

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.

Scala3-14CRV

CPU : IVY Bridge PGA

Chip Set : Intel Panther Point

GFX : NVIDIA N13M-GS/GE

Remarks : Chief River Platform

Model Name : Scala3-14CRV

PBA Name : MAIN_Dual

PCB Code : BA41-02092A (GCE)
BA41-02093A (HST)
BA41-02094A (PTC)
BA41-02098A (GBM)

Dev. Step : MP

Revision : 1.1

T.R. Date : 2012.06.14

Design	CHECK	APPROVAL
Tao Xiaofeng	Chu XF	BL LEE

Owner : SEC Mobile R & D

Signature :

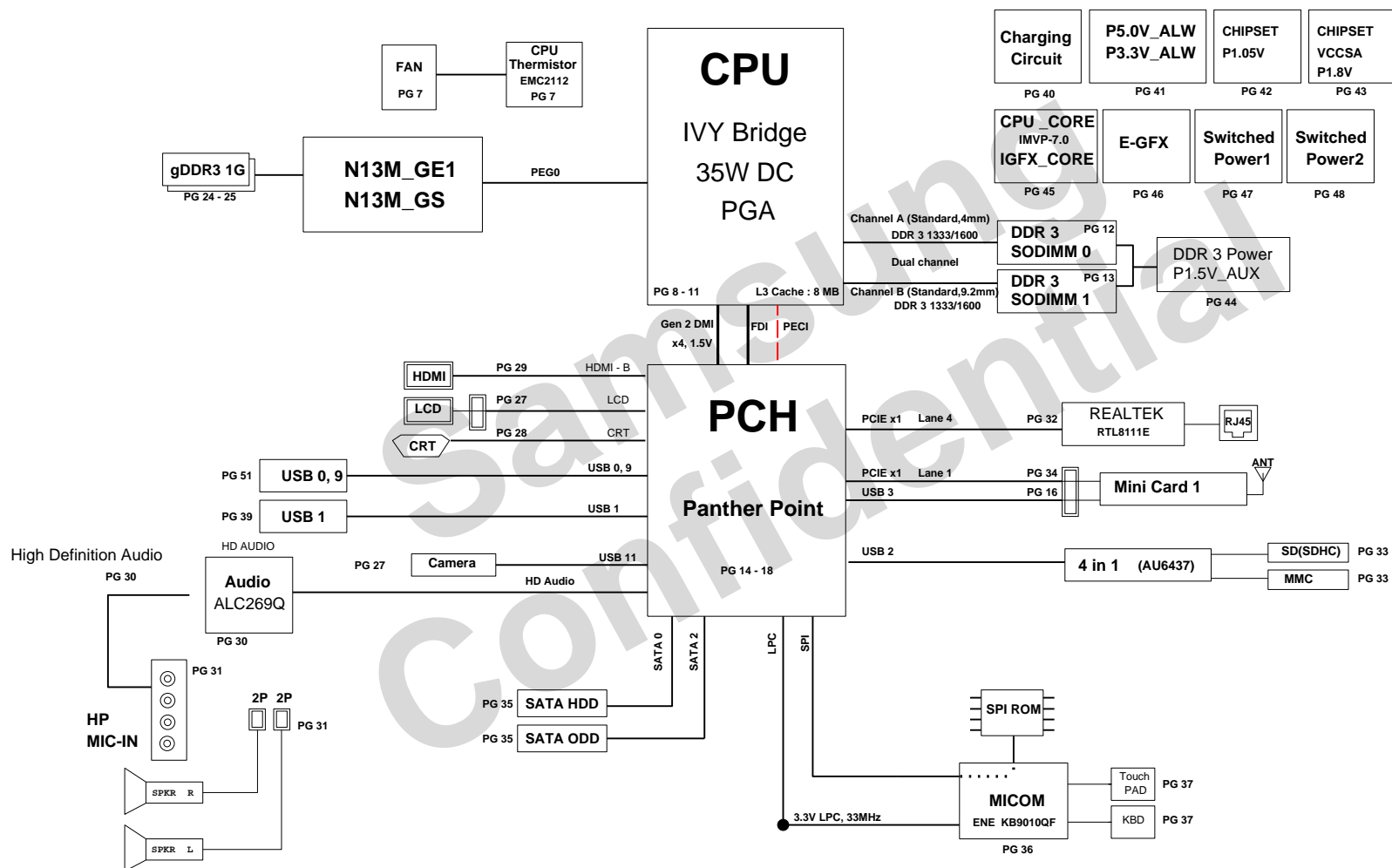
X

sheet01 : Cover
sheet02 : BLOCK DIAGRAM
sheet03 : BOARD INFORMATION
sheet04 : POWER DIAGRAM
sheet05 : CLOCK DISTRIBUTION
sheet06 : Green Clock
sheet07 : Thermal Sensor
sheet08 : CPU
sheet09 : CPU
sheet10 : CPU
sheet11 : CPU
sheet12 : DDR3 SODIMM #0
sheet13 : DDR3 SODIMM #1
sheet14 : PCH-CougarPoint
sheet15 : PCH-CougarPoint
sheet16 : PCH-CougarPoint
sheet17 : PCH-CougarPoint
sheet18 : PCH-CougarPoint
sheet19 : N12P-GVR
sheet20 : N12P-GVR
sheet21 : N12P-GVR
sheet22 : N12P-GVR
sheet23 : N12P-GVR
sheet24 : GFX memory
sheet25 : GFX memory
sheet26 : STRAP

sheet27 : LVDS/CAMERA
sheet28 : CRT
sheet29 : HDMI
sheet30 : Audio - ALC269
sheet31 : Audio - HP/MIC
sheet32 : LAN (Realtek RTL8111E)
sheet33 : 4-in-1 card (AU6437)
sheet34 : WLAN
sheet35 : SATA interface
sheet36 : MICOM / BIOS
sheet37 : MICOM Glue Logic (KBD / TP)
sheet38 : LED for 14" & for 15"
sheet39 : USB connector
sheet40 : Power - charger
sheet41 : Power - P3.3V_AUX / P5.0V_AUX
sheet42 : Power - P1.05V (Chipset Power)
sheet43 : Power - P0.8V (Chipset Power)
sheet44 : Power - DDR3
sheet45 : Power - CPU VRM
sheet46 : Power - EGFX_CORE
sheet47 : Power - Switched Power 1
sheet48 : Power - Switched Power 2
sheet49 : Power - Power Discharge
sheet50 : Mount Hole / Thermal Hole
sheet51 : USB Sub B'D

DRAW	XF TAO	DATE	11/06/2012	Scala3-14R			SAMSUNG ELECTRONICS		
CHECK	XF CHU	DEV. STEP	MP						
APPROVAL	BL LEE	REV	REV 1.1	MAIN					PART NO.
				COVER			BA41-02092-94A		
MODULE CODE	LAST EDIT		May 23, 2012 08:40:30 AM			PAGE	1	OF	51

BLOCK DIAGRAM



DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP	MAIN	MAIN	
APPROVAL	BL LEE	REV	REV 1.0	BLOCK DIAGRAM	PART NO. BA41-02092-94A	
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	2	OF 51

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_STB P5.0V_ALW P3.3V_ALW P12.0V_ALW	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 3.3V always power rail 12.0V 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 DDR3 (off in S4-S5)	
P5.0V P3.3V P1.8V P1.5V P0.75V P0.8V	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) 0.75V power rail for DDR3 (off in S3-S5) 0.8V switched power rail (off in S3-S5)	
VCC_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT	
P3.3V_D P1.5V_D P1.05V_D	3.3V discrete power rail for N12X 1.5V discrete power rail for N12X 1.05V discrete power rail for N12X	
		S3
		S0
		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	SYSTEM PORT 2	5	NC
5	NC	6	NC
6	NC	7	NC
7	NC	8	NC
8	NC		
9	NC		
10	BLUETOOTH		
11	Camera(LCD Cable)		
12	NC		
13	NC		

SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	NC
2	ODD
3	NC
4	NC
5	NC

Crystal / Oscillator

TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	HM65	Real Time Clock
Crystal	25MHz	LAN	Intel LAN
Crystal	25MHz	GREENCLK	GREENCLK
Crystal	25MHz	HM65	INTEL
Crystal	27MHz	N12P-GVR	NVIDIA

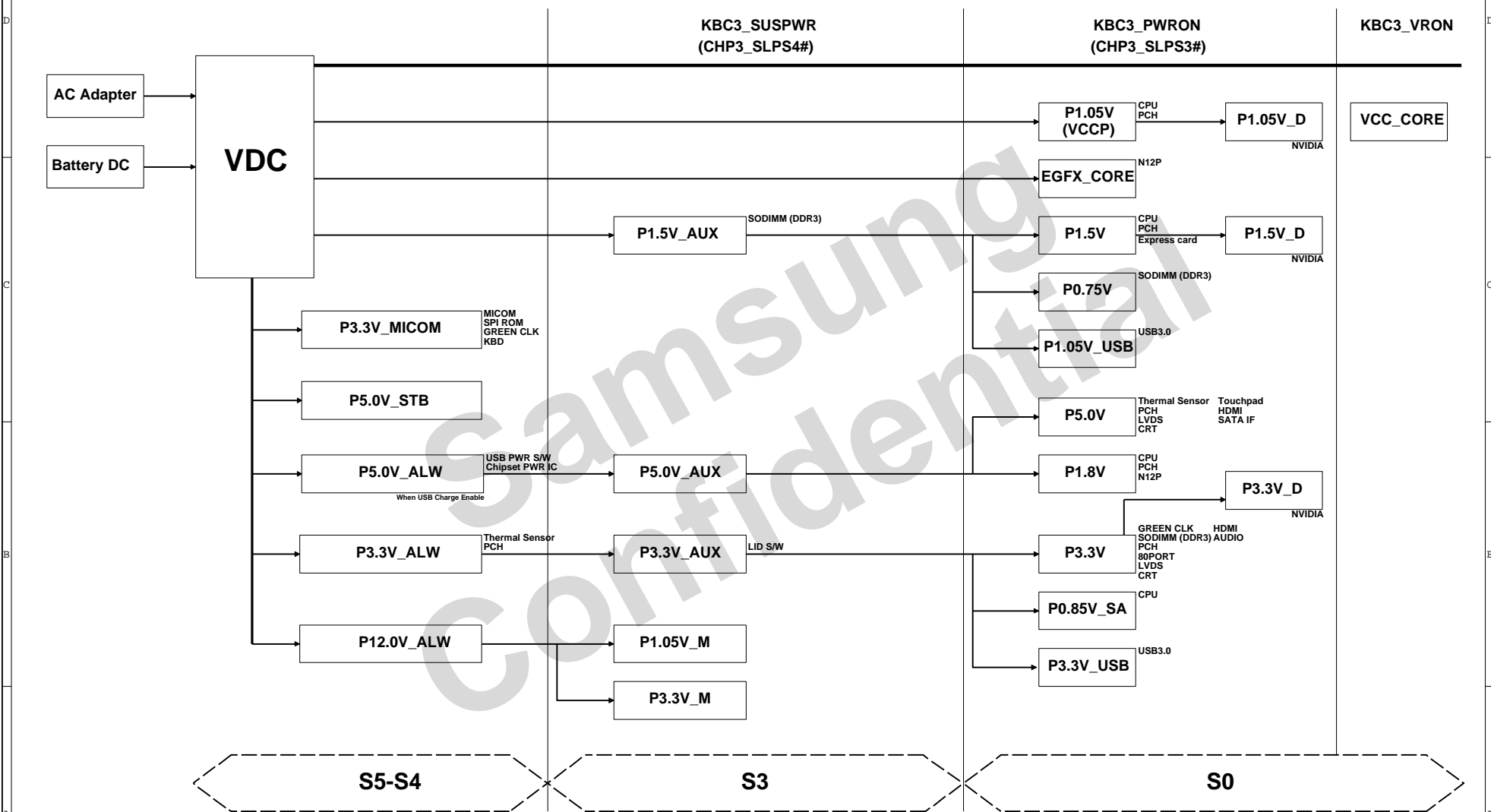
LCD Pannel Detect (TBD)

Devices	Resolution	PANNEL_DETECT_0
---------	------------	-----------------

I²C / SMB Address

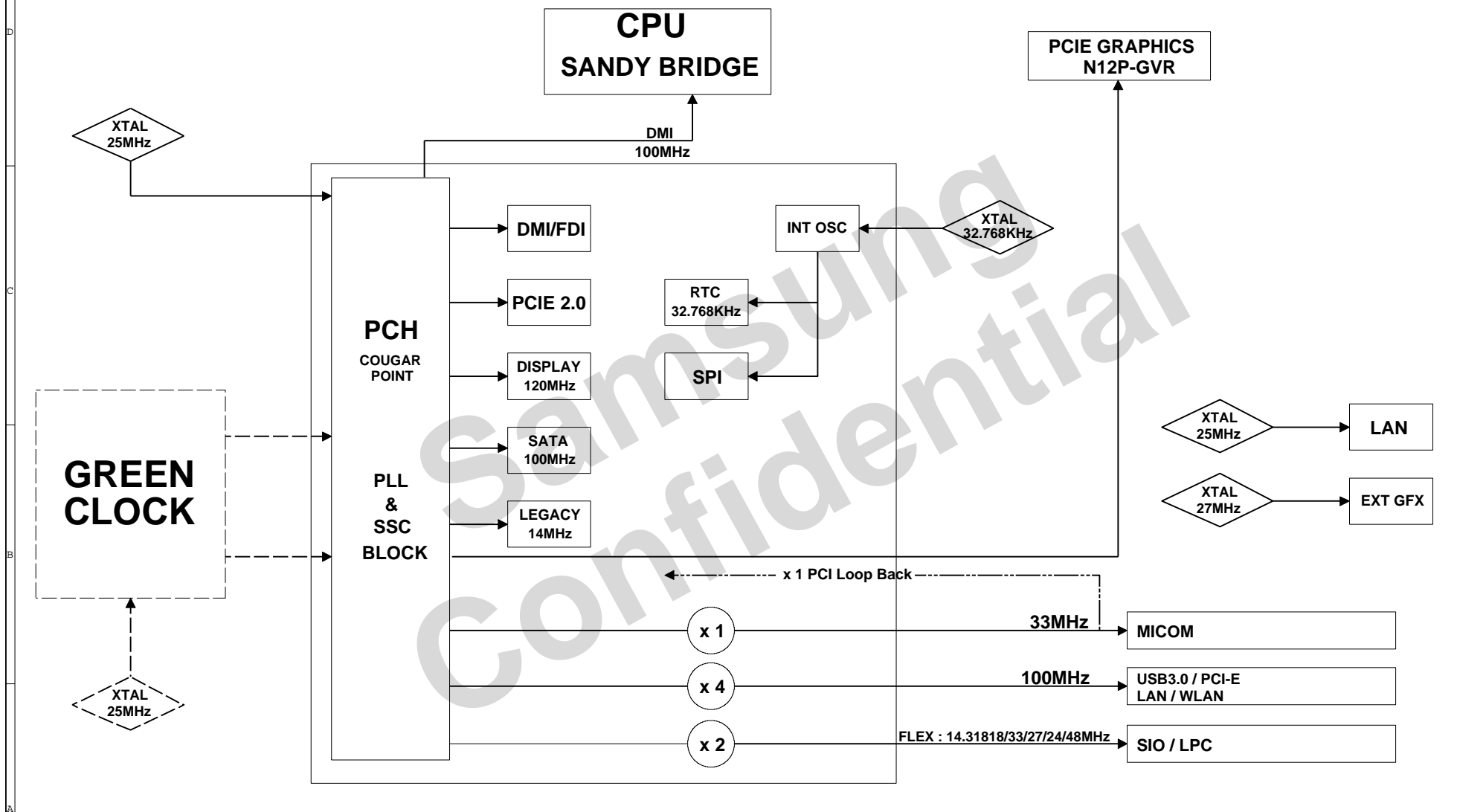
Devices	Address	Hex	Bus
HM65	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	Thermal Sensor
SODIMM0	1010 000x	A0h	
SODIMM1	1010 010x	A4h	
Thermal Sensor on SODIMM0	0011 000x	30h	
Thermal Sensor on SODIMM1	0011 010x	34h	
Thermal Sensor on board	1101 100x	98h	
Power thermal management TS	1101 011x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

DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R MAIN BOARD INFO	SAMSUNG ELECTRONICS PART NO. BA41-02092-94A
CHECK	XF CHU	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	3	OF 51



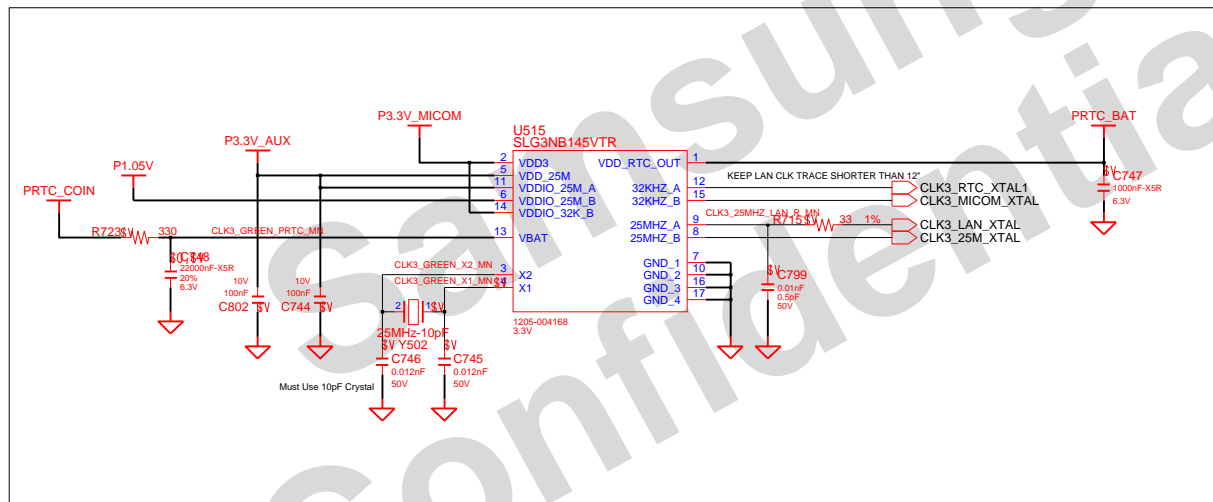
DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS PART NO. BA41-02092-94A
CHECK	XF CHU	DEV. STEP	MP		MAIN	
APPROVAL	BL LEE	REV	REV 1.0		POWER DIAGRAM	
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	4 OF 51	

CLOCK DISTRIBUTION Rev. 0.8



DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP	MAIN		
APPROVAL	BL LEE	REV	REV 1.0	CLOCK DIAGRAM		
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	5	OF 51

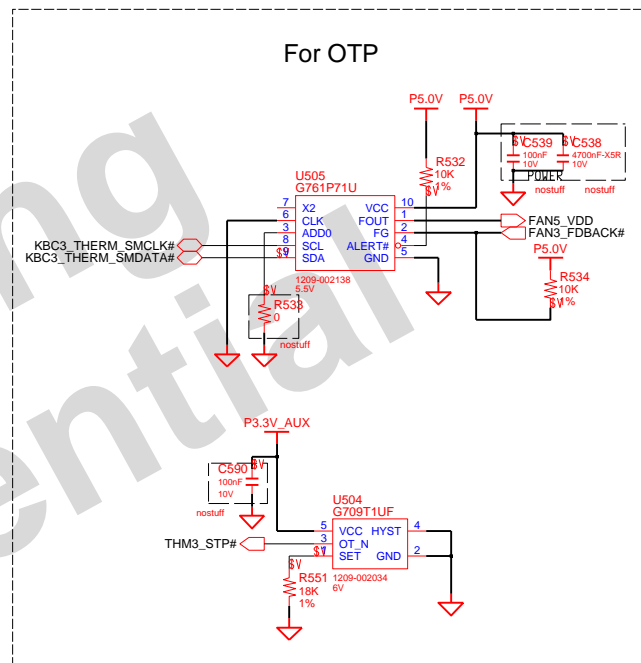
CLOCK DISTRIBUTOR



GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK

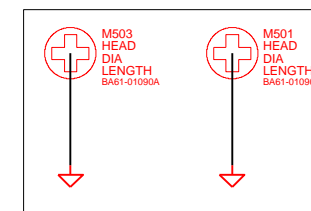
DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R CLOCK CLOCK DISTRIBUTION	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP			PART NO. BA41-02092-94A
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	6	OF 51

For OTP



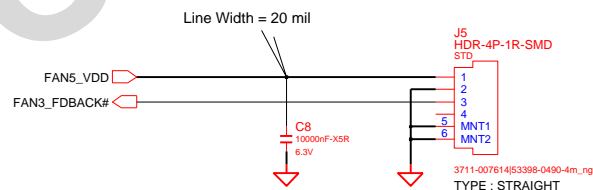
Temperature : 95.78c
confirmed by thermal charger
(2011.05.02)
 $R_{\text{ser}}(\text{kohm}) = 0.0012T^2 - 0.9308T + 96.147$

