

Scala2-R

CPU : Sandy Bridge PGA
Chip Set : Intel Cougar Point
GFX : N12P-GV/N12M-GE
Remarks : Huron River Platform

Model Name : Scala2-R
PBA Name : MAIN
PCB Code : BA41-01XXXA (GCE)
BA41-01XXXA (NY)
BA41-01XXXA (HAN)
BA41-01XXXA (GBM)
Dev. Step : ADV
Revision : 0.1
T.R. Date : 2011.01.20

Design	CHECK	APPROVAL
<i>GU HUI</i>	<i>SJ WU</i>	<i>BC LEE</i>

■ Owner : SRDC PD3

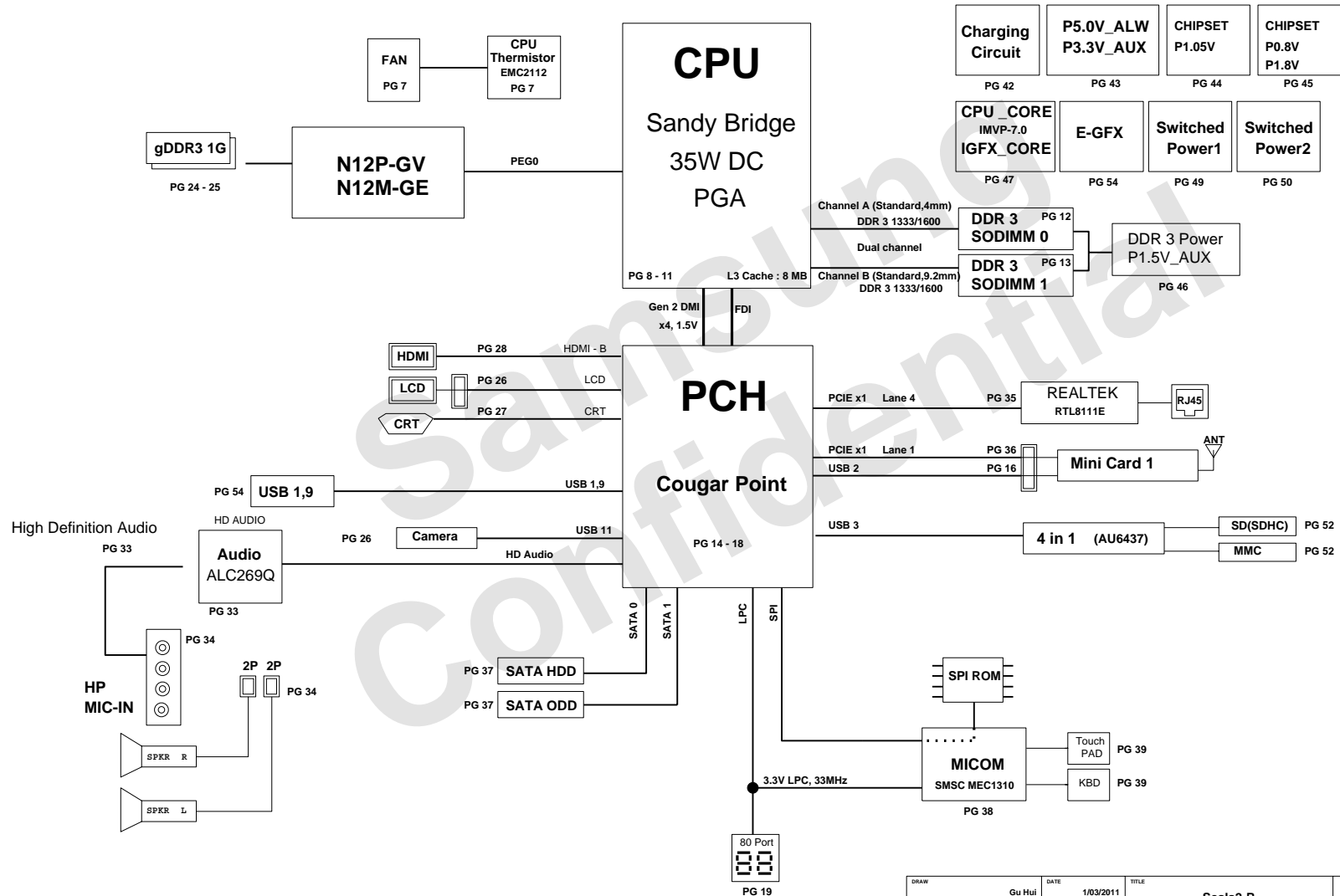
Signature : *GUHUI*

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

BLOCK DIAGRAM



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	BLOCK DIAGRAM	PART NO. BA41-01XXXA	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	2	OF 48

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BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails

Active in

VDC 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)	S3
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)	S0
VCC_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT	S0
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	

USB PORT Assign

PCI Express Assign

PORT #	ASSIGNED TO	PORT #	ASSIGNED TO
0	NC	1	Mini Card 1 (WLAN)
1	SYSTEM PORT 0	2	NC
2	Mini PCI Express	3	NC
3	Multi Memory Card Controller	4	LAN CONTROLLER
4	NC	5	USB 3.0
5	NC	6	NC
6	NC (N/A WITH HM55)	7	NC
7	NC (N/A WITH HM55)	8	NC
8	Camera		
9	SYSTEM PORT 1		
10	NC		
11	Camera(LCD Cable)		
12	NC		
13	NC		

SATA PORT Assign

PORT #	ASSIGNED TO
0	HDD
1	ODD
2	(N/A WITH HM65)
3	(N/A WITH HM65)
4	
5	

Crystal / Oscillator

TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	HM65	Real Time Clock
Crystal	25MHz	LAN	Intel LAN
Crystal	24MHz	USB 3.0	
Crystal	25MHz	HM65	INTEL
Crystal	27MHz	N12P-LP	NVIDIA

LCD Pannel Detect (TBD)

Devices	Resolution	PANNEL_DETECT_0

IC / SMB Address

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

DRAW

Gu Hui

DATE

1/03/2011

TITLE

Scala2-R

MAIN

BOARD INFO

CHECK

SJ Wu

DEV. STEP

ADV

APPROVAL

BC LEE

REV

rev. 0.1

MODULE CODE

undefined

LAST EDIT

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ELECTRONICS

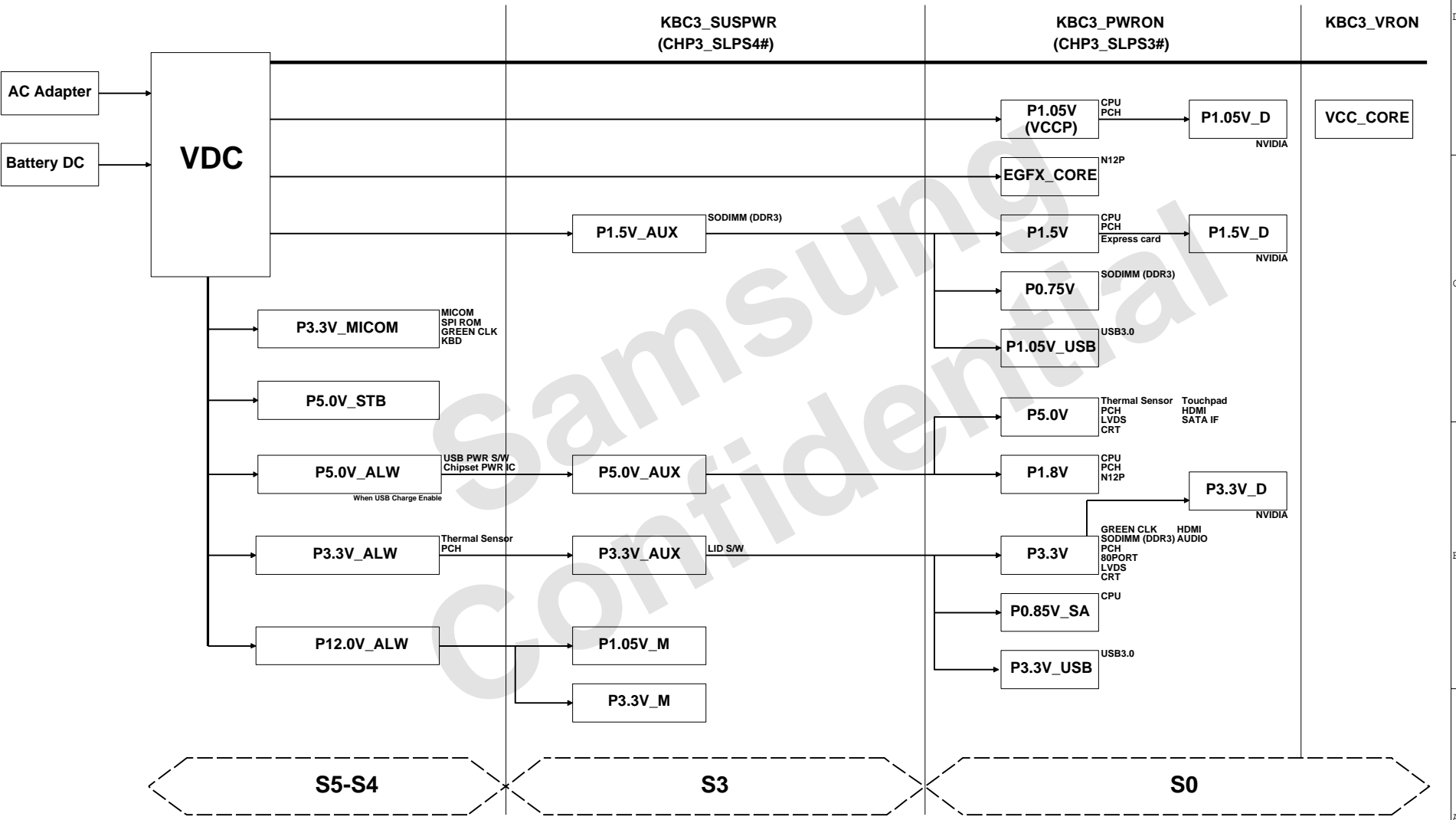
PART NO.

BA41-01XXXA

22C-015(1996.6.5) REV. 3

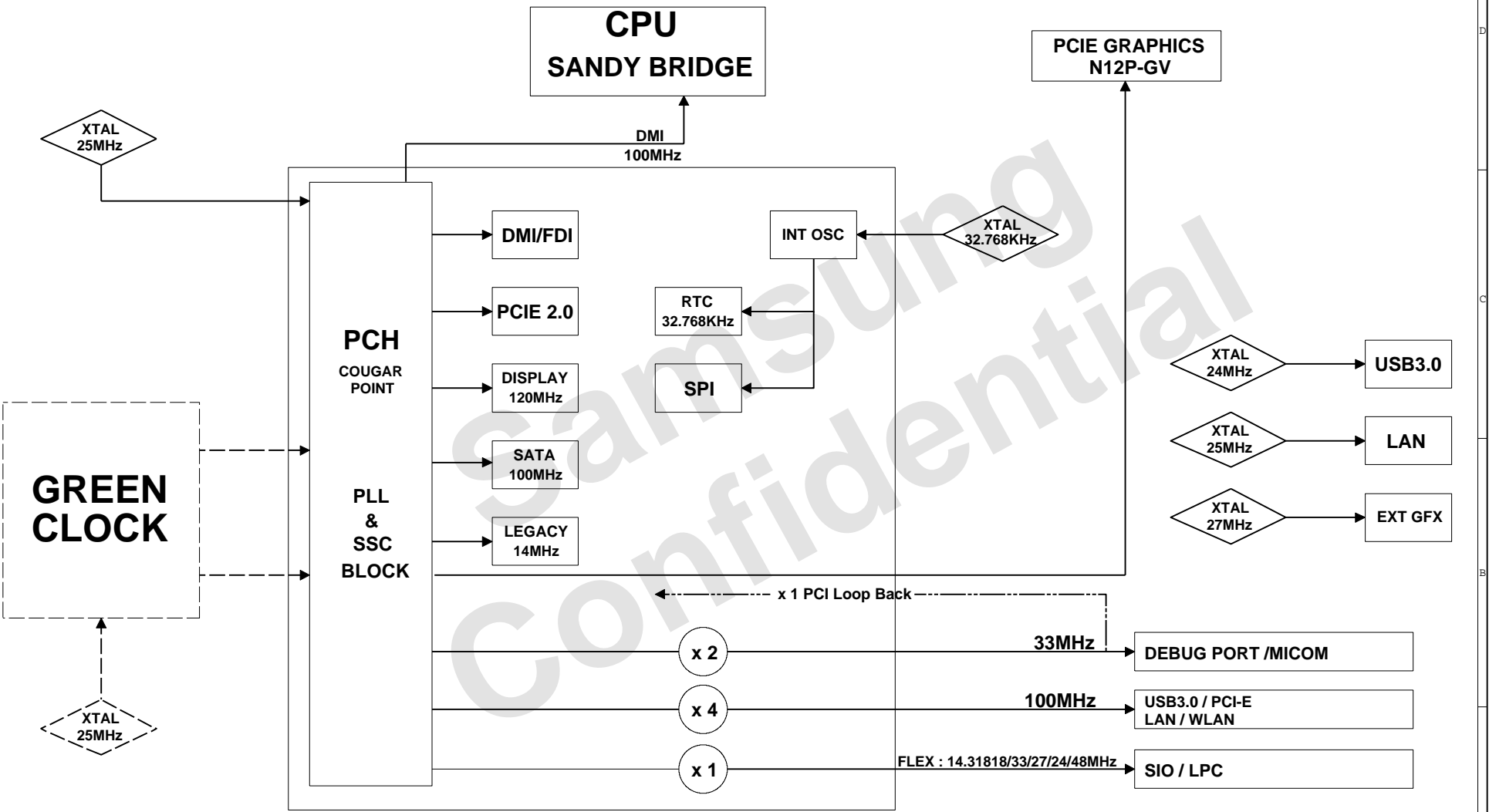
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POWER DIAGRAM Rev 0.8



