

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 : BA41-01609A (GCE)
BA41-01608A (NY)
BA41-01610A (HAN)
BA41-01XXXA (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

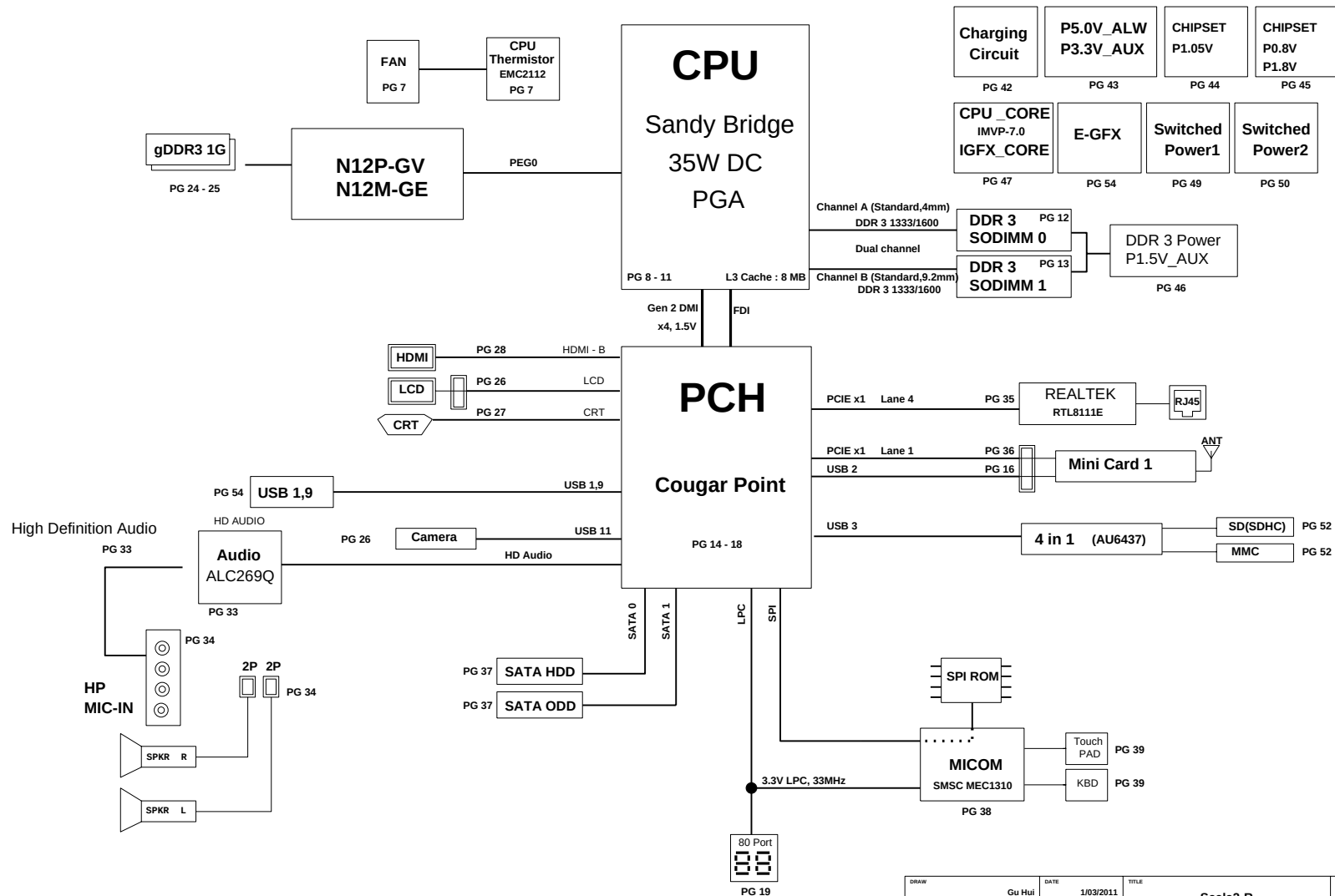
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sheet39 : Power - P0.8V (Chipset Power)
sheet40 : Power - DDR3
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sheet42 : Power - EGFX_CORE
sheet43 : Power - Switched Power 1
sheet44 : Power - Switched Power 2
sheet45 : Power - Power Discharge
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sheet47 : Touchpad & LED
sheet48 : Mount Hole

DRAW	Gu Hui	DATE	1/03/2011	TITLE Scala2-R MAIN COVER	SAMSUNG ELECTRONICS
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 1 OF 48

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BLOCK DIAGRAM



1

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

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

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

Active in

S4 - S5

S3

S0

S0

USB PORT Assign

PORT #

ASSIGNED TO

0

1

2

3

4

5

6

7

8

9

10

11

12

13

NC

SYSTEM PORT 0

Mini PCI Express

Multi Memory Card Controller

NC

NC

NC (N/A WITH HM55)

NC (N/A WITH HM55)

Camera

SYSTEM PORT 1

NC

Camera(LCD Cable)

NC

NC

PCI Express Assign

PORT #

ASSIGNED TO

1

2

3

4

5

6

7

8

Mini Card 1 (WLAN)

NC

NC

LAN CONTROLLER

USB 3.0

NC

NC

NC

SATA PORT Assign

PORT #

ASSIGNED TO

0

1

2

3

4

5

HDD

ODD

(N/A WITH HM65)

(N/A WITH HM65)

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

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

Gu Hui

CHECK

SJ Wu

APPROVAL

BC LEE

MODULE CODE

undefined

DATE

1/03/2011

DEV. STEP

ADV

REV

rev. 0.1

LAST EDIT

January 20, 2011 18:59:20 PM

TITLE

Scala2-R
MAIN
BOARD INFO

PART NO.

BA41-01XXA

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SAMSUNG

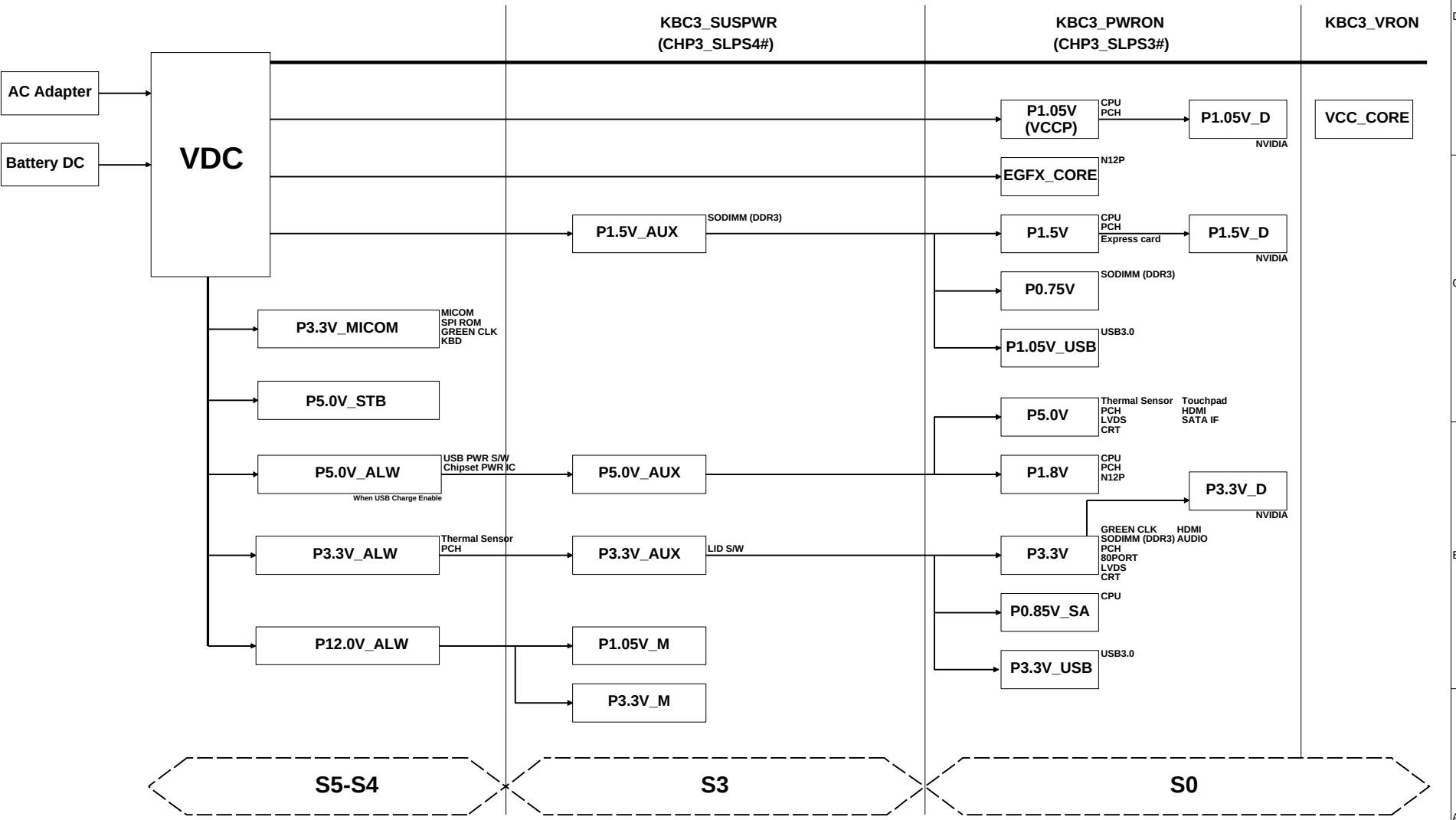
ELECTRONICS

22C-015(1996.6.5) REV. 3

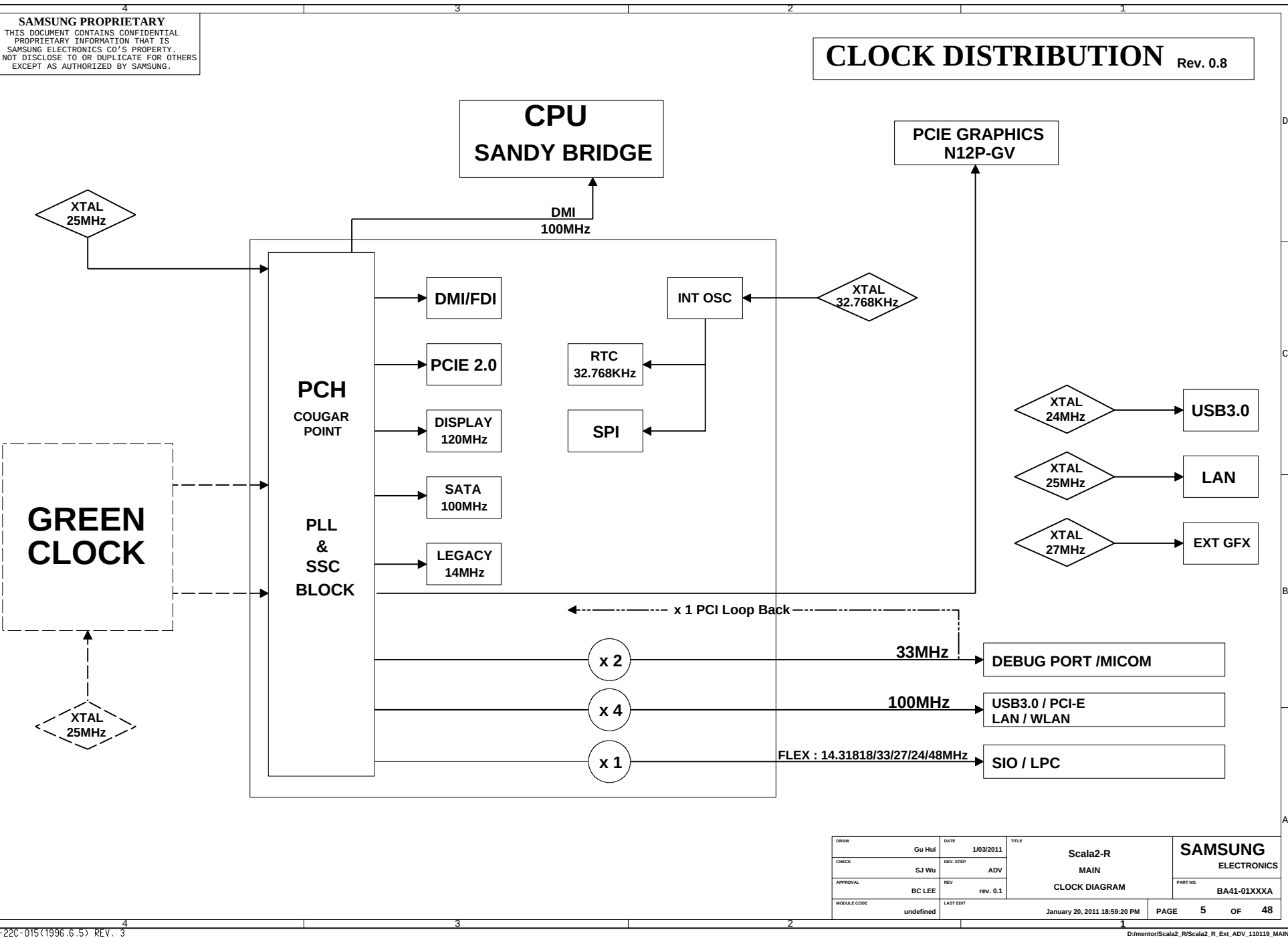
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POWER DIAGRAM

