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McLaren-15

CPU : IVY Bridge PGA
Chip Set : Intel Panther Point
GFX : N13P-GT
Remarks : Chief River Platform

Model Name : McLaren-15
PBA Name : MAIN_Quad
PCB Code : BA41-01898A(PTC)
BA41-01899A(GCE)
BA41-01900A(NY)

Dev. Step : PV
Revision : 0.9
T.R. Date : 2011.11.25

Design	CHECK	APPROVAL
SH YOU	SS BAIK	BL LEE

■ Owner : SEC N/P Lab

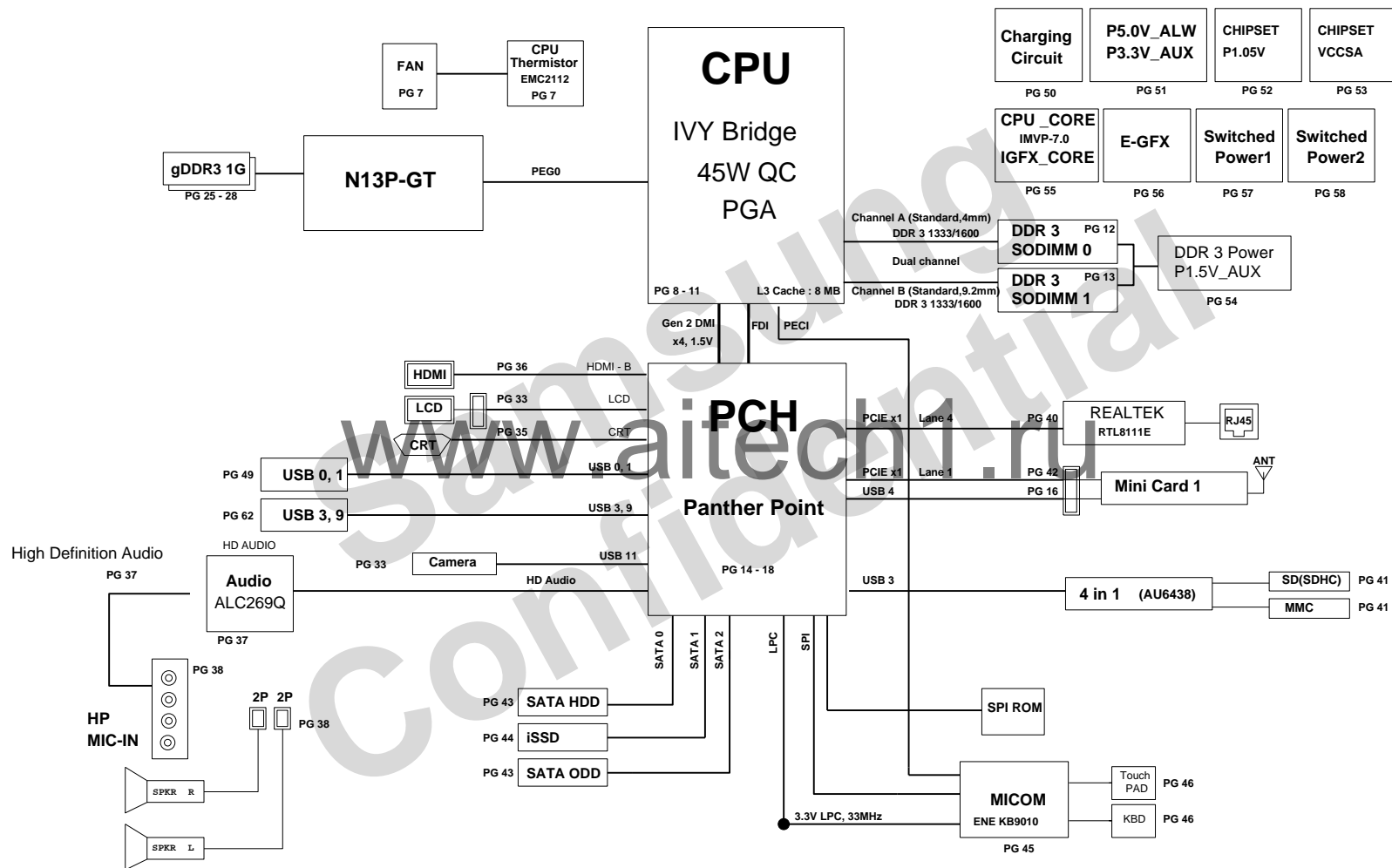
Signature : SH YOU

sheet01 : Cover
sheet02 : BLOCK DIAGRAM
sheet03 : BOARD INFORMATION
sheet04 : POWER DIAGRAM
sheet05 : CLOCK DISTRIBUTION
sheet06 : Green Clock
sheet07 : Thermal Sensor
sheet08 : CPU-IvyBridge
sheet09 : CPU-IvyBridge
sheet10 : CPU-IvyBridge
sheet11 : CPU-IvyBridge
sheet12 : DDR3 SODIMM #0
sheet13 : DDR3 SODIMM #1
sheet14 : PCH-PantherPoint
sheet15 : PCH-PantherPoint
sheet16 : PCH-PantherPoint
sheet17 : PCH-PantherPoint
sheet18 : PCH-PantherPoint
sheet19 : N13P-GT
sheet20 : N13P-GT
sheet21 : N13P-GT
sheet22 : N13P-GT
sheet23 : N13P-GT
sheet24 : STRAP
sheet25 : GFX memory
sheet26 : GFX memory
sheet27 : GFX memory
sheet28 : GFX memory
sheet33 : LVDS/CAMERA
sheet34 : 80 Port
sheet35 : CRT
sheet36 : HDMI
sheet37 : Audio - ALC269
sheet38 : Audio - HP/MIC/Woofers Amp
sheet39 : Audio - Stereo Amp
sheet40 : LAN (Realtek RTL8111E)
sheet41 : 4-in-1 card (AU6437)
sheet42 : WLAN
sheet43 : SATA interface
sheet44 : iSSD
sheet45 : MICOM / BIOS
sheet46 : MICOM Glue Logic (KBD / TP)
sheet47 : LED for 15"
sheet48 : 2 USB 2.0
sheet49 : USB 3.0 connector
sheet50 : Power - charger
sheet51 : Power - P3.3V_AUX / P5.0V_ALW
sheet52 : Power - P1.05V (Chipset Power)
sheet53 : Power - VCCSA (Chipset Power)
sheet54 : Power - DDR3
sheet55 : Power - CPU VRM
sheet56 : Power - EGFX_CORE
sheet57 : Power - Switched Power 1
sheet58 : Power - Switched Power 2
sheet59 : Power - Switched Power for iSSD
sheet60 : Power - Power Discharge
sheet61 : Mount Hole / Thermal Hole
sheet62 : USB Sub B'D (15")
sheet63 : USB Sub B'D (17")

DRAW	SH, YOU	DATE	3/11/2011	TITLE	McLaren-15_QUAD	SAMSUNG
CHECK	SS, BAIK	DEV. STEP	PV	MAIN		ELECTRONICS
APPROVAL	BL, LEE	REV	REV 0.9	COVER		PART NO. BA41-01898A
MODULE CODE		LAST EDIT	October, 24, 2011 9:57:03 PM	PAGE	1	OF 63

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BLOCK DIAGRAM



DRAW	MS YANG	DATE	3/11/2011	TITLE	McLaren-15_QUAD	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR	MAIN		
APPROVAL	BL LEE	REV	REV 1.0	BLOCK DIAGRAM	PART NO. BA41-01662A	
MODULE CODE	undefined	LAST EDIT			May 20, 2011 21:14:43 PM	PAGE 2 OF 51

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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)	
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	Multi Memory Card Controller	3	NC
3	SYSTEM PORT 2	4	LAN CONTROLLER
4	Mini PCI Express	5	NC
5	NC	6	NC
6	NC	7	NC
7	NC	8	NC
8	NC		
9	SYSTEM PORT 3		
10	NC		
11	Camera(LCD Cable)		
12	NC		
13	NC		

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

Crystal / Oscillator

TYPE	FREQUENCY	DEVICE	USAGE
Crystal	25MHz	ISSD	Express Cache
Crystal	25MHz	GREENCLK	GREENCLK
Crystal	27MHz	N13P-GT	NVIDIA
GREENCLK	32.768KHz	PCH	PCH
GREENCLK	32.768KHz	MICOM	MICOM
GREENCLK	25MHz	PCH	PCH
GREENCLK	25MHz	LAN	LAN

LCD Panel Detect (TBD)

Devices	Resolution	PANNEL_DETECT_0

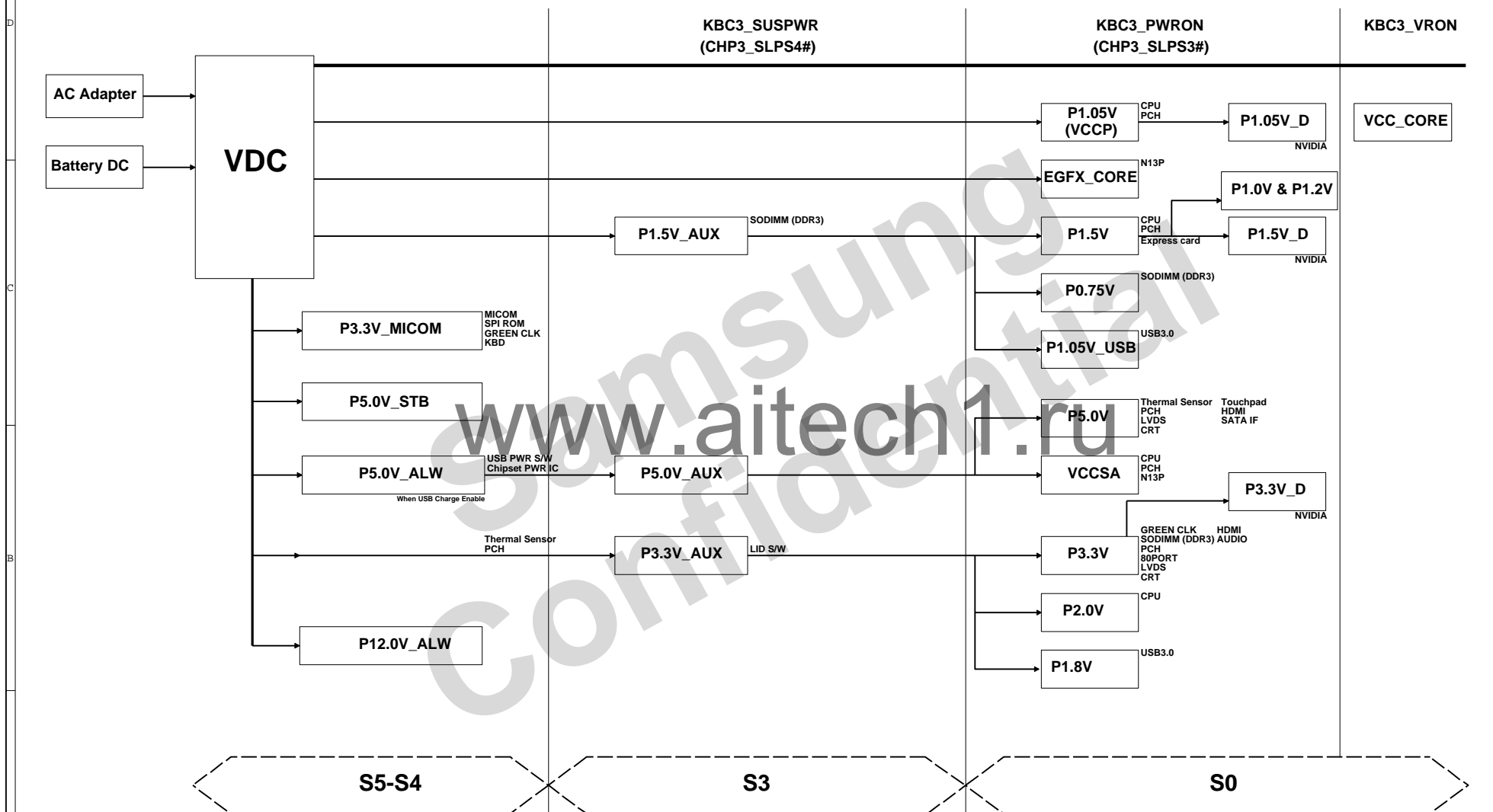
I²C / SMB Address

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	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR		MAIN	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0		BOARD INFO	PART NO. BA41-01662A
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	3	OF 51

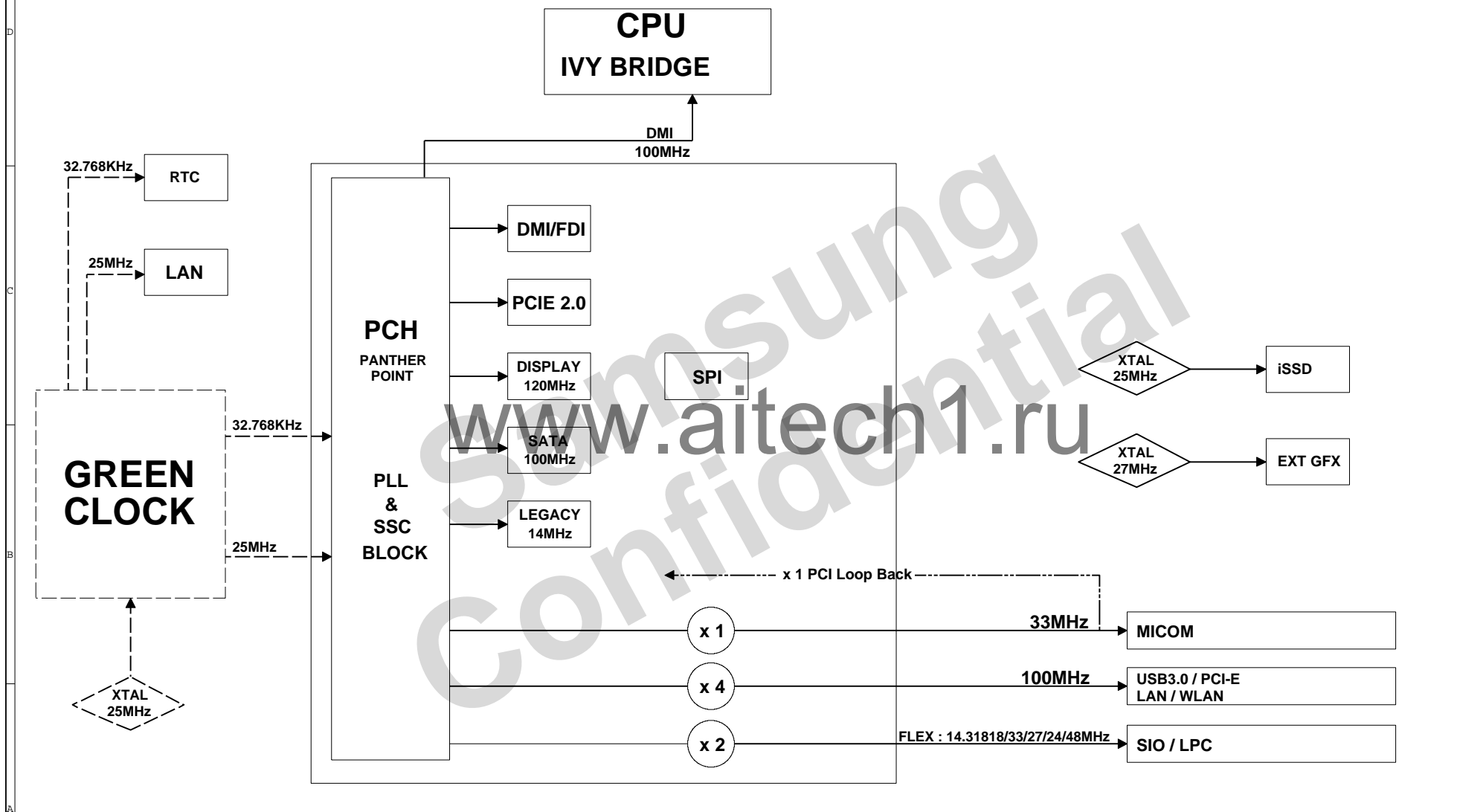
POWER DIAGRAM

Rev 1.0



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	MAIN	POWER DIAGRAM	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0			PART NO.
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	4	OF 51

CLOCK DISTRIBUTION Rev. 1.0



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD MAIN	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR			PART NO. BA41-01662A
APPROVAL	BL LEE	REV	REV 1.0		CLOCK DIAGRAM	
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	5	OF 51

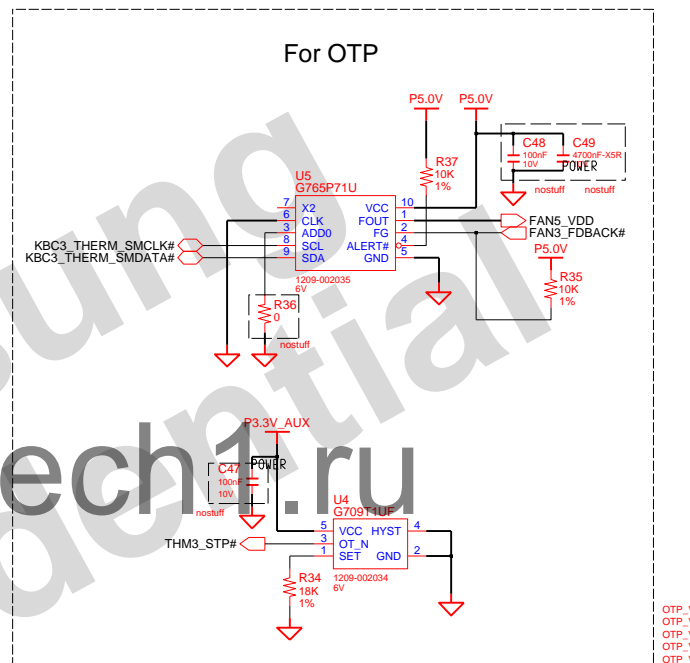
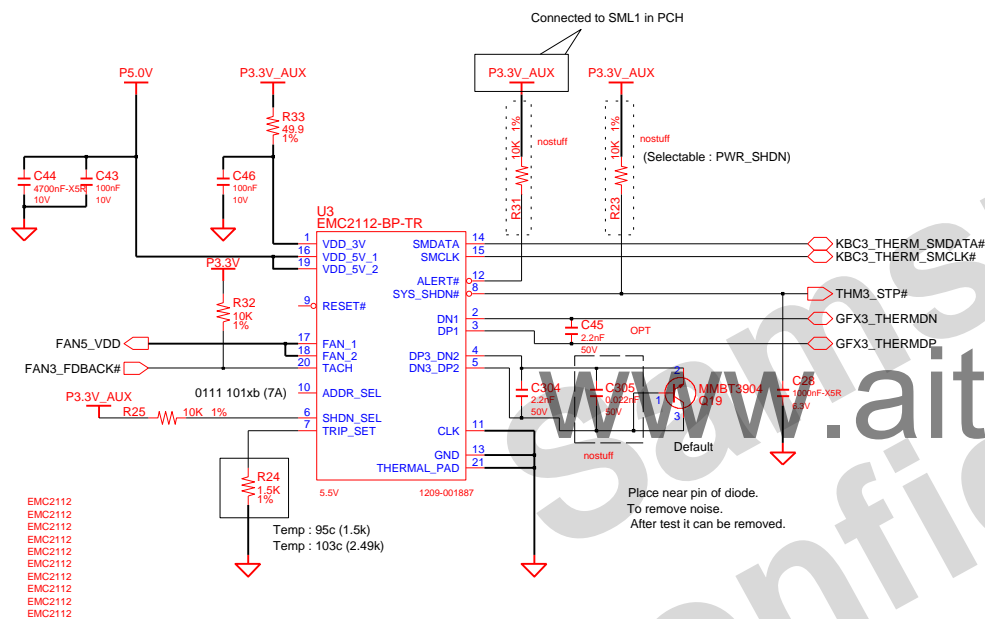
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DRAW	MS YANG	DATE	3/11/2011	TITLE		<div style="text-align: center;"> PETRONAS-15_ QUAD CLOCK CLOCK DISTRIBUTION </div>		<div style="text-align: center;"> SAMSUNG ELECTRONICS </div>	
CHECK	MK KIM	DEV. STEP	PR						
APPROVAL	BL LEE	REV	REV 1.0			PART NO.		BA41-01662A	
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM						
				PAGE	6	OF	51		

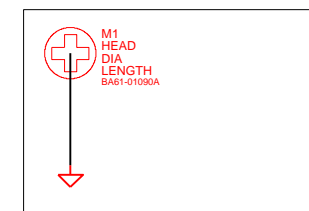
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THERMAL SENSOR & FAN CONTROL

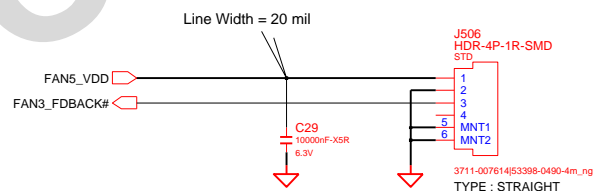


FAN PEM



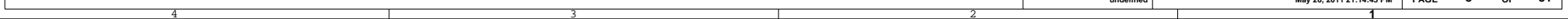
ADDRESSSEL MODE	
0	0101 111xb
✓ HIGH Z	0111 101xb (7A)
1	0101 110xb

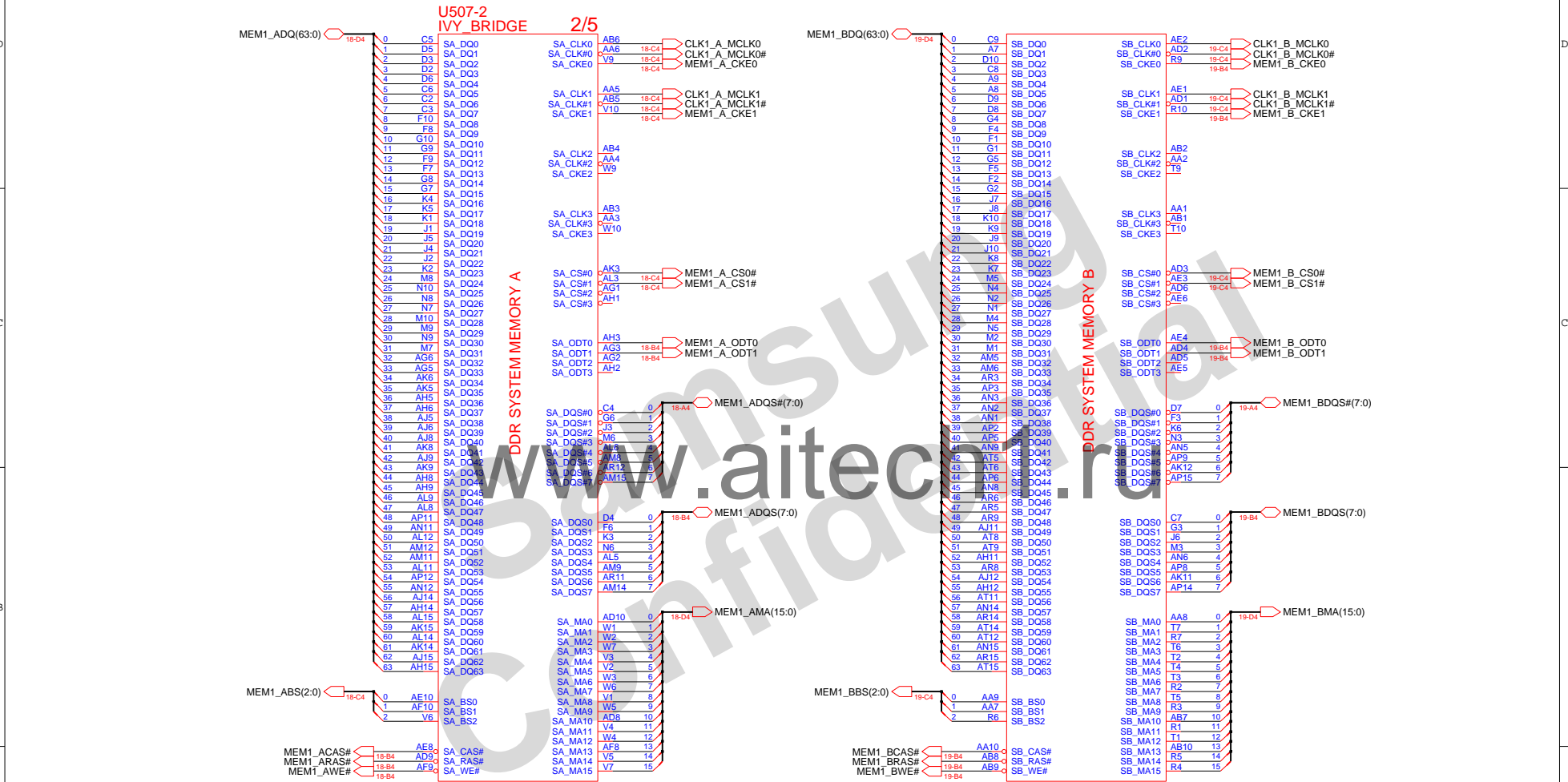
SHDN_SEL MODE	
0	INTEL TR MODE
✓ HIGH Z	AMD CPU/DIODE MODE
1	EXT.DIODE 2 MODE



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD THERMAL SENSOR	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR			
APPROVAL	BL LEE	REV	REV 1.0		THERMAL SENSOR EMC2112	PART NO. BA41-01662A
MODULE CODE		LAST EDIT				