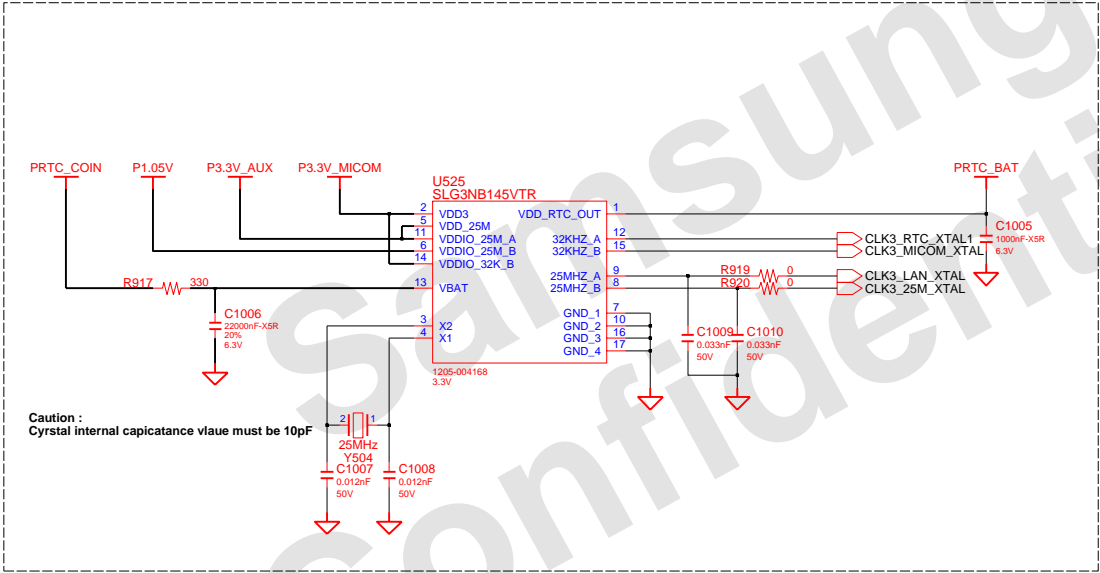
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APPROVAL	BC LEE	REV	rev. 0.1	POWER DIAGRAM	PART NO. BA41-01XXXA	
MODULE CODE	undefined	LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 4 OF 48	

CLOCK DISTRIBUTION Rev. 0.8



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R MAIN CLOCK DIAGRAM	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			PART NO. BA41-01XXXXA
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	5	OF 48

CLOCK DISTIBUTOR



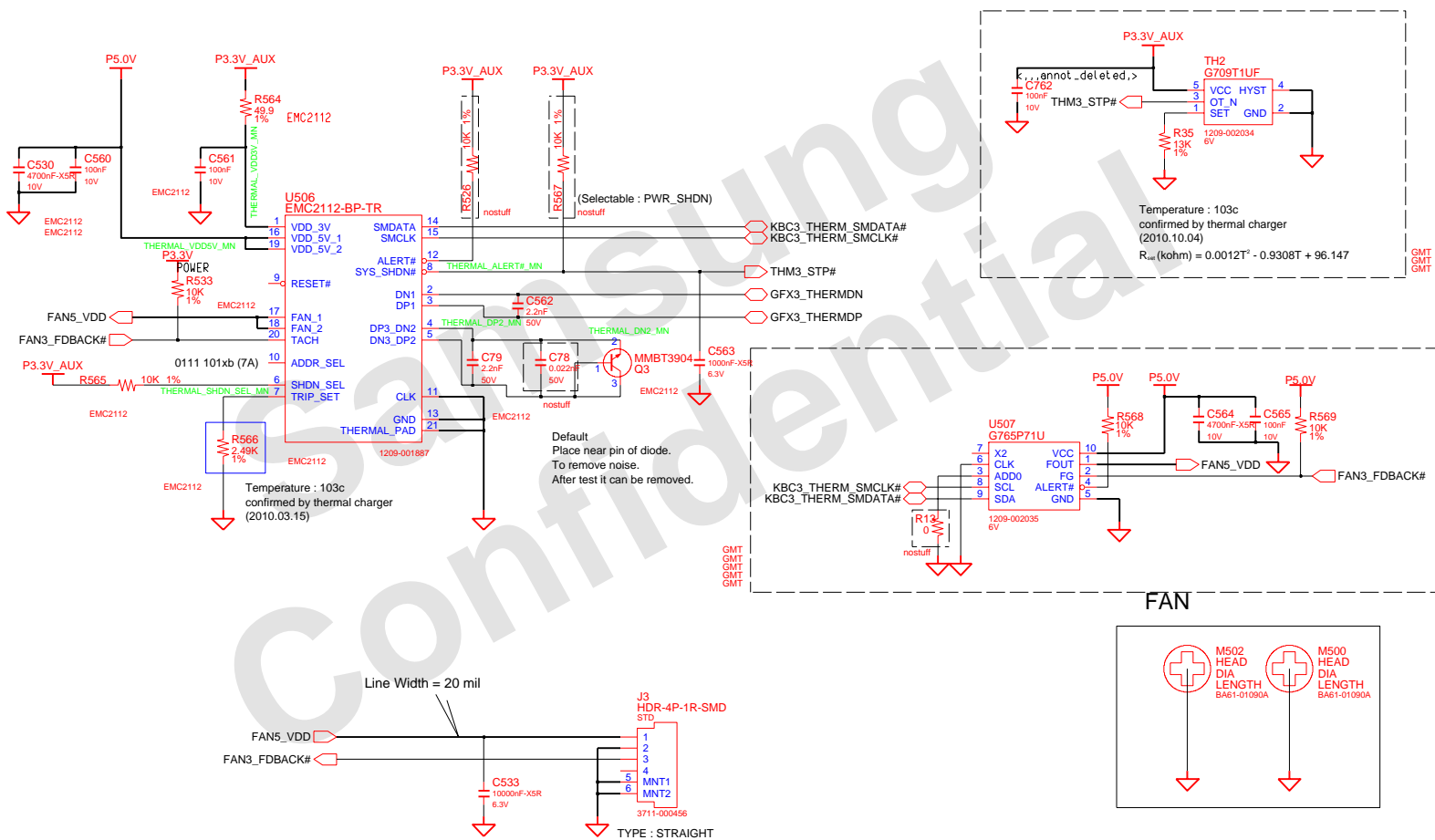
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK

ENGINEER	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXX
DESIGNED BY	short_date	SCALAZ-R_PV_MAIN	
CHANGED BY	DEV. STEP	Module Name	
FIG. CHK	REV	1.0	
LAST EDIT		last_edit	PAGE 6 OF XX

THERMAL SENSOR & FAN CONTROL

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

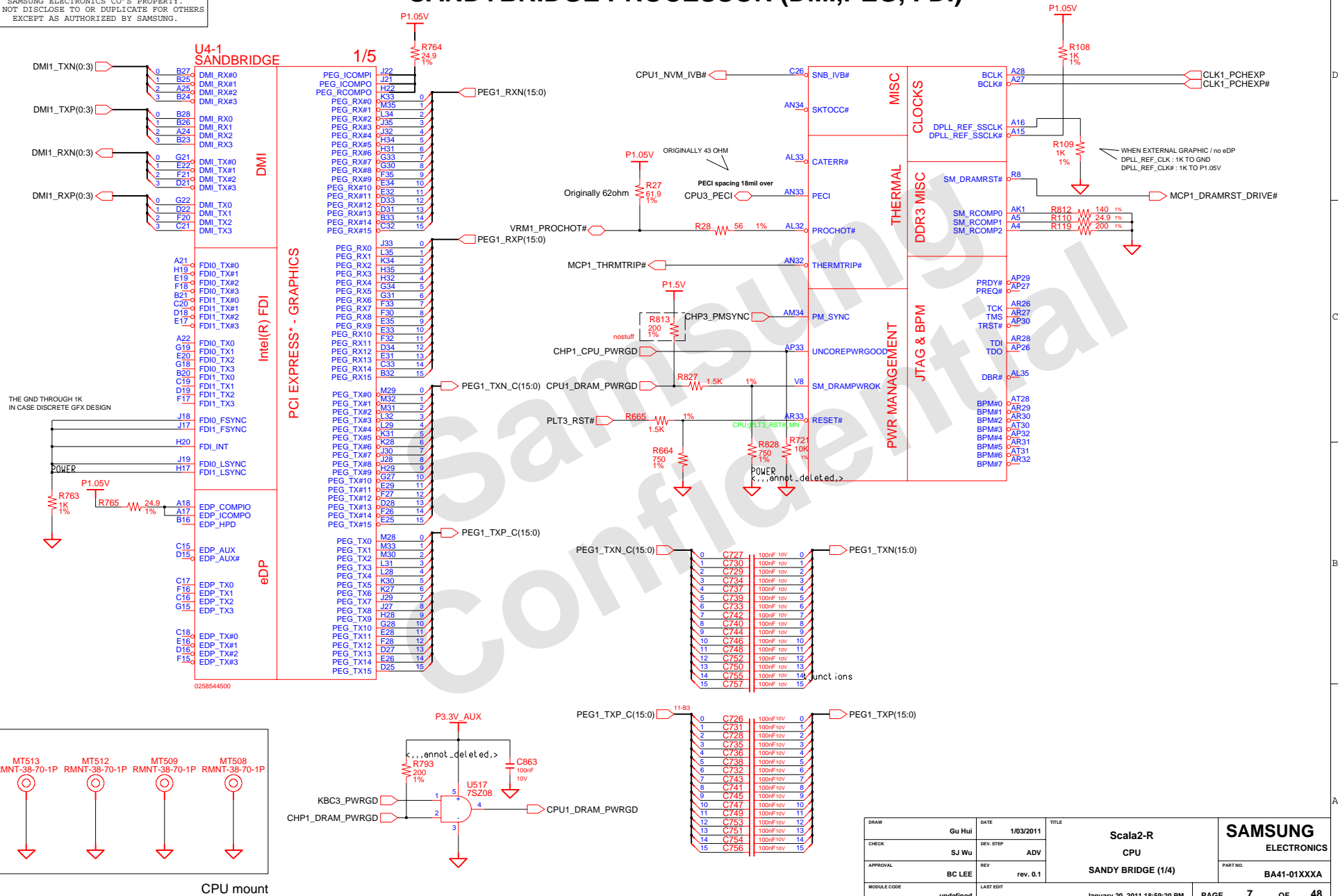
SHDNSEL_MODE	
0	INTEL TR MODE
HIGH Z	AMD CPU/DIODE MODE
✓ 1	EXT.DIODE 2 MODE



DESIGN	Gu Hui	DATE	1/03/2011	Scala2-R THERMAL SENSOR THERMAL SENSOR EMC2112	SAMSUNG ELECTRONICS		
CHECK	SJ Wu	DEV. STEP	ADV				
APPROVAL	BC LEE	REV	rev. 0.1				
MODULE CODE	LAST EDIT		January 20, 2011 18:59:20 PM				

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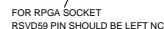
SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		CPU	
APPROVAL	BC LEE	REV	rev. 0.1		SANDY BRIDGE (1/4)	PART NO. BA41-01XXXXA
MODULE CODE	undefined	LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 7 OF 48	

D:/mentor/Scala2 R/Scala2 R Ext ADV 110119 MAIN

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	PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X
CFG2	1 : (DEFAULT) NORMAL OPERATION 0 : LANE REVERSED

PCIE PORT BIFURCACTION 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

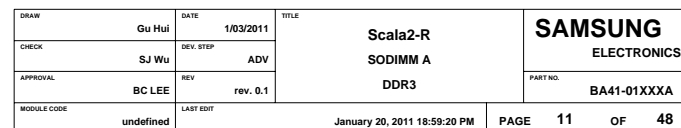
Display Port Presence	
CFG4	1 : Disabled - No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP

PEG DEFER TRAINING	
CFG7	1 : (DEFAULT)PEG TRAIN IMMEDIATELY FOLLOWING XXREBTS DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

22C-015(1996.6.5) REV. 3

DDR SO-DIMM #0

P/N : 3709-001656 (Foxconn)

