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# Jinmao

CPU : Arrandale PGA

Chip Set : Intel Ibex Peak

GFX : N12M / INT.GFX

Remarks : Calpella Platform

Model Name : Jinmao

PBA Name : MAIN

PCB Code : BA41-01432A (GCE)  
BA41-01433A (NY)  
BA41-01434A (HAN)  
BA41-01435A (GBM)

Dev. Step : PR

Revision : 1.0

T.R. Date : 2010.11.26

| Design  | CHECK  | APPROVAL |
|---------|--------|----------|
| MS YANG | MK KIM | BL LEE   |
|         |        |          |

■ Owner : SEC IT Solution N/P LAB Signature : mansu

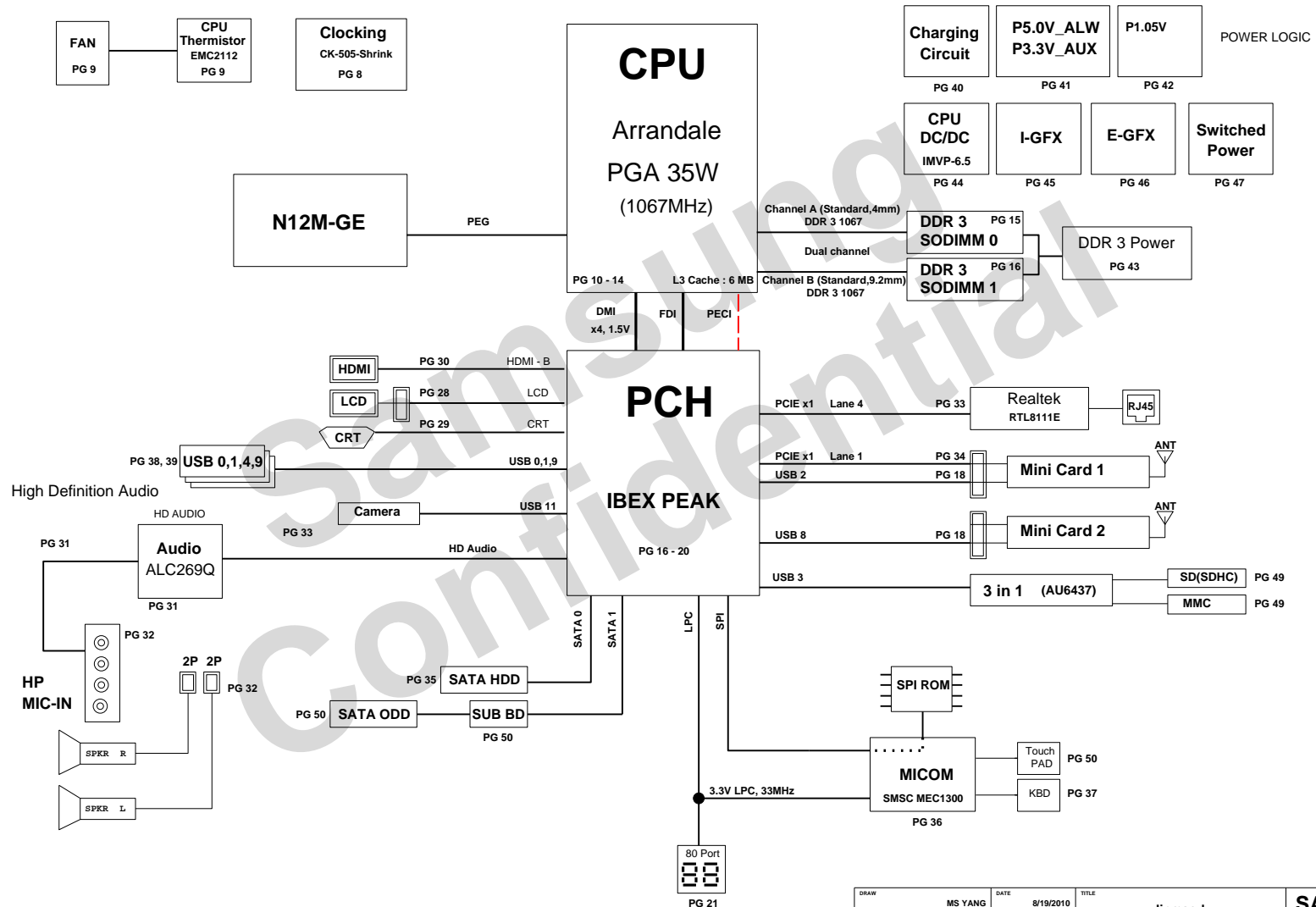
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sheet04 : POWER DIAGRAM  
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sheet16 : PCH-IbexPeak  
sheet17 : PCH-IbexPeak  
sheet18 : PCH-IbexPeak  
sheet19 : PCH-IbexPeak  
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sheet25 : N12M-GE2  
sheet26 : GFX memory  
sheet27 : GFX memory  
sheet28 : LVDS / CAMERA  
sheet29 : CRT  
sheet30 : HDMI

sheet31 : Audio - ALC269  
sheet32 : Audio - HP/MIC WOOFER(2.1CH)  
sheet33 : LAN (Realtek 8111E)  
sheet34 : WLAN  
sheet35 : SATA HDD, IR  
sheet36 : MICOM / BIOS  
sheet37 : MICOM Glue Logic (KBD )  
sheet38 : USB  
sheet39 : Power - charger  
sheet40 : Power - P3.3V\_AUX / P5.0V\_AUX  
sheet41 : Power - P1.05V (Chipset Power)  
sheet42 : Power - DDR3  
sheet43 : Power - CPU VRM  
sheet44 : Power - IGFX\_CORE  
sheet45 : Power - EGFX\_CORE  
sheet46 : Power - Switched Power 1  
sheet47 : Power - Power Discharge  
sheet48 : 3-in-1 card (AU6437)  
sheet49 : ODD Sub B'd  
sheet50 : Touchpad & LED  
sheet51 : MOUNT HOLE  
sheet52 : Power - Switched Power 2

|             |         |           |                               |       |          |             |
|-------------|---------|-----------|-------------------------------|-------|----------|-------------|
| DRAW        | MS YANG | DATE      | 8/19/2010                     | TITLE | Jinmao-L | SAMSUNG     |
| CHECK       | MK KIM  | DEV. STEP | PR                            | MAIN  |          | ELECTRONICS |
| APPROVAL    | BL LEE  | REV       | rev. 1.0                      | COVER |          | PART NO.    |
| MODULE CODE |         | LAST EDIT | November 22, 2010 15:53:34 PM | PAGE  | 1        | OF 52       |
|             |         |           |                               |       |          | BA41-01432A |

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# BLOCK DIAGRAM



|             |           |           |           |                               |                                   |                         |
|-------------|-----------|-----------|-----------|-------------------------------|-----------------------------------|-------------------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010 | TITLE                         | Jinmao-L<br>MAIN<br>BLOCK DIAGRAM | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM    | DEV. STEP | PR        |                               |                                   | PART NO.<br>BA41-01432A |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  |                               |                                   |                         |
| MODULE CODE | undefined | LAST EDIT |           | November 22, 2010 15:53:34 PM | PAGE 2 OF 52                      |                         |

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

| Voltage Rails  |   | Active in |
|--|---|-----------|
| VDC<br>P12.0V_ALW<br>P3.3V_MICOM<br>P5.0V_ALW<br>P5.0V_STB | Primary DC system power supply (7 to 21V)<br>12.0V always power rail<br>3.3V always power rail (for Micom)<br>5.0V always power rail<br>5.0V always power rail  | S4 - S5   |
| P5.0V_AUX<br>P3.3V_AUX<br>P1.5V_AUX                        | 5.0V switched on power rail (off in S4-S5)<br>3.3V switched on power rail (off in S4-S5)<br>1.5V power rail for DDR (off in S4-S5)  |           |
| P5.0V<br>P3.3V<br>P1.8V<br>P1.5V<br>P1.05V<br>P0.75V       | 5.0V switched power rail (off in S3-S5)<br>3.3V switched power rail (off in S3-S5)<br>1.8V switched power rail (off in S3-S5)<br>1.5V switched power rail (off in S3-S5)<br>1.05V power rail for chipset (off in S3-S5)<br>0.9V power rail for DDR (off in S3-S5) |           |
| VCC_CORE<br>IGFX_CORE<br>EGFX_CORE<br>P1.05V (VCCP)        | Core Voltage for CPU<br>Core Voltage for IGFX<br>Core Voltage for GPU<br>VCC for Arrandale & IBEX Peak  |           |

| 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             | 3                  | NC                 |
| 3               | Multi Memory Card Controller | 4                  | LAN CONTROLLER     |
| 4               | NC                           | 5                  | NC                 |
| 5               | NC                           | 6                  | NC                 |
| 6               | NC (N/A WITH HM55)           | 7                  | NC (N/A WITH HM55) |
| 7               | NC (N/A WITH HM55)           | 8                  | NC (N/A WITH HM55) |
| 8               | NC                           |                    |                    |
| 9               | SYSTEM PORT 2 (SUB BOARD)    |                    |                    |
| 10              | Bluetooth                    |                    |                    |
| 11              | Camera                       |                    |                    |
| 12              | NC                           |                    |                    |
| 13              | NC                           |                    |                    |

| SATA PORT Assign |                 |
|------------------|-----------------|
| PORT #           | ASSIGNED TO     |
| 0                | HDD             |
| 1                | ODD             |
| 2                | (N/A WITH HM55) |
| 3                | (N/A WITH HM55) |
| 4                |                 |
| 5                |                 |

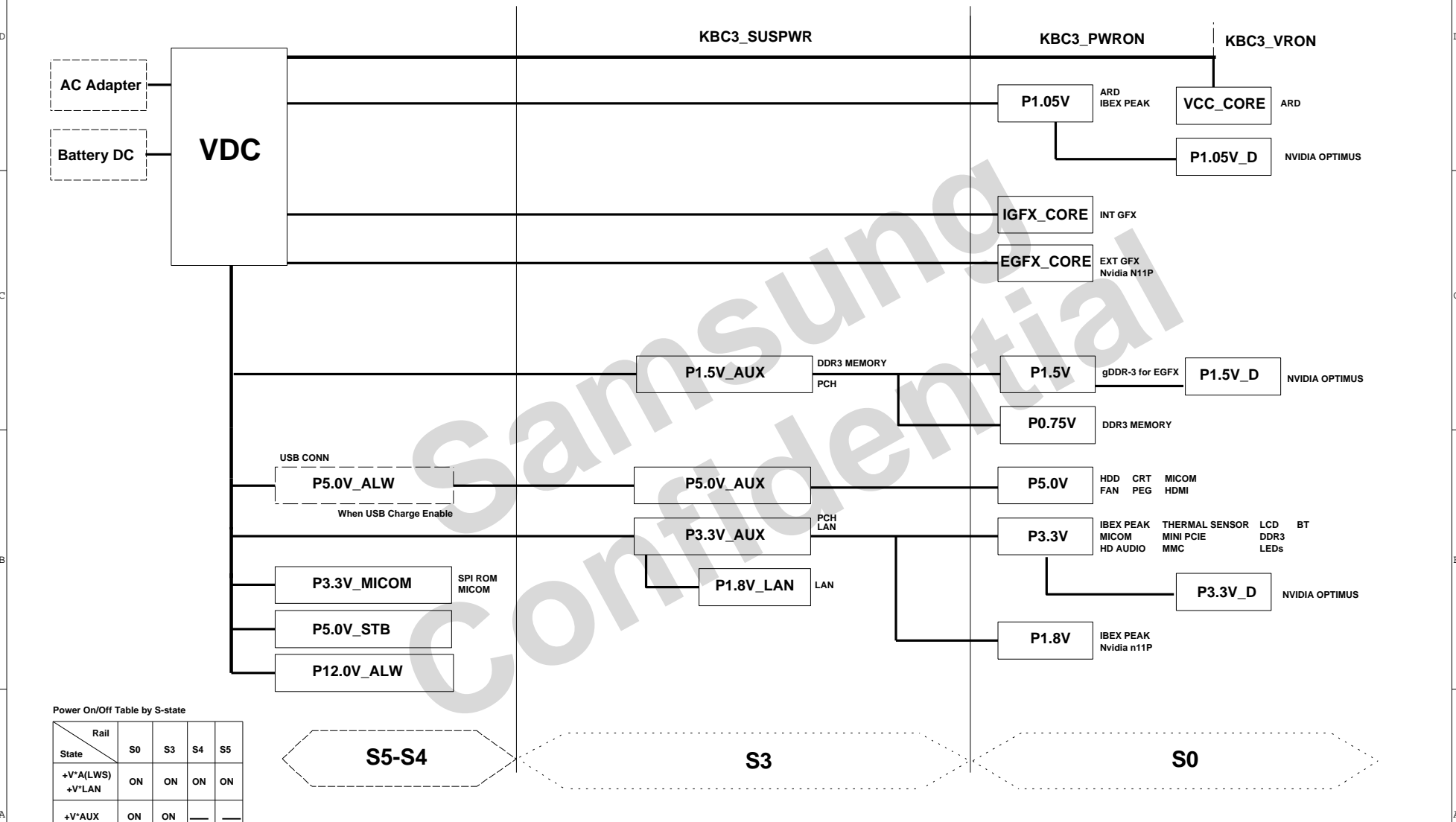
| Crystal / Oscillator |           |                 |                 |
|----------------------|-----------|-----------------|-----------------|
| TYPE                 | FREQUENCY | DEVICE          | USAGE           |
| Crystal              | 32.768KHz | IBEX-PEAK       | Real Time Clock |
| Crystal              | 14.318MHz | CLOCK-Generator | CK-505          |
| Crystal              | 25MHz     | LAN             | Intel LAN       |

| LCD Pannel Detect |              |                 |
|-------------------|--------------|-----------------|
| Devices           | Resolution   | PANNEL_DETECT_0 |
| LTN140AT17        | HD(1366x768) | SEC3250         |

| I <sup>2</sup> C / SMB Address  |           |     |                                    |
|---------------------------------|-----------|-----|------------------------------------|
| Devices                         | Address   | Hex | Bus                                |
| IBEX PEAK                       | 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 | -                                  |
| CK-505M Shrink(Clock Generator) | 1101 001x | D2h | Clock, Unused Clock Output Disable |
| Thermal Sensor on board         | 1101 100x | 98h |                                    |
| Power thermal management TS     | 1101 011x | 96h |                                    |

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# POWER DIAGRAM



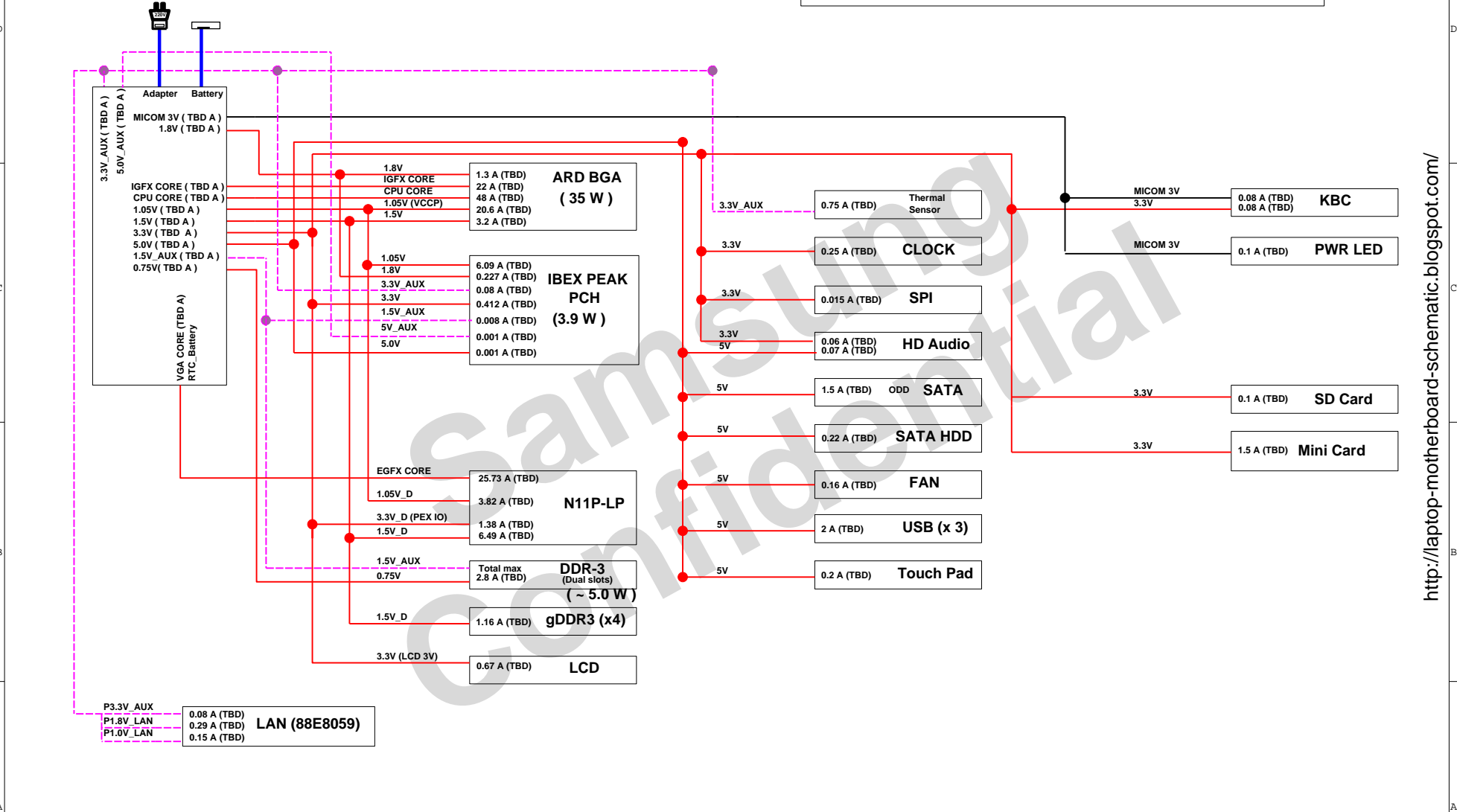
Power On/Off Table by S-state

| Rail       | S0 | S3 | S4 | S5 |
|------------|----|----|----|----|
| +V*A(LWS)  | ON | ON | ON | ON |
| +V*LAN     | ON | ON | ON | ON |
| +V*AUX     | ON | ON | ON | ON |
| +V         | ON | ON | ON | ON |
| +V* (CORE) | ON | ON | ON | ON |

|             |           |           |                               |       |                                   |                         |
|-------------|-----------|-----------|-------------------------------|-------|-----------------------------------|-------------------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010                     | TITLE | Jinmao-L<br>MAIN<br>POWER DIAGRAM | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM    | DEV. STEP | PR                            |       |                                   | PART NO.<br>BA41-01432A |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      |       |                                   |                         |
| MODULE CODE | undefined | LAST EDIT | November 22, 2010 15:53:34 PM | PAGE  | 4                                 | OF 52                   |

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# POWER RAILS ANALYSIS



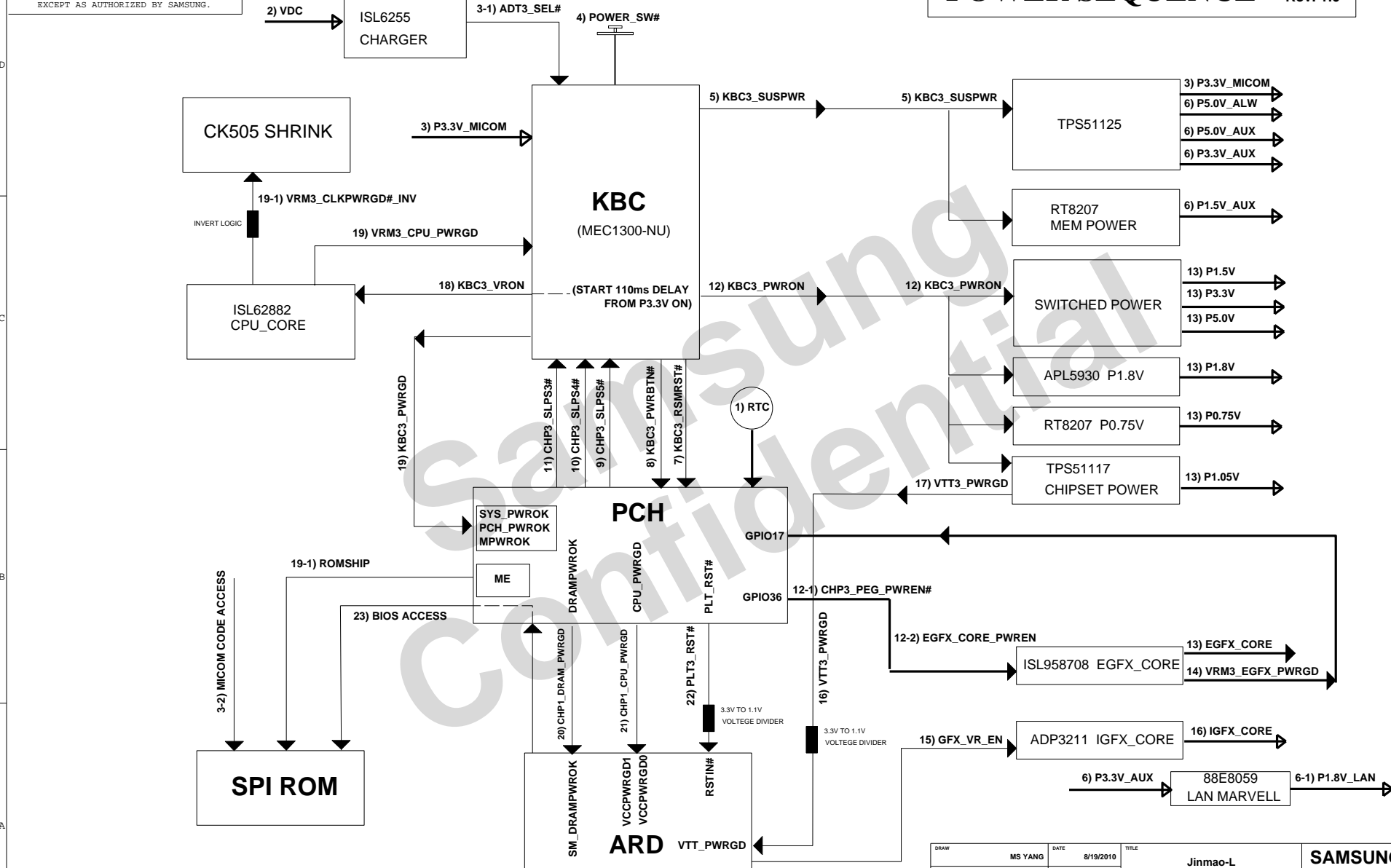
<http://laptop-motherboard-schematic.blogspot.com/>

|             |           |           |                               |       |                                 |                         |
|-------------|-----------|-----------|-------------------------------|-------|---------------------------------|-------------------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010                     | TITLE | Jinmao-L<br>MAIN<br>POWER RAILS | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM    | DEV. STEP | PR                            |       |                                 | PART NO.<br>BA41-01432A |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      |       |                                 |                         |
| MODULE CODE | undefined | LAST EDIT | November 22, 2010 15:53:34 PM | PAGE  | 5                               | OF 52                   |

