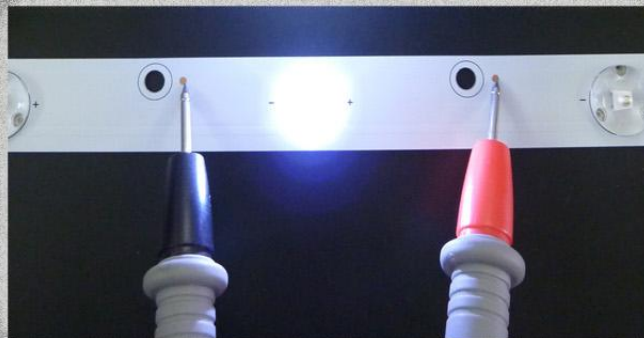


Collection of

V5.0

OLED/LED/LCD TV

Repair Tips



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All these tools and equipments will help you in troubleshooting and repairing the electronics devices.

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Thank You for Contribution

Here is to thank you to Mr. Ji Chun, Mr. Vladimir, Mr. Lei Yang, Mr. Jonathan, Mr. Ganesh and Mr. Huang. Because they had contributed the good repair information in part of this repair guides.

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BONUS-B

(This bonus NOT listed in this Ebook, it's on the Download Page)

- * Universal TV Mainboard Schematic Diagrams & Specification Sheets**
- * Samsung LCD & LED TV FastTrack Training**
- * LCD & LED TV Power Supply Schematic Diagrams**
- * LED TV –LED Driver/Drive Schematic Diagrams**
- * Panasonic 2010-2011-2012-2014-2015 LCD/LED TV Training**
- * Samsung 2011 & 2013 LCD-LED TV Training Guide**
- * Samsung 2012 LCD-LED TV Training Course**
- * Samsung 2013 LED TV Basic Troubleshooting Guide**
- * Samsung 2013 OLED TV Training Guide**

All these Bonuses are inside the BONUS-B section:



Highly recommended other great related repair information for you:

With all these great repair information, it will help you in troubleshooting and repairing electronic and the other display devices: (Please click on the ebook cover to get more details)

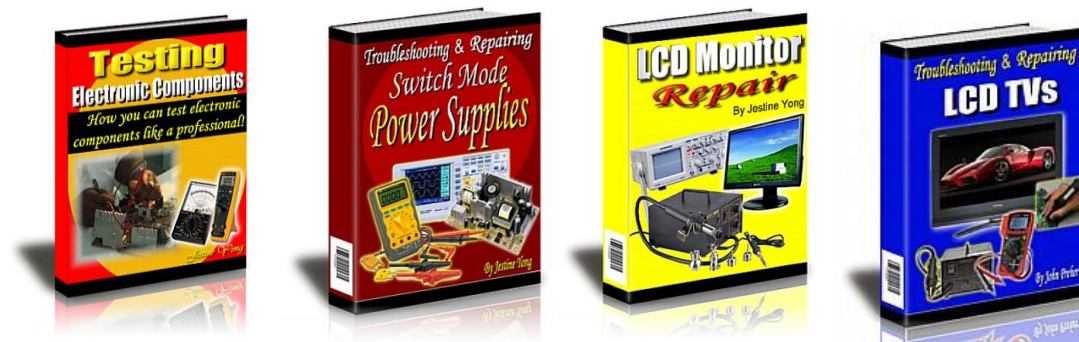
1) Flat Screen TV Troubleshooting & Repairing Ebooks:



<http://www.LCDRepairGuide.com>

<http://www.LCD-Television-Repair.com>

3) Other Great Electronic Repairing Ebooks:



How to Use This Repair Guide

1) Yes, this repair guide not only can save you time and money, it also can earn more profit from repairing LCD/LED TV. Because of LCD/LED TV has lots of the market now. And many of them are starting occur the problem now. If we can repair it, so the profit is quite high to earn.

2) Inside this repair guide, I will NOT or I will seldom to provide the repair case about the failure of “Bulged” or “Bad ESR” values of Electrolytic Capacitor/s. As a TV repairer it is a very first step to see and measure the PCB boards inside the TV. Because it is a very basic things as a repairer need to know or know how to measure it. I highly recommend using the [Blue ESR tester](#) to testing electrolytic capacitor.

3) You can choose the chapter you’re interesting to read. For example you want to know learn the new PSU Self Test Method, you can directly go to that chapter and reading it.

4) Actually all the LCD & LED TV their structure are nearly same. So we can learn the LCD/LED TV repairing information from other brands of TV.

5) I like to use the LED Strip instead of LED Light Bar. Both of these words are the same thing and same meaning. Please do not confuse.

6) All the Programmer mention in this ebook is using the RT809F Universal Programmer. For Nand Flash it is using the RT809H Universal Programmer.

7) After you finished reading this V5.0 ebook, I believe that you can improve yourself and confident in repairing the TV Mainboard without guessing it. ☺

How to Modify and Upgrade the LCD TV to LED Backlight with Step-by-Step

This is a LED and OLED generation now. The benefit to change LCD TV backlight to LED Backlight is: The TV Power saves as high as 50%~70%! The TV will be lighter in weight. When we try to do this “Modify & Upgrade the LCD TV to LED Backlight”, we can learnt more about how the LED backlight works.

This knowledge is better than just read from ebook or book. Because it is a practical experience to let us how the LCD backlight system can be change to a LED backlight system.

Before starting to do that, first we need to know:

- 1) How to do the PSU Self Test (old method & new method. The new method is in this ebook). You can refer to my V3.0 & V4.0 ebooks for more details.
- 2) How to get the necessary spare parts of this project. I will recommend you go to Aliexpress or eBay.com to buy it. (<http://www.LCDRepairGuide.com/tools>)
- 3) The knowledge on how to modify and upgrade the LCD TV to LED Backlight. Yes this knowledge is in this chapter.

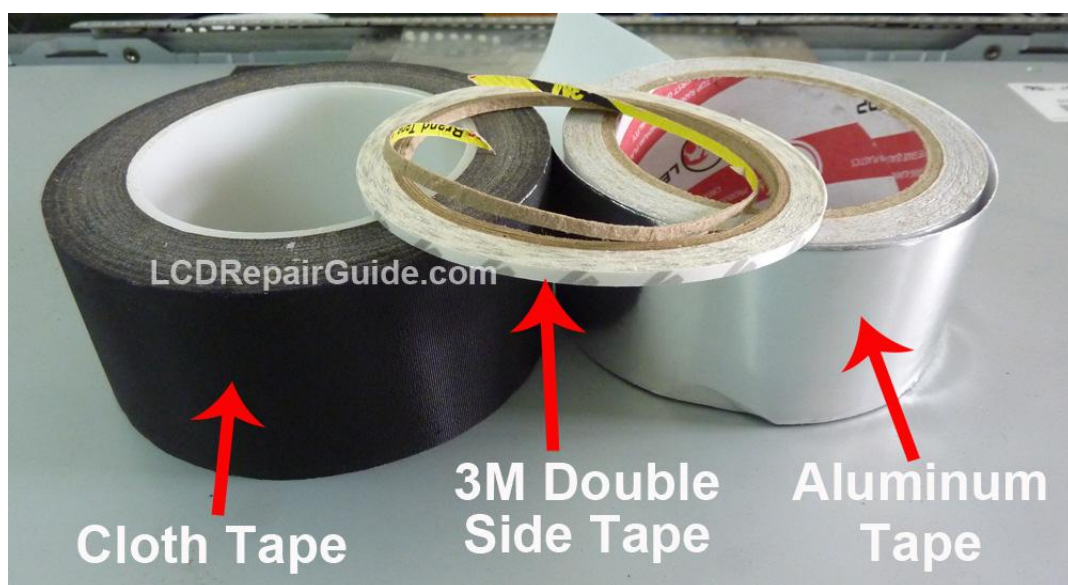


The Parts and Tools:

1) LED Strips, Universal LED Drive/Driver Board and their Cables to connect each other.



2) 3M Double Side Tape, Aluminum Tape and Cloth Tape



3) 2A DC-DC Step-up Module/Board (Optional)

Ampere Ioutput (max) = 2A (recommend use in between 1A)

Input voltage = 2V~24V

Output Voltage (max) = 28V (recommend use 26V or below)

This module can easily adjust output as: 9V, 12V, 15V, 18V and 24V.

**4) Universal LED Driver Board for 10~42 inches LED TV (Optional)**

Vin (Voltage Input) = 10.8V ~ 28V

Vout (Voltage Output) = 88V (max)

I out (Ampere output) = 480mA (typically)

Ampere output can be set in between = 10~1000mA

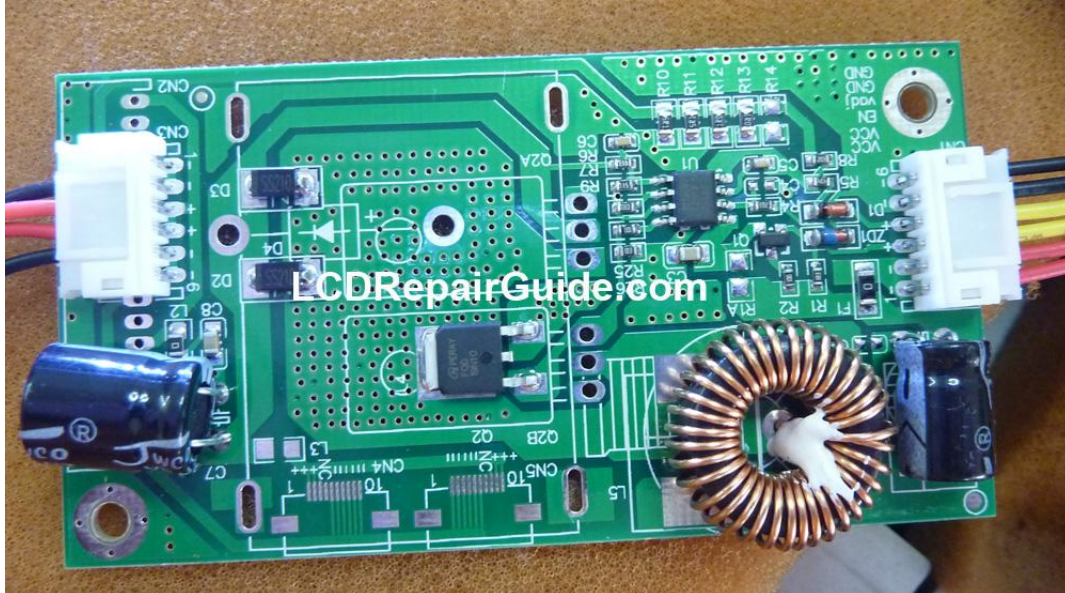
Notes: Be careful to all types of Universal LED Driver Board. Even this board wrote can support 10.8V ~24V input voltage, but their output ampere will difference as below:

When 24V input voltage (Vin): Vout= 75V, I out= 720mA (60W max)

When 12V input voltage (Vin): Vout= 75V, I out= 400mA (30W max)

* So it will affect the brightness of LED Light bulbs! That's why the PSU board if just has 12V or 13V output voltage to inverter section need to add in a 2A

DC-DC Step-up Module. But most of LCD inverter section is using 24V input. So it doesn't matter for this type of PSU board.



CN1 (input connector) = 1) Vcc, 2) Vcc, 3) EN (BL_ON), 4) Vadj (PWM), 5) & 6)= GND (Ground).

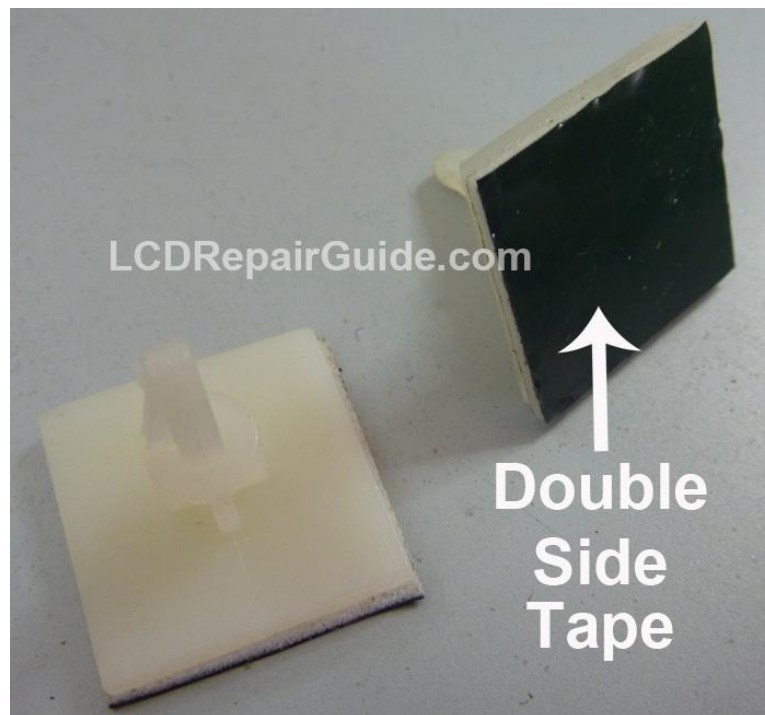
CN3 (output connector) = pin1, 2 is -ve (LED-)

= pin 3, 4 is +ve (LED+)

= pin 5,6 is -ve (LED-)

5) Accessories (Optional)

PCB Supporter or PCB Pillar => Use to support the PCB board.



6) LED Strips & LED Light Bulb Tester (A Must have tool if you repair LED TV)

This tool will let you easily testing the LED Light Bulb or LED Strip. Not only that, it will also show the voltage values of that LED light bulb or the LED Strip.



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Learn How to Modify and Upgrade LCD TV to LED Backlight

For the CCFL or normal type EEFL LCD Backlight, just removed their CCFL or EEFL lamps and replace with LED Strips. Make sure that the LED Strip size or their length is suitable for your panel. For the small inches LCD TV or LCD Monitor, most of their LCD backlight is design using Edge Light type. You need to remove their CCFL lamps from metal shield/cover of that Edge light.

So when you buy the set of LED Strip with LED Driver board, make sure that you told the seller what's type of LCD Panel is and their types of design. So that you can buy the suitable set of LED Strip + LED Drive Board to modify and upgrade your LCD TV backlight.

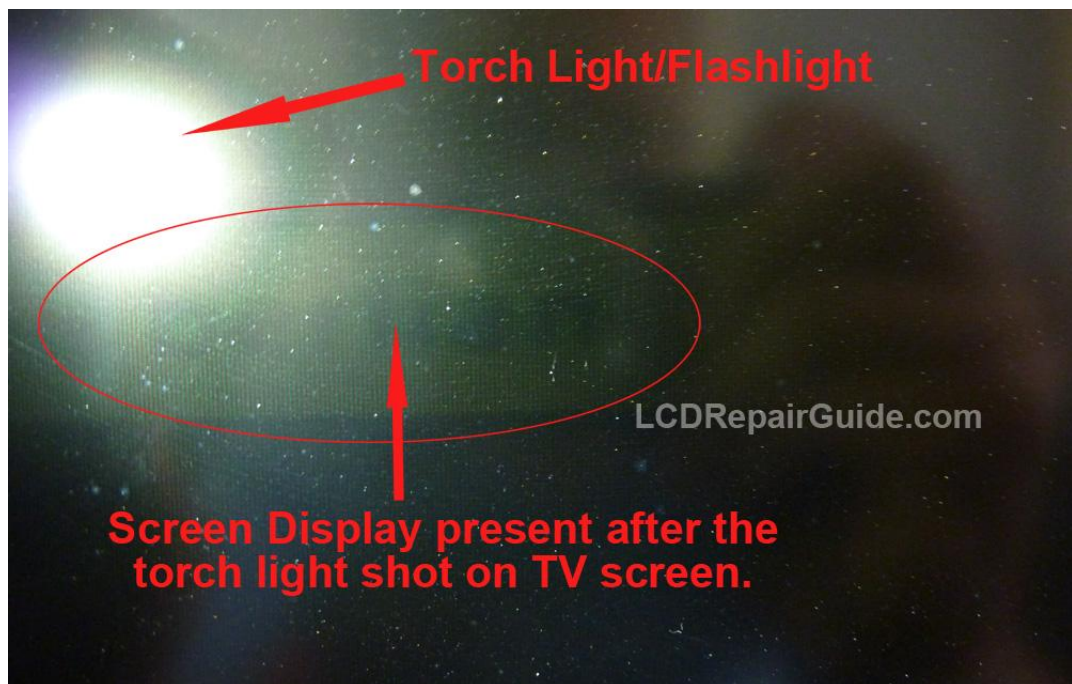
In this article, I will use the hard to modify model TV to modify and upgrade their LCD backlight to LED backlight! If you know how to modify the hard one, then the easy to modify tv model will not a problem to do the modification & upgrade!

I will show you 2 Cases, one is Fail case and another one is Successful case. So it will let you learn some good experience on how to modify the LED backlight.

A Samsung LA32R71B LCD TV complaint the problem is No Display, but sound is normal. After check the TV, the TV screen can present a darkness display.

After testing their PSU Board (that's the IP Board, Inverter + Power Supply), found the board is Ok. So the problem is in their EEFL Lamp. Next step will be dismantling their LCD Panel to checking their EEFL Lamp.

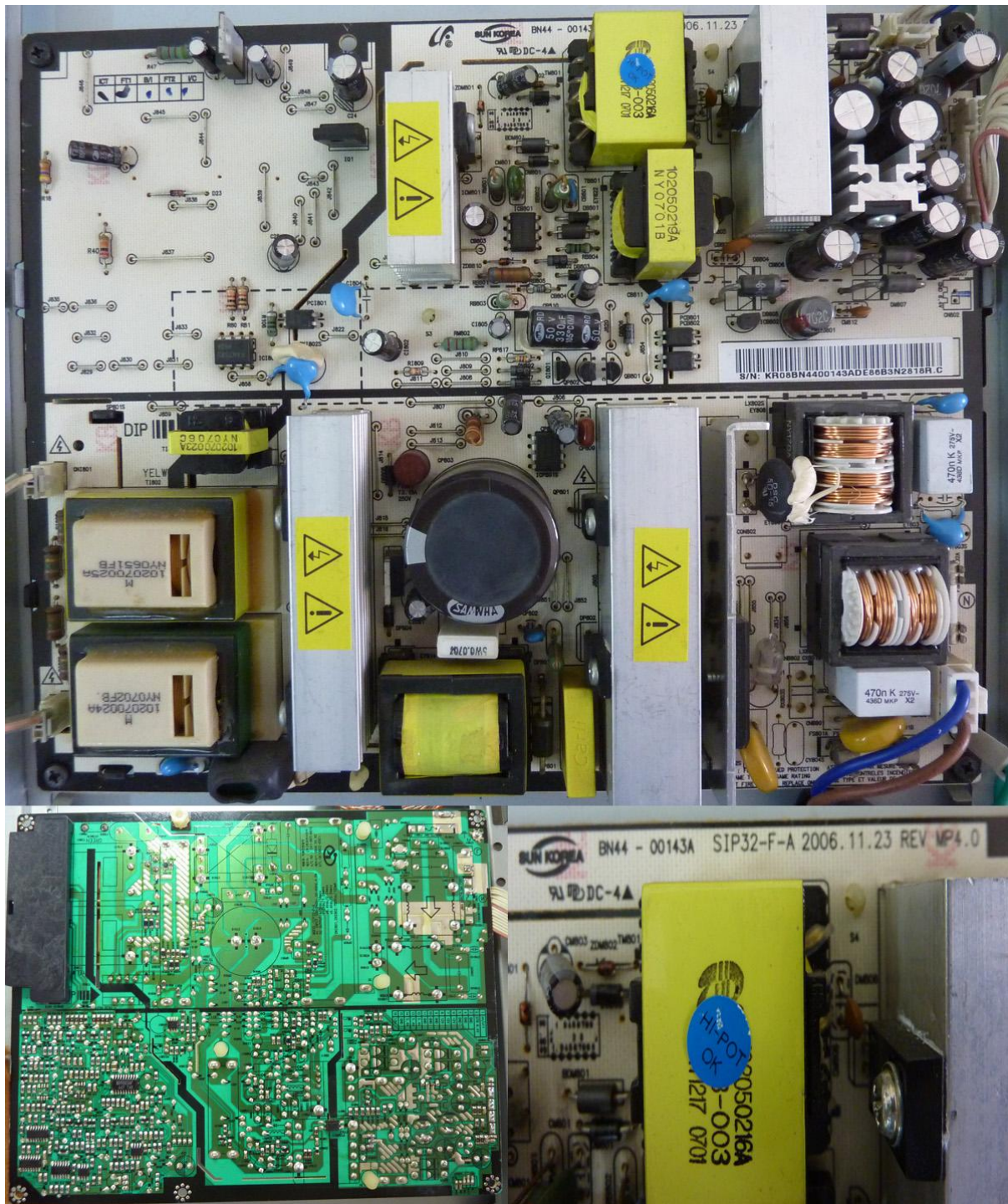
Samsung LA32R71B LCD TV with No Display Problem:



Samsung LA32R71B LCD TV rear side without the back cover:



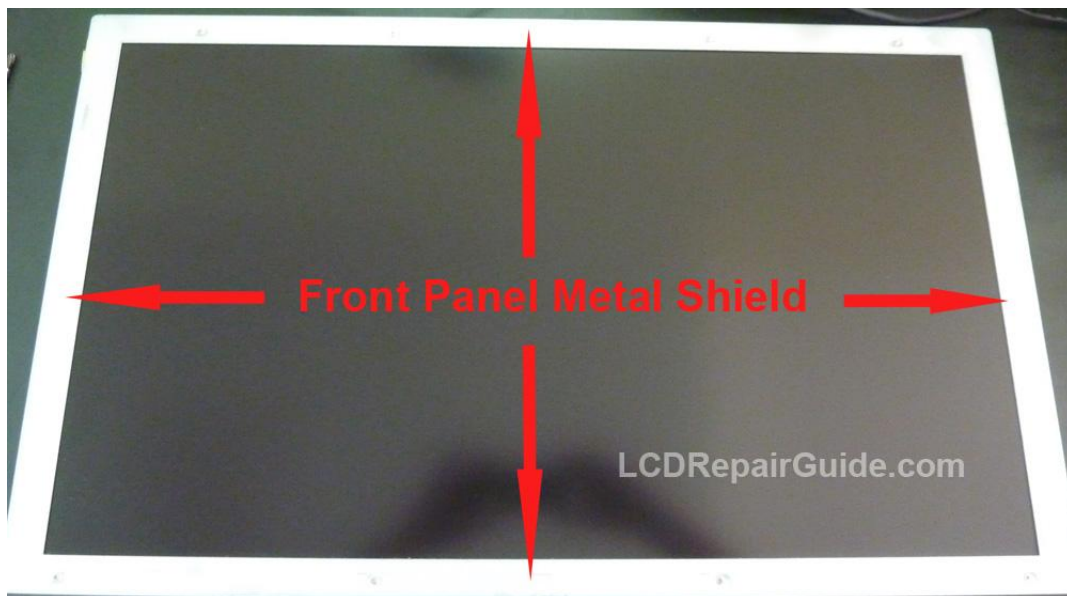
This LCD TV IP Board part number is: BN44-00143A



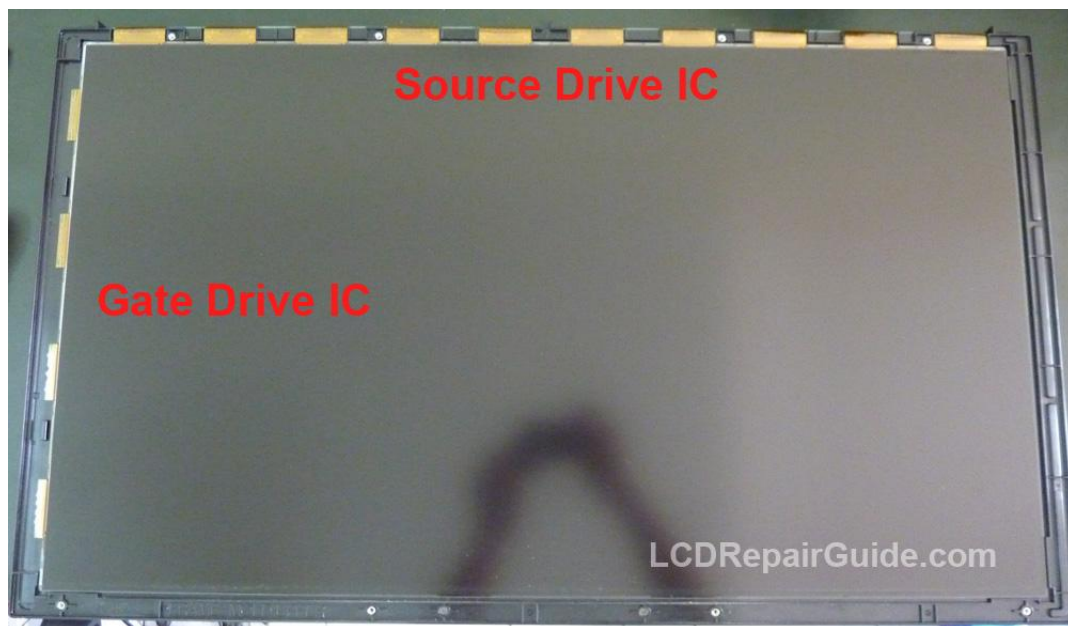
Removed all the PCB Board and dismantle the LCD Panel:



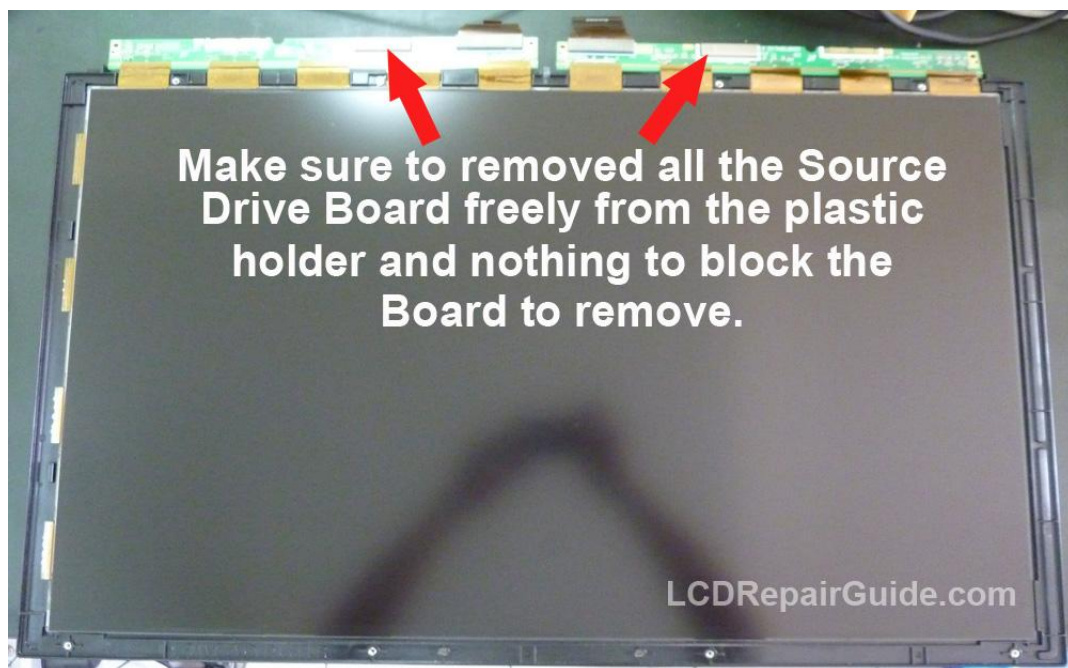
Removed the Front Metal Shield screws and then removed the metal shield carefully:



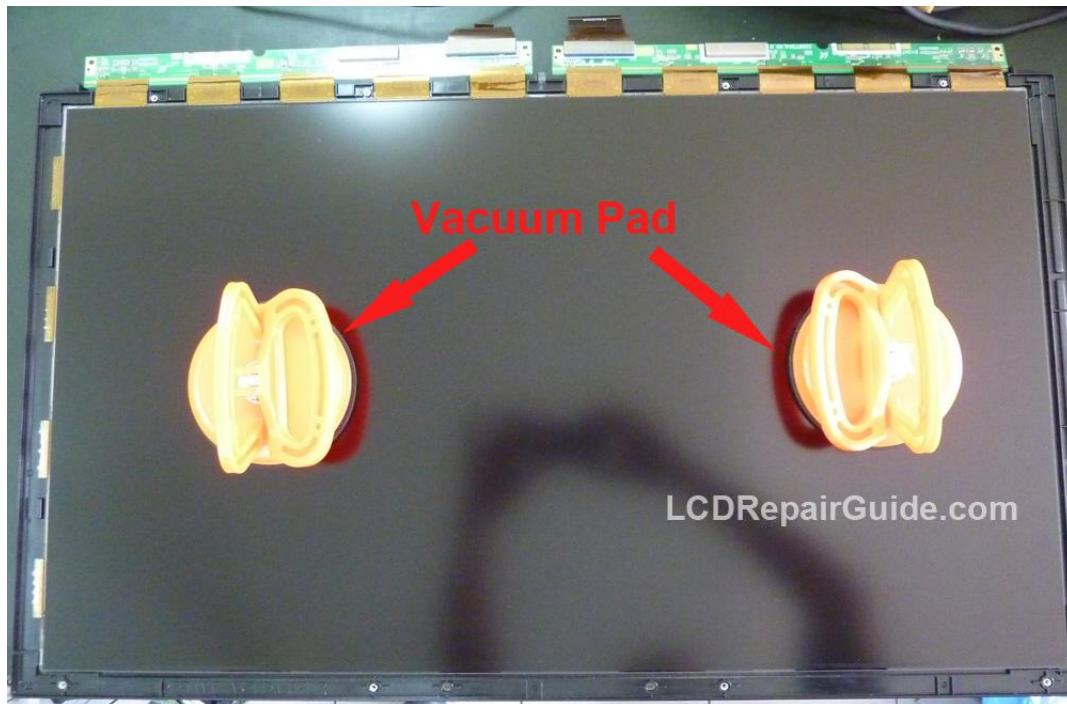
Panel Glass- After removed front metal shield:



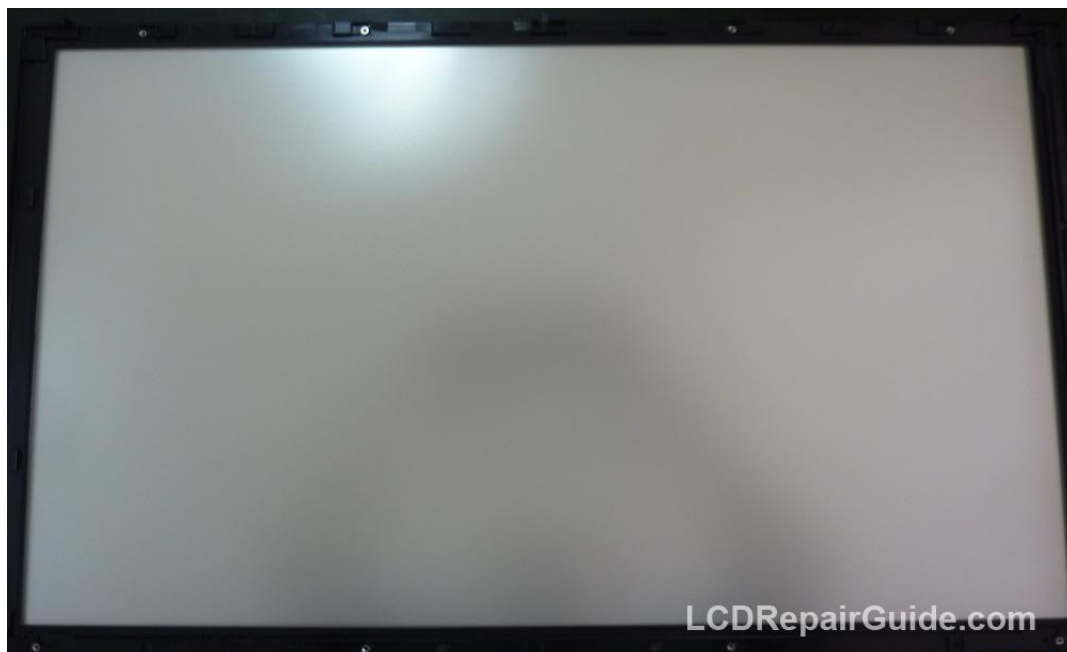
This step is important. If not It will damage the LCD Panel and causing the LCD Panel show vertical lines/bars:



Use the Vacuum Pad to safely remove LCD Panel Glass:



After removed Panel Glass, their Reflector, Prism Sheet & etc appears like photo below:



Finally, after removed the Reflector and etc their EEFL lamp is appear now:



This is a seldom use EEFL Lamp type in LCD TV:



Notes: Because of this type of EEFL Lamp, so I decided to help him to modify and upgrade the LCD TV to LED Backlight! Important thing is the customer accepts my suggestion to modify the TV.

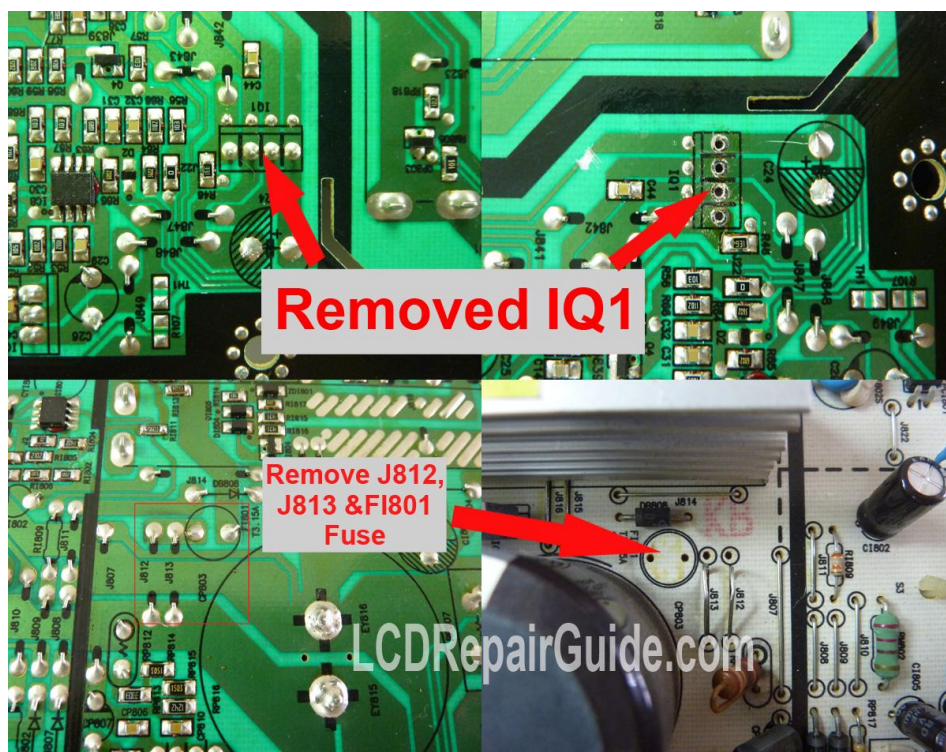
Modify Case A- Failed:

Before start to modify the LCD TV, make sure that all the parts and tools are ready to use. It will help us to do the job easily without any frustration.

Step-1:

To do the PSU Self Test first, make sure all the voltages are appears correctly. Because of this PSU board (IP Board, BN44-00143A) just output 5V, 12V and 13V only, no 24V. So its need to add in the 2A DC-DC Step-up Module to increase the 13V to 24V for LED Driver Board use. If not, the LED Backlight wills not working perfectly and their brightness is not enough.

For the IP Board, we need to bypass their inverter section first. This IP board design is supply the 13V to their IQ1 Regulator IC and supply to their inverter control circuit. And another way is supply from PFC voltage to their inverter section. So removed the IQ1, J812, J813 and FI801 (T3.15A 250V fuse), their inverter section will stop work.



Step-2:

The Universal LED Driver Board needs these voltage line and signal lines to operate. They are:

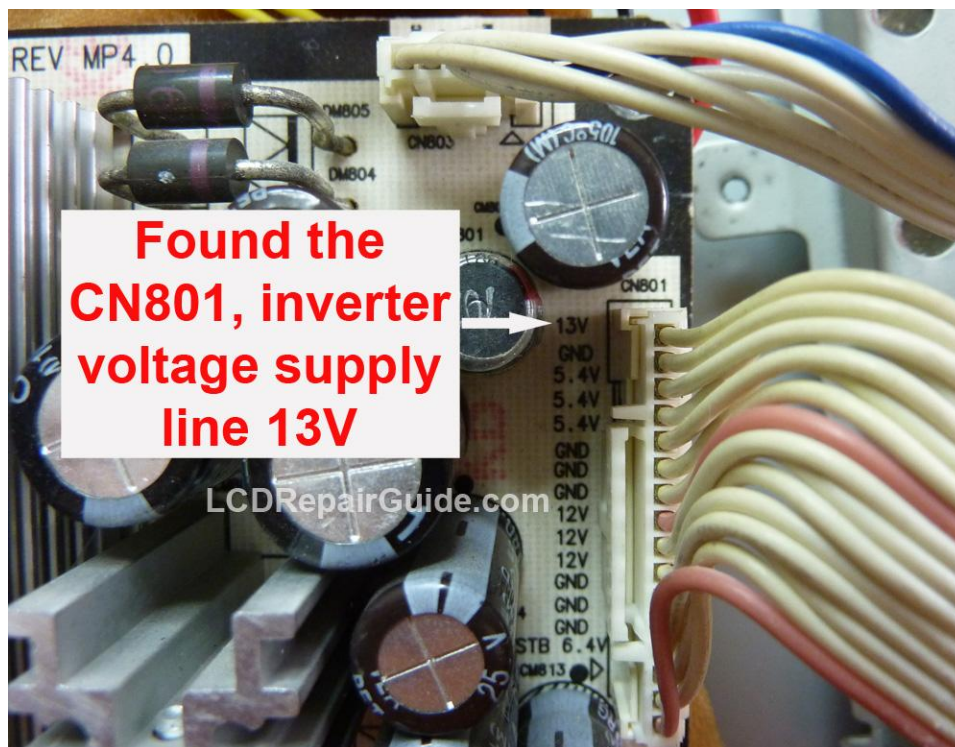
- 1) Vcc (Depend on the Universal LED Driver board their input voltage requirement)
- 2) GND
- 3) EN => same as BL_ON, SW and etc
- 4) Vadj => same as PWM, P-DIM, ADJ and etc

So find out these lines from the original IP board like photo below:

Found PWM and SW pins:

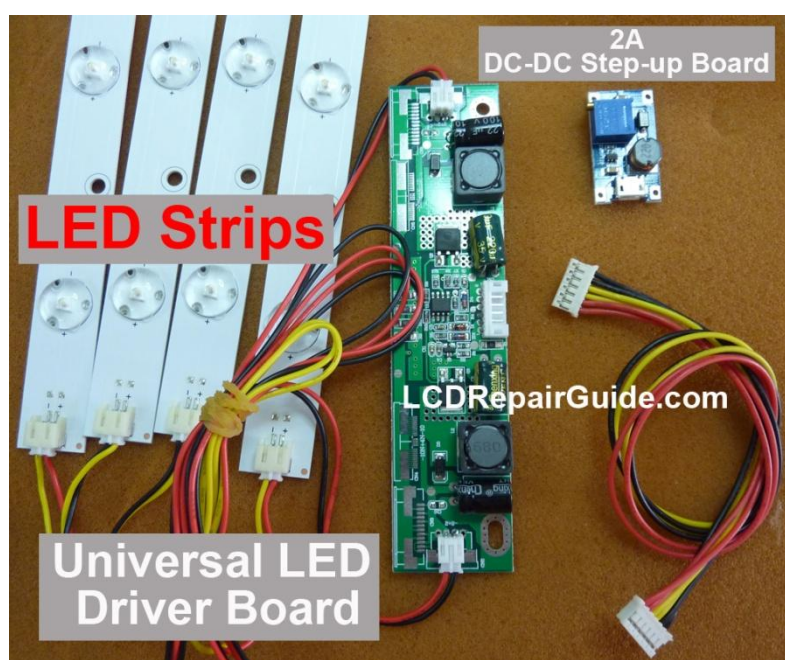


Found the Inverter supply voltage line-13V:



Step-3:

After found all these voltage and signal lines, we can start to modify the circuit now. Prepare the Universal LED Driver Board, LED Strips and the cables supply by the seller.



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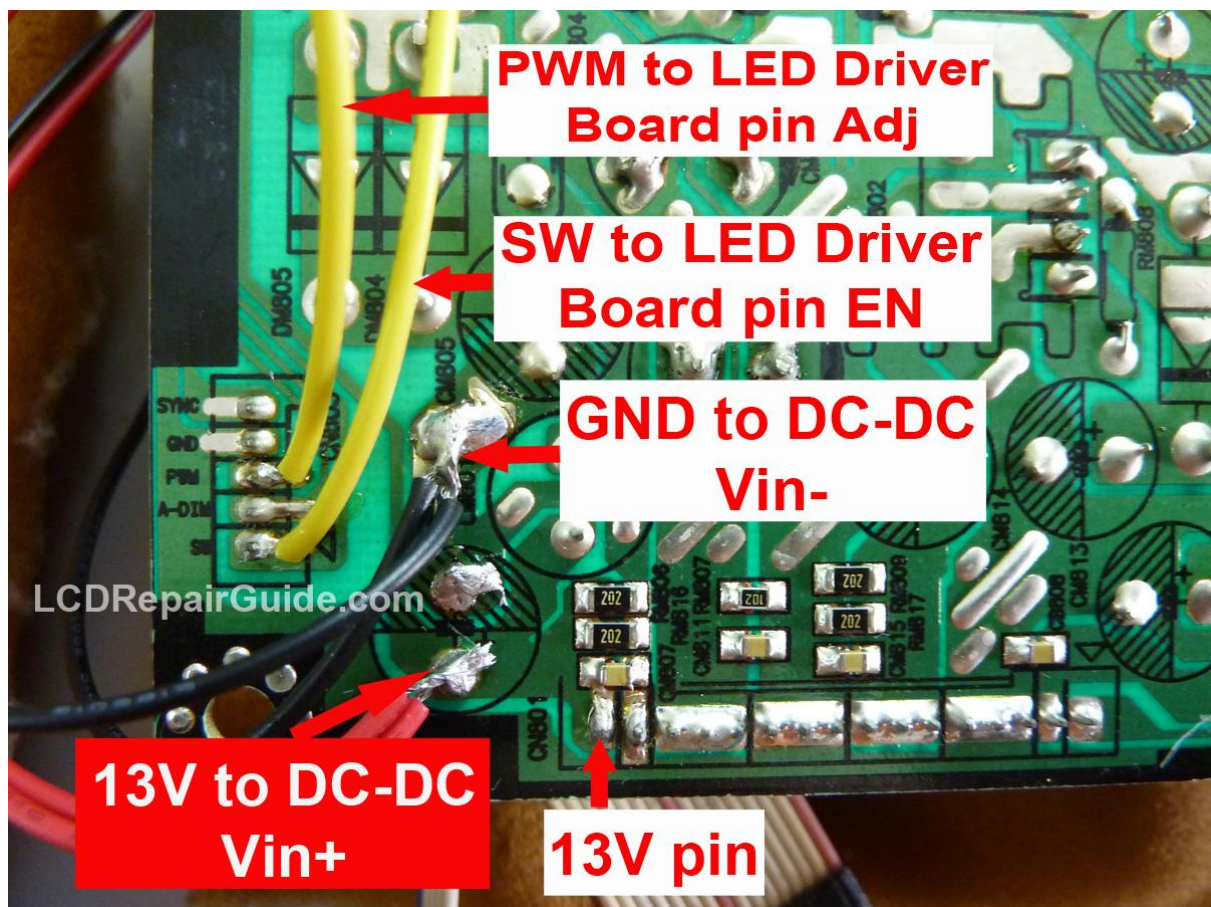
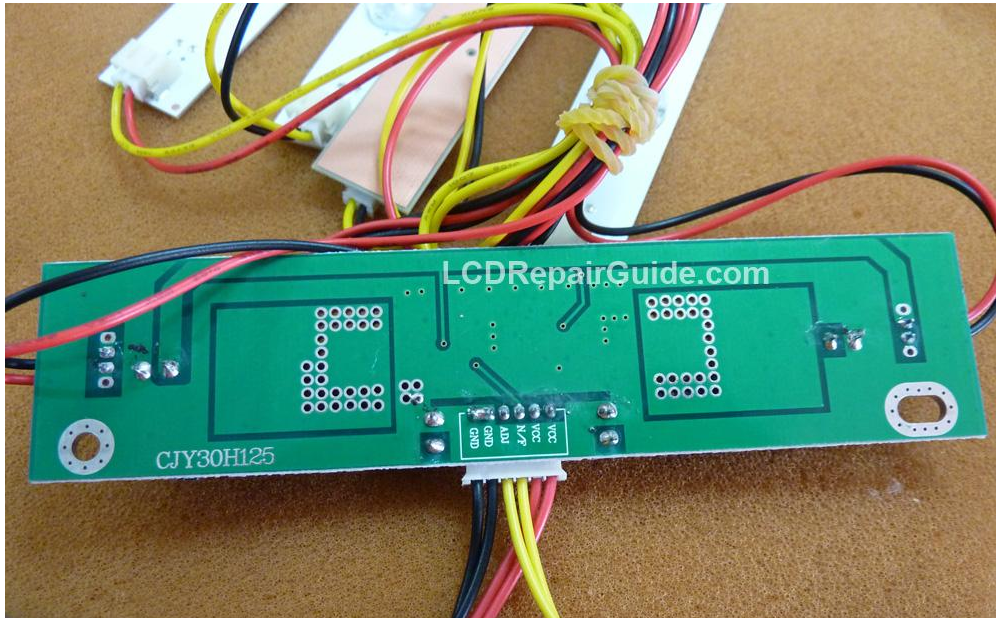
Also prepare the 2A DC-DC Step-up Module to set the output voltage to 24V. Connect the Module input voltage from IP board 13V supply. After that use a screw driver to adjust it until the voltage output reach 24V like photo below:



Connects the LED Driver board Vcc pin to 2A DC-DC Step-up Module OUTPUT+, GND connect to OUTPUT-.

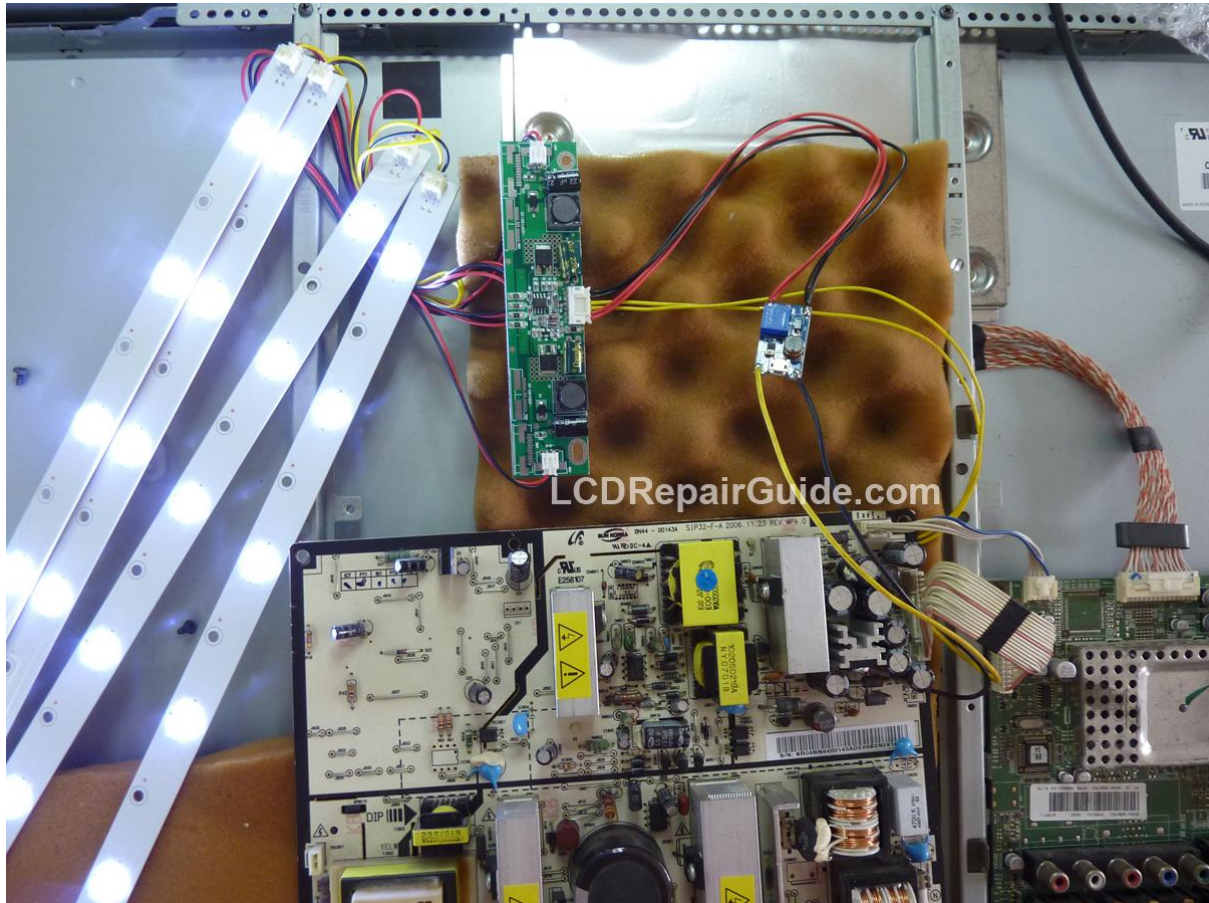
IP Board/PSU pin-13V supply connect to DC-DC Module Vin+, GND connect to Vin-.

After that connect the LED Strips to LED Driver Board



* Please check all the connections are connected properly. Especially DON'T wrong connect their supply line! If not, it will damage the LED Drive Board or IP Board. Also make sure that DC-DC module is output 24V!

If everything is ok, then we can try to power on the TV and see the LED Strips working or not.



Yes, the LED Strips are all working now. So the next step to be put all the LED Strips x4 into the EEFL Lamp there.

Step-4:

This step is to think how to put all the LED Strip into EEFL Lamp there. Also their cables need to manage it too. Because the cable some is long and some is a bit shorted.

After saw the situation in Panel and the EEFL location, decided to put the LED Strips all above the old EEFL Lamp there. Because the Panel Pillar there have some space to put it in. So try to do it now.

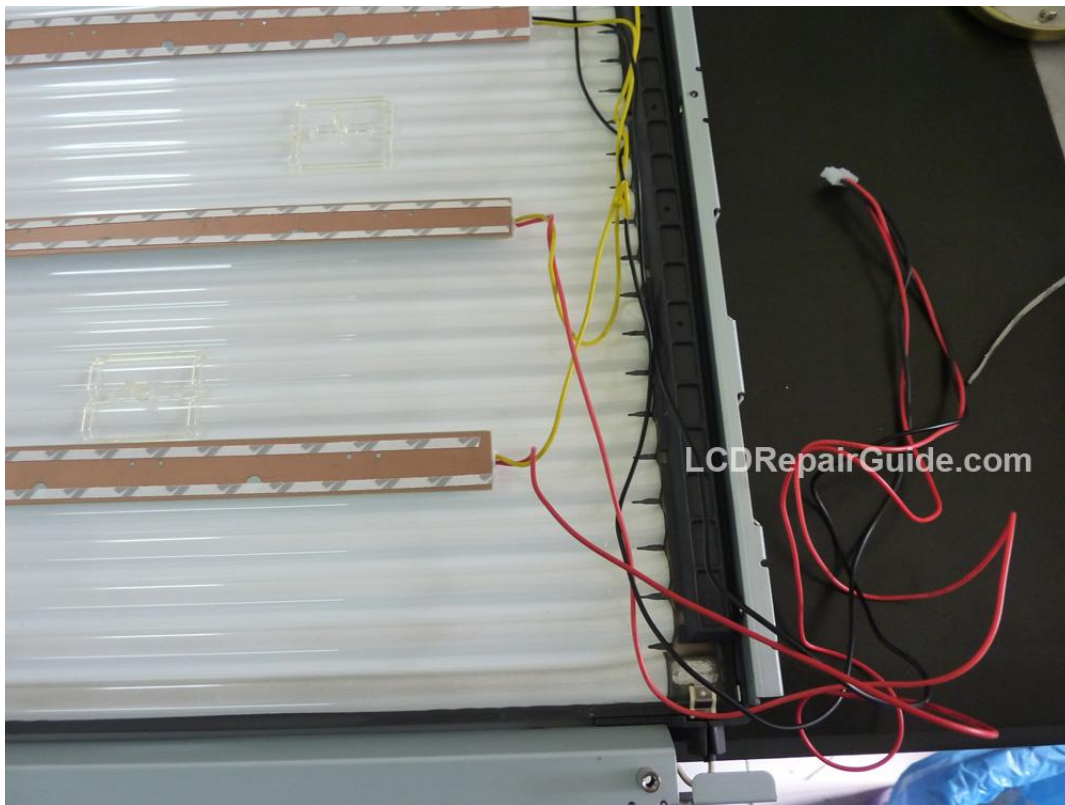
Temporary put the LED Strip on EEFL Lamp and balance their distance in between the LED Strips:



When everything is Ok, put the 3M Double Side tape below each LED Strips.



This is time to manage or tidy the wire now:



Use the Cloth tape to tidy wire like photo below:



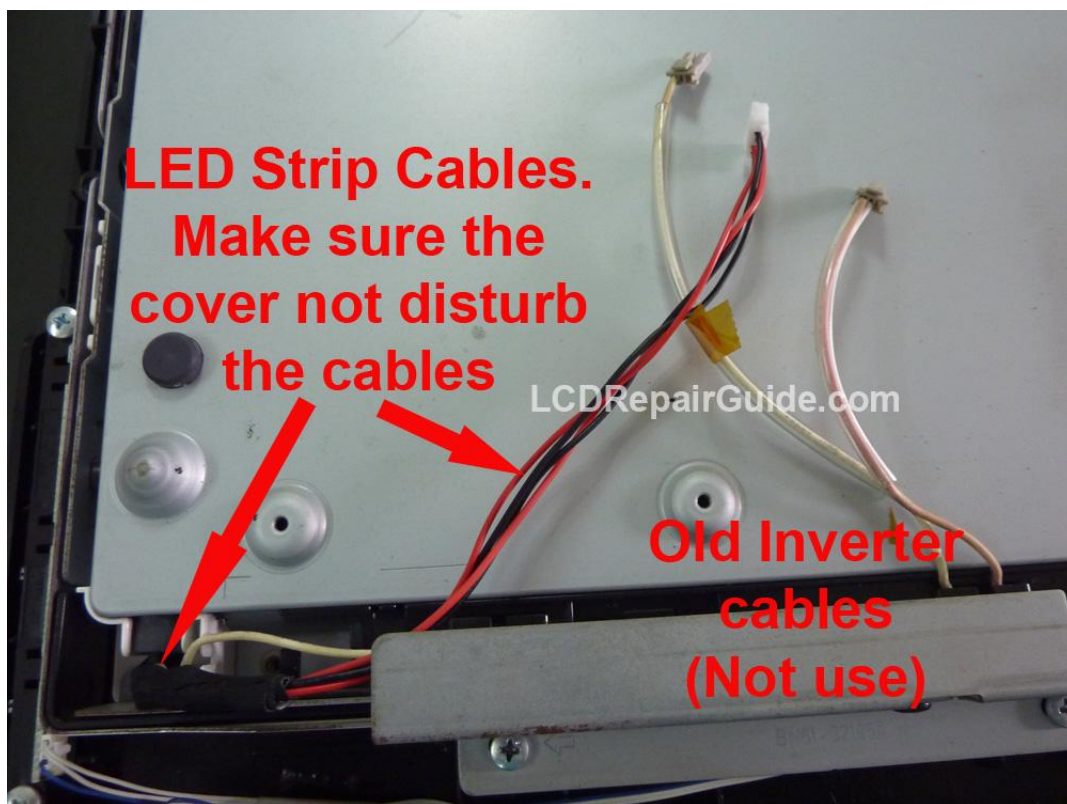


Notes: Please don't use too much cloth tape on the wire/cables. Because the space inside have limitation in between Panel and EEFL. So don't put too much tape until the plastic and front metal shield cannot close it properly.

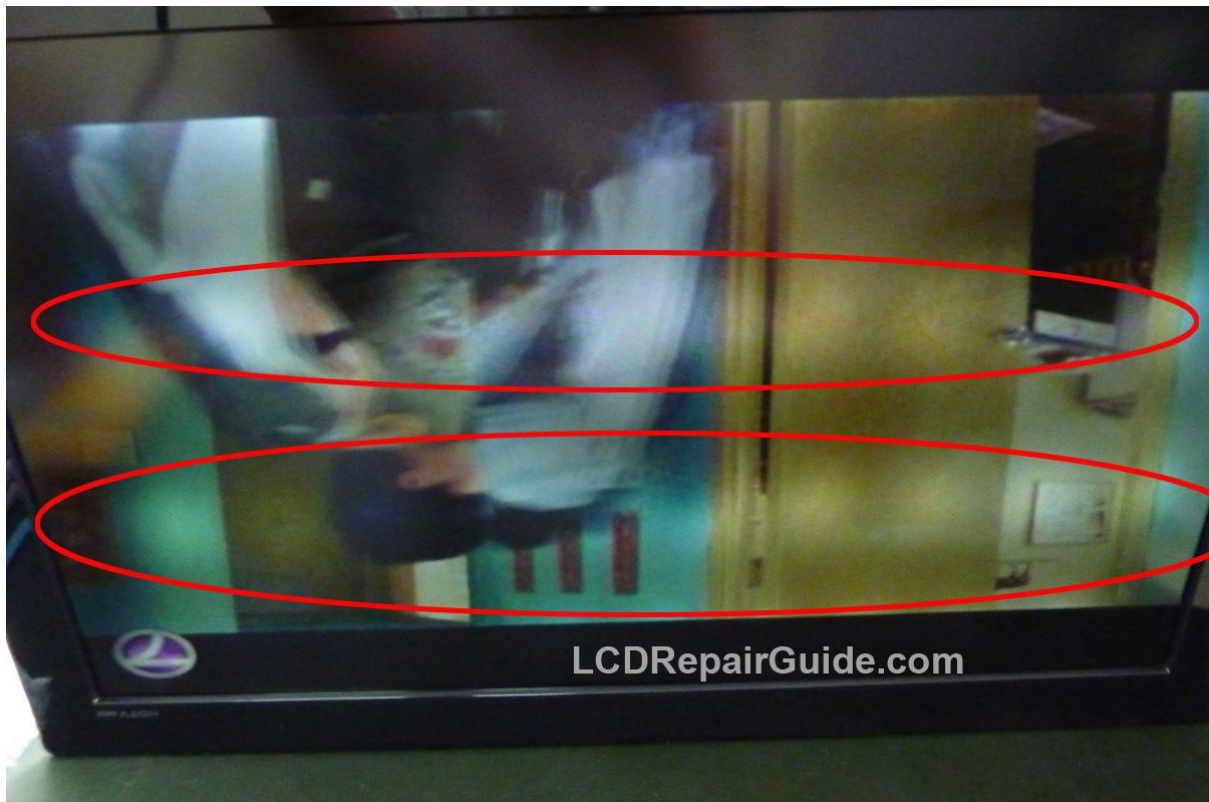
Removed the 3M Double Side tape paper and stick it on the EEFL Lamp. Also use the aluminum tape to close all the cables:



This is the time to put back all the Reflector, Prism Sheet Plastic cover and Front Metal Shield and etc. Make sure when close the plastic & metal cover not disturb the LED Strips cable.



Connect back all the PCBs to TV. Power on the TV now:



OMG! The result is failed!

Analysis the problem now:

1) Why the screen can saw all the LED light bulbs brightness?

Answer: It could be the LED Strip put too near the Panel Glass and causing this symptom on the screen.

2) Their total brightness for the screen it not good and bit darkness compare to the normal TV brightness?

Answer: The LED Driver Board and ADJ signals, also MENU setting for brightness and contrast also try already, but still same problem. Looks like the LED Driver Board cannot supply enough Ampere for the LED Strips to provide more brightness from it.

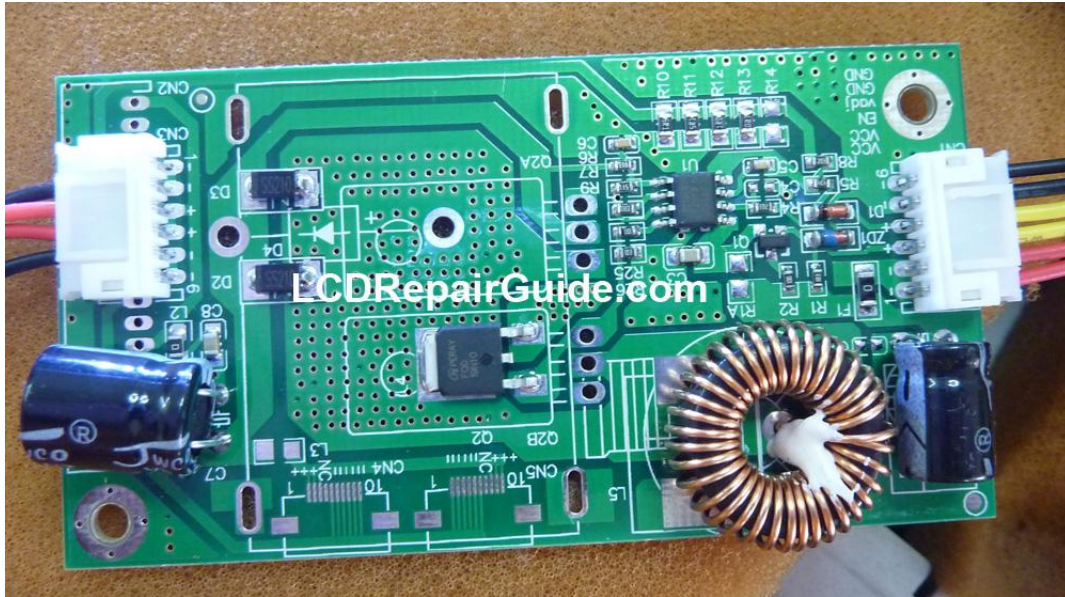
Solution:

1) Removed the old EEFL Lamp and other unnecessary parts inside the panel. So the LED Strips not to put too near the Panel Glass. One more thing, if the LED Strip put too near the Panel Glass, it will damage the LCD Panel Glass rear polarizer film on the future. It is because of the heat generated by the LED Strips!

2) The 4 x LED Strips is not enough to provide the good brightness to Panel. So will planning to put about 6 x LED Strips inside the Panel. The problem is that seller selling this LED Strips Kit set is just for 4 x LED Strips only and not support to 6 x LED Strips. So I will plan to replace another Universal LED Driver board to support 6 x LED Strips.

Modify Case B- Successful:

Follow by the Case A steps 1 to 3. Replace another LED Driver Board like photo below:



Remove the old EEFL Lamps and other unnecessary parts inside the Panel. Also add in total of 6 x LED Strips inside Panel. Please check the new LED Driver Board connector pins and then change it to suitable for this board. When everything is ok, power on the TV now:



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Same as the previous steps on Case-A steps 1~4, but this time it will stick the Panel Back Metal Cover with Aluminum tape as photo below:



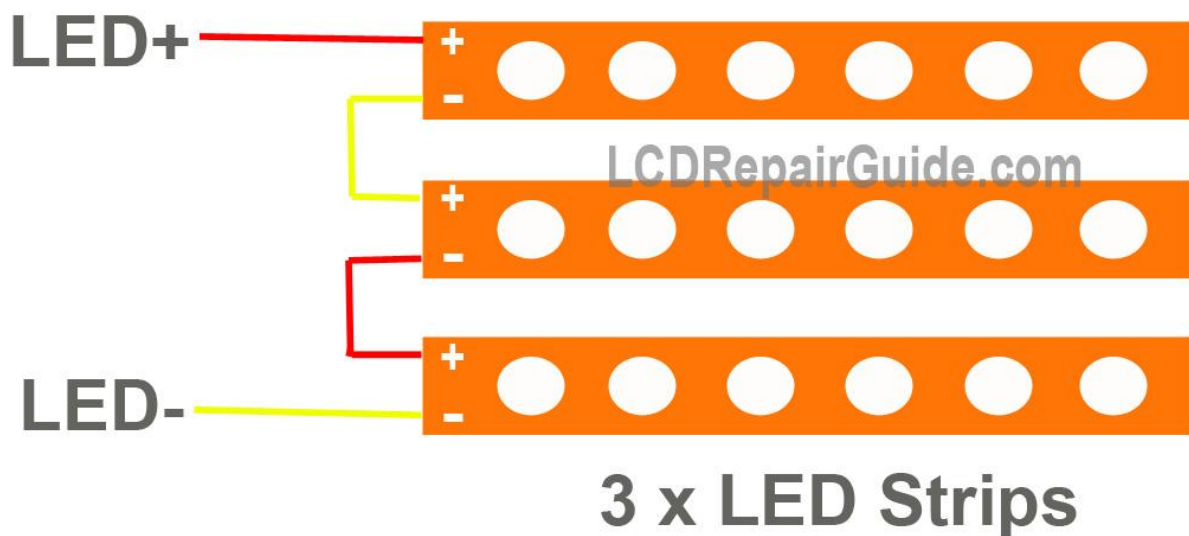
How to Connect from 4 x LED Strips to 6x LED Strips?

This is a good question! How to modification the LED Strip connection from 4 x LED Strips to 6x LED Strips.

Because of this LED Driver board just supply 2 x LED+ Channel only. So their LED Driver Board specification is 88V (max), that's mean each Channel of LED Strip cannot reach or over 88V (but recommendation for this board is just 75V [max]). If we want to add in total 6 x LED Strips, that's one channel is 3 x LED Strips. And these 3 x LED Strips total loading voltage cannot exceed 75V!

After connected the 3 x LED Strips, use the LED Tester I've shown on this ebook, measure their voltage. So you know that it is below 75V or exceeded. If below 75V, we can use this Universal LED Driver Board to use 6 x LED Strips!

The LED Strips connection from 2 to 3 x LED Strips is like below:

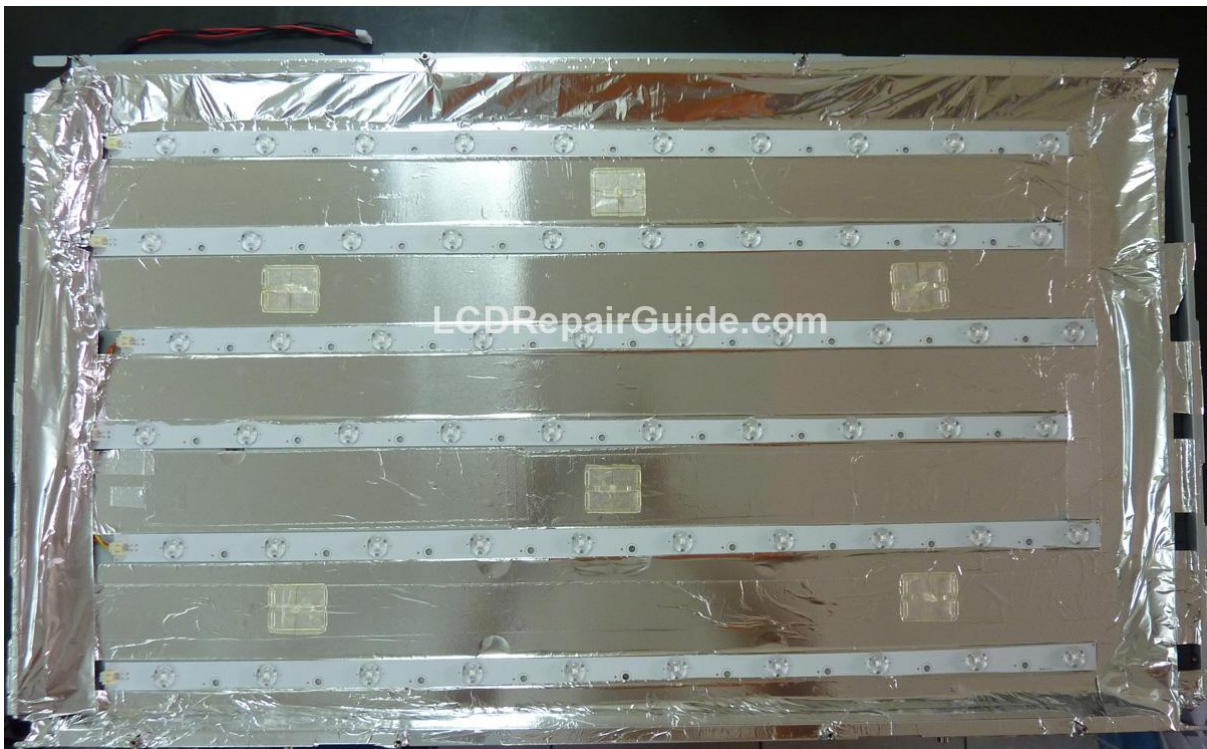


So one channel is 3 x LED Strips, 2 channels is 6 x LED Strips now.





Make sure to put back the Panel Pillar in the Panel. Because it is help to support the Panel and also has a distance in between Panel Glass & LED Strips.



Put back all the Reflector, Prism Sheet, Plastic Cover, Metal Shield, PCBs & etc to the Panel.

Find a location to put the LED Driver Board and the 2A DC-DC Step-Up Module for TV:





Finally, all the PCB boards are put back to the original place. The extra board like 2A DC-DC Step-up Board and LED Driver Board are fit like the photo below:



This is the time to testing the TV now! Check everything is ok and power on...



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Yes, finally this TV is Ok to use now! The customer also happy to own an LED TV now! ☺



Notes:

Make sure to find a good seller can provide the correct information to you. Sometime they will help you to provide a good idea or info to help you modify the TV successfully.

When buy the LCD upgrade to LED Backlight Kit set, I will recommend to buy 2 sets. Because the new Universal LED Driver board sometimes will not work! I think it was because of their manufacturer QC issues. So just buy it with smart and enjoy the modification of your new LED TV! ☺

How to Programming the LED/LCD TV Mainboard Correctly

I've received lots of members email said they're hard to learn how to programming the TV Mainboard. So this article will let you learn some of the basic information on how to programming the LCD/LED TV Mainboard correctly.

IMPORTANT & WARNING!!!

Before to do the **Read/Write** memory IC or MCU, or I call it as “**Programming**” action to the Main Board or Memory IC, please **BACKUP** the old & original firmware/data first!!! This step is very important and serious thing. But most of the repairers are lazy to do that.

So when occurs the new programming problem in their TV Main Board or memory IC and they did not backup the original firmware, they will cry...Yes, this is not a joke, it is happened too often. No matter what brands or models of their Programmers, you must train yourself to do that first.

One more thing, please use the Programmer original supply cables (VGA & USB). Don't modify their length of the cables. It will affect the programming or Read/Write data in memory IC. Especially do the ISP Programming.

Not All the Memory IC or MCU Chip Can Support by the Programmer

Before you want to programming a memory IC or MCU (Micro-Controller Unit) chip, you must check your Programmer Supported IC List first. Yes, even the Programmer seller said it is a Universal Programmer, but it cannot support all types of memory IC and MCU Chip, it will depends on the model of that Programmer. So you need to check by yourself which Programmer is suitable to use in your jobs.

If you want to update the TV firmware version, just go to the TV Brand official website there to download their latest firmware and follow their instruction to update.

In this article and other chapters, I will use this Universal RT809F ISP Programmer (<http://www.lcdrepairguide.com/tools/>) for your reference.



3 Types of Programming Method for LED/LCD TV MainBoard

Actually they have 3 types of Programming Method for TV Mainboard. They are:

- A) Online Programming
- B) Offline Programming
- C) USB Pendrive/Thumbdrive

Here is the description of these programming methods:

A) Online Programming

- 1) Online Programming also called as ISP Programming (ISP= In-System Programming).
- 2) This type of programming method must supply the voltage to TV Mainboard to be successful Read/Write their memory IC or MCU chip.

- 3) With Online Programming/ISP Programming, you can easy to read/write the TV Mainboard without to remove their IC or Chip from the Board.
- 4) Some of the Mainboard Design need to login to their Service Mode to open the ISP feature first. After that the programmer can do ISP Programming to their Mainboard. Especially the some of the MST Chip solution Mainboard using in Konka, TCL TV. For example the Konka LC32ES62 TV.
- 5) PROS & CONS for Online Programming: It is save time to do the Read/Write action to memory IC or MCU chip. Because we don't need to remove that IC/Chip from the Mainboard, after that need to solder it back to Mainboard too. But the CONS is their Read/Write data some time will not accurate! That's why I will recommend the repairer when using the ISP programming, need to do at least 2 times to Read or Write their data, after that compare their "Checksum" values is same or not. Be careful for the TV Main board design where their User Menu data will save in the flash memory there. So every time restart the TV, their Checksum values will difference.

B) Offline Programming

- 1) Offline Programming is to removed the memory IC or MCU Chip from TV Mainboard and put it in the Programmer Adapter to do the programming.
- 2) This type of programming no need to supply voltage to Mainboard.
- 3) All types of the Programmer can do this type of Programming.
- 4) PROS and CONS for Offline Programming is their Read/Write data is high reliability than Online Programming. When the memory IC/Chip damage, it can easily to detect it by Offline Programming method. But their CONS is too much trouble to remove the IC/Chip from Mainboard. After that need to re-solder it back to Mainboard. Some of the repairer because of this thing and damage the Mainboard circuit lines.
- 5) But the good news is it has a special tool to ignore to remove the IC from Mainboard. This tool is: IC Clip. But it is not for MCU Chip. The IC Clip like the photo below:



C) USB (PenDrive/ThumbDrive)

- 1) The TV can use USB Pendrive as a memory the Mainboard firmware. After that follow the instruction to insert it into the TV USB port to update their firmware.
- 2) This method just for add in new software features or correction some small problem through update their firmware by USB Pendrive.
- 3) This method need to supply voltage to their Mainboard to perform their firmware update.
- 4) If the TV or Mainboard not working, this USB method cannot be use.

How to Programming the LED/LCD TV Mainboard

Inside the LED/LCD TV Mainboard, they have several types of memory IC and MCU chip. Below are the types of memory IC in TV Mainboard:

1) 24 Series Memory IC (seldom use 93 Series Memory) use in:

=> EEPROM, HDCP EEPROM and EDID (DDC) EEPROM

You can use the RT809F doing Offline Programming to Read/Write their data into the memory IC.

2) 25 Series Memory IC use in:

=> Serial Flash Memory IC

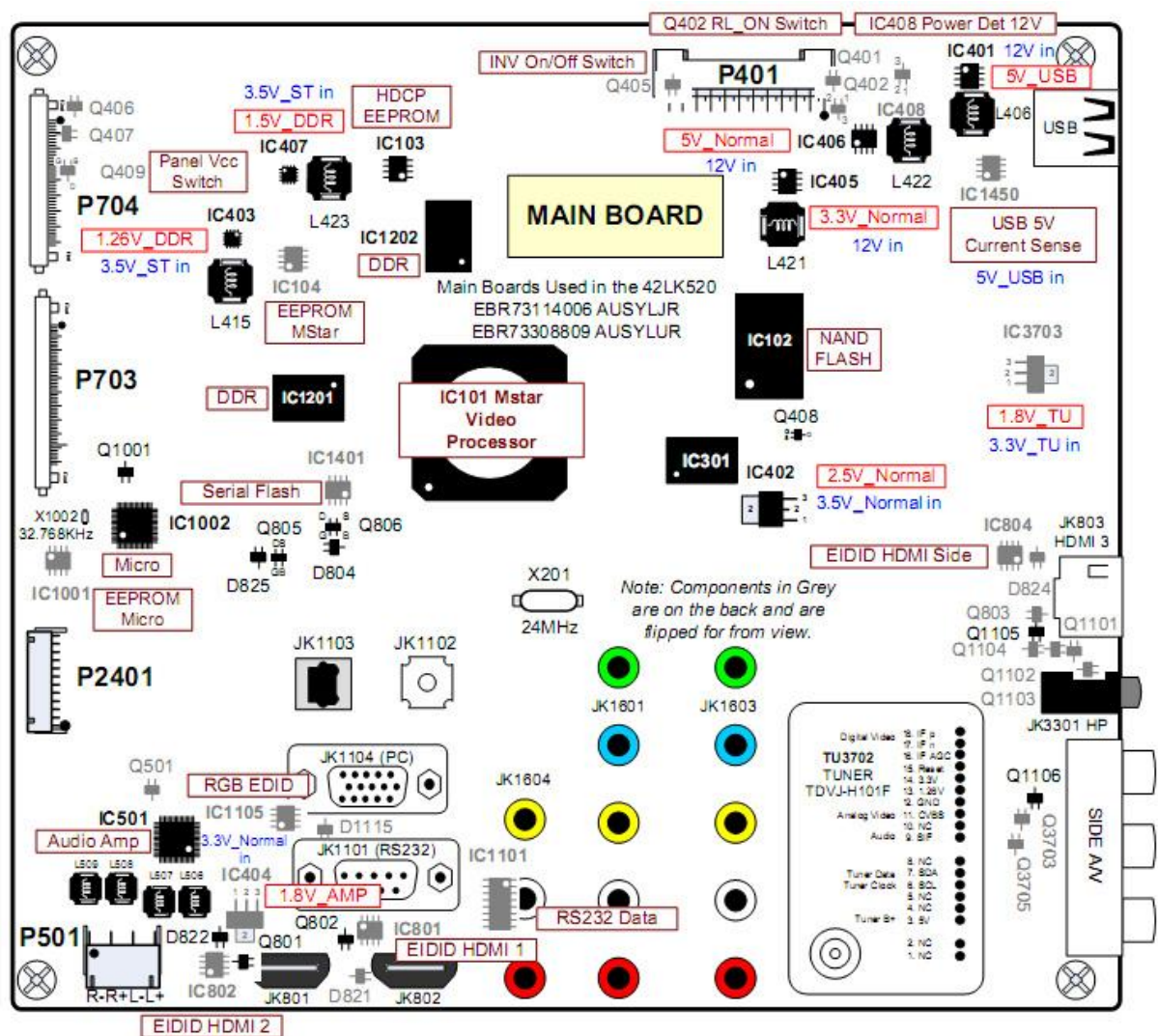
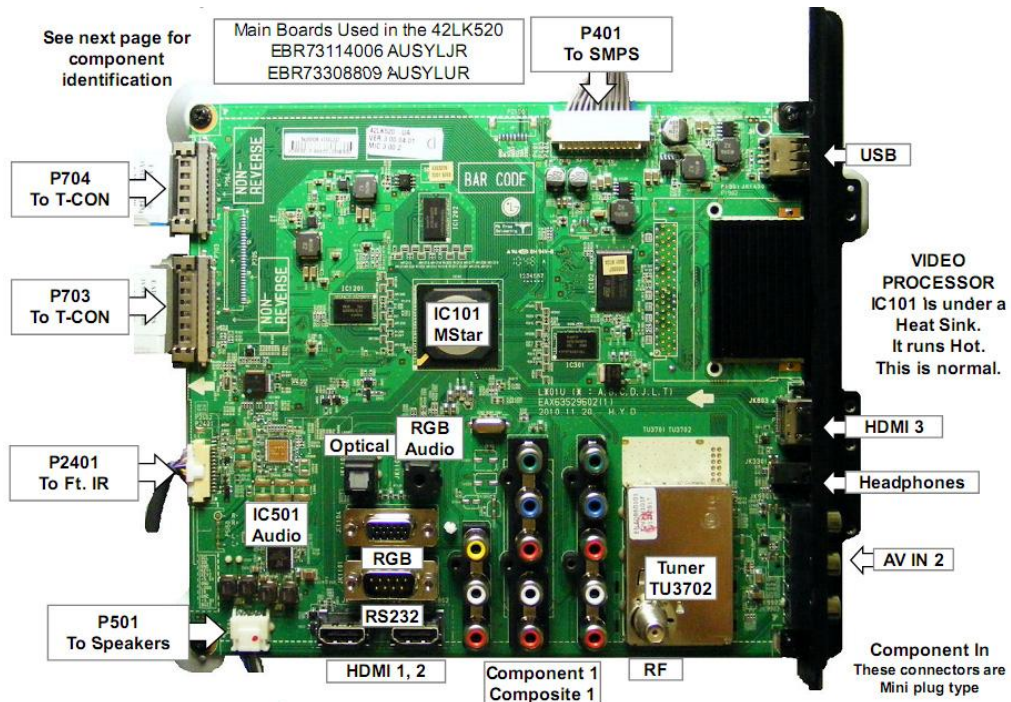
You can use the RT809F Programmer to do Offline Programming or Online Programming to Write/Read data into this Flash Memory IC.

3) H27Uxxx, K9Fxxx, TC58NVGO & etc Series Memory IC use in:

=> NAND Flash Memory IC (some older TV will use NOR Flash & eMMC)

You can use the RT809H Programmer to do the Offline programming to Read/Write their data into the memory IC.

Below is LG 42LK520 LCD TV Mainboard Layout:



Why you need to programming the TV Mainboard? Because the TV is can't start-up problem, so I want to try programming the Mainboard and solve the problem. Or I want to copy their firmware to prepare future use. These two answer is most of the TV repairer gave.

Q1: How to Programming the TV Main Board?

A1: Normally the Programmer when using the ISP (Online programming), it will go to detect their Flash memory. The flash memory is mean of the external 25 series Flash memory IC on Mainboard. So the Programmer software will shows like 25 xxx detected and prepare to Read or Write command.

Actually we can remove the 25 Series Flash Memory directly from Mainboard and to do the Offline Programming to Read (Copy) their firmware/data from the 25 series Flash Memory IC. And then save the firmware into the computer/laptop prepare for future use.

Q1: How to Copy the Firmware from Main Board?

A1: Like a said on the above, you can remove the 25 series Flash Memory IC from Mainboard and to do the Offline Programming. After click on the Programmer Software button "Read" (Copy) the firmware from 25 series Flash Memory IC, and then save it into the computer/laptop.

Notes: Most of the time (about 80%) to using Programmer on TV Mainboard is because of the TV Mainboard Can't Start-up the TV. Excluded the hardware problem in Mainboard (like regulator IC, crystal, reset circuit & etc, for more details, please do refer to my V3.0 & V4.0 ebooks), so the higher chances is their 25 series Flash Memory firmware corrupted or the 25 Flash IC defective.

Also don't forget their NAND Flash IC. It also can cause the TV can't start-up. If you want to programming the NAND Flash memory IC, please do carefully, because some of the NAND Flash IC need to programming their MBOOT or BootLoader first, after that is the main firmware for that NAND Flash Memory IC. Also for programming the NAND Flash, you need choose a Pro Programmer to support this type of memory IC.

How to Programming the Universal TV Mainboard



When we change a new Universal TV Mainboard to a TV, we need to change the firmware to suitable of the TV Panel model. If not, the TV will no display, funny color and display & etc occur.

So the Universal TV Mainboard has their own firmware list to suitable different Panel. If you buy a new Universal TV Mainboard, make sure to tell the seller your TV panel part number. After the correct version and panel types firmware is ready, just copy that file into the USB Pendrive and follow the instruction to update the firmware to the latest one to suitable the TV Panel.

Some of the Universal Mainboard is built-in the different Panel type firmware. Just follow some instruction to change the Panel type without using Programmer or USB update.

How about the Universal TV Mainboard firmware failure?

If this is the problem in this type of Mainboard, you need to use the programmer to do the offline programming to their flash memory IC. Most of the time, you can solve the problem easily if you've got that Mainboard firmware.

Where to Find or Get the TV Firmware?

Before programming the firmware, make sure these firmwares you get are the same as your TV:

- 1) TV Model
- 2) Mainboard Part number (Important)
- 3) Panel Part Number (Important)

* For example: If the firmware has the same Mainboard Part number but not the same Panel Part number. If that Panel part number also shows the same inches Panel, then you should give it a try. Make sure that you backup your old/original firmware first!

You can get the TV firmware from:

- 1) **Forum website**- Ask the member who has that model TV, Mainboard part number and Panel part number firmware.
- 2) **ASP Site**- If you're the Authorized Service Provider, you can get the firmware version from the company.
- 3) **Universal Board Seller**- If you bought the Mainboard from them, you must ask them to provide such firmware to use.
- 4) **Find Website Selling this Firmware**- I found that some of the websites they are selling the TV firmware. But the model is not much to choose.
- 5) **Ask Your Local Repairer/Friend**- Normally the repairer they will backup some local TV model firmware to prepare for future use.
- 6) **Find a Working TV Mainboard and Copy the Firmware from it**- You can try to find who/repair friend has this model of TV Mainboard and ask them to borrow the board to copy their working firmware.

A Superb Secret Revealed on

How to Repair LCD/LED TV Mainboard

This is another good repair tips on repairing the LCD/LED TV Mainboard. The Mainboard repairing method for this article, I call it as:

“TV Start-Up Log”

Most of all modern LED/LCD TV has this “TV Start-up Log” inside their TV Mainboard. I think after the year of 2008 model TVs will have this info log inside the TV.

So what is the TV Start-Up Log? The TV Start-Up Log like the Laptop power-on sequence. But the TV Start-up Log is a TV Mainboard boot up sequence. All the process is operated by the TV Mainboard MCU (Micro-Controller Unit) Chip firmware.

When the TV power on, the MCU will first detect:

- 1) **DDR** (DDR SDRAM) version and in between DDR and the Main Chipset (CPU) communication lines is OK or not.
- 2) If the above device normal, it will pass and detect the next devices. The next device is to detect their **BootLoader** (U-Boot or MBOOT) version and their operation. If the detection found any error or can't detect the device, it will stop there and not running their TV Start-up Log.
- 3) Next will be their Main Program (Firmware) on **NAND Flash**. As usual it will detect their NAND Flash version and operation status. If ok, it will pass to next devices.
- 4) Finally will detect their **USB, Sound, Tuner & etc I²C circuits' devices** (like EEPROMs).

* When the MCU pass all the above detection, finally the MCU will send out the Power On signal to start-up the Power Supply/PSU. So the TV can operate normally. If not pass the detection, it will stop on the device was detected not pass. So this TV symptom will looks like Can't Start-up TV!

What's the benefit of this TV Start-Up Log help to the repairer?

The modern LCD/LED TV Mainboard have lots of different types Memory IC. And their design is quite small size but the pins of IC are many! Not only that the Mainboard design at least double layer now. That's why, how repairer to repair the TV Mainboard in components level? If you don't know this TV Mainboard secret, I believe that you don't want to repair it, but just replace it.

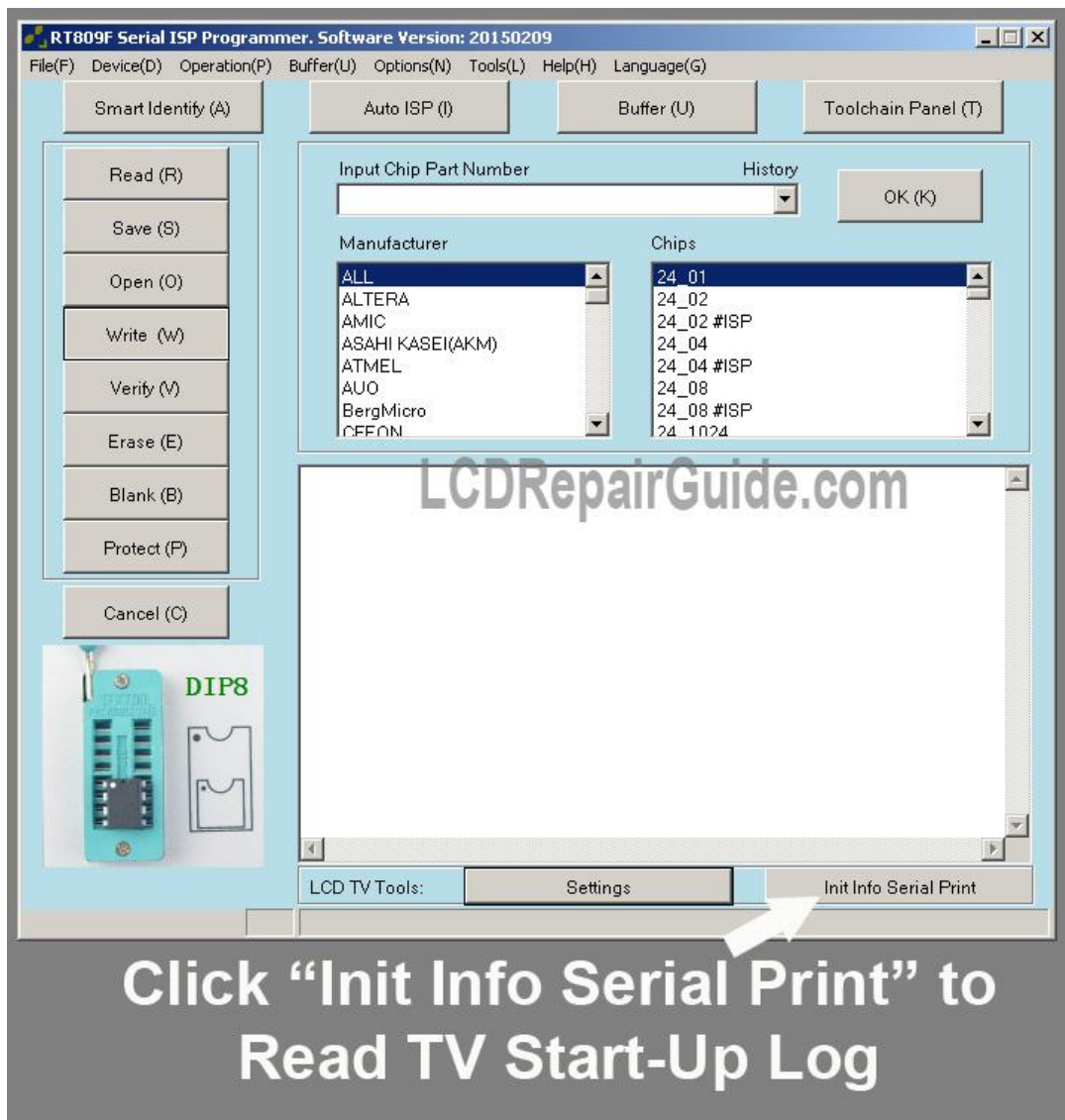
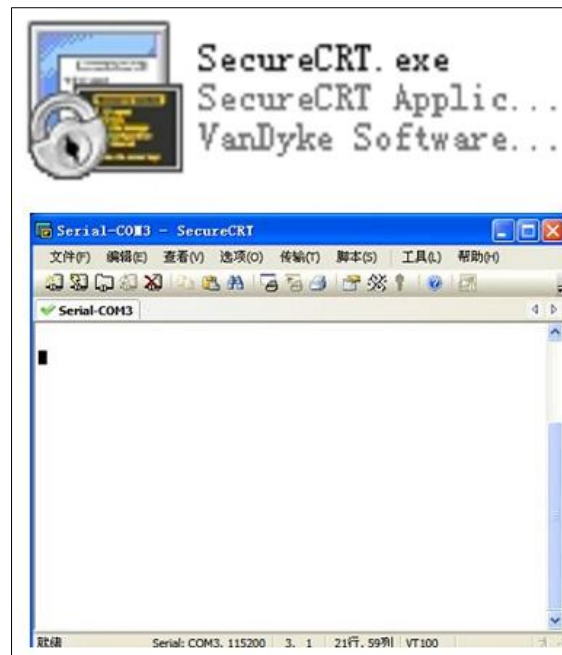
With this TV Start-up Log, you can easily to know what's wrong in TV. Like we learn from the previous V3.0 & V4.0 the Mainboard repair skills, plus this TV Start-up Log will increase the successful rate in TV Mainboard repair!

Again how this TV Start-up Log help to us? Ok for example, when a TV symptom is power LED light lit but TV can't start-up. So after check all the hardware on Mainboard like: voltage regulator IC, voltage input for Main Chip, reset circuit, crystal waveform and etc all Ok. So what can we do know?

So we can try to programming their 25 series Flash memory with the correct model and version firmware. Or we can do the TV Start-up Log first! After the TV Start-up Log appears, we can roughly know where or which device is defective. So we can directly go to that device section and checking it. So it will save lots of the time to guess what the problem in Mainboard if checking all hardware components in good condition.

