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McLaren-15

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

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

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

| Design | CHECK | APPROVAL |
|--------|---------|----------|
| SH YOU | SS BAIK | BL LEE |
| | | |

■ Owner : SEC N/P Lab

Signature : SH YOU

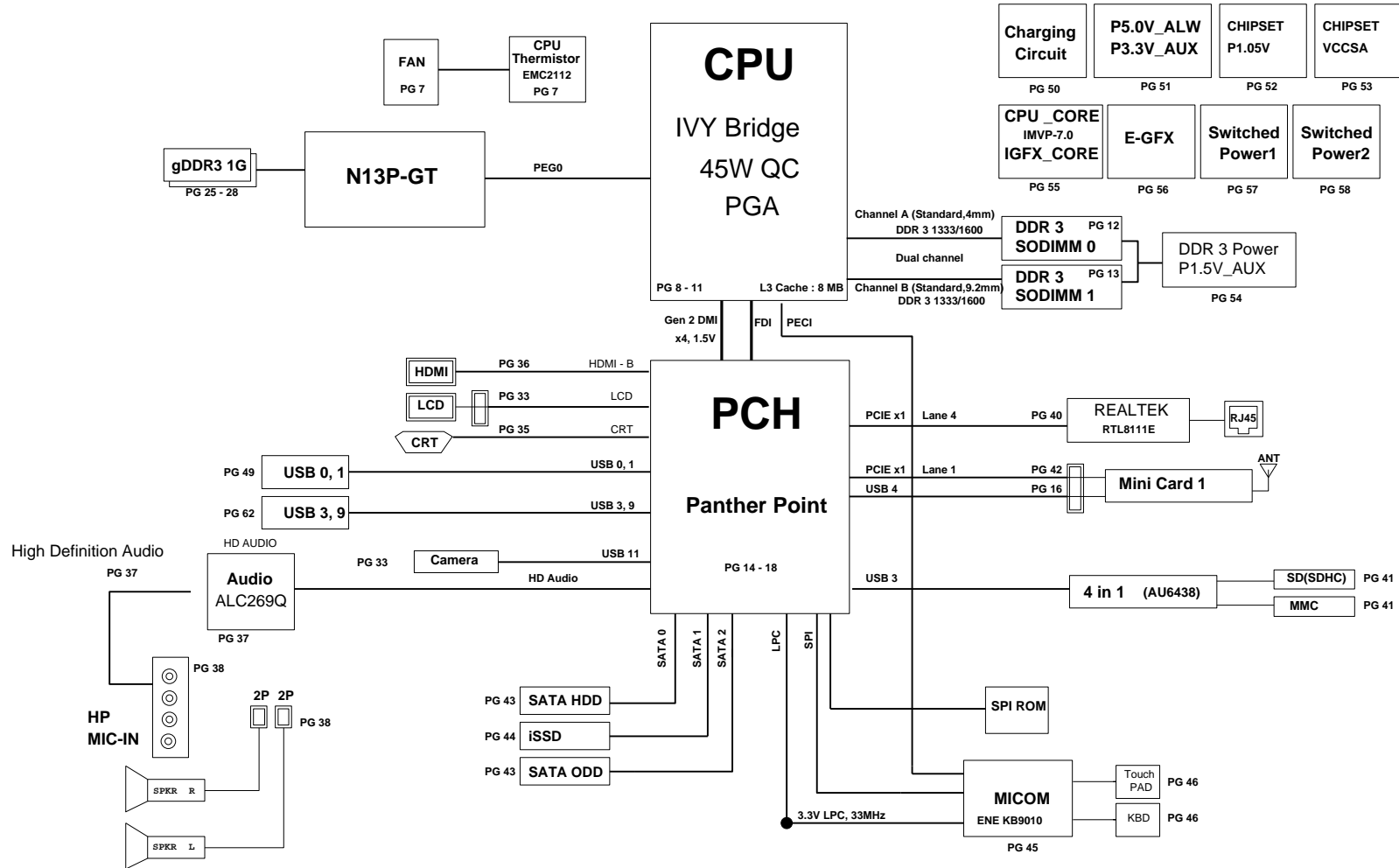
sheet01 : Cover
sheet02 : BLOCK DIAGRAM
sheet03 : BOARD INFORMATION
sheet04 : POWER DIAGRAM
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sheet06 : Green Clock
sheet07 : Thermal Sensor
sheet08 : CPU-IvyBridge
sheet09 : CPU-IvyBridge
sheet10 : CPU-IvyBridge
sheet11 : CPU-IvyBridge
sheet12 : DDR3 SODIMM #0
sheet13 : DDR3 SODIMM #1
sheet14 : PCH-PantherPoint
sheet15 : PCH-PantherPoint
sheet16 : PCH-PantherPoint
sheet17 : PCH-PantherPoint
sheet18 : PCH-PantherPoint
sheet19 : N13P-GT
sheet20 : N13P-GT
sheet21 : N13P-GT
sheet22 : N13P-GT
sheet23 : N13P-GT
sheet24 : STRAP
sheet25 : GFX memory
sheet26 : GFX memory
sheet27 : GFX memory
sheet28 : GFX memory

sheet33 : LVDS/CAMERA
sheet34 : 80 Port
sheet35 : CRT
sheet36 : HDMI
sheet37 : Audio - ALC269
sheet38 : Audio - HP/MIC/Woofer Amp
sheet39 : Audio - Stereo Amp
sheet40 : LAN (Realtek RTL8111E)
sheet41 : 4-in-1 card (AU6437)
sheet42 : WLAN
sheet43 : SATA interface
sheet44 : iSSD
sheet45 : MICOM / BIOS
sheet46 : MICOM Glue Logic (KBD / TP)
sheet47 : LED for 15"
sheet48 : 2 USB 2.0
sheet49 : USB 3.0 connector
sheet50 : Power - charger
sheet51 : Power - P3.3V_AUX / P5.0V_ALW
sheet52 : Power - P1.05V (Chipset Power)
sheet53 : Power - VCCSA (Chipset Power)
sheet54 : Power - DDR3
sheet55 : Power - CPU VRM
sheet56 : Power - EGFX_CORE
sheet57 : Power - Switched Power 1
sheet58 : Power - Switched Power 2
sheet59 : Power - Switched Power for iSSD
sheet60 : Power - Power Discharge
sheet61 : Mount Hole / Thermal Hole
sheet62 : USB Sub B'D (15")
sheet63 : USB Sub B'D (17")

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

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BLOCK DIAGRAM



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

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

| Voltage Rails | | Active in |
|---|---|-----------|
| VDC P3.3V_MICOM P5.0V_STB P5.0V_ALW P3.3V_ALW P12.0V_ALW | Primary DC system power supply (7 to 21V) 3.3V always power rail (for Micom) 5.0V always power rail 5.0V always power rail 3.3V always power rail 12.0V always power rail | S4 - S5 |
| P5.0V_AUX P3.3V_AUX P1.5V_AUX | 5.0V switched on power rail (off in S4-S5) 3.3V switched on power rail (off in S4-S5) 1.5V power rail for DDR3 (off in S4-S5) | |
| P5.0V P3.3V P1.8V P1.5V P0.75V P0.8V | 5.0V switched power rail (off in S3-S5) 3.3V switched power rail (off in S3-S5) 1.8V switched power rail (off in S3-S5) 1.5V switched power rail (off in S3-S5) 0.75V power rail for DDR3 (off in S3-S5) 0.8V switched power rail (off in S3-S5) | |
| VCC_CORE EGFX_CORE P1.05V (VCCP) | Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT | |
| P3.3V_D P1.5V_D P1.05V_D | 3.3V discrete power rail for N12X 1.5V discrete power rail for N12X 1.05V discrete power rail for N12X | |
| | | S3 |
| | | S0 |
| | | S0 |

| USB PORT Assign | | PCI Express Assign | |
|-----------------|------------------------------|--------------------|--------------------|
| PORT # | ASSIGNED TO | PORT # | ASSIGNED TO |
| 0 | SYSTEM PORT 0 | 1 | Mini Card 1 (WLAN) |
| 1 | SYSTEM PORT 1 | 2 | NC |
| 2 | Multi Memory Card Controller | 3 | NC |
| 3 | SYSTEM PORT 2 | 4 | LAN CONTROLLER |
| 4 | Mini PCI Express | 5 | NC |
| 5 | NC | 6 | NC |
| 6 | NC | 7 | NC |
| 7 | NC | 8 | NC |
| 8 | NC | | |
| 9 | SYSTEM PORT 3 | | |
| 10 | NC | | |
| 11 | Camera(LCD Cable) | | |
| 12 | NC | | |
| 13 | NC | | |

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

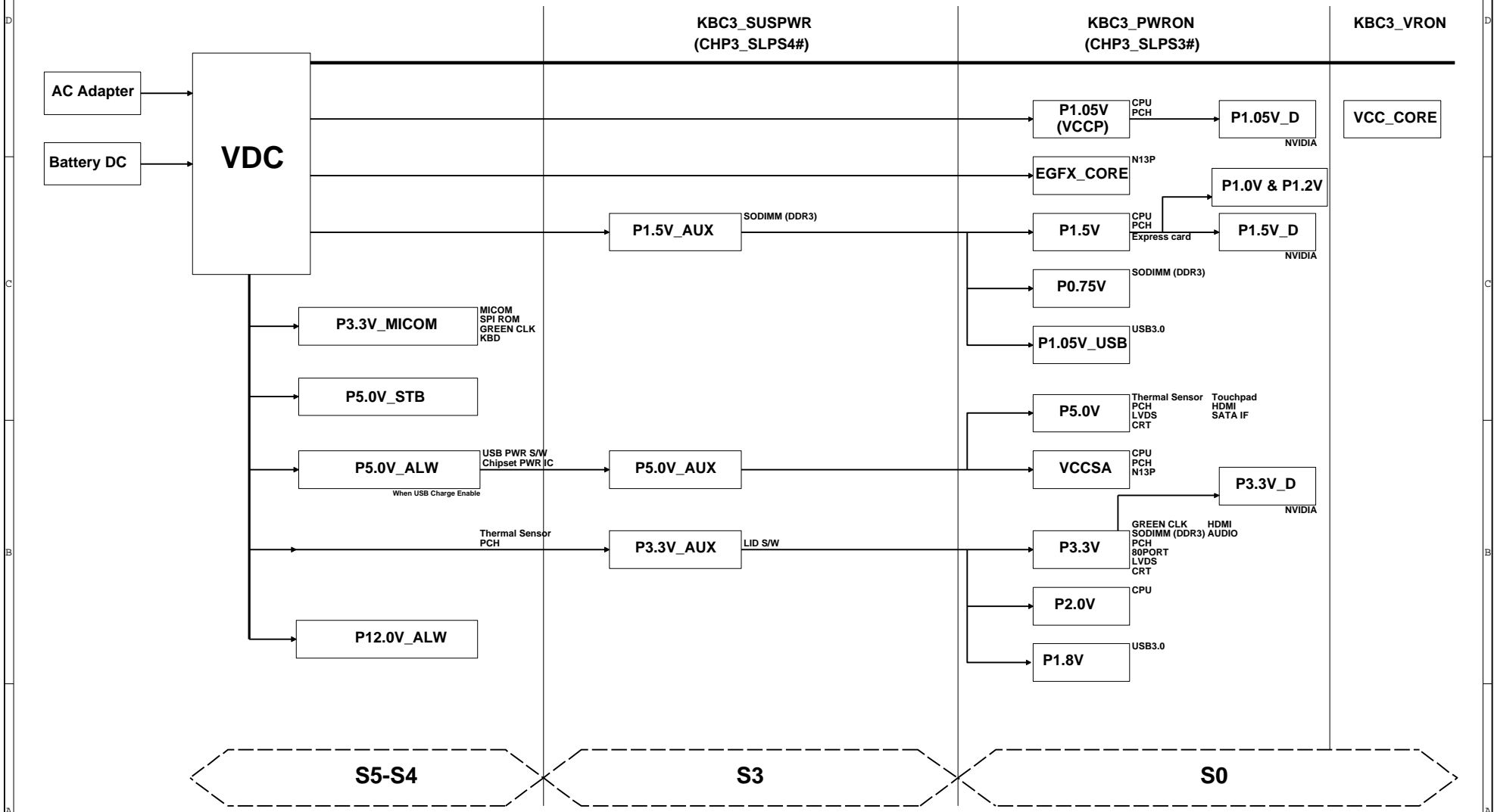
| Crystal / Oscillator | | | |
|----------------------|-----------|----------|---------------|
| TYPE | FREQUENCY | DEVICE | USAGE |
| Crystal | 25MHz | ISSD | Express Cache |
| Crystal | 25MHz | GREENCLK | GREENCLK |
| Crystal | 27MHz | N13P-GT | NVIDIA |
| GREENCLK | 32.768KHz | PCH | PCH |
| GREENCLK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

| LCD Panel Detect (TBD) | | |
|------------------------|------------|-----------------|
| Devices | Resolution | PANNEL_DETECT_0 |
| | | |

| I ² C / SMB Address | | | |
|--------------------------------|-----------|-----|----------------|
| Devices | Address | Hex | Bus |
| HM65 | Master | - | SMBUS Master |
| CPU Thermal Sensor | 0111 101x | 7Ah | Thermal Sensor |
| SODIMM0 | 1010 000x | A0h | |
| SODIMM1 | 1010 010x | A4h | |
| Thermal Sensor on SODIMM0 | 0011 000x | 30h | |
| Thermal Sensor on SODIMM1 | 0011 010x | 34h | |
| Thermal Sensor on board | 1101 100x | 98h | |
| Power thermal management TS | 1101 011x | 96h | |

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

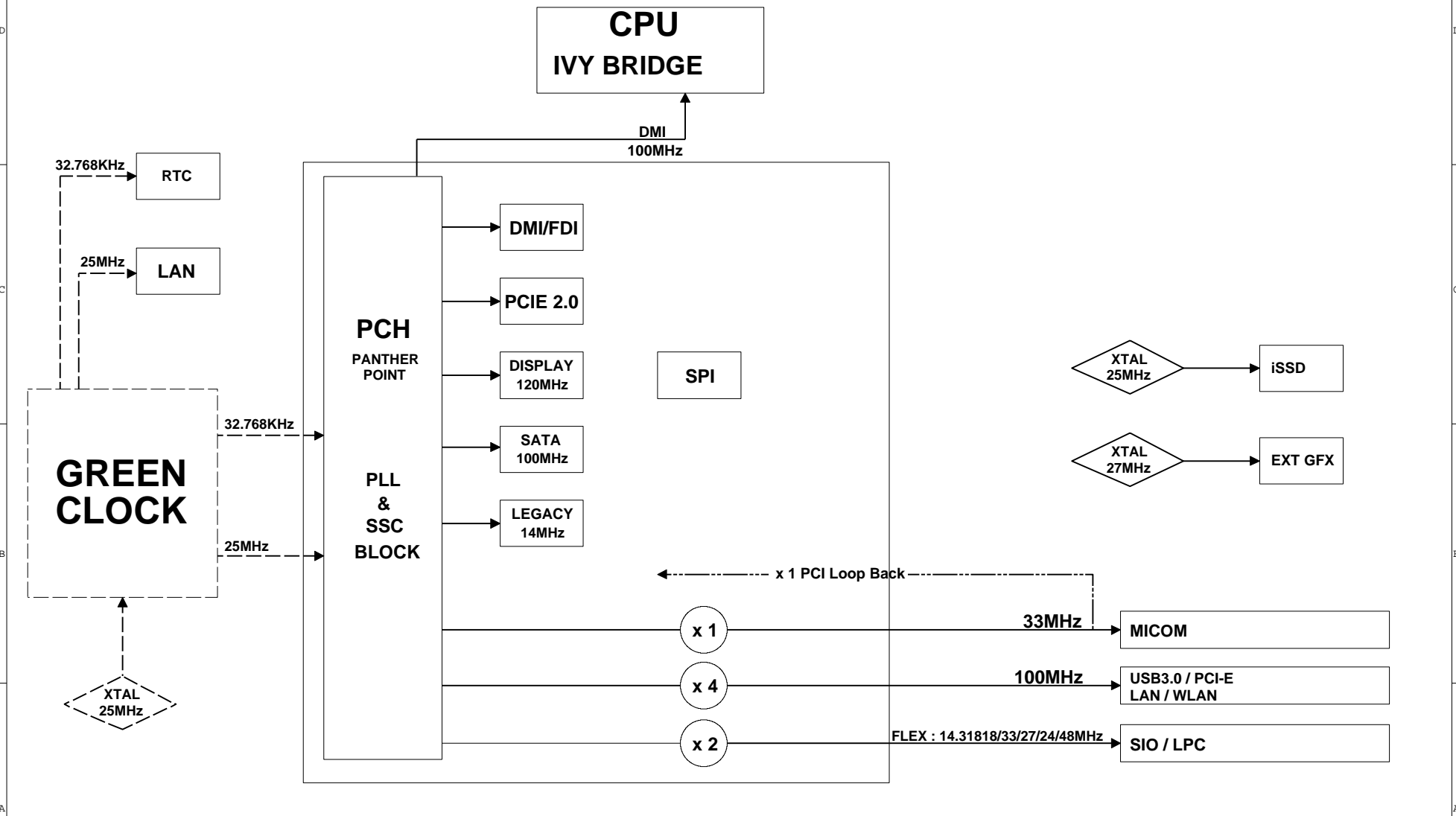
Rev 1.0



| | | | | | | |
|---------------------------|--|---------------------------------------|---|------------------|-------------------------------|--|
| DRAW MS YANG | | DATE 3/11/2011 | TITLE PETRONAS-15_QUAD MAIN POWER DIAGRAM | | SAMSUNG ELECTRONICS | |
| CHECK MK KIM | | DEV. STEP PR | | | | |
| APPROVAL BL LEE | | REV REV 1.0 | | | | |
| MODULE CODE undefined | | LAST EDIT May 20, 2011 21:14:43 PM | | PAGE 4 | OF 51 | |

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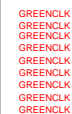
CLOCK DISTRIBUTION Rev. 1.0



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

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CLOCK DISTRIBUTOR

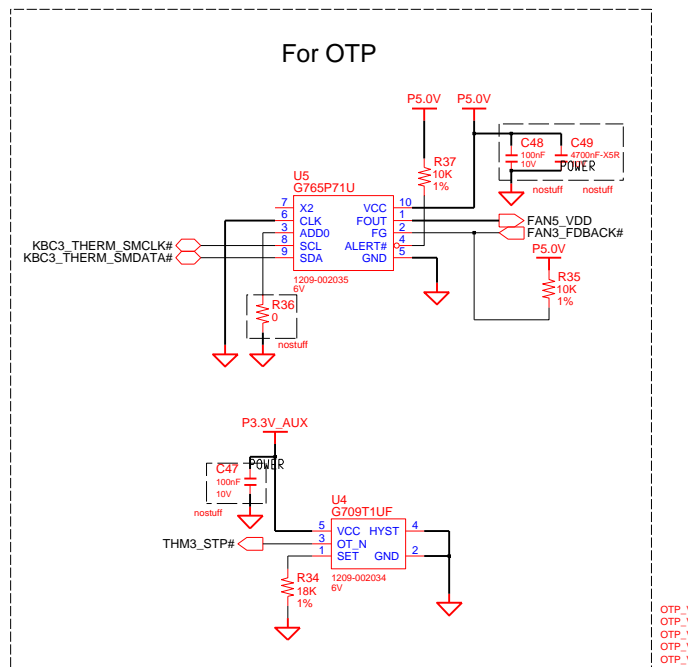
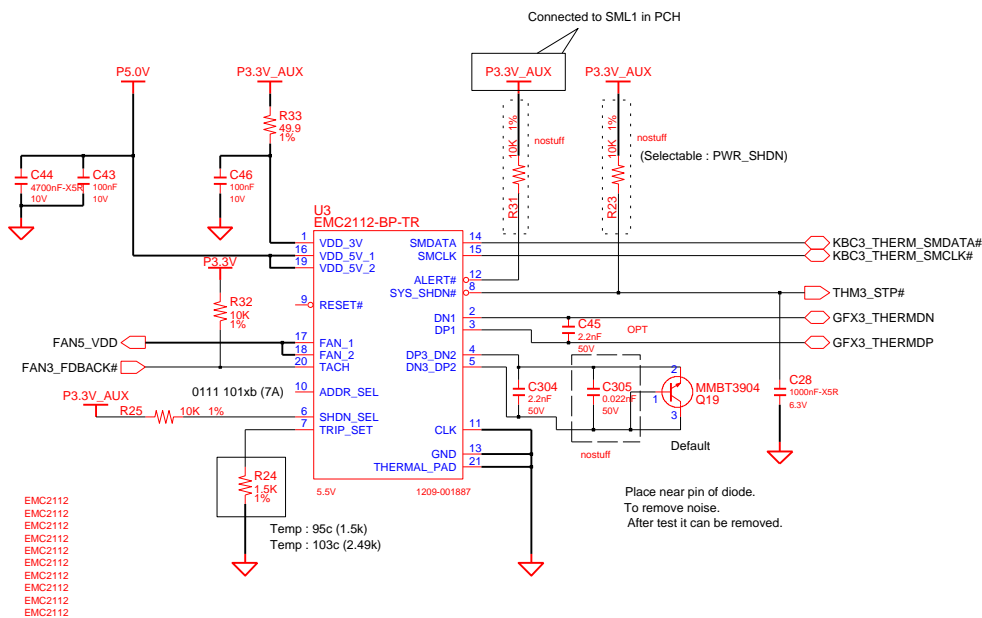


| | | | | | | | |
|-------------|-----------|-----------|--------------------------|--|--|-------------|-------|
| DRAW | MS YANG | DATE | 3/11/2011 | PETRONAS-15_QUAD CLOCK CLOCK DISTRIBUTION | SAMSUNG ELECTRONICS | | |
| CHECK | MK KIM | DEV. STEP | PR | | | | |
| APPROVAL | BL LEE | REV | REV 1.0 | | PART NO. | BA41-01662A | |
| MODULE CODE | undefined | LAST EDIT | May 20, 2011 21:14:43 PM | | PAGE | 6 | OF 51 |

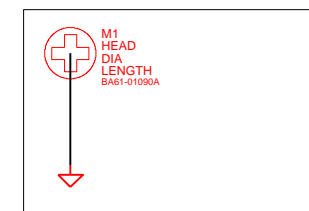
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THERMAL SENSOR & FAN CONTROL

