

# 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 : BA41-01XXXXA (GCE)  
BA41-01XXXXA (NY)  
BA41-01XXXXA (HAN)  
BA41-01XXXXA (GBM)  
Dev. Step : ADV  
Revision : 0.1  
T.R. Date : 2011.01.20

Design	CHECK	APPROVAL
GU HUI	SJ WU	BC LEE

■ Owner : SRDC PD3

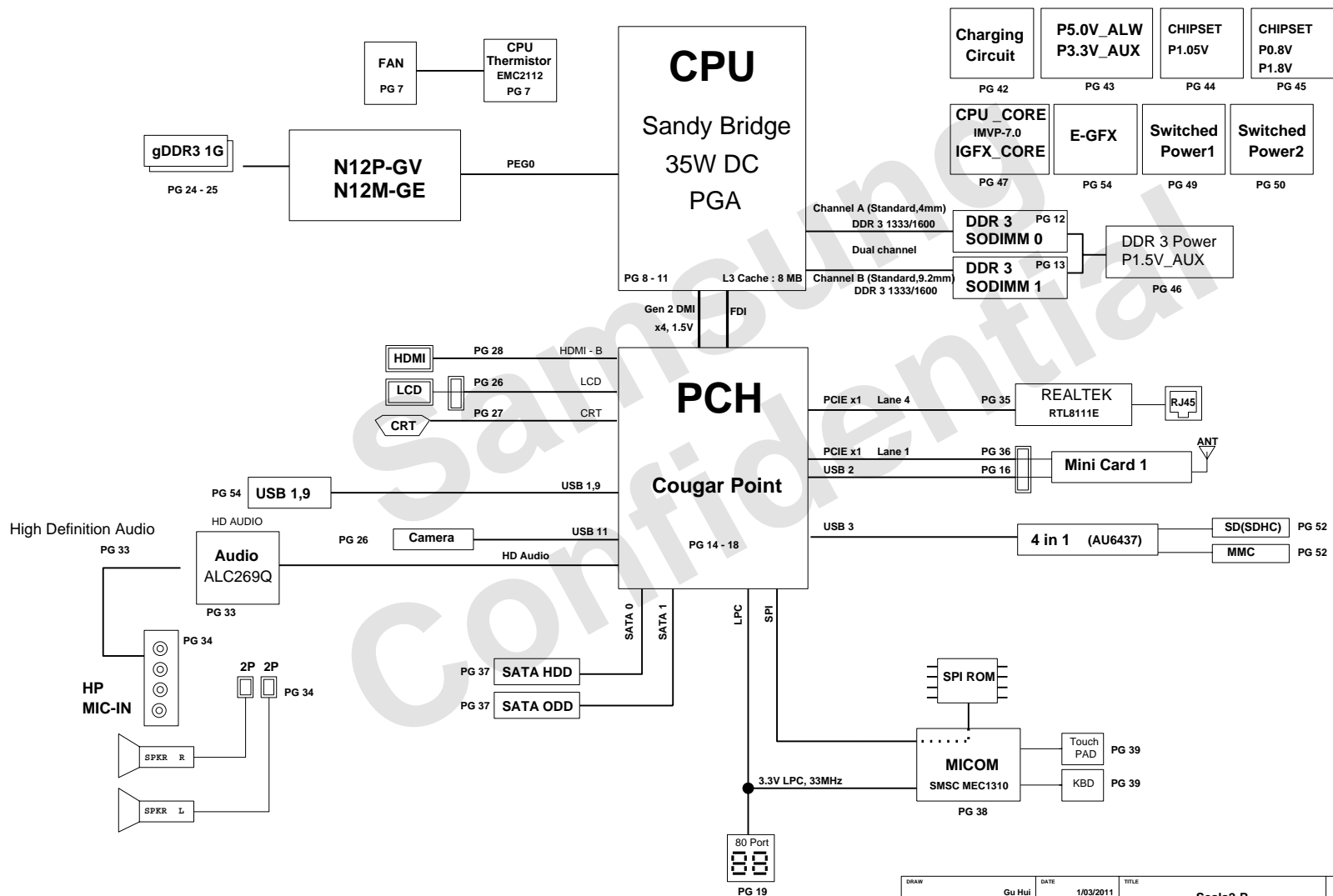
Signature : GUHUI

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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

## BLOCK DIAGRAM



DRAW	Gu Hui	DATE	1/03/2011	Scala2-R MAIN BLOCK DIAGRAM	SAMSUNG ELECTRONICS				
CHECK	SJ Wu	DEV. STEP	ADV						
APPROVAL	BC LEE	REV	REV. 0.1						
PART NO.			BA41-01XXXX						
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

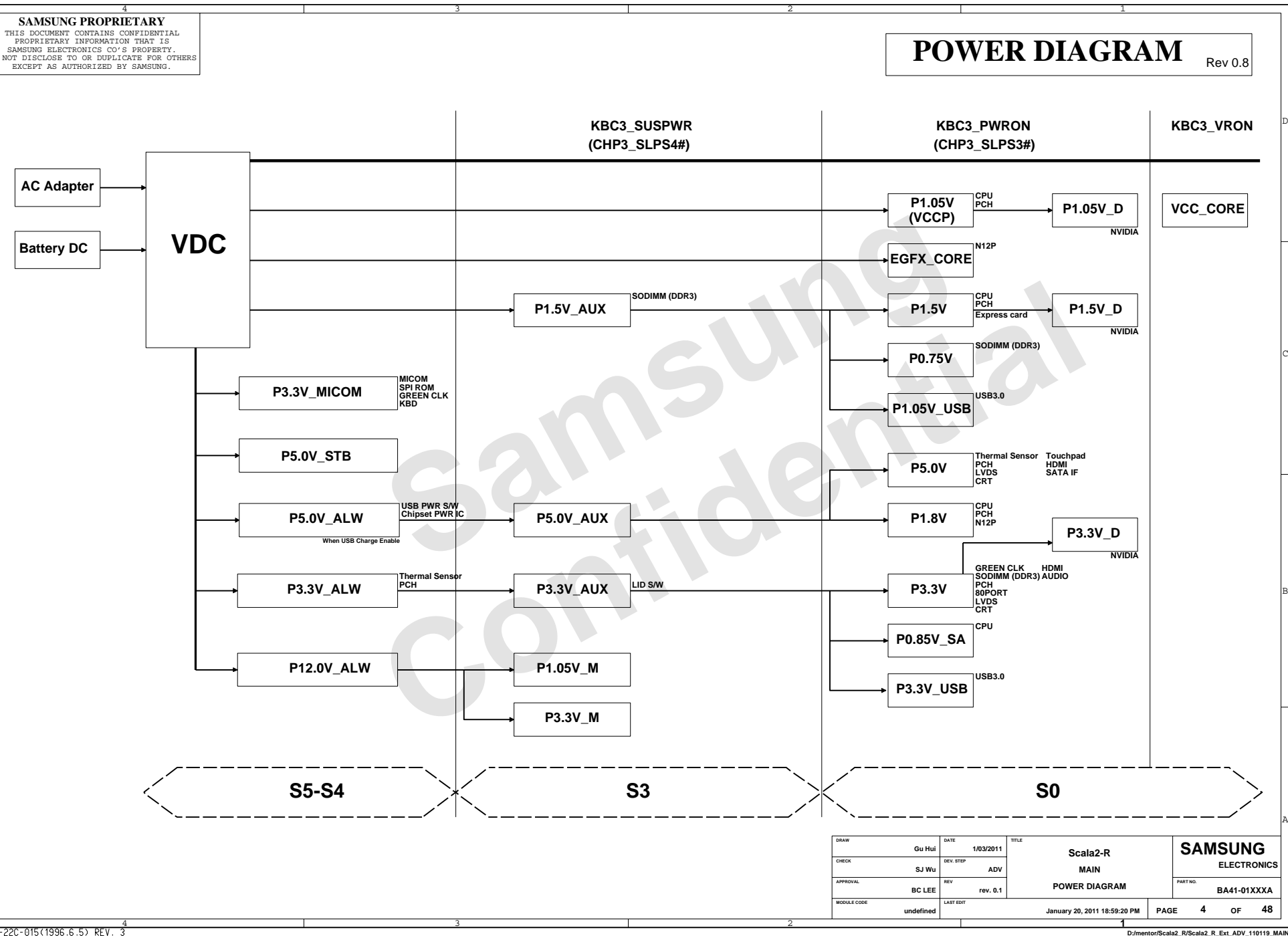
I<sup>2</sup>C / SMB Address

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	

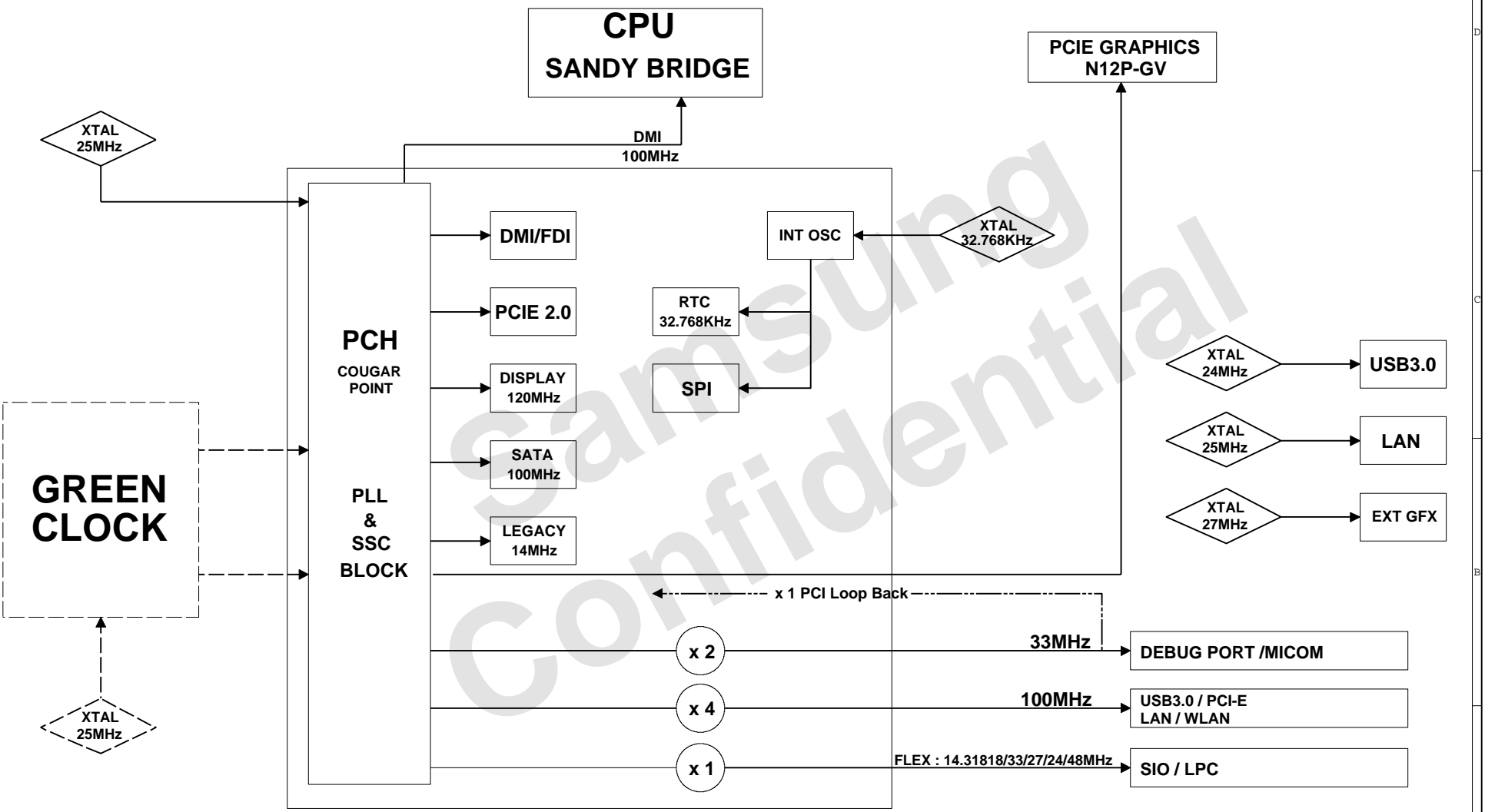
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CHECK	SJ Wu	DEV. STEP	ADV	MAIN	MAIN	
APPROVAL	BC LEE	REV	rev. 0.1	BOARD INFO	PART NO.	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	3 OF 48	

-22C-015(1996.6.5) REV. 3

D:/mentor/Scala2\_R/Scala2\_R.Ext ADV. 110119.MAIN

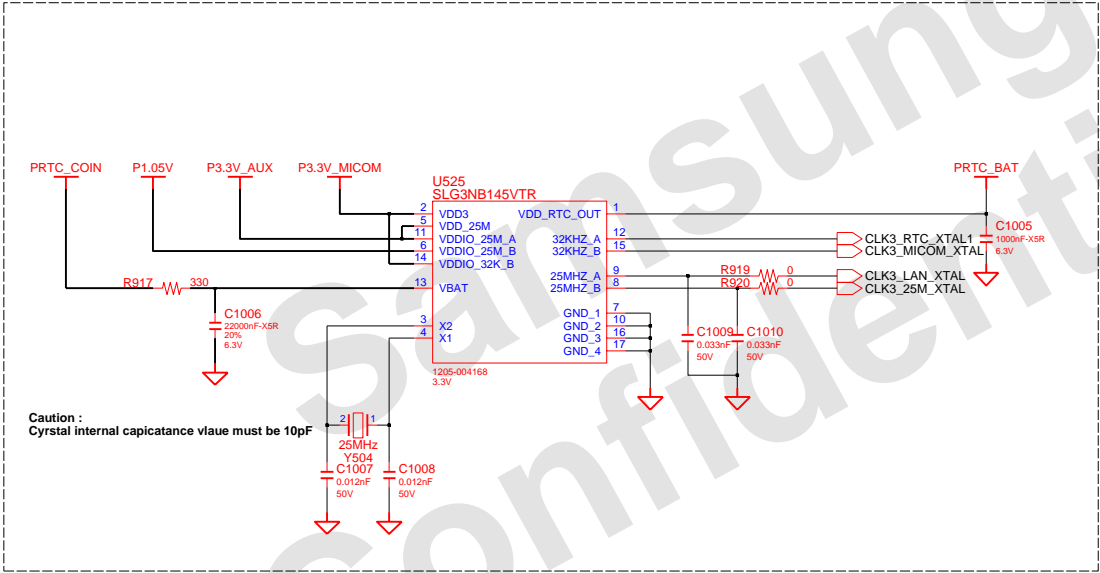


# CLOCK DISTRIBUTION Rev. 0.8



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CHECK	SJ Wu	DEV. STEP	ADV	MAIN		
APPROVAL	BC LEE	REV	rev. 0.1	CLOCK DIAGRAM	PART NO.	
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	5 OF 48	