How to Operate the TV Start-up Log?

The TV Start-up Log need to use a Programmer can support this feature. For example the RT809F Universal ISP Programmer. To run the TV Start-up Log, these two software can operate the TV Start-up Log. They are “**Init. Info Serial Print**” or “**SecureCRT**”. You can use below software to see the TV Start-Up Log to learn more about the TV Mainboard info.



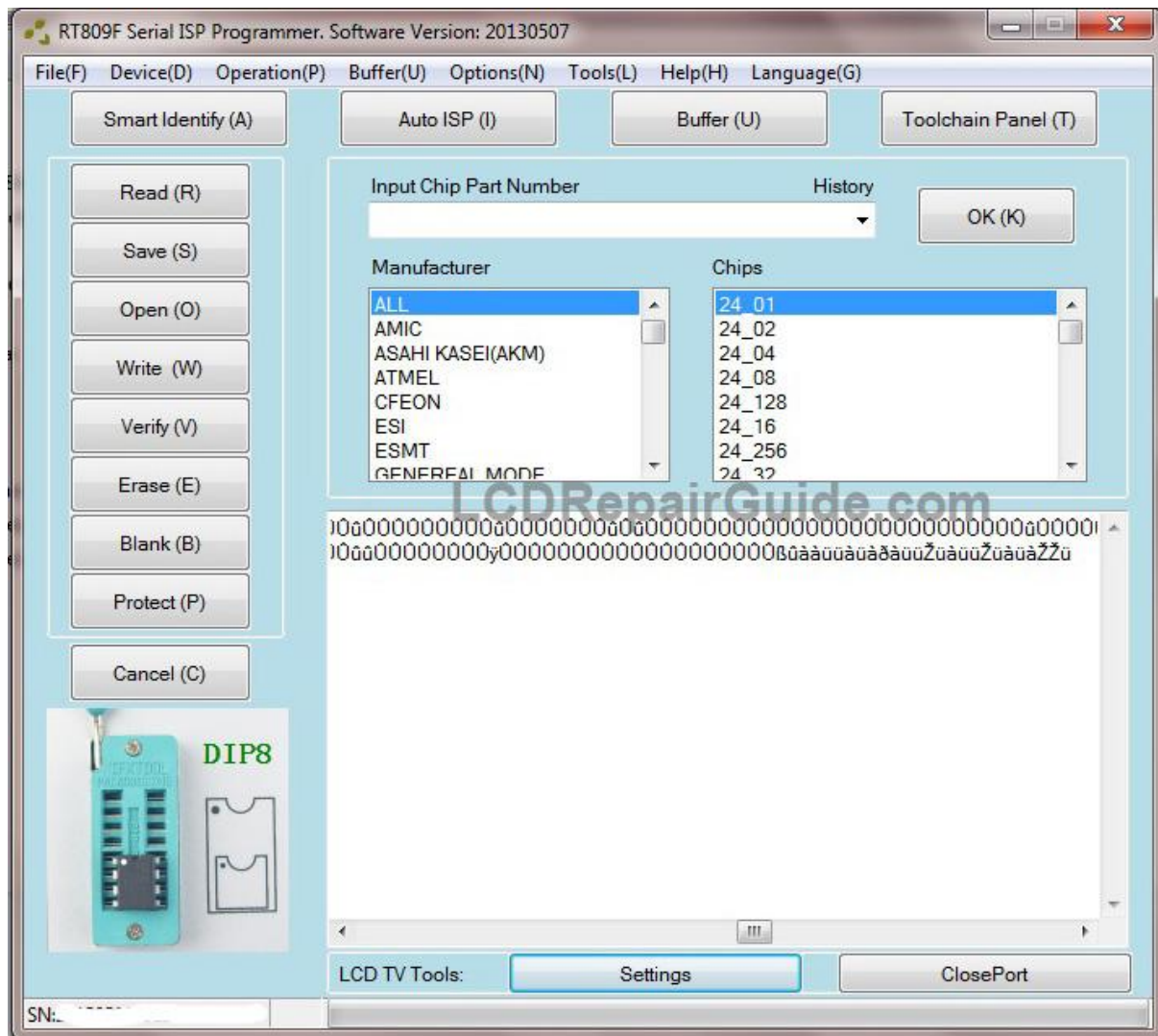
How to Operate the LG 32LH25 LCD TV TV Start-up Log:

This is a working LG 32LH25 LCD TV. Use the RT809F programmer to read their TV Start-up Log. Here are the steps to do:

- 1) Connected Programmer to TV VGA 15 pin DSUB port. And the Programmer connects to Laptop/Computer.



2) Run the RT809F Programmer software and then click on the “Init. Info Serial Print”. After that press TV power on. The TV Start-up Log will appear.

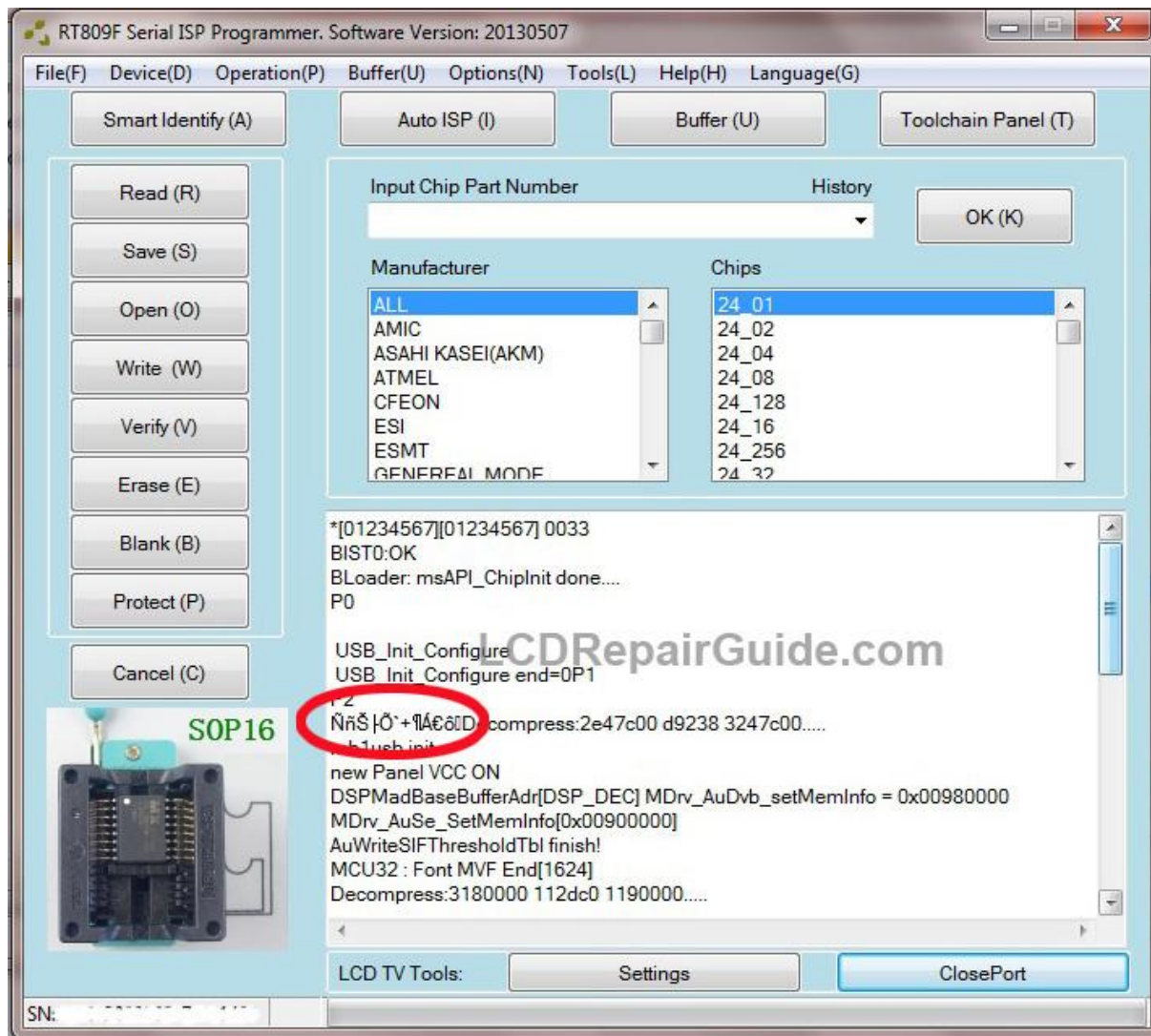


Unfortunately the result is just showing the funny or strange characters. This is because of their UART speeds select incorrect.

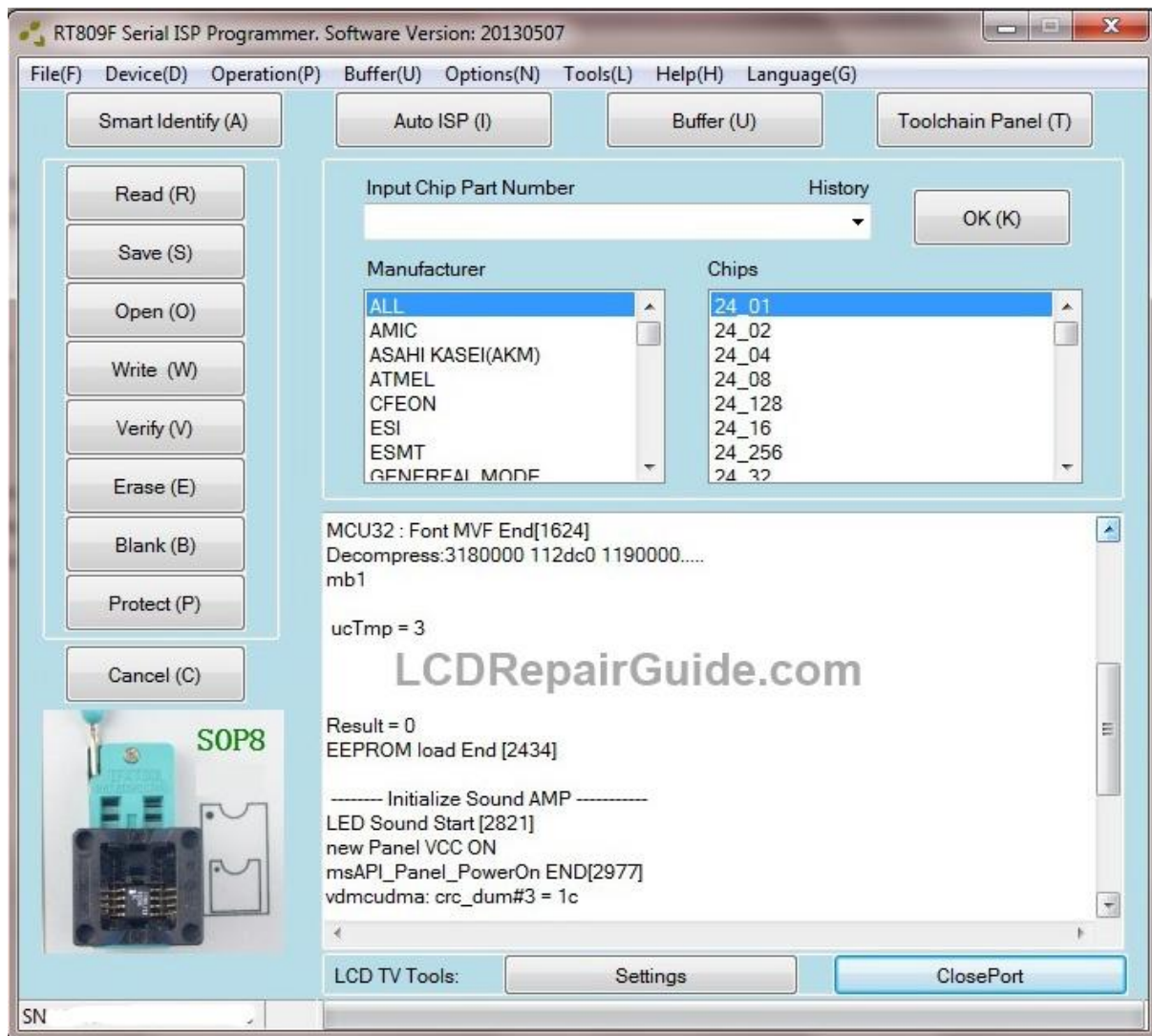
3) Press the (1) Setting and go to (2) Baud Rate speed and select another speed 38400. After that, press to the (3) to save the baud rate setting.



4) To re-run the Init Info Serial Print. Yes this time the TV Start-up Log is better than just now. But still has a little strange character there. Again go to the setting and change their baud rate to 9600 speed and save the setting.



5) Finally the complete TV Start-up Log information appears perfectly.



Here is the complete of LG 32LH25R-TH LCD TV-TV Start-up Log info:

*[01234567][01234567] 0033

BIST0:OK

BLoader: msAPI_ChipInit done....

P0

USB_Init_Configure

USB_Init_Configure end=0P1

P2

ÑàfH! ãÃÃõyDecompress:2e47c00 d9238 3247c00. ...

mb1usb init..

new Panel VCC ON

DSPMadBaseBufferAdr[DSP_DEC] MDrv_AuDvb_setMemInfo =
0x00980000

MDrv_AuSe_SetMemInfo[0x00900000]

AuWriteSIFThresholdTbl finish!

MCU32 : Font MVF End[1621] Decom

press:3180000 112dc0 1190000.....

mb1

ucTmp = 3

Result = 0

EEPROM load End [2431]

----- Initialize Sound AMP -----

LED Sound Start [2818]

new Panel VCC ON

msAPI_Panel_PowerOn END[2974]

vdmcudma: crc_dum#3 = 1c

[msAPI_OCP_LoadBitmap] [775][0][5106728]

new Panel Backlight VCC ON

Enter enUiInputSourceType = 1

enUiInputSourceType = 1

Result enInputSourceType = 1

MDrv_PowerSaveExecution

MDrv_PowerSaveExecution finish

SIG_PAL

P

How to Read the TV Start-Up Log?

For your information, the BIST0, BIST1 is DDR1 and DDR2. U-Boot or MBoot is the Bootloader. Flash : normally is their 25 series flash memory. NAND is their NAND Flash memory. For more info, please read the example below:

Below is an example of Skyworth TV -TV Start-up Log:

1) Stage 1:

```
>> reset UART_115200
BIST0-OK
BIST1-OK
[456789ABCD][456789ABCD]-88
[456789ABC][56789ABC]-88
-U
```

Baud Rate 115200

DDR1 detection OK

DDR2 detection OK

DDR1 data detection OK

DDR2 data detection OK

2) Stage 2:

Hello U-Boot	(U-Boot Code)
U-Boot 1.1.6(Jun 18 2011-10:24:15)	(BOOT version info)
Board: MSTAR JANUS2 (CPU Speed 600 MHz)	(CPU info and speed)
DRAM: 128MBytes	(DDR memory is128MB)
U-Boot is running at DRAM 0x87600000 Address)	(BOOT is running in DDR

3) Stage 3:

LOGO、ENV=SERIAL**(Environment)**Flash is detected(0x0906,0x1c,0x31,0x15) **(Detected Flash)**

MDrv_SERFLASH_GetInfo()

(Flash types and brand)

u32AccessWidth = 1

(Access width)

u32TotalSize= 2097152

(Flash capacity)

//u32BlkNum= 32

(Block number)

/u32BlkSize= 65536

(Block size)**>>> nand:AUTO CE/WP****(NAND: Auto Chip Enable/Write Protect)****Example of Skyworth 8M/S Series TV Normal Log:**

A good sample TV Start-Up Log:

Serial-COM5040917

BIST OK

BIST OK

ALL BIST OK!!

[3456789A][456789A][456789AB][56789ABC] 6778

[0123456789ABCDEF][0123456789ABCDEF][456789A][456789AB] 7777

U-Boot 2011.06 (Aug 31 2012 - 13:35:16)

.....

Starting kernel ...

Uncompressing Linux... done, booting the kernel.

Example Problem TV Start-up Log:**Good vs Bad values.****1) 8M/S Series DDR Abnormal 1:**

UART_115200	UART_115200
BIST0-OK	BIST0-OK
BIST1-OK	BIST1-OK
[0123456789A] [0123456789A]-55	[123456789A] []-55
[0123456789A] [0123456789]-54	[0123456789A] [0123456789A]-55
_nPD	

The TV Start-up Log shows that 2 x DDR detection normal. But the row-4 shows that detection data error in between the Main Chip with DDR. That position is for DDR1. That's mean the problem is on the DDR1 damage or dry join of DDR1. (After repair this TV, confirm is their U12 DD1 dry join only).

2) 8M/S Series DDR Abnormal 2:

UART_115200	UART_115200
BIST0-OK	BIST0-FAIL
BIST1-OK	BIST1-OK
[0123456789A] [0123456789A]-55	[] []-33
[0123456789A] [0123456789]-54	[0123456789] [0123456789]-44
_nPD	
U-Boot 1.1.6 (Aug 12 2010 - 16:	

DDR1 detected clock checksum error. On the row-4 detection, found that Main Chip through DDR input info is nothing, it could be the Main Chip damage or dry join. Or it may be the DDR1 dry join too. After repair, confirm that's the Main Chip dry join only. Just re-flow with BGA is Ok now.

3) 8M/S Series DDR Abnormal 3:

<pre> UART_115200 BIST0-OK BIST1-OK [123456789A][0123456789]-54 [0123456789][0123456789]-44 _nPD U-Boot 1.1.6 (Apr 16 2011 - 16:42:50) </pre>	<pre> UART 115200 BIST0-FAIL BIST1-FAIL [] []-33 [] []-33 </pre>
--	--

The row2 and 3 show both DDR detection failed. And the row 4 and 5 show that DDR cannot receive the data from Main Chip. Check the DDR supply voltage pins is normal. So it could be the Main Chip abnormal or dry join. After repair, confirm that's the Main Chip damage. (Sometimes when DDR supply voltage pins are open, it also can cause this type of error message).

4) 8M/S Series DDR Abnormal 4:

<pre> BIST0 OK BIST1 OK [0123456789A][02345678]-54 [0123456789][012345678]-44 BOOT_nPD U-Boot 1.1.6 (Jun 13 2011 - 19:54:53) </pre>	<pre> BIST0 NG </pre>
--	-----------------------

First DDR detection failed. So it could be the first DDR damage or Main Chip (CPU) and first DDR in between the network resistors is dry join. But mostly is the Main Chip damage. How to know Main Chip damage? Just measure the Main Chip core voltage supply LDO output and the Ground ohm values, normally is just 60 ohm. Or use the finger to touch the Main Chip temperature, when just power on TV, if their temperature increase quickly, that's mean their Main Chip is damage.

5) 8M/S Series Flash Abnormal 1:

<pre> UART_115200 BIST0-OK BIST1-OK [0123456789A][0123456789A]-55 [0123456789A][0123456789]-54 _nPD U-Boot 1.1.6 (Aug 12 2010 - 16:09:17) Board: MSTAR TITANIA (CPU Speed 504 MHz) DRAM: 0x8000000 Skipping flash_init Module: KEYPAD USB FAT NAND UBI UBIFS NET NAND: nand_bbt: searching bbt....Bad block nand_bbt: searching bbt....Bad block table nand_read_bbt: Bad block at 0x06a60000 nand_read_bbt: Bad block at 0x07fa0000 128 MiB </pre>	<pre> UART_115200 BIST0-OK BIST1-OK [123456789A][0123456789]-54 [0123456789][0123456789]-44 _nPD U-Boot 1.1.6 (Apr 16 2011 - 16:42:50) Board: MSTAR TITANIA (CPU Speed 504 MHz) DRAM: 0x8000000 Skipping flash_init Module: KEYPAD USB FAT NAND UBI UBIFS NET NAND: unknown FLASH </pre>
---	--

The TV Start-up Log shows that DDR and U-BOOT is pass detection. When running till the NAND, it cannot identify the Flash and cannot read their data. Normally this type of problem just using the Programmer to programming their main firmware is ok. If failed to do the programming to NAND, please replace a NAND Flash.

6) 8M/S Series Flash Abnormal 2:

<pre> UART_115200 BIST0-OK BIST1-OK [0123456789A][0123456789A]-55 [0123456789A][0123456789]-54 _nPD U-Boot 1.1.6 (Aug 12 2010 - 16:09:17) Board: MSTAR TITANIA (CPU Speed 504 MHz) DRAM: 0x8000000 Skipping flash_init Module: KEYPAD USB FAT NAND UBI UBIFS NET NAND: nand_bbt: searching bbt....Bad block nand_bbt: searching bbt....Bad block table nand_read_bbt: Bad block at 0x06a60000 nand_read_bbt: Bad block at 0x07fa0000 128 MiB In: serial Out: serial Err: serial Net: No ethernet found. MSVC00B000100100222324DA:100726 </pre>	<pre> UART_115200 BIST0-OK BIST1-OK [0123456789A][0123456789A]-55 [0123456789A][0123456789]-54 _nPD U-Boot 1.1.6 (Aug 2 2011 - 08:40:57) Board: MSTAR TITANIA (CPU Speed 504 MHz) DRAM: 0x8000000 Skipping flash_init Module: KEYPAD USB FAT NAND UBI UBIFS NET EEPROM J NAND: nand_bbt: searching bbt....Bad block table nand_bbt: searching bbt....Bad block table found nand_read_bbt: Bad block at 0x00000000 nand_read_bbt: Bad block at 0x00020000 nand_read_bbt: Bad block at 0x00040000 nand_read_bbt: Bad block at 0x00060000 nand_read_bbt: Bad block at 0x00100000 nand_read_bbt: Bad block at 0x00120000 nand_read_bbt: Bad block at 0x00140000 nand_read_bbt: Bad block at 0x00160000 </pre>
--	---

The error code shows that the NAND Flash have Bad Block and need to replace it.

7) 8M/S Series Flash Abnormal 3:

```

RPC: Registered udp transport module.
RPC: Registered tcp transport module.
ieee80211: 802.11 data/management/control stack, git-1.1.13
ieee80211: Copyright (C) 2004-2005 Intel Corporation <jketreno@linux.intel.com>
udev->speed: 3
UBIFS error (pid 1): ubifs_scan: corrupt empty space at LEB 3:4221
UBIFS error (pid 1): ubifs_scanned_corruption: corruption at LEB 3:4221
UBIFS error (pid 1): ubifs_scan: LEB 3 scanning failed
UBIFS error (pid 1): ubifs_recover_leb: corrupt empty space LEB 3:2048, corruptic
UBIFS error (pid 1): ubifs_scanned_corruption: corruption at LEB 3:2173
UBIFS error (pid 1): ubifs_recover_leb: LEB 3 scanning failed
VFS: Cannot open root device "ubi:RFS" or unknown-block(0,0)
Please append a correct "root=" boot option: here are the available partitions:
1f00          128 mtdblock0 (driver?)
1f01          1024 mtdblock1 (driver?)
1f02          1024 mtdblock2 (driver?)
1f03         115200 mtdblock3 (driver?)
1f04          13696 mtdblock4 (driver?)
Kernel panic - not syncing: VFS: Unable to mount root fs on unknown-block(0,0)

```

Cannot load root, the flash have unrecognized area. Normally this problem is their NAND or EMMC damage and need to replace.

8) 8M/S Main Firmware Abnormal log:

```

80200000: TT
80200000: 5a5aa5ff ..ZZ
.ndata_1[7fa]--->:ff
2.defatult_set is:165]
3.*ucp is:255
keypad_pressed_1 is:0
keypad_pressed_2 is:1

1.MSAPI_WDT_Start
3.MSAPI_WDT_StopCheck USB port[0]:
??? Waiting for Peripheral Connecting Fail...
1.usb init failed
Error, couldn't init Lowlevel part
Check USB port[1]:
Host type:2
scanning bus for devices... Wait for hub reset....
1 USB Device(s) found
    scanning bus for storage devices... 0 Storage Device(s) found

3.MSAPI_WDT_Stop<< MStar >>#

```

The BOOT normal, but the Main Firmware is missing. Need to re-programming their Main Firmware and TV is ok now.

Notes: The higher failure rate is their Main Chip and DDR (also included the lines in between both of them). But most of the time is their resistor network or Main Chip dry join! If even check with the TV Start-up Log also can't help, we can try to re-programming their BOOT and Main Firmware of NAND Flash. This method can solve lots of TV Mainboard problem!

New PSU Self Test Method for Modern TV

Nowadays, new design LED/LCD TV is using different standby voltages. Normally the older models of LCD/LED TV their power supply unit (PSU) is generated 3.3V or 5V standby voltages. But the latest models of LED/LCD TVs is using 8V (7.8V) now or more! For example the LG 2015/2016 LCD/LED TVs that use 13.2V as Standby voltage. For 2016 LCD/LED TV Models that use 8V Standby voltage when it start-up/run is 18V! If you use the old PSU Self Test method, it could be damage the PSU board.

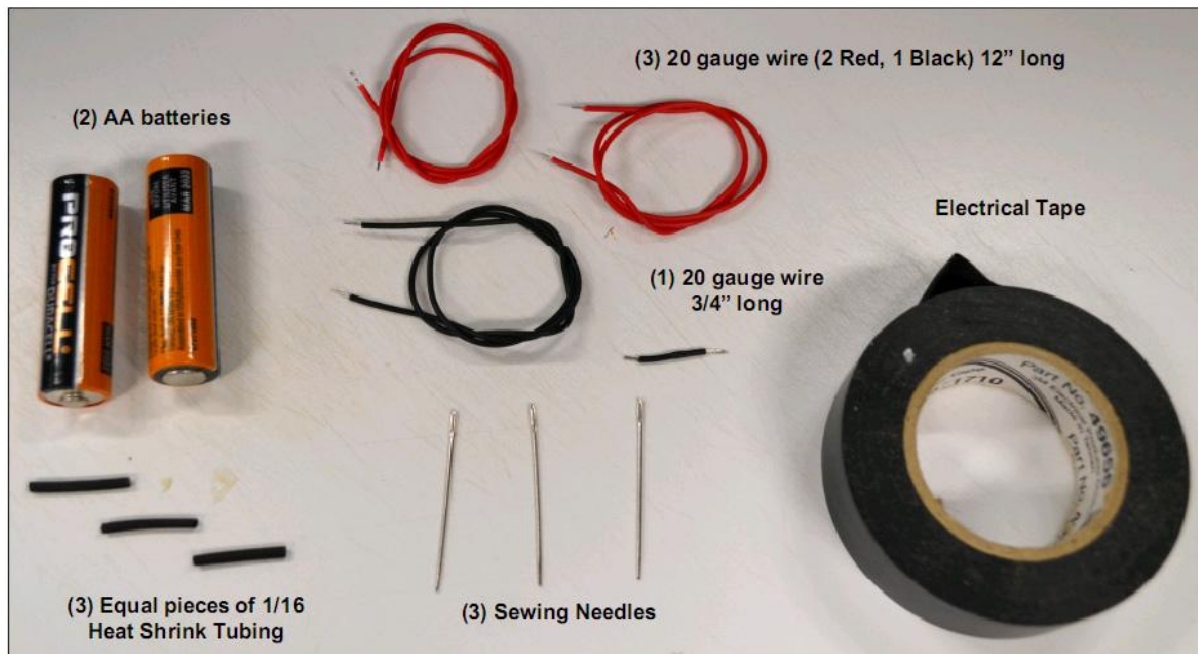
A new method or a tool called it as “**PSU Self Test 3V-JIG**”.

With this 3V-Jig you can use it on old or new models LED/LCD TV without risk to damage the PSU board. So this simple 3V-Jig can use to troubleshoot suspected power supply (PSU/SMPS) and/or backlight (LED/LCD) issues. This 3V-Jig can also work on any LCD/LED/OLED TV no matter the Standby Voltage output!

How to Build a PSU Self Test 3V-JIG

The following items will be required to build the 3V Simple Jig:

- AA size 1.5V Batteries x 2 units
- 20 Gauge wire, 3 each, at least 12” long (2 Red and 1 Black)
- 20 Gauge wire , 1 each, ¾” long (Black)
- Heat Shrink, 3 each, 1/16” DIA x ¾” L
- Sewing Needles. 3 each, 0.04” DIA x 1.5” L
- Electrical Tape

3V Simple JIG Required Supplies:**Steps to Making the 3V-JIG**

WARNING: Do not let the Jig leads touch positive (+) to negative (-) at any time as this will cause battery to overheat creating a potential fire or explosion hazard.

Procedure:

- 1) Place the two batteries side with the (+) of one at the same end as the (-) of the other and wrap two turns of Electrical Tape to hold them together.
- 2) Strip 1/8" from each end of the 3/4" wire and solder to the (+) and (-) ends of the batteries.
- 3) Cover the soldered end of the batteries with Electrical tape.
- 4) Strip 1/8" from each end of the 12" wires and prepare each end with solder paste.



AA Batteries
Taped Together
+/- ends



3/4" Wire, Prepared



AA Batteries: +/-
Soldered Together



Batteries +/- ends
Covered by Tape

Caution: Use caution when handling sewing needles as these are sharp and may cause personal injury.

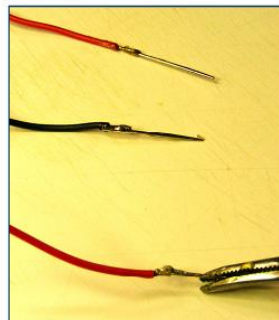
5) Cut the sewing needles to $\frac{3}{4}$ " in length and solder black and red wires to the needle eye ends.

6) Solder the black wire to the exposed Negative (-) terminal of the battery.

7) Solder both red wires to the exposed Positive (+) terminal of the battery.



12" Wires; Prepared



Sewing Needles
Soldered to Wires



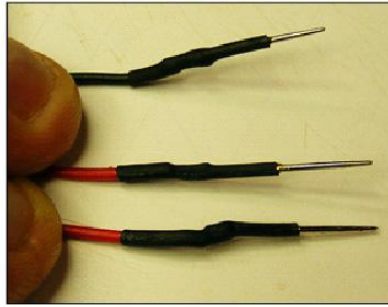
12" Wires Soldered to the +/- Battery
Terminals

8) Apply heat shrink to each solder joint of sewing needles; cover exposed bare wire and solder points leaving $\frac{1}{2}$ " of needle exposed.

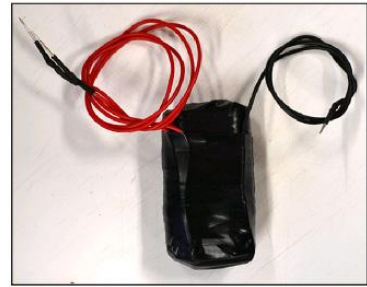
9) Apply electrical tape covering any exposed terminals and solder connection points to completed Jig.



Heat Shrink Tubing



Completed Wiring



Completed 3V Simple Jig

Completed PSU Self Test 3V-JIG



WARNING: Do not to let the Jig leads touch positive (+) to negative (-) at any time as this will cause battery to overheat creating a potential fire or explosion hazard.

Using the 3V-JIG for Testing the PSU (Test 1 of 2)

How to Identify You Need to Use this JIG:

Look on the Power Supply (PSU) for the Voltage Label for the connector that goes to the Main Board, example LG 49LF6300 PSU connector shown on below:

Example: 49LF6300
Silkscreen on SMPS Connector.

11	DRV-ON	P-DIM1	12
9	GND	GND	10
7	13.2V	13.2V	8
5	13.2V	13.2V	6
3	GND	13.2V	4
1	PWR-ON	P-DIM2	2

Note that the output power from the SMPS/PSU to the Mainboard during Stand-By or Run is approximately 13V. (Standby: Approx. 12.5V; Test Pin-1 Condition: 13.2V)

Preparing the TV for Test-1:

AC is not applied. “Unplug the Mainboard” connector that comes from the PSU. On the Mainboard, unplugged connector end, push in the following needles as described below. (Use the Mainboard unplugged connector to insert the needles from the 3V-JIG.

Procedure:

- 1) Push one (+) Red wire needle into PWR_ON pin 1. Push one (-) Black wire needle into Ground pin-3. (You can also use Chassis Ground).
- 2) Apple AC power. This turns on the Power Supply. Test the 13.2V that go to the Mainboard. Pin 4 through pin 8. (STBY: Approx. 12.5V, Test-1 Condition: 13.2V)

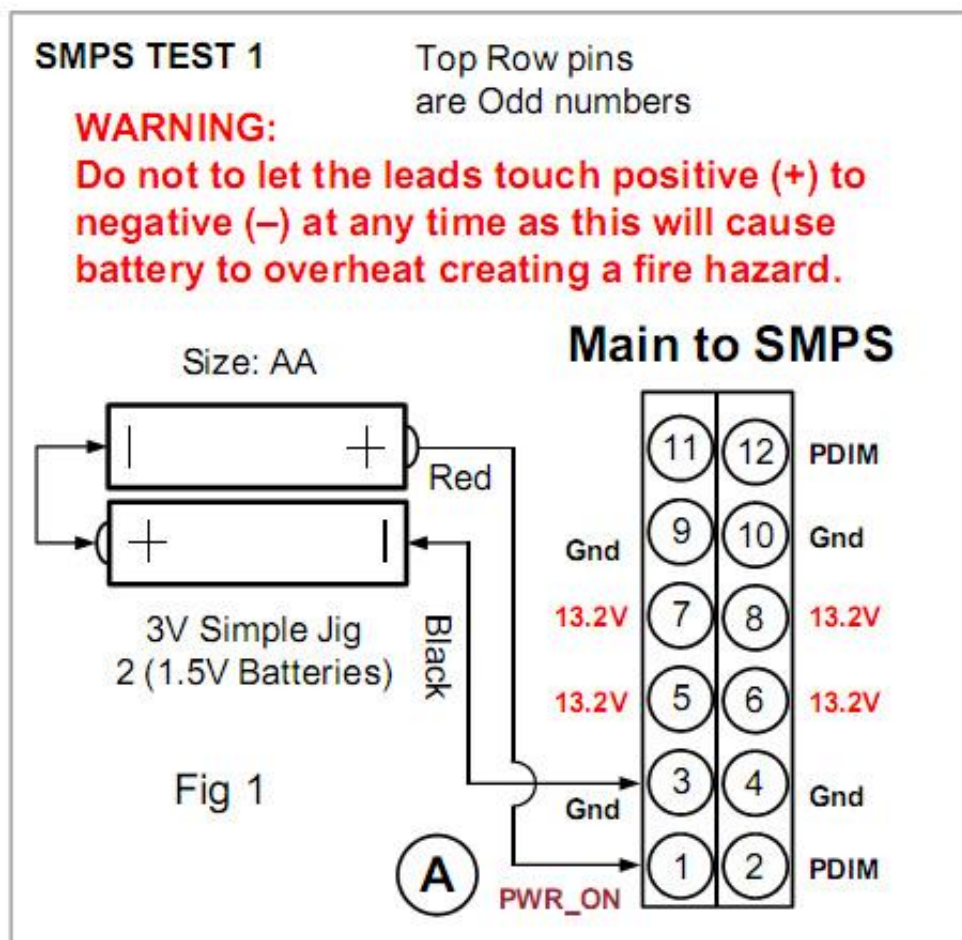
3) If Power Supply fails to come on or start-up, that's mean the Power Supply is defective and need to replace. Or you can concentrate to do the components level repair.

4) If troubleshooting TV for "No Turn On" symptom, and the Power Supply now test good, that's mean the problem is on the Mainboard. So you can concentrate to check and repair the Mainboard or replace it.

Notes:

A) Highly recommend to power off the TV SMPS board, and connect the Standby line 13.2V pin/s with a 24V 5~10Watt DC light bulb as a loading to testing it again to make sure that SMPS board is working properly.

B) If the Power Supply board is not producing Standby voltage 13V with the Mainboard disconnected (pins-4~12), replace the Power Supply or you can concentrate to check their standby circuit on PSU board.



Using the 3V-Jig for Testing the Backlight (Test 2 of 2)

Backlight Testing Procedure:

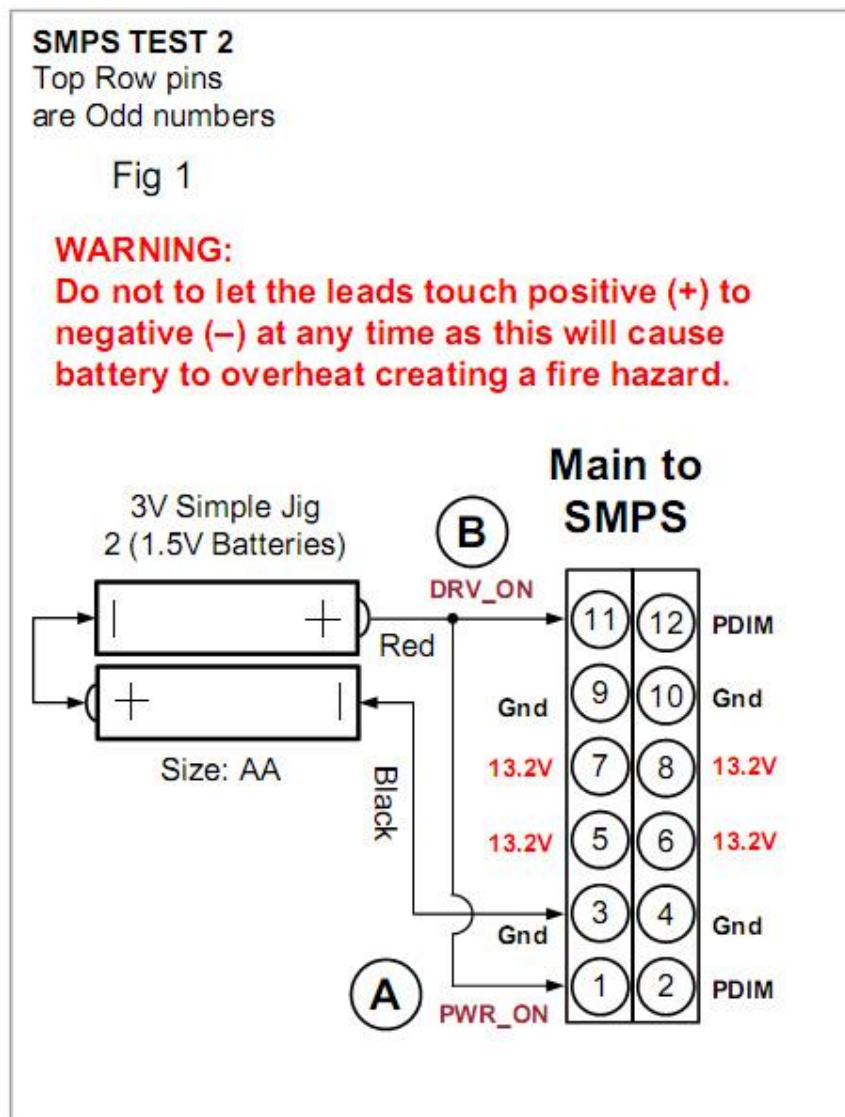
5) Remain the Power Supply Testing connection. Push one (+) Red wire into DRV_ON pin-11.

6) Apply AC Power. This turns on the Backlights.

7) The Backlights should come on, (Check visually).

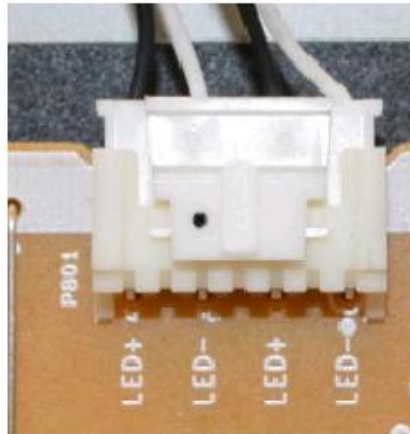
- Recheck all voltages from the SMPS to the Main. If Backlights are on, Backlight Power is OK.

- (See the next page for more details if Backlight fail to turn on).



Backlight Power Connector:

At the top of the Power Supply is a 4-pin connector going to the Backlight LEDs. The two labeled LED+ will be the Power pins. See silkscreen voltage output table for voltages. LED- is the grounding pulse feedback pin for the bank of Backlight LEDs.



Using the 3V-Jig for Troubleshooting Backlights

How to Identify the Power for Backlights:

Look for the Voltage Label on the Power Supply to know what the backlight voltage should be. As an example, on the below is from a 49 inches LG 49LF6300 TV. One pin (LED+) will have 175V and another one pin (LED+) will be 117V.

Silkscreen on SMPS (Voltage outputs)

INPUT	100V~240V~50/60Hz. 2.5A			
OUTPUT	13.2V = 3.0A			
	LG4760RI-15CH2	47	117V -- 230mA	117V -- 230mA
		49	175V -- 205mA	117V -- 205mA
		50	175V -- 205mA	117V -- 205mA
		55	210V -- 230mA	140V -- 230mA
		60	231V -- 180mA	231V -- 180mA
	LG49RID-15CH2	49	144V -- 170mA	144V -- 170mA
	LG55RID-15CH2	55	201V -- 155mA	201V -- 155mA

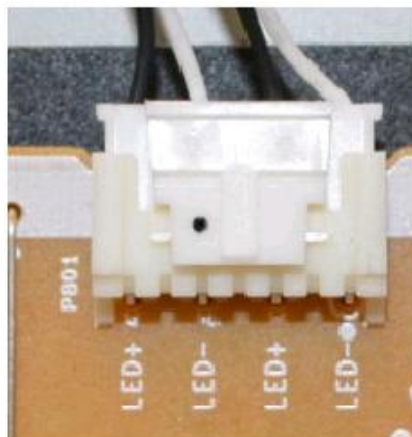
Troubleshooting the Backlight Connector (Backlight not lighting):

1) Check the voltage at the 2 Backlight LED power pins labeled (LED+), see chart. If Voltage is correct or goes high then drops down to about 50% to 75% of the correct voltage you can assume Power is OK. This may indicate an internal short in the backlights, for example the LED strip light bulb leakage. But wait until you complete Check 2 below.

2) Next Check the 2 Backlight (LED-) pins.

a) If LED- pins are 0V. Normally these pins should be (4V~10V). **If they are 0V, it can be assumed the Backlight LEDs strip are open and need to repair/replace.**

b) LED- pins are Hi (approx. 30V). This would indicate an open driver which is located on the Power Supply. Use a 100 ohm resistor and place one end on Chassis Ground. Place the other end on the High LED- pin. Apply power, **if Backlights turn on, you are assured the Power Supply is defective.**

**Notes:**

For older models of LCD/LED TV with 3.3V, 3.5V & 5V Stand-By voltage generate from Power Supply board, you can refer to my V3.0 & V4.0 PSU Self Test Method to testing it.

Secret Revealed on How to Fast Check the Bad LED Light Bulb in LED TV Backlight

Lots of the modern LED TV has a circuit protection design to protect their backlight system. When the system detects something wrong on LED strip (or LED light bulb/s) it will cause the LED Driver Board or PSU+ LED Driver shutdown the backlight. So the symptom will look like LED TV Backlight on then shutdown within 1~2 seconds.

With this little time, even we have dismantled the LED Panel, but we still can't see which LED Strip/s or LED Light Bulb causing the Backlight system shutdown. Because of the backlight shutdown, so we can't use the volt meter to testing their LED Strip voltage to compare to each other.

So what can do now? If you don't know this method, I believe that you will measure the LED Light Bulbs one by one! It will waste the time to checking it. Sometimes, we can direct see the burn LED Light bulb on the LED Strip and know that LED Strip is bad. But most of the time is not. So we need to learn a new method to solve this problem!

The answer for this new method is: **“Using Your Mobile Phone Video Mode”!!**



Here are the steps of “How to use Mobile Phone/SmartPhone Video Mode” to find out the faulty LED Light Bulb/s from LED TV Backlight:

1) After dismantled the LED Panel, we can see the Full LED Backlight (not the Edge-Lit type LED Backlight).



2) Use the SmartPhone and open the Video App. After that the camera direction will shot on the Full LED Backlight like photo above. Click start to record video now, and then power on the TV. The LED Backlight will lit and shutoff very fast till like haven't lit before. Stop record the video now.

3) This is time to play back the video, 'Pause' the video when you saw their LED light bulbs lit. Actually that's the Infra-Red light not the LED light bulb full light. This is because when LED light bulb supply with the input voltage, instantly it will generate the Infra-Red first, after that the full LED light lit! That's why, when the LED Tv Backlight system protection too fast until we can't see it from our eyes, but the Mobile Phone/SmartPhone camera can “see” and record their Infra-Red light before it shutdown the backlight.

Just play back the video, and “Pause” it when the Infra-Red just generated. So you can see which LED Strip is not lit or which LED light bulb is not working easily!

Process to Troubleshooting and Repairing LED TV Backlight & LED Strip

A Haier LE50A900K LED TV complaint problem was TV Backlight on then shutdown quickly within 1~2 seconds. But the TV sound is normal. Use torch light to check the screen and found the darkness display is present. So confirm the problem is on the backlight system.

This TV backlight LED Drive/Driver board is using L500H1-4EB. Use the LED Backlight Tester to testing their LED Connector LED+ and LED- channels. Found one of the channel LED Strip voltage a bit high than the other channels LED strips. Suspect this channel LED strip is abnormal and cause the LED Driver board start-up their backlight protection system to shutdown the backlight. So we need to dismantle the LED panel to check and repair it. Below is the process to dismantle LED Panel:

Steps:

1) Remove all the PCB board from TV. After that, flip the LED panel their LED screen glass was on the above and in front us now. Remove the Panel metal shield.

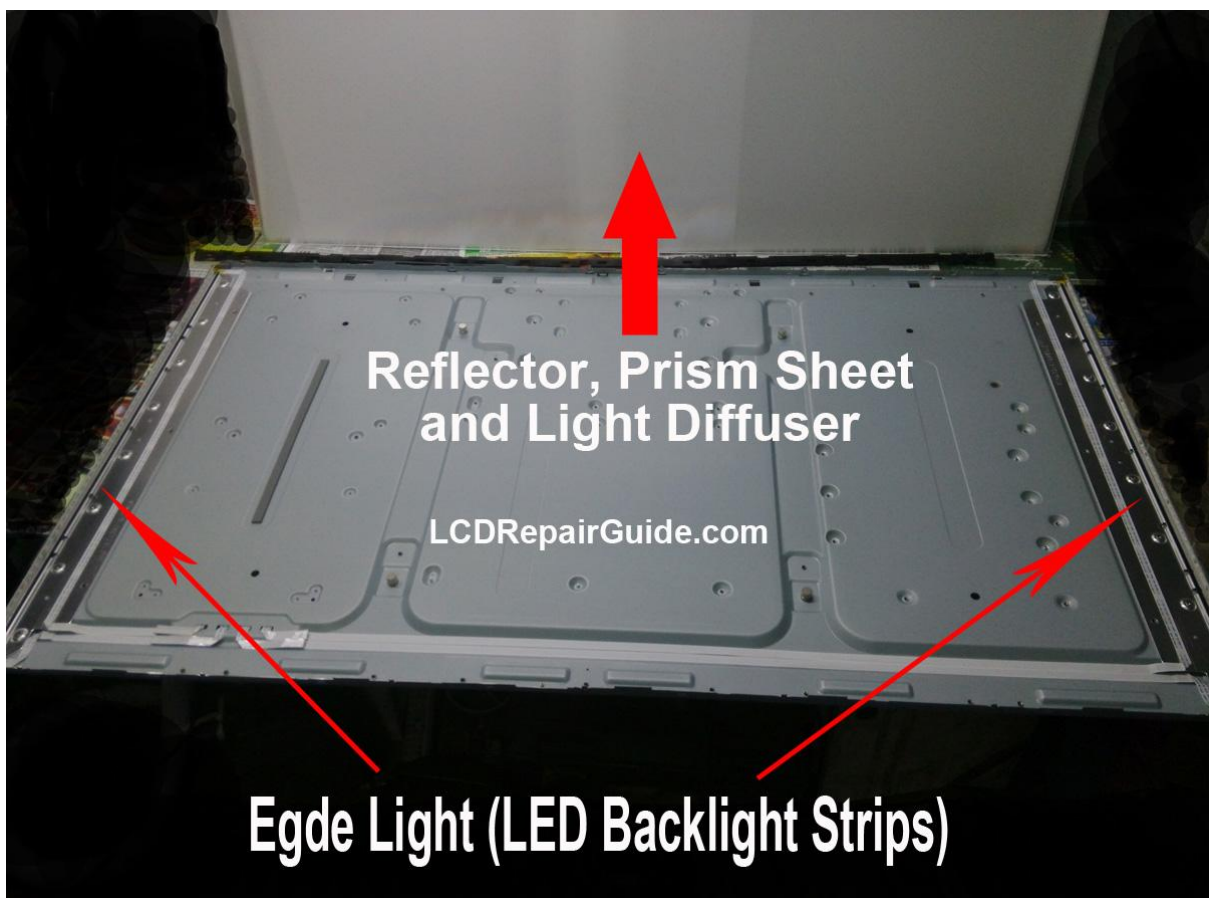


2) Release all the screws from T-con board, Source Driver board and etc. Remove all the cable/s and cable/s connected to Source Drive board. Make sure their Source Drive board, Gate COF IC and Panel Glass are freely now. If not you will easy damage their COF contact ACF glue and cause the screen display vertical lines/bars. After that using the Vacuum Pad to safety remove the Panel Glass and put it in a clean and safe place.





3) Before this step, make sure that your hands are clean now. Remove the Reflector, Prism Sheet, Light Diffuser and etc as photo below:



After removed their backlight sheets, you can see their LED strips was put on the left and right side, each got 2 LED strips.

4) Use the LED Backlight Tester (this Tester also can test LED strip and LED light bulb too) check all these LED Strips and found one of the LED Strip got one LED light bulb failed. This is the LED light bulb cause the backlight shutdown! This LED strip voltage is a bit high than the other LED Strips. Use the utility knife to remove double side tape of the LED Strip from its metal cover. So it will not bending the LED Strip with the utility knife.





5) Replace a new LED Strip (LED Strip part number: V500H1-LS5-TLEM4) into this LED Panel and this Haier LE50A900K LED TV is working perfectly now.



Notes:

If we don't have the LED Strip to replace, we can use the tool/s to remove defective LED light bulb/s to repair the LED Strip.

WARNING: Before proceed to dismantle the LED Panel, you must ask the permission from customer. Because it will take risk when dismantle LCD/LED Panel. Sometime after finish repair or replacement the LED strip, the LED screen will show vertical lines/bars or horizontal lines/bars on the screen. It was because when process to dismantle the LED Panel accidentally impacts their COF/TAB IC/Driver. So you must tell the customer first, before dismantle the LED or LCD Panel. That's why we need to learn the correct process to dismantle LED Panel to lower down the risk and increase the successful rate.

How to Remove the LED Light Bulb from LED Strip Easily?

The LED TV has lots of faulty in their backlight system, especially the LED Strip and their LED light bulb/s. So we will facing many LED TV need to replace the new LED Strip. But the problem is, they have many types of the LED Strip design with different LED light bulbs. The LED light bulbs have different voltage types, normally use are 3V, 6V and the new one is using 12V now! So it will have different voltage input for the LED Strips and different sizes (or LED Light bulbs quantity in a LED Strip) of LED Strip.

So the spare part stock will difficult to store different types & models LED Strips. The solution to solve this problem is to just replace their LED Light bulb/s only! It will save money, time and space to store the spare parts.

The question is how to remove the LED light bulb from LED Strip? Can I use the soldering iron to remove it? Yes, some of the good soldering iron can do that, but not perfect and sometimes can damage the LED Strip circuit or that LED Light bulb/s.

Finally found some of the good solution to solving this problem. These 3 solutions can help to easily remove the LED Light bulb/s from the LED Strips!

Solution-1:



Use the Hot Air Rework Station to remove LED Light bulb/s.



A suitable temperature to remove the LED Light Bulb from LED Strip is about 200°C ~ 280°C. Some will try until 350°C! So it will depend on your device performance. So starting with the lower temperature first! Because of each model and brands of Hot Air Rework Station their quality and accuracy is difference. Before using it to do the removing LED light bulb, so we need to use the bad or old LED Strip to testing that Hot Air Rework Station temperature first. So that we can find out the perfect temperature values for that Hot Air Rework Station to easily remove the LED light bulb and without damage to it.

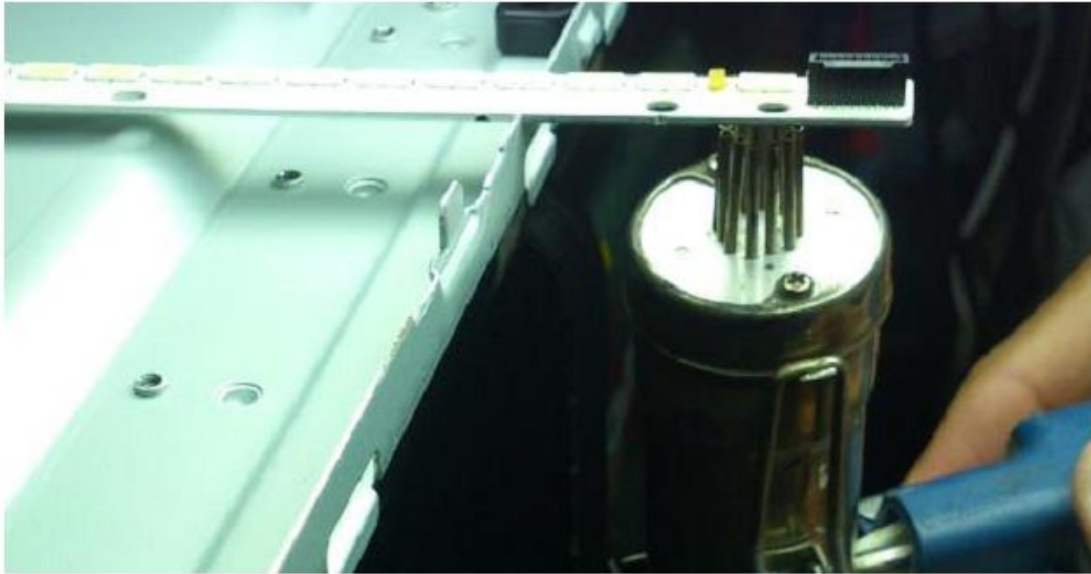
Solution-2:

Use a Hot Air Gun to remove the LED Light Bulb like photo below:



ImagineX ElectronicS

<http://www.LCDRepairGuide.com/V5/>

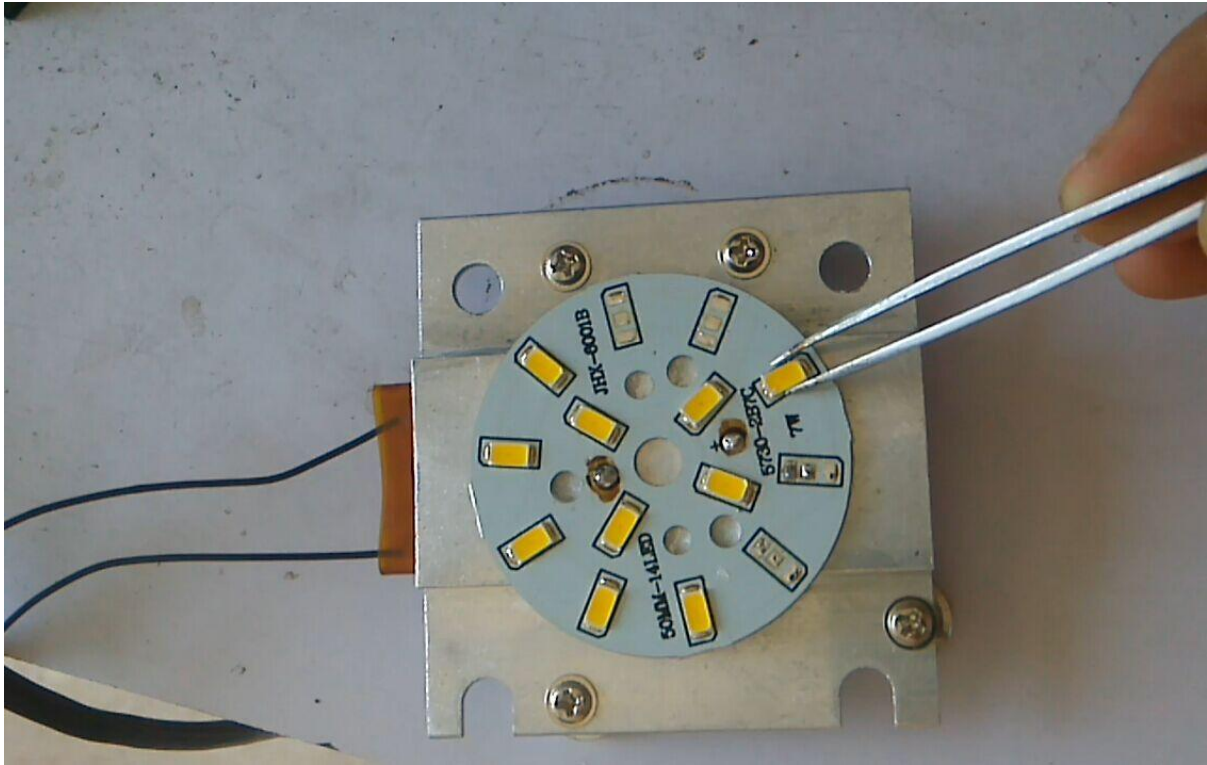


Solution-3:

This method is seldom repairer to using it. This is a PTC Heater. Yes, we can use a PTC Heater or PTC Thermistor to remove the LED Light Bulb! The PTC Heater just takes about 30 seconds to warm up, after that it can start to use. Its input voltage is: 220Vac, wide surface temperature is about 250°C (when input voltage is 220Vac) degree Celsius +/- 10°C. The PTC Heater is like photo below:



The above tool is call PTC Heater



This PTC Heater is easy to use, constant heating, automatic temperature control without any temperature-controlling system and the important thing is it is cheap! Just below \$5 USD (2017) only. But the weakness point is their input voltage cable/s easy to break.

Some of the repairer also using this PTC Heater to remove the FPC connectors, the FPC connector is from T-con board or Mainboard. But it must look at the situation of that T-con board bottom side, that's no any SMD components on the bottom foil side.

Other Useful Accessibility Tools:

- ⇒ Flux
- ⇒ Solder
- ⇒ Solder Wick
- ⇒ Tweezers
- ⇒ PCB Holder for easy handle LED Strip and etc.

Conclusion:

The Solution-1 & 3 is better to use than Solution-2. But I will recommend using the Solution-3. Because it is easy to use and nothing to set (temperature setting), and important thing is its price cheap. If your budget is Ok, then you can buy a high price “Constant Temperature Pre-heater” like photo below:



This Constant Temperature Pre-heater normally using in Mobile Phone repair. But it can use to remove the LED Light Bulb easily. But the price is not cheap.

LCD/LED TV Power Supply Repair Tips

This Power Supply repair tips to let you learn what's the common part or components failure in PSU board. This Power Supply repair tips can apply to different brands and model PSU boards. Actually you're learning the "experience" on how to repair LCD/LED TV power supply NOT just follow by their PSU part number only.

Note: You can download some of the Power Supply Schematic Diagram from the Bonus-B section of V5.0-OLED/LED/LCD TV Repair Tips.

1) PSU Board: 5800-P46TTS-02 (46 & 47 inches TV)

No.	Symptoms	Faulty Components	Repair Solutions	Failure Rate
1.	No Power, No LED Light	RS05 (2.2K 1/6W) RS03 (2.2K 1/6W)	If components dry join, just re-solder it. If not just replace it.	15%
2.	No Power, No LED Light	T605 (061979-00)	If components dry join, just re-solder it. If not just replace it.	5%
3.	PSU can't start-up, but Power LED light lit	DS01, DS02, DS03, DS04	Components dry joins, causing no 12V & 24V output.	40%
4.	PSU can't start-up, but Power LED light lit	L607 (4.7uH, Inductor)	Component dry join, Intermittent no 24V output, sometime will cause sparking too	30%
5.	PSU can't start-up, but Power LED light lit	QS01, CS09	If components dry join, just re-solder it. If not just replace it.	10%
6.	PSU can't start-up, but Power LED light lit	IC601 (L6599D)	If components dry join, just re-solder it. If not just replace it.	10%

7.	Intermittent Can't Start-up PSU	CP37 (63V 0.068uF)	Replace this cap with 63V/0.1uF.	50%
8.	Intermittent Can't Start-up PSU	QP09 (2222A)	Replace this component. Can use C8050 as an equivalent component	50%

2) PSU Board: 5800-P40TOS-00

TV Model: Skyworth 42L01HF LCD TV (Chassis= 8M19)

a) Symptom: TV Can't Start-up

When TV power on, measure the PSU standby voltage has 5V output, but no 12V & 24V output. Using the PSU self test method, found the 24V line output voltage increase to 27V after that PSU cutoff. That's mean the PSU is overvoltage protection now. Check the 24V line voltage regulator circuit, all components normal. Direct replace IC604 (KA431) and IC607 (L6599) also same problem. Check IC607 corresponding components all looks good. Try to power on the PSU again, when check the PFC voltage and found it's very high till 460V! It is because of the PFC over voltage causing the 24V output increase?

Check the PFC feedback circuit now. Found their R621 (560K) was opened circuit. After replace R621, their PFC voltage back to normal range is about 390V now. The PSU is ok now and output the 12V & 24V.

Repair : R621 (560K ohm)

b) Symptom: No 24V output, but 12V is normal.

Power on TV, check IC607 (L6599D) voltage supply pin is normal. Power off the TV and check IC607 corresponding components is normal. Direct replace IC607 also same problem. Further check the Q612 & Q614 found Q614 when power on, it will instantly breakover/work. After analysis the problem, it could be on the primary side of transformer. First check their voltage feedback circuit, because when 12V & 24V have normal outputs, their feedback optocoupler secondary side has 1V voltage there. So power on the TV and

check voltage feedback circuit optocoupler secondary side have voltage, but quickly drop to 0V. Try to remove the C669 (1000P) capacitor from circuit. Power on the TV, the PSU is working and output the 12V & 24V normally. Replace a new C669 capacitor, the PSU is working perfectly.

Repair : C669 (1000P = 1nF)

c) Symptom: TV Screen Flashing Randomly

This TV after working about half an hour's, the TV screen will start flashing and occur randomly. When the problem occur their PSU 24V line output drops to 21V only. But disconnect the loading of 24V line, the voltage will back to normal 24V. Check the 24V line corresponding components and their circuit line, found that the problem was because their 24V circuit line output D617 one of the pin circuit line is crack. Repair the crack line with just re-solder it, and the problem solved.

Repair : 24V circuit line nearby D617 pin circuit line crack. Just re-solder it problem solved.

Notes : For this PSU board, when the screen flashing problem occur, also need to check their R621 and R622 (both 560K). When these two resistor values drop to 500K ohm (normal 560K) it will cause the screen flashing too.

2) PSU Board: 168P-P42TTS-00

TV Model: Skyworth 42L01HF LCD TV (Chassis= 8M19)

a) Symptom: TV Can't Start-up but the Standby LED light is lit.

Use PSU self test method and found PSU board can generate standby 5V, but no 12V & 24V output. So the problem is in PSU board. Check PSU board PFC voltage is about 300V only (Normally it is about 380V at C523 +ve pin). That's mean their PFC circuit is not working. Check the PFC control IC IC609(NCP1653) pin-8 voltage supply input is 0V! Normally it is about 15V. Trace the voltage supply line to Q609 and ZD300, found ZD300 (15V) zener diode is damage. After replace ZD300, the PSU is ok now.

Repair : ZD300 (15V) zener diode

3) PSU Board: 5800-PLCD26-01 Common Faults

- a) No Power: IC608 (P1014AP10)
- b) PSU Standby voltage from 5V drop to 0V: R660 (2.5K ohm 1/8W) dry join or opened circuit.
- c) Can't Start-up TV: Q608 (4401)
: Q602 (2222A), ZD600 (B18PH)
- d) Can't Start-up TV or Screen Flashing: IC601 (5500A), Q601 (K3568), Q612 (4403)
- e) Screen Flashing: IC F9222 pin-14 connected capacitor 2.7nF/50V.

4) PSU Board: 5800-P37T00-13 & 5800-P37TOK-01 Common Faults

- a) No power: U3 (STR-A6159M)
- b) Screen Flashing: R20, R21, R22
: C15 (101/50V)
- c) Can't Start-up TV: ZD4 (B15PH), ZD3 (B27PH), D13 (1N4148)

5) PSU Board: 5800-P42TTS-10 Common Faults

- a) No Power: IC608 (STR-A6159M)
- b) Can't Start-up TV: Q605 (2222A), IC601 (PC817)
: R509 (3.3K 1/8W), R507 (1K 1/8W), R653 (220 ohm 1/8W) components dry solder join.
- c) Can't Start-up TV, 12V & 24V output a bit high then slowly drop to 0V: IC607 (L6599D)

6) PSU Board: Samsung BN44-00427A PSU

- a) Can't Start-up TV: DO803 & DP805
- b) Can't Start-up TV: IC5801 & C5802

7) PSU Board: Samsung BN44-00427B PSU

- a) No Power: RL801S
- b) No Power: FP801S, CY801S
- c) No Power, but Relay Clicking Sound appears: DM801 & DS804
- d) Tv Can't Start-up, Standby voltage is normal: QP805

8) PSU Board: Samsung BN44-00503A PSU

- a) Power Supply Try to Start-up but no voltage output: RS806 & ICS801
- b) TV Can't Start-up, but LED light lit: RM807 & LCM801
- c) Standby voltage appear then shutoff: ICP801S

LCD & LED TV Repair Tips

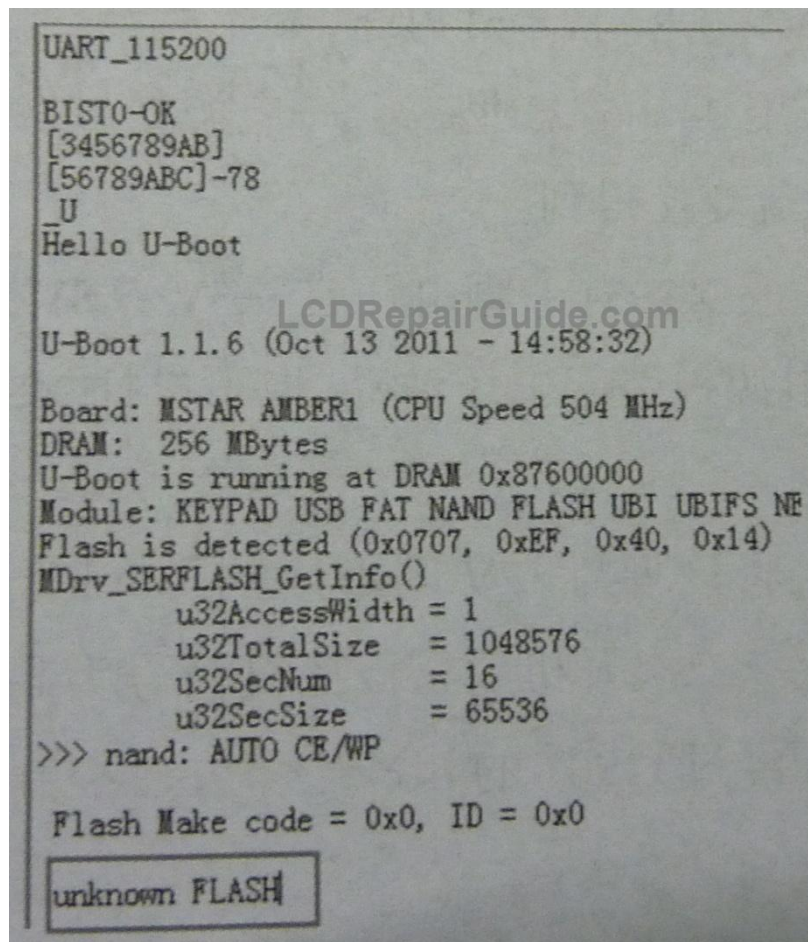
1) Model: KONKA LED42IS95D LED TV (Chassis: MSD6I8981)

Symptom: TV Can't Start-up, but power LED lit

Check MainBoard voltage supply 1.3V, 1.8V, 2.5V, 3.3V all normal. Check their reset circuit and crystal clock Ok.

Repair/Solution:

Connect this TV to a Programmer to read their TV Start-up Log. Shown photo below:



From the above TV Start-up Log, the DDR and BOOT firmware are normal. But detection for NAND main firmware is failed show “unknown FLASH”. Check between the Main Chip N501 connections with N510 (K9F2G08U0C) is Ok. Replace the N510 NAND FLASH the problem solved!

2) **Model:** LG 2014 & 2015 Models TV

Symptom: SMPS LD701 Blink Rate Explained

There is an LED on the Power Supply - LD701- that should be off under normal conditions. If this LED is blinking, it indicates an error.

-From 2014 and previous models (1 through 8 blinks every 6 seconds).

-From 2015 models (1 through 9 blinks every 6 seconds).

Table indicates what the error “Blink Rate” means:

Abnormal Condition	Blinking LED Counts	Check Point
Driver IC NG Check Driver IC & MCU Communication Check	Once (1)	DRV_IC's Operation
DC/DC Voltage Check LED B+ Voltage Check	Twice (2)	DC/DC's Operation
Open LED Protection	Three (3)	LED Line open Condition
Short LED Protection	Four (4)	Led Line short Condition
Driver On Signal error	Five (5)	DRIVER-ON Signal
V-Sync Input signal error or P-DIM Input Error	Six (6)	V-Sync signal and P-DIM
Local dimming data error	Seven (7)	Local Dimming Error
MCU NG Check LED Driver IC_OTP	Eight (8)	MCU & LED IC Communication
DC-to-DC or LLC Start up Check	Nine (9)	LED B+ Initial Check

- * V-Sync is a function utilized for Local Dimming timing.
- * Local Dimming Data includes MOSI or SIN, SCLK signals.
- * OTP: Over Thermal protect.

Repair/Solution:

-

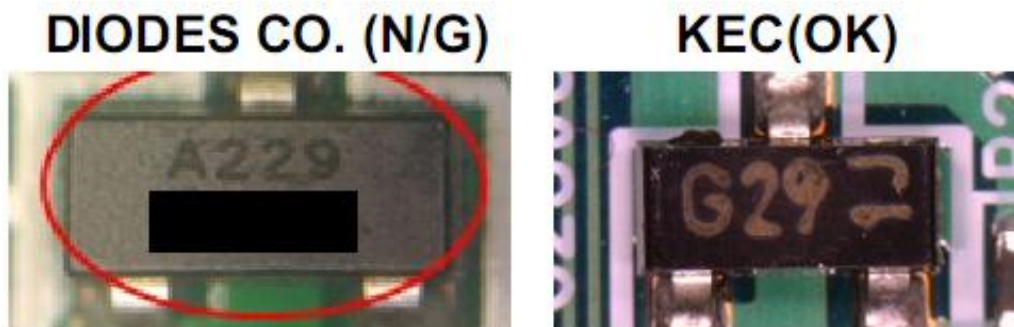
3) Model: LG OLED 65G6**, OLED77G6**, 65/60/55/49UH77** & UH87**, 55/49/43/32LH60/LH66** all series, 49/43LH57 & LH59**, 55/49/43LH57** & LH56** & LH58** LED TV

Symptom: TV Auto Turn-Off (Shut Off) while watching TV.

It was because of their RESET IC defect (DIODES Inc.)

Repair/Solution:

Check Power-Off History in the IN-START Menu. If there is "POWER_OFF_BY_5VMNT", replace the Reset IC with G29 (KEC).



Instart		Power On/Off Status
Model Name :	70UH635T-TA	0. POWER_ON_BY_REMOTE_KEY(0x20)
Serial Number :	604INZY4B605	1. POWER_OFF_BY_INSTOP_KEY(0x15)
S/W Version :	3.00.51.01	2. POWER_ON_BY_POWER_ONLY(0x25)
Micom Version :	V3.06.1	3. POWER_OFF_BY_LOCAL_KEY(0x1C)
Boot Version :	1.01.18/1.01.18	4. POWER_ON_BY_LAST_POWERON(0x2B)
UHD BE Version :	N/A	5. POWER_OFF_BY_5VMNT(0x05)
Chip Type :	RTD2999	6. POWER_ON_BY_REMOTE_KEY(0x20)
Wi-Fi Channel :	1	7. POWER_OFF_BY_REMOTE_KEY1(0x10)
Wi-Fi MAC :	C5:36:6C:C9:2B:A4	8. POWER_ON_BY_REMOTE_KEY(0x20)
Wi-Fi Speed :	USB 2.0	9. POWER_OFF_BY_LOCAL_KEY(0x1C)
MAC Address :	C8:08:E9:CE:97:56	10. POWER_ON_BY_LOCAL_KEY(0x22)
IP Address :	0.0.0.0	11. POWER_OFF_BY_REMOTE_KEY(0x20)
SFU Key :	OK	12. POWER_ON_BY_LAST_POWERON(0x2B)
Widevine :	LGTY16CRTK001155361	13. POWER_OFF_BY_ACDET(0x03)
ESN Num. :	LGTV20163=31001115190	14. POWER_ON_BY_LOCAL_KEY(0x22)
HDCP2(Miracast/HDMI) :	OK/NULL	15. POWER_OFF_BY_LOCAL_KEY(0x1C)
RF Receiver Version :	1.3.4.113	16. POWER_ON_BY_LOCAL_KEY(0x22)
Wi-Fi/Magic Search :	OK/OK	17. POWER_OFF_BY_LOCAL_KEY(0x1C)
Camera Ver. :	NULL	18. POWER_ON_BY_LOCAL_KEY(0x22)
Debug Status :	RELEASE	19. POWER_OFF_BY_REMOTE_KEY(0x20)
SIGN Key :	PRODKEY	20. POWER_ON_BY_LAST_POWERON(0x2B)
Eye Check :	OK	21. POWER_OFF_BY_5VMNT(0x05)
Control Key :	OK	22. POWER_ON_BY_LOCAL_KEY(0x22)
Access USB Status :	1/-1(T)/-1(C)	23. POWER_OFF_BY_ACDET(0x03)
UTT :	34	
APP History Version :	1921705 (deathvalley)	
PQL DB :	LSHPW_EDG3_XXXX	
Demo :	LCD_UHD_HDR_JA_02	

Rework Guide:

Step 1. Add small amount of solder to all pins (3 Points) of Reset IC using soldering iron.



Step 2. Remove the Reset IC using 2 soldering irons.
Using two soldering irons at the same time like tweezers, remove the Reset IC by carefully lifting the IC off the board.

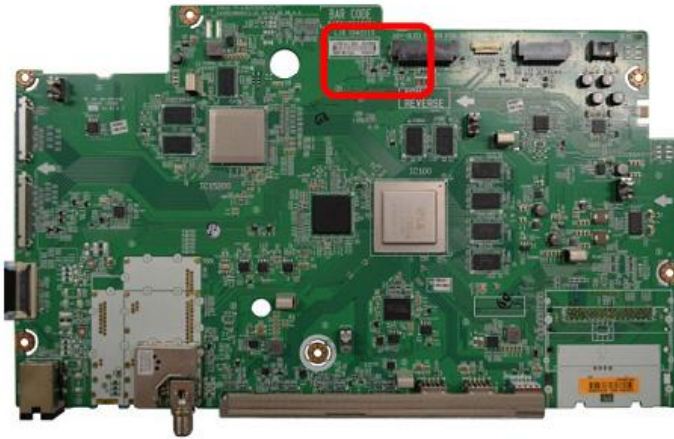


Step 3. Install the new KEC Reset IC using a soldering iron.

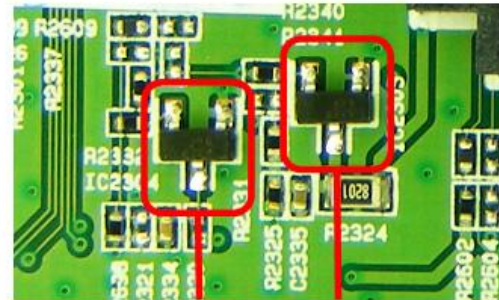
Reset IC Location:

a) Model: OLED65G6** & OLED77G6**, Marking Code: IC2304 & IC2305

IC Location



Detailed Picture



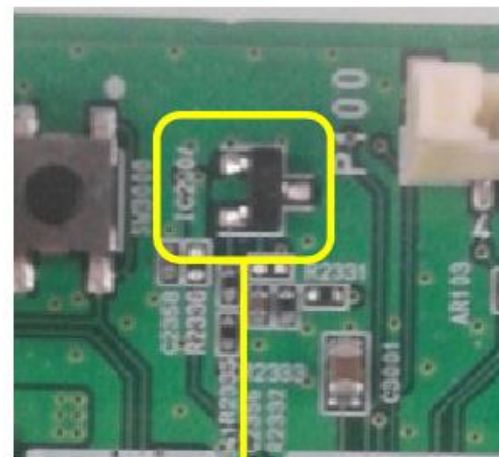
IC2304 IC2305

b) Model: 65/60/55/49UH77** & UH87** , Marking Code: IC2304

IC2304 IC Location



Detailed Picture



IC2304

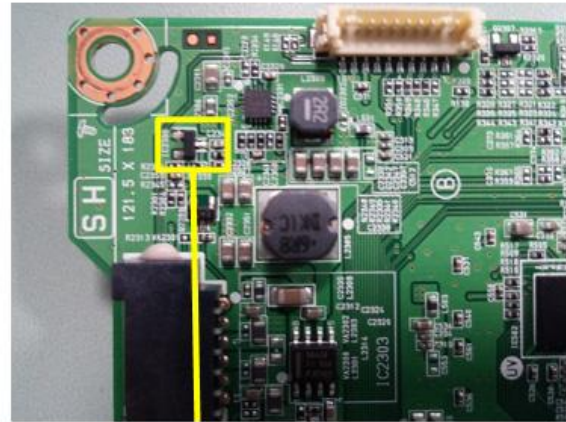
c) Model: 55/49/43/32LH60 & LH66** Series , Marking Code: IC2306

IC Location



IC2306

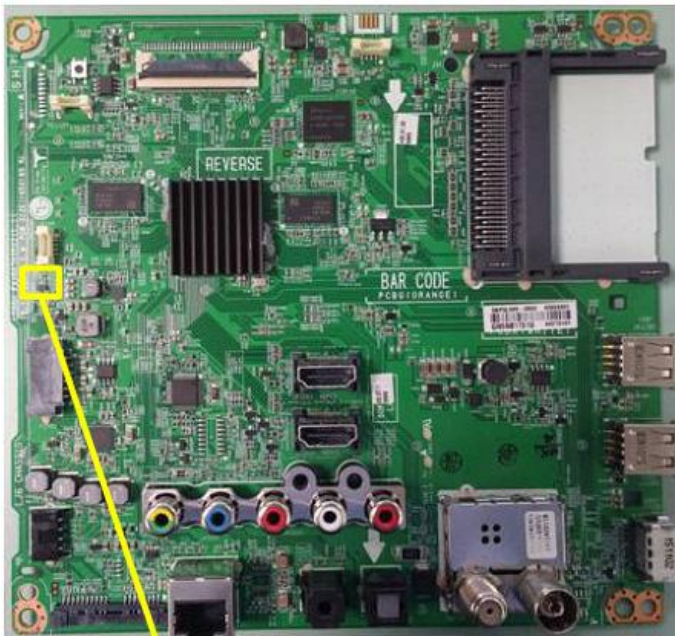
Detailed Picture



IC2306

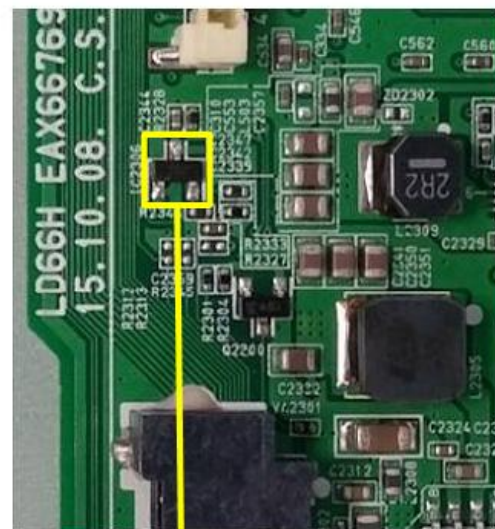
d) Model: 55/49/43/32LH60* , Marking Code: IC2306

IC Location



IC2306

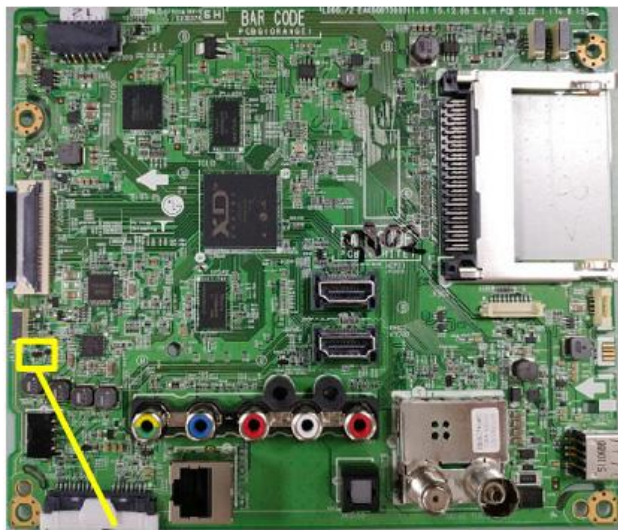
Detailed Picture



IC2306

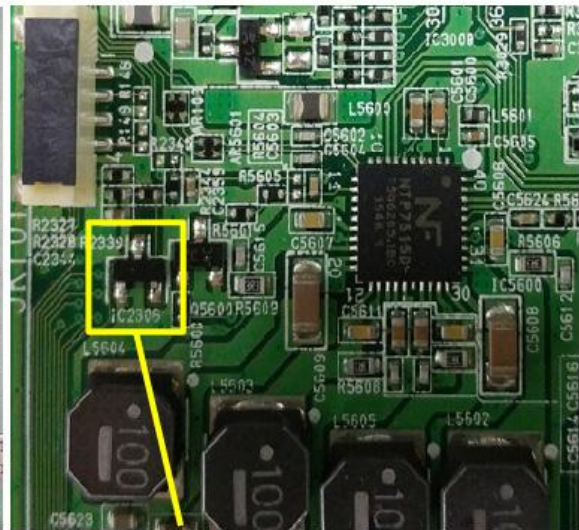
e) Model: 49/43LH57 & LH59**, 55/49/43LH59** , Marking Code: IC2306

IC Location



IC2306

Detailed Picture



IC2306

f) Model: 55/49/43LH56 & LH57 & 49/43LH58** , Marking Code: IC2306

IC Location



IC2306

Detailed Picture



IC2306

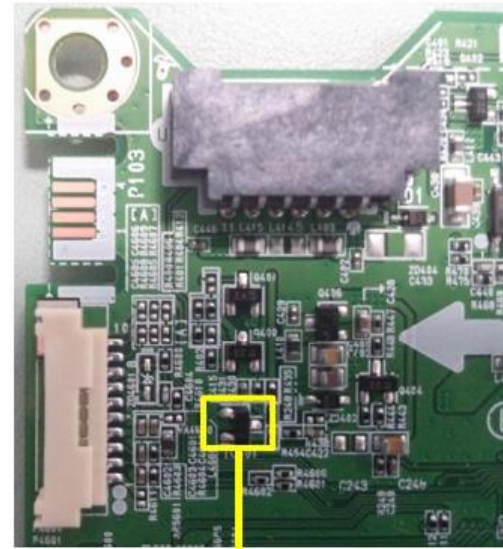
g) Model: 55/49/43LH58**-N, 55/49/43LH6420-N* , Marking Code: IC401

IC Location



IC401

Detailed Picture



IC401

h) Model: 43/49LF5400-UE, 40LH5300-UA , Marking Code: IC203

IC Location



IC203

Detailed Picture

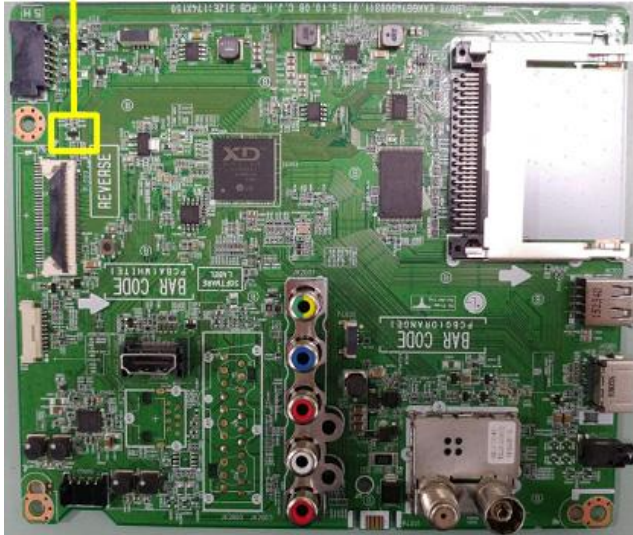


IC203

i) Model: **LH54*V-Z, 32LH53*V-Z , Marking Code: IC401

IC401

IC Location



Detailed Picture



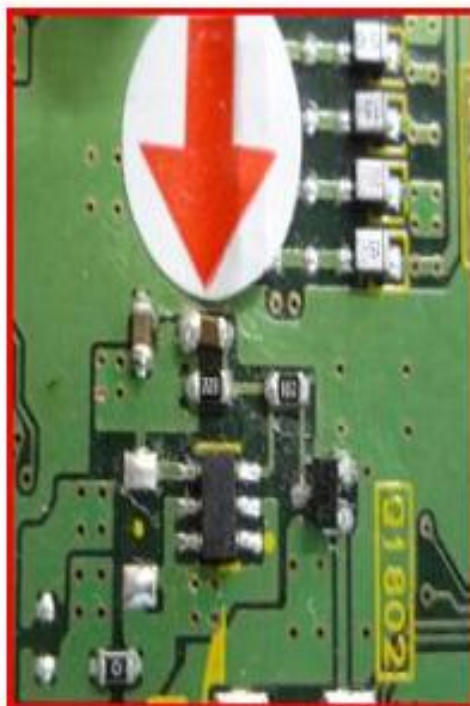
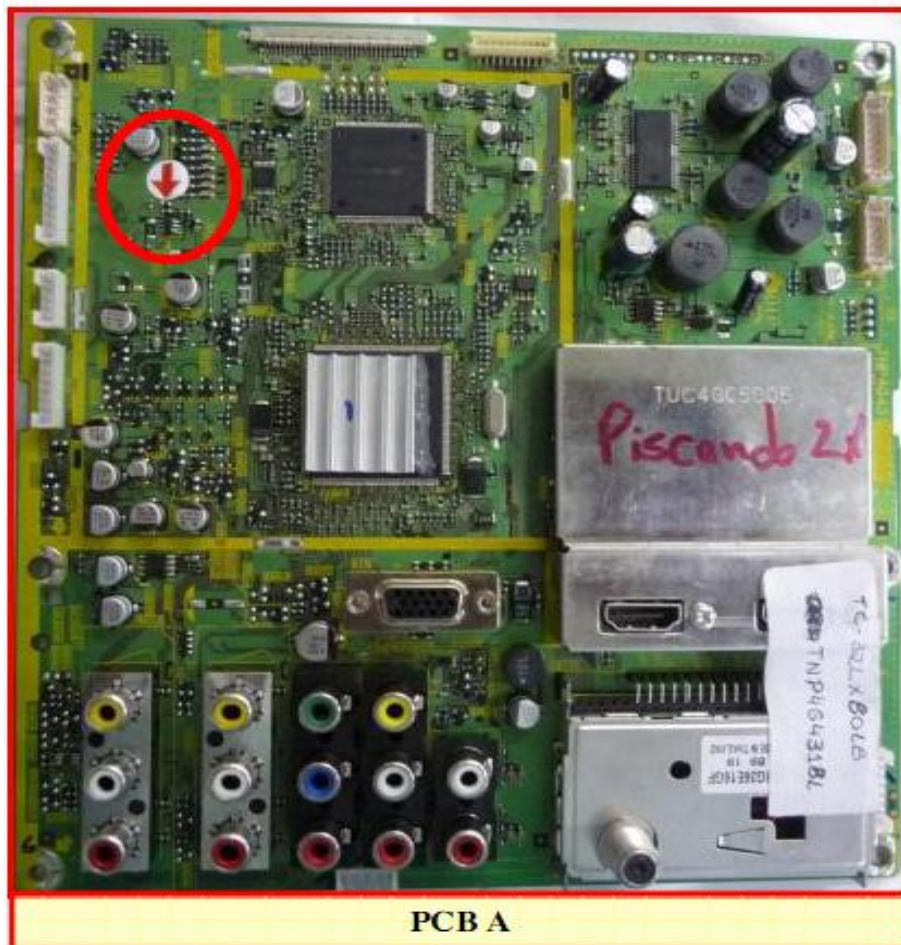
IC401

4) Model: Panasonic TC-32LX80LB & TC-37LX80LB LCD TV

Symptom: TV Can't Start-up, LED Blinking 2 Times

Repair/Solution:

The part Q1801 is supplied by STBY 3.3V and not supply MAIN 3.3V because a leakage in C1840 (1uF 10V). Replace the capacitor C1840.



5) Model: Samsung UN40ES6150 LED TV

Symptom: TV Power Start-up then Shut Off and Change to Standby Mode

Repair/Solution:

Found their PSU Board (BN44-00502A) DM855 rectifies diode shorted. Also re-solder the PSU board, especially their TM8015 transformer and corresponding area had dry joint.

6) Model: Sharp LC39LE651K, LC39LE751K, LC50LE651K & 751K, LC60LE651K & LE751K LED TV

Symptom: TV Turn on (Blue LED), but No Display and No Error Code are Record.

Repair/Solution:

This is be the result of firmware corruption. To recover the unit, find the correct version of BOOT firmware and updated a follows:







- a) Copy the BOOT firmware to a USB stick/Pendrive. The boot firmware should appear in a folder marked “boot”.
- b) Unplug the TV from the mains outlet.
- c) Insert the USB stick to one of the USB port on the TV.
- d) Power on the TV.
- e) When the front Panel LED becomes blue, keep pressing front panel “VOL-“.
- f) Wait until the front panel LED becomes RED (Flashing), then release the front panel “VOL-“ key.

Note: If the LED does not flash RED, repeat steps ‘d’ to ‘f’. This may take several attempts.

- g) The software upgrade operation will start, and the Red LED will blink as follows (1s Red, 1s OFF).

Note: If a different flashing sequence appears, refer to the chart below for more details of the error code.

h) Remove the power cord from the mains outlet, and then remove the USB memory stick.

Action performed	Led flashing period	Meaning
USB insertion without AC power	OFF	-
Power on the TV via AC cord	OFF	STM8 is starting up the FP2K controller
USB is being read and file containing the SW upgrade is identified	OFF	FP2K started and is able to perform USB connection and read from external device.
Writing process of FP2K starts	LED FLASHING: 1 second ON, 1 second OFF (RED LED).	Software from USB is being downloaded to the nand-flash
		
Writing process of STM8 starts	LED FLASHING: 1 second ON, 1 second OFF (RED LED).	FP2K downloads the software for STM8 via SWIM link.
		
Writing process stops successfully.	LED FLASHING: 1 second ON, 4 second OFF (RED LED)	Writing process OK.
		
Writing process stops erroneously because FP2K is not well written.	LED FLASHING: 2 flashes ON, 1 second OFF (RED LED)	FP2K writing failed
		
Writing process stops erroneously because STM8 is not well written.	LED FLASHING: 3 flashes ON, 1 second OFF (RED LED)	STM8 writing failed
		
Writing process stops erroneously because USB is not detected.	LED FLASHING: 4 flashes ON, 1 second OFF (RED LED)	USB connection failed
		

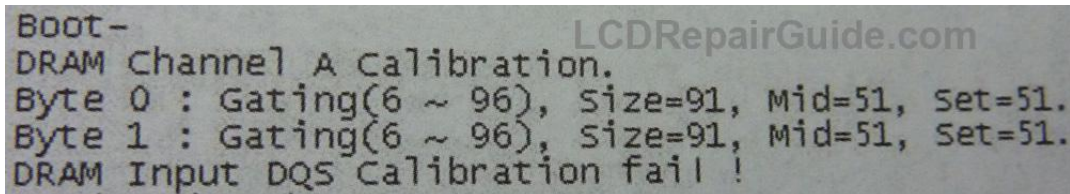
7) Model: Skyworth 55E550E (Chassis: 8K50) TV

Symptom: TV Can't Start-up.

Check MainBoard (5800-A8K500-0P40) voltage supply 1.3V, 1.8V, 2.5V, 3.3V all normal. Check their reset circuit and crystal clock Ok.