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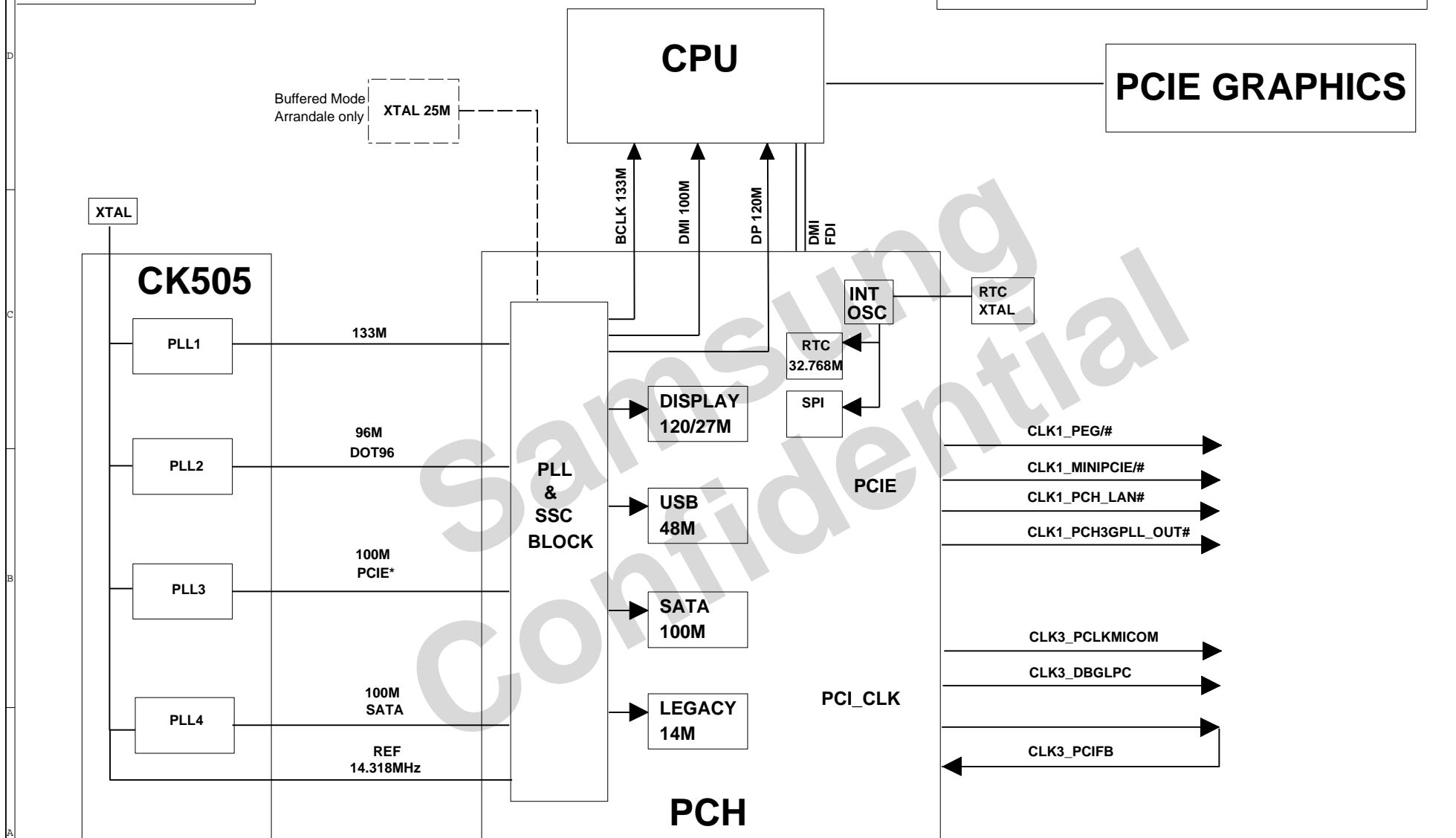
# POWER SEQUENCE

Rev. 1.0



|             |           |           |                               |       |                                    |                         |
|-------------|-----------|-----------|-------------------------------|-------|------------------------------------|-------------------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010                     | TITLE | Jinmao-L<br>MAIN<br>POWER SEQUENCE | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM    | DEV. STEP | PR                            |       |                                    | PART NO.<br>BA41-01432A |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      |       |                                    |                         |
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## Rev. 1.0



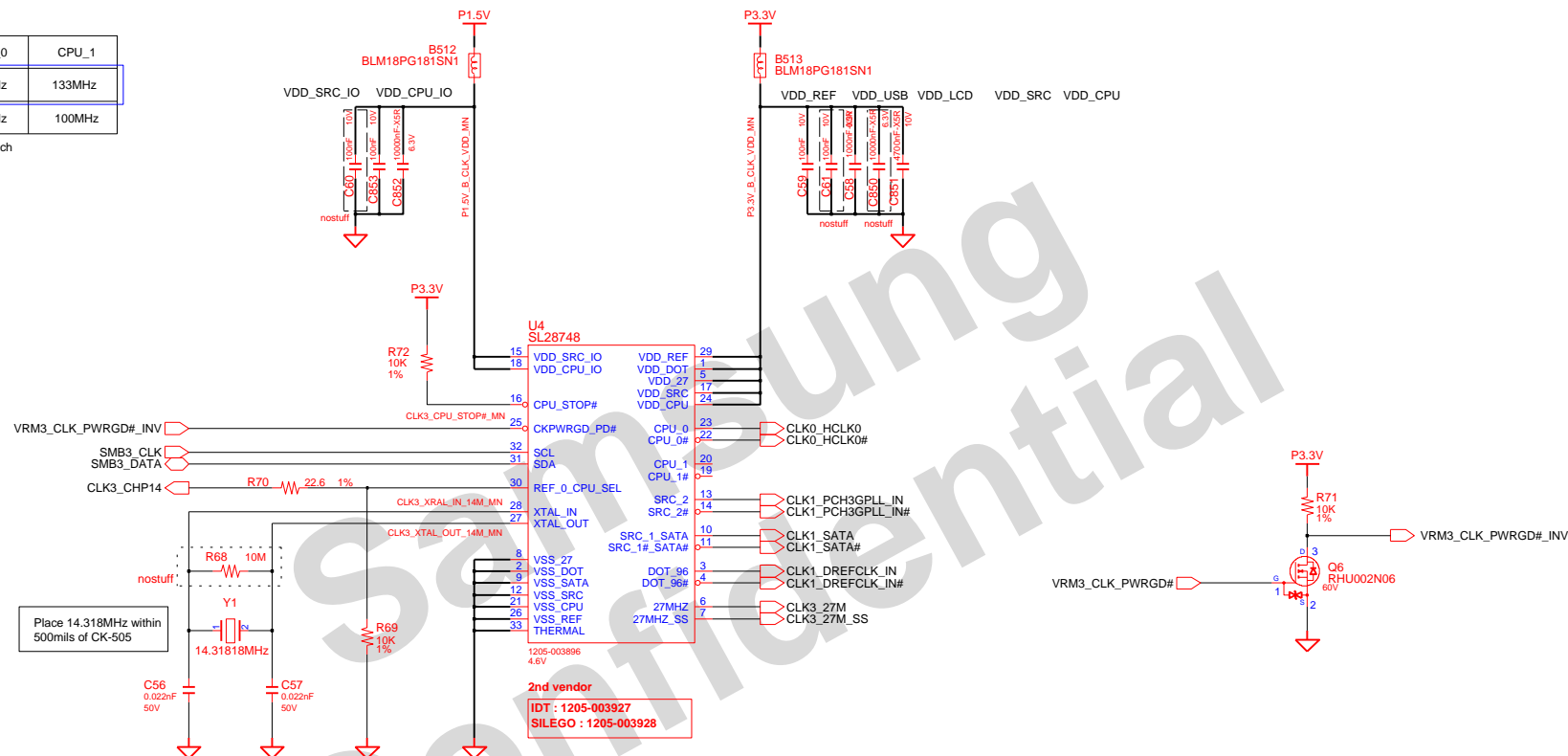
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|-------------|-----------|-----------|-------------------------------|-------|--|------------------------------------|-------------|-------|
| DRAW        | MS YANG   | DATE      | 8/19/2010                     | TITLE | <div>Jinmao-L<br/>MAIN<br/>CLOCK DIAGRAM</div> | <div>SAMSUNG<br/>ELECTRONICS</div> |             |       |
| CHECK       | MK KIM    | DEV. STEP | PR                            |       |  |                                    |             |       |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      |       |  | PART NO.                           | BA41-01432A |       |
| MODULE CODE | undefined | LAST EDIT | November 22, 2010 15:53:34 PM |       |  | PAGE                               | 7           | OF 52 |

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## CPU\_MODE\_SEL

| Pin 30      | CPU_0  | CPU_1  |
|-------------|--------|--------|
| CPU_SEL = 0 | 133MHz | 133MHz |
| CPU_SEL = 1 | 100MHz | 100MHz |

\*CPU SEL During CK\_PWRGD Latch




|             |           |           |           |                                   |                        |                               |              |
|-------------|-----------|-----------|-----------|-----------------------------------|------------------------|-------------------------------|--------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010 | Jinmao-L<br>CLOCK<br>CK505-SHRINK | SAMSUNG<br>ELECTRONICS |                               |              |
| CHECK       | MK KIM    | DEV. STEP | PR        |                                   |                        |                               |              |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  |                                   |                        | PART NO.                      | BA41-01432A  |
| MODULE CODE | LAST EDIT |           |           |                                   |                        | November 22, 2010 15:53:34 PM | PAGE 8 OF 52 |



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

| SHDN_SEL MODE |                                     |
|---------------|-------------------------------------|
| 0<br>HIGH Z   | INTEL TR MODE<br>AMD CPU/DIODE MODE |
| ✓ 1           | EXT.DIODE 2 MODE                    |

|             |           |           |                               |                        |          |   |             |
|-------------|-----------|-----------|-------------------------------|------------------------|----------|---|-------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010                     | TITLE                  | Jinmao-L |  |             |
| CHECK       | MK KIM    | DEV. STEP | PR                            | THERMAL SENSOR         |          |   |             |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      | THERMAL SENSOR EMC2112 |          | PART NO.  | BA41-01432A |
| MODULE CODE | LAST EDIT |           | November 22, 2010 15:53:34 PM |                        |          | PAGE  | 9 OF 52     |

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**CPU1-1 ARD/CFD PGA**

**1 / 5**

**DMI**

DMI1\_TXN(0:3) → DMI\_RX#\_0, DMI\_RX#\_1, DMI\_RX#\_2, DMI\_RX#\_3

DMI1\_TXP(0:3) → DMI\_RX#\_0, DMI\_RX#\_1, DMI\_RX#\_2, DMI\_RX#\_3

DMI1\_RXN(0:3) → DMI\_TX#\_0, DMI\_TX#\_1, DMI\_TX#\_2, DMI\_TX#\_3

DMI1\_RXP(0:3) → DMI\_TX#\_0, DMI\_TX#\_1, DMI\_TX#\_2, DMI\_TX#\_3

**FDI**

FDI1\_TXN(0:7) → FDI\_TX#\_0, FDI\_TX#\_1, FDI\_TX#\_2, FDI\_TX#\_3, FDI\_TX#\_4, FDI\_TX#\_5, FDI\_TX#\_6, FDI\_TX#\_7

FDI1\_TXP(0:7) → FDI\_TX#\_0, FDI\_TX#\_1, FDI\_TX#\_2, FDI\_TX#\_3, FDI\_TX#\_4, FDI\_TX#\_5, FDI\_TX#\_6, FDI\_TX#\_7

FDI1\_FSYNC0 → FDI\_FSYNC\_0

FDI1\_FSYNC1 → FDI\_FSYNC\_1

FDI1\_INT → FDI\_INT

FDI1\_LSYNC0 → FDI\_LSYNC\_0

FDI1\_LSYNC1 → FDI\_LSYNC\_1

**PCI EXPRESS -- GRAPHICS**

MT513 RMNT-38-70-1P

MT512 RMNT-38-70-1P

MT508 RMNT-38-70-1P

MT509 RMNT-38-70-1P

**Power Management**

CPU\_COMP0\_MN → R66, 20 1% AT23

CPU\_COMP1\_MN → R67, 20 1% AT24

CPU\_COMP2\_MN → R827, 49.9 1% G16

CPU\_COMP3\_MN → R750, 49.9 1% AT26

CPU\_PROCHOT#\_MN → R798, 49.9 1% AN26

CPU\_CATERR#\_MN → R826, 49.9 1% AK14

CPU\_PLT3\_RST#\_MN → R820, 750 1%

CPU\_VTT\_PWRGD → R829, 2K 1%

CPU\_VTT\_PWRGD → R828, 1.5K 1%

CPU\_TCK\_MN → R752, 49.9 1%

**Thermal Management**

MCP1\_THRMTRIP# → AK15

MCP1\_DRAMRST#\_DRIVE → MCP1\_DRAMRST#

MCP1\_DRAMRST# → CPU\_RCOMP\_0\_MN, CPU\_RCOMP\_1\_MN, CPU\_RCOMP\_2\_MN

**Signal Management**

CHP3\_PECI → AT15

CHP3\_PMSYNC → AL15

CHP1\_CPU\_PWRGD → AN14

CHP1\_DRAM\_PWRGD → AK13

CHP1\_TXN\_C(15:0) → PEG1\_TXN\_C(15:0)

CHP1\_TXP\_C(15:0) → PEG1\_TXP\_C(15:0)

CHP1\_TXN\_C(15:0) → PEG1\_TXN\_C(15:0)

CHP1\_TXP\_C(15:0) → PEG1\_TXP\_C(15:0)

**Power and Ground**

P1.05V → CPU\_PROCHOT#\_MN, CPU\_CATERR#\_MN, CPU\_PLT3\_RST#\_MN, CPU\_VTT\_PWRGD, CPU\_TCK\_MN

P1.05V → MCP1\_DRAMRST#\_DRIVE

P1.5V → R823, 10K 1%, R822, 3.01K 1%

**Table 1: Component Values**

| Component | Value    | Location |
|-----------|----------|----------|
| R66       | 20 1%    | AT23     |
| R67       | 20 1%    | AT24     |
| R827      | 49.9 1%  | G16      |
| R750      | 49.9 1%  | AT26     |
| R798      | 49.9 1%  | AN26     |
| R826      | 49.9 1%  | AK14     |
| R820      | 750 1%   |          |
| R829      | 2K 1%    |          |
| R828      | 1.5K 1%  |          |
| R752      | 49.9 1%  |          |
| R823      | 10K 1%   |          |
| R822      | 3.01K 1% |          |

**Table 2: Component Values**

| Component | Value     | Location |
|-----------|-----------|----------|
| C847      | 100nF 10V | 0        |
| C808      | 100nF 10V | 1        |
| C806      | 100nF 10V | 2        |
| C753      | 100nF 10V | 3        |
| C750      | 100nF 10V | 4        |
| C749      | 100nF 10V | 5        |
| C747      | 100nF 10V | 6        |
| C743      | 100nF 10V | 7        |
| C745      | 100nF 10V | 8        |
| C734      | 100nF 10V | 9        |
| C742      | 100nF 10V | 10       |
| C740      | 100nF 10V | 11       |
| C735      | 100nF 10V | 12       |
| C737      | 100nF 10V | 13       |
| C47       | 100nF 10V | 14       |
| C45       | 100nF 10V | 15       |
| C846      | 100nF 10V | 0        |
| C845      | 100nF 10V | 1        |
| C807      | 100nF 10V | 2        |
| C754      | 100nF 10V | 3        |
| C752      | 100nF 10V | 4        |
| C751      | 100nF 10V | 5        |
| C748      | 100nF 10V | 6        |
| C744      | 100nF 10V | 7        |
| C746      | 100nF 10V | 8        |
| C733      | 100nF 10V | 9        |
| C732      | 100nF 10V | 10       |
| C731      | 100nF 10V | 11       |
| C730      | 100nF 10V | 12       |
| C729      | 100nF 10V | 13       |
| C728      | 100nF 10V | 14       |
| C727      | 100nF 10V | 15       |

**Table 3: Component Values**

| Component | Value     | Location |
|-----------|-----------|----------|
| C846      | 100nF 10V | 0        |
| C845      | 100nF 10V | 1        |
| C807      | 100nF 10V | 2        |
| C754      | 100nF 10V | 3        |
| C752      | 100nF 10V | 4        |
| C751      | 100nF 10V | 5        |
| C748      | 100nF 10V | 6        |
| C744      | 100nF 10V | 7        |
| C746      | 100nF 10V | 8        |
| C733      | 100nF 10V | 9        |
| C732      | 100nF 10V | 10       |
| C731      | 100nF 10V | 11       |
| C730      | 100nF 10V | 12       |
| C729      | 100nF 10V | 13       |
| C728      |           |          |



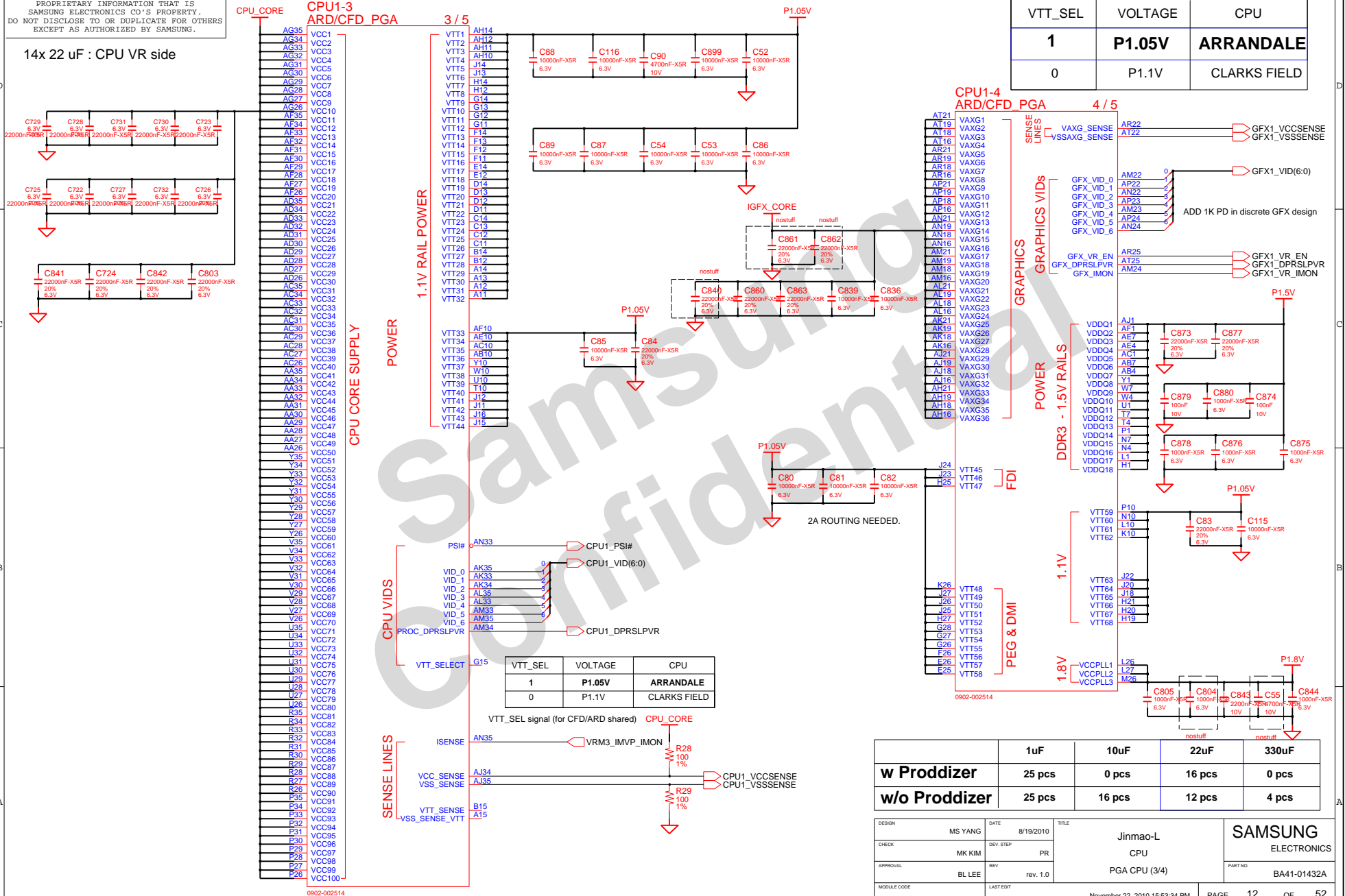
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14x 22 uF : CPU VR side

ALL VTT DECAP IS SHARED

\*\*VTT POWER SELECTION

| VTT_SEL | VOLTAGE | CPU          |
|---------|---------|--------------|
| 1       | P1.05V  | ARRANDALE    |
| 0       | P1.1V   | CLARKS FIELD |



**CPU1-5  
ARD/CFD\_PG5 / 5**

|      |       |        |      |
|------|-------|--------|------|
| AT20 | VSS1  | VSS81  | AE34 |
| AT17 | VSS2  | VSS82  | AE33 |
| AR31 | VSS3  | VSS83  | AE32 |
| AR28 | VSS4  | VSS84  | AE31 |
| AR26 | VSS5  | VSS85  | AE30 |
| AR24 | VSS6  | VSS86  | AE29 |
| AR23 | VSS7  | VSS87  | AE28 |
| AR20 | VSS8  | VSS88  | AE27 |
| AR17 | VSS9  | VSS89  | AE26 |
| AR15 | VSS10 | VSS90  | AE6  |
| AR12 | VSS11 | VSS91  | AD10 |
| AR9  | VSS12 | VSS92  | AC5  |
| AR6  | VSS13 | VSS93  | AC2  |
| AR3  | VSS14 | VSS94  | AC2  |
| AP20 | VSS15 | VSS95  | AB35 |
| AP17 | VSS16 | VSS96  | AB34 |
| AP13 | VSS17 | VSS97  | AB33 |
| AP10 | VSS18 | VSS98  | AB32 |
| AP7  | VSS19 | VSS99  | AB31 |
| AP4  | VSS20 | VSS100 | AB30 |
| AP2  | VSS21 | VSS101 | AB29 |
| AN34 | VSS22 | VSS102 | AB28 |
| AN31 | VSS23 | VSS103 | AB27 |
| AN23 | VSS24 | VSS104 | AB26 |
| AN20 | VSS25 | VSS105 | AB25 |
| AN17 | VSS26 | VSS106 | AB24 |
| AM29 | VSS27 | VSS107 | Y8   |
| AM27 | VSS28 | VSS108 | Y4   |
| AM25 | VSS29 | VSS109 | Y2   |
| AM20 | VSS30 | VSS110 | W35  |
| AM17 | VSS31 | VSS111 | W34  |
| AM14 | VSS32 | VSS112 | W33  |
| AM11 | VSS33 | VSS113 | W32  |
| AM8  | VSS34 | VSS114 | W31  |
| AM5  | VSS35 | VSS115 | W30  |
| AM2  | VSS36 | VSS116 | W29  |
| AL34 | VSS37 | VSS117 | W28  |
| AL31 | VSS38 | VSS118 | W27  |
| AL23 | VSS39 | VSS119 | W26  |
| AL20 | VSS40 | VSS120 | W25  |
| AL17 | VSS41 | VSS121 | V10  |
| AL12 | VSS42 | VSS122 | U8   |
| AL9  | VSS43 | VSS123 | U4   |
| AL6  | VSS44 | VSS124 | U2   |
| AK29 | VSS45 | VSS125 | T35  |
| AK27 | VSS46 | VSS126 | T34  |
| AK25 | VSS47 | VSS127 | T33  |
| AK20 | VSS48 | VSS128 | T32  |
| AK17 | VSS49 | VSS129 | T31  |
| AK13 | VSS50 | VSS130 | T30  |
| AK10 | VSS51 | VSS131 | T29  |
| AK7  | VSS52 | VSS132 | T28  |
| AK4  | VSS53 | VSS133 | T27  |
| AJ14 | VSS54 | VSS134 | T26  |
| AJ11 | VSS55 | VSS135 | T6   |
| AJ8  | VSS56 | VSS136 | R10  |
| AJ5  | VSS57 | VSS137 | P8   |
| AJ2  | VSS58 | VSS138 | P2   |
| AH35 | VSS59 | VSS139 | N35  |
| AH34 | VSS60 | VSS140 | N34  |
| AH33 | VSS61 | VSS141 | N33  |
| AH32 | VSS62 | VSS142 | N32  |
| AH31 | VSS63 | VSS143 | N31  |
| AH30 | VSS64 | VSS144 | N30  |
| AH29 | VSS65 | VSS145 | N29  |
| AH28 | VSS66 | VSS146 | N28  |
| AH27 | VSS67 | VSS147 | N27  |
| AH26 | VSS68 | VSS148 | N26  |
| AH25 | VSS69 | VSS149 | N25  |
| AH24 | VSS70 | VSS150 | N6   |
| AH17 | VSS71 | VSS151 | M10  |
| AH13 | VSS72 | VSS152 | L32  |
| AH9  | VSS73 | VSS153 | L29  |
| AH6  | VSS74 | VSS154 | L28  |
| AH3  | VSS75 | VSS155 | L8   |
| AG10 | VSS76 | VSS156 | L5   |
| AF6  | VSS77 | VSS157 | L2   |
| AF4  | VSS78 | VSS158 | K34  |
| AF2  | VSS79 | VSS159 | K33  |
| AE35 | VSS80 | VSS160 | K30  |

