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# CICHLID II

CPU : Intel Dothan533  
Chip Set : Intel Alviso & ICH6-M  
Remarks : Mobility Platform

Model Name : CICHLID II  
PBA Name : MAIN  
PCB Code : BA41-00489A (TPT)  
BA41-00537A (GCE)  
Dev. Step : MP  
Revision : 1.0  
T.R. Date : 2005.07.06

| DRAW | CHECK | APPROVAL |
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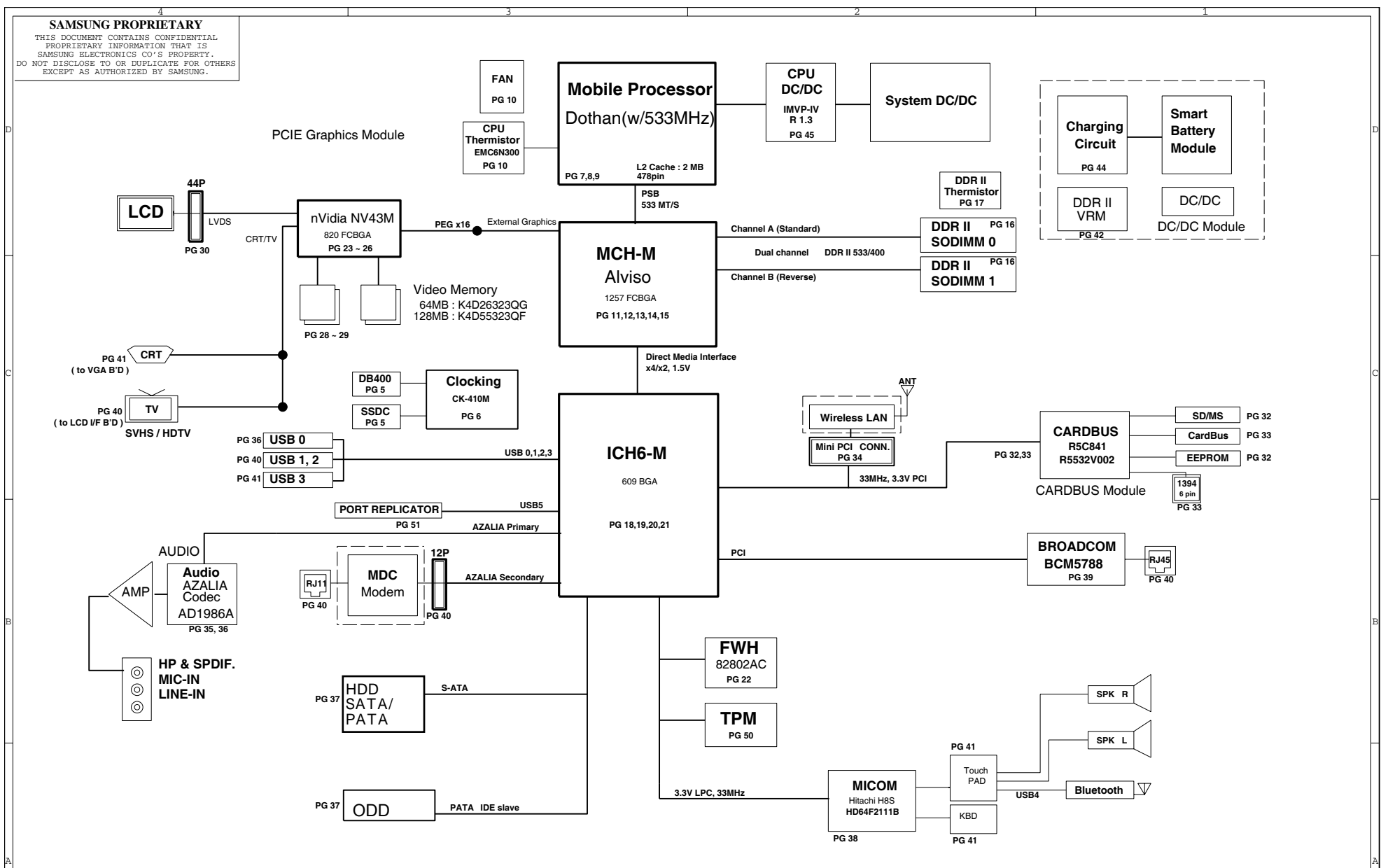
Owner : SEC Mobile R & D      Signature : X

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|             |           |           |                          |       |             |                        |
|-------------|-----------|-----------|--------------------------|-------|-------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II  | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | COVER | PART NO.    |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | BA41-00489A |                        |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 1 OF 56     |                        |

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|-------------|-----------|-----------|----------|-------|--|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE | CICH-LD-II<br>MAIN<br>OPERATION BLOCK DIAGRAM<br>July 7, 2005 11:26:14 AM PAGE 2 OF 56 | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y. SEO  | DEV. STEP | MP       |       |  |   |
| APPROVAL    | H.S. KIM  | REV       | 1.0      |       |  |   |
| MODULE CODE |           | LAST EDIT |          |       |  |   |
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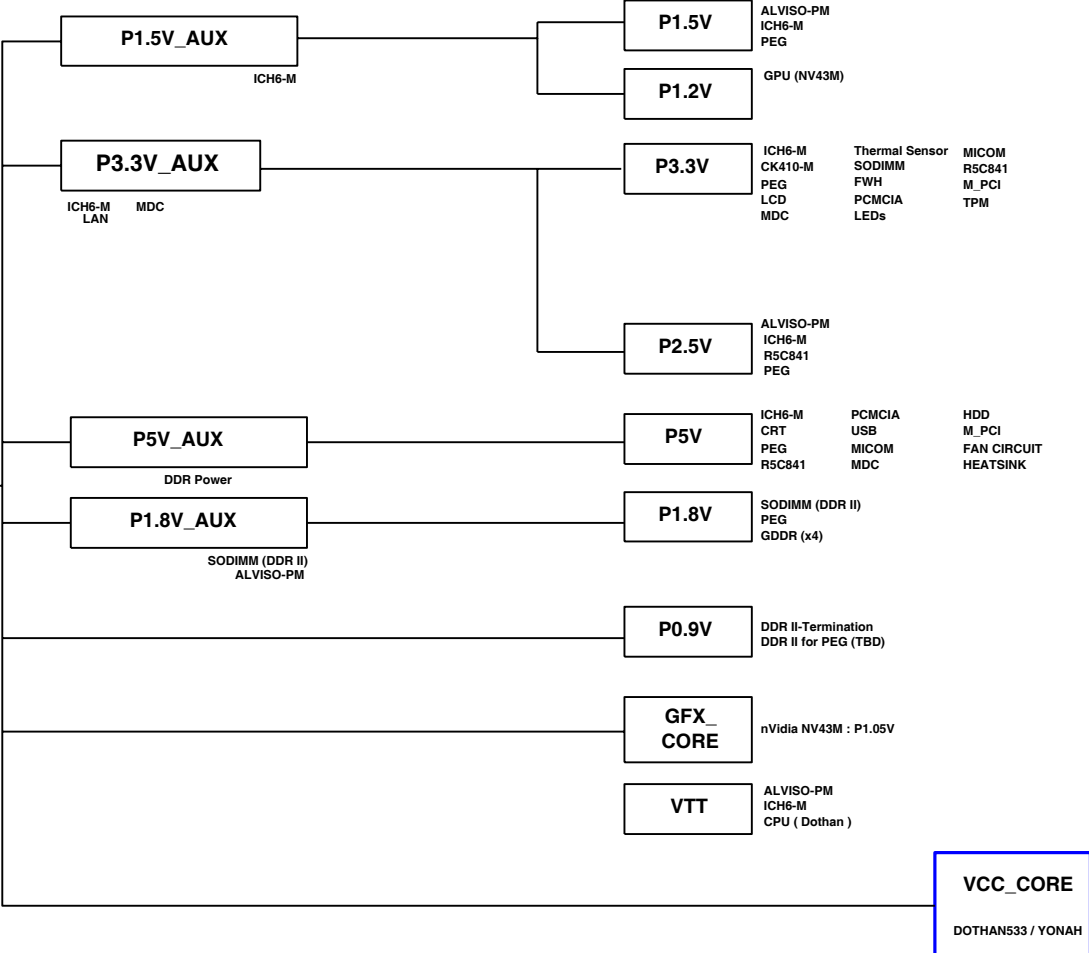
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# Power Diagram

**ADAPTOR  
BATTERY**

**VDC**

**MICOM\_P3V**

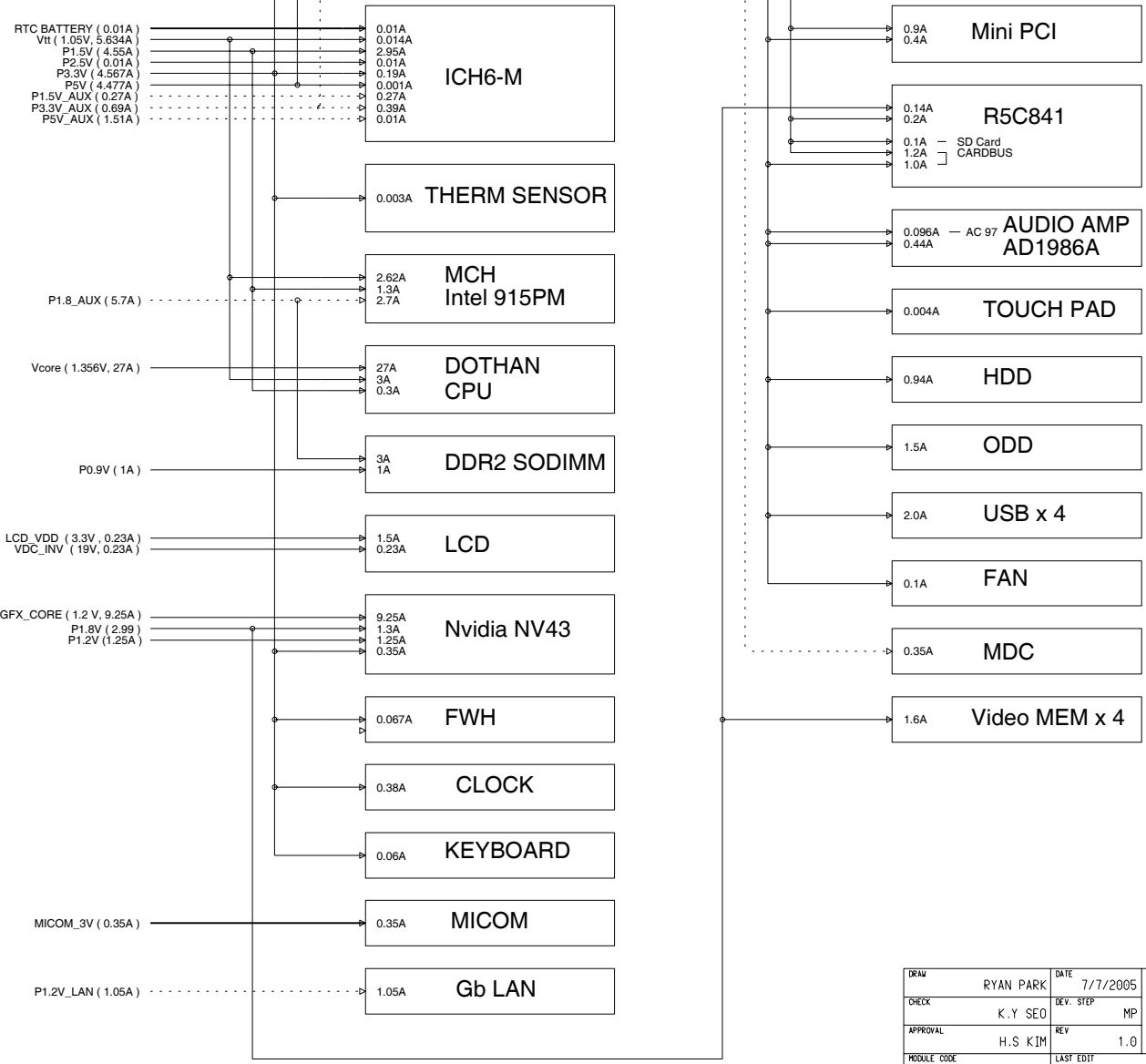
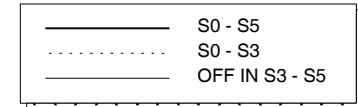


| Rail State | +V*Always | +V*AUX | +V  | SUSPWR | PWRON | VRON |
|------------|-----------|--------|-----|--------|-------|------|
| Full On    | ON        | ON     | ON  | ON     | ON    | ON   |
| S3         | ON        | ON     | OFF | ON     | OFF   | OFF  |
| S4         | ON        | ON     | OFF | ON     | OFF   | OFF  |
| S5         | ON        | OFF    | OFF | OFF    | OFF   | OFF  |

|             |           |           |                          |       |                                     |   |
|-------------|-----------|-----------|--------------------------|-------|-------------------------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>MAIN<br>POWER DIAGRAM | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y. SEO  | DEV. STEP | MP                       |       |                                     |   |
| APPROVAL    | H.S. KIM  | REV       | 1.0                      |       |                                     |   |
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| DRAW        | RYAN PARK | DATE                     | 7/7/2005 | TITLE     | CICHLID-II<br>POWER BLOCK | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP                | MP       | PART NO.  |                           |                               |
| APPROVAL    | H.S KIM   | REV                      | 1.0      | LAST EDIT |                           | PAGE 4 OF 56                  |
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# SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

## PCI Devices

| Devices                   | IDSEL#         | REQ/GNT# | Interrupts   |
|---------------------------|----------------|----------|--|
| Cardbus                   | AD25           | 0        | A,B,C  |
| LAN                       | AD21           | 2        | G  |
| MiniPCI SLOT1             | AD23           | 1        | E, F   |
| MiniPCI SLOT2             | AD22           | 3        | D, G   |
| USB                       | AD29(internal) | -        | USB2.0 #0 : A<br>USB2.0 #1 : D<br>USB2.0 #2 : C<br>USB2.0 #3 : ??? |
| Hub to PCI                | AD30(internal) | -        | -  |
| LPC bridge/IDE/AC97/SMBUS | AD31(internal) | -        | B  |
| Internal MAC              | AD24(internal) | -        | E  |
| AC Link                   | -              | -        | B  |

## Voltage Rails

|           |   |
|-----------|---|
| VDC       | Primary DC system power supply (7 to 21V)   |
| VCC_CORE  | Core voltage for DOTHAN (1.308-1.068V)  |
| VTT       | DOTHAN/ALVISO Processor System Bus(PSB) Termination (1.05V)<br>MCH-M Core Voltage |
| P0.9V     | 0.9V switched power rail (off in S3-S5)   |
| P1.2V     | 1.2V switched power rail (off in S3-S5)   |
| P1.5V     | 1.5V switched power rail (off in S3-S5)   |
| P1.5V_AUX | 1.5V power rail (off in S4-S5)  |
| P1.8V     | 1.8V switched power rail (off in S3-S5)   |
| P1.8V_AUX | 1.8V power rail(off in S4-S5)   |
| P2.5V     | 2.5V switched power rail (off in S3-S5)   |
| MICOM_P3V | 3.3V always on power rail for MICOM   |
| P3.3V     | 3.3V switched power rail (off in S3-S5)   |
| P3.3V_AUX | 3.3V power rail (off in S4-S5)  |
| P3.3V_DTV | 3.3V power rail (off in S4-S5)  |
| P5V       | 5.0V switched power rail (off in S3-S5)   |
| P5V_AUX   | 5.0V power rail (off in S4-S5)  |

## CPU Core Voltage Table

| VID5          | VID4 | VID3 | VID2 | VID1 | VID0 | Voltage | VID5 | VID4 | VID3 | VID2 | VID1 | VID0 | Voltage |
|---------------|------|------|------|------|------|---------|------|------|------|------|------|------|---------|
| 0             | 0    | 0    | 0    | 0    | 0    | 1.708 V | 1    | 1    | 0    | 0    | 0    | 0    | 1.196 V |
| 0             | 0    | 0    | 0    | 0    | 1    | 1.692 V | 1    | 1    | 0    | 0    | 0    | 0    | 1.180 V |
| 0             | 0    | 0    | 0    | 1    | 0    | 1.676 V | 1    | 1    | 0    | 0    | 0    | 1    | 1.164 V |
| 0             | 0    | 0    | 0    | 1    | 1    | 1.660 V | 1    | 1    | 0    | 0    | 1    | 1    | 1.148 V |
| 0             | 0    | 1    | 0    | 0    | 0    | 1.644 V | 1    | 1    | 0    | 1    | 0    | 0    | 1.132 V |
| 0             | 0    | 1    | 0    | 1    | 0    | 1.628 V | 1    | 1    | 0    | 1    | 0    | 1    | 1.116 V |
| 0             | 0    | 1    | 1    | 0    | 0    | 1.612 V | 1    | 1    | 0    | 1    | 1    | 0    | 1.100 V |
| 0             | 0    | 1    | 1    | 1    | 0    | 1.596 V | 1    | 1    | 0    | 1    | 1    | 1    | 1.084 V |
| 0             | 0    | 1    | 0    | 0    | 0    | 1.580 V | 1    | 1    | 0    | 1    | 0    | 0    | 1.068 V |
| 0             | 0    | 1    | 0    | 0    | 1    | 1.564 V | 1    | 1    | 0    | 1    | 0    | 1    | 1.052 V |
| 0             | 0    | 1    | 0    | 1    | 0    | 1.548 V | 1    | 1    | 0    | 1    | 0    | 0    | 1.036 V |
| 0             | 0    | 1    | 0    | 1    | 1    | 1.532 V | 1    | 1    | 0    | 1    | 1    | 1    | 1.020 V |
| 0             | 0    | 1    | 1    | 0    | 0    | 1.516 V | 1    | 1    | 0    | 1    | 1    | 0    | 1.004 V |
| 0             | 0    | 1    | 1    | 0    | 1    | 1.500 V | 1    | 1    | 0    | 1    | 1    | 0    | 0.988 V |
| 0             | 0    | 1    | 1    | 1    | 0    | 1.484 V | 1    | 1    | 0    | 1    | 1    | 0    | 0.972 V |
| 0             | 0    | 1    | 1    | 1    | 1    | 1.468 V | 1    | 1    | 0    | 1    | 1    | 1    | 0.956 V |
| 0             | 1    | 0    | 0    | 0    | 0    | 1.452 V | 1    | 1    | 0    | 0    | 0    | 0    | 0.940 V |
| 0             | 1    | 0    | 0    | 0    | 1    | 1.436 V | 1    | 1    | 0    | 0    | 0    | 1    | 0.924 V |
| 0             | 1    | 0    | 0    | 1    | 0    | 1.420 V | 1    | 1    | 0    | 0    | 0    | 0    | 0.908 V |
| 0             | 1    | 0    | 0    | 1    | 1    | 1.404 V | 1    | 1    | 0    | 0    | 1    | 1    | 0.892 V |
| 0             | 1    | 0    | 1    | 0    | 0    | 1.388 V | 1    | 1    | 0    | 1    | 0    | 0    | 0.876 V |
| 0             | 1    | 0    | 1    | 0    | 1    | 1.372 V | 1    | 1    | 0    | 1    | 0    | 1    | 0.860 V |
| Highest Freq. | 0    | 1    | 0    | 1    | 1    | 1.356 V | 1    | 1    | 0    | 1    | 1    | 0    | 0.844 V |
|               | 0    | 1    | 1    | 1    | 1    | 1.340 V | 1    | 1    | 0    | 1    | 1    | 1    | 0.828 V |
|               | 0    | 1    | 1    | 0    | 0    | 1.324 V | 1    | 1    | 1    | 0    | 0    | 0    | 0.812 V |
|               | 0    | 1    | 1    | 0    | 0    | 1.308 V | 1    | 1    | 1    | 0    | 0    | 1    | 0.796 V |
|               | 0    | 1    | 1    | 0    | 1    | 1.292 V | 1    | 1    | 1    | 0    | 1    | 0    | 0.780 V |
|               | 0    | 1    | 1    | 0    | 1    | 1.276 V | 1    | 1    | 1    | 0    | 1    | 1    | 0.764 V |
|               | 0    | 1    | 1    | 1    | 0    | 1.260 V | 1    | 1    | 1    | 1    | 0    | 0    | 0.748 V |
|               | 0    | 1    | 1    | 1    | 0    | 1.244 V | 1    | 1    | 1    | 1    | 0    | 1    | 0.732 V |
|               | 0    | 1    | 1    | 1    | 1    | 1.228 V | 1    | 1    | 1    | 1    | 1    | 0    | 0.716 V |
|               | 0    | 1    | 1    | 1    | 1    | 1.212 V | 1    | 1    | 1    | 1    | 1    | 1    | 0.700 V |

## I C / SMB Address

| Devices                      | Address   | Hex | Bus                                |
|------------------------------|-----------|-----|------------------------------------|
| ICH6                         | Master    | -   | SMBUS Master                       |
| EMC6N300(CPU Thermal Sensor) | 1001 110X | 9Ch | Thermal Sensor                     |
| SODIMMO                      | 1010 0000 | A0h | -                                  |
| SODIMM1                      | 1010 001X | A2h | -                                  |
| CK-408 (Clock Generator)     | 1101 001x | D2h | Clock, Unused Clock Output Disable |

## USB PORT Assign

| PORT NUMBER | ASSIGNED TO     |
|-------------|-----------------|
| 0           | SYSTEM PORT A   |
| 1,2         | SYSTEM PORT B   |
| 3           | AUDIO B'D       |
| 4           | BLUETOOTH       |
| 5           | PORT REPLICATOR |

## System Power States

- CHP3\_SLPS1\* S1, Powered-On-Suspend(POS) : In this state, all clocks(except the 32.768KHz clock) are stopped. The system context is maintained in system DRAM. Power is maintained to PCI, the CPU, memory controller, memory, and all other critical subsystems. Note that this state does not preclude power being removed from non-essential devices, such as disk drives. During this state, CPU can be selected for either Deep Sleep or Deeper Sleep.
- CHP3\_SLPS3\* S3, Suspend-To-RAM(STR) : The system context is maintained in system DRAM, but power is shut off to non-critical circuits. Memory is retained, and refreshes continue. All clocks stop except RTC clock.
- CHP3\_SLPS4\* S4, Suspend-To-Disk(STD) : The Context of the system is maintained on the disk. All power is then shut off to the system except for the logic required to resume. Externally appears same as S5, but may have different wake events.
- CHP3\_SLPS5\* S5, Soft Off(SOFF) : System context is not maintained. All power is shut off except for the logic required to restart. A full boot is required when waking.

## REVISION HISTORY

See rev notes in the changes file for more information.

|             |           |           |                          |              |   |   |
|-------------|-----------|-----------|--------------------------|--------------|---|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE        | CICHLID-II<br>MAIN<br>BOARD INFORMATION | SAMSUNG<br>ELECTRONICS<br>PART NO.<br>BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |              |   |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |              |   |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE 5 OF 56 |   |   |

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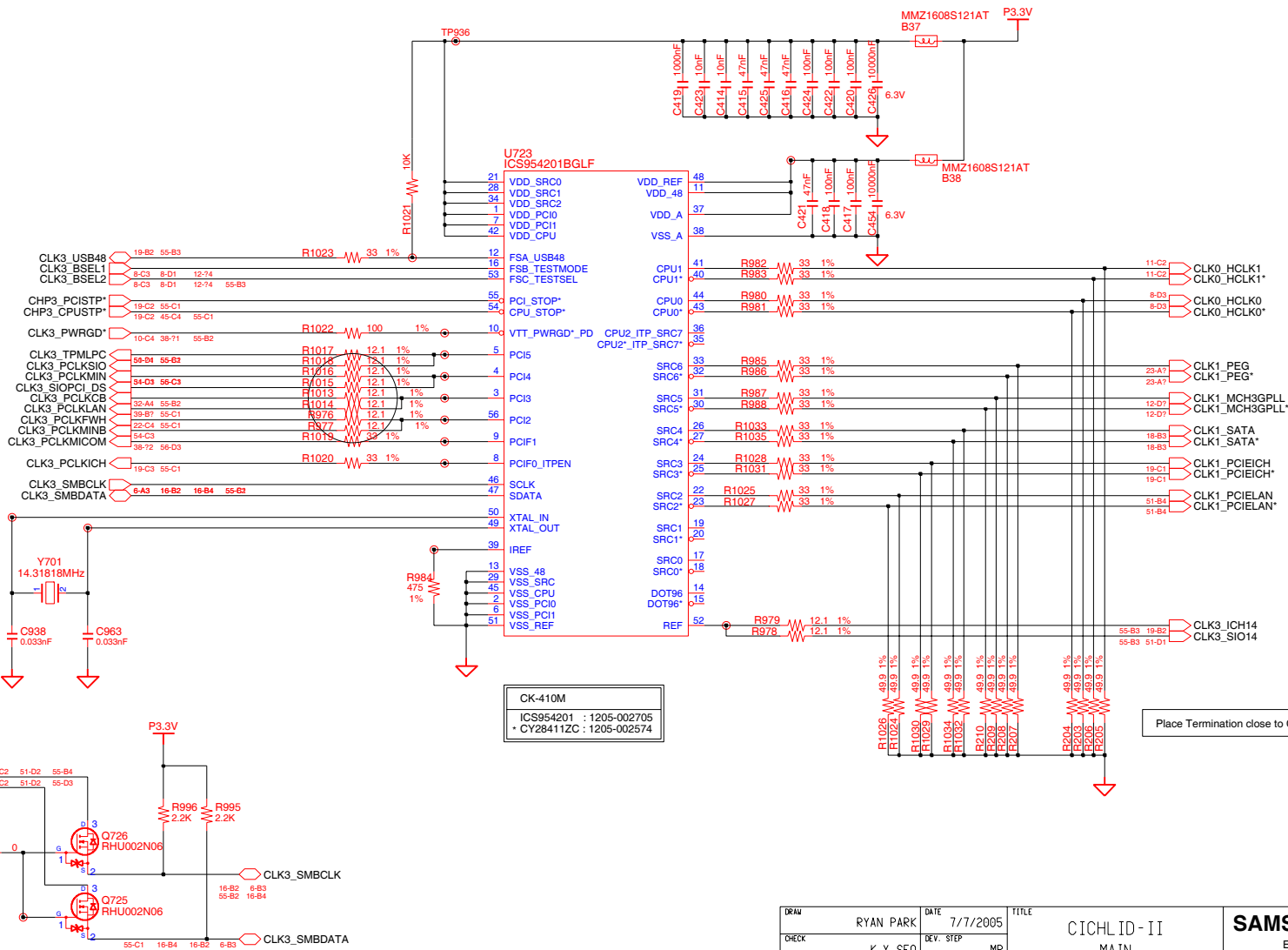
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| FSA   | FSB   | FSC   | HOST CLK |
|-------|-------|-------|----------|
| BSEL2 | BSEL1 | BSEL0 |          |
| 0     | 0     | 0     | 266 MHz  |
| 0     | 0     | 1     | 333 MHz  |
| 0     | 1     | 0     | 200 MHz  |
| 0     | 1     | 1     | 400 MHz  |
| 1     | 0     | 0     | 133 MHz  |
| 1     | 0     | 1     | 100 MHz  |
| 1     | 1     | 0     | 166 MHz  |
| 1     | 1     | 1     | RSVD     |

Place 14.318MHz within 500mils of CK-410M

CK-410M  
ICS954201 : 1205-002705  
CY28411ZC : 1205-002574

Place Termination close to CK-410M

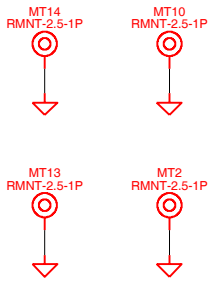
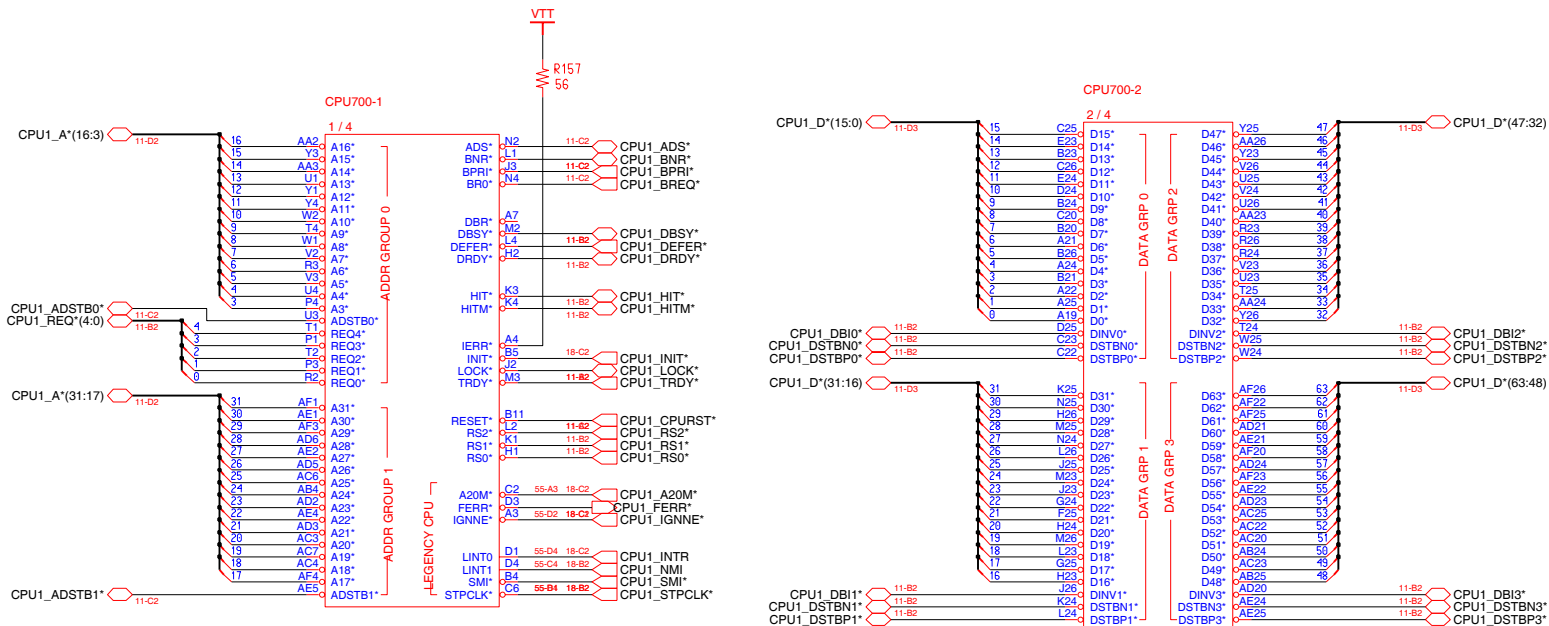


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|-------------|-----------|-----------|----------|-------|-----------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE | CICHLID-II      | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP       |       | MAIN            |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0      |       | CLOCK GENERATOR | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT |          |       |                 |                         |

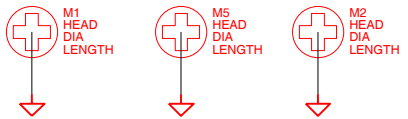
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**RHE SUPPORTER**

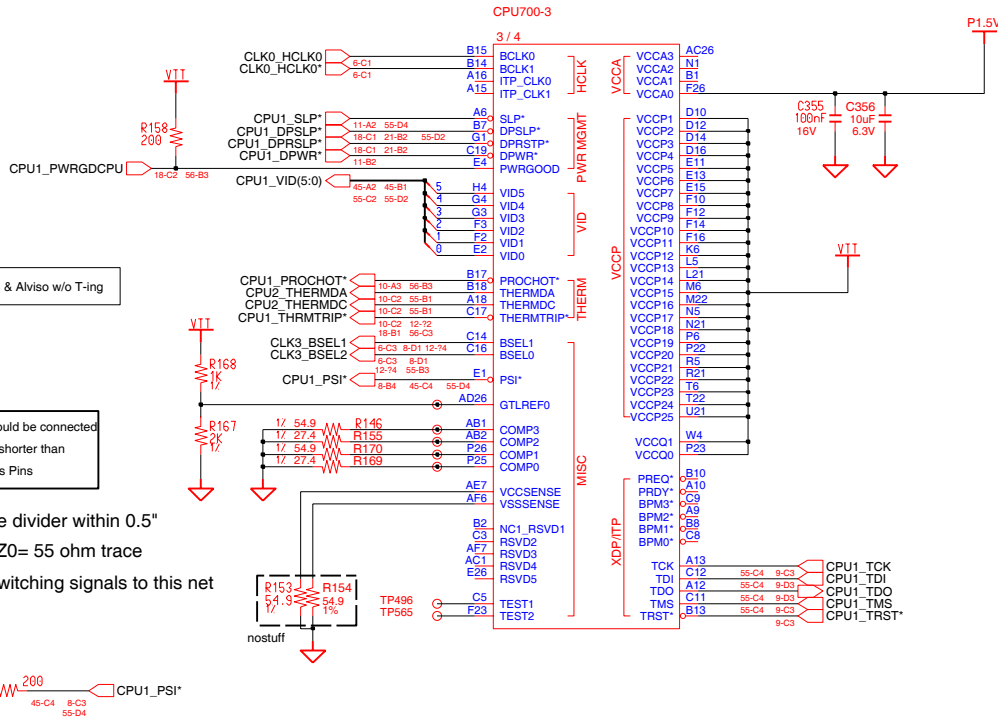


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|             |           |           |                          |                  |             |                        |
|-------------|-----------|-----------|--------------------------|------------------|-------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE            | CICHLID-II  | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | MAIN             | PART NO.    |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0                      | DOTHAN CPU (1/3) | BA41-00489A |                        |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE             | 7 OF 56     |                        |

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THERTRIP\* should connect to ICH6M & Alviso w/o T-ing

COMP 0, 2 <(COMP 1,3) should be connected Z0=27.4 ohm (55 ohm) trace shorter than 1/2 \* to their respective Banias Pins

GTLREF : Keep the Voltage divider within 0.5" of the First GTLREF0 with Z0= 55 ohm trace Minimize coupling of any switching signals to this net

