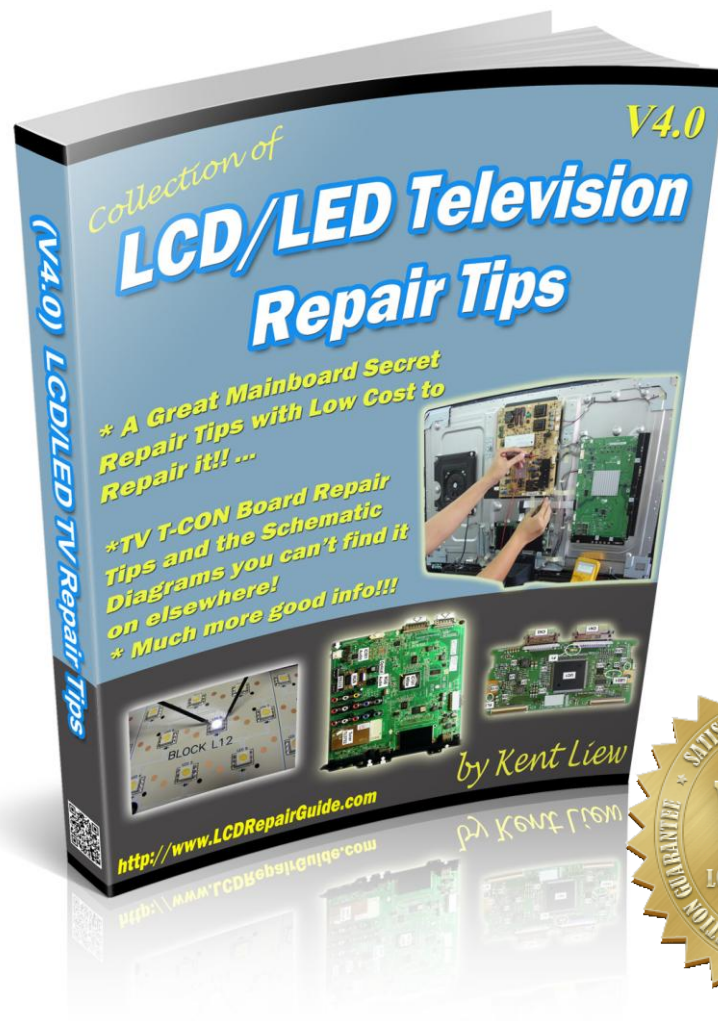


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Collection of LCD/LED Television Repair Tips

V4.0

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Brought to you by *Kent Liew*

ImagineX ElectronicS

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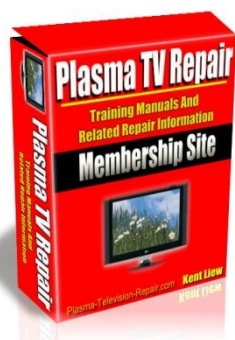
If you want to buy the Test Equipment, Tools and Spare Parts please visit to the page here:

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

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

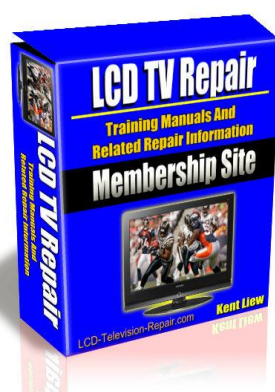
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With all these great repair information, it will help you in troubleshooting and repairing electronic and the other display devices:



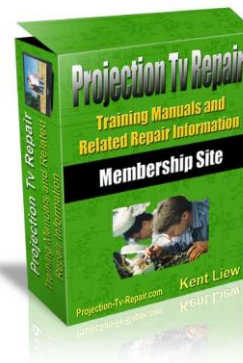
[Plasma TV Repair Membership Site](#)

If you're a Plasma TV repairer, then these Plasma TV repair information is you want! Some hard to find information also included inside this Plasma TV Repair Membership Site!



[LCD & LED TV Repair Membership Site](#)

This is complete repair information for LCD Television!
These repair information included: training manual, service manual, psu schematic diagram, service bulletin, firmware & so on!



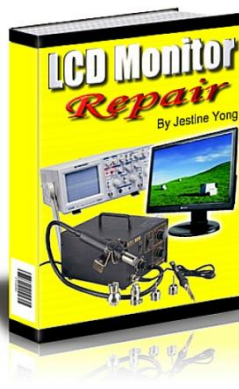
[Projection TV Repair Membership Site](#)

This membership site included two main repair information, these are Projection TV and Projector!



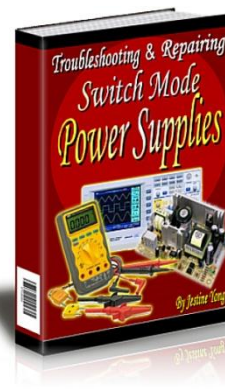
[Testing Electronic Components E-book](#)

A guide on how you can test electronic components like a professional. Even some of the testing method you haven't saw or learn before. It is enjoy learning testing electronic components through this value e-book.



[LCD Monitor Repair E-Book](#)

A step by step guide on how you can become a Professional in LCD Monitor Repair. Actually after I read this e-book, it is not only LCD Monitor but apply to LCD TV too! Some of the repair tips and gadgets can be apply to the LCD TV troubleshooting & repairing!



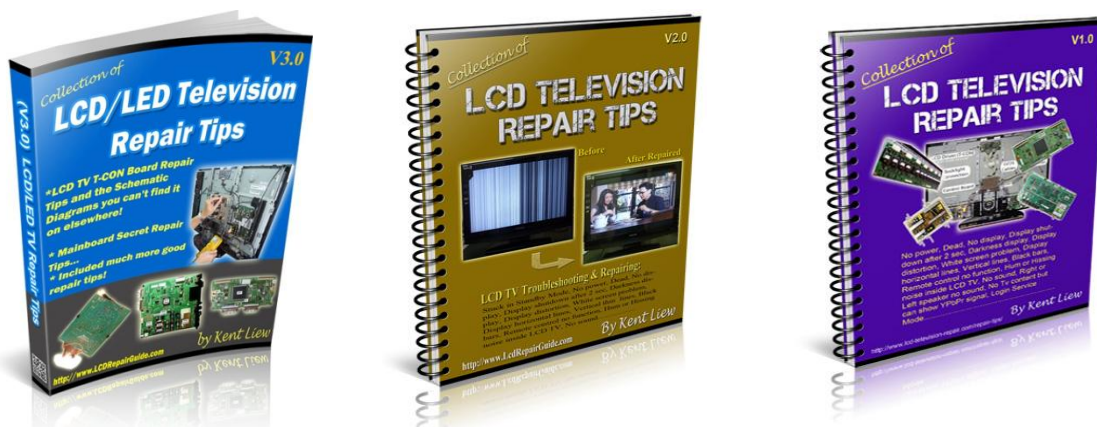
[SMPS Power Supply Repair Guide](#)

This is one of the great SMPS repair guide I have seen. Where Mr. Jestine Yong had reveal all his secret methods to troubleshooting & repairing the power supplies for the reader. Some of his tactic in this guide, I'm sure you're haven't seen it before. Highly recommended must have!

How To Use This Guide

- 1) Yes this guide can save you time and money. You will get the results directly because you will know which components you want to replace. This means you don't need to pay more money and time to learn how to troubleshoot LCD TV from starting until the end. Before using this guide, you need to know how to disassemble the LCD TV first. You need to know some of the basic testing electronic components skill and must know how to solder components on the PCB board. This guide can help you to solve LCD TV problems on the spot.
- 2) Find the solution by comparing other brands or models but with the same symptom of your LCD TV. For example, if one of your LCD TV problems is OSD Menu auto pop up and you can't find your model inside this guide, you can try to find other brands or model but with the same symptom with your LCD TV problem. Then the solution can be use for reference.
- 3) This V4.0 –Collection of LCD LED TV Repair Tips ebook was different than other previous volume V1.0, V2.0 & V3.0. The V1.01 & V2.0 are more on repair tips or problem solution only. The V3.0 is more on special and details on that subject. But you can learn and use the knowledge from it to apply to other brands and models of LCD/LED TV.
- 4) After you have finished reading this guide, I believe you will have the confident to repair LCD TV now. The reason for it is because you now know what is the most common fault inside the LCD TV's and what are the common parts that need to be changed.

Previous Collection of LCD & LED TV Repair Tips ebook:



LCD & LED TV Repair Tips

Note: Most of these repair tips are not included the fault of electrolytic capacitors! Because of the electrolytic capacitor bulge or bad on ESR values are easily detected by the ESR Capacitor Tester. Before read these repair tips, please make sure that you had testing the electrolytic capacitors first.

1) Model: ChangHong LED32B1000C LED TV

Symptom: No Power, Dead

The Power Supply board is using HSS35D-1MF

Repair/Solution:

Open the TV rear cover, look at the PSU board and can't find any burn component on it. Checking the F101 main fuse is ok. Power on the TV, their 5V, 12V & 24V all no outputs. Suspect the PFC section failure. Measure the big filter cap is only 302V, instead of 380V! That's mean their PFC section not working. So power off TV and using the Multimeter testing the PFC circuit components and found that Q108, Q109 and Q110 (all are 2T (4403) marking code, SMD) all are gone. So using the 2A (3906) SMD as a replacement and the TV is working properly. Actually this is a common fault in this PSU HSS35D-1MF board.

2) Model: ChangHong LED43A9000i LED TV

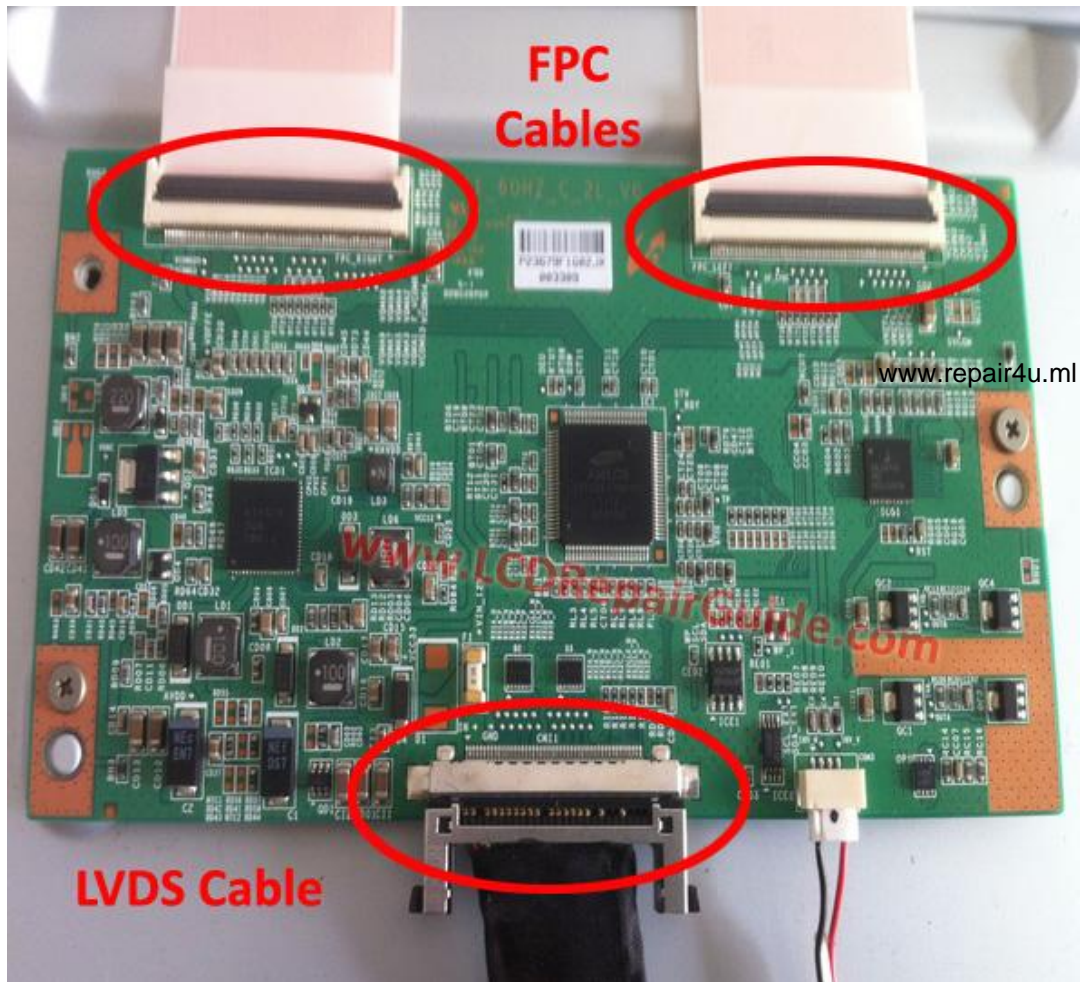
Symptom: Display Problem Randomly- Distortion or No Display





Repair/Solution:

Customer complaints this TV after use about several hours the TV display will distortion or no display. Normally this type of problem is difficult to diagnose. This LED TV using Samsung LTA43HN01 LED Panel, T-CON board is K160HZC2LV0.1. From the above fault picture, suspect the LVDS cable, T-con board, FPC cable/s or the LED Panel.



Remove the LVDS cable and FPC cables, using the eraser to clean their contact pins (Golden Fingers). After clean the LVDS cable connector, also checking their LVDS socket contact points on the T-con board. After finish cleaning, power on the TV to testing it and found that the TV was back to normal and problem solved! Even burn test the TV whole day also no problem.

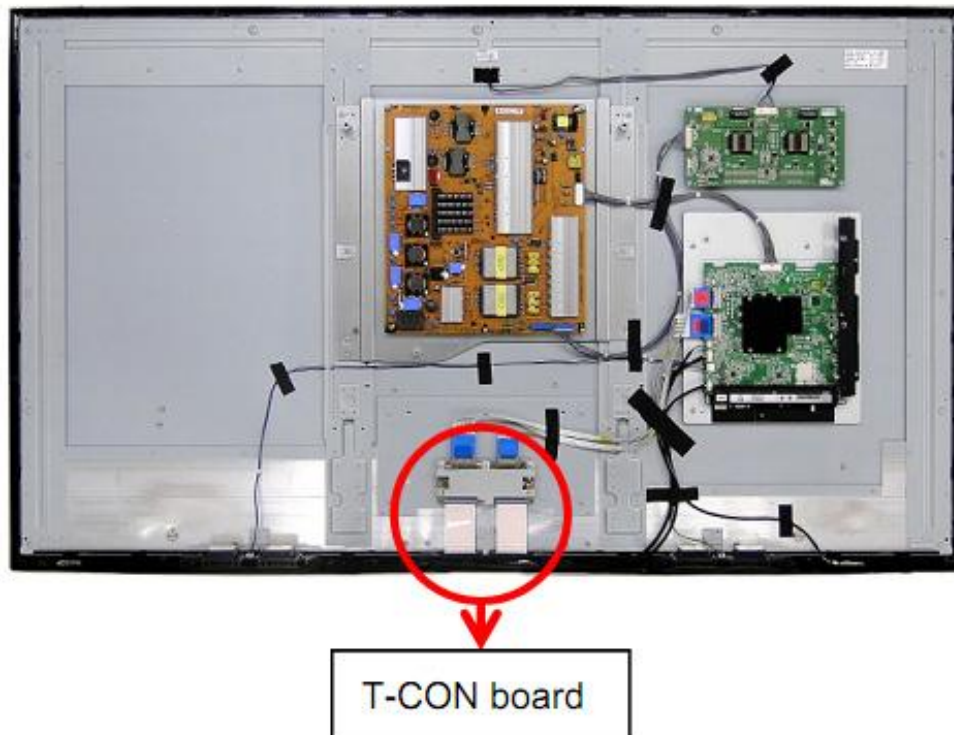
3) Model: LG 60LS5700-UA & 60LS5750-UA LCD TV

Symptom: No Display but Sound is Normal

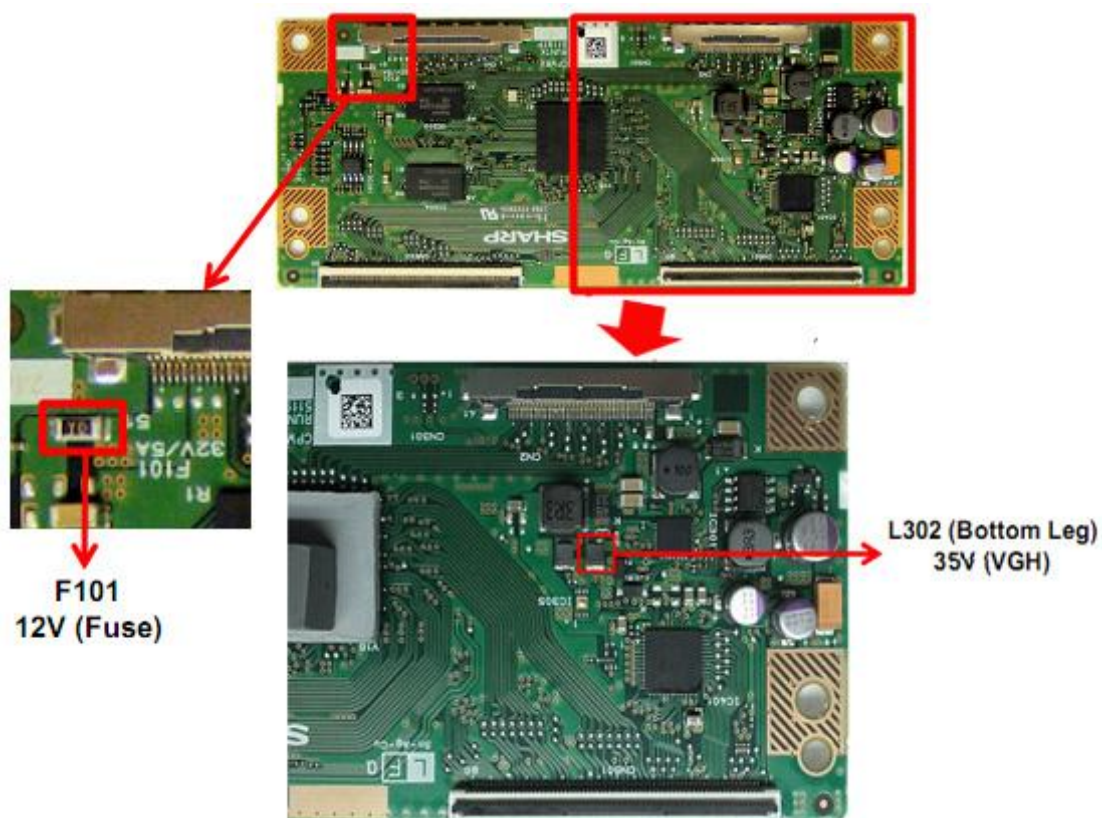
The TV front buttons are all working well.

Repair/Solution:

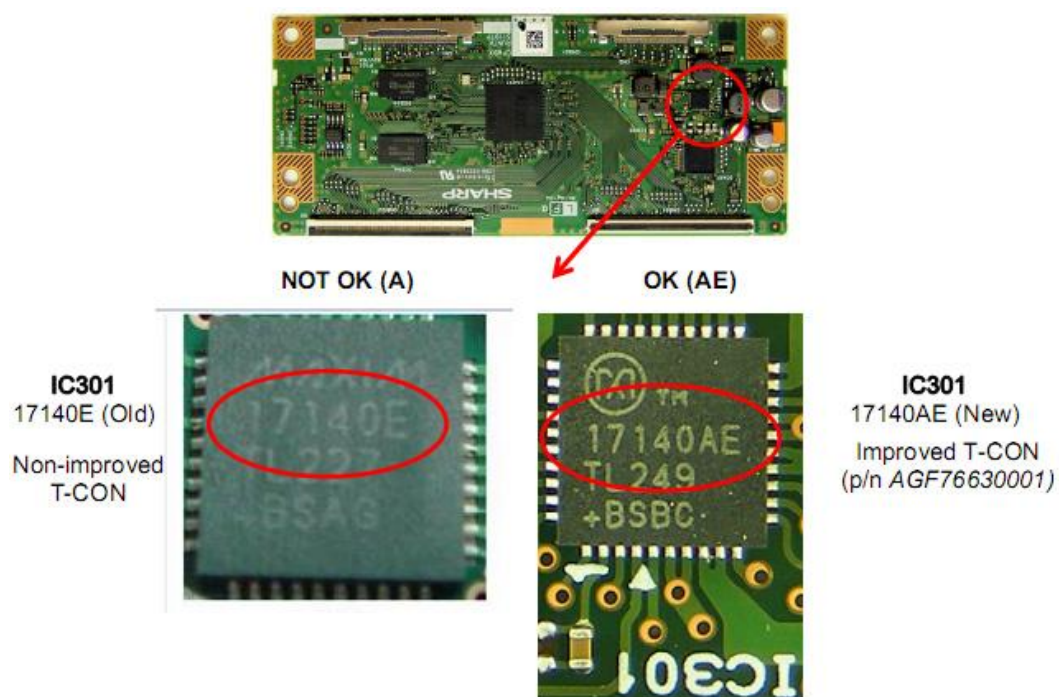
The Power Supply voltage outputs are all normal. This TV backlight is lit and the sound is OK. The T-con board Vcc voltage 12V was present. That's mean their backlight system, PSU board and Main board are all OK.



So suspect the T-con board failure. Power off the TV, measure the T-con board SMD fuse (5A, 32V) was opened. Before replace the fuse, check the Vcc line and found that their ohm value is very low (below 100 ohm). After trace the Vcc line to IC301 (17140E) and confirm that this IC was shorted. Because of this IC no stock, so direct replace this T-con board (p/n: AGF76630001) and the problem solved.



For your information, the new T-con board will use the 17140AE (IC301), the older version is using the 17140E.



4) Model: LG 32LX3DC-UA, 32LXDCS-UA LCD TV**Symptom:** Remote Control Operation Error in Stand-by Mode

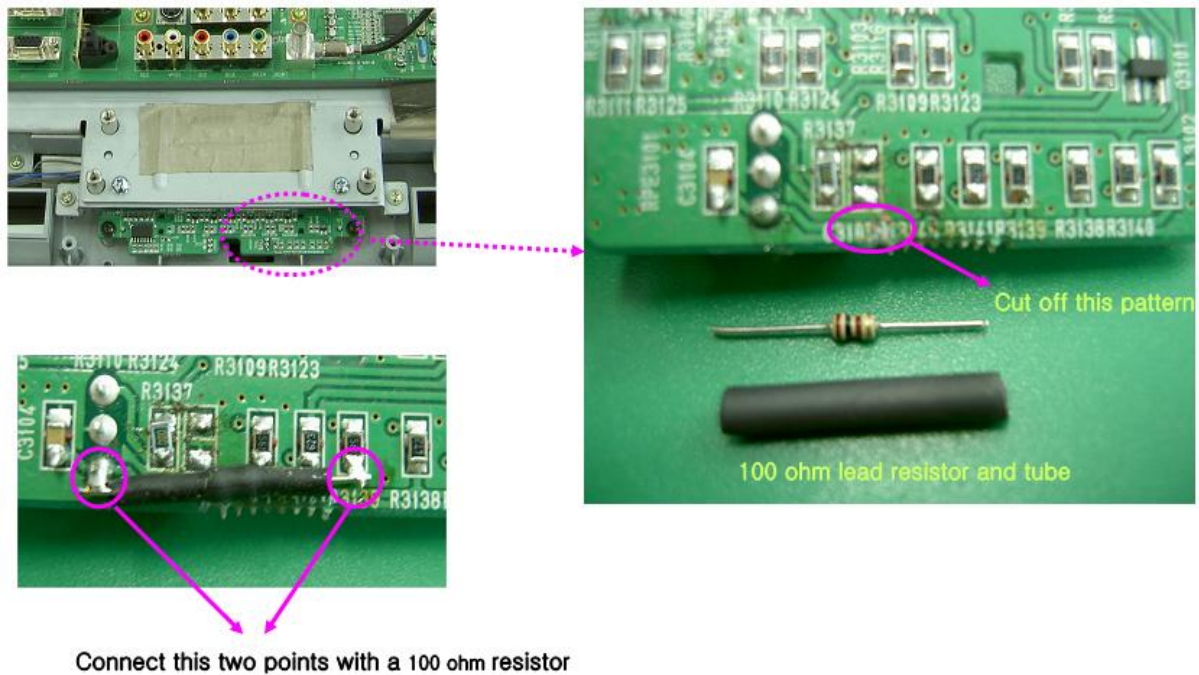
When Power Remote button is operated in stand-by mode, set will not respond or intermittent not working.

Repair/Solution:

This TV has using the IR Assembly unit with design bug. So the IR Assembly unit with these part numbers will cause this issue too. The part numbers are: 3911900021A, 3911TR0006A & 3911TR0004A. Their replacement IR Assembly unit is using this part number: 39119S0082A.

If not change the IR Assembly unit, just add a 100 ohm resistor into it and the problem solved. Refer to the picture below:





5) Model: LG 26LD350 and 32LD350-UB LCD TV

Symptom: TV No Start-up

When TV is turned on, Power LED light is blue, but set has no sound and no display.

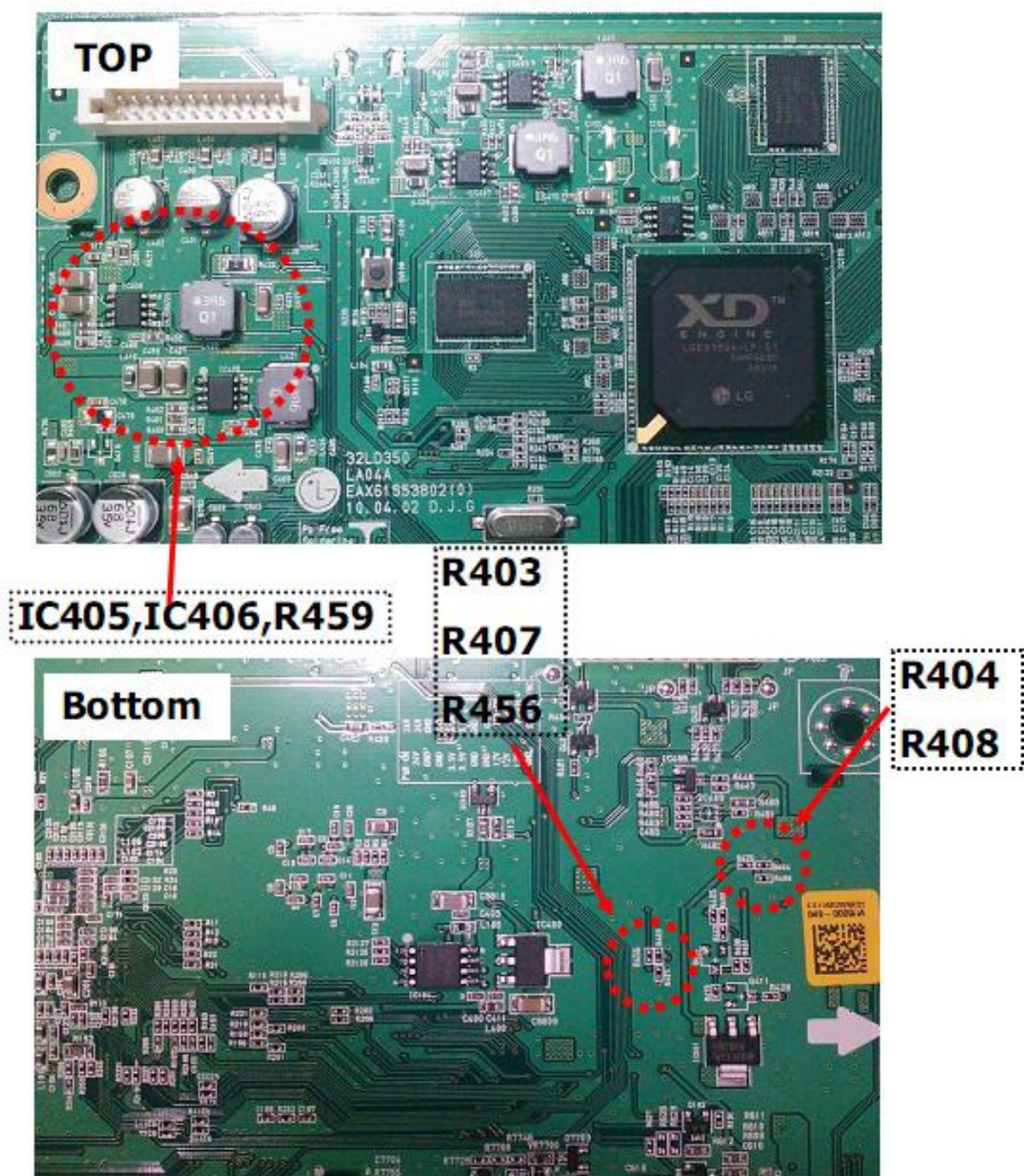
Repair/Solution:

This is because the IC405 not working properly. Power enable has incorrect voltage supplied.

Replace the Main board or the improvement method to solve this problem.
Replace Main board with corrected change in resistance in Power On/Off1 to IC405.

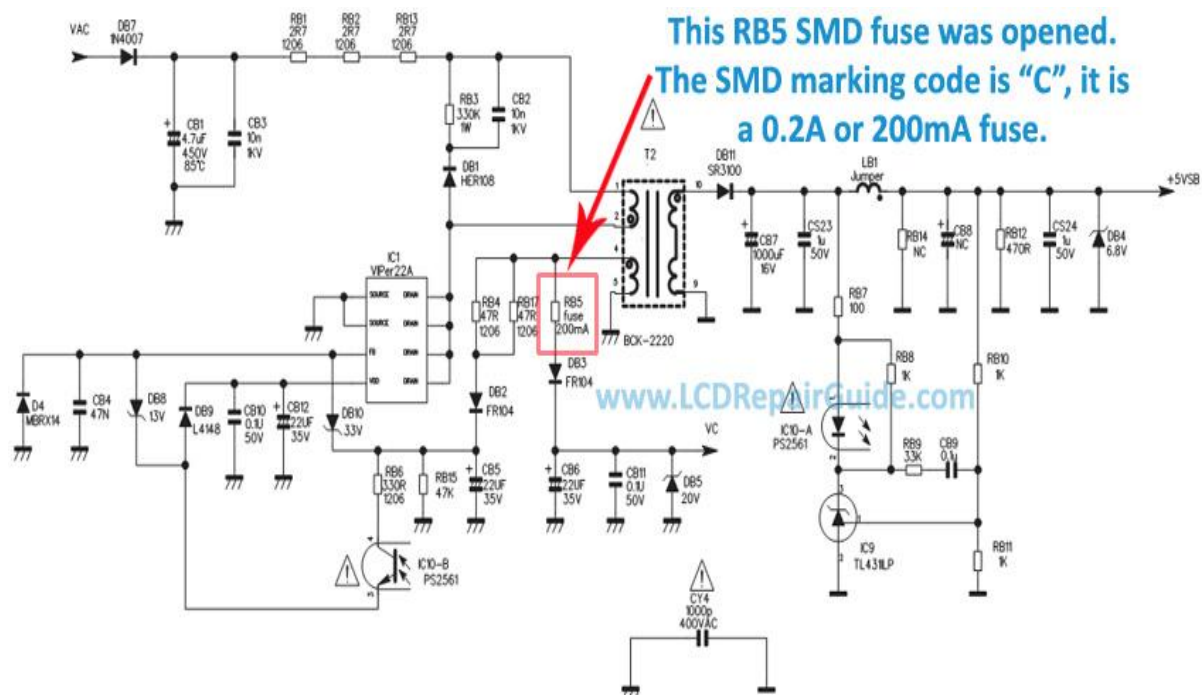
Add: R403 (33K, 1/16w), R404 (33K, 1/16w), R407 (10K, 1/16w) and R408 (10K, 1/16w)

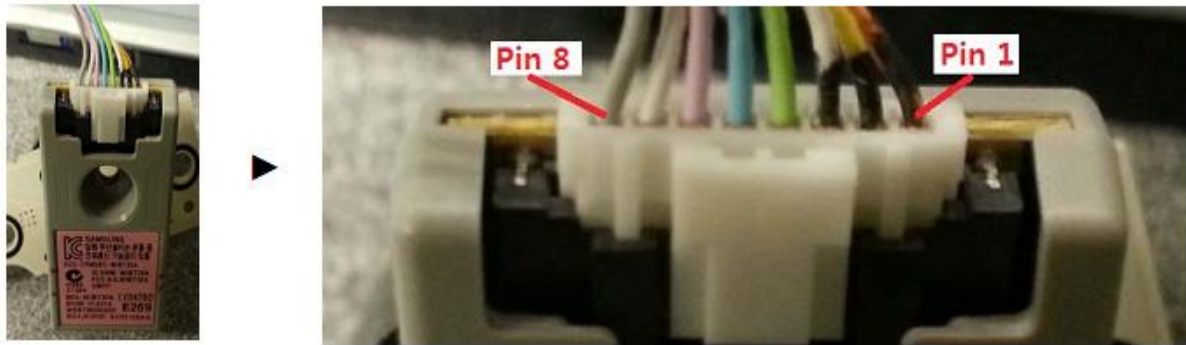
Delete: R456 (10K, 1/16w) & R459 (10K, 1/16w)



6) Model: Philips 26PFL3403D-10 Chassis TCM2.0E LA LCD TV**Symptom:** No Power/ Dead**Repair/Solution:**

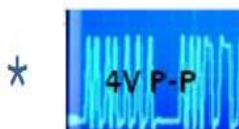
This PSU board standby 5V, 12V and 24V all no outputs. Checking the PFC section filter capacitor C5 (150uF/450V) has 302V only. Check the standby circuit and found that RB5 was opened. It is a SMD fuse and marking code is "C", that's mean it is a 0.2A or 200mA fuse. After replace it, the TV can start-up and operate properly.





1. With the TV in **Standby** mode, measure pins 2, 3, 8 and verify that the DC voltages are correct. If the voltages are missing or not correct, check the cabling and voltage supply feed from the Main board.
2. Turn on the TV, measure pins 2, 3, 8 and also pin 1 for correct DC supply voltages. If the voltages are missing or not correct, check the cable and supply feed the Main board.
3. Now measure pins 4 and 5 which are the Bluetooth signals. If the voltages for pins 4 and 5 are missing or not correct in the Power On state, the problem is likely the Bluetooth module.

	Stand-by	Power On	Note
Pin 1	0 VDC	3.3 VDC	DC
Pin 2	3.3 VDC	3.3 VDC	DC
Pin 3	5.3 VDC	5.3 VDC	DC
Pin 4	0 V	1.1VDC *	BT (2.4Ghz) Signal
Pin 5	0 V	2.0 VDC *	BT (2.4Ghz) Signal
Pin 6	0 V	0 V	N/A
Pin 7	0 V	0 V	N/A
Pin 8	2.0VDC	3.1 VDC	DC

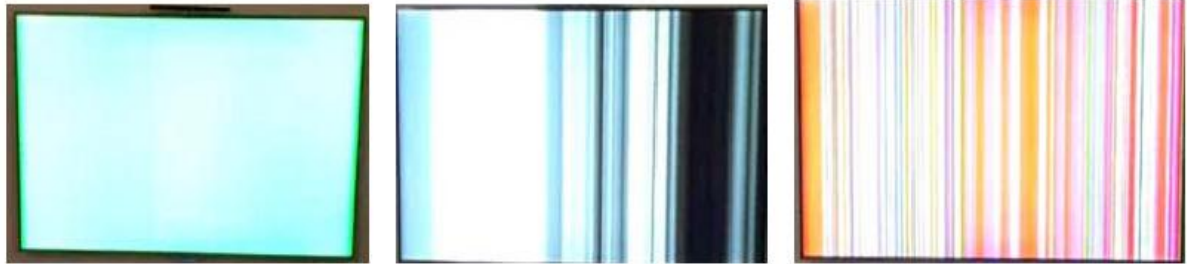


Left: The Actual "Bluetooth Signal". The effective DC volt readings are in the table above for Pins 4 and 5.

Note: For other brands and model TV with Bluetooth Module, their troubleshoot method is nearly same like this repair tips. So you can using this tip as a reference.

8) Model: Samsung ES7500 and ES8000 Series 2012 LED TV**Symptom:** Auto Power Cycling/Reset Issue

The TV sometimes displays vertical lines on the screen and then turns OFF and ON by itself. The WD Count in Service Menu> Control>Sub Option is higher than 0.

**Repair/Solution:**

1. Check the power cable between the Main board and PSU (Power Supply).

- If the cable or connector on the PSU is discolored, replace the cable. After that using the PSU self test methods to make sure that is working properly or not, if not then replace it.
- If the cable or connector on the Main board is discolored, replace the cable and Main board.
- If the cables and connectors are all OK, do not replace the cable or PSU or Main board and skip it to Step 2 below.



2. Check or replace both LVDS cable and their T-con board.

9) Model: Samsung UN46C8000 LED TV

Symptom: Half the Screen has a Red Solarisation Effect



Picture 1



Picture 2

Repair/Solution:

Picture 1 shows the problem: Red solarisation on the bottom of the screen. Your first impulse is probably to replace the panel, but if you look closely, you'll notice that solarisation appears only on the right side of the screen. The left side does not show the problem. This tells you it's not a panel issue. What should you consider? The signal source PCB, or LVDS cable connections.

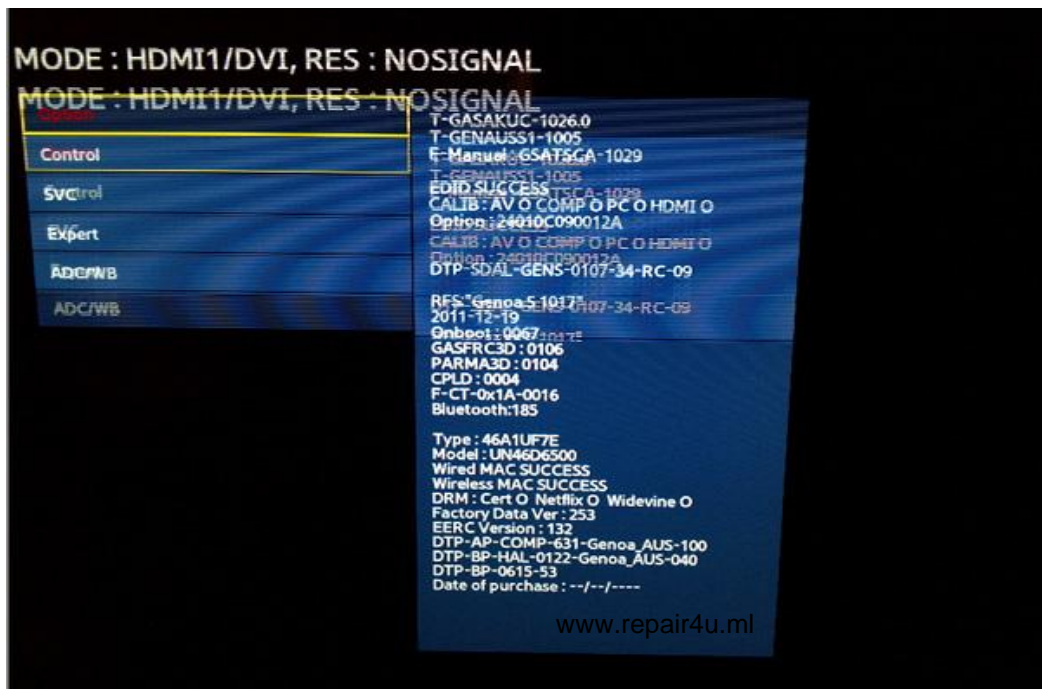
To see if it's a signal source issue, enter the service mode and check the test patterns. This is shown in Picture 2. Notice that in service mode, the right side is all Red, showing you that the signal source is not the problem. This leaves three items as the probable cause: the Main board, the LVDS, the T-con board or the FPC cable. In this case, the cause was the LVDS cable connector on Main board. It was not closing tightly enough. Putting hand pressure on the connector there caused the problem to come and go.

So try to using the strong tape or silicon glue to fix the connector and prevent it loose again. So the TV problem was solved.

10) Model: Samsung UN46D6500VFXZA LED TV

Symptom: Ghosting Image or Double Image Vertically.





Repair/Solution:

Checking or replace the T-con. Before that, make sure to clean the LVDS and FPC cable contact pins with eraser.

11) Model: Samsung LN55C650 LCD TV

Symptom: The Screen has Colored Vertical Lines



Repair/Solution:

If the lines appear in the Picture Test/OSD Menu, the cause is a bad panel. If the lines do not appear, disconnect all signal sources and check again. If the lines are still in the Picture Test, checking the LVDS cable contacts or change the Main board. If the lines are gone, then a signal source is causing the problem.

12) Model: Samsung UN46C6500 LED TV

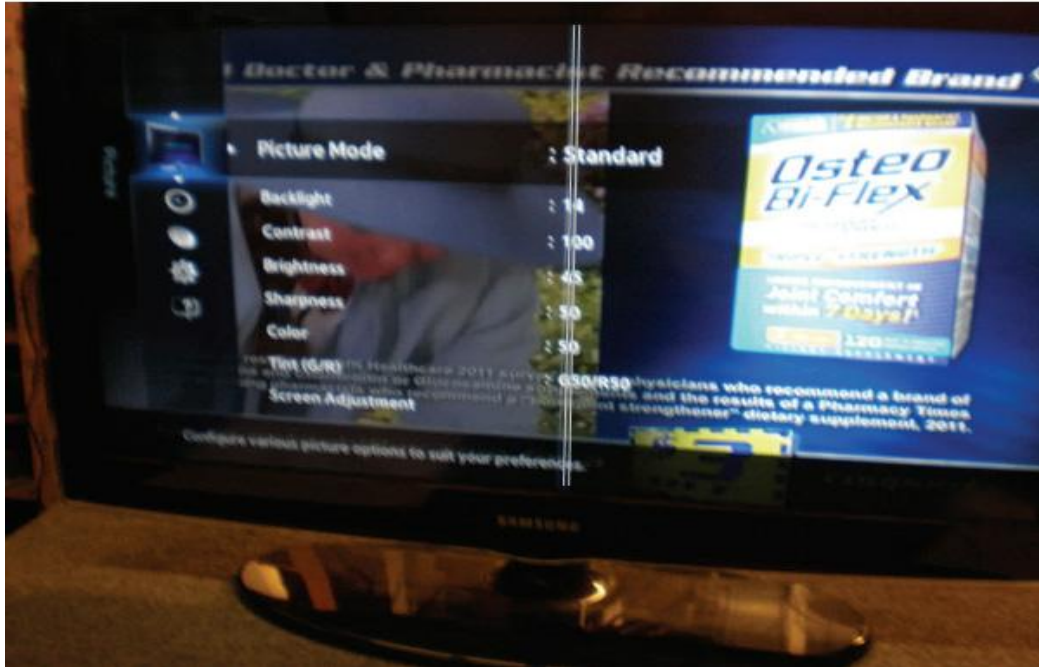
Symptom: A Thin Vertical Line and Bar in the Test/OSD Menu.

**Repair/Solution:**

If the lines appear in the Picture Test, the cause is a bad panel. If the lines do not appear, disconnect all signal sources and check again. If the lines are still in the Picture Test, checking the LVDS cable contacts or change the Main board. If the lines are gone, then a signal source is causing the problem.

13) Model: Samsung LN32D450G1D LCD TV

Symptom: The Screen has Double Vertical Lines

**Repair/Solution:**

If the lines appear in the OSD Menu, the cause is a bad panel. If the lines do not appear, disconnect all signal sources and check again. If the lines are still over the OSD Menu, so checking the LVDS cable contacts or change the Main board. If the lines are gone with different video signal input, then a signal source is causing the problem, so you need to trace that video input circuit to find out what's wrong in it.

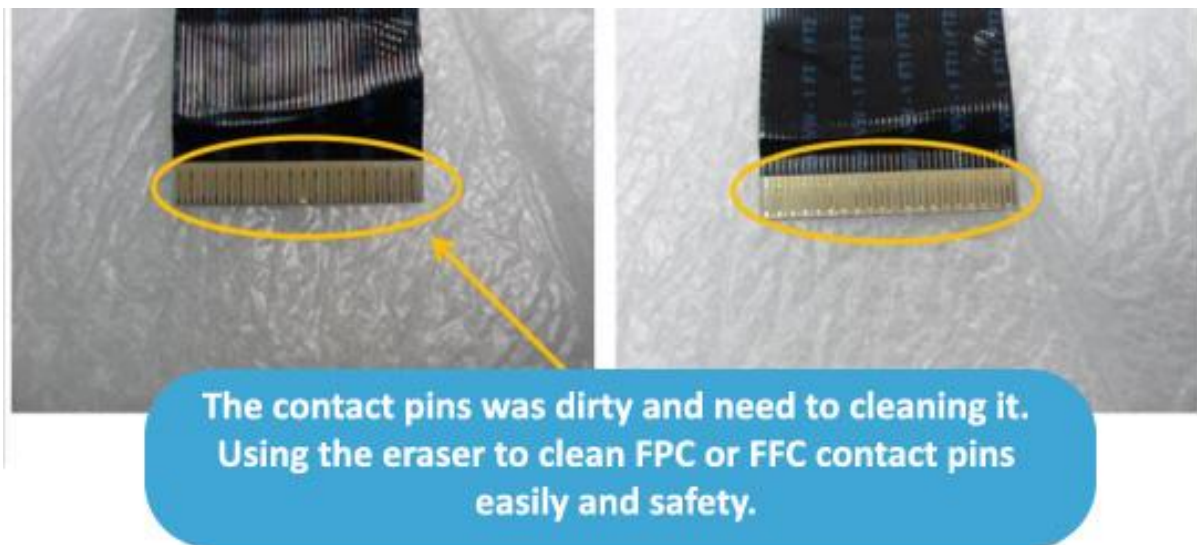
But most of the time, this type of symptom were causing by the LCD Panel, bad COF contact in between Source Driver board or the other side of the Panel glass contact pins.

14) Model: Samsung LN37A550P1F LCD TV

Symptom: The Screen One Side is Darker than the other.

**Repair/Solution:**

Try to call out the OSD Menu. If one side is darker than the other, it's a bad T-con board or FPC cable. If the OSD Menu is fine, then checking the LVDS cable and main board. Most of the time is their FPC cable contact pins dirty. After clean the screen problem solved.



15) Model: Samsung UN60D7000 LED TV

Symptom: These's a Thin Vertical Line on the Left Side of the Menu



Repair/Solution:

Try to call out the OSD Menu or Smart Hub Page. If the line goes through the OSD Menu or Smart Hub like the picture above, the panel is bad. If it's behind the OSD Menu, disconnect all signal sources and check again. If the vertical line is still behind the OSD Menu, then checking the LVDS cable or replace the main board. If the line is gone, then the signal source is the problem.

Or try to use the finger to touch or knock the top cover of that line position. If the line can missing randomly, that's mean their COF or TAB contacts was dry join on the Panel.

16) Model: Samsung LED TV**Symptom:** The Picture is Upside Down

When you ordered the Main board for an LED TV, after installing, you notice that the picture is upside down!

Repair/Solution:

First, make sure the OPTION BYTE settings are correct. If setting the Option Byte settings does not correct the problem, enter the service mode and adjust the HV FLIP settings (Toggle the setting on or off).

Entering Factory Mode:

To enter “Service Mode”, press the remote control keys in this sequence: MUTE 1 8 2 Power On. Then, select Control -> Config Option -> HV FLIKP. See the illustrations below:



After you have changed the HV FLIP setting, power cycle the TV (turn it off and then on) to lock in the setting.

Note: Whenever you replace a main board or lcd panel, always refer to the OPTION BYTE list to verify that the settings are correct. Option Bytes mainly match the correct drive to the panel, but can also have effects based on feature functionality. Some of the settings, if not set correctly, may cause minor defects in the overall operation of a TV. These defects are often not immediately obvious and may be discovered by the customer days after the repair.

17) Model: Sharp LCD-32D500A-BK LCD TV

Symptom: Backlight ON & OFF, then No Display

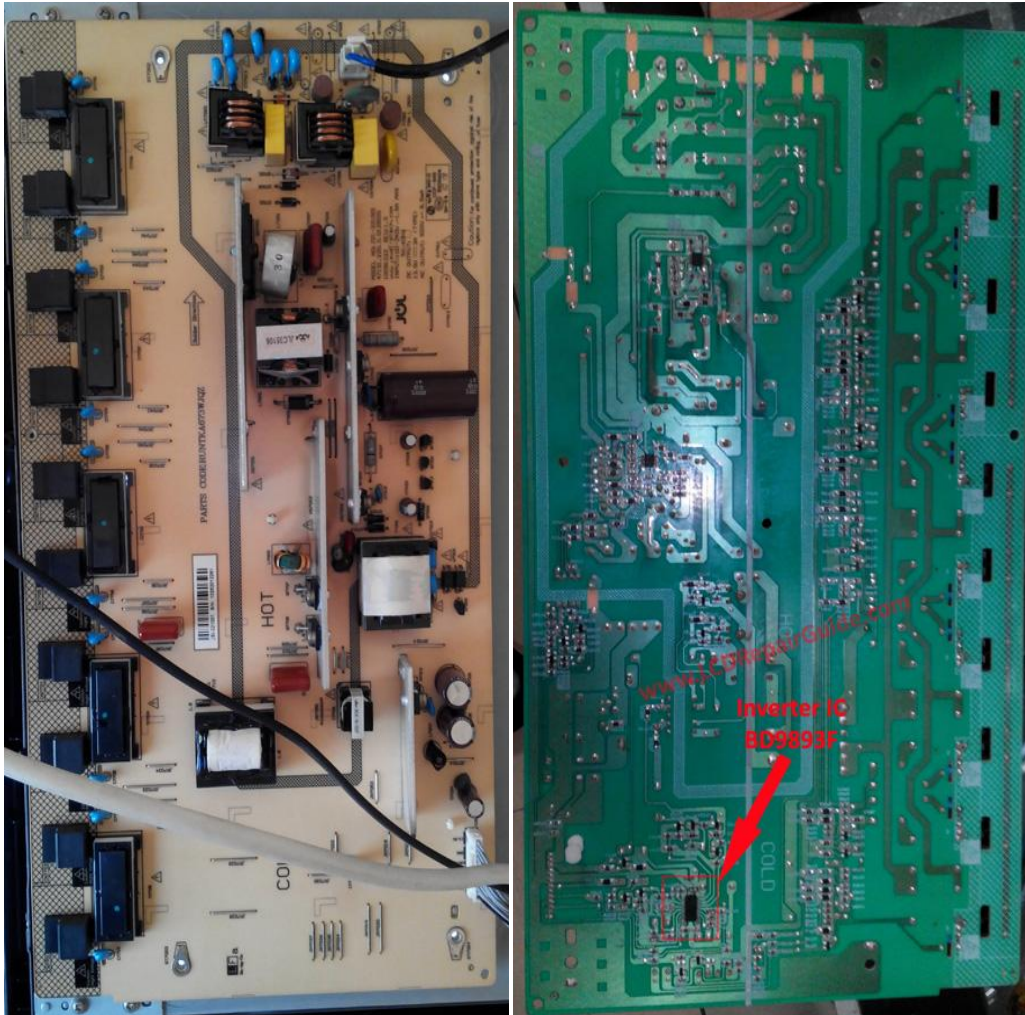
When power on the TV, everything is OK, after about 2 seconds, display darkness and then no display. After 2 seconds, display back to normal, but after about 2 seconds it will no display. This will happen several times, after that the TV will auto shutdown. Sound is normal.

Inverter Board Part Code: RUNTKA673WJQZ

Repair/Solution:

Suspect their CCFL lamp defective. Use the CCFL tester to testing the lamps, all looking good. Measure the PWR_ON/OFF, BL_ON and DIM signals all

normal and stable. The inverter board 24V input voltage also OK. So the problem looks like is the inverter board. Checking the inverter board MOSFET, HV Transformer and caps all are OK. So replace the inverter IC BD9893F and the problem solved.



18) Model: Sony KLV-32BX205 LCD TV

Symptom: When Power On the TV, the Screen show “Binary File Detecting”, After that TV Shutdown.

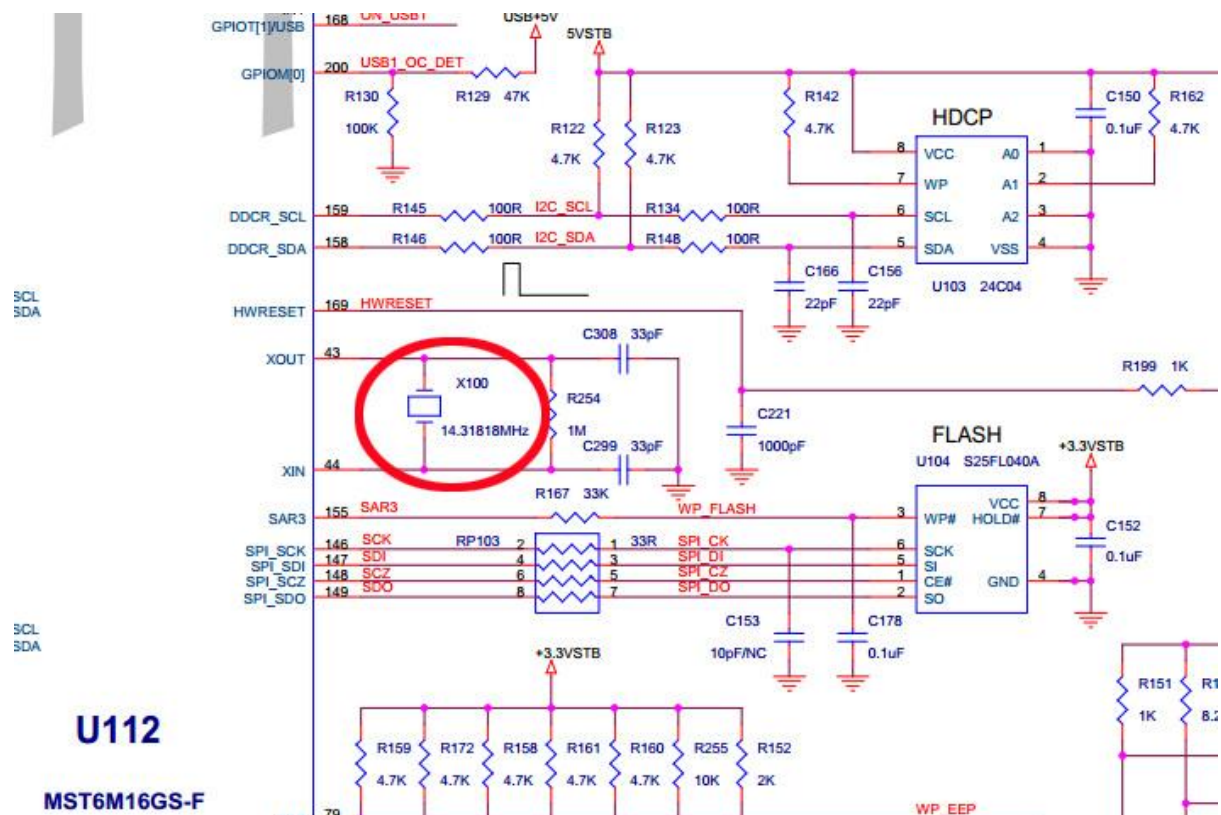
Repair/Solution:

Try to re-program their flash memory but no help. The TV owner said this TV has water by his children. When checking their front button, it has liquid inside the buttons. Use the alcohol to cleaning these buttons. Power on the TV and it is working properly.

19) Model: TCL L32E09 LCD TV**Symptom:** Stuck in Standby Mode**Repair/Solution:**

This LCD TV look like dead, but when checking their Backlight and PSU voltages all working properly. But the Main board PS_ON signal is missing. When testing the Main board all LDO DC-DC circuit, 5V, 3.3V, 2.5V and 1.27V are normal and stable. Try to using the Remote Control or front button also not working at all. Measure the flash memory IC U104 (S25FL040A) Vcc voltage input is OK, their Main Chipset can feel some warm temperature.

So suspect the TV is their firmware corrupted. Use the ISP Programmer, first checking their Initial Serial Print Info and found that all information is garbled. Try to re-programmer their firmware, but also no help. So the last suspect is maybe their Main Chipset (U112, BGA type) or the crystal X100 (14.31818MHz). Replace the crystal X100, the problem solved! Try to using the ISP Programmer to checking their Initial Serial Print Info, all are ok now.



21) Model: Xoceco_Prima LC-52HW35 LCD TV

Symptom: TV Channel No Display, but Other Signal Input Normal

Repair/Solution:

Check the PSU board output voltages normal, Main Board LDO (DC-DC) output voltages normal and stable. Checking the TV Tuner all voltages OK, but found that their clock signal lines SCL and SDA was drop to 0.8V, normally it is about 5V. These two lines are go to the Tuner section, so disconnect these two lines, the SDA & SCL lines are back to about 5V! So trace these two lines to the Tuner section and found that Tuner socket got two pins was shorted. After re-solder these two pins, this TV problem solved!

How to Isolate the LCD TV Problem Fast

I've receive lots of the email to ask me how to repair the TV no display problem or etc? But they are never provided more details or information about the TV. For example the TV brand, model number (for Philips TV must provide with their Chassis Number), TV symptoms, what's their power supply secondary voltage output values and so on.

Because of this reason, this chapter will help the repairer learn more about how to isolate the LCD/LED TV problem before starting repair it. When you know how to isolate the TV problem fast, then you can quickly repair the LCD/LED TV in board levels repair. So that you need to know about these:

- A) Basic Knowledge
- B) How LCD TV Work
- C) The Method and Tools to Help Isolate the LCD TV Problem

A) Basic Knowledge

Before starting to check the TV, the very first step is listening to the customer.

- The TV problem complaint by the owner/customer

After that, power on the TV to look at their symptom is it same describe as the customer complaint. Remember, if the TV complaint shorted and will causing the home main Power System shutdown (PLCB fuse/switch activate), this TV can't power on first, but need to open their rear cover to checking their Power Supply board first. If the TV problem same as the customer describe, so we can start to check the TV now. If the TV symptom is different than what customer describe, then we need to call the customer first before proceed it.

Lots of the LCD & LED TV they have self test system. When an abnormally occurs in TV, the self test protection circuit will operate and reset the unit to standby mode. During this time, the defective block/board can be identified by the number of blinking times of the Power LED on the front panel of the TV. If the self test system found that the CCFL lamps abnormal or disconnected, it will shutdown the backlight system and then provide the error message or error code to let the repair engineer easy to know what's wrong inside the TV. So their TV

front Power LED light will blink differently, for example: LED light blinking 1 times then stop 2 seconds and continue to blinking 1 times. To find out what's meaning of these LED light blinking, you need to refer to their service manual. But not all the service manual will show their error chart. So you need to search other nearest model service manual to compare with it.

Blinking times	Contents	BOARD
1	BACK LIGHT_SOS	P BOARD
3	PANEL POWER_SOS	A BOARD
4	DTV12V_SOS	P/A BOARD
7	SUB 3.3V_SENSE	A BOARD
9	SOUND SOS	A BOARD
13	EMERGENCY_SOS	A BOARD

Panasonic TC-L32C22 Power LED Blinking Timing Chart

Failure LED Displays

MONITORING ITEMS	NUMBER OF STANDBY LED (RED) BLINKING TIMES	POSSIBLE CAUSE / DETECTED SYMPTOMS
DC_DET	2	• Power Supply voltage error
DC_ALERT 1	3	<ul style="list-style-type: none"> • Confirm, which the voltage the right voltage doesn't appear about D3. 3V,VDDMQO(=2.5V) • If it is D3. 3V,VDDMQO(=2.5V), confirm about 3.3V input IC7001 5th Pin and F7000 is not open. • If it is VD1.8V, confirm about 3.3V input IC7002 5th Pin and F7000 is not open. • If it is VD1.8V, confirm about 3.3V input IC7000 12th Pin and PS7000 is not open.
DC_ALERT 2	4	
DC_ALERT 3	5	<ul style="list-style-type: none"> • Confirm, the voltage of REG12V is about 12V. • If no voltage is on REG12V, Confirm R3031, R3034, R3037 is mounted. • If no voltage is on REG12V, Confirm REG12V is short-circuits in GND. • If REG12V is not short-circuits in GND, change PWB to new one.
Backlight	6	<ul style="list-style-type: none"> • Confirm, about D3. 3 input to Q4014/Q4015. • If 6 times, change backlight-board.
Temperature	7	<ul style="list-style-type: none"> • Confirm, heat sink and heat sheet adhere to IC4500. • If set isn't shutdown, BH-board temp-trouble.
Audio	8	<ul style="list-style-type: none"> • Confirm, the right voltage appears about D3. 3V, VDDMQO(=2.5V), VD1_8, D5V. • If the output voltage is right, confirm whether X4500 does an oscillation definitely. • Change IC4500 to new one.
HFR	9	• Trouble-Info from BH-board-ICbus.
DFE	10	• No communication from FE-IC.
B_ENGINE	11	• No communication from Trident-bus.

*Each of the above blinking is repeated every 2 seconds

Sony KLV-32S310 LCD TV Standby LED Timing Chart

If the TV malfunction and show the error code (blinking times), you roughly know where to check and repair it. If you're doing the board level repair, then you can direct replace the PCB board to solve the TV problem. Or you need to do the components level repair, then you need to concentrate to checking the appropriate PCB board, when found the defective component/s, then you can direct replace the components and solve the TV problem with the lowest cost compare with board level repair.

If the Power LED light blinking non-stop or with the relay "tic..tac.." sound inside the TV, that's mean something wrong in the PSU board or their loading shorted. So you need to check their PSU board first.

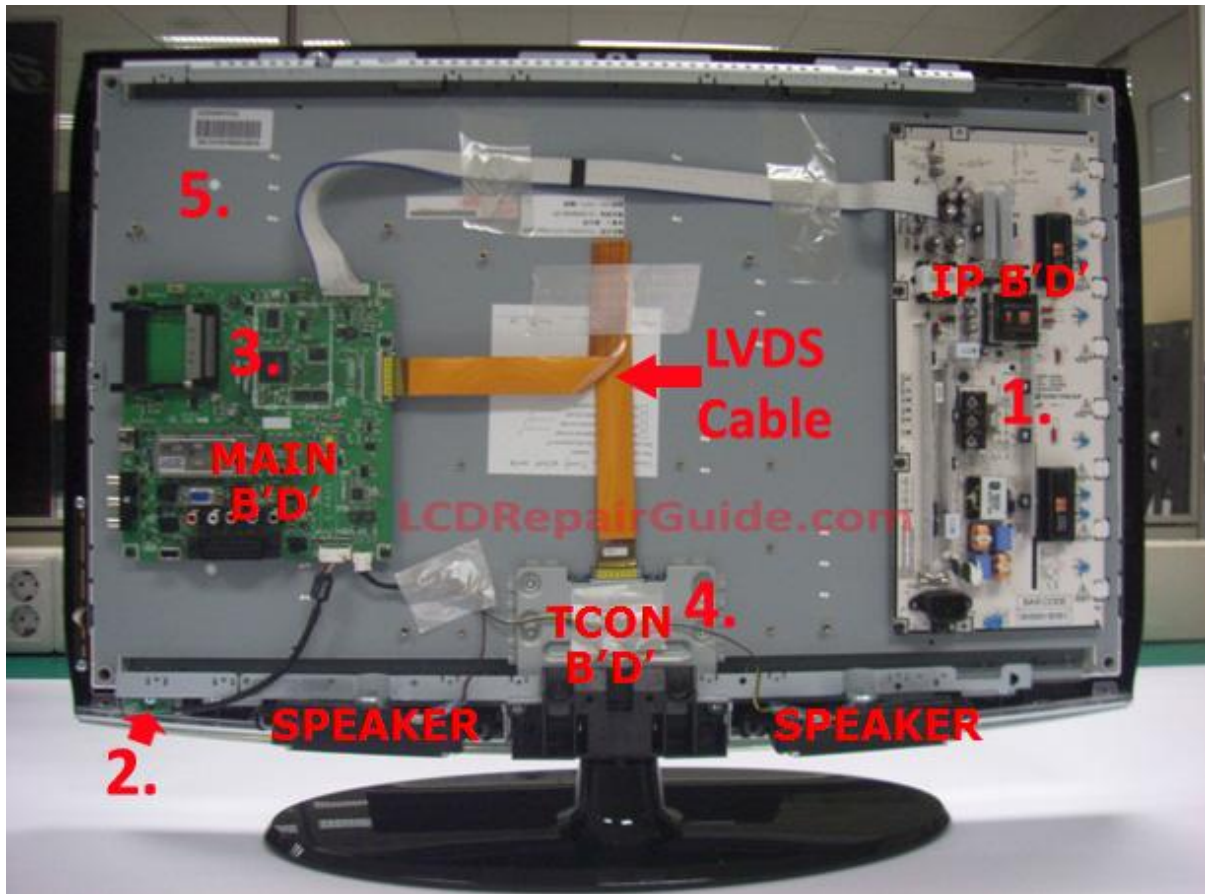
B) How LCD TV Works

Here is the basic information of how LCD TV works. Actually this information/knowledge you must know before you starting to repair the TV. If not, you will not sure where to troubleshoot the TV first.

The whole set of LCD TV is just have 7 parts/PCB in it. They are:

- 1) Power Supply Board
- 2) Inverter Board
- 3) CCFL/EEFL lamps
- 4) Main Board
- 5) Front Panel PCB
- 6) T-CON board
- 7) LCD Panel

Some LCD TV, their use the IP board (Power Supply + Inverter in one board) and the T-CON board was built-in the LCD Panel. So some LCD TV just has 5 parts/PCBs only.



1) IP Board (Inverter Power Supply Board)

* The IP Board or Power Supply board feature is use to input the AC voltage supply and converter it into DC voltage supply. The IP Board is Power Supply + Inverter section built-in it. For the Power Supply Board, it is only use to generate the DC voltage supply only. The Power Supply board will generate several output DC voltage supply in their secondary side and supply it to Main board, Inverter board/section and T-CON board (but this voltage supply will go through and control by Main board).

* The Inverter Board/Section is use to step up the low voltage (DC voltage) to output high voltage (VAC) to start-up the CCFL/EEFL lamps. Normally the voltage input to inverter board is 24Vdc and their voltage output is about 1500Vac (start-up) and then will steady at 600~800Vac (it will depends on what types of lamps in use).

* Normally the Power Supply or IP board will generate 5VSTB (standby voltage), 24V, 12V, 5V, 3.3V and 18V (or other voltage values for Audio section use).

2) Front Panel PCB (Key Board)

* This PCB board feature is to input the command from front buttons and remote control and then send to Main Board. Some LCD & LED TV design is built-in this PCB into the Power Supply Board.

3) Main board

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* The Main board has lots of the features inside. It's function like the computer main board. But it can divide to 4 parts:

i) With the Main board CPU + MCU (microcontroller unit), its can control the whole system through send out the signals. For example the signals like PS_ON, BL_ON, PANEL_ON and etc.

ii) Process different types of video signal inputs. For example: TV Tuner, AV, HDMI, PC, S-Video, USB & etc. After that the Main board will convert these video signal inputs to RSDS type video signals and send to T-Con Board through LVDS cable. At the same time, the Main board will also process the audio signals and amplify it and send to the speaker.

iii) The Main board DC-DC section. This is a very important section in Main board. This section will received the voltage supply from the Power Supply board and generate the appropriate DC voltage to other system use. For example, CPU core power, CPU Vcc, DDR RAM Vcc, Tuner Vcc and all analogue and digital circuits use.

iv) If that is SMART TV with 3D, WIFI & etc features, so these TV Main board will have add in or built-in 3D or WIFI features card/plug-in into the Main board.

4) T-CON Board

* The T-CON board is use to receive the LVDS format video signals and convert it into TTL (Transistor Transistor Logic) or RSDS (Reduced Swing Differential Signaling) signals. These signals can driving the LCD Panel to working and generate the complete display in the screen.

* Not only that, the T-con board has another important section, which is a DC-DC circuit. This DC-DC section received the voltage supply (Vcc) from the Power Supply and through the Main board. After that, convert it into several voltages and supply to the T-con board and also to driving the LCD Panel too.

5) LCD Panel

* The feature of LCD Panel is to convert the video signals into a complete display or picture in the screen.

6) The CCFL/EEFL lamps were inside the LCD Panel

* If the LCD Panel without the backlight, the screen will darkness and hard to see their contents or display. The Backlight system is using the CCFL/EEFL lamps (with the voltage supply from Inverter board) or LED strip (with the voltage supply from LED Driver board) to generate the back light.

A Simple Description of How LCD TV Work

When the TV power cord connects to AC supply and switch it ON, the LCD TV PSU board will automatic received this AC voltage input. After that the PSU board will automatically generate the Standby Voltage 5V (5VSTB) and send to Main board. They are not any other voltages in PSU board except the 5VSTB.

When the Main Board received the 5V standby voltage from PSU board, it will going through a voltage regulator IC or DC-DC circuit to generate the 3.3V voltage. After that, this 3.3V will supply to MCU (microcontroller unit) IC, CPU and the Front Panel board. So that we can see the standby LED light is lit in front of the TV. The TV is in the Standby Mode now.

After press the power on switch button in Front Panel board or remote control, the Main board will send out the Power On signal (PS_ON, PWR_ON or etc marking code) to PSU board. This PS_ON signal will send to Power Supply board PFC section and then the PWM section to generate other voltage outputs like 24V, 12V, 5V, 3.3V and etc to Main board, T-con board and Inverter board/section. Finally the TV can show the display now.