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|        |        |      |
|--------|--------|------|
| K27    | VSS161 | AE34 |
| K6     | VSS162 | AE33 |
| K3     | VSS163 | AE32 |
| J32    | VSS164 | AE31 |
| J21    | VSS165 | AE30 |
| J19    | VSS166 | AE29 |
| H35    | VSS167 | AE28 |
| H32    | VSS168 | AE27 |
| H28    | VSS169 | AE26 |
| H24    | VSS170 | AE6  |
| H22    | VSS171 | AD10 |
| H18    | VSS172 | AC5  |
| H15    | VSS173 | AC2  |
| H13    | VSS174 | AC2  |
| H11    | VSS175 | AB35 |
| H8     | VSS176 | AB34 |
| H5     | VSS177 | AB33 |
| H2     | VSS178 | AB32 |
| G34    | VSS179 | AB31 |
| G31    | VSS180 | AB30 |
| G20    | VSS181 | AB29 |
| G19    | VSS182 | AB28 |
| G6     | VSS183 | AB27 |
| G3     | VSS184 | AB26 |
| F30    | VSS185 | AB25 |
| F27    | VSS186 | AB24 |
| F25    | VSS187 | Y8   |
| F22    | VSS188 | Y4   |
| F19    | VSS189 | Y2   |
| F16    | VSS190 | W35  |
| E35    | VSS191 | W34  |
| E32    | VSS192 | W33  |
| E29    | VSS193 | W32  |
| E24    | VSS194 | W31  |
| E21    | VSS195 | W30  |
| E18    | VSS196 | W29  |
| E13    | VSS197 | W28  |
| E11    | VSS198 | W27  |
| E8     | VSS199 | W26  |
| E5     | VSS200 | W25  |
| E2     | VSS201 | V10  |
| D33    | VSS202 | U8   |
| D30    | VSS203 | U4   |
| D26    | VSS204 | U2   |
| D9     | VSS205 | T35  |
| D6     | VSS206 | T34  |
| D3     | VSS207 | T33  |
| C34    | VSS208 | T32  |
| C32    | VSS209 | T31  |
| C29    | VSS210 | T30  |
| C28    | VSS211 | T29  |
| C26    | VSS212 | T28  |
| C24    | VSS213 | T27  |
| C22    | VSS214 | T26  |
| C20    | VSS215 | T6   |
| C19    | VSS216 | R10  |
| C16    | VSS217 | P8   |
| B31    | VSS218 | P2   |
| B25    | VSS219 | N35  |
| B21    | VSS220 | N34  |
| B18    | VSS221 | N33  |
| B17    | VSS222 | N32  |
| B13    | VSS223 | N31  |
| B11    | VSS224 | N30  |
| B8     | VSS225 | N29  |
| B6     | VSS226 | N28  |
| B4     | VSS227 | N27  |
| A29    | VSS228 | N26  |
| A27    | VSS229 | N25  |
| A23    | VSS230 | N6   |
| A9     | VSS231 | M10  |
| VSS232 | VSS232 | L32  |
| VSS233 | VSS233 | L29  |

NCTF  
AT35  
AT1  
AR34  
B2  
B34  
B3  
A35  
-VSS\_NCTF1  
-VSS\_NCTF2  
-VSS\_NCTF3  
-VSS\_NCTF4  
-VSS\_NCTF5  
-VSS\_NCTF6  
-VSS\_NCTF7

VSS

AP25  
AL25  
AL24  
AL22  
AJ33  
AG9  
M27  
L28  
H17  
G25  
G17  
E30

AM30  
AM28  
AP31  
AL32  
AL30  
AM31  
AM29  
AM32  
AK32  
AK31  
AK28  
AJ28  
AN30  
AN32  
AJ32  
CFG\_12  
CFG\_13  
CFG\_14  
CFG\_15  
CFG\_16  
CFG\_17  
RSVD\_TP\_86

B19  
A19  
A20  
B20  
U9  
T9  
C9  
A9  
C1  
A3

J29  
J28  
A34  
A33  
C35  
B35

(VSS) RSVDB6

RSVD1  
RSVD2  
RSVD3  
RSVD4  
RSVD5  
RSVD6  
RSVD7  
RSVD8  
SA\_DIMM\_VREFDQ  
SB\_DIMM\_VREFDQ  
RSVD11  
RSVD12  
RSVD13  
RSVD14

CFG\_0  
CFG\_1  
CFG\_2  
CFG\_3  
CFG\_4  
CFG\_5  
CFG\_6  
CFG\_7  
CFG\_8  
CFG\_9  
CFG\_10  
CFG\_11  
CFG\_12  
CFG\_13  
CFG\_14  
CFG\_15  
CFG\_16  
CFG\_17  
RSVD\_TP\_86

RSVD15  
RSVD16  
RSVD17  
RSVD18  
RSVD19  
RSVD20  
RSVD21  
RSVD22

RSVD26  
RSVD27  
RSVD\_NCTF\_28  
RSVD\_NCTF\_29  
RSVD\_NCTF\_30  
RSVD\_NCTF\_31

(VSS) RSVDB6

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RSVD52  
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RSVD\_NCTF\_55  
RSVD\_NCTF\_56  
RSVD\_NCTF\_57  
RSVD58

RSVD\_TP\_66  
RSVD\_TP\_67  
RSVD\_TP\_68  
RSVD\_TP\_69  
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RSVD\_TP\_73  
RSVD\_TP\_74  
RSVD\_TP\_75

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RSVD\_TP\_82  
RSVD\_TP\_83  
RSVD\_TP\_84  
RSVD\_TP\_85

(VSS) RSVDB6

AJ13  
AJ12  
AH25  
AK26  
AL26  
AR2  
AJ26  
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AT3  
AR1  
AT28  
AL29  
AP30  
AP32  
AL27  
AT31  
AT32  
AP33  
AR33  
AT33  
AT34  
AR35  
AR32

AA5  
AA4  
R8  
AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

V4  
V5  
N2  
AD5  
AD7  
W3  
W2  
N3  
AE5  
AD9

(VSS) RSVDB6

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RSVD\_TP\_66  
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RSVD\_TP\_85

(VSS) RSVDB6

AJ13  
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AT3  
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AR35  
AR32

AA5  
AA4  
R8  
AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

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N2  
AD5  
AD7  
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N3  
AE5  
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(VSS) RSVDB6

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RSVD\_TP\_85

(VSS) RSVDB6

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AA5  
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R8  
AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

V4  
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AD5  
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AE5  
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(VSS) RSVDB6

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(VSS) RSVDB6

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AT34  
AR35  
AR32

AA5  
AA4  
R8  
AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

V4  
V5  
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AD5  
AD7  
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N3  
AE5  
AD9

(VSS) RSVDB6

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(VSS) RSVDB6

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AT3  
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AT33  
AT34  
AR35  
AR32

AA5  
AA4  
R8  
AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

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(VSS) RSVDB6

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(VSS) RSVDB6

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AT3  
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AA5  
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AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

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AE5  
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(VSS) RSVDB6

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(VSS) RSVDB6

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AJ27

AT3  
AR1  
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AP30  
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AL27  
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AR33  
AT33  
AT34  
AR35  
AR32

AA5  
AA4  
R8  
AD3  
AD2  
AA2  
AA1  
R9  
AG7  
AE3

V4  
V5  
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AD5  
AD7  
W3  
W2  
N3  
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(VSS) RSVDB6

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RSVD58

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(VSS) RSVDB6

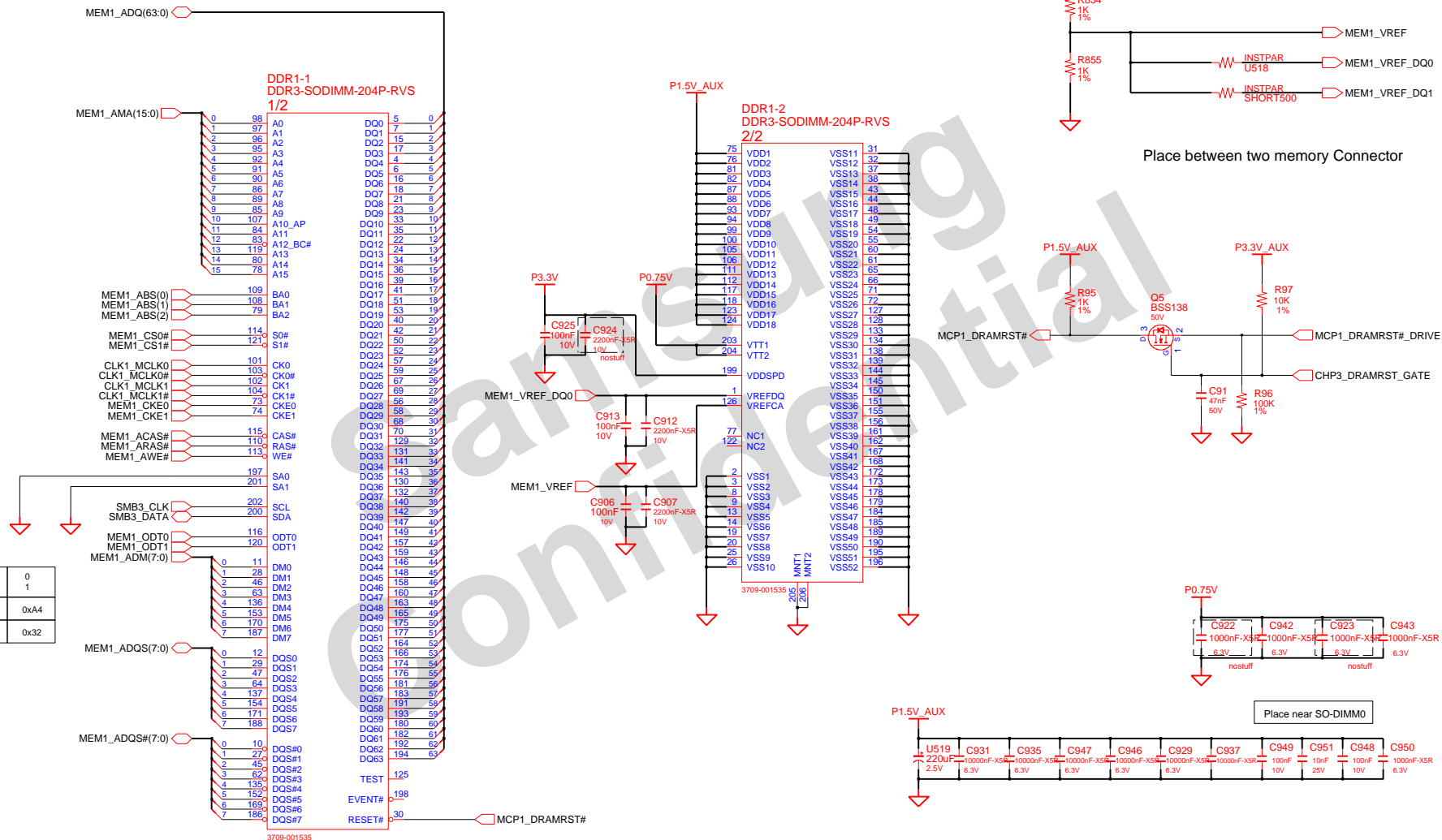
AJ13

## DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001535 (FOXCONN)

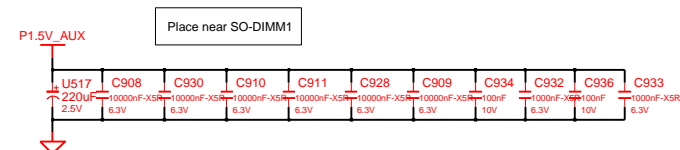
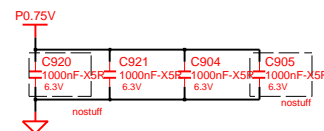
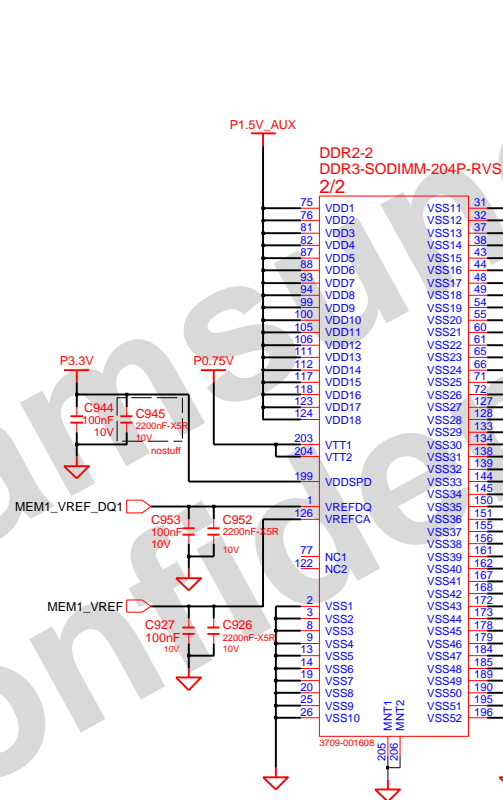
P/N : 3709-001609 (CONCRAFT)



|         |      |      |
|---------|------|------|
| SA0     | 0    | 0    |
| SA1     | 0    | 1    |
| SPD ADD | 0xA0 | 0xA4 |
| TS ADD  | 0x30 | 0x32 |

|             |           |           |           |       |                                  |                        |
|-------------|-----------|-----------|-----------|-------|----------------------------------|------------------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010 | TITLE | Jinmao-L<br>SODIMM A<br><br>DDR3 | SAMSUNG<br>ELECTRONICS |
| CHECK       | MK KIM    | DEV. STEP | PR        |       |                                  |                        |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  |       |                                  |                        |
| MODULE CODE | LAST EDIT |           |           |       |                                  |                        |
| PART NO.    |           |           |           |       |                                  | BA41-01432A            |

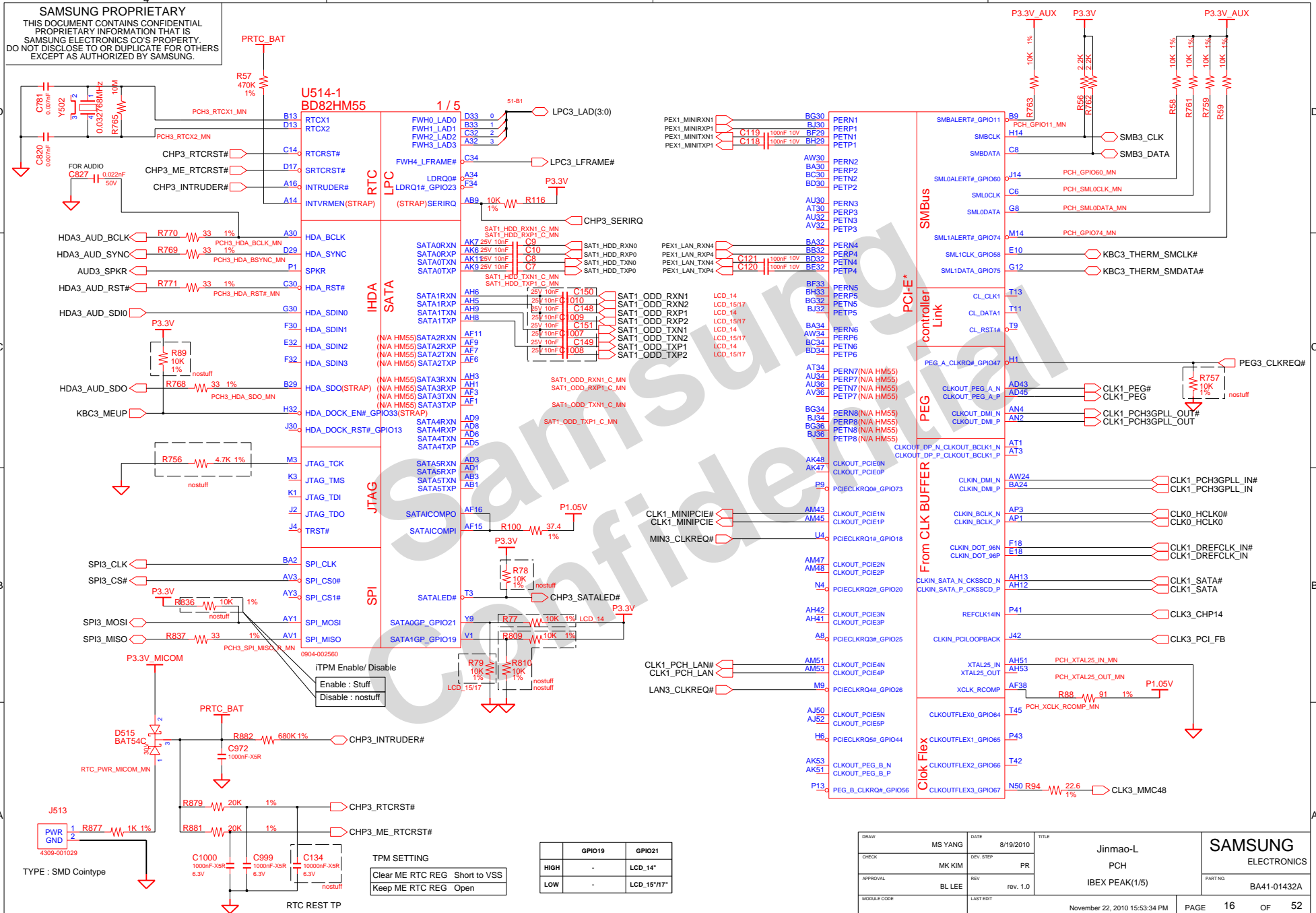
**DDR SO-DIMM #1**  
Height : 4 mm (REVERSE)

[illegible]


|             |           |           |           |   |                               |
|-------------|-----------|-----------|-----------|---|-------------------------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010 | TITLE<br><br>Jinmao-L<br>SODIMM B<br>DDR3 | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | MK KIM    | DEV. STEP | PR        |   |                               |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  |   |                               |
| MODULE CODE | LAST EDIT |           |           |   |                               |
|             |           |           |           | November 22, 2010 15:53:34 PM             | PAGE 15 OF 52                 |



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EXCEPT AS AUTHORIZED BY SAMSUNG.



|      |        |             |
|------|--------|-------------|
|      | GPIO19 | GPIO21      |
| HIGH | -      | LCD_14"     |
| LOW  | -      | LCD_15"/17" |

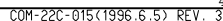
|             |         |           |           |                                   |   |
|-------------|---------|-----------|-----------|-----------------------------------|---|
| DRAWN       | MS YANG | DATE      | 8/19/2010 | Jinmao-L<br>PCH<br>IBEX PEAK(1/5) |  |
| CHECK       | MK KIM  | DEV. STEP | PR        |                                   |   |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                                   |   |
| MODULE CODE |         |           |           | LAST EDIT                         | PART NO.  |
|             |         |           |           | November 22, 2010 15:53:34 PM     | BA41-01432A   |
|             |         |           |           | PAGE                              | 16 OF 52  |



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NEED UPDATE THE PEM CODE

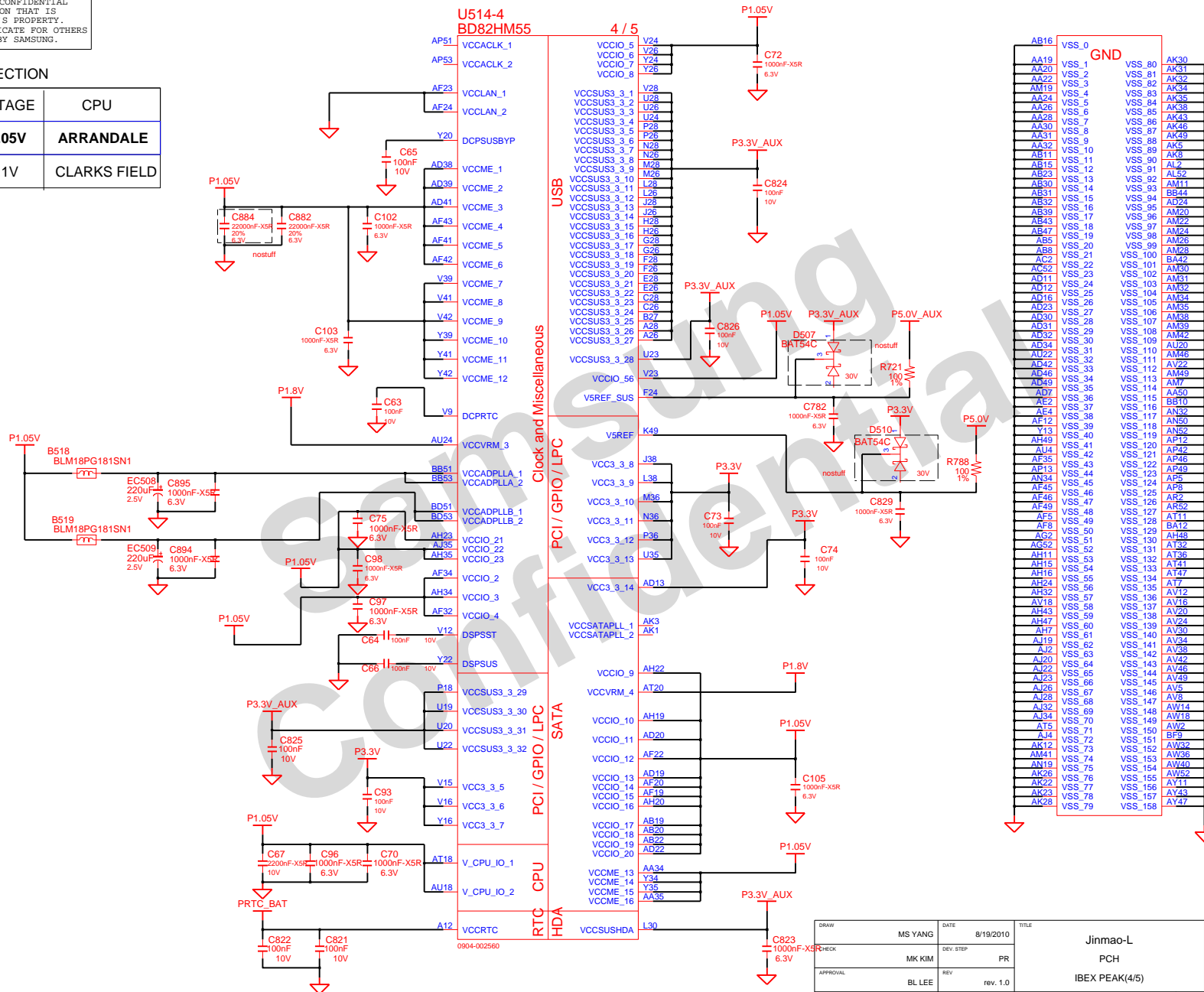


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## \*\*VTT POWER SELECTION

| VTT_SEL | VOLTAGE | CPU          |
|---------|---------|--------------|
| 1       | P1.05V  | ARRANDALE    |
| 0       | P1.1V   | CLARKS FIELD |