Repair/Solution:

Connect this TV to a Programmer to read their TV Start-up Log. Shown photo below:



```
Boot-
DRAM Channel A Calibration. LCDRepairGuide.com
Byte 0 : Gating(6 ~ 96), Size=91, Mid=51, Set=51.
Byte 1 : Gating(6 ~ 96), Size=91, Mid=51, Set=51.
DRAM Input DQS Calibration fail !
```

From the above TV Start-up Log info shows that in between Main Chip and DDR is abnormal. Check DDR input voltage and other voltage normal. The DDR corresponding components and circuit lines are OK. Replace the DDR memory the TV problem solved.

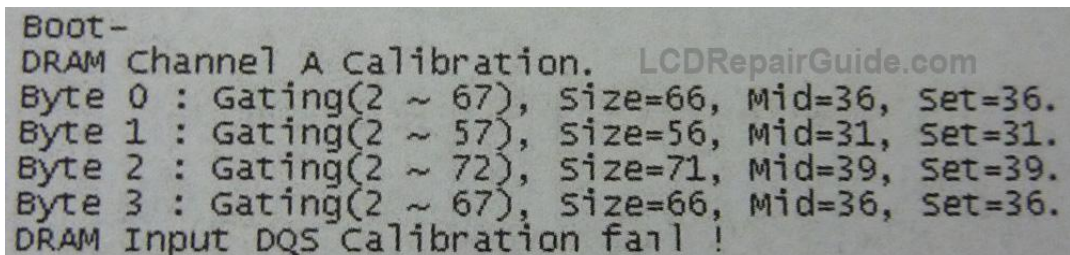
8) Model: Skyworth 32E680F (Chassis: 8K55) TV

Symptom: TV Can't Start-up.

Check MainBoard (5800-A8K560-0P40) voltage supplies are all normal. Check their reset circuit and crystal clock Ok.

Repair/Solution:

Connect this TV to a Programmer to read their TV Start-up Log. Shown photo below:



```
Boot-
DRAM Channel A Calibration. LCDRepairGuide.com
Byte 0 : Gating(2 ~ 67), Size=66, Mid=36, Set=36.
Byte 1 : Gating(2 ~ 57), Size=56, Mid=31, Set=31.
Byte 2 : Gating(2 ~ 72), Size=71, Mid=39, Set=39.
Byte 3 : Gating(2 ~ 67), Size=66, Mid=36, Set=36.
DRAM Input DQS Calibration fail !
```

From the above TV Start-up Log info shows that in between Main Chip and DDR is abnormal. Check DDR input voltage and other voltage all normal. Try to apply some pressure on the Main Chip there and re-run the TV Start-up Log (the TV can start-up a bit then shut off), it can shows more info then shows failed too. Use BGA to reflow the Main Chip and problem solved.

9) Model: TCL L46E5200BE (Chassis: MS28) TV

Symptom: TV Hang After 1 Minutes.

When the watching the TV about one minutes, the display will hang or hold there.

Repair/Solution:

Try to use USB to update their firmware but still not success. Suspect their NAND Flash problem, so replace U601 (HY27UF082G2B). After replace U601 and update their firmware, the TV problem solved.

10) Model: TCL L46P21FBD (Chassis: MT01C) TV

Symptom: TV Auto Shutdown

Normally the TV auto shutdown is causing by the voltage supply not stable.

Repair/Solution:

When the problem appear, check their 12V, 24V are normal. But the 5V no output just 0V. Replace their U006 (RT8110), after that power on the TV, the RT8110 output 5V. But just after about 1~2 minutes, same problem again.

Check the U006 corresponding components and found the U006 pin-7 and C001 in between has a loophole there. Check the loophole ohm values it shows nearly 2Kohm! Looks like the loophole inside line break and causing no 5V output. Connect a wire to bypass this loophole. Finally this problem solved!

If you want to buy the Test Equipment, Tools and Spare Parts please visit to the page here:

<http://www.LCDRepairGuide.com/tools>

All these tools and equipment will help you in troubleshooting and repairing the electronics devices.

Completer Flat Screen TV Troubleshooting & Repairing Ebooks:



*For searching the training manuals, service manuals or schematic diagram, please join the LED/LCD Television repair membership, highly recommended:

[Http://www.LCD-Television-Repair.com](http://www.LCD-Television-Repair.com)

ImagineX ElectronicS

<http://www.LCDRepairGuide.com/V5/>



Please visit the Resources Page to get more useful repairing information at:

<http://www.lcd-television-repair.com/newsletter/Recommend.html>

Bonus-A

LG LED/LCD TV Interconnect Schematic Diagrams

29LN4510-Interconnect_2013.....	117
42LB5800-Interconnect_2014.....	119
42LN5300-Interconnect_2013.....	124
47LB6000-Interconnect_2014.....	132
47LN5750-Interconnect_2013.....	139
49LF5500-Interconnect_2015.....	147
49UB8500-Interconnect_2014.....	155
50LB6500-Interconnect_2014.....	168
55EA9800-Interconnect-OLED_2013.....	177
55LA8600-Interconnect_2013.....	184
55LA9700-UHD_Interconnect_2013.....	193
55LB7200-Interconnect_2014.....	202

ImagineX ElectronicS

<http://www.LCDRepairGuide.com/V5/>

Below Models Interconnect Diagram Move to Bonus-B Section

55LM6200-Interconnect_2012.....	
55LM6700-Interconnect_2013.....	
55LM8600-3D-Interconnect_2012.....	
55LN5700-Interconnect_2014.....	
55LS4500-Interconnect_2014.....	
55UB9500-Interconnect_2014.....	
55UF7600-SMPS_T-CON_Mainboard_Interconnect_2015...	
60LN5400-Interconnect_2013.....	
65LB5200-Interconnect_2014.....	
65UF9500-UHD_Interconnect_2015.....	
84UB9800-Interconnect_2014.....	
OLED65G6P-Interconnect_2016.....	

T-Con Board Schematic/Circuit Diagrams**BONUS-A: T-Con Board Schematic/Circuit Diagrams**

AUO T546HF02-VO-CB_T-con Schematic Diagram	210
Samsung ESP_C4LV0.4 LJ94-03842E T-Con Schematic Diagram..	246
Sharp RUNTK0093FVZx_4K2K 120Hz_LC60UD20KN_T-con Schematic Diagram	251

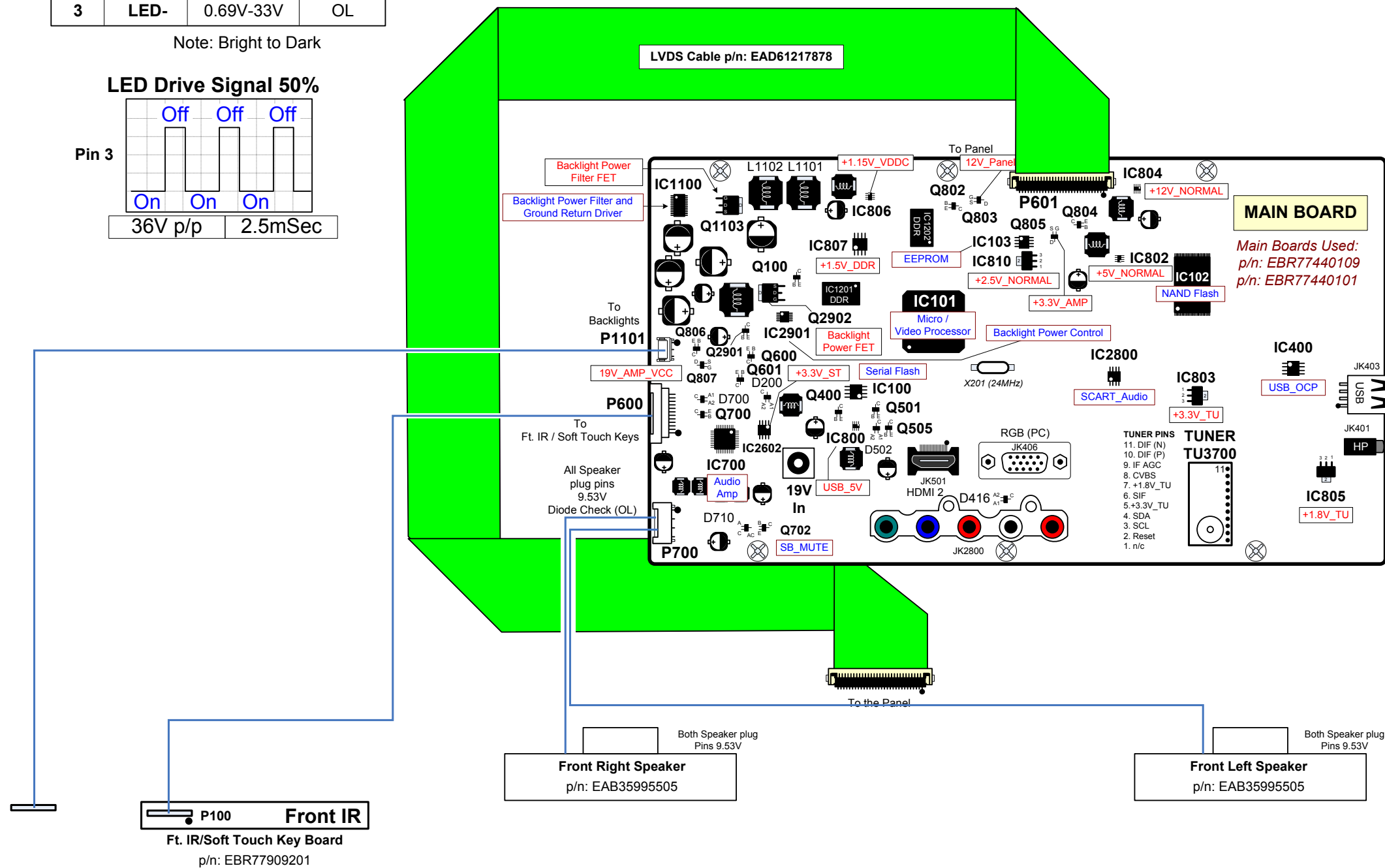
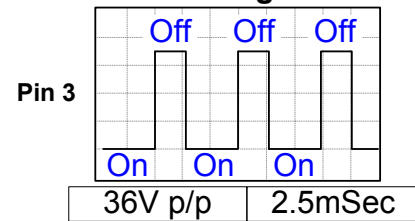
PANEL p/n: EAJ62189101

P1101 "MAIN" to the "Panel"

PIN	LABEL	RUN	Diode ✓
1	V_OUT	150.5V-154V	OL
2	N/C	n/c	n/c
3	LED-	0.69V-33V	OL

Note: Bright to Dark

LED Drive Signal 50%

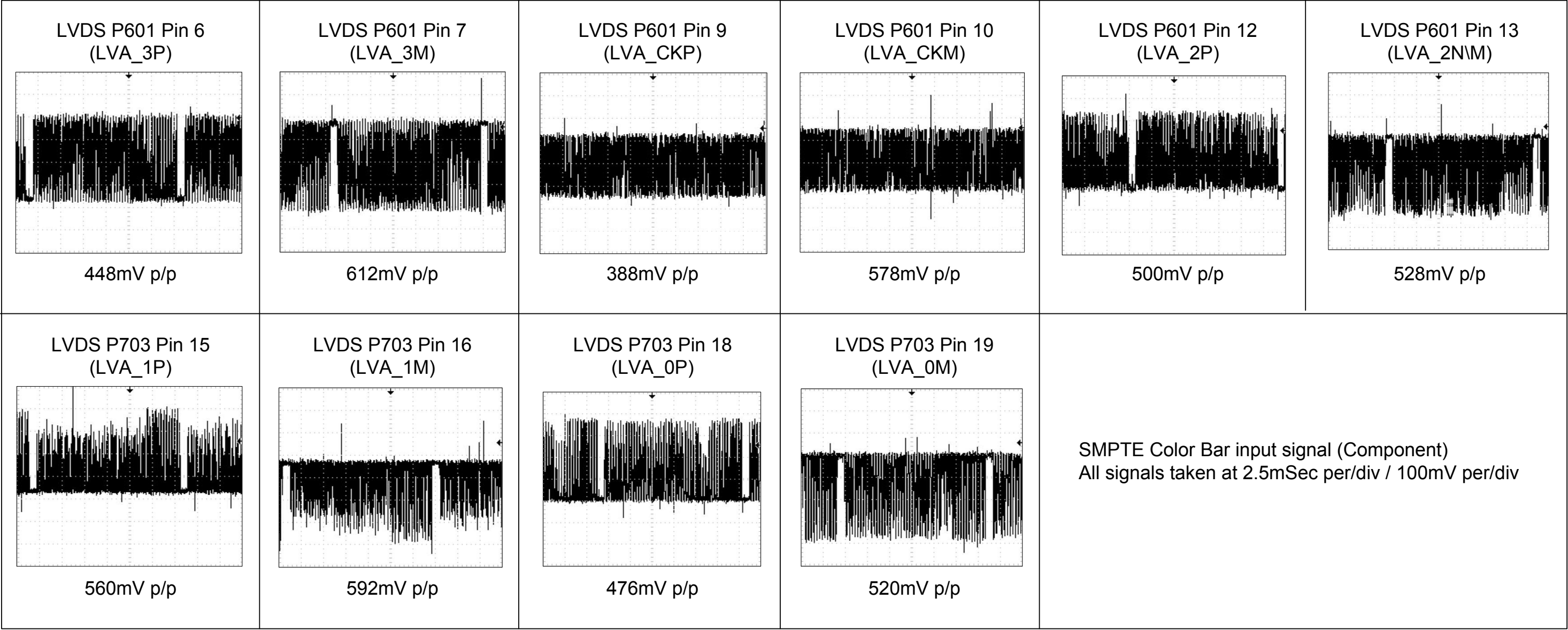


P601 "MAIN LVDS" to the "Panel"

PIN	LABEL	STBY	RUN	Diode Check
1	Gnd	Gnd	Gnd	Gnd
2-4	N/C	n/c	n/c	n/c
5	Gnd	Gnd	Gnd	Gnd
6	LVA_3P	0V	1.16V	1.34V
7	LVA_3N	0V	1.21V	1.34V
8	Gnd	Gnd	Gnd	Gnd
9	LVA_CKP	0V	1.22V	1.34V
10	LVA_CKN	0V	1.17V	1.34V
11	Gnd	Gnd	Gnd	Gnd
12	LVA_2P	0V	1.12V	1.34V
13	LVA_2N	0V	1.27V	1.34V
14	Gnd	Gnd	Gnd	Gnd
15	LVA_1P	0V	1.10V	1.34V
16	LVA_1N	0V	1.28V	1.34V
17	Gnd	Gnd	Gnd	Gnd
18	LVA_0P	0V	1.11V	1.34V
19	LVA_0N	0V	1.29V	1.34V
20	Gnd	Gnd	Gnd	Gnd
21-23	N/C	n/c	n/c	n/c
24-26	Gnd	Gnd	Gnd	Gnd
27-30	+12V_Panel_Power	0V	11.96V	OL

P600 "MAIN" to "Front IR Board" P100

PIN	LABEL	STBY	RUN	Diode Check
12	3.3V_ST	3.37V	3.37V	1.07V
11	IR	3.35V	3.34V	OL
10	LED_Amber	1.97V	1.97V	OL
9	LED_Red	0.12V	1.91V	OL
8	Amber_Led B+	3.37V	3.37V	1.35V
7	Red_Led B+	1.99V	3.37V	1.41V
6	Key_SDA	0V	3.33V	OL
5	Key_SCL	0V	3.33V	OL
4	Gnd	Gnd	Gnd	Gnd
3	Key1	3.37V	3.37V	OL
2	Key2	3.37V	3.37V	OL
1	3.3V_ST	3.37V	3.37V	1.07V



IC100 NVRAM
(Non-Volatile)

- Pin
- [1] n/c
 - [2] Gnd
 - [3] 3.31V
 - [4] Gnd
 - [5] 3.31V
 - [6] 3.31V
 - [7] 0V
 - [8] 3.31V (Vcc In)

IC500 AVDD_33SB
Regulator

- Gnd Out In
- [1] Gnd
 - [2] 3.34V (Out)
 - [3] 3.52V (Vcc In)

IC2400 +1.2V_MTK_CORE
Regulator

- Pin
- [1] Gnd
 - [2] 11.97V (Vcc In)
 - [3] Gnd
 - [4] 0.8V
 - [5] 1.6V
 - [6] 3.49V
 - [7] 1.22V (Out)
 - [8] 1.22V (Out)

IC2402 PWR_Det
+12V in

- 2 1 3
- [1] Gnd
 - [2] 3.66V (Out)
 - [3] 3.69V (In)

IC2403 +1.5V_DDR
Regulator

- Pin
- [1] 3.52V (Vcc In)
 - [2] 3.52V (Vcc In)
 - [3] Gnd
 - [4] Gnd
 - [5] Gnd
 - [6] 0.83V
 - [7] 0.68V
 - [8] 0.51V
 - [9] 1.85V
 - [10] 1.53V (Out)
 - [11] 1.53V (Out)
 - [12] 1.53V (Out)
 - [13] 5.06V
 - [14] n/c
 - [15] 3.5V
 - [16] 3.52V (Vcc In)

IC2404 (+5V_NORMAL)
Regulator

- Pin
- [1] 9.2V
 - [2] 0V (n/c)
 - [3] 0V (n/c)
 - [4] 1.22V
 - [5] 3.22V
 - [6] Gnd
 - [7] 24.44V (Vcc In)
 - [8] 5.10V

IC2405 +3.3V_NORMAL
Regulator

- Pin
- [1] 3.44V
 - [2] 0.77V
 - [3] 5.51V
 - [4] 5.32V
 - [5] Gnd
 - [6] 3.32V (Out)
 - [7] 8.78V
 - [8] 11.98V (Vcc In)

IC3301 +5VMHL
Regulator

- Pin
- [1] 0V
 - [2] Gnd
 - [3] 0.07V
 - [4] 0V (MHL_Det)
 - [5] 5.10V (Vcc In)

IC3700 RS232
Data Buffer

- Pin
- [1] 3.31V (C1+)
 - [2] 5.52V (V+)
 - [3] 0V (C1-)
 - [4] 0V (C2+)
 - [5] (-5.43V) (C2-)
 - [6] (-5.46V) (V2-)
 - [7] (n/c)
 - [8] (n/c)
 - [9] (n/c)
 - [10] (n/c)
 - [11] 3.27V (DIN2)
 - [12] 3.3V (ROut1)
 - [13] 0V (RIn1)
 - [14] (-5.46V) (DOut1)
 - [15] 0V (Gnd)
 - [16] 0V (In) +3.3V_ST

IC4306 +5V_USB2/3
USB2/3 OCP

- Pin
- [1] Gnd
 - [2] 5.10V (Vcc In)
 - [3] 3.3V
 - [4] 3.34V
 - [5] 3.31V
 - [6] 5.10V (Out USB2)
 - [7] 5.10V (Out USB3)
 - [8] 3.31V

IC4500 +5V_USB1
USB1 OCP

- Pin
- [1] Gnd
 - [2] 5.10V (Vcc In)
 - [3] 5.10V (Vcc In)
 - [4] 3.3V
 - [5] 3.3V
 - [6] 5.10V (Out USB1)
 - [7] 5.10V (Out USB1)
 - [8] 5.10V (Out USB1)

IC6515 1.2V_MHL
Regulator

- Gnd Out In
- [Gnd] Gnd
 - [Out] 1.2V
 - [In] 3.3V



Q100

OTP_Write Switch

Pin	
[S]	3.31V
[G]	3.30V
[D]	0V

Q500

'+3.5V_ST_WAKE Switch Q501 CTRL

Pin	
[B]	0.65V
[C]	0.05V
[E]	Gnd

Q501

'+3.5V_ST_WAKE Switch

Pin	
[S]	0V
[G]	0.58V
[D]	3.52V

Q2401

PWR_On Switch

Pin	
[1]	3.51V
[2]	2.83V
[3]	3.42V

Q2406

Panel VCC Switch (Q2407) Control

Pin	
[B]	0.64V
[C]	0.06V
[E]	Gnd

Q2407

Panel_VCC Switch

Pin	
[G]	1.8V
[S]	11.97V
[D]	11.96V

Q2408

VDD3V3_HDMI Switch

Pin	
[G]	1.95V
[S]	3.31V
[D]	3.31V

ZD2403

Clamp for +3.5V_ST

Pin	
C	3.5V
A	Gnd

Q3001

CEC (Consumer Electronic Control)

Pin	
[G]	3.51V
[S]	3.59V
[D]	7.66V

Q3300

HDMI 2 Hot Swap

Pin	
B	0V
C	0V
E	Gnd

Q3301

MHL_Det Switch Driver

Pin	
[B]	0.53V
[C]	3.51V
[E]	0V

Q3302

MHL Detection Switch

Pin	
[B]	3.52V
[C]	0V
[E]	3.51V

Q3303

HDMI1_Hot Swap

Pin	
B	0V
C	0V
E	Gnd

Q3309

MHL_SDA/SCL 5V Pull-Up

Pin	
[G]	5.09V
[S]	5.10V
[D]	2.46V

Q3310

MHL_Det Switch Changes to HDMI_Det

Pin	
[B]	0V
[C]	5V
[E]	0V

IC3000

Micro Processor

Pin	
[1]	0.06V
[2]	3.3V
[3]	0.05V
[4]	0.08V
[5]	0.02V
[6]	3.51V
[7]	3.49V
[8]	3.51V
[9]	3.51V
[10]	3.51V
[11]	3.51V
[12]	0.17V
[13]	3.34V
[14]	3.66V
[15]	3.51V
[16]	0V
[17]	3.51V
[18]	3.51V
[19]	3.24V
[20]	3.34V
[21]	0.08V
[22]	0V
[23]	0V
[24]	0V

Pin	
[25]	0V
[26]	0.04V
[27]	3.5V
[28]	0V
[29]	0V
[30]	0V
[31]	3.51V
[32]	3.51V
[33]	3.51V
[34]	3.51V
[35]	0V
[36]	0V
[37]	0V
[38]	1.06V
[39]	3.51V
[40]	3.51V
[41]	0.64V
[42]	0.12V
[43]	0V
[44]	0V (n/c)
[45]	0V (n/c)
[46]	2.09V
[47]	Gnd
[48]	3.51V (Vcc In)

IC3304

HDMI4_MHL Processor

Pin	
[1]	Gnd
[2]	1.2V
[3]	Gnd
[4]	3.3V
[5]	0V
[6]	0.05V
[7]	4.83V
[8]	5.09V
[9]	0V
[10]	5.10V
[11]	0V
[12]	0V (n/c)
[13]	0V (n/c)
[14]	5V
[15]	0V
[16]	0V (n/c)
[17]	3.29V
[18]	3.28V
[19]	3.37V
[20]	1.02V

Pin	
[21]	3.36V
[22]	3.31V
[23]	3.31V
[24]	3.31V
[25]	3.31V
[26]	3.31V
[27]	3.31V
[28]	3.31V
[29]	3.31V
[30]	1.2V
[31]	3.31V (Vcc In)
[32]	0.03V
[33]	0.03V
[34]	0.03V
[35]	0.03V
[36]	0.03V
[37]	0.03V
[38]	0.03V
[39]	0.03V
[40]	3.31V (Vcc In)

IC5400

Audio Amp

Pin	
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	0V
[6]	1.2V
[7]	0V
[8]	1.63V
[9]	1.62V
[10]	3.31V
[11]	3.31V
[12]	3.31V
[13]	3.25V
[14]	1.65V
[15]	1.65V
[16]	16.77V
[17]	Gnd
[18]	12.2V
[19]	24.45V
[20]	24.45V

Pin	
[21]	12.2V
[22]	Gnd
[23]	16.77V
[24]	3.16V
[25]	Gnd
[26]	0V
[27]	5.12V
[28]	16.76V
[29]	Gnd
[30]	12.2V
[31]	24.45V
[32]	12.2V
[33]	12.2V
[34]	Gnd
[35]	16.76V
[36]	3.29V
[37]	Gnd
[38]	1.59V
[39]	Gnd
[40]	3.31V (Vcc In)

D3000

CEC Bias

Pin	
[A1]	2.9V
[A2]	3.52V
[C]	3.5V

D3301

DDC_SCL_4_JACK Pull_Up

Pin	
[A1]	3.51V
[A2]	5.10V
[C]	5V

D3304

DDC_SCL_MHL Routing

Pin	
[A1]	3.51V
[A2]	5.10V
[C]	5V

D3312

DC_SCL_MHL Pull_Up

Pin	
[A1]	0V
[A2]	2.49V
[C]	5.09V

D3313

DC_SDA_MHL Pull_Up

Pin	
[A1]	0V
[A2]	2.49V
[C]	4.83V

D3314

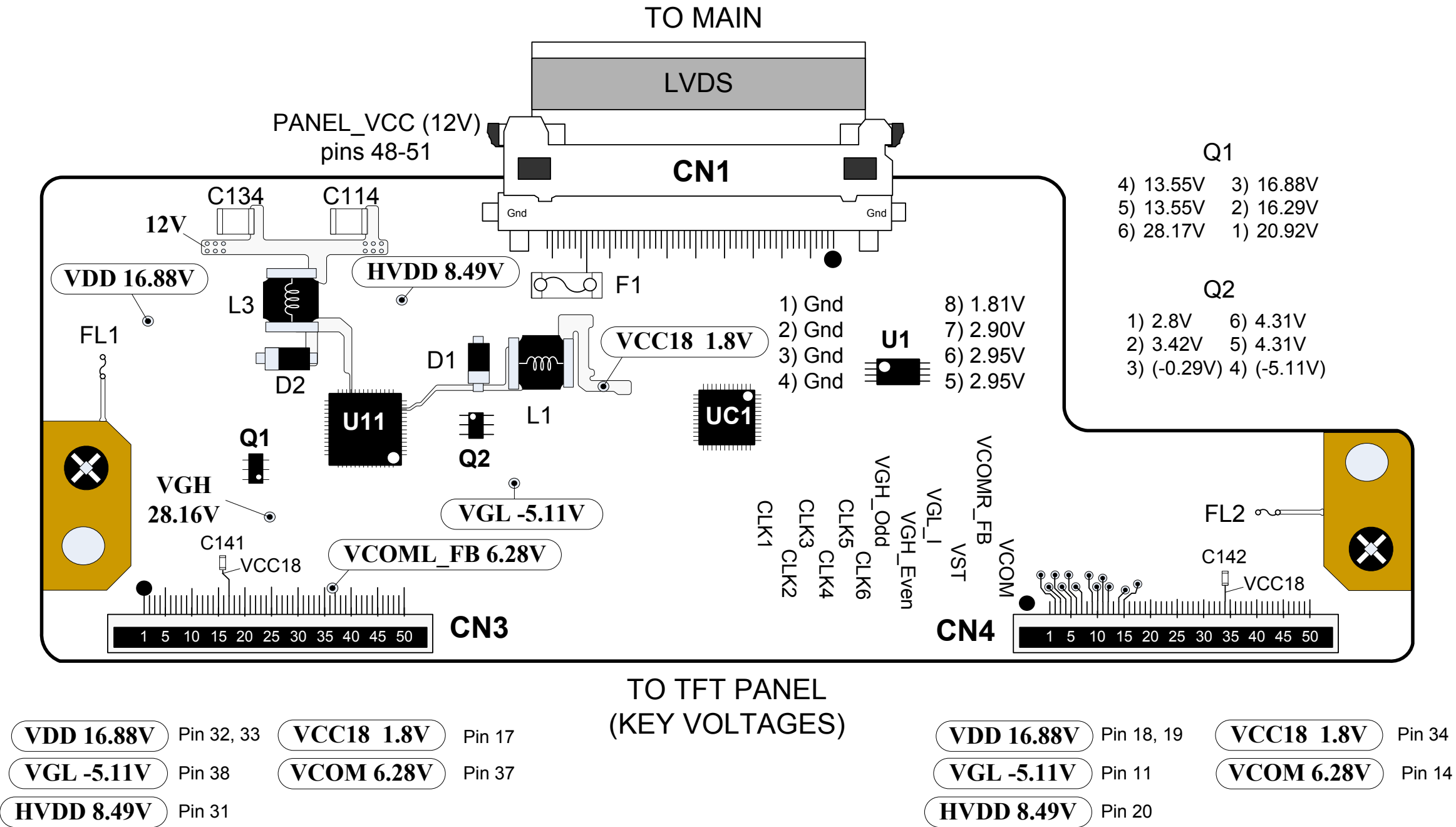
DC_SDA_SCL Pull_Up

Pin	
[A1]	0V
[A2]	2.49V
[C]	4.83V



42LB5800 T-CON Board Component Voltages

Warning: T-Con Board under shield. Be sure to reinsert screws before operating set with shield removed.



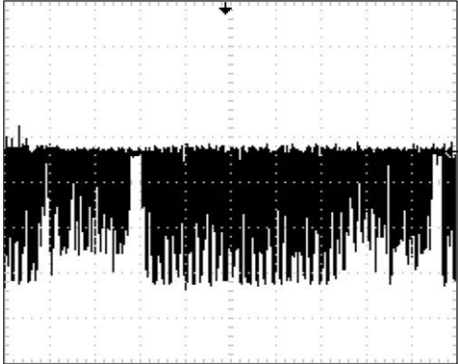
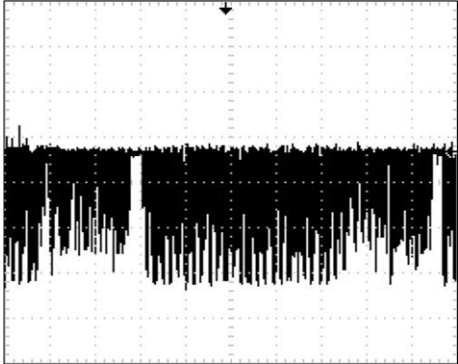
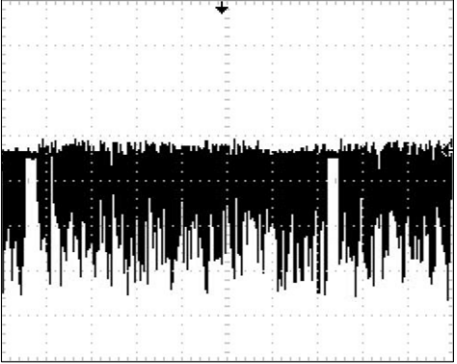
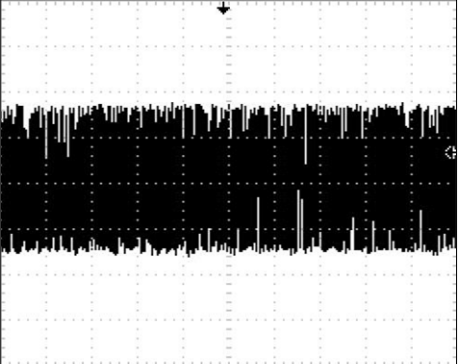
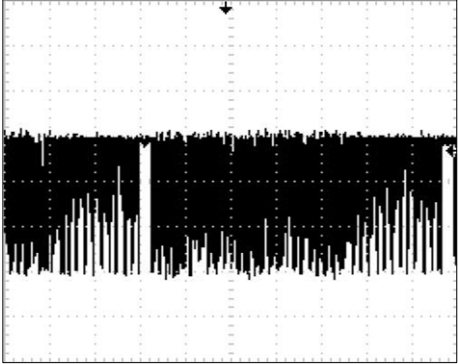
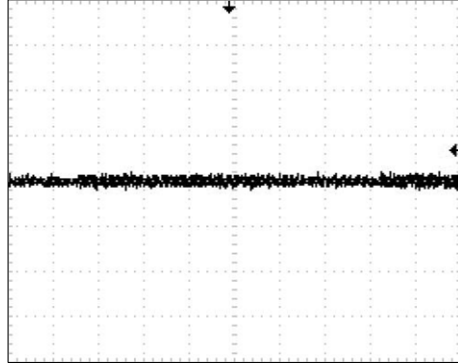
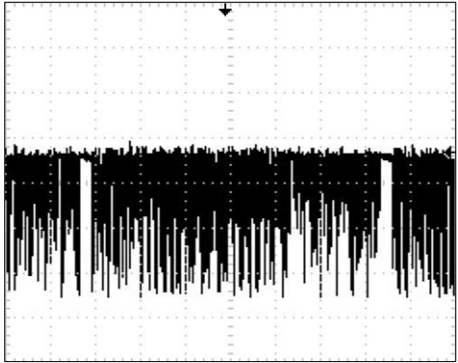
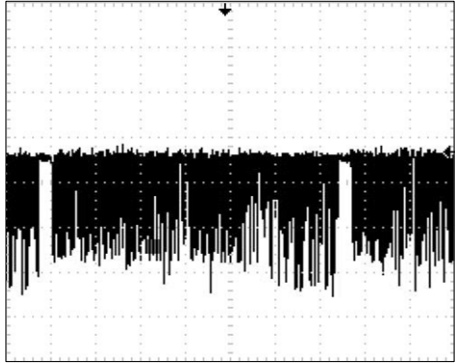
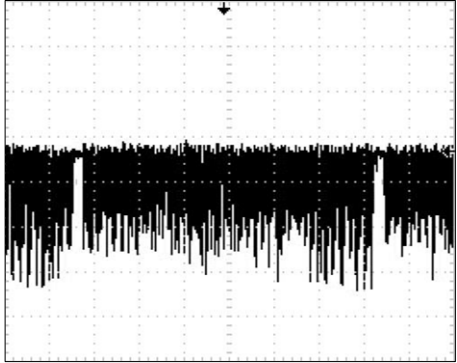
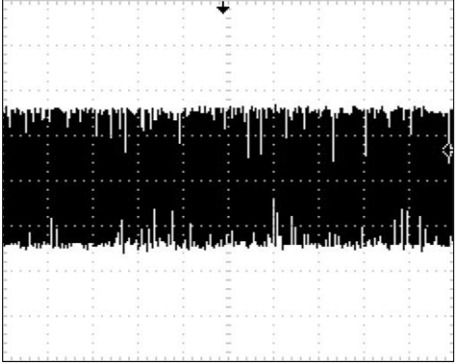
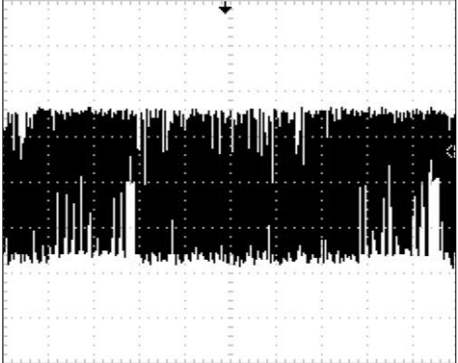
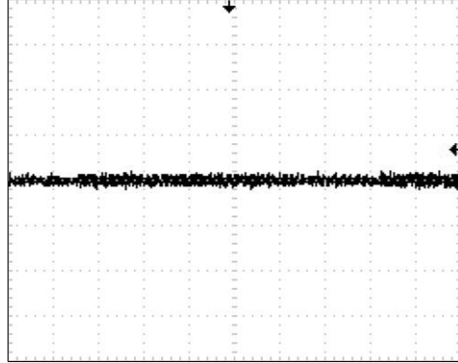
CN3	OTHER VOLTAGES	CN4
Pin 8	VGH (U11 pin 42, 43) 28.14V	Pin 43
Pin 9	*VGH_ODD (U11 pin 47) -5.09V to 28.14V	Pin 42
Pin 10	*VGH_EVEN (U11 pin 46) -5.09V to 28.14V	Pin 41
Pin 12	VST (U11 pin 45) -5.09V	Pin 39
Pin 18-19	VDD (U11 pin 28) 16.88V	Pin 32-33

**VGH_ODD and *VGH_EVEN cycle between -5.09V to 28.14V every second.*



42LB5800 P7100 LVDS Connector Video Waveforms

All LVDS signals are taken with SMPTY Color Bar signal input (1080P) Component Input.
All LVDS signals are “Differential Pairs”. The ones shown are the “Positive” signal of the pair. The Negative signal looks exactly the same but flipped 180°. Scope Settings are 100mV per/division, 2.5uSec per/division.

<div>Pin 12 (TXA0N)</div> <div></div> <div>360mV p/p</div>	<div>Pin 14 (TXA1N)</div> <div></div> <div>352mV p/p</div>	<div>Pin 16 (TXA2N)</div> <div></div> <div>356mV p/p</div>	<div>Pin 19 (TXACLKN)</div> <div></div> <div>336mV p/p</div>	<div>Pin 22 (TXA3N)</div> <div></div> <div>332mV p/p</div>	<div>Pin 24 (TXA4N)</div> <div></div> <div>40mV p/p No Waveform</div>
<div>Pin 28 (TXB0N)</div> <div></div> <div>344mV p/p</div>	<div>Pin 30 (TXB1N)</div> <div></div> <div>336mV p/p</div>	<div>Pin 32 (TXB2N)</div> <div></div> <div>332mV p/p</div>	<div>Pin 35 (TXBCLKN)</div> <div></div> <div>328mV p/p</div>	<div>Pin 38 (TXB3N)</div> <div></div> <div>352mV p/p</div>	<div>Pin 40 (TXB4N)</div> <div></div> <div>44mV p/p No Waveform</div>

42LN5300 INTERCONNECT DIAGRAM

Note: If a backlights are exhibiting a dim picture, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal. If not, 1st. Check the P-DIM level, it should rise with the percentage shown on screen. 100% = 2.76V. Follow the P-DIM signal all the way to the SMPS.

DIM OR DARK PICTURE:

Turn the Brightness, Contrast and Backlights all the way up. Confirm 180V D801. Confirm P-DIM is approx. 2.8V. Using a 220Ω resistor, jump backlight grounding pin on P801 (pin 1) while observing the picture. The Backlights should turn on maximum. If not, replace panel.

P201 "SMPS Board" To P401 "MAIN Board"

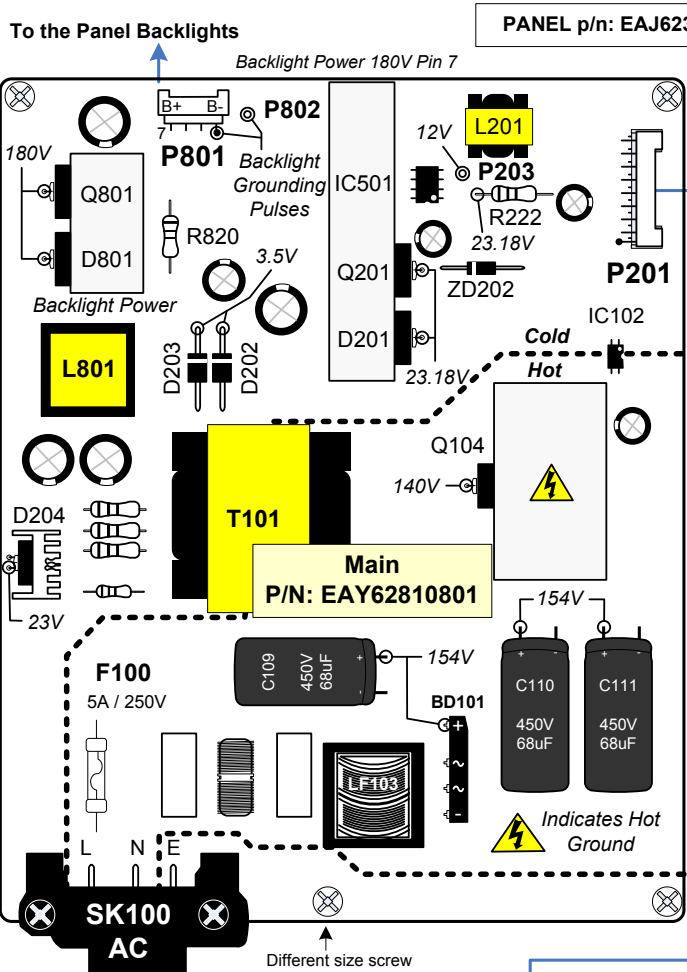
PIN	LABEL	STBY	RUN	Diode
17-18	Gnd	Gnd	Gnd	Gnd
16	n/c	n/c	n/c	OL
13-15	12V	0V	11.95V	2.18V
11-12	Gnd	Gnd	Gnd	Gnd
9-10	24V	0V	24.19V	1.96V
7-8	Gnd	Gnd	Gnd	Gnd
6	n/c	n/c	n/c	OL
5	3.5V_ST	3.42V	3.43V	OL
⁽³⁾ 4	P_DIM	0V	*0.23V-2.76V	OL
3	3.5V_ST	3.42V	3.43V	OL
⁽²⁾ 2	DRV_ON	0V	2.97V	OL
⁽¹⁾ 1	PWR_ON	0V	3.23V	1.15V

*0% to 100%

PWR-ON:
Starts 12V, 24V
No Backlight Power.
No Backlights.

DRV-ON: Starts
Backlights
LED Power goes to
180V.

⁽¹⁾ **PWM Pins 4:** can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition). Output from the Video Processor. Range 0.23V to 2.76V.



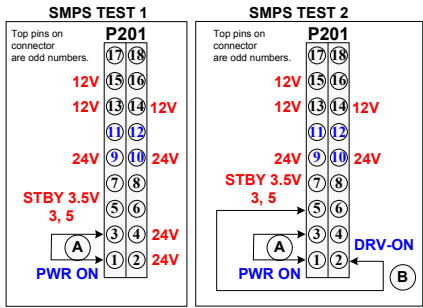
WARNING: Do not add or remove jumpers with Power Applied.

SMPS TEST 1: To Force Power Supply On without the Main Board.

Disconnect the P401 on the Main board.
(A) Jump pin 3 or 5 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main. (No Backlight power and the Backlights are not on at this time). LED Ground Return Line is (0V). Remove AC power. Leave the jumper in place.

SMPS TEST 2: (Turning on the Backlights)

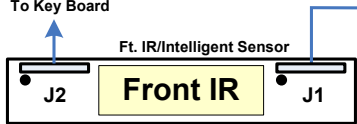
(B) Jump pin 3 or 5 (3.5V) to pin 2 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now read to 180V. LED Ground Return Line is (72V). P-DIM P201 (pin 4) pulls up to 4V.



Note; If there is a problem with a load from the panel backlights, you can remove AC and Disconnect P801. When AC is reapplied, the Backlight power will start at 108V, rise to 230V and stay there.

BACKLIGHT INFORMATION:
50 Total LEDs, 5 LEDs per/Board.
2 boards per/row. All LEDs are controlled by one ground return line. Backlight power 180V.

Back Left of Set
Keyboard
p/n: EBR77104601

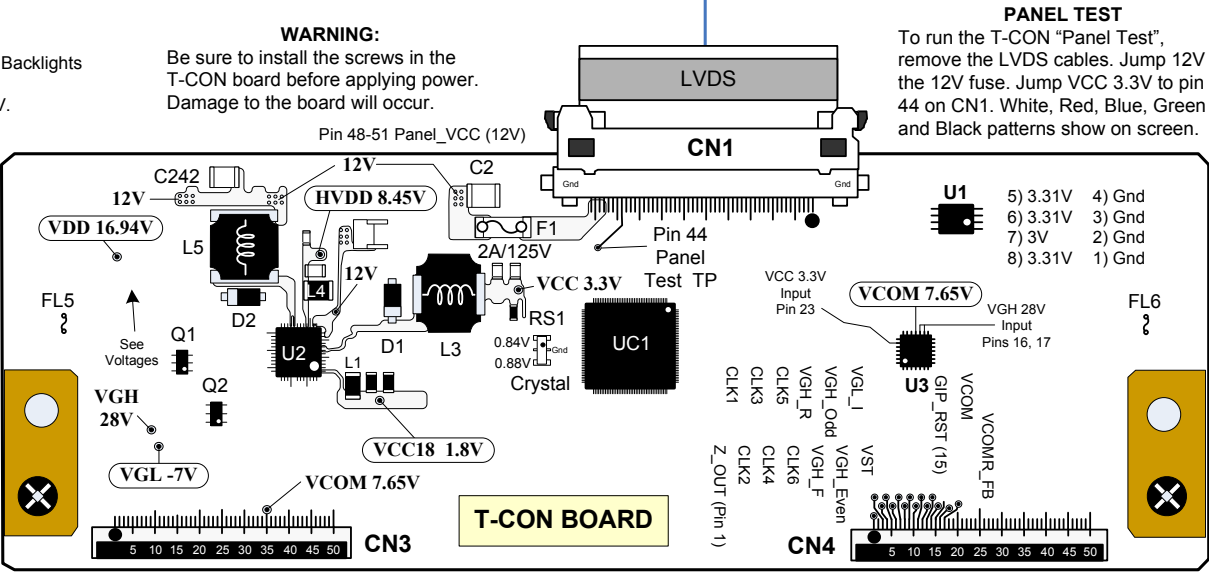


Bottom Center of Set
Front IR
p/n: EBR76405802

Additional Voltages from U3 to the Panel with no silk screen labels:

U3 pin 1 (7.76V) CN4 pin 48 CN5 pin 3
U3 pin 2 (7.74V) CN4 pin 47 CN5 pin 4
U3 pin 3 (7.75V) CN4 pin 46 CN5 pin 5
U3 pin 4 (7.74V) CN4 pin 45 CN5 pin 6
U3 pin 5 (7.76V) CN4 pin 44 CN5 pin 7

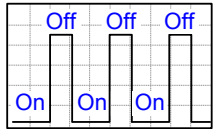
U3 pin 6 (7.74V) CN4 pin 43 CN5 pin 8
U3 pin 8 (27.9V) CN4 pin 42 CN5 pin 9
U3 pin 9 (-6.97V) CN4 pin 41 CN5 pin 10
U3 pin 10 (-6.95V to 27.9V) CN4 pin 40 CN5 pin 11
U3 pin 11 (-6.95V to 27.9V) CN4 pin 39 CN5 pin 12



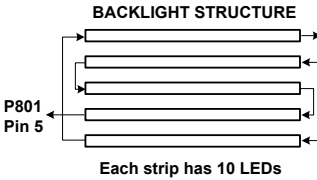
PANEL TEST

To run the T-CON "Panel Test", remove the LVDS cables. Jump 12V to the 12V fuse. Jump VCC 3.3V to pin 44 on CN1. White, Red, Blue, Green and Black patterns show on screen.

LED Drive Signal 50%
Backlight Setting
On the Cust. Menu.



No Local Dimming
In this Model.



For LVDS Waveforms
see Page 4 of the
Interconnect diagram.

P801 "SMPS Board" To "LED Backlights"

PIN	LABEL	RUN	Diode
1	BL-	66V~11V	OL
3	Jumper	113V~79V	OL
5	Jumper	113V~79V	OL
7	BL+	180V	OL

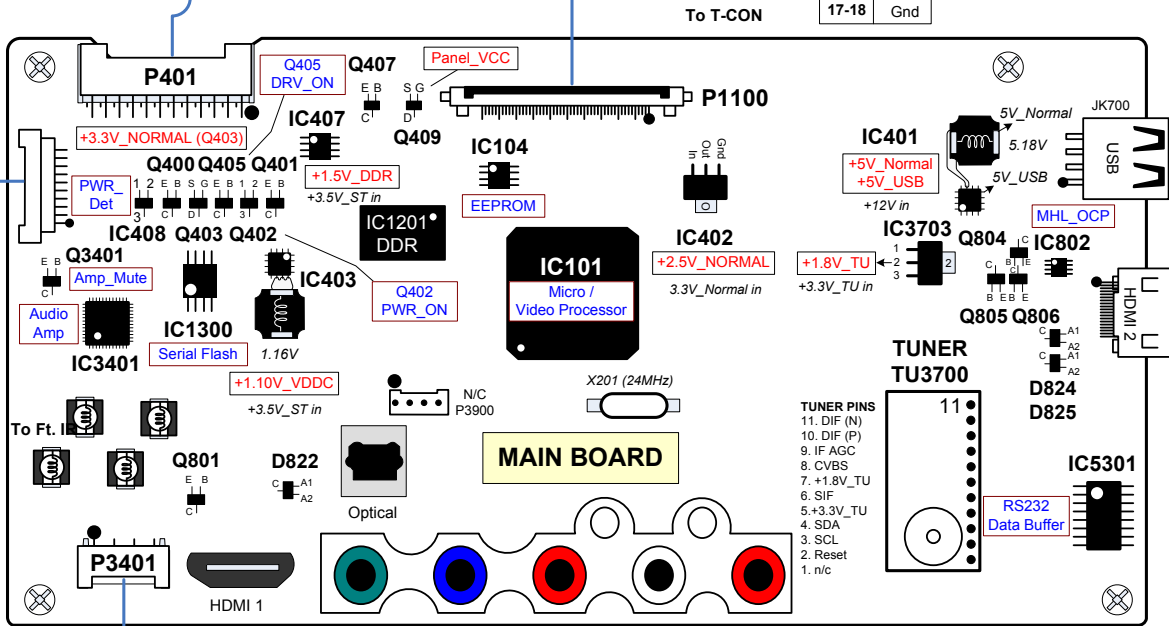
No Stand-By Voltages
Pins 2, 4, 6 are n/c.

For DC voltages
See P201 Chart

P401 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	OL
2	1.82V
3	0.84V
4	n/c
5	0.84V
6	OL
7-8	Gnd
9-10	OL
11-12	Gnd
13-15	OL
16	OL
17-18	Gnd

For DC voltages for Main board
components see Page 2 of the
Interconnect diagram.



42LN5300 Main Board (ICs) Component Voltages

IC104		Pin	EEPROM
			Memory

- [1] Gnd
- [2] Gnd
- [3] Gnd
- [4] Gnd
- [5] 3.27V
- [6] 3.27V
- [7] Gnd
- [8] 3.27V

IC401		Pin	+5V+NORMAL
			Regulator

- [1] n/c
- [2] 0.63V
- [3] 6.26V
- [4] 0.46V
- [5] 3.27V
- [6] 4.77V
- [7] Gnd
- [8] 5.18V (5V_USB Out)
- [9] 5.18V (5V_Normal Out)
- [10] 0.8V
- [11] 5.18V (5V_Normal Out)
- [12] 11.32V
- [13] Gnd
- [14] 11.93V (Vcc In)
- [15] 6.28V
- [16] 6.86V

IC402		Pin	+1.8V_TU
			Regulator

- [1] 0V (Gnd)
- [2] 2.5V (Out)
- [3] 3.27V (In)

IC403		Pin	+1.1V_DDR
			Regulator

- [1] 3.29V (Vcc In)
- [2] 3.29V (Vcc In)
- [3] Gnd
- [4] Gnd
- [5] Gnd
- [6] 0.83V
- [7] 0.67V
- [8] 0.51V
- [9] 0.85V
- [10] 1.17V (Out)
- [11] 1.17V (Out)
- [12] 1.17V (Out)
- [13] 4.49V
- [14] n/c
- [15] 3.23V
- [16] 3.29V (Vcc In)

IC407		Pin	+1.5V_DDR
			Regulator

- [1] 3.29V (Vcc In)
- [2] n/c
- [3] 3.29V (Vcc In)
- [4] 3.27V
- [5] Gnd
- [6] 3.18V
- [7] 0.8V
- [8] 1.53V (Out)

IC408		Pin	PWR_Det
			+12V in

- [1] Gnd
- [2] 3.3V (Out)
- [3] 3.3V (In)

IC802		Pin	+5V_USB2/3
			OCP

- [1] Gnd
- [2] 5.18V (Vcc In)
- [3] 5.18V (Vcc In)
- [4] 0V
- [5] 3.26V
- [6] 5.10V (Out)
- [7] 5.10V (Out)
- [8] 5.10V (Out)

IC1300		Pin	Serial FLASH
			Memory

- [1] 3.29V
- [2] 3.28V
- [3] 0V
- [4] Gnd
- [5] 0V
- [6] 0V
- [7] 3.29V (Vcc In)
- [8] 3.29V (Vcc In)

IC3703		Pin	+1.8V_TU
			Regulator

- [1] 0V (Gnd)
- [2] 1.8V (Out)
- [3] 3.27V (In)

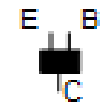
IC5301		Pin	RS232
			Data Buffer

- [1] 3.31V (C1+)
- [2] 5.52V (V+)
- [3] 0V (C1-)
- [4] 0V (C2+)
- [5] (-5.43V) (C2-)
- [6] (-5.46V) (V2-)
- [7] (n/c)
- [8] (n/c)
- [9] (n/c)
- [10] (n/c)
- [11] 3.27V (DIN2)
- [12] 3.3V (ROut1)
- [13] 0V (RIn1)
- [14] (-5.46V) (DOut1)
- [15] 0V (Gnd)
- [16] 0V (In) +3.3V_ST

47LN5750 Main Board (Transistors and Large Flat Pack ICs) Component Voltages

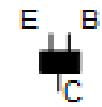
Q400	Drives	
	Q403	

Pin	
[B]	0.63V
[C]	0.04V
[E]	Gnd



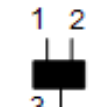
Q401	Drives	
	Q402	

Pin	
[B]	0.66V
[C]	0.05V
[E]	Gnd



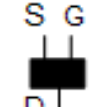
Q402	PWR_On	
	Switch	

Pin	
[1]	3.31V
[2]	2.62V
[3]	3.22V



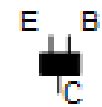
Q403	+3.3V_NORMAL	
	Switch	

Pin	
[G]	0.34V
[S]	3.31V
[D]	11.963.29



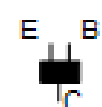
Q405	DRV_ON	
	Switch	

Pin	
[B]	0.2V
[C]	2.99V
[E]	Gnd



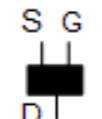
Q407	Drives	
	Q409	

Pin	
[B]	0.64V
[C]	0.04V
[E]	Gnd



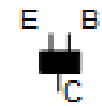
Q409	Panel_VCC	
	Switch	

Pin	
[G]	1.78V
[S]	11.93V
[D]	11.91V



Q801	HDMI	
	Hot Swap	

Pin	
[B]	0V
[C]	0.07V
[E]	Gnd



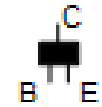
Q804	MHL_EN	
	Driver	

Pin	
[B]	1.365V
[C]	0V
[E]	0.07V



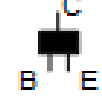
Q805	MHL_OCP_EN	
	Driver	

Pin	
[B]	0.65V
[C]	0.03V
[E]	Gnd



Q806	VBUS_EN	
	Driver	

Pin	
[B]	0.68V
[C]	0.07V
[E]	Gnd



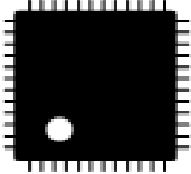
Q3401	Amp Mute	
	Driver	

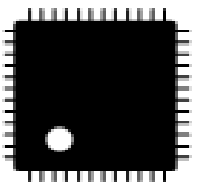
Pin	
[B]	0.02V
[C]	3.31V
[E]	Gnd



IC3401	Audio	
	Amp	

[1] 24.13V	[25] n/c
[2] 20.88V	[26] n/c
[3] 1.06V	[27] n/c
[4] Gnd	[28] 3.27V (Vcc In)
[5] 24.16V	[29] Gnd
[6] 1.06V	[30] n/c
[7] 1.06V	[31] n/c
[8] 24.16V	[32] n/c
[9] Gnd	[33] n/c
[10] 1.07V	[34] 1.8V
[11] 3.28V	[35] Gnd
[12] 0V	[36] 1.4V
[13] n/c	[37] 1.44V
[14] n/c	[38] 1.64V
[15] n/c	[39] 1.14V
[16] n/c	[40] 3.27V
[17] n/c	[41] 3.27V
[18] n/c	[42] n/c
[19] n/c	[43] 3.27V
[20] n/c	[44] 3.27V
[21] n/c	[45] Gnd
[22] n/c	[46] Gnd
[23] n/c	[47] Gnd
[24] n/c	[48] 3.27V (Vcc In)

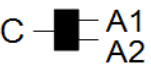




D822

D824	DDC_SCL_2/4	
	Pull_Up	

Pin	
[A1]	0V
[A2]	5.18V
[C]	4.92V



D825

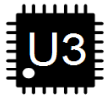
Pin	
[A1]	0.07V
[A2]	3.3V
[C]	4.92V

42LN5300 T-CON Board Component Voltages

U3 DC-to-DC

Panel Power Level Shifter

Pin		Pin	
[1]	7.76V (GCLK1)	[15]	(-6.97) (VGL)
[2]	7.74V (GCLK2)	[16]	27.96V (VGH)
[3]	7.75V (GCLK3)	[17]	27.96V (VGH)
[4]	7.74V (GCLK4)	[18]	7.65V (V_COM)
[5]	7.76V (GCLK5)	[19]	7.65V
[6]	7.74V (GCLK6)	[20]	7.62V
[7]	2.5V	[21]	16.9V
[8]	27.9V (VGH_R)	[22]	Gnd
[9]	(-6.97) (VGH_F)	[23]	3.3V (VCC)
[10]	*(-6.95V to 27.9V) (VGH_ODD)	[24]	0V
[11]	*(-6.95V to 27.9V) (VGH_EVEN)	[25]	0V
[12]	(-6.91) (VST)	[26]	0.7V
[13]	(-6.88) (GIP_RST)	[27]	1.27V
[14]	(-6.97)	[28]	3.24V



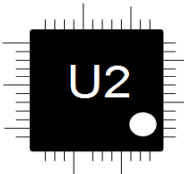
* EVERY Second

U2 DC-to-DC

T-CON and Panel Power

DC-to-DC Conv

Pin		Pin
[1]	1.81V	[25] 4.95V
[2]	1.86V	[26] 0.53V
[3]	Gnd	[27] 3.3V
[4]	3.3V	[28] 3.3V
[5]	1.79V	[29] 4.99V
[6]	1.81V	[30] 1.3V
[7]	Gnd	[31] 16.4V
[8]	3.31V (VCC)	[32] 27.94V
[9]	3.31V (VCC)	[33] 5.69V
[10]	0V	[34] 8.21V
[11]	11.7V (Panel_VCC)	[35] (-6.98V) (VGL_FB)
[12]	11.7V (Panel_VCC)	[36] 1.19V
[13]	11.7V (Panel_VCC)	[37] 13.86V
[14]	11.7V (Panel_VCC)	[38] 12.85V
[15]	8.45V (H_VDD)	[39] 10.91V
[16]	8.44V (H_VDD_FB)	[40] 6.55V
[17]	Gnd	[41] 4.6V
[18]	Gnd	[42] 3.5V
[19]	Gnd	[43] 7.65V
[20]	11.7V (Panel_VCC)	[44] 7.64V
[21]	11.7V (Panel_VCC)	[45] 7.63V
[22]	16.97V	[46] 7.61V (VCOM_RFB)
[23]	16.97V (VDD)	[47] 1.61V
[24]	Gnd	[48] Gnd



U1

Buffer

Pin	
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	3.31V
[6]	3.31V
[7]	3.31V
[8]	3.31V


Q1

VDD Rectifier

Pin	Voltage
[1]	20.2V
[2]	16.38V
[3]	16.93V Output
[4]	12.98V
[5]	12.98V
[6]	12.95V

Q2

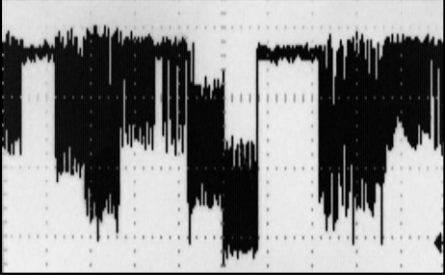
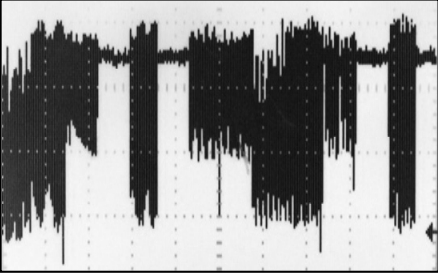
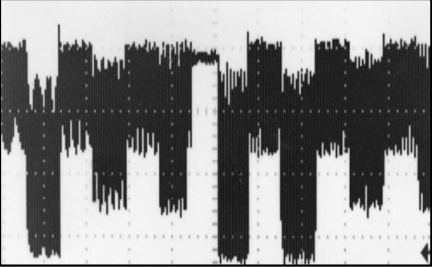
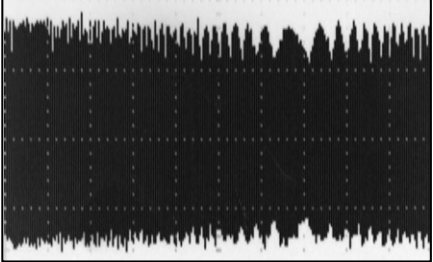
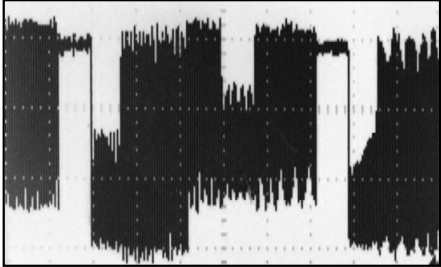
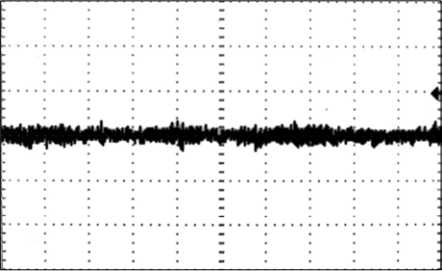
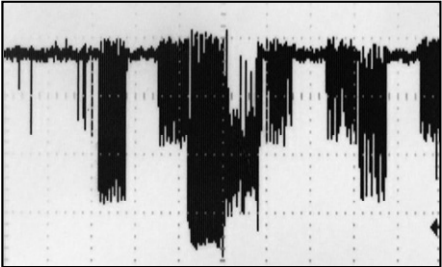
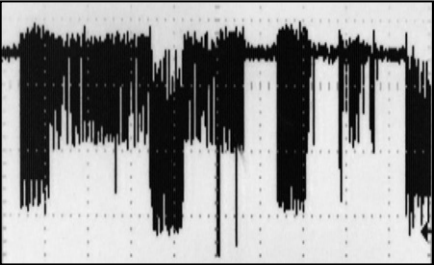
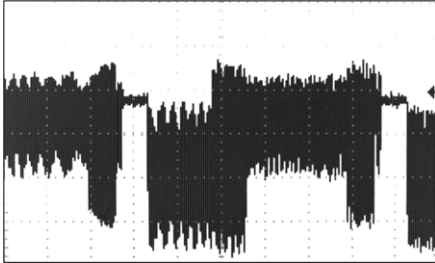
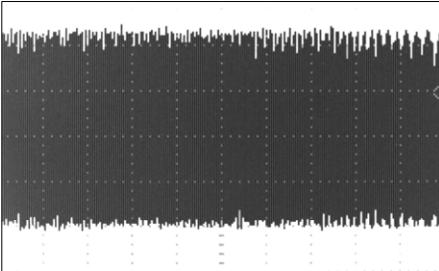
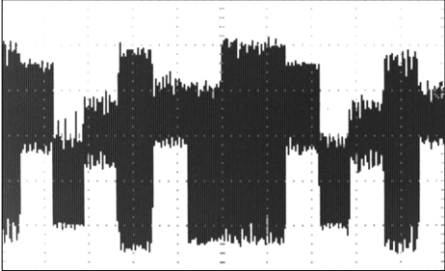
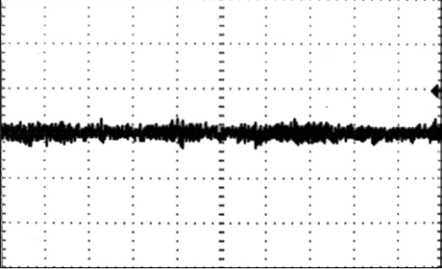
VGL Rectifier



Pin	Value
[1]	0.56V
[2]	1.18V
[3]	(-2.9V)
[4]	(-7V) Output
[5]	2.97V
[6]	2.97V

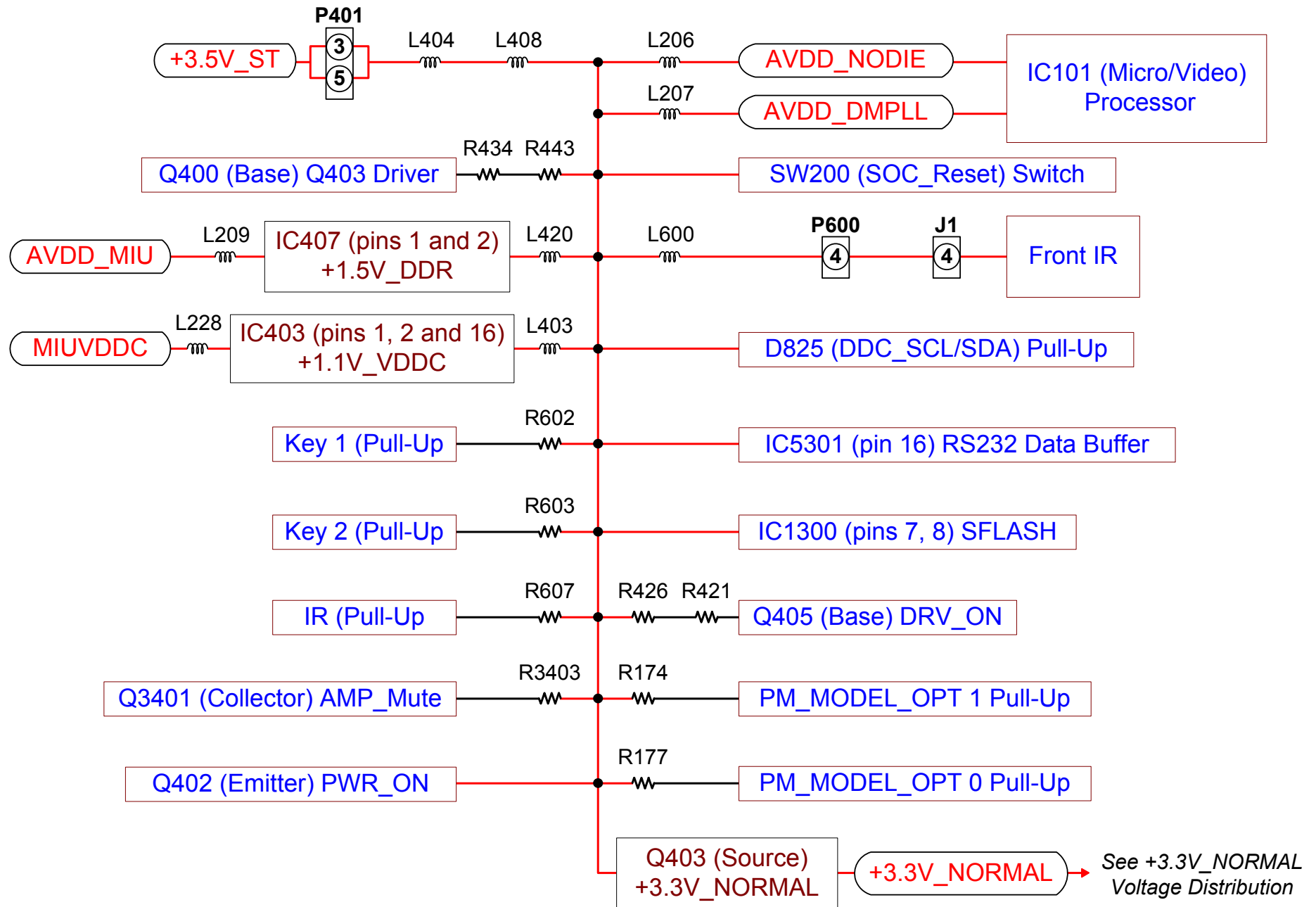
42LN5300 P1100 LVDS Connector Video Waveforms

All LVDS signals are taken with SMPTY Color Bar signal input (1080P) Component Input.
All LVDS signals are “Differential Pairs”. The ones shown are the “Positive” signal of the pair. The Negative signal looks exactly the same but flipped 180°. Scope Settings are 100mV per/division, 2.5uSec per/division.

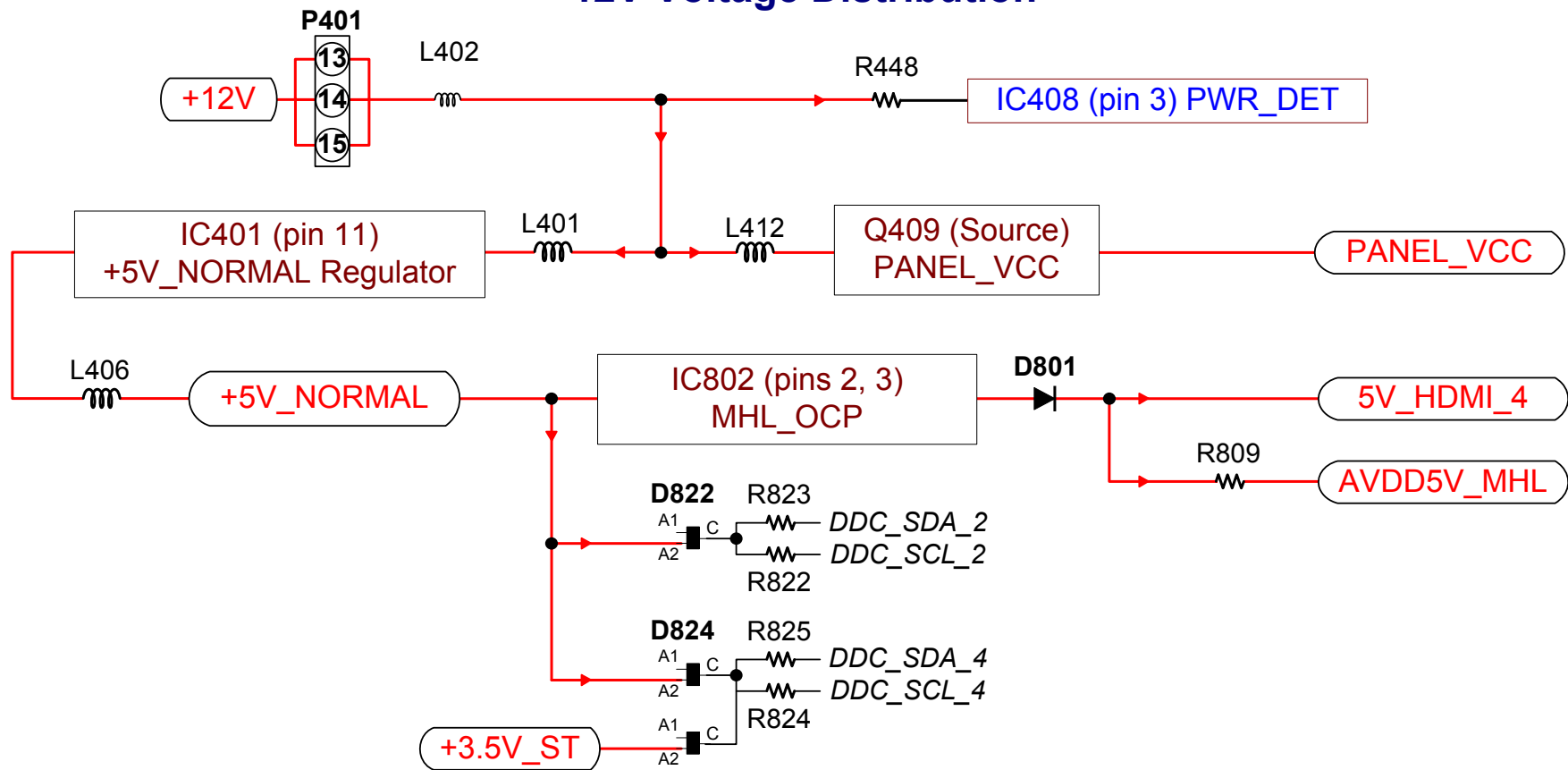
<div>Pin 12</div> <div></div> <div>340mV p/p</div>	<div>Pin 14</div> <div></div> <div>384mV p/p</div>	<div>Pin 16</div> <div></div> <div>380mV p/p</div>	<div>Pin 19</div> <div></div> <div>340mV p/p</div>	<div>Pin 22</div> <div></div> <div>348mV p/p</div>	<div>Pin 24</div> <div></div> <div>56mV p/p No Waveform</div>
<div>Pin 28</div> <div></div> <div>384mV p/p</div>	<div>Pin 30</div> <div></div> <div>356mV p/p</div>	<div>Pin 32</div> <div></div> <div>448mV p/p</div>	<div>Pin 35</div> <div></div> <div>340mV p/p</div>	<div>Pin 38</div> <div></div> <div>449mV p/p</div>	<div>Pin 40</div> <div></div> <div>64mV p/p No Waveform</div>

42LN5300 Main Board (+3.5V_ST) Voltage Distribution

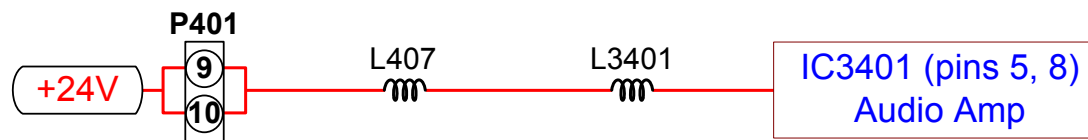
42LN5300 (2013) Main Board Section 08



+12V Voltage Distribution



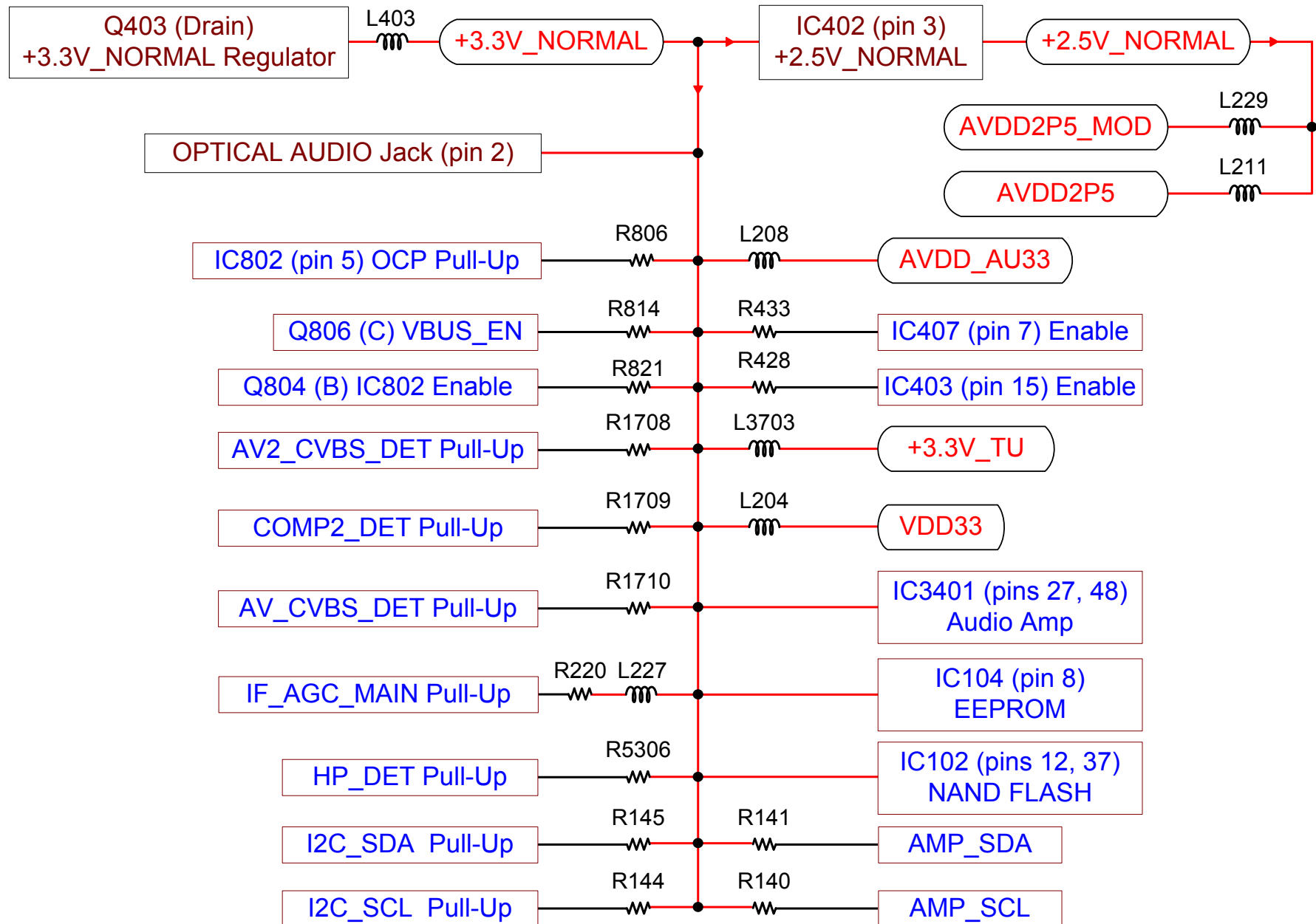
+24V Voltage Distribution



42LN5300 Main Board (+3.3V_NORMAL) Voltage Distribution

42LN5300 (2013) Main Board Section 08

From +2.5V_ST Voltage Distribution



47LB6000 INTERCONNECT DIAGRAM

Note: If the top or bottom of the picture is exhibiting a dimmer backlight level than the other or the overall brightness seems dim, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal.
If not, Check the P-DIM level, it should rise with the percentage shown on screen.

You can also test either the Top or Bottom blocks functionality by grounding the return path signal (using 1KΩ resistor).

LED TOP OR BOTTOM BLOCK TEST (DIM OR DARK PICTURE AREA):
Turn the Brightness, Contrast and Backlights all the way up. Confirm 116V on P801 pin 2 and pin 4.
Confirm P-DIM is approx. 3V. Using a 1KΩ resistor, (one end on ground), jump the block grounding pins on P801 (Top is controlled by P801 pin 1 and the Bottom is controlled by P801 pin 3), while observing the picture. Each block should turn on brighter. (If No: Bad Panel, If Yes: Bad SMPS).

(1) **PWR_ON** turns on the 12V and 24V lines. It also turns on the backlight power, but it's 85.1V P801 pin 2 (85.6V P801 pin 4) Backlights are not on.

(2) **DRV_ON** (INV_ON from Main) turns on the Backlights. Backlight power is 116.4V P801 pin 2 (116.7V P801 pin 4).

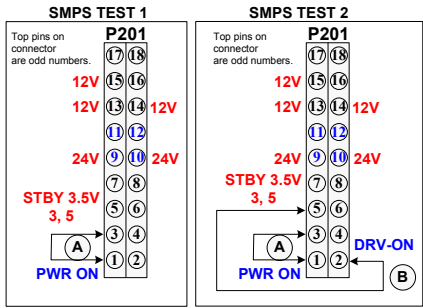
(3) **P-DIM** controls the backlight brightness. Controlled by Cust. Menu, Video, Backlights. Range 0% to 100% directly proportional to DC voltage to Backlight brightness. P-DIM is actually a PWM signal.


If P801 is disconnected, the backlight power P801 pin 2 or pin 4 will rise to 146.6V and fall to 130.5V repeatedly.

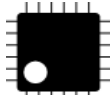
WARNING: Do not add or remove jumpers with Power Applied.


SMPS TEST 1: To Force Power Supply On without the Main Board.
Disconnect the P401 on the Main board.
(A) Jump pin 3 or 5 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main. (85V Backlight power but the Backlights are not on at this time). LED Ground Return Line is (7.41V).
Remove AC power. Leave the jumper in place.


SMPS TEST 2: (Turning on the Backlights)
(B) Jump pin 3 or 5 (3.5V) to pin 2 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now read to 116.4V.
LED Ground Return Line is (0.98V). P-DIM P201 (pin 4) pulls up to 3.4V.

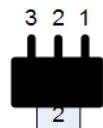



IC104	EEPROM Memory
	
Pin	
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	3.33V
[6]	3.34V
[7]	Gnd
[8]	3.33V


IC400	+5V+NORMAL Regulator
	
Pin	
[1]	6.8V (Enable)
[2]	0.57V
[3]	n/c
[4]	6.24V
[5]	0.0V (MHL_5V_En)
[6]	3.33V (USB1_CTL)
[7]	3.33V (MHL_OCP_Det)
[8]	3.33V (USB1_OCD)
[9]	0.0V (5V_HDMI_4)
[10]	0.45V
[11]	Gnd
[12]	5.18V (+5V_USB)
[13]	5.18V
[14]	5.18V
[15]	0.81V
[16]	5.18V(5V_Normal Out)
[17]	5.18V(5V_Normal Out)
[18]	11.11V
[19]	Gnd
[20]	Gnd
[21]	11.9V (Vcc In)
[22]	11.9V (Vcc In)
[23]	n/c
[24]	6.27V

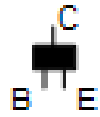
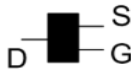
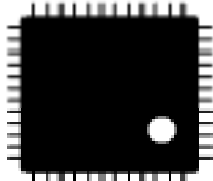


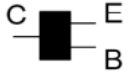
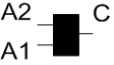
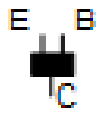
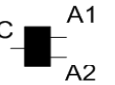

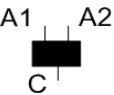
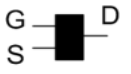
IC401	PWR_Det +12V in
	
Pin	
[1]	3.45V
[2]	0V (Out)
[3]	3.66V (In)

IC403	+1.10V_VDDC Regulator
	
Pin	
[1]	4.5V
[2]	3.37V (Vcc In)
[3]	1.17V (Out)
[4]	Gnd
[5]	0.81V
[6]	0.68V
[7]	3.31V (EN)
[8]	1.91V

IC404	+1.5V_DDR Regulator
	
Pin	
[1]	Gnd
[2]	1.51V (Out)
[3]	3.33V (In)

IC1300	Serial FLASH Memory
	
Pin	
[1]	0V
[2]	0V
[3]	0V (Flash_WP)
[4]	Gnd
[5]	0V
[6]	0V
[7]	3.38V (Vcc In)
[8]	3.38V (Vcc In)

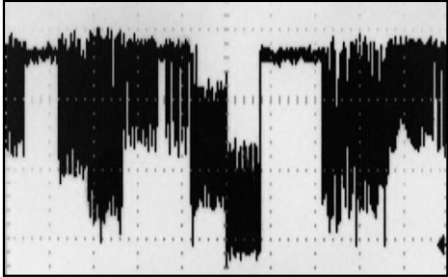
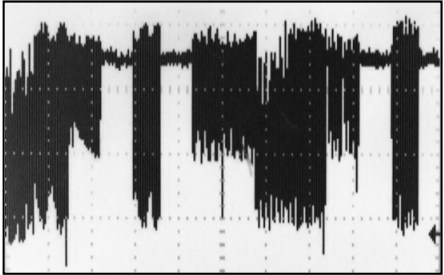
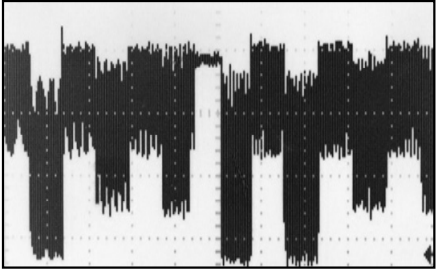
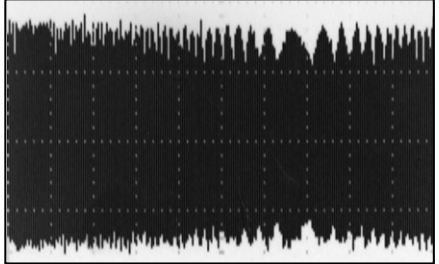
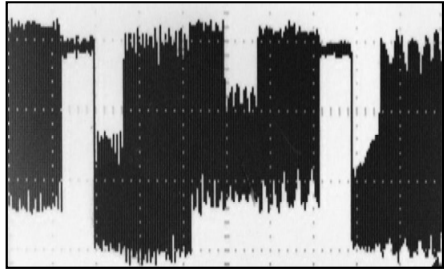
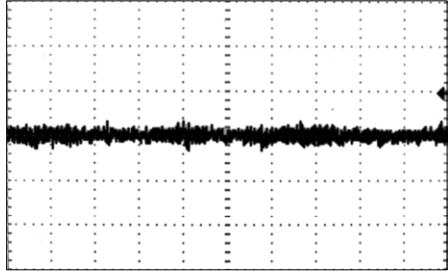
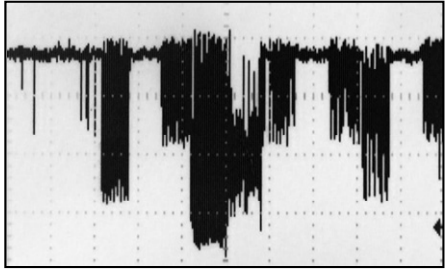
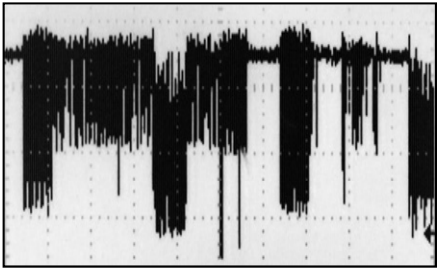
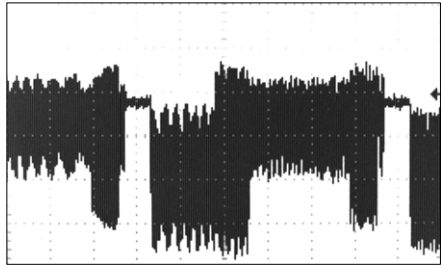
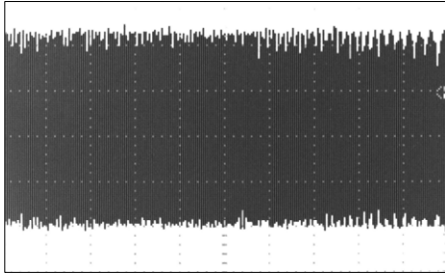
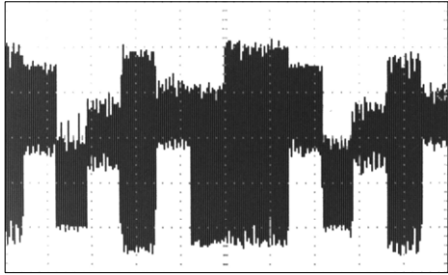
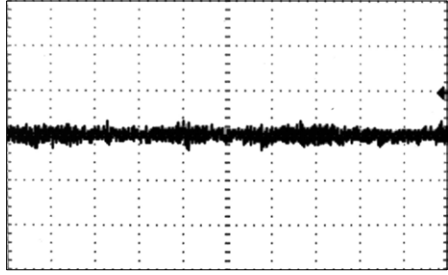
IC5800	MHL Switch
	
Pin	
[1]	0V
[2]	3.3V
[3]	Gnd
[4]	0V (MHL_5V_EN)
[5]	3.33V (Vcc In)

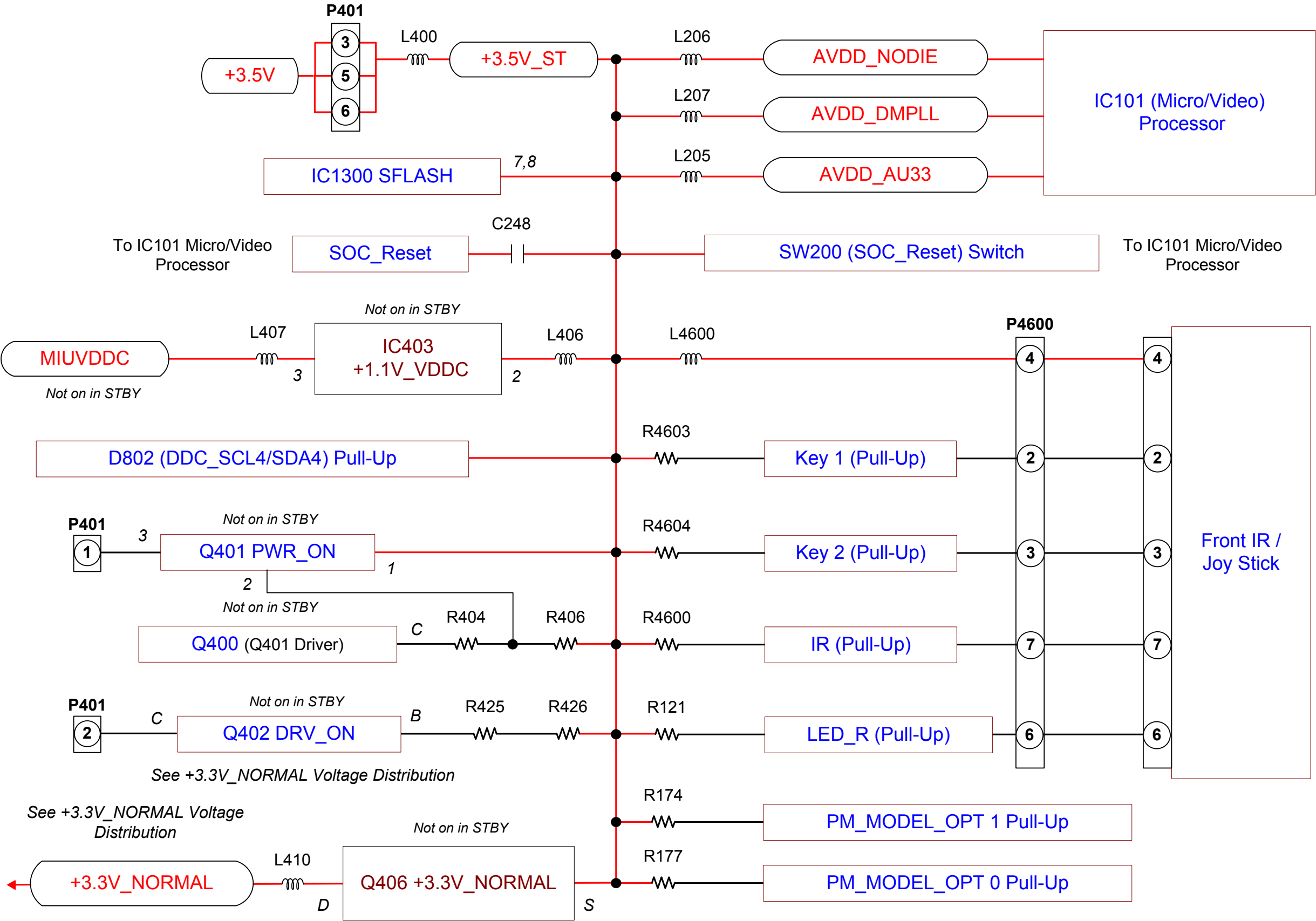
<div><div>Q400</div><div><div>Pin</div><div>Drives Q401</div></div><div><div></div><div>[B] 0.66V [C] 0.07V [E] Gnd</div></div></div>	<div><div>Q406</div><div><div>Pin</div><div>+3.3V_NORMAL Switch</div></div><div><div></div><div>[G] 0.37V [S] 3.38V (In) [D] 3.36V (Out)</div></div></div>	<div><div>IC3401</div><div><div>Pin</div><div>Audio Amp</div></div><div><div></div><div><div>[1] 11.96V (SPK_L+) [2] 23.96V (Vcc In) [3] 23.96V (Vcc In) [4] 18.03V [5] n/c [6] 3.31V [7] n/c [8] Gnd [9] 0V [10] 0.68V [11] 1.05V [12] 1.8V [13] 3.32V [14] 0.39V [15] 1.67V [16] 1.0V [17] Gnd [18] 1.81V [19] 3.32V [20] 1.65V [21] 1.65V [22] 1.2V [23] 3.31V [24] 3.31V</div><div><div>[25] 3.3V [26] Gnd [27] 3.32V [28] Gnd [29] Gnd [30] Gnd [31] 3.32V [32] 6.68V [33] 17.96V [34] 23.96V (Vcc In) [35] 23.96V (Vcc In) [36] 11.96V (SPK_R_) [37] Gnd [38] Gnd [39] 11.96V (SPK_R+) [40] n/c [41] n/c [42] 17.95V [43] 17.95V [44] n/c [45] n/c [46] 11.96V (SPK_L-) [47] Gnd [48] Gnd</div></div></div></div></div>
<div><div>Q401</div><div><div>Pin</div><div>PWR_On Switch</div></div><div><div></div><div>[1] 3.38V (In) [2] 2.68V [3] 3.29V (Out)</div></div></div>	<div><div>Q800</div><div><div>Pin</div><div>HDMI Hot Swap</div></div><div><div></div><div>[B] 0V (HPD2) [C] 0.07V [E] Gnd</div></div></div>	
<div><div>Q402</div><div><div>Pin</div><div>DRV_On Switch</div></div><div><div></div><div>[B] 0.2V [C] 3.22V (Out) [E] Gnd</div></div></div>	<div><div>D800</div><div><div>Pin</div><div>DDC_SCL_2 Pull_Up</div></div><div><div></div><div>[A1] 0.07V [A2] 5.18V [C] 4.90V</div></div></div>	
<div><div>Q403</div><div><div>Pin</div><div>Drives Q405</div></div><div><div></div><div>[B] 0.66V [C] 0.06V [E] Gnd</div></div></div>	<div><div>D801</div><div><div>Pin</div><div>DDC_SCL_4 Pull_Up</div></div><div><div></div><div>[A1] 0.05V [A2] 5.18V [C] 4.87V</div></div></div>	
<div><div>Q404</div><div><div>Pin</div><div>Drives Q409</div></div><div><div></div><div>[B] 0.62V [C] 0.06V [E] Gnd</div></div></div>	<div><div>D802</div><div><div>Pin</div><div>DDC_SCL_4 Pull_Up</div></div><div><div></div><div>[A1] 0.1V [A2] 3.37V [C] 4.89V</div></div></div>	
<div><div>Q405</div><div><div>Pin</div><div>Panel_VCC Switch</div></div><div><div></div><div>[G] 3.21V [S] 11.9V (In) [D] 11.89V (Out)</div></div></div>		



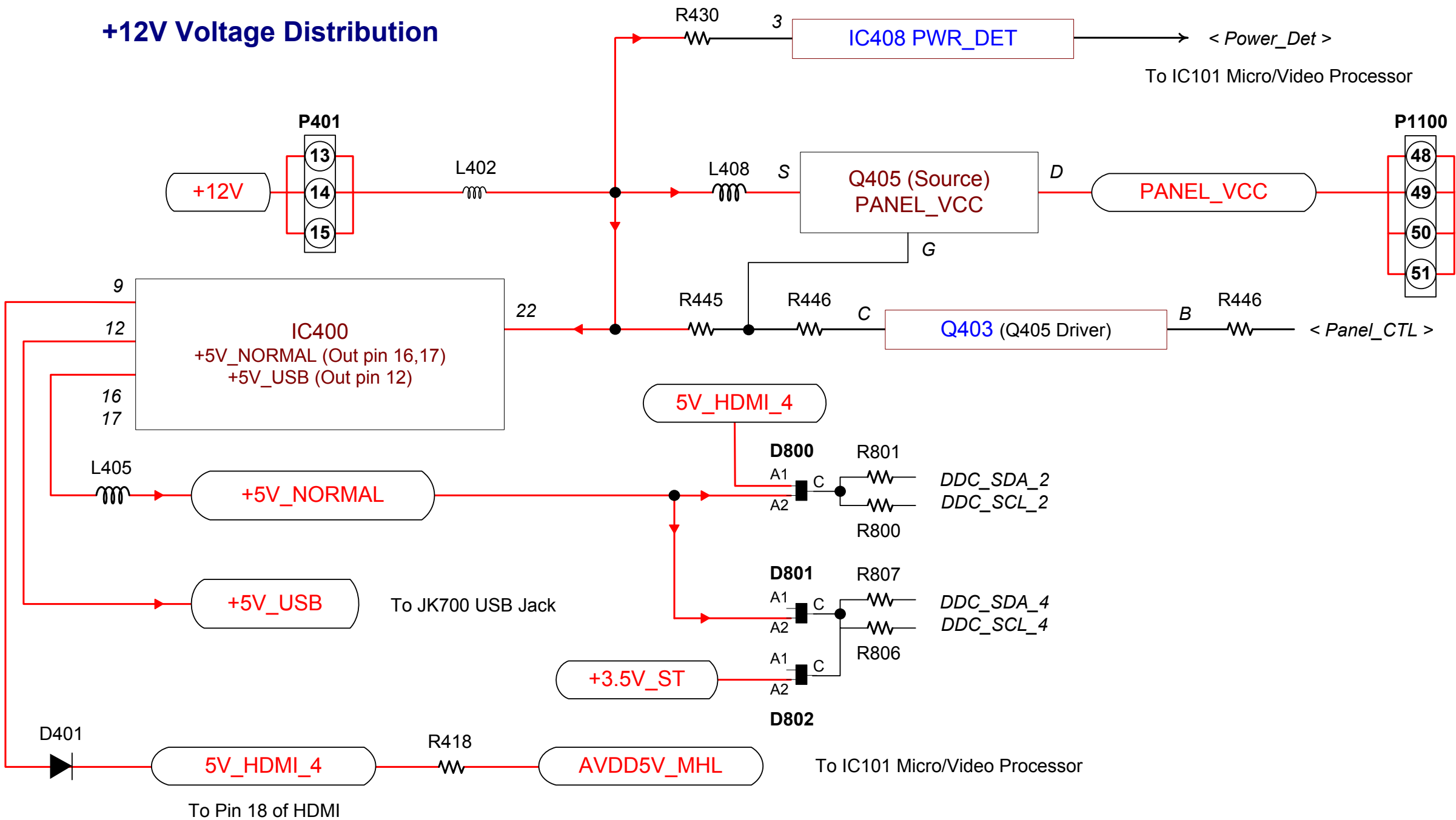
47LB6000 P1100 LVDS Connector Video Waveforms

All LVDS signals are taken with SMPTY Color Bar signal input (1080P) Component Input.
All LVDS signals are “Differential Pairs”. The ones shown are the “Positive” signal of the pair. The Negative signal looks exactly the same but flipped 180°. Scope Settings are 100mV per/division, 2.5uSec per/division.

