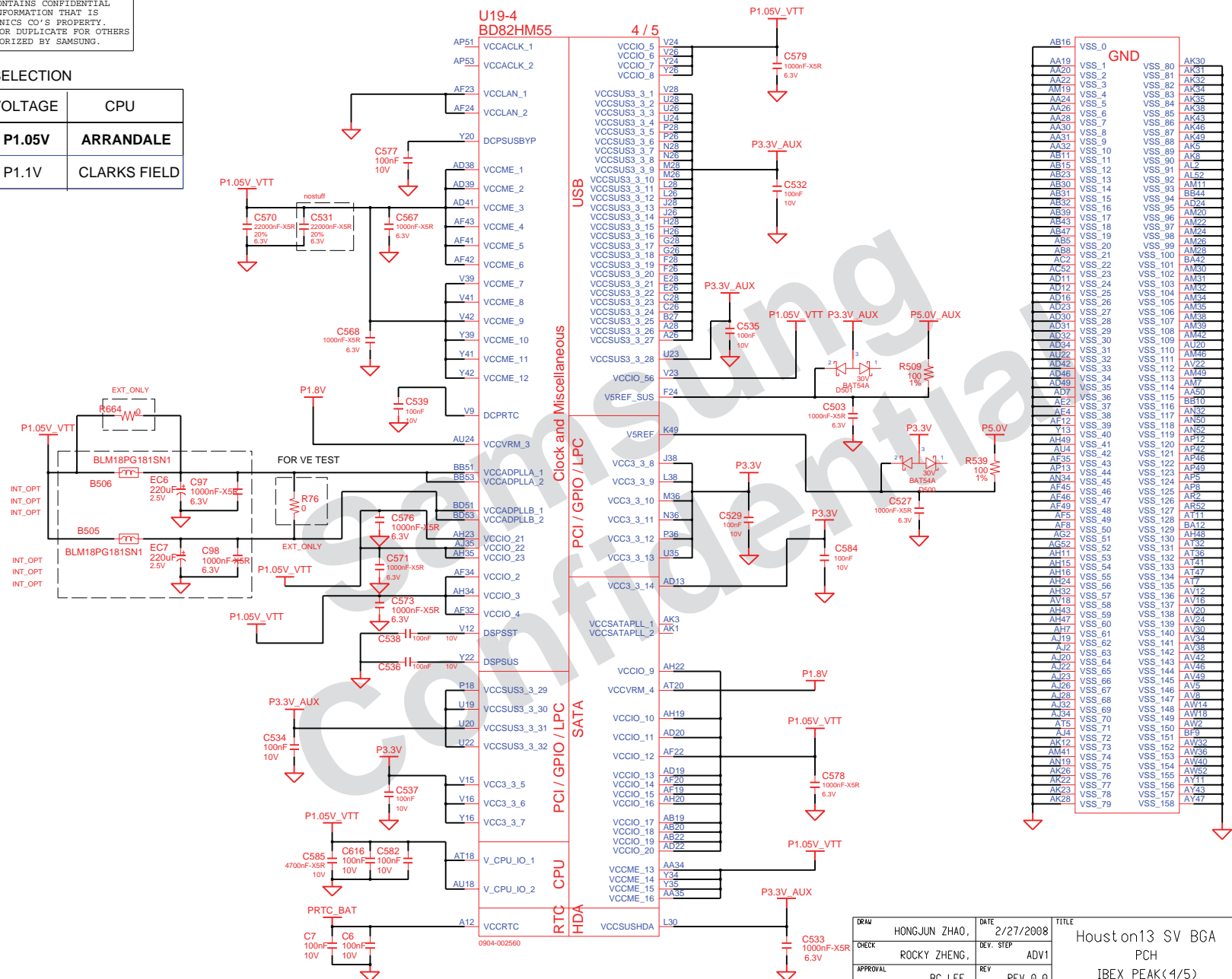
http://hobi-elektronika.net

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.

****VTT POWER SELECTION**

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



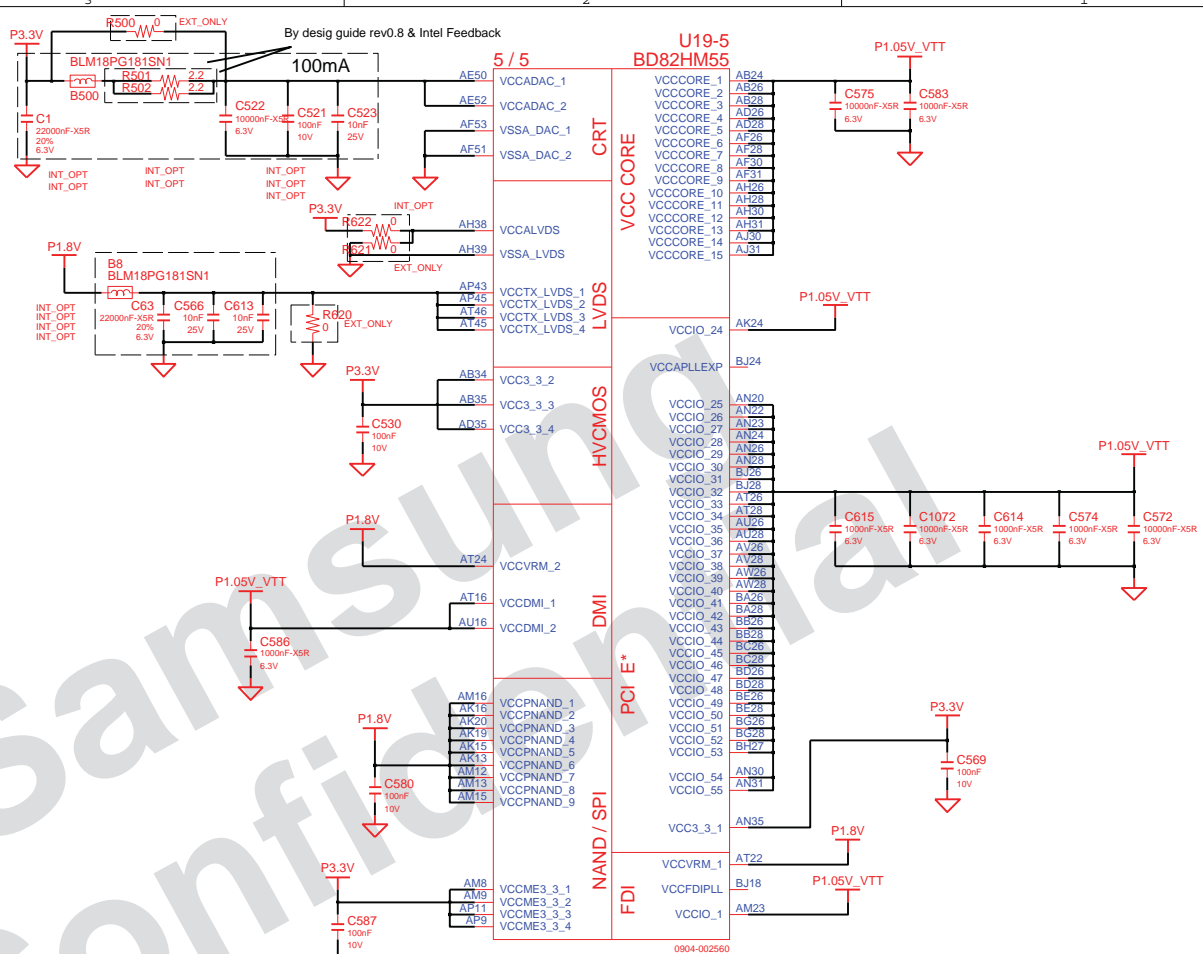
DRAW	HONGJUN ZHAO,	DATE	2/27/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-#####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		PCH	
APPROVAL	BC LEE,	REV	REV 0.0		IBEX PEAK<4/5>	
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 10:13:38 AM	PAGE	20 OF 603	

<http://hobi-elektronika.net>

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_259	VSS_159	AY7
H5	VSS_260	VSS_160	B11
J24	VSS_261	VSS_161	B15
K11	VSS_262	VSS_162	B19
K43	VSS_263	VSS_163	B23
K47	VSS_264	VSS_164	B27
K7	VSS_264	VSS_164	B35
L14	VSS_265	VSS_165	B39
L18	VSS_266	VSS_166	B43
L22	VSS_267	VSS_167	B47
L22	VSS_268	VSS_168	B7
L32	VSS_269	VSS_169	BG12
L36	VSS_270	VSS_170	BB12
L40	VSS_271	VSS_171	BB16
M2	VSS_272	VSS_172	BB20
M12	VSS_273	VSS_173	BB24
M16	VSS_274	VSS_174	BB28
M20	VSS_275	VSS_175	BB32
M20	VSS_276	VSS_176	BB36
M36	VSS_277	VSS_177	BB40
M34	VSS_278	VSS_178	BB44
M38	VSS_279	VSS_179	BB48
M42	VSS_280	VSS_180	BB52
M46	VSS_281	VSS_181	BB56
M46	VSS_282	VSS_182	BB60
M46	VSS_283	VSS_183	BB64
M8	VSS_284	VSS_184	BB68
N24	VSS_285	VSS_185	BB72
P11	VSS_286	VSS_186	BB76
AD1	VSS_287	VSS_187	BB80
P22	VSS_288	VSS_188	BB84
P30	VSS_289	VSS_189	BB88
P32	VSS_290	VSS_190	BB92
P34	VSS_291	VSS_191	BB96
P42	VSS_292	VSS_192	BB100
P46	VSS_293	VSS_193	BB104
P47	VSS_294	VSS_194	BB108
R2	VSS_295	VSS_195	BB112
R52	VSS_296	VSS_196	BB116
T12	VSS_297	VSS_197	BB120
I41	VSS_298	VSS_198	BB124
I46	VSS_299	VSS_199	BB128
I49	VSS_300	VSS_200	BB132
I5	VSS_301	VSS_201	BB136
I8	VSS_302	VSS_202	BB140
U30	VSS_303	VSS_203	BB144
U31	VSS_304	VSS_204	BB148
U32	VSS_305	VSS_205	BB152
U34	VSS_306	VSS_206	BB156
P38	VSS_307	VSS_207	BB160
V11	VSS_308	VSS_208	BF3
P16	VSS_309	VSS_209	BF49
V19	VSS_310	VSS_210	BF17
V20	VSS_311	VSS_211	BG18
V22	VSS_312	VSS_212	BG24
V30	VSS_313	VSS_213	BG4
V31	VSS_314	VSS_214	BG50
V32	VSS_315	VSS_215	BH17
V34	VSS_316	VSS_216	BH19
V35	VSS_317	VSS_217	BH23
V38	VSS_318	VSS_218	BH31
V43	VSS_319	VSS_219	BH35
V46	VSS_320	VSS_220	BH39
V47	VSS_321	VSS_221	BH43
V49	VSS_322	VSS_222	BH47
V5	VSS_323	VSS_223	BH7
V7	VSS_324	VSS_224	C12
V8	VSS_325	VSS_225	C50
W5	VSS_326	VSS_226	D61
W2	VSS_327	VSS_227	E16
W52	VSS_328	VSS_228	E20
Y11	VSS_329	VSS_229	E24
Y15	VSS_330	VSS_230	E30
Y19	VSS_331	VSS_231	E34
Z23	VSS_332	VSS_232	E38
Z28	VSS_333	VSS_233	E42
Y30	VSS_334	VSS_234	E46
Y31	VSS_335	VSS_235	E48
Y32	VSS_336	VSS_236	E4
Y32	VSS_337	VSS_237	E8
Y38	VSS_338	VSS_238	EA
Y43	VSS_339	VSS_239	EA9
Y46	VSS_340	VSS_240	EA9
P49	VSS_341	VSS_241	F6
Y5	VSS_342	VSS_242	G10
Y5	VSS_343	VSS_243	G14
Y8	VSS_344	VSS_244	G18
P24	VSS_345	VSS_245	G2
T43	VSS_346	VSS_246	G22
AD51	VSS_347	VSS_247	G26
A78	VSS_348	VSS_248	G30
AD47	VSS_349	VSS_249	G34
Y47	VSS_350	VSS_250	G38
AT12	VSS_351	VSS_251	G42
AM6	VSS_352	VSS_252	G46
AT13	VSS_353	VSS_253	H16
AM5	VSS_354	VSS_254	H20
AK45	VSS_355	VSS_255	H30
AK39	VSS_356	VSS_256	H34
AV14	VSS_366	VSS_257	H38
		VSS_258	H42



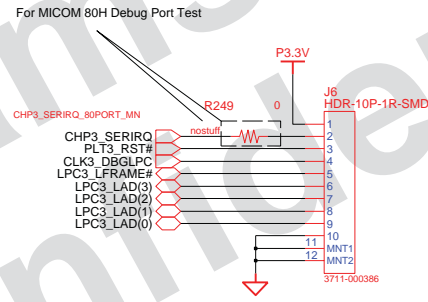
DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	PCH	IBEX PEAK(5/5)	
APPROVAL	BC LEE,	REV	REV 0.0			PART NO. BA41-####A
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 10:14:16 AM	PAGE	21	OF 53

<http://hobi-elektronika.net>

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.

80H PORT DEBUG

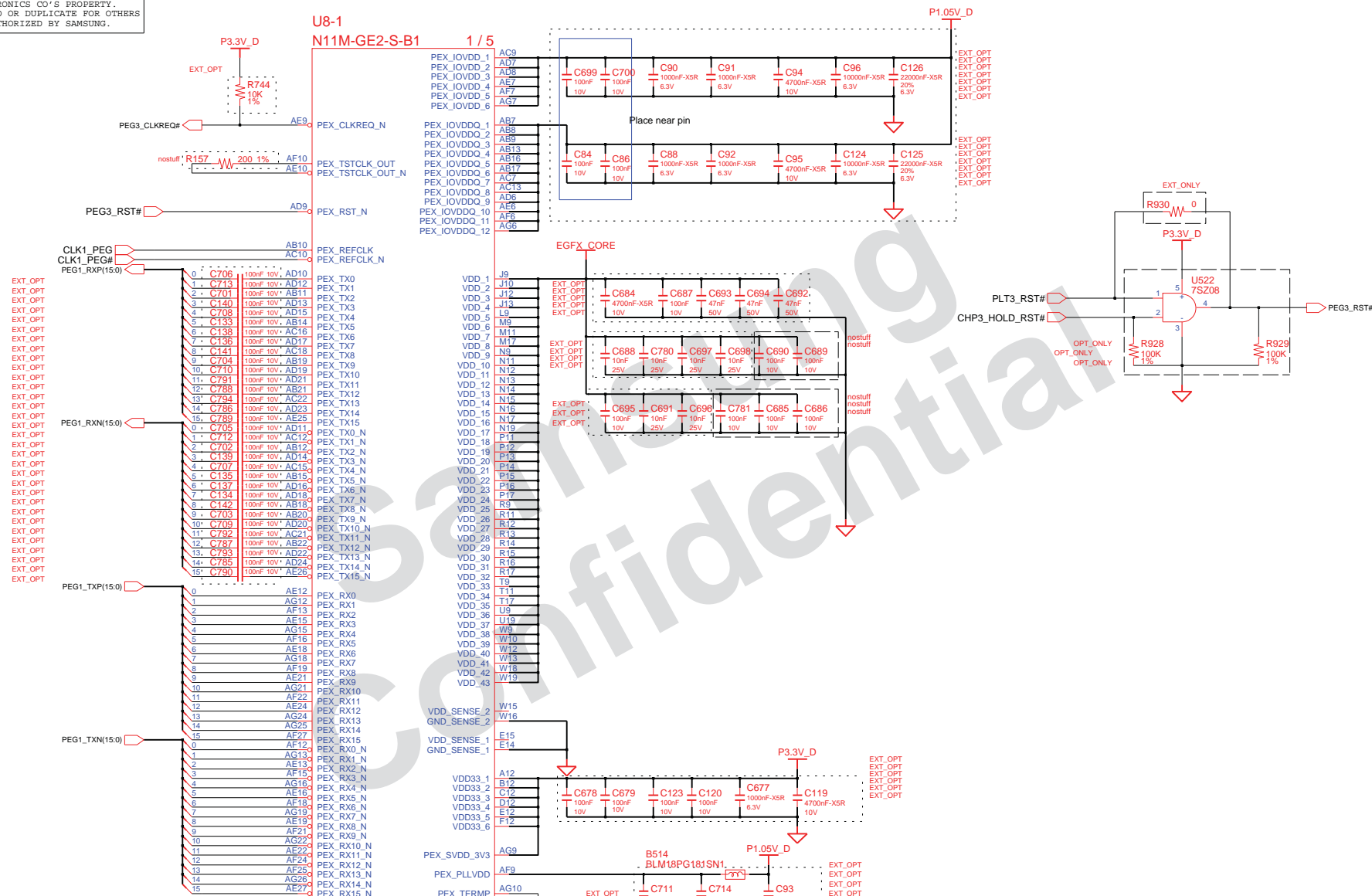
Samsung
Confidential



DESIGN	HONGJUN ZHAO,	DATE	11/10/2008	TITLE	Houston13 SV BGA DEBUG PORT 80H DECODER	SAMSUNG ELECTRONICS	
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	PART NO.			BA41-####A
APPROVAL	BC LEE,	REV	REV 0.0				
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 10:15:03 AM	PAGE	22	OF 53	

<http://hobi-elektronika.net>

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.