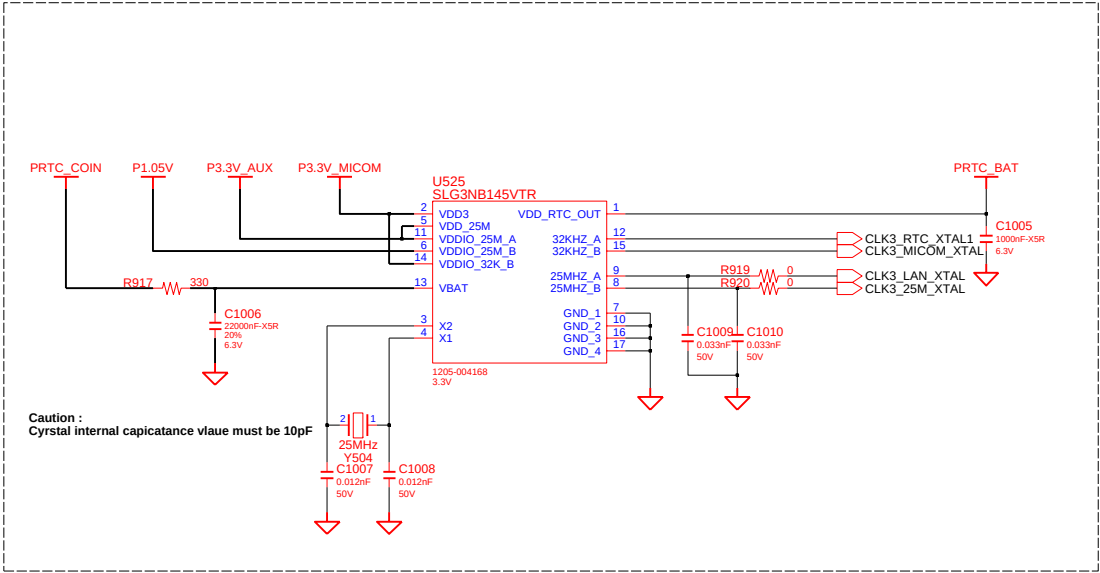
Rev 0.8



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



CLOCK DISTIBUTOR



GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK

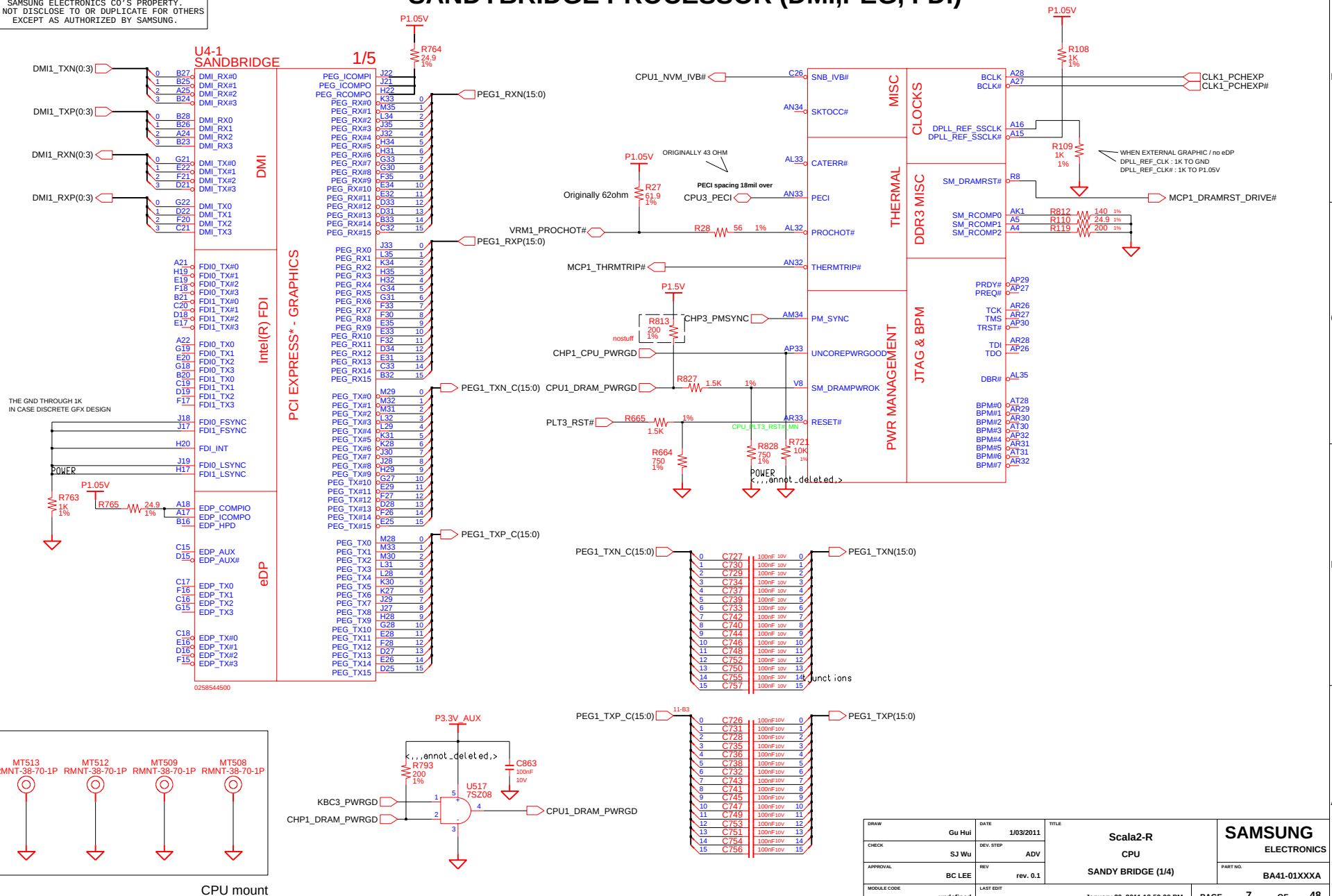
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DESIGNED BY	short_date	SCALA2-R_PV_MAIN	
CHANGED BY	DEV. STEP	Module Name	
FIG. CHK	REV	1.0	
LAST EDIT		last_edit	PAGE 6 OF XX

A

22C-0157(1996.6.5)	REV. 3	4	3	2	1	D:\mentor\Scala2_R\Scala2_R_Ext_ADV_110119_MAIN
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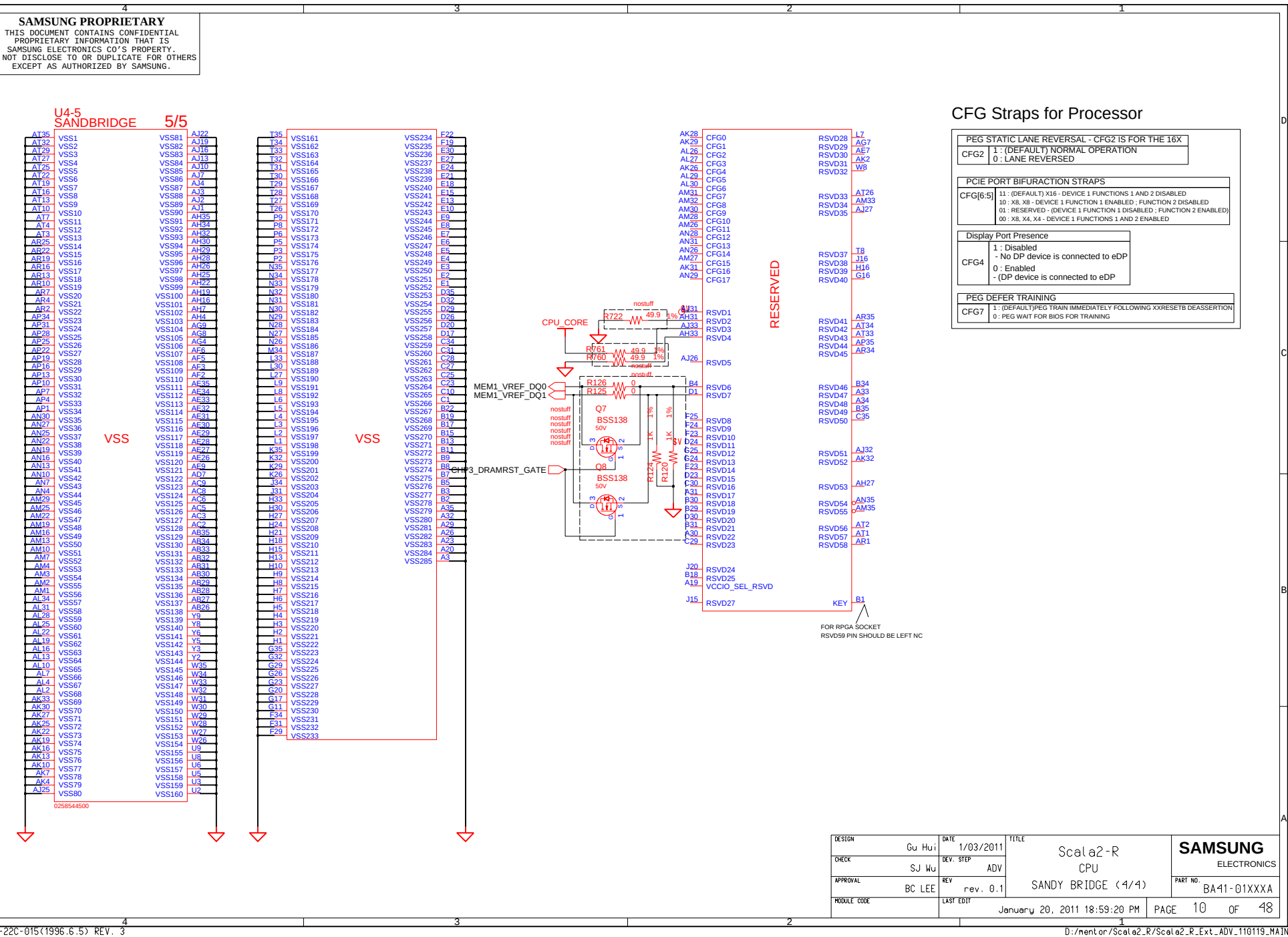
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SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)



A

D:/mentor/Scala2_R/Scala2_R_Ext_ADV_110119_MAIN



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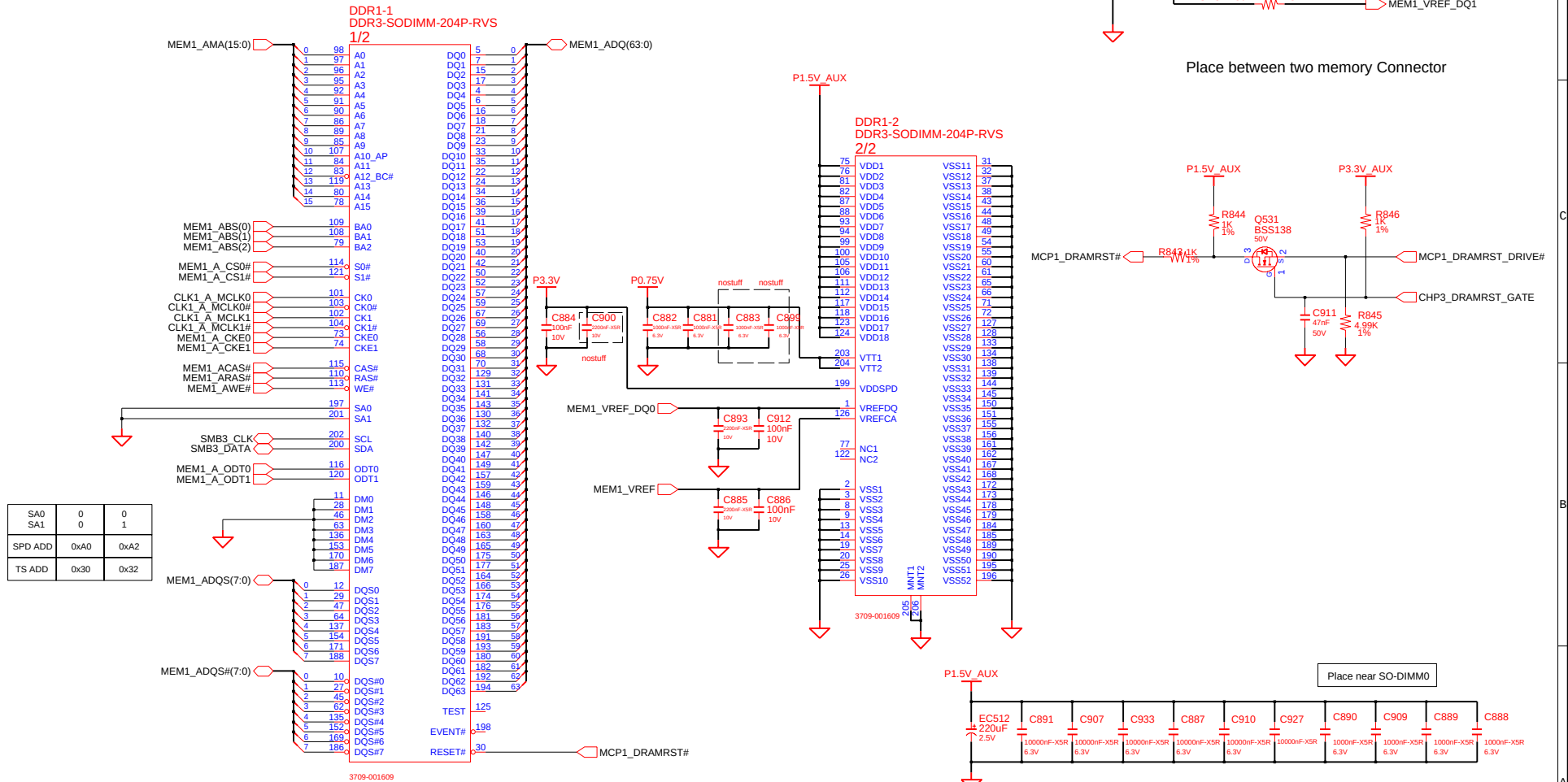
SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001609 (CONCRAFT)

