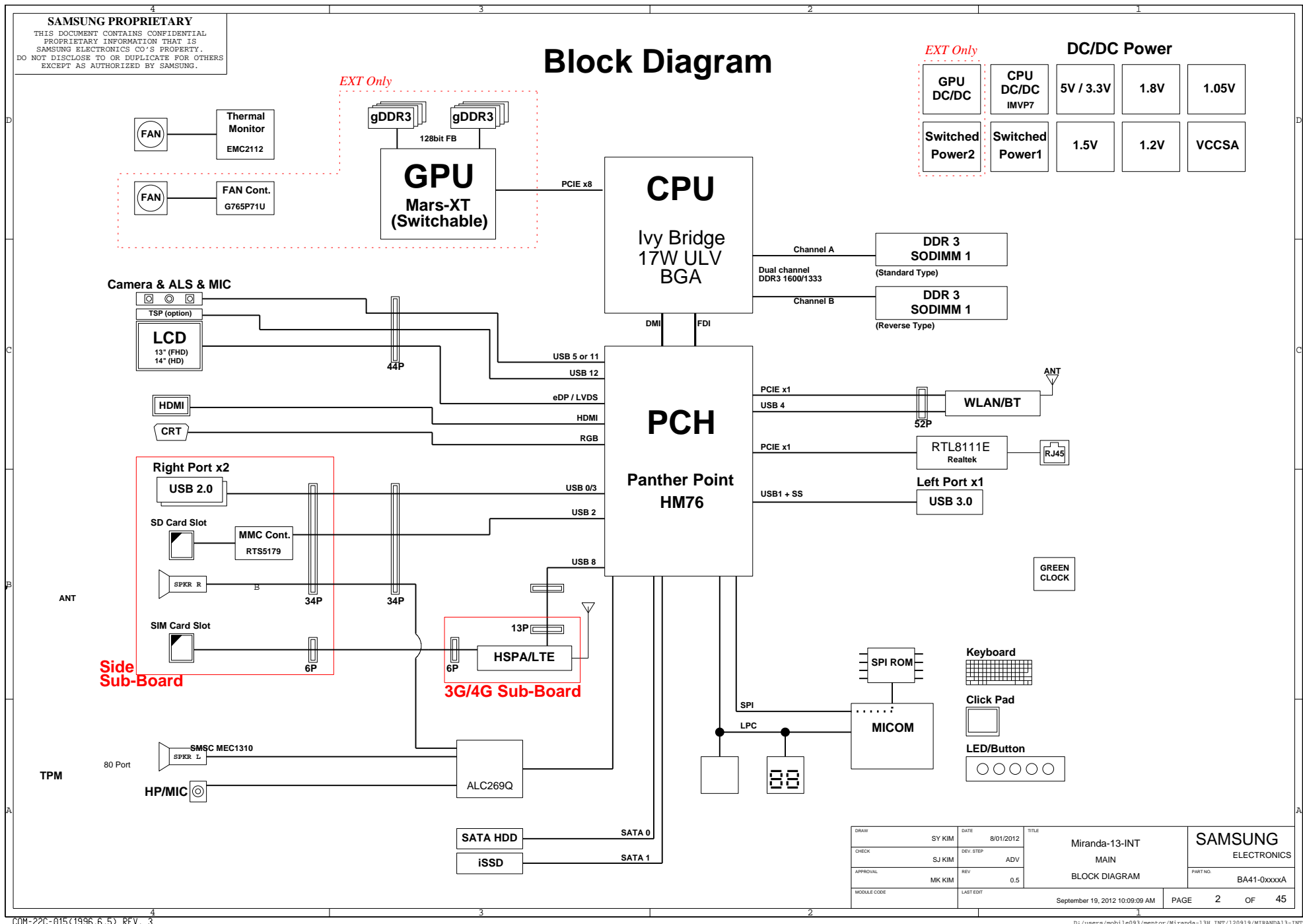


| <div>SAMSUNG PROPRIETARY<br/>THIS DOCUMENT CONTAINS CONFIDENTIAL<br/>PROPRIETARY INFORMATION THAT IS<br/>SAMSUNG ELECTRONICS CO.'S PROPERTY.<br/>DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS<br/>EXCEPT AS AUTHORIZED BY SAMSUNG.</div>   |                            |            | <div>Table of Contents</div> <table><tr><th>Page</th><th>Title</th></tr><tr><td>1.</td><td>Cover Sheet</td></tr><tr><td>2.</td><td>Block Diagram</td></tr><tr><td>3.</td><td>Power Diagram</td></tr><tr><td>4.</td><td>Power Sequence</td></tr><tr><td>5.</td><td>Clock Diagram</td></tr><tr><td>6.</td><td>Green Clock</td></tr><tr><td>7.</td><td>Thermal Sensor &amp; FAN</td></tr><tr><td>8.</td><td>CPU - Ivy Bridge ULV (1/5)</td></tr><tr><td>9.</td><td>CPU - Ivy Bridge ULV (2/5)</td></tr><tr><td>10.</td><td>CPU - Ivy Bridge ULV (3/5)</td></tr><tr><td>11.</td><td>CPU - Ivy Bridge ULV (4/5)</td></tr><tr><td>12.</td><td>CPU - Ivy Bridge ULV (5/5)</td></tr><tr><td>13.</td><td>DDR3 SO-DIMM Slot</td></tr><tr><td>14.</td><td>DDR3 SO-DIMM Slot</td></tr><tr><td>15.</td><td>Chipset - HM76 (1/5)</td></tr><tr><td>16.</td><td>Chipset - HM76 (2/5)</td></tr><tr><td>17.</td><td>Chipset - HM76 (3/5)</td></tr><tr><td>18.</td><td>Chipset - HM76 (4/5)</td></tr><tr><td>19.</td><td>Chipset - HM76 (5/5)</td></tr><tr><td>20.</td><td>Display - eDP/LVDS I/F</td></tr><tr><td>21.</td><td>Display - VGA I/F</td></tr><tr><td>22.</td><td>Display - HDMI I/F</td></tr><tr><td>23.</td><td>AUDIO - Codec ALC269Q</td></tr><tr><td>24.</td><td>AUDIO - HP &amp; MIC</td></tr><tr><td>25.</td><td>PCIe - LAN RTL8111E</td></tr><tr><td>26.</td><td>PCIe - WLAN Card Slot</td></tr><tr><td>27.</td><td>SATA - HDD</td></tr><tr><td>28.</td><td>SATA - iSSD i100</td></tr><tr><td>29.</td><td>USB - SS Charge Port</td></tr><tr><td>30.</td><td>USB - Sub I/F &amp; TSP &amp; HSPA</td></tr><tr><td>31.</td><td></td></tr><tr><td>32.</td><td>Keyboard I/F</td></tr><tr><td>33.</td><td>LED &amp; Click Pad I/F</td></tr><tr><td>34.</td><td></td></tr><tr><td>35.</td><td>Power - Charger</td></tr><tr><td>36.</td><td>Power - 5&amp;3.3V ALW/AUX</td></tr><tr><td>37.</td><td>Power - 1.05V</td></tr><tr><td>38.</td><td>Power - VCCSA &amp; 1.8V</td></tr><tr><td>39.</td><td>Power - 1.5V AUX &amp; 0.75V</td></tr><tr><td>40.</td><td>Power - CPU VRM</td></tr><tr><td>41.</td><td>Power - FET Switch</td></tr><tr><td>42.</td><td>Power - Linear Regulator</td></tr><tr><td>43.</td><td></td></tr><tr><td>44.</td><td>Power - Discharger</td></tr><tr><td>45.</td><td>PCB Stuffs &amp; Decaps</td></tr><tr><td>46.</td><td>mSATA SSD Sub Board</td></tr></table> |                                |                | Page                   | Title | 1.       | Cover Sheet | 2.  | Block Diagram | 3.         | Power Diagram      | 4.     | Power Sequence | 5.   | Clock Diagram | 6.    | Green Clock    | 7.                     | Thermal Sensor & FAN | 8.     | CPU - Ivy Bridge ULV (1/5) | 9.  | CPU - Ivy Bridge ULV (2/5) | 10.      | CPU - Ivy Bridge ULV (3/5) | 11. | CPU - Ivy Bridge ULV (4/5) | 12.   | CPU - Ivy Bridge ULV (5/5) | 13.       | DDR3 SO-DIMM Slot | 14. | DDR3 SO-DIMM Slot              | 15.          | Chipset - HM76 (1/5) | 16. | Chipset - HM76 (2/5) | 17. | Chipset - HM76 (3/5) | 18. | Chipset - HM76 (4/5) | 19. | Chipset - HM76 (5/5) | 20. | Display - eDP/LVDS I/F | 21. | Display - VGA I/F | 22. | Display - HDMI I/F | 23. | AUDIO - Codec ALC269Q | 24. | AUDIO - HP & MIC | 25. | PCIe - LAN RTL8111E | 26. | PCIe - WLAN Card Slot | 27. | SATA - HDD | 28. | SATA - iSSD i100 | 29. | USB - SS Charge Port | 30. | USB - Sub I/F & TSP & HSPA | 31. |  | 32. | Keyboard I/F | 33. | LED & Click Pad I/F | 34. |  | 35. | Power - Charger | 36. | Power - 5&3.3V ALW/AUX | 37. | Power - 1.05V | 38. | Power - VCCSA & 1.8V | 39. | Power - 1.5V AUX & 0.75V | 40. | Power - CPU VRM | 41. | Power - FET Switch | 42. | Power - Linear Regulator | 43. |  | 44. | Power - Discharger | 45. | PCB Stuffs & Decaps | 46. | mSATA SSD Sub Board |
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| 10.  | CPU - Ivy Bridge ULV (3/5) |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 11.  | CPU - Ivy Bridge ULV (4/5) |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 12.  | CPU - Ivy Bridge ULV (5/5) |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 13.  | DDR3 SO-DIMM Slot          |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 14.  | DDR3 SO-DIMM Slot          |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 15.  | Chipset - HM76 (1/5)       |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
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| 17.  | Chipset - HM76 (3/5)       |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 18.  | Chipset - HM76 (4/5)       |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
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| 24.  | AUDIO - HP & MIC           |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 25.  | PCIe - LAN RTL8111E        |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 26.  | PCIe - WLAN Card Slot      |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 27.  | SATA - HDD                 |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 28.  | SATA - iSSD i100           |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 29.  | USB - SS Charge Port       |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 30.  | USB - Sub I/F & TSP & HSPA |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 31.  |                            |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 32.  | Keyboard I/F               |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 33.  | LED & Click Pad I/F        |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 34.  |                            |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 35.  | Power - Charger            |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 36.  | Power - 5&3.3V ALW/AUX     |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 37.  | Power - 1.05V              |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 38.  | Power - VCCSA & 1.8V       |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 39.  | Power - 1.5V AUX & 0.75V   |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 40.  | Power - CPU VRM            |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 41.  | Power - FET Switch         |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 42.  | Power - Linear Regulator   |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 43.  |                            |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 44.  | Power - Discharger         |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 45.  | PCB Stuffs & Decaps        |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| 46.  | mSATA SSD Sub Board        |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| <div>Miranda-13H,14M-INT</div> <div>CPU : Ivy Bridge ULV<br/>Chip Set : Intel Panther Point<br/>GFX : Internal GFX<br/>Remarks : Chief River Platform</div> <div><div>Model Name : Miranda-13H,14M-INT<br/>PBA Name : MAIN<br/>PCB Code : BA41-02234A<br/>(GCE, HANNSTAR, PIOTEK)<br/><br/>Dev. Step : MP<br/>Revision : 1.0<br/>T.R. Date : 2012.12.06</div></div> <div><table><tr><td>Design</td><td>Check</td><td>Approval</td></tr><tr><td>LPC</td><td>TPM</td><td></td></tr><tr><td>SY KIM</td><td>SJ KIM</td><td>MK KIM</td></tr></table><div>Owner : SEC Mobile R &amp; D      Signature :      X</div></div>   |                            |            |  |                                |                | Design                 | Check | Approval | LPC         | TPM |               | SY KIM     | SJ KIM             | MK KIM |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| Design   | Check                      | Approval   |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| LPC  | TPM                        |            |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| SY KIM   | SJ KIM                     | MK KIM     |  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| <div>Revision History</div> <table><tr><th>Step</th><th>Rev</th><th>Date</th><th>Description</th></tr><tr><td>ADV</td><td>1.0</td><td>2012.09.04</td><td>ADV1 First Release</td></tr></table> <div><table><tr><td>DRAW</td><td>SY KIM</td><td>DATE</td><td>8/01/2012</td><td>TITLE</td><td>Miranda-13-INT</td><td rowspan="4">SAMSUNG<br/>ELECTRONICS</td></tr><tr><td>CHECK</td><td>SJ KIM</td><td>DEV. STEP</td><td>ADV</td><td>MAIN</td></tr><tr><td>APPROVAL</td><td>MK KIM</td><td>REV</td><td>0.5</td><td>COVER</td></tr><tr><td>MODULE CODE</td><td colspan="3">LAST EDIT</td><td>September 19, 2012 10:09:09 AM</td><td>PAGE 1 OF 45</td></tr></table></div> |                            |            |  |                                |                | Step                   | Rev   | Date     | Description | ADV | 1.0           | 2012.09.04 | ADV1 First Release | DRAW   | SY KIM         | DATE | 8/01/2012     | TITLE | Miranda-13-INT | SAMSUNG<br>ELECTRONICS | CHECK                | SJ KIM | DEV. STEP                  | ADV | MAIN                       | APPROVAL | MK KIM                     | REV | 0.5                        | COVER | MODULE CODE                | LAST EDIT |                   |     | September 19, 2012 10:09:09 AM | PAGE 1 OF 45 |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| Step   | Rev                        | Date       | Description  |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| ADV  | 1.0                        | 2012.09.04 | ADV1 First Release   |                                |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| DRAW   | SY KIM                     | DATE       | 8/01/2012  | TITLE                          | Miranda-13-INT | SAMSUNG<br>ELECTRONICS |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| CHECK  | SJ KIM                     | DEV. STEP  | ADV  | MAIN                           |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| APPROVAL   | MK KIM                     | REV        | 0.5  | COVER                          |                |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |
| MODULE CODE  | LAST EDIT                  |            |  | September 19, 2012 10:09:09 AM | PAGE 1 OF 45   |                        |       |          |             |     |               |            |                    |        |                |      |               |       |                |                        |                      |        |                            |     |                            |          |                            |     |                            |       |                            |           |                   |     |                                |              |                      |     |                      |     |                      |     |                      |     |                      |     |                        |     |                   |     |                    |     |                       |     |                  |     |                     |     |                       |     |            |     |                  |     |                      |     |                            |     |  |     |              |     |                     |     |  |     |                 |     |                        |     |               |     |                      |     |                          |     |                 |     |                    |     |                          |     |  |     |                    |     |                     |     |                     |



## SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

| Voltage Rails  |  | Active in      |
|--|--|----------------|
| VDC<br>P3.3V_MICOM<br>P5.0V_ALW<br>P5.0V_STB         | Primary DC system power supply (7 to 21V)<br>3.3V always power rail (for Micom)<br>5.0V always power rail<br>5.0V always power rail  | <b>S4 - S5</b> |
| P5.0V_AUX<br>P3.3V_AUX<br>P1.5V_AUX                  | 5.0V switched on power rail (off in S4-S5)<br>3.3V switched on power rail (off in S4-S5)<br>1.5V power rail for DDR3 (off in S4-S5)  | <b>S3</b>      |
| P5.0V<br>P3.3V<br>P1.8V<br>P1.5V<br>P0.75V<br>P0.85V | 5.0V switched power rail (off in S3-S5)<br>3.3V switched power rail (off in S3-S5)<br>1.8V switched power rail (off in S3-S5)<br>1.5V switched power rail (off in S3-S5)<br>0.75V power rail for DDR3 (off in S3-S5)<br>0.85V switched power rail (off in S3-S5) | <b>S0</b>      |
| VCC_CORE<br>EGFX_CORE<br>P1.05V (VCCP)               | Core Voltage for CPU<br>Core Voltage for GPU<br>VCC for COUGARPOINT  | <b>S0</b>      |