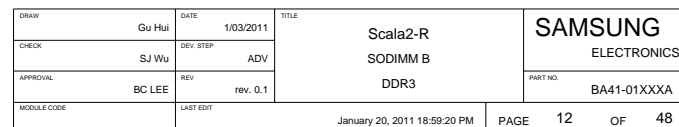


DDR SO-DIMM #1

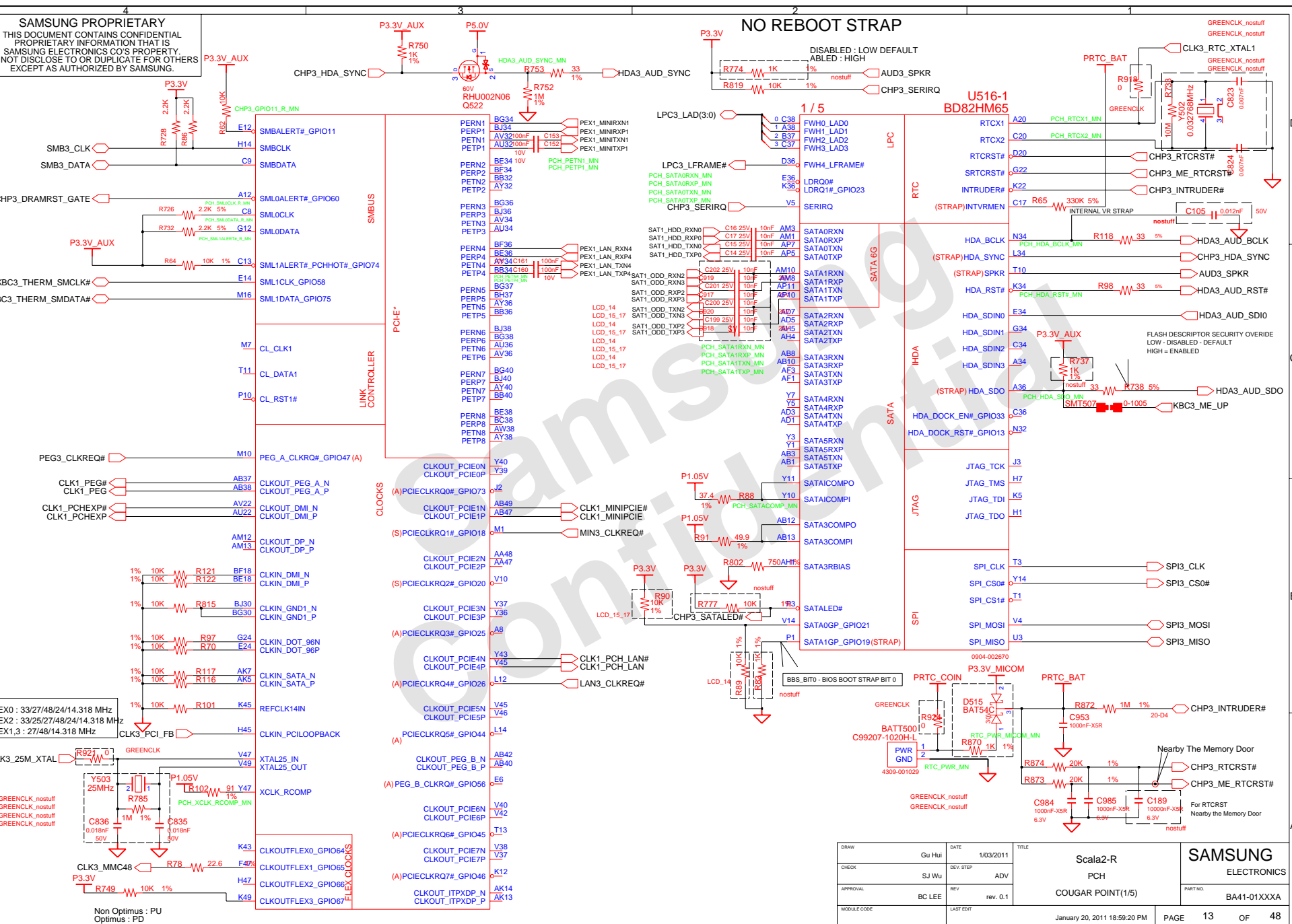
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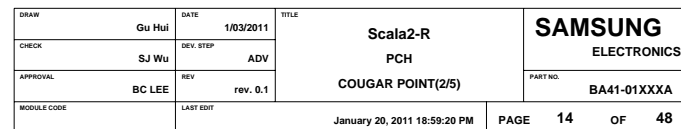
P/N : 3709-001608 (CONCRAFT)

P/N : 3709-001654 (Foxconn)

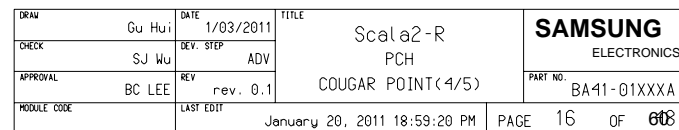


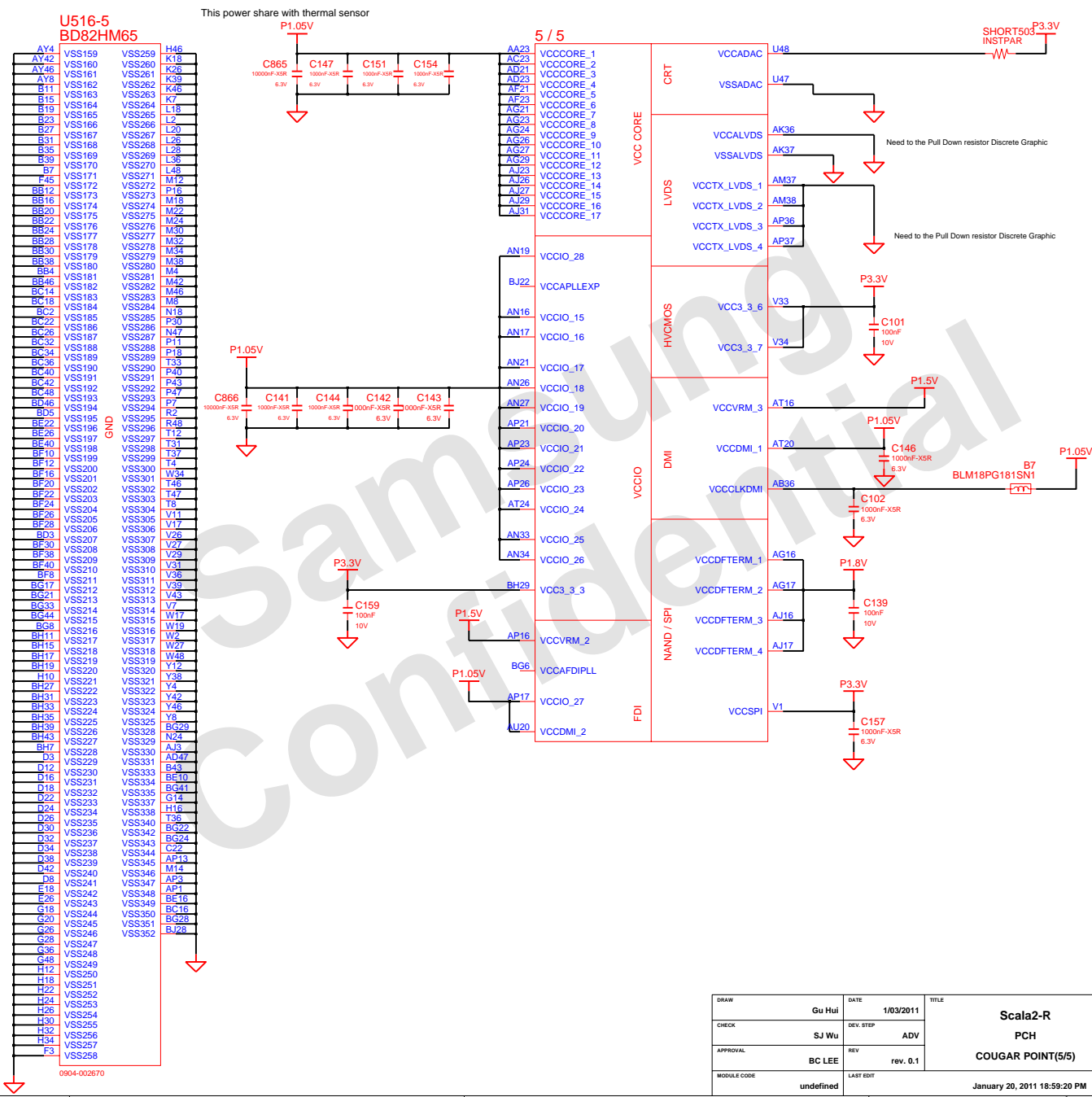
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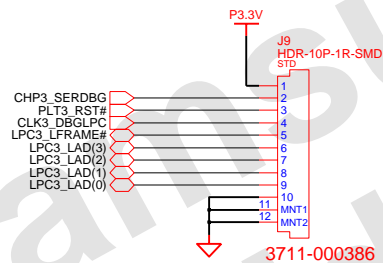
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APPROVAL	BC LEE	REV	rev. 0.1	COUGAR POINT(5/5)	PART NO.	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	17 OF 48	

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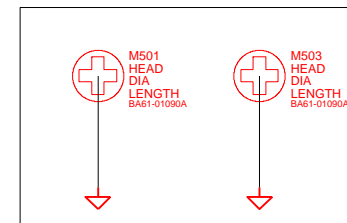
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80H PORT DEBUG

