SAMSUNG PANEL SCREEN REPAIR PROCEDURE

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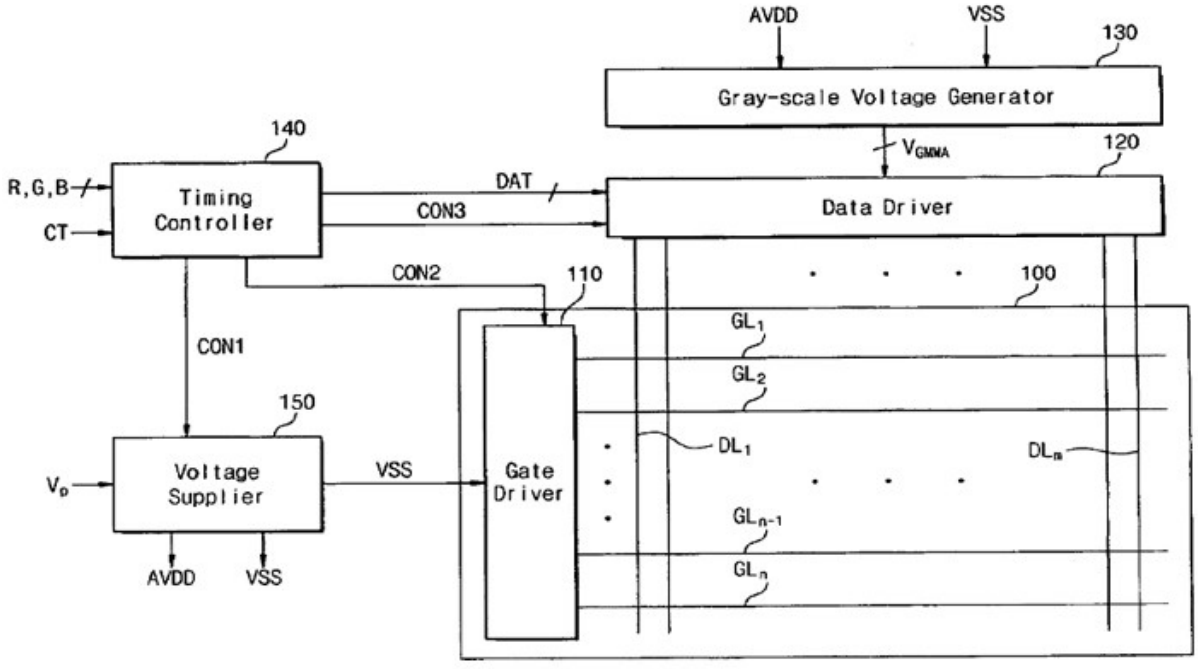
The procedure described in this file, will help you repair a Samsung 2008-2013 panel screens, that use gate circuits embodied in glass screen cell (chip on glass - COG). The procedure has a rate of success of 0-100%, depending on your screen panel. You have to accept that sometimes, even the screen panel will work, a thin line may appear aleatory on screen. Also, sometimes, the screen will not respond to any procedure described here. In this file, I will refer only on repairing gate problems of fault Samsung cell screen panels.

CHAPTER 1 ABOUT SAMSUNG PANELS

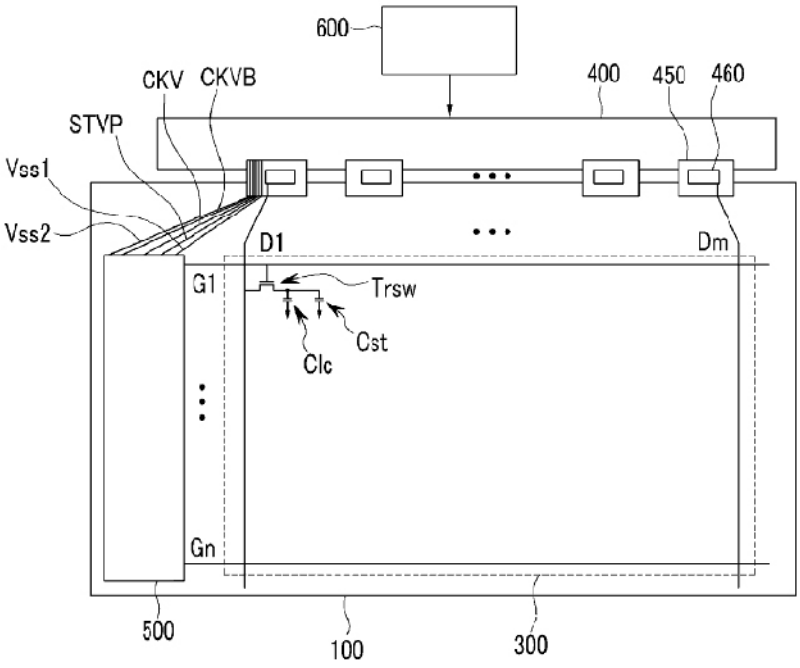
A display device includes multiple pairs of field generating electrodes and an electro-optical active layer interposed there between. Generally, one of the pair of field generating electrodes is connected to a switching element to receive an electric signal and the electro-optical active layer converts electric signal into an optical signal to display images.

The display device typically includes a gate driver and a data driver. The gate driver applies to a gate line a gate signal that turns a pixel on and off, and the data driver converts image data into a data voltages and then applies the converted data voltage to a data line.

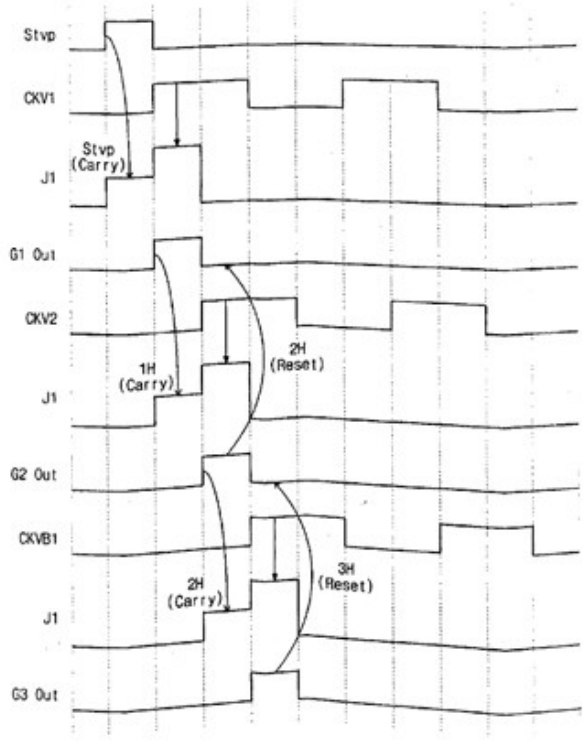


We are interested only in gate signal circuit, this is the one that faults and need to be fixed.

The gate signals are are processed by the scan driver circuits and amplified by the level shifter to analog signals, which are outputted as the gate pulses for scanning the display panel.
Gate driving circuits can be mounted - (TCP) tape carrier package or printed on glass - (COG) chip on glass. On Samsung panels, gate driving circuits were replaced since 2008-2009 with gate drivers on glass mounted transistors, using ASG technology (Amorphous Silicon Gate)

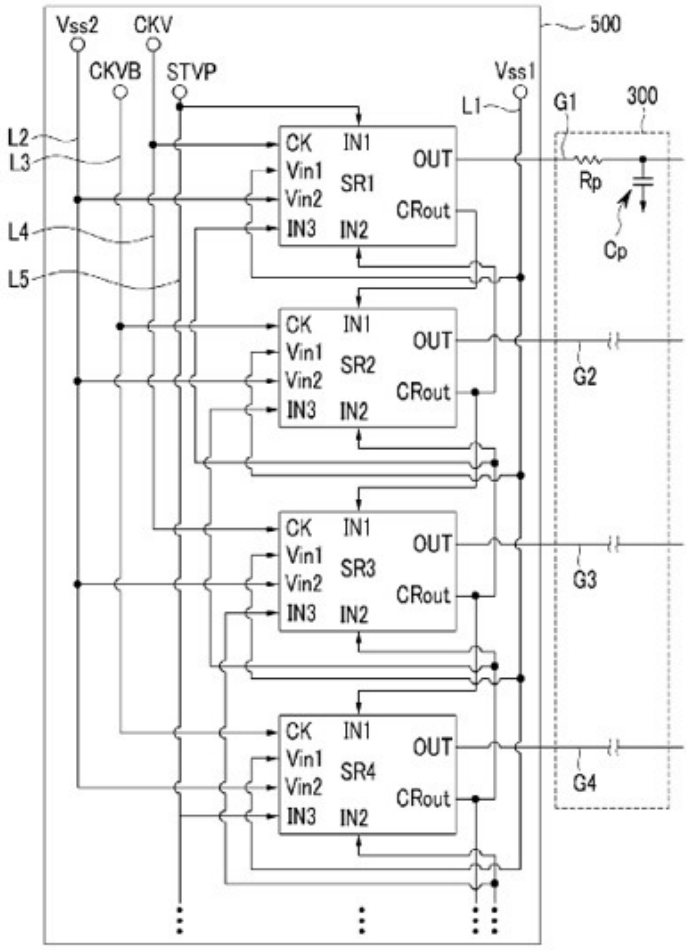


Each gate line has a block circuit glass mounted transistors called SR, made using ASG technology. The gate driver receives clock signals CKV and CKVB and the start signal STVP, and sequentially apply on voltages to gate lines G1-Gn.