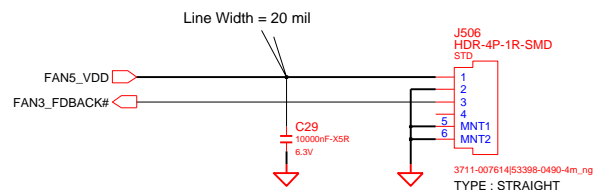


FAN PEM



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

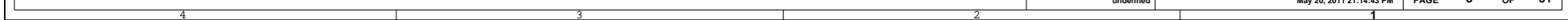
| SHDN_SEL MODE | |
|---------------|--------------------|
| 0 | INTEL TR MODE |
| ✓ HIGH Z | AMD CPU/DIODE MODE |
| 1 | EXT.DIODE 2 MODE |

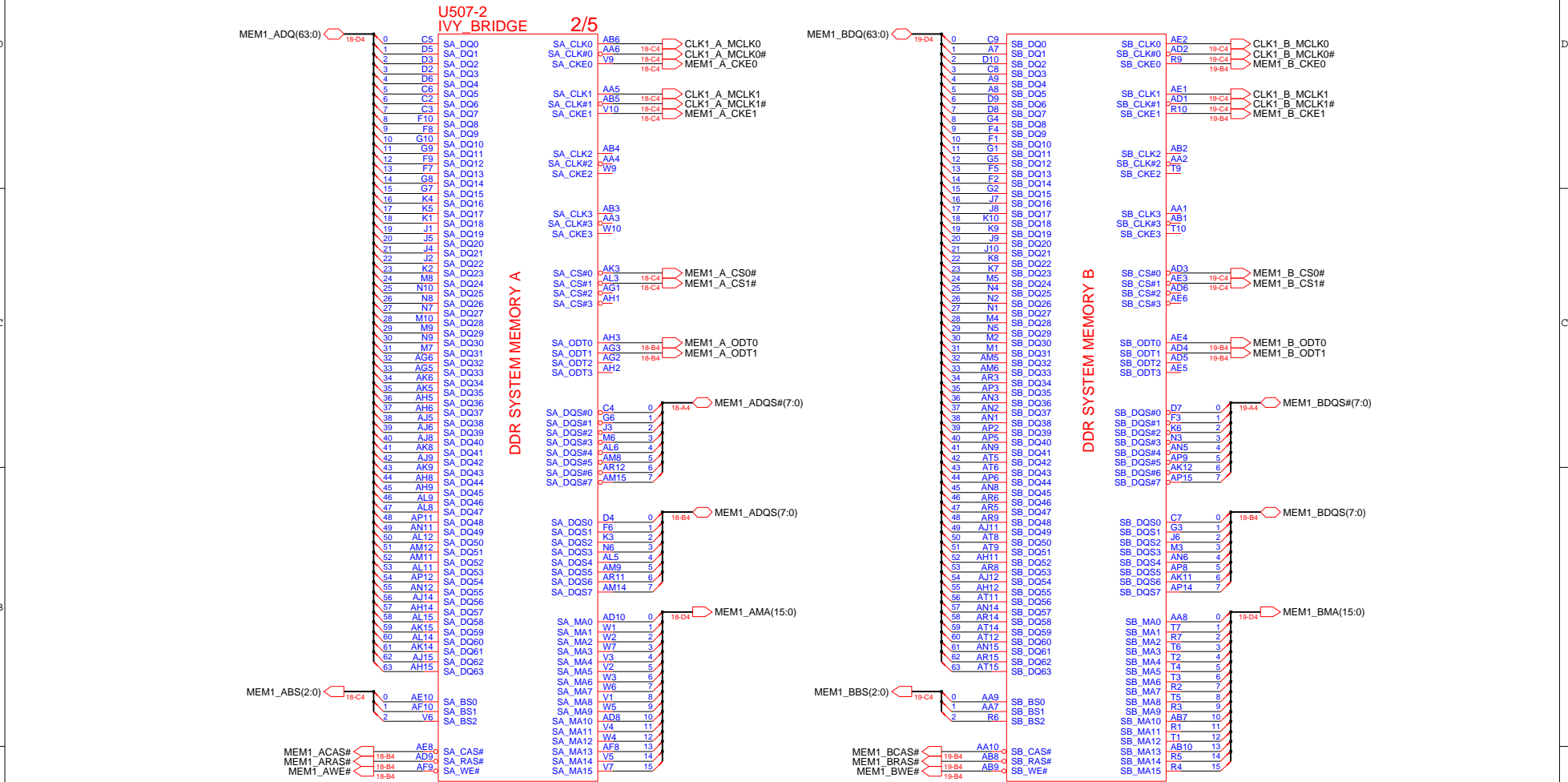


| | | | | | | |
|-------------|---------|-----------|-----------|-------|--|-------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD THERMAL SENSOR THERMAL SENSOR EMC2112 | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | | PART NO. BA41-01662A |
| APPROVAL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

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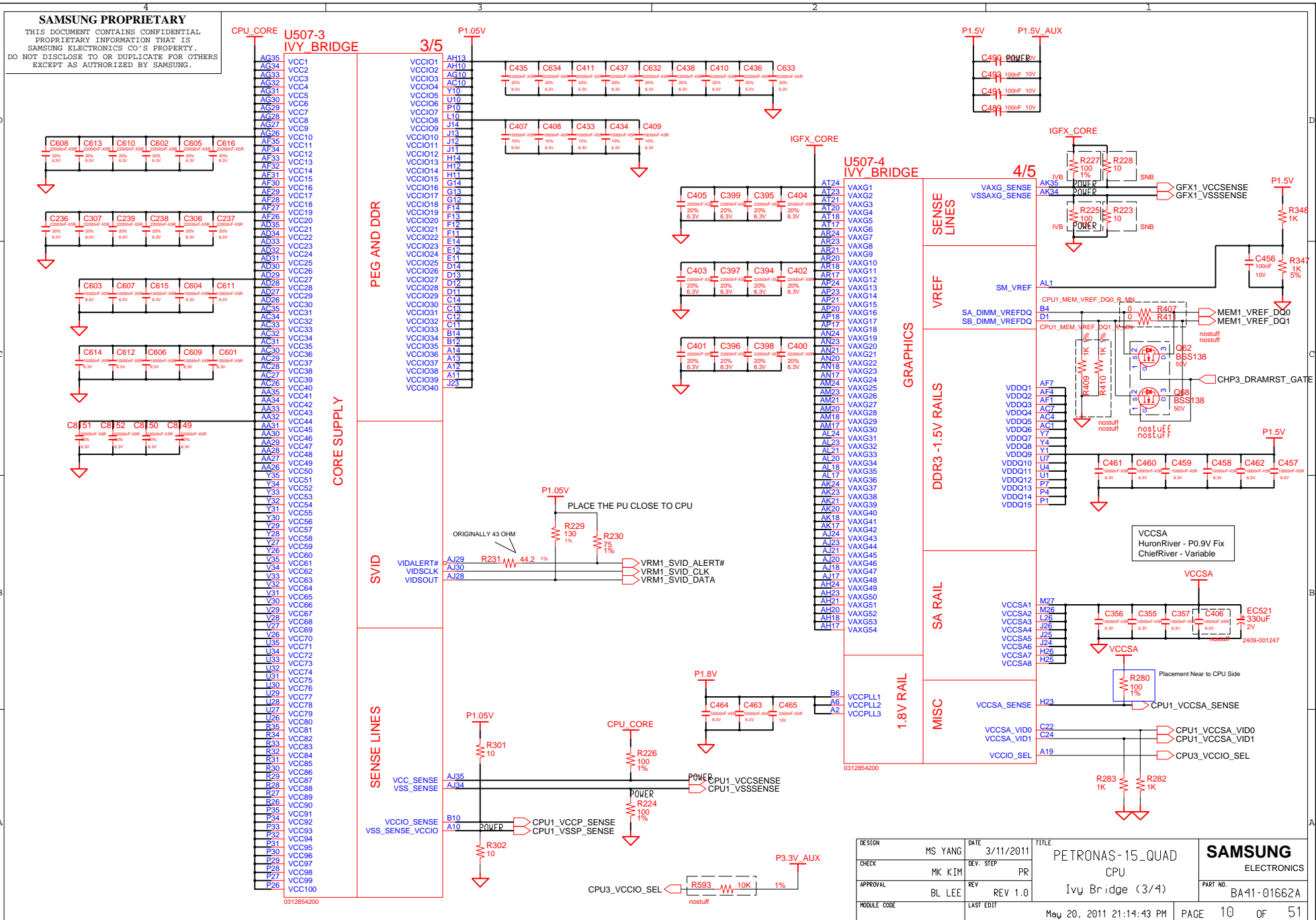
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|-------------|-----------|-----------|--------------------------|------------------|------------------|-------------|
| DRAW | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | CPU | | ELECTRONICS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

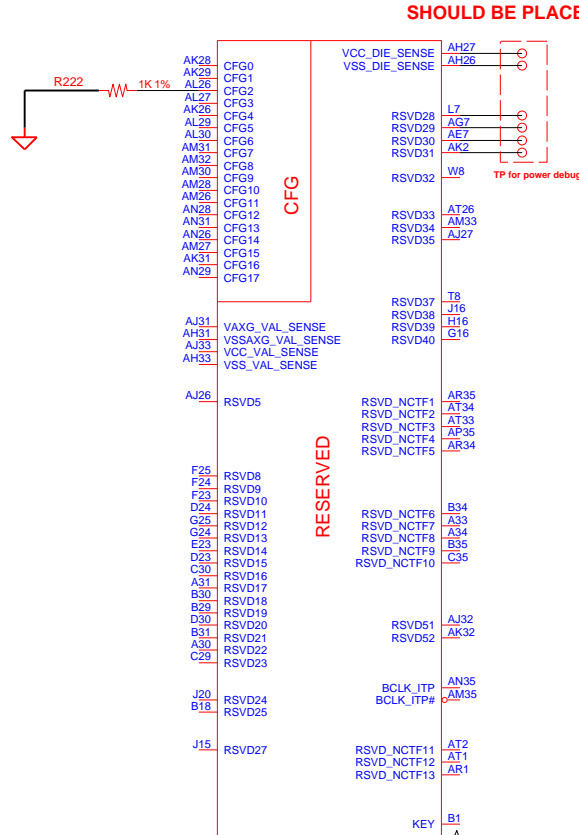
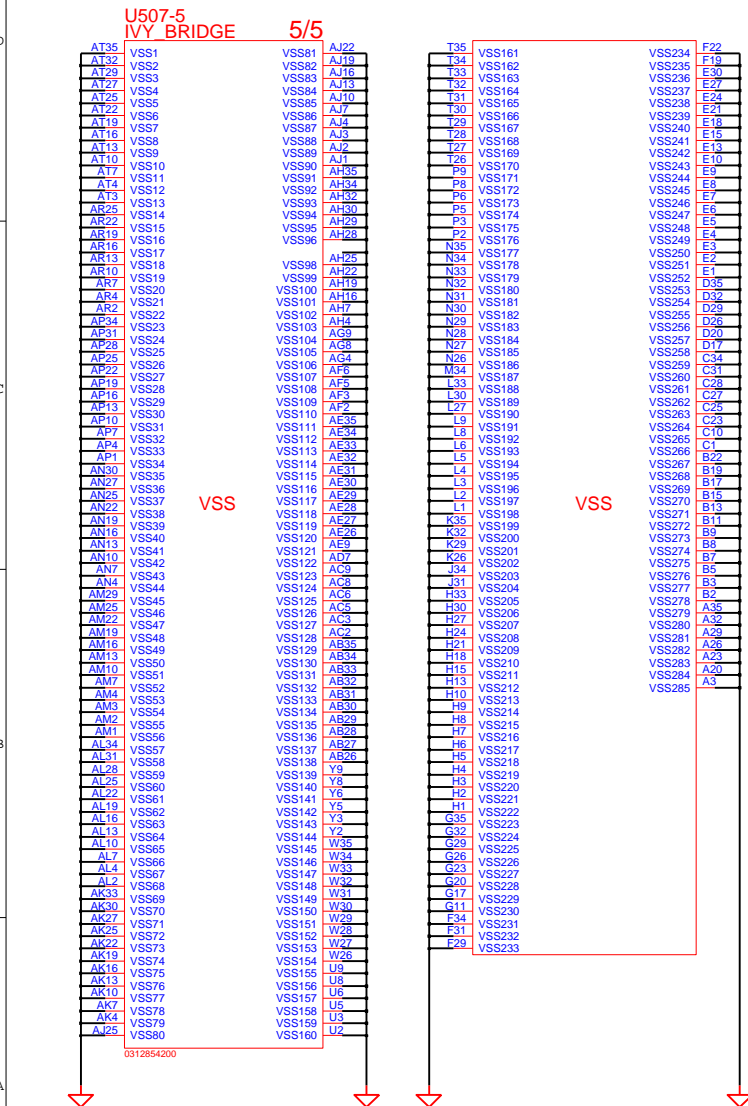
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|-------------|---------|-----------|-----------|--------------------------|------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD |
| CHECK | MK KIM | DEV. STEP | PR | CPU | |
| APPROVAL | BL LEE | REV | REV 1.0 | Ivy Bridge (3/4) | |
| MODULE CODE | | LAST EDIT | | | |
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ELECTRONICS
PART NO. BA41-01662A

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CFG Straps for Processor

| | |
|--|--|
| PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X | |
| CFG2 | 1 : (DEFAULT) NORMAL OPERATION 0 : LANE REVERSED |
| PCIE PORT BIFURCATION STRAPS | |
| CFG[6:5] | 11 : (DEFAULT) X16 - DEVICE 1 FUNCTIONS 1 AND 2 DISABLED 10 : X8, X8 - DEVICE 1 FUNCTION 1 ENABLED ; FUNCTION 2 DISABLED 01 : RESERVED - (DEVICE 1 FUNCTION 1 DISABLED ; FUNCTION 2 ENABLED) 00 : X8, X4, X4 - DEVICE 1 FUNCTIONS 1 AND 2 ENABLED |
| Display Port Presence | |
| CFG4 | 1 : Disabled - No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP) |
| PEG DEFER TRAINING | |
| CFG7 | 1 : (DEFAULT) PEG TRAIN IMMEDIATELY FOLLOWING XXRESETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING |

| | | | | | | |
|--------------------------|---------|-----------|-----------|-------|---|-------------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD CPU Ivy Bridge (4/4) | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | | PART NO. BA41-01662A |
| APPROVAL | BL LEE | REV | REV 1.0 | | | |
| MODULE CODE | | LAST EDIT | | | | |
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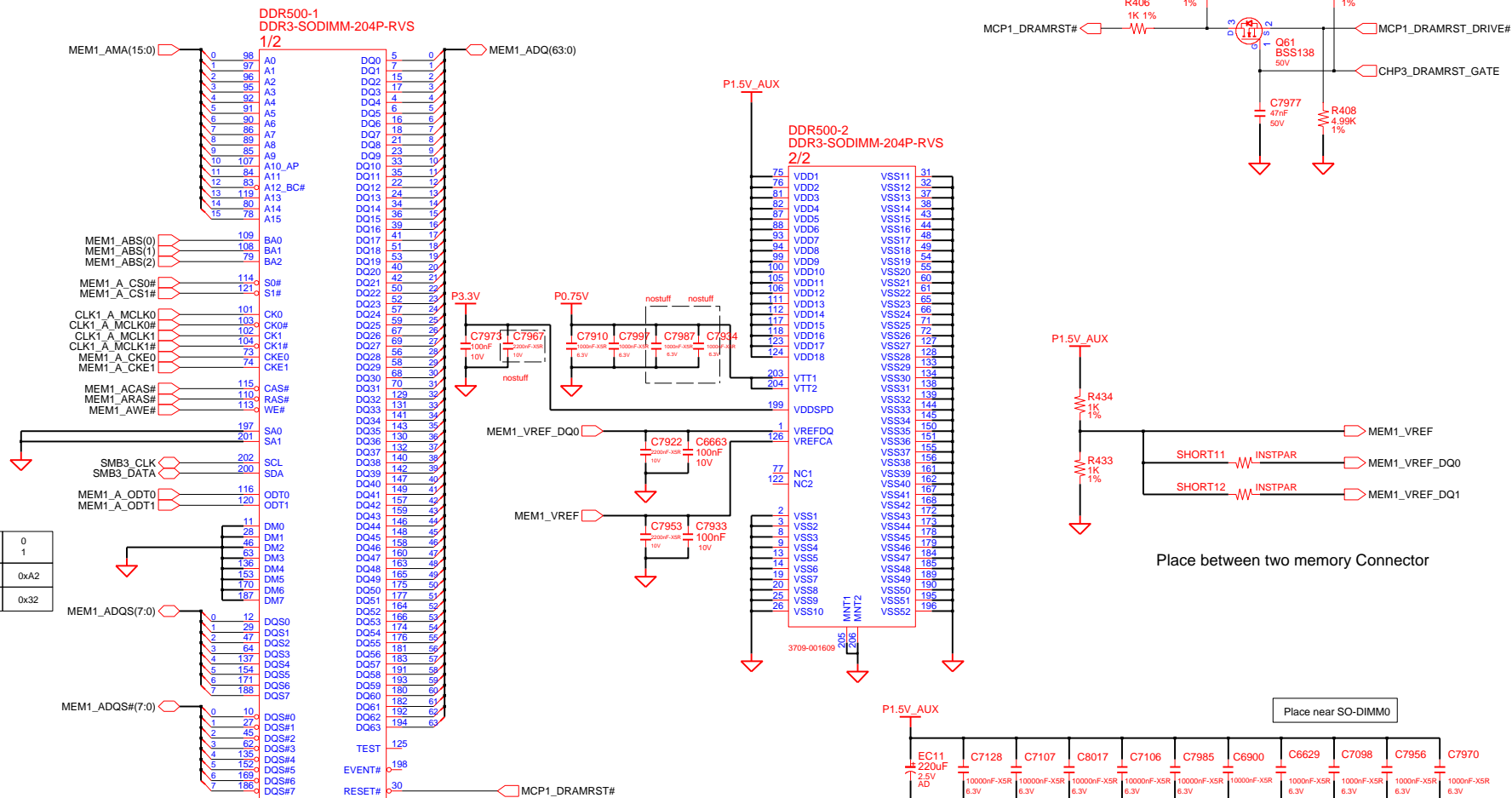
SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001656 (Foxconn)

P/N : 3709-001609 (Concraft)



Place between two memory Connector

Place near SO-DIMM0

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

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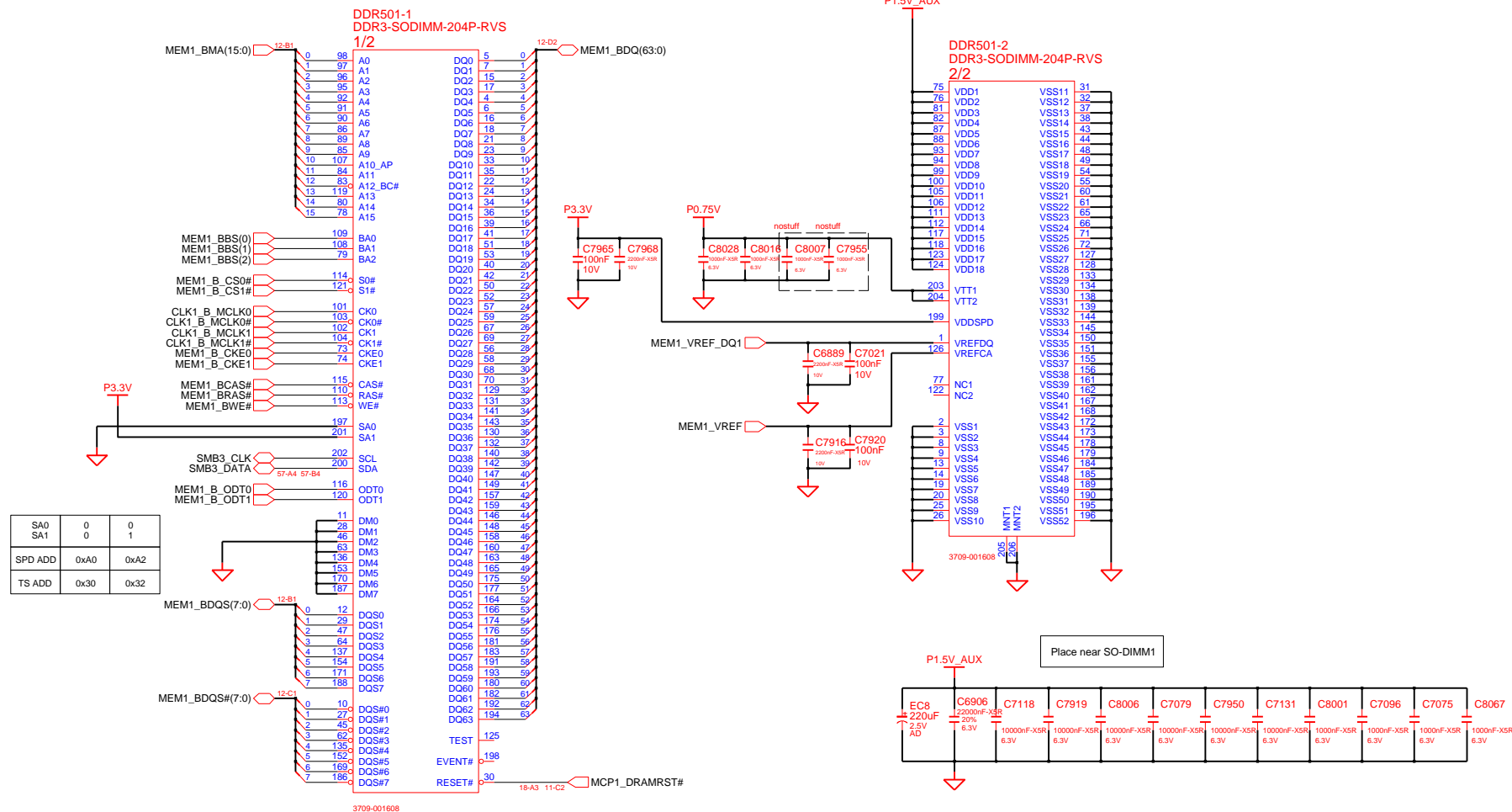
SO-DIMM#1 : 1st SO-DIMM