FAN PEM



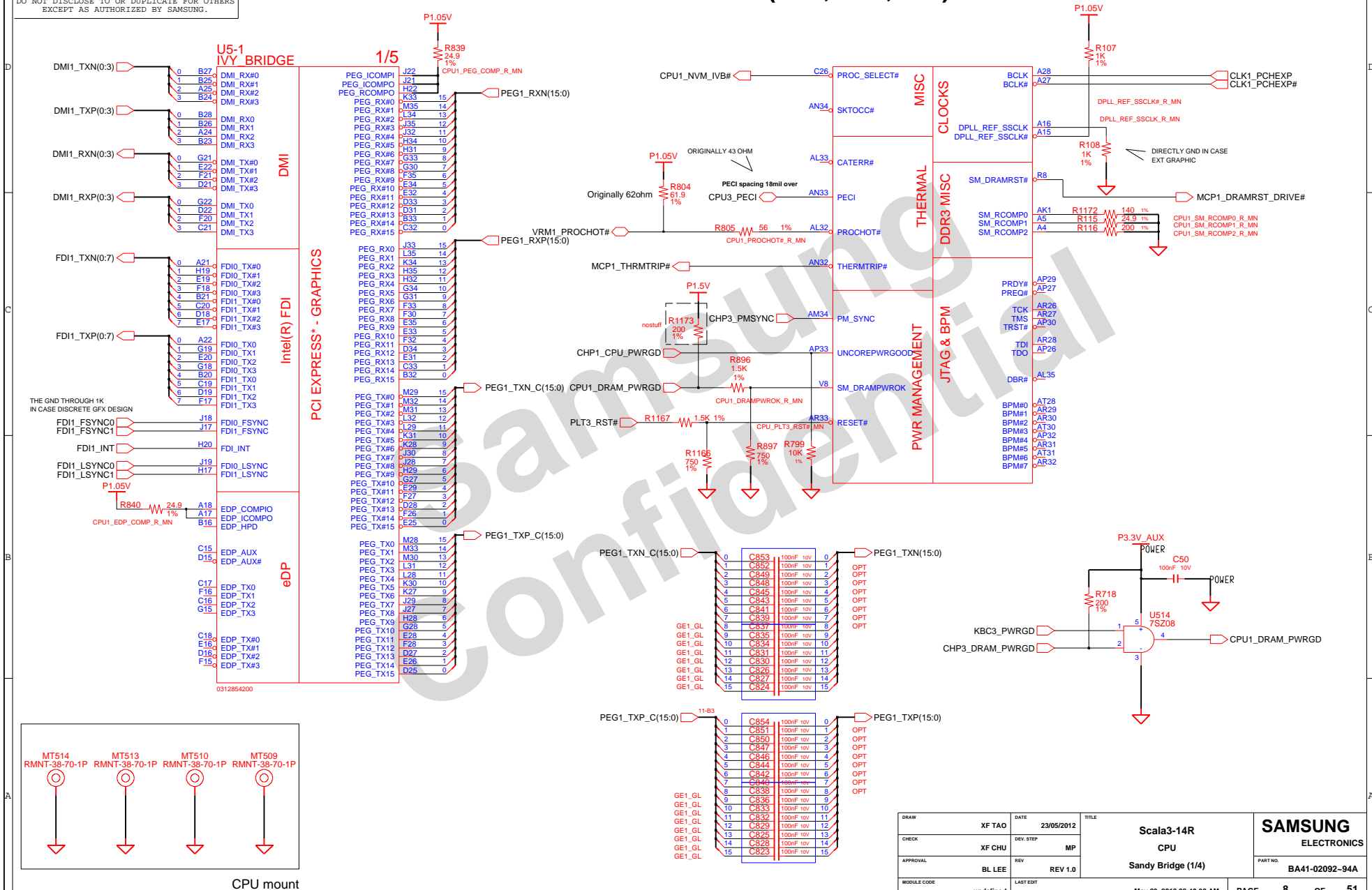
ADDRESSSEL MODE	
0	0101 111xb
✓ HIGH Z	0111 101xb (7A)
1	0101 110xb

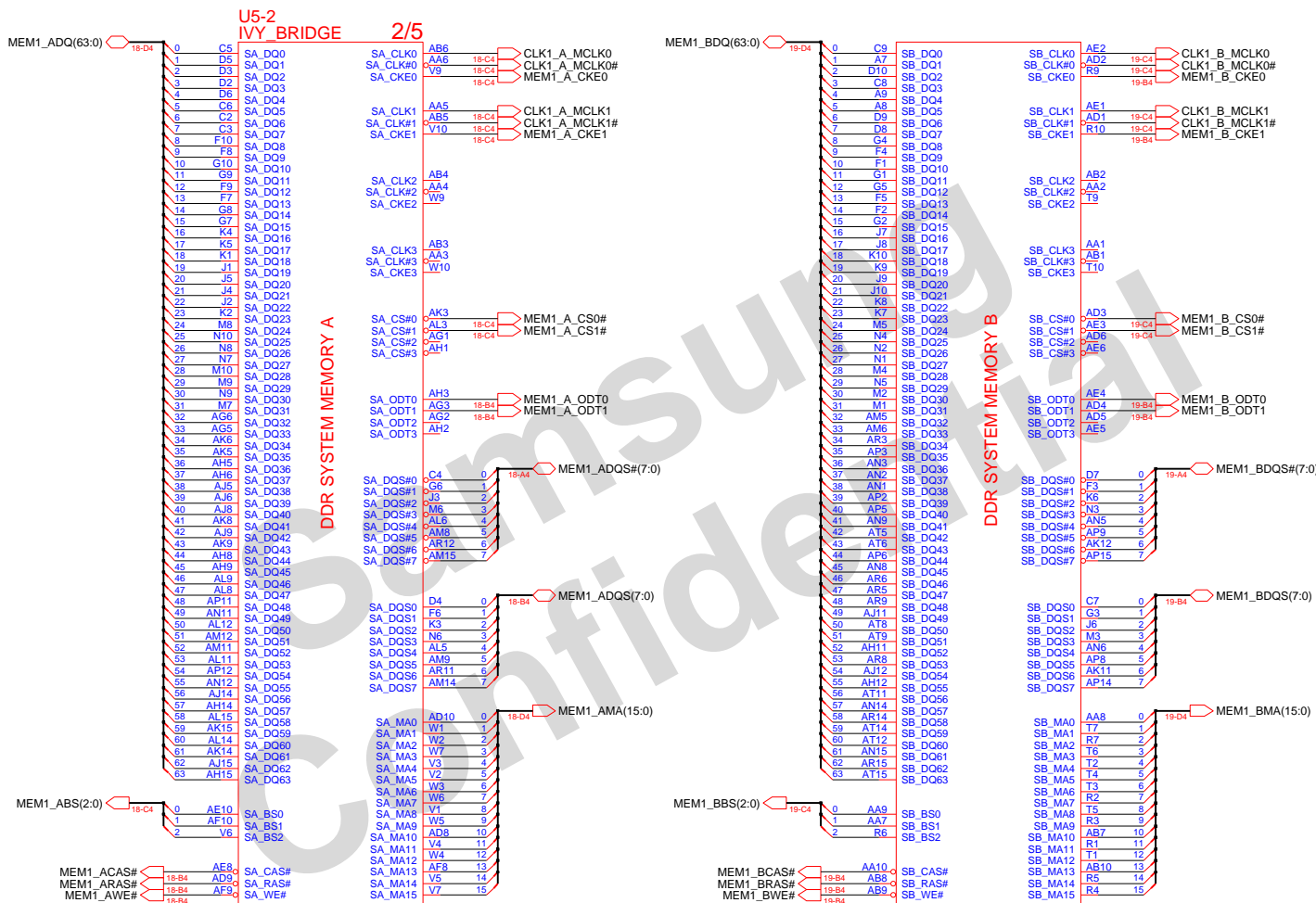
SHDN_SEL MODE	
0 HIGH Z	INTEL TR MODE AMD CPU/DIODE MODE
✓ 1	EXT.DIODE 2 MODE



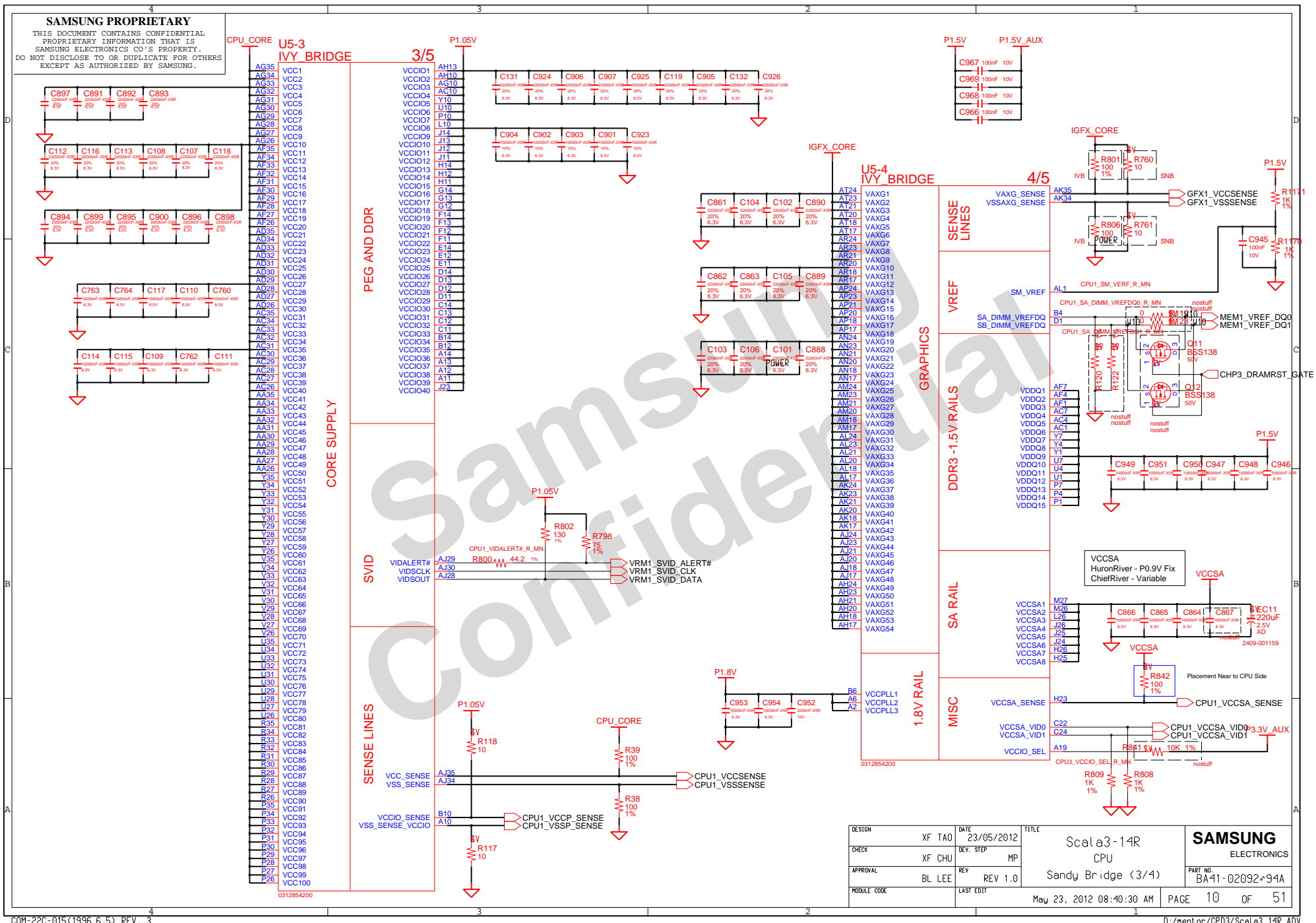
DESIGN	XF TAO	DATE	23/05/2012	TITLE Scala3-14R THERMAL SENSOR THERMAL SENSOR EMC2112	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
PART NO.					
MODULE CODE	LAST EDIT			May 23, 2012 08:40:30 AM	PAGE 7 OF 51

IVY BRIDGE PROCESSOR (DMI,PEG, FDI)

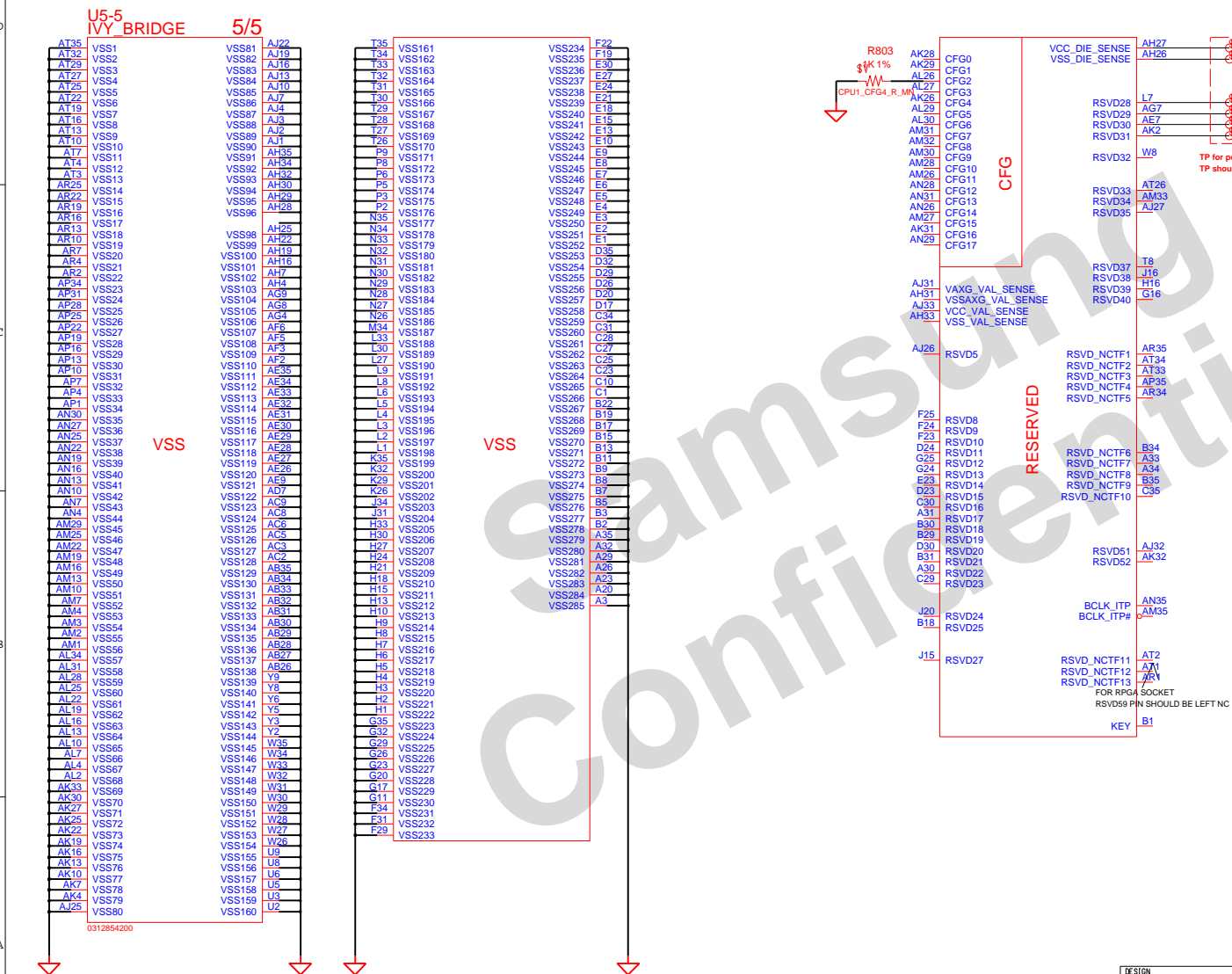




DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R CPU Sandy Bridge (2/4)	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP			PART NO. BA41-02092-94A
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	9	OF 51



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.



CFG Straps for Processor

PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X	
CFG2	1 : (DEFAULT) NORMAL OPERATION 0 : LANE REVERSED
PCIe PORT BIFURCATION STRAPS	
CFG[6:5]	11 : (DEFAULT) X16 - DEVICE 1 FUNCTIONS 1 AND 2 DISABLED 10 : X8, X8 - DEVICE 1 FUNCTION 1 ENABLED ; FUNCTION 2 DISABLED 01 : RESERVED - (DEVICE 1 FUNCTION 1 DISABLED ; FUNCTION 2 ENABLED) 00 : X8, X4, X4 - DEVICE 1 FUNCTIONS 1 AND 2 ENABLED
Display Port Presence	
CFG4	1 : Disabled - No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP)
PEG DEFER TRAINING	
CFG7	1 : (DEFAULT) PEG TRAIN IMMEDIATELY FOLLOWING XXRESETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R CPU	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP			PART NO. BA41-02092*94A
APPROVAL	BL LEE	REV	REV 1.0		Sandy Bridge (4/4)	
MODULE CODE		LAST EDIT			May 23, 2012 08:40:30 AM	PAGE 11 OF 51

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.

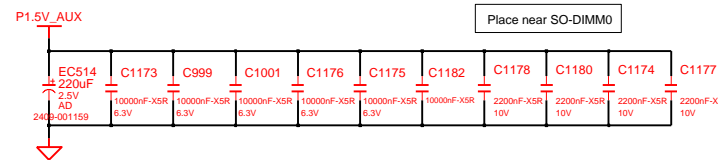
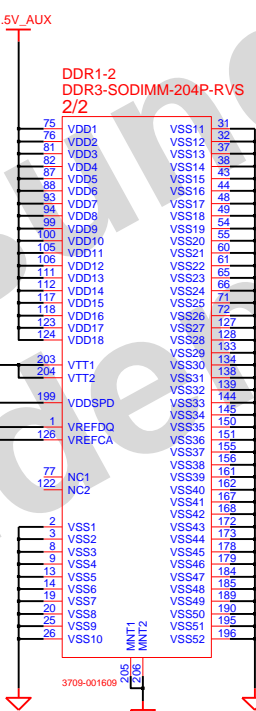
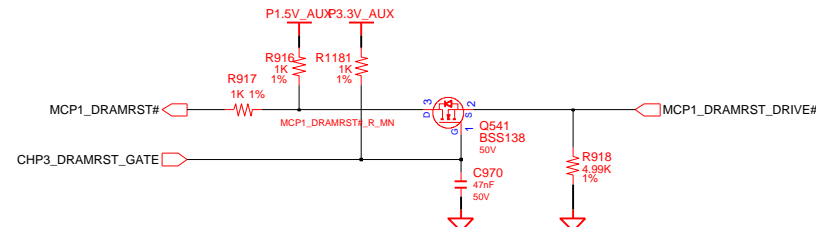
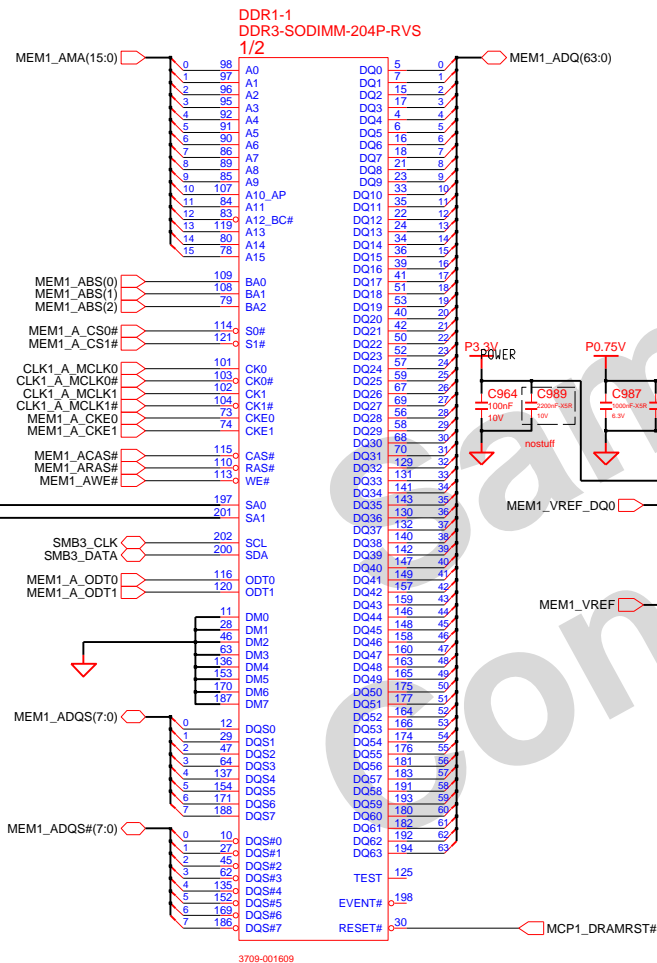
SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001656 (Foxconn)