The display area 300 is represented by the resistor Rp and the capacitor Cp. As show below, the gate lines G1-Gn, and the liquid crystal capacitor CIc and storage capacitor Cst , respectively have the resistance and capacitance, and the sum thereof is represented by one resistor Rp and one capacitor Cp. The gate voltage output from each line block SR1-SRn is analog transmitted through the gate line corresponding.

The SR blocks are connected between, with glass printed connections, and when a component of one SR block faults, owing to the fact that is on glass, the repair is impossible.



However, with some trickery made on command signals of gate drivers blocks, you can partially or totally repair the faults.

CKV and phase opposition CKVB signal, and start STVP signal, are synchronizing the gate outputs to screen lines. For a small screen, we will have only one set of signals: CKV, CKVB and STVP

For a bigger screen, we will have 2 gate drivers blocks and 2 sets of signals, CKV1, CKVB1, STVP1 and CKV2, CKVB2, STVP2, each of this signals sets will command a gate driver on down or upper side of the screen.

The fault can be visible on all screen, half of screen, so we need to cut in both signals sets, or one by one, depending on each situation.

On large screen panels, starting with 32 inch, there are gate drivers on both sides of the screen, and we can have 2,3 or 4 sets of signals.

In this case, the command of 4 blocks gate drivers (CKV1.....CKV4, etc) are made in various ways, one way it is as below:

-first gate signal will command upper side of screen odd lines, second gate signal - lower side of screen odd lines, third gate signal will command upper side of screen even lines, fourth gate signal lower side of screen even lines.

A fault screen will display in many ways:

-Doubled image on all screen, on vertical, or image stop.

-Half of screen, upper or lower, doubled or static image, the other half will be correct displayed
-On whole screen are horizontal lines where image is reversed or static.
-a part of the screen is darker, with lines
-vertical flickering image on all screen or upper or lower half of the screen
-in a area of the screen, the image have lines on it.
-on area where image is not right, can also to have a certain color or fail of color

CHAPTER 2. GENERAL CONSIDERENTS REGARDING REPAIRING SAMSUNG SCREENS BY DISCONNECTING GATE DRIVERS SIGNALS.

2.1) The generating circuit for gate drivers, called LEVEL SHIFTER or SCAN DRIVER, can be mounted on T-CON drivers, on PWB (printed wire board) connected to screen, or in glass screen.

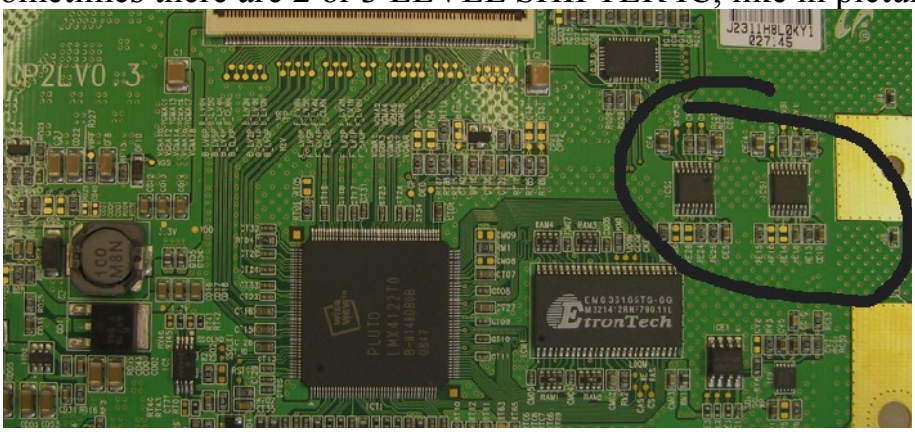
2.2) When level shifter is in glass cell, you cannot disconnect it, but you can try to disconnect the input signal – CPV, STV and OE. This signals will go on both sides of the screen, thru left and right PWB, you can disconnect one side first, check if any improvement, and if not, disconnect other side and re-connect first one.

2.3) First of all you have to check where is the LEVER SHIFTER IC, by finding check points CKV CKVB and STVP. Usually the LEVER SHIFTER is on T-CON board or on T-CON PWB attached to the screen glass cell.

2.4) When you cut CKV, CKVB and STVP signals on printed wire circuit, you have to be sure that the disconnection will be made to screen direction, there are several situations when connection with level shifter is between check points and screen, so cutting the printed wire circuit near this check points to be with no result.

2.5) The T-CON processor generates only low voltage gate signals, like CPV, STV and OE, the level shifter circuit is not integrated in t-con processor, is a separate IC.

2.6) Sometimes there are 2 or 3 LEVEL SHIFTER IC, like in picture below;



but latest t-con boards have the same IC for LEVEL SHIFTER and DC-DC source, especially on small size screens (15-32”)

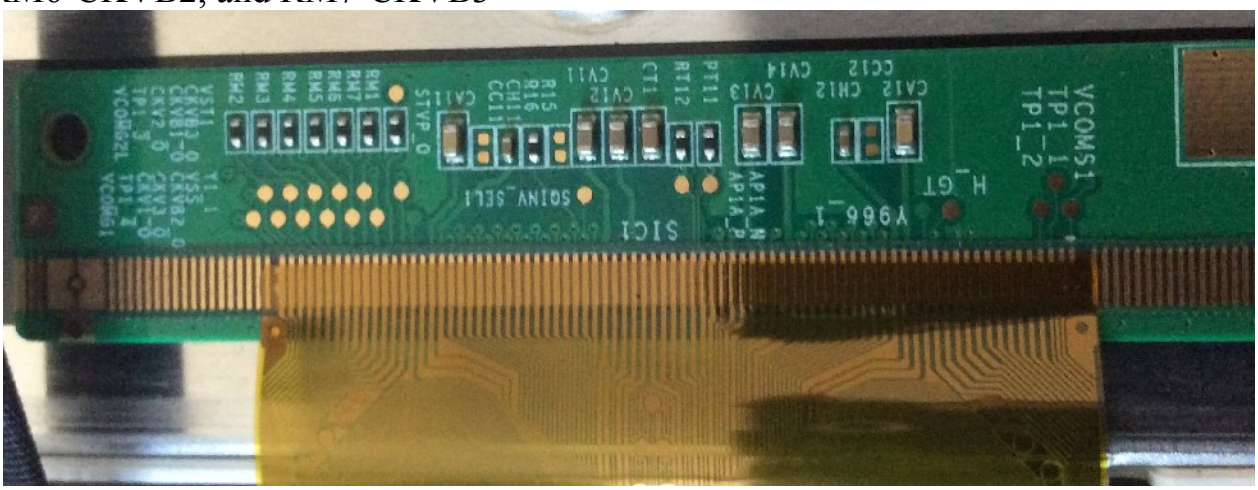
2.7) Generally, if screen configuration permits, you have to check the printed wire circuit from T-COn to both left/right PWBs, in connection to panel for all signals CKV, CKVB and STVP. The best way to repair is to cut the signals near screen, on left/right PWB, or left/right connection to screen on PWB (if only one board attached to screen cell)

2.8) Sometimes, cutting some signals only from left or right will solve the image problems but cutting same signals from both right / left connection to screen to generate more errors.

2.9) If you have a T-con apart from screen cell, first step is to find which part of the screen is fault. Disconnect left FFC between T-con and left PWB and power the tv. If you have now on right part of the screen a normal image, means that you have a fault in left side of the cell. If still a fault image, re-connect the left FFC and disconnect right FFC between T-con and left PWB and power the tv. If you have now on left part of the screen a normal image, means that you have a fault in right side of the cell.

2.10) On some screens, Level Shifter IC have on outputs, some zero ohms resistors, so, you can first remove this resistors and check if any improvements. You should remove on signal groups, for example, when you remove output of CKV2, you have to remove also CKVB2 signal.