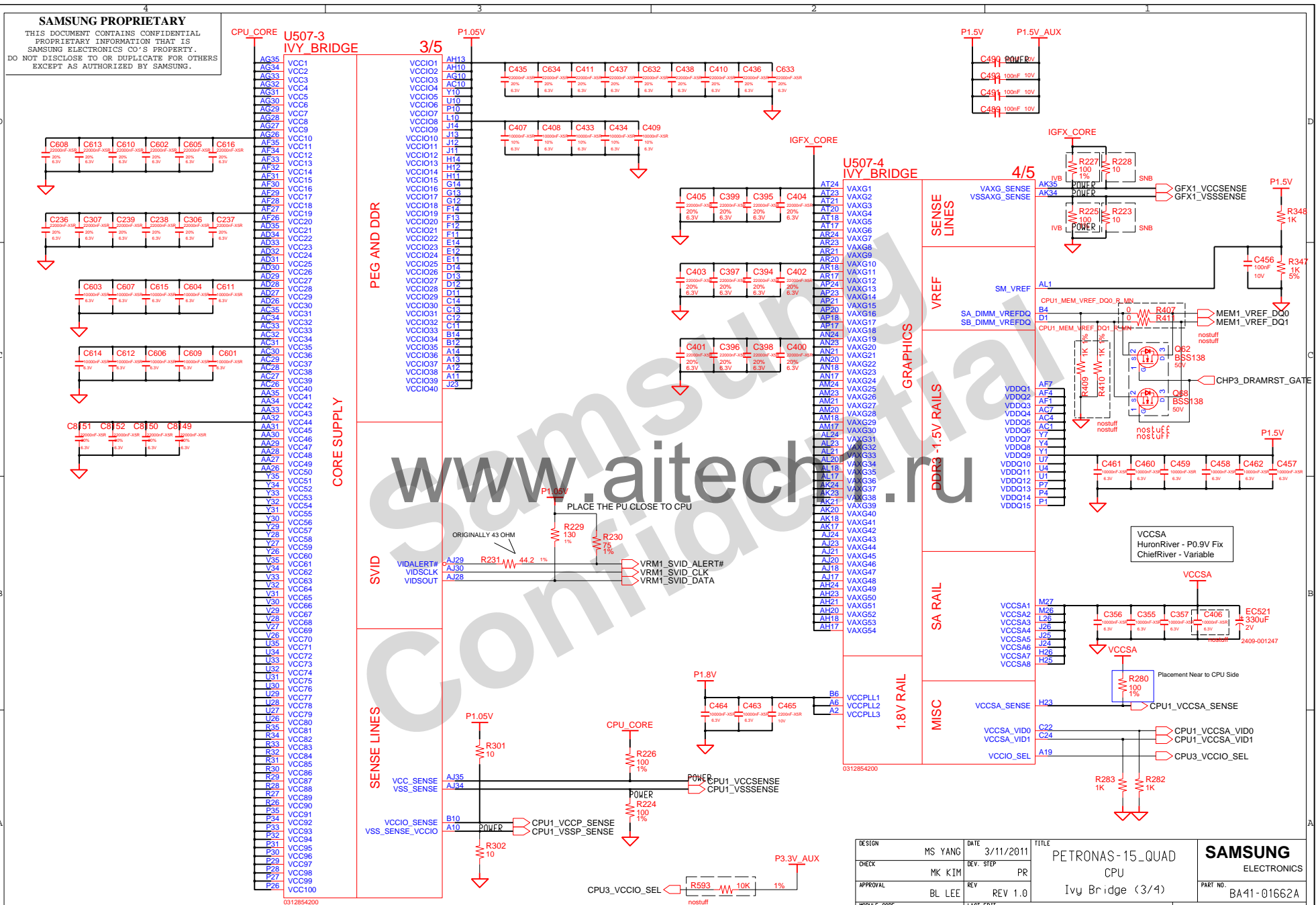
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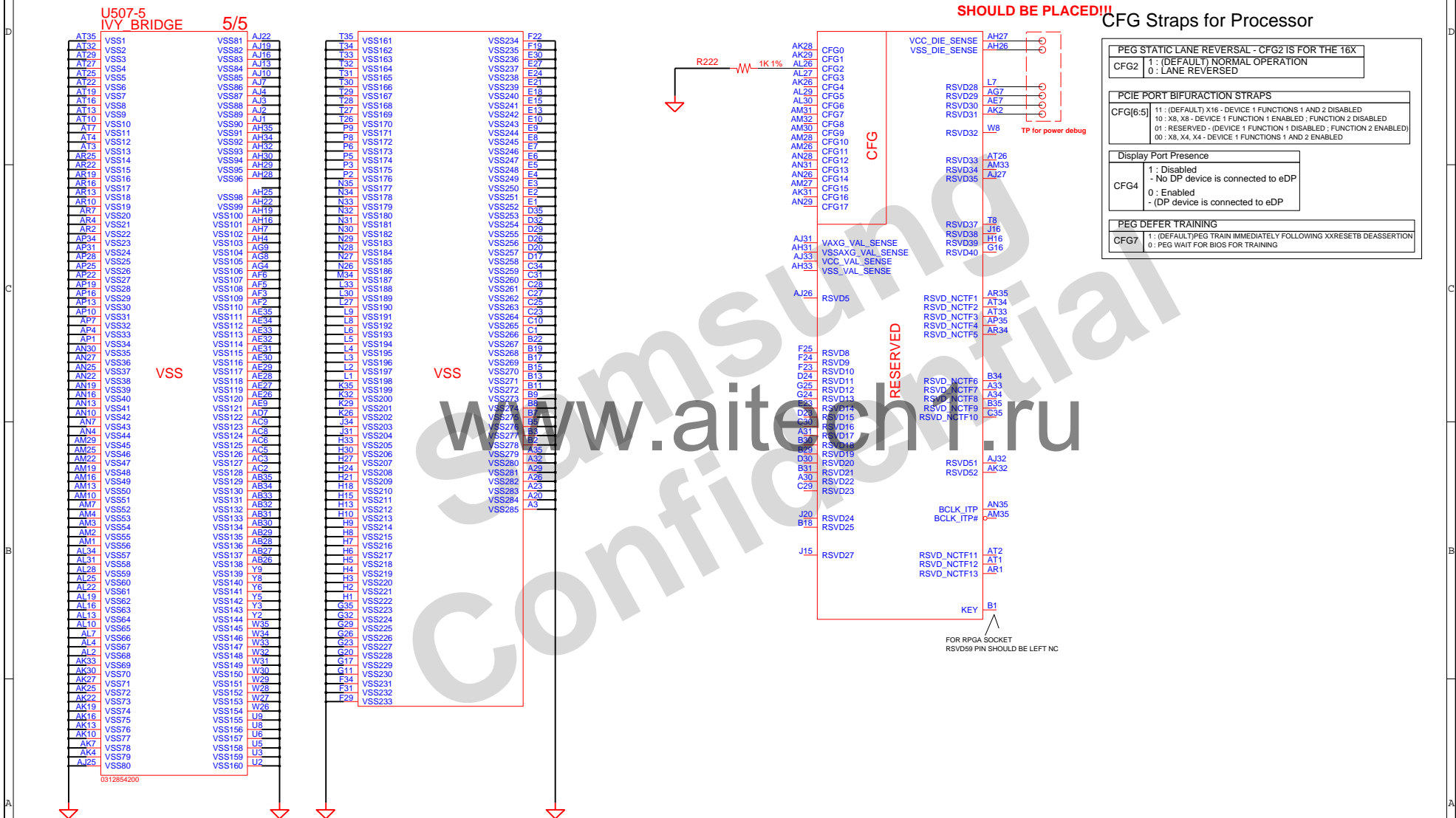


DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	CPU	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.0	Ivy Bridge (2/4)	PART NO.	BA41-01662A
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	9	OF 51

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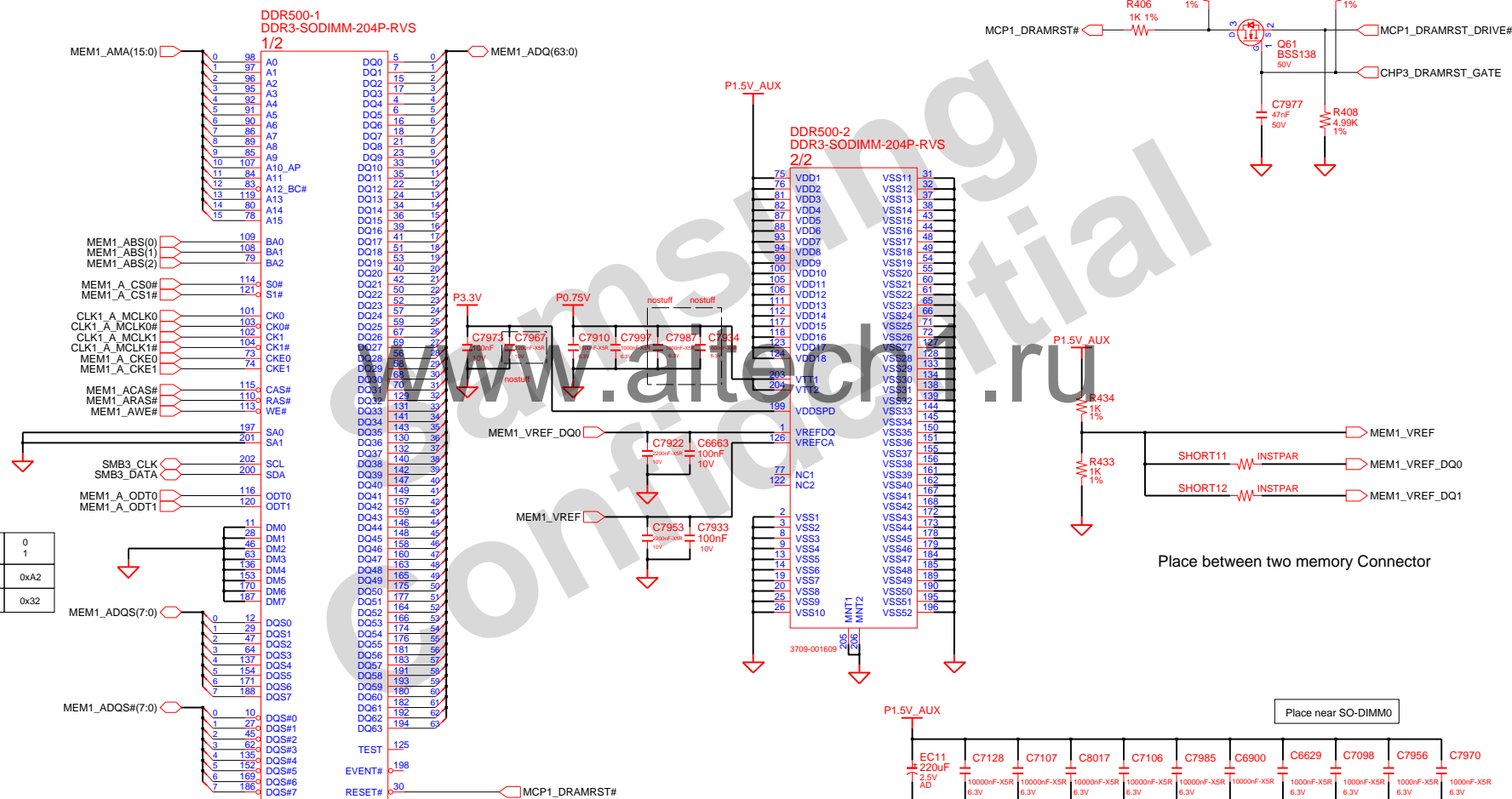
SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001656 (Foxconn)

P/N : 3709-001609 (Concraft)



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR		SODIMM A	
APPROVAL	BL LEE	REV	REV 1.0		DDR3	
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	12 OF 51	

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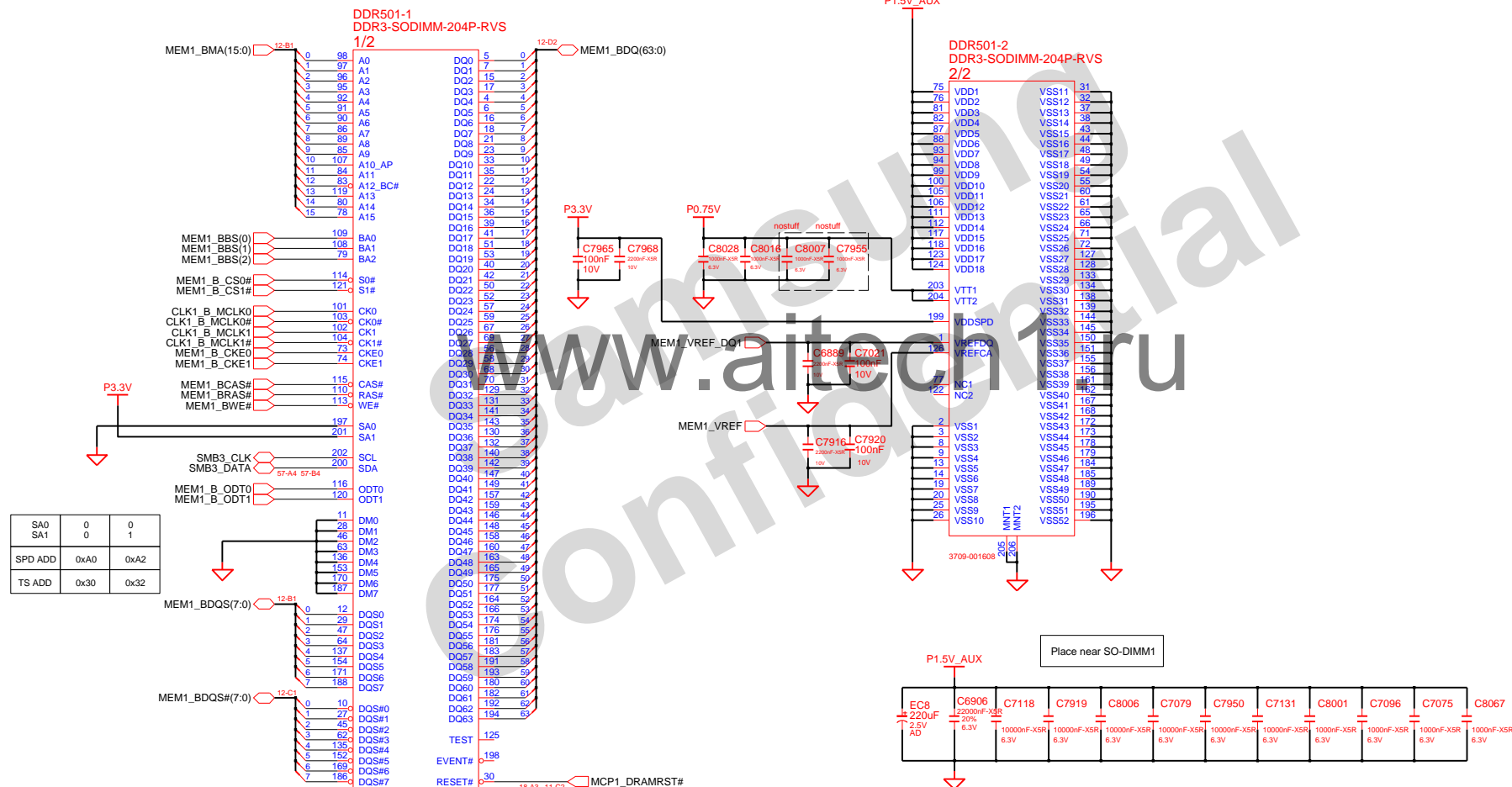
SO-DIMM#1 : 1st SO-DIMM

DDR SO-DIMM #1

Height : 4.0 mm (REVERSE)

P/N : 3709-001654 (Foxconn)

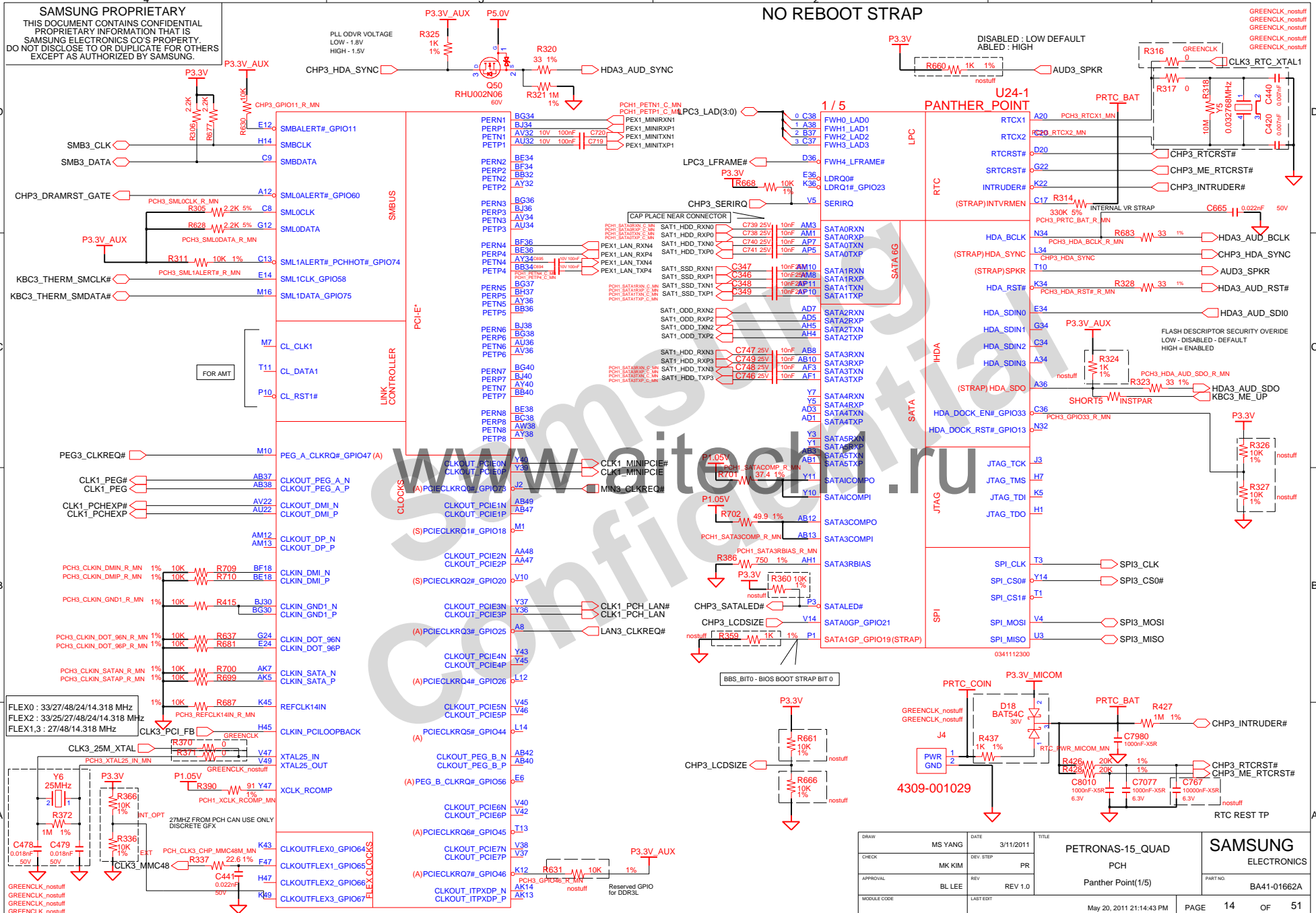
P/N : 3709-001608 (Concraft)

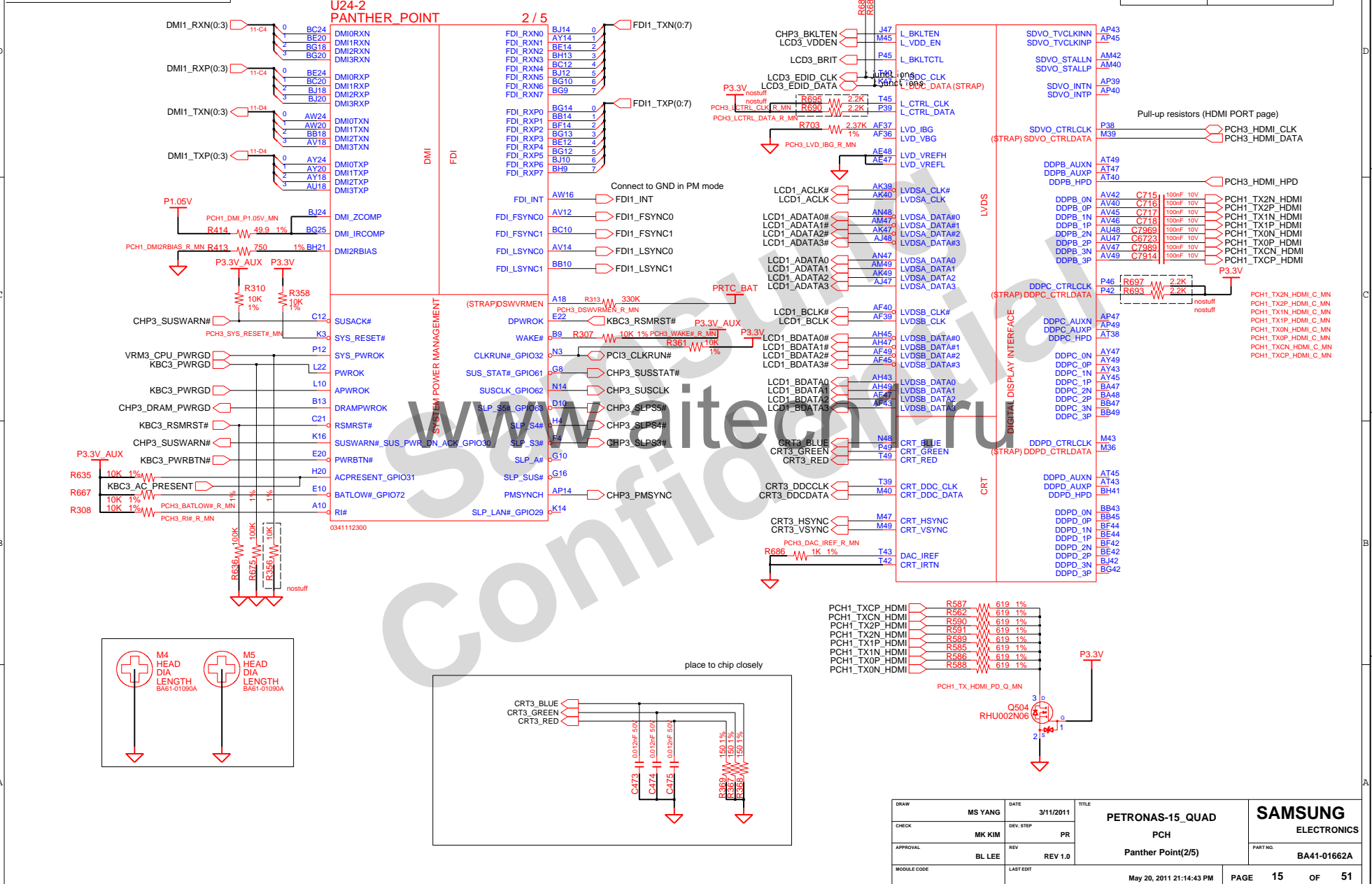


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CHECK	MK KIM	DEV. STEP	PR	SODIMM B	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.0	DDR3	PART NO.	BA41-01662A
MODULE CODE		LAST ENT				
				May 20, 2011 21:14:43 PM	PAGE	13 OF 51