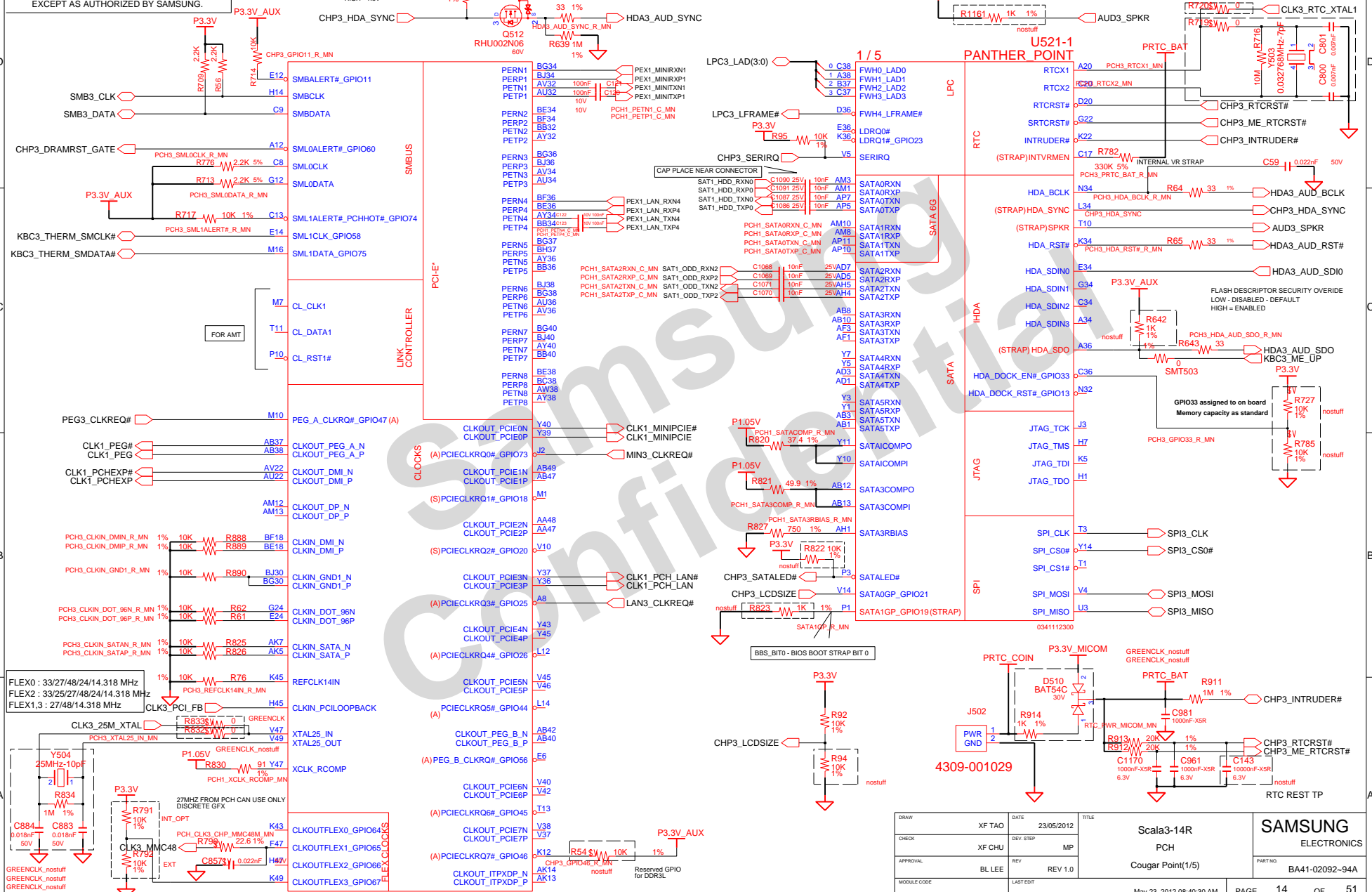
P/N : 3709-001609 (Concraft)

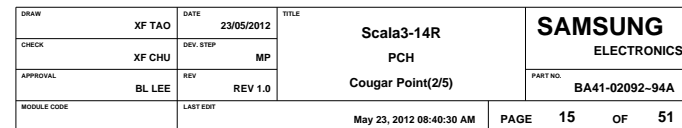


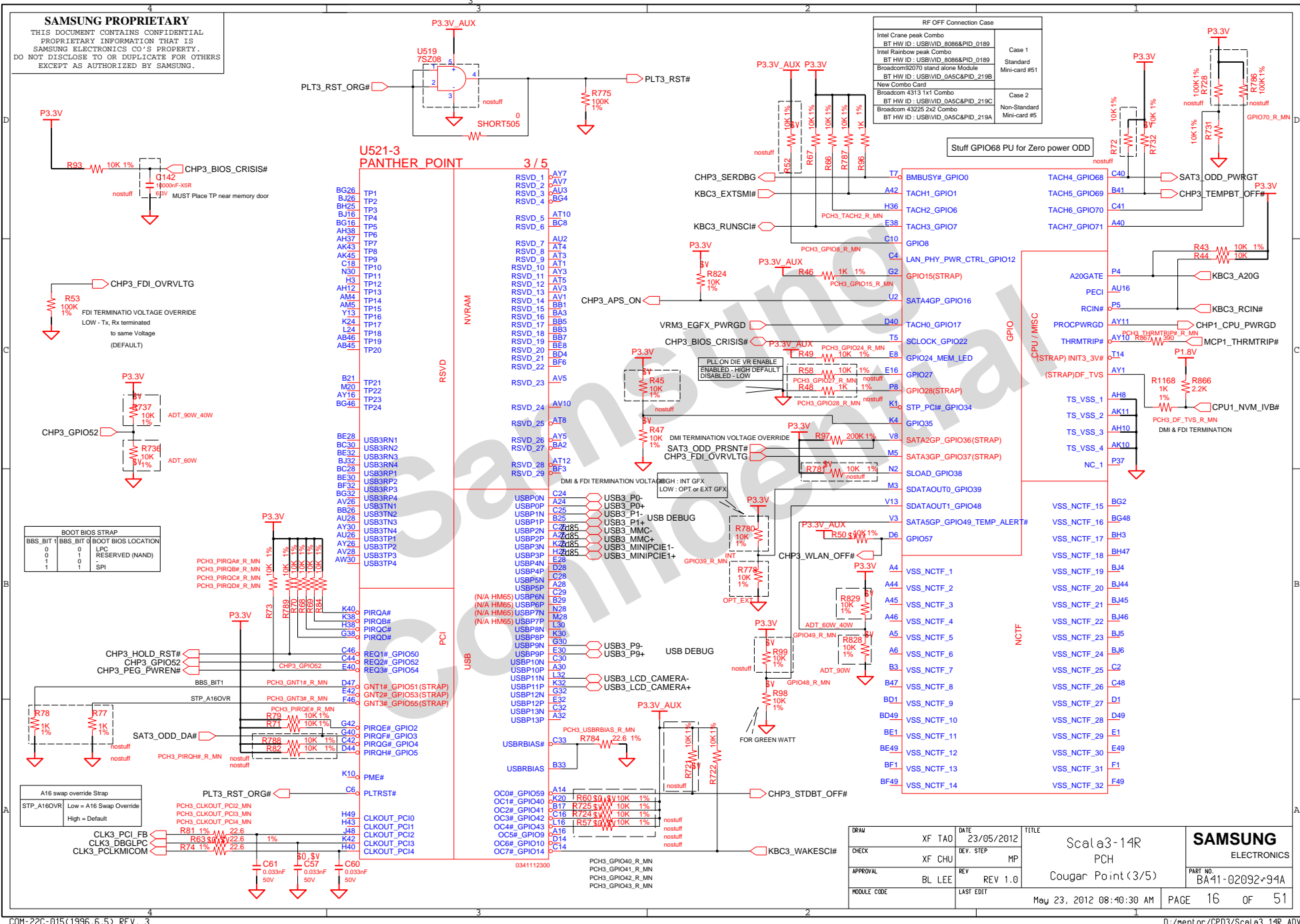
DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG
CHECK	XF CHU	DEV. STEP	MP		SODIMM A	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0		DDR3	PART NO.
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM			BA41-02092-94A
				PAGE	12	OF 51

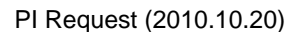
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.


NO REBOOT STRAP









DATE	23/05/2012	TITLE	Scala3-14R	
DRAW	XF TAO	DEV. STEP	PCH	
CHECK	XF CHU	MP	Cougar Point (4/5)	
APPROVAL	BL LEE	REV	REV 1.0	
MODULE CODE	LAST EDIT		May 23, 2012 08:40:30 AM	PART NO. BA41-02092-94A PAGE 17 OF 661

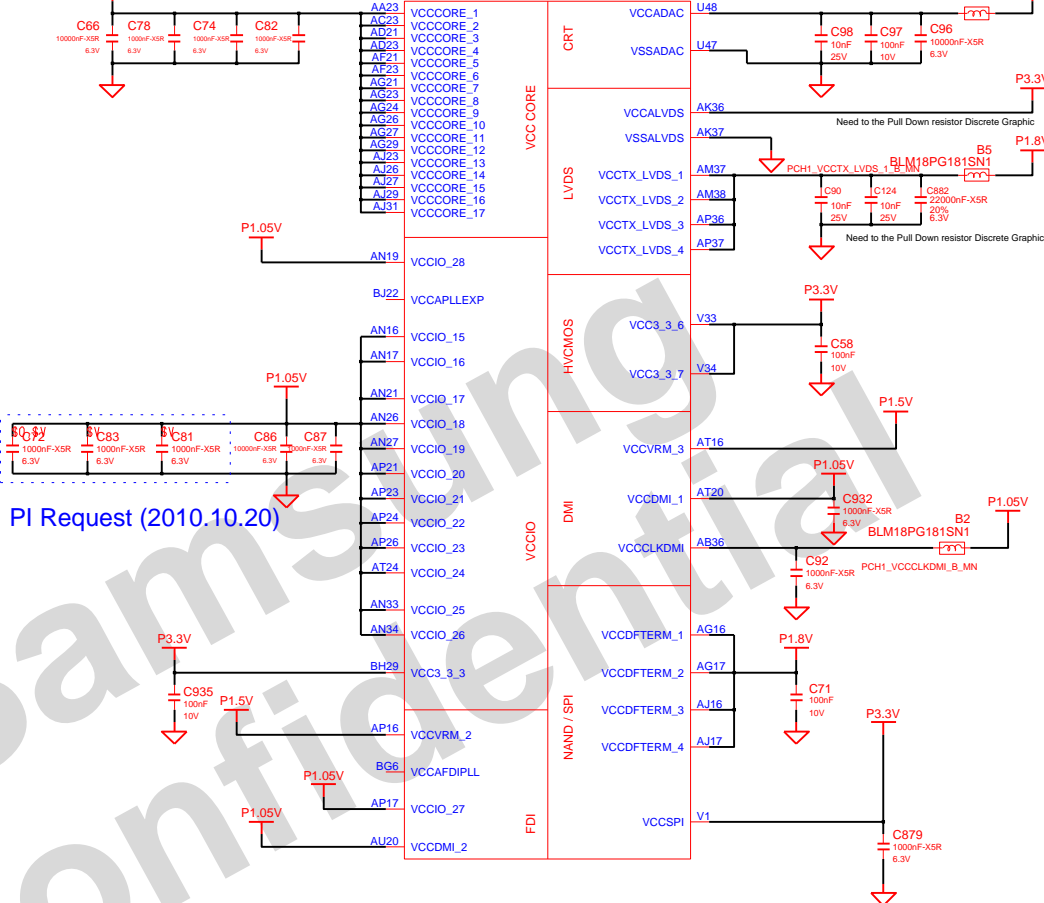
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

U521-5 PANTHER POINT

This power share with thermal sensor

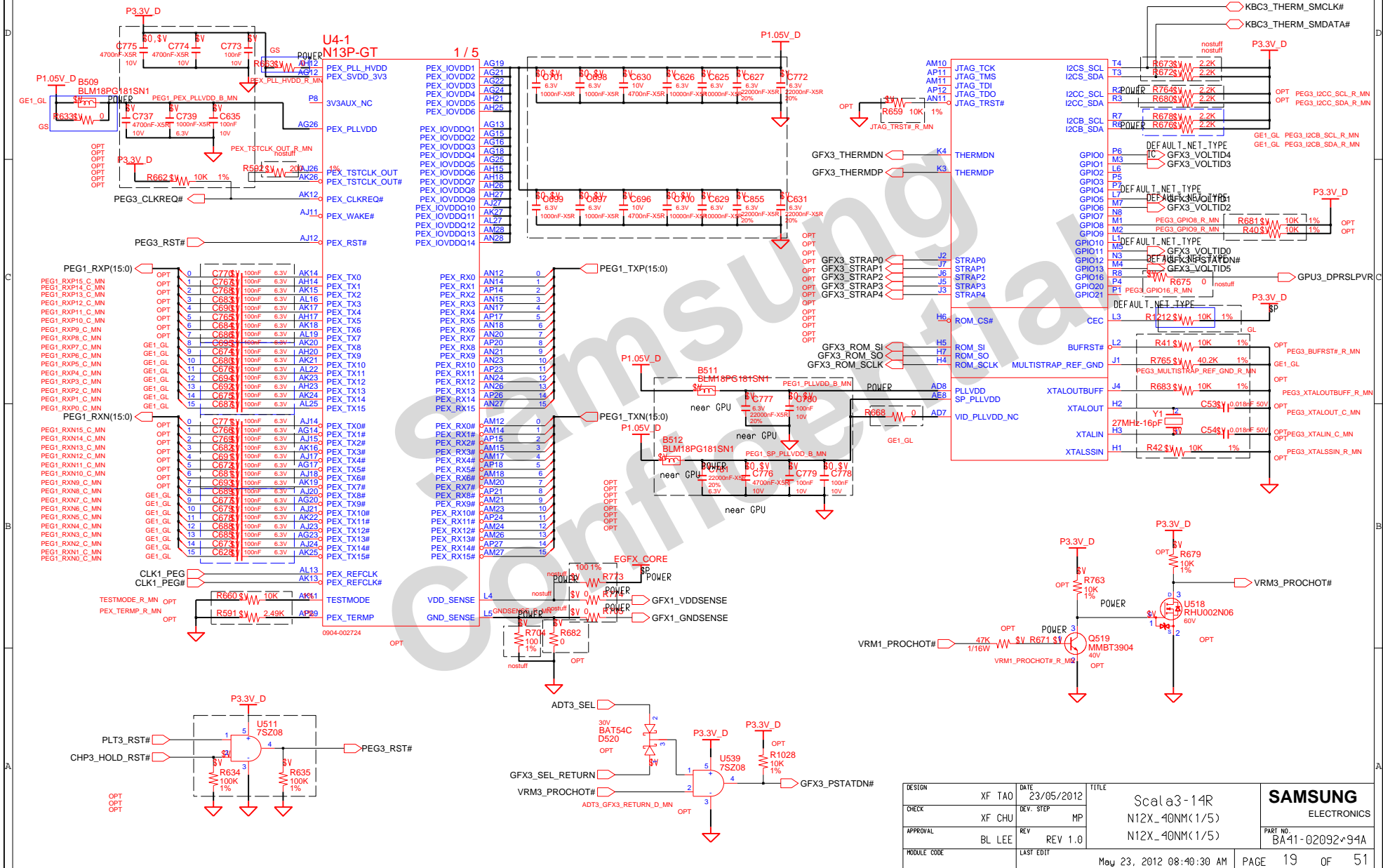
5 / 5

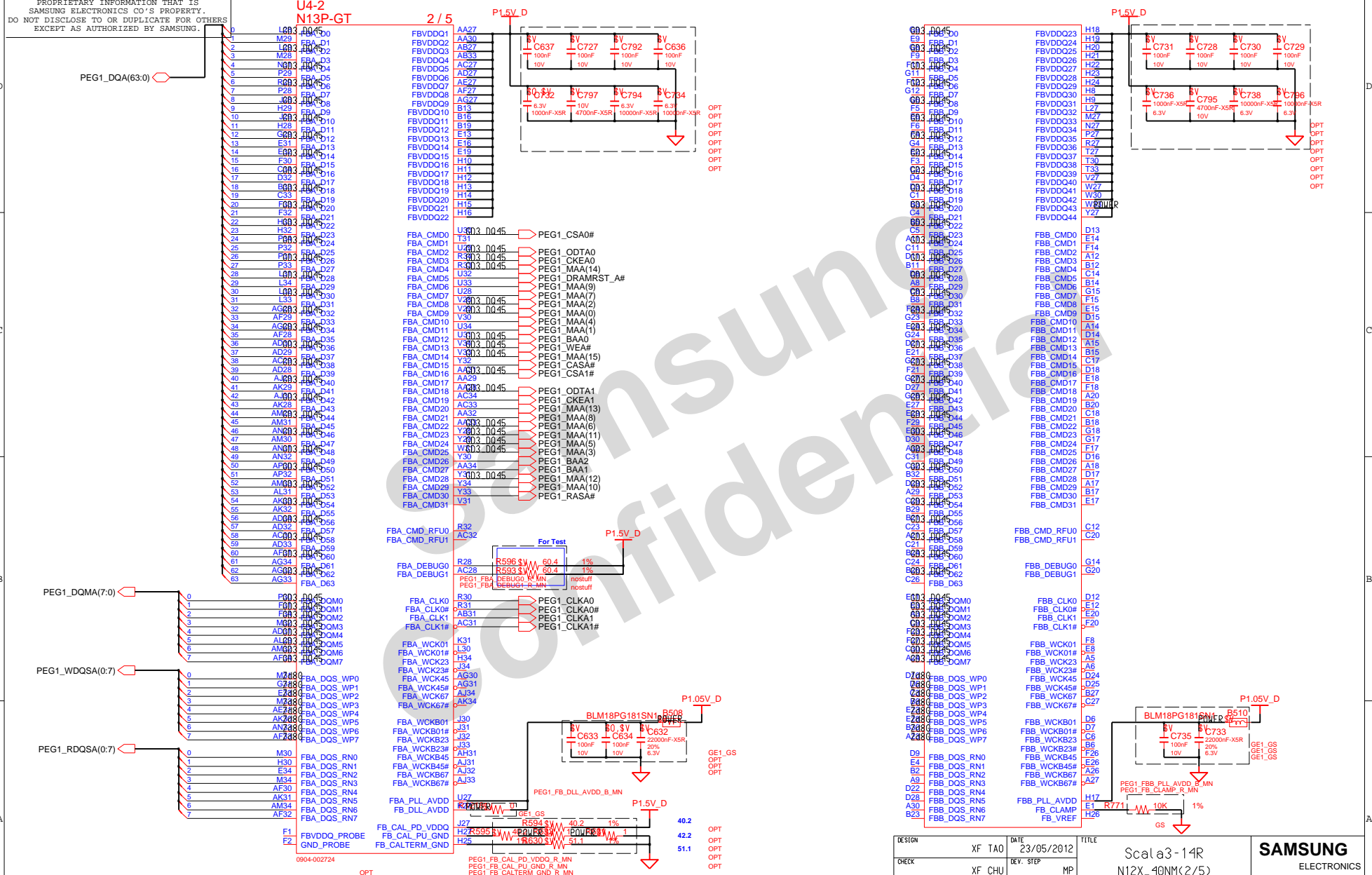
AY4	VSS159	VSS259	H46
AY2	VSS160	VSS260	K18
AY46	VSS161	VSS261	K26
AY8	VSS162	VSS262	K30
B11	VSS163	VSS263	K46
B15	VSS164	VSS264	K7
B19	VSS165	VSS265	L18
B23	VSS166	VSS266	L2
B27	VSS167	VSS267	L20
B31	VSS168	VSS268	L26
B35	VSS169	VSS269	L28
B39	VSS170	VSS270	L36
B7	VSS171	VSS271	L48
F45	VSS172	VSS272	M12
BB12	VSS173	VSS273	M16
BB16	VSS174	VSS274	M18
BB20	VSS175	VSS275	M24
BB22	VSS176	VSS276	M30
BB24	VSS177	VSS277	M32
BB28	VSS178	VSS278	M34
BB30	VSS179	VSS279	M36
BB38	VSS180	VSS280	M4
BB4	VSS181	VSS281	M42
BB46	VSS182	VSS282	M46
BC14	VSS183	VSS283	N18
BC18	VSS184	VSS284	N19
BC2	VSS185	VSS285	N26
BC22	VSS186	VSS286	N47
BC26	VSS187	VSS287	P11
BC32	VSS188	VSS288	P15
BC34	VSS189	VSS289	P18
BC36	VSS190	VSS290	P21
BC40	VSS191	VSS291	P24
BC42	VSS192	VSS292	P27
BC46	VSS193	VSS293	P30
BD46	VSS194	VSS294	P34
BD5	VSS195	VSS295	R2
BD22	VSS196	VSS296	R48
BD26	VSS197	VSS297	T1
BE40	VSS198	VSS298	T13
BF10	VSS199	VSS299	T14
BF12	VSS200	VSS300	T16
BF16	VSS201	VSS301	T17
BF20	VSS202	VSS302	T19
BF22	VSS203	VSS303	T2
BF24	VSS204	VSS304	T24
BF26	VSS205	VSS305	T26
BF28	VSS206	VSS306	T27
BF30	VSS207	VSS307	T28
BF38	VSS208	VSS308	T29
BF40	VSS209	VSS309	T30
BF8	VSS210	VSS310	V19
BG17	VSS211	VSS311	V26
BG21	VSS212	VSS312	V27
BG23	VSS213	VSS313	V28
BG33	VSS214	VSS314	V29
BG44	VSS215	VSS315	V30
BG8	VSS216	VSS316	V31
BH11	VSS217	VSS317	V32
BH15	VSS218	VSS318	V33
BH17	VSS219	VSS319	V34
BH19	VSS220	VSS320	V35
H10	VSS221	VSS321	V36
BH27	VSS222	VSS322	V37
BH31	VSS223	VSS323	V38
BH33	VSS224	VSS324	V39
BH36	VSS225	VSS325	V40
BH38	VSS226	VSS326	V41
BH43	VSS227	VSS327	V42
BH7	VSS228	VSS328	V43
D3	VSS229	VSS329	V44
D12	VSS230	VSS330	V45
D16	VSS231	VSS331	V46
D18	VSS232	VSS332	V47
D22	VSS233	VSS333	V48
D24	VSS234	VSS334	V49
D26	VSS235	VSS335	V50
D30	VSS236	VSS336	V51
D32	VSS237	VSS337	V52
D34	VSS238	VSS338	V53
D36	VSS239	VSS339	V54
D42	VSS240	VSS340	V55
D8	VSS241	VSS341	V56
E18	VSS242	VSS342	V57
E26	VSS243	VSS343	V58
E16	VSS244	VSS344	V59
G20	VSS245	VSS345	V60
G26	VSS246	VSS346	V61
G28	VSS247	VSS347	V62
G36	VSS248	VSS348	V63
G46	VSS249	VSS349	V64
H12	VSS250	VSS350	V65
H18	VSS251	VSS351	V66
H22	VSS252	VSS352	V67
H24	VSS253		
H26	VSS254		
H30	VSS255		
H32	VSS256		
H34	VSS257		
F3	VSS258		




DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		PCH	
APPROVAL	BL LEE	REV	REV 1.0		Cougar Point(5/5)	
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	18	OF 51

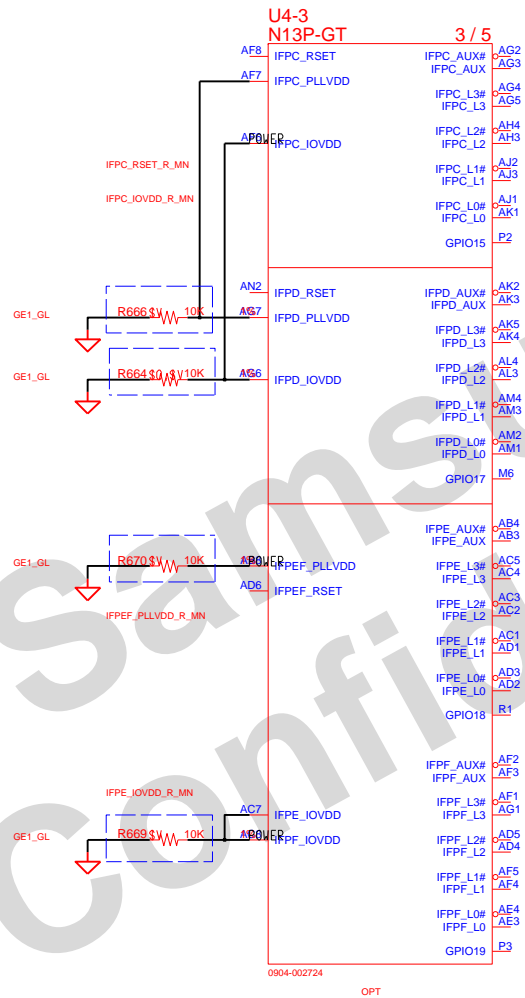
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.