2.11) Sometimes, you have on left/right PWB, some zero ohms resistors that connect Level Shifter to right/left screen cell. In this case, just remove those resistors for groups that fault. In example below, RM1 connects to screen the STVP signal, RM2 connects to screen CKV1 signal, RM3-CKV2, RM4-CKV3, RM5-CKVB1, RM6-CKVB2, and RM7-CKVB3



3.12) As I explained in previous presentation, the CKV, CKVB and STVP signals scan between positive voltage VONE and negative voltage VOFFE. Sometimes, a small raise of VOFFE negative voltage will remove faults of the screen.

CHAPTER 3 STEPS YOU HAVE TO MAKE WHEN REPAIRING A SAMSUNG PANEL

3.1) identify the Level Shifter generator, by finding the inputs CPV, OE and STV check points, or finding the outputs CKV1...CKVn, CKVB1...CKVBn, and STVP1...STVPn check points

3.2) Check the VONE and VOFF voltages and note the values

3.3) First disconnect the CKV1, CKVB1 and STVP signals, after that CKV2, CKVB2, and so on.

3.4) disconnections will be made so the wires from screen panel to be “on air”

3.5) when disconnect the printed wire board near screen entrance, by cutting the printed circuit, you have to be sure that you will be able to solder this wires, so the cut has to be made with some distance from data driver flexible circuit.

3.6) First disconnect, CKV1 and CKVB1- if image still have thin lines, just strap the wires coming from screen panel CKV1 and CKVB1 with a thin wire.

3.7) After connecting CKV1 and CKVB1 with a thin wire, try also to ground this 2 points, or try to connect to VOFF.

3.8) If no improvements, try to disconnect CKV2 and CKVB2 (with STVP disconnected) and make same steps as for CKV1 and CKVB1 (3,6 and 3.7)

3.9) If we have also CKV3, CKVB3 and CKV4 and CKVB4, make the same procedure as CKV1 and CKVB1, described on 3.6-3.7

3.10) If, for example, by disconnecting CKV3 and CKVB3 we have a normal screen display, re-connect the former signals to panel screen, one by one in pairs (CKV1 and CKVB1, and so on)

3.11) It is possible that, sometimes, only by disconnecting pair 1 and 4 to have a normal screen, but by disconnecting all 4 pairs to have a fault image

3.12) Sometimes, even the image is correct displayed, you'll have a thin line in the area where gain glass circuit is defective - this cannot be repairable. You have to advice the client about this, and ask him to put in balance the final result of this procedure against the cost of a new panel screen.

CHAPTER 4. PANEL SCREEN REPAIR

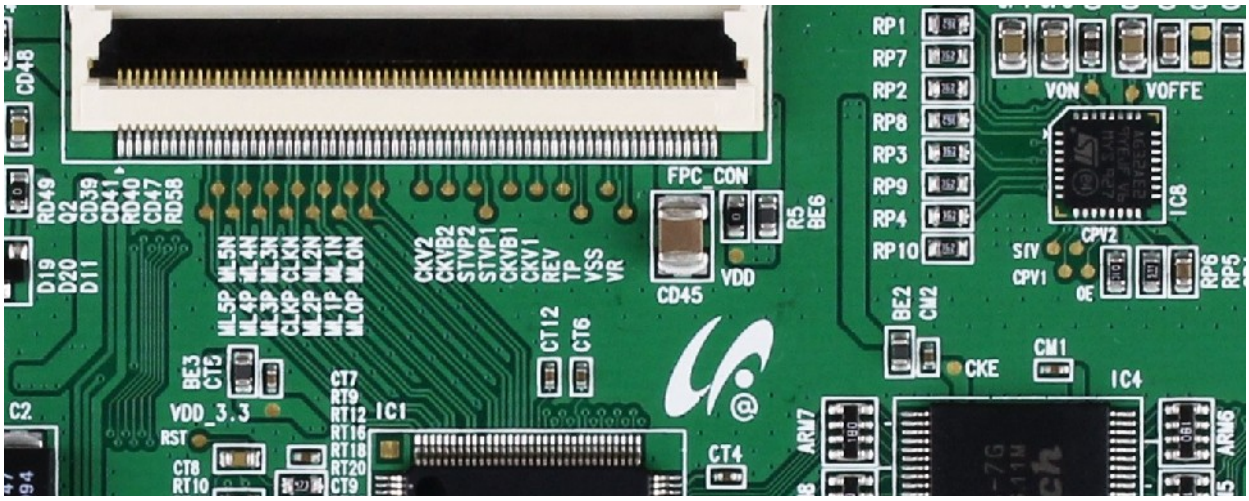
Panel screen: LTA260AP02

T-CON 260AP02C2LV0.2

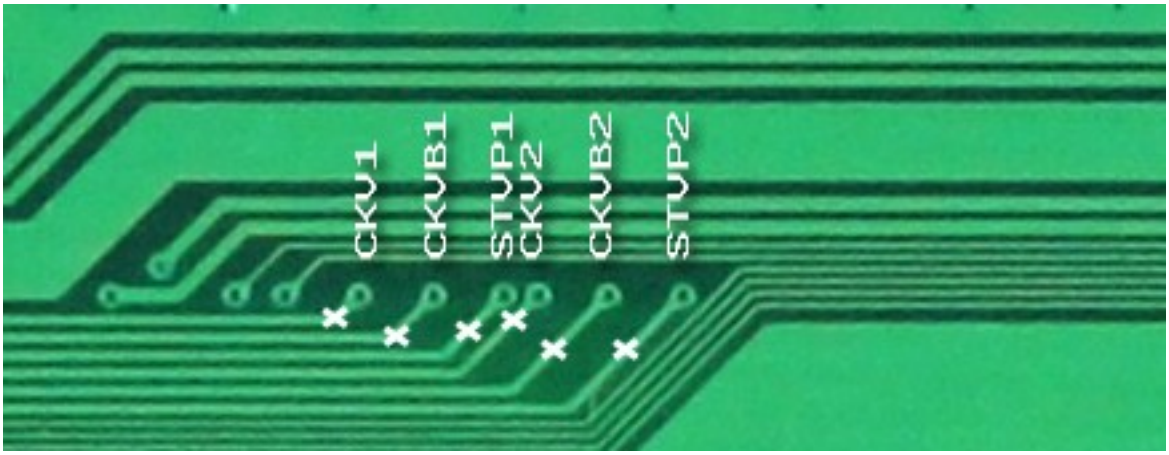
Level Shifter-IC8-AG32AE2

Level shifter receives from processor this low voltage signals: OE, STV and CPV1, CPV2, and from DC-DC source, VON and VOFF voltages

Output signals that controls 2 gate drivers are CKV1, CKVB1 and STVP1, respectively, CKV2, CKVB2 and STVP2

