

# Miranda-13H-EXT

CPU : Ivy Bridge ULV  
Chip Set : Intel Panther Point  
GFX : ATI Mars-Pro  
Remarks : Chief River Platform

Model Name : Miranda-13H-EXT  
PBA Name : MAIN  
PCB Code : BA41-02235A  
(GCE, AT&S, NANYA, UNIMICRON)

Dev. Step : MP  
Revision : 1.0  
T.R. Date : 2012.12.06

Design	Check	Approval
SY KIM	SJ KIM	MK KIM

Owner : SEC Mobile R & D Signature : X

## Table of Contents

Page	Title
1.	Cover Sheet
2.	Block Diagram
3.	Power Diagram
4.	Power Sequence
5.	Clock Diagram
6.	Green Clock
7.	Thermal Sensor & FAN
8.	CPU - Ivy Bridge ULV (1/5)
9.	CPU - Ivy Bridge ULV (2/5)
10.	CPU - Ivy Bridge ULV (3/5)
11.	CPU - Ivy Bridge ULV (4/5)
12.	CPU - Ivy Bridge ULV (5/5)
13.	DDR3 On-board Rank1 (1/4)
14.	DDR3 On-board Rank1 (2/4)
15.	DDR3 On-board Rank1 (3/4)
16.	DDR3 On-board Rank1 (4/4)
17.	DDR3 SO-DIMM Slot
18.	Chipset - HM76 (1/5)
19.	Chipset - HM76 (2/5)
20.	Chipset - HM76 (3/5)
21.	Chipset - HM76 (4/5)
22.	Chipset - HM76 (5/5)
23.	GPU - Mars-XT (1/6)
24.	GPU - Mars-XT (2/6)
25.	GPU - Mars-XT (3/6)
26.	GPU - Mars-XT (4/6)
27.	GPU - Mars-XT (5/6)
28.	GPU - Mars-XT (6/6)
29.	GPU - DDR3 (1/4)
30.	GPU - DDR3 (2/4)
31.	Display - eDP / LVDS I/F
32.	Display - VGA I/F
33.	Display - HDMI I/F
34.	AUDIO - Codec ALC269Q
35.	AUDIO - HP & MIC
36.	PCIe - LAN RTL8111E
37.	PCIe - WLAN Card Slot
38.	SATA - HDD
39.	-
40.	USB - SS Charge Port
41.	USB - Sub I/F & TSP & HSPA
42.	LPC - TPM
43.	MICOM - MEC1310
44.	Keyboard I/F
45.	LED & Click Pad I/F
46.	Power - Charger
47.	Power - 5&3.3V ALW/AUX
48.	Power - 1.05V
49.	Power - VCCSA & 1.8V
50.	Power - 1.5V AUX & 0.75V
51.	Power - CPU VRM
52.	Power - FET Switch
53.	-
54.	Power - GPU VRM
55.	Power - GPU Linear Regulator
56.	Power - GPU FET Switch
57.	Power - Discharger
58.	PCB Stuffs & Decaps
59.	mSATA sub board

## 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-EXT	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 17, 2012 22:22:27 PM	PAGE	1	OF 58



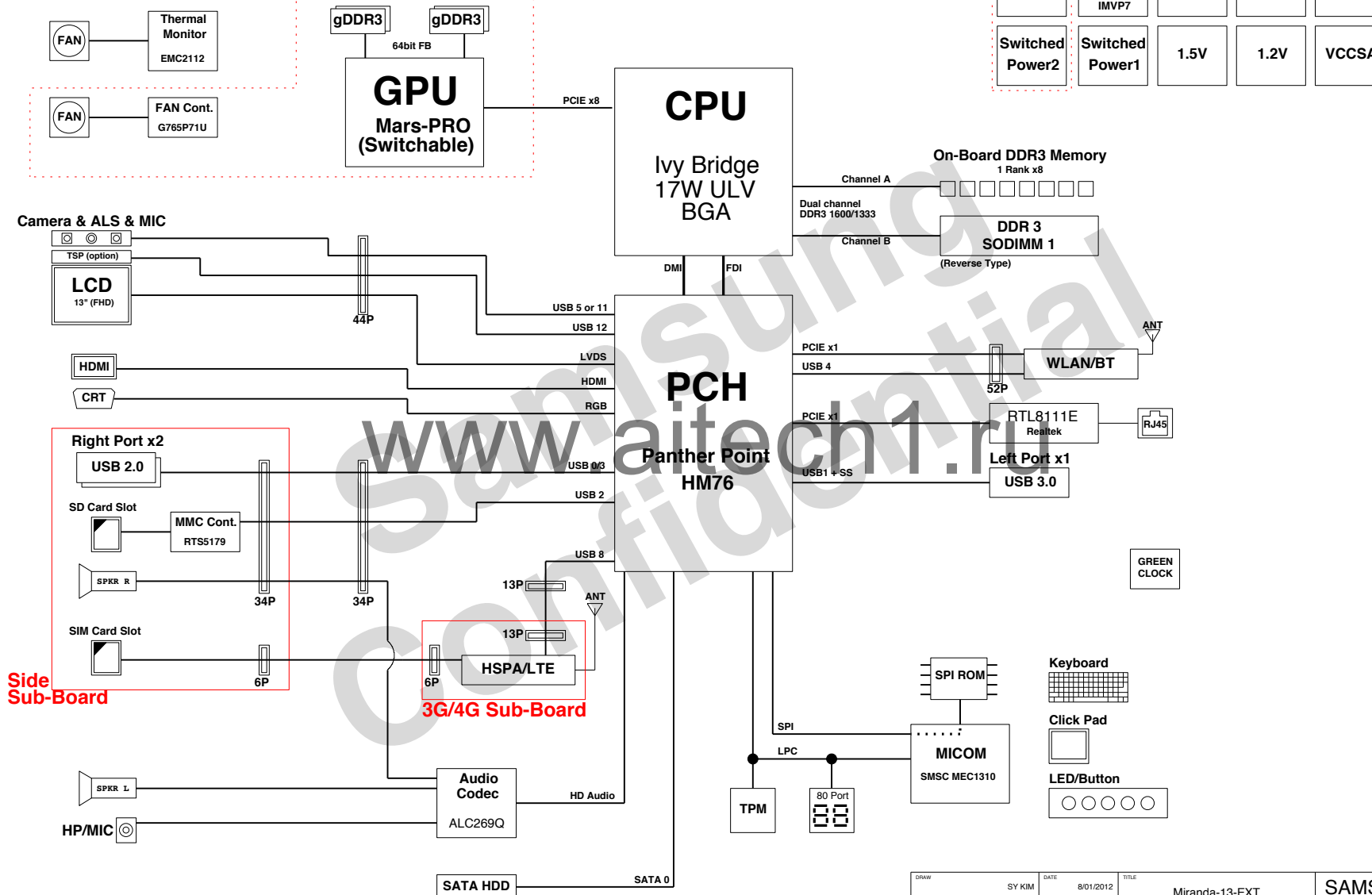
# Block Diagram

**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

EXT Only

EXT Only

DC/DC Power



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV	MAIN		
APPROVAL	MK KIM	REV	0.5	BLOCK DIAGRAM		
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE 2 OF 58	PART NO. BA41-0xxxxA



## BOARD INFORMATION

### 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 Micom) 5.0V always power rail 5.0V 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 P0.85V	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)
VCC_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT

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		
11	Camera		
12	USIM		
13	NC		

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)

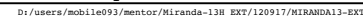
Devices	Resolution	PANNEL_DETECT_0
---------	------------	-----------------

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

Devices	Address	Hex	Bus
COUGARPOINT	Master	-	SMBUS Master
CPU Thermal Sensor	0011 000x	30h	
SODIMM0	1010 000x	A0h	Thermal Sensor
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	

DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT MAIN BOARD INFO	SAMSUNG ELECTRONICS PART NO. BA41-0xxxxA
CHECK	SJ KIM	DEV. STEP	ADV			
APPROVAL	MK KIM	REV	0.5			
MODULE CODE		LAST EDIT	September 17, 2012 22:22:27 PM		PAGE	3 OF 58





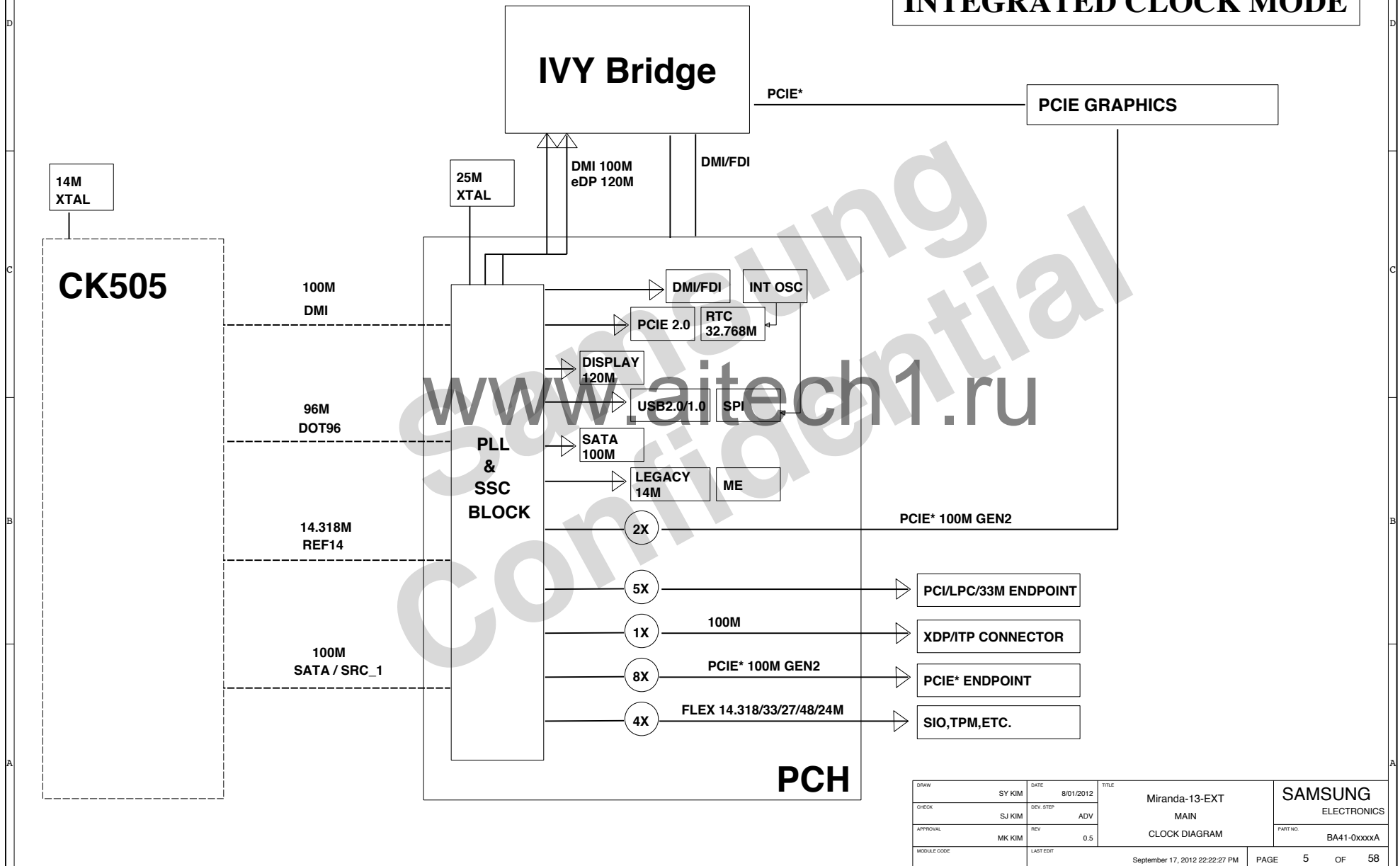


SAMSUNG PROPRIETARY  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

# CLOCK DISTRIBUTION

Rev. 1.0

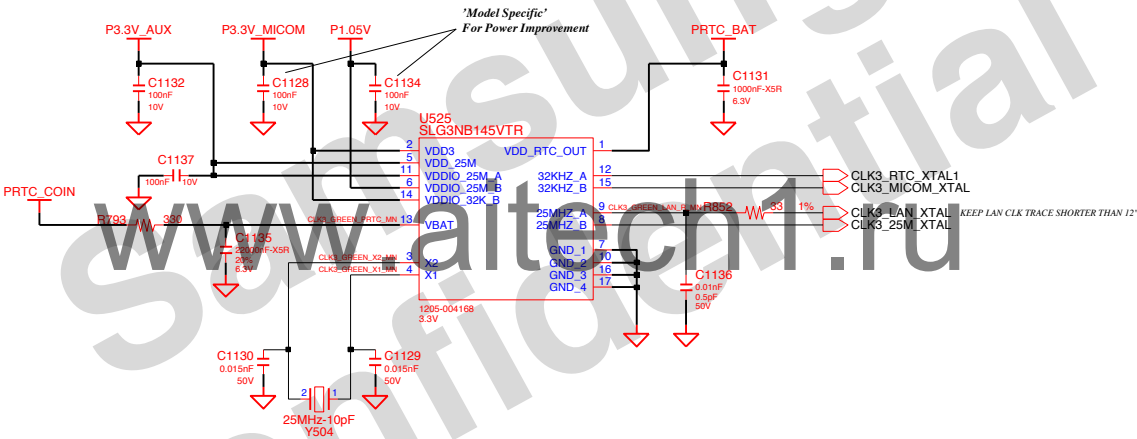
## INTEGRATED CLOCK MODE



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV	MAIN		ELECTRONICS
APPROVAL	MK KIM	REV	0.5	CLOCK DIAGRAM	PART NO.	BA41-0xxxxA
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE	5 OF 58



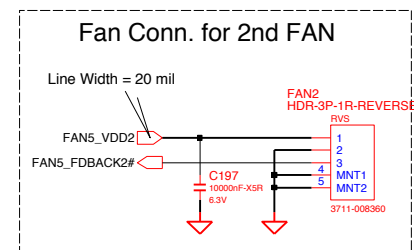
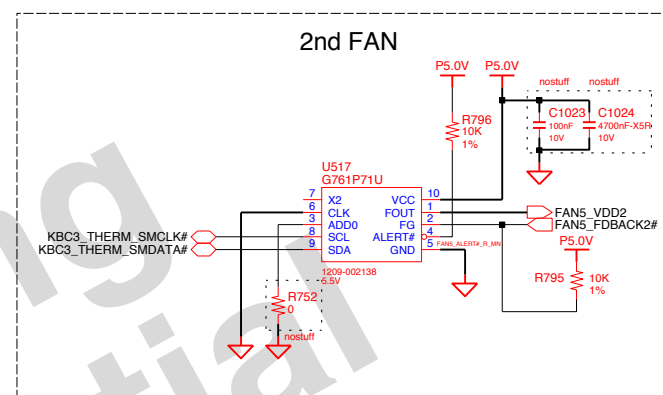
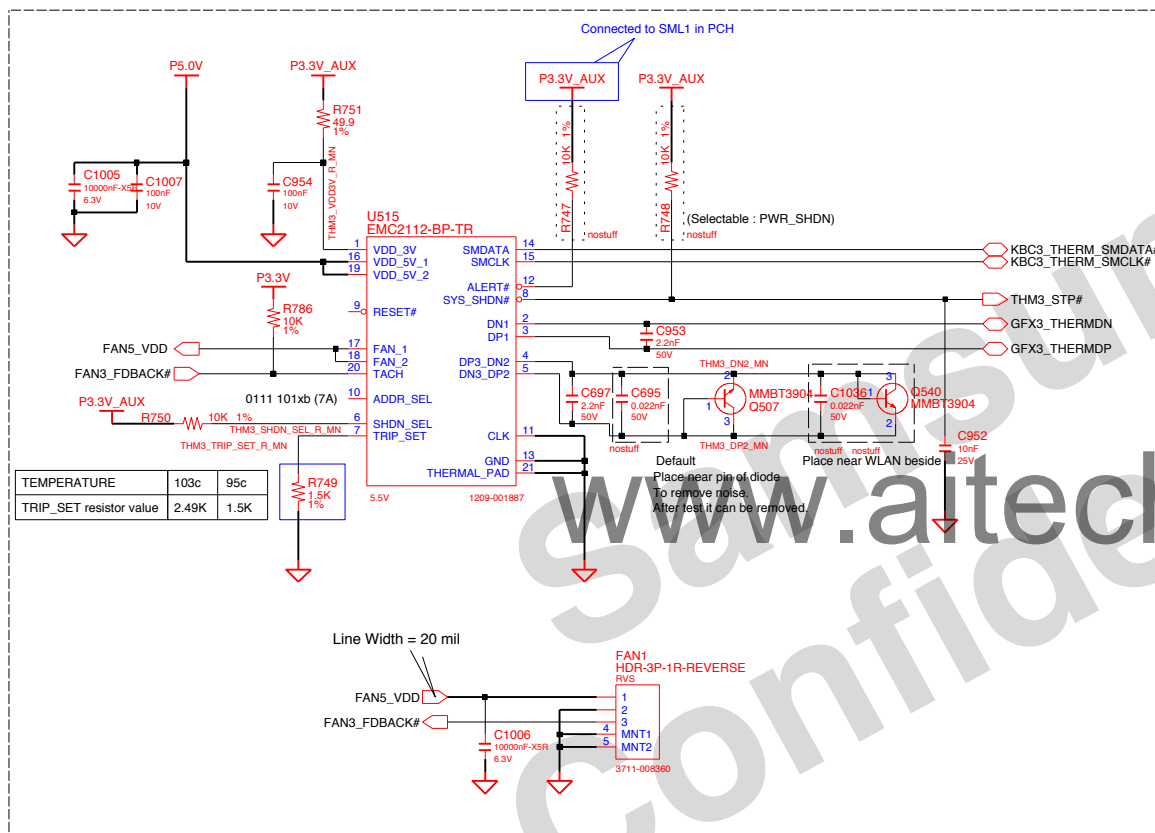
CLOCK DISTRIBUTOR



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		CLOCK	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		CLOCK DISTRIBUTION	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	6	OF 58



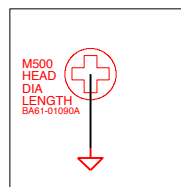
# THERMAL SENSOR & FAN CONTROL



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

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

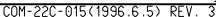
*for FAN(Top)*



DESIGN	SY KIM	DATE	8/01/2012	TITLE Miranda-13-EXT THERMAL SENSOR THERMAL SENSOR EMC2112	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		
APPROVAL	MK KIM	REV	0.5		
MODULE CODE					
LAST EDIT				September 17, 2012 22:22:27 PM	PAGE 7 OF 58

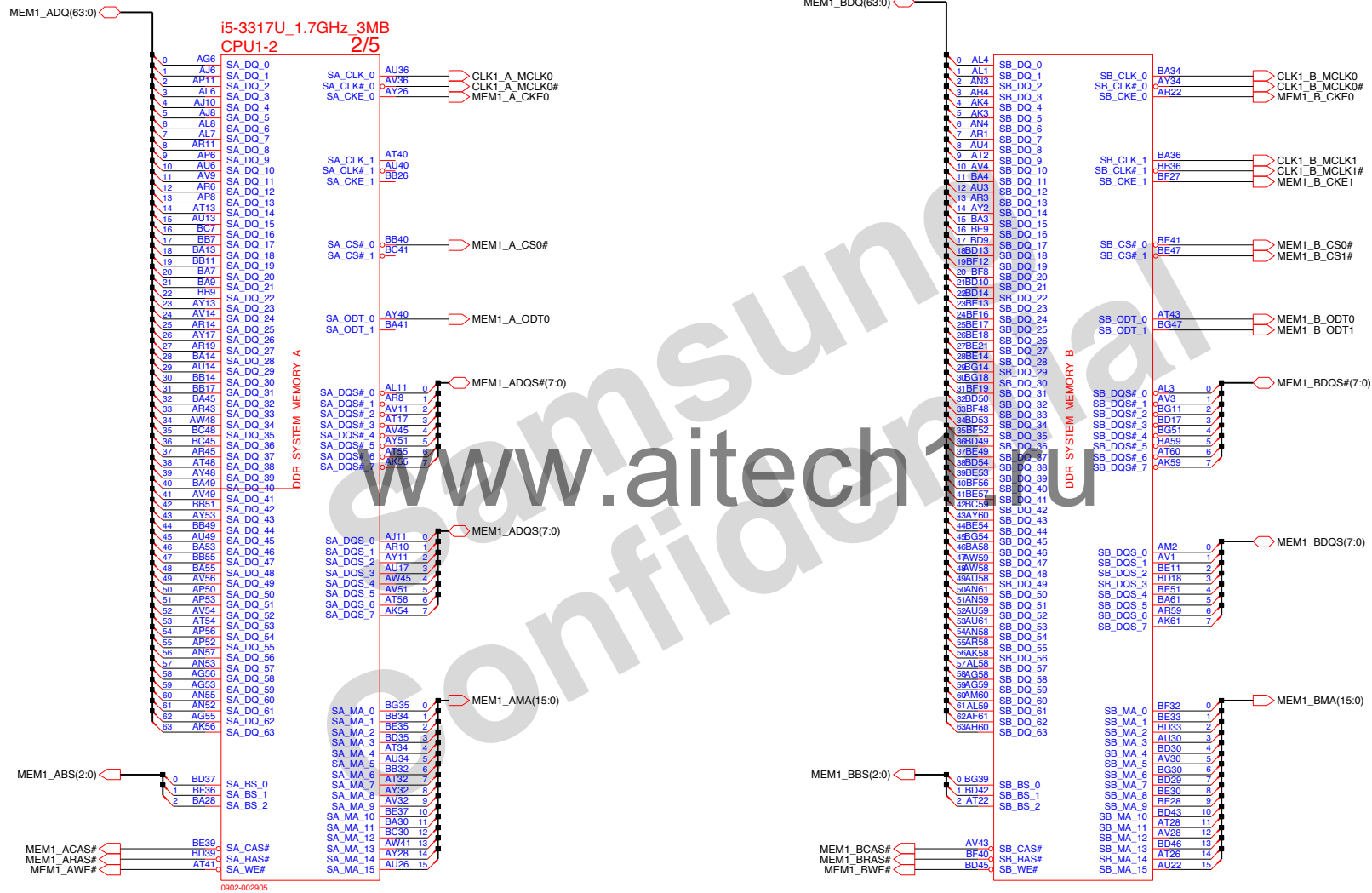


i5-3317U\_1.7GHz\_3MB  
CPU1-1 1/5

D:/users/mobile093/mentor/Miranda-13H EXT/120917/MIRANDA13-EXT

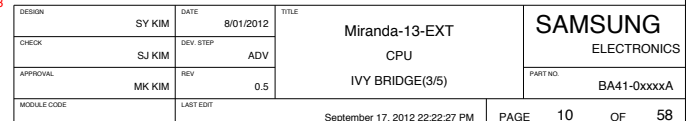


**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		CPU	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		IVY BRIDGE(2/5)	PART NO.
MODULE CODE	undefined	LAST EDIT				BA41-0xxxxA
				September 17, 2012 22:22:27 PM	PAGE	9 OF 58