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

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

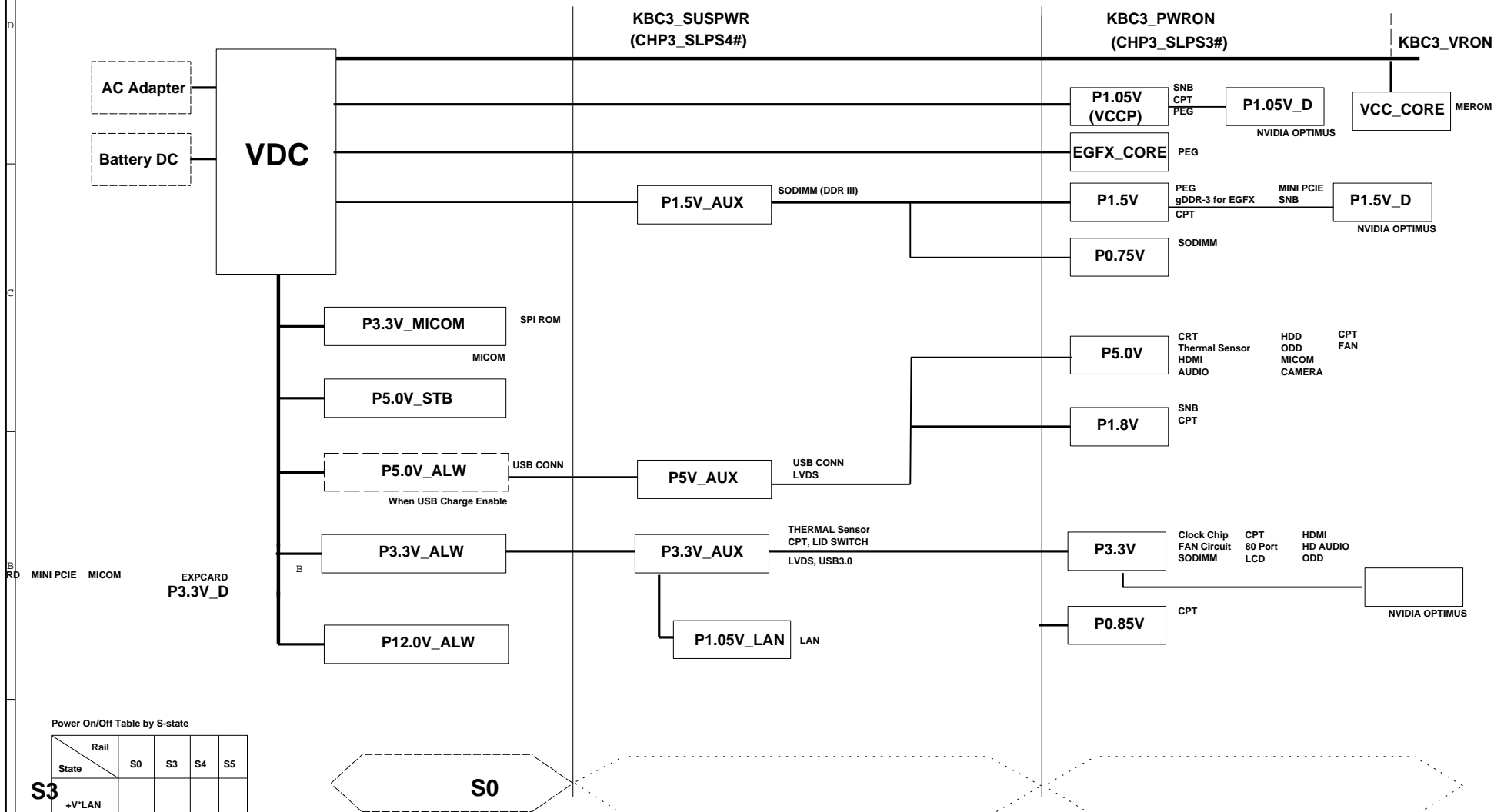
| Crystal / Oscillator |           |              |                 |
|----------------------|-----------|--------------|-----------------|
| TYPE                 | FREQUENCY | DEVICE       | USAGE           |
| Crystal              | 32.768KHz | COUGAR POINT | Real Time Clock |
| Crystal           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

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

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

|             |        |           |           |                                |                                      |                        |
|-------------|--------|-----------|-----------|--------------------------------|--------------------------------------|------------------------|
| DRAW        | SY KIM | DATE      | 8/01/2012 | TITLE                          | Miranda-13-INT<br>MAIN<br>BOARD INFO | SAMSUNG<br>ELECTRONICS |
| CHECK       | SJ KIM | DEV. STEP | ADV       |                                |                                      |                        |
| APPROVAL    | MK KIM | REV       | 0.5       |                                |                                      |                        |
| MODULE CODE |        | LAST EDIT |           | September 19, 2012 10:09:09 AM |                                      | PAGE 3 OF 45           |

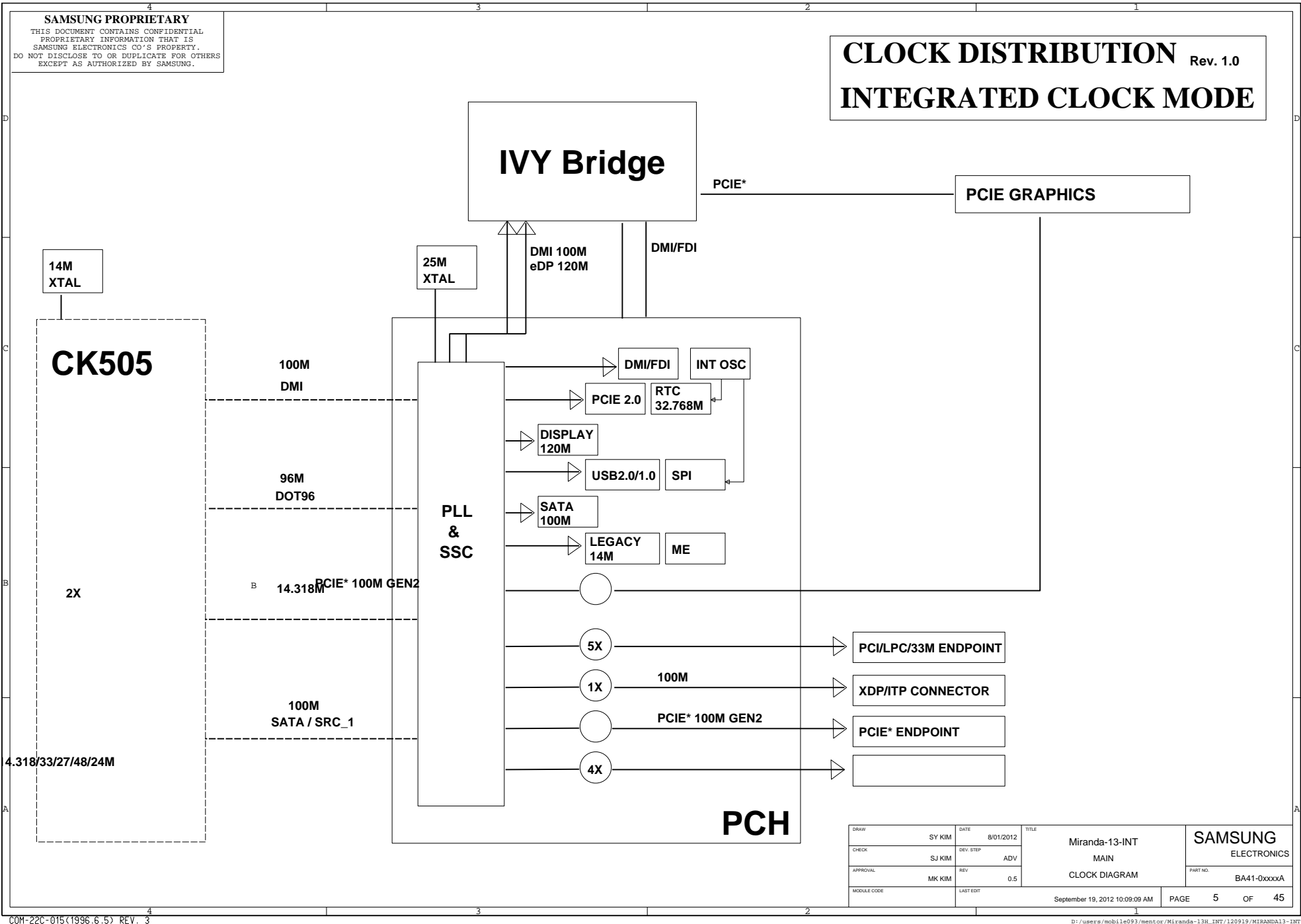
## Rev 0.7



### Power On/Off Table by S-state

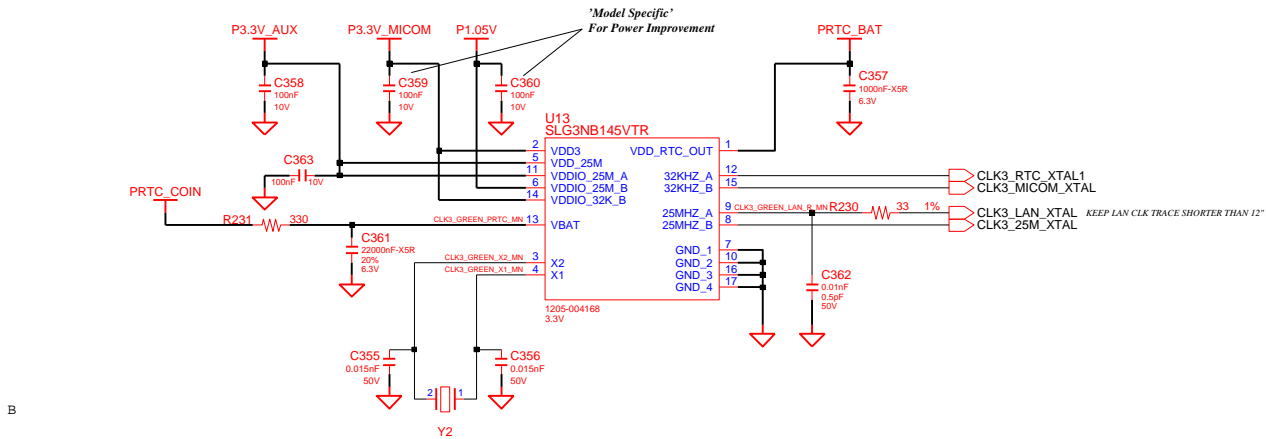
| Rail<br>State \    | \$0 | \$3 | \$4 | \$5 |
|--------------------|-----|-----|-----|-----|
| +V*LAN             |     |     |     |     |
| +1.8V_AUX<br>+0.9V | ON  | ON  | —   | —   |
| +V*AUX             | ON  | ON  | —   | —   |
| +V                 | ON  | —   | —   | —   |
| +V* (CORE)         | ON  | —   | —   | —   |

|             |           |           |           |   |   |             |         |
|-------------|-----------|-----------|-----------|---|---|-------------|---------|
| DRAW        | SY KIM    | DATE      | 8/01/2012 | <div style="text-align: center;"> <b>Miranda-13-INT</b><br/> <b>MAIN</b><br/> <b>POWER DIAGRAM</b> </div> | <div style="text-align: center;"> <b>SAMSUNG</b><br/> <b>ELECTRONICS</b> </div> |             |         |
| CHECK       | SJ KIM    | DEV. STEP | ADV       |   |   |             |         |
| APPROVAL    | MK KIM    | REV       | 0.5       |   | PART NO.  | BA41-0xxxxA |         |
| MODULE CODE | LAST EDIT |           |           |   | September 19, 2012 10:09:09 AM  | PAGE        | 4 OF 45 |



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# CLOCK DISTRIBUTOR

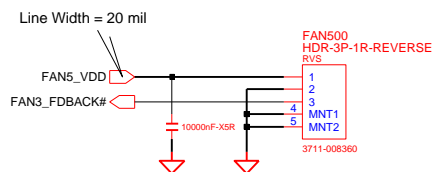
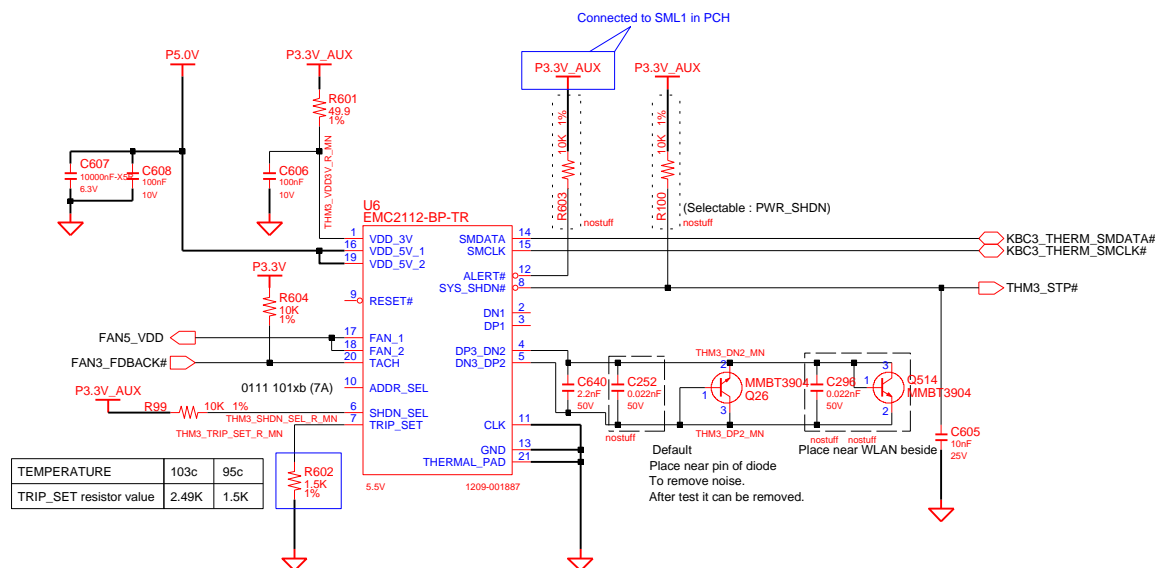


|             |        |           |                                |       |   |                         |
|-------------|--------|-----------|--------------------------------|-------|---|-------------------------|
| DESIGN      | SY KIM | DATE      | 8/01/2012                      | TITLE | Miranda-13-INT<br>CLOCK<br>CLOCK DISTRIBUTION | SAMSUNG<br>ELECTRONICS  |
| CHECK       | SJ KIM | DEV. STEP | ADV                            |       |   | PART NO.<br>BA41-0xxxxA |
| APPROVAL    | MK KIM | REV       | 0.5                            |       |   |                         |
| MODULE CODE |        | LAST EDIT | September 19, 2012 10:09:09 AM | PAGE  | 6   | OF 45                   |

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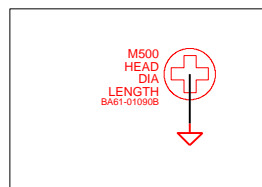
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## THERMAL SENSOR & FAN CONTROL



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

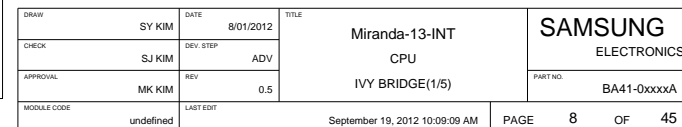
| SHDNSEL MODE |                    |
|--------------|--------------------|
| 0            | INTEL TR MODE      |
| HIGH Z       | AMD CPU/DIODE MODE |
| ✓ 1          | EXT.DIODE 2 MODE   |



|             |        |           |           |                                |                        |                         |
|-------------|--------|-----------|-----------|--------------------------------|------------------------|-------------------------|
| DESIGN      | SY KIM | DATE      | 8/01/2012 | TITLE                          | Miranda-13-INT         | SAMSUNG<br>ELECTRONICS  |
| CHECK       | SJ KIM | DEV. STEP | ADV       |                                | THERMAL SENSOR         |                         |
| APPROVAL    | MK KIM | REV       | 0.5       |                                | THERMAL SENSOR EMC2112 | PART NO.<br>BA41-0xxxxA |
| MODULE CODE |        | LAST EDIT |           | September 19, 2012 10:09:09 AM | PAGE                   | 7 OF 45                 |

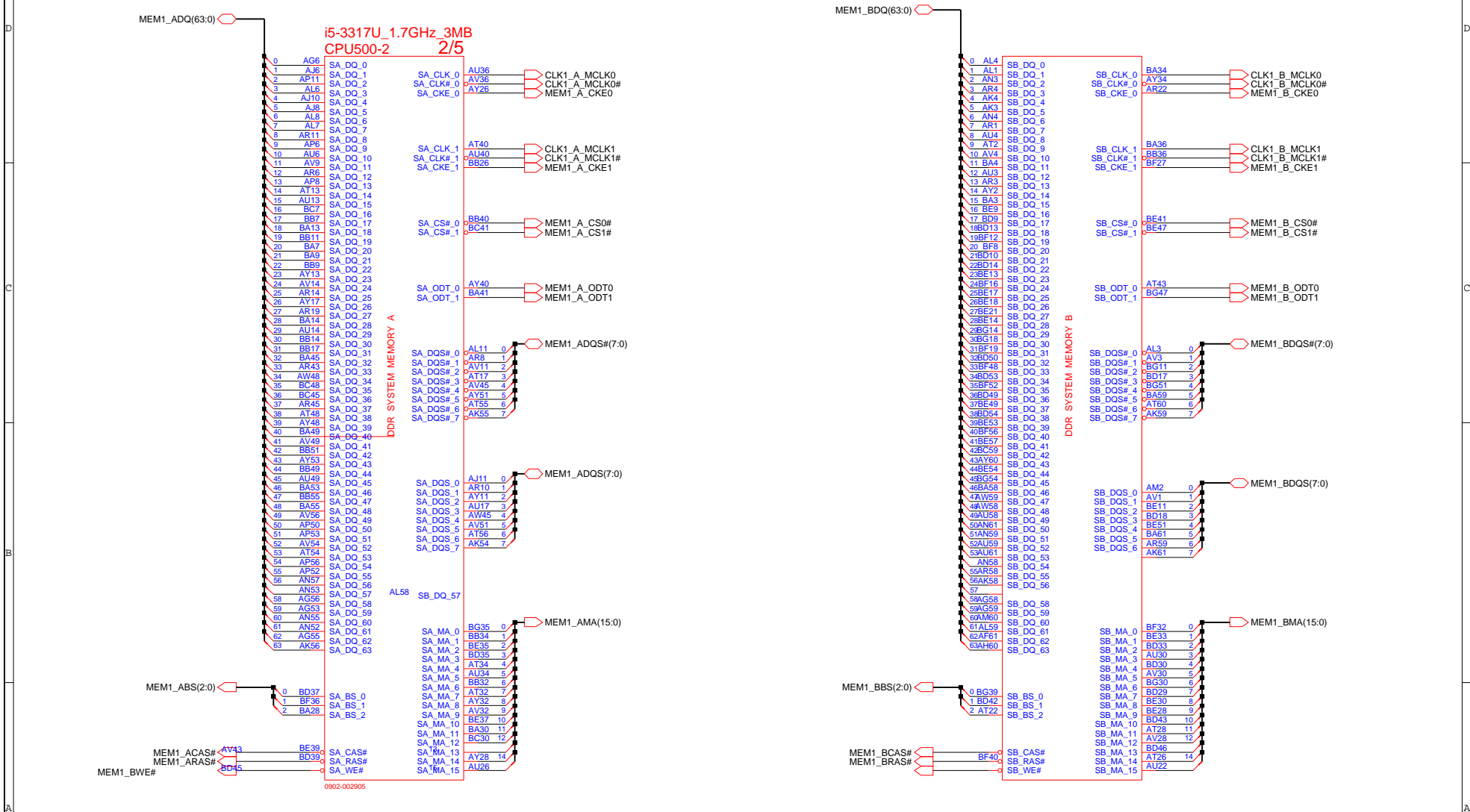
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i5-3317U\_1.7GHz\_3MB  
CPU500-1 1/5