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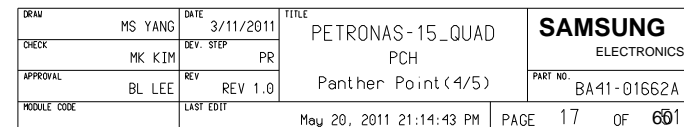
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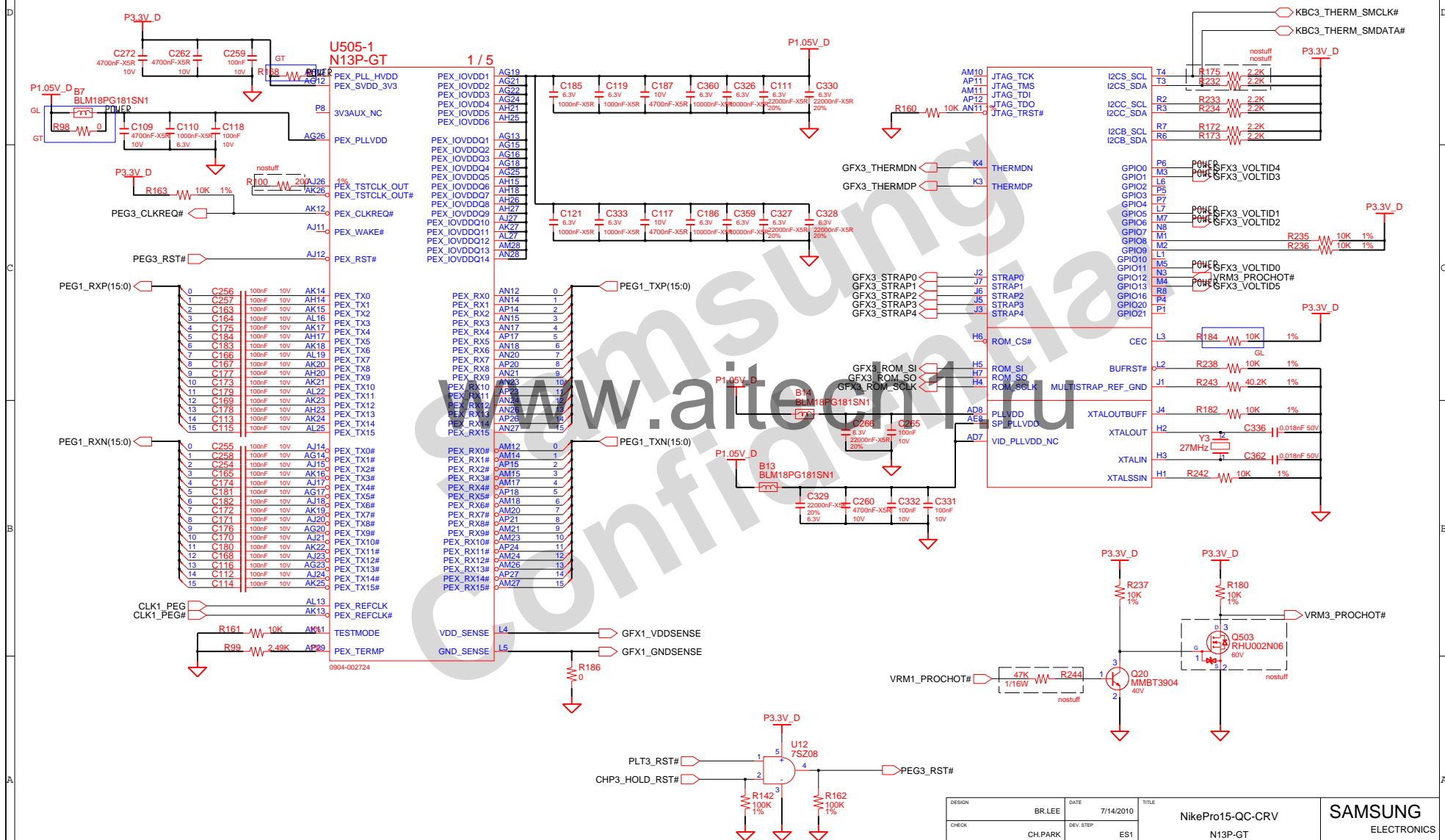
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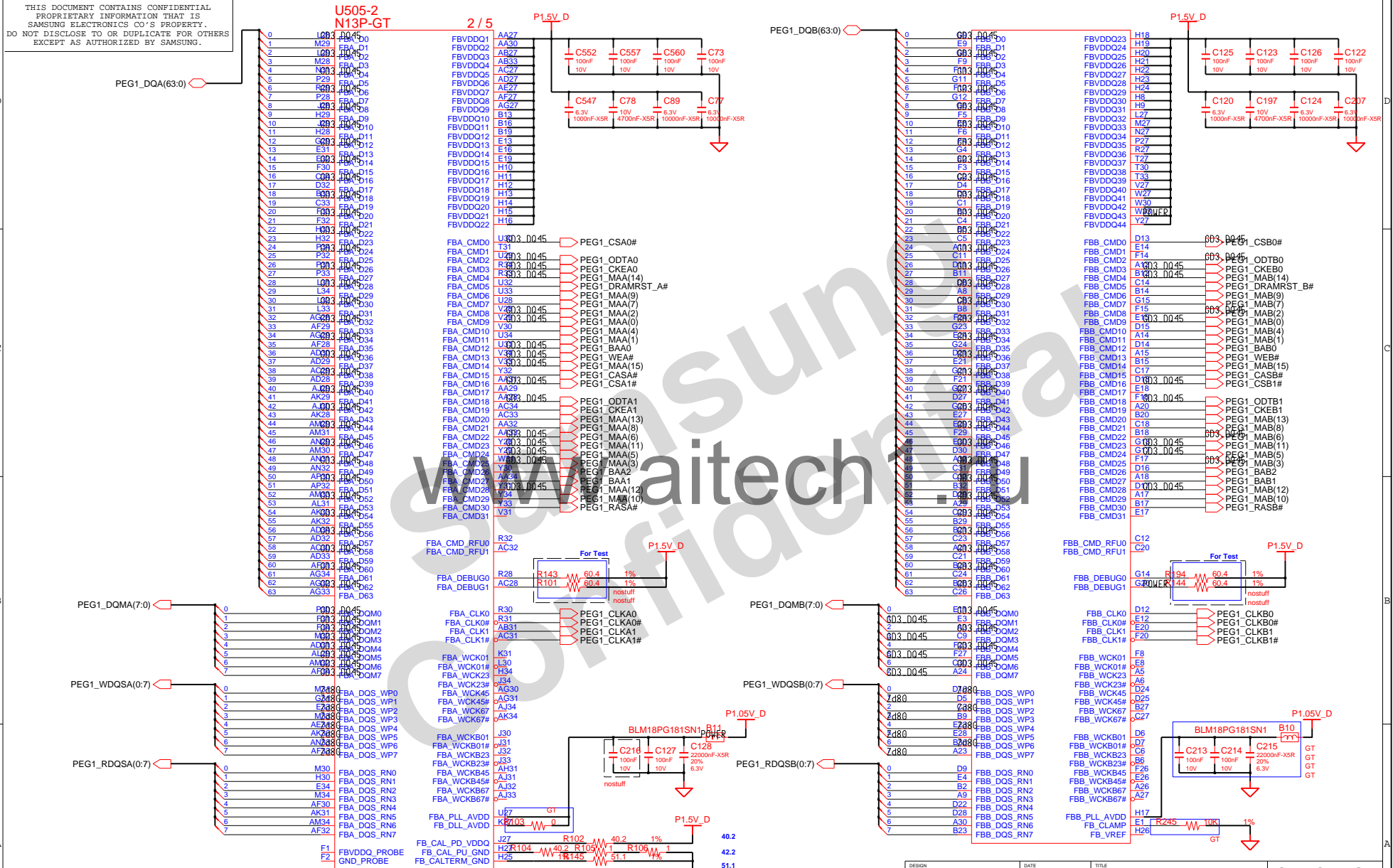
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DESIGN	BR.LEE	DATE	7/14/2010	TITLE	NikePro15-QC-CRV
CHECK	CH.PARK	DEV. STEP	ES1		N13P-GT
APPROVAL	KS.CHO	REV	REV 0.8		N13P-GT (1/5)
MODULE CODE		LAST EDIT			
				May 13, 2011 10:03:37 AM	PAGE 27 OF 65

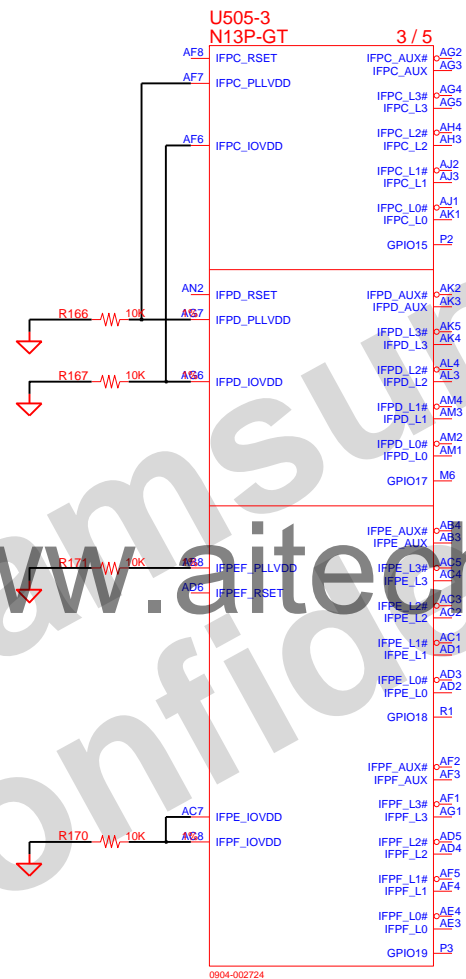
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DESIGN	BR.LEE	DATE	7/14/2010	TITLE	NikePro15-QC-CRV
CHECK	CH.PARK	DEV. STEP	ES1		N13P-GT
APPROVAL	KS.CHO	REV	REV 0.8		N13P-GT (2/5)
MODULE CODE		LAST EDIT			
			May 13, 2011 10:03:37 AM	PAGE	28 OF 65

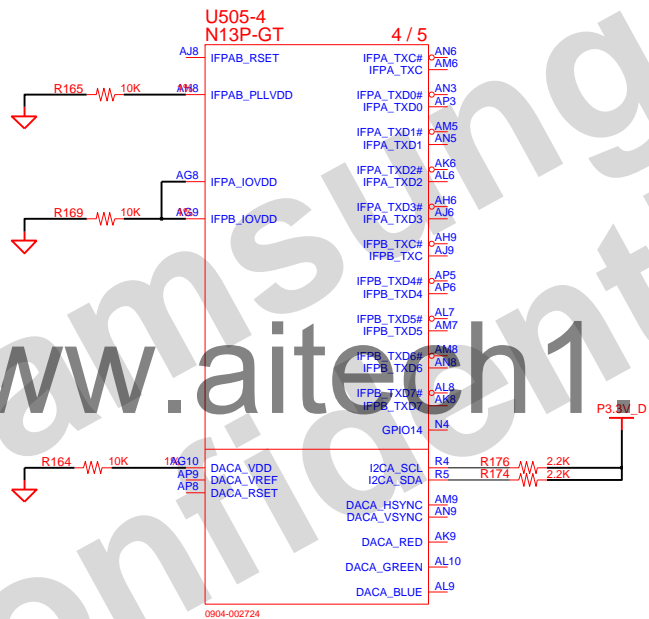
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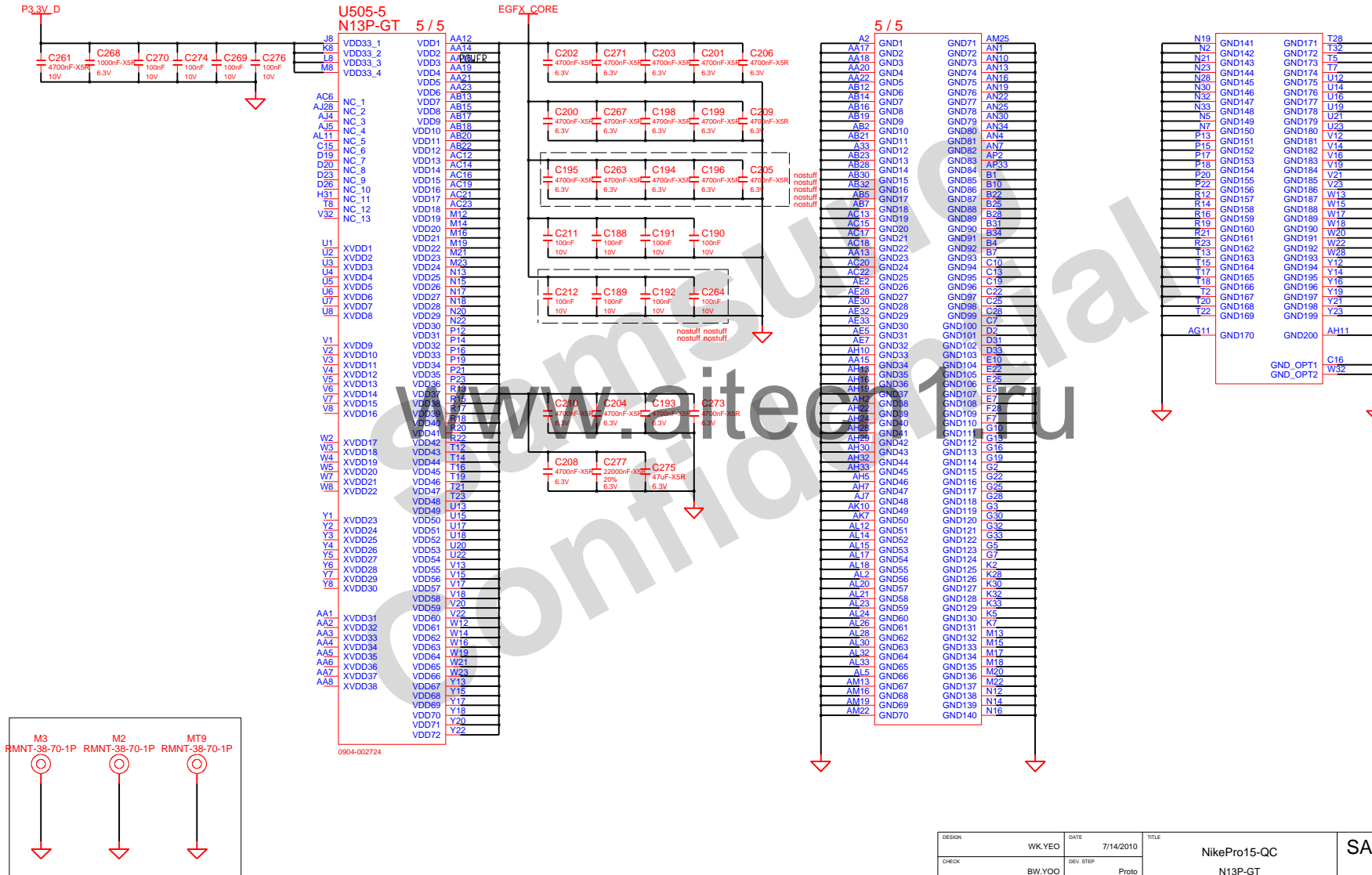
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CHECK	CH.PARK	DEV. STEP	ES1		N13P-GT	ELECTRONICS
APPROVAL	KS.CHO	REV	REV 0.8		N13P-GT (3/5)	PART NO. BA41-####A
MODULE CODE		LAST EDIT	May 13, 2011 10:03:37 AM	PAGE	29	OF 65

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DESIGN	BR.LEE	DATE	7/14/2010	TITLE	NikePro15-QC-CRV	SAMSUNG
CHECK	CH.PARK	DEV. STEP	ES1		N13P-GT	ELECTRONICS
APPROVAL	KS.CHO	REV	REV 0.8		N13P-GT (4/5)	PART NO. BA41-####A
MODULE CODE		LAST EDIT	May 13, 2011 10:03:37 AM	PAGE	30	OF 65

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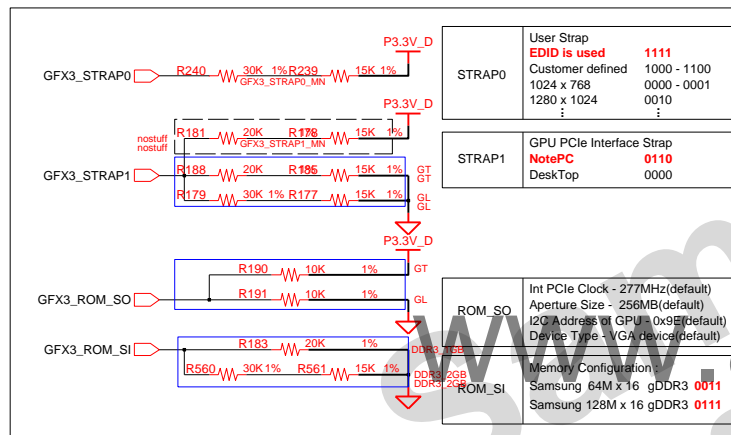
DESIGN	WK.YEO	DATE	7/14/2010	TITLE	NikePro15-QC	SAMSUNG ELECTRONICS
CHECK	BW.YOO	DEV. STEP	Proto		N13P-GT	
APPROVAL	SH.LEE	REV	REV 0.8		N13P-GT (5/5)	
MODULE CODE		LAST EDIT		April 22, 2011 14:15:44 PM	PAGE 31 OF 66	

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N13x STRAP

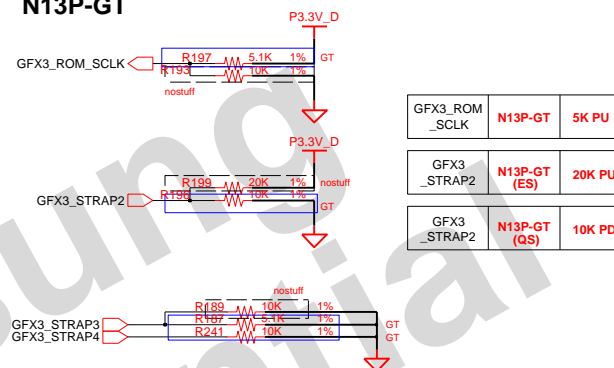
Function Straps



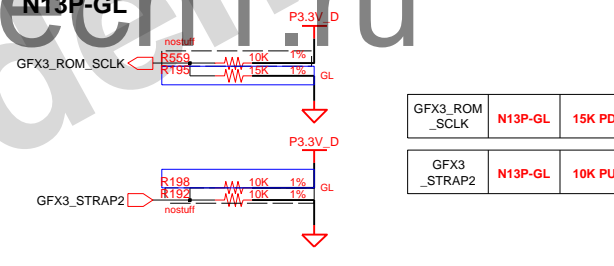
RESISTOR	PULL UP	PULL DOWN
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

STRAP PIN	BIT 3	BIT 2	BIT 1	BIT 0
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
STRAP1	3GIO_PADCFG[3]	3GIO_PADCFG[2]	3GIO_PADCFG[1]	3GIO_PADCFG[0]
ROM_SO	XCLK_417	FB_0_BAR_SIZE	SMB_ALT_ADDR	VGA_DEVICE
ROM_SI	RAMCFG[3]	RAMCFG[2]	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	PEX_PLL_EN_TERM

N13P-GT



N13P-GL

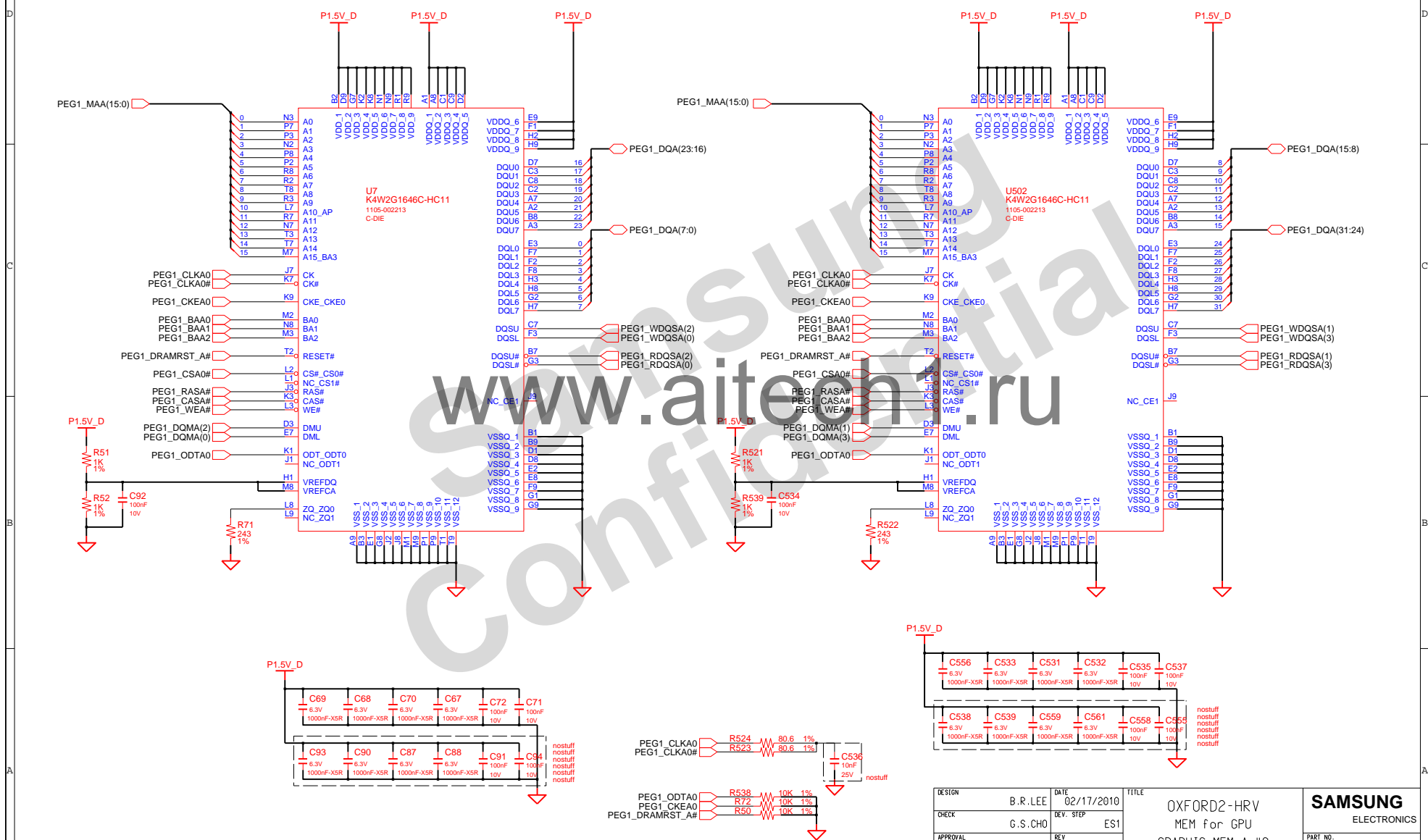


DESIGN	WK.YEO	DATE	7/14/2010	TITLE	NikePro15-QC	SAMSUNG
CHECK	BW.YOO	DEV. STEP	Proto		GRAPHIC STRAP	ELECTRONICS
APPROVAL	SH.LEE	REV	REV 0.8		GRAPHIC STRAP	PART NO.
MODULE CODE		LAST EDIT				BA41-####A
				April 22, 2011 14:15:44 PM	PAGE	32 OF 66

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A-Channel #0 (D-mode)