0904-002586

EXT_OPT

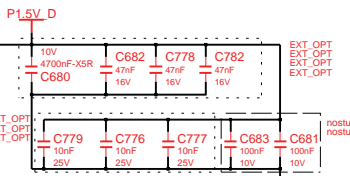
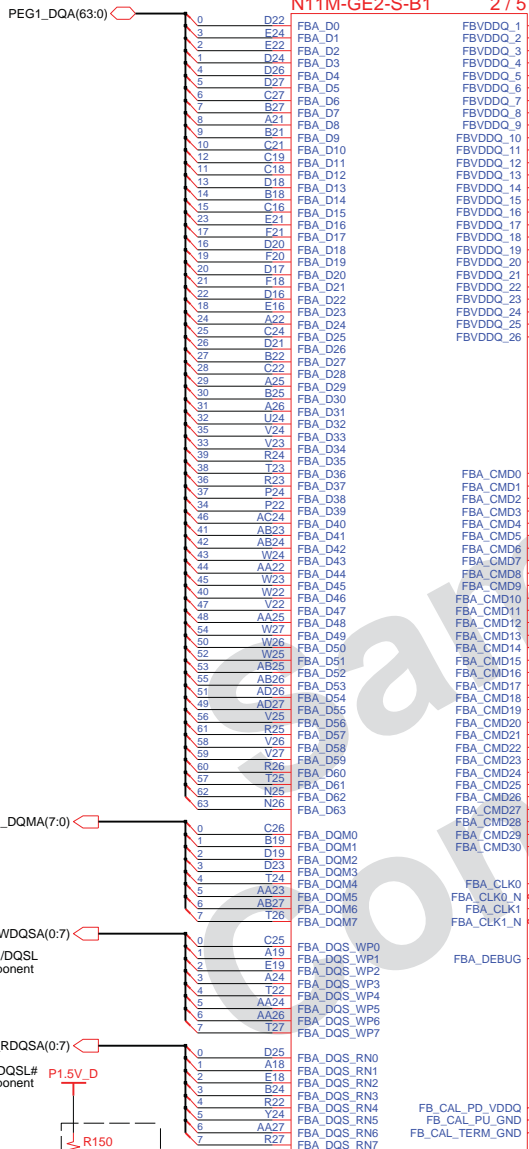
<http://hobi-elektronika.net>

DESIGN	HONGJUN ZHAO,	DATE	03/14/2009	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHEGN,	DEV. STEP	ADV1		N10X_40NM(1/5)	
APPROVAL	BC LEE,	REV	REV 0.0		N10X_40NM(1/5)	
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 10:16:15 AM	PAGE	23 OF 53	

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.

**U8-2
N11M-GE2-S-B1 2 / 5**



CMD MODE A

PEG1_DQA(63:0)

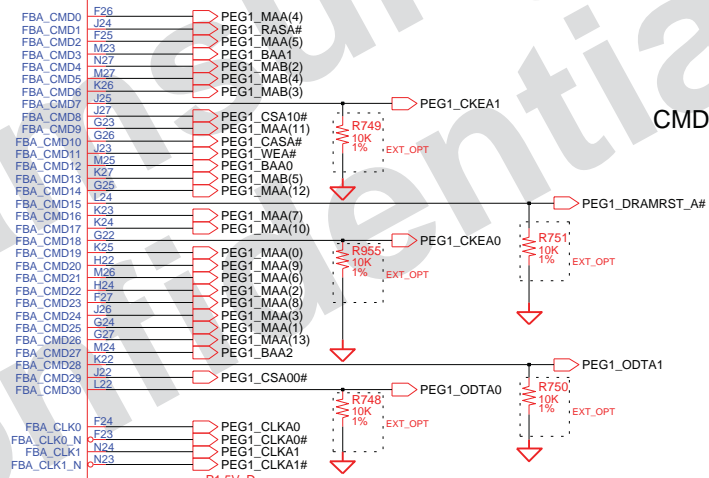
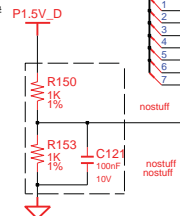
PEG1_DQMA(7:0)

PEG1_WDQSA(0:7)

PEG1_RDQSA(0:7)

FB_DQS_WP must be connected to DQSU/DQSL @ gDDR3 component

FB_DQS_RN must be connected to DQSU#/DQSL# @ gDDR3 component



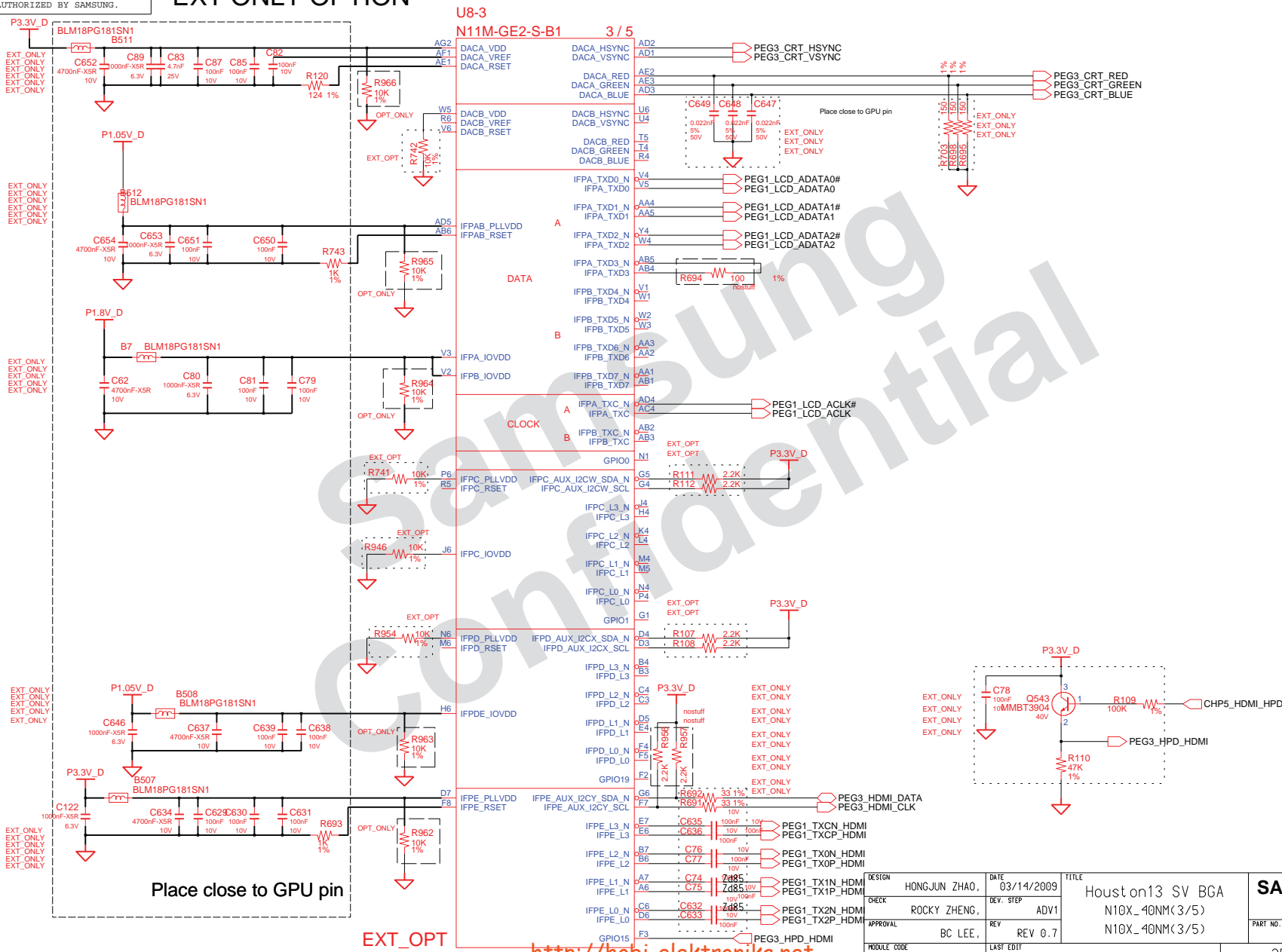
<http://hobi-elektronika.net>

DESIGN	HONGJUN ZHAO,	DATE	03/14/2009	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		N10X_40NM(2/5)	
APPROVAL	BC LEE,	REV	REV 0.0		N10X_40NM(2/5)	PART NO. BA41-####A
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 11:41:16 AM	PAGE	24	OF 53

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.

EXT ONLY OPTION



DESIGN	HONGJUN ZHAO,	DATE	03/14/2009	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		N10X_40NM(3/5)	
APPROVAL	BC LEE,	REV	REV 0.7		N10X_40NM(3/5)	PART NO. BA41-####A
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 11:42:45 AM	PAGE	25	OF 53

<http://hobi-elektronika.net>

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	

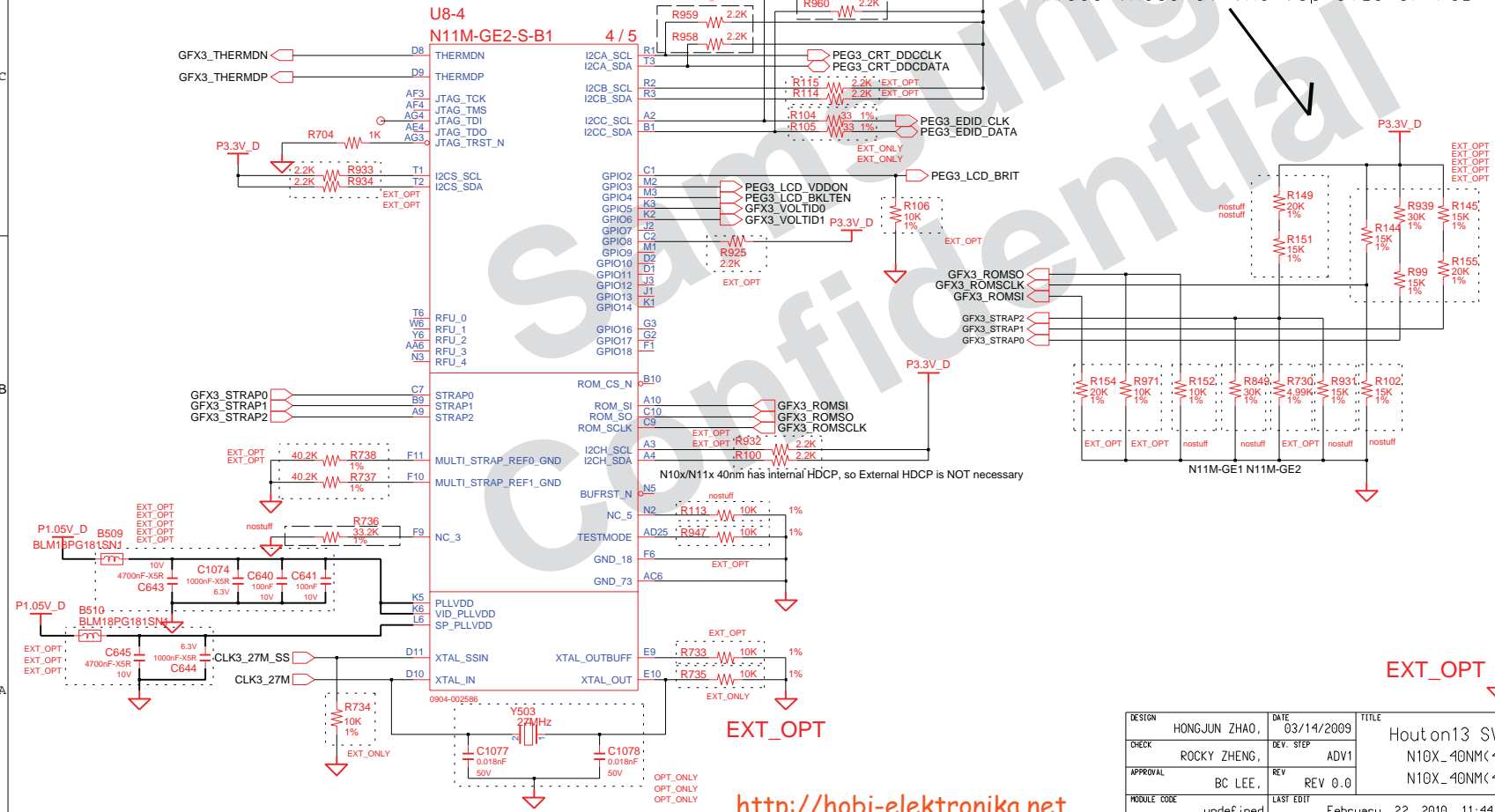
	Bit3	Bit2	Bit1	Bit0
ROMSO	0	0	0	27M
SCLK	1	0	1	0
SI	0	0	1	1
Strap2	0	0	0	0
Strap1	1	1	1	0
Strap0	1	1	1	1

U8-5
N11M-GE2-S-B1

B2	NC.1	C15
B5	GND_1	D5
B8	GND_2	J5
B11	GND_3	NC_4
B14	GND_4	
B17	GND_5	
B20	GND_6	
B23	GND_7	
E2	GND_8	
E5	GND_9	
E8	GND_10	
E11	GND_11	
E14	GND_12	
E17	GND_13	
E20	GND_14	
E23	GND_15	
E26	GND_16	
H2	GND_17	
H5	GND_18	
J11	GND_19	
J14	GND_20	
J17	GND_21	
K9	GND_22	
K10	GND_23	
L2	GND_24	
L5	GND_25	
L11	GND_26	
L12	GND_27	
L14	GND_30	
L15	GND_31	
L16	GND_32	
L17	GND_33	
M12	GND_34	
M13	GND_35	
M14	GND_36	
M15	GND_37	
M16	GND_38	
P2	GND_39	
P5	GND_40	
P9	GND_41	
P19	GND_42	
P23	GND_43	
P26	GND_44	
T12	GND_45	
T13	GND_46	
T14	GND_47	
T15	GND_48	
T16	GND_49	
U2	GND_50	
U5	GND_51	
U11	GND_52	
U12	GND_53	
U13	GND_54	
U14	GND_55	
U15	GND_56	
U16	GND_57	
U17	GND_58	
U23	GND_59	
U26	GND_60	
V9	GND_61	
V19	GND_62	
W11	GND_63	
W14	GND_64	
W17	GND_65	
Y2	GND_66	
Y5	GND_67	
Y23	GND_68	
Y26	GND_69	
AC2	GND_70	
AC5	GND_71	
AC8	GND_72	
AC11	GND_73	
AC14	GND_74	
AC17	GND_75	
AC20	GND_76	
AC23	GND_77	
AC26	GND_78	
AF2	GND_79	
AF5	GND_80	
AF8	GND_81	
AF11	GND_82	
AF14	GND_83	
AF17	GND_84	
AF20	GND_85	
AF23	GND_86	
AF26	GND_87	
	GND_88	
	GND_89	

5 / 5

N11M-GE2: 0x0A70
Place these at the top side of PCB



<http://hobi-elektronika.net>

DESIGN	HONGJUN ZHAO,	DATE	03/14/2009	TITLE	Houton13 SV BGA
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		N10X_40NM(4/5)
APPROVAL	BC LEE,	REV	REV 0.0		N10X_40NM(4/5)
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 11:44:01 AM		

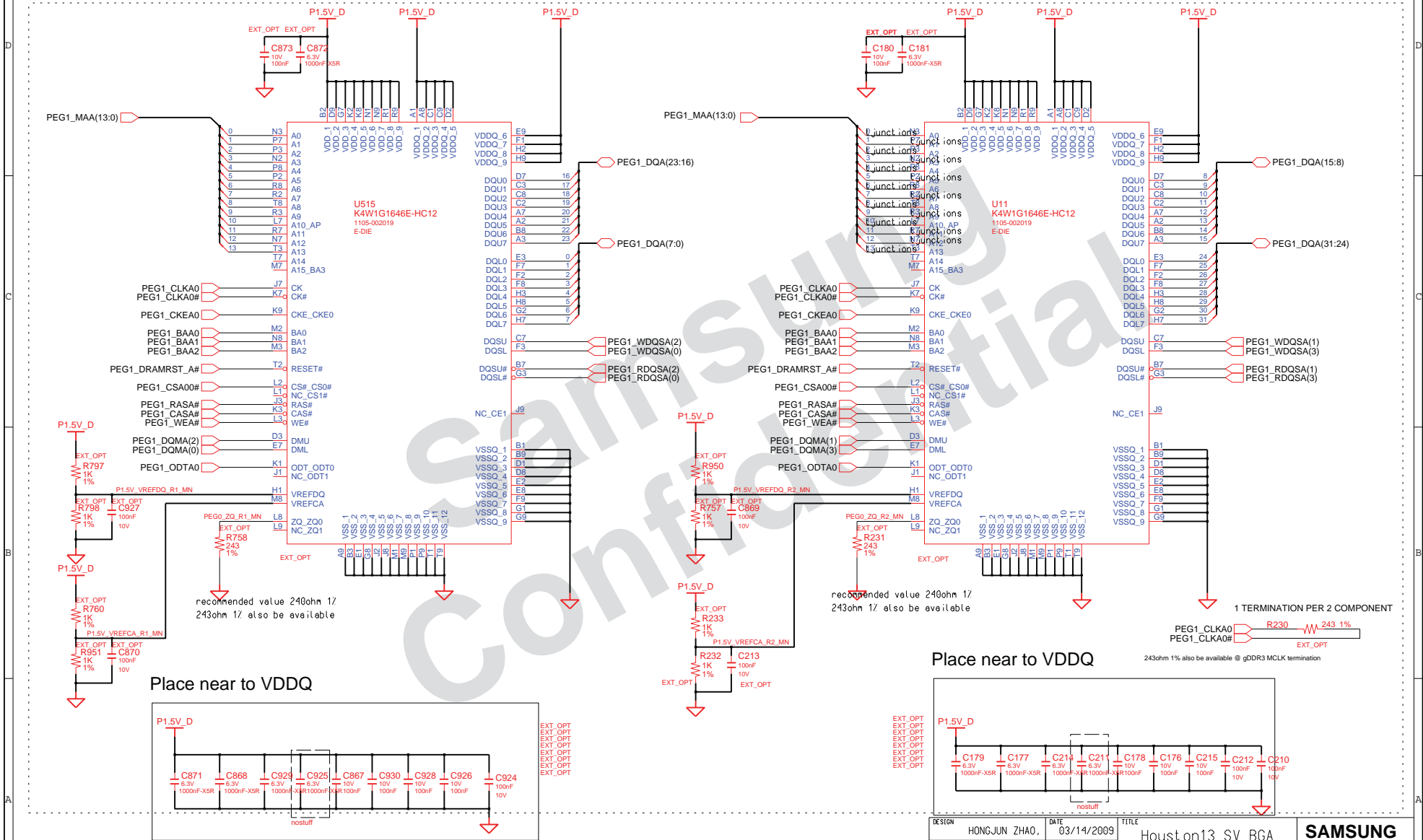
SAMSUNG
ELECTRONICS
PART NO. BA41-#####A

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.

