

# Miranda-13H,14M-INT

CPU : Ivy Bridge ULV  
Chip Set : Intel Panther Point  
GFX : Internal GFX  
Remarks : Chief River Platform

Model Name : Miranda-13H,14M-INT

PBA Name : MAIN

PCB Code : BA41-02234A

(GCE, HANNSTAR, PIOTEK)

Dev. Step : MP

Revision : 1.0

T.R. Date : 2012.12.06

Design	Check	Approval
LPC	TPM	
SY KIM	SJ KIM	MK KIM

Owner : SEC Mobile R & D Signature : X

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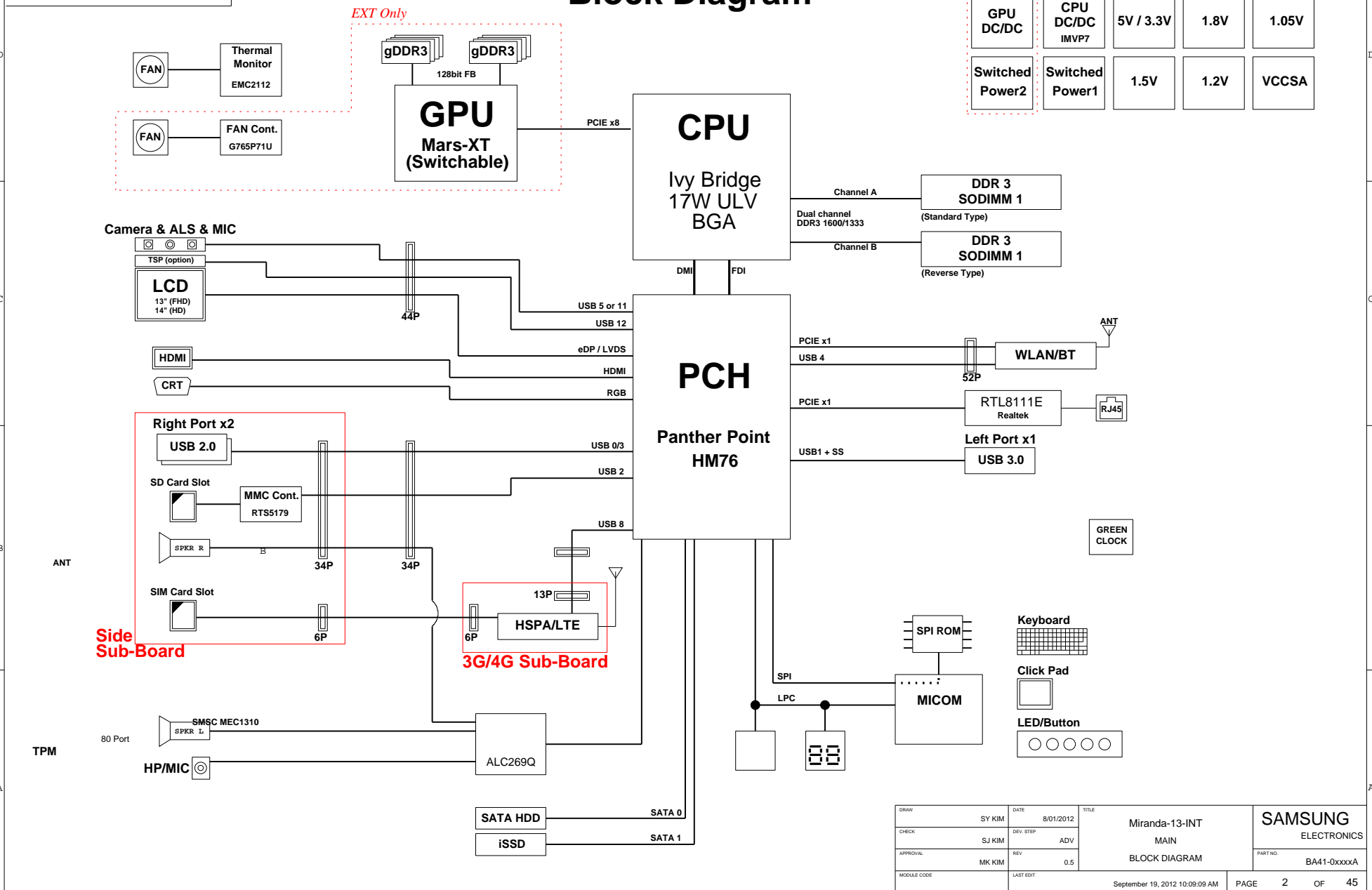
## Revision History

Step	Rev	Date	Description
ADV	1.0	2012.09.04	ADV1 First Release

DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		MAIN	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		COVER	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT		September 19, 2012 10:09:09 AM	PAGE	1 OF 45

# Block Diagram

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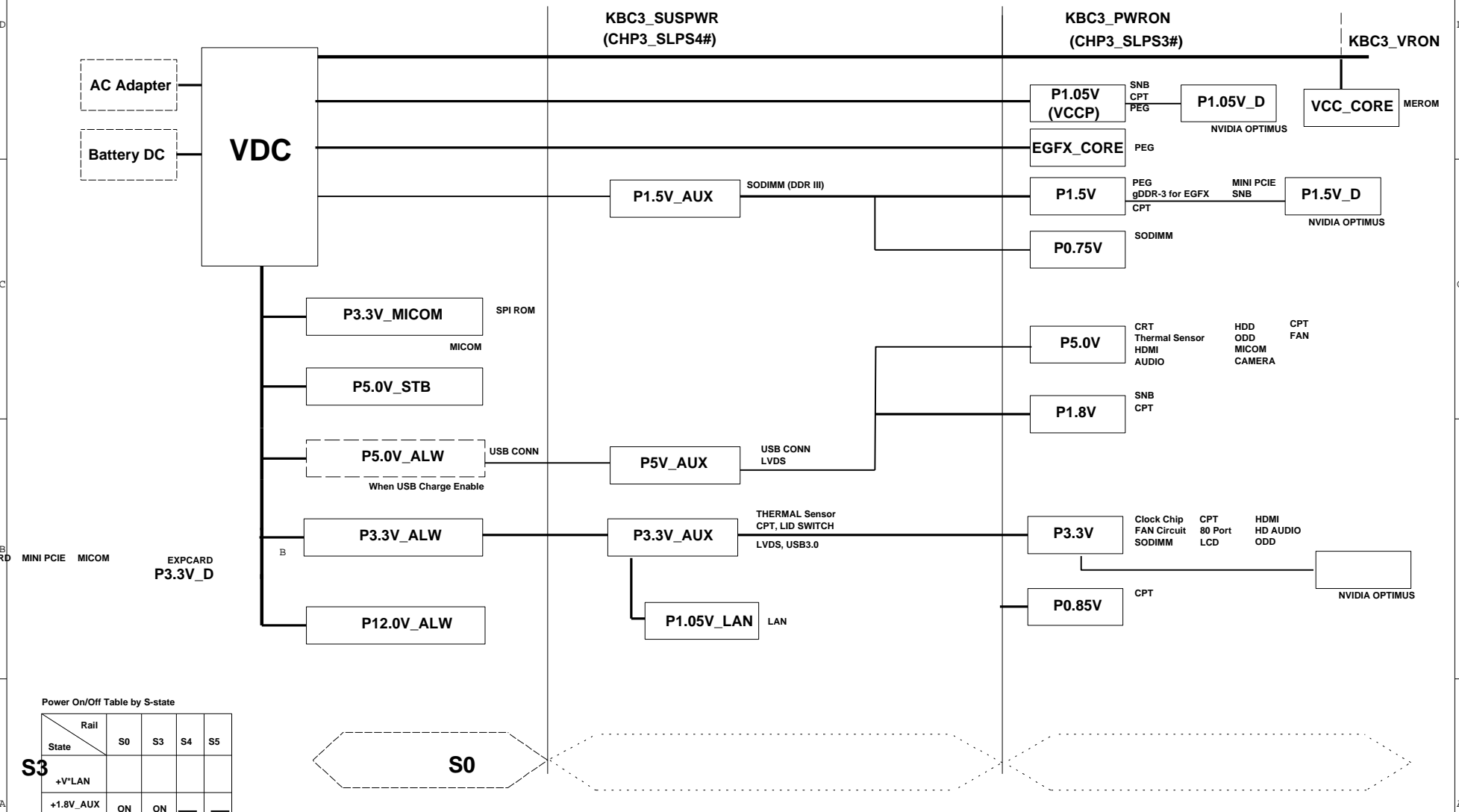


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APPROVAL	MK KIM	REV	0.5	BLOCK DIAGRAM		
MODULE CODE		LAST EDIT				
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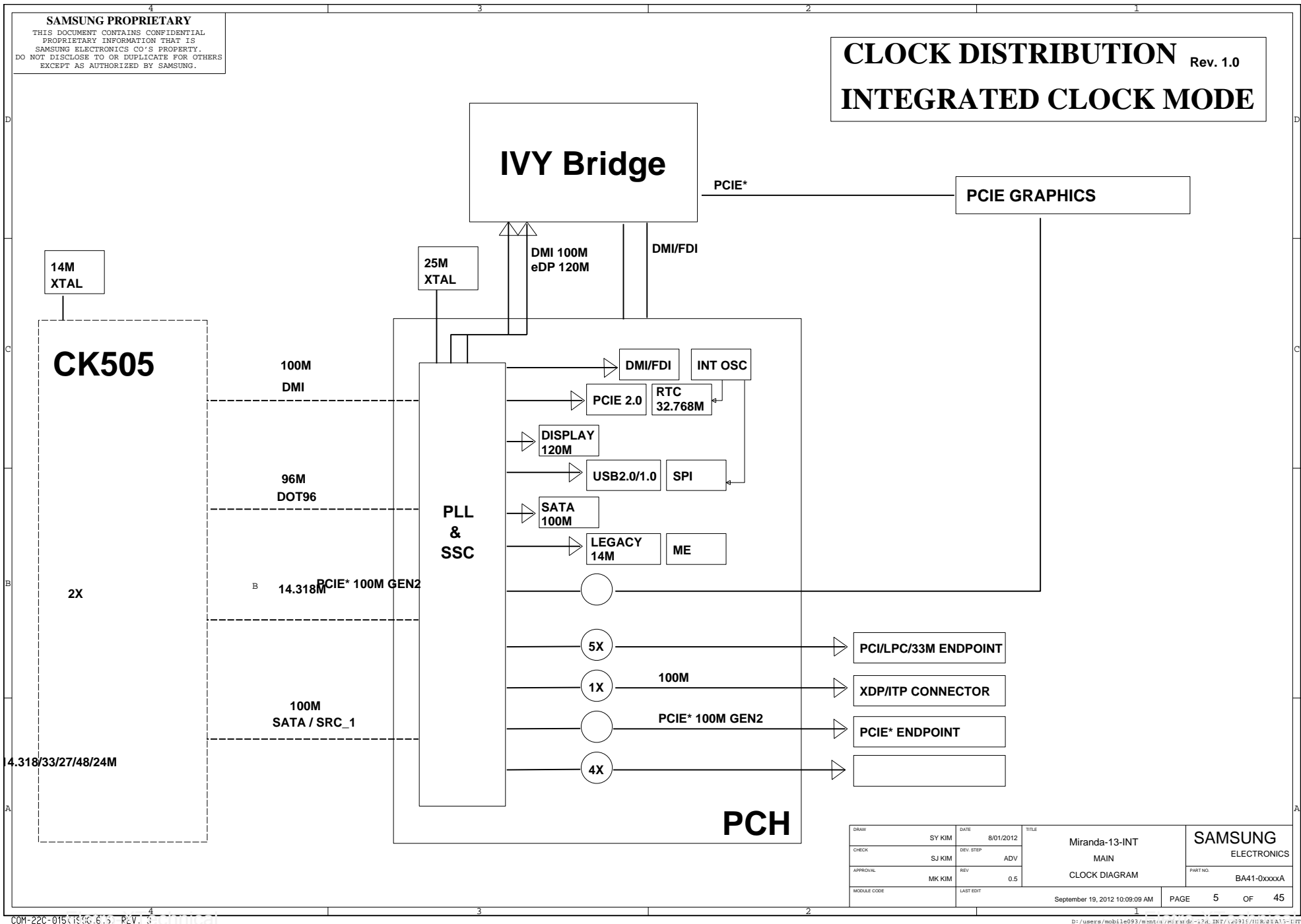
# POWER DIAGRAM

Rev 0.7



Power On/Off Table by S-state

Rail	S0	S3	S4	S5
State				
+V*LAN				
+1.8V_AUX +0.9V	ON	ON	---	---
+V*AUX	ON	ON	---	---
+V	ON	---	---	---
+V* (CORE)	ON	---	---	---



## SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails		Active in
VDC P3.3V_MICOM P5.0V_ALW P5.0V_STB	Primary DC system power supply (7 to 21V) 3.3V always power rail (for Microm) 5.0V always power rail 5.0V 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 P0.85V	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) 0.85V 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

USB PORT Assign		PCI Express Assign	
PORT #	ASSIGNED TO	PORT #	ASSIGNED TO
0	SYSTEM PORT 0	1	Mini Card 1 (WLAN)
1	SYSTEM PORT 1	2	NC
2	Mini PCI Express (WLAN)	3	NC
3	Multi Memory Card Controller	4	LAN CONTROLLER
4	NC	5	USB3.0 BRIDGE
5	NC	6	NC
6	NC (N/A WITH HM65)	7	NC
7	NC (N/A WITH HM65)	8	NC
8	Mini PCI Express (HSPA)		
9	SYSTEM PORT 2		
10	NC	B	
11	Camera		
12	USIM		
13			

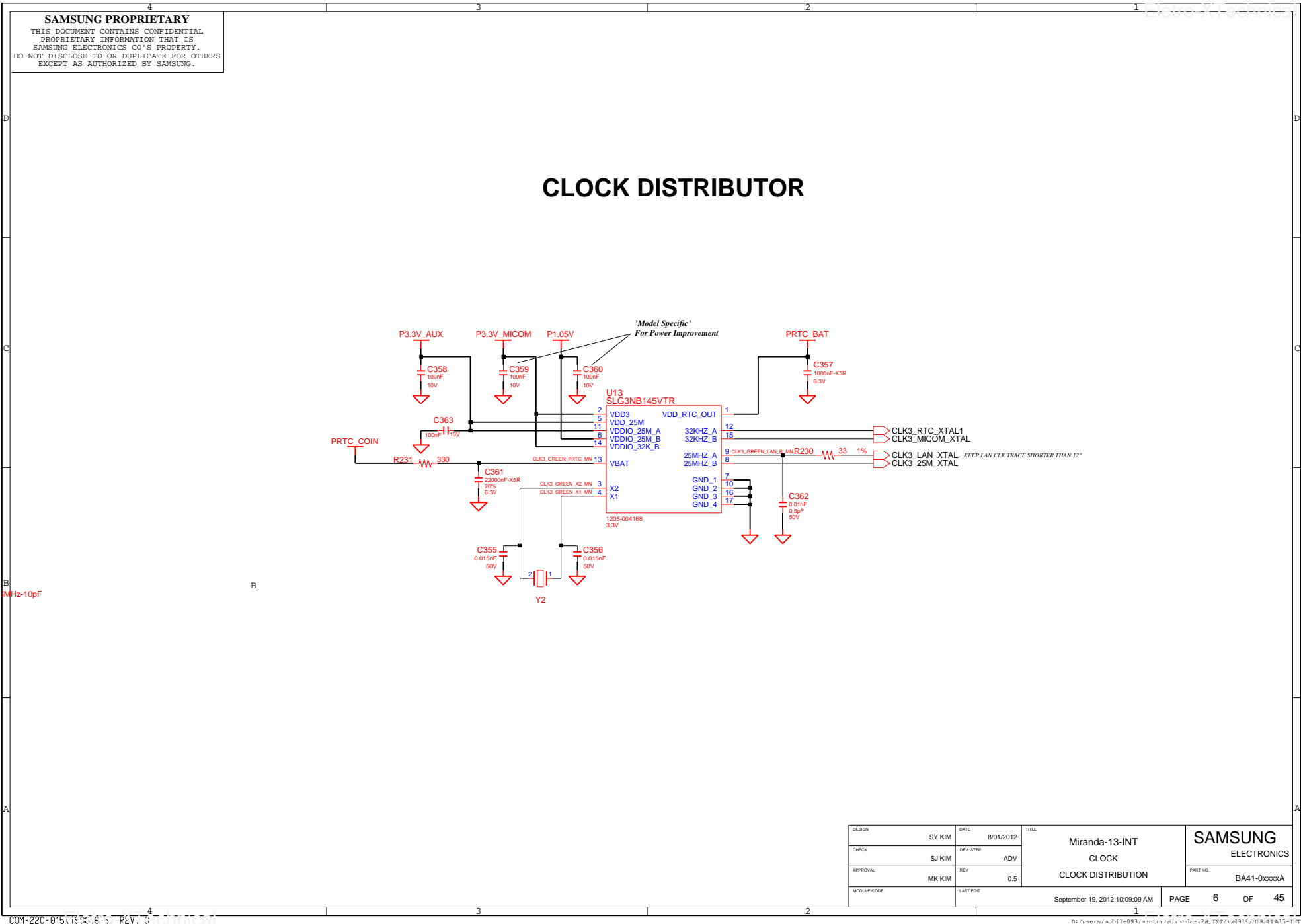
SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	SSD
2	ODD
3	
4	
5	

Crystal / Oscillator			
TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	COUGAR POINT	Real Time Clock
Crystal	25MHz	LAN	REALTEK
Crystal	25MHz	COUGAR POINT	
Crystal	27MHz	N12P	
Crystal	24MHz	USB3.0 CHIP	

LCD Pannel Detect (TBD)		
Devices	Resolution	PANNEL_DETECT_0

I <sup>2</sup> C / SMB Address			
Devices	Address	Hex	Bus
COUGARPOINT	Master	-	SMBUS Master
CPU Thermal Sensor	0011 000X	30h	Thermal Sensor
SODIMM0	1010 000x	A0h	-
SODIMM1	1010 010x	A4h	-
Thermal Sensor on SODIMM0	0011 000x	30h	-
Thermal Sensor on SODIMM1	0011 010x	34h	-
on board DDR3 thermal Sensor	1001 100x	98h	
Platform thermal management TS	1001 011x	96h	