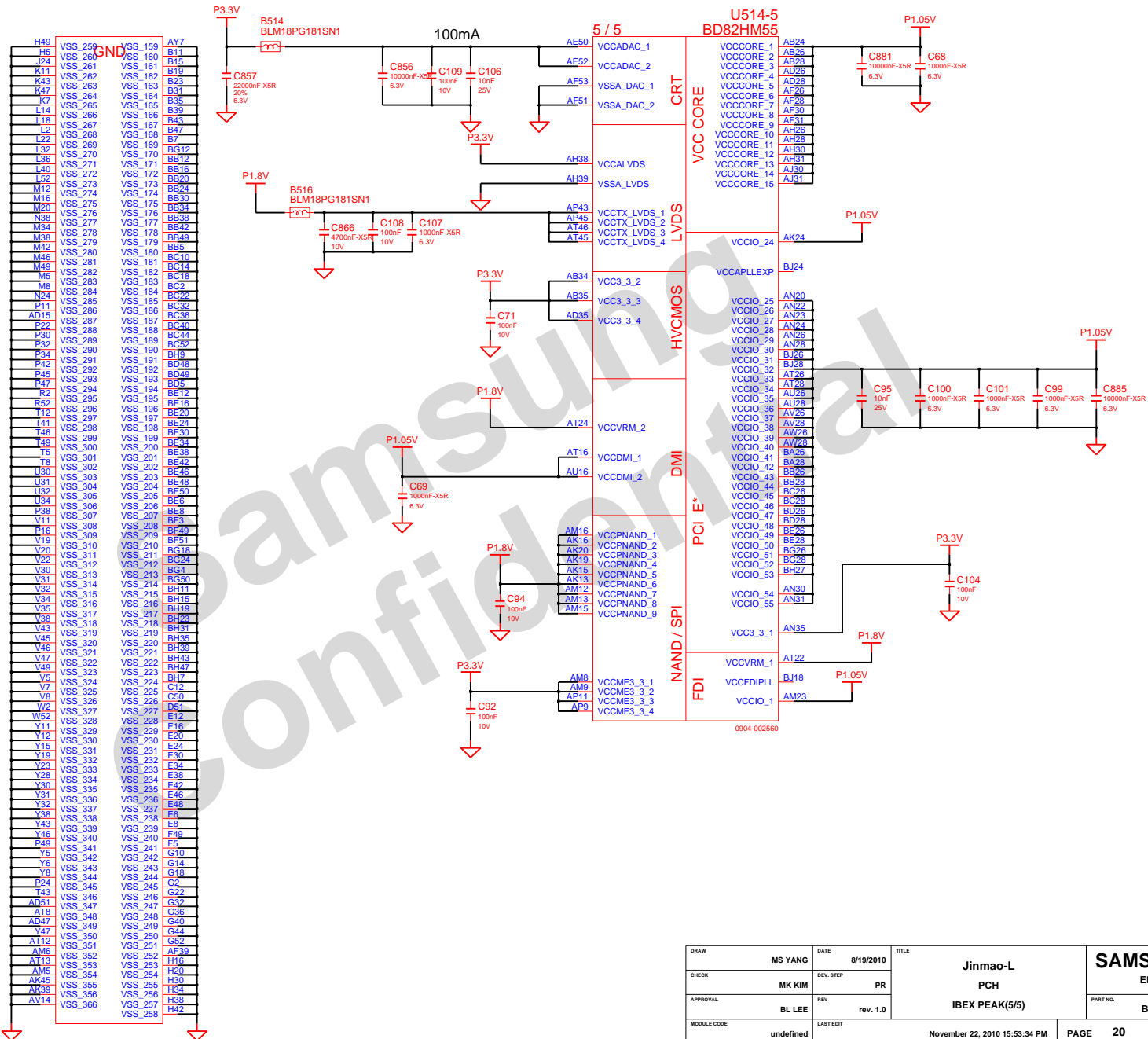
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| DRAW                          | MS YANG | DATE      | 8/19/2010 | TITLE | Jinmao-L       |
| CHECK                         | MK KIM  | DEV. STEP | PR        |       | PCH            |
| APPROVAL                      | BL LEE  | REV       | rev. 1.0  |       | IBEX PEAK(4/5) |
| MODULE CODE                   | 52      | LAST EDIT |           |       |                |
| November 22, 2010 15:53:34 PM |         |           |           |       | PAGE 19 OF 60  |

SAMSUNG  
ELECTRONICS

PART NO. BA41-01432A

# SAMSUNG PROPRIETARY

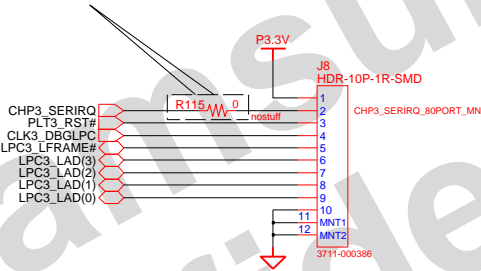
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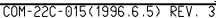
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|---------------|-----------|-----------|-------------------------------|-------|----------------|-------------------------|
| DRAW          | MS YANG   | DATE      | 8/19/2010                     | TITLE | Jinmao-L       | SAMSUNG<br>ELECTRONICS  |
| CHECK         | MK KIM    | DEV. STEP | PR                            |       | PCH            |                         |
| APPROVAL      | BL LEE    | REV       | rev. 1.0                      |       | IBEX PEAK(5/5) |                         |
| MODULE CODE   | undefined | LAST EDIT | November 22, 2010 15:53:34 PM |       |                |                         |
| PAGE 20 OF 52 |           |           |                               |       |                | PART NO.<br>BA41-01432A |

80H PORT DEBUG

For MICOM 80H Debug Port Test



|             |           |           |           |                               |          |             |
|-------------|-----------|-----------|-----------|-------------------------------|----------|-------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010 | TITLE                         | Jinmao-L | SAMSUNG     |
| CHECK       | MK KIM    | DEV. STEP | PR        | DEBUG PORT                    |          | ELECTRONICS |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  | 80H DECODER                   | PART NO. | BA41-01432A |
| MODULE CODE | LAST EDIT |           |           | November 22, 2010 15:53:34 PM | PAGE     | 21 OF 52    |



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U3-2  
N12M-GE-S-B1 2 / 5

PEG1\_DQA(63:0)

|    |      |         |           |     |
|----|------|---------|-----------|-----|
| 0  | D22  | FBA D0  | FBVDDQ_1  | A13 |
| 1  | E24  | FBA D1  | FBVDDQ_2  | B13 |
| 2  | E22  | FBA D2  | FBVDDQ_3  | C13 |
| 3  | D24  | FBA D3  | FBVDDQ_4  | D13 |
| 4  | D26  | FBA D4  | FBVDDQ_5  | E13 |
| 5  | D27  | FBA D5  | FBVDDQ_6  | F13 |
| 6  | C27  | FBA D6  | FBVDDQ_7  | G13 |
| 7  | B27  | FBA D7  | FBVDDQ_8  | H13 |
| 8  | A21  | FBA D8  | FBVDDQ_9  | I13 |
| 9  | B21  | FBA D9  | FBVDDQ_10 | J13 |
| 10 | C21  | FBA D10 | FBVDDQ_11 | K13 |
| 11 | C19  | FBA D11 | FBVDDQ_12 | L13 |
| 12 | C18  | FBA D12 | FBVDDQ_13 | M13 |
| 13 | D18  | FBA D13 | FBVDDQ_14 | N13 |
| 14 | B18  | FBA D14 | FBVDDQ_15 | O13 |
| 15 | E21  | FBA D15 | FBVDDQ_16 | P13 |
| 16 | F21  | FBA D16 | FBVDDQ_17 | Q13 |
| 17 | F20  | FBA D17 | FBVDDQ_18 | R13 |
| 18 | D20  | FBA D18 | FBVDDQ_19 | S13 |
| 19 | F20  | FBA D19 | FBVDDQ_20 | T13 |
| 20 | D17  | FBA D20 | FBVDDQ_21 | U13 |
| 21 | F18  | FBA D21 | FBVDDQ_22 | V13 |
| 22 | D16  | FBA D22 | FBVDDQ_23 | W13 |
| 23 | E16  | FBA D23 | FBVDDQ_24 | X13 |
| 24 | A22  | FBA D24 | FBVDDQ_25 | Y13 |
| 25 | C24  | FBA D25 | FBVDDQ_26 | Z13 |
| 26 | D21  | FBA D26 |           |     |
| 27 | B22  | FBA D27 |           |     |
| 28 | C22  | FBA D28 |           |     |
| 29 | A25  | FBA D29 |           |     |
| 30 | B25  | FBA D30 |           |     |
| 31 | A26  | FBA D31 |           |     |
| 32 | U24  | FBA D32 |           |     |
| 33 | V23  | FBA D33 |           |     |
| 34 | R24  | FBA D34 |           |     |
| 35 | T23  | FBA D35 |           |     |
| 36 | R23  | FBA D36 |           |     |
| 37 | P24  | FBA D37 |           |     |
| 38 | P22  | FBA D38 |           |     |
| 39 | AC24 | FBA D39 |           |     |
| 40 | AB23 | FBA D40 |           |     |
| 41 | AB24 | FBA D41 |           |     |
| 42 | AB24 | FBA D42 |           |     |
| 43 | W24  | FBA D43 |           |     |
| 44 | AA22 | FBA D44 |           |     |
| 45 | W23  | FBA D45 |           |     |
| 46 | W22  | FBA D46 |           |     |
| 47 | V22  | FBA D47 |           |     |
| 48 | AA25 | FBA D48 |           |     |
| 49 | W27  | FBA D49 |           |     |
| 50 | W26  | FBA D50 |           |     |
| 51 | W25  | FBA D51 |           |     |
| 52 | AB25 | FBA D52 |           |     |
| 53 | AB26 | FBA D53 |           |     |
| 54 | AD26 | FBA D54 |           |     |
| 55 | AD27 | FBA D55 |           |     |
| 56 | V25  | FBA D56 |           |     |
| 57 | R25  | FBA D57 |           |     |
| 58 | V26  | FBA D58 |           |     |
| 59 | V27  | FBA D59 |           |     |
| 60 | R26  | FBA D60 |           |     |
| 61 | T25  | FBA D61 |           |     |
| 62 | N25  | FBA D62 |           |     |
| 63 | N26  | FBA D63 |           |     |

PEG1\_DQMA(7:0)

PEG1\_WDQSA(0:7)

PEG1\_RDQSA(0:7)

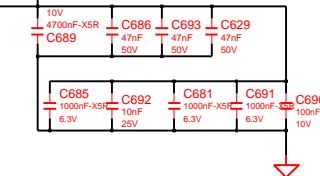
FBA\_CLK0  
FBA\_CLK1  
FBA\_CLK1\_N  
FBA\_DEBUG

FB\_CAL\_PD\_VDDQ  
FB\_CAL\_PU\_GND  
FB\_CAL\_TERM\_GND  
FB\_PLAVDD\_1  
FB\_DLLAVDD  
FB\_PLAVDD\_2

0904-002633

OPT

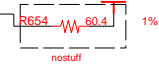
P1.5V\_D



OPT  
OPT  
OPT  
OPT  
OPT  
OPT

CMD MODE A

P1.5V\_D

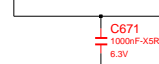


P1.5V\_D

NVIDIA REFERENCE



P1.05V\_D



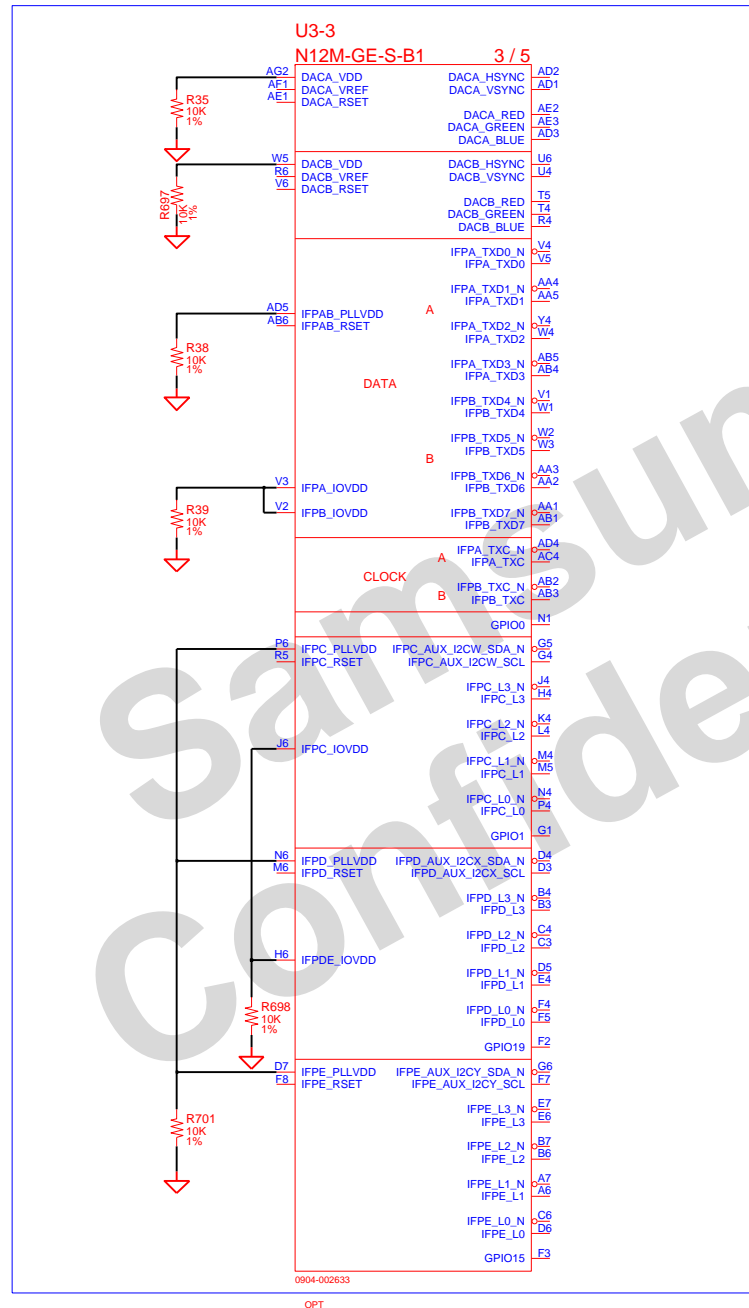
B507  
BLM18PG181SN1

OPT  
OPT  
OPT

|             |         |           |           |                               |                |                         |
|-------------|---------|-----------|-----------|-------------------------------|----------------|-------------------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L       | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM  | DEV. STEP | PR        |                               | N12M_40NM(2/4) |                         |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                               | N12M_40NM(2/4) |                         |
| MODULE CODE |         | LAST EDIT |           |                               |                | PART NO.<br>BA41-01432A |
|             |         |           |           | November 22, 2010 15:53:34 PM | PAGE           | 23 OF 52                |



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|             |         |           |           |                               |                |                         |
|-------------|---------|-----------|-----------|-------------------------------|----------------|-------------------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L       | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM  | DEV. STEP | PR        |                               | N12M_40NM(3/4) |                         |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                               | N12M_40NM(3/4) |                         |
| MODULE CODE |         | LAST EDIT |           | November 22, 2010 15:53:34 PM | PAGE 24 OF 52  | PART NO.<br>BA41-01432A |



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| Pin      | Description     | Activate          |
|----------|-----------------|-------------------|
| GPIO(0)  | General Purpose | NC                |
| GPIO(1)  | HPD-C           | NC                |
| GPIO(2)  | LCD0_BL_PWM     | High              |
| GPIO(3)  | LCD0_VDD        | High              |
| GPIO(4)  | LCD0_BL_EN      | High              |
| GPIO(5)  | GPU VID0        | 00 0.8V 10 0.95V  |
| GPIO(6)  | GPU VID1        | 01 0.85V 11 1.03V |
| GPIO(7)  | GPU VID2        | NC                |
| GPIO(8)  | OVERT           | LOW               |
| GPIO(9)  | ALERT           | NC                |
| GPIO(10) | MEM_VREF        | NC                |
| GPIO(11) | SLI_SYNC        | NC                |
| GPIO(12) | PWR_LEVEL       | NC                |
| GPIO(13) | MEM_VID         | NC                |
| GPIO(14) | PWR_CTRL1       | NC                |
| GPIO(15) | HPD-E           | High              |
| GPIO(16) | FAN_PWM         | NC                |
| GPIO(17) | Reserved        | NC                |
| GPIO(18) | Reserved        | NC                |
| GPIO(19) | HPD-D           | NC                |

| Strap option   | Bit 3     | Bit 2         | Bit 1                   | Bit 0      |
|----------------|-----------|---------------|-------------------------|------------|
| ROM_SO         | XCLK_417  | FB_0_BAR_SIZE | SMB_ALT_ADDR            | VGA_DEVICE |
| ROM_SCLK       | DEVID[4]  | VENID         | CLK_CFG                 | PLL_TERM   |
| ROM_SI         | RAMCFG[3] | RAMCFG[2]     | RAMCFG[1]               | RAMCFG[0]  |
| STRAP2         | DEVID[3]  | DEVID[2]      | DEVID[1]                | DEVID[0]   |
| STRAP1         | PADCFG[3] | PADCFG[2]     | PADCFG[1]               | PADCFG[0]  |
| STRAP0         | USER[3]   | USER[2]       | USER[1]                 | USER[0]    |
| Resistor value | PU to VDD | PD to GND     | XCLK417 = 0 27MHz       |            |
| 5K ohm         | 1000      | 0000          | RAM CFG (SEC)           |            |
| 10 Kohm        | 1001      | 0001          | 0011 gDDR3 1Gb          |            |
| 15K ohm        | 1010      | 0010          | USER[3:0]=1111 for EDID |            |
| 20K ohm        | 1011      | 0011          | PADCFG[3:0]=0110 for NB |            |
| 25K ohm        | 1100      | 0100          |                         |            |
| 30K ohm        | 1101      | 0101          |                         |            |
| 35K ohm        | 1110      | 0110          |                         |            |
| 45K ohm        | 1111      | 0111          |                         |            |

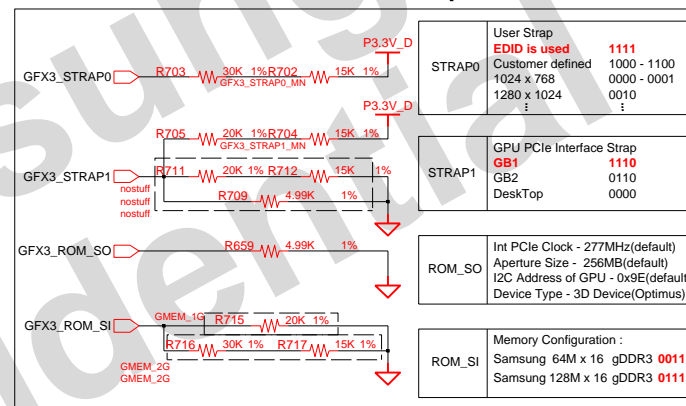
|        | Bit3 | Bit2 | Bit1 | Bit0 |
|--------|------|------|------|------|
| ROMSO  | 0    | 0    | 0    | 0    |
| SCLK   | 1    | 0    | 1    | 0    |
| SI     | 0    | 0    | 1    | 1    |
| SI     | 0    | 1    | 1    | 1    |
| Strap2 | 0    | 0    | 0    | 0    |
| Strap2 | 0    | 1    | 0    | 1    |
| Strap1 | 1    | 1    | 1    | 0    |
| Strap0 | 1    | 1    | 1    | 1    |

U3-5  
N12M-GE-S-B1

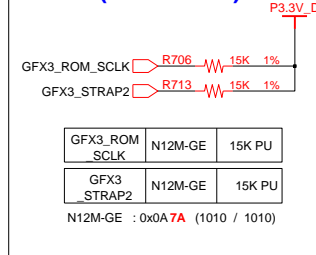
NC\_1  
NC\_2

5 / 5

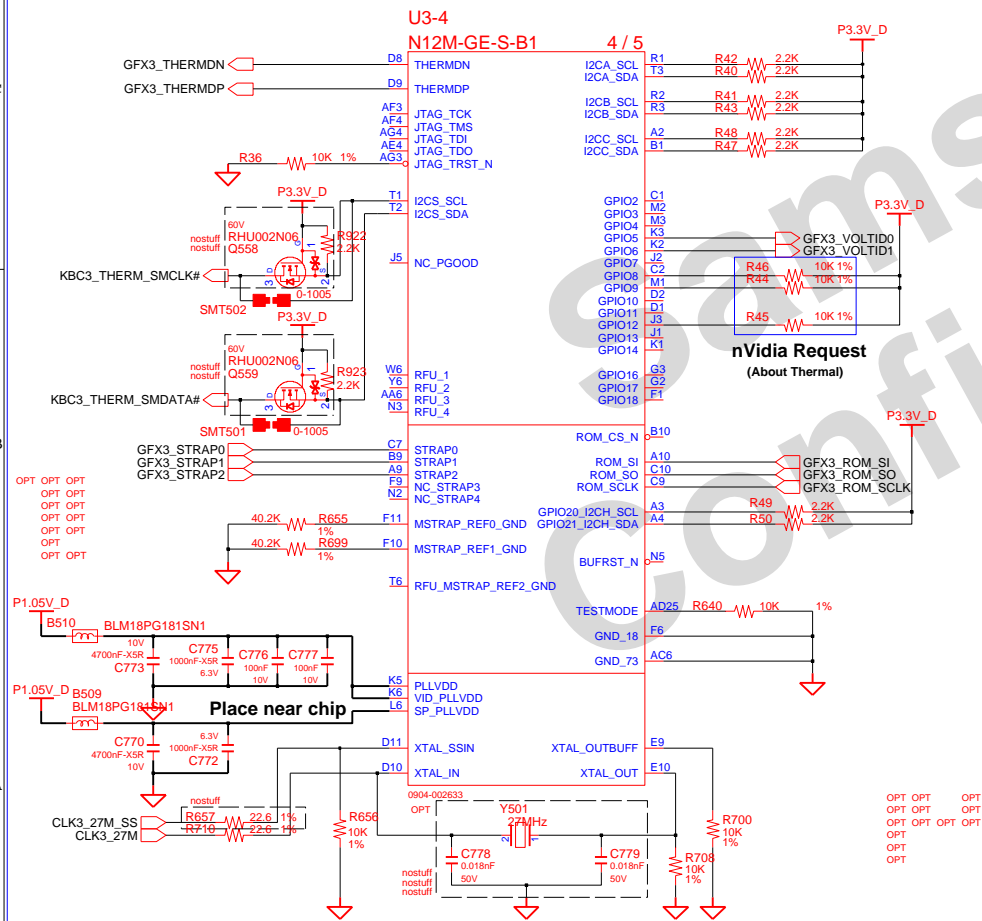
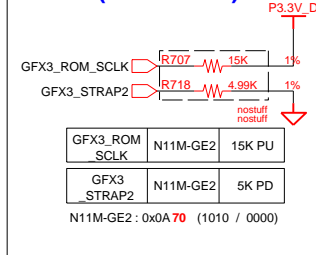
## Function Straps