CLOCK DISTIBUTOR



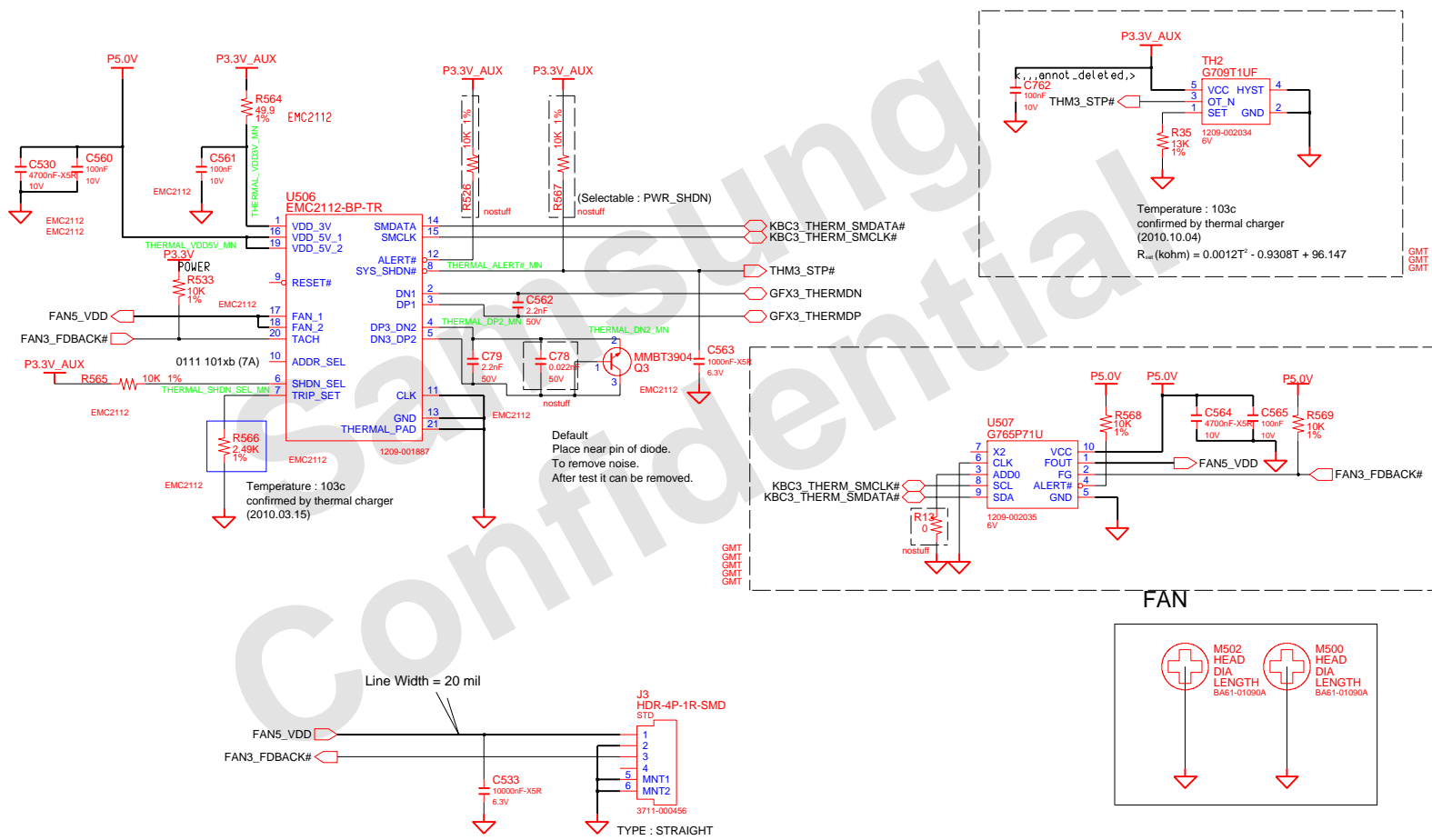
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK

ENGINEER	DATE	TITLE	<b>SAMSUNG</b> 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

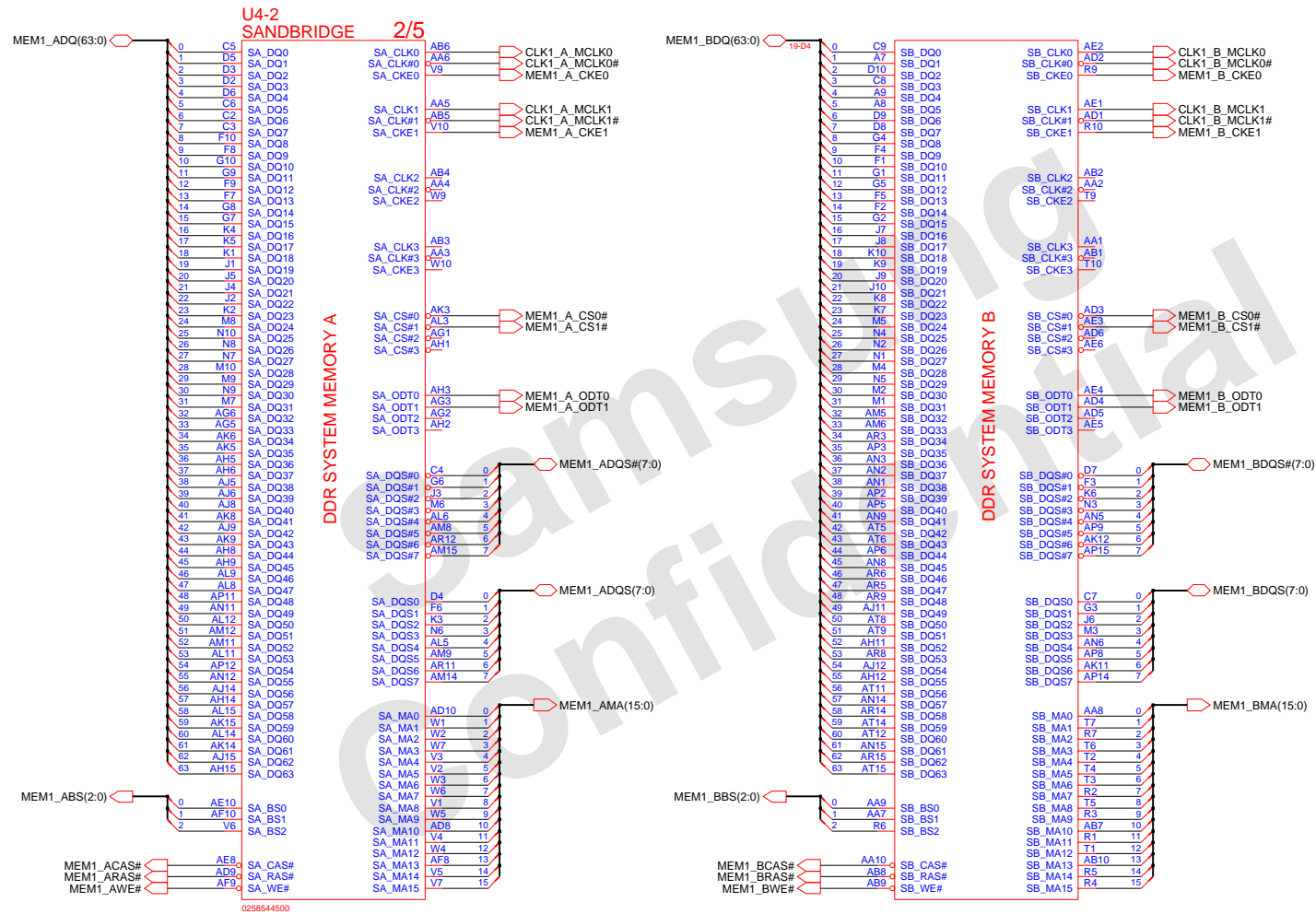
SHDNSEL MODE	
0	INTEL TR MODE
✓ HIGH Z	AMD CPU/DIODE MODE
1	EXT.DIODE 2 MODE



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		THERMAL SENSOR	
APPROVAL	BC LEE	REV	rev. 0.1		THERMAL SENSOR EMC2112	PART NO. BA41-01XXXXA
MODULE CODE		LAST EDIT			January 20, 2011 18:59:20 PM	PAGE 6 OF 48







DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG
CHECK	SJ Wu	DEV. STEP	ADV	CPU		ELECTRONICS
APPROVAL	BC LEE	REV	rev. 0.1	SANDY BRIDGE (2/4)	PART NO.	BA41-01XXXA
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	8	OF 48

CPU CORE U4-3

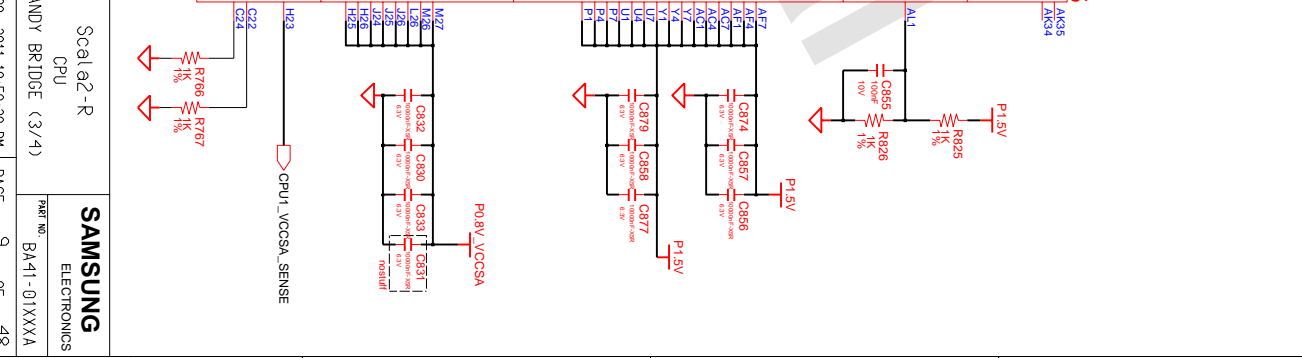
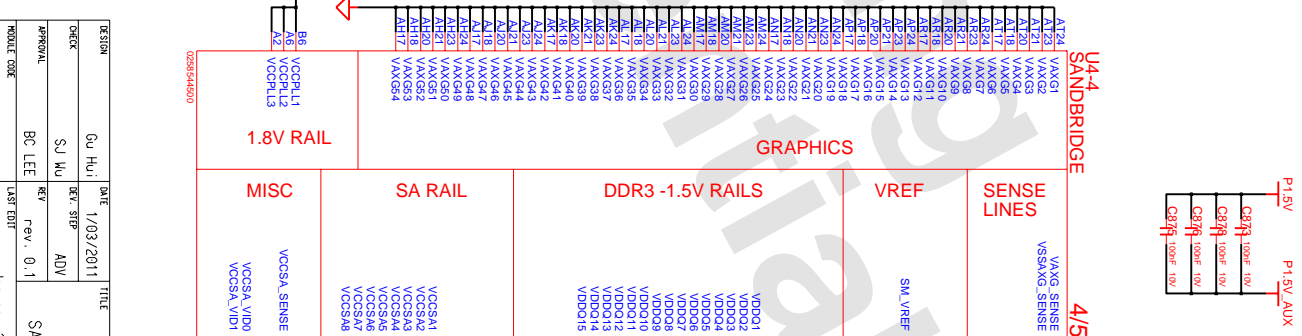
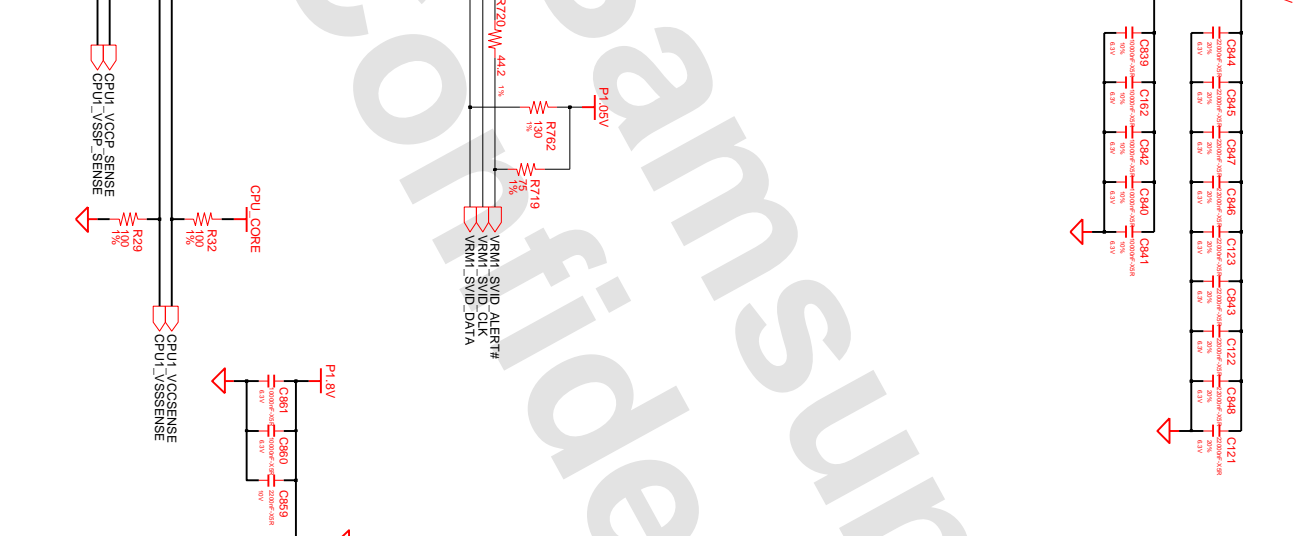
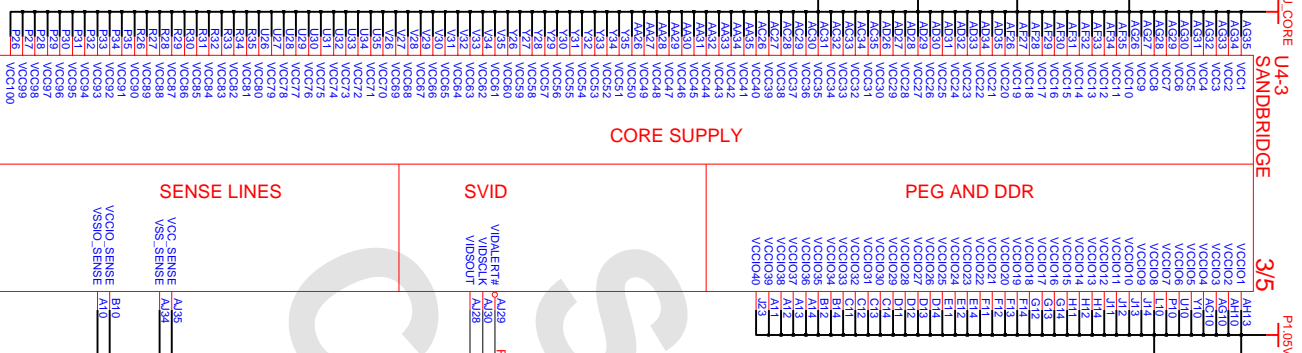
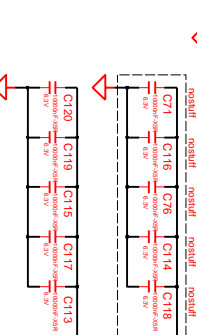
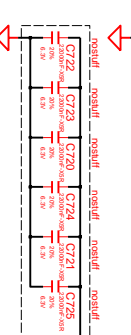
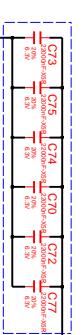
SANDBRIDGE

3/5

P1.05V

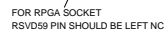
Undecore : Stiff

Undecore : Stiff



DESIGN	DATE	TITLE	SAMSUNG
SCal2-R	1/03/2011	CPU	ELECTRONICS
DESIGN	BY: HUI	REV: STP	
CHECK	SJ WU	ADV	
APPROVAL	BC LEE	rev. 0.1	
MODULE CODE		January 20, 2011 18:59:20 PM	PAGE 9 OF 48

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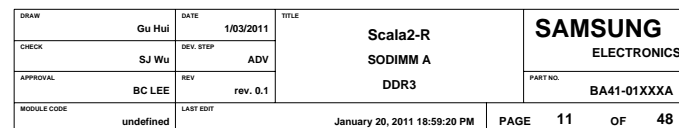


	PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X
CFG2	1 : (DEFAULT) NORMAL OPERATION 0 : LANE REVERSED
PCIE PORT BIFURCACTION STRAPS	
CFG6[5]	11 : (DEFAULT) X16 - DEVICE 1 FUNCTIONS 1 AND 2 DISABLED 10 : X8, X8 - DEVICE 1 FUNCTION 1 ENABLED, FUNCTION 2 DISABLED 01 : RESERVED - (DEVICE 1 FUNCTION 1 DISABLED, 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 XRES#ETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

D:/mentor/Scale2\_R/Scale2\_R\_Ext\_ADV\_110119\_MAIN

## DDR SO-DIMM #0

P/N : 3709-001656 (Foxconn)