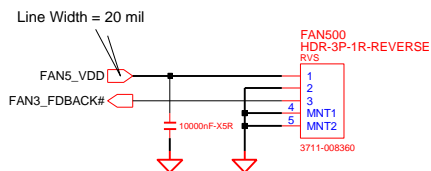
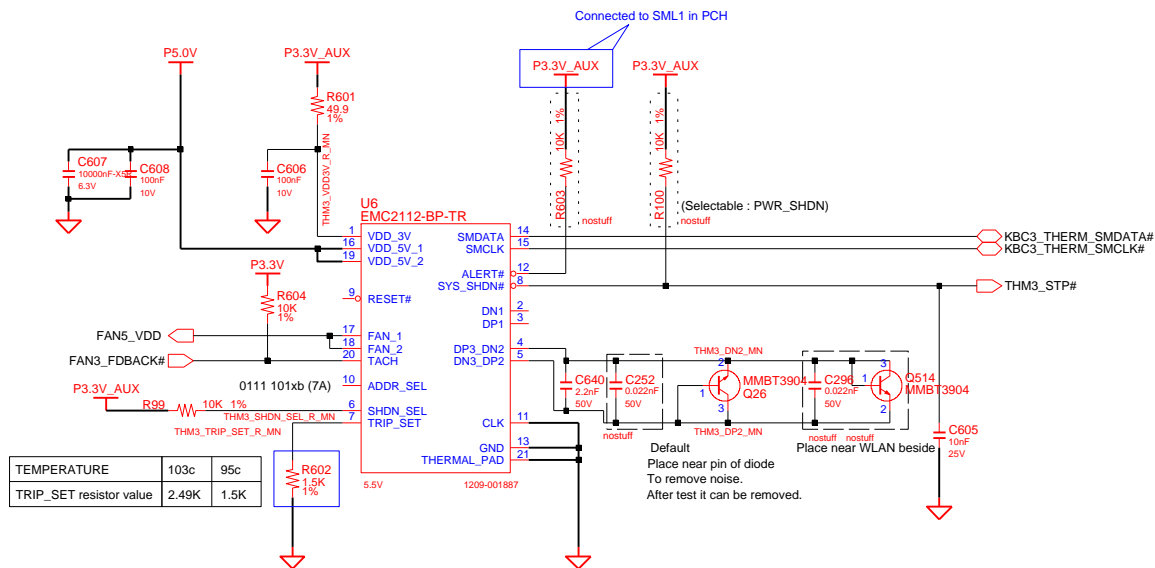
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APPROVAL	MK KIM	REV	0.5		
MODULE CODE			LAST EDIT		
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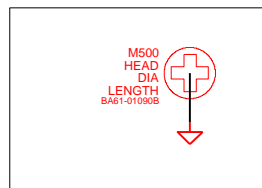
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## THERMAL SENSOR & FAN CONTROL



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

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



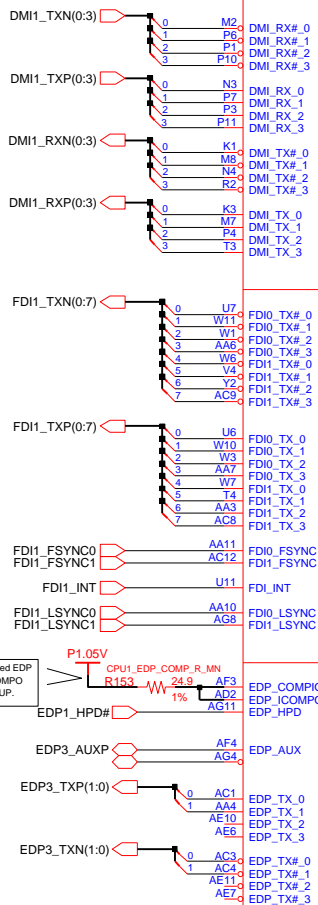
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APPROVAL	MK KIM	REV	0.5		THERMAL SENSOR EMC2112	
MODULE CODE		LAST EDIT	September 19, 2012 10:09:09 AM	PAGE	7	OF 45

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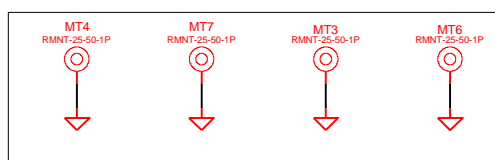
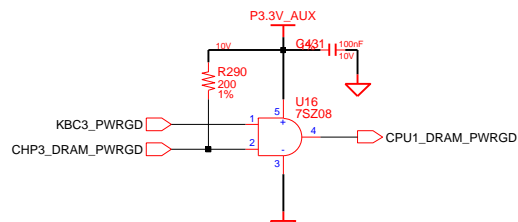
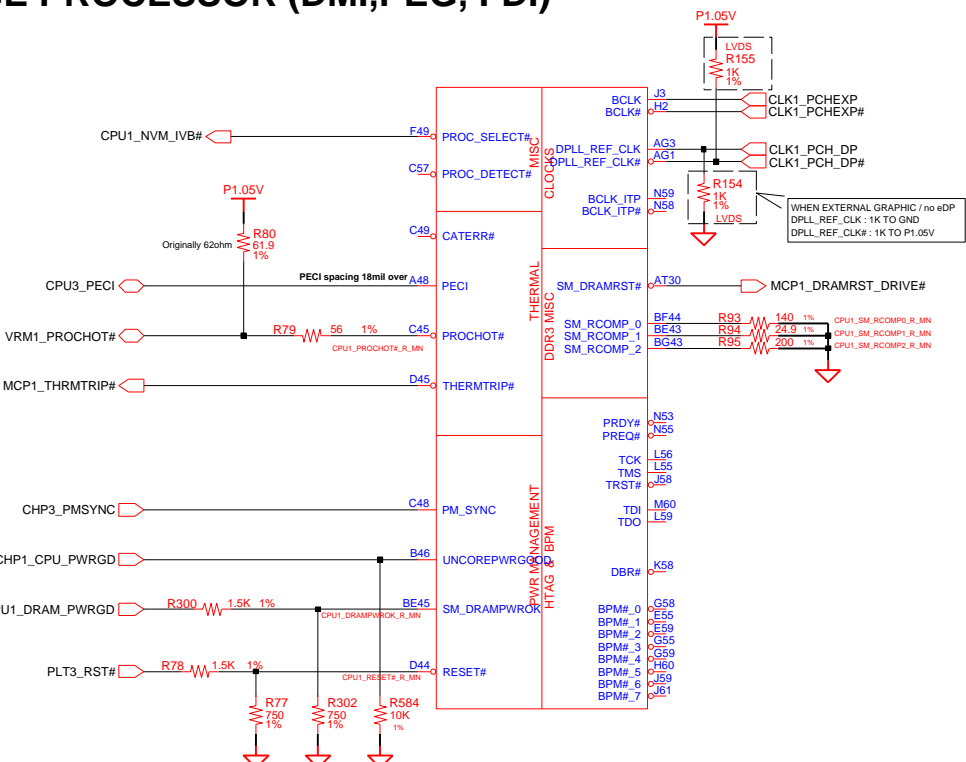
## IVYBRIDGE PROCESSOR (DMI,PEG, FDI)

i5-3317U\_1.7GHz\_3MB  
 CPU500-1 1/5



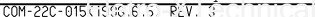
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## HPD INVERSION FOR EDP

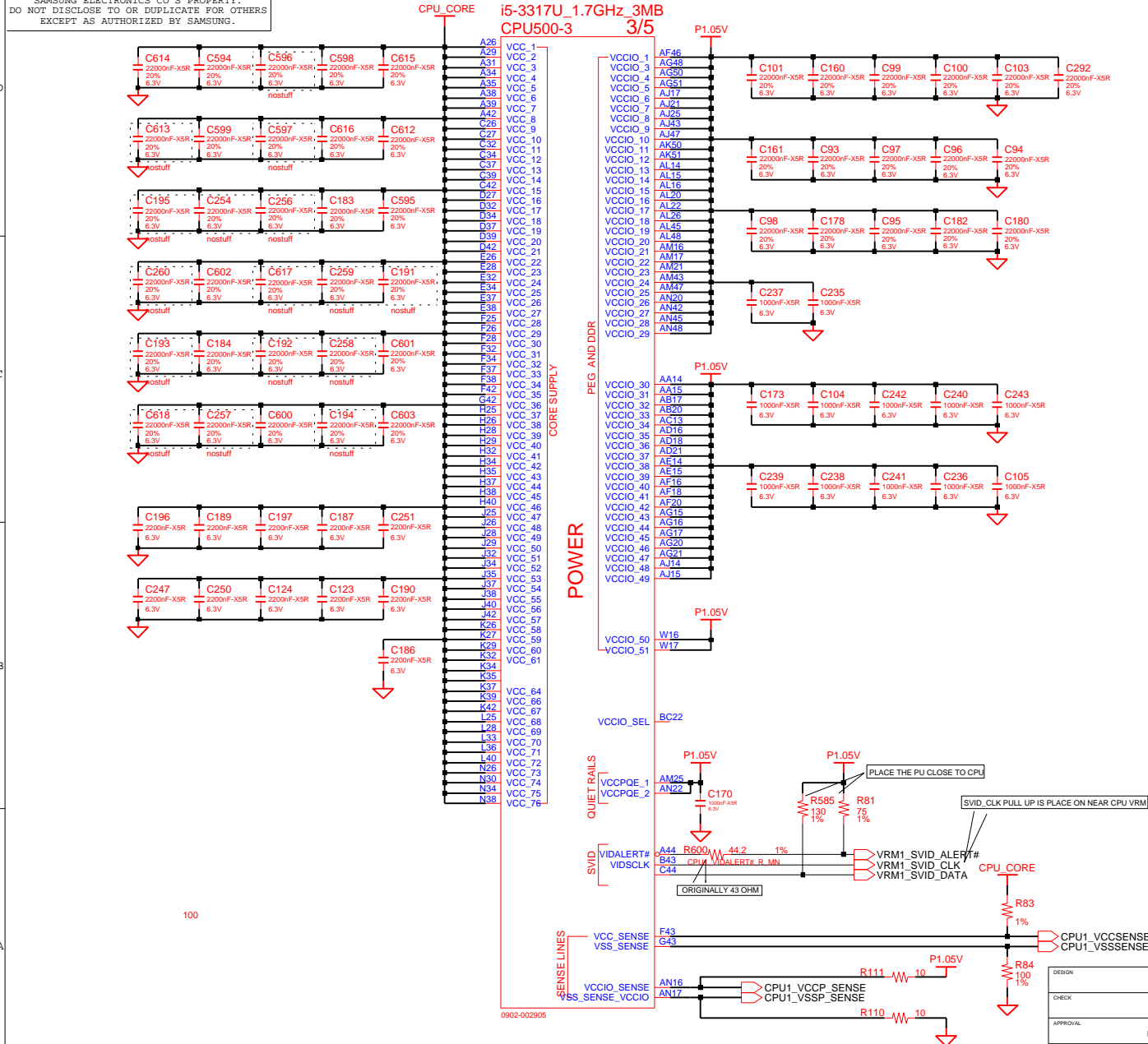


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MODULE CODE	undefined	LAST EDIT	September 19, 2012 10:09:09 AM			BA41-0xxxxA
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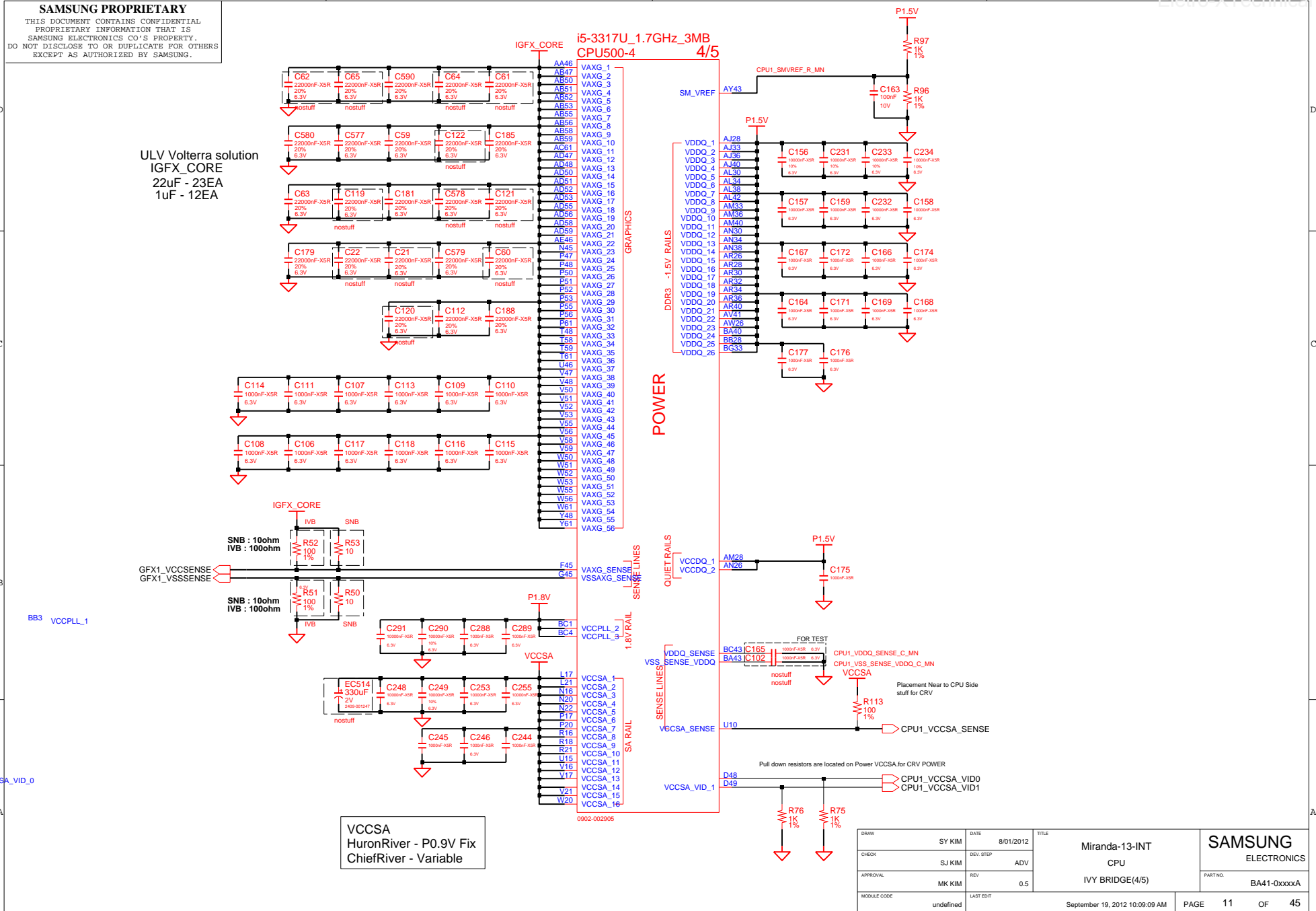
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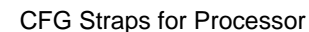


DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT CPU	SAMSUNG ELECTRONICS
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CHECK	SJ KIM	DEV. STEP	ADV		CPU	
APPROVAL	MK KIM	REV	0.5		IVY BRIDGE(4/5)	PART NO. BA41-0xxxxA
MODULE CODE	undefined	LAST EDIT				
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PCI Express Static Lane Reversal	
CFG2	1 : Normal operation 0 : Lane Reversed

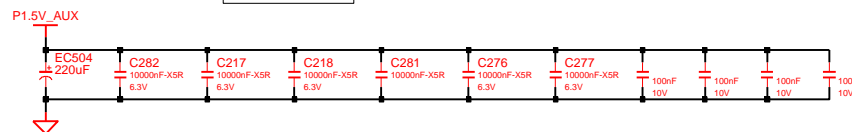
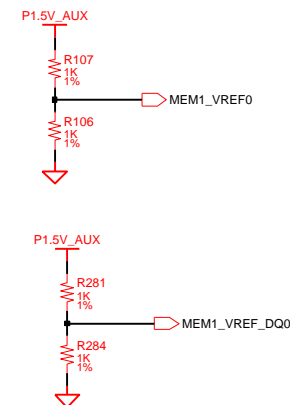
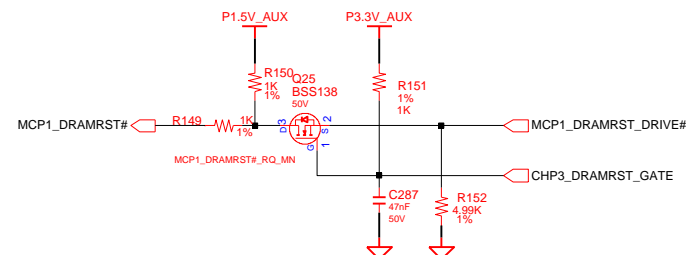
00	: 1 x 8, 2 x 4 PCI Express
01	: reserved
11	: 1 x 16 PCI Express

PEG DEFER TRAINING	
CFG7	1 : (DEFAULT) PEG TRAIN IMMEDIATELY FOLLOWING XXRESETB DEASEERTION 0 : PCIE 2.0 PEG WAIT FOR BIOS FOR TRAINING