C) The Method and Tools to Help Isolate the LCD TV Problem

In this stage, we must have some electronic testing skills to troubleshoot the TV. If you think your skill is not enough to do that, then I will highly recommend you read these e-books: Testing Electronic Components & SMPS Power Supply Repair Guide at:

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

Here is the list of TV problems is always occurring in LCD TV:

1) No Power/Dead (no any LED light lit in front the of Front Panel board)

* If the TV is No Power symptom, first need to check their Power Supply AC input after fuse is appear or not. If it is appear 110Vac or 220 Vac, that's mean the AC input, power switch and fuse is ok. If not you need to check the AC plug main switch is press ON or not. Check the power cord and the fuse also.

If the 110Vac or 220Vac appear, but PSU secondary side no voltage outputs then you need to replace a working PSU board to solve this problem. If their Standby voltage 5V is appear but other voltages are no output then you need to check the Main board and the Front Panel board. If you have learned the V3.0 ebook, then you can use the PSU self test method to confirm it is the Main board or backlight problem.

2) No Display & No Sound (but the LED light is lit or LED light blinking)

* When the TV No Display but the LED light is lit from Red change to Blue or Green color light, that's mean the Main board has sent out the start-up signal to PSU board. But the actual situation is we need to know the PSU board has output all the voltages correctly. So that still need to checking the PSU board secondary side output voltages is normal and stable or not. If all voltages output normal and stable (including the BL_ON and PS_ON signals appears), that's mean the problem is in the Main board. Make sure that's in the TV Mode, if not sure then you must also check their T-con board too.

* When the TV No Display but their LED light is blinking nonstop, so need to check their standby 5VSTB is normal or not. If the 5VSTB is normal

and stable, also need to know the PS_ON signal appears or not. If the PS_ON signal not appears, need to check the Main board and their Front Panel PCB board. In this case, disconnect the Front Panel PCB from the Main board and power on the TV again, if the TV can show the display normally, that's mean the Front Panel PCB is something wrong happen in it. If after replace the Front Panel PCB still same symptom, then need to check the Main board or replace it.

* When the TV No Display & No Sound but the LED light is blinking few times then stop and continue to blinks, this type of LED blinking is showing the error code to the repairer. Regarding this type of symptom, you need to refer to their service manual to find out what's the meaning of this error code like I wrote in this chapter (A) Basic Knowledge there.

3) No Display but Sound Normal

* If the TV is No Display but sound normal, sometime we can hear the sound from TV channel changed. For this symptom, need to know:

a) If their backlight is lit, need to check the T-con board Vcc voltage input after SMD fuse. If the Vcc voltage appear (typically it is 12V or 5V), the higher opportunity is the T-con board gone. So replace a working T-con board to give it a try.

b) If this TV backlight is off, need to check the BL_ON & PDIM signals are appear or not. If not appear, the problem is in the Main board there. If these signals appear, the problem is in the inverter board/section or their CCFL/EEFL lamps.

4) No Display in Certain Video Signal Input

* If the TV can show the display in one of the video signal input, but other video signal inputs are ok, so this type of TV symptom is causing by the Main board. If want to do the components level repair, need to check their appropriate section. For example the HDMI section, AV section and etc.

5) No Display after Several Seconds (or call it as Backlight shutdown)

* This type of TV symptom is causing by their inverter board/section or the CCFL lamp/s. Before that, make sure their BL_ON and PDIM signals are normal and stable. If not stable or abnormal, need to check and tracing it to the Main board there. If not sure problem is causing by Inverter board or CCFL lamp/s, we can use the CCFL lamp Tester to testing it. So that we can confirm it

is the inverter problem and their CCFL lamps are ok. With this tool, we can quickly found that's the inverter or their CCFL lamps problem.

6) Display Problem/Abnormal Display

* This type of symptom we can divide it into:

a) **Black Screen/No Display:** For this symptom, please refer to the 2), 3) & 4) in this chapter.

b) **Grey Screen Problem:** This type of problem is same as the 3) a.

c) **Vertical Lines/Bars in the Screen:** If the lines/bars is across the OSD Menu and all the video signal inputs also same result, that's mean this TV LCD Panel is defective.

d) **Horizontal Lines/Bar in the Screen:** If the lines/bars is across the OSD Menu and all the video signal inputs also same result, that's mean this TV LCD Panel is defective.

e) **Half Screen Blank but Another Half is Normal:** Mostly this type of symptom is causing by their FPC cable/s. This cable is output from the T-CON to Source Driver board. Besides the FPC cable, their connectors in T-CON board and the Source Driver Board must check also. Because some repairer after they replace the T-con board and solved this type of problem, but their actual problem was because of the connector dry joins or etc problem only. Or the Half Screen is Abnormal but another Half Screen is normal then this type of problem is causing by their T-CON board.

f) **Negative Picture:** This type of problem was because of their T-con board GAMMA circuit malfunction. So just replace the T-con board and the problem solved.

g) **Display Distortion:** For this type of TV symptom, it is hard to say which section is defective, but most of the time, it is causing by the T-con board or Main board.

h) **Display Full of Vertical Color Lines:** This type of TV problem, we must call out the OSD Menu to confirm. If the OSD Menu is showing normally in the screen but their background is fully of vertical lines then this symptom is causing by the Main board or their LVDS cable.

i) **Display is Opposite in the Screen:** This type of symptom is causing by their Main board firmware setting or firmware corrupted.

The above information is just for the repairers who want to repair the TV in board levels repair only. If you need to do the components levels repair, you need to learn more in this ebook and my other series ebook like V1.01, V2.0, V3.0 or etc.

Another Main Board Secret Repair Tips

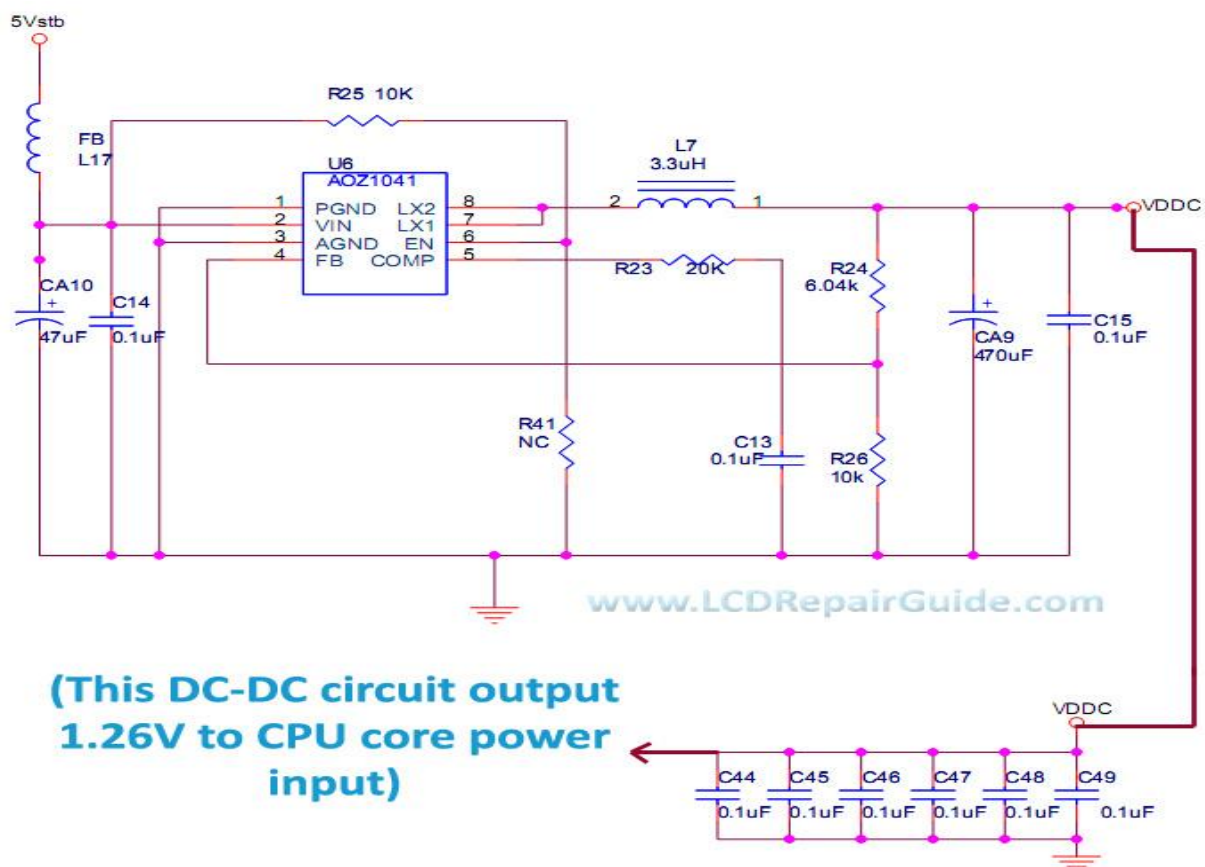
Nowadays, lots of LCD or LED TV Main board problem difficult to repair it. Even you had checking all the components in the Main board or re-program their flash memory IC or EEPROM but no help too.

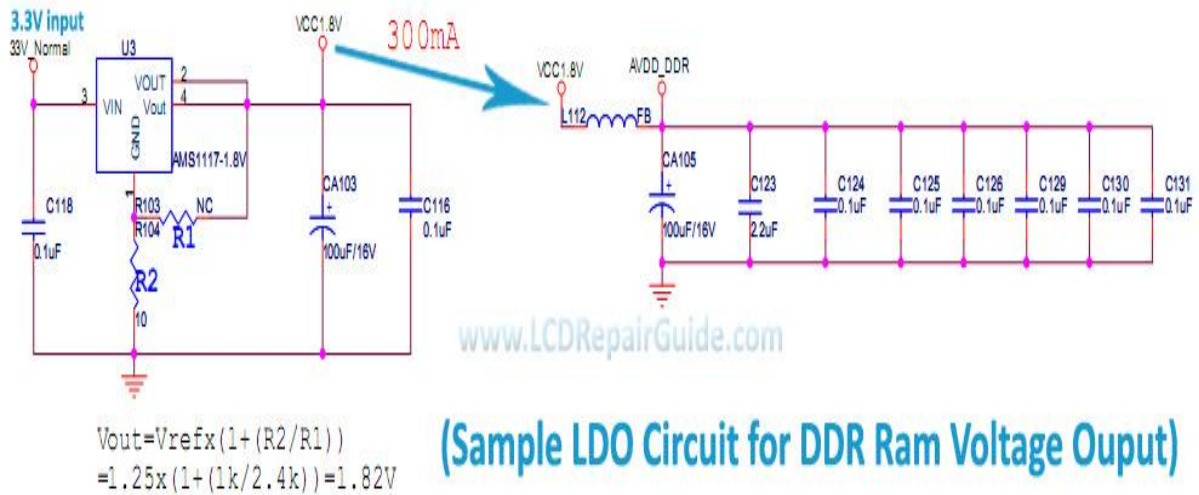
So what's happen to the TV Main board? Why can't to repair it? But after buy a new Main board to replace it, the problem solved!

Finally, found the answer for this Main board problem. Actually it is causing by their **Main board LDO and DC-DC circuits!!!** Some repairer may said, I had checking their voltage outputs properly and values are stable too. Yes, even their output voltage value is correct and stable, BUT some of these output voltage values are not accept by the Main board Chips like their CPU, DDR RAM & the Flash memory! So, is it hard to repair and expensive to replace it? NO, it is cheap and easy to get it!

Note: LDO is stand for Low-DropOut Regulator

(http://en.wikipedia.org/wiki/Low-dropout_regulator)





The above two sample of DC-DC & LDO Voltage Output Circuits

Note: The LDO circuit normally using the IC like: 1117 series, 1084 series & etc. For the DC-DC circuit, it is using the IC like: AOZ1041, AOZ1072, AP1534, MP1482, MP2212 & etc.

The Main board problem like:

- 1) TV stuck in standby mode because of the POWER_ON signal missing.
- 2) The TV Backlight problem and causing by their BL_ON signal missing.
- 3) TV some time can start-up but some time not. The POWER_ON signal unstable and causing the TV non-stop on and off.
- 4) The TV Backlight flickering and causing by the BL_ON signal unstable.
- 5) Display Distortion
- 6) No Display, even the power LED light change from Red to Blue color light.
- 7) And other strange TV problem.....

From the above TV symptoms, even you had confirm their Power Supply (PSU) board is ok, inverter board/section is ok, CCFL lamps or LED strip are ok, T-con board is ok and even the LCD/LED panel is ok too.

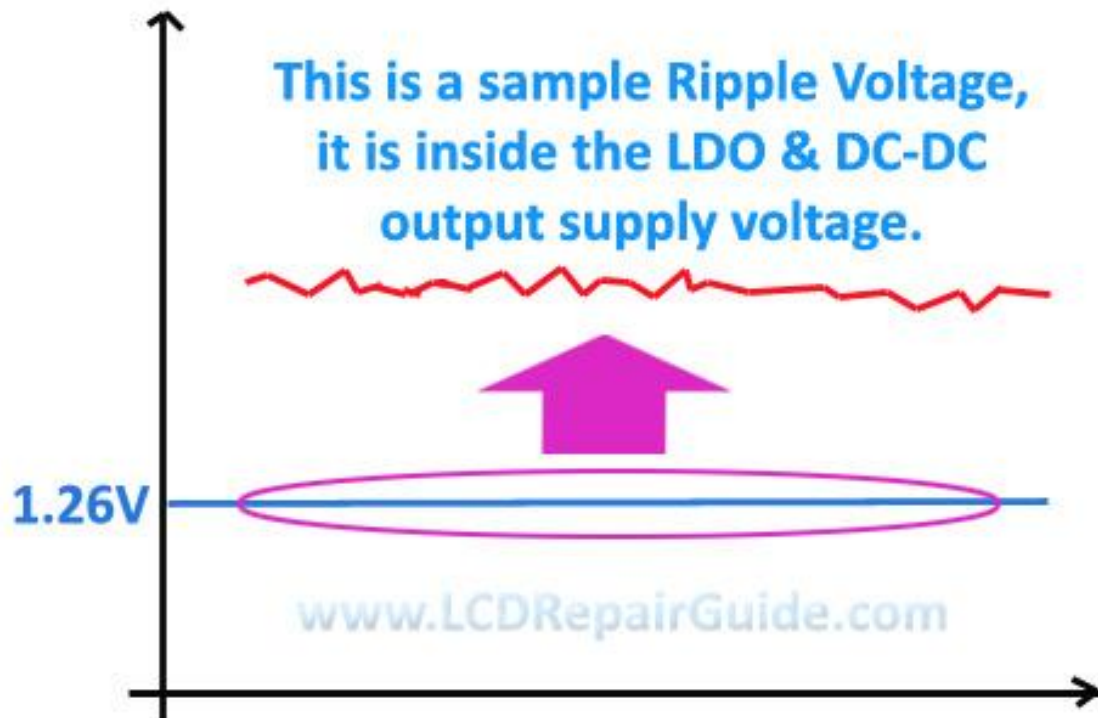
When you confirm that the problem was the Main board, some of the repairer will stop checking it, or just measure some common components then replace the whole Main board and the problem solved and case closed.

For some repairer, they will continue to checking the Main board with these steps:

- 1) Checking the Main board output signals like POWER_ON and BL_ON are normal and stable or not.
- 2) Checking Main board LDO & DC-DC circuit voltage outputs values is normal and stable or not.
- 3) If all voltage outputs are normal and stable, they will continue to checking the Flash Memory and the EEPROM circuits.
- 4) After that checking the CPU (Main Chip) Vcc input voltages, crystal and reset circuit. Or try to replace the crystal and give it a try.
- 5) Also checking the DDR Ram Vcc and their other signals lines too.
- 6) If above steps all also no help, then it can try to re-program the correct firmware to Flash Memory using ISP Programmer. Also try to replace an empty EEPROM IC into the Main board and give it a try (most main board can accept this method, but little Main board will not). Or replace the Flash memory or EEPROM IC to give it a try.
- 7) If still no help, then replace the CPU (Main Chip). But most of the repairer after doing step No.6 they will give up and replace the whole Main board.

Actually the TV Main board CPU Core Power (normally are **1.26V, 1.2V or 0.9V**, it will depends on their design) voltage require very strict to it. For example the 1.26V core voltage line, If a bit different voltage values, when testing it with 1.29V or 1.3V values, then this voltage is not accept by the CPU and will causing the Main board not working or working abnormal. So the acceptable voltage values for 1.26V core power will be 1.25V~1.27V. The LG 42LK530 LCD TV Main board it is using 0.9V of their CPU core power.

So what will cause the CPU not working or working abnormal except the voltage input not correct or not stable? Yes, the answer is the “**Ripple Voltage**” for this CPU core power!



This is a sample voltage output of CPU core power 1.26V

Not only the CPU, the DDR RAM also require the voltage input very strict and stable! The Flash Memory voltage input also same too.

So lots of the TV repairer they don't know about this, or even know about this, but the Oscilloscope also can't detect this Ripple voltage in the LDO or DC-DC output! If this Ripple Voltage over 10mV (some Main board will accept to not more than 100mV ripple voltage, depends on the Main board design), the CPU will not working or working abnormally. If the Ripple Voltage is below 10mV, it is acceptable by the CPU core power system.

So the TV repairer will think this output voltage is ok and can be trusted (Because of the Multimeter and Oscilloscope not detect any abnormal values or waveform there). But from lots of the Main board repair case, this Ripple Voltage always occurs in CPU core power input and the DDR Ram Vcc input! This causing lots of the strange problem in Main board and can't be repair (the repairer don't know about this) also throw this Main board in the trash can. After you learn this tip, if you had throw this type of Main board in the trash can before, you will regret it.

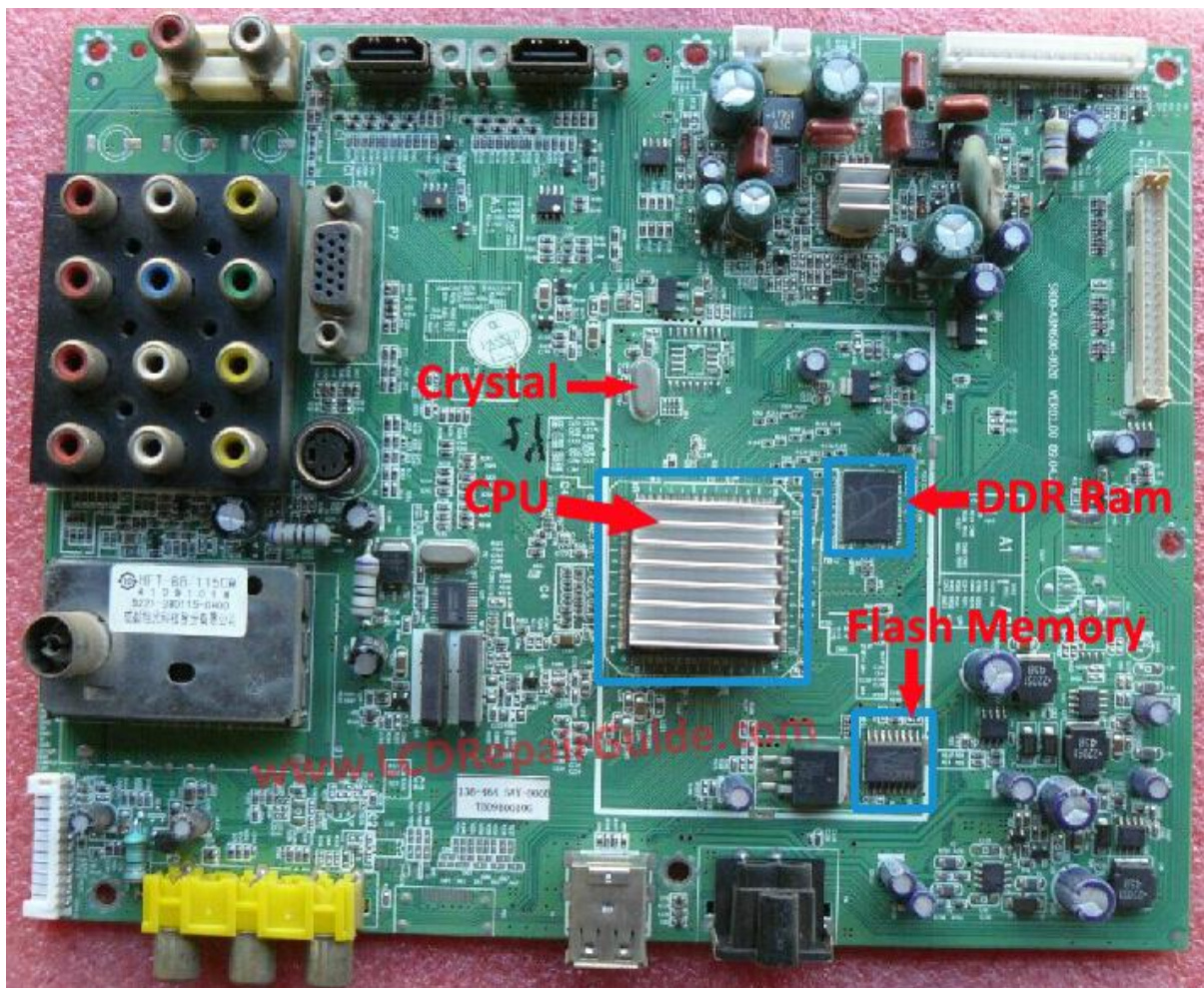
Main Board Repair Tips

1) Model: Skyworth 42L05HF LCD TV

Chassis: 8M60 Main board chassis

Symptom: TV Can't Start-up, Power LED Light Change from Red to Blue Color.

After open the rear cover, their backlight can lit about 10 seconds, then shutdown about 5 seconds. After that the backlight will lit about 10 seconds and it will on & off repeatedly. But the TV screen is always no display.



Skyworth 42L05HF Chassis 8M60 Main board

Repair/Solution:

Open the TV rear cover, testing their PSU voltage outputs. The 24V= 23.8V, 12V= 12.5V and 5VSTB= 5.04V all are ok and stable. Checking the PR ON/OFF signal has 2.65V but the BL-ON/OFF signal not stable. This BL-ON/OFF signal voltage repeated changed from 4.93V~0.02V. When the backlight lit about 10 seconds, this BL-ON/OFF signal has 4.93V, when backlight off about 5 seconds, the signal voltage has 0.02V only.

So suspect the CCFL lamp/s or the inverter board failure. Use the PSU self test method (I had mention it in my V3.0 ebook before), to testing the PSU and the backlight system. Surprisingly, PSU board and the backlight system are working properly!

The BL-ON/OFF line disconnect to inverter board and testing it in the Main board there. Found this BL-ON/OFF signal voltage still up and down. So confirm that the problem was in TV Main board.

The steps to checking the TV Main board are:

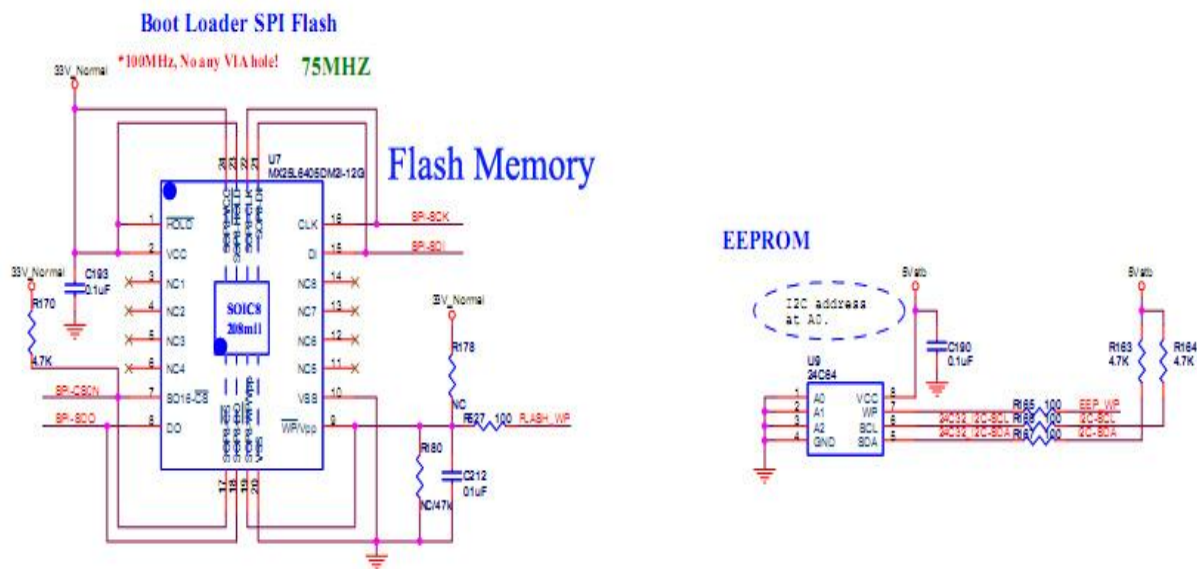
- 1) LDO and DC-DC circuits
- 2) EEPROM and Flash Memory circuit
- 3) CPU Reset circuit
- 4) CPU Crystal
- 5) DDR Ram circuit
- 6) Try to replace the firmware for Flash Memory with ISP Programmer
- 7) Replace DDR Ram or CPU chip or just replace a new Main board.

To checking the LDO & DC-DC circuits in TV Main board, we need to use the Main board schematic diagram to know how many LDO or DC-DC circuits in this board. Below is the voltage output value of this Main board:

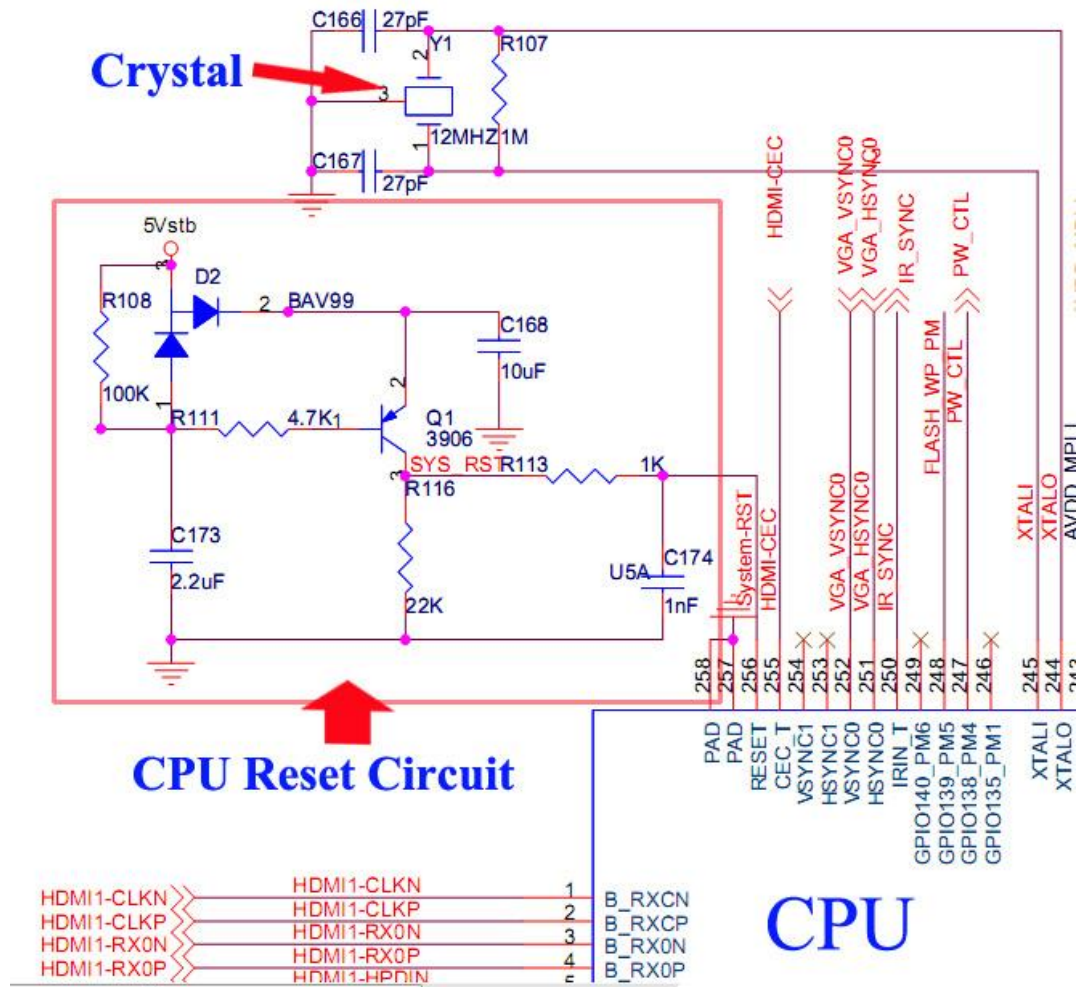
- 1) U2 (LDO) 3.3VSTB= 3.331V
- 2) U3 (LDO) DDR_1.8= 1.818V
- 3) U4 (LDO) ADC_33= 3.351V

- 4) U12 (LDO) 5V_IF= 5.02V
- 5) U21 (DC-DC) 5V= 5.03V
- 6) U25 (DC-DC) VDDC= 1.273V (CPU core power 1.26V)
- 7) U26 (DC-DC) 5V_USB= 5.02V

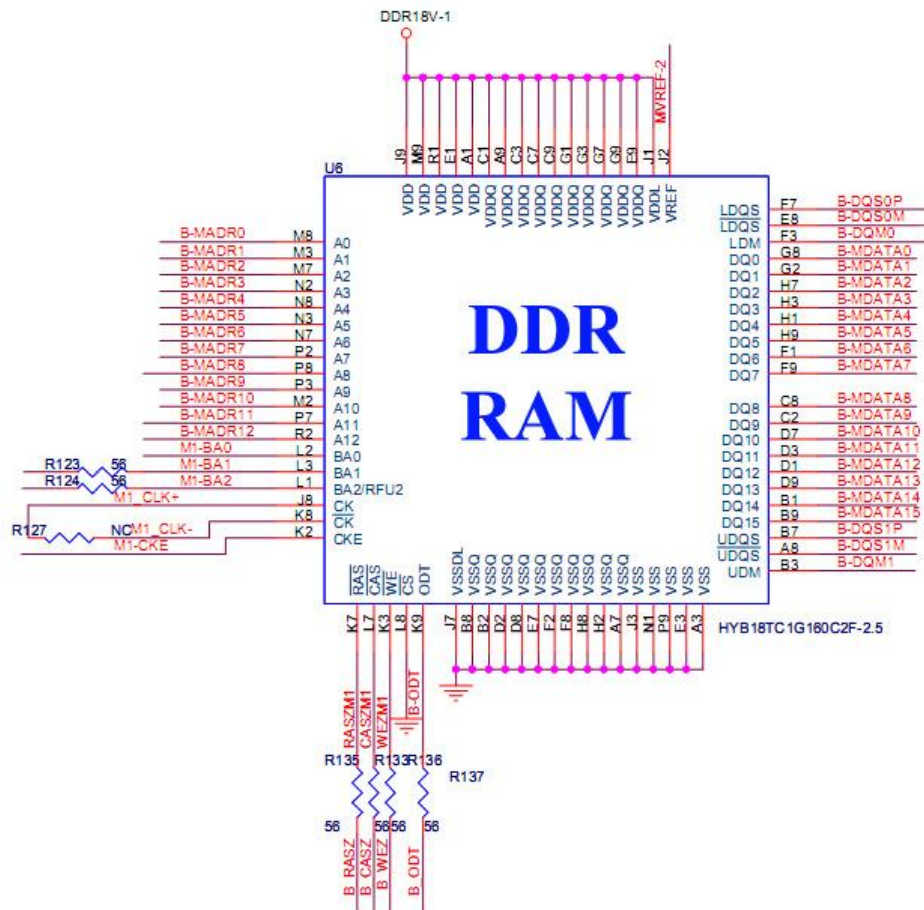
The above voltage values look like normal and stable. So the next step will be checking the EEPROM and Flash Memory. So measure the EEPROM Vcc input, SCL & SDA signals, all are good and stable. The Flash Memory Vcc input and the CLK signal also OK.



So continue to checking the CPU reset circuit and the crystal waveform. The Reset Circuit is operating properly. When checking the Crystal, the oscilloscope can detect the Sine waveform, but sometime this waveform will missing and come again! So suspect this Y1 crystal (12MHz) is failure and tries to replace it with a new one. But TV problem still the same and no change!



To checking the DDR Ram, normally just to measure their Vdd voltage input and the Vref (Reference Voltage) voltage. This Vref voltage is about 0.9V, it is using the input voltage Vdd (1.8V) divided by two. Also check their control signals and the clock signals in between to CPU there. These Control signals are: RAS, CAS, WE and CS. The Clock signal like: CK & CKE. Make sure these signals are reach to the CPU there. Sometime these signals will break in half way. This is because of the PCB circuit hole causing the signal line broken and these signals can't communicate with the CPU. After checking all these signals and the voltage inputs, all are normal.



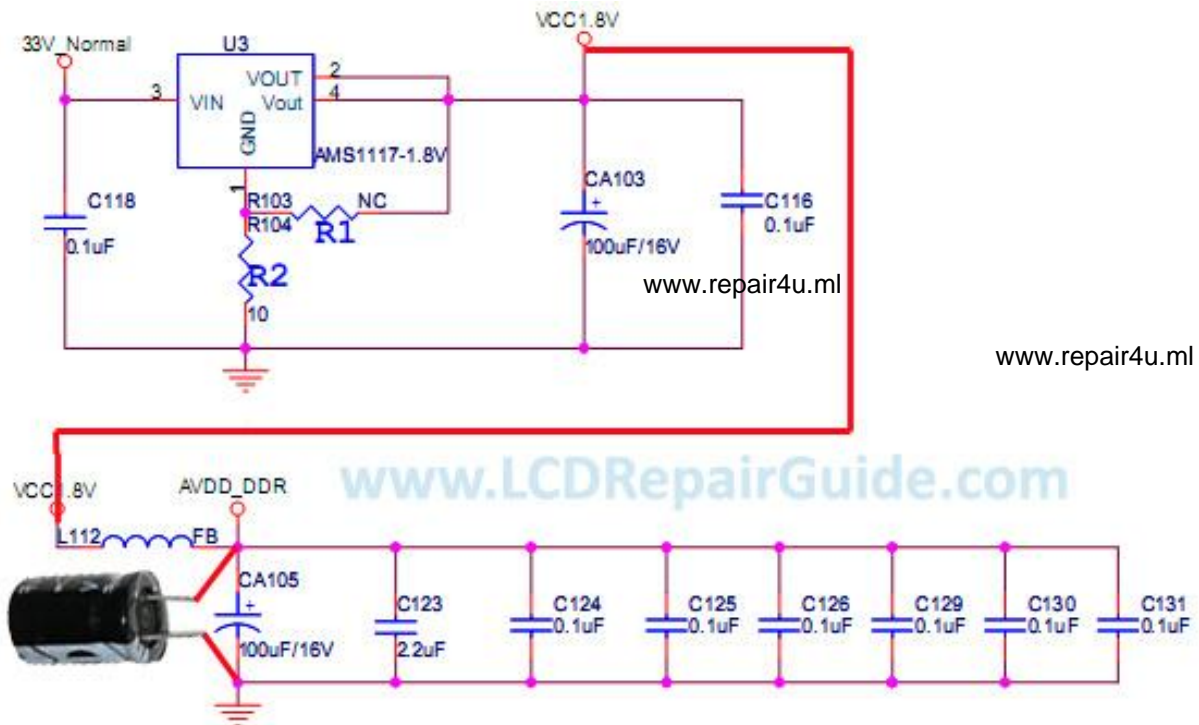
This Main board using Qimonda HYB18TC1G160C2F-2.5 DDR RAM

Since the above steps can't find out what's wrong in this Main board, so just try to using the ISP Programmer to re-program their Flash Memory firmware. Remember, the firmware MUST find out the correct version and suitable for the LCD Panel. One more thing, before re-program the Flash Memory, I highly recommend to backup their old firmware first before replace it with the new one. Finally found the correct version and same LCD Panel firmware to this Main board. The result is "still same problem"!

The last remaining is replacing the DDR Ram, CPU or just replaces a new Main board. Suddenly think of the supply voltage to CPU core power and the DDR Ram if their Ripple Voltage higher than 10mV will cause the Main board not working or working abnormal.

So use a 470uF/16V electrolytic capacitor connect parallel with their CPU core power DC-DC voltage output (U25) there, but the problem still persist. And then use a 220uF/16V capacitor connect it with their U3 LDO voltage output to

DDR Ram, suddenly the problem gone and the TV can show the display perfectly! Wow, just a cap can solved this TV problem.



Added a 220uF/16V capacitor to U3 output voltage and connect it parallel with the output voltage.

Uses the capacitance meter to testing CA103 and CA105 both capacitance and ESR values are normal. The other ceramic capacitors all looks like good. So decide to replace the CA105 with a 220uF/16V electrolytic capacitor into it. Finally this TV problem solved!

Conclusion:

Starting now, when repair the TV Main board with strange problem, first step try to checking their LDO and DC-DC voltage outputs. If all voltage outputs normal and stable, then directly add the electrolytic capacitor into the voltage input of CPU core power, DDR Ram and the Flash Memory. It will save your time and the money too!

2) Model: Sanyo LCD-32CA828 LCD TV**Symptom:** TV Auto Shutdown Randomly

This TV will auto shutdown randomly, but sometime it can work whole day without any problem. When the TV auto shutdown, after a while it will auto power on the TV and till the display show SANYO logo then auto shutdown again! When the problems occur, it will non-stop to shutdown and then auto power on again. But some time it can work properly!

Repair/Solution:

Even try the repair tip procedure on (1) above, still can't find any problem. After that, think about the Main board LDO and DC-DC circuit Ripple Voltage issue. So try to add the electrolytic capacitor 220uF/16V to DDR Vcc input line and their DDR Vref (Reference Voltage) line. But the problems still same. After that, add another 220uF/16V capacitor to CPU core power line, parallel with C747, power on the TV and the problem solved!! Replace the C747 capacitor with a 470uF/16V cap. This TV even burn test several days, but it still can working in good condition. Finally this TV problem was solved.

This Main Board Secret Repair Tips Can Apply to:

- 1) LCD, LED & Plasma TV Main board
- 2) LCD & LED Monitor Main board
- 3) Laptop & Desktop Main board
- 4) CNC machine Main board
- 5) Or all the Main board using the big Chipset with CPU inside & has their core power in it, so you can try this tip to it. Also the Main board has high speed DDR/SD Ram circuits; you can try to use this method too.

I'm happy to receive your email about how you successful to repair the Main board with this tip and also what's type of Main board it is.

NOTE:

For the SHARP LCD/LED TV, some of their TV Main board has a special function, when the problem occurs about 5 times (on the TV, but it's not working, after that off and power on again the TV, it will count as two times already), their TV Main board will store the error code inside Main board memory IC. So even you're solved the problem like changed the PSU board, inverter or lamps, the TV is still not working. The front LED light will flashing Red, Green then Red again and non-stop or etc. Unless you change the Main board, the TV will work!

Actually this problem is easy to solve, if you know how to do that. If you don't know, then you will need to replace the Main board. So the solution is just login to the Service Mode to clear their "Failure Mode Memory" and then save & exit the Service Mode and the TV problem solved. For more details on how to do that, you can refer to my LCD TV Repair Tips V2.0 ebook, pages 53. So this is an exception case of the Main board problem. Their Main board is ok, just you need to know what's happen into it, and then you can fix it.

How to find a Substitution of SPI Serial Flash Memory and EEPROM ICs in LCD/LED TV and Monitor

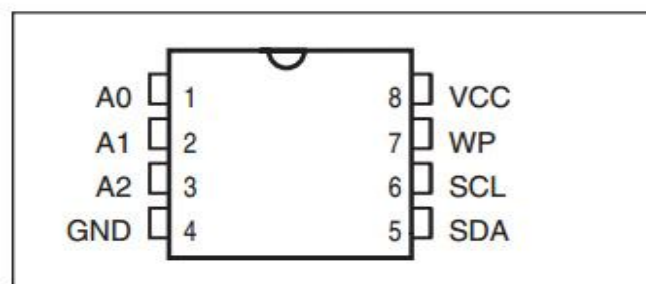
Nowadays, lots of the LCD/LED TV and Monitor use the memory IC to store the data and firmware on their Main board. Besides to using the Programmer to send data or firmware to memory IC, as a TV repairer, most of the times they want to replace the EEPROM IC or Flash Memory to make sure that memory IC is normal or not. Because of the EEPROM and Flash Memory IC have lots of brands and part numbers, so the repairer cannot prepare all type of memory IC.

Actually all electronic component inside the PCB board, it is better to use the original part number to replace it. But some time it is difficult to do that, especially you don't have the same part number to replace it. So this information is to let you know, how to choose the right memory IC for the Main board.

How to Choose a Substitute EEPROM IC

PIN CONFIGURATION

8-Pin DIP, SOIC, DFN, TSSOP, MSOP



PIN DESCRIPTIONS

A0-A2	Address Inputs
SDA	Serial Address/Data I/O
SCL	Serial Clock Input
WP	Write Protect Input
Vcc	Power Supply
GND	Ground

In general for TV & Monitor Main board, if you want to find an equivalent EEPROM IC, you can choose the memory size a bit bigger than the original

memory size. For the **24C** series EEPROM IC, it can be divided into two: 24C16 is downward compatibility for replace 24C02, 24C04, 24C08. The 24C08 can replace 24C04 and 24C02, 24C04 can replace 24C02. But the 24C32 cannot replace 24C02, 24C04, 24C08 and 24C16. The 24C64 can replace 24C32. The 24C128 can replace 24C64 and 24C32. Please make sure that it is using the same IC packages. Because some different packages, their Vcc input voltages will different. For more details, please refer to their own datasheet and it is save before replace it.

Note:

* EEPROM= Electrically Erasable and Programmable Read-Only Memory

24C01= 1K bits (128 x 8= 1024 bits)

24C02= 2K bits (256 x 8= 2048 bits)

24C04= 4K bits (512 x 8= 4096 bits)

24C08= 8K bits (1024 x 8= 8192 bits)

24C16= 16K bits (2048 x 8= 16384 bits)

And so on.....



Can I replace the EEPROM IC with other brands IC?

Yes, it can replace it. For example, in the Samsung 943 series LCD monitor main board, commonly using this EEPROM IC S24CS08A (Seiko Instrument) and causing lots of the problem. So you can use the AT24C08A (Atmel) as an equivalent. And it can work very well.

The 24Cxx series EEPROM IC pin7 (WP- Write Protect) have two kinds of method to connect it. The EEPROM IC manufacturer like AT (Atmel), ST (STMicroelectronic) and BR (ROHM), their EEPROM IC pin7 need to connect to the ground to allow data write into the EEPROM memory. The other EEPROM IC manufacturer like KOA, KOR and KS, their pin7 is working on

“Active High”, after that the data can write into the EEPROM memory. The “**Active High**” means this pin7 need to connect to 5V with a 6.8Kohm resistor. If not, when you wrong replace with this type of EEPROM IC, the TV will not save the TV channel or Volume setting & etc.

Philips PCF Series EEPROM IC

For Philips EEPROM IC, most of their PCF series IC are compatible with 24Cxx series. For example, they can replace with:

24C01 ⇔ PCF8522

24C02 ⇔ PCF8582

24C04 ⇔ PCF8592



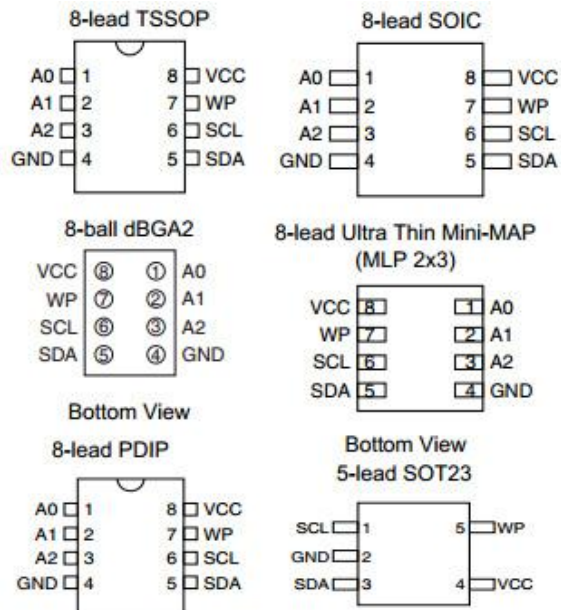
The PCF8522 and PCF8581/PCF8582 their connection for pin7 (WP) are different. PCF8522 pin7 need to connect to ground. The PCF8581 and PCF8582 their pin7 need to connect it as “Active High”. The substitute for this PCF series IC also same, choose the bigger size to replace a bit small size memory. For example, PCF8582 can replace PCF8581; PCF8598 can replace PCF8594 EEPROM IC.

Atmel Series EEPROM IC

Some repairer said they can see any 24Cxx memory IC inside their Main board. Especially if the Main board is use the Atmel latest type of EEPROM IC. Actually it is using the part number or calls it as marking code. Besides the DIP packaging, the EEPRM IC also have other type of packages like the picture below:

Table 1. Pin Configuration

Pin Name	Function
A0 - A2	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect
NC	No Connect
GND	Ground
VCC	Power Supply



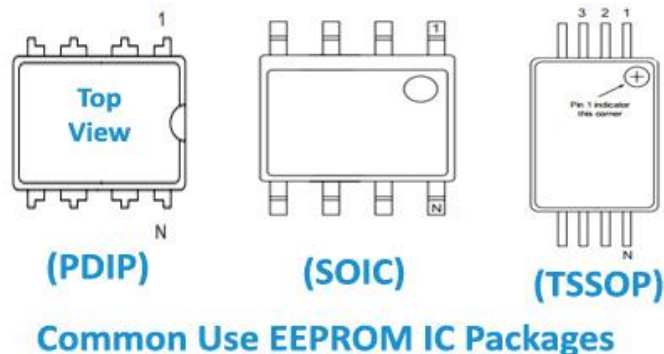
How to read Atmel EEPROM IC part number?

Besides the normal marking code we can direct see it on the EEPROM IC like 24Cxxx, actually some ATMEL memory IC also have special marking code for it. Here is some of the Atmel EEPROM IC part marking code. With this code you will know that what part number of this Atmel EEPROM IC.



This is an Atmel 24C16 EEPROM IC

Atmel packaging information:



24C02: 02B 1, 02C M B, 02CM Y, 02C M Y



(SOIC packages)



(TSSOP packages)

24C04: 04B 1, 04CM B, 04CM B



8-PDIP & 8-SOIC

Seal Year

Top Mark

0	4	B	1
---	---	---	---

* Lot Number

Pin 1 Indicator (Dot)

Y - SEAL YEAR		WN - SEAL WEEK	
6: 2006	0: 2010	02 = Week 2	
7: 2007	1: 2011	04 = Week 4	
8: 2008	2: 2012	:: : :::: :	
9: 2009	3: 2013	:: : :::: :	
		50 = Week 50	
		52 = Week 52	

Lot Number to Use ALL Characters in Marking

BOTTOM MARK

No Bottom Mark

8-TSSOP

Top Mark

Pin 1 Indicator (Dot)

0	4	B	1
---	---	---	---

Y - SEAL YEAR		WN - SEAL WEEK	
6: 2006	0: 2010	02 = Week 2	
7: 2007	1: 2011	04 = Week 4	
8: 2008	2: 2012	:: : :::: :	
9: 2009	3: 2013	:: : :::: :	
		50 = Week 50	
		52 = Week 52	

Bottom Mark

P	H	A	A	A	A	A	A
---	---	---	---	---	---	---	---

<- Pin 1 Indicator

24C08: 08B 1, 08CM B, 08CM Y



24CS08 /24CS04: N8 (24CS08), N4 (24CS04)

AT24CS04 and AT24CS08: Package Marking Information

8-lead SOIC	8-lead TSSOP
8-lead UDFN	5-lead SOT-23
2.0 x 3.0 mm Body 	

Note 1: ● designates pin 1

Note 2: Package drawings are not to scale

Catalog Number Truncation			
AT24CS04		Truncation Code ##: N4	
AT24CS08		Truncation Code ##: N8	
Date Codes			Voltages
Y = Year	M = Month	WW = Work Week of Assembly	M: 1.7V min
2: 2012	6: 2016	A: January	
3: 2013	7: 2017	B: February	
4: 2014	8: 2018	...	
5: 2015	9: 2019	L: December	
Country of Assembly		Lot Number	Grade/Lead Finish Material
@ = Country of Assembly		AAA...A = Atmel Wafer Lot Number	H: Industrial/NiPdAu U: Industrial/Matte Tin
Trace Code			Atmel Truncation
XX = Trace Code (Atmel Lot Numbers Correspond to Code) Example: AA, AB.... YZ, ZZ			AT: Atmel ATM: Atmel ATML: Atmel

24C16: 16B 1, 16CM Y

24C32: 32D M Y**24C64:** 64D M Y, 64C 1**8-PDIP & 8-SOIC**

TOP MARK

Seal Year		Seal Week	
Y	W	Y	W

A T M L U Y W W
 6 4 C 1
 * Lot Number

Pin 1 Indicator (Dot)

Y = SEAL YEAR		WW = SEAL WEEK	
6: 2006	0: 2010	02 = Week 2	
7: 2007	1: 2011	04 = Week 4	
8: 2008	2: 2012	:: : :::: :	
9: 2009	3: 2013	:: : :::: :	
		50 = Week 50	
		52 = Week 52	

Lot Number to Use ALL Characters in Marking

BOTTOM MARK

No Bottom Mark

8-TSSOP

TOP MARK

Pin 1 Indicator (Dot)	
Y	W

* H Y W W
 6 4 C 1

Y = SEAL YEAR		WW = SEAL WEEK	
6: 2006	0: 2010	02 = Week 2	
7: 2007	1: 2011	04 = Week 4	
8: 2008	2: 2012	:: : :::: :	
9: 2009	3: 2013	:: : :::: :	
		50 = Week 50	
		52 = Week 52	

BOTTOM MARK

P	H
A	A A A A A A

<- Pin 1 Indicator

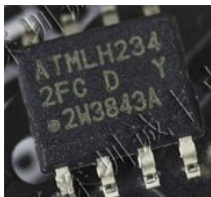
24C128: 2DB 1, 2DC M Y



24C256: 2EC L B, 2ECL B, 2ECL Y



24C512: 2FC D B, 2FC D Y, 2FB 2



24C1024 : 2GB 1, 2GB 2



Atmel: 2GB 1, 2GB2**8-PDIP(1.8V) (Same as 8-SOIC)**

TOP MARK

				Seal Year				Seal Week			
	---	---	---		---	---	---		---	---	---
A	T	M	L	U	Y	W	W				
	---	---	---		---	---	---		---	---	---
2	G	B					1				
	---	---	---		---	---	---		---	---	---
*	Lot Number										
	---	---	---		---	---	---		---	---	---
Pin 1 Indicator (Dot)											

Y = SEAL YEAR		WW = SEAL WEEK	
6: 2006	0: 2010	02 =	Week 2
7: 2007	1: 2011	04 =	Week 4
8: 2008	2: 2012	:: : :	::: : :
9: 2009	3: 2013	:: : :	::: : ::
		50 =	Week 50
		52 =	Week 52

Lot Number to Use ALL Characters in Marking

BOTTOM MARK

No Bottom Mark

8-PDIP(2.5V) (Same as 8-SOIC)

TOP MARK

				Seal Year				Seal Week			
	---	---	---		---	---	---		---	---	---
A	T	M	L	U	Y	W	W				
	---	---	---		---	---	---		---	---	---
2	G	B					2				
	---	---	---		---	---	---		---	---	---
*	Lot Number										
	---	---	---		---	---	---		---	---	---
Pin 1 Indicator (Dot)											

Y = SEAL YEAR		WW = SEAL WEEK	
6: 2006	0: 2010	02 =	Week 2
7: 2007	1: 2011	04 =	Week 4
8: 2008	2: 2012	:: : :	::: : :
9: 2009	3: 2013	:: : :	::: : ::
		50 =	Week 50
		52 =	Week 52

Lot Number to Use ALL Characters in Marking

BOTTOM MARK

No Bottom Mark

****** Be careful of different EEPROM IC packages will have different Vcc input voltage range. For example Vcc input voltage range for Atmel series EEPROM IC: 4.5~5.5V, 2.5V~5.5V, 1.8V~5.5V and 1.7V~5.5V.

Conclusion:

- 1) If the EEPROM IC damage, the best choice is use an original part number. If can't get it, highly recommend to use same specification part number but different brands IC. For example, the original part number is ST24C16, so you can use AT24C16 EEPROM IC to replace it.
- 2) When find the equivalent EEPROM IC, need to find a memory size bigger than the original one. For example, 24C02 can be replaced by 24C04 or 24C08. Please make sure not to use too bigger memory size EEPROM IC, sometime it could be malfunction or other strange problem will occur.
- 3) Some model TV can't use the bigger memory size or different brands of EEPROM IC to replace their original EEPROM IC. Because of this TV Main board CPU will detect the memory IC their ID number. If the number is different, the CPU will not accept it and the Main board will not operate or strange problem will occur.
- 4) Some 24W series EEPROM IC their pin7 (WP) connect to MCU, so this type of EEPROM IC is highly recommend to use their original part number memory IC.
- 5) Again, the EEPROM IC brands like AT, ST & BR their pin7 (WP) need to connect to ground, so that the data can write into the EEPROM IC memory. For the Korea type EEPROM IC, like KOA, KS & KOR their pin7 (WP) must connect to Vcc (5V) with a resistor. For example, when the original memory IC is the KS EEPROM IC, if replace by the AT or ST EEPROM IC, make sure that the pin7 (WP) need to connect it to the ground (GND). If not, the TV will can't save the TV Channel or other setting values. When the original memory IC is ST EEPROM IC, if replace by the KS or KOA EEPROM IC, make sure that the pin7 (WP) solder a 6.8K ohm resistor and connect it to Vcc (5V).
- 6) Lastly, if using different packaging EEPROM IC, make sure that their Vcc pin input voltage suitable the original memory IC or cover in the voltage range. Also make sure that the pins are same. So recommend to read their IC datasheet to compare it first before replace it.

How to Choose a Substitute Serial SPI

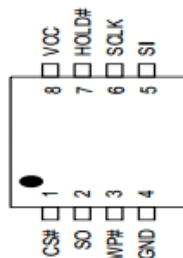
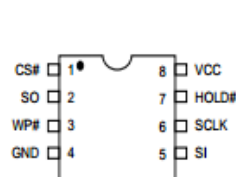
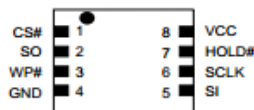
Flash Memory

The Flash Memory in LCD/LED TV and Monitor Main board, it is use to store the firmware and this firmware was using by the MCU (MicroController Unit). They are many type of the flash memory use in the Main board. But in this chapter, I'm telling you how to choose the right Serial SPI Flash Memory for the TV and Monitor Main board.

Actually this SPI (Serial Peripheral Interface) flash memory, some memory manufacturer will call it as Serial Flash Memory, Serial NOR Flash Memory or Serial SPI Flash Memory. But in this ebook I call it as "Flash Memory". All this type of memory will use the "25" series as their marking code.

They are many flash memory manufacturers in the market now. Most of the TV and Monitor Main board flash memory manufacturers are:

- **Atmel/ADESTO:** AT25xxx, AT25DFxx, AT25Fxx
- **AMIC:** A25xxx series
- **CFEON/EON** (same company): EN25Bxx, EN25Fxx, EN25Pxx, EN25Qxx, EN25Txx
- **Chingis Technology Corp. (PMC):** PM25LDxxx, PM25LQxxx, PM25LVxxx, PM25WDxx, PM25WQxx
- **GIGADEVICE:** GD25Dxx, GD25Qxx
- **Macronix:** MX25Lxxx series
- **Microchip:** SST25LFxxx, SST25VFxxx
- **Nantronics:** N25Sxx
- **Nexflash:** NX25Pxx
- **ShangHai Fudan Microelectronics:** FM25Fxxx
- **Spansion:** S25FLxxx
- **STMicroelectronics:** M25Pxx, M25PXxx
- **Trojan:** T25Pxx
- **Winbond:** W25Pxx, W25Qxx, W25Xxx
- and etc

**PIN CONFIGURATIONS****8-PIN SOP (150/200mil)****8-PIN PDIP (300mil)***** 8-LAND SON/WSO (6x5mm), USON (4x4mm)****PIN DESCRIPTION**

SYMBOL	DESCRIPTION
CS#	Chip Select
SI	Serial Data Input
SO	Serial Data Output
SCLK	Clock Input
HOLD#	Hold, to pause the device without deselecting the device
WP#	Write Protection
VCC	+ 3.3V Power Supply
GND	Ground

When need to replace the Flash Memory IC, the best way is use the original part number. But most of the time, it is not available or hard to get the original part number flash memory IC. Actually to find the substitute flash memory IC you must follow these rules and successfully to replace it. These **RULES** are:

- 1) The Flash Memory need to find the same packages, Vcc input voltage and their pins configuration. But most of the time, their pins configuration is same.
- 2) Flash Memory Density (space of the memory) must same or bigger than the original. For example, if the original flash memory is MX25L1605, this IC density is 16Mbit, if you use the EN25T80 to replace it, then the Main board will not work. Because of this flash memory EN25T80 density is just 8Mbit only. So the Main board firmware is missing half of the data and cause the firmware corrupt. So we can use the W25X16 (16Mbit) to replace it. Or use the EN25F32, density is 32Mbit also can replace it. Not recommend to use 64Mbit or 128Mbit to replace it.

3) If after replaced with the same density flash memory also not works, then you may want to consider their original flash memory Read/Write IO type and part number problems. Actually the flash memory different to several types, commonly is using the Standard SPI series flash memory, Unique ID series, Default Lock Protection series and so on. Most of the LCD/LED TV and Monitor Main board is using the Standard SPI series flash memory.

Normally the Standard SPI 25xxx flash memory I/O has one data input and one data output; but for example the EON 25B or 25Q is different, the 25B series have 2 bidirectional I/O and for the 25Q series have 4 bidirectional I/O (EN25Q16 or EN25Q32). So the 25B and 25Q series are suitable to substitute the Standard SPI flash memory, but the Standard 25xxx flash memory is not suitable to substitute the 25B or 25Q series. If the Main board is using 4 bidirectional I/O, the EN25B16 cannot substitute the W25Q16, but we can use the GD25Q16 to substitute the W25Q16 and so on.

4) Some TV/Monitor Main board they will recognition the flash memory ID, so their firmware will first checking the device ID first before working. So for this type of Main board, you need to replace it with the same specification of flash memory IC. For example the Macronix MX25xxx08 Unique ID series flash memory.

5) After substitute the flash memory on the Main board, if using the ISP programmer to do the in circuit (ISP) Read/Write firmware, some MCU IC like NT68 series with external flash memory type, maybe will not recognition the new flash memory. This issue is seldom happen, but it happened too.

One more thing, highly recommend to read the original and substitute flash memory specification datasheet first before replace it. So that you can make sure their pins configuration and the Vcc voltage input are same. And other information like the type of flash memory for original and the substitute flash memory.

The Serial Flash Memory IC Packages Type: (except DIP or PDIP type)**Serial Packages****8 SOP (150mil)**

Length	6
Width	5
Thickness	1.75
Pitch	1.27
	(mm)

**8 SOP (200mil)**

Length	7.9
Width	5.23
Thickness	2.16
Pitch	1.27
	(mm)

**16 SOP (300mil)**

Length	10.3
Width	10.3
Thickness	2.65
Pitch	1.27
	(mm)

**24 BGA (Ball Dia.0.4)**

Length	8
Width	6
Thickness	1.2
Pitch	1.0
	(mm)

**8 WSON (8x6)**

Length	8
Width	6
Thickness	0.8
Pitch	1.27
	(mm)

**8 WSON (6x5)**

Length	6
Width	5
Thickness	0.8
Pitch	1.27
	(mm)

**8 USON (4x4)**

Length	4
Width	4
Thickness	0.6
Pitch	0.8
	(mm)

**8 USON (2x3)**

Length	3
Width	2
Thickness	0.6
Pitch	0.5
	(mm)

**Wafer Level
Chip Scale Package
(WLCSP)**

The result package is subject to various die sizes. The smallest chip so far is 1.46mm x 1.40mm.

List of Manufacturer Flash Memory IC Specification:

⇒ MACRONIX (MX25 Series- Serial Flash Memory)

Serial Flash Example

MX 25L 256 35 F M I - 10 G

DEVICE : _____
 25L/66L: 3V, Serial Flash
 25U/66U: 1.8V, Serial Flash
 25V: 2.5V, Serial Flash

DENSITY : _____
 512 : 512Kb
 10 : 1Mb
 20 : 2Mb
 40 : 4Mb
 80 : 8Mb
 16 : 16Mb
 32 : 32Mb
 64 : 64Mb
 128 : 128Mb
 256/257 : 256Mb
 512 : 512Mb
 1G : 1Gb

MODE : _____
 06: Single-in, Dual-out
 26: Default lock protection
 33/35: MXSMIO® - Multi-in, Multi-out
 36: MXSMIO® - Single-in, Multi-out
 45: MXSMIO® - Multi-in, Multi-out Duplex
 50: MXSMIO® - Security RPMC type
 55: MXSMIO® - Security type
 73: MXSMIO® Duplex- Multi I/O, Quad I/O Permanent Enable

OPTION : _____
 G : RoHS Compliant

SPEED : _____
 08 : 133MHz
 10 : 104MHz/108MHz
 12 : 80MHz/86MHz
 13 : 75MHz
 15 : 66MHz
 20 : 45MHz

TEMPERATURE RANGE : _____
 I : Industrial (-40°C to 85°C)
 S : Automotive Grade 3 (-40°C to 85°C)
 R : Automotive Grade 2 (-40°C to 105°C)
 Q : Automotive Grade 1 (-40°C to 125°C)

PACKAGE TYPE : _____
 P : PDIP
 ZN : 8-WSON
 Z2 : 8-WSON (8x6mm)
 Z3 : 8-WSON (6x5mm)
 Z4 : 8-WSON (8x6mm) 3.4X4.3EP
 ZU : 8-USON
 ZB : 8-USON (4x3mm)
 M : SOP
 MB : 200mil 8-VSOP
 O : 173mil 8-TSSOP
 X : BGA
 BA/BB/BC : WLCSP

GENERATION

Serial Flash Portfolio

	512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb	1Gb
MX25Lxx05/06 Standard Serial Interface	•	•	•	•	•	•	•	•				
MX25Lxx08 Unique ID series					•	•	•	•				
MX25Lxx25/26 Default Lock Protection series		•	•	•								
3V MX25L/66Lxx33/35/36/45 MXSMIO®					•	•	•	•	•	•	•	
MX25L/66Lxx45 MXSMIO® Duplex series								•	•	•	•	•
MX25L/66Lxx55 MXSMIO® Secure series						•	•	•	•	•	•	•
MX25Lxx73 MXSMIO® series (Quad I/O Permanent Enable)					•	•	•	•	•			
2.5V MX25Vxx05/06 Standard Serial Interface	•	•	•	•	•							
MX25Vxx35 MXSMIO® series				•	•							
1.8V MX25Uxx35/33 MX66Uxx35 MXSMIO® series			•	•	•	•	•	•	•	•	•	

3V Serial Flash Family

Part number	Density	Organization	I/O Bus	Frequency (MHz)	Package	Voltage	Automotive Grade
Standard Serial Interface Series:							
MX25LS12E	512Kb	4KB / 64KB	Single / Dual	104(x1), 80(x2)	150mil 8-SOP, 8-TSSOP, 8-USON(2x3mm)	2.7-3.6V	
MX25LS121E	512Kb	4KB / 64KB	Single	45	150mil 8-SOP, 173mil 8-TSSOP, 8-USON(2x3mm)	2.7-3.6V	
MX25L1006E	1Mb	4KB / 64KB	Single / Dual	104(x1), 80(x2)	150mil 8-SOP, 8-USON(2x3mm), WLCSP	2.7-3.6V	-40°C to 105°C
MX25L1021E	1Mb	4KB / 64KB	Single	45	150mil 8-SOP	2.7-3.6V	
MX25L2006E	2Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 8-USON(2x3mm), 8-WSON(6x5mm)	2.7-3.6V	-40°C to 125°C
MX25L4006E	4Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 200mil 8-SOP, 300mil 8-PDIP, 8-USON(2x3mm), 8-WSON(6x5mm)	2.7-3.6V	-40°C to 125°C
MX25L8006E	8Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 200mil 8-SOP, 300mil 8-PDIP, 8-WSON(6x5mm), 8-USON(4x4mm)	2.7-3.6V	-40°C to 125°C
MX25L1606E	16Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP, 200mil 8-SOP, 300mil 16-SOP, 300mil 8-PDIP, 8-WSON(6x5mm), 8-USON(4x4mm), 24-TFBGA(6x8mm)	2.7-3.6V	-40°C to 125°C
MX25L3206E	32Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	200mil 8-SOP, 300mil 16-SOP, 300mil 8-PDIP, 8-WSON(6x5mm), 8-USON(4x4mm), 24-TFBGA(6x8mm)	2.7-3.6V	-40°C to 105°C
MX25L6406E	64Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSON(6x5mm), 8-WSON(8x6mm), 200mil 8-VSOP, 24-TFBGA(6x8mm)	2.7-3.6V	
Default Lock Protection Series							
MX25L1026E	1Mb	4KB / 64KB	Single / Dual	104(x1), 80(x2)	150mil 8-SOP	2.7-3.6V	
MX25L2026E	2Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP	2.7-3.6V	
MX25L4026E	4Mb	4KB / 64KB	Single / Dual	86(x1), 80(x2)	150mil 8-SOP	2.7-3.6V	

3V Serial Flash Family: MXSMIO® (Multi-I/O) & MXSMIO® Duplex (DTR) Series

Part number	Density	Organization	I/O Bus	Frequency(MHz)	Package	Voltage	Features	Automotive Grade
MX25L8035E	8Mb	4KB / 64KB	Single / Dual / Quad	108(x1, x4), 80(x2)	200mil 8-SOP	2.7-3.6V		
MX25L8036E	8Mb	4KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP	2.7-3.6V		
MX25L8073E	8Mb	4KB / 64KB	Single / Dual / Quad	108(x1, x4), 80(x2)	200mil 8-SOP	2.7-3.6V		
MX25L1633E	16Mb	4KB / 64KB	Single / Dual / Quad	104(x1), 85(x2, x4)	200mil 8-SOP, 8-WSO(6x5mm), 8-USO(4x4mm)	2.7-3.6V		-40°C to 125°C
MX25L1635E	16Mb	4KB / 64KB	Single / Dual / Quad	108(x1, x4), 80(x2)	200mil 8-SOP	2.7-3.6V		
MX25L1636E	16Mb	4KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP	2.7-3.6V		
MX25L1673E	16Mb	4KB / 64KB	Single / Dual / Quad	104(x1), 85(x2, x4)	200mil 8-SOP, 8-WSO(6x5mm), 8-USO(4x4mm)*	2.7-3.6V		
MX25L3235E	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSO(6x5mm)	2.7-3.6V		-40°C to 105°C
MX25L3273E	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 200mil 8-VSO, 300mil 16-SOP*, 8-WSO(6x5mm)*	2.7-3.6V		
MX25L3233F	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	120(x1, x2, x4)	150mil 8-SOP, 8-WSO(6x5mm), 8-USO(4x3mm)	2.65-3.6V		
MX25L6435E	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 300mil 16-SOP, 8-WSO(6x5mm), 8-WSO(8x6mm), 24-TFBGA(6x8mm), WLCSP	2.7-3.6V		-40°C to 105°C
MX25L6473E	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 86(x2)	200mil 8-SOP, 200mil 8-VSO, 300mil 16-SOP*, 8-WSO(6x5mm), WLCSP	2.7-3.6V		
MX25L6433F	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	120(x1, x2, x4)	200mil 8-SOP, 300mil 16-SOP, 8-WSO(8x6mm), 8-USO(4x4mm)	2.65-3.6V		
MX25L12835F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP, 300mil 16-SOP, 8-WSO(6x5mm), 8-WSO(8x6mm)	2.7-3.6V	QPI	-40°C to 105°C
MX25L12873F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	200mil 8-SOP, 300mil 16-SOP, 8-WSO(6x5mm)	2.7-3.6V	QPI	
MX25L25635F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSO(8x6mm)	2.7-3.6V	QPI	-40°C to 105°C
MX25L25735F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSO(8x6mm)	2.7-3.6V	QPI	
MX25L51245G	512Mb	4KB / 32KB / 64KB	Single / Dual / Quad	166 (x1, x2), 133 (x4)	300mil 16-SOP, 8-WSO(8x6mm), 24-TFBGA(6x8mm)	2.7-3.6V	QPI	DTR
MX66L51235F	512Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSO(8x6mm), 24-TFBGA(6x8mm)	2.7-3.6V	QPI	-40°C to 125°C
MX66L1G45G	1Gb	4KB / 32KB / 64KB	Single / Dual / Quad	166 (x1, x2), 133 (x4)	300mil 16-SOP, 24-TFBGA(6x8mm)	2.7-3.6V	QPI	DTR

* Advance Information

2.5V Serial Flash Family: Standard Serial Interface Series

Part Number	Density	Organization	I/O Bus	Frequency (MHz)	Package
MX25V512E	512Kb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 173mil 8-TSSOP, 8-USON(2x3mm)
MX25V1006E	1Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 173mil 8-TSSOP, 8-USON(2x3mm)
MX25V2006E	2Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSO(6x5mm)
MX25V4006E	4Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSO(6x5mm), 8-USON (2x3mm)
MX25V8006E	8Mb	4KB / 64KB	Single / Dual	75(x1), 70(x2)	150mil 8-SOP, 8-WSO(6x5mm)

2.5V Serial Flash Family: MXSMIO® (Multi-I/O) Series

Part Number	Density	Organization	I/O Bus	Frequency (MHz)	Package
MX25V4035	4Mb	4KB / 32KB / 64KB	Single / Dual / Quad	66(x1), 50(x2, x4)	150mil 8-SOP, 8-WSON(6x5mm)
MX25V8035	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	66(x1), 50(x2, x4)	150mil 8-SOP, 8-WSON(6x5mm)

1.8V MXSMIO® Family

Part Number	Density	Organization	I/O Bus	Frequency (MHz)	Package	Feature
MX25U2033E	2Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm), WLCSP	
MX25U4033E	4Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm), WLCSP	
MX25U8033E	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	80(x1, x2), 70(x4)	150mil 8-SOP, 200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm), WLCSP	
MX25U8035E	8Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84 (x2)	150mil 8-SOP, 200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm)	QPI
MX25U1635E	16Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84 (x2)	150mil 8-SOP, 200mil 8-SOP, 8-WSON(6x5mm), 8-USON(4x4mm)	QPI
MX25U1635F	16Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(4x3mm), WLCSP	QPI
MX25U3235F	32Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(6x5mm), WLCSP	QPI
MX25U6435F	64Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	200mil 8-SOP, 8-WSON(6x5mm), WLCSP	QPI
MX25U12835F	128Mb	4KB / 32KB / 64KB	Single / Dual / Quad	104(x1, x4), 84(x2)	300mil 16-SOP, 8-WSON(6x5mm), 8-WSON(8x6mm)	QPI
MX25U25635F	256Mb	4KB / 32KB / 64KB	Single / Dual / Quad	133(x1, x2, x4)	300mil 16-SOP, 8-WSON(8x6mm), 3.4X4.3EP	QPI
MX66U51235F	512 Mb	4KB / 32KB / 64KB	Single / Dual / Quad	108(x1, x2, x4)	300mil 16-SOP, 8-WSON(8x6mm) 3.4X4.3EP, 24-TFBGA(6x8mm)	QPI

⇒ **Winbond – W25 Series- SPI Flash Memory**

W25X SpiFlash Family: 512Kbit to 4Mbit

W25Q SpiFlash Family: 2Mbit to 256Mbit, superset compatible with 25X series.