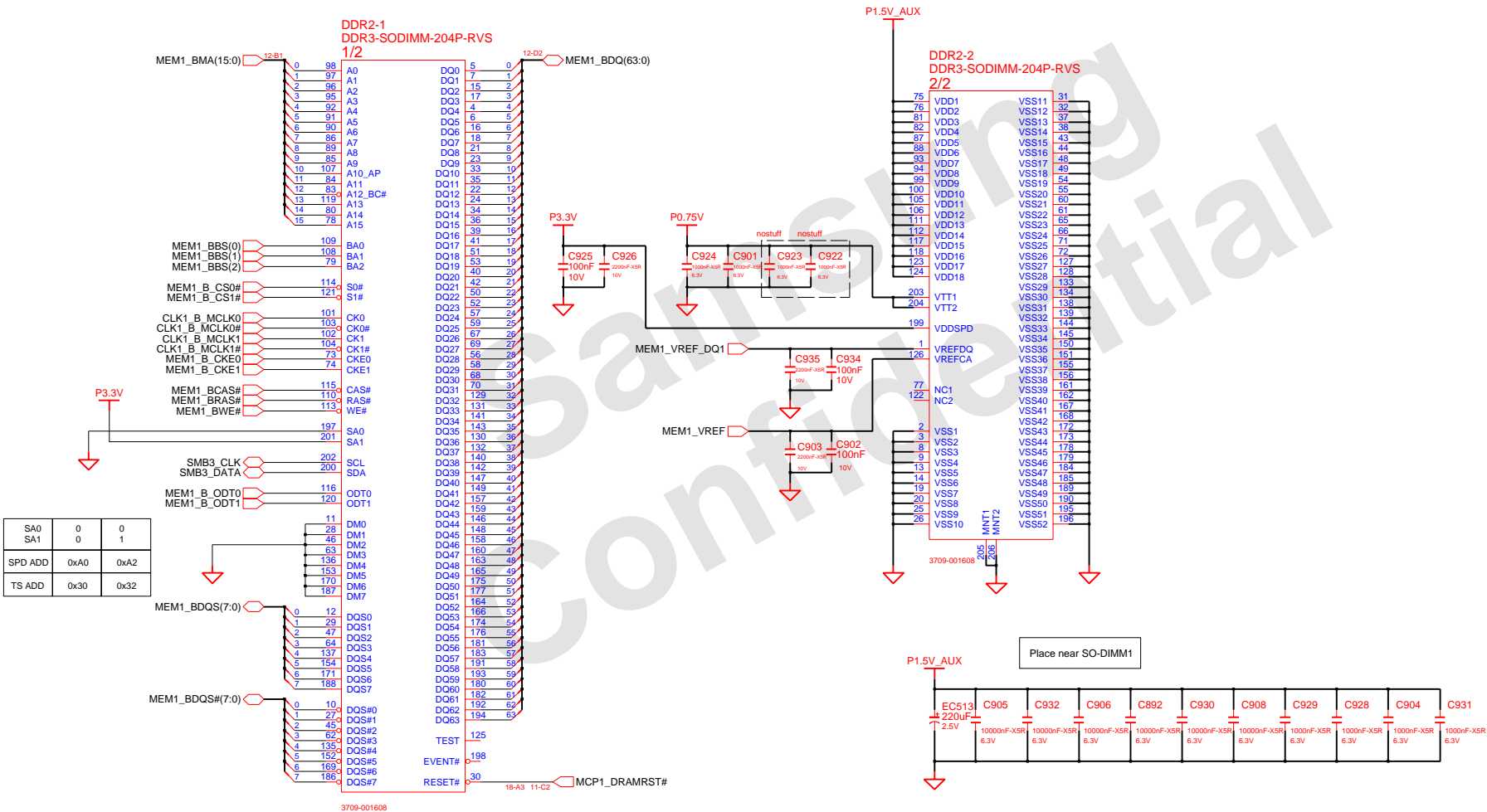
## SO-DIMM#1 : 1st SO-DIMM

### DDR SO-DIMM #1

Height : 4 mm (REVERSE)

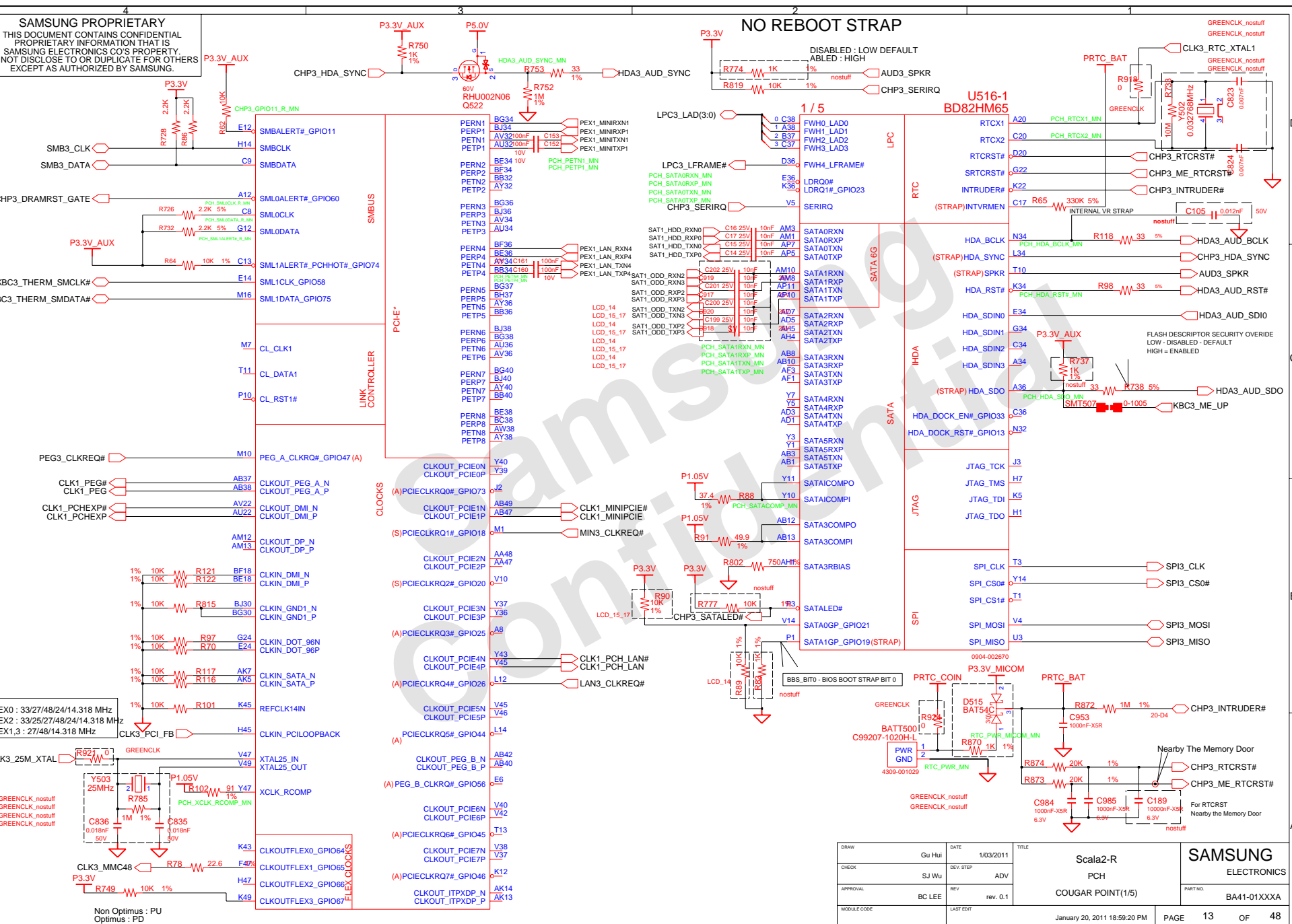
P/N : 3709-001608 (CONCRAFT)

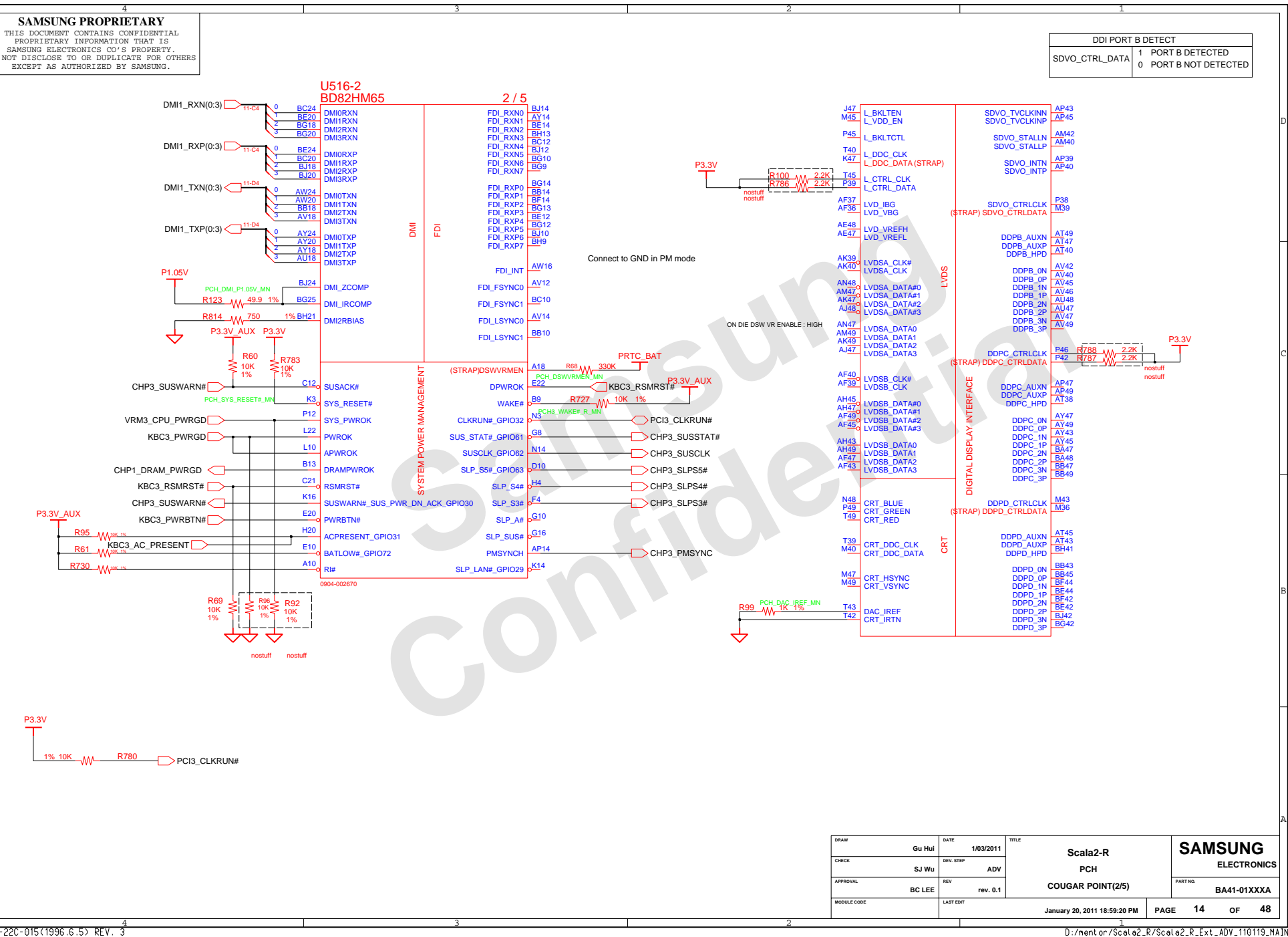
P/N : 3709-001654 (Foxconn)



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CHECK	SJ Wu	DEV. STEP	ADV		SODIMM B	ELECTRONICS
APPROVAL	BC LEE	REV	REV. 0.1		DDR3	PART NO.
MODULE CODE		LAST EDIT				BA41-01XXA
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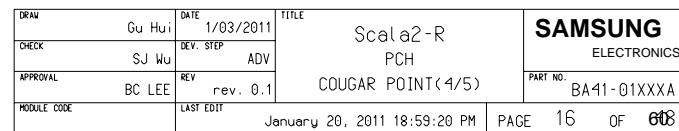


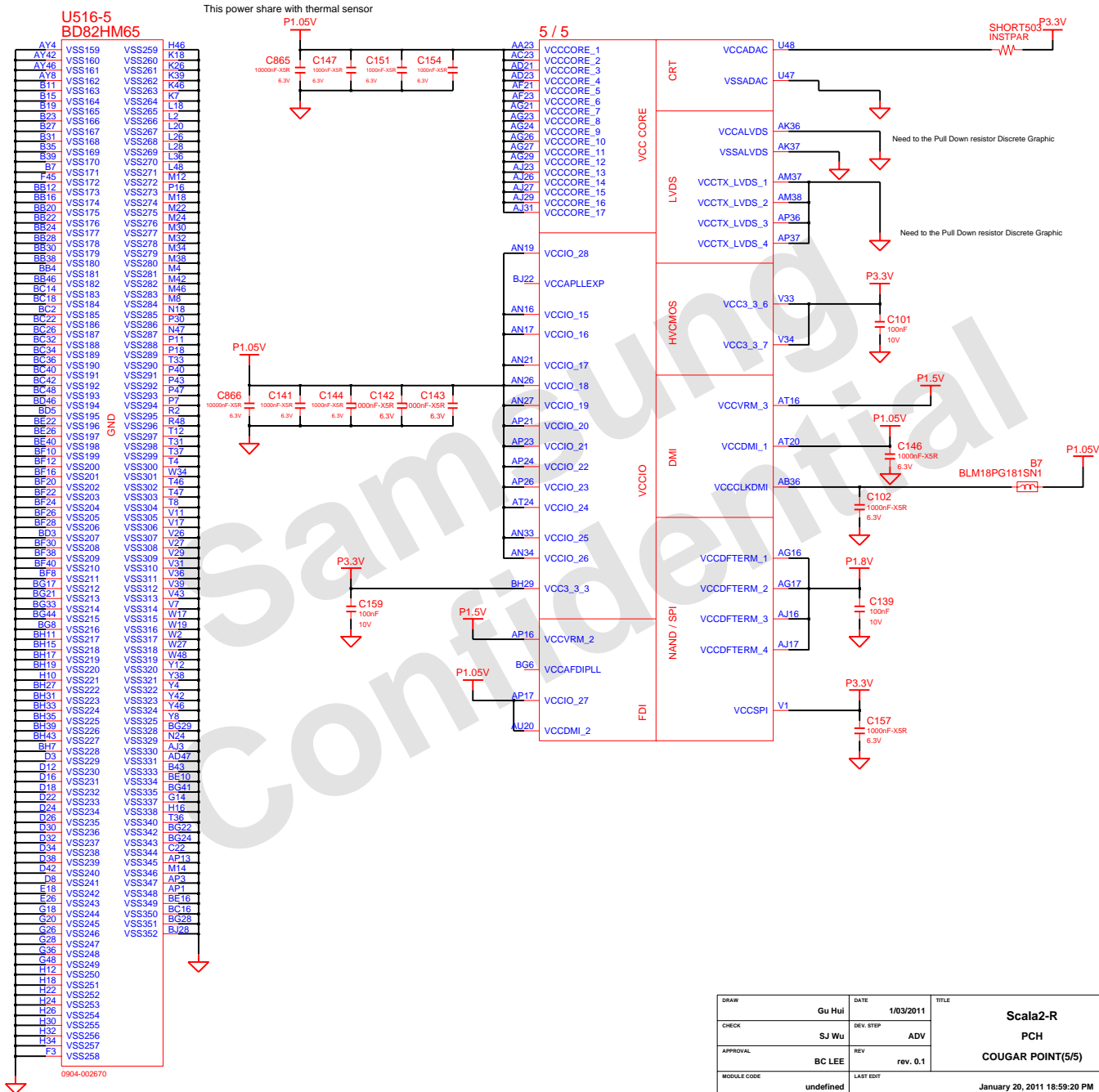






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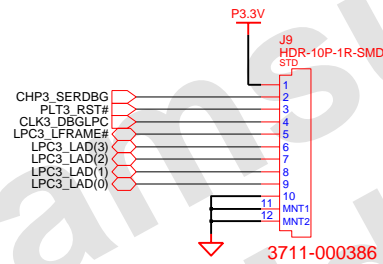
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APPROVAL	BC LEE	REV	rev. 0.1		COUGAR POINT(5/5)	PART NO.
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3

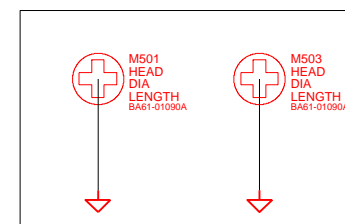
2

1

## 80H PORT DEBUG



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R DEBUG PORT 80H DECODER	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			PART NO. BA41-01XXXXA
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	18	OF 48