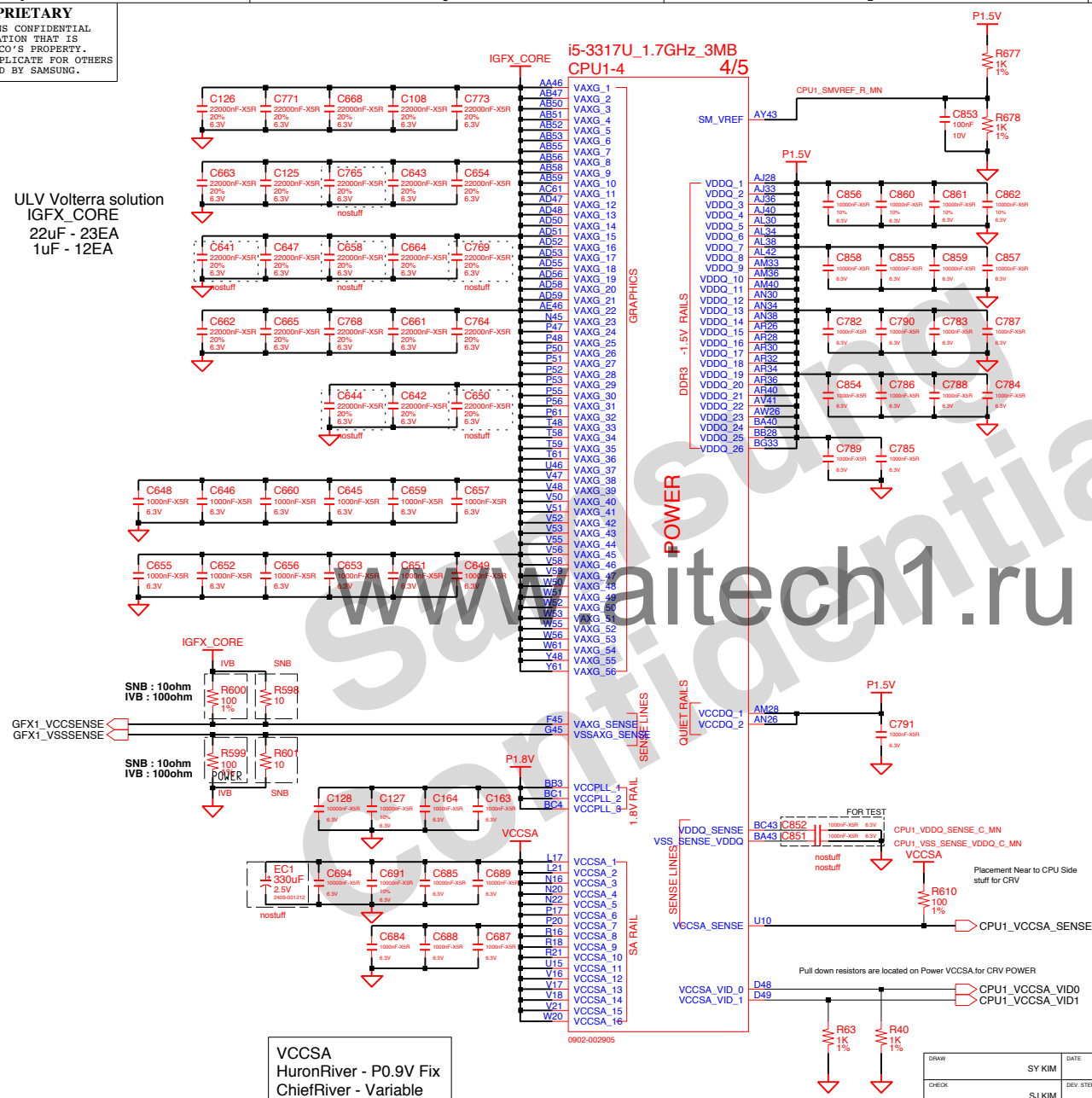






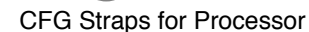
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

ULV Volterra solution  
IGFX\_CORE  
22uF - 23EA  
1uF - 12EA



DRAW	SY KIM	DATE	8/01/2012	TITLE Miranda-13-EXT CPU IVY BRIDGE(4/5)	SAMSUNG ELECTRONICS		
CHECK	SJ KIM	DEV. STEP	ADV		PART NO.	BA41-0xxxxA	
APPROVAL	MK KIM	REV	0.5				
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM			PAGE	11





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

DESIGN	SY KIM	DATE	8/01/2012	TITLE  Miranda-13-EXT  CPU  IVY BRIDGE(5/5)	SAMSUNG  ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		
APPROVAL	MK KIM	REV	0.5		
MODULE CODE	LAST EDIT				
				September 17, 2012 22:22:27 PM	PAGE 12 OF 58



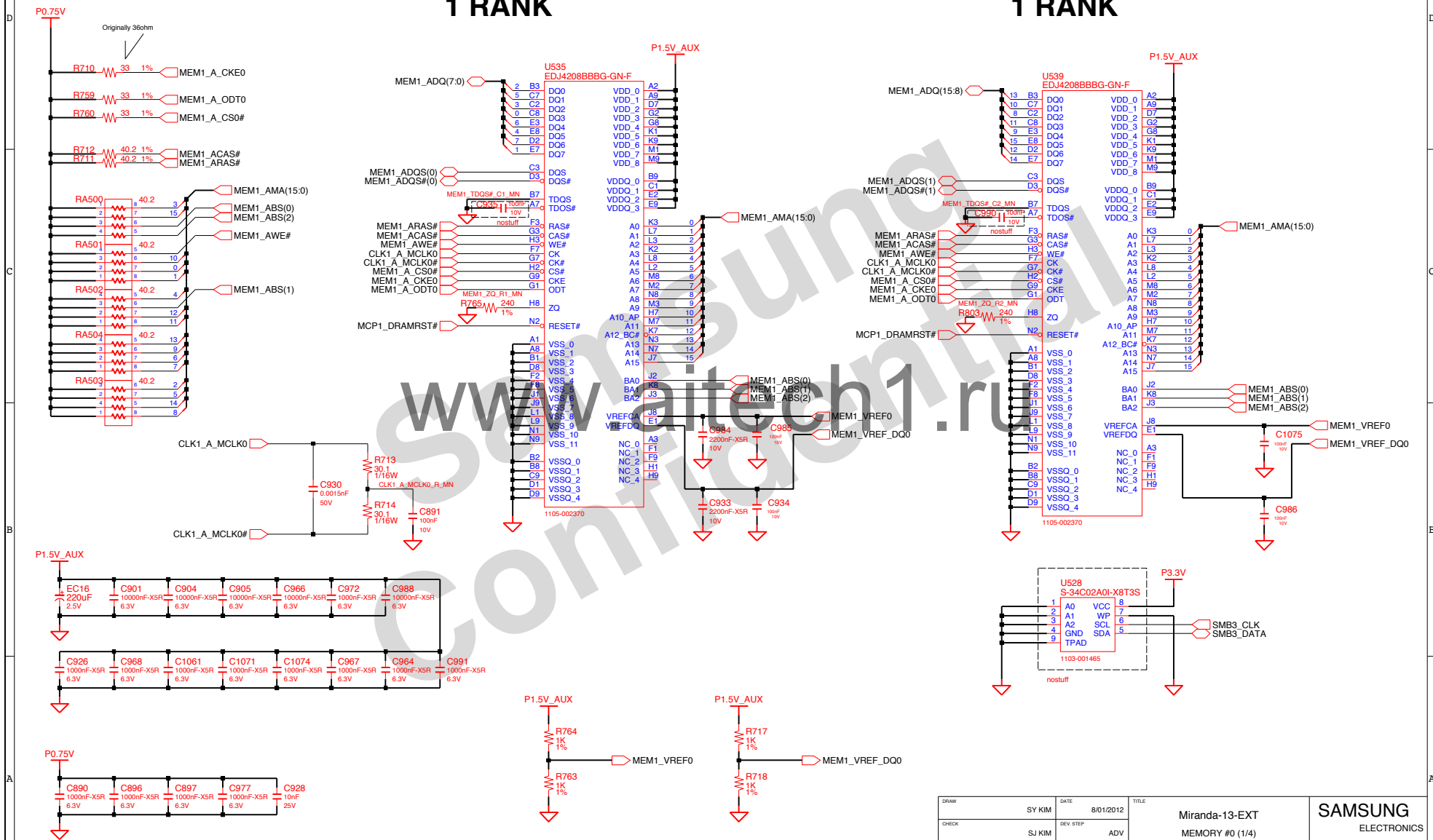
SAMSUNG PROPRIETARY  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## DDR3 on board #0 (1/4)

1105-002342 : Elpida D-die 2Gb 1600MHz  
1105-002331 : Samsung D-die 2Gb 1600MHz  
1105-002370 : Samsung C-die 4Gb 1600MHz

### 1 RANK

### 1 RANK

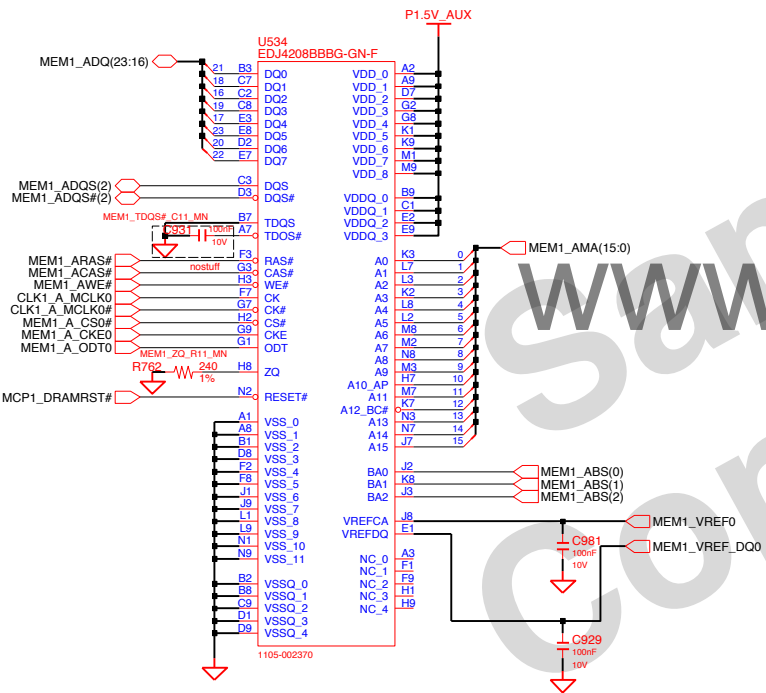


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT
CHECK	SJ KIM	DEV STEP	ADV		MEMORY #0 (1/4)
APPROVAL	MK KIM	REV	0.5		DDR3 2Gb #0
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	13 OF 58

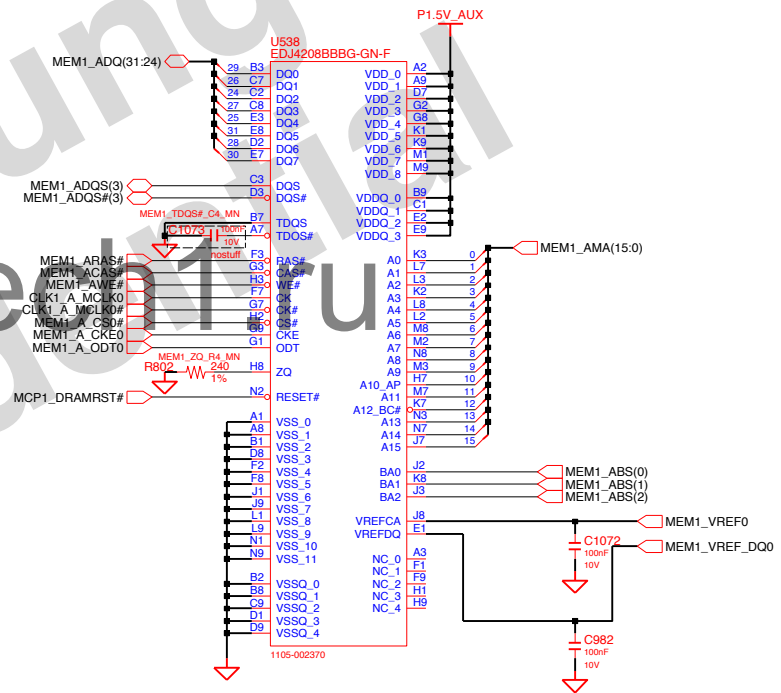


## DDR3 on board #0 (2/4)

### 1 RANK



### 1 RANK

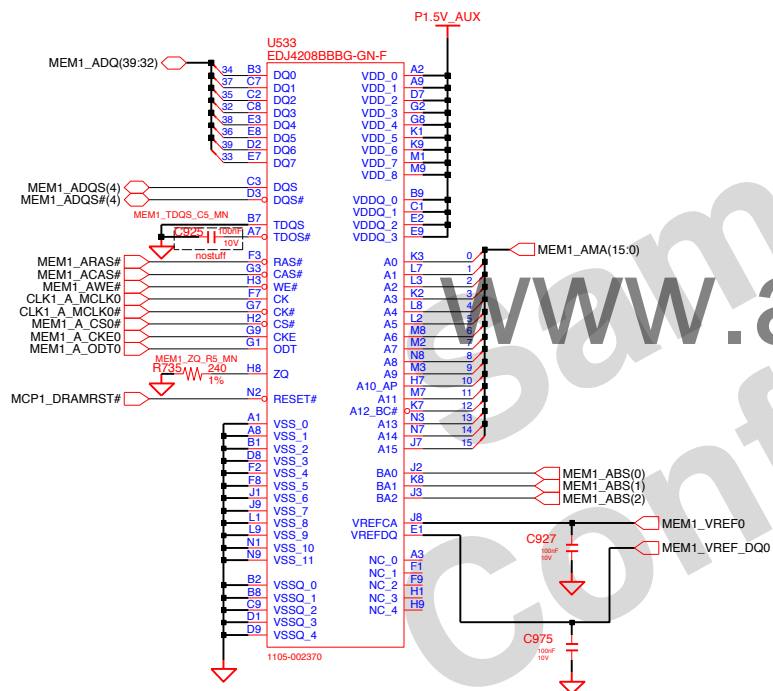


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		MEMORY #0 (2/4)	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		DDR3 2Gb #0	PART NO.
MODULE CODE	undefined	LAST EDIT				BA41-0xxxxA
				September 17, 2012 22:27 PM	PAGE	14 OF 58

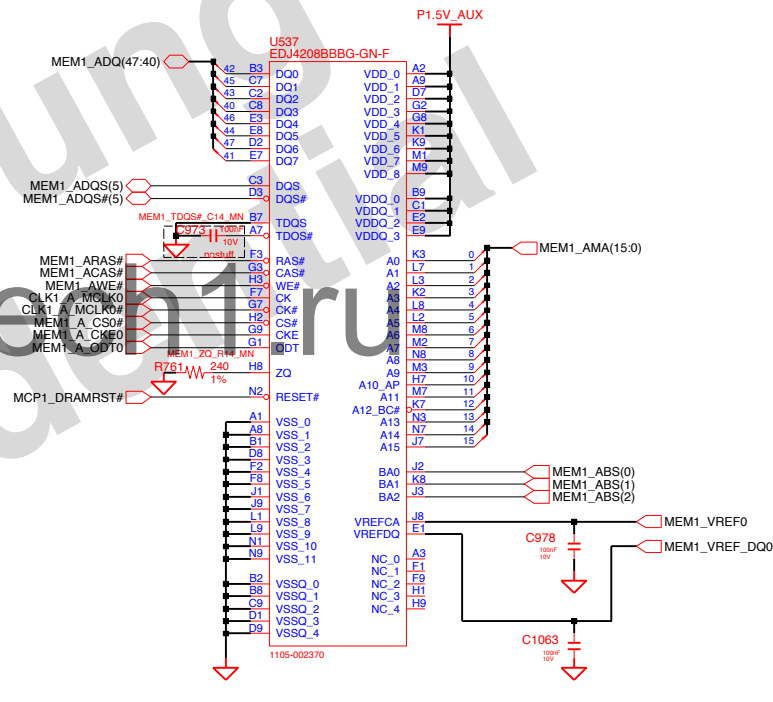


## DDR3 on board #0 (3/4)

1 RANK



1 RANK

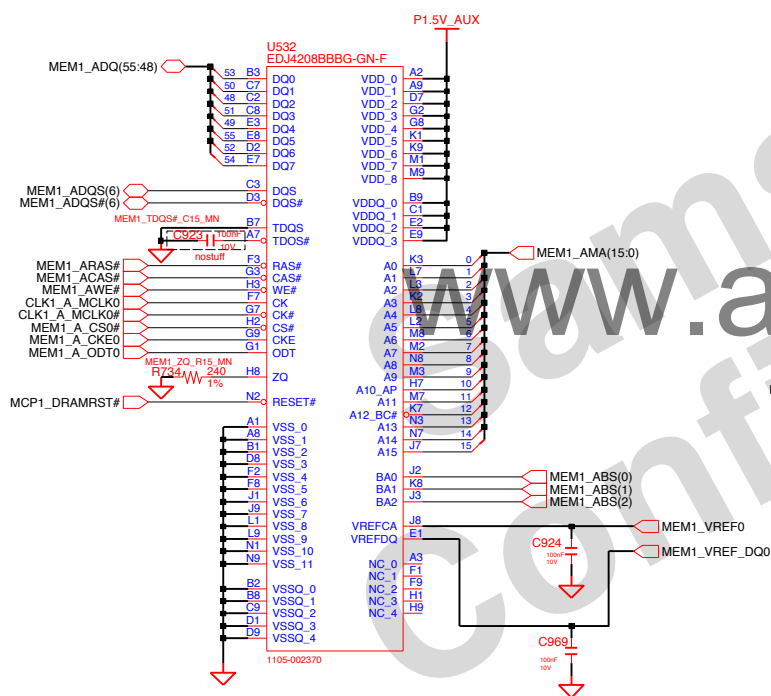


DRAWN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		MEMORY #0 (3/4)	
APPROVAL	MK KIM	REV	0.5		DDR3 2Gb #0	PART NO. BA41-0xxxxA
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	15	OF 58