DDR SO-DIMM #1

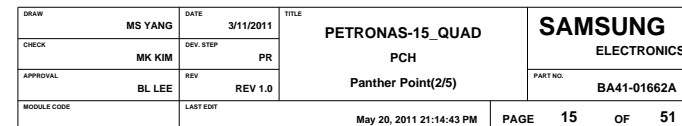
Height : 4.0 mm (REVERSE)

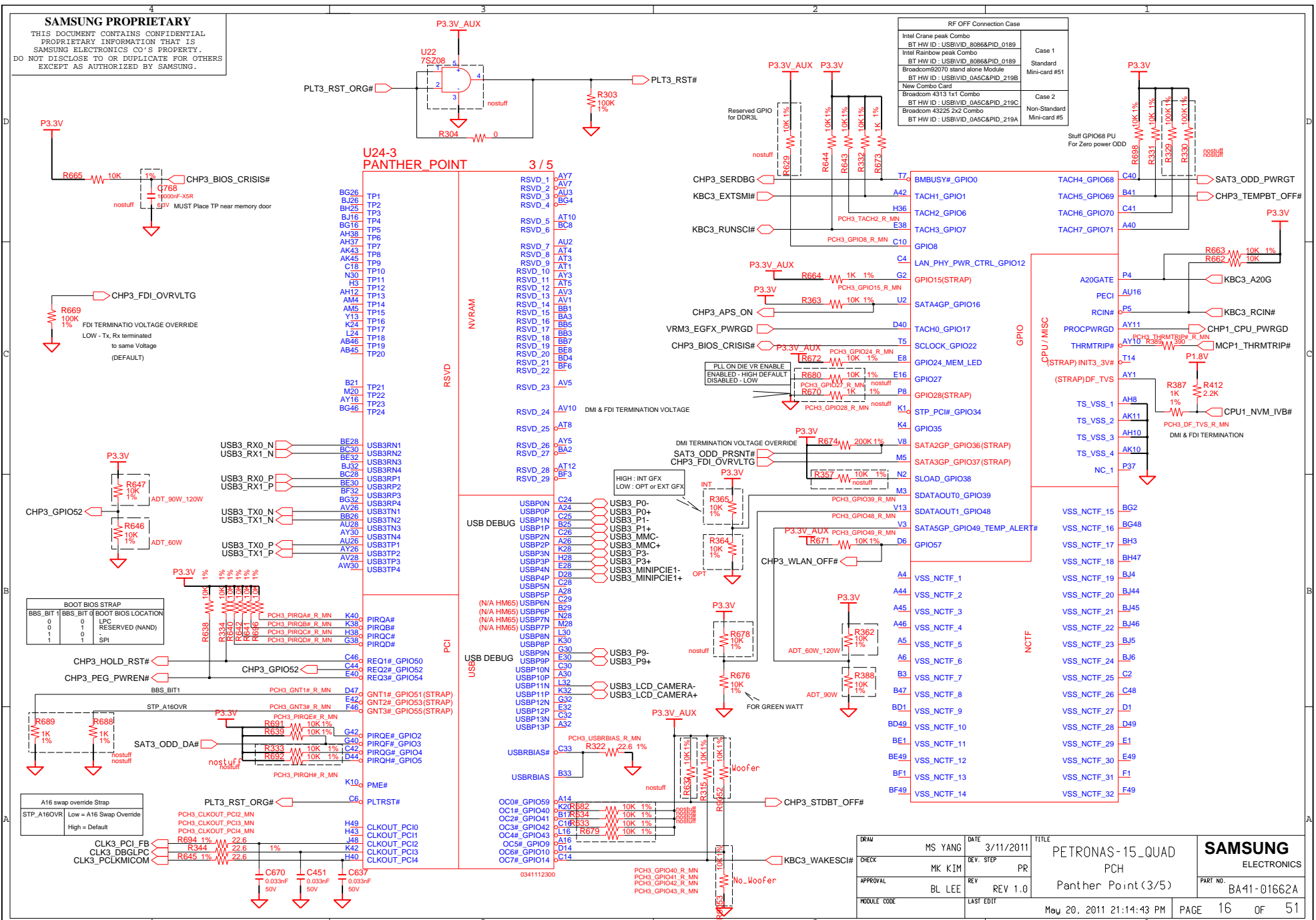
P/N : 3709-001654 (Foxconn)

P/N : 3709-001608 (Concraft)



| | | | | | | |
|--------------------------|---------|-----------|-----------|-------|------------------|-------------------------|
| DRAW | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | SODIMM B | |
| APPROVAL | BL LEE | REV | REV 1.0 | | DDR3 | |
| MODULE CODE | | LAST ENT | | | | PART NO. BA41-01662A |
| May 20, 2011 21:14:43 PM | | | | | | PAGE 13 OF 51 |





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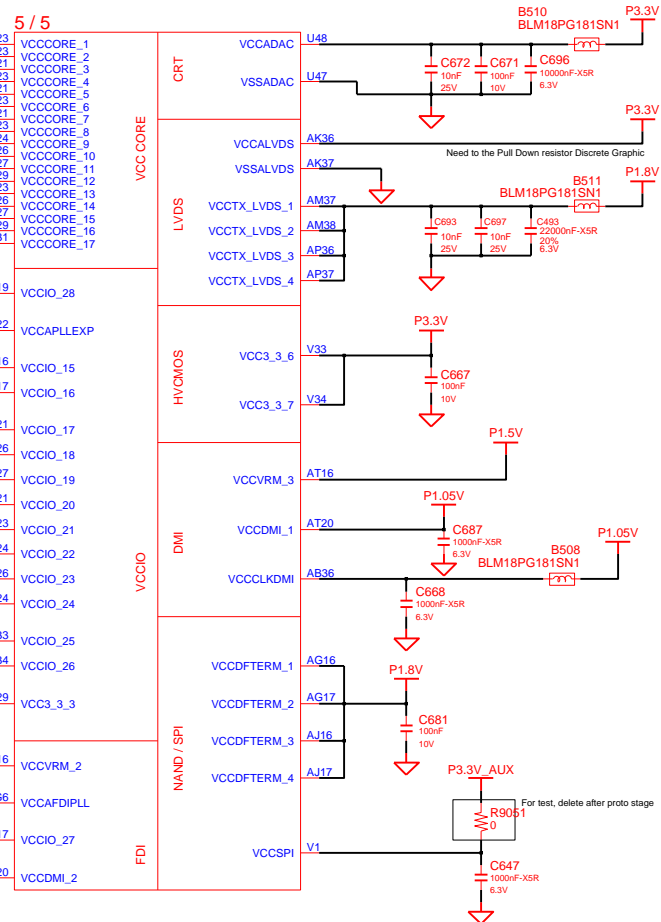
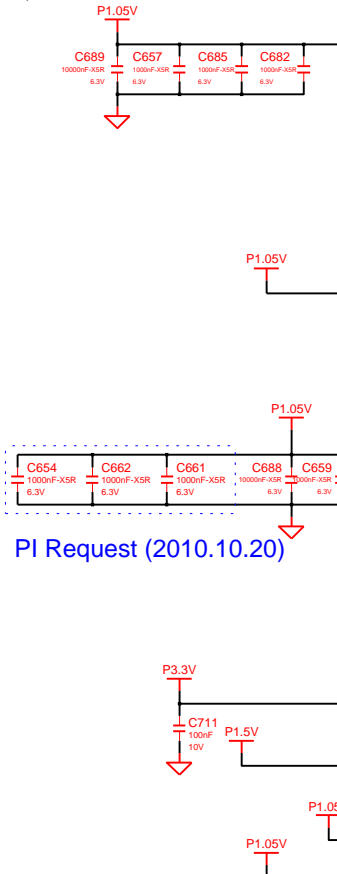
**U24-5
PANTHER POINT**

This power share with thermal sensor

5 / 5

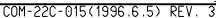
| | | | |
|------|--------|--------|------|
| AY4 | VSS159 | VSS259 | H46 |
| AY42 | VSS160 | VSS260 | K18 |
| AY46 | VSS161 | VSS261 | K26 |
| AY8 | VSS162 | VSS262 | K30 |
| B11 | VSS163 | VSS263 | K46 |
| B15 | VSS164 | VSS264 | K7 |
| B19 | VSS165 | VSS265 | L2 |
| B23 | VSS166 | VSS266 | L20 |
| B27 | VSS167 | VSS267 | L26 |
| B31 | VSS168 | VSS268 | L26 |
| B35 | VSS169 | VSS269 | L28 |
| B39 | VSS170 | VSS270 | L48 |
| B7 | VSS171 | VSS271 | M12 |
| F45 | VSS172 | VSS272 | P16 |
| BB12 | VSS173 | VSS273 | P16 |
| BB16 | VSS174 | VSS274 | M18 |
| BB20 | VSS175 | VSS275 | M24 |
| BB22 | VSS176 | VSS276 | M30 |
| BB24 | VSS177 | VSS277 | M32 |
| BB28 | VSS178 | VSS278 | M34 |
| BB30 | VSS179 | VSS279 | M36 |
| BB38 | VSS180 | VSS280 | M4 |
| BB4 | VSS181 | VSS281 | M46 |
| BB46 | VSS182 | VSS282 | M46 |
| BC14 | VSS183 | VSS283 | N18 |
| BC18 | VSS184 | VSS284 | N18 |
| BC2 | VSS185 | VSS285 | P30 |
| BC22 | VSS186 | VSS286 | P47 |
| BC26 | VSS187 | VSS287 | P47 |
| BC32 | VSS188 | VSS288 | P16 |
| BC34 | VSS189 | VSS289 | T33 |
| BC36 | VSS190 | VSS290 | P40 |
| BC40 | VSS191 | VSS291 | P40 |
| BC48 | VSS192 | VSS292 | P47 |
| BD46 | VSS193 | VSS293 | P7 |
| BD5 | VSS194 | VSS294 | R2 |
| BD22 | VSS195 | VSS295 | R48 |
| BE26 | VSS196 | VSS296 | T12 |
| BE40 | VSS197 | VSS297 | T31 |
| BF10 | VSS198 | VSS298 | T37 |
| BF12 | VSS199 | VSS299 | T4 |
| BF16 | VSS200 | VSS300 | W34 |
| BF20 | VSS201 | VSS301 | T46 |
| BF22 | VSS202 | VSS302 | T47 |
| BF24 | VSS203 | VSS303 | T8 |
| BF26 | VSS204 | VSS304 | V11 |
| BF28 | VSS205 | VSS305 | V17 |
| BD3 | VSS206 | VSS306 | V26 |
| BF30 | VSS207 | VSS307 | V27 |
| BF38 | VSS208 | VSS308 | V29 |
| BF40 | VSS209 | VSS309 | V30 |
| BF9 | VSS210 | VSS310 | V31 |
| BG17 | VSS211 | VSS311 | V36 |
| BG21 | VSS212 | VSS312 | V43 |
| BG33 | VSS213 | VSS313 | V7 |
| BG44 | VSS214 | VSS314 | V7 |
| B38 | VSS215 | VSS315 | W17 |
| BH11 | VSS216 | VSS316 | W2 |
| BH15 | VSS217 | VSS317 | W27 |
| BH17 | VSS218 | VSS318 | W48 |
| BH19 | VSS219 | VSS319 | Y12 |
| H10 | VSS220 | VSS320 | Y30 |
| BH27 | VSS221 | VSS321 | Y4 |
| BH31 | VSS222 | VSS322 | Y42 |
| BH33 | VSS223 | VSS323 | Y46 |
| BH36 | VSS224 | VSS324 | Y8 |
| BH38 | VSS225 | VSS325 | BG29 |
| BH43 | VSS226 | VSS326 | N24 |
| BH7 | VSS227 | VSS327 | N43 |
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| D12 | VSS229 | VSS329 | AD47 |
| D16 | VSS230 | VSS330 | B43 |
| D18 | VSS231 | VSS331 | BE10 |
| D22 | VSS232 | VSS332 | BG41 |
| D24 | VSS233 | VSS333 | G14 |
| D26 | VSS234 | VSS334 | H16 |
| D30 | VSS235 | VSS335 | T36 |
| D32 | VSS236 | VSS336 | BG22 |
| D34 | VSS237 | VSS337 | BG24 |
| D38 | VSS238 | VSS338 | C22 |
| D42 | VSS239 | VSS339 | AP13 |
| D8 | VSS240 | VSS340 | M14 |
| E18 | VSS241 | VSS341 | AP3 |
| E26 | VSS242 | VSS342 | AP1 |
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| G26 | VSS246 | VSS346 | BJ28 |
| G28 | VSS247 | VSS347 | |
| G36 | VSS248 | VSS348 | |
| G48 | VSS249 | VSS349 | |
| H12 | VSS250 | VSS350 | |
| H18 | VSS251 | VSS351 | |
| H22 | VSS252 | VSS352 | |
| H26 | VSS253 | | |
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| H34 | VSS256 | | |
| H36 | VSS257 | | |
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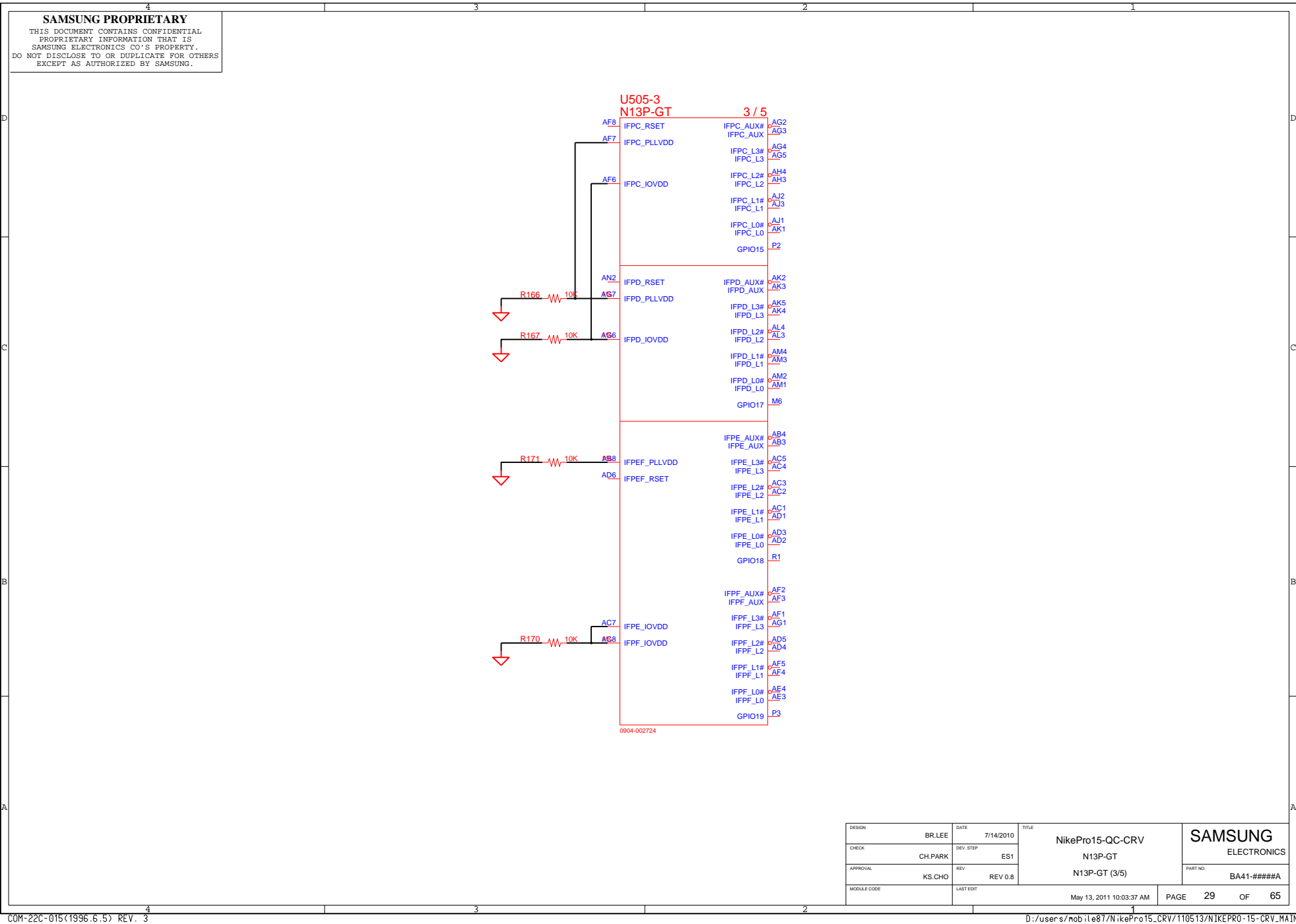
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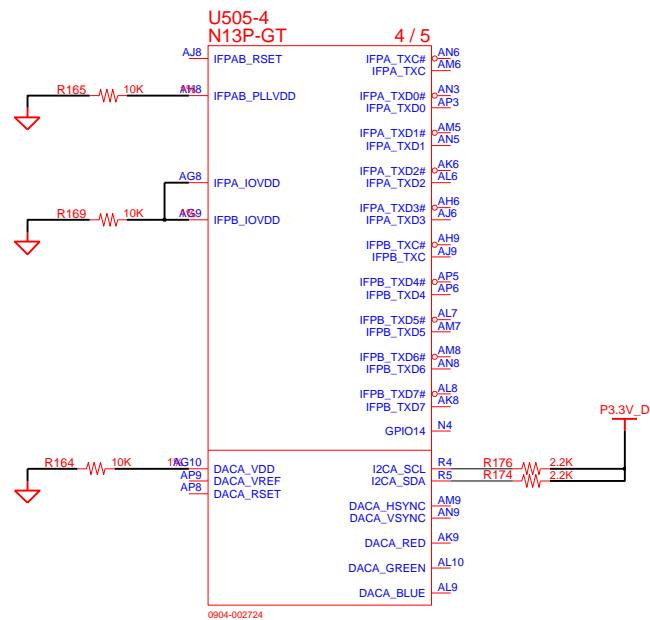
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| MODULE CODE | | LAST EDIT | | | May 13, 2011 10:03:37 AM | | |
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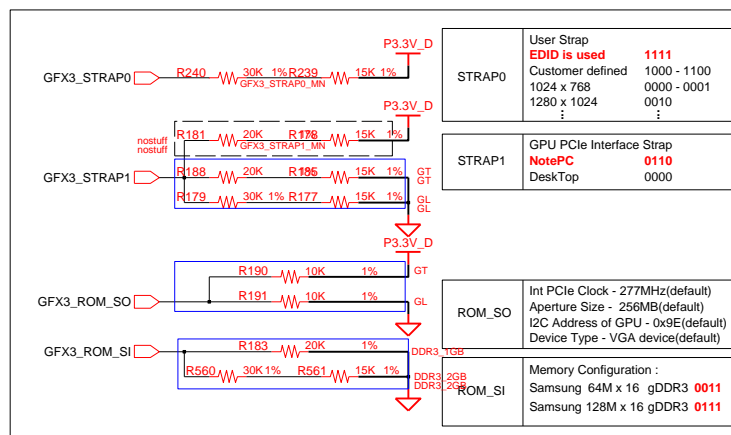
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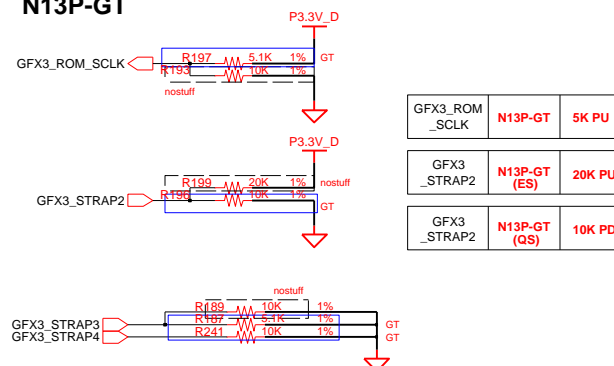
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N13x STRAP

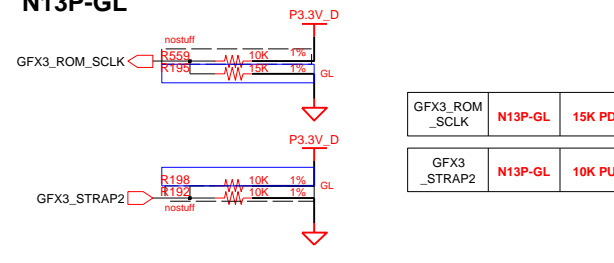
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N13P-GT