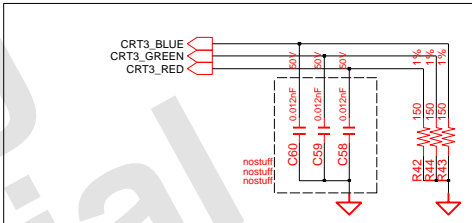
## Graphic PEM

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APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	LAST EDIT					

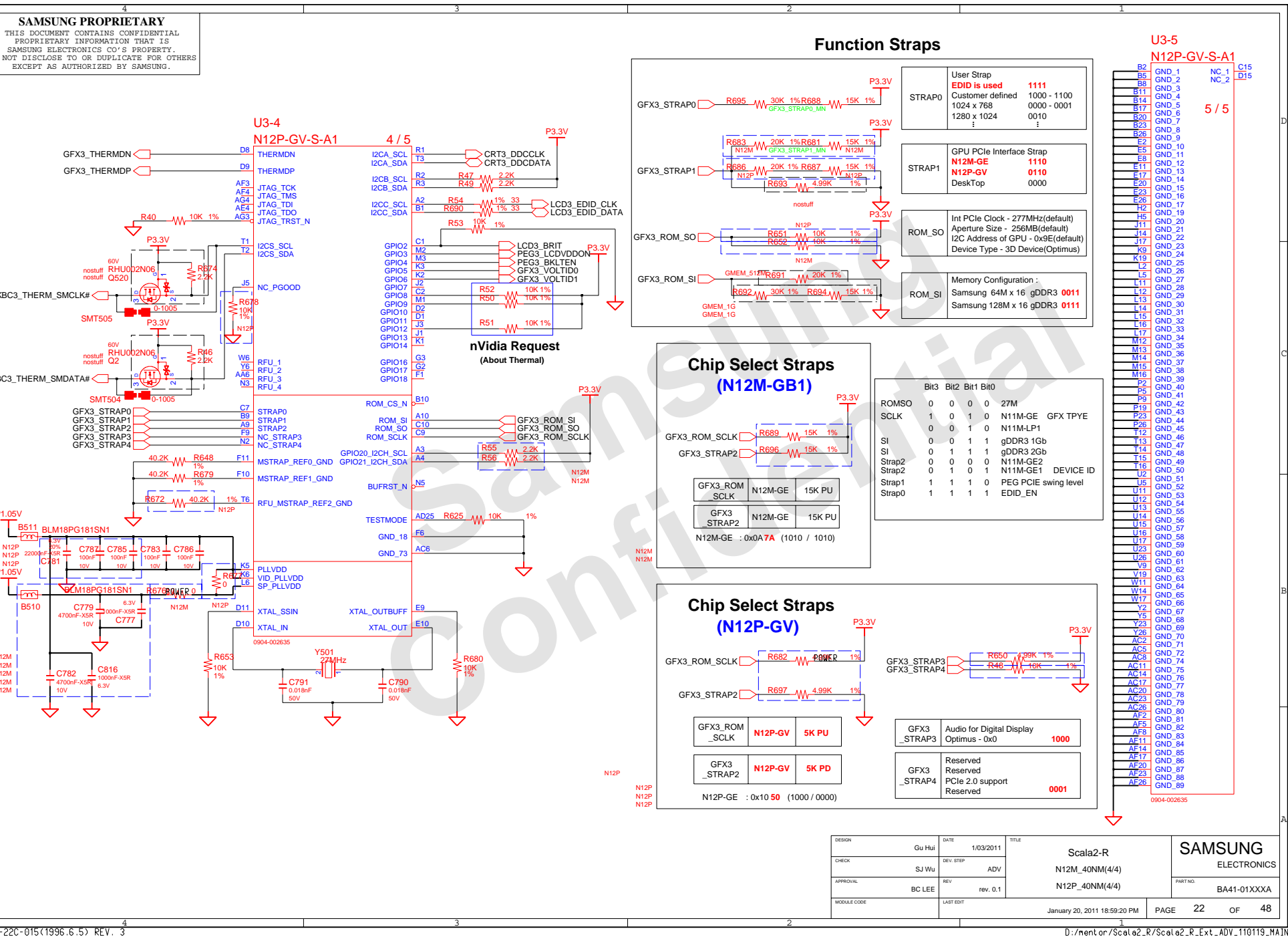


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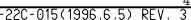
MATERIAL	DESIGN	Gu Hui	DATE	1/03/2011	Scala2-R N12P_40NM(3/4) N12P_40NM(3/4)	SAMSUNG ELECTRONICS					
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	APPROVAL	BC LEE	REV	rev. 0.1							
	PART NO.		BA41-01XXXXA								
MODULE CODE			LAST EDIT			January 20, 2011 18:59:20 PM		PAGE	21	OF	48





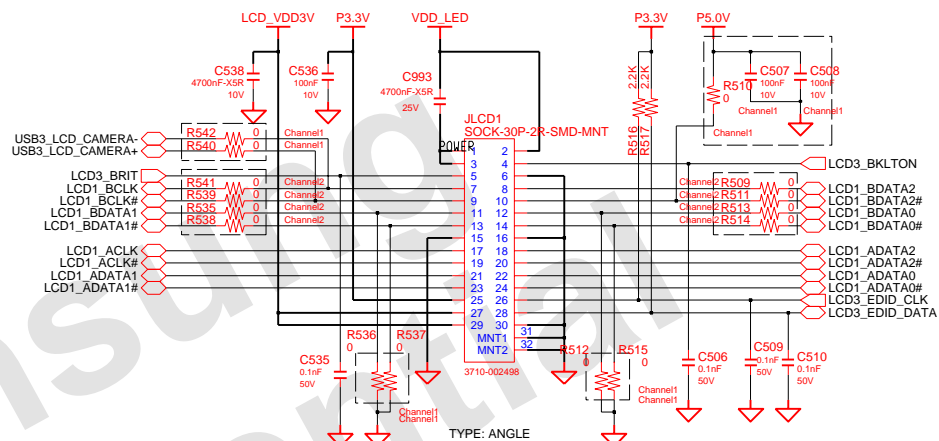
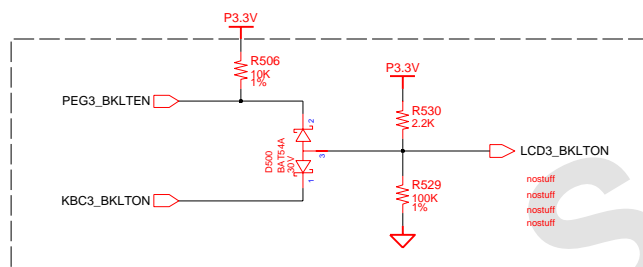
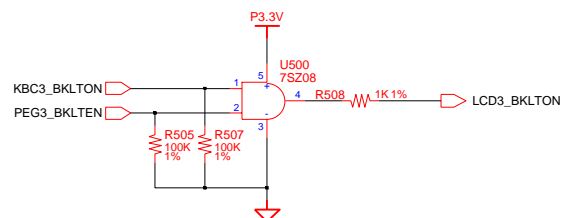
DESIGN	Gu Hui	DATE	1/03/2011	Scala2-R GRAPHIC_MEM A#0 GRAPHIC_MEM A#0	SAMSUNG ELECTRONICS
CHECK	SJ WU	DEV. STEP	ADV		
APPROVAL	BC LEE	REV	REV. 0.1		
MODULE CODE	LAST EDIT				
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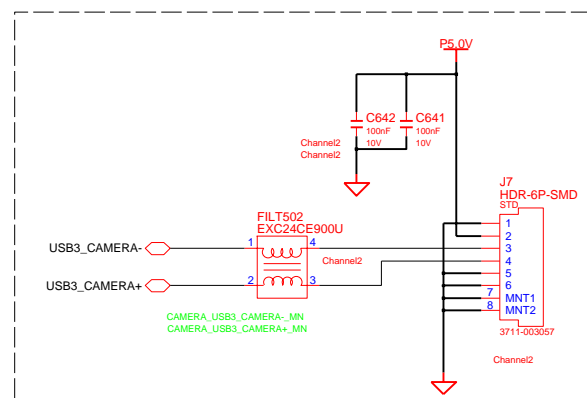
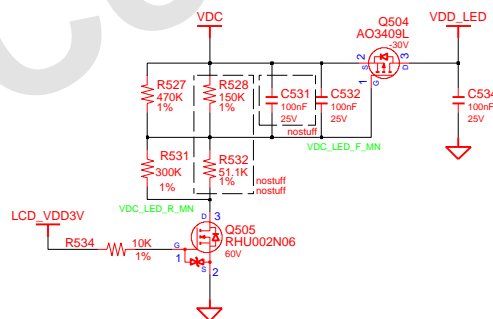
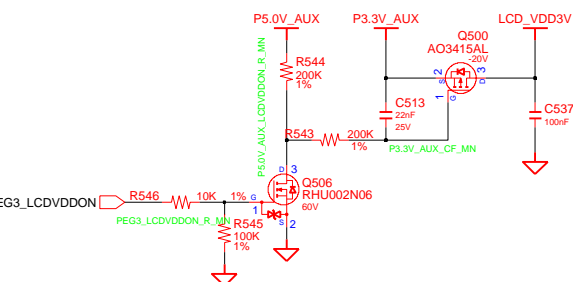
## 1Ch. LCD Connector + CAMERA

NOTE : Place R20 close to connector to minimize stub



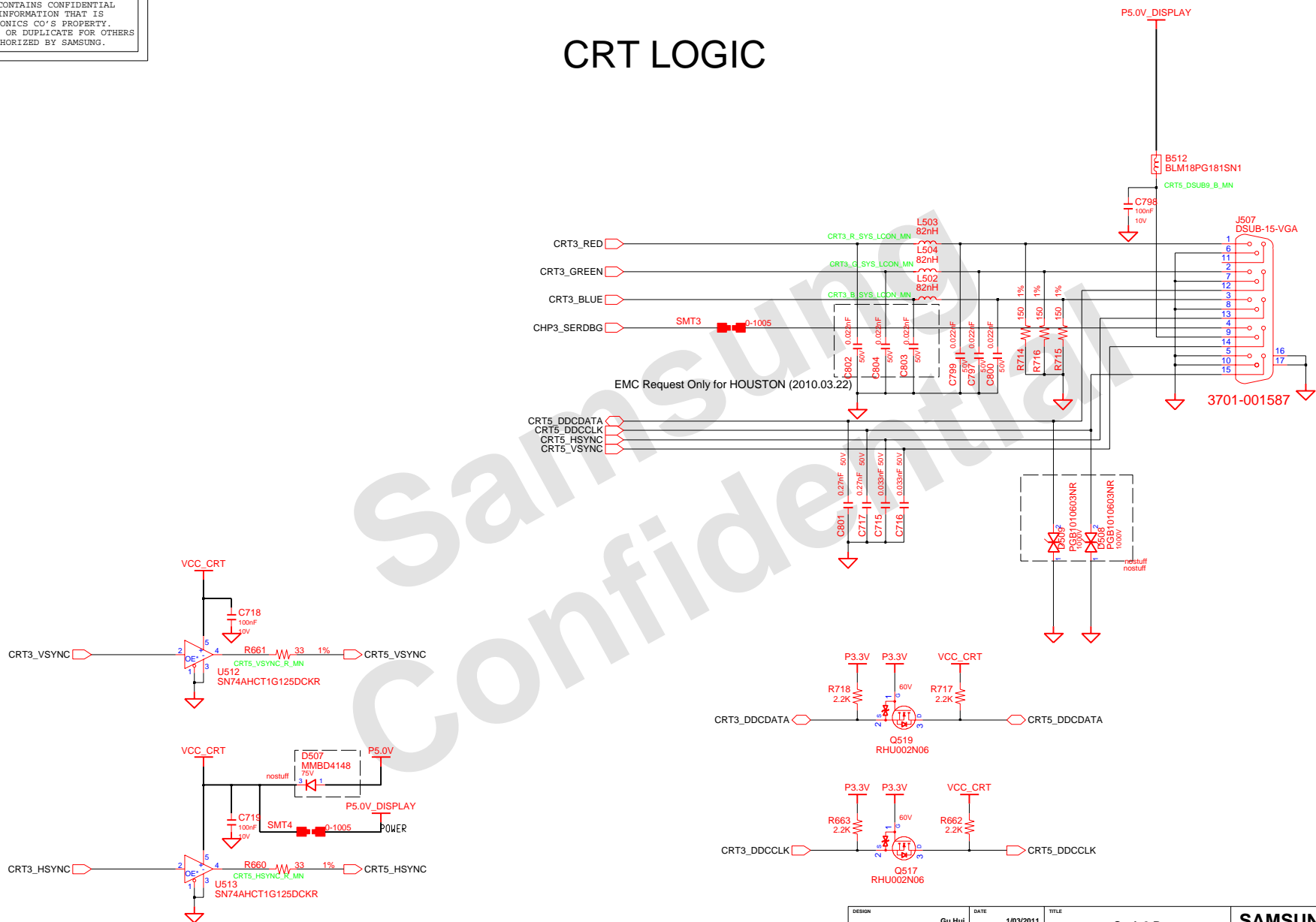
## CAMERA CONN FOR 2ch LVDS

# LED Power



DESIGN	Gu Hui	DATE	1/03/2011	Scala2-R GRAPHICS_IF LVDS	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	25 OF 48

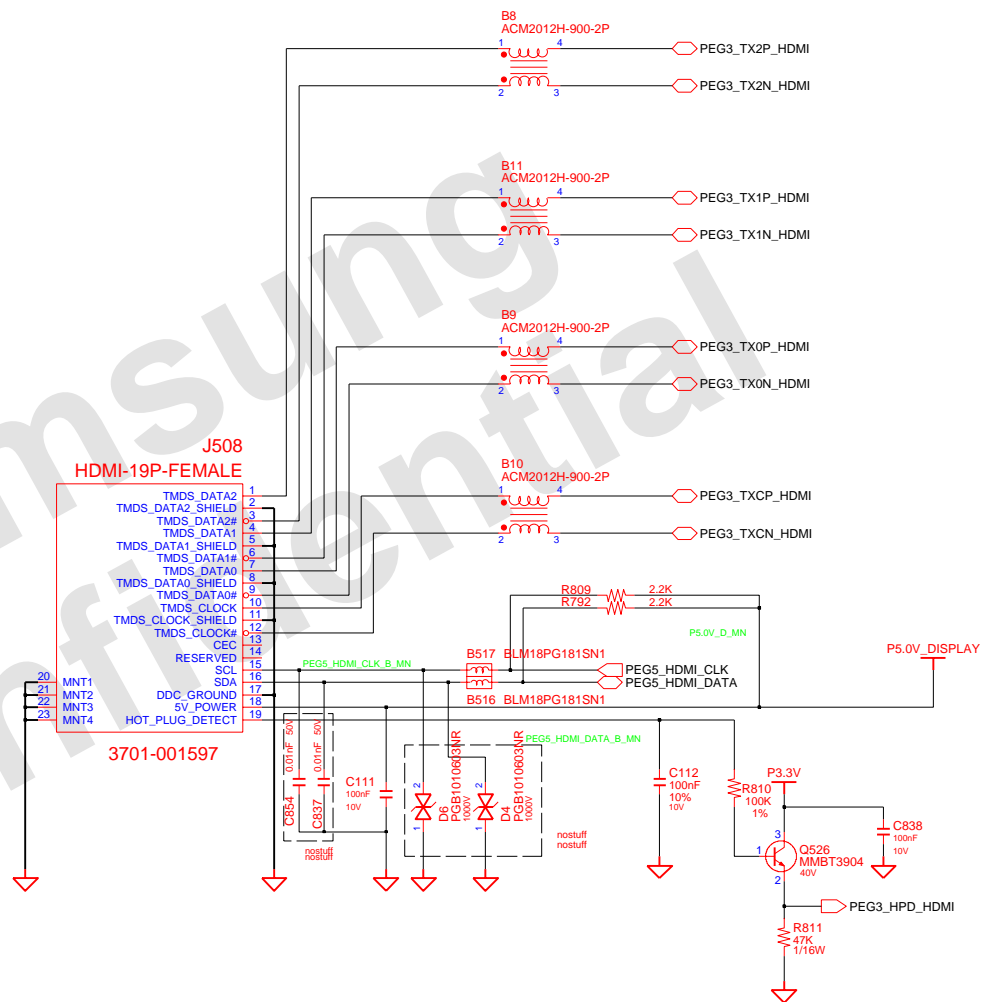
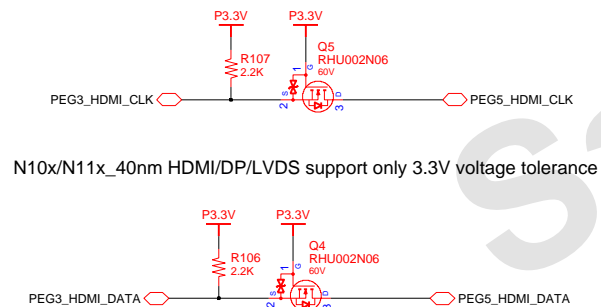
# CRT LOGIC