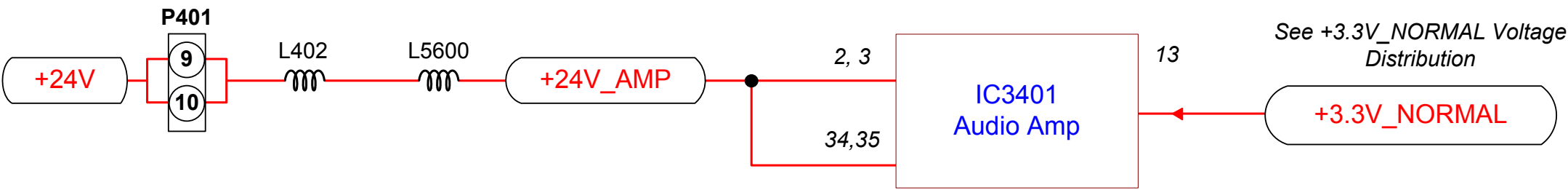
<div>Pin 12</div> <div></div> <div>340mV p/p</div>	<div>Pin 14</div> <div></div> <div>384mV p/p</div>	<div>Pin 16</div> <div></div> <div>380mV p/p</div>	<div>Pin 19</div> <div></div> <div>340mV p/p</div>	<div>Pin 22</div> <div></div> <div>348mV p/p</div>	<div>Pin 24</div> <div></div> <div>56mV p/p No Waveform</div>
<div>Pin 28</div> <div></div> <div>384mV p/p</div>	<div>Pin 30</div> <div></div> <div>356mV p/p</div>	<div>Pin 32</div> <div></div> <div>448mV p/p</div>	<div>Pin 35</div> <div></div> <div>340mV p/p</div>	<div>Pin 38</div> <div></div> <div>449mV p/p</div>	<div>Pin 40</div> <div></div> <div>64mV p/p No Waveform</div>

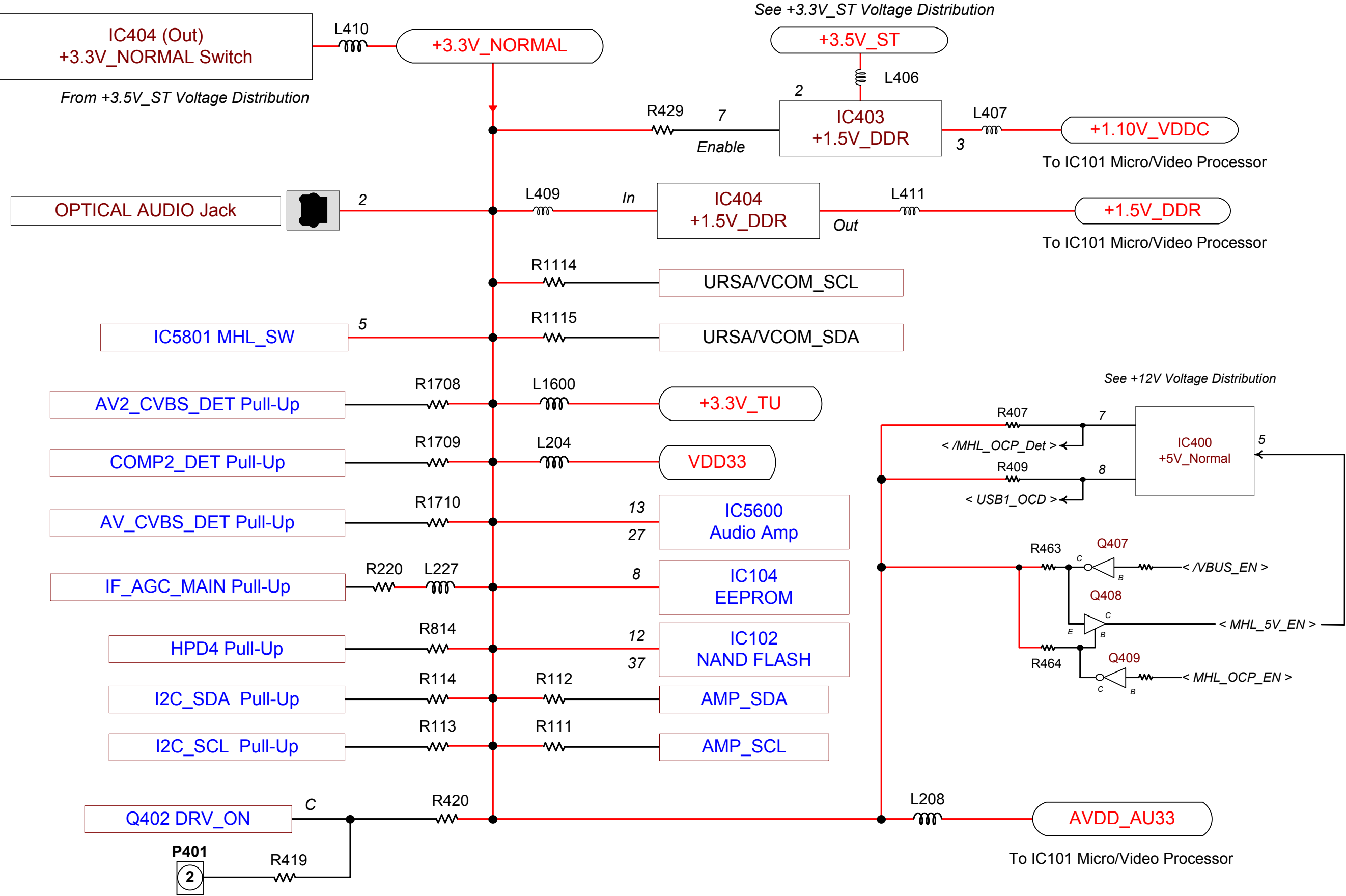


+12V Voltage Distribution



+24V Voltage Distribution





47LN5750 INTERCONNECT DIAGRAM

Note: If a particular area is exhibiting a dimmer backlight level than other areas or the overall brightness seems dim, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal.

If not,
1st. Check the P-DIM level, it should rise with the percentage shown on screen.
100% = 2.91V. Follow the P-DIM signal all the way to the SMPS.

DIM OR DARK PICTURE AREA (LED SINGLE BLOCK TEST):

Turn the Brightness, Contrast and Backlights all the way up. Confirm 99V D801 or D804.
Confirm P-DIM is approx. 3V. Using a 220Ω resistor, jump any of the blocks grounding pins on P801 (pins 1 or 3) while observing the picture and each block should turn on maximum.

P201 "SMPS Board" to P2400 "MAIN Board"

PIN	LABEL	STBY	RUN	Diode Check
17-18	Gnd	Gnd	Gnd	Gnd
16	24V	0V	24.45V	OL
13-15	12V	0V	12.02V	1.37V
11-12	Gnd	Gnd	Gnd	Gnd
9-10	24V	0V	24.45V	1.07V
7-8	Gnd	Gnd	Gnd	Gnd
6	P-DIM2	0V	0.16V~3.17V	OL
5	3.5V_ST	3.55V	3.56V	OL
4	P-DIM	0V	0.16V~3.17V	OL
3	3.5V_ST	3.58V	3.56V	OL
2	DRV_ON	0V	3.23V	OL
1	PWR_ON	0V	3.42V	1.16V

Note: Pin 2 (DRV_ON) is INV_ON from Main.
Note: Pin 16: Is Open. The voltage is loopback from the Main board.

PWR-ON:
Starts 12V, 24V and 77.7V LED Power. No Backlights.

DRV-ON: Starts Backlights LED Power goes to 99V.

(1) **PWM Pins 4 and 6:** can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition). Output from the Video Processor.

Range 0.15V to 2.91V.

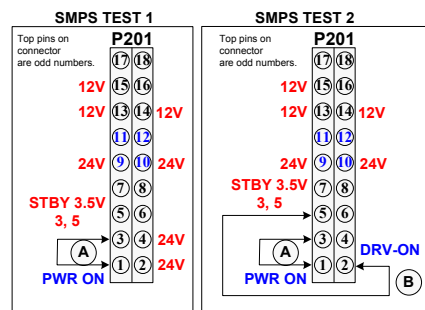
WARNING: Do not add or remove jumpers with Power Applied.

SMPS TEST 1: To Force Power Supply On without the Main Board.

Disconnect the P2400 on the Main board.
(A) Jump pin 3 or 5 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main and 77.7V to the Backlights. (No Backlights at this time).
LED Ground Return Line is (17.5V).
Remove AC power. Leave the jumper in place.

SMPS TEST 2: (Turning on the Backlights)

(B) Jump pin 3 or 5 (3.5V) to pin 2 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now jump to 99V.
LED Ground Return Line is (1.21V).



Note: If there is a problem with a load from the panel backlights, you can remove AC and Disconnect P801. When AC is reapplied, the Backlight power will start at 78V, rise to 162V then gradually fall back to 78V.

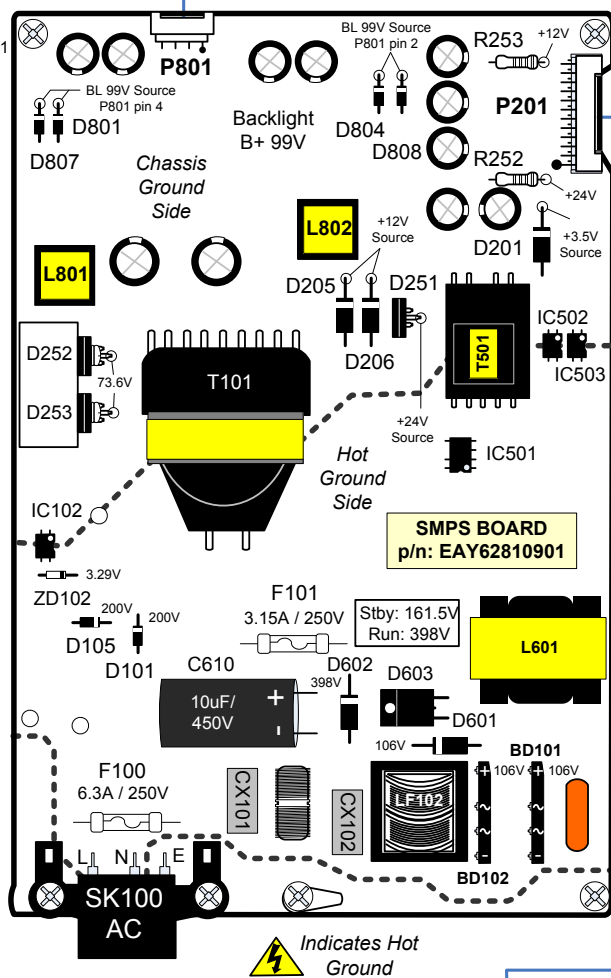
BACKLIGHT INFORMATION:
54 Total LEDs, 9 LEDs per/Board.
2 boards per/row. One group consist of 3 rows consisting of 27 LEDs.
2 Groups make up the backlights.

Back Left of Set
Keyboard
p/n: EBR77104601



Bottom Center of Set
Front IR
p/n: EBR76405802

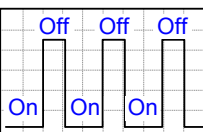
To the Panel Backlights



PANEL p/n: EAJ62310101

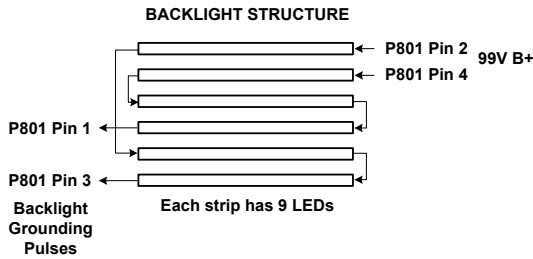
No Local Dimming
In this Model.

LED Drive Signal 50%
Backlight Setting
On the Cust. Menu.

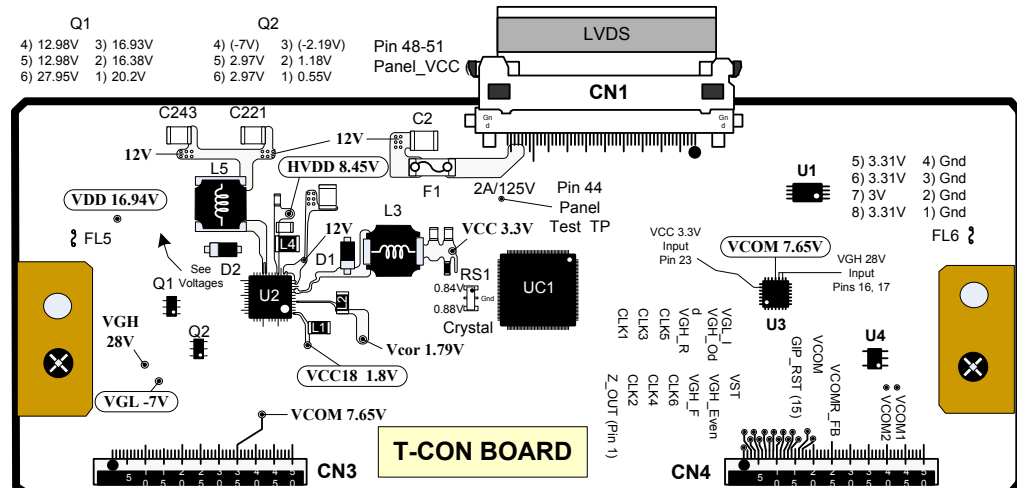


44.8V p/p 2.5mSec

Either pin 1 or 3 P801
LED Block grounding pulse



For LVDS Waveforms see Page 4 of
the Interconnect diagram.



VDD 16.94V	Pin 31, 32	VCC18 1.8V	Pin 17	VDD 16.94V	Pin 19, 20	VCC18 1.8V	Pin 34
VGL -7V	Pin 38	VCOM 7.65V	Pin 35	VGL -7V	Pin 13	VCOM 7.65V	Pin 11
HVDD 8.45V	Pin 30			HVDD 8.45V	Pin 21		

Additional Voltages from U3 to the Panel with no silk screen labels:

U3 pin 1 (7.76V) CN4 pin 48 CN5 pin 3
U3 pin 2 (7.74V) CN4 pin 47 CN5 pin 4
U3 pin 3 (7.75V) CN4 pin 46 CN5 pin 5
U3 pin 4 (7.74V) CN4 pin 45 CN5 pin 6
U3 pin 5 (7.76V) CN4 pin 44 CN5 pin 7
U3 pin 6 (7.74V) CN4 pin 43 CN5 pin 8
U3 pin 8 (27.9V) CN4 pin 42 CN5 pin 9
U3 pin 9 (-6.97V) CN4 pin 41 CN5 pin 10
U3 pin 10 (-6.95V to 27.9V) CN4 pin 40 CN5 pin 11
U3 pin 11 (-6.95V to 27.9V) CN4 pin 39 CN5 pin 12

P801 "SMPS Board" To "Panel LEDs"

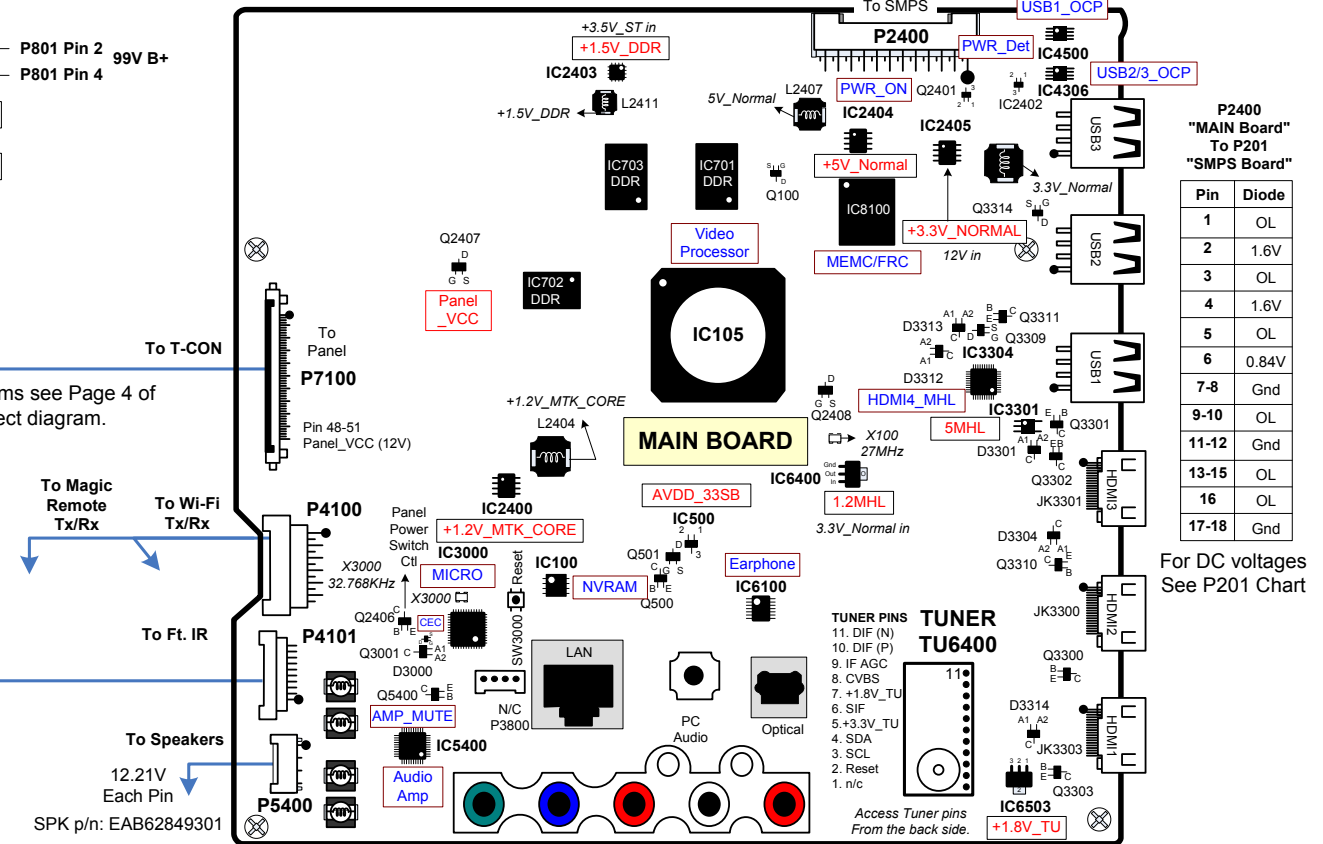
Pin	Label	Run	Diode Check
1	BL-	*43.93V - 1.78V	OL
2	BL+	99V	OL
3	BL-	*43.93V - 1.78V	OL
4	BL+	99V	OL

*Dim to Bright

P4800 Connector "MAIN Board" To J1" Magic Remote

Pin	Label	STBY	Run	Diode Check
1	3.3V	0V	3.29V	0.56V
2	Gnd	Gnd	Gnd	Gnd
3	RX	0V	3.29V	0.98V
4	TX	0V	3.28V	1.08V
5	RESET	0V	0V	1.18V
6	DC	0V	0V	0.9V
7	DD	0V	0V	OL
8	Gnd	Gnd	Gnd	Gnd

For DC voltages for Main board
components see Page 2 of the
Interconnect diagram.



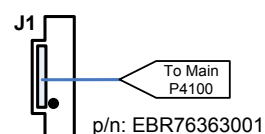
Pin	Diode
1	OL
2	1.6V
3	OL
4	1.6V
5	OL
6	0.84V
7-8	Gnd
9-10	OL
11-12	Gnd
13-15	OL
16	OL
17-18	Gnd

For DC voltages
See P201 Chart

PANEL TEST

To run the T-CON "Panel Test", remove the LVDS cables.
Jump 12V to the 12V fuse. Jump VCC 3.3V to pin 44 on CN1.
White, Red, Blue, Green and Black patterns show on screen.

Magic Remote
Tx/Rx



P4101 "MAIN" to "Front IR Board" J1

PIN	LABEL	STBY	RUN	DIODE
10	EYE_SDA	3.56V	3.53V	OL
9	EYE_SCL	3.56V	3.53V	OL
8	Gnd	Gnd	Gnd	Gnd
7	IR	3.54V	3.51V	OL
6	LED_R	1.64V	0V	OL
5	Gnd	Gnd	Gnd	Gnd
4	3.5V_ST	3.56V	3.53V	OL
3	Key2	3.56V	3.53V	OL
2	Key1	3.56V	3.53V	OL
1	Gnd	Gnd	Gnd	Gnd

Pin	Diode
1	OL
2	OL
3	OL
4	OL

Pin	Diode
5	OL
6	OL
7	1.86V
8	Gnd

P4100 "Main Board" to "WiFi and Motion Boards"

PIN	LABEL	RUN	DIODE
1	+3.5V_ST_Wake	3.51V	0.83V
2	+3.3V_Normal	3.31V	0.55V
3	WIFI_DM	0.04V	1.02V
4	RTS	0V	1.18V
5	WIFI_DP	0.04V	1.02V
6	M_Remote_Rx	3.3V	OL
7	Gnd	Gnd	Gnd
8	M_Remote_Tx	3.3V	OL
9	WiFi_PWR_On	0.02V	OL
10	RF_Reset	3.34V	1.29V
11	Gnd	Gnd	Gnd
12	CTS	0V	1.18V

No Stand_By Voltages

To What
WiFi Tx/Rx
Magic Remote
WiFi Tx/Rx
Magic Remote
WiFi Tx/Rx
Magic Remote
WiFi Tx/Rx
Magic Remote
Magic Remote
Magic Remote

Wi-Fi
Tx/Rx

Pin	Diode
1	0.94V
2	0.86V
3	1.11V
4	Gnd
5	1.56V
6	OL

p/n: EAT61813801

47LN5750 Main Board (ICs) Component Voltages

IC100 NVRAM (Non-Volatile)

Pin	
[1]	n/c
[2]	Gnd
[3]	3.31V
[4]	Gnd
[5]	3.31V
[6]	3.31V
[7]	0V
[8]	3.31V (Vcc In)

IC500 AVDD_33SB Regulator

Pin	
[1]	Gnd
[2]	3.34V (Out)
[3]	3.52V (Vcc In)

IC2400 +1.2V_MTK_CORE Regulator

Pin	
[1]	Gnd
[2]	11.97V (Vcc In)
[3]	Gnd
[4]	0.8V
[5]	1.6V
[6]	3.49V
[7]	1.22V (Out)
[8]	1.22V (Out)

IC2402 PWR_Det +12V in

Pin	
[1]	Gnd
[2]	3.66V (Out)
[3]	3.69V (In)

IC2403 +1.5V_DDR Regulator

Pin	
[1]	3.52V (Vcc In)
[2]	3.52V (Vcc In)
[3]	Gnd
[4]	Gnd
[5]	Gnd
[6]	0.83V
[7]	0.68V
[8]	0.51V
[9]	1.85V
[10]	1.53V (Out)
[11]	1.53V (Out)
[12]	1.53V (Out)
[13]	5.06V
[14]	n/c
[15]	3.5V
[16]	3.52V (Vcc In)

IC2404 (+5V_NORMAL) Regulator

Pin	
[1]	9.2V
[2]	0V (n/c)
[3]	0V (n/c)
[4]	1.22V
[5]	3.22V
[6]	Gnd
[7]	24.44V (Vcc In)
[8]	5.10V

IC2405 +3.3V_NORMAL Regulator

Pin	
[1]	3.44V
[2]	0.77V
[3]	5.51V
[4]	5.32V
[5]	Gnd
[6]	3.32V (Out)
[7]	8.78V
[8]	11.98V (Vcc In)

IC3301 +5VMHL Regulator

Pin	
[1]	0V
[2]	Gnd
[3]	0.07V
[4]	0V (MHL_Det)
[5]	5.10V (Vcc In)

IC4306 +5V_USB1 OCP

Pin	
[1]	Gnd
[2]	5.10V (Vcc In)
[3]	3.3V
[4]	3.34V
[5]	3.31V
[6]	5.10V (Out USB2)
[7]	5.10V (Out USB3)
[8]	3.31V

IC6400 1.2V_MHL Regulator

Pin	
[Gnd]	Gnd
[Out]	1.2V
[In]	3.3V

IC4500 +5V_USB2/3 OCP

Pin	
[1]	Gnd
[2]	5.10V (Vcc In)
[3]	5.10V (Vcc In)
[4]	3.3V
[5]	3.3V
[6]	5.10V (Out USB1)
[7]	5.10V (Out USB1)
[8]	5.10V (Out USB1)

IC6100 Earphone Amp

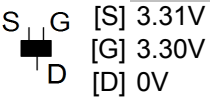
Pin	
[1]	Gnd
[2]	0V (R In)
[3]	0V (R Out)
[4]	Gnd
[5]	3.5V (Mute)
[6]	(-3.24V)
[7]	(-1.62V)
[8]	1.66V
[9]	3.31V
[10]	Gnd
[11]	2.34V
[12]	0V (L Out)
[13]	0V (L In)
[14]	Gnd

IC6503 +1.8V_TU Regulator

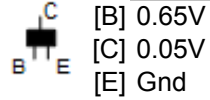
Pin	
[1]	0V (Gnd)
[2]	1.81V (Out)
[3]	3.3V (In)

47LN5750 Main Board (Transistors and Large Flat Pack ICs) Component Voltages

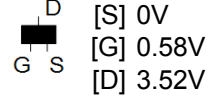
Q100	OTP_Write Switch	
	Pin	



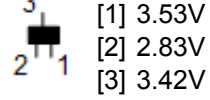
Q500	'+3.5V_ST_WAKE Switch Q501 CTRL	
	Pin	



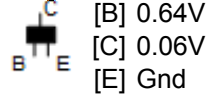
Q501	'+3.5V_ST_WAKE Switch	
	Pin	



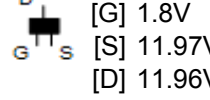
Q2401	PWR_On Switch	
	Pin	



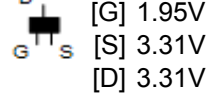
Q2406	Panel VCC Switch (Q2407) Control	
	Pin	



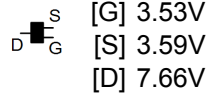
Q2407	Panel_VCC Switch	
	Pin	



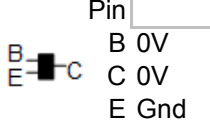
Q2408	VDD3V3_HDMI Switch	
	Pin	



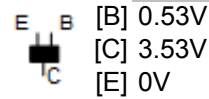
Q3001	CEC (Consumer Electronic Control)	
	Pin	



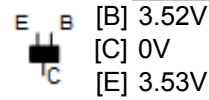
Q3300	HDMI 1, 2 Hot Swap	
	Pin	



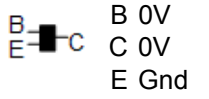
Q3301	MHL_Det Switch Driver	
	Pin	



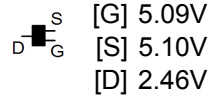
Q3302	MHL Detection Switch	
	Pin	



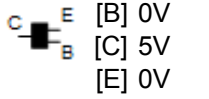
Q3303	HDMI1_Hot Swap	
	Pin	



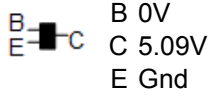
Q3309	MHL_SDA/SCL 5V Pull-Up	
	Pin	



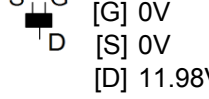
Q3310	MHL_Det Switch Changes to HDMI_Det	
	Pin	



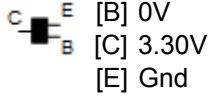
Q3311	MHL_SDA/SCL 5V Q3309 Control	
	Pin	



Q3314	HDMI3 Hot Swap Load Pull-Up	
	Pin	

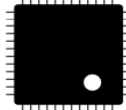


Q5400	Amp Mute Driver	
	Pin	

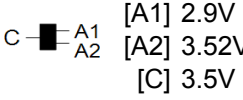


IC3000	Micro Processor	
	Pin	

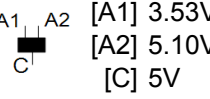
[1]	0.06V	[25]	0V
[2]	3.3V	[26]	0.04V
[3]	0.05V	[27]	3.5V
[4]	0.08V	[28]	0V
[5]	0.02V	[29]	0V
[6]	3.51V	[30]	0V
[7]	3.49V	[31]	3.53V
[8]	3.53V	[32]	3.53V
[9]	3.53V	[33]	3.53V
[10]	3.53V	[34]	3.53V
[11]	3.53V	[35]	0V
[12]	0.17V	[36]	0V
[13]	3.34V	[37]	0V
[14]	3.66V	[38]	1.06V
[15]	3.53V	[39]	3.53V
[16]	0V	[40]	3.53V
[17]	3.51V	[41]	0.64V
[18]	3.53V	[42]	0.12V
[19]	3.24V	[43]	0V
[20]	3.34V	[44]	0V (n/c)
[21]	0.08V	[45]	0V (n/c)
[22]	0V	[46]	2.09V
[23]	0V	[47]	Gnd
[24]	0V	[48]	3.53V (Vcc In)



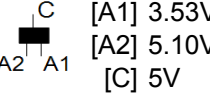
D3000	CEC Bias	
	Pin	



D3301	DDC_SCL_4_JACK Pull_Up	
	Pin	

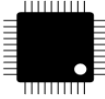


D3304	DDC_SCL_MHL Routing	
	Pin	

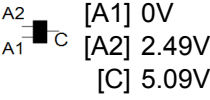


IC3304	HDMI4_MHL Processor	
	Pin	

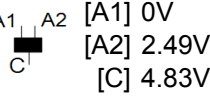
[1]	Gnd	[21]	3.36V
[2]	1.2V	[22]	3.31V
[3]	Gnd	[23]	3.31V
[4]	3.3V	[24]	3.31V
[5]	0V	[25]	3.31V
[6]	0.05V	[26]	3.31V
[7]	4.83V	[27]	3.31V
[8]	5.09V	[28]	3.31V
[9]	0V	[29]	3.31V
[10]	5.10V	[30]	1.2V
[11]	0V	[31]	3.31V (Vcc In)
[12]	0V (n/c)	[32]	0.03V
[13]	0V (n/c)	[33]	0.03V
[14]	5V	[34]	0.03V
[15]	0V	[35]	0.03V
[16]	0V (n/c)	[36]	0.03V
[17]	3.29V	[37]	0.03V
[18]	3.28V	[38]	0.03V
[19]	3.37V	[39]	0.03V
[20]	1.02V	[40]	3.31V (Vcc In)



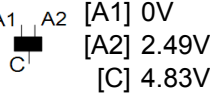
D3312	DDC_SCL_MHL Pull_Up	
	Pin	



D3313	DDC_SDA_MHL Pull_Up	
	Pin	

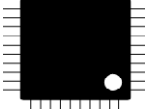


D3314	DDC_SDA_SCL Pull_Up	
	Pin	



IC5400	Audio Amp	
	Pin	

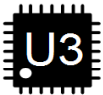
[1]	Gnd	[21]	12.2V
[2]	Gnd	[22]	Gnd
[3]	Gnd	[23]	16.77V
[4]	Gnd	[24]	3.16V
[5]	0V	[25]	Gnd
[6]	1.2V	[26]	0V
[7]	0V	[27]	5.12V
[8]	1.63V	[28]	16.76V
[9]	1.62V	[29]	Gnd
[10]	3.31V	[30]	12.2V
[11]	3.31V	[31]	24.45V
[12]	3.31V	[32]	12.2V
[13]	3.25V	[33]	12.2V
[14]	1.65V	[34]	Gnd
[15]	1.65V	[35]	16.76V
[16]	16.77V	[36]	3.29V
[17]	Gnd	[37]	Gnd
[18]	12.2V	[38]	1.59V
[19]	24.45V	[39]	Gnd
[20]	24.45V	[40]	3.31V (Vcc In)



47LN5750 T-CON Board Component Voltages

U3 DC-to-DC

Panel Power Level Shifter

Pin		Pin
[1] 7.76V (GCLK1)		[15] (-6.97) (VGL)
[2] 7.74V (GCLK2)		[16] 27.96V (VGH)
[3] 7.75V (GCLK3)		[17] 27.96V (VGH)
[4] 7.74V (GCLK4)		[18] 7.65V (V_COM)
[5] 7.76V (GCLK5)		[19] 7.65V
[6] 7.74V (GCLK6)		[20] 7.62V
[7] 2.5V		[21] 16.9V
[8] 27.9V (VGH_R)		[22] Gnd
[9] (-6.97) (VGH_F)		[23] 3.3V (VCC)
[10] *(-6.95V to 27.9V) (VGH_ODD)		[24] 0V
[11] *(-6.95V to 27.9V) (VGH_EVEN)		[25] 0V
[12] (-6.91) (VST)		[26] 0.7V
[13] (-6.88) (GIP_RST)		[27] 1.27V
[14] (-6.97)		[28] 3.24V

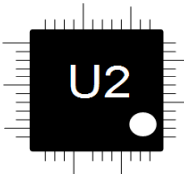
* EVERY Second

U2 DC-to-DC

T-CON and Panel Power

DC-to-DC Conv

Pin		Pin	
[1]	1.81V	[25]	4.95V
[2]	1.86V	[26]	0.53V
[3]	Gnd	[27]	3.3V
[4]	3.3V	[28]	3.3V
[5]	1.79V	[29]	4.99V
[6]	1.81V	[30]	1.3V
[7]	Gnd	[31]	16.4V
[8]	3.31V (VCC)	[32]	27.94V
[9]	3.31V (VCC)	[33]	5.69V
[10]	0V	[34]	8.21V
[11]	11.7V (Panel_VCC)	[35]	(-6.98V) (VGL_FB)
[12]	11.7V (Panel_VCC)	[36]	1.19V
[13]	11.7V (Panel_VCC)	[37]	13.86V
[14]	11.7V (Panel_VCC)	[38]	12.85V
[15]	8.45V (H_VDD)	[39]	10.91V
[16]	8.44V (H_VDD_FB)	[40]	6.55V
[17]	Gnd	[41]	4.6V
[18]	Gnd	[42]	3.5V
[19]	Gnd	[43]	7.65V
[20]	11.7V (Panel_VCC)	[44]	7.64V
[21]	11.7V (Panel_VCC)	[45]	7.63V
[22]	16.97V	[46]	7.61V (VCOM_RFB)
[23]	16.97V (VDD)	[47]	1.61V
[24]	Gnd	[48]	Gnd



U1

Buffer

Pin	
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	3.31V
[6]	3.31V
[7]	3.31V
[8]	3.31V

Q1

VDD Rectifier

Pin	Voltage
[1]	20.2V
[2]	16.38V
[3]	16.93V Output
[4]	12.98V
[5]	12.98V
[6]	12.95V

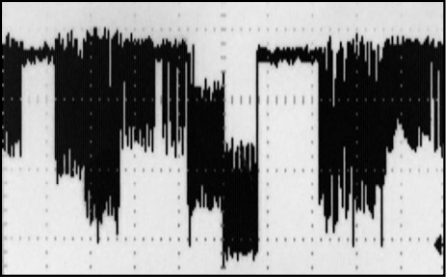
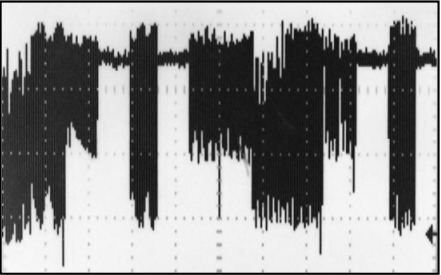
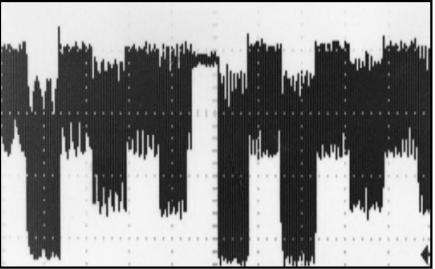
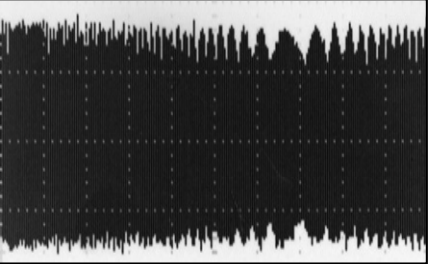
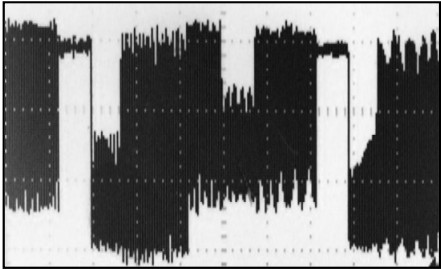
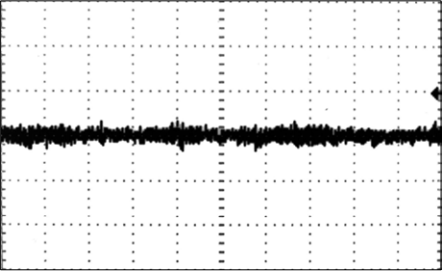
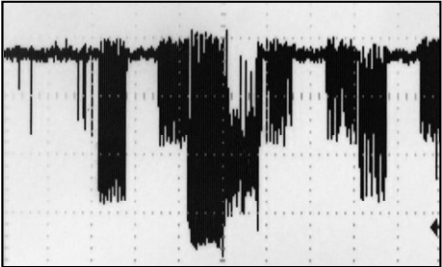
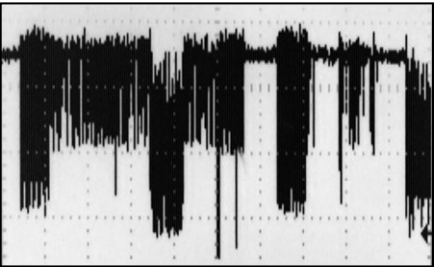
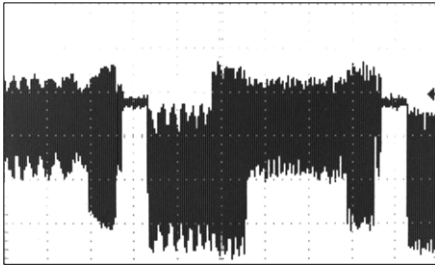
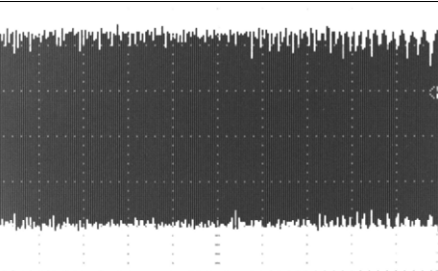
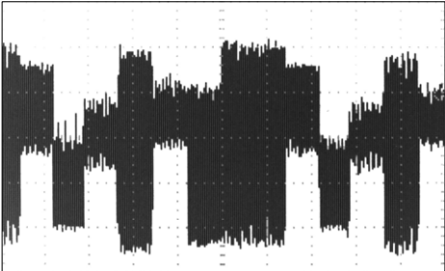
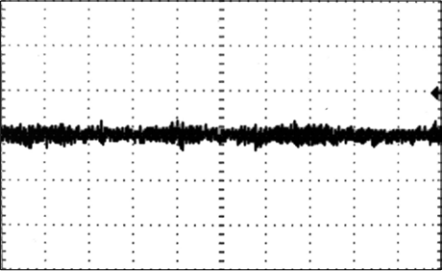
Q2

VGL Rectifier

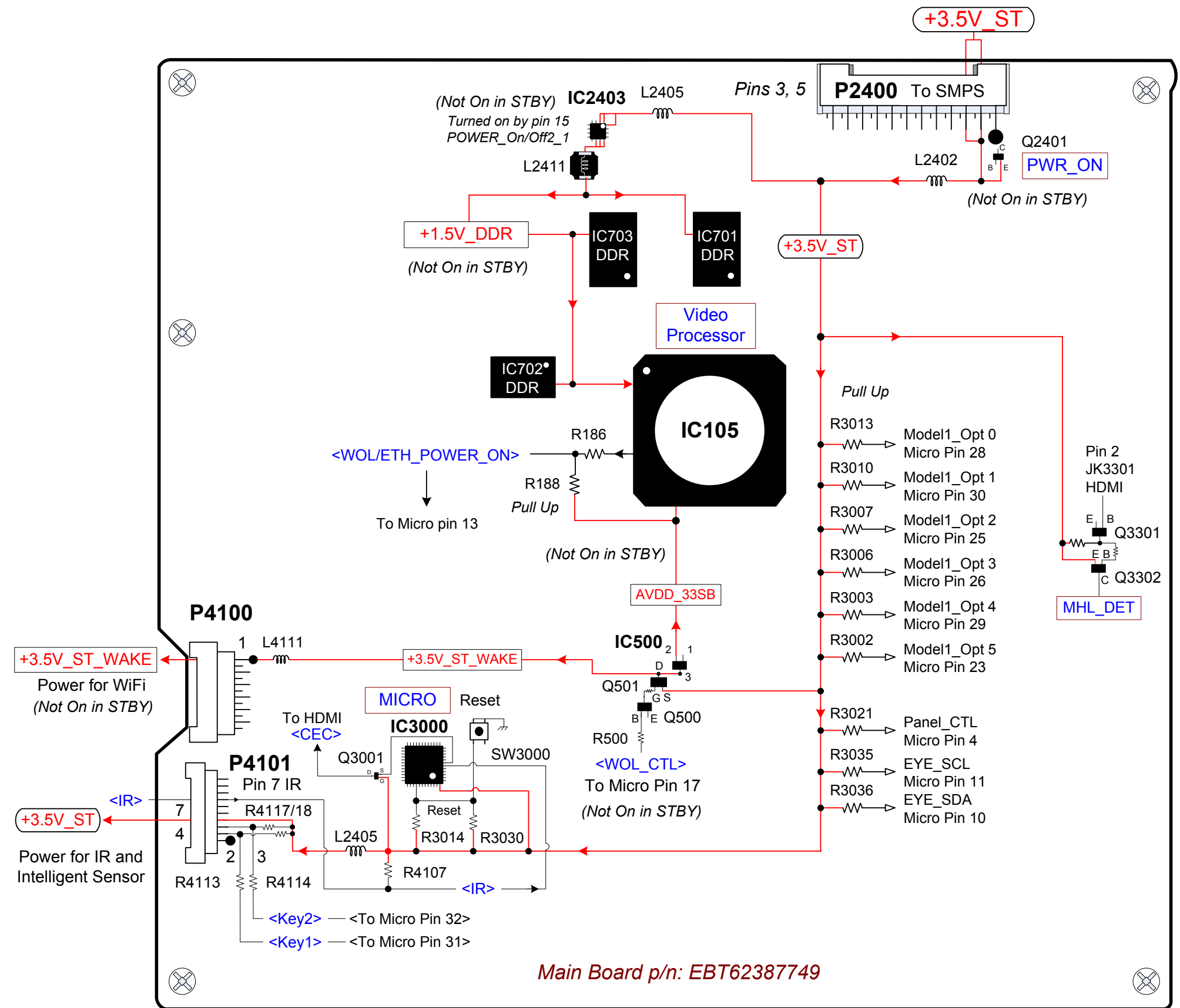
Pin
[1] 0.56V
[2] 1.18V
[3] (-2.9V)
[4] (-7V) Output
[5] 2.97V
[6] 2.97V

47LN5750 P7100 LVDS Connector Video Waveforms

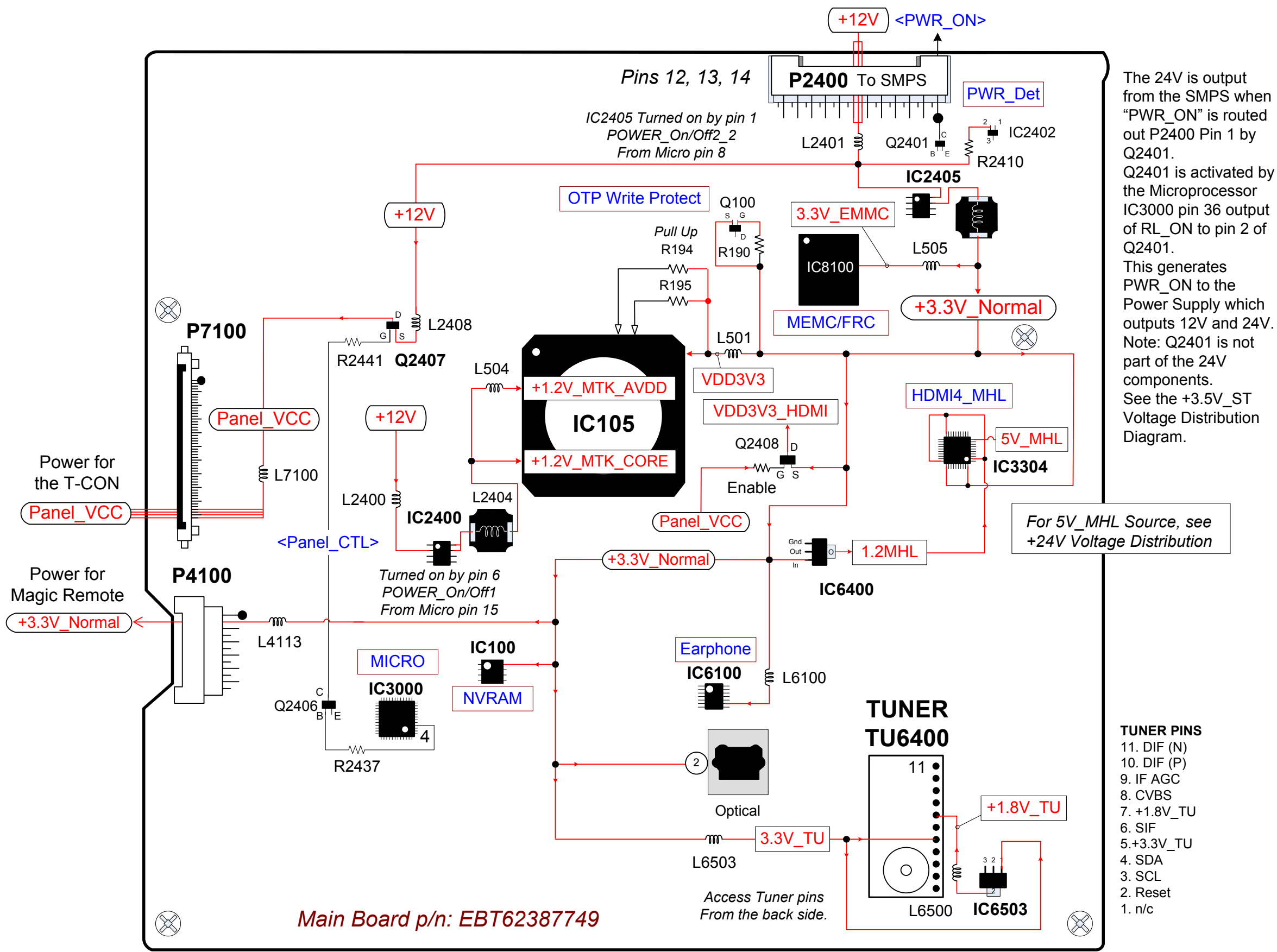
All LVDS signals are taken with SMPTY Color Bar signal input (1080P) Component Input.
All LVDS signals are “Differential Pairs”. The ones shown are the “Positive” signal of the pair. The Negative signal looks exactly the same but flipped 180°. Scope Settings are 100mV per/division, 2.5uSec per/division.

<div>Pin 12</div> <div></div> <div>340mV p/p</div>	<div>Pin 14</div> <div></div> <div>384mV p/p</div>	<div>Pin 16</div> <div></div> <div>380mV p/p</div>	<div>Pin 19</div> <div></div> <div>340mV p/p</div>	<div>Pin 22</div> <div></div> <div>348mV p/p</div>	<div>Pin 24</div> <div></div> <div>56mV p/p No Waveform</div>
<div>Pin 28</div> <div></div> <div>384mV p/p</div>	<div>Pin 30</div> <div></div> <div>356mV p/p</div>	<div>Pin 32</div> <div></div> <div>448mV p/p</div>	<div>Pin 35</div> <div></div> <div>340mV p/p</div>	<div>Pin 38</div> <div></div> <div>449mV p/p</div>	<div>Pin 40</div> <div></div> <div>64mV p/p No Waveform</div>

47LN5750 Main Board (+3.5V_ST) Voltage Distribution



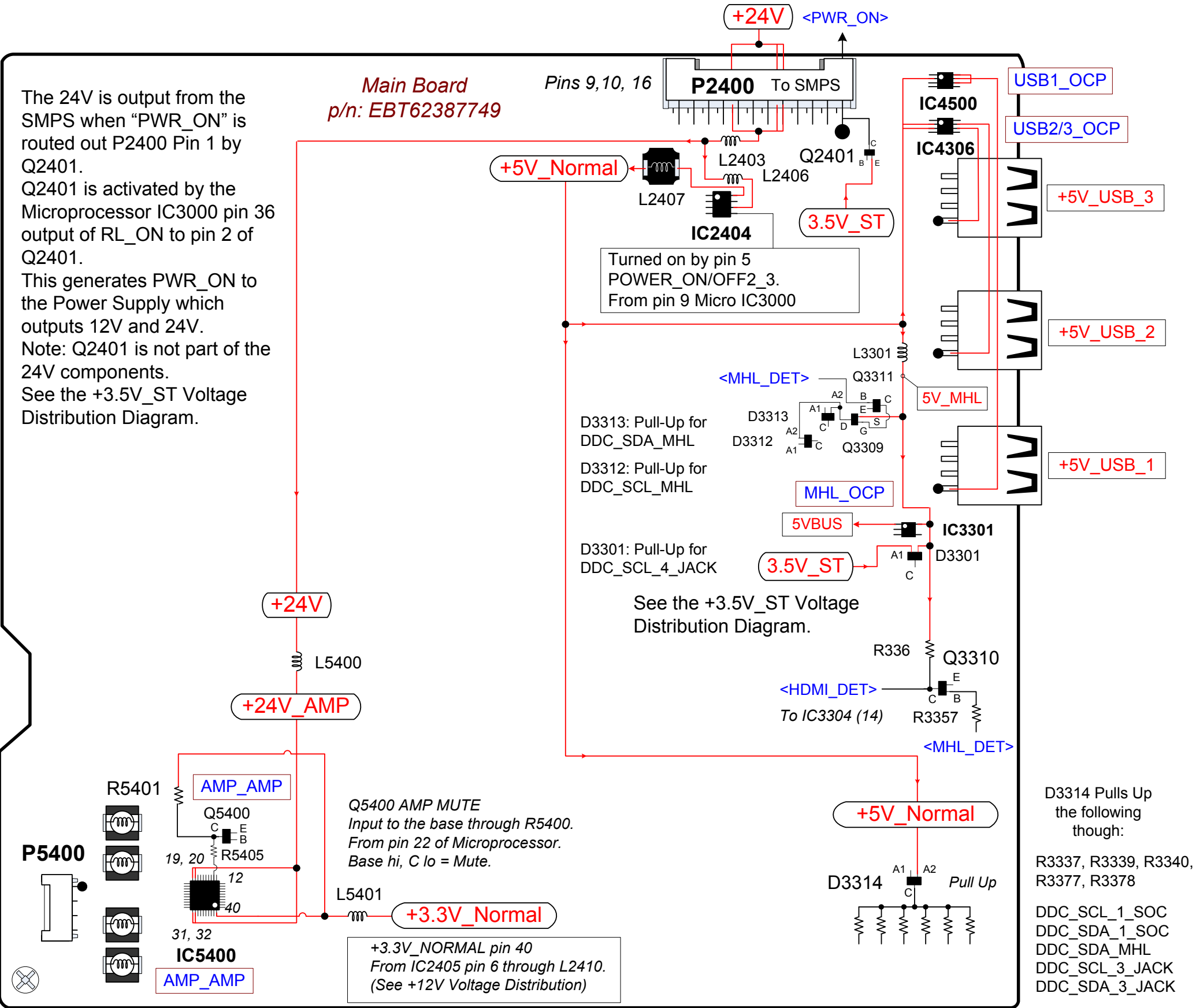
47LN5750 Main Board (+12V) Voltage Distribution



The 24V is output from the SMPS when "PWR_ON" is routed out P2400 Pin 1 by Q2401. Q2401 is activated by the Microprocessor IC3000 pin 36 output of RL_ON to pin 2 of Q2401. This generates PWR_ON to the Power Supply which outputs 12V and 24V. Note: Q2401 is not part of the 24V components. See the +3.5V_ST Voltage Distribution Diagram.

For 5V_MHL Source, see +24V Voltage Distribution

47LN5750 Main Board (+24V) Voltage Distribution



49LF5500 INTERCONNECT DIAGRAM

Note: If the top or bottom of the picture is exhibiting a dimmer backlight level than the other or the overall brightness seems dim, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal.
If not, Check the P-DIM level, it should rise with the percentage shown on screen.

You can also test either the Top or Bottom blocks functionality by grounding the return path signal (using 10KΩ resistor).

LED TOP OR BOTTOM BLOCK TEST (DIM OR DARK PICTURE AREA):
Turn the Brightness, Contrast and Backlights all the way up. Confirm 120V on P801 pin 3 and 180V on pin 7.
Confirm P-DIM is approx. 3V. Using a 10KΩ resistor, (one end on ground), jump the block grounding pins on P801 (Top is controlled by P801 pin 1 and the Bottom is controlled by P801 pin 5), while observing the picture. Each block should turn on brighter. (If No: Bad Panel, If Yes: Bad SMPS).

- (1) **PWR-On Pin 1:** Turns on 13.2V to the Main. No backlight power at this time. Backlight Power is 86.9V.
- (2) **DRV_On Pin 11:** Turns on the Backlights. Backlight power goes to 116V P801 Pin 3 (174.6B Pin 7).
- (3) **P_DIM#1 Pin 12 and P_DIM#2 Pin 2:** Will vary according to incoming video IRE level and OSD Backlight setting. Output from the Video Processor. It is then routed out P200 and sent to the LED Driver IC on the Back of the SMPS. Range 0.2V~2.60V.

P801 "SMPS Board" To "LED Backlights"

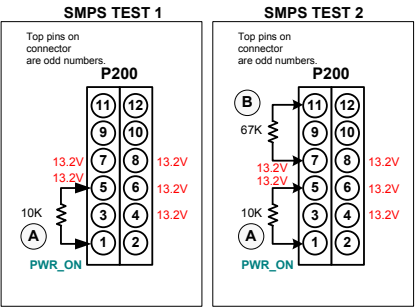
PIN	LABEL	RUN	Diode
1	BL-(2)	36.99V-8.25V	OL
3	BL+(2)	120.3V-116.7V	OL
5	BL-(1)	55.18V-11.81V	OL
7	BL+(1)	181.4V-175.8V	OL

No Stand-By Voltages
Pins 2, 4, 6 are n/c.

WARNING: Do not add or remove jumpers with Power Applied.

SMPS TEST 1: To Force Power Supply On without the Main Board.
Disconnect the P200 on the Main board.
SMPS must be producing 13.2V (12V in STBY).
(A) Use a 10K resistor and jump pin 5 (13.2V) to pin 1. Test Voltage Outputs 13.2V to Main. (86.9V Backlight power but the Backlights are not on at this time).
LED Ground Return Line is (9.15V).
Remove AC power. Leave the jumper in place.

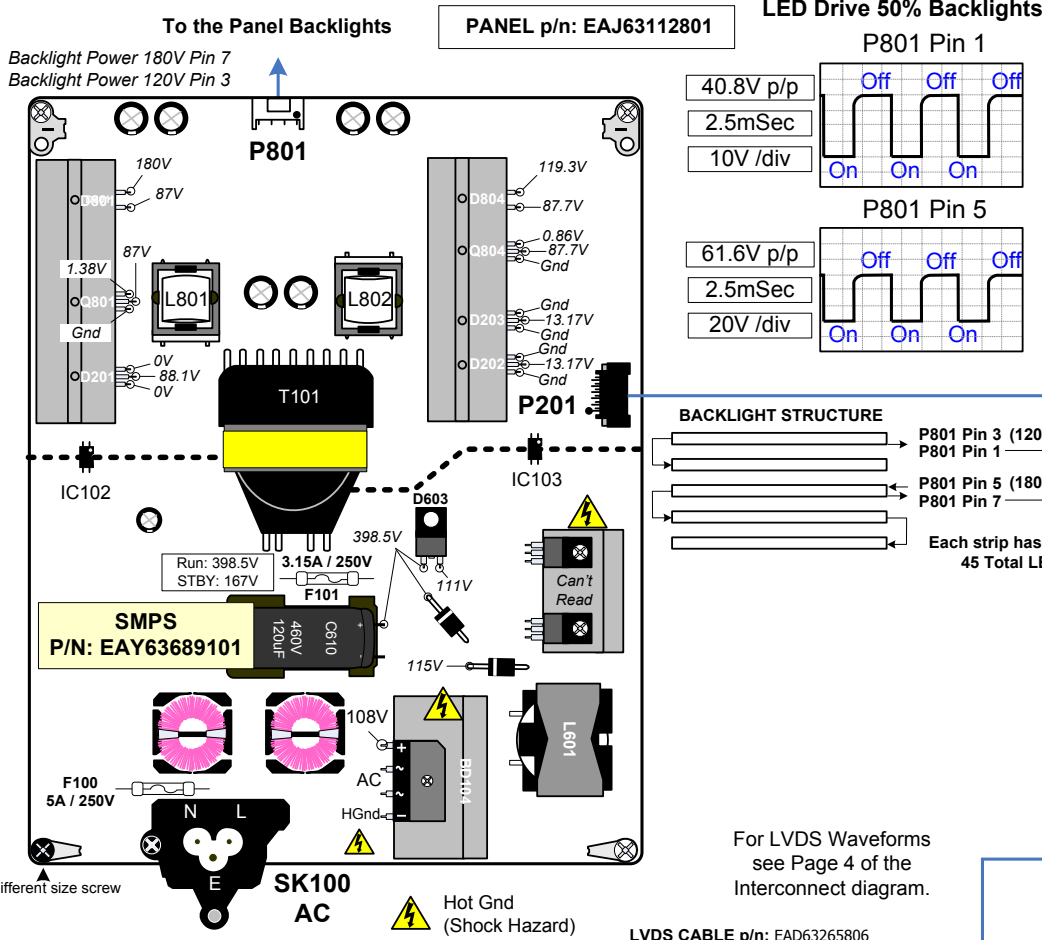
SMPS TEST 2: (Turning on the Backlights)
(B) Use a 67K resistor and Jump pin 7 (13.2V) to pin 11 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now read 116V P801 Pin 3 (174.6B Pin 7).
LED Ground Return Line is (0.96V). P-DIM P201 (pin 4) pulls up to 3.35V.



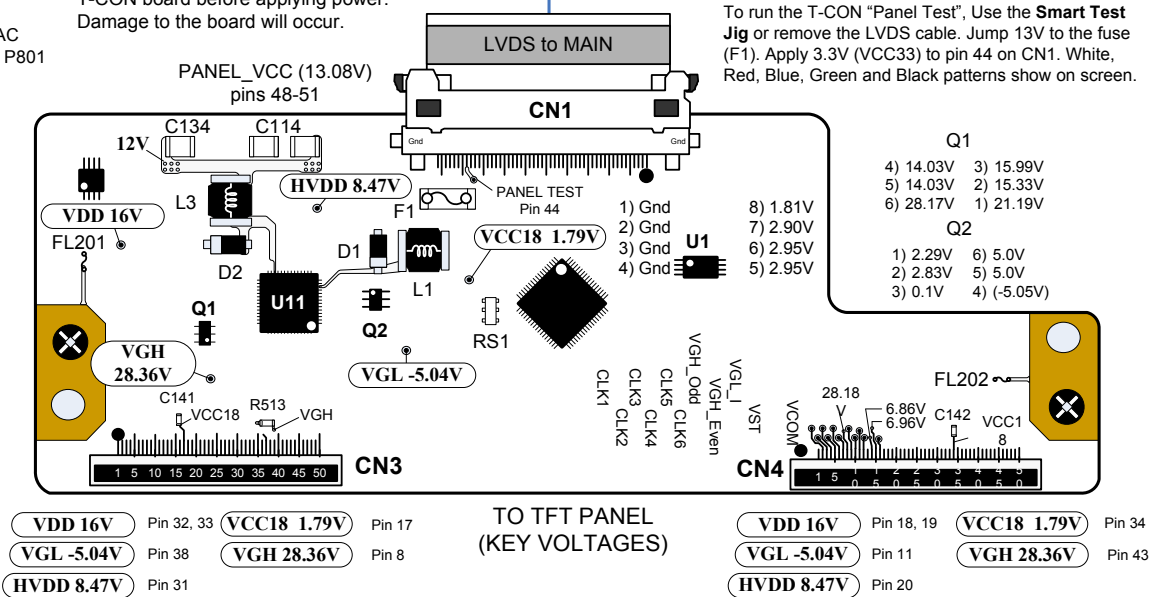
Warning: Failure to use the right value resistors may cause damage to the SMPS during these test.

If P801 is disconnected, the backlight power will be 86V rise to 260V and stay there.
Warning: Backlight power is slow to bleed down after power off, connected or disconnected.
Power remains to the Main board.

45 Total LEDs, 9 LEDs per/Row.
2 boards per/row, one with 4 and one with 5 LEDs.
Top group has 18 LEDs, Bottom group has 27 LEDs.

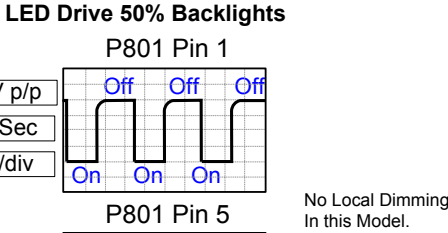


WARNING:
Be sure to install the screws in the T-CON board before applying power. Damage to the board will occur.



TO TFT PANEL (KEY VOLTAGES)

CN3	OTHER VOLTAGES	CN4
Pin 8 VDD 16V	Pin 8 VGH (U11 pin 42, 43) 28.18V	Pin 43 VDD 16V
Pin 9 VGL -5.04V	Pin 9 *VGH_ODD (U11 pin 47) -5.09V to 28.14V	Pin 42 VGL -5.04V
Pin 10 HVDD 8.47V	Pin 10 *VGH_EVEN (U11 pin 46) -5.09V to 28.14V	Pin 41 VGH 28.36V
	Pin 12 VST (U11 pin 45) -5.09V	Pin 39 VGH 28.36V
	Pin 18-19 VDD (U11 pin 28) 16.88V	Pin 32-33 HVDD 8.47V



No Local Dimming
In this Model.

P201 "SMPS Board" To P200 "MAIN Board"

PIN	LABEL	STBY	RUN	Diode
(3) 12	P_DIM#1	0V	*0.2V-2.60V	OL
(2) 11	DRV_ON	0V	2.98V	OL
9-10	Gnd	Gnd	Gnd	Gnd
4-8	13.2V	12V	13.16V	OL
3	Gnd	Gnd	Gnd	Gnd
(3) 2	P_DIM#2	0V	*0.2V-2.60V	OL
(1) 1	PWR_ON	0V	3.43V	1.19V

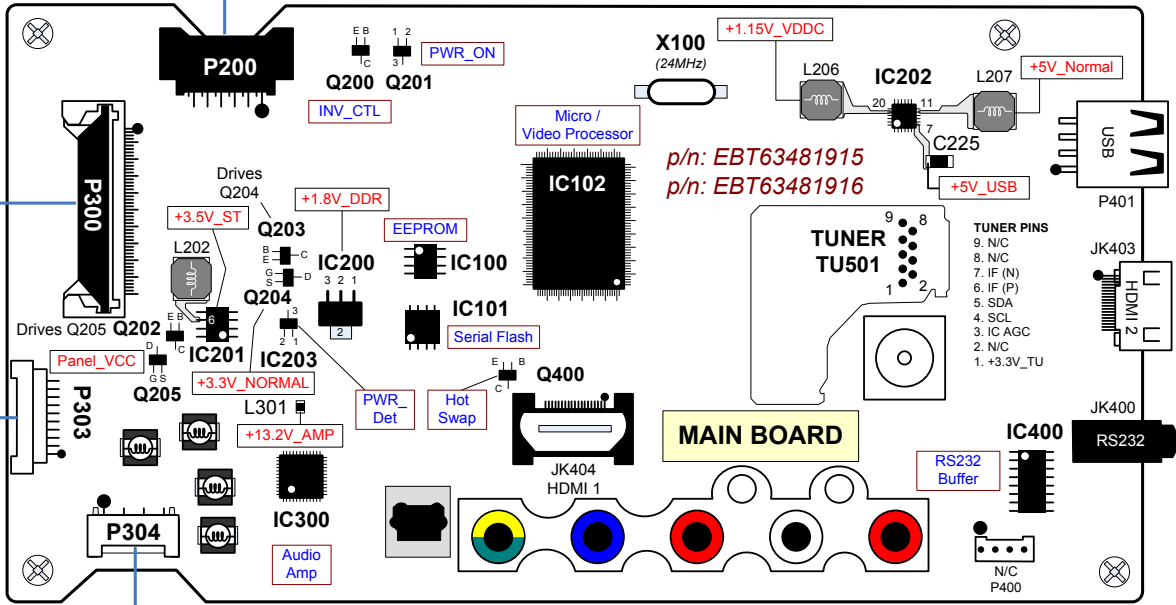
*0% to 100%

For DC voltages
See P201 Chart

P200 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	OL
2	OL
3	Gnd
4-8	OL
9-10	Gnd
11	1.86v
12	OL

For DC voltages for Main board
components see Page 2 of the
Interconnect diagram.



To Speakers

SPK Ft Right
p/n: EAB63650102

SPK Ft Left
p/n: EAB63650101

All Speaker
plug pins
6.58V

Diode Check (OL)



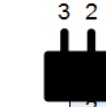

Front IR/Joy Stick



Bottom Center of Set
Front IR
p/n: EBR78925201


P303 "MAIN" to "Front IR/Joy Stick Board"

PIN	LABEL	STBY	RUN	Diode Check
10	N/C	n/c	n/c	n/c
9	N/C	n/c	n/c	n/c
8	Gnd	Gnd	Gnd	Gnd
7	IR	3.22V	3.23V	OL
6	LED_R	2.84V	0V	OL
5	Gnd	Gnd	Gnd	Gnd
4	3.5V_ST	3.29V	3.31V	0.65V
3	Key2	3.29V	3.31V	OL
2	Key1	3.29V	3.31V	OL
1	Gnd	Gnd	Gnd	Gnd

IR 3.60V p/p

IC100 	EEPROM Memory	
	Pin	
	[1]	Gnd
	[2]	Gnd
	[3]	Gnd
	[4]	Gnd
	[5]	3.21V
	[6]	3.21V
	[7]	Gnd
	[8]	3.31V
IC101 	Serial FLASH Memory	
	Pin	
	[1]	3.29V
	[2]	3.28V
	[3]	0V (Flash_WP)
	[4]	Gnd
	[5]	0V
	[6]	0V
	[7]	3.31V (Vcc In)
	[8]	3.31V (Vcc In)
IC200 	+1.8V_DDR Regulator	
	Pin	
	[1]	0.59V
	[2]	1.83V (Out)
	[3]	3.37V (In)
IC203 	PWR_Det Checks Panel_VCC	
	Pin	
	[1]	3.32V
	[2]	0V (Out)
	[3]	3.73V (In)

IC201 	+3.5V_ST Regulator	
	Pin	
	[1]	3.25V (EN)
	[2]	0.76V (FB)
	[3]	5.23V
	[4]	2.50V
	[5]	Gnd
	[6]	3.32V (Out)
	[7]	8.37V
	[8]	13.14V (Vcc In)
IC202 	+5V_NORMAL / +5V_USB +1.5V_VDDC	
	Pin	
	[1]	1.99V (n/c)
	[2]	3.31V (EN1)
	[3]	3.31V (EN2)
	[4]	3.17V
	[5]	3.17V (USB1_CTL)
	[6]	2.94V (USB1_OCD)
	[7]	5.02V (+5V_USB)
	[8]	5.02V
	[9]	13.15V (Vcc In)
	[10]	Gnd
	[11]	5.02V (5V_Normal Out)
	[12]	9.21V
	[13]	0.34V
	[14]	0.61V
	[15]	0.49V
	[16]	Gnd
	[17]	0.60V
	[18]	0.37V
	[19]	7.48V
	[20]	1.17V (1.15V_VDDC Out)
	[21]	Gnd
	[22]	13.15V (Vcc In)
	[23]	6.29V
	[24]	2.0V (n/c)

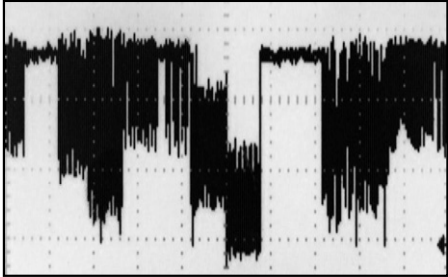
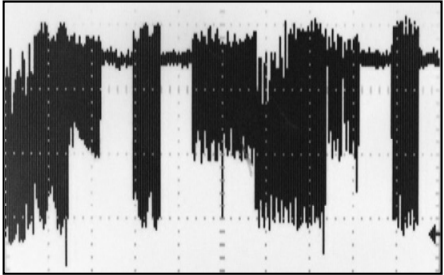
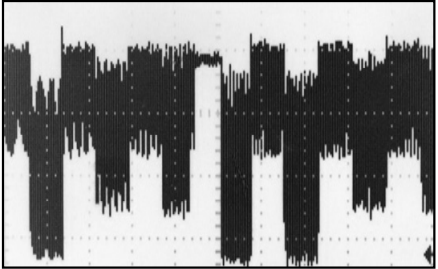
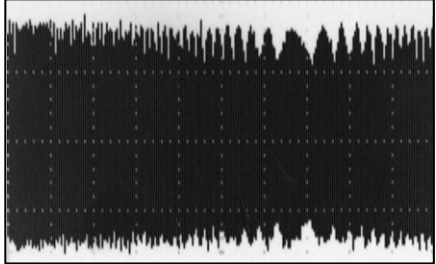
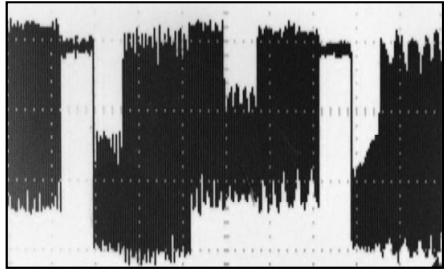
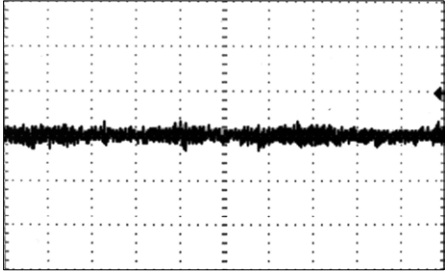
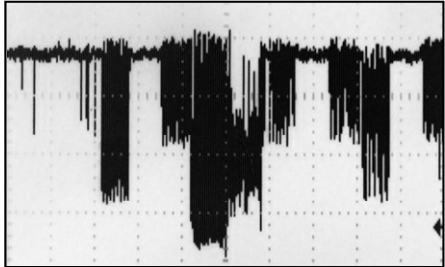
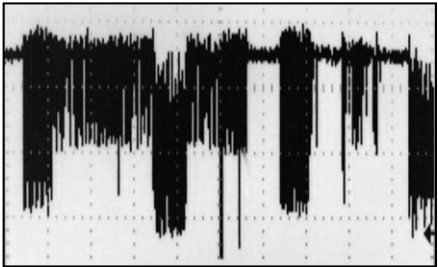
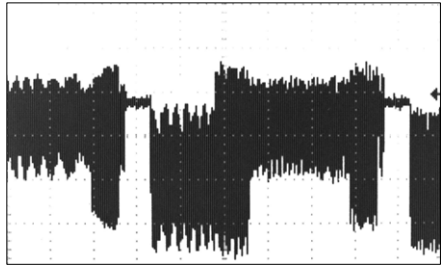
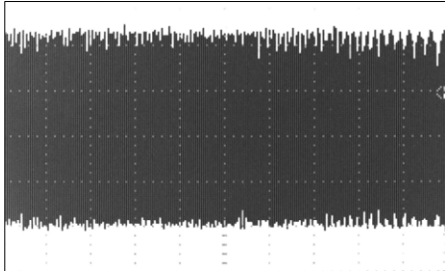
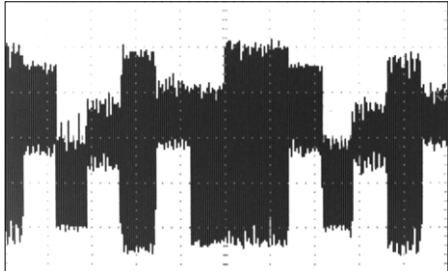
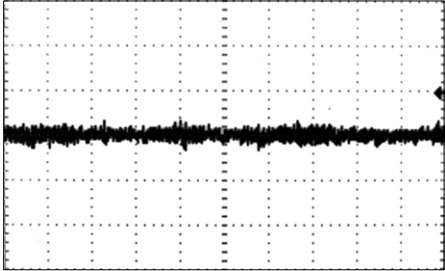
IC400 	RS232 Data Buffer	
	Pin	
	[1]	3.31V (C1+)
	[2]	5.52V (V+)
	[3]	0V (C1-)
	[4]	0V (C2+)
	[5]	(-5.43V) (C2-)
	[6]	(-5.46V) (V2-)
	[7]	(n/c)
	[8]	(n/c)
	[9]	(n/c)
	[10]	(n/c)
	[11]	3.27V (DIN2)
	[12]	3.3V (ROut1)
	[13]	0V (RIn1)
	[14]	(-5.46V) (DOut1)
	[15]	0V (Gnd)
	[16]	0V (In) +3.3V_ST

<div><div>Q200</div><div>INV_CTL Switch</div><div><div><div></div><div></div><div></div></div><div><div>E</div><div>B</div><div>C</div></div><div><div>[B] 0.15V</div><div>[C] 3.14V (Out)</div><div>[E] Gnd</div></div></div></div>	<div><div>Q400</div><div>HDMI Hot Swap</div><div><div><div></div><div></div><div></div></div><div><div>E</div><div>B</div><div>C</div></div><div><div>[B] 0V (HPD2)</div><div>[C] 0.07V</div><div>[E] Gnd</div></div></div></div>	<div><div>IC300</div><div>Audio Amp</div><div><div><div></div><div></div><div></div></div><div><div>[1] 6.58V (SPK_L+)</div><div>[2] 13.17V (Vcc In)</div><div>[3] 13.17V (Vcc In)</div><div>[4] 18.03V</div><div>[5] n/c</div><div>[6] 3.31V</div><div>[7] n/c</div><div>[8] Gnd</div><div>[9] 0V</div><div>[10] 0.68V</div><div>[11] 1.05V</div><div>[12] 1.8V</div><div>[13] 3.32V</div><div>[14] 0.39V</div><div>[15] 1.67V</div><div>[16] 1.0V</div><div>[17] Gnd</div><div>[18] 1.81V</div><div>[19] 3.32V</div><div>[20] 1.65V</div><div>[21] 1.65V</div><div>[22] 1.2V</div><div>[23] 3.31V</div><div>[24] 3.31V</div></div></div></div>	<div><div><div></div><div></div><div></div></div><div><div>[25] 3.3V</div><div>[26] Gnd</div><div>[27] 3.32V</div><div>[28] Gnd</div><div>[29] Gnd</div><div>[30] Gnd</div><div>[31] 3.32V</div><div>[32] 6.68V</div><div>[33] 17.96V</div><div>[34] 13.17V (Vcc In)</div><div>[35] 13.17V (Vcc In)</div><div>[36] 6.58V (SPK_R_)</div><div>[37] Gnd</div><div>[38] Gnd</div><div>[39] 6.58V (SPK_R+)</div><div>[40] n/c</div><div>[41] n/c</div><div>[42] 12.47V</div><div>[43] 12.47V</div><div>[44] n/c</div><div>[45] n/c</div><div>[46] 6.58V (SPK_L-)</div><div>[47] Gnd</div><div>[48] Gnd</div></div></div>
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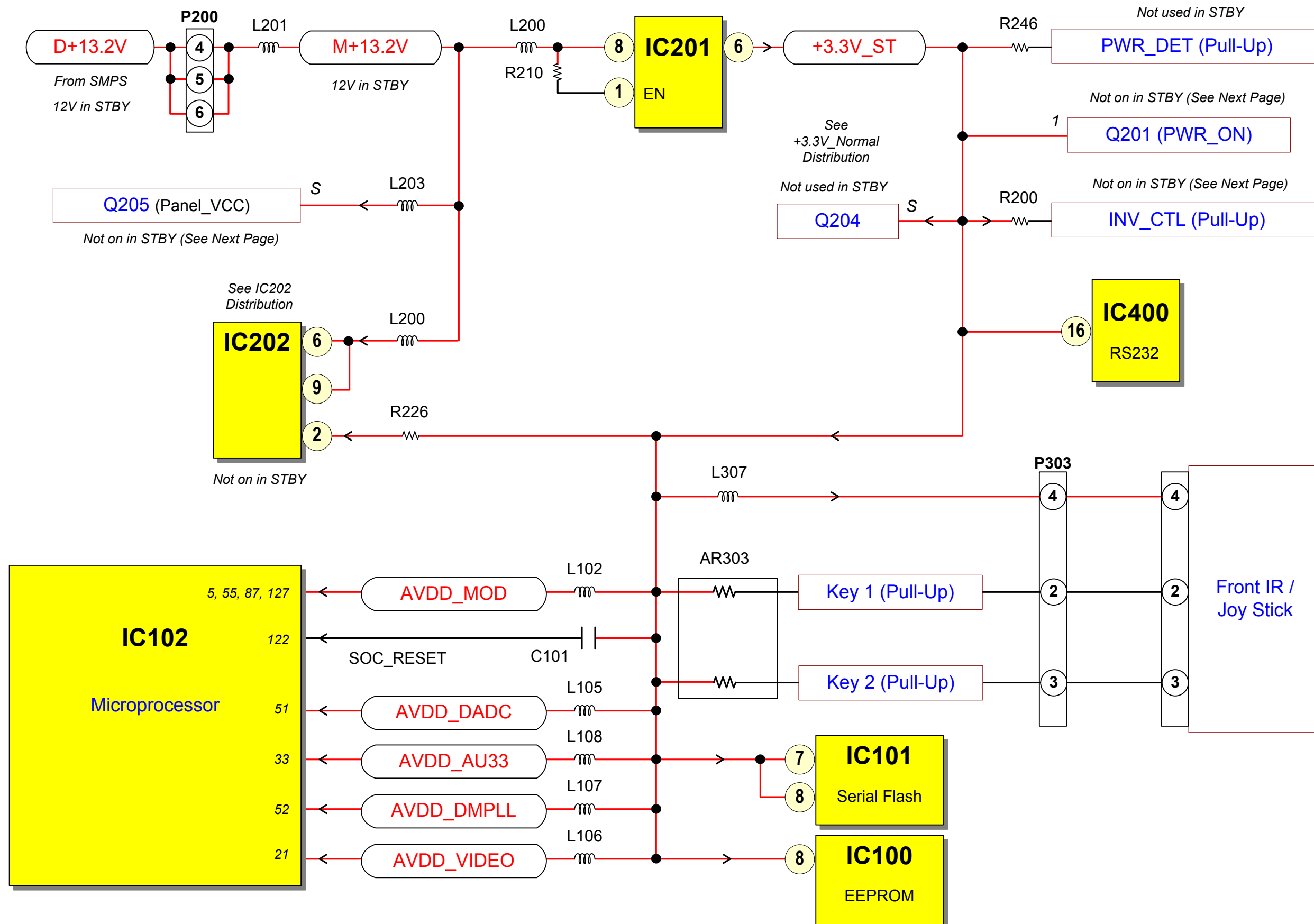
49LF5500 P300 LVDS Connector Video Waveforms

All LVDS signals are taken with SMPTY Color Bar signal input (1080P) Component Input.
All LVDS signals are “Differential Pairs”. The ones shown are the “Positive” signal of the pair. The Negative signal looks exactly the same but flipped 180°. Scope Settings are 100mV per/division, 2.5uSec per/division.

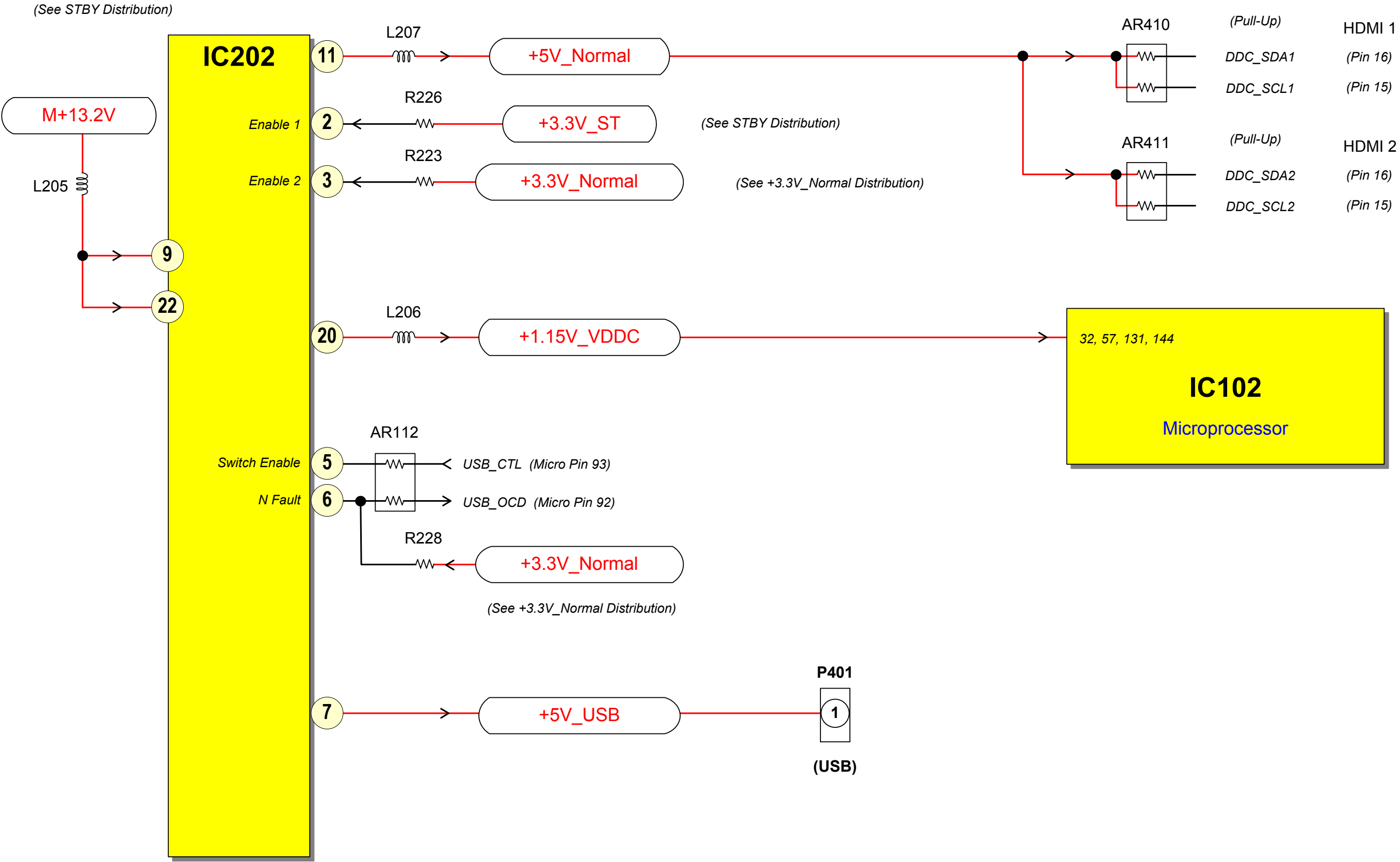
<div>Pin 12</div> <div></div> <div>340mV p/p</div>	<div>Pin 14</div> <div></div> <div>384mV p/p</div>	<div>Pin 16</div> <div></div> <div>380mV p/p</div>	<div>Pin 19</div> <div></div> <div>340mV p/p</div>	<div>Pin 22</div> <div></div> <div>348mV p/p</div>	<div>Pin 24</div> <div></div> <div>56mV p/p No Waveform</div>
<div>Pin 28</div> <div></div> <div>384mV p/p</div>	<div>Pin 30</div> <div></div> <div>356mV p/p</div>	<div>Pin 32</div> <div></div> <div>448mV p/p</div>	<div>Pin 35</div> <div></div> <div>340mV p/p</div>	<div>Pin 38</div> <div></div> <div>449mV p/p</div>	<div>Pin 40</div> <div></div> <div>64mV p/p No Waveform</div>

49LF5500 Main Board (Stand-By) Voltage Distribution

49LF5500 (2015) Interconnect Section 11

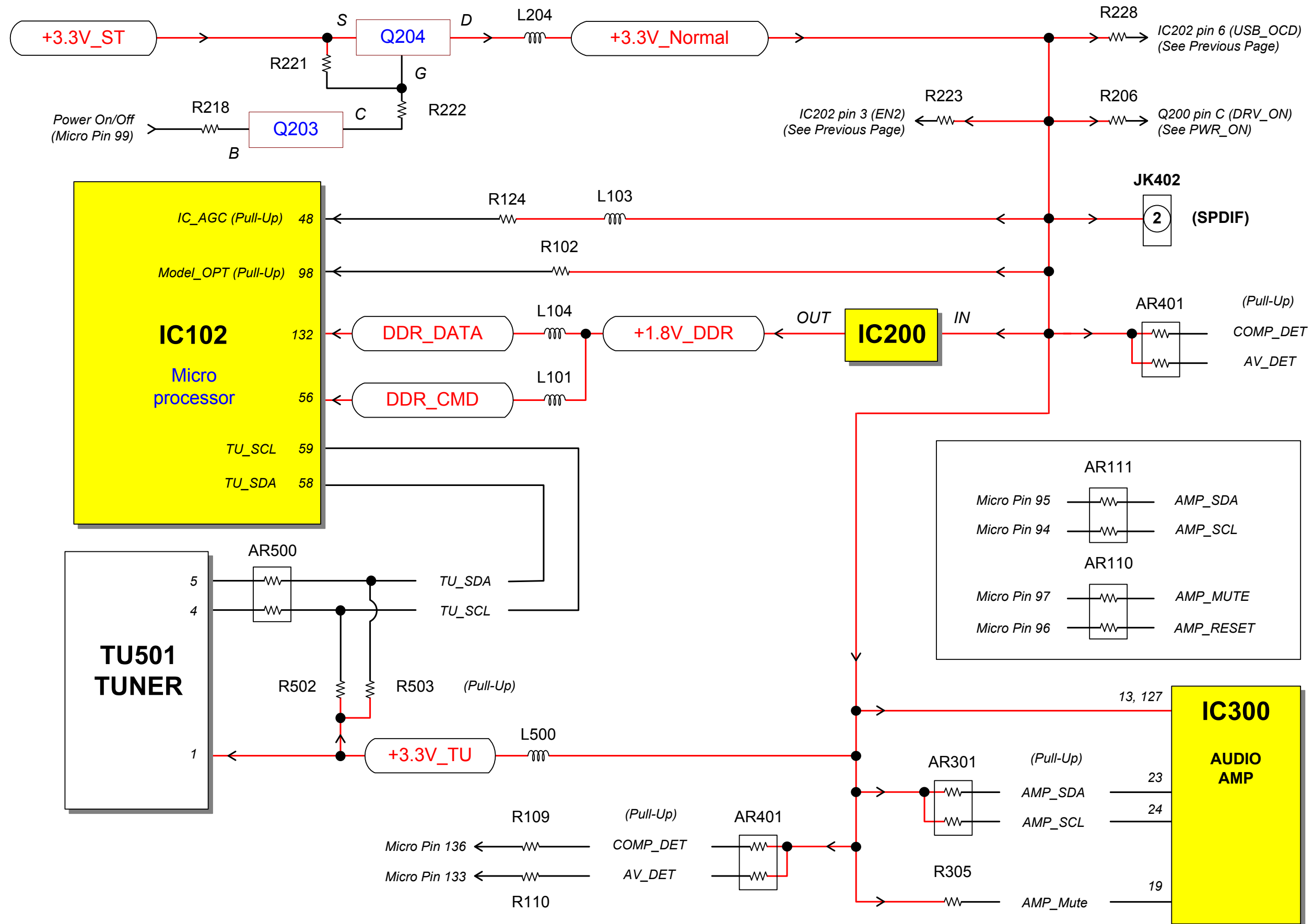


49LF5500 Main Board (IC202) Voltage Distribution



49LF5500 Main Board (+3.3V_NORMAL) Voltage Distribution

49LF5500 (2015) Interconnect Section 11



49UB8500 INTERCONNECT DIAGRAM

PANEL p/n: EAJ626883601

49UB8500 (2014) Interconnect Section 14

P801 Black "SMPS Board" to the "Backlights"

Pin	Label	Run	Diode Check	TP
1	VC_6	1.32V-13.14V	OL	EL85
2	VC_5	1.27V-12.99V	OL	EL84
3	VC_4	1.2V-13.31V	OL	EL86
4	VC_3	1.30V-13.35V	OL	EL83
5	VC_2	1.10V-13.59V	OL	EL87
6	VC_1	1.15V-13.54V	OL	EL82
7	N/C	n/c	n/c	
8	LED+	64.62V-64.49V	OL	P210

Bright (100%) to *Dim (0%)

P802 White "SMPS Board" to the "Backlights"

PIN	LABEL	RUN	Diode ✓	TP
1	LED+	64.94V	OL	P210
2	N/C	n/c	n/c	
3	VC_7	1.12V~12.91V	OL	EL79
4	VC_8	1.07V~13.05V	OL	EL76
5	VC_9	1.12V~13.22V	OL	EL80
6	VC_10	1.14V~13.35V	OL	EL77
7	VC_11	1.35V~13.11V	OL	EL81
8	VC_12	1.46V~13.24V	OL	EL78

To Backlights

Bright (100%) to *Dim (0%)

P201 "SMPS Board" to "MAIN Board" P13002

Pin	Label	STBY	Run	Diode Check
28	*Vsync	0V	0.04V	OL
27	*SCLK	0V	0.01V	OL
26	*Gnd	Gnd	Gnd	Gnd
25	*SCLK	0V	0.07V	OL
23-24	Gnd	Gnd	Gnd	Gnd
18-22	24V	0V	23.83V	1.12V
16-17	Gnd	Gnd	Gnd	Gnd
11-15	12V	0V	11.66V	0.44V
9-10	Gnd	Gnd	Gnd	Gnd
7-8	3.5V	3.54V	3.52V	OL
6	Gnd	Gnd	Gnd	Gnd
5	3.5V	3.54V	3.52V	OL
4	(4) P-DIM2	0V	1.53V	OL
3	(3) P-DIM	0V	0.16V~3.25V	OL
2	(2) DRV-ON	0V	3.12V	1.66V
1	(1) PWR-ON	0V	3.41V	1.15V

* To the T-CON (3) Dim to Bright

Note: If a part of the picture is exhibiting a dimmer backlight level than the other or the overall brightness seems dim, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal. If not, Check the P-DIM level, it should rise with the percentage shown on screen.