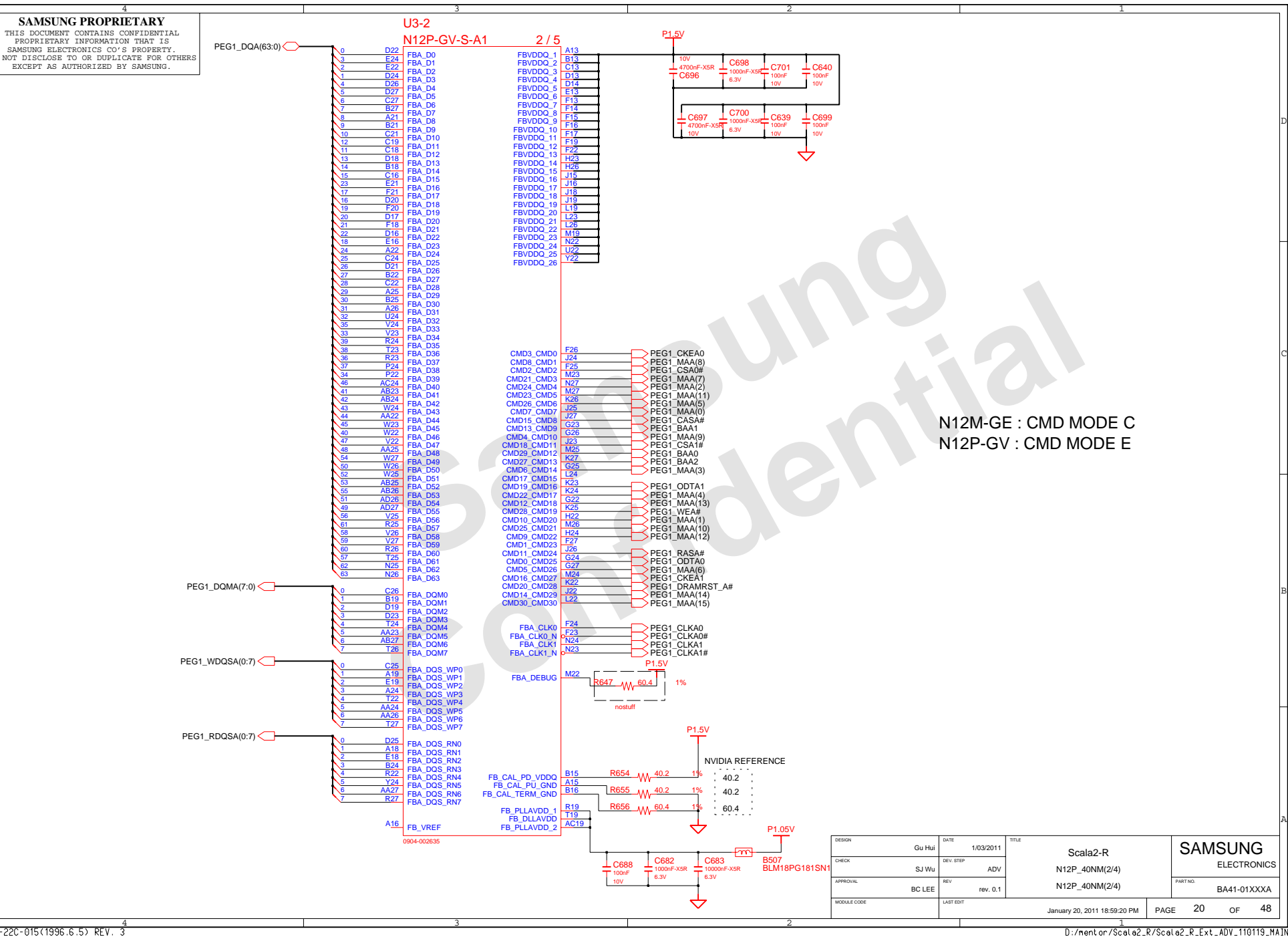


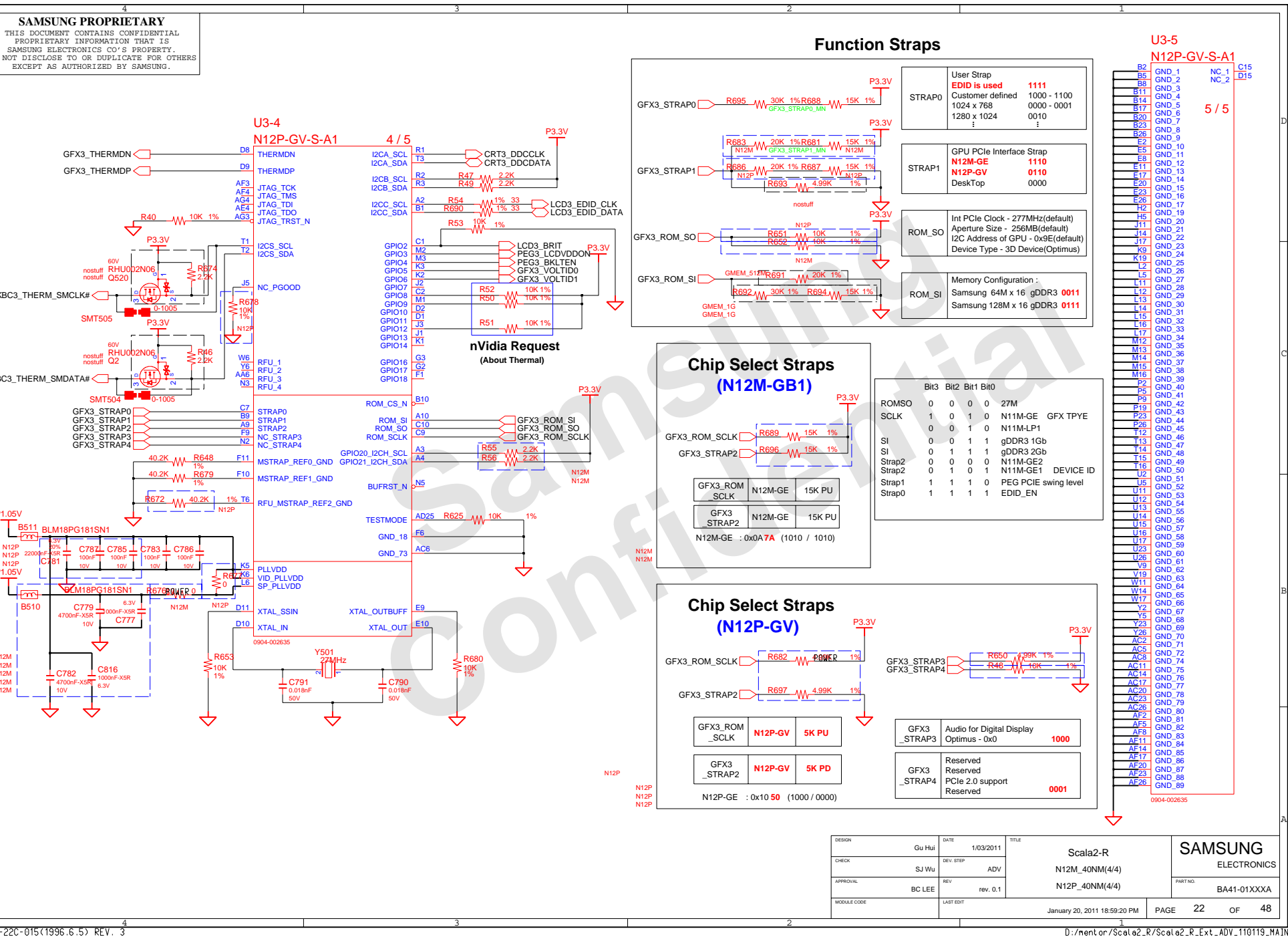
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APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	18	OF 48

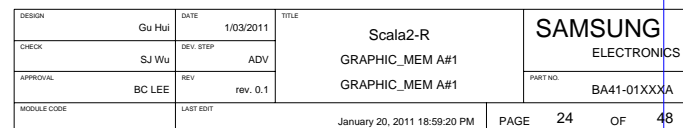
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CHECK	SJ Wu	DEV. STEP	ADV		PART NO.	BA41-01XXXX
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	LAST EDIT			January 20, 2011 18:59:20 PM	PAGE	19 OF 48

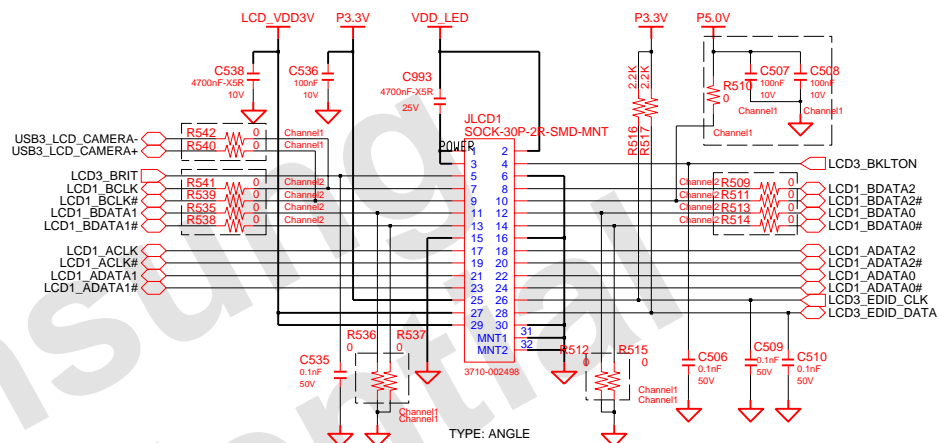
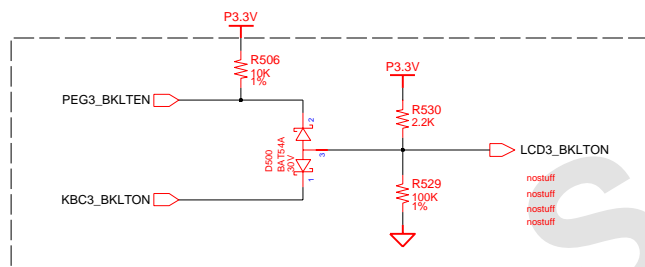
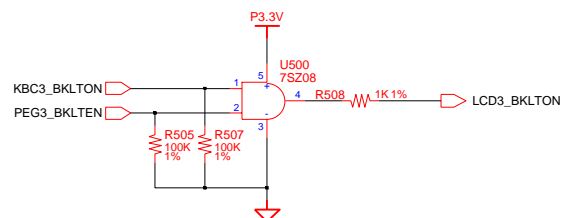






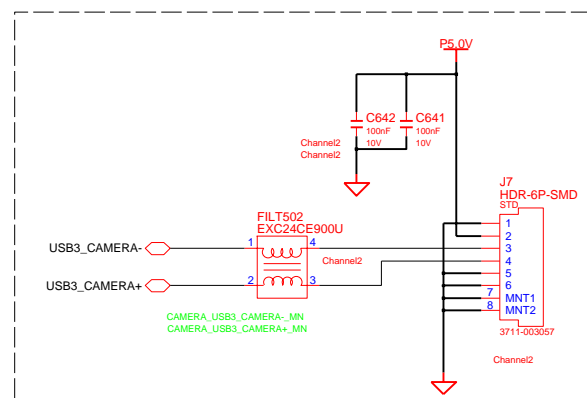
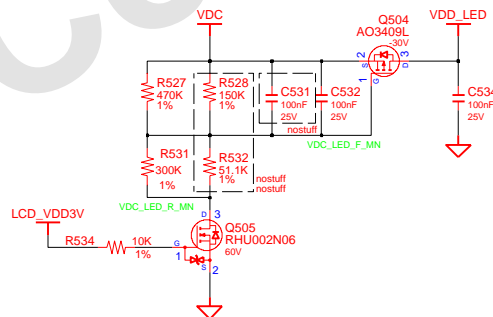
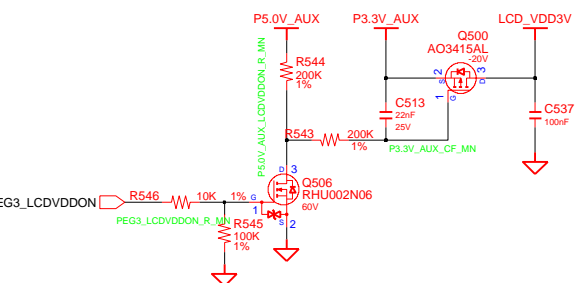
1Ch. LCD Connector + CAMERA


NOTE : Place R20 close to connector to minimize stub



CAMERA CONN FOR 2ch LVDS

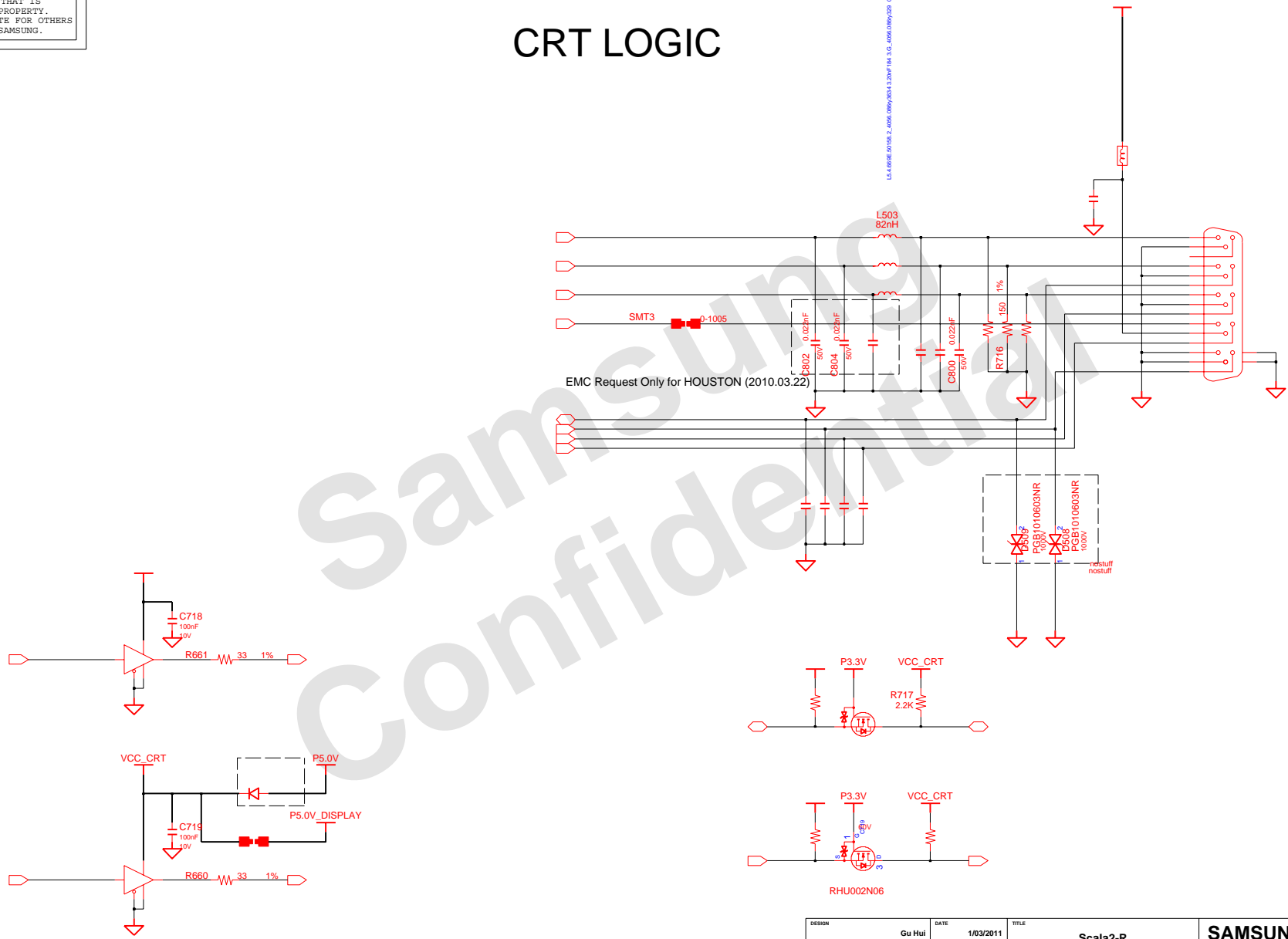
LED Power



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APPROVAL	BC LEE	REV	rev. 0.1		
MODULE CODE	LAST EDIT		January 20, 2011 18:59:20 PM		