N13P-GL

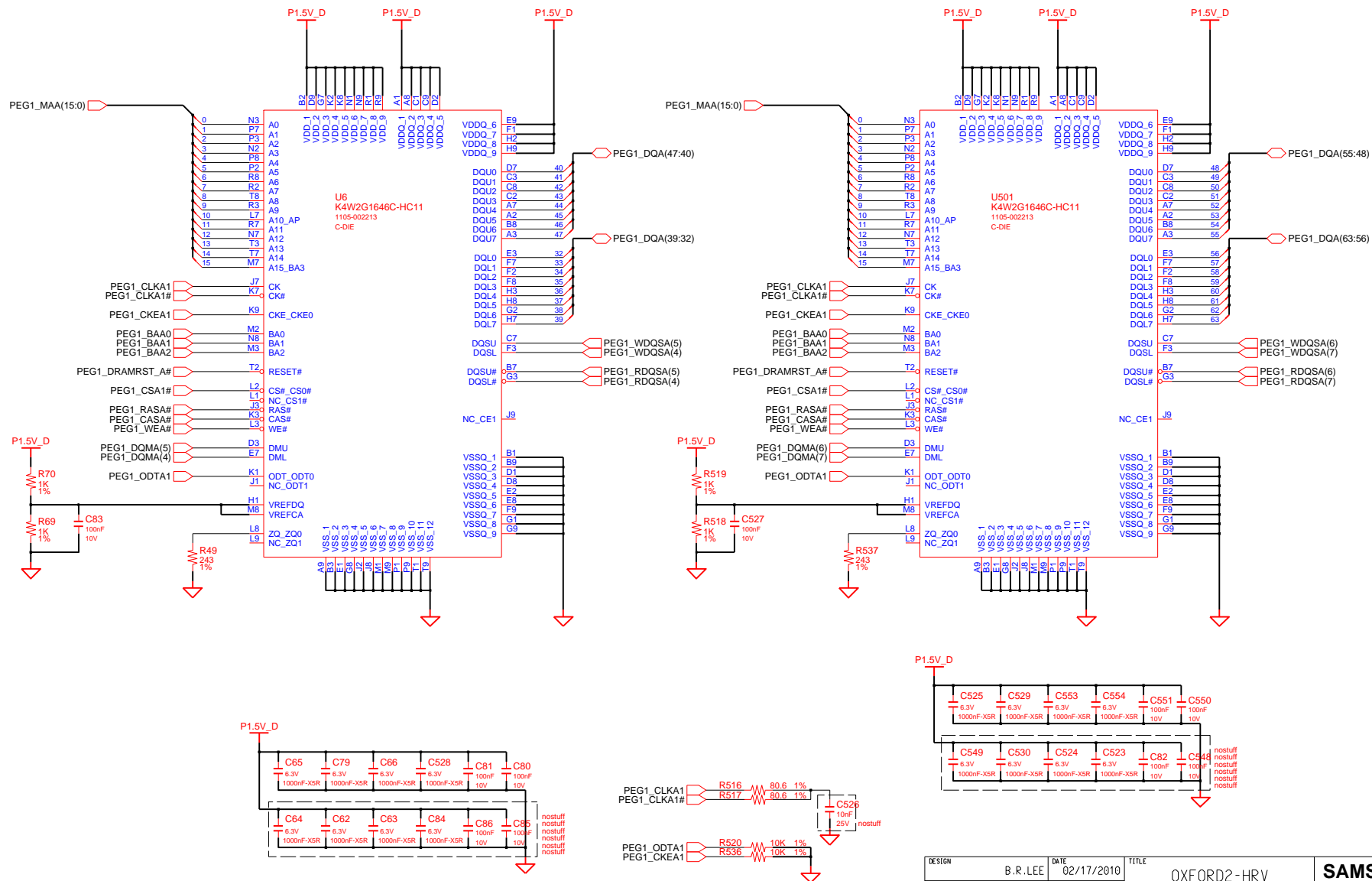


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| | | | | PAGE | 27 | OF 73 |

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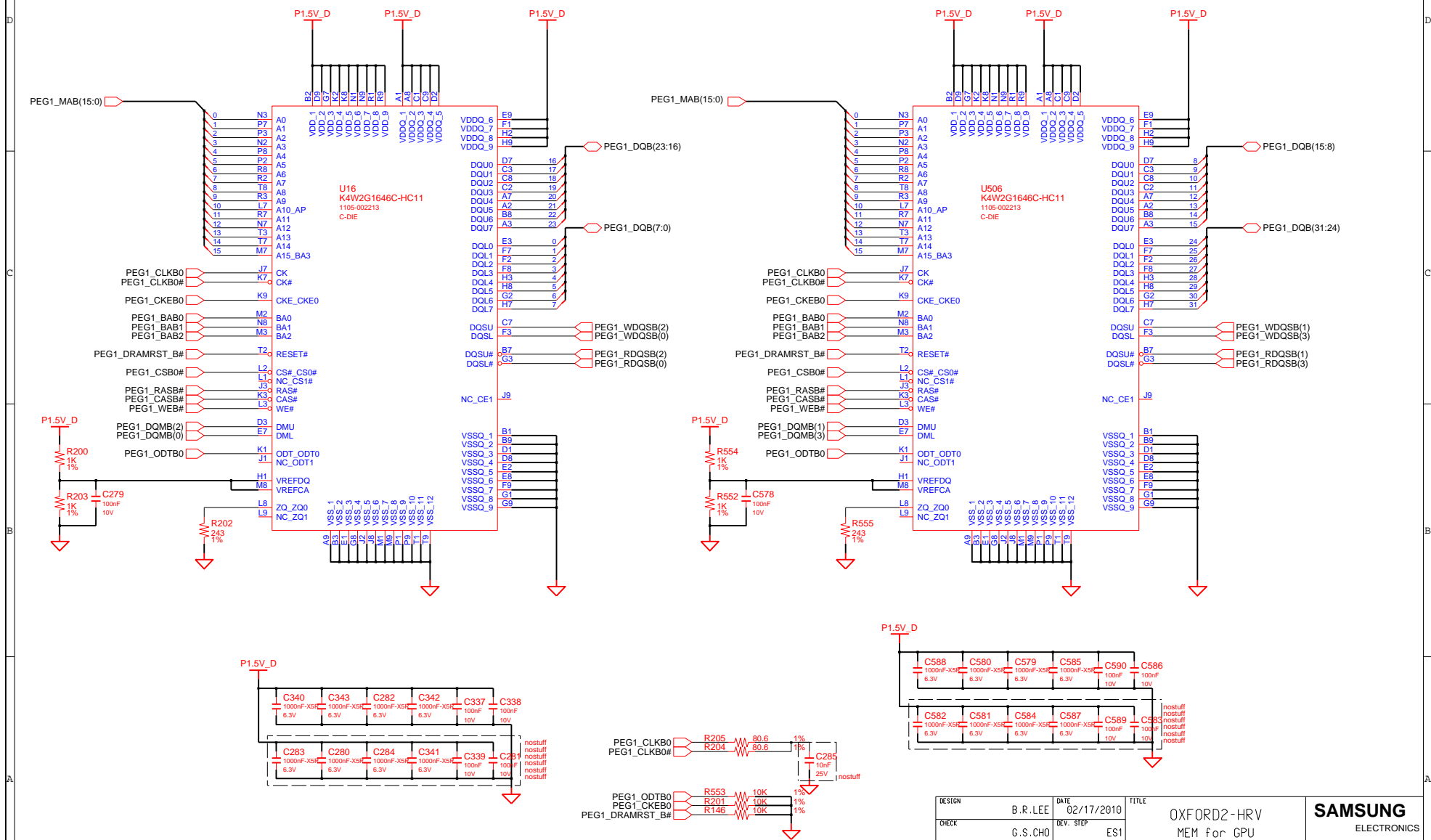


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B-Channel #0 (D-mode)



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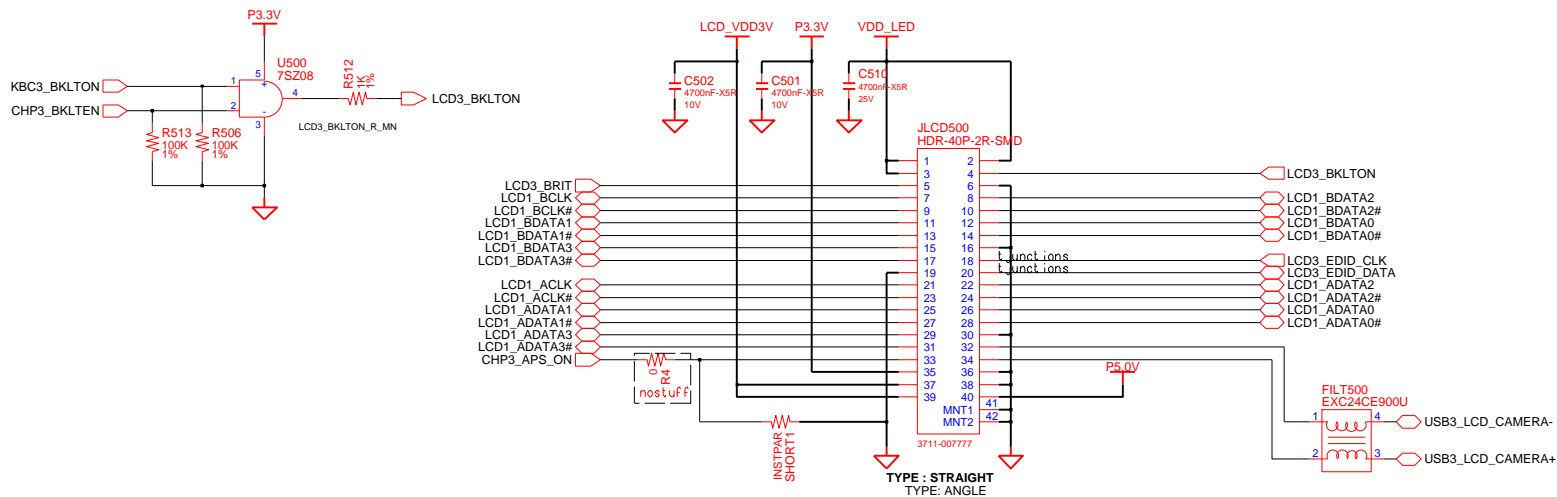
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LVDS LOGIC

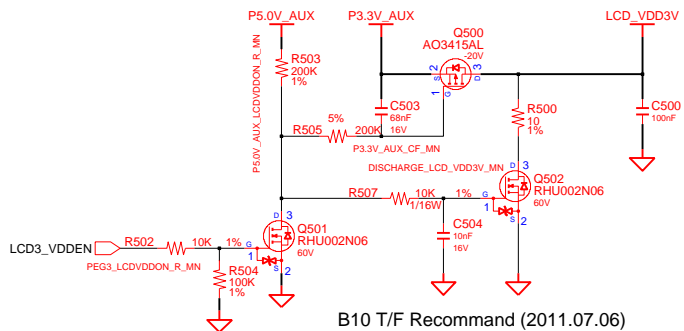
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2Ch. LCD Connector + CAMERA



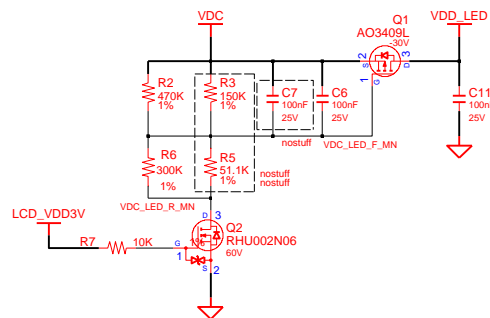
LCD Power

EBL Purpose



B10 T/F Reccomand (2011.07.06)

LED Power



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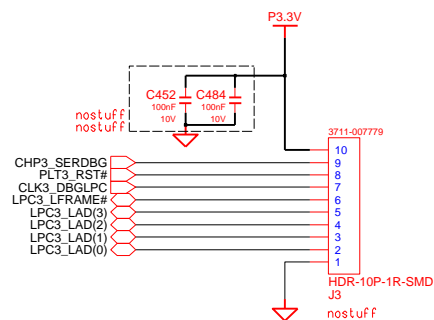
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80H PORT DEBUG



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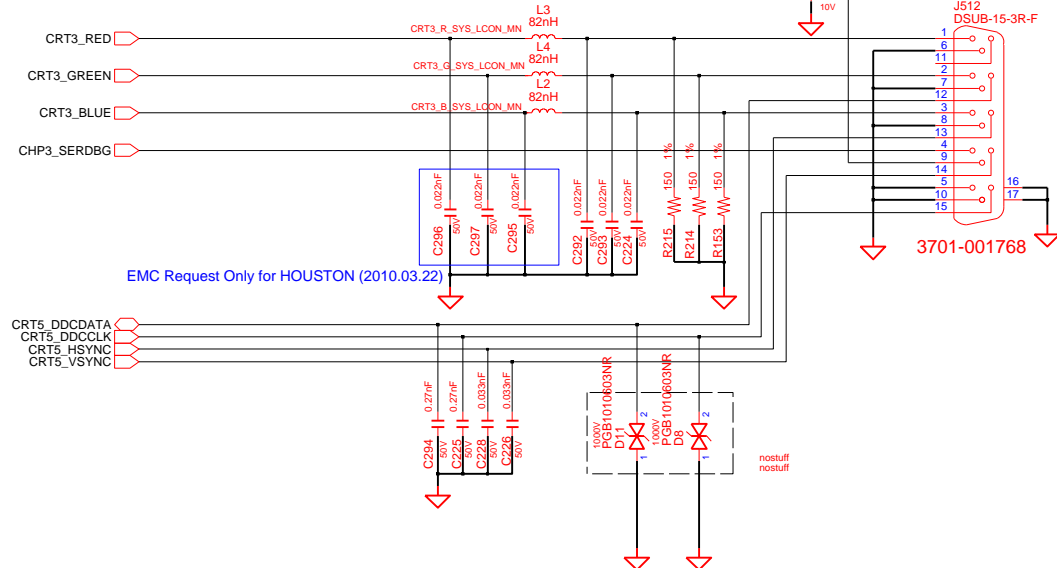
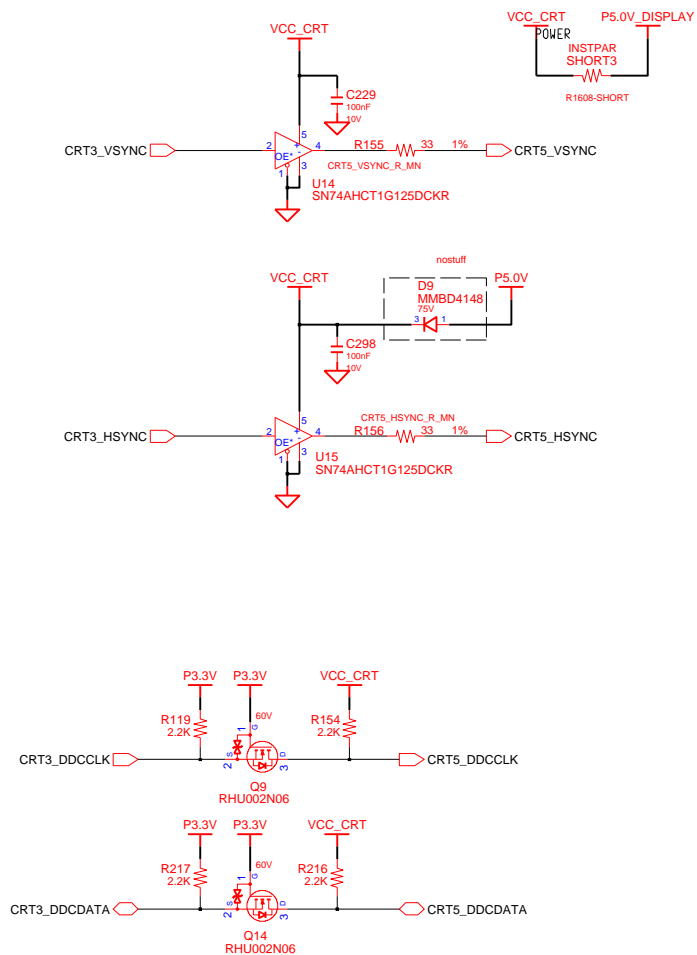
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CRT LOGIC



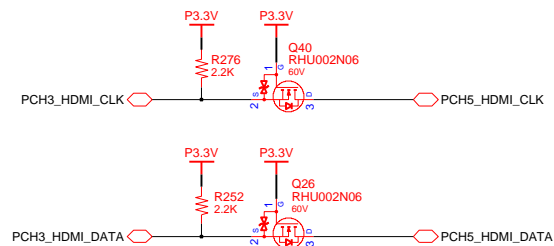
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STANDARD NET NAME

| Display from PCH | Display from GPU |
|------------------|------------------|
| PCH3_HDMI_xxx | PEG3_HDMI_xxx |
| PCH1_xxxx_HDMI | PEG3_xxxx_HDMI |



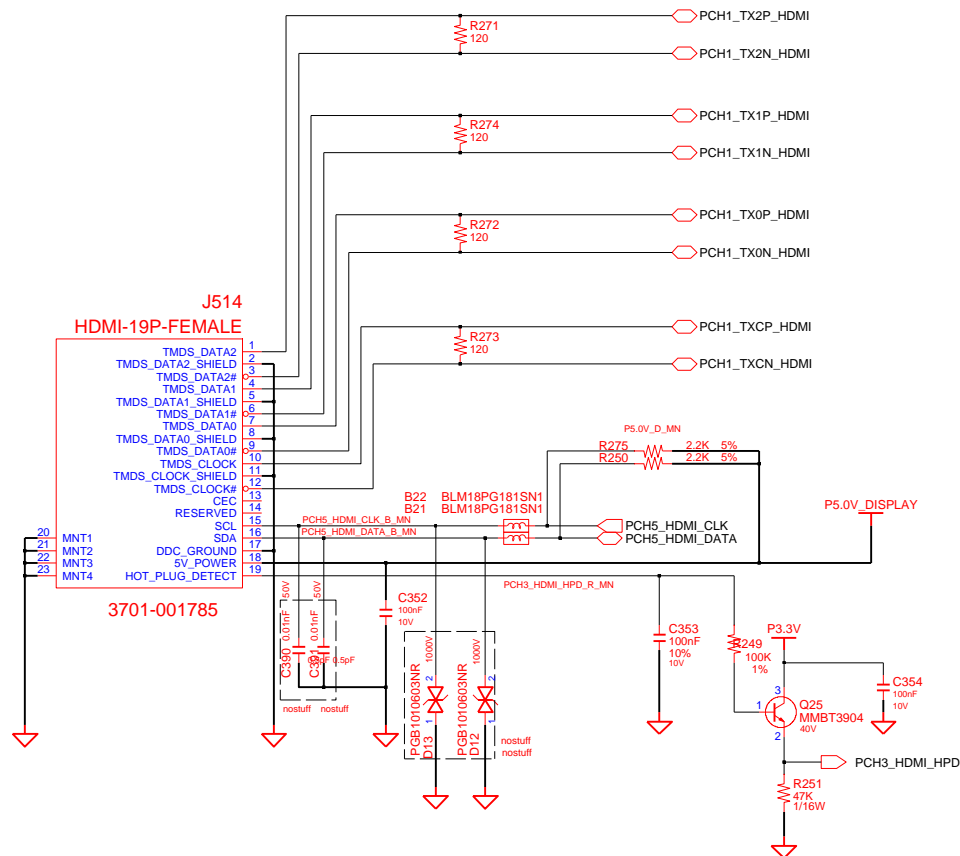
HDMI Graphic

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

(EMC request at 2010.04.15)

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

(EMC request at 2010.12.03)



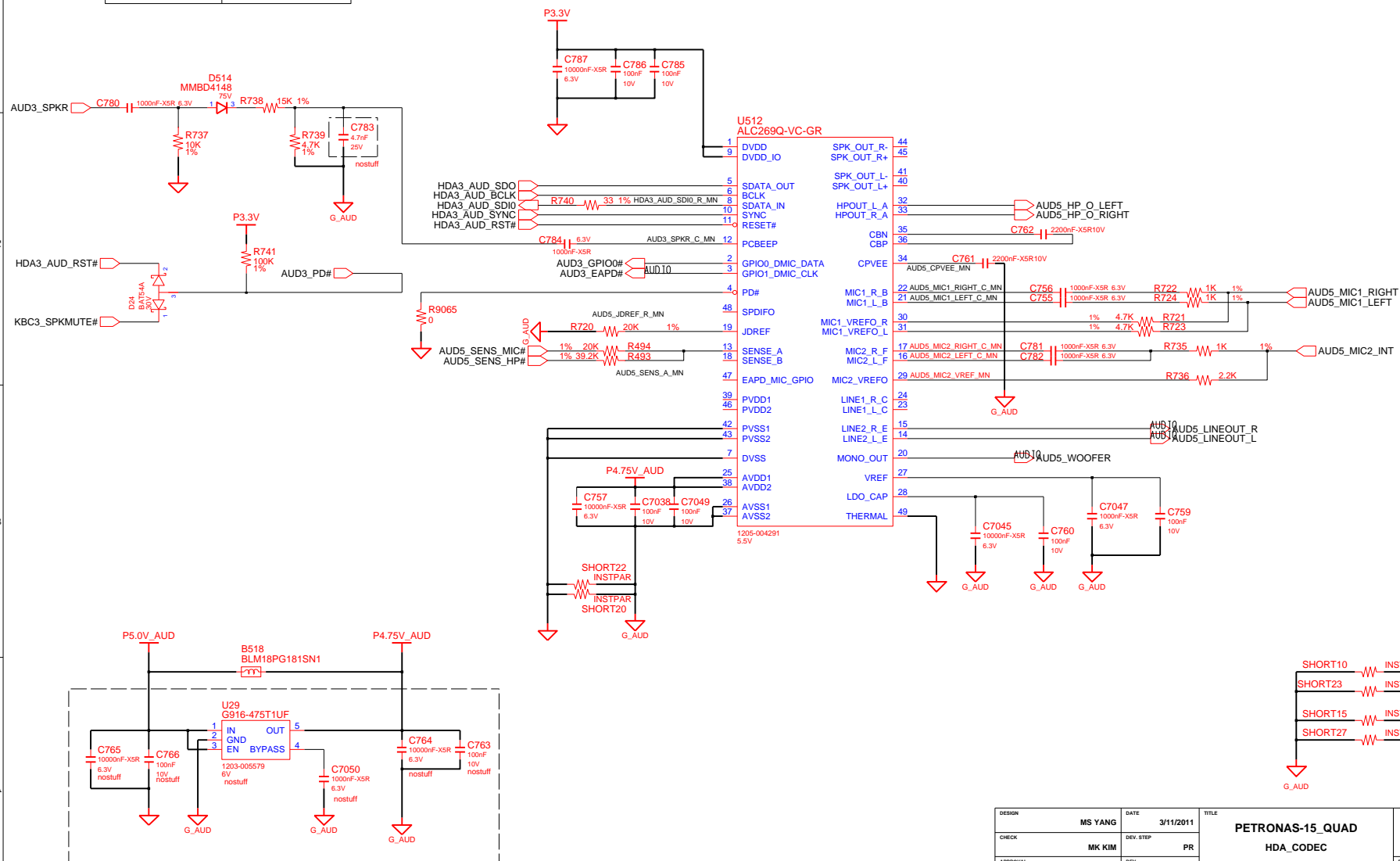
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|-------------|---------|-----------|-----------|--------------------------|------------------|-------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | GRAPHICS_IF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

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

HD AUDIO



| | | | | | | |
|-------------|---------|-----------|-----------|--------------------------|--------------------|-------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | | HDA_CODEC | ELECTRONICS |
| APPROVAL | BL LEE | REV | REV 1.0 | | AUDIO CODEC ALC269 | PART NO. |
| MODULE CODE | | LAST EDIT | | | | BA41-01662A |
| | | | | May 20, 2011 21:14:43 PM | PAGE | 30 OF 51 |