**CPU Core Voltage Table**

| VID(5:0)  | VID(5:0)  | Voltage | VID(5:0)  | Voltage |
|-----------|-----------|---------|-----------|---------|
| 0 0 0 0 0 | 0 0 0 0 0 | 1.708 V | 1 0 0 0 0 | 1.196 V |
| 0 0 0 0 0 | 0 0 0 0 1 | 1.692 V | 1 0 0 0 1 | 1.180 V |
| 0 0 0 0 0 | 0 0 0 1 0 | 1.676 V | 1 0 0 0 1 | 1.164 V |
| 0 0 0 0 0 | 0 0 0 1 1 | 1.660 V | 1 0 0 0 1 | 1.148 V |
| 0 0 0 0 0 | 0 0 1 0 0 | 1.644 V | 1 0 0 1 0 | 1.132 V |
| 0 0 0 0 0 | 0 0 1 0 1 | 1.628 V | 1 0 0 1 0 | 1.116 V |
| 0 0 0 0 0 | 0 0 1 0 1 | 1.612 V | 1 0 0 1 0 | 1.100 V |
| 0 0 0 0 0 | 0 0 1 1 0 | 1.596 V | 1 0 0 1 1 | 1.084 V |
| 0 0 0 0 0 | 0 0 1 1 0 | 1.580 V | 1 0 0 1 0 | 1.068 V |
| 0 0 0 0 0 | 0 0 1 0 1 | 1.564 V | 1 0 0 1 0 | 1.052 V |
| 0 0 0 0 1 | 0 0 1 0 1 | 1.548 V | 1 0 0 1 0 | 1.036 V |
| 0 0 0 0 1 | 0 0 1 0 0 | 1.532 V | 1 0 0 1 0 | 1.020 V |
| 0 0 0 0 1 | 0 0 1 1 0 | 1.516 V | 1 0 0 1 0 | 1.004 V |
| 0 0 0 0 1 | 0 0 1 1 0 | 1.500 V | 1 0 0 1 0 | 0.988 V |
| 0 0 0 0 1 | 0 0 1 1 1 | 1.484 V | 1 0 0 1 1 | 0.972 V |
| 0 0 0 0 1 | 0 0 1 1 1 | 1.468 V | 1 0 0 1 1 | 0.956 V |
| 0 0 0 0 0 | 0 0 1 0 0 | 1.452 V | 1 0 0 0 0 | 0.940 V |
| 0 0 1 0 0 | 0 0 1 0 1 | 1.436 V | 1 0 0 0 1 | 0.924 V |
| 0 0 1 0 0 | 0 0 1 0 0 | 1.420 V | 1 0 0 0 1 | 0.908 V |
| 0 0 1 0 0 | 0 0 1 0 1 | 1.404 V | 1 0 0 0 1 | 0.892 V |
| 0 0 1 0 0 | 0 0 1 0 0 | 1.388 V | 1 0 0 0 1 | 0.876 V |
| 0 0 1 0 0 | 0 0 1 0 1 | 1.372 V | 1 0 0 0 1 | 0.860 V |
| 0 0 1 0 0 | 0 0 1 0 1 | 1.356 V | 1 0 0 0 1 | 0.844 V |
| 0 0 1 0 1 | 0 0 1 0 1 | 1.340 V | 1 0 0 1 1 | 0.828 V |
| 0 0 1 0 1 | 0 0 1 0 0 | 1.324 V | 1 0 0 1 0 | 0.812 V |
| 0 0 1 0 1 | 0 0 1 0 0 | 1.308 V | 1 0 0 1 0 | 0.796 V |
| 0 0 1 0 1 | 0 0 1 0 0 | 1.292 V | 1 0 0 1 0 | 0.780 V |
| 0 0 1 0 1 | 0 0 1 0 1 | 1.276 V | 1 0 0 1 1 | 0.764 V |
| 0 0 1 1 0 | 0 0 1 1 0 | 1.260 V | 1 0 0 1 0 | 0.748 V |
| 0 0 1 1 0 | 0 0 1 1 0 | 1.244 V | 1 0 0 1 0 | 0.732 V |
| 0 0 1 1 1 | 0 0 1 1 0 | 1.228 V | 1 0 0 1 0 | 0.716 V |
| 0 0 1 1 1 | 0 0 1 1 1 | 1.212 V | 1 0 0 1 1 | 0.700 V |

Highest Freq. of Dothan400(1.8GHz)  
\* Highest Freq. of Dothan533(?? GHz : TBD)

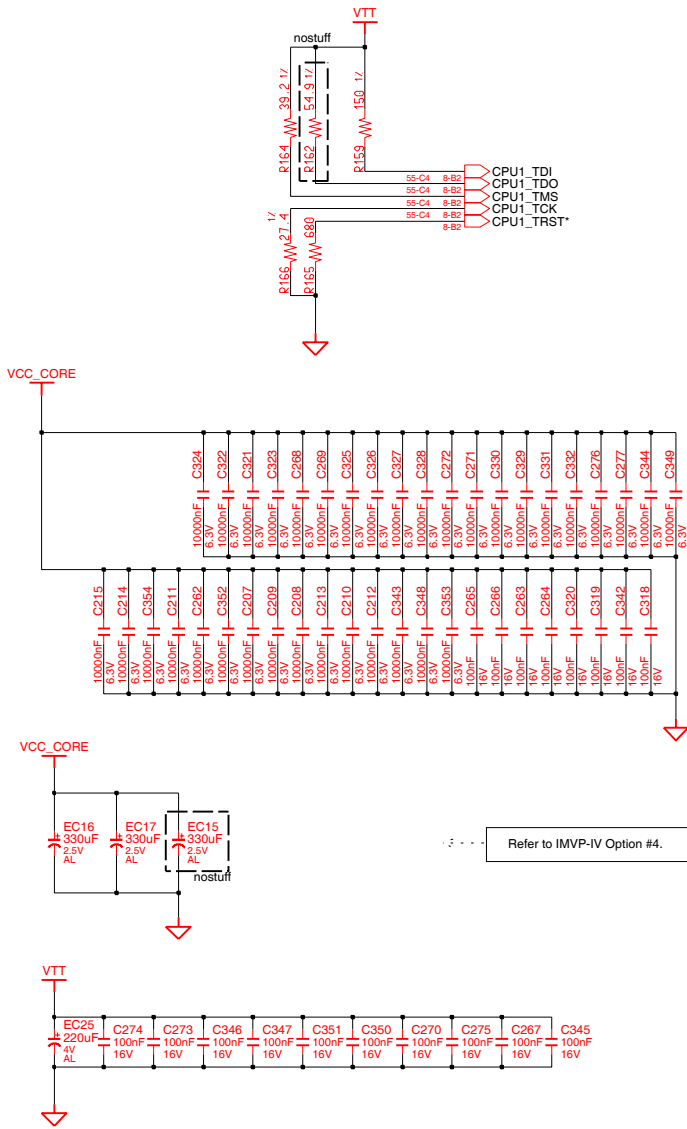
|             |           |           |                          |       |                 |   |
|-------------|-----------|-----------|--------------------------|-------|-----------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II      | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN            |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | DOTHAN CPU(2/3) |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 8 OF 56         |   |
|             |           |           |                          |       |                 |   |



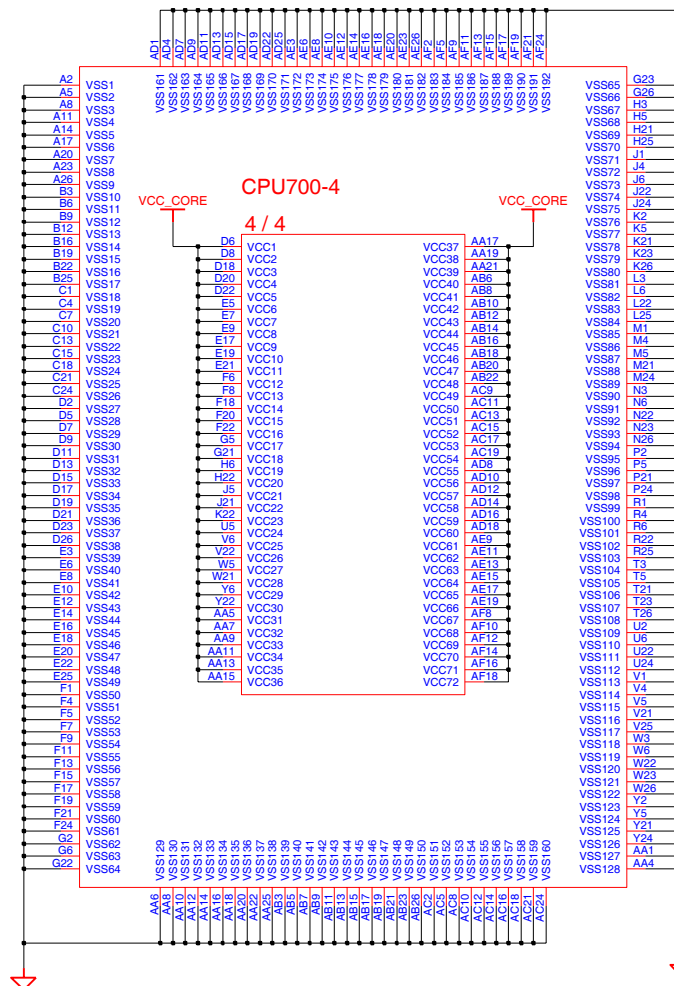
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Refer to Sonoma Platform Design Guide(4.6.1.4)



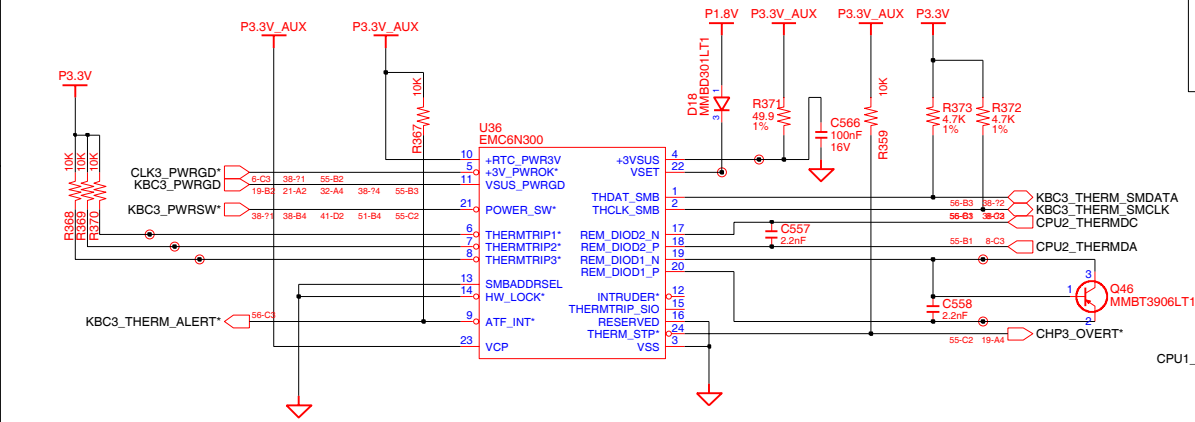
Refer to IMVP-IV Option #4.



|             |           |           |                          |       |                 |                         |
|-------------|-----------|-----------|--------------------------|-------|-----------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II      | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y. SEO  | DEV. STEP | MP                       |       | MAIN            |                         |
| APPROVAL    | H.S. KIM  | REV       | 1.0                      |       | DOTHAN CPU(3/3) | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 9               | OF 56                   |

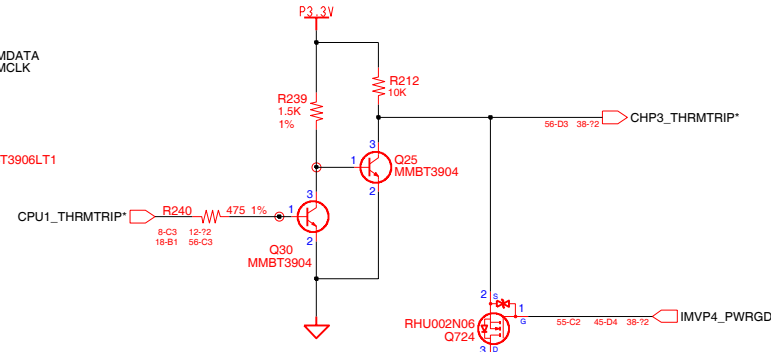
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### CPU / DDR Thermal Sensor

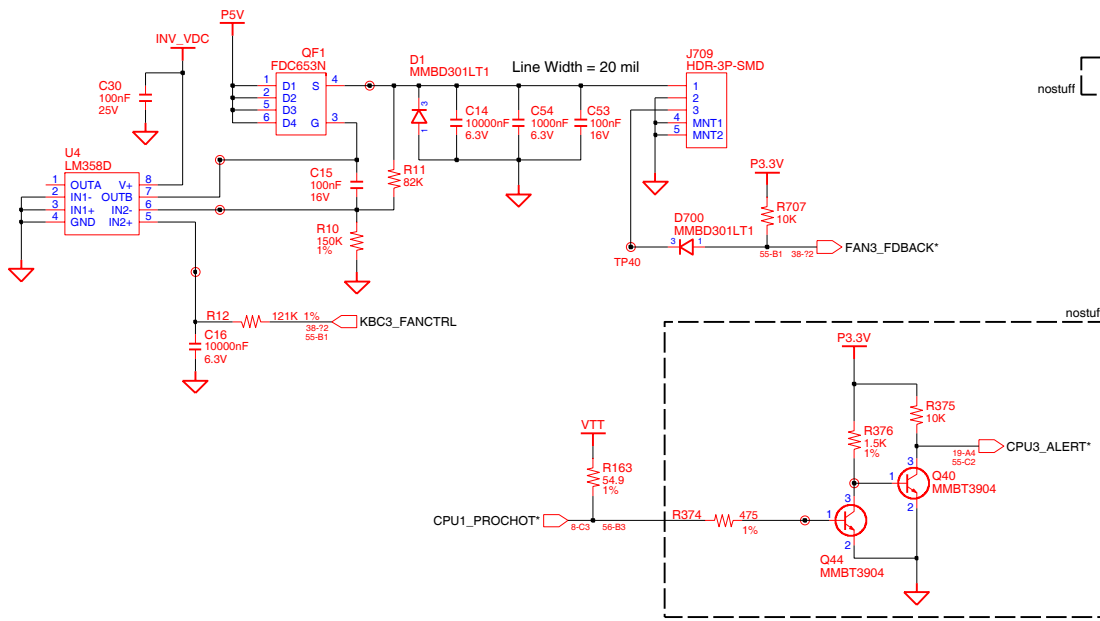


**Refer To Thermal Sensor Layout Guidelines.**

- Place the Thermal Sensor close to a remote diode.
- Keep traces away from high voltage (+12V bus)
- Keep data traces away from fast data buses and CRT signal.
- Use recommended trace widths and spacings (10mil)
- Place a ground plane under the traces.
- Use guard traces flanking DXP and DXN and connecting to GND



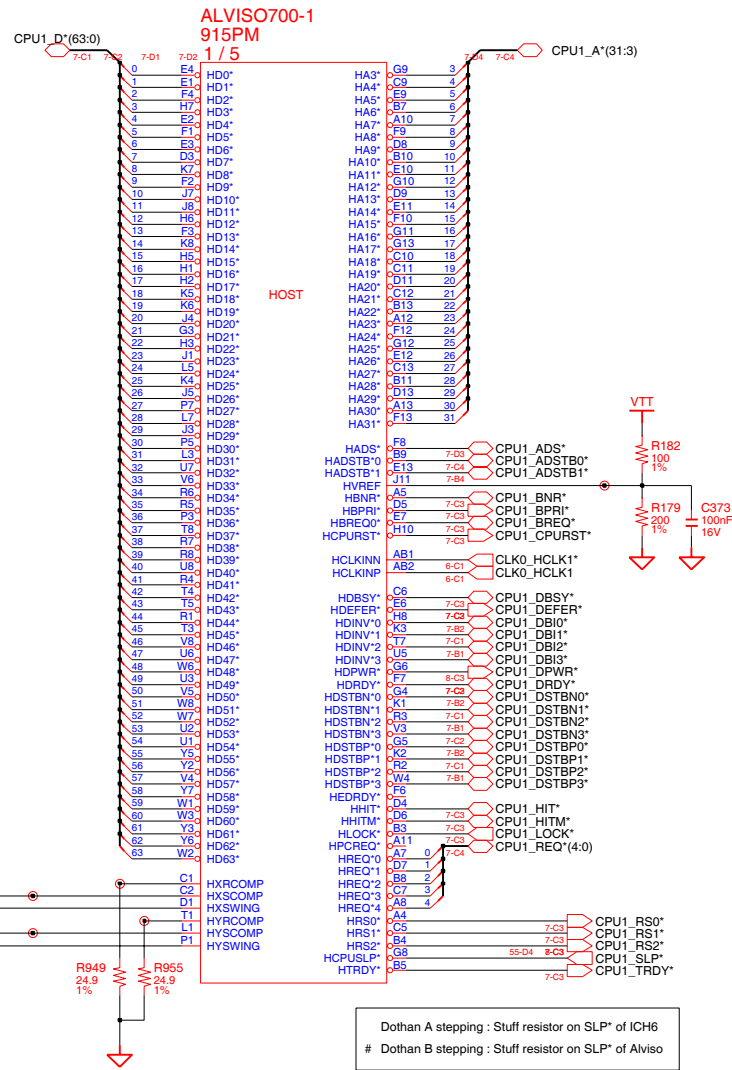
### FAN Control Logic



|             |           |           |               |                           |                    |   |
|-------------|-----------|-----------|---------------|---------------------------|--------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005      | TITLE                     | CICHLID-II<br>MAIN | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP            | THERMAL SENSOR/FAN CONTRL |                    |   |
| APPROVAL    | H.S KIM   | REV       | 1.0           | July 7, 2005 11:26:14 AM  |                    |   |
| MODULE CODE | LAST EDIT |           | PAGE 10 OF 56 |                           |                    |   |

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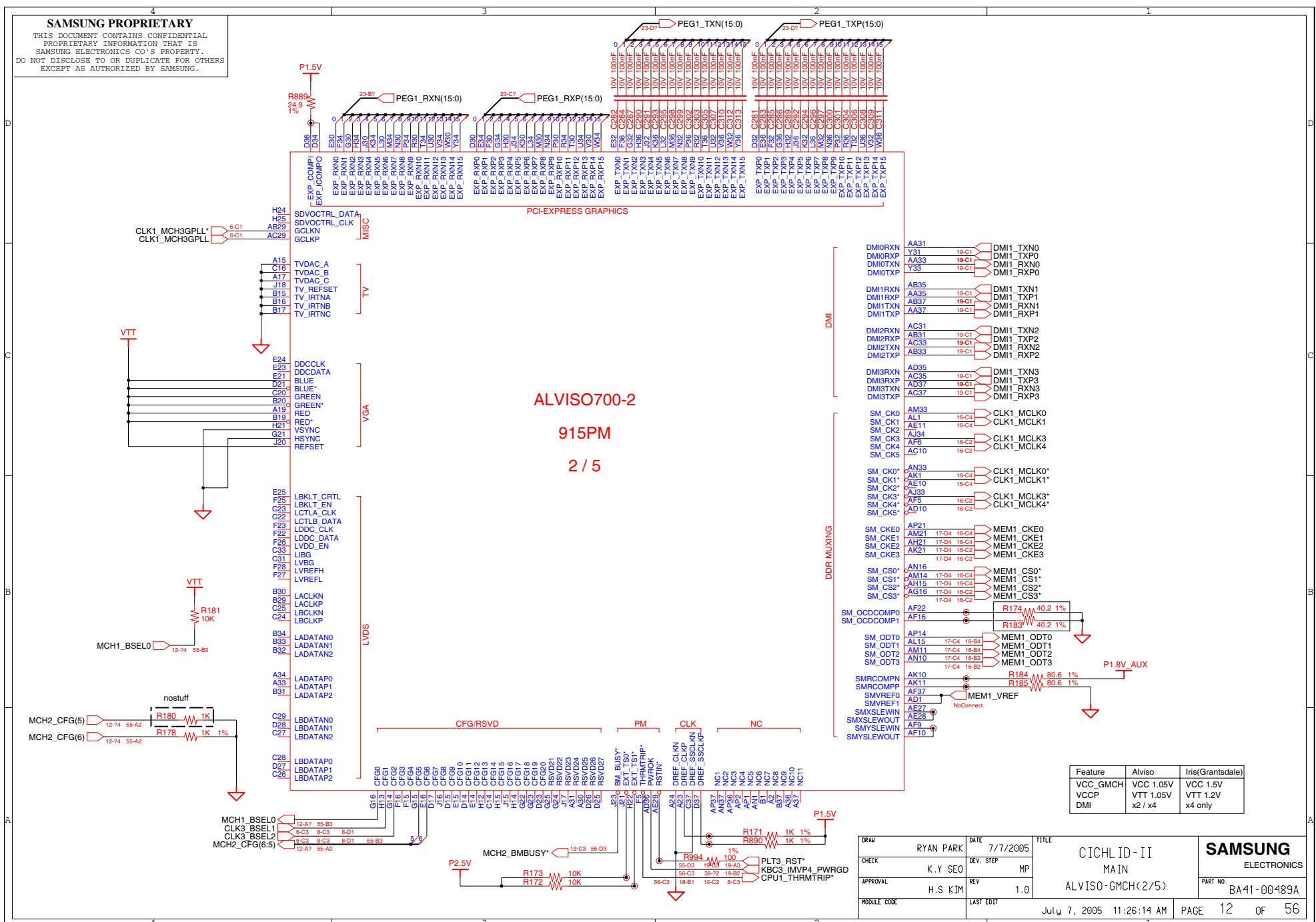


|             |           |           |          |       |                  |                         |
|-------------|-----------|-----------|----------|-------|------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE | CICHLID-II       | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP       |       | MAIN             |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0      |       | ALVISO-GMCH(1/5) | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT |          |       |                  |                         |

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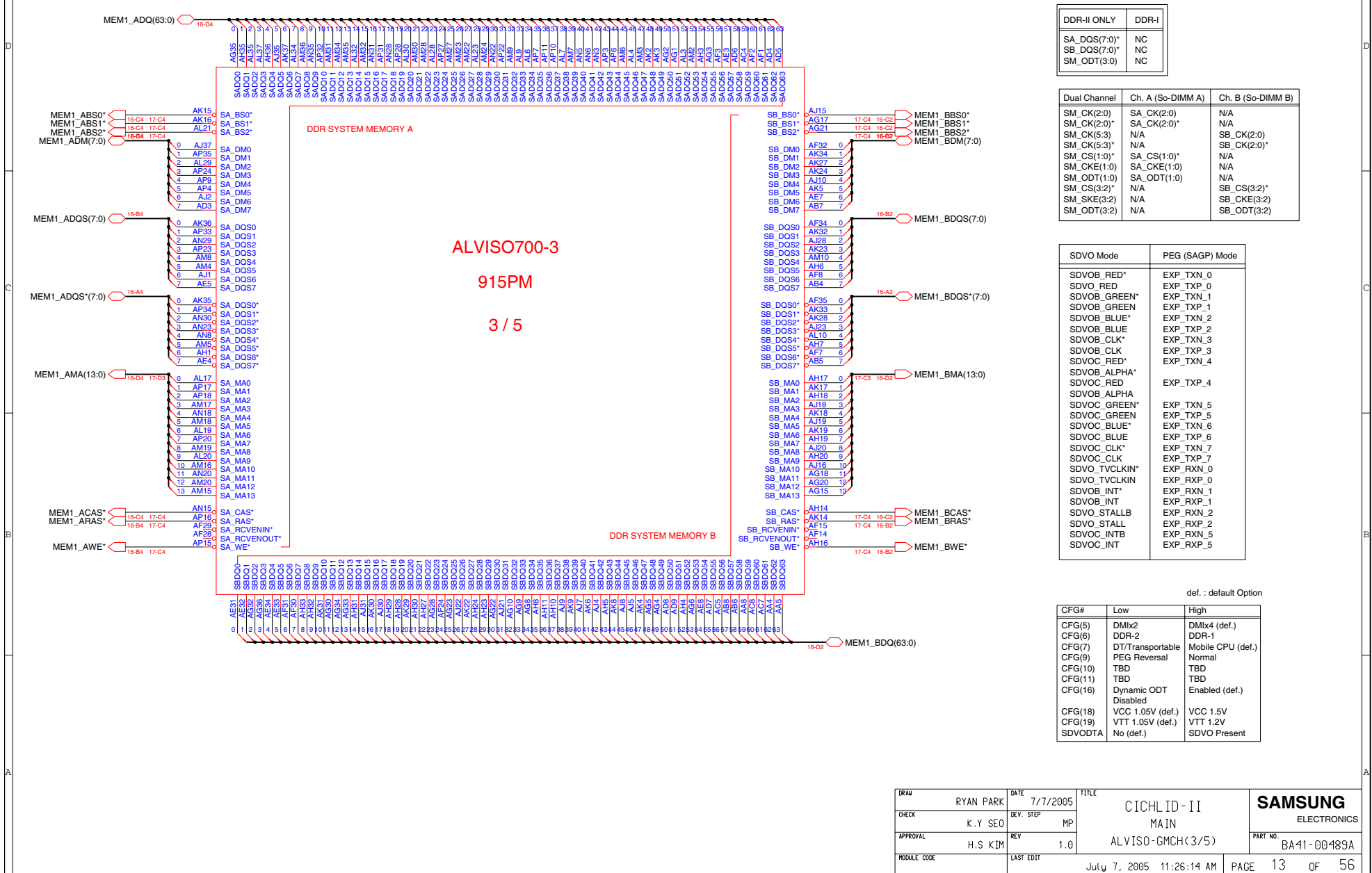


| Feature  | Alviso    | Iris(Grantsdale) |
|----------|-----------|------------------|
| VCC_GMCH | VCC 1.05V | VCC 1.5V         |
| VCCP     | VTT 1.05V | VTT 1.2V         |
| DMI      | x2 / x4   | x4 only          |

|             |           |           |                          |       |                  |                         |
|-------------|-----------|-----------|--------------------------|-------|------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II       | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN             |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | ALVISO-GMCH(2/5) | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 12               | OF 56                   |

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**ALVISO700-3**  
**915PM**  
**3 / 5**

| DDR-II ONLY  | DDR-I |
|--------------|-------|
| SA_DQS(7:0)* | NC    |
| SB_DQS(7:0)* | NC    |
| SM_ODT(3:0)  | NC    |

| Dual Channel | Ch. A (So-DIMM A) | Ch. B (So-DIMM B) |
|--------------|-------------------|-------------------|
| SM_CK(2:0)   | SA_CK(2:0)        | N/A               |
| SM_CK(2:0)*  | SA_CK(2:0)*       | N/A               |
| SM_CK(5:3)   | N/A               | SB_CK(2:0)        |
| SM_CK(5:3)*  | N/A               | SB_CK(2:0)*       |
| SM_CS(1:0)*  | SA_CS(1:0)*       | N/A               |
| SM_CKE(1:0)  | SA_CKE(1:0)       | N/A               |
| SM_ODT(1:0)  | SA_ODT(1:0)       | N/A               |
| SM_CS(3:2)*  | N/A               | SB_CS(3:2)*       |
| SM_SKE(3:2)  | N/A               | SB_CKE(3:2)       |
| SM_ODT(3:2)  | N/A               | SB_ODT(3:2)       |

| SDVO Mode     | PEG (SAGP) Mode |
|---------------|-----------------|
| SDVOB_RED*    | EXP_TXN_0       |
| SDVO_RED      | EXP_TXP_0       |
| SDVOB_GREEN*  | EXP_TXN_1       |
| SDVOB_GREEN   | EXP_TXP_1       |
| SDVOB_BLUE*   | EXP_TXN_2       |
| SDVOB_BLUE    | EXP_TXP_2       |
| SDVOB_CLK*    | EXP_TXN_3       |
| SDVOB_CLK     | EXP_TXP_3       |
| SDVOC_RED*    | EXP_TXN_4       |
| SDVOC_ALPHA*  | EXP_TXP_4       |
| SDVOC_ALPHA   |                 |
| SDVOC_GREEN*  | EXP_TXN_5       |
| SDVOC_GREEN   | EXP_TXP_5       |
| SDVOC_BLUE*   | EXP_TXN_6       |
| SDVOC_BLUE    | EXP_TXP_6       |
| SDVOC_CLK*    | EXP_TXN_7       |
| SDVOC_CLK     | EXP_TXP_7       |
| SDVO_TVCLKIN* | EXP_RXN_0       |
| SDVO_TVCLKIN  | EXP_RXP_0       |
| SDVOB_INT*    | EXP_RXN_1       |
| SDVOB_INT     | EXP_RXP_1       |
| SDVO_STALLB   | EXP_RXN_2       |
| SDVO_STALL    | EXP_RXP_2       |
| SDVOC_INTB    | EXP_RXN_5       |
| SDVOC_INT     | EXP_RXP_5       |

def. : default Option

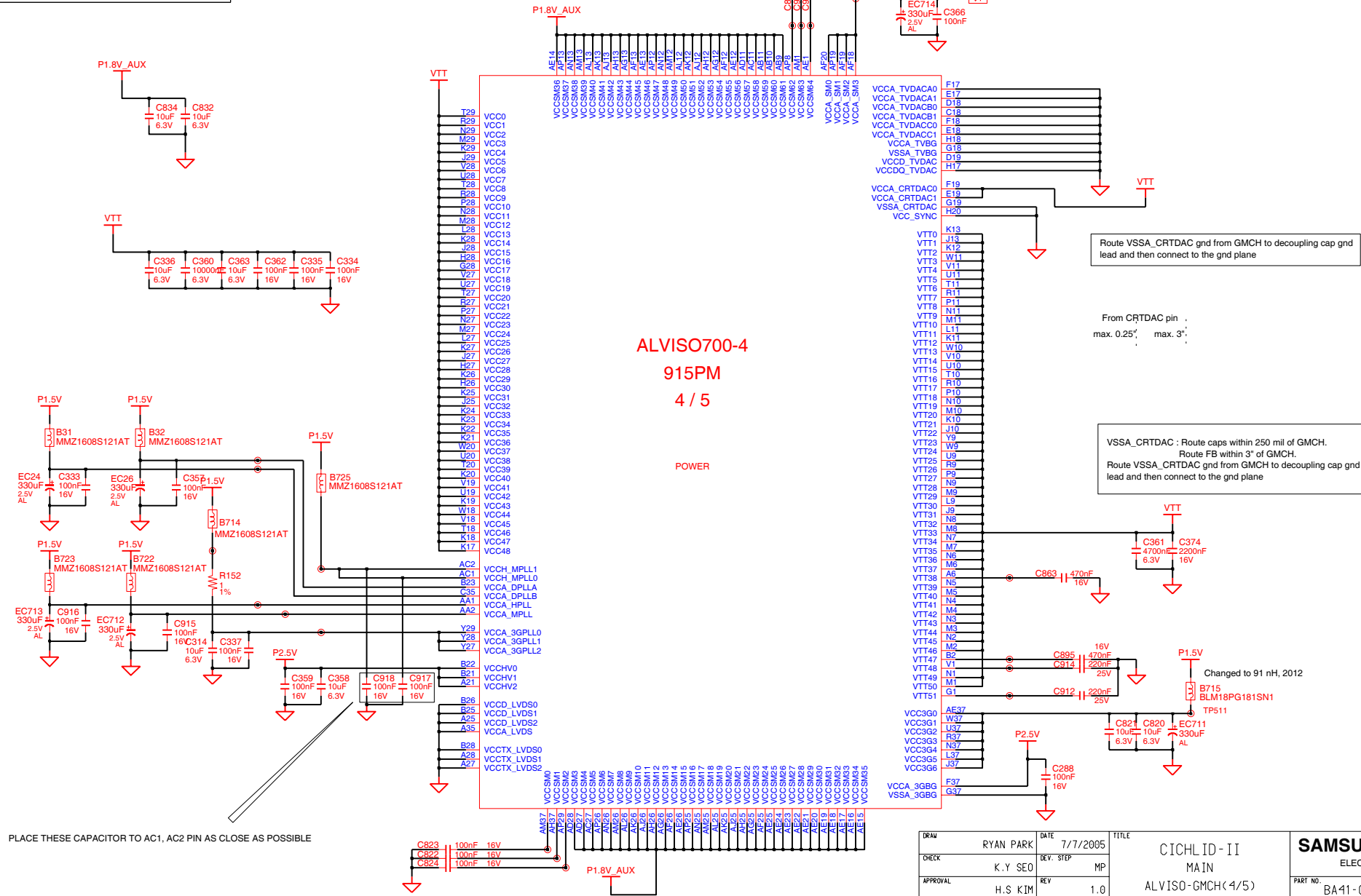
| CFG#    | Low                  | High              |
|---------|----------------------|-------------------|
| CFG(5)  | DMix2                | DMix4 (def.)      |
| CFG(6)  | DDR-2                | DDR-1             |
| CFG(7)  | DT/Transportable     | Mobile CPU (def.) |
| CFG(9)  | PEG Reversal         | Normal            |
| CFG(10) | TBD                  | TBD               |
| CFG(11) | TBD                  | TBD               |
| CFG(16) | Dynamic ODT Disabled | Enabled (def.)    |
| CFG(18) | VCC 1.05V (def.)     | VCC 1.5V          |
| CFG(19) | VTT 1.05V (def.)     | VTT 1.2V          |
| SDVODTA | No (def.)            | SDVO Present      |

|             |           |           |          |                          |                  |   |
|-------------|-----------|-----------|----------|--------------------------|------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLID-II       | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP       |                          | MAIN             |   |
| APPROVAL    | H.S KIM   | REV       | 1.0      |                          | ALVISO-GMCH(3/5) |   |
| MODULE CODE |           | LAST EDIT |          | July 7, 2005 11:26:14 AM | PAGE 13 OF 56    |   |

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**ALVISO700-4**  
915PM  
4 / 5  
POWER