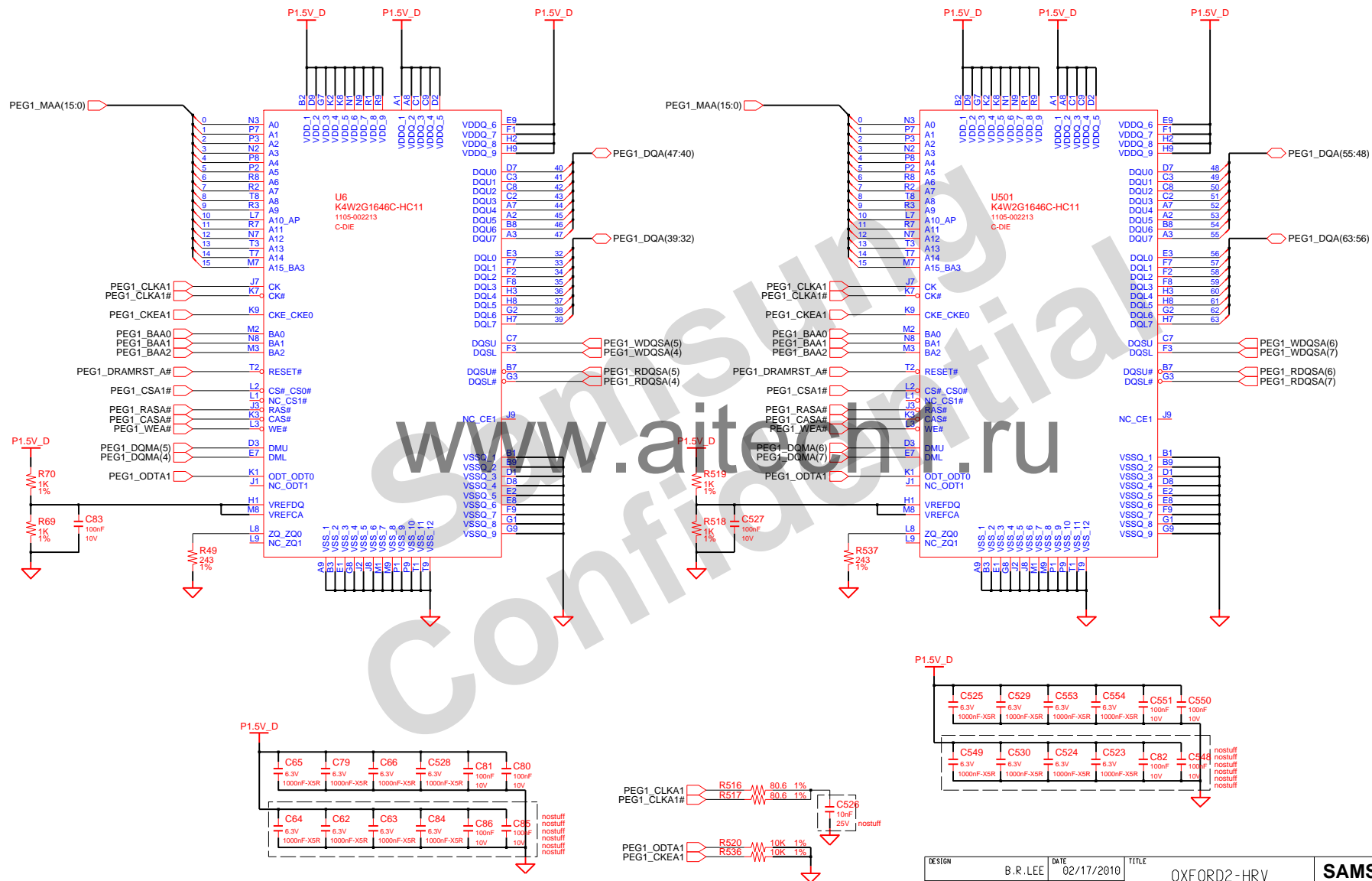


DESIGN	B.R.LEE	DATE	02/17/2010	TITLE	OXFORD2-HRV MEM for GPU GRAPHIC_MEM A #0	SAMSUNG ELECTRONICS
CHECK	G.S.CHO	DEV. STEP	ES1			PART NO. BA41-#####A
APPROVAL	JG.KOO	REV	REV 0.65			
MODULE CODE		LAST EDIT	February 26, 2010 20:43:59 PM	PAGE	27	OF 73

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A-Channel #1 (D-mode)

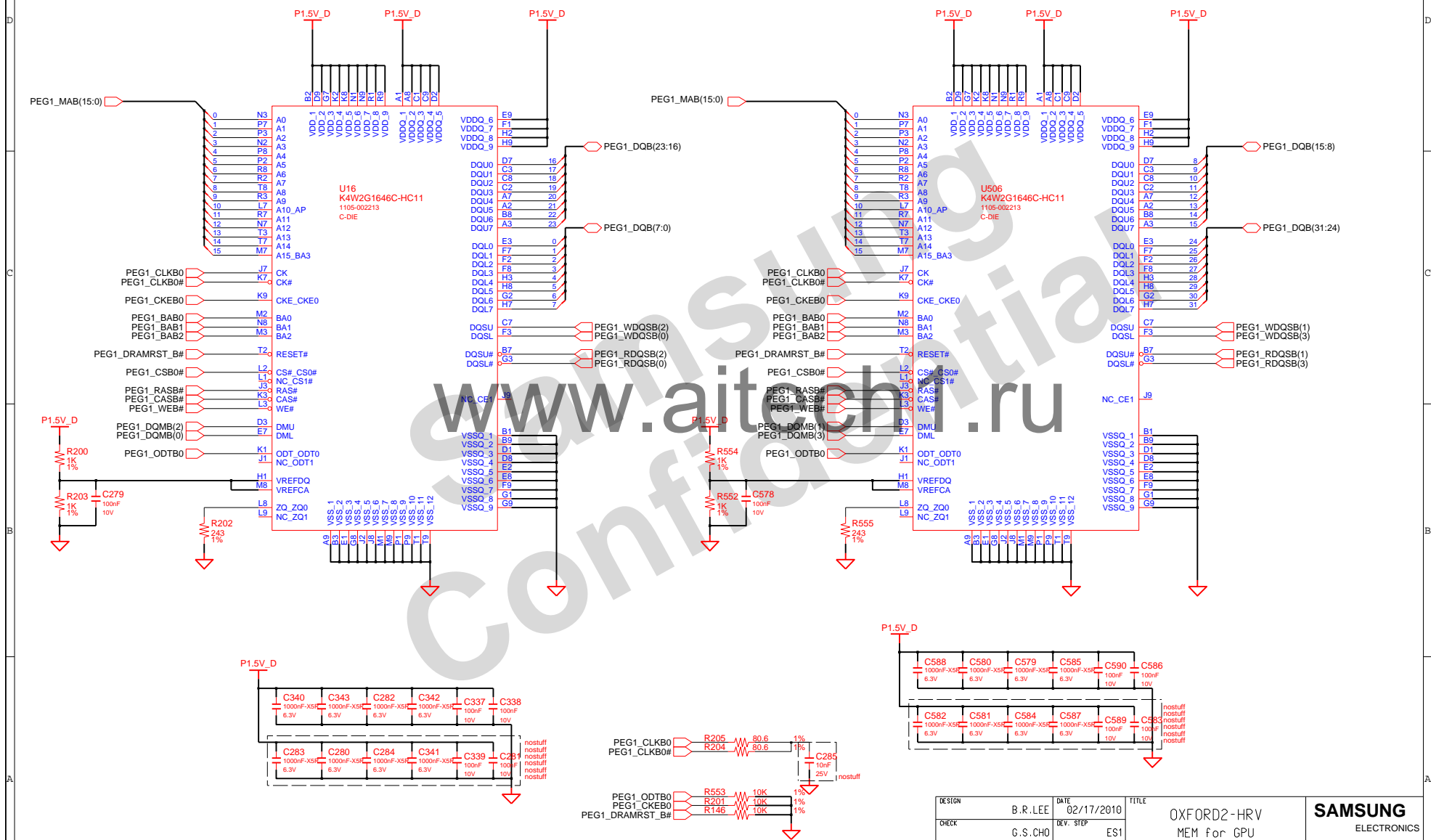


DESIGN	B.R.LEE	DATE	02/17/2010	TITLE	OXFORD2-HRV MEM for GPU GRAPHIC_MEM A #1	SAMSUNG ELECTRONICS
CHECK	G.S.CHO	DEV. STEP	ES1			PART NO. BA41-#####A
APPROVAL	JG.KOO	REV	REV 0.65			
MODULE CODE		LAST EDIT	February 26, 2010 20:43:59 PM	PAGE	28	OF 73

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B-Channel #0 (D-mode)

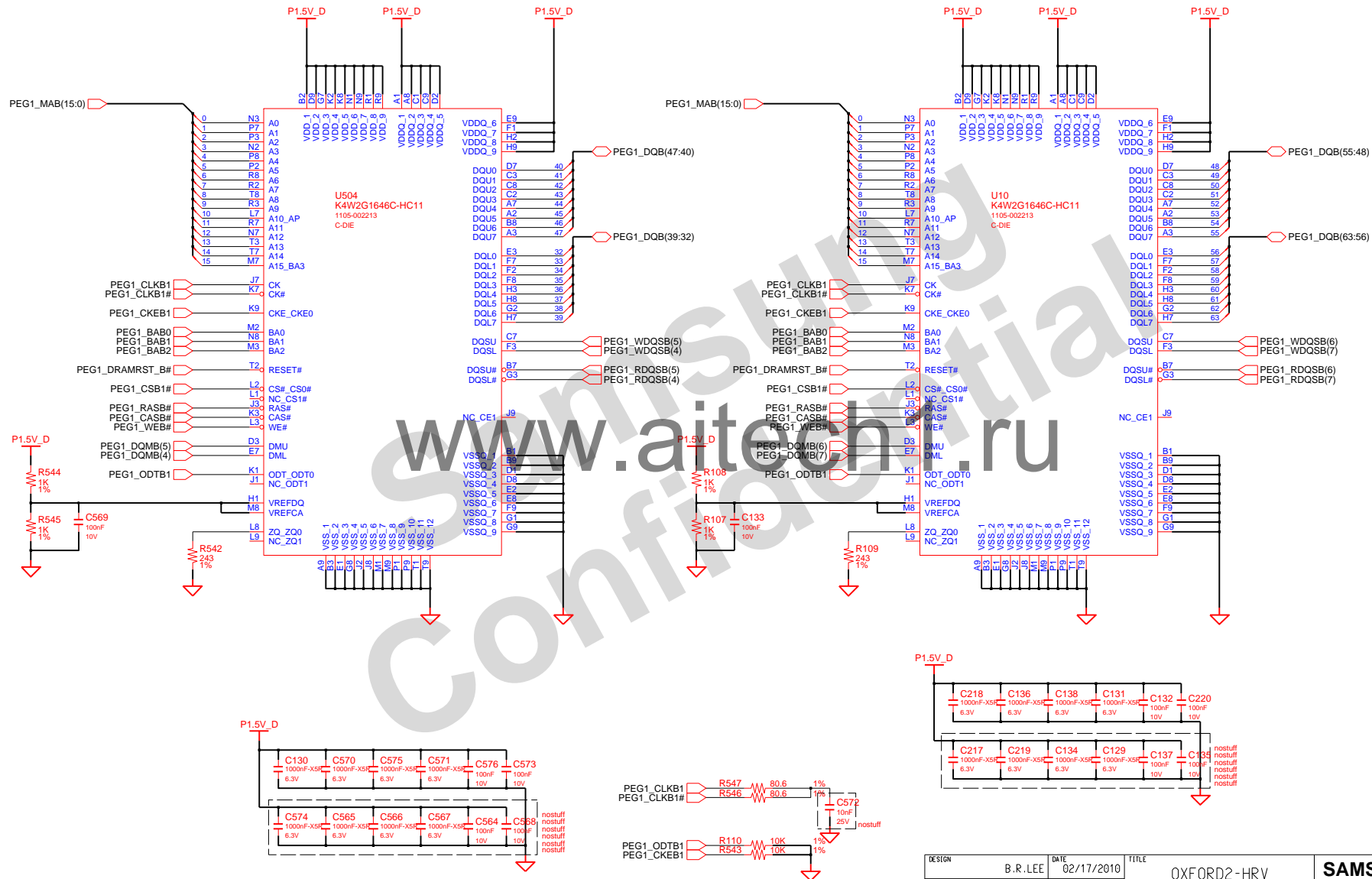


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APPROVAL	JG.KOO	REV	REV 0.65			
MODULE CODE		LAST EDIT	February 26, 2010 20:43:59 PM	PAGE	29	OF 73

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B-Channel #1 (D-mode)



DESIGN	B.R.LEE	DATE	02/17/2010	TITLE	OXFORD2-HRV MEM for GPU GRAPHIC_MEM B #1	SAMSUNG ELECTRONICS
CHECK	G.S.CHO	DEV. STEP	ES1			PART NO. BA41-#####A
APPROVAL	JG.KOO	REV	REV 0.65			
MODULE CODE		LAST EDIT	February 26, 2010 20:43:59 PM	PAGE	30	OF 73

4				3				2				1			
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www.aitech1.ru															
SAMSUNG Confidential															
DESIGN				DATE				TITLE				SAMSUNG			
B.R.LEE				02/17/2010				OXFORD2-HRV				ELECTRONICS			
CHECK				DEV. STEP								PART NO.			
G.S.CHO				ES1								BA41-####A			
APPROVAL				REV											
JG.KOO				REV 0.65											
MODULE CODE				LAST EDIT				February 26, 2010 20:43:59 PM				PAGE 31 OF 73			
4				3				2				1			

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DESIGN	B.R.LEE	DATE	02/17/2010	TITLE	OXFORD2-HRV	SAMSUNG ELECTRONICS
CHECK	G.S.CHO	DEV. STEP	ES1			
APPROVAL	JG.KOO	REV	REV 0.65			
MODULE CODE	LAST EDIT		February 26, 2010 20:43:59 PM			
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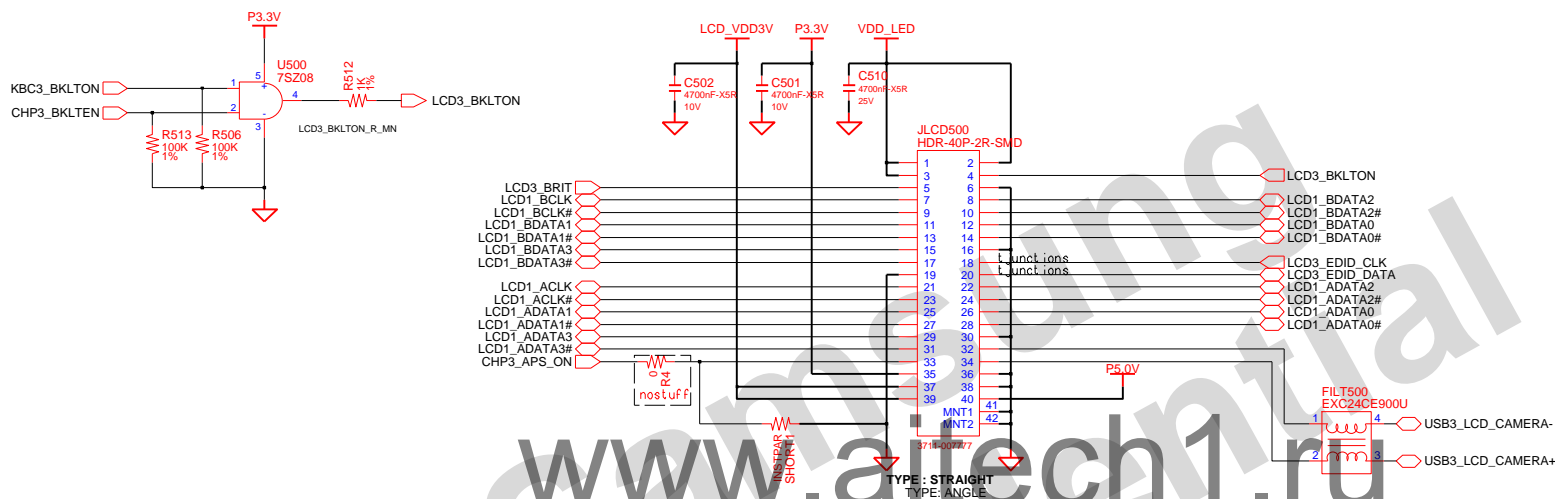
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MODULE CODE	LAST EDIT		February 26, 2010 20:43:59 PM			
				PART NO.	BA41-#####	

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B.R.LEE				02/17/2010				OXFORD2-HRV				ELECTRONICS			
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APPROVAL				REV											
JG.KOO				REV 0.65											
MODULE CODE				LAST EDIT				February 26, 2010 20:43:59 PM				PAGE 34 OF 73			
4				3				2				1			

LVDS LOGIC

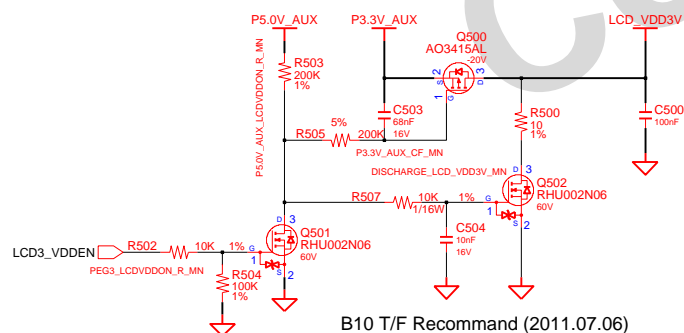
Backlight On

2Ch. LCD Connector + CAMERA



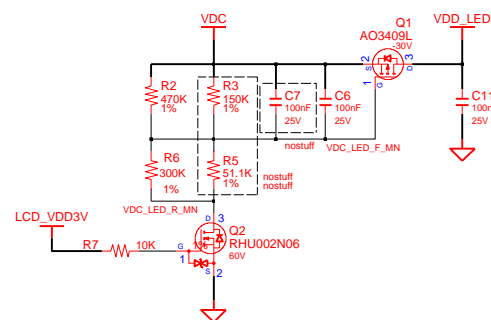
LCD Power

EBL Purpose



B10 T/F Recommand (2011.07.06)

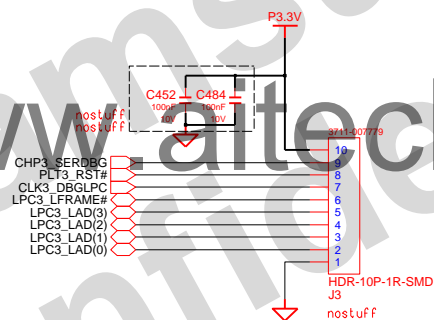
LED Power



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD		SAMSUNG	
CHECK	MK KIM	DEV. STEP	PR		GRAPHICS_IF		ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.0		LVDS		PART NO.	BA41-01662A
MODULE CODE	LAST EDIT			May 20, 2011 21:14:43 PM			PAGE	27 OF 51

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80H PORT DEBUG

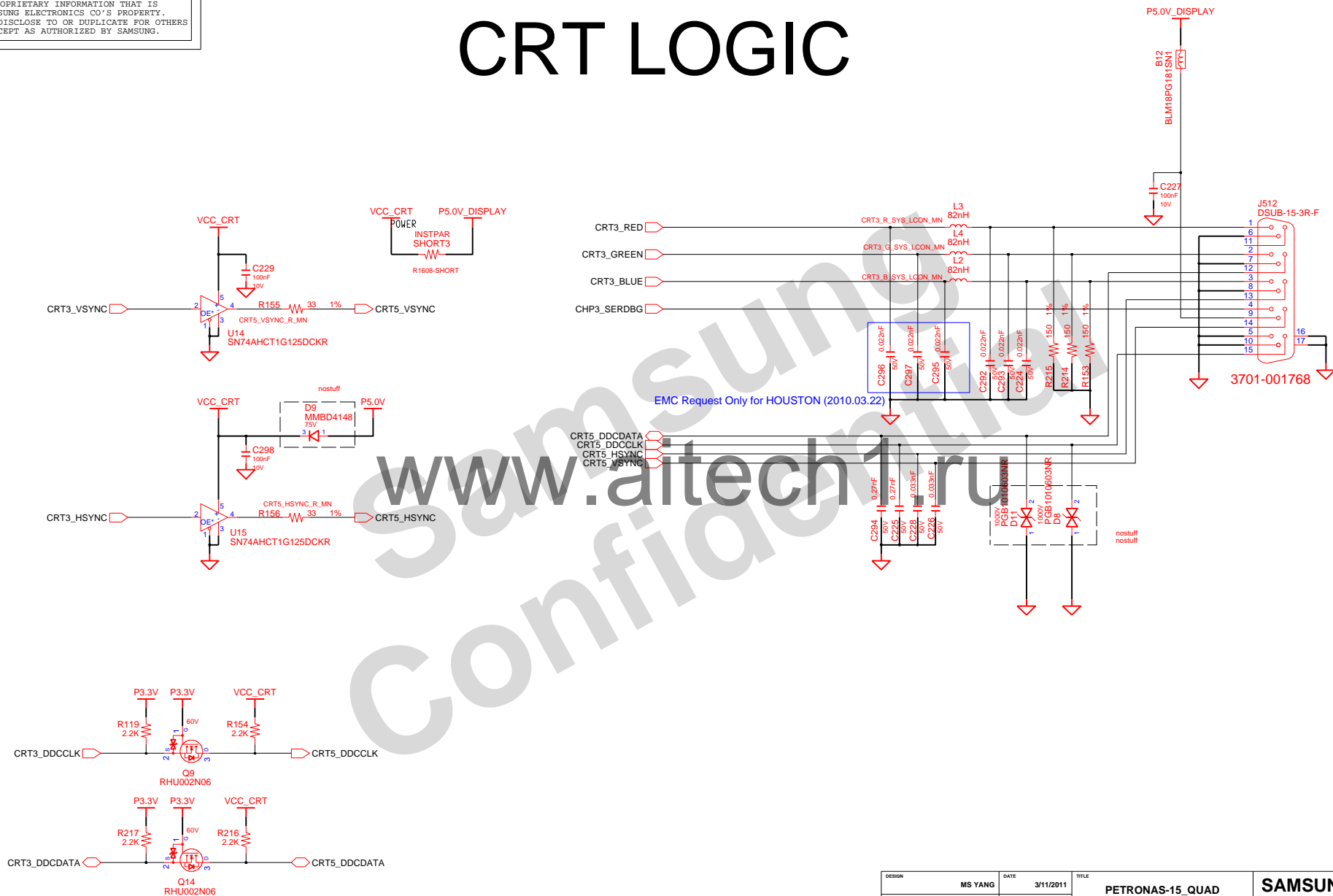


DESIGN	MS YANG	DATE	3/11/2011	TITLE PETRONAS-15_QUAD GRAPHICS_IF LVDS		SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	PR				
APPROVAL	BL LEE	REV	REV 1.0				
				PART NO.		BA41-01662A	
MODULE CODE	LAST EDIT		May 20, 2011 21:14:43 PM			PAGE	27 OF 51

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CRT LOGIC



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HDMI Graphic

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

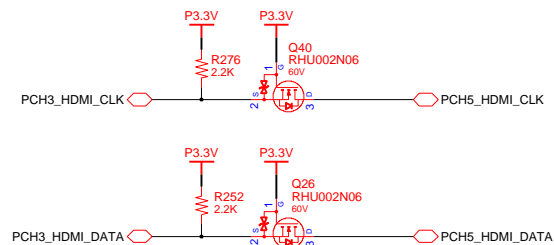
(EMC request at 2010.04.15)

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

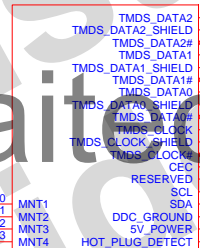
(EMC request at 2010.12.03)

STANDARD NET NAME

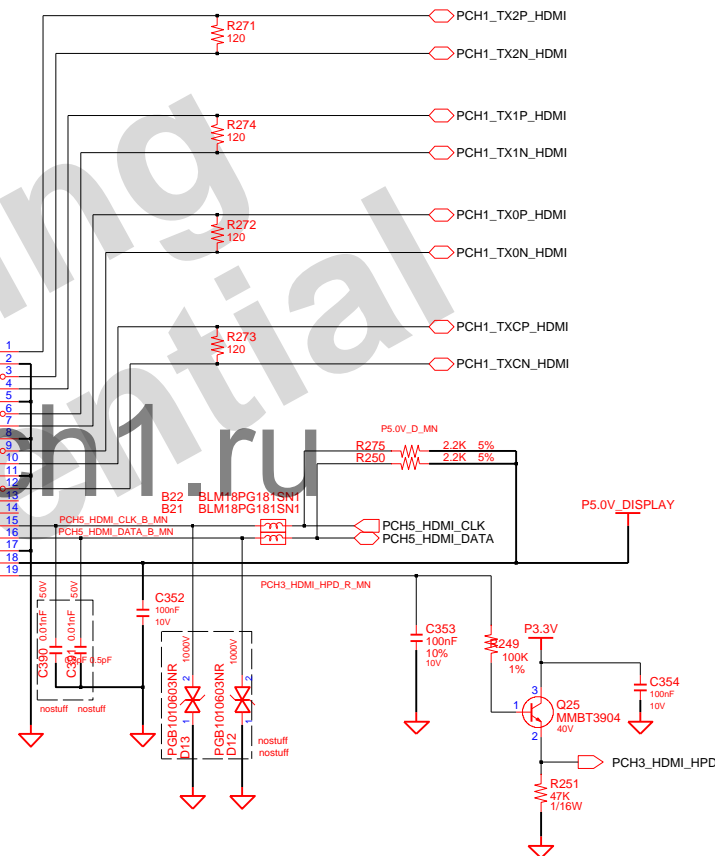
Display from PCH	Display from GPU
PCH3_HDMI_xxx	PEG3_HDMI_xxx
PCH1_xxxx_HDMI	PEG3_xxxx_HDMI