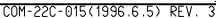


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|             |           |           |                                |                 |                |             |
|-------------|-----------|-----------|--------------------------------|-----------------|----------------|-------------|
| DRAW        | SY KIM    | DATE      | 8/01/2012                      | TITLE           | Miranda-13-INT | SAMSUNG     |
| CHECK       | SJ KIM    | DEV. STEP | ADV                            | CPU             | ELECTRONICS    |             |
| APPROVAL    | MK KIM    | REV       | 0.5                            | IVY BRIDGE(2/5) | PART NO.       | BA41-0xxxxA |
| MODULE CODE | undefined | LAST EDIT | September 19, 2012 10:09:09 AM | PAGE            | 9              | OF 45       |

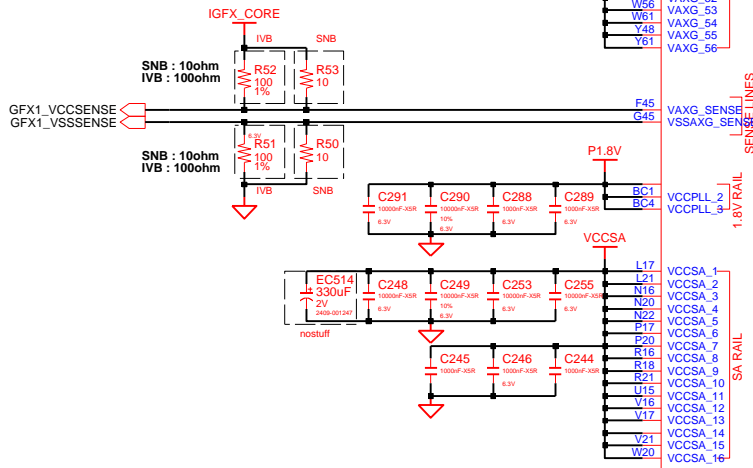
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ULV Volterra solution  
IGFX\_CORE  
22uF - 23EA  
1uF - 12EA

IGFX\_CORE  
i5-3317U\_1.7GHz\_3MB  
CPU500-4  
4/5



POWER

SIGNAL LINES

QUIET RAILS

SENSE LINES

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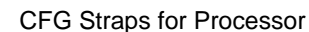
VCCSA\_VID\_1

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| PCI Express Static Lane Reversal |   |
|----------------------------------|---|
| CFG2                             | 1 : Normal operation<br>0 : Lane Reversed |

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

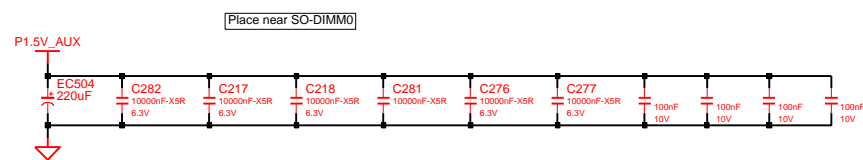
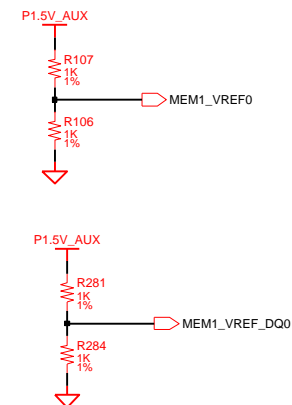
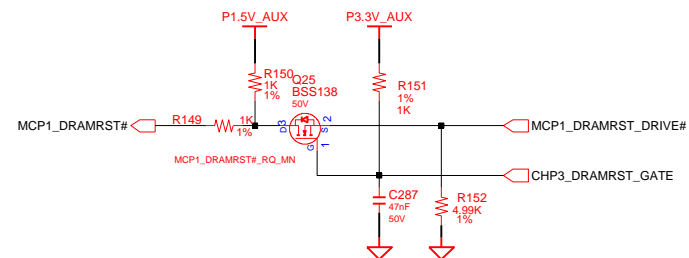
|                    |   |
|--------------------|---|
| PEG DEFER TRAINING |   |
| CFG7               | 1 : (DEFAULT) PEG TRAIN IMMEDIATELY FOLLOWING XXRESETB DEASEERTION<br>0 : PCIE 2.0 PEG WAIT FOR BIOS FOR TRAINING |

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

|             |           |           |           |  |                                |               |
|-------------|-----------|-----------|-----------|--|--------------------------------|---------------|
| DESIGN      | SY KIM    | DATE      | 8/01/2012 | Miranda-13-INT<br>CPU<br>IVY BRIDGE(5/5) | <b>SAMSUNG</b><br>ELECTRONICS  |               |
| CHECK       | SJ KIM    | DEV. STEP | ADV       |  |                                |               |
| APPROVAL    | MK KIM    | REV       | 0.5       |  | PART NO.                       | BA41-0xxxxA   |
| MODULE CODE | LAST EDIT |           |           |  | September 19, 2012 10:09:09 AM | PAGE 12 OF 45 |

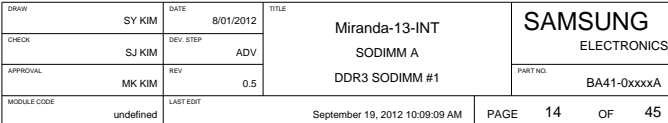
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## STANDARD

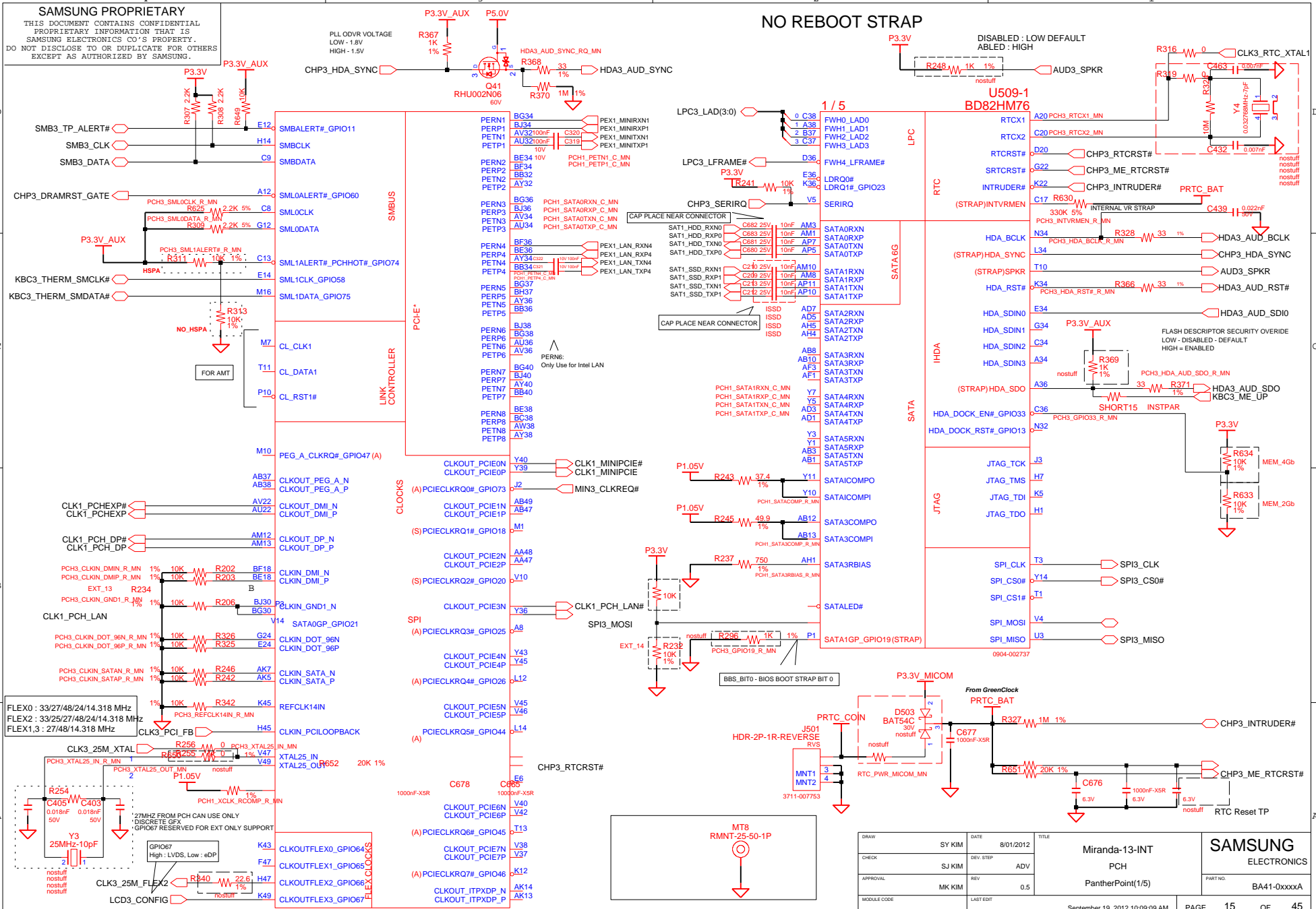


|             |        |           |           |                                    |                        |
|-------------|--------|-----------|-----------|------------------------------------|------------------------|
| DRAW        | SY KIM | DATE      | 8/01/2012 | Miranda-13-INT<br>SODIMM A<br>DDR3 | SAMSUNG<br>ELECTRONICS |
| CHECK       | SJ KIM | DEV. STEP | ADV       |                                    |                        |
| APPROVAL    | MK KIM | REV       | 0.5       |                                    |                        |
| PART NO.    |        |           |           |                                    |                        |
| MODULE CODE |        | LAST EDIT |           | September 19, 2012 10:09:09 AM     | PAGE 13 OF 45          |

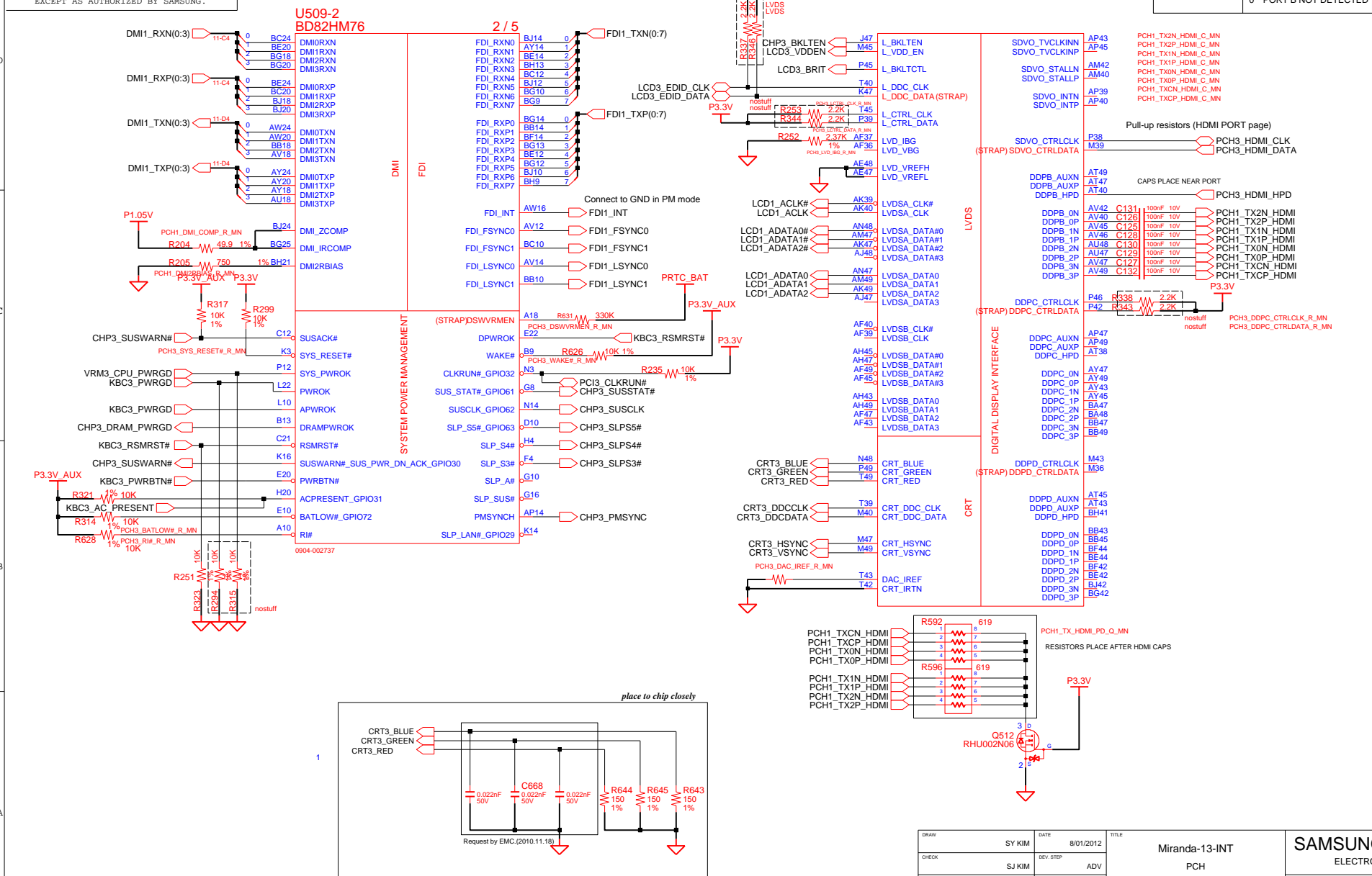
## DDR3 SO-DIMM #1



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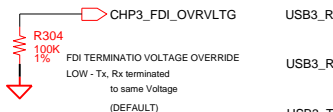
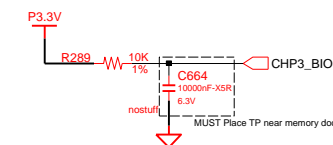
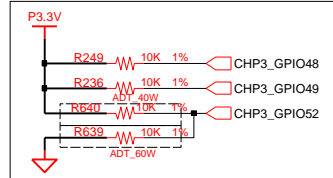


|             |        |           |           |   |                             |                                |
|-------------|--------|-----------|-----------|---|-----------------------------|--------------------------------|
| DRAWN       | SY KIM | DATE      | 8/01/2012 | TITLE<br><br>Miranda-13-INT<br>PCH<br>PantherPoint(2/5) | SAMSUNG<br>ELECTRONICS      |                                |
| CHECK       | SJ KIM | DEV. STEP | ADV       |   | PART NO.<br><br>BA41-0xxxxA |                                |
| APPROVAL    | MK KIM | REV       | 0.5       |   |                             |                                |
| MODULE CODE |        | LAST EDIT |           |   |                             | September 19, 2012 10:09:09 AM |

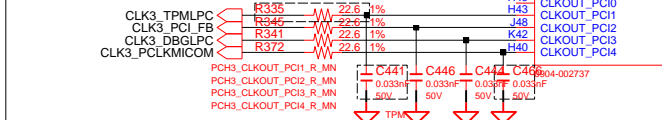
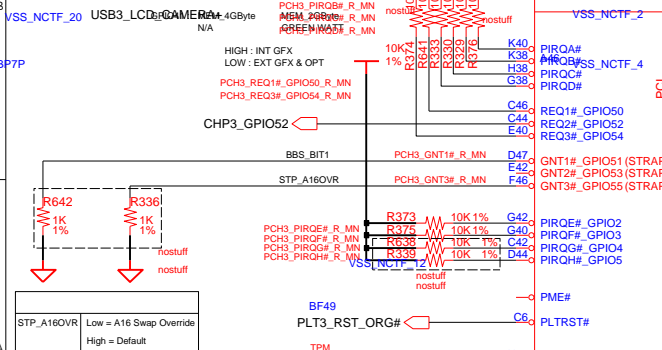


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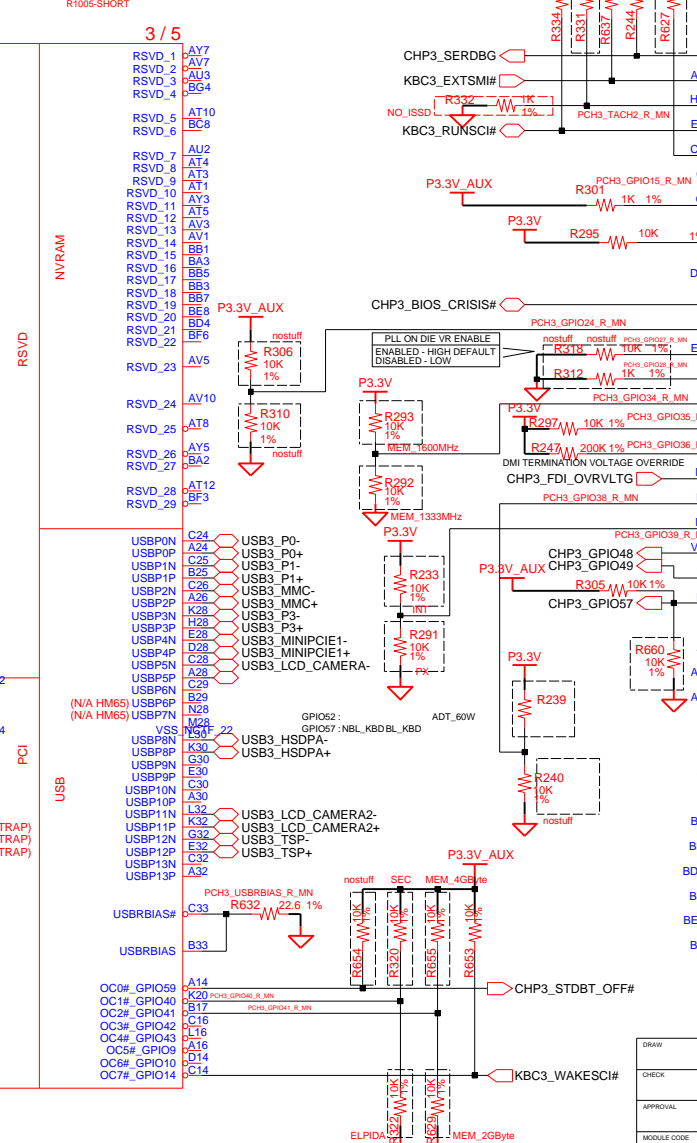
## GREEN WATT