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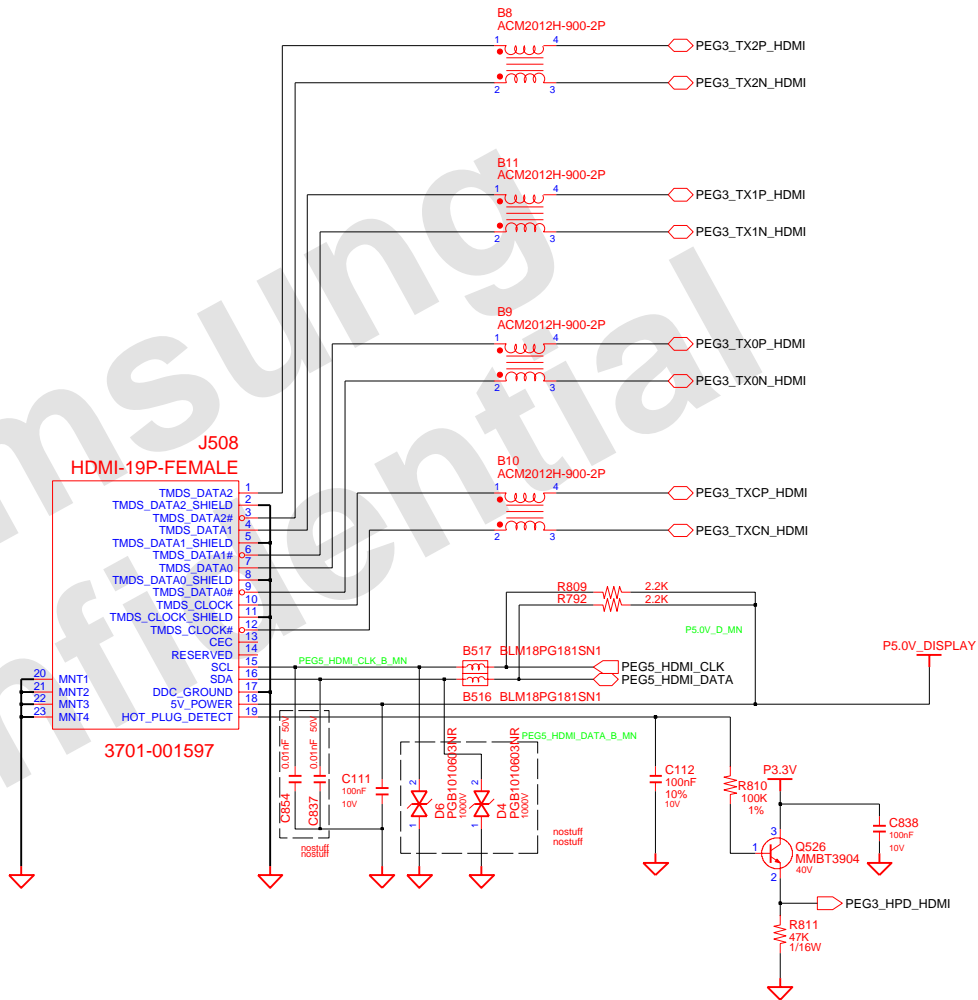
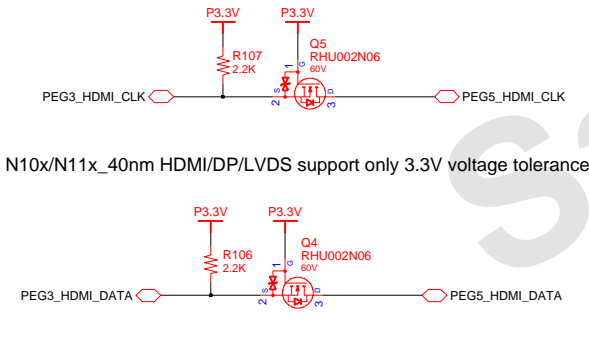
CRT LOGIC



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APPROVAL	BC LEE	REV	rev. 0.1	CRT		
MODULE CODE		LAST EDIT				
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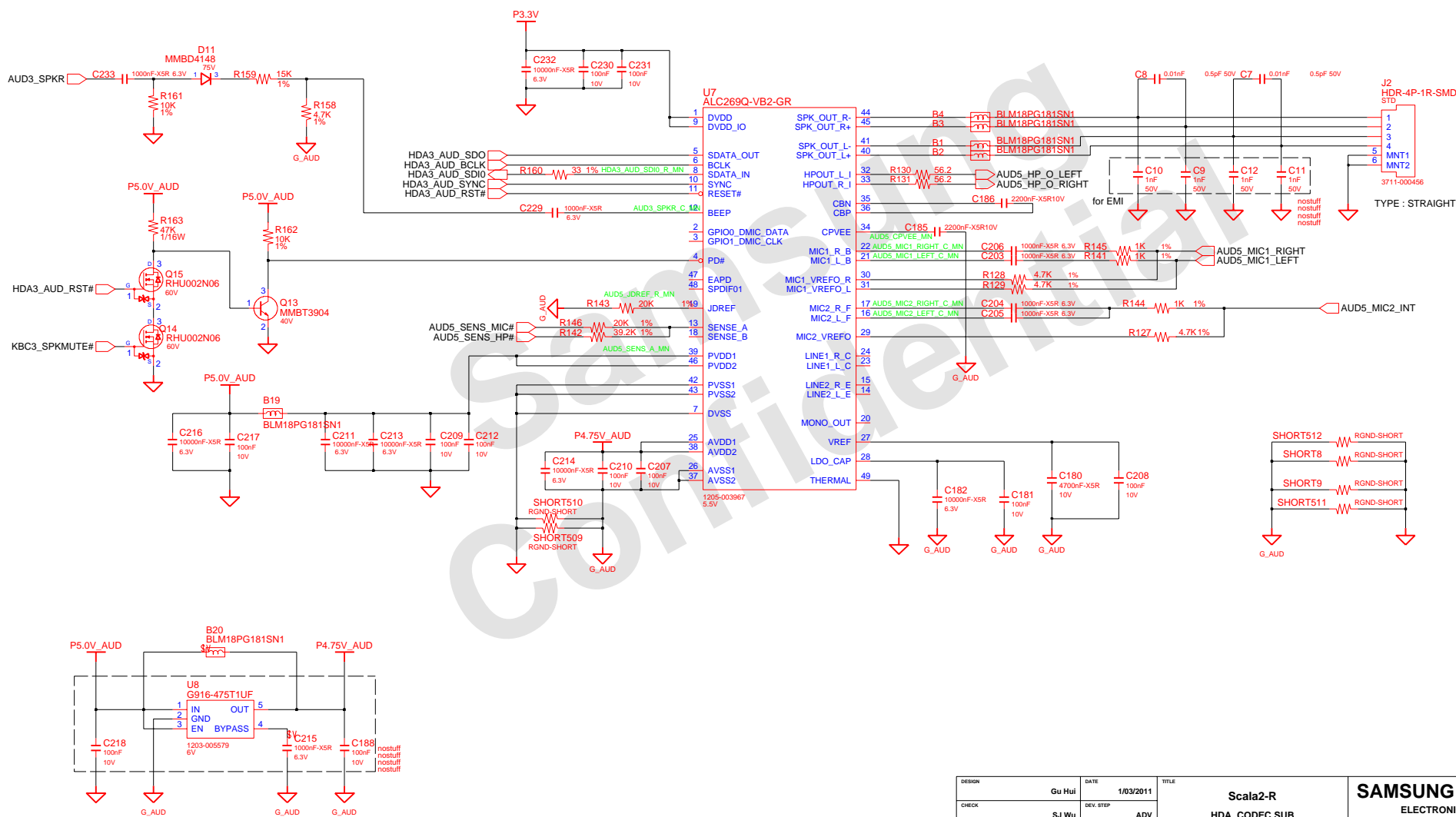
HDMI Graphic

FOR HDMI VERIFICATION TEST

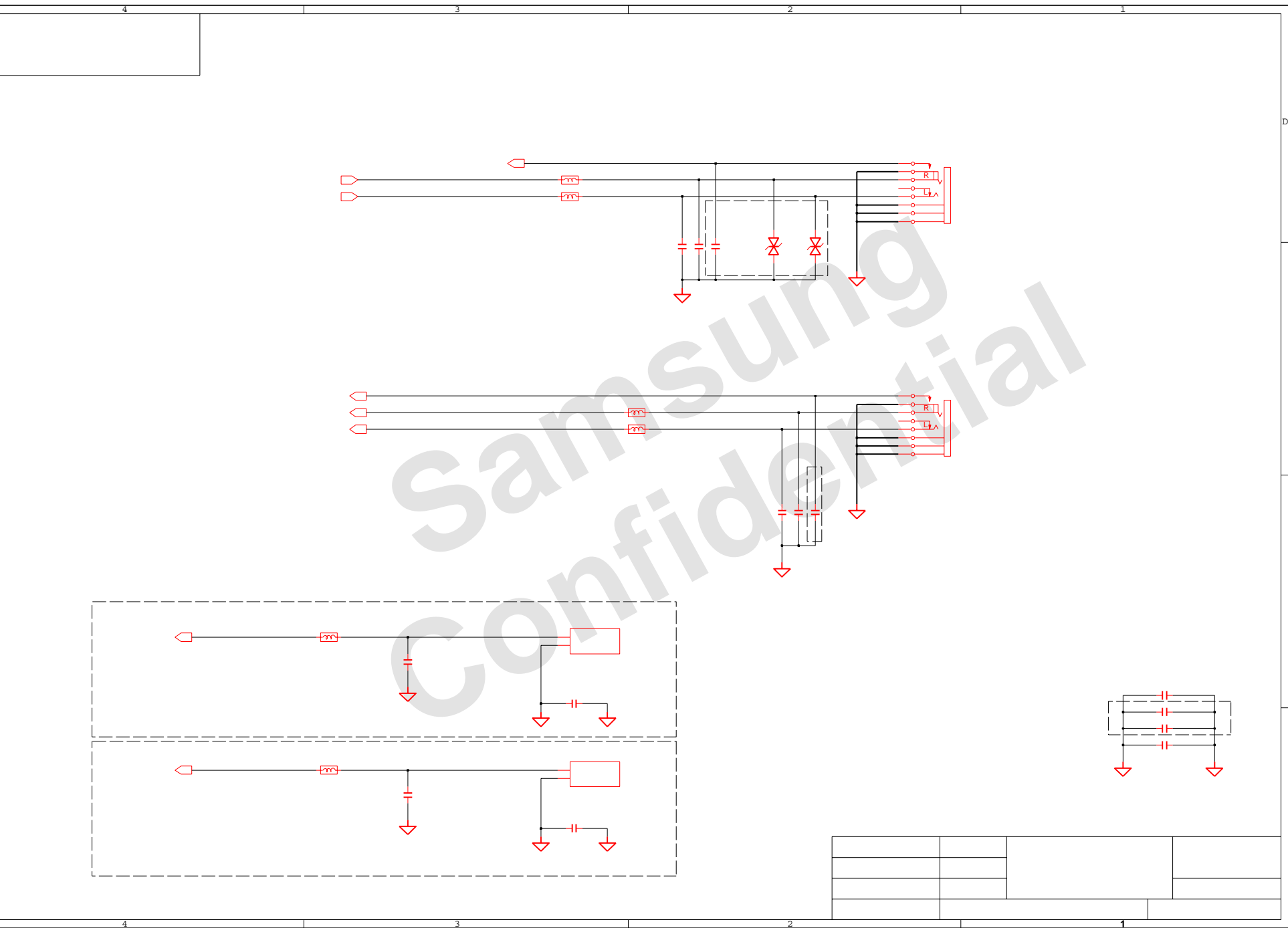


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MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM			
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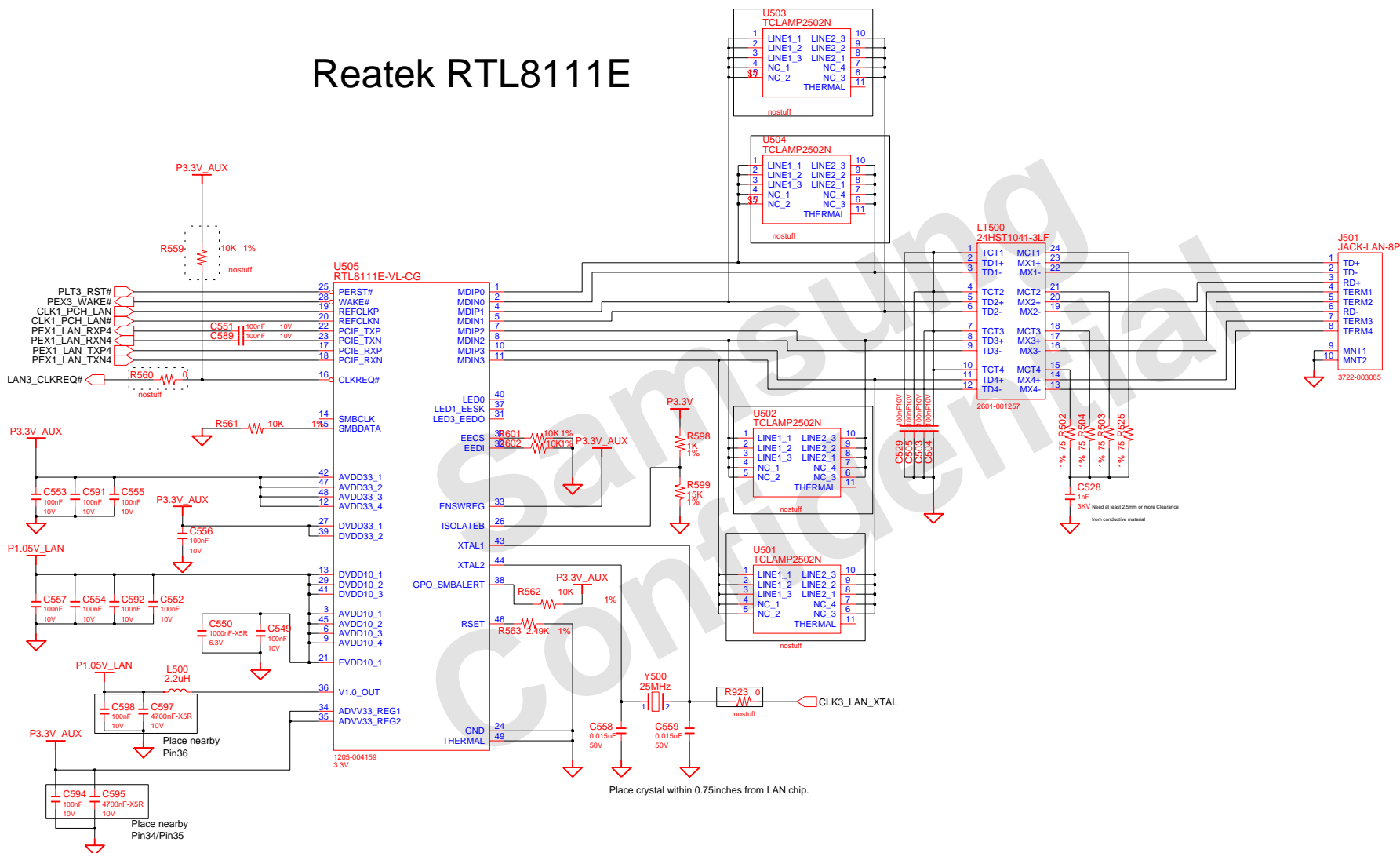
HD AUDIO