## Chip Select Straps (N12M-GB1)



## Chip Select Straps (N11M-GB1)



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# A-Channel #0

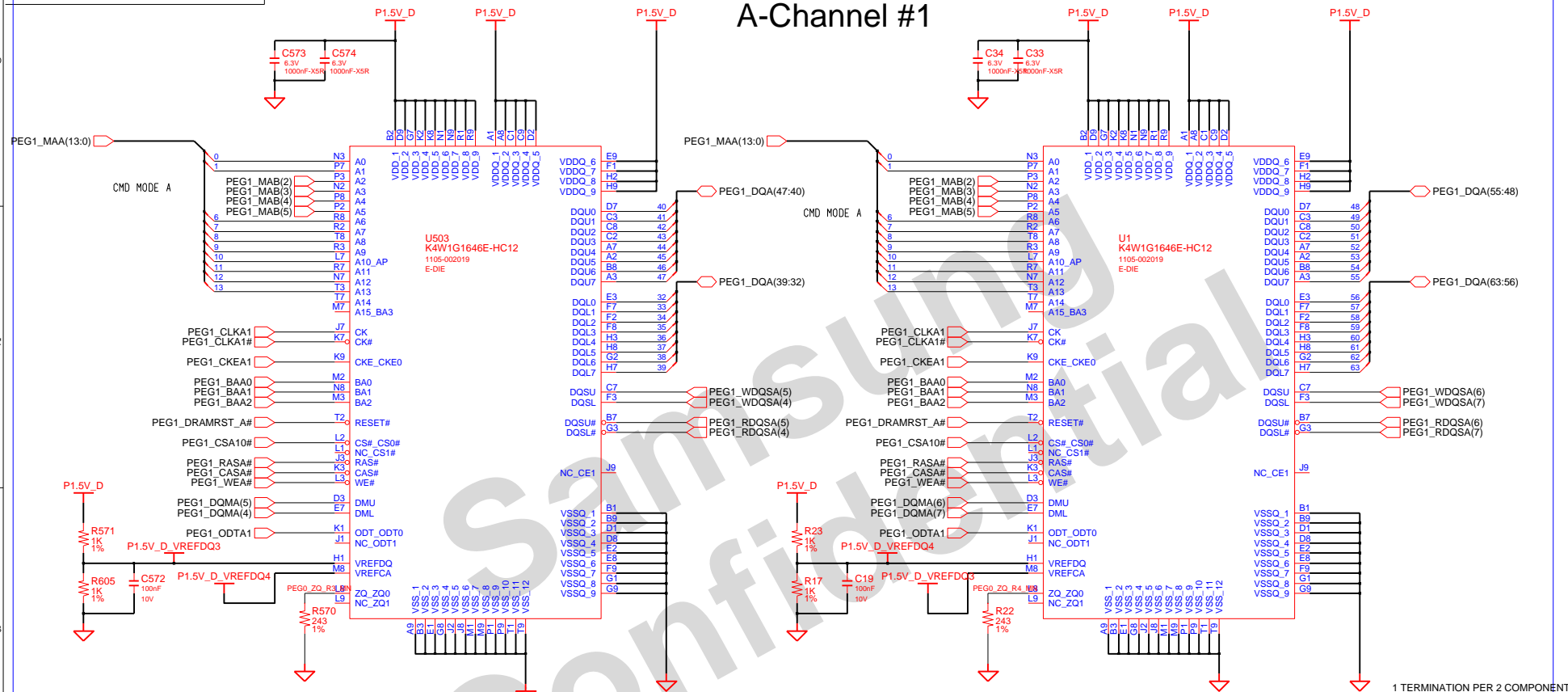
Place near to VDDQ

Place near to VDDQ

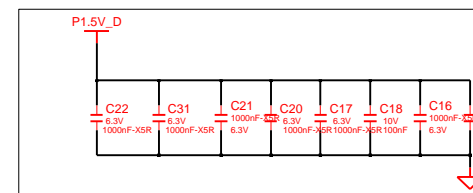
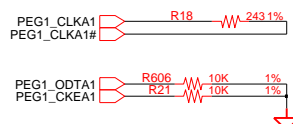
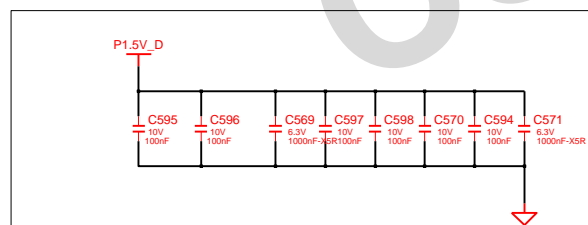
|             |           |           |                               |                 |          |                               |             |
|-------------|-----------|-----------|-------------------------------|-----------------|----------|-------------------------------|-------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010                     | TITLE           | Jinmao-L | <b>SAMSUNG</b><br>ELECTRONICS |             |
| CHECK       | MK KIM    | DEV. STEP | PR                            | GRAPHIC_MEM A#0 |          |                               |             |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      | GRAPHIC_MEM A#0 |          |                               |             |
| MODULE CODE | LAST EDIT |           | November 22, 2010 15:53:34 PM |                 |          |                               |             |
|             |           |           |                               |                 |          | PARTNO.                       | BA41-01432A |
|             |           |           |                               |                 |          | PAGE                          | 26 OF 52    |

D:/users/mobile39/mentor/Jinmao-L/Main/PR/Jinmao-L\_MAIN

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Place near to VDDQ



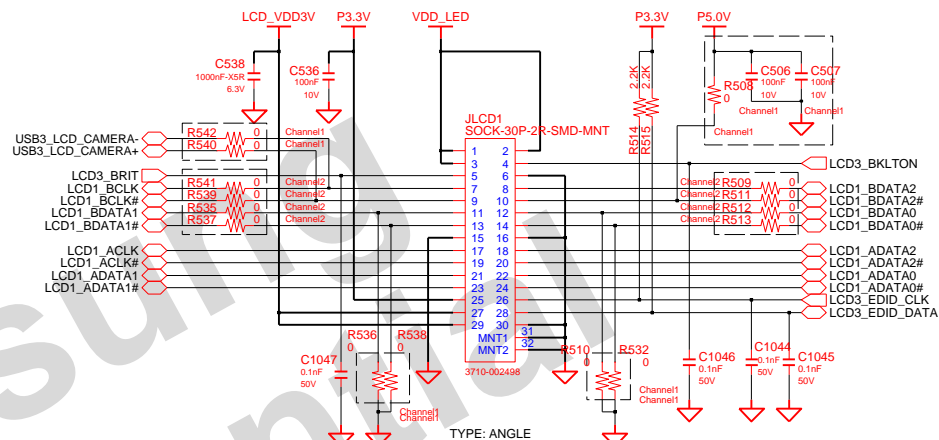
1 TERMINATION PER 2 COMPONENT

OPT  
OPT  
OPT  
OPT  
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OPT  
OPT

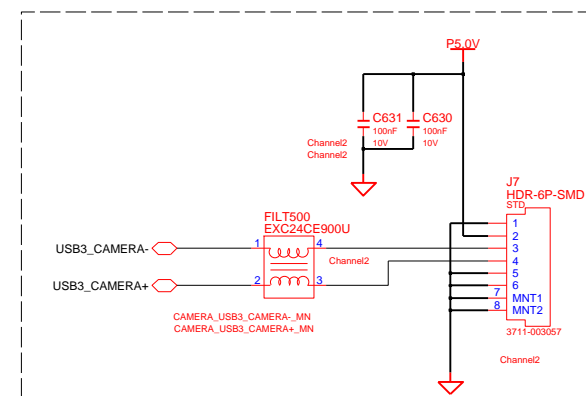
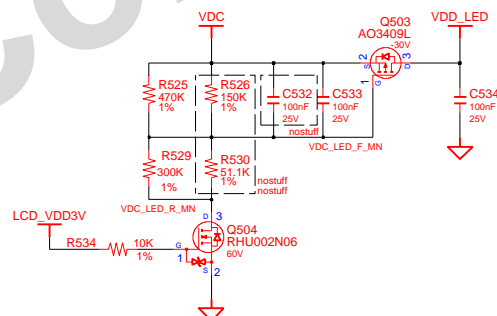
OPT OPT  
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OPT OPT  
OPT OPT

|             |         |           |           |  |                               |
|-------------|---------|-----------|-----------|--|-------------------------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | Jinmao-L<br>GRAPHIC_MEM A#1<br>GRAPHIC_MEM A#1 | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | MK KIM  | DEV. STEP | PR        |  |                               |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |  |                               |
| MODULE CODE |         | LAST EDIT |           | November 22, 2010 15:53:34 PM<br>PAGE 27 OF 52 | PART NO.<br>BA41-01432A       |

NOTE : Place R20 close to connector to minimize stub



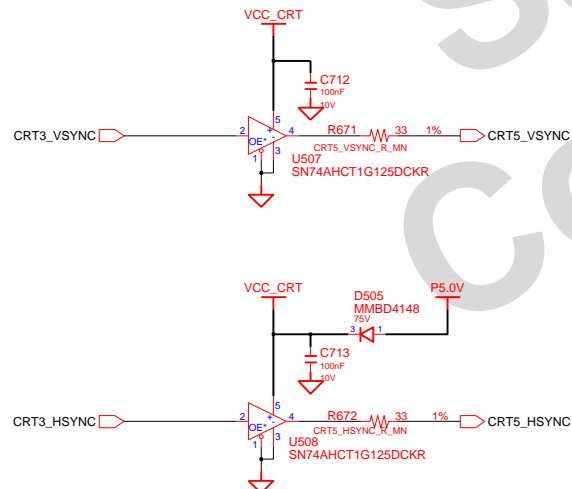
# LED Power

D:/users/mobile39/mentor/.linmac-l/Main/PR/.linmac-l MAIN

# CRT LOGIC

The schematic diagram illustrates the electrical connections for the CRT3 and CRT5 signal paths. It includes the following components and connections:

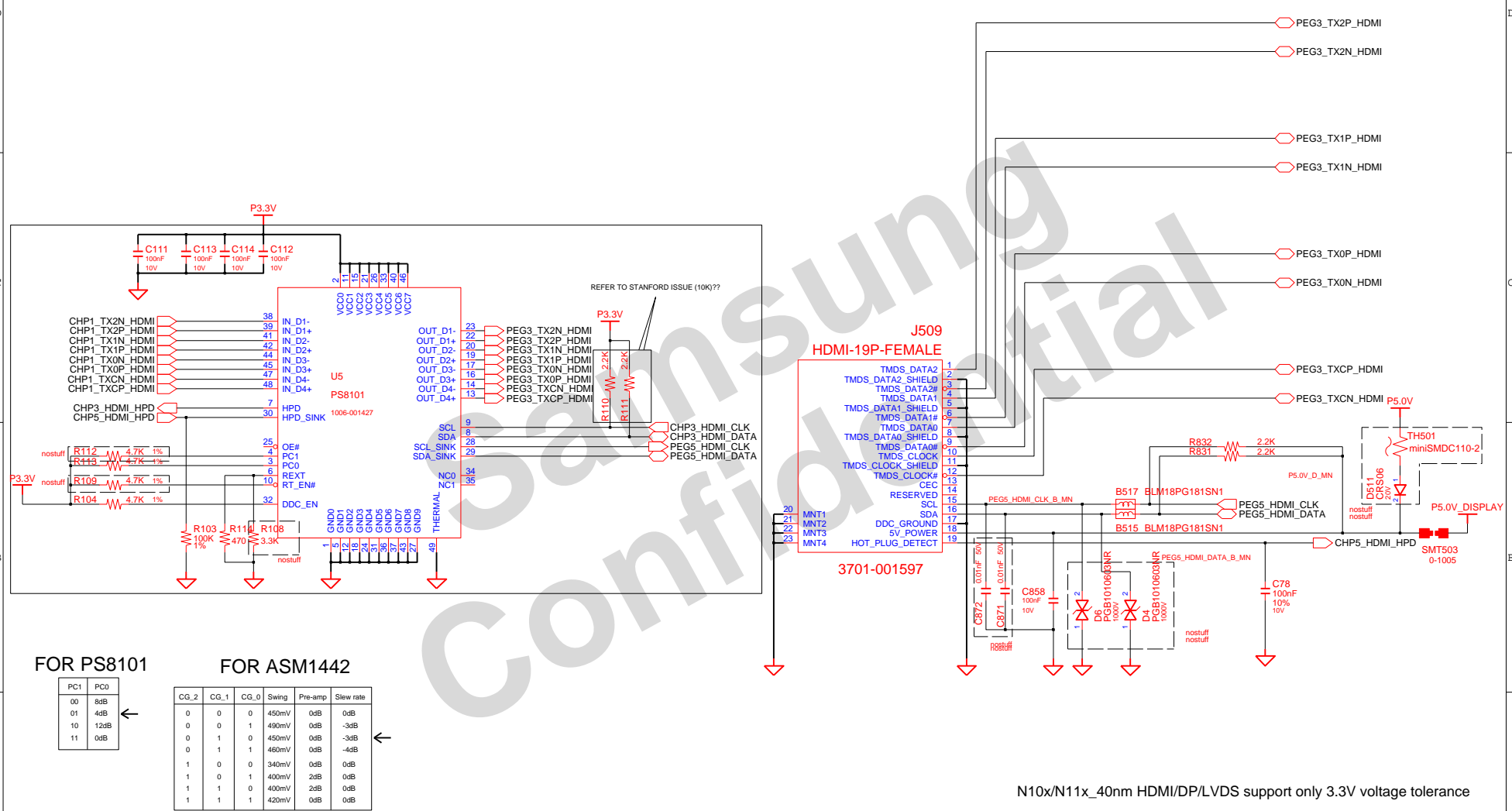
- Power Supply Decoupling:**
  - CRT3 Power:** CRT3\_R\_SYS\_LCON\_MN, CRT3\_G\_SYS\_LCON\_MN, and CRT3\_B\_SYS\_LCON\_MN are connected to a common ground. Decoupling capacitors C795, C793, C794, C790, C788, and C791 are used for filtering. Inductors L502, L504, and L503 are also present.
  - CRT5 Power:** CRT5\_DDCDATA, CRT5\_DDCCLK, CRT5\_HSYNC, and CRT5\_VSYNC are connected to a common ground. Decoupling capacitors C792, C710, C709, and C711 are used for filtering.
- Signal Conditioning:**
  - CRT3\_DDCDATA:** The signal is connected to the input of the Q528 RHU002N06 buffer. The buffer is powered by P3.3V and VCC\_CRT. A 2.2K resistor (R739) is connected between P3.3V and the input.
  - CRT5\_DDCCLK:** The signal is connected to the input of the Q525 RHU002N06 buffer. The buffer is powered by P3.3V and VCC\_CRT. A 2.2K resistor (R674) is connected between P3.3V and the input.
- Other Components:**
  - Resistors:** R738 (2.2K) is connected between P3.3V and the output of Q528. R737 (150) and R735 (150) are connected between the output of Q528 and ground.
  - Capacitors:** C796 (0.02uF) and C797 (0.02uF) are connected between the output of Q528 and ground.
  - Inductors:** L502 (82nH), L504 (82nH), and L503 (82nH) are connected between the output of Q528 and ground.



|             |           |           |           |   |                        |                               |               |
|-------------|-----------|-----------|-----------|---|------------------------|-------------------------------|---------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010 | TITLE<br><br>Jinmao-L<br>GRAPHICS_IF<br><br>CRT | SAMSUNG<br>ELECTRONICS |                               |               |
| CHECK       | MK KIM    | DEV. STEP | PR        |   |                        |                               |               |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  |   |                        | PART NO.                      | BA41-01432A   |
| MODULE CODE | LAST EDIT |           |           |   |                        | November 22, 2010 15:53:34 PM | PAGE 29 OF 52 |

(EMC request at 2010.04.15)

## HDMI Graphic



FOR PS8101

| PC1 | PC0  |
|-----|------|
| 00  | 8dB  |
| 01  | 4dB  |
| 10  | 12dB |
| 11  | 0dB  |

FOR ASM1442

| CG_2 | CG_1 | CG_0 | Swing | Pre-amp | Slew rate |
|------|------|------|-------|---------|-----------|
| 0    | 0    | 0    | 450mV | 0dB     | 0dB       |
| 0    | 0    | 1    | 490mV | 0dB     | -3dB      |
| 0    | 1    | 0    | 450mV | 0dB     | -3dB      |
| 0    | 1    | 1    | 460mV | 0dB     | -4dB      |
| 1    | 0    | 0    | 340mV | 0dB     | 0dB       |
| 1    | 0    | 1    | 400mV | 2dB     | 0dB       |
| 1    | 1    | 0    | 400mV | 2dB     | 0dB       |
| 1    | 1    | 1    | 420mV | 0dB     | 0dB       |

| HDMI Level Shifter | EXT_Pin6)       | PC1_CG0(Pin3) | PC1_CG1(Pin4) | RT_EN#_CG2(Pin10) | NC_EQ_0(Pin34) | NC_EQ_1(Pin35) | Note   | 4-6 CODE    |
|--------------------|-----------------|---------------|---------------|-------------------|----------------|----------------|--|-------------|
| PS8101             | 499 phm         | stuff         | nostuff       | nostuff           | NC             | NC             |  | 1006-001427 |
| ASM1442            | 3.4K(3.24~3.3K) | nostuff       | nostuff       | nostuff           | nostuff        | nostuff        | Internal PU/PD exist<br>CGs nostuff is 450mV swing | 1006-001471 |

FOR ASM1442

| EQ_1 | EQ_0 | Equalization |
|------|------|--------------|
| 0    | 0    | 12dB         |
| 0    | 1    | 9dB          |
| 1    | 0    | 6dB          |
| 1    | 1    | 3dB          |

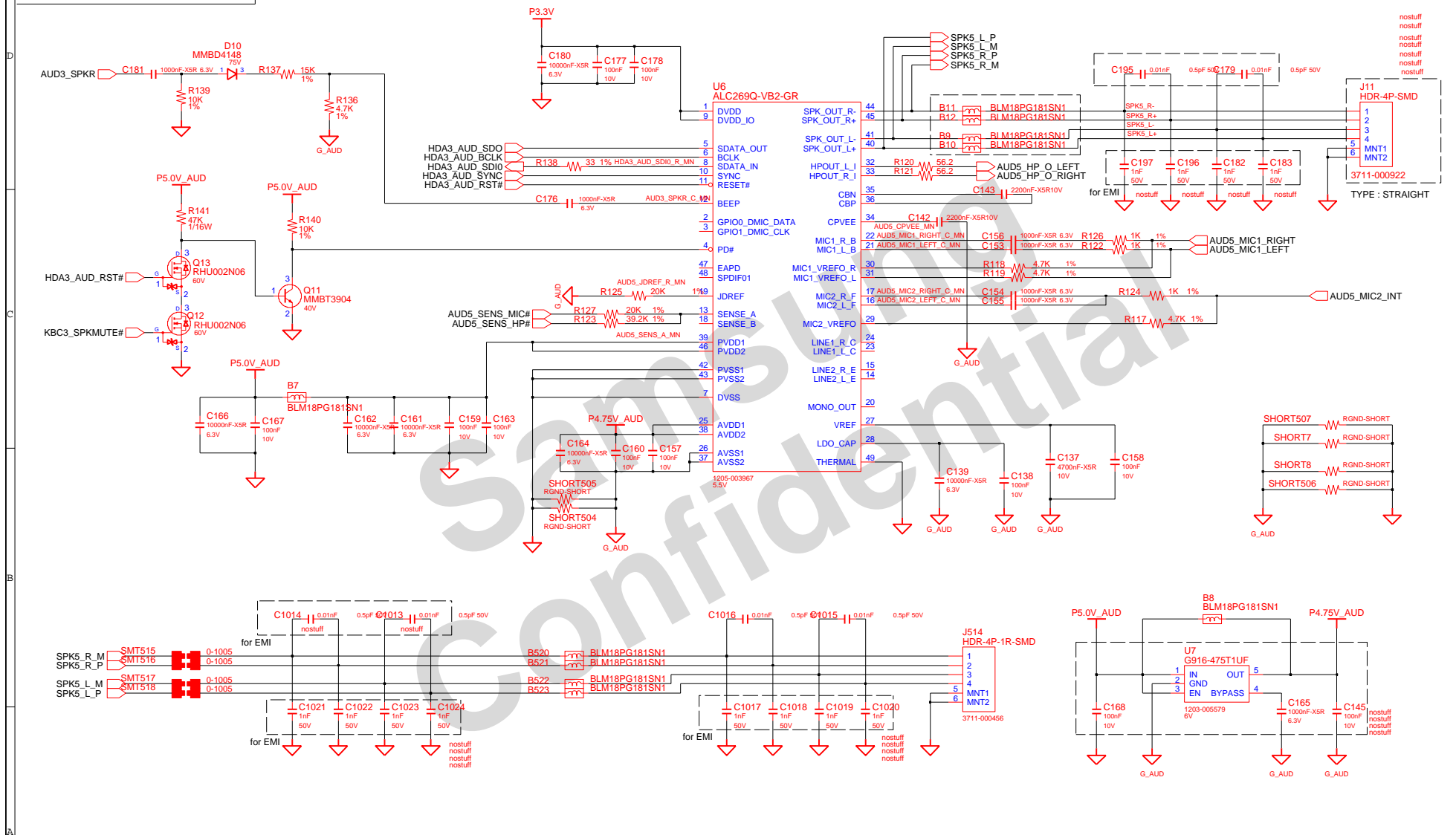
Internal Default Value

|                               |           |           |           |                                 |                               |
|-------------------------------|-----------|-----------|-----------|---------------------------------|-------------------------------|
| DESIGN                        | MS YANG   | DATE      | 8/19/2010 | Jinmao-L<br>GRAPHICS_IF<br>HDMI | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK                         | MK KIM    | DEV. STEP | PR        |                                 |                               |
| APPROVAL                      | BL LEE    | REV       | rev. 1.0  |                                 |                               |
| MODULE CODE                   | LAST EDIT |           |           |                                 |                               |
| November 22, 2010 15:53:34 PM |           |           |           | PAGE                            | 30 OF 52                      |