Density	Winbond Part # ²	Quad SPI	Clock MHz	Features ³	Voltage
512M-bit	W25M512JVxIG/Q	•	104	QPI, Enhanced, DTR	3V
256M-bit	W25Q256FVxIG/Q/F	•	80/104	QPI, Enhanced	3V
	W25Q257FVxIG/Q ⁵	•	80/104	QPI, Enhanced	3V
	W25Q256JVxIG/Q	•	80/104	QPI, Enhanced, DTR	3V
128M-bit	W25Q128FVxIG/Q/F	•	104	QPI, Enhanced	3V
	W25R128FVxIQ	•	104	RPMC, Enhanced	3V
	W25Q128JVxIG/Q	•	104	QPI, Enhanced, DTR	3V
	W25Q128FWxIG	•	104	QPI, Enhanced	1.8V
64M-bit	W25Q64FVxxIG/Q/F	•	104	QPI, Enhanced	3V
	W25R64FVxxIQ	•	104	RPMC, Enhanced	3V
	W25Q64JVxxIG/Q	•	104	QPI, Enhanced, DTR	3V
	W25Q64FWxxIG	•	104	QPI, Enhanced	1.8V
32M-bit	W25Q32FVxxIG/Q/F	•	104	QPI, Enhanced	3V
	W25Q32JVxxIG/Q	•	104	QPI, Enhanced, DTR	3V
	W25Q32DWxxIG	•	104	QPI, Enhanced	1.8V
	W25Q32FWxxIG	•	104	QPI, Enhanced	1.8V
16M-bit	W25Q16DVxxIG/Q	•	80/104	Enhanced	3V
	W25Q16CLxxIG	•	50/80	Enhanced	2.5V/3V
	W25Q16DWxxIG	•	104	QPI, Enhanced	1.8V
	W25Q16FWxxIG	•	104	QPI, Enhanced	1.8V
8M-bit	W25Q80BVxxIG	•	80/104	Fast Write, Enhanced	3V
	W25Q80DVxxIG	•	80/104	Fast Write, Enhanced	3V
	W25Q80BLxxIG	•	50/80	Fast Write, Enhanced	2.5V
	W25Q80DLxxIG	•	80/104	Fast Write, Enhanced	2.5V
	W25Q80BWxxIG ⁷	•	80	Fast Write, Enhanced	1.8V
	W25Q80EWxxIG	•	80	Fast Write, Enhanced	1.8V
4M-bit	W25X40CLxxIG		80/104	Fast Write	2.5V/3V
	W25Q40CLxxIG	•	104	Fast Write, Enhanced	2.5V/3V
	W25Q40BWxxIG	•	80	Fast Write, Enhanced	1.8V
	W25Q40EWxxIG	•	80	Fast Write, Enhanced	1.8V
2M-bit	W25X20CLxxIG		80/104	Fast Write	2.5V/3V
	W25Q20CLxxIG	•	80/104	Fast Write	2.5V/3V
	W25Q20BWxxIG	•	80	Fast Write, Enhanced	1.8V
	W25Q20EWxxIG	•	80	Fast Write, Enhanced	1.8V
1M-bit	W25X10CLxxIG		80/104	Fast Write	2.5V/3V
	W25Q10EWxxIG	•	80/104	Fast Write, Enhanced	1.8V
512K-bit	W25X05CLxxIG		80/104	Fast Write	2.5V/3V

** For more information in Serial Flash Memory IC specification, please refer to this file “Flash Memory Specification List” in the **Bonuses Section B**.

Serial SPI Flash Memory Substitute/Compatible List

- ⇒ Before use the list below, make sure the flash memory must fit with their 5 rules of how to substitute it.
- ⇒ This list is use the SPANSION flash memory part number as a cross reference. But most of the time, inside the same column flash memory, it can use as a substitute or equivalent. But make sure that fit the rules on how to substitute it.
- ⇒ For example, if the original flash memory is MX25L4005A, then we can use the substitute flash memory like MX25L8005A, S25FL004A, W25P40 & etc.
- ⇒ If the spec likes this W25Q80BL & W25Q80BV, it will write as: W25Q80BL/BV.

Density	Spansion Flash Memory	Substitute Flash Memory
512K-bit		A25L512 AT25F512AN/AY/B, AT25BCM512B EN25F05, EN25P05 M25P05 MX25L512E PM25LD512C, PM25LV512
1M-bit		A25L010 AT25F1024AN/AY AT45DB011D EN25F10, EN25P10 M25P10, M25PE10, M45PE10 MX25L1005, MX25L1006E PM25LD010C, PM25LV010A SST25LF010A W25X10BV
2M-bit		AT25F2048N, AT25DF021 EN25F20 M25P20, M25PE20, M45PE20 MX25L2005, MX25L2006E PM25LD020C, PM25LV020A W25X20BV

COLLECTION OF LCD/LED TELEVISION REPAIR TIPS-V4.0

4M-bit	S25FL004K	A25L040 AT25F4096/W/Y, AT25DF041A EN25F40, EN25Q40 F25L04UA, F25L004A GD25Q40 M25P40, M25PE40 MX25L4005A/C, MX25L4006E, MX25L4025C, MX25L4026E PM25LD040/C S25FL004A SST25VF040B W25P40, W25X040, W25Q40BL/BV, W25X40AL/AV/BL/BV
8M-bit	S25FL008K	A25L080 AT25DF081A EN25F80, EN25Q80A F25L08PA, F25L008A GD25Q80 M25P80, M25PE80 MX25L8005, MX25L8006E, MX25L8035E, MX25L8036E S25FL008A SST25VF080B W25P80, W25Q80BL/BV, W25X80AL/AV/AVS/V
16M-bit	S25FL016K	A25L016 At25DF161, AT25DQ161 EN25F16, EN25Q16 F25L016A, F25L16PA GD25Q16 M25P16, M25PX16, M25PE16 MX25L1605/D, MX25L1606E, MX25L1633E, MX25L1635D/E, MX25L1636D/E SST25VF016B, SST26VF016 W25Q16BV/CL/CV, W25X16AL/AV/BV/V
32M-bit	S25FL032P	A25L032, A25LQ032 AT25DF321/A, AT25DQ321A EN25B32, EN25F32, EN25P32, EN25Q32A/B F25L32PA/QA M25P32, M25PX32 MX25L3205D, MX25L3206E, MX25L3225D,

		MX25L3235D, MX25L3236D, MX25L3237D, MX25L6405 N25Q032 SST25VF032B, SST26VF032 W25Q32BV/V, W25X32AV/BV/V W25Q64BV, W25X64AV
64Mb-bit	S25FL064K	GD25Q64
	S25FL064P	AT25DF641/A EN25B64, EN25P64, EN25Q64 M25P64, M25PX64 MX25L6405D, MX25L6406E, MX25L6436E, MX25L6445E, MX25L6446E N25Q064 SST25VF064C W25Q64BV/FV, W25X64BV/V
128M-bit	S25FL128P	MX25L12805D M25P128
	S25FL129P	EN25Q128 MX25L12865E, MX12845E, MX25L12835E N25Q128 W25Q128BV/FV
256M-bit	S25FL256S S70FL256P	MX25L25635E/F, MX25L25735E N25Q256 W25Q256FV
512M-bit	S25FL512S	MT25QL512AB MX66L51235F N25Q512A13/23/33/43/73/83 W25Q512JV
1G-bit	S70FL01GS	MX66L1G45G MT25QL01GB N25Q00AA
2G-bit		MT25QL02GC

For more information in Serial Flash Memory Substitute/Compatible list, please refer to this file “Flash Memory Cross Reference Table” in the V4.0 ebook Bonuses Section B download page.

What is LED Driver in LED TV?

The LED Driver in old LED TV service manual will call it as “inverter”, LED inverter & etc. But the latest LED TV service manual or training manual will call it as “LED Driver” board now.

This LED Driver function like the LCD Inverter board, where the voltage input is low or small but output voltage is high. For example the LCD TV inverter input 24Vdc, but their output is about 1500VAC (depends on the inverter board design). For the LED Driver, its input 12Vdc (Vcc input for small inches LED TV) or 24Vdc and the output voltage is about 57Vdc, 120Vdc, 200Vdc and etc.

But some of the small sizes LED TV (19, 22, 24 inches & etc) will direct generate voltage like 33V, 42V, 44V & etc, from the PSU secondary side supply to the LED strips/bars. This type of design, their brightness is cannot be adjust. Also some of them can't control the backlight on/off, when TV power on, the LED backlight is automatically on.

So the LED Driver board/section their function is use to boost up the low voltage (DC voltage) and output to higher voltage (DC voltage). And it also included the typical features like backlight On/Off, Brightness control, circuit protection and etc.

The Advantages of LED TV vs LCD TV

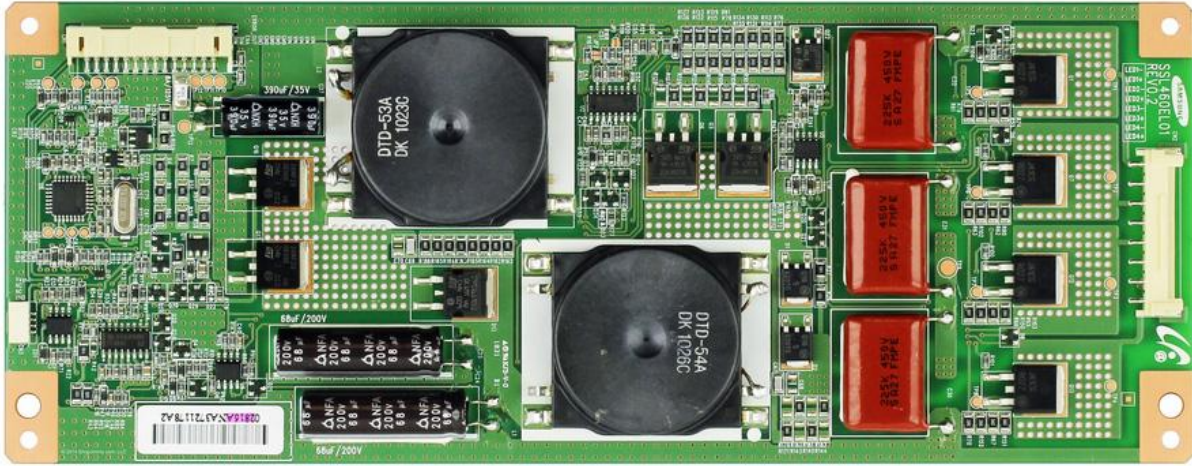
Actually the LED TV has lots of the advantage when compare with LCD TV (CCFL or EEFL backlight). For example: energy saving save space (so the LED TV can manufacture more thinly than the LCD TV and etc. Some of the repairer will surprisingly why the latest 32 inches LED TV their Power Supply not included the PFC circuit in it! Because of the 32 inch LED TV their power consumption is below 85Watts or 70 Watts. For international standard, if the TV power consumption is 70 Watts or below it (China is below 85 Watts), their Power Supply (PSU) no need to built-in the PFC circuit in it.

That's why lots of the latest 32 inches LED TV their selling price is so cheap. One of the reasons is, their PSU no need to built-in the PFC circuit and save the cost. It is because of the latest 32 inches LED TV their power consumption is just about 45Watts ~ 80Watts only.

Types of LED Driver in LED TV

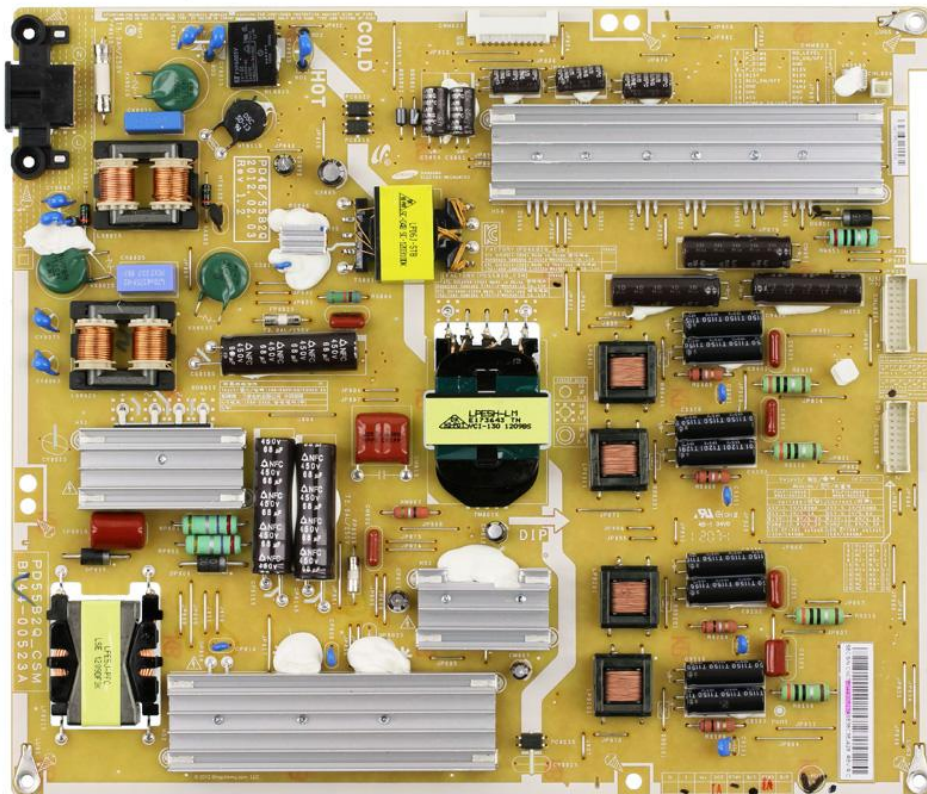
The LED Driver board/section is separated to 3 types:

1) LED Driver board



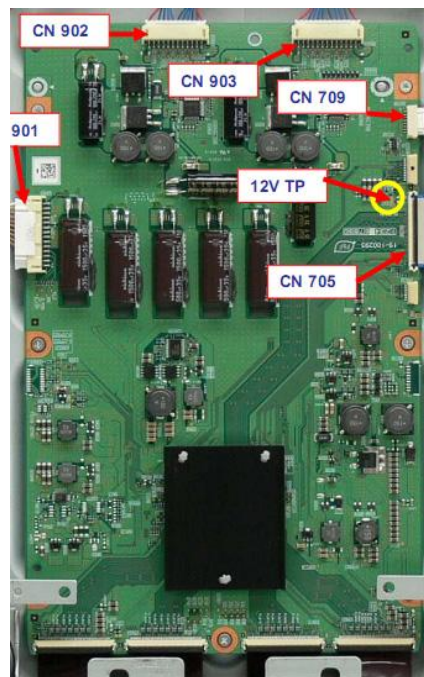
Samsung SSL460EL01 LED Driver Board

2) IP Board (Power Supply and the LED Driver built-in together)



Samsung BN44-00523A IP PSU with LED Driver Board

3) LED Driver built-in the T-con board



Panasonic TC-L37DT30 LED TV- T-Con + LED Driver Board

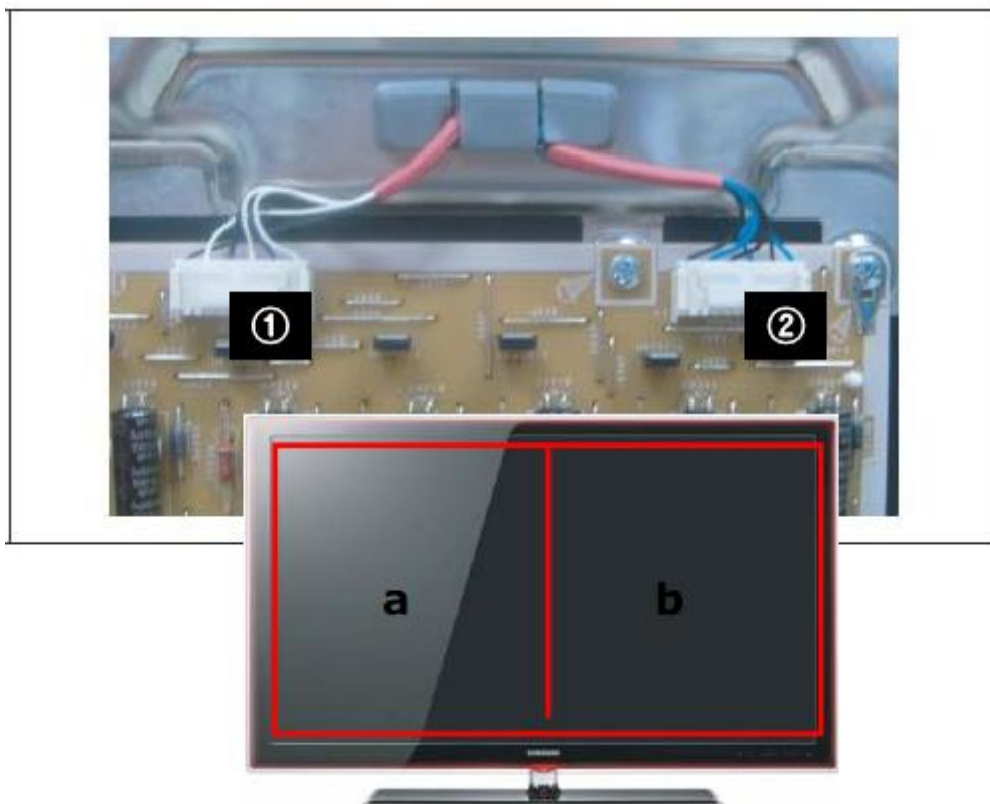
Most of the signal lines from Main board to LED Driver board/section are same as the LCD TV inverter. But some of them maybe their marking name/code in PCB board is different. For example the BL_ON signal, in some LED Driver it will show as DRV_ON, BLU_ON & etc. But their feature is the same, just to switch on the backlight system.

For the P-DIM (Digital Dimming) signal in LED Driver, it is a bit different than the LCD TV. Some LED Driver board P-DIM signal is call it as PWM, PWM_DIM and etc. Where the LED Driver P-DIM (or similar name of it)

signal voltage range is about 0~5V (LG LED TV is about 0.2V~3.3V, Samsung LED TV is about 0.5V~4V). This signal is use to control the Brightness levels for backlight system. When the LED TV is Maximum (MAX) brightness, its P-DIM signal voltage is about 5V, for Minimum (MIN) brightness of LED TV, it is about 0V. So the P-DIM signal functions like backlight dim control.

A Tip to Check the LED Panel

If the LED TV left and right side has abnormal brightness or one side is darkness but another side is ok, then you can use this tip to checking the LED Panel.



When you see the screen in front of TV, if a left side (a) has a problem, connect (2) cable at the (1) position and see the display result. If after changed cable position the TV (a) side has normal picture now, that's mean their LED Panel is ok (LED Blocks/Strips are normal), problem was in their LED Driver section. If after changed cable position, the TV side (a) still shows abnormal picture, for example darkness picture, that's mean their LED Panel side (a) LED blocks was defective and need to checking or replace it.

Note:

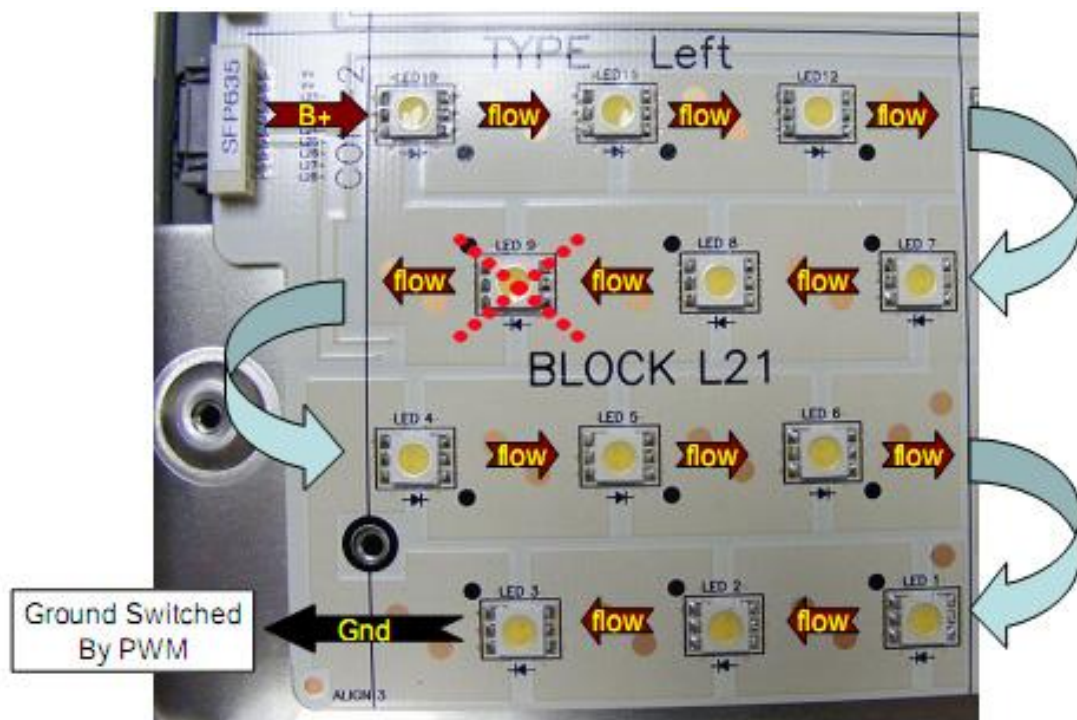
Remember below TV symptom, this type of symptom is not the backlight problem, but is their FPC cable (higher chances), T-CON board (the FPC connector) or LCD Panel.



LED Backlight Repair Tips for LED TV

Nowadays, lots of LED TV and LED Monitor are come to the work bench now. Most of the time LED TV display darkness problem is causing by the LED Driver board detected some abnormal status in LED strips/bars and shutdowns the LED backlight system. If the LED Driver not shutdown the backlight, it will show as one of screen position is darkness (top, bottom, left or right side).

Normally this type of problem is causing by one LED light bulb opens in a LED strip/bar or block. So it will affect the other LED light cannot work. After that the LED Driver will shutdown the LED backlight or that.

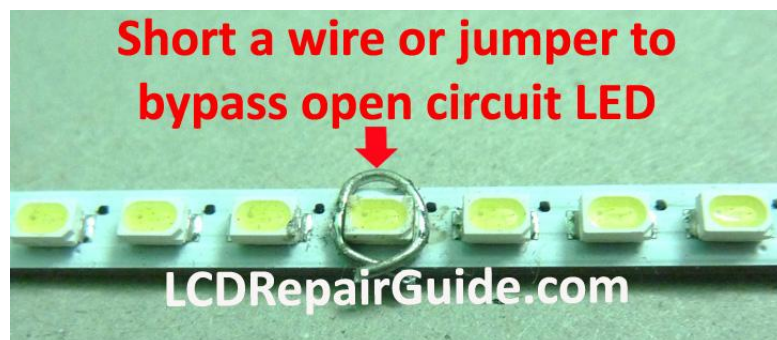


LED Block (1 block)



LED Strip/Bar- Testing it with the Meter Diode Range (Or X10 for Analogue Meter)

If confirm that's the one LED light bulb was damaged, but the problem is we don't have the LED light bulb in stock so what can we do know? Just a simple method to repair this LED strip or block; "Bypass" this open circuit LED light bulb, so that the other LED light bulbs can receive the voltage supply from LED Driver. So just using a wire or jumper solder it in the open circuit LED light bulb as photo below, the LED strip or block can light up now.



Assemble back the LED strip into LED Panel and the LED TV is working properly now.

How to Bypass LCD TV Inverter Board Shutdown Backlight System- Inverter IC List

SAFETY FIRST!

- If you're not understand about how to testing the electronic components, please DON'T read this chapter.
- Please make sure that the Inverter board are no any components is shorted or leakage, if not it will burn Inverter board again.
- Again, this bypass method is just for troubleshoot the Inverter Board for components level repair and it is NOT to repair the Inverter Board. If you're bypassing the Inverter Board protection in this way, it may occur the fire in Inverter Board and the TV. Because when happen heavy shorted in the Inverter Board, it will not start-up the protection and causing the Inverter Board burn and TV maybe explode too!

This method also calls it as: 'How to Bypass LCD TV Inverter OVP Protection'. I had one article mention it before at:

<http://www.lcd-television-Repair.com/Bypass-Inverter-OVP-Protection.html>

Most of the time, we will feel headache when we repair LCD TV with symptom display shutdown after few seconds, but they have normal sound. And sometime, you can use the strong flash light to see some content in the screen there. So it will confirm that the problem was in the backlight system (inverter board/section and their CCFL lamps).

Before checking the backlight system, make sure that BL_ON/INV_ON signal (backlight on signal) and PDIM/DIM/ADJ (brightness control signal) are appears in the Inverter board/section. These both signals are come from the TV Main board and their normal voltage should be: BL_ON= 2.5V~5V and the ADJ= 0.8V~5V (5V is maximum brightness in the screen). Also you need to measure the voltage supply (Vcc) to inverter board is normal and stable; normally it is 24V or 12V.

So with the above information, if all signals and voltage appears, we can know that this TV Display shutdown problem is in the inverter section or their CCFL lamp/s. For the CCFL lamp problem, normally it is leakage, broken or their wire contact with the lamp terminal has open. When checking the CCFL lamp, you need to open the lcd panel. But make sure to carefully remove their metal shield and other parts to prevent any damage on the lcd panel glass, especially their COF/TAB.

For the inverter board/section, after checking all the suspicion components in it and still can't find any damage components then you will not sure what's the next step to check.

So this chapter is to let you learn the method on different inverter IC for how to bypass their OVP Protection, so that we can see and check their inverter board and the lamps.

Before using this method to testing the Inverter board and their CCFL lamps, make sure the Inverter board no any shorted or leakage components in it. This is a very important step to prevent any burn or explode in the board.

When the TV is shutdown the backlight after few seconds, with the help of bypass Inverter IC protection, we can check the Inverter board in components level repair. After bypass the inverter IC OVP protection, these will happen in the TV:

a) The backlight is lit now but we can see one of these CCFL lamp is off or weakness.

* That's meant this CCFL lamp is damage and need to replace. Before replace, first check their both side of wire terminal connection is solder ok or not. If not then re-solder it and try to power on the backlight to see the problem solved or not, if not then just replace it with a working one. We can use the CCFL Lamp Tester to testing this lamp to confirm it is ok or not.

* If the lamp is ok but this lamp still not lit, that's mean this CCFL lamp their circuit is abnormal, so that we can concentrate and quickly checking on this CCFL lamp circuit to find out what's wrong in it.

b) If the TV backlight still shutdown after bypass their inverter protection.

* This problem is because of the Inverter board has shorted or leakage component/s in the board. So that you need to confirm the components in Inverter board is not shorted or leakage.

* Or the inverter IC pin is wrong to do the bypass protection and make sure to put the correct pin number of the inverter IC.

This Inverter IC list is use to bypass the inverter board/section to shutdown their backlight system. For your information, before using it, make sure they are no any shorted or leakage components in the Inverter board or section there.



LCD TV and LCD Monitor Inverter IC List		
Inverter IC	Bypass Protection Pin/s	Action To Do
AAT1100	8	StG (Short to Ground)
AAT1101A/B/C	8	StG
AAT1107	15	StG
AAT1343	15	StG
AT1380	2	StG
AT1741	15	StG
BA9741	15	StG
BA9743	15	StG
BIT3101/BIT3101A	2 & 15	OD
BIT3102/BIT3012A	5	OD
BIT3105	4	OD
BIT3106	4 & 27	OD
BIT3107	4	OD
BIT3193	15	OD
BIT3713	15	OD
DF6106	14	StG
DF6109	13	StG

FA3629	15 & 16	StG (Remove both pins capacitor and then short to ground)
FA3630	7 & 10	StG
FAN7314	1	StG
FP5451	15	StG
KA7500	1 & 16	StG
MB3775	15	StG
OZ960	2	StG
OZ962	2	StG
OZ965	4	StG
OZ9RR	8	StG
OZ9930	7	OD (or remove their capacitor connected to this pin)
OZ9936	7	OD (or remove their capacitor connected to this pin)
OZ9938	3(StG), 6 (OD)	If pin 3 StG still can't bypass the OVP, then open the pin 6 (remove the component to this pin, so that this pin is not connect to the circuit like opened)
OZ9939	3(StG), 6 (OD)	Same as above
SEM2005	2 & 3	OD
SP5001	4	OD
TL494	1 & 16	StG
TL1451	15	StG
TL1454	15	StG
TL5001	5	StG
TL5451	15	StG

Remark:

1) StG = The Inverter IC pin/s Short to Ground.

* Solder a wire to this pin/s and another side to the Ground (Cold Ground).

2) OD = Open or Disconnect the Pin/s from the circuit.

* Solder out this IC pin/s and the pin/s is not connecting to the Inverter circuit/PCB board. Or remove the component connected to this pin, so that it is same like this pin is open circuit or disconnect from the inverter circuit.

The Method of How to Find LCD & LED TV Panel/Screen as a Replacement or Equivalent

When I'm doing the email support for my members, I'm receiving lots of question about "How can I replace the LCD Panel with different part number"? The reason to replace it was because the LCD Panel is broken or damage. My answer to them is "YES" it can be replaced! But their question is how can I replace it?

Normally I will not recommend this method to the TV repairers who are:

- 1) Don't have extra good or working LCD Panel in hand.
- 2) Don't know how to Self Test the PSU board + Backlight without connect it to Main Board. (This method was wrote in V3.0-
<http://www.lcdrepairguide.com/V3>)
- 3) Don't know how to testing the voltage and signals in Main board, PSU board, Inverter Board and the T-Con board.

In this chapter, I will let you know how to find a replacement for LVDS type LCD Panel. Actually the LCD Panel has two types, one is TTL (old model LCD TV) and another is LVDS type (Low Voltage Differential Signaling). But in this chapter I just show you how to choose the LVDS type LCD Panel as a replacement.

Basic Knowledge of LCD Panel

The LCD TV Panel has different types, but in this chapter I just reveal the LVDS type LCD & LED Panel. The important information we need to know for LCD Panel are:

1) Screen Size:

* The LCD screen have many sizes, common use in Monitor & TV are 15~65 inches. But it also divides to different aspect ratio (DAR), they are: standard screen (4:3) and wide screen (16:9 or 16:10).

2) Resolution:

* LCD Panel resolutions are often quoted in terms of raw subpixels, misnamed “pixels” in manufacturer’s specifications. Each real pixel includes one subpixels for each of three colors, so calling subpixels “pixels” inflates the claimed resolution by a factor of three. This bit of marketing obfuscation is calculated as horizontal resolution x vertical resolution x 3(HxVx3). For example: 1024 x768 x3= 2359296 subpixels, but only 786432 full-color pixels. The LCD TV Panel have different resolution, they are:

Standard Definition (SD): 1366 x 768, 50Hz/60Hz, 2 Channels/Ports

High Definition (HD): 1920 x 1080, 50Hz/ 60Hz, 4 Channels/Ports

Full HD TV (FHD TV): 1920 x 1080, 100Hz/ 120Hz, 8 Channels/Ports

Ultra HD (UHD): 3840 x 2160, 60Hz, 16 Channels/Ports

And etc.....

3) Bits:

* The Color Depth or Color Support is sometimes expressed in ‘Bits’, either as the number of bits per sub-pixel or the number of bits per pixel. The LCD TV Panel has divides to 6 bits, 8 bits and 10 bits. Also have different channels for each bits, for example, 8 bits 2 channels (LVDS interface), 10 bits 4 channels and etc.

4) Input Voltage:

* Normally the LCD TV Panel input voltage (actually is the T-con board Vcc input voltage) is using 5V or 12V, but some special part number of LCD Panel will use 18V too. For the small inches LCD Panel, it will use 5V or 3.3V as their Panel Vcc input voltage.

5) LVDS pins Description & Connector types

* The LVDS pins description we can refer to their LCD Panel datasheet or product specification manual.

* The LVDS interface has many types of connector design & number of pins. Normally it has 20 pins, 30 pins, 41pins, 51 pins and etc.

Please refer to the Bonuses Section B Download Page to download the LCD Panel datasheet. Inside the datasheet you can find lots of useful information to help you to replace the LCD Panel correctly.

The Methods to Find a Replacement of LCD & LED Panel

If you want to successfully replace the LCD Panel, you must follow and check these information below before replace it:

1) LCD Panel input voltage (Important step and make sure the voltage input is same)

* If the input voltage not same it will damage the T-CON board or/and LCD Panel! If LCD Panel is 12V type the Main board is supply 5V to it, the LCD Panel will not working only. If LCD Panel is 5V type but the Main board is supply 12V to it, the LCD Panel will damage or the T-CON board burn or both also gone.

* Actually the LCD Panel voltage input type is depending on the T-CON board Vcc input, except the T-con board is built-in the LCD Panel.

* Some repairer if they know how to use the DC-DC module, they can use it and put it in the T-CON board Vcc input and modify it. For example the DC-DC module like 12V to 5V output, but make sure their Ampere is match with the LCD Panel. For your information, some of the Main board is already built-in 12V and 5V Panel select jumper to choose. So this type of Main board can save the time and money to match the new LCD Panel.

2) LVDS connector type and LVDS pins configuration

* Make sure to check the original and replacement lcd panel pins configuration from their panel datasheet. For the LVDS connector type we can use the eyes to look at it. If the LVDS connector type is different than the replacement LCD Panel, so need to find or buy a suitable LVDS cable with the same connector type. If their pins configuration is different, some LVDS cable can manually change or correct their pins position to the right position. For this step, we must refer to their LCD Panel datasheet to do it correctly.

* Attention: Make sure their Vcc Voltage Input pin is put in the correct position, if not it will damage the LCD Panel!!

3) LVDS Interface

* LVDS interface format is divides to two:

- a) JEIDA Format
- b) VESA Format

It is control by the SELLVDS or LVDS_SEL signal pin. Normally different LCD Panel manufacturer they have different method to setting it. For example, CHIMEI V315H3-LS2 LCD Panel, their JEIDA format is set SELLVDS to 'L' (active Low) and VESA format is set SELLVDS to 'H' (active High) or Open. To set this signal pin you can do like that:

- a) Active Low 'L' = Short this pin to Ground.
- b) Active High 'H' = Connect this pin to Main board 3.3V supply.
- c) Open = Remove this SELLVDS wire pin from the LVDS connector or Main board side connector.

If this SELLVDS signal pin set it incorrectly, the TV display will show display distortion symptom or their display show reverse 180 degree.

4) 'Bits' select for the LCD Panel

* Most of the time, the LCD TV Panel is using 8 bits type. Some high definition LCD Panel is using the 10 bits type. The 10 bits type LCD Panel divides to two:

a) The 'Bits' cannot be select, only can working in 10 bits status. This type of LCD Panel cannot choose as a replacement for 8 bits type LCD Panel.

b) The 'Bits' is selectable by setting the signal pin in LVDS interface. As usual, it is set by Active Low, Active High or Open. So this type of LCD Panel can choose to working in 8 bits or 10 bits status. So this type of LCD Panel can use to choose as a replacement for 8 bits type LCD Panel.

* If the 10 bits LCD Panel is use as a replacement of 8 bits LCD Panel and their display quality was not good and have some noise in the screen, please

double check their “Bit” select control signal pin/s is set to the correct position (L, H or Open).

5) Backlight System

* The backlight system has many types. If it is LCD type, they will use the CCFL or EEFL lamps. If the LED type, it is using the LED light bulbs with different voltage control in LED Driver.

a) EEFL type: If the LCD Panel is using these EEFL lamps, then it is easy to replace their LCD Panel. Because it just use two connector or wire in their inverter board only. Most of their connector design is same, so it will let the repairer easy to replace it.

b) CCFL type: If their replacement LCD Panel is using Single inverter board but original LCD Panel has Master and Slave inverter board, so their extra wires can bypass it. But make sure all the voltage cable, signals cables are connecting correctly. If the replacement LCD Panel is using master and slave inverter board but original LCD panel just has single inverter board, then you need to modify it and connect the extra cables to their slave inverter board there. Make sure their voltage supply and signals cables connecting correctly.

* For LED type: Use their replacement LED Panel LED Driver board and make sure their voltage and signals cables are connecting correctly. If that is IP board type LED driver, then you need to make sure their output voltages is match the LED Panel, if not it will not work or maybe will damage the LED light bulbs or this LED Panel will not lasting long time use.

* For more details in their control signals, please refer to the V3.0 LED LCD TV Repair Tips ebook.

6) LCD Panel Parameters

* If these LCD Panel parameters not same, so this LCD Panel cannot be a replacement.

a) LCD Panel Resolution not same, it is can't be a replacement.

b) LCD Panel size not same, it is can't be a replacement. For example 32 inches is use the 32 inches LCD Panel as a replacement. The 31.5 inches cannot

use the 32 inches LCD Panel as a replacement. Also their aspect ratio (DAR) must choose it correctly and it is divides to: 4:3, 16:9 or etc.

* One more thing, some LCD Panel their thickness is different. If the original LCD Panel is thicker than the replacement, it is ok to replace. Because the TV cover can close it perfectly. But if the original is thin than the replacement, it is hard to say ok or not. Make sure the TV rear cover can close it perfectly, if not, then it is not recommend to replace it.

The LCD Panel Replacement Tables

This is a TCL manufacturer reference tables to let you easy to find the correct LCD Panel as a replacement. You can use these tables as a reference only, but you must compare their datasheet first before replace it.

Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
15-17 inches	BOE	4A-LCD15T-BE1	HT150X02-100			
	LPL	4A-LCD15T-LG1	LM150X08			
	SS	4A-LCD15T-SS0	LTM150XH-L106			
	AUO	4A-LCD17T-AU1	M170EN06V.1			
19 inches	AUO	4A-LCD19T-AU1	M185XW01 V0	1366X768	5V	Interchangeable
	BOE	4A-LCD19M-BE3	HT185WX1-100	1366X768	5V	
	CPT	4A-LCD19M-CH0	CLAA 185WA02A	1366X768	5V	
	CPT	4A-LCD19T-CH1	CLAA185WA03	1366X768	5V	
	SS	4A-LCD19M-SS2	LTM185AT01	1366X768	5V	Interchangeable
	LPL	4A-LCD19M-LG1	LC190WH1-TLA1	1366X768	5V	
	LPL	8A-LCD19T-LG4	LM185WH1-TLA1	1366X768	5V	
	AUO	4A-LCD19T-AU0	T190PW01 V0	1440X900	5V	Interchangeable
	BOE	4A-LCD19M-BE1	HT190WG1-100	1440X900	5V	
	BOE	4A-LCD19M-BE2	HT190WG1-600	1440X900	5V	
	SS	4A-LCD19M-SS0	LTM190M2-L31	1440X900	5V	
	SS	4A-LCD19M-SS1	LTM190M2-L31	1440X900	5V	
	LPL	4A-LCD19M-LG0	LM190WX1-TLA1	1440X900	5V	
	LPL	8A-LCD19T-LG5	LM190WX1-TLG1	1440X900	5V	
	IVO龙腾	8A-LCD19T-IV1	M190MWW1-101	1440X900	5V	
	IVO龙腾	8A-LCD19T-IV0	M190MWW1-201			
	SVA	8A-LCD19T-SV0	SVA190WX1-05TB	1440X900	5V	
	LPL	8A-LCD19T-LG0	LM190WH1-TLA1			
	LPL	8A-LCD19T-LG1	LM190WX1-TLC2			
	LPL	8A-LCD19T-LG2	LM190WX1-TLG2			
	LPL	8A-LCD19T-LG3	LM190WX1-TLC1			
	SS	8A-LCD19T-SS0	LTM190MZ-L11			
	CMO	4A-LCD19M-CM0	M190Z1-L01	1680X1050	5V	
20 inches	AUO	4A-LCD20T-AU1	A201SN02 V5			
	BOE	4A-LCD20T-BE1	HT201V01-101			
	BOE	4A-LCD20T-BE2	HT201V01-100			
	CMO	4A-LCD20T-CM1	V201V1-T01			
	CMO	4A-LCD20T-CM2	V201V1-T03			
	LPL	4A-LCD20T-LG1	LCDLC201V02			
	LPL	4A-LCD20T-LG2	LCD201V02-A3KB			
	LPL	4A-LCD20T-LG3	LC201V02-SD02			
	LPL	4A-LCD20T-LG4	LC201V02-SDB1			
	SVA	4A-LCD20T-SV1	SVA201VG01TB			

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Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
22 inches	AUO	4A-LCD22T-AU1	T216XW01 V0	1366X768	5V	Interchangeable
	AUO	4A-LCD22T-AU2	T216XW01 V1	1366X768	5V	
	LPL	4A-LCD22T-LG1	LC220WXE-TBA1	1366X768	5V	
	CPT	4A-LCD22T-CH2	CLAA 216WA01	1366X768	5V	
	SS	4A-LCD22M-SS2	LTA216AT01	1366X768	5V	
	CMO	8A-LCD22T-CM0	V216B1- L01	1366X768	5V	Interchangeable
	CMO	8A-LCD22T-CM3	V216B1- L03	1366X768	5V	
	CMO	4A-LCD22L-CM1	V216B1- LN1	1366X768	12V	Interchangeable
	SS	4A-LCD22M-SS1	LTM220M1-L01	1680X1050	5V	
	SS	4A-LCD22M-SS0	LTM220M1-TLE1	?		
	AUO	4A-LCD22T-AU0	T220SW01 V0	1680X1050	5V	
	CPT	4A-LCD22T-CH1	CLAA220WA01	1680X1050	5V	
	CMO	4A-LCD22T-CM0	M220Z1-L03	1680X1050	5V	
	LPL	4A-LCD22T-LG0	LM220WE1	1680X1050	5V	
	LPL	8A-LCD22T-LG0	LM220WE1-TLA1	?		
	LPL	8A-LCD22T-LG1	LM220WE1-TLE1	1680X1050	5V	
	LPL	8A-LCD22T-LG2	LM220WE3-TLA1	1680X1050	5V	
	LPL	8A-LCD22T-LG3	LM220WE3-TLA3	?		
	LPL	8A-LCD22T-LG4	LM220WE1-TLD1	?		
	LPL	8A-LCD22T-LG5	LM220WE1-TLD2	1680X1050	5V	
	LPL	8A-LCD22T-LG6	LM220WE1-TLD4	?		
	LPL	8A-LCD22T-LG7	LC220WE1-TLE1	1680X1050	5V	
	AUO	8A-LCD22T-AU0	M220EW01 V0	1680X1050	5V	
	CMO	8A-LCD22T-CM1	V216B1-P03			
	CMO	8A-LCD22T-CM2	V216B1-DL03			
	INNOLUX	8A-LCD22T-IN0	MT220WW01 V.0			
	INNOLUX	8A-LCD22T-IN1	MT220WW01 V.1			
	INNOLUX	8A-LCD22T-IN2	MT220WW01 V.5			
	INNOLUX	8A-LCD22T-IN3	MT220WW01 V.B			
23 inches	CMO	4A-LCD23T-CMO	V230W1-L02	1280X720	5V	
	LPL	4A-LCD23T-LG1	L230W01-A2	1280X720	12V	
	LPL	4A-LCD23T-LG2	L230W02-A5K4	1366X768	12V	
	QDI	4A-LCD23T-QD1	QD23HL02	1366X768	12V	
	SS	4A-LCD23T-SS0	LTA230W1-L02	1366X768	5V	
24 inches	AUO	4A-LCD24T-AU1	T240XW01 V0	1366X768	12V	
	CMO	4A-LCD24T-CM0	M236H1- L01	1920X1080	5V	

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Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
26 inches	AUO	4A-LCD26T-AU1	T260XW02 V5	1366X768	5V	Interchangeable
	AUO	4A-LCD26T-AU2	T260XW02 V6	1366X768	5V	
	AUO	4A-LCD26T-AU3	T260XW03 V2	1366X768	5V	
	SS	4A-LCD26T-SS1A	LTA260W2-L01	1366X768	5V	
	SVA	4A-LCD26T-SV1	SVA260WX01SA	1366X768	5V	
	SS	4A-LCD26T-SS2	LTA260AP02	1366X768	12V	
	CMO	4A-LCD26T-CM1	V260B1-L01	1366X768	5V	Interchangeable
	CMO	4A-LCD26T-CM3	V260B1-L07	1366X768	5V	
	CMO	4A-LCD26T-CM2	V260B1-L02	1366X768	5V	Interchangeable
	CMO	4A-LCD26T-CM4	V260B1-LN1	1366X768	5V	
	LPL	4A-LCD26T-LG0	LC260WX2-SL01	1366X768	12V	Interchangeable
	LPL	4A-LCD26T-LG1	LC260WX2-SLB3	1366X768	12V	
	AUO	4A-LCD26T-AU4	T260XW03 V3	1366X768	12V	
	LPL	4A-LCD26T-LG3	LC260WXN-SBA1	1366X768	12V	
	QDI	4A-LCD26T-QD1	QD26HL02	1366X768	12V	
	AUO	4A-LCD26T-AU5	V260XW02 VM	1366X768	12V	
	AUO	4A-LCD26T-AU6	T260XW02 VQ	1366X768	12V	
	AUO	4A-LCD26T-AU7	T260XW02 VP	1366X768	12V	
	CMO	4A-LCD26T-CM5	V260B1-L11	1366X768	12V	
	LPL	4A-LCD26T-LG2	LC260WXE-SBA1	1366X768	12V	
	CMO	4A-LCD26T-CM6	V260B2 - L03	1366X768	12V	
	SS	4A-LCD26T-SS3	LTA260AP06	1366X768	12V	
	IVO	4A-LCD26T-IV1	M260TWR1			
	CMO	8A-LCD26T-CM0	V260B1-L03			
	CMO	4A-LCD26L-CM0	V260B1-L12 (Outsourcing)			
27 inches	CMO	4A-LCD27T-CM0	V270W1-L03	1280X720	5V	
	CMO	4A-LCD27T-CM1	V270W1-L04	1280X720	5V	
	CMO	4A-LCD27T-CM2	V270B1-L01	1366X768	5V	
	CMO	4A-LCD27T-CM4	V270B1-L04	1366X768	5V	
	CMO	4A-LCD27T-CM3	V270B1-L03	1366X768	5V	
30 inches	LPL	4A-LCD30T-LG0	LC300W01	1280X768	12V	Interchangeable
	LPL	4A-LCD30T-LG1	LC300W01-C5	1280X768	12V	
	CMO	4A-LCD30T-CM0	V296W1-L04	1280X768	5V	

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Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
32 inches	AUO	4A-LCD32T-AU1	T315XW01 V5	1366X768	5V	Interchangeable
	AUO	4A-LCD32T-AU2	T315XW02 VC	1366X768	5V	
	CMO	4A-LCD32T-CM2	V315B1-L01	1366X768	5V	
	SS	4A-LCD32T-SS0	LTA320W2-L01/3	1366X768	5V	
	SS	4A-LCD32T-SS1	LTA320W2-L14	1366X768	5V	
	SS	4A-LCD32T-SS2	LTA320W2-L16	1366X768	5V	
	SS	4A-LCD32T-SS3	LTA320WT-L05	1366X768	5V	
	SS	4A-LCD32T-SS4	LTA320AB01	1366X768	12V	
	SS	4A-LCD32T-SS5	LTA320AP02	1366X768	12V	
	CPT	4A-LCD32T-CH5	CLAA320WF01 SC	1366X768	12V	
	CPT	4A-LCD32T-CH6	CLAA320WF01U	1366X768	12V	
	CMO	4A-LCD32T-CM0	V320B1-L01	1366X768	5V	Interchangeable
	CMO	4A-LCD32T-CM1	V320B1-L04	1366X768	5V	
	CMO	4A-LCD32T-CM3	V320B1-L06	1366X768	5V	
	SH	4A-LCD32T-SH0	LK315T3LZ54	1366X768	5V	Interchangeable
	SH	4A-LCD32T-SH1	LK315T3LZ94	1366X768	5V	
	SH	4A-LCD32T-SH2	LK315T3LA24	1366X768	5V	
	SH	4A-LCD32T-SH3	LK315T3LZ9Z	1366X768	5V	
	SH	4A-LCD32T-SH4	LK315T3LA31	1366X768	12V	
	AUO	4A-LCD32T-AU3	T315XW02 VL	1366X768	12V	
	AUO	4A-LCD32T-AU4	T315XW02 VS	1366X768	12V	
	AUO	4A-LCD32T-AU6	T315XW02 VT	1366X768	12V	
	CMO	4A-LCD32T-CM5	V315B3-L01	1366X768	12V	
	CMO	4A-LCD32L-CM0	V315B3-L01	1366X768	12V	
	CMO	4A-LCD32T-CMB	V315B1-L05	1366X768	12V	
	CPT	4A-LCD32T-CH3	CLAA320WB02	1366X768	12V	
	CPT	4A-LCD32T-CH4	CLAA320WB02 C	1366X768	12V	
	QDI	4A-LCD32T-QD1	QD32HL03	1366X768	12V	
	LPL	4A-LCD32T-LG3	LC320W01-SLA1	1366X768	12V	
	LPL	4A-LCD32T-LG5	LC320WXN-SAC1	1366X768	12V	
	LPL	4A-LCD32T-LG6	LC320WXN-SBD1	1366X768	12V	
	LPL	4A-LCD32T-LG8	LC320WXN-SBA1	1366X768	12V	
	LPL	4A-LCD32T-LGB	LC320WXN-SAB1	1366X768	12V	
	LPL	4A-LCD32T-LG0	LC320W01-A6	1366X768	12V	
	LPL	4A-LCD32T-LG1	LC320W01-SL01	1366X768	12V	
	LPL	4A-LCD32T-LG2	LC320W01-SL21	1366X768	12V	
	LPL	4A-LCD32T-LG7	LC320WXE-SBA1	1366X768	12V	
	CPT	4A-LCD32T-CH1	CLAA320WA01	1366X768	12V	
	CPT	4A-LCD32T-CH2	CLAA320WA01 C	1366X768	12V	
	SS	4A-LCD32T-SS6	LTA320AP07	1366X768	12V	
	CMO	4A-LCD32L-CM4	V315B3-L04(Outsourcing)			
	CMO	4A-LCD32T-CM4	V320B1-L07			
	AUO	4A-LCD32T-AU5	T315HW02 V0	1920X1080	12V	
	AUO	4A-LCD32T-AU7	T315HW02 V9	1920X1080	12V	
	AUO	4A-LCD32T-AU8	T315HW02 V5	1920X1080	12V	
	LPL	4A-LCD32T-LG9	LC320WUE-SLA1	1920X1080	12V	

COLLECTION OF LCD/LED TELEVISION REPAIR TIPS-V4.0

Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
37 inches	AUO	4A-LCD37T-AU1	T370XW01 V1	1366X768	12V	Interchangeable
	AUO	4A-LCD37T-AU2	T370XW02 V0	1366X768	12V	
	AUO	4A-LCD37T-AU3	T370XW02 V5	1366X768	12V	
	LPL	4A-LCD37T-LG0	LC370W01-A5K1	1366X768	12V	
	LPL	4A-LCD37T-LG1	LC370WX1-SL01	1366X768	12V	
	LPL	4A-LCD37T-LG3	LC370WX1-SLA1	1366X768	12V	
	LPL	4A-LCD37T-LG5	LC370WX4-SLA1	1366X768	12V	
	LPL	4A-LCD37T-LG9	LC370WXN-SAB1	1366X768	12V	
	LPL	4A-LCD37T-LGB	LC370WXN-SBD1	1366X768	12V	
	AUO	4A-LCD37T-AU6	T370XW02 VC	1366X768	12V	
	CPT	4A-LCD37T-CH2	CLAA370WA03	1366X768	12V	
	CPT	4A-LCD37T-CH1	CLAA370WA02	1366X768	12V	
	CPT	4A-LCD37T-CH3	CLAA370WF02S	1366X768	12V	
	LPL	4A-LCD37T-LG4	LC370WX2-SLA1	1366X768	12V	Interchangeable
	LPL	4A-LCD37T-LG7	LC370WX4-SLE1	1366X768	12V	
	AUO	4A-LCD37T-AU4	T370HW02 V1	1920X1080	12V	Interchangeable
	LPL	4A-LCD37T-LG2	LC370WU1-SL02	1920X1080	12V	
	LPL	4A-LCD37T-LG6	LC370WU3-SLA1	1920X1080	12V	
	LPL	4A-LCD37T-LG8	LC370WUN-SAB1	1920X1080	12V	
	LPL	4A-LCD37T-LGC	LC370WUN-SBD1	1920X1080	12V	
	LPL	4A-LCD37T-LGD	LC370WUN-SBA1	1920X1080	12V	
	AUO	4A-LCD37T-AU5	T370HW02 V4	1920X1080	12V	
	LPL	4A-LCD37T-LGA	LC370WUE-SBA1	1920X1080	12V	
	AUO	4A-LCD37T-AU7	T370HW02 VC	1920X1080	12V	
	AUO	4A-LCD37T-AU8	T370HW03. V7	1920X1080	12V	
	CMO	4A-LCD37T-CM0	V370H1-L02	1920X1080	18V	
	AUO	8A-LCD37T-AU0	T370HW02. V3	1920X1080	12V	
	CMO	4A-LCD37T-CM1	V370H1-L01			
	CMO	4A-LCD37T-CM2	V370B1-L01			

Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
40 inches	SS	4A-LCD40T-SS0	LTA400W2-L01	1366X768	5V	Interchangeable
	SS	4A-LCD40T-SS1	LTA400WT-L11	1366X768	5V	
	SS	4A-LCD40T-SS2	LTA400WT-L17	1366X768	12V	
	SS	4A-LCD40T-SS6	LTA400AA04	1366X768	12V	
	SS	4A-LCD40T-SS9	LTA400AA11-001	1366X768	12V	
	AU	4A-LCD40T-AU1	T400XW01 V6	1366X768	12V	
	SS	4A-LCD40T-SS3	LTA400WH-L01	1366X768	12V	
	SS	4A-LCD40T-SS4	LTA400WT-L02	1366X768	12V	
	SS	4A-LCD40T-SS5	LTA400HT-L03	1920X1080	12V	Interchangeable
	SS	4A-LCD40T-SS8	LTA400HA07	1920X1080	12V	
	SS	4A-LCD40T-SSE	LTA400HA07*NL	1920X1080	12V	
	SS	4A-LCD40T-SS7	LTA400HT-LH4	1920X1080	12V	Interchangeable
	SS	4A-LCD40T-SSB	LTA400HA08	1920X1080	12V	
	SS	4A-LCD40T-SSD	LTA400HA11	1920X1080	12V	
	SS	4A-LCD40T-SSC	LTA400HC10	1920X1080	12V	
	SS	4A-LCD40T-SSF	LTA400HF05	1920X1080	12V	
	AUO	4A-LCD40T-AU2	T400HW02 V8	1920X1080	12V	
	SH	4A-LCD40T-SH1	LK400D3LA14	1920X1080	12V	
	SS	4A-LCD40T-SSG	LTA400HA12	1920X1080	12V	
	SS	4A-LCD40T-SSH	LTA400HF02	1920X1080	12V	

COLLECTION OF LCD/LED TELEVISION REPAIR TIPS-V4.0

Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
42 inches	AUO	4A-LCD42T-AU1	T420XW01 V0	1366X768	12V	Interchangeable
	AUO	4A-LCD42T-AU3	T420XW01 VC	1366X768	12V	
	LPL	4A-LCD42T-LG4	LC420WX5 SLA1	1366X768	12V	
	LPL	4A-LCD42T-LG6	LC420WX7 SLA1	1366X768	12V	
	AUO	4A-LCD42T-AU2	T420XW01 V5	1366X768	12V	
	LPL	4A-LCD42T-LG9	LC420WXN-SAB1	1366X768	12V	
	LPL	4A-LCD42T-LG0	LC420W02	1366X768	12V	Interchangeable
	LPL	4A-LCD42T-LG1	LC420W02 SLA1	1366X768	12V	
	LPL	4A-LCD42T-LG3	LC420W02 SLA2	1366X768	12V	
	LPL	4A-LCD42T-LG5	LC420WX4 SLB1	1366X768	12V	Interchangeable
	LPL	4A-LCD42T-LG8	LC420WX7 SLE1	1366X768	12V	
	LPL	4A-LCD42T-LGD	LC420WXE SAA1	1366X768	12V	
	AUO	4A-LCD42T-AU4	T420HW02 V0	1920X1080	12V	Interchangeable
	LPL	4A-LCD42T-LG7	LC420WU5-SLA2	1920X1080	12V	
	AUO	4A-LCD42T-AU5	T420HW04 V2	1920X1080	12V	
	CMO	4A-LCD42T-CM1	V420H1-L05	1920X1080	12V or 18V	
	CMO	4A-LCD42T-CM4	V420H1-L13	1920X1080	12V	
	CMO	4A-LCD42T-CM3	V420H1-L11	1920X1080	12V	
	LPL	4A-LCD42T-LGA	LC420WUN-SAA1	1920X1080	12V	
	LPL	4A-LCD42T-LGF	LC420WUN-SBD1	1920X1080	12V	
	LPL	4A-LCD42T-LGJ	LC420WUN-SBA1	1920X1080	12V	
	LPL	4A-LCD42T-LGM	LC420WUN-SBD2	1920X1080	12V	
	AUO	4A-LCD42T-AU7	T420HW04 V3	1920X1080	12V	Interchangeable
	LPL	4A-LCD42T-LGE	LC420WUD-SAC1	1920X1080	12V	
	LPL	4A-LCD42T-LGH	LC420WUD-SBA1	1920X1080	12V	
	LPL	4A-LCD42T-LGN	LC420WUD-SBM1	1920X1080	12V	
	AUO	4A-LCD42T-AU6	T420HW04 V0	1920X1080	12V	Interchangeable
	AUO	4A-LCD42T-AU8	T420HW04 V0	1920X1080	12V	
	AUO	4A-LCD42T-AU9	T420HW04 V0	1920X1080	12V	
	LPL	4A-LCD42T-LGB	LC420WUE-SAA1	1920X1080	12V	
	LPL	4A-LCD42T-LGG	LC420WUE-SBA1	1920X1080	12V	
	LPL	4A-LCD42T-LGC	LC420WUF-SAA1	1920X1080	12V	
	LPL	4A-LCD42T-LGK	LC420WUF-SBN1	1920X1080	12V	
	CMO	4A-LCD42T-CM0	V420H1-L01	1920X1080	18V	
	CMO	4A-LCD42T-CM2	V420H1-L07	1920X1080	12V	Interchangeable
	CMO	4A-LCD42T-CM5	V420H1 – L15	1920X1080	12V	
	LPL	4A-LCD42T-LG2	LC420WU1-SLB1	1920X1080	12V	
	AUO	4A-LCD42T-AUA	T420HW04 V8	1920X1080	12V	

COLLECTION OF LCD/LED TELEVISION REPAIR TIPS-V4.0

Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
46 inches	SS	4A-LCD46T-SS0	LTA460WS-L03	1366X768	5V	Interchangeable
	SS	4A-LCD46T-SS1	LTA460WT-L03	1366X768	5V	
	SS	4A-LCD46T-SS2	LTA460WT-L14	1366X768	12V	
	SS	4A-LCD46T-SS3	LTA460AD01-J01	1366X768	12V	
	SS	4A-LCD46T-SS4	LTA460HT-L03	1920X1080	12V	Interchangeable
	SS	4A-LCD46T-SS5	LTA460HB07	1920X1080	12V	
	SS	4A-LCD46T-SS7	LTA460HB09	1920X1080	12V	
	SS	4A-LCD46T-SS9	LTA460HA07	1920X1080	12V	
	SS	4A-LCD46T-SS6	LTA460HT-LH3	1920X1080	12V	Interchangeable
	SS	4A-LCD46T-SS8	LTA460HB08	1920X1080	12V	
	SS	4A-LCD46T-SSA	LTA460HF03	1920X1080	12V	
	SS	4A-LCD46T-SSC	LTA460HE09	1920X1080	12V	
	SS	4A-LCD46T-SSD	LTA460HF07	1920X1080	12V	
	SH	4A-LCD46T-SH1	LK460D3LA28	1920X1080	12V	
	AUO	4A-LCD46T-AU1	T460HW03 V1	1920X1080	12V	
	AUO	4A-LCD46T-AU2	T460HW03 VD	1920X1080	12V	
47 inches						
	LPL	4A-LCD47T-LG2	LC470WX1 SLA1	1366X768	12V	Interchangeable
	LPL	4A-LCD47T-LG5	LC470WXN-SAB1	1366X768	12V	
	LPL	4A-LCD47T-LG1	LC470WU1 SLA1	1920X1080	12V	Interchangeable
	LPL	4A-LCD47T-LG4	LC470WU4 SLA1	1920X1080	12V	
	LPL	4A-LCD47T-LG6	LC470WUN SAA1	1920X1080	12V	
	LPL	4A-LCD47T-LG7	LC470WUD SAC1	1920X1080	12V	
	LPL	4A-LCD47T-LGA	LC470WUN SBC1	1920X1080	12V	
	LPL	4A-LCD47T-LGD	LC470WUN	1920X1080	12V	
	LPL	4A-LCD47T-LG8	LC470WUF SAA1	1920X1080	12V	
	LPL	4A-LCD47T-LG9	LC470WUE SBA1	1920X1080	12V	
	LPL	4A-LCD47T-LGB	LC470WUE SAA1	1920X1080	12V	
	LPL	4A-LCD47T-LGC	LC470WUF SBN1	1920X1080	12V	
	CMO	4A-LCD47T-CM1	V470H1-L01	1920X1080	18V	

Screen Size	Brands	TCL Part Number	LCD Panel Part Number	Resolution	Panel Vcc	Notes
52 inches	SS	4A-LCD52T-SS2	LTA520HB03	1920X1080	12V	Interchangeable
	SS	4A-LCD52T-SS3	LTA520HB09	1920X1080	12V	
	SS	4A-LCD52T-SS1	LTA520HA02	1920X1080	12V	
	SS	4A-LCD52T-SS4	LTA520HE16	1920X1080	12V	Interchangeable
	SS	4A-LCD52T-SS5	LTA520HE17	1920X1080	12V	
	SH1	4A-LCD52T-SH0	LK520D3LZ1X	1920X1080	12V	Interchangeable
	SH1	4A-LCD52T-SH1	LK520D3LZ13	1920X1080	12V	
	SH1	4A-LCD52T-SHE	LK520D3LZ83	1920X1080	12V	
	SH1	4A-LCD52T-SH2	LK520D3LA63	1920X1080	12V	Interchangeable
	SH1	4A-LCD52T-SHD	LK520D3LZ93	1920X1080	12V	
55 inches						
	SS	4A-LCD55T-SS2	LTA550HF02	1920X1080	12V	
	SS	4A-LCD55T-SS1	LTA550HF03	1920X1080	12V	
	LPL	4A-LCD55T-LG1	LC550WUD- SBA1	1920X1080	12V	
65 inches						
	AUO	4A-LCD65T-AU2	T645HW02 V1	1920X1080	12V	
	AUO	4A-LCD65T-AU1	T645HW01 V0	1920X1080	12V	

Remark:

The above charts just for reference only and you must follow the “The Methods to Find a Replacement of LCD & LED Panel”. So you can find the correct LCD Panel to replace. One more thing, inside the 32 inches chart, the 320 is for 32 inches and the 315 is for 31.5 inches. So some of the LCD they will not match to replace, because the original TV Main board will not send out the correct LVDS format signal to it. But some LCD Panel like AUO T320XVN02-A, it is 31.5 inches type not the 32 inches. So it is suggest referring to their datasheet for more details.

Another thing is their Panel voltage input (Vcc). Besides the 5V and 12V, some part number of LCD Panel have different Vcc input, for example the CMO V420H1-L01 it is using the 18V. So be careful about it, if not it will damage the LCD Panel again.

The T-CON Board

Nowadays, the LCD LED Panel Timing Control section is not only in the T-CON board, but it also built-in the LCD Panel and the Main board. The Timing Control section and their DC-DC circuit have higher repair rate in LCD LED TV. If the T-CON was built-in the LCD/LED Panel, then lots of TV repairer will direct return the TV to customer and told them this TV is beyond repair or not worth to repair it, because it is the LCD Panel problem.



The T-CON Board



The Timing Control Section & DC-DC Circuit Built-In the LCD Panel



The Timing Control Section and DC-DC Circuit are Built-in the Main Board

So if you have enough knowledge on how the Timing Control and their DC-DC circuit works, then it is no problem to troubleshooting and repairing it.

Actually the small sizes LCD/LED Panel, their Timing Control and the DC-DC circuit were built-in the Panel long time ago. And we call this board as LCD Controller Board. But they are same thing, just the name is different. For more basic knowledge of T-Con Board, please refer to the V3.0 ebook for more details.

If we know how the T-con board work and also know how to troubleshoot it, then it will help us to repair the T-con board or LCD Panel easily. Another problem to repair the T-con board/section is their spare parts. So we can search the parts online or find the part in the junk T-con boards.

The Importance of Checking GAMMA & Vcom Voltage in T-CON Board

If you're repair LCD or LED TV, or even the LCD/LED Monitor, the Timing Control section is important and we must figure out how it work and how to troubleshoot it. Some repairer will say the T-CON board is cheap to replace, so no need to learn more about it.

But the problem is not all LCD/LED TV and Monitor are using the T-CON board, especially the LCD/LED Monitor and Laptop LCD/LED Panel their Timing Control section are built inside the Panel or call it as LCD Controller.

I found that lots of the LCD/LED Monitor and Laptop Panel/Screen problem can be repair but lots of the repairers just throw away it into the rubbish. And then replace a new Panel or just return back the Monitor to customer and say beyond repair or not worth to repair.

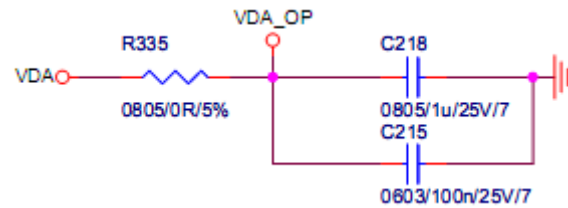
So we must learn how the T-CON work and the method to troubleshoot it. No wonder the Timing Control section is design inside the Panel, T-CON Board or Main Board, so that we know how it works and where to checking their circuit.

How the GAMMA channels voltages and VCOM voltages generated?