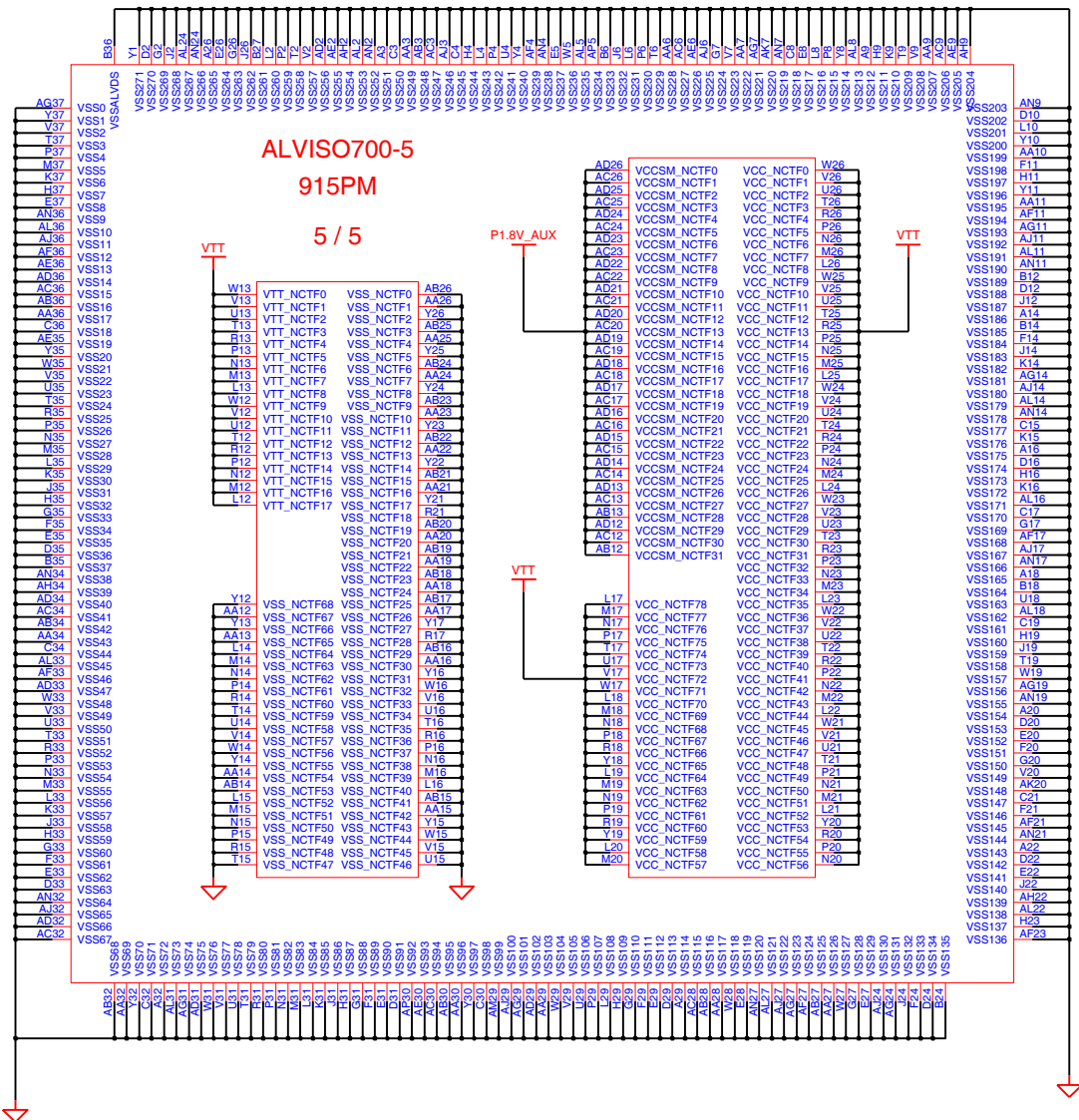


PLACE THESE CAPACITOR TO AC1, AC2 PIN AS CLOSE AS POSSIBLE

|             |           |           |          |                          |  |   |
|-------------|-----------|-----------|----------|--------------------------|--|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLID-II<br>MAIN<br>ALVISO-GMCH(4/5) | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y. SEO  | DEV. STEP | MP       |                          |  |   |
| APPROVAL    | H.S. KIM  | REV       | 1.0      |                          |  |   |
| MODULE CODE |           | LAST EDIT |          |                          |  |   |
|             |           |           |          | July 7, 2005 11:26:14 AM | PAGE 14 OF 56                          |   |

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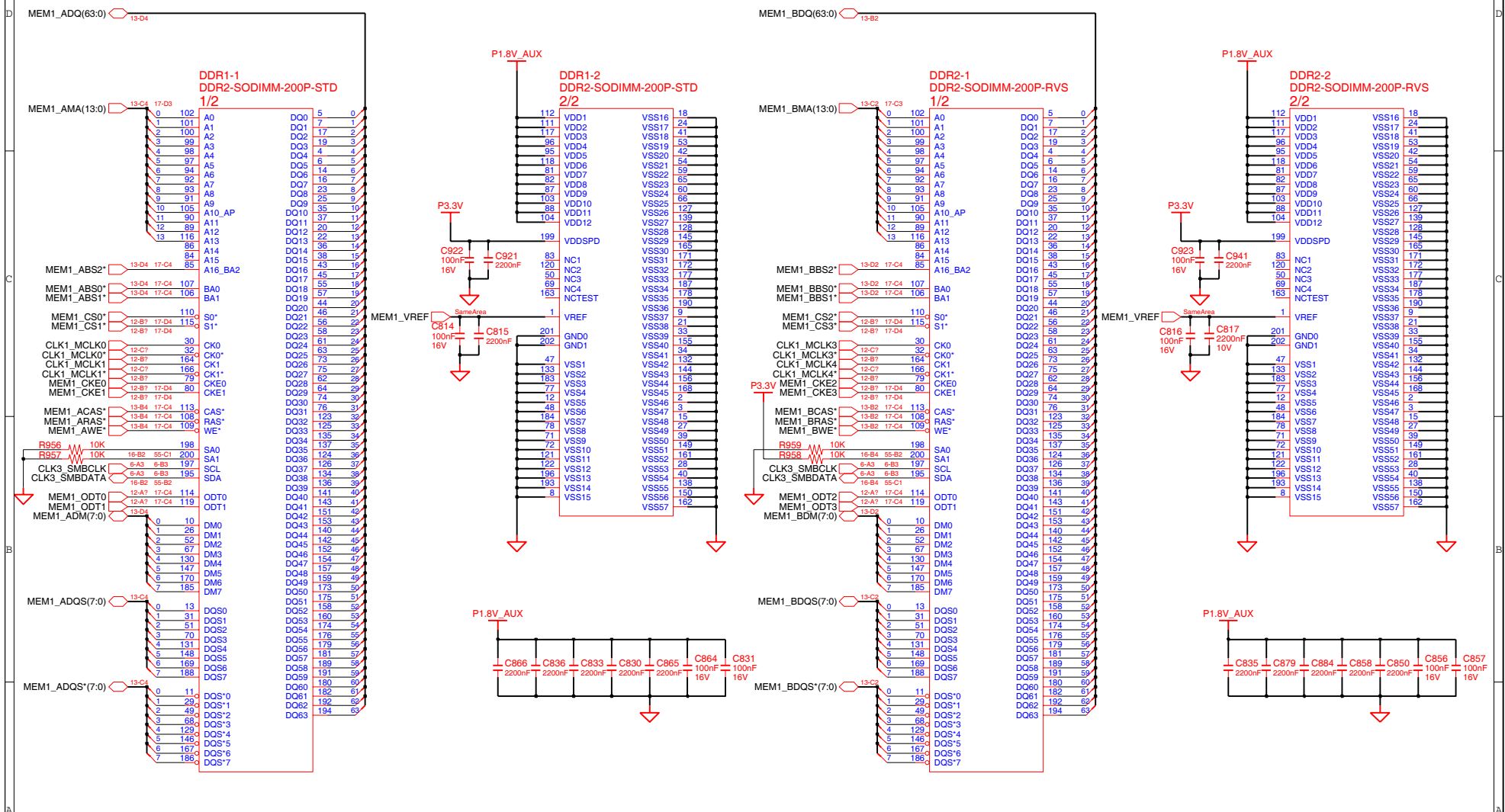


**ALVISO700-5  
915PM  
5 / 5**

|             |           |           |                          |                      |                    |                               |
|-------------|-----------|-----------|--------------------------|----------------------|--------------------|-------------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE                | CICHLID-II<br>MAIN | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | K.Y. SEO  | DEV. STEP | MP                       | ALVISO-GMCH(5/5)     |                    |                               |
| APPROVAL    | H.S. KIM  | REV       | 1.0                      | PART NO. BA41-00489A |                    | PAGE 15 OF 56                 |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM |                      |                    |                               |

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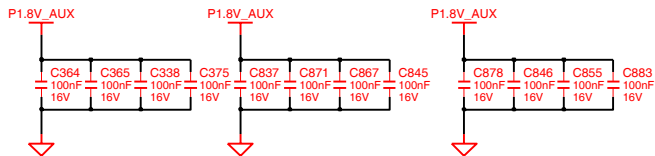
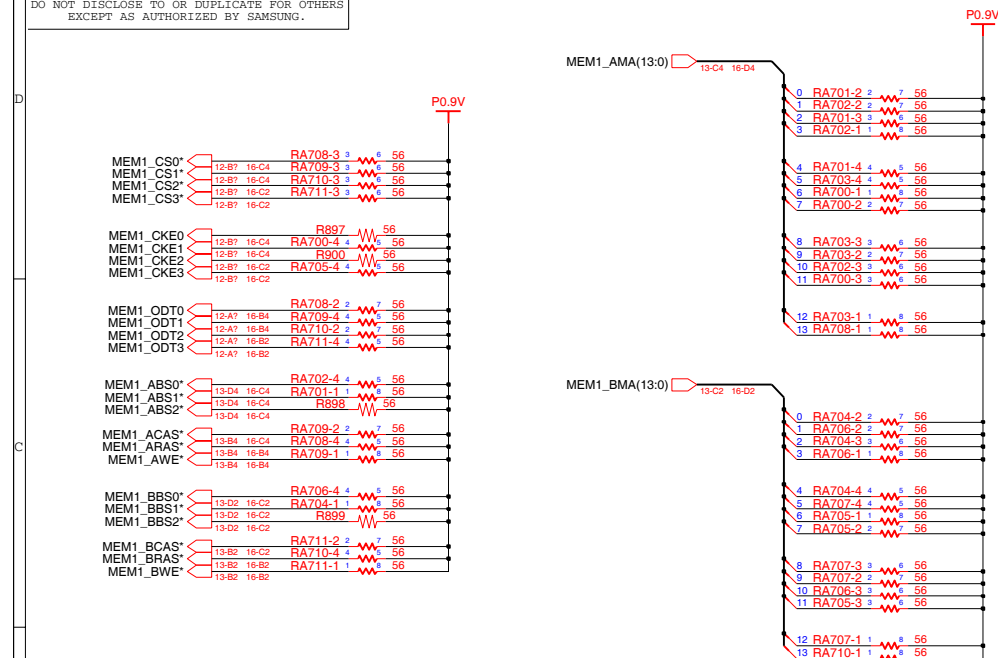


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|-------------|-----------|-----------|--------------------------|-------|---------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II    | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN          |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | DDR2 - SODIMM | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 16            | OF 56                   |



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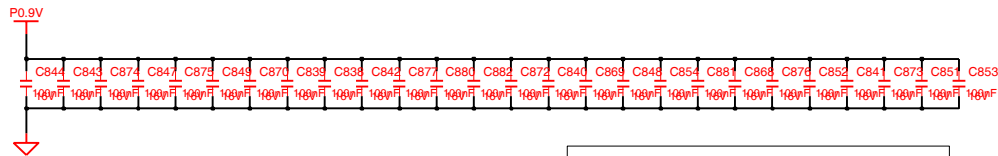
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Place near GMCH

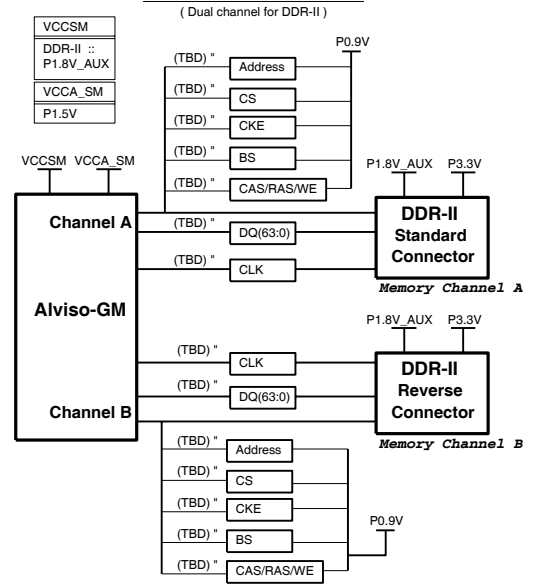
Place near SO-DIMM0

Place near SO-DIMM1

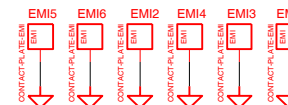


Place one cap close to every 2 pull-up resistors terminated to P0.9V

**Memory Topology**



BA70-00601A



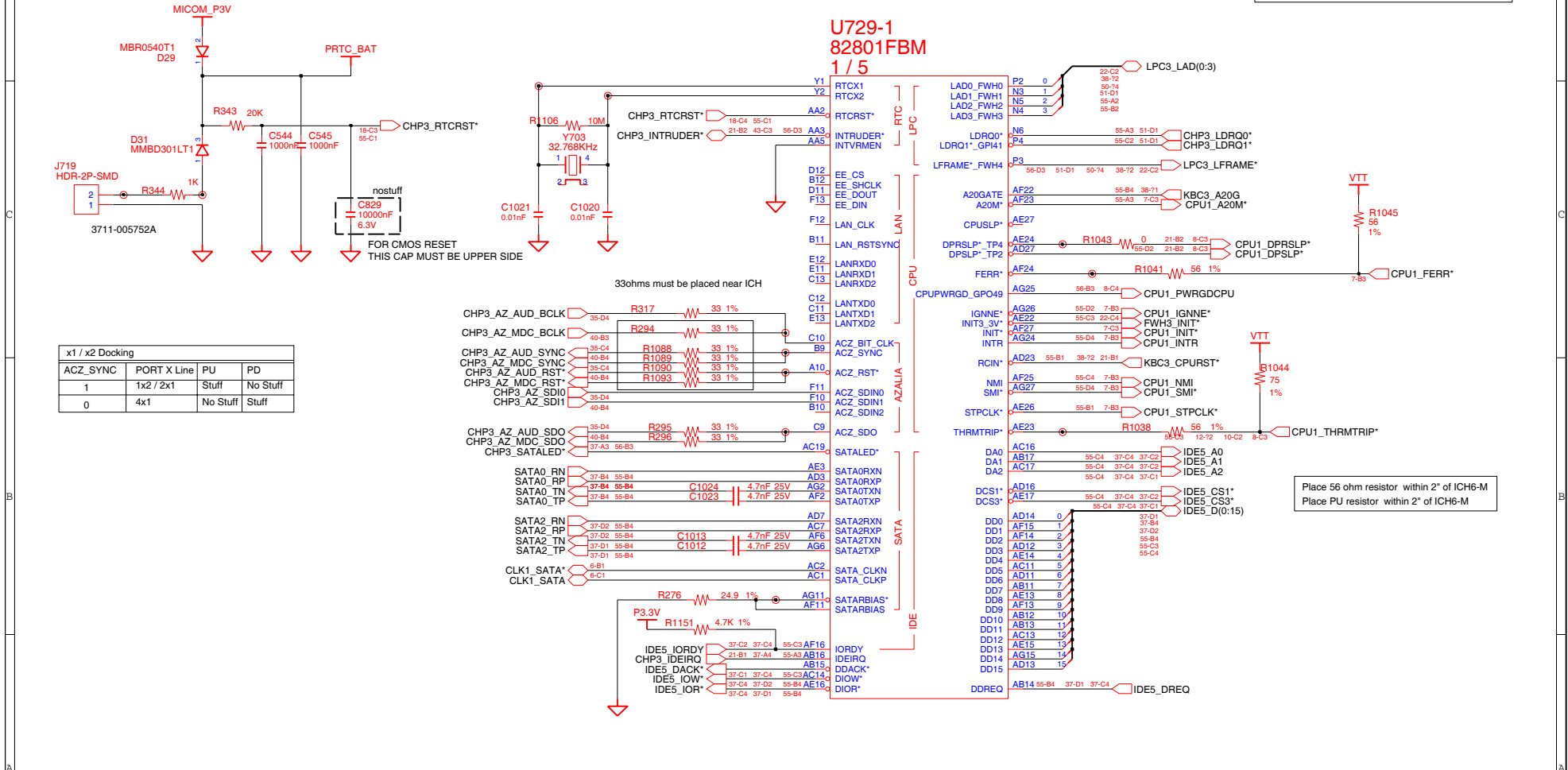
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| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE              | CICHLID-II<br>MAIN | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | DDR2 - TERMINATION |                    |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |                    | PART NO.           | BA41-00489A            |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE               | 17                 | OF 56                  |

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CPUSLP\*  
Dothan A stepping : Stuff resistor on SLP\* of ICH6  
# Dothan B stepping : Stuff resistor on SLP\* of Alviso

DPRS\*LP\*  
Dothan A stepping : No Stuff  
# Dothan B stepping : Stuff



x1 / x2 Docking

| ACZ_SYNC | PORT X Line | PU       | PD       |
|----------|-------------|----------|----------|
| 1        | 1x2 / 2x1   | Stuff    | No Stuff |
| 0        | 4x1         | No Stuff | Stuff    |

Place 56 ohm resistor within 2" of ICH6-M  
Place PU resistor within 2" of ICH6-M

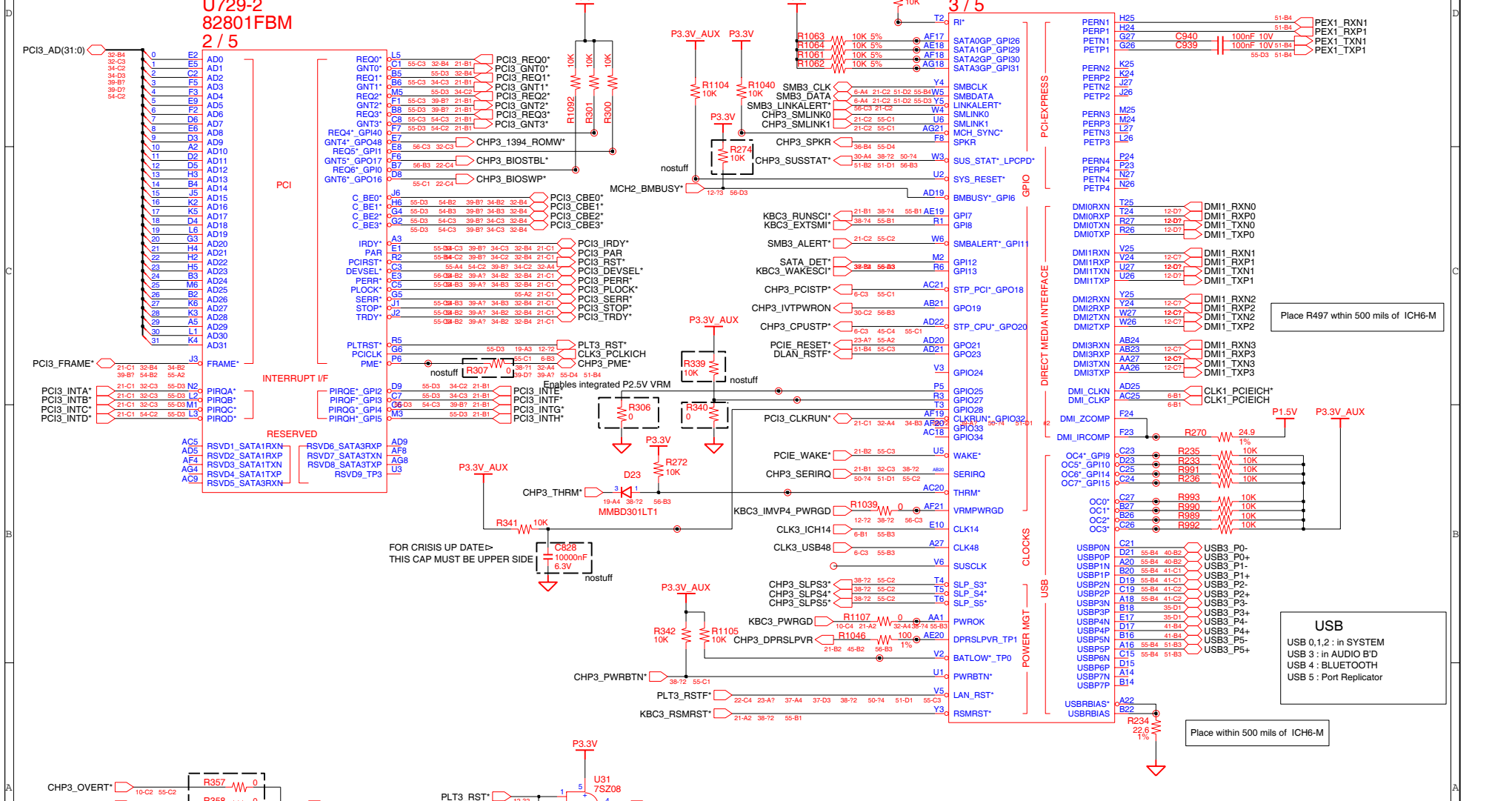
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| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II    | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN          |                               |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | ICH6 - M(1/4) | PART NO.<br>BA41-00489A       |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 18            | OF 56                         |

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U729-2 82801FBM 2/5

U729-3 82801FBM 3/5



Place R497 within 500 mils of ICH6-M

USB  
USB 0, 1, 2 : in SYSTEM  
USB 3 : in AUDIO B'D  
USB 4 : BLUETOOTH  
USB 5 : Port Replicator

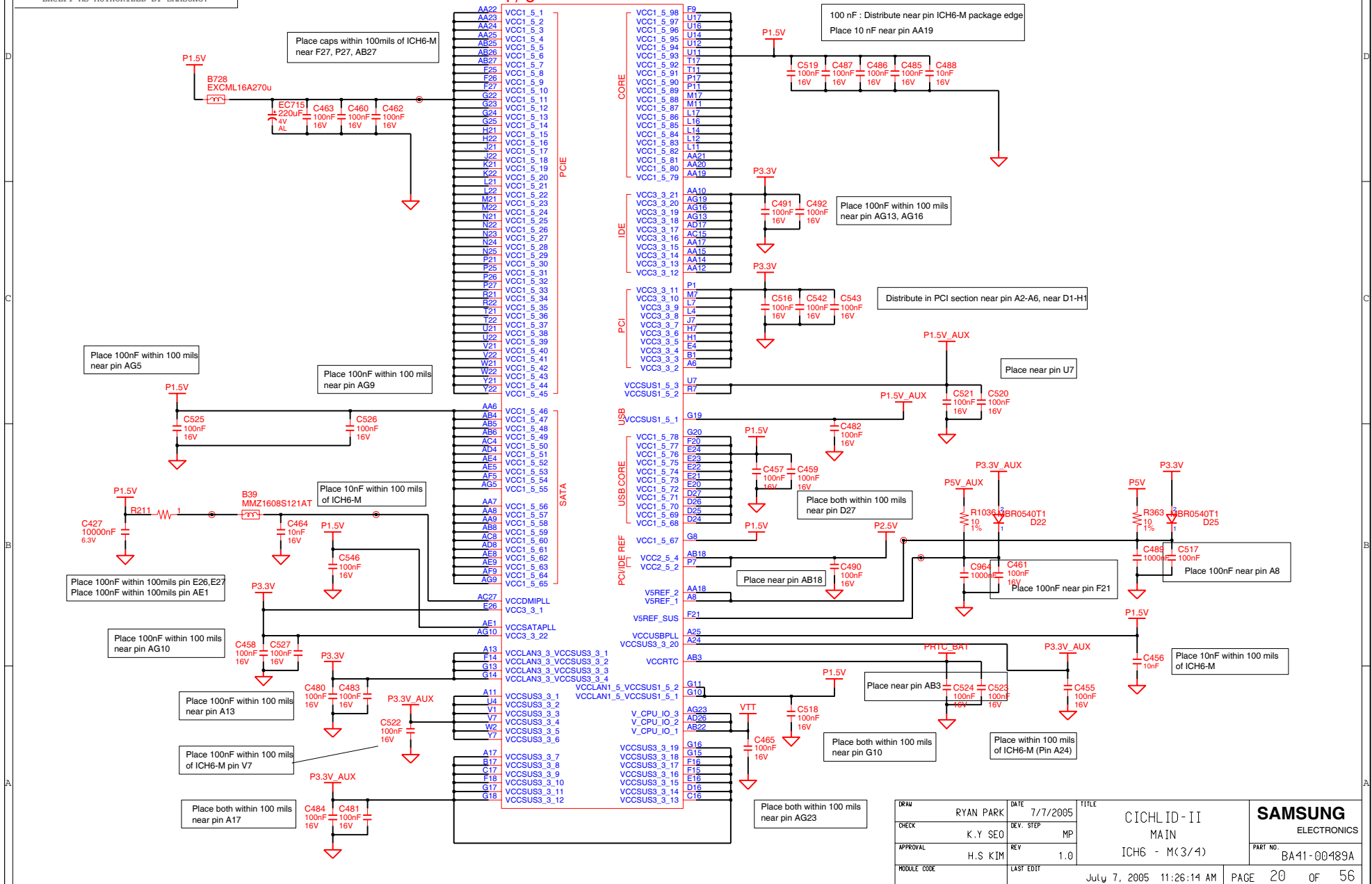
Place within 500 mils of ICH6-M

|             |           |           |                          |       |               |                               |
|-------------|-----------|-----------|--------------------------|-------|---------------|-------------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II    | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN          |                               |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | ICH6 - M(2/4) | PART NO.<br>BA41-00489A       |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 19            | OF 56                         |

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U729-4 82801FBM 4 / 5



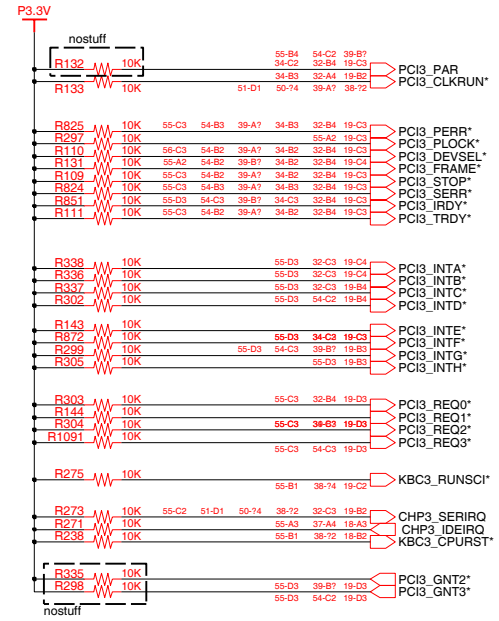
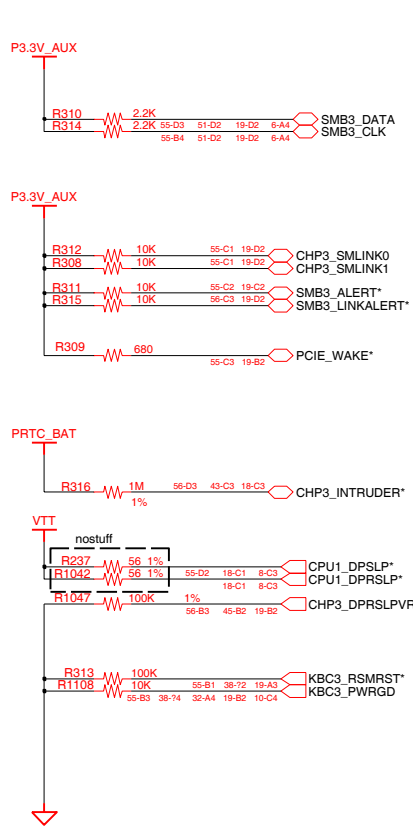
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|-------------|-----------|-----------|----------|--------------------------|---------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLID-II    | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y. SEO  | DEV. STEP | MP       |                          | MAIN          |                         |
| APPROVAL    | H.S. KIM  | REV       | 1.0      |                          | ICHG - M(3/4) | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT |          | July 7, 2005 11:26:14 AM | PAGE          | 20 OF 56                |

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**U729-5  
82801FBM  
5 / 5**

|      |         |        |     |
|------|---------|--------|-----|
| AG22 | VSS_172 | VSS_86 | P22 |
| AG20 | VSS_171 | VSS_85 | P16 |
| AG17 | VSS_170 | VSS_84 | P15 |
| AG14 | VSS_169 | VSS_83 | P14 |
| AG12 | VSS_168 | VSS_82 | P13 |
| AG7  | VSS_168 | VSS_82 | P12 |
| AG3  | VSS_167 | VSS_81 | N17 |
| AG1  | VSS_166 | VSS_80 | N16 |
| AF26 | VSS_165 | VSS_79 | N15 |
| AF12 | VSS_164 | VSS_78 | N14 |
| AF10 | VSS_163 | VSS_77 | N13 |
| AF7  | VSS_162 | VSS_76 | N12 |
| AF3  | VSS_161 | VSS_75 | N11 |
| AF1  | VSS_160 | VSS_74 | N7  |
| AE25 | VSS_159 | VSS_73 | N1  |
| AE21 | VSS_158 | VSS_72 | M27 |
| AE12 | VSS_157 | VSS_71 | M26 |
| AE10 | VSS_156 | VSS_70 | M25 |
| AE7  | VSS_155 | VSS_69 | M18 |
| AE6  | VSS_154 | VSS_68 | M15 |
| AE2  | VSS_153 | VSS_67 | M14 |
| AD24 | VSS_152 | VSS_66 | M13 |
| AD18 | VSS_151 | VSS_65 | M12 |
| AD15 | VSS_149 | VSS_63 | M4  |
| AD10 | VSS_148 | VSS_62 | L25 |
| AD5  | VSS_147 | VSS_61 | L24 |
| AD3  | VSS_146 | VSS_60 | L15 |
| AD1  | VSS_145 | VSS_59 | L13 |
| AC26 | VSS_144 | VSS_58 | K27 |
| AC24 | VSS_143 | VSS_57 | K26 |
| AC23 | VSS_142 | VSS_56 | K23 |
| AC22 | VSS_141 | VSS_55 | K17 |
| AC12 | VSS_140 | VSS_54 | K1  |
| AC10 | VSS_138 | VSS_52 | J25 |
| AC8  | VSS_137 | VSS_51 | J24 |
| AC3  | VSS_136 | VSS_50 | J4  |
| AB19 | VSS_135 | VSS_49 | H27 |
| AB10 | VSS_134 | VSS_48 | H26 |
| AB7  | VSS_133 | VSS_47 | H23 |
| AB2  | VSS_132 | VSS_46 | G21 |
| AB1  | VSS_131 | VSS_45 | G12 |
| AA16 | VSS_130 | VSS_44 | G9  |
| AA13 | VSS_129 | VSS_43 | G7  |
| AA11 | VSS_128 | VSS_42 | G1  |
| AA4  | VSS_127 | VSS_41 | F22 |
| Y27  | VSS_126 | VSS_40 | F19 |
| Y26  | VSS_124 | VSS_38 | F17 |
| Y23  | VSS_123 | VSS_37 | F4  |
| Y6   | VSS_122 | VSS_36 | E27 |
| W25  | VSS_122 | VSS_36 | E25 |
| W24  | VSS_121 | VSS_35 | E19 |
| W23  | VSS_120 | VSS_34 | E18 |
| W7   | VSS_119 | VSS_33 | E15 |
| W7   | VSS_118 | VSS_32 | E14 |
| V27  | VSS_117 | VSS_31 | D22 |
| V26  | VSS_116 | VSS_30 | D20 |
| V23  | VSS_115 | VSS_29 | D18 |
| V4   | VSS_114 | VSS_28 | D14 |
| U25  | VSS_113 | VSS_27 | D13 |
| U24  | VSS_112 | VSS_26 | D10 |
| U23  | VSS_110 | VSS_24 | D7  |
| U15  | VSS_109 | VSS_23 | D1  |
| T27  | VSS_108 | VSS_22 | C22 |
| T26  | VSS_107 | VSS_21 | C20 |
| T23  | VSS_106 | VSS_20 | C18 |
| T16  | VSS_105 | VSS_19 | C14 |
| T15  | VSS_104 | VSS_18 | B25 |
| T14  | VSS_103 | VSS_17 | B24 |
| T13  | VSS_102 | VSS_16 | B23 |
| T12  | VSS_101 | VSS_15 | B21 |
| T7   | VSS_100 | VSS_14 | B19 |
| T1   | VSS_99  | VSS_13 | B15 |
| R25  | VSS_98  | VSS_12 | B13 |
| R24  | VSS_97  | VSS_11 | A26 |
| R23  | VSS_96  | VSS_10 | A25 |
| R17  | VSS_95  | VSS_9  | A21 |
| R16  | VSS_94  | VSS_8  | A19 |
| R15  | VSS_93  | VSS_7  | A15 |
| R14  | VSS_92  | VSS_6  | A12 |
| R13  | VSS_91  | VSS_5  | A9  |
| R12  | VSS_90  | VSS_4  | A7  |
| R11  | VSS_89  | VSS_3  | A4  |
| R4   | VSS_88  | VSS_2  | A1  |
| R4   | VSS_87  | VSS_1  | A1  |