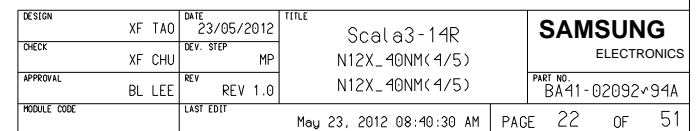
DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	
CHECK	XF CHU	DEV. STEP	MP	N12X_40NM(2/5)		
APPROVAL	BL LEE	REV	REV 1.0	N12X_40NM(2/5)	PART NO.	
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	BA41-02092-94A	
				PAGE	20	OF 51

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

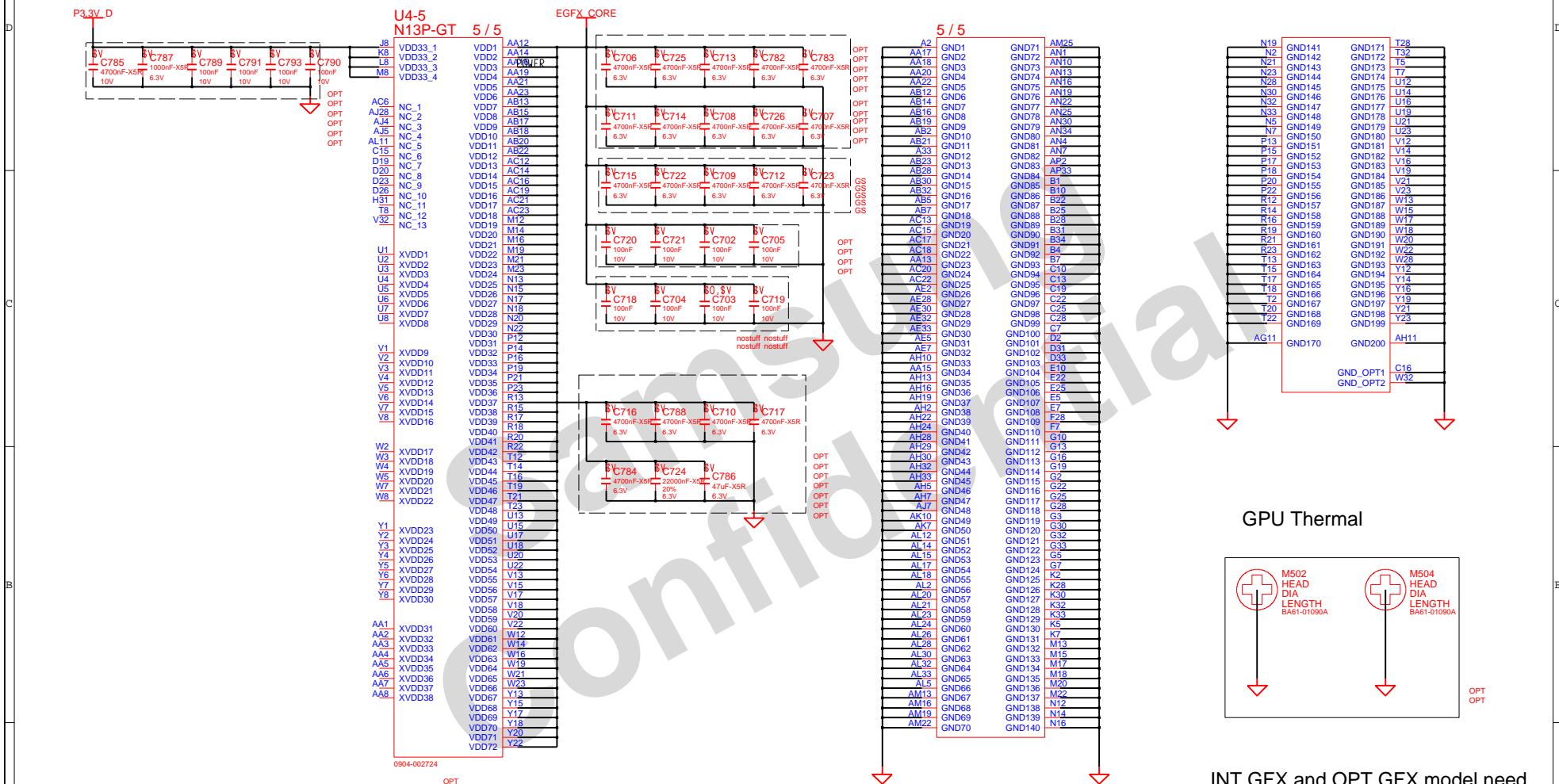


DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS PART NO. BA41-02092-94A
CHECK	XF CHU	DEV. STEP	MP		N12X_40NM(3/5)	
APPROVAL	BL LEE	REV	REV 1.0		N12X_40NM(3/5)	
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	PAGE 21 OF 51	

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.



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.



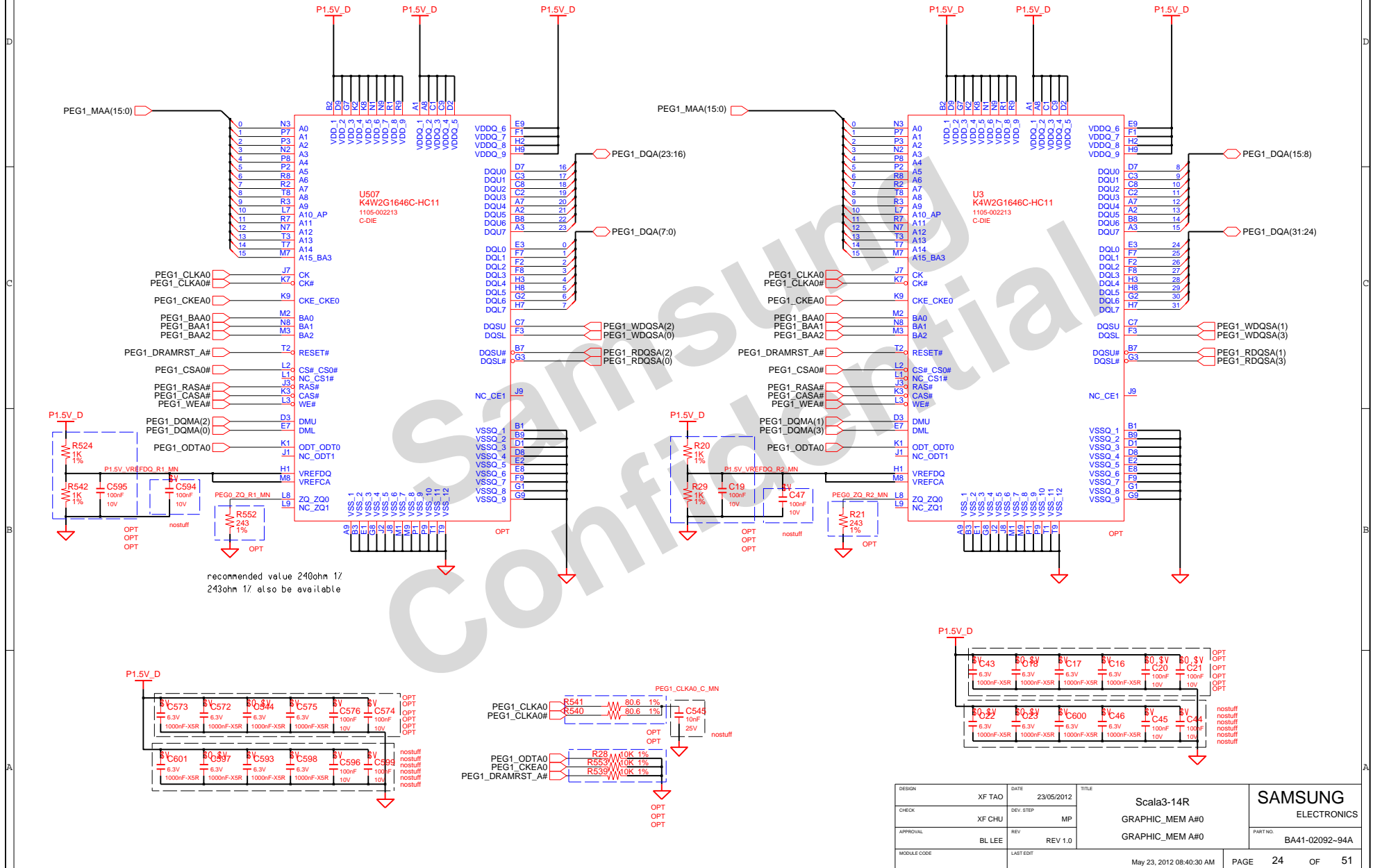
INT GFX and OPT GFX model need.

DESIGN	XF TAO	DATE	23/05/2012	TITLE Scala3-14R N12X_40NM(5/5) N12X_40NM(5/5)	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE	LAST EDIT			May 23, 2012 08:40:30 AM	PART NO. BA41-02092-94A
				PAGE	23 OF 51

SAMSUNG PROPRIETARY

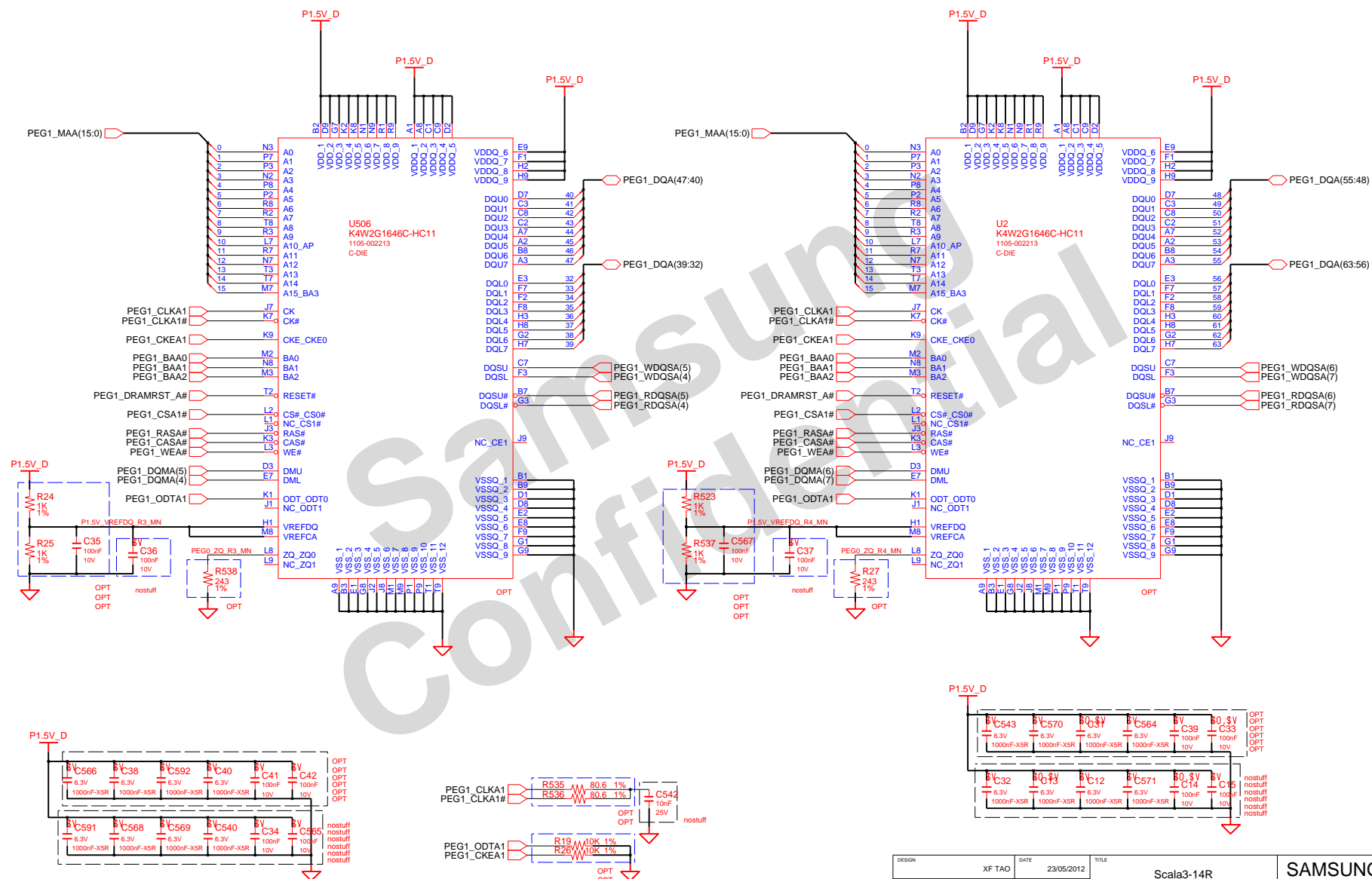
THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.


A-Channel #0 (D-mode)



DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		GRAPHIC_MEM A#0	
APPROVAL	BL LEE	REV	REV 1.0		GRAPHIC_MEM A#0	
MODULE CODE		LAST EDIT				PART NO. BA41-02092-94A
May 23, 2012 08:40:30 AM						PAGE 24 OF 51

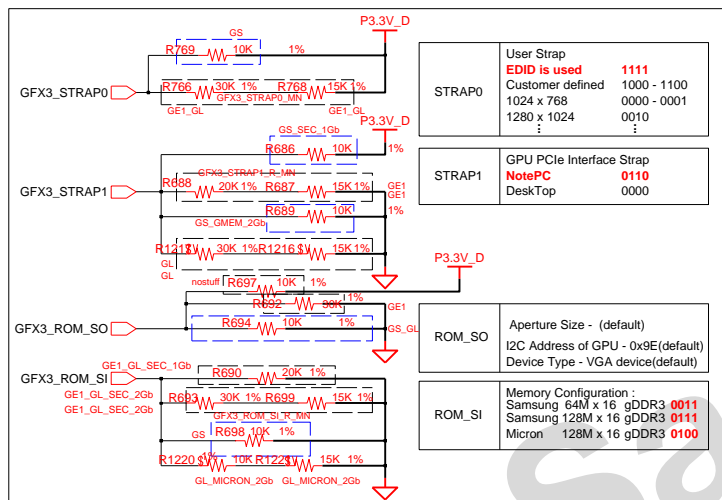
A-Channel #1 (D-mode)



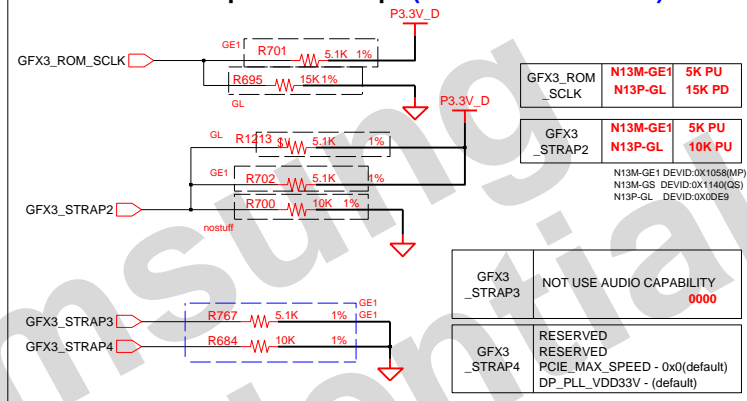
DESIGN	XF TAO	DATE	23/05/2012	TITLE Scala3-14R GRAPHIC_MEM A#1 GRAPHIC_MEM A#1	
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE	LAST EDIT			May 23, 2012 08:40:30 AM	PART NO. BA41-02092-94A
					PAGE 25 OF 51

N13x STRAP

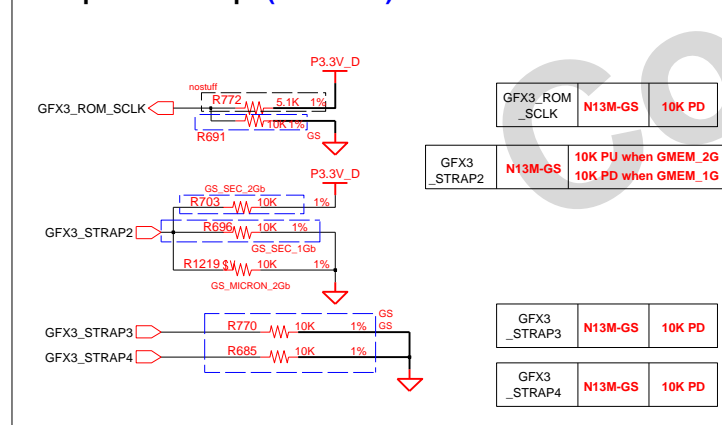
Function Straps



Chip Select Straps (N13M-GE1/N13P-GL)



Chip Select Straps (N13M-GS)



N13M-GS

STRAP PIN	STRAP MAPPING	Resistance	Polarity
STRAP0	RAMCFG[0]	10K ohm	Pull-up to 3V3 for binary '1'
STRAP1	RAMCFG[1]	10K ohm	Pull-down to GND for binary '0'
STRAP2	RAMCFG[2]	10K ohm	Samsung 64M x 16 gDDR3 0011
STRAP3	RAMCFG[3]	10K ohm	Samsung 128M x 16 gDDR3 0101
ROM_SO	VGA_DEVICE	10K ohm	Micron 128M x 16 gDDR3 0001
ROM_SI	SUB_VENDOR	10K ohm	Pull-down to GND(no display)
ROM_SCLK	SMB_ALT_ADDR	10K ohm	Pull-up to 3V3 if VBIOS ROM exists
STRAP4	PCI_MAX_SPEED	10K ohm	Pull-down to GND if no VBIOROM