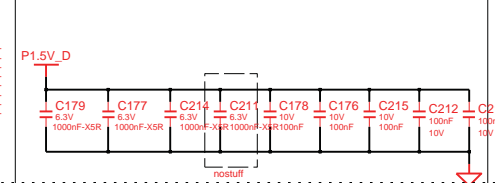
EXT_OPT

A-Channel #0



Place near to VDDQ

Place near to VDDQ



DESIGN	HONGJUN ZHAO,	DATE	03/14/2009	TITLE	Houston13 SV BGA
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		GRAPHIC_MEM A#0
APPROVAL	BC LEE,	REV	REV 0.0		GRAPHIC_MEM A#0
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 11:44:42 AM	PAGE	27 OF 53

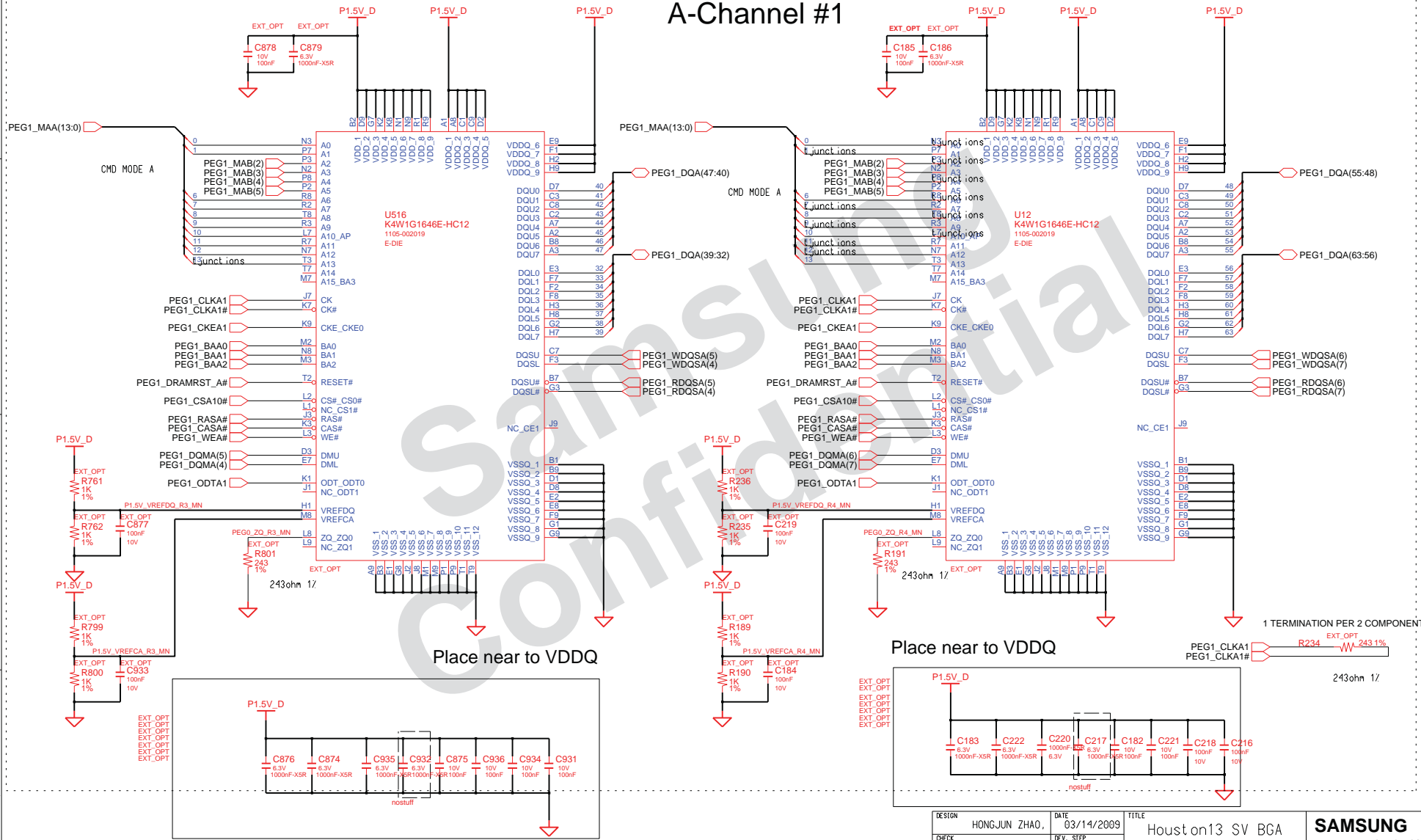
SAMSUNG
ELECTRONICS
PART NO.
BA41-#####A

<http://hobi-elektronika.net>

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.

A-Channel #1



DESIGN	HONGJUN ZHAO,	DATE	03/14/2009	TITLE	Houston13 SV BGA
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		GRAPHIC_MEM A#1
APPROVAL	BC LEE,	REV	REV 0.0		GRAPHIC_MEM A#1
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 11:45:46 AM	PAGE	28 OF 53

SAMSUNG
ELECTRONICS
PART NO. BA41-#####A

<http://hobi-elektronika.net>

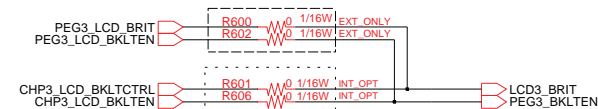
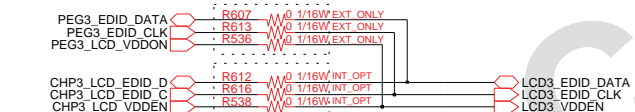
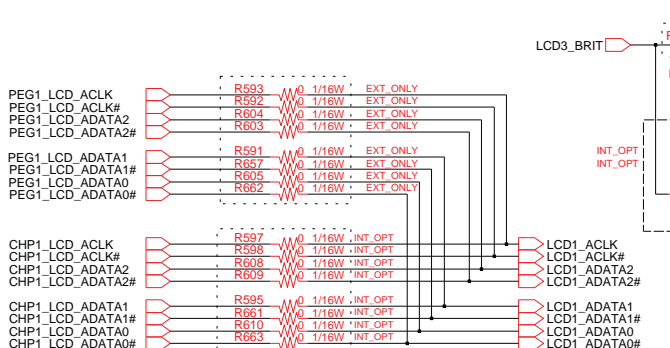
SAMSUNG PROPRIETARY

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.

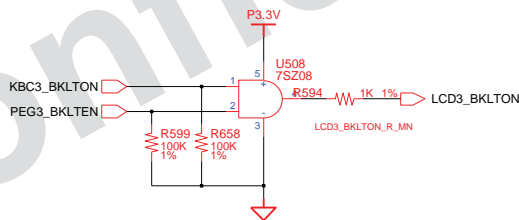
LVDS LOGIC

1Ch. LCD Connector + CAMERA

TSP I/F

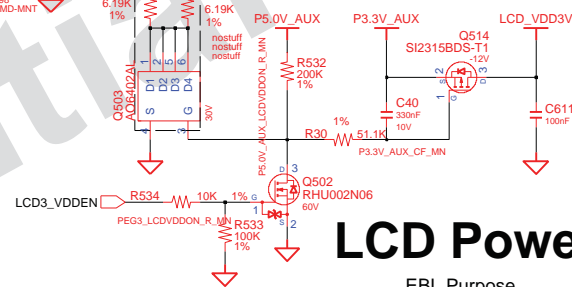


Backlight On

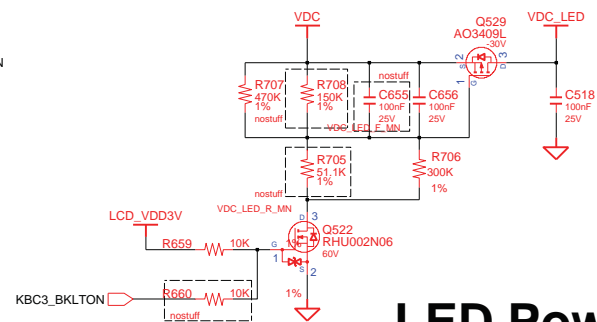


LCD Power

EBL Purpose



LED Power



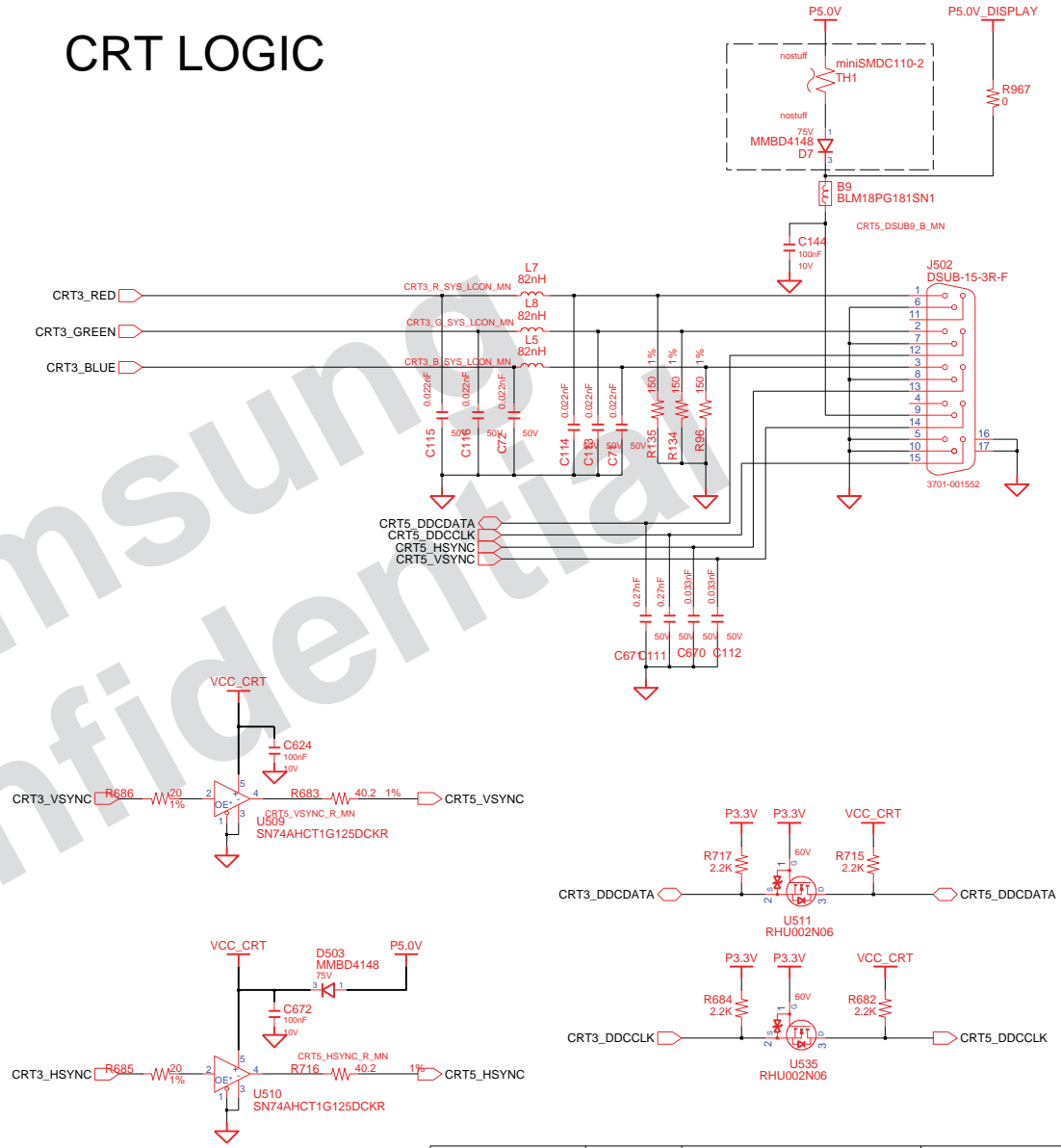
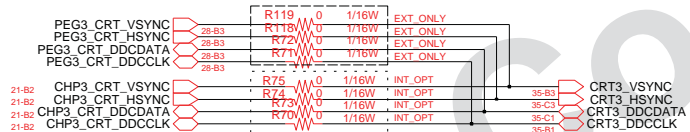
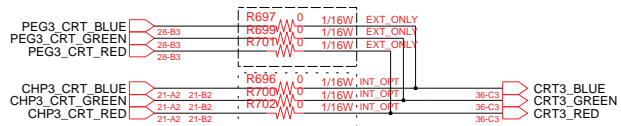
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		GRAPHICS_IF	
APPROVAL	BC LEE,	REV	REV 0.0		LVDS	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:46:49 AM	PAGE	29	OF 53

<http://hobi-elektronika.net>

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



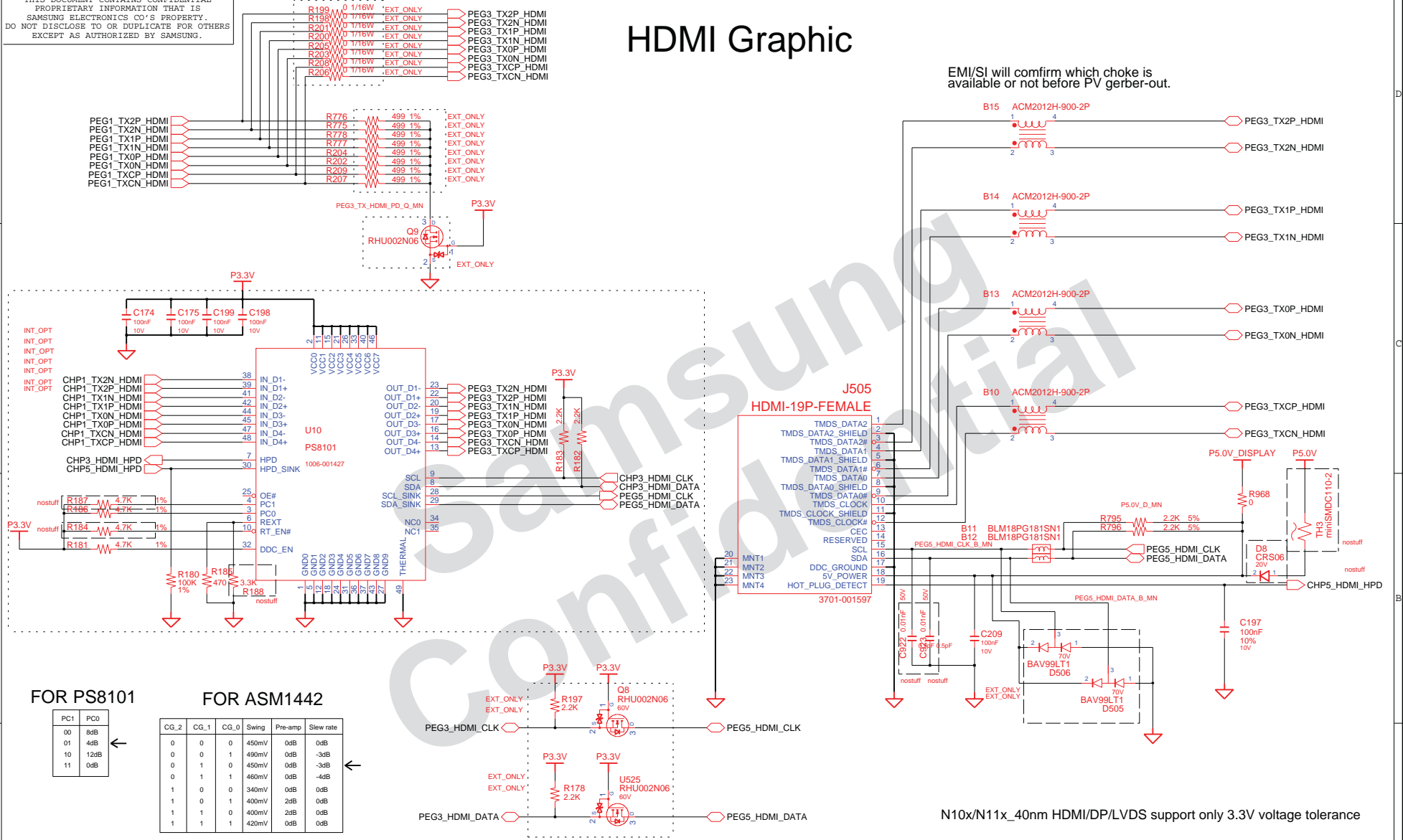
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Honston13 SV BGA	SAMSUNG ELECTRONICS	
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		GRAPHICS_IF		
APPROVAL	BC LEE,	REV	REV 0.0		CRT	PART NO.	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:47:34 AM			BA41-####A	
						PAGE	30 OF 53

<http://hobi-elektronika.net>

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.