DESIGN	Gu Hui	DATE	1/03/2011	Scala2-R HDA_CODEC SUB AUDIO CODEC ALC269 SUB	SAMSUNG ELECTRONICS
CHECK	SJ WU	DEV. STEP	ADV		
APPROVAL	BC LEE	REV	rev. 0.1		
MODULE CODE	LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE 28 OF 48

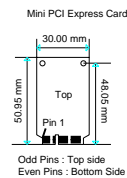
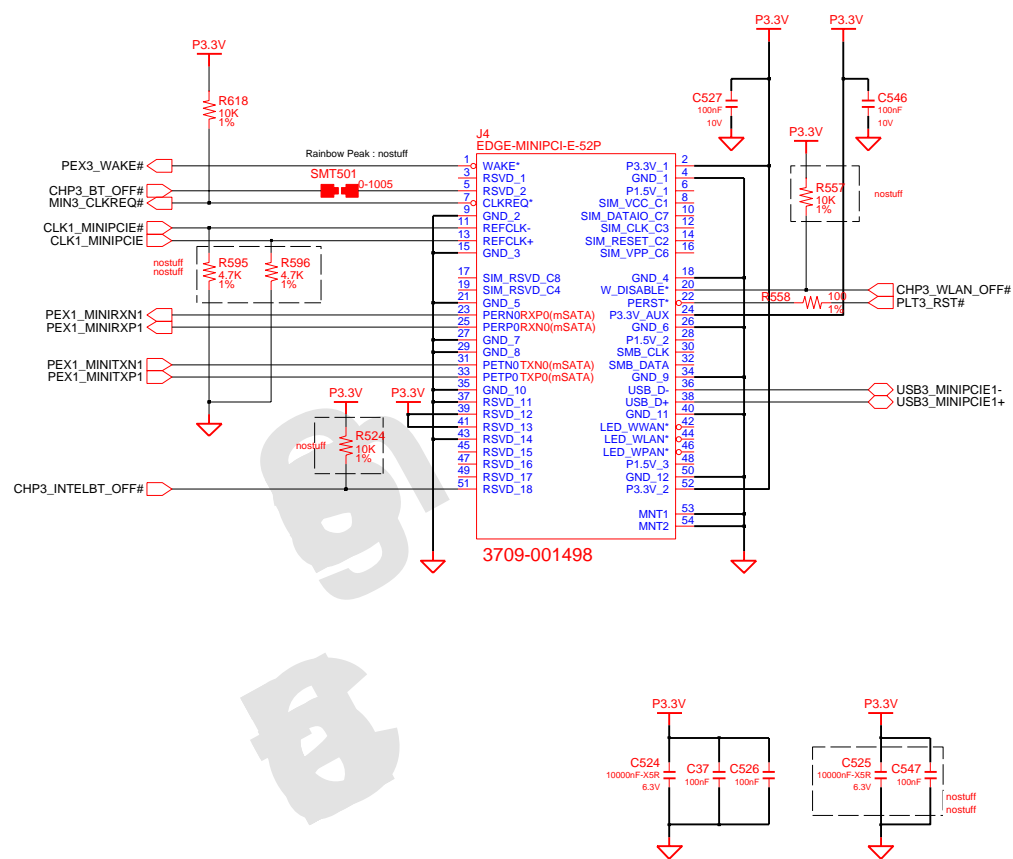








Reatek RTL8111E



DESIGN	Gu Hui	DATE	1/03/2011	Scala2-R LAN LAN_Realtek_RTL8111	
CHECK	SJ Wu	DEV. STEP	ADV		
APPROVAL	BC LEE	REV	rev. 0.1		
MODULE CODE	LAST EDIT				
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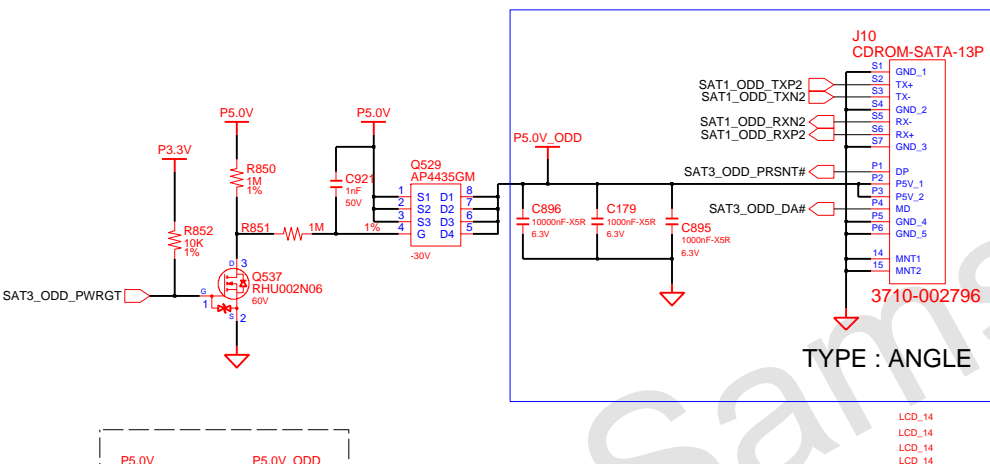
WLAN, 4mm



1	01	1/03/2011				
2	31					
3	1E	0.1				
4						

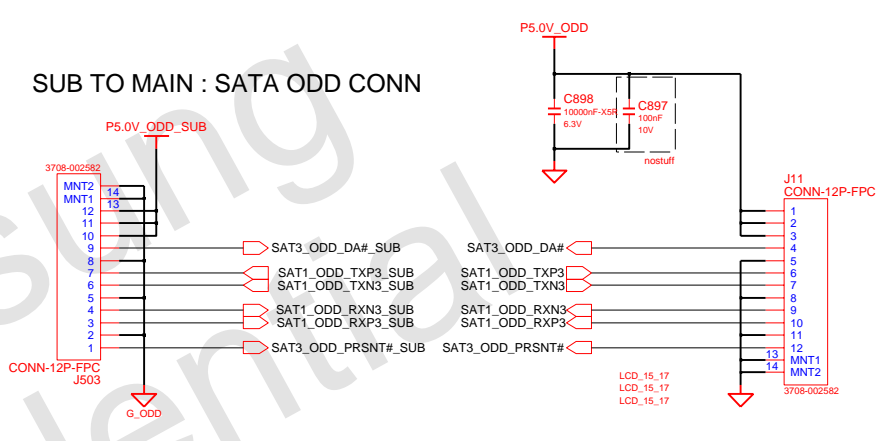
SATA I/F CONN

SATA ODD CONN

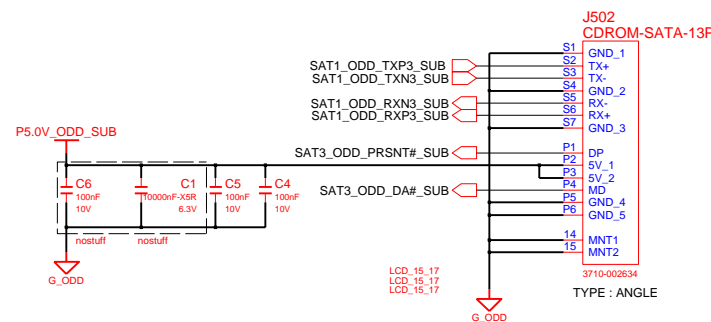


15.6" / 17.3"

MAIN TO SUB : SATA ODD CONN



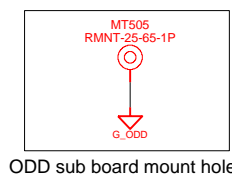
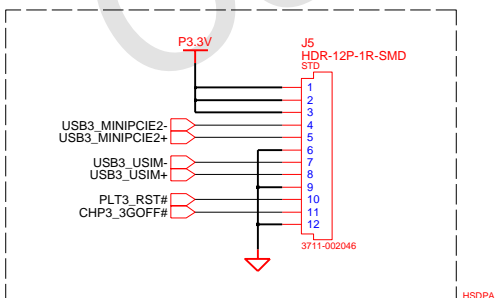
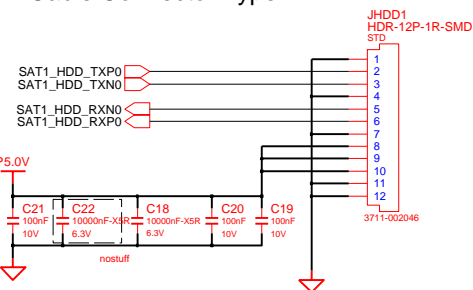
SATA ODD CONN



SATA HDD CONN

MAIN to HSDPA SUB

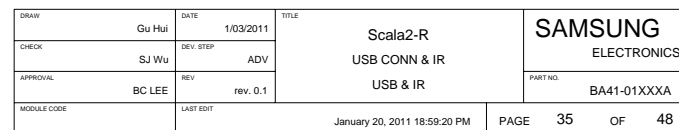
Cable Connector Type



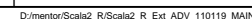
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APPROVAL	BC LEE	REV	rev. 0.1		SATA I/F Conn	
MODULE CODE		LAST EDIT				
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MAIN BOARD (MICOM)