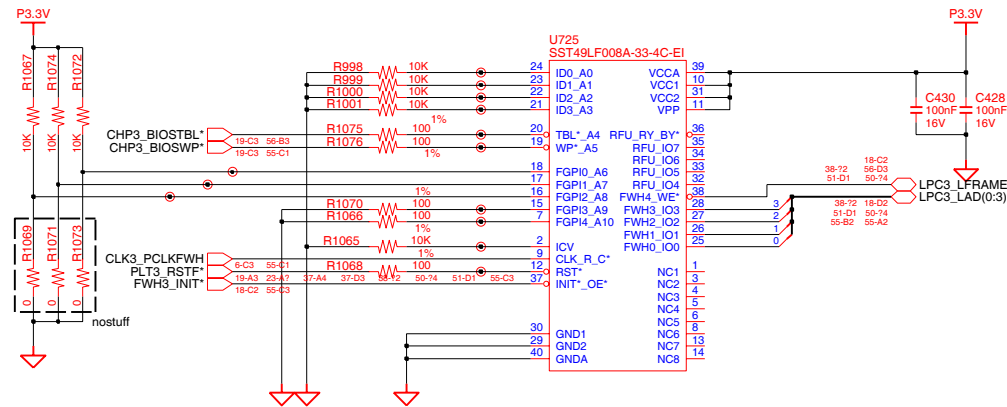
**ICH6-m Strapping Options**

|              | Function          | Default  |
|--------------|-------------------|----------|
| CHP3_SPKR    | No Reboot         | No Stuff |
| CHP3_BIOSWP* | Boot BIOS         | No Stuff |
| PC/PCI GNTA* | A16 swap override | No Stuff |
| AC97_SDOUT   | Safe Mode         | TBD      |
| EEP_DOUT     |                   | TBD      |

|             |           |           |                          |       |               |                         |
|-------------|-----------|-----------|--------------------------|-------|---------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II    | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y. SEO  | DEV. STEP | MP                       |       | MAIN          |                         |
| APPROVAL    | H.S. KIM  | REV       | 1.0                      |       | ICH6 - M(4/4) | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 21            | OF 56                   |

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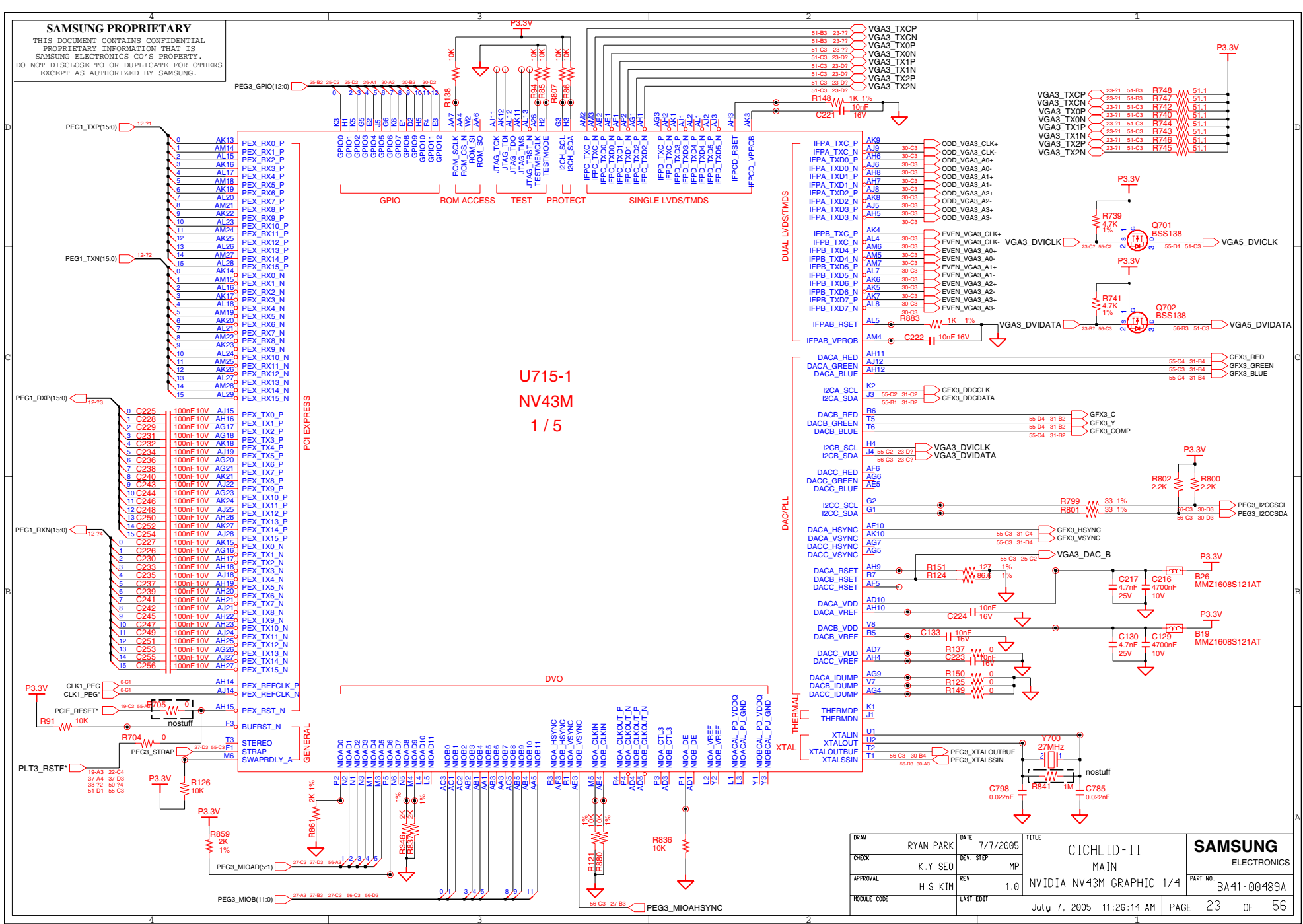
- |    |  |    |                                 |
|----|--|----|---------------------------------|
| 02 | VERIFY REAL MODE                             | 66 | CONFIGURE ADVANCE CACHE REG.    |
| 03 | DISABLE NMI                                  | 6A | DISPLAY EXTERNAL CACHE SIZE     |
| 04 | GET CPU TYPE                                 | 6C | DISPLAY SHADOW MESSAGE          |
| 06 | INIT. SYSTEM H/W                             | 6E | DISPLAY NON-DISPOSABLE SEGMENT  |
| 08 | INIT. CHIPSET REG.                           | 70 | DISPLAY ERROR MESSAGE           |
| 09 | SET IN POST FLAG                             | 72 | CHECK FOR CONFIGURATION ERROR   |
| 0A | INIT. CPU.REG                                | 74 | TEST REAL-TIME CLOCK            |
| 0B | CPU CACHE ON                                 | 76 | CHECK FOR KEYBOARD ERROR        |
| 0C | INIT.CACHE TO POST                           | 7C | SETUP HARDWARE INTERRUPT VECTOR |
| 0E | INIT. I/O VALUE                              | 7E | TEST COPROCESSER IF PRESENT     |
| 0F | ENABLE THE L-BUS IDE                         | 80 | DISABLE ON-BOARD I/O PORT       |
| 10 | INIT. POWER MANAGER                          | 82 | DETECT AND INSTALL EXT.RS232C   |
| 11 | LOAD ALTERNATE REG.                          | 84 | DETECT AND INSTALL EXT.PARALLEL |
| 13 | PCI BUS MASTER RESET WITH INITIAL POST VALUE | 86 | RE-INIT. ON-BOARD I/O PORT      |
| 14 | INIT. KEYBOARD CONTROLLER                    | 88 | INIT. BIOS DATA ROM             |
| 16 | CHECK CHECKSUM                               | 8A | INIT. EXTENDED BIOS DATA AREA   |
| 18 | 8254 TIMER INIT.                             | 8C | INIT. FDD CONTROLLER            |
| 1A | 8237 DMA CONTROLLER INIT.                    | 9A | SHADOW OPTION ROMS              |
| 1C | RESET INTERRUPT CONTROLLER                   | 9C | SETUP POWER MANAGEMENT          |
| 20 | TEST DRAM REFRESH                            | 9E | ENABLE H/W INTERRUPT            |
| 22 | TEST 8742 KEYBOARD CONTROLLER                | A0 | SET TIME OF DAY                 |
| 24 | SET ES SEGMENT REG. TO 4GB                   | A4 | INIT. TYPEMATIC RATE            |
| 26 | ENABLE A20                                   | A8 | ERASE F2 PROMPT                 |
| 28 | AUTO SIZING DRAM                             | AA | SCAN FOR F2 KEY STROKE          |
| 32 | COMPUTE THE CPU SPEED                        | AC | ENTER SETUP                     |
| 34 | TESET CMOS RAM                               | AE | CLEAR IN POST FLAG              |
| 38 | SHADOW SYSTEM BIOS ROM                       | B0 | CHECK FOR ERRORS                |
| 3A | AUTO SIZING CACHE                            | B2 | POST DONE-PREPARE TO BOOT O/S   |
| 3C | CONFIGURE ADVANCED CHIPSET REG.              | B4 | ONE BEEP                        |
| 3D | LOAD ALTER REG. WITH CMOS VALUE              | B6 | CHECK PASSWORD (OPTION)         |
| 42 | INIT. INTERRUPT VECTOR                       | B7 | ACPI INIT                       |
| 44 | INIT. BIOS INTERRUPT                         | BA | DMI INIT                        |
| 46 | CHECK ROM COPYRIGHT NOTICE                   | BE | CLEAR SCREEN                    |
| 47 | INIT. I20 SUPPORT IF INSTALLED               | C0 | TRY BOOT WITH INT19             |
| 48 | CHECK VIDEO CONFIGURE AGAINST CMOS           | D0 | INTERRUPT HANDLER ERROR         |
| 49 | INIT. PCI BUS AND DEVICE                     | D2 | UNKNOWN INTERRUPT ERROR         |
| 4A | INIT. ALL VIDEO BIOS ROM                     | D4 | PENDING INTERRUPT ERROR         |
| 4C | SHADOW VIDEO BIOS ROM                        | D6 | SHUTDOWN 5                      |
| 50 | DISPLAY CPU TYPE AND SPEED                   | D8 | SHUTDOWN ERROR                  |
| 52 | TEST KEYBOARD                                | DA | EXTENDED BLOCK MOVE             |
| 54 | SET KEYCLICK IF ENABLED                      | DC | SHUTDOWN 10                     |
| 56 | ENABLE KEYBOARD                              | 89 | ENABLE NMI                      |
| 58 | TEST FOR UNEXPECTED INTERRUPTS               | 90 | INIT. HDD CONTROLLER            |
| 5A | DISPLAY * PRESS ..... SETUP*                 | 91 | INIT. LOCAL BUS HDD CONTROLLER  |
| 5C | TEST RAM BETWEEN 512K AND 640K               | 92 | JUMP TO USER PATCH 2            |
| 60 | TEST EXTENDED MEMORY                         | 94 | DISABLE A20 ADDRESS LINE        |
| 62 | TEST EXTENDED MEMORY ADDRESS LINE            | 96 | CLEAR HUGE ES SEGMENT REG.      |
| 64 | JUMP TO USER PATCH 1                         | 98 | SEARCH FOR OPTION ROMS          |

|             |           |           |                          |       |              |   |
|-------------|-----------|-----------|--------------------------|-------|--------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II   | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN         |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | FIRMWARE HUB |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 22 OF 56     |   |

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U715-1  
NV43M  
1 / 5

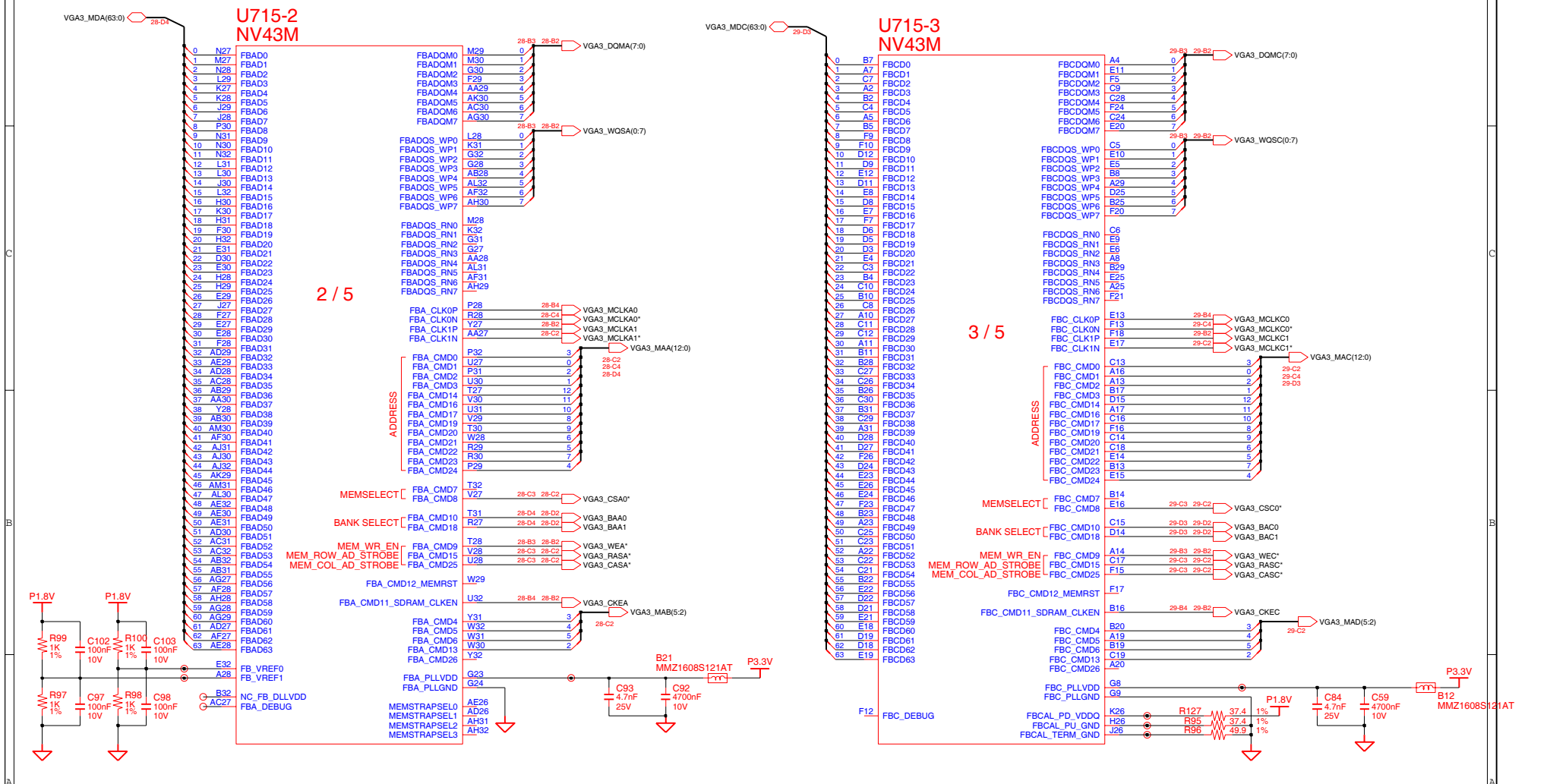


|             |           |           |                          |                          |            |                        |
|-------------|-----------|-----------|--------------------------|--------------------------|------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE                    | CICHLID-II | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |                          | MAIN       |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0                      | NVIDIA NV43M GRAPHIC 1/4 | PART NO.   | BA41-00489A            |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM |                          | PAGE       | 23 OF 56               |

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### Graphic Memory I/F (Using FBA Channel)

### Graphic Memory I/F (Using FBC Channel)

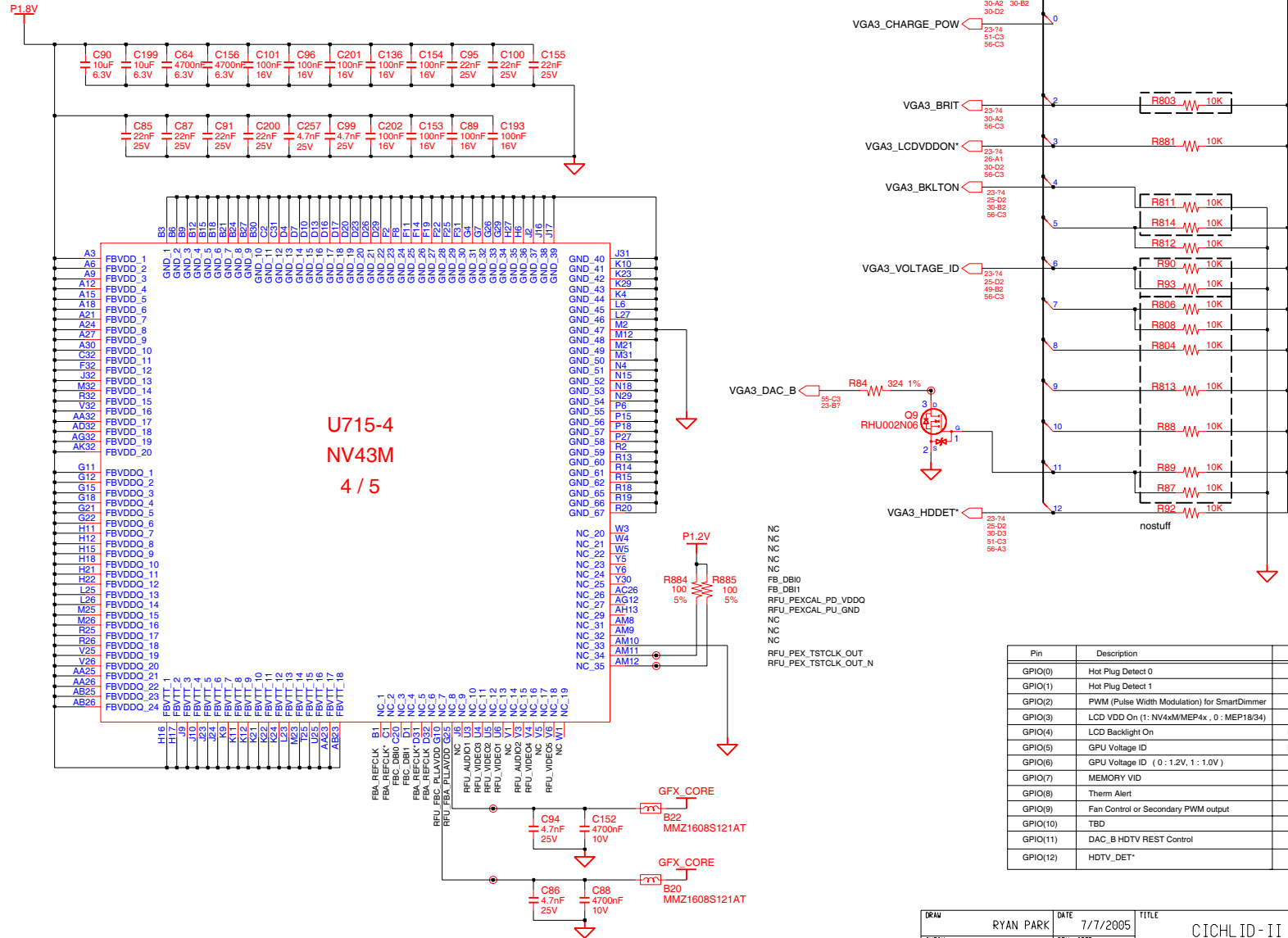


|             |           |           |                          |       |                          |                         |
|-------------|-----------|-----------|--------------------------|-------|--------------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II               | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN                     |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | NVIDIA NV43M GRAPHIC 2/4 | PART NO.<br>BA41-00489A |
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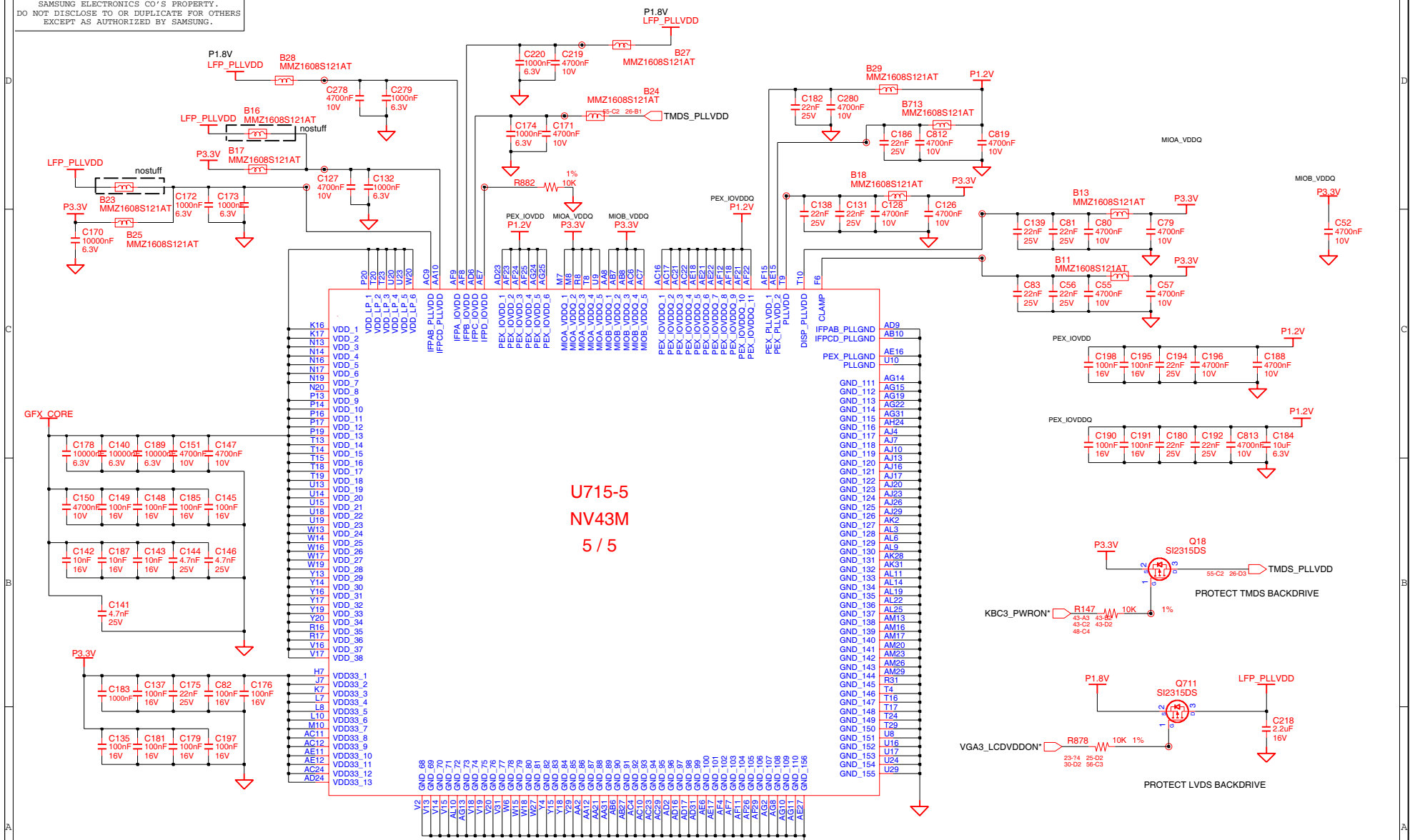
**U715-4  
NV43M  
4 / 5**

| Pin      | Description                                  |           |
|----------|--|-----------|
| GPIO(0)  | Hot Plug Detect 0                            | NC        |
| GPIO(1)  | Hot Plug Detect 1                            | NC        |
| GPIO(2)  | PWM (Pulse Width Modulation) for SmartDimmer | NC        |
| GPIO(3)  | LCD VDD On (1: NV4xMMEP4x, 0: MEP1834)       | Pull-Up   |
| GPIO(4)  | LCD Backlight On                             | Pull-Down |
| GPIO(5)  | GPU Voltage ID                               | Pull-Down |
| GPIO(6)  | GPU Voltage ID (0: 1.2V, 1: 1.0V)            | NC        |
| GPIO(7)  | MEMORY VID                                   | NC        |
| GPIO(8)  | Therm Alert                                  | NC        |
| GPIO(9)  | Fan Control or Secondary PWM output          | NC        |
| GPIO(10) | TBD  | NC        |
| GPIO(11) | DAC_B HDTV REST Control                      | NC        |
| GPIO(12) | HDTV_DET*                                    | Pull-Up   |

|             |           |           |                          |       |                          |                         |
|-------------|-----------|-----------|--------------------------|-------|--------------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II               | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y. SEO  | DEV. STEP | MP                       |       | MAIN                     |                         |
| APPROVAL    | H.S. KIM  | REV       | 1.0                      |       | NVIDIA NV43M GRAPHIC 3/4 | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 25                       | OF 56                   |

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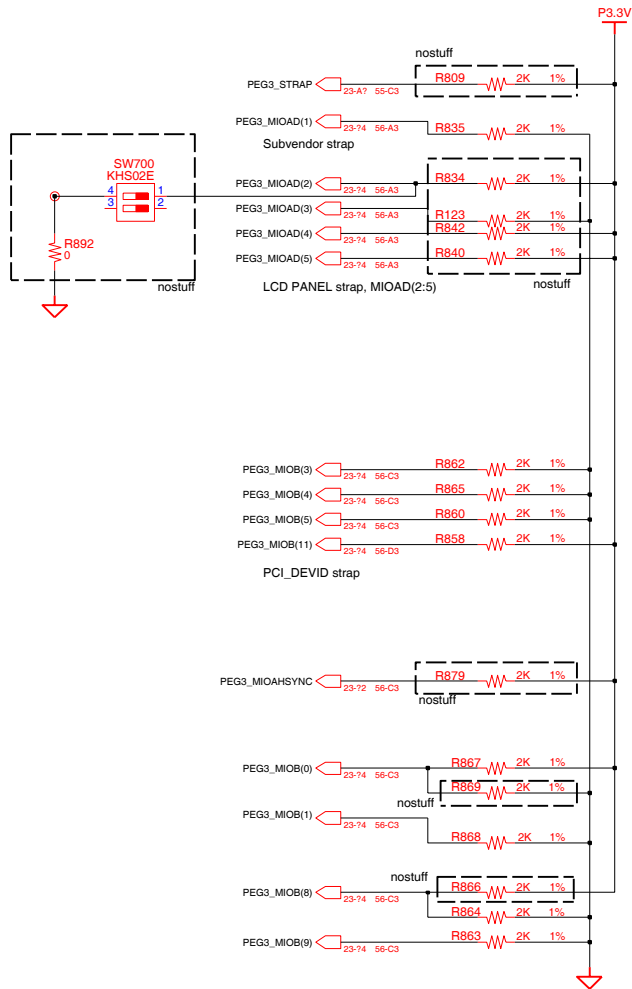


U715-5  
NV43M  
5/5

|             |           |           |                          |                          |            |                        |
|-------------|-----------|-----------|--------------------------|--------------------------|------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE                    | CICHLID-II | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | MAIN                     |            |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0                      | NVIDIA NV43M GRAPHIC 4/4 | PART NO.   | BA41-00489A            |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE                     | 26         | OF 56                  |

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| Straps         | Pin # (Rev.A01)                            | Pin # (Rev.A02)                           | Descriptions   |
|----------------|--|---|--|
| SUB_VENDOR     | MIOAD(1)                                   | MIOAD(1)                                  | 0 : No BIOS<br>1 : Read from BIOS  |
| RAMCFG(3:0)    | MIOAD(5:2)                                 | MIOB(0)<br>MIOB(1)<br>MIOB(8)<br>MIOB(9)  | -> 0001 : 8Mx32 DDR 128bit    1001 : 8Mx32 DDR 64bit<br>1100 : 16Mx32 DDR 128bit    1011 : 16Mx32 DDR 64bit<br>-> 0100 : 4Mx32 DDR 128bit    1101 : 16Mx32 DDR 64bit<br>0010 : 8Mx32 DDR 128bit QF |
| CRYSTAL(1:0)   | MIOB(2)<br>MIOB(6)                         | MIOB(2)<br>MIOB(6)                        | 01 : 14.318 MHz<br>10 : 27 MHz<br>11 : Unknown<br>00 : 13.5 MHz  |
| TV_MODE(1:0)   | MIOAD(7)<br>MIOAD(10)                      | MIOAD(7)<br>MIOAD(10)                     | 00 : SECAM    01 : NTSC<br>10 : PAL    11 : CRT  |
| PCI_DEVID(3:0) | MIOB(4)<br>MIOB(5)<br>MIOB(3)<br>MIOAHSYNC | MIOB(4)<br>MIOB(5)<br>MIOB(3)<br>MIOB(11) | 0x0148   |
| ROM_TYPE(1:0)  | MIOB(11:10)                                | MIOB(10)<br>MIOB(9)                       | ???  |
| USER STRAP     | MIOB(0)<br>MIOB(1)<br>MIOB(8)<br>MIOB(9)   | MIOAD(2:5)                                | LCD PANEL STRAP<br>1101 : 17" WIDE XGA ( 1440 x 900 )<br>1100 : 17" WIDE SXGA+ ( 1680 x 1200 )   |
| GPIO(12:0)     | Sheet 25                                   | Sheet 25                                  | Refer to Sheet 25  |

Test Options for GPIO should be updated..

|       | MIOB(8) |       | MIOB(0) |       |
|-------|---------|-------|---------|-------|
|       | R866    | R864  | R867    | R869  |
| 64MB  | STUFF   | X     | X       | STUFF |
| 128MB | X       | STUFF | STUFF   | X     |

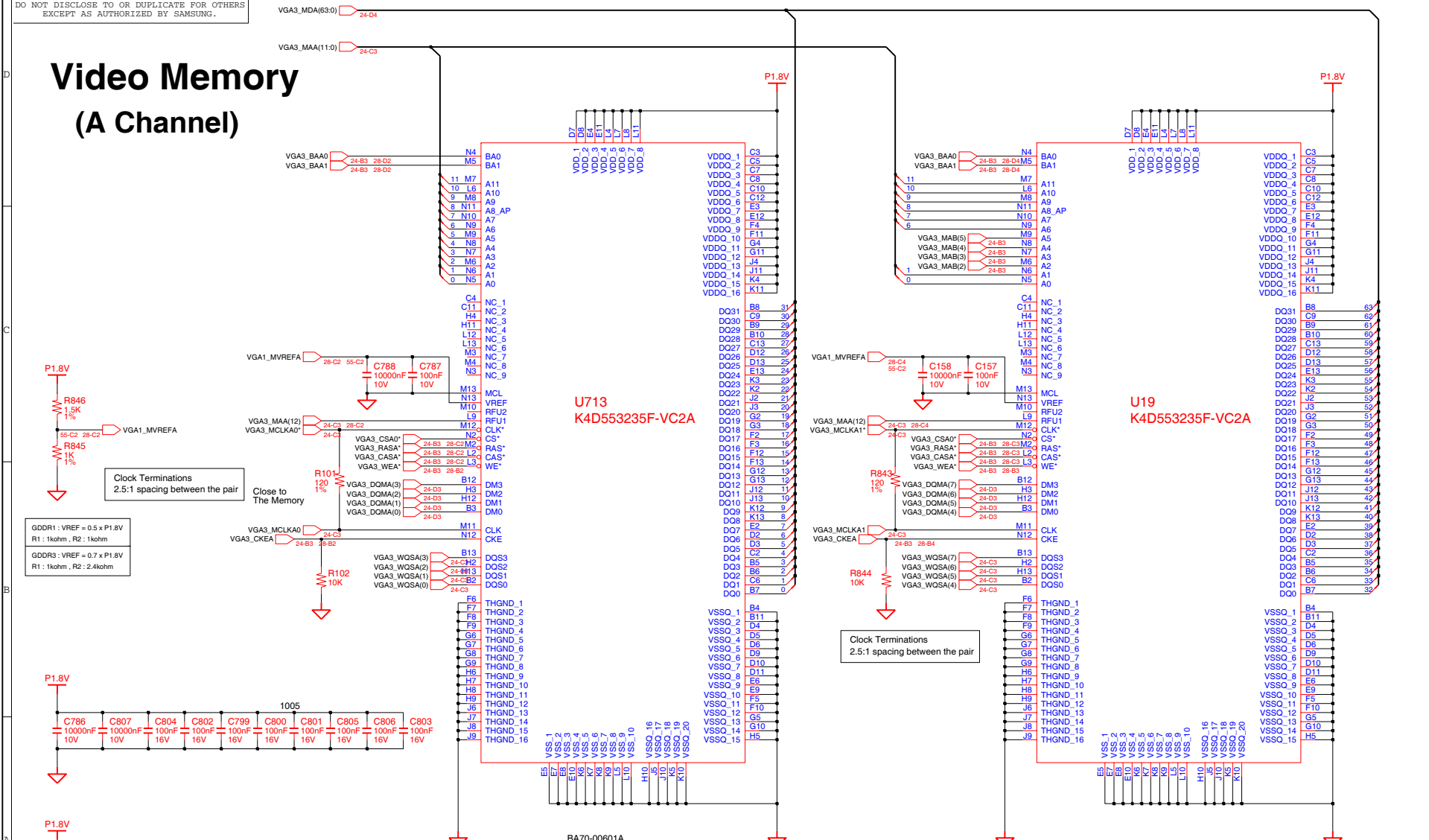
Default -->

0001 : 8Mx32 DDR 128bit  
0100 : 4Mx32 DDR 128bit

|             |           |           |                          |               |  |   |
|-------------|-----------|-----------|--------------------------|---------------|--|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE         | CICHLID-II<br>MAIN<br>NVIDIA NV43M STRAP | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |               |  |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |               |  |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE 27 OF 56 |  |   |

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# Video Memory (A Channel)