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



U509-3  
BD82HM76

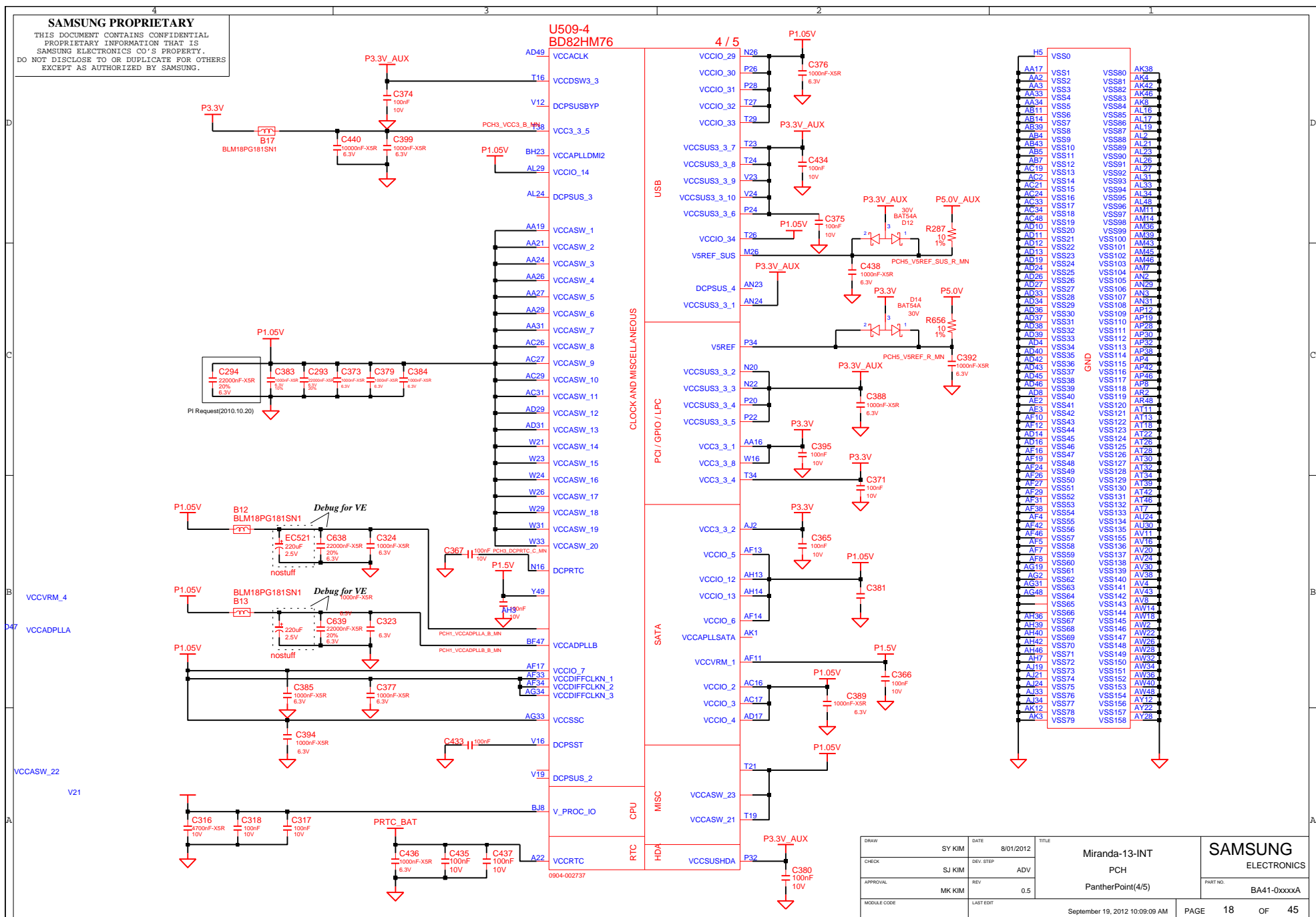


| RF OFF Connection Case  |                           |
|---|---------------------------|
| Intel Crane peak Combo<br>BT HW ID: USBVID_8086&PID_0189                    | Case 1                    |
| Intel Rainbow peak Combo<br>BT HW ID: USBVID_8086&PID_0189                  | Standard Mini-card #51    |
| Broadcom 92070 stand alone Module<br>BT HW ID: USBVID_0A5C&PID_219B         | Case 2                    |
| New Combo Card<br>Broadcom 4313 1x1 Combo<br>BT HW ID: USBVID_0A5C&PID_219C | Non-Standard Mini-card #5 |
| Broadcom 43225 2x2 Combo<br>BT HW ID: USBVID_0A5C&PID_219A                  |                           |

|                      | HIGH | LOW         |
|----------------------|------|-------------|
| GPI06 : ISSD         |      | NO ISSD     |
| GPI021 : 13 EXT      |      | 14 EXT      |
| GPI024 : Reserved    |      | Reserved    |
| GPI033 : MEM_4Gb     |      | MEM_2Gb     |
| GPI034 : MEM_1600MHz |      | MEM_1333MHz |
| GPI038 : Reserved    |      | Reserved    |
| GPI039 : INT         |      | OPT         |
| GPI040 : SEC         |      | ELPIDA      |
| GPI048 :             |      |             |
| GPI049 : ADT_40W 60W |      | ADT_90W     |
| GPI067 : LVDS        |      | eDP         |
| GPI074 : HSPA        |      | NO HSPA     |

|             |        |           |           |                                |                |                        |
|-------------|--------|-----------|-----------|--------------------------------|----------------|------------------------|
| DRAW        | SY KIM | DATE      | 8/01/2012 | TITLE                          | Miranda-13-INT | SAMSUNG<br>ELECTRONICS |
| CHECK       | SJ KIM | DEV STEP  | ADV       | PCH                            |                |                        |
| APPROVAL    | MK KIM | REV       | 0.5       | PantherPoint(3/5)              |                | PART NO.               |
| MODULE CODE |        | LAST EDIT |           | September 19, 2012 10:09:09 AM | PAGE           | 17 OF 45               |

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U509-5  
 BD82HM76

This power share with thermal sensor

5 / 5

P1.05V

VCCIO\_27

VCCDMI\_2

6.3V

PI Request (2010.10.20)

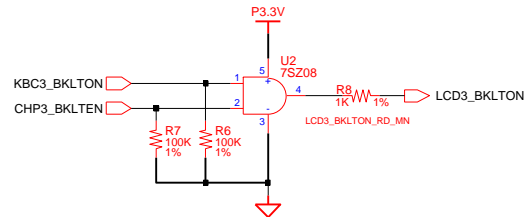
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|-------------|--------|-----------|-----------|--------------------------------|-------------------|------------------------|
| DRAW        | SY KIM | DATE      | 8/01/2012 | TITLE                          | Miranda-13-INT    | SAMSUNG<br>ELECTRONICS |
| CHECK       | SJ KIM | DEV. STEP | ADV       |                                | PCH               |                        |
| APPROVAL    | MK KIM | REV       | 0.5       |                                | PantherPoint(5/5) |                        |
| MODULE CODE |        | LAST EDIT |           | September 19, 2012 10:09:09 AM | PAGE              | 19 OF 45               |

# eDP/LVDS LOGIC

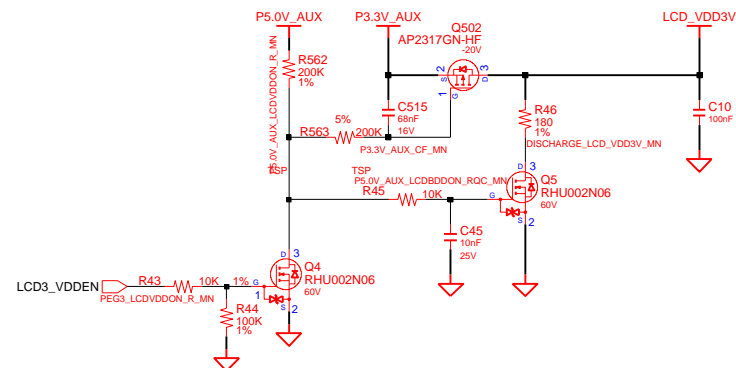
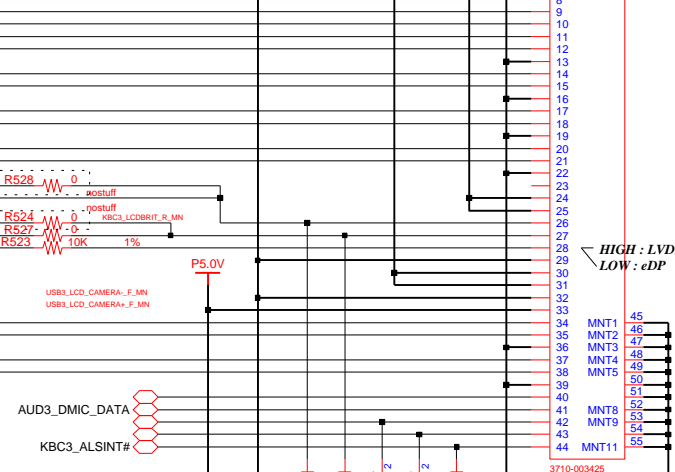
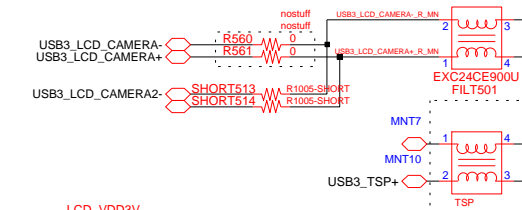
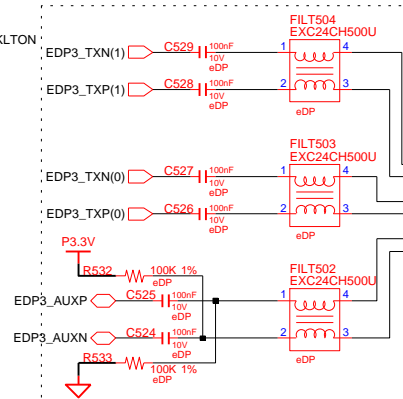
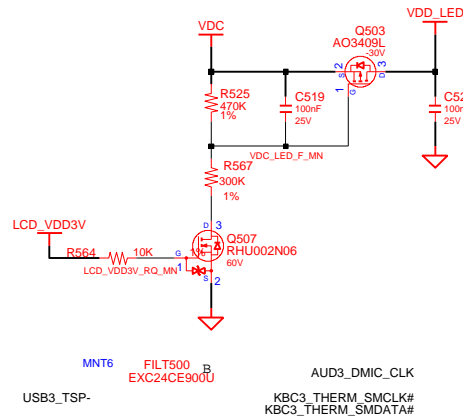
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## Backlight On



## LED Power

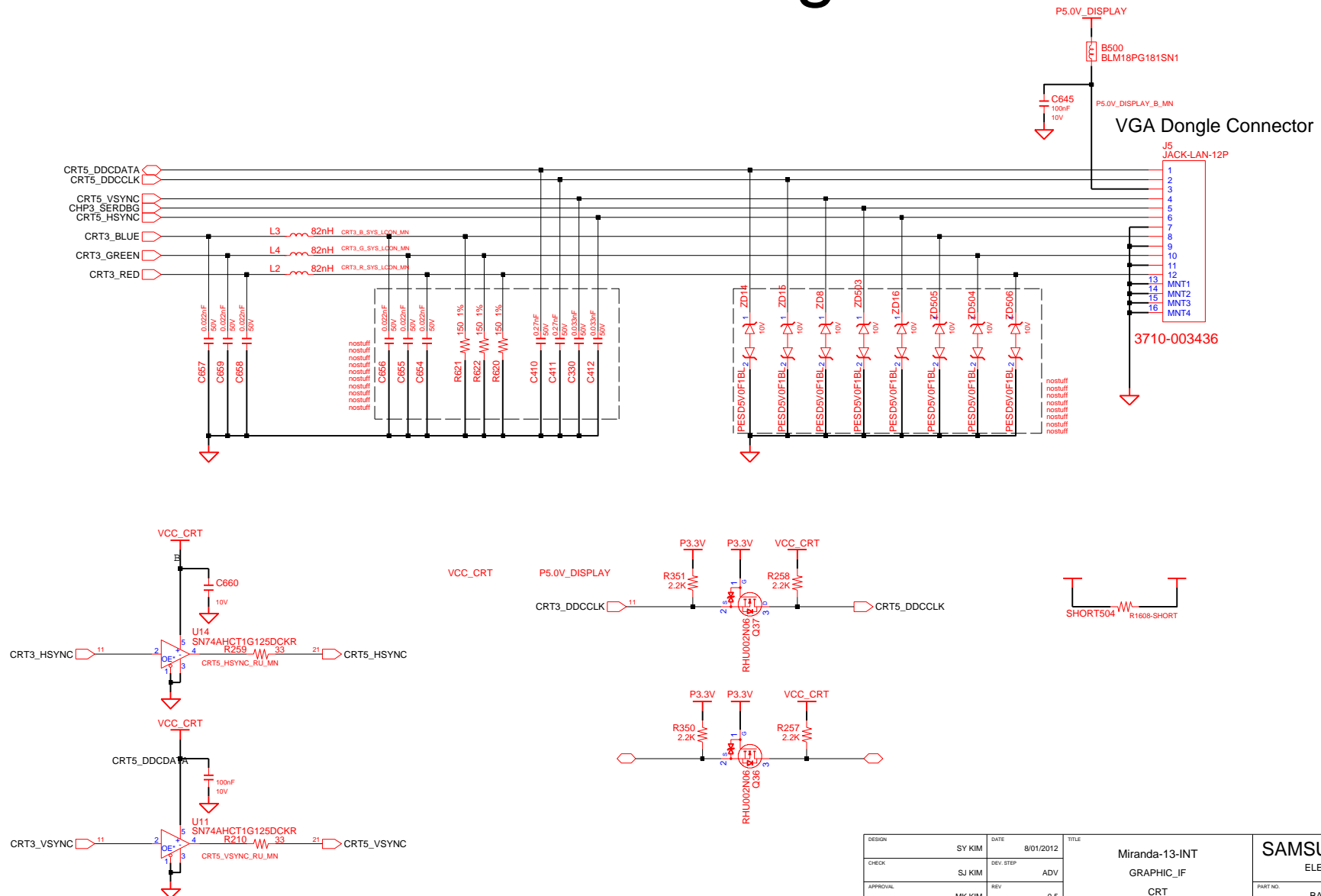


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|--------------------------------|--------|-----------|-----------|-------------|----------------|---------------|
| DESIGN                         | SY KIM | DATE      | 8/01/2012 | TITLE       | Miranda-13-INT | SAMSUNG       |
| CHECK                          | SJ KIM | DEV. STEP | ADV       | GRAPHICS_IF | ELECTRONICS    |               |
| APPROVAL                       | MK KIM | REV       | 0.5       | LVDS        |                |               |
| MODULE CODE                    |        | LAST EDIT |           |             |                |               |
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# VGA Dongle



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

**SAMSUNG PROPRIETARY**

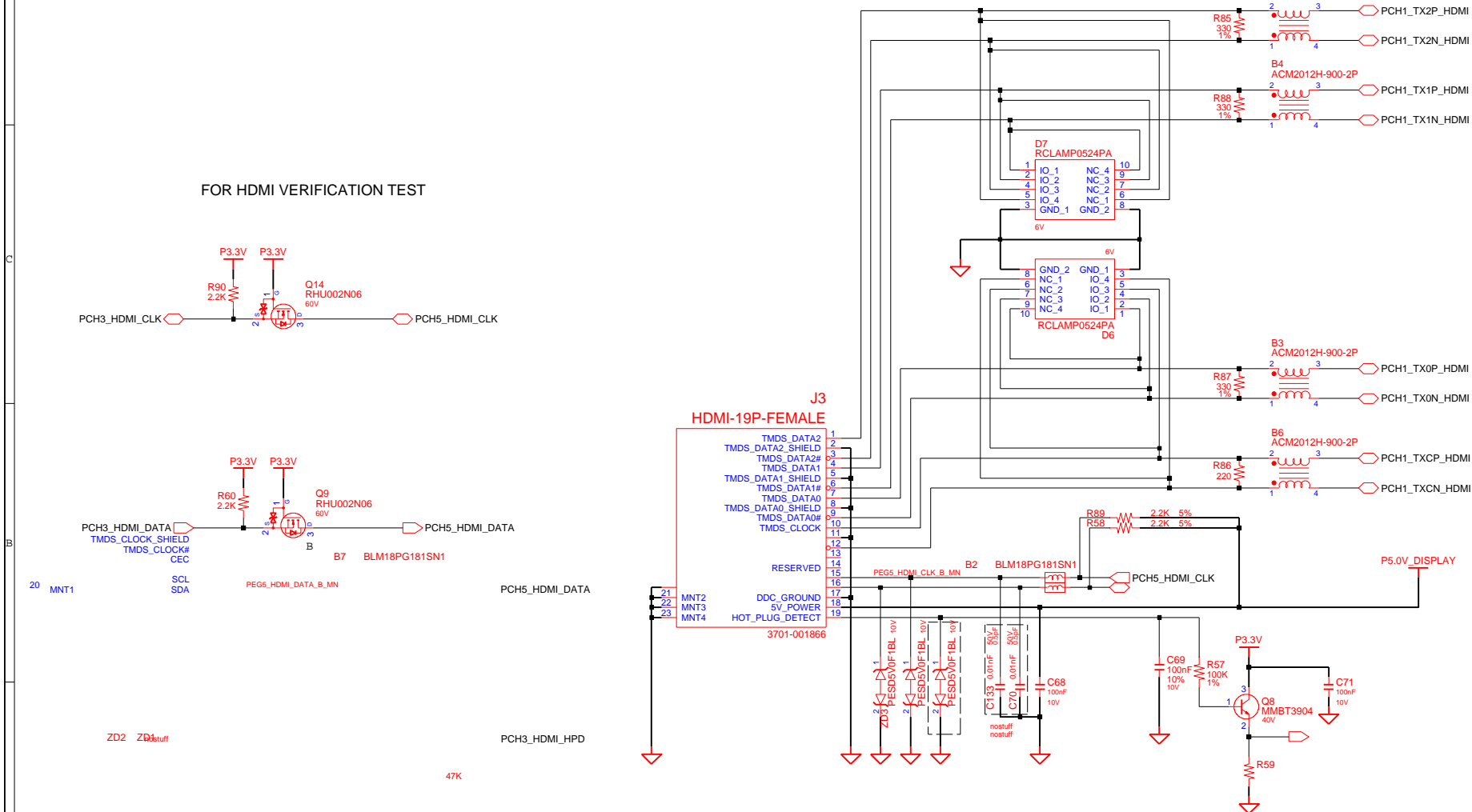
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# HDMI Graphic