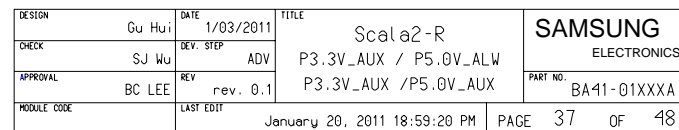


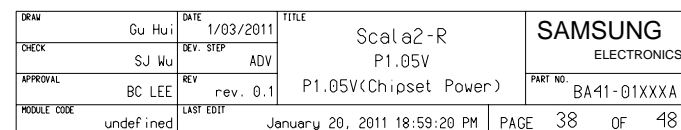


CHARGER & POWER MANAGEMENT

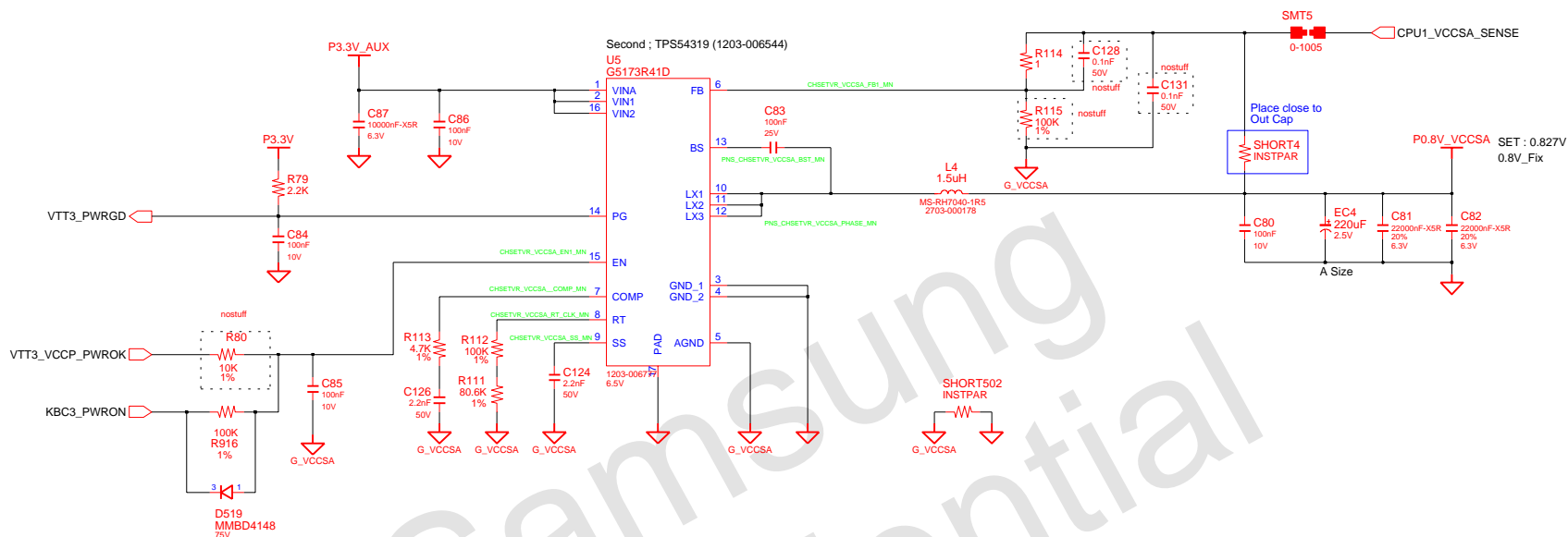


P3.3V_AUX & P5.0V_AUX

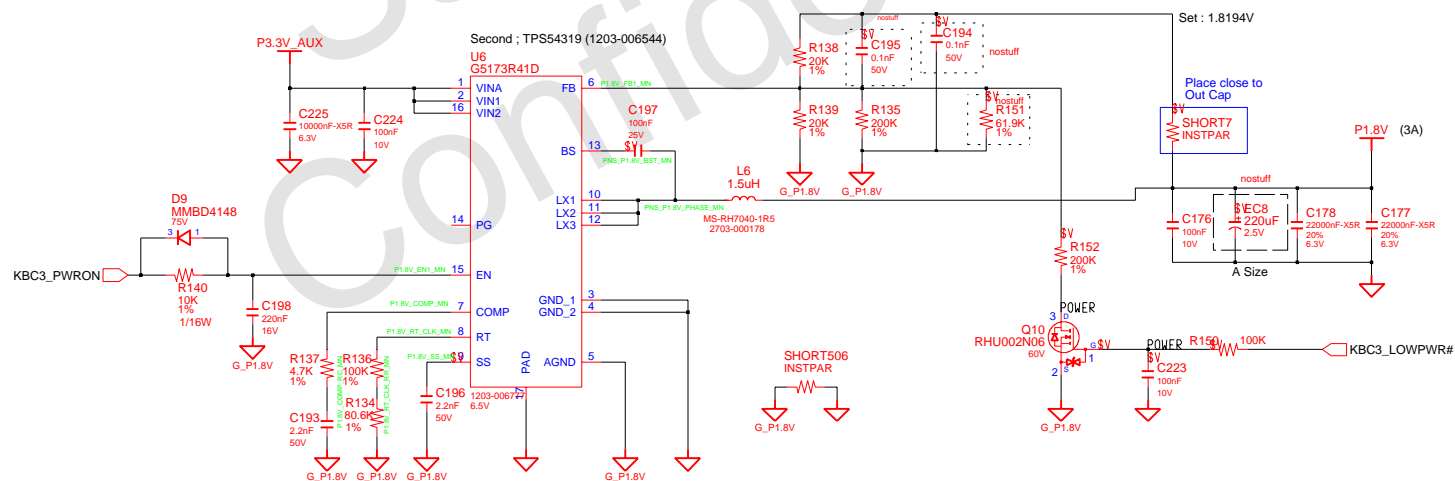




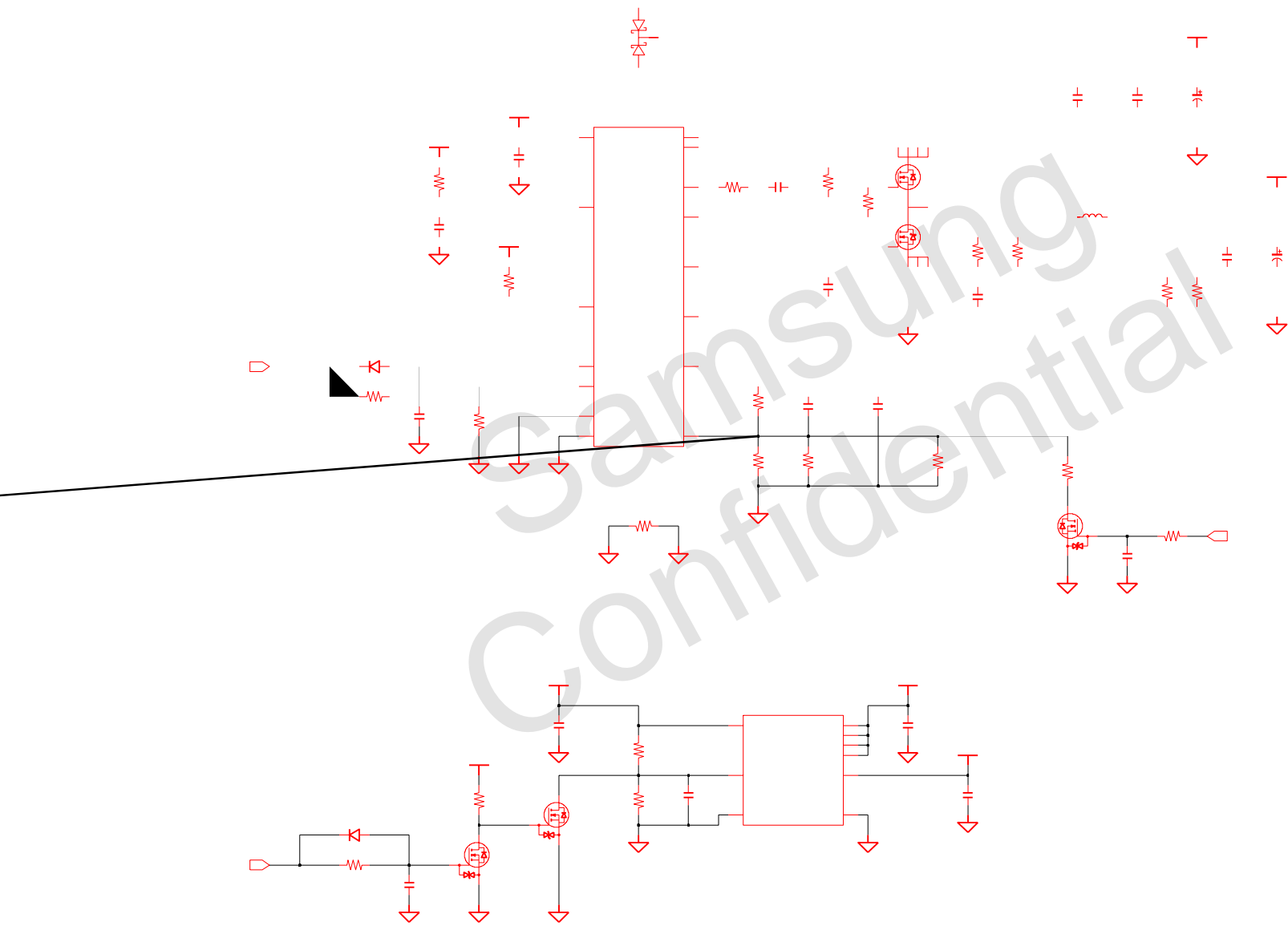
CHIPSET POWER(VCCSA)



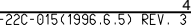
CHIPSET POWER(P1.8V)



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

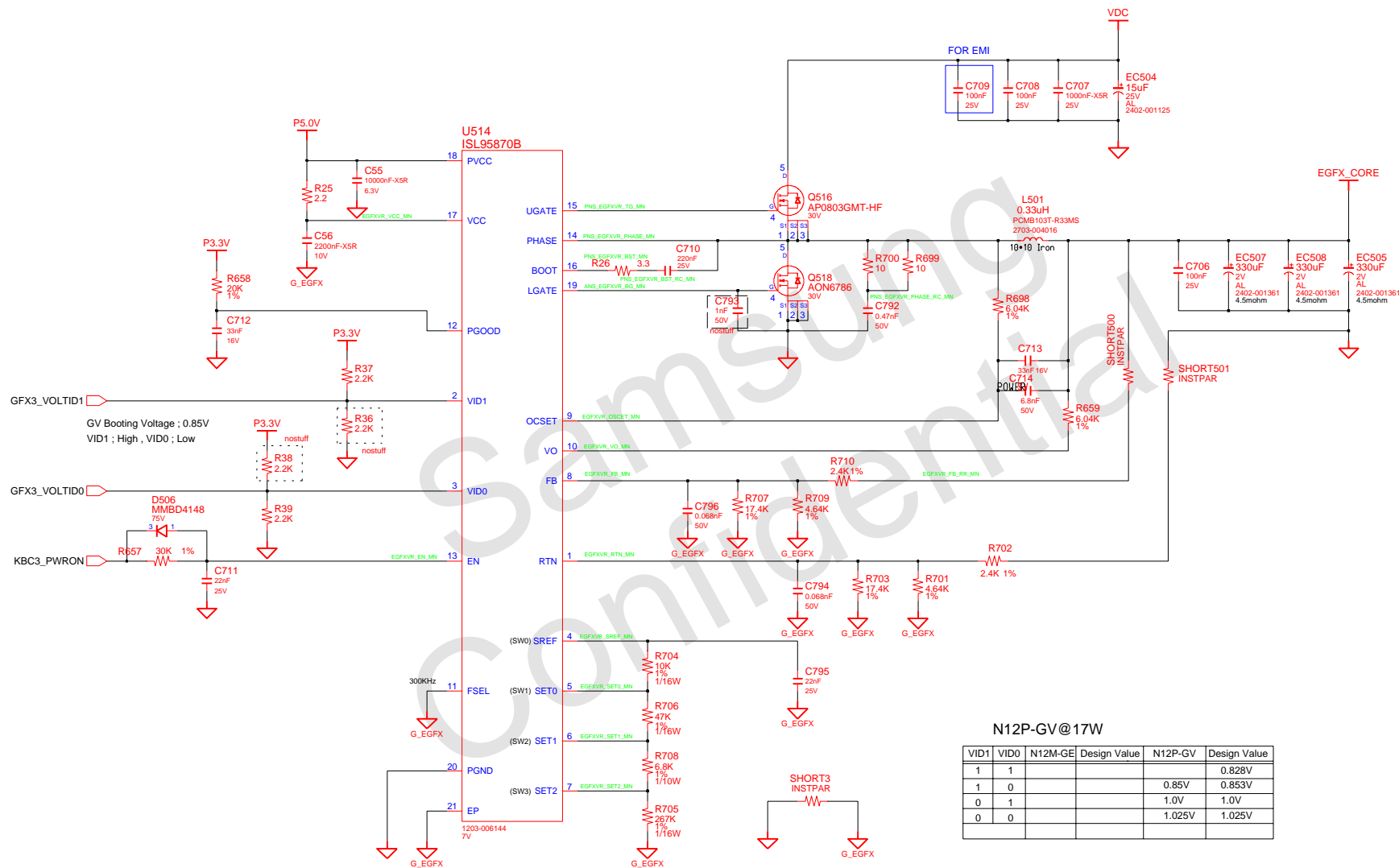


Place next to phase1 highside FET



D:\mentor\Scala2_R\Scala2_R_Ext_ADV_110119_MAIN

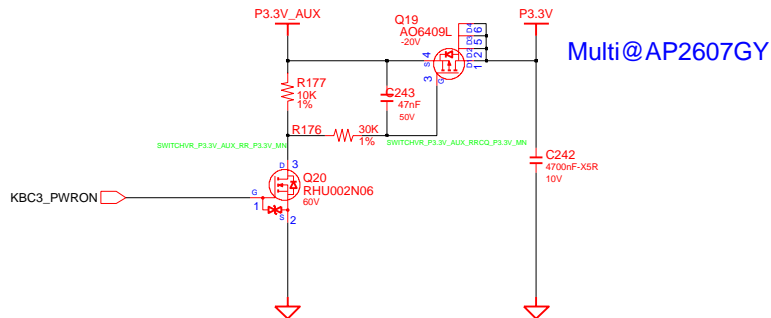
External GFX Core Power



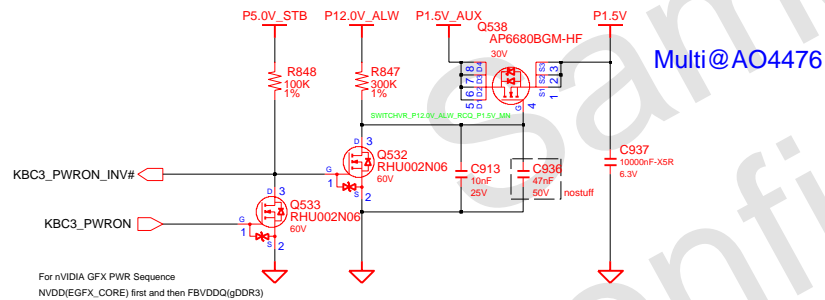
Switched Power

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

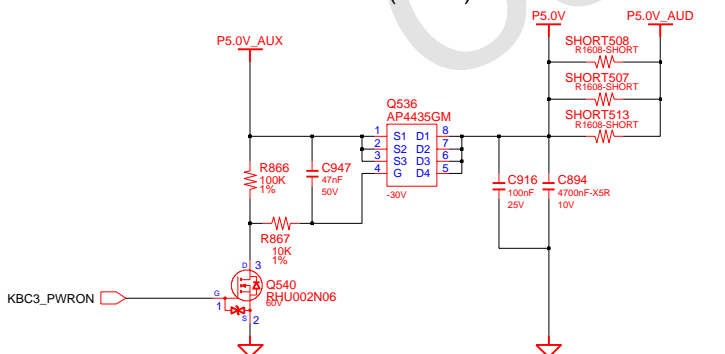
Switched Power On (P3.3V)