HDMI Graphic



FOR PS8101

FOR ASM1442

PC1	PC0
00	0dB
01	4dB
10	12dB
11	0dB

CG_2	CG_1	CG_0	Swing	Pre-amp	Slew rate
0	0	0	450mV	0dB	0dB
0	0	1	490mV	0dB	-3dB
0	1	0	450mV	0dB	-3dB
0	1	1	460mV	0dB	-4dB
1	0	0	340mV	0dB	0dB
1	0	1	400mV	2dB	0dB
1	1	0	400mV	2dB	0dB
1	1	1	420mV	0dB	0dB

HDMI Level Shifter	REXT(Pin#)	PC1_CG0(Pin#)	PC1_CG1(Pin#)	RT_EN#_CG2(Pin10)	NC_EQ_0(Pin34)	NC_EQ_1(Pin35)	Note	4-6 CODE
PS8101	499 phm	stuff	nostuff	nostuff	NC	NC	Internal PU/PD exist CGs nostuff is 450mV swing	1006-001427
ASM1442	3.4K(3.24~3.3K)	nostuff	nostuff	nostuff	nostuff	nostuff		1006-001471

FOR ASM1442

EQ_1	EQ_0	Equalization
0	0	12dB
0	1	9dB
1	0	6dB
1	1	3dB

Internal Default Value

<http://hobi-elektronika.net>

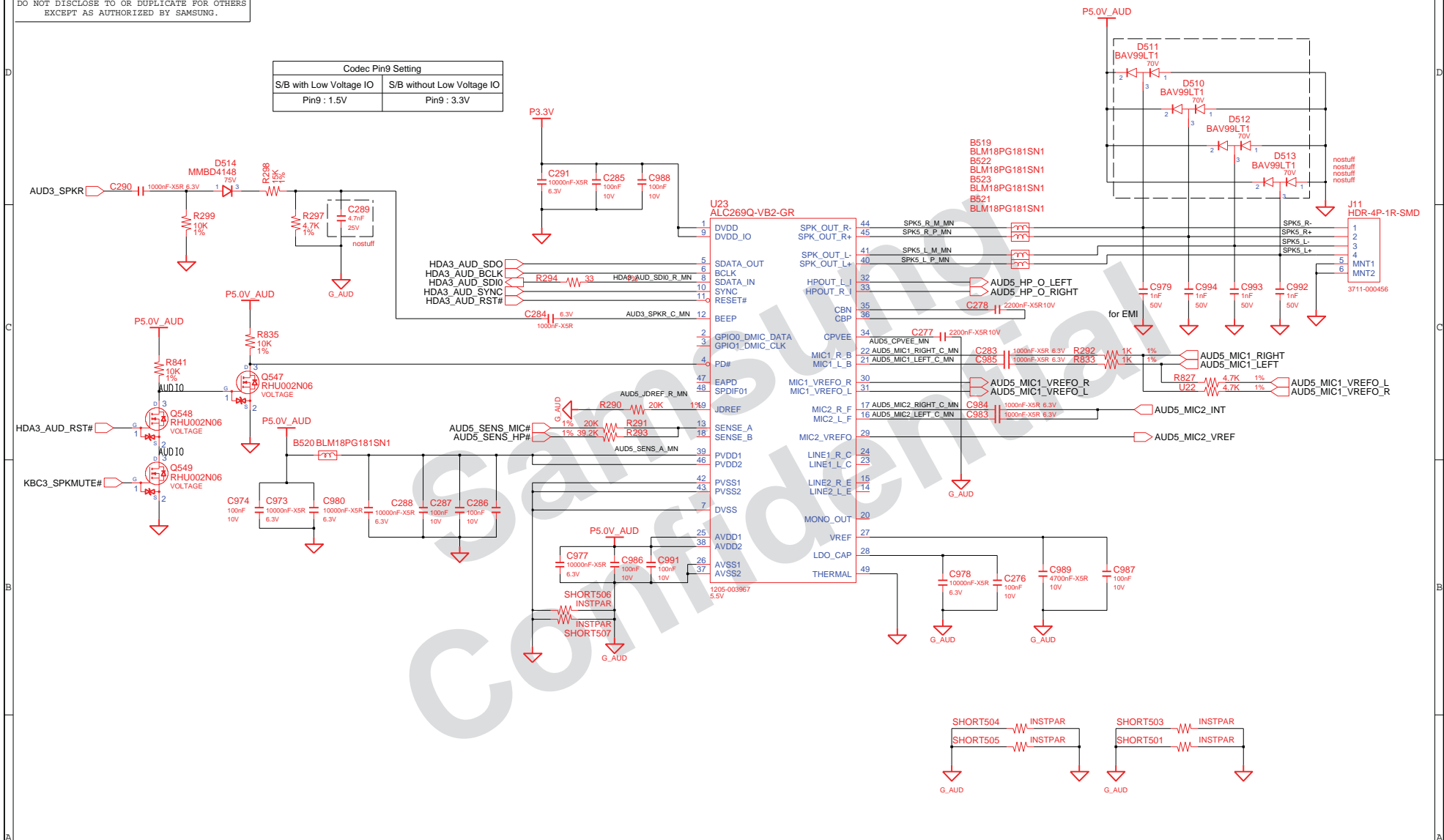
N10x/N11x_40nm HDMI/DP/LVDS support only 3.3V voltage tolerance

DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Honst13 SV BGA	SAMSUNG
CHECK	ROCKY ZHENG,	DEV_STEP	ADV1	GRAPHICS_IF	ELECTRONICS	
APPROVAL	BC LEE,	REV	REV 0.0	HDMI	PART NO.	BA41-####A
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:48:26 AM	PAGE	31	OF 53

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.

Codec Pin9 Setting	
S/B with Low Voltage IO	S/B without Low Voltage IO
Pin9 : 1.5V	Pin9 : 3.3V



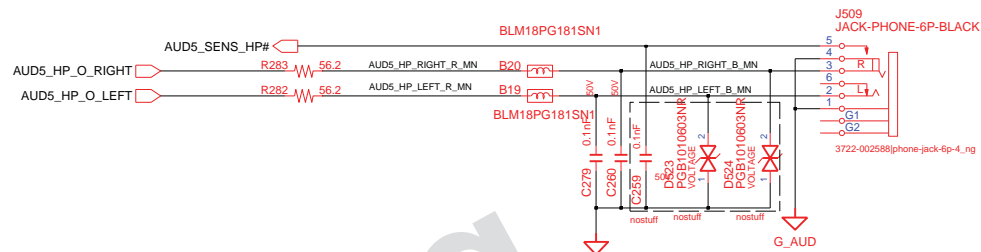
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		HDA_CODEC	
APPROVAL	BC LEE,	REV	REV 0.0		AUDIO CODEC ALC269	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:49:10 AM	PAGE	32 OF 53	

<http://hobi-elektronika.net>

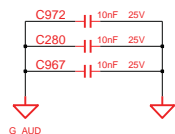
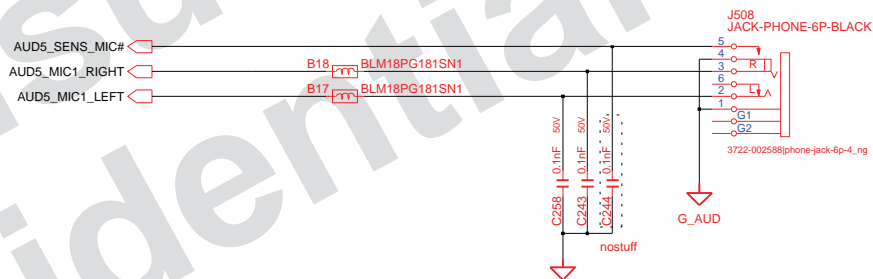
SAMSUNG PROPRIETARY

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.

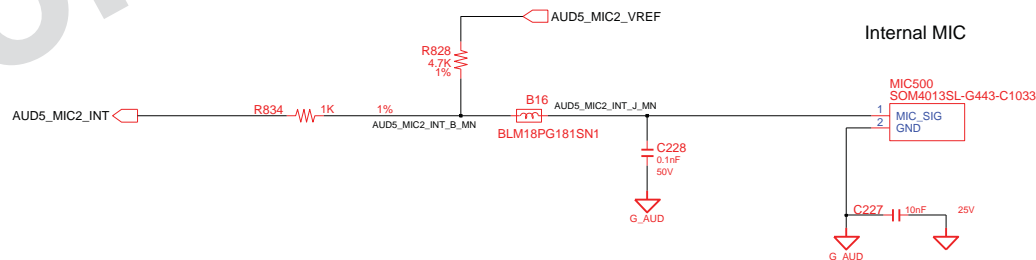
HEADPHONE



MIC JACK



Internal MIC



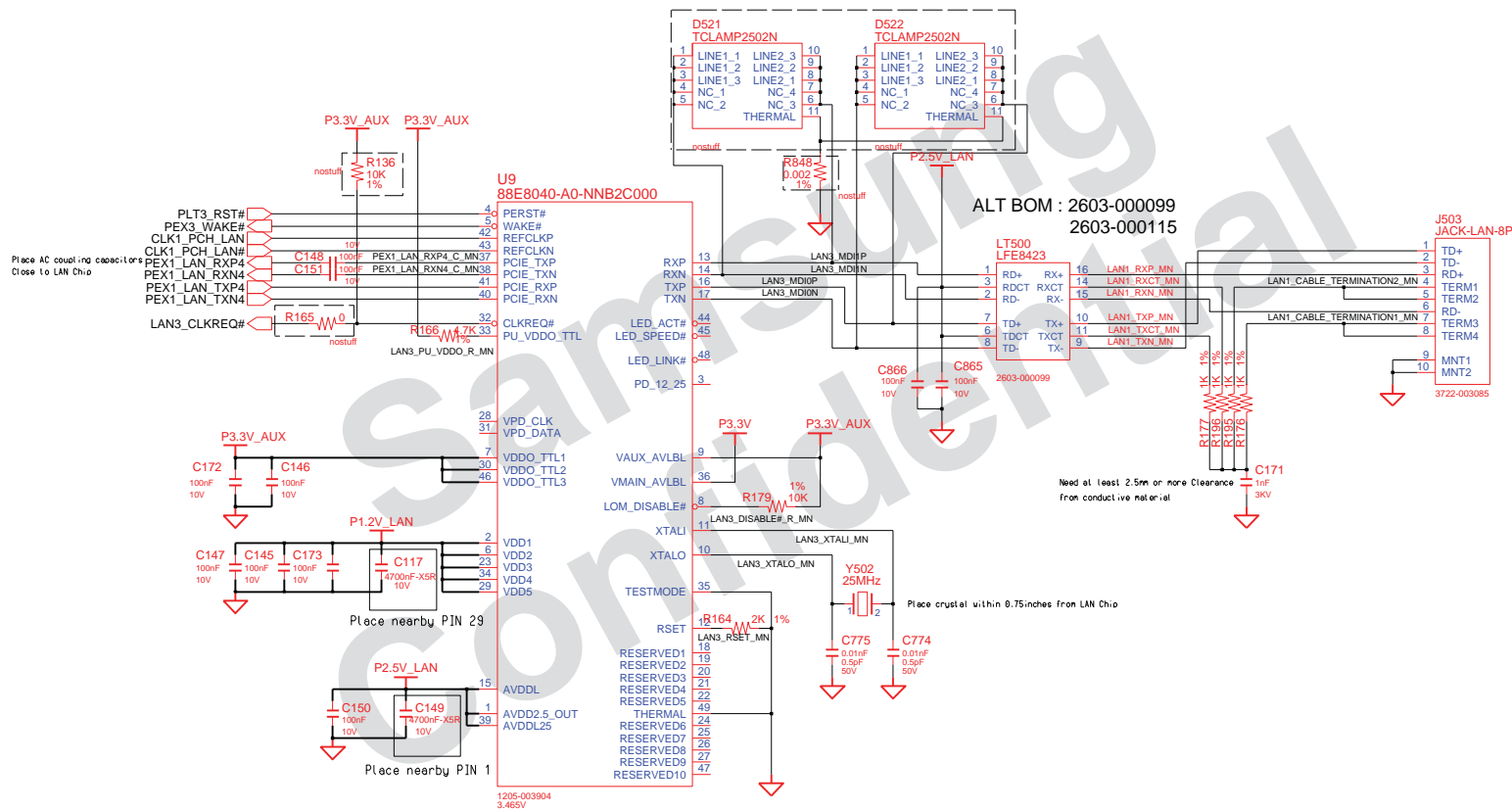
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		HDA_CODEC	
APPROVAL	BC LEE,	REV	REV 0.0		AUDIO JACK	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:50:03 AM	PAGE	33	OF 53

<http://hobi-elektronika.net>

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.

Marvell 88E8040(48pin, QFN,no LED)



ALT BOM : 2603-00099
2603-000115

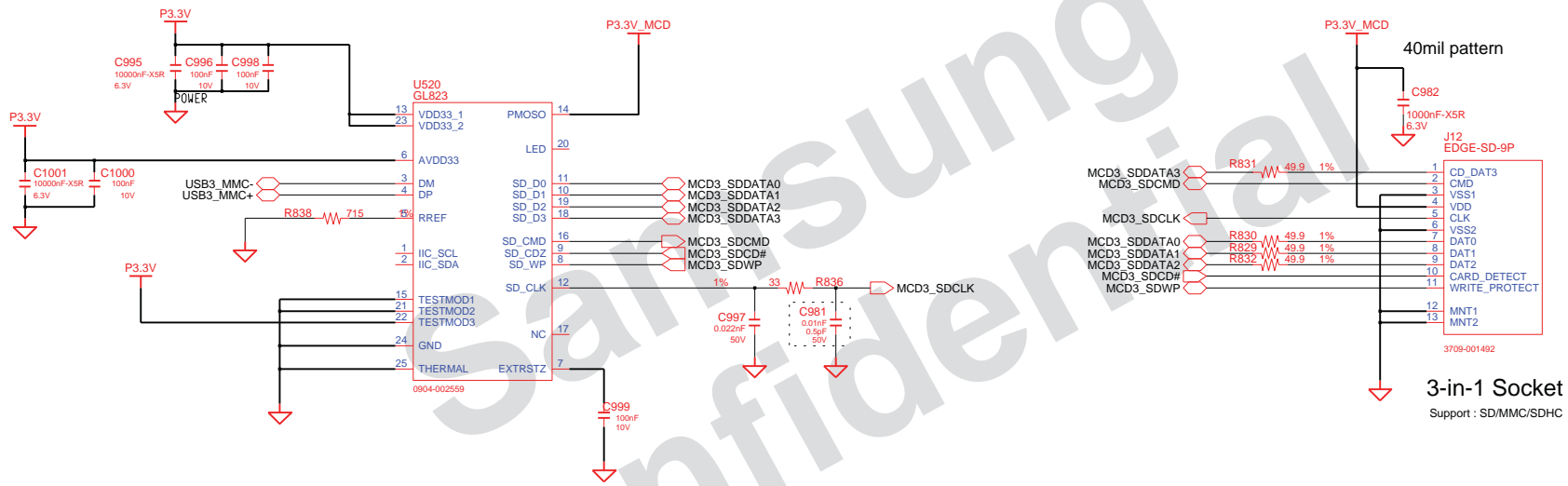
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		LAN	
APPROVAL	BC LEE,	REV	REV 0.0		LAN_Realttek_RTL8103EL	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:51:14 AM	PAGE	34	OF 53

<http://hobi-elektronika.net>

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.