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

(EMC request at 2010.04.15)

FOR HDMI VERIFICATION TEST

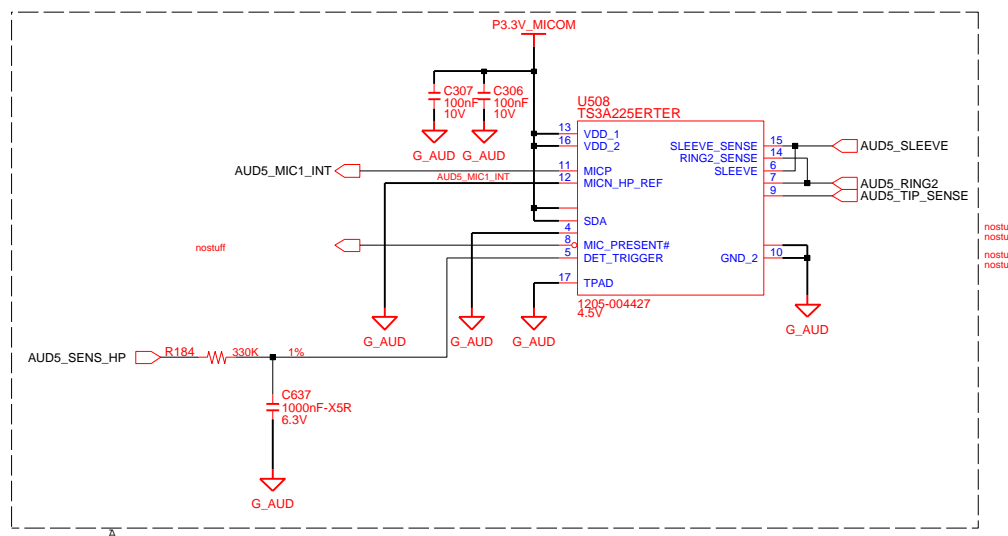
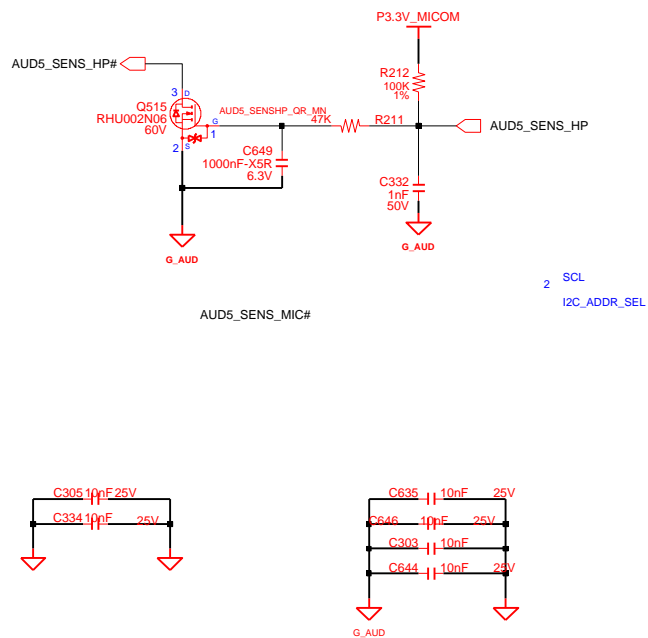


|                                |        |           |           |             |                |                        |
|--------------------------------|--------|-----------|-----------|-------------|----------------|------------------------|
| DESIGN                         | SY KIM | DATE    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

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|-------------|--------|-----------|-----------|-------|------------------------------------|--|--|--------------------------------|--|--|-------------|----|----|
| DESIGN      | SY KIM | DATE      | 8/01/2012 | TITLE | Miranda-13-INT<br>AUDIO<br>ALC269Q |  |  | SAMSUNG<br>ELECTRONICS         |  |  |             |    |    |
| CHECK       | SJ KIM | REV. STEP | ADV       |       |                                    |  |  |                                |  |  |             |    |    |
| APPROVAL    | MK KIM | REV       | 0.5       |       |                                    |  |  | PART NO.                       |  |  | BA41-0xxxxA |    |    |
| MODULE CODE |        | LAST EDIT |           |       |                                    |  |  | September 19, 2012 10:09:09 AM |  |  | PAGE        | 23 | OF |

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|             |           |           |           |                                       |                        |  |                                |               |
|-------------|-----------|-----------|-----------|---------------------------------------|------------------------|--|--------------------------------|---------------|
| DESIGN      | SY KIM    | DATE      | 8/01/2012 | Miranda-13-INT<br>AUDIO<br>Combo Jack | SAMSUNG<br>ELECTRONICS |  |                                |               |
| CHECK       | SJ KIM    | DEV. STEP | ADV       |                                       |                        |  |                                |               |
| APPROVAL    | MK KIM    | REV       | 0.5       |                                       |                        |  | PART NO.                       | BA41-0xxxxA   |
| MODULE CODE | LAST EDIT |           |           |                                       |                        |  | September 19, 2012 10:09:09 AM | PAGE 24 OF 45 |



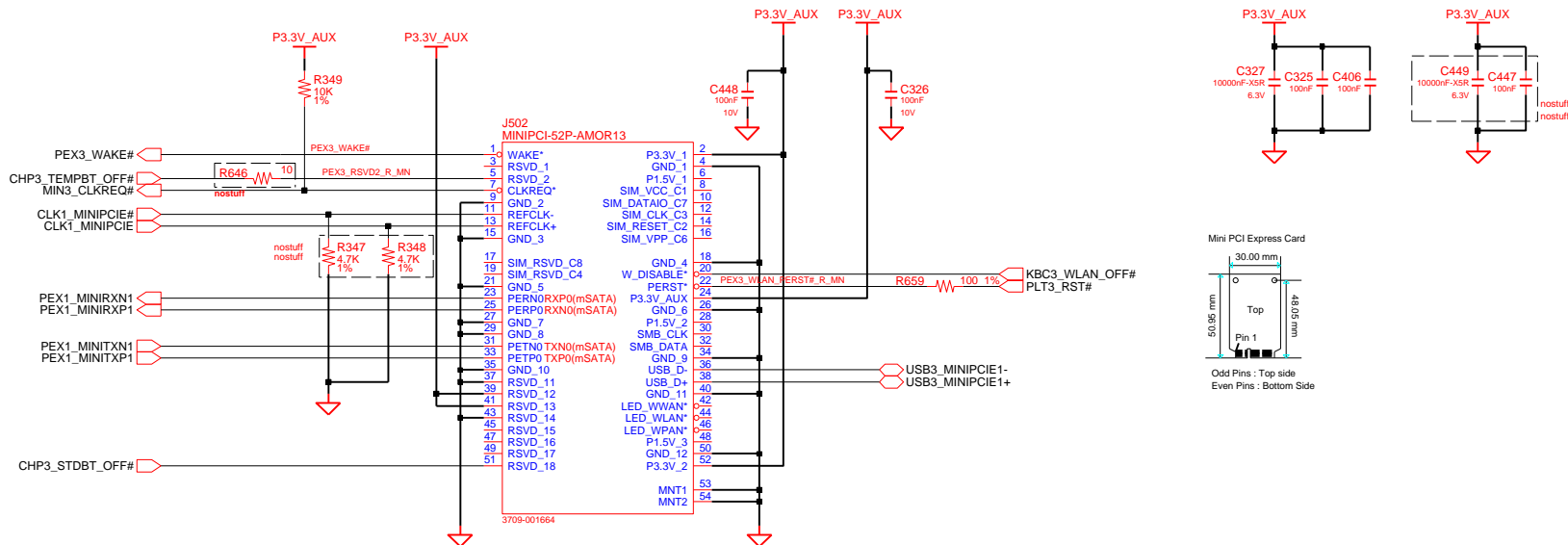
COM-22C-015(1996.6.5) REV. 3

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## WLAN

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



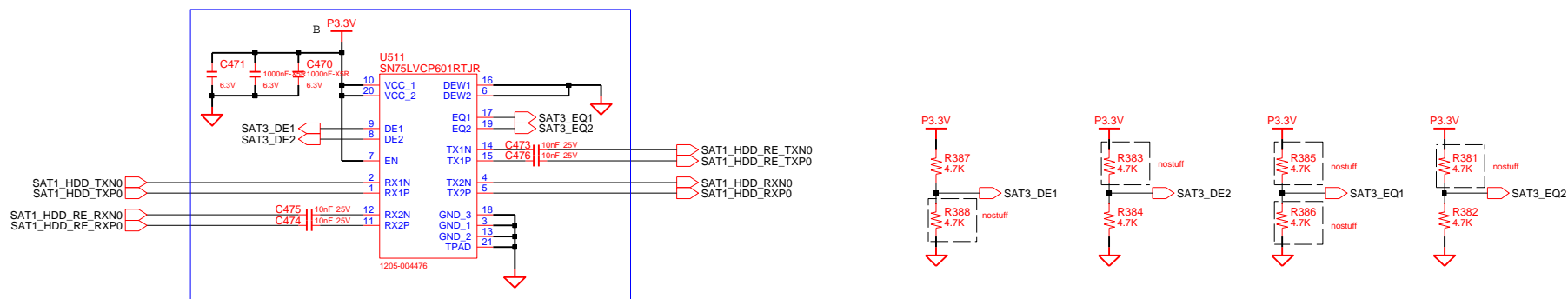
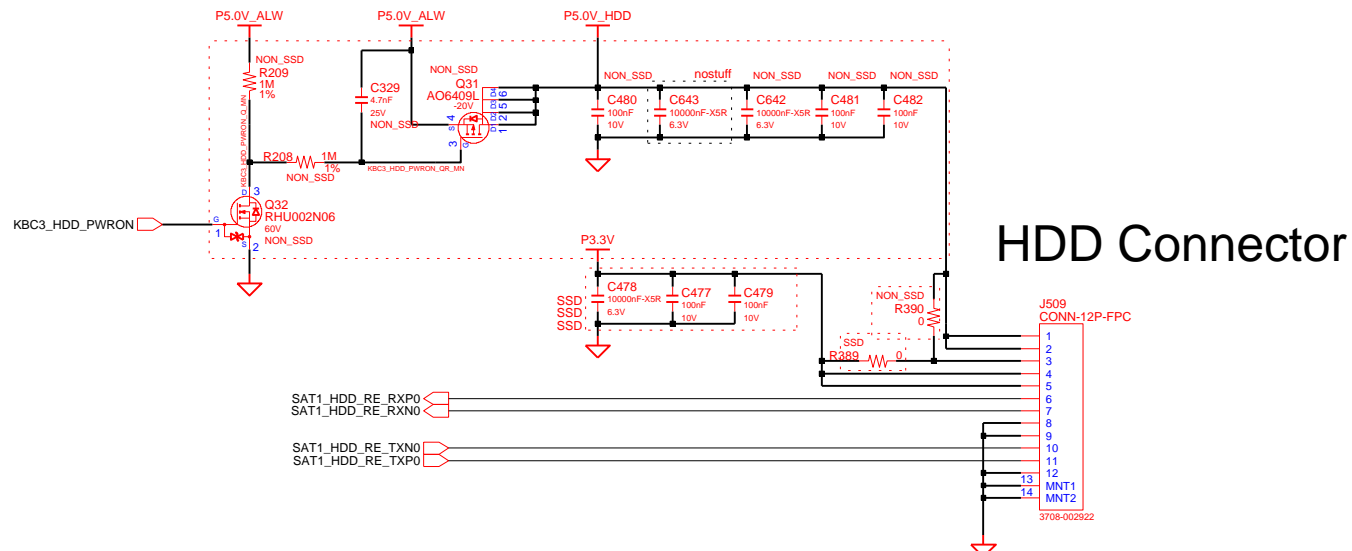
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| DESIGN      | SY KIM | DATE      | 8/01/2012                      | TITLE | Miranda-13-INT | SAMSUNG     |
| CHECK       | SJ KIM | DEV. STEP | ADV                            | WLAN  | ELECTRONICS    |             |
| APPROVAL    | MK KIM | REV       | 0.5                            | WLAN  | PART NO.       | BA41-0xxxxA |
| MODULE CODE |        | LAST EDIT | September 19, 2012 10:09:09 AM | PAGE  | 26             | OF 45       |

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## SATA I/F CONN

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



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

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BA59-03507A

[illegible]

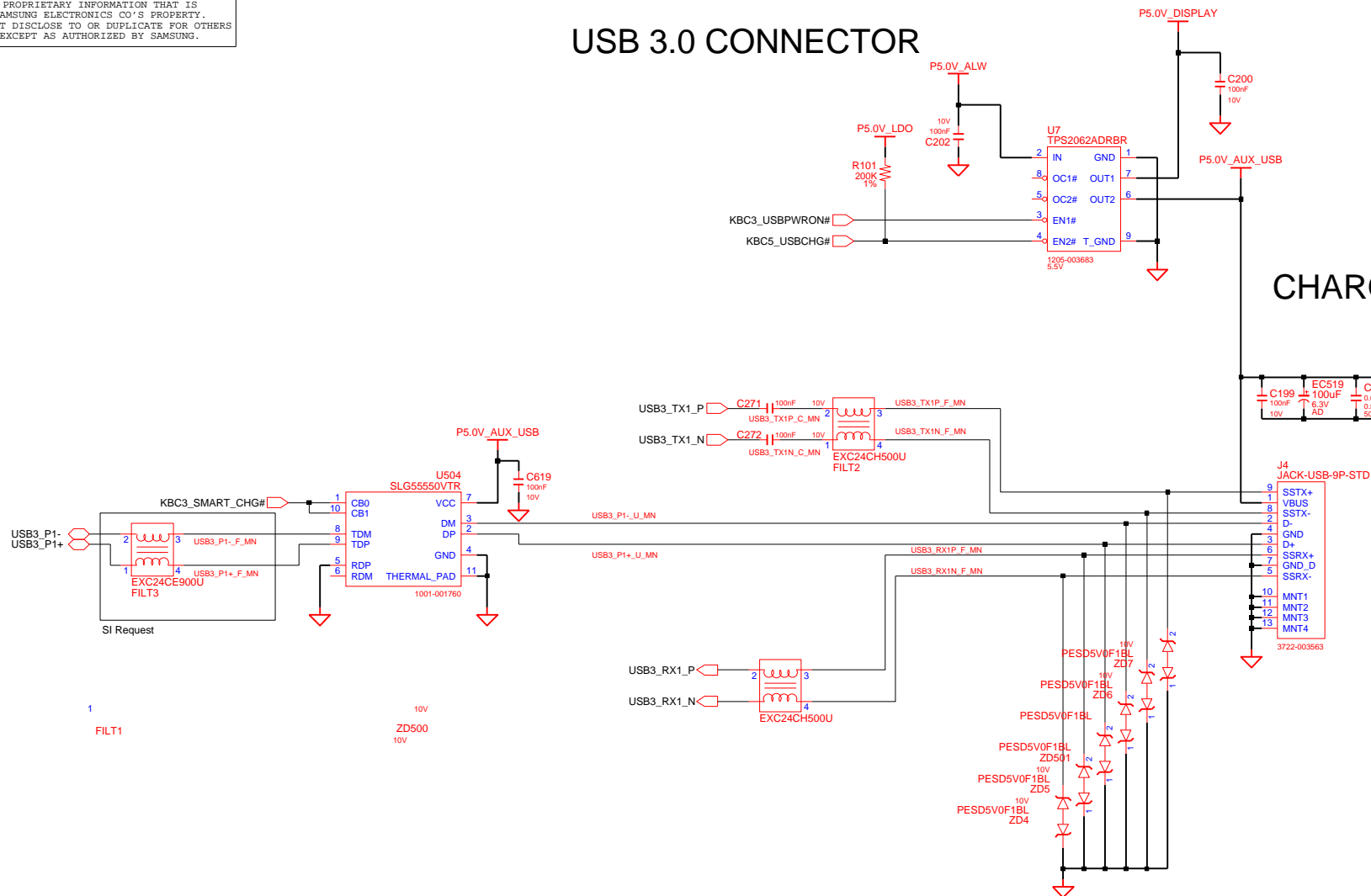
3

A

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

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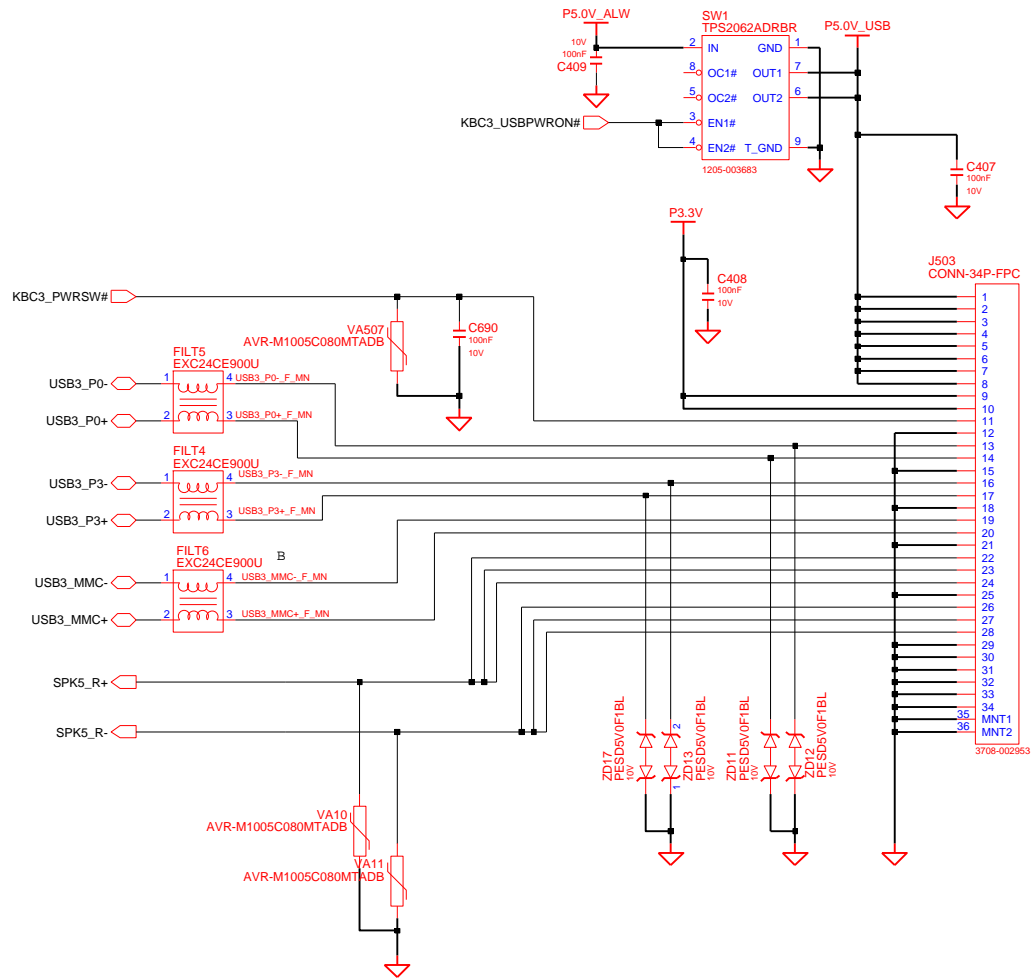
## CHARGEABLE USB