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# HD AUDIO

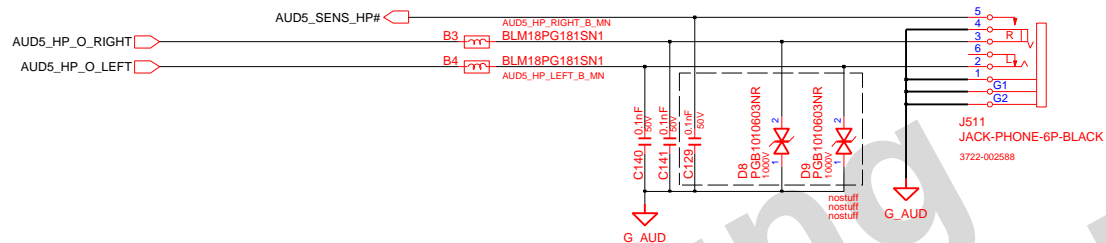


|             |         |           |           |  |   |
|-------------|---------|-----------|-----------|--|---|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE<br><br>Jinmao-L<br><br>HDA_CODEC SUB<br><br>AUDIO CODEC ALC269 SUB | <b>SAMSUNG</b><br><br>ELECTRONICS<br><br>PART NO. BA41-01432A |
| CHECK       | MK KIM  | DEV. STEP | PR        |  |   |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |  |   |
| MODULE CODE |         | LAST EDIT |           |  |   |
|             |         |           |           | November 22, 2010 15:53:34 PM  | PAGE 31 OF 52   |

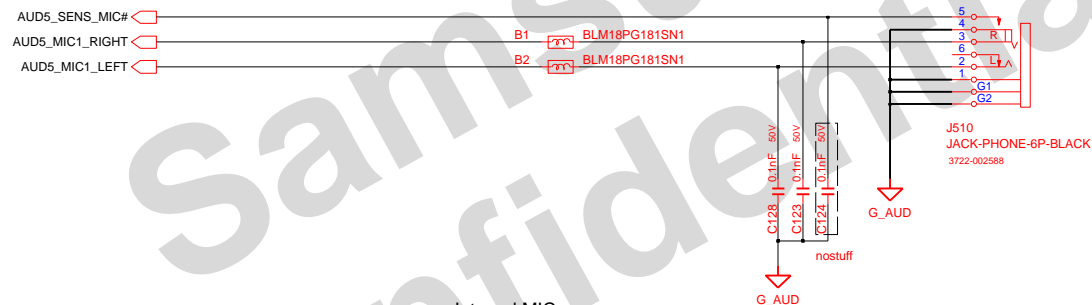
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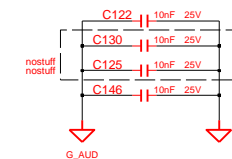
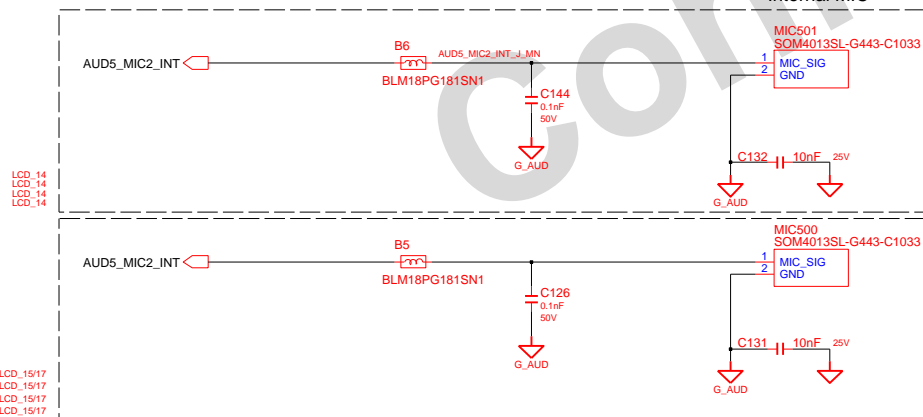
## HEADPHONE



## MIC JACK



## Internal MIC



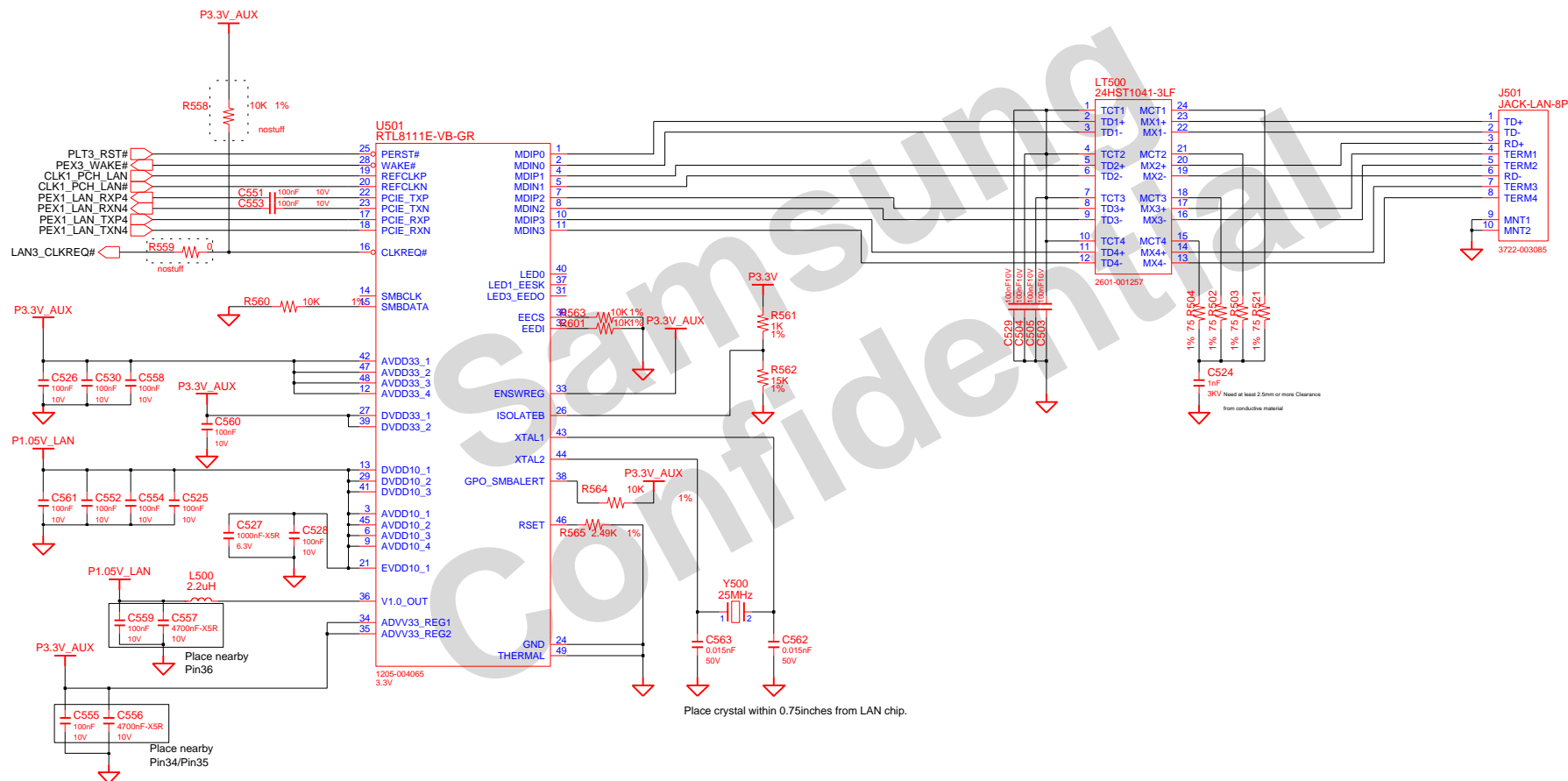
|             |         |           |           |                               |          |             |
|-------------|---------|-----------|-----------|-------------------------------|----------|-------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L | SAMSUNG     |
| CHECK       | MK KIM  | DEV. STEP | PR        | HDA_CODEC & LED SUB           |          | ELECTRONICS |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  | AUDIO JACK & LED SUB          | PART NO. | BA41-01432A |
| MODULE CODE |         | LAST EDIT |           | November 22, 2010 15:53:34 PM | PAGE     | 32 OF 52    |



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# Reatek RTL8111E

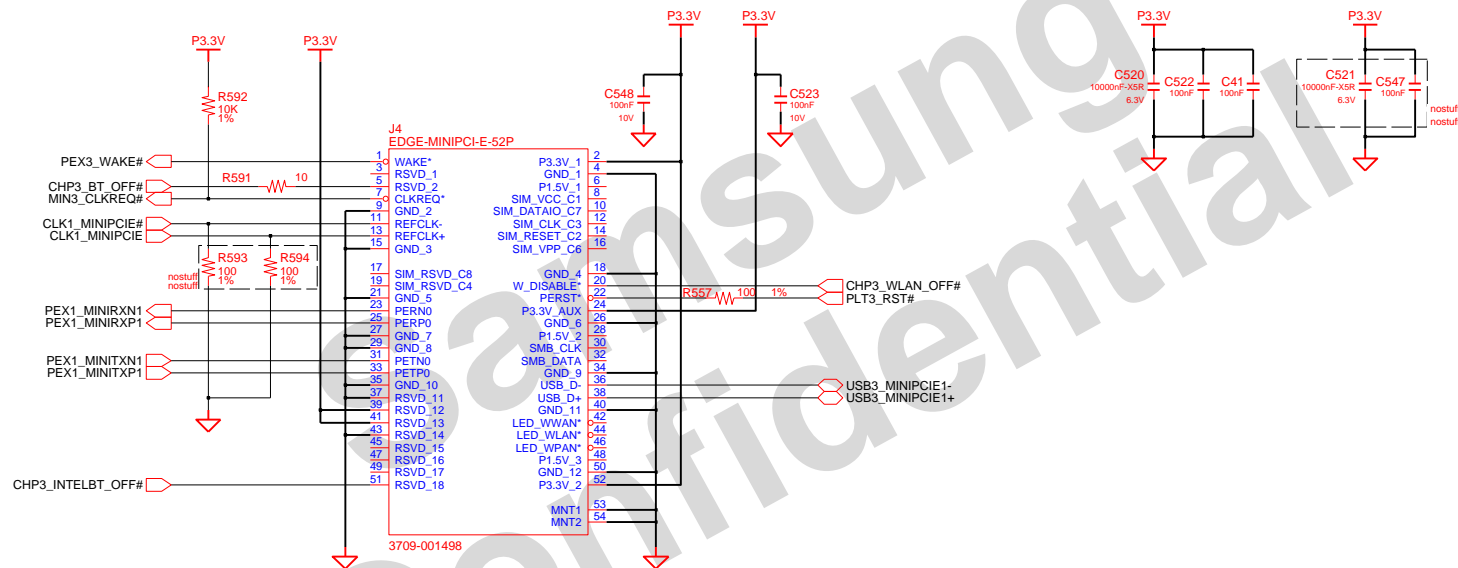


|             |         |           |           |                               |                     |                         |
|-------------|---------|-----------|-----------|-------------------------------|---------------------|-------------------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L            | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM  | DEV. STEP | PR        |                               | LAN                 |                         |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                               | LAN_Realtek_RTL8111 |                         |
| MODULE CODE |         | LAST EDIT |           |                               |                     | PART NO.<br>BA41-01432A |
|             |         |           |           | November 22, 2010 15:53:34 PM | PAGE 33             | OF 52                   |

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## WLAN Height : 4.0mm



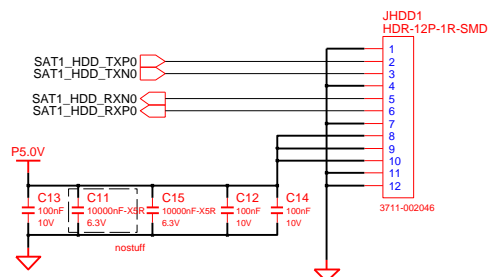
|             |         |           |           |                               |          |             |
|-------------|---------|-----------|-----------|-------------------------------|----------|-------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L | SAMSUNG     |
| CHECK       | MK KIM  | DEV. STEP | PR        | WLAN                          | WLAN     | ELECTRONICS |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  | WLAN                          | WLAN     | PART NO.    |
| MODULE CODE |         | LAST EDIT |           |                               |          | BA41-01432A |
|             |         |           |           | November 22, 2010 15:53:34 PM | PAGE     | 34 OF 52    |

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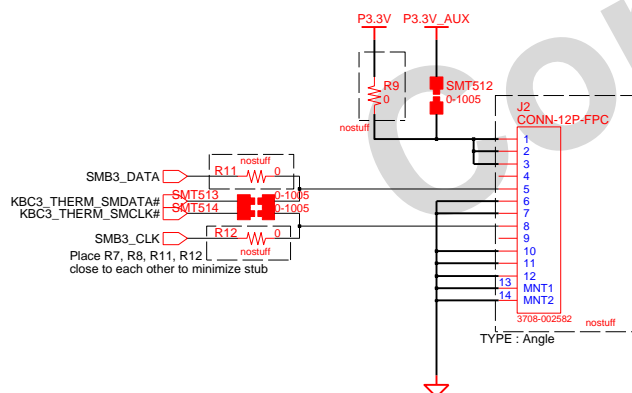
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## SATA HDD CONN

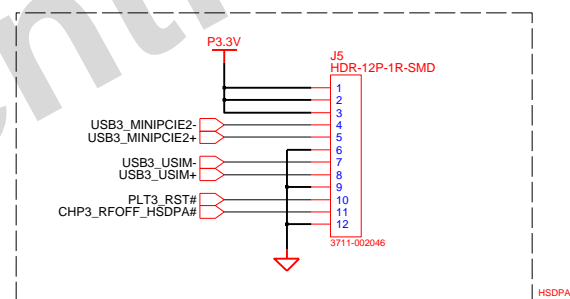
Cable Connector Type



FOR IR

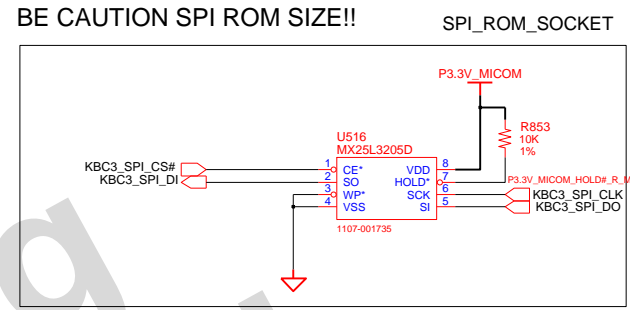



## MAIN to HSDPA SUB



|             |         |           |           |                               |               |             |
|-------------|---------|-----------|-----------|-------------------------------|---------------|-------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L      | SAMSUNG     |
| CHECK       | MK KIM  | DEV. STEP | PR        |                               | SATA HDD & IR | ELECTRONICS |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                               | SATA HDD & IR | PART NO.    |
| MODULE CODE |         | LAST EDIT |           |                               |               | BA41-01432A |
|             |         |           |           | November 22, 2010 15:53:34 PM | PAGE          | 35 OF 52    |

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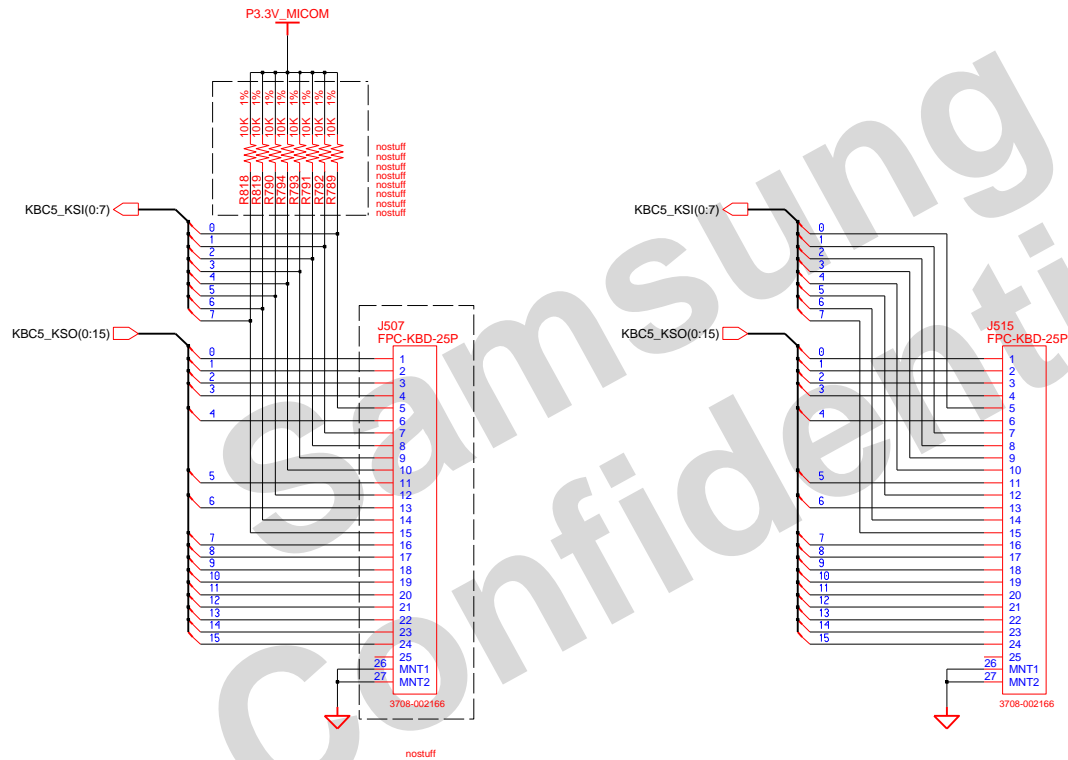


|             |           |           |           |                                   |   |             |
|-------------|-----------|-----------|-----------|-----------------------------------|---|-------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010 | Jinmao-L<br>MICOM<br>SMSC MEC1300 |  |             |
| CHECK       | MK KIM    | DEV. STEP | PR        |                                   |   |             |
| APPROVAL    | BL LEE    | REV       | REV. 1.0  |                                   |   |             |
|             |           |           |           |                                   | PART NO.  | BA41-01432A |
| MODULE CODE | LAST EDIT |           |           | November 22, 2010 15:53:34 PM     | PAGE  | 36 OF 52    |

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# Micom Glue Logic

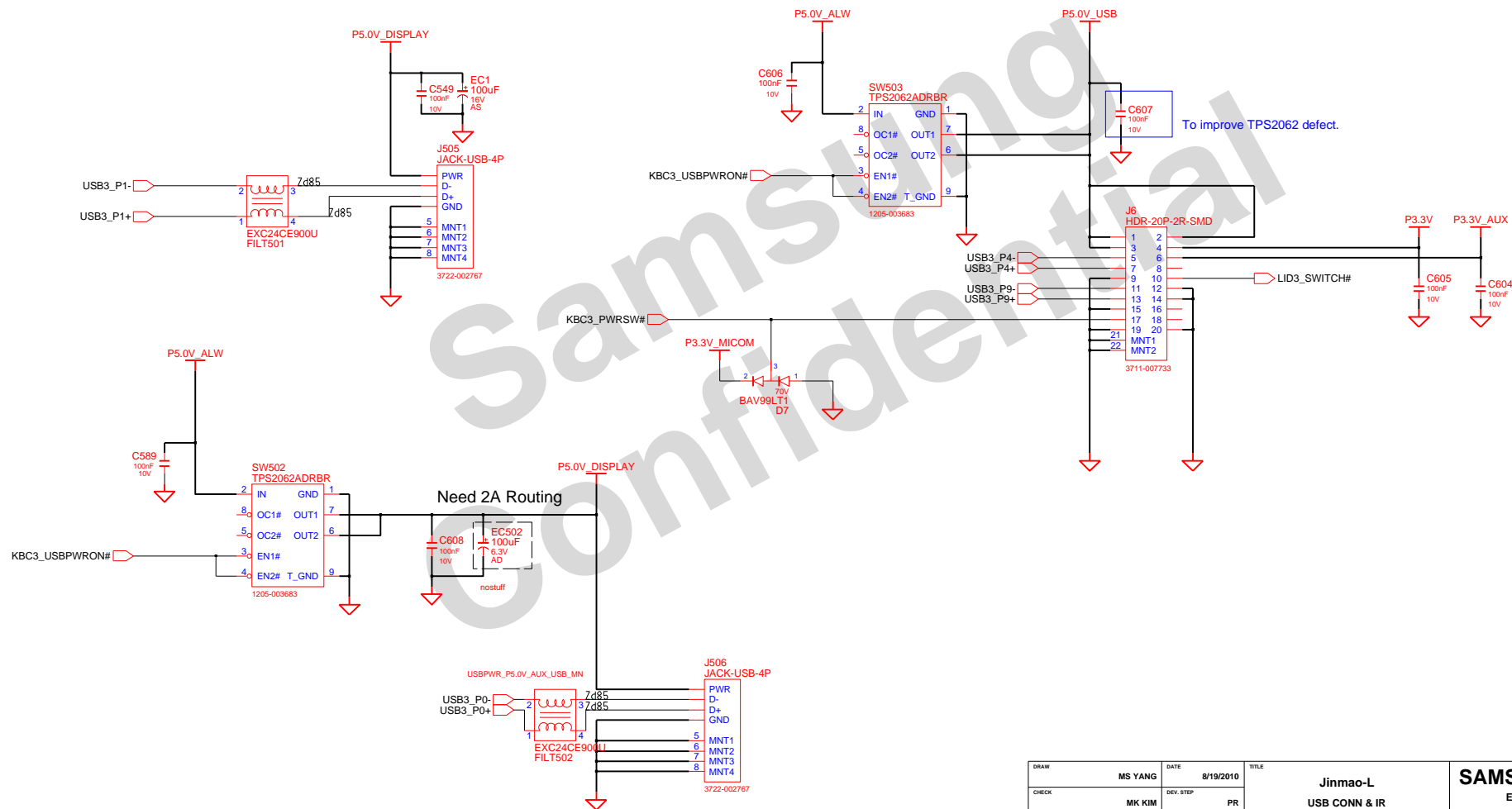
## KEYBOARD



|             |         |           |           |                               |                  |                         |
|-------------|---------|-----------|-----------|-------------------------------|------------------|-------------------------|
| DRAW        | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L         | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM  | DEV. STEP | PR        |                               | MICOM GLUE LOGIC |                         |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                               | MICOM GLUE LOGIC |                         |
| MODULE CODE |         | LAST EDIT |           | November 22, 2010 15:53:34 PM | PAGE 37 OF 52    | PART NO.<br>BA41-01432A |

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

|             |           |           |                               |                           |      |   |    |    |
|-------------|-----------|-----------|-------------------------------|---------------------------|------|---|----|----|
| DRAW        | MS YANG   | DATE      | 8/19/2010                     | TITLE                     |      | SAMSUNG<br>ELECTRONICS<br><br>PART NO.<br>BA41-01432A |    |    |
| CHECK       | MK KIM    | DEV. STEP | PR                            | Jinmao-L<br>USB CONN & IR |      |   |    |    |
| APPROVAL    | BL LEE    | REV       | rev. 1.0                      | USB & IR                  |      |   |    |    |
| MODULE CODE | LAST EDIT |           | November 22, 2010 15:53:34 PM |                           |      |   |    |    |
|             |           |           |                               |                           | PAGE | 38  | OF | 52 |