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

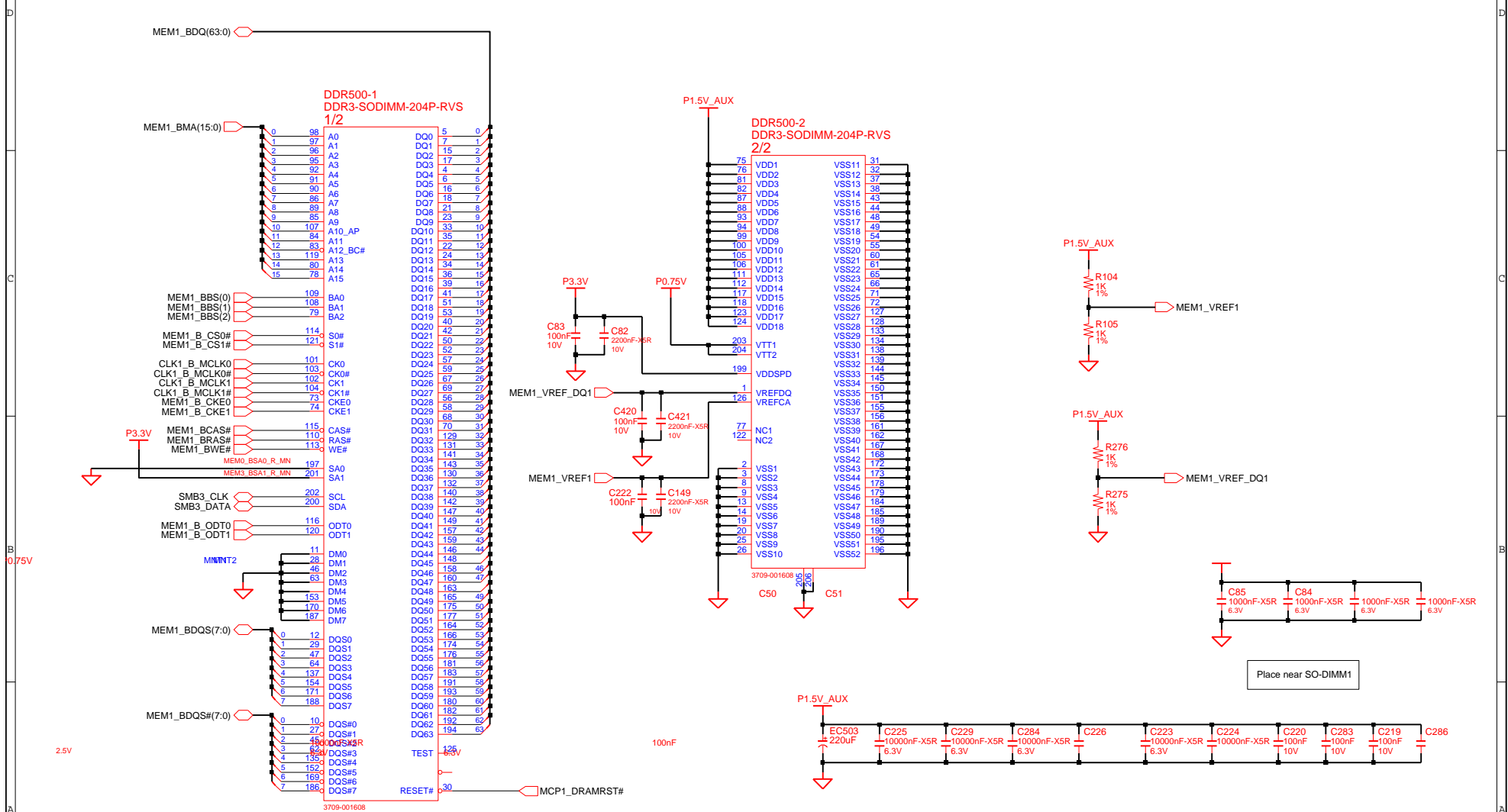
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MODULE CODE	LAST EDIT				September 19, 2012 10:09:09 AM	PAGE 12 OF 45

## STANDARD



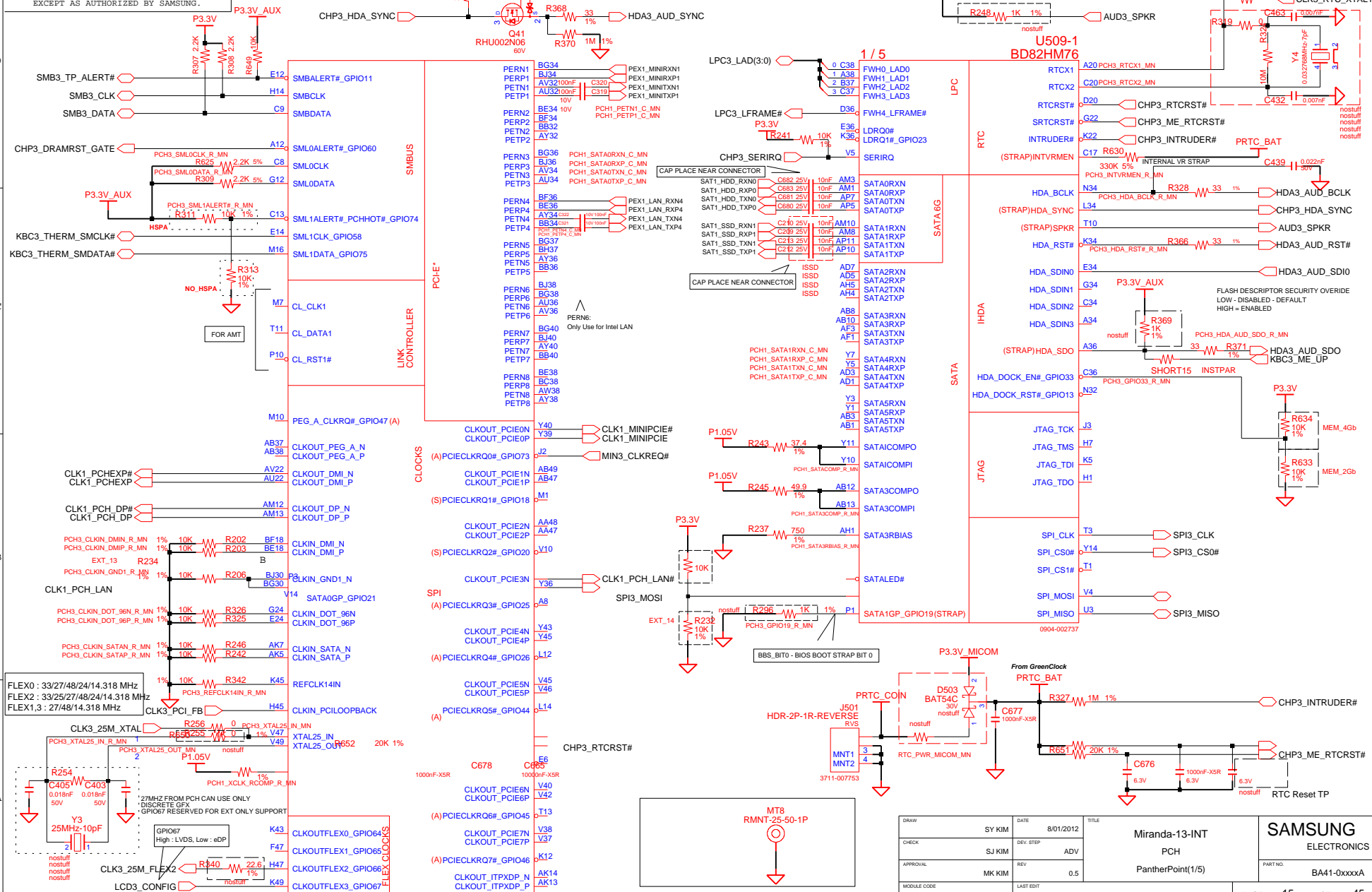
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## DDR3 SO-DIMM #1



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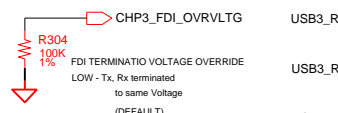
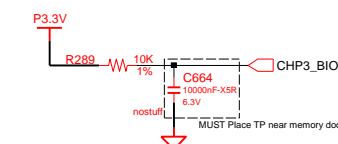
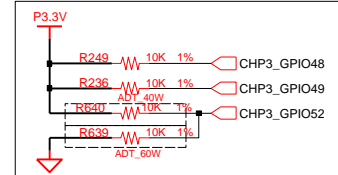




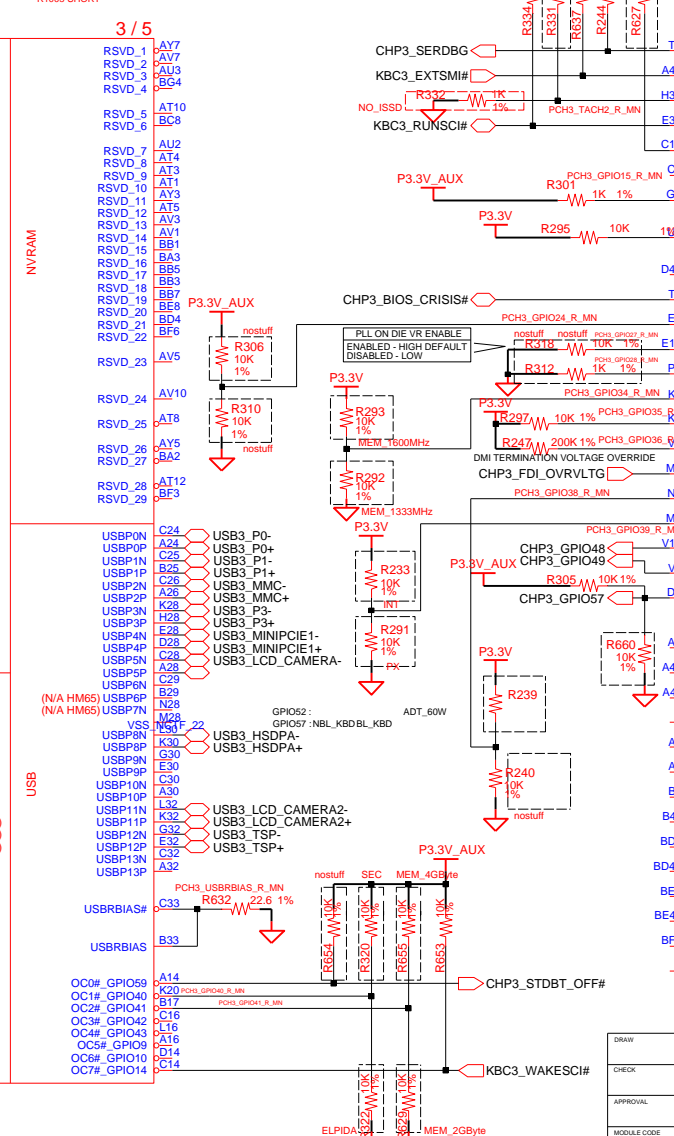
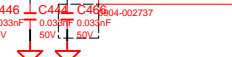
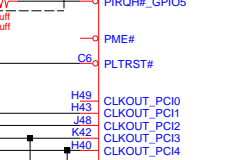
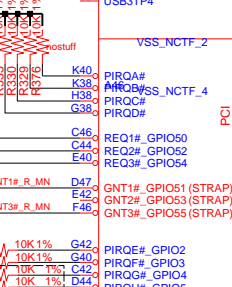
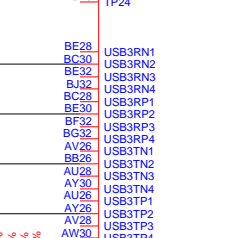
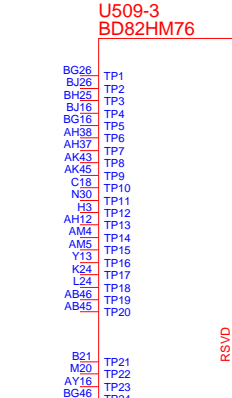
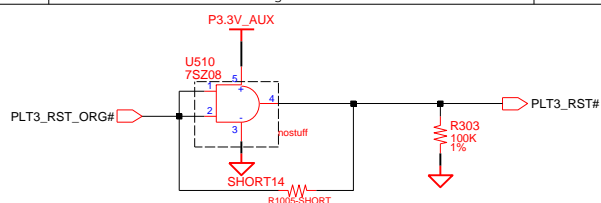
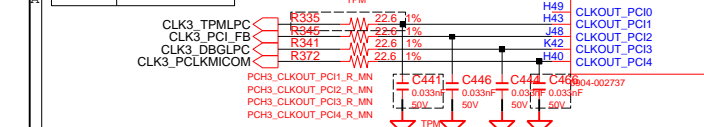
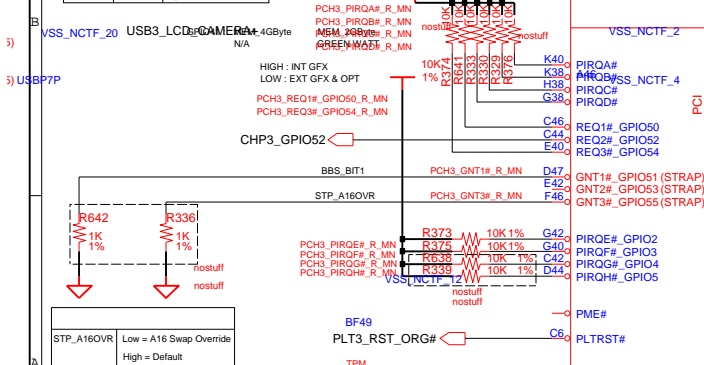