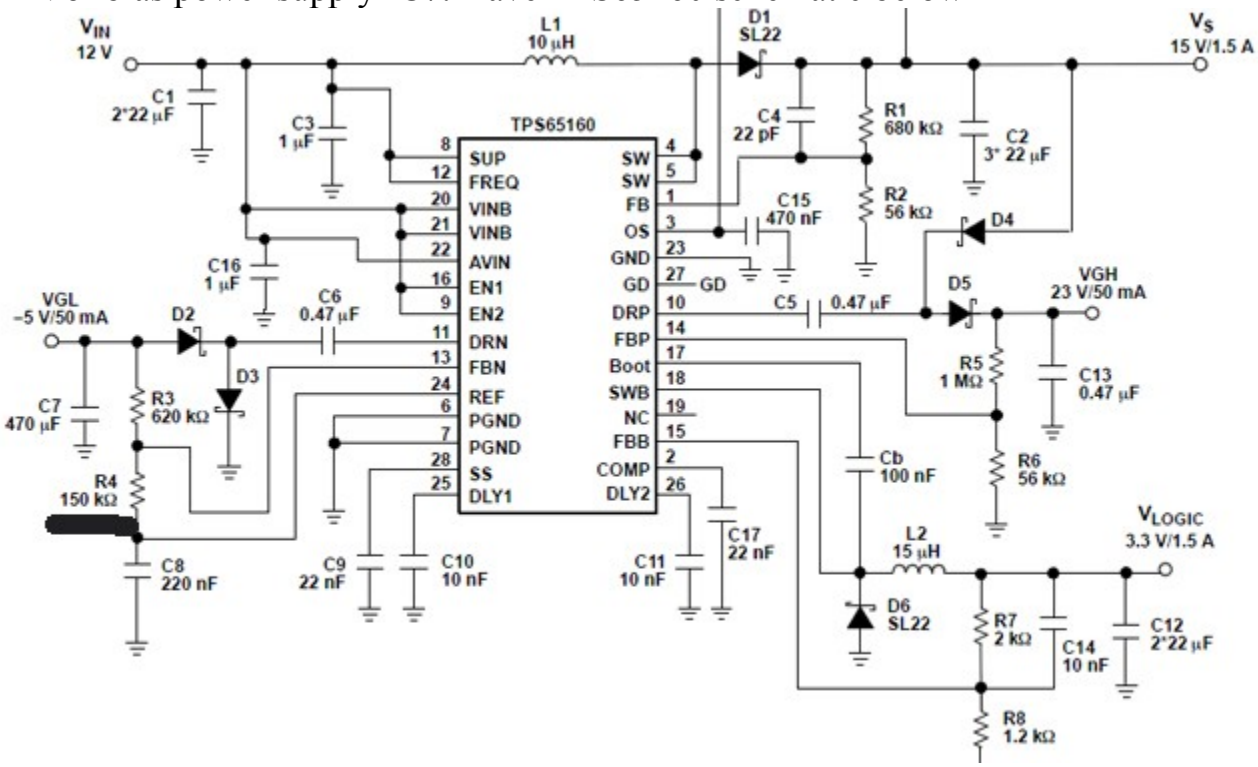


Clock signals are starting from T-con Board, and you don't have to open the screen panel. First, cut and disconnect on printed side, where indicated in picture, CKV1 and CKVB1, strap on the check point on component side only CKV1 and CKVB1



If still image fault, proceed identical with CKV2 and CKVB2. If there is no image, just rebuild the CKV1 and CKVB1 connections on printed side. Sometimes, you need to disconnect also STVP1 (2) signal. Be patience, and check all combinations possible to have a normal picture. If fault solved but after a while appears some vertical white lines in an area with a static image, like a channel logo, you have to connect strapped pair to VOFF, instead of GND, and raise a little the VOFF with minus 3-5v. You can do that by lowering the resistor connected between REF and

FBN of bias power supply IC7. Have TPS65160 schematic below



Another fault, over all image there are vertical thin colored lines.
All voltages are correct. SDRAM – IC4 EM638325TS-7G is fault. Change T-con or replace memory.

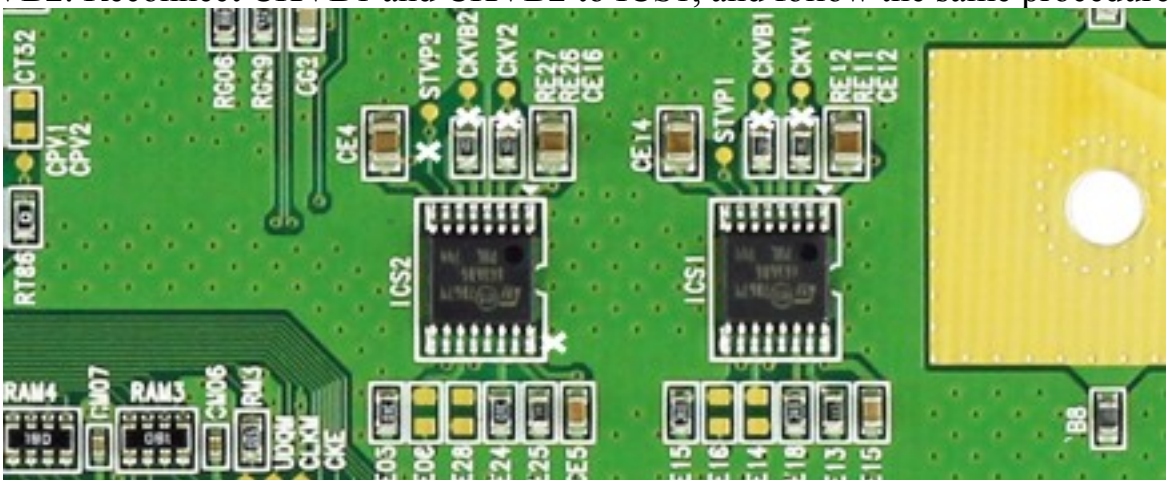
Another fault – black screen, after a while will appear vertical colored lines. Check all voltages – AVDD, VCC, VON, VOFF. Usually there is a problem with Von voltage, bias power supply TPS65160 fault. Change T-con or replace IC.

Panel screen: LTA320AB02 and LTF320AB01

T-CON 320AB02CP2LV0.3
Level Shifter-2x AG16BG
On this panels, we have 2 versions of repairing it.

1) on T-con board: There are 2 gate drivers and clock signals are outputted by 2 level shifter IC's, ICS1 and ICS2, located on T-con board

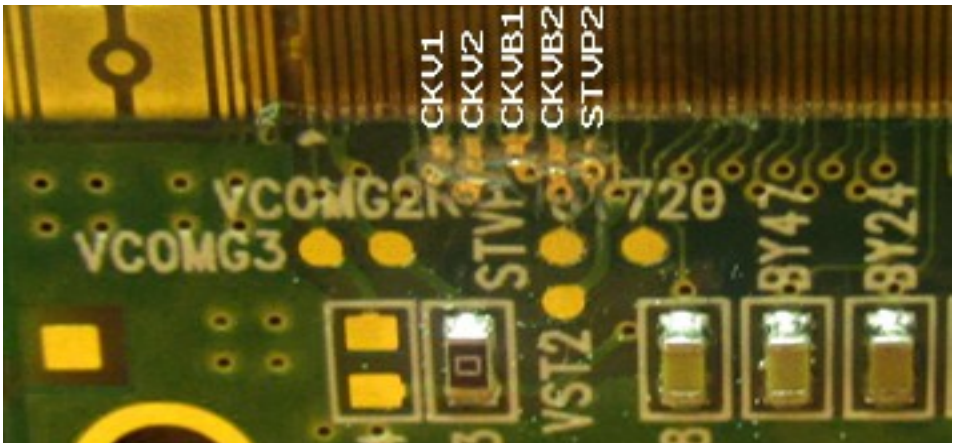
First, cut the circuits between ICS1 - CKV1 and CKVB1, right near resistors, as shown in image below. If image still fault, try to strap CKV1 and CKVB1, connect to the ground, or connect with an wire to Voff. ATTENTION! Make sure the connection between check point and ICS1 is opened with diode instrument, before strapping CKV1 and CKVB1. If there is still connection to the level shifter IC, you can burn it by connecting to the ground or Voff.
If image still faults, make a similar procedure with ICS2, by disconnecting CKV2 and CKVB2. Reconnect CKVB1 and CKVB2 to ICS1, and follow the same procedure.



If image is correct, but on still images there are some white vertical artefacts, you have to connect strapped pair to VOFF, instead of GND.

2) on PWB connected to glass screen panel

Cut the connections CKV1, CKVB1, CKV2, CKVB2 and STVP1 (2) on side with



gate block fault (left or right) . You can see where is the fault, by checking left/right margin of the screen with a magnifier lens, or a microscope. You will see a burned glass circuit, in the area where screen faults.

PANEL SCREEN: LTJ400HM03 B

T-Con S100FAPC2LV0.3

Screen is flickering, have a part/all the screen with doubled image

First step is to find which part of the screen is fault. Disconnect left FFC between T-con and left PWB and power the tv. If you have now on right part of the screen a normal image, means that you have a fault in left side of the cell. If still a fault image, re-connect the left FFC and disconnect right FFC between T-con and left PWB and power the tv. If you have now on left part of the screen a normal image, means that you have a fault in right side of the cell. On the right side (with problems) just remove the CKV1 and CKVB1 resistors RM2 and RM5 and see any improvements.