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D

C

B

A

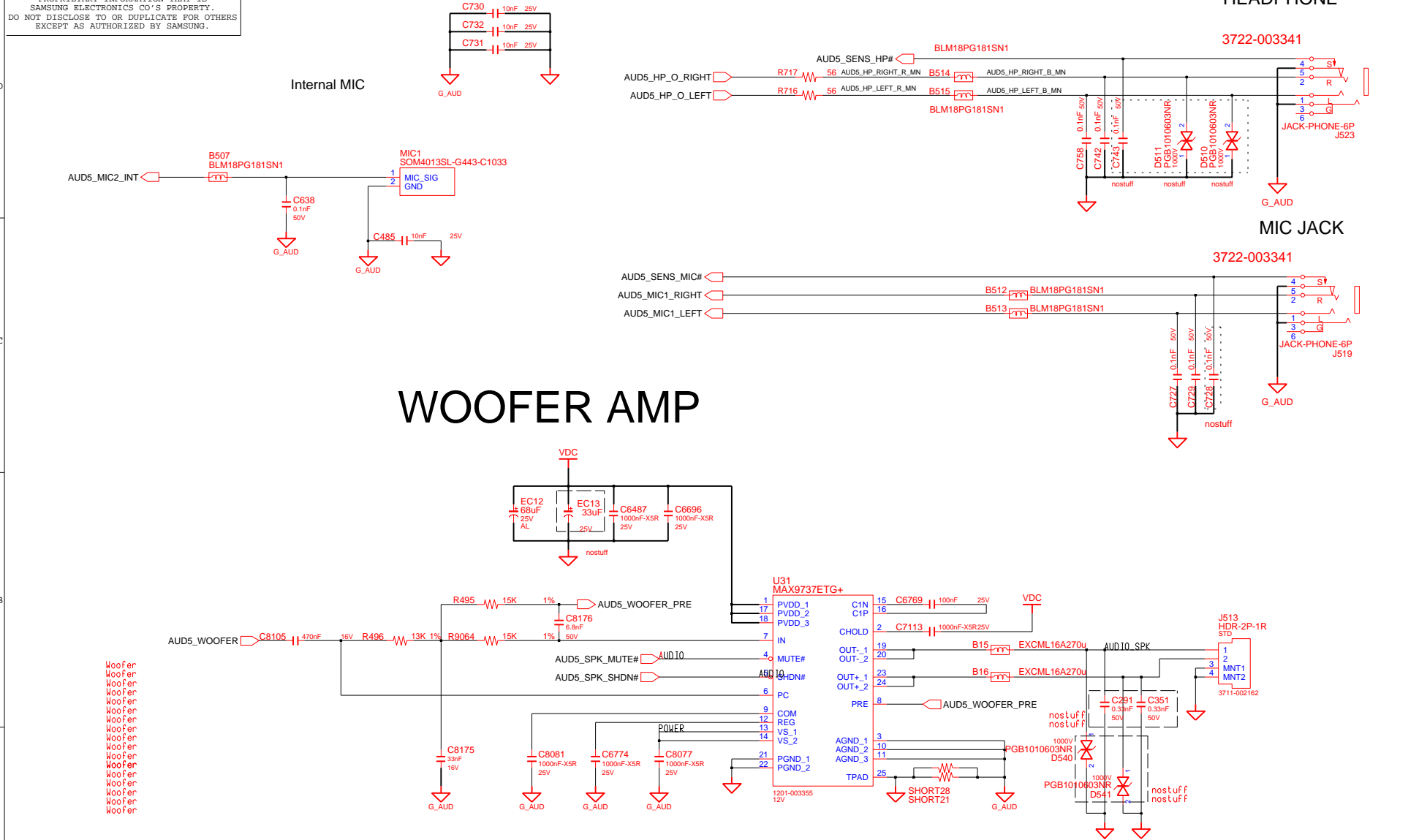
D

C

B

A

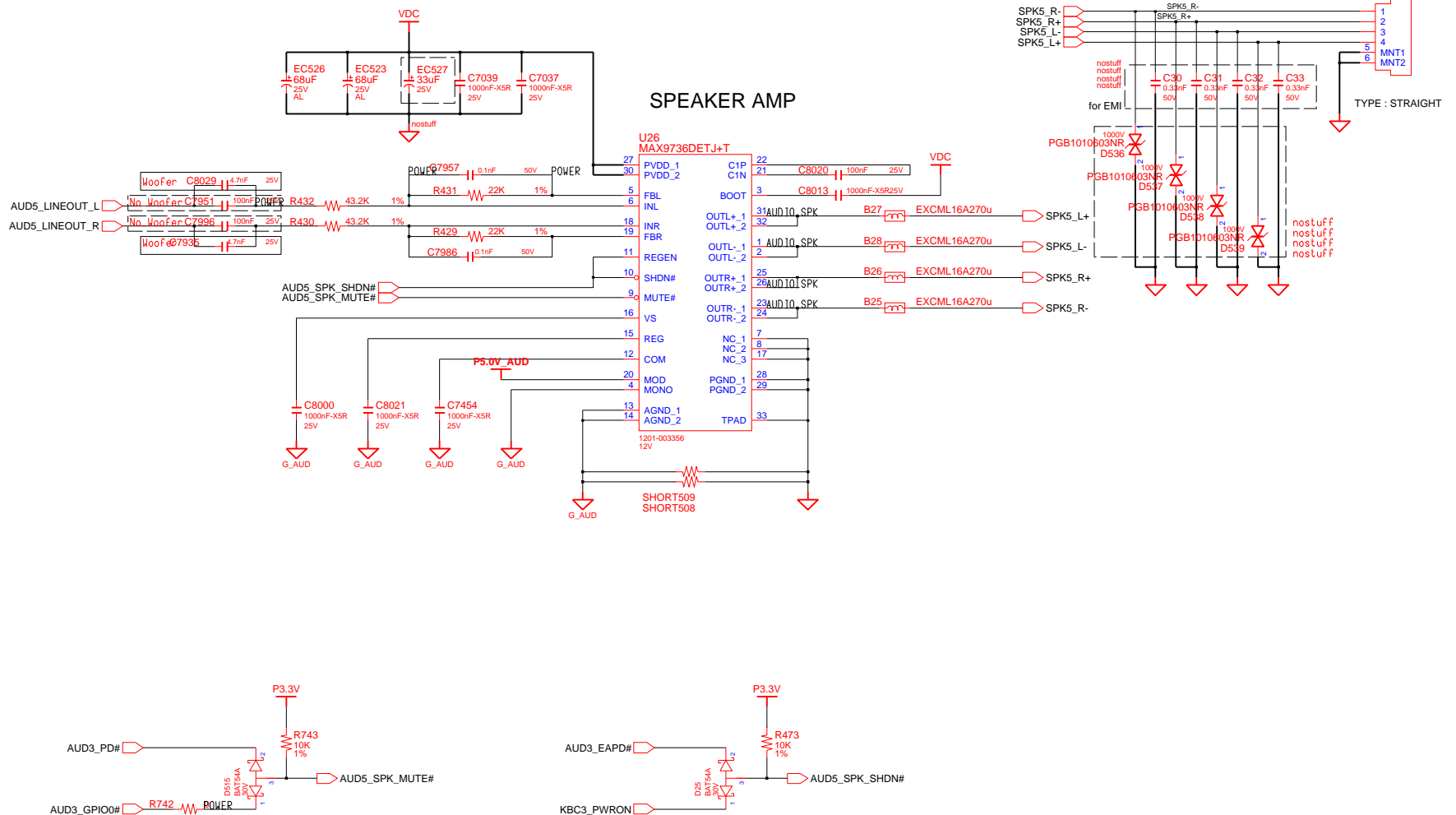
WOOFER AMP




| | | | | | | |
|-------------|---------|-----------|-----------|--------------------------|------------------|-------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | HDA_CODEC | ELECTRONICS | |
| APPROVAL | BL LEE | REV | REV 1.0 | AUDIO JACK | PART NO. | BA41-01662A |
| MODULE CODE | | LAST EDIT | | | | |
| | | | | May 20, 2011 21:14:43 PM | PAGE | 31 OF 51 |

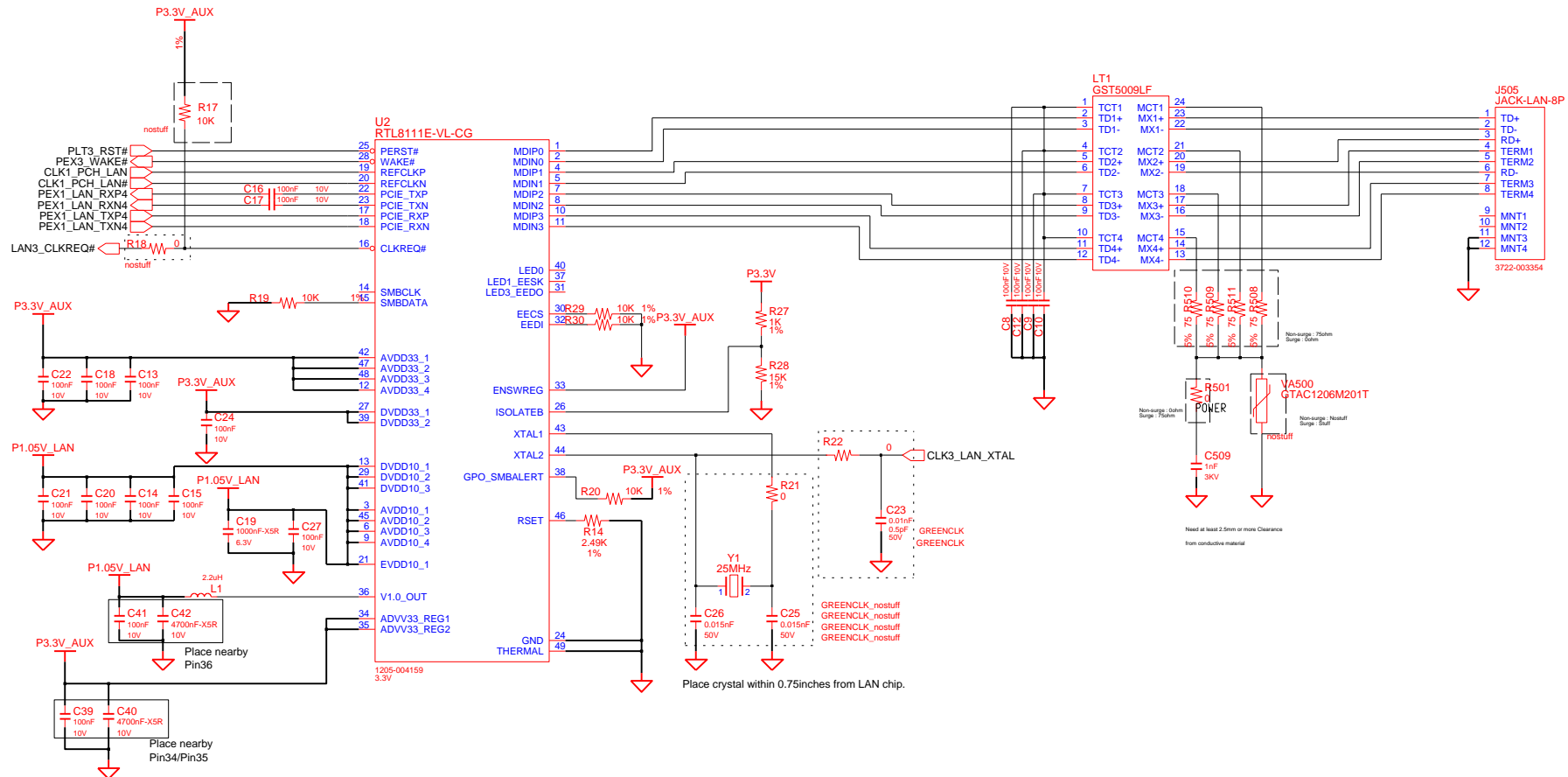
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SPEAKER AMP



| | | | | |
|-------------|-----------|-----------------------------|---|---|
| DESIGN | DATE | 8/5/2011 | TITLE McLaren-15 Audio Speaker AMP |  |
| CHECK | DEV. STEP | UNDEFINED | | |
| APPROVAL | REV | UNDEFINED | | |
| MODULE CODE | LAST EDIT | October, 7, 2011 2:49:44 PM | | |

Reatek RTL8111E

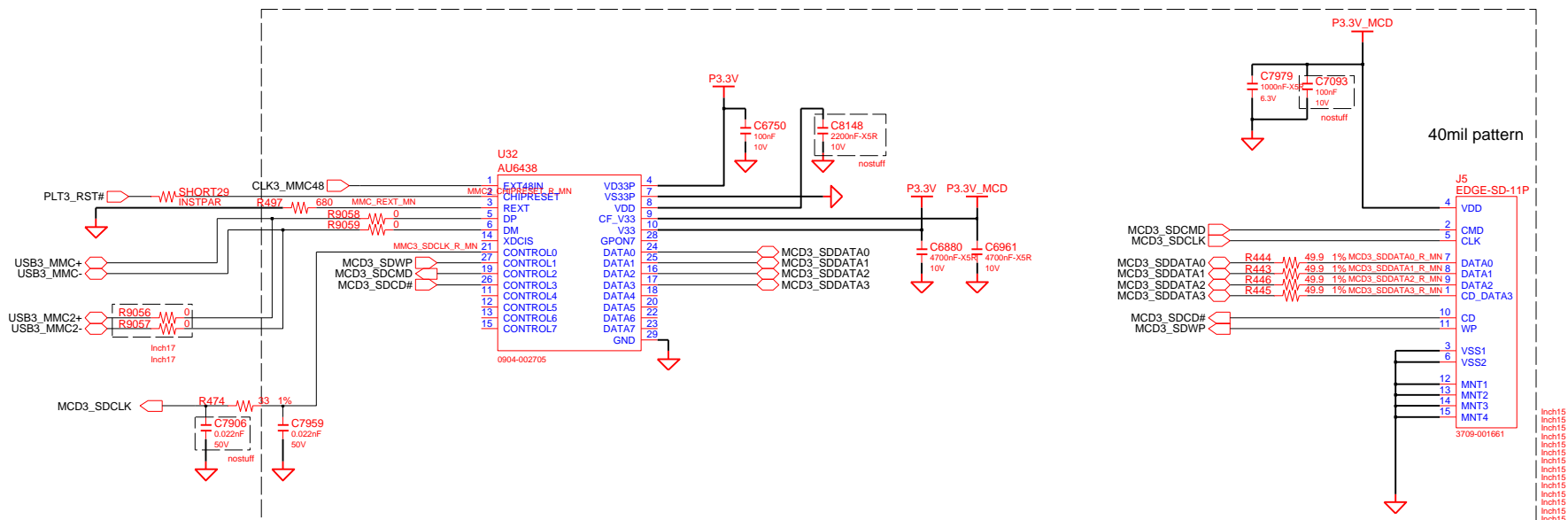


| | | | | | | |
|-------------|---------|-----------|-----------|-------|--------------------------|-------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | LAN | |
| APPROVAL | BL LEE | REV | REV 1.0 | | LAN_Reatek_RTL8111 | |
| MODULE CODE | | LAST EDIT | | | | PART NO. BA41-01662A |
| | | | | | May 20, 2011 21:14:43 PM | PAGE 32 OF 51 |

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4 IN 1 CARD

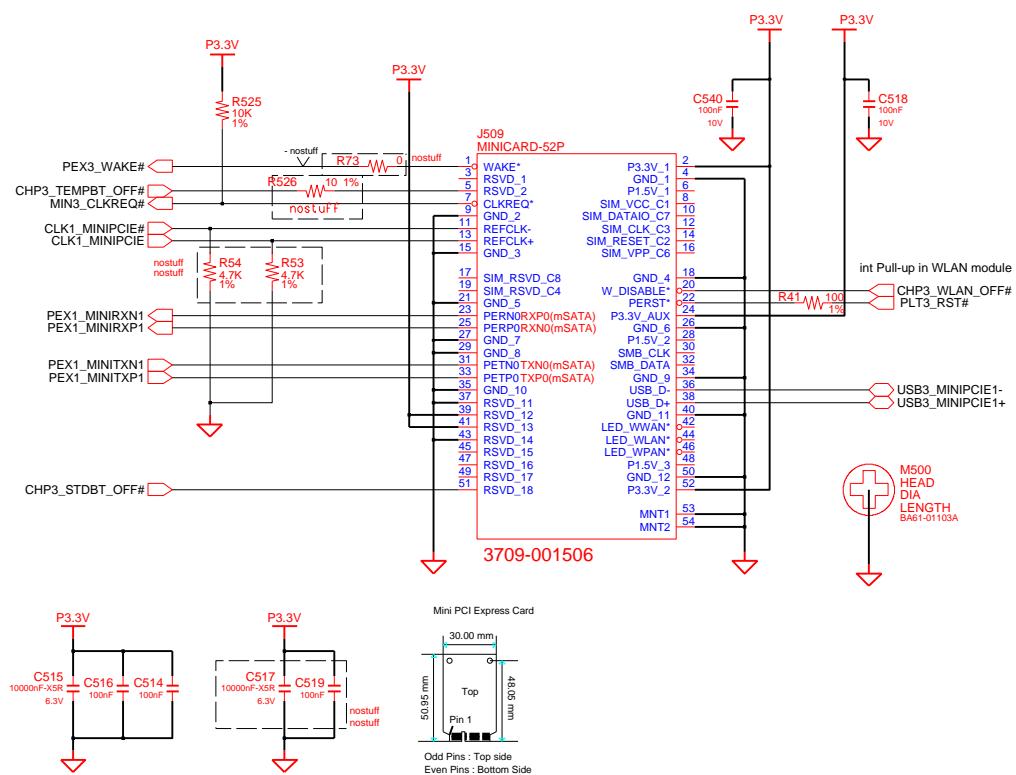


| | | | | | | |
|-------------|---------|-----------|--------------------------|-------|---|-------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD MULTICARD 4 IN 1 CARD (AU6438) | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | | PART NO. BA41-01662A |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

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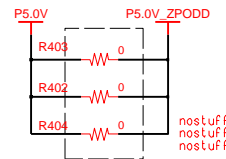
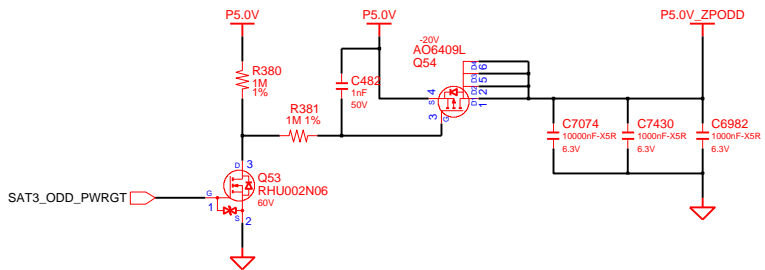
WLAN, 7mm



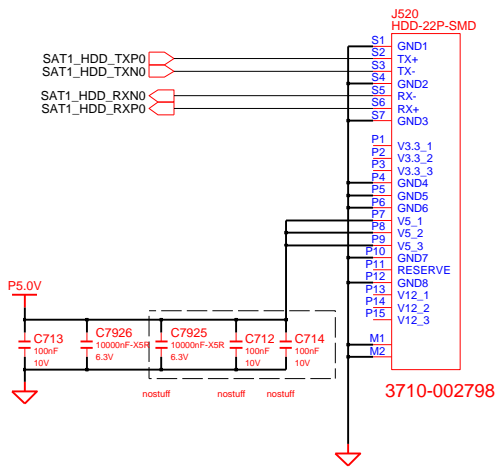
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|-------------|---------|-----------|-----------|--------------------------|------------------|-------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | MINI_PCIE_CONN | |
| APPROVAL | BL LEE | REV | REV 1.0 | | WLAN | |
| MODULE CODE | | LAST EDIT | | May 20, 2011 21:14:43 PM | PAGE 34 OF 51 | PART NO. BA41-01662A |

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SATA I/F CONN

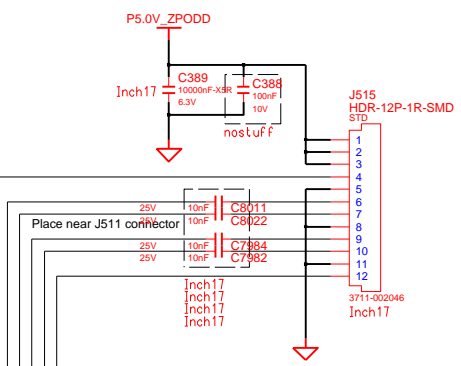
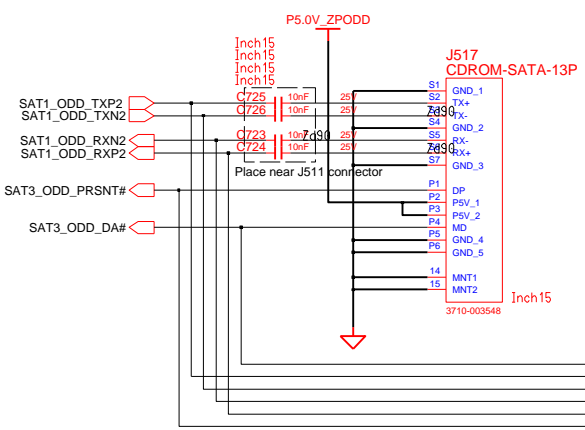


SATA HDD CONN

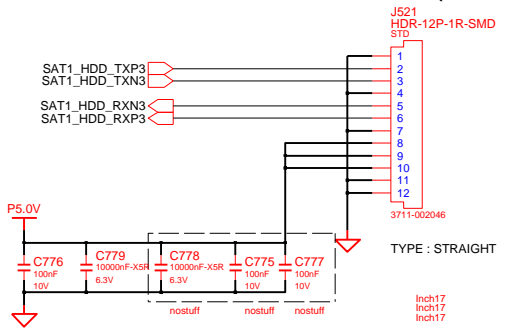


SATA 2'nd ODD CONN (17" only)

SATA ODD CONN (15" Only)