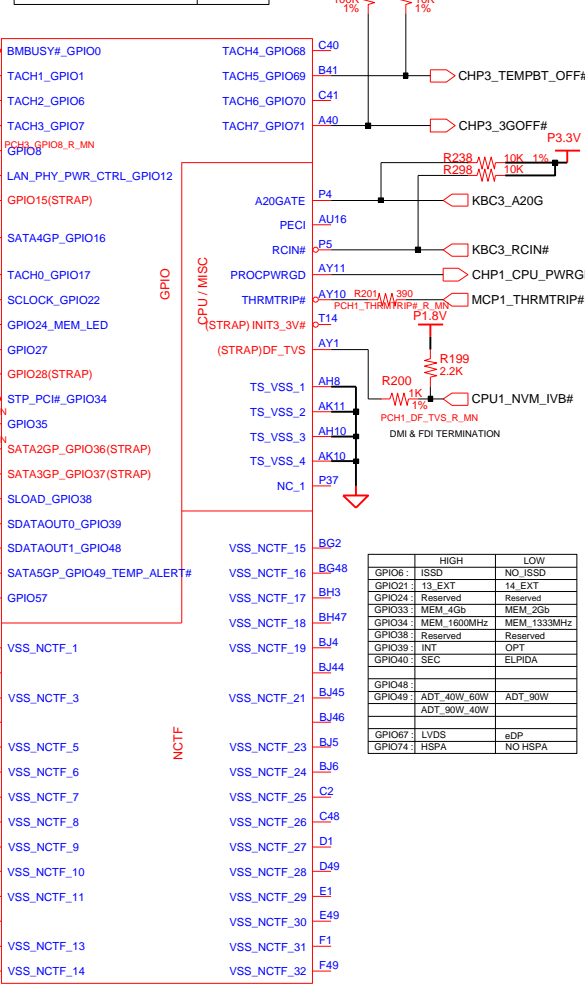
GREEN WATT



BOOT BIOS STRAP		
BBS_BIT 1	BBS_BIT 0	BOOT BIOS LOCATION
0	0	LPC
0	1	RESERVED (NAND)
1	0	-
1	1	SPI

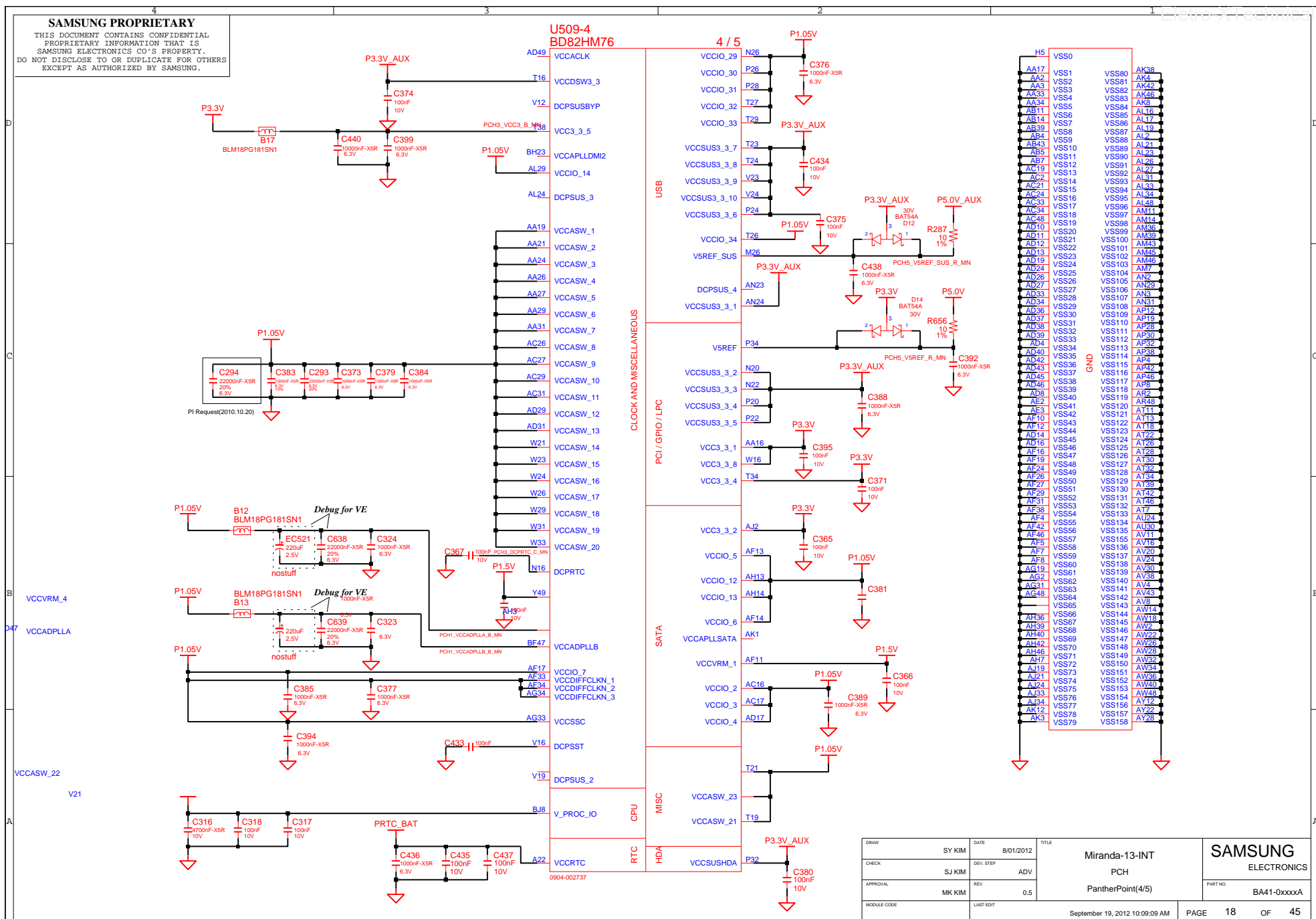


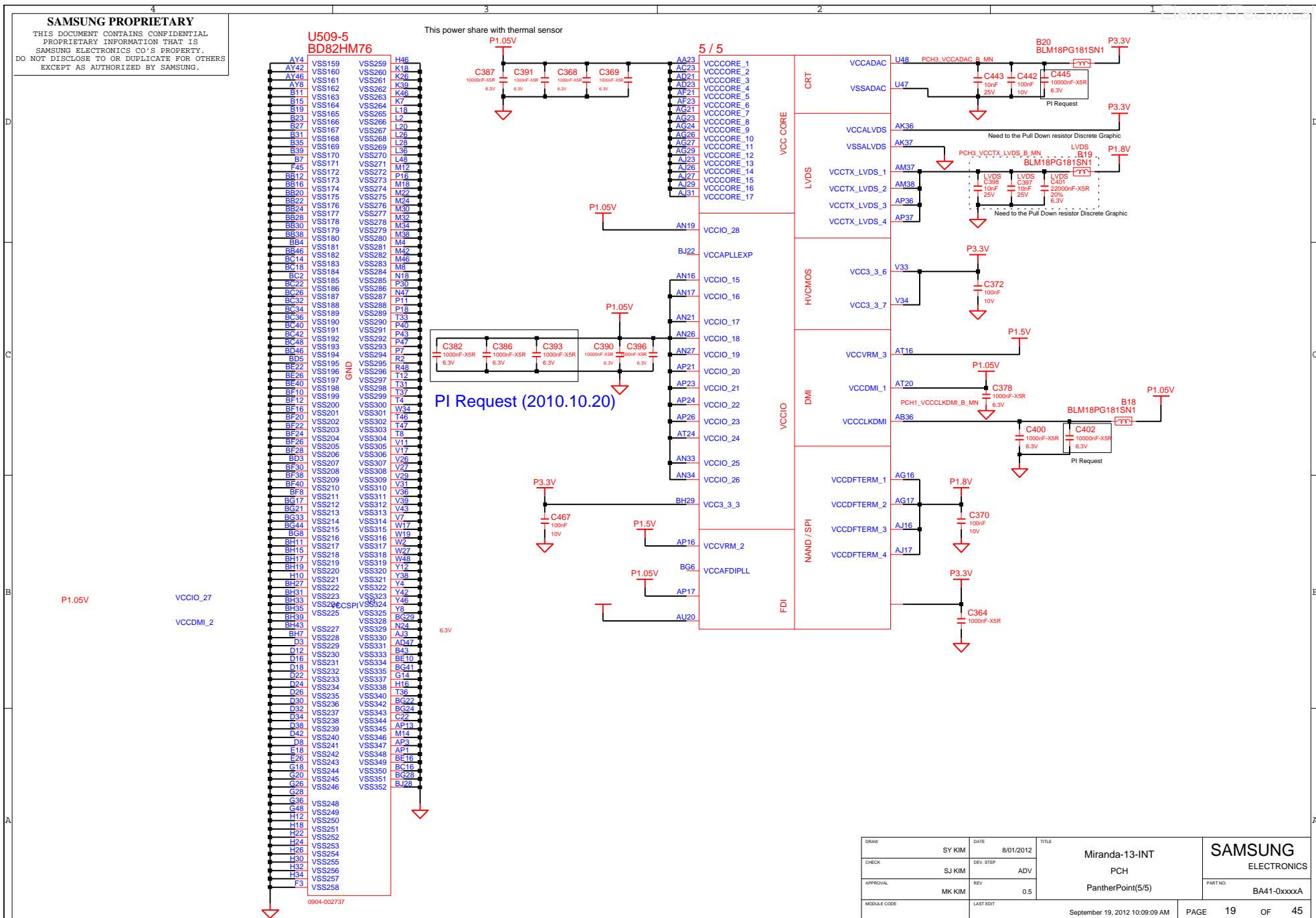
RF OFF Connection Case	
Intel Crane peak Combo BT HW ID : USB/VID_8086&PID_0189	Case 1 Standard Mini-card #5
Intel Rainbow peak Combo BT HW ID : USB/VID_8086&PID_0189	
Broadcom92070 stand alone Module BT HW ID : USB/VID_0A5C&PID_219B	
New Combo Card	Case 2 Non-Standard Mini-card #5
Broadcom 4313 1x1 Combo BT HW ID : USB/VID_0A5C&PID_219C	
Broadcom 43225 2x2 Combo BT HW ID : USB/VID_0A5C&PID_219A	



	HIGH	LOW
GPIO6:	ISSD	NO_JSSD
GPIO21:	13_EXT	14_EXT
GPIO24:	Reserved	Reserved
GPIO33:	MEM_4Gb	MEM_2Gb
GPIO34:	MEM_1600MHz	MEM_1333MHz
GPIO38:	Reserved	Reserved
GPIO39:	INT	OPT
GPIO40:	SEC	ELPIDA
GPIO48:		
GPIO49:	ADT_40W_60W ADT_90W_40W	ADT_90W
GPIO6:	LVDS	eDP
GPIO7:	FSBA	FSBA

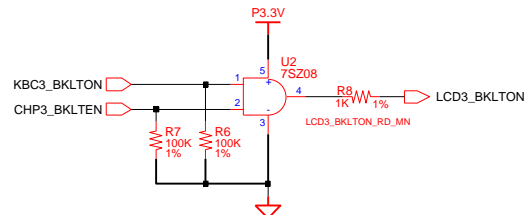
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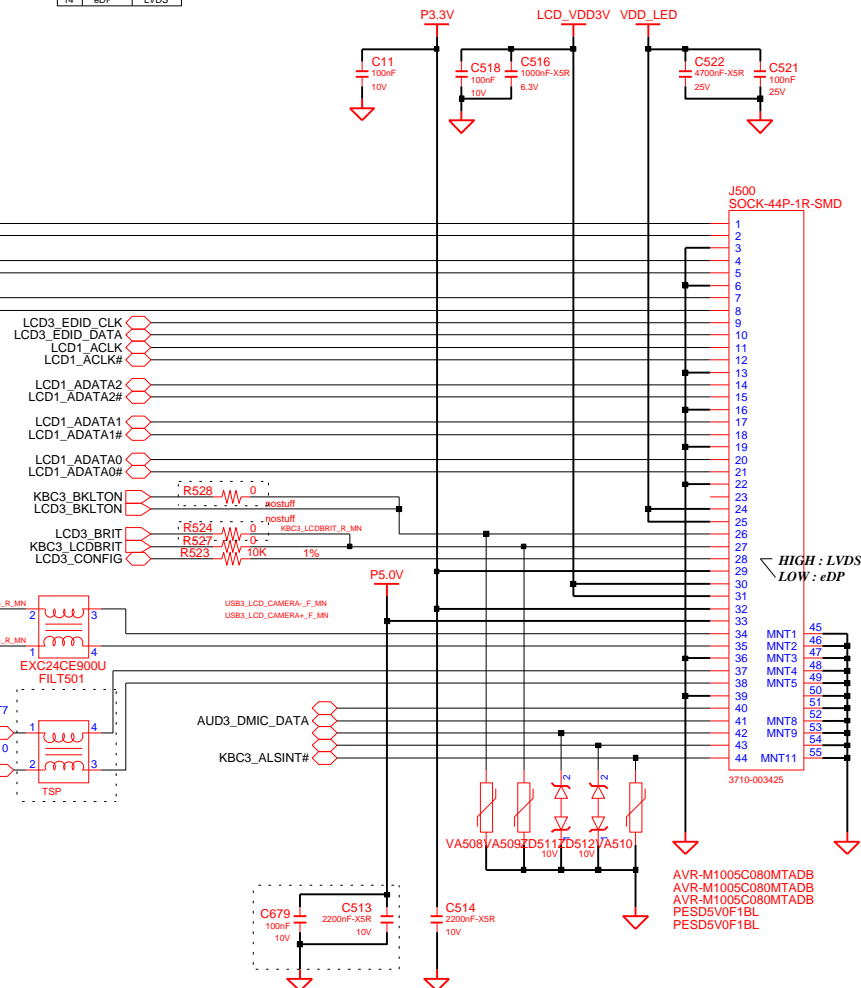
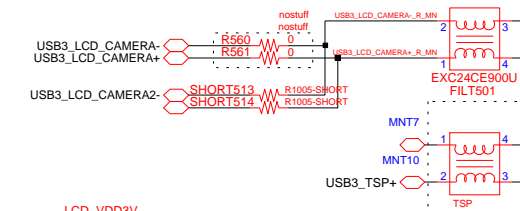
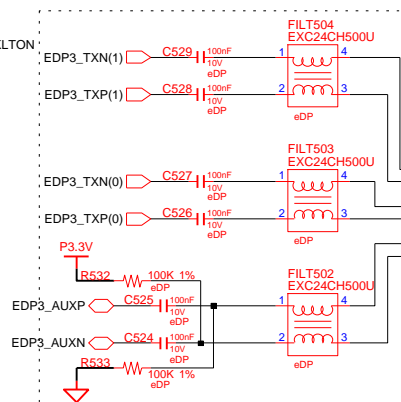
## 1 Eletro-XI Electronics

	SERIES 7	SERIES 5
13"	eDP	LVDS
14"	eDP	LVDS



The schematic diagram illustrates the power and signal connections for the USB3 module. Key components and connections include:

- Power Connections:**
  - VDC:** Connected to R525 (470K 1%), which leads to R567 (300K 1%) and then to the LCD\_VDD3V line.
  - VDD\_LED:** Connected to Q503 (AO3409L -30V) and C520 (100nF 25V).
  - LCD\_VDD3V:** Connected to R564 (10K) and R567 (300K 1%).
  - P5.0V\_AUX:** Connected to R562 (200K 1%) and R563 (200K 1%).
  - P3.3V\_AUX:** Connected to R563 (200K 1%) and C515 (68nF 16V).
  - LCD\_VDD3V:** Connected to R46 (180 1%) and C10 (100nF).
- Signal Connections:**
  - USB3\_LCD\_CAMER:** Connected to Q507 (RHU002N06) and Q5 (RHU002N06).
  - USB3\_LCD\_CAMER:** Connected to Q507 (RHU002N06) and Q5 (RHU002N06).
- Other Components:**
  - Q503:** AO3409L -30V MOSFET.
  - Q507:** RHU002N06 MOSFET.
  - Q502:** AP2317GN-HF -20V MOSFET.
  - Q5:** RHU002N06 MOSFET.
  - Q4:** RHU002N06 MOSFET.

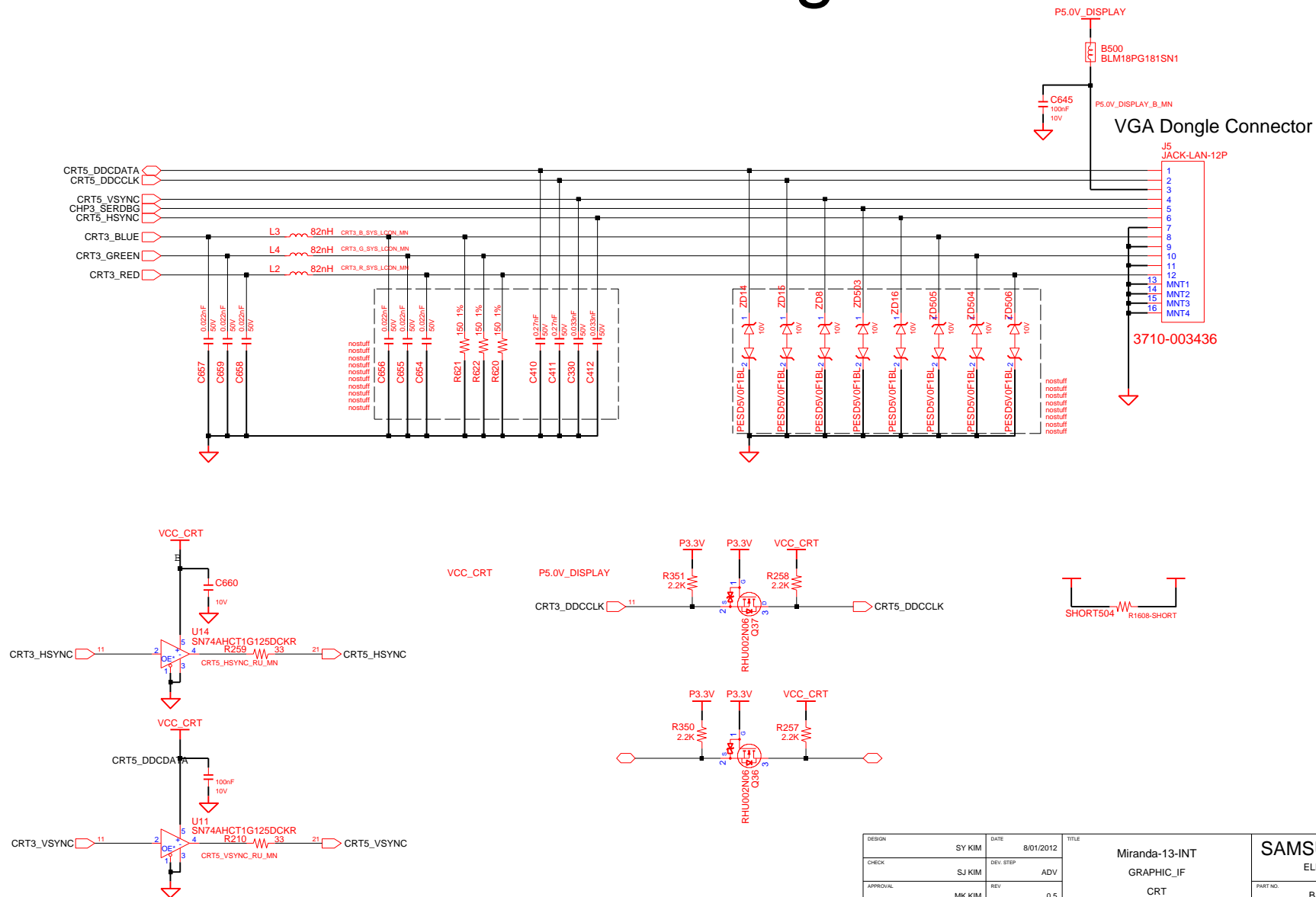


DESIGN	SY KIM	DATE	8/01/2012	TITLE Miranda-13-INT GRAPHICS_IF LVDS	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		
APPROVAL	MK KIM	REV	0.5		
MODULE CODE	LAST EDIT			September 19, 2012 10:09:09 AM	PART NO. BA41-0xxxxA
				PAGE 20	OF 45

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# VGA Dongle



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV	GRAPHIC_IF	ELECTRONICS	
APPROVAL	MK KIM	REV	0.5	CRT	PART NO.	BA41-0xxxxA
MODULE CODE		LAST EDIT		September 19, 2012 10:09:09 AM	PAGE	21 OF 45

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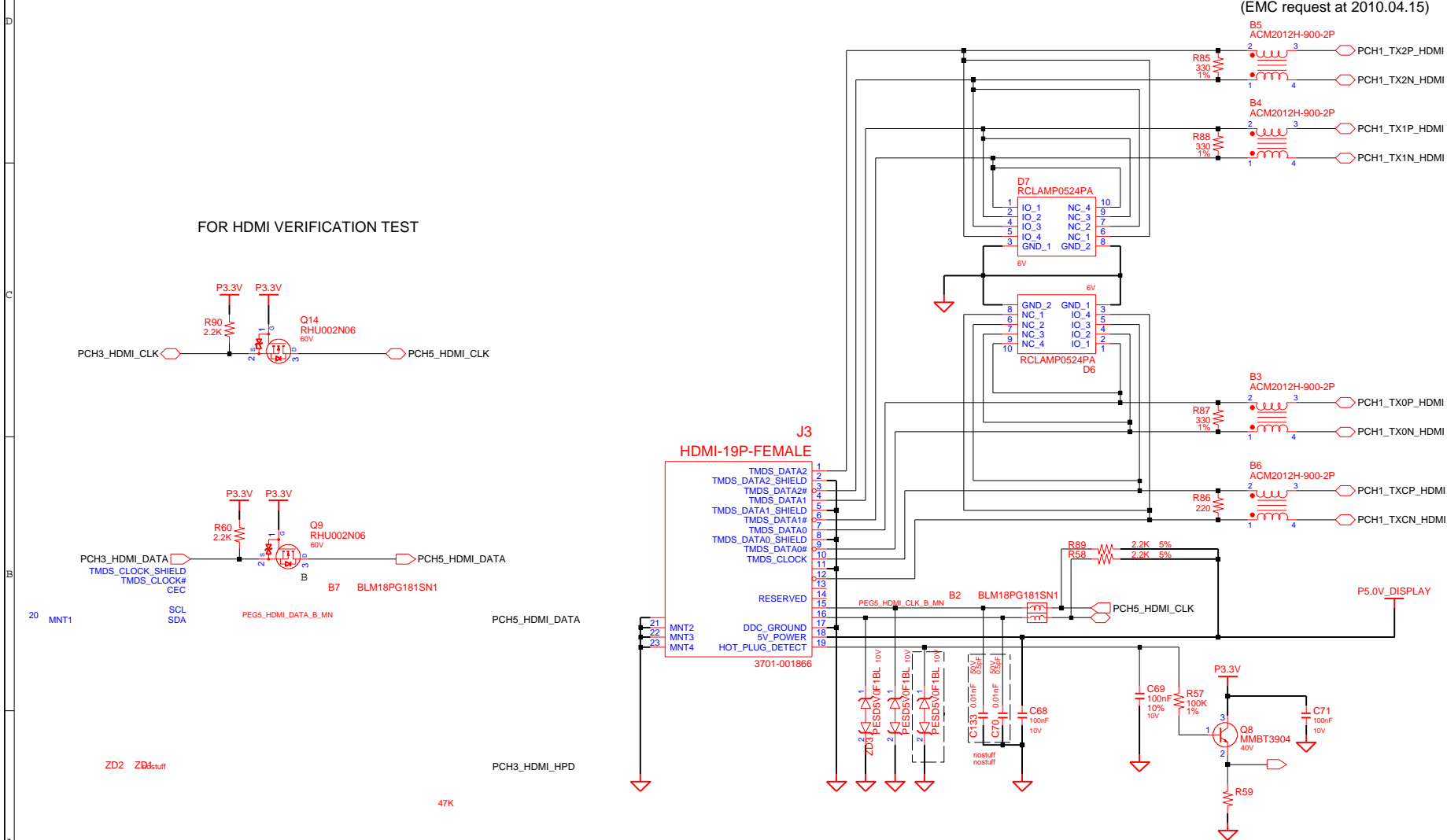
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# HDMI Graphic