HDMI-19P-FEMALE



3701-001785

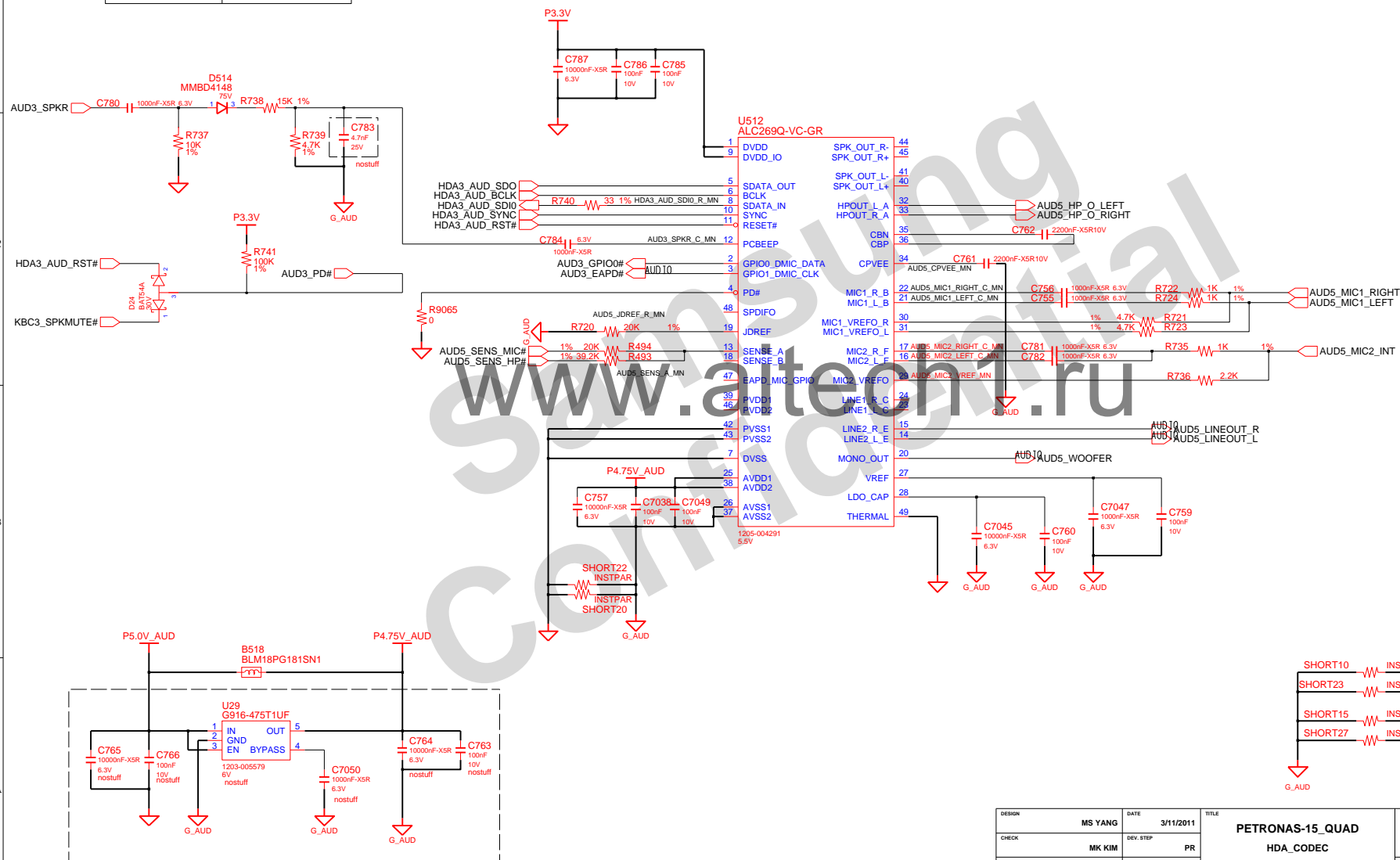


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	GRAPHICS_IF	GRAPHICS_IF	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0	HDMI	HDMI	PART NO.
MODULE CODE		LAST EDIT				BA41-01662A
				May 20, 2011 21:14:43 PM	PAGE	29 OF 51

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

HD AUDIO



DESIGN	MS YANG	DATE	3/1/2011	PETRONAS-15_QUAD HDA_CODEC AUDIO CODEC ALC269		SAMSUNG ELECTRONICS			
CHECK	MK KIM	DEV. STEP	PR						
APPROVAL	BL LEE	REV	REV 1.0	PART NO. BA41-01662A					
MODULE CODE	LAST EDIT								
				May 20, 2011 21:14:43 PM		PAGE	30	OF	51

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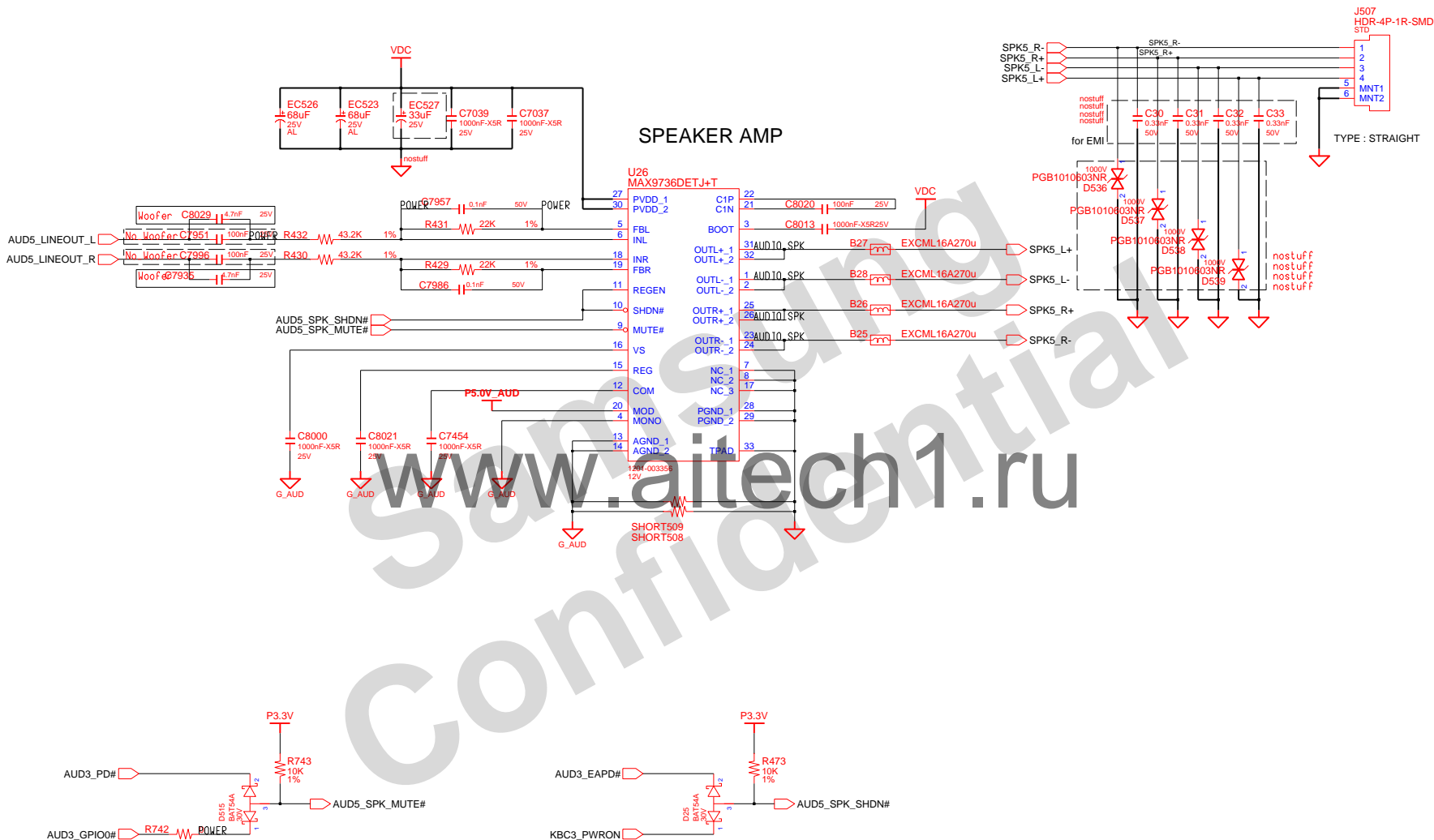
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CHECK	MK KIM	DEV. STEP	PR						
APPROVAL	BL LEE	REV	REV 1.0	HDA_CODEC AUDIO JACK		PART NO.		BA41-01662A	
MODULE CODE		LAST EDIT				May 20, 2011 21:14:43 PM		PAGE	31

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3711-007614|53398-0490-4m_ng

SPEAKER AMP

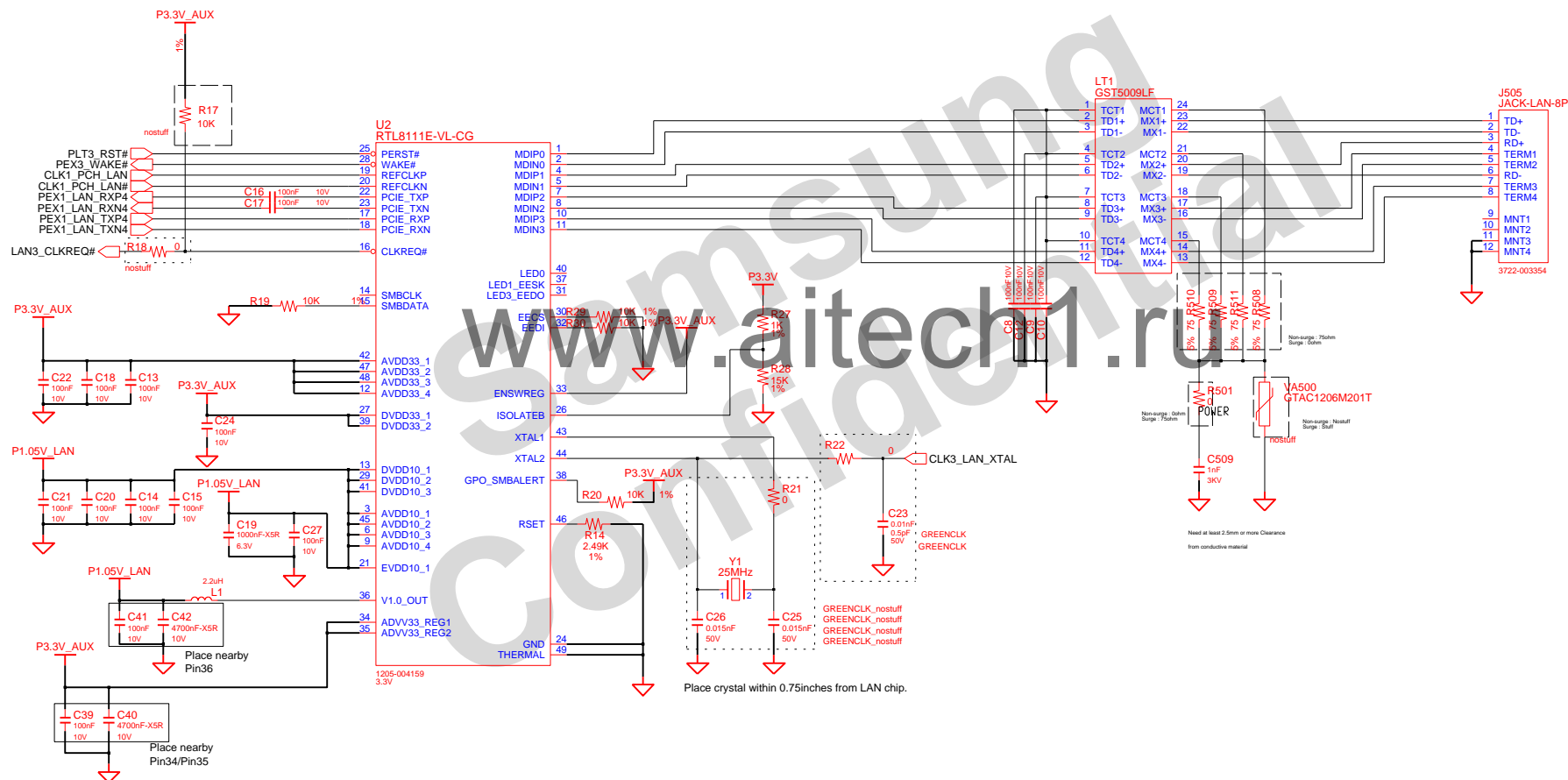


DESIGN	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-undef i
CHECK	8/5/2011	McLaren-15 Audio	
APPROVAL	DEV. STEP	Speaker AMP	
MODULE CODE	REV	UNDEFINED	
LAST EDIT		October, 7, 2011 2:49:44 PM	PAGE 39 OF

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Reatek RTL8111E

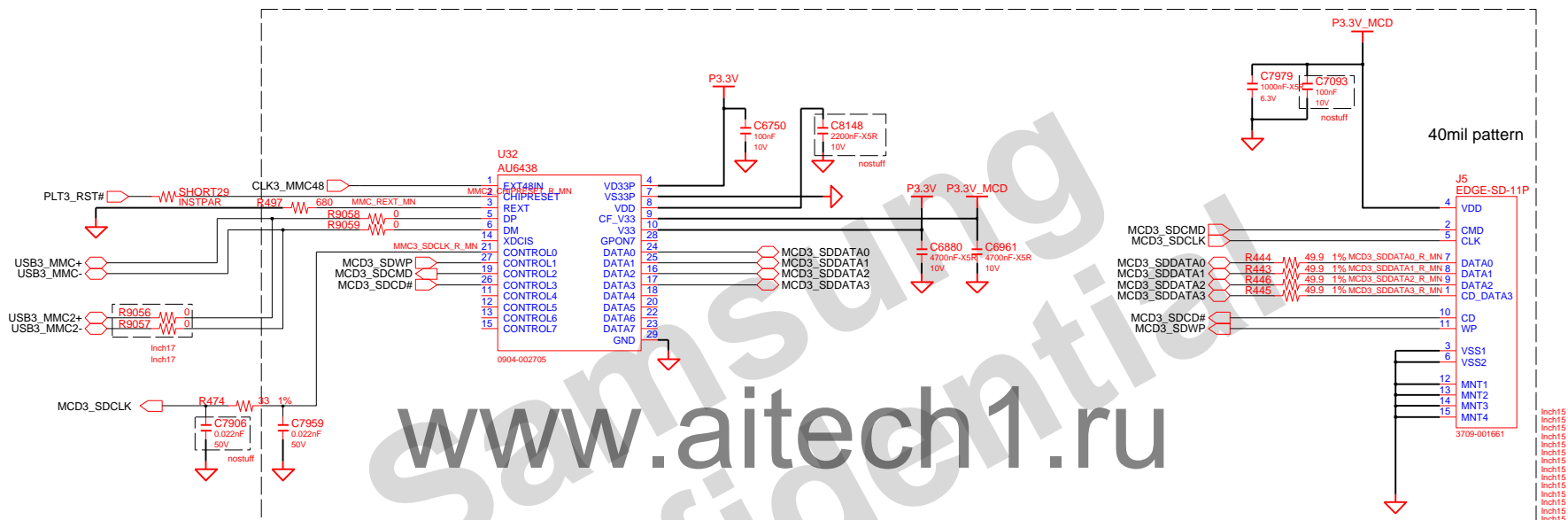


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG ELECTRONICS	
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APPROVAL	BL LEE	REV	REV 1.0		LAN_Realtek_RTL8111		
MODULE CODE		LAST EDIT				PART NO.	BA41-01662A
May 20, 2011 21:14:43 PM						PAGE	32 OF 51

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4 IN 1 CARD



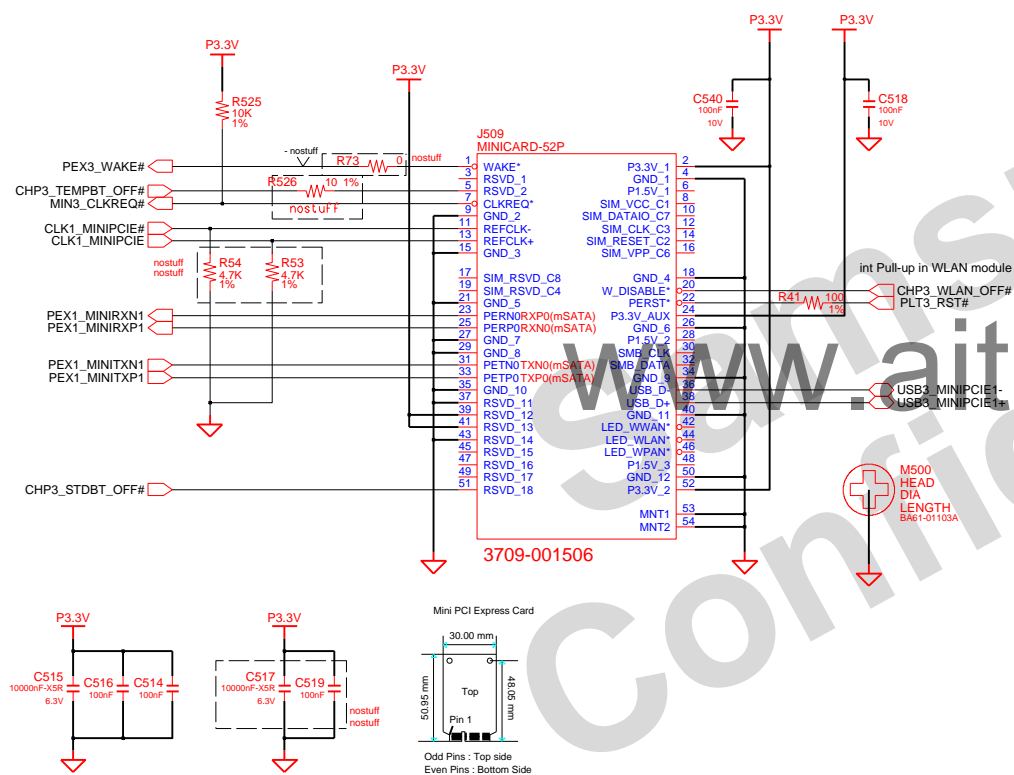
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DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD MULTICARD 4 IN 1 CARD (AU6438)	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR			PART NO. BA41-01662A
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE		LAST EDIT		May 20, 2011 21:14:43 PM	PAGE 33 OF 51	

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WLAN, 7mm



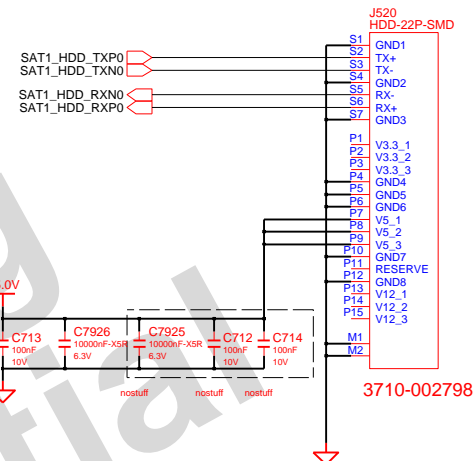
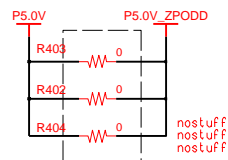
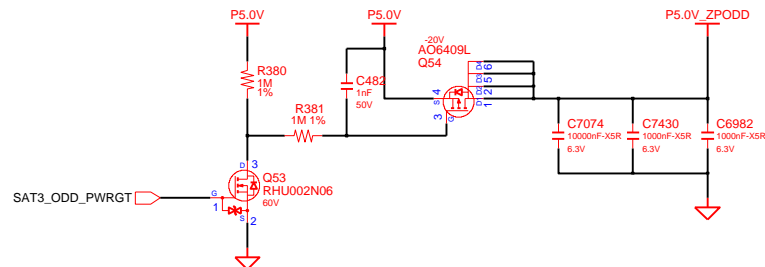
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APPROVAL	BL LEE	REV	REV 1.0		WLAN	
MODULE CODE		LAST EDIT				PART NO. BA41-01662A
				May 20, 2011 21:14:43 PM	PAGE 34 OF 51	

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SATA I/F CONN

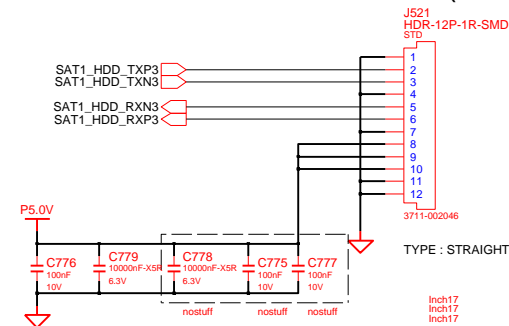
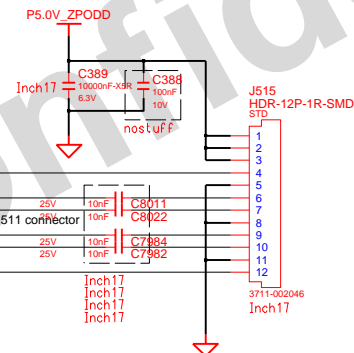
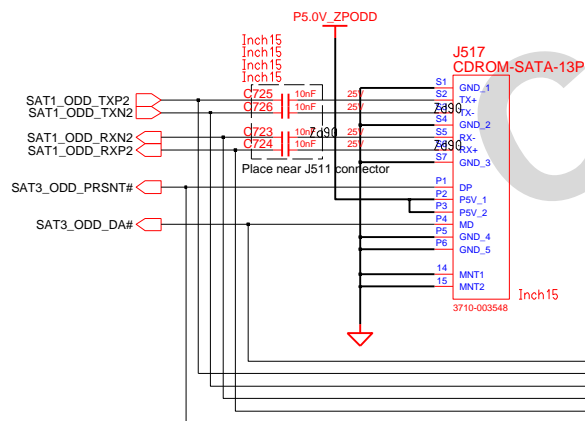
SATA HDD CONN



SATA 2'nd ODD CONN (17" only)

SATA 2'nd HDD CONN (17" only)

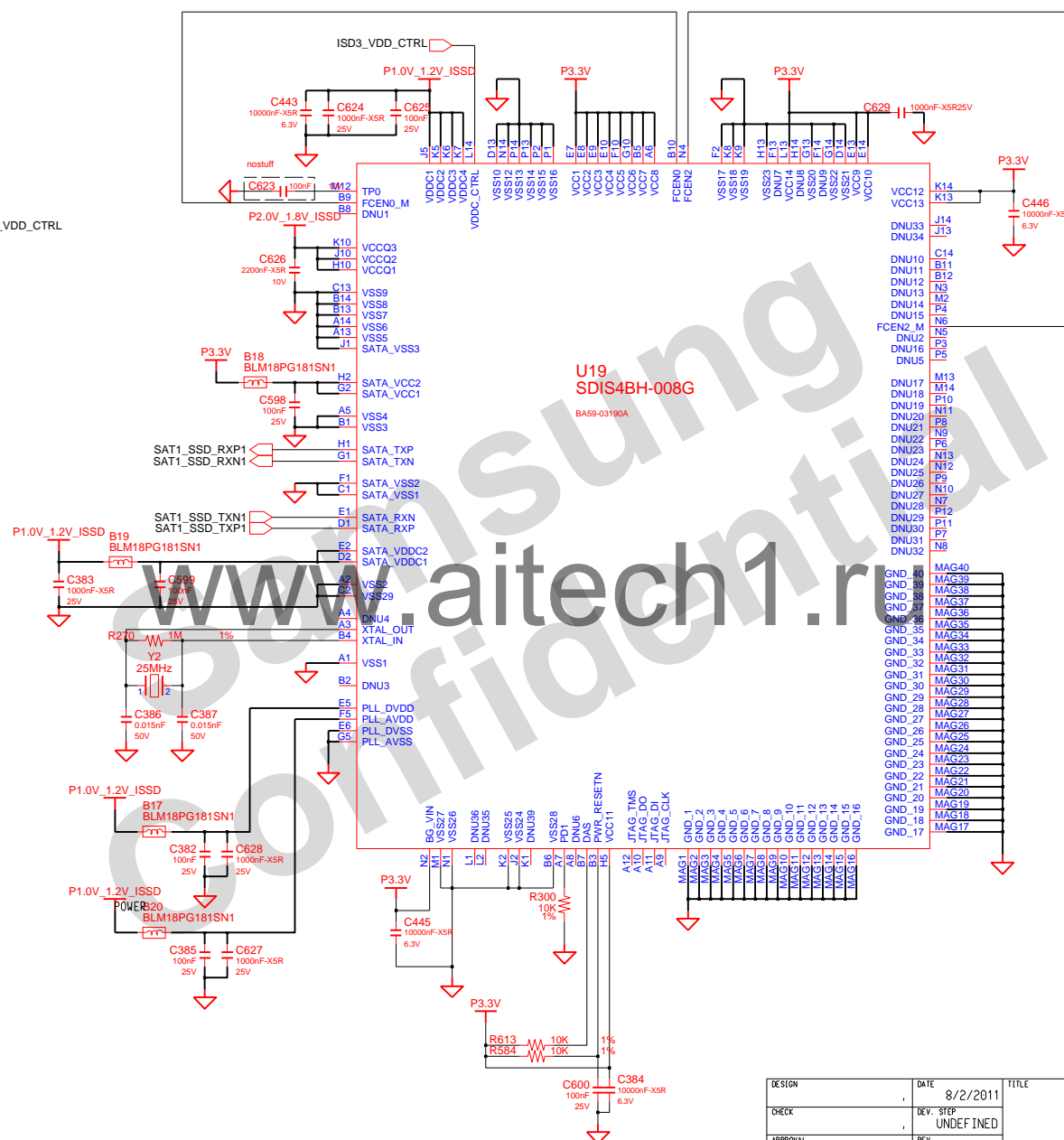
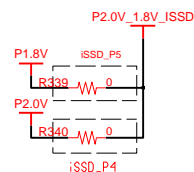
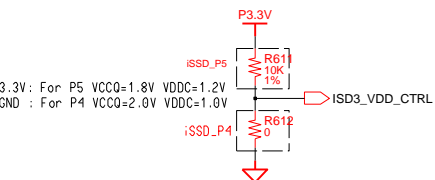
SATA ODD CONN (15" Only)




DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15 QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	SATA DEVICES	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.0	SATA Interface	PART NO.	BA41-01662A
MODULE CODE		LAST EDIT				

ISSD

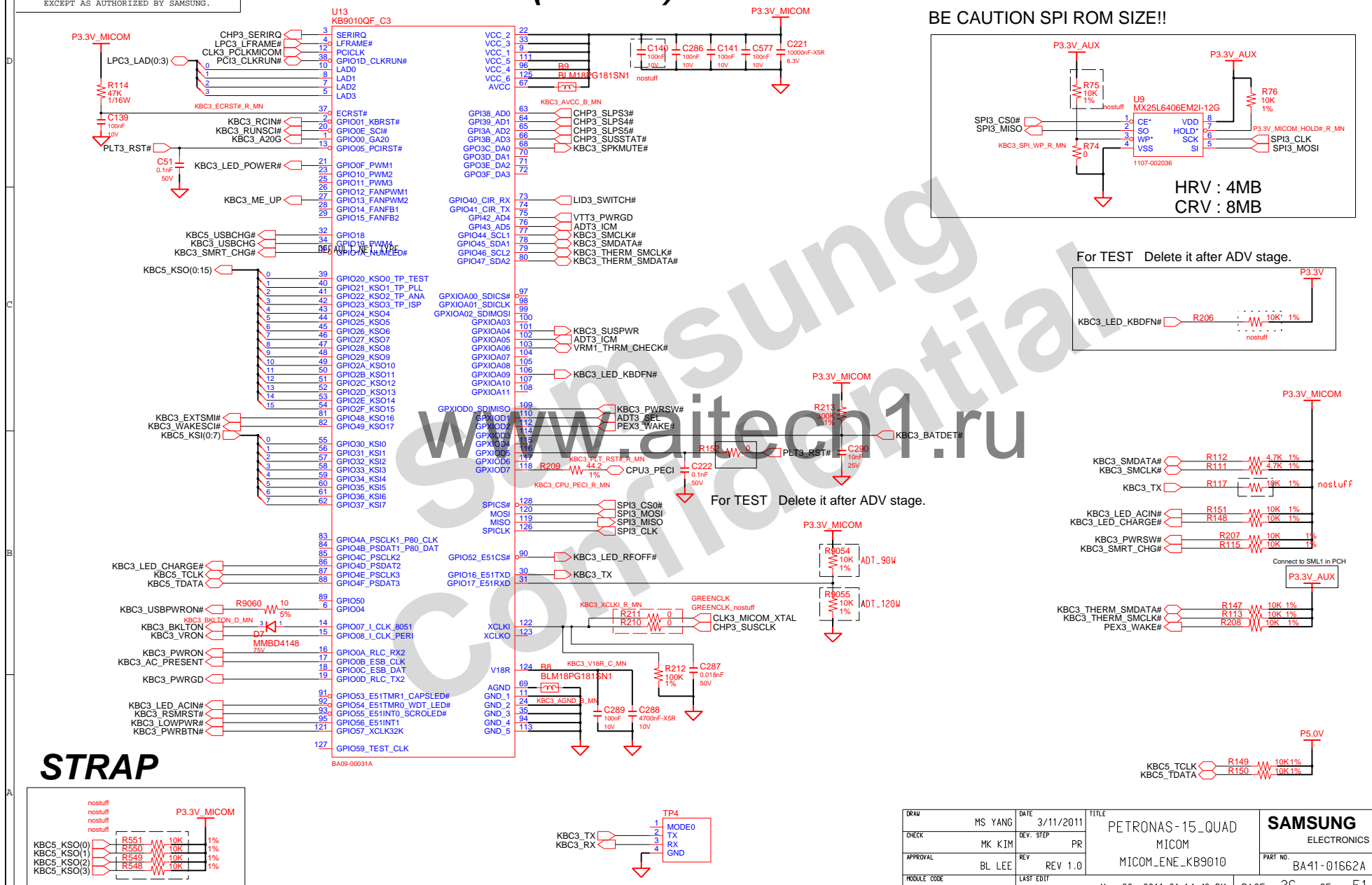
3.3V: For P5 VCCQ=1.8V VDDC=1.2V
GND : For P4 VCCQ=2.0V VDDC=1.0V



DESIGN	DATE	TITLE		
CHECK	DEV. STEP	ISSD		
APPROVAL	REV	ISSD		
UNDEFINED		PART NO.		
MODULE CODE		LAST EDIT		BA41-undefi
		August, 2, 2011 9:27:26 PM		PAGE 6undefined

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MAIN BOARD (MICOM)

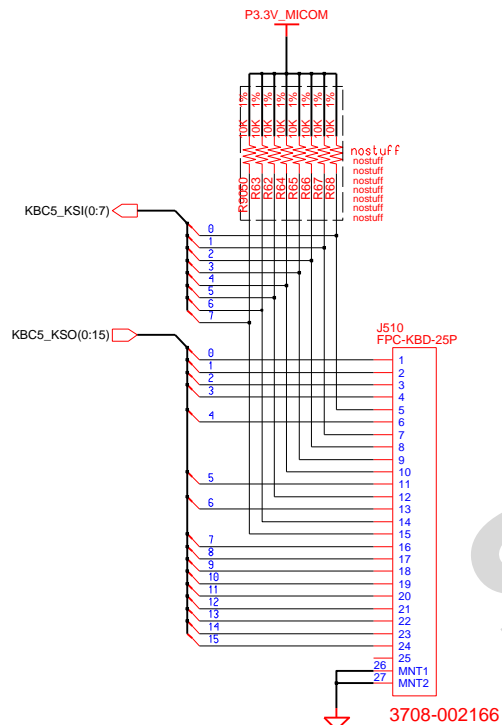


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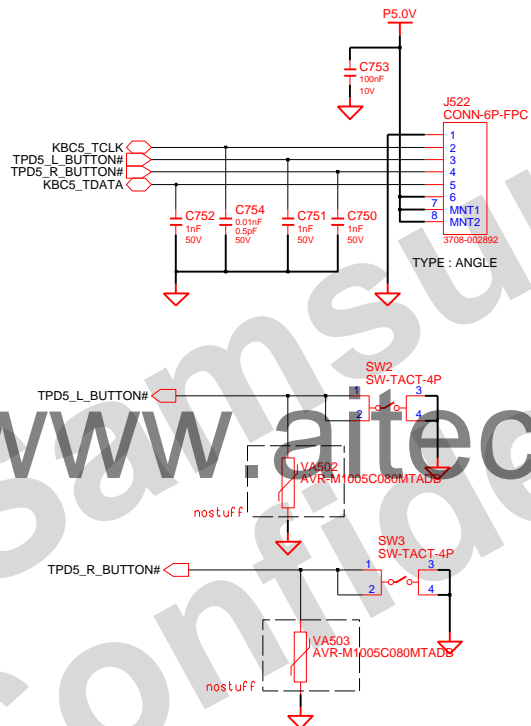
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Micom Glue Logic

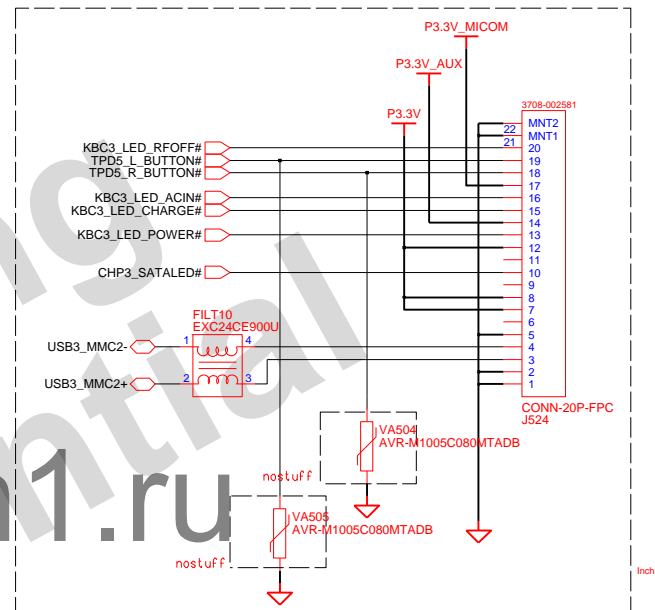
KEYBOARD



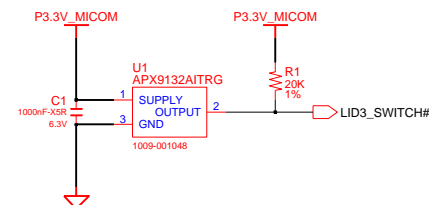
TOUCHPAD



TOUCHPAD MAIN TO SUB



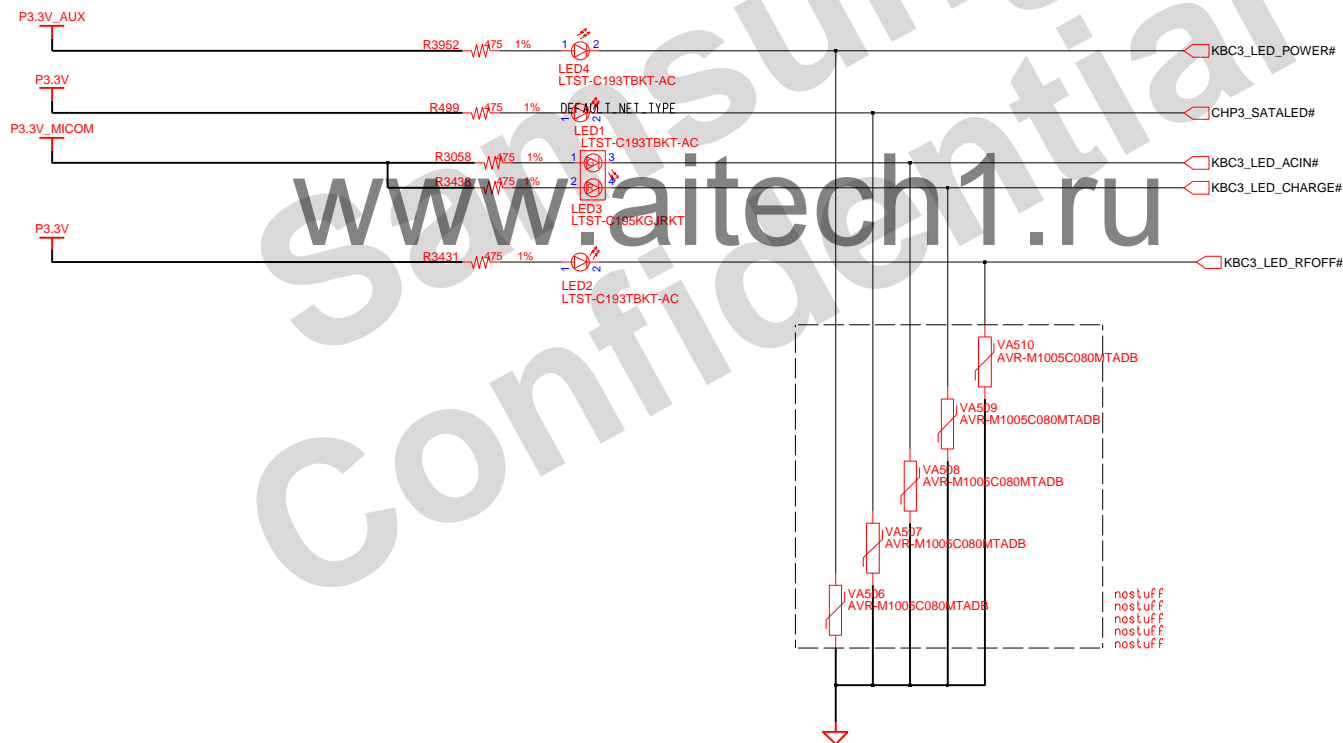
LID_SWITCH



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD MICOM GLUE LOGIC KEYBOARD & TOUCHPAD	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR			PART NO. BA41-01662A
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE		LAST EDIT		May 20, 2011 21:14:43 PM	PAGE 37 OF 51	

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LED for 15"

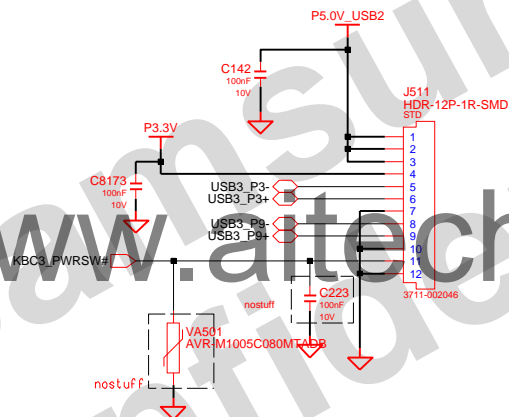
DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	LED_SWITCH	LED_SWITCH	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0	LED_SWITCH	PART NO.	BA41-01662A
MODULE CODE	LAST EDIT		May 20, 2011 21:14:43 PM		PAGE	38 OF 51

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2 USB 2.0

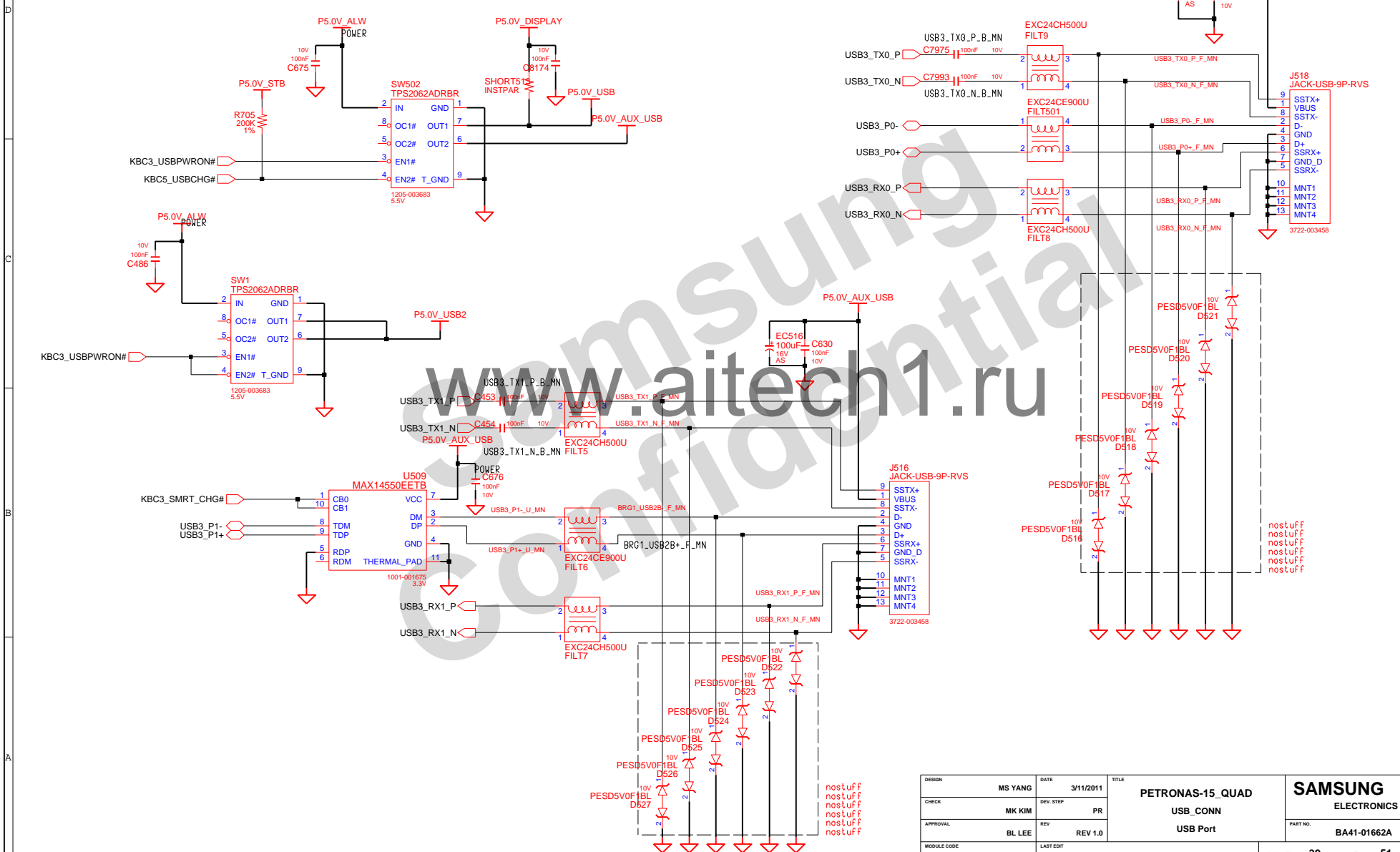
MAIN TO SUB



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	USB_CONN	USB Port	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0			PART NO.
MODULE CODE		LAST EDIT	May 20, 2011 21:14:43 PM			BA41-01662A
				PAGE	39	OF 51

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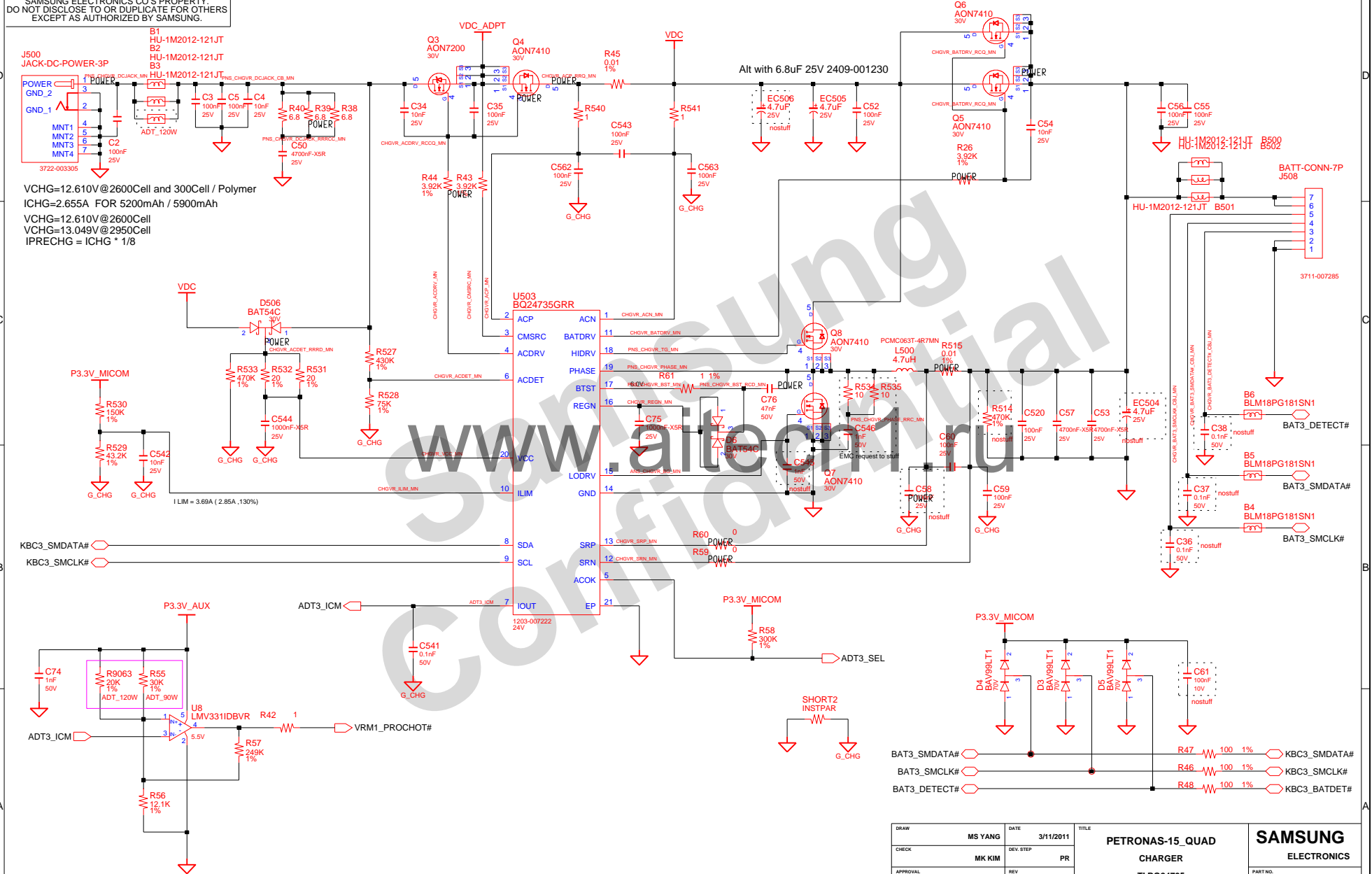
2 USB PORT 3.0



DESIGN	MS YANG	DATE	3/11/2011	TITLE PETRONAS-15_QUAD USB_CONN USB Port	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR		
APPROVAL	BL LEE	REV	REV 1.0		
PART NO.					
MODULE CODE	LAST EDIT			May 20, 2011 21:14:43 PM	PAGE 39 OF 51

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CHARGER & POWER MANAGEMENT



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
CHECK	MK KIM	DEV. STEP	PR	CHARGER		ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.0	TI BQ24735	PART NO.	BA41-01662A
MODULE CODE	undefined	LAST EDIT				
				May 20, 2011 21:43 PM	PAGE	40 OF 51

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The schematic diagram illustrates the power management section of the U28 TPS51125RGER. It shows the regulation of various voltage rails from a single input source. Key components and sections include:

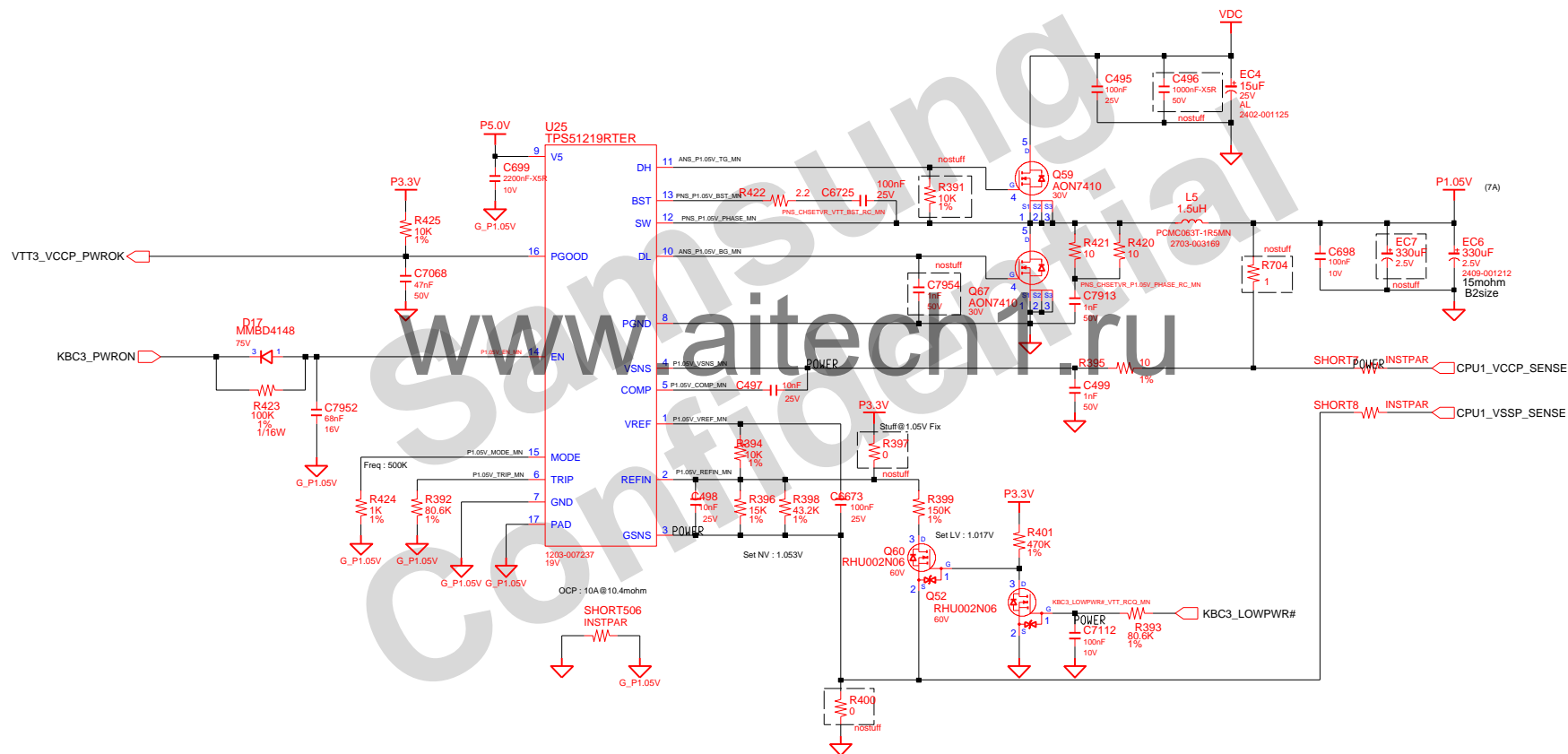
- Input and Initial Regulation:** The input is connected to the VIN pin of the U28 TPS51125RGER. The initial regulation stage uses the AON7410 (Q70) and AON6912ALS (Q507) for the P5.0V_ALW rail.
- P5.0V Rails:**
 - P5.0V_ALW (6A):** Regulated by the AON7410 (Q70) and AON6912ALS (Q507). It includes a feedback network with resistors R733, R734, R735, and R736, and capacitors C773, C774, and C775.
 - P5.0V_STB:** Regulated by the Q80 RHU002N06 MOSFET. It includes a feedback network with resistors R469, R470, R471, and R472, and capacitors C6677, C6678, and C6679.
- P3.3V Rails:**
 - P3.3V_AUX (6A):** Regulated by the Q79 AON7410 MOSFET. It includes a feedback network with resistors R454, R455, R456, and R457, and capacitors C7023, C7024, and C7025.
 - P3.3V_MICOM:** Regulated by the Q88 RHU002N06 MOSFET. It includes a feedback network with resistors R462, R463, R464, and R465, and capacitors C6984, C6985, and C6986.
 - P3.3V_TONSEL:** Regulated by the Q89 RHU002N06 MOSFET. It includes a feedback network with resistors R491, R492, R493, and R494, and capacitors C6987, C6988, and C6989.
- P12.0V_ALW:** Regulated by the Q87 MMBT3904 MOSFET. It includes a feedback network with resistors R482, R483, R484, and R485, and capacitors C6965, C6966, and C6967.
- Other Components:** The diagram includes various other components such as resistors (R458, R459, R460, R461, R462, R463, R464, R465, R466, R467, R468, R469, R470, R471, R472, R473, R474, R475, R476, R477, R478, R479, R480, R481, R482, R483, R484, R485, R486, R487, R488, R489, R490, R491, R492, R493, R494, R495, R496, R497, R498, R499, R500, R501, R502, R503, R504, R505, R506, R507, R508, R509, R510, R511, R512, R513, R514, R515, R516, R517, R518, R519, R520, R521, R522, R523, R524, R525, R526, R527, R528, R529, R530, R531, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543, R544, R545, R546, R547, R548, R549, R550, R551, R552, R553, R554, R555, R556, R557, R558, R559, R560, R561, R562, R563, R564, R565, R566, R567, R568, R569, R570, R571, R572, R573, R574, R575, R576, R577, R578, R579, R580, R581, R582, R583, R584, R585, R586, R587, R588, R589, R590, R591, R592, R593, R594, R595, R596, R597, R598, R599, R600, R601, R602, R603, R604, R605, R606, R607, R608, R609, R610, R611, R612, R613, R614, R615, R616, R617, R618, R619, R620, R621, R622, R623, R624, R625, R626, R627, R628, R629, R630, R631, R632, R633, R634, R635, R636, R637, R638, R639, R640, R641, R642, R643, R644, R645, R646, R647, R648, R649, R650, R651, R652, R653, R654, R655, R656, R657, R658, R659, R660, R661, R662, R663, R664, R665, R666, R667, R668, R669, R670, R671, R672, R673, R674, R675, R676, R677, R678, R679, R680, R681, R682, R683, R684, R685, R686, R687, R688, R689, R690, R691, R692, R693, R694, R695, R696, R697, R698, R699, R700, R701, R702, R703, R704, R705, R706, R707, R708, R709, R710, R711, R712, R713, R714, R715, R716, R717, R718, R719, R720, R721, R722, R723, R724, R725, R726, R727, R728, R729, R730, R731, R732, R733, R734, R735, R736, R737, R738, R739, R740, R741, R742, R743, R744, R745, R746, R747, R748, R749, R750, R751, R752, R753, R754, R755, R756, R757, R758, R759, R760, R761, R762, R763, R764, R765, R766, R767, R768, R769, R770, R771, R772, R773, R774, R775, R776, R777, R778, R779, R780, R781, R782, R783, R784, R785, R786, R787, R788, R789, R790, R791, R792, R793, R794, R795, R796, R797, R798, R799, R800, R801, R802, R803, R804, R805, R806, R807, R808, R809, R810, R811, R812, R813, R814, R815, R816, R817, R818, R819, R820, R821, R822, R823, R824, R825, R826, R827, R828, R829, R830, R831, R832, R833, R834, R835, R836, R837, R838, R839, R840, R841, R842, R843, R844, R845, R846, R847, R848, R849, R850, R851, R852, R853, R854, R855, R856, R857, R858, R859, R860, R861, R862, R863, R864, R865, R866, R867, R868, R869, R870, R871, R872, R873, R874, R875, R876, R877, R878, R879, R880, R881, R882, R883, R884, R885, R886, R887, R888, R889, R890, R891, R892, R893, R894, R895, R896, R897, R898, R899, R900, R901, R902, R903, R904, R905, R906, R907, R908, R909, R910, R911, R912, R913, R914, R915, R916, R917, R918, R919, R920, R921, R922, R923, R924, R925, R926, R927, R928, R929, R930, R931, R932, R933, R934, R935, R936, R937, R938, R939, R940, R941, R942, R943, R944, R945, R946, R947, R948, R949, R950, R951, R952, R953, R954, R955, R956, R957, R958, R959, R960, R961, R962, R963, R964, R965, R966, R967, R968, R969, R970, R971, R972, R973, R974, R975, R976, R977, R978, R979, R980, R981, R982, R983, R984, R985, R986, R987, R988, R989, R990, R991, R992, R993, R994, R995, R996, R997, R998, R999, R1000, R1001, R1002, R1003, R1004, R1005, R1006, R1007, R1008, R1009, R1010, R1011, R1012, R1013, R1014, R1015, R1016, R1017, R1018, R1019, R1020, R1021, R1022, R1023, R1024, R1025, R1026, R1027, R1028, R1029, R1030, R1031, R1032, R1033, R1034, R1035, R1036, R1037, R1038, R1039, R1040, R1041, R1042, R1043, R1044, R1045, R1046, R1047, R1048, R1049, R1050, R1051, R1052, R1053, R1054, R1055, R1056, R1057, R1058, R1059, R1060, R1061, R1062, R1063, R1064, R1065, R1066, R1067, R1068, R1069, R1070, R1071, R1072, R1073, R1074, R1075, R1076, R1077, R1078, R1079, R1080, R1081, R1082, R1083, R1084, R1085, R1086, R1087, R108

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG ELECTRONICS
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APPROVAL	BL LEE	REV	REV 1.0	TI TPS51125	PART NO.	
MODULE CODE		LAST EDIT		May 20, 2011 21:14:43 PM	PAGE 41 OF 51	

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Chipset Power (P1.05V)



DRW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD P1.05V TI TPSS1219	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR			PART NO. BA41-01662A
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	42	OF 51

CHIPSET POWER(VCCSA)

The schematic diagram illustrates the power supply section of the iM860 board, centered around the U510 TPS51461REER DC-DC converter. The input stage features a 5.0V ALW input with a 22000nF-XSR capacitor (C646) and a 100nF capacitor (C645) connected to the V5DRV and V5FILT pins. The converter's output is filtered by a 0.47uH inductor (L506) and a series of output capacitors (C618-C635) connected to the VCCSA pin. The feedback network includes resistors R659, R658, R657, R656, R655, R654, R640, R641, R639, R638, R637, R636, R635, R634, R633, R632, R631, R630, R629, R628, R627, R626, R625, R624, R623, R622, R621, R620, R619, R618, R617, R616, R615, R614, R613, R612, R611, R610, R609, R608, R607, R606, R605, R604, R603, R602, R601, R600, R599, R598, R597, R596, R595, R594, R593, R592, R591, R590, R589, R588, R587, R586, R585, R584, R583, R582, R581, R580, R579, R578, R577, R576, R575, R574, R573, R572, R571, R570, R569, R568, R567, R566, R565, R564, R563, R562, R561, R560, R559, R558, R557, R556, R555, R554, R553, R552, R551, R550, R549, R548, R547, R546, R545, R544, R543, R542, R541, R540, R539, R538, R537, R536, R535, R534, R533, R532, R531, R530, R529, R528, R527, R526, R525, R524, R523, R522, R521, R520, R519, R518, R517, R516, R515, R514, R513, R512, R511, R510, R509, R508, R507, R506, R505, R504, R503, R502, R501, R500, R499, R498, R497, R496, R495, R494, R493, R492, R491, R490, R489, R488, R487, R486, R485, R484, R483, R482, R481, R480, R479, R478, R477, R476, R475, R474, R473, R472, R471, R470, R469, R468, R467, R466, R465, R464, R463, R462, R461, R460, R459, R458, R457, R456, R455, R454, R453, R452, R451, R450, R449, R448, R447, R446, R445, R444, R443, R442, R441, R440, R439, R438, R437, R436, R435, R434, R433, R432, R431, R430, R429, R428, R427, R426, R425, R424, R423, R422, R421, R420, R419, R418, R417, R416, R415, R414, R413, R412, R411, R410, R409, R408, R407, R406, R405, R404, R403, R402, R401, R400, R399, R398, R397, R396, R395, R394, R393, R392, R391, R390, R389, R388, R387, R386, R385, R384, R383, R382, R381, R380, R379, R378, R377, R376, R375, R374, R373, R372, R371, R370, R369, R368, R367, R366, R365, R364, R363, R362, R361, R360, R359, R358, R357, R356, R355, R354, R353, R352, R351, R350, R349, R348, R347, R346, R345, R344, R343, R342, R341, R340, R339, R338, R337, R336, R335, R334, R333, R332, R331, R330, R329, R328, R327, R326, R325, R324, R323, R322, R321, R320, R319, R318, R317, R316, R315, R314, R313, R312, R311, R310, R309, R308, R307, R306, R305, R304, R303, R302, R301, R300, R299, R298, R297, R296, R295, R294, R293, R292, R291, R290, R289, R288, R287, R286, R285, R284, R283, R282, R281, R280, R279, R278, R277, R276, R275, R274, R273, R272, R271, R270, R269, R268, R267, R266, R265, R264, R263, R262, R261, R260, R259, R258, R257, R256, R255, R254, R253, R252, R251, R250, R249, R248, R247, R246, R245, R244, R243, R242, R241, R240, R239, R238, R237, R236, R235, R234, R233, R232, R231, R230, R229, R228, R227, R226, R225, R224, R223, R222, R221, R220, R219, R218, R217, R216, R215, R214, R213, R212, R211, R210, R209, R208, R207, R206, R205, R204, R203, R202, R201, R200, R199, R198, R197, R196, R195, R194, R193, R192, R191, R190, R189, R188, R187, R186, R185, R184, R183, R182, R181, R180, R179, R178, R177, R176, R175, R174, R173, R172, R171, R170, R169, R168, R167, R166, R165, R164, R163, R162, R161, R160, R159, R158, R157, R156, R155, R154, R153, R152, R151, R150, R149, R148, R147, R146, R145, R144, R143, R142, R141, R140, R139, R138, R137, R136, R135, R134, R133, R132, R131, R130, R129, R128, R127, R126, R125, R124, R123, R122, R121, R120, R119, R118, R117, R116, R115, R114, R113, R112, R111, R110, R109, R108, R107, R106, R105, R104, R103, R102, R101, R100, R99, R98, R97, R96, R95, R94, R93, R92, R91, R90, R89, R88, R87, R86, R85, R84, R83, R82, R81, R80, R79, R78, R77, R76, R75, R74, R73, R72, R71, R70, R69, R68, R67, R66, R65, R64, R63, R62, R61, R60, R59, R58, R57, R56, R55, R54, R53, R52, R51, R50, R49, R48, R47, R46, R45, R44, R43, R42, R41, R40, R39, R38, R37, R36, R35, R34, R33, R32, R31, R30, R29, R28, R27, R26, R25, R24, R23, R22, R21, R20, R19, R18, R17, R16, R15, R14, R13, R12, R11, R10, R9, R8, R7, R6, R5, R4, R3, R2, R1, R0, R-1, R-2, R-3, R-4, R-5, R-6, R-7, R-8, R-9, R-10, R-11, R-12, R-13, R-14, R-15, R-16, R-17, R-18, R-19, R-20, R-21, R-22, R-23, R-24, R-25, R-26, R-27, R-28, R-29, R-30, R-31, R-32, R-33, R-34, R-35, R-36, R-37, R-38, R-39, R-40, R-41, R-42, R-43, R-44, R-45, R-46, R-47, R-48, R-49, R-50, R-51, R-52, R-53, R-54, R-55, R-56, R-57, R-58, R-59, R-60, R-61, R-62, R-63, R-64, R-65, R-66, R-67, R-68, R-69, R-70, R-71, R-72, R-73, R-74, R-75, R-76, R-77, R-78, R-79, R-80, R-81, R-82, R-83, R-84, R-85, R-86, R-87, R-88, R-89, R-90, R-91, R-92, R-93, R-94, R-95, R-96, R-97, R-98, R-99, R-100, R-101, R-102, R-103, R-104, R-105, R-106, R-107, R-108, R-109, R-110, R-111, R-112, R-113, R-114, R-115, R-116, R-117, R-118, R-119, R-120, R-121, R-122, R-123, R-124, R-125, R-126, R-127, R-128,

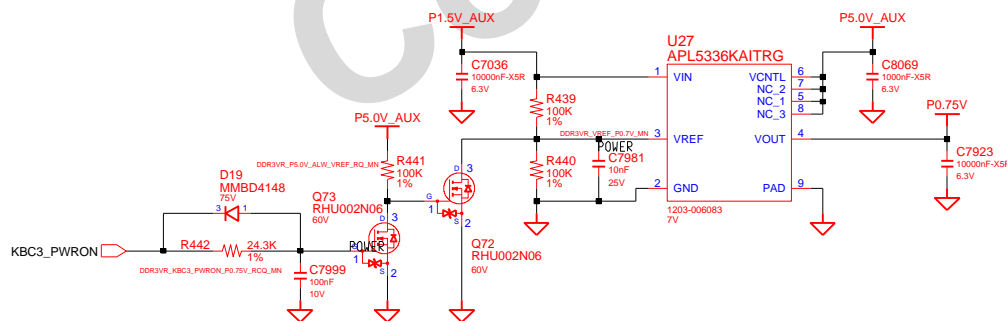
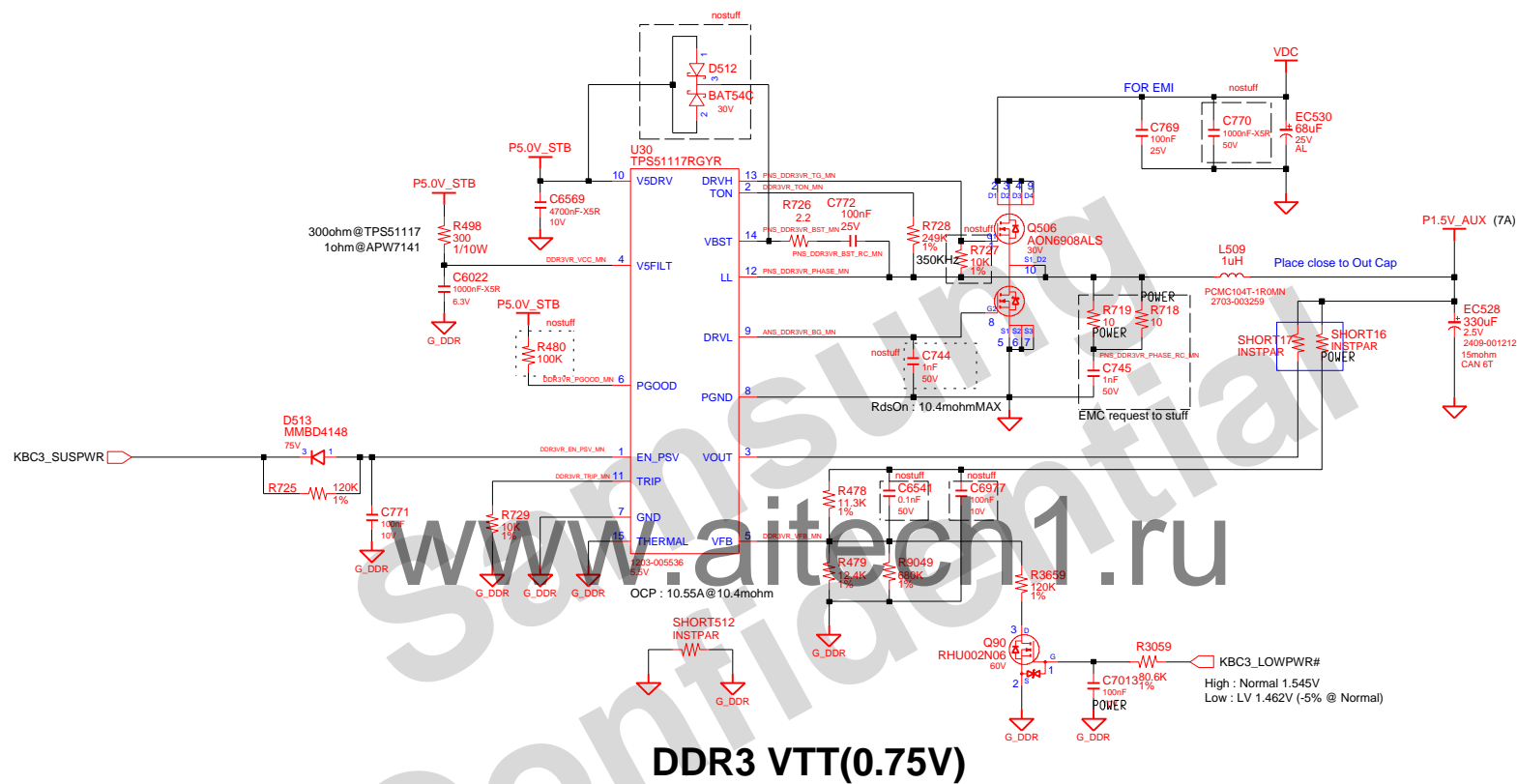
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0	1	0.8V @ MODE = OPEN
0	1	0.85V @ MODE = 33K Ω
1	0	0.725V
1	1	0.675V

DESIGN	MS YANG	DATE	3/11/2011	TITLE PETRONAS-15_QUAD P1.1V_VTT	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	PR		
APPROVAL	BL LEE	REV	REV 1.0		
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				PART NO.	BA41-01662A

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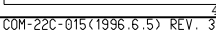
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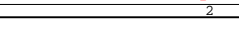
DDR3 Power

DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG
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APPROVAL	BL LEE	REV	REV 1.0	DDR3 POWER	PART NO.	BA41-01662A
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	44	OF 51

TH2
NTCG104QH474G



R84 C100

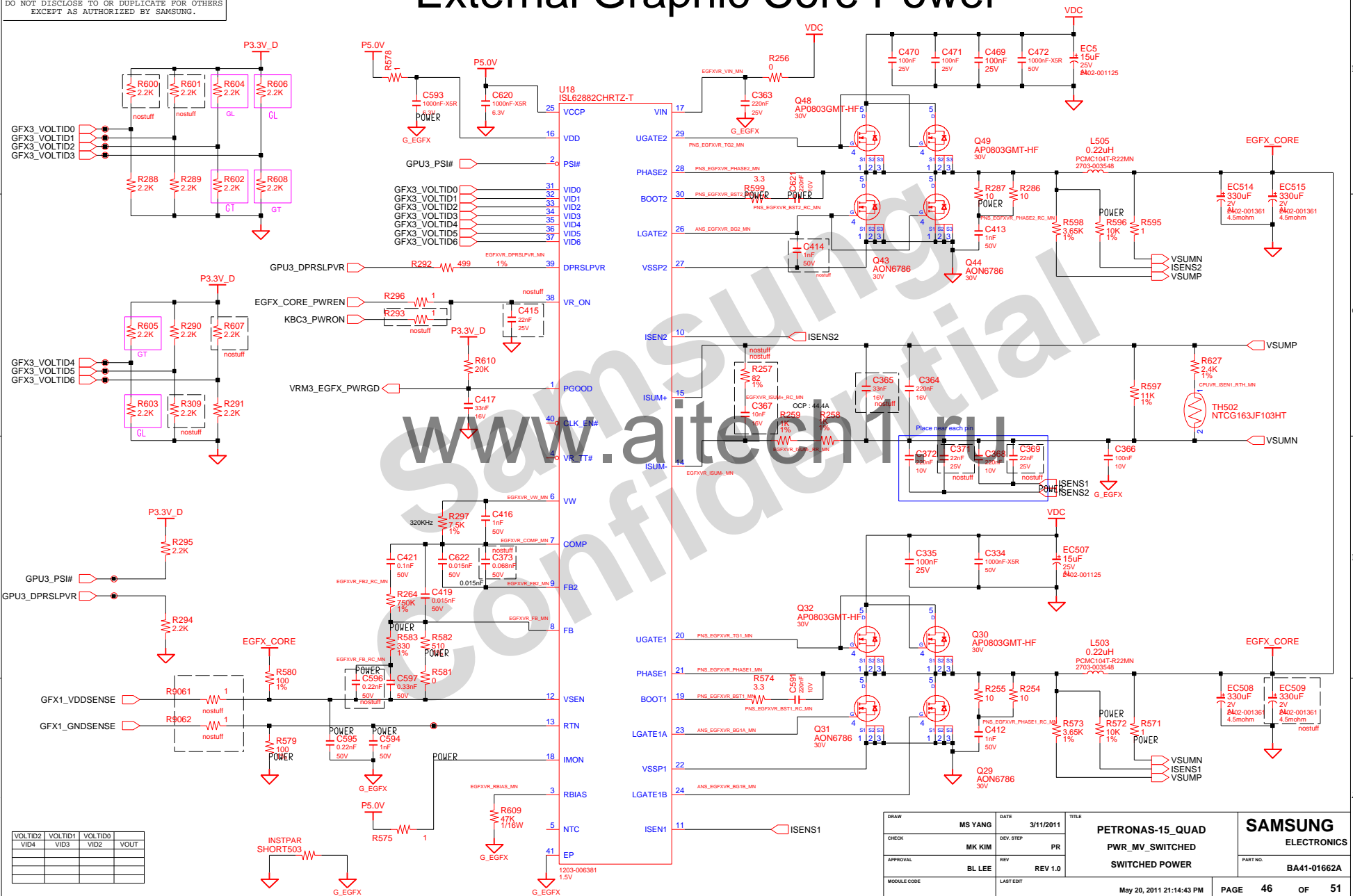


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External Graphic Core Power



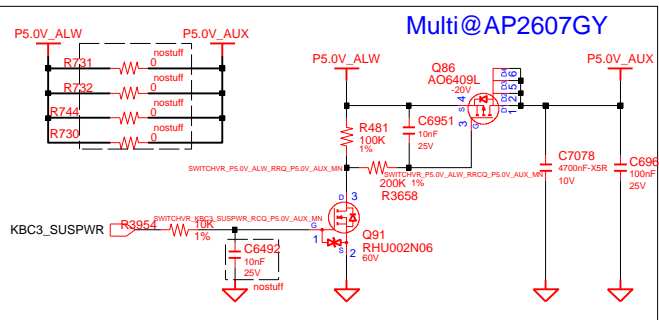
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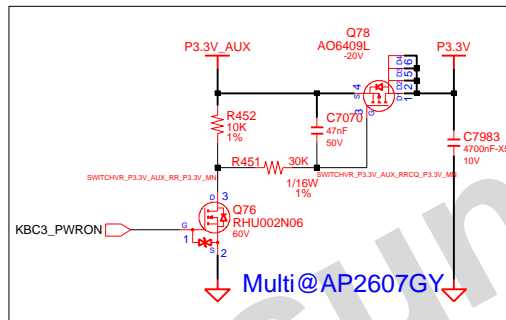
Switched Power 1