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF	PART NO.	
APPROVAL	BC LEE	REV	REV. 0.1	CRT	BA41-01XXXXA	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 26 OF 48	

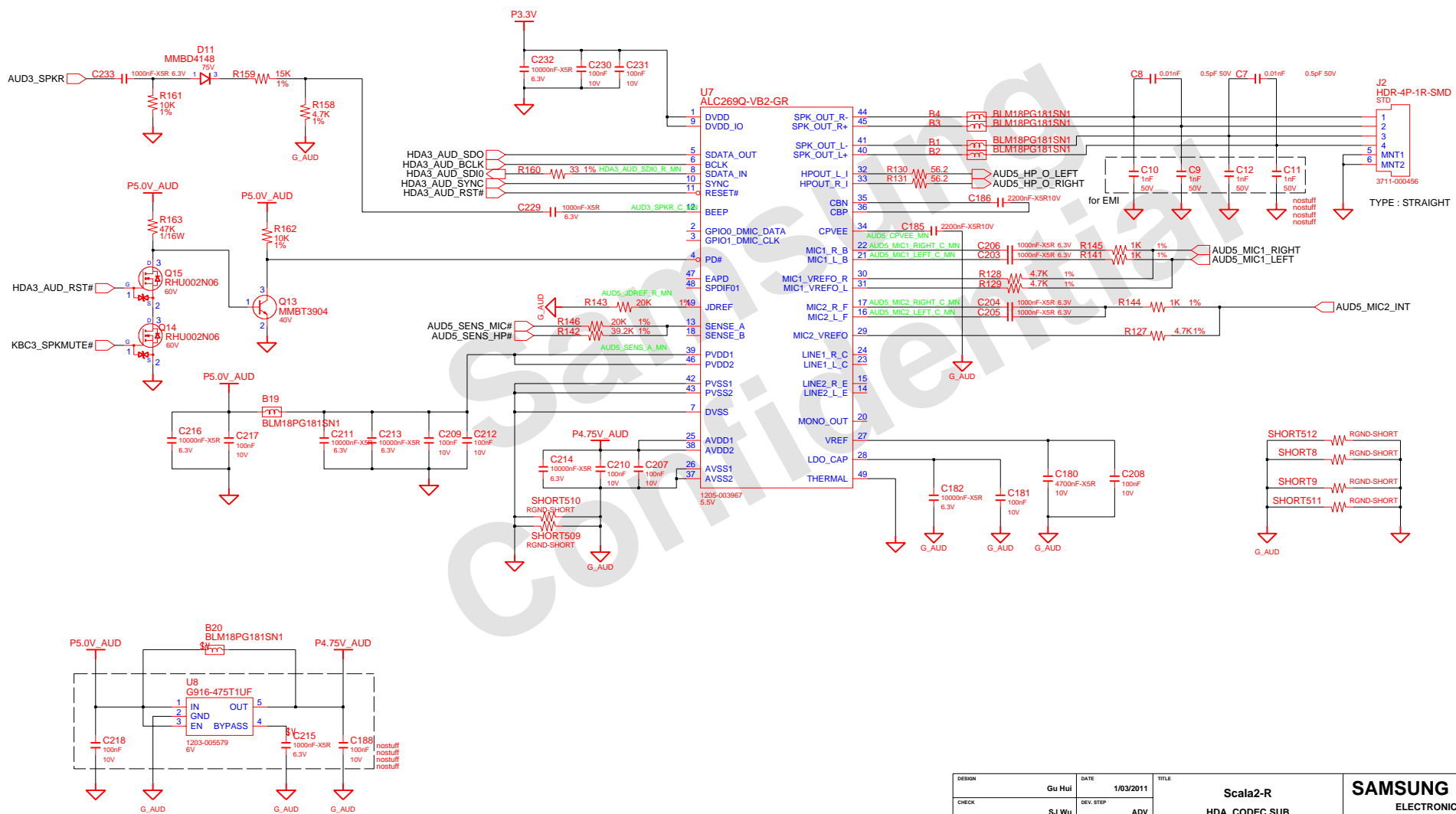
# HDMI Graphic

FOR HDMI VERIFICATION TEST



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CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	HDMI		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM			
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# HD AUDIO

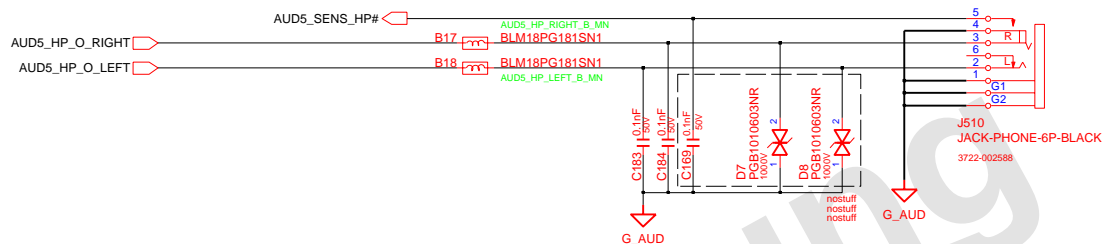


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		HDA_CODEC SUB	
APPROVAL	BC LEE	REV	rev. 0.1		AUDIO CODEC ALC269 SUB	
MODULE CODE		LAST EDIT				
					January 20, 2011 18:59:20 PM	PAGE 28 OF 48

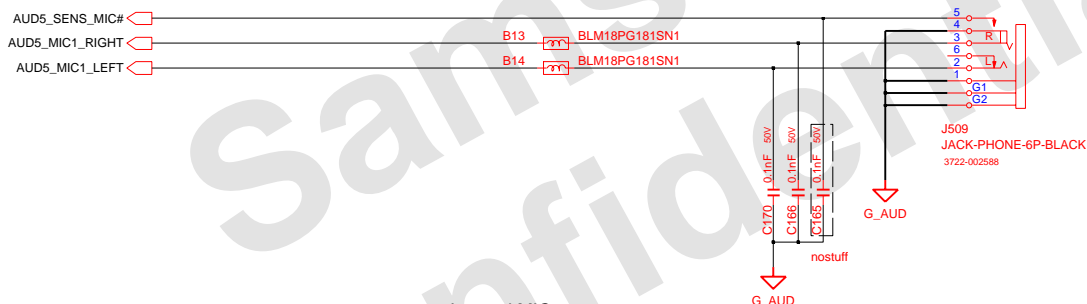
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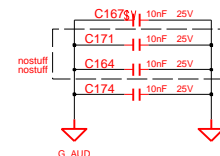
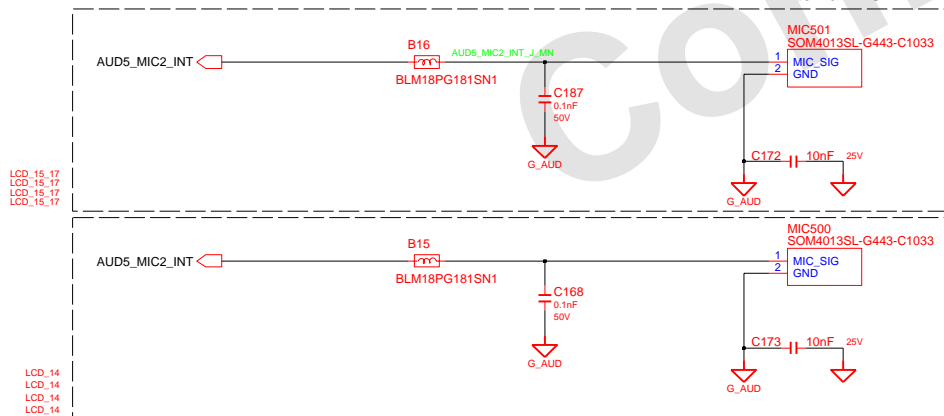
## HEADPHONE



## MIC JACK

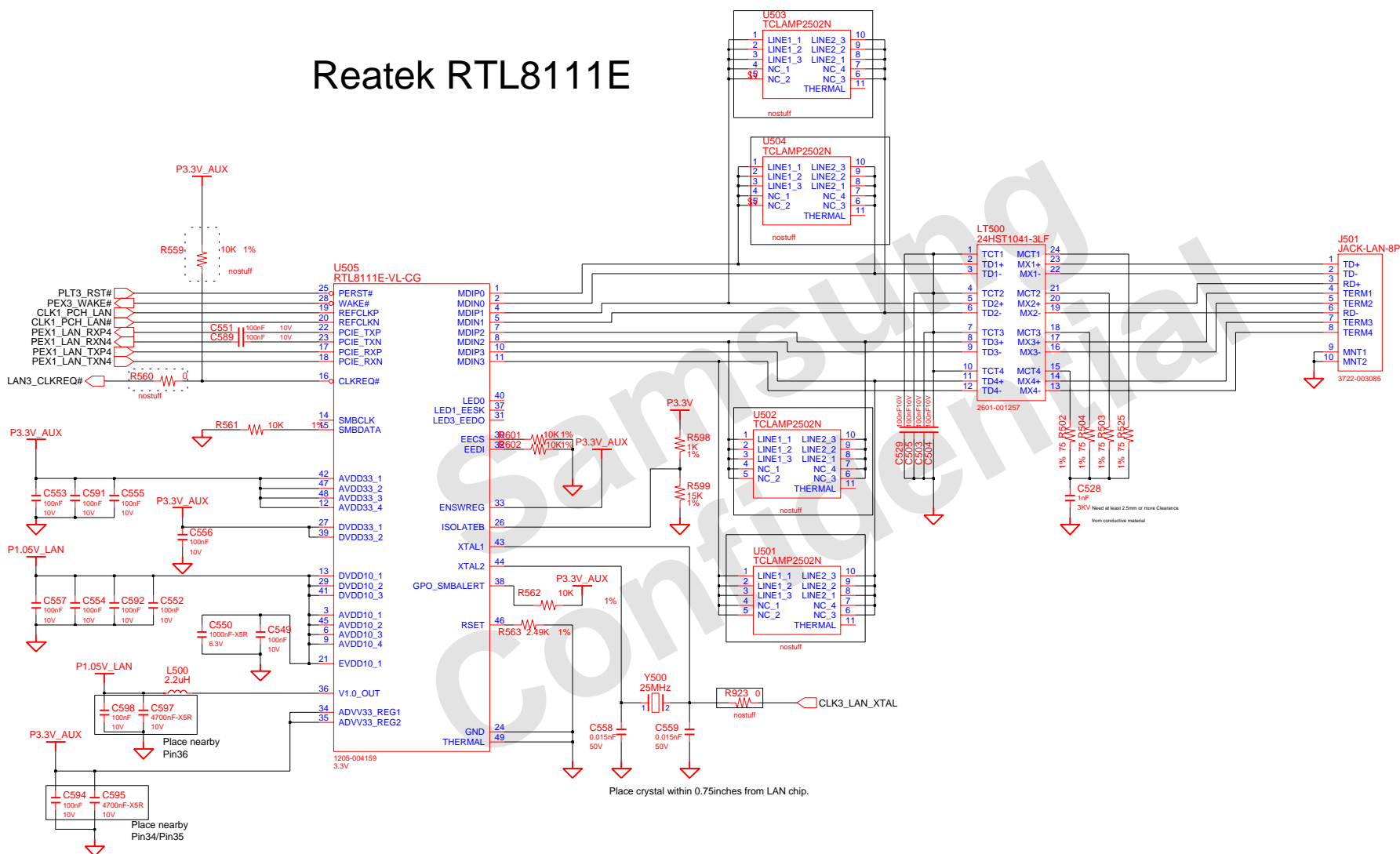



## Internal MIC



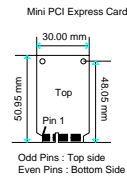
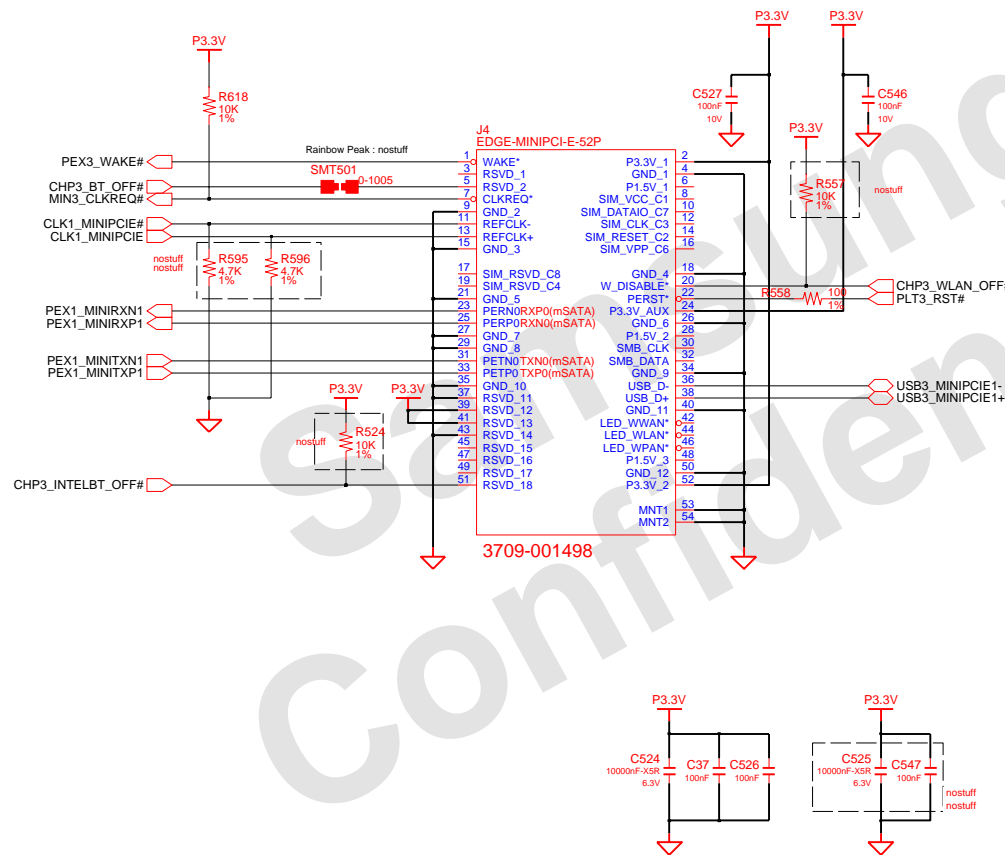
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		HDA_CODEC & LED SUB	
APPROVAL	BC LEE	REV	rev. 0.1		AUDIO JACK & LED SUB	
MODULE CODE		LAST EDIT				
				January 20, 2011 18:59:20 PM	PAGE 29 OF 48	PART NO. BA41-01XXXA

# 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				
				January 20, 2011 18:59:20 PM	PAGE 30 OF 48

## WLAN, 4mm

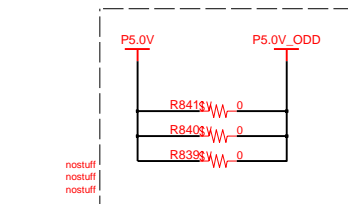
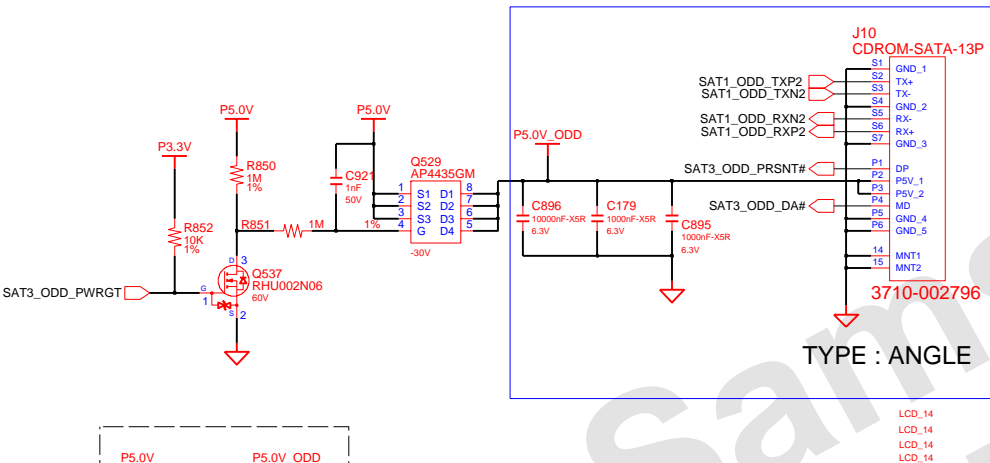