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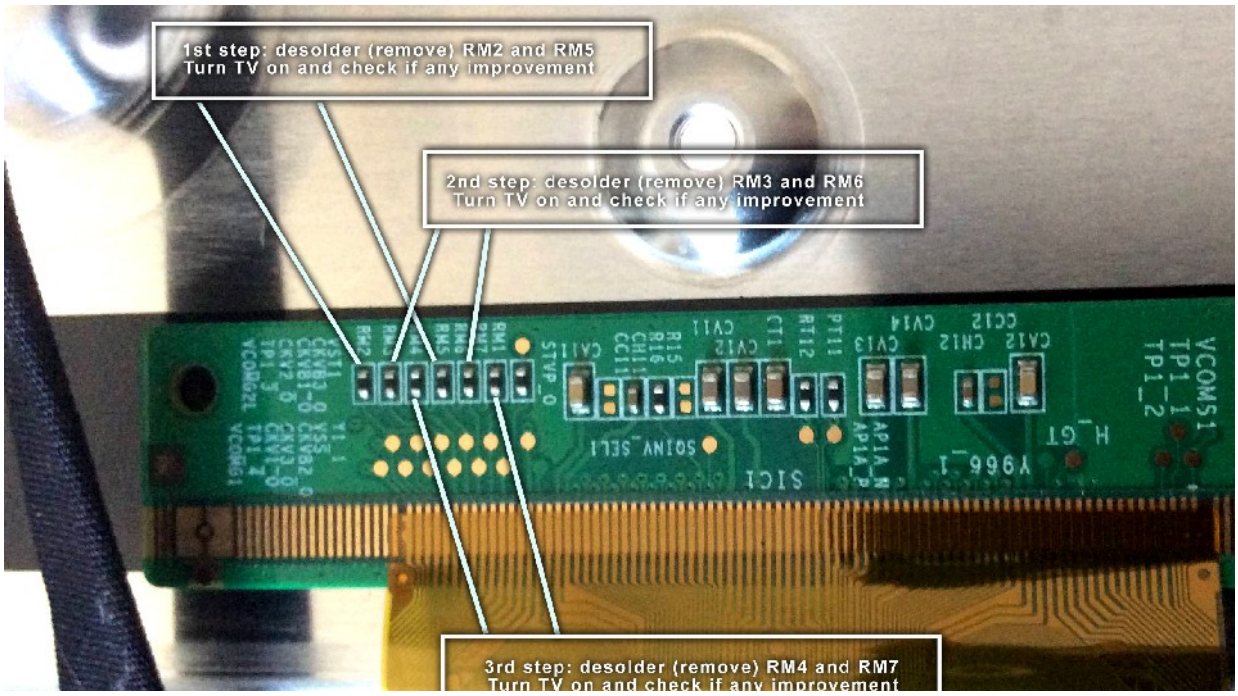
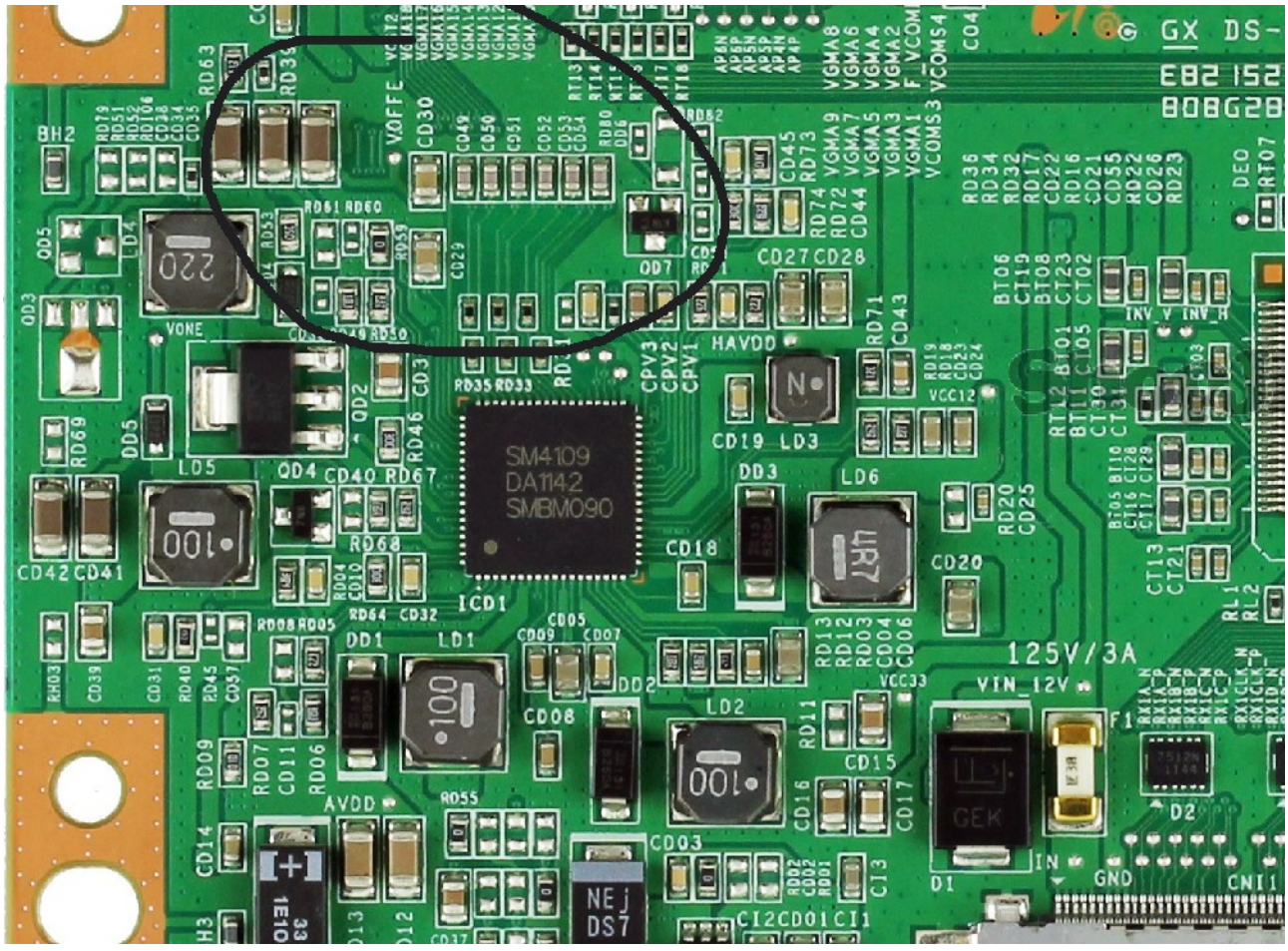


.If not, remove CKV2 and CKVB2 resistors RM2 and RM6, check if any

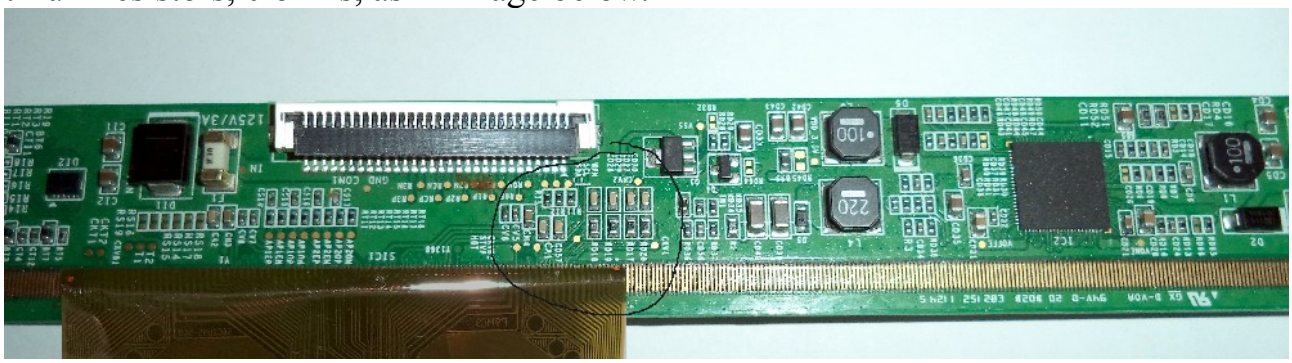
improvements, and if not, remove CKV3 and CKVB3 resistors RM3 and RM7. If still no improvements, remove STVP resistor, RM1 see picture.
You will have a normal picture now, but sometimes, you will have, on side with problems, a little ODD/EVEN lines distance. Strap with a wire, on check points, CKV1 with CKVB1, see if lines are now correct displayed. If not, strap with a wire, on check points, CKV2 with CKVB2, check, and repeat procedure with CKV3 with CKVB3. Now you will have a clean image. Sometimes, will be better to put back the resistors for the blocks pair that have no problem. For example if only by disconnecting CKV3 and CKVB3 will solve image problem, that means pair 1 and 2 have no problems. Sometimes, if you have a bigger problem on cell circuit, the image will be correct but a / some thin line (s) will be displayed sometimes on screen, noticeable on lighter/darker images. Try to connect the strapped pair that not work on GND or Voff. You can also raise Voff voltage with 3-5 volts to minus and the line will disappear. You can do that by changing the input resistors from FBN input of BiasPS/Level shifter ICD1 – SM4109



PANEL SCREEN: LTF320AP11

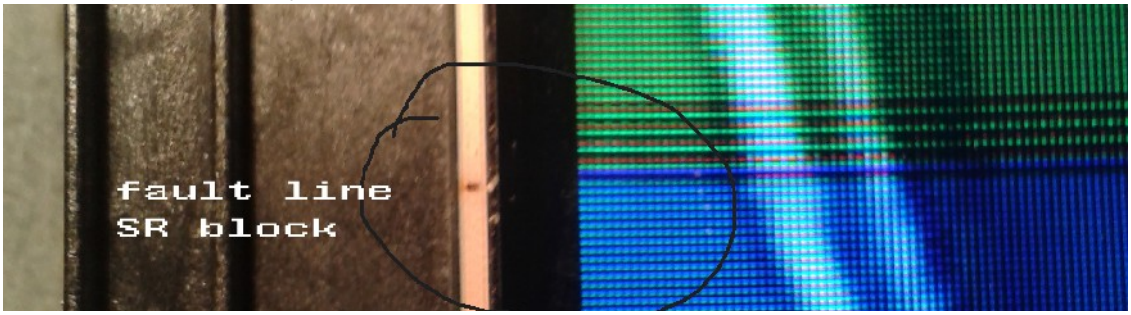
T-Con S100FAPC2LV0.3
Processor: BD8193MWV, Gamma MAX9694E
Panel screen used in Samsung LE32D450G1W TV

VONE value=28v, VOFFE= -11,5v
Gain signals CKV1, CKVB1, CKV2, CKVB2 and STVP are outputted to screen cell thru 4 resistors, 0 ohms, as in image below.