RESISTOR	PULL UP	PULL DOWN
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

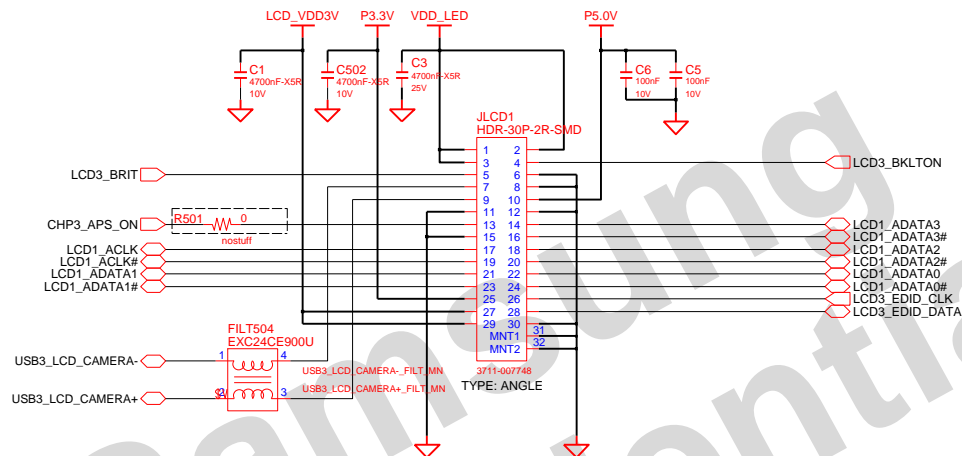
N13M-GE1/N13P-GL

STRAP PIN	BIT 3	BIT 2	BIT 1	BIT 0
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
STRAP1	3GIO_PAD_CFG_ADR[3]	3GIO_PAD_CFG_ADR[2]	3GIO_PAD_CFG_ADR[1]	3GIO_PAD_CFG_ADR[0]
ROM_SO	FB[1] (GE1)	FB[0] (GE1)	SMB_ALT_ADDR	VGA_DEVICE
ROM_SI	RAMCFG[3] (GL)	RAMCFG[2] (GL)	RAMCFG[1]	RAMCFG[0]
STRAP2	PCI_DEVID[3]	PCI_DEVID[2]	PCI_DEVID[1]	PCI_DEVID[0]
ROM_SCLK	PCI_DEVID[4]	SUB_VENDOR	SLOT_CLK_CFG (GE1)	PEX_PLL_EN_TERM
STRAP3	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
STRAP4	RESERVED	RESERVED	PCIE_MAX_SPEED	DP_PLL_VDD33V

DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		GRAPHIC_MEM C#0	
APPROVAL	BL LEE	REV	REV 1.0		GRAPHIC_MEM C#0	
MODULE CODE		LAST EDIT				PART NO. BA41-02092-94A
					May 23, 2012 08:40:30 AM	PAGE 26 OF 51

LVDS LOGIC

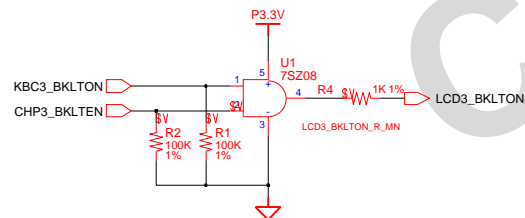
1Ch. LCD Connector + CAMERA



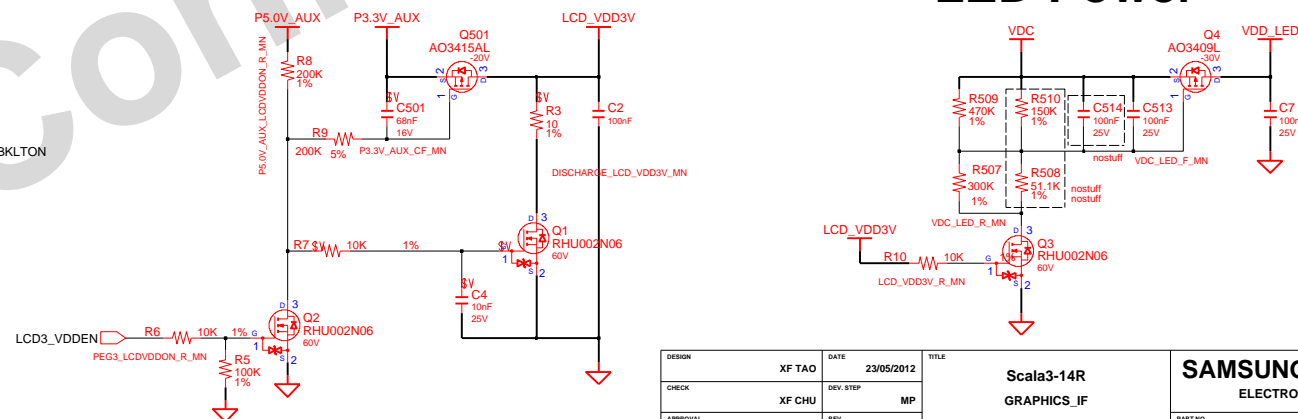
LCD Power


EBL Purpose

Backlight On



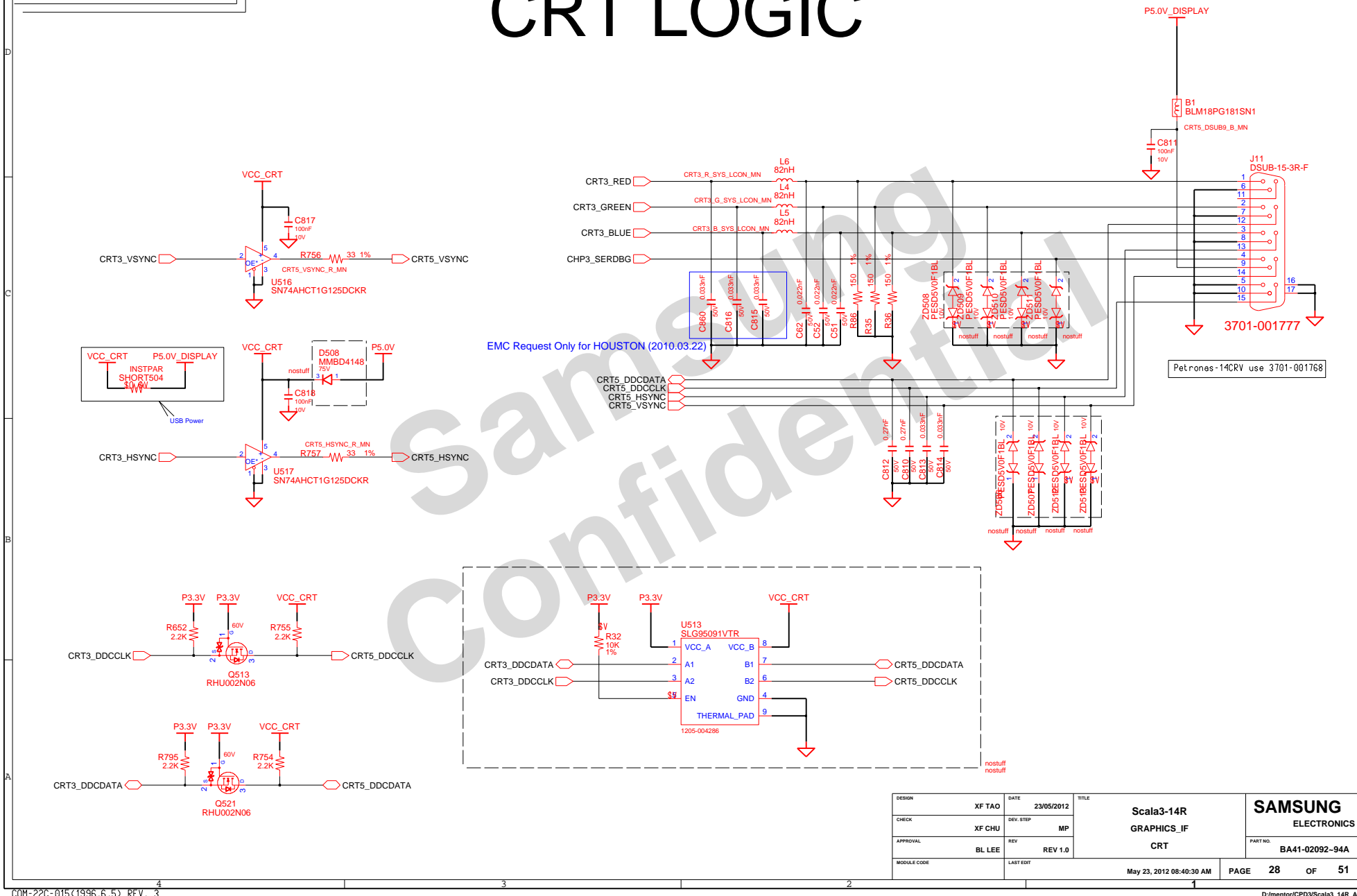
LED Power



DESIGN	XF TAO	DATE	23/05/2012	TITLE Scala3-14R GRAPHICS_IF LVDS	
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE	LAST EDIT				
				May 23, 2012 08:40:30 AM	PAGE 27 OF 51

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.

EMC Request Only for HOUSTON (2010.03.22)



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

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

(EMC request at 2010.04.15)

After checking, Veyron_R don't need to use CMC for each signal.

(EMC request at 2010.12.03)

FOR HDMI VERIFICATION TEST

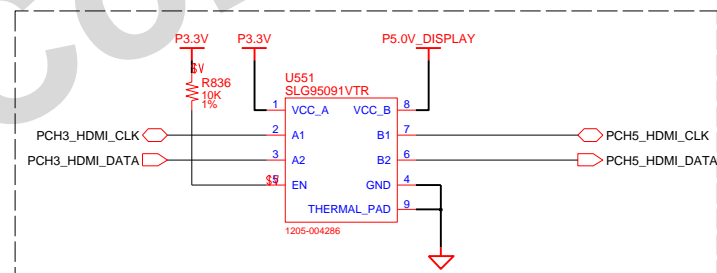
PCH3_HDMI_CLK \rightarrow PCH5_HDMI_CLK
N10x/N11x_40nm HDMI/DP/LVDS support only 3.3V voltage tolerance

PCH3_HDMI_DATA \rightarrow PCH5_HDMI_DATA

Petrones-14CRV use 3701-001785

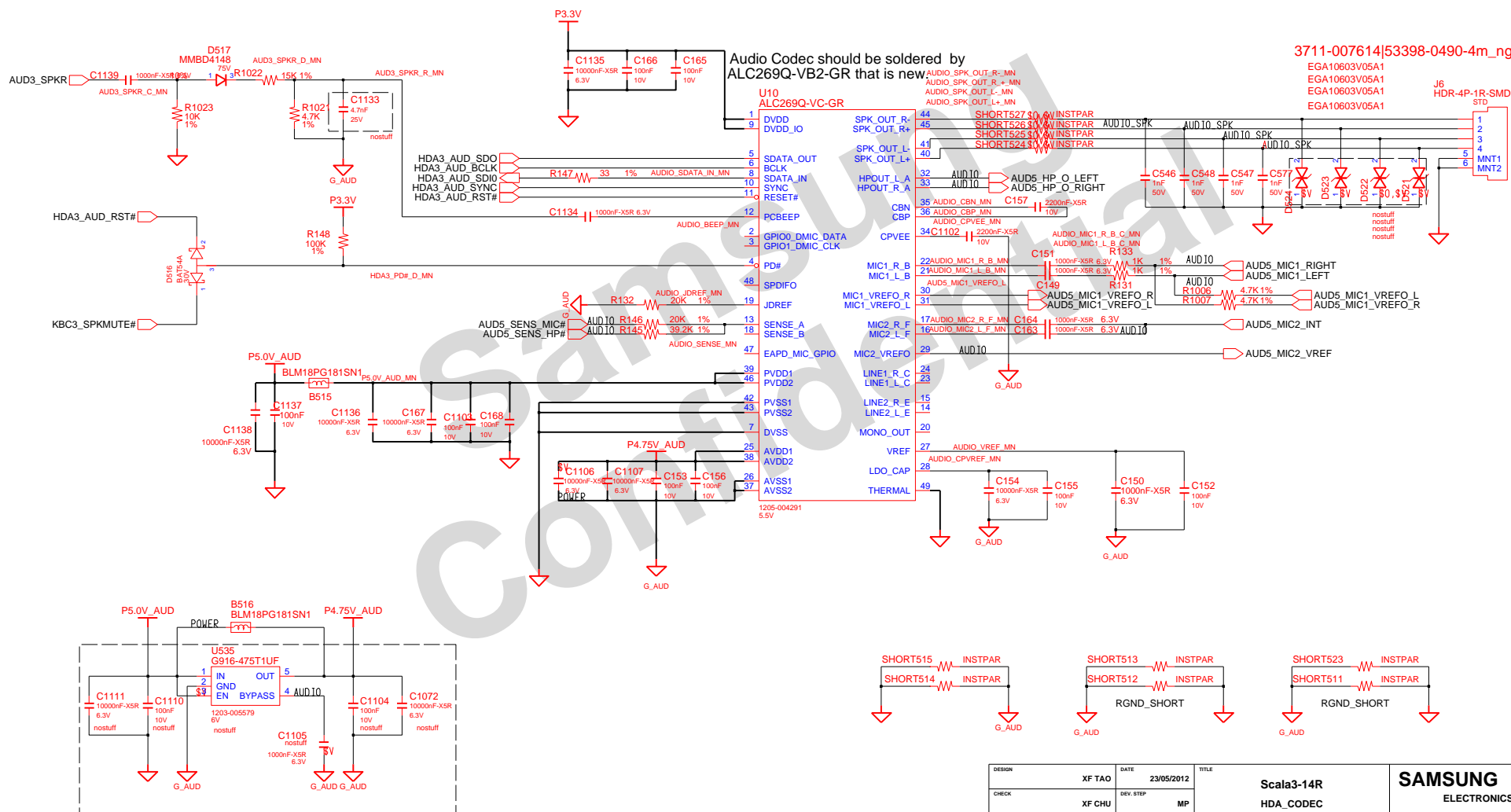
J12
HDMI-19P-FEMALE


3701-001782



DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		GRAPHICS_IF	
APPROVAL	BL LEE	REV	REV 1.0		HDMI	
MODULE CODE		LAST EDIT			May 23, 2012 08:40:30 AM	PAGE 29 OF 51

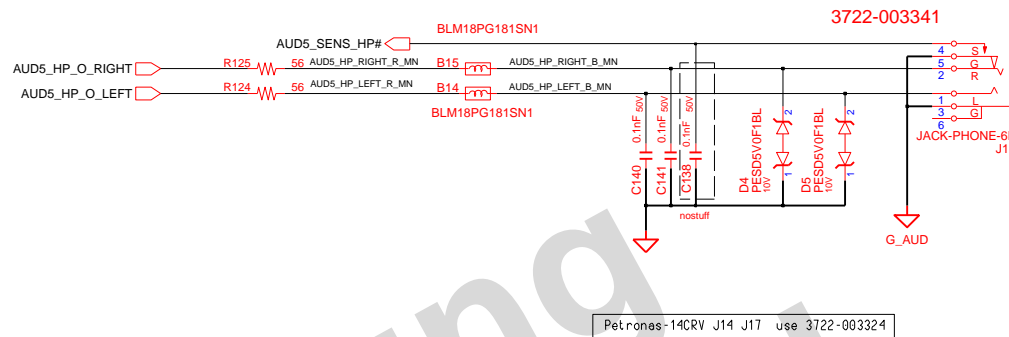
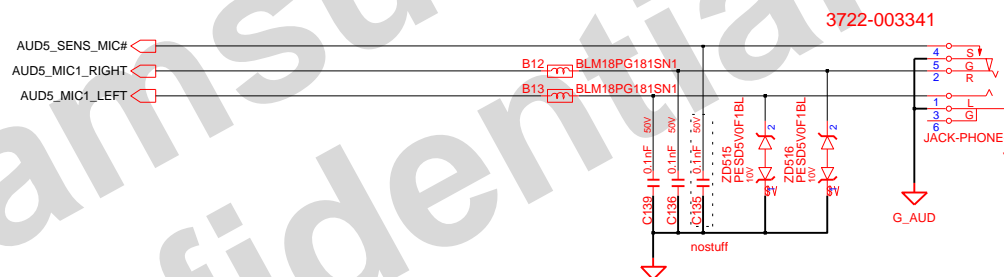
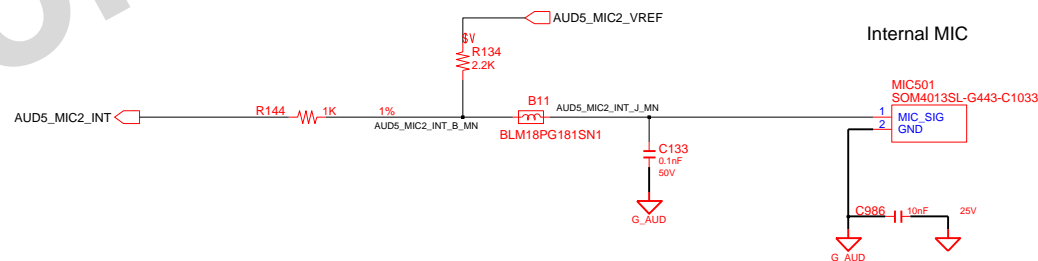
Codec Pin9 Setting	
S/B with Low Voltage IO	S/B without Low Voltage IO
Pin9 : 1.5V	Pin9 : 3.3V



DESIGN	XF TAO	DATE	23/05/2012	Scala3-14R HDA_CODEC AUDIO CODEC ALC269	
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE	LAST EDIT		May 23, 2012 08:40:30 AM		
				PAGE	30 OF 51

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.

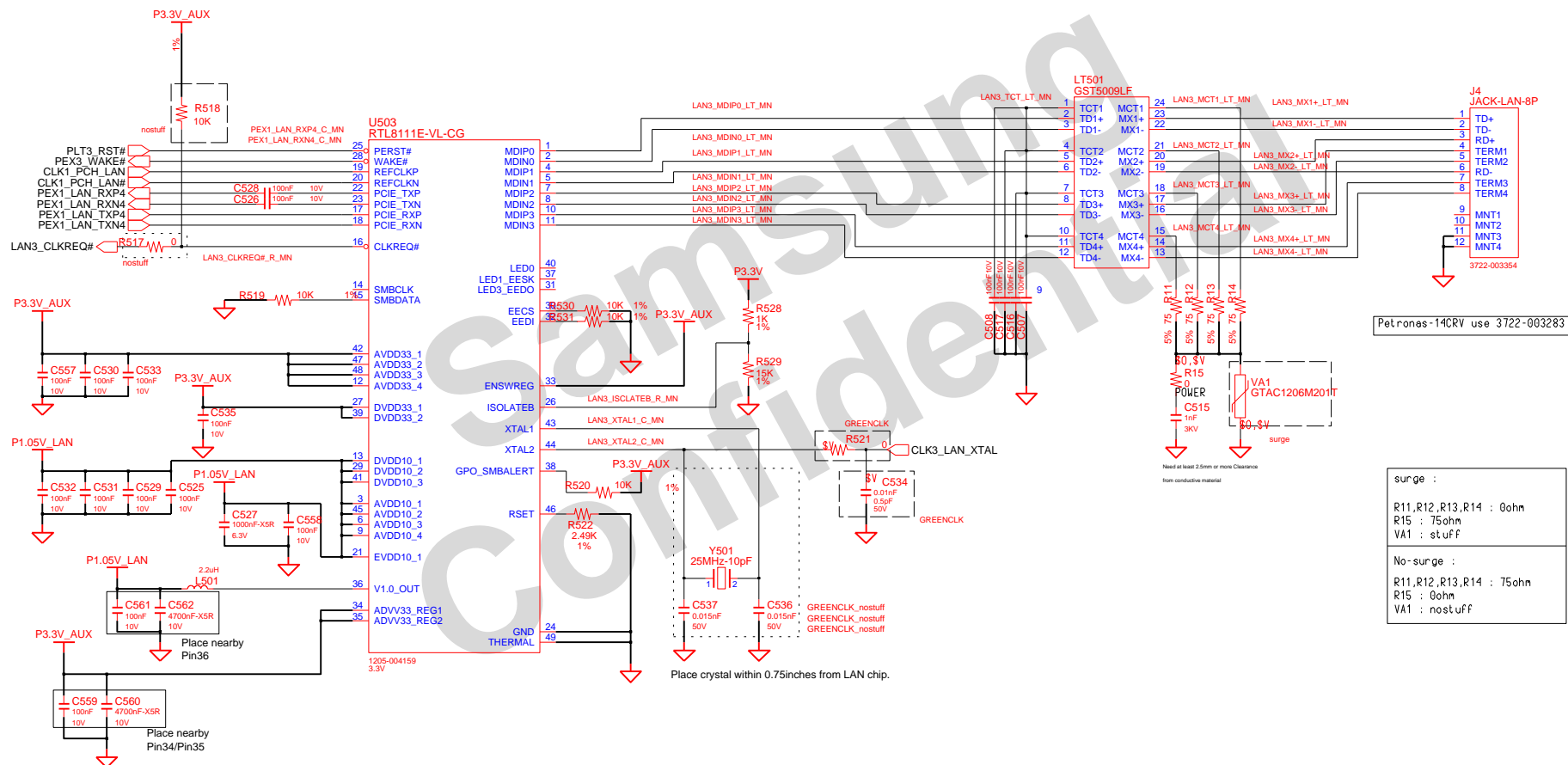
HEADPHONE**MIC JACK****Internal MIC**

DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		HDA_CODEC	
APPROVAL	BL LEE	REV	REV 1.0		AUDIO JACK	
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	PAGE	31 OF 51

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.

Reatek RTL8111E



DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		LAN	
APPROVAL	BL LEE	REV	REV 1.0		LAN_Reatek_RTL8111E	
MODULE CODE		LAST EDIT				PART NO. BA41-02092-94A
					May 23, 2012 08:40:30 AM	PAGE 32 OF 51

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.