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		MINI_PCIE_CONN	
APPROVAL	BC LEE	REV	rev. 0.1		WLAN	
MODULE CODE		LAST EDIT				PART NO. BA41-01XXXXA
				January 20, 2011 18:59:20 PM	PAGE 31 OF 48	



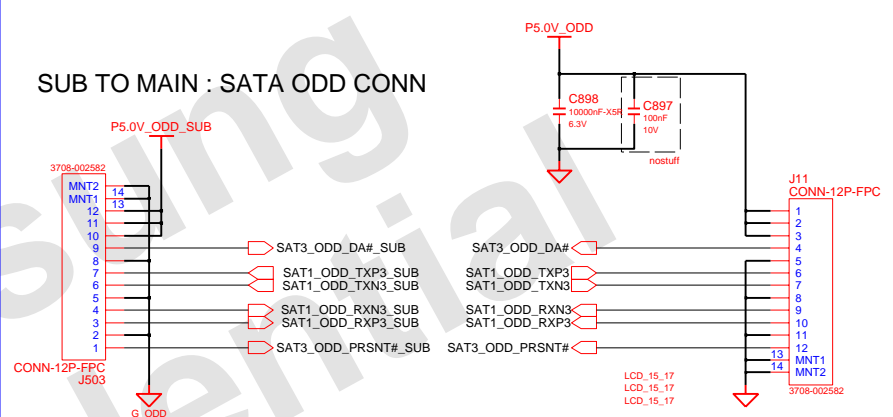
# SATA I/F CONN

## SATA ODD CONN

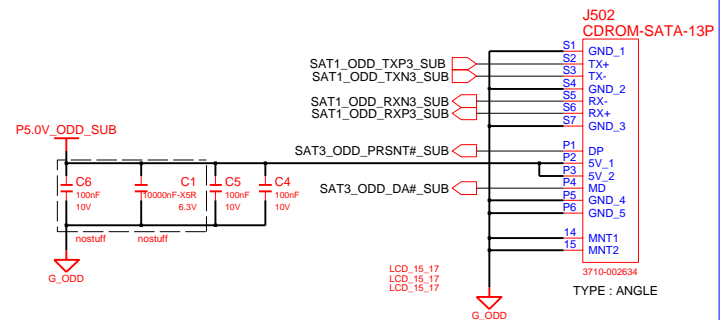


15.6" / 17.3"

MAIN TO SUB : SATA ODD CONN



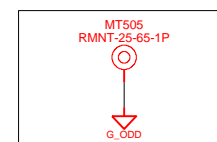
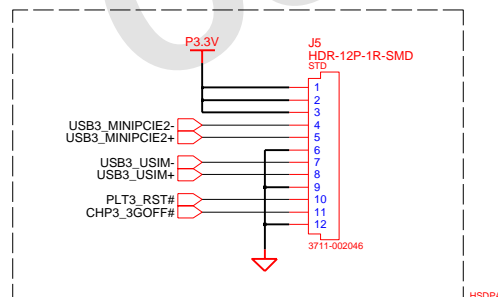
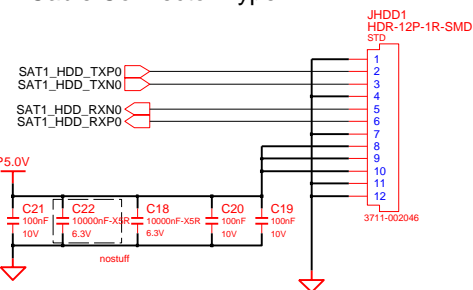
SATA ODD CONN



## SATA HDD CONN

## MAIN to HSDPA SUB

Cable Connector Type

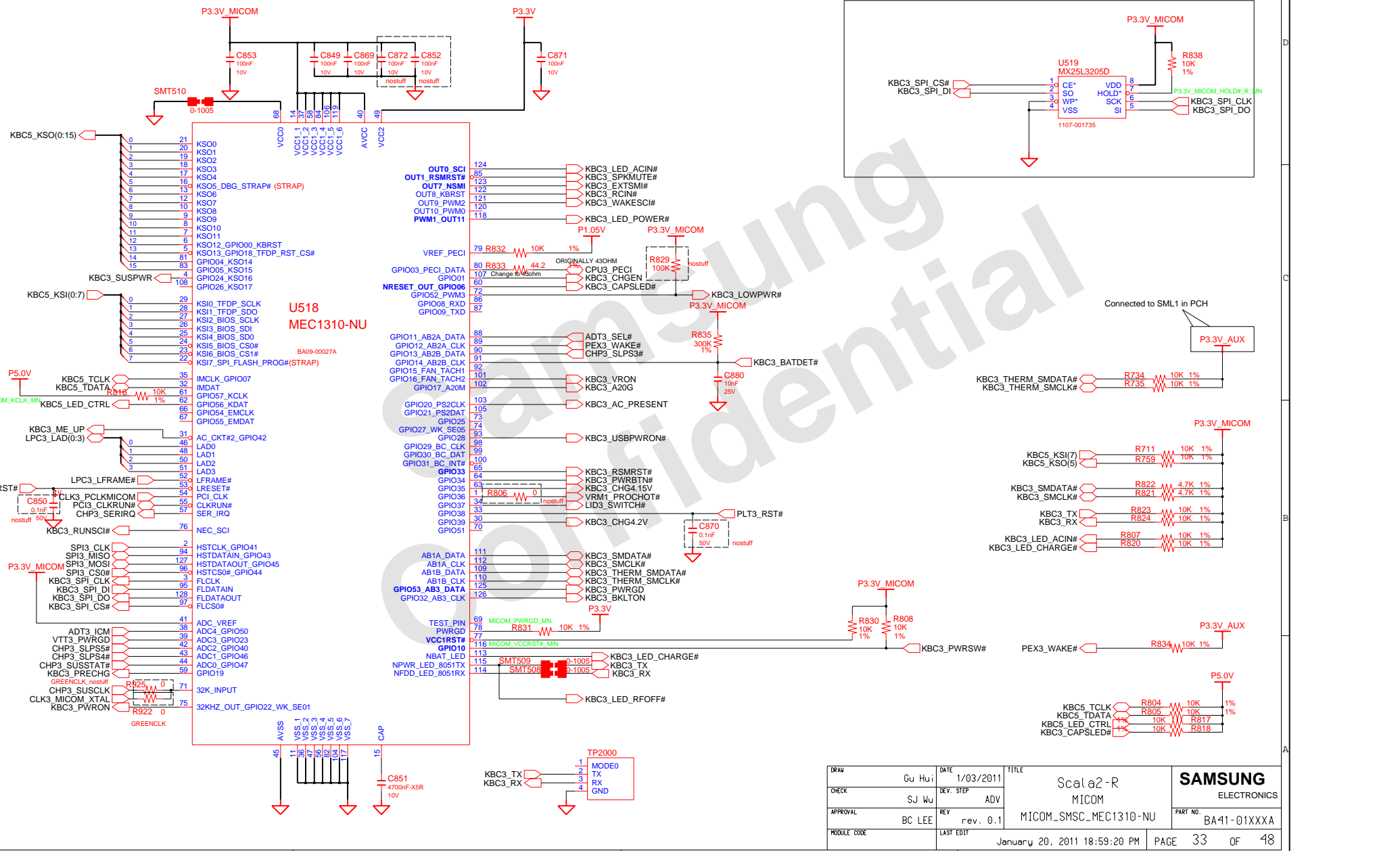


ODD sub board mount hole

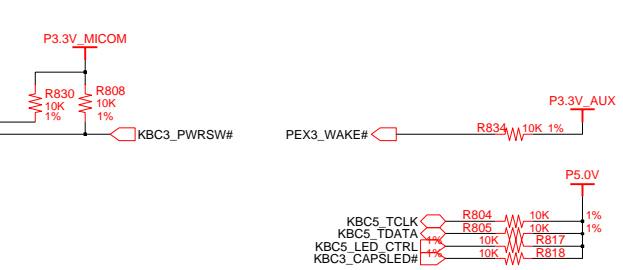
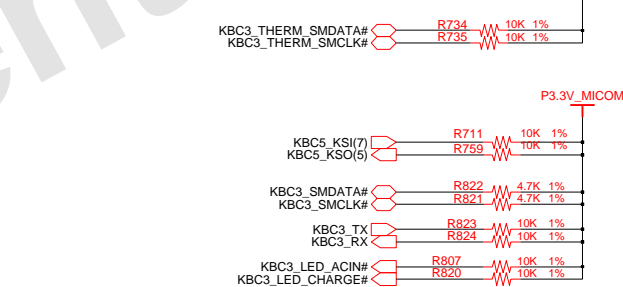
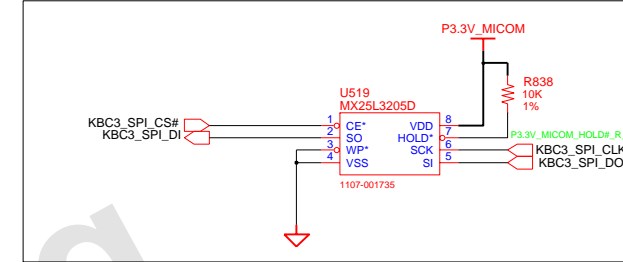
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		SATA DEVICES	
APPROVAL	BC LEE	REV	rev. 0.1		SATA I/F Conn	
MODULE CODE		LAST EDIT				
					January 20, 2011 18:59:20 PM	PAGE 32 OF 48

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# MAIN BOARD (MICOM)



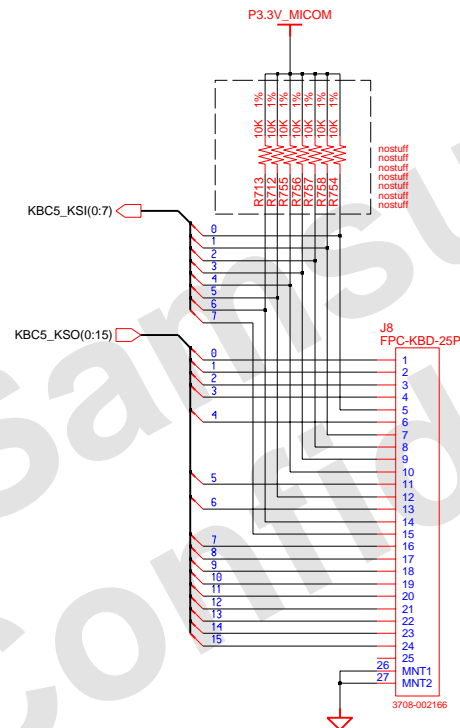
BE CAUTION SPI ROM SIZE!! SPI\_ROM\_SOCKET



DRAW	Gu Hu	DATE	1/03/2011	TITLE	Scala2-R MICOM	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1		MICOM_SMSC_MEC1310-NU	PART NO. BA41-01XXXXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	33	OF 48

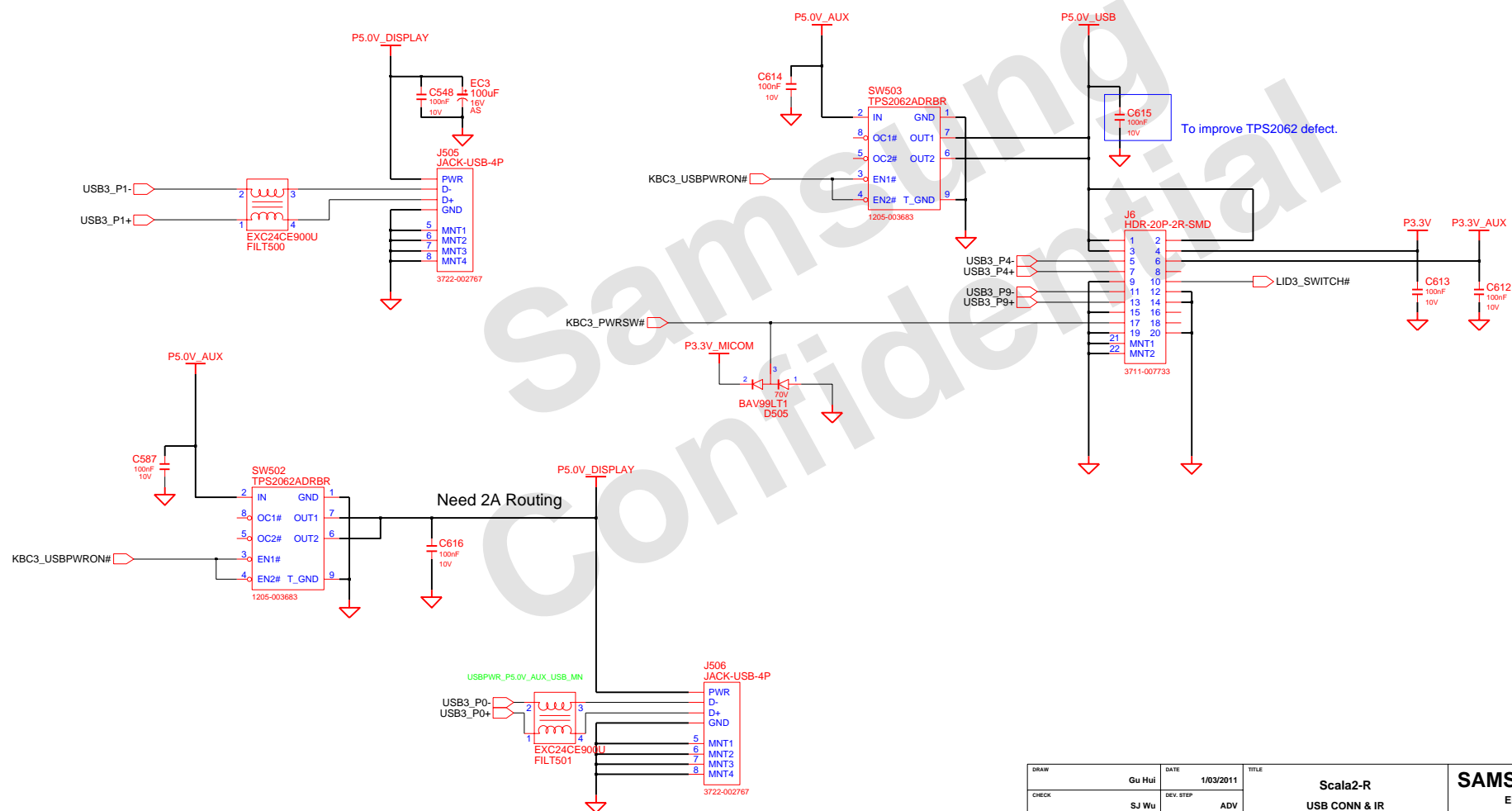
# Micom Glue Logic

## KEYBOARD



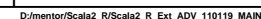
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	MICOM GLUE LOGIC	MICOM GLUE LOGIC	
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	34	OF 48