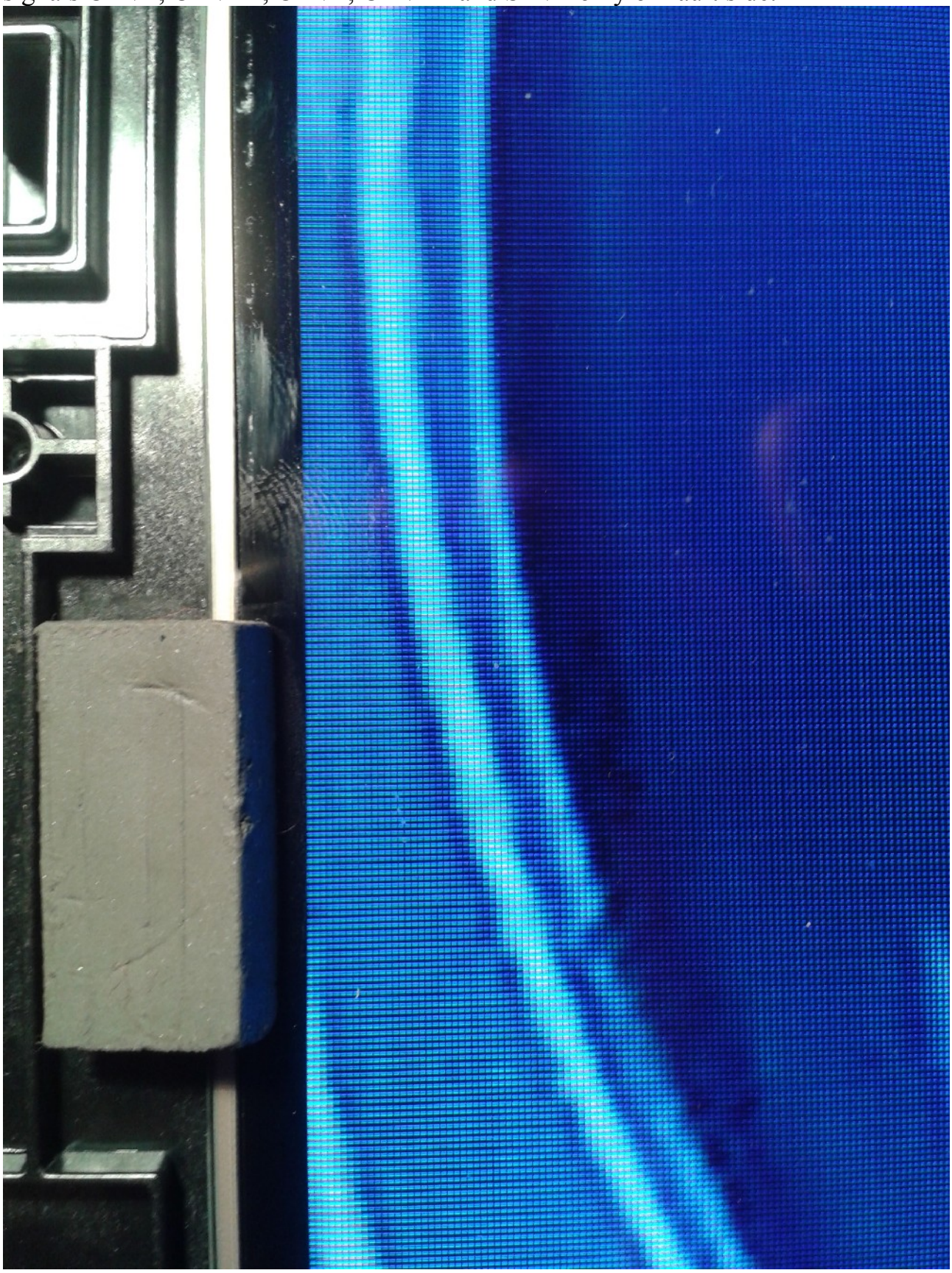


When all image is colorless or with hue of green/red pale, the fault is from NVM Eeprom, 24C64WP. Replace it, with another one, write it before solder. If you need, just ask and I will send the .bin file.
A very often fault found with this type of panel - image is ok only on lower part of the screen, and upper side is discolored and full of visible horizontal lines, as in picture below

The reason for this fault, is a fried connection of a SR gate block, from left/right side of the screen (check after you remove the metal rim that covers the screen)



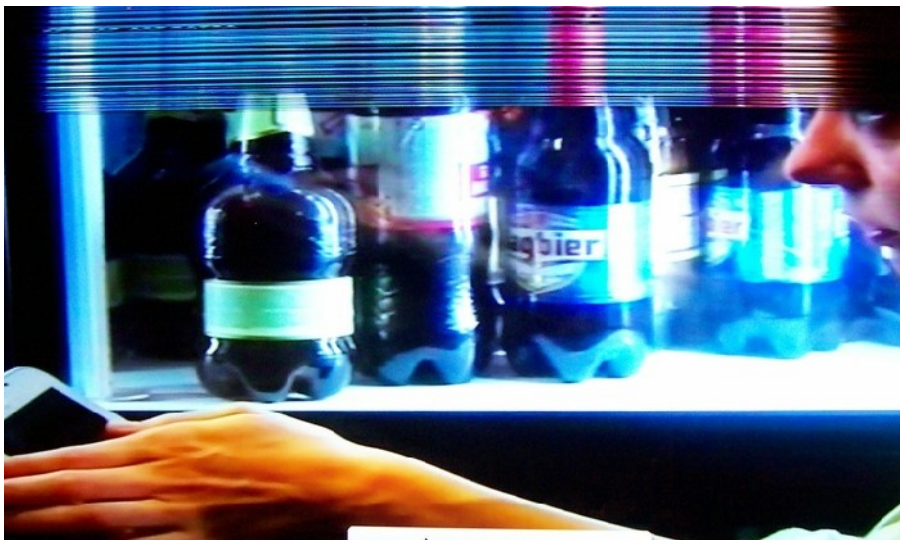
The repair procedure: The fault starts after a few minutes, when faulty SR gate run too hot, so you can add a thermal sponge pressed by metal rim, or you can cut the signals CKV1, CKVB1, CKV2, CKVB2 and STVP only on fault side.