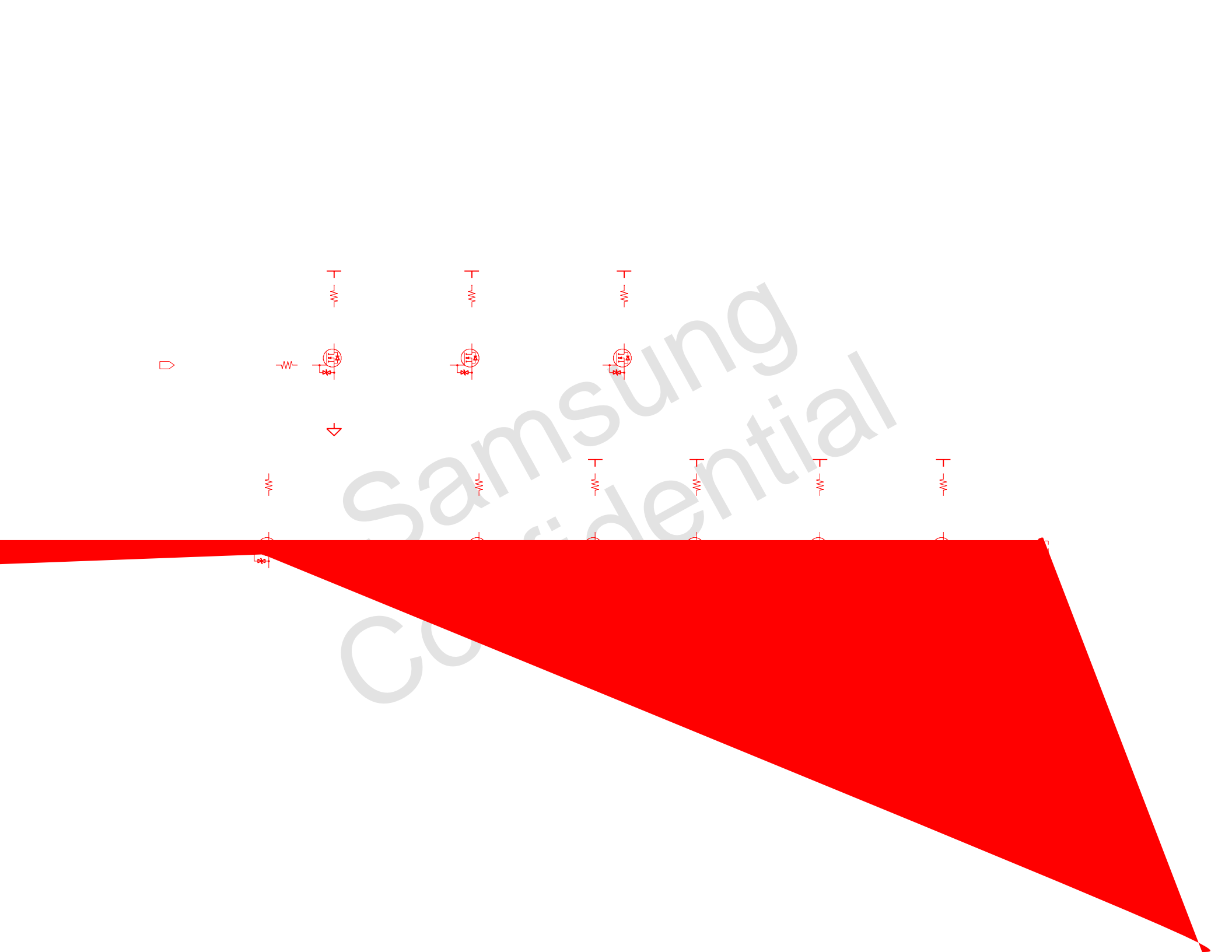
Switched Power On (P1.5V)



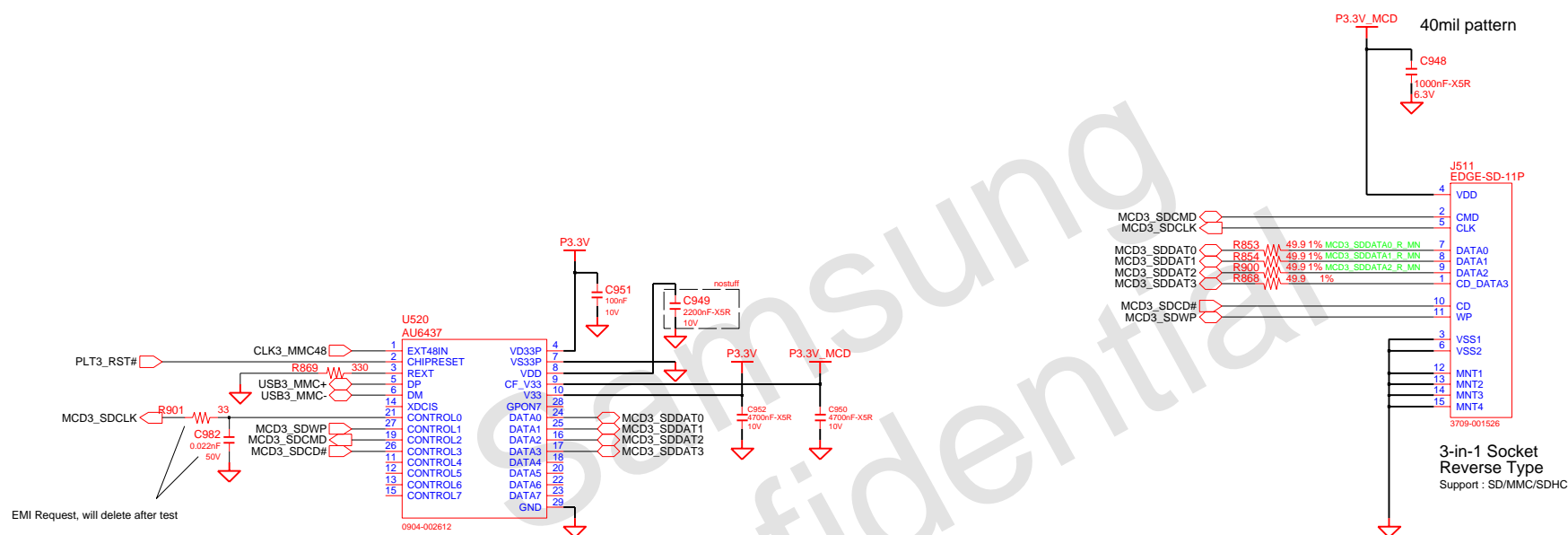
Switched Power On (P5.0V)



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

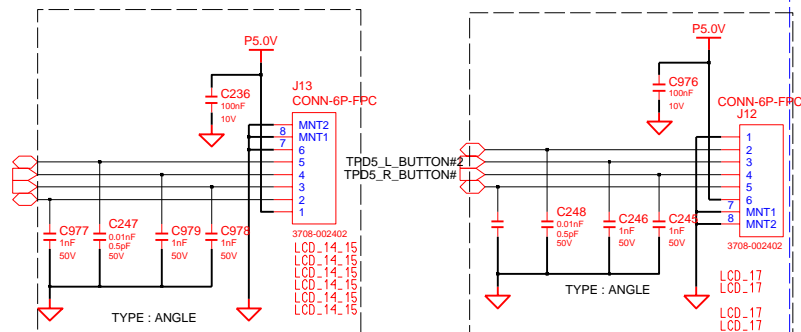


AU6437 (4-in-1)



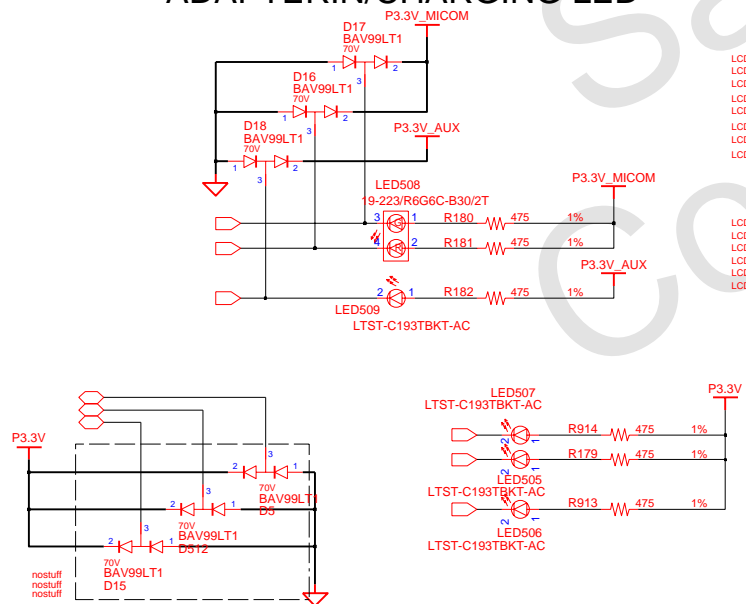
DESIGN	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG
CHECK	MK KIM	DEV. STEP	ADV	AU 6437	AU 6437	ELECTRONICS
APPROVAL	BL LEE	REV	rev. 0.3			PART NO.
MODULE CODE		LAST EDIT	January 18, 2011 08:10:20 AM			BA41-01XXXXA
				PAGE	46	OF 48

TOUCHPAD

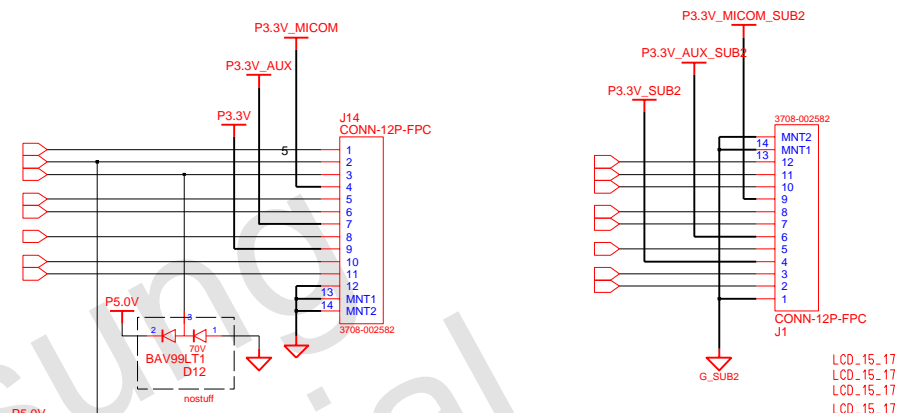


14"

ADAPTERIN/CHARGING LED

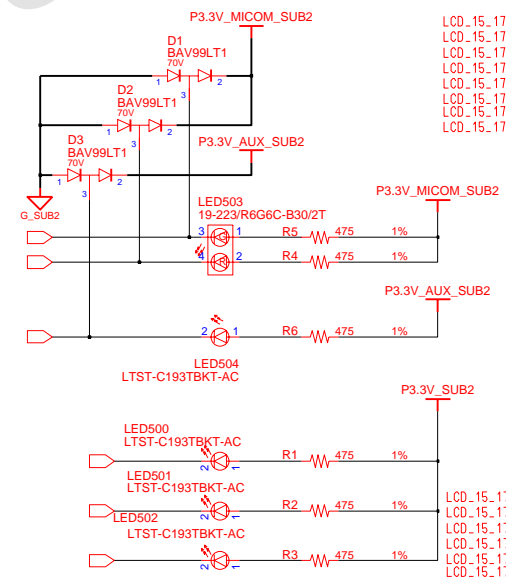
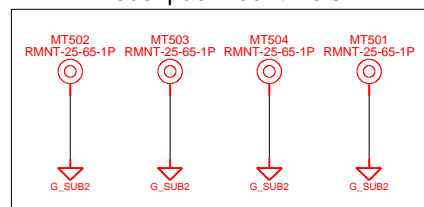


15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



ADAPTERIN/CHARGING LED

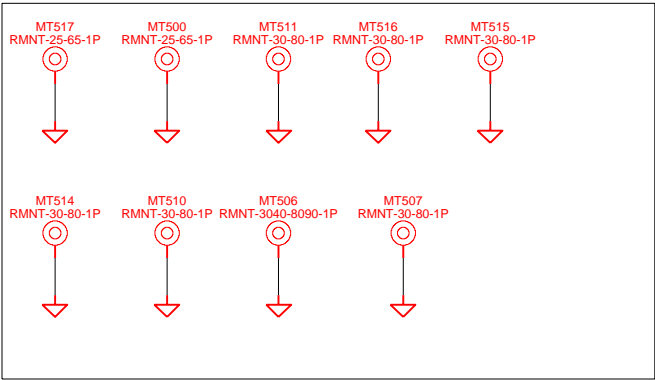
Touchpad Mount Hole



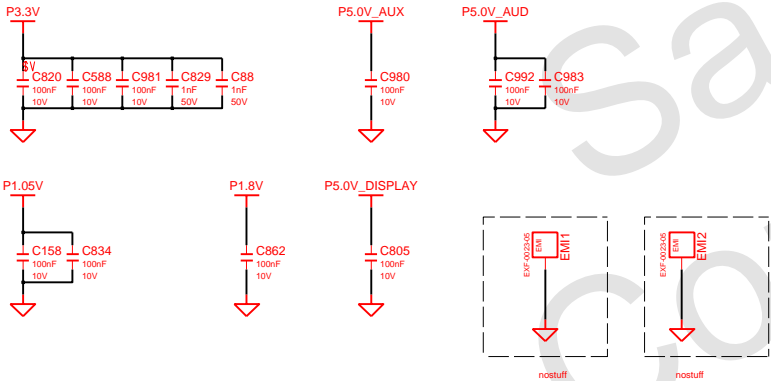
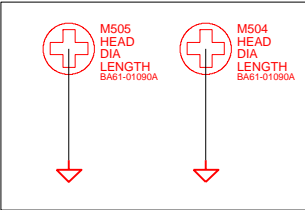
DRAW	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG
CHECK	MK KIM	DEV. STEP	ADV		Touchpad	ELECTRONICS
APPROVAL	BL LEE	REV	rev. 0.3		Touchpad	PART NO.
MODULE CODE		LAST EDIT	January 18, 2011 08:10:20 AM			BA41-01XXXXA
			PAGE	47	OF	48

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Mainboard Mount ((25-65)X2EA, (30-80)X7EA)



PCH Thermal



DESIGN	MS YANG	DATE	1/03/2011	Jinmao-R	SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	ADV			MNT hole
APPROVAL	BL LEE	REV	REV. 0.3			MNT hole
				PART NO.	BA41-01XXXX	
MODULE CODE	LAST EDIT			January 18, 2011 08:10:20 AM	PAGE 48 OF 48	