You can also test any of the 12 blocks functionality by grounding the return path signal (using 1KΩ resistor).

LED TOP OR BOTTOM BLOCK TEST (DIM OR DARK PICTURE AREA):

Turn the Brightness, Contrast and Backlights all the way up. Confirm 64V on P210.

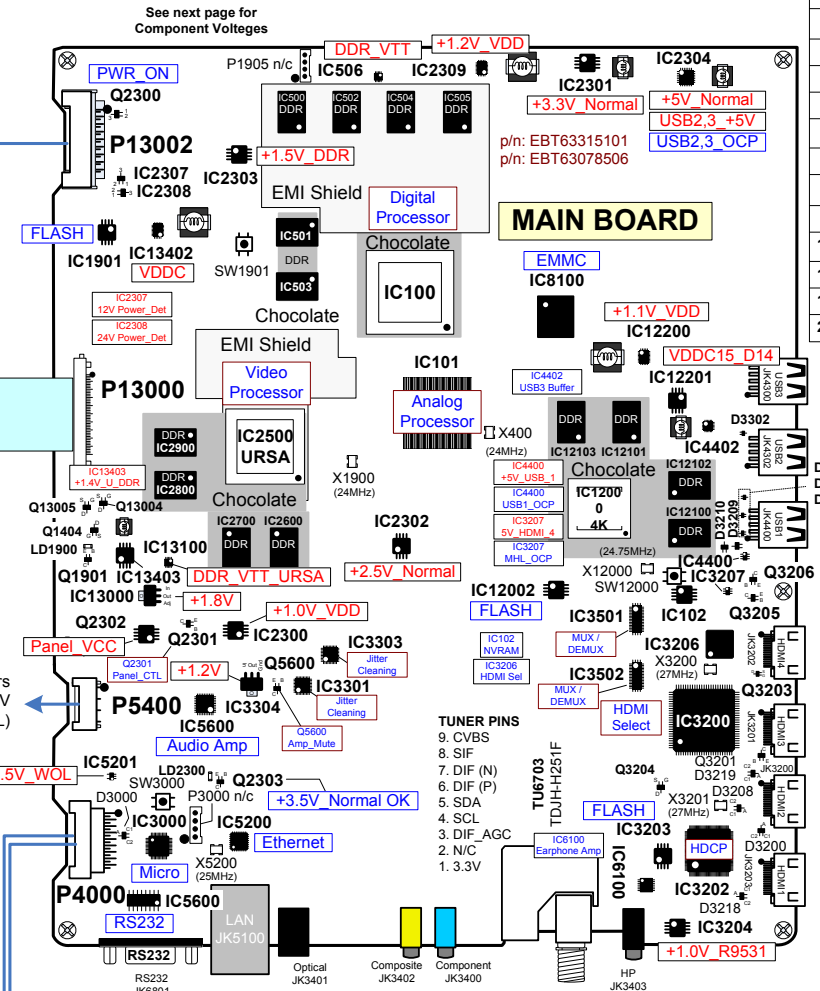
Confirm P-DIM is approx. 3V. You can turn on a Block of LEDs by using a 100 ohm resistor from any test point EL76 – EL87 to Ground.

The Power Supply must be producing the 64V for the Backlight B+.

Failure to use a resistor will damage the panels backlight and may also damage the power supply.

- (1) PWR_ON: turns on the 12V and 24V lines. Backlight power goes to 47V.
- (2) DRV_ON: (INV_ON from Main) turns on the Backlights. Backlight power goes to 64V.
- (3) P-DIM: controls the backlight brightness. Controlled via the Customer's Menu: Home □ Settings □ Picture □ Backlights. Range 0% to 100% directly proportional to DC voltage to Backlight brightness. (0.16V~3.27V) P-DIM is actually a PWM signal.
- (4) P_DIM2: Fixed Voltage

See next page for Component Voltages

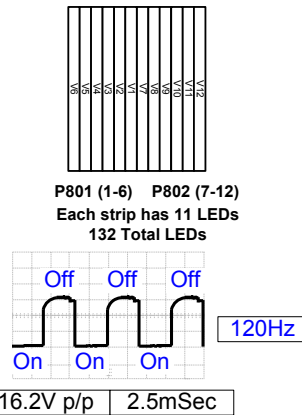


For DC voltages See P201 Chart

P401 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	OL
2	1.52V
3	OL
4	OL
5	1.20V
6	Gnd
7-8	1.20V
9-10	Gnd
11-15	1375V
16-17	Gnd
18-22	OL
23-24	Gnd

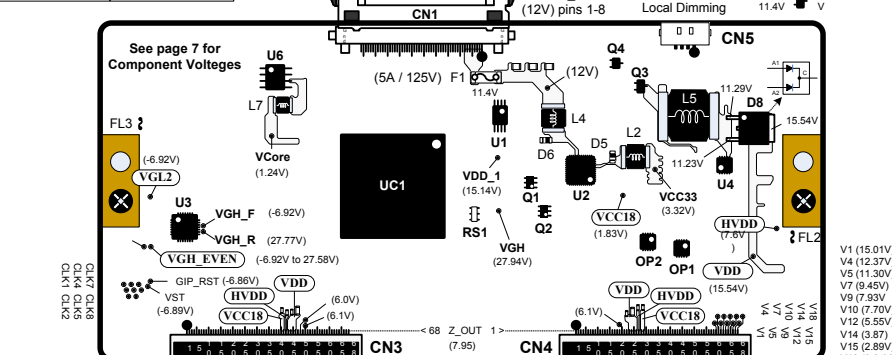
BACKLIGHT STRUCTURE



For LVDS Waveforms see Page 5 of the Interconnect diagram.

WARNING:

Be sure to install the screws in the T-CON board before applying power. Damage to the board will occur.



WiFi / M-Remote

Bottom Center of Set Front IR
p/n: EAB63129202

Front IR/Joy Stick

Bottom Center of Set Front IR
p/n: MAZ64123603

P4000 "Main" To "Joy Stick" & "M-Remote & WiFi Board" J1

Pin	Label	STBY	Run	Diode Check	
1	Gnd	Gnd	Gnd	Gnd	WiFi pin 1
2	3.5V_WOL	0V	3.51V	1.16V	WiFi pin 8
3	BT_RESET	2.34V	3.31V	OL	WiFi pin 2
4	WiFi_DM	0V	0V	1.20V	WiFi pin 7
5	N/C	n/c	n/c	n/c	WiFi pin 3
6	WiFi_DP	1.16V	0V	1.26V	WiFi pin 6
7	WOL (WiFi On)	0V	0V	1.94V	WiFi pin 4
8	Gnd	Gnd	Gnd	Gnd	WiFi pin 5
9	Eye_SDA	3.55V	3.54V	1.95V	Joy Stick pin 10
10	Gnd	Gnd	Gnd	Gnd	Joy Stick pin 1
11	Eye_SCL	3.55V	3.54V	1.95V	Joy Stick pin 9
12	Key 1	3.54V	3.54V	1.96V	Joy Stick pin 2
13	Gnd	Gnd	Gnd	Gnd	Joy Stick pin 8
14	Key 2	3.54V	3.54V	1.94V	Joy Stick pin 3
15	IR	3.52V	3.50V	1.85V	Joy Stick pin 7
16	3.5V_ST	3.55V	3.53V	1.20V	Joy Stick pin 4
17	LED_R	2.78V	0V	OL	Joy Stick pin 6
18	Gnd	Gnd	Gnd	Gnd	Joy Stick pin 5

IR 3.76V p/p

If P801 is disconnected, the backlight power will start at 49V, then jump to 69V and then fall back to 49V. Warning: Backlight power is slow to bleed down after power off, connected or disconnected.




































132 Total LEDs, 66 LEDs per/Strip.
2 boards per/strip. (11 LEDs per/board) 12 columns.
6 on the left are controlled by P801
6 on the right are controlled by P802

WARNING: Do not add or remove jumpers with Power Applied.

SMPS TEST 1: To Force Power Supply On without the Main Board.
Disconnect the P13002 on the Main board.
(A) Jump pin 5 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main.
(47.34V Backlight power but the Backlights are not on at this time).
LED Ground Return Line is (0.62V).
Remove AC power. Leave the jumper in place.

SMPS TEST 2: (Turning on the Backlights)
(B) Jump pin 8 (3.5V) to pin 2 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now read to 64.68V.
LED Ground Return Line is (1.07-1.38V). P-DIM P201 (pin 4) reads 3.52V.

49UB8500 Main Board Component Voltages

IC102  Pin [1] Gnd [2] Gnd [3] Gnd [4] Gnd [5] 3.26V [6] 3.27V [7] Gnd [8] 3.28V	IC2302  Pin [1] 3.35V (In) [2] n/c [3] 5.12V (In) [4] 3.53V (ctrl) [5] Gnd [6] 4.92V [7] 0.81V [8] 2.56V (out)	IC3207  Pin [1] 3.09V (In) [2] Gnd [3] 0V (Enable) [4] 0V (MHL_OCP) [5] 0V [6] 0.0V (Out)	IC12002  Pin [1] 3.28V [2] 0V [3] 2.46V [4] Gnd [5] 0.11V [6] 0V [7] 3.28V [8] 3.28V (In)	Q1404  Pin [G] 1.80V [S] 0.56V [D] 0.56V	Q3204  Pin [G] 5.09V (In) [S] 3.28V (Enable) [D] 3.29V (Out)
IC506  Pin [1] 0.73V [2] 1.5V [3] 0.74V VTT (In) [4] Gnd [5] 0.74V [6] 0.74V [7] 3.33V (Enable) [8] Gnd [9] n/c [10] 3.33V VTT (Out)	IC2303  Pin [1] 3.47V (Enable) [2] 3.77V [3] 5.22V [4] 2.45V [5] Gnd [6] 1.57V (Out) [7] 6.5V [8] 12V (+11.61V In)	IC3304  Pin [Gnd] 0V (Gnd) [Out] 1.2V (Out) [In] 3.28V (In)	IC12201  Pin [1] 3.47V (Enable) [2] 0.77V [3] 5.27V [4] 2.51V [5] Gnd [6] 1.53V (Out) [7] 6.40V [8] 11.57V (In)	Q1901  Pin [E] 1.18V [B] 0.56V [C] Gnd	Q3205  Pin [B] 0V [C] 3.52V (Out) [E] 0V
IC1901  Pin [1] 3.27V [2] 3.25V [3] 0V [4] Gnd [5] 3.27V [6] 0V [7] 3.27V [8] 3.27V (In)	IC2307  Pin [1] Gnd [2] 3.54V (Reset) [3] 3.57V (In)	IC4400  Pin [1] 5.09V (In) [2] Gnd [3] 3.27V (Enable) [4] 2.96V (USB_OCD1) [5] 0.41V [6] 5.09V (Out)	IC13000  Pin [Gnd] 0.55V (Adj) [Out] 1.8V (Out) [In] 3.28V (In)	Q2300  Pin [1] 3.52V [2] 2.84V [3] 3.41V	Q3206  Pin [B] 3.52V [C] 0V (Out) [E] 3.52V
IC2300  Pin [1] 3.44V (Enable) [2] 0.77V [3] 3.45V [4] 5.42V [5] Gnd [6] 1.02V (Out) [7] 6.41V [8] 12V (In)	IC2308  Pin [1] Gnd [2] 0V (Reset) [3] 0V (In)	IC5201  Pin [1] 3.52V (Out) [2] Gnd [3] 0.01V n/c [4] 3.51V (OCP Out) [5] 3.51V (Vcc In)	IC13100  Pin [1] 0.73V [2] 1.53V [3] 0.76V VTT (In) [4] Gnd [5] 0.76V [6] 0.76V [7] 3.28V (Enable) [8] Gnd [9] n/c [10] 3.28V VTT (Out)	Q2301  Pin [B] 0.61V [C] 0.03V [E] Gnd	Q5600  Pin [B] 0V [C] 3.27V [E] Gnd
IC2301  Pin [1] 3.44V (Enable) [2] 0.77V [3] 3.46V [4] 3.42V [5] Gnd [6] 3.37V (Out) [7] 8.79V [8] 12V (In)	IC3203  Pin [1] 0V [2] 0V [3] 0V [4] Gnd [5] 0V [6] 0V [7] 3.28V [8] 3.28V (In)	IC6601  Pin [1] 3.52V [2] 5.72V [3] 0V [4] 0.02V [5] (-5.63V) [6] (-5.66V) [7] n/c [8] n/c [9] n/c [10] n/c [11] 3.29V [12] 3.51V [13] 0V [14] (-5.67V) [15] Gnd [16] 3.52V (3.5V_ST In)	IC13403  Pin [1] 3.47V (Enable) [2] 0.77V [3] 5.26V [4] 2.51V [5] Gnd [6] 1.55V (Out) [7] 6.51V [8] 11.60V (In)	Q2302  Pin [1] 11.56V (In) [2] 11.56V (In) [3] 11.56V (In) [4] (Enable) [5] 11.58V (Out) [6] 11.58V (Out) [7] 11.58V (Out) [8] 11.58V (Out)	Q13004  Pin [G] 3.24V [S] 3.31V [D] 3.29V
	IC3204  Pin [1] n/c [2] 3.23V [3] 3.28V (In) [4] 5.09V (Enable) [5] n/c [6] 1.0V (Out) [7] 0.6V [8] Gnd			Q12303  Pin [E] Gnd [B] 0.64V [C] 0.02V	Q13005  Pin [G] 3.29V [S] 3.32V [D] 3.29V
				Q3201  Pin [B] 0V [C] 0V [E] Gnd	
				Q3203  Pin [B] 3.28V [C] 3.46V [E] 3.28V	

49UB8500 Main Board Component Voltages (Large ICs) Page 1 of 2

IC2304	
+5V_Normal Regulator	
Pin	Pin
[1] 24.68V (In)	[15] 5.04V (OCP2)
[2] 24.68V (In)	[16] 5.09V
[3] 24.68V (In)	[17] 5.09V
[4] Gnd	[18] 12.04V
[5] Gnd	[19] 5.09V (Out)
[6] Gnd	[20] 5.09V (Out)
[7] 6.25V	[21] 5.09V (Out)
[8] 6.25V	[22] 1.94V
[9] 3.53V (Enable)	[23] 0.60V
[10] 5.09V (Out USB2)	[24] 0.35V
[11] 5.09V (Out USB3)	[25] 1.24V
[12] 5.09V (USB2 Ctrl)	[26] 0.45V
[13] 5.09V (USB3 Ctrl)	[27] 0.45V
[14] 5.04V (OCP2)	[28] Gnd

IC2309	
+5V_Normal Regulator	
Pin	Pin
[1] 1.18V	[15] 11.59V (In)
[2] 5.18V	[16] 11.59V (In)
[3] 3.51V (Enable)	[17] 11.59V (In)
[4] 6.44V	[18] 11.59V (In)
[5] n/c	[19] 11.59V (In)
[6] 1.29V (Out)	[20] 5.18V
[7] 1.29V (Out)	[21] 5.18V
[8] 1.29V (Out)	[22] Gnd
[9] 1.29V (Out)	[23] 0.61V
[10] Gnd	[24] 1.26V
[11] Gnd	[25] 0.41V
[12] Gnd	[26] Gnd
[13] Gnd	[27] Gnd
[14] Gnd	[28] Gnd

IC3000	
Micro Processor	
Pin	Pin
[1] 3.28V	[25] 0V
[2] 3.28V	[26] 3.53V
[3] 0.0V	[27] 3.53V
[4] 2.09V	[28] 0.03V
[5] 0.06V	[29] 0.1V
[6] 3.5V	[30] 0V
[7] 3.49V	[31] 3.34V
[8] 3.53V	[32] 3.53V
[9] 0V	[33] 3.53V
[10] 3.53V	[34] 3.75V
[11] 3.53V	[35] 0V
[12] 0V	[36] 0V
[13] 3.51V	[37] 0.02V
[14] 3.68V	[38] 0V
[15] 3.53V	[39] 3.53V
[16] 0V	[40] 3.53V
[17] 3.48V	[41] 0.65V
[18] 3.53V	[42] 0.13V
[19] 3.29V	[43] 0V
[20] 3.32V	[44] 0V
[21] 3.53V	[45] 0V
[22] 0V	[46] 2.09V
[23] 0V	[47] Gnd
[24] 0.1V	[48] 3.53V

IC3301	
Jitter Cleaner	
Pin	Pin
[1] 2.99V (In)	[21] 3.27V
[2] 2.99V	[22] 3.27V
[3] n/c	[23] 0V
[4] 2.99V	[24] 3.27V
[5] 2.99V	[25] 3.27V
[6] 2.99V	[26] 3.27V
[7] 2.99V	[27] 3.27V
[8] 0V (Ctl_En)	[28] 5.06V
[9] 2.99V	[29] 3.27V
[10] 2.99V	[30] 3.27V
[11] 3.27V	[31] 1.2V (In)
[12] 1.2V	[32] n/c
[13] 3.09V	[33] n/c
[14] 0V	[34] 0V
[15] Gnd	[35] Gnd
[16] 0V	[36] n/c
[17] 0V	[37] 1.2V (In)
[18] 0.45V	[38] n/c
[19] 1.2V	[39] n/c
[20] 1.2V	[40] 1.2V (In)

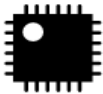
IC3303	
Jitter Cleaner	
Pin	Pin
[1] 2.99V (In)	[21] 3.27V
[2] 2.99V	[22] 3.27V
[3] n/c	[23] 0V
[4] 2.99V	[24] 3.27V
[5] 2.99V	[25] 3.27V
[6] 2.99V	[26] 3.27V
[7] 2.99V	[27] 3.27V
[8] 0V (Ctl_En)	[28] 5.06V
[9] 2.99V	[29] 3.27V
[10] 2.99V	[30] 3.27V
[11] 3.27V	[31] 1.2V (In)
[12] 1.2V	[32] n/c
[13] 3.09V	[33] n/c
[14] 0V	[34] 0V
[15] Gnd	[35] Gnd
[16] 0V	[36] n/c
[17] 0V	[37] 1.2V (In)
[18] 0.45V	[38] n/c
[19] 1.2V	[39] n/c
[20] 1.2V	[40] 1.2V (In)

IC3501	
MUX/ DEMUX	
Pin	Pin
[1] 3.28V (In)	[22] 2.94V
[2] 3.28V	[23] 2.94V
[3] 4.88V	[24] 2.94V
[4] 4.88V	[25] 2.94V
[5] 2.98V	[26] 2.94V
[6] 2.98V	[27] 2.94V
[7] 2.98V	[28] 2.94V
[8] 2.98V	[29] 2.94V
[9] n/c	[30] n/c
[10] 2.98V	[31] 2.94V
[11] 2.98V	[32] 2.94V
[12] 2.98V	[33] 2.94V
[13] 2.98V	[34] 2.94V
[14] n/c	[35] 2.94V
[15] n/c	[36] 2.94V
[16] 3.28V	[37] 2.94V
[17] 3.28V	[38] 2.94V
[18] n/c	[39] 4.88V
[19] n/c	[40] 4.88V
[20] n/c	[41] 3.28V
[21] n/c	[42] 3.28V

IC3502	
MUX/ DEMUX	
Pin	Pin
[1] 3.28V (In)	[22] 2.94V
[2] 3.28V	[23] 2.94V
[3] 4.88V	[24] 2.94V
[4] 4.88V	[25] 2.94V
[5] 2.98V	[26] 2.94V
[6] 2.98V	[27] 2.94V
[7] 2.98V	[28] 2.94V
[8] 2.98V	[29] 2.94V
[9] n/c	[30] n/c
[10] 2.98V	[31] 2.94V
[11] 2.98V	[32] 2.94V
[12] 2.98V	[33] 2.94V
[13] 2.98V	[34] 2.94V
[14] n/c	[35] 2.94V
[15] n/c	[36] 2.94V
[16] 3.28V	[37] 2.94V
[17] 3.28V	[38] 2.94V
[18] n/c	[39] 4.88V
[19] n/c	[40] 4.88V
[20] n/c	[41] 3.28V
[21] n/c	[42] 3.28V

IC4402

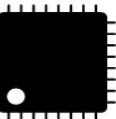
USB 2-3
Processor



Pin		Pin	
[1]	n/c	[13]	3.3V (In)
[2]	n/c	[14]	0.08V
[3]	3.3V (In)	[15]	0V
[4]	3.3V	[16]	1.63V
[5]	3.3V	[17]	3.23V
[6]	n/c	[18]	n/c
[7]	3.27V	[19]	3.26V
[8]	3.27V	[20]	3.26V
[9]	Gnd	[21]	Gnd
[10]	1.45V	[22]	2.63V
[11]	1.45V	[23]	2.63V
[12]	Gnd	[24]	n/c

IC5200

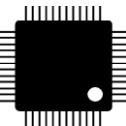
Ethernet
IC



Pin		Pin	
[1]	0V	[17]	0V
[2]	1.1V	[18]	n/c
[3]	1.1V	[19]	n/c
[4]	1.1V	[20]	0V
[5]	1.1V	[21]	3.26V
[6]	1.1V	[22]	1.23V
[7]	3.51V (In)	[23]	3.25V
[8]	0.03V	[24]	3.25V
[9]	0V	[25]	3.24V
[10]	0V	[26]	0V
[11]	0V	[27]	0V
[12]	0V	[28]	0V
[13]	n/c	[29]	1.08V
[14]	3.51V (In)	[30]	3.51V (In)
[15]	1.32V	[31]	0V
[16]	0V	[32]	0.58V

IC5600

Audio
Amp



Pin		Pin	
[1]	n/c	[21]	(Out R-)
[2]	1.29V	[22]	Gnd
[3]	n/c	[23]	7.47V
[4]	Gnd	[24]	5.17V
[5]	n/c	[25]	Gnd
[6]	1.27V	[26]	n/c
[7]	1.14V	[27]	5.16V
[8]	1.63V	[28]	7.46V
[9]	1.63V	[29]	Gnd
[10]	0V	[30]	2.76V (Out L-)
[11]	3.09V	[31-32]	23.89V (L B+)
[12]	3.27V (Mute)	[33]	2.76V (Out L+)
[13]	n/c	[34]	Gnd
[14]	1.36V	[35]	7.45V
[15]	n/c	[36]	3.20V (Reset)
[16]	7.46V	[37]	Gnd
[17]	Gnd	[38]	1.66V
[18]	2.77V (Out R-)	[39]	Gnd
[19-20]	23.89V (R B+)	[40]	(In)

IC6100

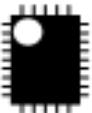
Earphone
IC



Pin		Pin	
[1]	Gnd	[8]	1.64V
[2]	0V (R-In)	[9]	3.28V (In)
[3]	0V (R-Out)	[10]	Gnd
[4]	Gnd	[11]	n/c
[5]	(Mute)	[12]	0V (L-Out)
[6]	(-3.16V)	[13]	0V (L-In)
[7]	(-1.57V)	[14]	Gnd

IC12200

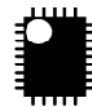
+1.1V_VDD
Regulator



Pin		Pin	
[1]	1.17V	[15]	11.62V (In)
[2]	5.13V	[16]	11.62V (In)
[3]	3.51V (Enable)	[17]	11.62V (In)
[4]	6.27V	[18]	11.62V (In)
[5]	n/c	[19]	11.62V (In)
[6]	1.2V (Out)	[20]	5.13V
[7]	1.2V (Out)	[21]	5.13V
[8]	1.2V (Out)	[22]	Gnd
[9]	1.2V (Out)	[23]	0.6V
[10]	Gnd	[24]	1.19V
[11]	Gnd	[25]	0.39V
[12]	Gnd	[26]	n/c
[13]	Gnd	[27]	Gnd
[14]	Gnd	[28]	Gnd

IC13402

VDDC Regulator



Pin		Pin	
[1]	1.19V	[15]	11.62V (In)
[2]	5.19V	[16]	11.62V (In)
[3]	3.51V (Enable)	[17]	11.62V (In)
[4]	6.34V	[18]	11.62V (In)
[5]	n/c	[19]	11.62V (In)
[6]	1.19V (Out)	[20]	5.20V
[7]	1.19V (Out)	[21]	5.20V
[8]	1.19V (Out)	[22]	Gnd
[9]	1.19V (Out)	[23]	0.6V
[10]	Gnd	[24]	0.39V
[11]	Gnd	[25]	0V
[12]	Gnd	[26]	Gnd
[13]	Gnd	[27]	Gnd
[14]	Gnd	[28]	Gnd



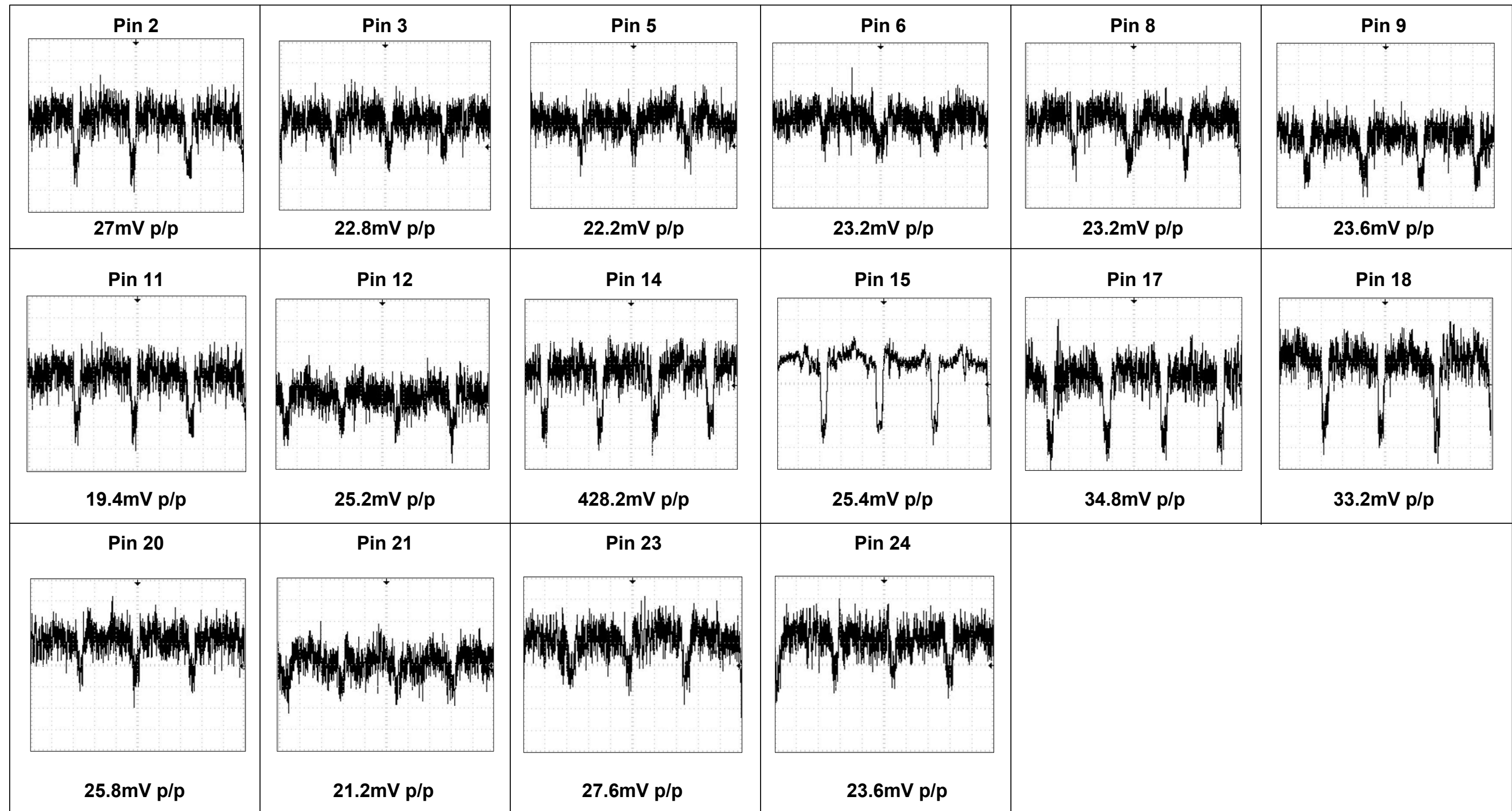
49UB5800 Main Board P13000 LVDS Connector Video Waveforms

49UB8500 (2014) Interconnect Section 14

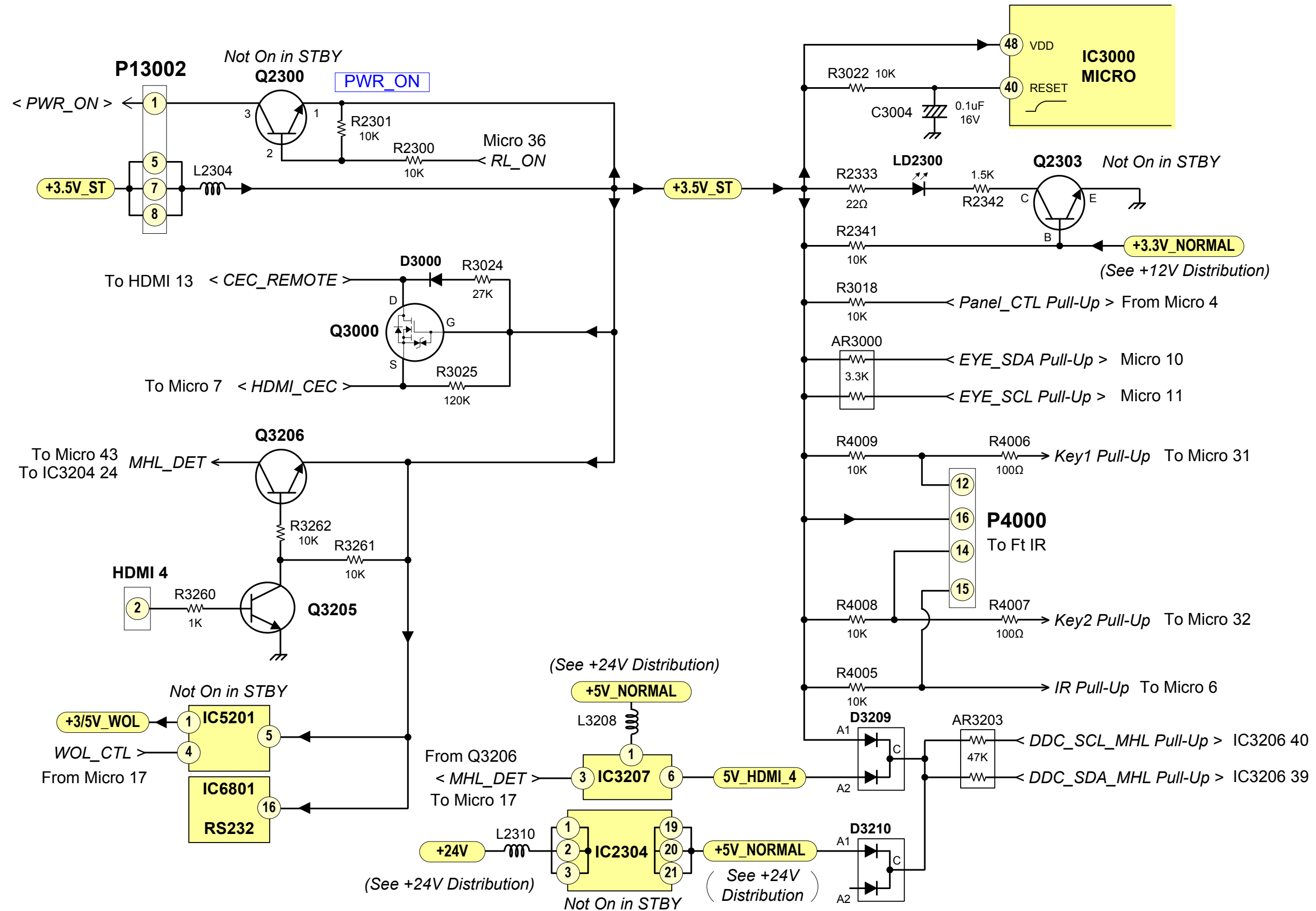
All LVDS signals are taken with SMPTY Color Bar signal input (1080P) Component Input.

All LVDS signals are “Differential Pairs”.

Scope Settings are 5mV per/division, 100uSec per/division.



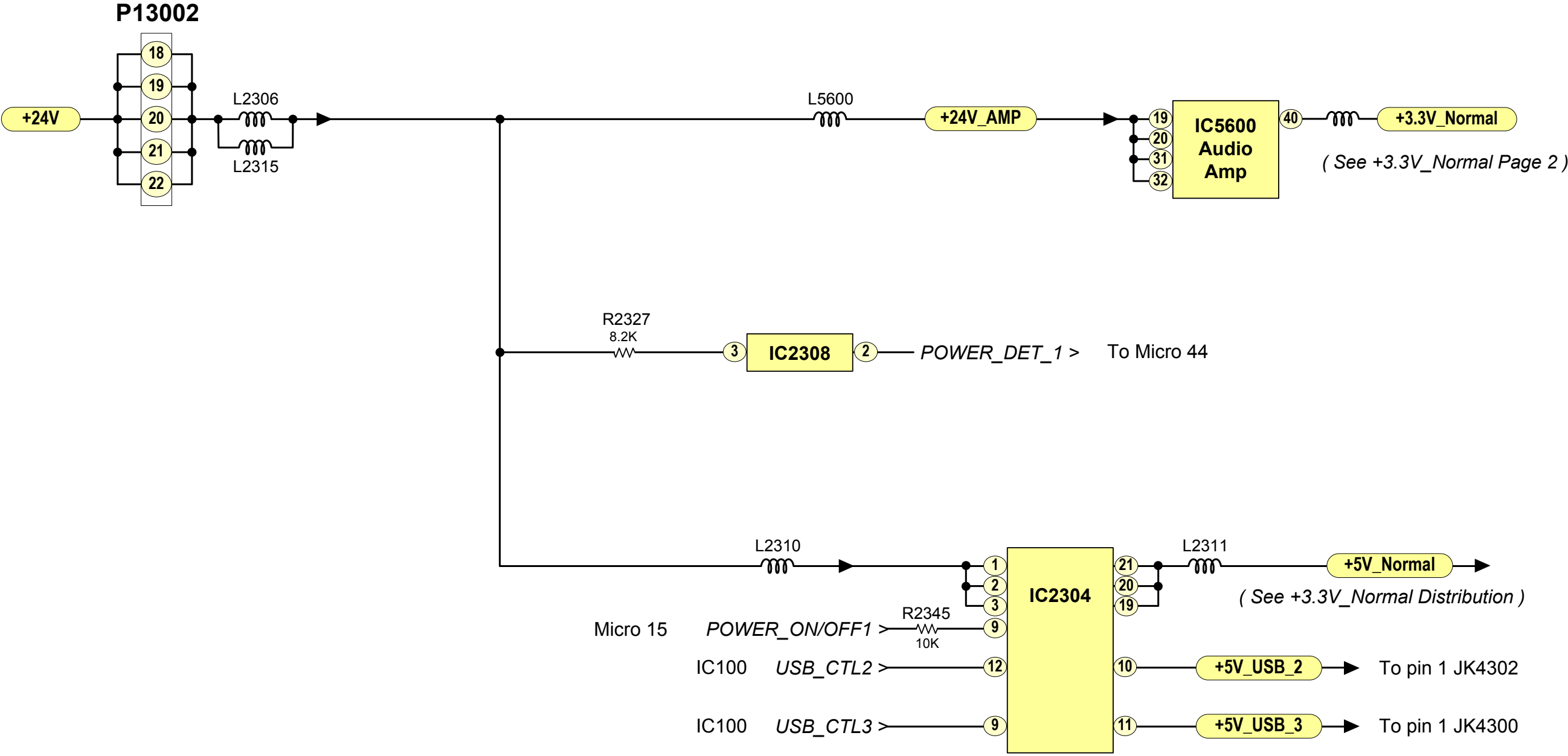
49UB8500 +3.5V_ST Voltage Distribution (In Stand-By)



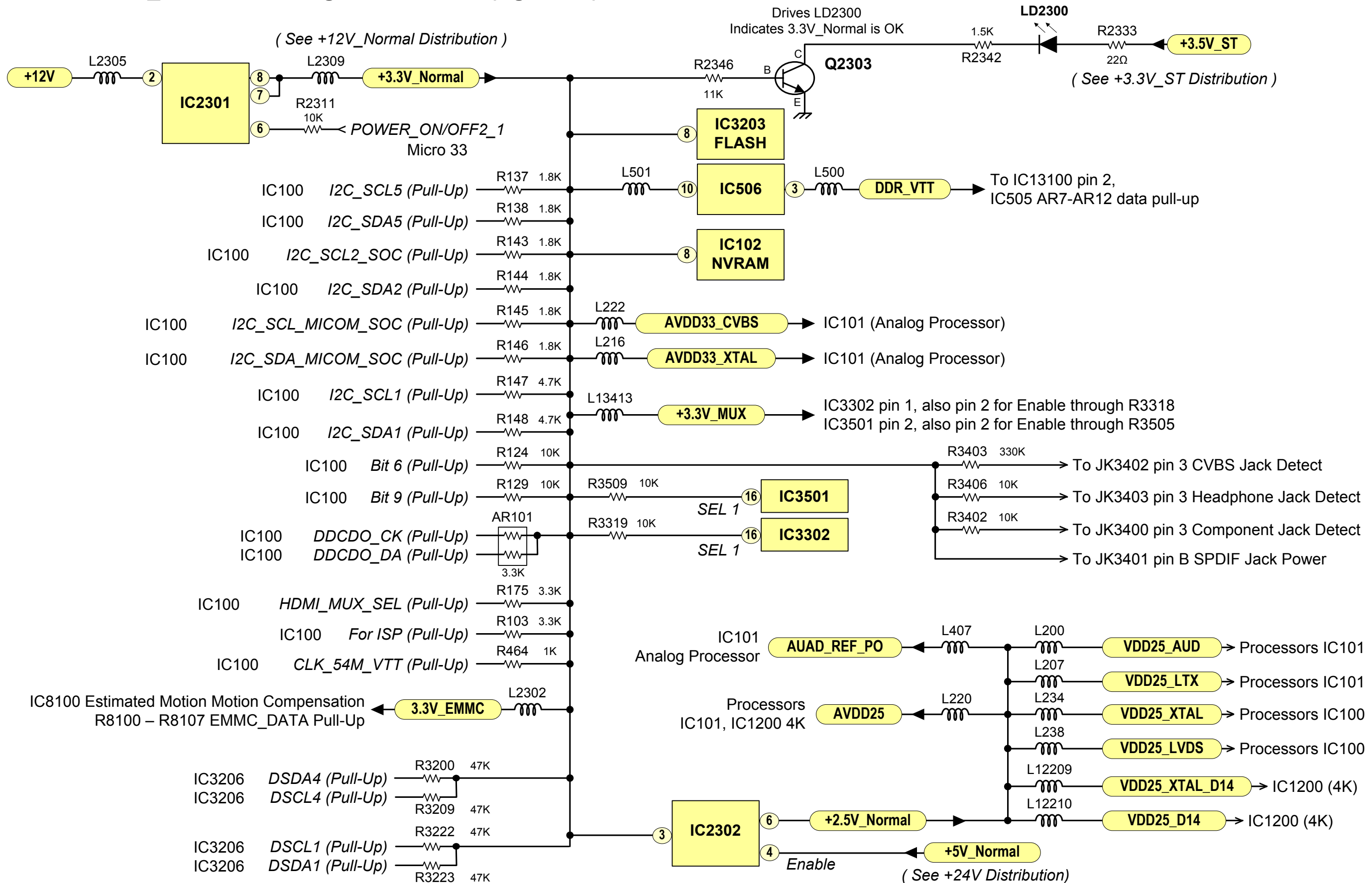


49UB8500 +24V Voltage Distribution (Power On)

In Power_On, Power_On pin 1, INV_CTL pin 2 and PANEL_CTL are On and High.

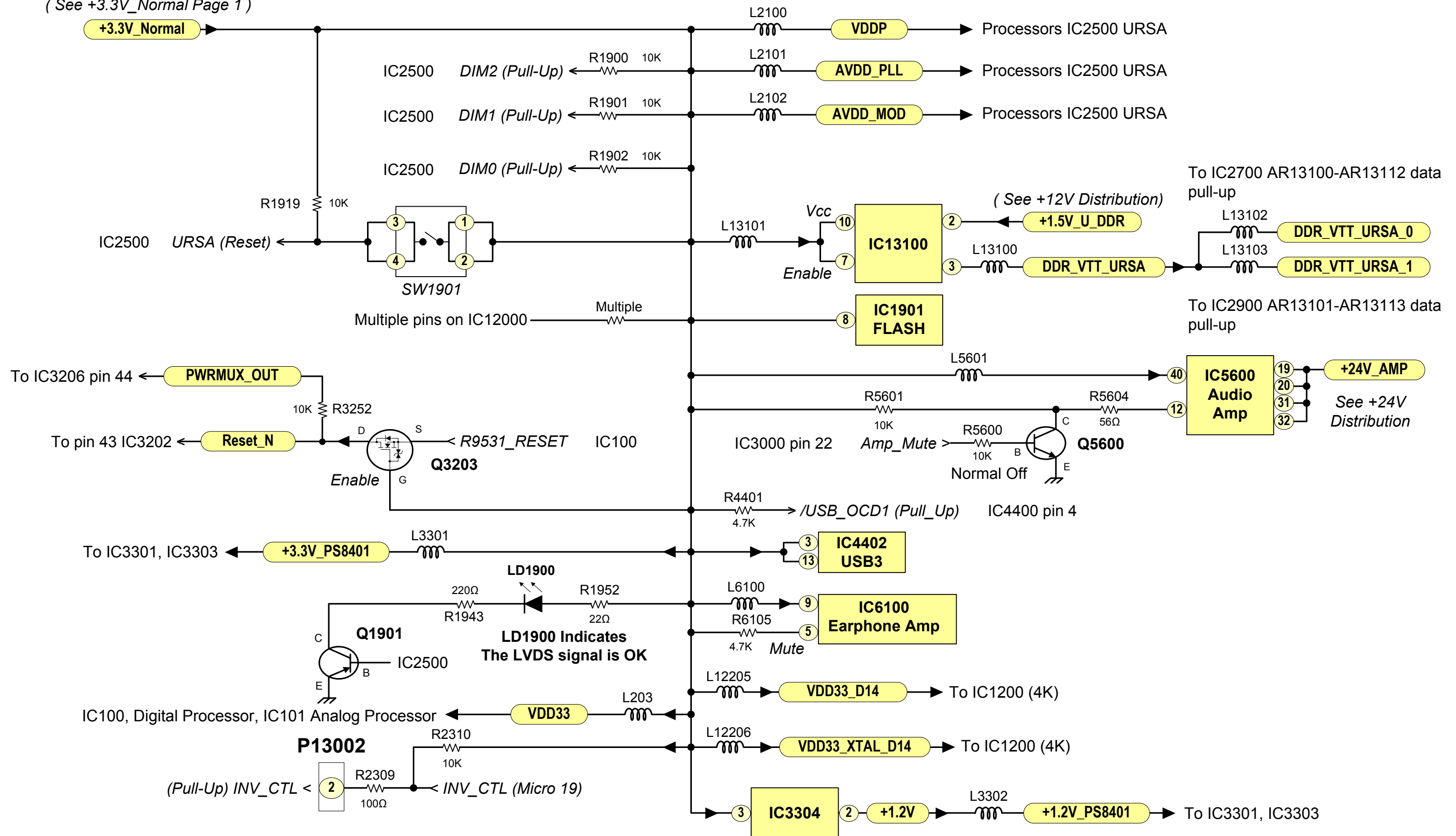


49UB8500 +3.3V_NORMAL Voltage Distribution (Pg 1 of 3)



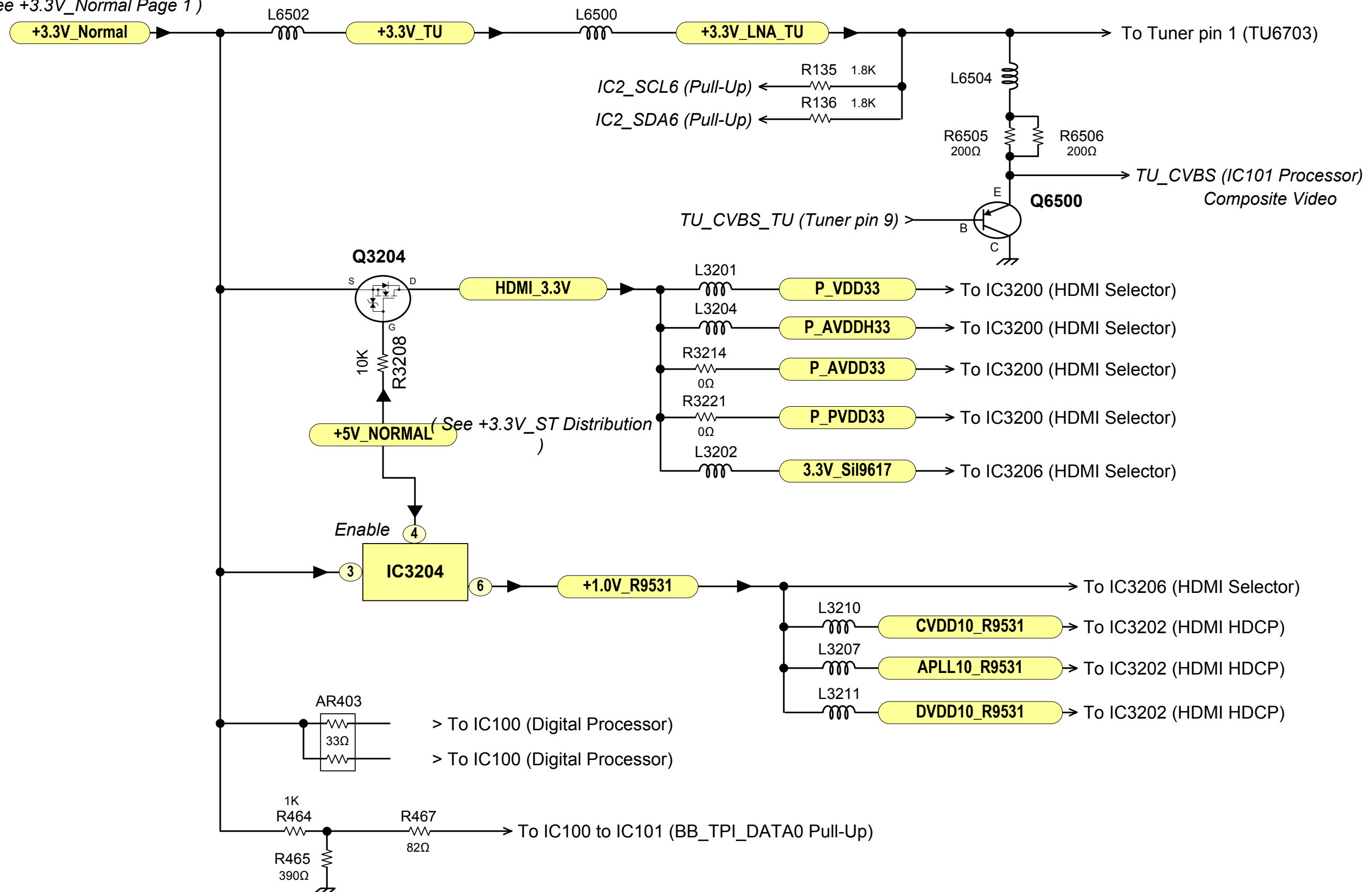
49UB8500 +3.3V_NORMAL Voltage Distribution (Pg 2 of 3)

(See +3.3V_Normal Page 1)



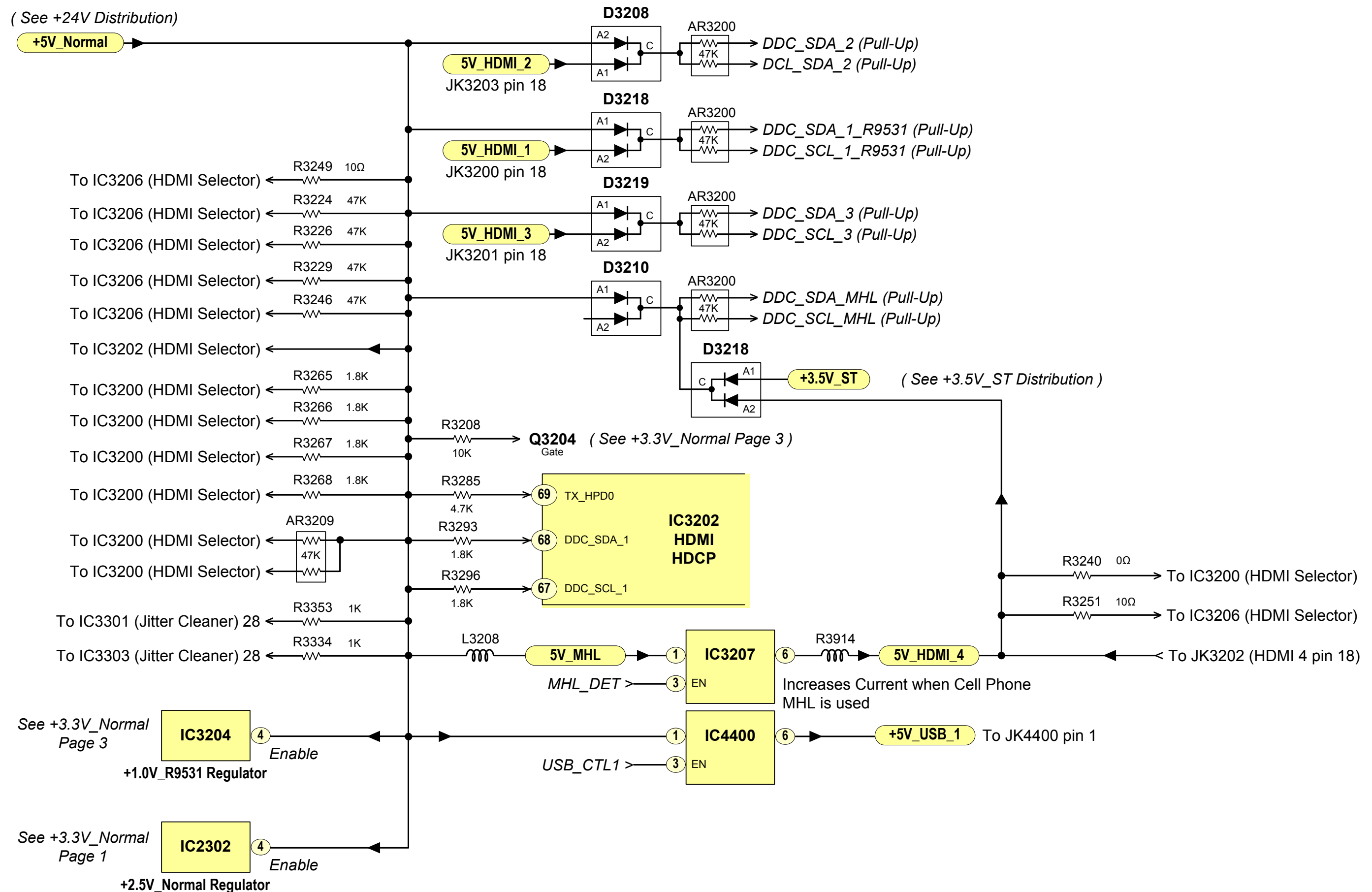
49UB8500 +3.3V_NORMAL Voltage Distribution (Pg 3 of 3)

(See +3.3V_Normal Page 1)



49UB8500 +5V_NORMAL Voltage Distribution (Power On)

(See +24V Distribution)

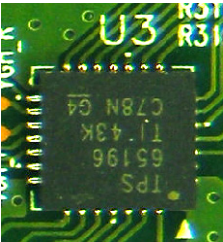


49UB8500 T-CON Component Voltages

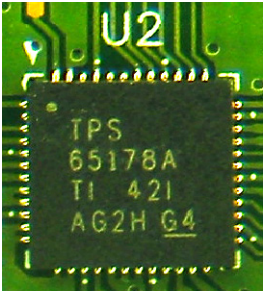
U3 DC-to-DC (TPS6169)

Pin	Label	DC
1	VGL_2	(-6.92V)
2	n/c	n/c
3	VGH1	27.80V
4	VGH2	27.92V
5	*VGH_ODD	(-6.92V to 27.58V)
6	*VGH_EVEN	(-6.92V to 27.58V)
7	CLK1	8.92V
8	CLK2	8.92V
9	CLK3	8.93V
10	CLK4	9.0V
11	CLK5	8.94V
12	CLK6	8.93V
13	CLK7	8.93V
14	CLK8	9.93V
15	Ref	1.08V
16	VGH_R	27.79V
17	VGH_F	(-6.92V)
18	VST	(-6.86V)
19	Reset	(-6.86V)
20	Discharge	(-6.92V)
21	Gnd	GND
22	V_Sense	3.21V
23	EO	0.03V
24	GST	0.04V
25	MCLK	0.09V
26	GCLK	1.90V
27	BI-SCAN	3.28V
28	Soft Start	10.66V

* EVERY Second



U2 DC-to-DC (TPS65178A)



Pin	DC
1	3.31V
2	n/c
3	3.31V
4	3.31V
5	1.82V
6	1.83V
7	Gnd
8	3.32V
9	3.32V
10	0V
11	11.42V
12	11.42V
13	11.42V
14	11.42V
15	7.59V
16	7.59V
17	Gnd
18	Gnd
19	Gnd
20	11.33V
21	11.33V
22	15.14V
23	15.14V
24	Gnd

U1

Pin	DC
1	11.30V
2	11.30V
3	15.53V
4	11.34V
5	n/c
6	1.33V
7	1.27V
8	3.11V
9	Gnd
10	Gnd

Pin	DC
25	11.33V
26	11.33V
27	15.14V
28	15.14V
29	3.0V
30	1.18V
31	14.47V
32	27.91V
33	7.32V
34	5.52V
35	(-6.95V)
36	0.65V
37	12.35V
38	11.28V
39	9.43V
40	5.54V
41	3.86V
42	2.88V
43	n/c
44	n/c
45	5.99V
46	n/c
47	Gnd
48	0.29V

U6

Pin	DC
1	1.76V
2	0.8V
3	5.51V
4	5.48V
5	0V
6	1.28V
7	6.75V
8	11.38V

OP1

Pin	DC
1	n/c
2	5.99V
3	6V
4	n/c
5	n/c
6	6.0V
7	15.13V
8	n/c

OP2

Pin	DC
1	n/c
2	5.99V
3	6V
4	n/c
5	n/c
6	6.0V
7	15.13V
8	n/c

Q1

Pin	DC
1	0.03V
2	0.66V
3	(-251V)
4	(-6.95V)
5	2.24V
6	2.21V

Q2

Pin	DC
1	21.20V
2	14.48V
3	15.13V
4	15.00V
5	15.00V
6	27.93V

50LB6500 INTERCONNECT DIAGRAM

Note: If the top or bottom of the picture is exhibiting a dimmer backlight level than the other or the overall brightness seems dim, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal. If not, Check the P-DIM level, it should rise with the percentage shown on screen.

You can also test either the Top or Bottom blocks functionality by grounding the return path signal (using 1K Ω resistor).

LED TOP OR BOTTOM BLOCK TEST (DIM OR DARK PICTURE AREA):

Turn the Brightness, Contrast and Backlights all the way up. Confirm 120V on P801 pin 2 and 178V on P801 pin 4. Confirm P-DIM is above 2V. Using a 1K Ω resistor, (one end on ground), jump the block grounding pins on P801 (Top is controlled by P801 pin 1 and the Bottom is controlled by P801 pin 3), while observing the picture. Each block should turn on brighter. (If No: Bad Panel, If Yes: Bad SMPS).

P801 "SMPS Board" to the "Panel Backlights"

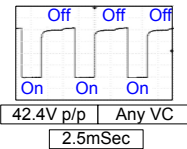
PIN	LABEL	RUN	Diode Check
1	BL- (2)	37.82V - 12.09V	OL
2	BL+ (2)	121.1V - 116.7V	OL
3	BL- (1)	54.85V - 17.01V	OL
4	BL+ (1)	181.7V - 174.9V	OL

PDIM 0% to 100%

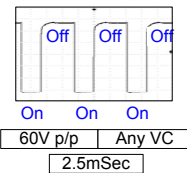
Note: LED POWER

85.1V P801 pin 4 (85V P801 pin 2)
when PWR_ON arrives, (no backlights).
173.4V P801 pin 1 (115.8V P801 pin 2) with DRV_ON
See chart above when DRV_ON arrives, Backlights On.

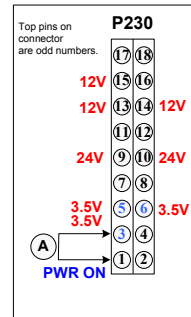
LED Drive P801 pin 1 50% Backlights



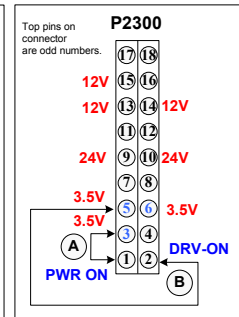
LED Drive P801 pin 3 50% Backlights



SMPS TEST 1



SMPS TEST 2



SMPS TEST 1: To Force Power Supply On without the Main Board.

Disconnect the P2300 on the Main board.
(A) Jump pin 3 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main, Note: Backlight power is 85V P801 pin 2 and 85.1V P801 pin 4. Remove AC power. No Backlights at this time.
LED Ground Return line: 7.83V P801 pin 1 and 0.04V P801 pin 3.

SMPS TEST 2: (Turning on the Backlights)

Leave 1st jumper in place.
(B) Jump pin 5 (3.5V) to pin 2 (DRV-ON). Apply AC power, the Backlights should turn on. Note, Backlight Power (BL+) Backlight power is 115.8V P801 pin 2 and 173.4V P801 pin 4.
LED Ground Return line: 0.83V P801 pin 1 and 0.82V P801 pin 3.

(1) **PWR_ON**: turns on the 12V and 24V lines. It also turns on the backlight power, but it's 85V P801 pin 4 (85.1V P801 pin 2) Backlights are not on.

(2) **DRV_ON**: (INV_ON from Main) turns on the Backlights. Backlight power is 173.4V P801 pin 4 (115.8V P801 pin 2).

(3) **P-DIM**: controls the backlight brightness. Controlled by Cust. Menu, Video, Backlights. Range 0% to 100% directly proportional to DC voltage to Backlight brightness. P-DIM is actually a PWM signal.

If P801 is disconnected, the backlight power P801 pin 2 will be 140V and stay there. P801 pin 4 will be 175V and stay there.

TFT (IPS) PANEL

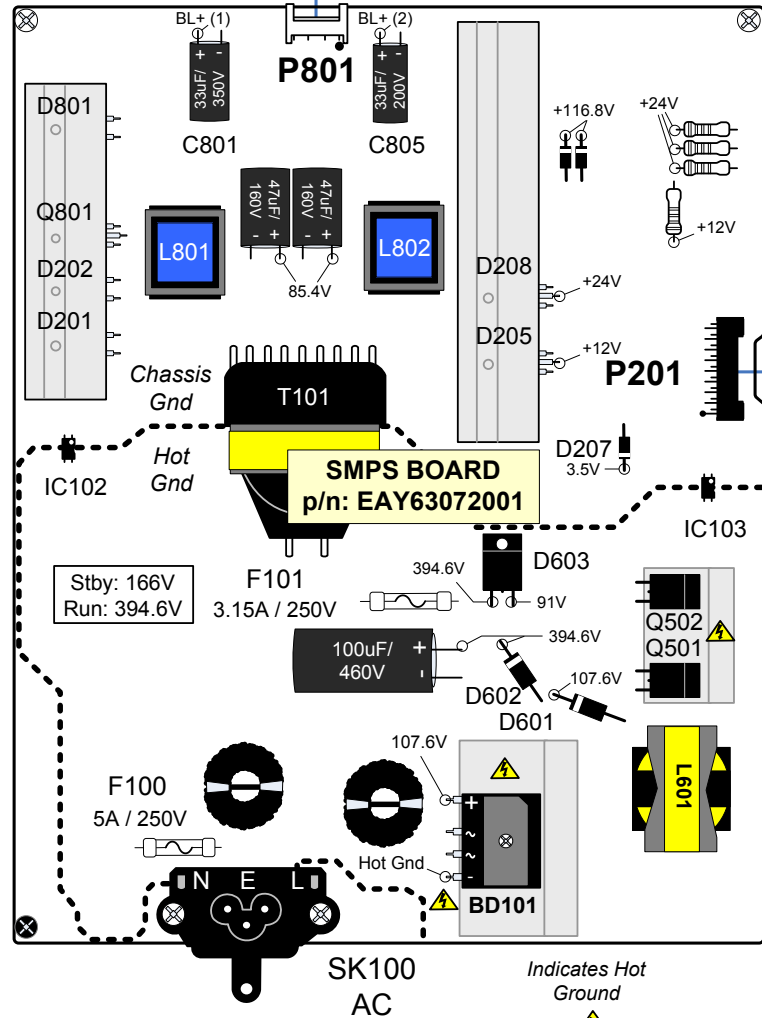
p/n: EAJ62548101 AUSWLJR / BUSWLJR
p/n: EAJ62630101 BUSDLJR

P1

p/n: EAT62093301

Wi-Fi / Magic Remote Tx/Rx

To the Panel Backlights
At the top of the panel



DC Voltages to the Panel developed
by on the Main Board,
Output from P7702 and P7703

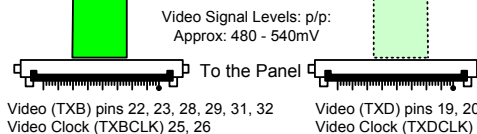
P7702 P7703 "MAIN Board" To "The Panel"

Pin	Pin	Label	Voltage	Source
35	16	Vcore	1.1V	Q7702 Drain
34	17	VCC18	1.78V	IC7703 pin 18
20	31	H_VDD	7.81V	IC7703 pin 17
19	32	VDD	15.7V	IC7703 pin 28
18	33	VDD	15.7V	IC7703 pin 28
13	38	GIP_RST	(-4.86V)	IC7703 pin 45
12	39	VST	1.4V	IC7703 pin 46
11	40	VGL	(-5V)	IC7703 pin 7
10	41	VGH_EVEN	*28V - (-5V)	IC7703 pin 47
9	42	VGH_ODD	*28V - (-5V)	IC7703 pin 48
8	43	VGH	27.92V	Cathode D7704
1	50	Z-OUT	0V	P7702 pin 1

*Toggles every second

p/n: EBR77970405
p/n: EBR77970401

Joy Stick / IR



P201 "SMPS Board" to P2300 "MAIN Board"

PIN	LABEL	STBY	RUN	Diode Check
17-18	Gnd	Gnd	Gnd	Gnd
16	N/C	n/c	n/c	n/c
13-15	12V	0V	11.89V	1.79V
11-12	Gnd	Gnd	Gnd	Gnd
9-10	24V	0V	23.94V	1.10V
8	P-DIM2	0V	0.16V~2.29V	OL
7	Gnd	Gnd	Gnd	Gnd
5-6	3.5V	3.55V	3.56V	OL
4	P-DIM1	0V	0.16V~2.29V	OL
3	3.5V	3.55V	3.56V	OL
2	DRV_ON	0V	3.51V	OL
1	PWR_ON	0V	3.43V	1.15V

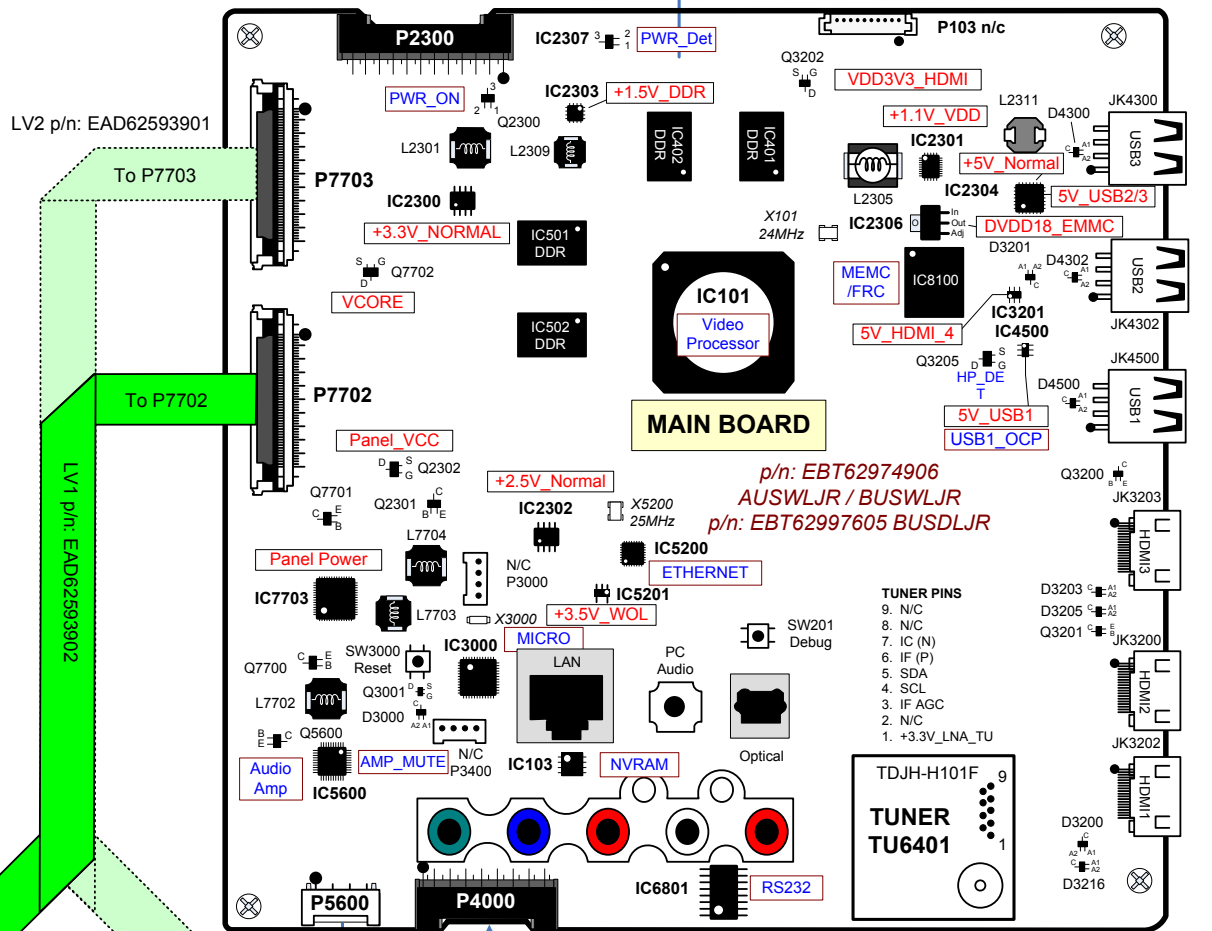
P4000 "MAIN" To "Joy Stick" & "M-Remote & WiFi Board"

PIN	LABEL	STBY	RUN	Diode Check
1	Gnd	Gnd	Gnd	Gnd
2	3.5V_WOL	0V	3.51V	1.2V
3	BT_Reset	0.06V	3.28V	OL
4	WiFi_DM	0V	0V	1.24V
5	N/C	n/c	n/c	n/c
6	WiFi_DP	0V	0V	OL
7	WOL	0V	0V	1.97V
8	Gnd	Gnd	Gnd	Gnd
10	Eye_SCL	3.58V	3.54V	1.98V
11	Gnd	Gnd	Gnd	Gnd
12	Key 1	3.58V	3.54V	1.97V
13	Gnd	Gnd	Gnd	Gnd
14	Key 2	3.58V	3.54V	1.98V
15	IR	3.55V	3.51V	1.89V
16	3.5V_ST	3.58V	3.55V	1.24V
17	LED_R	2.68V	0V	OL
18	Gnd	Gnd	Gnd	Gnd

P2300 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	OL
2	1.70V
3	1.24V
4	OL
5-6	1.24V
7	Gnd
8	OL
9-10	OL
11-12	Gnd
13-15	OL
16	n/c
17-18	Gnd

For voltages
See P201




All Speaker plug pins
11.94V
Diode Check (OL)

To Wi-Fi / Magic
Remote Tx/Rx
and Joy Stick

For DC voltages for Main board
components see Page 2 of the
Interconnect diagram.


50LB6500 Main Board IC Voltages

IC103




Pin	NVRAM (Non-Volatile)
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	3.32V
[6]	3.32V
[7]	Gnd
[8]	3.32V (Vcc In)

IC2300




Pin	+3.3V_NORMAL Regulator
[1]	3.48V (Enable)
[2]	0.77V
[3]	5.22V
[4]	2.52V
[5]	Gnd
[6]	3.33V (Out)
[7]	8.28V
[8]	12.07V (Vcc In)

IC2302




Pin	+2.5V_NORMAL Regulator
[1]	3.32V (In)
[2]	n/c
[3]	5.09V (Vcc In)
[4]	3.53V (Enable)
[5]	Gnd
[6]	4.24V
[7]	0.8V
[8]	2.5V (Out)

IC2306




Pin	DVDD18_EMMC 1.8V Regulator
[In]	3.23V
[Out]	1.81V
[Adj]	0.35V

IC2303




Pin	+1.5V_DDR Regulator
[1]	3.52V (Vcc In)
[2]	3.52V (Vcc In)
[3]	Gnd
[4]	Gnd
[5]	Gnd
[6]	0.83V
[7]	0.34V
[8]	0.0V
[9]	2.26V
[10]	1.53V (Out)
[11]	1.53V (Out)
[12]	1.53V (Out)
[13]	5.06V
[14]	n/c
[15]	3.49V
[16]	3.52V (Vcc In)

IC2307




Pin	PWR_Det +12V in
[1]	Gnd
[2]	3.68V (Out)
[3]	3.71V (In)

IC3201




Pin	5V_HDMI_4 (MHL) Regulator
[1]	5.09V (Vcc In)
[2]	Gnd
[3]	0V (Enable)
[4]	n/c
[5]	0V
[6]	0V (Out)

IC4500




Pin	+5V_USB1 OCP_USB1
[1]	5.09V (Vcc In)
[2]	Gnd
[3]	3.29V (Enable)
[4]	2.96V (OCP Out)
[5]	0.38V
[6]	5.09V (Out USB1)

IC5201



Pin	+3.5V_WOL Regulator
[1]	3.52V (Out)
[2]	Gnd
[3]	0.44V n/c
[4]	3.52V (OCP Out)
[5]	3.52V (Vcc In)

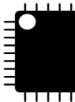
IC6801



Pin	RS232 Routing
[1]	3.53V
[2]	5.69V
[3]	0V
[4]	0V
[5]	(-5.60V)
[6]	(-5.63V)
[7]	n/c (5.64V)
[8]	n/c (0V)
[9]	n/c (3.49V)
[10]	n/c (0V)
[11]	3.34V
[12]	3.48V
[13]	0V
[14]	(-5.59V)
[15]	0V (Gnd)
[16]	3.5V (Vcc In)

IC2301

+1.1V_VDD Regulator



Pin		Pin	
[1]	1.16V	[15]	
[2]	5.08V	[16]	
[3]	3.52V (Enable)	[17]	
[4]	6.2V	[18]	
[5]	n/c	[19]	
[6]	1.14V (Out)	[20]	
[7]	1.14V (Out)	[21]	
[8]	1.14V (Out)	[22]	
[9]	1.14V (Out)	[23]	
[10]	Gnd	[24]	
[11]	Gnd	[25]	
[12]	Gnd	[26]	
[13]	Gnd	[27]	
[14]	Gnd	[28]	


IC2304


+5V_Normal Regulator

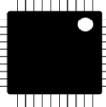
Pin		Pin
[1]	24.68V (In)	[15]
[2]	24.68V (In)	[16]
[3]	24.68V (In)	[17]
[4]	Gnd	[18]
[5]	Gnd	[19]
[6]	Gnd	[20]
[7]	6.25V	[21]
[8]	6.25V	[22]
[9]	3.53V (Enable)	[23]
[10]	5.09V (Out USB2	[24]
[11]	5.09V (Out USB3	[25]
[12]	5.09V (USB2 Ctrl	[26]
[13]	5.09V (USB3 Ctrl	[27]
[14]	5.04V (OCP2)	[28]





55LB7200 Transistors and Flat Pack IC Voltages


IC3000			Microprocessor	
Pin		Pin		
[1]	0.06V	[25]	0V	
[2]	3.3V	[26]	0.04V	
[3]	0.05V	[27]	3.5V	
[4]	0.08V	[28]	0V	
[5]	0.02V	[29]	0V	
[6]	3.51V	[30]	0V	
[7]	3.49V	[31]	3.53V	
[8]	3.53V	[32]	3.53V	
[9]	3.53V	[33]	3.53V	
[10]	3.53V	[34]	3.53V	
[11]	3.53V	[35]	0V	
[12]	0.17V	[36]	0V	
[13]	3.34V	[37]	0V	
[14]	3.66V	[38]	1.06V	
[15]	3.53V	[39]	3.53V	
[16]	0V	[40]	3.53V	
[17]	3.51V	[41]	0.64V	
[18]	3.53V	[42]	0.12V	
[19]	3.24V	[43]	0V	
[20]	3.34V	[44]	0V (n/c)	
[21]	3.48V (Enable)	[45]	0V (n/c)	
[22]	0V	[46]	2.09V	
[23]	5.22V	[47]	Gnd	
[24]	2.52V	[48]	3.53V (Vcc In)	


IC5200			Ethernet	
Pin		Pin		
[1]	0.65V	[17]	0V	
[2]	1.09V	[18]	n/c	
[3]	1.09V	[19]	n/c	
[4]	1.09V	[20]	0V	
[5]	1.09V	[21]	3.31V	
[6]	1.09V	[22]	1.66V	
[7]	3.52V (In)	[23]	3.52V	
[8]	0.05V	[24]	3.52V	
[9]	0V	[25]	0V	
[10]	0.05V	[26]	0V	
[11]	n/c	[27]	0V	
[12]	0V	[28]	0V	
[13]	n/c	[29]	1.08V	
[14]	3.52V (In)	[30]	3.52V (In)	
[15]	1.78V	[31]	0.78V	
[16]	0V	[32]	0.78V	


IC5600			Audio Amp	
Pin		Pin		
[1]	n/c	[21]	12.34V	
[2]	1.28V	[22]	Gnd	
[3]	n/c	[23]	17.02V	
[4]	Gnd	[24]	5.23V	
[5]	n/c	[25]	Gnd	
[6]	1.28V	[26]	n/c	
[7]	0V	[27]	5.22V	
[8]	1.65V	[28]	17.01V	
[9]	1.65V	[29]	Gnd	
[10]	3.32V	[30]	12.32V	
[11]	3.32V	[31]	24.71V (Vcc In)	
[12]	3.31V (Mute)	[32]	24.71V (Vcc In)	
[13]	n/c	[33]	12.34V	
[14]	3.31V	[34]	Gnd	
[15]	n/c	[35]	17.03V (Reset)	
[16]	17.02V	[36]	3.32V	
[17]	Gnd	[37]	Gnd	
[18]	12.33V	[38]	1.66V	
[19]	24.71V (Vcc In)	[39]	Gnd	
[20]	24.71V (Vcc In)	[40]	3.32V (Vcc In)	


Q2300			PWR_On Switch	
Pin		Pin		
[1]	3.53V		[2]	2.85V
[2]	2.85V		[3]	3.42V
[3]	3.42V			


Q2301			Q2302 Control	
Pin		Pin		
[B]	0.62V		[C]	0.07V
[C]	0.07V		[E]	Gnd
[E]	Gnd			


Q2302			Panel_VCC Switch	
Pin		Pin		
[G]	1.8V		[S]	12.03V
[S]	12.03V		[D]	12.00V
[D]	12.00V			


Q3001			CEC Bi-Directional	
Pin		Pin		
[G]	3.53V		[S]	3.49V
[S]	3.49V		[D]	3.49V
[D]	3.49V			


Q3200			Q3201 Control	
Pin		Pin		
[B]	0.0V		[C]	3.53V
[C]	3.53V		[E]	Gnd
[E]	Gnd			

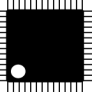
Q3201			MHL Switch	
Pin		Pin		
[B]	3.52V		[C]	0V
[C]	0V		[E]	3.52V
[E]	3.52V			


Q3202			VDD3V3_HDMI Switch	
Pin		Pin		
[S]	3.32V (VCC In)		[G]	12.01V
[G]	12.01V		[D]	3.32V (Out)
[D]	3.32V (Out)			


Q3205			HP Detection	
Pin		Pin		
[G]	0V		[S]	Gnd
[S]	Gnd		[D]	12.05V
[D]	12.05V			

Q5600			Amp Mute Driver	
Pin		Pin		
[B]	0V		[C]	3.32V
[C]	3.32V		[E]	Gnd
[E]	Gnd			

Q7700			VGL Control	
Pin		Pin		
[B]	0V		[C]	5V
[C]	5V		[E]	0V
[E]	0V			

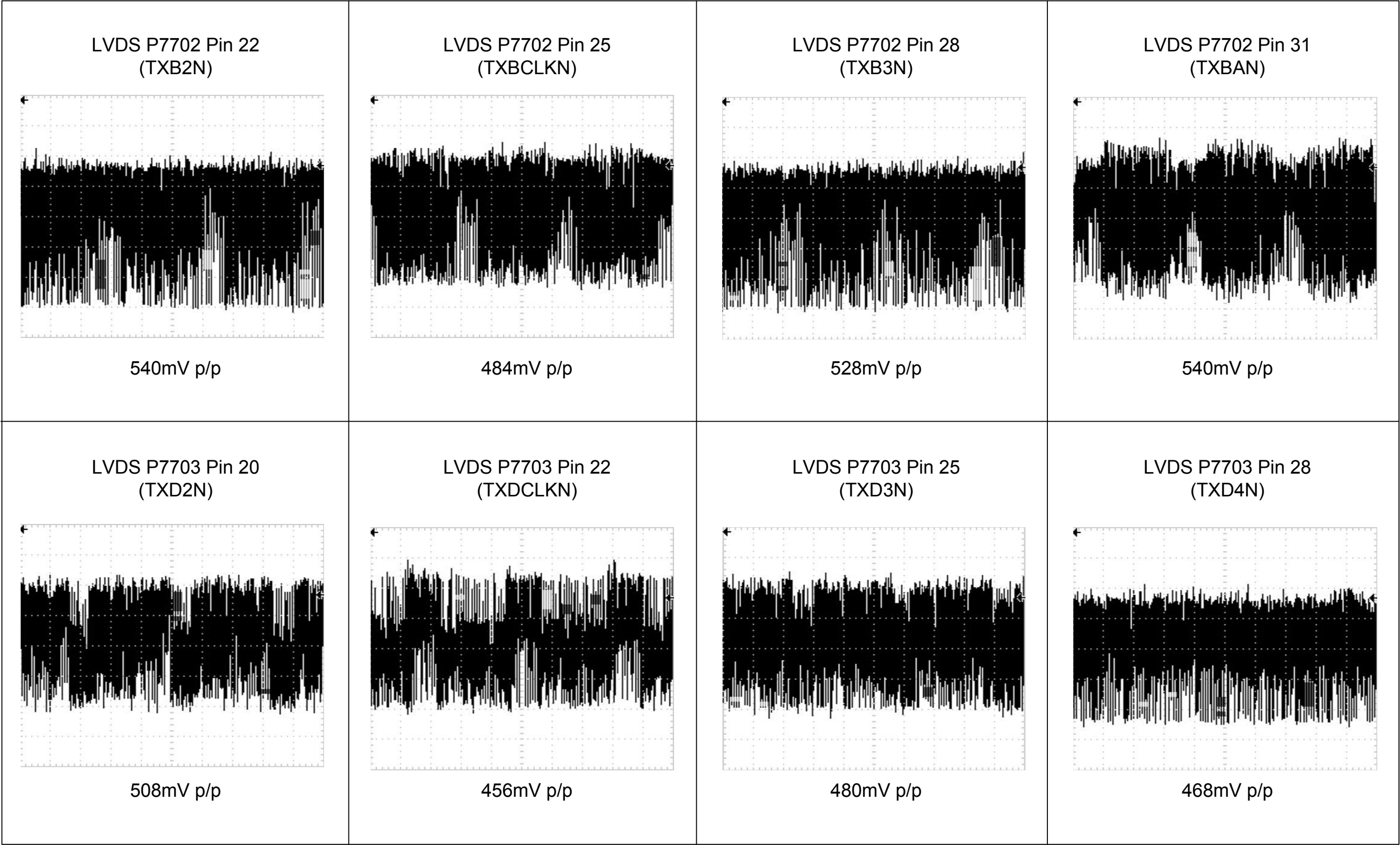
IC7703			Panel Power DC-to-DC Conv	
Pin		Pin		
[1]	3.79V	[29]	4.93V	
[2]	1.67V	[30]	0.47V	
[3]	0.07V	[31]	14.86V	
[4]	0.02V	[32]	11.73V	
[5]	0V	[33]	8.14V	
[6]	Gnd	[34]	7.29V	
[7]	(-5.07V) VGL Out	[35]	3.97V	
[8]	5.89V	[36]	0.81V	
[9]	0.68V	[37]	Gnd	
[10]	1.81V	[38]	6.73V	
[11]	1.81V (VCC18 In)	[39]	6.73V	
[12]	1.81V (VCC18 Out)	[40]	6.69V	
[13]	Gnd	[41]	15.0V	
[14]	12.03V (Vcc In)	[42]	7.69V	
[15]	12.03V (Vcc In)	[43]	27.89V (VGH Ou	
[16]	12.03V (Vcc In)	[44]	27.89V (VGH Ou	
[17]	7.81V (HVDD Out)	[45]	(-4.95V)	
[18]	7.81V	[46]	(-5.03V)	
[19]	Gnd	[47]	(-5.06V) VGH_E	
[20]	3.32V	[48]	27.86V (VGH_O	
[21]	3.32V	[49]	n/c	
[22]	4.98V (VL Out)	[50]	0.81V (CLK6)	
[23]	1.31V	[51]	0V (CLK5)	
[24]	Gnd	[52]	2.98V (CLK4)	
[25]	12.03V (Vcc In)	[53]	3.97V (CLK3)	
[26]	12.03V (Vcc In)	[54]	5.68V (CLK2)	
[27]	15.73V	[55]	7.28V (CLK1)	
[28]	15.70V (VDD Out)	[56]	6.08V	

Q7701			VGH Control	
Pin		Pin		
[B]	15V		[C]	15.70V
[C]	15.70V		[E]	14.14V
[E]	14.14V			

Q7702			VCORE Switch	
Pin		Pin		
[S]	1.11V (In)		[G]	3.47V (Enable)
[G]	3.47V (Enable)		[D]	1.11V (Out)
[D]	1.11V (Out)			



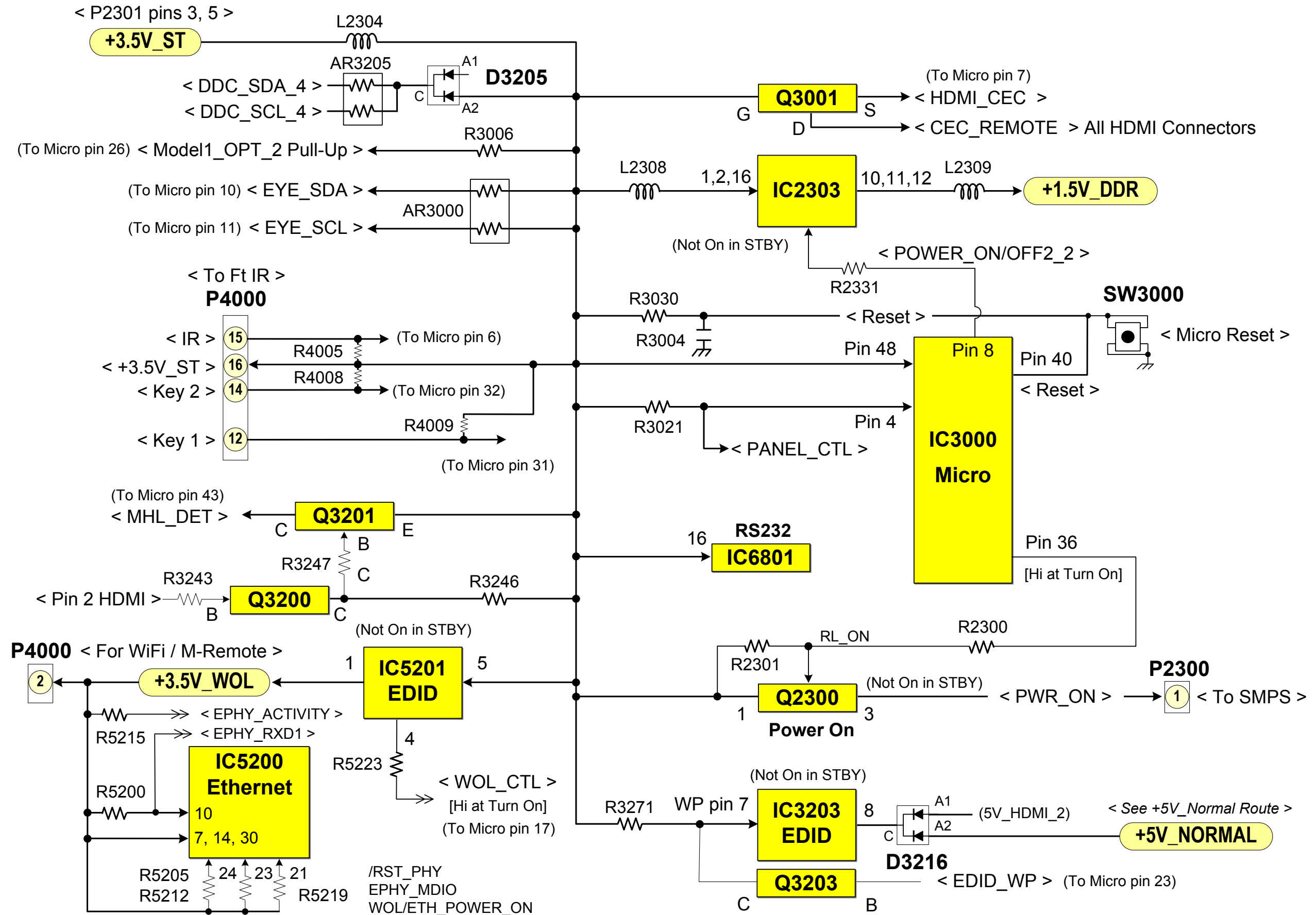
50LB6500 LVDS P7702 and P7703 Video Waveforms



SMPTE Color Bar input signal (Component)
All signals taken at 2.5uSec per/sec / 100mV per/div