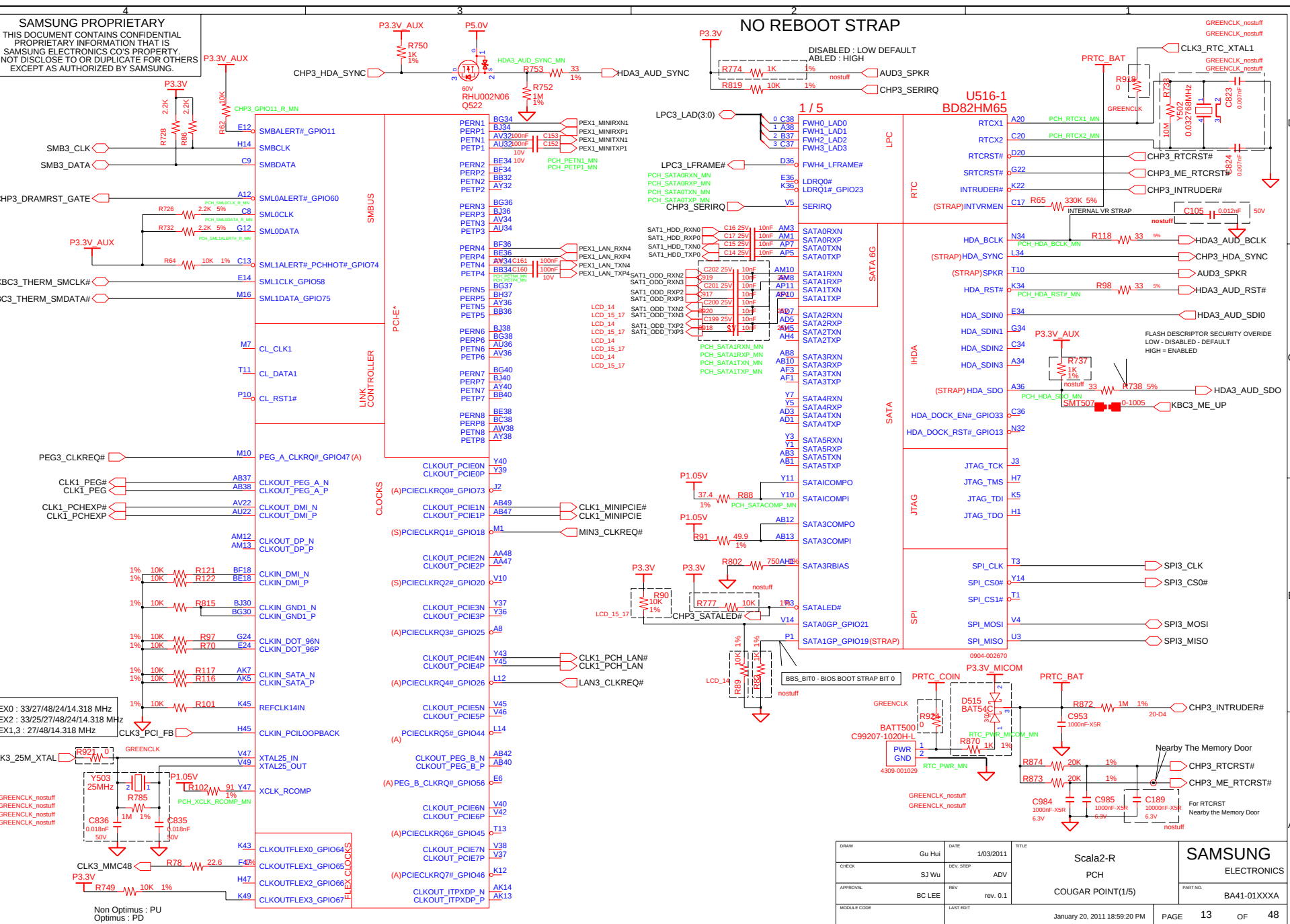
P/N : 3709-001656 (Foxconn)



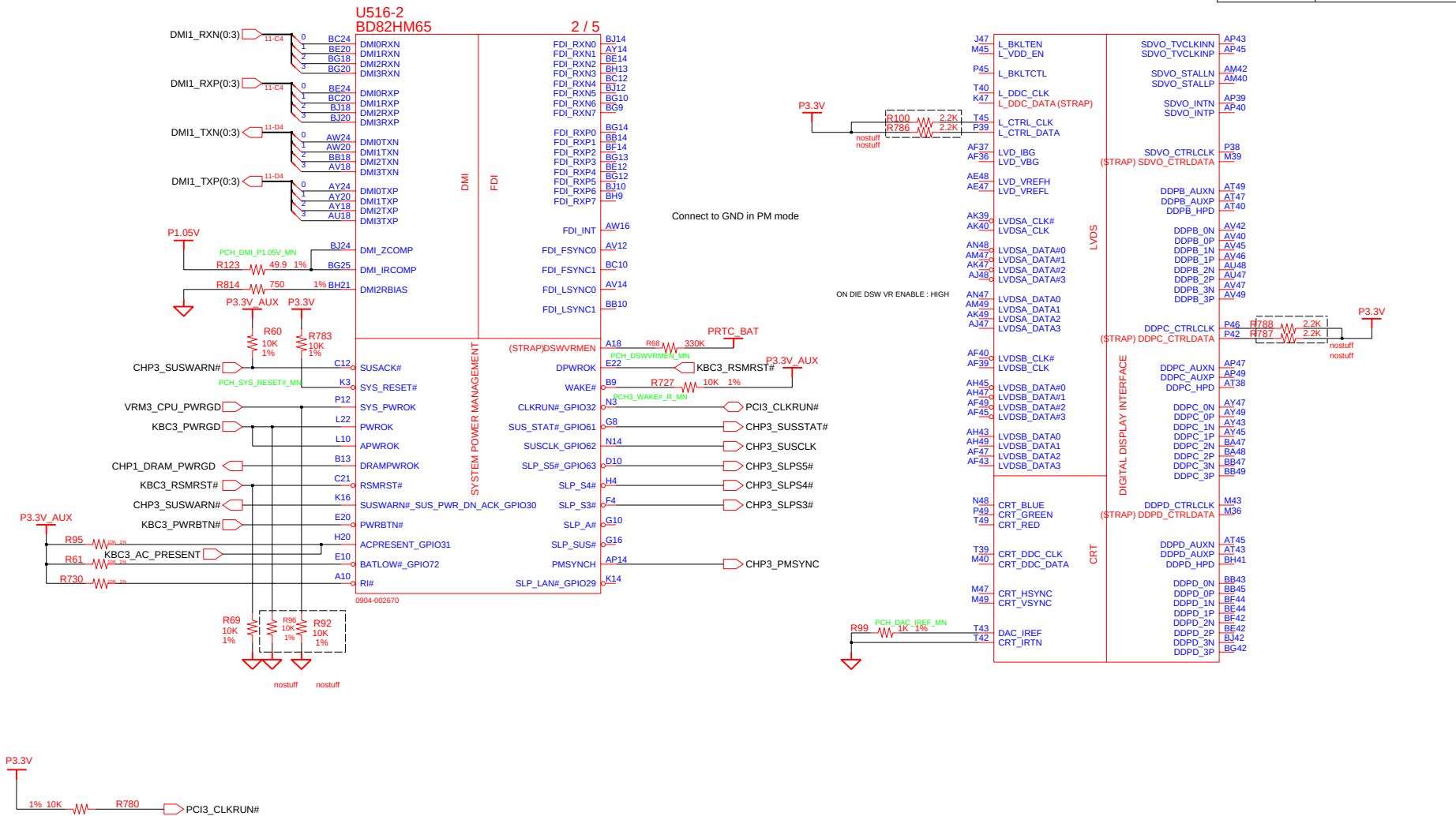
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CHECK	SJ Wu	DEV. STEP	ADV		SODIMM A
APPROVAL	BC LEE	REV	rev. 0.1		DDR3
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	11 OF 48

SAMSUNG	PART NO.	BA41-01XXXA
ELECTRONICS		

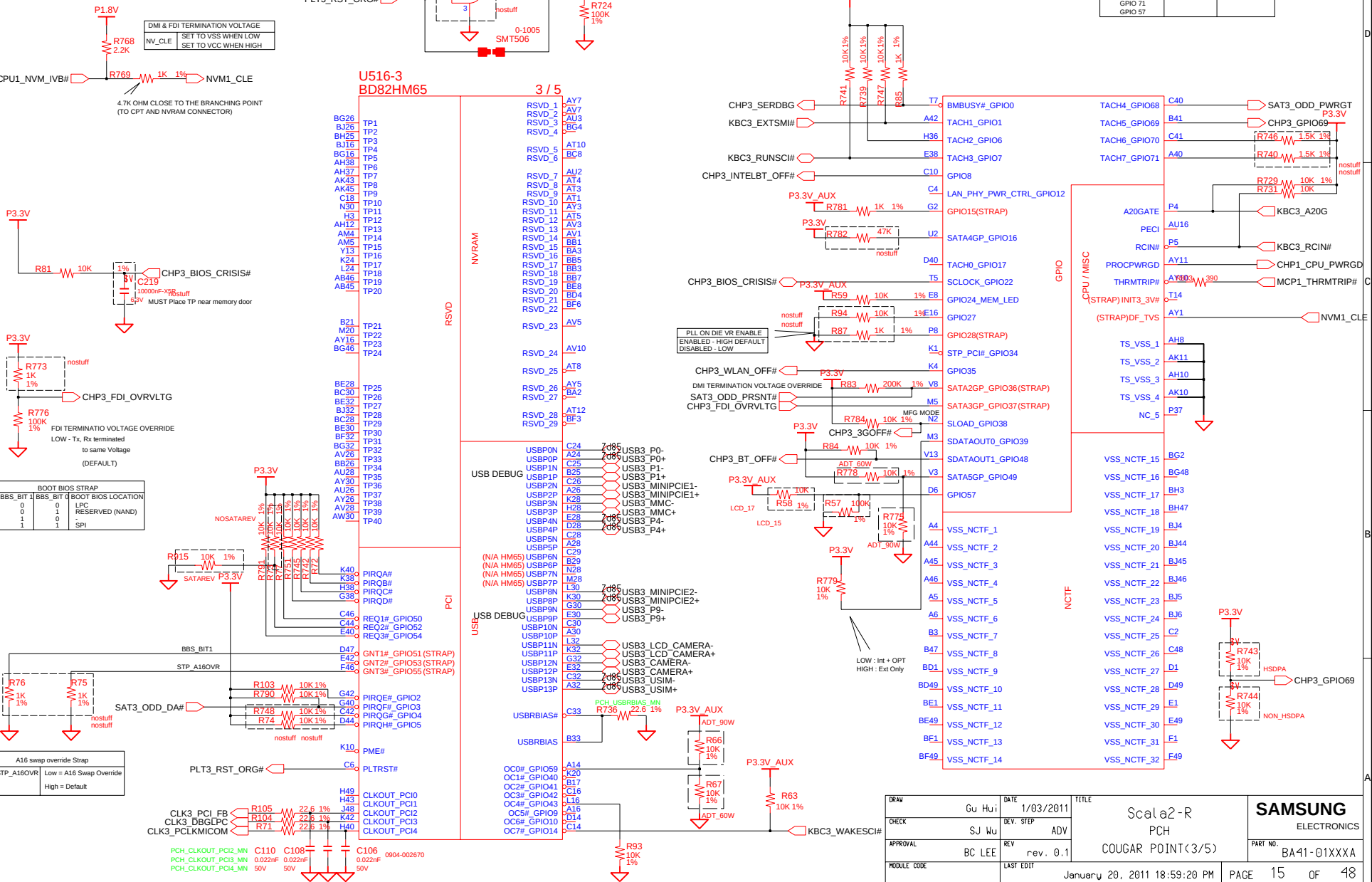
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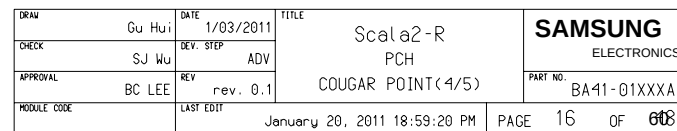
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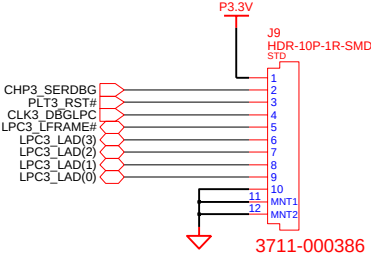
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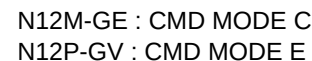
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80H PORT DEBUG