2 IN 1 CARD (GL823)



Cost down 0.014\$ to AU6366

Samsung Confidential

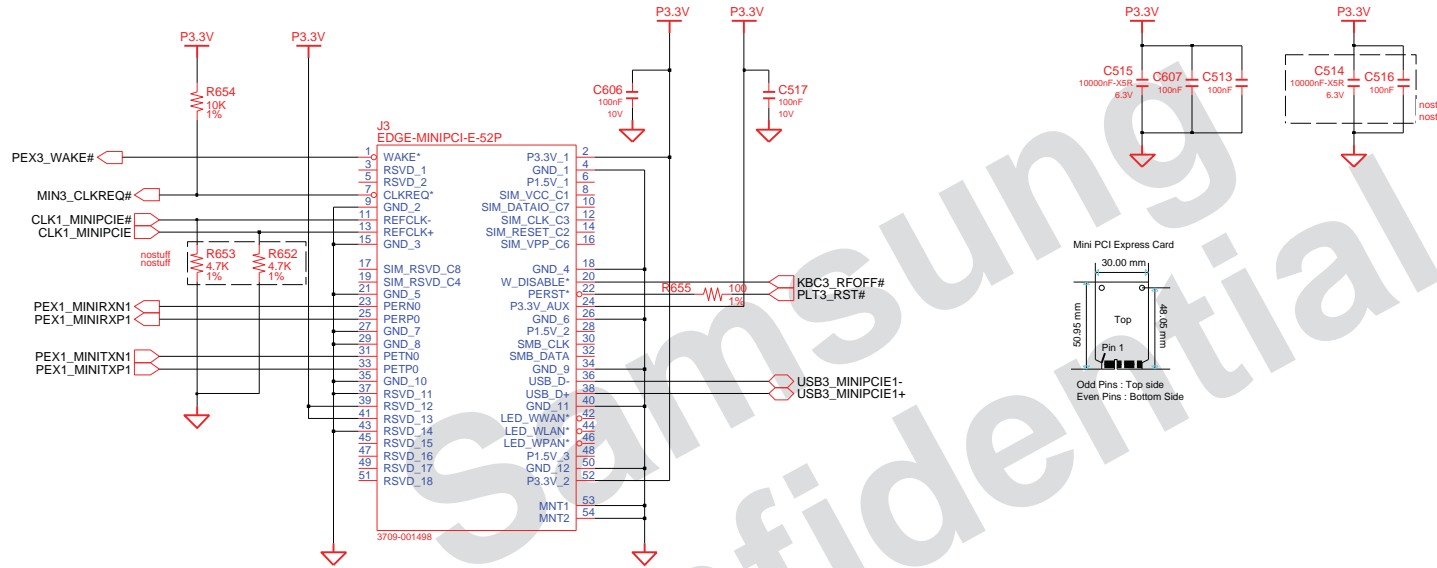
<http://hobi-elektronika.net>

DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		MULTICARD	
APPROVAL	BC LEE,	REV	REV 0.0		3 IN 1 CARD(GL827S)	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:53:09 AM	PAGE	35	OF 53

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, 4mm

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



Samsun...
Confidential

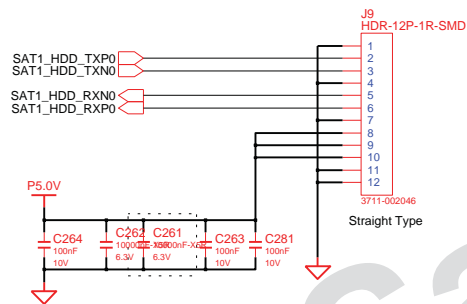
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS			
CHECK	ROCKY ZHENG,	DEV.STEP	ADV1		MINI_PCIE_CONN				
APPROVAL	BC LEE,	REV	REV 0.0		WLAN				
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:53:59 AM						
						PAGE	36	OF	53

<http://hobi-elektronika.net>

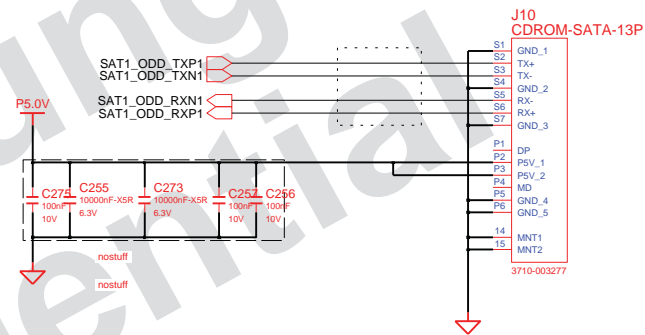
SAMSUNG PROPRIETARY
 THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

SATA I/F CONN

SATA HDD CONN



MAIN TO SUB SATA ODD CONN



Samsung
Confidential

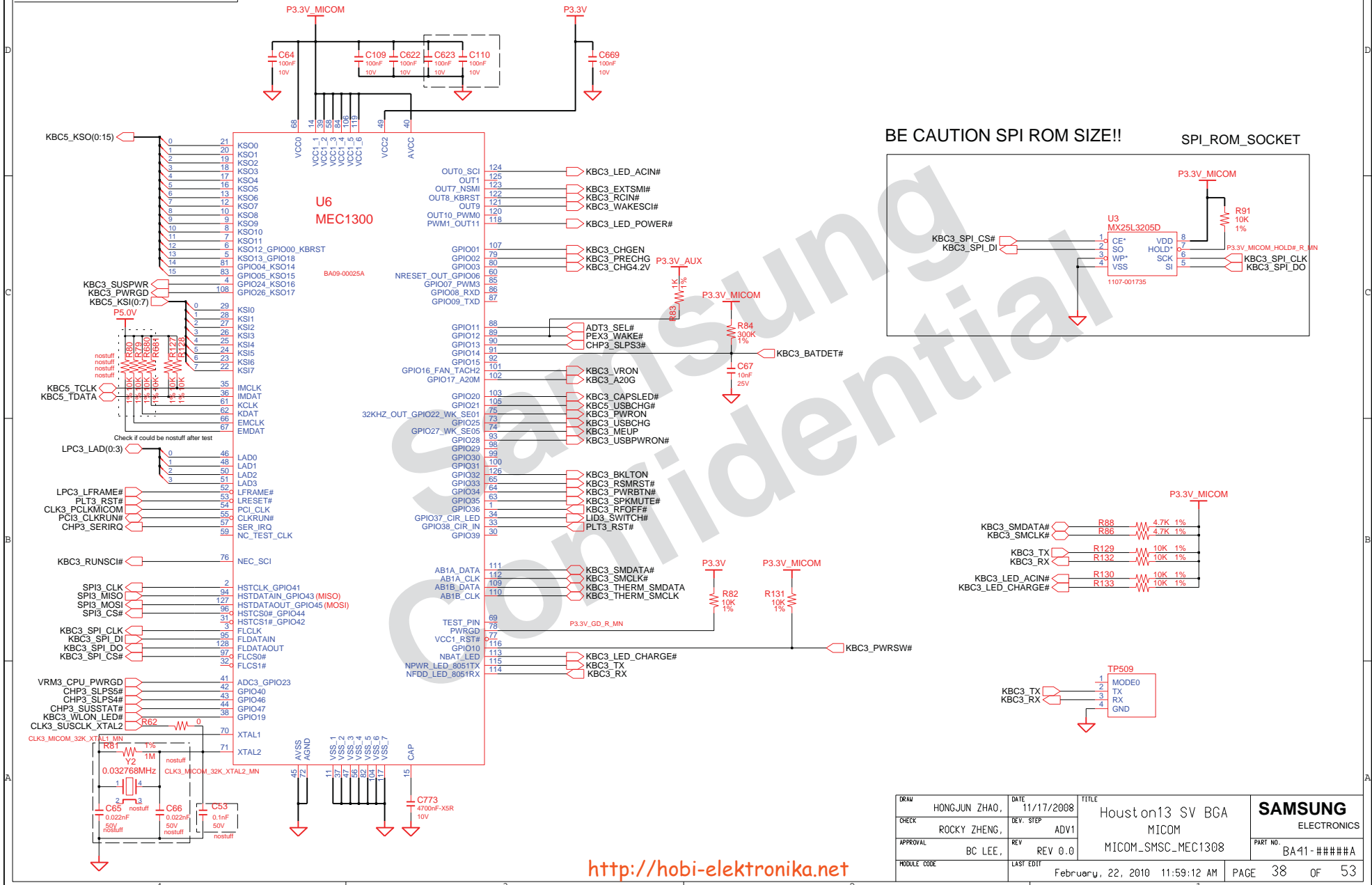
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	SATA_DEVICES	PART NO.	
APPROVAL	BC LEE,	REV	REV 0.0	HDD & ODD SUB CONNECTOR	BA41-####A	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 11:58:42 AM	PAGE	37 OF 53	

<http://hobi-elektronika.net>

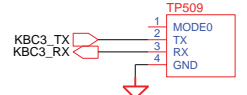
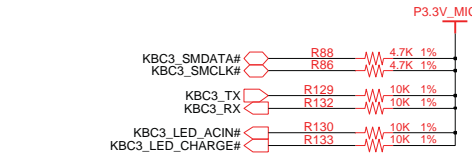
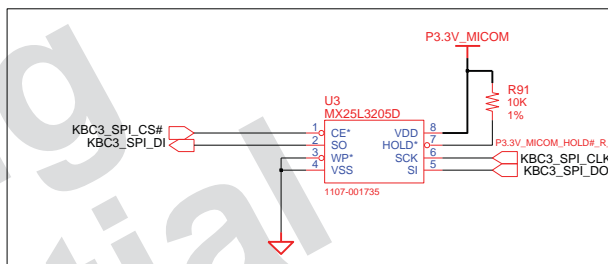
SAMSUNG PROPRIETARY

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.

MAIN BOARD (MICOM)



BE CAUTION SPI ROM SIZE!!



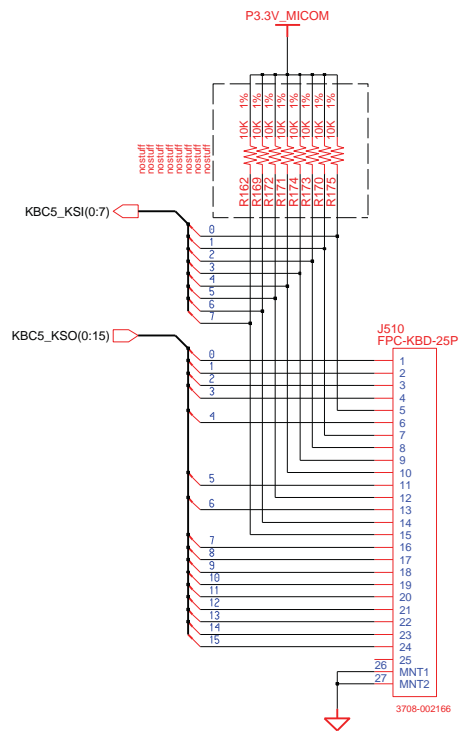
DRAW	HONGJUN ZHAO,	DATE	11/17/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		MICOM	
APPROVAL	BC LEE,	REV	REV 0.0		MICOM_SMSC_MEC1308	
MODULE CODE		LAST EDIT	February, 22, 2010 11:59:12 AM	PAGE	38	OF 53

<http://hobi-elektronika.net>

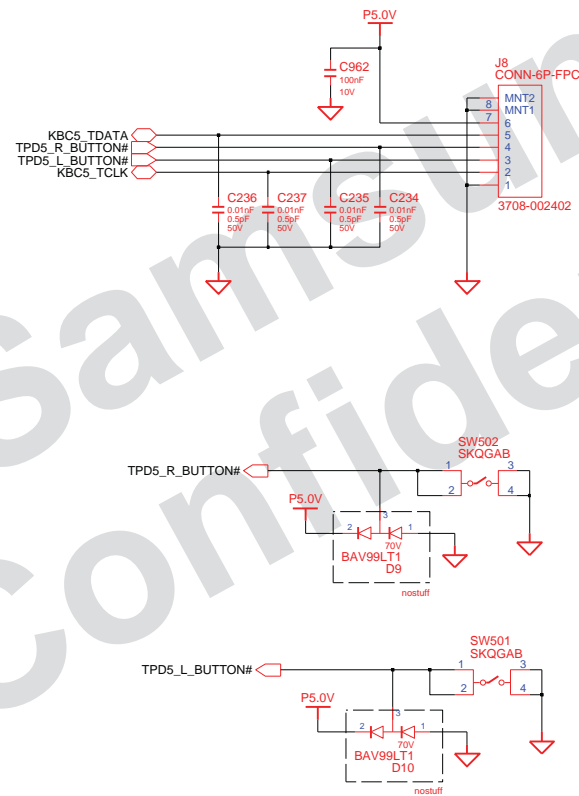
SAMSUNG PROPRIETARY
 THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

Micom Glue Logic

KEYBOARD



TOUCHPAD



Samsung
Confidential

<http://hobi-elektronika.net>

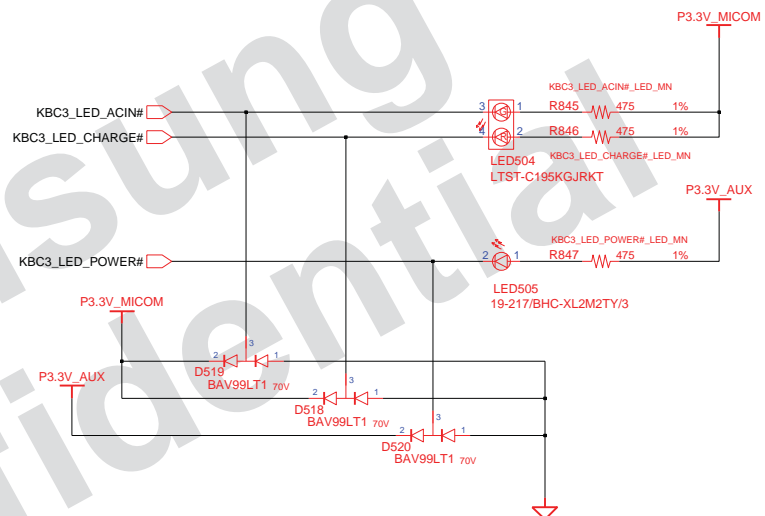
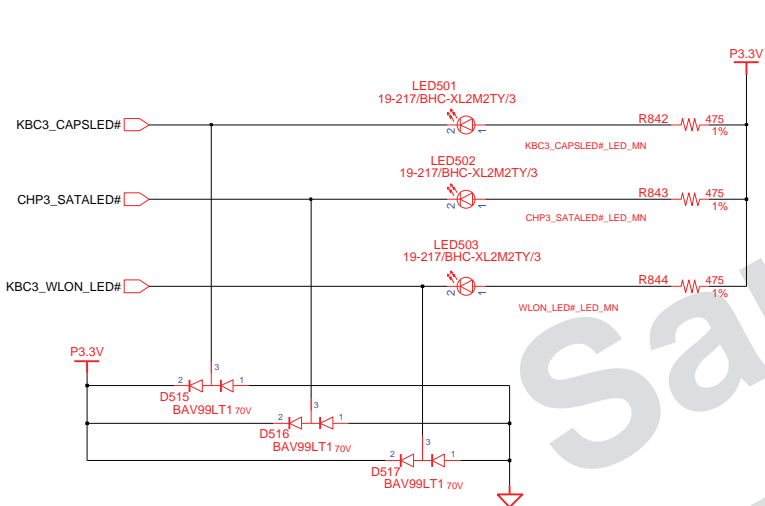
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	MICOM GLUE LOGIC	PART NO.	
APPROVAL	BC LEE,	REV	REV 0.0	KEYBOARD & TOUCHPAD	BA41-####A	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:02:24 PM	PAGE	39 OF 53	

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.

FUNCTION KEY LED

ADAPTERIN/CHARGING LED



SamSung
Confidential

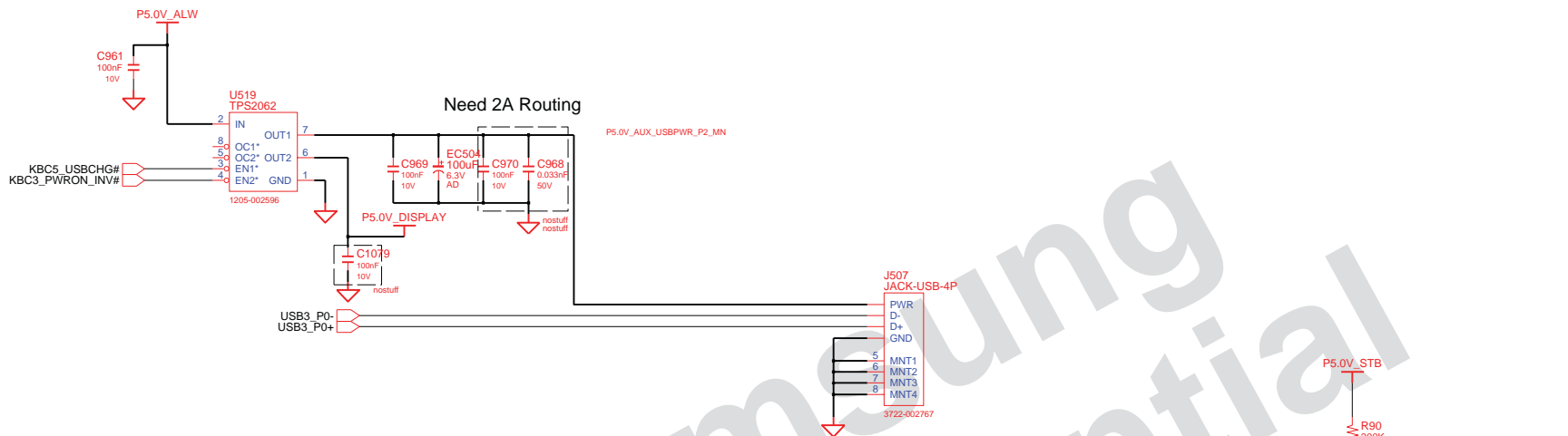
<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		LED_SWITCH	
APPROVAL	BC LEE,	REV	REV 0.0		LED_SWITCH	
MODULE CODE		LAST EDIT		February, 22, 2010 12:03:11 PM	PAGE 40 OF 53	

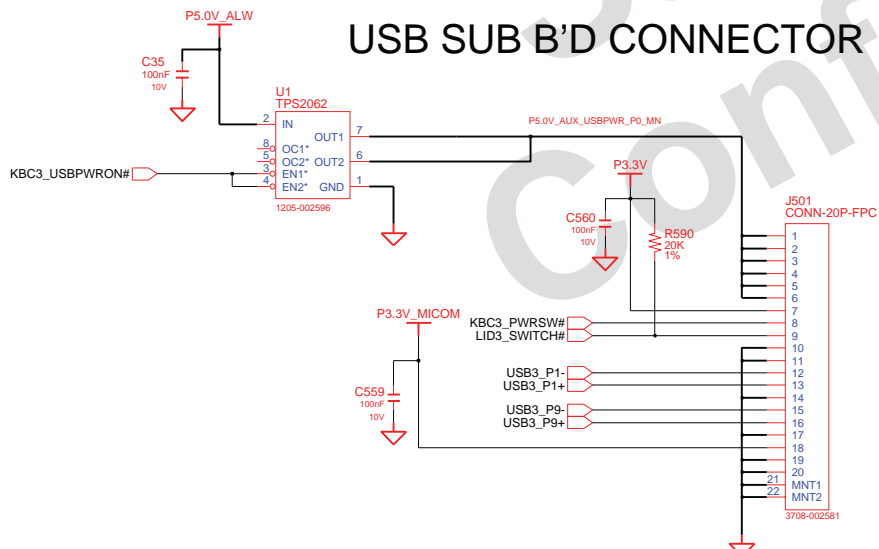
SAMSUNG PROPRIETARY

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.