GDDR1 : VREF = 0.5 x P1.8V  
 R1 : 1kohm , R2 : 1kohm

GDDR3 : VREF = 0.7 x P1.8V  
 R1 : 1kohm , R2 : 2.4kohm

Clock Terminations  
 2.5:1 spacing between the pair

Clock Terminations  
 2.5:1 spacing between the pair

U713  
 K4D553235F-VC2A

U19  
 K4D553235F-VC2A

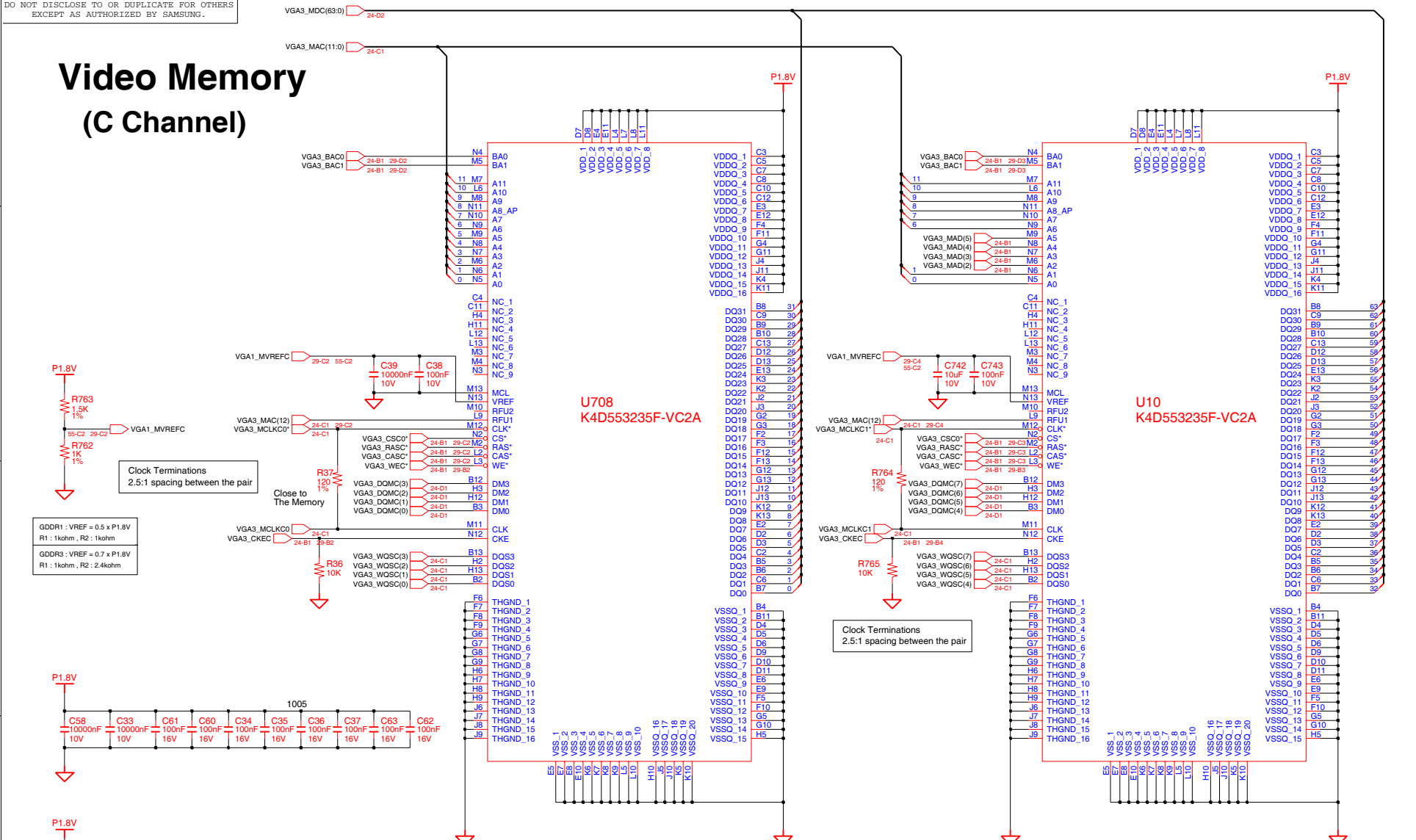
BA70-00601A

|             |           |           |          |       |                          |                        |
|-------------|-----------|-----------|----------|-------|--------------------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE | CICHL ID - II            | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP       |       | MAIN                     |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0      |       | VIDEO MEMORY (CHANNEL A) | PART NO. BA41-00489A   |
| MODULE CODE |           | LAST EDIT |          |       |                          |                        |

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# Video Memory (C Channel)



GDDR1 : VREF = 0.5 x P1.8V  
 R1 : 1kohm , R2 : 1kohm

GDDR3 : VREF = 0.7 x P1.8V  
 R1 : 1kohm , R2 : 2.4kohm

Clock Terminations  
 2.5:1 spacing between the pair

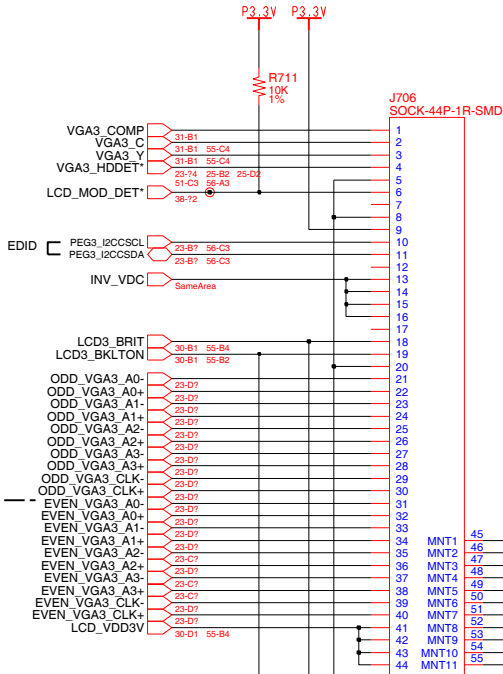
Close to  
 The Memory

Clock Terminations  
 2.5:1 spacing between the pair

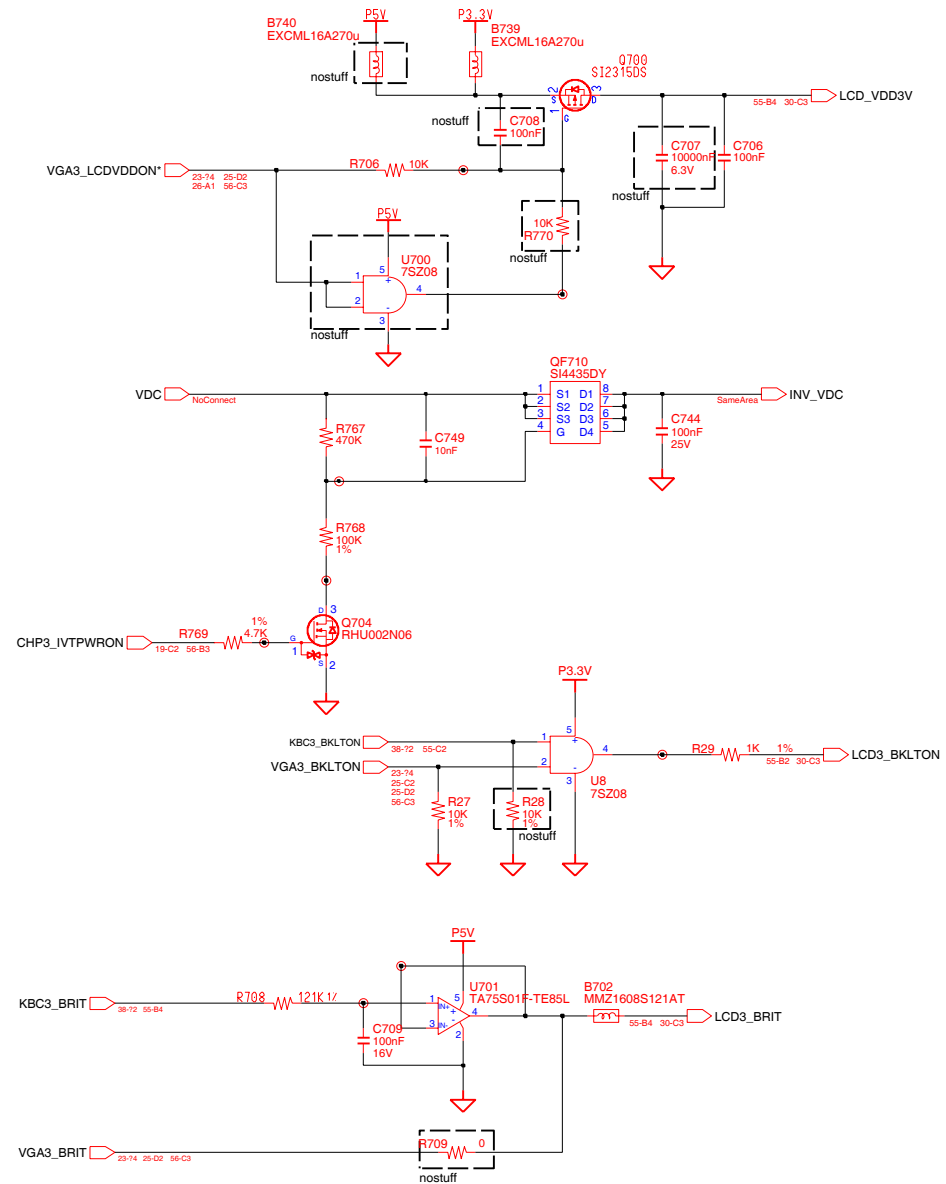
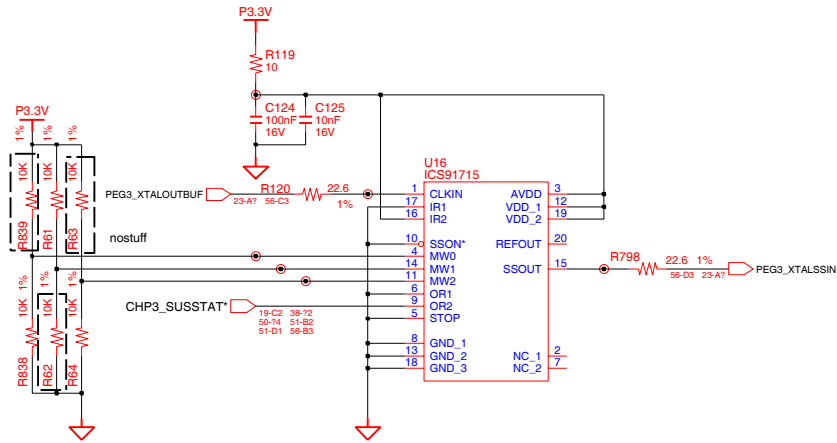
|             |           |           |          |                          |                    |   |
|-------------|-----------|-----------|----------|--------------------------|--------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLID-II<br>MAIN | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA11-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP       | VIDEO MEMORY (CHANNEL C) |                    |   |
| APPROVAL    | H.S KIM   | REV       | 1.0      | July 7, 2005 11:26:14 AM |                    |   |
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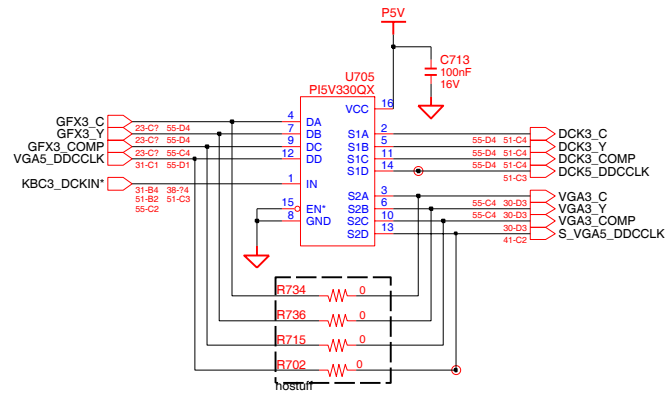
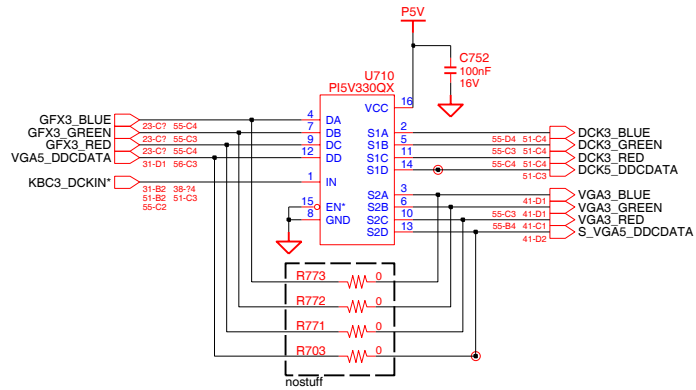
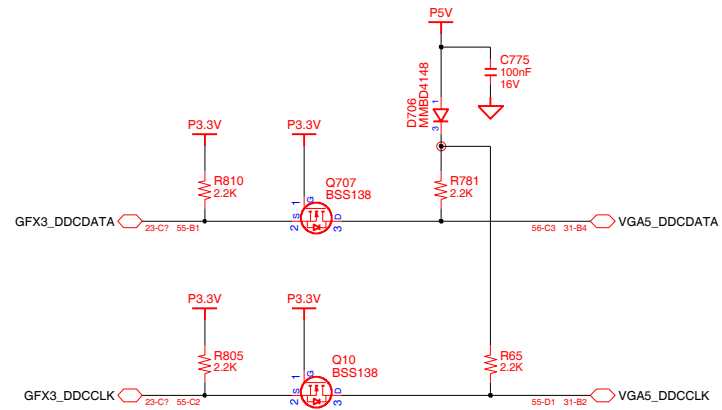
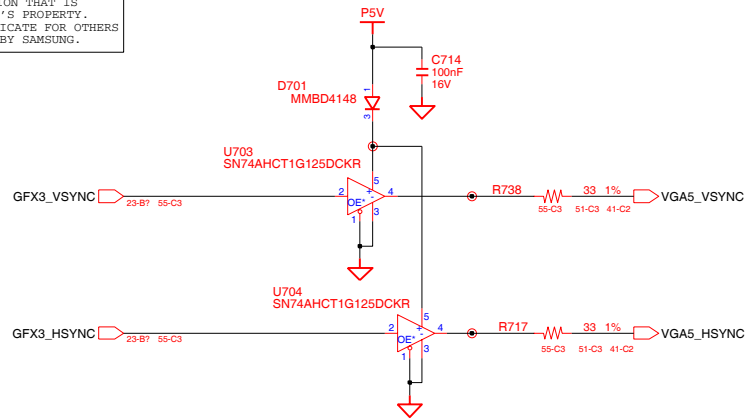
**SPREAD SPECTRUM CLOCK CHIP**  
Located nearby NV43M



|             |           |           |          |                          |   |   |
|-------------|-----------|-----------|----------|--------------------------|---|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLD-II<br>LCD Connector &<br>SPREAD SPECTRUM | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP       |                          |   |   |
| APPROVAL    | H.S KIM   | REV       | 1.0      |                          |   |   |
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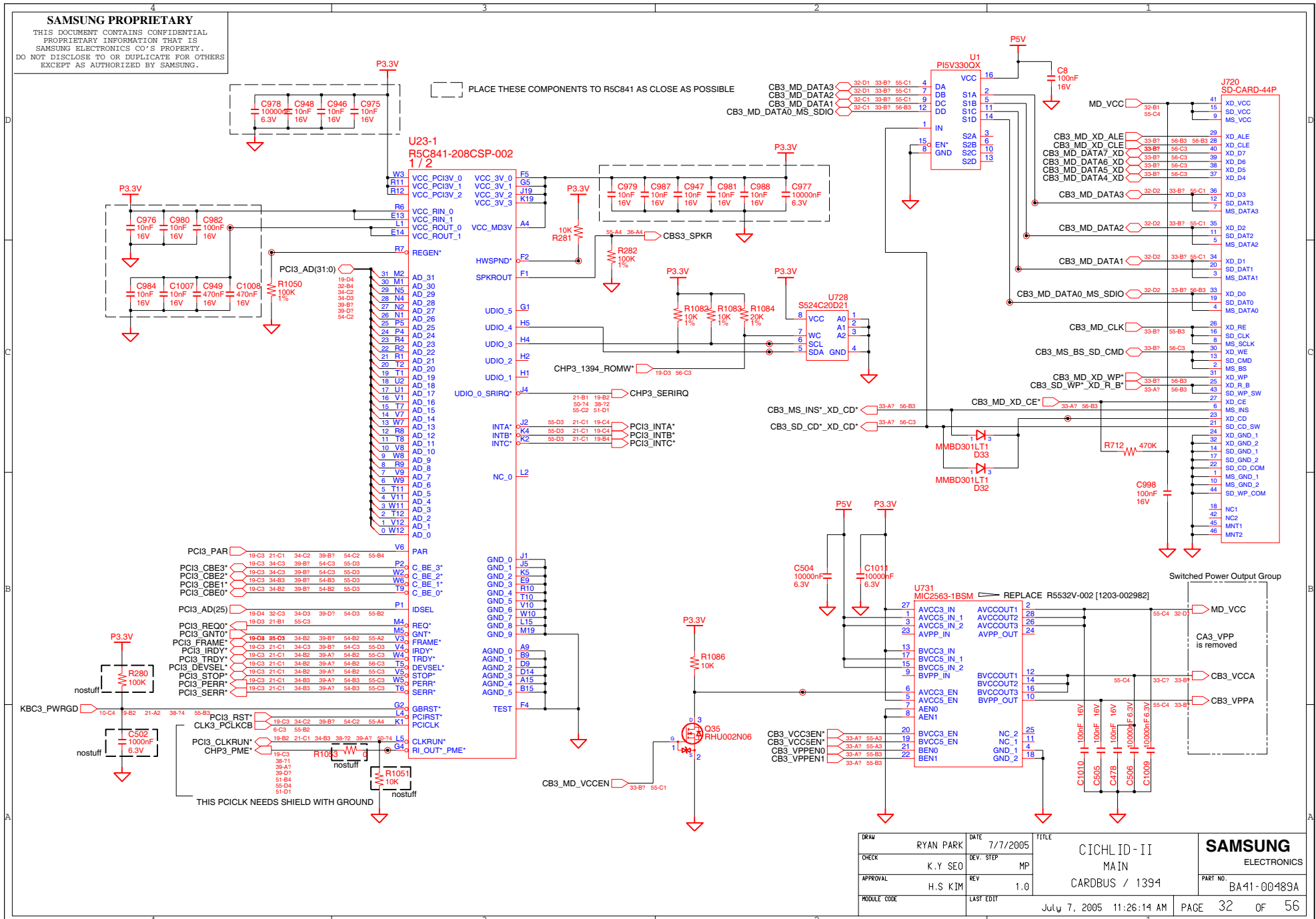
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| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE         | CICHLID-II<br>MAIN<br>CRT PORT | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO.<br>BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |               |                                |  |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |               |                                |  |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE 31 OF 56 |                                |  |

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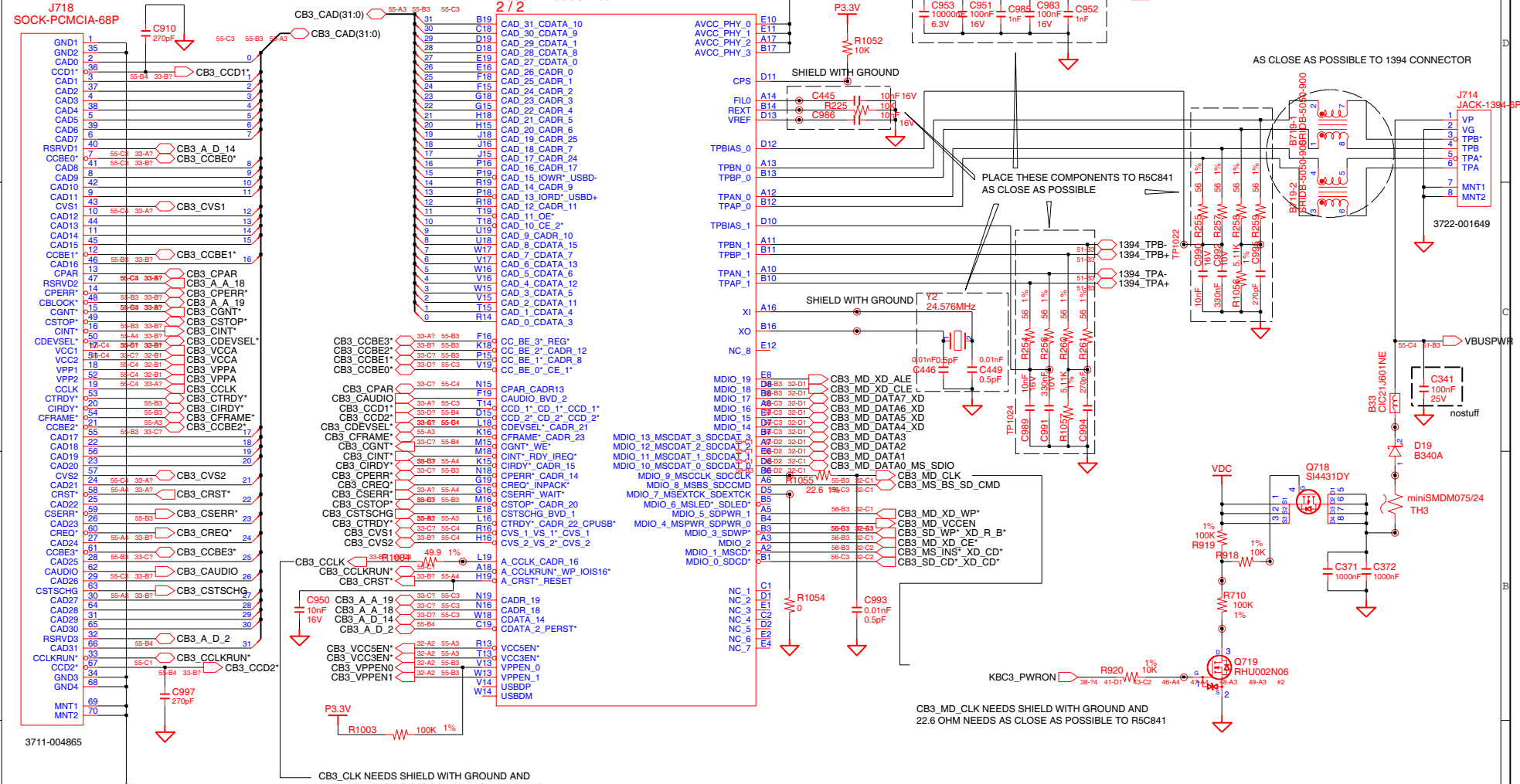


|             |           |           |                          |       |                |                      |
|-------------|-----------|-----------|--------------------------|-------|----------------|----------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II     | SAMSUNG ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN           |                      |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | CARDBUS / 1394 | PART NO. BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 32 OF 56       |                      |

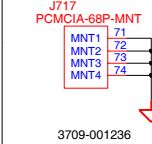


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U23-2  
**R5C841-208CSP-002**  
 2 / 2



3711-004865

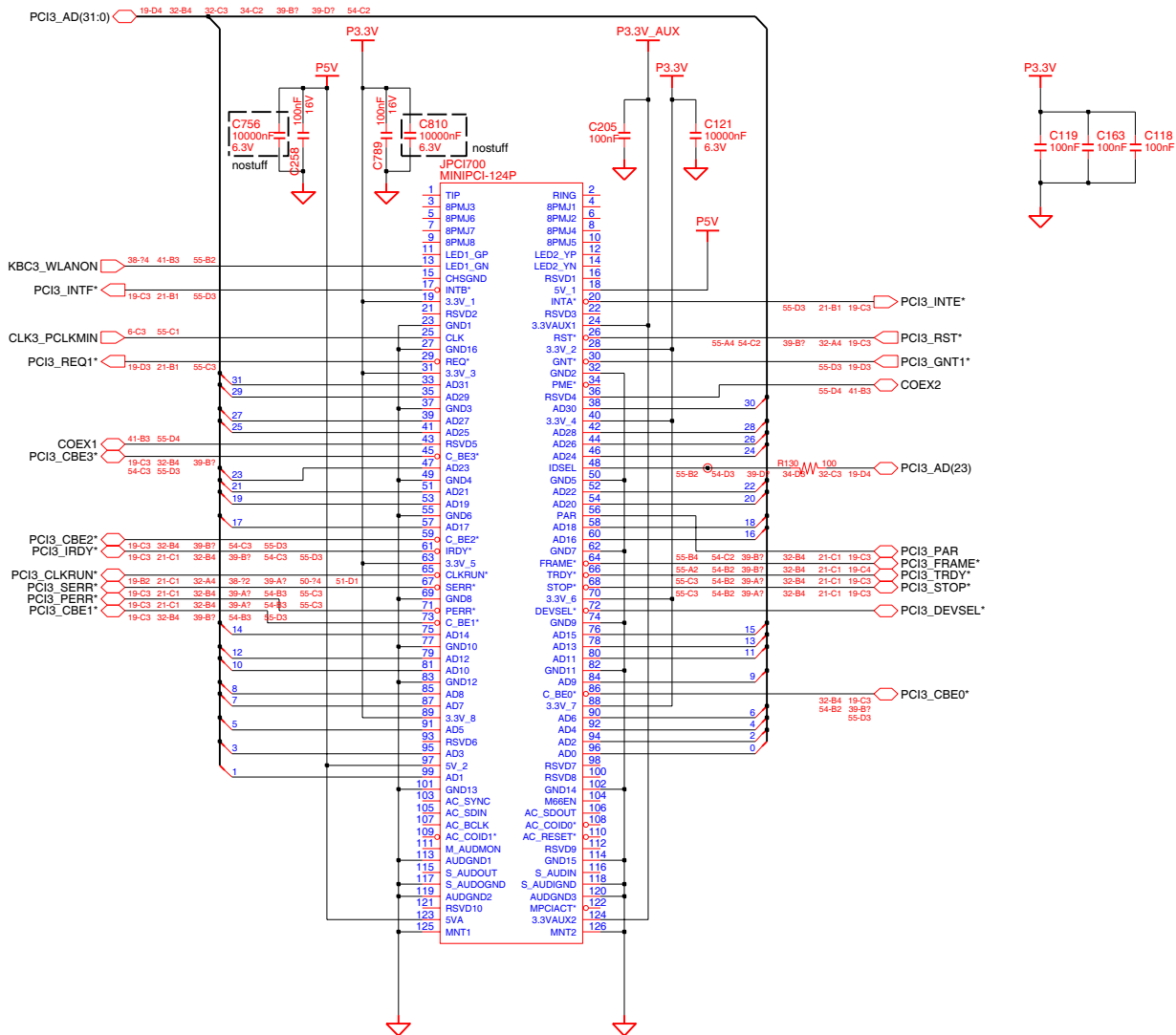


3709-001236

|             |           |           |          |                          |                           |   |
|-------------|-----------|-----------|----------|--------------------------|---------------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLID-II                | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y. SEO  | DEV. STEP | MP       |                          | MAIN                      |   |
| APPROVAL    | H.S. KIM  | REV       | 1.0      |                          | CARDBUS SOCKET/MEDIA CARD |   |
| MODULE CODE |           | LAST EDIT |          |                          |                           |   |
|             |           |           |          | July 7, 2005 11:26:14 AM | PAGE 33 OF 56             |   |

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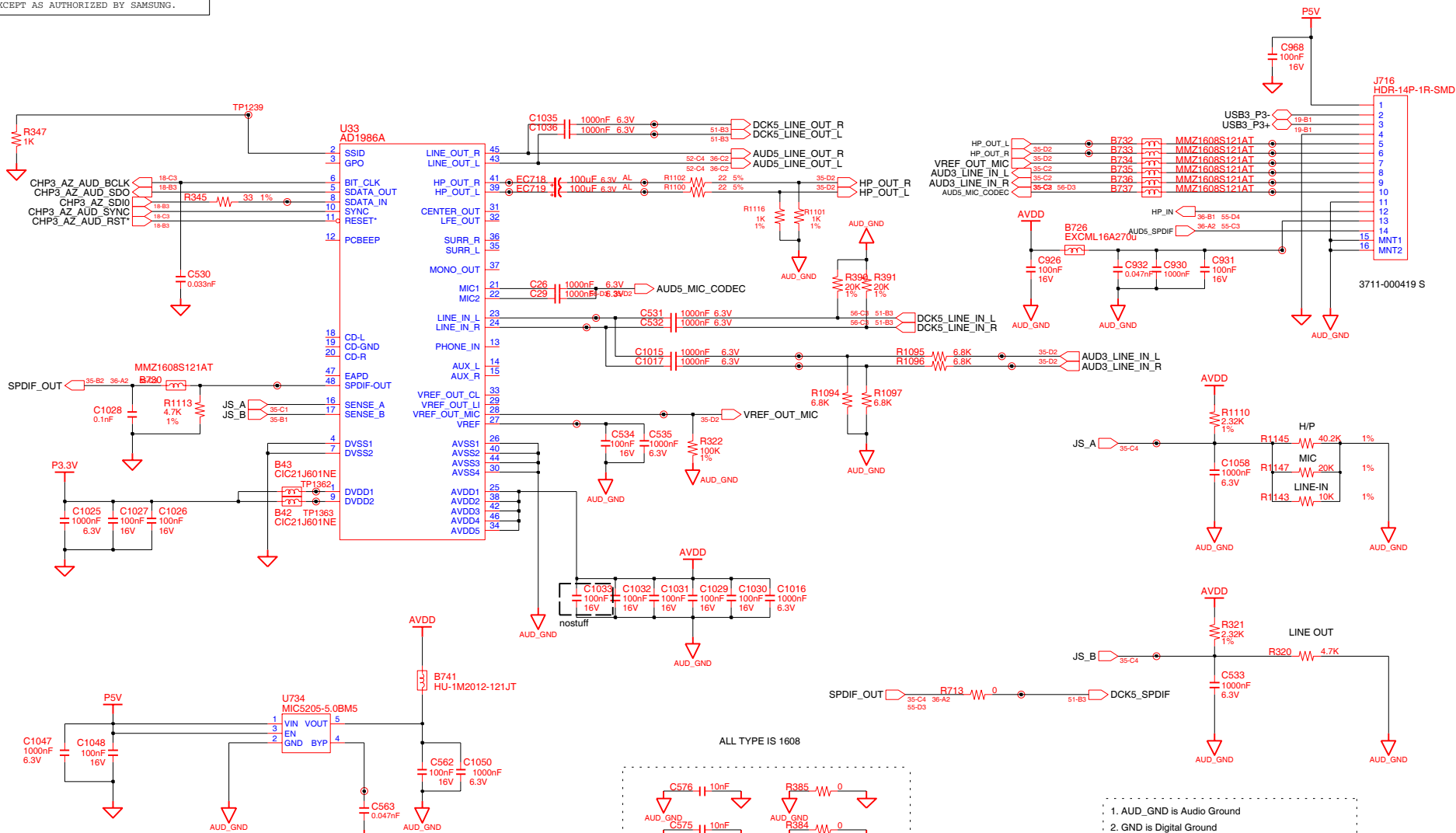
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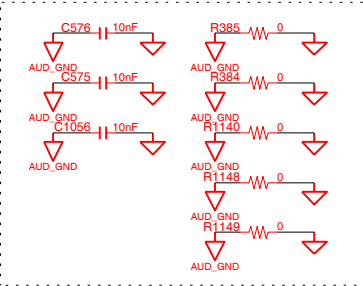
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| DRAW     | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>MAIN<br>MINI PCI | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO.<br>BA41-00489A |
| CHECK    | K.Y SEO   | DEV. STEP | MP                       | REV   | 1.0                            |  |
| APPROVAL | H.S KIM   | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 34                             | OF 56  |

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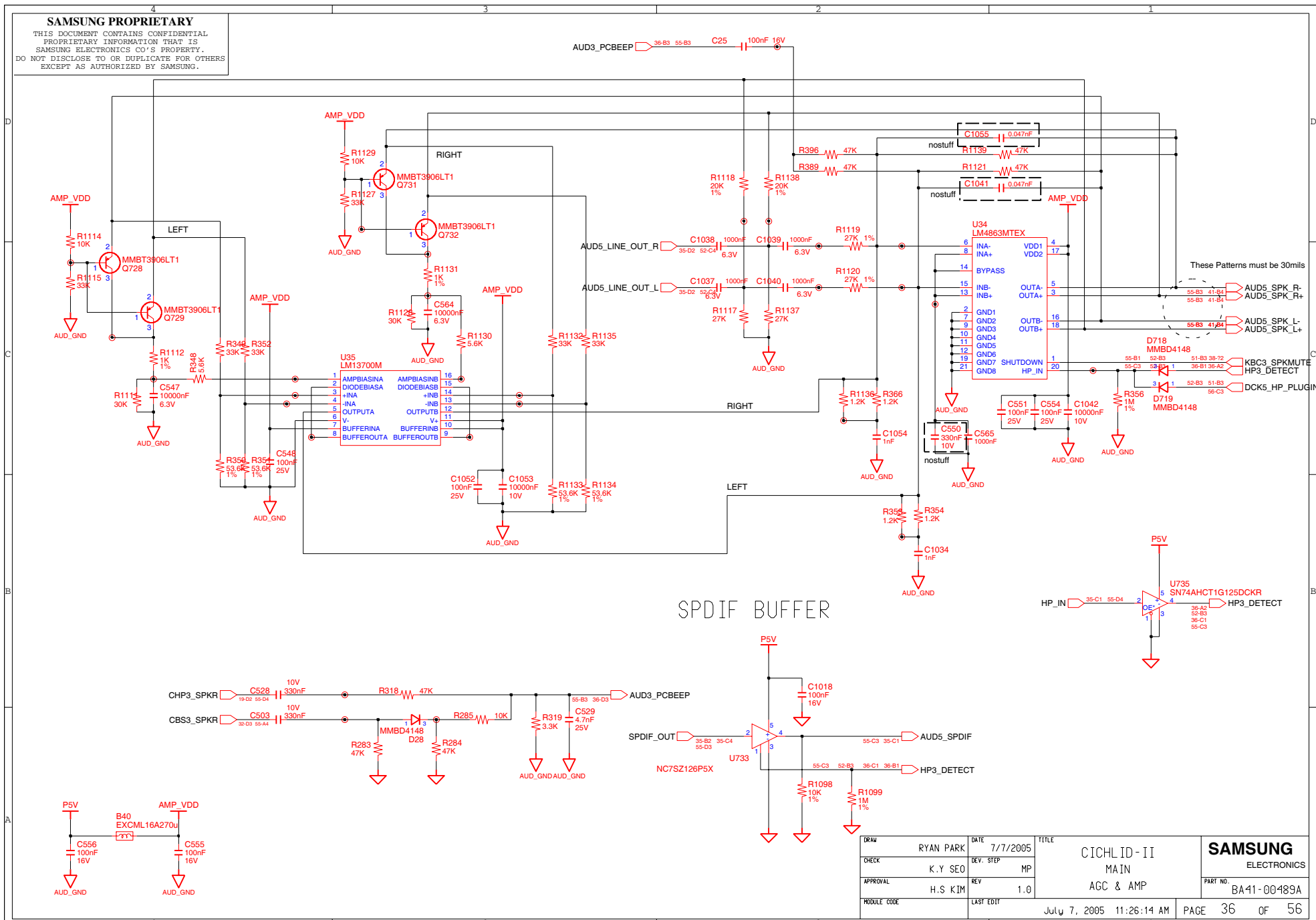
- 1. AUD\_GND is Audio Ground
- 2. GND is Digital Ground
- 3. MGND is Mic\_Ground



|             |           |           |                          |                        |                      |                        |
|-------------|-----------|-----------|--------------------------|------------------------|----------------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE                  | CICHLID-II           | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |                        | MAIN                 |                        |
| APPROVAL    | H.S KIM   | REV       | 1.0                      | AUDIO CODEC ( AZALIA ) | PART NO. BA41-00489A |                        |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE                   | 35                   | OF 56                  |