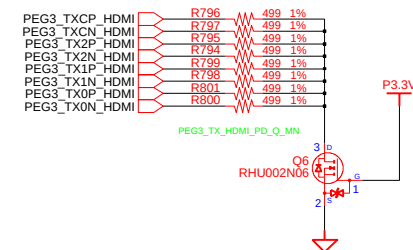
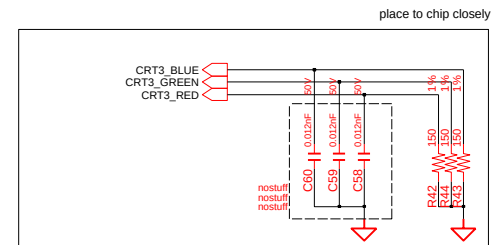
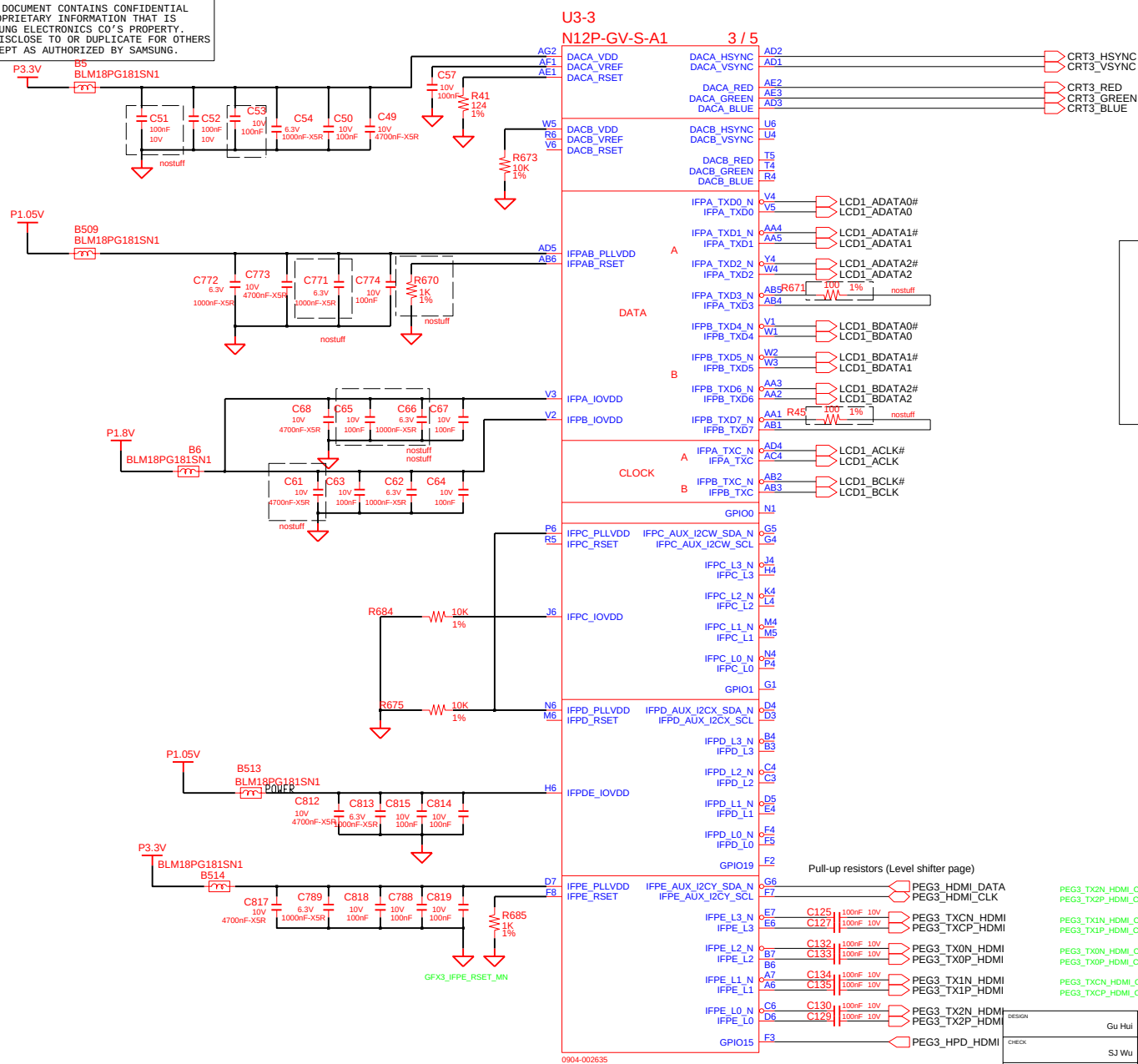


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CHECK	SJ Wu	DEV. STEP	ADV			PART NO. BA41-01XXXXA
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	18	OF 48

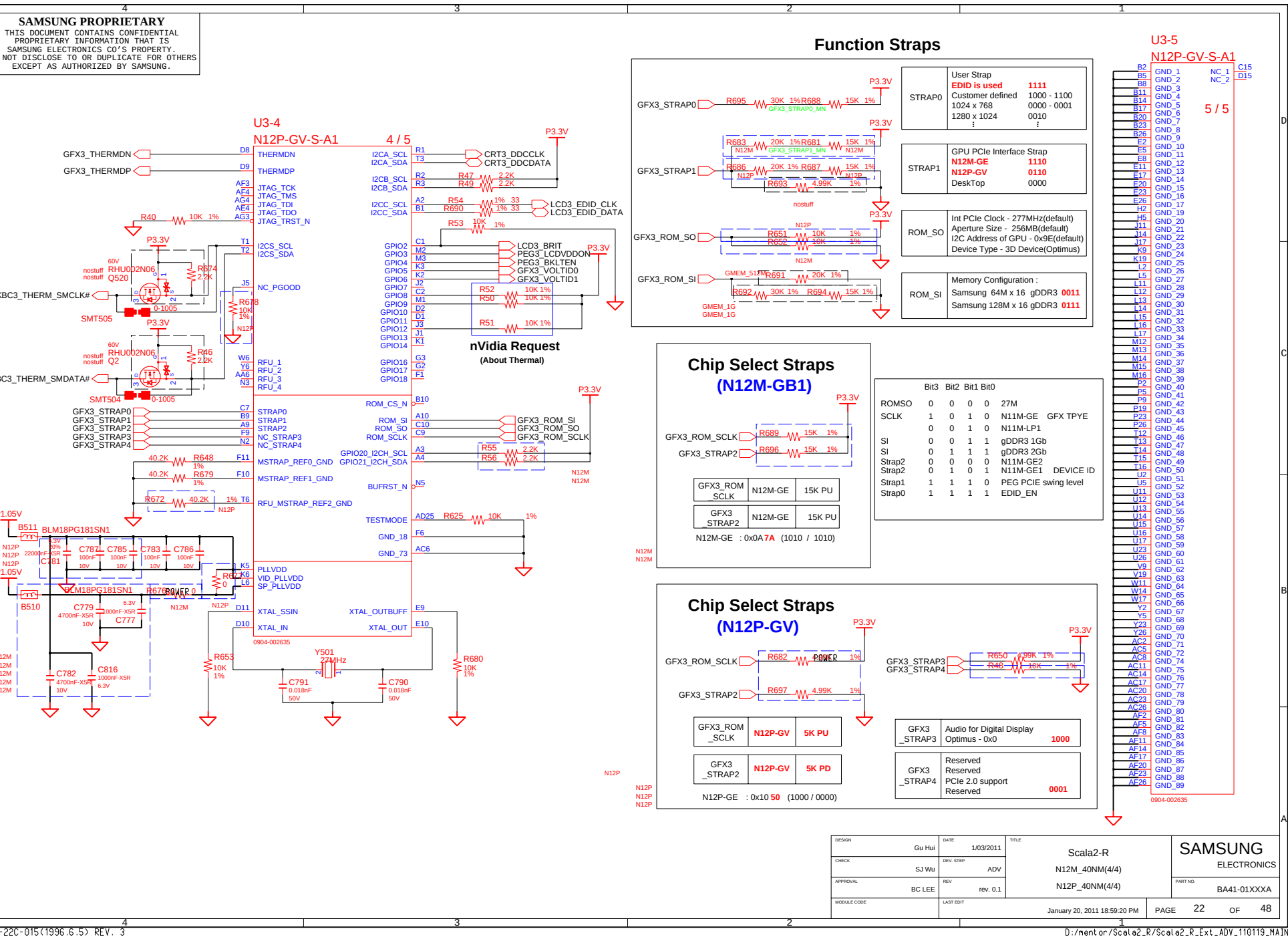
P1 5V

D:/mentor/Scale2_R/Scale2_R_Ext_ADV_110119_MAIN

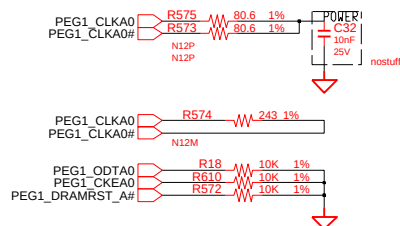
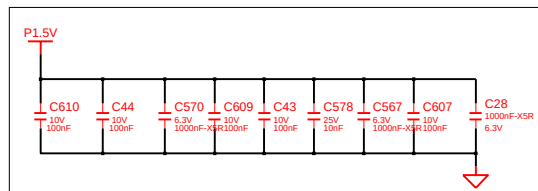
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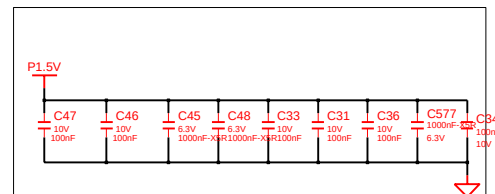
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	CHECK	SJ WU	DEV. STEP	ADV						
	APPROVAL	BC LEE	REV	REV. 0.1						
	PART NO.		BA41-01XXXX							
MODULE CODE			LAST EDIT			January 20, 2011 18:59:20 PM	PAGE	21	OF	48