USB Single connector



USB SUB B'D CONNECTOR



for sleep in charge

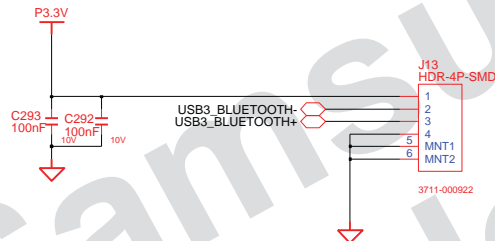
DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		USB_CONN	
APPROVAL	BC LEE,	REV	REV 0.0		USB & eSATA	PART NO. BA41-####A
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:07:20 PM	PAGE	41	OF 53

<http://hobi-elektronika.net>

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.

USB I/F Devices

Bluetooth Interface



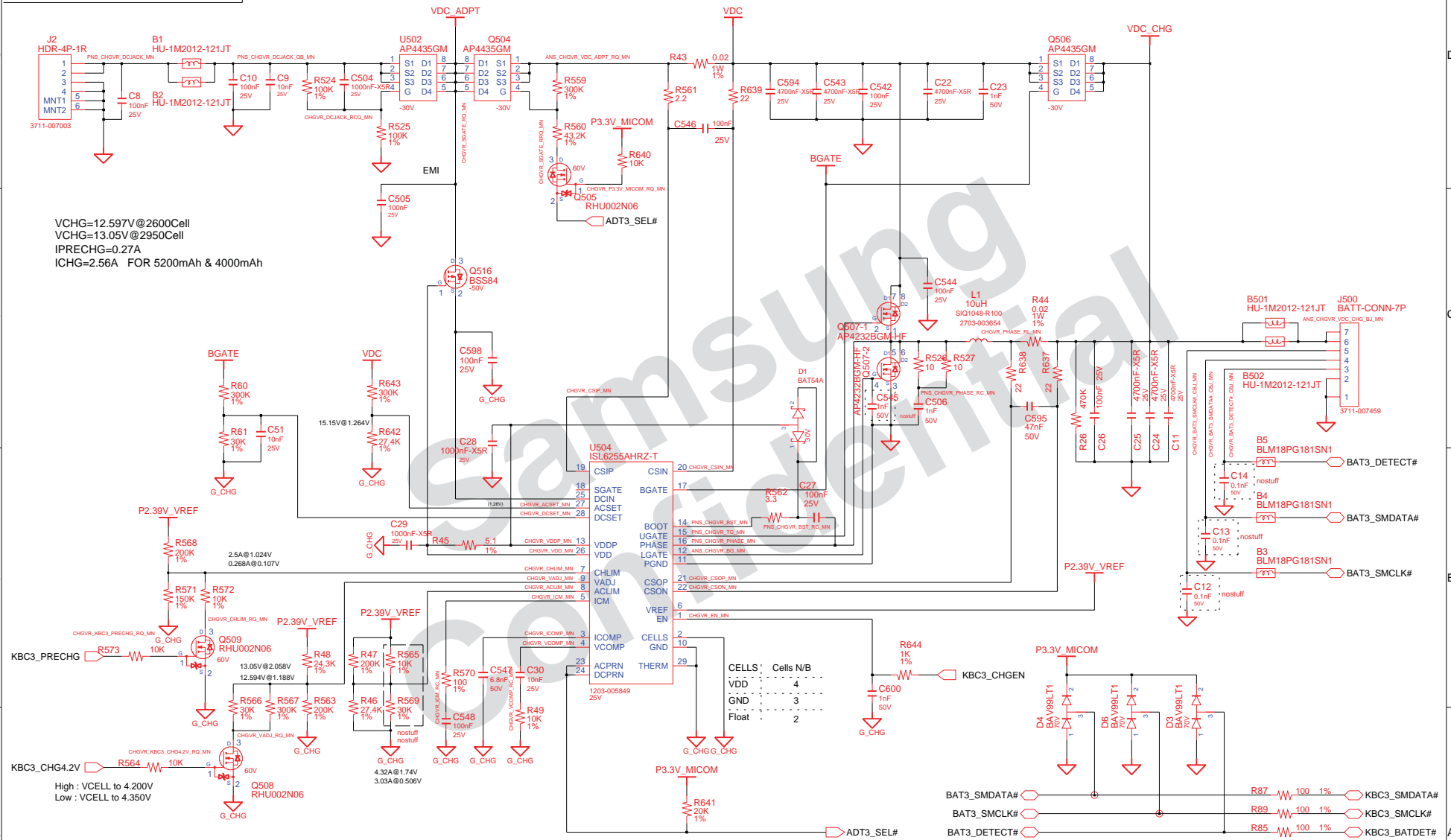
Samsung
Confidential

DESIGN	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	USB_DEVICES	PART NO.	
APPROVAL	BC LEE,	REV	REV 0.0	BLUETOOTH & CAMERA	BA41-####A	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:08:32 PM	PAGE	42 OF 53	

<http://hobi-elektronika.net>

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.

CHARGER & POWER MANAGEMENT



VCHG=12.597V@2600Cell
 VCHG=13.05V@2950Cell
 IPRECHG=0.27A
 ICHG=2.56A FOR 5200mAh & 4000mAh

High : VCELL to 4.200V
 Low : VCELL to 4.350V

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

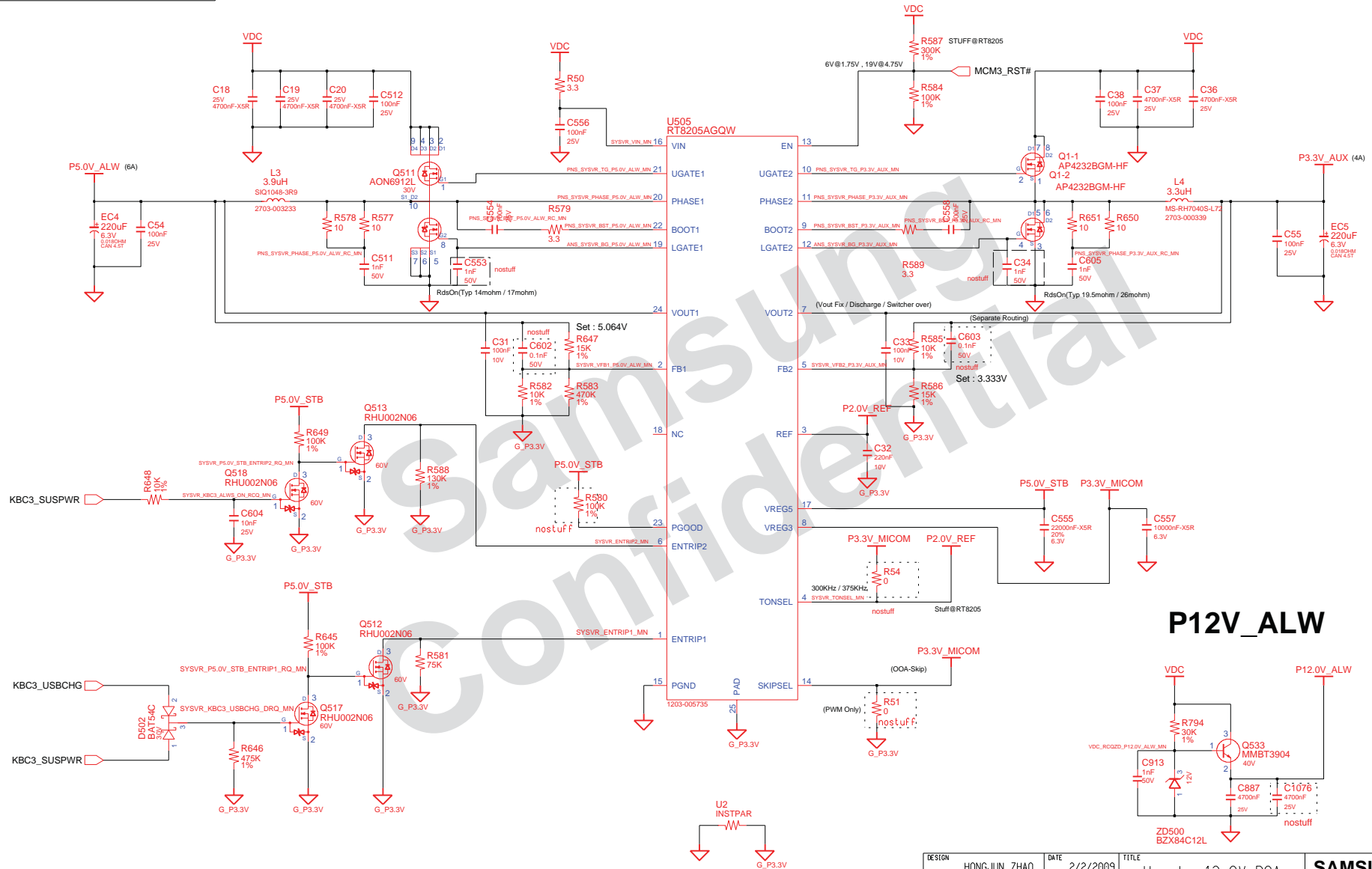
SHORT2 INSTPAR (ACTIVE LOW)

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 5V BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		CHARGER	
APPROVAL	BC LEE,	REV	REV 0.0		Intersil ISL6256A	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:09:15 PM	PAGE	43	OF 53

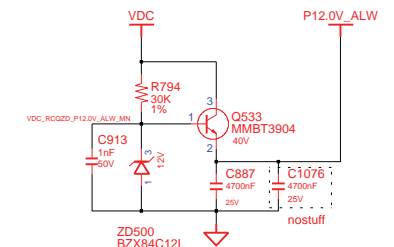
SAMSUNG PROPRIETARY

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.

P3.3V_AUX & P5.0V_ALW



P12V_ALW



P5.0V_AUX Inductor: 10x10x4.8
P3.3V_AUX Inductor: 7x7x4 (5.2A)
Output Cap: 6x6x4.5

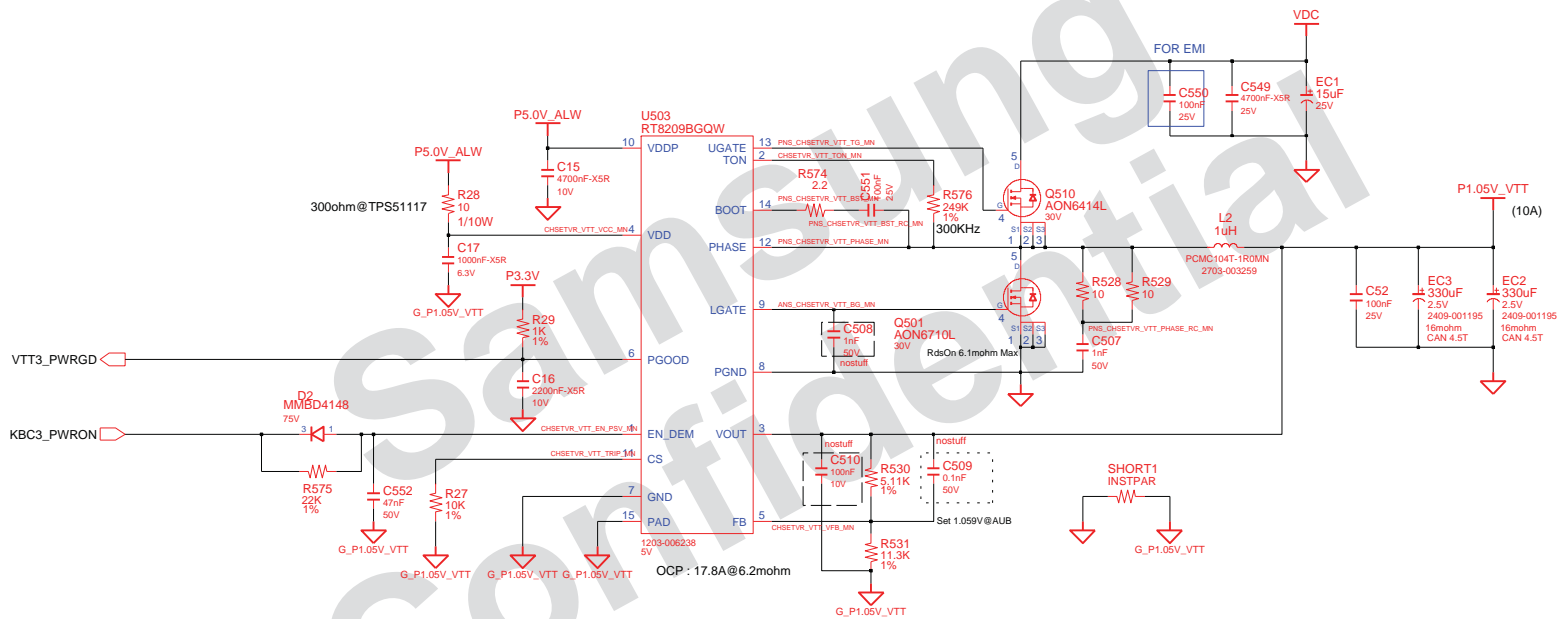
<http://hobi-elektronika.net>

DESIGN	HONGJUN ZHAO,	DATE	2/2/2009	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		P3.3V_AUX / P5.0V_ALW	
APPROVAL	BC LEE,	REV	REV 0.0		TI TPS51125	PART NO.
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 12:11:35 PM			BA41-#####A
					PAGE	44 OF 53

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.