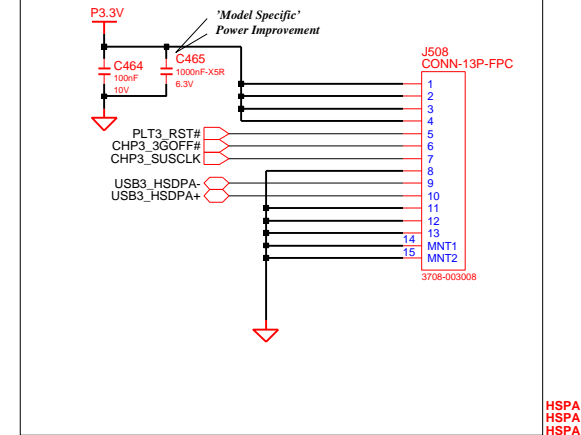
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| DRAW        | SY KIM | DATE      | 8/01/2012 | Miranda-13-INT<br>USB<br>USB Charge Port | <b>SAMSUNG</b><br>ELECTRONICS |
| CHECK       | SJ KIM | DEV. STEP | ADV       |  |                               |
| APPROVAL    | MK KIM | REV       | 0.5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

## PWR SW & USB SUB Board

to Sub-Board (FFC)

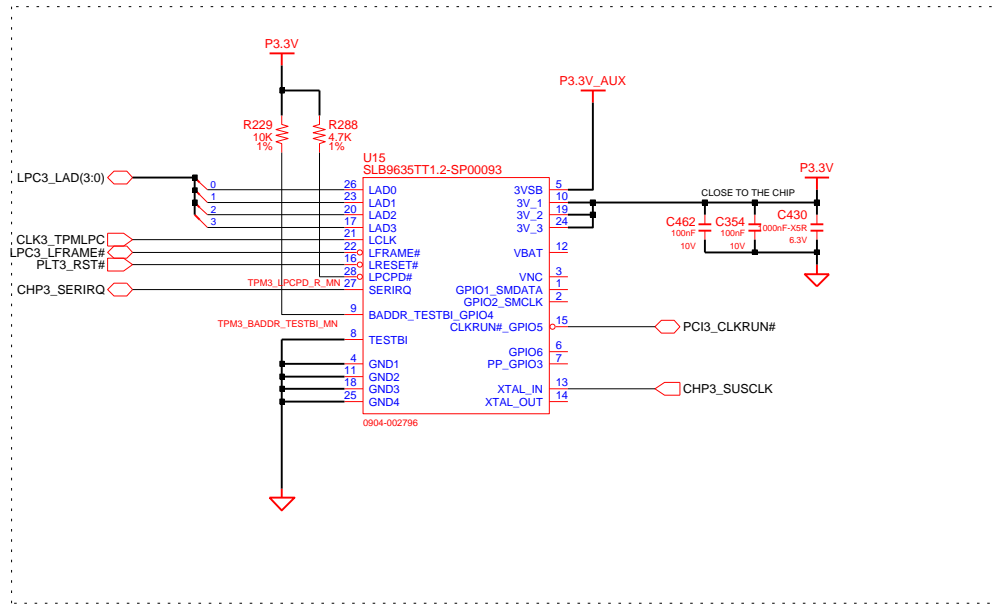


to Sub-HSPA (FFC)



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

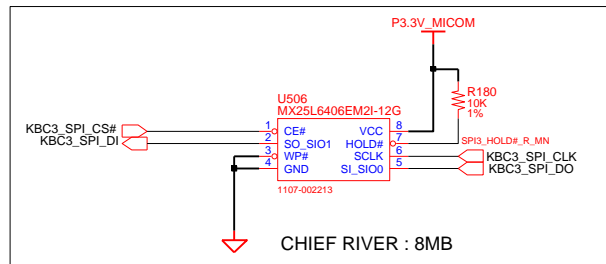
# TPM1.2



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

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## SPI ROM SOCKET



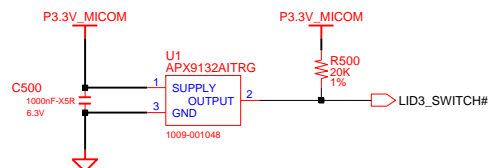
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|-------------|--|--------|-----------|-----------|--|--|------------------------|----|-------------|----|
| DRAWN       |  | SY KIM | DATE      | 8/01/2012 | TITLE<br><br>Miranda-13-INT<br><br>MICOM<br><br>SMSC MEC1310 |  | SAMSUNG<br>ELECTRONICS |    |             |    |
| CHECK       |  | SJ KIM | DEV. STEP | ADV       |  |  |                        |    |             |    |
| APPROVAL    |  | REV    | 0.5       | PART NO.  |  |  |                        |    | BA41-0xxxxA |    |
| MODULE CODE |  |        | LAST EDIT |           | September 19, 2012 10:09:09 AM                               |  | PAGE                   | 32 | OF          | 45 |



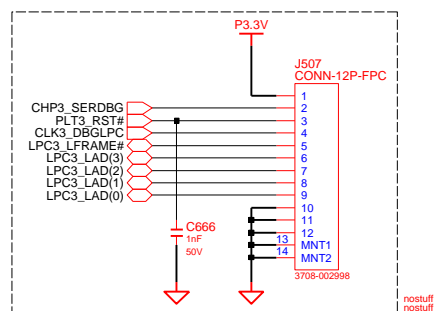
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# KEYBOARD

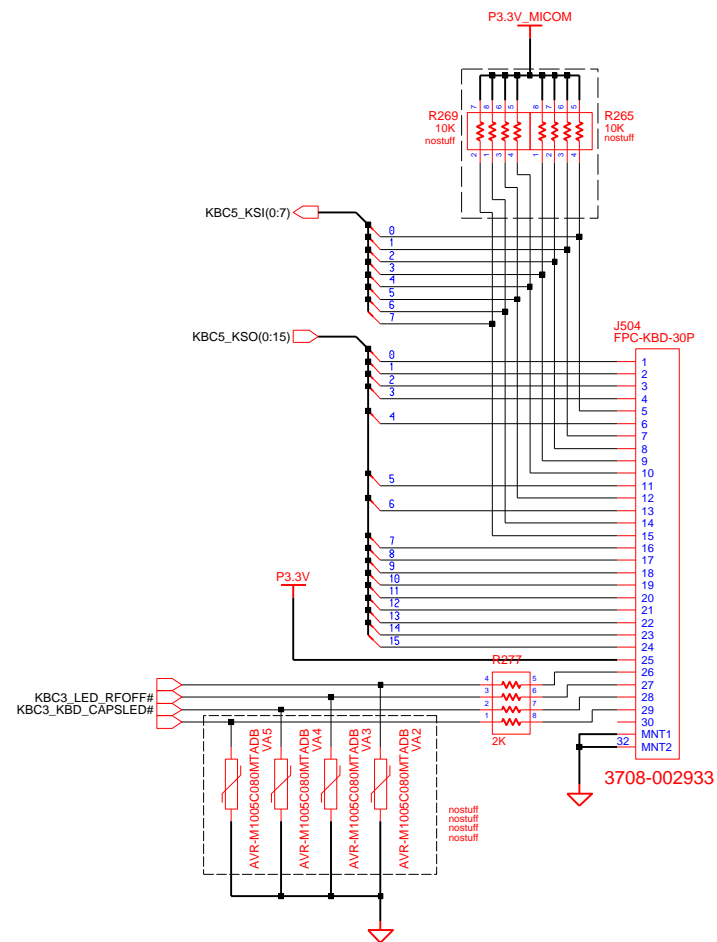
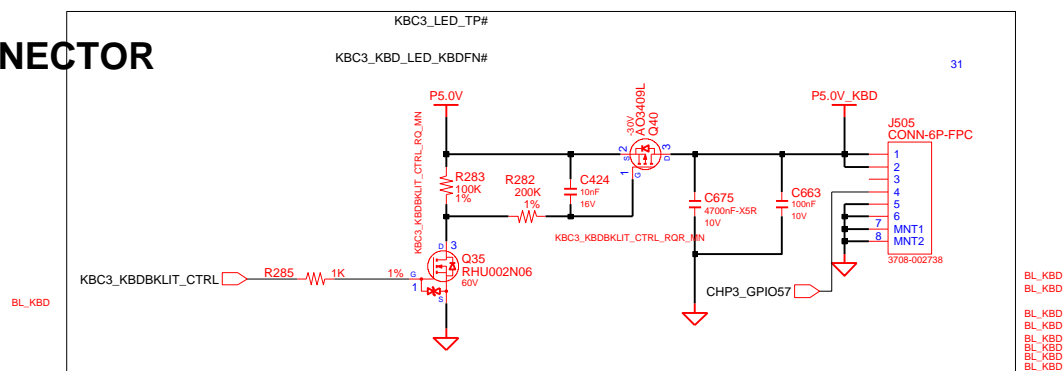
## LID3\_SWITCH



## 80H PORT DEBUG



# NNECTOR



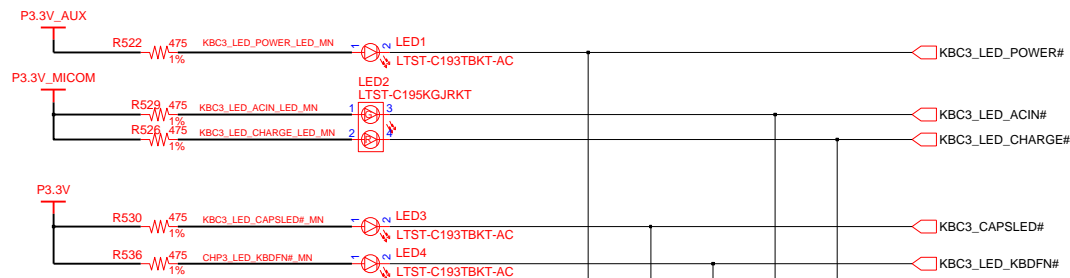
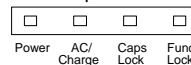
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|-------------|--------|-----------|-----------|---|----------------------------|
| DRAW        | SY KIM | DATE      | 8/01/2012 | TITLE<br><br>Miranda-13-INT<br><br>IO I/F<br><br>Keyboard | SAMSUNG<br><br>ELECTRONICS |
| CHECK       | SJ KIM | DEV. STEP | ADV       |   |                            |
| APPROVAL    | MK KIM | REV       | 0.5       |   |                            |
| MODULE CODE |        |           |           |   |                            |
| LAST EDIT   |        |           |           | September 19, 2012 10:09:09 AM                            | PAGE 33 OF 45              |

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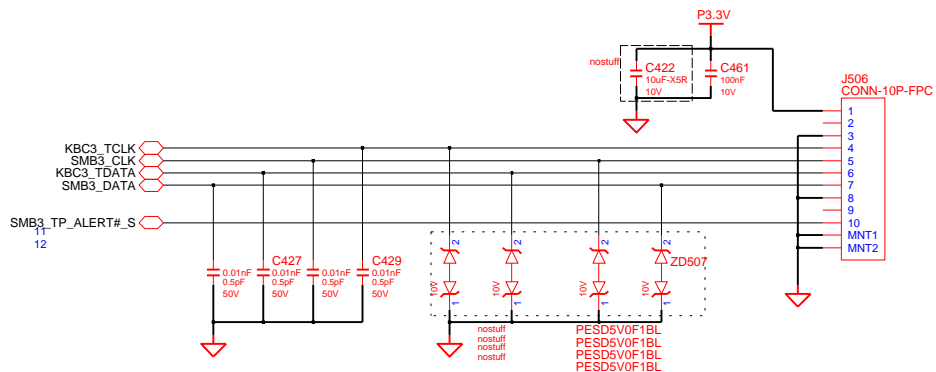
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## System LED

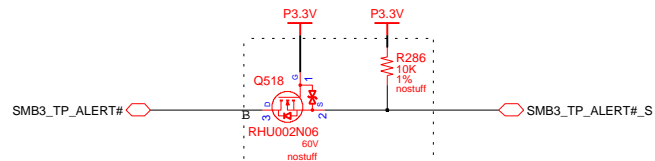
### LED Top View



## Click Pad I/F



3708-003000

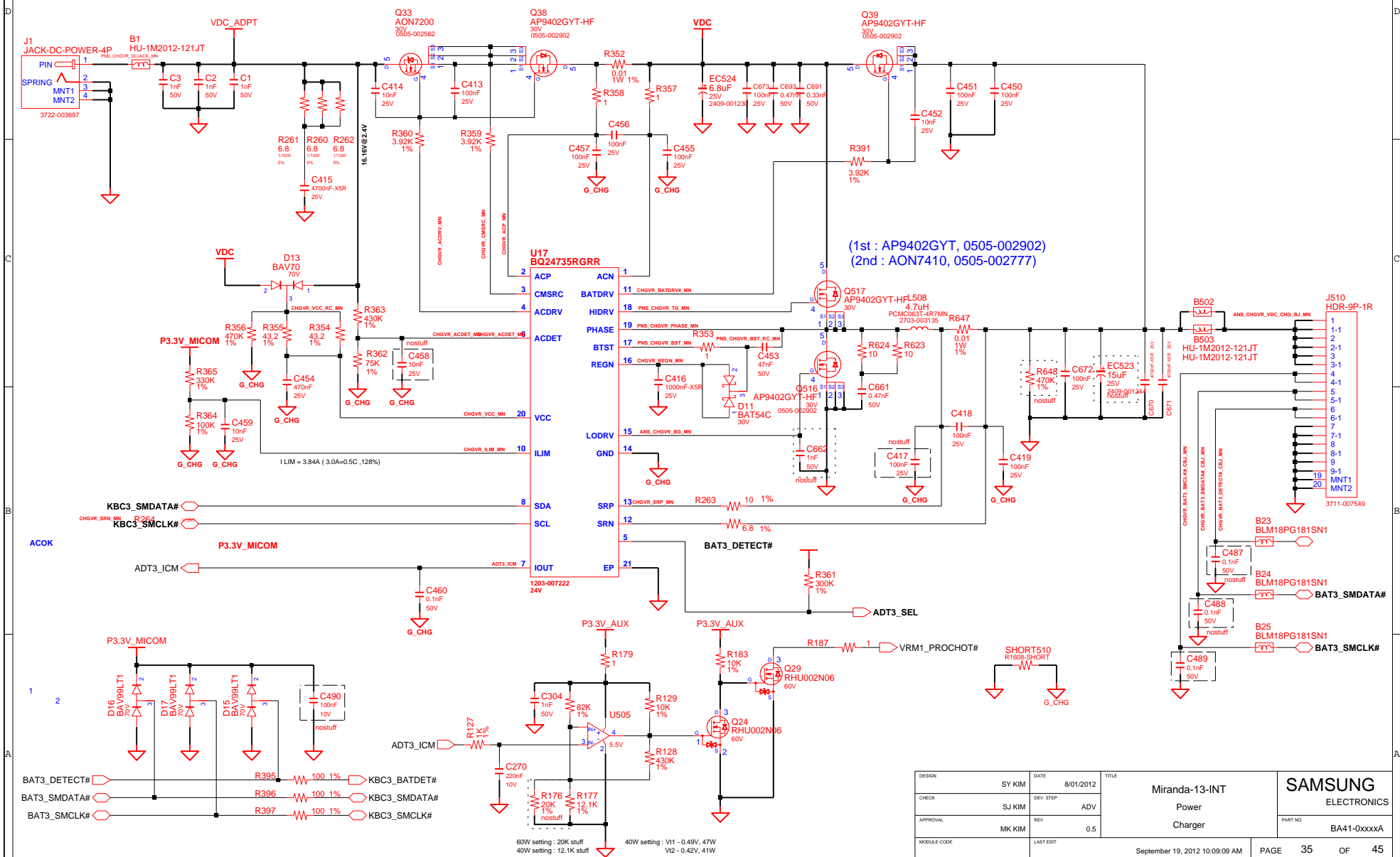


|             |        |           |           |                                |                          |                         |
|-------------|--------|-----------|-----------|--------------------------------|--------------------------|-------------------------|
| DRAW        | SY KIM | DATE 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