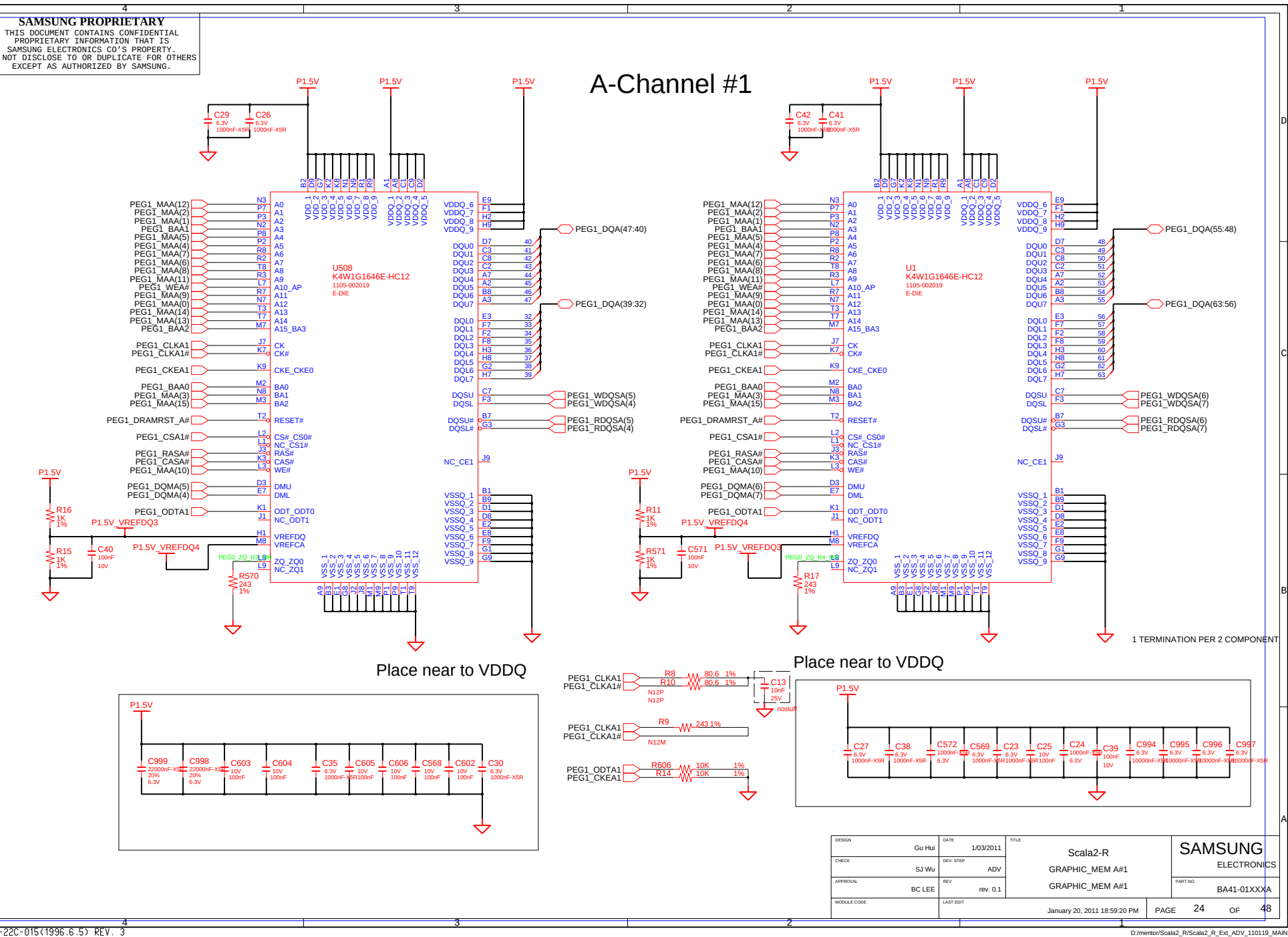
A-Channel #0



Place near to VDDQ



-22C-015(1996.6.5) REV. 3

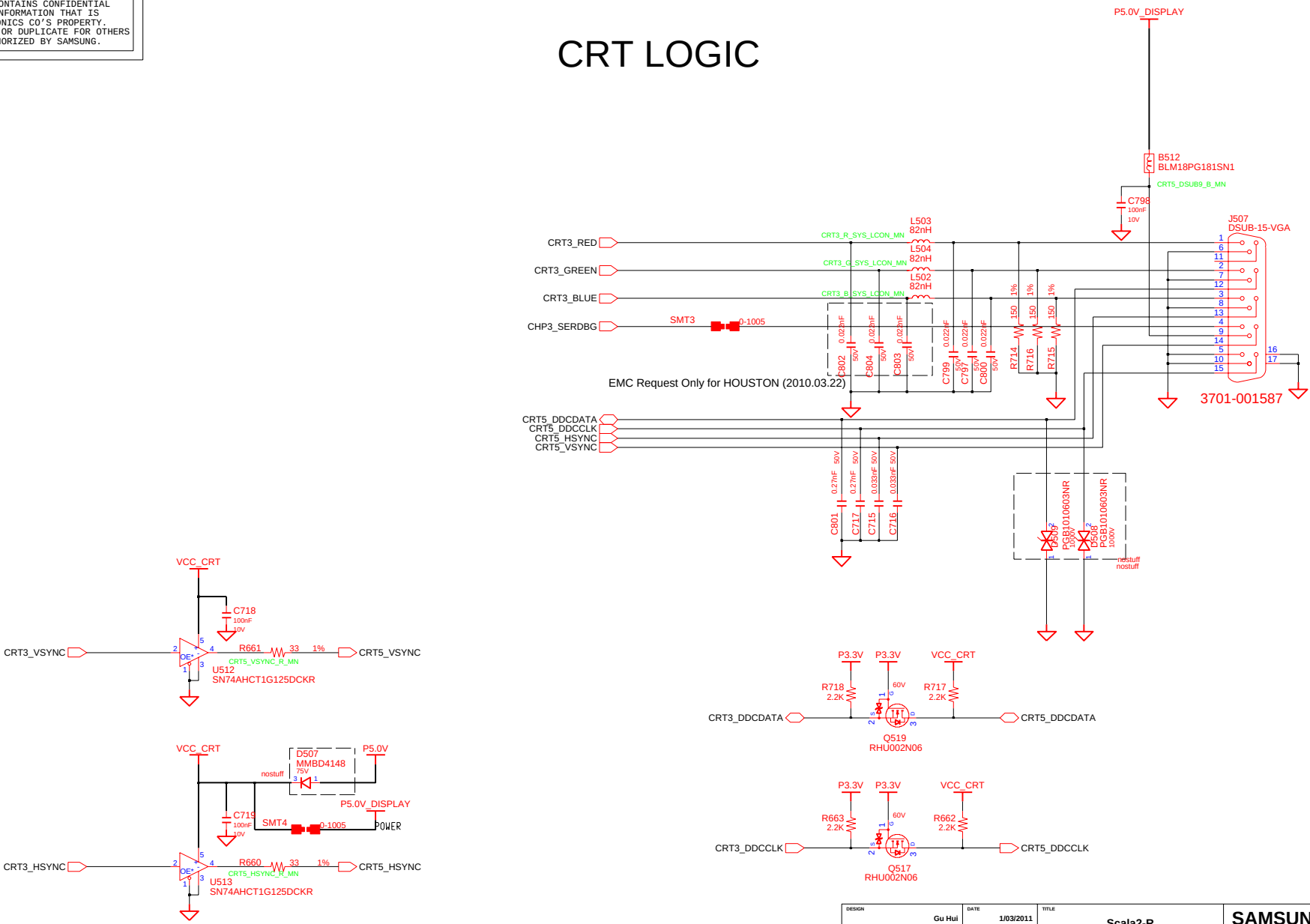


NOTE : Place R20 close to connector to minimize stub

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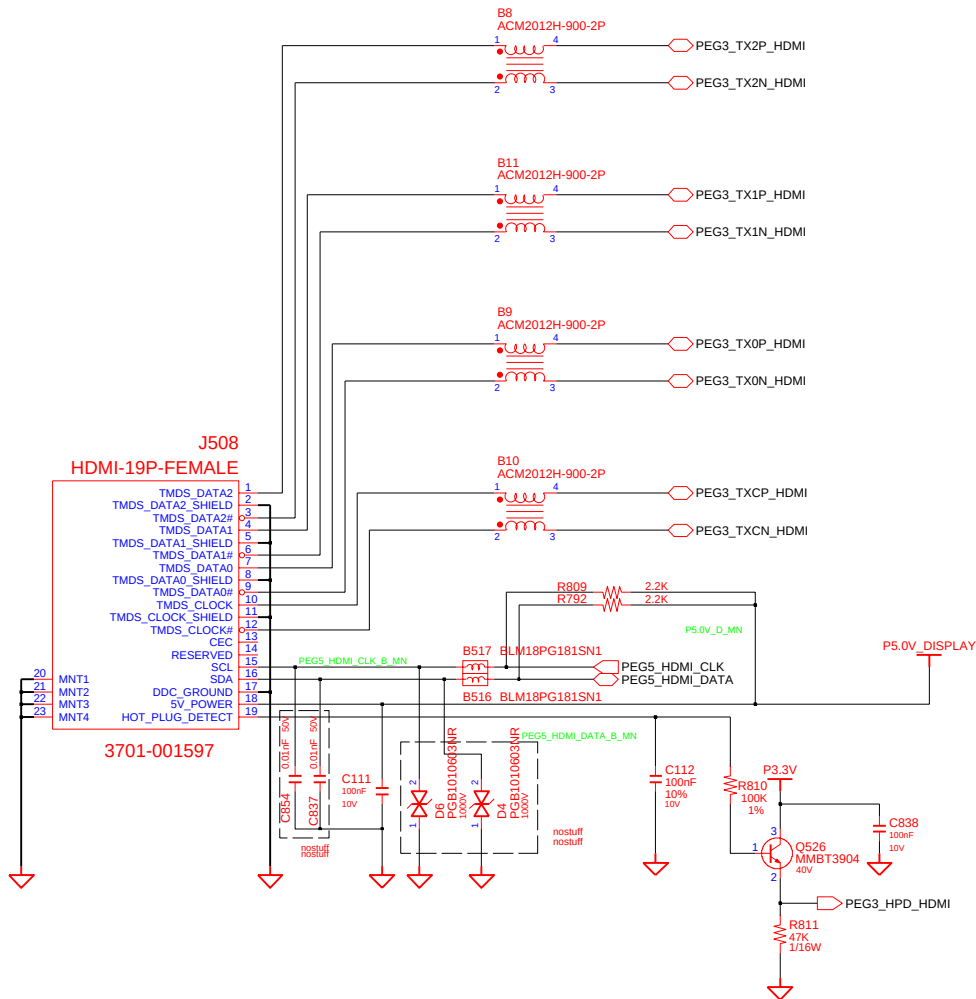
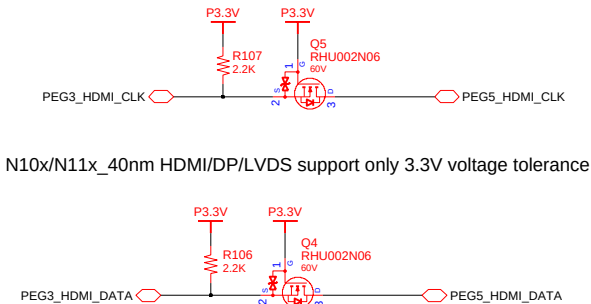
CRT LOGIC



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CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	CRT		
MODULE CODE		LAST EDIT				
					January 20, 2011 18:59:20 PM	PAGE 26 OF 48

HDMI Graphic

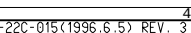
FOR HDMI VERIFICATION TEST



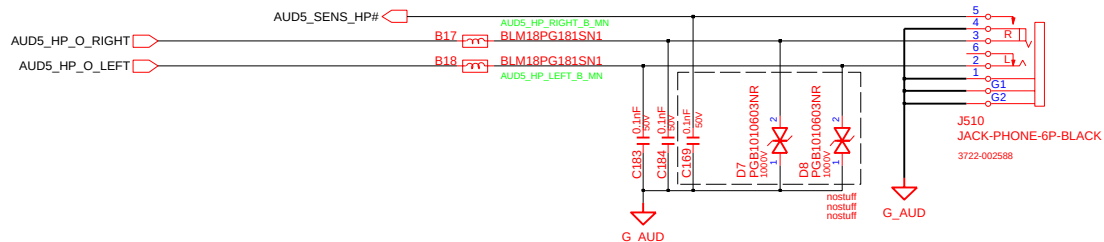
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CHECK	SJ Wu	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	BC LEE	REV	rev. 0.1	HDMI		
MODULE CODE		LAST EDIT	January 20, 2011 18:59:20 PM			
PAGE 27 OF 48						PART NO. BA41-01XXXXA

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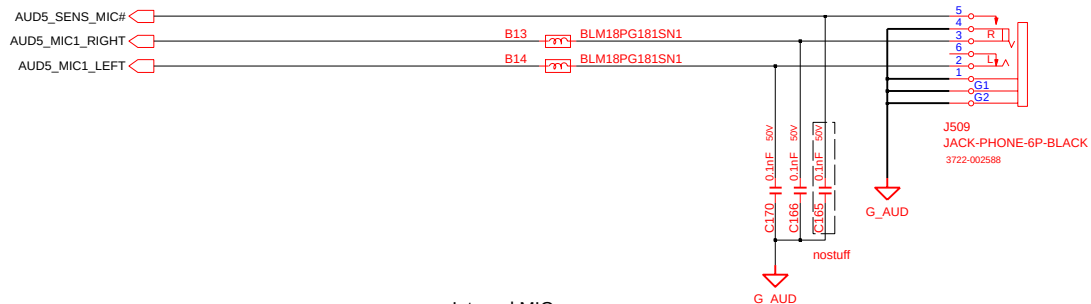
	C
	C
	E
A	

D:/mentor/Scala2_R/Scala2_R Ext ADV 110119 MAIN

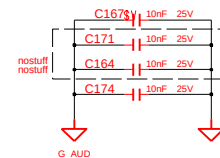
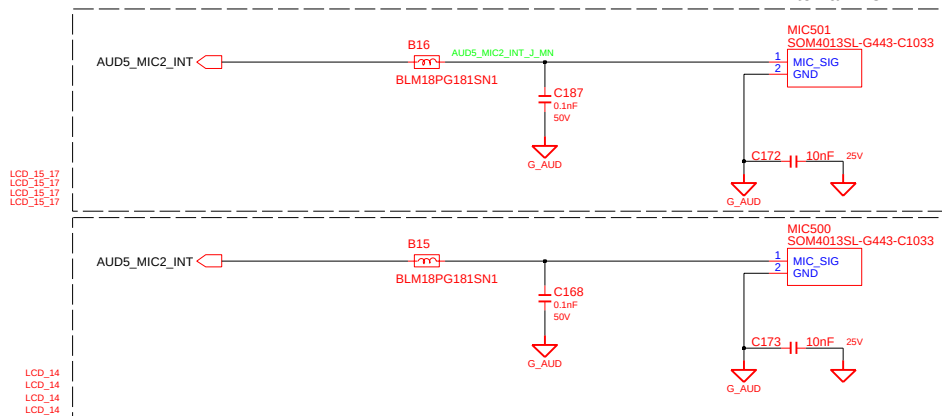
HEADPHONE



MIC JACK



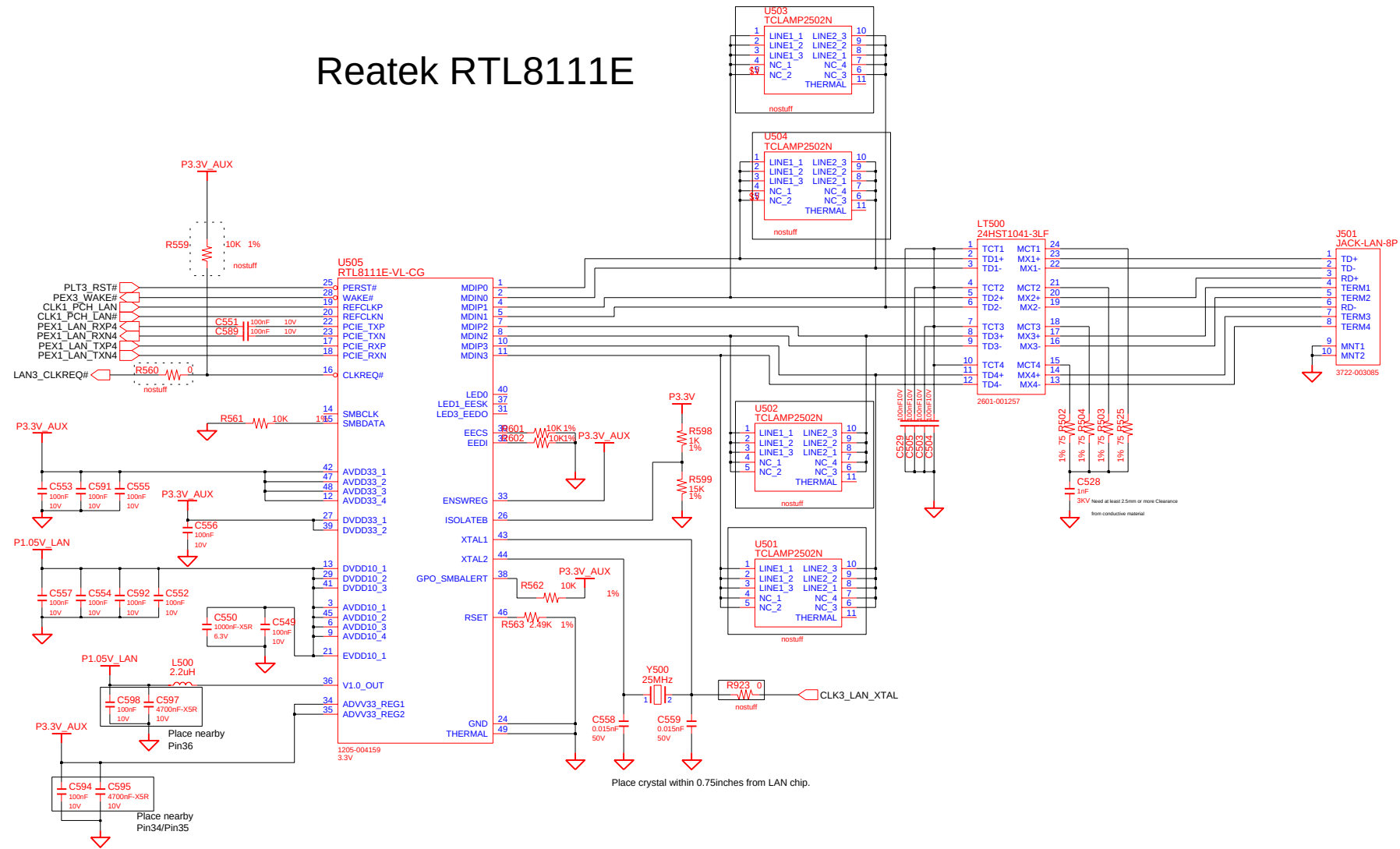
Internal MIC



DESIGN	Gu Hui	DATE	1/03/2011	TITLE Scala2-R HDA_CODEC & LED SUB AUDIO JACK & LED 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 29 OF 48