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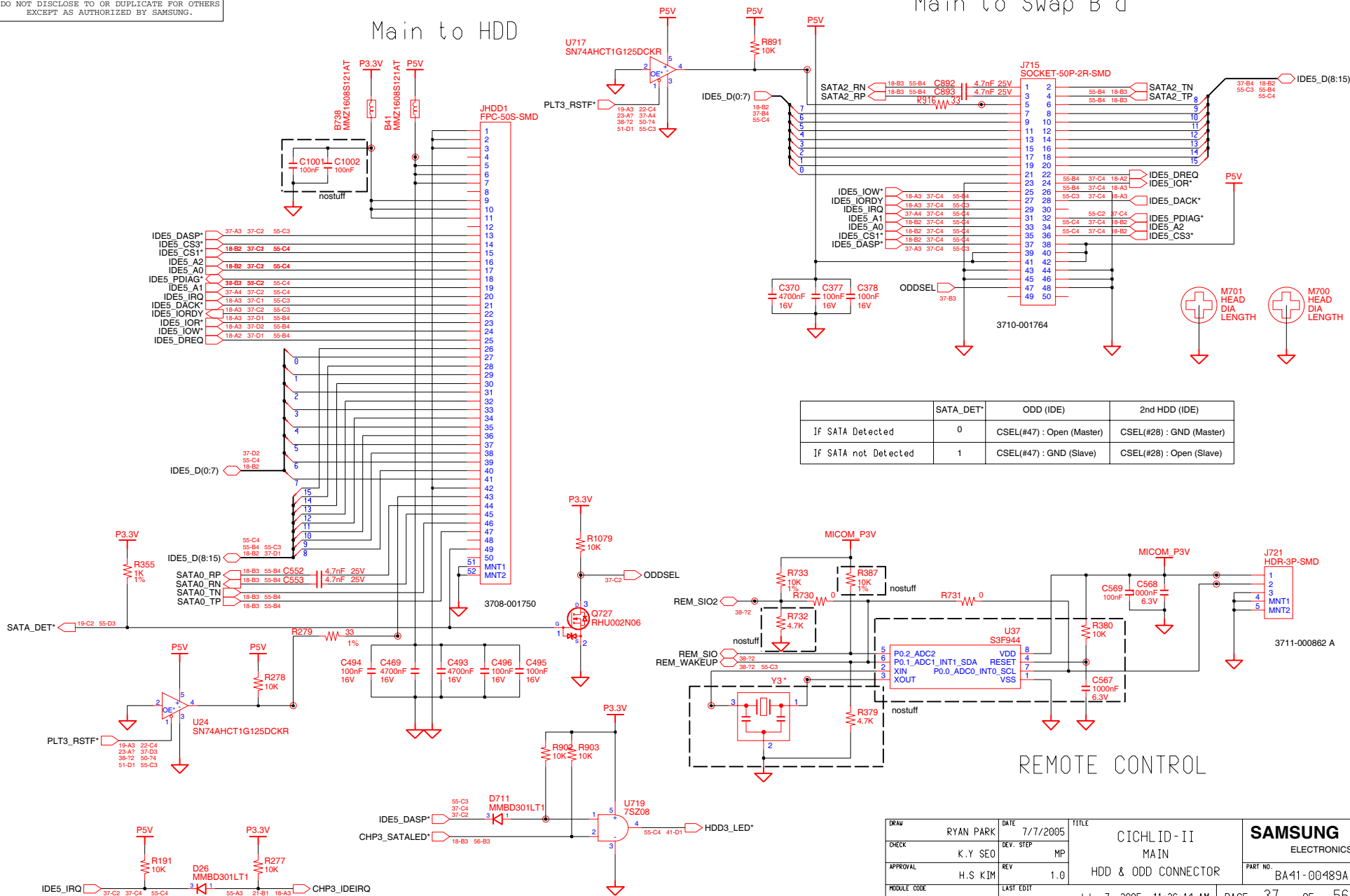


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Main to Swap B'd

Main to HDD



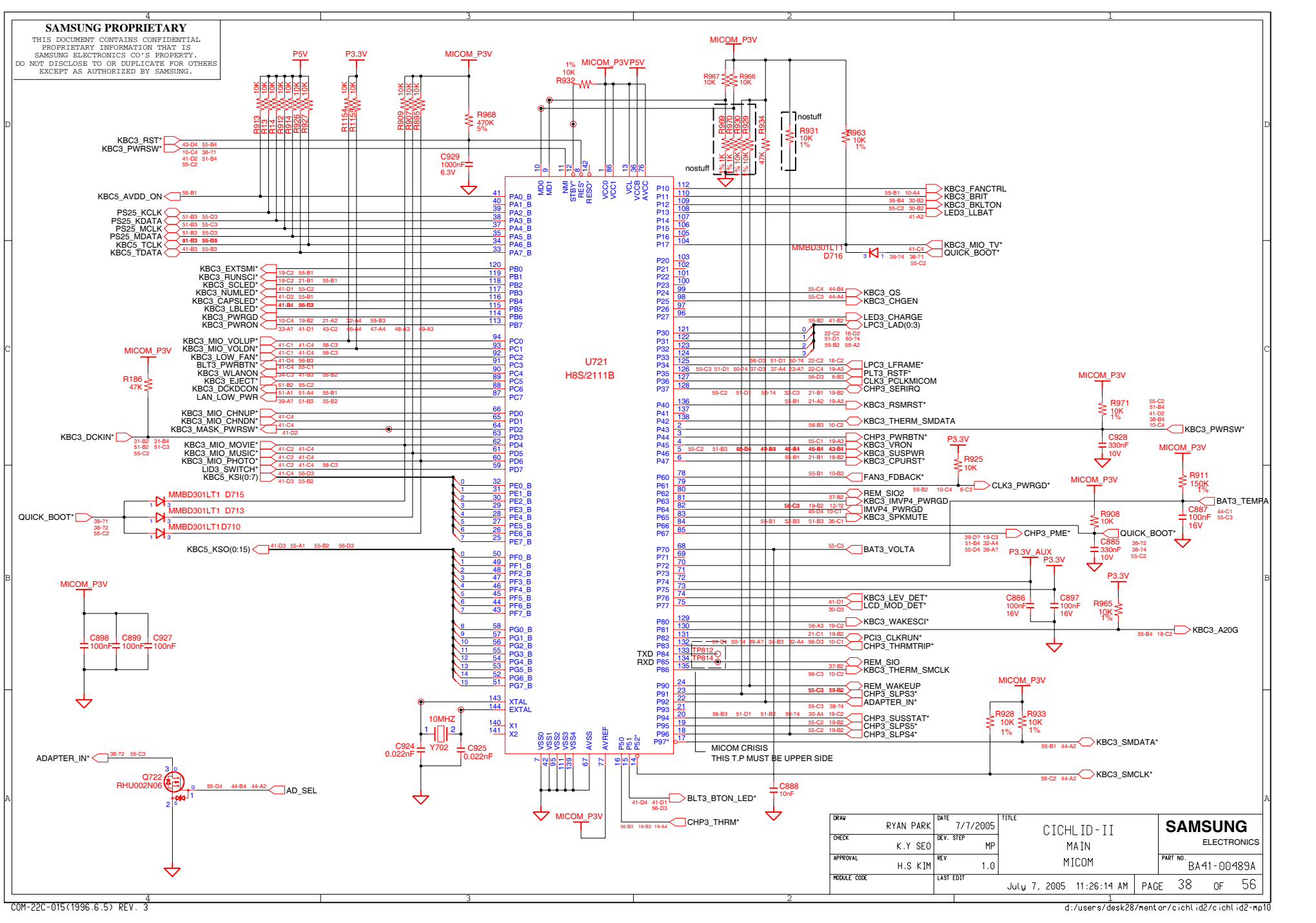
|                      | SATA_DET* | ODD (IDE)                 | 2nd HDD (IDE)            |
|----------------------|-----------|---------------------------|--------------------------|
| If SATA Detected     | 0         | CSEL(#47) : Open (Master) | CSEL(#28) : GND (Master) |
| If SATA not Detected | 1         | CSEL(#47) : GND (Slave)   | CSEL(#28) : Open (Slave) |

REMOTE CONTROL

|             |           |           |                          |       |                     |                         |
|-------------|-----------|-----------|--------------------------|-------|---------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II          | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN                |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | HDD & ODD CONNECTOR | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 37                  | OF 56                   |

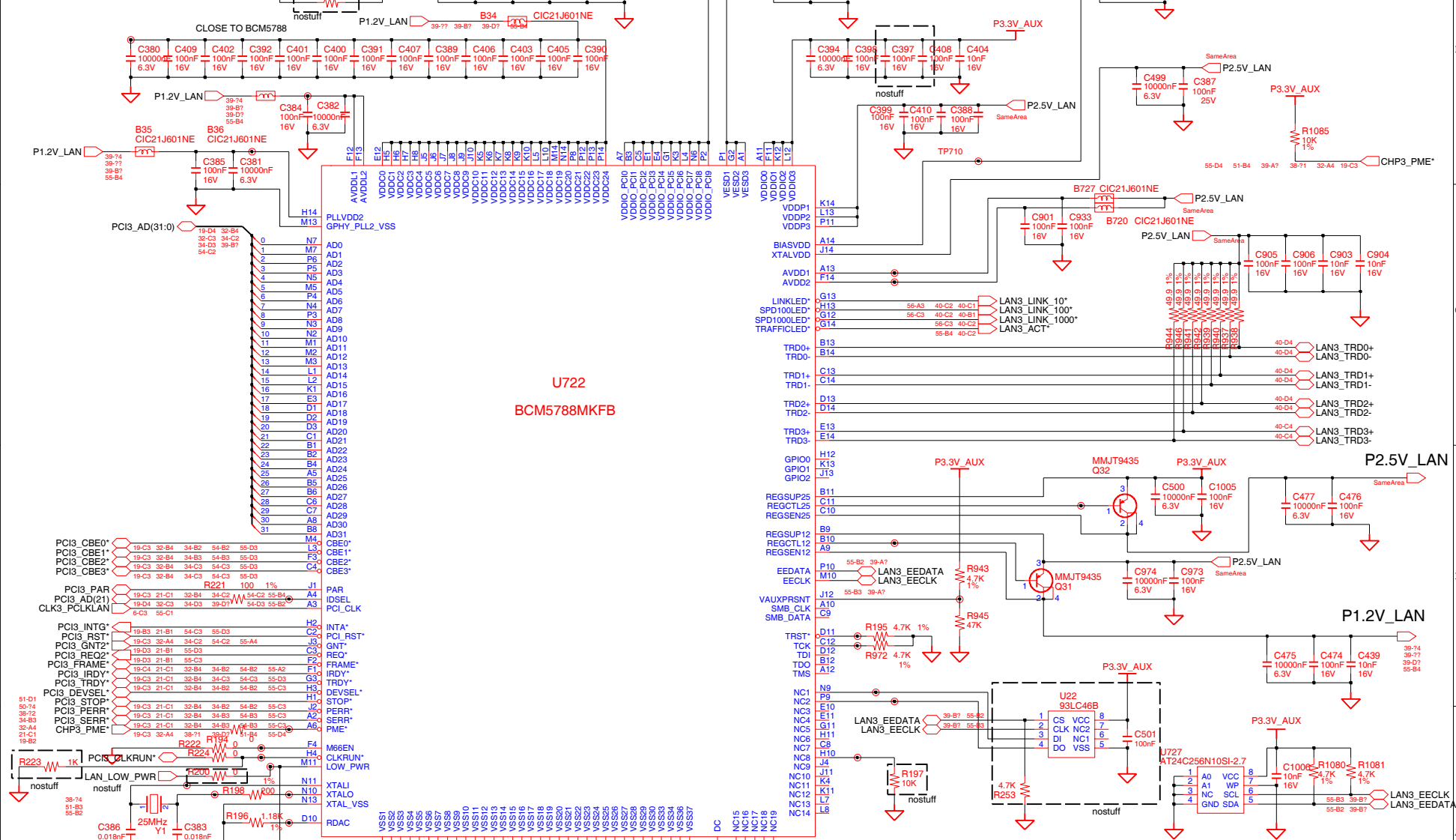
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|             |           |           |                          |       |            |                         |
|-------------|-----------|-----------|--------------------------|-------|------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | MAIN  |            |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      | MICOM |            | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM |       |            | PAGE 38 OF 56           |

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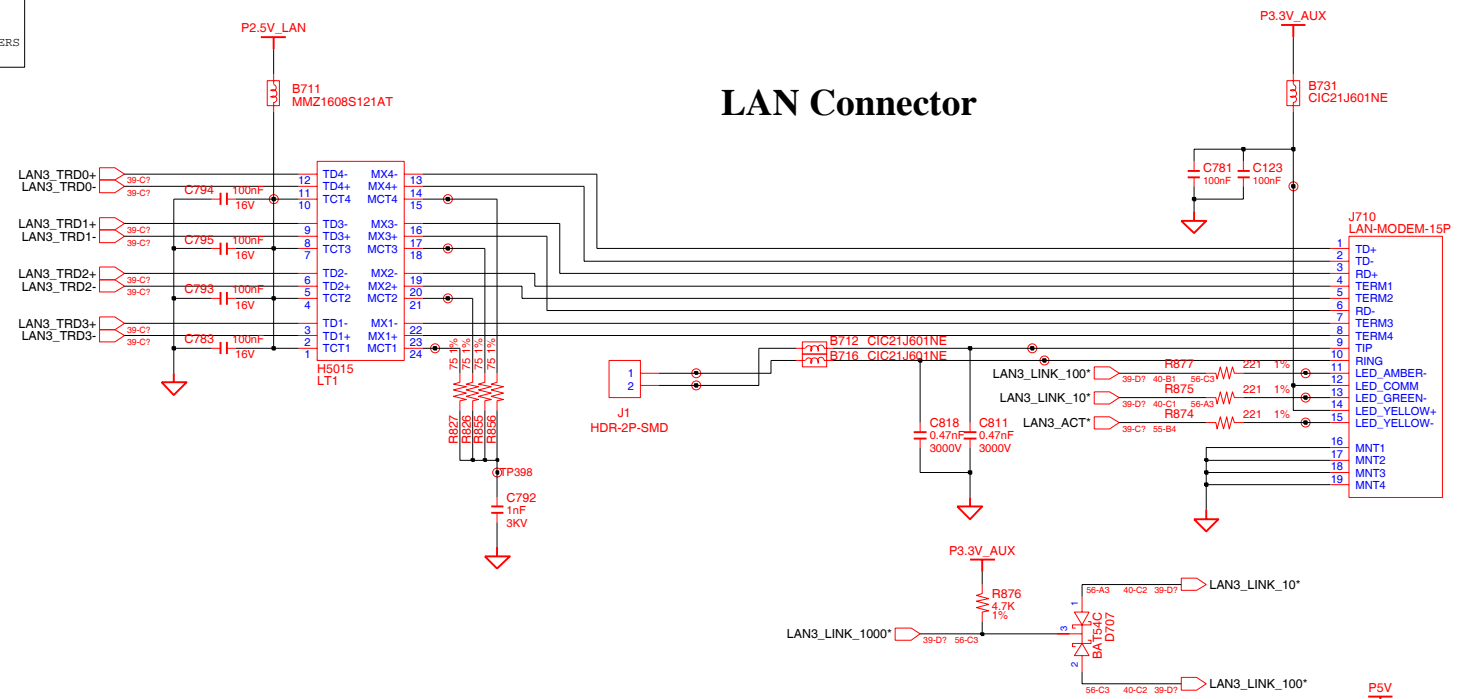
**U722**  
**BCM5788MKFB**

|             |           |           |          |       |                       |                               |
|-------------|-----------|-----------|----------|-------|-----------------------|-------------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE | CICHLID-II            | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP       | MAIN  | LAN<BROADCOM BCM5788M |                               |
| APPROVAL    | H.S KIM   | REV       | 1.0      |       |                       | PART NO. BA41-00489A          |
| MODULE CODE |           | LAST EDIT |          |       |                       |                               |

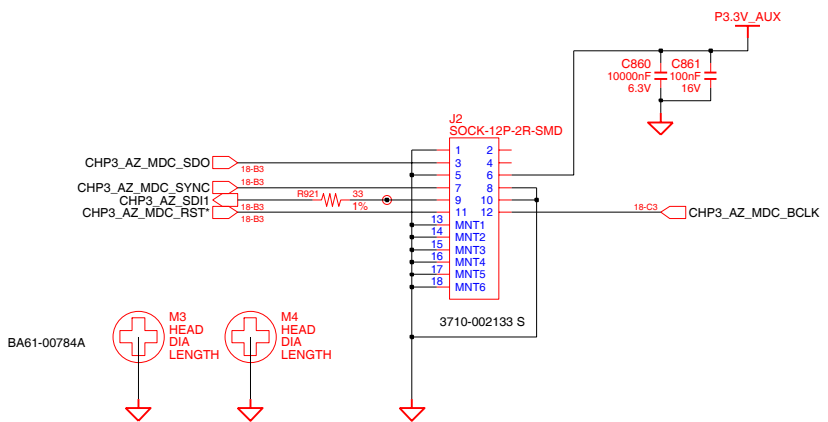
July 7, 2005 11:26:14 AM PAGE 39 OF 56

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### LAN Connector

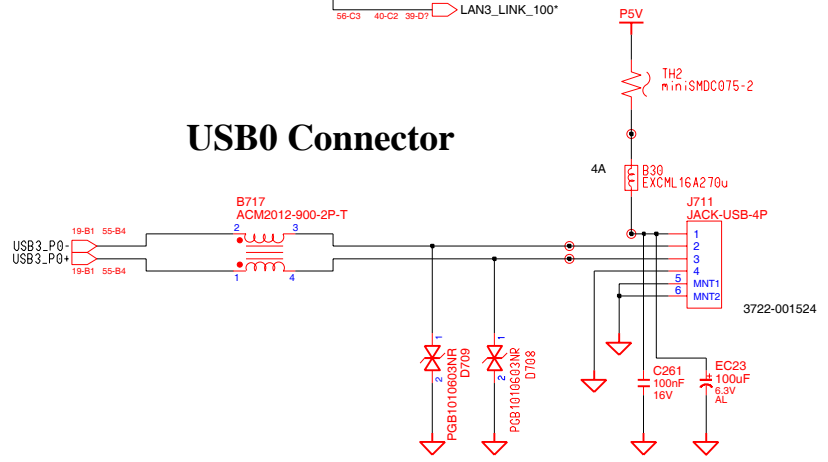


### MDC Connector



MUST TO REPLACE  
 Height : 3 mm

### USB0 Connector



|             |           |           |                          |                          |                         |                               |
|-------------|-----------|-----------|--------------------------|--------------------------|-------------------------|-------------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE                    | CICHLID-II<br>MAIN      | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | LAN & USB0 & MODEM Conn. | PART NO.<br>BA41-00489A |                               |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |                          |                         |                               |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE                     | 40                      | OF 56                         |



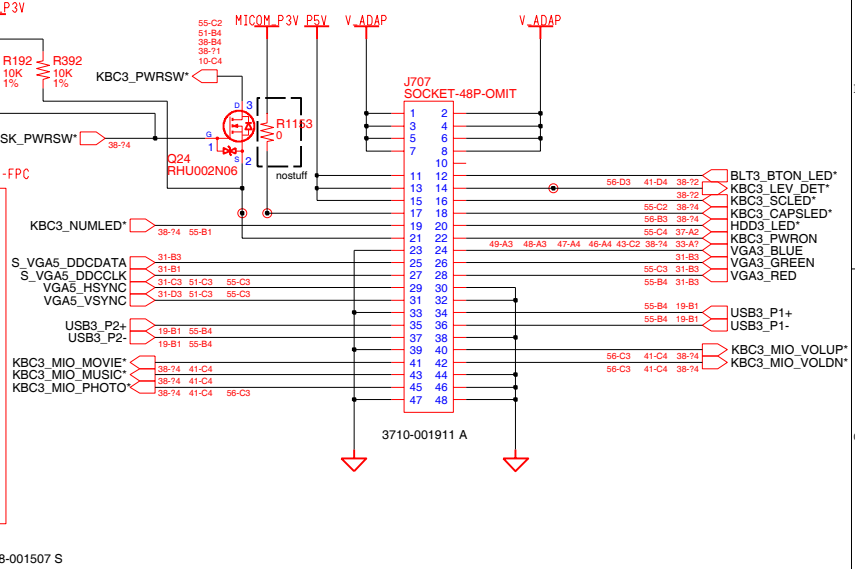
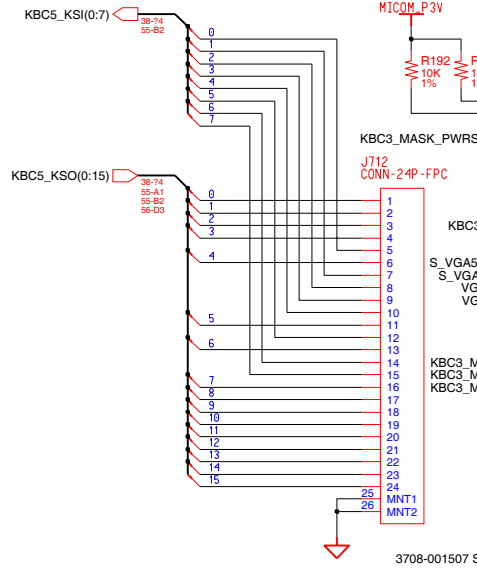
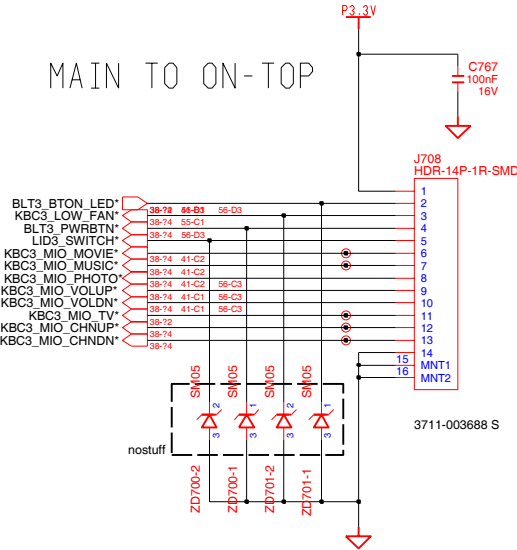
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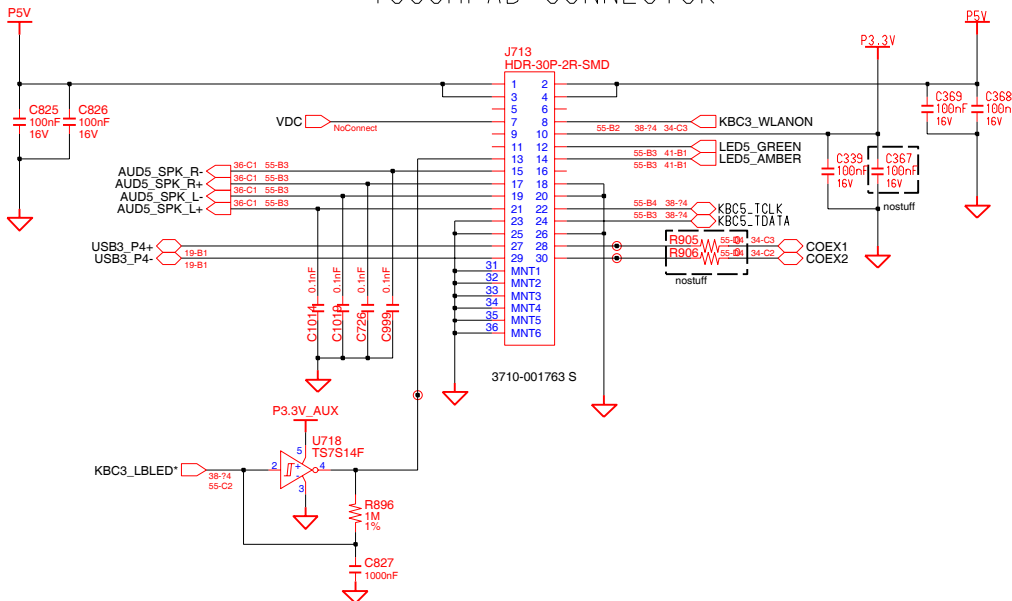
**KEYBOARD**

**Main to DC/DC BOARD**

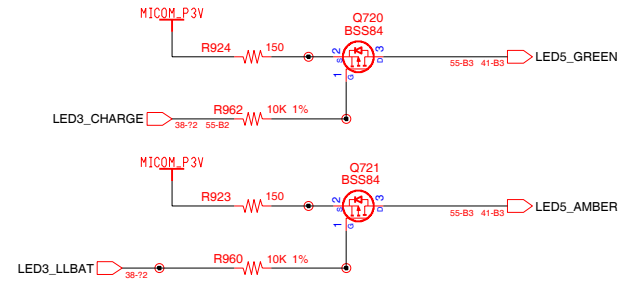
**MAIN TO ON-TOP**



**TOUCHPAD CONNECTOR**



**ADAPTERIN/CHARGING LED**

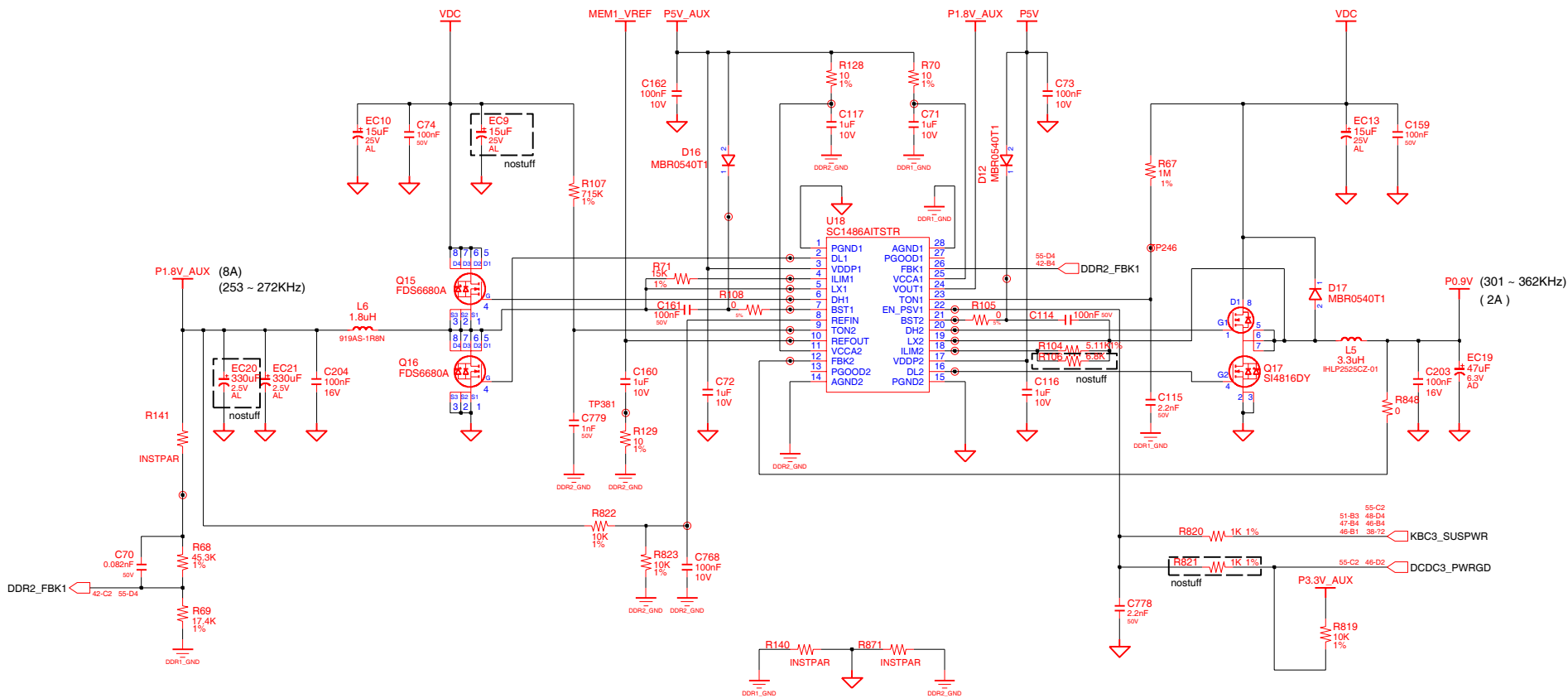


|             |           |           |                          |       |                      |                         |
|-------------|-----------|-----------|--------------------------|-------|----------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II           | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN                 |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | B'D TO B'D CONNECTOR | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 41                   | OF 56                   |

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# DDR2 Power

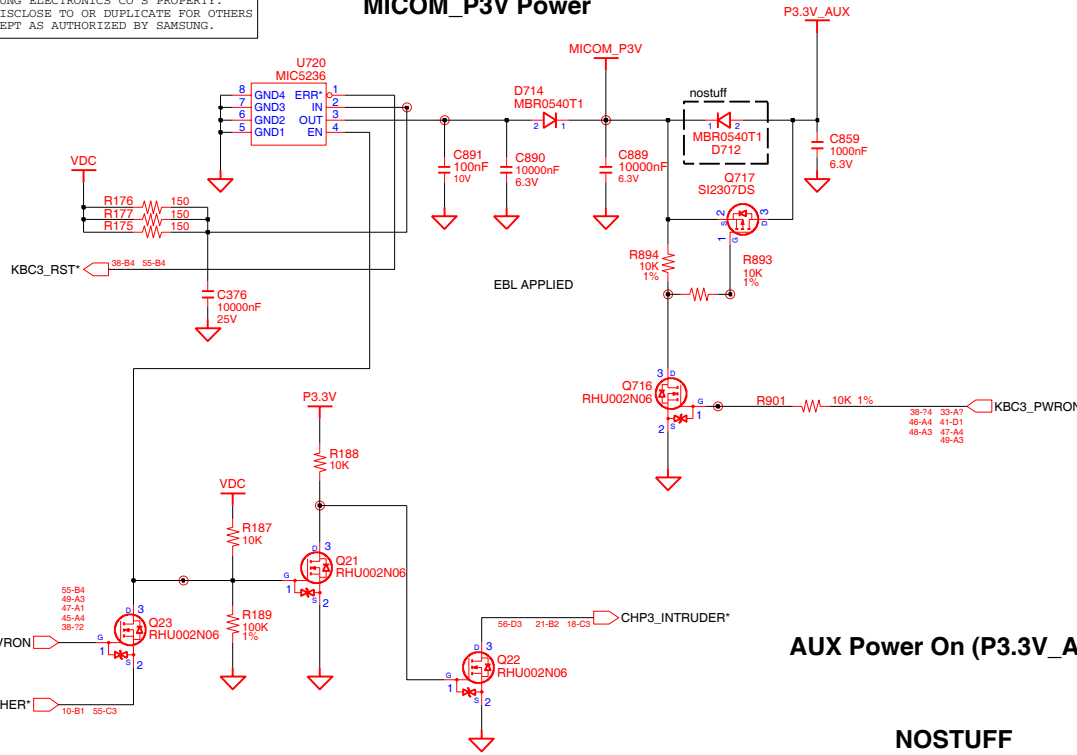


| DRW         | RYAN PARK | DATE      | 7/7/2005                 | TITLE    | CICHLID-II MAIN<br>DDR2 POWER |
|-------------|-----------|-----------|--------------------------|----------|-------------------------------|
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | PART NO. | BA41-00489A                   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      | PAGE     | 42 OF 56                      |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM |          |                               |

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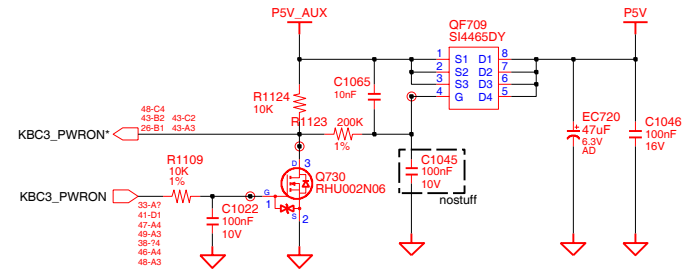
**MICOM\_P3V Power**