MAIN to SUB

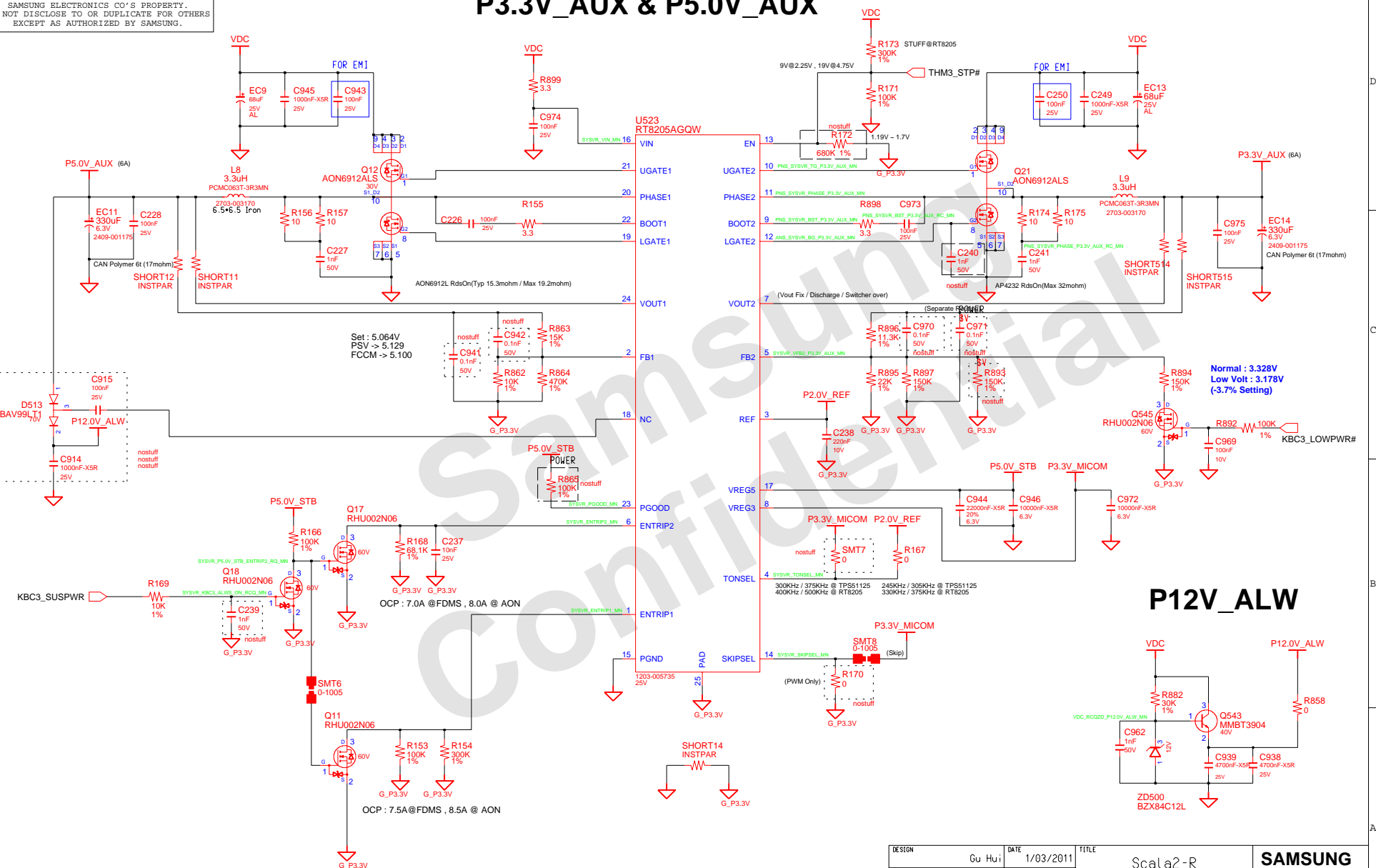


DRAW	Gu Hui	DATE	1/03/2011	<div style="text-align: center;"> <b>Scala2-R</b>  <b>USB CONN &amp; IR</b>    <b>USB &amp; IR</b> </div>	<div style="text-align: center;"> <b>SAMSUNG</b>  <b>ELECTRONICS</b> </div>	
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1		PART NO.	BA41-01XXXX
MODULE CODE	LAST EDIT				January 20, 2011 18:59:20 PM	PAGE 35 OF 48

## CHARGER & POWER MANAGEMENT

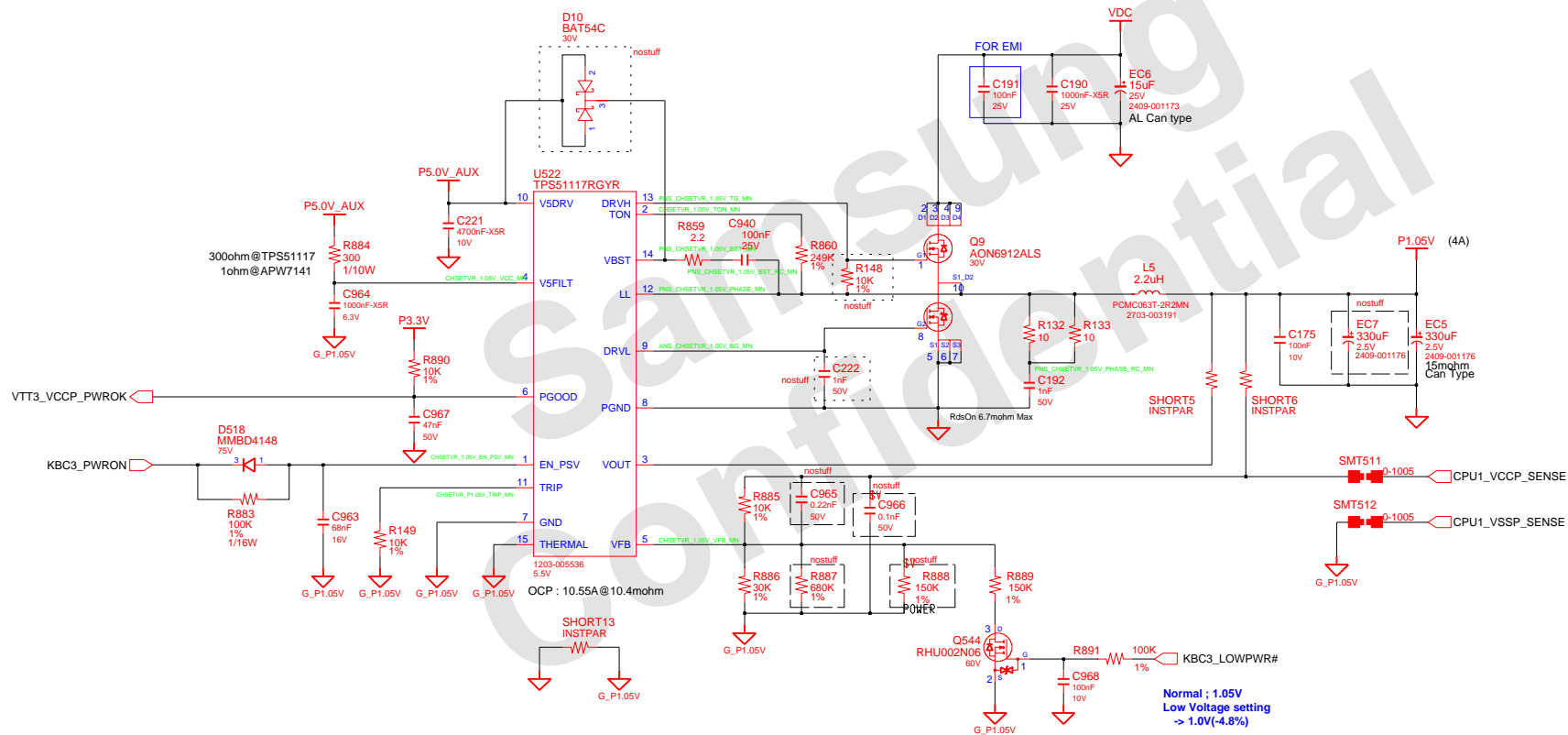


## P3.3V\_AUX & P5.0V\_AUX



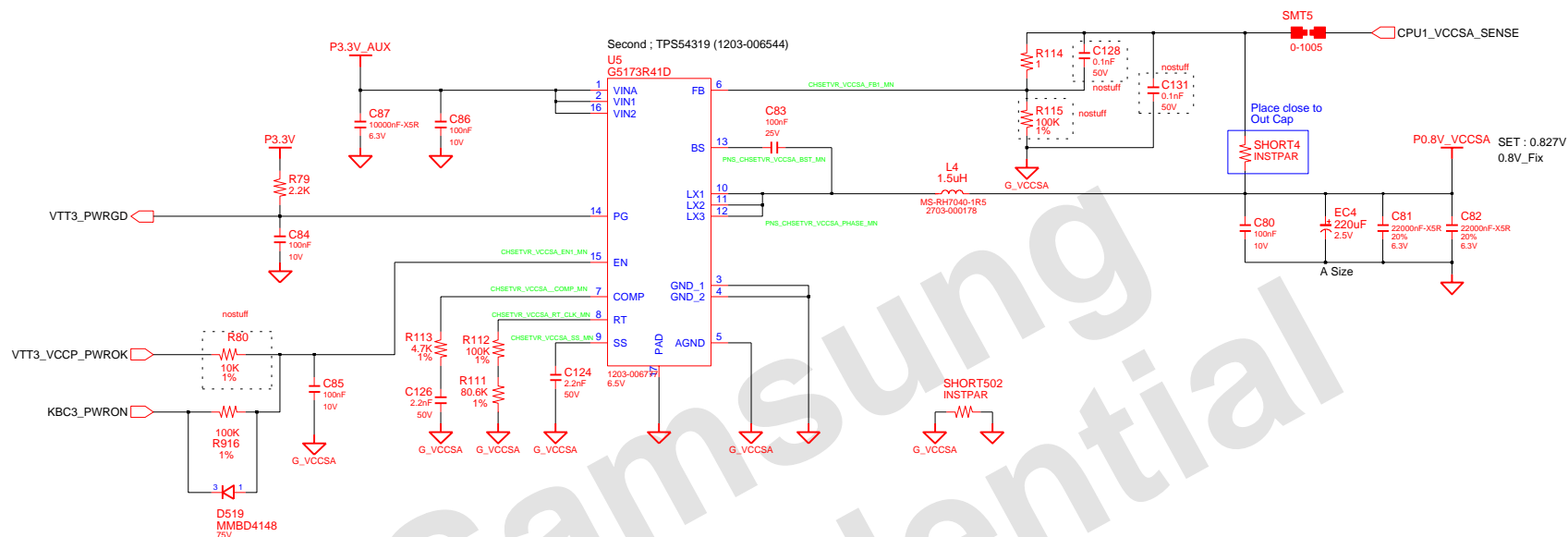
DESIGN	Gu Hui	DATE	1/03/2011	TITLE Scalaz-R P3.3V_AUX / P5.0V_ALW P3.3V_AUX /P5.0V_AUX	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		
APPROVAL	BC LEE	REV	rev. 0.1		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM		
				PAGE	37 OF 48

## CHIPSET POWER(P1.05V)

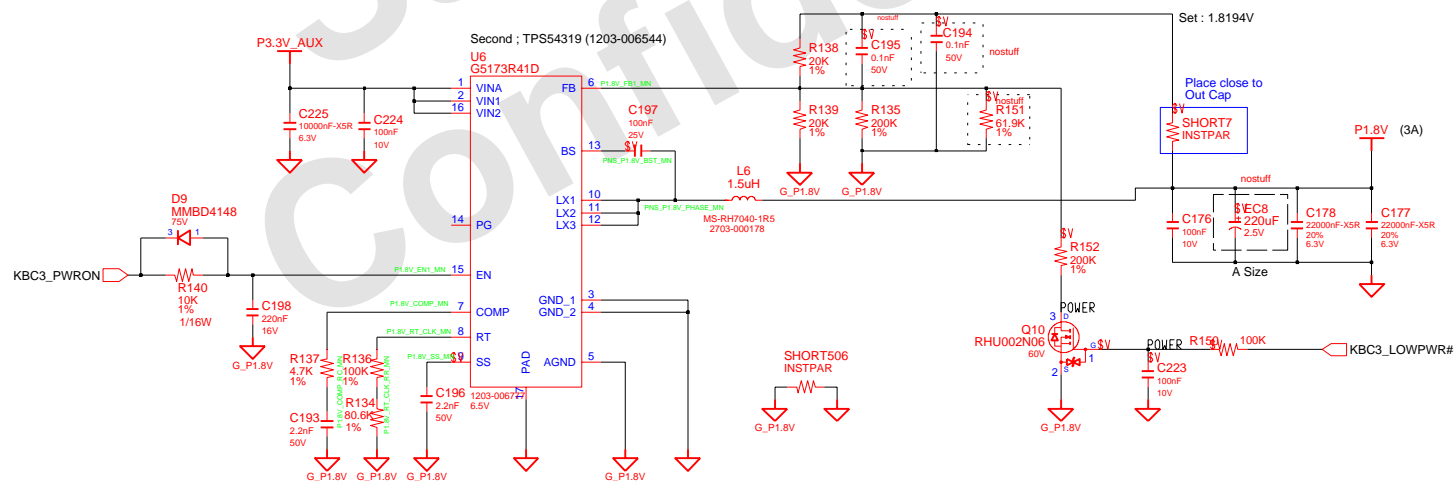


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R P1.05V P1.05V(Chipset Power)	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			PART NO. BA41-01XXXXA
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	38	OF 48

## CHIPSET POWER(VCCSA)



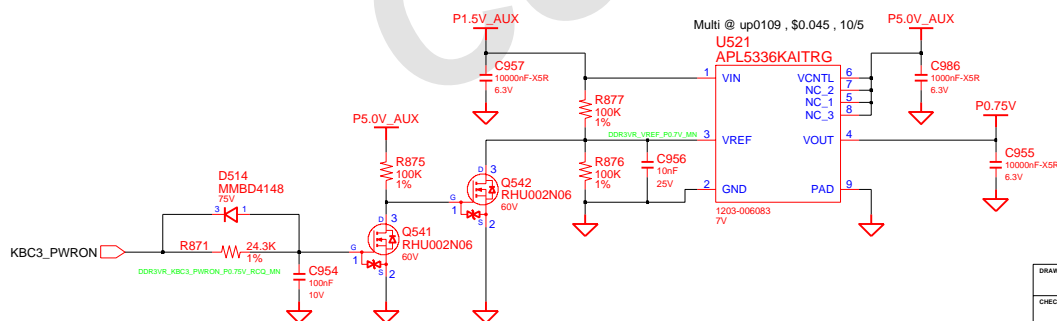
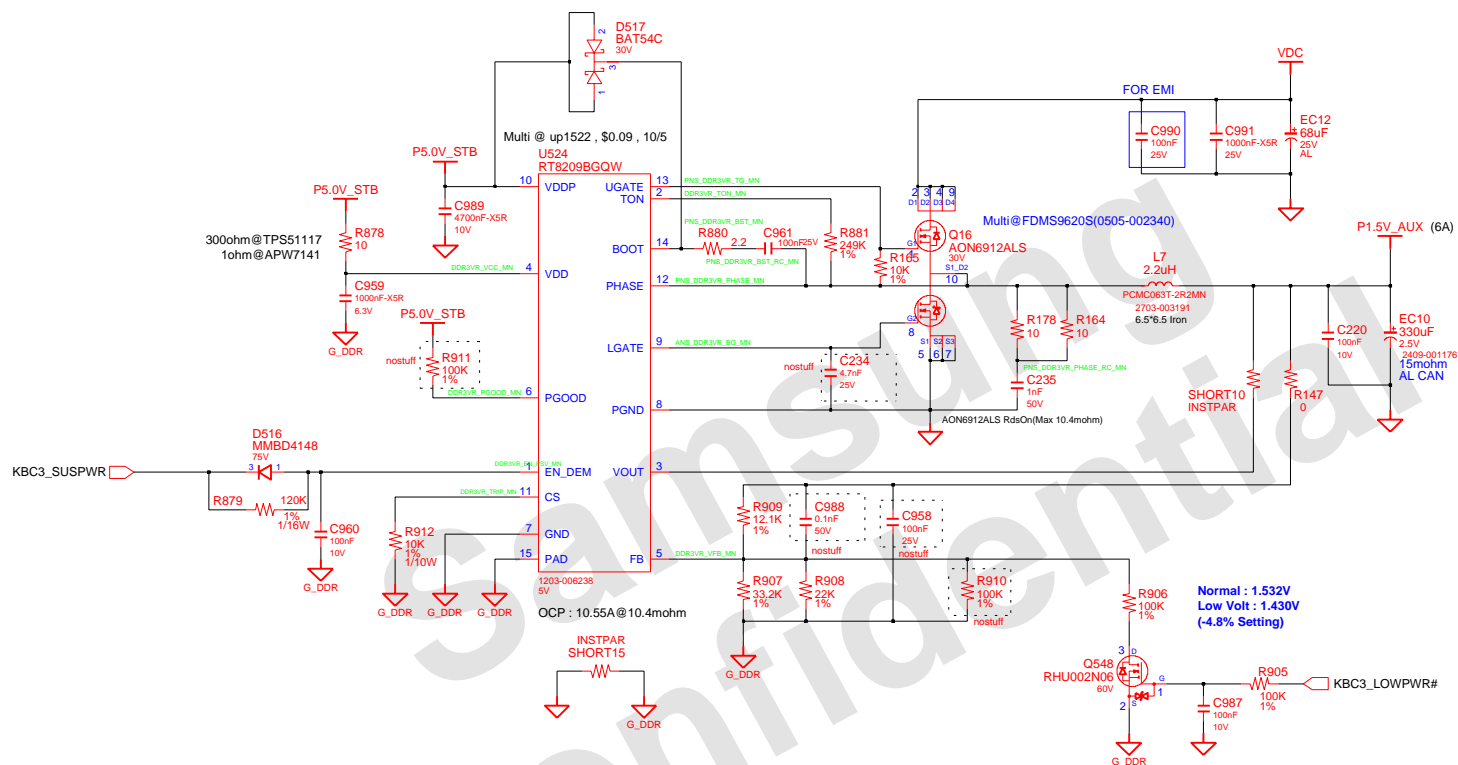
## CHIPSET POWER(P1.8V)



DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01XXXXA
CHECK	SJ Wu	DEV. STEP	ADV		P1.1V_VTT	
APPROVAL	BC LEE	REV	rev. 0.1		P0.8V(Chipset Power)	
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	39 OF 48	



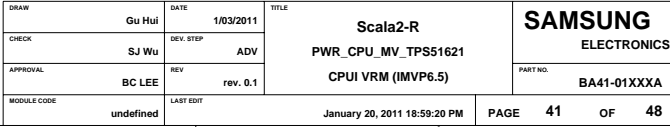
## DDR3 VTT(0.75V)



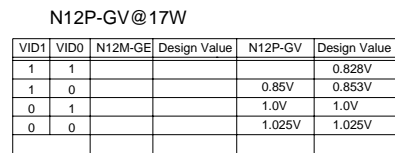
DRAW	Gu Hui	DATE	1/03/2011	Scala2-R PWR_MEMORY DDR3 POWER	SAMSUNG ELECTRONICS			
CHECK	SJ Wu	DEV. STEP	ADV					
APPROVAL	BC LEE	REV	rev. 0.1					
MODULE CODE	undefined	LAST EDIT						
				January 20, 2011 18:59:20 PM	PAGE	40	OF	48

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57K@283KHz



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ELECTRONICS

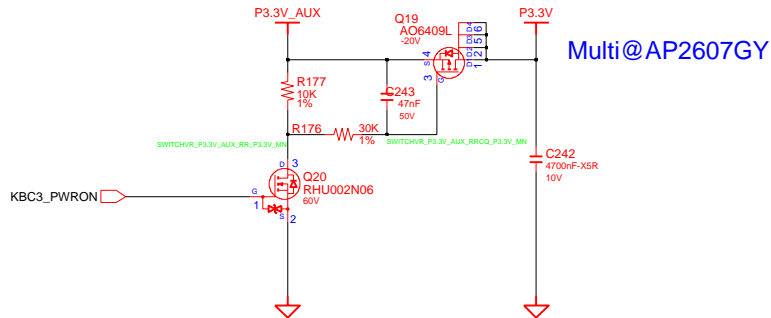
---

PART NO. **BA41-01XXXXA**

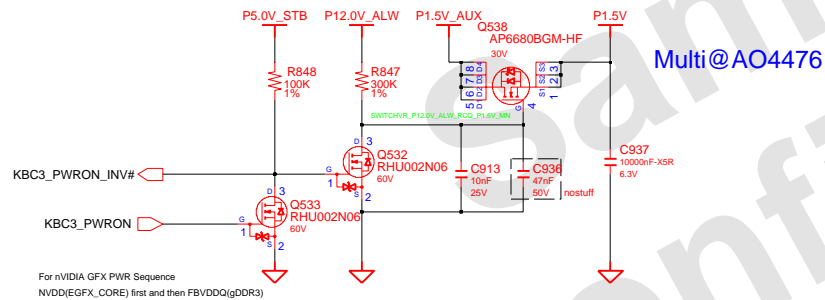
# Switched Power

P5.0V -> P3.3V -> EGFX\_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.8V\_VCCSA -> CPU\_CORE

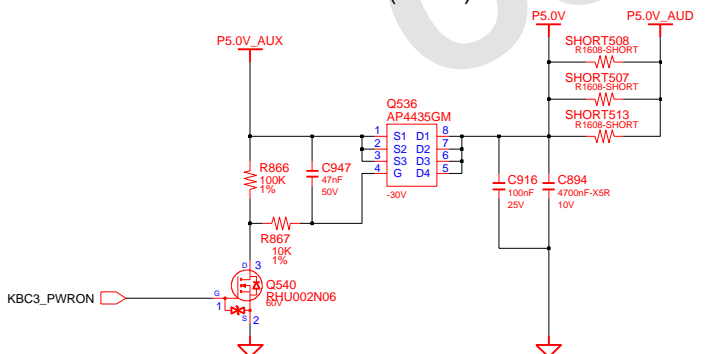
## Switched Power On (P3.3V)



## Switched Power On (P1.5V)

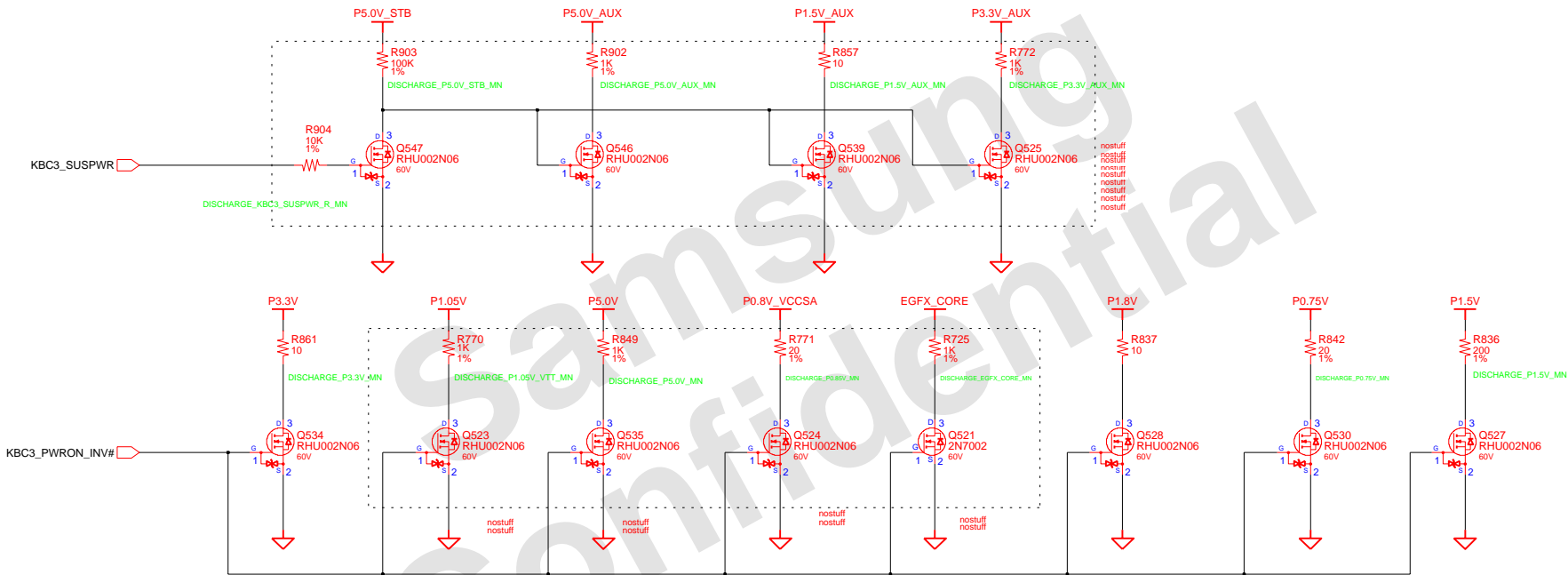


## Switched Power On (P5.0V)



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

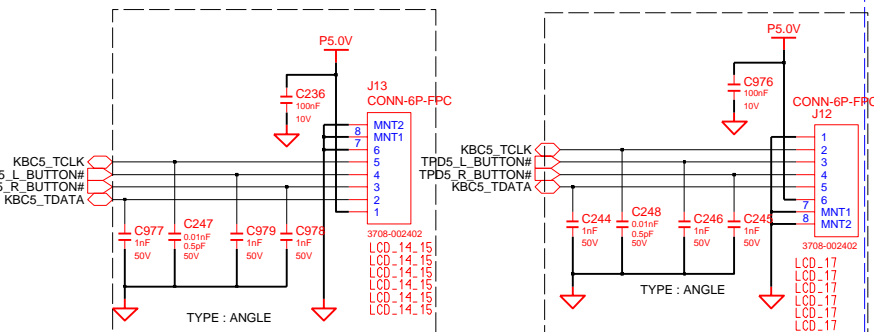


DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV		SUB BOARD1	
APPROVAL	BC LEE	REV	rev. 0.1		Power Discharger	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 45 OF 48	PART NO. BA41-01XXXXA

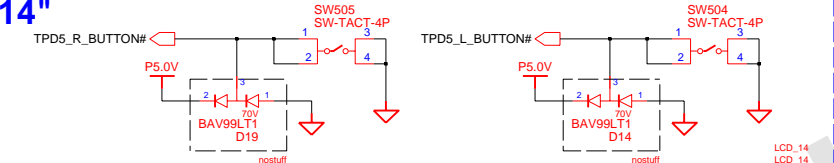
[www.vinafix.vn](http://www.vinafix.vn)

January 18, 2011 08:10:20 AM

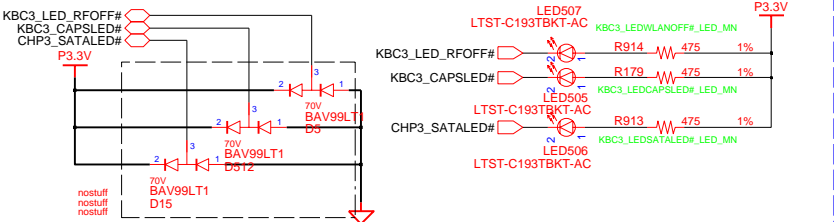
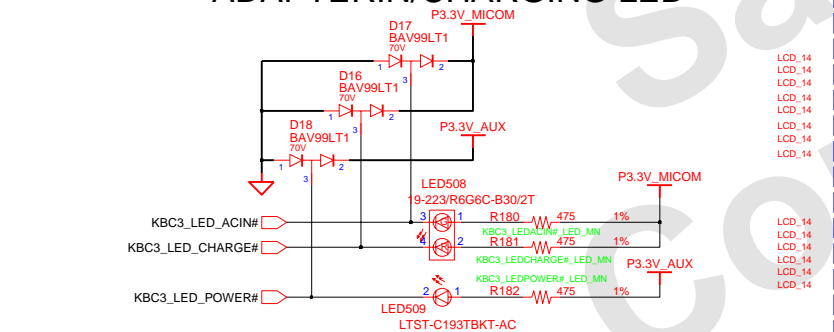
## TOUCHPAD



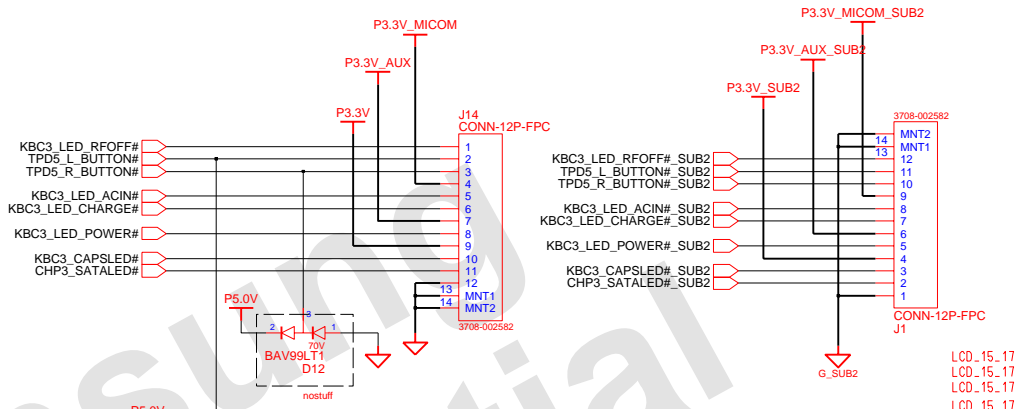
14"



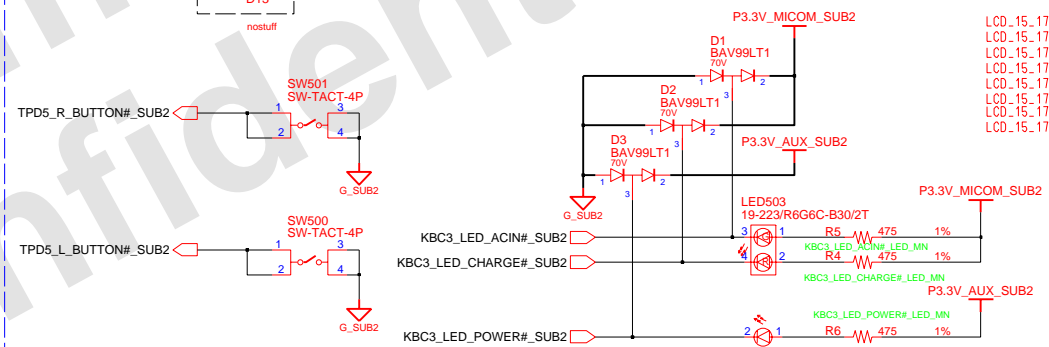
## ADAPTERIN/CHARGING LED



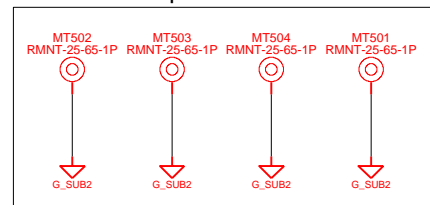
## 15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



## ADAPTERIN/CHARGING LED



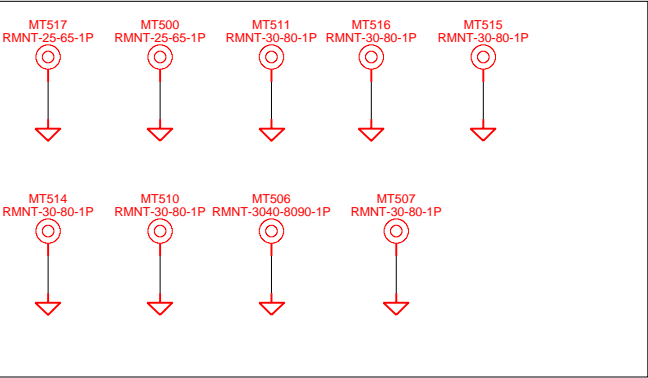
## Touchpad Mount Hole



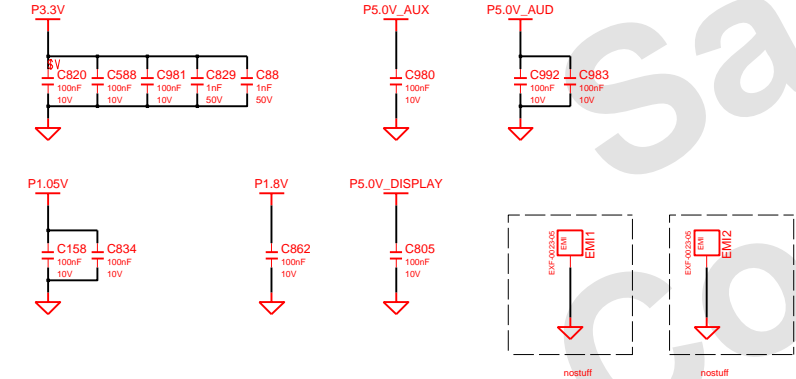
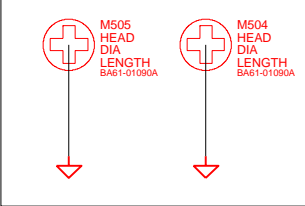
DRAW	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	ADV		Touchpad	
APPROVAL	BL LEE	REV	rev. 0.3		Touchpad	
MODULE CODE		LAST EDIT				
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Mainboard Mount ((25-65)X2EA, (30-80)X7EA)



PCH Thermal



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