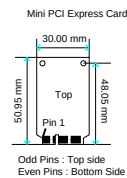
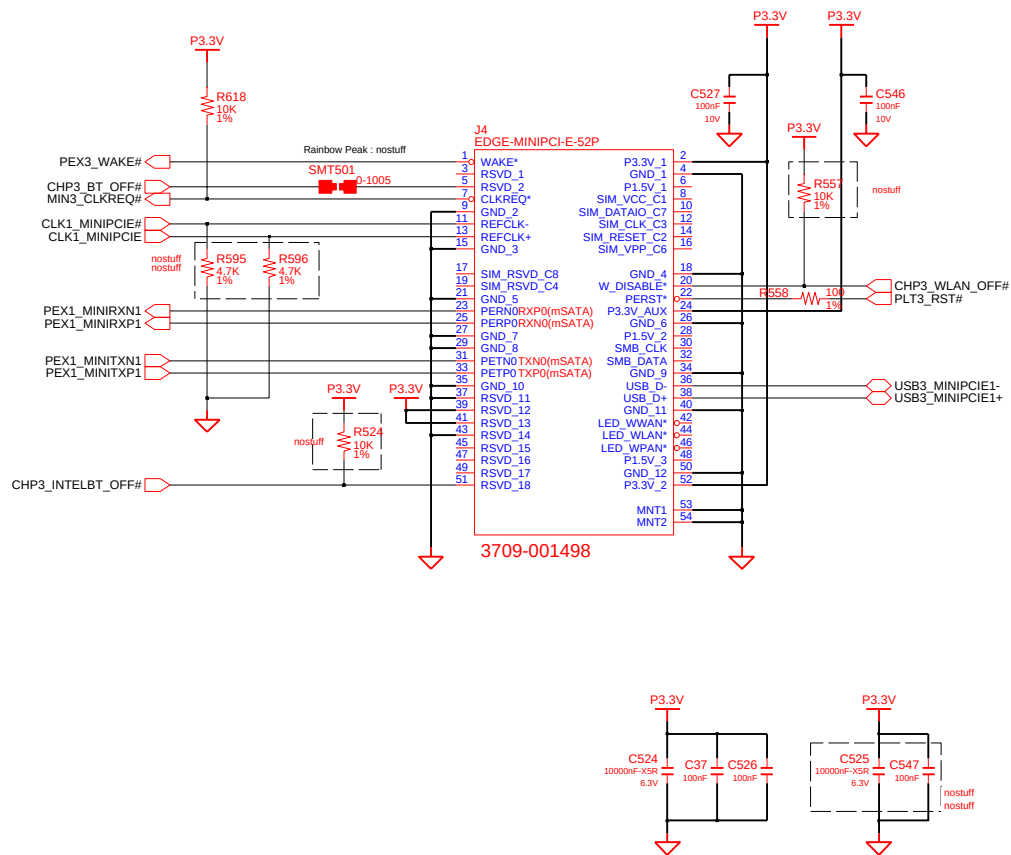
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Reatek RTL8111E



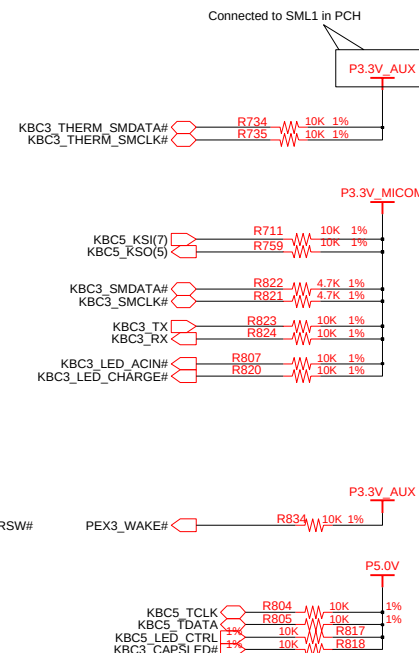
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APPROVAL	BC LEE	REV	rev. 0.1		LAN_Realttek_RTL8111	
MODULE CODE		LAST EDIT				
					January 20, 2011 18:59:20 PM	PAGE 30 OF 48

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

MAIN BOARD (MICOM)



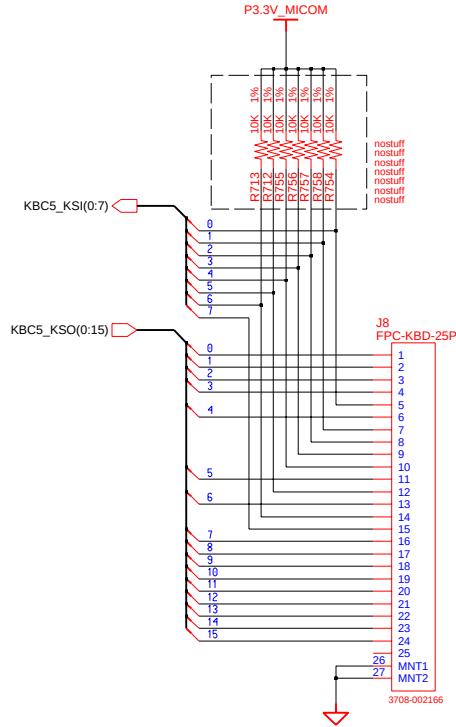
22C-015(1996.6.5) REV. 3	3	2	1
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3

Micom Glue Logic

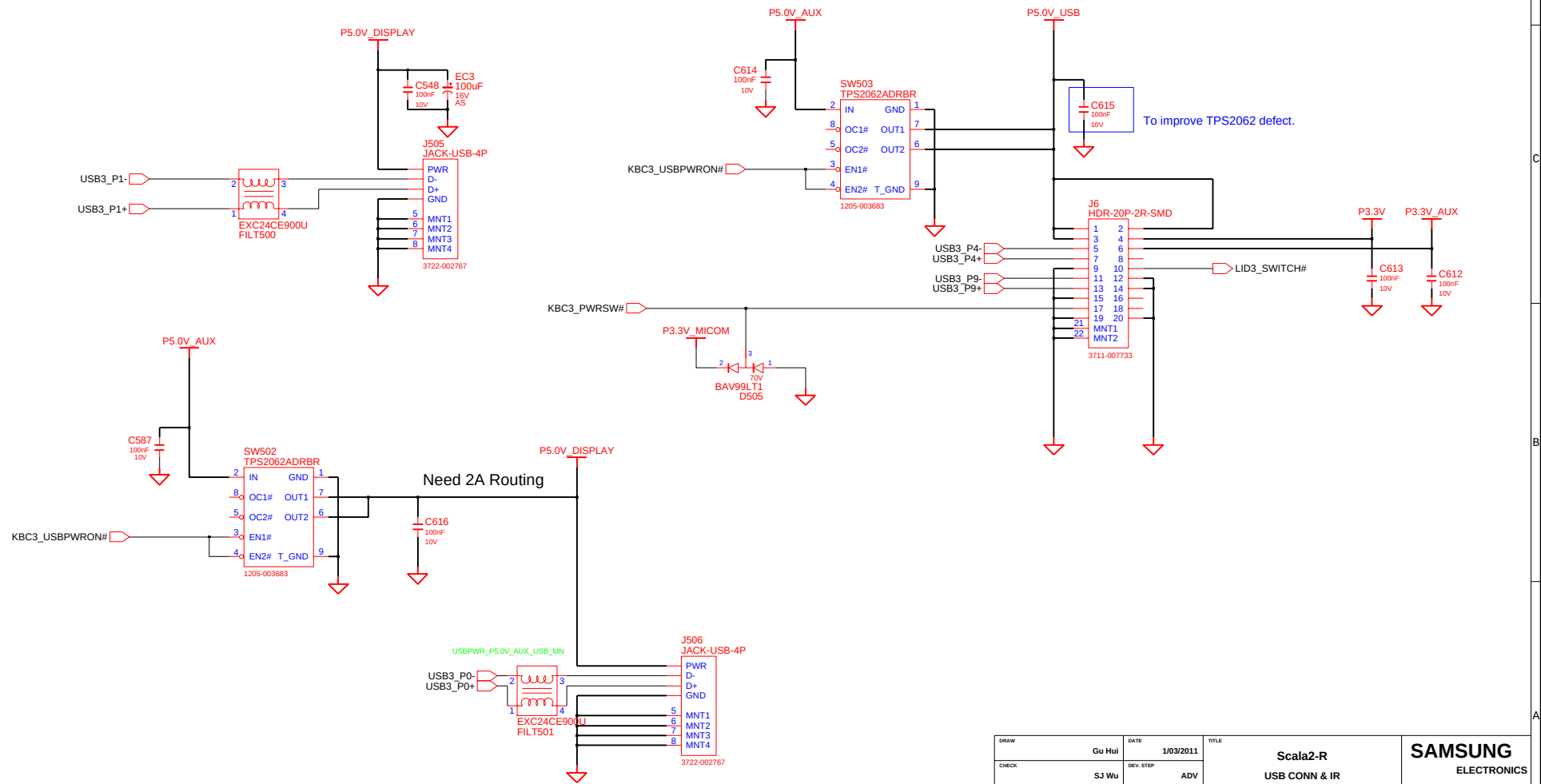
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KEYBOARD



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

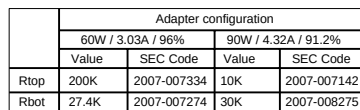
POWER S/W SUB B'D CONNECTOR
MAIN to SUB



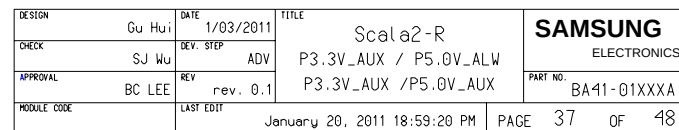
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R USB CONN & IR	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			
APPROVAL	BC LEE	REV	rev. 0.1			PART NO. BA41-01XXXA
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 35	OF 48