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

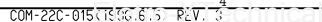
(EMC request at 2010.04.15)

FOR HDMI VERIFICATION TEST

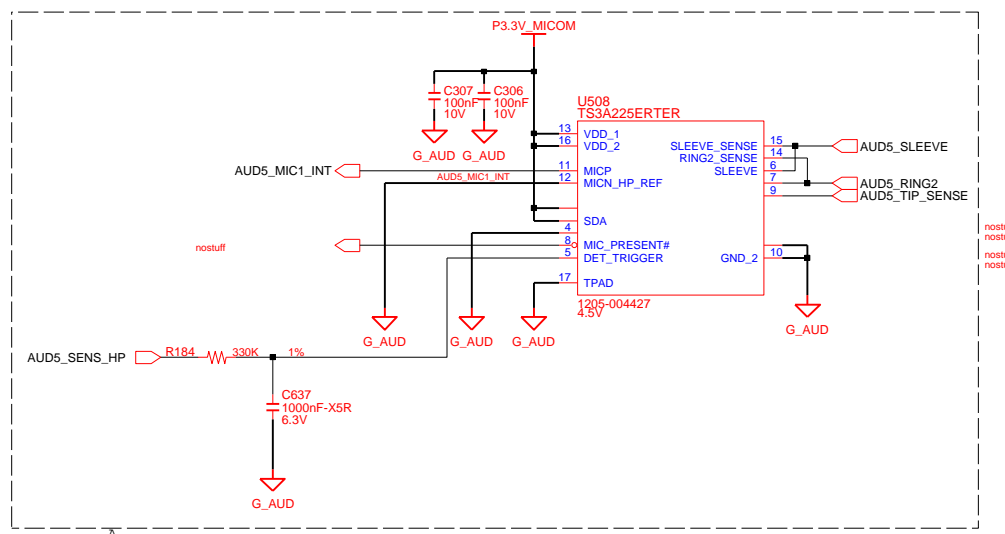
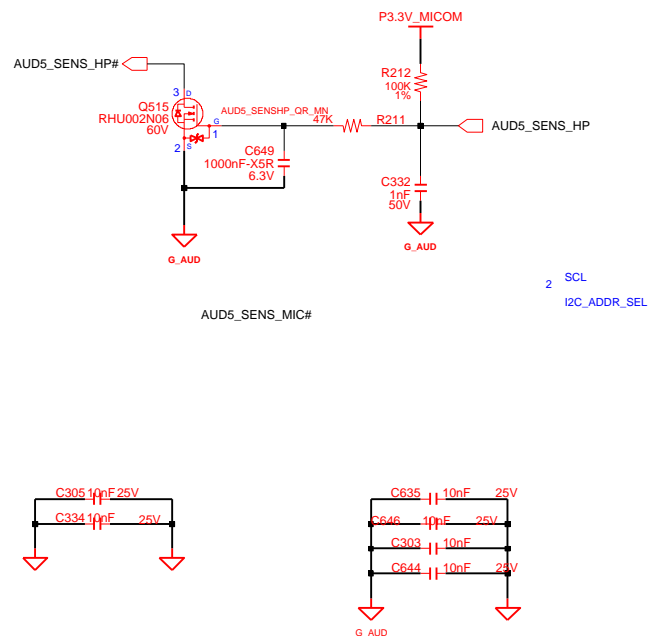


DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	MK KIM	REV	0.5	HDMI		
MODULE CODE		LAST EDIT		September 19, 2012 10:09:09 AM	PAGE 22 OF 45	BA41-0xxxxA

## 1 Eletro-XI Electronics

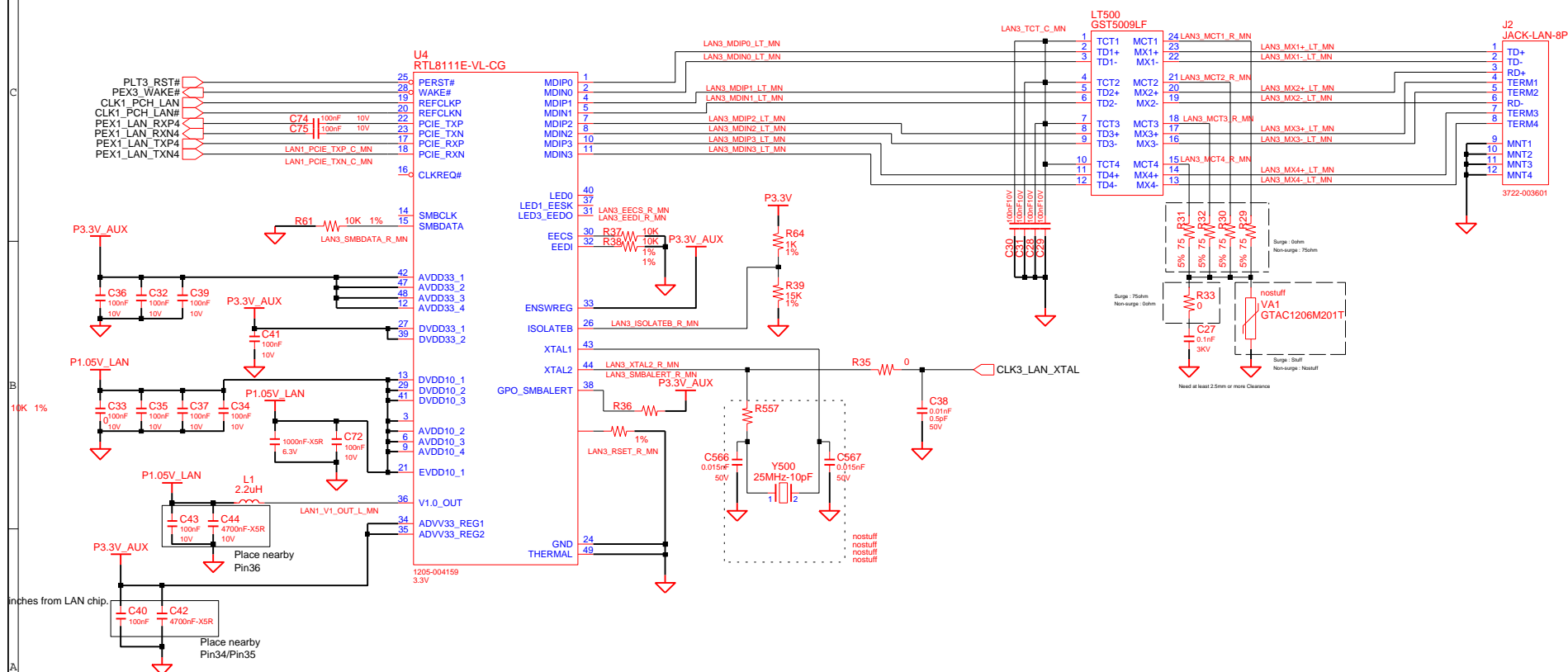


## 1 Eletro-XI Electronics



DESIGN	SY KIM	DATE	8/01/2012	<div>Miranda-13-INT</div> <div>AUDIO</div> <div>Combo Jack</div>	<div>SAMSUNG</div> <div>ELECTRONICS</div>
CHECK	SJ KIM	DEV. STEP	ADV		
APPROVAL	MK KIM	REV	0.5		
MODULE CODE	LAST EDIT			September 19, 2012 10:09:09 AM	<div>PAGE 24 OF 45</div>





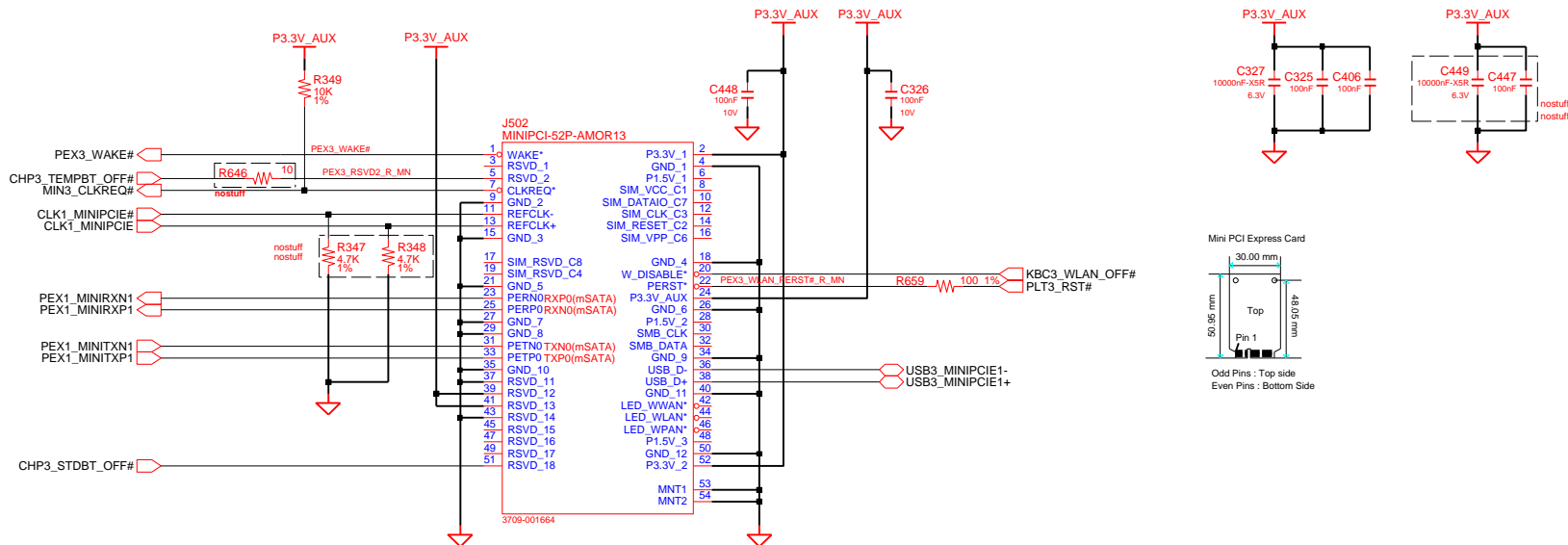
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CHECK	SJ KIM	DEV. STEP	ADV		
APPROVAL	MK KIM	REV	0.5		
MODULE CODE	LAST EDIT				
				September 19, 2012 10:09 AM	PAGE 25 OF 45

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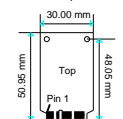
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## WLAN

CLKREQ# pin on PCH is SUS Well to support both AMT & noAMT



Mini PCI Express Card



Odd Pins : Top Side  
 Even Pins : Bottom Side

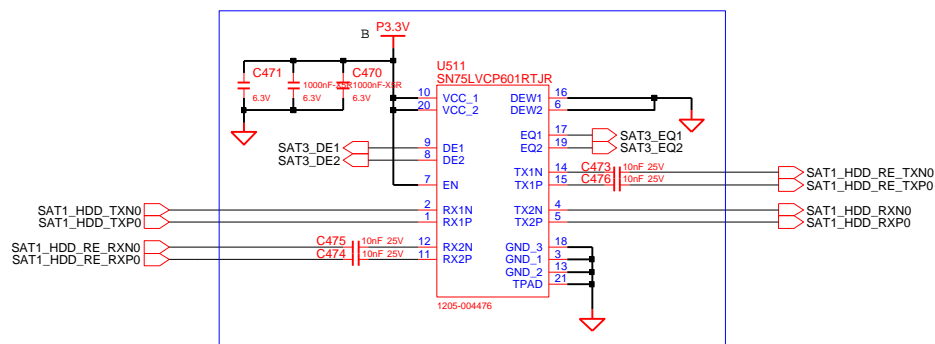
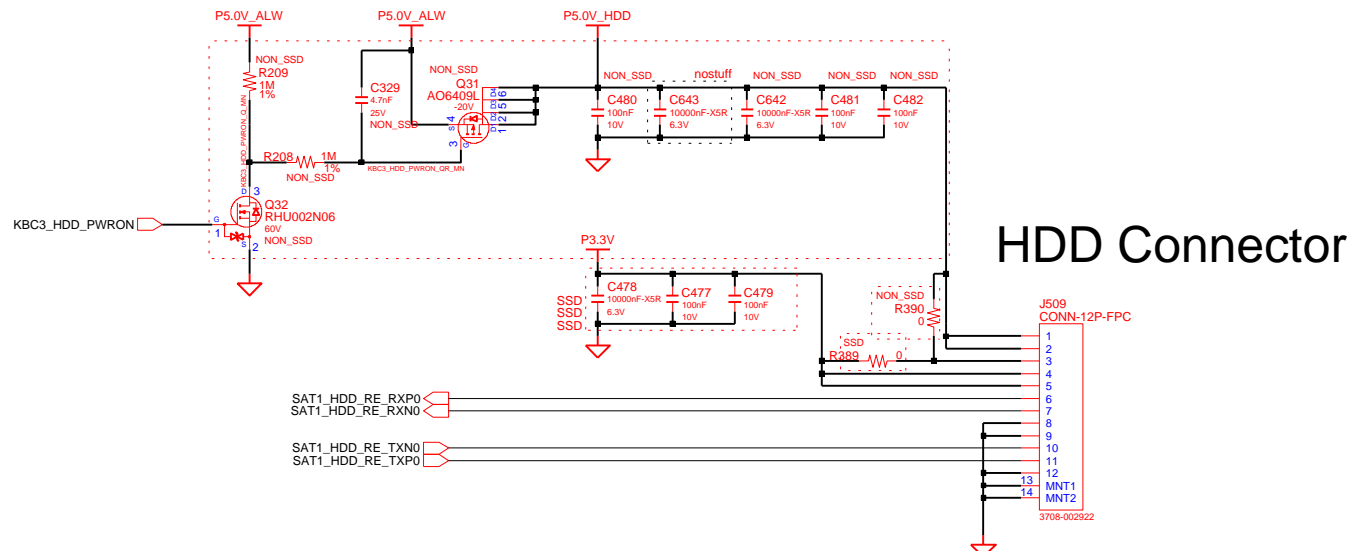
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MODULE CODE		LAST EDIT		September 19, 2012 10:09:09 AM	PAGE 26 OF 45	PART NO. BA41-0xxxxA

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## SATA I/F CONN

	HDD	mSATA ONLY	mSATA JIG
ISSD:	stuff	nostuff	nostuff
NON_ISSD:	nostuff	stuff	stuff
SSD:	nostuff	stuff	nostuff
NON_SSD:	stuff	nostuff	stuff



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		SATA I/F	
APPROVAL	MK KIM	REV	0.5		HDD	
MODULE CODE		LAST EDIT		September 19, 2012 10:09:09 AM	PAGE 27 OF 45	PART NO. BA41-0xxxxA