4 IN 1 CARD

40mil pattern

J503
EDGE-SD-11P

VDD

CMD

CLK

DATA0

DATA1

DATA2

CD_DATA3

CD

WP

VSS1

VSS2

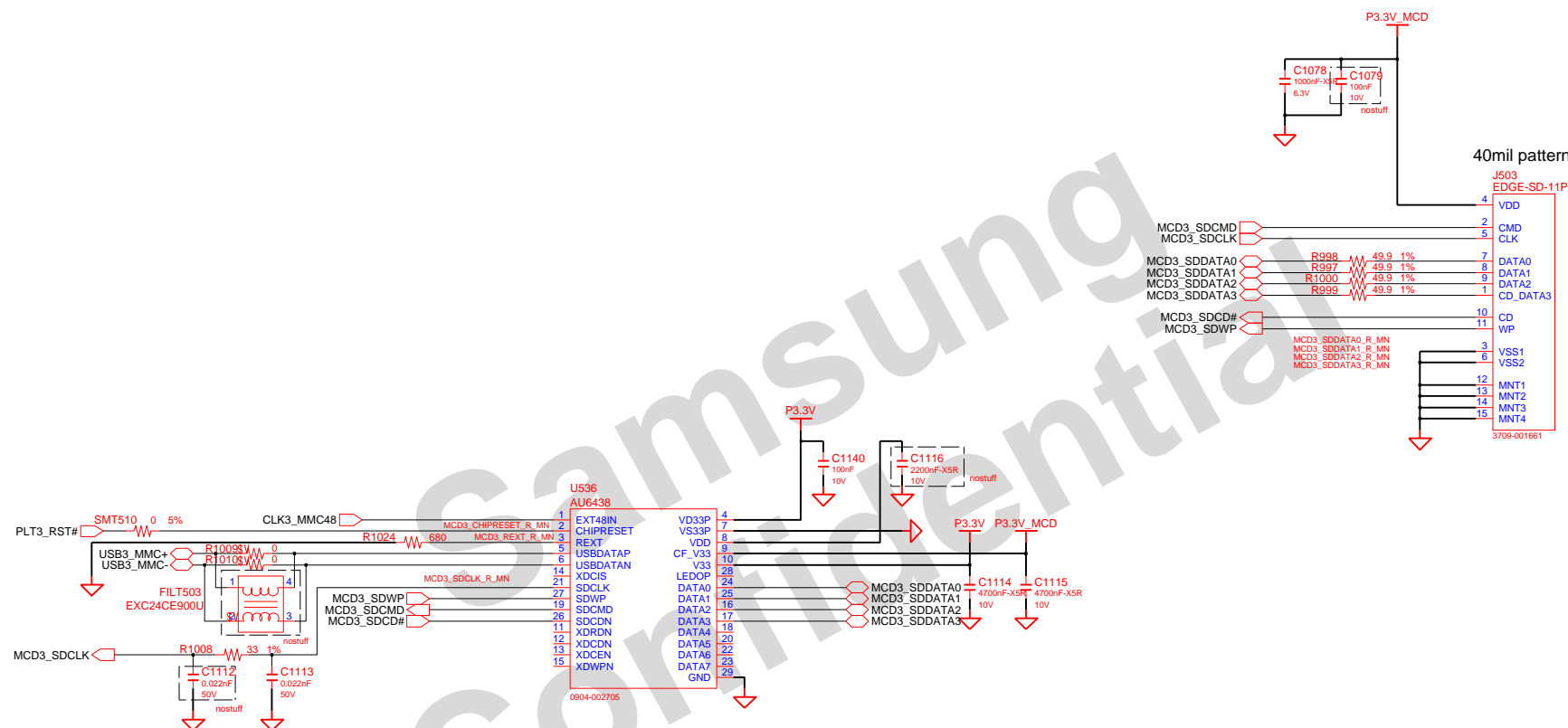
MNT1

MNT2

MNT3

MNT4

3709-001661

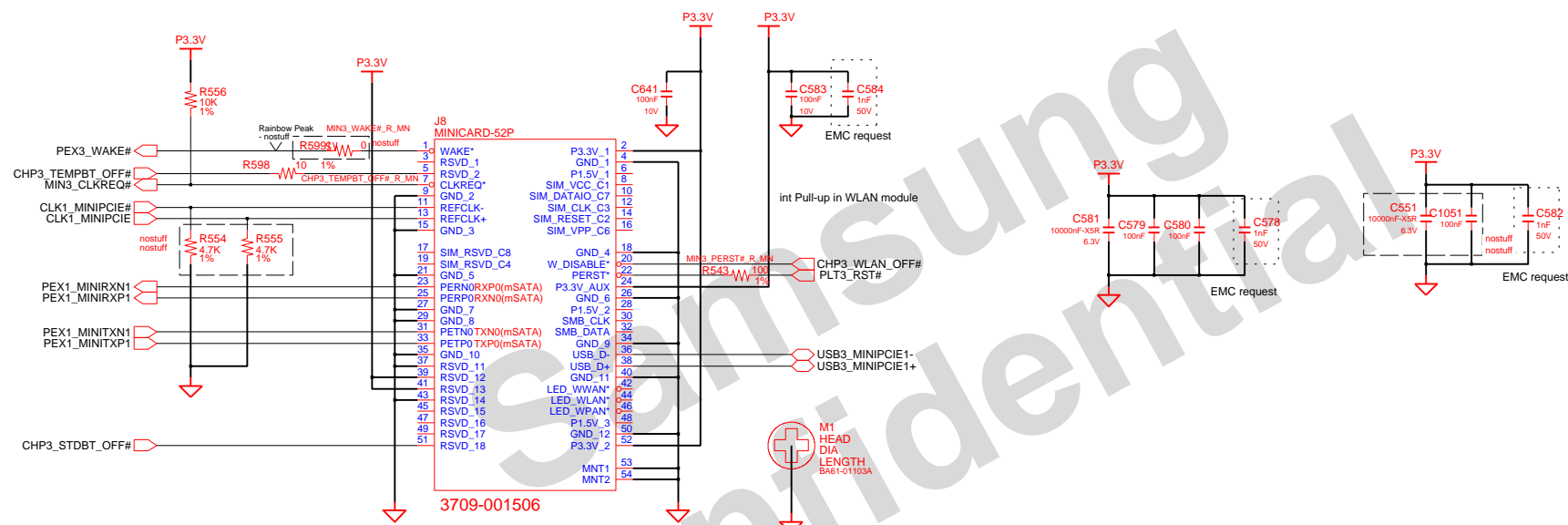


DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		MULTICARD	
APPROVAL	BL LEE	REV	REV 1.0		4 IN 1 CARD(AU6438)	
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	PAGE	33 OF 51

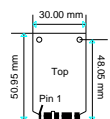
SAMSUNG PROPRIETARY

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, 7mm



Mini PCI Express Card



Odd Pins : Top side
Even Pins : Bottom Side

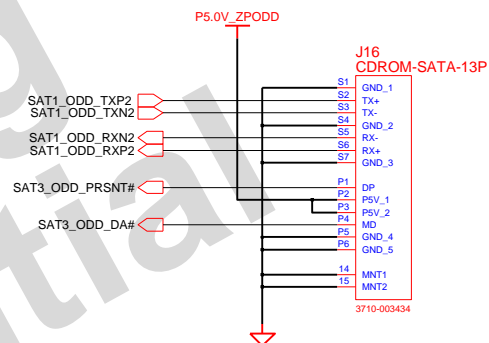
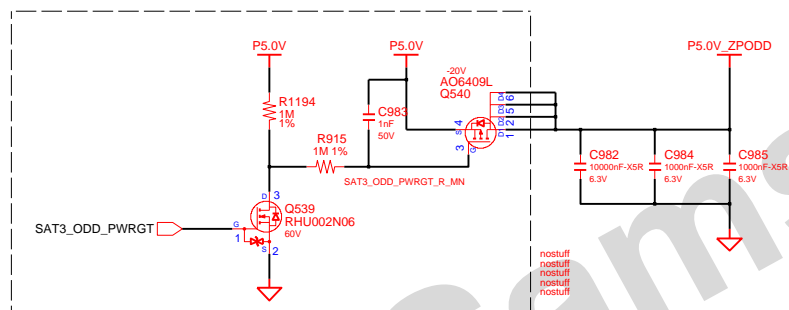
DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		MINI_PCIE_CONN	
APPROVAL	BL LEE	REV	REV 1.0		WLAN	
MODULE CODE		LAST EDIT				PART NO. BA41-02092-94A
				May 23, 2012 08:40:30 AM	PAGE	34 OF 51

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.

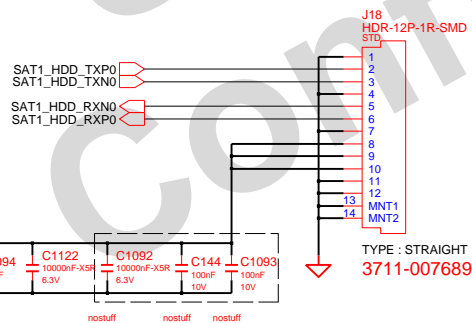
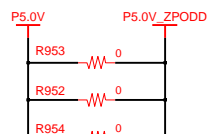
SATA I/F CONN

SATA ODD CONN 14"



Petrones-14CRV use 3710-002796

SATA HDD CONN



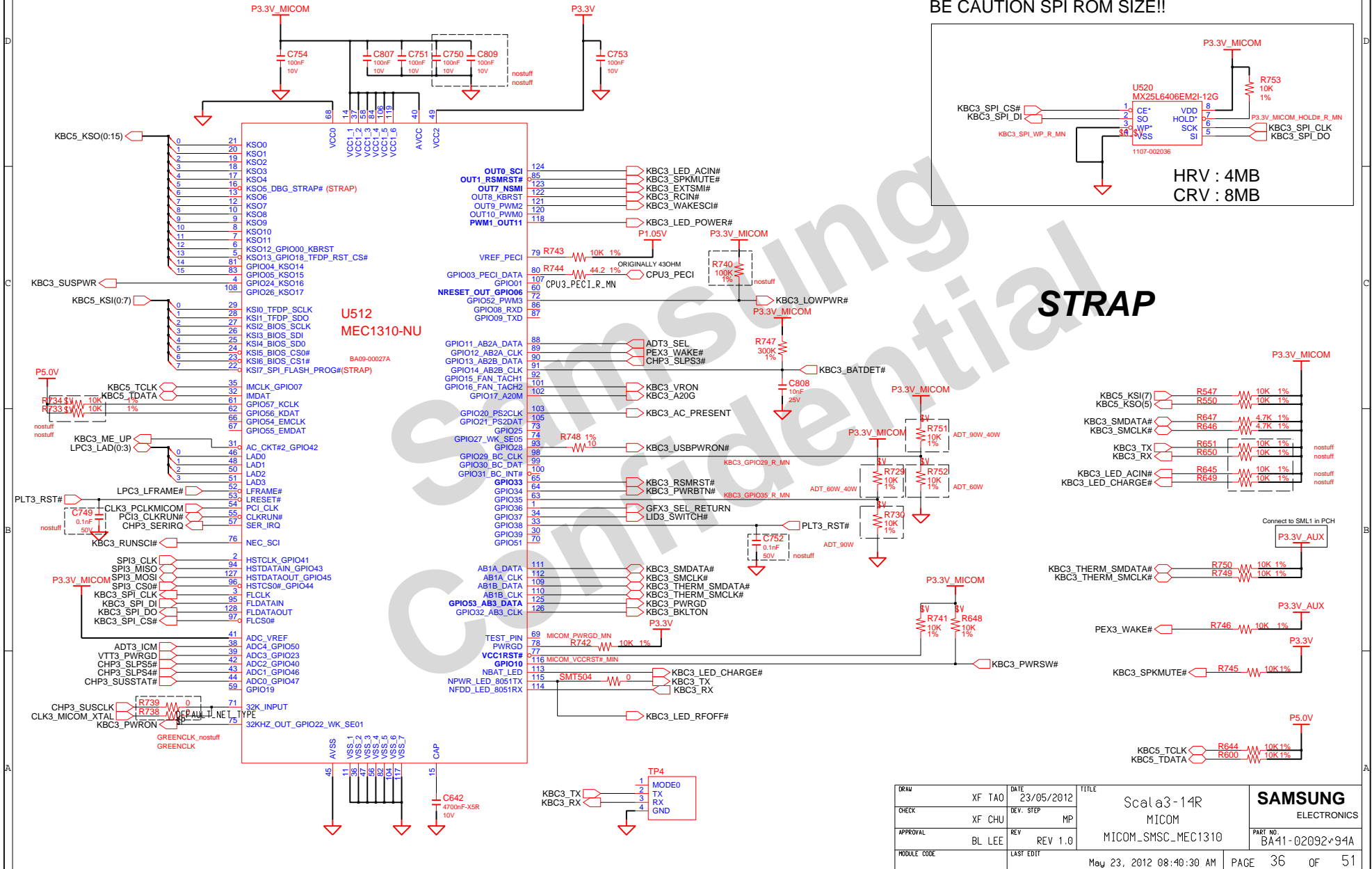
TYPE : STRAIGHT
3711-007689

DESIGN	XF TAO	DATE	23/05/2012	TITLE Scala3-14R SATA_DEVICES HDD & ODD SUB CONNECTOR	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE		LAST EDIT			
				May 23, 2012 08:40:30 AM	PAGE 35 OF 51

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.

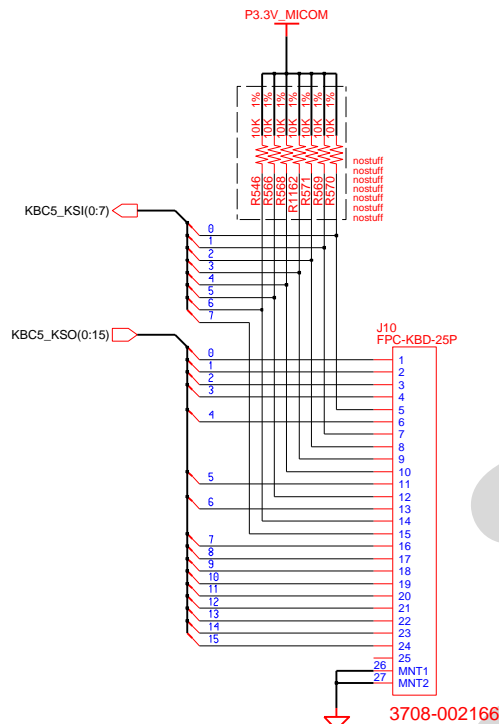
MAIN BOARD (MICOM)

BE CAUTION SPI ROM SIZE!!

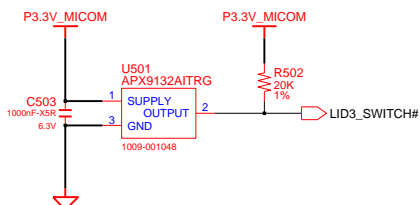


Micom Glue Logic

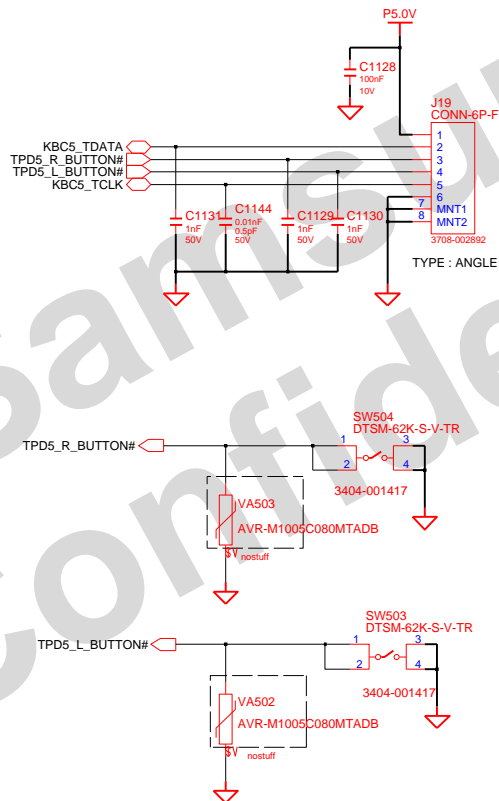
KEYBOARD



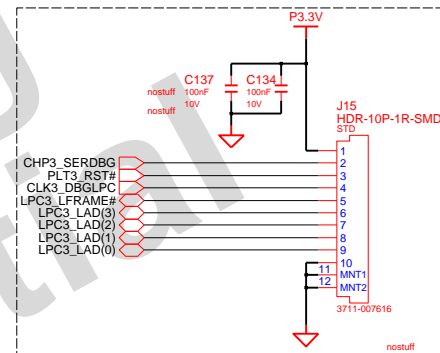
LID_SWITCH



TOUCHPAD



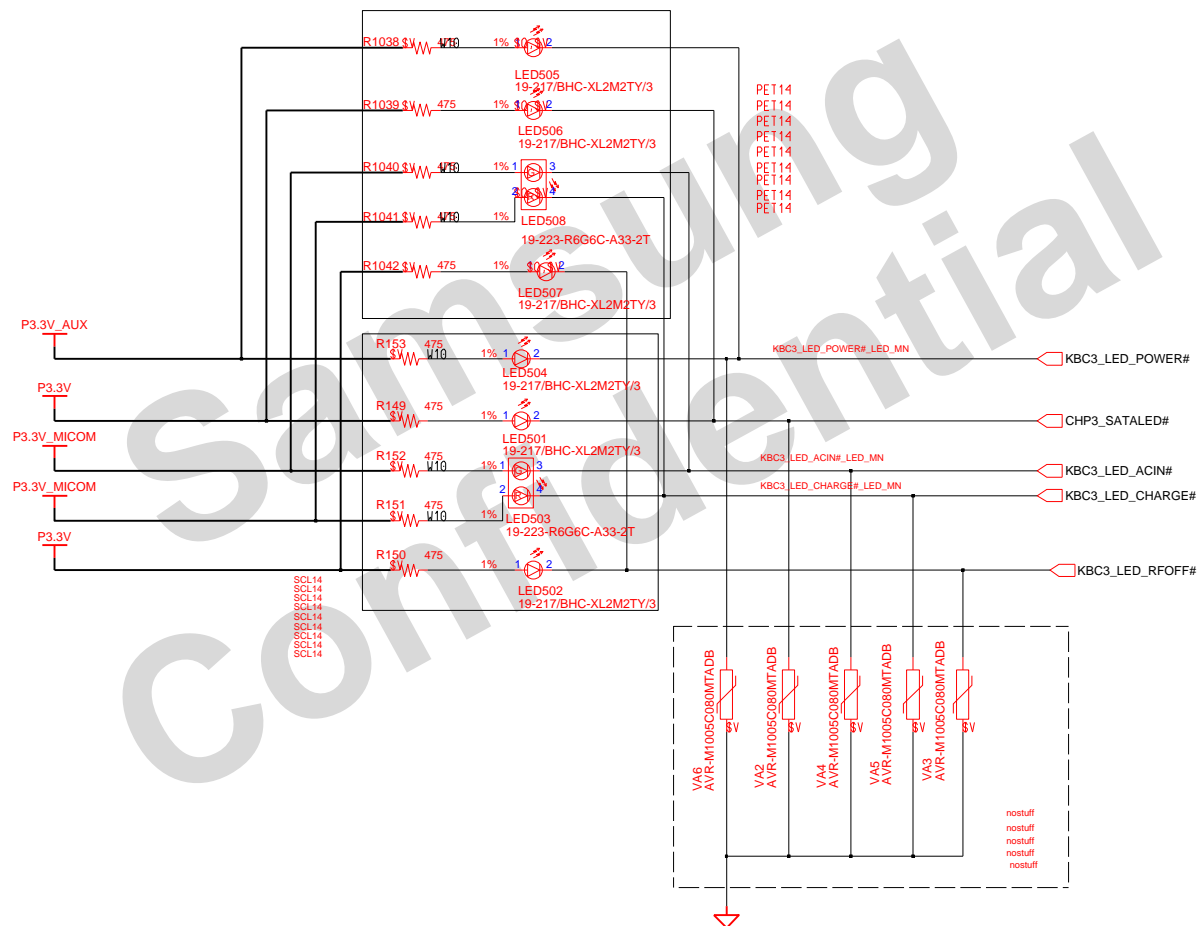
80H PORT DEBUG



DESIGN	XF TAO	DATE	23/05/2012	Scala3-14R MICOM GLUE LOGIC KETBOARD & TOUCHPAD	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE	LAST EDIT				
				May 23, 2012 08:40:30 AM	PAGE 37 OF 51