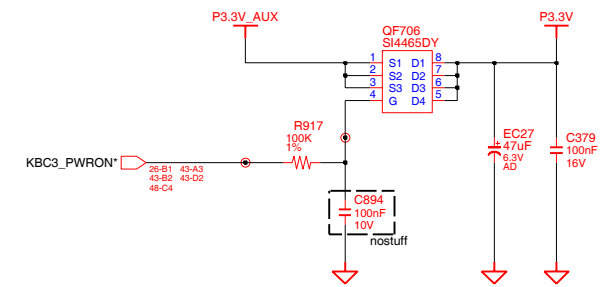
**AUX Power On (P3.3V\_AUX)**

NOSTUFF

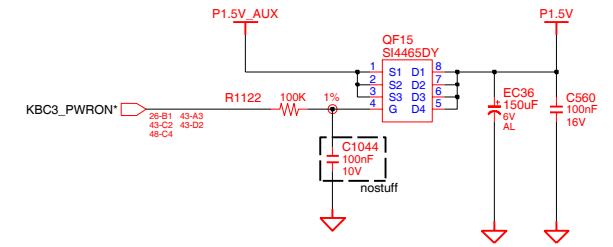
**Switched Power On (P5V)**



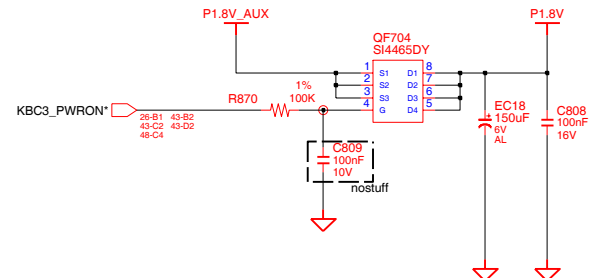
**Switched Power On (P3.3V)**



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



**Switched Power On (P1.8V)**



|             |           |           |                          |       |                        |                         |
|-------------|-----------|-----------|--------------------------|-------|------------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II             | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN                   |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | MICOM & SWITCHED POWER | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 43                     | OF 56                   |

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[2600mA\_CELL]

ICHG = 3.52A  
R1=150kohm  
R2=100kohm

[2400mA\_CELL]

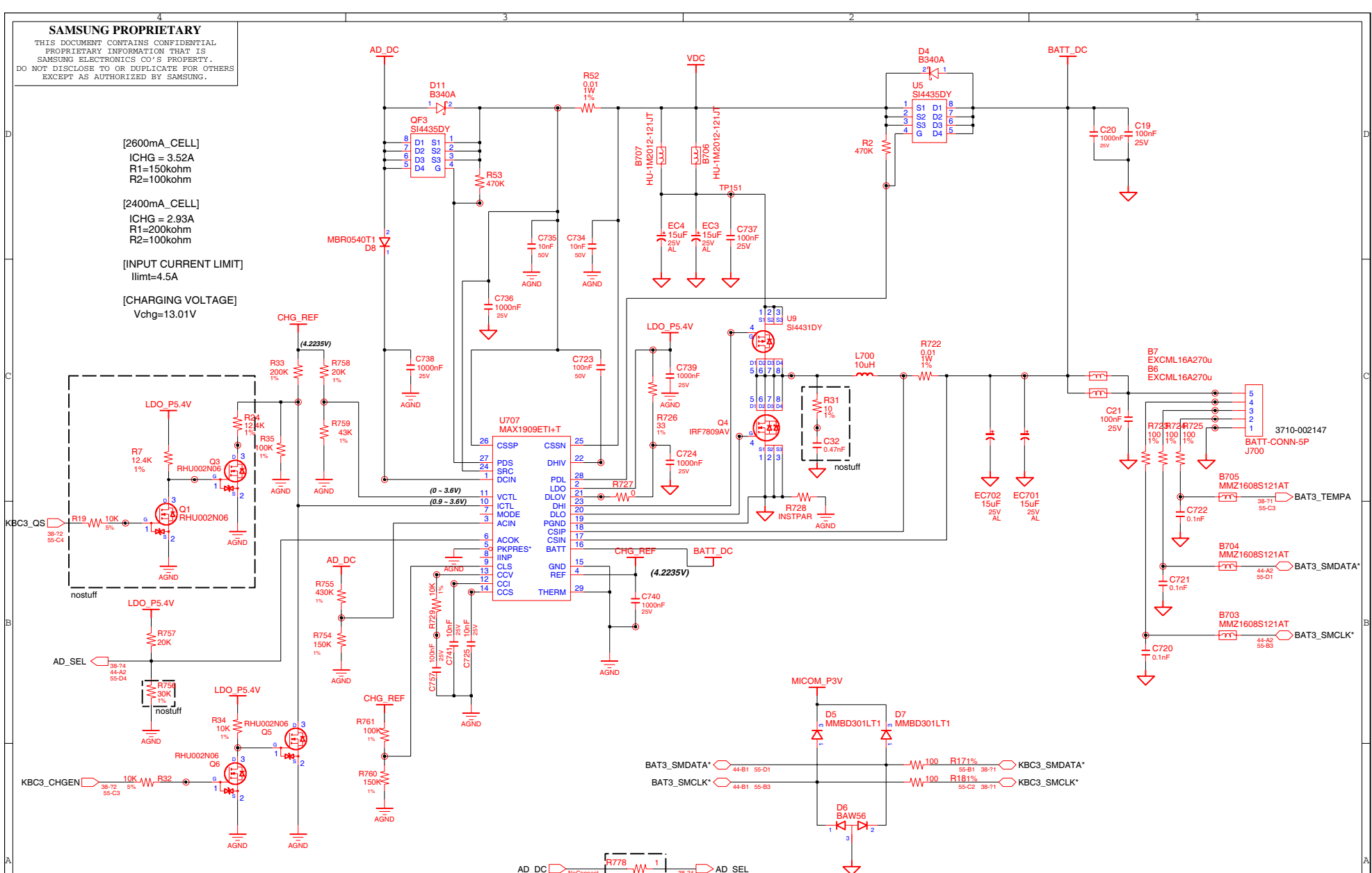
ICHG = 2.93A  
R1=200kohm  
R2=100kohm

[INPUT CURRENT LIMIT]

Ilimit=4.5A

[CHARGING VOLTAGE]

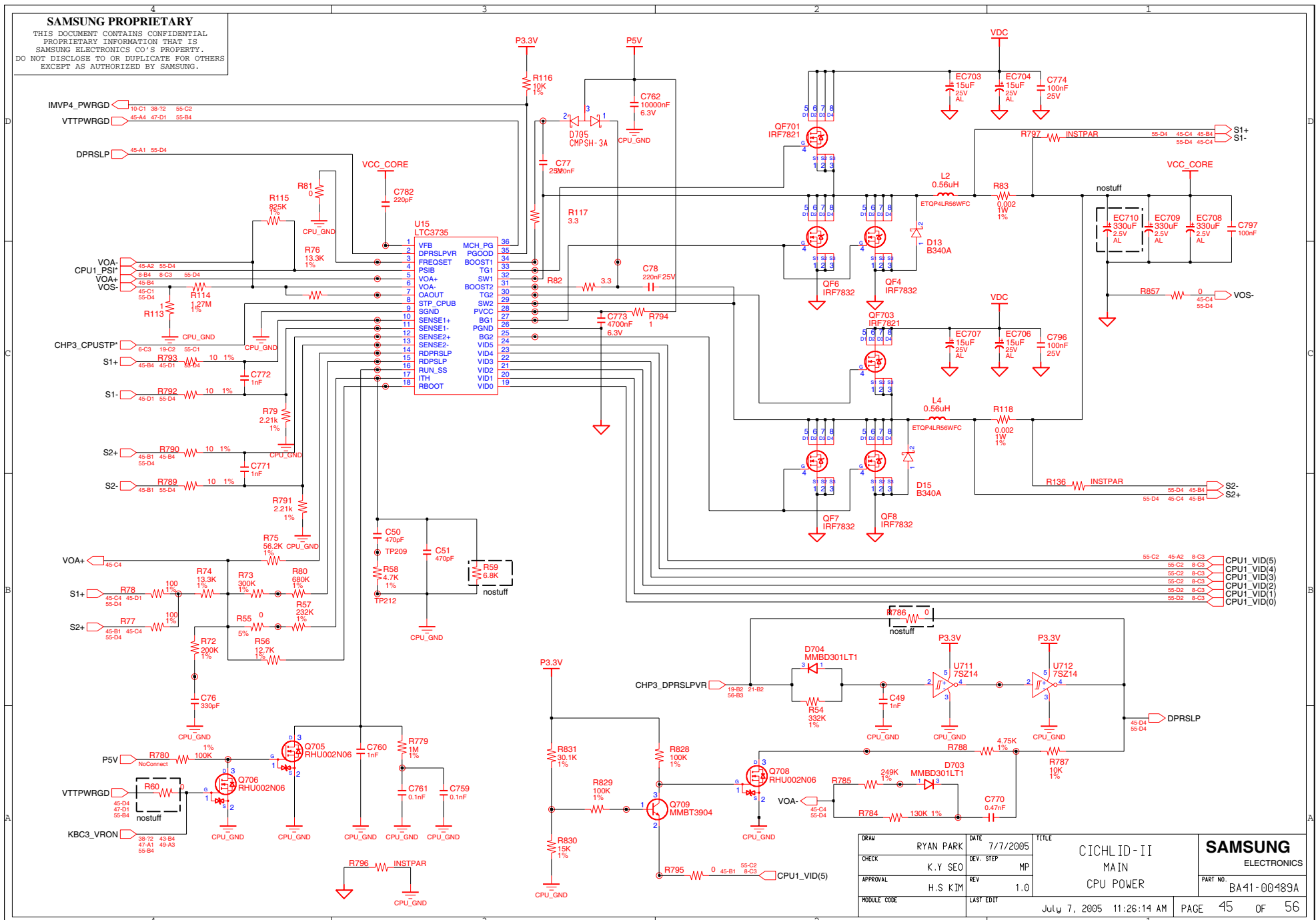
Vchg=13.01V



|          |           |           |                          |       |                               |   |
|----------|-----------|-----------|--------------------------|-------|-------------------------------|---|
| DRAW     | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>MAIN<br>CHARGER | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK    | K.Y SEO   | DEV. STEP | MP                       | REV   | 1.0                           |   |
| APPROVAL | H.S KIM   | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 44                            | OF 56   |

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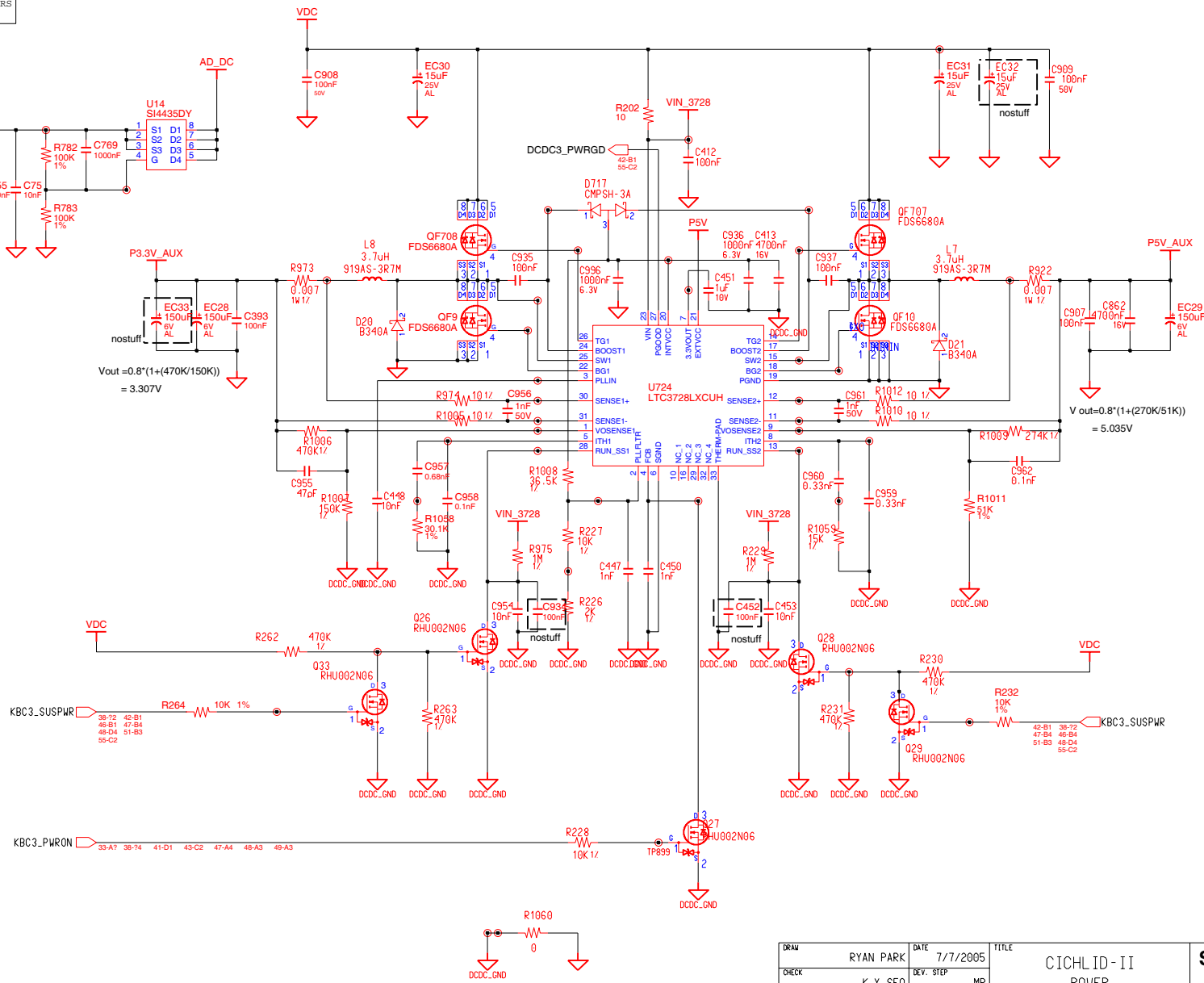
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|          |           |           |                         |       |                                 |   |
|----------|-----------|-----------|-------------------------|-------|---------------------------------|---|
| DRAW     | RYAN PARK | DATE      | 7/7/2005                | TITLE | CICHLID-II<br>MAIN<br>CPU POWER | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK    | K.Y SEO   | DEV. STEP | MP                      | REV   | 1.0                             |   |
| APPROVAL | H.S KIM   | LAST EDIT | Jul 7, 2005 11:26:14 AM | PAGE  | 45                              | OF 56   |

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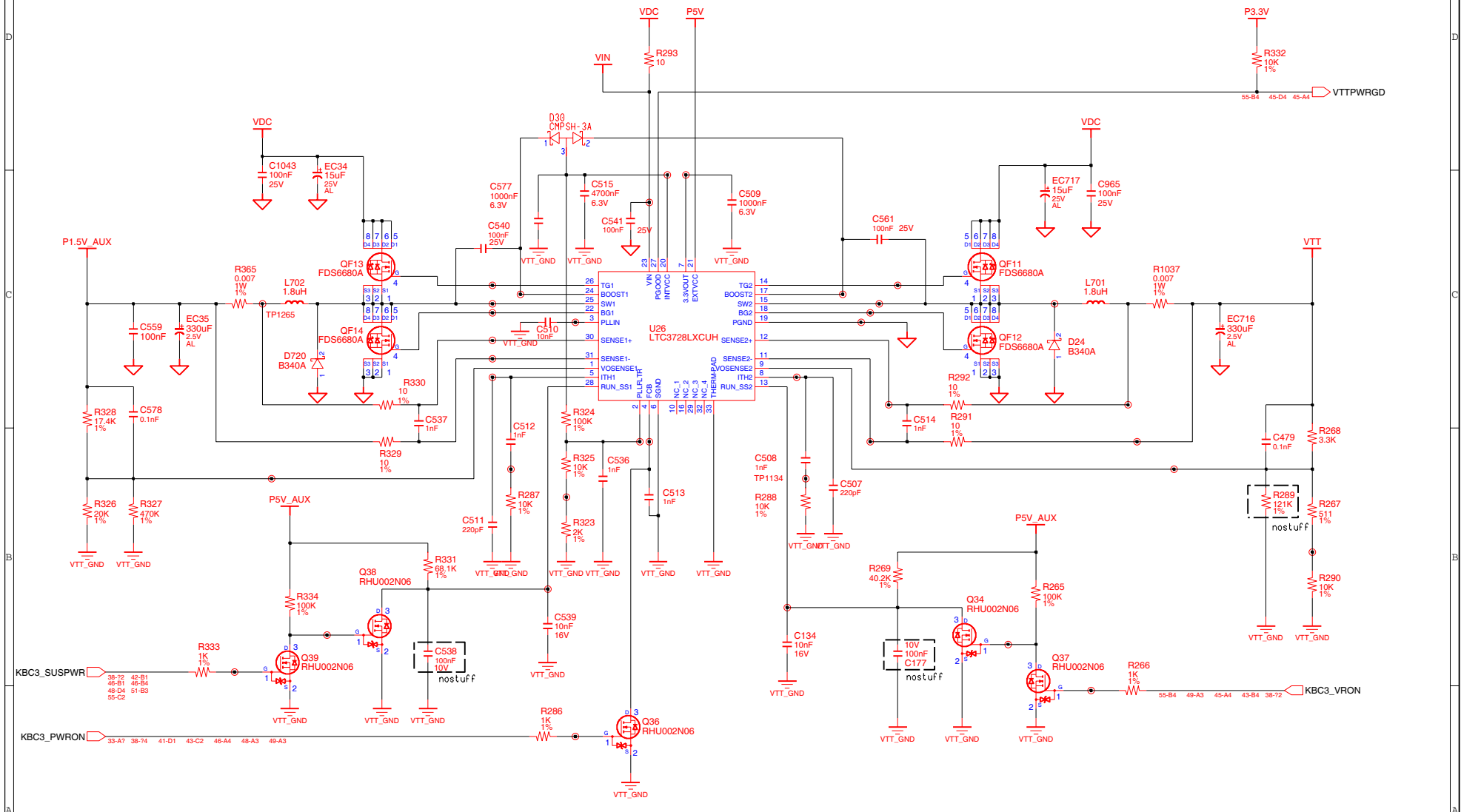
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|             |           |           |                          |               |  |   |
|-------------|-----------|-----------|--------------------------|---------------|--|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE         | CICHLID-II<br>POWER<br>P3.3V_AUX & P5V_AUX | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |               |  |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |               |  |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE 46 OF 56 |  |   |
|             |           |           |                          |               |  |   |

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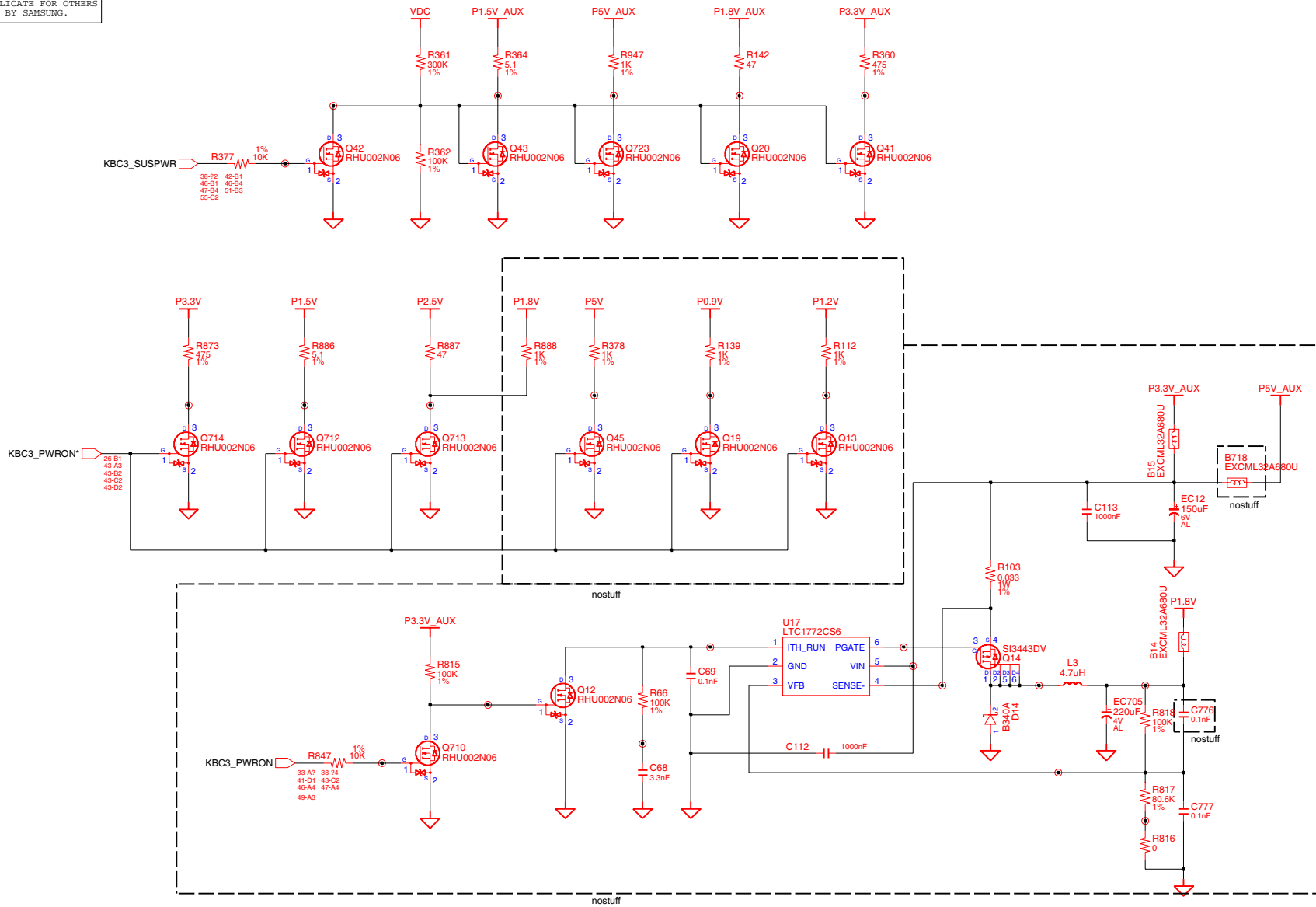
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|             |           |           |                          |       |                                       |   |
|-------------|-----------|-----------|--------------------------|-------|---------------------------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHID-II<br>POWER<br>P1.5V_AUX & VTT | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       |                                       |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       |                                       |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 47                                    | OF 56   |

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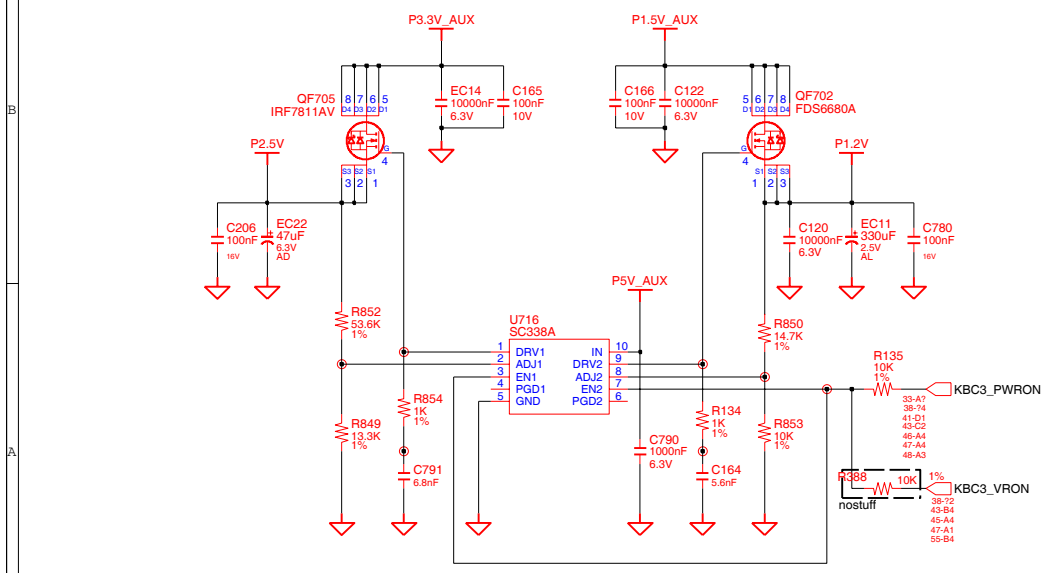
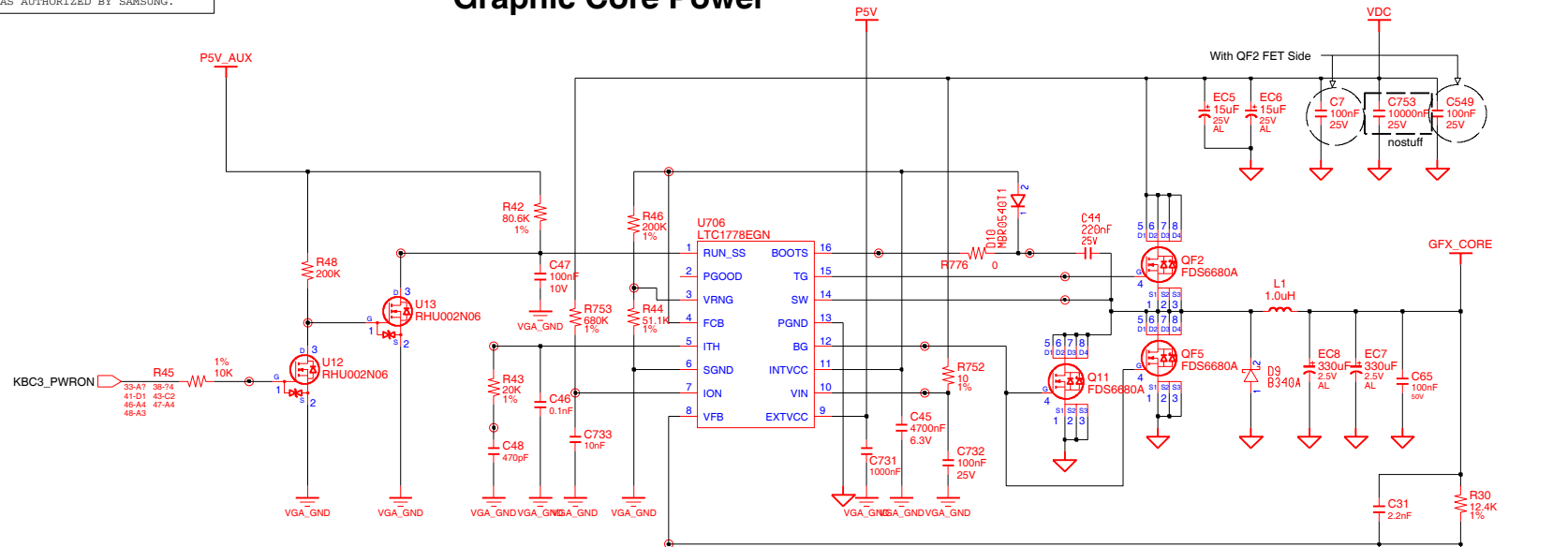
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|-------------|-----------|-----------|--------------------------|---------------|---------------------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE         | CICHLID-II<br>POWER<br>SEQUENCE | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |               |                                 |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |               |                                 |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE 48 OF 56 |                                 |   |
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# Graphic Core Power



## P1.5V / P2.5V POWER

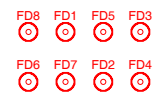
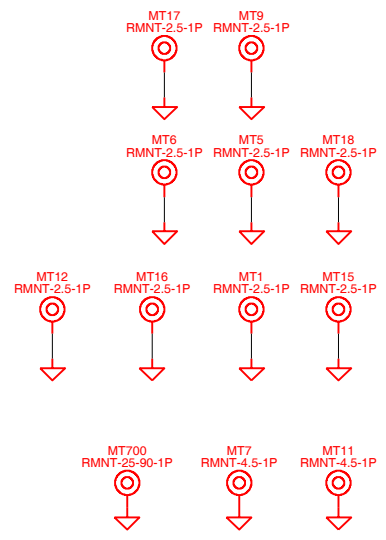
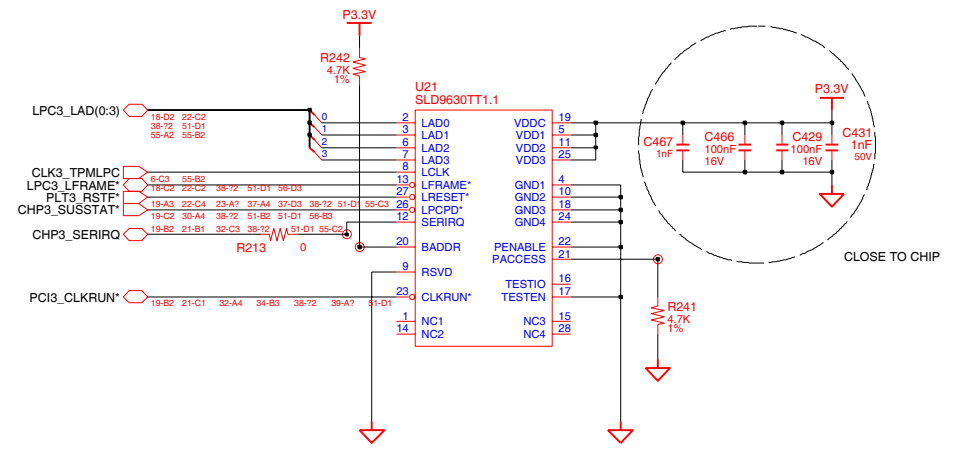
|             |           |           |                          |                         |                         |                        |
|-------------|-----------|-----------|--------------------------|-------------------------|-------------------------|------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE                   | CICHLID-II<br>GFX POWER | SAMSUNG<br>ELECTRONICS |
| CHECK       | K.Y. SEO  | DEV. STEP | MP                       | PART NO. BA41-00489A    |                         |                        |
| APPROVAL    | H.S. KIM  | REV       | 1.0                      | P1.2V & P2.5V AUX POWER |                         | PAGE 49 OF 56          |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM |                         |                         |                        |

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# AIRBAG



# TPM



REV1  
 1 0  
 2 0 0 3

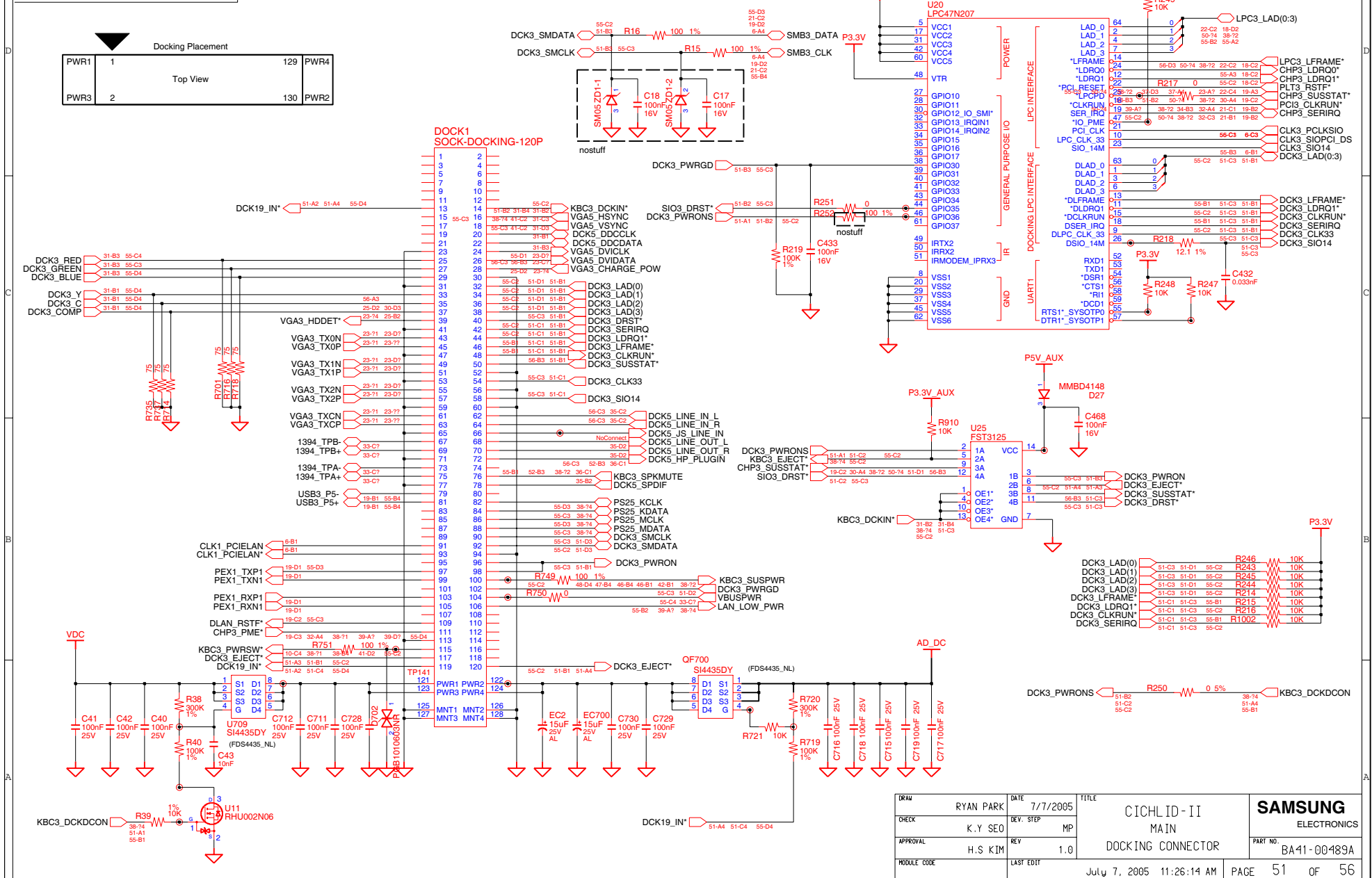
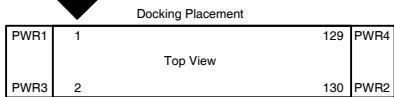
| PCB REVISION CONTROL (ICT) |            |             |          |      |
|----------------------------|------------|-------------|----------|------|
| NO                         | CONNECTION | DATE(Y/M/D) | REVISION | STEP |
| 1                          | N.C.       |             |          |      |
| 2                          | 1-2        |             |          |      |
| 3                          | 2-3        |             |          |      |
| 4                          | 3-1        |             |          |      |
| 5                          | 1-2-3      |             |          |      |
| 6                          | N.C.       |             |          |      |
| 7                          | 1-2        |             |          |      |
| 8                          | 2-3        |             |          |      |
| 9                          | 3-1        |             |          |      |
| 10                         | 1-2-3      |             |          |      |

|             |           |           |                          |       |                        |                         |
|-------------|-----------|-----------|--------------------------|-------|------------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II             | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAINBD                 |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | AIRBAG & TPM & REMOCON | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 50                     | OF 56                   |