CHARGER & POWER MANAGEMENT

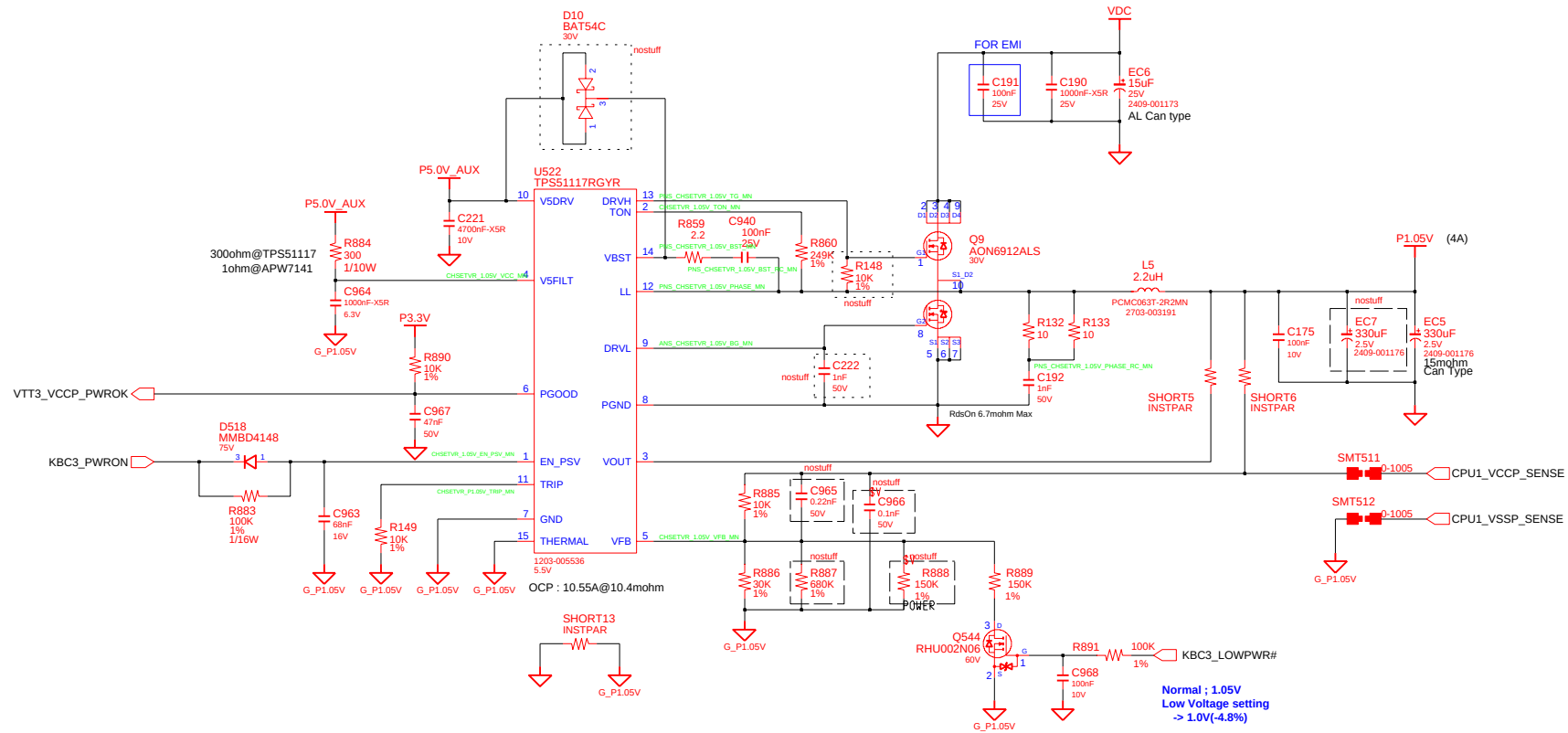
ICHG=2.561A FOR 5200mAh & 4400mAh

22C-015(1996.6.5) REV. 3

P3.3V_AUX & P5.0V_AUX

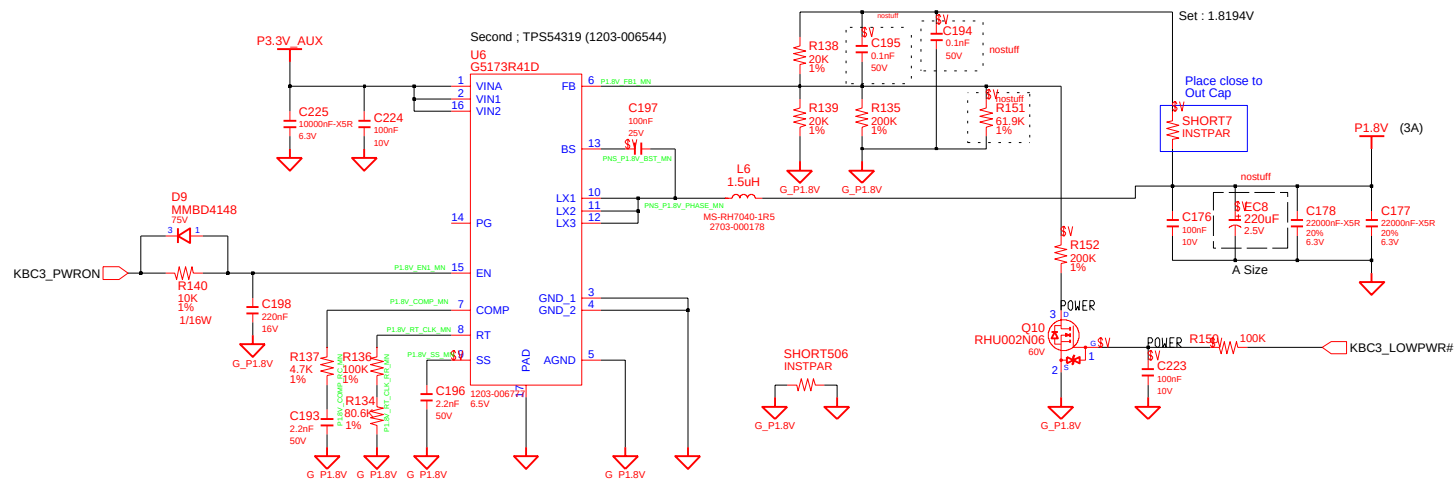


CHIPSET POWER(P1.05V)

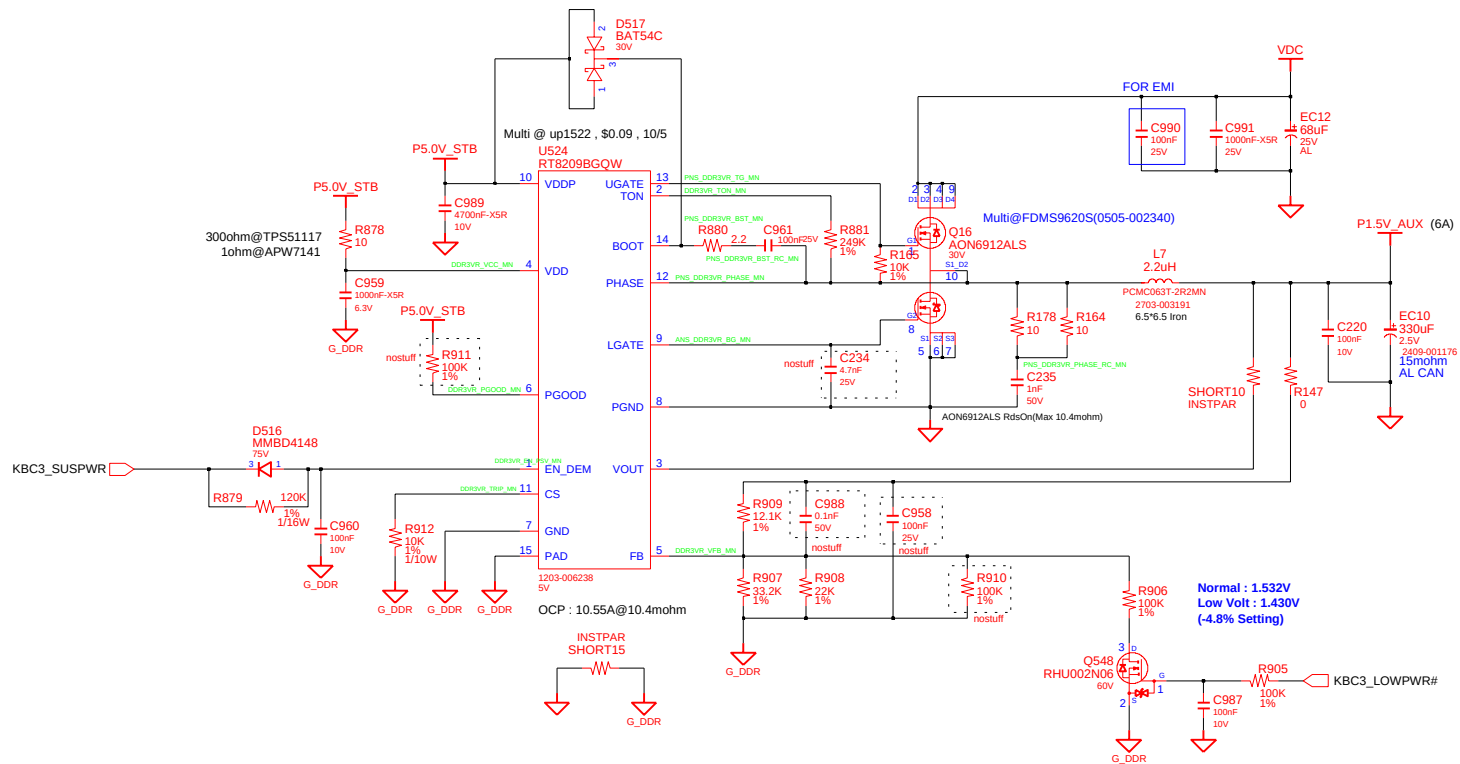


DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R P1.05V P1.05V(Chipset Power)	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV			PART NO. BA41-01XXXXA
APPROVAL	BC LEE	REV	rev. 0.1			
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	38	OF 48

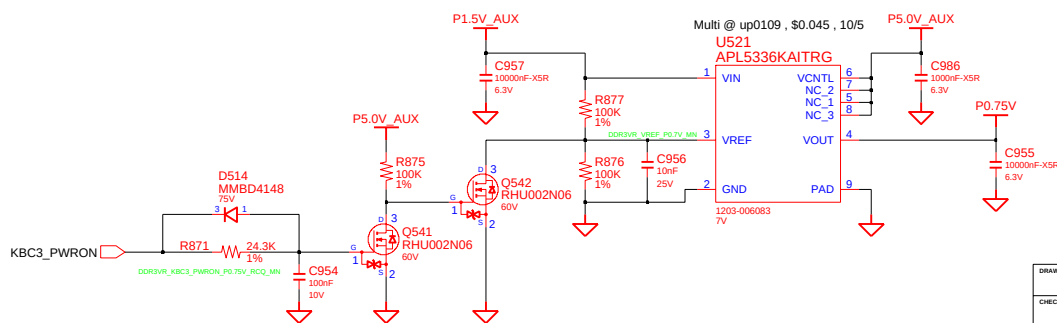
CHIPSET POWER(VCCSA)

D:/mentor/Scale2_R/Scale2_R_Ext_ADV_110119_MAIN

DDR3 Power

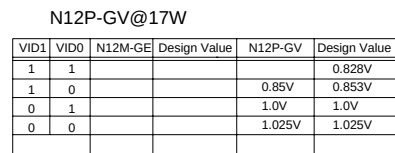


DDR3 VTT(0.75V)



DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG
CHECK	SJ Wu	DEV. STEP	ADV	PWR. MEMORY	DDR3 POWER	ELECTRONICS
APPROVAL	BC LEE	REV	rev. 0.1			PART NO.
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM	PAGE	40	BA41-01XXA
				OF	48	

External GFX Core Power



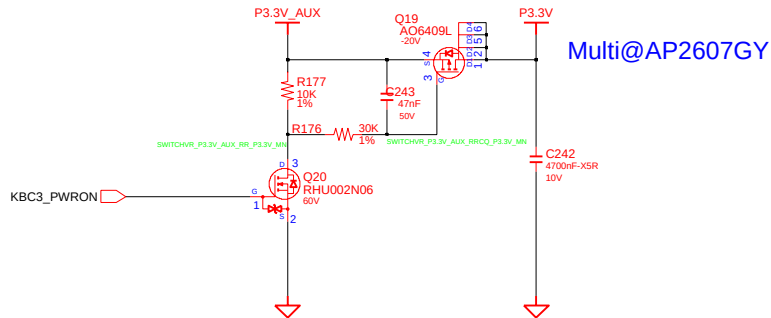
SAMSUNG
ELECTRONICS

PART NO. BA41-01XXXA

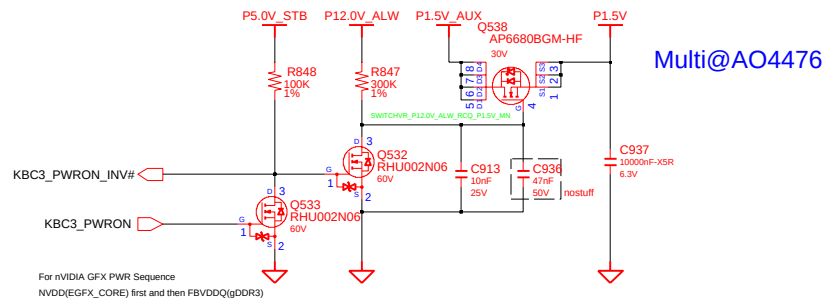
Switched Power

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

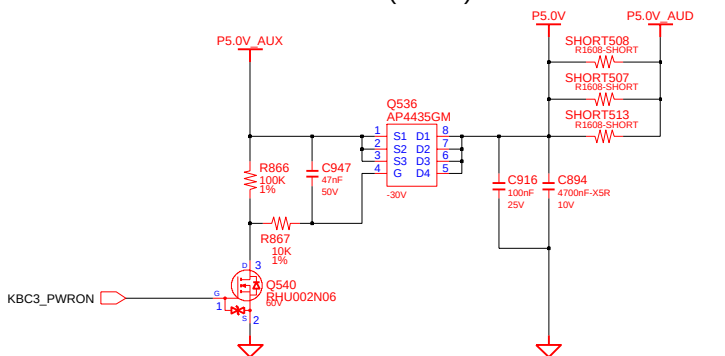
Switched Power On (P3.3V)



Switched Power On (P1.5V)

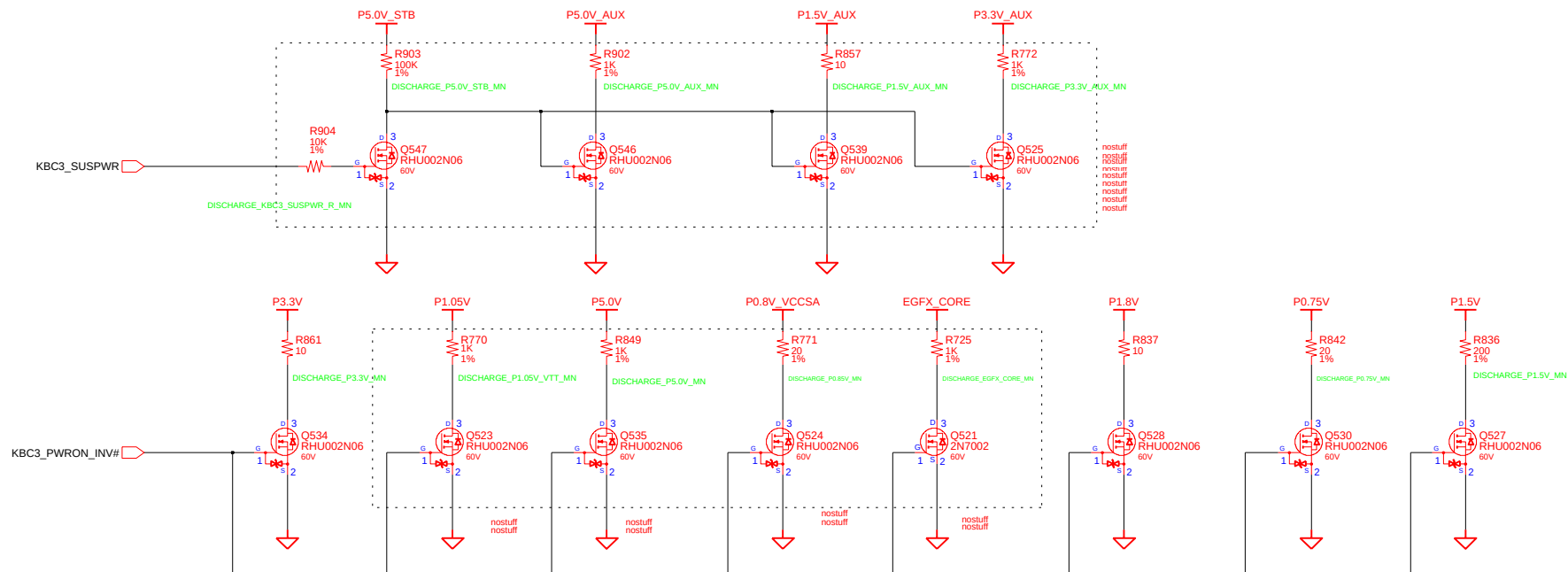


Switched Power On (P5.0V)