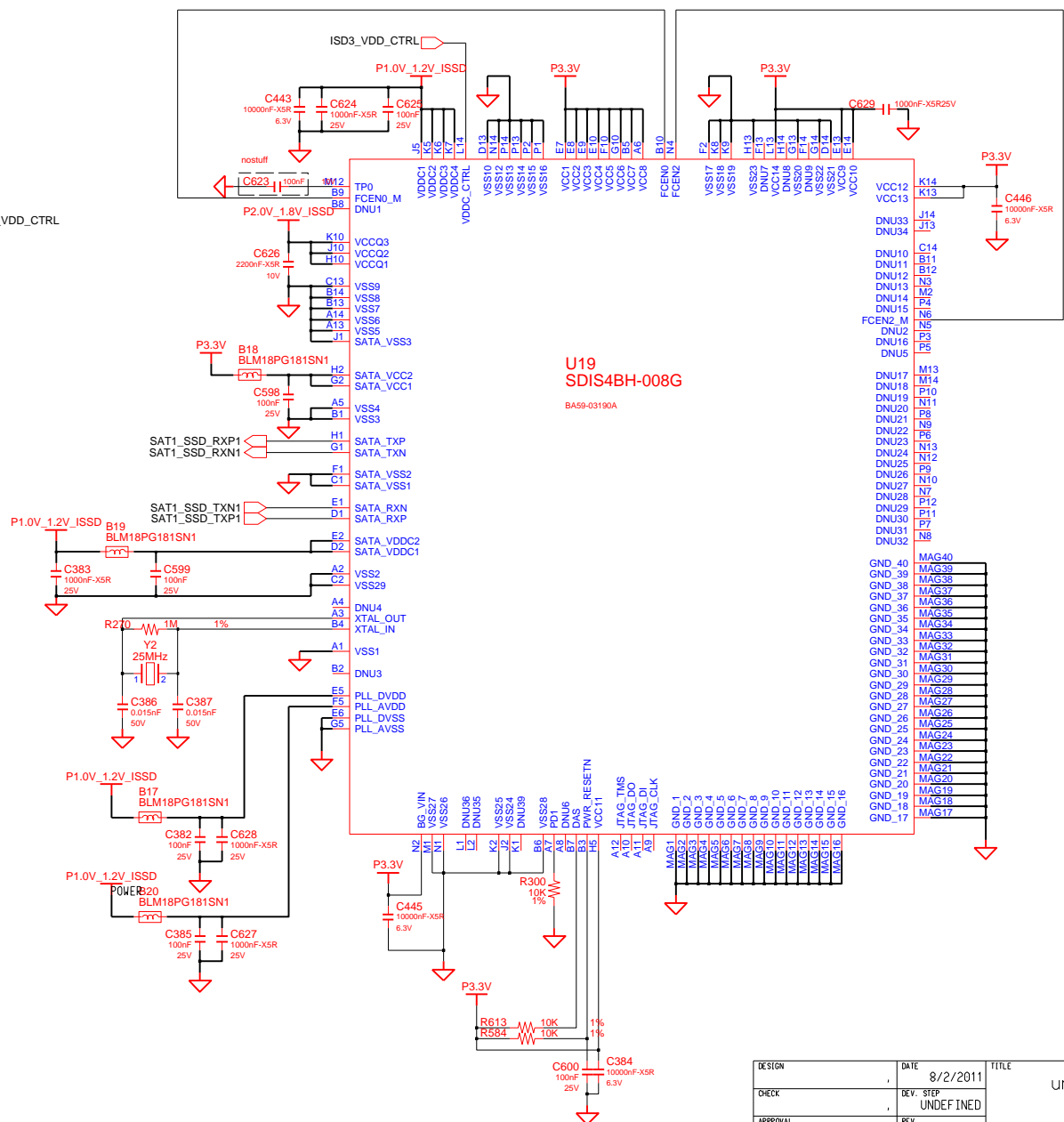
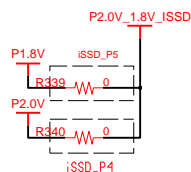
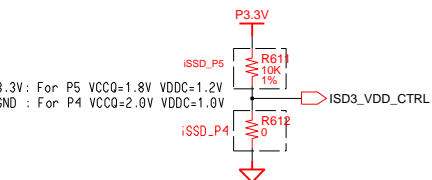
SATA 2'nd HDD CONN (17" only)



| | | | | | | |
|-------------|---------|-----------|-----------|--------------------------|------------------|-------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | SATA_DEVICES | ELECTRONICS | |
| APPROVAL | BL LEE | REV | REV 1.0 | SATA Interface | PART NO. | BA41-01662A |
| MODULE CODE | | LAST EDIT | | | | |
| | | | | May 20, 2011 21:14:43 PM | PAGE | 35 OF 51 |

ISSD

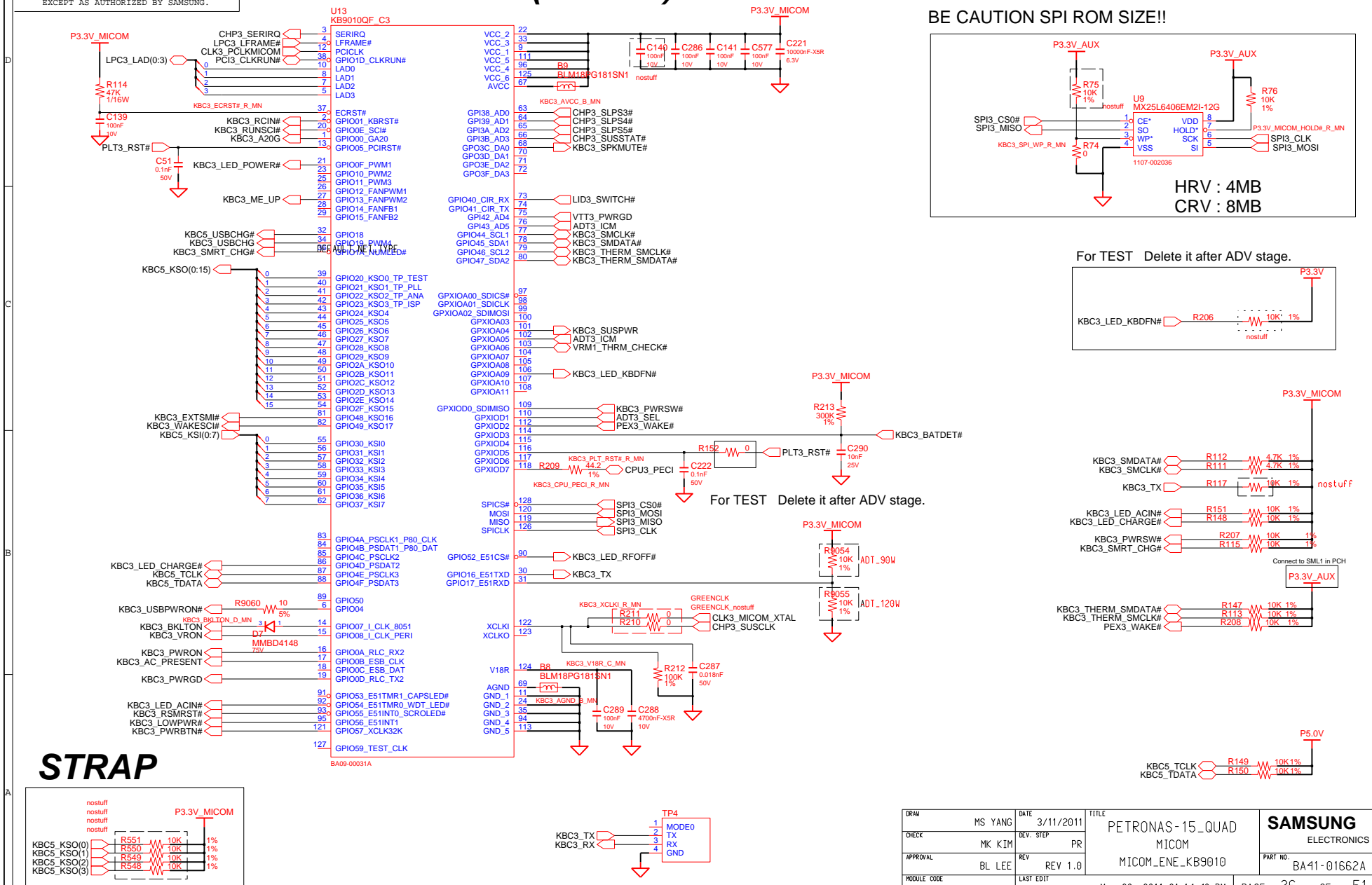
3.3V: For P5 VCCQ=1.8V VDDC=1.2V
GND : For P4 VCCQ=2.0V VDDC=1.0V

[illegible]

| | | | | |
|-------------|-----------|-----------------------------|--|-------------------------------|
| DESIGN | DATE | TITLE | | SAMSUNG ELECTRONICS |
| CHECK | DEV. STEP | iSSD | | |
| APPROVAL | REV | iSSD | | |
| | | | | PART NO. |
| | | | | BA1- undef i |
| MODULE CODE | | LAST EDIT | | |
| | | August , 2, 2011 9:27:26 PM | | PAGE 61undef i |

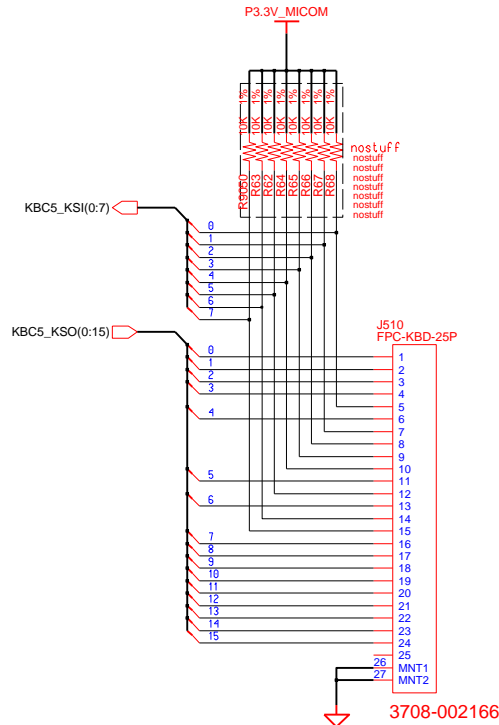
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MAIN BOARD (MICOM)

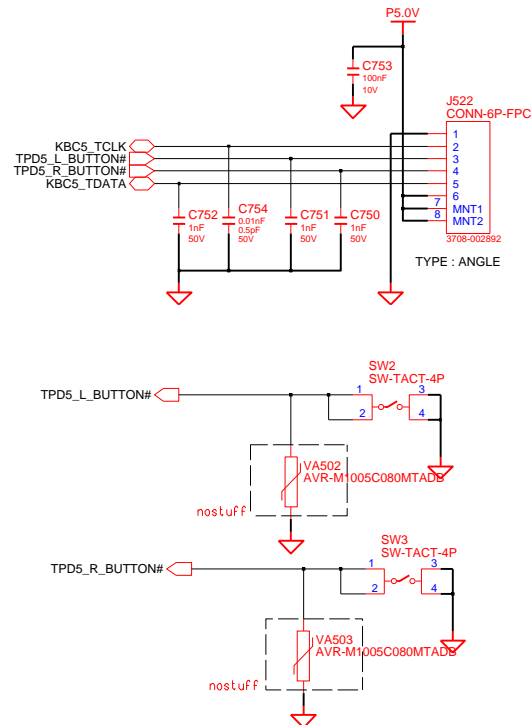


Micom Glue Logic

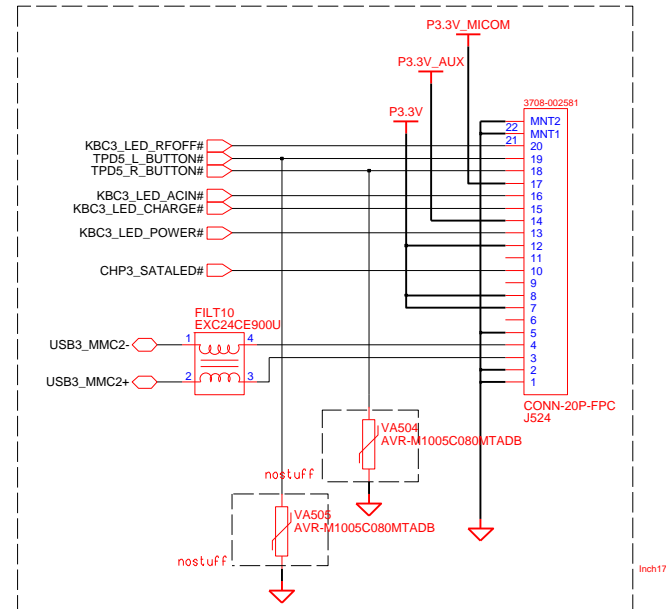
KEYBOARD



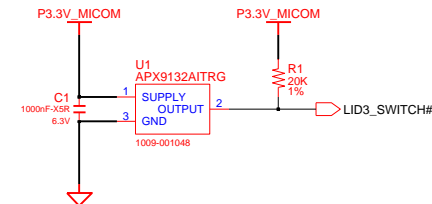
TOUCHPAD



TOUCHPAD MAIN TO SUB



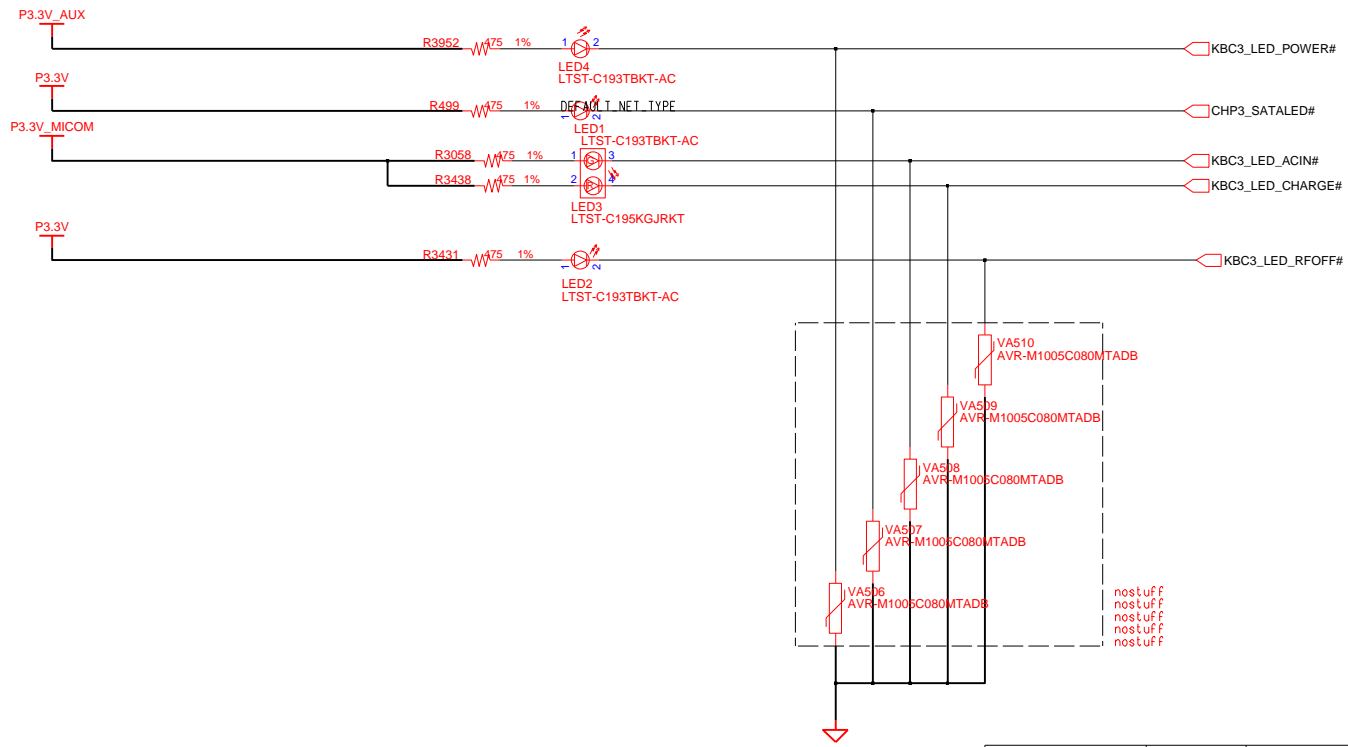
LID_SWITCH



| | | | | | | |
|--------------------------|---------|-----------|-----------|-------|---------------------|------------------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS |
| CHECK | MK KIM | DEV. STEP | PR | | MICOM GLUE LOGIC | |
| APPROVAL | BL LEE | REV | REV 1.0 | | KEYBOARD & TOUCHPAD | |
| MODULE CODE | | LAST EDIT | | | | |
| May 20, 2011 21:14:43 PM | | | | | | PAGE 37 OF 51 |

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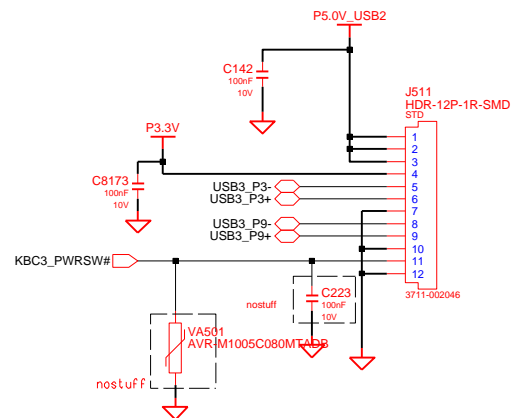
LED for 15"



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

2 USB 2.0

MAIN TO SUB

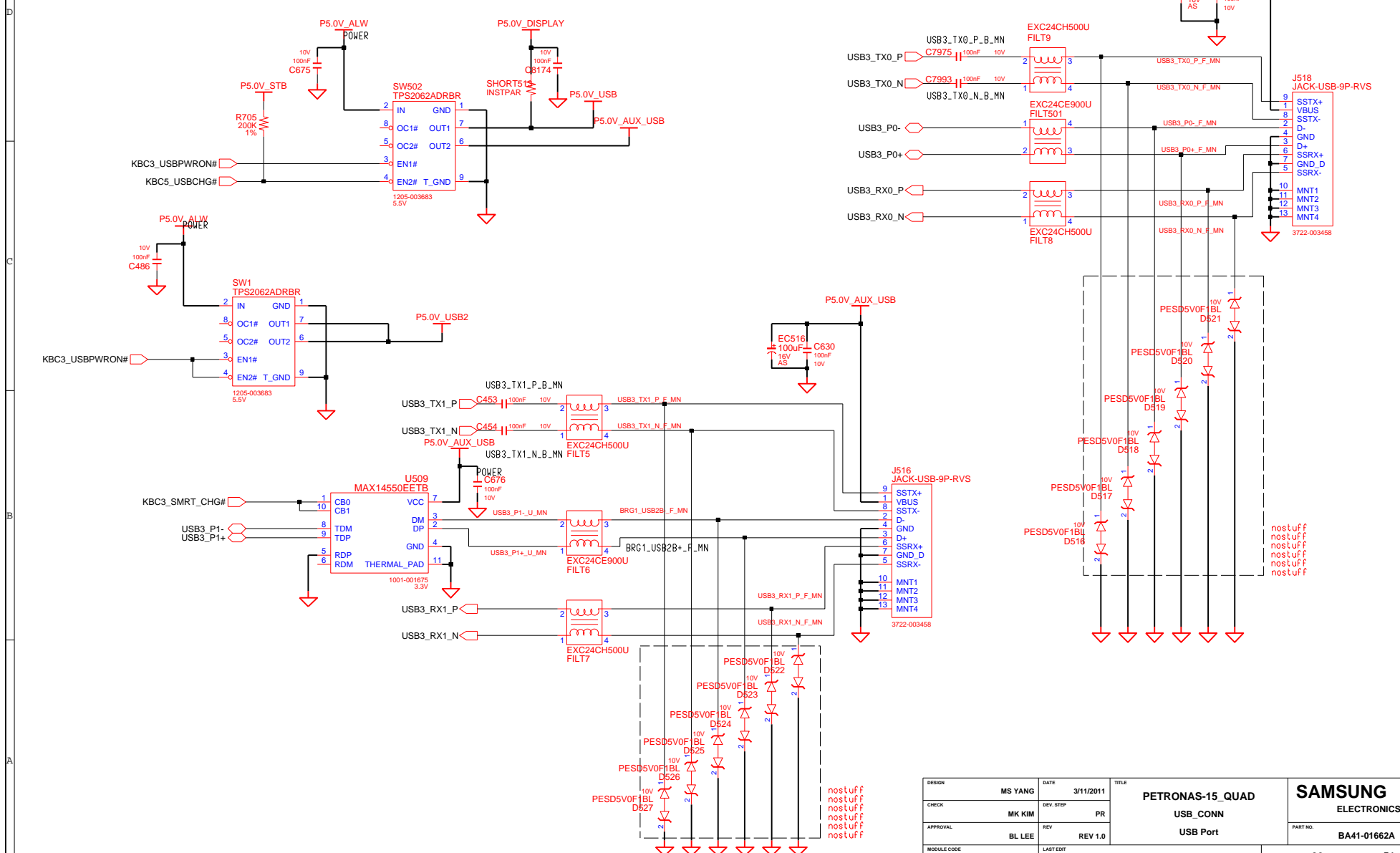


COM-22C-015(1996.6.5) REV. 3

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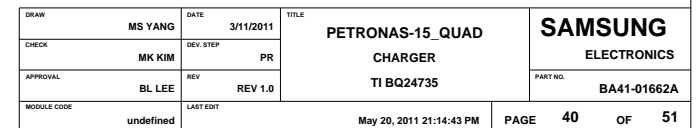
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2 USB PORT 3.0