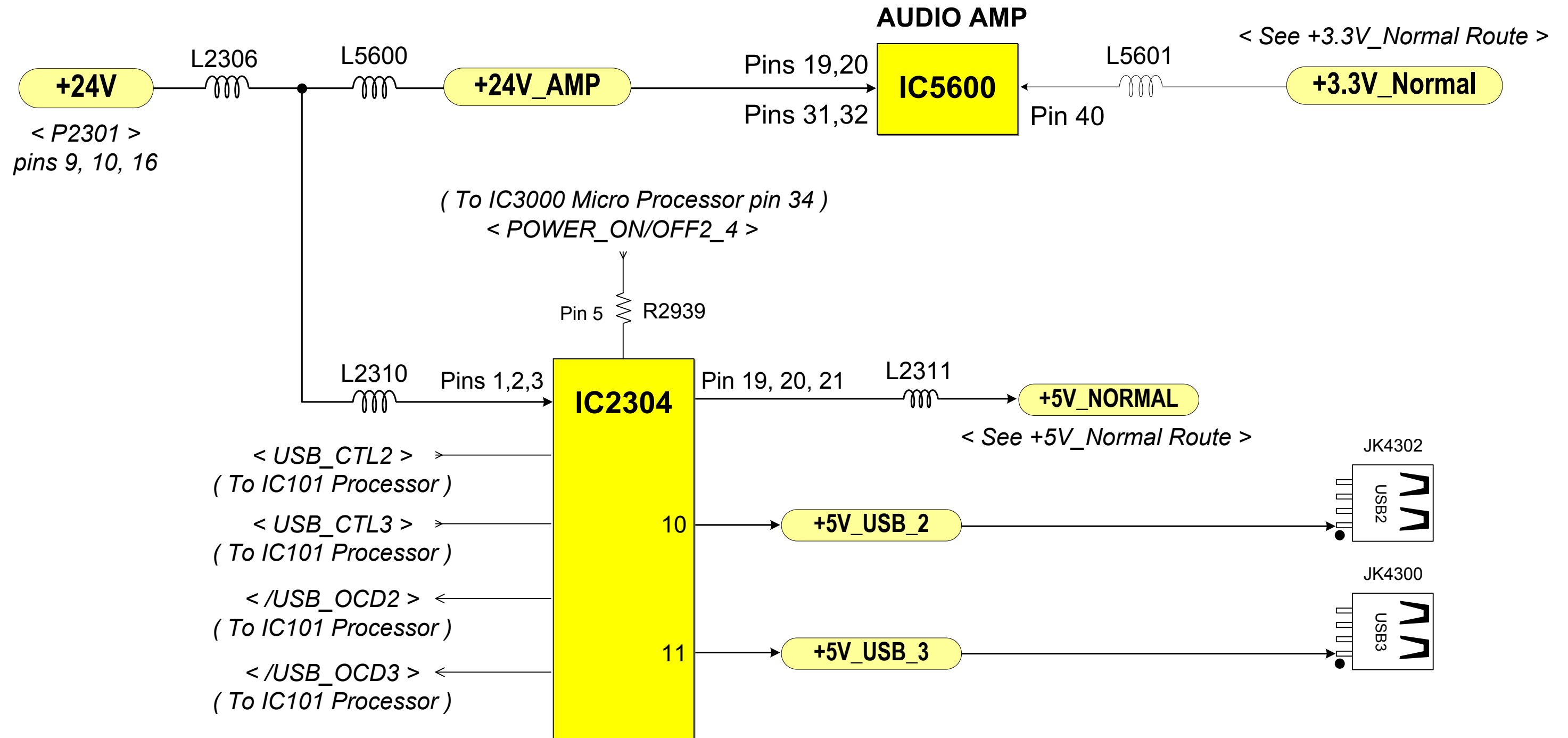
50LB6500 Main Board (+3.5V_ST) Voltage Routing

50LB6500 (2014) Interconnect Section 13



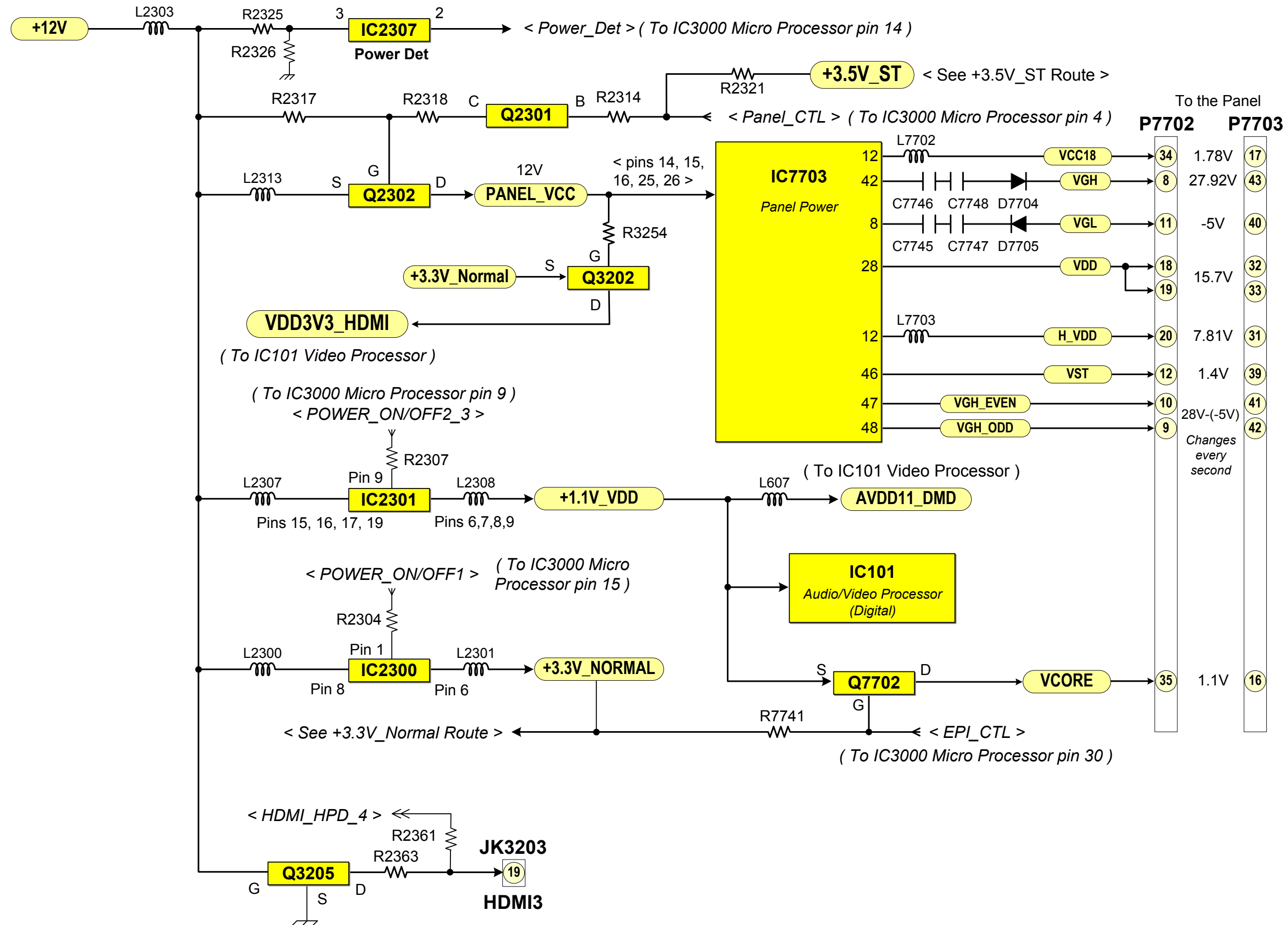
50LB6500 Main Board (+24V) Voltage Routing

50LB6500 (2014) Interconnect Section 13



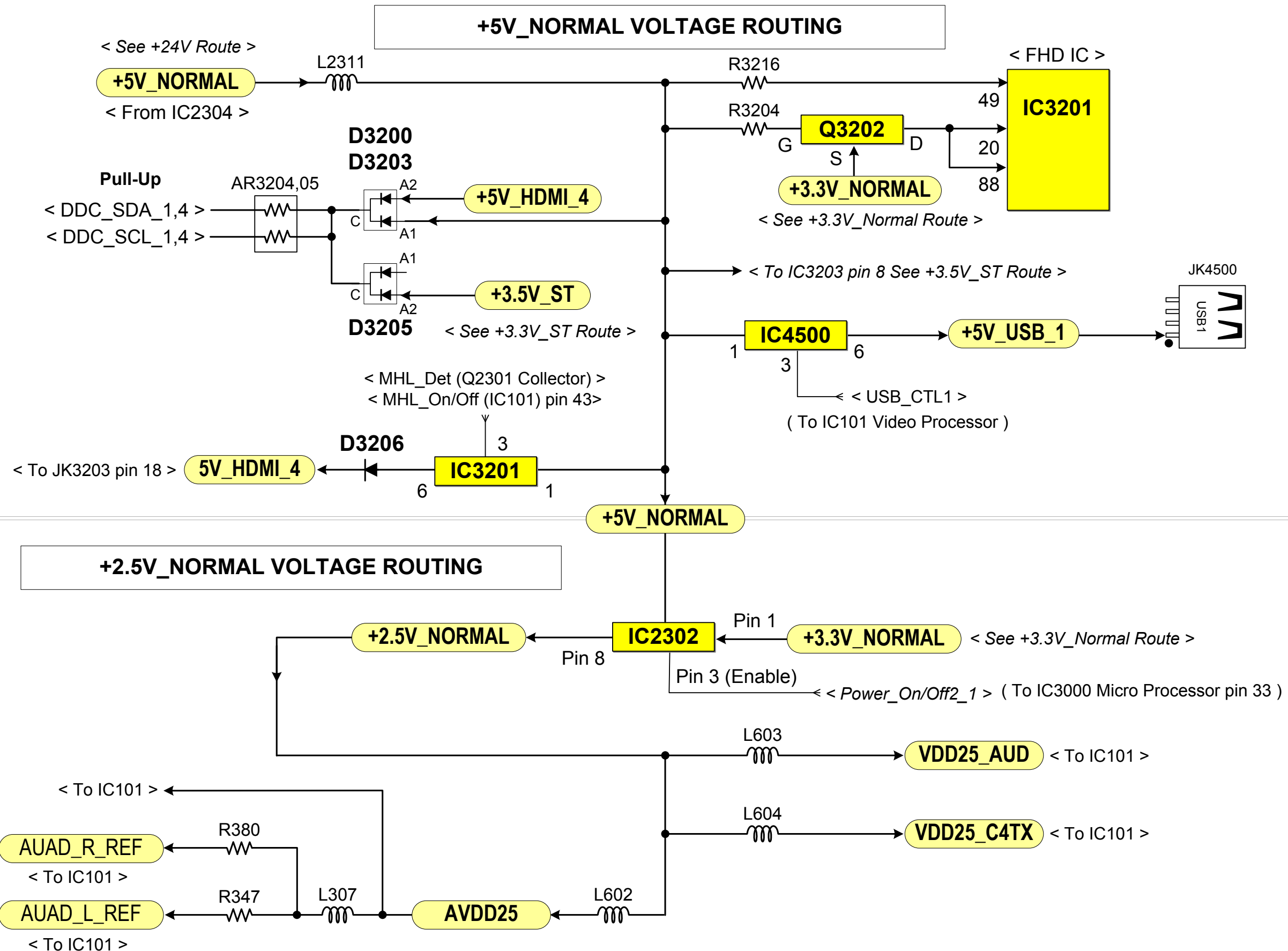
50LB6500 Main Board (+12V) Voltage Routing

50LB6500 (2014) Interconnect Section 13



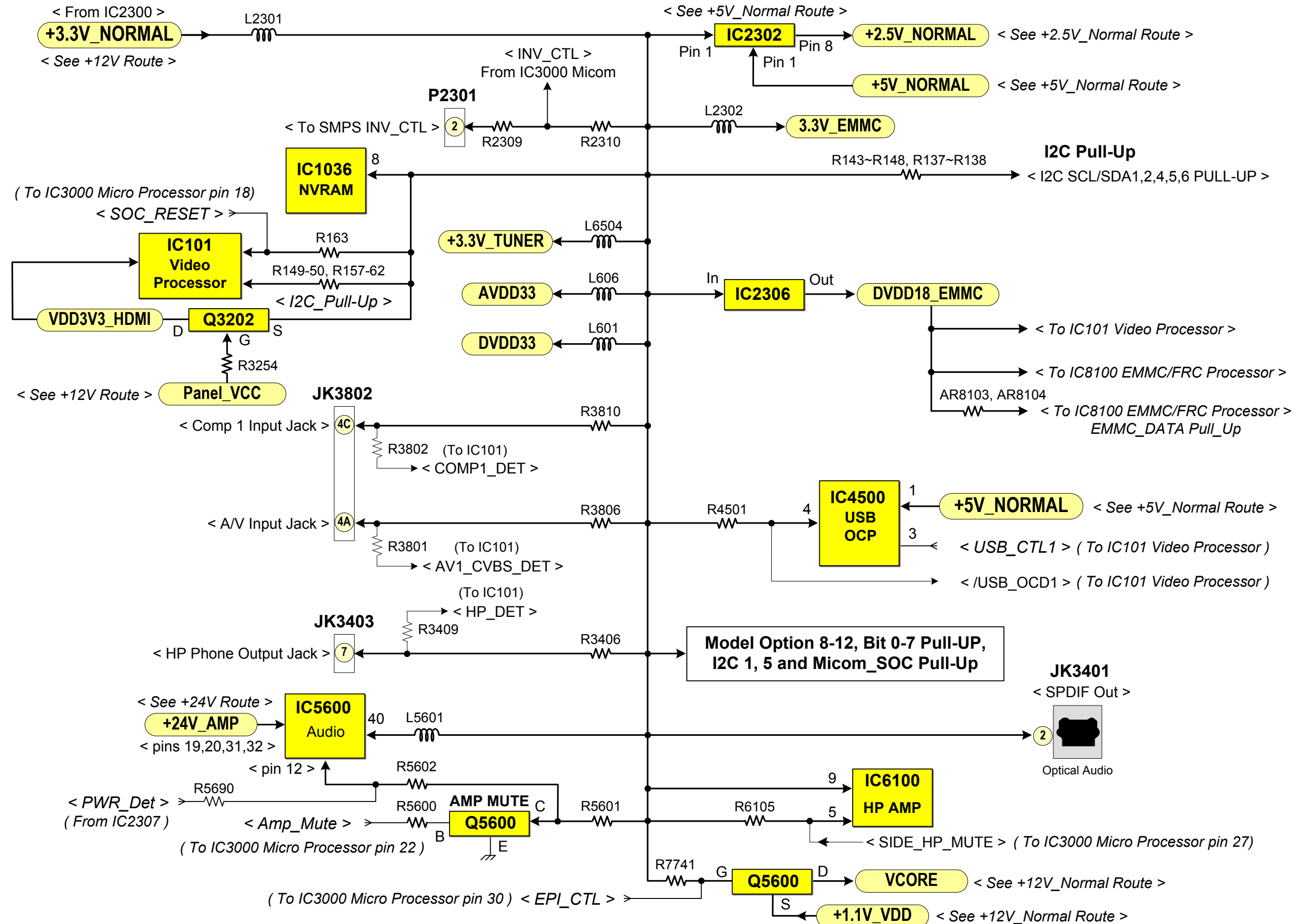
50LB6500 Main Board (+5V_Normal / +2.5V_Normal) Voltage Routing

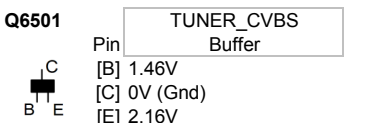
50LB6500 (2014) Interconnect Section 13



50LB6500 Main Board (+3.3V_Normal) Voltage Routing

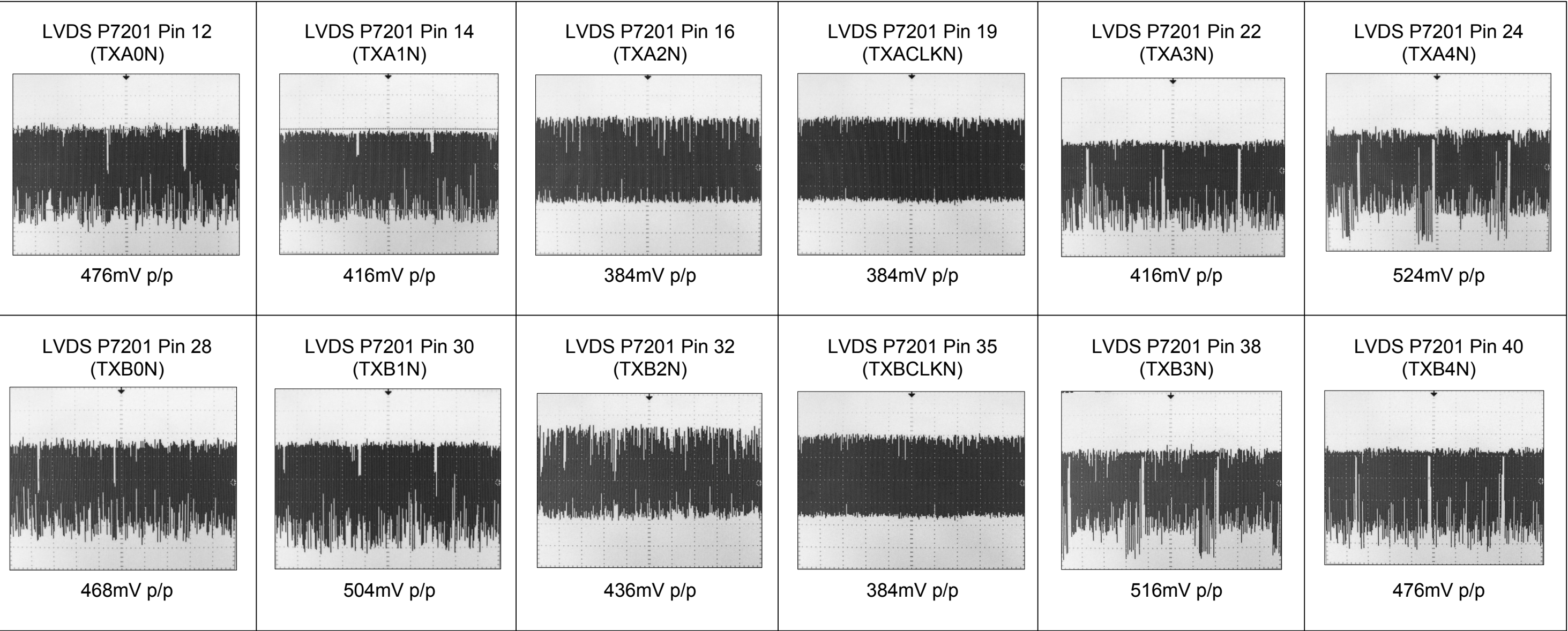
50LB6500 (2014) Interconnect Section 13





55EA9800 LVDS Signals P7201

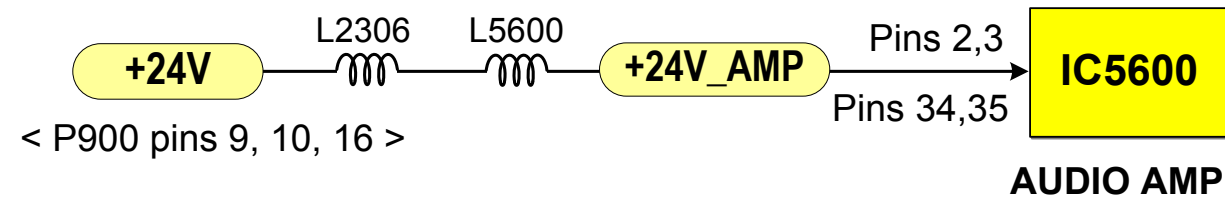
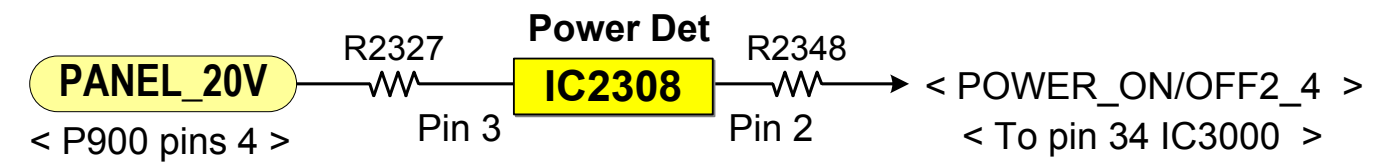
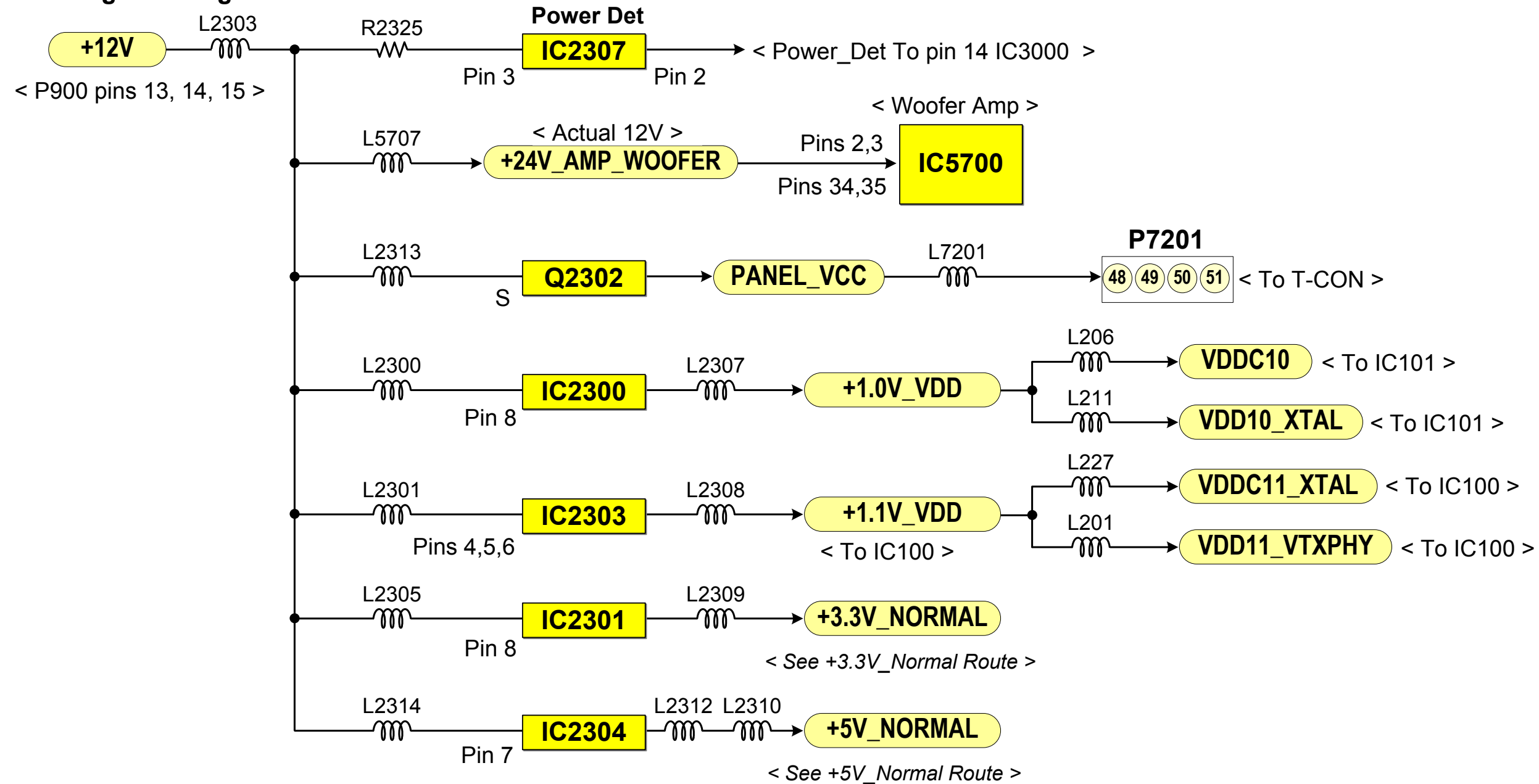
The below waveforms are only the Negative signal of the differential pair. The Positive signal is identical only flipped upside down. This represents only one of the two LVDS signals. P7202 signals also look very similar.



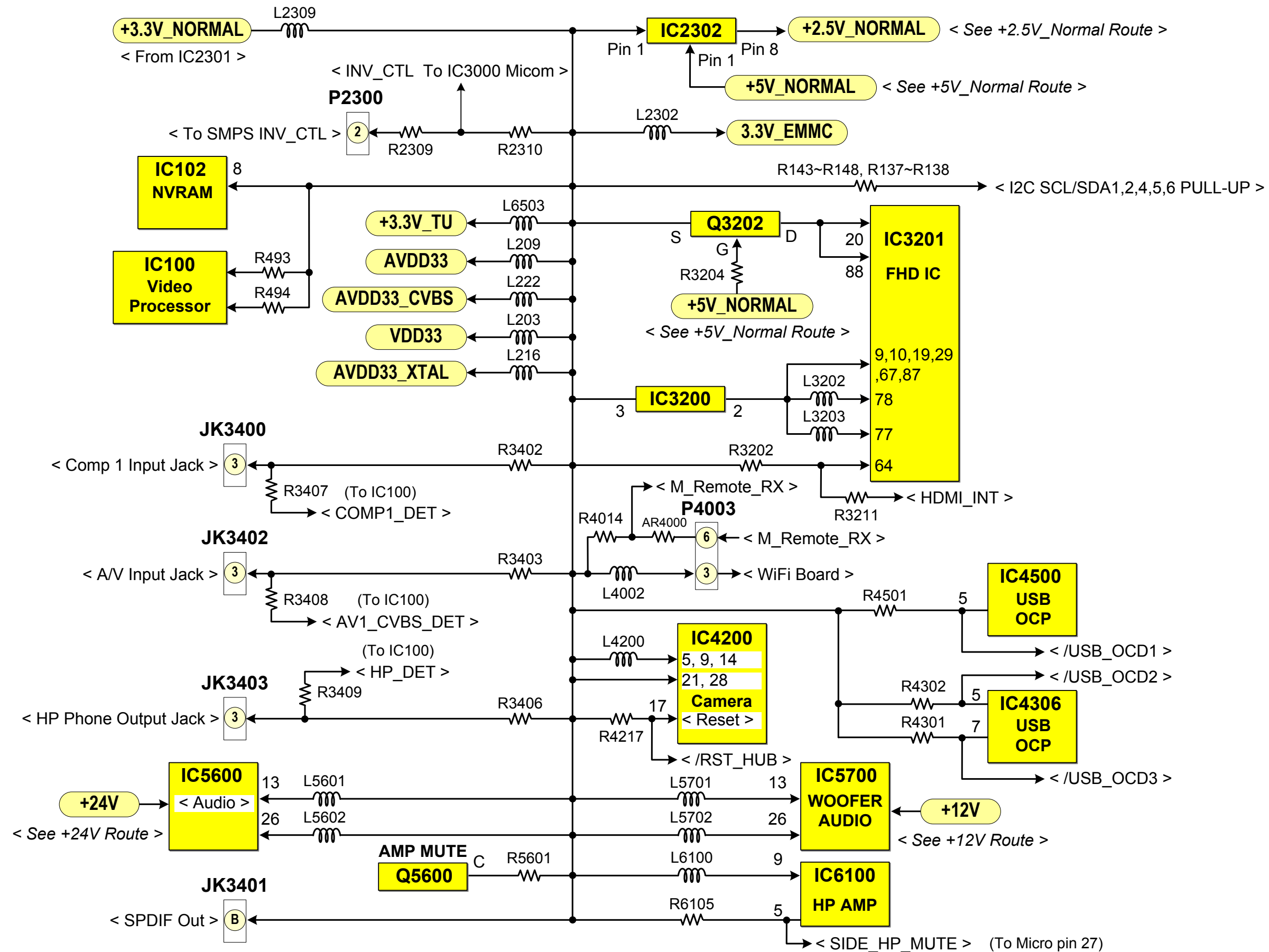
SMPTE Color Bar input signal (Component)
All signals taken at 2.5MSec per/sec / 100mV per/div



55EA9800 Main Board (+24V, +12V and +20V) Voltage Routing

+24V Voltage Routing**PANEL_20V Voltage Routing****+12V Voltage Routing**

55EA9800 Main Board (+3.3V_Normal) Voltage Routing



55LA8600 INTERCONNECT DIAGRAM

Note: If a particular area is exhibiting a dimmer backlight level than other areas or the overall brightness seems dim, be sure to first check the customer's Menu setting for **Backlights**. Raise the percentage and see if the overall brightness returns to normal. If not,

1st: Check the P-DIM level, it should rise with the percentage shown on screen.
100% = 3.27V. Follow the P-DIM signal all the way to the SMPS.

2nd: Turn off Local Dimming in the Customers Menu.

If the brightness returns to normal, examine the signals required for Local Dimming. (SIN, V-SYNC and SCLK). Suspect the Main Board.

You can also test each of the 6 blocks functionality by grounding the return path signal (using 220Ω resistor).

LED SINGLE BLOCK TEST (DIM OR DARK PICTURE AREA):

Turn the Brightness, Contrast and Backlights all the way up. Confirm 84V on TP P803. Confirm P-DIM is approx. 3V. Using a 220Ω resistor, jump any of the blocks grounding pin on P801 or P802 (VC1~VC6) while observing the picture and each block should turn on maximum. (No: Bad Panel, Yes: Bad SMPS).

P801 Black Plug "SMPS Board" To "Panel LEDs"

Pin	Label	Run	Diode Check
1	VC-6	*1.68V~24V	OL
2	VC-5	*1.68V~24V	OL
3	VC-4	*1.68V~24V	OL
4	n/c	n/c	n/c
5	n/c	n/c	n/c
6	n/c	n/c	n/c
7	n/c	n/c	OL
8	LED+	84V	OL

*White to Black screen

P802 White Plug "SMPS Board" To "Panel LEDs"

Pin	Label	Run	Diode Check
1	LED+	84V	OL
2	n/c	n/c	OL
3	n/c	n/c	n/c
4	n/c	n/c	n/c
5	n/c	n/c	n/c
6	VC-3	*1.68V~24V	OL
7	VC-2	*1.68V~24V	OL
8	VC-1	*1.68V~24V	OL

*White to Black screen

"Key Board" To J2 "Front IR"

Label	STBY	Run
Key 1	3.56V	3.52V
Gnd	Gnd	Gnd
Key 2	3.56V	3.52V
Gnd	Gnd	Gnd

Tact Switch Keys
p/n: EBR76384101

p/n: EBR76405604

Ft. IR/Intelligent Sensor

Front IR

J1

SMPS TEST 1: To Force Power Supply On without the Main Board.

Disconnect the P2301 on the Main board.
(A) Jump pin 3 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main and 62.6V Backlight power. Remove AC power. No Backlights at this time.

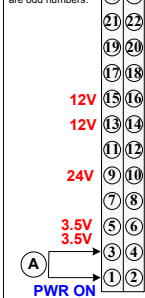
During Test 1, the Error LED (after 1 minute) begins to blink 5 times every 5 seconds.

SMPS TEST 2: (Turning on the Backlights)

Leave 1st jumper in place.
(B) Jump pin 5 (3.5V) to pin 2 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now jump to 84V. During Test 2, the Error LED (immediately) begins to blink 6 times every 5 seconds.

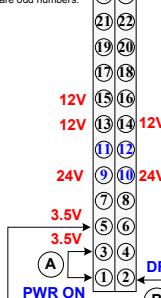
SMPS TEST 1

Top pins on connector are odd numbers.



SMPS TEST 2

Top pins on connector are odd numbers.



Note: If there is a problem with a load from the panel backlights, you can remove AC and Disconnect either P801 or P802. When AC is reapplied, the Backlight LEDs should turn on for about 4 seconds and then shut off.

p/n: EBR76363001

Motion Remote Tx/Rx

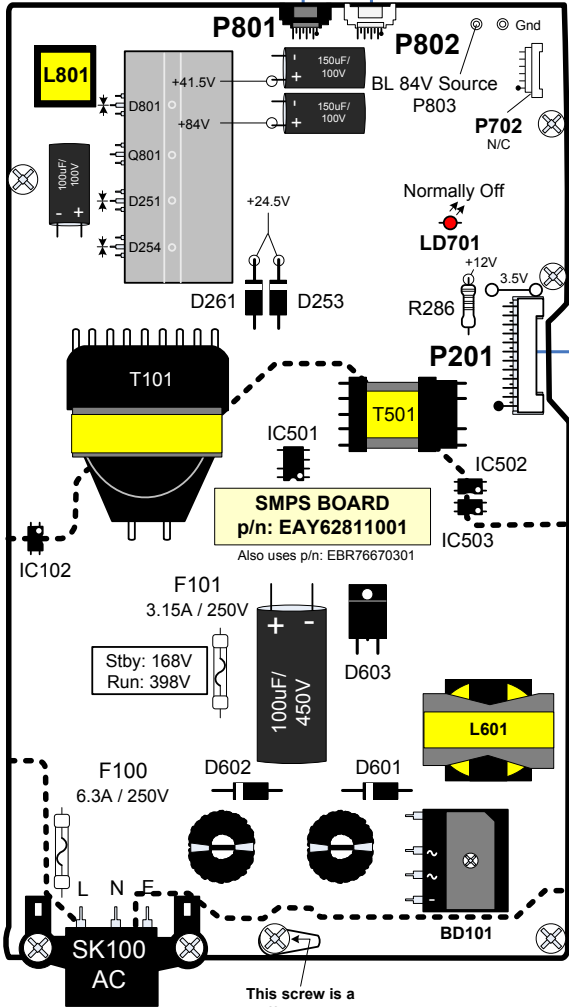


To the Panel

Video (TXA) pins 19, 20, 27, 28
Video Clock (TXACLK) 23, 24

PANEL p/n: EAJ62270501

To the Panel Backlights At the bottom of the panel



PWR_ON Pin 1: Turns on 12V and 24V (Also see Note 2)

DRV_ON Pin 2: Turns on Backlights. (Also see Note 2) DRV_ON is INV_ON from Main.

Note 1: Pin 16: Is Open on the SMPS. The voltage is loopback from the Main board.

Note 2: Backlight power is 62.6V with PWR_ON arrives, (no backlights) it goes to 84V when DRV_ON arrives, Backlights On).

Note 3: LD701 normal state is Off. If it is blinking, it indicates a problem. Missing DRV_ON, P-DIM, BL feedback error, etc.... Example: If either P801 or P802 is disconnected, LD701 blinks 5 times at start, then blinks 3 times every 5 seconds. If DRV_ON is missing, LD701 (after 1 minute), blinks 5 times every 5 seconds.

P4200 "MAIN Board" To "Camera"

Pin	Label	STBY	Run	Diode
1	Camera_Slide_Det	0.12V	3.3V	OL
2	+3.5V_CAM	0V	3.51V	OL
3	AUD_LRCH	0V	0V	OL
4	AUD_LRCK	0.11V	0.9V	OL
5	AUD_SCK	0.1V	1.01V	OL
6	Gnd	Gnd	Gnd	Gnd
7	CAM_PWR_ON_CMD	Gnd	Gnd	OL
8	ST_BY_DET_CAM	0V	0V	OL
9	Gnd	Gnd	Gnd	Gnd
10	USB_CAMERA_DP	0V	0.08V	1.1V
11	USB_CAMERA_DM	0V	0.08V	1.1V
12	Gnd	Gnd	Gnd	Gnd

* Note: Pin 1 is Low with Camera down and Hi with Camera up.

For DC voltages for Main board components see Page 2 of the Interconnect diagram.

P2301 "SMPS Board" to P2301 "MAIN Board"

PIN	LABEL	STBY	Run	Diode
24	SCLK	0V	0V	OL
23	SIN	0V	3.29V	OL
22	V_SYNC	0V	0V	OL
17-21	Gnd	Gnd	Gnd	Gnd
16	24V	0V	24.94V	OL
13-15	12V	0V	11.81V	0.49V
11-12	Gnd	Gnd	Gnd	Gnd
9-10	24V	0V	24.94V	1.11V
7-8	Gnd	Gnd	Gnd	Gnd
6	P-DIM2	0V	0.19V~3.27V	OL
5	3.5V	3.57V	3.54V	OL
4	P-DIM	0V	0.19V~3.27V	OL
3	3.5V	3.57V	3.54V	OL
2	DRV_ON	0V	3.28V	OL
1	PWR_ON	0V	3.41V	1.2V

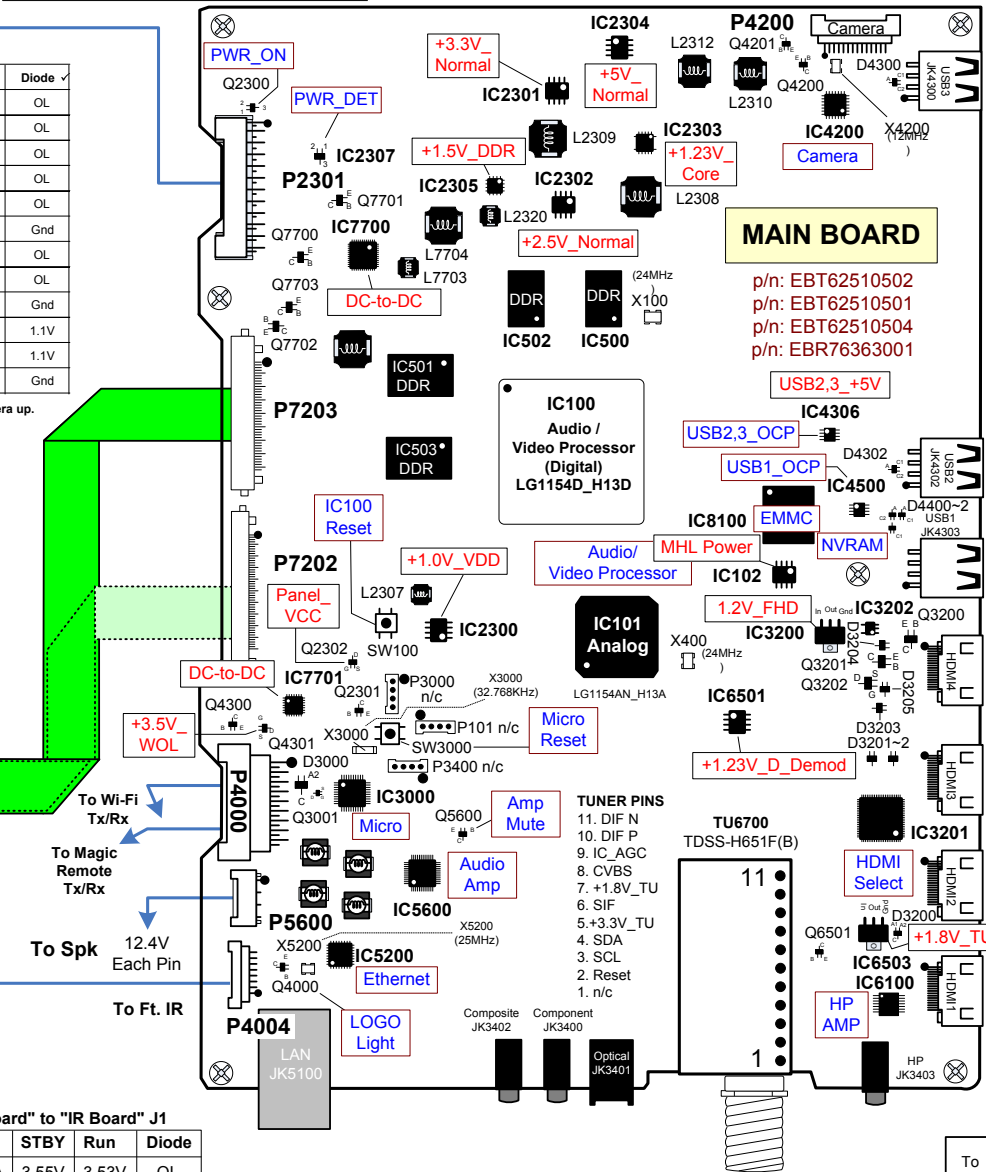
P4000 "MAIN Board" To "Wi-Fi and Motion Board"

Pin	Label	STBY	Run	Diode Check	To What
1	+3.5V_WOL	0V	3.51V	1.26V	WiFi Tx/Rx
2	+3.5V_Normal	0V	3.36V	0.6V	Magic Remote
3	WiFi_DM	0V	0.04V	1.4V	WiFi Tx/Rx
4	RTS	0V	0V	OL	Magic Remote
5	WiFi_DP	0V	0.04V	1.21V	WiFi Tx/Rx
6	M_Remote_Rx	0V	3.36V	OL	Magic Remote
7	Gnd	Gnd	Gnd	Gnd	WiFi Tx/Rx
8	M_Remote_Tx	0V	3.34V	OL	Magic Remote
9	WOL	0V	0.02V	OL	WiFi Tx/Rx
10	RF_Reset	0V	3.33V	OL	Magic Remote
11	Gnd	Gnd	Gnd	Gnd	Magic Remote
12	CTS	0V	0V	OL	Magic Remote

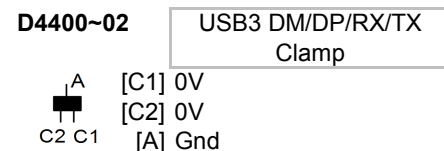
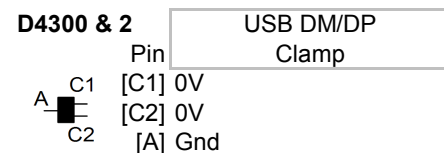
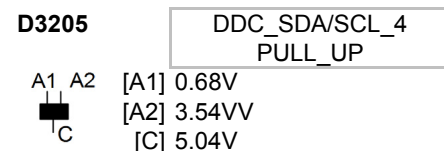
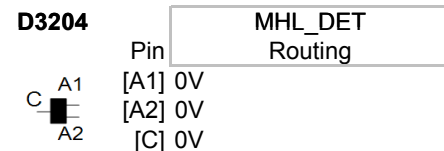
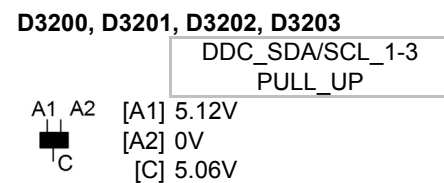
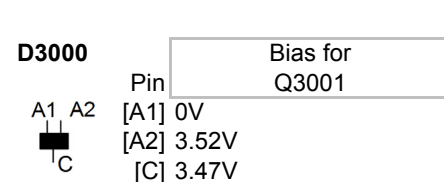
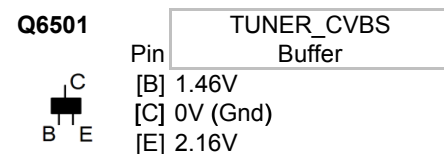
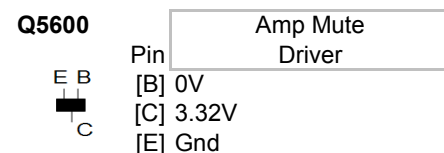
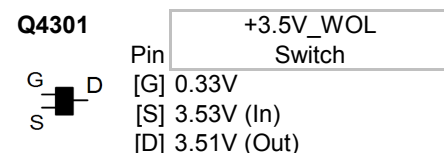
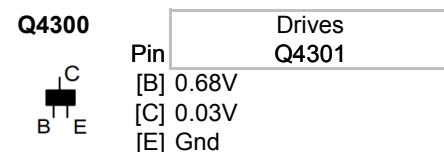
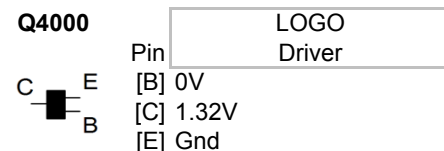
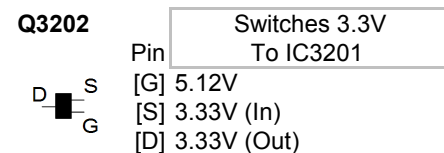
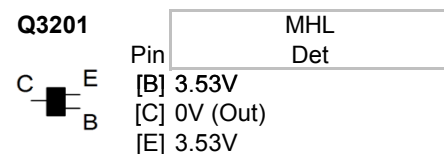
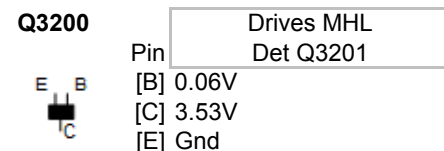
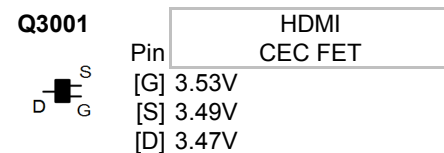
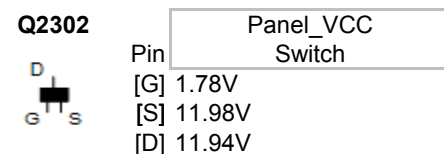
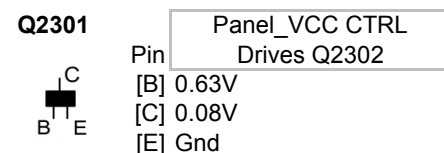
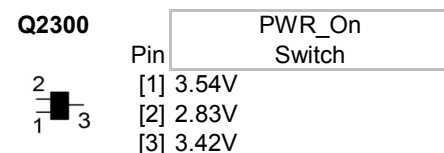
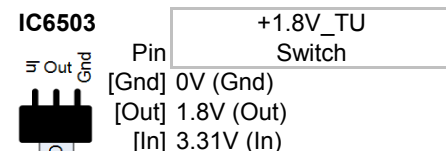
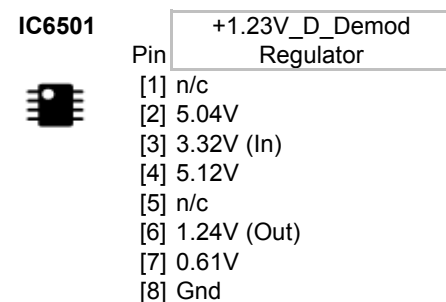
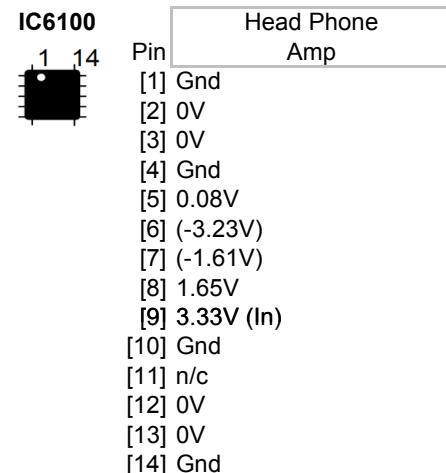
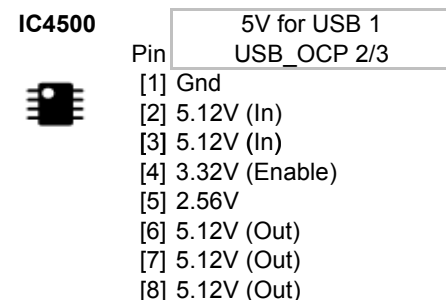
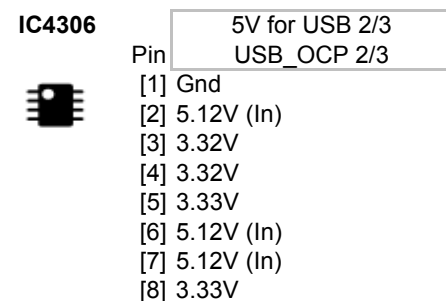
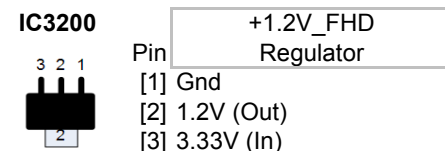
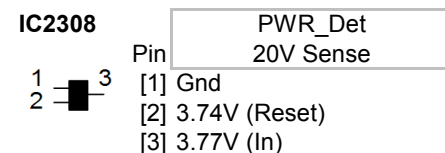
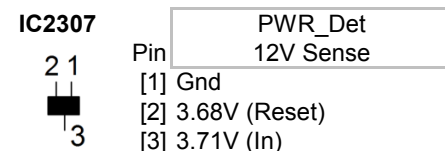
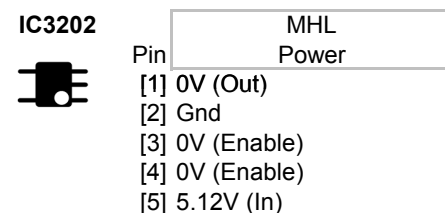
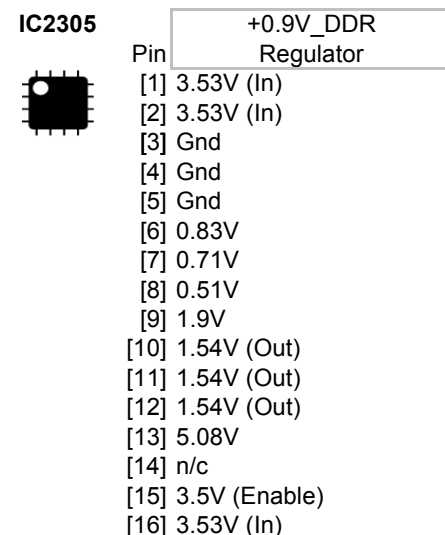
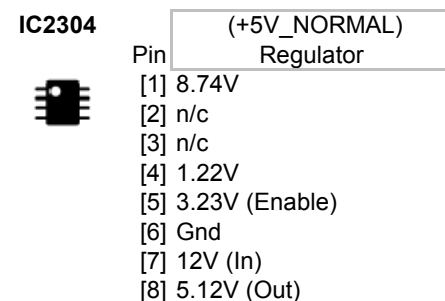
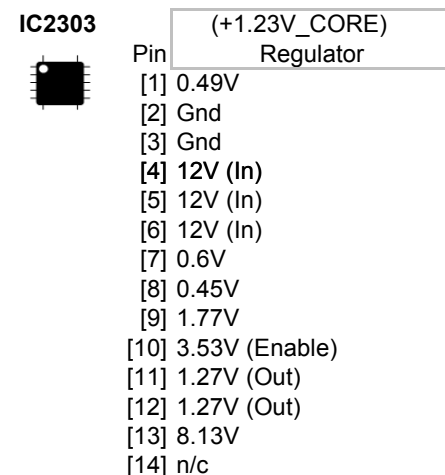
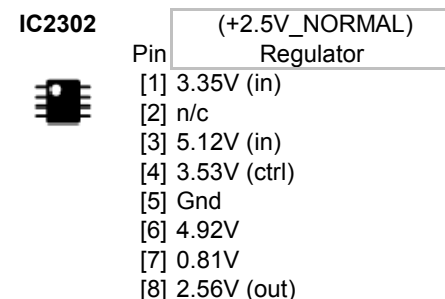
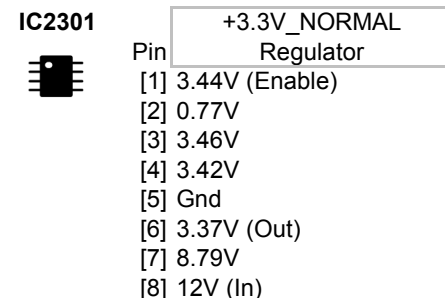
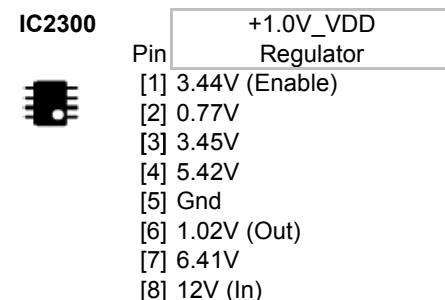
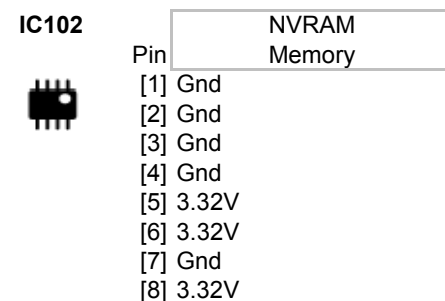
P2301 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	OL
2	1.65V
3	OL
4	OL
5	OL
6	OL
7-8	Gnd
9-10	OL
11-12	Gnd
13-15	OL
16	OL
17-21	Gnd
22	OL
23	OL
24	OL

For voltages See P201



55LA8600 Main Board Component Voltages

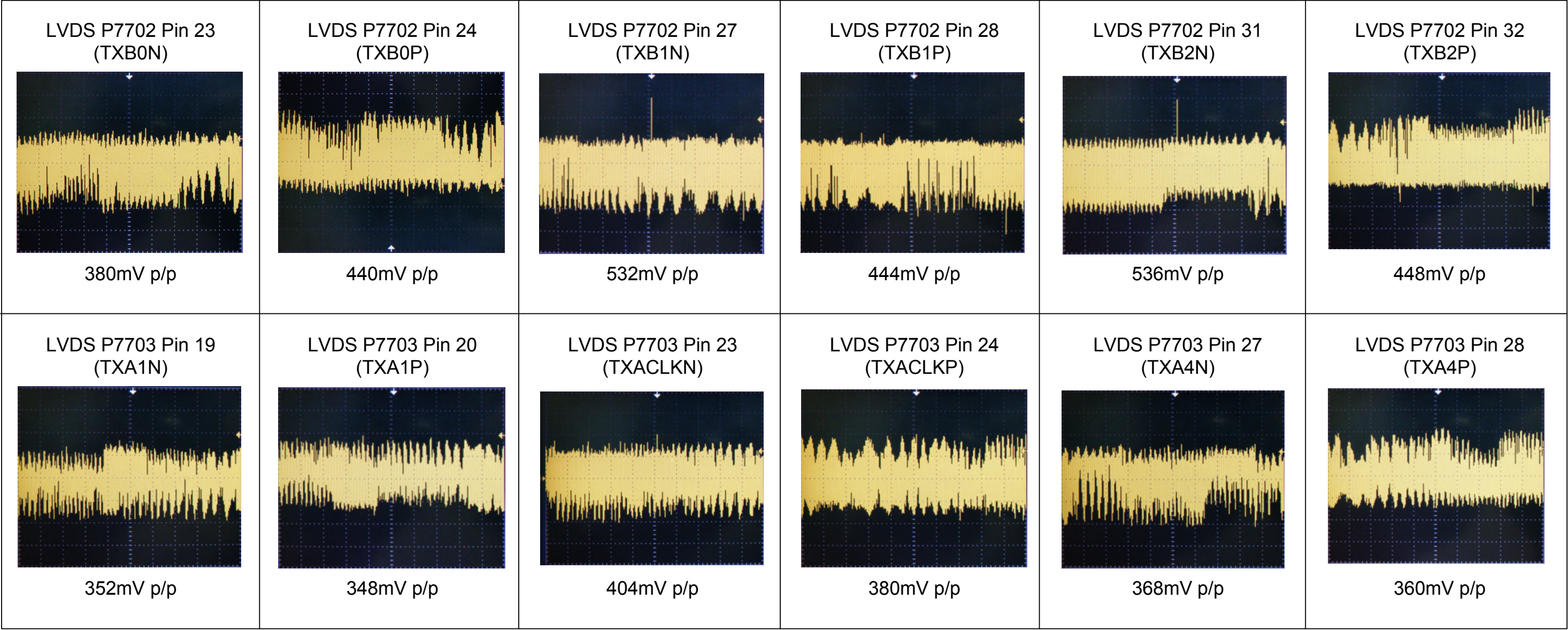


55LA8600 Main Board Component Voltages (Large ICs)

IC3000			IC5600			IC7700			
Micro Processor			Audio Amp			Panel Power DC-to-DC Conv			
Pin		Pin	Pin		Pin	Pin		Pin	
[1]	3.28V	[25]	0V	[1]	0V	[1]	1.89V	[25]	4.95V
[2]	3.28V	[26]	3.53V	[2]	23.92V	[2]	1.89V	[26]	0.52V
[3]	0.0V	[27]	3.53V	[3]	23.92V	[3]	3.4V	[27]	3.31V
[4]	2.09V	[28]	0.03V	[4]	17.94V	[4]	3.4V	[28]	3.31V
[5]	0.06V	[29]	0.1V	[5]	n/c	[5]	1.2V	[29]	5V
[6]	3.5V	[30]	0V	[6]	3.31V	[6]	1.2V	[30]	1.27V
[7]	3.49V	[31]	3.34V	[7]	n/c	[7]	Gnd	[31]	1.59V
[8]	3.53V	[32]	3.53V	[8]	Gnd	[8]	3.4V	[32]	2.8V
[9]	0V	[33]	3.53V	[9]	0V	[9]	3.4V	[33]	8.12V
[10]	3.53V	[34]	3.75V	[10]	0.68V	[10]	0V	[34]	8.12V
[11]	3.53V	[35]	0V	[11]	1.05V	[11]	11.75V	[35]	(-5V)
[12]	0V	[36]	0V	[12]	1.8V	[12]	11.75V	[36]	0.67V
[13]	3.51V	[37]	0.02V	[13]	3.32V	[13]	11.76V	[37]	13.56V
[14]	3.68V	[38]	0V	[14]	0.39V	[14]	11.75V	[38]	12.38V
[15]	3.53V	[39]	3.53V	[15]	1.67V	[15]	8.29V	[39]	10.42V
[16]	0V	[40]	3.53V	[16]	1.0V	[16]	8.29V	[40]	5.97V
[17]	3.48V	[41]	0.65V	[17]	Gnd	[17]	Gnd	[41]	5.95V
[18]	3.53V	[42]	0.13V	[18]	1.81V	[18]	Gnd	[42]	2.85V
[19]	3.29V	[43]	0V	[19]	3.32V	[19]	Gnd	[43]	6.7V
[20]	3.32V	[44]	0V	[20]	1.65V	[20]	11.71V	[44]	6.7V
[21]	3.53V	[45]	0V	[21]	1.65V	[21]	11.7V	[45]	6.69V
[22]	0V	[46]	2.09V	[22]	1.2V	[22]	14.84V	[46]	6.69V
[23]	0V	[47]	Gnd	[23]	3.31V	[23]	16V	[47]	Gnd
[24]	0.1V	[48]	3.53V	[24]	3.31V	[24]	Gnd	[48]	Gnd

IC5200		IC4200		IC7701			
Ethernet IC		Camera Processor		Panle Power Level Shifter			
Pin		Pin		Pin			
[1]	0V	[17]	0V	[1]	8.33V	[15]	(-5V)
[2]	1.1V	[18]	n/c	[2]	8.33V	[16]	28V
[3]	1.1V	[19]	n/c	[3]	8.33V	[17]	28V
[4]	1.1V	[20]	0V	[4]	8.33V	[18]	6.7V
[5]	1.1V	[21]	3.26V	[5]	8.33V	[19]	6.7V
[6]	1.1V	[22]	1.23V	[6]	8.33V	[20]	6.7V
[7]	3.51V (In)	[23]	3.25V	[7]	6.21V	[21]	16.58V
[8]	0.03V	[24]	3.25V	[8]	27.9V	[22]	Gnd
[9]	0V	[25]	3.24V	[9]	(-5V)	[23]	3.29V
[10]	0V	[26]	0V	[10]	*27.5V to -5V	[24]	0V
[11]	0V	[27]	0V	[11]	*27.5V to -5V	[25]	0V
[12]	0V	[28]	0V	[12]	(-5V)	[26]	0.07V
[13]	n/c	[29]	1.08V	[13]	(-5V)	[27]	1.36V
[14]	3.51V (In)	[30]	3.51V (In)	[14]	(-4.9V)	[28]	3.37V
[15]	1.32V	[31]	0V	*Changes once a second			
[16]	0V	[32]	0.58V				

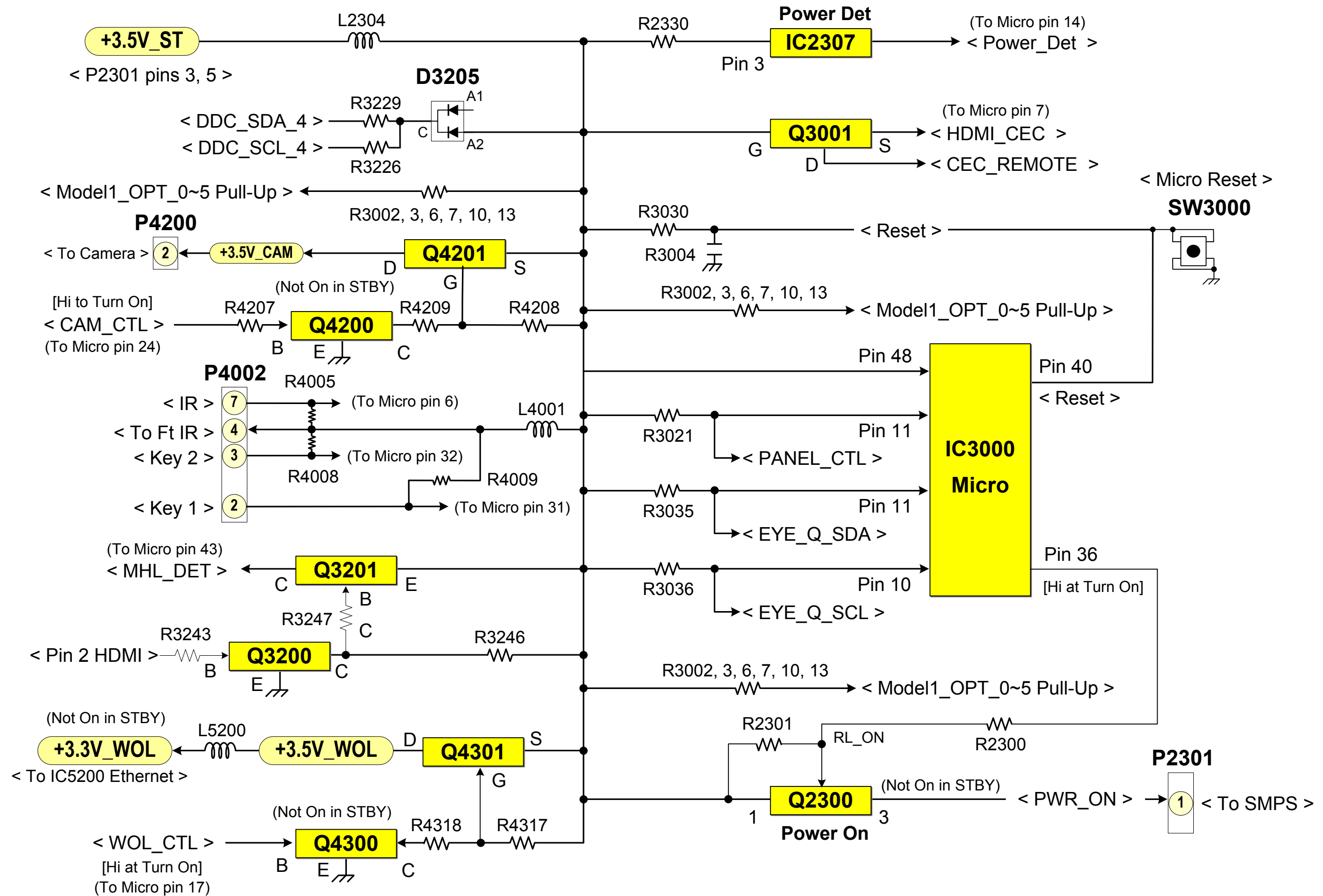




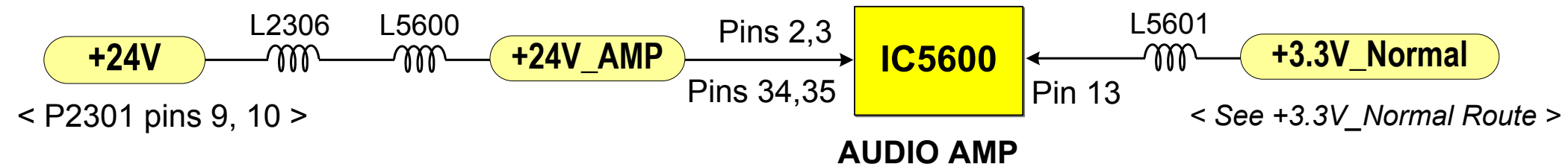
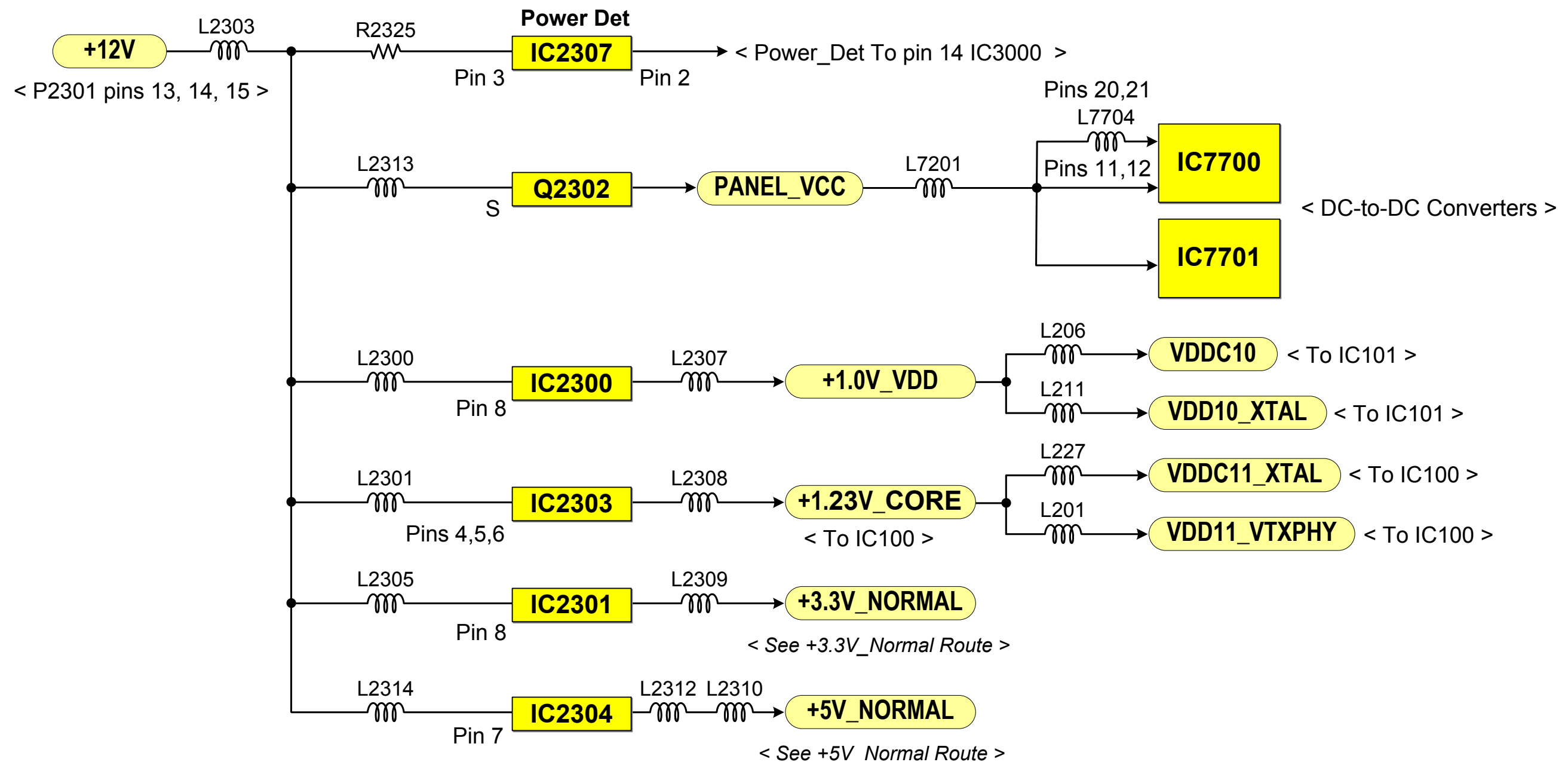
SMPTE Color Bar input signal (Component)
All signals taken at 2.5uSec per/sec / 100mV per/div

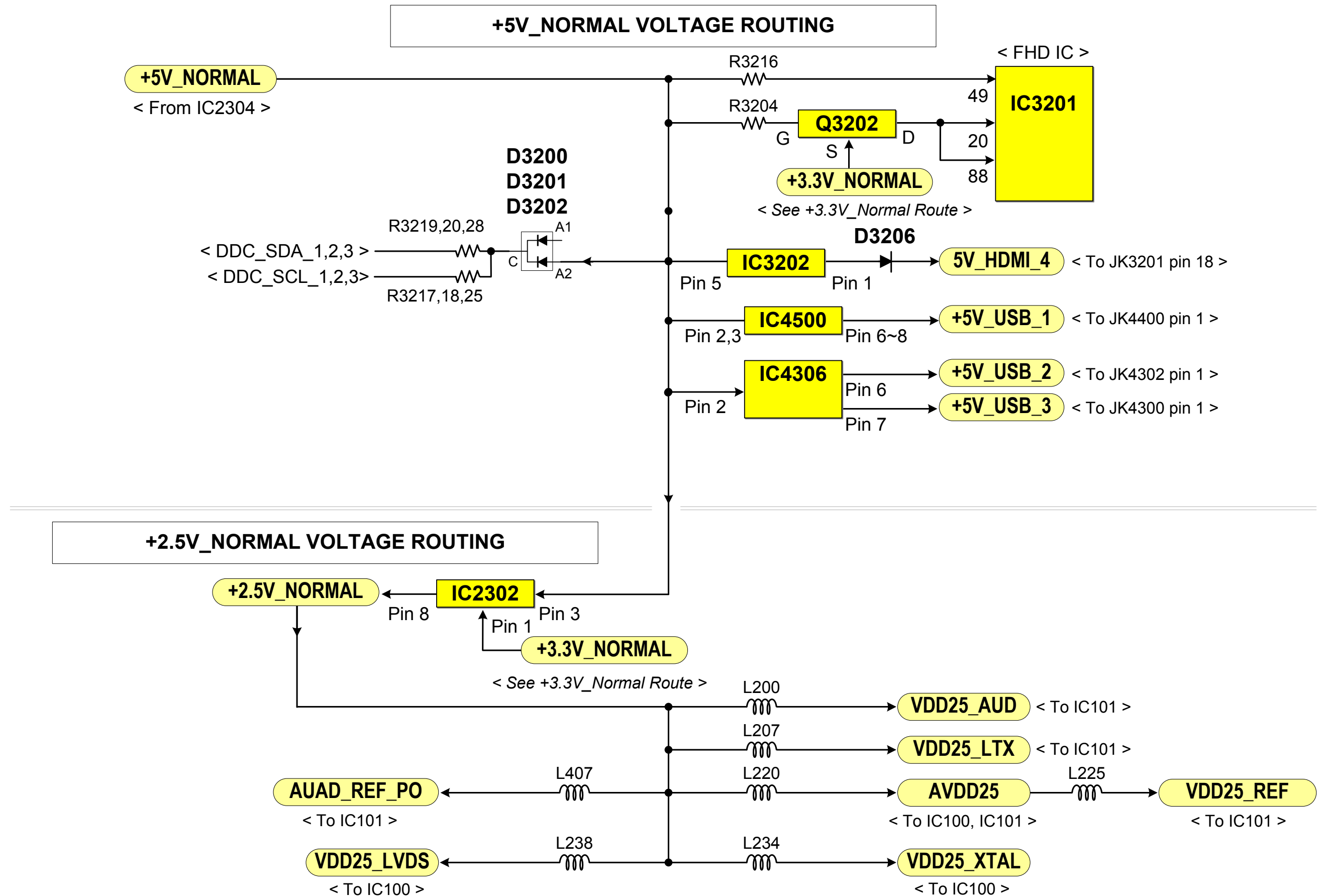
55LA8600 Main Board (+3.5V_ST) Voltage Routing

55LA8600 (2014) Interconnect Section 14



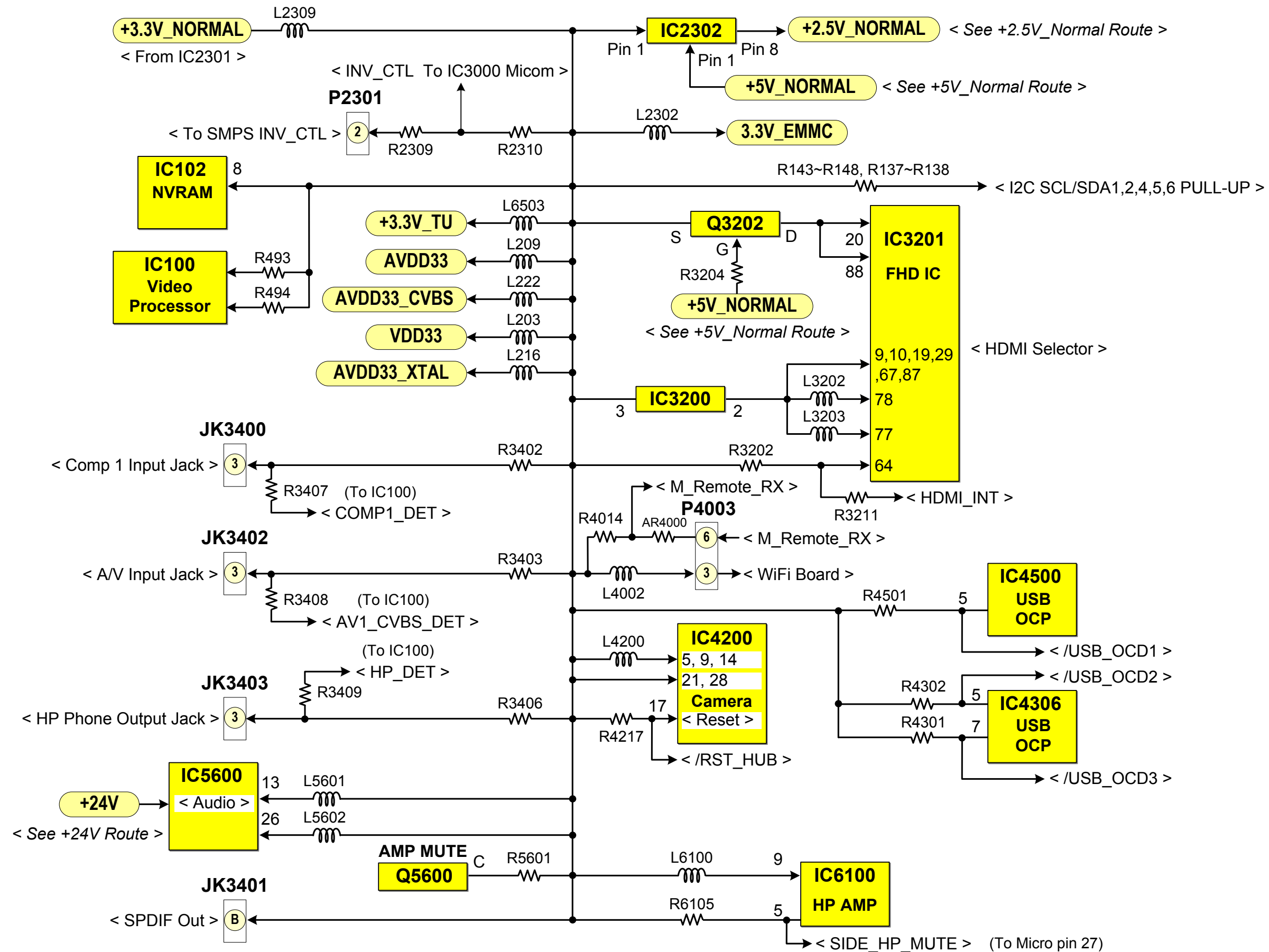
55LA8600 Main Board (+24V and +12V) Voltage Routing

+24V VOLTAGE ROUTING**+12V VOLTAGE ROUTING**




55LA8600 Main Board (+3.3V_Normal) Voltage Routing

55LA8600 (2013) Interconnect Section 14




55LA9700 Main Board Component Voltages

IC102




Pin	NVRAM Memory
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	3.32V
[6]	3.32V
[7]	Gnd
[8]	3.32V

IC506




Pin	DDR_VTT Regulator
[1]	0.73V
[2]	1.5V
[3]	0.74V VTT (In)
[4]	Gnd
[5]	0.74V
[6]	0.74V
[7]	3.33V (Enable)
[8]	Gnd
[9]	n/c
[10]	3.33V VTT (Out)

IC2300




Pin	+1.0V_VDD Regulator
[1]	3.44V (Enable)
[2]	0.77V
[3]	3.45V
[4]	5.42V
[5]	Gnd
[6]	1.02V (Out)
[7]	6.41V
[8]	12V (In)

IC2301




Pin	+3.3V_NORMAL Regulator
[1]	3.44V (Enable)
[2]	0.77V
[3]	3.46V
[4]	3.42V
[5]	Gnd
[6]	3.37V (Out)
[7]	8.79V
[8]	12V (In)

IC2302




Pin	(+2.5V_NORMAL) Regulator
[1]	3.35V (in)
[2]	n/c
[3]	5.12V (in)
[4]	3.53V (ctrl)
[5]	Gnd
[6]	4.92V
[7]	0.81V
[8]	2.56V (out)

IC2303




Pin	(+1.1V_CORE) Regulator
[1]	0.49V
[2]	Gnd
[3]	Gnd
[4]	11.89V (12V In)
[5]	11.89V (12V In)
[6]	11.89V (12V In)
[7]	0.6V
[8]	0.44V
[9]	1.77V
[10]	3.47V (Enable)
[11]	1.27V (Out)
[12]	1.27V (Out)
[13]	8.16V
[14]	n/c

IC2304




Pin	(+5V_NORMAL) Regulator
[1]	8.74V
[2]	n/c
[3]	n/c
[4]	1.22V
[5]	3.23V (Enable)
[6]	Gnd
[7]	12V (In)
[8]	5.12V (Out)

IC2305




Pin	+1.5V_DDR Regulator
[1]	3.47V (3.5V_ST In)
[2]	3.47V (3.5V_ST In)
[3]	Gnd
[4]	Gnd
[5]	Gnd
[6]	0.83V
[7]	0.69V
[8]	0.51V
[9]	1.86V
[10]	1.54V (Out)
[11]	1.54V (Out)
[12]	1.54V (Out)
[13]	5.04V
[14]	n/c
[15]	3.47V (Enable)
[16]	3.47V (3.5V_ST In)

IC2307



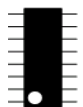
Pin	PWR_Det 12V Sense
[1]	Gnd
[2]	3.68V (Reset)
[3]	3.71V (In)

IC2308



Pin	PWR_Det 20V Sense
[1]	Gnd
[2]	3.74V (Reset)
[3]	3.77V (In)

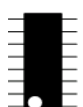
IC3100



Pin	Spk Motor Control
[1-3]	0.08V (Motor_Ctrl_A)
[4-6]	0.08V (Motor_Ctrl_B)
[7]	n/c
[8]	Gnd
[9]	12V (In)
[10]	n/c
[11-13]	0.08V (CTRL_B)
[14-16]	0.08V (CTRL_A)

Control Lines are 1.48V during Movement

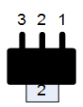
IC3101



Pin	Spk Motor Control
[1-3]	0.08V (Motor_Ctrl_C)
[4-6]	0.08V (Motor_Ctrl_D)
[7]	n/c
[8]	Gnd
[9]	12V (In)
[10]	n/c
[11-13]	0.08V (CTRL_C)
[14-16]	0.08V (CTRL_D)


Control Lines are 1.48V during Movement

IC3200




Pin	VDD_12V Regulator
[1]	Gnd
[2]	1.2V (VDD_12 Out)
[3]	3.33V (3.3V_Normal In)

IC3202




Pin	MHL Power
[1]	0V (5V_HDMI4_Out)
[2]	Gnd
[3]	0V (MHL_Det Enable)
[4]	0V (MHL_Det Enable)
[5]	5.12V (5V_Normal In)

IC4306




Pin	5V for USB 2/3 USB_OCP 2/3
[1]	Gnd
[2]	5.12V (5V_Normal In)
[3]	3.32V (USB_CTRL3)
[4]	3.32V (USB_CTRL2)
[5]	3.33V (USB_OCD2)
[6]	5.12V (5V_USB2_Out)
[7]	5.12V (5V_USB3_Out)
[8]	3.33V (USB_OCD3)

IC4500




Pin	5V for USB 1 USB_OCP 2/3
[1]	Gnd
[2-3]	5.12V (5V_Normal In)
[4]	3.32V (Enable)
[5]	2.56V
[6-8]	5.12V (5V_USB1_Out)

IC6100



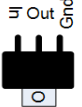
Pin	Head Phone Amp
[1]	Gnd
[2]	0V (R_In)
[3]	0V (R_Out)
[4]	Gnd
[5]	0.08V (Mute)
[6]	(-3.23V)
[7]	(-1.61V)
[8]	1.65V
[9]	3.33V (In)
[10]	Gnd
[11]	n/c
[12]	0V (L_Out)
[13]	0V (L_In)
[14]	Gnd

IC6501




Pin	+1.23V_D_Demod Regulator
[1]	n/c
[2]	5.04V
[3]	3.32V (In)
[4]	5.12V
[5]	n/c
[6]	1.24V (Out)
[7]	0.61V
[8]	Gnd

IC6503




Pin	+1.8V_TU Switch
[Gnd]	0V (Gnd)
[Out]	1.8V (Out)
[In]	3.31V (In)

IC6801




Pin	RS232 Data
[1]	3.49V
[2]	3.72V
[3]	0V
[4]	0.02V
[5]	(-5.04V)
[6]	(-5.68V)
[7]	n/c
[8]	n/c
[9]	n/c
[10]	n/c
[11]	3.32V
[12]	3.49V
[13]	0V
[14]	(-5.68V)
[15]	Gnd
[16]	3.49V (3.5V_ST In)

Q2300




Pin	PWR_On Switch
[1]	3.54V
[2]	2.83V
[3]	3.42V

Q2301




Pin	Panel_VCC CTRL Drives Q2302
[B]	0.63V
[C]	0.08V
[E]	Gnd

Q2302




Pin	Panel_VCC Switch
[G]	1.78V
[S]	11.98V
[D]	11.94V

Q3001




Pin	HDMI CEC FET
[G]	3.53V
[S]	3.49V
[D]	3.47V

Q3200




Pin	Drives MHL Det Q3201
[B]	0.06V
[C]	3.53V
[E]	Gnd

Q3201




Pin	MHL Det
[B]	3.53V
[C]	0V (Out)
[E]	3.53V

Q3202




Pin	Switches VDD33 To IC3201
[G]	5.12V
[S]	3.33V (In)
[D]	3.33V (Out)

Q4200



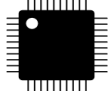
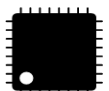
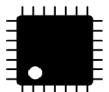
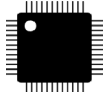
Pin	Q4201 Driver
[B]	0V
[C]	1.32V
[E]	Gnd

Q4201

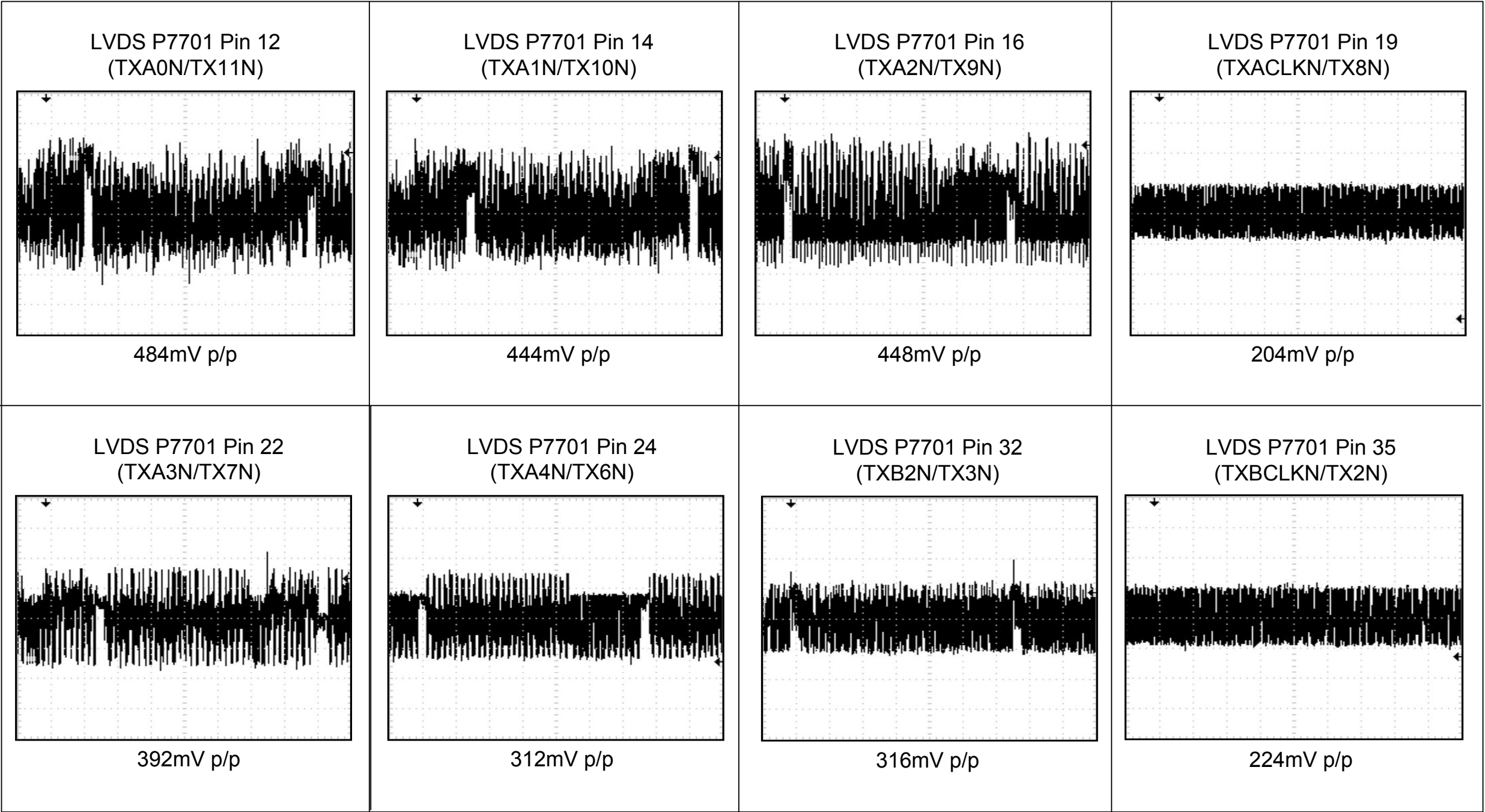


Pin	Camera Power
[G]	0.34V
[S]	3.48V
[D]	3.47V

55LA9700 Main Board Component Voltages (Large ICs)

IC3000 Micro Processor		IC5200 Ethernet IC		IC5700 Woofer Audio Amp	
Pin		Pin		Pin	Pin
[1] 3.28V		[1] 0V		[1] 0V (Spk_Woofer_L+)	[25] 3.3V (Reset)
[2] 3.28V		[2] 1.1V		[2-3] 23.92V (24V_AMP_Woofer In)	[26] Gnd
[3] 0.0V		[3] 1.1V		[4] 17.94V	[27] 3.32V (3.3V_Normal In)
[4] 2.09V		[4] 1.1V		[5] n/c	[28] Gnd
[5] 0.06V		[5] 1.1V		[6] 3.31V	[29] Gnd
[6] 3.5V		[6] 1.1V		[7] n/c	[30] Gnd
[7] 3.49V		[7] 3.51V (In)		[8] Gnd	[31] 3.32V
[8] 3.53V		[8] 0.03V		[9] 0V	[32] 6.68V
[9] 0V		[9] 0V		[10] 0.68V	[33] 17.96V
[10] 3.53V		[10] 0V		[11] 1.05V	34-35] 23.92V (24V_AMP_Woofer In)
[11] 3.53V		[11] 0V		[12] 1.8V	[36] 11.94V (Spk_Woofer_R-)
[12] 0V		[12] 0V		[13] 3.32V (3.3V_Normal In)	[37] Gnd
[13] 3.51V		[13] n/c		[14] 0.39V	[38] Gnd
[14] 3.68V		[14] 3.51V (In)		[15] 1.67V	[39] 11.94V (Spk_Woofer_R+)
[15] 3.53V		[15] 1.32V		[16] 1.0V	[40] n/c
[16] 0V		[16] 0V		[17] Gnd	[41] n/c
[17] 3.48V				[18] 1.81V	[42] 17.95V
[18] 3.53V				[19] 3.32V (Mute)	[43] 17.95V
[19] 3.29V				[20] 1.65V	[44] n/c
[20] 3.32V				[21] 1.65V	[45] n/c
[21] 3.53V				[22] 1.2V	[46] 11.94V (Spk_Woofer_L-)
[22] 0V				[23] 3.31V	47-48] Gnd
[23] 0V				[24] 3.31V	
[24] 0.1V					
IC4200 Camera Processor		IC5600 Audio Amp		IC5800 Height Speaker Audio Amp	
Pin		Pin		Pin	Pin
[1] 0V		[1] 11.94V (Spk_L+)		[1] 0V (HSpk_L+)	[25] 3.3V (Reset)
[2] 0V		[2-3] 23.92V (24V_AMP In)		[2-3] 23.92V (24V_UD_Amp In)	[26] Gnd
[3] 0V		[4] 17.94V		[4] 17.94V	[27] 3.32V (3.3V_Normal In)
[4] 0V		[5] n/c		[5] n/c	[28] Gnd
[5] 3.34V (In)		[6] 3.31V		[6] 3.31V	[29] Gnd
[6] 0V		[7] n/c		[7] n/c	[30] Gnd
[7] 0V		[8] Gnd		[8] Gnd	[31] 3.32V
[8] 0.44V		[9] 0V		[9] 0V	[32] 6.68V
[9] 3.34V (In)		[10] 0.68V		[10] 0.68V	[33] 17.96V
[10] 1.45V		[11] 1.05V		[11] 1.05V	34-35] 23.92V (24V_UD_AMP In)
[11] 1.1V		[12] 1.8V		[12] 1.8V	[36] 11.94V (HSpk_R-)
[12] n/c		[13] 3.32V (3.3V_Normal In)		[13] 3.32V (3.3V_Normal In)	[37] Gnd
[13] n/c		[14] 0.39V		[14] 0.39V	[38] Gnd
[14] 3.34V (In)		[15] 1.67V		[15] 1.67V	[39] 11.94V (HSpk_R+)
		[16] 1.0V		[16] 1.0V	[40] n/c
		[17] Gnd		[17] Gnd	[41] n/c
		[18] 1.81V		[18] 1.81V	[42] 17.95V
		[19] 3.32V (Mute)			
		[20] 1.65V			
		[21] 1.65V			
		[22] 1.2V			
		[23] 3.31V			
		[24] 3.31V			

55LA8600 P7701 LVDS Video Waveforms



SMPTE Color Bar input signal (Component)
All signals taken at 2.5uSec per/sec / 100mV per/div

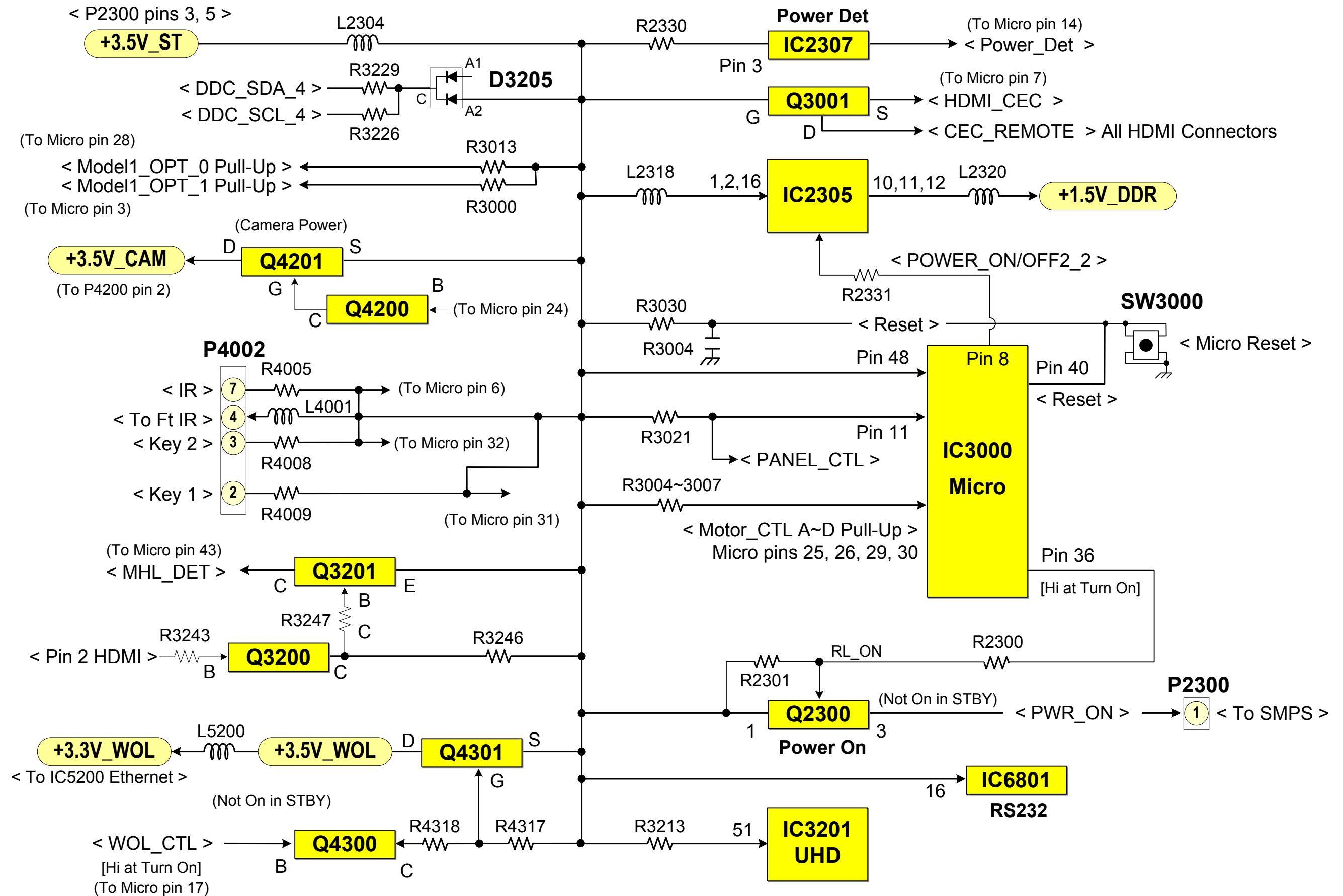
LVDS example signals taken from P7201. (These are just (+) side signals, (-) looks the same but inverted. P7702 signal are very similar, but are on Pins 10-15, 26-31, 36-398.