**Table 1: KBC3\_CHG4.2V, VCHG, and VREF Voltages**

| KBC3_CHG4.2V | KBC3_CHG4.15V | VCHG    |
|--------------|---------------|---------|
| 0            | 0             | 12.597V |
| 1            | 0             | 12.509V |
| 0            | 1             | 12.443V |
| 1            | 1             | 12.391V |

**Table 2: Adapter configuration**

| Adapter configuration |             |                     |             |
|-----------------------|-------------|---------------------|-------------|
| 60W / 3.03A / 96%     |             | 90W / 4.32A / 91.2% |             |
| Value                 | SEC Code    | Value               | SEC Code    |
| Rtop 200K             | 2007-007334 | 10K                 | 2007-007142 |
| Rbot 27.4K            | 2007-007274 | 30K                 | 2007-008275 |

**Table 3: VREF Voltages**

| VREF             | VREF              |
|------------------|-------------------|
| 2.561A @ (0.58C) | 1.792A @ (0.407C) |

**Table 4: Adapter configuration**

| Adapter configuration |             |                     |             |
|-----------------------|-------------|---------------------|-------------|
| 60W / 3.03A / 96%     |             | 90W / 4.32A / 91.2% |             |
| Value                 | SEC Code    | Value               | SEC Code    |
| Rtop 200K             | 2007-007334 | 10K                 | 2007-007142 |
| Rbot 27.4K            | 2007-007274 | 30K                 | 2007-008275 |

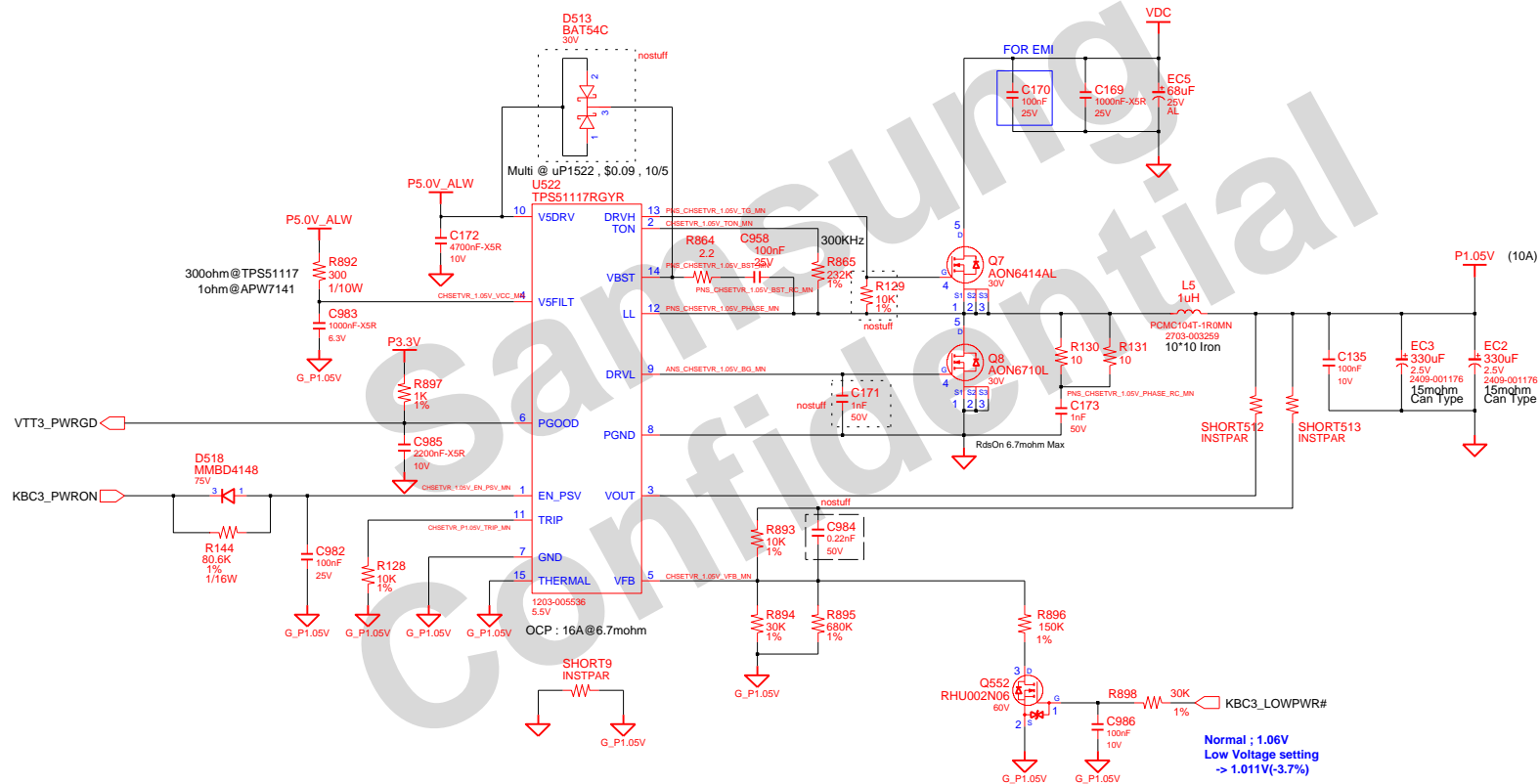
## P3.3V\_AUX & P5.0V\_AUX

D:/users/mobile39/mentor/Jinmao-L/Main/PR/Jinmao-L MAIN



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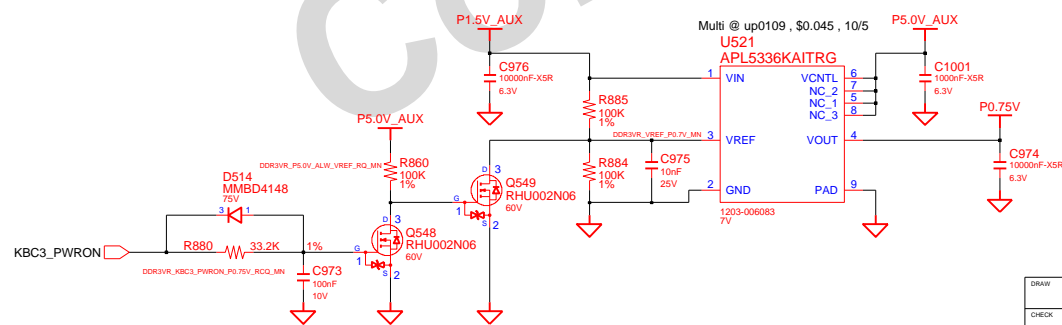
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**CHIPSET POWER(P1.05V)**

|             |         |           |           |                               |               |                         |
|-------------|---------|-----------|-----------|-------------------------------|---------------|-------------------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L      | SAMSUNG<br>ELECTRONICS  |
| CHECK       | MK KIM  | DEV. STEP | PR        |                               | P1.05V        |                         |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |                               | TI TPS51117R  |                         |
| MODULE CODE |         | LAST EDIT |           | November 22, 2010 15:53:34 PM | PAGE 41 OF 52 | PART NO.<br>BA41-01432A |

## DDR3 Power

## DDR3 VTT(0.75V)

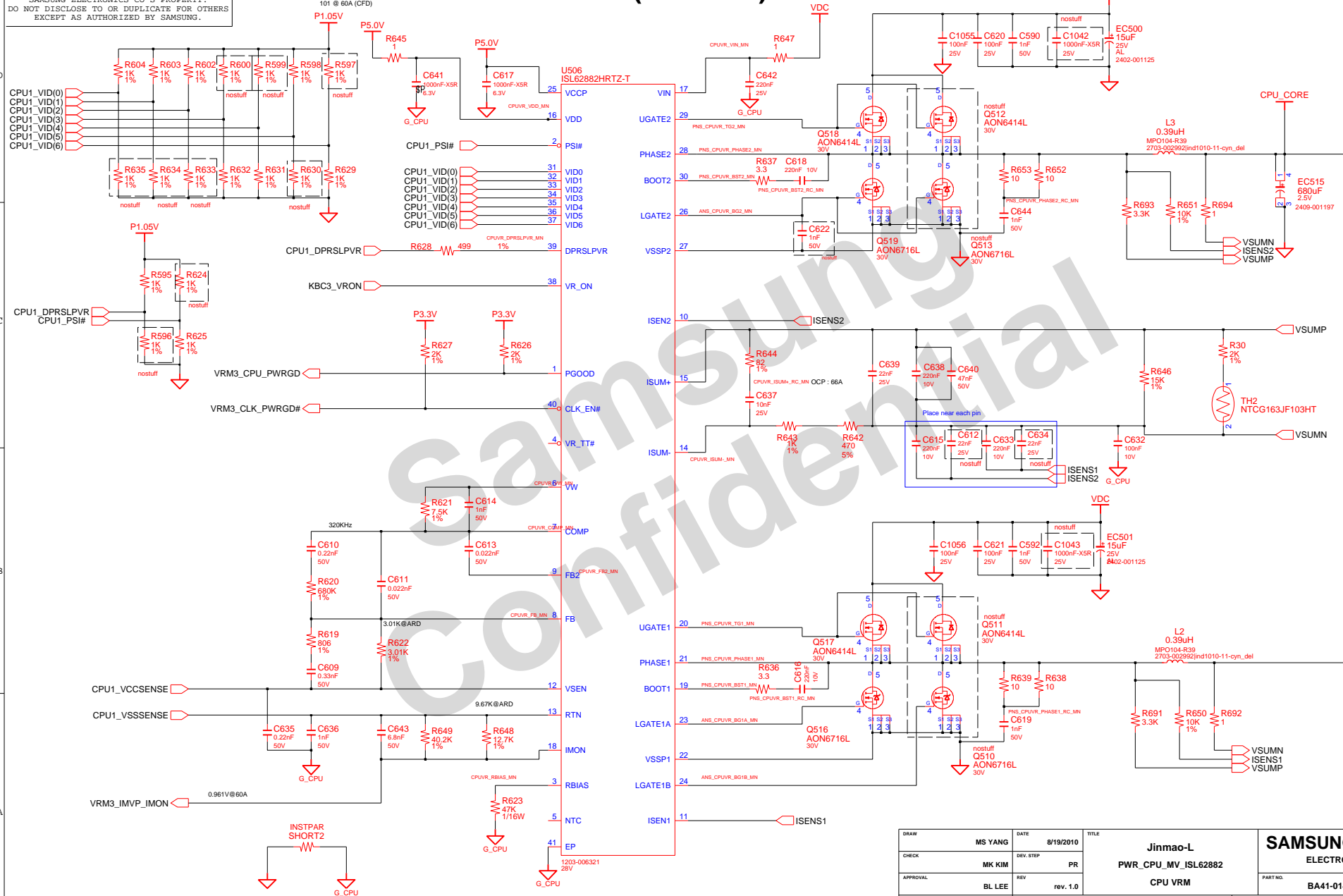


COM-22C-015(1996.6.5) REV. 3

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VID[5:3] @ IMON CPU Gain  
100 @ 50A (ARD)  
101 @ 60A (CFD)

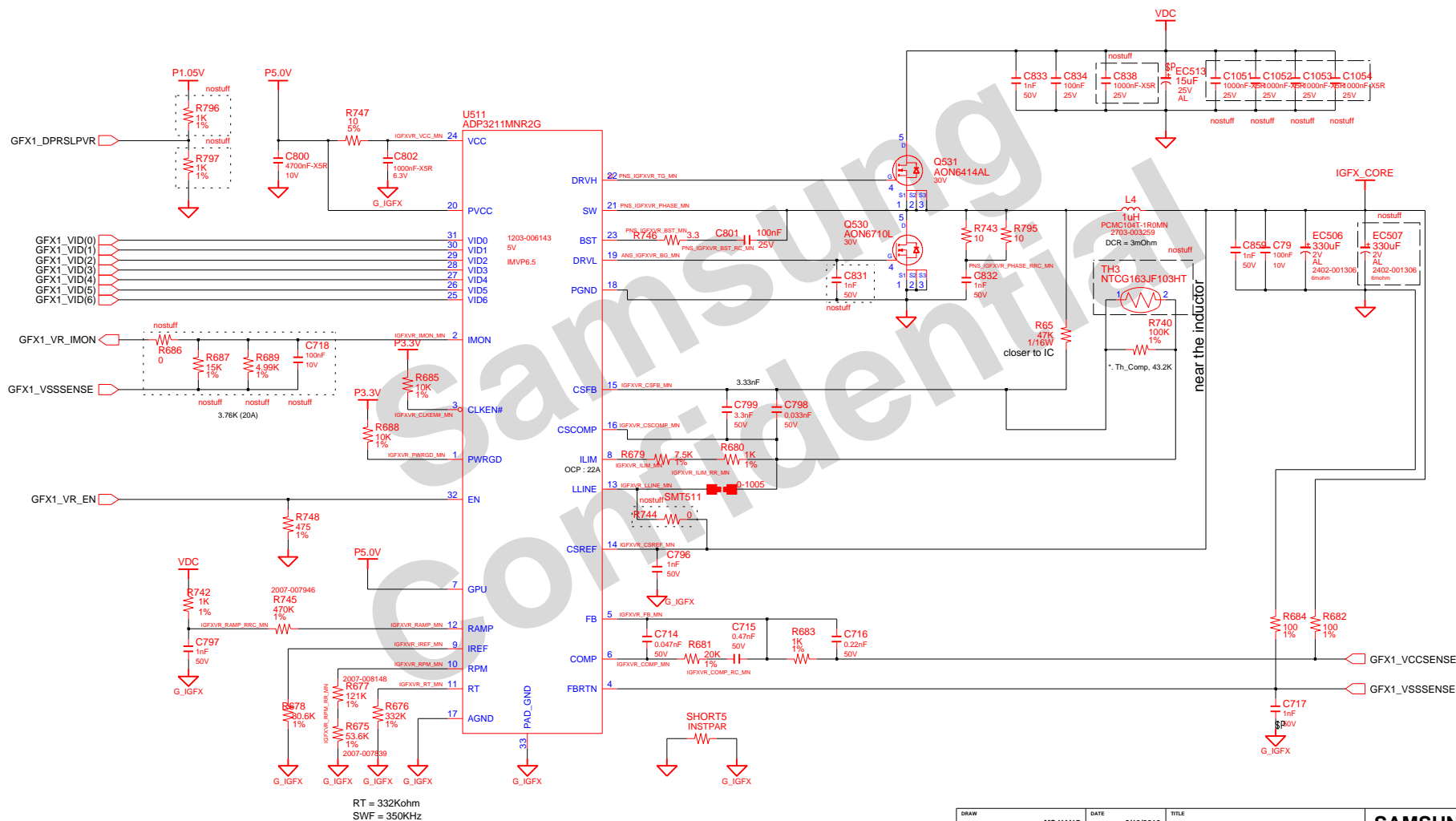
### CPU VRM (IMVP-6.5)



|             |           |           |           |   |  |                                   |    |    |    |
|-------------|-----------|-----------|-----------|---|--|-----------------------------------|----|----|----|
| DRAW        | MS YANG   | DATE      | 8/19/2010 | TITLE<br><br>Jinmao-L<br><br>PWR_CPU_MV_ISL62882<br><br>CPU VRM |  | <b>SAMSUNG</b><br><br>ELECTRONICS |    |    |    |
| CHECK       | MK KIM    | DEV. STEP | PR        |   |  |                                   |    |    |    |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  | PART NO.<br><br>BA41-01432A                                     |  |                                   |    |    |    |
| MODULE CODE | undefined | LAST EDIT |           |   |  |                                   |    |    |    |
|             |           |           |           | November 22, 2010 15:53:34 PM                                   |  | PAGE                              | 43 | OF | 52 |

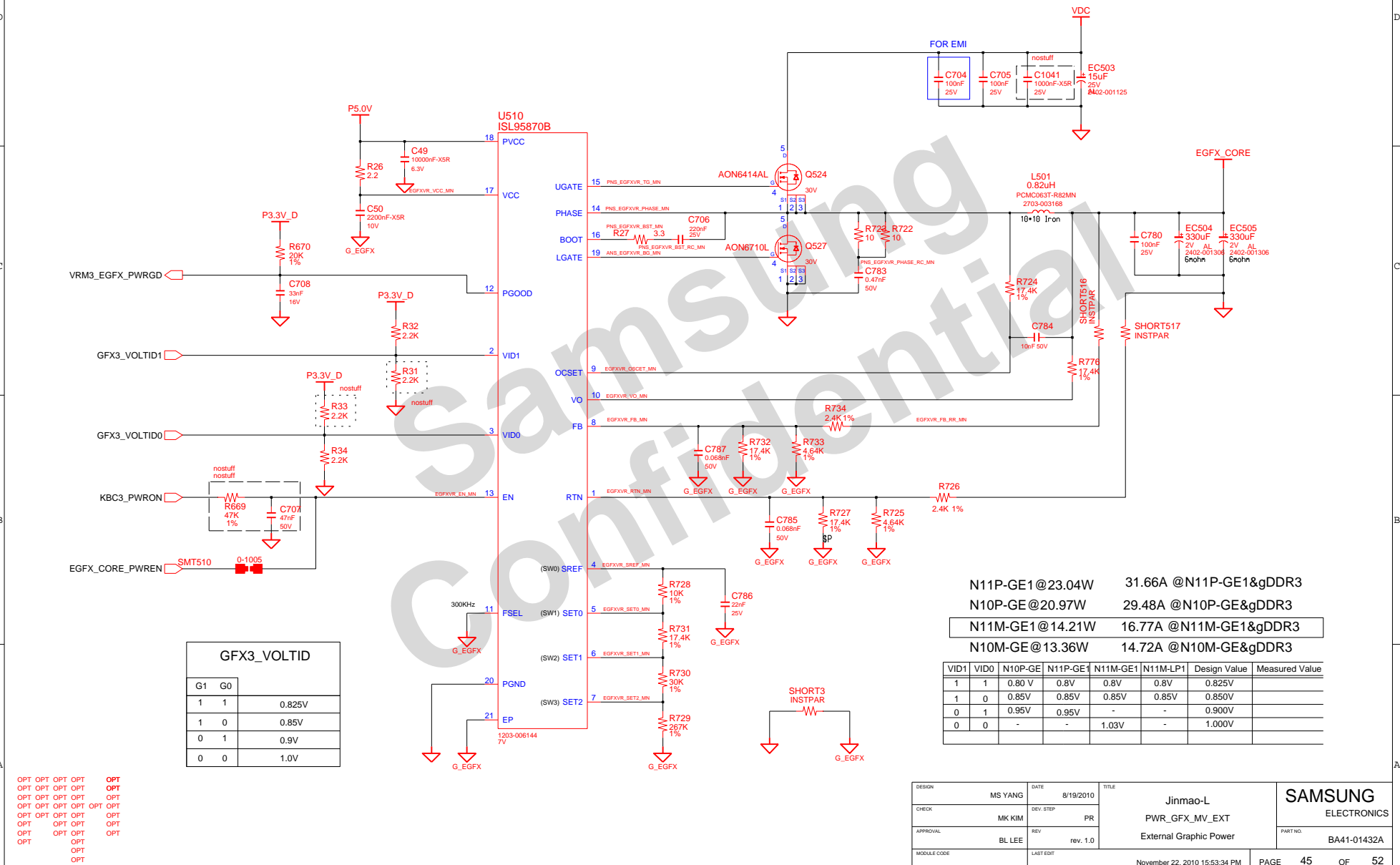
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## Internal GFX Core Power



|             |           |           |           |              |                               |                |             |
|-------------|-----------|-----------|-----------|--------------|-------------------------------|----------------|-------------|
| DRAW        | MS YANG   | DATE      | 8/19/2010 | TITLE        | Jinmao-L                      | <b>SAMSUNG</b> |             |
| CHECK       | MK KIM    | DEV. STEP | PR        | PWR GFX_INT_ | Internal Graphic Power        | ELECTRONICS    |             |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  |              |                               | PART NO.       | BA41-01432A |
| MODULE CODE | undefined | LAST EDIT |           |              | November 22, 2010 15:53:34 PM | PAGE           | 44 OF 52    |

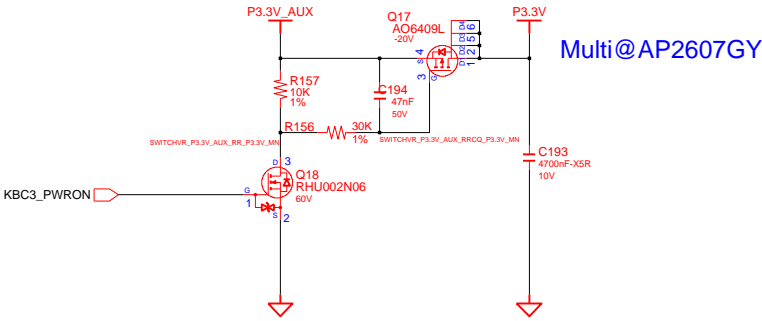
## External GFX Core Power



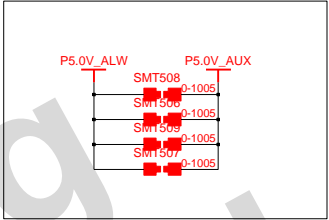
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# Switched Power

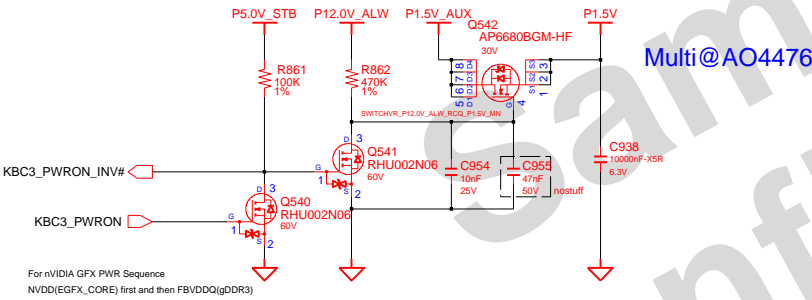
## Switched Power On (P3.3V)



## P5.0V\_AUX

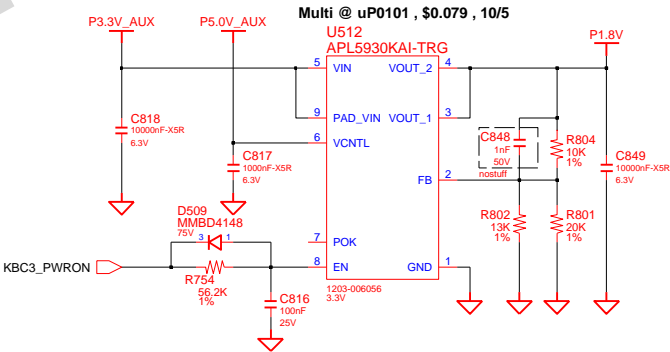


## Switched Power On (P1.5V)

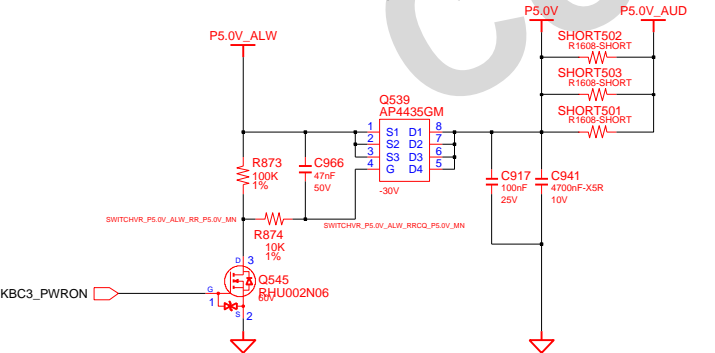


For nVidia GFX PWR Sequence  
NVDD(EGFX\_CORE) first and then FBVDDQ(gDDR3)