PANEL SCREEN LTJ400HM07

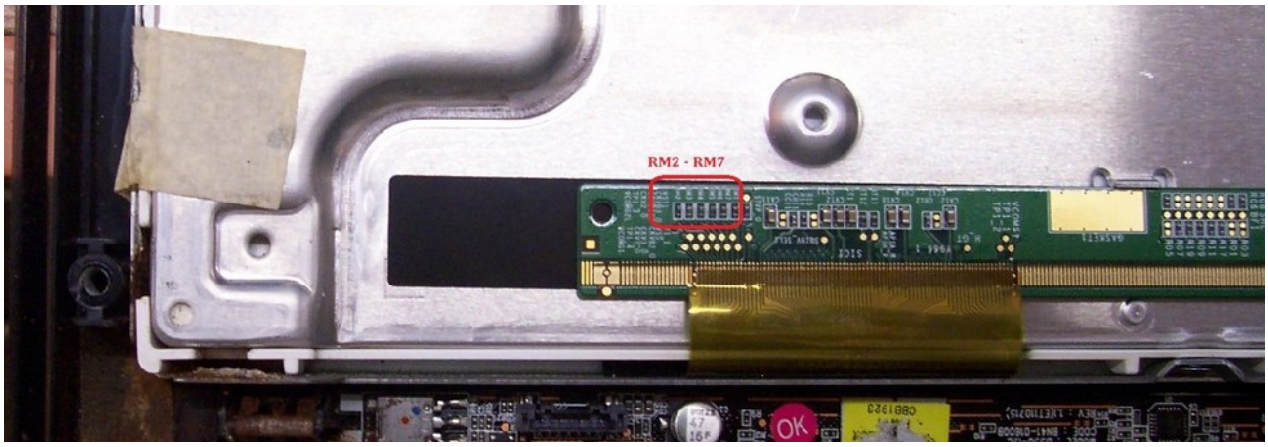
T-CON **S100FAPC2L v0.3 (BN41-01687A)**

Fault: The thin horizontal stripes at the top of the screen. Cause of the defect: burned SR block in the higher right/left corner of the panel



Repair procedure: Disconnect left FFC between T-con and left PWB and power the tv. If you have now on right part of the screen a normal image, means that you have a fault in left side of the cell. If still a fault image, re-connect the left FFC and disconnect right FFC between T-con and left PWB and power the tv. If you have now on left part of the screen a normal image, means that you have a fault in right side of the cell. On the right side (with problems) resistors RM2, RM3, RM4, RM5 RM6 and RM7

You will have a normal picture now, but sometimes, you will have, on side with problems, a little ODD/EVEN lines distance. Strap with a wire, on check points, CKV1 with CKVB1, see if lines are now correct displayed. If not, strap with a wire, on check points CKV2 with CKVB2, check, and repeat procedure with CKV3 with CKVB3. Now you will have a clean image. Sometimes, if you have a bigger problem on SR circuit, the image will be correct but a / some thin line (s) will be displayed sometimes on screen, noticeable on lighter/darker images. Check if any improvements if connect all pairs of check points on fault side on GND or Voff.



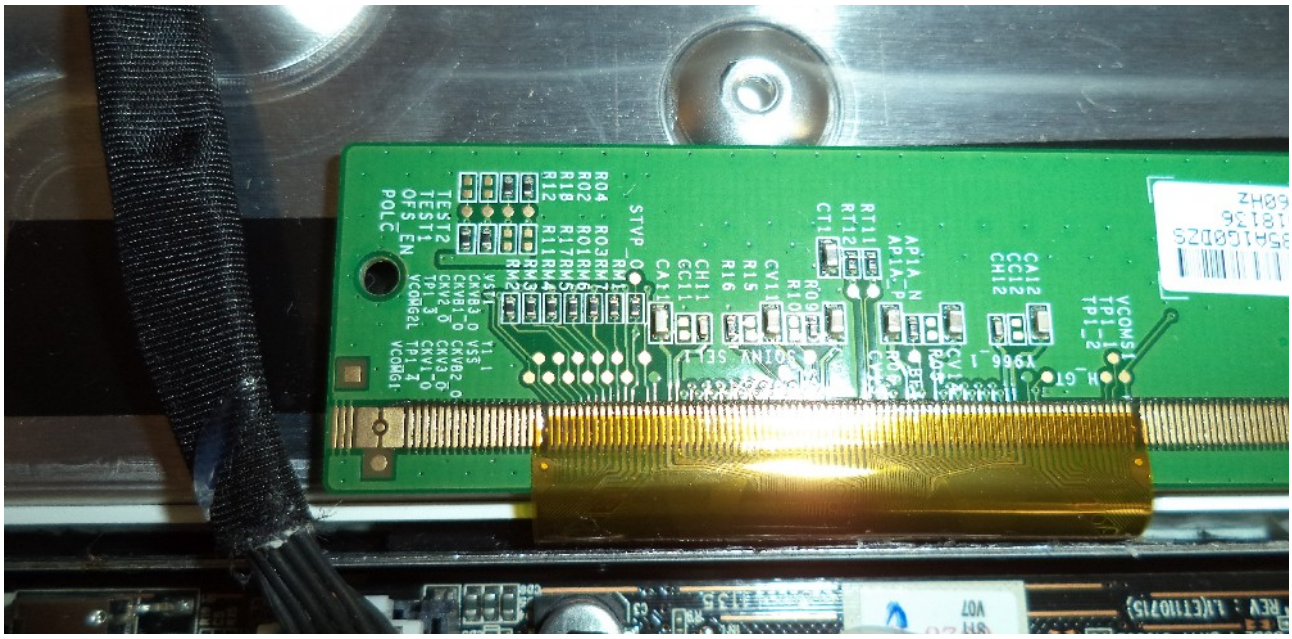
PANEL SCREEN LTF400HM03

T-CON S100FAPC2L v0.3

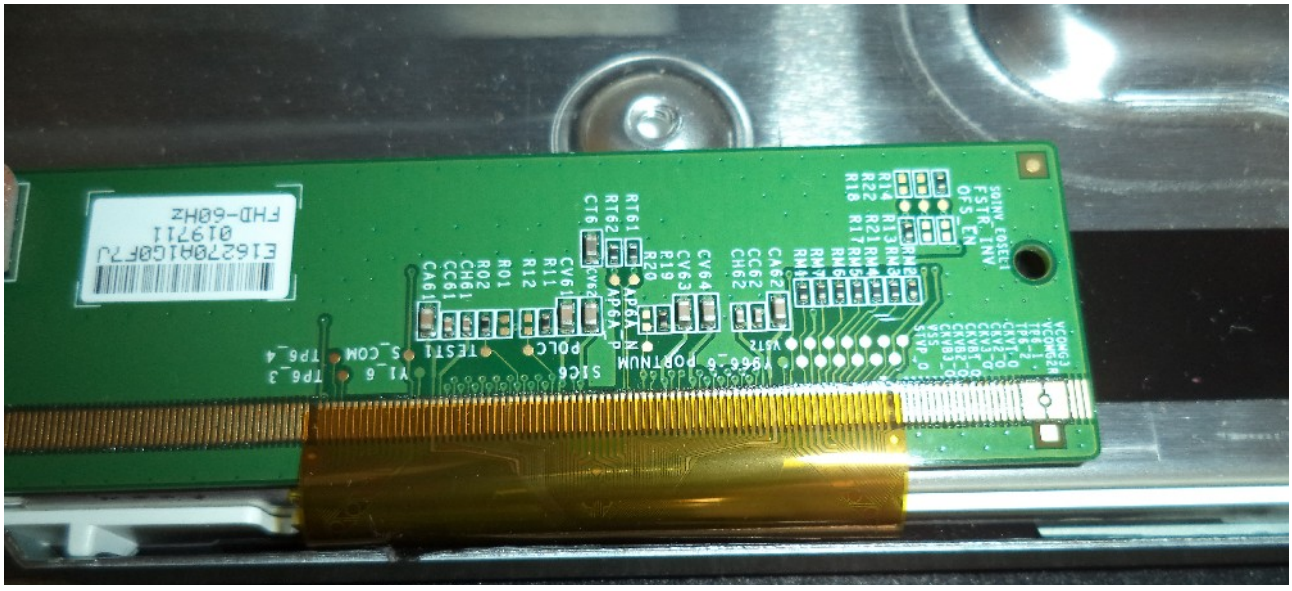
Fault: 15 - 30 minutes of good image, begins to trembling, double vertically. If you check on strips of glass with your fingers, you will find that hot broken drivers are on one of the the left/right bar.

Repair procedure: Disconnect left/right FFC cable between T-con and left/right PWB one by one, and check which part is fault. Remove on pairs (CKV1 and CKVB1 and so on), the 7 resistors from fault side RM1-RM7. If needed, strap pairs comming from screen, on check points (CKV1 with CKVB1, CKV2 and CKVB2, and so on) You can also try to strap pairs to GND or Voff and see if better picture.