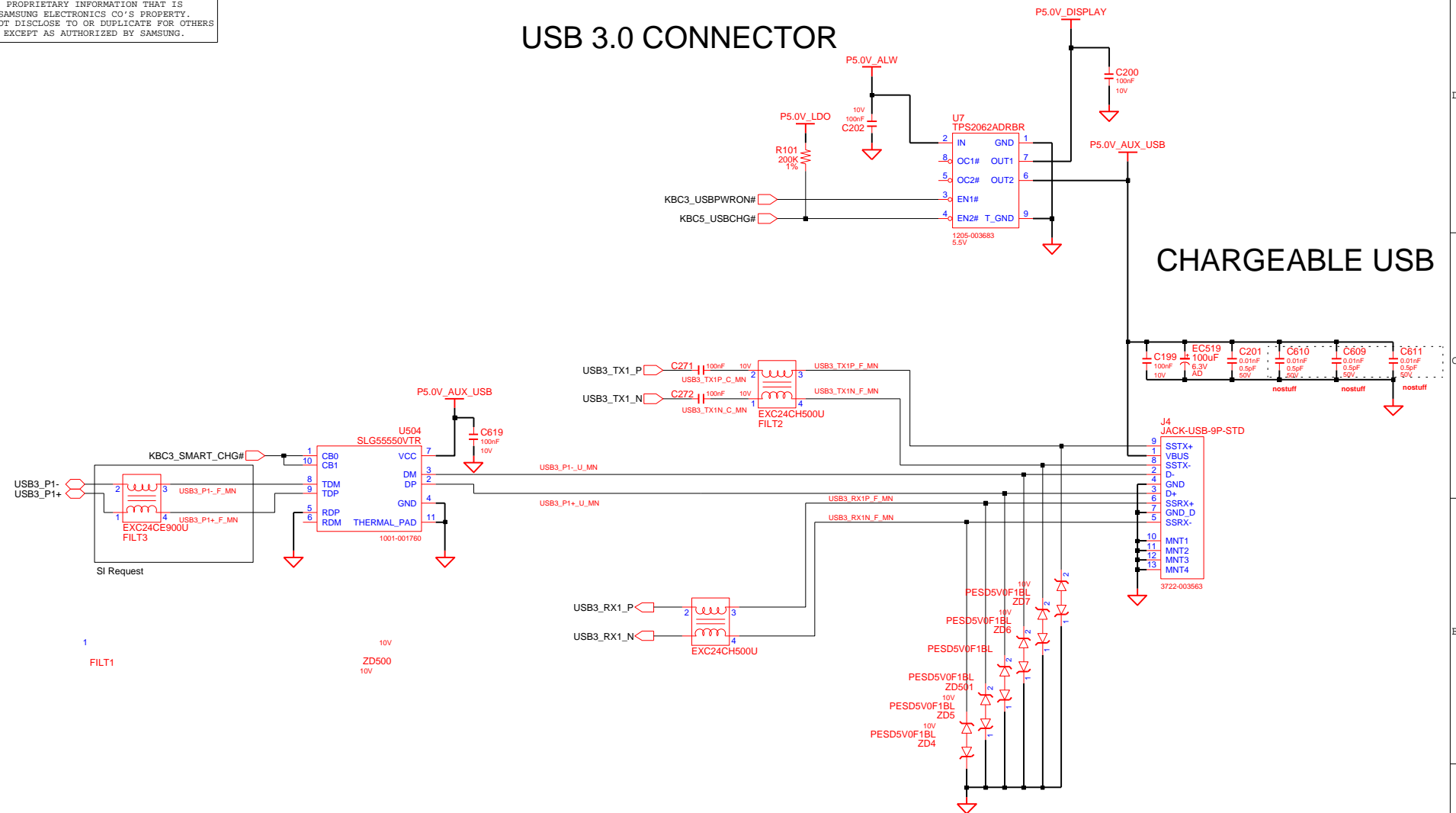
BA59-03507A

COM-22C-015 CTSG 6.5 REV. 3

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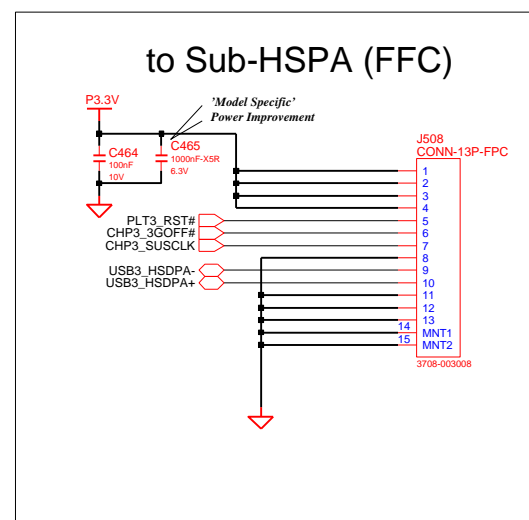
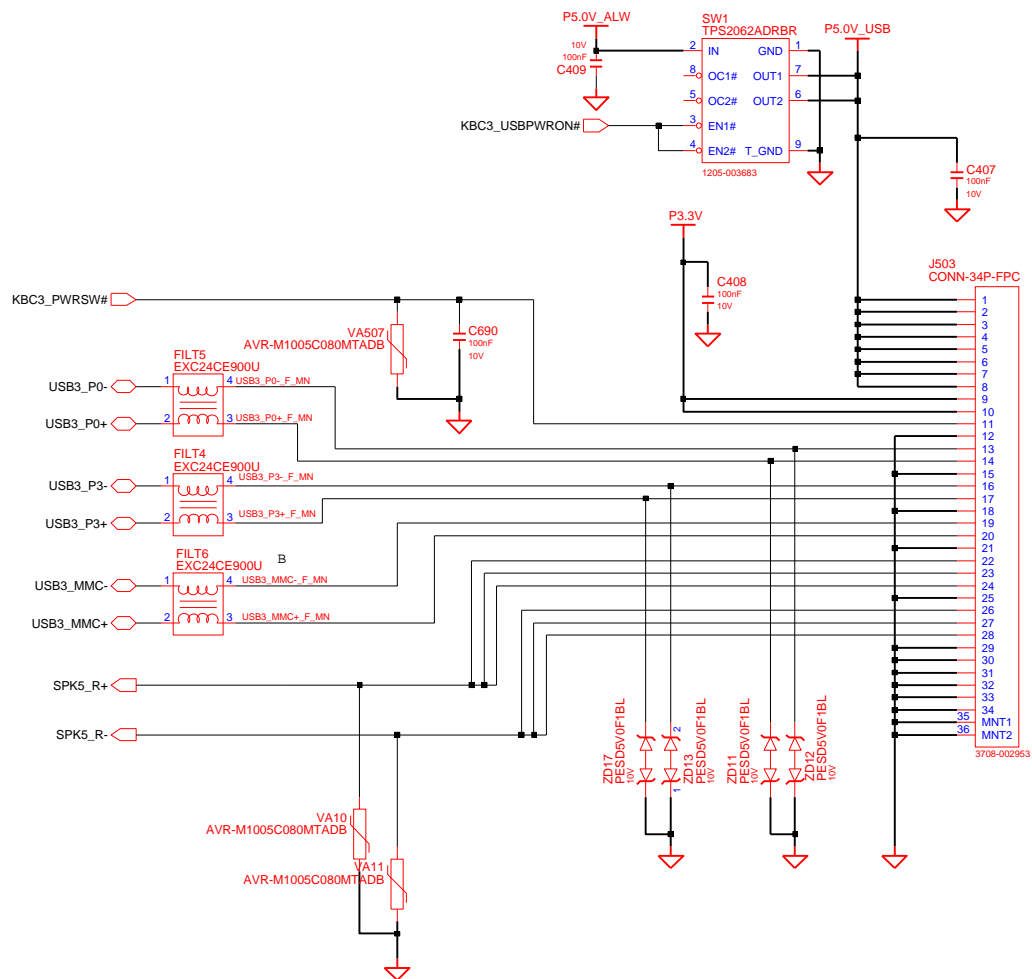
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## USB 3.0 CONNECTOR



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		USB	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		USB Charge Port	PART NO.
MODULE CODE		LAST EDIT				BA41-0xxxxA
				September 19, 2012 10:09:09 AM	PAGE	29 OF 45

to Sub-Board (FFC)

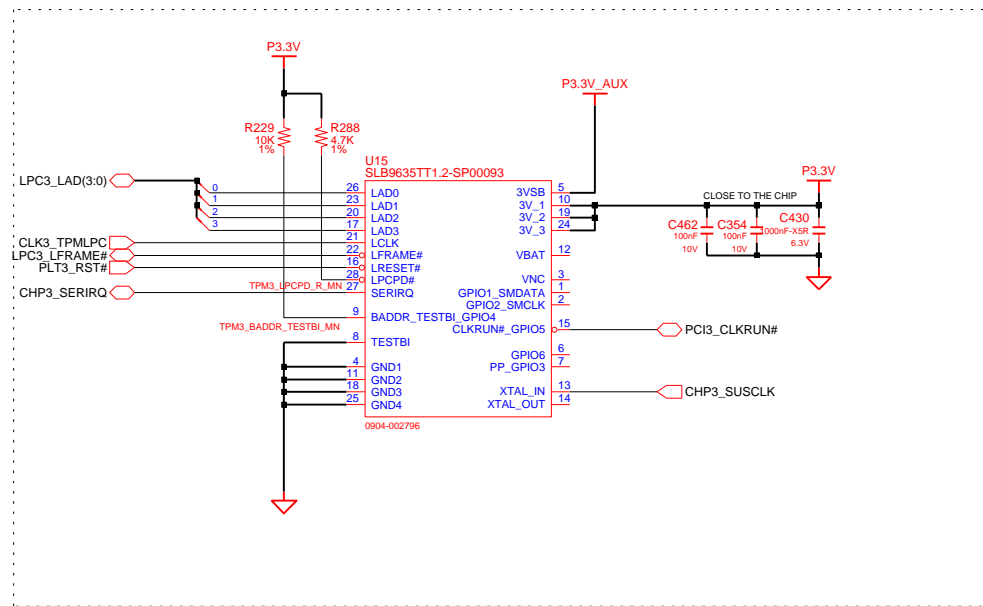


DESIGN	SY KIM	DATE	8/01/2012	TITLE Miranda-13-INT USB USB Sub board I/F & HSPA	<b>SAMSUNG</b> ELECTRONICS		
CHECK	SJ KIM	DEV STEP	ADV				
APPROVAL	MK KIM	REV	0.5		PART NO.	BA41-0xxxxA	
MODULE CODE	LAST EDIT				September 19, 2012 10:09:09 AM	PAGE	30 OF 45

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## TPM1.2



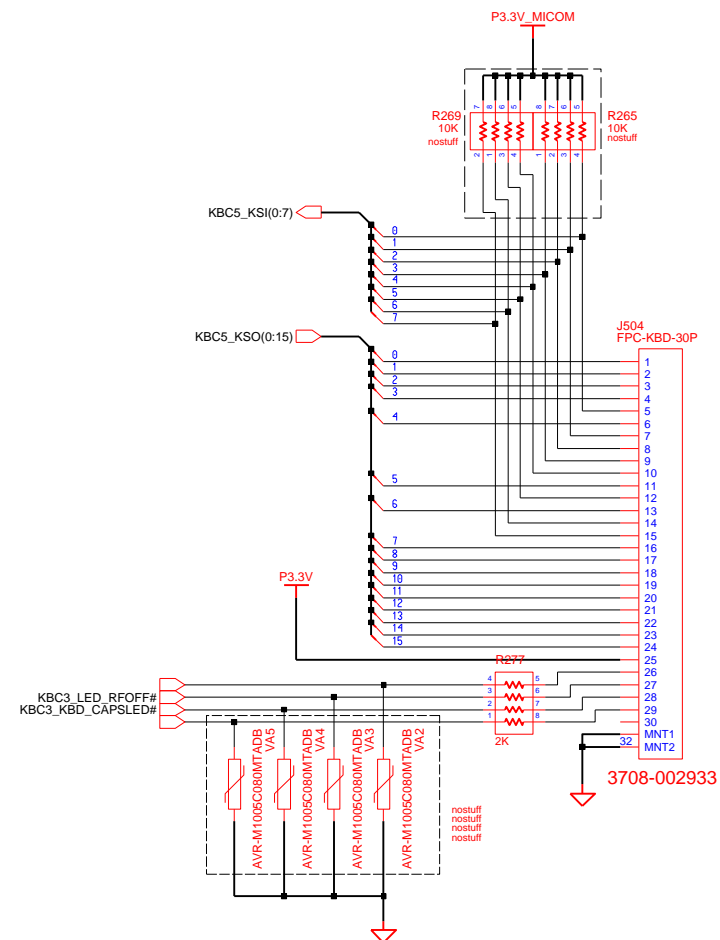
TPM  
 TPM  
 TPM  
 TPM  
 TPM  
 TPM

DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		LPC	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		FFS & TPM	PART NO.
MODULE CODE		LAST EDIT	September 19, 2012 10:09:09 AM			BA41-0xxxxA
				PAGE	31	OF 45





## KEYBOARD



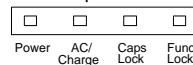
D:\users\mobile093\mnt\p\miranda-2d\INF\110915\HUB\HUB15-11

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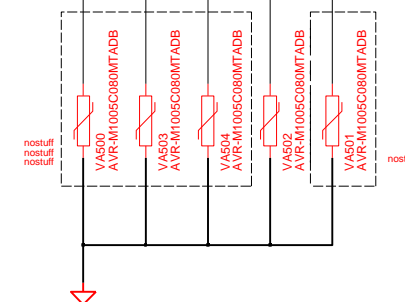
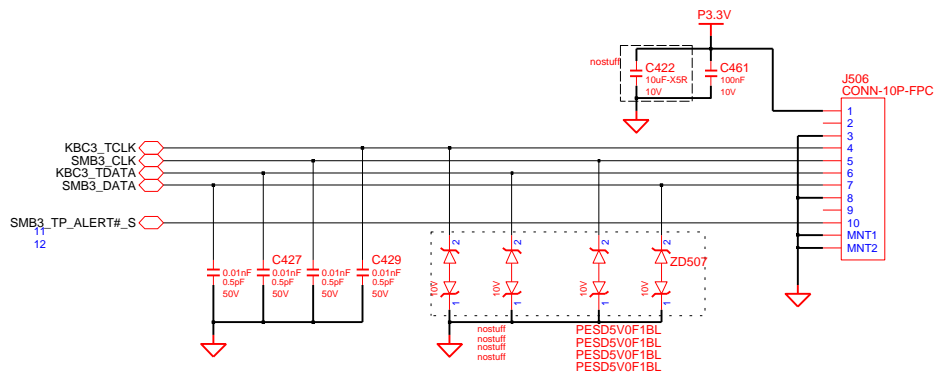
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## System LED

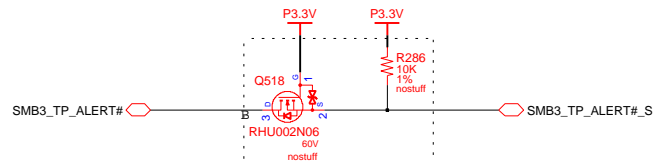
### LED Top View



## Click Pad I/F



3708-003000

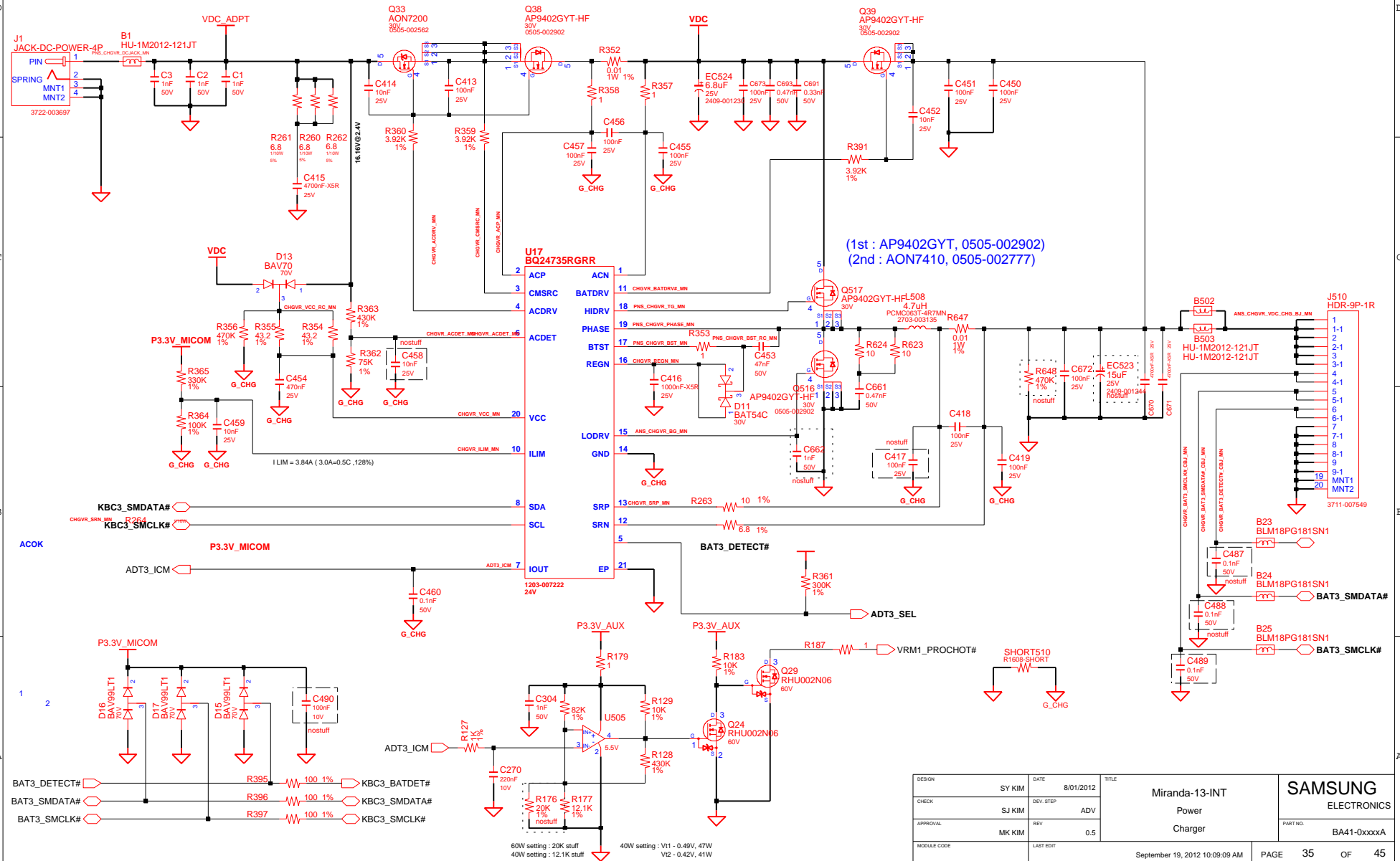


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT IO I/F LED&Clickpad	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV			PART NO. BA41-0xxxxA
APPROVAL	MK KIM	REV	0.5			
MODULE CODE		LAST EDIT	September 19, 2012 10:09:09 AM	PAGE	34	OF 45

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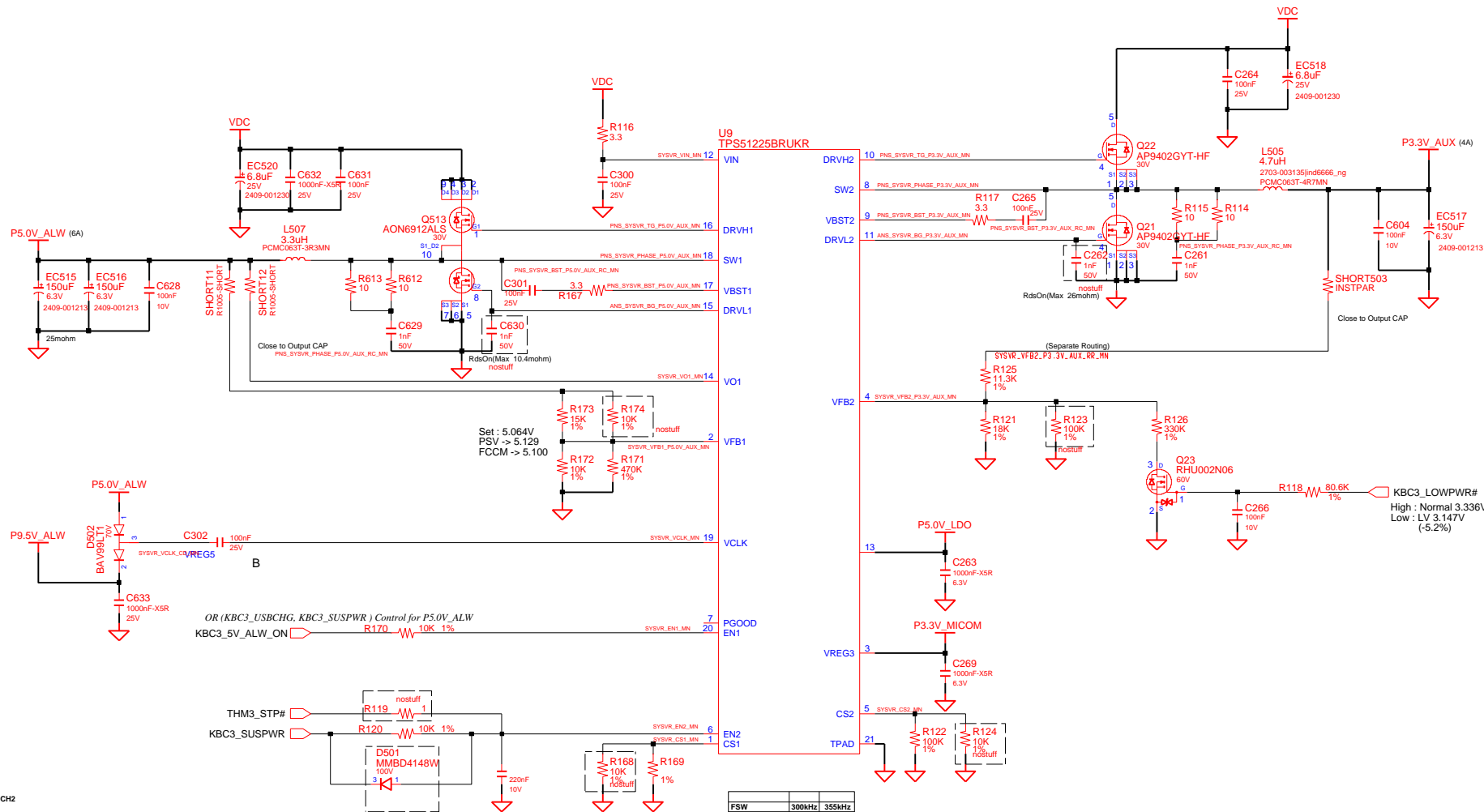
# CHARGER & POWER MANAGEMENT