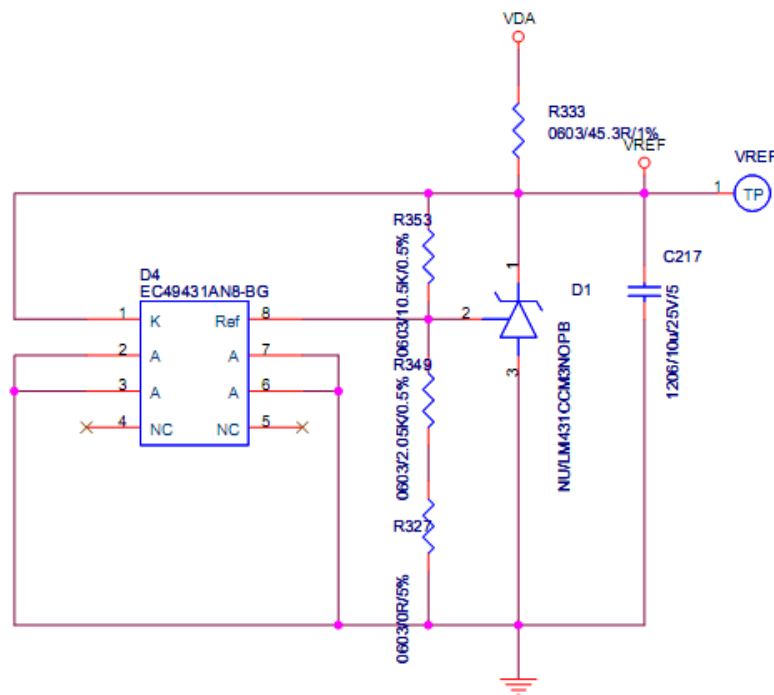
When the T-CON board (for example V315B3-C01 T-con board) DC-DC circuit generated the VDA voltage, this voltage is use to generate the GAMMA and VCOM voltages through U6 (HX8915A). This HX8915A is a 14+1 channels buffer IC, the '14' is for 14 x GAMMA channels and another '1' is for 1 x VCM channel use.

This VDA voltage will go to:

1) VDA voltage go through the R335 resistor to generate the VDA_OP voltage for GAMMA IC U6 (HX8915-A, similar with the AS15 series IC) Vcc input use.

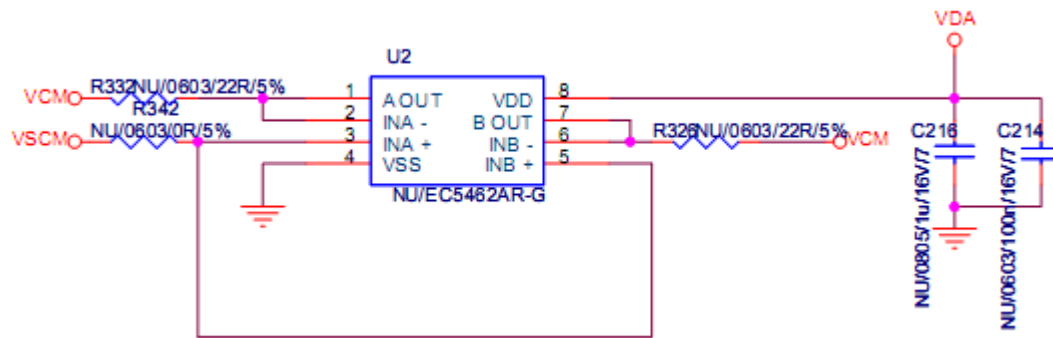


2) The VDA voltage also goes to D1 & D4 to generate the VREF (Voltage Reference) voltage and send it to their voltage divider resistor circuits.



Normally the VREF circuit just uses the D1 (KA431 type component) to generated VREF voltage only. This VREF voltage normally is about 12.5V. But different design it has a bit different on it.

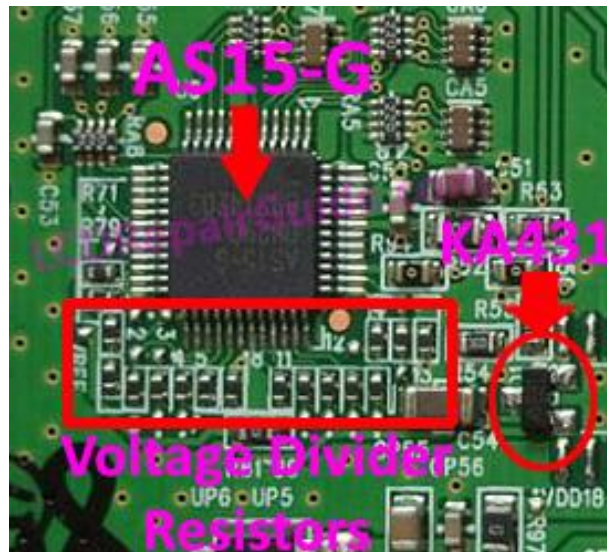
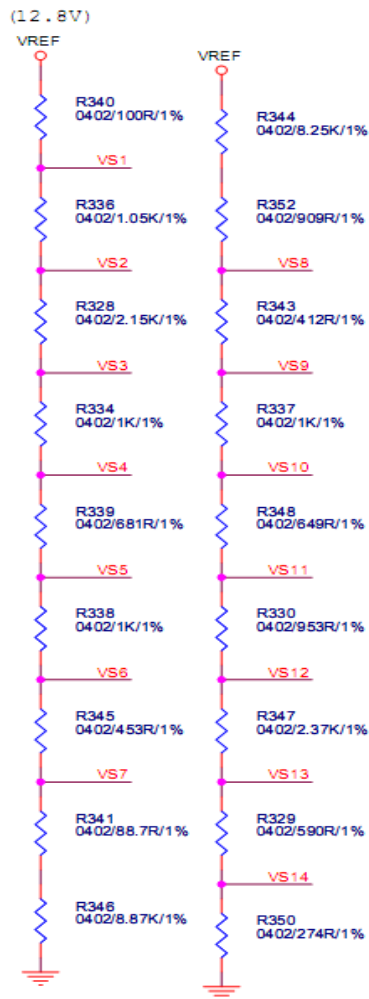
3) For this T-CON board V315B3-C01, the VDA voltage also sends to U2 to generate the VSCM voltage and then send to U6 to generate the VCM (Vcom) voltage. Normally this VCM voltage is generated by the VREF circuit. The VREF output line go through two resistors as voltage divider resistor circuit and get the VSCM voltage, and then send it to U6 (HX8915A) to output the VCM (Vcom) voltage. This Vcom voltage will send to the LCD Panel glass.



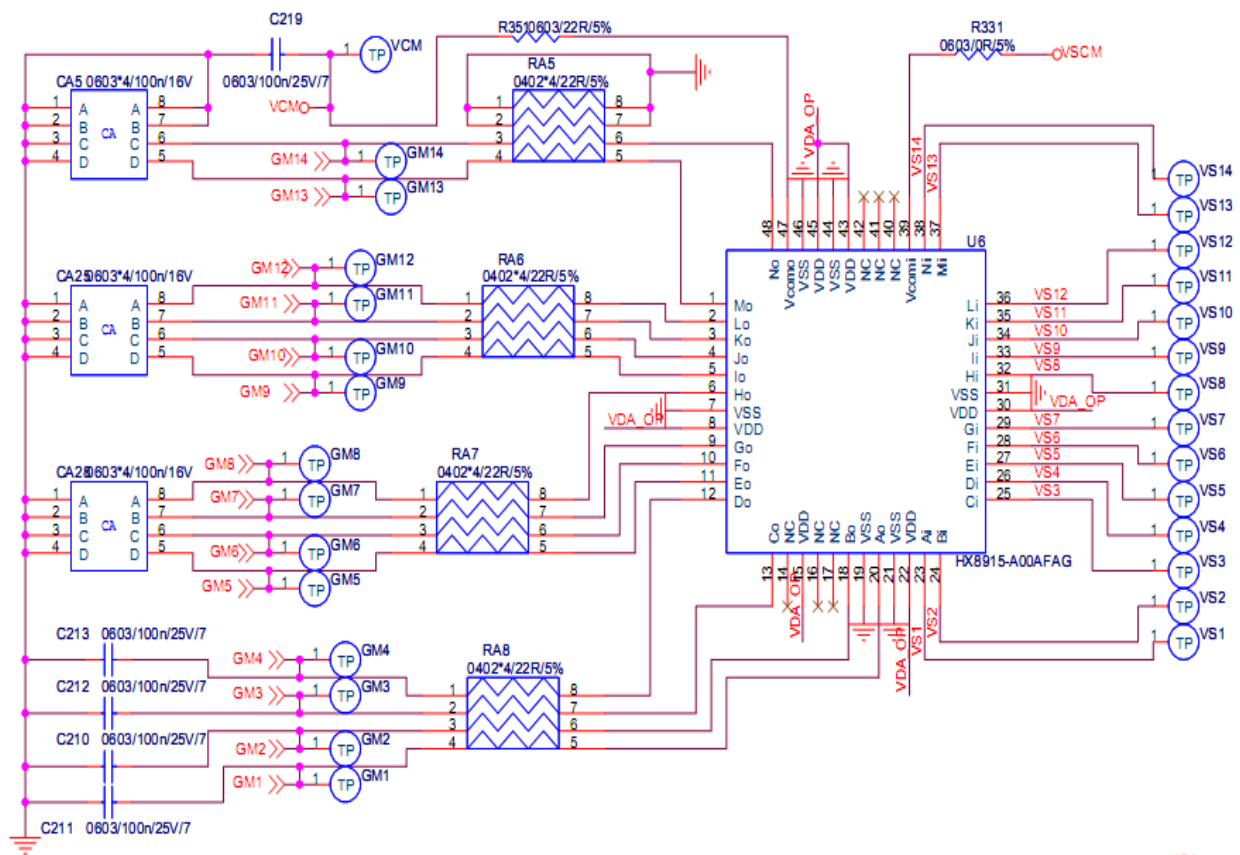
Note:

The Vcom (VCM, Common Voltage) voltage is about half of the VREF voltage. Remember this rules, the VCM voltage is about half of the VREF voltage. If the Vcom voltage not stable or their voltage is out from the original values, the TV display will abnormal or their brightness problem.

After the VREF voltage was generated, it will send to 2 groups of resistors voltage dividing circuits. These 2 groups of resistors voltage divider resistor circuits will divided the VREF voltage to 14 channels different voltages call it as VS1~VS14 GAMMA voltages. But these voltages can't direct send to the LCD Panel use, they need to send it to the buffer IC U6 (HX8915A or AS15 IC), and then it will output the GAMMA voltages GM1~GM14. These GAMMA voltages will send to the LCD Panel Source Driver board.

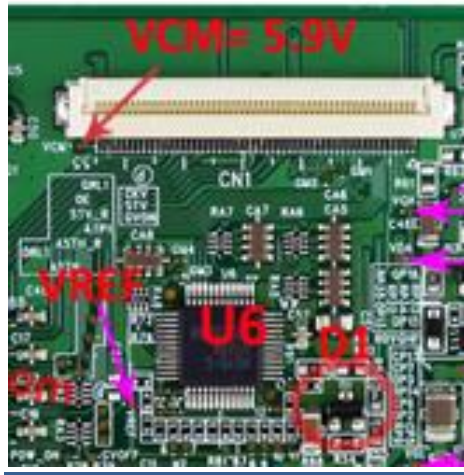


Finally the GAMMA voltages and the Vcom (VCM) voltages were generated through the circuit below:



What will happen when Vcom (Common Voltage) voltage missing?

When the Vcom (VCM) voltage is missing, the Panel display will become white and it is looks like the negative picture. If this is happen to your TV, you need to check their output voltage at the T-CON board. Normally their marking code at PCB board is “Vcom”, “VCM” or etc. If you’re not sure what voltage values is normal for the Vcom, never mind, do you remember the Vcom voltage is about half of the VREF voltage. So you can find the VREF voltage to measure it and then you can roughly know what the voltage values for the Vcom voltage are.



How to know the GAMMA channels voltages normal or abnormal?

As you know that the GAMMA channels voltages when different T-con board or Panel, it has different channels in it. Normally is about 14 channels, 18 channels or above 20 channels. But all these GAMMA channels voltages has one important rules, that is **“ The GAMMA Channels Voltage their voltages order is from high to low or low to high”!**

For example good GAMMA Voltages from high to low (V315B3-C01T-CON):

CM1- 15.17V	CM8- 6.27V
CM2- 14.16V	CM9- 5.99V
CM3- 11.99V	CM10- 5.20V
CM4- 11.40V	CM11- 4.26V
CM5-10.67V	CM12- 3.36V
CM6- 9.88V	CM13- 1.35V
CM7- 8.21V	CM14- 0.73V

Their voltages order high to low will looks like this:

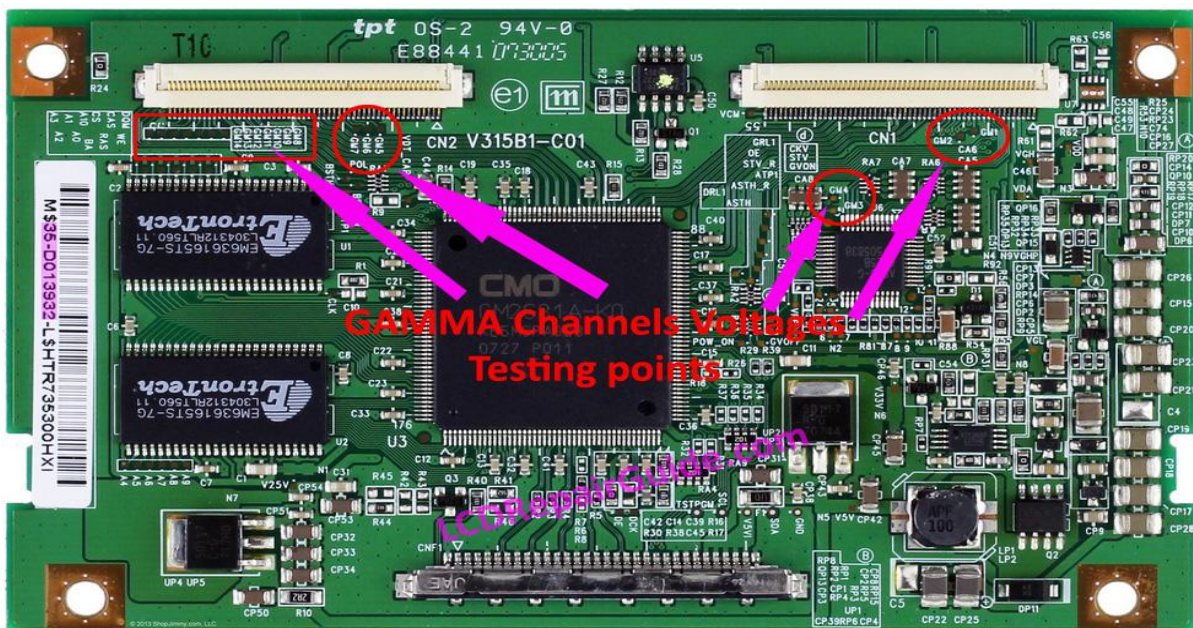
15.17V, 14.16V, 11.99V, 11.40V, 10.67V, 9.88V, 8.21V, 6.27V, 5.99V, 5.20V, 4.26V, 3.36V, 1.35V, 0.73V

If you found the GAMMA Channel Voltages like these, that's mean the GAMMA circuit is failure and you need to check it. If not find any components failure, just try to replace their buffer IC like AS15, HX8915A & etc.

The Example of Bad GAMMA Voltages:

- 1) 11.5V, 10V, 8V, **3V**, 7.06V, 6.75V, 6.03V, 5.73V, 4.88V, 4.02V, 3.66V, 2.81V, 1.35V, 0.53V
- 2) 0.78V, 1.45V, 2.28V, 3.88V, 4.34V, 5.02V, 5.78V, 6.67V, **9.23V**, **8.95V**, 8.55V, 9.46V, 10.78V, 12.3V
- 3) 15.02V, 14.52V, 11.38V, 10.01V, 9.47V, 8.95V, 8.03V, 7.55V, 6.68V, 5.62V, 4.03V, 2.76V, **5.13V**, 0.68V

You can check the GAMMA voltages on the T-CON board and their marking code is GM, CM, PGM or etc.



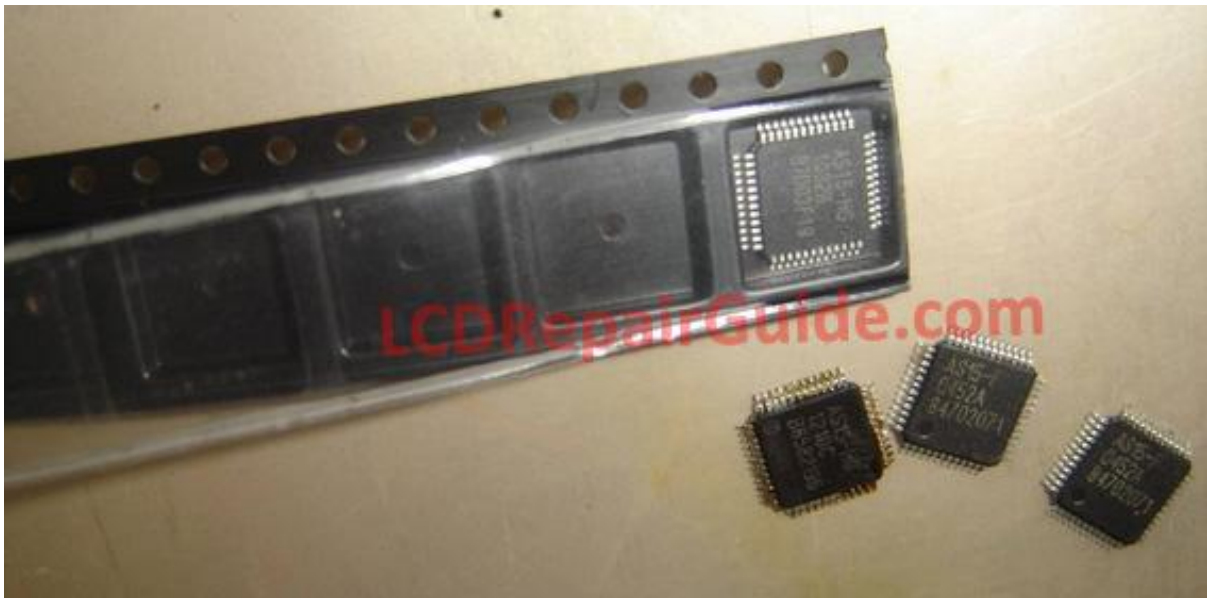
Besides the DC-DC circuit has higher failure rate in T-Con board, the second is the GAMMA circuit. So if the GAMMA voltages abnormal, it will cause the TV display color abnormal, display noise in the display background or etc.

Why After Replaced the AS15-G IC to AS15-HG The TV Still Has Problem?

The AS15 series IC is a 15 x Op Amp IC. It is 14 + 1 Op-Amp, 14 Op-Amp is for the GAMMA use and another one is for VCOM. Some TV repairer said after replace the AS15-HF to AS15-HG, the TV screen problem not solve or more serious than before. Sometime after replace the AS15 IC, the TV display is ok about 20 minutes, then whole screen change to nearly white screen about 3~5 seconds, and then screen back to normal about 5 minutes and then changed to white screen again. So the screen is non-stop to change like that, and the new replace AS15 IC can feeling extremely heat. Are the AS15G and AS15HG compatible? But when change to another batch of AS15 IC, the T-Con board problem solved!



Actually the AS15F, AS15G, AS15-HF & AS15-HG all are compatible and equivalent to use! But the problem is lots of the AS15 series IC in the market now is not in good condition or call is as recon IC. Especially the cheapest price of AS15 IC, this type of IC mostly has higher chances is not a good IC.



The above picture of AS15-F IC, this batch of IC: 0452A, we found that after change to this IC, the IC is extremely heat on the T-con. Finally found the AS15-HG IC batch no: 1032B, after replace AS15-F with this AS15-HG, the TV display problem solved and the IC temperature is just feeling warm only. Even the AS15-HG batch no: 1210C also not good to use.

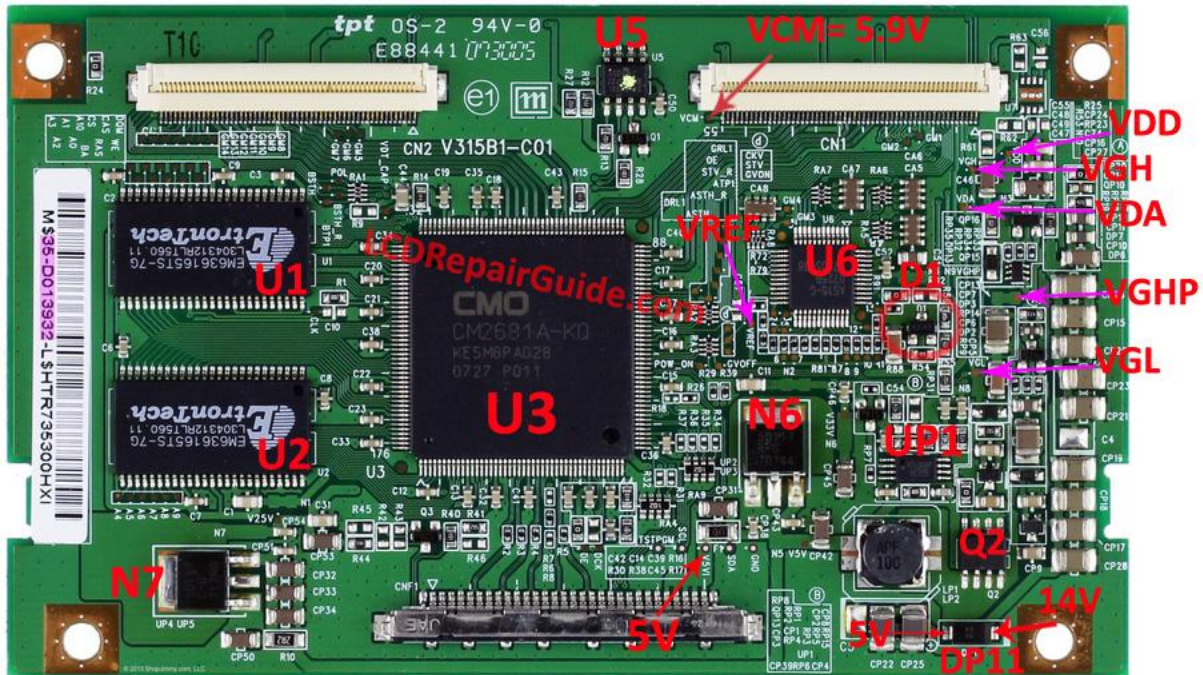
Note:

I have a tip for this AS15 series IC or even the AS19 series also same. When they replace the equivalent or compatible AS15 IC on the T-con board, if the finger can feel AS15 IC surface is very hot, but the display is ok, then I will recommend change another AS15 IC. Because it will cause this T-con board cannot last long to use. Or the AS15 IC is extremely heat on the IC surface and their TV display also abnormal, then direct removes it and replaces another one to try again. So lots of the TV repairer if they facing this problem before, hopefully they know what can do now and don't confuse about it again.

Various of T-CON Board Voltage Testing Points and Their Symptom When Voltage Fail to Appears

This chapter will provide the T-CON Board/Section of components part number and their good testing point voltage values.

1) T-CON Board P/N: CMO V315B1-C01 (V315B1-L01)



D1= 431W

N6= 3.3V (LDO)

N7= 2.5V (LDO)

Q2= 4422

U1 & U2 = EM636165TS

U3= CM2681A

U5= 24LC128

U6= AS15-G

UPI1= AT1380AP (pin1= 0.5V, pin2= 0, pin3= 5V, pin4= 0V, pin5= 2.6V, pin6= GND, pin7= 0.36V, pin8= 0.19V)

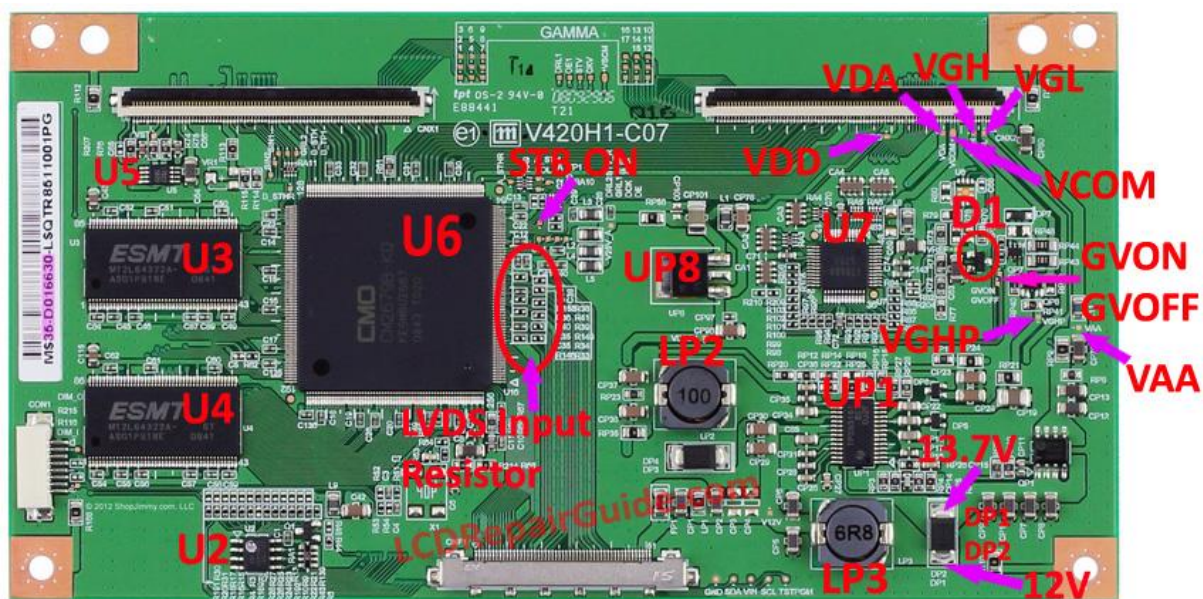
VCM= 5.9V, VREF= 12V, VDD= 3.3V, VGH= 19V, VDA= 13.5V,
VGHP= 24V, VGL= -5.6V

When U6 (AS15-G) fail, the TV will occur symptom like: display distortion, no display, TV auto shutdown & etc. The **AS15 IC** can use **HX8915-A** as a replacement at V315B1-L01, V315B3-L01, V315B1-L08 and V315B3-L04 T-CON Board.

The D1 (431W) pin1 (C)=12V, pin2 (R)= 2.4V and pin3 (A)= GND. When D1 damage, U6 (AS15-G) will no VREF voltage output and causing the TV no display symptom. Note: 431W and M431A is not same pin position, their pin1 & pin2 are opposite. So be careful when using the M431A as a replacement. But we can direct replace it with the “N1B” marking code 431 component on the inverter board.

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2) T-CON Board P/N: CMO V420H1-C07 (V420H1-L07)



D1= N1B (can replace with 431W)

LP2= 3.3V

U2= 24LC128, U3& U4= EM638325TS

U5= i7822 (pin1&2= VST 0.6V, pin3= 0.6V, pin4= GND, pin5= 5.8V, pin6&7-
VCOM= 5.5V, pin8-VDA= 13.7V)

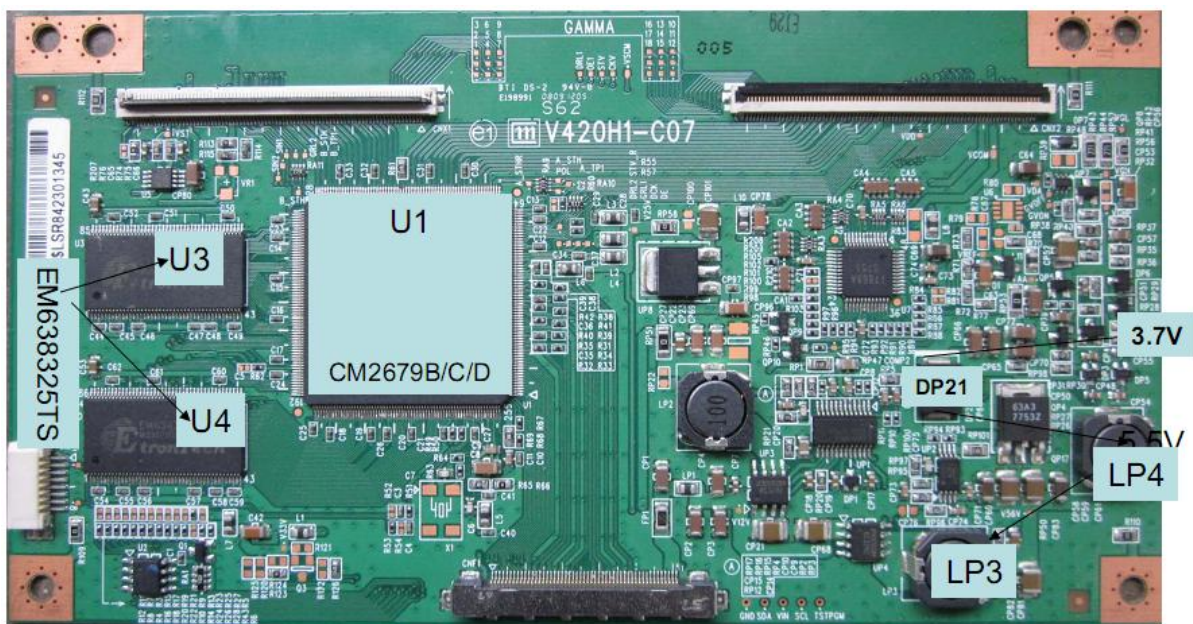
U7=i7868A, U16= CM2679B/C/D, UP1= TPS65161, UP8= 2.5V (LDO)

COLLECTION OF LCD/LED TELEVISION REPAIR TIPS-V4.0

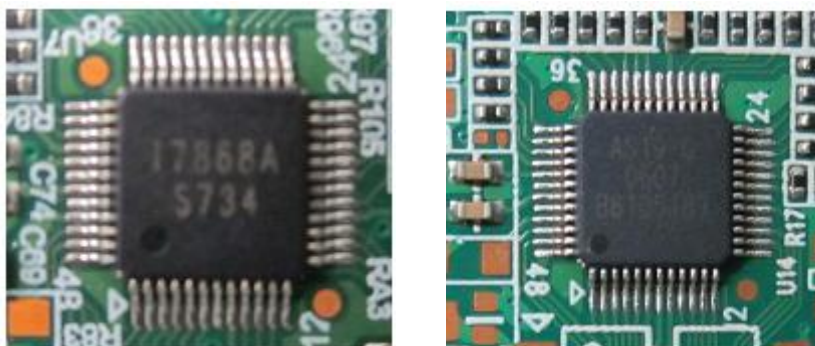
VDD= 3.3V, VDA= 13.7V, VGH= 18V, VGL= -5.5V, VCOM= 5.5V, GVON= 0V, GVOFF= 2.6V, VAA= 13.7V, VGHP= 20V

When U16 is using the CM2679D, the UP8 is use the 1.8V LDO. For the CM2679B & C is use the 2.5V LDO. The LVDS Input Resistors for CM2679B/C their good ohm values (between the resistor and GND) is about 400 ohm. If that is CM2679D is about 500 ohm. If the R149 ohm values increases, normally this is because of the U16 (CM2679) is defective.

Another design of the V420H1-C07:



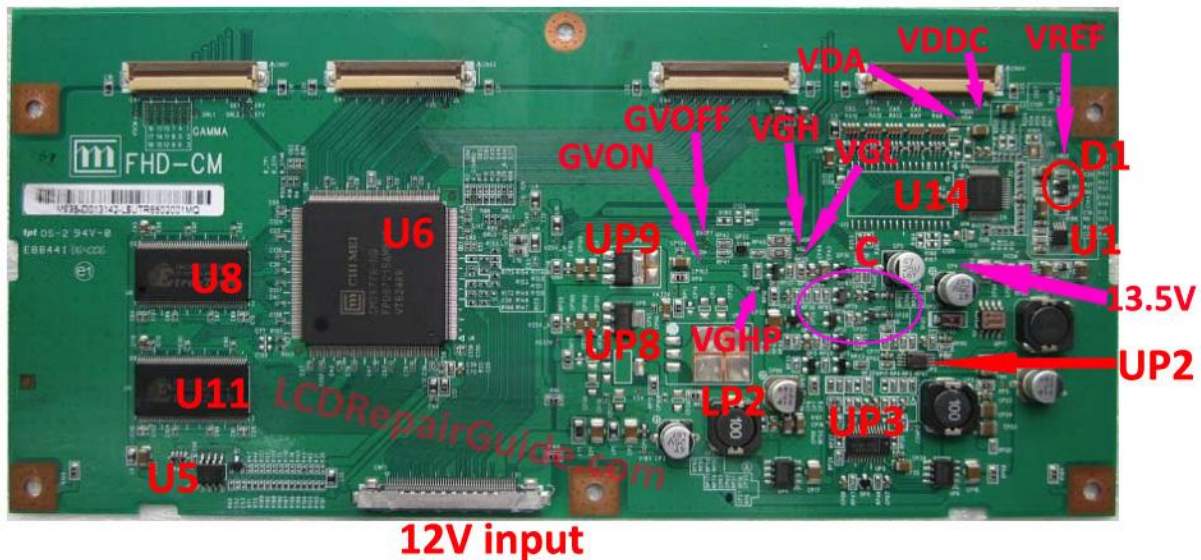
I7868A (same as i7868A) and AS19 IC can be interchangeable in CMO 37 inches and above LCD/LED Panel, like HX8919-A.



If U1 (CM2679B) damage, or the voltage supply: 2.5V, 3.3V, 13.7V, 18V, -5.5V and 12V missing, the TV will no display, but the backlight is lit. If the TV screen is abnormal display, it could be their U1 (CM2679B) damage or dry

joins, GAMMA Correction IC i7868 or the T-CON board voltage supply abnormal. When the VCOM= 5.5V voltage is missing, the TV display will change to white or looks like negative picture.

3) T-CON Board P/N: CMO V370H1-L0A (35-D013142 [FHD-CM])



C= CP28, DP7 or Q9 damage will causing the 23V no output and the TV will No Display symptom.

D1= 431

LP2 (Coil)= 3.3V

U1= 8902 (pin5 output VCOM= 5.5V)

U5= 24LC128

U6= CM2677B

U8 & U11= EM638325

U14= AS19-G

UP2= FPS138, UP3= MAX1858, UP8= 2.5V (LDO), UP9= 2.5V (LDO)

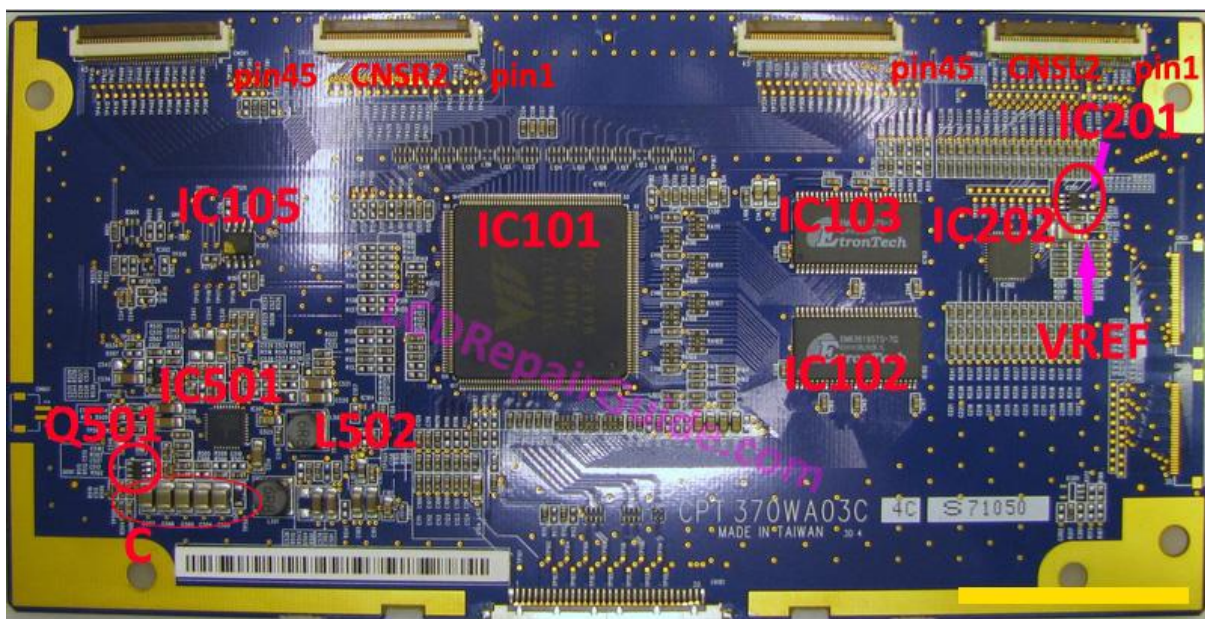
VGHP= 23V, GVON= 0V, GVOFF= 2.6V, VGH= 21V, VGL= -5.5,

VDA= 13.5V, VDDC= 3.3V, VREF=12V, VCOM=5.5V

When the voltage supply 13.5V & 23V their filter capacitor is leakage or shorted, the TV will No Display. Also for the other voltage supply like VDDC-3.3V, VREF-12V, VDA-13.5V, VGH-21V, VGL=-5.5V, UP8&9=2.5V if missing, the TV also No Display.

If the U6 (CM2677B) dry joins or U14 (AS19-G) damage will causing the TV display distortion problem. When the U1 (8902) damage and causing the VCOM 5.5V missing, the TV display will become white screen.

4) T-CON Board P/N: Chung Hwa CPT370WA03C



IC101= VTII8872, IC102 & IC103= EM636165TS, IC105= 25F12,

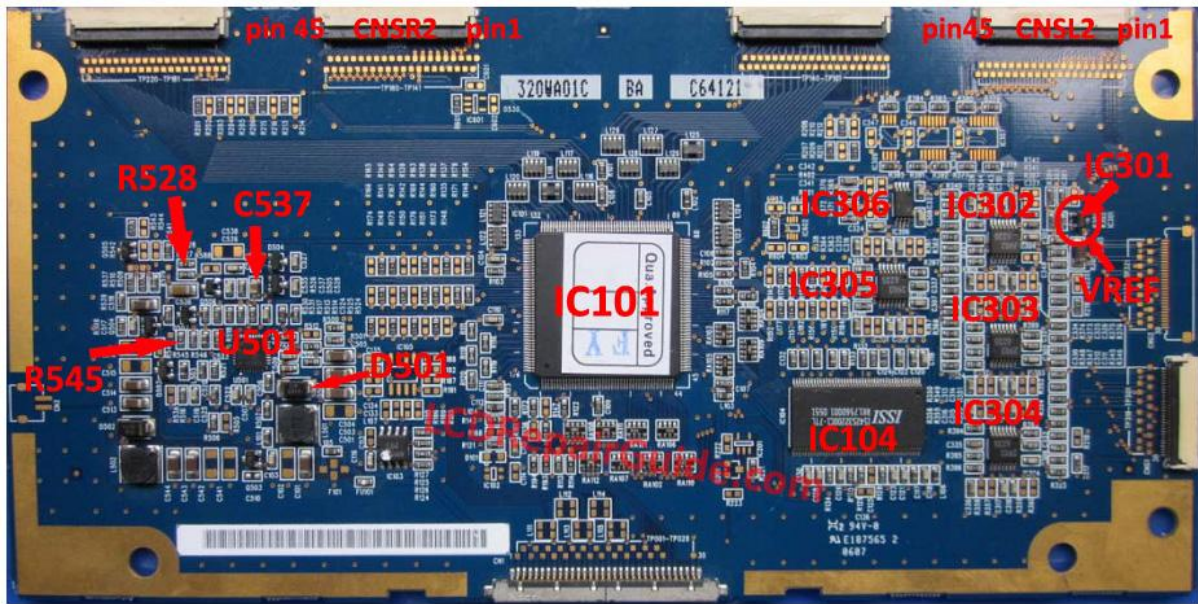
IC201= E3A (same as 431), IC202= ISL24003, IC501= ISL976, L502= 3.3V

Q501= 576RE (pin1,2,5&6 is output, pin3 is a control pin, pin4= 13.7V input)

VREF= 12V

C= This 13.7V line filter capacitors always short circuit in this T-CON board.
Looks like a common fault in this T-CON board.

CNSR2 & CNSL2=> pin7 &8= -6.2V, pin9&10= 24V, pin11&12= 13.7V, pin13&14= 6.5V, pin15&16= 3.3V, pin 17&18= 13.7V

5) T-CON Board P/N: Chung Hwa CPT320WA01C

D501= 3.3V

IC101= VE606RL (FPDB7352CXAVV)

IC104= IS42S32200

IC301= M431A

IC302, IC303, IC304, IC305, IC306= 2904

U501= 8728E

VREF= 12V

C537= 24V

R528= 13.7V

R545= -6.2V

CNSR2 & CNSL2= PIN7&8= -6.2, PIN9&10= 24V, PIN11&12= 13.7V,
PIN13&14= 6.5V, PIN15&16= 3.3V, PIN17&18= 13.7V

When one of these IC: IC302, IC303, IC304, IC305 or IC306 defective, the TV display will be darkness. This IC101 has higher damage rate in this T-Con board. For example, their symptom likes no display and display distortion.

6) T-CON Board P/N: HV365WXC-200**LCD Panel:** ChangHong M370X12-E1-B LED Panel

Testing the working voltage with Changhong LED37B1000C LED TV and the screen is no display with blue screen only.

HV365WXC 200 T-CON Board FPC Pins Test Points					
Pins No.	Pins Description	Voltage Values	Pins No.	Pins Description	Voltage Values
1	VMID	7.98	31	OE1	0.767
2	VOFF	-8.02	32	OE2	2.489
3	QREF	-15.96	33	UD-C	0.006
4	DVDD	3.25	34	OO-EN	0.008
5	DI02	0.01	35	DVDD-APR	1.202
6	XAO	3.25	36	V1	15.44
7	VON	24.17	37	V2	15.32
8	VREF-FB	1.26	38	V3	13.34
9	AVDD-S	16.24	39	V4	12.63
10	AVDD	16.26	40	V5	11.71
11	VGH	26.14	41	V6	10.88
12	VDDIN	12.22	42	V7	10.1
13	LVDS-FORMAT	0.006	43	V8	8.36
14	LVON	1.348	44	V9	8.12
15	LV1N	1.282	45	V10	7.57
16	LV2N	1.195	46	V11	7.23
17	LVCKN	1.161	47	V12	5.52
18	LV3N	1.283	48	V13	4.74
19	LV0P	1.042	49	V14	3.864
20	LV1P	1.103	50	V15	2.992
21	LV2P	1.191	51	V16	2.251
22	LVCKP	1.208	52	V17	0.298
23	LV3P	1.102	53	V18	0.219
24	BIST	0.015	54	SCL-EEPROM	3.243
25	STVU	0.007-0.009	55	SDA-EEPROM	3.243
26	STVUO	0.007-0.009	56	SCL-PGMA	-0.025
27	TP	0.155	57	SDA-PGMA	-0.034
28	POL	1.624	58		
29	CPV	1.134	59		
30	STV	0.08	60		

Repair Case Study for T-CON Board

Model: Samsung 43 inches LED TV (This is a fake Samsung LED TV!)

Symptom: Display Color Problem like Oil Painting and the Display also Reverse 180 degree now.

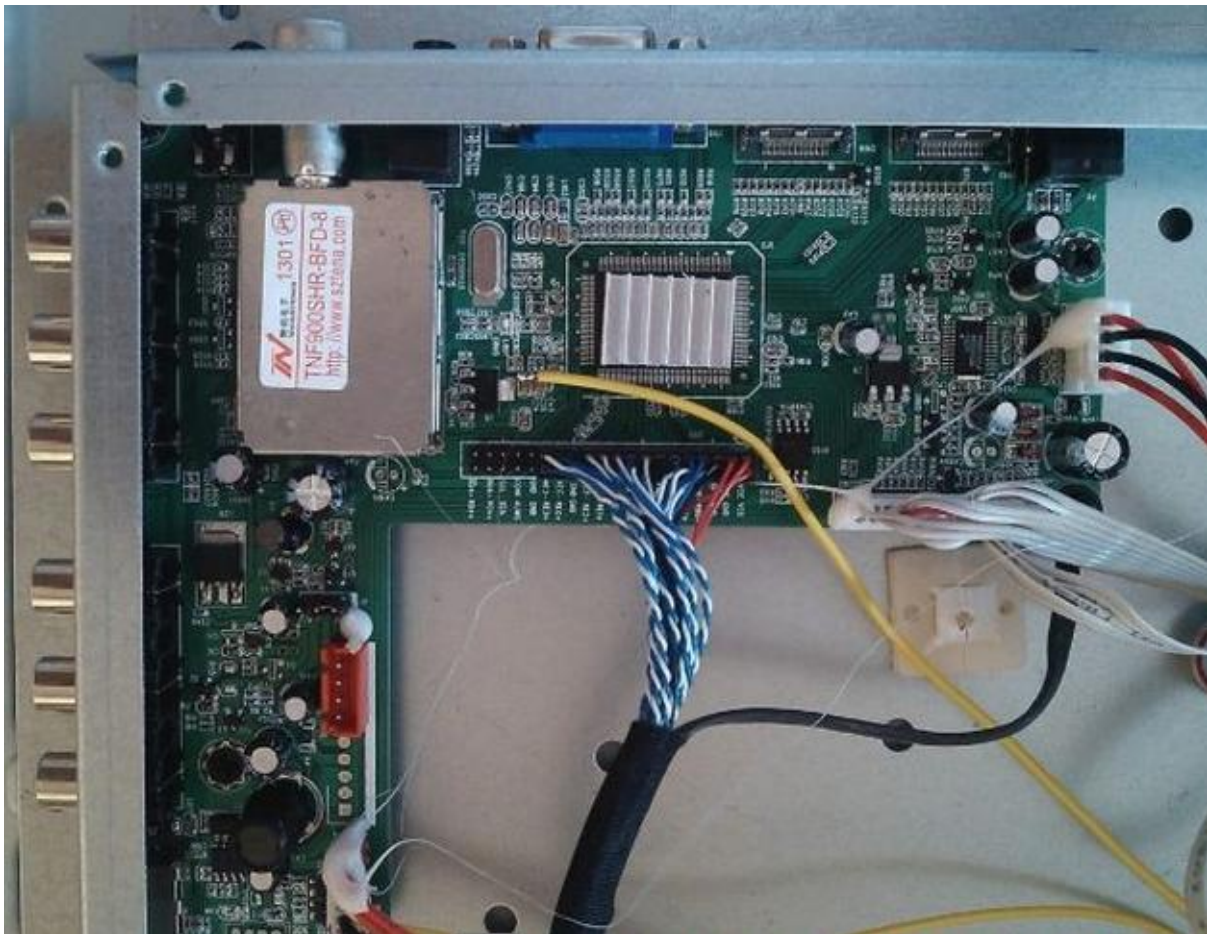


Repair/Solution:

Regarding this type of symptoms, lots of the TV repairer will give up to repair it. Because they will think it is their LED Panel (or T-CON Board) problem. Also this TV is a fake Samsung 43 inches LED TV, their repair information is hard to find to compare to the original TV manufacturer.

So this TV is send by another TV Repairer and he also said if can't repair it doesn't matter, because it is not the original Samsung LED TV. This TV cover is looking like Samsung, but inside the TV, it is just using an OEM brand TV Main board only.





After analysis this LED TV symptoms, I suspect it was the T-CON board or Main board problem. Why I'm not suspecting the LED Panel? Because I know that the display reverse problem is causing by their SELLVDS or Rotation signal set as incorrect by Main board or the T-con board problem.

Before starting to repair this LED TV, I will checking their Service Mode setting or just try to do the firmware upgrade for it. But the problem is, this is not the branded TV, so we don't have the enough information to find their service manual and then know how to login to their Service Mode. Also we don't have this Main board good firmware to do the upgrade too.

So what can I do now? Actually for this type of OEM TV Main board, they have the part number in the Main board there. Finally found the Main board part number: TSUMV59UXS_V1.1 as picture below:



Found the information for this Main board. This is a ROWA V59 series Main board and its Service Mode login step is using the remote control:

- a) Press MENU, the screen is showed the Menu OSD there
- b) Press number buttons: 1147 and the screen will show another OSD Menu
- c) Select: General, Setting, Login
- d) Select LVDS MAP adjust 1, 2, 3, 4.....16 after adjusted ok, press the EXIT button to log out the Service Mode.

Finally this TV problem was solved and it is working properly now.

T-CON Board Repair Tips

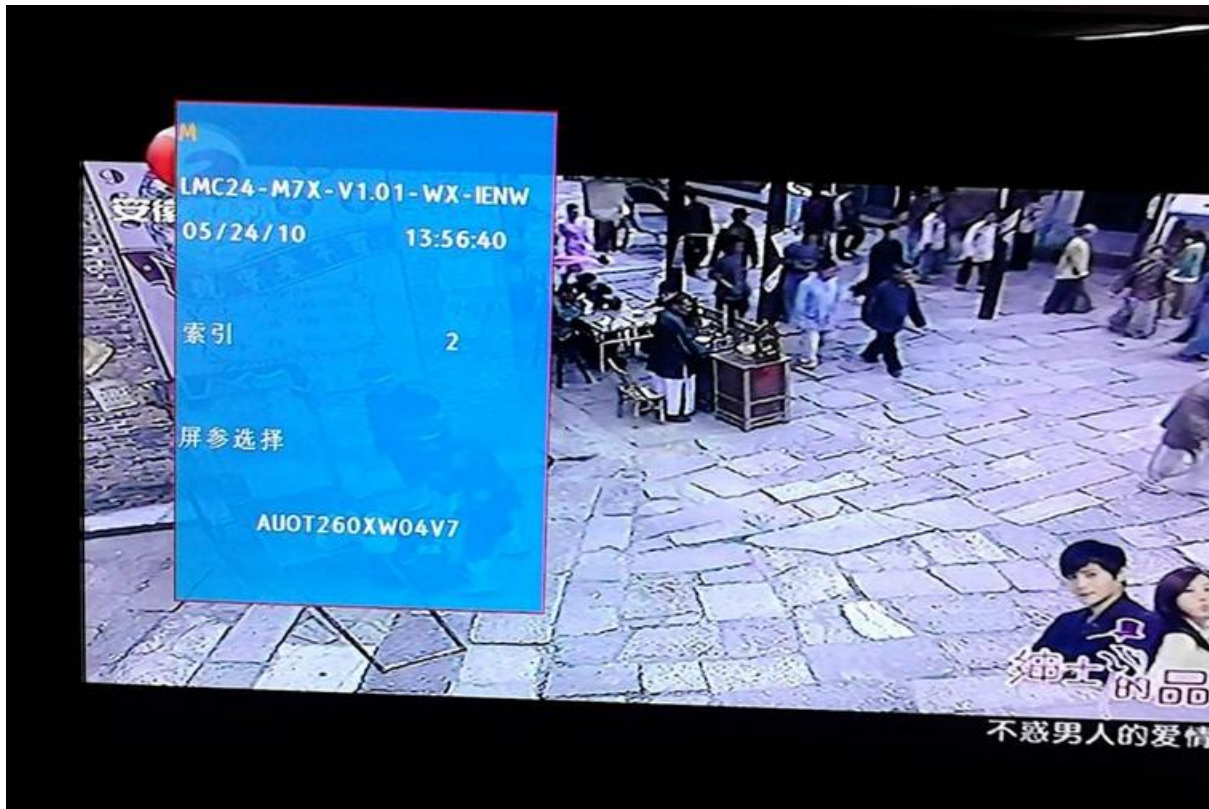
1) Model: ChangHong LT26830EX LCD TV

Symptom: Display Distortion Problem



Repair/Solution:

Normally this type of display symptom is causing by the Main board, LVDS cable or T-CON. So start to check their Service Mode Panel setting. Use the remote control press and hold the MUTE button about 3 seconds, then press TV Key board "MENU" button, then it will login to the Service Mode successfully. Changed the Panel setting to the correct Panel part number, after that, use the remote control to power off the TV. Power on again the TV, the TV display distortion problem is ok now.



2) Model: Changhong LT42729F LCD TV

Symptom: Display Distortion

Repair/Solution:

Again this TV is also same display distortion problem. So again we need to login to their Service Mode to adjust the Panel setting.

Method to login to the Service Mode: In TV Mode, use the remote control press buttons: MUTE --MENU --6, 1, 1, 5. So it will login to the Service Mode successfully and go to Panel setting there to change it to the AU_T420HW04 (the TV LCD Panel part number). After change the Panel setting, this TV is ok now.



3) Model: Hisense LED39K310X3D, LED39K316, LED39K320 & LED39K321 LED TV

Symptom: The TV is White Screen Problem

The TV is White Screen problem, but the sound is normal. This LED TV is using the CMI V390HK1-LS5 LED Panel and their T-CON board part number is V236H3-CS3-C.

Repair/Solution:

This is a common fault in this LED Panel. Their V390HK-LS5 Rev.C7, Rev. C8 & Rev. C9 also have the same symptom. Their solution is removed the U3 (MX25L2026E) flash memory and using the programmer to program a good firmware in it. After that, solder back this flash memory to U3. After replace the U3 firmware, the LED TV can show the perfect display now.



4) Model: Konka LC22E561B LCD TV

Symptom: Display Distortion Problem



Repair/Solution:

After dismantle this LCD TV and found that their Timing Control is built-in the Main board there. When checking the Main board and saw that their GAMMA IC is using this AS15-G IC, so measure their GAMMA output voltage. Found that one of their GAMMA voltage output was abnormally. So direct replace this AS15-G IC with this AS15-F and the TV problem solved!



5) Model: Sharp LCD32WXN LCD TV

Symptom: Negative Display

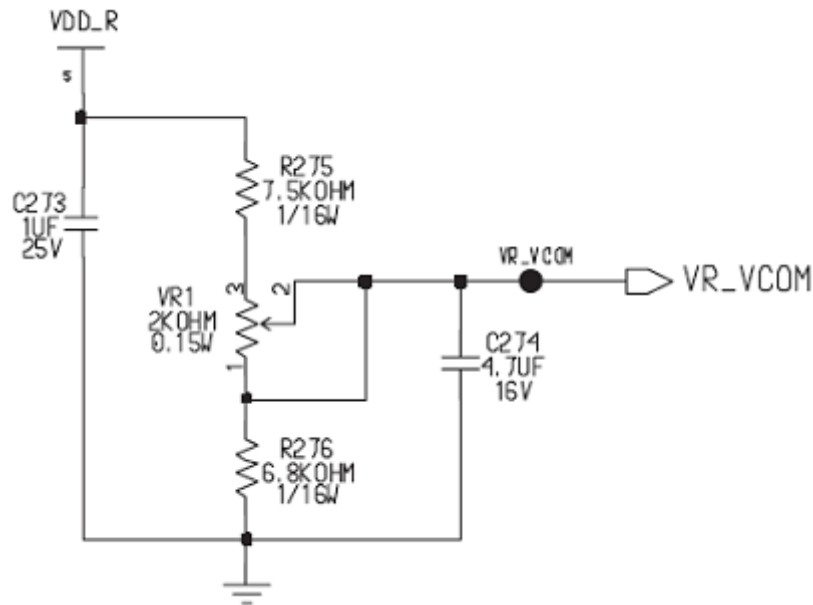
The screen brightness is high and the display no gray scale in it.



Repair/Solution:

After analysis the picture above and found that this type of symptom is causing by the T-CON board. The screen is just show negative display only and no any gray scale for the picture. Most of the time, this type of problem also cause by their T-con Board GAMMA or Vcom circuit.

This LCD TV T-con section was built- in the LCD Panel, so need to remove their metal bracket to checking their T-con section. First check the VDD_R has 14.9V, after that checking the VR_VCOM has 0V! So this voltage values is abnormal for the VCOM voltage, because the Vcom voltage normally is about half of the VDA voltage. Measure the VR1 pin 1 (one of the R276 pin), its voltage still 0V, so suspect the VR1 is open circuit. Remove the VR1 (marking as '23') and using the Multimeter measure it and found the VR1 was opened circuit.



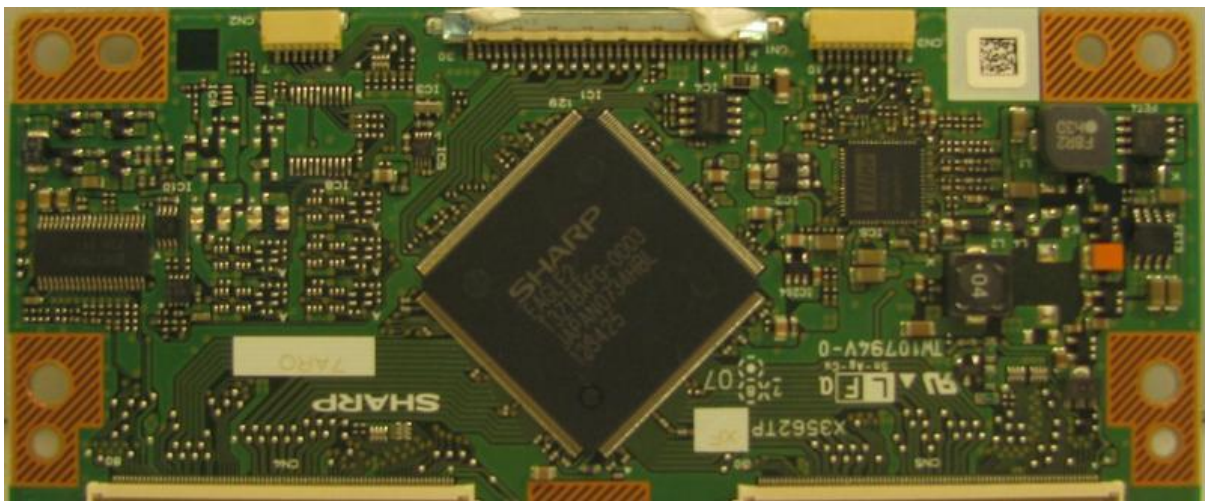
VCOM Voltage Circuit

Since the VR1 is marking as '23', that's mean their ohm values is 2K ohm. Because of the VR1 center pin position is in the middle, that's mean, the ohm values is about 1K ohm (half of the 2K ohm). So you can replace a 1K ohm resistor to VR1 pin2 & pin3, but make sure the VR1 position pin1 & 2 is shorted. After replace the VR1, VR_VCOM has output 7.54V there and the TV problem was solved.

6) Model: Sharp LK315T3LZ54 LCD Panel

Symptom: Tips for Display Reverse Problem

T-con Board: CPWBX3562TPXF



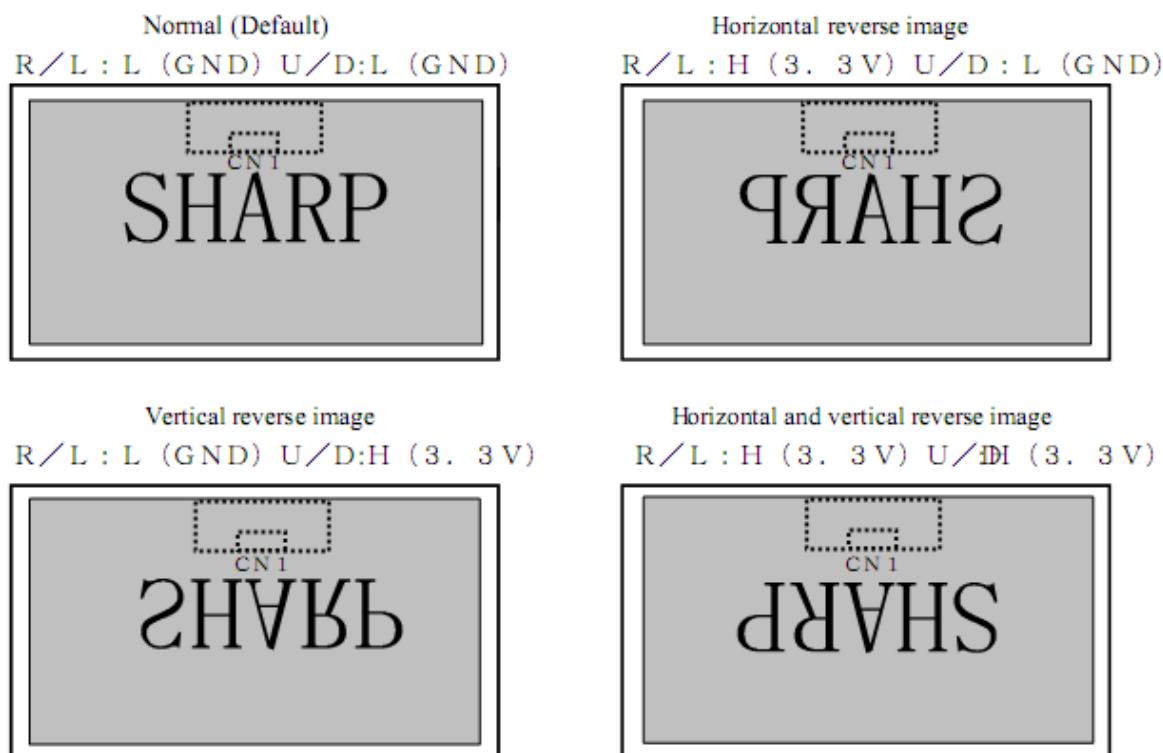
Repair/Solution:

Actually this type of symptom is we can repair it through:

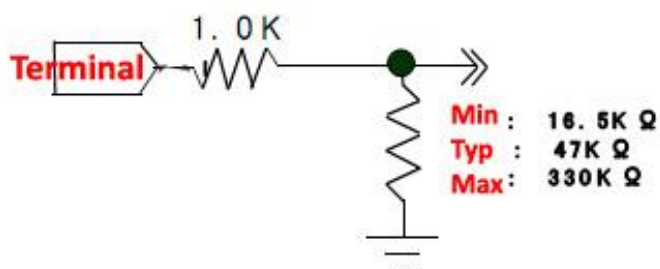
- a) Software control: Some TV is allowed to login to the Service Mode and change their setting to cure this problem.
- b) Hardware modify: If the TV not provide the software control, then we can modify the hardware, especially the T-CON board LVDS connector pin27 & 28.

27	R/L	Horizontal shift direction 【Note 2】	Pull down Default L:GND 【Note 4】
28	U/D	Vertical shift direction 【Note 2】	Pull down Default L:GND 【Note 4】

【Note 2】 Display reversal function



【Note 4】 The equivalent circuit figure of the terminal



**The other Screen Problem repair tips, please refer to V2.0 & V3.0-LED LCD TV Repair Tips at: <http://www.LCDRepairGuide.com/V2/>

<http://www.LCDRepairGuide.com/V3/>

*For the complete learning LCD Television repair, highly recommend you join the LCD Television Repair membership site as below:

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

A promotional banner for the LCD/LED TV Repair Membership Site. On the left is a 3D rendering of a blue box labeled 'LCD TV Repair' with 'Training Manuals And Related Repair Information' and 'Membership Site' on it. In the center, the text 'LCD/LED TV Repair Membership Site' is written in large, bold, white letters with a blue outline, and 'www.LCD-Television-Repair.com' is written below it in yellow. On the right is a photograph of a person's hands working on the internal circuitry of a television, using a multimeter.

Conclusion:

I strongly suggest you to print out this e-book and binding it as a book for easy reference.

If you have questions about LCD/LED Television Repair, please do not hesitate to send me an email at:

fastrepairguide@gmail.com

I wish you all the best and look forward to hearing your success story. Enjoy repair!

To your success,

Kent Liew

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<http://www.Projection-Tv-Repair.com>

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

BONUSES Section A:

LG LCD & LED TV Interconnect Schematic Diagrams:

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T-CON Board Schematic/Circuits Diagrams:

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Attention: Bonuses Section B is inside the Download Page when you download the V4.0 ebook.

42LE5500 INTERCONNECT DIAGRAM

P204 "SMPS" To "The Panel"

Pin	Label	STBY	Run	Diode Check
12	02.A	0V	117.8V	Open
11	n/c	n/c	n/c	Open
10	02-1C	0V	1V~30V	Open
9	02-2C	0V	1V~30V	Open
8	02-3C	0V	1V~30V	Open
7-6	n/c	n/c	n/c	Open
5	01-3C	0V	1V~30V	Open
4	01-2C	0V	1V~30V	Open
3	02-1C	0V	1V~30V	Open
2	n/c	n/c	0V	Open
1	01.A	0V	117.8V	Open

P205 "SMPS" To "The Panel"

Pin	Label	STBY	Run	Diode Check
12	04.A	0V	120V	Open
11	n/c	n/c	n/c	Open
10	04-1C	0V	1V~30V	Open
9	04-2C	0V	1V~30V	Open
8	04-3C	0V	1V~30V	Open
7-6	n/c	n/c	n/c	Open
5	03-3C	0V	1V~30V	Open
4	03-2C	0V	1V~30V	Open
3	03-1C	0V	1V~30V	Open
2	n/c	n/c	0V	Open
1	03.A	0V	120V	Open

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%, 3.3V. Follow the P-DIM signal all the way to the Inverter.
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).

You can also check each of the 12 blocks functionality by grounding the driver output signals. See "Forcing on a Block of LEDs" on the right.

Pin 17-19-21 P201

Pin	Label	STBY	Run	Diode Check
1	VDD-33	3.5V		
2	VLED-RANGE	0V		
3	Gnd	Gnd		
4	+12VS	12.44V		
5	Gnd	Gnd		
6	+3.5VS	3.57V		

Pin 18 P201

Pin	Label	STBY	Run	Diode Check
1	INV_ON	3.28V		
2	Gnd	Gnd		
3	Gnd	Gnd		
4	SCLK	0.09V		
5	FB_STR_VF	1V		
6	P-DM1	1.9V		

Pin 20 P201

Pin	Label	STBY	Run	Diode Check
1	Error	0V		
2	(L-DIM) SIN	3.3V		
3	POWER_ON	3.35V		
4	VSYNC_IN	0V		
5	Gnd	Gnd		
6	Gnd	Gnd		

Pin 22 P201

Pin	Label	STBY	Run	Diode Check
1	Error	0V		
2	(L-DIM) SIN	3.3V		
3	POWER_ON	3.35V		
4	VSYNC_IN	0V		
5	Gnd	Gnd		
6	Gnd	Gnd		

Pin 24 P201

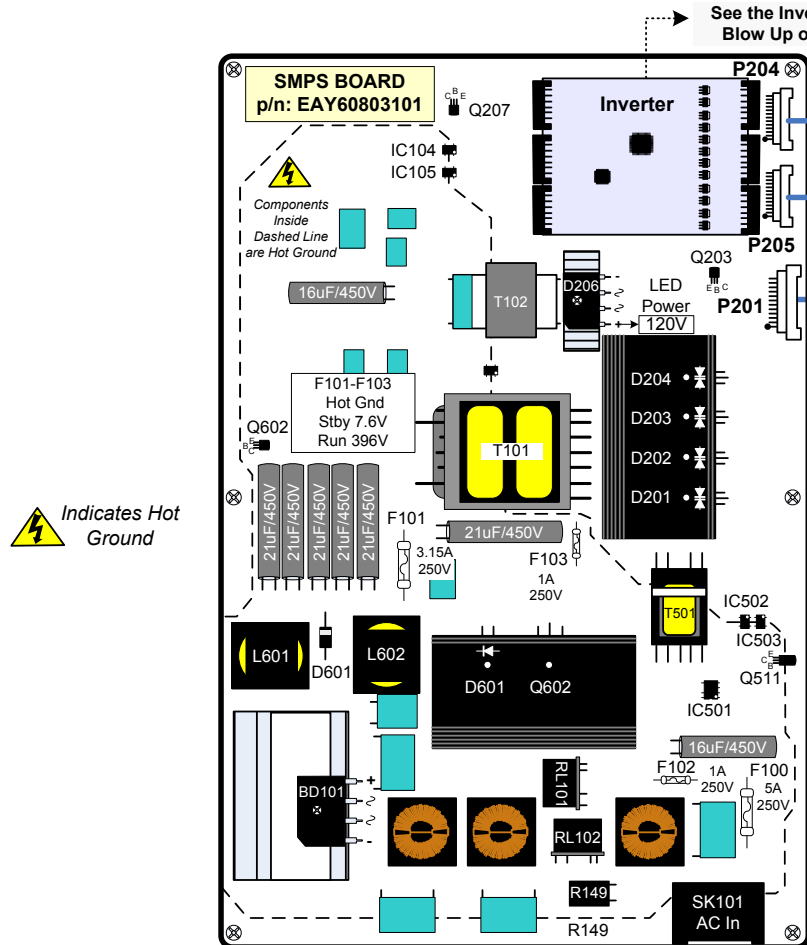
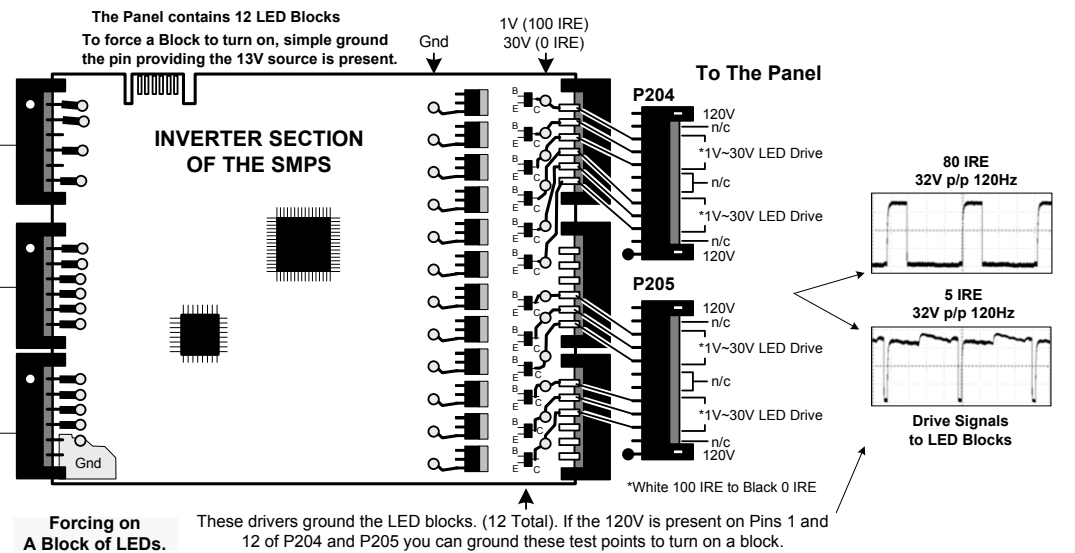
Pin	Label	STBY	Run	Diode Check
1	Error	0V		
2	(L-DIM) SIN	3.3V		
3	POWER_ON	3.35V		
4	VSYNC_IN	0V		
5	Gnd	Gnd		
6	Gnd	Gnd		

Pin 23 P201

Pin	Label	STBY	Run	Diode Check
1	Error	0V		
2	(L-DIM) SIN	3.3V		
3	POWER_ON	3.35V		
4	VSYNC_IN	0V		
5	Gnd	Gnd		
6	Gnd	Gnd		

Pin 16 P201

Pin	Label	STBY	Run	Diode Check
1	Error	0V		
2	(L-DIM) SIN	3.3V		
3	POWER_ON	3.35V		
4	VSYNC_IN	0V		
5	Gnd	Gnd		
6	Gnd	Gnd		

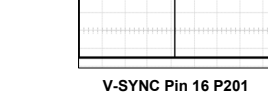
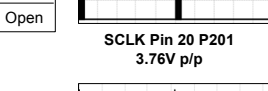
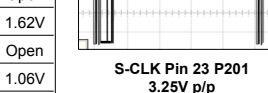
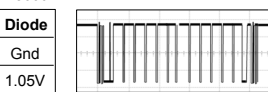


P201 "SMPS" To P8000 "MAIN Board"

Pin	Label	STBY	Run	Diode Check
24	ERROR	0V	0V	1.45V
23	L-DIM (SIN)	0V	3.3V	Open
22	P-DIM	0V	0.38V~3.3V	Open
21	12V	0V	11.43V	0.178V
20	SCLK	0V	0.09V	Open
19	12V	0V	11.43V	0.178V
18	INV-ON	0V	3.28V	Open
17	12V	0V	11.43V	0.178V
16	V-SYNC	0V	0.02V	Open
13-15	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.57V	3.5V	Open
5-8	Gnd	Gnd	Gnd	Gnd
2-4	20V	0V	21.27V	1.10V
1	PWR-ON	0V	3.36V	1.02V

(1) PDIM Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition) Output from the Video Processor IC900. Range 0.37V to 3.3V.