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

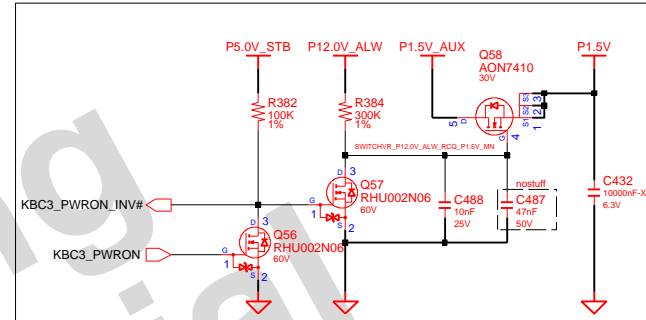
P5.0V_AUX



Switched Power On (P3.3V)



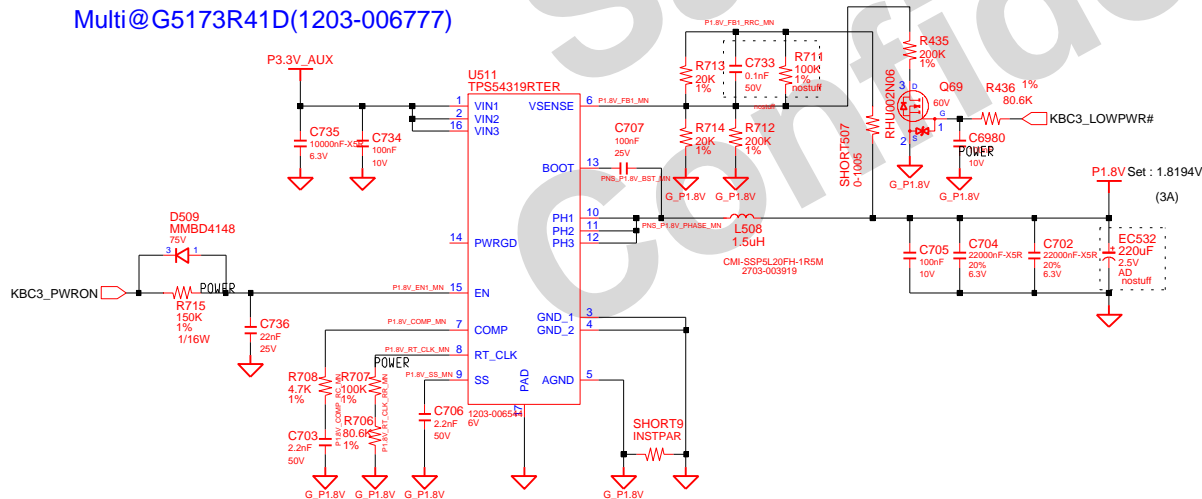
Switched Power On (P1.5V)



For nVIDIA GFX PWR Sequence
NVDD(EGFX_CORE) first and then FBVDDQ(qDDR3)

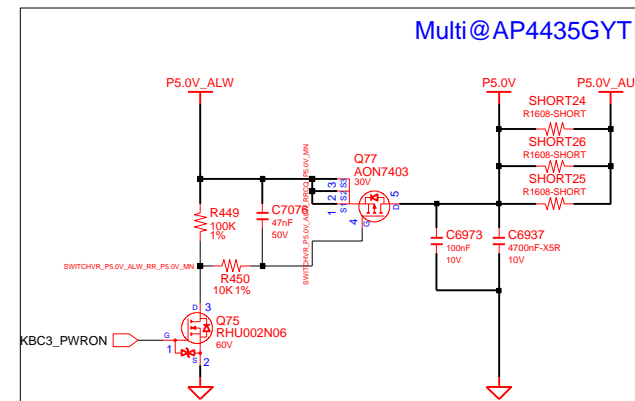
CHIPSET POWER(P1.8V)

Multi@G5173R41D(1203-006777)



Switched Power On (P5.0V)

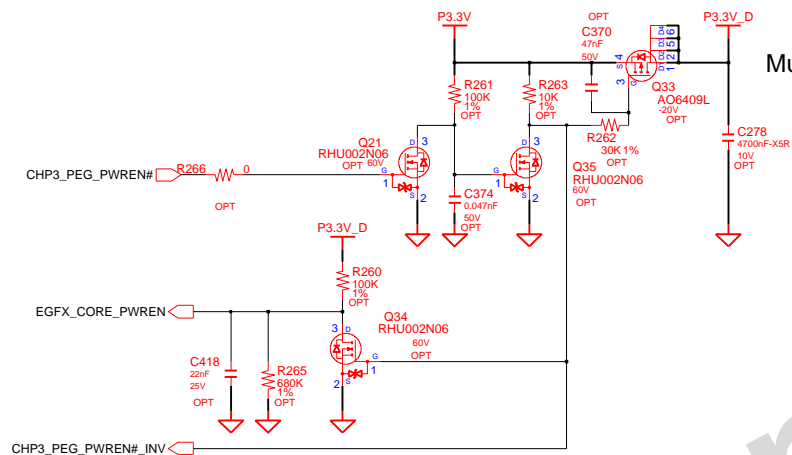
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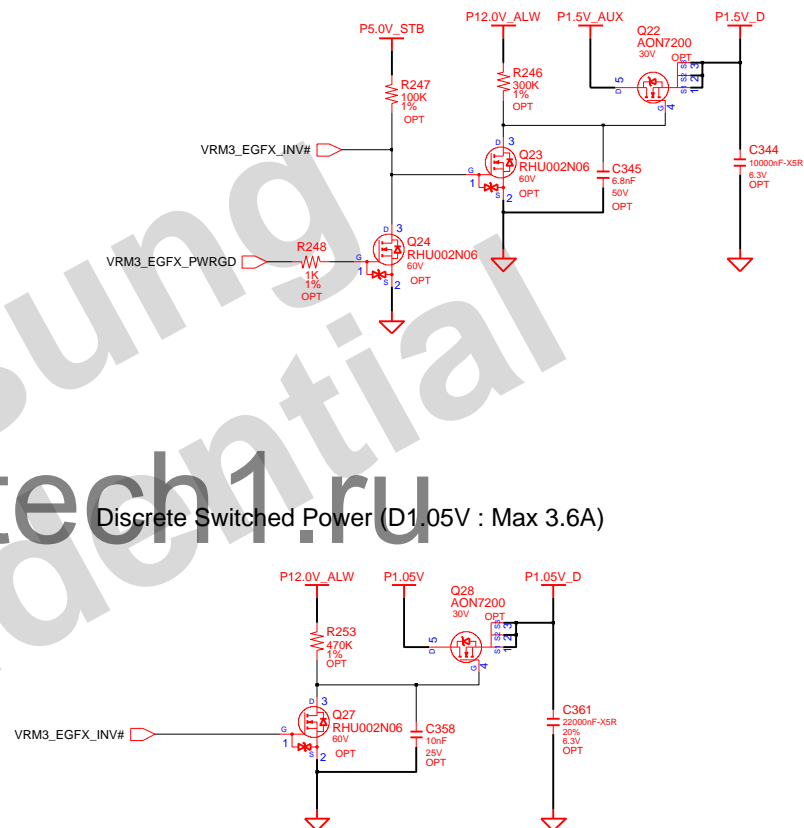
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CHECK	MK KIM	DEV. STEP	PR	PWR_MV_SWITCHED POWER	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.0	SWITCHED POWER	PART NO.	BA41-01662A
MODULE CODE	undefined	LAST EDIT	May 20, 2011 21:14:43 PM	PAGE	47	OF 51

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Multi@AP2607GY



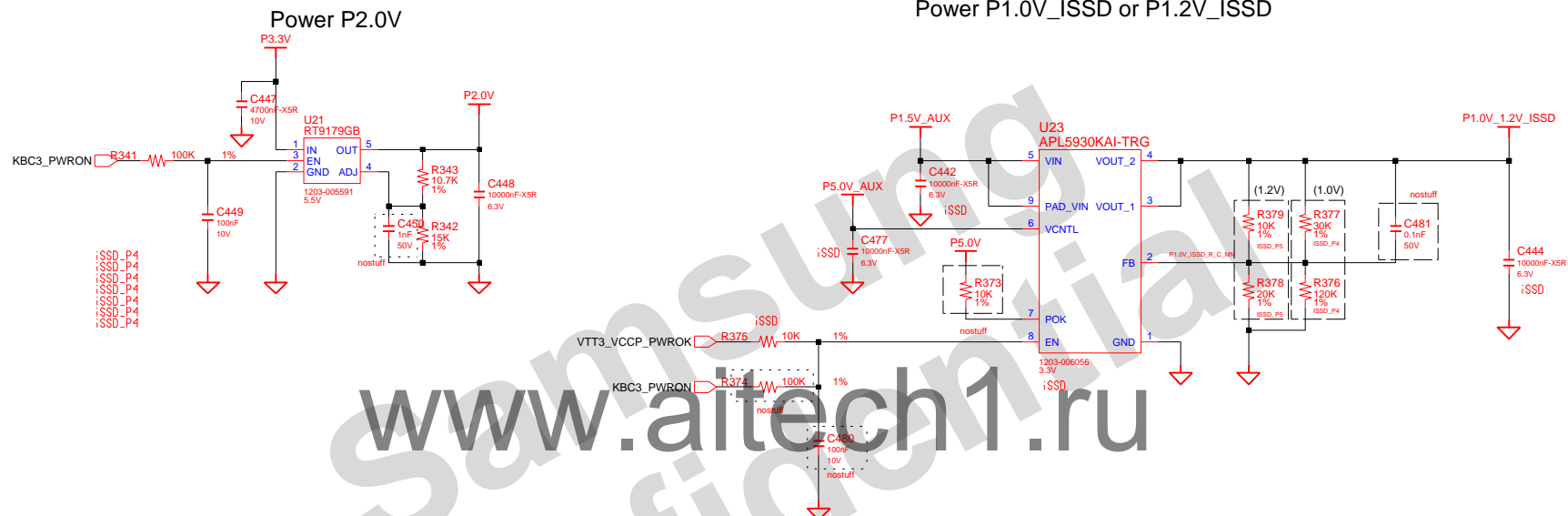
Discrete Switched Power (D1.05V : Max 3.6A)



DRAW	MS YANG	DATE	3/11/2011	PETRONAS-15_QUAD Switched PWR 2 FOR OPTIMUS PWR		SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	PR				
APPROVAL	BL LEE	REV	REV 1.0	PART NO. BA41-01662A			
MODULE CODE		LAST EDIT				May 20, 2011 21:14:43 PM	

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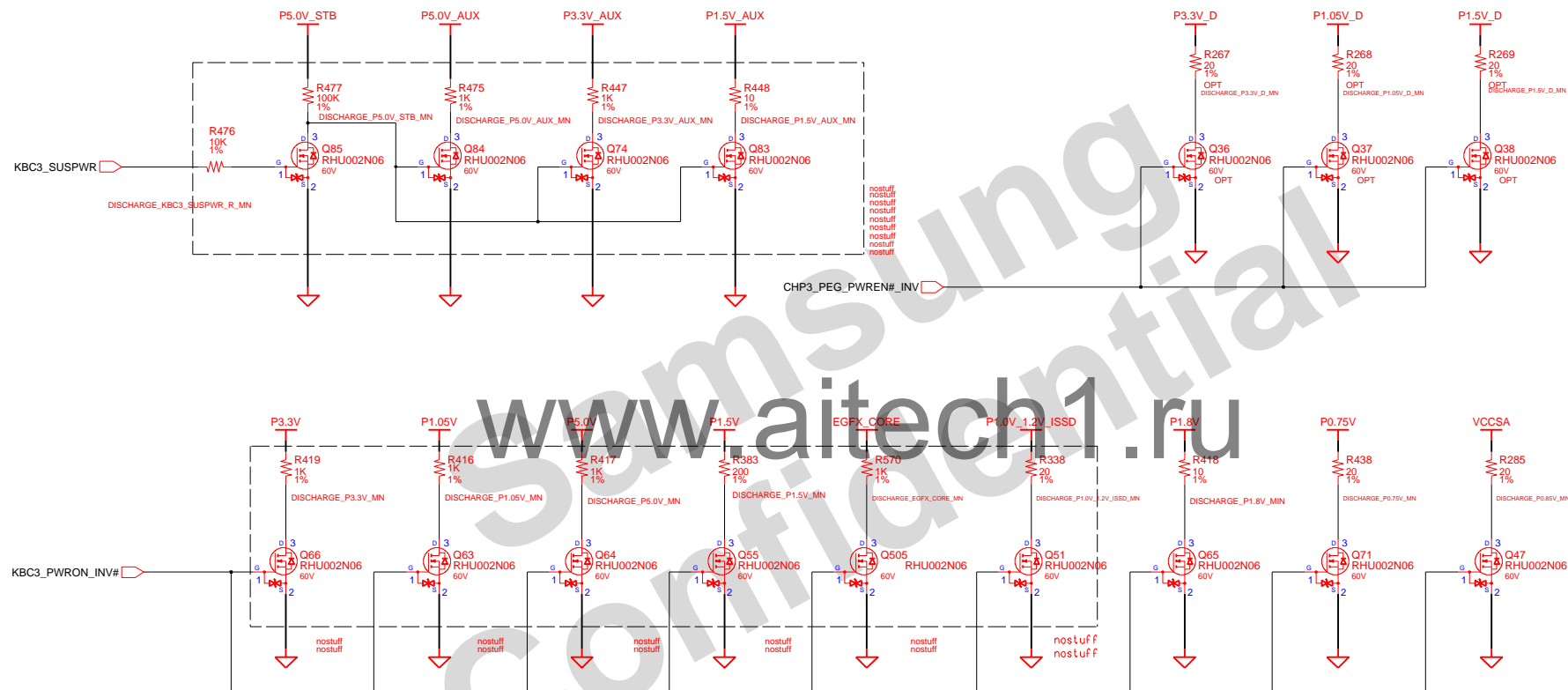
iSSD POWER

DESIGN	DATE	8/9/2011	TITLE undefined iSSD POWER iSSD POWER		SAMSUNG ELECTRONICS PART NO. BA41-undef i
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APPROVAL	REV	UNDEFINED			
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POWER DISCHARGER

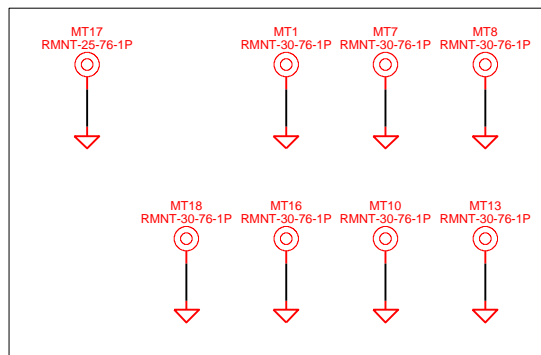


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CHECK	MK KIM	DEV. STEP	PR			PART NO. BA41-01662A
APPROVAL	BL LEE	REV	REV 1.0			
MODULE CODE		LAST EDIT		May 20, 2011 21:14:43 PM	PAGE 49 OF 51	

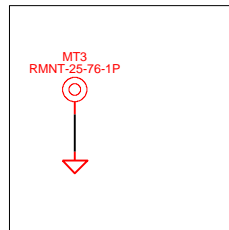
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Mainboard Mount ((25-76)X1EA, (30-76)X7EA)

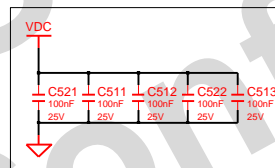


PCB FIX

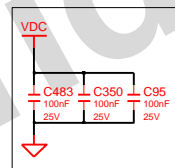


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For bottom VDC line



For 3rd layer VDC line



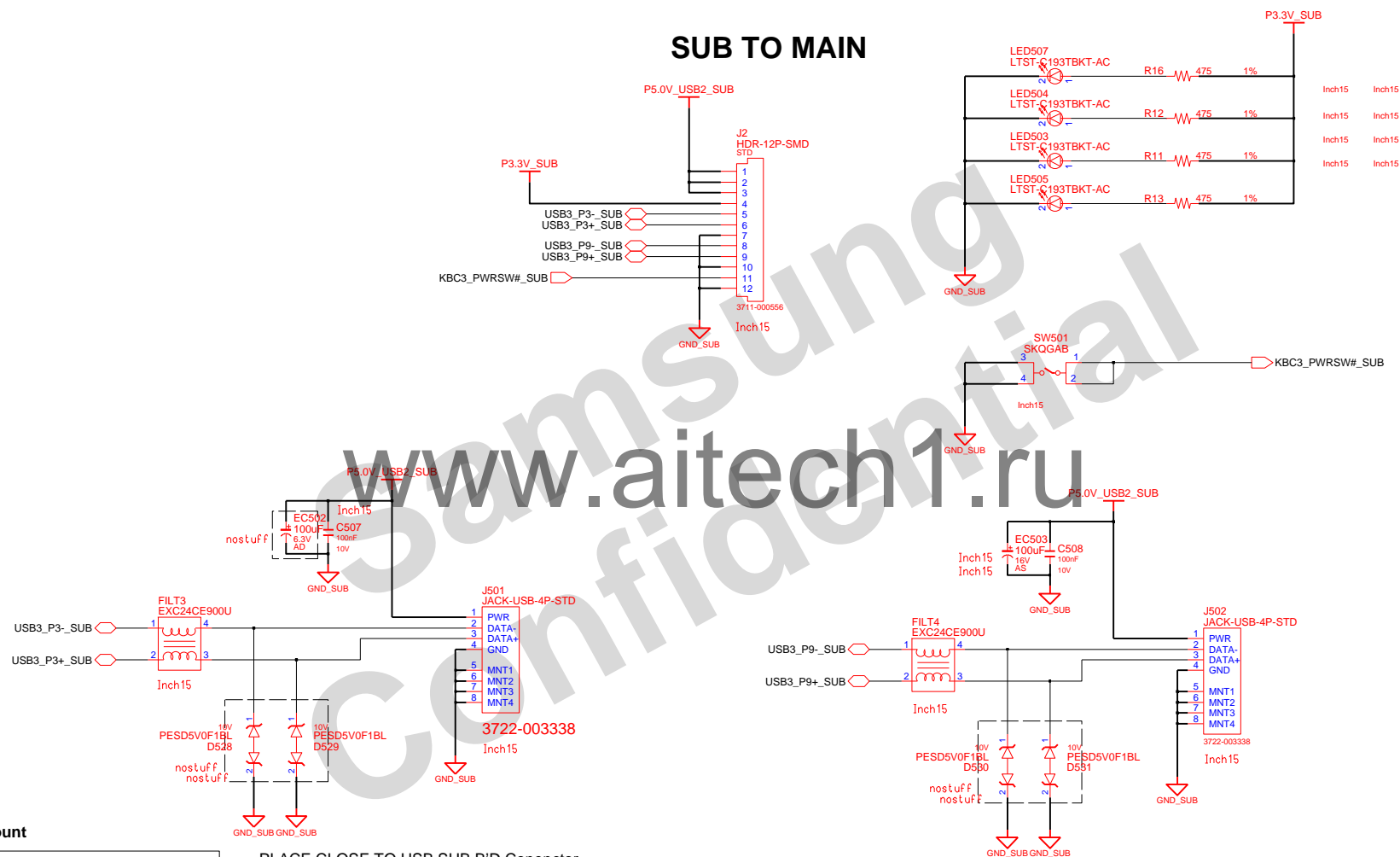
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-15_QUAD	SAMSUNG ELECTRONICS PART NO. BA41-01662A
CHECK	MK KIM	DEV. STEP	PR		MT Hole	
APPROVAL	BL LEE	REV	REV 1.0		MT Hole	
MODULE CODE		LAST EDIT		May 20, 2011 21:14:43 PM	PAGE 50 OF 51	

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USB SUB BOARD (15")

SUB TO MAIN



PLACE CLOSE TO USB SUB B'D Conenctor

PLACE CLOSE TO USB SUB B'D Conenctor

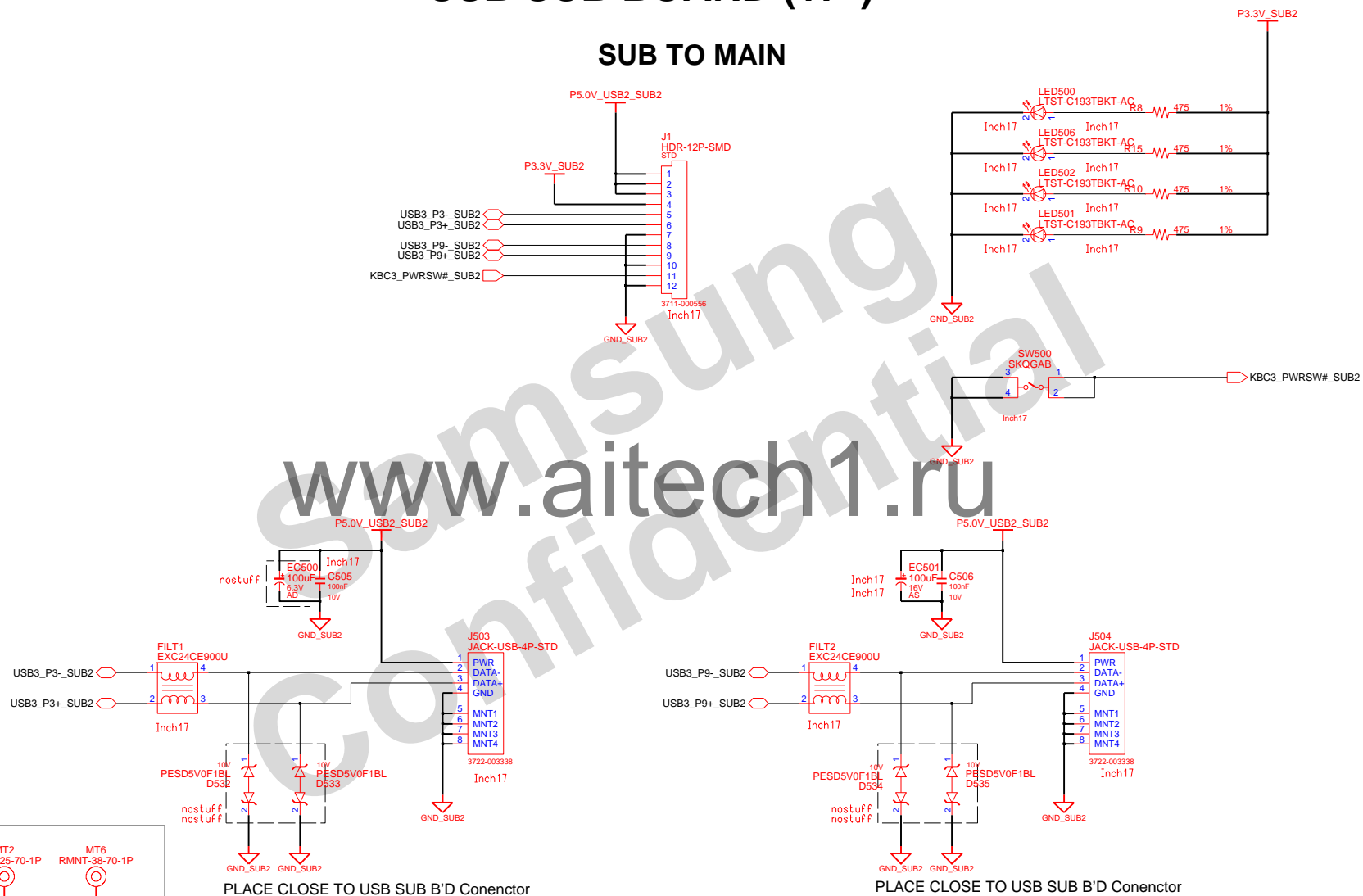
DESIGN	MS YANG	DATE	3/11/2011	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-01662A
CHECK	MK KIM	DEV. STEP	PR	PETRONAS-15_QUAD SUB BOARD	
APPROVAL	BL LEE	REV	REV 1.0	15" USB Sub BOARD	
MODULE CODE		LAST EDIT	May 20, 2011 21:14:43 PM		
				PAGE	51 OF 51

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USB SUB BOARD (17")

SUB TO MAIN



DESIGN	DATE	TITLE	SAMSUNG ELECTRONICS PART NO. BA41-undefi
CHECK	6/18/2011	undefined SUB BOARD	
APPROVAL	DEV. STEP	17" USB SUB BOARD	
MODULE CODE	REV	undefined	
	LAST EDIT	June, 18, 2011 2:15:38 PM	PAGE 52 of 52