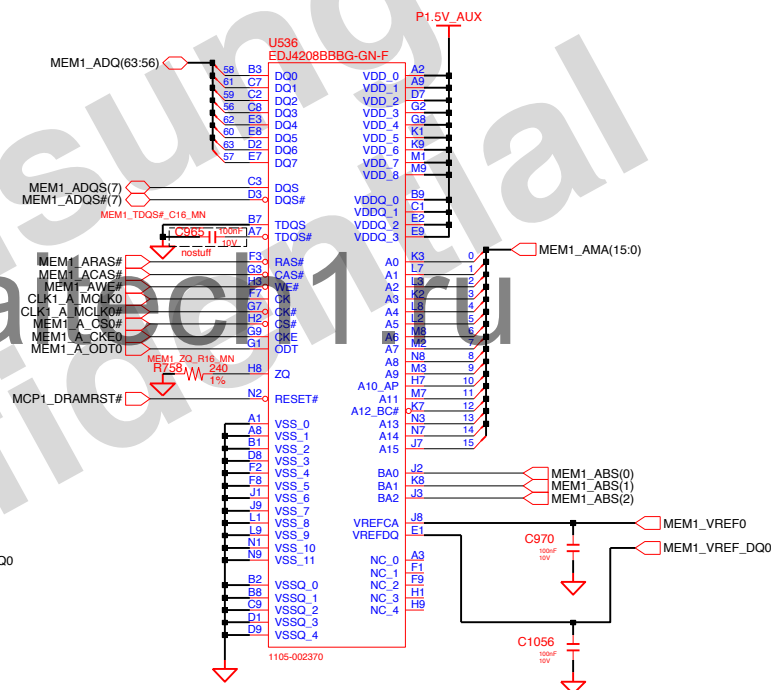


## DDR3 on board #0 (4/4)

# 1 RANK

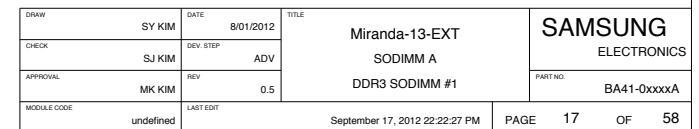


## 1 RANK

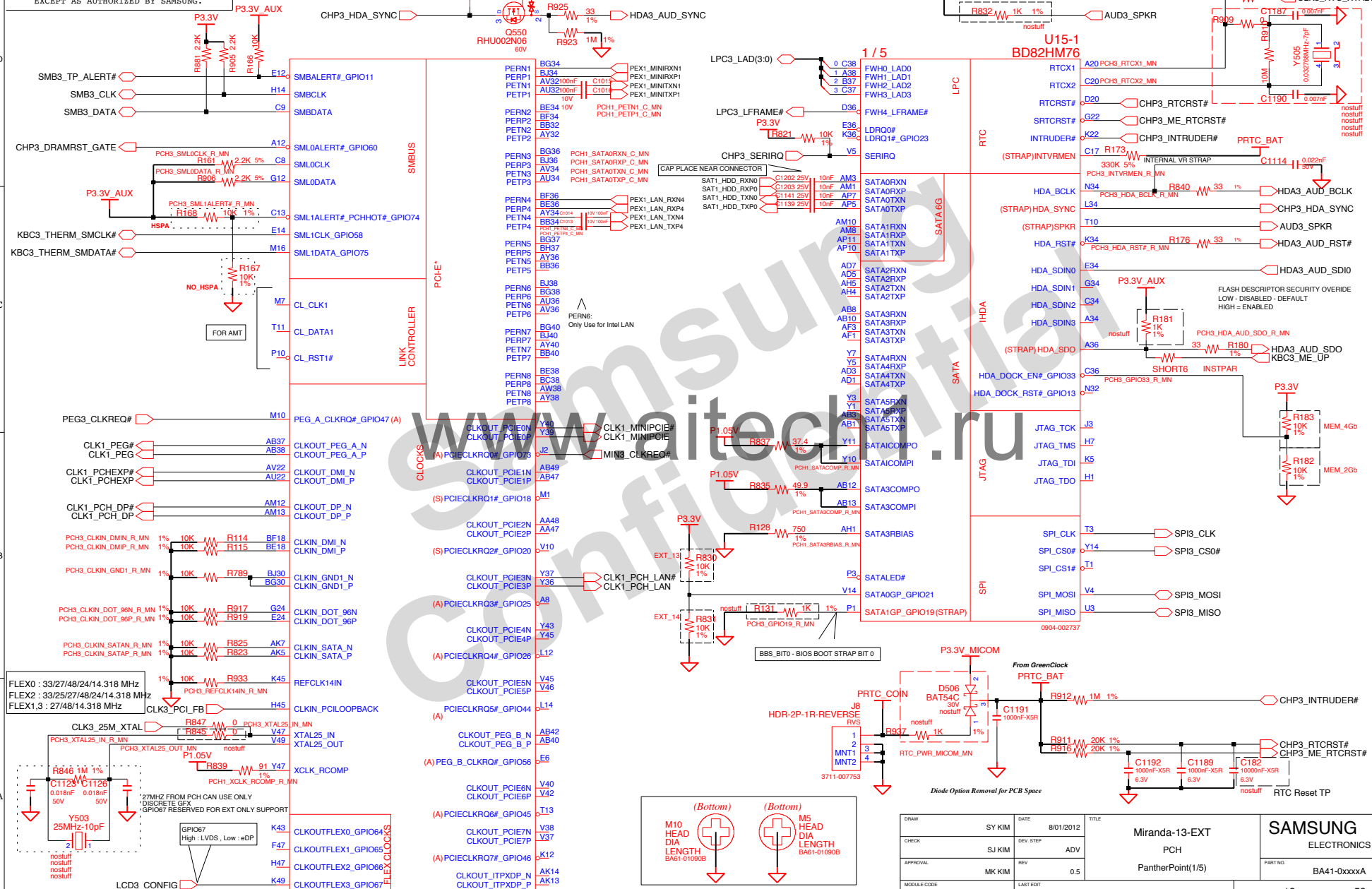
COM-22C-015(1996.6.5) REV. 3



## DDR3 SO-DIMM #1

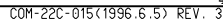








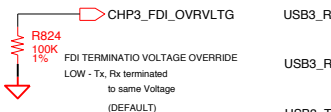
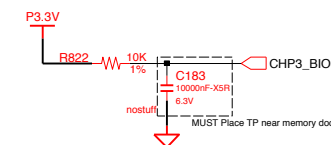
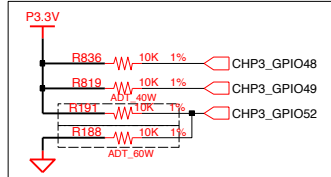
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.





**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## GREEN WATT



BOOT BIOS STRAP	
BBS_BIT	BOOT BIOS LOCATION
0	LPC RESERVED (NAND)
1	SP1

CHP3\_HOLD\_RST#  
CHP3\_GPIO52  
CHP3\_PEG\_PWREN#

BBS\_BIT1  
STP\_A16OVR

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

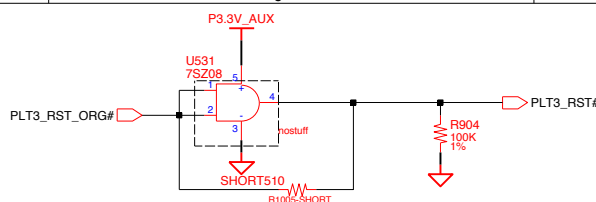
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN

CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN  
CHP3\_PIRQ#\_R\_MN



U15-3  
BD82HM76

3 / 5

RSVD\_1  
RSVD\_2  
RSVD\_3  
RSVD\_4

RSVD\_5  
RSVD\_6

RSVD\_7  
RSVD\_8  
RSVD\_9  
RSVD\_10

RSVD\_11  
RSVD\_12  
RSVD\_13  
RSVD\_14

RSVD\_15  
RSVD\_16  
RSVD\_17  
RSVD\_18

RSVD\_19  
RSVD\_20  
RSVD\_21  
RSVD\_22

RSVD\_23  
RSVD\_24  
RSVD\_25  
RSVD\_26

RSVD\_27  
RSVD\_28  
RSVD\_29  
RSVD\_30

RSVD\_31  
RSVD\_32  
RSVD\_33  
RSVD\_34

RSVD\_35  
RSVD\_36  
RSVD\_37  
RSVD\_38

RSVD\_39  
RSVD\_40  
RSVD\_41  
RSVD\_42

RSVD\_43  
RSVD\_44  
RSVD\_45  
RSVD\_46

RSVD\_47  
RSVD\_48  
RSVD\_49  
RSVD\_50

RSVD\_51  
RSVD\_52  
RSVD\_53  
RSVD\_54

RSVD\_55  
RSVD\_56  
RSVD\_57  
RSVD\_58

RSVD\_59  
RSVD\_60  
RSVD\_61  
RSVD\_62

RSVD\_63  
RSVD\_64  
RSVD\_65  
RSVD\_66

RSVD\_67  
RSVD\_68  
RSVD\_69  
RSVD\_70

RSVD\_71  
RSVD\_72  
RSVD\_73  
RSVD\_74

RSVD\_75  
RSVD\_76  
RSVD\_77  
RSVD\_78

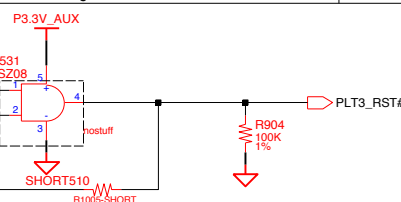
RSVD\_79  
RSVD\_80  
RSVD\_81  
RSVD\_82

RSVD\_83  
RSVD\_84  
RSVD\_85  
RSVD\_86

RSVD\_87  
RSVD\_88  
RSVD\_89  
RSVD\_90

RSVD\_91  
RSVD\_92  
RSVD\_93  
RSVD\_94

RSVD\_95  
RSVD\_96  
RSVD\_97  
RSVD\_98



U15-3  
BD82HM76

3 / 5

RSVD\_1  
RSVD\_2  
RSVD\_3  
RSVD\_4

RSVD\_5  
RSVD\_6

RSVD\_7  
RSVD\_8  
RSVD\_9  
RSVD\_10

RSVD\_11  
RSVD\_12  
RSVD\_13  
RSVD\_14

RSVD\_15  
RSVD\_16  
RSVD\_17  
RSVD\_18

RSVD\_19  
RSVD\_20  
RSVD\_21  
RSVD\_22

RSVD\_23  
RSVD\_24  
RSVD\_25  
RSVD\_26

RSVD\_27  
RSVD\_28  
RSVD\_29  
RSVD\_30

RSVD\_31  
RSVD\_32  
RSVD\_33  
RSVD\_34

RSVD\_35  
RSVD\_36  
RSVD\_37  
RSVD\_38

RSVD\_39  
RSVD\_40  
RSVD\_41  
RSVD\_42

RSVD\_43  
RSVD\_44  
RSVD\_45  
RSVD\_46

RSVD\_47  
RSVD\_48  
RSVD\_49  
RSVD\_50

RSVD\_51  
RSVD\_52  
RSVD\_53  
RSVD\_54

RSVD\_55  
RSVD\_56  
RSVD\_57  
RSVD\_58

RSVD\_59  
RSVD\_60  
RSVD\_61  
RSVD\_62

RSVD\_63  
RSVD\_64  
RSVD\_65  
RSVD\_66

RSVD\_67  
RSVD\_68  
RSVD\_69  
RSVD\_70

RSVD\_71  
RSVD\_72  
RSVD\_73  
RSVD\_74

RSVD\_75  
RSVD\_76  
RSVD\_77  
RSVD\_78

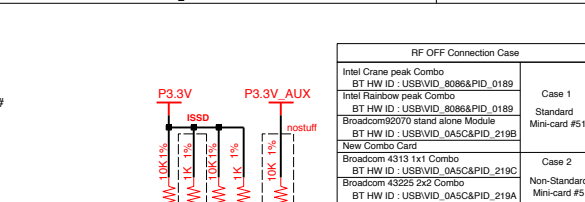
RSVD\_79  
RSVD\_80  
RSVD\_81  
RSVD\_82

RSVD\_83  
RSVD\_84  
RSVD\_85  
RSVD\_86

RSVD\_87  
RSVD\_88  
RSVD\_89  
RSVD\_90

RSVD\_91  
RSVD\_92  
RSVD\_93  
RSVD\_94

RSVD\_95  
RSVD\_96  
RSVD\_97  
RSVD\_98



U15-3  
BD82HM76

3 / 5

RSVD\_1  
RSVD\_2  
RSVD\_3  
RSVD\_4

RSVD\_5  
RSVD\_6

RSVD\_7  
RSVD\_8  
RSVD\_9  
RSVD\_10

RSVD\_11  
RSVD\_12  
RSVD\_13  
RSVD\_14

RSVD\_15  
RSVD\_16  
RSVD\_17  
RSVD\_18

RSVD\_19  
RSVD\_20  
RSVD\_21  
RSVD\_22

RSVD\_23  
RSVD\_24  
RSVD\_25  
RSVD\_26

RSVD\_27  
RSVD\_28  
RSVD\_29  
RSVD\_30

RSVD\_31  
RSVD\_32  
RSVD\_33  
RSVD\_34

RSVD\_35  
RSVD\_36  
RSVD\_37  
RSVD\_38

RSVD\_39  
RSVD\_40  
RSVD\_41  
RSVD\_42

RSVD\_43  
RSVD\_44  
RSVD\_45  
RSVD\_46

RSVD\_47  
RSVD\_48  
RSVD\_49  
RSVD\_50

RSVD\_51  
RSVD\_52  
RSVD\_53  
RSVD\_54

RSVD\_55  
RSVD\_56  
RSVD\_57  
RSVD\_58

RSVD\_59  
RSVD\_60  
RSVD\_61  
RSVD\_62

RSVD\_63  
RSVD\_64  
RSVD\_65  
RSVD\_66

RSVD\_67  
RSVD\_68  
RSVD\_69  
RSVD\_70

RSVD\_71  
RSVD\_72  
RSVD\_73  
RSVD\_74

RSVD\_75  
RSVD\_76  
RSVD\_77  
RSVD\_78

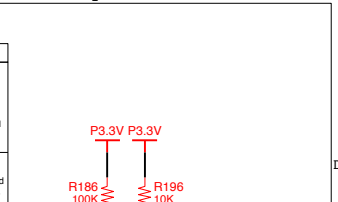
RSVD\_79  
RSVD\_80  
RSVD\_81  
RSVD\_82

RSVD\_83  
RSVD\_84  
RSVD\_85  
RSVD\_86

RSVD\_87  
RSVD\_88  
RSVD\_89  
RSVD\_90

RSVD\_91  
RSVD\_92  
RSVD\_93  
RSVD\_94

RSVD\_95  
RSVD\_96  
RSVD\_97  
RSVD\_98



U15-3  
BD82HM76

3 / 5

RSVD\_1  
RSVD\_2  
RSVD\_3  
RSVD\_4

RSVD\_5  
RSVD\_6

RSVD\_7  
RSVD\_8  
RSVD\_9  
RSVD\_10

RSVD\_11  
RSVD\_12  
RSVD\_13  
RSVD\_14

RSVD\_15  
RSVD\_16  
RSVD\_17  
RSVD\_18

RSVD\_19  
RSVD\_20  
RSVD\_21  
RSVD\_22

RSVD\_23  
RSVD\_24  
RSVD\_25  
RSVD\_26

RSVD\_27  
RSVD\_28  
RSVD\_29  
RSVD\_30

RSVD\_31  
RSVD\_32  
RSVD\_33  
RSVD\_34

RSVD\_35  
RSVD\_36  
RSVD\_37  
RSVD\_38

RSVD\_39  
RSVD\_40  
RSVD\_41  
RSVD\_42

RSVD\_43  
RSVD\_44  
RSVD\_45  
RSVD\_46

RSVD\_47  
RSVD\_48  
RSVD\_49  
RSVD\_50

RSVD\_51  
RSVD\_52  
RSVD\_53  
RSVD\_54

RSVD\_55  
RSVD\_56  
RSVD\_57  
RSVD\_58

RSVD\_59  
RSVD\_60  
RSVD\_61  
RSVD\_62

RSVD\_63  
RSVD\_64  
RSVD\_65  
RSVD\_66

RSVD\_67  
RSVD\_68  
RSVD\_69  
RSVD\_70

RSVD\_71  
RSVD\_72  
RSVD\_73  
RSVD\_74

RSVD\_75  
RSVD\_76  
RSVD\_77  
RSVD\_78

RSVD\_79  
RSVD\_80  
RSVD\_81  
RSVD\_82

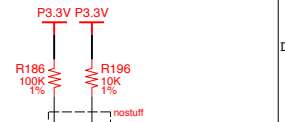
RSVD\_83  
RSVD\_84  
RSVD\_85  
RSVD\_86

RSVD\_87  
RSVD\_88  
RSVD\_89  
RSVD\_90

RSVD\_91  
RSVD\_92  
RSVD\_93  
RSVD\_94

RSVD\_95  
RSVD\_96  
RSVD\_97  
RSVD\_98

RF OFF Connection Case	
Intel Crane peak Combo BT HW ID : USBVID_8086&PID_0189	Case 1
Intel Rainbow peak Combo BT HW ID : USBVID_8086&PID_0189	Standard Mini-card #51
Broadcom92070 stand alone Module BT HW ID : USBVID_0A5C&PID_219B	Case 2
New Combo Card Broadcom 4313 1x1 Combo BT HW ID : USBVID_0A5C&PID_219C	Non-Standard Mini-card #5
Broadcom 43225 2x2 Combo BT HW ID : USBVID_0A5C&PID_219A	



U15-3  
BD82HM76

3 / 5

RSVD\_1  
RSVD\_2  
RSVD\_3  
RSVD\_4

RSVD\_5  
RSVD\_6

RSVD\_7  
RSVD\_8  
RSVD\_9  
RSVD\_10

RSVD\_11  
RSVD\_12  
RSVD\_13  
RSVD\_14

RSVD\_15  
RSVD\_16  
RSVD\_17  
RSVD\_18

RSVD\_19  
RSVD\_20  
RSVD\_21  
RSVD\_22

RSVD\_23  
RSVD\_24  
RSVD\_25  
RSVD\_26

RSVD\_27  
RSVD\_28  
RSVD\_29  
RSVD\_30

RSVD\_31  
RSVD\_32  
RSVD\_33  
RSVD\_34

RSVD\_35  
RSVD\_36  
RSVD\_37  
RSVD\_38

RSVD\_39  
RSVD\_40  
RSVD\_41  
RSVD\_42

RSVD\_43  
RSVD\_44  
RSVD\_45  
RSVD\_46

RSVD\_47  
RSVD\_48  
RSVD\_49  
RSVD\_50

RSVD\_51  
RSVD\_52  
RSVD\_53  
RSVD\_54

RSVD\_55  
RSVD\_56  
RSVD\_57  
RSVD\_58

RSVD\_59  
RSVD\_60  
RSVD\_61  
RSVD\_62

RSVD\_63  
RSVD\_64  
RSVD\_65  
RSVD\_66

RSVD\_67  
RSVD\_68  
RSVD\_69  
RSVD\_70

RSVD\_71  
RSVD\_72  
RSVD\_73  
RSVD\_74

RSVD\_75  
RSVD\_76  
RSVD\_77  
RSVD\_78

RSVD\_79  
RSVD\_80  
RSVD\_81  
RSVD\_82

RSVD\_83  
RSVD\_84  
RSVD\_85  
RSVD\_86

RSVD\_87  
RSVD\_88  
RSVD\_89  
RSVD\_90

RSVD\_91  
RSVD\_92  
RSVD\_93  
RSVD\_94

	HIGH	LOW
GPIO6 : ISSD		NO ISSD
GPIO21 : 13_EXT		14_EXT
GPIO24 : Reserved		Reserved
GPIO33 : MEM_4GB		MEM_2GB
GPIO34 : MEM_1600MHz		MEM_1333MHz
GPIO38 : MARS_PRO		SUN_PRO
GPIO39 : INT		OPT
GPIO40 : SEC		ELPIDA
GPIO41 : MEM_4GByte		MEM_2GByte
GPIO48 : NA		GREEN WATT
GPIO49 : ADT_40W_60W		ADT_60W
GPIO52 : ADT_60W_40W		ADT_60W
GPIO57 : NBL_KBD		BL_KBD
GPIO67 : LVDS		eDP
GPIO74 : HSPA		NO HSPA

DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT
CHECK	SJ KIM	DEV STEP	ADV	PCH	
APPROVAL	MK KIM	REV	0.5	PantherPoint(3/5)	
MODULE CODE		LAST EDIT		September 17, 2012 22:27 PM	
					PAGE 20 OF 58