P8000



P8800 "Main" To "Speakers"

Pin	Label	SBY	Run	Diode
1	SPK-R(-)	0V	12.3V	Open
2	SPK-R(+)	0V	12.3V	Open
3	SPK-L(-)	0V	12.3V	Open
4	SPK-L(+)	0V	12.3V	Open

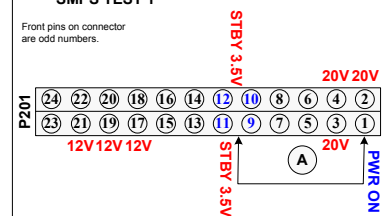
To Speakers

P8200 "MAIN Board" To J1 "IR Board"

Pin	Label	STBY	Run	Diode Check
1	SCL	3.56V	3.5V	Open
2	SDA	3.56V	3.5V	Open
3	Gnd	Gnd	Gnd	Gnd
4	Key1	3.32V	3.3V	1.9V
5	Key2	3.29V	3.3V	1.9V
6	3.5V_ST	3.56V	3.47V	1.24V

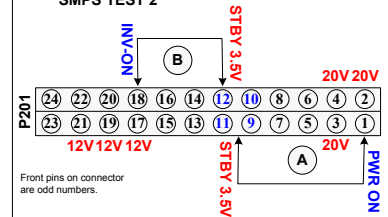
Pin	Label	STBY	Run	Diode Check
7	Gnd	Gnd	Gnd	Gnd
8	LED LOGO	0V	0V	Open
9	IR	1.63V	1.6V	Open
10	Gnd	Gnd	Gnd	Gnd
11	3.3V_Normal	0V	3.34V	0.59V
12	LED_BUZZ	0V	0V	Open

SMPS TEST 1



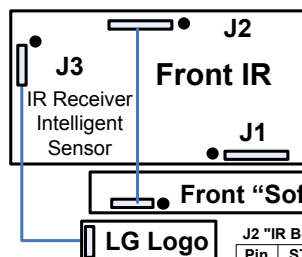
SMPS TEST 1: To Force Power Supply On. Disconnect P8000 on Main board.
(A) Jump pins 9, 10, 11 or 12 (3.5V) to pin 1. (Test Voltage Outputs 12V, 20V to Main and 120V to the Inverter). Remove AC power. Leave the jumper in place.

SMPS TEST 2



SMPS TEST 2: (B) Jump pins 9, 10, 11 or 12 (3.5V) to pin 18 (INV-ON). Apply AC power, the Backlights should turn on.

Note: If there is a problem with a load on the Inverter you can Remove AC and Disconnect P205 or P204. When AC is reapplied, the Backlight LEDs should turn on for about 4 seconds and then shut off.



J3 "IR Board" To "Center Logo Board"

Pin	STBY	Run	Diode
1	3.45V	3.0V	1.5V
2	Gnd	Gnd	Gnd
3	1.36V	0.64V	Open
4	Gnd	Gnd	Gnd

J2 "IR Board" To "Soft Touch Key Board"

Pin	STBY	Run	Diode
1	3.45V	3.36V	Open
2	0V	1.63V	Open
3	Gnd	Gnd	Gnd
4	3.3V	3.3V	Open

Pin	STBY	Run	Diode
5	3.28V	3.28V	Open
6	Gnd	Gnd	Gnd
7	3.45V	3.36V	Open
8	3.45V	3.36V	Open

Intelligent Sensor
Intelligent Sensor

Stand-by

42LE5500 MAIN (FRONT SIDE) SIMICONDUCTORS

IC700



Pin	(+1.26V_TU) Regulator
[1]	0V (Gnd)
[2]	1.26V (Out)
[3]	3.3V (In)

IC1000



Pin	SOC Reset Generator
[1]	3.32V (In)
[2]	0V (Gnd)
[3]	3.3V (Out)

IC8000



Pin	5V Regulator for USB
[1]	11.79V (In)
[2]	5V (Out)
[3]	5V (Out)
[4]	10.5V
[5]	3.3V
[6]	0.8V
[7]	4.99V
[8]	0V (Gnd)

IC8001



Pin	D1.2V and A1.2V Regulator
[1]	0V (Gnd)
[2]	3.3V
[3]	0V (Gnd)
[4]	1.2V
[5]	3.3V
[6]	n/c
[7]	4.46V
[8]	3.3V
[9]	3.3V
[10]	3.3V
[11]	1.2V
[12]	Gnd
[13]	3.3V
[14]	0.8V

IC8002



Pin	(D1.8V) Regulator
[1]	5V
[2]	3.34V (In)
[3]	1.8V (Out)
[4]	Gnd
[5]	Gnd
[6]	0.9V
[7]	0.9V
[8]	1V
[9]	2.38V
[10]	3.36V (PWR On/Off1 Ctl)

IC8003



Pin	(+5V_NORMAL) Regulator
[1]	0V (Gnd)
[2]	11.8V (In)
[3]	0V (Gnd)
[4]	0.8V
[5]	0.86V
[6]	3.37V (PWR On/Off2 Ctl)
[7]	5V (In)
[8]	5V (In)

IC8004



Pin	A2.5V Regulator for USB
[1]	n/c
[2]	3.26V (In)
[3]	3.26V (In)
[4]	n/c
[5]	n/c
[6]	2.55V (Out)
[7]	0.8V
[8]	0V (Gnd)

IC8005



Pin	(+3.3V_NORMAL) Regulator
[1]	0V (Gnd)
[2]	11.8V (In)
[3]	0V (Gnd)
[4]	0.8V
[5]	0.86V
[6]	3.36V (PWR On/Off2 Ctl)
[7]	3.36V (Out)
[8]	3.36V (Out)

IC8007



Pin	Power Det Gen (+12V and +3.5V)
[1]	0V (Gnd)
[2]	3.6V (In)
[3]	3.5V (Out)

IC8008



Pin	Power Det Gen (+24V)
[1]	0V (Gnd)
[2]	3.6V (In)
[3]	3.7V (Out)

IC8800



Pin	(+1.8V_AMP) Regulator
[1]	0V (Gnd)
[2]	1.8V (Out)
[3]	3.295V (In)

IC8901



Pin	(+1.5V_MEMC) Regulator
[1]	0V (Gnd)
[2]	1.5V (Out)
[3]	3.3V (In)

IC8902



Pin	(+1.26V_MEMC) Regulator
[1]	0V (Gnd)
[2]	11.8V (In)
[3]	0V (Gnd)
[4]	0.8V
[5]	0.7V
[6]	3.36V (PWR On/Off2 Ctl)
[7]	1.3V (Out)
[8]	1.3V (Out)

IC8903



Pin	(+3.3V_MEMC) Regulator
[1]	0V (Gnd)
[2]	11.8V (In)
[3]	0V (Gnd)
[4]	0.8V
[5]	0.8V
[6]	3.36V (PWR On/Off2 Ctl)
[7]	3.3V (Out)
[8]	3.3V (Out)

IC9100



Pin	P-GAMMA Chip
[1]	3.3V
[2]	0V (Gnd)
[3]	3.3V (In)
[4]	0V (Gnd)
[5]	6.8V
[6]	6.8V
[7]	15.3V
[8]	15.3V
[9]	n/c
[10]	13.47V
[11]	12.75V
[12]	11.8V
[13]	10V
[14]	5.96V
[15]	4.06V
[16]	15.3V
[17]	0V
[18]	2.96V
[19]	2.33V
[20]	3.3V (In)

IC9102



Pin	DC to DC HVDD T-CON
[1]	0V (Gnd)
[2]	11.72V (In)
[3]	11.72V (In)
[4]	3.25V
[5]	3.2V
[6]	0V
[7]	0V
[8]	11.7V
[9]	0V (Gnd)
[10]	1.13V
[11]	0V (Gnd)
[12]	0V (Gnd)
[13]	0V (Gnd)
[14]	7.7V
[15]	7.7V (HVDD)
[16]	0V (Gnd)

IC9300



Pin	Reset for LG5111
[1]	3.32V (In)
[2]	0V (Gnd)
[3]	3.34V (Out)

IC9302



Pin	(1.8V_LDimming) Regulator
[1]	0V (Gnd)
[2]	11.8V (In)
[3]	0V (Gnd)
[4]	0.8V
[5]	0.76V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	1.8V (In)
[8]	1.8V (In)

Q8001



Pin	PANEL_VCC Control 1st Driver
B	0V
C	0.68V
E	Gnd

Q8003



Pin	PANEL_VCC Control 2nd Driver
B	0.679V
C	0V
E	Gnd

Q8004



Pin	PANEL_VCC Switch
S	11.8V (In)
G	1.8V (Enable)
D	11.8V (Out)

Q8005



Pin	INV_ON Driver
B	0V (INV ON) En
C	3.1V (Out)
E	Gnd

Q8200



Pin	IR Buffer 2nd
B	0.02V
C	3.4V
E	Gnd

Q8201



Pin	IR Buffer 1st
B	0V
C	3.3V
E	Gnd

Q8306



Pin	HDMI Det
B	0V
C	3.3V
E	Gnd

Q8307



Pin	HDMI Det
B	0V
C	4.18V
E	Gnd

Q8700



Pin	Wireless PWR Turns on Q8701
B	0.66V
C	0.14V
E	Gnd

Q8700



Pin	Wireless PWR Turns on Q8701
B	0.0V
C	24V
E	Gnd

Q8800



Pin	AMP_MUTE Pin 25 IC8801
B	0V
C	3.336V
E	Gnd

D9101



Pin	VGH/VDD Rectifyer
A	15.4V
AC	22.2V
C	27.4V (VGH)

D9102



Pin	VGL/VCC Rectifier
A	(-5V VGL)
AC	(-1.9V)
C	0V

42LE5500 MAIN (BACK SIDE) SIMICONDUCTORS

IC602



Pin	D1.8V Regulator
[1]	0V (Gnd)
[2]	3.29V (PWR On/Off1 Ctl)
[3]	0.9V (DDR_VTT)
[4]	0.93V
[5]	1.83V
[6]	3.38V (In)
[7]	1.8V (Out)
[8]	0.91V (DDR_VTT)

IC8100



Pin	EEPROM Micro
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	0V (Gnd)
[8]	3.37V

IC8200



Pin	RS232 Routing
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V
[6]	(-5.47V)
[7]	n/c (5.59V)
[8]	n/c (0V)
[9]	n/c (3.3V)
[10]	n/c (0.2V)
[11]	n/c (3.3V)
[12]	3.35V
[13]	0V
[14]	(-5.47V)
[15]	0V (Gnd)
[16]	3.37V

IC8400



Pin	RGB H/V Sync
[1]	1.9V
[2]	1.9V
[3]	4.4V
[4]	0V
[5]	0.9V
[6]	n/c (4.5V)
[7]	0V (Gnd)
[8]	n/c (4.5V)
[9]	n/c (1.9V)
[10]	n/c (1.9V)
[11]	n/c (4.5V)
[12]	0.9V
[13]	0.9V
[14]	5V

IC8401



Pin	EDID Data PC
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	0.7V
[6]	4.1V
[7]	4.5V
[8]	4.5V (In)

IC8700



Pin	Wireless Buffer
[1]	0V (3.3V Dongle In)
[2]	3.3V (0.3V Dongle In)
[3]	n/c
[4]	n/c
[5]	n/c
[6]	Gnd
[7]	Gnd
[8]	Gnd
[9]	n/c
[10]	0.02V
[11]	0V
[12]	3.3V
[13]	0V (3.3V Dongle In)
[14]	3.3V
[15]	3.3V
[16]	3.3V

IC9000



Pin	Serial Flash T-CON
[1]	0.06V
[2]	0.67V
[3]	3.3V (In)
[4]	0V (Gnd)
[5]	0V
[6]	0.34V
[7]	3.31V (In)
[8]	3.34V (In)

IC9303



Pin	EEPROM for LG5111
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	3.34V
[8]	3.37V (In)

Q200



Pin	(1.8V_HDMI) Switch
S	1.83V (Out)
G	3.35V (PWR On/Off2 Ctl)
D	1.83V (In)

Q701



Pin	Tuner SIF (Sound) Buffer
B	0.16V
C	Gnd
E	0.83V

Q702



Pin	Tuner Video (Analog) Buffer
B	2.05V
C	2.75V
E	Gnd

Q901



Pin	FLASH_WP for IC901
B	0V (Flash_WP)
C	3.36V
E	Gnd

Q8000



Pin	RL_ON (PWR_On) 1st Driver
B	0.66V
C	0V
E	Gnd

Q8002



Pin	PWR_ON Switch
[1]	3.36V (In)
[2]	0V
[3]	3.3V (Out)

Q8203



Pin	IR Wireless Pass 2nd Driver
B	0V
C	3.3V
E	Gnd

Q8205



Pin	IR Wireless Pass 1st Driver
B	0.6V
C	0V
E	Gnd

Q8300, 2



Pin	HDMI 2 Det
B	4.2V
C	0V
E	Gnd

Q8303, 4, 5



Pin	HDMI 3 Det
B	0V
C	4.2V
E	Gnd

Q8308

[illegible]

Pin	Label	STBY	Run	Diode Check
24	² PDIM	0V	3.2V	Open
23	nc	nc	nc	nc
22	Err Out	0V	0V	Open
21	¹ A.DIM	0V	1.66V	Open
20	INV.ON	0V	3.8V	2.25V
19	nc	nc	nc	nc
17,18	24V	0V	21.4V	0.81V
15,16	Gnd	Gnd	Gnd	Gnd
13,14	12V	0V	12.3V	1.2V
11,12	Gnd	Gnd	Gnd	Gnd
7,8,9,10	5V	5.14V	5.14V	2.85V
3,4,5,6	Gnd	Gnd	Gnd	Gnd
2	PWR-On	0V	4.98V	1.19V
1	nc	nc	nc	nc

On
Anode 3.3V Cathode 0.7V
30 Seconds later
Off
Anode 3.3V Cathode 1.38V

R406 / R403
Bottom leg
48Khz
53V p/p

Pin	Label	STBY	Run	Diode Check
1	SCL	3.3V	3.3V	Open
2	SDA	3.3V	3.3V	1.67V
3	Gnd	Gnd	Gnd	Gnd
4	Key1	3.3V	3.3V	1.4V
5	Key2	3.3V	3.3V	1.1V
6	5V ST	5.1V	5.1V	1.5V
7	Gnd	Gnd	Gnd	Gnd
8	Gnd	Gnd	Gnd	Gnd
9	IR	4.8V	4.8V	Open
10	Gnd	Gnd	Gnd	Gnd
11	3.3V_ST	3.29V	3.29V	0.76V
12	POWER On/Off	0V	3.29V	Open

SMPS
Switch Mode
Power Supply

P201

F501

3.15A/250V
Run 390V
STBY 165V
From Hot Gnd

Hot Gnd

250V 82mF

250V 82mF

250V 82mF

250V 82mF

F100
6.3A/250V
AC IN

R406
R403

1.2KV

P402

T704

1.2KV

P401

T703

SK102

F100

SK101
AC IN

SMPS TEST 2: Jump pin 2 to pin 20 (INV-ON). (Backlights and all voltages should turn on).

Speakers

Diode Check	
24	Open
23	nc
22	Open
21	Open
20	Open
19	nc
17,18	Open
15,16	Gnd
13,14	Open
11,12	Gnd
7,8,9,10	Open
3,4,5,6	Gnd
2	Open
1	nc

Pin	Label	STBY	Run	Diode Check
1	Key1	3.3V	3.3V	Open
2	Gnd	Gnd	Gnd	Gnd
3	Key2	3.3V	3.3V	Open
4	Gnd	Gnd	Gnd	Gnd

Front PWB Assembly

IR Receiver
Intelligent Sensor

P1

P2

Side (Key) Controls

P3000

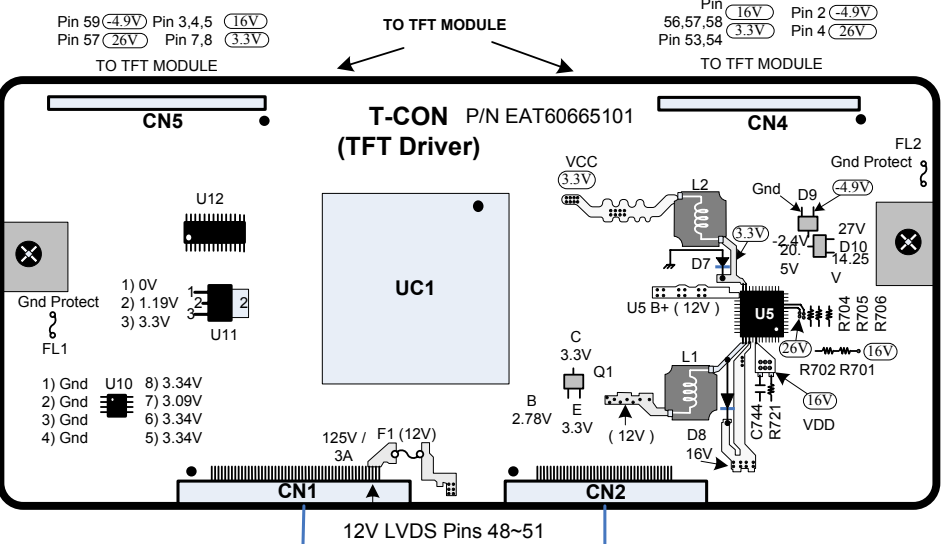
42LH50 MAIN (FRONT SIDE) SIMICONDUCTORS

IC102 BCM Reset Pin [1] 3.3V [2] Gnd [3] 3.29V	IC2103 RS232 Rx/Tx Pin [1] 3.25V [2] 3.27V [3] n/c [4] n/c [5] n/c [6] Gnd [7] n/c [8] Gnd [9] Gnd [10] 4.76V [11] 4.76V [12] 3.17V [13] 3.3V [14] 3.3V [15] 3.3V [16] 5V	IC2401 5V USB Fan Pin [1] 0V [2] 12V [3] Gnd [4] 0.8V [5] 0.8V [6] 5V [7] 5V [8] 5V	IC2404 3.3V-ST Pin [1] 3.3V-VDDP-ST [2] 3.3V [3] 5V	IC2407 A2.5V Reg Pin [1] n/c [2] 3.23V [3] 3.3V [4] n/c [5] n/c [6] 2.53V [7] 0.53V [8] Gnd	IC2502 5V Reg Pin for Tuner [1] 8.98V [2] 1.9V [3] 5V [4] 0V [5] 0V	IC3211 Power Det Pin [1] Gnd [2] 3.3V [3] 3.36V	Q2401 24V PWR Sw Pin [1] Q2405 [2] B 0.59V [3] C 0V [4] E 0V	Q2406 5V and Pin [1] 5V [2] 0.2V [3] 12.3V [4] 6V [5] 12.3V [6] 12.3V [7] 5V [8] 5V
IC2101 RGB Sync Pin [1] 1.9V [2] 1.9V [3] 4.38V [4] 1.9V [5] 1.9V [6] 4.5V [7] Gnd [8] n/c [9] 1.9V [10] 1.9V [11] 4.38V [12] 1.9V [13] 1.9V [14] 5V	IC2400 1.2V Core Pin [1] Gnd [2] 5V [3] Gnd [4] 0.8V [5] 0.9V [6] 3.23V [7] 1.2V	IC2402 1.8V-MEMC Pin [1] Gnd [2] 5V [3] Gnd [4] 0.8V [5] 1V [6] 4.98V [7] 1.89V [8] 1.89V	IC2405 1.8V-DDR Reg Pin [1] 0.58V [2] 1.8V [3] 3.3V	IC2408 1.8V-DDR Reg Pin [1] Gnd [2] 3.3V [3] 0.89V [4] 0.9V [5] 1.8V [6] 3.3V [7] 1.8V [8] 0.89V	IC3200 Micro Reset Pin [1] 3.3V [2] Gnd [3] 0.6V	IC3400 USB 5V Pin [1] 5V [2] 0V [3] 3.3V [4] 3.3V [5] 0V [6] 5V	Q2402 5V Sw Ctl Pin [1] Q2406 [2] B 0.59V [3] C 0V [4] E 0V	Q2407 POW On/Off2 Pin [1] B 3.37V [2] C 4.7V [3] E 5V
IC2300 1.8V Amp Audio Pin [1] Gnd [2] 1.8V [3] 3.3V		IC2403 3.3V/A3.3V Reg Pin [1] Gnd [2] 12V [3] Gnd [4] 0.8V [5] 0.9V [6] 3.23V [7] 3.37V [8] 3.37V	IC2406 1.26V-MEMC Reg Pin [1] n/c [2] 1.87V [3] 1.87V [4] n/c [5] n/c [6] 1.27V [7] 0.8V [8] Gnd	IC2500 9V Reg Pin for Tuner [1] 12.3V [2] 8.9V [3] Gnd	IC3201 uP EEPROM Pin [1] Gnd [2] Gnd [3] 3.29V [4] Gnd [5] 3.3V [6] 3.3V [7] 0V [8] 3.3V	IC501 HDMI Remote Pin [1] 3.3V [2] 3.3V [3] n/c [4] n/c [5] n/c [6] 3.19V	Q2404 LVDS Sw Ctl Pin [1] Q2406 [2] B 0.59V [3] C 0V [4] E 0V	Q2408 INV Ctl Pin [1] B 0V [2] C 4.55V [3] E 0V
				D500 IC501 shunt Pin [1] A1 0V [2] C 3.1V [3] A2 3.29V	LD2400 A3.3V OK Pin [1] CA1 n/c [2] C Gnd [3] A2 1.62V	ZD3400 IR Clamp Pin [1] C 2.68V [2] A Gnd	ZD3401 Key2 Clamp Pin [1] C 3.3V [2] A Gnd	ZD3402 Key1 Clamp Pin [1] A Gnd [2] C 3.3V

42LH50 MAIN (BACK SIDE) SIMICONDUCTORS

IC103 BCM EEPROM Pin [1] Gnd [2] Gnd [3] Gnd [4] Gnd [5] 3.3V [6] 3.3V [7] Gnd [8] 3.3V	IC2102 RGB EEPROM Pin [1] Gnd [2] Gnd [3] Gnd [4] Gnd [5] 3V [6] 3.7V [7] 4.8V [8] 4.49V	IC2100 RS232 Rx/Tx Pin [1] 3.3V [2] 5.4V [3] 0V [4] 0V [5] (-5V) [6] (-5V) [7] (-5V) [8] 0V [9] 3.29V [10] 3V [11] n/c [12] n/c [13] 0V [14] 5.4V [15] Gnd [16] 3.3V	Q100 IC101 Flash Pin [1] Write Protect [2] B 0V [3] C 3.3V [4] E 0V	Q2501 Tuner Video Buffer Pin [1] B 3.4V [2] C 0V [3] E 2.79V
IC1100 SPI Flash Pin [1] 0V [2] 1.4V [3] 3.3V [4] Gnd [5] 0V [6] 0.34V [7] 3.3V [8] 3.3V	D2128 5V to IC2102 Pin [1] A1 5V [2] C 4.5V [3] A2 0V		Q2400 12V PWR Ctl Pin [1] Q2405 [2] B 0V [3] C 0V [4] B 0.778V	Q3400 LED PWR On Pin [1] B 0V [2] C 3.3V [3] E 0V
			Q2500 Tuner SIF Buffer Pin [1] B 0.898V [2] C 0V [3] E 0.246	Q3401 EDID WP Pin [1] B 0V [2] C 4.8V [3] E 0V

42LH90 INTERCONNECT DIAGRAM



INVERTER CN3-CN4 INFO.

CN3	CN4
27.5V Line on CN3	27.5V Line on CN4
Pins 1-2 (Out_M2)	Pins 1-2 (Out_M3)
Pins 13-14 (Out_M2)	Pins 13-14 (Out_M3)
Pins 16-17 (Out_M2)	Pins 16-17 (Out_M3)
Pins 26-29 (Out_M2)	Pins 26-29 (Out_M3)
Pins 31-32 (Out_M4)	Pins 31-32 (Out_M1)
Pins 43-44 (Out_M4)	Pins 43-44 (Out_M1)
Pins 46-47 (Out_M4)	Pins 46-47 (Out_M3)
Pins 58-59 (Out_M4)	Pins 58-59 (Out_M1)

(Pin 6) 3.46Vp/p
(Pin 4) 3.48Vp/p
(Pin 1) 3.54Vp/p

P203 "SMPS" TO CN1 "INVERTER"

Pin	Label	Diode Check
14	AGP	OPEN
13	Ext_VBR_B	OPEN
12	ON/OFF	OPEN
11	NC	OPEN
10	GND	GND
9	GND	GND
8	GND	GND
7	GND	GND
6	GND	GND
1-5	VIN	0.74V

For Voltages see CN1 Table

P201 "SMPS" to P700 "Main"

Pin	Label	STBY	Run	Diode Check
24	² PDIM	0V	3.2V	Open
23	nc	nc	nc	nc
22	Err Out	0V	0V	Open
21	1 A.DIM	0V	1.66V	Open
20	INV.ON	0V	4.65V	Open
19	nc	nc	nc	nc
17,18	24V	0V	24V	0.74V
15,16	Gnd	Gnd	Gnd	Gnd
13,14	12V	0V	12V	0.98V
11,12	Gnd	Gnd	Gnd	Gnd
7,8,9,10	5V	5.15V	5.15V	Open
3,4,5,6	Gnd	Gnd	Gnd	Gnd
2	PWR-On	0V	4.98V	1.6V
1	nc	nc	nc	nc

P700 "Main" to P201 "SMPS"

Diode Check	
1	Open
2	2.6V
3,4,5,6	Gnd
7,8,9,10	1.1V
11,12	Gnd
13,14	2.2V
15,16	Gnd
17,18	Open
19	Open
20	2.9V
21	Open
22	Open
23	Open
24	1.3V

For Voltages see P201

²PDIM Pin 24 can vary according to type of signal being processed and the OSD Backlight setting. 0.6V 0% to 3.3V 100%. Output from the IC100 Video Processor.

P1200 "MAIN" to P101 "Front IR / LED"

Pin	Label	STBY	Run	Diode Check
1	SCL	0.57V	3.3V	Open
2	SDA	0.57V	3.3V	Open
3	Gnd	Gnd	Gnd	Gnd
4	Key1	3.2V	3.2V	Open
5	Key2	3.2V	3.2V	Open
6	5V ST	5.1V	5.1V	Open
7	Gnd	Gnd	Gnd	Gnd
8	Warm ST	0V	0V	Open
9	IR	3.5V	3.5V	Open
10	Gnd	Gnd	Gnd	Gnd
11	3.3V_ST	3.2V	3.2V	Open
12	POWER On/Off	0V	3.2V	Open

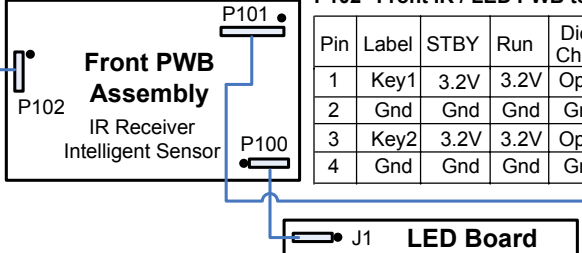
CN1 "INVERTER" TO P203 "SMPS"

Pin	Label	STBY	Run	Diode Check
14	AGP	0V	0V	OPEN
13	¹ Ext_VBR_B	0V	0.33V-3.2V	OPEN
12	ON/OFF	0V	4.65V	1.6V
11	NC	0.47V	1.66V	OPEN
10	GND	GND	GND	GND
9	GND	GND	GND	GND
8	GND	GND	GND	GND
7	GND	GND	GND	GND
6	GND	GND	GND	GND
1-5	VIN	0V	24.0V	2.9V

¹Ext_VBR_B same as (P-DIM)

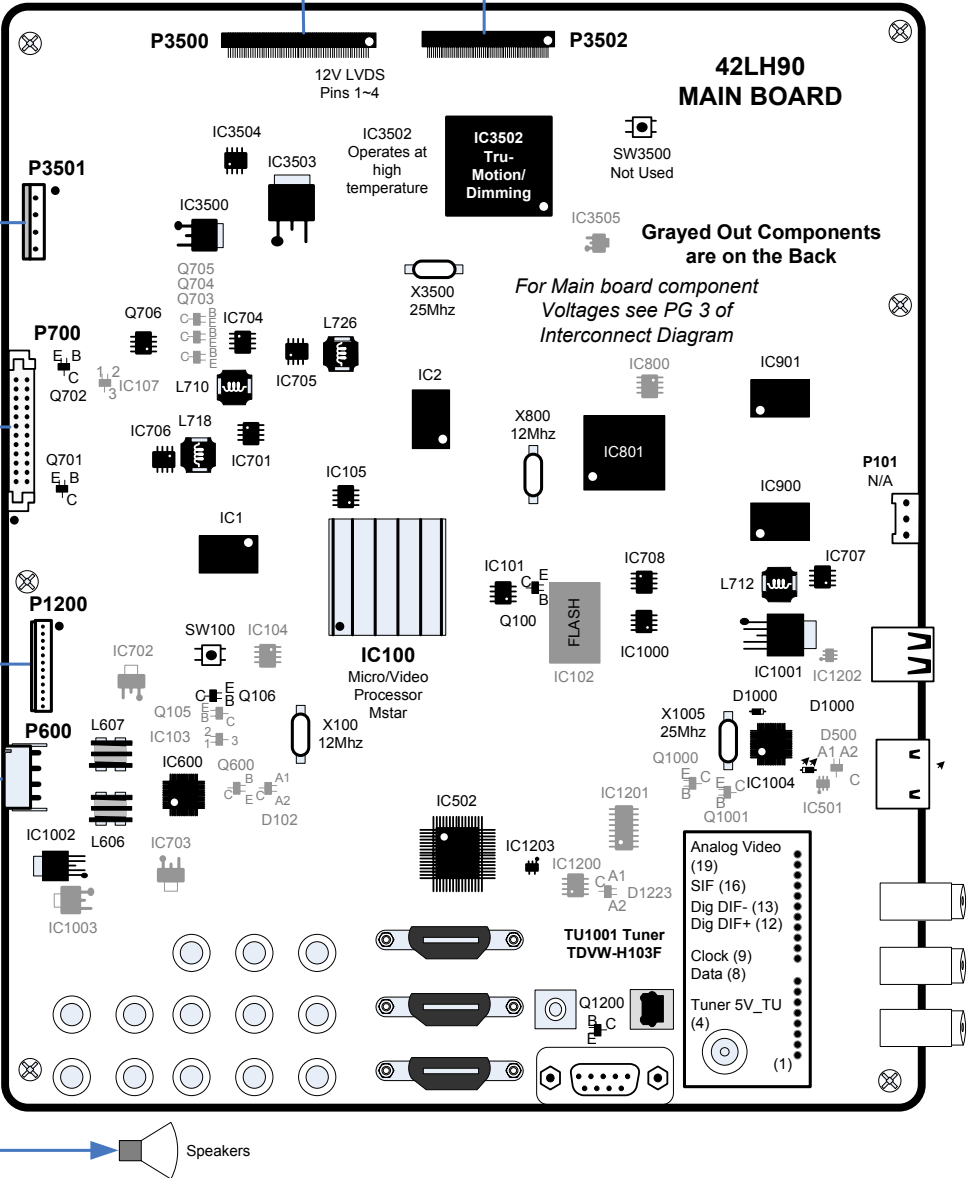
P102 "Front IR / LED PWB to P100 Keys"

Pin	Label	STBY	Run	Diode Check
1	Key1	3.2V	3.2V	Open
2	Gnd	Gnd	Gnd	Gnd
3	Key2	3.2V	3.2V	Open
4	Gnd	Gnd	Gnd	Gnd
























SMPS TEST 1: To Force Power Supply On. Disconnect P700 on Main PWB. Jump pin 7,8,9 or 10 (5V) to pin 2 using a 100Ω resistor. (Test Voltage Outputs 12V, and 24V).












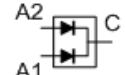




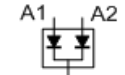



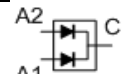
SMPS TEST 2: Jump pin 2 to pin 20 (INV-ON). (Backlights and all voltages should turn on).



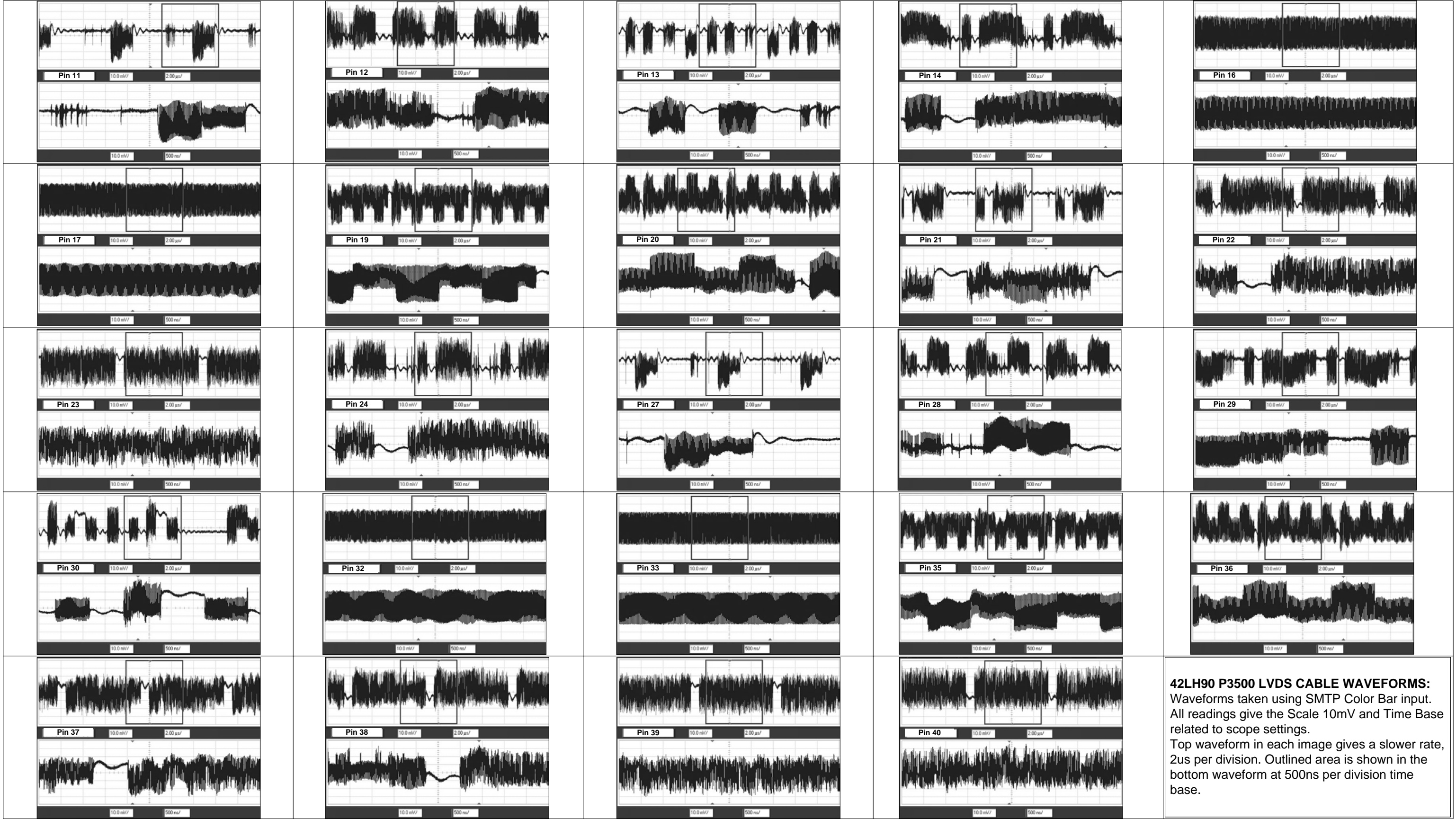
42LH90 MAIN (FRONT SIDE) SIMICONDUCTORS

IC101  Serial Flash Memory Pin [1] 0.05V [2] 3.2V [3] 2.5V [4] Gnd [5] 0V [6] 0V [7] 3.3V [8] 3.3V	IC704  +3.3V_FE Regulator Pin [1] 0.8V [2] Gnd [3] 5V [4] 7.5V [5] 5V [6] 3.3V [7] 3.3V [8] 2.1V	IC707  +1.8V_MEMC Regulator Pin [1] 0.8V [2] Gnd [3] 4.92V [4] 6.5V [5] 4.8V [6] 1.8V [7] 1.8V [8] 4.8V	IC1001  +3.3V_PVSB +3.3V_FE Pin [1] 4.94V [2] 4.94V [3] Gnd [4] 3.4V [5] 1.25V	IC3500  +3.3V_Dimming Regulator Pin [1] Gnd [2] 3.3V [3] 5V	Q100  W/P IC101 Pin B 0V C 2.5V E Gnd	Q706  +5V/12VLVDS Switch Pin [1] 5.1V [2] 0.29V [3] 11.9V [4] 5.99V [5] 11.98V [6] 11.98V [7] 5.06V [8] 5.06V
IC105  HDCP EEPROM Pin [1] Gnd [2] Gnd [3] 3.29V [4] Gnd [5] 3.3V [6] 3.3V [7] 0V [8] 3.3V	IC705  +1.26V_VDDC Regulator Pin [1] 0.8V [2] Gnd [3] 5V [4] 6V [5] 3.2V [6] 1.2V [7] 1.26V [8] 5V	IC708  +1.26V_MEMC Regulator Pin [1] Gnd [2] 0.8V [3] 1.26V [4] 1.26V [5] 1.8V [6] 5V [7] 1.26V [8] 5V	IC1002  +5V_TU Tuner Pin [1] 8.92V [2] 1.88V [3] 5.04V [4] 0V [5] Gnd	IC3503  +1.8V Reg Dimming Pin [1] 0.58 [2] 1.8V [3] 3.19V	Q106  S5/S6 Reset Mstar Pin B 0V C 3.28V E 0V	Q1200  IR RS232 Buffer Pin B 0.634V C 0.97V E Gnd
IC701  +1.8V_DDR Regulator Pin [1] 0V [2] 3.2V [3] 3.2V [4] n/c [5] n/c [6] 1.8V [7] 0.8V [8] Gnd	IC706  5V_EXT Memory Pin [1] 0.8V [2] Gnd [3] 12V [4] 9.6V [5] 5V [6] 4.97V [7] 4.97V [8] 1.9V	IC1000  +1.26V_PVSB Regulator Pin [1] 0V [2] 3.39V [3] 3.4V [4] 0V [5] 0V [6] 1.21V [7] 0.8V [8] Gnd	IC1203  SPIF Optical Audio Pin [1] 1.58V [2] 3.2V [3] Gnd [4] 1.61V [5] 3.21V	IC3504  Dimming EEPROM Pin [1] Gnd [2] Gnd [3] Gnd [4] Gnd [5] 3.3V [6] 3.3V [7] 0V [8] 3.3V	Q702  INV_ON Inverter Pin B 0.05V C 4.66V E Gnd	D1000  Speed Up Reset IC1004 Pin C 3.4V A 3.38V

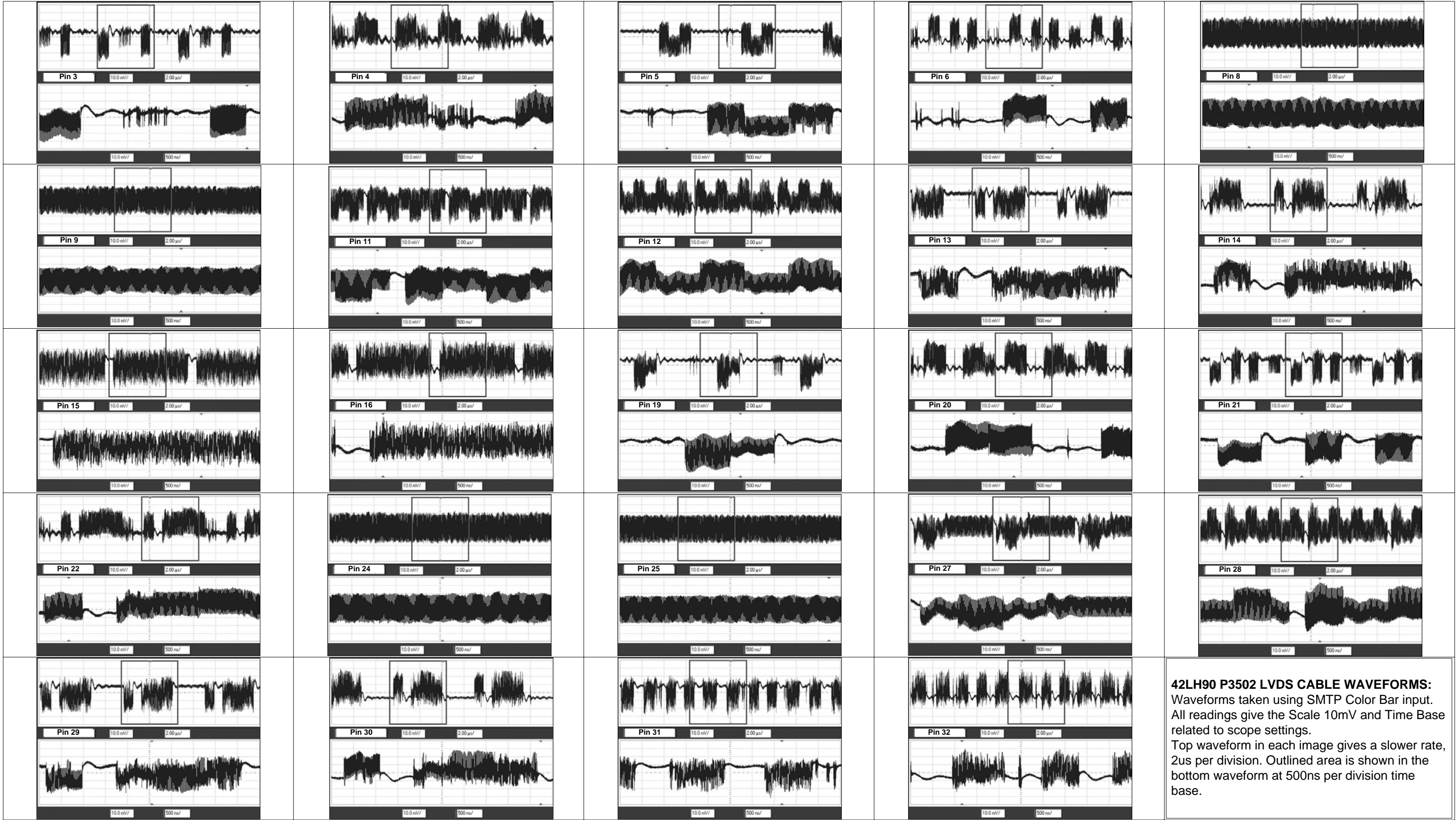
42LH90 MAIN (BACK SIDE) SIMICONDUCTORS

IC103  Reset Gen Mstar IC100 Pin [1] Gnd [2] 0V [3] 3.3V	IC703  +3.3V_ST Regulator Pin [1] 0V [2] 1.8V [3] 3.21V	IC1200  RGB EEPROM Pin [1] Gnd [2] Gnd [3] Gnd [4] Gnd [5] 4.82V [6] 4.82V [7] 4.82V [8] 4.82V	IC1202  USB +5V Switch Pin [1] 4.95V [2] Gnd [3] 3.21V [4] 4.95V [5] 0V [6] 4.95V	Q703  5V Switch Control Pin B 0.6V C 0.03V E Gnd	Q1001  Tuner Video Buffer Pin B 3.09V C 0V E 3.72V
IC104  RGB (PC) EEPROM Pin [1] Gnd [2] Gnd [3] Gnd [4] Gnd [5] 3.22V [6] 3.22V [7] 0V [8] 3.22V	IC800  SPI Flash Pin [1] 0.12V [2] 1.13V [3] 3.26V [4] Gnd [5] 0.06V [6] 1.2V [7] 3.27V [8] 3.27V	IC1201  RS232 Rx/Tx Pin [1] 3.3V [2] 5.56V [3] 0.02V [4] 0.03V [5] 5.46V [6] 5.5V [7] 5.5V [8] 0V [9] 3.29V [10] 3.24V [11] 0.02V [12] 3.29V [13] 0V [14] 5.5V [15] Gnd [16] 3.29V	IC3505  Reset Gen for IC3502 Pin [1] 3.3V [2] Gnd [3] 3.22V	Q704  1st 12V LVDS Switch Control Pin B 0.05V C 0.65V E Gnd	D102  Audio Mute Routing Pin A1 0.047V C 0.089V A2 0V
IC107  Power Det Gen Pin [1] Gnd [2] 3.9V [3] 3.28V	IC1003  9V Reg to IC1002 For Tuner Voltage 5V Pin [1] 12V [2] Gnd [3] 8.9V		Q105  PWR On Delay Q2405 Pin B 0V C 1.95V E Gnd	Q705  2nd 12V LVDS Switch Control Pin B 0.65V C 0.0V E Gnd	D500  Shunt for IC501 Pin A1 3.25V C 3.12V A2 0V
IC702  +3.3V_ST +3.3V_AVDD_MPLL Regulator Pin [1] Gnd [2] 3.29V [3] 5.11V			Q600  Audio Mute Switch Pin B 0.08V C 3.26V E Gnd	Q1000  Tuner SIF Buffer Pin B 2.4V C 0V E 3.85V	D1223  5V Routing for IC1200 Pin A1 0V C 4.82V A2 5.11V

















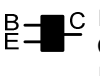




42LH90 LVDS P3500 WAVEFORMS





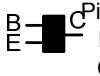








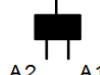

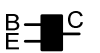
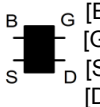


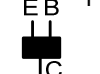



42LH90 LVDS P3502 WAVEFORMS



42LV5500 MAIN (FRONT SIDE) SIMICONDUCTORS

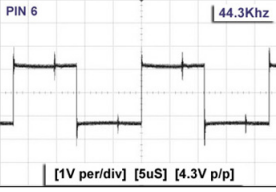
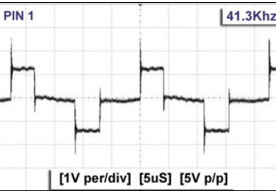
<div>IC103</div> <div>Pin</div> <div><div>NVRAM for USB</div></div> <div><div>[1] n/c [2] 0V [3] 3.34V [4] 0V [5] 3.22V [6] 3.22V [7] 0V (Gnd) [8] 3.34V</div></div>	<div>IC505</div> <div>Pin</div> <div><div>(+3.3V_NORMAL) Regulator</div></div> <div><div>[1] 0V (Gnd) [2] 11.96V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.79V [6] 3.47V (PWR On/Off2_2) [7] 3.35V (Out) [8] 3.35V (Out)</div></div>	<div>IC508</div> <div>Pin</div> <div><div>(+1.5V_DDR) Regulator</div></div> <div><div>[1] 3.46V [2] n/c [3] 3.46V (In) [4] 3.49V (PWR On/Off1) [5] 0V (Gnd) [6] 3.31V [7] 0.79V [8] 1.5V (Out)</div></div>	<div>IC801</div> <div>Pin</div> <div><div>RGB Data Buffer</div></div> <div><div>[1] 1.81V [2] 1.81V [3] 3.72V [4] 1.8V [5] 1.8V [6] n/c (4.44V) [7] 0V (Gnd) [8] n/c (4.43V) [9] n/c (1.79V) [10] n/c (1.79V) [11] 3.72V [12] 1.81V [13] 1.81V [14] 5V (Vcc In)</div></div>	<div>Q1001</div> <div>Pin</div> <div><div>Wireless Vcc Driver</div></div> <div><div>B 0.02V C 24.5V E Gnd</div><div>On when wireless dongle connected</div></div>	<div>IC1203</div> <div>Pin</div> <div><div>EDID Data PC</div></div> <div><div>[1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl2) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V)</div></div>	<div>Q502</div> <div>Pin</div> <div><div>PWR_ON Switch</div></div> <div><div>[1] 3.5V (In) [2] 0.67V [3] 2.62V (Out)</div></div>
<div>IC501</div> <div>Pin</div> <div><div>+0.9V_CORE DC to DC</div></div> <div><div>[1] 3.17V [2] 0.59V [3] 0.44V [4] 11.95V [5] 0V [6] 5.33V [7] 4.6V [8] 5.81V [9] 0.95V [10] 1.36V</div></div>	<div>IC506</div> <div>Pin</div> <div><div>Switched 5V for USB 2</div></div> <div><div>[1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out)</div></div>	<div>Q901</div> <div>Pin</div> <div><div>IR Buffer 2nd</div></div> <div><div>B 0.02V C 3.48V E Gnd</div></div>	<div>IC802</div> <div>Pin</div> <div><div>EDID Data PC</div></div> <div><div>[1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.73V [6] 4.73V [7] 4.73V [8] 4.73V (Vcc In)</div></div>	<div>Q1002</div> <div>Pin</div> <div><div>Wireless Vcc Switch</div></div> <div><div>D G S S 24.5V G 24.5V D 0V</div><div>On when wireless dongle connected</div></div>	<div>IC1204</div> <div>Pin</div> <div><div>EDID Data PC</div></div> <div><div>[1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl1) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V)</div></div>	<div>Q503</div> <div>Pin</div> <div><div>0.9V FET Switch</div></div> <div><div>[1] 0.95V [2] 0.95V [3] 0.95V [4] 1.36V [5] 11.96V [6] 11.96V [7] 11.96V [8] 11.96V</div></div>
<div>IC504</div> <div>Pin</div> <div><div>+2.5V BCM Regulator</div></div> <div><div>[1] n/c [2] 4.92V (En) [3] 3.47V (In) [4] 3.49V (Ctl) [5] n/c [6] 2.57V (Out) [7] 0.6V [8] 0V (Gnd)</div></div>	<div>IC507</div> <div>Pin</div> <div><div>(+5V_NORMAL) Regulator</div></div> <div><div>[1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out)</div></div>	<div>Q902</div> <div>Pin</div> <div><div>IR Buffer 1st</div></div> <div><div>B 0.57V C 0.02V E Gnd</div></div>		<div>IC803</div> <div>Pin</div> <div><div>RS232 Routing</div></div> <div><div>[1] 3.5V [2] 5.64V [3] 0V [4] 0V [5] (-5.56V) [6] (-5.59V) [7] n/c (5.64V) [8] n/c (0V) [9] n/c (3.49V) [10] n/c (0V) [11] n/c (3.34V) [12] 3.48V [13] 0V [14] (-5.59V) [15] 0V (Gnd) [16] 3.5V (Vcc In)</div></div>	<div>IC2103</div> <div>Pin</div> <div><div>(+1.26V_TU) Regulator</div></div> <div><div>[1] 0V (Gnd) [2] 1.27V (Out) [3] 3.33V (In)</div></div>	<div>Q508</div> <div>Pin</div> <div><div>0.9V FET Switch</div></div> <div><div>[1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 4.6V [5] 0.95V [6] 0.95V [7] 0.95V [8] 0.95V</div></div>
					<div>Q501</div> <div>Pin</div> <div><div>RL_ON (PWR_On) 1st Driver</div></div> <div><div>B 0.64V C 0V E Gnd</div></div>	

42LV5500 MAIN (BACK SIDE) SIMICONDUCTORS

<div>IC502</div> <div>Pin</div> <div><div>Power Det Gen (For +12V)</div></div> <div><div>[1] 0V (Gnd) [2] 3.8V (In) [3] 3.73V (Out)</div></div>	<div>Q101</div> <div>Pin</div> <div><div>RGB_DDC_SDA FET Buffer</div></div> <div><div>[B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V</div></div>	<div>Q506</div> <div>Pin</div> <div><div>PANEL_VCC Control 2nd Driver</div></div> <div><div>B 0.67V C 0V E Gnd</div></div>	<div>Q904</div> <div>Pin</div> <div><div>IR Wireless Pass 2nd Driver</div></div> <div><div>B 0.02V C 3.48V E Gnd</div></div>	<div>D707</div> <div>Pin</div> <div><div>5V Pull-Up to DDC_SCL/SDA_1</div></div> <div><div>A1 4.96V C 5V A2 0V</div></div>	<div>D713</div> <div>Pin</div> <div><div>Bias for Q710 HDMI CEC</div></div> <div><div>A1 0V C 3.45V A2 3.5V</div></div>
<div>IC503</div> <div>Pin</div> <div><div>Power Det Gen (For +24V)</div></div> <div><div>[1] 0V (Gnd) [2] 3.7V (In) [3] 3.73V (Out)</div></div>	<div>Q102</div> <div>Pin</div> <div><div>RGB_DDC_SCL FET Buffer</div></div> <div><div>[B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V</div></div>	<div>Q507</div> <div>Pin</div> <div><div>PANEL_VCC Switch</div></div> <div><div>S 11.97V (In) G 1.8V (Enable) D 11.94V (Out)</div></div>	<div>Q906</div> <div>Pin</div> <div><div>IR Wireless Pass 1st Driver</div></div> <div><div>B 0.57V C 0V E Gnd</div></div>	<div>D708</div> <div>Pin</div> <div><div>5V Pull-Up to DDC_SCL/SDA_3</div></div> <div><div>A1 4.96V C 5V A2 0V</div></div>	<div>D810</div> <div>Pin</div> <div><div>5V Routing to IC802 RGB EDID</div></div> <div><div>A1 4.73V C 5.01V A2 0.07V</div></div>
<div>IC601</div> <div>Pin</div> <div><div>EEPROM Micro</div></div> <div><div>[1] 0V (Gnd) [2] 0V (Gnd) [3] 3.49V [4] 0V (Gnd) [5] 3.49V [6] 3.49V [7] 0V (Gnd) [8] 3.50V (Vcc In)</div></div>	<div>Q504</div> <div>Pin</div> <div><div>INV_CTL (Drv_On) Driver</div></div> <div><div>B 0V (INV ON) En C 3.28V (Out) E Gnd</div></div>	<div>Q710</div> <div>Pin</div> <div><div>CEC Remote HDMI CEC</div></div> <div><div>[B] 3.47V [G] 3.51V [S] 3.47V [D] 3.49V</div></div>	<div>Q2104</div> <div>Pin</div> <div><div>Tuner SIF (Sound) Buffer</div></div> <div><div>B 0.23V C 0V (Gnd) E 0.93V</div></div>	<div>D710</div> <div>Pin</div> <div><div>5V Pull-Up to DDC_SCL/SDA_2</div></div> <div><div>A1 4.96V C 5V A2 0V</div></div>	
	<div>Q505</div> <div>Pin</div> <div><div>PANEL_VCC Control 1st Driver</div></div> <div><div>B 0V C 0.68V E Gnd</div></div>	<div>Q801</div> <div>Pin</div> <div><div>Earphone Mute</div></div> <div><div>B 0V C 3.35V E Gnd</div></div>	<div>Q2106</div> <div>Pin</div> <div><div>Tuner Video (Analog) Buffer</div></div> <div><div>B 3.67V C 0V (Gnd) E 4.35V</div></div>	<div>D711</div> <div>Pin</div> <div><div>5V Pull-Up to DDC_SCL/SDA_4</div></div> <div><div>A1 4.96V C 5V A2 0V</div></div>	

42LG70 INTERCONNECT DIAGRAM

Any Transformer on Ballast



P204 "SMPS" to MCN1 "Ballast PWB"

Pin	Label	STBY	Run	Diode Check
1	24V	0V	24V	0.72V
2	24V	0V	24V	0.72V
3	24V	0V	24V	0.72V
4	24V	0V	24V	0.72V
5	24V	0V	24V	0.72V
6	Gnd	Gnd	Gnd	Gnd
7	Gnd	Gnd	Gnd	Gnd
8	Gnd	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd	Gnd
10	Gnd	Gnd	Gnd	Gnd
11	BR1	0V	1.7V	OL
12	INV On-Off	0V	3.2V	OL
13	*PWM-DIM	0V	1.4V	OL
14	ERROR	0V	0V	OL

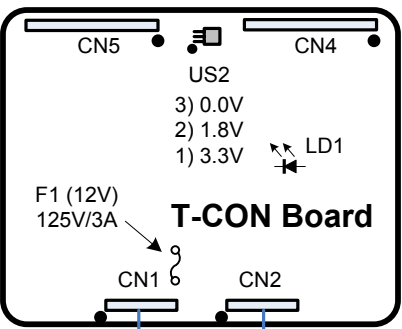
SEE NOTE (A) BELOW

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

LD1
Set In Stby: LD1 Off
Anode 0V Cathode 0V
Power On: LD1 Lit
Anode 12V Cathode 0V
Set on: LD1 Off
Anode 12V Cathode 9.6V

Far left and right pins for CN1 and CN2 are not counted, they are ground.

TO TFT MODULE



P201 Odd "SMPS" to P800 "Main PWB"

Pin	Label	STBY	Run	Diode Check
1	16.5V	0V	16.2V	0.49V
3	Gnd	Gnd	Gnd	Gnd
5	12V	0V	12.3V	1.6V
7	Gnd	Gnd	Gnd	Gnd
9	5V	5.1V	5.1V	1.27V
11	5V	5.1V	5.1V	1.27V
13	Gnd	Gnd	Gnd	Gnd
15	Gnd	Gnd	Gnd	Gnd
17	Error	0V	0V	0V
19	Power On	0V	2.8V	1.6V
21	BR1	0V	1.7V	0V
23	N/C	0V	0V	0V

*PWM-DIM (PDIM) Pin 22 can vary according to OSD Backlight setting. 0.9V 0% to 3.3V 100%

Both cables are LVDS Type

P201 Even "SMPS" to P800 "Main PWB"

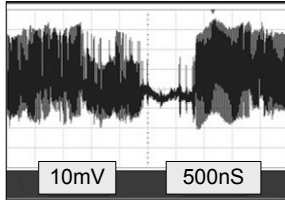
Pin	Label	STBY	Run	Diode Check
2	16.5V	0V	16.2V	0.49V
4	Gnd	Gnd	Gnd	Gnd
6	12V	0V	12.3V	1.6V
8	Gnd	Gnd	Gnd	Gnd
10	5V	5.1V	5.1V	1.27V
12	5V	5.1V	5.1V	1.27V
14	Gnd	Gnd	Gnd	Gnd
16	Gnd	Gnd	Gnd	Gnd
18	ACD	5V	5V	2.1V
20	INV-On/Off	0V	3.2V	0V
22	*PWM-DIM	0V	1.4V	0V
24	N/C	0V	0V	0V

LVDS Signals for P1000
Pins 11~22 / Pins 27~38

LVDS Signals for P1001
Pins 1~12 / Pins 15~26

All waveforms on page 2
of 11X17 fold out

P1000 Pin 12
(SMTP Color Bars)

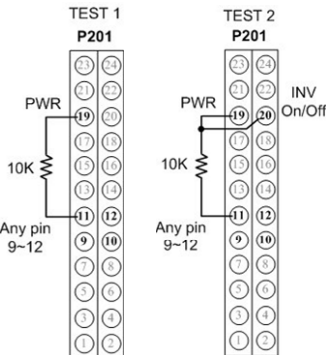


Example Of LVDS Signal

*PWM-DIM (PDIM) Pin 13 can vary according to OSD Backlight setting. 0.9V 0% to 3.3V 100%

TEST 1: To Force Power Supply On.
Disconnect P800 on Main PWB.
Jump pin 9,10,11 or 12 (5V) to pin 19 using a 10K resistor.
Test Low Voltage Outputs 16V and 12V. Test 24V P204

TEST 2: Jump pin 19 to pin 20 (INV-ON).
Ballast and all voltages should turn on.



For voltages and pin labels, see P201 chart

P800 to P201

Pin	Diode Check	Pin	Diode Check
1	OL	2	OL
3	Gnd	4	Gnd
5	3.1V	6	3.1V
7	Gnd	8	Gnd
9	1.48V	10	1.48V
11	1.48V	12	1.48V
13	Gnd	14	Gnd
15	Gnd	16	Gnd
17	2.86V	18	OL
19	1V	20	1.89V
21	OL	22	OL
23	OL	24	OL

P404 "Main" to J1

Pin	Label	STBY	Run	Diode Check
1	EYEQ-SCL	3.3V	3.3V	2.13V
2	EYEQ-SDA	3.3V	3.3V	2.13V
3	Gnd	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd	Gnd
5	Key1	3.3V	3.3V	1.77V
6	Key2	3.3V	3.3V	1.77V
7	3.3V	0V	3.3V	0.55V
8	5V ST	5V	5V	1.48V
9	Ready	0V	0V	OL
10	IR	3.9V	3.9V	1.24V
11	EYEQ-Reset	0V	0V	OL
12	Gnd	Gnd	Gnd	Gnd
13	Ready	0V	0V	OL
14	PWB-Buzz	0V	0V	3V
15	Gnd	Gnd	Gnd	Gnd

Intelligent Sensor
Intelligent Sensor

STBY 5V

Remote Sensor
Intelligent Sensor

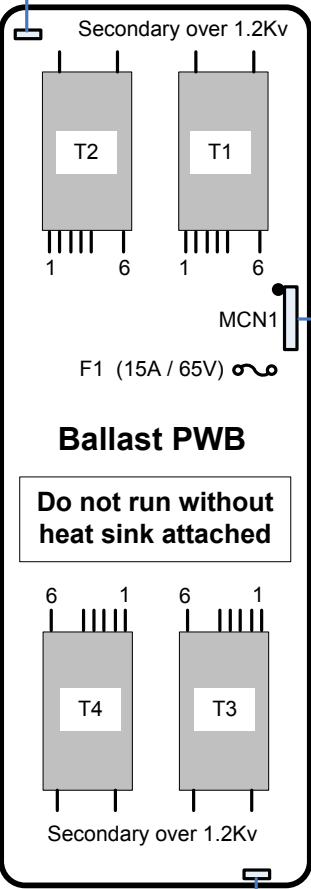
NOTE (A) T-CON RELATED

CN5 to Panel
VGH 24.5V Pin 85
VGL -4.3V Pin 89
VCC 3.3V Pin 91-92
VDD 16V Pins 94-95

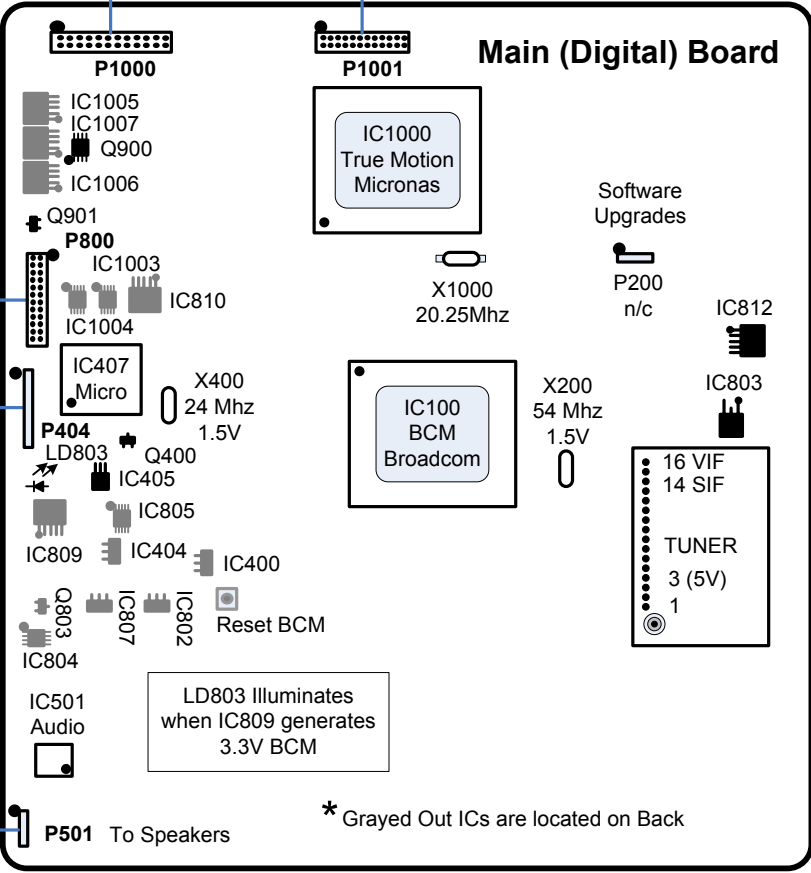
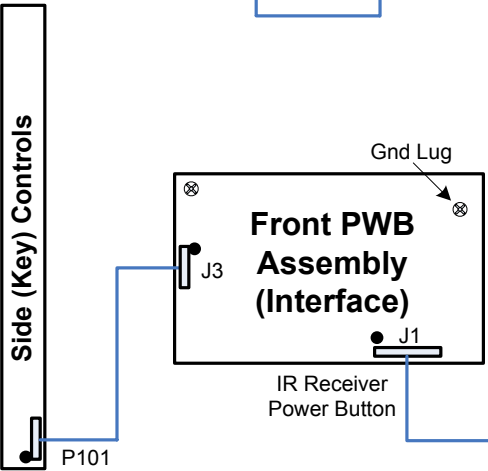
CN4 to Panel
VGH 24.5V Pin 12
VGL -4.3V Pin 8
VCC 3.3V Pin 5-6
VDD 16V Pins 2-3

From U10 DC to DC Converter
VGH 24.5V Pin 8 of U10
VGL -4.3V Bottom of R436
VCC 3.3V Bottom of L2
VDD 16V Pins 42

To Backlight Left Side



To Backlight Right Side




For Regulator Voltages, see back of page.