Clocks are on Pins 17-18 and 33-34. All signals taken with SMTPE Color bar input signal.
With an SMPTE Color Bar input signal, pins 28, 29, 30 and 31 do not have a signal.

With an SMPTE Color Bar input signal, P7201 pins 28 – 31 and 40-41 and P7202 pins 10 - 13 do not have a signal.

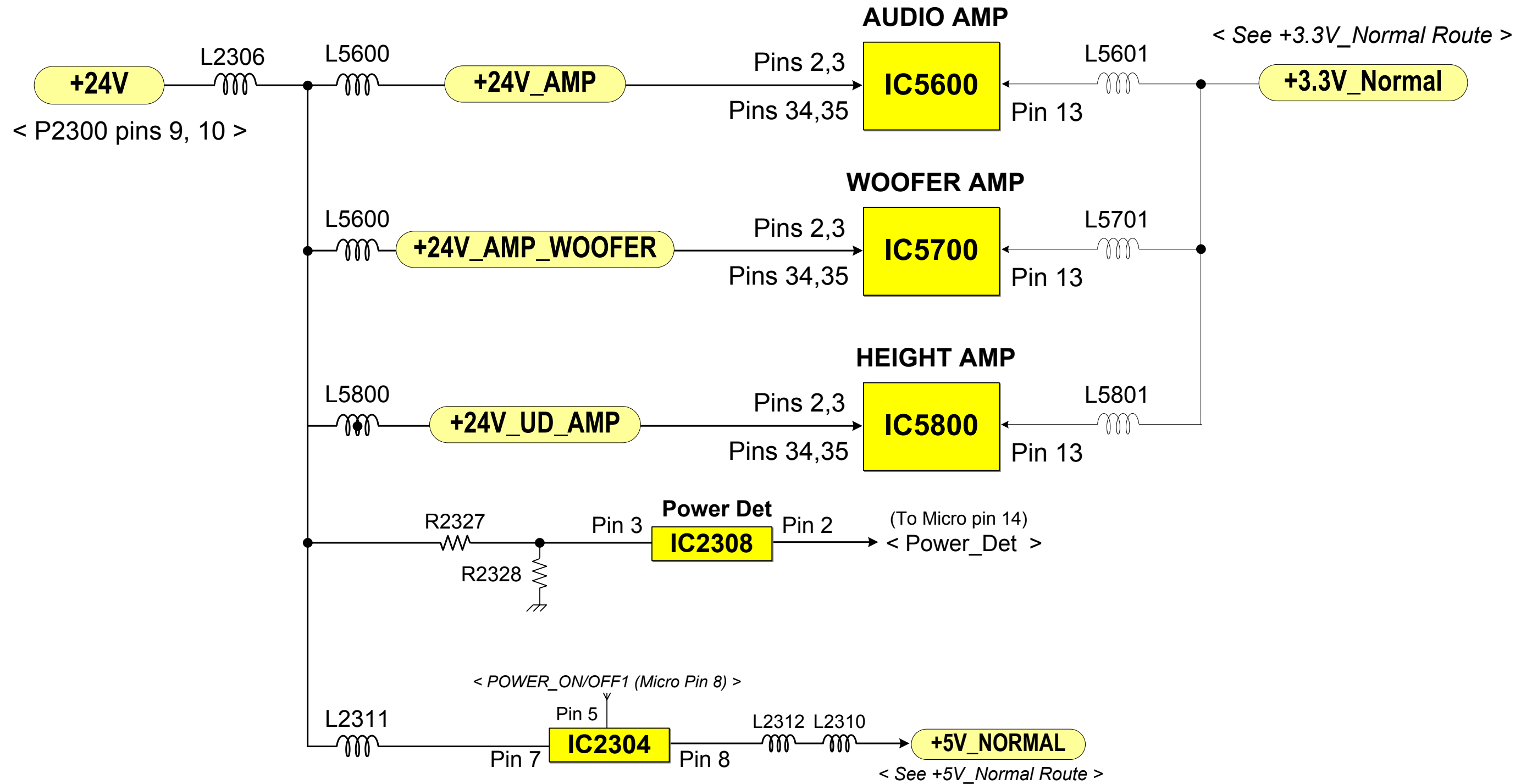
55LA9700 Main Board (+3.5V_ST) Voltage Routing

55LA9700 (2013) Interconnect Section 17

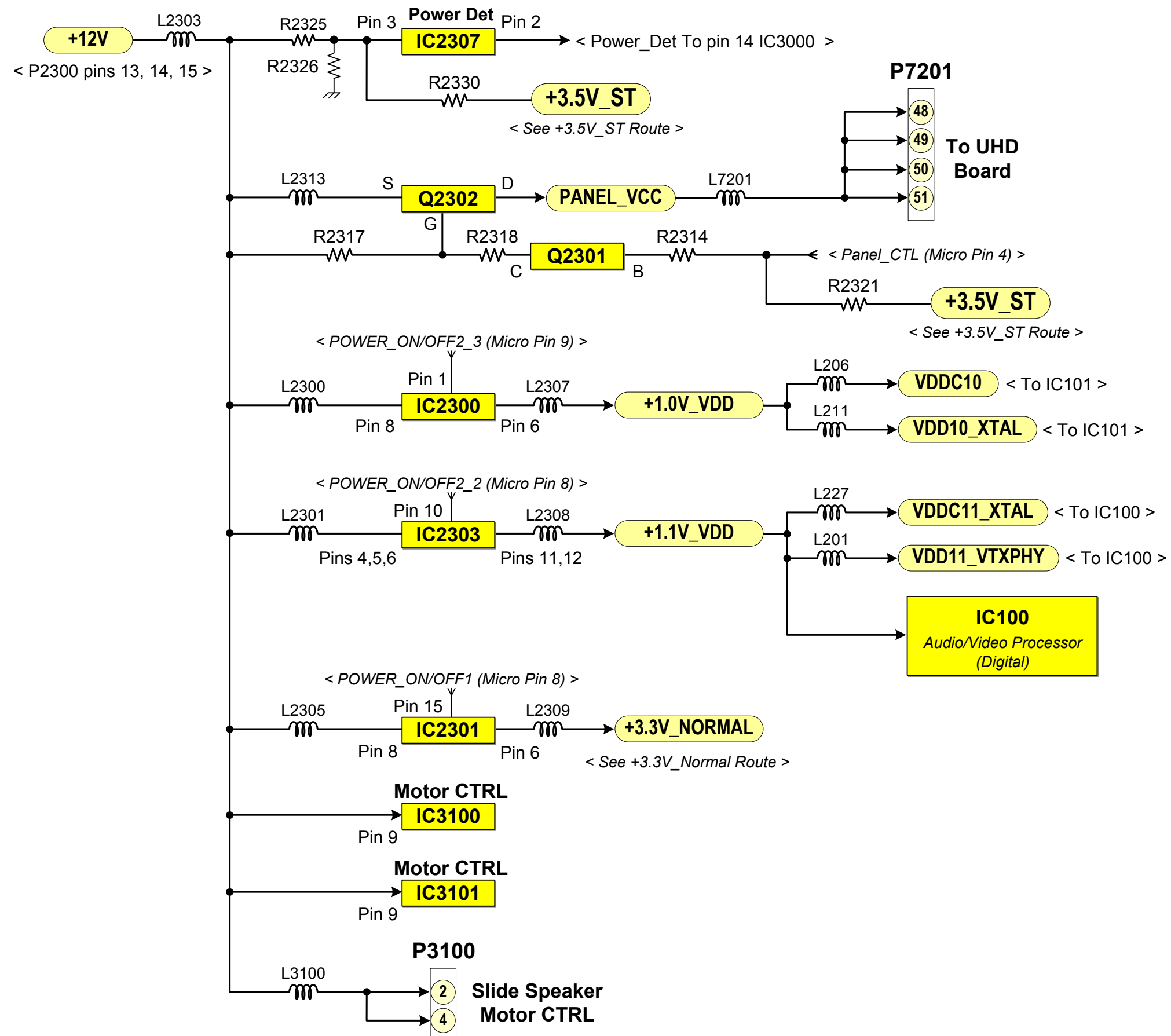


55LA9700 Main Board (+24V) Voltage Routing

55LA9700 (2013) Interconnect Section 17

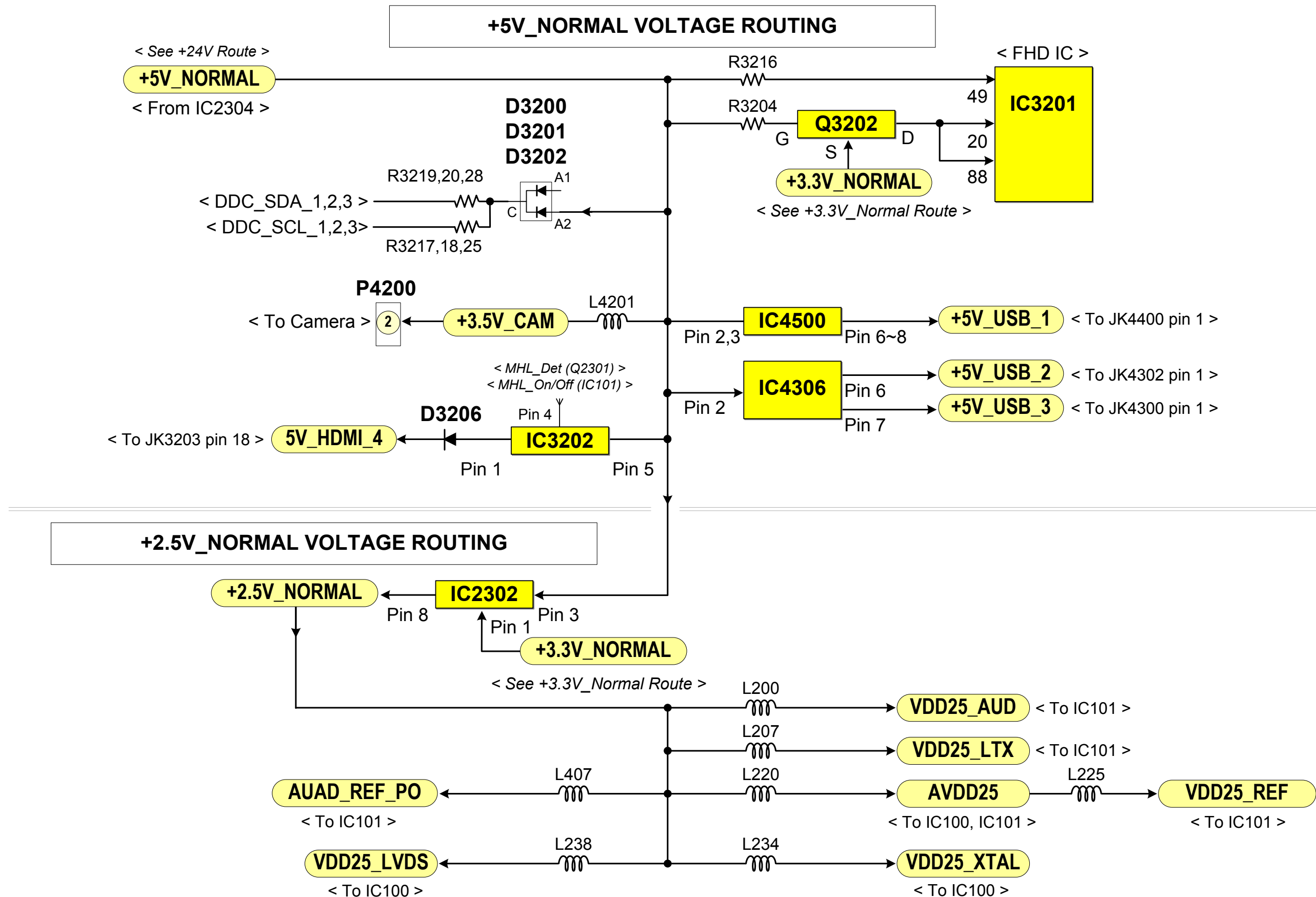


55LA9700 Main Board (+12V) Voltage Routing



55LA9700 Main Board (+5V_Normal / +2.5V_Normal) Voltage Routing


55LA9700 (2013) Interconnect Section 17






55LB7200 Main Board IC Voltages

IC103




Pin	NVRAM (Non-Volatile)
[1]	Gnd
[2]	Gnd
[3]	Gnd
[4]	Gnd
[5]	3.32V
[6]	3.32V
[7]	Gnd
[8]	3.32V (Vcc In)

IC2300




Pin	+3.3V_NORMAL Regulator
[1]	3.48V (Enable)
[2]	0.77V
[3]	5.22V
[4]	2.52V
[5]	Gnd
[6]	3.33V (Out)
[7]	8.28V
[8]	12.07V (Vcc In)

IC2302




Pin	+2.5V_NORMAL Regulator
[1]	3.32V (In)
[2]	n/c
[3]	5.09V (Vcc In)
[4]	3.53V (Enable)
[5]	Gnd
[6]	4.24V
[7]	0.8V
[8]	2.5V (Out)

IC2306




Pin	DVDD18_EMMC 1.8V Regulator
[In]	3.23V
[Out]	1.81V
[Adj]	0.35V

IC2303




Pin	+1.5V_DDR Regulator
[1]	3.52V (Vcc In)
[2]	3.52V (Vcc In)
[3]	Gnd
[4]	Gnd
[5]	Gnd
[6]	0.83V
[7]	0.34V
[8]	0.0V
[9]	2.26V
[10]	1.53V (Out)
[11]	1.53V (Out)
[12]	1.53V (Out)
[13]	5.06V
[14]	n/c
[15]	3.49V
[16]	3.52V (Vcc In)

IC2307




Pin	PWR_Det +12V in
[1]	Gnd
[2]	3.68V (Out)
[3]	3.71V (In)

IC3201




Pin	5V_HDMI_4 (MHL) Regulator
[1]	5.09V (Vcc In)
[2]	Gnd
[3]	0V (Enable)
[4]	n/c
[5]	0V
[6]	0V (Out)

IC4500




Pin	+5V_USB1 OCP_USB1
[1]	5.09V (Vcc In)
[2]	Gnd
[3]	3.29V (Enable)
[4]	2.96V (OCP Out)
[5]	0.38V
[6]	5.09V (Out USB1)

IC5201




Pin	+3.5V_WOL Regulator
[1]	3.52V (Out)
[2]	Gnd
[3]	0.44V n/c
[4]	3.52V (OCP Out)
[5]	3.52V (Vcc In)

IC6801




Pin	RS232 Routing
[1]	3.53V
[2]	5.69V
[3]	0V
[4]	0V
[5]	(-5.60V)
[6]	(-5.63V)
[7]	n/c (5.64V)
[8]	n/c (0V)
[9]	n/c (3.49V)
[10]	n/c (0V)
[11]	3.34V
[12]	3.48V
[13]	0V
[14]	(-5.59V)
[15]	0V (Gnd)
[16]	3.5V (Vcc In)

IC2301



Pin	+1.1V_VDD Regulator	Pin	
[1]	1.16V	[15]	12.05V (In)
[2]	5.08V	[16]	12.05V (In)
[3]	3.52V (Enable)	[17]	12.05V (In)
[4]	6.2V	[18]	n/c
[5]	n/c	[19]	12.05V (In)
[6]	1.14V (Out)	[20]	5.07V
[7]	1.14V (Out)	[21]	5.07V
[8]	1.14V (Out)	[22]	Gnd
[9]	1.14V (Out)	[23]	0.61V
[10]	Gnd	[24]	1.12V
[11]	Gnd	[25]	0.41V
[12]	Gnd	[26]	n/c
[13]	Gnd	[27]	Gnd
[14]	Gnd	[28]	Gnd

IC2304



Pin	+5V_Normal Regulator	Pin	
[1]	24.68V (In)	[15]	5.04V (OCP2)
[2]	24.68V (In)	[16]	5.09V
[3]	24.68V (In)	[17]	5.09V
[4]	Gnd	[18]	12.04V
[5]	Gnd	[19]	5.09V (Out)
[6]	Gnd	[20]	5.09V (Out)
[7]	6.25V	[21]	5.09V (Out)
[8]	6.25V	[22]	1.94V
[9]	3.53V (Enable)	[23]	0.60V
[10]	5.09V (Out USB2)	[24]	0.35V
[11]	5.09V (Out USB3)	[25]	1.24V
[12]	5.09V (USB2 Ctrl)	[26]	0.45V
[13]	5.09V (USB3 Ctrl)	[27]	0.45V
[14]	5.04V (OCP2)	[28]	Gnd




55LB7200 Transistors and Flat Pack IC Voltages

IC3000

Microprocessor

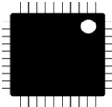
Pin		Pin	
[1]	0.06V	[25]	0V
[2]	3.3V	[26]	0.04V
[3]	0.05V	[27]	3.5V
[4]	0.08V	[28]	0V
[5]	0.02V	[29]	0V
[6]	3.51V	[30]	0V
[7]	3.49V	[31]	3.53V
[8]	3.53V	[32]	3.53V
[9]	3.53V	[33]	3.53V
[10]	3.53V	[34]	3.53V
[11]	3.53V	[35]	0V
[12]	0.17V	[36]	0V
[13]	3.34V	[37]	0V
[14]	3.66V	[38]	1.06V
[15]	3.53V	[39]	3.53V
[16]	0V	[40]	3.53V
[17]	3.51V	[41]	0.64V
[18]	3.53V	[42]	0.12V
[19]	3.24V	[43]	0V
[20]	3.34V	[44]	0V (n/c)
[21]	3.48V (Enable)	[45]	0V (n/c)
[22]	0V	[46]	2.09V
[23]	5.22V	[47]	Gnd
[24]	2.52V	[48]	3.53V (Vcc In)



IC5600

Audio Amp

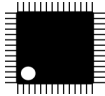
Pin		Pin	
[1]	n/c	[21]	12.34V
[2]	1.28V	[22]	Gnd
[3]	n/c	[23]	17.02V
[4]	Gnd	[24]	5.23V
[5]	n/c	[25]	Gnd
[6]	1.28V	[26]	n/c
[7]	0V	[27]	5.22V
[8]	1.65V	[28]	17.01V
[9]	1.65V	[29]	Gnd
[10]	3.32V	[30]	12.32V
[11]	3.32V	[31]	24.71V (Vcc In)
[12]	3.31V (Mute)	[32]	24.71V (Vcc In)
[13]	n/c	[33]	12.34V
[14]	3.31V	[34]	Gnd
[15]	n/c	[35]	17.03V (Reset)
[16]	17.02V	[36]	3.32V
[17]	Gnd	[37]	Gnd
[18]	12.33V	[38]	1.66V
[19]	24.71V (Vcc In)	[39]	Gnd
[20]	24.71V (Vcc In)	[40]	3.32V (Vcc In)



IC7703

Panel Power DC-to-DC Conv


Pin		Pin	
[1]	3.79V	[29]	4.93V
[2]	1.67V	[30]	0.47V
[3]	0.07V	[31]	14.86V
[4]	0.02V	[32]	11.73V
[5]	0V	[33]	8.14V
[6]	Gnd	[34]	7.29V
[7]	(-5.07V) VGL Out	[35]	3.97V
[8]	5.89V	[36]	0.81V
[9]	0.68V	[37]	Gnd
[10]	1.81V	[38]	6.73V
[11]	1.81V (VCC18 In)	[39]	6.73V
[12]	1.81V (VCC18 Out)	[40]	6.69V
[13]	Gnd	[41]	15.0V
[14]	12.03V (Vcc In)	[42]	7.69V
[15]	12.03V (Vcc In)	[43]	27.89V (VGH Ou
[16]	12.03V (Vcc In)	[44]	27.89V (VGH Ou
[17]	7.81V (HVDD Out)	[45]	(-4.95V)
[18]	7.81V	[46]	(-5.03V)
[19]	Gnd	[47]	(-5.06V) VGH_E
[20]	3.32V	[48]	27.86V (VGH_O
[21]	3.32V	[49]	n/c
[22]	4.98V (VL Out)	[50]	0.81V (CLK6)
[23]	1.31V	[51]	0V (CLK5)
[24]	Gnd	[52]	2.98V (CLK4)
[25]	12.03V (Vcc In)	[53]	3.97V (CLK3)
[26]	12.03V (Vcc In)	[54]	5.68V (CLK2)
[27]	15.73V	[55]	7.28V (CLK1)
[28]	15.70V (VDD Out)	[56]	6.08V



IC5200

Ethernet


Pin		Pin	
[1]	0.65V	[17]	0V
[2]	1.09V	[18]	n/c
[3]	1.09V	[19]	n/c
[4]	1.09V	[20]	0V
[5]	1.09V	[21]	3.31V
[6]	1.09V	[22]	1.66V
[7]	3.52V (In)	[23]	3.52V
[8]	0.05V	[24]	3.52V
[9]	0V	[25]	0V
[10]	0.05V	[26]	0V
[11]	n/c	[27]	0V
[12]	0V	[28]	0V
[13]	n/c	[29]	1.08V
[14]	3.52V (In)	[30]	3.52V (In)
[15]	1.78V	[31]	0.78V
[16]	0V	[32]	0.78V



Q2300

PWR_On Switch


Pin	
[1]	3.53V
[2]	2.85V
[3]	3.42V



Q3201

MHL Switch


Pin	
[B]	3.52V
[C]	0V
[E]	3.52V



Q2301

Q2302 Control


Pin	
[B]	0.62V
[C]	0.07V
[E]	Gnd



Q3202

VDD3V3_HDMI Switch


Pin	
[S]	3.32V (VCC In)
[G]	12.01V
[D]	3.32V (Out)



Q2302

Panel_VCC Switch


Pin	
[G]	1.8V
[S]	12.03V
[D]	12.00V



Q3205

HP Detection


Pin	
[G]	0V
[S]	Gnd
[D]	12.05V



Q7701

VGH Control


Pin	
[B]	15V
[C]	15.70V
[E]	14.14V



Q3001

CEC Bi-Directional


Pin	
[G]	3.53V
[S]	3.49V
[D]	3.49V



Q5600

Amp Mute Driver


Pin	
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[C]	3.32V
[E]	Gnd



Q7702

VCORE Switch


Pin	
[S]	1.11V (In)
[G]	3.47V (Enable)
[D]	1.11V (Out)



Q3200

Q3201 Control


Pin	
[B]	0.0V
[C]	3.53V
[E]	Gnd



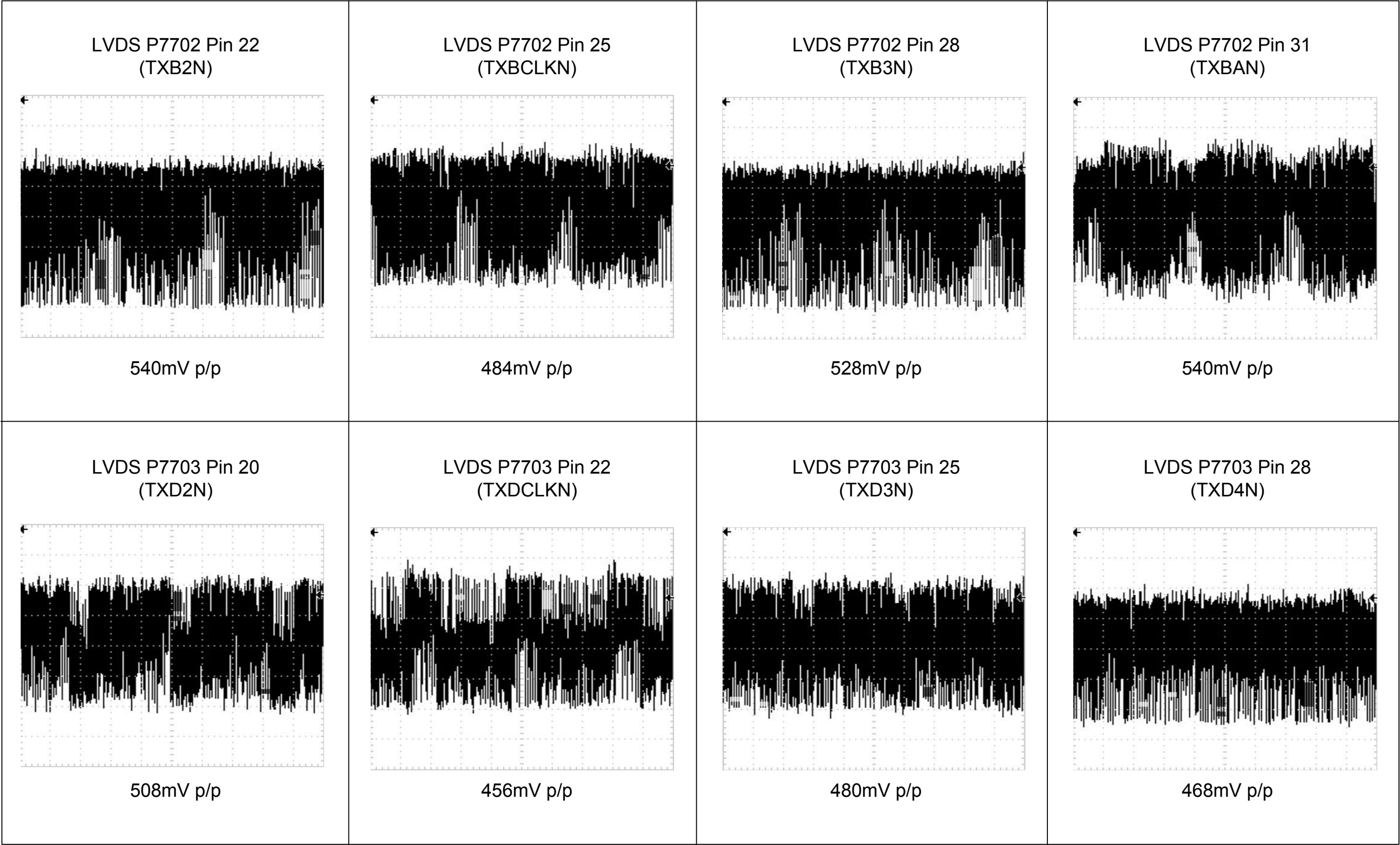
Q7700

VGL Control

Pin	
[B]	0V
[C]	5V
[E]	0V



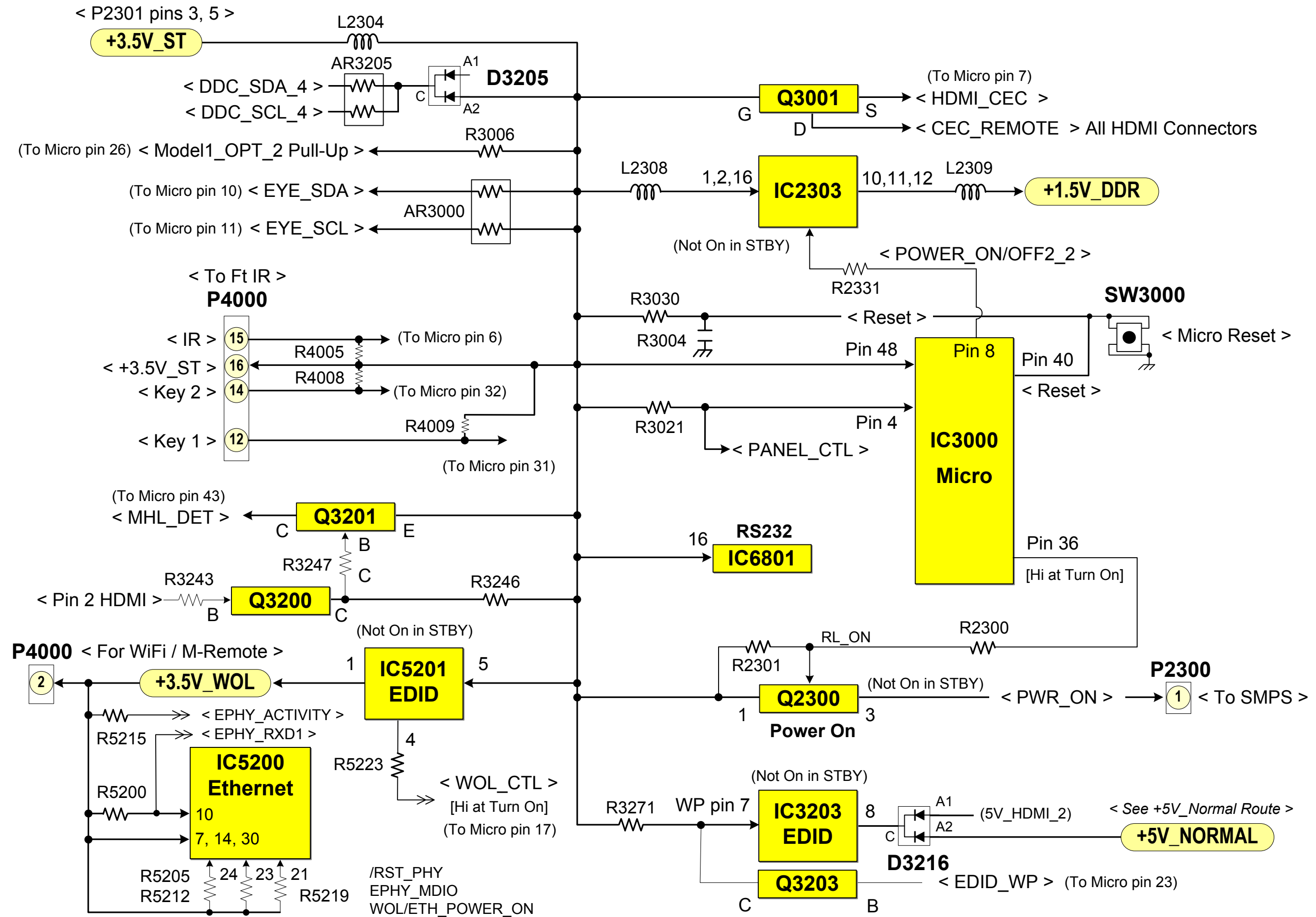
55LB7200 LVDS P7702 and P7703 Video Waveforms



SMPTE Color Bar input signal (Component)
All signals taken at 2.5uSec per/sec / 100mV per/div

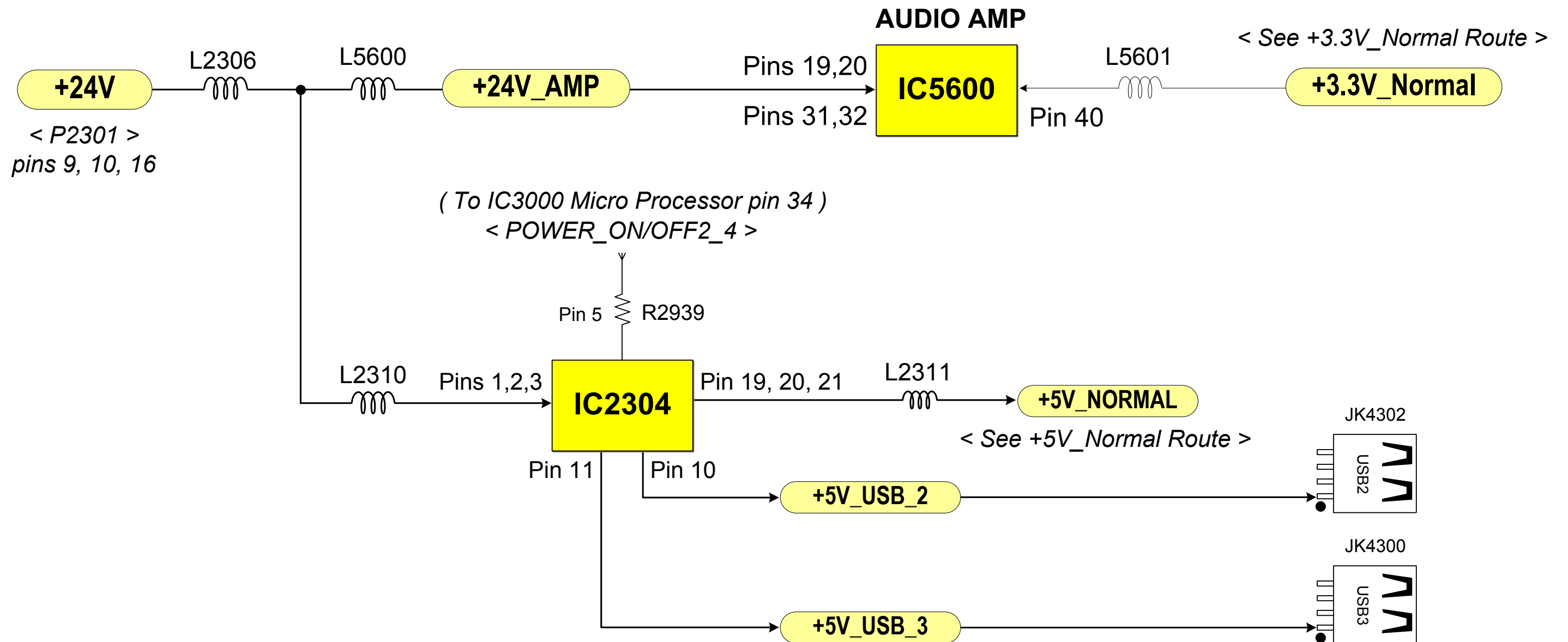
55LB7200 Main Board (+3.5V_ST) Voltage Routing

55LB7200 (2014) Interconnect Section 13

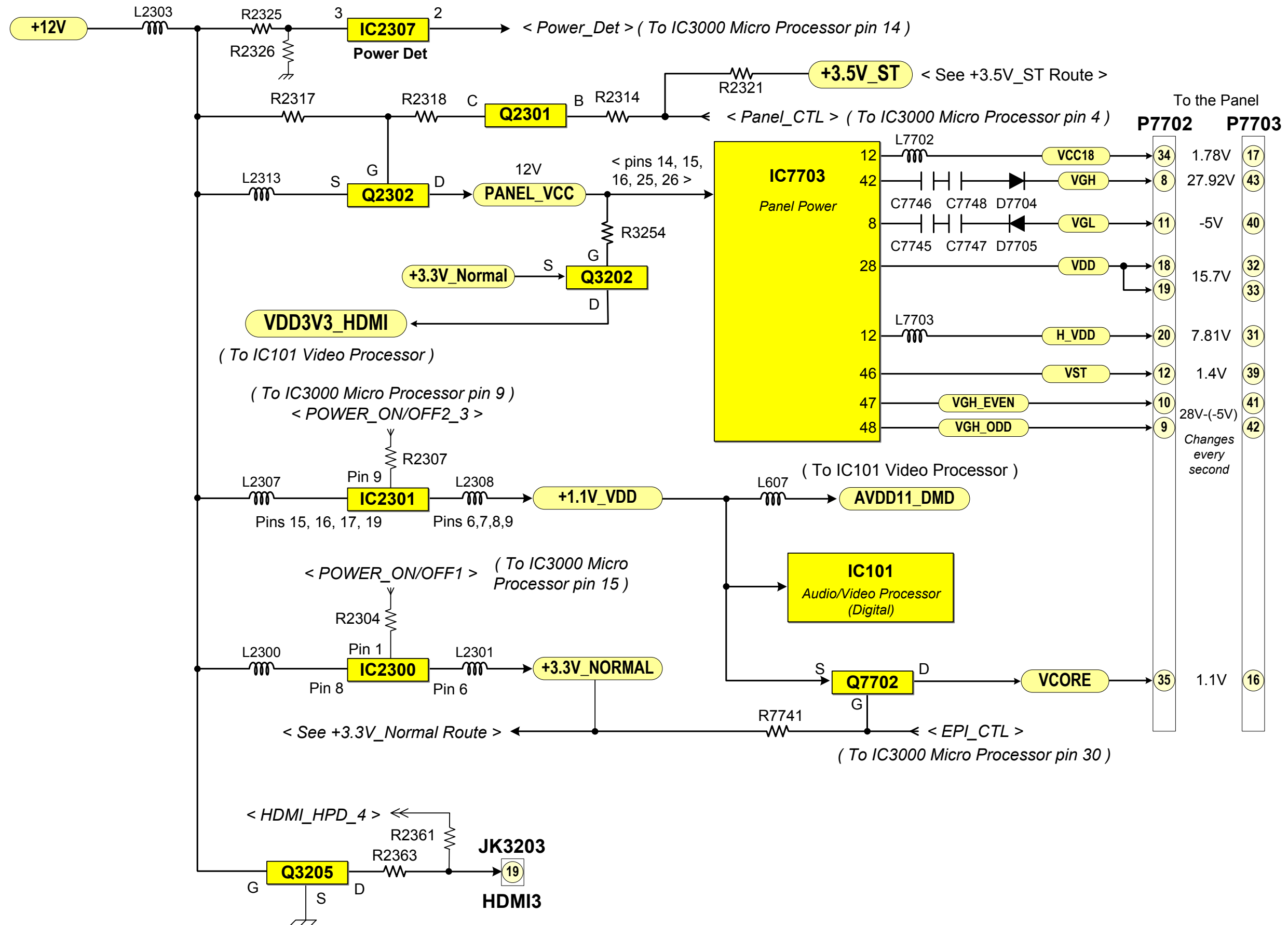


55LB7200 Main Board (+24V) Voltage Routing

55LB7200 (2014) Interconnect Section 13

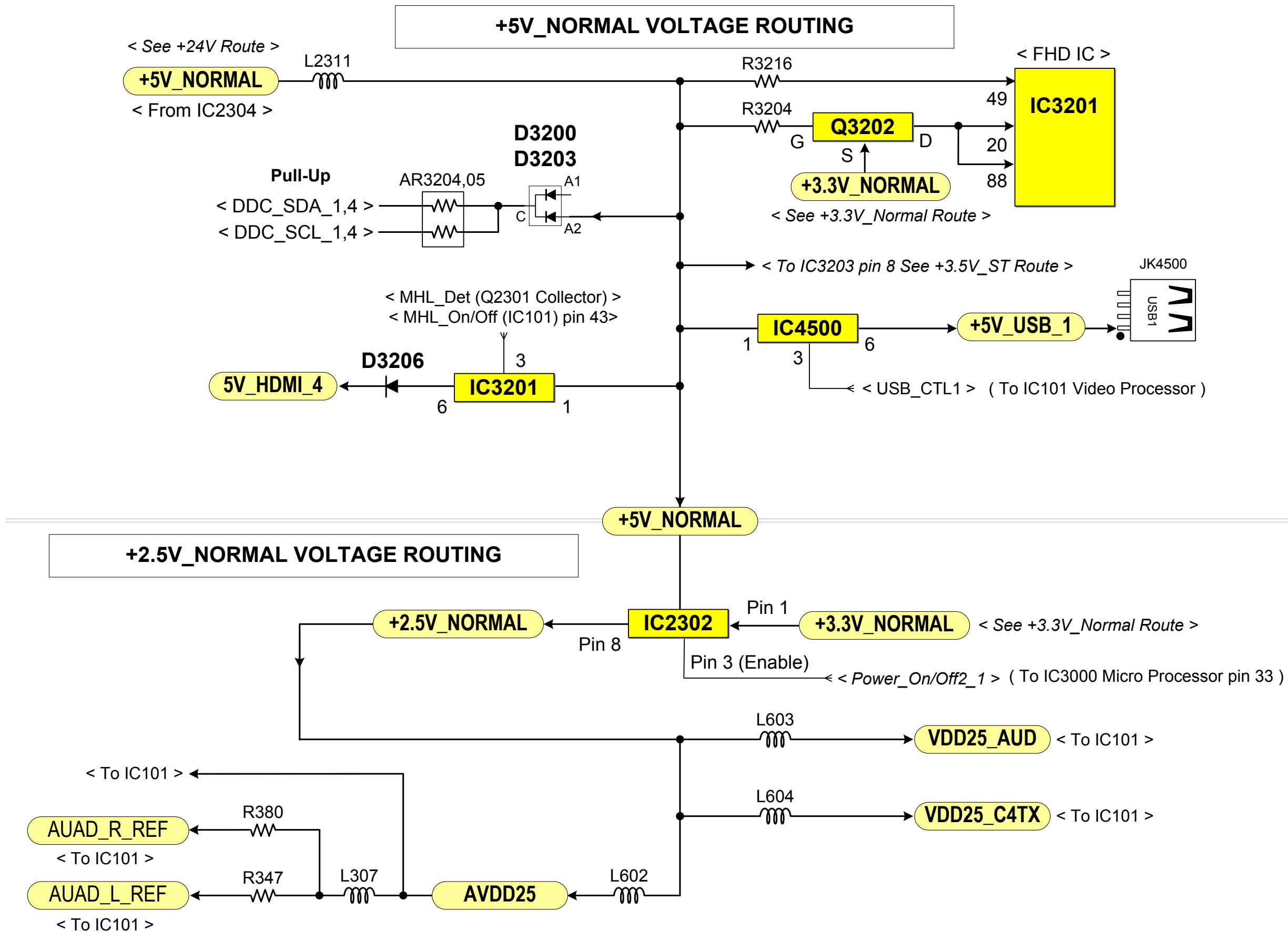


55LB7200 Main Board (+12V) Voltage Routing



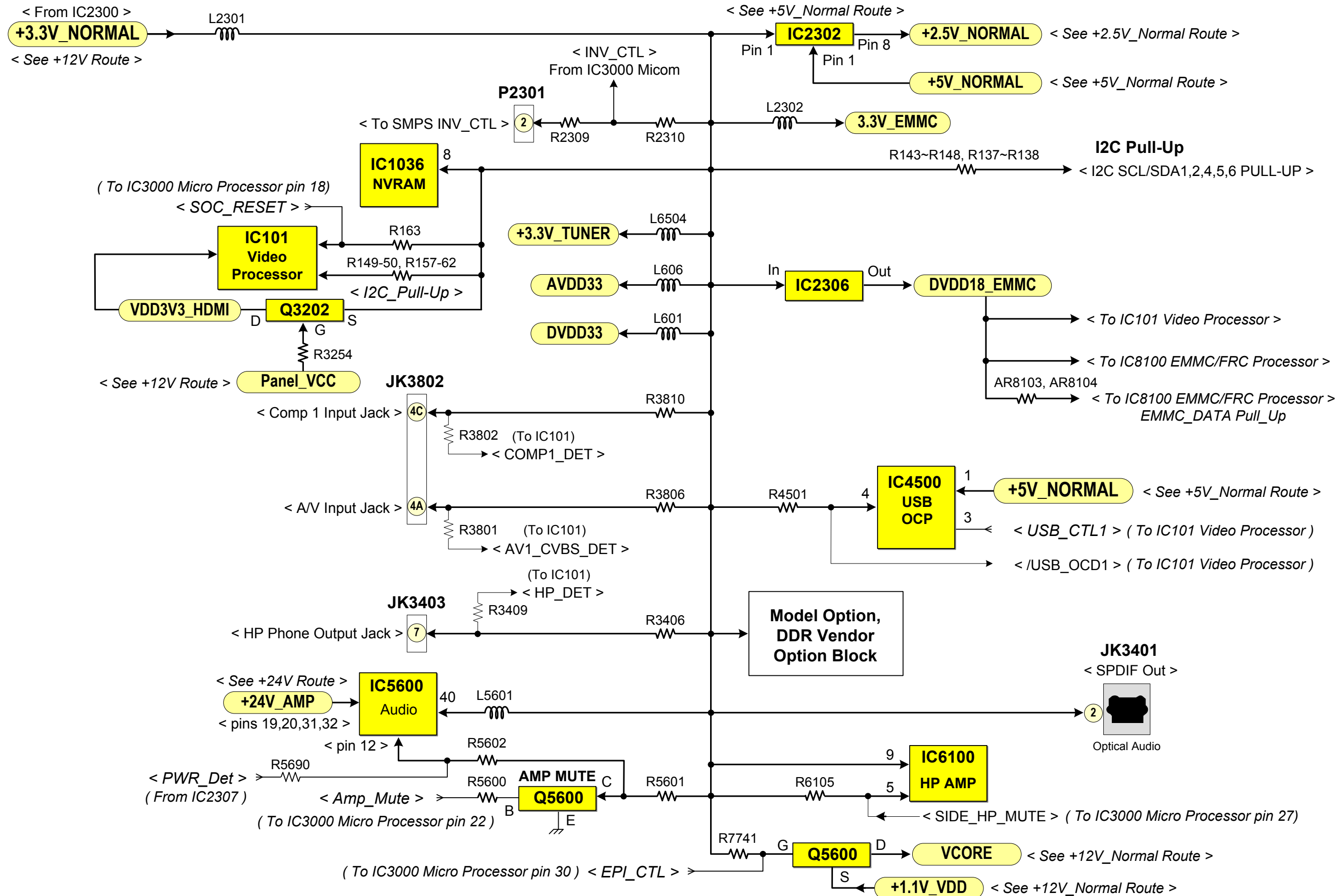
55LB7200 Main Board (+5V_Normal / +2.5V_Normal) Voltage Routing

55LB7200 (2014) Interconnect Section 13



55LB7200 Main Board (+3.3V_Normal) Voltage Routing

55LB7200 (2014) Interconnect Section 13



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SCHEMATIC DIAGRAMS

PRODUCT NAME Amoy T-CON/AITHER

UNIT NAME T-CON/AITHER BOARD

UNIT NO. PE0971

PWA NAME

PWA NO.

PWB NAME

PWB NO.

PAGE	FUNCTION	REV	PAGE	FUNCTION	REV	PAGE	FUNCTION	REV	PAGE	FUNCTION	REV
1	表紙-1 sh.001		26	3D GLASSES I/F(Ir) sh.828		51			76		
2	表紙-2 sh.002		27	CONFIGURATION REGs.1 sh.831		52			77		
3	AITHER (SYSTM) sh.800		28	CONFIGURATION REGs.2 sh.832		53			78		
4	AITHER [Back Light] sh.801		29	T-CON LVDS E/H INPUT sh.850		54			79		
5	AITHER [LVDS Input] sh.802		30	T-CON LVDS A/D INPUT sh.851		55			80		
6	AITHER [LVDS Output 1] sh.803		31	T-CON sh.852		56			81		
7	AITHER [LVDS Output 2] sh.804		32	T-CON sh.853		57			82		
8	AITHER [DDR3 I/F] sh.805		33	T-CON sh.854		58			83		
9	AITHER [POWER 1] sh.806		34	T-CON sh.856		59			84		
10	AITHER [POWER 2] sh.807		35	TCON Placement sh.857		60			85		
11	AITHER [POWER 3] sh.808		36	TCON Circuit (TOP) sh.858		61			86		
12	AITHER [POWER 4] sh.809		37	POWER 1.5V sh.891		62			87		
13	AITHER POWER Sep. sh.810		38	POWER 1.2V sh.892		63			88		
14	Clocks for Aither sh.811		39	POWER 3.3V sh.893		64			89		
15	DDR3 SDRAM 1 for AITHER sh.812		40	L-CON PWR CONNECTOR sh.894		65			90		
16	DDR3 SDRAM 2 for AITHER sh.813		41			66			91		
17	DDR3 Termination Regs. sh.814		42			67			92		
18	DDR3 VTT-REG sh.815		43			68			93		
19	DDR3 DUMPING REGs. sh.816		44			69			94		
20	EEP ROM1 for AITHER sh.817		45			70			95		
21	EEP ROM2 for AITHER sh.818		46			71			96		
22	EEP ROM3 for AITHER sh.819		47			72			97		
23	EEP ROM4 for AITHER sh.820		48			73			98		
24	LVDS Input Conn. 1 sh.821		49			74			99		
25	LVDS Input Conn. 2 sh.822		50			75			100		

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TITLE

CIRCUIT DIAGRAM

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表紙-1

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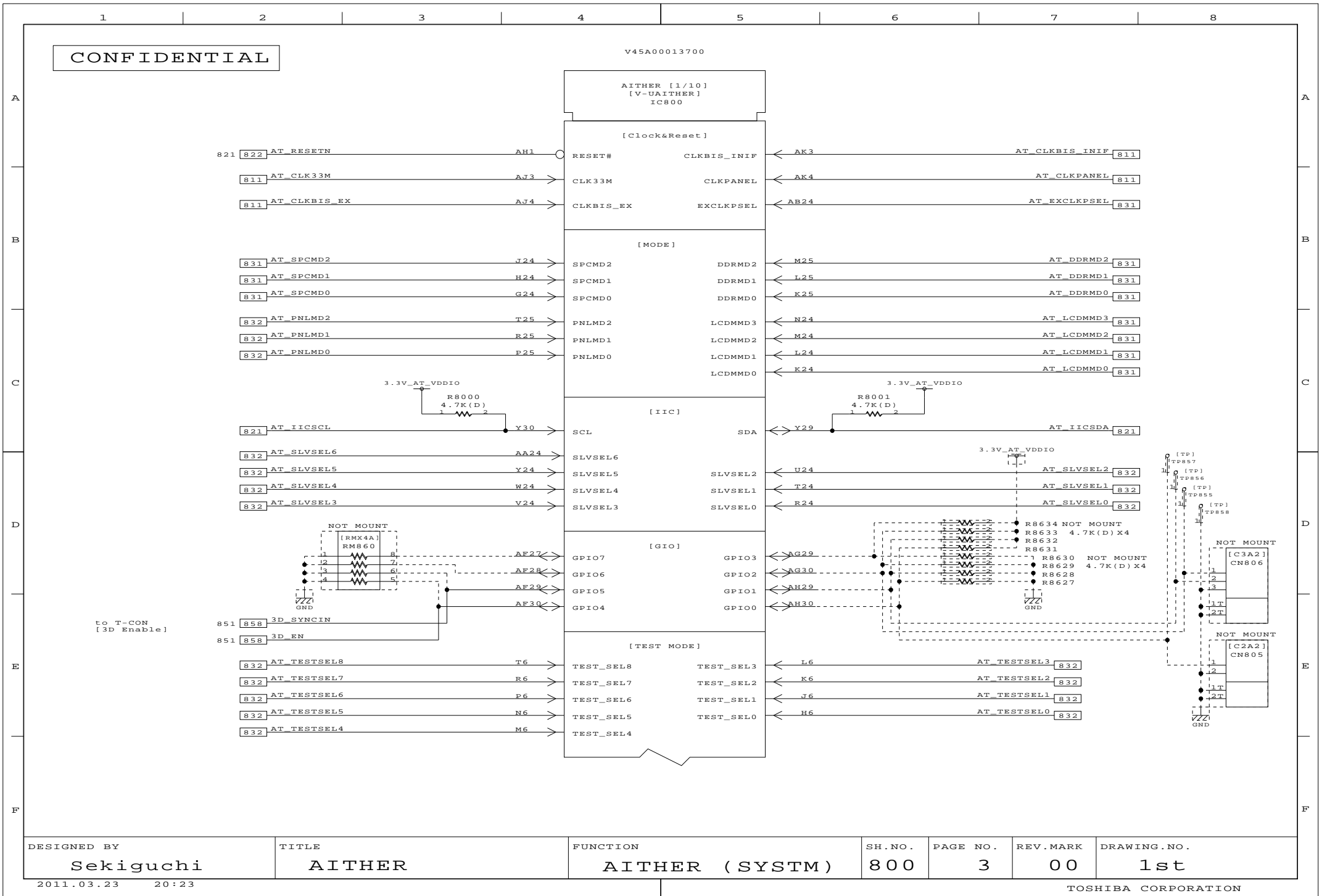
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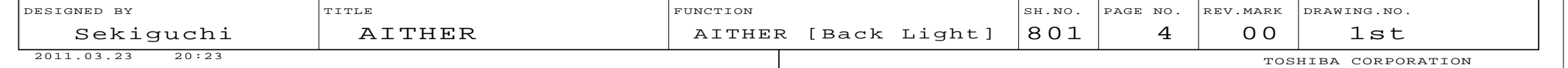
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B															B
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F															F
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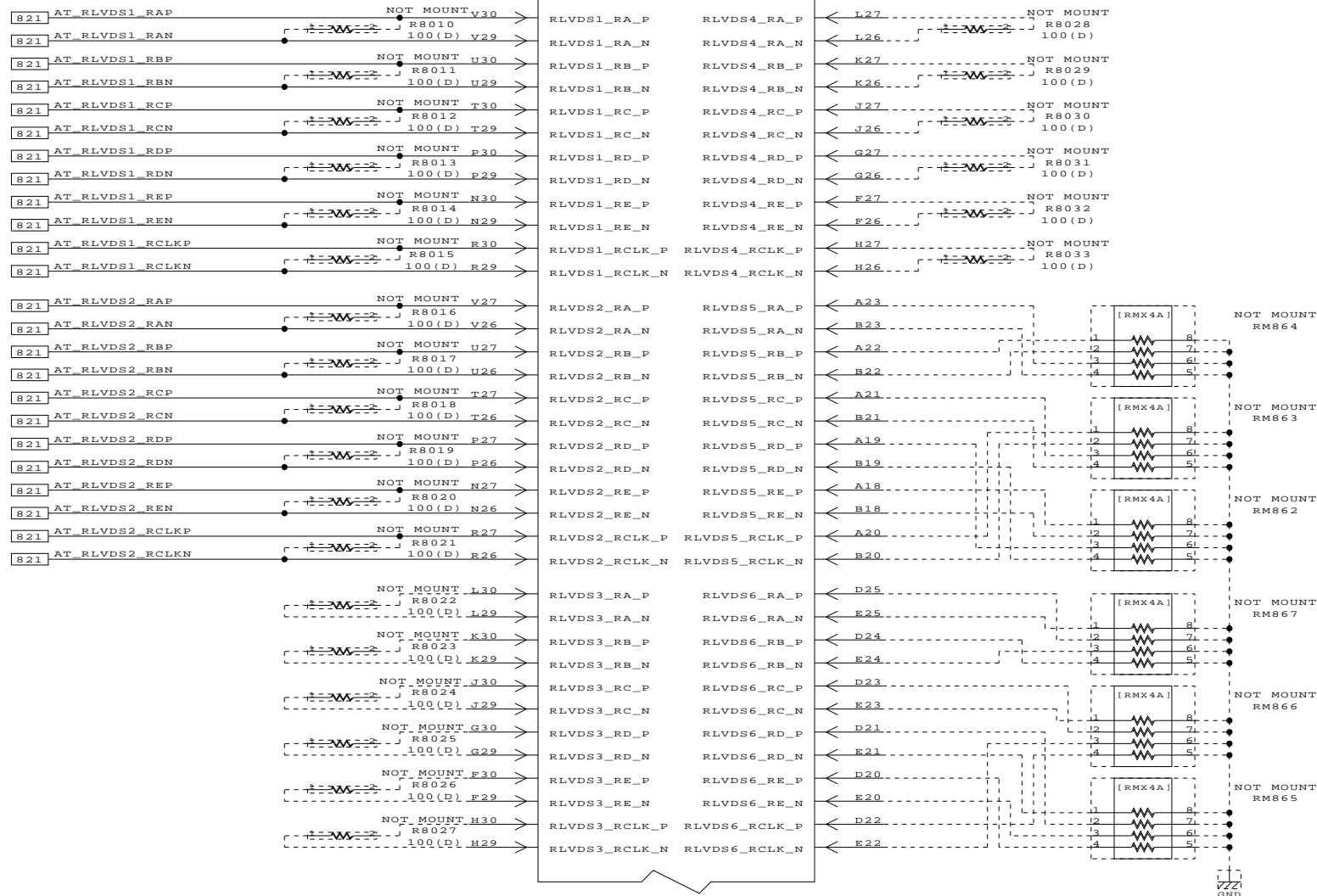
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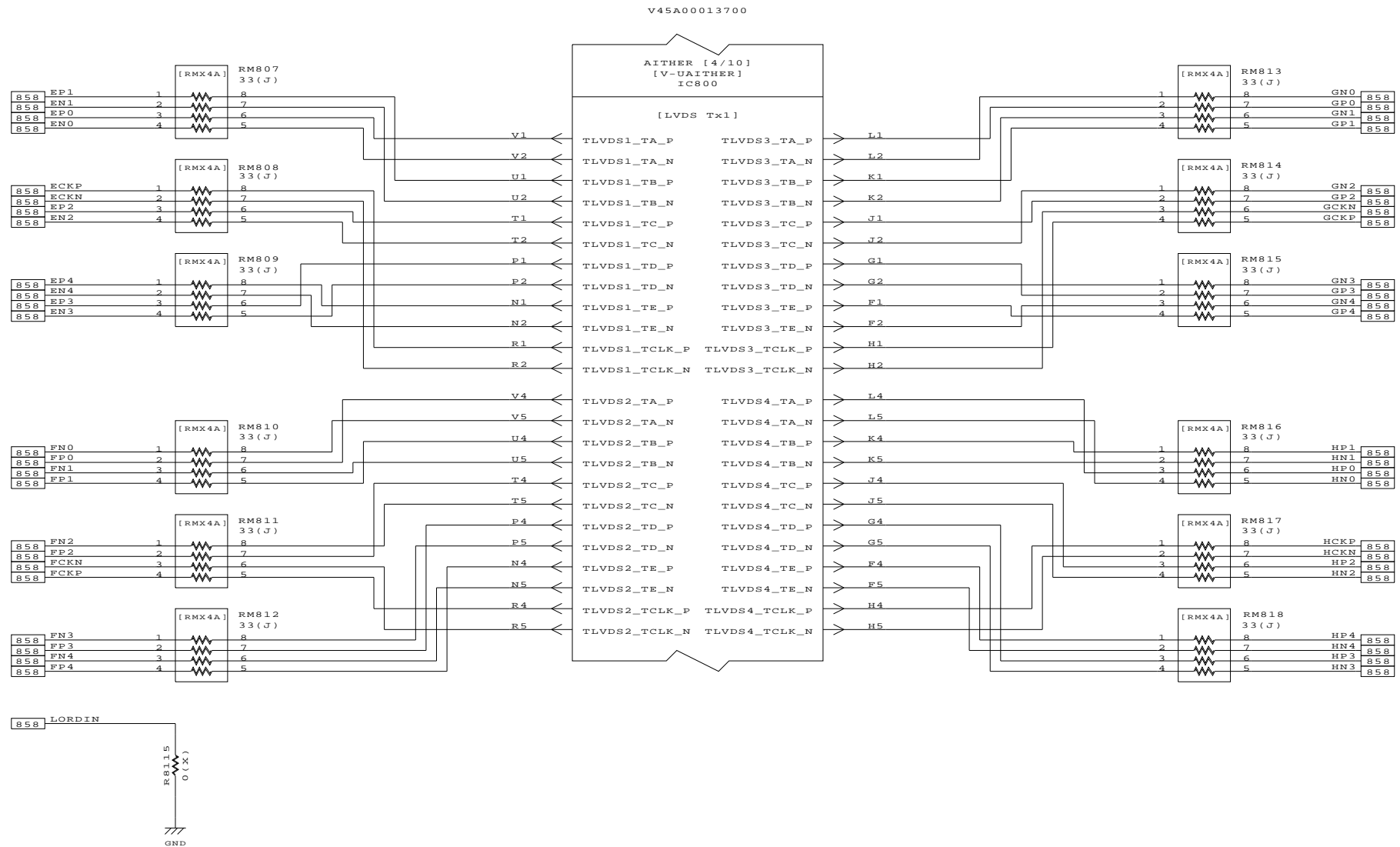
AIETHER [3/10]
[V-UAITHER]
IC800

[LVDS Rx]



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TITLE

AIETHER

FUNCTION

AIETHER [LVDS Output 1]

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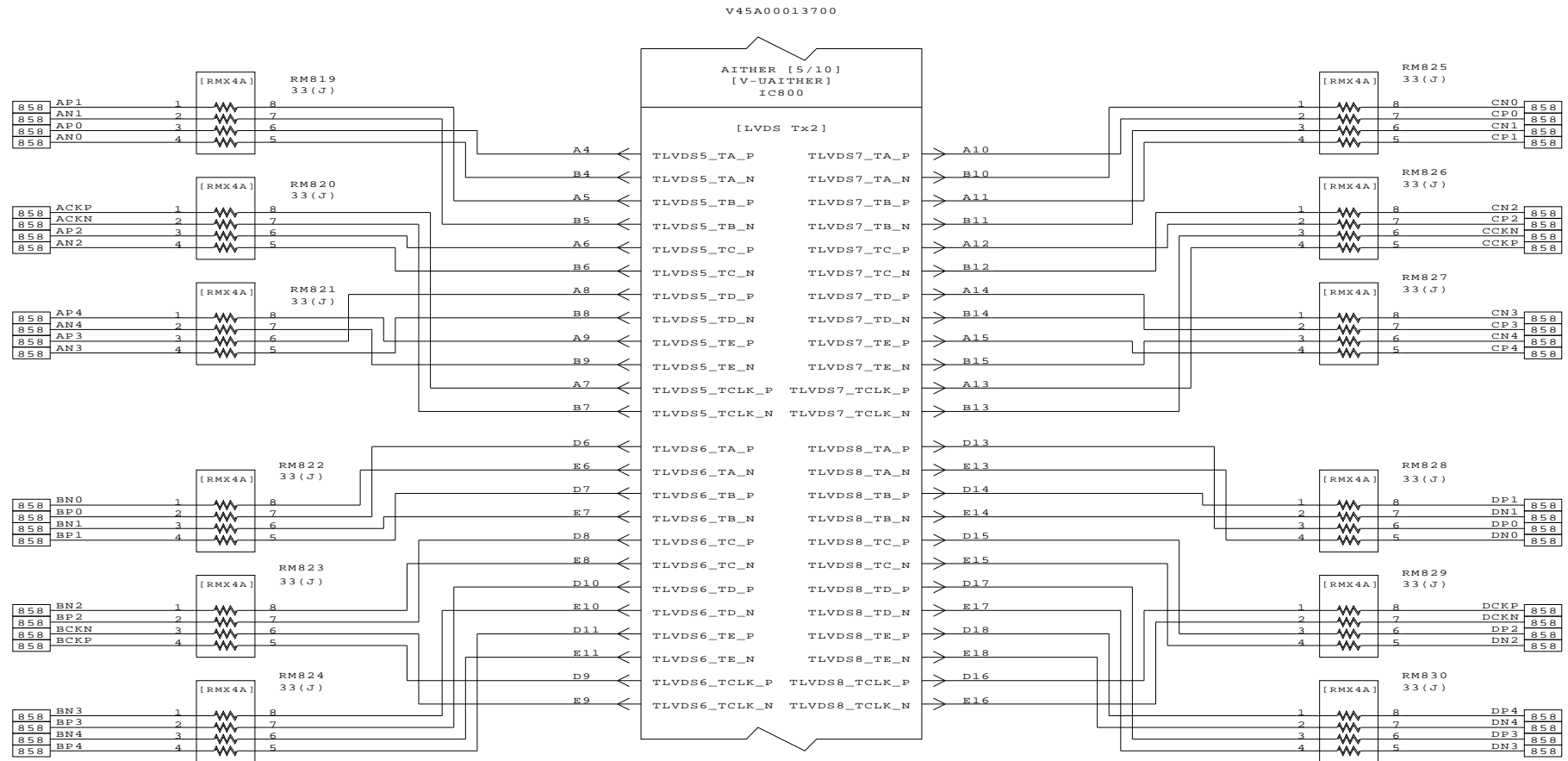
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TITLE

AIETHER

FUNCTION

AIETHER [LVDS Output 2]

SH.NO.

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PAGE NO.

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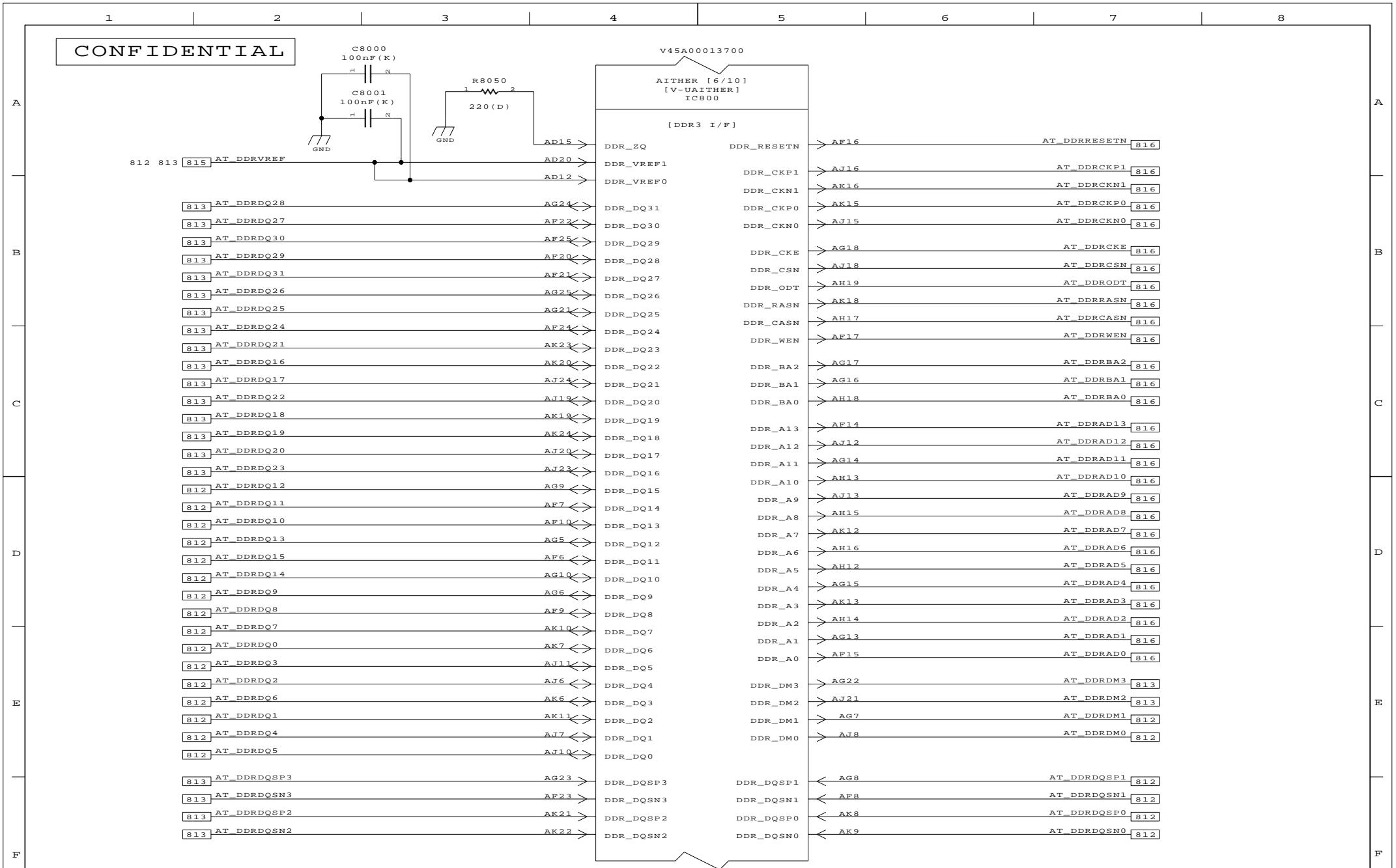
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AITHER

FUNCTION

AITHER [DDR3 I/F]

SH.NO.

805

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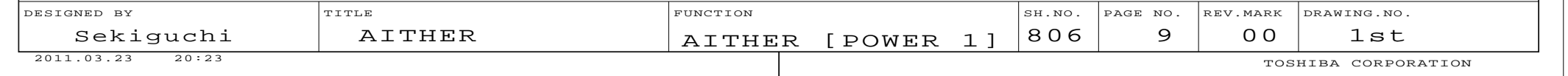
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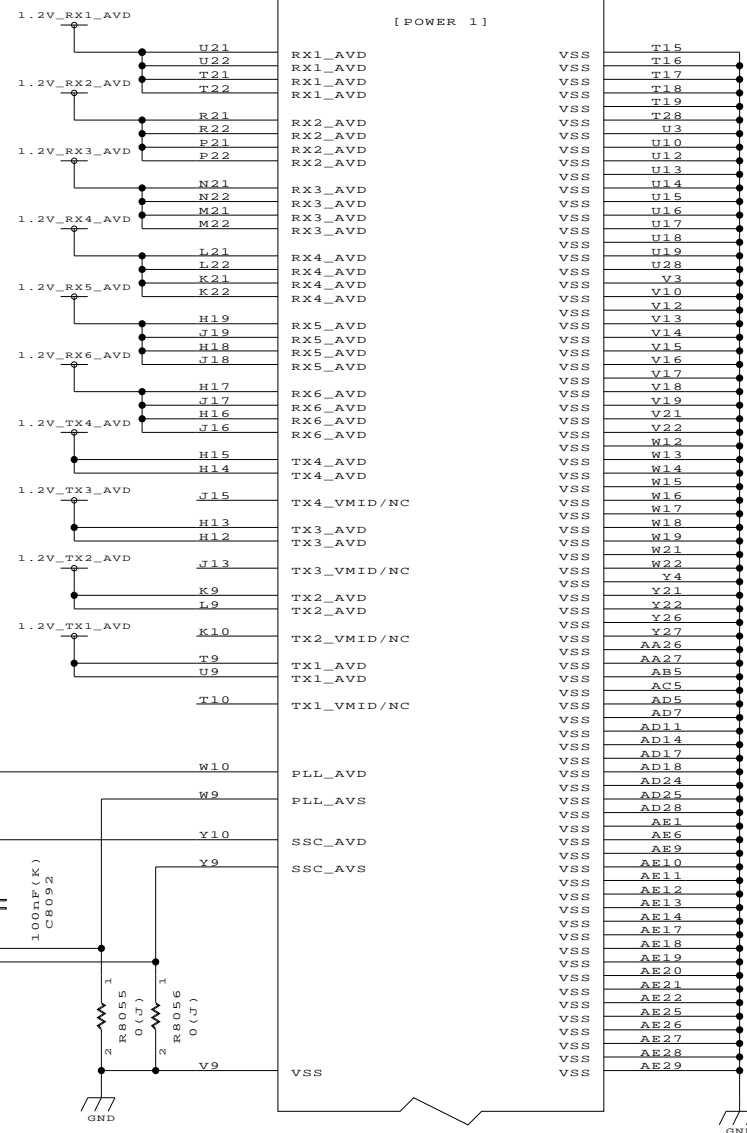
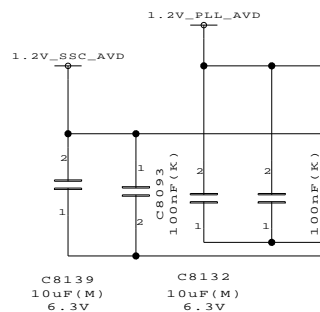
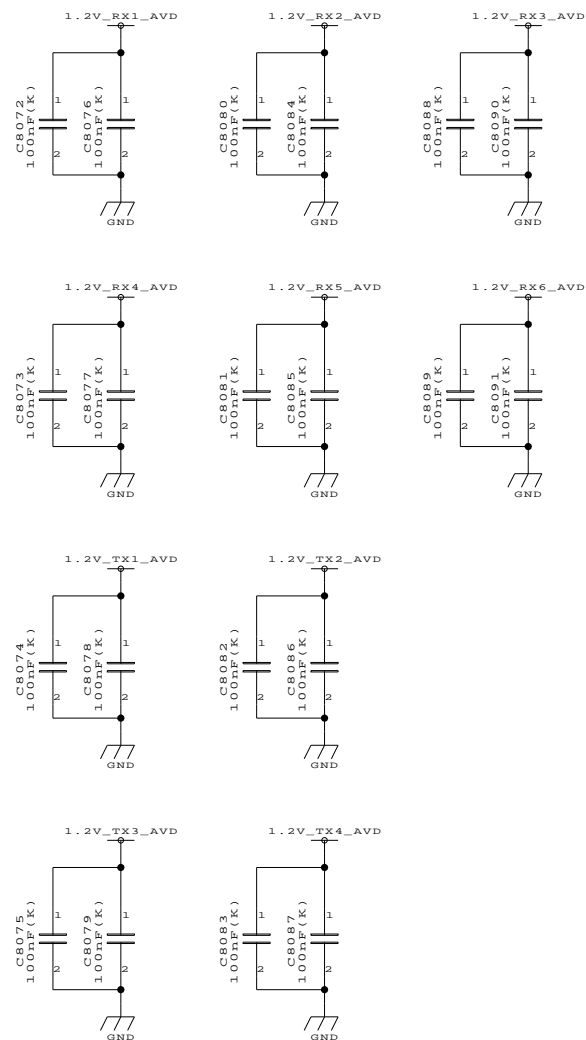




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AITHER

FUNCTION

AITHER [POWER 3]

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808

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TOSHIBA CORPORATION

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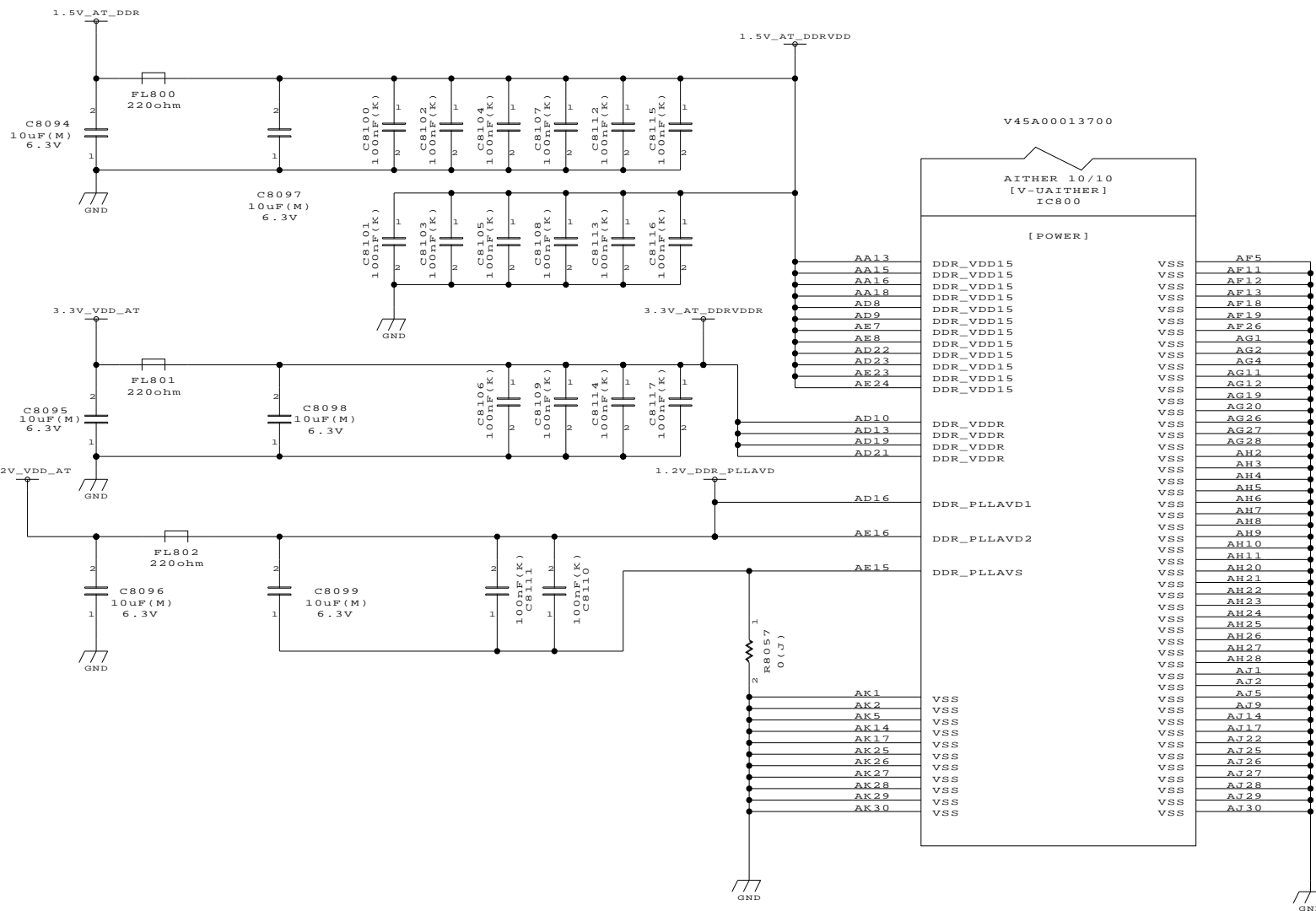
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EITHER

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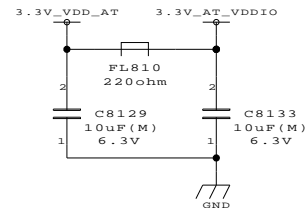
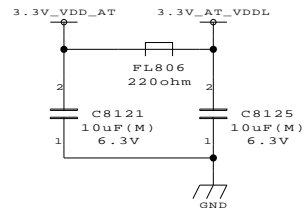
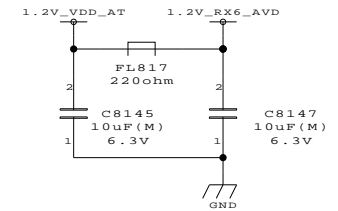
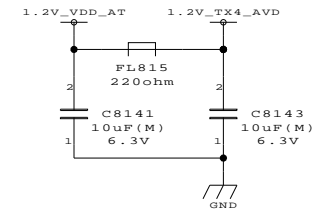
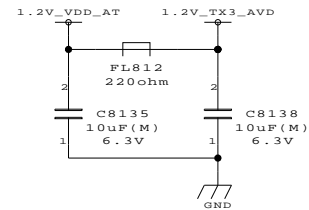
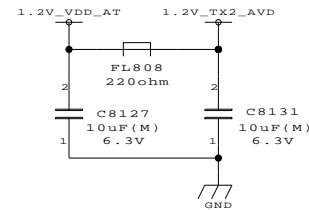
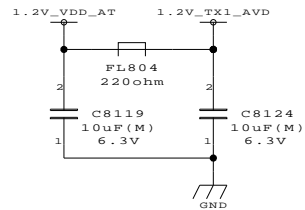
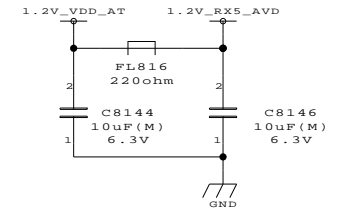
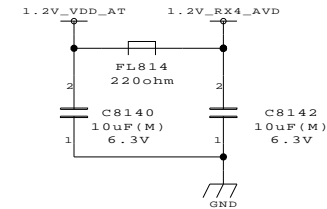
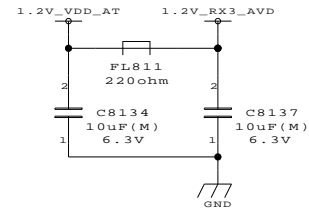
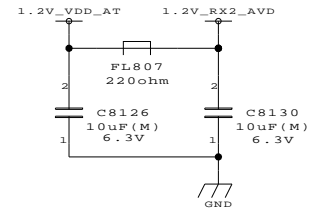
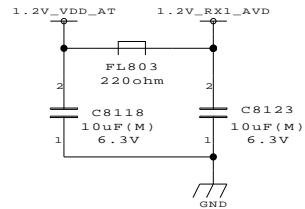
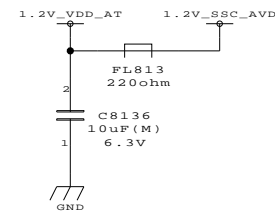
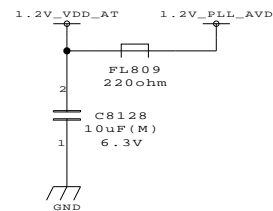
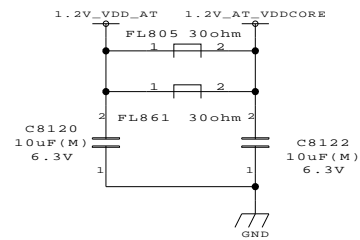
1st

2011.03.23 20:23

TOSHIBA CORPORATION

5T03655D

CONFIDENTIAL



DESIGNED BY

Sekiguchi

TITLE

AITHER

FUNCTION

AITHER POWER Sep. 810

SH.NO.

PAGE NO.

13

REV.MARK

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DRAWING.NO.

1st

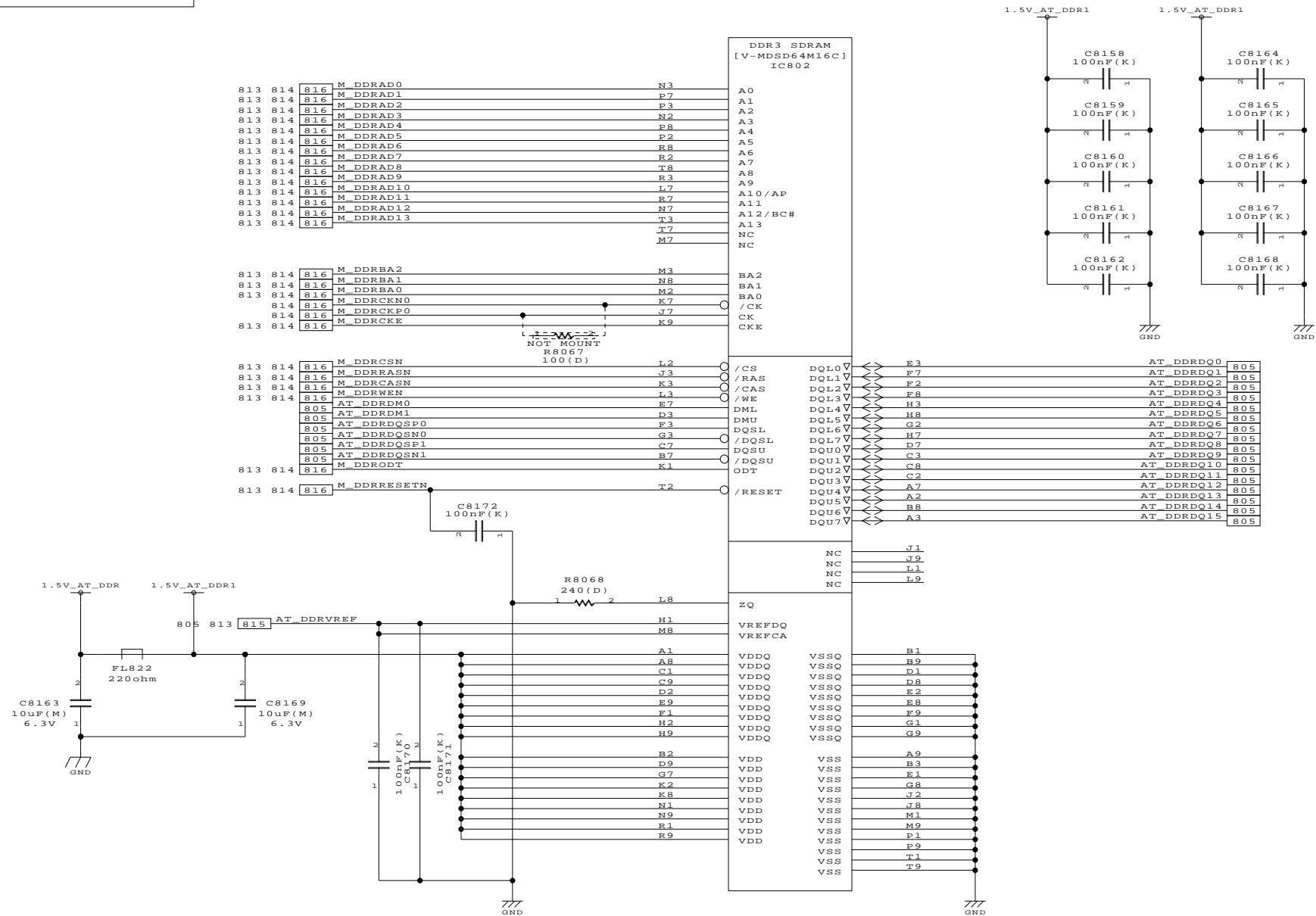
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TOSHIBA CORPORATION



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Sekiguchi

TITLE

AITHER

FUNCTION

DDR3 SDRAM 1 for AITHER

SH.NO.

812

PAGE NO.

15

REV.MARK

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1st

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TOSHIBA CORPORATION

812	814	816	M	DDRAD0	N3	A0
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812	814	816	M	DDRAD2	P3	A2
812	814	816	M	DDRAD3	N2	A3
812	814	816	M	DDRAD4	P8	A4
812	814	816	M	DDRAD5	P2	A5
812	814	816	M	DDRAD6	R8	A6
812	814	816	M	DDRAD7	R2	A7
812	814	816	M	DDRAD8	T8	A8
812	814	816	M	DDRAD9	R3	A9
812	814	816	M	DDRAD10	L7	A10 / AP
812	814	816	M	DDRAD11	R7	A11
812	814	816	M	DDRAD12	N7	A12 / BC#
812	814	816	M	DDRAD13	T3	A13

		M	DDRBA2		M3	BA2
812	814	816	M	DDRB A1	N8	BA1
812	814	816	M	DDRBA0	M2	BA0
812	814	816	M	DDRCN1	K7	CK
812	814	816	M	DDRCKP1	J7	CK
812	814	816	M	DDRCKE	K9	CKE

812	814	816	M	DDRCRN	100 (D)	L2		
812	814	816	M	DDRRASN		J3		/CS
812	814	816	M	DDRCASN		K3		/CAS
812	814	816	M	DDRWN		L3		/WE
		805	AT	DDDRM2		E7		
		805	AT	DDDRM3		D3		DML
		805	AT	DDRDQSP2		F3		
		805	AT	DDRDQSN2		G3		DQSL
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		805	AT	DDRDQSN3		B7		DQSU
812	814	816	M	DDRODT		K1		/DQSU

812 814 816 M_DDRRESETN T2 /RESET

DDR3 SDRAM
[V-MDSD64M16C]
IC803

A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10/AP
A11
A12/BC#
A13
NC
NC

BA2
BA1
BA0
/CK
CK
CKE

```

/CS
/RAS
/CAS
/WE
DML
DMU
DQSL
/DQSL
DQSU
/DQSU
ODT

/RESET

```

ZQ
VREFDQ
VREFCA

VDDQ
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E3	AT	DDRDQ16	805
F7	AT	DDRDQ17	805
F2	AT	DDRDQ18	805
F8	AT	DDRDQ19	805
G3	AT	DDRDQ20	805
H8	AT	DDRDQ21	805
G2	AT	DDRDQ22	805
H7	AT	DDRDQ23	805
D7	AT	DDRDQ24	805
C3	AT	DDRDQ25	805
C8	AT	DDRDQ26	805
C2	AT	DDRDQ27	805
A7	AT	DDRDQ28	805
A2	AT	DDRDQ29	805
B8	AT	DDRDQ30	805
A3	AT	DDRDQ31	805

J1
J9
L1
L9

B1
B9
D1
D8
E2
E8
F9
G1
G9
A9
B3
E1
G8
J2
J8
M1
M9
P1
P9
T1
T9

DESIGNED BY

Sekiguchi

TITLE

EITHER

FUNCTION

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DDR3  SDRAM  2  for  EITHER
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SH. NO.	
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R	8	1	3
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PAGE NO.

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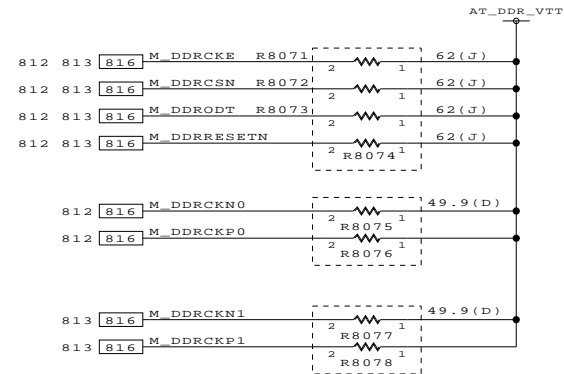
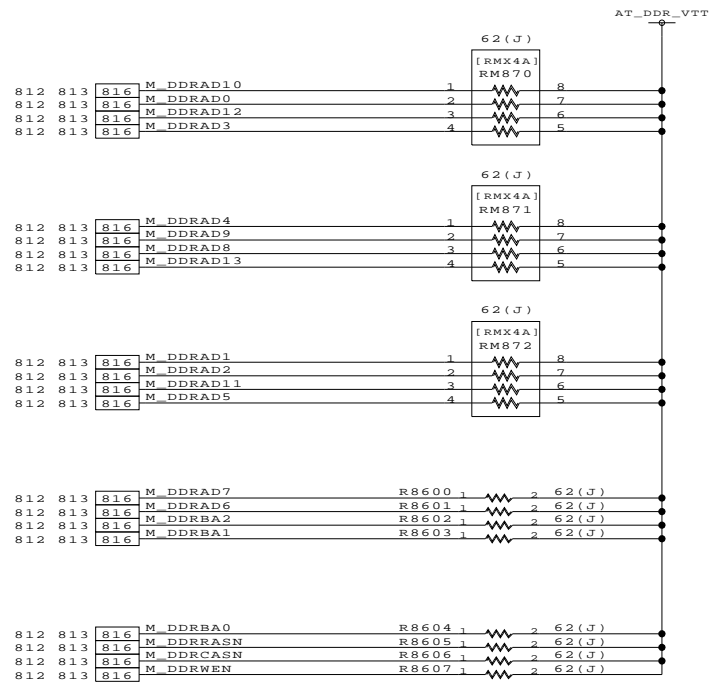
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Sekiguchi

TITLE

AITHER

FUNCTION

DDR3 Termination Regs.

SH.NO.

814

PAGE NO.

17

REV.MARK

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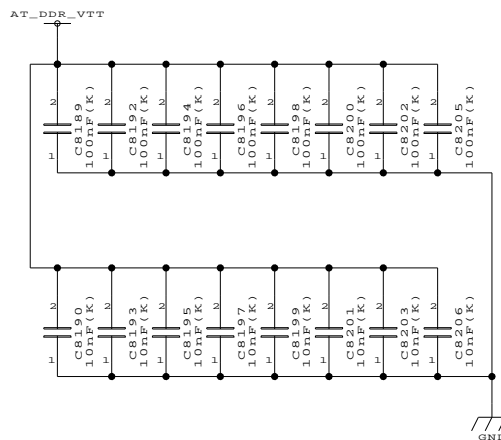
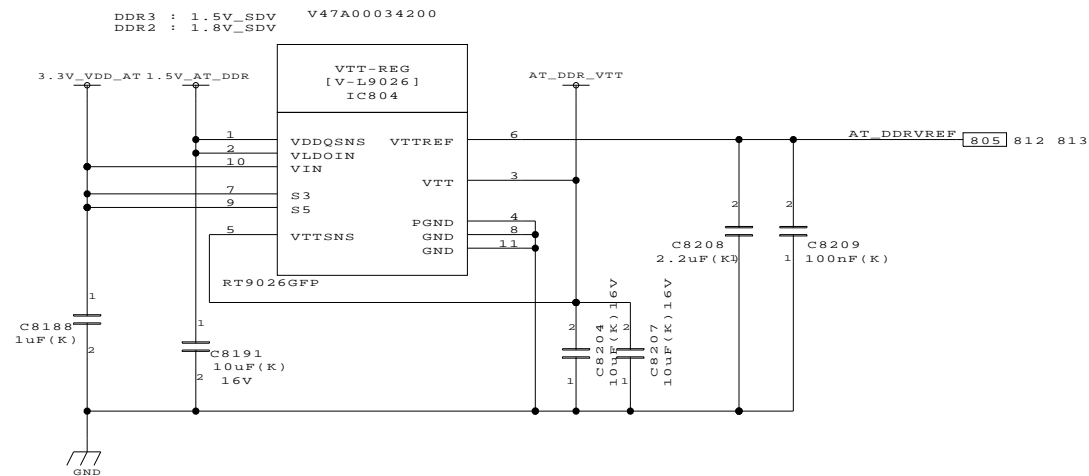
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TITLE

AITHER

FUNCTION

DDR3 VTT-REG

SH.NO.