SAMSUNG PROPRIETARY

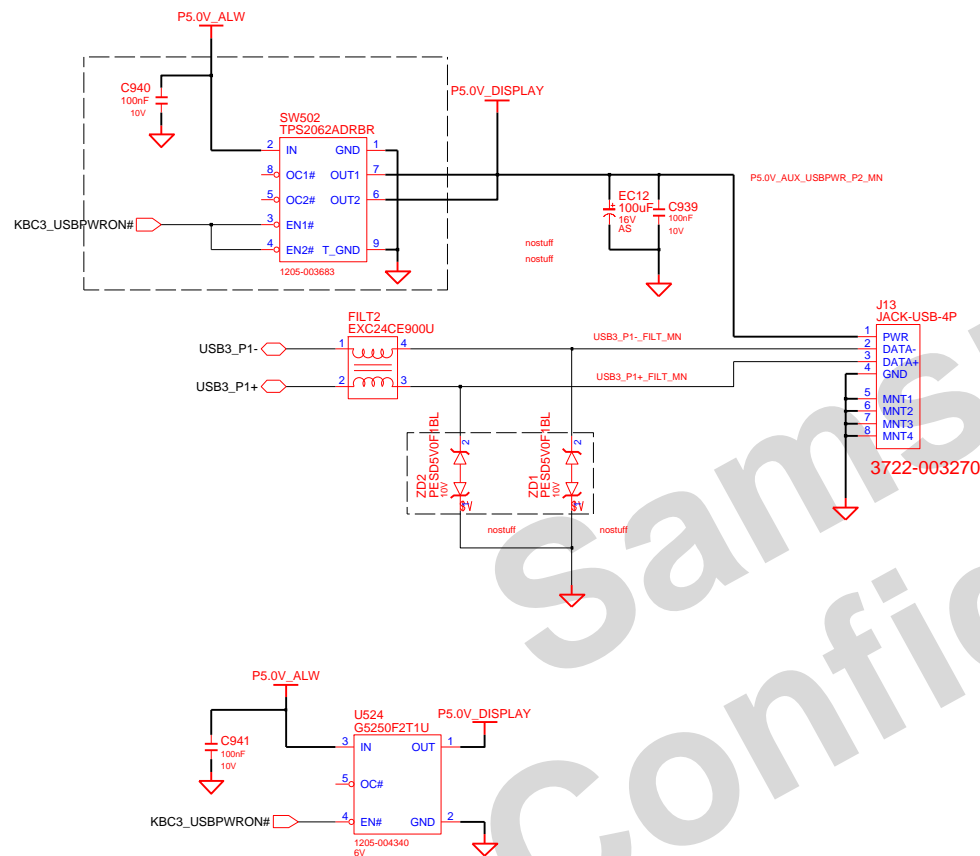
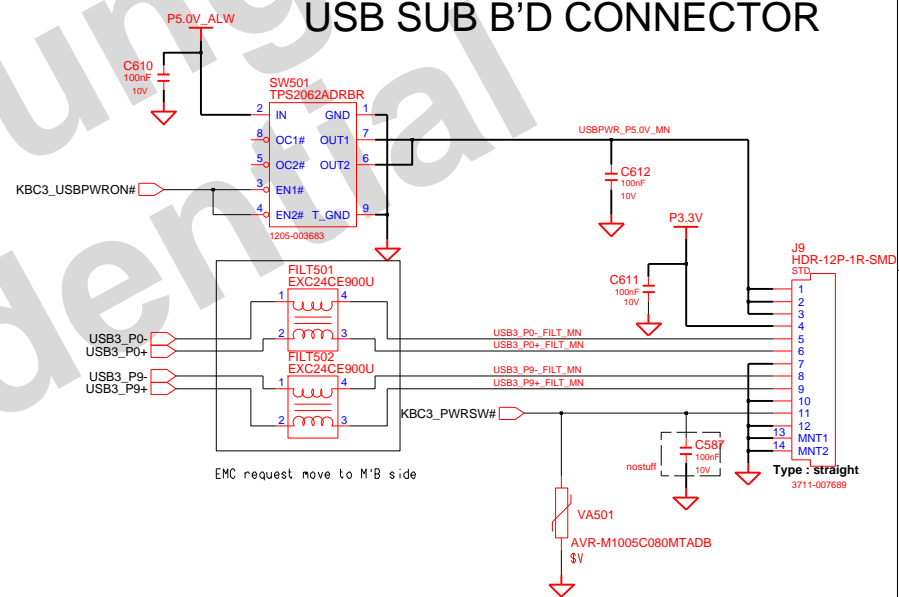
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

LED for 14"

DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP	LED_SWITCH	LED_SWITCH	
APPROVAL	BL LEE	REV	REV 1.0	LED_SWITCH	PART NO. BA41-02092-94A	
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	PAGE	38 OF 51

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**MAIN TO SUB USB CONN****Right 2USB Port****USB SUB B'D CONNECTOR**

PLACE CLOSE TO USB SUB B'D Conenctor

DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		USB_CONN	
APPROVAL	BL LEE	REV	REV 1.0		USB Port	
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	PAGE	39 OF 51

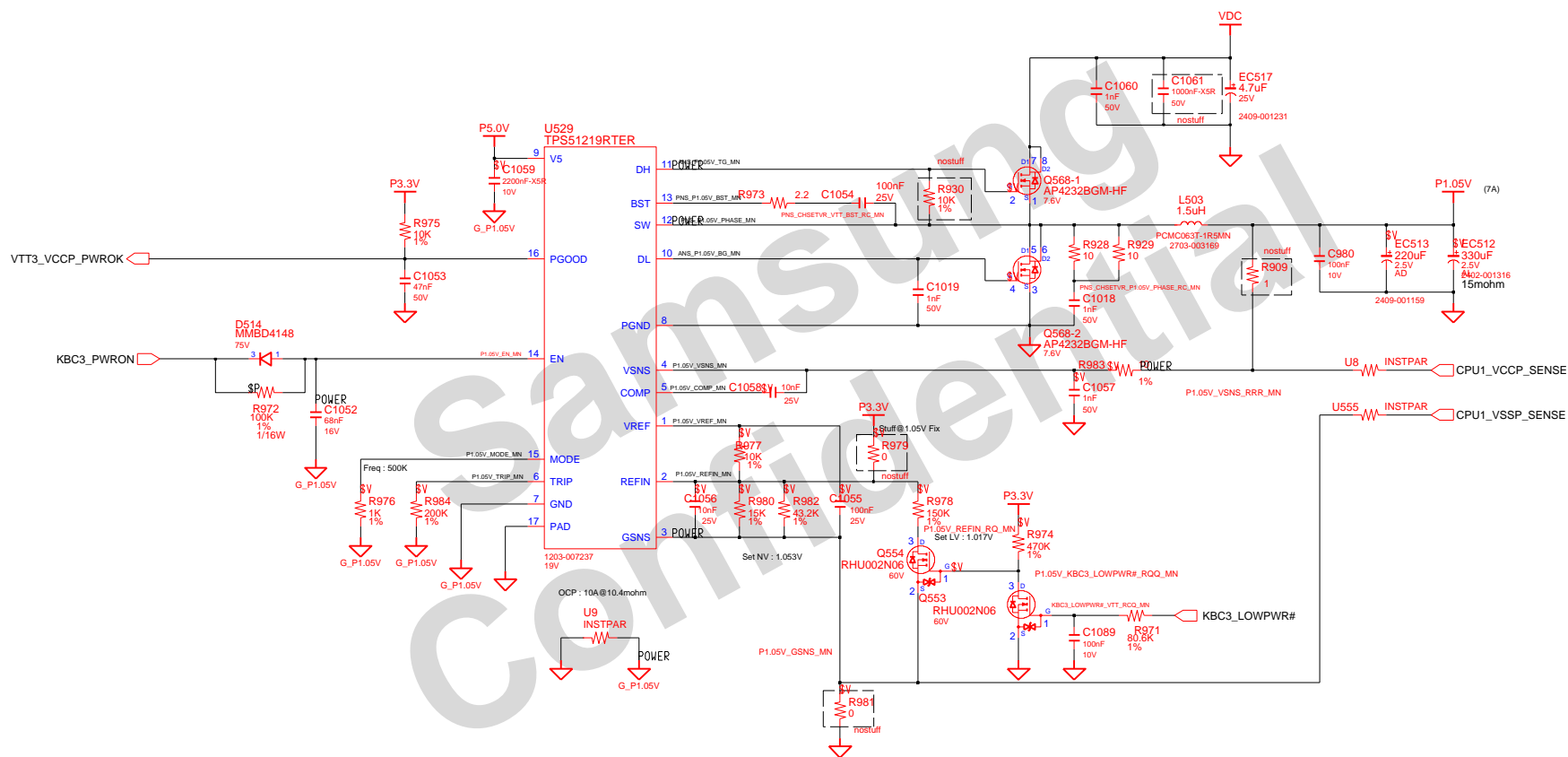
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

DESIGN	XF TAO	DATE	23/05/2012	TITLE Scale3-14R P3.3V_AUX / P5.0V_ALW TI TPS51125		SAMSUNG ELECTRONICS		
CHECK	XF CHU	DEV. STEP	MP					
APPROVAL	BL LEE	REV	REV 1.0					
MODULE CODE		LAST EDIT						
				May 23, 2012 08:40:30 AM	PAGE	41	OF	51

SAMSUNG PROPRIETARY

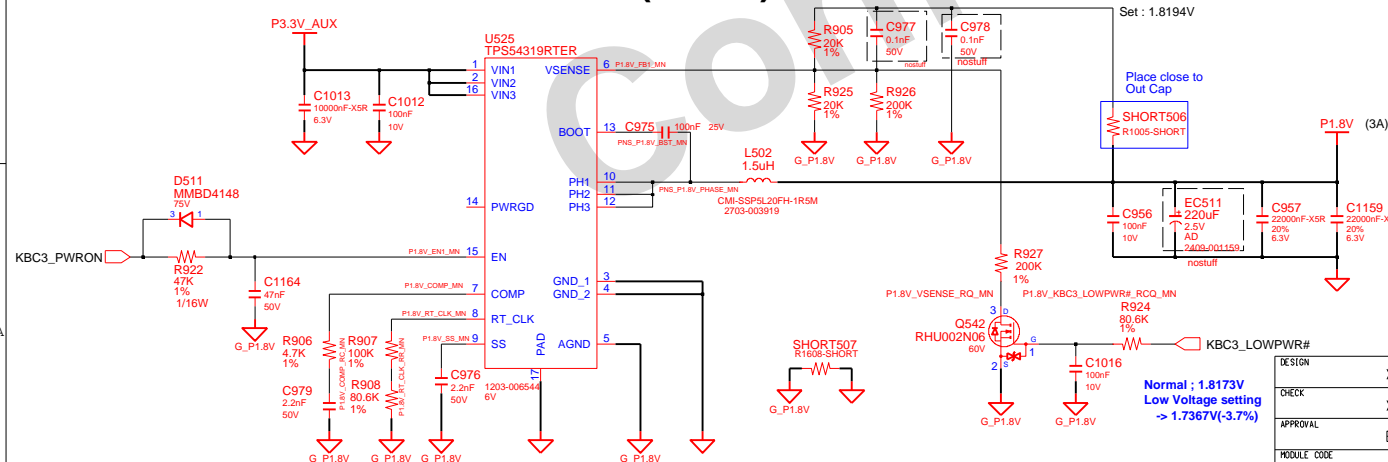
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

Chipset Power (P1.05V)



DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R P1.05V TI TPS51125	SAMSUNG ELECTRONICS PART NO. BA41-02092-94A
CHECK	XF CHU	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	42 OF 51	

CHIPSET POWER(P1.8V)



VID0	VID1	VCCSA
0	0	0.9V
0	1	0.8V @ MODE = OPEN
0	1	0.85V @ MODE = 33K Ω
1	0	0.725V
1	1	0.675V

S/W Frequency
1MHz @ Mode = Open & 33Kohm

et : 1,8194V

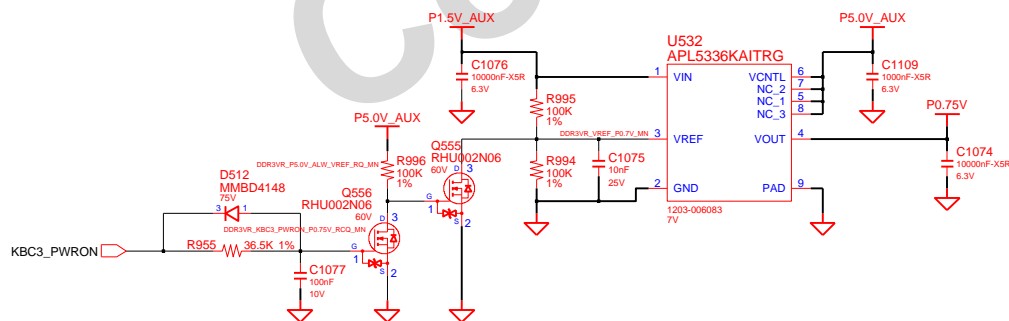
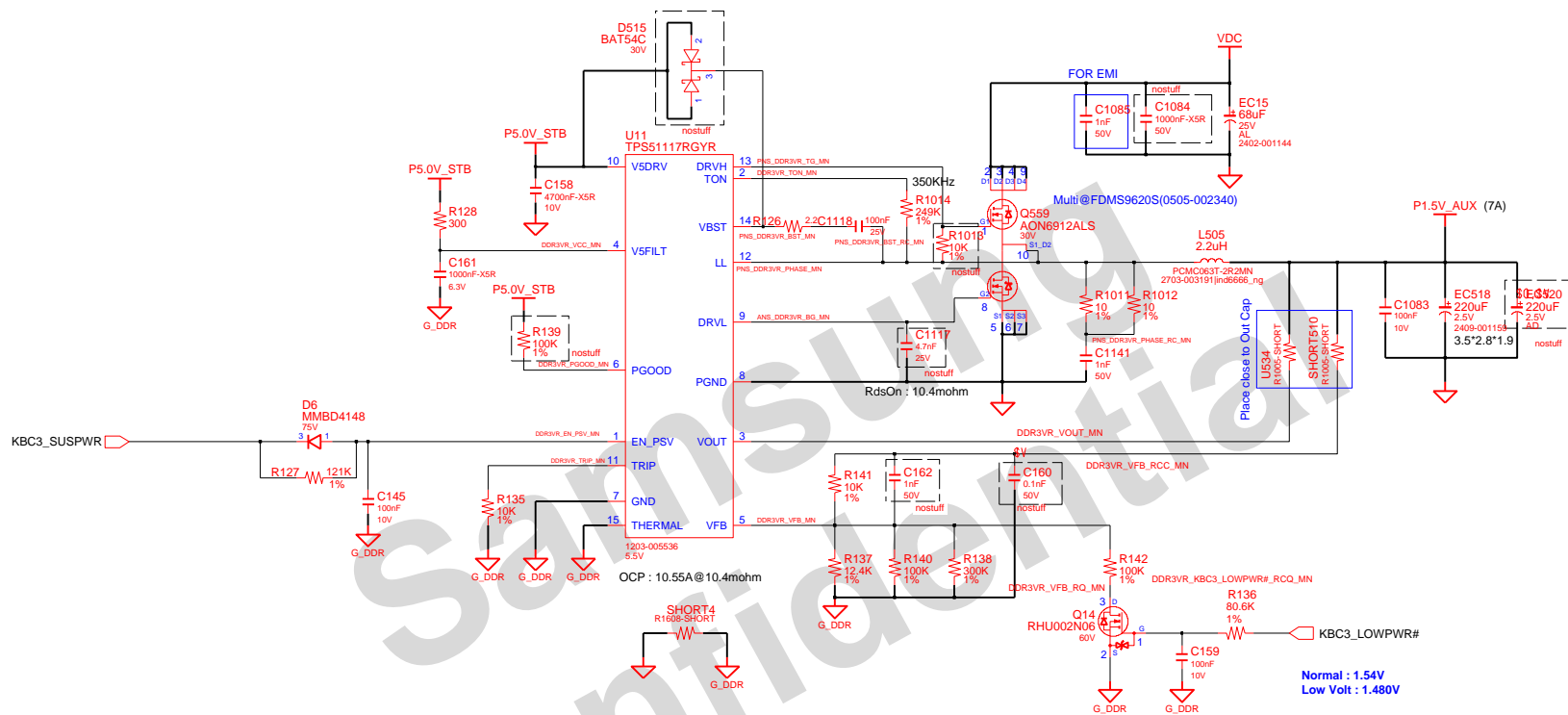
Place close to
Out Cap

SHORT50
R1005-SHOR

Normal ; 1.8173V
Low Voltage setting
-> 1.7367V(-3.7%)

DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R P1.1V_VIT	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	LAST EDIT		May 23, 2012 08:40:30 AM			
				PART NO.		BA41-02092-94A

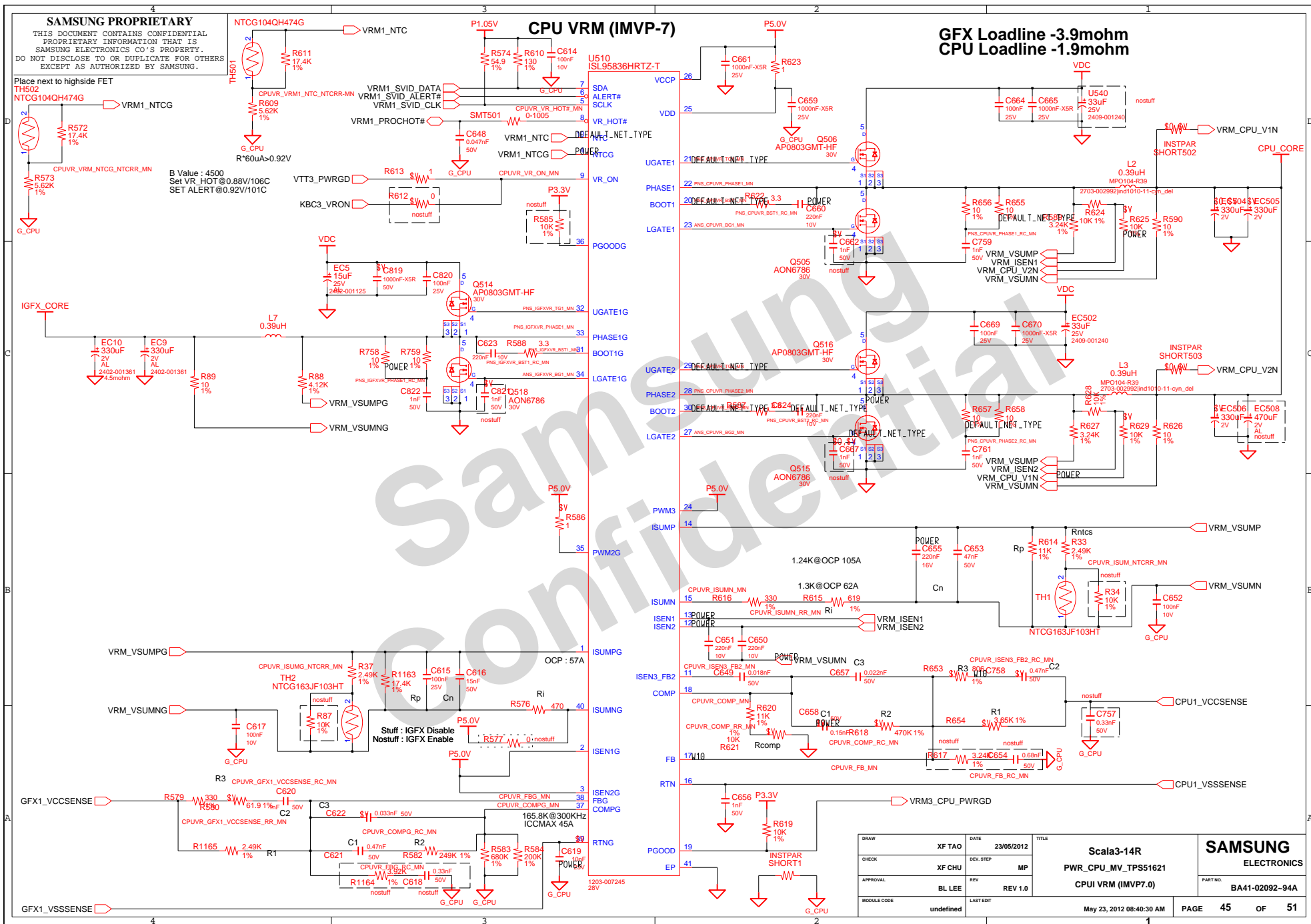
DDR3 VTT(0.75V)



DRAW	XF TAO	DATE	23/05/2012	Scala3-14R PWR MEMORY DDR3 POWER	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV_STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE		LAST EDIT		May 23, 2012 08:40:30 AM	PART NO. BA41-02092-94A PAGE 44 OF 51

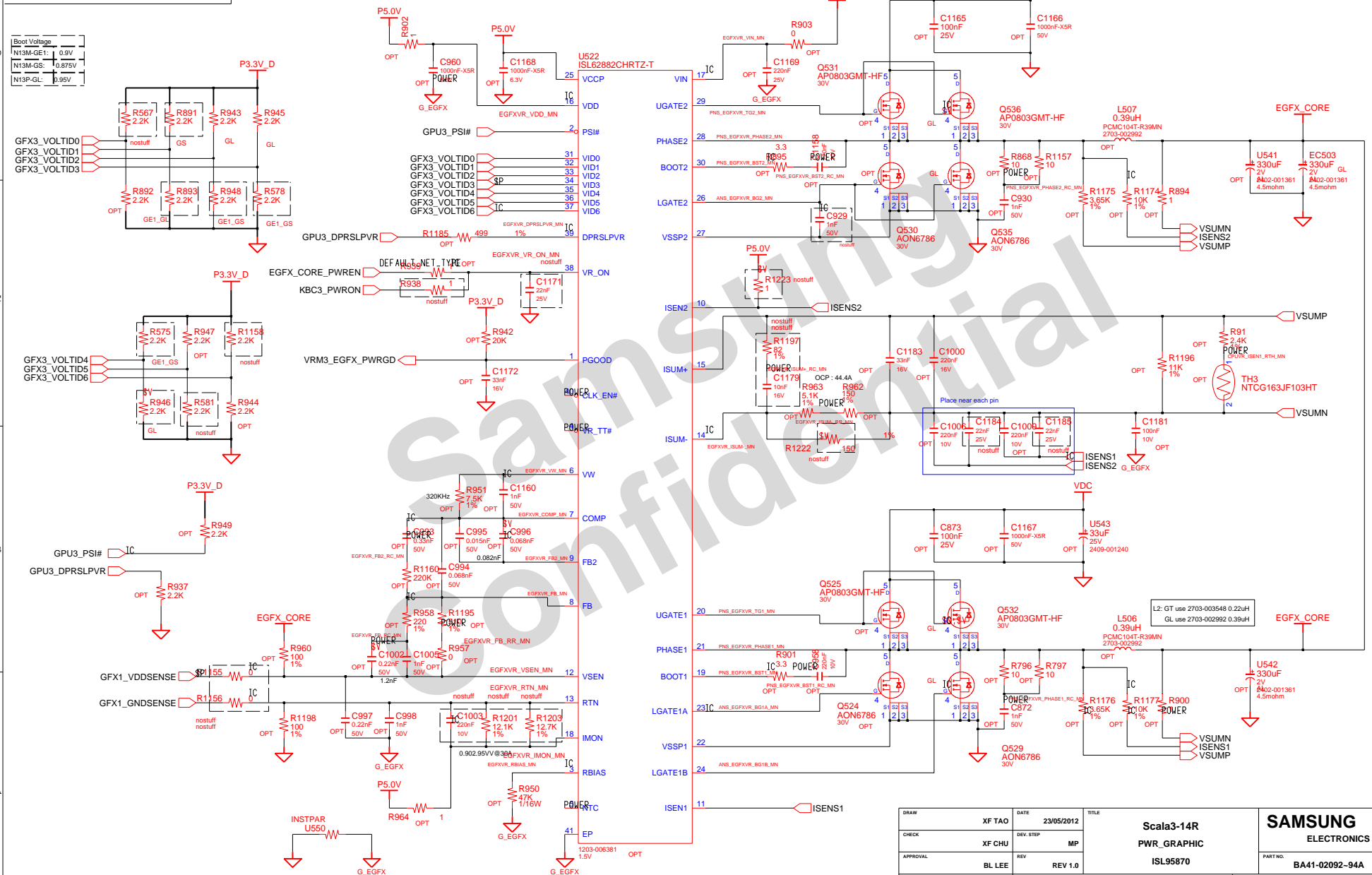
TH502
NTCG104QH474G

```
B Value : 4500
Set VR_HOT@0.88V/106C
SET ALERT@0.92V/101C
```



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.