* Grayed Out ICs are located on Back


47LM7600 Main Board Component Voltages


IC7700		
Panel Power DC-to-DC Conv		
Pin		Pin
[1]	1.89V	[25] 4.95V
[2]	1.89V	[26] 0.52V
[3]	3.4V	[27] 3.31V
[4]	3.4V	[28] 3.31V
[5]	1.2V	[29] 5V
[6]	1.2V	[30] 1.27V
[7]	Gnd	[31] 1.59V
[8]	3.4V	[32] 2.8V
[9]	3.4V	[33] 8.12V
[10]	0V	[34] 8.12V
[11]	11.75V	[35] (-5V)
[12]	11.75V	[36] 0.67V
[13]	11.76V	[37] 13.56V
[14]	11.75V	[38] 12.38V
[15]	8.29V	[39] 10.42V
[16]	8.29V	[40] 5.97V
[17]	Gnd	[41] 5.95V
[18]	Gnd	[42] 2.85V
[19]	Gnd	[43] 6.7V
[20]	11.71V	[44] 6.7V
[21]	11.7V	[45] 6.69V
[22]	14.84V	[46] 6.69V
[23]	10.6V	[47] Gnd
[24]	Gnd	[48] Gnd


IC7701		
Panle Power Level Shifter		
Pin		Pin
[1]	8.33V	[15] (-5V)
[2]	8.33V	[16] 28V
[3]	8.33V	[17] 28V
[4]	8.33V	[18] 6.7V
[5]	8.33V	[19] 6.7V
[6]	8.33V	[20] 6.7V
[7]	6.21V	[21] 16.58V
[8]	27.9V	[22] Gnd
[9]	(-5V)	[23] 3.29V
[10]	27.5V to -5V	[24] 0V
[11]	27.5V to -5V	[25] 0V
[12]	(-5V)	[26] 0.07V
[13]	(-5V)	[27] 1.36V
[14]	(-4.9V)	[28] 3.37V


IC100		HDCP EEPROM	
		Pin	
		[1]	n/c
		[2]	n/c
		[3]	n/c
		[4]	Gnd
		[5]	3.35V
		[6]	3.35V
		[7]	3.31V
		[8]	3.31V


IC104		NVRAM Memory	
		Pin	
		[1]	0V
		[2]	Gnd
		[3]	3.32V
		[4]	Gnd
		[5]	3.32V
		[6]	3.32V
		[7]	Gnd
		[8]	3.31V


IC501		DAC_3V3 Regulator	
		Pin	
		[1]	5.13V
		[2]	3.26V
		[3]	Gnd


IC2400		+1.2V_MTK_CORE Regulator	
		Pin	
		[1]	Gnd
		[2]	11.92V
		[3]	Gnd
		[4]	0.8V
		[5]	0.85V
		[6]	3.51V
		[7]	1.27V
		[8]	1.27V


Q2401		PWR_On Switch	
		Pin	
		[1]	3.51V
		[2]	2.83V
		[3]	3.4V


Q2406		Panel_VCC Driver	
		Pin	
		[B]	0.64V
		[C]	0.1V
		[E]	Gnd


IC2402		PWR_Det +12V in	
		Pin	
		[1]	Gnd
		[2]	3.64V
		[3]	3.68V

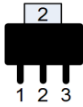
IC2403		+1.5V_DDR Regulator	
		Pin	
		[1]	3.5V
		[2]	5.5V
		[3]	Gnd
		[4]	Gnd
		[5]	Gnd
		[6]	0.83V
		[7]	0.72V
		[8]	1.5V Sound goes Loud
		[9]	1.84V
		[10]	1.54V
		[11]	1.54V
		[12]	1.54V
		[13]	5.07V
		[14]	n/c
		[15]	3.48V
		[16]	3.5V (Vcc In)


IC2404		(+5V_NORMAL) Regulator	
		Pin	
		[1]	3.42V
		[2]	0.78V
		[3]	5.47V
		[4]	5.44V
		[5]	Gnd
		[6]	5.13V
		[7]	10.49V
		[8]	11.81V


IC2405		+3.3V_NORMAL Regulator	
		Pin	
		[1]	3.33V
		[2]	0.77V
		[3]	5.49V
		[4]	5.46V
		[5]	Gnd
		[6]	5.44V
		[7]	3.41V
		[8]	Gnd
		[9]	Gnd
		[10]	3.32V
		[11]	3.32V
		[12]	8.74V
		[13]	11.81V
		[14]	11.81V


IC4303		5V for USB OCP	
		Pin	
		[1]	0V (Gnd)
		[2]	5.11V (In)
		[3]	5.11V (In)
		[4]	0V (Gnd)
		[5]	0V
		[6]	0V
		[7]	0.05V
		[8]	5.11V (Out)
		[9]	5.11V (Out)
		[10]	3.31V


Silked Screend IC6303		5V for USB Regulator	
		Pin	
		[1]	11.08V
		[2]	24.61V
		[3]	3.32V
		[4]	1.25V
		[5]	0.8V
		[6]	0.51V
		[7]	Gnd
		[8]	5.11V (Out)


IC6503		+1.8V_TU Regulator	
		Pin	
		[1]	0V (Gnd)
		[2]	1.8V (Out)
		[3]	3.33V (In)


Q2407		Panel_VCC Switch	
		Pin	
		[G]	1.9V
		[S]	11.92V
		[D]	11.92V


Q3001		CEC FET	
		Pin	
		[G]	3.51V
		[S]	3.48V
		[D]	3.47V


Q3300 Q3301 Q3302 Q3303		HDMI 1-4 Hot Swap	
		Pin	
		B	0V
		C	0V
		E	Gnd


Q5400		Amp Mute Driver	
		Pin	
		[B]	0V
		[C]	
		[E]	Gnd


Q6500		TUNER_SIF Buffer	
		Pin	
		[B]	0.22V
		[C]	0V (Gnd)
		[E]	0.91V

Q6501		Tuner (Analog) Video Buffer	
		Pin	
		[B]	3.61V
		[C]	0V (Gnd)
		[E]	4.28V

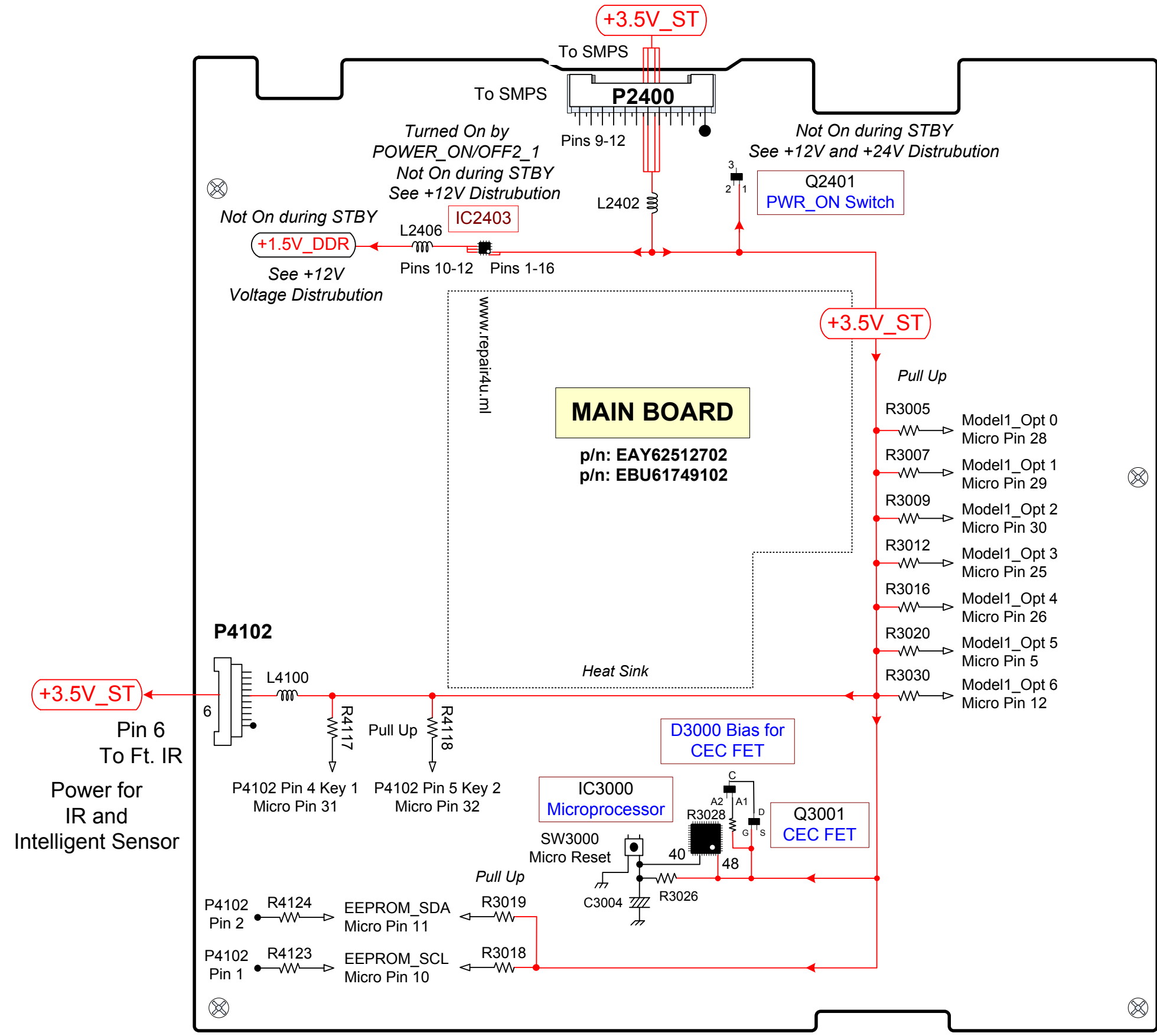
Q7700		VGL_FB / VGL Switch	
		Pin	
		[B]	0.67V
		[C]	4.67V
		[E]	0V

Q7701		VGH / VGH_FB Switch	
		Pin	
		[B]	15.91V
		[C]	15.63V
		[E]	16.6V

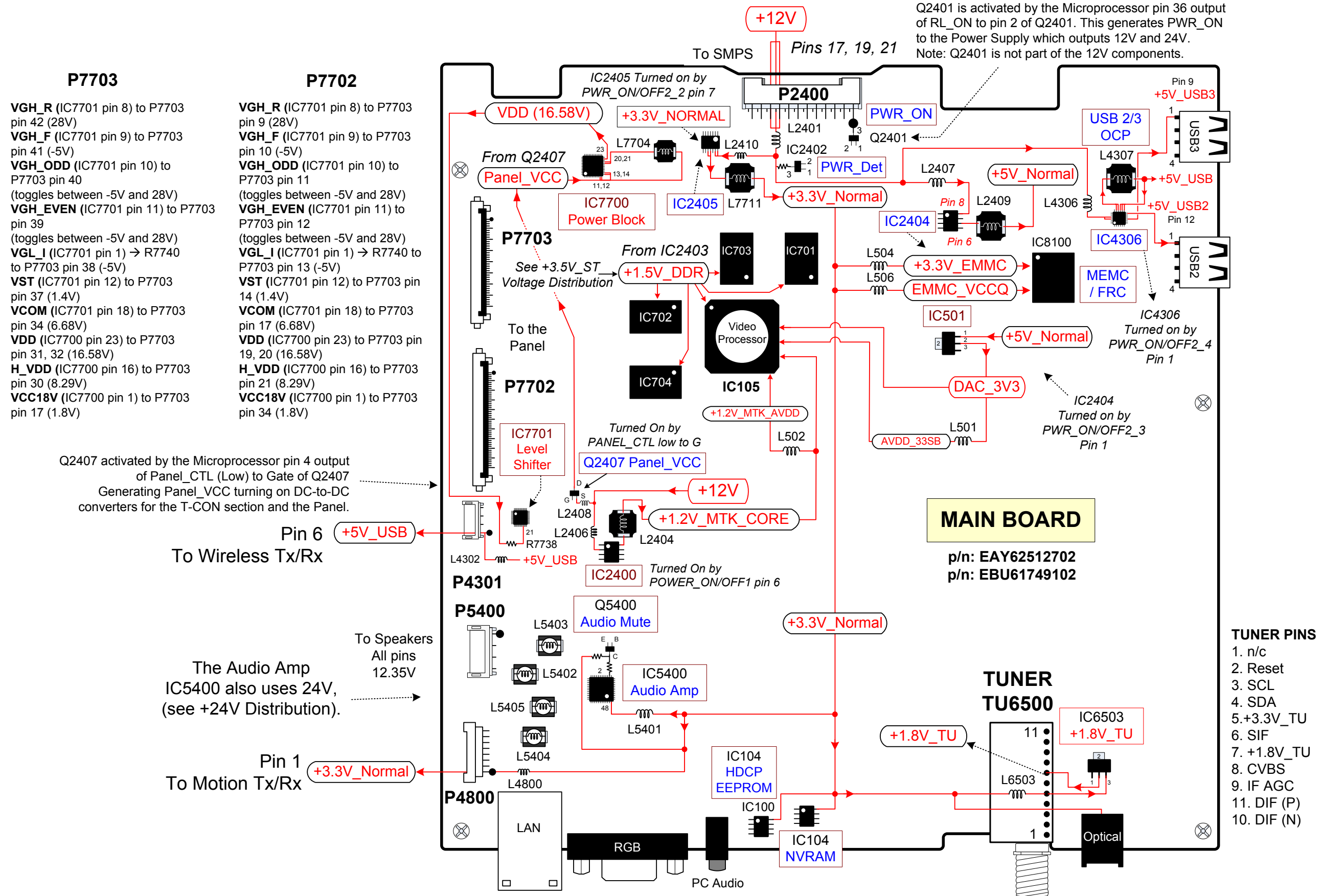
Q7702		EPI_LOCK6 Drives Q7703	
		Pin	
		[B]	0.77V
		[C]	0.02V
		[E]	0V (Gnd)

Q7703		EPI_LOCK6 Source	
		Pin	
		[B]	0V (Gnd)
		[C]	3.31V
		[E]	0V (Gnd)

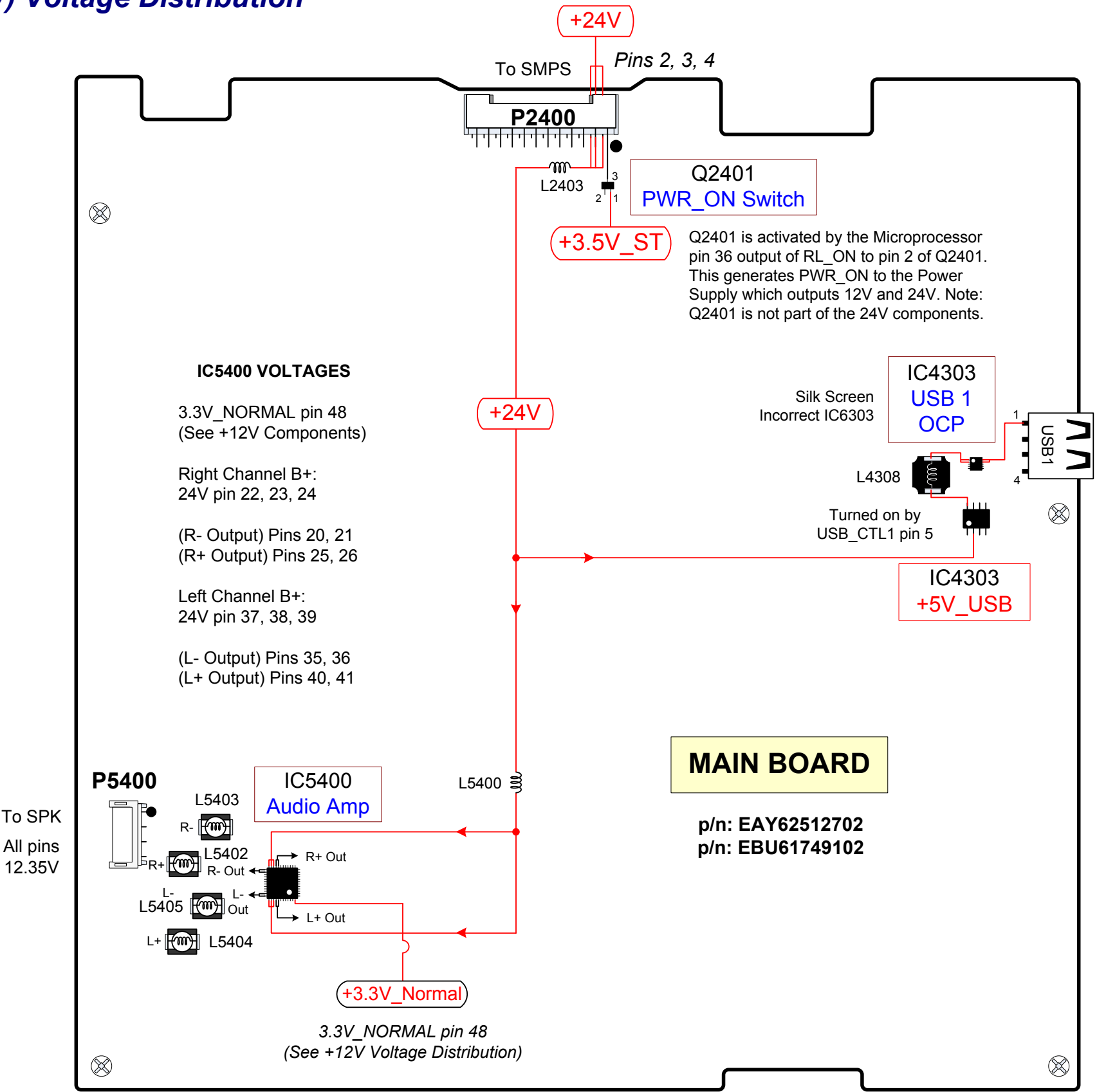
47LM7600 Main Board (+3.5V_ST) Voltage Distribution



47LM7600 Main Board (+12V) Voltage Distribution



47LM7600 Main Board (+24V) Voltage Distribution



47LW5600 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%, 3.3V. Follow the P-DIM signal all the way to the Inverter.
2nd: Turn off Local Dimming in the Customers Menu or unplug P832. 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 12 blocks functionality by grounding the return path signal (V1~V4) through a 220Ω, providing the 50V LED Power is present. See "LED Single Block Test" instructions below.

P202 White Plug "SMPS Board" To "Panel LEDs"

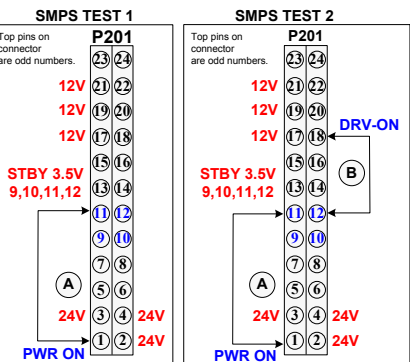
Pin	Label	TP	Run	Diode
1	LED+	C256+	50V	OL
2	n/c	n/c	n/c	OL
3	VC-3A	EL70	*1.39V~13.74V	OL
4	VC-3B	EL71	*1.39V~13.74V	OL
5	VC-3C	EL72	*1.39V~13.74V	OL
6	VC-3D	EL73	*1.39V~13.74V	OL
7	VC-4A	EL74	*1.39V~13.74V	OL
8	VC-4B	EL75	*1.39V~13.74V	OL
9	VC-4C	EL76	*1.39V~13.74V	OL
10	VC-4D	EL77	*1.39V~13.74V	OL
11	n/c	n/c	n/c	OL
12	LED+	C256+	50V	OL

*White to Black screen

P203 Black Plug "SMPS Board" To "Panel LEDs"

Pin	Label	TP	Run	Diode
1	LED+	C256+	50V	OL
2	n/c	n/a	n/c	OL
3	VC-1A	EL62	*1.39V~13.74V	OL
4	VC-1B	EL63	*1.39V~13.74V	OL
5	VC-1C	EL64	*1.39V~13.74V	OL
6	VC-1D	EL65	*1.39V~13.74V	OL
7	n/c	n/a	n/c	OL
8	VC-2A	EL66	*1.39V~13.74V	OL
9	VC-2B	EL67	*1.39V~13.74V	OL
10	VC-2C	EL68	*1.39V~13.74V	OL
11	VC-2D	EL69	*1.39V~13.74V	OL
12	n/c	n/a	n/c	OL
13	LED+	C256+	50V	OL

*White to Black screen



p/n: EBR72671301

Front IR/Key

Ft. IR/Intelligent Sensor
And Soft Touch Key Board

SMPS TEST 1: Force Power Supply On.

Disconnect P502 on Main board.
(A) Jump pins 9, 10, 11 or 12 (3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main and 36V to the Inverter Section of the SMPS. Remove AC power. Leave the jumper in place. No Backlights. 50V to Backlights reads 36V.

SMPS TEST 2: Force the Backlights On.

(B) Jump pins 9, 10, 11 or 12 (3.5V) to pin 18 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now jump to 65V then back down to 50V.

Note: If there is a problem with a load from the panel backlights, you can remove AC and Disconnect P202 or P203. When AC is reapplied, the Backlight LEDs should turn on for about 4 seconds and then shut off.

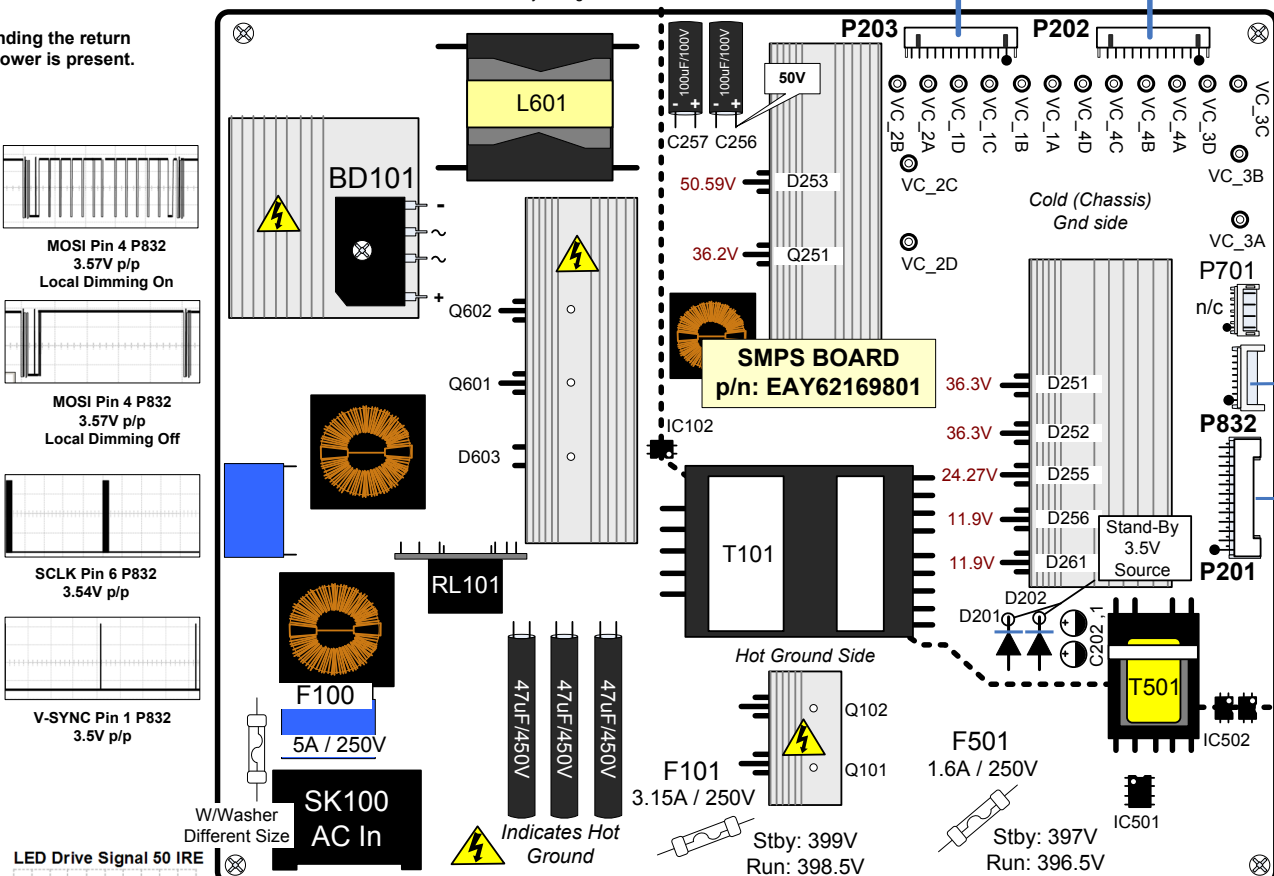
LED SINGLE BLOCK TEST DIM OR DARK PICTURE:

Turn the Brightness, Contrast and Backlights all the way up. Confirm P-DIM is 3.3V. Using a 220Ω resistor, jump any of the blocks grounding lug (VC_1~4 A~D) while observing the picture and each block should turn on maximum.

P832 "SMPS" to P3503 "MAIN Board"

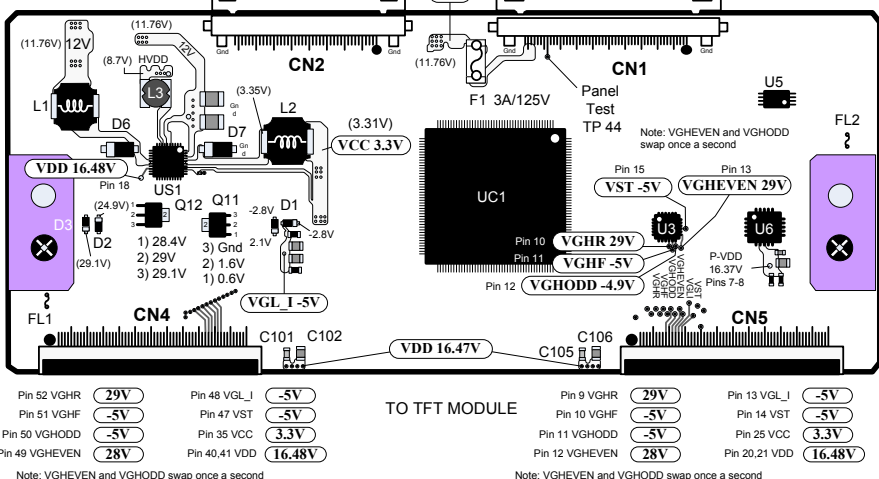
Pin	Label	Run	Diode	Pin	Label	Run	Diode
1	VSYNC	0.1V	OL	5	GND	Gnd	Gnd
2	SDA	3.25V	OL	6	SCLK	0V	OL
3	SCL	3.25V	OL	7	N.C.	0V	OL
4	SIN	Gnd	OL	8	REVERSE	0V	1.91V

No Stand-By voltages



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.



PWR-ON: Starts 12V, 24V and 36V LED Power. No Backlights.

DRV-ON: Starts Backlights LED Power goes to 65 then down to 50V.

(1) PWM Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition). Output from the Video Processor. Range 0.2V to 3.3V.

P201 "SMPS Board" To P502 "MAIN Board"

Pin	Label	STBY	Run	Diode Check
24	ERROR	n/c	n/c	2.03V
23	n/c	n/c	n/c	OL
22	(1) PWM	0V	0.2V~3.3V	OL
21	12V	0V	11.92V	0.48V
20	n/c	n/c	n/c	OL
19	12V	0V	11.92V	0.48V
18	DRV-ON	0V	3.26V	OL
17	12V	0V	11.92V	0.48V
16	V_Sync	0V	0V	OL
13-15	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.55V	3.53V	2.63V
5-8	Gnd	Gnd	Gnd	Gnd
2-4	24V	0V	24.19V	1.09V
1	PWR-ON	0V	3.4V	1.15V

P1302 "MAIN Board" To "Motion Remote"

Pin	Label	STBY	Run	Diode Check
1	3.5V_Normal	0.35V	3.33V	0.53V
2	Gnd	Gnd	Gnd	Gnd
3	M_Remote_RX	0.35V	3.33V	OL
4	M_Remote_TX	0.35V	3.33V	OL
5	Reset	0.35V	3.33V	2.41V
6	DC_MRemote	0.35V	3.33V	2.38V
7	DD_MRemote	0.35V	3.33V	Gnd
8	Gnd	Gnd	Gnd	Gnd
9	GPIO-O	0V	0V	OL
10	GPIO-1	0V	0V	OL
11	GPIO-2	0V	0V	OL
12	GPIO-3	0V	0V	OL

P502 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	OL
2-4	OL
5-8	Gnd
9-12	1.16V
13-15	Gnd
16	OL
17	2.32V
18	1.62V
19	2.32V
20	OL
21	2.07V
22	2.32V
23	OL
24	OL

P3503 "SMPS Board" To P832 "MAIN Board"

Pin	Diode
1	OL
2	OL
3	OL
4	Gnd
5	OL
6	1.73V
7	1.71V
8	OL

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

P901 Connector "MAIN Board" To "IR Board"

Pin	Label	STBY	Run	Diode	Pin	Label	STBY	Run	Diode
1	SCL	3.55V	3.49V	OL	7	Gnd	Gnd	Gnd	Gnd
2	SDA	3.55V	3.49V	OL	8	LED_B	0V	0V	OL
3	Gnd	Gnd	Gnd	Gnd	9	IR	1.48V	1.47V	OL
4	KEY 1	3.33V	3.3V	OL	10	Gnd	Gnd	Gnd	Gnd
5	KEY 2	3.33V	3.3V	OL	11	+3.3V_Normal	0V	3.33V	OL
6	3.5V_ST	3.55V	3.49V	OL	12	LED_R	0V	0V	OL
























Panel p/n: EAJ61768201
AUSYLHR, AUSYLJR, AUSYLUR

Panel p/n: EAJ61928101
AUSYLUR























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Motion Remote

47LW5600 MAIN (FRONT SIDE) SIMICONDUCTORS

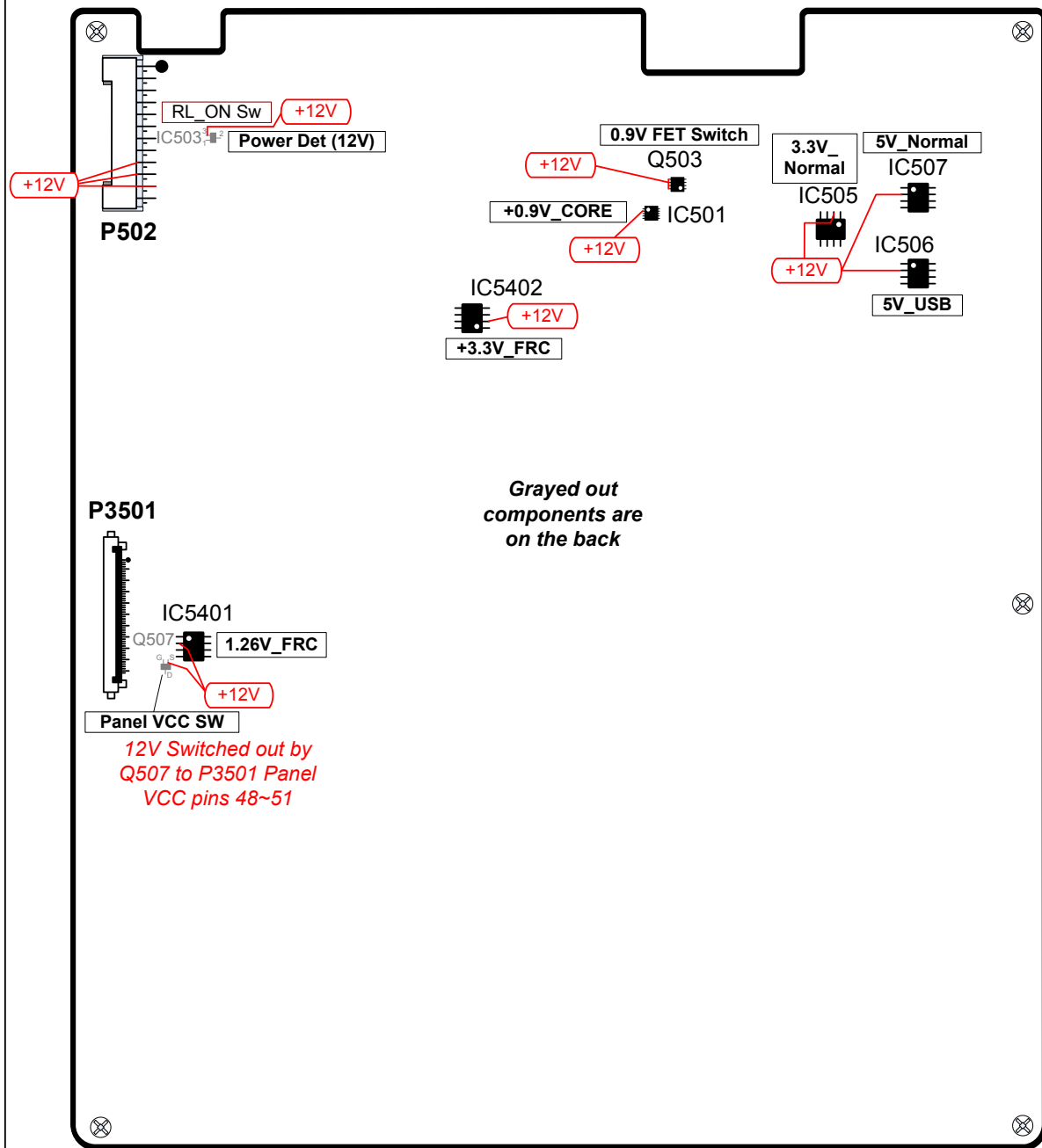
IC103  Pin [1] n/c [2] 0V [3] 3.34V [4] 0V [5] 3.22V [6] 3.22V [7] 0V (Gnd) [8] 3.34V NVRAM for USB	IC505  Pin [1] 0V (Gnd) [2] 11.96V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.79V [6] 3.47V (PWR On/Off2_2) [7] 3.35V (Out) [8] 3.35V (Out) (+3.3V_NORMAL) Regulator	IC508  Pin [1] 3.46V [2] n/c [3] 3.46V (In) [4] 3.49V (PWR On/Off1) [5] 0V (Gnd) [6] 3.31V [7] 0.79V [8] 1.5V (Out) (+1.5V_DDR) Regulator	IC802  Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.73V [6] 4.73V [7] 4.73V [8] 4.73V (Vcc In) EDID Data PC	IC1203  Pin [1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl2) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V) EDID Data PC	IC5401  Pin [1] 0V (Gnd) [2] 11.85V (Vcc In) [3] 0V (Gnd) [4] 0.8V (FB) [5] 0.7V [6] 3.29V (Enable) [7] 1.29V (Out) [8] 1.29V (Out) (+1.26V_FRC) Regulator	Q503  Pin [1] 0.95V [2] 0.95V [3] 0.95V [4] 1.36V [5] 11.96V [6] 11.96V [7] 11.96V [8] 11.96V 0.9V FET Switch	Q1001  Pin B 0.02V C 24.5V E Gnd On when wireless dongle connected Wireless Vcc Driver
IC501  Pin [1] 3.17V [2] 0.59V [3] 0.44V [4] 11.95V [5] 0V [6] 5.33V [7] 4.6V [8] 5.81V [9] 0.95V [10] 1.36V +0.9V_CORE DC to DC	IC506  Pin [1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out) Switched 5V for USB 2	IC801  Pin [1] 1.81V [2] 1.81V [3] 3.72V [4] 1.8V [5] 1.8V [6] n/c (4.44V) [7] 0V (Gnd) [8] n/c (4.43V) [9] n/c (1.79V) [10] n/c (1.79V) [11] 3.72V [12] 1.81V [13] 1.81V [14] 5V (Vcc In) RGB Data Buffer	IC803  Pin [1] 3.5V [2] 5.64V [3] 0V [4] 0V [5] (-5.56V) [6] (-5.59V) [7] n/c (5.64V) [8] n/c (0V) [9] n/c (3.49V) [10] n/c (0V) [11] n/c (3.34V) [12] 3.48V [13] 0V [14] (-5.59V) [15] 0V (Gnd) [16] 3.5V (Vcc In) RS232 Routing	IC1204  Pin [1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl1) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V) EDID Data PC	IC5402  Pin [1] Under Shield [2] Under Shield [3] Under Shield [4] Under Shield [5] 0.8V [6] 3.45 (PWR On/Off2_2) [7] 3.3V [8] 3.3V (+3.3V_FRC) Regulator	Q508  Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 4.6V [5] 0.95V [6] 0.95V [7] 0.95V [8] 0.95V 0.9V FET Switch	Q1002  Pin D S 24.5V G S D 0V On when wireless dongle connected Wireless Vcc Switch
IC504  Pin [1] n/c [2] 4.92V (En) [3] 3.47V (In) [4] 3.49V (Ctl) [5] n/c [6] 2.57V (Out) [7] 0.6V [8] 0V (Gnd) +2.5V BCM Regulator	IC507  Pin [1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out) (+5V_NORMAL) Regulator			IC2103  Pin [1] 0V (Gnd) [2] 1.27V (Out) [3] 3.33V (In) (+1.26V_TU) Regulator	Q501  Pin B 0.64V C 0V E Gnd RL_ON (PWR_On) 1st Driver		Q901  Pin B 0.02V C 3.48V E Gnd IR Buffer 2nd
					Q502  Pin [1] 3.5V (In) [2] 0.67V [3] 2.62V (Out) PWR_ON Switch		Q902  Pin B 0.57V C 0.02V E Gnd IR Buffer 1st

47LW5600 MAIN (BACK SIDE) SIMICONDUCTORS

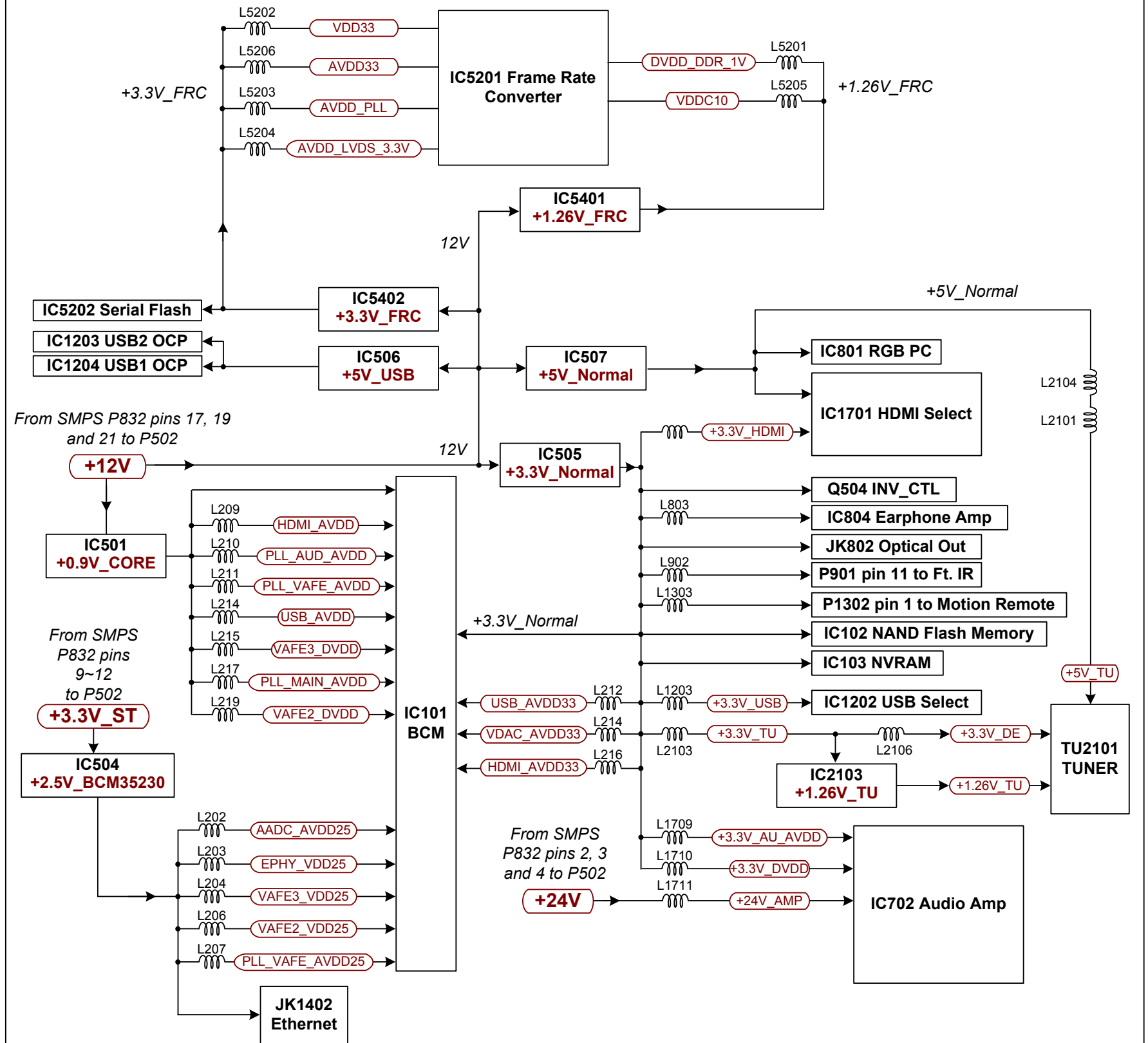
IC502  Pin [1] 0V (Gnd) [2] 3.8V (In) [3] 3.73V (Out) Power Det Gen (For +12V)	IC5202  Pin [1] 0.43V [2] 3.29V [3] 3.29V [4] 0V (Gnd) [5] ?? [6] ?? [7] 3.29V [8] 3.29V (3.3V_FRC in) SPI FLASH	Q101  Pin [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V RGB_DDC_SDA FET Buffer	Q710  Pin [B] 3.47V [G] 3.51V [S] 3.47V [D] 3.49V CEC Remote HDMI CEC	Q2104  Pin B 0.23V C 0V (Gnd) E 0.93V Tuner SIF (Sound) Buffer	D710  Pin A1 4.96V C 5V A2 0V 5V Pull-Up to DDC_SCL/SDA_2
IC503  Pin [1] 0V (Gnd) [2] 3.7V (In) [3] 3.73V (Out) Power Det Gen (For +24V)		Q102  Pin [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V RGB_DDC_SCL FET Buffer	Q801  Pin B 0V C 3.35V E Gnd Earphone Mute	Q2106  Pin B 3.67V C 0V (Gnd) E 4.35V Tuner Video (Analog) Buffer	D711  Pin A1 4.96V C 5V A2 0V 5V Pull-Up to DDC_SCL/SDA_4
IC601  Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 3.49V [4] 0V (Gnd) [5] 3.49V [6] 3.49V [7] 0V (Gnd) [8] 3.50V (Vcc In) EEPROM Micro	Q506  Pin B 0.67V C 0V E Gnd PANEL_VCC Control 2nd Driver	Q504  Pin B 0V (INV ON) En C 3.28V (Out) E Gnd INV_CTL (Drv_On) Driver	Q904  Pin B 0.02V C 3.48V E Gnd IR Wireless Pass 2nd Driver	D707  Pin A1 4.96V C 5V A2 0V 5V Pull-Up to DDC_SCL/SDA_1	D713  Pin A1 0V C 3.45V A2 3.5V Bias for Q710 HDMI CEC
	Q507  Pin S 11.97V (In) G 1.8V (Enable) D 11.94V (Out) PANEL_VCC Switch	Q505  Pin B 0V C 0.68V E Gnd PANEL_VCC Control 1st Driver	Q906  Pin B 0.57V C 0V E Gnd IR Wireless Pass 1st Driver	D708  Pin A1 4.96V C 5V A2 0V 5V Pull-Up to DDC_SCL/SDA_3	D810  Pin A1 4.73V C 5.01V A2 0.07V 5V Routing to IC802 RGB EDID

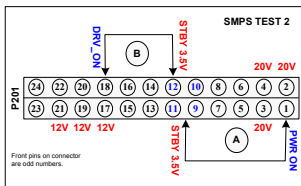
47LW5600 Main Board Components on with (12V) and Other Voltage Distributions

Components on by 12V



Other Voltage Distributions





Apply AC power, the Backlights should turn on.
Note: 116V will now be 142V.

P205 Black Plug "SMPS" To "Panel LEDs"

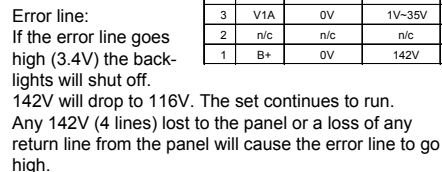
Pin	Label	STBY	Run	Diode Check
13	B+	0V	142V	Open
12	n/c	n/c	n/c	Open
11	V4A	0V	1V-35V	Open
10	V4B	0V	1V-35V	Open
9	V4C	0V	1V-35V	Open
8-6	n/c	n/c	n/c	Open
5	V3C	0V	1V-35V	Open
4	V3B	0V	1V-35V	Open
3	V3A	0V	1V-35V	Open
2	n/c	n/c	n/c	Open
1	B+	0V	142V	Open


(1) **P-DIM1 (Digital Dimming)** Global Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and room light condition.
0.38V 0% to 3.3V 100% and the Intelligent Sensor. Output from the Video Processor IC900.

Pin	Label	STBY	Run	Diode Check
24	ERROR	0V	0V	1.45V
23	L-DIM SIN	0V	3.23V	Open
22	⁽¹⁾ P-DIM1	0V	0.38V~3.3V	Open
21	12V	0V	12.37V	0.18V
20	SCLK	0V	0.16V	Open
19	12V	0V	12.37V	0.178V
18	DRV-ON	0V	2.98V	Open
17	12V	0V	12.37V	0.178V
16	V_Sync	0V	0.02V	Open
13-15	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.5V	3.38V	Open
5-8	Gnd	Gnd	Gnd	Gnd
2-4	20V	0V	21.7V	1.10V
1	PWR-ON	0V	3.25V	1.02V

Pin	Label	Run	Diode
1	PANEL_VCC	12.18V	3.02V
2	PANEL_VCC	12.18V	3.02V
3	PANEL_VCC	12.18V	3.02V
4	PANEL_VCC	12.18V	3.02V
5	n/c	n/c	n/c
6	Gnd	Gnd	Gnd
7	Gnd	Gnd	Gnd
8	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd
10	Gnd	Gnd	Gnd
11	RRXB+	1.09V	0.91V
12	RRXB-	1.26V	1.08V
13	RRXB+	1.14V	0.91V
14	RRXB-	1.22V	1.08V
15	Gnd	Gnd	Gnd
16	RRXBCK+	1.2V	0.91V
17	RRXBCK-	1.16V	1.08V

Pin	Label	Run	Diode	Pin	Label	Run	Diode
18	Gnd	Gnd	Gnd	35	RRXA2+	1.14V	0.91V
19	RRXB2+	1.14V	0.91V	36	RRXA2-	1.22V	1.15V
20	RRXB2-	1.2V	1.08V	37	RRXA1+	1.17V	0.91V
21	RRXB1+	1.16V	0.91V	38	RRXA1-	1.19V	1.08V
22	RRXB1-	1.19V	1.08V	39	RRXA0+	1.19V	0.91V
23	RRXB0+	1.19V	0.91V	40	RRXA0-	1.17V	1.08V
24	RRXB0-	1.19V	1.08V	41	n/c	n/c	n/c
25	n/c	n/c	n/c	42	3D_DIM_2	0.05V	1.03V
26	Gnd	Gnd	Gnd	43	3D_DIM	0V	1.03V
27	RRXA4+	1.08V	0.91V	44	3DTV	0V	Open
28	RRXA4-	1.26V	1.08V	45	n/c	n/c	n/c
29	RRXA3+	1.14V	0.91V	46	FR_C_RESET	3.32V	0.91V
30	RRXA3-	1.2V	1.08V	47	SLC3_3.3V	3.34V	2.99V
31	Gnd	Gnd	Gnd	48	SDA3_3.3V	3.34V	2.99V
32	RRXACK+	1.2V	0.91V	49	V_SYNC	3.33V	1.0V
33	RRXACK-	1.16V	0.91V	50	3D_Sync_Out	0.03V	0.99V
34	Gnd	Gnd	Gnd	51	Gnd	Gnd	Gnd



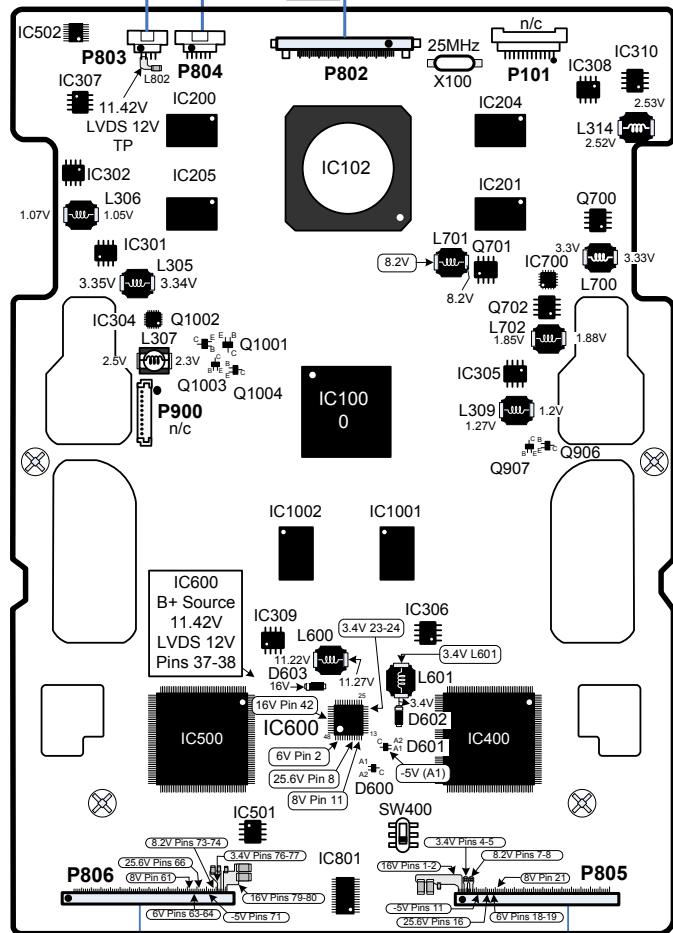
 **Hot Ground**
Shock Hazard



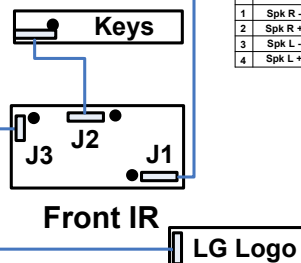
P803 "T-CON" to P7802 "Main"

Pin	LABEL	Run	Diode
1	Panel_VCC	12.18V	Open
2	Panel_VCC	12.18V	Open
3	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd

Pin	LABEL	Run	Diode
1	Gnd	Gnd	Gnd
2	E_TCK	0V	Open
3	E_TDO	3.29V	Open
4	E_TMS	3.29V	Open
5	E_TDI	3.29V	Open
6	Gnd	Gnd	Gnd



To TFT Panel



Pin	LABEL	Run	Diode
1	Spk R -	10.86V	Open
2	Spk R +	10.86V	Open
3	Spk L -	10.86V	Open
4	Spk L +	10.86V	Open

Pin	LABEL	Run
1	PANEL_VCC	12.18V
2	PANEL_VCC	12.18V
3	Gnd	Gnd
4	Gnd	Gnd

Pin	LABEL	Run	D
1	+5V_EMITTER	5.11V	2
2	Gnd	Gnd	0
3	3D_SYNC	0.03V	2

JK8700 Jack "MAIN Board" To "Wireless Dungle"

Pin	Label	STBY	Run	Diode
1 - 6	20V	0V	21.7V	2.38V
7	Detect	0V	0.3V	Open
8	Interrupt	0V	3.3V	Open
9	Gnd	0V	Gnd	Gnd
10	n/c	0V	3.3V	Open
11	Gnd	0V	Gnd	Gnd
12	I2C_SCL	0V	3.3V	1.04V
13	I2C_SDA	0V	3.3V	1.04V
14	Gnd	0V	Gnd	Gnd
15	Wireless_RX	0V	3.3V	1.8V
16	Wireless_TX	0V	3.3V	1.8V
17	Gnd	0V	Gnd	Gnd
18	IR	0.67V	3.3V	Open
19 - 20	Gnd	0V	Gnd	Gnd

Voltages with Dongle plugged in.
(Use Dongle side to read voltages. Remove cover.)
+20V Switched from Q8701 Drain
Q8701 turned on by Q8700

Pin	Label	STBY	Run	Diode
1	3.5V ST	3.5V	3.33V	2.47V
2	Ref	0V	2.29V	2.42V
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.31V	3.31V	Open
5	KEY 2	3.29V	3.29V	Open
6	Gnd	Gnd	Gnd	Gnd
7	LED drive	3.5V	3.34V	Open
8	LED drive	3.5V	3.34V	Open

Pin	LABEL	SBY	Run	Diode Check
1	3.5V ST	3.5V	3.31V	2.59V
2	Gnd	Gnd	Gnd	Gnd
3	Logo Drive	1.46V	0.55V	Open
4	Gnd	Gnd	Gnd	Gnd

1.46V LOGO Off 0.55V LOGO On

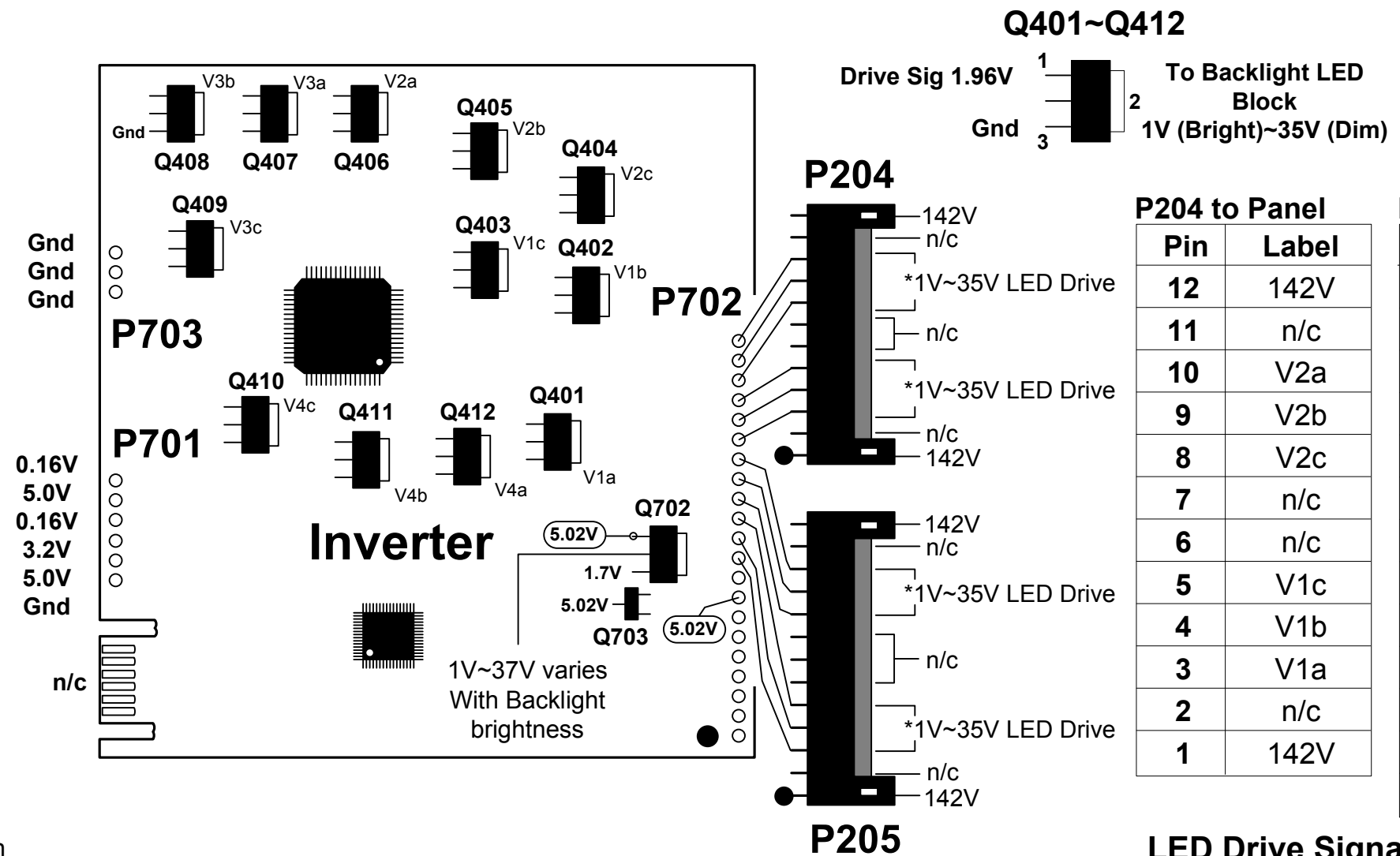
JK8700 Jack "MAIN Board" To "Wireless Dungle"

Pin	Label	STBY	Run	Diode
1 - 6	20V	0V	21.7V	2.38V
7	Detect	0V	0.3V	Open
8	Interrupt	0V	3.3V	Open
9	Gnd	0V	Gnd	Gnd
10	n/c	0V	3.3V	Open
11	Gnd	0V	Gnd	Gnd
12	I2C_SCL	0V	3.3V	1.04V
13	I2C_SDA	0V	3.3V	1.04V
14	Gnd	0V	Gnd	Gnd
15	Wireless_RX	0V	3.3V	1.8V
16	Wireless_TX	0V	3.3V	1.8V
17	Gnd	0V	Gnd	Gnd
18	IR	0.67V	3.3V	Open
19 - 20	Gnd	0V	Gnd	Gnd

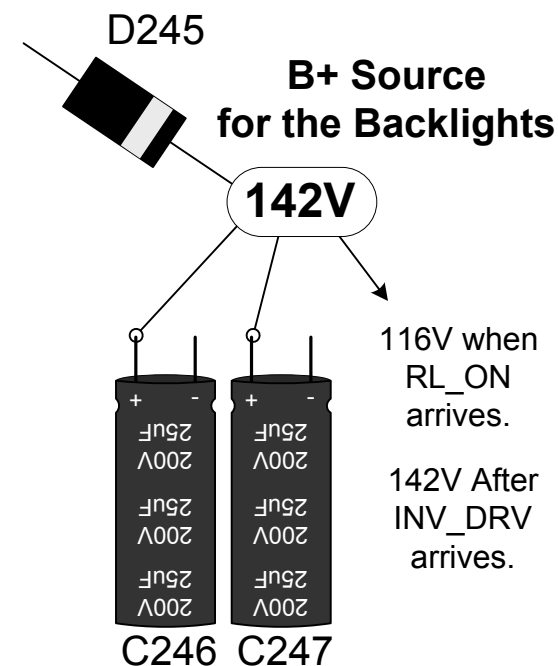
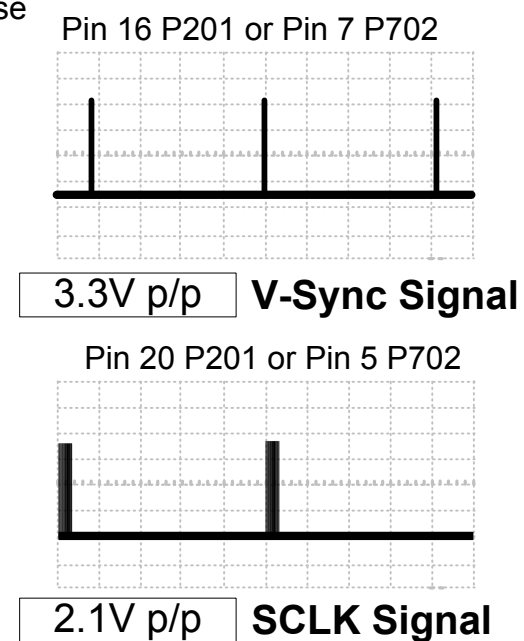
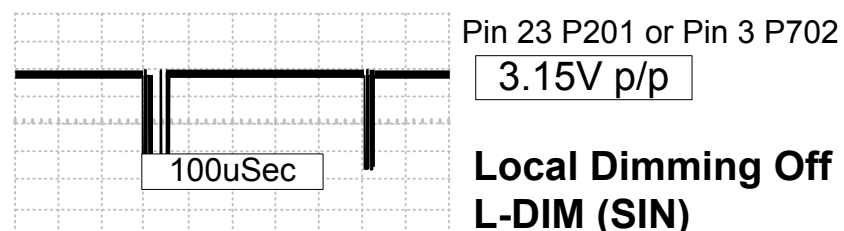
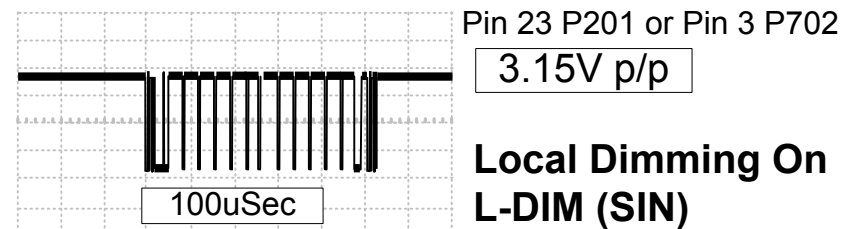
47LX6500 Power Supply EAY60803402 Inverter Section

P702 on the Inverter to SMSP

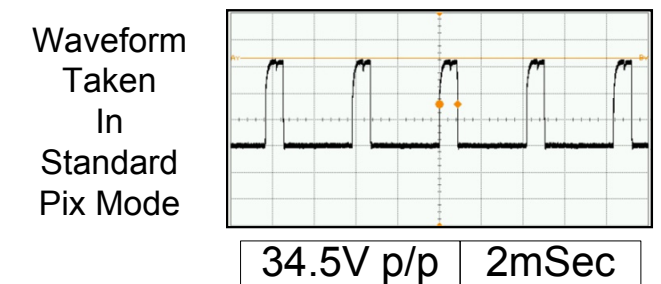
Pin	Label	Run
21	V2a	1V~35V
20	V2b	1V~35V
19	V2c	1V~35V
18	V1c	1V~35V
17	V1b	1V~35V
16	V1a	1V~35V
15	V4a	1V~35V
14	V4b	1V~35V
13	V4c	1V~35V
12	V3c	1V~35V
11	V3b	1V~35V
10	V3a	1V~35V
9	LED_FB	1.37V
8	5.2V	5.07V
7	V-sync	0.02V
6	DRV_On	2.98V
5	SCLK	0.16V
4	Gnd	Gnd
3	SIN	3.23V
2	PWM	0.38V~3.3V
*1	ERROR	0V



If the Error Line goes high (3.5V), the Inverter shuts off. An open line on any of the four 142V lines to the panel or an open on any of the 12 LED block ground return path will cause an error. Detection takes 10 seconds before turn off.



LED Drive Signal 50 IRE



The drivers Q401~Q412 ground the LED blocks, (12 Total). If a block is not lighting after 6~8 seconds the error line will go high. 116V will be present on top and bottom pins of P204 and P205 (D245 cathode), you can ground the top case of the driver to the defective block to turn it on. If the block turns on, the panel is not the problem.