## P1.8V(LDO)



## Switched Power On (P5.0V)

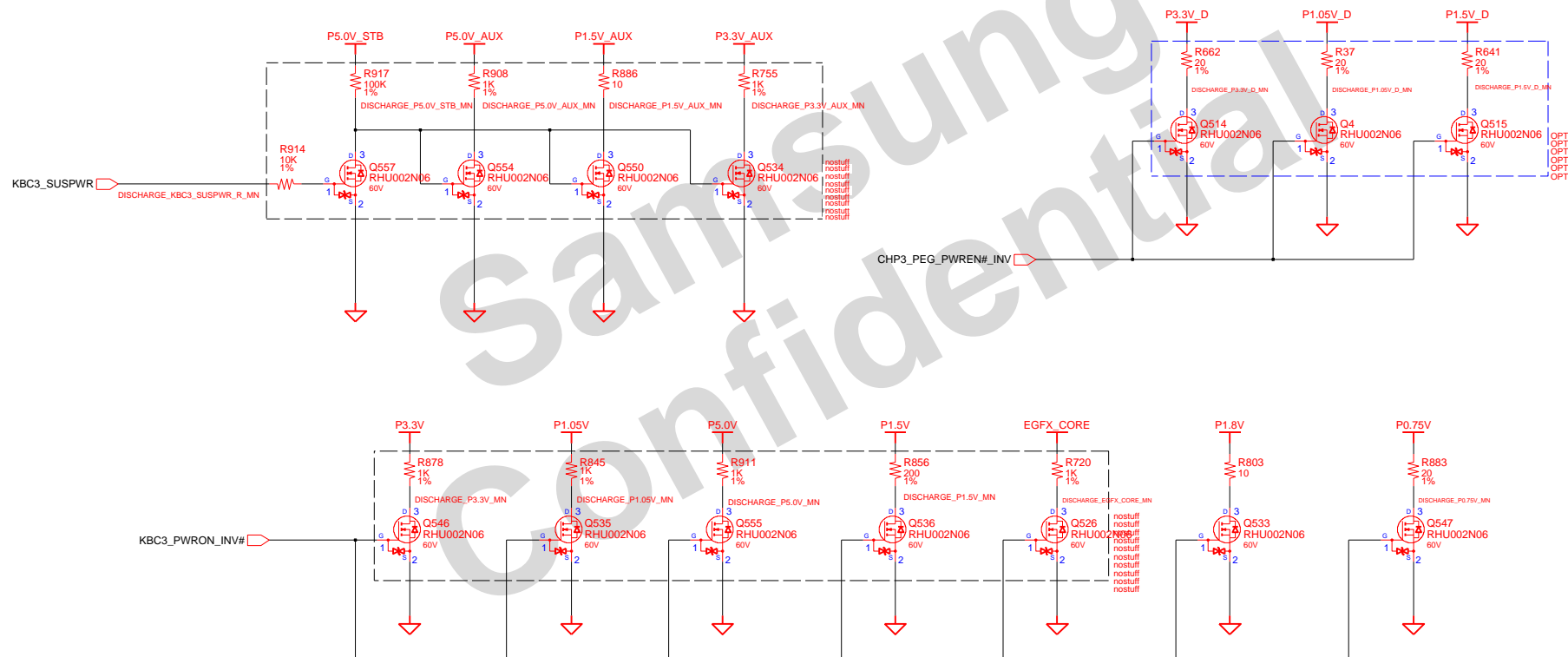


|             |         |           |                               |                 |             |             |
|-------------|---------|-----------|-------------------------------|-----------------|-------------|-------------|
| DRAW        | MS YANG | DATE      | 8/19/2010                     | TITLE           | Jinmao-L    | SAMSUNG     |
| CHECK       | MK KIM  | DEV. STEP | PR                            | PWR_MV_SWITCHED | ELECTRONICS |             |
| APPROVAL    | BL LEE  | REV       | rev. 1.0                      | SWITCHED POWER  | PART NO.    | BA41-01432A |
| MODULE CODE |         | LAST EDIT | November 22, 2010 15:53:34 PM | PAGE            | 46          | OF 52       |

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# POWER DISCHARGER



|             |           |           |           |                               |  |          |    |             |    |
|-------------|-----------|-----------|-----------|-------------------------------|--|----------|----|-------------|----|
| DRAW        | MS YANG   | DATE      | 8/19/2010 | TITLE                         |  | Jinmao-L |    | SAMSUNG     |    |
| CHECK       | MK KIM    | DEV. STEP | PR        | PWR_MV_DISCHARGER             |  |          |    | ELECTRONICS |    |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  | DISCHARGING LOGIC             |  | PART NO. |    | BA41-01432A |    |
| MODULE CODE | undefined | LAST EDIT |           | November 22, 2010 15:53:34 PM |  | PAGE     | 47 | OF          | 52 |

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40mil pattern

3-in-1 Socket Reverse Type  
Support : SD/MMC/SDHC

Confidential

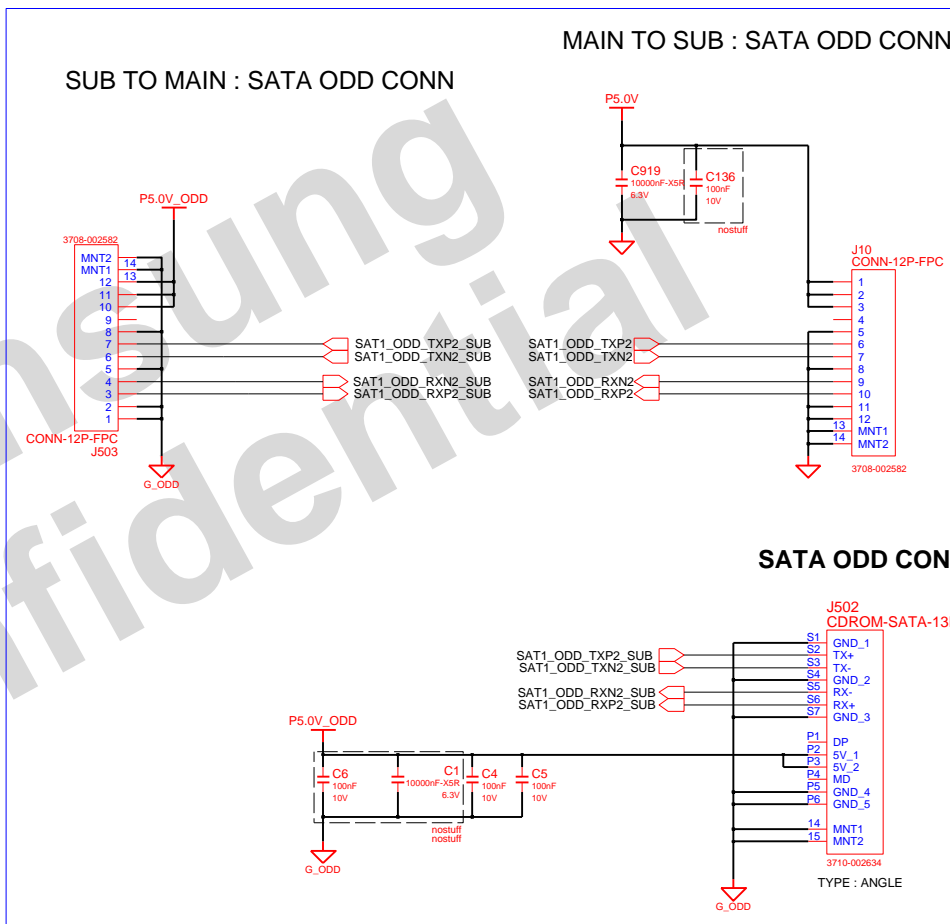
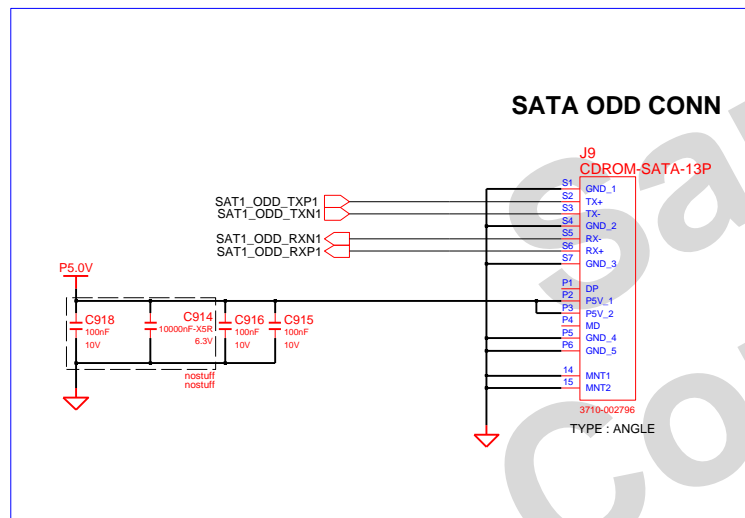
|             |         |           |           |   |                            |
|-------------|---------|-----------|-----------|---|----------------------------|
| DESIGN      | MS YANG | DATE      | 8/19/2010 | TITLE<br><br>Jinmao-L<br><br>AU 6437<br><br>AU 6437 | SAMSUNG<br><br>ELECTRONICS |
| CHECK       | MK KIM  | DEV. STEP | PR        |   |                            |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  |   |                            |
| MODULE CODE |         |           |           |   |                            |
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# SATA ODD SUB BOARD

**15.6" & 17.3"****MAIN TO SUB : SATA ODD CONN****SUB TO MAIN : SATA ODD CONN****14"****SATA ODD CONN****MT505  
RMNT-25-65-1P****G\_ODD**

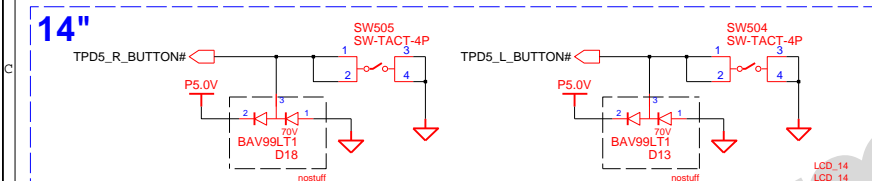
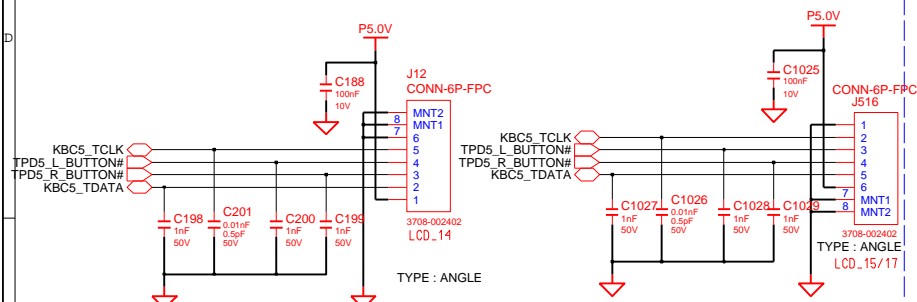
ODD sub board mount hole

|             |         |           |           |                               |          |  |
|-------------|---------|-----------|-----------|-------------------------------|----------|--|
| DRAW        | MS YANG | DATE      | 8/19/2010 | TITLE                         | Jinmao-L | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO.<br>BA41-01432A |
| CHECK       | MK KIM  | DEV. STEP | PR        | SATA ODD                      | SATA ODD |  |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  | SATA ODD                      |          |  |
| MODULE CODE |         | LAST EDIT |           | November 22, 2010 15:53:34 PM | PAGE     | 49 OF 52   |

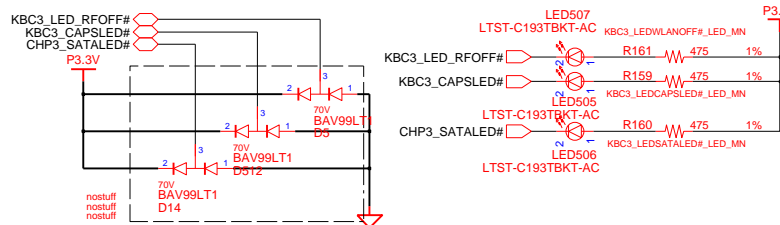
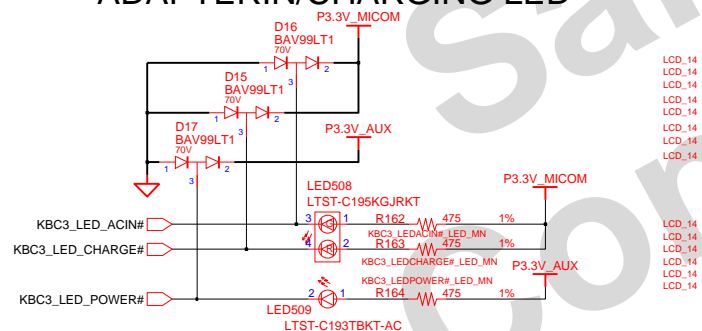
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## TOUCHPAD

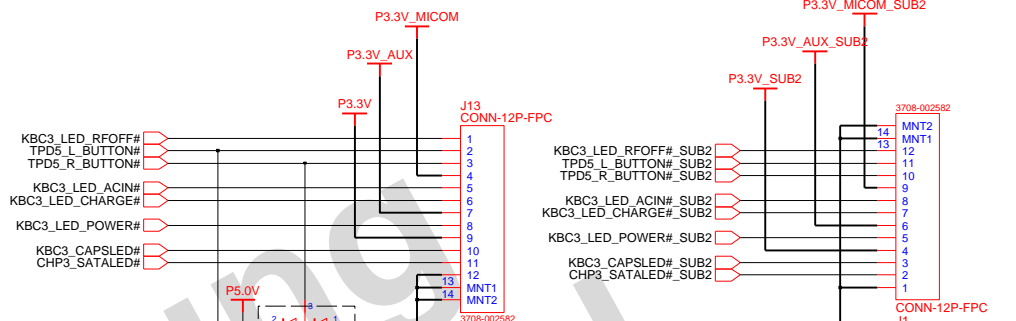


## ADAPTERIN/CHARGING LED

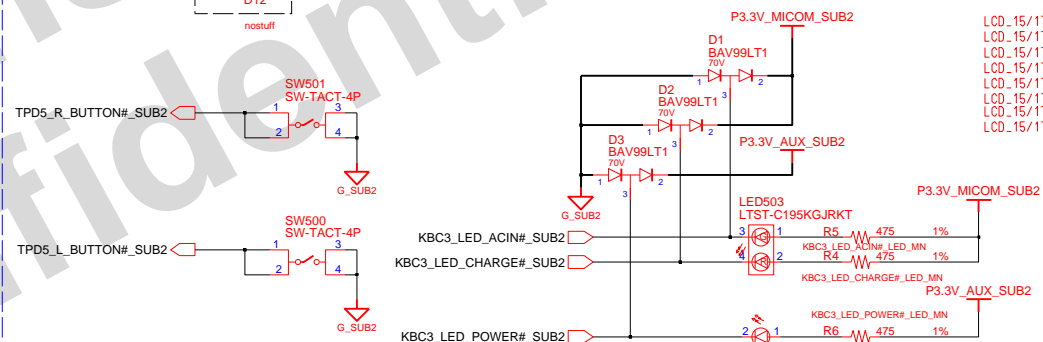


## 15.6" & 17.3"

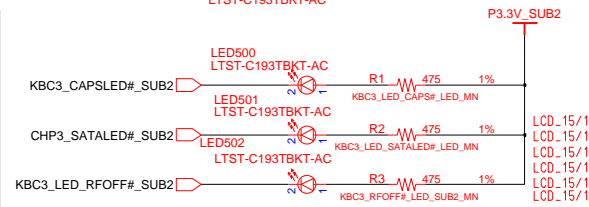
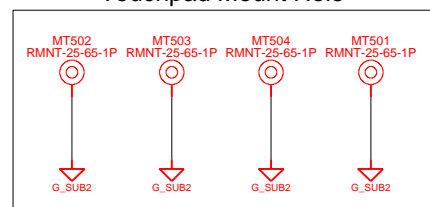
## TOUCHPAD MAIN TO SUB TOUCHPAD SUB TO MAIN



## ADAPTERIN/CHARGING LED



## Touchpad Mount Hole



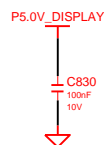
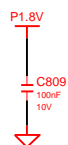
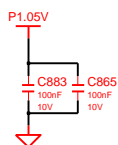
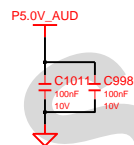
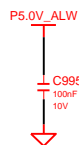
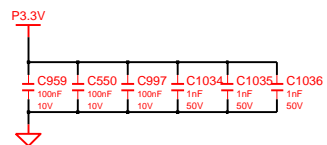
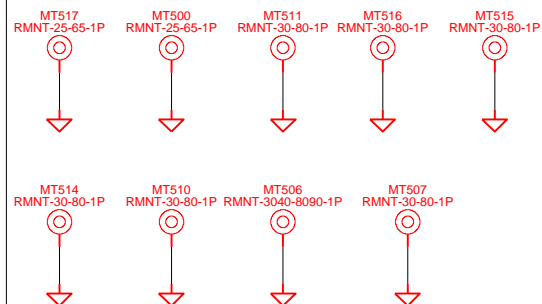
|                               |         |           |           |       |          |
|-------------------------------|---------|-----------|-----------|-------|----------|
| DRAW                          | MS YANG | DATE      | 8/19/2010 | TITLE | Jinmao-L |
| CHECK                         | MK KIM  | DEV. STEP | PR        |       | Touchpad |
| APPROVAL                      | BL LEE  | REV       | rev. 1.0  |       | Touchpad |
| MODULE CODE                   |         | LAST EDIT |           |       |          |
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**SAMSUNG**  
ELECTRONICS  
PART NO.  
BA41-01432A

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**Mainboard Mount ((25-65)X2EA, (30-80)X7EA)**



|             |           |           |           |          |                               |                        |
|-------------|-----------|-----------|-----------|----------|-------------------------------|------------------------|
| DESIGN      | MS YANG   | DATE      | 8/19/2010 | TITLE    | Jinmao-L                      | SAMSUNG<br>ELECTRONICS |
| CHECK       | MK KIM    | DEV. STEP | PR        | MNT hole |                               |                        |
| APPROVAL    | BL LEE    | REV       | rev. 1.0  | MNT hole | PART NO.<br>BA41-01432A       |                        |
| MODULE CODE | LAST EDIT |           |           |          | November 22, 2010 15:53:34 PM | PAGE 51 OF 52          |

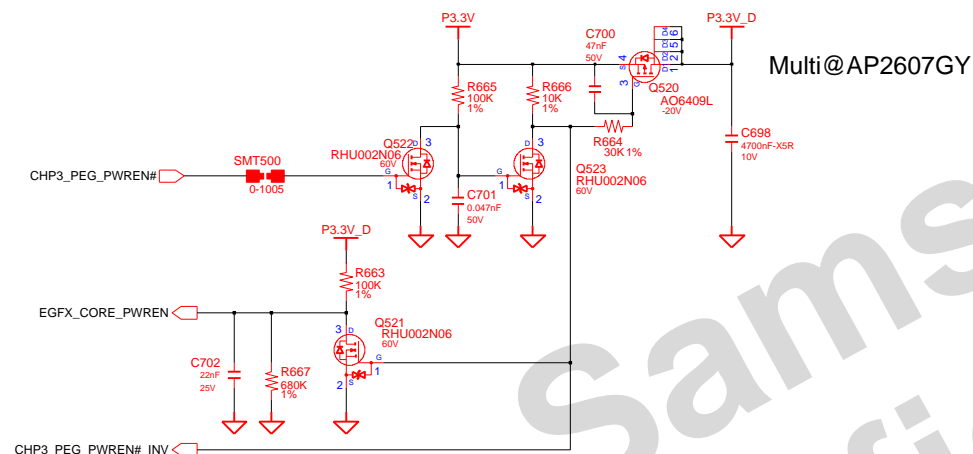
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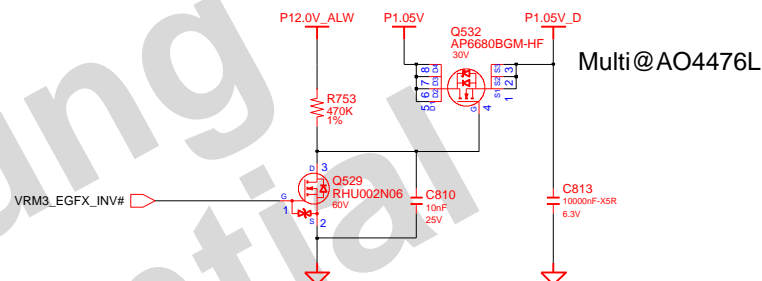
## Switched Power 2 (For nVidia GFX Power Sequence)

Sequence (D3.3V -> GFX Core -> D1.8V -> D1.5V -> D1.05V)

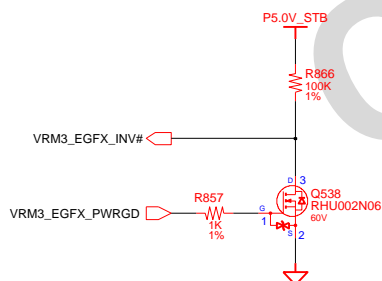
Discrete Switched Power (D3.3V : Max\_1.2A)



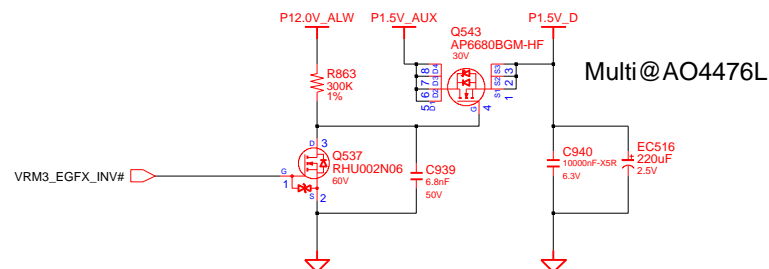
Discrete Switched Power (D1.05V : Max 3.6A)



Discrete Switched Power (D1.8V : Max 0.5A)



Discrete Switched Power (D1.5V : Max 5.0A)



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|             |         |           |           |                               |             |             |
|-------------|---------|-----------|-----------|-------------------------------|-------------|-------------|
| DRAW        | MS YANG | DATE      | 5/10/2010 | TITLE                         | Jinmao-L    | SAMSUNG     |
| CHECK       | MK KIM  | DEV. STEP | PR        | Switched PWR 2                | ELECTRONICS |             |
| APPROVAL    | BL LEE  | REV       | rev. 1.0  | FOR OPTIMUS PWR               | PART NO.    | BA41-01432A |
| MODULE CODE |         | LAST EDIT |           |                               |             |             |
|             |         |           |           | November 22, 2010 15:53:34 PM | PAGE        | 52 OF 52    |