815

PAGE NO.

18

REV.MARK

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TOSHIBA CORPORATION

A



B



c



D



E



F

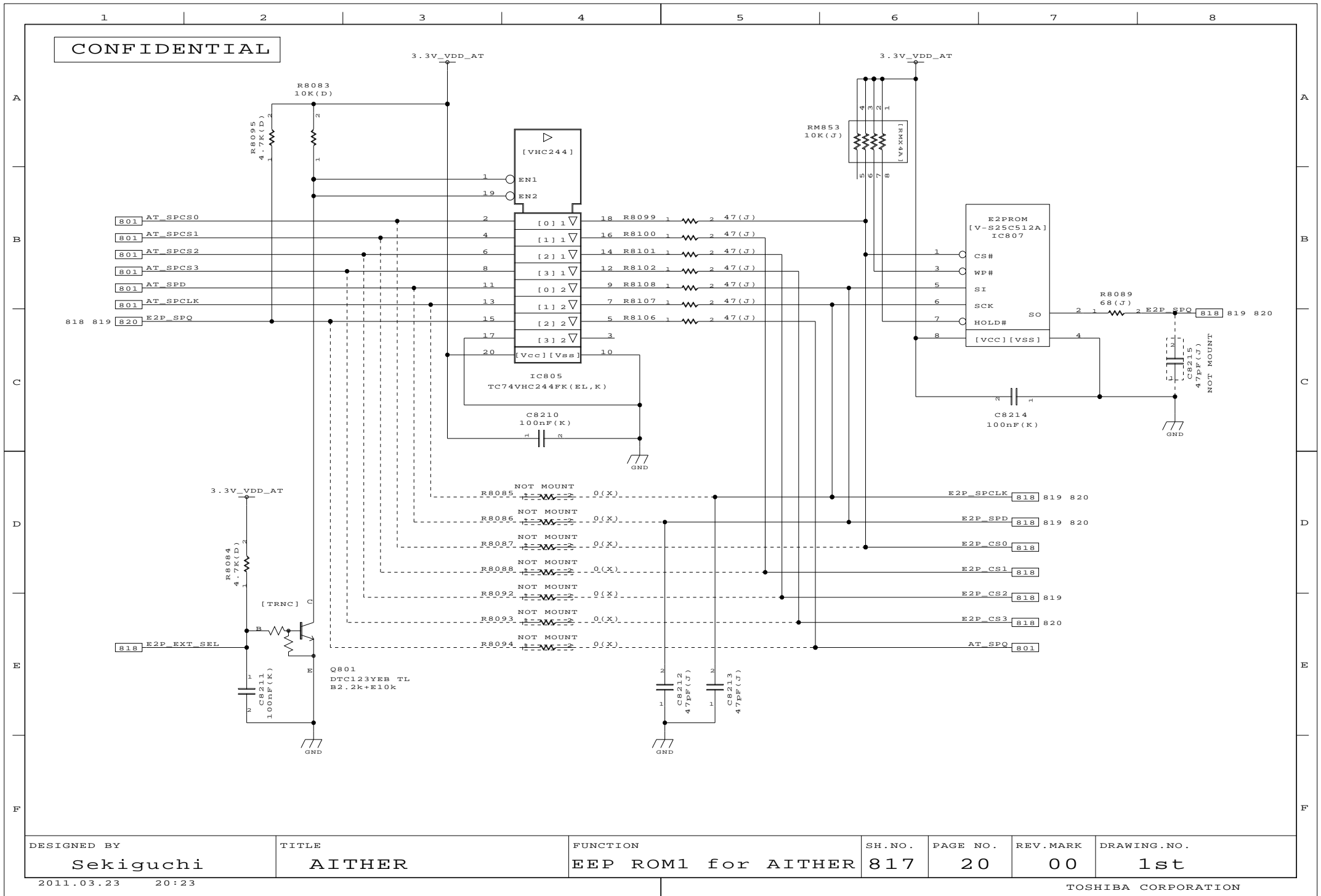


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TOSHIBA CORPORATION

5T03655D



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Sekiguchi

TITLE

AITHER

FUNCTION

EEP ROM1 for AITHER

SH.NO.

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PAGE NO.

20

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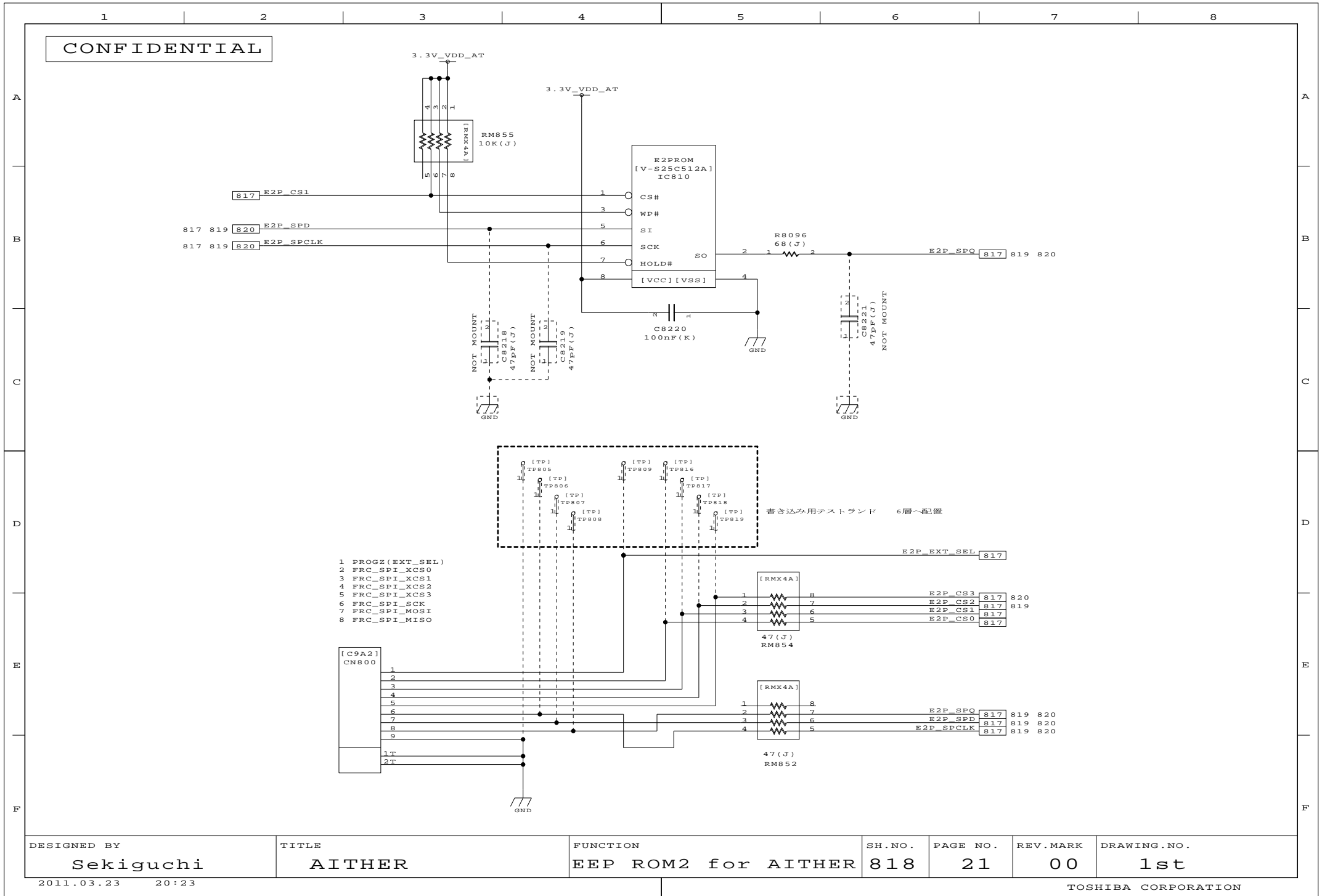
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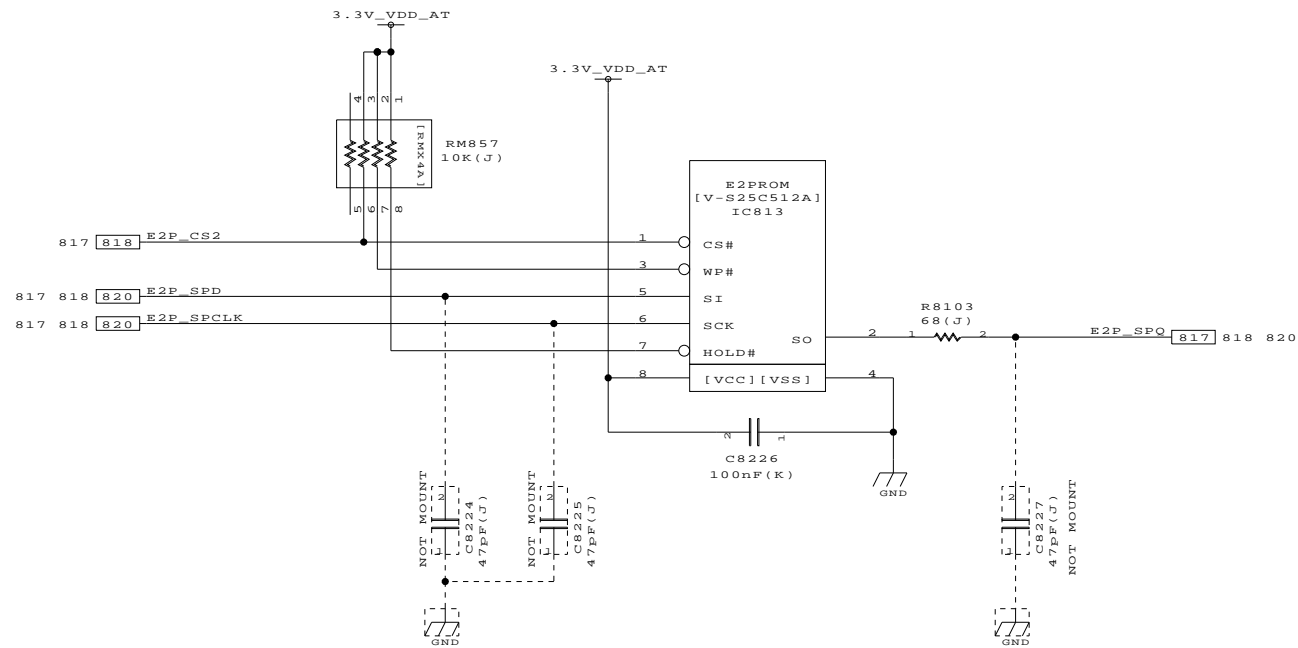
TOSHIBA CORPORATION

5T03655D



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TITLE

AITHER

FUNCTION

EEP ROM3 for AITHER

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PAGE NO.

22

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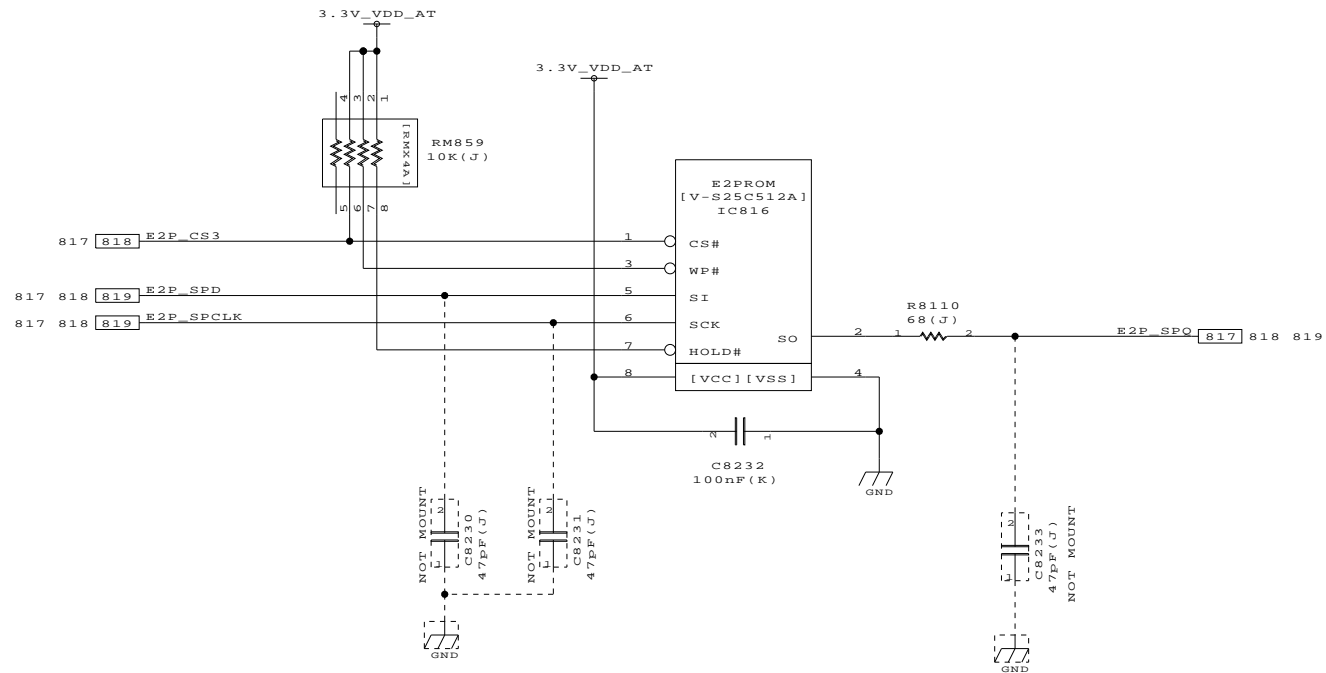
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Sekiguchi

TITLE

AITHER

FUNCTION

EEP ROM4 for AITHER

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820

PAGE NO.

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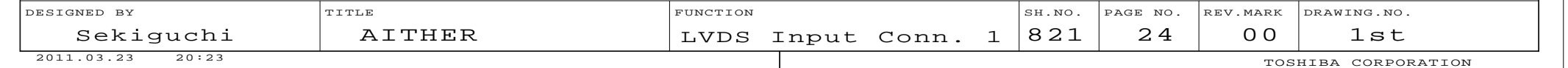
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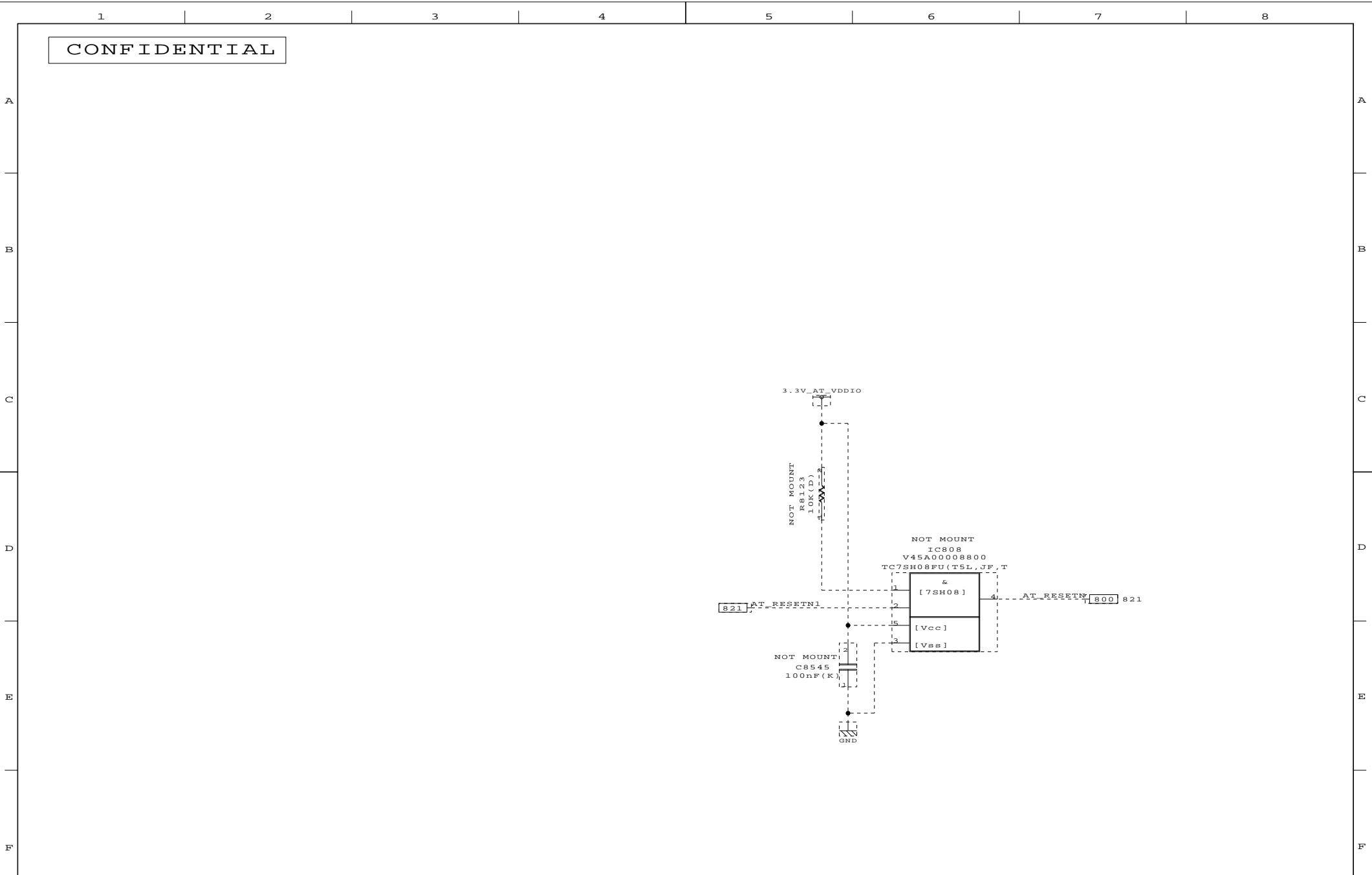
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TOSHIBA CORPORATION



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DESIGNED BY	TITLE	FUNCTION	SH.NO.	PAGE NO.	REV.MARK	DRAWING.NO.
Sekiguchi	AITHER	LVDS Input Conn. 2	822	25	00	1st

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TOSHIBA CORPORATION

A



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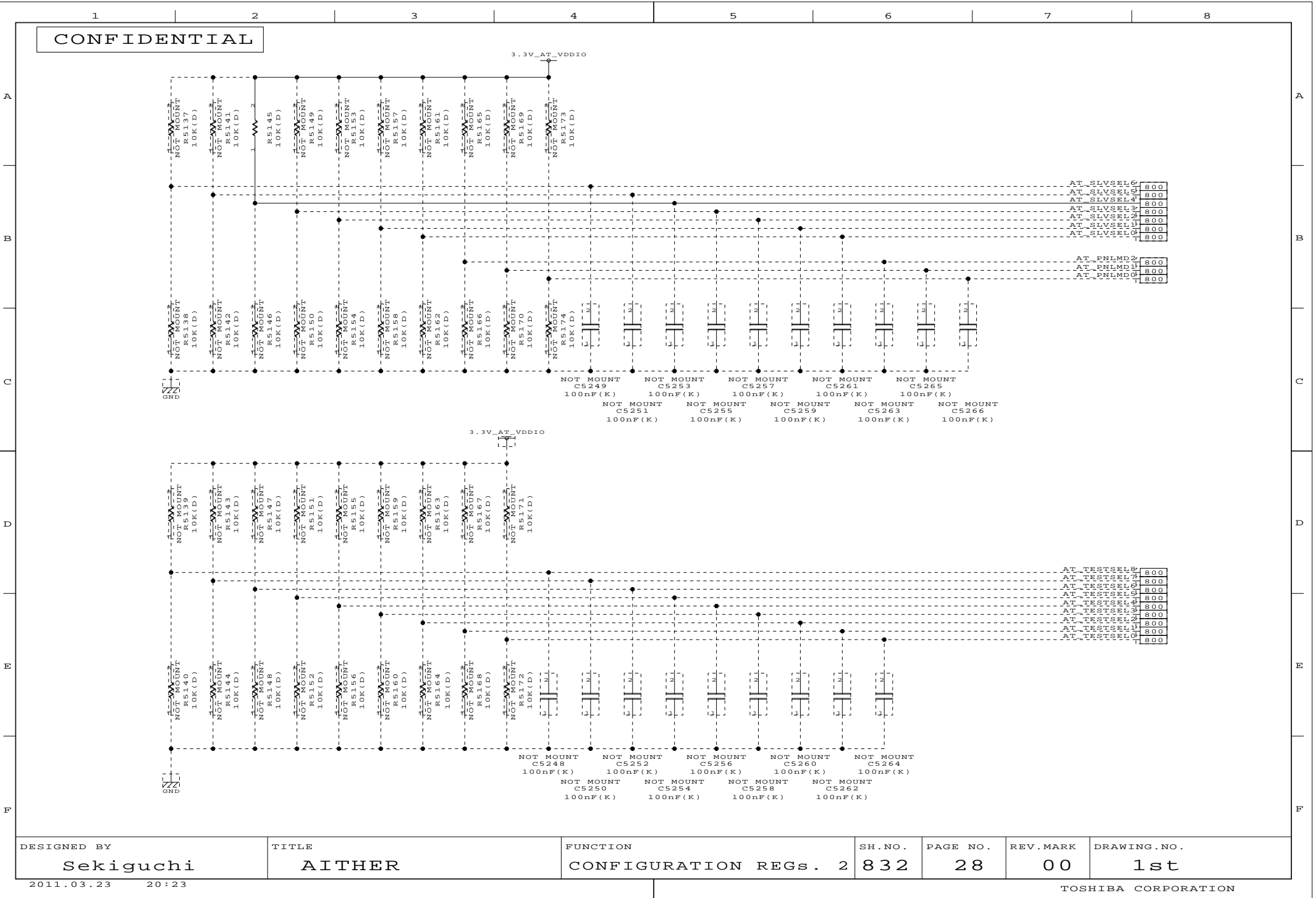
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F

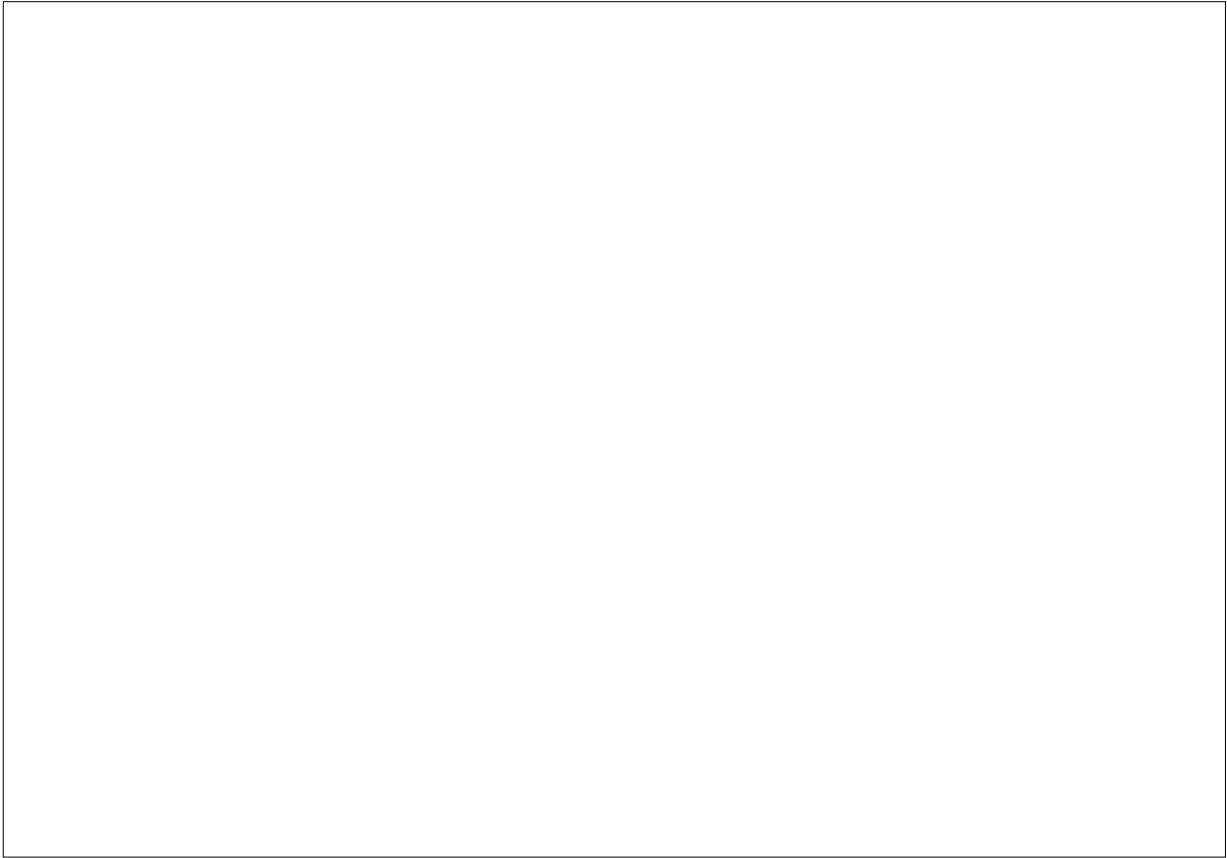


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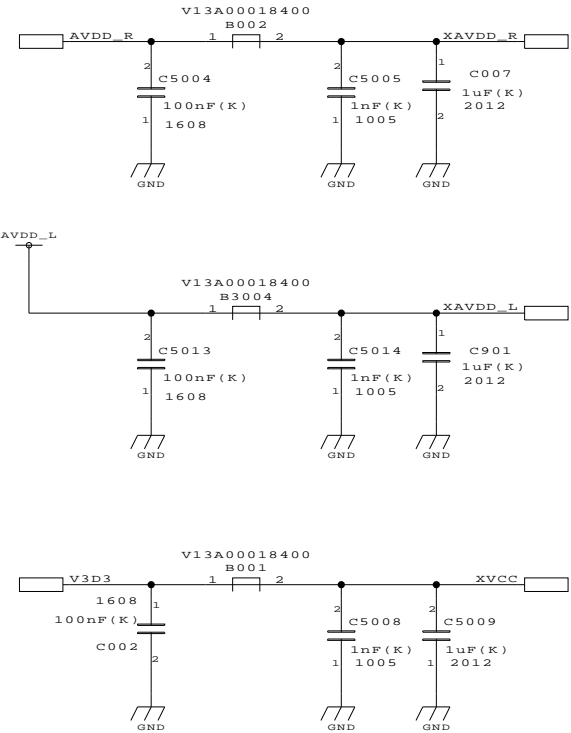


5T03655D

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J1,J2はSheet 857のJ1,J2と同一。
シートコネクタは Sheet 857 J1,J2の同一 Net 名に接続。
Net を接続した上で J1,J2は削除してください。

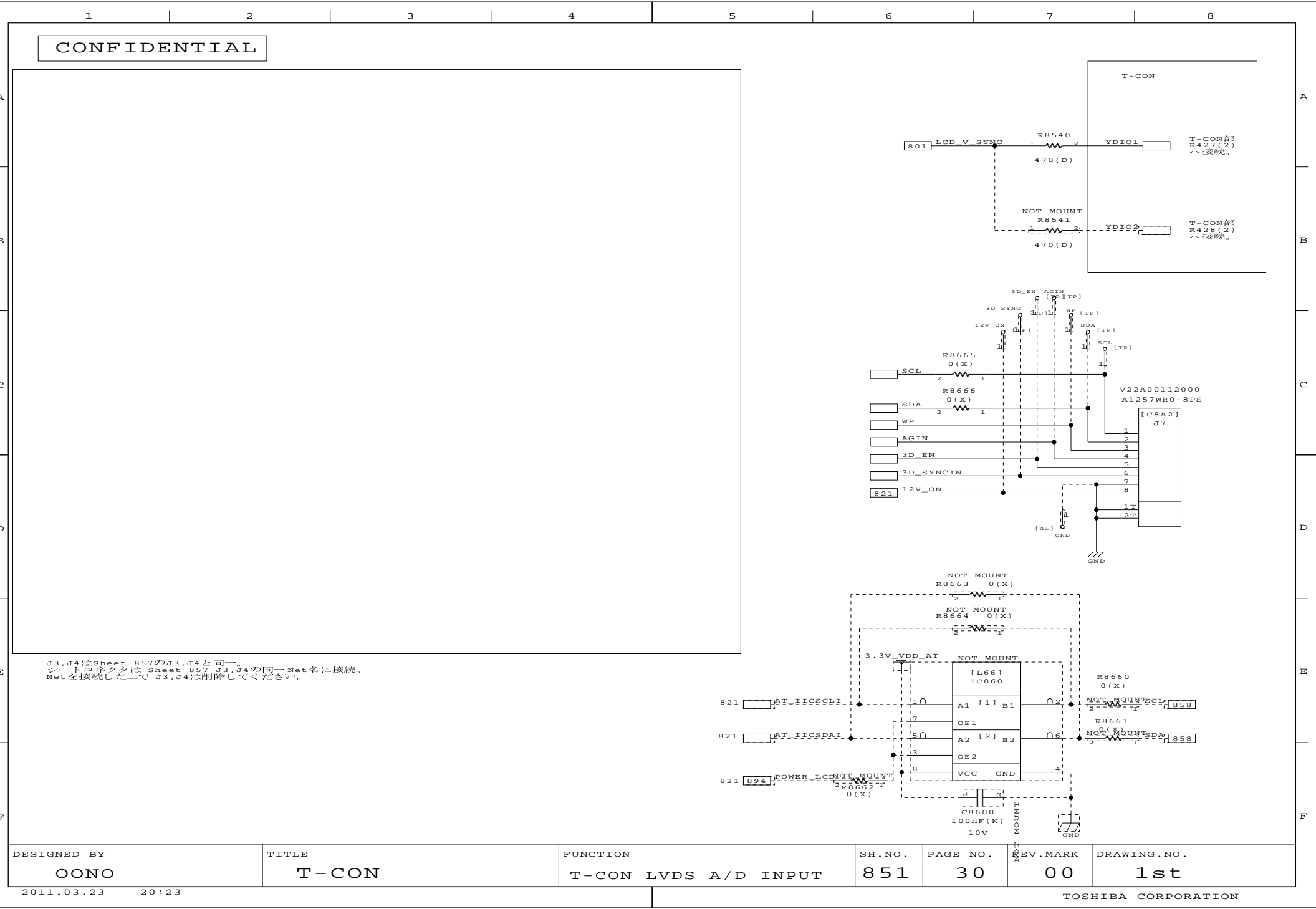


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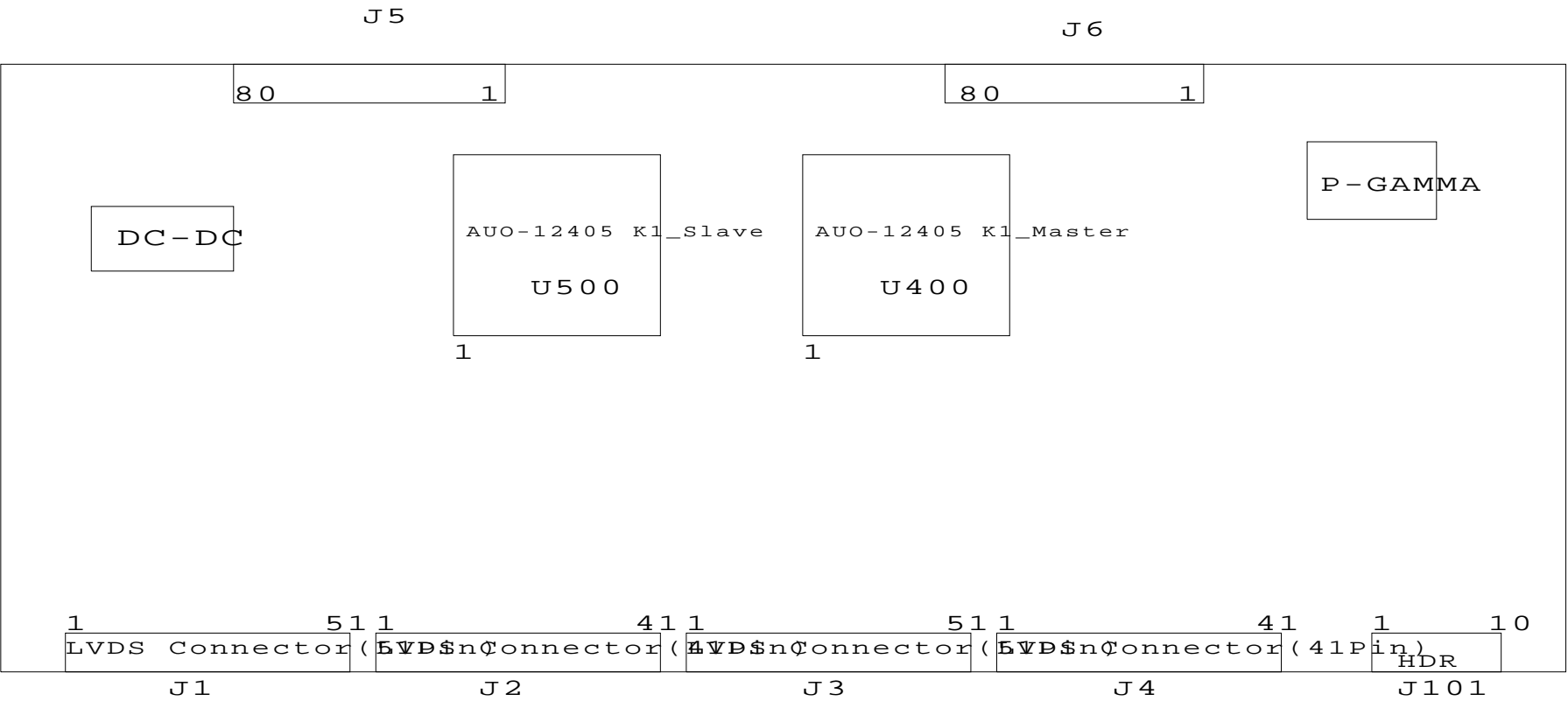
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TOSHIBA CORPORATION

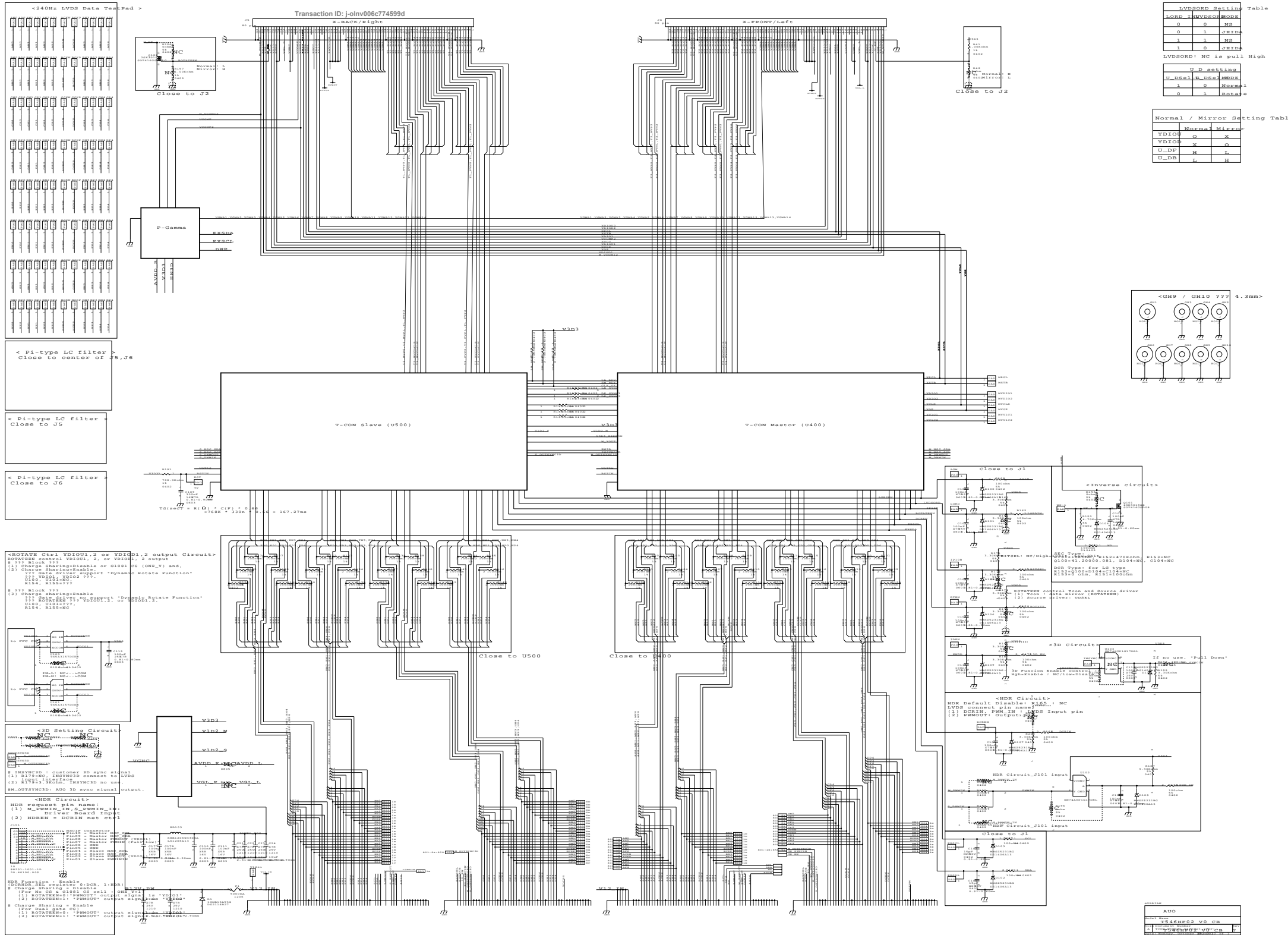
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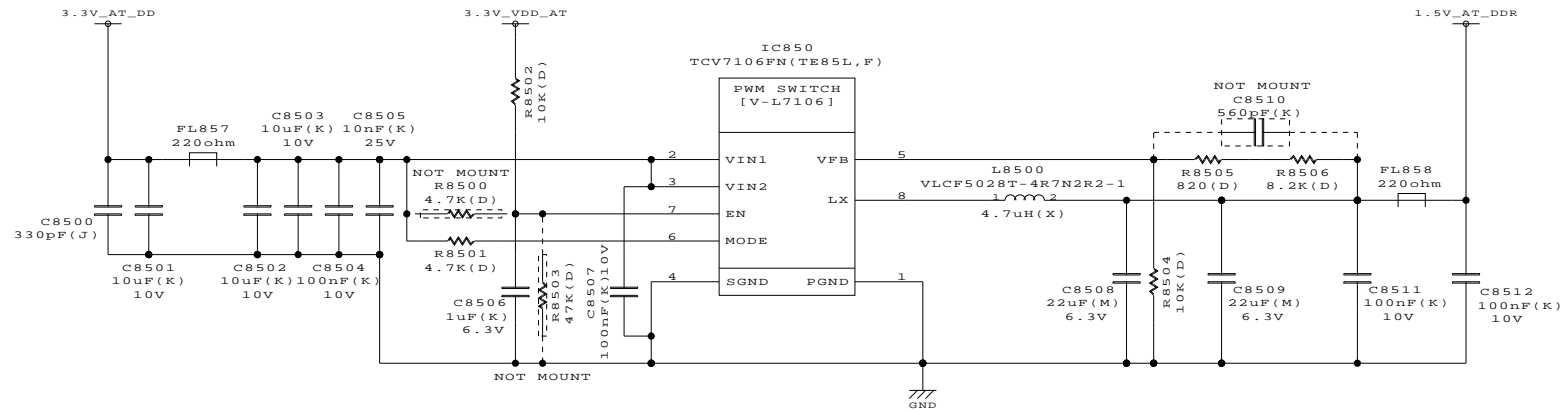
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@VARIAN			
AUO			
Model Number T546HF02 V0 CB			
Placement			
Size A	Document Number T546HF02 V0 CB		
Date: Monday, October 18, 2010			Rev ?
Sheet 10 of 1			



5T03655D



DESIGNED BY 2011/01/24
Nagaoka/Nakano

TITLE
AITHER

FUNCTION
POWER 1.5V

SH.NO.
891

PAGE NO.
31

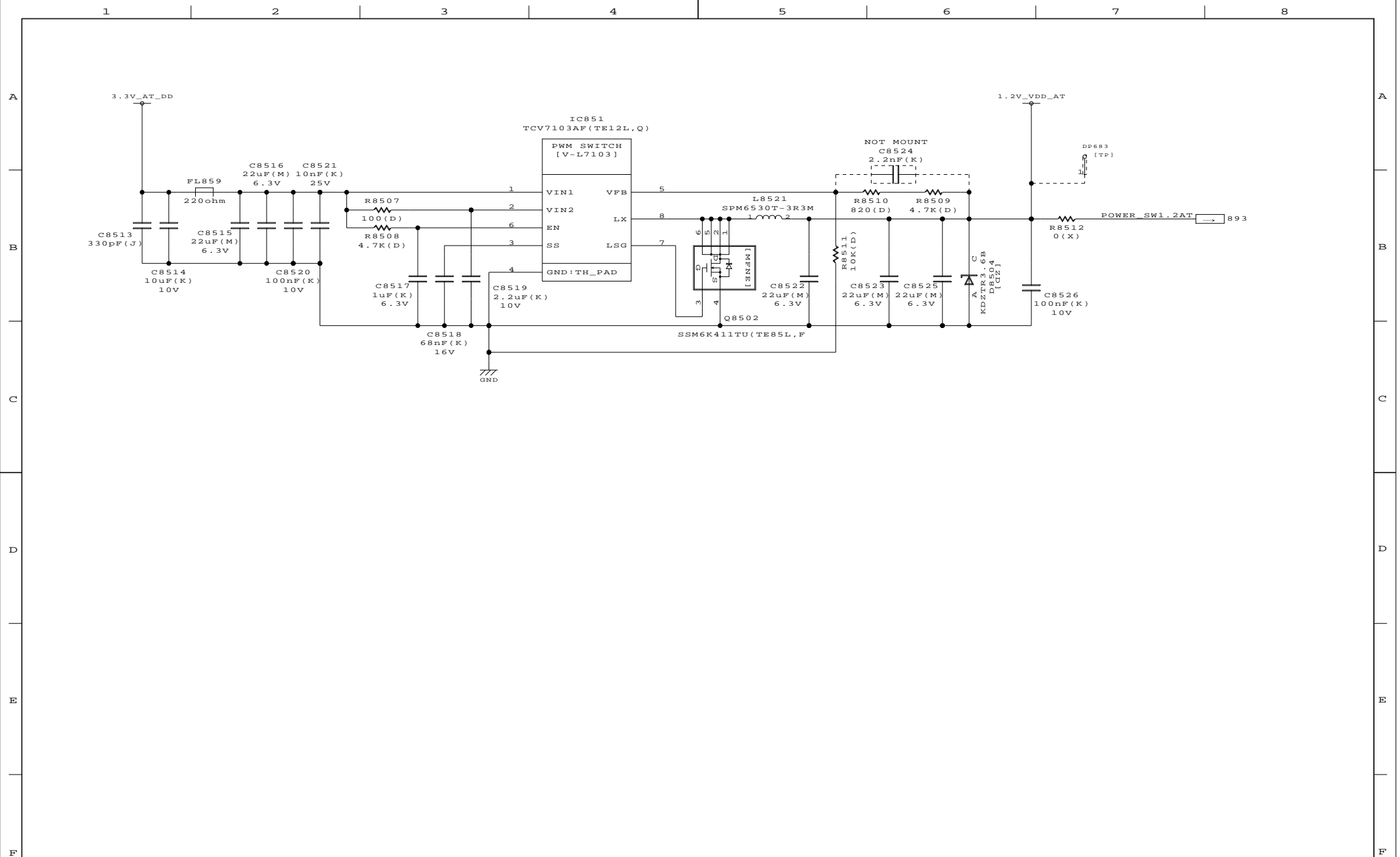
REV.MARK
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1st

2011.03.23 20:23

TOSHIBA CORPORATION

5T03655D



DESIGNED BY 2011/01/24
Nagaoka/Nakano

TITLE
AITHER

FUNCTION
POWER 1.2V

SH.NO.
892

PAGE NO.
32

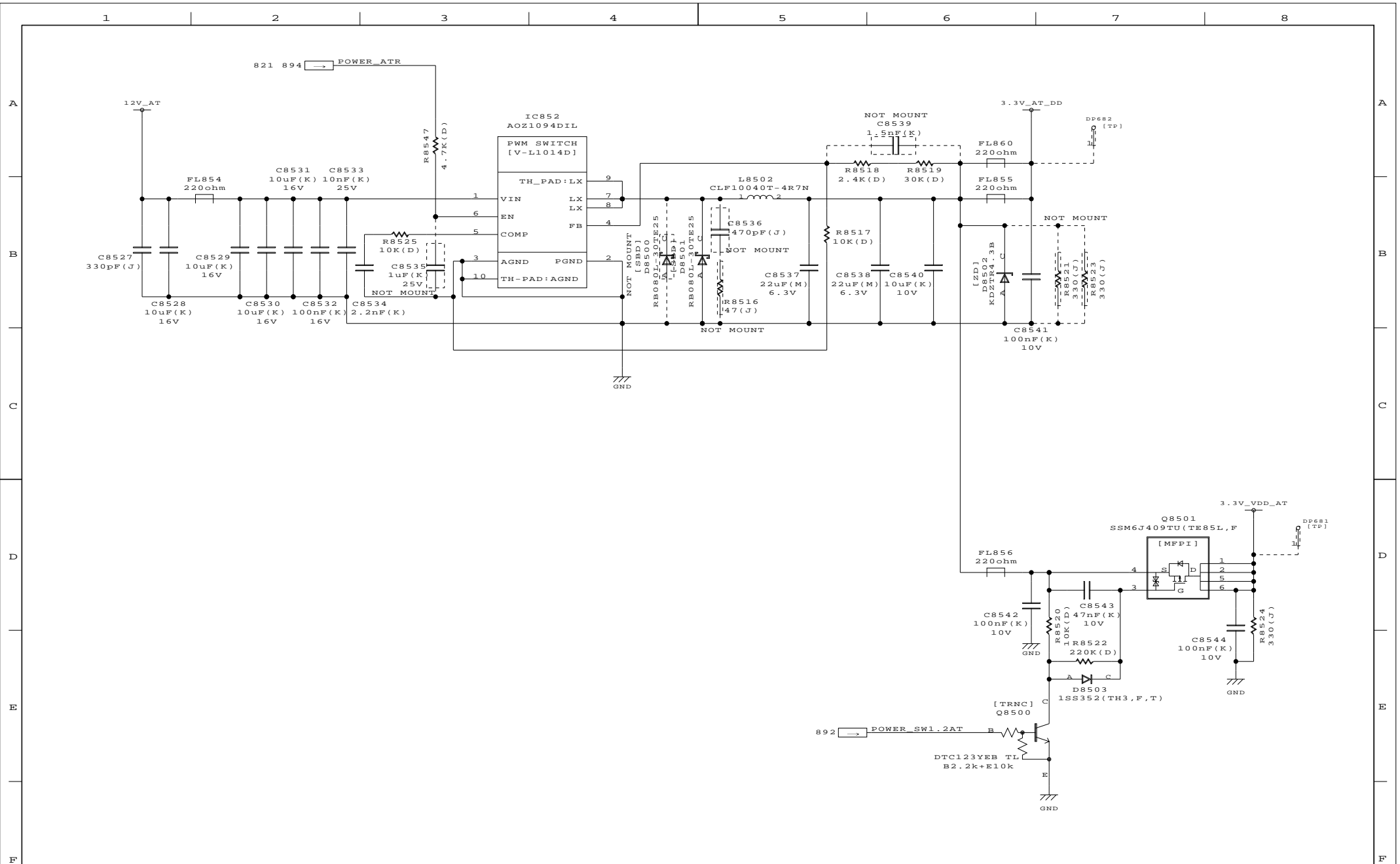
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TOSHIBA CORPORATION

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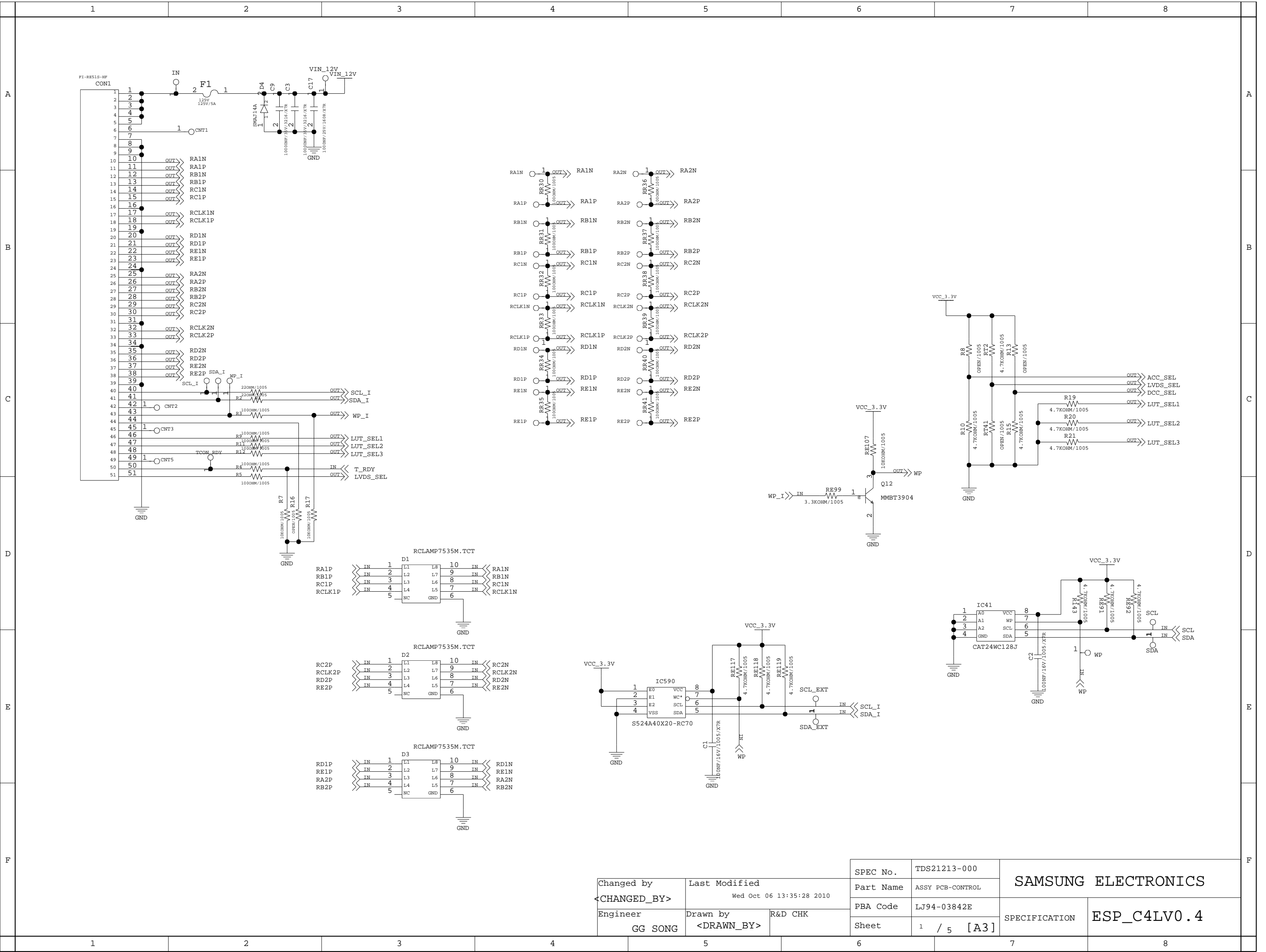


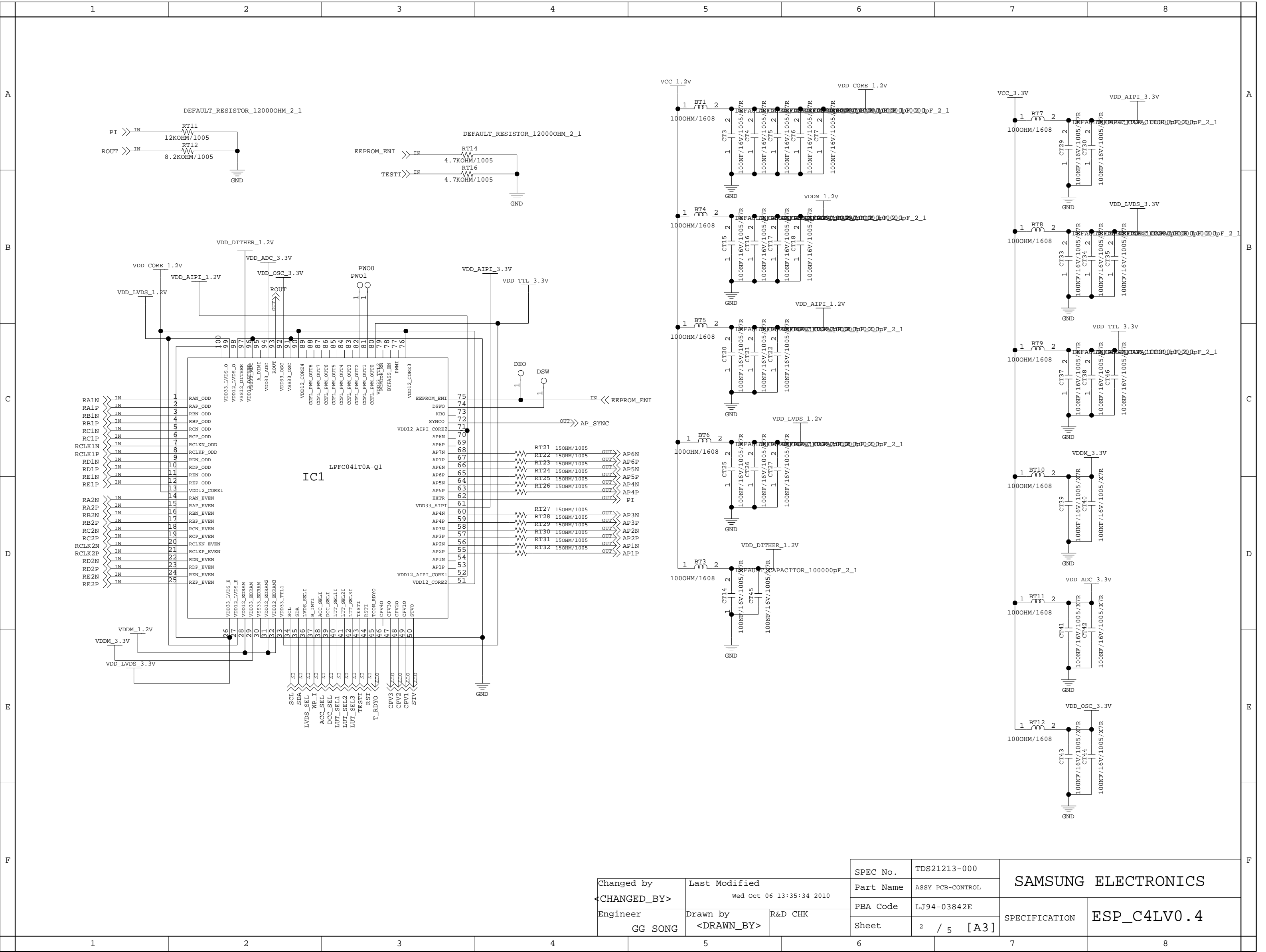


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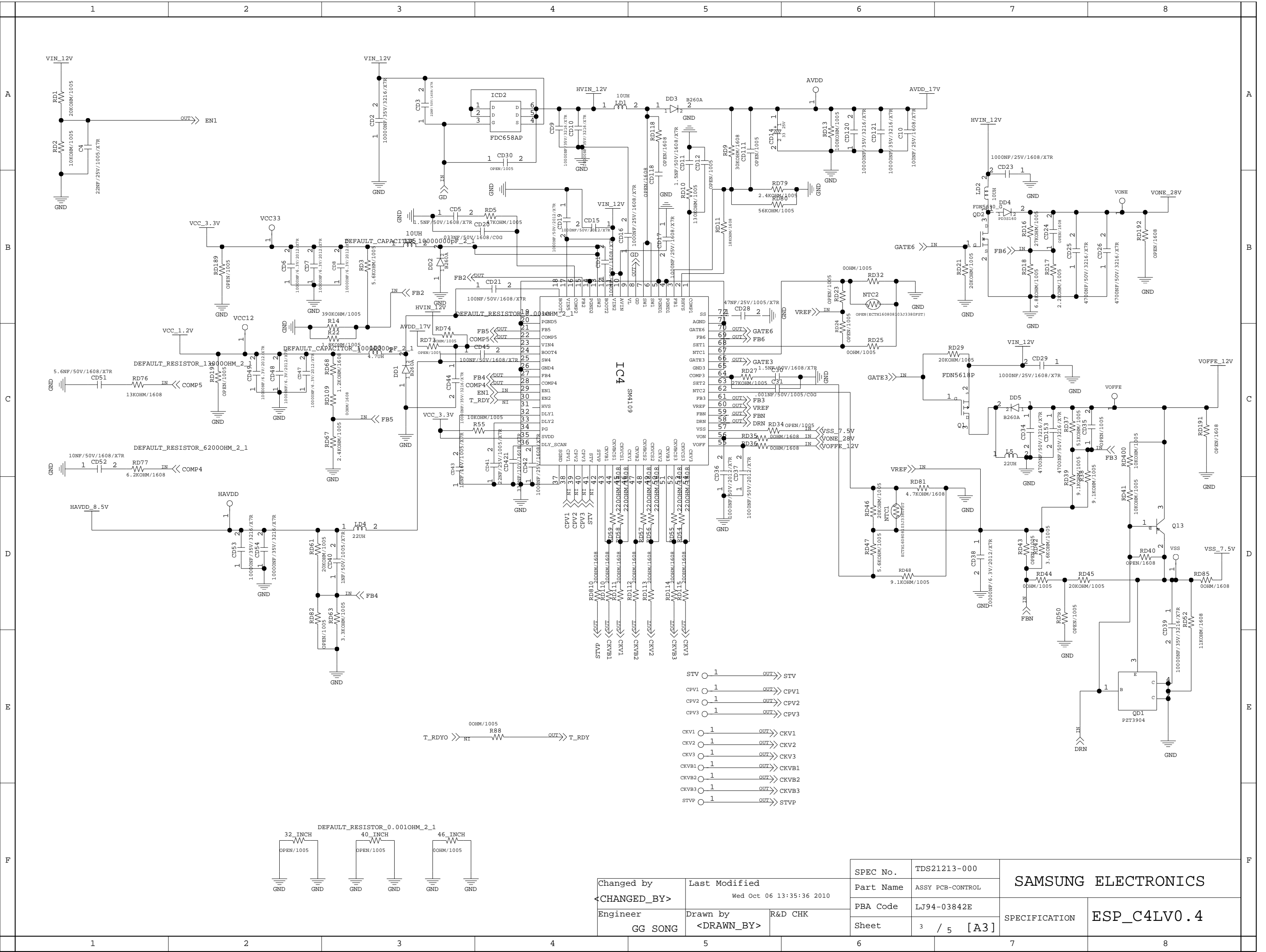
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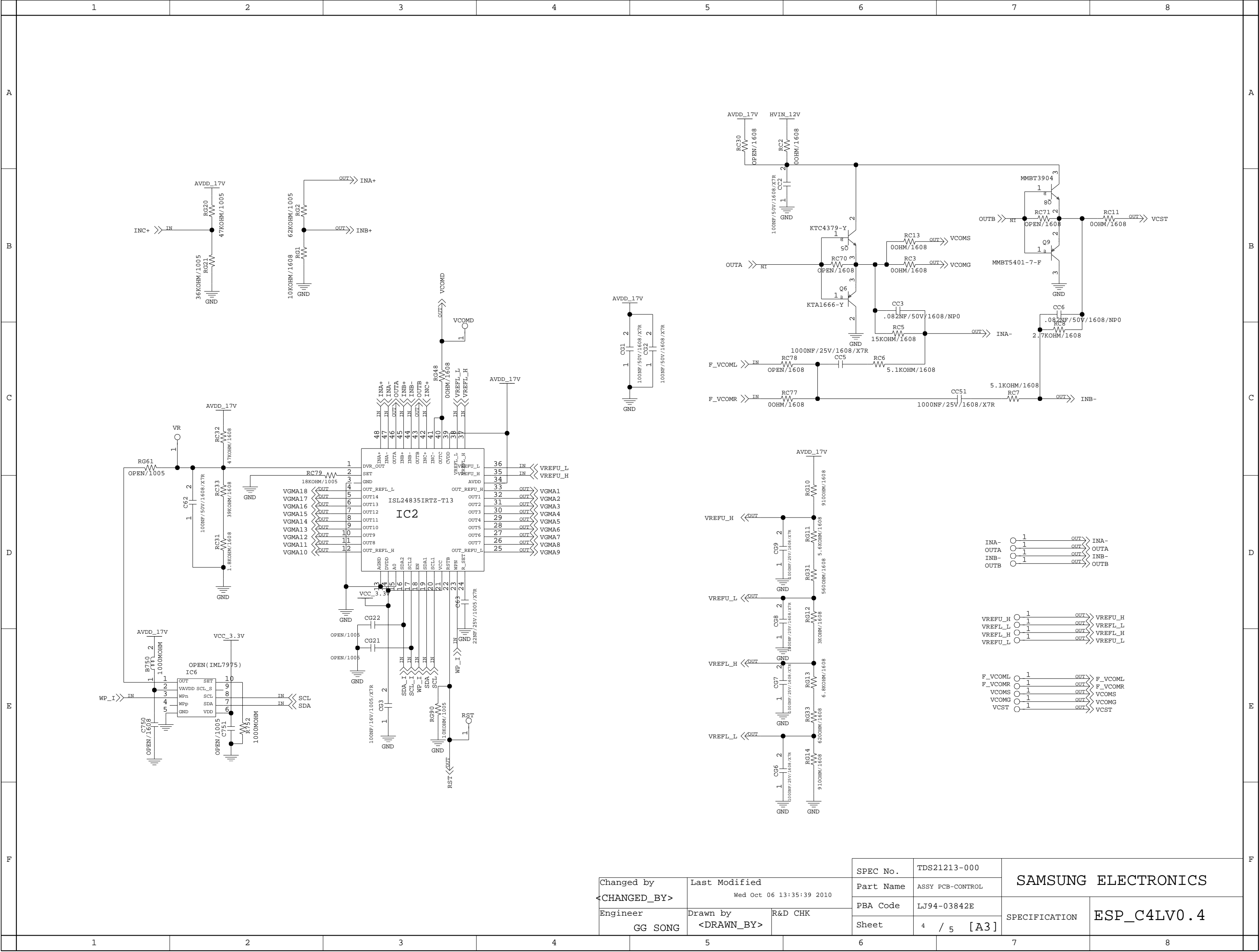
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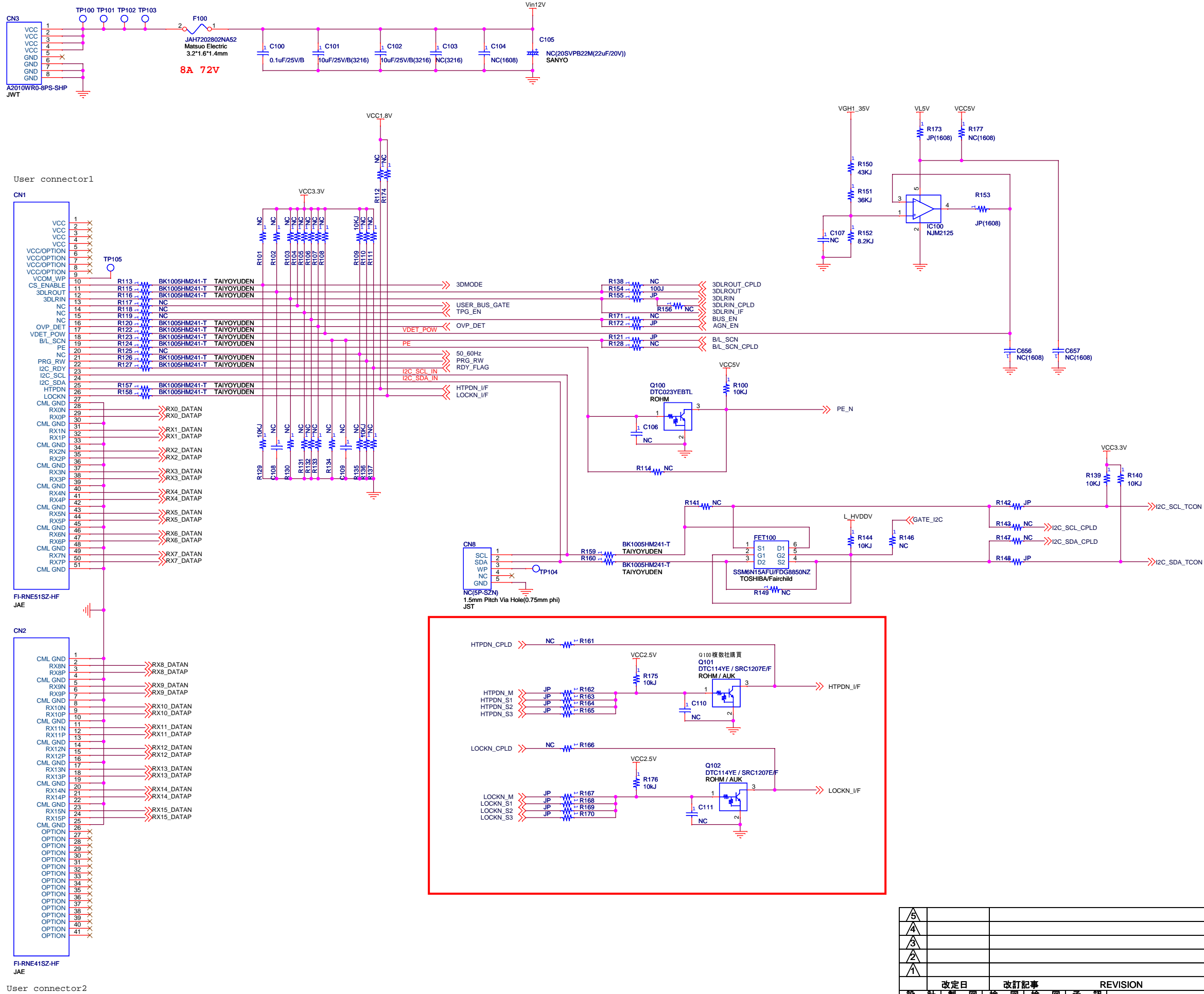




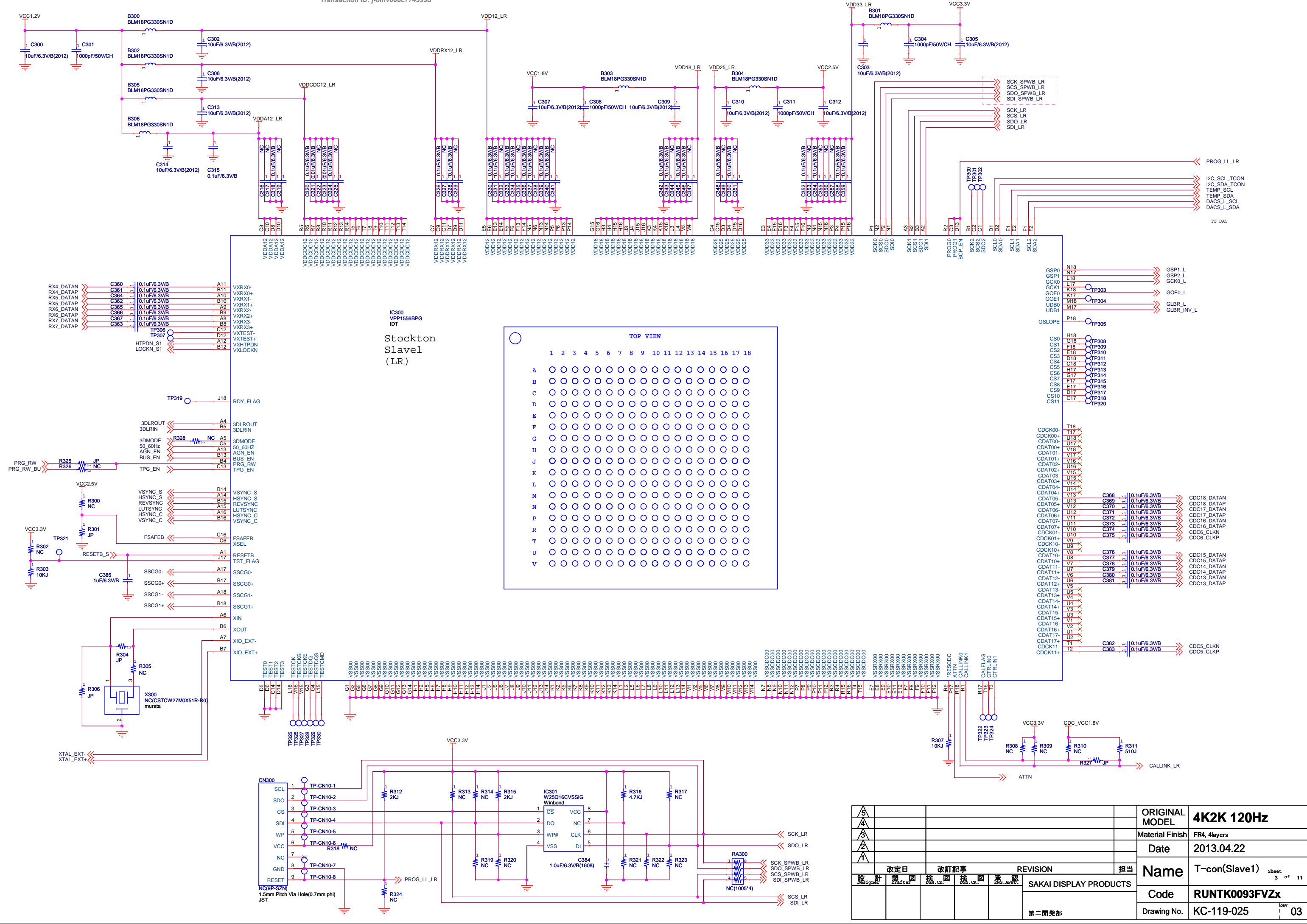
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Engineer GG SONG		Drawn by <DRAWN_BY>		R&D CHK			
				Part Name	ASSY PCB-CONTROL	SPECIFICATION	ESP_C4LV0.4
				Sheet	2 / 5 [A3]		



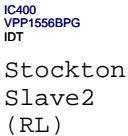


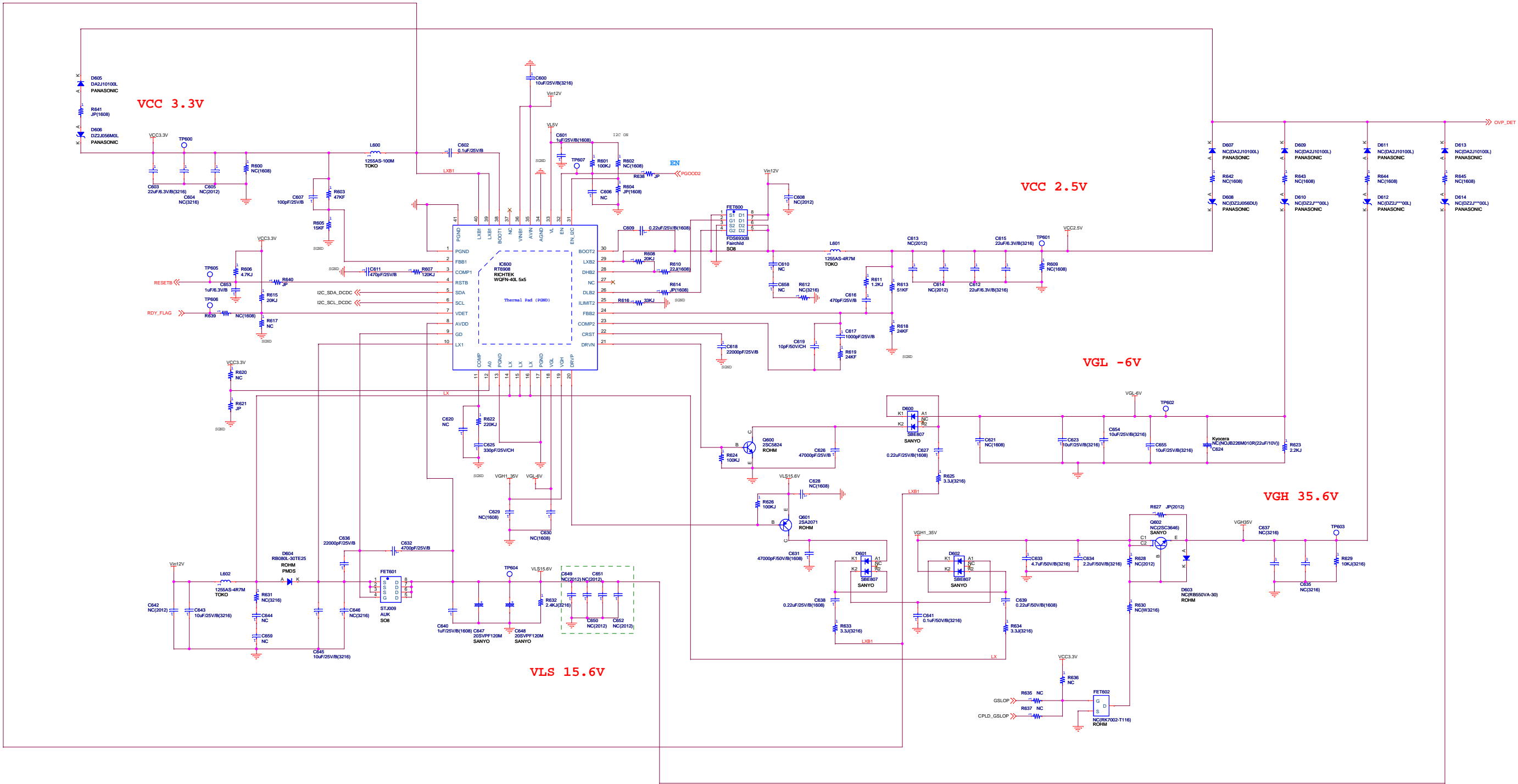


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△					Material Finish	FR4, 4layers
△					Date	2013.04.22
△					Name	I/F
△					Code	RUNK0093FVZx
△					Drawing No.	KC-119-025
△					REVISION	
△					Design	
△					Check	
△					Draw	
△					Eng. Appr.	
△					Second Release	

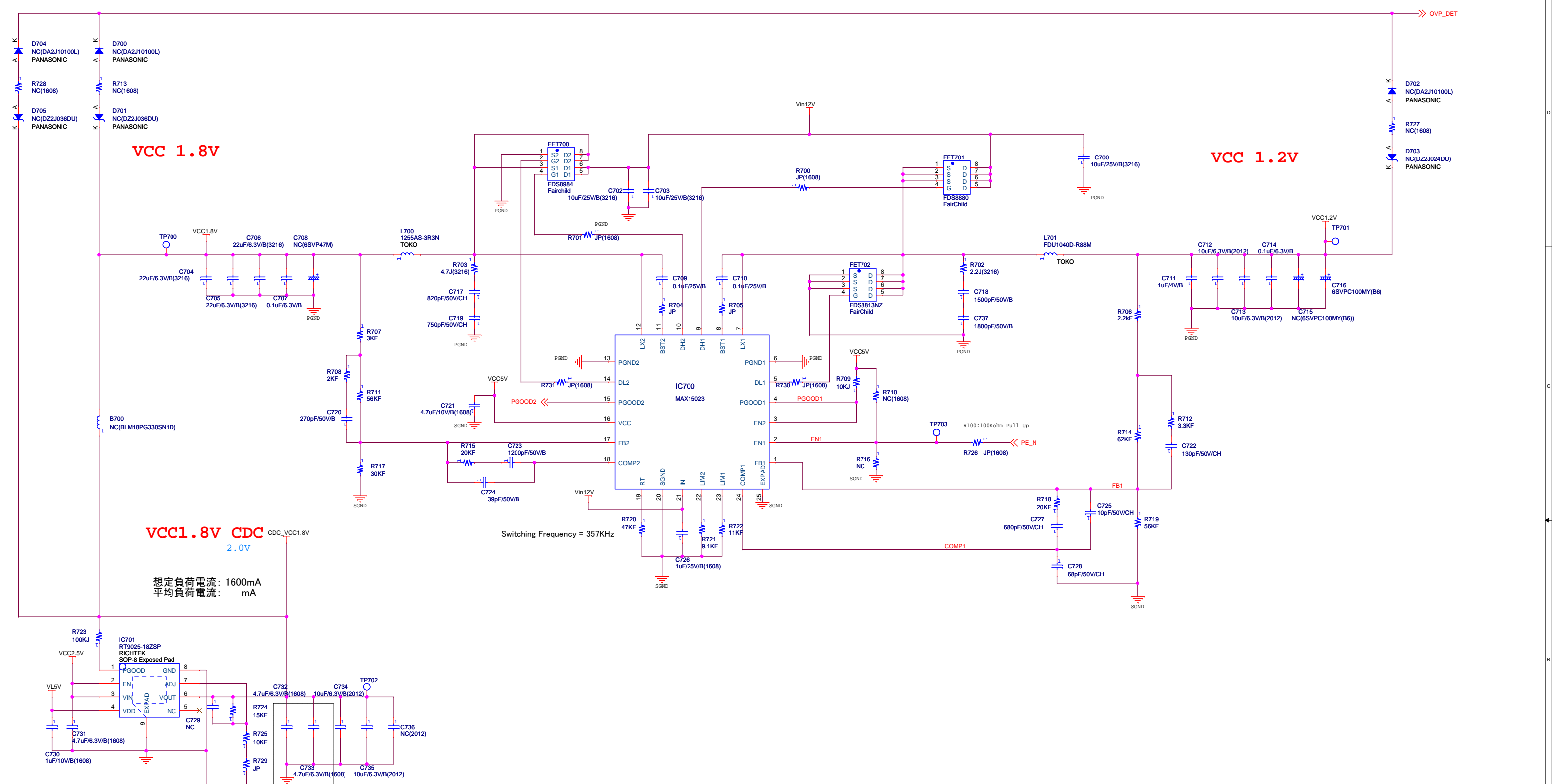


5						ORIGINAL MODEL	4K2K 120Hz
4						Material Finish	FR4, 4layers
3						Date	2013.04.22
2						Name	T-con(Slave1) <div>Sheet 3 of 11</div>
1							
改定日		改訂記事		REVISION		担当	
設計	製図	検図	検図	承認	SAKAI DISPLAY PRODUCTS		
Designer	Drafter	CSN_CK	CSN_CK	CSN_APPR	第二開発部		
						Code	RUNTK0093FVZx
						Drawing No.	KC-119-025 <div>Rev 03</div>





△				ORIGINAL	4K2K 120Hz
△				MODEL	
△				Material Finish	
△				Date	2013.04.22
△				Name	POWER1
△				Code	RUNTK0093FVZx
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REVISION					Sheet 6 of 11
SAKAI DISPLAY PRODUCTS					Rev 1
液晶事業本部					

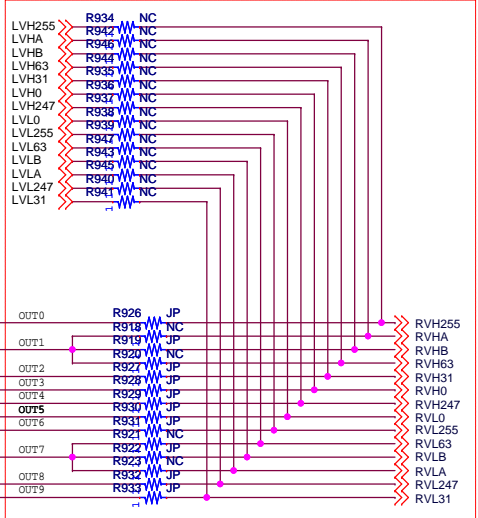
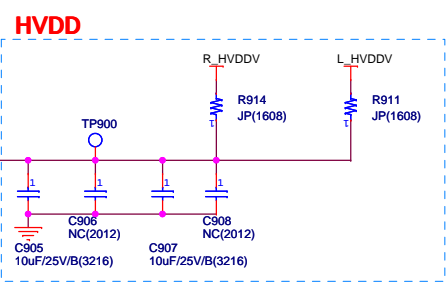
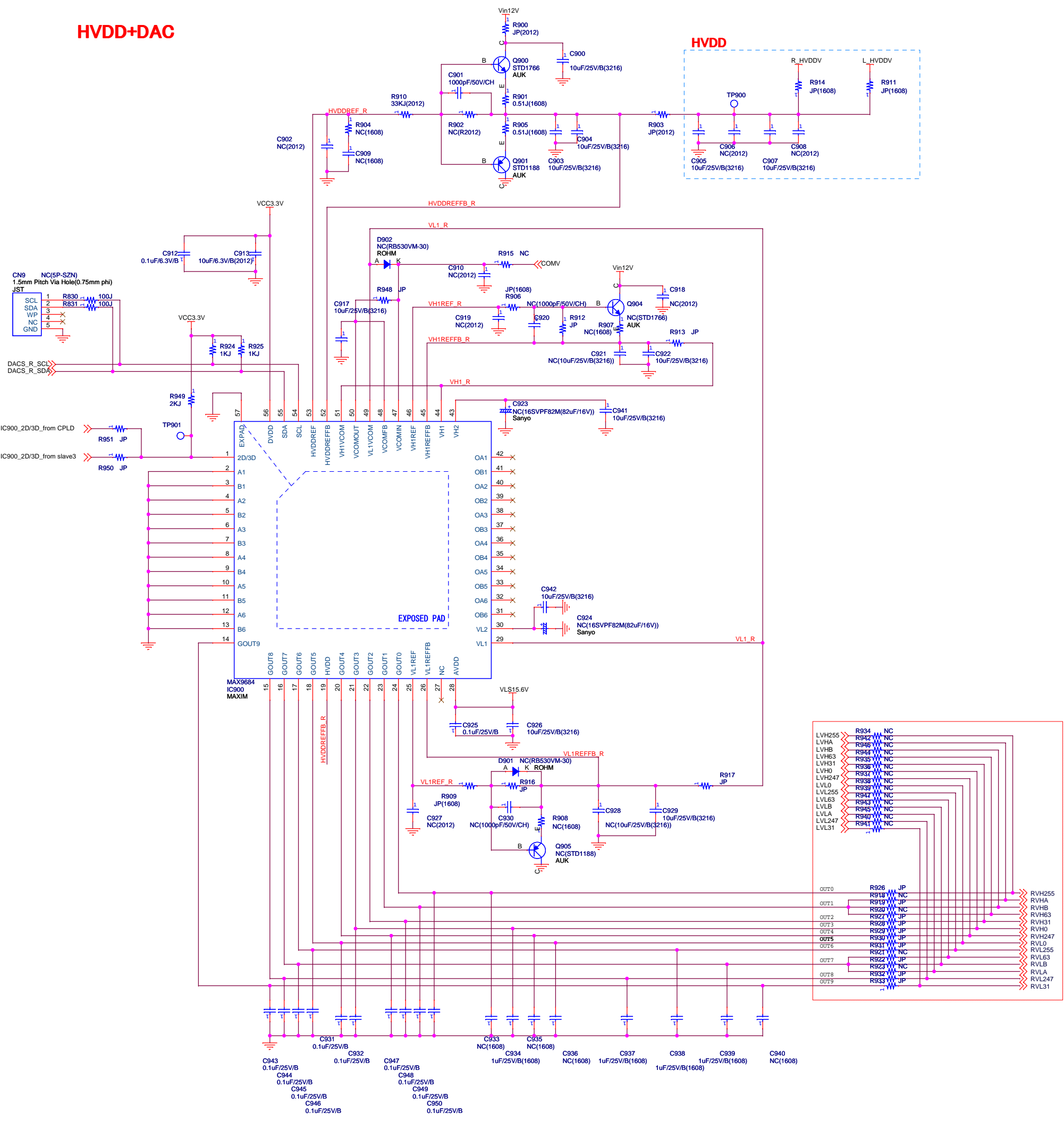


指示のない抵抗、コンデンサは、1005サイズです。

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△				Material Finish	FR4, 4layers
△				Date	2013.04.22
△				Name	POWER2
△				Code	RUNK0093FVZx
△				Drawing No.	KC-119-025
改定日					担当
改訂記事					REVISION
設計	製図	検図	検図	承認	SAKAI DISPLAY PRODUCTS
Designer	Draft	DSN CK	DSN CK	ENG APPR	第二開発部
					Rev 03

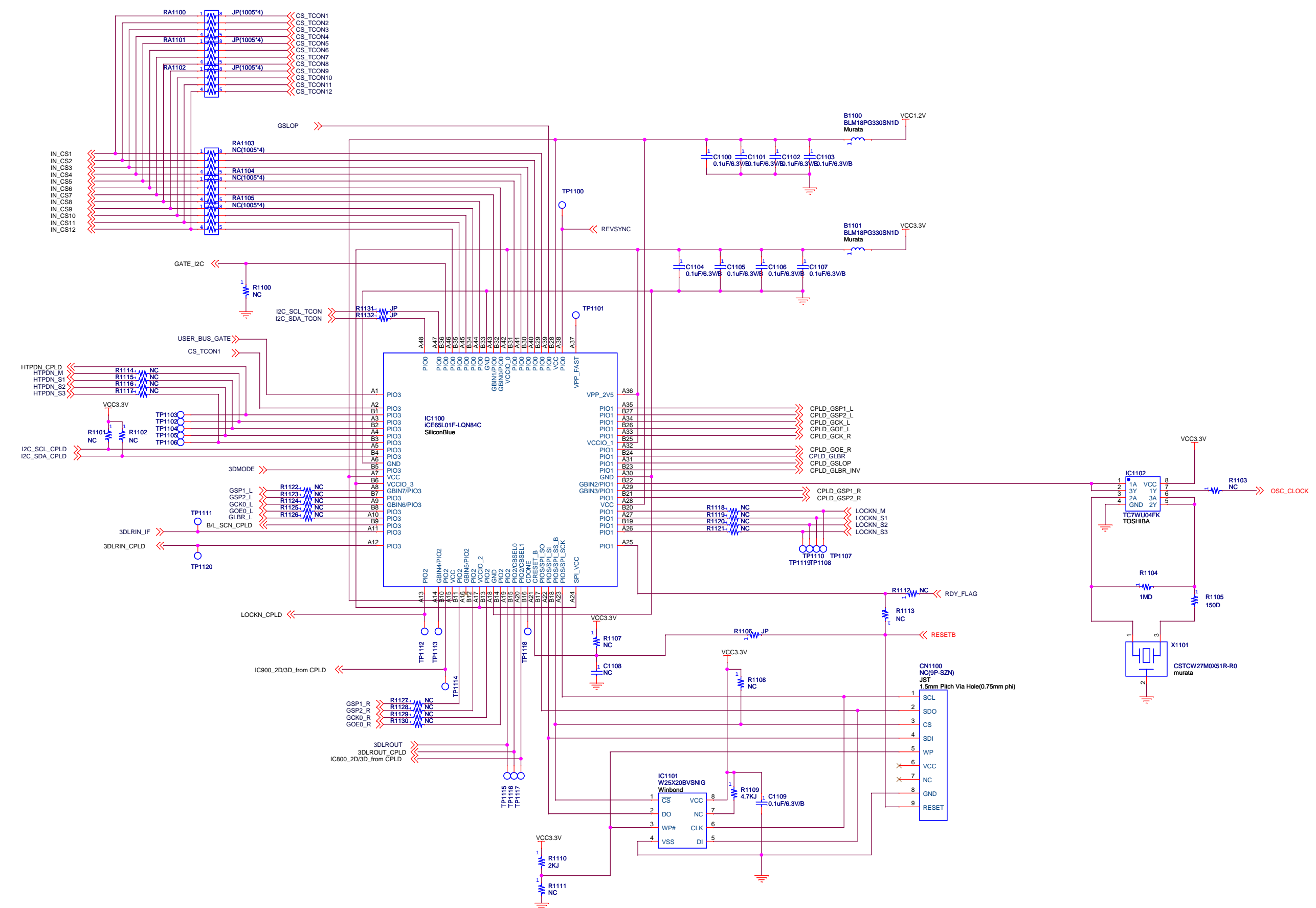
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④					Material Finish	FR4, 4layers
③					Date	2013.04.22
②					Name	DAC-CS_L Sheet 8 of 11
①						
改定日		改訂記事		REVISION	担当	
設計 Designer	製図 Drafter	検図 CHK. CK.	検図 CHK. CK.	承認 ENG. APPR.	SAKAI DISPLAY PRODUCTS	
					Code	RUNTK0093FVzx
					Drawing No.	KC-119-025 03
					第二開発部	

HVDD+DAC



抵抗、コンデンサは温度定格85℃品以上のものを使用すること
指示なき抵抗コンデンサーは1005サイズ、抵抗アレイは1005×4

⑤ ④ ③ ② ①	改定日	改訂記事	REVISION	担当	ORIGINAL MODEL	4K2K 120Hz
					Material Finish	FR4, 4layers
					Date	2013.04.22
					Name	DAC-CS_R Sheet 9 of 11
設計	製図	検図	検図	承認	SAKAI DISPLAY PRODUCTS	Code
Design	Draw	DSN CK	DSN CK	ENG APPR		RUNTK0093FVZx
第二開発部					Drawing No.	KC-119-025 Rev 03

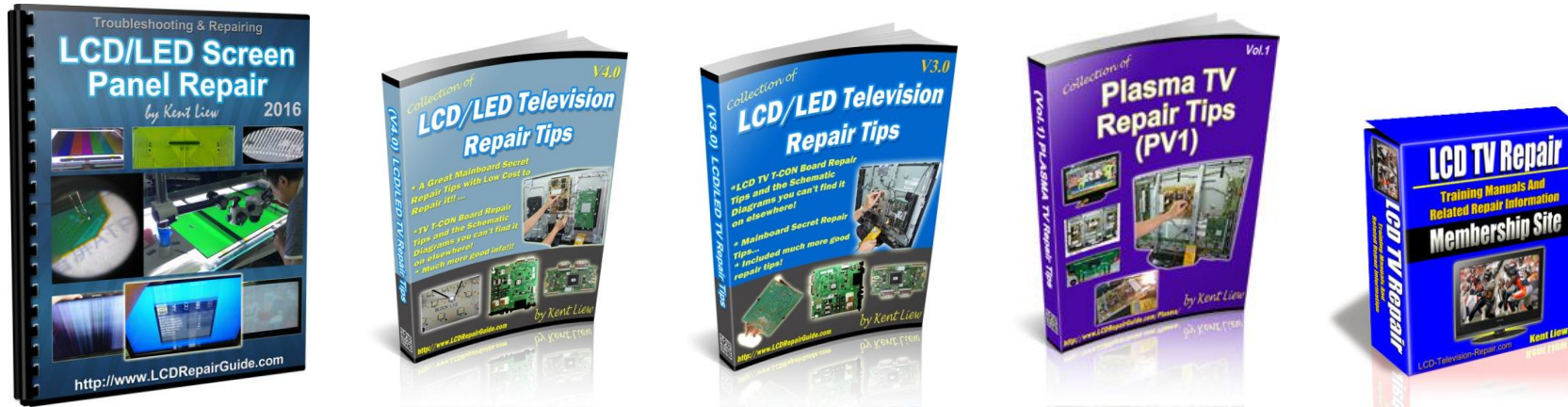


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改定日					担当
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REVISION					担当
設計	製図	検図	承認	SAKAI DISPLAY PRODUCTS	
Design	Draft	DSN_CK	DSN_CK	第二開発部	
					Rev 03

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(Please click on the ebook cover to get more details)

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<http://www.LCDRepairGuide.com>

<http://www.lcd-television-repair.com/newsletter/Recommend.html>

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