47LX6500 MAIN (FRONT SIDE) SIMICONDUCTORS

IC300	Earphone Amp
Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V (HP R Out)
[6]	3.3V
[7]	3.3V
[8]	(-1.8V)
[9]	(-0.88V)
[10]	Gnd
[11]	0.94V
[12]	1.83V
[13]	3.32V (Mute)
[14]	3.32V (B+)
[15]	Gnd
[16]	0V (HP L Out)

IC301	USB 2 5V
Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC302	USB 1 5V
Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC601	NVRAM
Pin	
[1]	n/c
[2]	0V
[3]	3.31V
[4]	Gnd
[5]	3.24V
[6]	0V
[7]	Gnd
[8]	3.32V (B+)

IC700	(+1.26V_TU) Regulator
Pin	
[1]	0V (Gnd)
[2]	1.27V (Out)
[3]	3.27V (B+)

IC8000	5V Regulator for USB
Pin	
[1]	12.32V (B+)
[2]	5.1V (Out)
[3]	5.1V (Out)
[4]	10.5V
[5]	3.28V
[6]	0.79V
[7]	5.15V
[8]	0V (Gnd)

IC8001	D1.2V and A1.2V Regulator
Pin	
[1]	0V (Gnd)
[2]	3.3V
[3]	0V (Gnd)
[4]	1.27V
[5]	3.32V
[6]	n/c
[7]	4.48V
[8]	3.32V
[9]	3.32V
[10]	3.34V
[11]	1.28V
[12]	Gnd
[13]	3.3V
[14]	0.82V

IC8002	D1.8V Regulator
Pin	
[1]	5V
[2]	3.35V (B+)
[3]	1.83V (Out)
[4]	Gnd
[5]	Gnd
[6]	2.36V
[7]	0.91V
[8]	1.05V
[9]	2.4V
[10]	3.37V (PWR On/Off1 Ctl)

IC8003	(+5V_NORMAL) Regulator
Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.86V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	5.17V (In)
[8]	5.17V (In)

IC8004	A2.5V Regulator for USB
Pin	
[1]	n/c
[2]	3.26V (B+)
[3]	3.26V (B+)
[4]	n/c
[5]	n/c
[6]	2.57V (Out)
[7]	0.83V
[8]	Gnd

IC8005	(+3.3V_NORMAL) And D3.3V Regulator
Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.89V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	3.36V (Out)
[8]	3.36V (Out)

IC8007	Power Det Gen (+12V and +3.5V)
Pin	
[1]	Gnd
[2]	3.69V (B+)
[3]	3.69V (Out)

IC8008	Power Det Gen (+24V)
Pin	
[1]	Gnd
[2]	3.64V (B+)
[3]	3.76V (Out)

IC8800	(+1.8V_AMP) Regulator
Pin	
[1]	Gnd
[2]	1.87V (Out)
[3]	3.28V (B+)

IC9702	(+1.8V_L/Dimming) Regulator
Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V (FB)
[5]	0.77V
[6]	3.34V
[7]	3.32V (Out)
[8]	3.34V (Out)

IC9703	EEPROM for LG5111
Pin	
[1]	Gnd
[2]	3.34V
[3]	Gnd
[4]	Gnd
[5]	3.34V
[6]	3.34V
[7]	3.32V
[8]	3.34V (B+)

Q308	Headphone Mute
Pin	
B	0V
C	3.32V
E	Gnd

Q8001	PANEL_VCC Control 1st Driver
Pin	
B	0V
C	0.68V
E	Gnd

Q8003	PANEL_VCC Control 2nd Driver
Pin	
B	0.66V
C	0V
E	Gnd

Q8004	PANEL_VCC Switch
Pin	
S	12.28V (In)
G	1.92V (Enable)
D	12.2V (Out)

Q8005	INV_ON Driver
Pin	
B	0V (INV ON) En
C	2.97V (Out)
E	Gnd

Q8200	IR Buffer 2nd
Pin	
B	0.56V
C	0V
E	Gnd

Q8201	IR Buffer 1st
Pin	
B	0V
C	3.36V
E	Gnd

Q8307	Side HDMI Hot Swap
Pin	
B	0V
C	4.32V
E	Gnd

Q8700	Wireless PWR Turns on Q8701
Dongle In	
B	0.66V (0.0V w/Dongle In)
C	0.14V (24V w/Dongle In)
E	Gnd
Dongle Out	
B	0V (0.0V w/Dongle Out)
C	24.6V (24V w/Dongle Out)
E	Gnd

Q8800	AMP Mute to AMP_MUTE1 IC8801
Pin	
B	0V
C	3.34V
E	Gnd

47LX6500 MAIN (BACK SIDE) SIMICONDUCTORS

IC602	D1.8V Regulator
Pin	
[1]	0V (Gnd)
[2]	3.29V (PWR On/Off1 Ctl)
[3]	0.9V (DDR_VTT)
[4]	0.93V
[5]	1.83V
[6]	3.38V (In)
[7]	1.8V (Out)
[8]	0.91V (DDR_VTT)

IC8100	EEPROM Micro
Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	0V (Gnd)
[8]	3.37V

IC8200	RS232 Routing
Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V
[6]	(-5.47V)
[7]	n/c (5.59V)
[8]	n/c (0V)
[9]	n/c (3.3V)
[10]	n/c (0.2V)
[11]	n/c (3.3V)
[12]	3.35V
[13]	0V
[14]	(-5.47V)
[15]	0V (Gnd)
[16]	3.37V

IC8400	RGB H/V Sync
Pin	
[1]	1.9V
[2]	1.9V
[3]	4.4V
[4]	0V
[5]	0.9V
[6]	n/c (4.5V)
[7]	0V (Gnd)
[8]	n/c (4.5V)
[9]	n/c (1.9V)
[10]	n/c (1.9V)
[11]	n/c (4.5V)
[12]	0.9V
[13]	0.9V
[14]	5V

IC8401	EDID Data PC
Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	0.7V
[6]	4.1V
[7]	4.5V
[8]	4.5V (In)

IC8700	Wireless Buffer
Pin	
[1]	0V (3.3V Dongle In)
[2]	3.3V (0.3V Dongle In)
[3]	n/c
[4]	n/c
[5]	n/c
[6]	Gnd
[7]	Gnd
[8]	Gnd
[9]	n/c
[10]	0.02V
[11]	0V
[12]	3.3V
[13]	0V (3.3V Dongle In)
[14]	3.3V
[15]	3.3V
[16]	3.3V

Q200	(1.8V_HDMI) Switch
Pin	
S	1.83V (Out)
G	3.35V (PWR On/Off2 Ctl)
D	1.83V (In)

Q701	Tuner SIF (Sound) Buffer
Pin	
B	0.16V
C	Gnd
E	0.83V

Q702	Tuner Video (Analog) Buffer
Pin	
B	2.05V
C	2.75V
E	Gnd

Q901	FLASH_WP for IC901
Pin	
B	0V (Flash_WP)
C	3.36V
E	Gnd

Q8000	RL_ON (PWR_On) 1st Driver
Pin	
B	0.66V
C	0V
E	Gnd

Q8002	PWR_ON Switch
Pin	
[1]	3.36V (In)
[2]	0V
[3]	3.3V (Out)

Q8203	IR Wireless Pass 2nd Driver
Pin	
B	0V
C	3.3V
E	Gnd

Q8205	IR Wireless Pass 1st Driver
Pin	
B	0.6V
C	0V
E	Gnd

Q8300,1,2,6	HDMI 1 Hot Swap
Pin	
B	4.2V
C	0V
E	Gnd

Q8303,4,5,7	HDMI Hot Swap
Pin	
B	0V
C	4.2V
E	Gnd
























Q8308	CEC Remote HDMI CEC
Pin	
[B]	2.72V
[G]	2.73V
[S]	3.27V
[D]	3.37V

Q8701	IR Wireless Pass 2nd Driver
Pin	
G	24.5V (2.3V Dongle In)
S	24V
D	0V (24.5V Dongle In)

D8306,7,9,10	5V Pull Up Routing HDMI SCL/SDA
Pin	
A1	5.04V
C	4.58V
A2	0V

D8312	3.5V Pull Up HDMI CEC
Pin	
A1	0V
C	3.26V
A2	3.2V

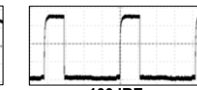
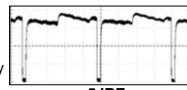
47LX6500 T-CON/3D Component Voltages

<div>IC202</div> <div></div> <div>+1.8V DDR Reg</div>	<div>1) Gnd</div> <div>2) 3.2V</div> <div>3) 0.09V</div> <div>4) 0.09V</div> <div>5) 1.8V</div> <div>6) 3.34V</div> <div>7) 1.18V</div> <div>8) 0.89V</div>	<div>IC304</div> <div></div> <div>+2.5V VQ Reg</div>	<div>1) 0.75V</div> <div>2) 5.0V</div> <div>3) Gnd</div> <div>4) 0V</div> <div>5) 2.5V</div> <div>6) 5.0V</div> <div>7) 7.55V</div> <div>8) 11.36V</div> <div>9) 11.36V</div> <div>10) 11.36V</div> <div>11) 11.36V</div> <div>12) 2.55V</div> <div>13) Gnd</div> <div>14) Gnd</div> <div>15) 2.55V</div> <div>16) Gnd</div> <div>17) Gnd</div> <div>18) Gnd</div> <div>19) Gnd</div> <div>20) 2.5V</div> <div>21) 2.5V</div> <div>22) n/c</div> <div>23) 0V</div> <div>24) 2.5V</div> <div>25) n/c</div> <div>26) Gnd</div> <div>27) 1.13V</div> <div>28) 10.99V</div>	<div>IC306</div> <div></div> <div>1V2 Reg</div>	<div>1) n/c</div> <div>2) 2.5V</div> <div>3) 2.51V</div> <div>4) n/c</div> <div>5) n/c</div> <div>6) 1.81V</div> <div>7) 0.81V</div> <div>8) Gnd</div>	<div>IC307</div> <div></div> <div>+1.8V DDR Reg</div>	<div>1) n/c</div> <div>2) 2.49V</div> <div>3) 2.51V</div> <div>4) n/c</div> <div>5) n/c</div> <div>6) 1.81V</div> <div>7) 0.81V</div> <div>8) Gnd</div>	<div>IC308</div> <div></div> <div>+1.8V DDRS Reg</div>	<div>1) n/c</div> <div>2) 2.47V</div> <div>3) 2.49V</div> <div>4) n/c</div> <div>5) n/c</div> <div>6) 1.8V</div> <div>7) 0.8V</div> <div>8) Gnd</div>	<div>IC309</div> <div></div> <div>DDR VTT Reg</div>	<div>1) Gnd</div> <div>2) 3.26V</div> <div>3) 0.89V</div> <div>4) 0.9V</div> <div>5) 1.8V</div> <div>6) 3.34V</div> <div>7) 1.8V</div> <div>8) 0.9V</div>	<div>IC310</div> <div></div> <div>2V5 Reg</div>	<div>1) 11.41V</div> <div>2) 2.53V</div> <div>3) 2.53V</div> <div>4) 7.97V</div> <div>5) 3.11V</div> <div>6) 0.8V</div> <div>7) 5.07V</div> <div>8) Gnd</div>	<div>IC600</div> <div></div> <div>DC-DC Conv</div>	<div>1) 5.96V</div> <div>2) 6.03V</div> <div>3) 3.15V</div> <div>4) 0.17V</div> <div>5) 2.72V</div> <div>6) 3.3V</div> <div>7) 0V</div> <div>8) 25.6V</div> <div>9) 24.7V</div> <div>10) 1.26V</div> <div>11) Gnd</div> <div>12) 5.54V</div> <div>13) 0V</div> <div>14) 0V</div> <div>15) Gnd</div> <div>16) 0V</div> <div>17) 1.26V</div> <div>18) 4.24V</div> <div>19) Gnd</div> <div>20) Gnd</div> <div>21) 1.27V</div> <div>22) 11.45V</div> <div>23) 3.4V</div> <div>24) 3.4V</div>	<div>IC700</div> <div></div> <div>For +3.3V TCON</div>	<div>13) Gnd</div> <div>14) 3.6V</div> <div>15) 0.12V</div> <div>16) 5.21V</div> <div>17) 0.6V</div> <div>18) 1.13V</div> <div>19) 1.18V</div> <div>20) Gnd</div> <div>21) 11.4V</div> <div>22) 0.56V</div> <div>23) 0.81V</div> <div>24) 0.9V</div>	<div>IC701</div> <div></div> <div>DC-DC Conv For HVDD</div>	<div>1) Gnd</div> <div>2) 11.68V</div> <div>3) 5.26V</div> <div>4) 0.73V</div> <div>5) 0.58V</div> <div>6) 1.97V</div> <div>7) 0.59V</div> <div>8) 1.20V</div> <div>9) Gnd</div> <div>10) 5.20V</div> <div>11) 1.40V</div> <div>12) 13.1V</div> <div>13) 8.10V</div> <div>14) 11.68V</div>	<div>IC801</div> <div></div> <div>Data Buffer</div>	<div>1) 8.01V</div> <div>2) 15.7V</div> <div>3) 15.7V</div> <div>4) 14.05V</div> <div>5) 13.35V</div> <div>6) 12.27V</div> <div>7) 11.07V</div> <div>8) Gnd</div> <div>9) 16.02V</div> <div>10) 10.28V</div> <div>11) 8.31V</div> <div>12) 7.72V</div> <div>13) 3.33V</div> <div>14) 3.33V</div> <div>15) 3.33V</div> <div>16) Gnd</div> <div>17) 0V</div> <div>18) Gnd</div> <div>19) 4.94V</div> <div>20) 3.75V</div> <div>21) 2.67V</div> <div>22) 16.02V</div> <div>23) 0V</div> <div>24) Gnd</div> <div>25) 0.27V</div> <div>26) 0.27V</div> <div>27) 0.25V</div> <div>28) 5.96V</div>	<div>Q803</div> <div></div>	<div>B) 2.52V</div> <div>E) 2.52V</div> <div>C) 2.27V</div>	<div>Q804</div> <div></div>	<div>B) 2.52V</div> <div>E) 2.52V</div> <div>C) 2.27V</div>	<div>Q906</div> <div></div>	<div>B) 0.61V</div> <div>E) Gnd</div> <div>C) 0.03V</div>	<div>Q907</div> <div></div>	<div>B) 0.0V</div> <div>E) Gnd</div> <div>C) 1.9V</div>	<div>Q1001</div> <div></div>	<div>B) 0V</div> <div>E) Gnd</div> <div>C) 1.97V</div>	<div>Q1002</div> <div></div>	<div>B) 0.6V</div> <div>E) Gnd</div> <div>C) 0.02V</div>	<div>Q1003</div> <div></div>	<div>B) 0.59V</div> <div>E) Gnd</div> <div>C) 0.02V</div>	<div>Q1004</div> <div></div>	<div>B) 0.02V</div> <div>E) Gnd</div> <div>C) 3.33V</div>	<div>Q700</div> <div></div> <div>+3.3V TCON Reg</div>	<div>1) Gnd</div> <div>2) 3.26V</div> <div>3) 3.33V</div> <div>4) 4.79V</div> <div>5) 11.42V</div> <div>6) 11.42V</div> <div>7) 3.34V</div> <div>8) 3.34V</div>	<div>Q701</div> <div></div> <div>+8.2V HVDD Reg</div>	<div>1) Gnd</div> <div>2) 1.42V</div> <div>3) 8.16V</div> <div>4) 11.7V</div> <div>5) 11.42V</div> <div>6) 11.42V</div> <div>7) 8.2V</div> <div>8) 8.2V</div>	<div>Q702</div> <div></div> <div>+1.8V TCON Reg</div>	<div>1) Gnd</div> <div>2) 4.27V</div> <div>3) 1.89V</div> <div>4) 2.72V</div> <div>5) 11.41V</div> <div>6) 11.41V</div> <div>7) 0V</div> <div>8) 1.89V</div>	<div>D600</div> <div></div>	<div>A1) 16V</div> <div>A2) 25.6V</div> <div>C) 20.68V</div>
--	---	---	---	---	--	---	---	--	---	---	---	---	---	---	--	---	--	--	--	--	---	--	---	--	---	--	---	--	---	--	--	---	--	---	---	---	---	--	---	--	---	---	--	--	--

47LX9500 INTERCONNECT DIAGRAM

Note: If a particular block is exhibiting a dimmer 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, 1st, Check the P-DIM level, it should rise with the percentage shown on screen. 100%, 3.3V. Follow the P-DIM signal all the way to each Inverter.

2nd, Turn off the set and unplug the connector to the Inverters coming from the Main board. If the brightness returns to normal, the Main board is defective.



Drive Signals to LED Blocks

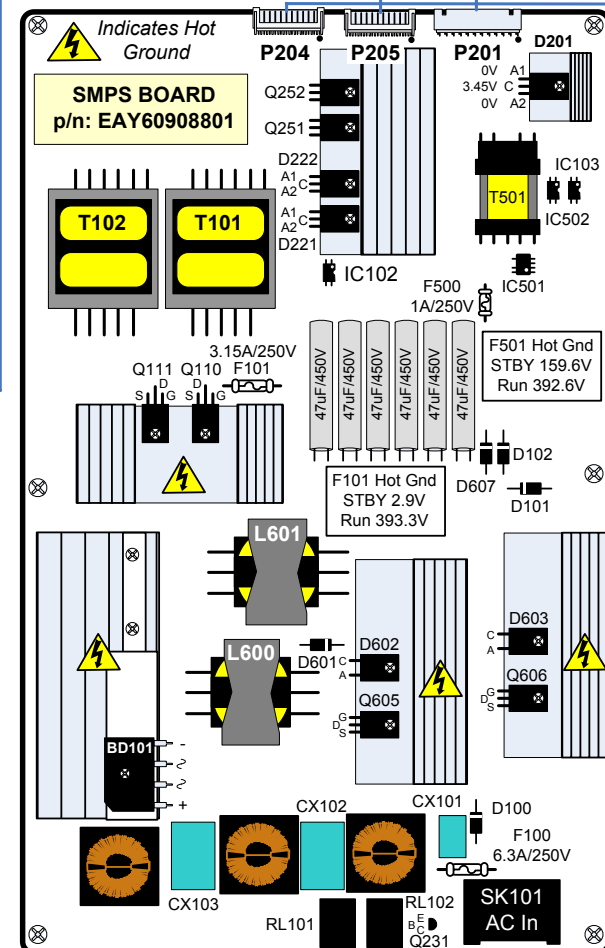
*To force a Block to turn on, simply ground the pin. Providing the 13V source is present.

P201 "SMPS" To P8000 "MAIN"

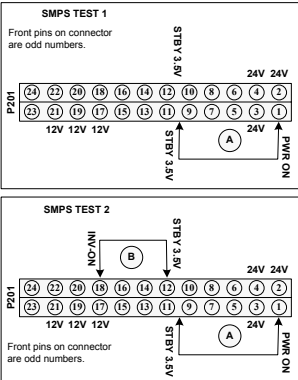
Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.31V	1.88V
2	24V	0V	24.7V	0.42V
3	GND	GND	GND	GND
4	3.3V	0V	3.31V	1.88V
5	12V	0V	12.0V	0.42V
6	12V	0V	12.0V	0.42V
7	12V	0V	12.0V	0.42V
8	12V	0V	12.0V	0.42V
9	12V	0V	12.0V	0.42V
10	12V	0V	12.0V	0.42V
11	12V	0V	12.0V	0.42V
12	12V	0V	12.0V	0.42V
13	12V	0V	12.0V	0.42V
14	12V	0V	12.0V	0.42V
15	12V	0V	12.0V	0.42V
16	12V	0V	12.0V	0.42V
17	12V	0V	12.0V	0.42V
18	12V	0V	12.0V	0.42V
19	12V	0V	12.0V	0.42V
20	12V	0V	12.0V	0.42V
21	12V	0V	12.0V	0.42V
22	12V	0V	12.0V	0.42V
23	12V	0V	12.0V	0.42V
24	12V	0V	12.0V	0.42V

Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.31V	1.88V
2	24V	0V	24.7V	0.42V
3	GND	GND	GND	GND
4	3.3V	0V	3.31V	1.88V
5	12V	0V	12.0V	0.42V
6	12V	0V	12.0V	0.42V
7	12V	0V	12.0V	0.42V
8	12V	0V	12.0V	0.42V
9	12V	0V	12.0V	0.42V
10	12V	0V	12.0V	0.42V
11	12V	0V	12.0V	0.42V
12	12V	0V	12.0V	0.42V
13	12V	0V	12.0V	0.42V
14	12V	0V	12.0V	0.42V
15	12V	0V	12.0V	0.42V
16	12V	0V	12.0V	0.42V
17	12V	0V	12.0V	0.42V
18	12V	0V	12.0V	0.42V
19	12V	0V	12.0V	0.42V
20	12V	0V	12.0V	0.42V
21	12V	0V	12.0V	0.42V
22	12V	0V	12.0V	0.42V
23	12V	0V	12.0V	0.42V
24	12V	0V	12.0V	0.42V

Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.31V	1.88V
2	24V	0V	24.7V	0.42V
3	GND	GND	GND	GND
4	3.3V	0V	3.31V	1.88V
5	12V	0V	12.0V	0.42V
6	12V	0V	12.0V	0.42V
7	12V	0V	12.0V	0.42V
8	12V	0V	12.0V	0.42V
9	12V	0V	12.0V	0.42V
10	12V	0V	12.0V	0.42V
11	12V	0V	12.0V	0.42V
12	12V	0V	12.0V	0.42V
13	12V	0V	12.0V	0.42V
14	12V	0V	12.0V	0.42V
15	12V	0V	12.0V	0.42V
16	12V	0V	12.0V	0.42V
17	12V	0V	12.0V	0.42V
18	12V	0V	12.0V	0.42V
19	12V	0V	12.0V	0.42V
20	12V	0V	12.0V	0.42V
21	12V	0V	12.0V	0.42V
22	12V	0V	12.0V	0.42V
23	12V	0V	12.0V	0.42V
24	12V	0V	12.0V	0.42V



P806 LVDS to Panel												P805 LVDS to Panel											
PIN	LABEL	RUN	PIN	LABEL	RUN	PIN	LABEL	RUN	PIN	LABEL	RUN	PIN	LABEL	RUN	PIN	LABEL	RUN						
1	GND	GND	28	GND	GND	54	V14	3.75V	2	VDD (16V)	16V	28	V15	11.81V	54	RLMVPCK	1.19V						
2	LLMVP	1.25V	29	LLMVP	1.25V	55	V15	11.81V	3	VDD (16V)	16V	29	V16	11.81V	55	RLMVPCK	1.19V						
3	LLMVP	1.24V	30	LLMVP	1.25V	56	V16	0.27V	4	VCC (3.3V)	3.4V	30	V17	8.33V	56	RLMVP	1.24V						
4	LLMVP	1.18V	31	LLMVP	1.18V	57	V17	0.26V	5	VCC (3.3V)	3.4V	31	V10	7.71V	57	RLMVP	1.18V						
5	LLMVP	1.3V	32	LLMVP	1.26V	58	V18	0.26V	6	VCC (3.3V)	3.4V	32	V12	3.37V	58	RLMVP	1.26V						
6	LLMVP	1.25V	33	LLMVP	1.25V	59	V19	0.26V	7	VDD (16V)	16V	33	V13	11.81V	59	RLMVP	1.24V						
7	LLMVP	1.29V	34	LLMVP	1.25V	60	Z	0.0V	8	HVDD (8V)	8.2V	34	V14	3.75V	60	RLMVP	1.22V						
8	GND	GND	35	GND	GND	61	Z_OUT	8V	9	HVDD (8V)	8.2V	35	V15	2.68V	61	RLMVP	1.22V						
9	LLMVPCK	1.22V	36	OPT	N	3.53V	62	GND	10	GND	GND	36	V16	0.17V	62	RLMVP	1.23V						
10	LLMVPCK	1.23V	37	GSP	0.0V	63	VCOMLFB	0.0V	11	VOL(-V)	0.0V	37	V17	0.36V	63	RLMVP	1.23V						
11	LLMVPCK	1.23V	38	GSP	0.0V	64	VCOMLFB	0.0V	12	VOL(-V)	0.0V	38	V18	0.36V	64	RLMVP	1.23V						
12	LLMVP	1.18V	39	POL	1.66V	65	GND	GND	13	GND	GND	39	V19	0.36V	65	RLMVP	1.23V						
13	LLMVP	1.26V	40	GND	0.26V	66	VGH (28V)	25.8V	14	GOE	0.83V	40	GSP	0.0V	66	RLMVP	1.25V						
14	LLMVP	1.25V	41	SCS	0.26V	67	VGH (28V)	25.8V	15	GOE	0.83V	41	GSP	0.0V	67	RLMVP	1.25V						
15	LLMVP	1.27V	42	GND	0.26V	68	GSC	0.26V	16	GND	GND	42	GND	0.26V	68	RLMVP	1.25V						
16	LLMVP	1.16V	43	V1	15.75V	69	GOE	0.83V	17	VGH (28V)	25.6V	43	SOE	R	0.25V	69	RLMVP	1.19V					
17	LLMVP	1.26V	44	V2	15.75V	70	V1	15.75V	18	VGH (28V)	25.6V	44	H_CONV	0.44V	70	RLMVP	1.25V						
18	LLMVP	1.17V	45	V3	15.75V	71	VGH (28V)	25.6V	19	VCOMRFB	0.0V	45	GND	0.26V	71	RLMVP	1.19V						
19	LLMVP	1.17V	46	V4	12.22V	72	GND	GND	20	VCOMRFB	0.0V	46	GND	0.26V	72	RLMVP	1.19V						
20	RLMVP	1.28V	47	V5	11.07V	73	HVDD (8V)	8.2V	21	GND	GND	47	RLMVP	0.15V	73	GND	GND						
21	RLMVP	1.15V	48	V6	11.07V	74	Z_OUT	8V	22	Z_OUT	8V	48	RLMVP	0.17V	74	RLMVP	1.13V						
22	RLMVP	1.26V	49	V7	10.27V	75	V1	15.75V	23	V1	15.75V	49	RLMVP	0.17V	75	RLMVP	1.13V						
23	RLMVP	1.17V	50	V8	8.33V	76	VCC (3.3V)	3.4V	24	V1	15.75V	50	RLMVP	1.23V	76	RLMVP	1.11V						
24	RLMVP	1.27V	51	V9	8.33V	77	VCC (3.3V)	3.4V	25	V2	15.75V	51	RLMVP	1.14V	77	RLMVP	1.12V						
25	GND	GND	52	V12	GND	78	GND	GND	26	V3	15.75V	52	RLMVP	1.22V	78	RLMVP	1.12V						
26	RLMVPCK	1.21V	53	V13	4.94V	79	VDD (16V)	16V	27	V4	15.75V	53	RLMVP	1.22V	79	RLMVP	1.12V						
27	RLMVPCK	1.23V	54	V14	3.75V	80	VDD (16V)	16V	28	V5	12.2V	54	RLMVP	1.22V	80	RLMVP	1.12V						



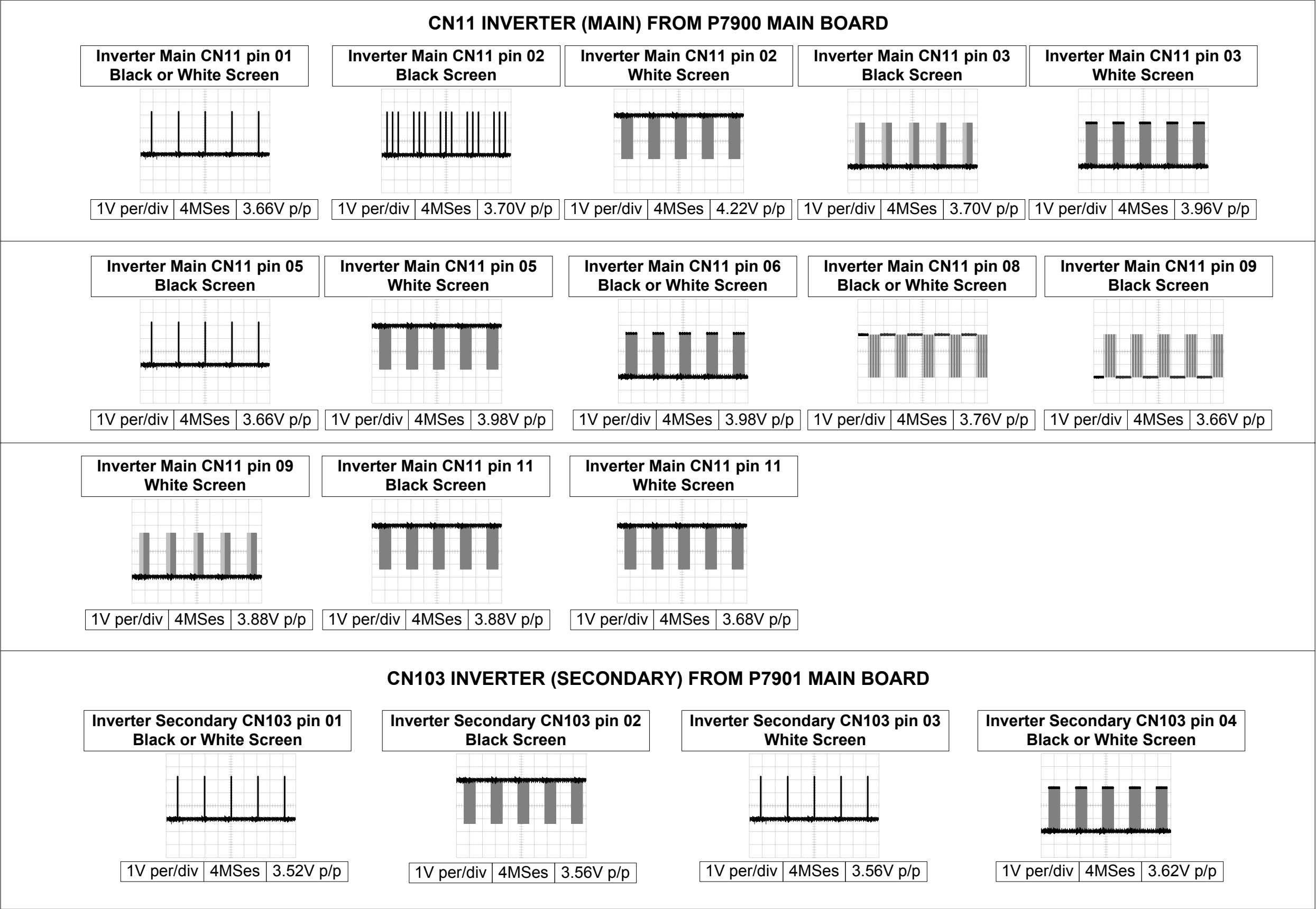
SMPS TEST 1: To Force Power Supply On. Disconnect P8000 on Main board. (A) Jump pins 9, 10, 11 or 12 (3.5V) to pin 1. (Test Voltage Outputs 12V, 24V to Main and 24V to both Inverters). Remove AC power. Leave the jumper in place.

SMPS TEST 2: (B) Jump pins 9, 10, 11 or 12 (3.5V) to pin 18 (INV-ON). Apply AC power, the Backlights should turn on.

Note: If Inverter Main or Secondary is loading down 24V, each Inverter can be run separately. Remove AC and Disconnect P204. When AC is reapplied, the Backlight LEDs on the Right (Back View) should turn on. Remove AC and Disconnect P205 and reinstall P204. When AC is reapplied, the Backlight LEDs on the Left (Back View) should turn on.

Label	Run	Diode Check	Label	Run	Diode Check	Label	Run	Diode Check
PANEL_VCC	11.89V	Open	RRXA4	1.20V	1.67V	RRXA4	1.20V	1.67V
PANEL_VCC	11.89V	Open	RRXA5	1.19V	1.67V	RRXA5	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA6	1.19V	1.67V	RRXA6	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA7	1.19V	1.67V	RRXA7	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA8	1.19V	1.67V	RRXA8	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA9	1.19V	1.67V	RRXA9	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA10	1.19V	1.67V	RRXA10	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA11	1.19V	1.67V	RRXA11	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA12	1.19V	1.67V	RRXA12	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA13	1.19V	1.67V	RRXA13	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA14	1.19V	1.67V	RRXA14	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA15	1.19V	1.67V	RRXA15	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA16	1.19V	1.67V	RRXA16	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA17	1.19V	1.67V	RRXA17	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA18	1.19V	1.67V	RRXA18	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA19	1.19V	1.67V	RRXA19	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA20	1.19V	1.67V	RRXA20	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA21	1.19V	1.67V	RRXA21	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA22	1.19V	1.67V	RRXA22	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA23	1.19V	1.67V	RRXA23	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA24	1.19V	1.67V	RRXA24	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA25	1.19V	1.67V	RRXA25	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA26	1.19V	1.67V	RRXA26	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA27	1.19V	1.67V	RRXA27	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA28	1.19V	1.67V	RRXA28	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA29	1.19V	1.67V	RRXA29	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA30	1.19V	1.67V	RRXA30	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA31	1.19V	1.67V	RRXA31	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA32	1.19V	1.67V	RRXA32	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA33	1.19V	1.67V	RRXA33	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA34	1.19V	1.67V	RRXA34	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA35	1.19V	1.67V	RRXA35	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA36	1.19V	1.67V	RRXA36	1.19V	1.67V
PANEL_VCC	11.89V	Open	RRXA37	1.19V	1.67V			

42LE8500 Inverter Main and Secondary Local Dimming Control Signals Waveforms



47LX9500 MAIN (FRONT SIDE) SIMICONDUCTORS

IC300

Earphone Amp

Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V (HP R Out)
[6]	3.3V
[7]	3.3V
[8]	(-1.8V)
[9]	(-0.88V)
[10]	Gnd
[11]	0.94V
[12]	1.83V
[13]	3.32V (Mute)
[14]	3.32V (B+)
[15]	Gnd
[16]	0V (HP L Out)

IC301

USB 2
5V

Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC302

USB 1
5V

Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC601

NVRAM

Pin	
[1]	n/c
[2]	0V
[3]	3.34V
[4]	Gnd
[5]	3.34V
[6]	0V
[7]	Gnd
[8]	3.34V (B+)

IC700

(+1.26V_TU)
Regulator

Pin	
[1]	0V (Gnd)
[2]	1.27V (Out)
[3]	3.32V (B+)

IC8000

5V Regulator
for USB

Pin	
[1]	11.75V (B+)
[2]	5.1V (Out)
[3]	5.1V (Out)
[4]	10.5V
[5]	3.3V
[6]	0.81V
[7]	5.06V
[8]	0V (Gnd)

IC8001

D1.2V and A1.2V
Regulator

Pin	
[1]	0V (Gnd)
[2]	3.3V
[3]	0V (Gnd)
[4]	1.27V
[5]	3.32V
[6]	n/c
[7]	4.48V
[8]	3.32V
[9]	3.32V
[10]	3.34V
[11]	1.28V
[12]	Gnd
[13]	3.3V
[14]	0.82V

IC8002

D1.8V
Regulator

Pin	
[1]	5V
[2]	3.35V (B+)
[3]	1.83V (Out)
[4]	Gnd
[5]	Gnd
[6]	2.36V
[7]	0.91V
[8]	1.05V
[9]	2.4V
[10]	3.37V (PWR On/Off1 Ctl)

IC8003

(+5V_NORMAL)
Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.86V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	5.17V (In)
[8]	5.17V (In)

IC8004

A2.5V Regulator
for USB

Pin	
[1]	n/c
[2]	3.26V (B+)
[3]	3.26V (B+)
[4]	n/c
[5]	n/c
[6]	2.57V (Out)
[7]	0.83V
[8]	Gnd

IC8005

(+3.3V_NORMAL)
And D3.3V Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.89V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	3.36V (Out)
[8]	3.36V (Out)

IC8007

Power Det Gen
(+12V and +3.5V)

Pin	
[1]	Gnd
[2]	3.6V (B+)
[3]	3.5V (Out)

IC8008

Power Det Gen
(+24V)

Pin	
[1]	Gnd
[2]	3.64V (B+)
[3]	3.76V (Out)

IC8800

(+1.8V_AMP)
Regulator

Pin	
[1]	Gnd
[2]	1.8V (Out)
[3]	3.3V (B+)

Q8700

Wireless PWR
Turns on Q8701

Dongle In	
B	0.66V (0.0V w/Dongle In)
C	0.14V (24V w/Dongle In)
E	Gnd

IC9702

(+1.8V_L/Dimming)
Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V (FB)
[5]	0.77V
[6]	3.34V
[7]	3.32V (Out)
[8]	3.34V (Out)

IC9703

EEPROM
for LG5111

Pin	
[1]	Gnd
[2]	3.34V
[3]	Gnd
[4]	Gnd
[5]	3.34V
[6]	3.34V
[7]	3.32V
[8]	3.34V (B+)

Q308

Headphone
Mute

Pin	
B	0V
C	3.32V
E	Gnd

Q2200

LOGO
Driver

Pin	
B	0.36V
C	0.66V
E	Gnd

Q8001

PANEL_VCC
Control 1st Driver

Pin	
B	0V
C	0.68V
E	Gnd

Q8700

Wireless PWR
Turns on Q8701

Dongle Out	
B	0V (0.0V w/Dongle Out)
C	24.6V (24V w/Dongle Out)
E	Gnd

Q8003

PANEL_VCC
Control 2nd Driver

Pin	
B	0.66V
C	0V
E	Gnd

Q8004

PANEL_VCC
Switch

Pin	
S	11.62V (In)
G	1.8V (Enable)
D	11.8V (Out)

Q8005

INV_ON
Driver

Pin	
B	0V (INV ON) En
C	2.97V (Out)
E	Gnd

Q8200

IR Buffer
2nd

Pin	
B	0.56V
C	0V
E	Gnd

Q8201

IR Buffer
1st

Pin	
B	0V
C	3.36V
E	Gnd

Q8307

Side HDMI
Hot Swap

Pin	
B	0V
C	4.32V
E	Gnd

Q8800

AMP Mute to
AMP_MUTE1 IC8801

Pin	
B	0V
C	3.34V
E	Gnd

47LX9500 MAIN (BACK SIDE) SIMICONDUCTORS

IC602

D1.8V
Regulator

Pin	
[1]	0V (Gnd)
[2]	3.29V (PWR On/Off1 Ctl)
[3]	0.9V (DDR_VTT)
[4]	0.93V
[5]	1.83V
[6]	3.38V (In)
[7]	1.8V (Out)
[8]	0.91V (DDR_VTT)

IC8100

EEPROM
Micro

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	0V (Gnd)
[8]	3.37V

IC8200

RS232
Routing

Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V
[6]	(-5.47V)
[7]	n/c (5.59V)
[8]	n/c (0V)
[9]	n/c (3.3V)
[10]	n/c (0.2V)
[11]	n/c (3.3V)
[12]	3.35V
[13]	0V
[14]	(-5.47V)
[15]	0V (Gnd)
[16]	3.37V

IC8400

RGB
H/V Sync

Pin	
[1]	1.9V
[2]	1.9V
[3]	4.4V
[4]	0V
[5]	0.9V
[6]	n/c (4.5V)
[7]	0V (Gnd)
[8]	n/c (4.5V)
[9]	n/c (1.9V)
[10]	n/c (1.9V)
[11]	n/c (4.5V)
[12]	0.9V
[13]	0.9V
[14]	5V

IC8401

EDID Data
PC

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	0V
[6]	4.1V
[7]	4.5V
[8]	4.5V (In)

IC8700

Wireless
Buffer

Pin	
[1]	0V (3.3V Dongle In)
[2]	3.3V (0.3V Dongle In)
[3]	n/c
[4]	n/c
[5]	n/c
[6]	Gnd
[7]	Gnd
[8]	Gnd
[9]	n/c
[10]	0.02V
[11]	0V
[12]	3.3V
[13]	0V (3.3V Dongle In)
[14]	3.3V
[15]	3.3V
[16]	3.3V

IC9000

Serial Flash
T-CON

Pin	
[1]	0.06V
[2]	0V (Gnd)
[3]	3.3V (In)
[4]	0V (Gnd)
[5]	0V
[6]	0.34V
[7]	3.31V (In)
[8]	3.34V (In)

IC9303

EEPROM
for LG5111

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	3.34V
[8]	3.37V (In)

Q200

(1.8V_HDMI)
Switch

Pin	
S	1.83V (Out)
G	3.35V (PWR On/Off2 Ctl)
D	1.83V (In)

Q701

Tuner SIF
(Sound) Buffer

Pin	
B	0.16V
C	Gnd
E	0.83V

Q702

Tuner Video
(Analog) Buffer

Pin	
B	2.05V
C	2.75V
E	Gnd

Q901

FLASH_WP
for IC901

Pin	
B	0V (Flash_WP)
C	3.36V
E	Gnd

Q8000

RL_ON (PWR_On)
1st Driver

Pin	
B	0.66V
C	0V
E	Gnd

Q8002

PWR_ON
Switch

Pin	
[1]	3.36V (In)
[2]	0V
[3]	3.3V (Out)

Q8203

IR Wireless Pass
2nd Driver

Pin	
B	0V
C	3.3V
E	Gnd

Q8205

IR Wireless Pass
1st Driver

Pin	
B	0.6V
C	0V
E	Gnd

Q8300,1,2,6

HDMI 2
Det

Pin	
B	4.2V
C	0V
E	Gnd

Q8303,4,5,7

HDMI 3
Det

Pin	
B	0V
C	4.2V
E	Gnd

Q8308

CEC Remote
HDMI CEC

Pin	
[B]	2.72V
[G]	2.73V
[S]	3.27V
[D]	3.37V

D8312

3.5V Pull Up
HDMI CEC


Pin	
A1	0V
C	3.26V
A2	3.2V


D8306,7,9,10


5V Pull Up Routing
HDMI SCL/SDA


Pin	
A1	5.04V
C	4.58V
A2	0V


47LX9500 T-CON/3D Component Voltages


IC202  1) Gnd
2) 3.2V
3) 0.09V
+1.8V 4) 0.09V
DDR 5) 1.8V
Reg 6) 3.34V
7) 1.18V
8) 0.89V


IC203  1) Gnd
2) 3.27V
3) 0.89V
+1.8V 4) 0.9V
DDRS 5) 1.8V
Reg 6) 3.34V
7) 1.8V
8) 0.9V


IC301  1) 11.41V
2) 3.35V
3) 3.35V
+3.3V 4) 8.77V
Reg 5) 3.11V
6) 0.81V
7) 5.02V
8) Gnd


IC302  1) 0.8V
2) Gnd
3) 3.33V
+1.0V 4) 4.26V
VDC 5) 3.3V
Reg 6) 1.08V
7) 1.08V
8) 3.0V


IC304  1) 0.75V
2) 5.0V
3) Gnd
+2.5V 4) 0V
VQ 5) 2.5V
Reg 6) 5.0V
7) 7.55V
8) 11.36V
9) 11.36V
10) 11.36V
11) 11.36V
12) 2.55V
13) Gnd
14) Gnd
15) 2.55V
16) Gnd
17) Gnd
18) Gnd
19) Gnd
20) 2.5V
21) 2.5V
22) n/c
23) 0V
24) 2.5V
25) n/c
26) Gnd
27) 1.13V
28) 10.99V


IC305  1) 0.8V
2) Gnd
3) 3.32V
1V2 4) 4.32V
Reg 5) 3.3V
6) 1.22V
7) 1.22V
8) 2.98V


IC306  1) n/c
2) 2.5V
3) 2.51V
1V2 4) n/c
Reg 5) n/c
6) 1.81V
7) 0.81V
8) Gnd


IC307  1) n/c
2) 2.49V
3) 2.51V
+1.8V 4) n/c
DDR 5) n/c
Reg 6) 1.81V
7) 0.81V
8) Gnd


IC308  1) n/c
2) 2.47V
3) 2.49V
+1.8V 4) n/c
DDRS 5) n/c
Reg 6) 1.8V
7) 0.8V
8) Gnd


IC309  1) Gnd
2) 3.26V
3) 0.89V
DDR 4) 0.9V
VTT 5) 1.8V
Reg 6) 3.34V
7) 1.8V
8) 0.9V


IC310  1) 11.41V
2) 2.53V
3) 2.53V
2V5 4) 7.97V
Reg 5) 3.11V
6) 0.8V
7) 5.07V
8) Gnd


IC600  DC-DC
Conv 1) 5.96V 25) 11.38V
2) 6.03V 26) 11.38V
3) 3.15V 27) 11.07V
4) 0.17V 28) 0V
5) 2.72V 29) 4.24V
6) 3.3V 30) 1.9V
7) 0V 31) 0.59V
8) 25.6V 32) 3.3V
9) 24.7V 33) 3.13V
10) 1.26V 34) 0V
11) Gnd 35) 0V
12) 5.54V 36) 0V
13) 0V 37) 11.33V
14) 0V 38) 11.37V
15) Gnd 39) n/c
16) 0V 40) n/c
17) 1.26V 41) 1.27V
18) 4.24V 42) 16V
19) Gnd 43) 5.96V
20) Gnd 44) 5.96V
21) 1.27V 45) 5.96V
22) 11.45V 46) 5.96V
23) 3.4V 47) Gnd
24) 3.4V 48) 5.97V


DC-DC IC700 For +3.3V
Conv TCON  13) Gnd
1) 0.59V 14) 3.6V
2) 3.3V 15) 0.12V
3) 3.3V 16) 5.21V
4) 0V 17) 0.6V
5) 4.26V 18) 1.13V
6) Gnd 19) 1.18V
7) 1.8V 20) Gnd
8) 7V 21) 11.4V
9) 2.7V 22) 0.56V
10) 4.78V 23) 0.81V
11) 8.47V 24) 0.9V
12) 3.33V


IC701  1) Gnd
2) 11.68V
DC-DC 3) 5.26V
Conv 4) 0.73V
For 5) 0.58V
HVDD 6) 1.97V
7) 0.59V
8) 1.20V
9) Gnd
10) 5.20V
11) 1.40V
12) 13.1V
13) 8.10V
14) 11.68V


IC801  1) 8.01V
2) 15.7V
3) 15.7V
Data 4) 14.05V
Buffer 5) 13.35V
6) 12.27V
7) 11.07V
8) Gnd
9) 16.02V
10) 10.28V
11) 8.31V
12) 7.72V
13) 3.33V
14) 3.33V
15) 3.33V
16) Gnd
17) 0V
18) Gnd
19) 4.94V
20) 3.75V
21) 2.67V
22) 16.02V
23) 0V
24) Gnd
25) 0.27V
26) 0.27V
27) 0.25V
28) 5.96V


Q803  B) 2.52V
E) 2.52V
C) 2.27V


Q804  B) 2.52V
E) 2.52V
C) 2.27V


Q906  B) 0.61V
E) Gnd
C) 0.03V


Q907  B) 0.0V
E) Gnd
C) 1.9V


Q1001  B) 0V
E) Gnd
C) 1.97V


Q1002  B) 0.6V
E) Gnd
C) 0.02V


Q1003  B) 0.59V
E) Gnd
C) 0.02V

Q1004  B) 0.02V
E) Gnd
C) 3.33V

Q700  1) Gnd
2) 3.26V
3) 3.33V
+3.3V 4) 4.79V
TCON 5) 11.42V
Reg 6) 11.42V
7) 3.34V
8) 3.34V

Q701  1) Gnd
2) 1.42V
3) 8.16V
+8.2V 4) 11.7V
HVDD 5) 11.42V
Reg 6) 11.42V
7) 8.2V
8) 8.2V

Q702  1) Gnd
2) 4.27V
3) 1.89V
+1.8V 4) 2.72V
TCON 5) 11.41V
Reg 6) 11.41V
7) 0V
8) 1.89V

D600  A1) 16V
A2) 25.6V
C) 20.68V

55LW5700 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%, 3.3V. Follow the P-DIM signal all the way to the Inverter.
2nd: Turn off Local Dimming in the Customers Menu or unplug P832. 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 12 blocks functionality by grounding the return path signal (V1~V4) through a 220Ω, providing the 63V LED Power is present. See "LED Single Block Test" instructions below.

P202 White Plug "SMPS Board" To "Panel LEDs"

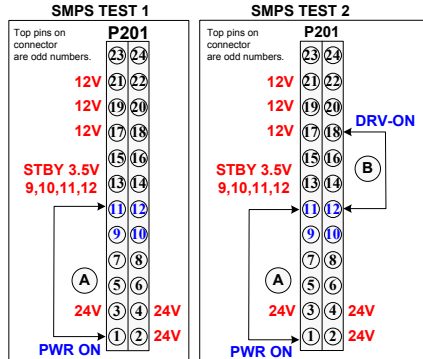
Pin	Label	TP	Run	Diode
1	LED+	C256+	63V	OL
2	n/c	n/c	n/c	OL
3	VC-3A	EL70	*1.59V~18V	OL
4	VC-3B	EL71	*1.59V~18V	OL
5	VC-3C	EL72	*1.59V~18V	OL
6	VC-3D	EL73	*1.59V~18V	OL
7	VC-4A	EL74	*1.59V~18V	OL
8	VC-4B	EL75	*1.59V~18V	OL
9	VC-4C	EL76	*1.59V~18V	OL
10	VC-4D	EL77	*1.59V~18V	OL
11	n/c	n/c	n/c	OL
12	LED+	C256+	63V	OL

*White to Black screen























P203 Black Plug "SMPS Board" To "Panel LEDs"

Pin	Label	TP	Run	Diode
1	LED+	C256+	63V	OL
2	n/c	n/a	n/c	OL
3	VC-1A	EL62	*1.59V~18V	OL
4	VC-1B	EL63	*1.59V~18V	OL
5	VC-1C	EL64	*1.59V~18V	OL
6	VC-1D	EL65	*1.59V~18V	OL
7	n/c	n/a	n/c	OL
8	VC-2A	EL66	*1.59V~18V	OL
9	VC-2B	EL67	*1.59V~18V	OL
10	VC-2C	EL68	*1.59V~18V	OL
11	VC-2D	EL69	*1.59V~18V	OL
12	n/c	n/a	n/c	OL
13	LED+	C256+	63V	OL

























*White to Black screen



55LW5700 MAIN (FRONT SIDE) SIMICONDUCTORS

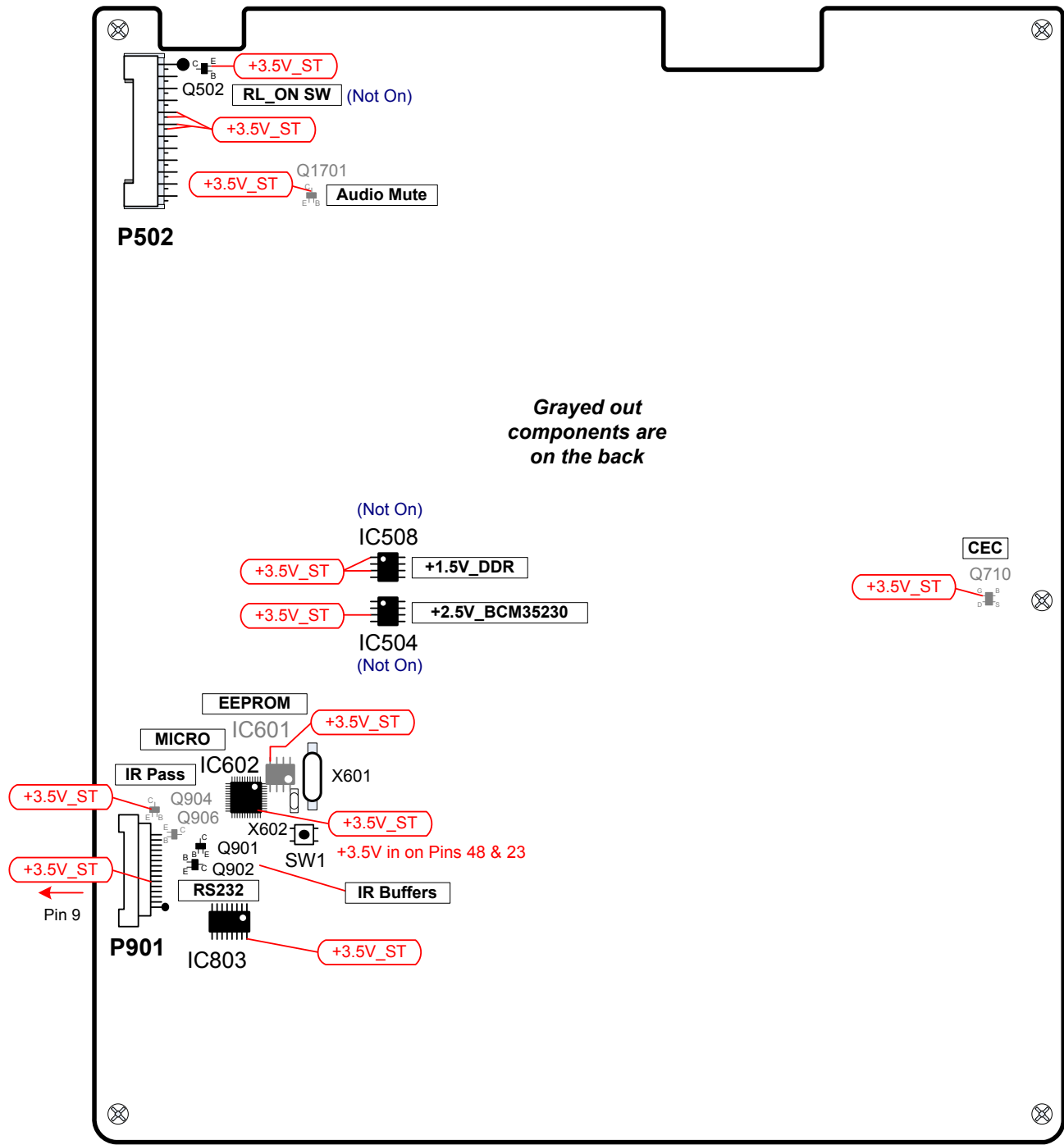
IC103 	Pin [1] n/c [2] 0V [3] 3.34V [4] 0V [5] 3.22V [6] 3.22V [7] 0V (Gnd) [8] 3.34V	NVRAM for USB	IC505 	Pin [1] 0V (Gnd) [2] 11.96V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.79V [6] 3.47V (PWR On/Off2_2) [7] 3.35V (Out) [8] 3.35V (Out)	(+3.3V_NORMAL) Regulator	IC508 	Pin [1] 3.46V [2] n/c [3] 3.46V (In) [4] 3.49V (PWR On/Off1) [5] 0V (Gnd) [6] 3.31V [7] 0.79V [8] 1.5V (Out)	(+1.5V_DDR) Regulator	IC802 	Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.73V [6] 4.73V [7] 4.73V [8] 4.73V (Vcc In)	EDID Data PC	IC1203 	Pin [1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl2) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V)	EDID Data PC	IC5401 	Pin [1] 0V (Gnd) [2] 11.85V (Vcc In) [3] 0V (Gnd) [4] 0.8V (FB) [5] 0.7V [6] 3.29V (Enable) [7] 1.29V (Out) [8] 1.29V (Out)	(+1.26V_FRC) Regulator	Q503 	Pin [1] 0.95V [2] 0.95V [3] 0.95V [4] 1.36V [5] 11.96V [6] 11.96V [7] 11.96V [8] 11.96V	0.9V FET Switch	Q1001 	Pin B 0.02V C 24.5V E Gnd On when wireless dongle connected	Wireless Vcc Driver
IC501 	Pin [1] 3.17V [2] 0.59V [3] 0.44V [4] 11.95V [5] 0V [6] 5.33V [7] 4.6V [8] 5.81V [9] 0.95V [10] 1.36V	+0.9V_CORE DC to DC	IC506 	Pin [1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out)	Switched 5V for USB 2	IC801 	Pin [1] 1.81V [2] 1.81V [3] 3.72V [4] 1.8V [5] 1.8V [6] n/c (4.44V) [7] 0V (Gnd) [8] n/c (4.43V) [9] n/c (1.79V) [10] n/c (1.79V) [11] 3.72V [12] 1.81V [13] 1.81V [14] 5V (Vcc In)	RGB Data Buffer	IC803 	Pin [1] 3.5V [2] 5.64V [3] 0V [4] 0V [5] (-5.56V) [6] (-5.59V) [7] n/c (5.64V) [8] n/c (0V) [9] n/c (3.49V) [10] n/c (0V) [11] n/c (3.34V) [12] 3.48V [13] 0V [14] (-5.59V) [15] 0V (Gnd) [16] 3.5V (Vcc In)	RS232 Routing	IC1204 	Pin [1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl1) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V)	EDID Data PC	IC5402 	Pin [1] Under Shield [2] Under Shield [3] Under Shield [4] Under Shield [5] 0.8V [6] 3.45 (PWR On/Off2_2) [7] 3.3V [8] 3.3V	(+3.3V_FRC) Regulator	Q508 	Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 4.6V [5] 0.95V [6] 0.95V [7] 0.95V [8] 0.95V	0.9V FET Switch	Q1002 	Pin S 24.5V G 24.5V D 0V On when wireless dongle connected	Wireless Vcc Switch
IC504 	Pin [1] n/c [2] 4.92V (En) [3] 3.47V (In) [4] 3.49V (Ctl) [5] n/c [6] 2.57V (Out) [7] 0.6V [8] 0V (Gnd)	+2.5V BCM Regulator	IC507 	Pin [1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out)	(+5V_NORMAL) Regulator	Q501 	Pin B 0.64V C 0V E Gnd	RL_ON (PWR_On) 1st Driver	Q502 	Pin [1] 3.5V (In) [2] 0.67V [3] 2.62V (Out)	PWR_ON Switch	Q901 	Pin B 0.02V C 3.48V E Gnd	IR Buffer 2nd	Q902 	Pin B 0.57V C 0.02V E Gnd	IR Buffer 1st						

55LW5700 MAIN (BACK SIDE) SIMICONDUCTORS

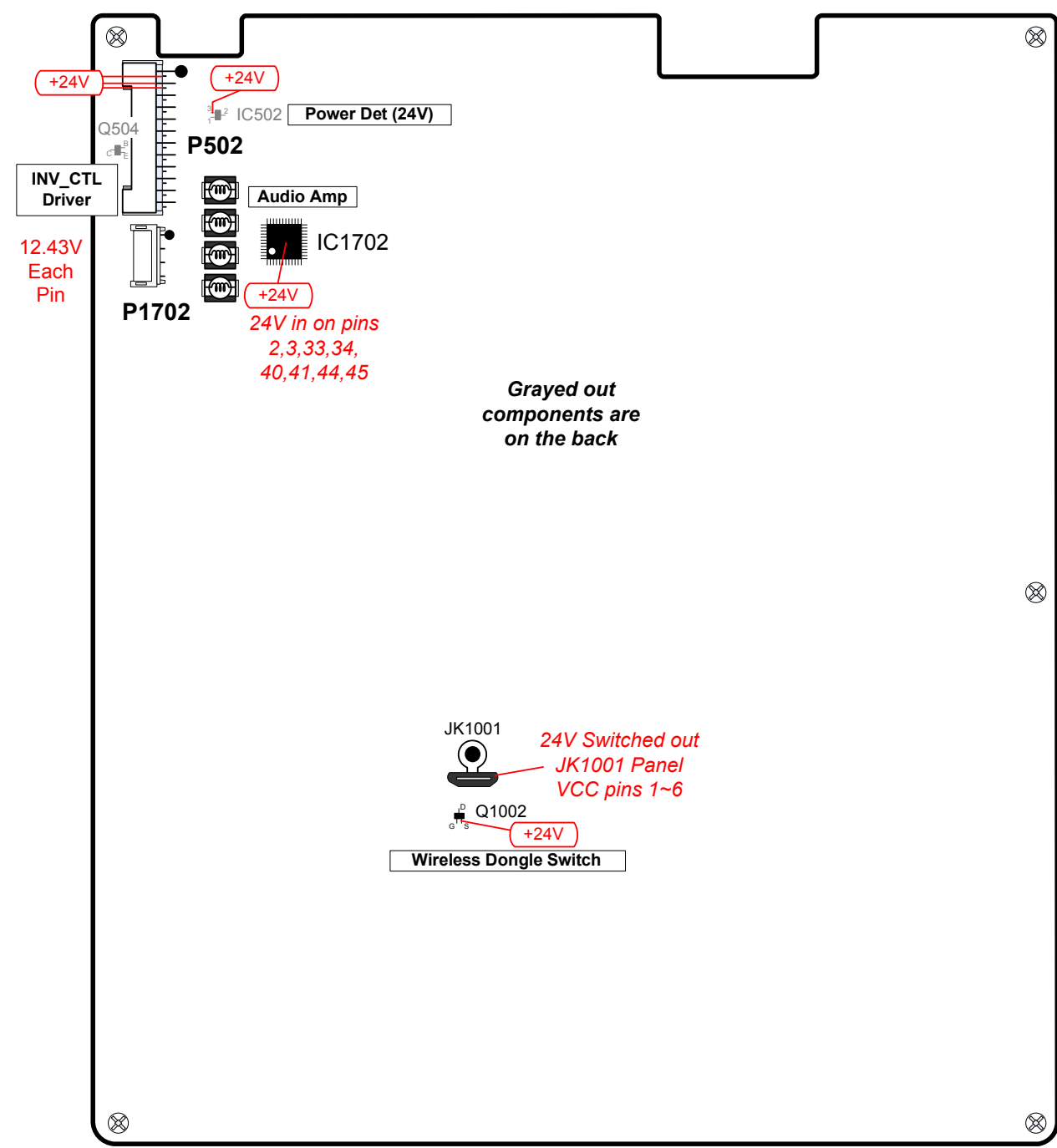
IC502  Pin [1] 0V (Gnd) [2] 3.8V (In) [3] 3.73V (Out)	Power Det Gen (For +12V)	IC5202  Pin [1] 0.43V [2] 3.29V [3] 3.29V [4] 0V (Gnd) [5] ?? [6] ?? [7] 3.29V [8] 3.29V (3.3V_FRC in)	SPI FLASH	Q101  Pin [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V	RGB_DDC_SDA FET Buffer	Q710  Pin [B] 3.47V [G] 3.51V [S] 3.47V [D] 3.49V	CEC Remote HDMI CEC	Q2104  Pin B 0.23V C 0V (Gnd) E 0.93V	Tuner SIF (Sound) Buffer	D707  Pin A1 4.96V C 5V A2 0V	5V Pull-Up to DDC_SCL/SDA_1	D713  Pin A1 0V C 3.45V A2 3.5V	Bias for Q710 HDMI CEC
IC503  Pin [1] 0V (Gnd) [2] 3.7V (In) [3] 3.73V (Out)	Power Det Gen (For +24V)	Q506  Pin B 0.67V C 0V E Gnd	PANEL_VCC Control 2nd Driver	Q102  Pin [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V	RGB_DDC_SCL FET Buffer	Q801  Pin B 0V C 3.35V E Gnd	Earphone Mute	Q2106  Pin B 3.67V C 0V (Gnd) E 4.35V	Tuner Video (Analog) Buffer	D708  Pin A1 4.96V C 5V A2 0V	5V Pull-Up to DDC_SCL/SDA_3	D810  Pin A1 4.73V C 5.01V A2 0.07V	5V Routing to IC802 RGB EDID
IC601  Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 3.49V [4] 0V (Gnd) [5] 3.49V [6] 3.49V [7] 0V (Gnd) [8] 3.50V (Vcc In)	EEPROM Micro	Q507  Pin S 11.97V (In) G 1.8V (Enable) D 11.94V (Out)	PANEL_VCC Switch	Q504  Pin B 0V (INV ON) En C 3.28V (Out) E Gnd	INV_CTL (Drv_On) Driver	Q904  Pin B 0.02V C 3.48V E Gnd	IR Wireless Pass 2nd Driver	Q5201  Pin B 0.11V C 3.33V E 0V (Gnd)	URSA Reset Driver	D710  Pin A1 4.96V C 5V A2 0V	5V Pull-Up to DDC_SCL/SDA_2	D711  Pin A1 4.96V C 5V A2 0V	5V Pull-Up to DDC_SCL/SDA_4
		Q505  Pin B 0V C 0.68V E Gnd	PANEL_VCC Control 1st Driver	Q906  Pin B 0.57V C 0V E Gnd	IR Wireless Pass 1st Driver	Q5202  Pin G 3.33V S 3.33V D 0V (Out)	URSA Reset						

55LW5700 Main Board Components on in (Stand_By 3.5V) and with (24V)

Components on by Stand_By 3.5V

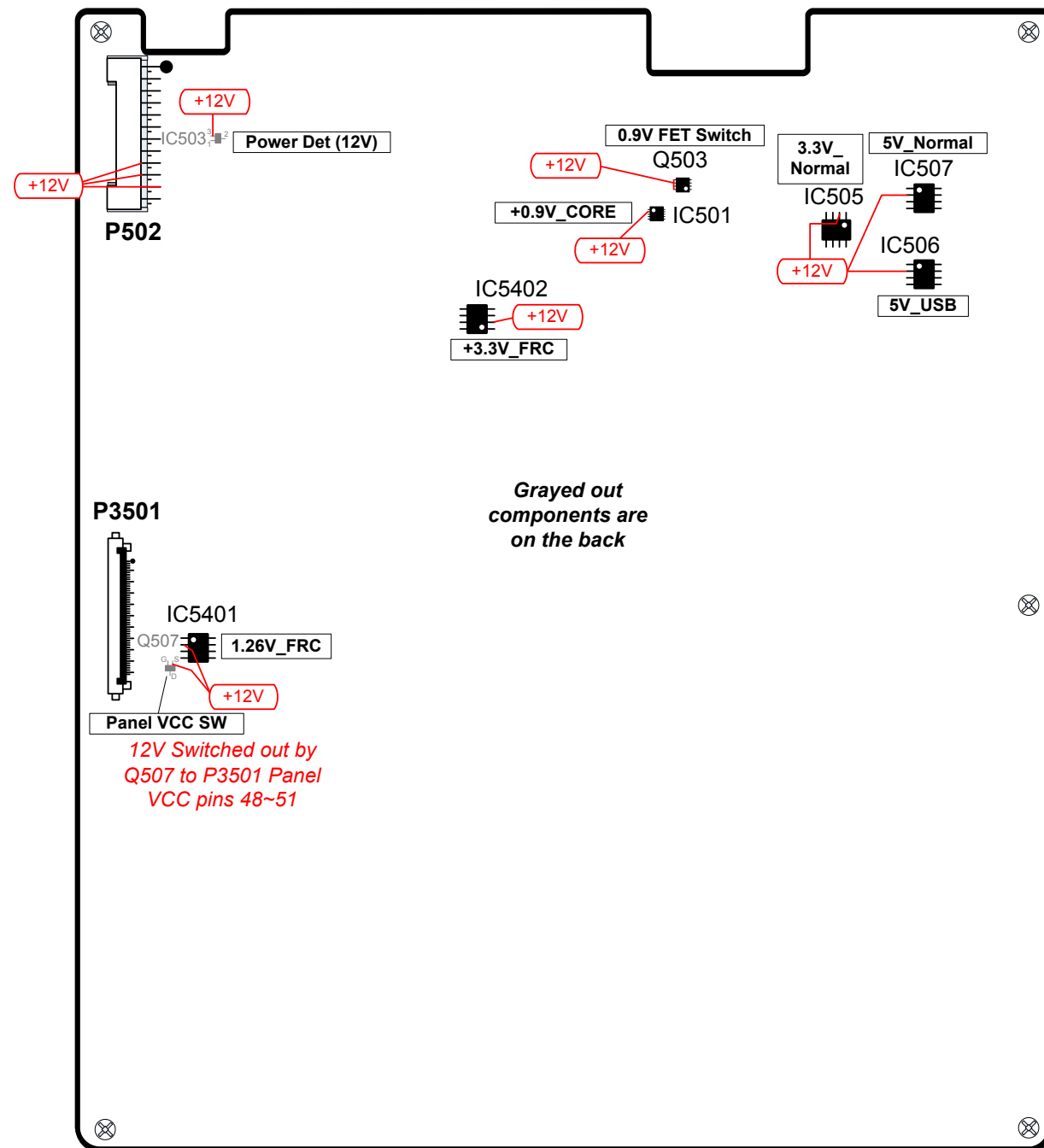


Components on by 24V

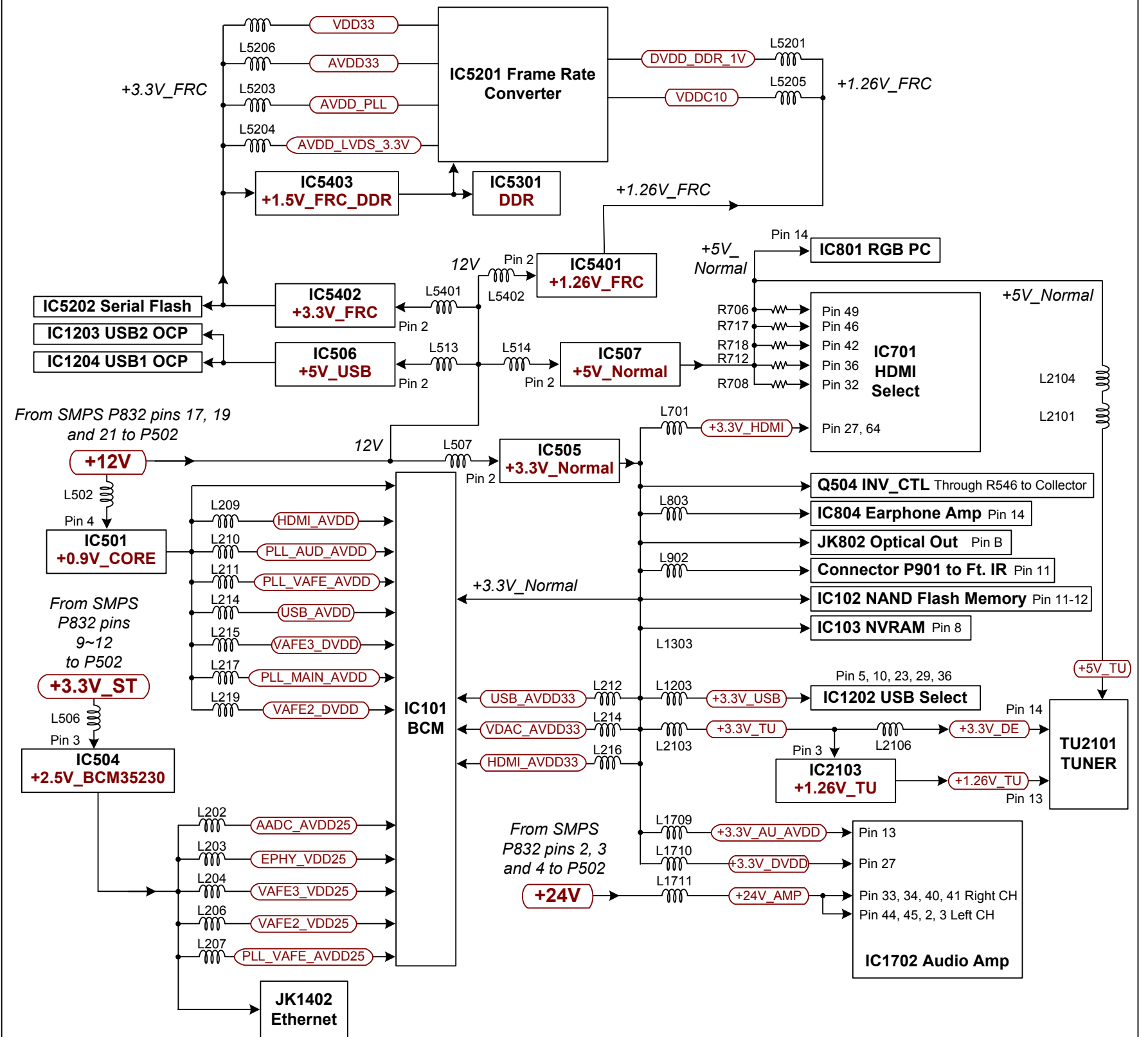


55LW5700 Main Board Components on with (12V) and Other Voltage Distributions

Components on by 12V



Other Voltage Distributions



B140XW02 V0 Cascade

Version

01

Resolution

1366x 3 x 768 @ 60Hz

XPCBA P/N

55.14B40.C01 TSMT

Source Driver P/N

UPD160977 46.S0642.009

Gate Driver P/N

NT39508 46.G0600.006

ASIC P/N

AUO-11102 U2 (ORISE)

LED Driver

MAX17105 (MAXIM)

PCB:

4v翠垂/8ms

翠垂:ZAU5304-LA

Power Voltage

AVDD = 8.76V

VGH = 24.2V

VGL = -6.2V

VCOM = 3.5V

Gamma Voltage

V1=8.62V

V8=4.421V

V2=8.43V

V9=2.982V

V3=7.11V

V10=2.302V

V4=6.628V

V11=1.874V

V5=6.295V

V12=1.308V

V6=5.776V

V13=0.232V

V7=4.723V

V14=0.151V



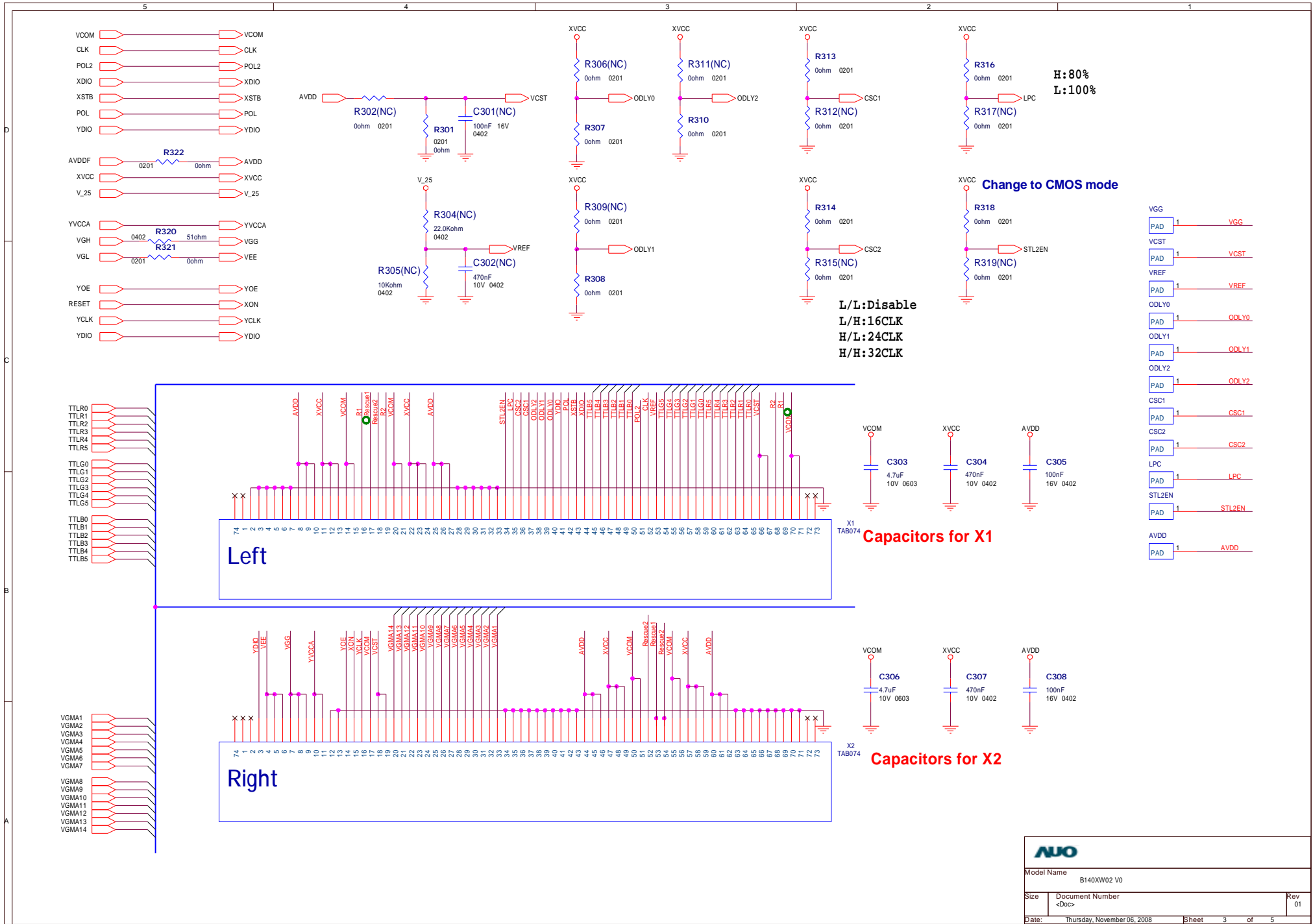
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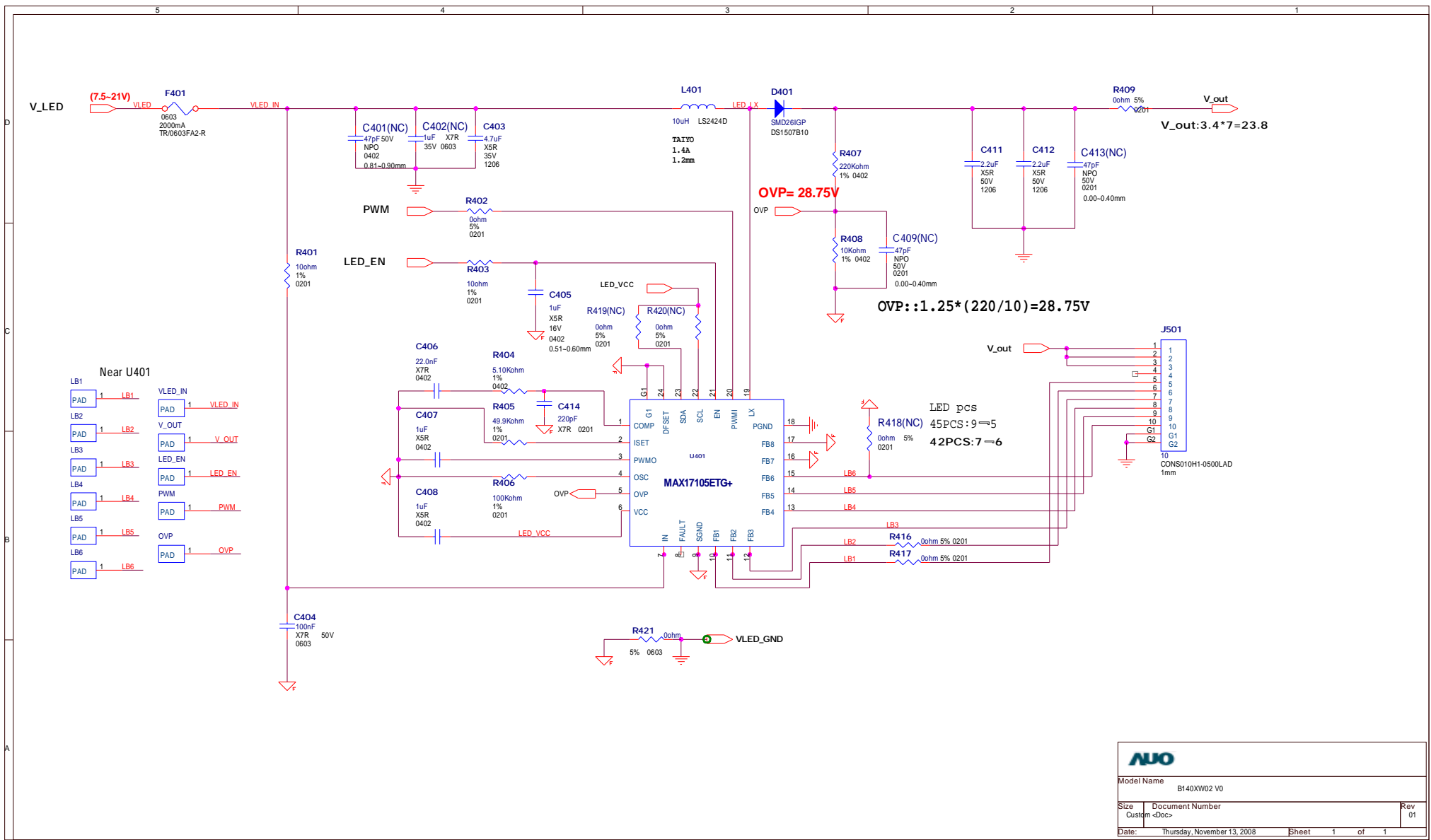
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Size