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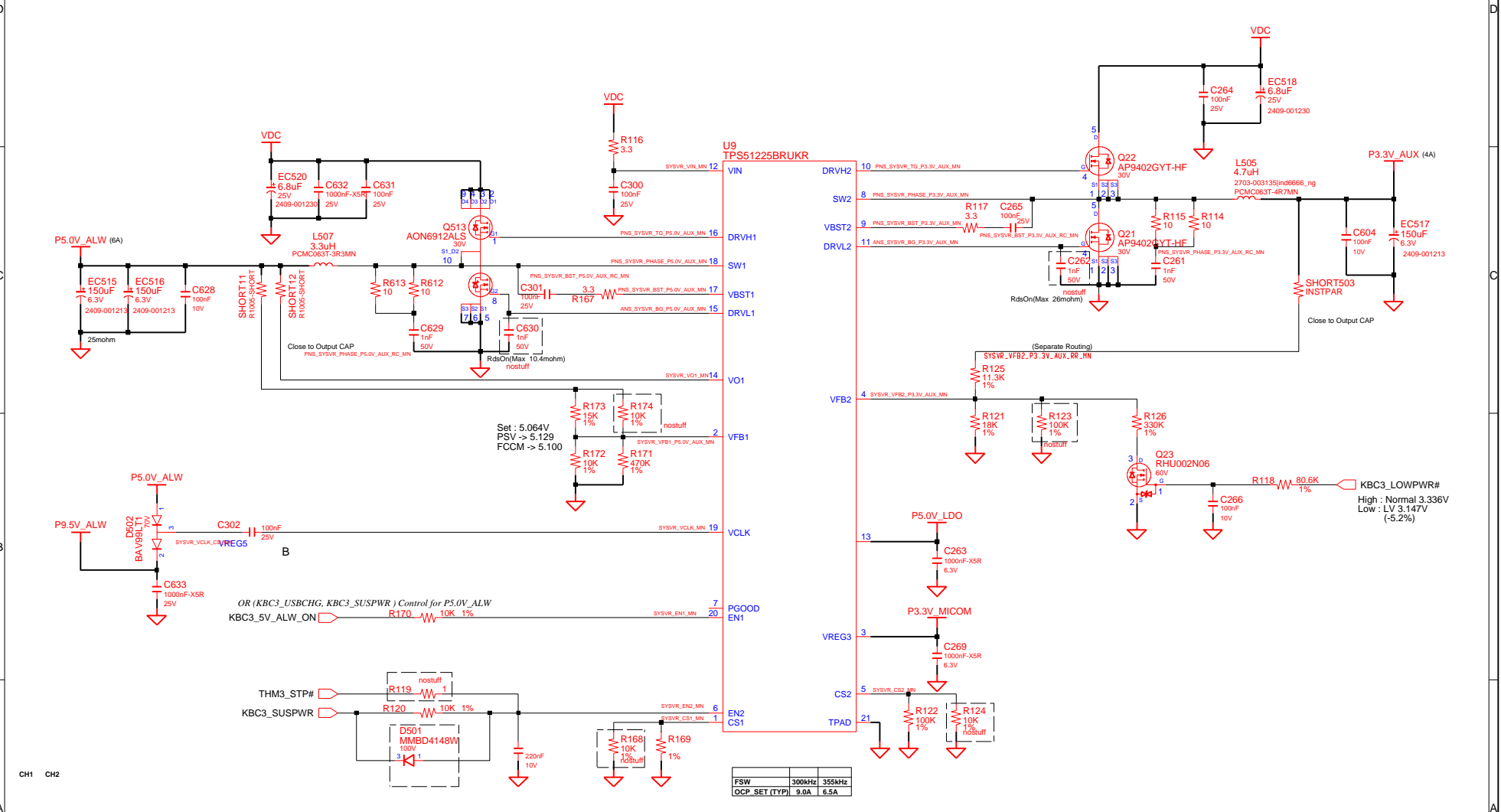
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# CHARGER & POWER MANAGEMENT



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

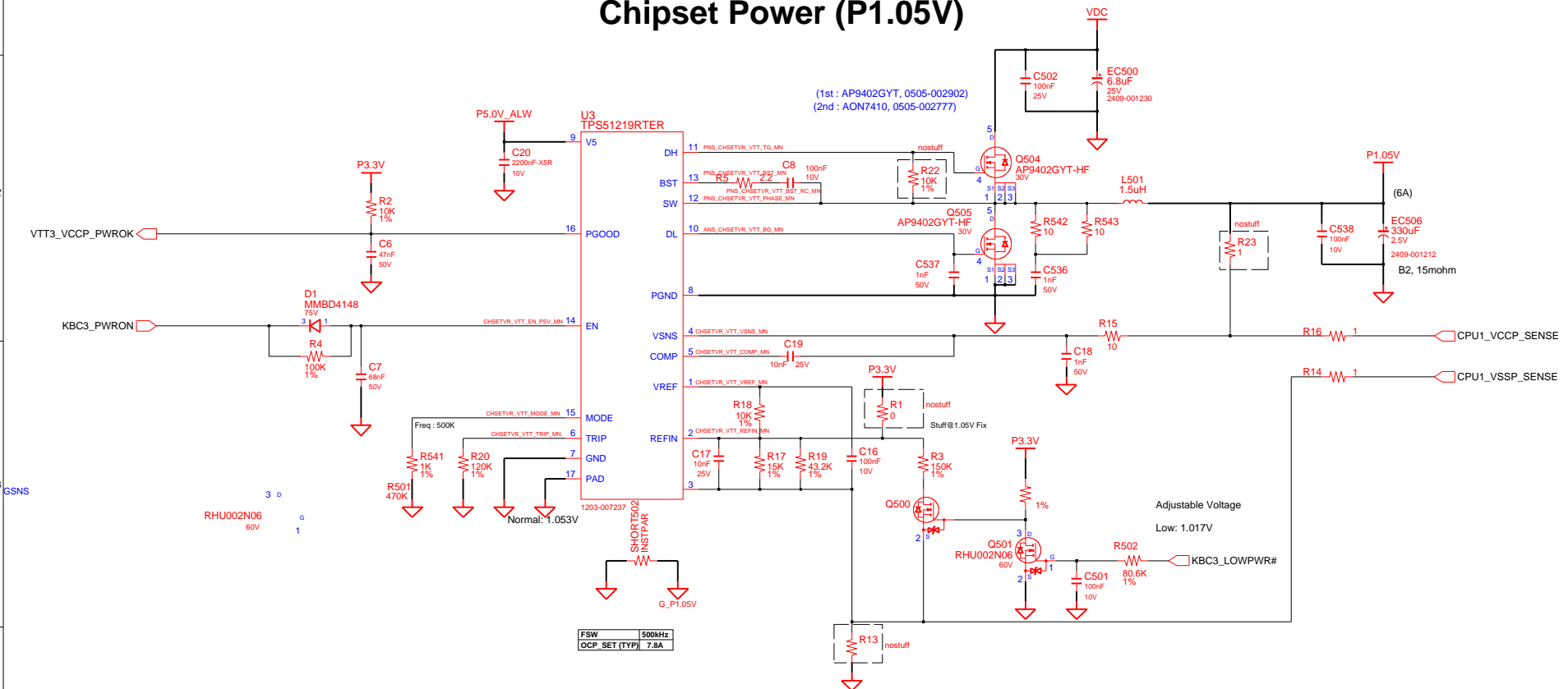


CH1 CH2

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

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## Chipset Power (P1.05V)



|                                |        |           |           |       |                |                         |
|--------------------------------|--------|-----------|-----------|-------|----------------|-------------------------|
| DESIGN                         | SY KIM | DATE      | 8/01/2012 | TITLE | Miranda-13-INT | SAMSUNG<br>ELECTRONICS  |
| CHECK                          | SJ KIM | DEV. STEP | ADV       |       | Power          |                         |
| APPROVAL                       | MK KIM | REV       | 0.5       |       | P1.05V         |                         |
| MODULE CODE                    |        | LAST EDIT |           |       |                | PART NO.<br>BA41-0xxxxA |
| September 19, 2012 10:09:09 AM |        |           |           |       | PAGE           | 37 OF 45                |

| VID0 | VID1 | VCCSA  |
|------|------|--------|
| 0    | 0    | 0.9V   |
| 0    | 1    | 0.85V  |
| 1    | 0    | 0.775V |
| 1    | 1    | 0.75V  |

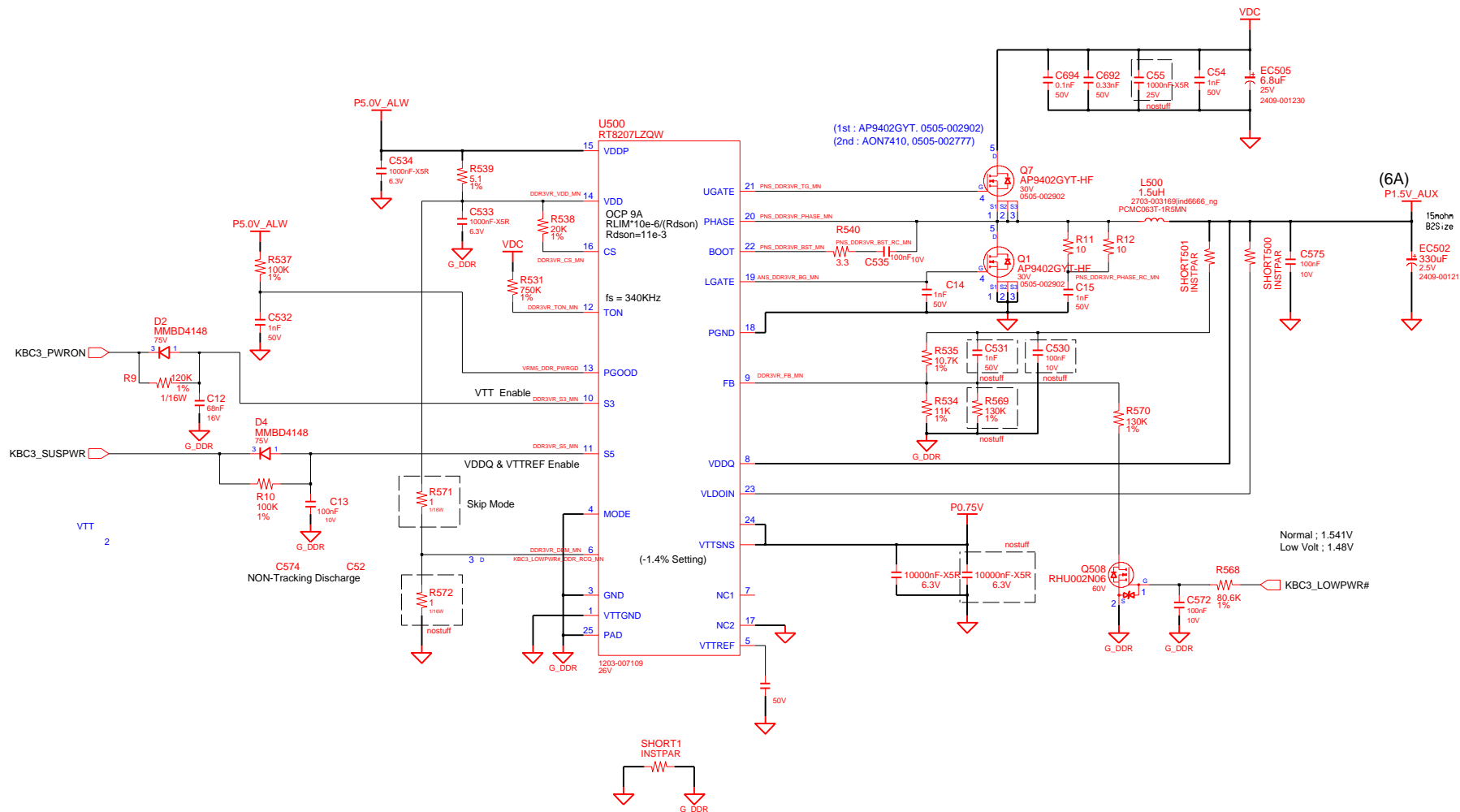
**PMIC Section Schematic**

The schematic shows the internal circuitry of the U507 TPS54319RTER PMIC. Key components and connections include:

- Input/Output Pins:** VIN1, VIN2, VIN3, VSENSE, BOOT, PH1, PH2, PH3, PWRGD, EN, COMP, RT\_CLK, SS, PWD, AGND.
- Capacitors:** C262 (1000nF-XSR, 6.3V), C299 (100nF, 10V), C293 (100nF, 10V), C622 (220uF, 2.5V, 20%, 6.3V), C621 (2200nF-XSR, 6.3V), C620 (2200nF-XSR, 6.3V), C641 (2.2nF, 50V), C627 (100nF, 10V).
- Resistors:** R166 (100nF), R608 (100nF), R609 (4.7K, 1%), R607 (100K, 1%), R614 (80.6K, 1%), R610 (20K, 1%), R611 (200K, 1%), R164 (200K, 1%), R615 (80.6K, 1%).
- Diode:** D8 MMBD4148.
- Other Components:** L506 (1.0uH), PCMB042T-1R0MHG (2703-003431), Q30 RHU002N06 (60V).
- Notes:**
  - Place close to Out Cap
  - Low Voltage setting = 1.7367V (-3.7%)
  - Normal: 1.8194V

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A circuit diagram showing a short circuit. A red wire connects a terminal to a ground symbol (a triangle with a circle inside). The wire is labeled "SHORT1 INSTPAR" in red text. Another ground symbol is visible to the right, labeled "G" in red text.

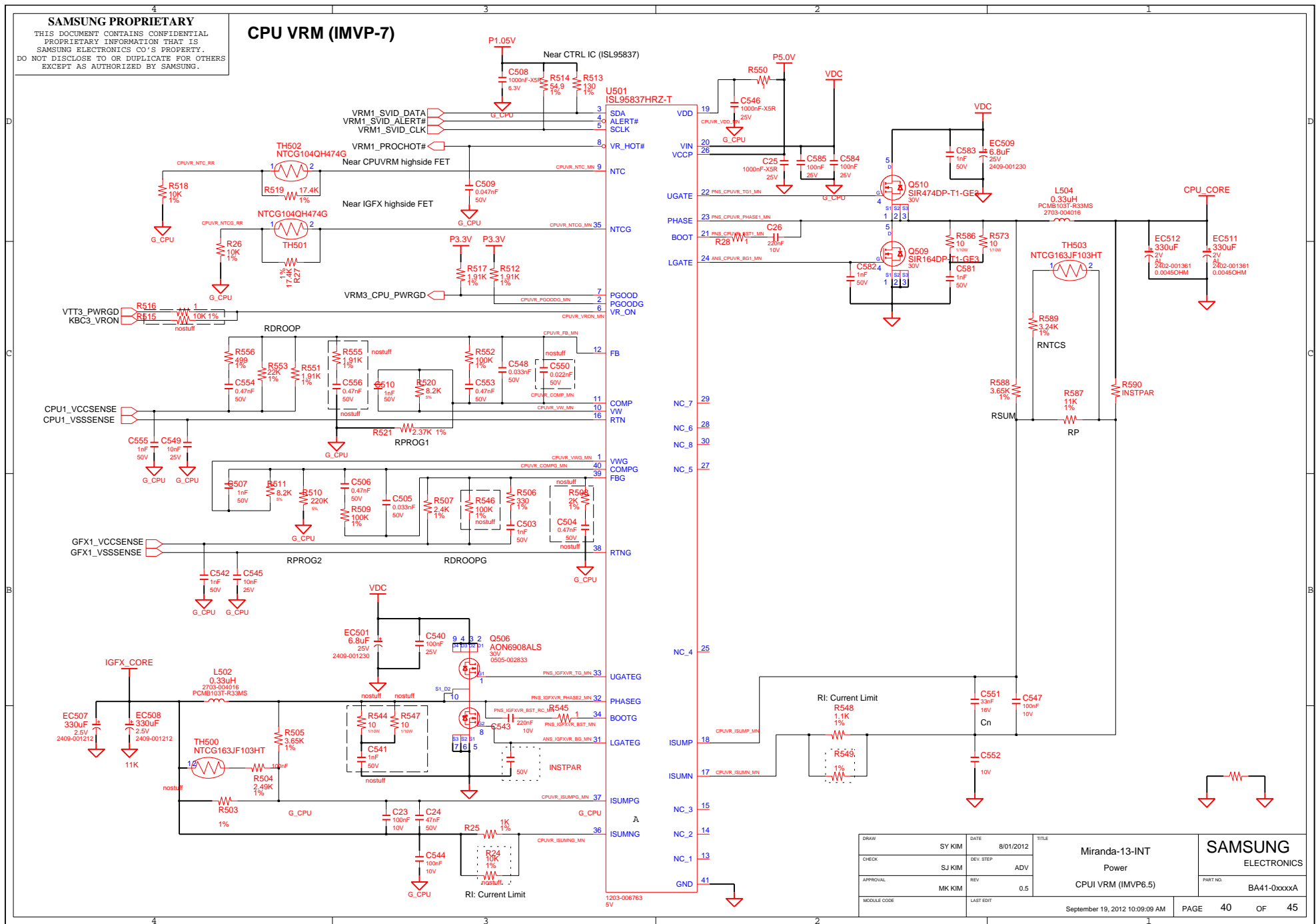


|             |           |           |           |  |   |             |          |
|-------------|-----------|-----------|-----------|--|---|-------------|----------|
| DESIGN      | SY KIM    | DATE      | 8/01/2012 | <div style="text-align: center;"> <b>Miranda-13-INT</b><br/> <b>Power</b><br/> <b>TI TSPS1125</b> </div> | <div style="text-align: center;"> <b>SAMSUNG</b><br/> <b>ELECTRONICS</b> </div> |             |          |
| CHECK       | SJ KIM    | DEV. STEP | ADV       |  |   |             |          |
| APPROVAL    | MK KIM    | REV       | 0.5       |  | PART NO.  | BA41-0xxxxA |          |
| MODULE CODE | LAST EDIT |           |           |  | September 19, 2012 10:09:09 AM  | PAGE        | 39 OF 45 |