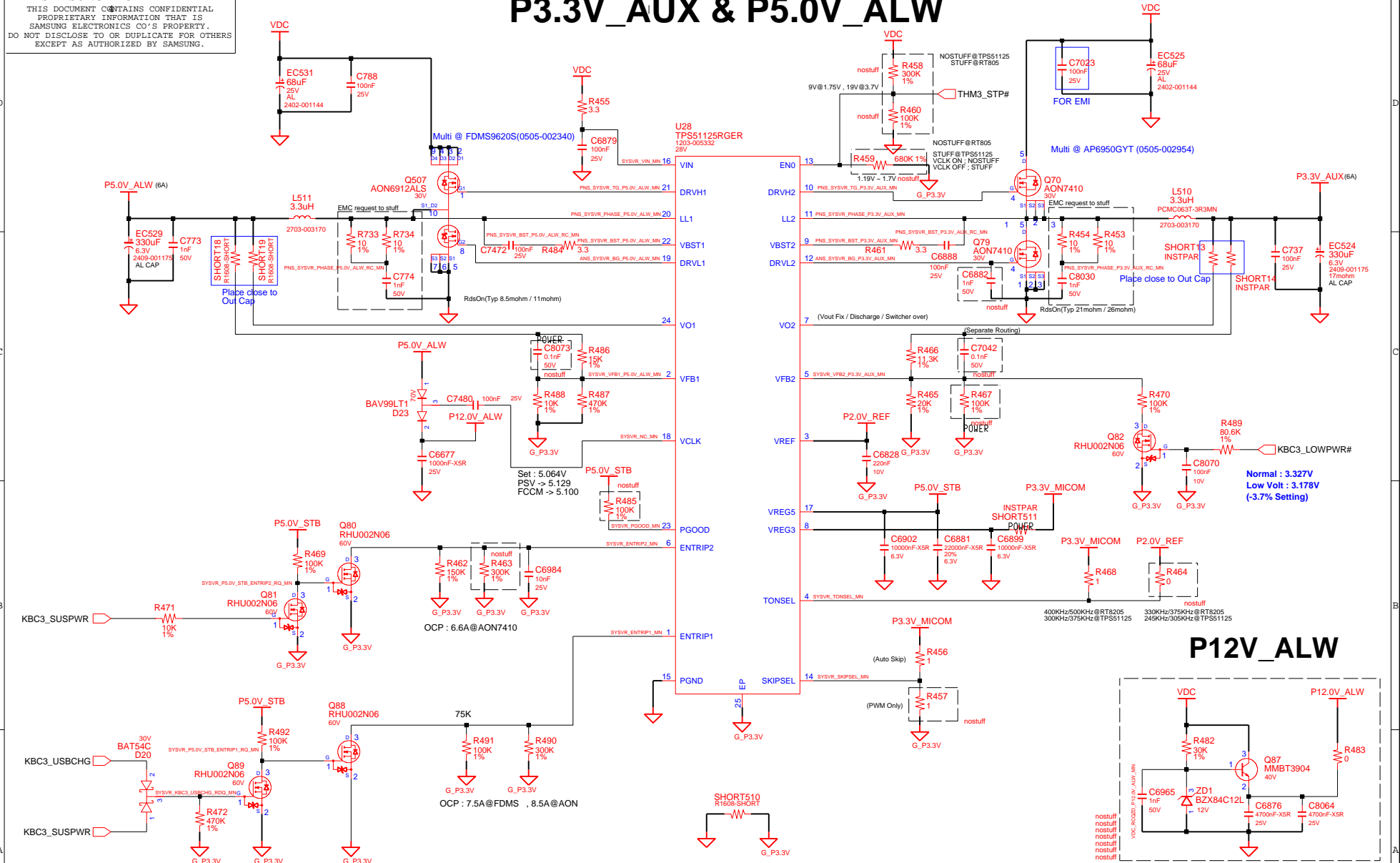
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|-------------|---------|-----------|-----------|--------------------------|------------------|-------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | | USB_CONN | ELECTRONICS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

CHARGER & POWER MANAGEMENT



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P3.3V_AUX & P5.0V_ALW



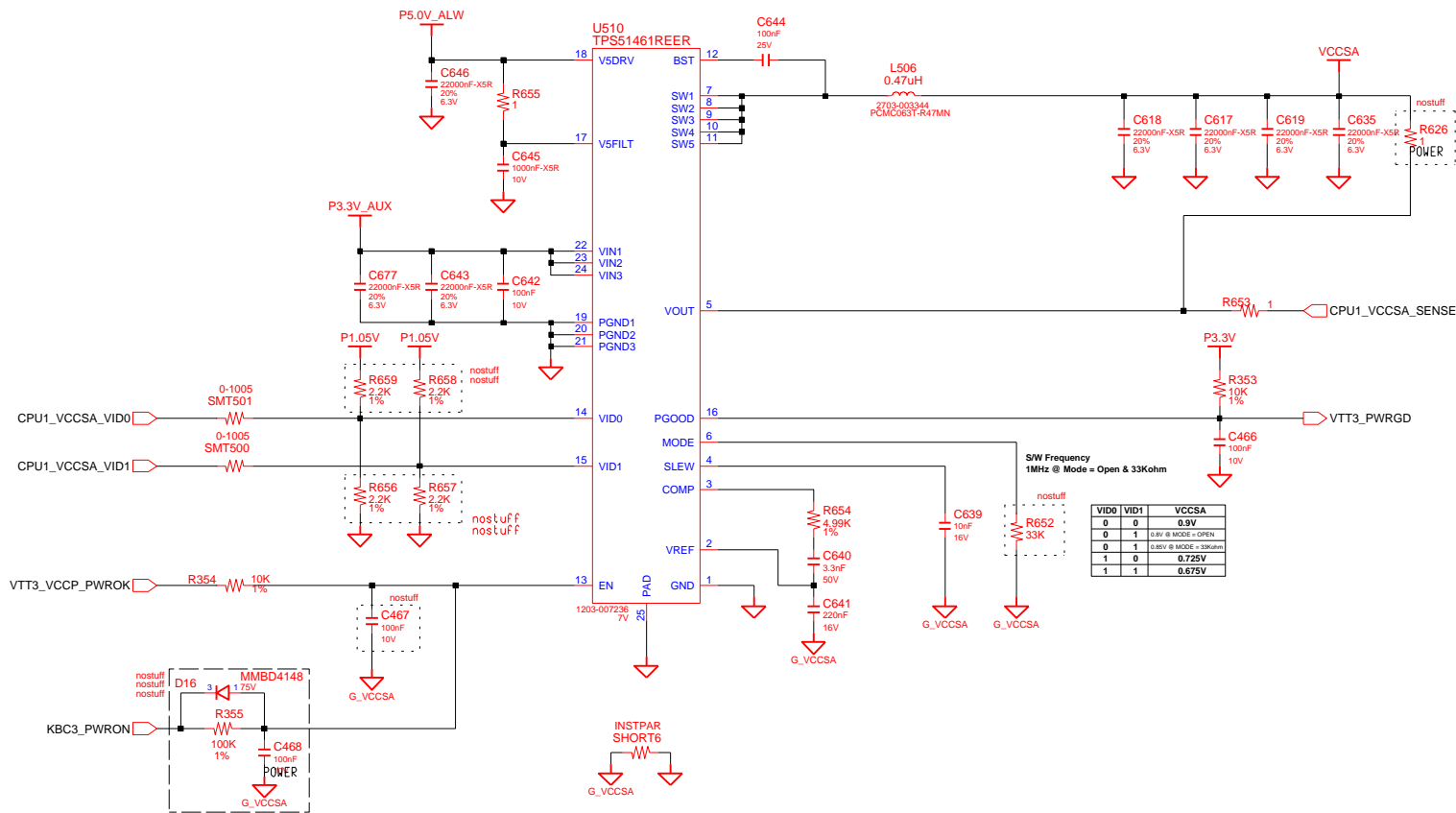
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| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS PART NO. BA41-01662A |
| CHECK | MK KIM | DEV. STEP | PR | | P3.3V_AUX / P5.0V_ALW | |
| APPROVAL | BL LEE | REV | REV 1.0 | | TI TPS51125 | |
| MODULE CODE | | LAST EDIT | | | | |
| | | | | | | |

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

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CHIPSET POWER(VCCSA)

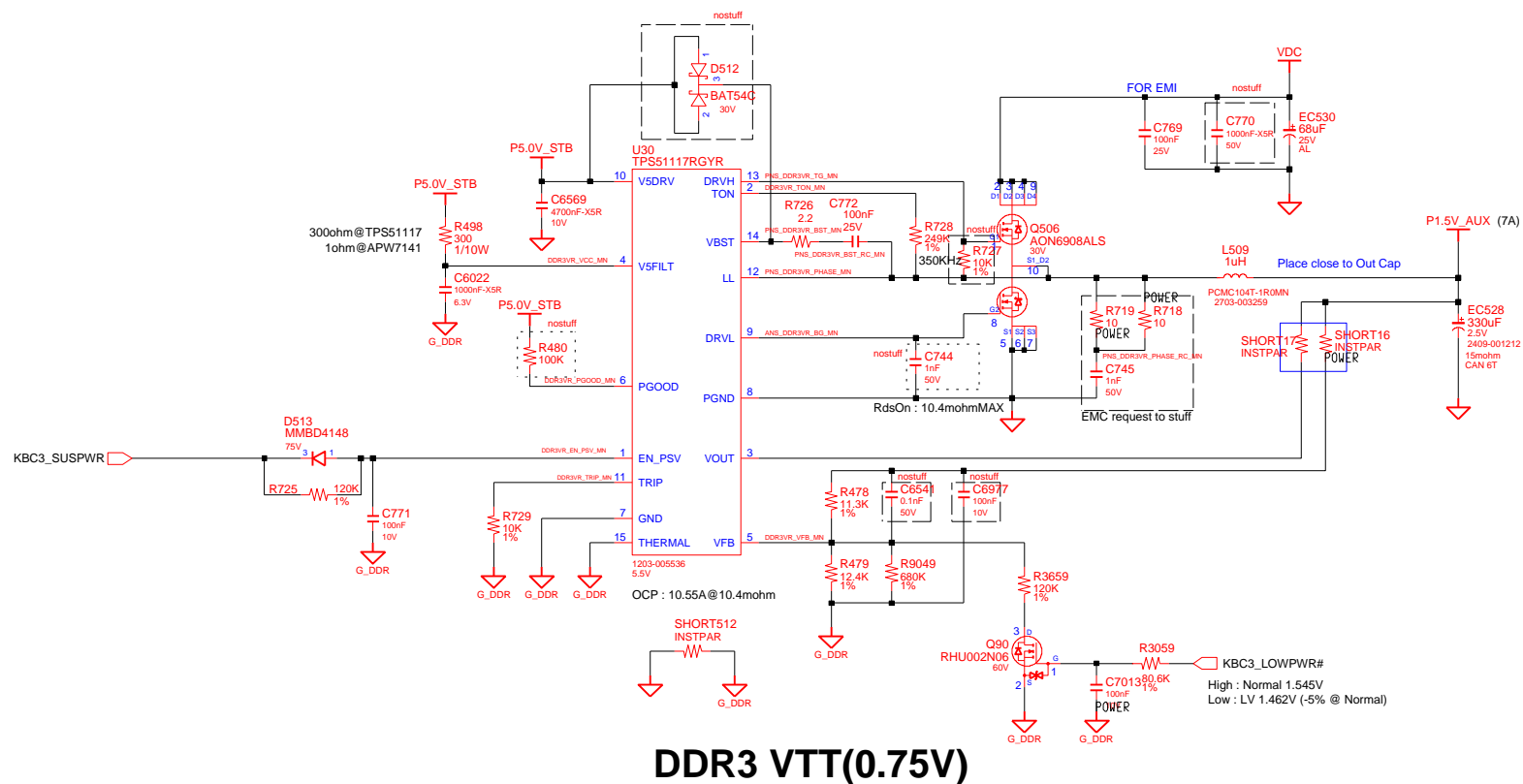
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|--------------------------|---------|-----------|-----------|-------|-------------------------------|--|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD P1.1V_VTT | SAMSUNG ELECTRONICS PART NO. BA41-01662A |
| CHECK | MK KIM | DEV. STEP | PR | | | |
| APPROVAL | BL LEE | REV | REV 1.0 | | | |
| MODULE CODE | | LAST EDIT | | | | |
| May 20, 2011 21:14:43 PM | | | | | | PAGE 43 OF 51 |

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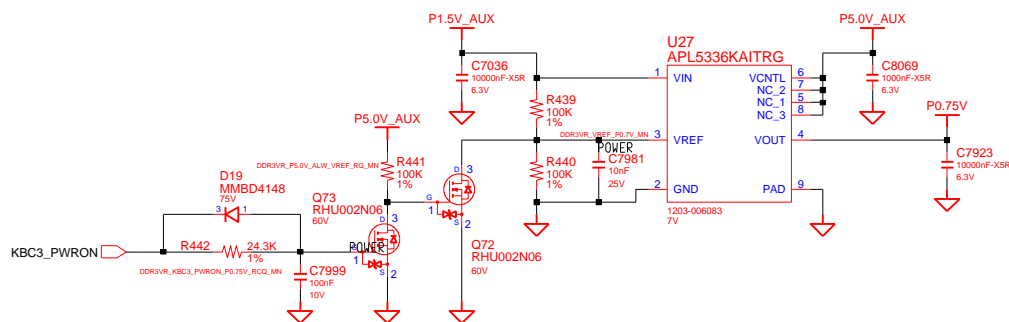
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DDR3 Power

Multi @ FDMS9620S(0505-002340)



DDR3 VTT(0.75V)

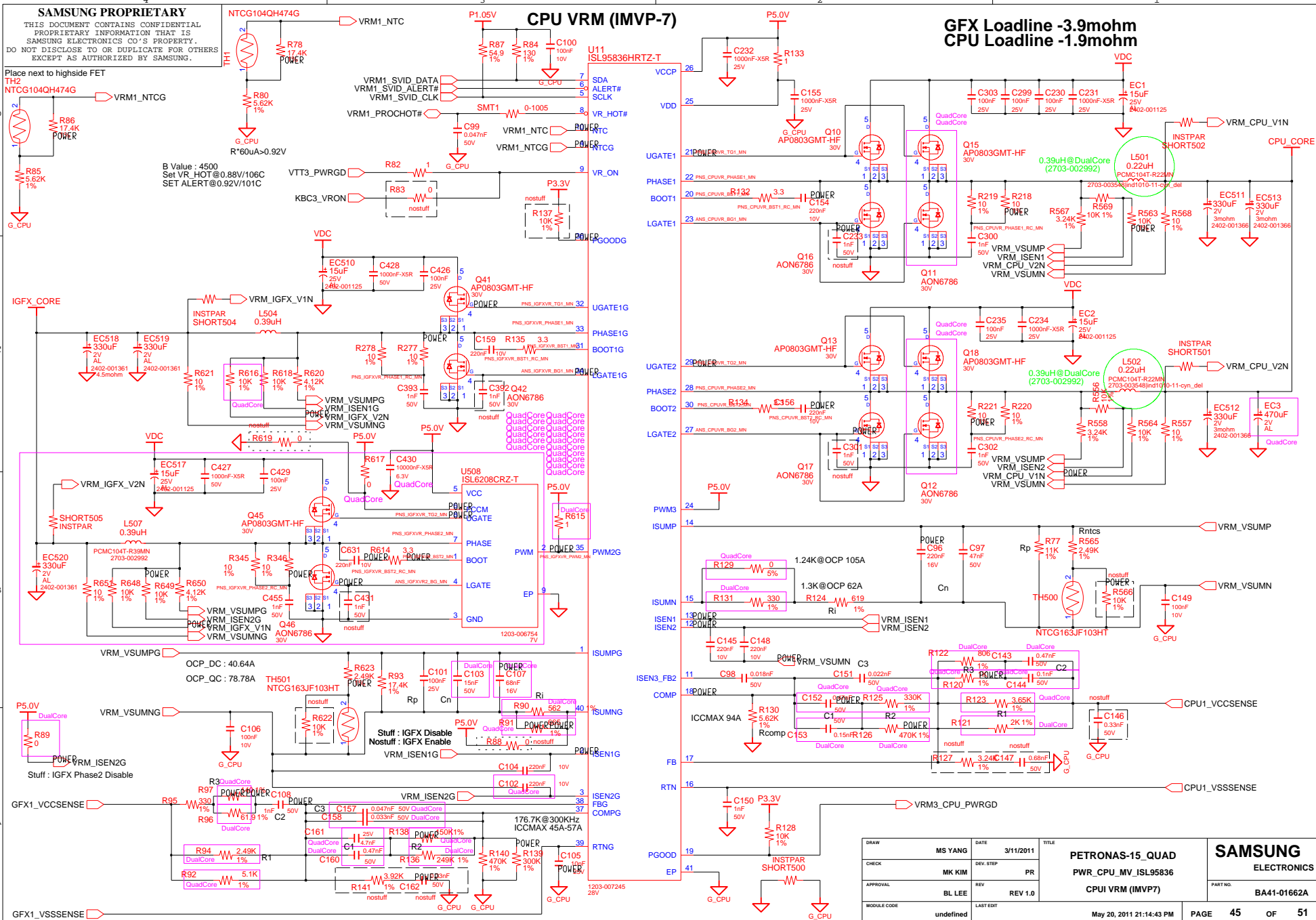


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|-------------|-----------|-----------|--------------------------|------------|------------------|-------------|
| DRAW | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | PWR_MEMORY | | ELECTRONICS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

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NTCG104QH474G VRM1 NTCG

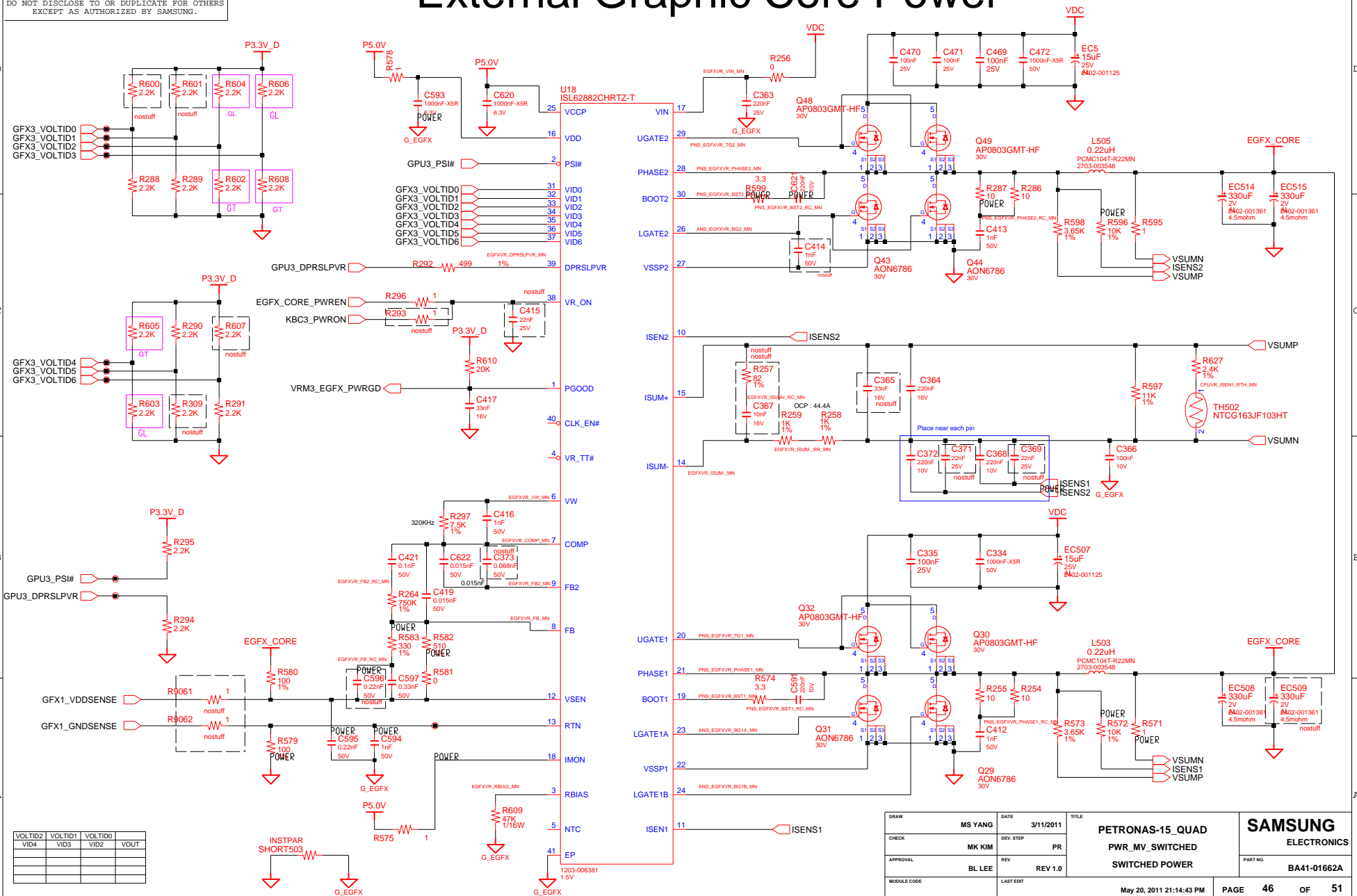
B Value : 4500
Set VR_HOT@0.88V/106C
SET ALERT@0.92V/101C



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External Graphic Core Power



| | | | | | |
|-------------|---------|-----------|-----------|--------------------------|------------------|
| DRAW | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD |
| CHECK | MK KIM | DEV. STEP | PR | PWR_MV_SWITCHED | |
| APPROVAL | BL LEE | REV | REV 1.0 | SWITCHED POWER | |
| MODULE CODE | | LAST EDIT | | | |
| | | | | May 20, 2011 21:14:43 PM | PAGE 46 OF 51 |
| | | | | SAMSUNG ELECTRONICS | |
| | | | | PART NO. BA41-01662A | |

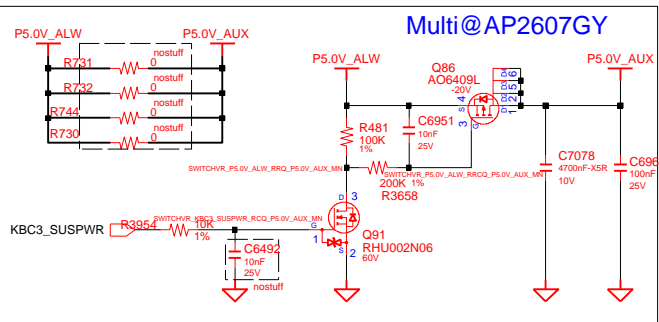
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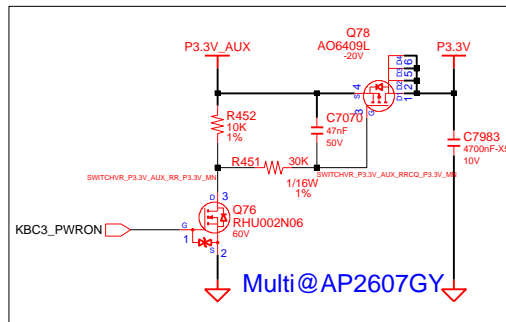
Switched Power 1