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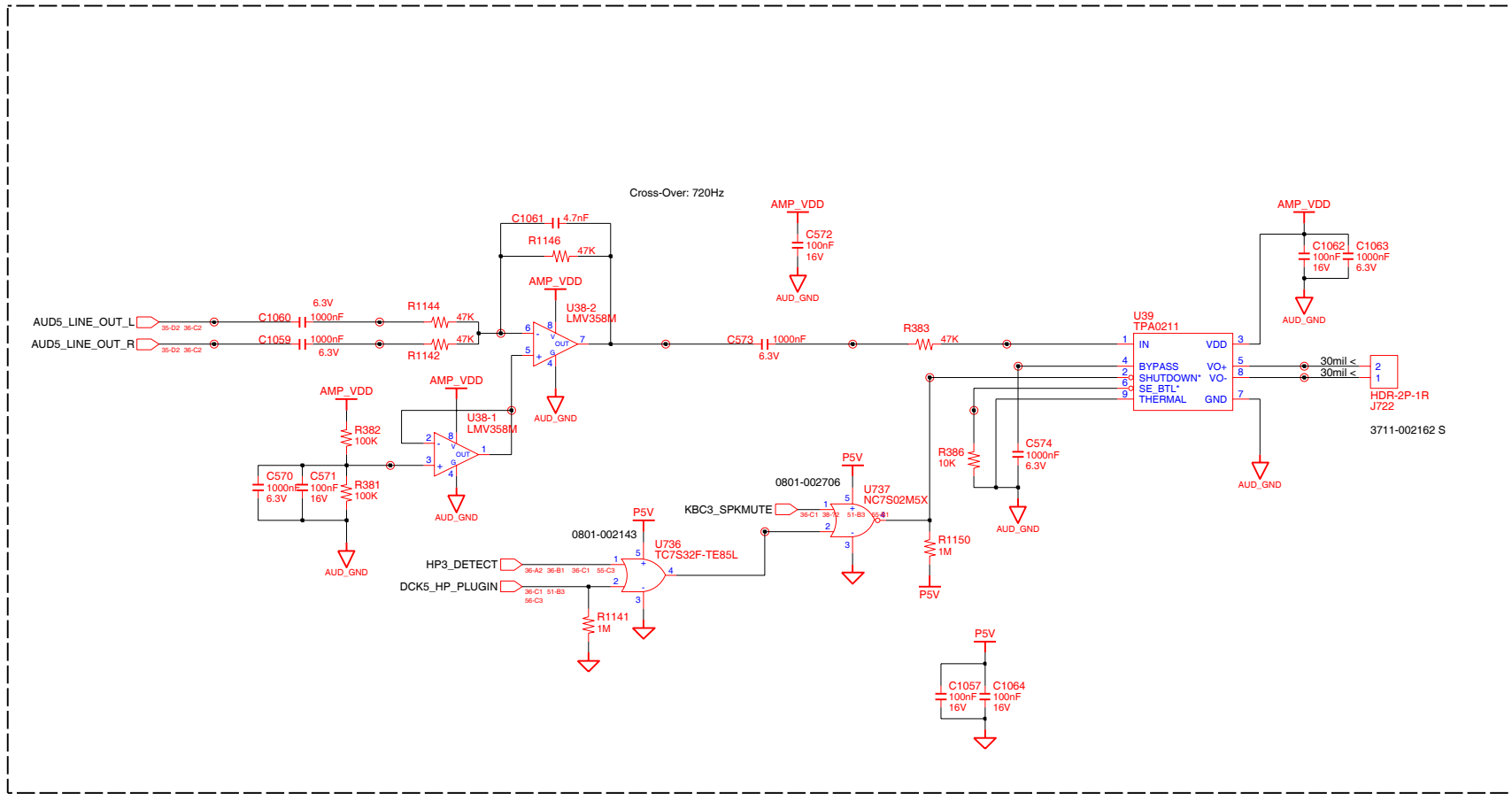
**DOCKING CONNECTOR (130PIN)**



|             |           |           |                          |       |                   |                         |
|-------------|-----------|-----------|--------------------------|-------|-------------------|-------------------------|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II        | SAMSUNG<br>ELECTRONICS  |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       | MAIN              |                         |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       | DOCKING CONNECTOR | PART NO.<br>BA41-00489A |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 51 OF 56          |                         |

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nostuff in CICHLD2

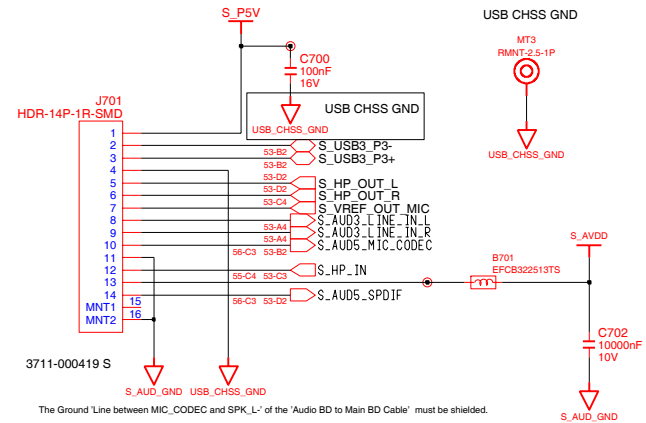
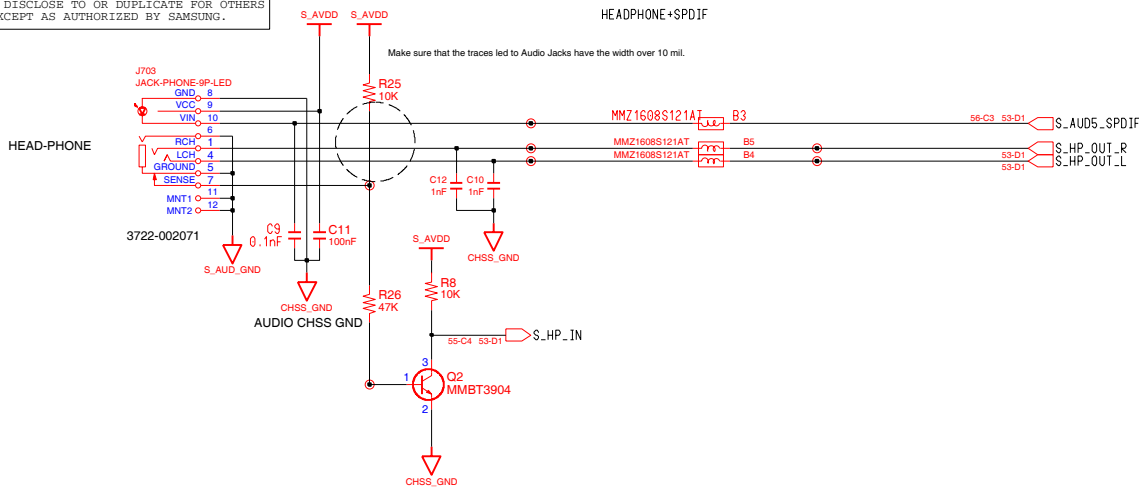
|             |           |           |                          |       |                               |   |
|-------------|-----------|-----------|--------------------------|-------|-------------------------------|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>AUDIO<br>WOOPER | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       |                               |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       |                               |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 52 OF 56                      |   |

**SAMSUNG PROPRIETARY**

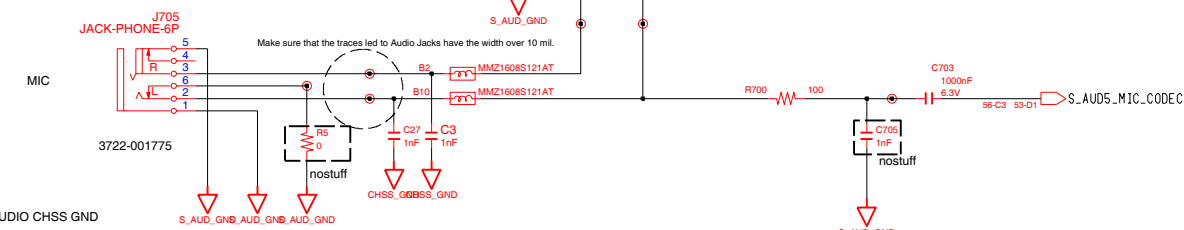
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**HEADPHONE+SPDIF**

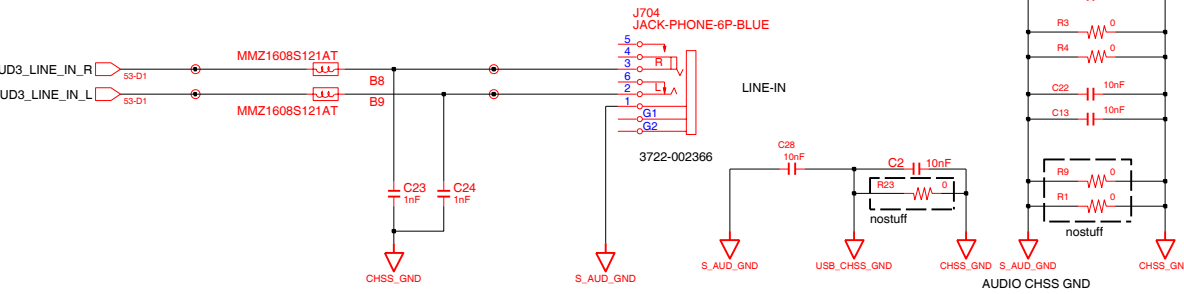
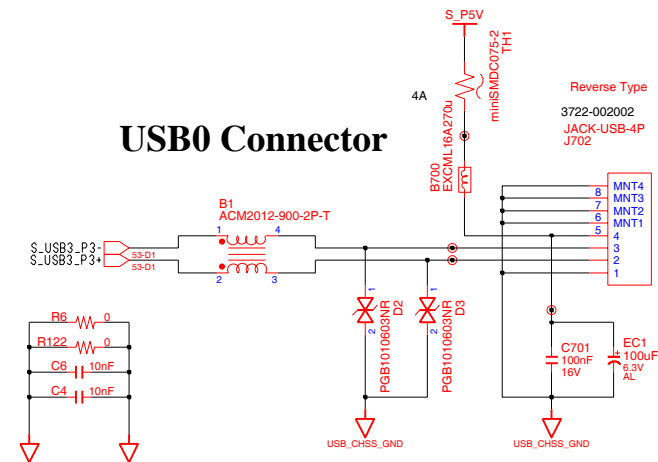
Make sure that the traces led to Audio Jacks have the width over 10 mil.



The Ground Line between MIC\_CODEC and SPK\_L' of the 'Audio BD to Main BD Cable' must be shielded.



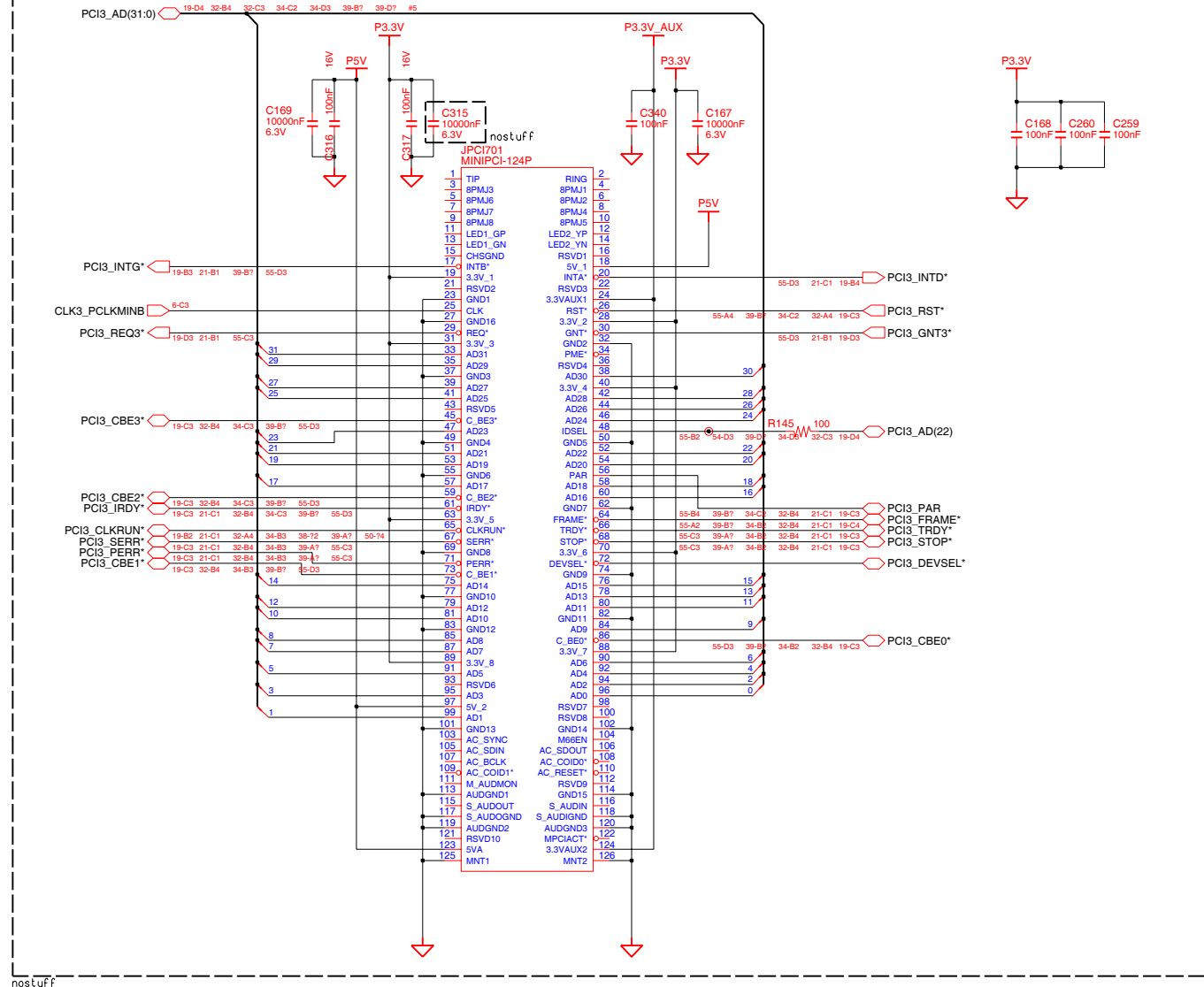
**USB0 Connector**



|             |           |           |                          |       |  |   |
|-------------|-----------|-----------|--------------------------|-------|--|---|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>SUB B'D<br>AUDIO JACK & USB2.0 | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO. BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       |       |  |   |
| APPROVAL    | H.S KIM   | REV       | 1.0                      |       |  |   |
| MODULE CODE |           | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 53 OF 56                                     |   |
|             |           |           |                          |       |  |   |

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|             |           |           |                          |       |                              |  |
|-------------|-----------|-----------|--------------------------|-------|------------------------------|--|
| DRAW        | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>TV<br>MINI PCI | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO.<br>BA41-00489A |
| CHECK       | K.Y SEO   | DEV. STEP | MP                       | REV   | 1.0                          |  |
| APPROVAL    | H.S KIM   | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 54                           | OF 56  |
| MODULE CODE |           |           |                          |       |                              |  |

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TP1017OCHP3\_PME+  
TP1168OCHP3\_SPKR

TP774OCPU1\_INT1R  
TP336OCPU1\_PSI+

TP499OCPU1\_SLP+  
TP807OCPU1\_SM1+  
TP78OCCK19\_IN+  
TP133OCCK3\_BLUE  
TP130OCCK3\_COMP  
TP243ODDR2\_FBK1

TP285OS1+  
TP215OS1-  
TP399OS2+  
TP400OS2-  
TP262OVDA-  
TP333OVOS-  
TP600OCDEX1  
TP601OCDEX2  
TP751OHP\_IN  
TP807OCPU1\_SM1+  
TP699OSEL\_SEL  
TP123OCCK3\_C  
TP128OCCK3\_Y  
TP264ODPRSLP  
TP122OCFX3\_C  
TP124OCFX3\_Y  
TP1128OVD\_VCC  
TP120OVGA3\_C  
TP119OVGA3\_Y

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TP641OIDE5\_A1  
TP644OIDE5\_A2  
TP117OINV\_VDC

TP36OS\_HP\_IN  
TP140OVBUSPWK  
TP915OCB3\_CCLK  
TP784OCB3\_CPAP  
TP721OCA\_A\_CVSI1  
TP913OCB3\_CVSI2  
TP1037OCB3\_VCCA  
TP1126OCB3\_VPPA

TP804OCPU1\_MM1  
TP535OCPU1\_TCK  
TP536OCPU1\_TD1  
TP501OCPU1\_ID0  
TP498OCPU1\_TMS  
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TP170OCFX3\_RED  
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TP101OKBC3\_QS

TP1099OCPC13\_PAR  
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TP1184OSATA0\_RP  
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TP1232OSATA0\_IP  
TP603OSATA2\_RN  
TP604OSATA2\_RP  
TP707OSATA2\_TN  
TP645OSATA2\_IP  
TP178OSMB3\_CLK

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TP531OUSB3\_P0-  
TP1059OUSB3\_P1+  
TP1058OUSB3\_P1-  
TP811OUSB3\_P2+  
TP850OUSB3\_P2-  
TP139OUSB3\_P5+  
TP138OUSB3\_P5-  
TP172OVGA3\_RED  
TP608OVITPWGRD

TP883OCB3\_A\_D\_2  
TP876OCB3\_CCD1+  
TP1130OCB3\_CCD2+  
TP878OCB3\_CEN+  
TP877OCB3\_CIN1+  
TP907OCB3\_CRED+  
TP910OCB3\_CRS1+  
TP1116OCBS3\_SPKR

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TP635OIDE5\_DX5+  
TP636OIDE5\_DX6+  
TP639OIDE5\_DX7+  
TP1164OIDE5\_DX8+  
TP1165OIDE5\_DX9+  
TP643OIDE5\_DREQ0  
TP647OIDE5\_IOR+  
TP1189OIDE5\_IOW+  
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TP776OCB3\_CCBEE1+  
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TP914OCB3\_CCBEE3+  
TP919OCB3\_CIRDY+  
TP782OCB3\_CPERE+  
TP909OCB3\_CSEER+  
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TP937OCLK3\_USB48

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TP1251OSATA\_DET+  
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TP620OCB3\_SMCLK  
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TP57OVGA5\_VSYNC  
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TP433OPC13\_REO1+  
TP881OPC13\_REO2+  
TP1147OPC13\_REO3+  
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TP906OCB3\_CSTSCHG  
TP1027OCB3\_VCCSEN+  
TP1029OCB3\_VCCSEN+  
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TP1213OCHP3\_LDRG0+

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TP568OMCH2\_CFC(6)

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TP500OCPU1\_IGNNE+  
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TP446OCPU1\_VID(2)  
TP493OCPU1\_VID(3)  
TP492OCPU1\_VID(4)  
TP491OCPU1\_VID(5)  
TP1258OCPU3\_ALERT1+  
TP316OCDC3\_PWRGD  
TP1084OCCK3\_EJECT+  
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TP974OCCK3\_LAD(1)  
TP972OCCK3\_LAD(2)  
TP975OCCK3\_LAD(3)  
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TP848OCCK3\_PWRONS  
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TP218OCFX3\_DDCCLK  
TP646OIDE5\_PD1AG+  
TP741OINV4\_PWRGD  
TP44OKBC3\_BKL\_TON  
TP1079OKBC3\_DCK\_IN+  
TP1067OKBC3\_EJECT+

TP580OQUICK\_BOOT+  
TP1159OSMB3\_ALERT1+  
TP404OIMDS\_PLVDD  
TP698OVGA1\_MVREF\_A  
TP115OVGA1\_MVREF\_C

TP521OKBC3\_LBL\_ECT+  
TP706OKBC3\_PWRSH+  
TP193OKBC3\_SCLEED  
TP685OKBC3\_SMCLK+  
TP752OKBC3\_SUSPMR

TP680KBC3\_MLANON  
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TP552OKBC5\_KSI(12)  
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TP681OLEDS3\_CHARGE

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TP821OLPC3\_LAD(3)  
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TP568OMCH2\_CFC(6)

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TP837OVGA1\_MVREF\_A  
TP689OCCK3\_SMDATA  
TP218OCFX3\_DDCCLK  
TP646OIDE5\_PD1AG+  
TP741OINV4\_PWRGD  
TP44OKBC3\_BKL\_TON  
TP1079OKBC3\_DCK\_IN+  
TP1067OKBC3\_EJECT+

TP580OQUICK\_BOOT+  
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TP115OVGA1\_MVREF\_C

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TP685OKBC3\_SMCLK+  
TP752OKBC3\_SUSPMR

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TP742OLAN\_LOW\_PWR  
TP1116OLCD3\_BKL\_TON  
TP681OLEDS3\_CHARGE

TP967OLPC3\_LAD(0)  
TP966OLPC3\_LAD(1)  
TP965OLPC3\_LAD(2)  
TP821OLPC3\_LAD(3)  
TP610MCH2\_CFC(5)  
TP568OMCH2\_CFC(6)

TP220OVGA5\_DDCCLK  
TP59OVGA5\_DVICLK

TP92OBAT3\_SMDATA+  
TP249OCB13\_PWRBTN+  
TP884OCB3\_CCLKRUN+  
TP789OCB3\_CDEVSEL+  
TP1047OCB3\_MD\_DATA1  
TP1299OCB3\_MD\_DATA2  
TP1298OCB3\_MD\_DATA3  
TP1122OCB3\_MD\_VCCEN  
TP1176OCHP3\_B10SWP+  
TP655OCHP3\_CPUSTR+  
TP791OCHP3\_PCIS1FP+  
TP744OCHP3\_PWRBTN+  
TP1229OCHP3\_RTCRST+  
TP1227OCHP3\_SMLINK0  
TP1157OCHP3\_SMLINK1

TP793OCLK3\_PCLKFWH  
TP1048OCLK3\_PCLKICH  
TP895OCLK3\_PCLKLAN  
TP479OCLK3\_PCLKMIN  
TP826OCLK3\_PCLKS10  
TP810OCLK3\_SMBDATA

TP772OCPUI1\_STPCLK+  
TP1256OCPUI2\_THEBND+  
TP1255OCPUI2\_PCLKLAN  
TP825OCCK3\_CCLKRUN+  
TP828OCCK3\_LFRAME+  
TP41OFAN3\_FBACK+  
TP224OCFX3\_DDCDATA  
TP859OCB3\_CPURST+  
TP866OCB3\_CPURST+  
TP857OCB3\_DCKOCON  
TP746OKBC3\_EXTSM1+  
TP91OKBC3\_FANCTRL  
TP194OKBC3\_NML\_ECT+  
TP1173OKBC3\_RSMRST+  
TP968OKBC3\_RUNSCL+  
TP693OKBC3\_SMDATA+  
TP1396OKBC3\_SPMUTE+  
TP869OKBC5\_AVDD\_ON  
TP621OKBC5\_KSI(10)  
TP864OCB3\_FRAME+  
TP553OKBC5\_KSI(11)  
TP616OKBC5\_KSI(12)  
TP619OKBC5\_KSI(13)

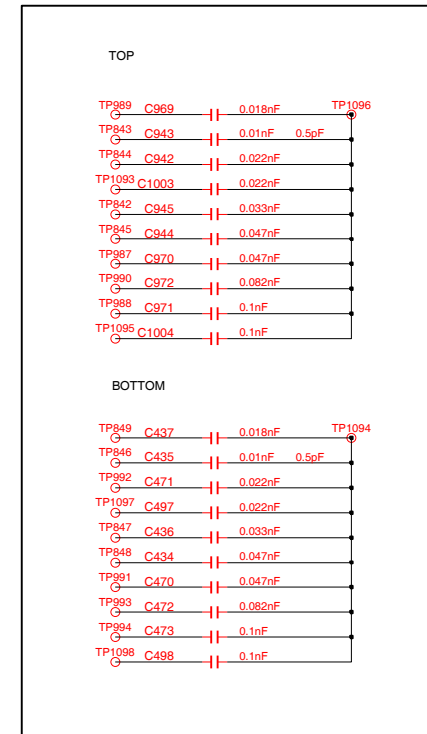
| DRAW        | RYAN PARK | DATE      | 7/7/2005 | TITLE                    | CICHLID-II<br>POWER BLOCK | SAMSUNG<br>ELECTRONICS  |
|-------------|-----------|-----------|----------|--------------------------|---------------------------|-------------------------|
| CHECK       | K.Y SEO   | DEV. STEP | MP       |                          | UNDEFINED                 | PART NO.<br>BA41-00489A |
| APPROVAL    | H.S KIM   | REV       | 1.0      |                          |                           |                         |
| MODULE CODE |           | LAST EDIT |          |                          |                           |                         |
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- TP554 OKBC5\_KS0(14)
- TP582 OKBC5\_KS0(15)
- TP294 CL\_ID3\_SWITCH\*
- TP835 O\_LPC3\_LFRAME\*
- TP664 OMCH1\_HXSWING
- TP668 OMCH1\_HYSWING
- TP1060 OMCH2\_BMBUSY\*
- TP121 OPEG3\_GP10(0)
- TP363 OPEG3\_GP10(2)
- TP112 OPEG3\_GP10(3)
- TP293 OPEG3\_GP10(4)
- TP295 OPEG3\_GP10(5)
- TP191 OPEG3\_GP10(6)
- TP365 OPEG3\_GP10(7)
- TP297 OPEG3\_GP10(8)
- TP294 OPEG3\_GP10(9)
- TP287 OPEG3\_I2CCSCL
- TP289 OPEG3\_I2CCSDA
- TP413 OPEG3\_MIOB(0)
- TP414 OPEG3\_MIOB(1)
- TP411 OPEG3\_MIOB(3)
- TP408 OPEG3\_MIOB(4)
- TP405 OPEG3\_MIOB(5)
- TP450 OPEG3\_MIOB(8)
- TP406 OPEG3\_MIOB(9)
- TP34 OS\_AUD5\_SPDIF
- TP134 OVGA3\_DVIDATA
- TP868 OPC13\_CLKRUN\*
- TP1212 OPC13\_DEVSEL\*
- TP223 OVGA5\_DDCDATA
- TP131 OVGA5\_DVIDATA
- TP1303 OCB3\_MD\_XD\_ALE
- TP1304 OCB3\_MD\_XD\_CE\*
- TP1305 OCB3\_MD\_XD\_CLE
- TP1121 OCB3\_MD\_XD\_WP\*
- TP1175 OCHP3\_BI0STBL\*
- TP1129 OCHP3\_DPREST\_PVR
- TP308 OCHP3\_IVTPURON
- TP585 OCHP3\_SATALED\*
- TP1069 OCHP3\_SUSSTAT\*
- TP534 OCPU1\_PROCHOT\*
- TP494 OCPU1\_PWRGDCPU
- TP132 OCK3\_SUSSTAT\*
- TP826 OCHP3\_THRM\*
- TP195 OKBC3\_CAPSLED\*
- TP235 OKBC3\_LOW\_FAN\*
- TP1171 OKBC3\_WAKESCI\*
- TP485 OLAN3\_LINK\_10\*
- TP299 OPEG3\_GP10(10)
- TP221 OPEG3\_GP10(11)
- TP118 OPEG3\_GP10(12)
- TP366 OPEG3\_MIOAD(1)
- TP537 OPEG3\_MIOAD(2)
- TP361 OPEG3\_MIOAD(3)
- TP353 OPEG3\_MIOAD(4)
- TP354 OPEG3\_MIOAD(5)
- TP415 OPEG3\_MIOB(11)
- TP401 OPEG3\_XTALSS1IN
- TP838 OAUD5\_MIC\_CODEC
- TP236 OBLT3\_BTON\_LED\*
- TP1162 OCHP3\_INTRUDER\*
- TP813 OCHP3\_THRMTRIP\*
- TP933 OCLK3\_PCLKMICOM
- TP929 OCLK3\_SIOPCI\_DS
- TP958 OCPU1\_THRMTRIP\*
- TP70 OCK5\_HP\_PLUGIN
- TP68 OCK5\_LINE\_IN\_L
- TP137 OCK5\_LINE\_IN\_R
- TP487 OLAN3\_LINK\_100\*
- TP451 OPEG3\_MIOAHSYNC
- TP1117 OCB3\_MD\_DATA4\_XD
- TP1115 OCB3\_MD\_DATA5\_XD
- TP1297 OCB3\_MD\_DATA6\_XD
- TP1123 OCB3\_MD\_DATA7\_XD
- TP1102 OCHP3\_I394\_ROM\*
- TP557 OKBC3\_MIO\_PHOTO\*
- TP252 OKBC3\_MIO\_VOLDN\*
- TP326 OKBC3\_MIO\_VOLUP\*
- TP488 OLAN3\_LINK\_1000\*
- TP946 OPEG3\_XTALOUTBUF
- TP1160 OSMB3\_LINKALERT\*
- TP1050 OCB3\_MS\_BS\_SD\_CMD
- TP957 OKBC3\_IMVP4\_PWRGD
- TP1301 OKBC3\_THERM\_SMCLK
- TP22 OS\_AUD5\_MIC\_CODEC
- TP1197 OCB3\_SD\_CD\_XD\_CD\*
- TP1293 OKBC3\_THERM\_ALERT\*
- TP688 OKBC3\_THERM\_SMDATA
- TP1118 OCB3\_MS\_INS\_XD\_CD\*
- TP1307 OCB3\_SD\_WP\_XD\_R\_B\*
- TP1131 OCB3\_MD\_DATA0\_MS\_SDIO
- TP1182 OAVDD
- TP254 OAD\_DC
- TP81 OAD\_DC
- TP80 OAD\_DC
- TP10 OAD\_DC
- TP9 OAD\_DC
- TP1253 OAMP\_VDD
- TP1274 OAUD\_GND
- TP1291 OAUD\_GND
- TP1236 OAUD\_GND
- TP83 OBATT\_DC
- TP105 OCHSS\_GND
- TP15 OCHSS\_GND
- TP240 ODDR1\_GND
- TP426 ODDR2\_GND
- TP231 OGF\_X\_CORE
- TP165 OGF\_X\_CORE
- TP370 OGF\_X\_CORE
- TP168 OGF\_X\_CORE
- TP371 OGF\_X\_CORE
- TP502 OLFPLLVD0
- TP527 OPEV
- TP394 OPEV
- TP978 OPEV
- TP1118 OPEV
- TP1030 OPEV
- TP477 OP0\_9V
- TP548 OP0\_9V
- TP516 OP0\_9V
- TP549 OP0\_9V
- TP550 OP0\_9V
- TP472 OP1\_2V
- TP329 OP1\_2V
- TP473 OP1\_2V
- TP470 OP1\_2V
- TP328 OP1\_2V
- TP538 OP1\_5V
- TP510 OP1\_5V
- TP802 OP1\_5V
- TP54 OP1\_5V
- TP805 OP1\_5V
- TP228 OP1\_8V
- TP423 OP1\_8V
- TP227 OP1\_8V
- TP232 OP1\_8V
- TP422 OP1\_8V
- TP434 OP2\_5V
- TP428 OP2\_5V
- TP544 OP2\_5V
- TP542 OP2\_5V
- TP543 OP2\_5V
- TP526 OP3\_3V
- TP982 OP3\_3V
- TP482 OP3\_3V
- TP649 OP3\_3V
- TP854 OP3\_3V
- TP658 OP5V\_AUX
- TP659 OP5V\_AUX
- TP1269 OP5V\_AUX
- TP1233 OP5V\_AUX
- TP247 OP5V\_AUX
- TP1163 OPRTC\_BAT
- TP1092 OP1\_5V\_AUX
- TP1254 OP1\_5V\_AUX
- TP1196 OP1\_5V\_AUX
- TP986 OP1\_5V\_AUX
- TP330 OP1\_5V\_AUX
- TP615 OP1\_8V\_AUX
- TP575 OP1\_8V\_AUX
- TP576 OP1\_8V\_AUX
- TP577 OP1\_8V\_AUX
- TP425 OP1\_8V\_AUX
- TP850 OP2\_5V\_LAN
- TP851 OP2\_5V\_LAN
- TP852 OP2\_5V\_LAN
- TP996 OP2\_5V\_LAN
- TP716 OP2\_5V\_LAN
- TP522 OP3\_3V\_AUX
- TP480 OP3\_3V\_AUX
- TP1214 OP3\_3V\_AUX
- TP797 OP3\_3V\_AUX
- TP1132 OP3\_3V\_AUX
- TP4 OS\_AVDD
- TP19 OS\_AUD\_GND
- TP184 OVGA\_GND
- TP1146 OVTT\_GND
- TP1133 OVTT\_GND
- TP489 OVCC\_CORE
- TP488 OVCC\_CORE
- TP582 OVCC\_CORE
- TP532 OVCC\_CORE
- TP593 OVCC\_CORE
- TP1310 OCGROUND
- TP444 OCGROUND
- TP144 OCGROUND
- TP558 OCGROUND
- TP995 OCGROUND
- TP335 OCGROUND
- TP559 OCGROUND
- TP656 OCGROUND
- TP331 OCGROUND
- TP375 OCGROUND
- TP708 OCGROUND
- TP199 OV\_ADAP
- TP200 OV\_ADAP
- TP198 OV\_ADAP
- TP102 OV\_ADAP
- TP344 OVDC
- TP343 OVDC
- TP722 OVDC
- TP717 OVDC

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|          |           |           |                          |       |  |  |
|----------|-----------|-----------|--------------------------|-------|--|--|
| DRAW     | RYAN PARK | DATE      | 7/7/2005                 | TITLE | CICHLID-II<br>POWER BLOCK<br>UNDEFINED | <b>SAMSUNG</b><br>ELECTRONICS<br>PART NO.<br>BA41-00489A |
| CHECK    | K.Y SEO   | DEV. STEP | MP                       | REV   | 1.0                                    |  |
| APPROVAL | H.S KIM   | LAST EDIT | July 7, 2005 11:26:14 AM | PAGE  | 56                                     | OF 56  |