Boot Voltage	
N13M-GE1:	0.9V
N13M-GS:	0.875V
N13P-GL:	0.95V



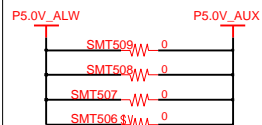
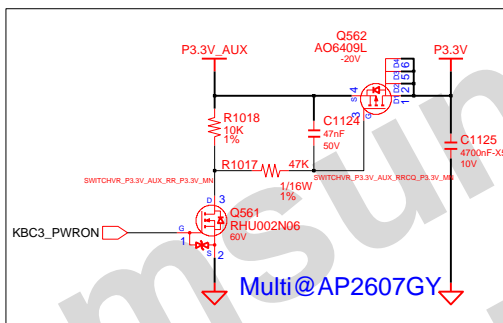
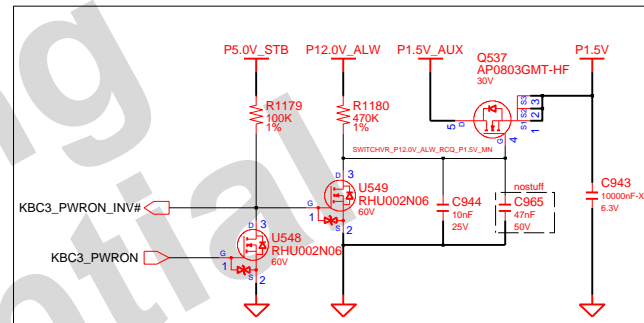
DRAW	XF TAO	DATE	23/05/2012	Scala3-14R PWR_GRAPHIC ISL95870	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.0		
MODULE CODE					
LAST EDIT				May 23, 2012 08:40:30 AM	PAGE 46 OF 51

SAMSUNG PROPRIETARY

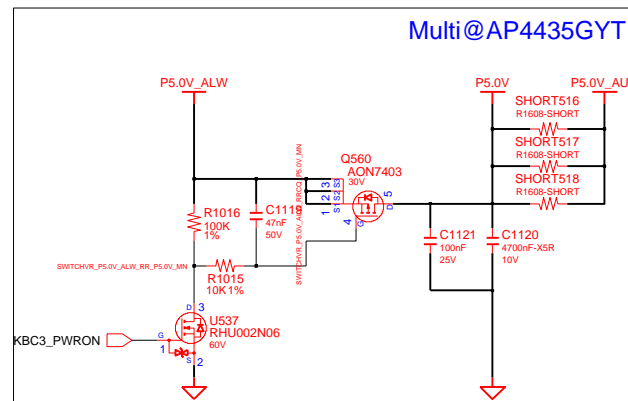
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

Switched Power 1

(P5.0V -> P3.3V -> EGFX_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.85V_SA -> CPU_CORE)

P5.0V_AUX**Switched Power On (P3.3V)****Switched Power On (P1.5V)**

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

Switched Power On (P5.0V)

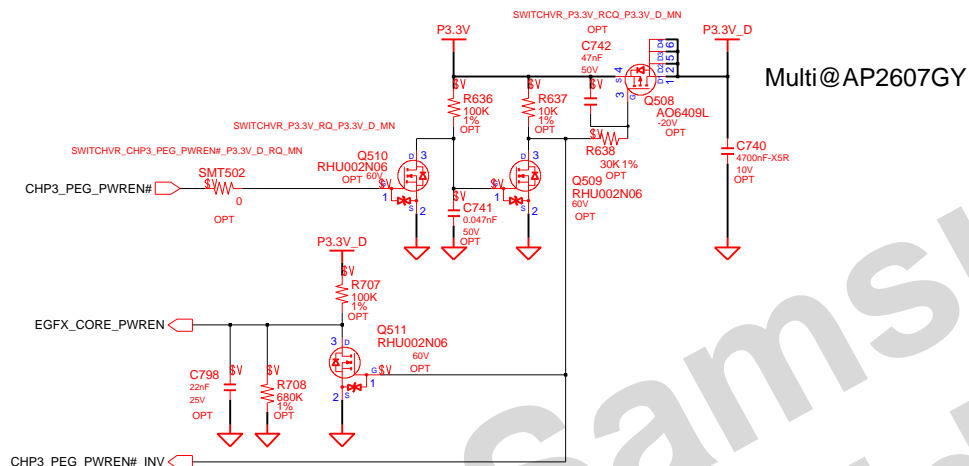
DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		Switched PWR 2	
APPROVAL	BL LEE	REV	REV 1.0		Switched Power	
MODULE CODE	undefined	LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	47	OF 51

SAMSUNG PROPRIETARY

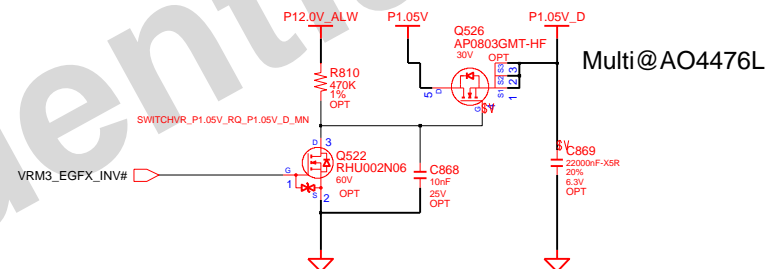
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

Switched Power 2 (For nVidia GFX Power Sequence)

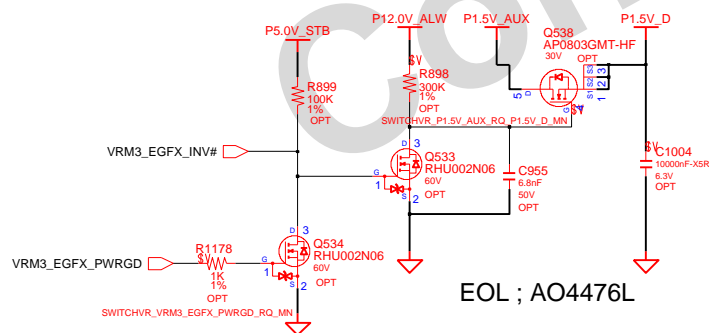
Discrete Switched Power (D3.3V : Max_1.2A)



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



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

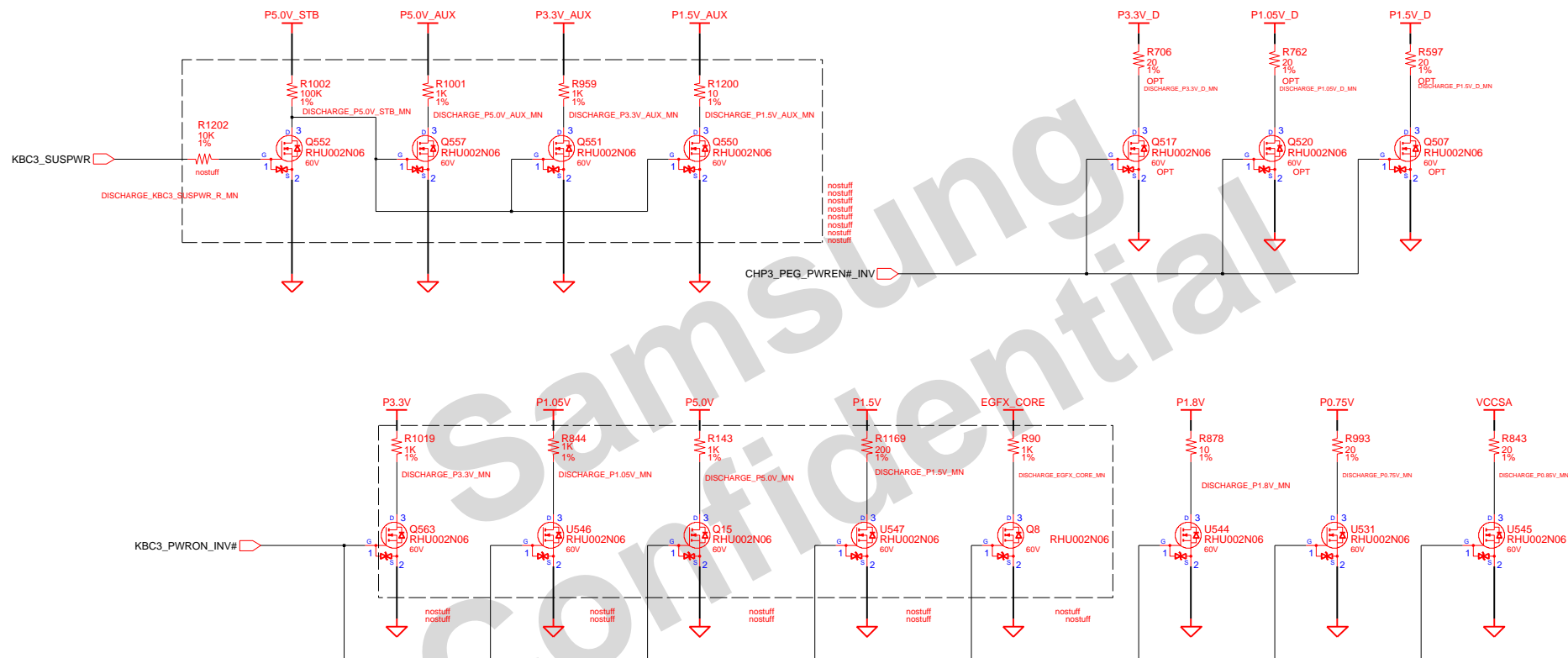


DRAW	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		Switched PWR	
APPROVAL	BL LEE	REV	REV 1.0		FOR OPTIMUS PWR	
MODULE CODE		LAST EDIT			May 23, 2012 08:40:30 AM	PAGE 48 OF 51

SAMSUNG PROPRIETARY

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

POWER DISCHARGER

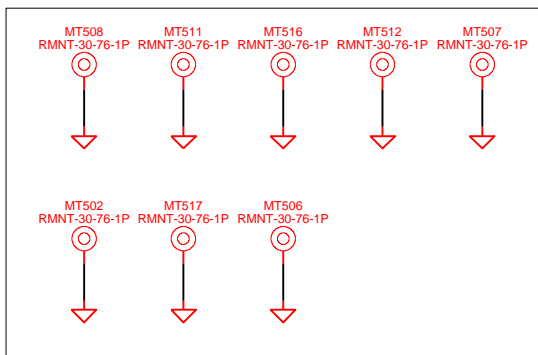


DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		DISCHARGER LOGIC	
APPROVAL	BL LEE	REV	REV 1.0		DISCHARGING LOGIC	
MODULE CODE		LAST EDIT	May 23, 2012 08:40:30 AM	PAGE	49	OF 51

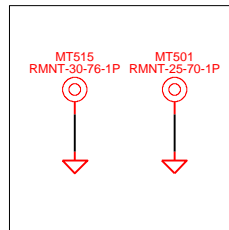
SAMSUNG PROPRIETARY

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.

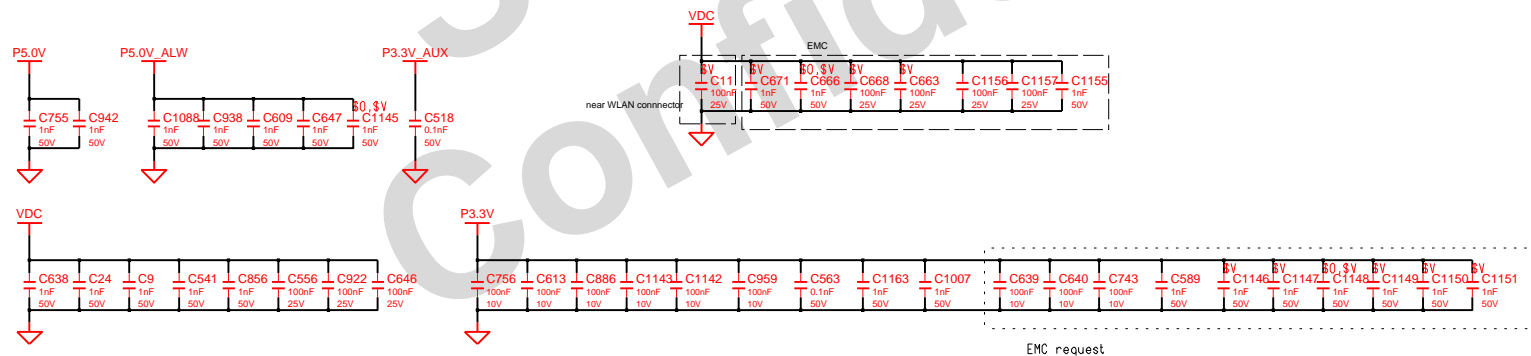
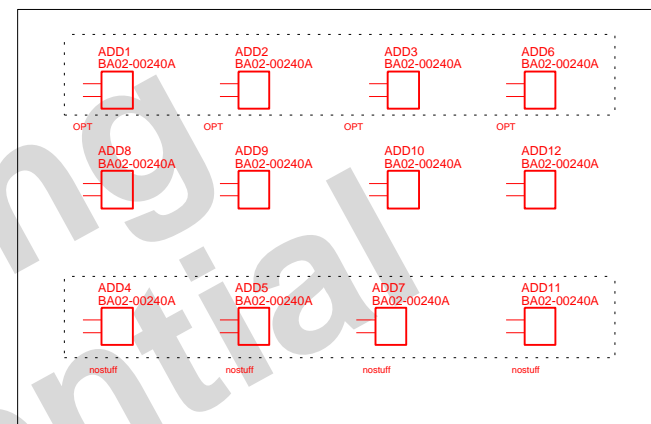
Mainboard Mount ((30-76)X8EA)



PCB FIX

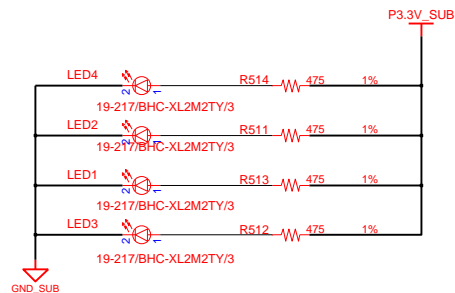


Corner Fill for GPU, PCH

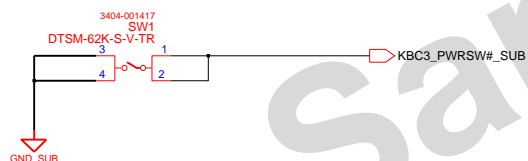


DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP		MT Hole	
APPROVAL	BL LEE	REV	REV 1.0		MT Hole	
MODULE CODE		LAST EDIT				PART NO. BA41-02092-94A
May 23, 2012 08:40:30 AM						PAGE 50 OF 51

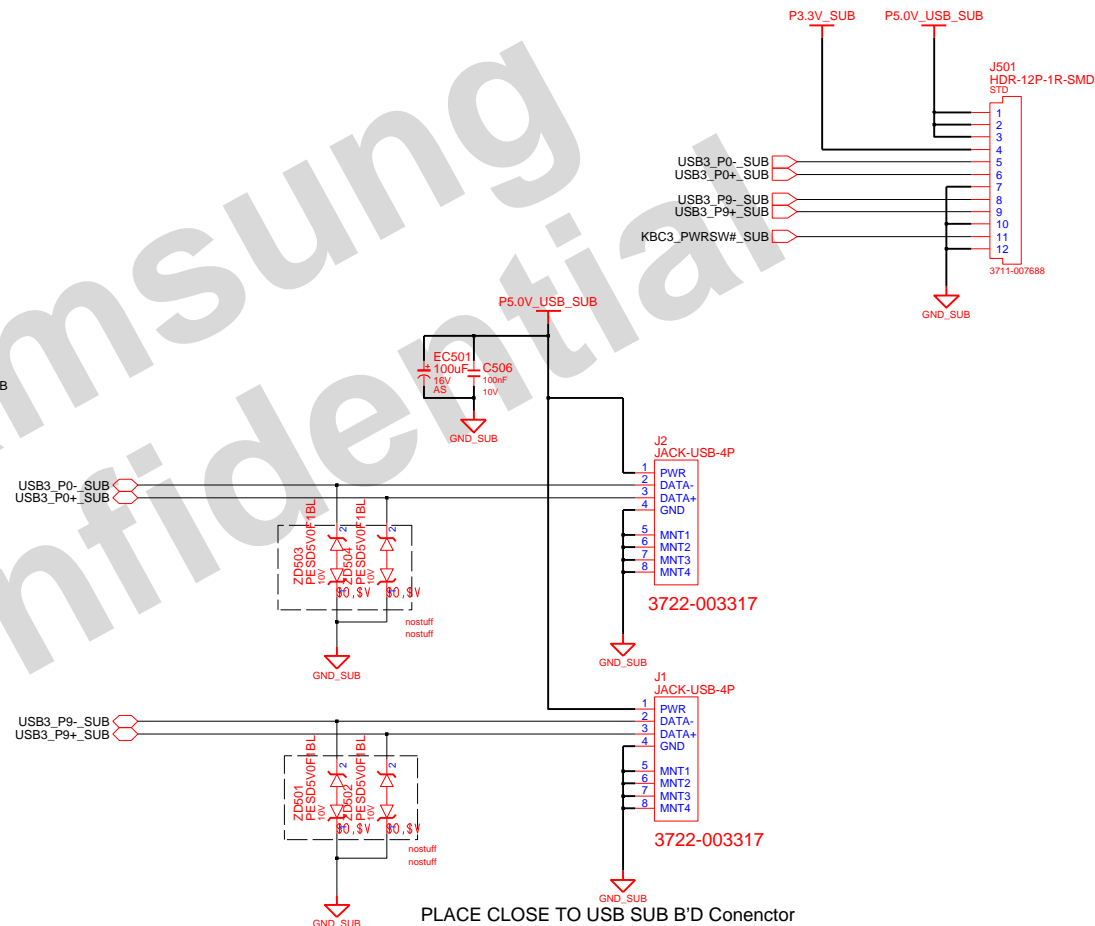
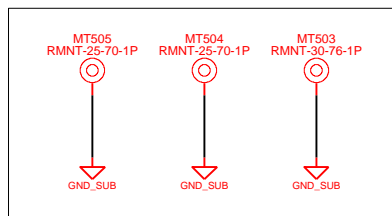
SUB TO MAIN



Power Switch Button



PCB Mount



DESIGN	XF TAO	DATE	23/05/2012	TITLE	Scala3-14R SUB BOARD SUB BOARD	SAMSUNG ELECTRONICS
CHECK	XF CHU	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	LAST EDIT		May 23, 2012 08:40:30 AM			