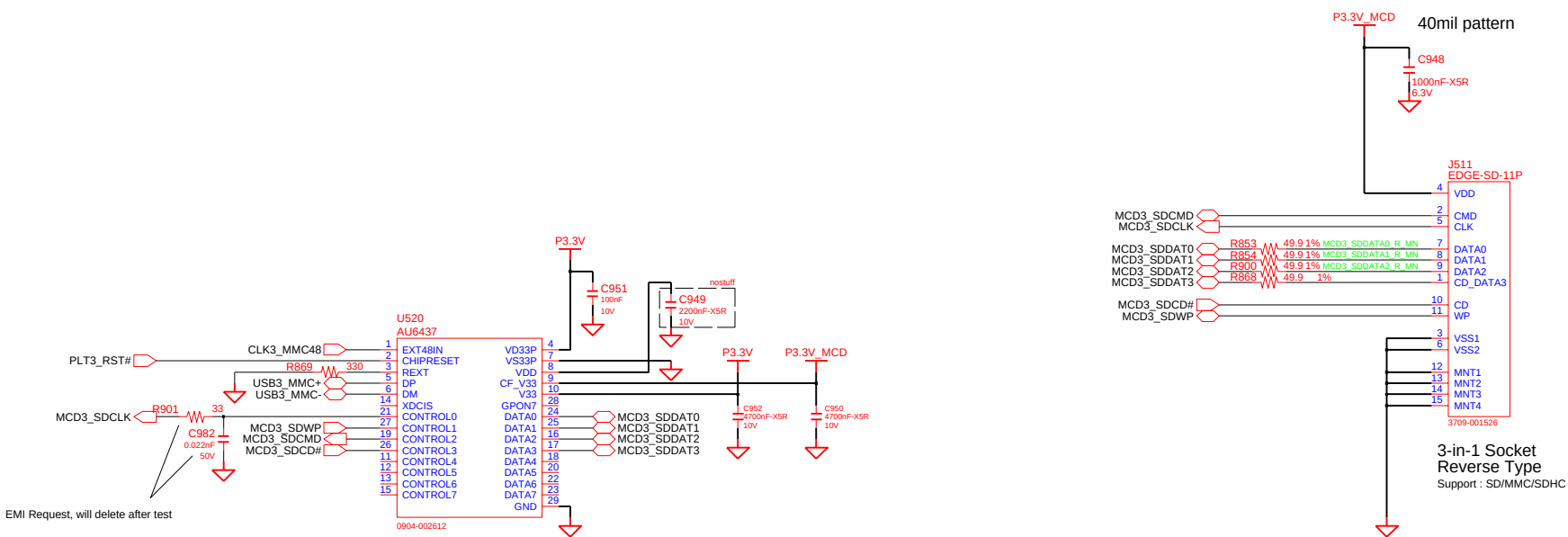
DRAW	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG
CHECK	SJ Wu	DEV. STEP	ADV	PWR_MV_DISCHARGER		ELECTRONICS
APPROVAL	BC LEE	REV	rev. 0.1	SWITCHED POWER		PART NO.
MODULE CODE	undefined	LAST EDIT	January 20, 2011 18:59:20 PM			BA41-01XXXA
				PAGE	43	OF 48

POWER DISCHARGER



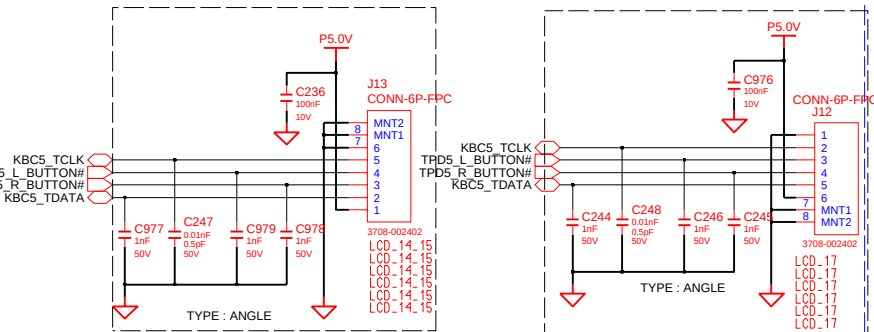
DESIGN	Gu Hui	DATE	1/03/2011	TITLE	Scala2-R	SAMSUNG ELECTRONICS
CHECK	SJ Wu	DEV. STEP	ADV	SUB BOARD1		
APPROVAL	BC LEE	REV	rev. 0.1	Power Discharger	PART NO. BA41-01XXXA	
MODULE CODE		LAST EDIT		January 20, 2011 18:59:20 PM	PAGE 45 OF 48	

AU6437 (4-in-1)

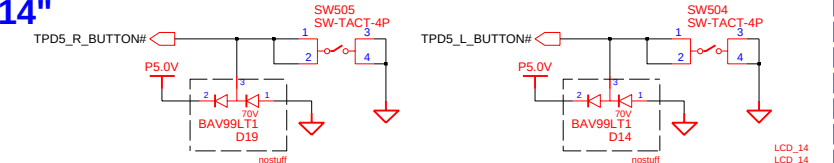


DESIGN	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	ADV	AU 6437	AU 6437	
APPROVAL	BL LEE	REV	rev. 0.3			
MODULE CODE		LAST EDIT	January 18, 2011 08:10:20 AM	PAGE	46 OF 48	

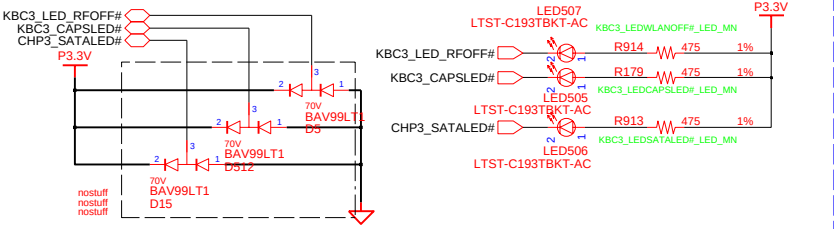
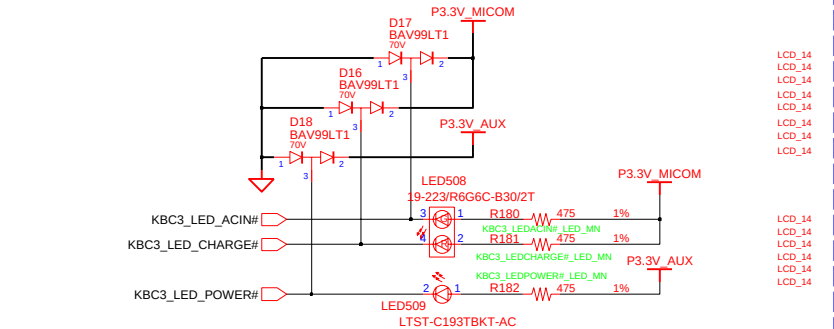
TOUCHPAD



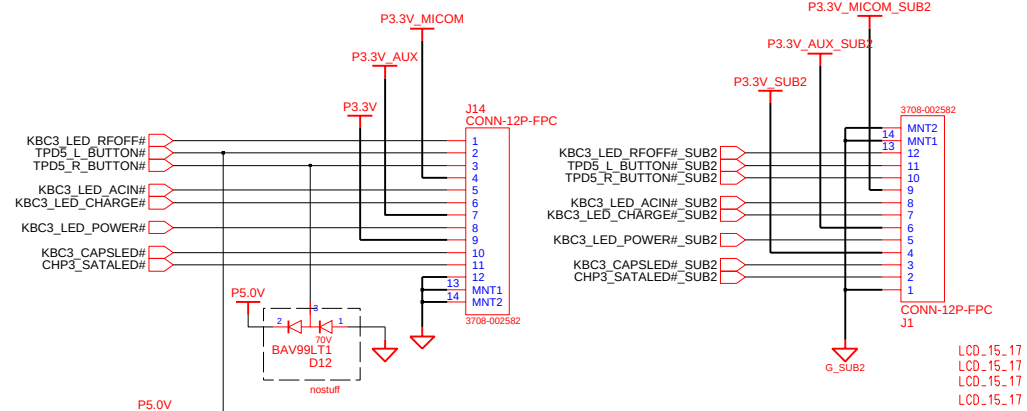
14"



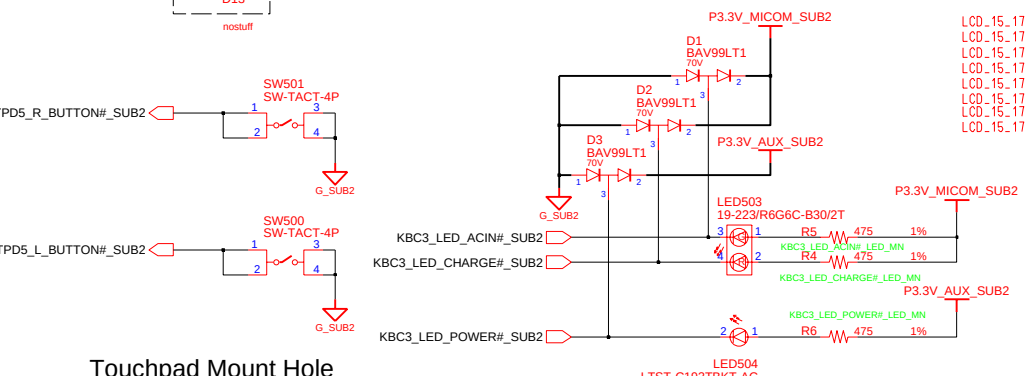
ADAPTERIN/CHARGING LED



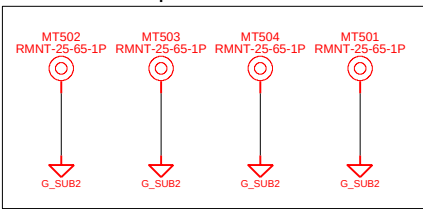
15.6" & 17.3" TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



ADAPTERIN/CHARGING LED

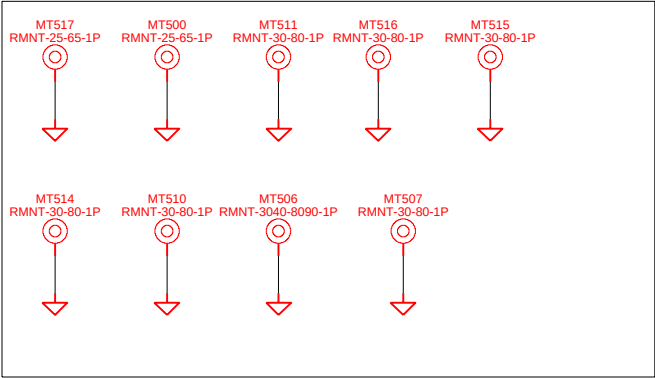


Touchpad Mount Hole

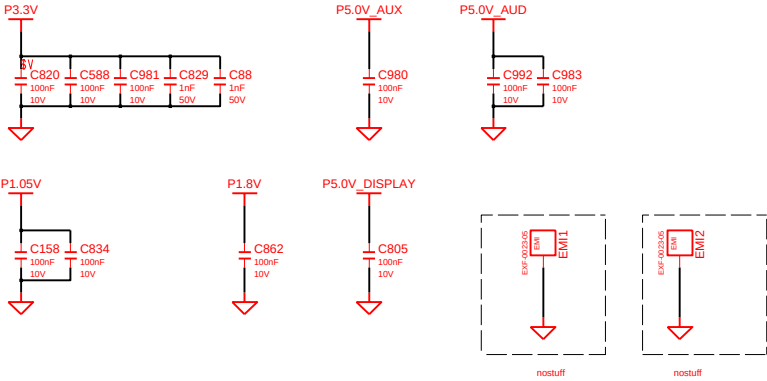
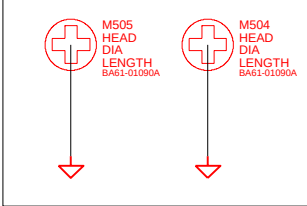


DRAW	MS YANG	DATE	1/03/2011	TITLE	Jinmao-R	SAMSUNG
CHECK	MK KIM	DEV. STEP	ADV	Touchpad	Touchpad	ELECTRONICS
APPROVAL	BL LEE	REV	rev. 0.3			PART NO.
MODULE CODE		LAST EDIT				BA41-01XXA
				January 18, 2011 08:20 AM	PAGE	47 OF 48

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.
						BA41-01XXXX		
MODULE CODE		LAST EDIT		January 18, 2011 08:10:20 AM		PAGE 48 OF 48		