**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

U15-4  
BD82HM76

4 / 5

VCCACLK

VCCDSW3\_3

DCPSUSBYP

VCC3\_3\_5

VCCAPLLDM2

VCCIO\_14

DCPSUS\_3

VCCASW\_1

VCCASW\_2

VCCASW\_3

VCCASW\_4

VCCASW\_5

VCCASW\_6

VCCASW\_7

VCCASW\_8

VCCASW\_9

VCCASW\_10

VCCASW\_11

VCCASW\_12

VCCASW\_13

VCCASW\_14

VCCASW\_15

VCCASW\_16

VCCASW\_17

VCCASW\_18

VCCASW\_19

VCCASW\_20

DCPRTC

VCCVRM\_4

VCCADPLLA

VCCADPLL

VCCIO\_7

VCCDIFFCLKN\_1

VCCDIFFCLKN\_2

VCCDIFFCLKN\_3

VCCSSC

DCPSST

DCPSUS\_1

DCPSUS\_2

V\_PROC\_IO

VCCRTC

0904-002737

CLOCK AND MISCELLANEOUS

PQ/GPIO/LPC

SATA

CPU

RTC

HDA

MISC

USB

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF

VCCSUS3\_3\_2

VCCSUS3\_3\_3

VCCSUS3\_3\_4

VCCSUS3\_3\_5

VCC3\_3\_1

VCC3\_3\_2

VCCIO\_5

VCCIO\_12

VCCIO\_13

VCCIO\_6

VCCAPLSATA

VCCVRM\_1

VCCIO\_2

VCCIO\_3

VCCIO\_4

VCCASW\_22

VCCASW\_23

VCCASW\_21

VCCSUSHDA

VCCIO\_29

VCCIO\_30

VCCIO\_31

VCCIO\_32

VCCIO\_33

VCCSUS3\_3\_7

VCCSUS3\_3\_8

VCCSUS3\_3\_9

VCCSUS3\_3\_10

VCCSUS3\_3\_6

VCCIO\_34

V5REF\_SUS

DCPSUS\_4

VCCSUS3\_3\_1

V5REF



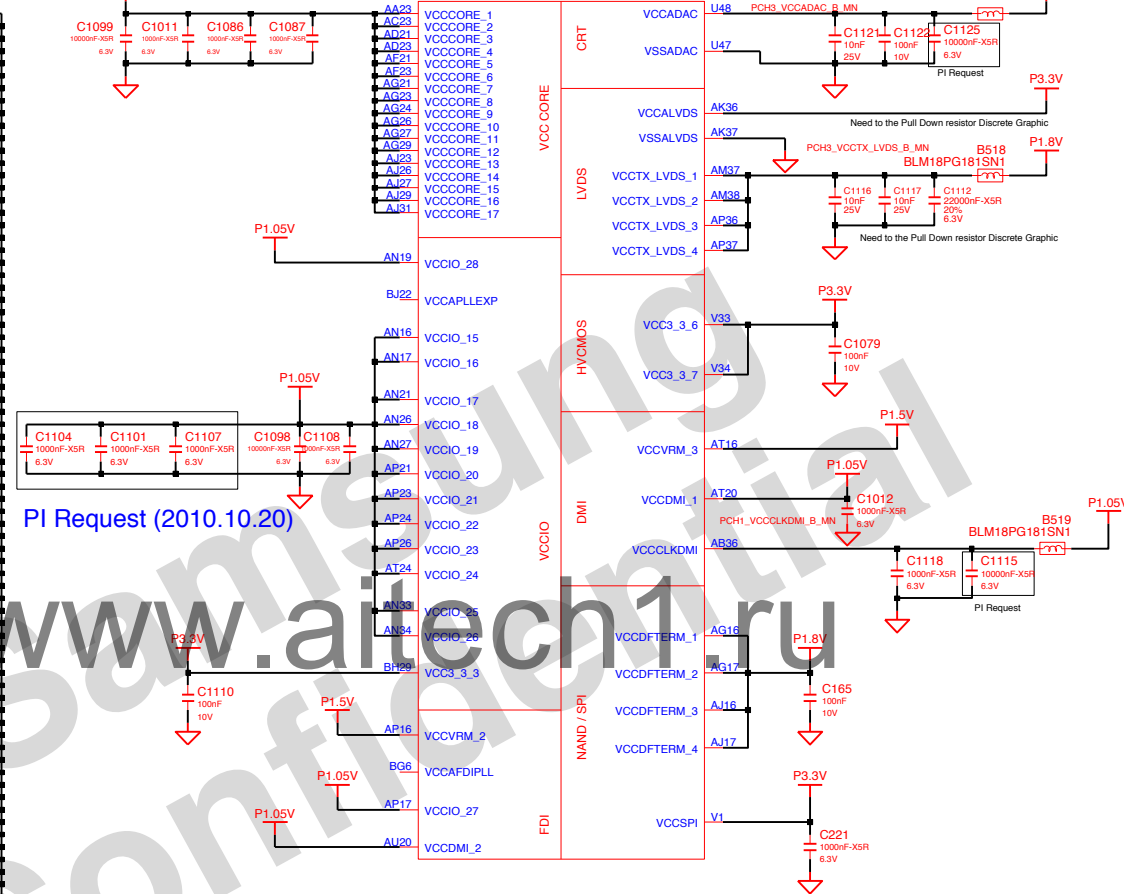
U15-5  
BD82HM76

This power share with thermal sensor

5 / 5

AV4	VSS159	VSS259	H46
AY42	VSS160	VSS260	K26
AY46	VSS161	VSS261	K39
AY8	VSS162	VSS262	K46
B11	VSS163	VSS263	K7
B15	VSS164	VSS264	L18
B19	VSS165	VSS265	L2
B23	VSS166	VSS266	L20
B27	VSS167	VSS267	L28
B31	VSS168	VSS268	L28
B35	VSS169	VSS269	L36
B39	VSS170	VSS270	L48
B7	VSS171	VSS271	M2
F45	VSS172	VSS272	M12
RB12	VSS173	VSS273	M18
RB16	VSS174	VSS274	M22
RB20	VSS175	VSS275	M24
RB22	VSS176	VSS276	M30
RB24	VSS177	VSS277	M32
RB28	VSS178	VSS278	M34
RB30	VSS179	VSS279	M38
RB38	VSS180	VSS280	M42
RB4	VSS181	VSS281	M46
RB46	VSS182	VSS282	M8
BC14	VSS183	VSS283	N18
BC18	VSS184	VSS284	P30
BC2	VSS185	VSS285	N47
BC22	VSS186	VSS286	P11
BC26	VSS187	VSS287	P18
BC32	VSS188	VSS288	P43
BC34	VSS189	VSS289	P47
BC36	VSS190	VSS290	R2
BC40	VSS191	VSS291	R48
BC42	VSS192	VSS292	T3
BC48	VSS193	VSS293	T37
BD46	VSS194	VSS294	T4
BD5	VSS195	VSS295	T12
BE22	VSS196	VSS296	T18
BE26	VSS197	VSS297	T19
BE40	VSS198	VSS298	T27
FE10	VSS199	VSS299	T47
FE12	VSS200	VSS300	T8
FE16	VSS201	VSS301	V17
FE22	VSS202	VSS302	V26
FE24	VSS203	VSS303	V30
FE26	VSS204	VSS304	V36
FE28	VSS205	VSS305	V38
BD3	VSS206	VSS306	V39
FE30	VSS207	VSS307	V43
FE38	VSS208	VSS308	V46
BF40	VSS209	VSS309	W17
BF8	VSS210	VSS310	W19
BG17	VSS211	VSS311	W27
BG21	VSS212	VSS312	W48
BG33	VSS213	VSS313	Y2
BG44	VSS214	VSS314	Y38
BG8	VSS215	VSS315	Y4
BH11	VSS216	VSS316	Y42
BH15	VSS217	VSS317	Y6
BH17	VSS218	VSS318	Y8
BH19	VSS219	VSS319	Y9
H10	VSS220	VSS320	Y12
RH27	VSS221	VSS321	Y16
BH31	VSS222	VSS322	Y18
BH33	VSS223	VSS323	Y26
BH35	VSS224	VSS324	Y30
BH39	VSS225	VSS325	Y36
BH43	VSS226	VSS326	Y42
BH7	VSS227	VSS327	Y46
D3	VSS228	VSS328	Y48
D12	VSS229	VSS329	Y52
D16	VSS230	VSS330	Y54
D18	VSS231	VSS331	Y56
D22	VSS232	VSS332	Y58
D24	VSS233	VSS333	Y60
D26	VSS234	VSS334	Y62
D30	VSS235	VSS335	Y64
D32	VSS236	VSS336	Y66
D34	VSS237	VSS337	Y68
D38	VSS238	VSS338	Y70
D42	VSS239	VSS339	Y72
D8	VSS240	VSS340	Y74
E18	VSS241	VSS341	Y76
E26	VSS242	VSS342	Y78
G18	VSS243	VSS343	Y80
G20	VSS244	VSS344	Y82
G26	VSS245	VSS345	Y84
G28	VSS246	VSS346	Y86
G36	VSS247	VSS347	Y88
G48	VSS248	VSS348	Y90
H12	VSS249	VSS349	Y92
H18	VSS250	VSS350	Y94
H22	VSS251	VSS351	Y96
H24	VSS252	VSS352	Y98
H26	VSS253		
H30	VSS254		
H32	VSS255		
H34	VSS256		
F3	VSS257		
VSS258			

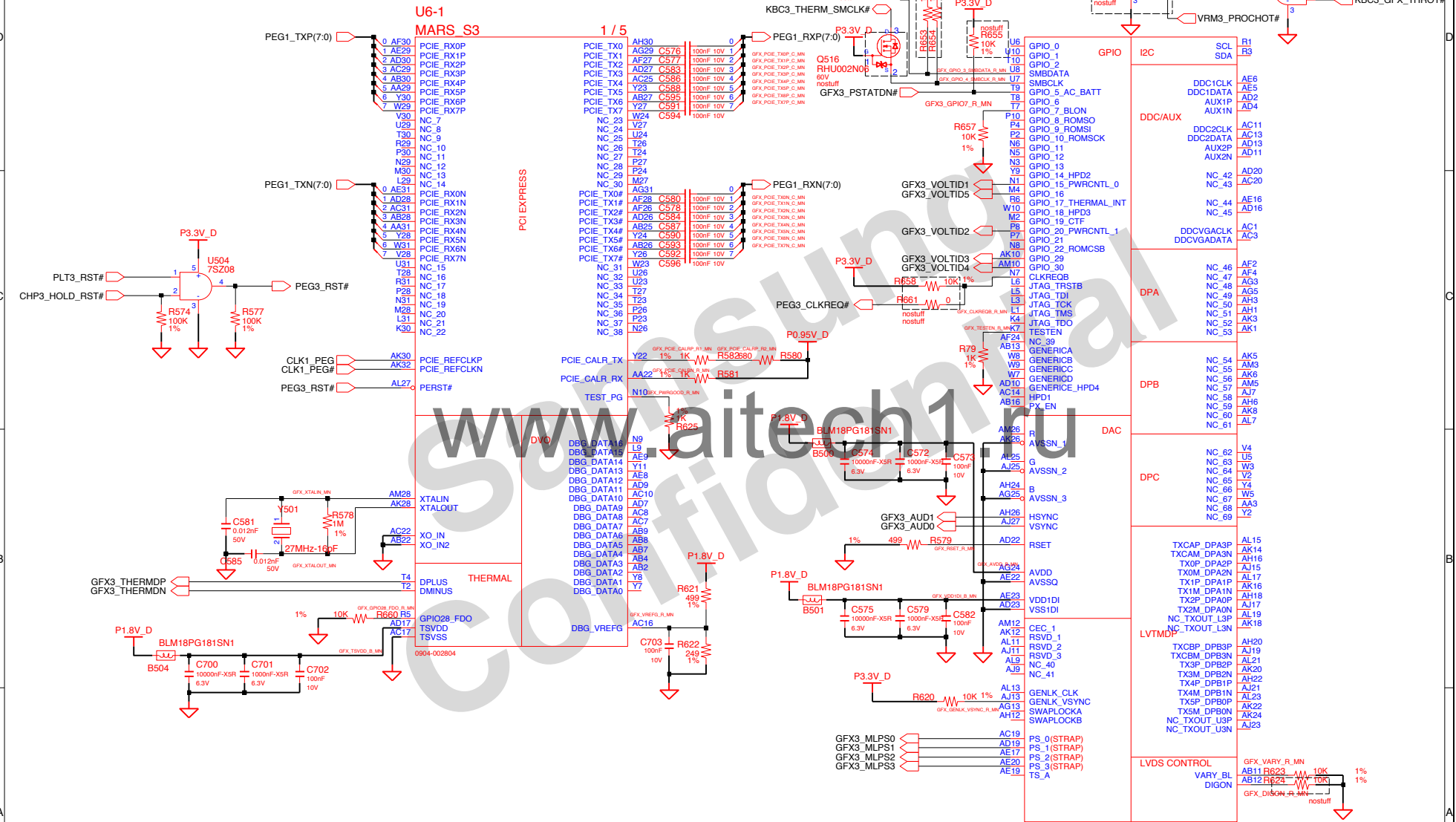
0904-002737



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		PCH	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		PantherPoint(5/5)	PART NO.
MODULE CODE		LAST EDIT				BA41-0xxxxA
September 17, 2012 22:22:27 PM						PAGE 22 OF 58



**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

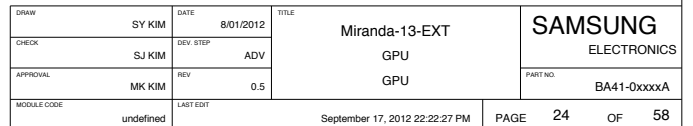


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		GPU	
APPROVAL	MK KIM	REV	0.5		GPU	
MODULE CODE	undefined	LAST EDIT				
September 17, 2012 22:22:27 PM						PAGE 23 OF 58



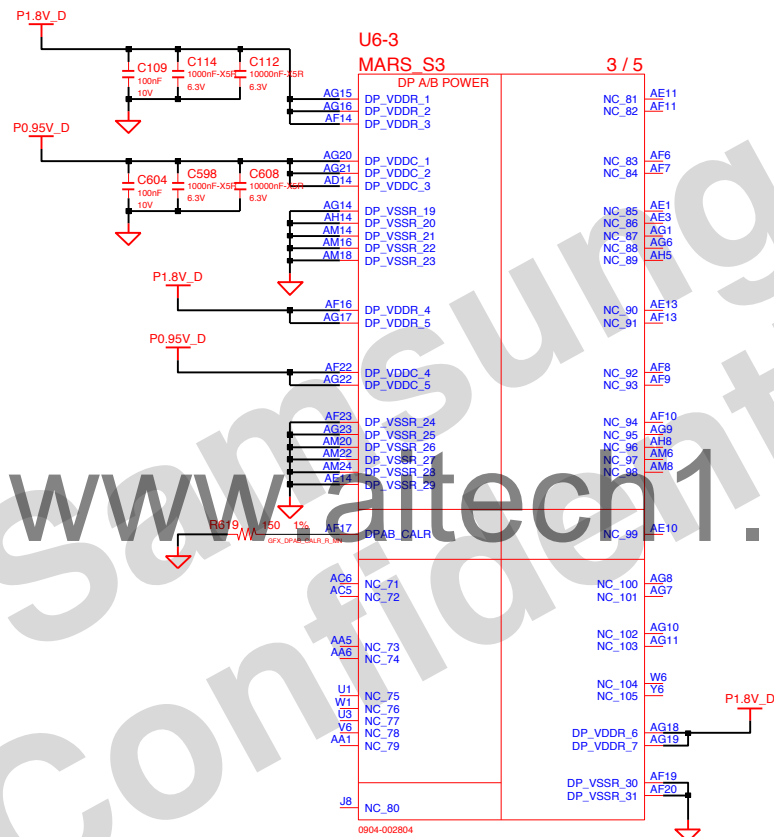
A

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.





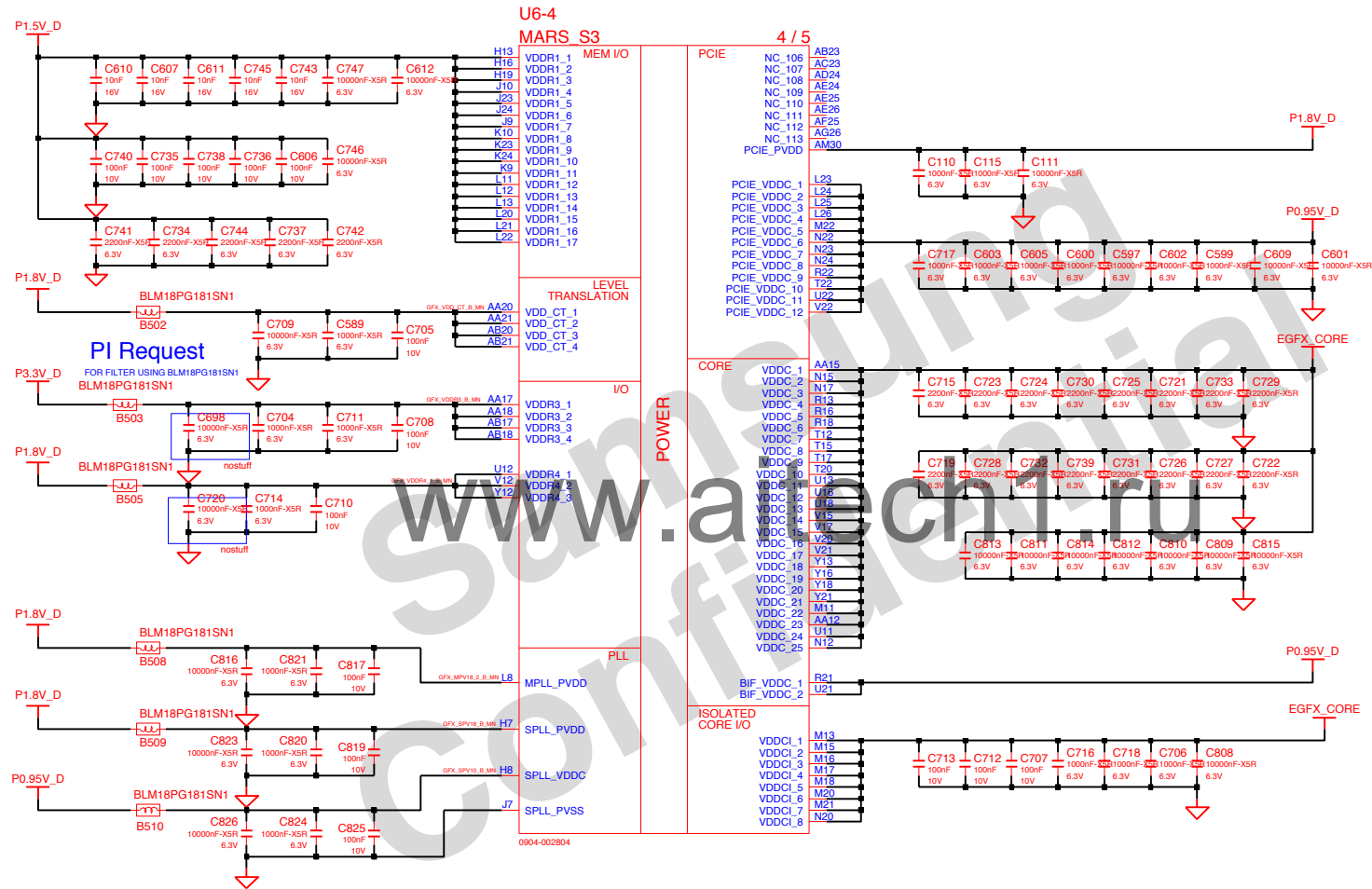
SAMSUNG PROPRIETARY  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		GPU	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		GPU	PART NO.
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	25	OF 58



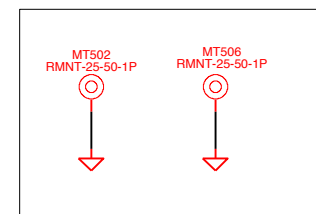
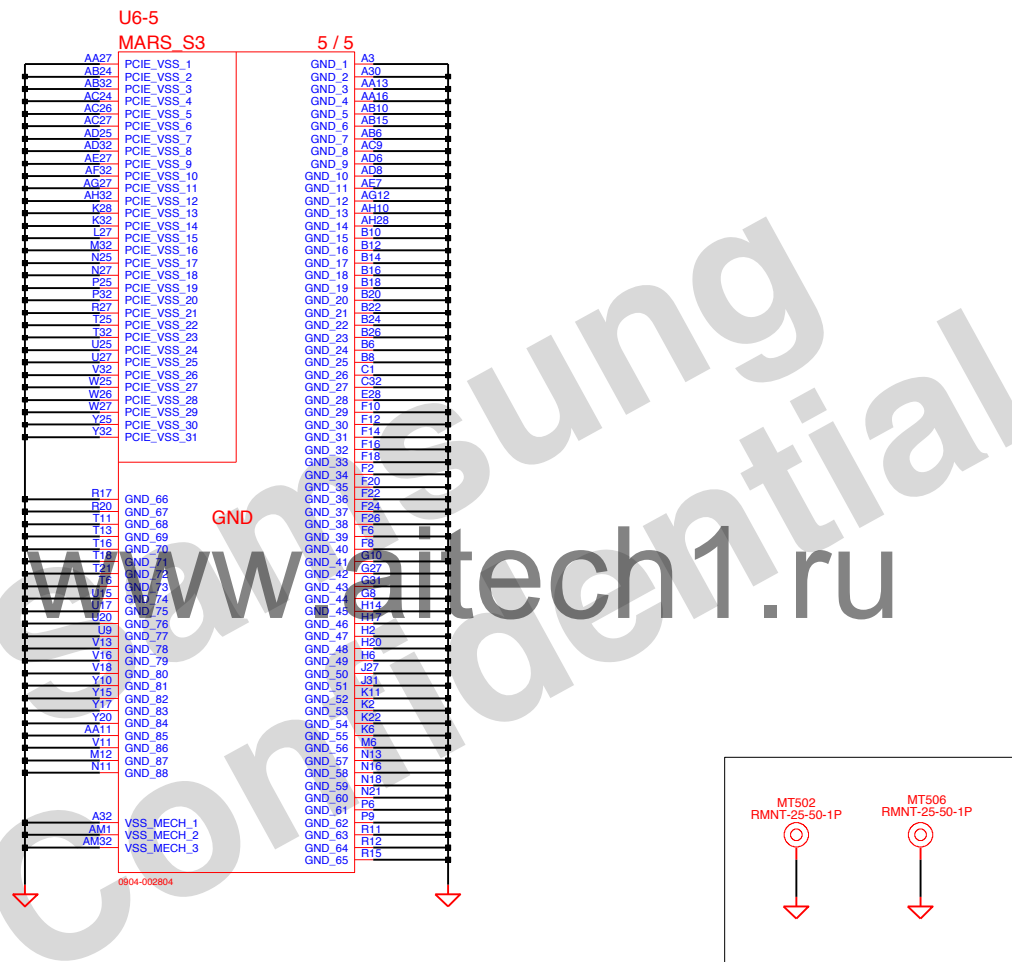
SAMSUNG PROPRIETARY  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		GPU	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		GPU	PART NO.
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	26	BA41-0xxxxA
				OF	58	



SAMSUNG PROPRIETARY  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV	GPU	GPU	ELECTRONICS
APPROVAL	MK KIM	REV	0.5	GPU		PART NO.
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM			BA41-0xxxxA
				PAGE	27	OF 58



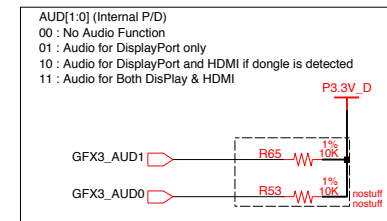
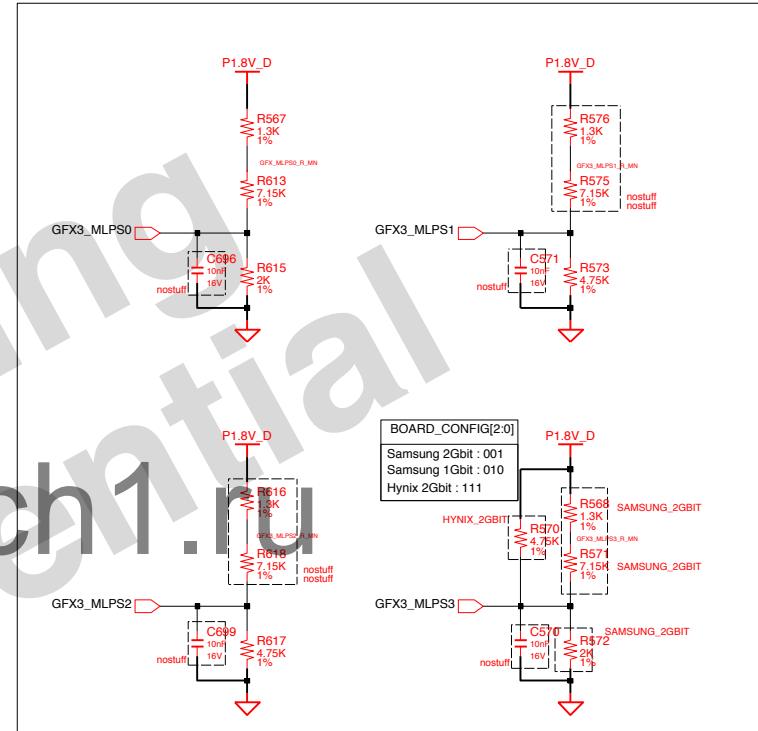
## Straps

STRAP PIN	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1
PS_0	AUD_PINSTRAP[0]	N/A	ROM_CONFIG[2]	ROM_CONFIG[1]	ROM_CONFIG[0]
PS_1	TX_DEEMPH_EN	TX_FULL_SWING	N/A	CLK_PM_EN	GEN3_EN
PS_2	N/A	VGA_DIS	BIOS_ROM_EN	N/A	N/A
PS_3	AUD_PINSTRAP[2]	AUD_PINSTRAP[1]	BOARD_CONFIG[2]	BOARD_CONFIG[1]	BOARD_CONFIG[0]

CAPACITOR	Bits[5:4]
680	00
82	01
10	10
NC	11

PULL UP	PULL DOWN	Bits[3:1]
NC	4750	000
8450	2000	001
4530	2000	010
6980	4990	011
4530	4990	100
3240	5620	101
3400	10000	110
4750	NC	111