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		Charger	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT				
September 19, 2012 10:09:09 AM						PAGE 35 OF 45

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



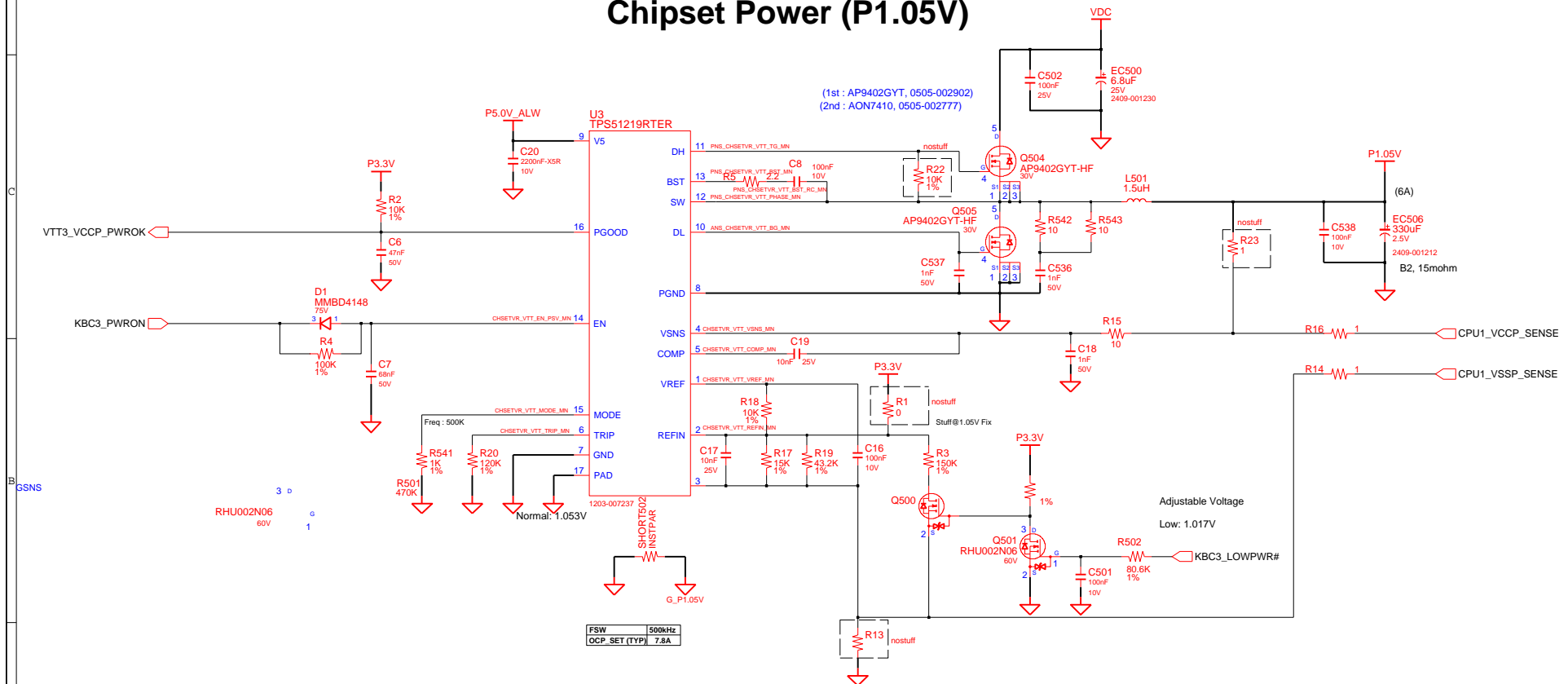
FSW	300kHz	355kHz
OCF SET (TYP)	9.0A	6.5A

DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		Power	
APPROVAL	MK KIM	REV	0.5		P3.3V_AUX & P5.0V_ALW	
MODULE CODE	undefined	LAST EDIT	September 19, 2012 10:09:09 AM			
PAGE 36 OF 45						PART NO. BA41-0xxxxA

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## Chipset Power (P1.05V)

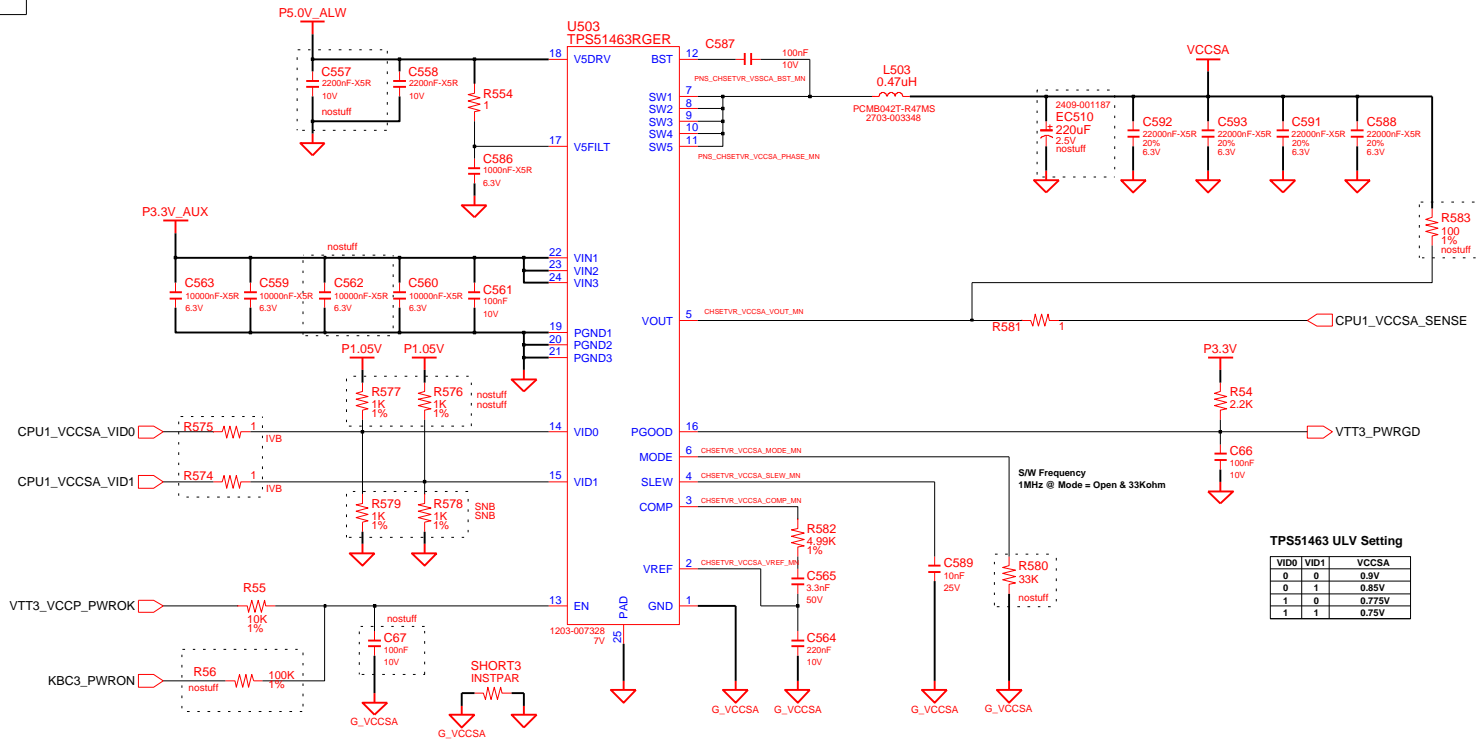
(1st : AP9402GYT, 0505-002902)  
(2nd : AON7410, 0505-002777)



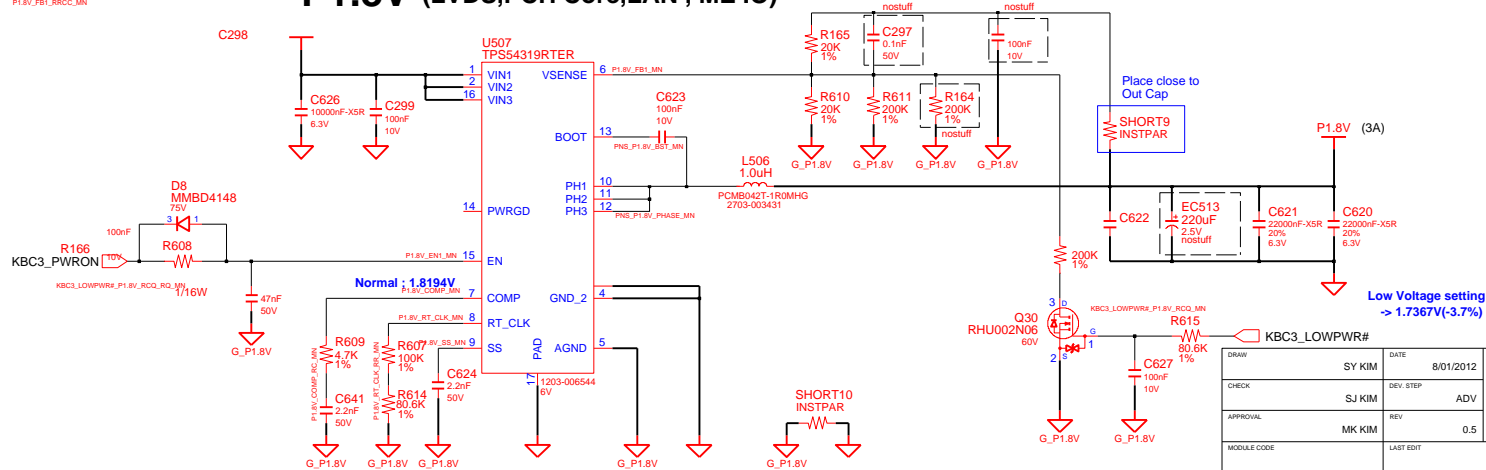
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CHECK	SJ KIM	DEV. STEP	ADV	Power		
APPROVAL	MK KIM	REV	0.5	P1.05V		
MODULE CODE		LAST EDIT				PART NO. BA41-0xxxxA
September 19, 2012 10:09:09 AM					PAGE	37 OF 45

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## CHIPSET POWER(VCCSA)

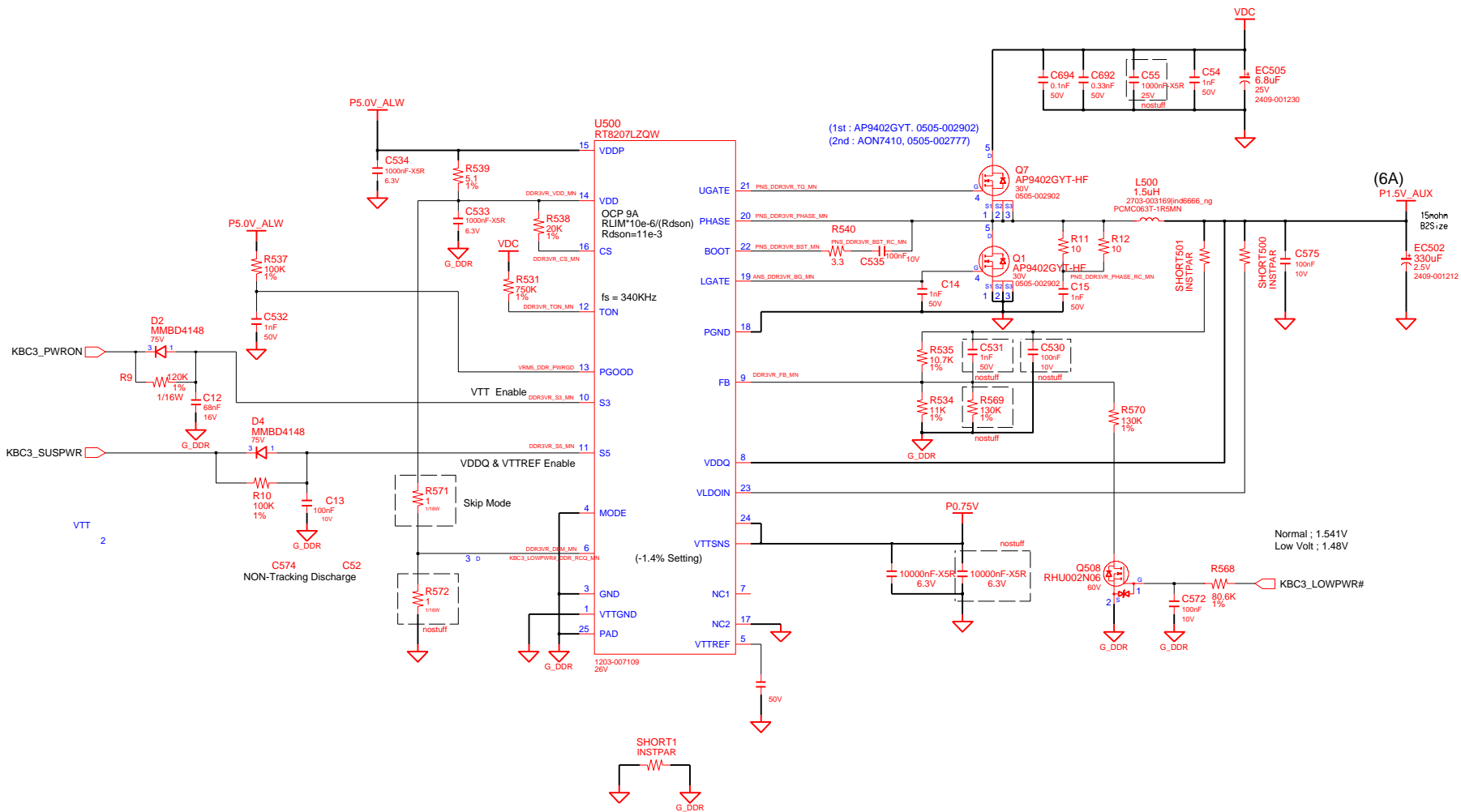


## P1.8V (LVDS, PCH Core, LAN, ME IO)



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		VCCSA	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT			September 19, 2012 10:09:09 AM	PAGE 38 OF 45

## DDR3 Power

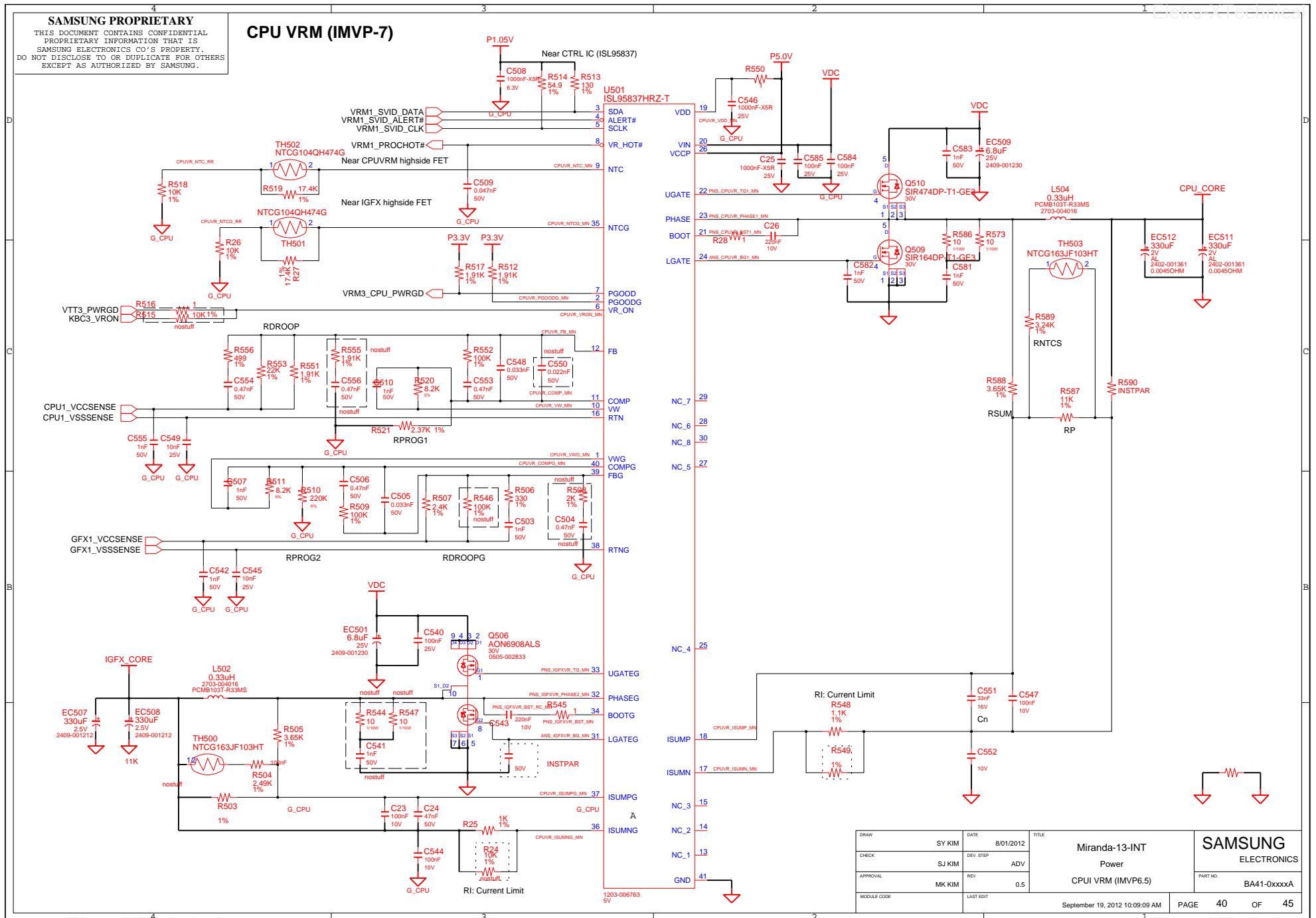


DRAW	SY KIM	DATE	8/01/2012	TITLE Miranda-13-INT Power TI TPS51125	<b>SAMSUNG</b> ELECTRONICS	
CHECK	SJ KIM	DEV. STEP	ADV			
APPROVAL	MK KIM	REV	0.5			
					PART NO.	BA41-0xxxxA
MODULE CODE		LAST EDIT		September 19, 2012 10:09:09 AM	PAGE	39 OF 45