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

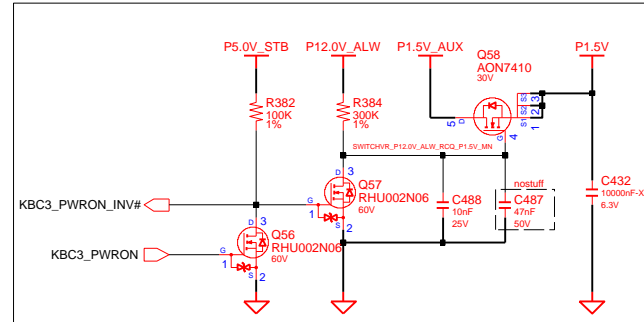
P5.0V_AUX



Switched Power On (P3.3V)



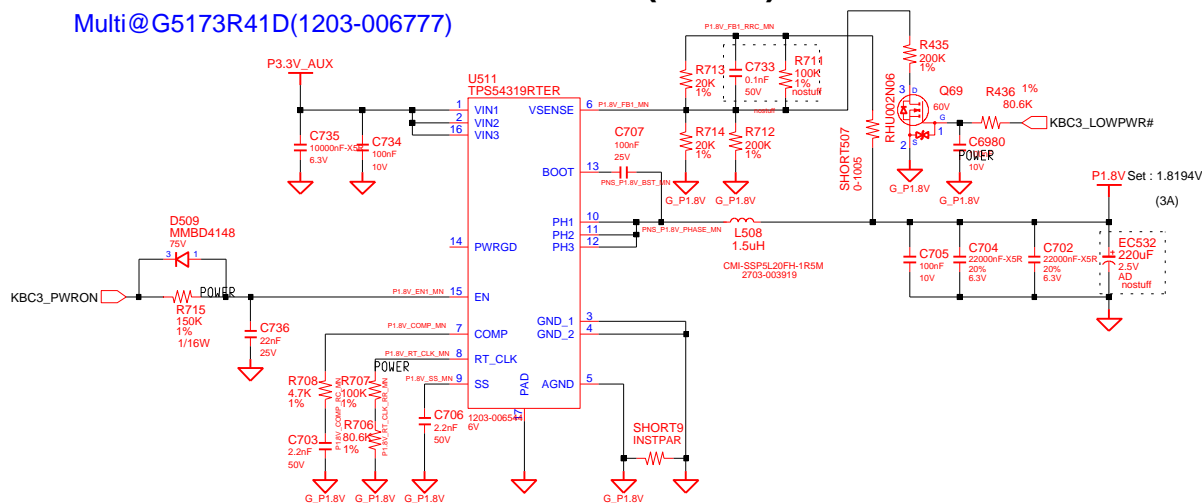
Switched Power On (P1.5V)



For nVIDIA GFX PWR Sequence
NVDD(EGFX_CORE) first and then FBVDDQ(gDDR3)

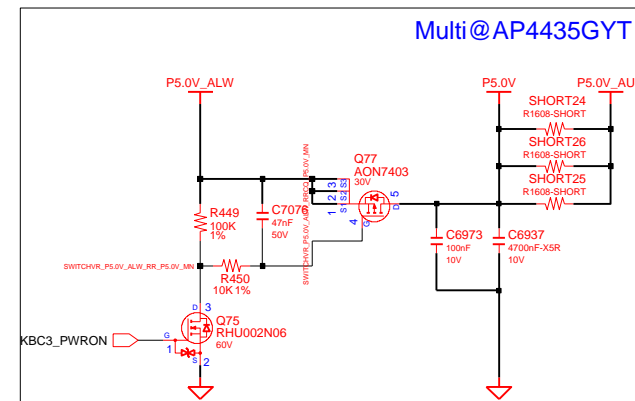
CHIPSET POWER(P1.8V)

Multi@G5173R41D(1203-006777)



Switched Power On (P5.0V)

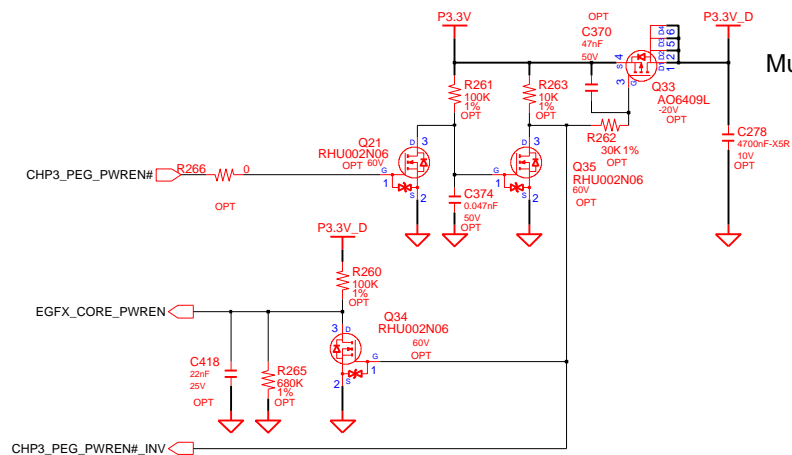
Multi@AP4435GYT



| | | | | | | |
|-------------|-----------|-----------|--------------------------|-----------------------|------------------|-------------|
| DRAW | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | PWR_MV_SWITCHED POWER | ELECTRONICS | |
| APPROVAL | BL LEE | REV | REV 1.0 | SWITCHED POWER | PART NO. | BA41-01662A |
| MODULE CODE | undefined | LAST EDIT | May 20, 2011 21:14:43 PM | PAGE | 47 | OF 51 |

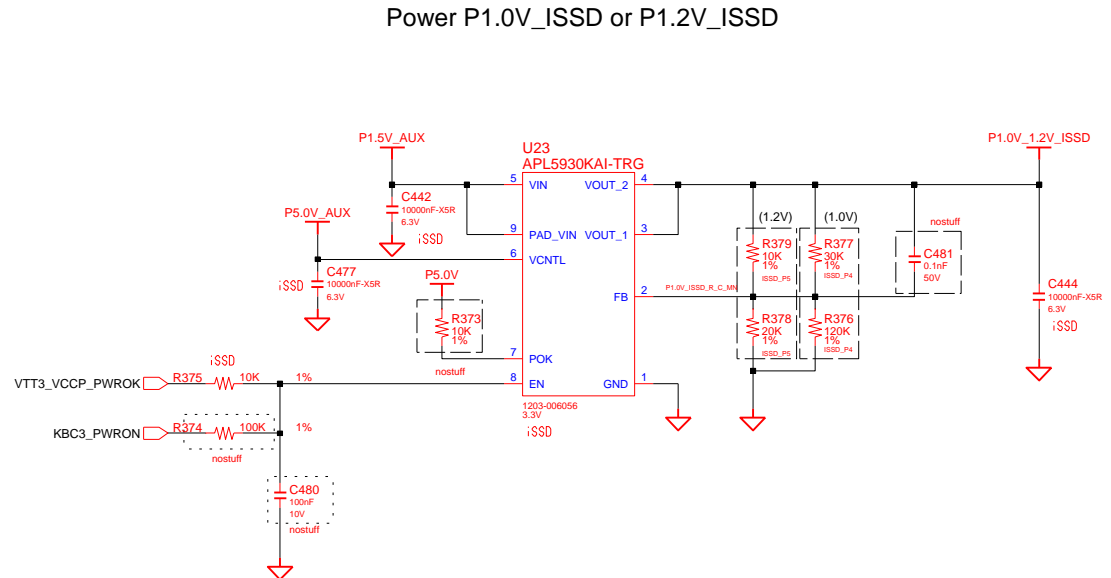
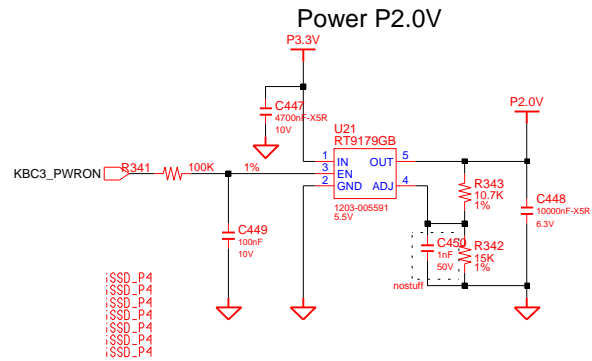
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Multi@AP2607GY

[illegible]

| | | | | | | | | |
|-------------|-----------|-----------|-----------|--------------------------|------------------|-------------|-------------|-------|
| DRAW | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | | SAMSUNG | |
| CHECK | MK KIM | DEV. STEP | PR | Switched PWR 2 | | ELECTRONICS | | |
| APPROVAL | BL LEE | REV | REV 1.0 | FOR OPTIMUS PWR | | PART NO. | BA41-01662A | |
| MODULE CODE | LAST EDIT | | | May 20, 2011 21:14:43 PM | | PAGE | 48 | OF 51 |

iSSD POWER

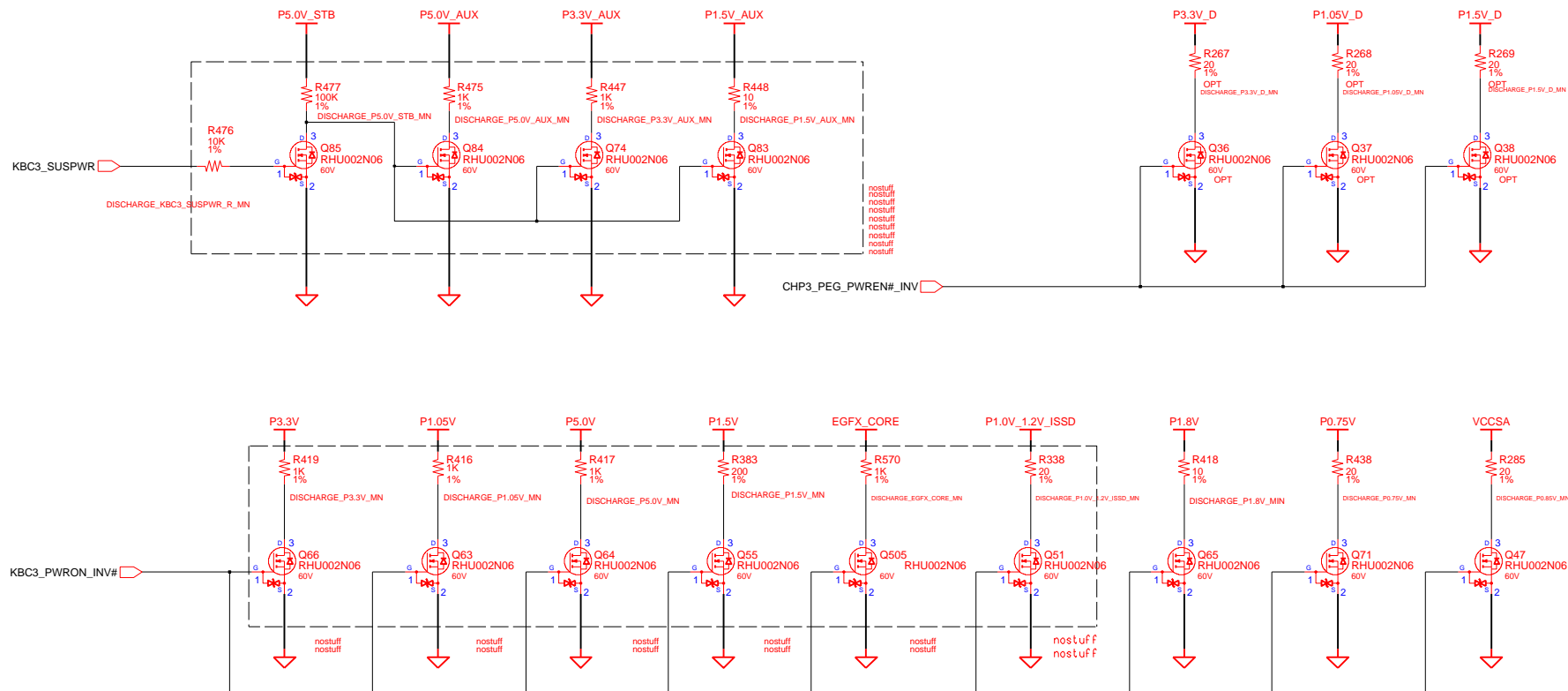


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|-------------|-----------|-----------------------------|-------|-------------|--|
| DESIGN | DATE | 8/9/2011 | TITLE | undefined | SAMSUNG ELECTRONICS PART NO. BA41-undef i |
| CHECK | DEV. STEP | UNDEFINED | | iSSD POWER | |
| APPROVAL | REV | UNDEFINED | | iSSD POWER | |
| MODULE CODE | LAST EDIT | August , 9, 2011 8:05:39 PM | PAGE | 58undefined | |

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POWER DISCHARGER



| | | | | | | |
|-------------|---------|-----------|--------------------------|------------------|------------------|-------------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG |
| CHECK | MK KIM | DEV. STEP | PR | POWER DISCHARGER | POWER DISCHARGER | ELECTRONICS |
| APPROVAL | BL LEE | REV | REV 1.0 | POWER DISCHARGER | PART NO. | BA41-01662A |
| MODULE CODE | | LAST EDIT | May 20, 2011 21:14:43 PM | PAGE | 49 | OF 51 |

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Diagram showing the connection of 16 pins to the RMNT-30-76-1P connector. The connections are as follows:

- MT17 is connected to RMNT-25-76-1P.
- MT1 is connected to RMNT-30-76-1P.
- MT7 is connected to RMNT-30-76-1P.
- MT8 is connected to RMNT-30-76-1P.
- MT18 is connected to RMNT-30-76-1P.
- MT16 is connected to RMNT-30-76-1P.
- MT10 is connected to RMNT-30-76-1P.
- MT13 is connected to RMNT-30-76-1P.

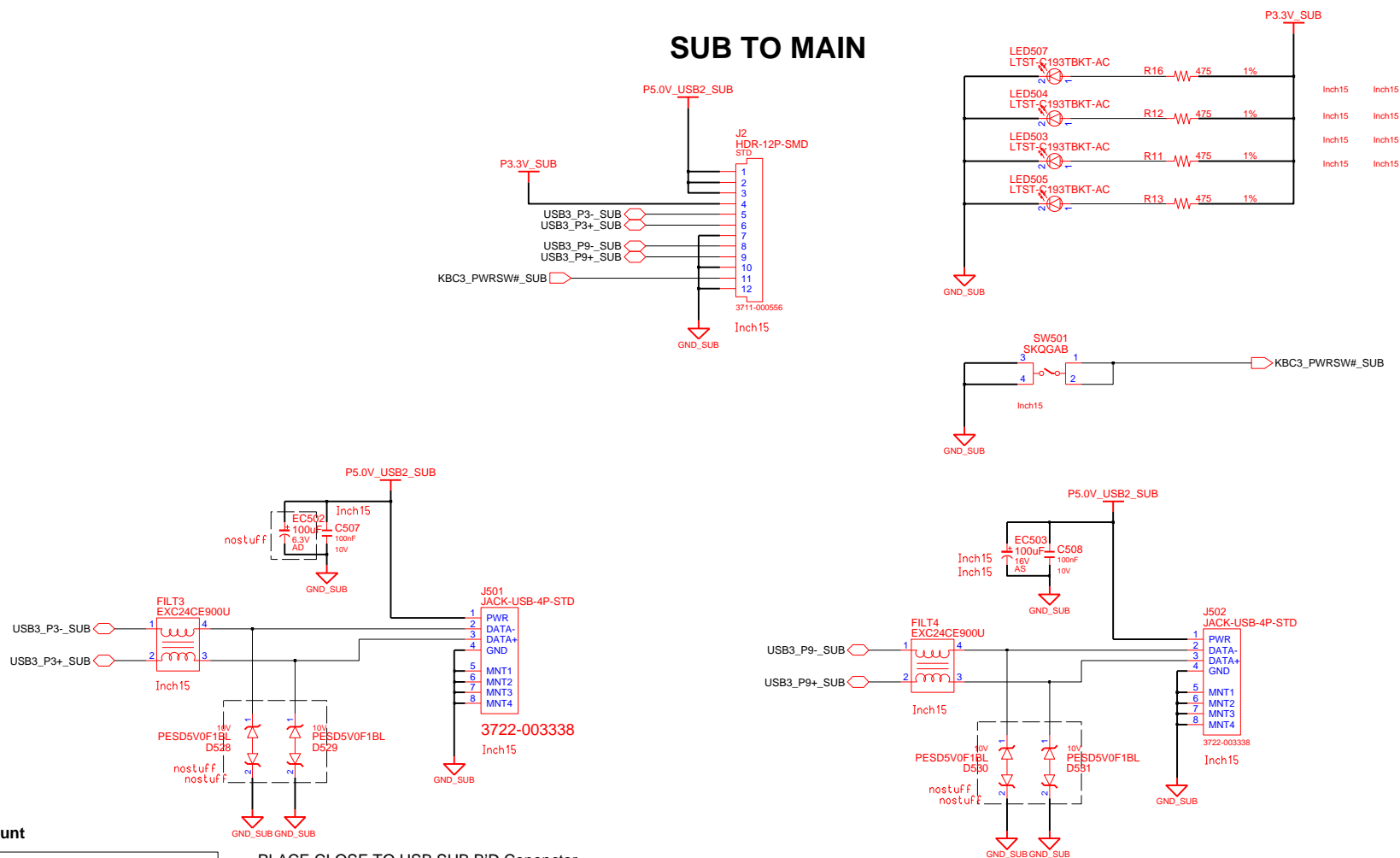
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|-------------|-----------|-----------|--------------------------|-------|------------------|-------------------------------|---------|
| DESIGN | MS YANG | DATE | 3/11/2011 | TITLE | PETRONAS-15_QUAD | SAMSUNG ELECTRONICS | |
| CHECK | MK KIM | DEV.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

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USB SUB BOARD (15")

SUB TO MAIN



PLACE CLOSE TO USB SUB B'D Conenctor

PLACE CLOSE TO USB SUB B'D Conenctor

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

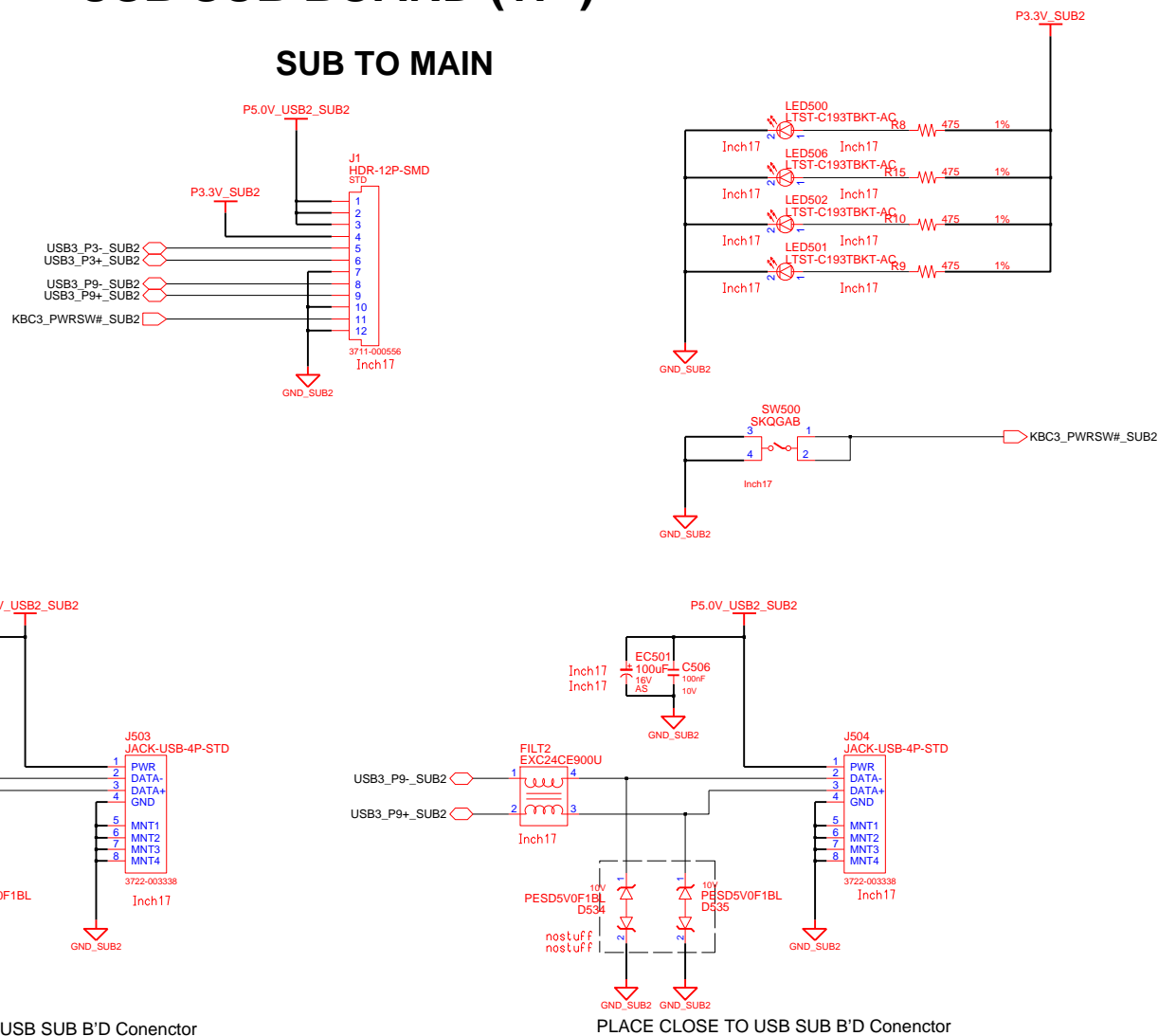
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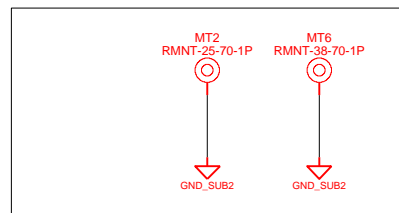
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USB SUB BOARD (17")

SUB TO MAIN



PCB Mount



PLACE CLOSE TO USB SUB B'D Conenctor

PLACE CLOSE TO USB SUB B'D Conenctor

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