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Document Number





B156XW02 V2 XPCB Check List

Version

EC04

Resolution

HD 1366 x 3 x 768 @ 60Hz

TN mode, Normally White

4.0V 8ms LC:Merck LCT-08-446 (68.24500.013)

Gerber File name

***15B36-COM (48.15B36.COM)

4-Layer PCB, LED/PWM 2-GND

PCBA Part number

55.15B36.C23

Source Driver P/N

RM91120FD-0900 / 46.S0804.014

NT39951H-C02I5 / 46.S0804.013

Gate Driver P/N

RM76180FD-0910 / 46.G0600.019

NT39522H-C02I4 / 46.G0600.018

ASIC P/N

AUO-11305 K1

LED Driver P/N

MAX17105ETG+ / 05.17105.CH0

Power Voltage

AVDD = +8.72 V

VGH = +24 V

VGL = -6.2 V

VCOM = 3.0 V

Gamma Voltage

V1 = 8.651V V7 = 4.350 V

V2 = 8.393 V V6 = 3.263V

V3 = 6.785 V V8 = 2.214 V

V4 = 5.735 V V9 = 0.390 V

V5 = 4.648 V V10 = 0.132 V

Terminal Resistor for CLK Line

100 ohm

Terminal Resistor for Data Line

100 ohm

2009/09/18

< EC04 >

<Core Design>

AUO

Model Name

B156XW02 V2

Size

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Document Number

Rev

EC04

Date:

Friday, September 18, 2009

Sheet

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6

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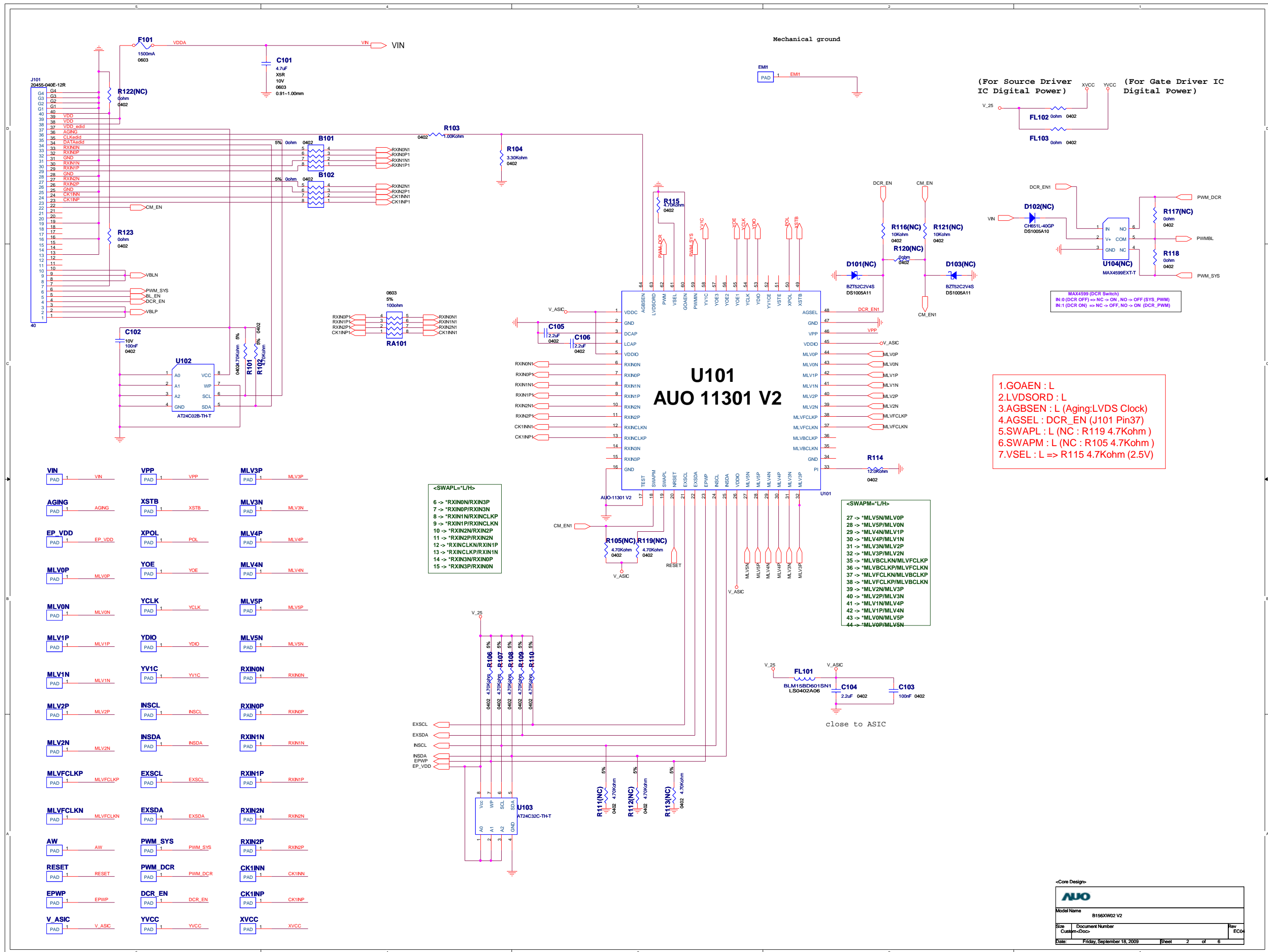


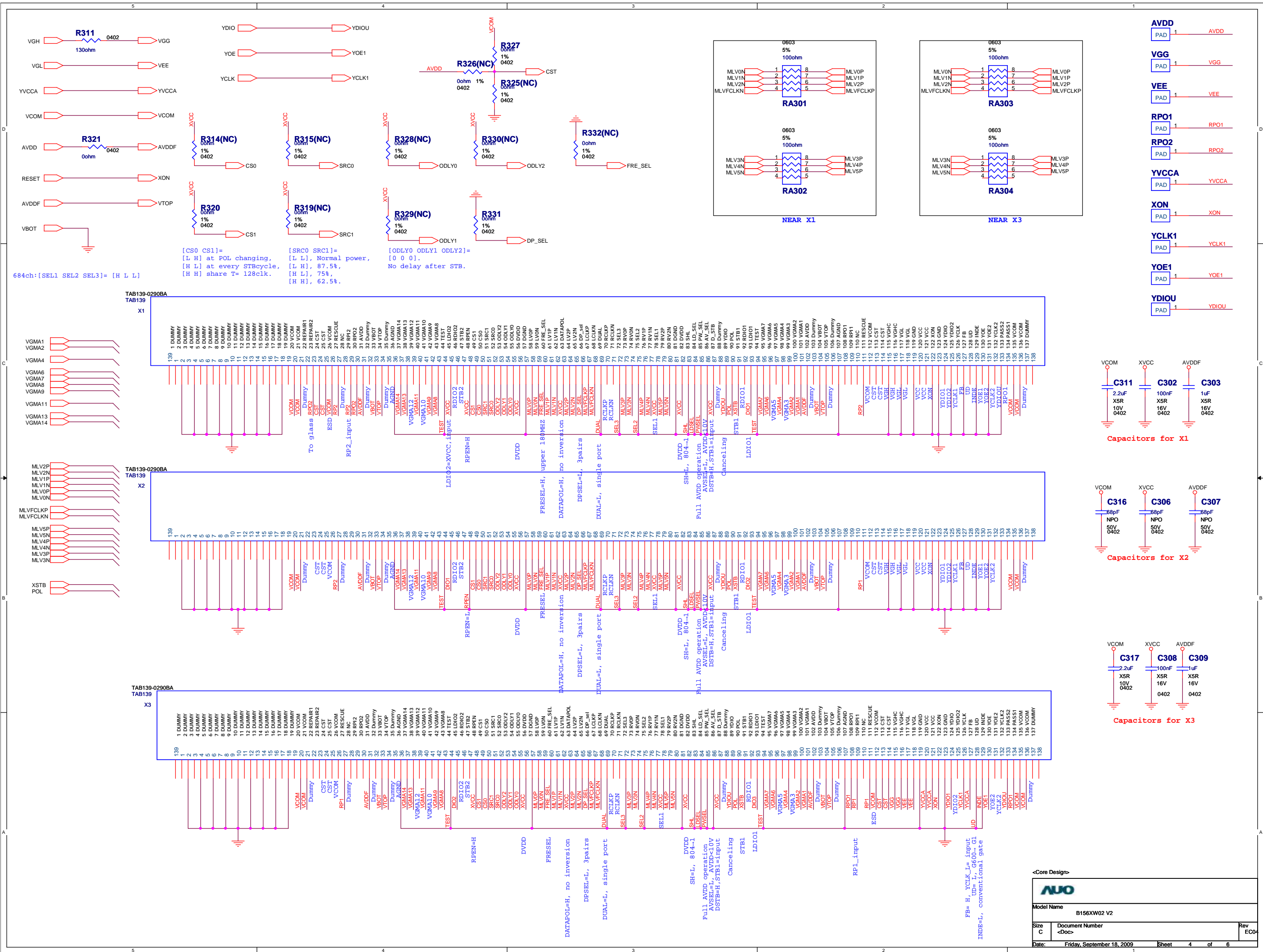
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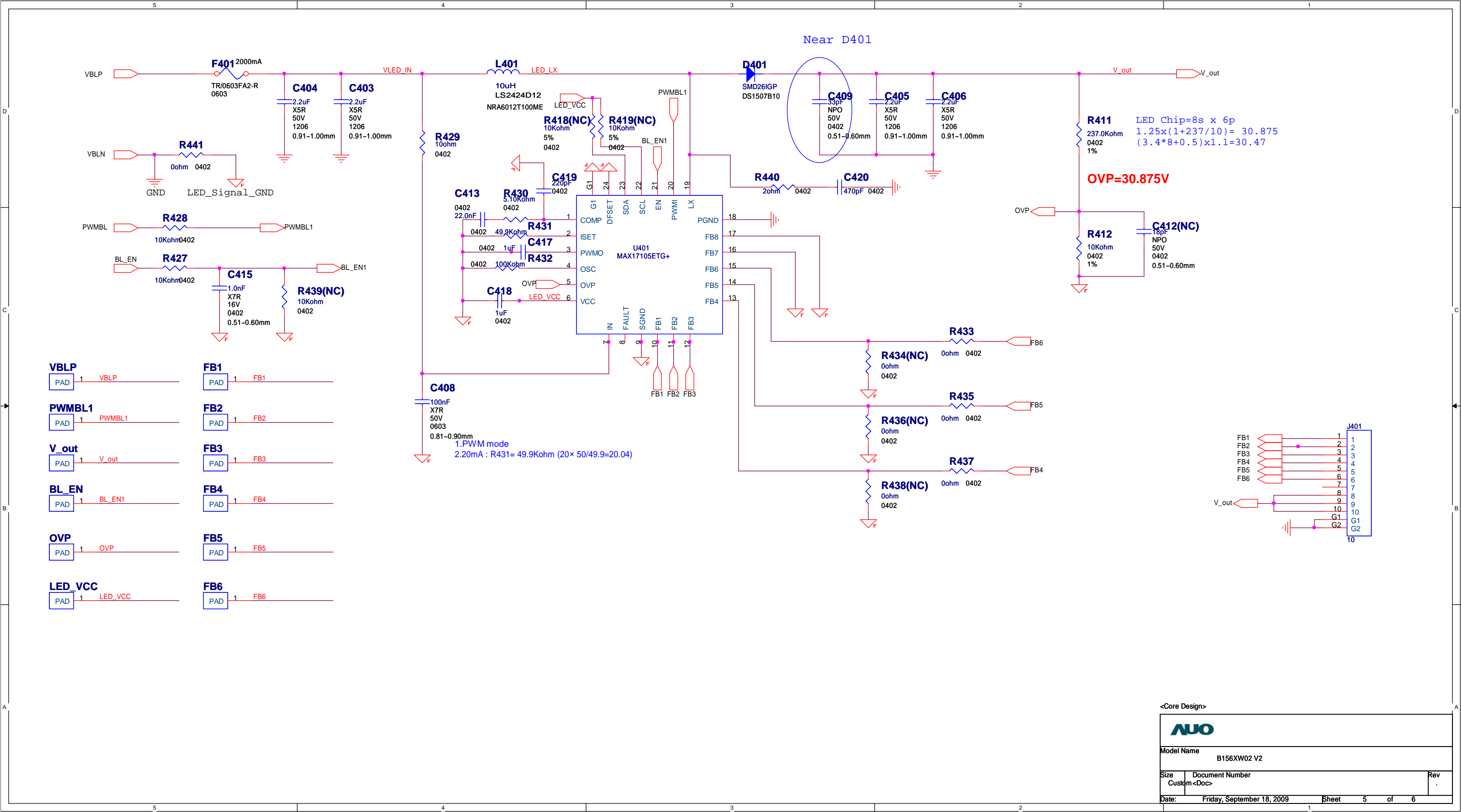
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Rev	
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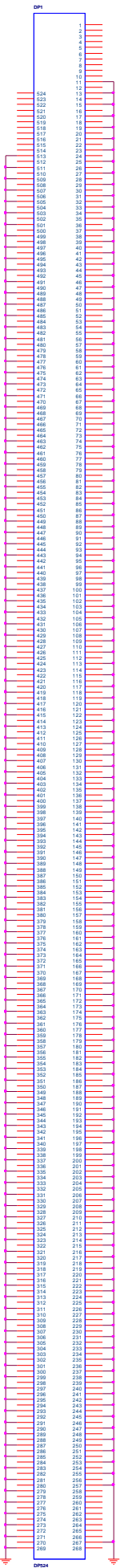


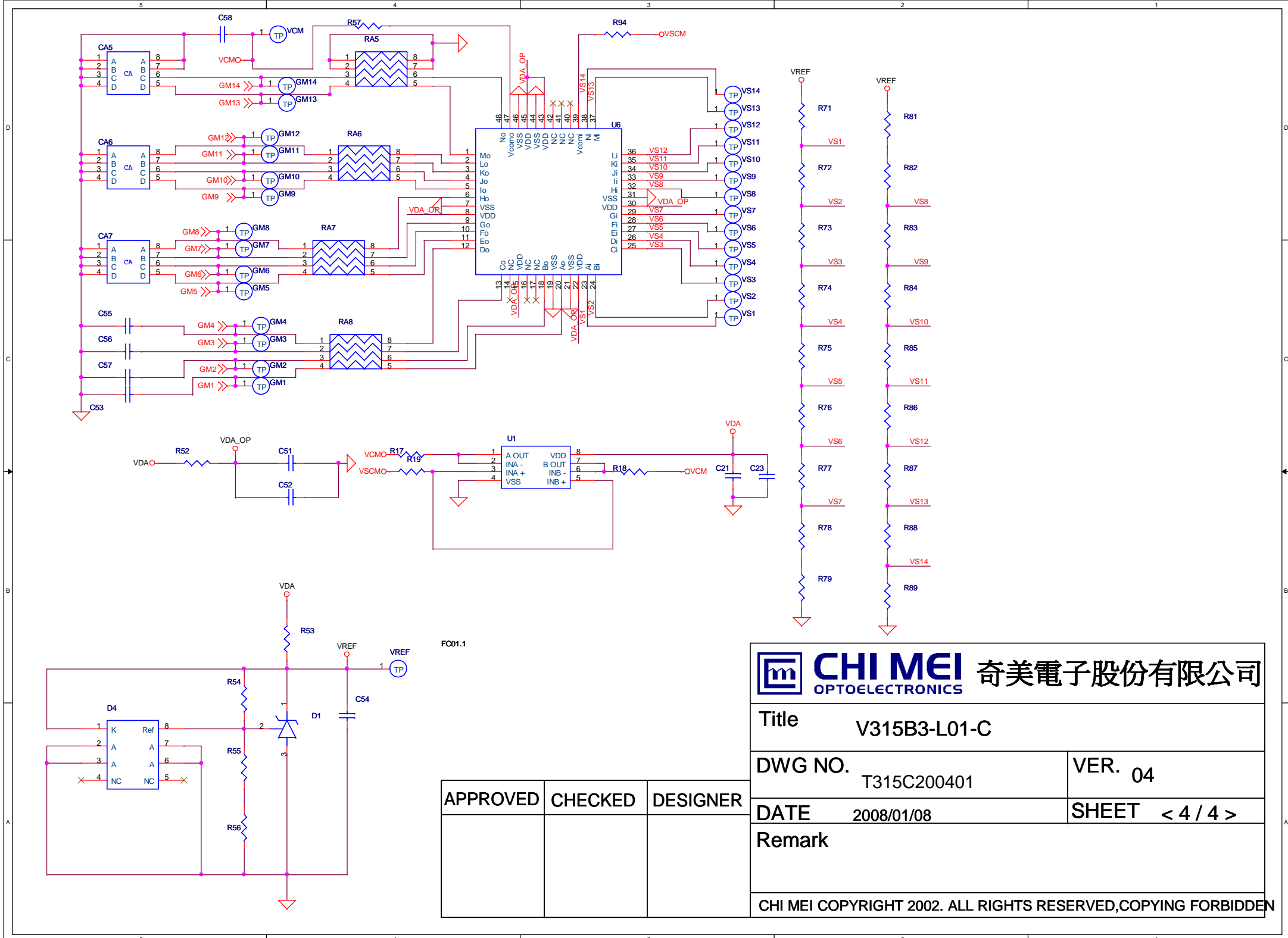
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Date: Friday, September 18, 2009

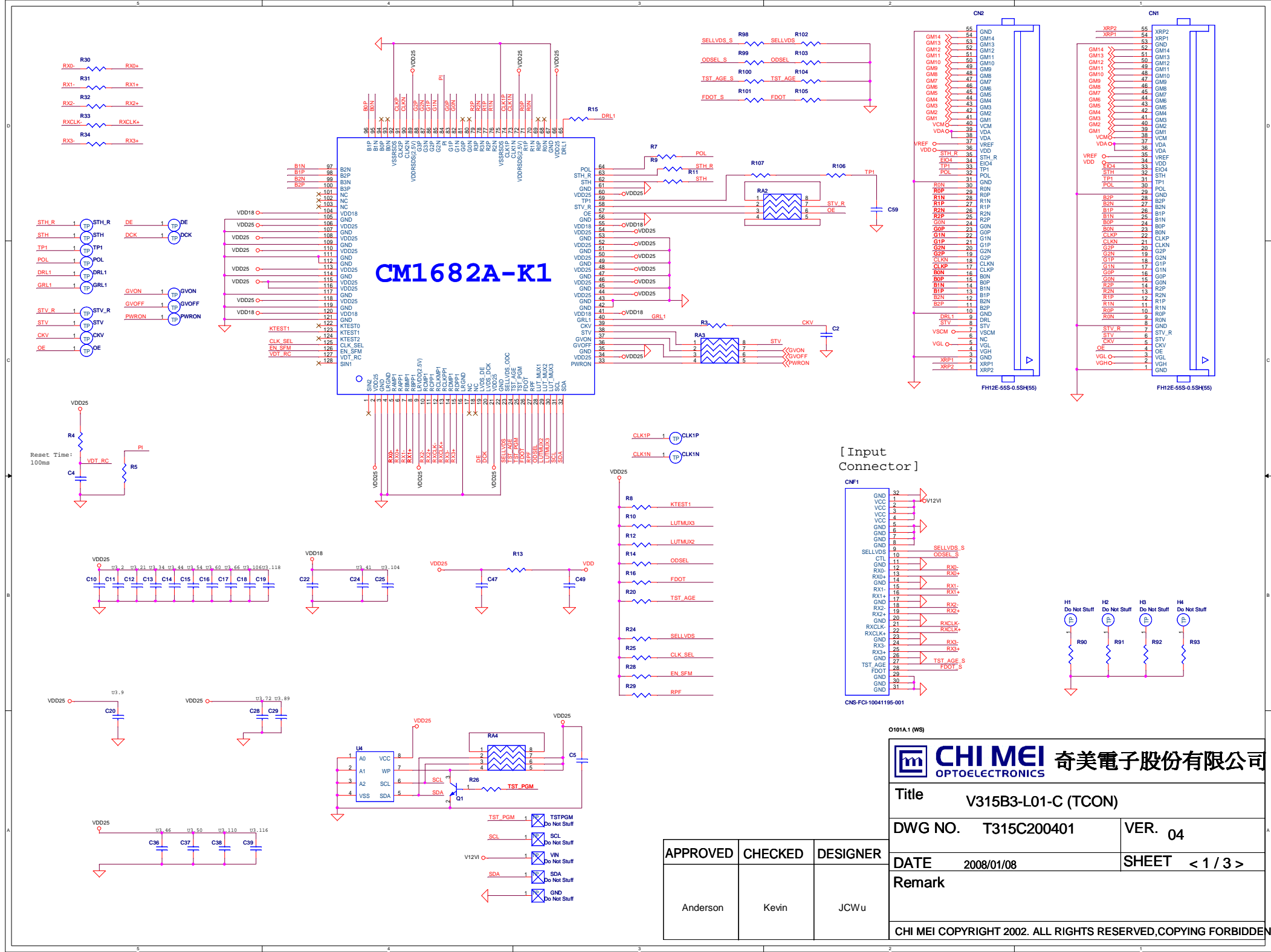
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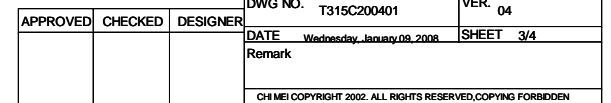


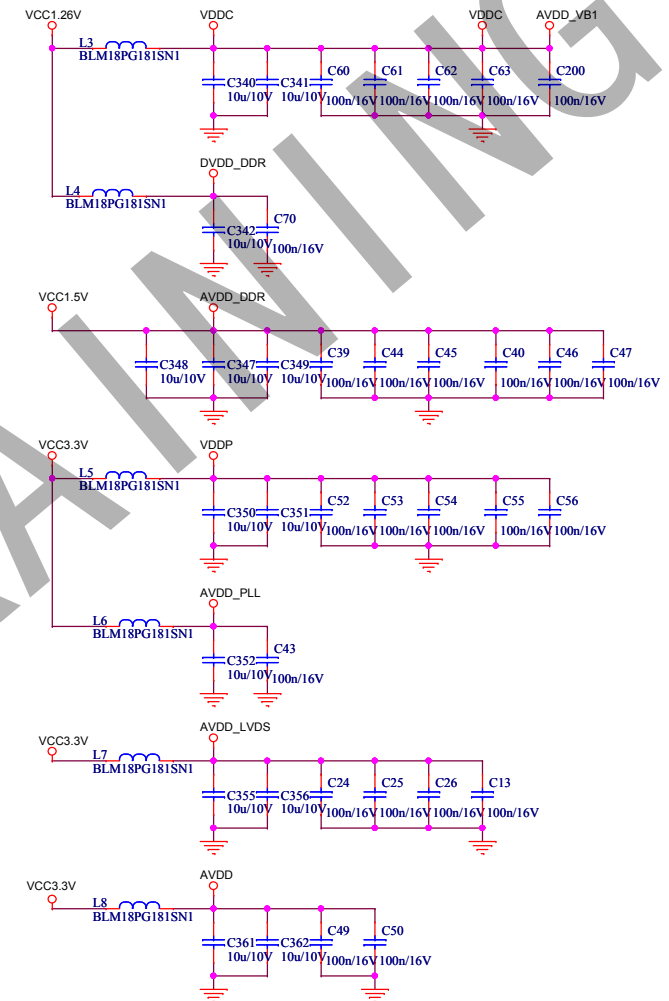
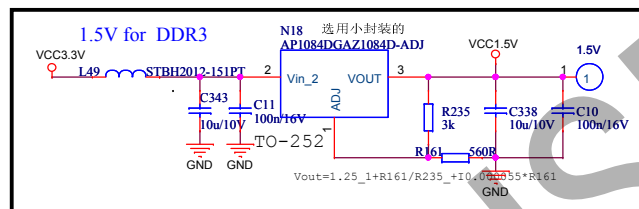
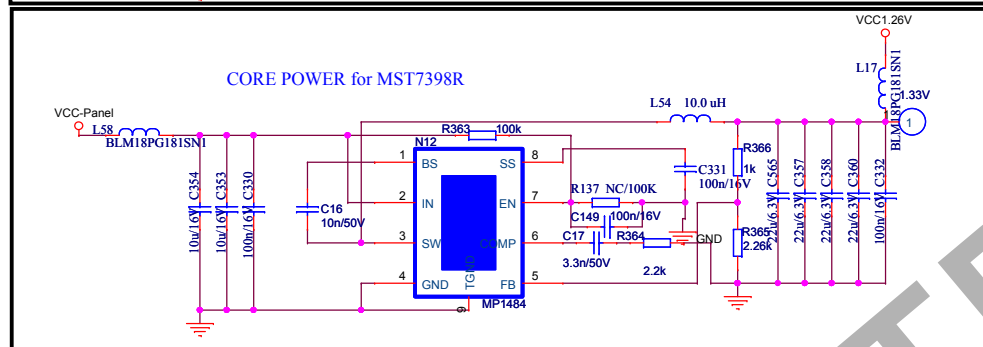
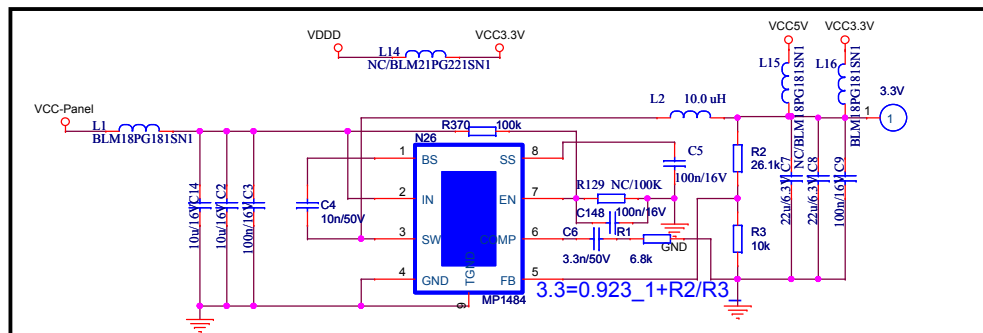


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OPTOELECTRONICS

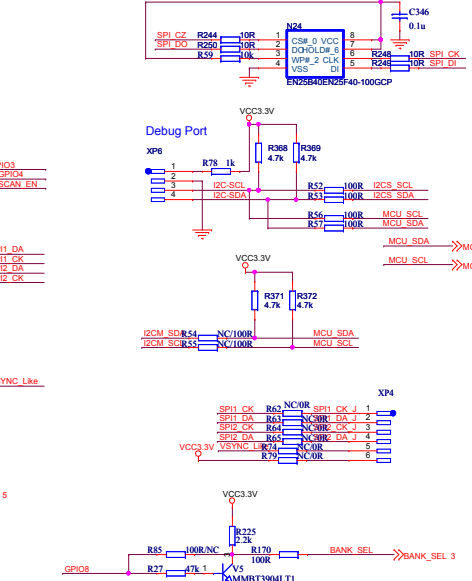
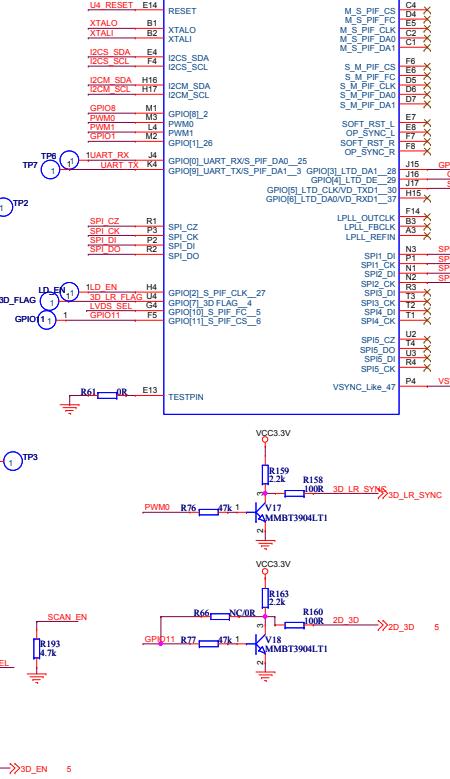
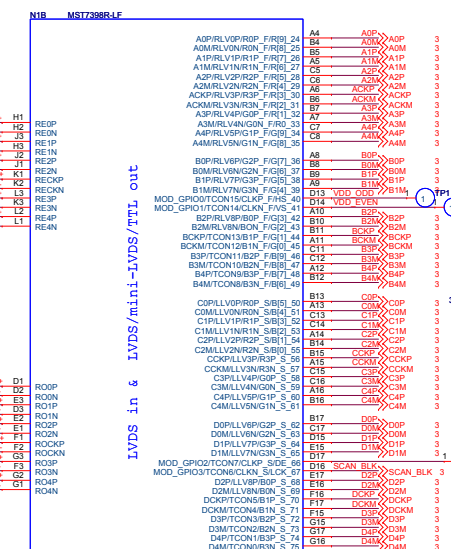
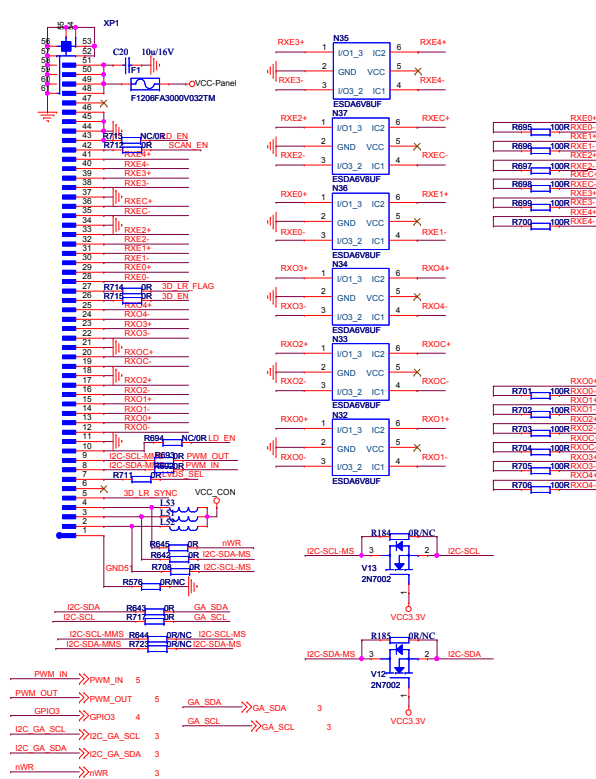
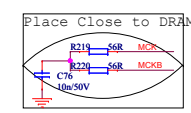
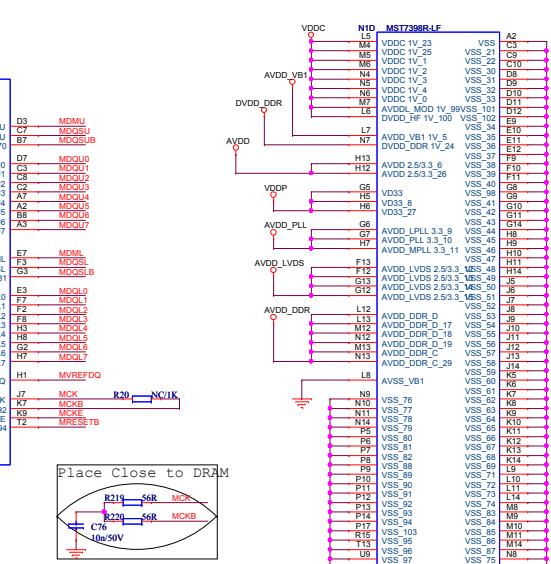
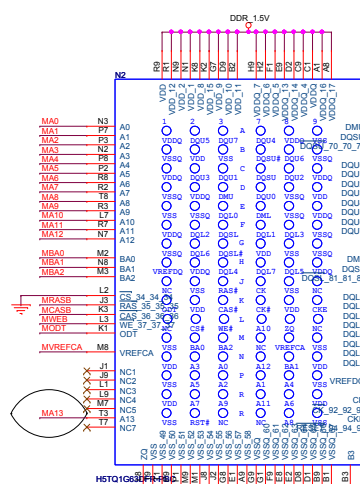
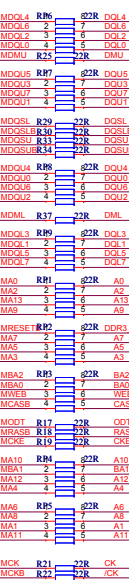
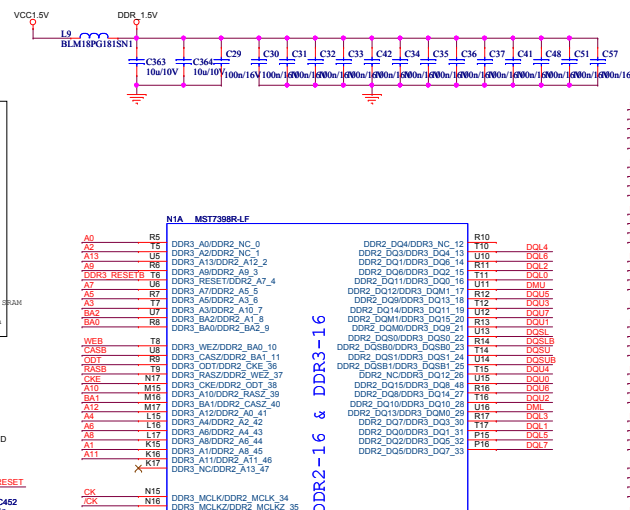
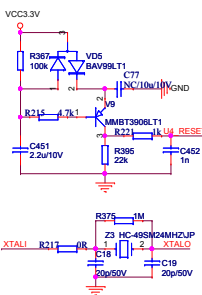
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DATE		2008/01/08	SHEET < 4 / 4 >
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Size	Document Number		
Custom	POWER		
Date:	Sunday, November 20, 2011	Sheet	1 of 6
		Rev	A



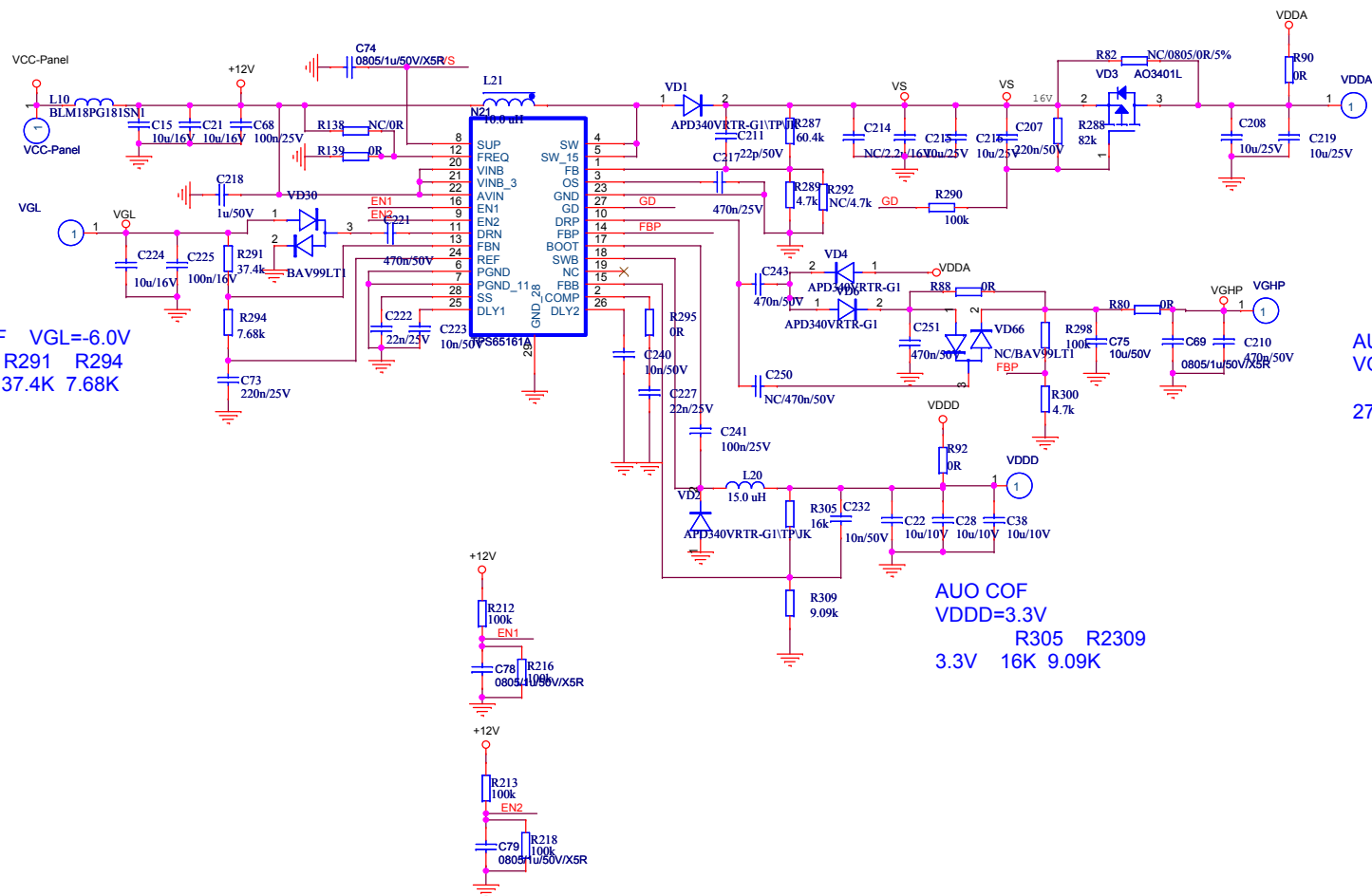
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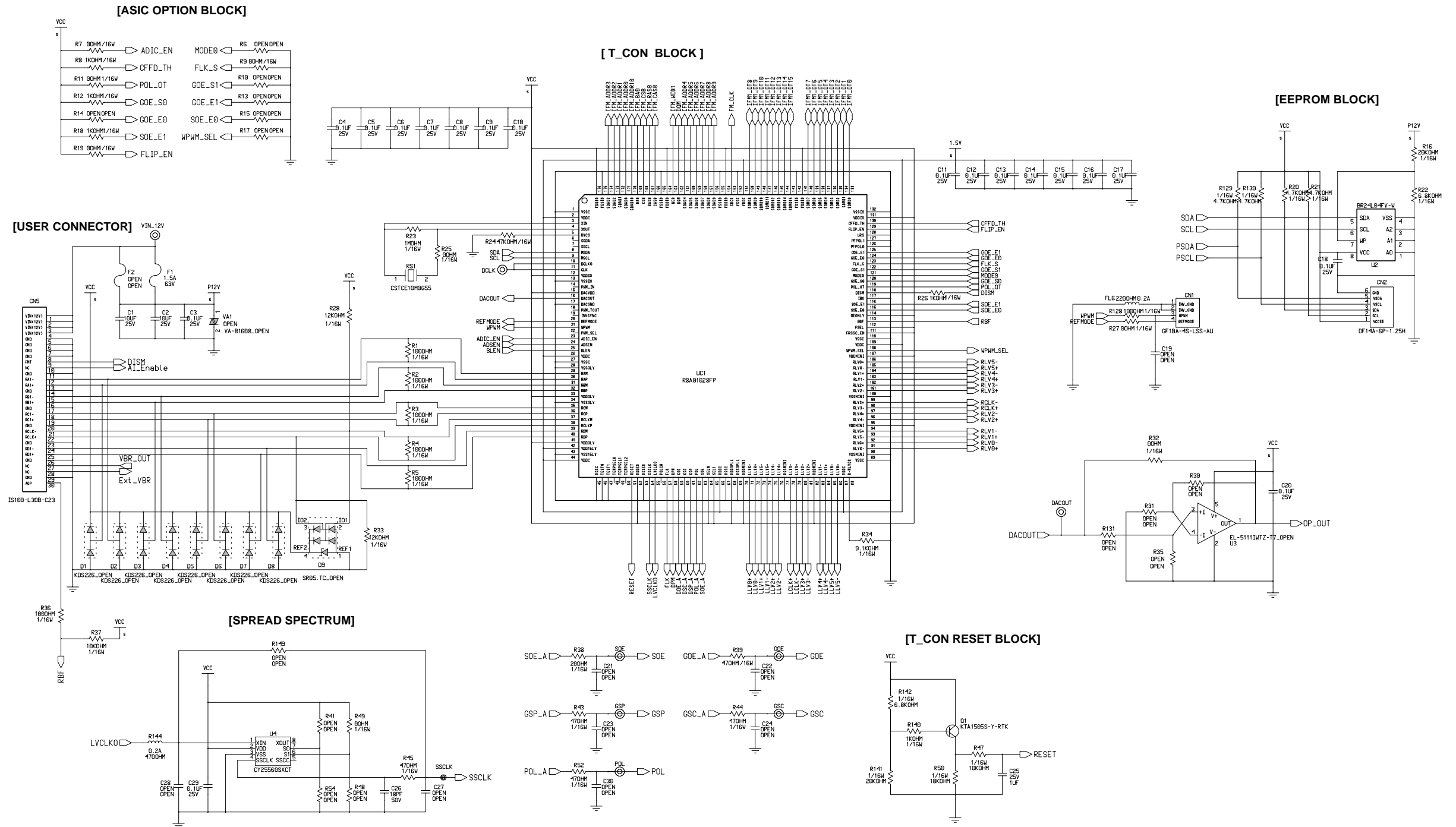
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R291 R294
-5.9V 37.4K 7.68K

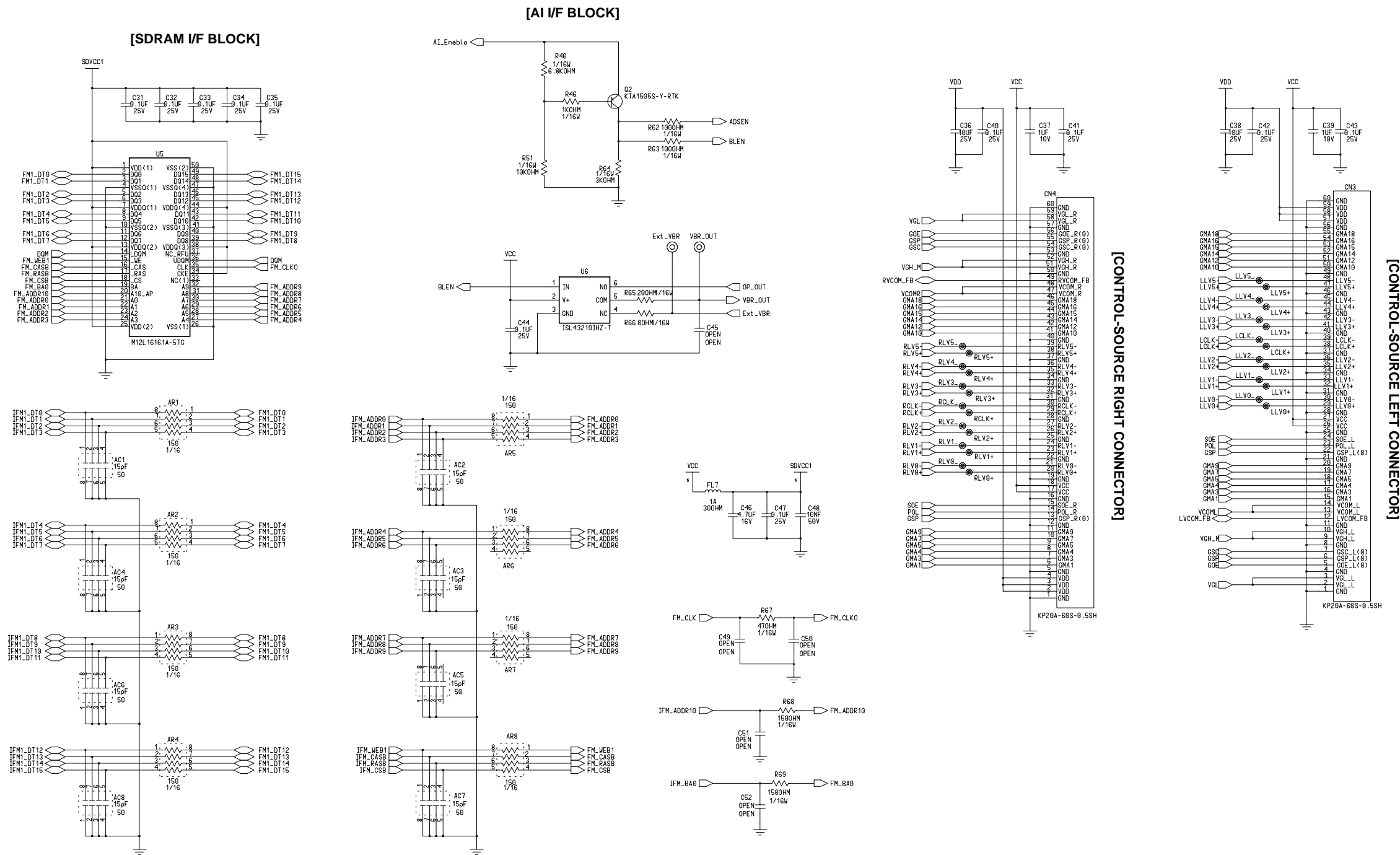
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R298 R299
27.0V 100K 4.7K

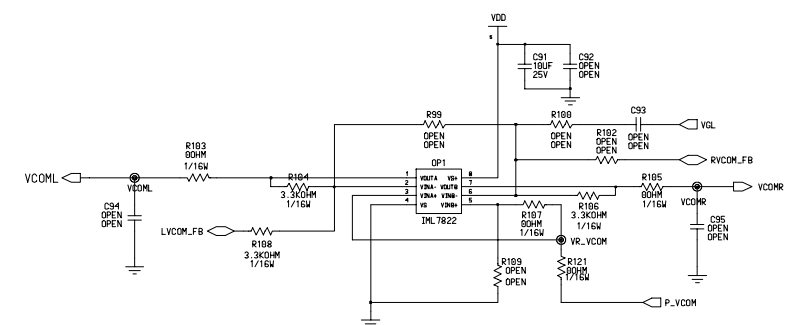
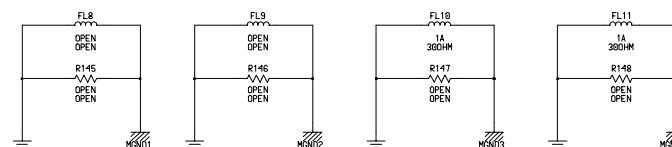
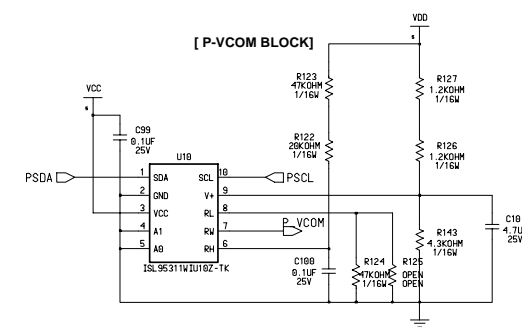
AUO COF
VDDD=3.3V
R305 R2309
3.3V 16K 9.09K

AUO COF
VDDA=15.85V
R287 R289
15.87V 60.4K 4.7K





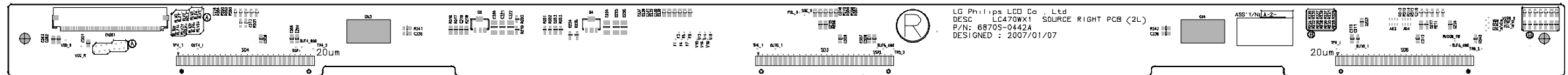




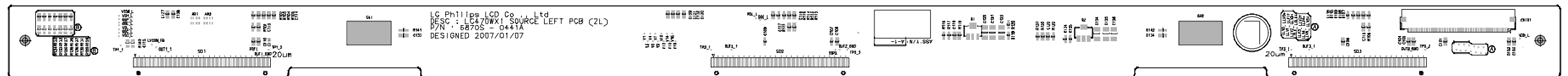
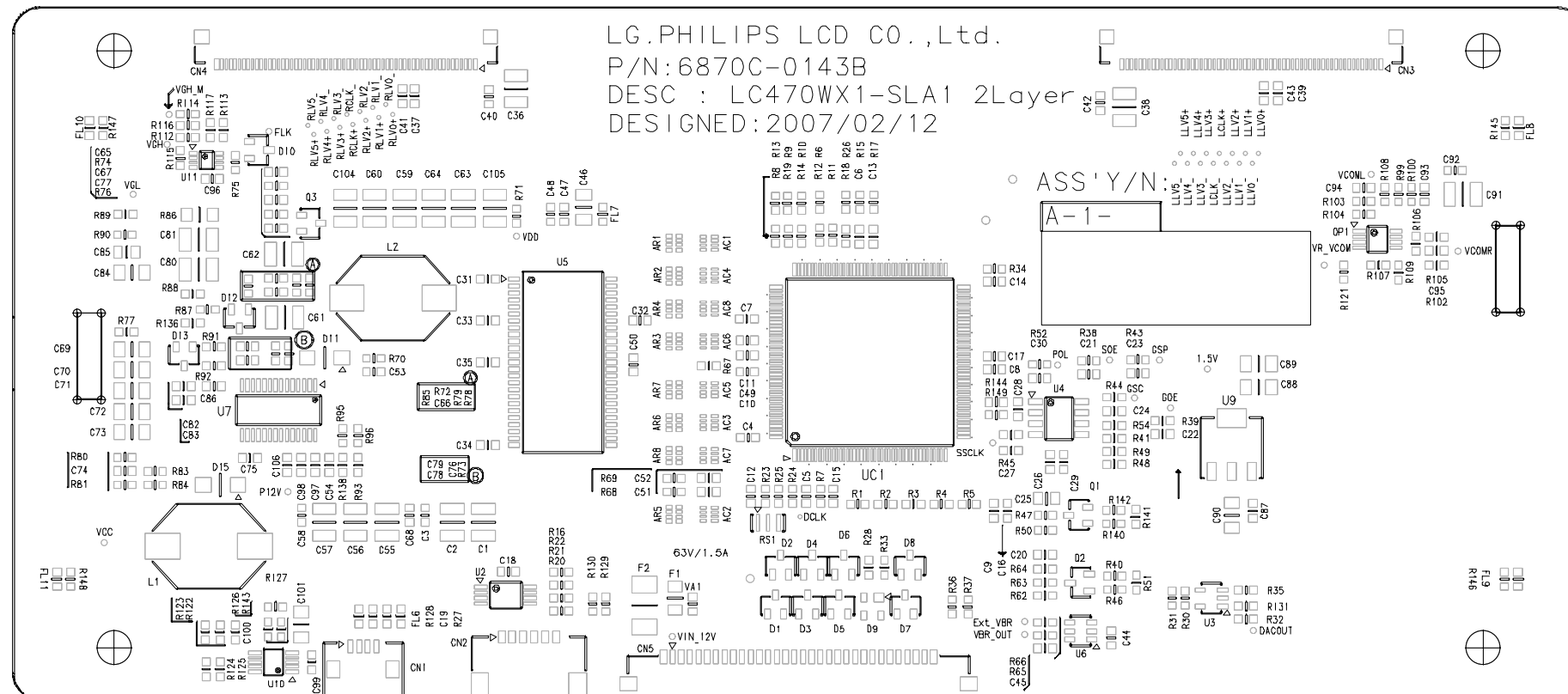


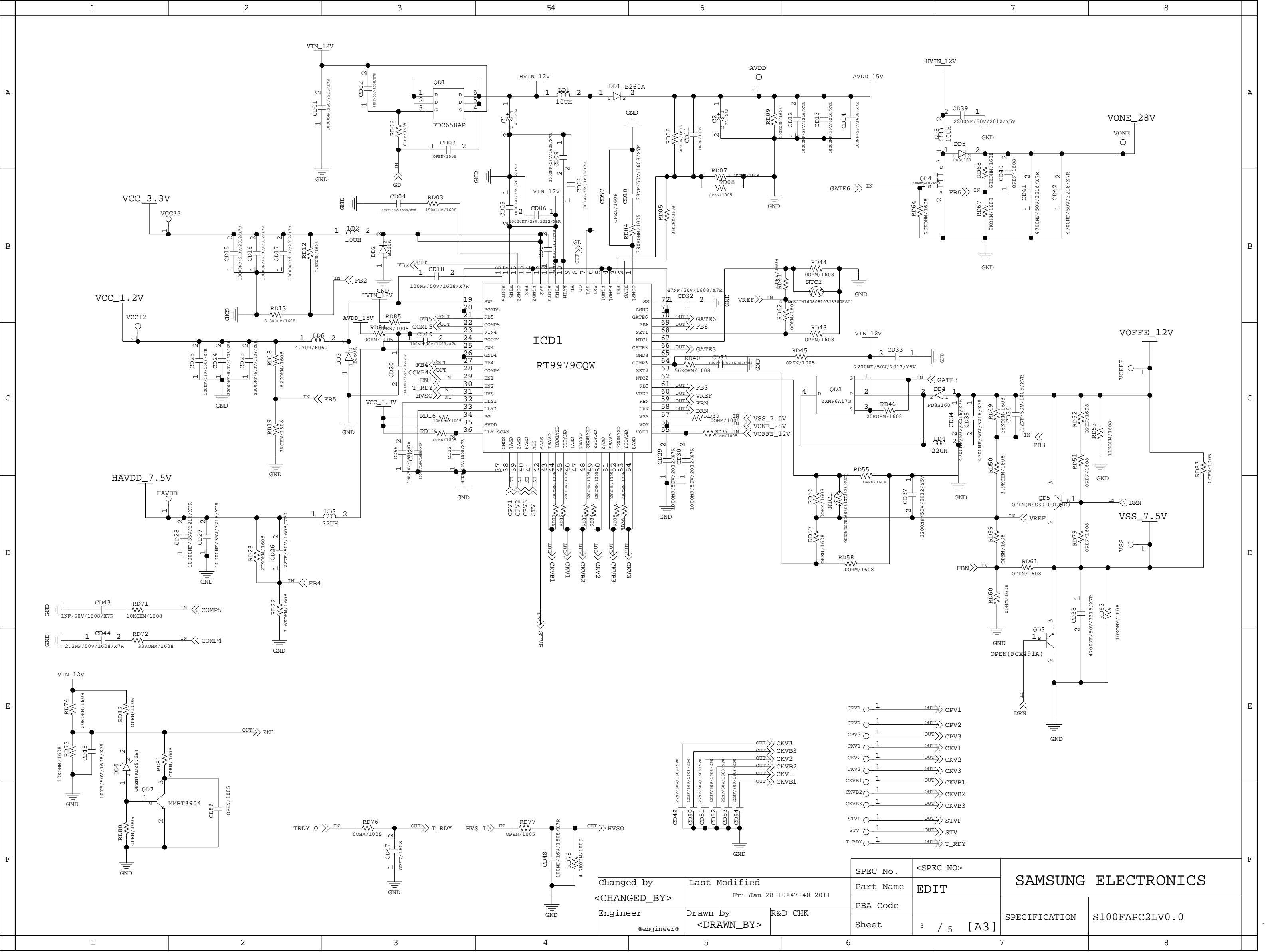
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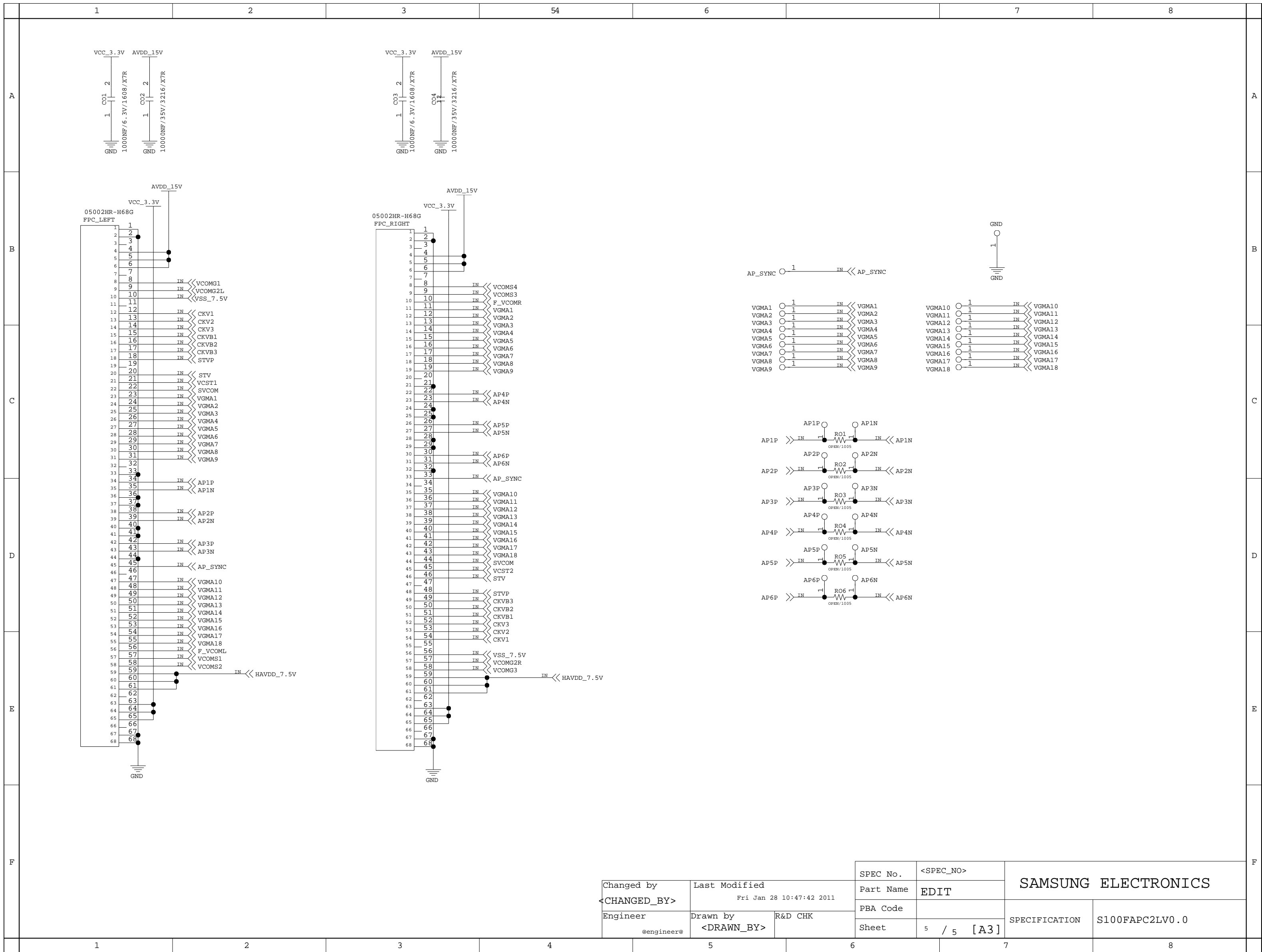
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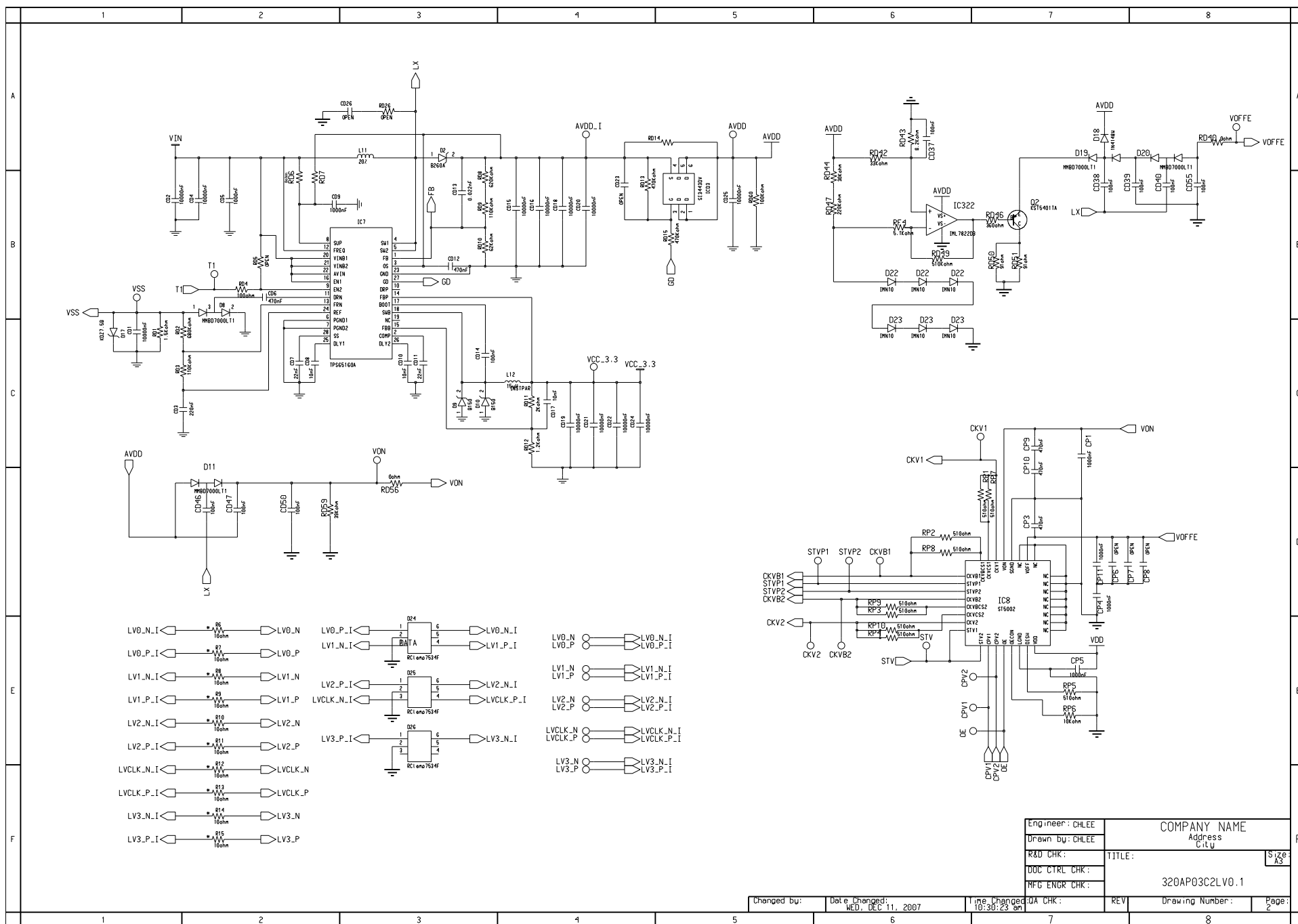
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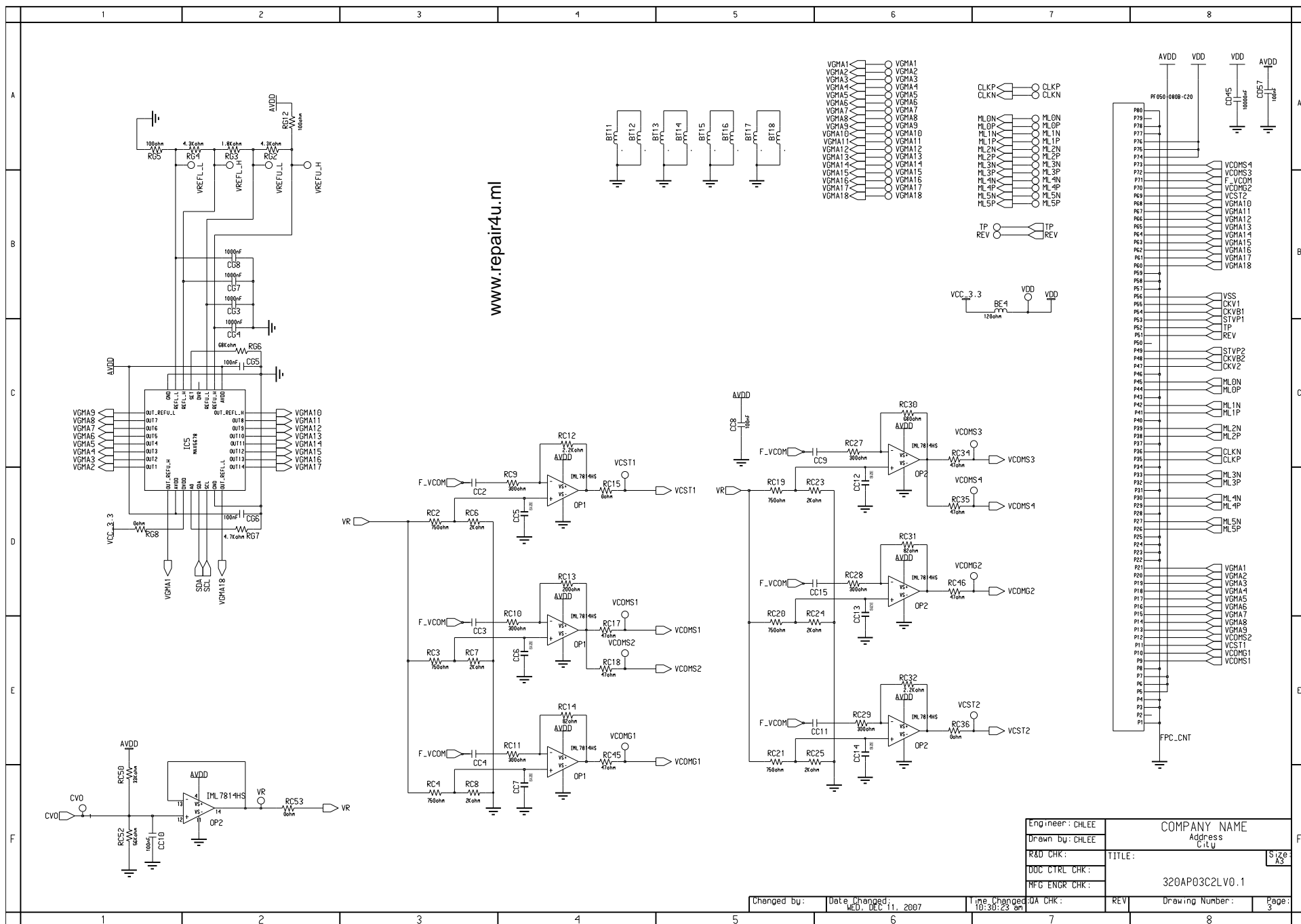


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Engineer @engineer@	Drawn by <DRAWN_BY>	R&D CHK

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Sheet	3 / 5 [A3]		







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