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## CPU VRM (IMVP-7)



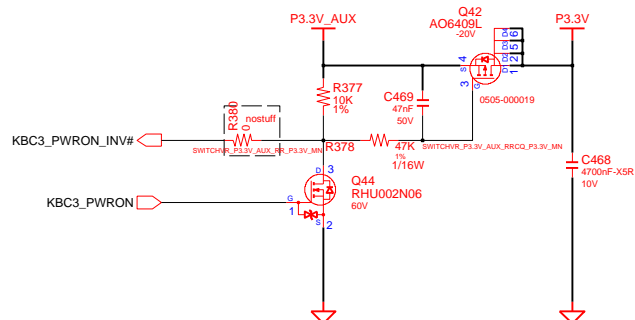


# SAMSUNG PROPRIETARY

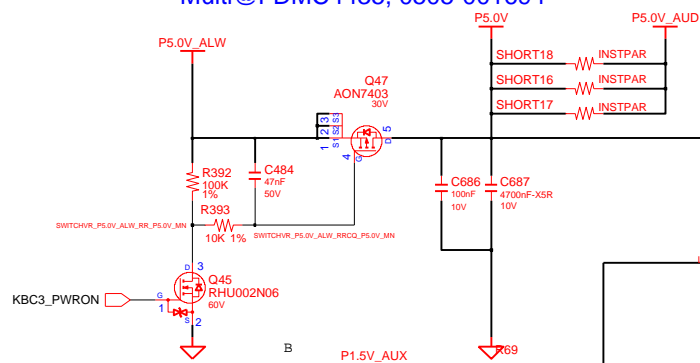
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## Switched Power

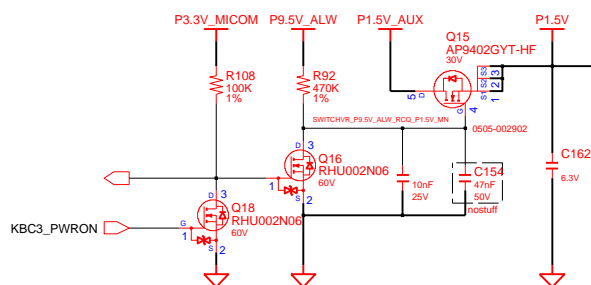
### Switched Power On (P3.3V) Multi@AP2607GY



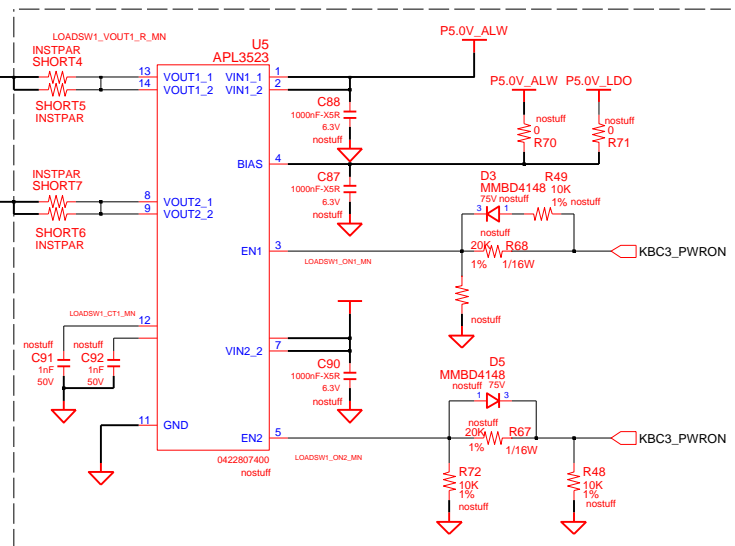
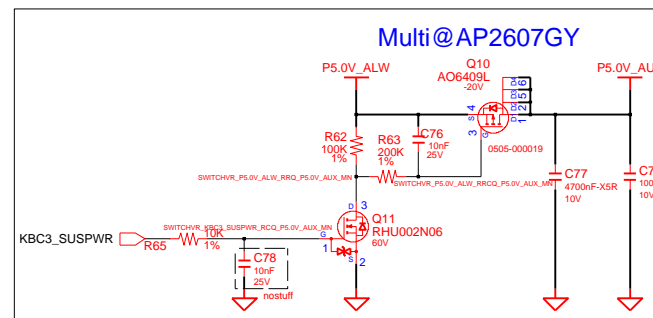
### Switched Power On (P5.0V) Multi@FDMC4435, 0505-001694



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



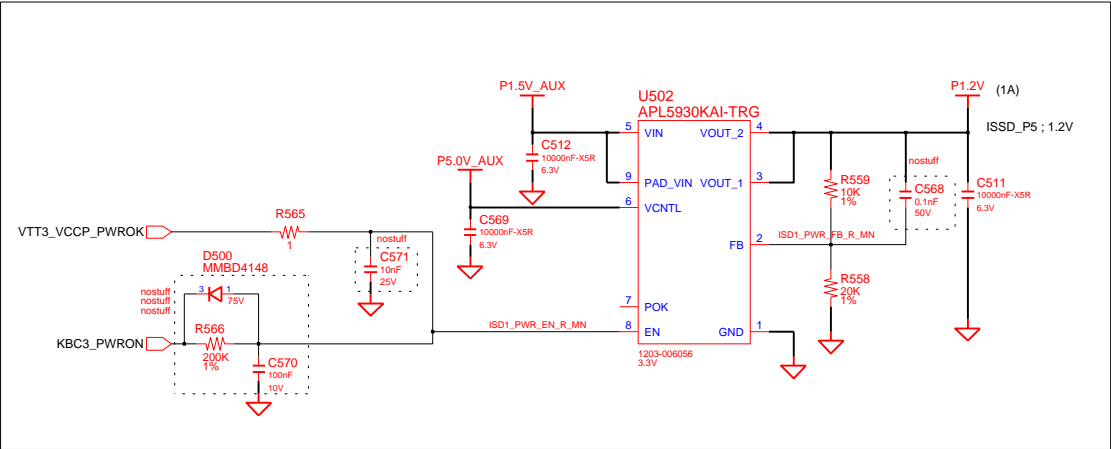
### P5.0V\_AUX



|                                |        |           |           |       |                |               |
|--------------------------------|--------|-----------|-----------|-------|----------------|---------------|
| DRAW                           | SY KIM | DATE      | 8/01/2012 | TITLE | Miranda-13-INT | SAMSUNG       |
| CHECK                          | SJ KIM | DEV. STEP | ADV       |       | Power          | ELECTRONICS   |
| APPROVAL                       | MK KIM | REV       | 0.5       |       | SWITCHED POWER | PART NO.      |
| MODULE CODE                    |        | LAST EDIT |           |       |                | BA41-0xxxxA   |
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# Switched Power 2 (ISSD PWR)

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



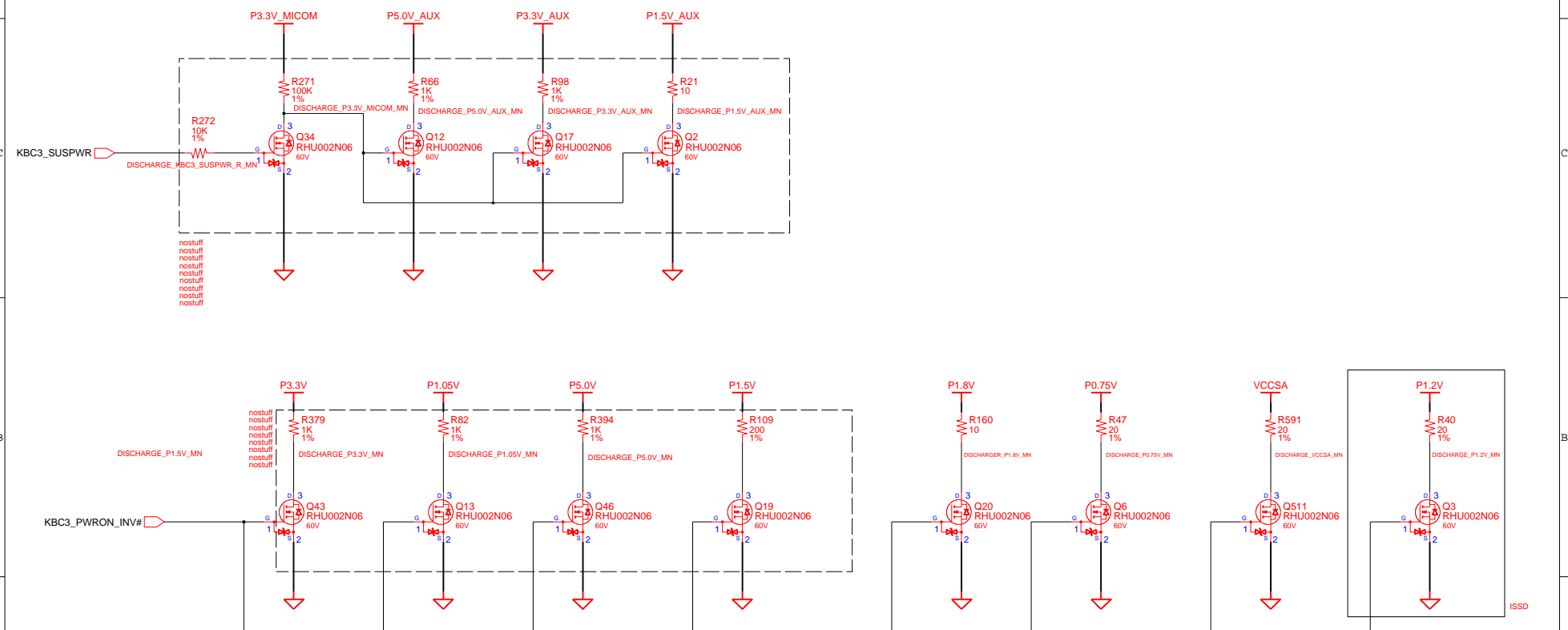
ISSD  
ISSD  
ISSD  
ISSD  
ISSD  
ISSD


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

[illegible][illegible][illegible]

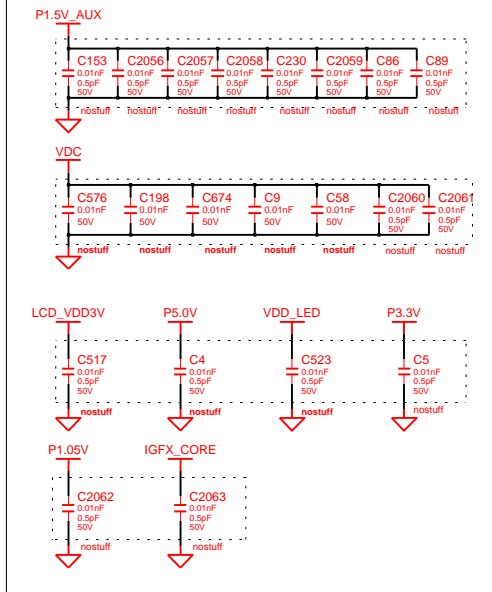
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## POWER DISCHARGER

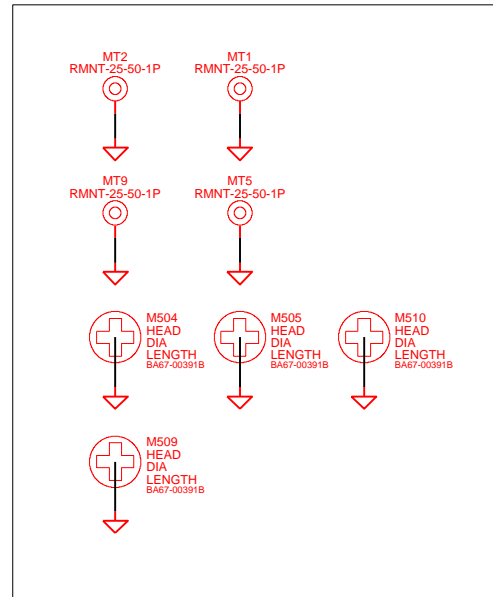


|             |  |        |           |           |   |  |   |    |    |    |
|-------------|--|--------|-----------|-----------|---|--|---|----|----|----|
| DRAW        |  | SY KIM | DATE      | 8/01/2012 | TITLE<br><br>Miranda-13-INT<br><br>Power<br><br>Power Rail Discharger |  |  |    |    |    |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

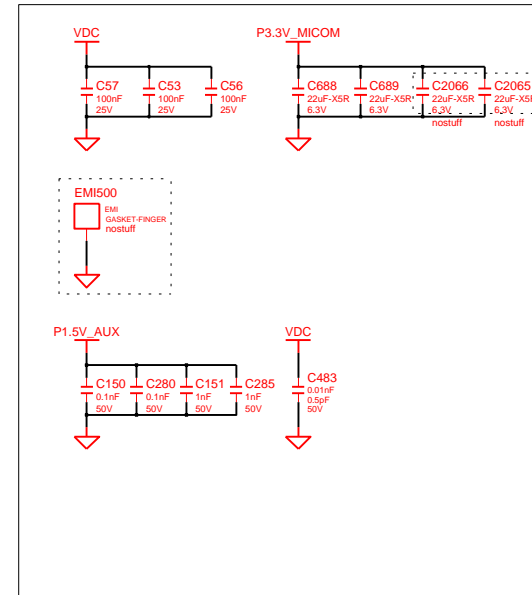
## WLAN Performance issue



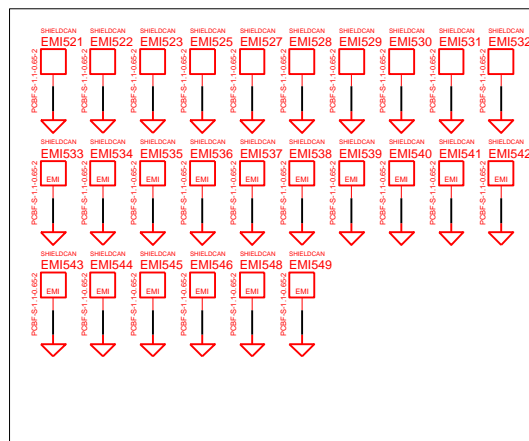
## Mainboard PEM / Mount



## Decap



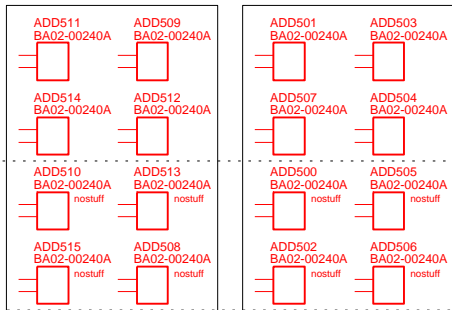
## Shield can EMI gasket



## Underfilm for BGA

### CPU

### PCH

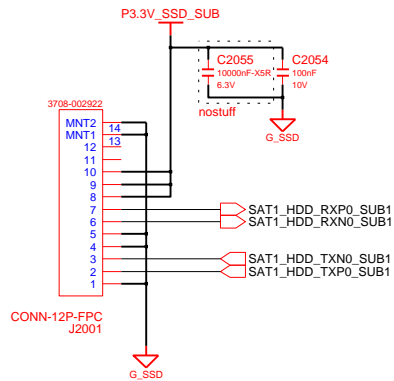


|             |        |           |           |                                |                     |                        |
|-------------|--------|-----------|-----------|--------------------------------|---------------------|------------------------|
| DESIGN      | SY KIM | DATE      | 8/01/2012 | TITLE                          | Miranda-13-INT      | SAMSUNG<br>ELECTRONICS |
| CHECK       | SJ KIM | DEV. STEP | ADV       |                                | PCB Stuffs          |                        |
| APPROVAL    | MK KIM | REV       | 0.5       |                                | Mount Hole & Decaps |                        |
| MODULE CODE |        | LAST EDIT |           | September 19, 2012 10:09:09 AM | PAGE                | 45 OF 45               |

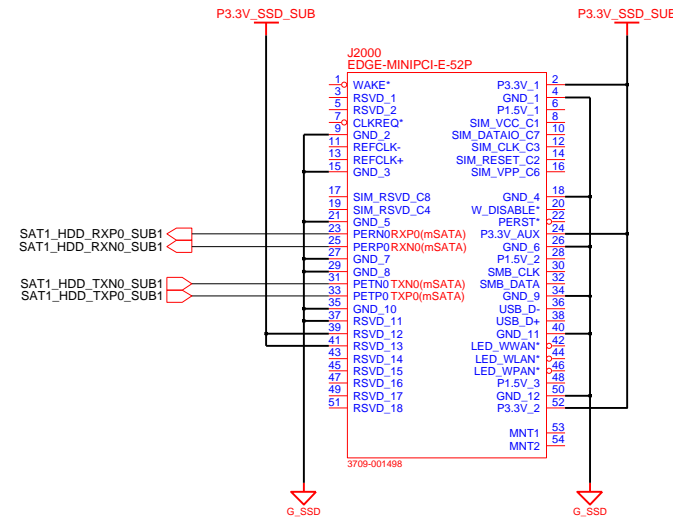
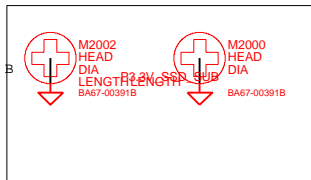
# Sub board #3 (1/1)

## mSATA SSD Sub-Board

### From Mainboard



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



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