ROM_CONFIG[2:0] If BIOS_ROM_EN=1, ROM type If BIOS_ROM_EN=0, Memory Aperture Size 000 : 128MB 001 : 256MB 010 : 64MB 011 : Reserved	BIOS_ROM_EN 0 : External BIOS ROM disabled 1 : External BIOS ROM enabled
	TX_FULL_SWING 0 : 50% TX output swing => Low loss interconnection 1 : Full TX output swing
AUD_PINSTRAP[2:0] 111 : No endpoints 110 : One endpoint 101 : Two endpoints 100 : Three endpoints 011 : Four endpoints 010 : Five endpoints 001 : Six endpoints 000 : All endpoints	TX_DEEMPH_EN 0 : TX DE-EMPHASIS disabled (eg. on-board) 1 : TX DE-EMPHASIS enabled (eg. MXM)
	GEN3_EN 0 : 5.0GT/s capable for PCIe DEVICE 1 : 8.0GT/s capable for PCIe DEVICE
BOARD_CONFIG[2:0] Used for board configuration (eg: Different Memory Vendors) If don't use : 000	CLK_PM_EN 0 : CLKREQB Power management disabled 1 : CLKREQB Powermanagement enabled
	VGA_DIS 0 : VGA Controller capacity enabled 1 : Not recognized as VGA controller



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		GRAPHIC	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		STRAP	PART NO.
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM			BA41-0xxxxA
			PAGE	28	OF	58

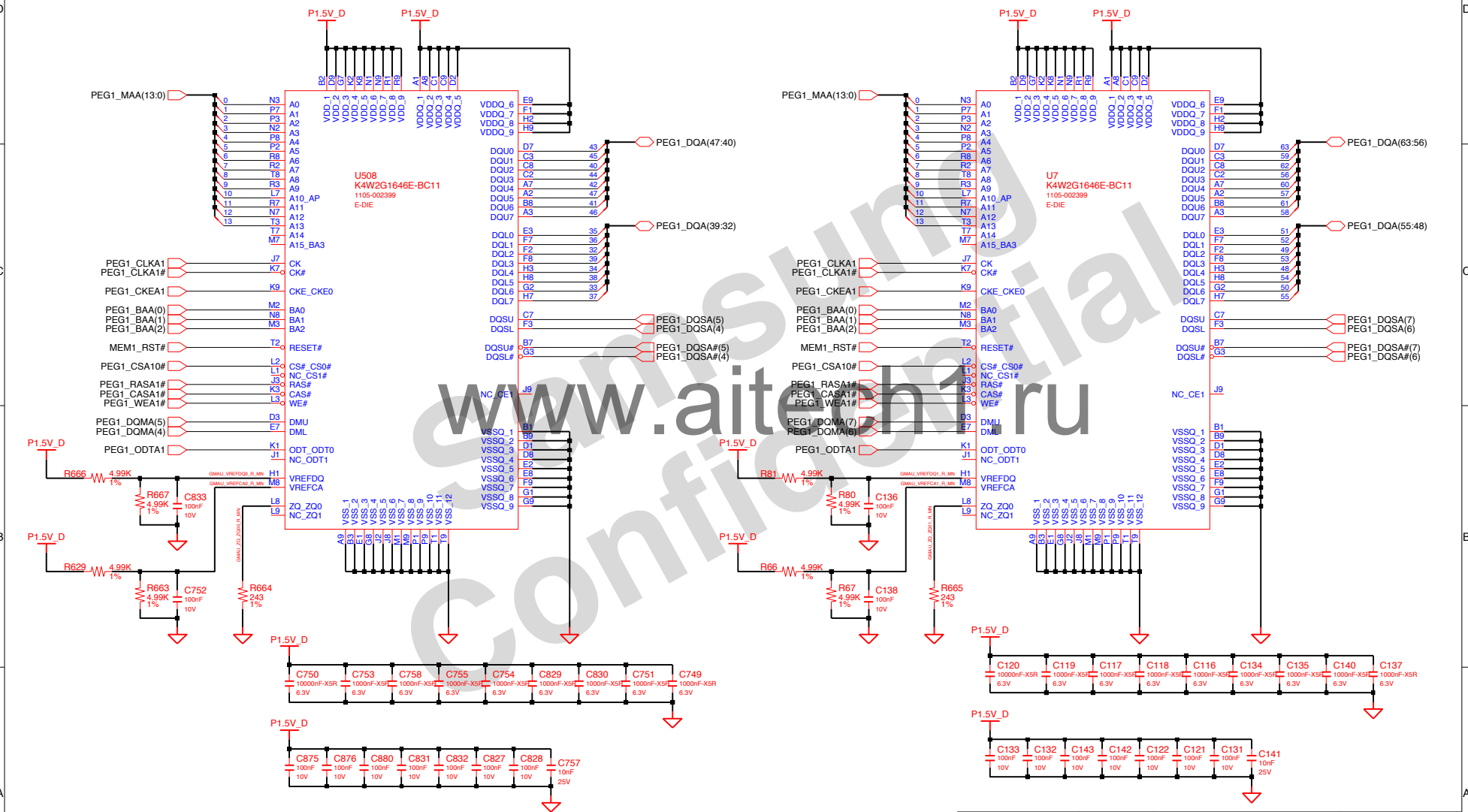


## A-channel Lower Data





# A-channel Upper Data



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		GRAPHIC MEMORY	
APPROVAL	MK KIM	REV	0.5		GRAPHIC MEMORY	
MODULE CODE	undefined	LAST EDIT				
September 17, 2012 22:27 PM						PAGE 30 OF 58

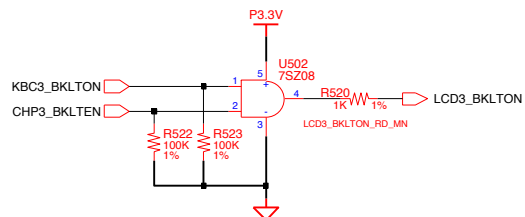


# SAMSUNG PROPRIETARY

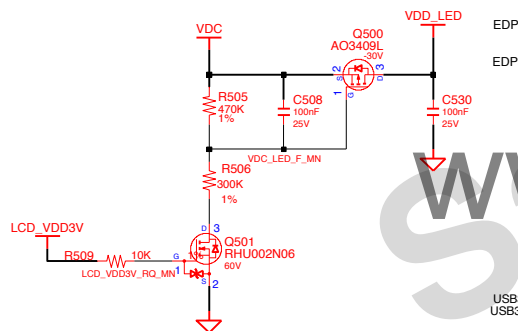
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

# eDP/LVDS LOGIC

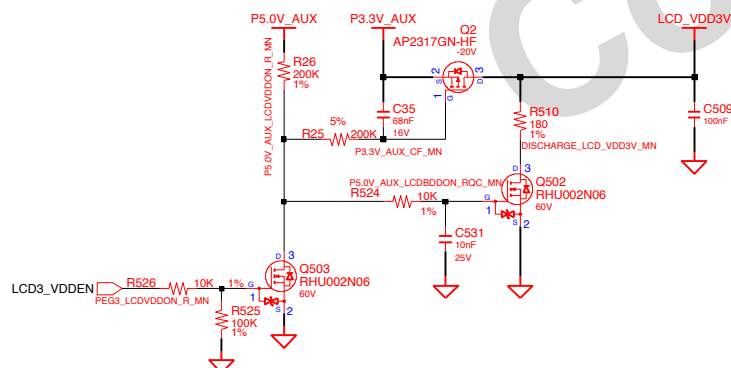
## Backlight On



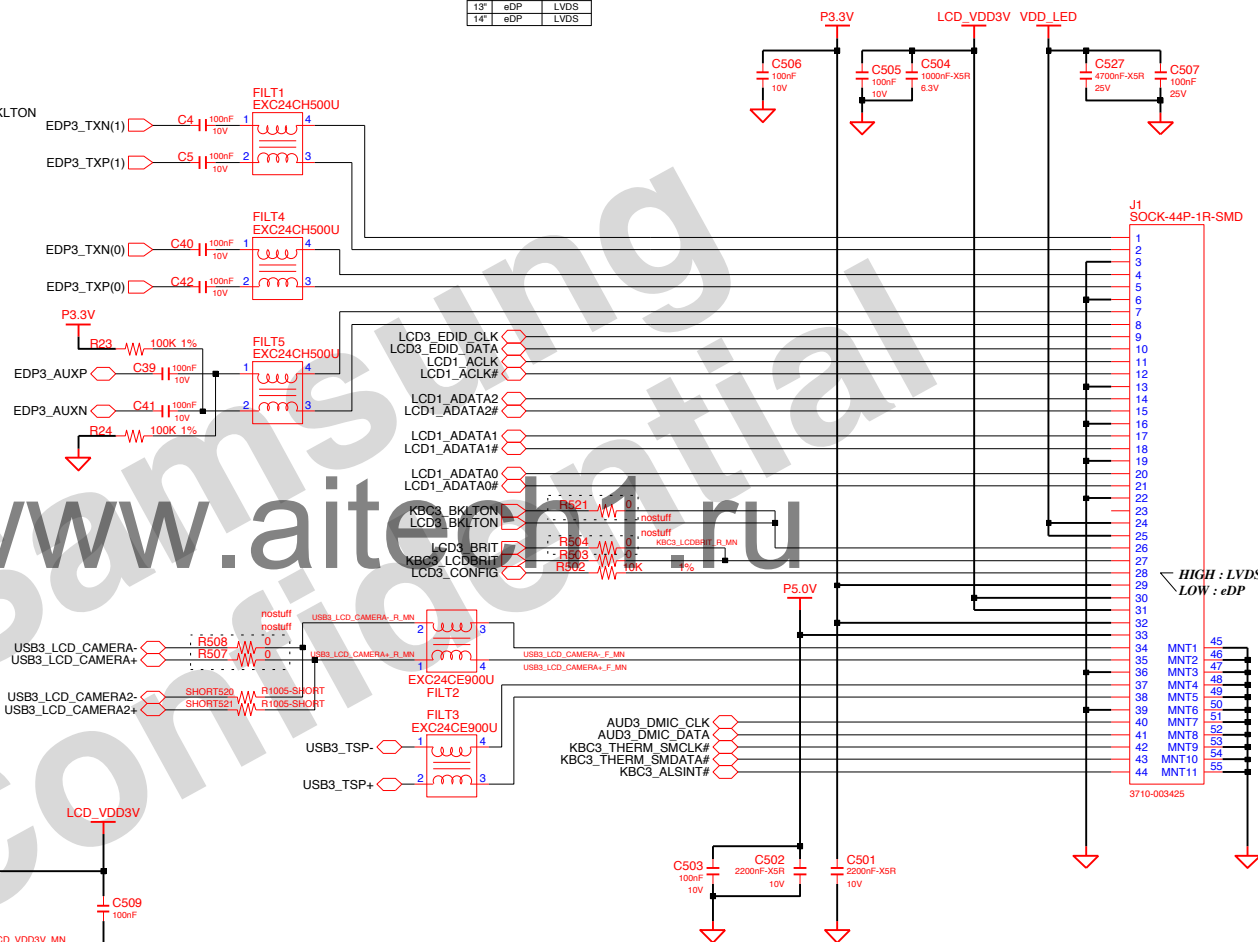
## LED Power



## LCD Power



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



HIGH : LVDS  
LOW : eDP

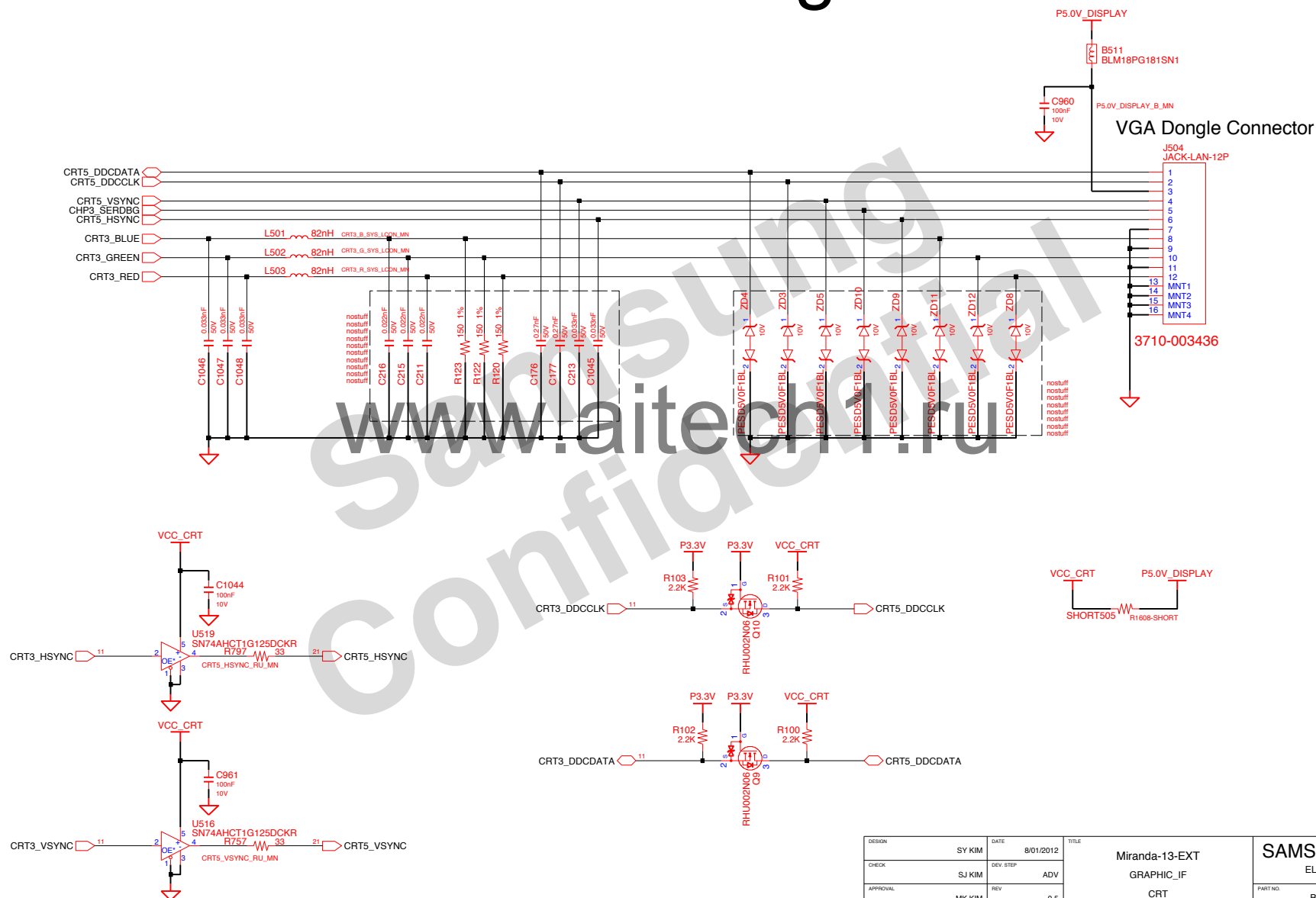
DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS PART NO. BA41-0xxxxA
CHECK	SJ KIM	DEV. STEP	ADV	GRAPHICS_IF		
APPROVAL	MK KIM	REV	0.5	LVDS		
MODULE CODE		LAST EDIT				
September 17, 2012 22:22:27 PM						PAGE 31 OF 58



# SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

# VGA Dongle



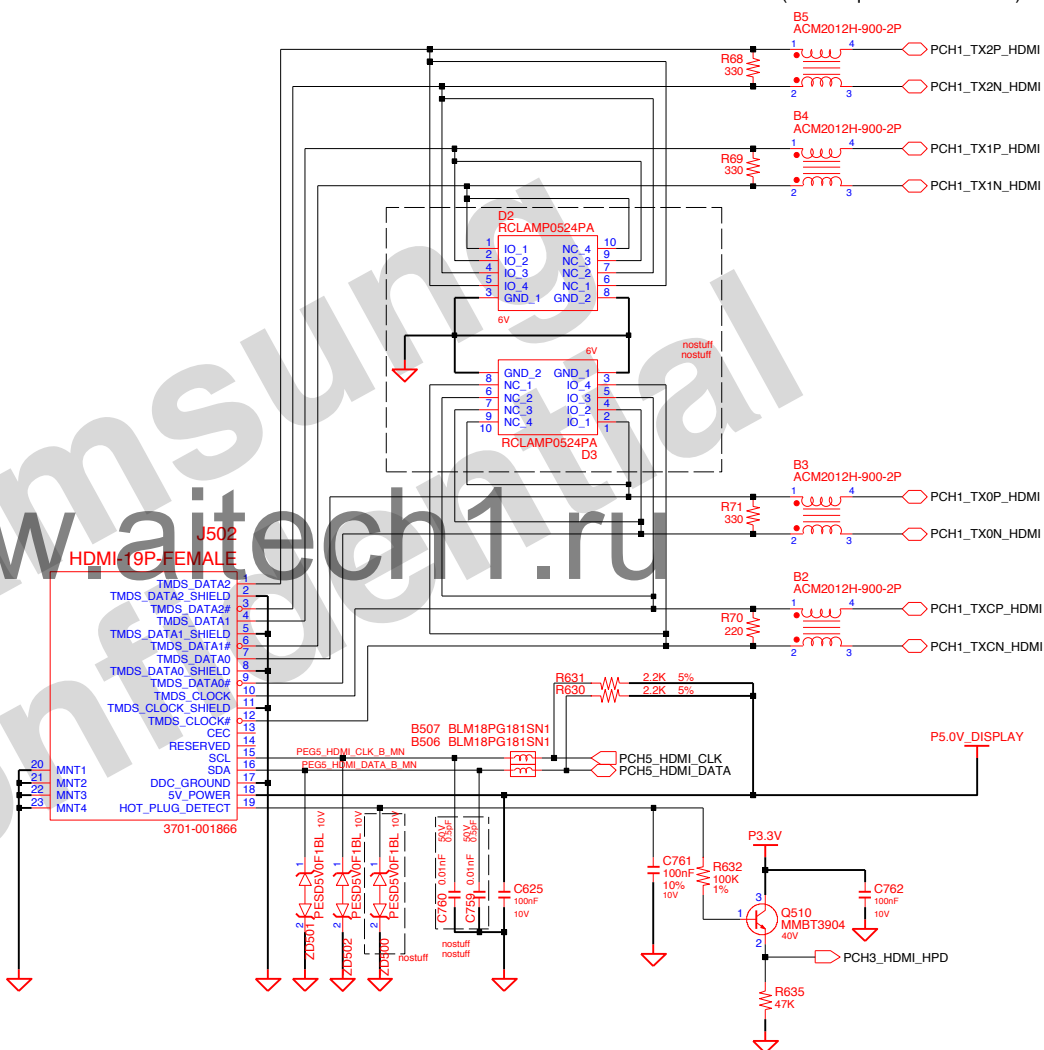
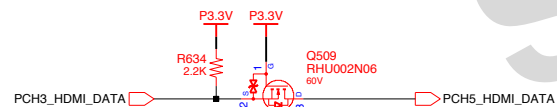
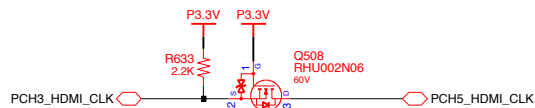
DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV	GRAPHIC_IF		
APPROVAL	MK KIM	REV	0.5	CRT		
MODULE CODE		LAST EDIT				PART NO. BA41-0xxxxA
September 17, 2012 22:27 PM						PAGE 32 OF 58



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-EXT GRAPHICS_IF HDMI	PART NO. BA41-0xxxxA	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV			
APPROVAL	MK KIM	REV	0.5			
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE 33	OF 58