Chipset Power (P1.05V)



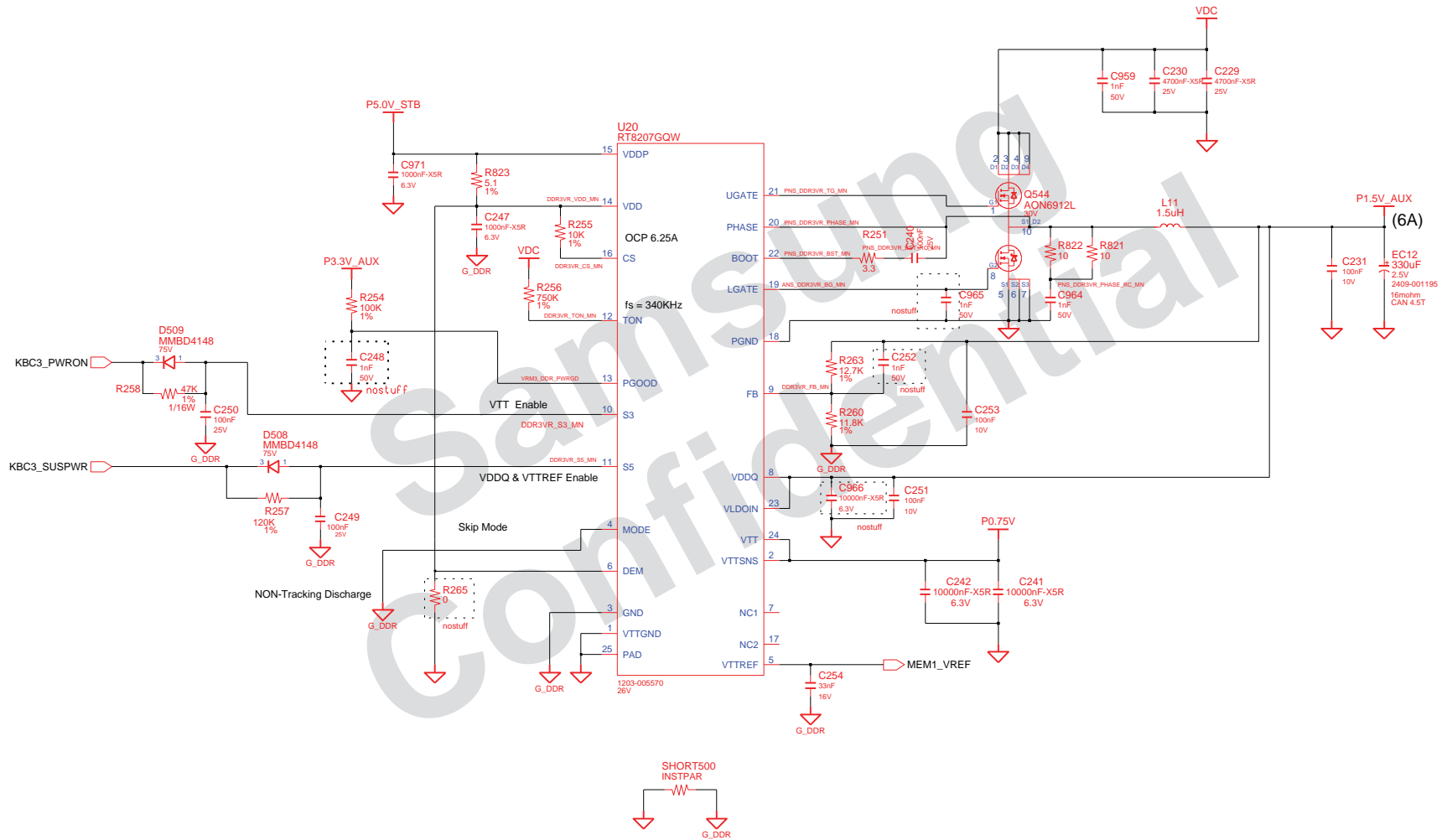
DRAW	HONGJUN ZHAO,	DATE	01/09/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		P1.05V	
APPROVAL	BC LEE,	REV	REV 0.0		TI TPS51125	
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 12:12:12 PM	PAGE	45 OF 53	

<http://hobi-elektronika.net>

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



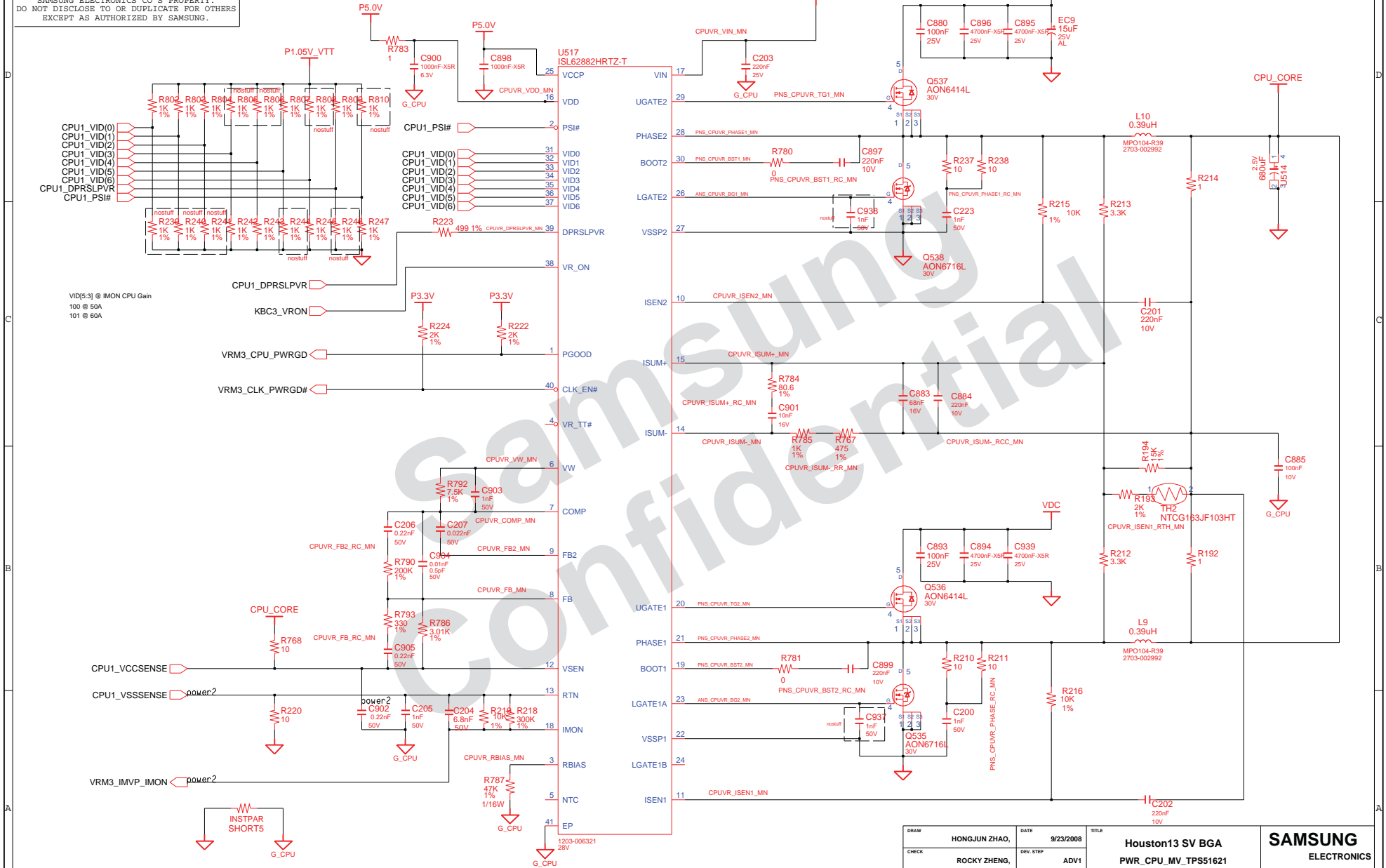
<http://hobi-elektronika.net>

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV.STEP	ADV1		PWR_MEMORY	
APPROVAL	BC LEE,	REV	REV 0.0		DDR3 POWER	PART NO. BA41-####A
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:12:49 PM	PAGE	46	OF 53

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.

CPU VRM (IMVP-6.5)



VID(5-3) @ IMON CPU Gain
100 @ 50A
101 @ 60A

INSTPAR SHORTS
G_CPU

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		PWR_CPU_MV_TPS51621	
APPROVAL	BC LEE,	REV	REV 0.0		CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:13:44 PM	PAGE	47 OF 53	

<http://hobi-elektronika.net>

SAMSUNG PROPRIETARY

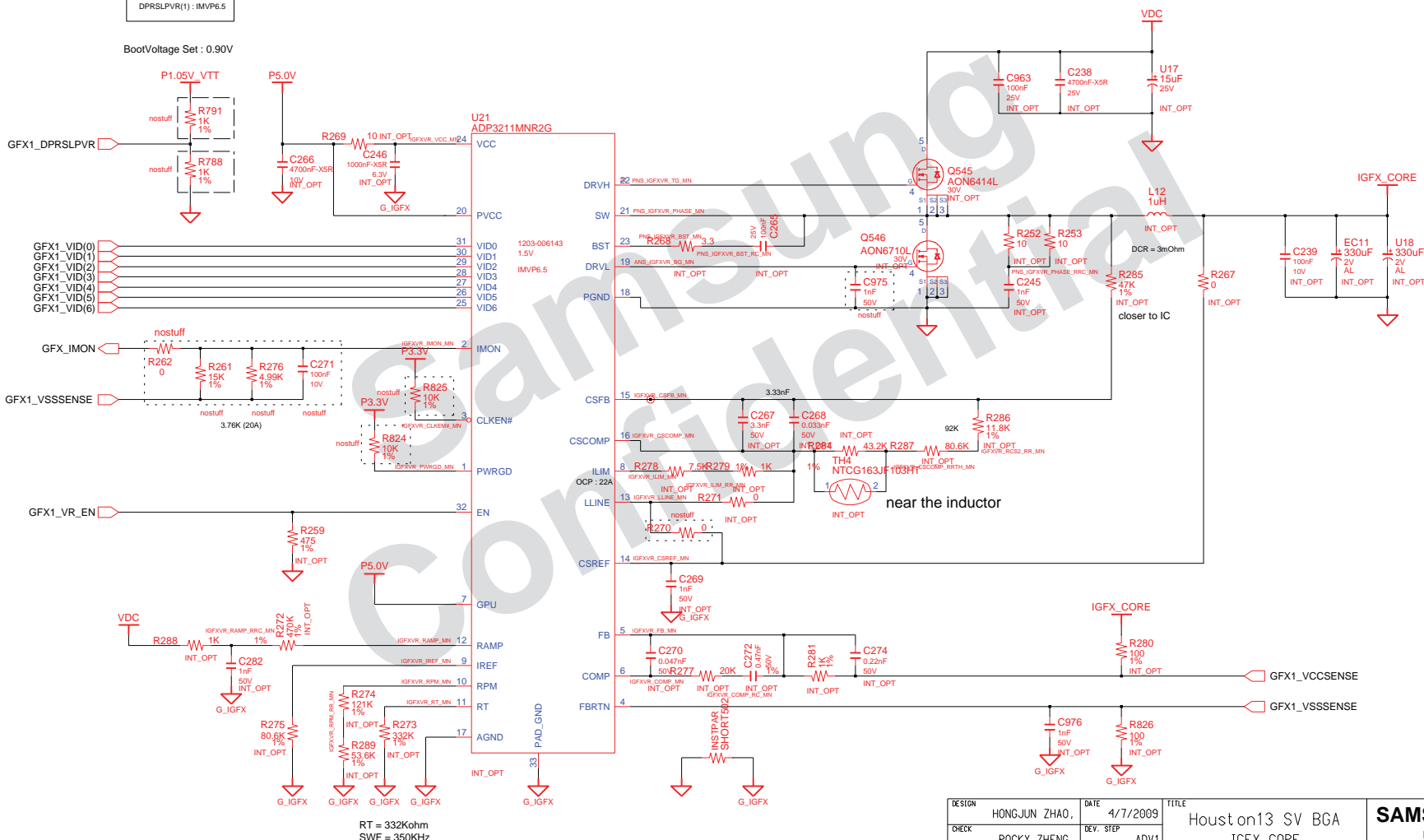
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.

IMON GPU Gain Setting

VID0 (1) : Reserved
VID1 (1) : Reserved
VID2 (1) : Reserved
VID3 (1) : IMON
VID4 (0) : IMON , 20A
VID5 (0) : IMON
VID6 (0) : Reserved
DPRSLPVR(1) : IMVP6.5

Internal GFX Core Power

BootVoltage Set : 0.90V



RT = 332Kohm
SWF = 350KHz

http://hobi-elektronika.net

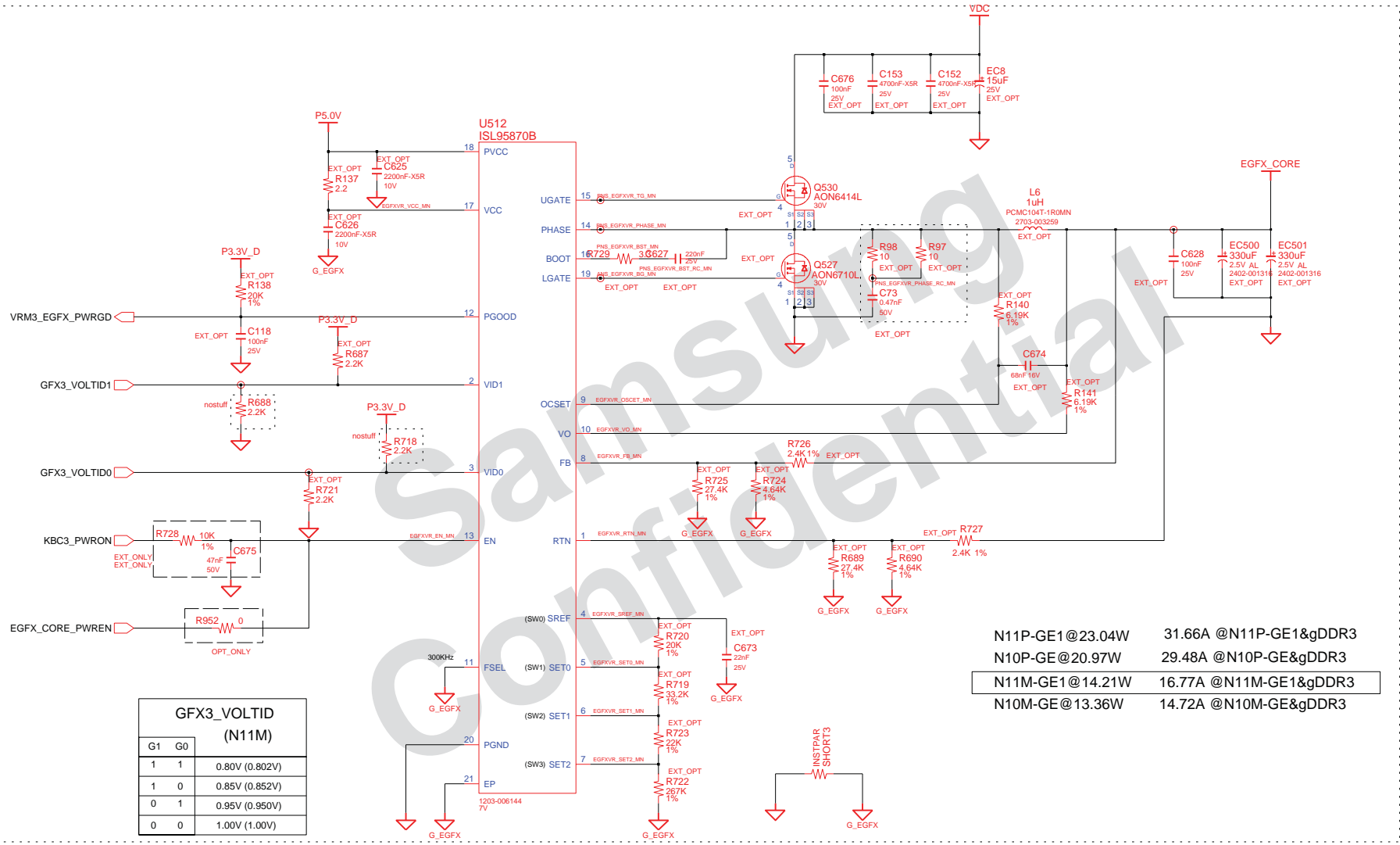
Table with columns for DESIGN, CHECK, APPROVAL, MODULE CODE, DATE, DEV. STEP, REV, LAST EDIT, TITLE, and PAGE. Content includes names like HONGJUN ZHAO, ROCKY ZHENG, BC LEE, and dates like 4/7/2009, February, 22, 2010 12:15:38 PM.

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.

EXT_OPT

External GFX Core Power



N11P-GE1@23.04W	31.66A @N11P-GE1&gDDR3
N10P-GE@20.97W	29.48A @N10P-GE&gDDR3
N11M-GE1@14.21W	16.77A @N11M-GE1&gDDR3
N10M-GE@13.36W	14.72A @N10M-GE&gDDR3

<http://hobi-elektronika.net>

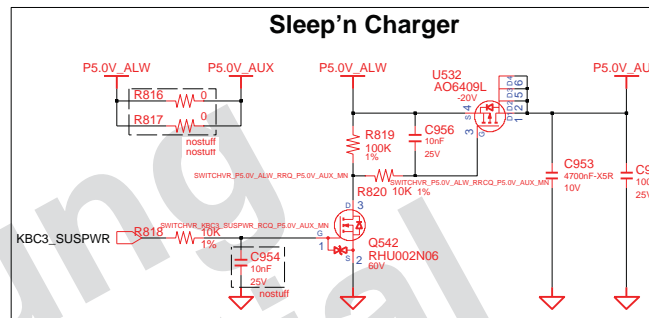
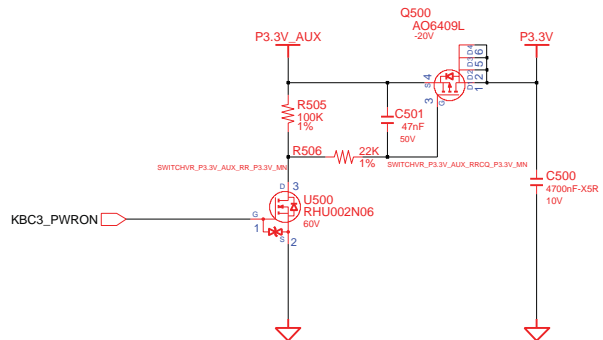
DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	EGFX_CORE		
APPROVAL	BC LEE,	REV	REV 0.0			
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:16:30 PM	PAGE	49	OF 53

SAMSUNG PROPRIETARY

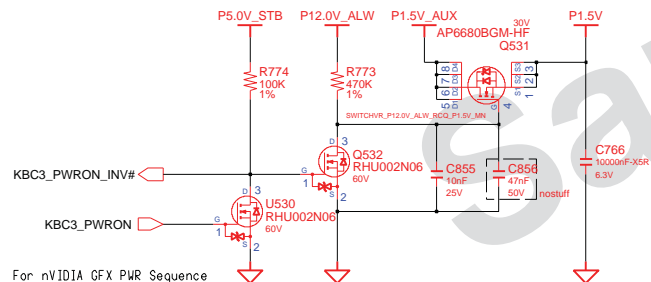
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.