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## CPU VRM (IMVP-7)

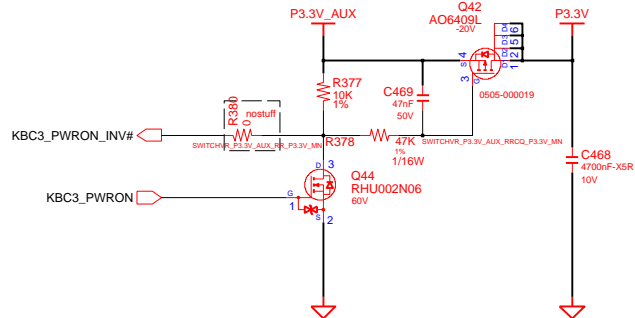




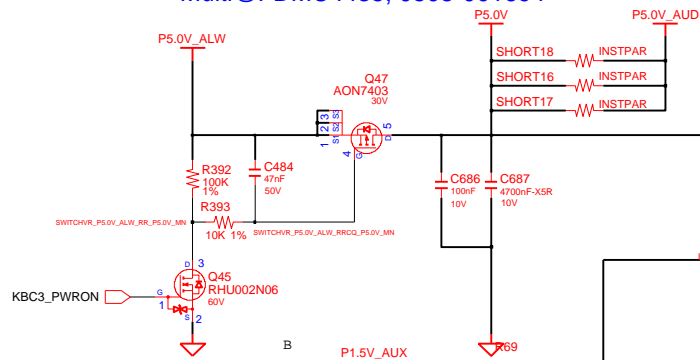
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# Switched Power

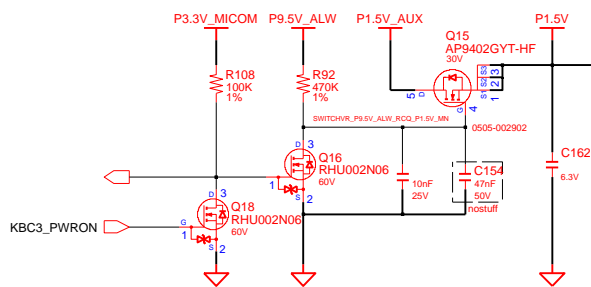
## Switched Power On (P3.3V) Multi@AP2607GY



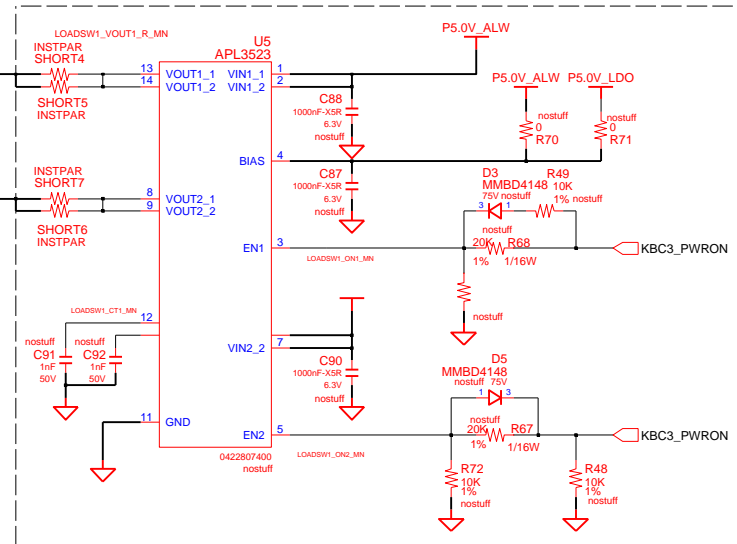
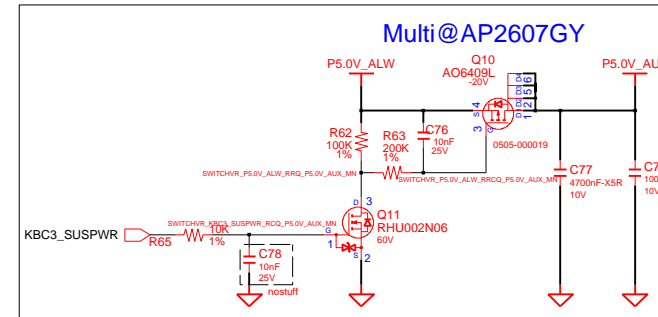
## Switched Power On (P5.0V) Multi@FDMC4435, 0505-001694



## Switched Power On (P1.5V) Multi@AP9402GYT



## P5.0V\_AUX

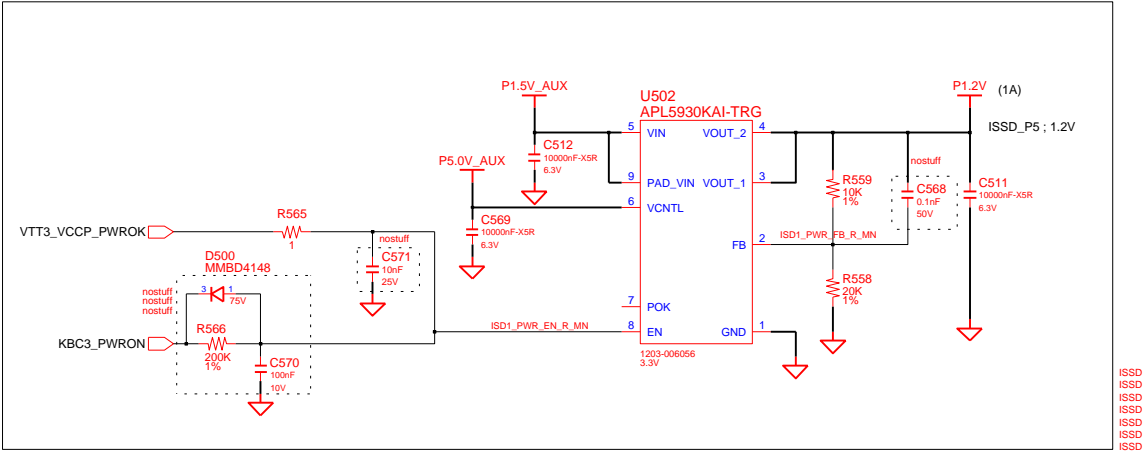


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		SWITCHED POWER	PART NO.
MODULE CODE		LAST EDIT				BA41-0xxxxA
September 19, 2012 10:09:09 AM						PAGE 41 OF 45

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# Switched Power 2 (ISSD PWR)

ISSD Power (P1.0V\_P1.2V : Max 1.0A)



ISSD  
ISSD  
ISSD  
ISSD  
ISSD  
ISSD  
ISSD

DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV	Power		ELECTRONICS
APPROVAL	MK KIM	REV	0.5	FOT POWER XPRESS & USB3.0 PWR	PART NO.	BA41-0xxxxA
MODULE CODE		LAST EDIT	September 19, 2012 10:09:09 AM	PAGE	42	OF 45

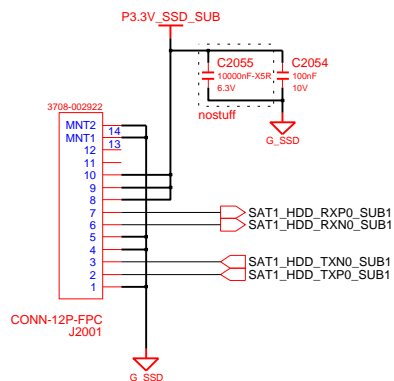
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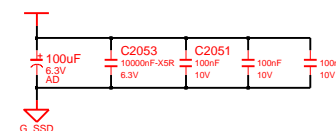
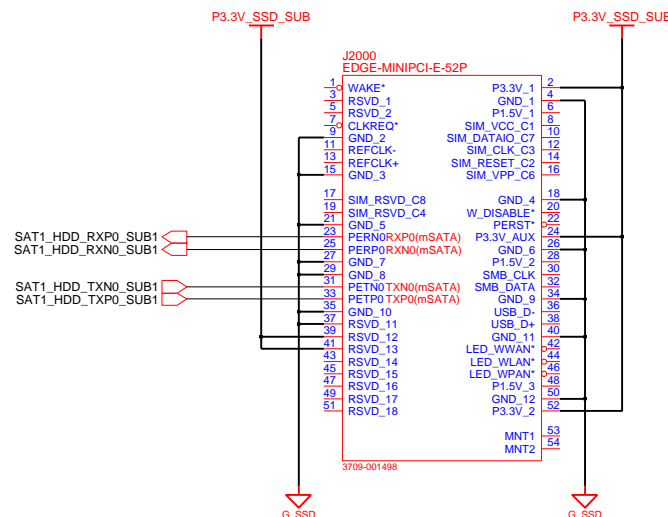
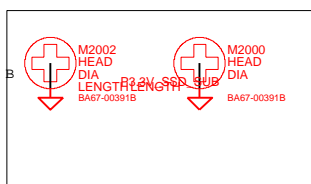
## Sub board #3 (1/1)

### mSATA SSD Sub-Board

#### From Mainboard



#### SSD Sub-Board (#3) PEM

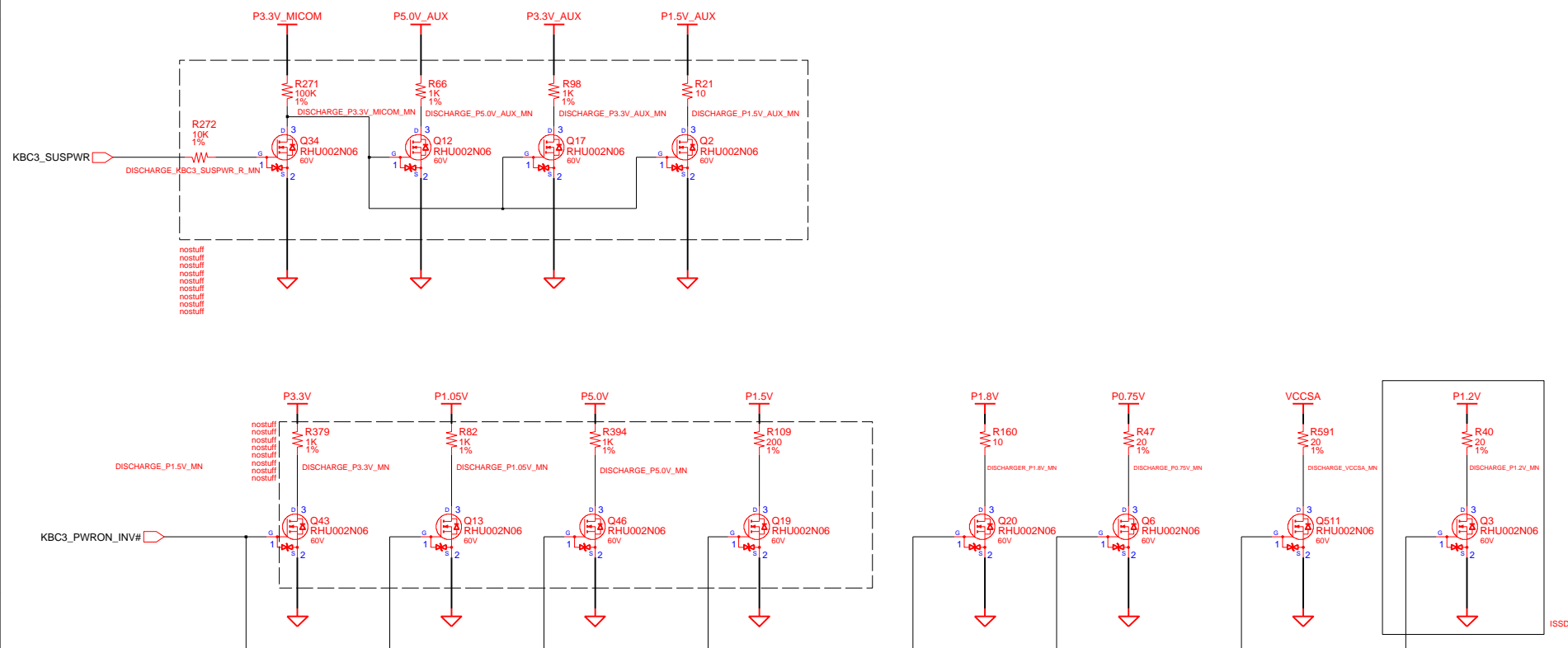


DESIGN	SY KIM	DATE	8/28/2012	TITLE	Miranda-Sub mSATA	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV	Sub-Board #3 (1/1)		
APPROVAL	MK KIM	REV	0.85	mSATA SSD I/F	PART NO. BA41-0xxxxA	
MODULE CODE		LAST EDIT		October 04, 2012 15:11:27 PM	PAGE 3 OF 3	

# SAMSUNG PROPRIETARY

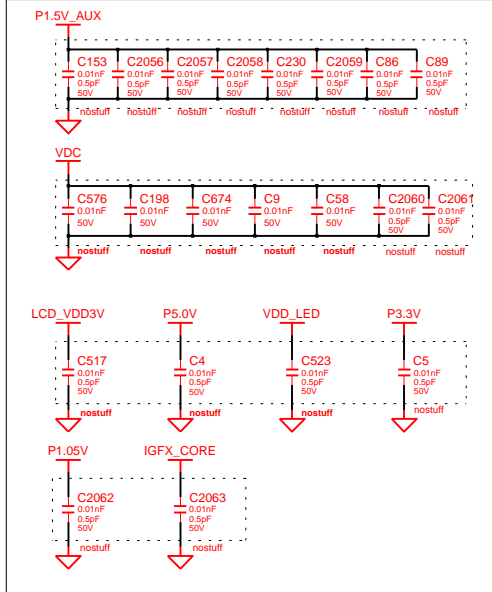
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## POWER DISCHARGER

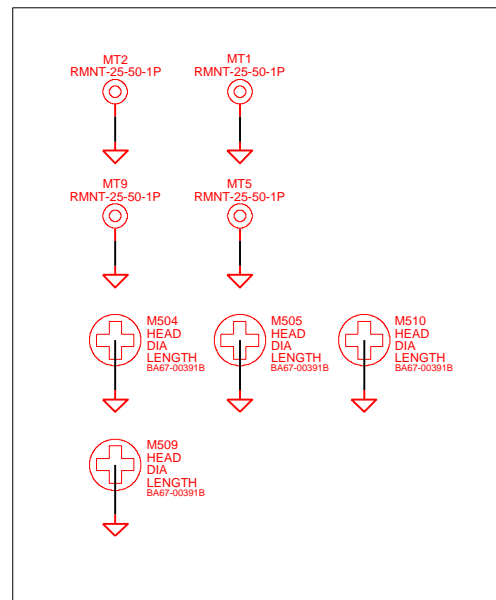


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		Power Rail Discharger	PART NO.
MODULE CODE	undefined	LAST EDIT	September 19, 2012 10:09:09 AM			BA41-0xxxxA
				PAGE	44	OF 45

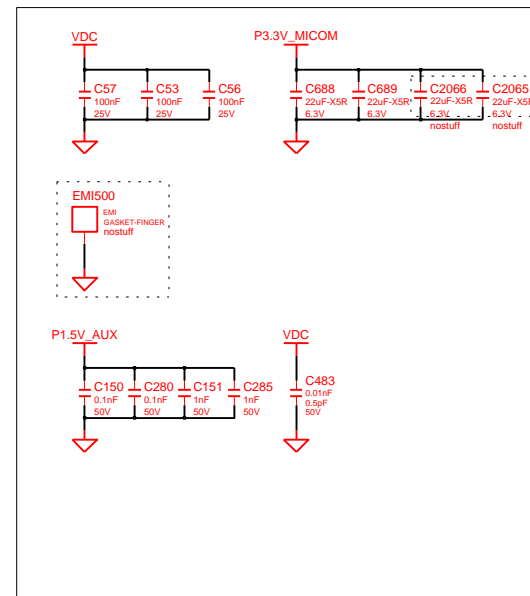
## WLAN Performance issue



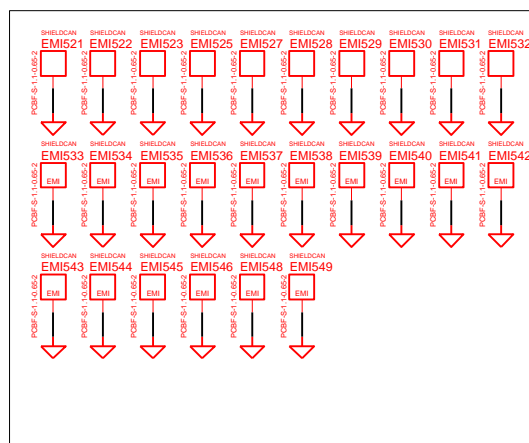
## Mainboard PEM / Mount



## Decap

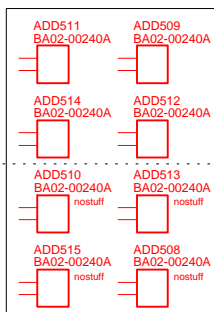


## Shield can EMI gasket

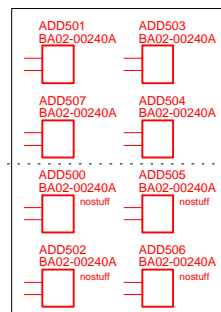


## Underfilm for BGA

### PCH



### CPU



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-INT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		PCB Stuffs	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		Mount Hole & Decaps	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT				
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