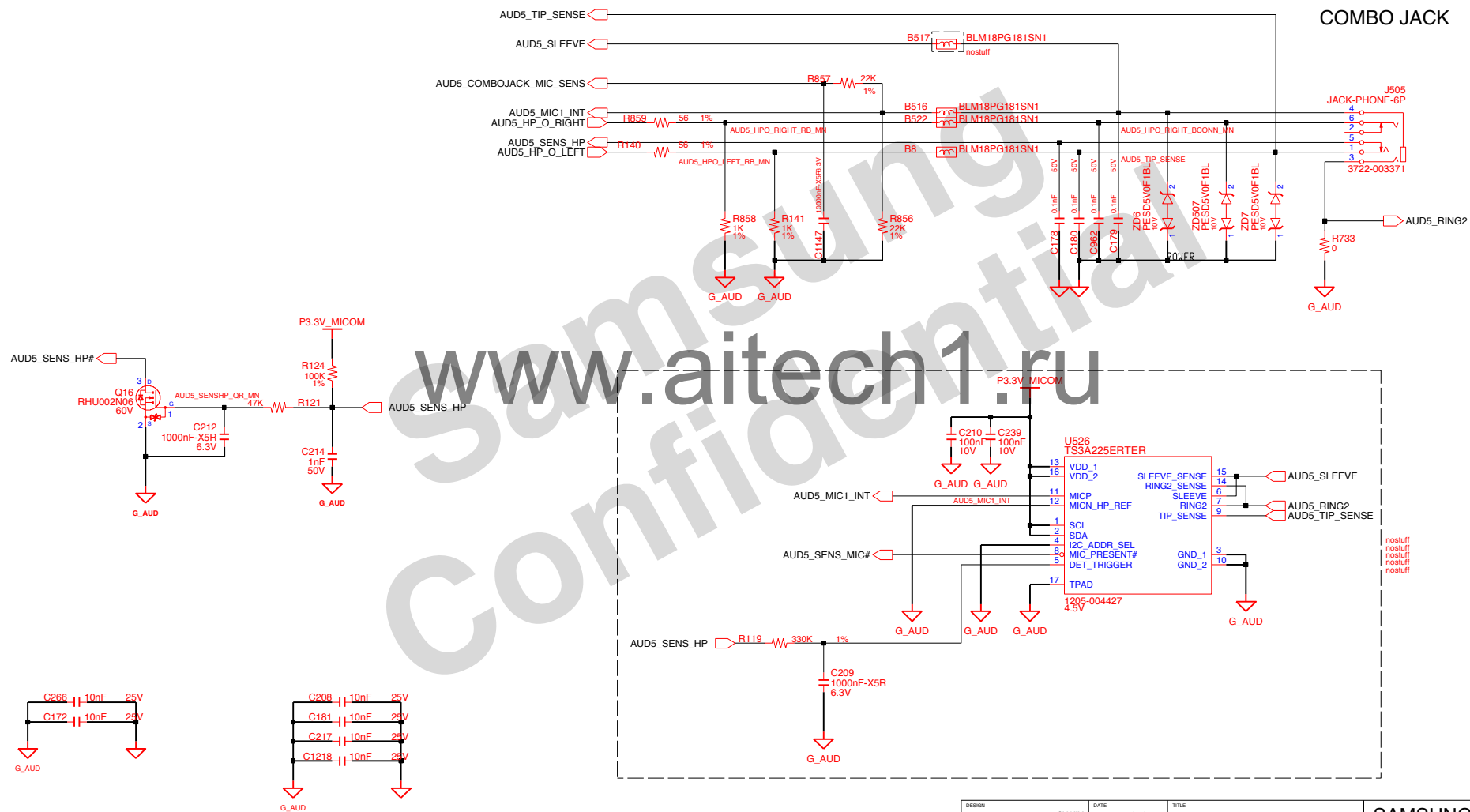


THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT AUDIO ALC269Q		SAMSUNG ELECTRONICS			
CHECK	SJ KIM	DEV. STEP	ADV							
APPROVAL	MK KIM	REV	0.5							
MODULE CODE		LAST EDIT					September 17, 2012 22:22:27 PM		PAGE	34
						PART NO.		BA41-0xxxxA		



www.aitech1.ru



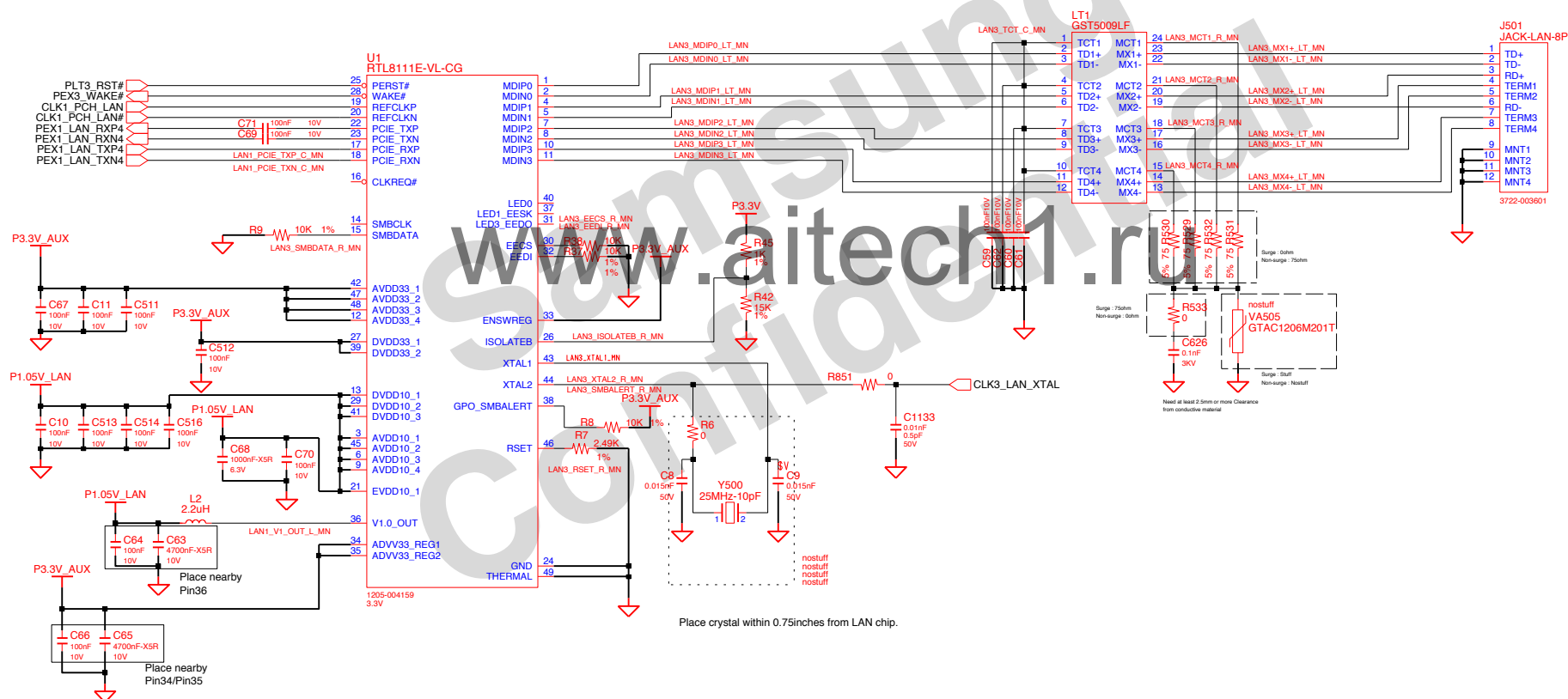
DESIGN	SY KIM	DATE	8/01/2012	Miranda-13-EXT AUDIO Combo Jack		SAMSUNG ELECTRONICS			
CHECK	SJ KIM	DEV. STEP	ADV						
APPROVAL	MK KIM	REV	0.5						
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM		PAGE	35	OF	58



**SAMSUNG PROPRIETARY**

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

# Realtek RTL8111E (GigaBit)



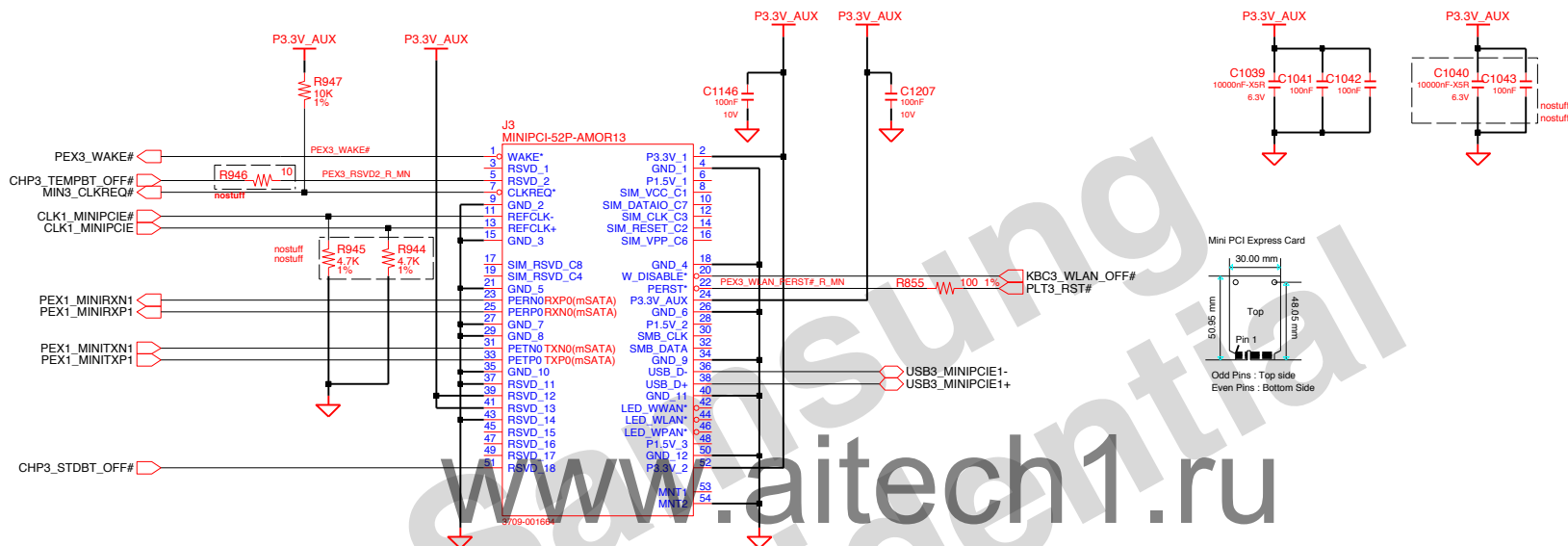
Place crystal within 0.75inches from LAN chip.

DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		LAN	
APPROVAL	MK KIM	REV	0.5		RTL8111E	
MODULE CODE		LAST EDIT				PART NO. BA41-0xxxxA
September 17, 2012 22:22:27 PM						PAGE 36 OF 58



45 RSVD\_15 46 LED\_WPAN\* 46  
47 RSVD\_16 48 P1.5V\_3 48  
49 RSVD\_17 50 GND\_12 50  
51 RSVD\_18 52 P3.3V\_2 52  
MNT1 53  
MNT2 54  
8709-001654

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



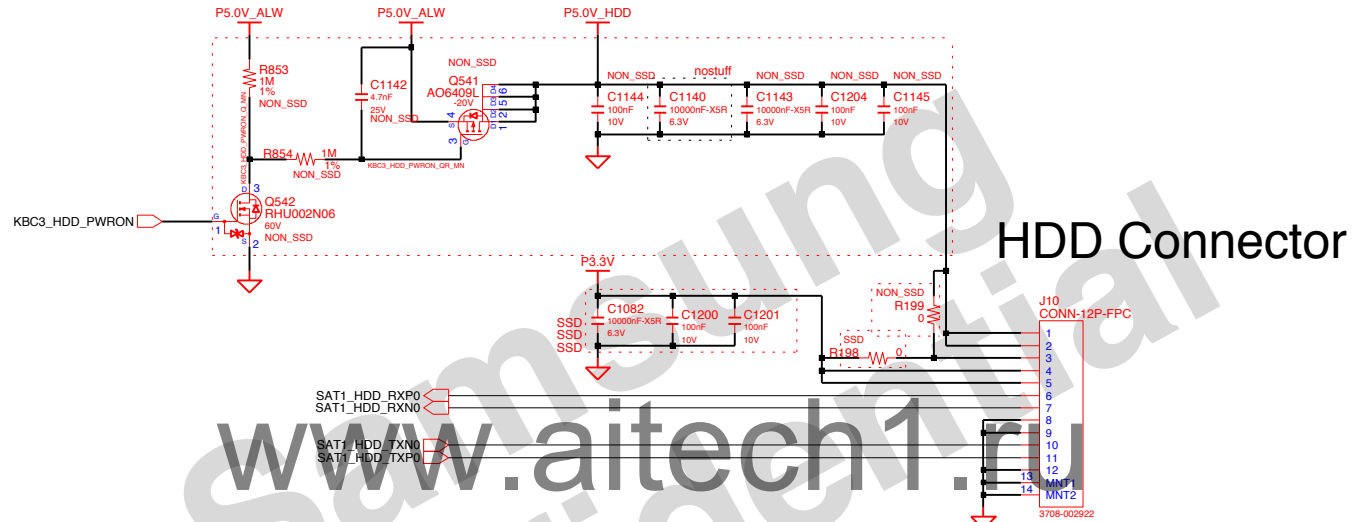
DESIGN	SY KIM	DATE	8/01/2012	TITLE Miranda-13-EXT WLAN WLAN	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		
APPROVAL	MK KIM	REV	0.5		
MODULE CODE				LAST EDIT September 17, 2012 22:22:27 PM	PART NO. BA41-0xxxxA
				PAGE	37 OF 58



SAMSUNG PROPRIETARY  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

# SATA I/F CONN

	HDD	msATA ONLY	msATA JIG
ISSD:	stuff	nostuff	nostuff
NON_SSD:	nostuff	stuff	stuff
SSD:	nostuff	stuff	nostuff
NON_SSD:	stuff	nostuff	stuff



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV	SATA I/F		
APPROVAL	MK KIM	REV	0.5	HDD		
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE	38 OF 58

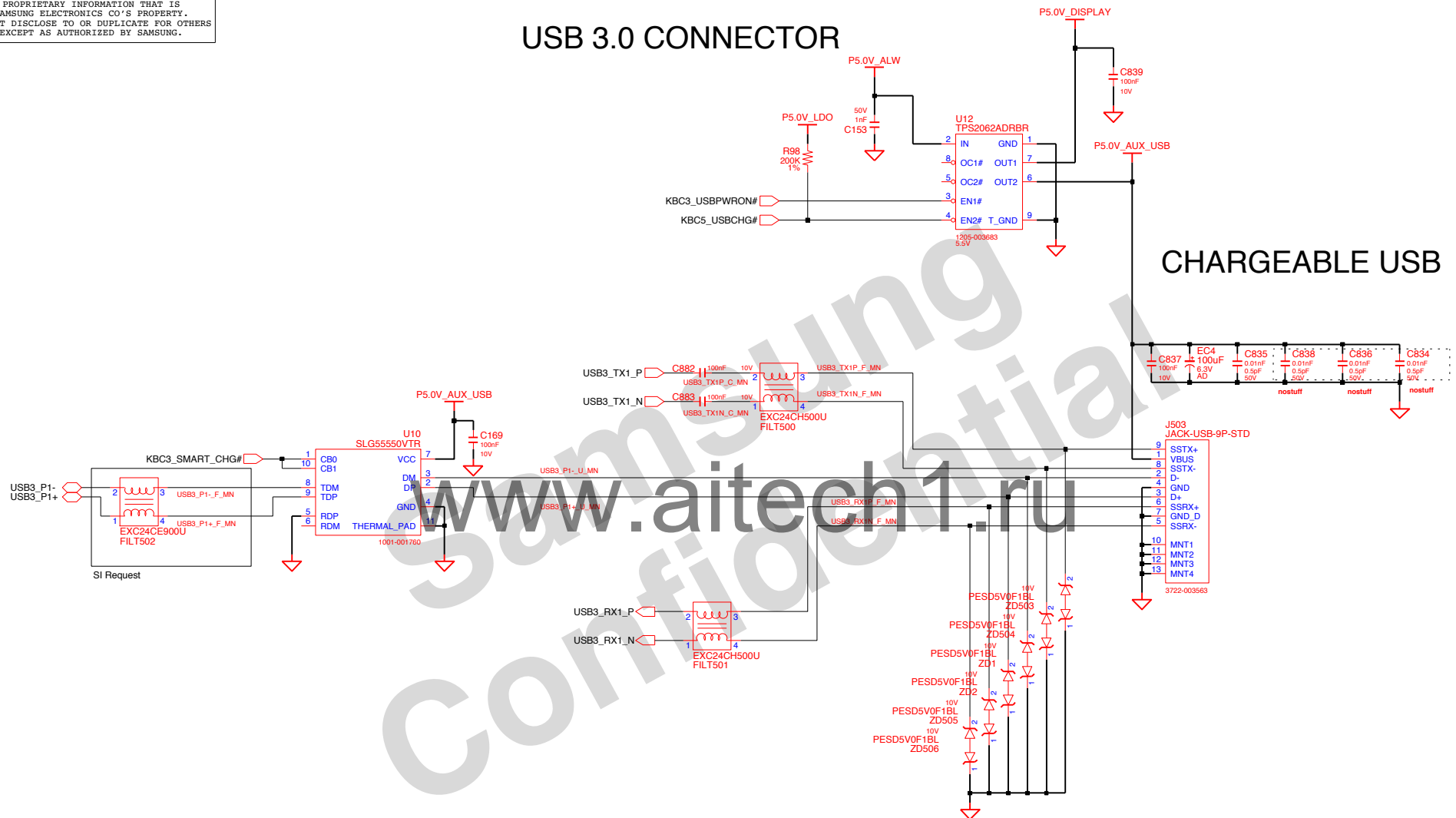


<div>SAMSUNG PROPRIETARY THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.</div>																																			
<div>www.aitech1.ru</div>																DESIGN		SY KIM		DATE		8/01/2012		TITLE Miranda-13-EXT SATA I/F ISSD				SAMSUNG ELECTRONICS PART NO. BA41-0xxxxA							
																CHECK		SJ KIM		DEV. STEP		ADV													
																APPROVAL		MK KIM		REV		0.5													
																MODULE CODE				LAST EDIT				September 17, 2012 22:22:27 PM				PAGE		39		OF		58	



THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## CHARGEABLE USB

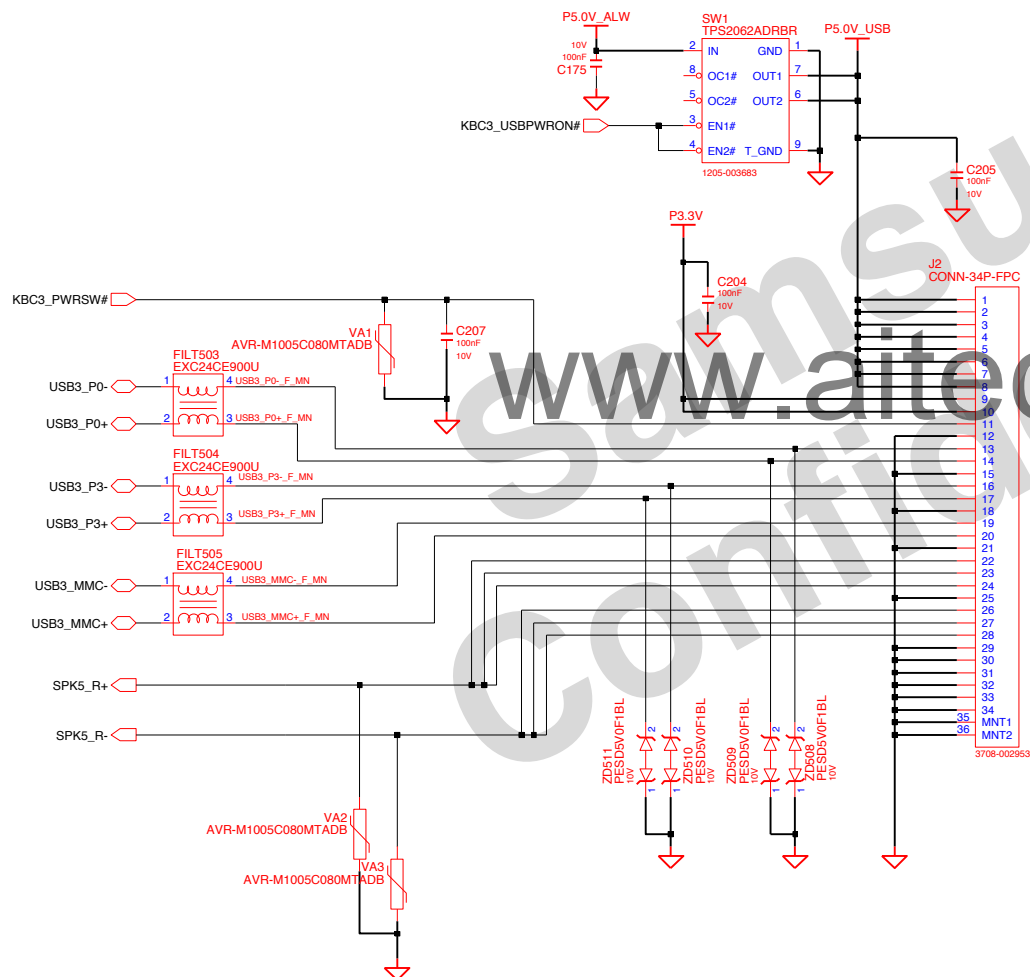


DRAW	SY KIM	DATE	8/01/2012	Miranda-13-EXT USB USB Charge Port	PART NO. BA41-0xxxxA	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV			
APPROVAL	MK KIM	REV	0.5			
MODULE CODE		LAST EDIT September 17, 2012 22:22:27 PM			PAGE 40	OF 58

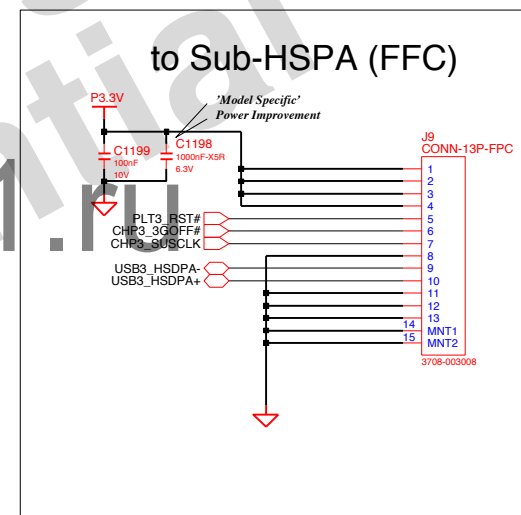


## PWR SW & USB SUB Board

to Sub-Board (FFC)



to Sub-HSPA (FFC)



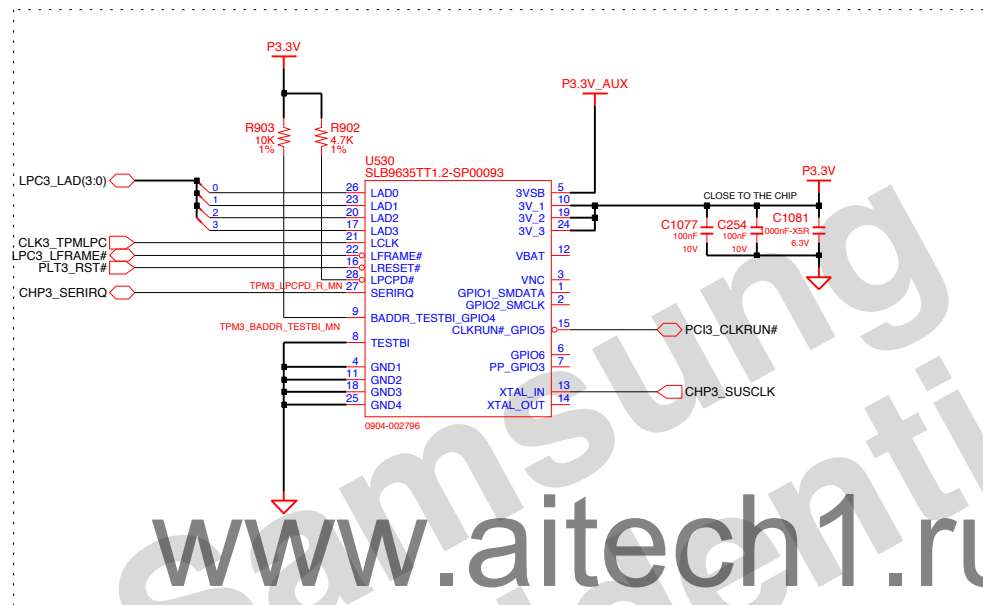
DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		USB	
APPROVAL	MK KIM	REV	0.5		USB Sub board I/F & HSPA	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE 41 OF 58	



# SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## TPM1.2

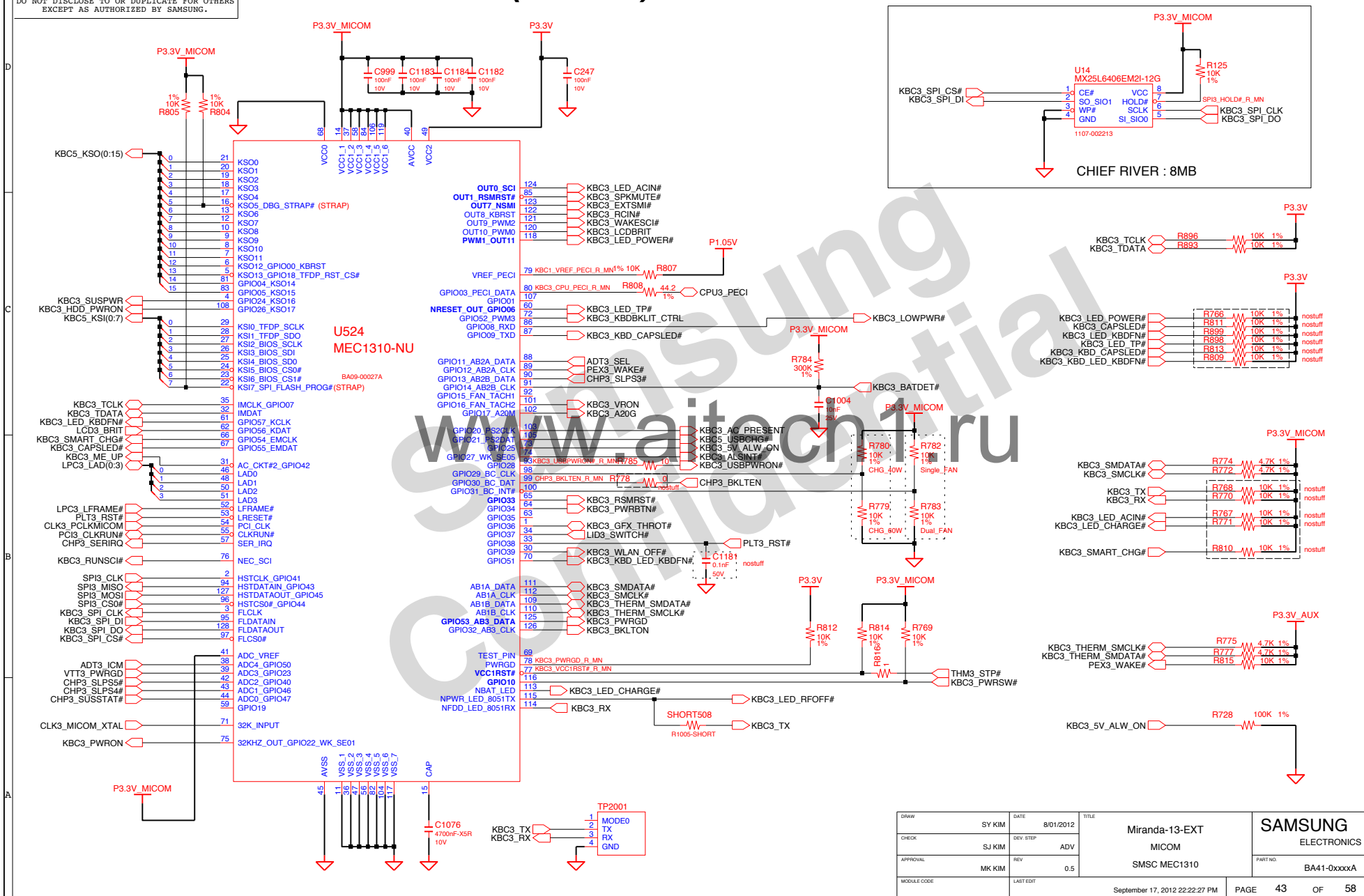


DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		LPC	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		FFS & TPM	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	42	OF 58



THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## SPI ROM SOCKET



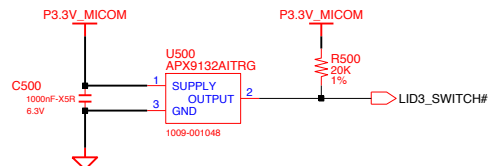


# SAMSUNG PROPRIETARY

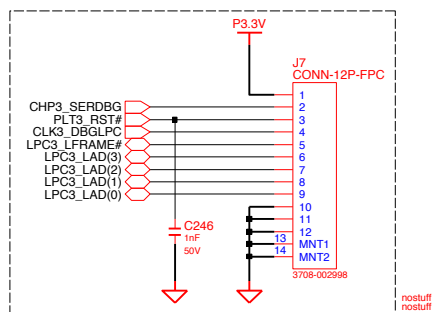
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

# Micom Glue

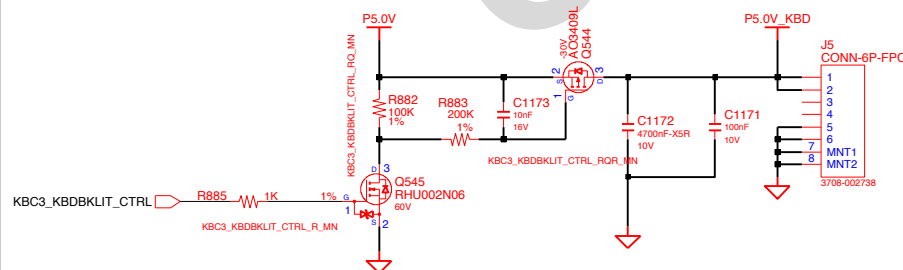
## LID3\_SWITCH



## 80H PORT DEBUG

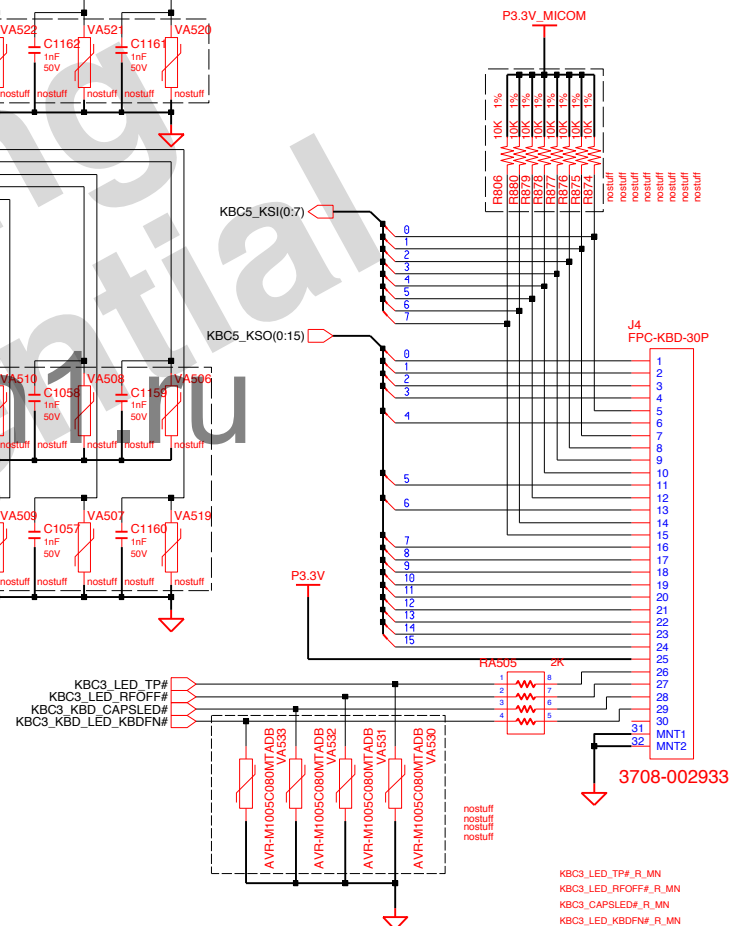


## MAIN TO KBD BKLIT CONNECTOR



AVR-M1005C080MTADB AVR-M1005C080MTADB  
AVR-M1005C080MTADB AVR-M1005C080MTADB  
AVR-M1005C080MTADB AVR-M1005C080MTADB  
AVR-M1005C080MTADB AVR-M1005C080MTADB

## KEYBOARD



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		IO I/F	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		Keyboard	PART NO.
MODULE CODE		LAST EDIT				BA41-0xxxxA
				September 17, 2012 22:22:27 PM	PAGE	44 OF 58

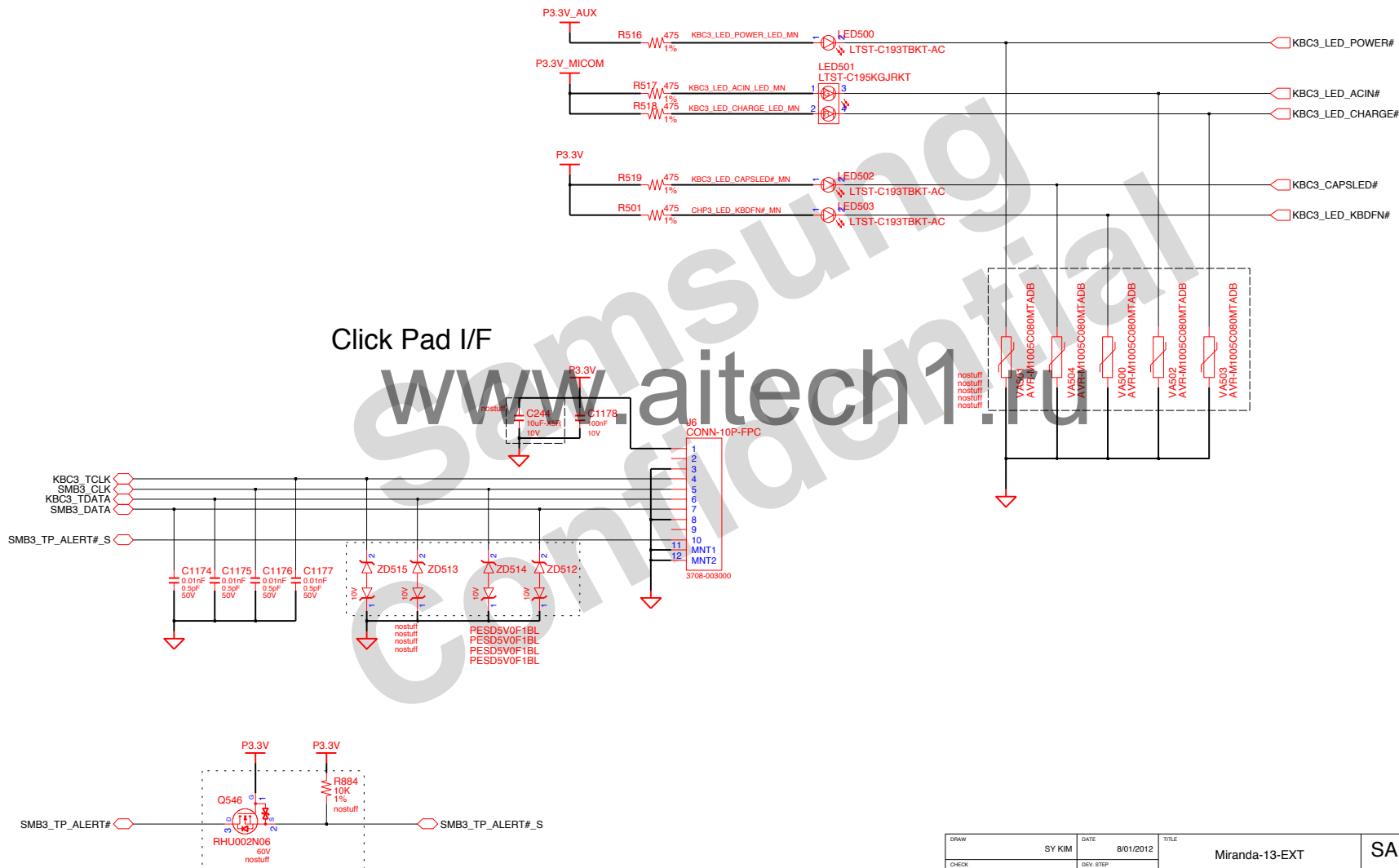
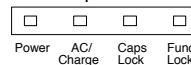


# SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## System LED

### LED Top View



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		IO I/F	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		LED&Clickpad	PART NO. BA41-0xxxxA
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE 45	OF 58



THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

**DESIGN** SY KIM **DATE** 8/01/2012 **TITLE** Miranda-13-EXT

**CHECK** SJ KIM **DEV. STEP** ADV **Power**

**APPROVAL** MK KIM **REV** 0.5 **Charger**

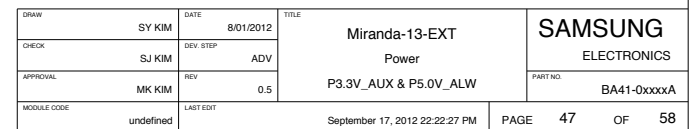
**MODULE CODE** **LAST EDIT** **September 17, 2012 22:22:27 PM** **PAGE** 46 **OF** 58

**SAMSUNG**  
ELECTRONICS

PART NO. BA41-0xxxxA



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

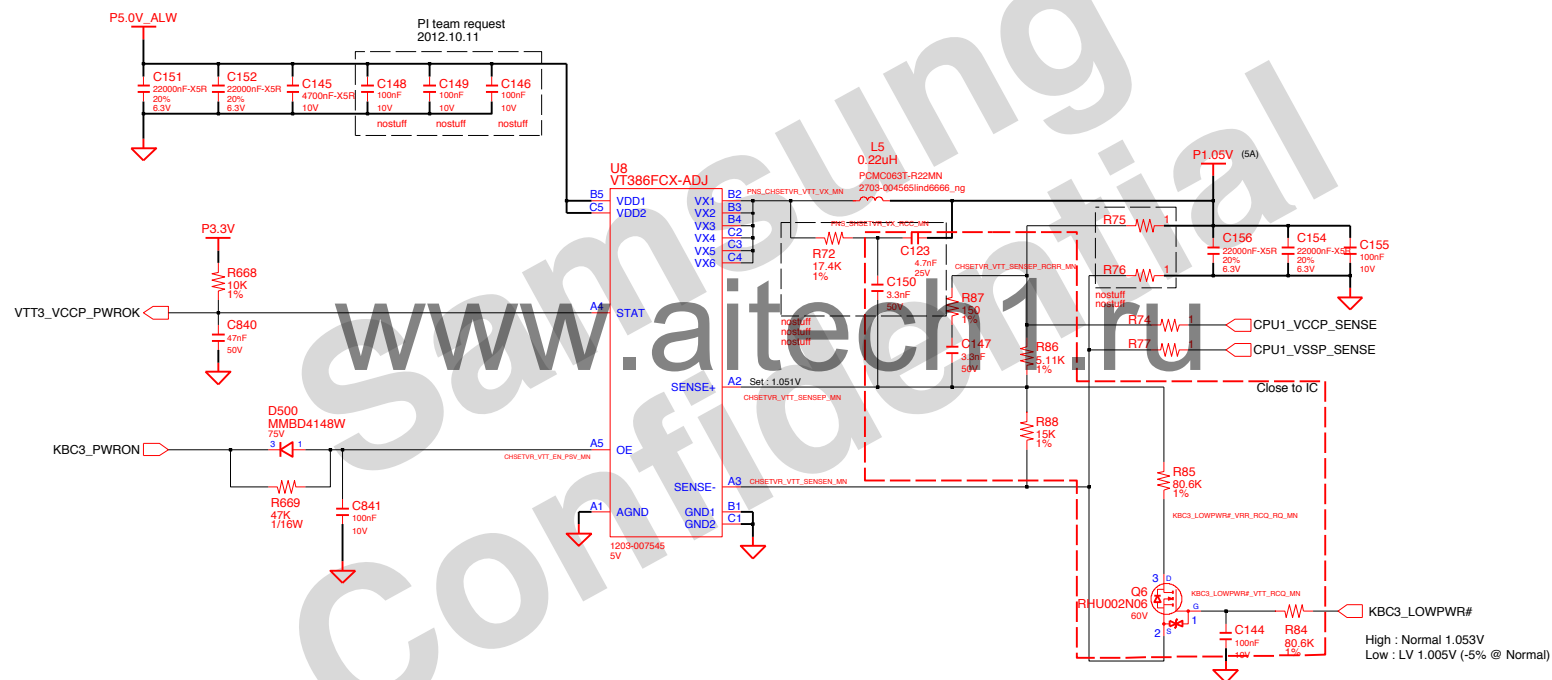




**SAMSUNG PROPRIETARY**

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## Chipset Power (P1.05V)



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		Power	
APPROVAL	MK KIM	REV	0.5		P1.05V	
MODULE CODE		LAST EDIT		September 17, 2012 22:22:27 PM	PAGE 48 OF 58	PART NO. BA41-0xxxxA

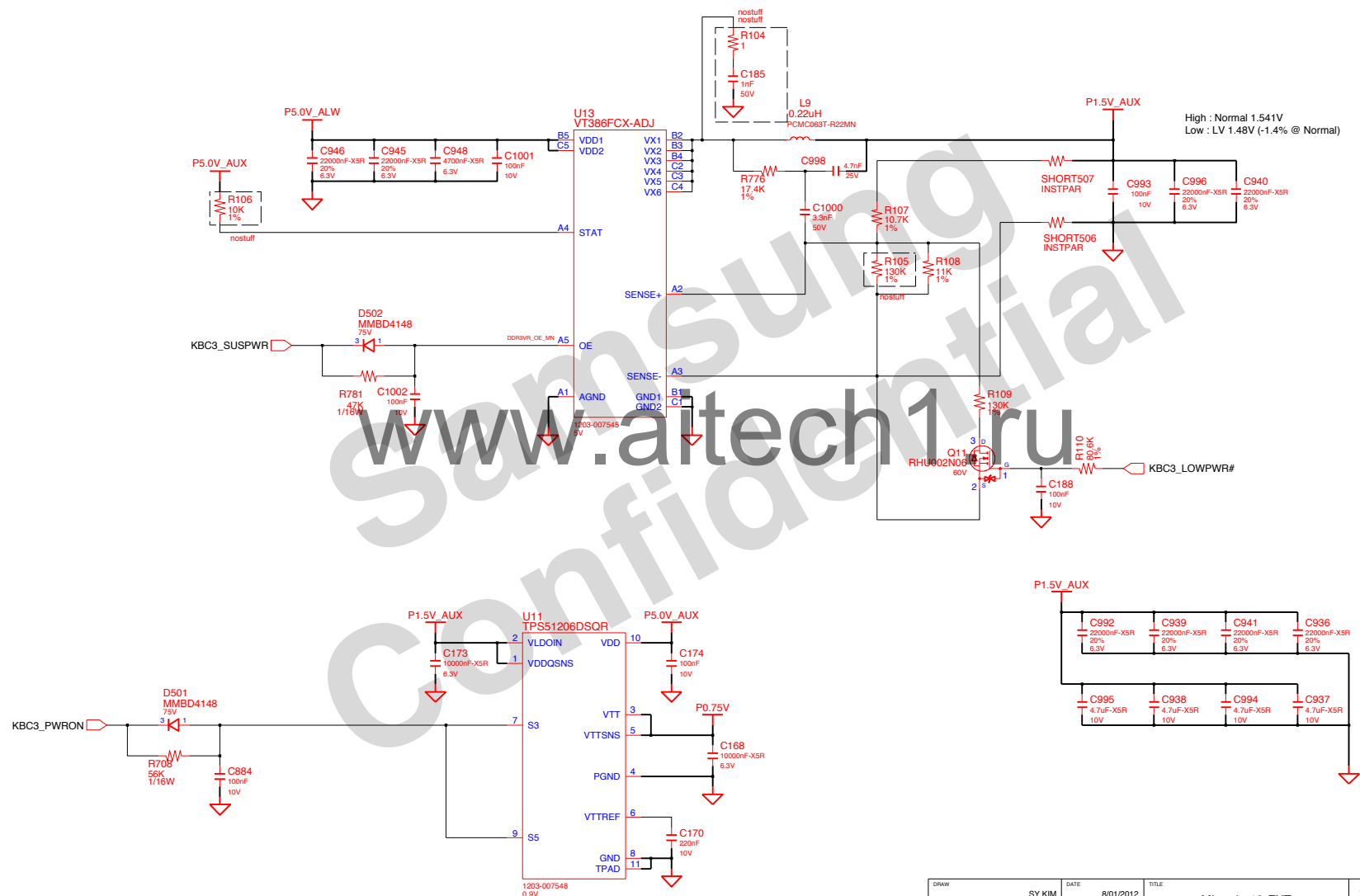


COM-22C-015(1996.6.5) REV. 3



**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## DDR3 Power



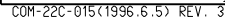
DRAW	SY KIM	DATE	8/01/2012	TITLE Miranda-13-EXT Power TI TPS51125	PART NO. BA41-0xxxxA	<b>SAMSUNG</b> ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV			
APPROVAL	MK KIM	REV	0.5			
MODULE CODE		LAST EDIT			September 17, 2012 22:22:27 PM	PAGE 50 OF 58



### CPU VRM (IMVP-7)

IPH:

C

D:/users/mobile093/mentor/Miranda-13H EXT/120917/MIRANDA13-EX

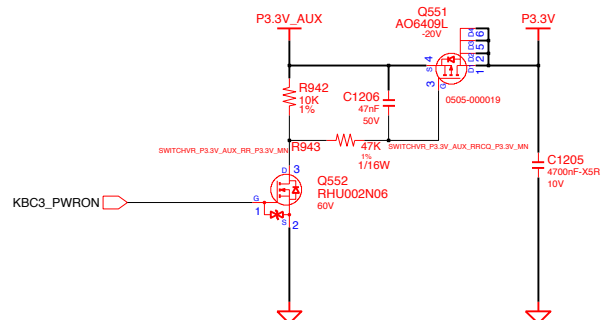


# SAMSUNG PROPRIETARY

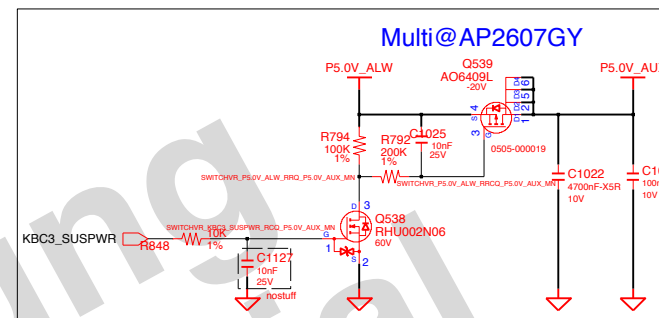
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## Switched Power

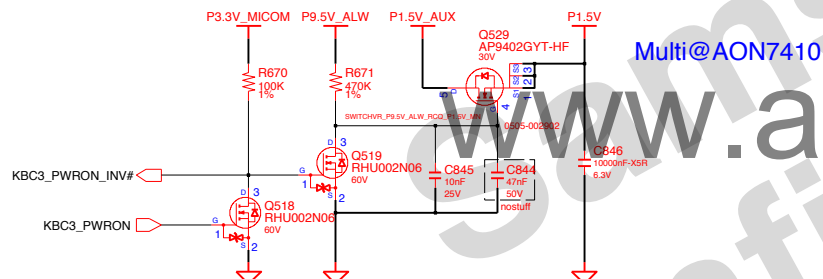
### Switched Power On (P3.3V) Multi@AP2607GY



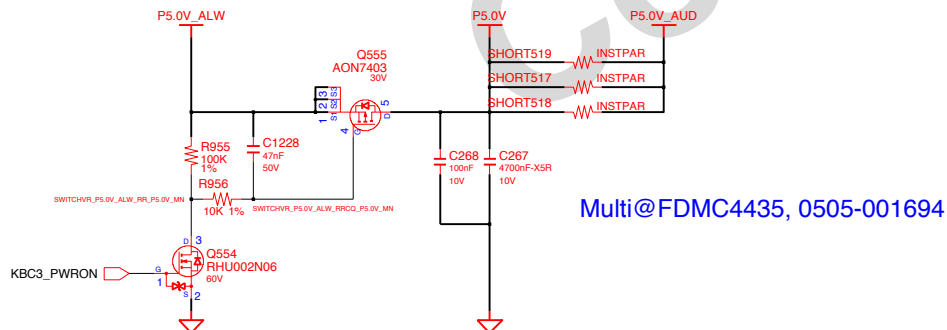
### P5.0V\_AUX



### Switched Power On (P1.5V)



### Switched Power On (P5.0V)



DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT Power SWITCHED POWER	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV			PART NO. BA41-0xxxxA
APPROVAL	MK KIM	REV	0.5			
MODULE CODE		LAST EDIT				

September 17, 2012 22:27:27 PM PAGE 52 OF 58

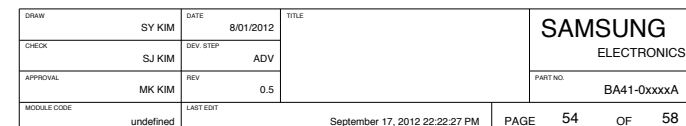


4				3				2				1			
<div><div>SAMSUNG PROPRIETARY THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.</div></div>															
D															
C															
B															
A															
<div>www.aitech1.ru</div>															
A															
B															
C															
D															
4				3				2				1			
CON-22C-015(1996.6.5) REV. 3												D:\users\mobile093\mentor\Miranda-13H_EXT\120917\MIRANDA13-EXT			

DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	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 17, 2012 22:22:27 PM	PAGE	53 OF 58



## External Graphic Core Power

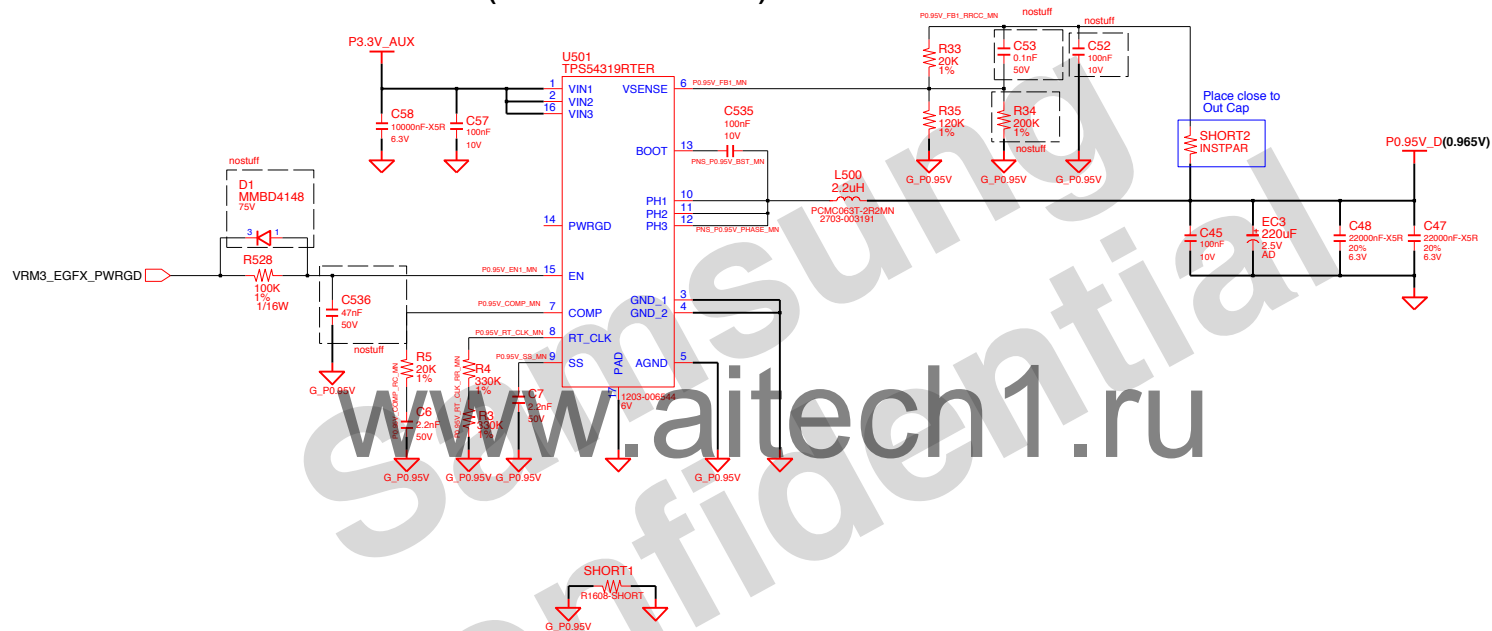




**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

## P0.95V FOR AMD EGFX PWR

(BUCK - UNDER 300K)



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		GPU Linear Regulator	PART NO.
MODULE CODE		LAST EDIT				BA41-0xxxxA
				September 17, 2012 22:22:27 PM	PAGE	55 OF 58

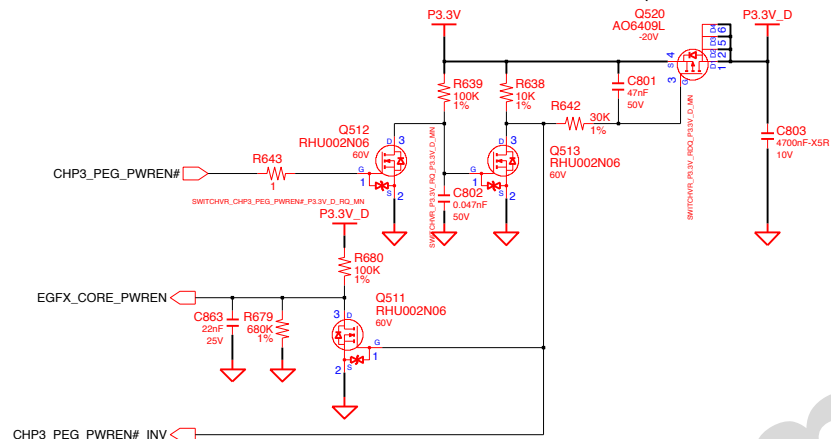


# SAMSUNG PROPRIETARY

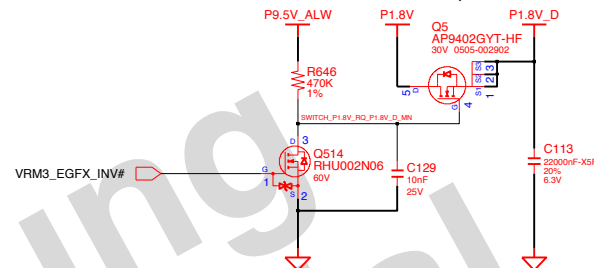
THIS DOCUMENT CONTAINS CONFIDENTIAL  
 PROPRIETARY INFORMATION THAT IS  
 SAMSUNG ELECTRONICS CO.'S PROPERTY.  
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
 EXCEPT AS AUTHORIZED BY SAMSUNG.

## Switched Power 2 (For AMD GFX Power Sequence)

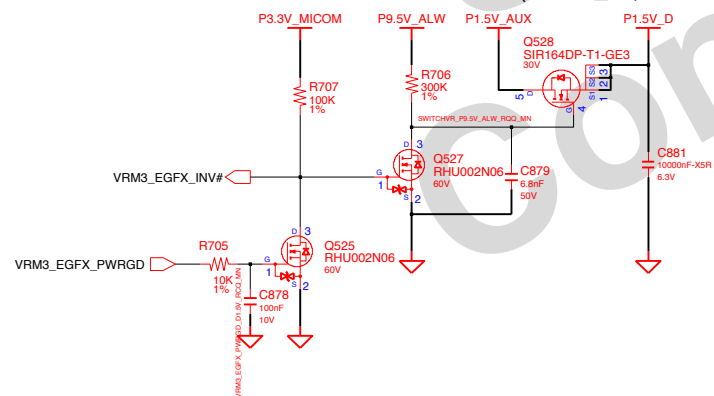
### Discrete Switched Power (P3.3V\_D, MAX 1.2A )



### Discrete Switched Power (P1.8V\_D : MAX 3.6A )



### Discrete Switched Power (P1.5V\_D , Max 5.0A)

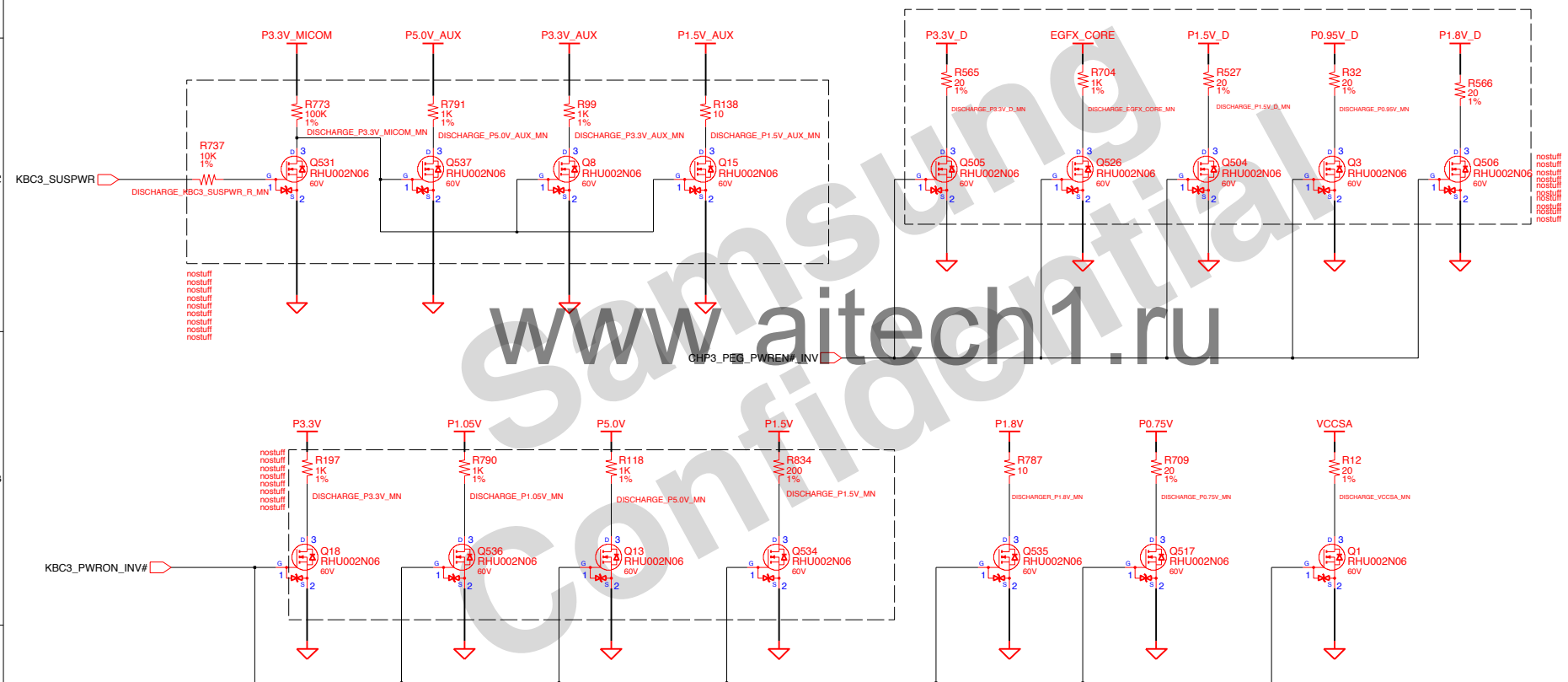


DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		Switched FET (GPU)	PART NO.
MODULE CODE		LAST EDIT				BA41-0xxxxA
				September 17, 2012 22:22:27 PM	PAGE	56 OF 58



**SAMSUNG PROPRIETARY**  
 THIS DOCUMENT CONTAINS CONFIDENTIAL  
 PROPRIETARY INFORMATION THAT IS  
 SAMSUNG ELECTRONICS CO.'S PROPERTY.  
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
 EXCEPT AS AUTHORIZED BY SAMSUNG.

# POWER DISCHARGER

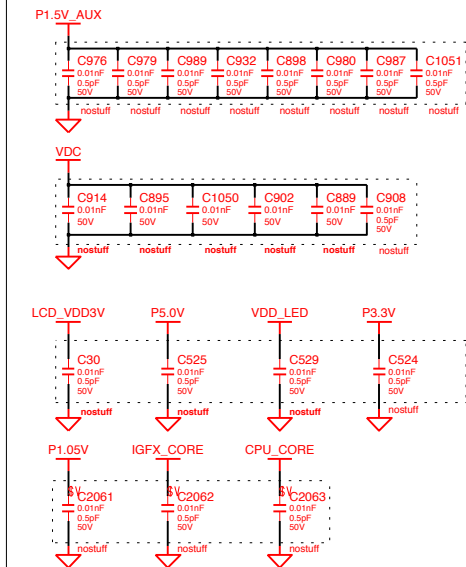


DRAW	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG
CHECK	SJ KIM	DEV. STEP	ADV		Power	ELECTRONICS
APPROVAL	MK KIM	REV	0.5		Power Rail Discharger	PART NO.
MODULE CODE	undefined	LAST EDIT	September 17, 2012 22:22:27 PM	PAGE	57	BA41-0xxxxA
				OF	58	

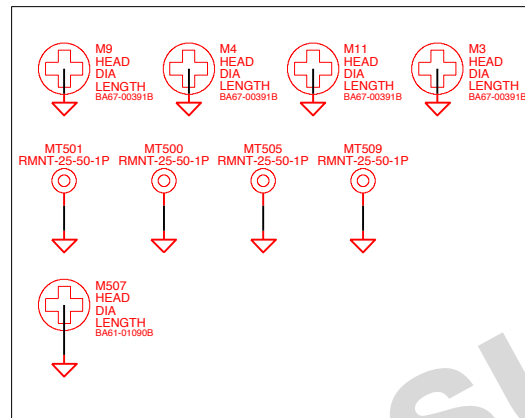


**SAMSUNG PROPRIETARY**  
THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

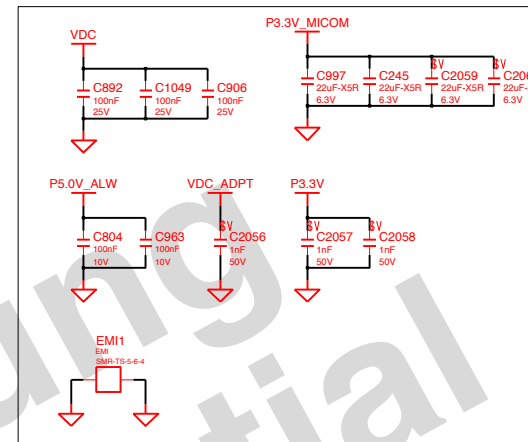
## WLAN Performance issue



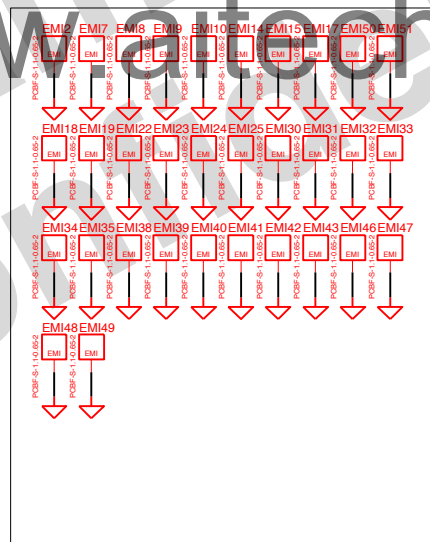
## Mainboard PEM / Mount



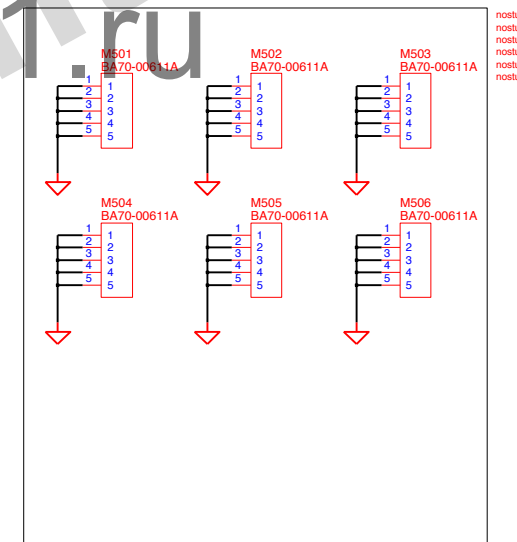
## Decap



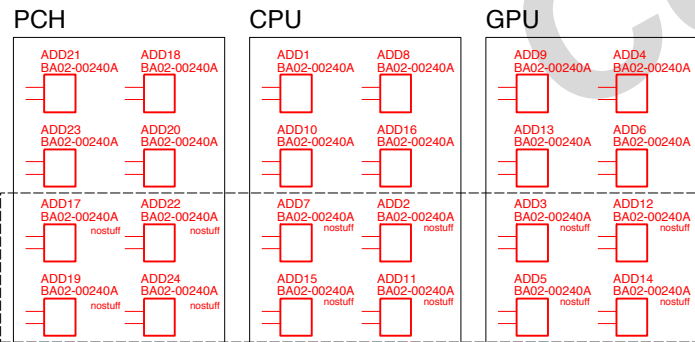
## Shield can EMI gasket



## Shield can Clip



## Underfilm for BGA



DESIGN	SY KIM	DATE	8/01/2012	TITLE	Miranda-13-EXT	SAMSUNG ELECTRONICS
CHECK	SJ KIM	DEV. STEP	ADV		PCB Stuffs	
APPROVAL	MK KIM	REV	0.5		Mount Hole & Decaps	
MODULE CODE		LAST EDIT			September 17, 2012 22:22:27 PM	PAGE 58 OF 58



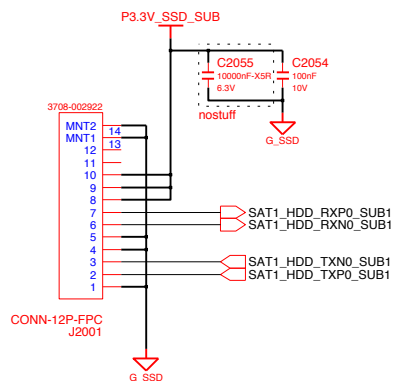
# SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL  
PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO.'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

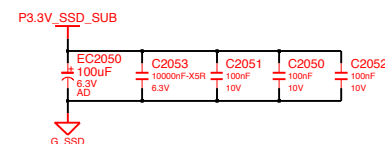
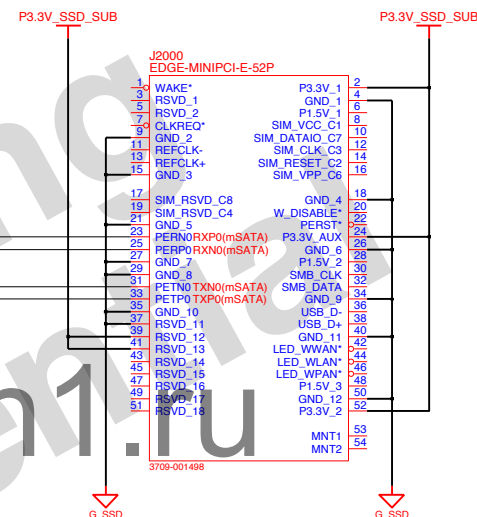
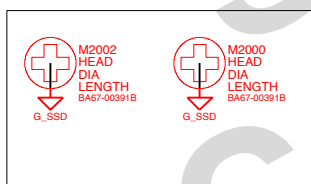
## Sub board #3 (1/1)

### 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	
MODULE CODE		LAST EDIT		October 04, 2012 15:11:27 PM	PAGE	3 OF 3