Switched Power 1

Switched Power On (P3.3V) Multi@AP2607GY,Si3433BDV

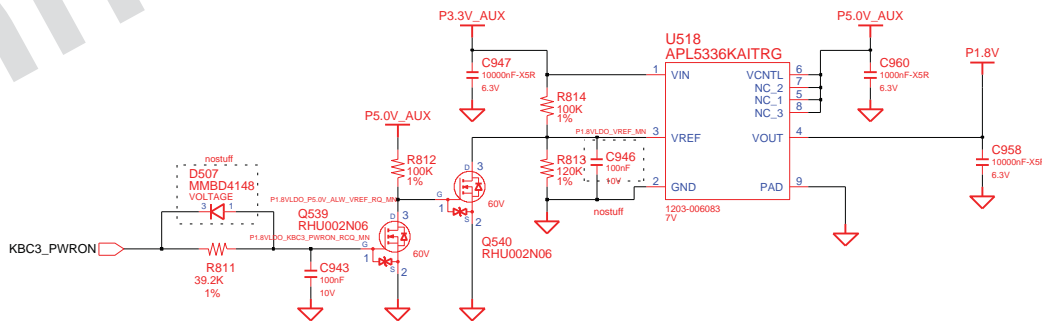


Switched Power On (P1.5V)

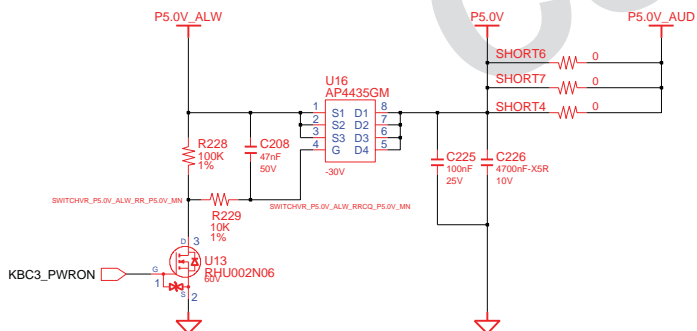


For nVIDIA GFX PWR Sequence
NVDD(EGFX_CORE) first and then FBVDDQ(gDDR3)

P1.8V(LDO)



Switched Power On (P5.0V) Multi@Si443DDY



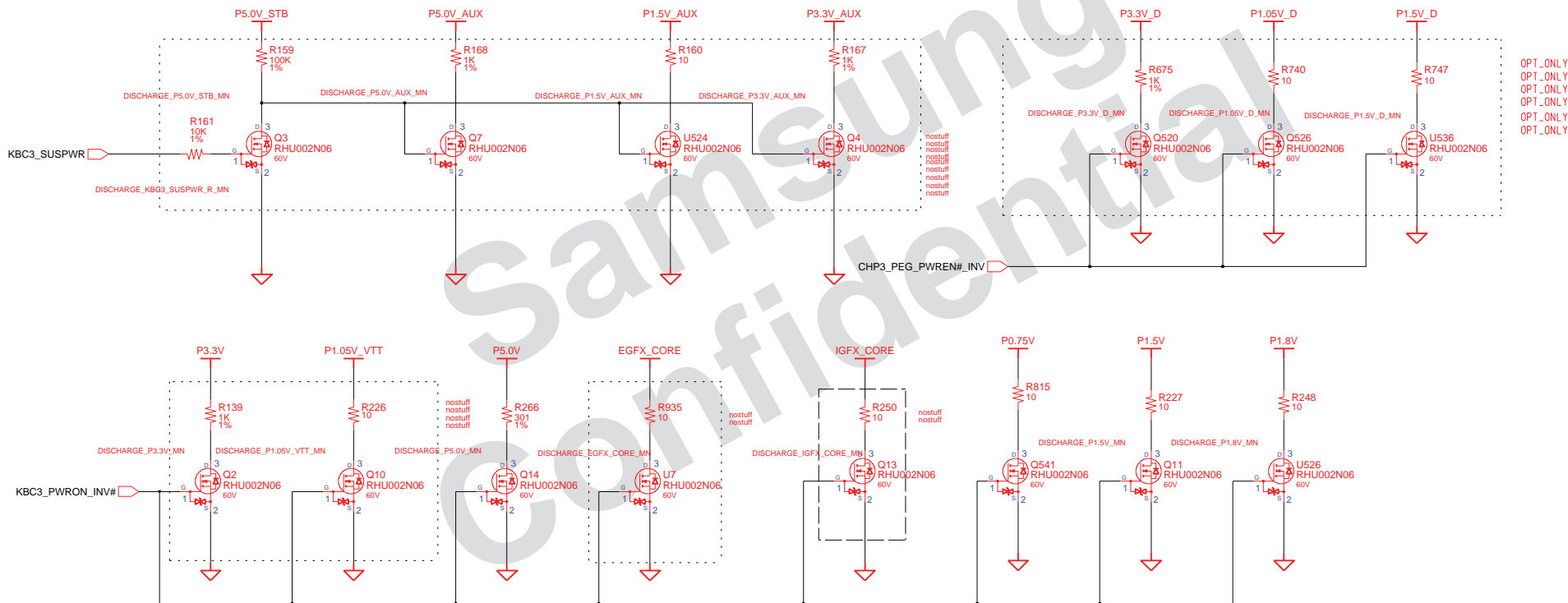
DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1	PWR_MV_SWITCHED	PART NO.	
APPROVAL	BC LEE,	REV	REV 0.0	SWITCHED POWER	BA41-####A	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:34:53 PM	PAGE	50	OF 53

<http://hobi-elektronika.net>

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 DisCharge



OPT_ONLY
OPT_ONLY
OPT_ONLY
OPT_ONLY
OPT_ONLY

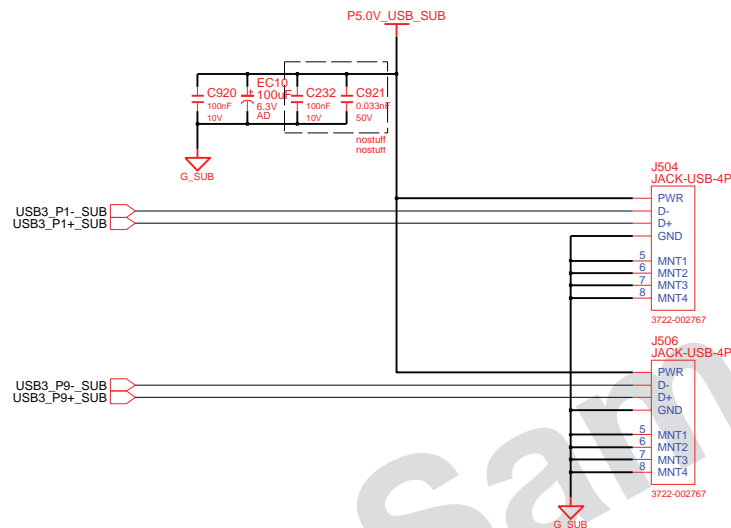
DRAW	HONGJUN ZHAO,	DATE	10/30/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		LPC_TPM1p2	
APPROVAL	BC LEE,	REV	REV 0.0		LPC_TPM1p2	
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 12:35:29 PM	PAGE	51	OF 53

<http://hobi-elektronika.net>

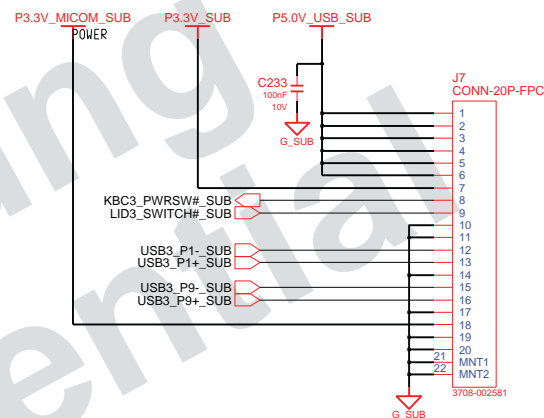
SAMSUNG PROPRIETARY

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.

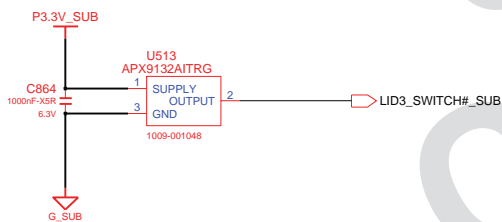
2 USB PORT & POWER S/W SUB B'D



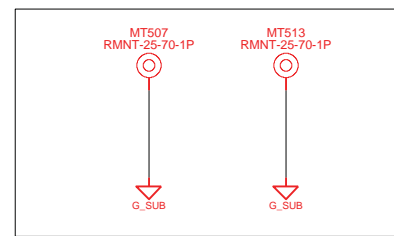
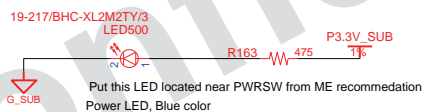
SUB TO MAIN USB CONN



LID_SWITCH

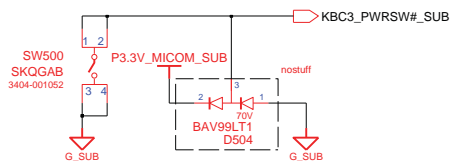


Power ON LED



USB sub board mount hole

Power Switch Button



<http://hobi-elektronika.net>

DESIGN	HONGJU ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		SUB BOARD1	
APPROVAL	BC LEE,	REV	REV 0.0		2 USB & POWER SW	
MODULE CODE	undefined	LAST EDIT	February, 22, 2010 12:36:28 PM	PAGE	52	OF 53

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.

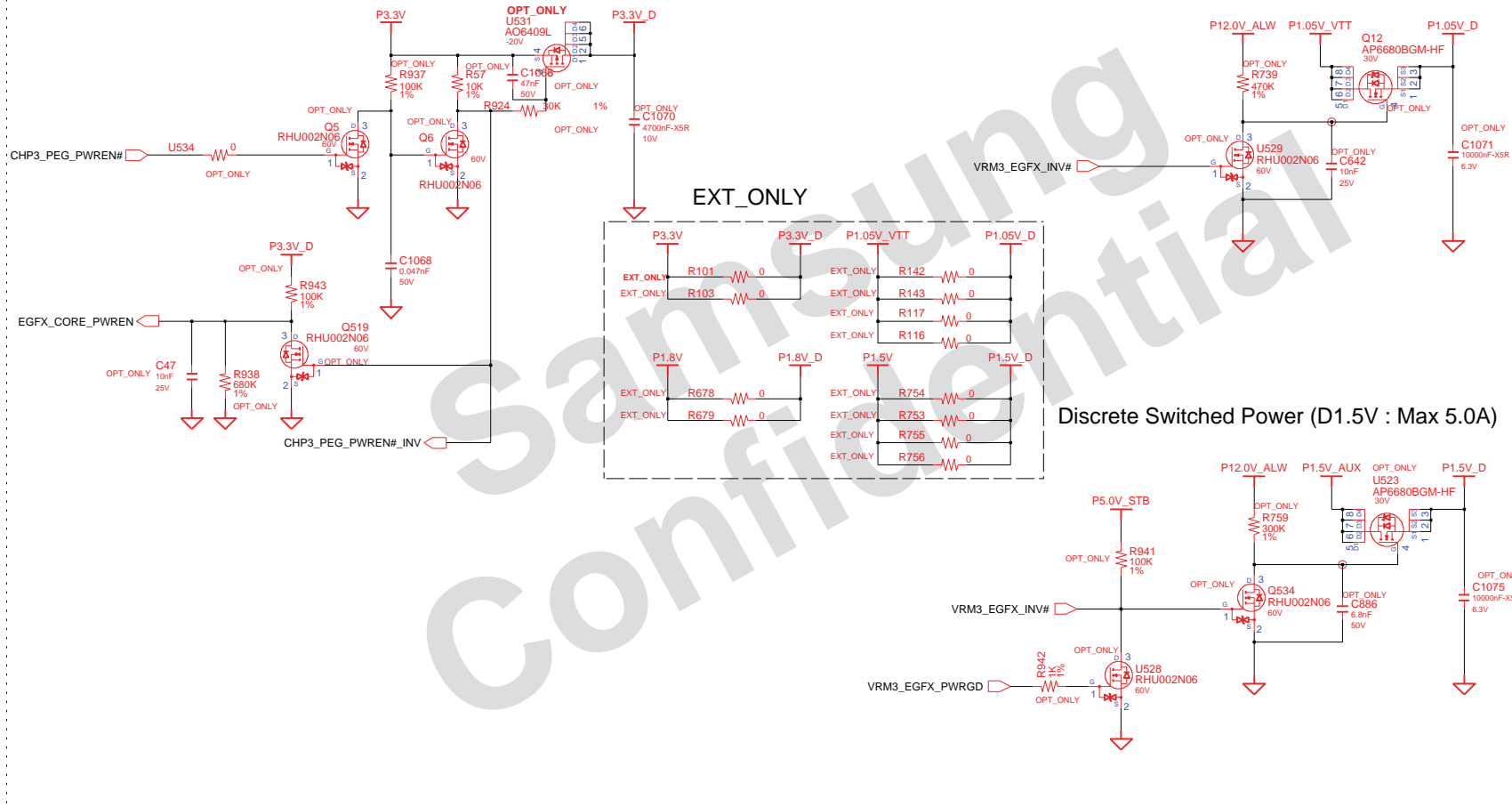
Switched Power 2 (For nVidia GFX Power Sequence)

Sequence (D3.3V -> GFX Core -> D1.8V -> D1.5V -> D1.05V)

OPT_ONLY

Discrete Switched Power (D3.3V : Max_1.2A)

Discrete Switched Power (D1.05V : Max 3.6A)



Discrete Switched Power (D1.5V : Max 5.0A)

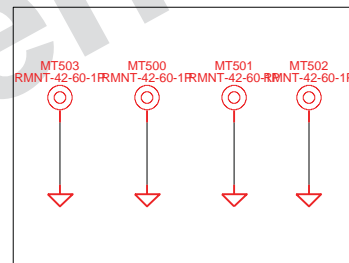
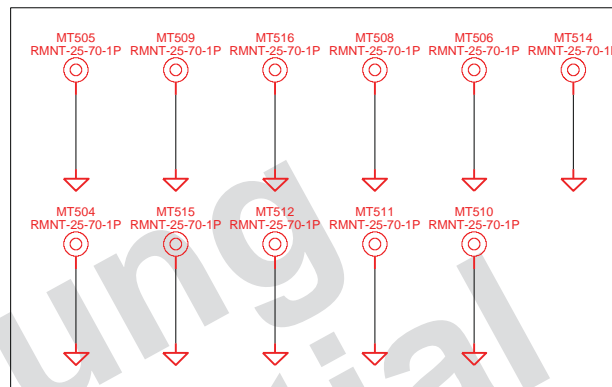
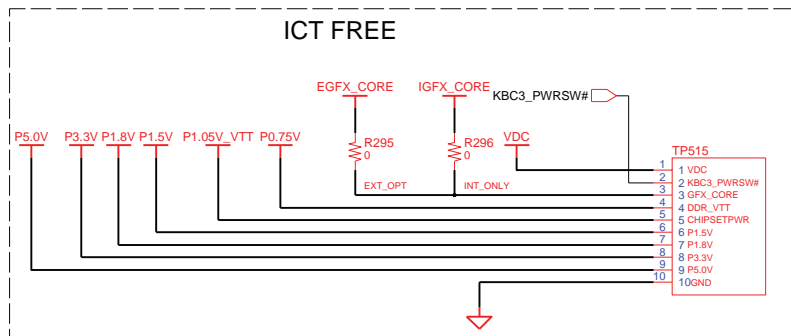
DRAW	HONGJUN ZHAO,	DATE	10/30/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		LPC_TPM_1p2	
APPROVAL	BC LEE,	REV	REV 0.0		LPC_TPM_1p2	
MODULE CODE	undef ined	LAST EDIT	February, 22, 2010 12:35:29 PM	PAGE	51 OF 53	

<http://hobi-elektronika.net>

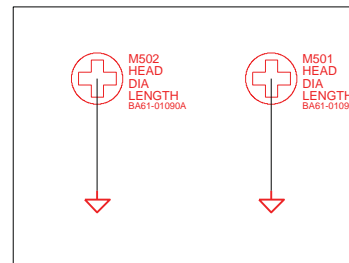
SAMSUNG PROPRIETARY

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.

Mainboard Mount ((25,70)x12EA)



CPU Thermal



GPU Thermal

DRAW	HONGJUN ZHAO,	DATE	9/23/2008	TITLE	Houston13 SV BGA	SAMSUNG ELECTRONICS PART NO. BA41-####A
CHECK	ROCKY ZHENG,	DEV. STEP	ADV1		ICT PORT	
APPROVAL	BC LEE,	REV	REV 0.0		ICT PORT	
MODULE CODE		LAST EDIT		February, 22, 2010 12:37:07 PM	PAGE 53 OF 53	

<http://hobi-elektronika.net>