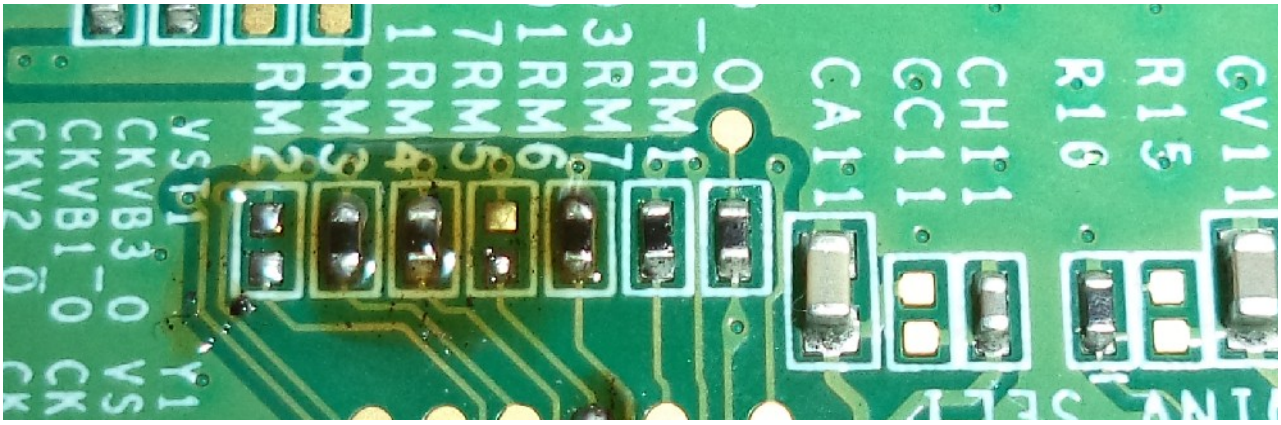
LEFT PWB



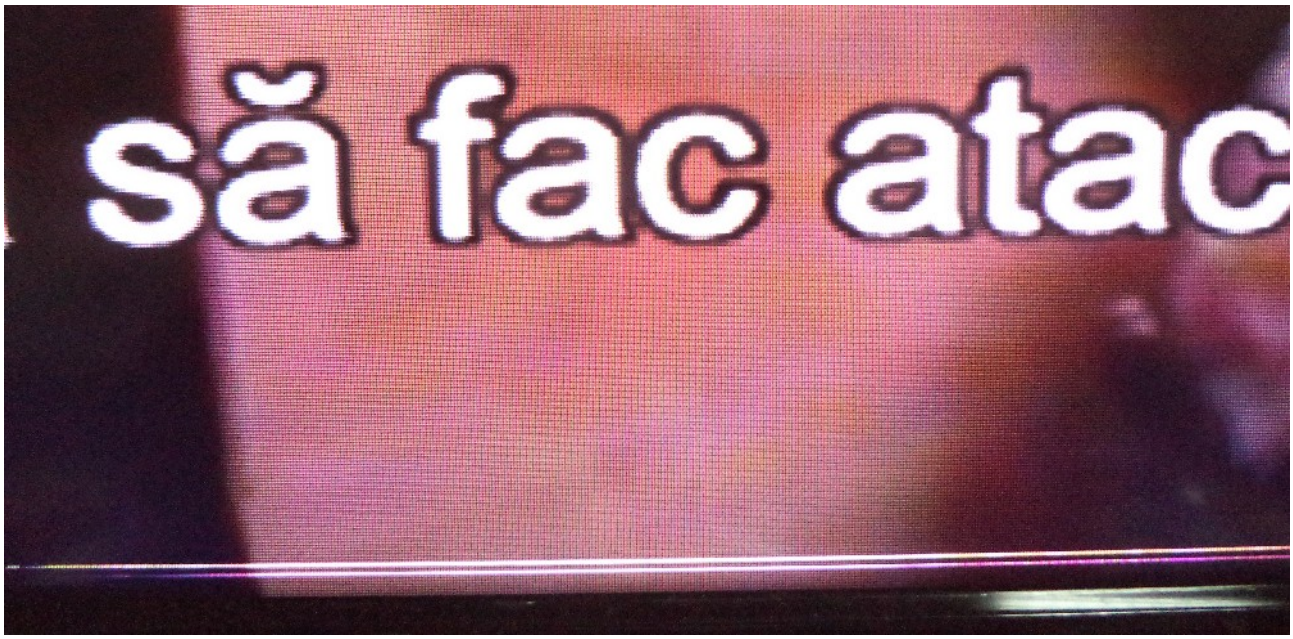
RIGHT PWB



On example below, was enough to cut CKV1-CKVB1 pair on fault side, by removing corresponding resistors, and the image came back to normal.



Some thin lines can appear sometimes. Just Strap CKV1-CKVB1 pair, and connect

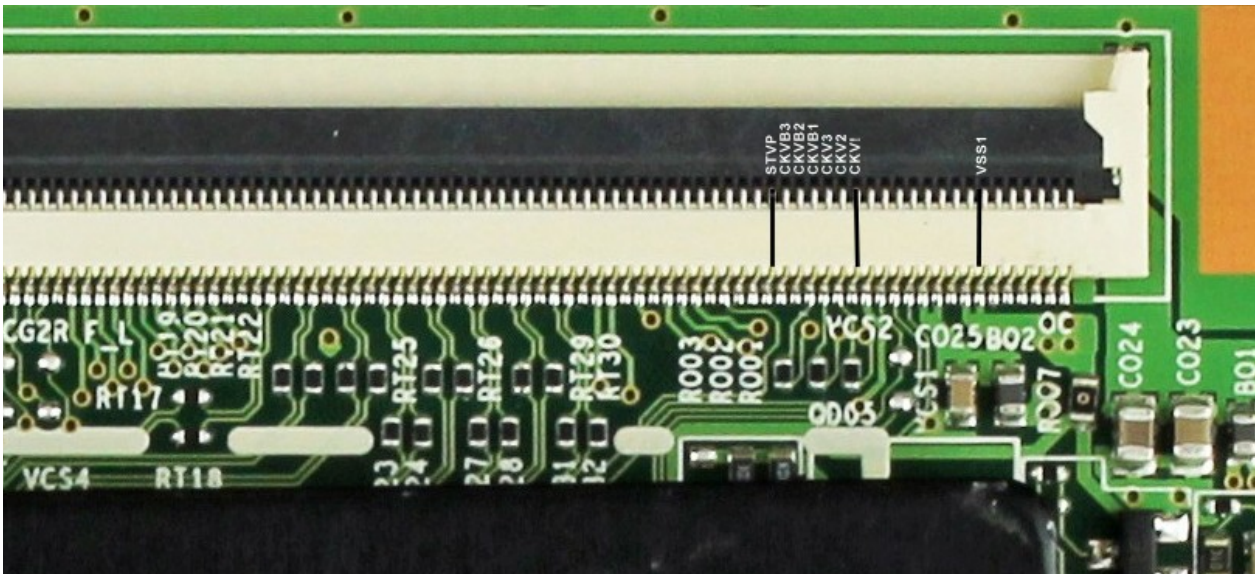


it to GND or VSS, and the lines will dissapear.

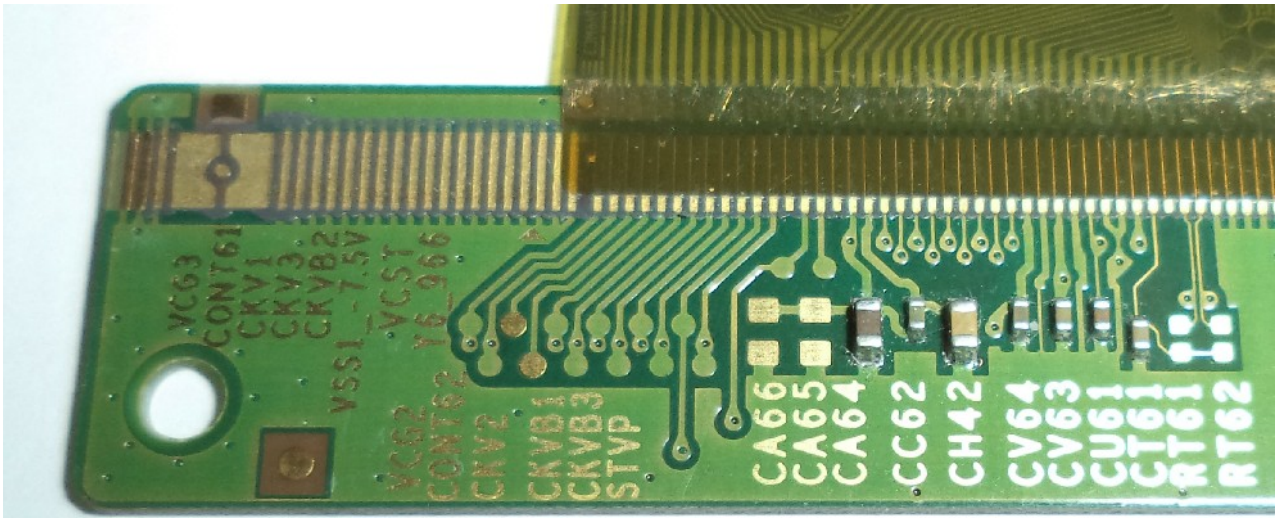
PANEL SCREEN LSF320HJ01

T-CON: 2013_TCON_FOX_FT1 (BN41-01939)
FAULT: Horizontal lines on partial/ all screen

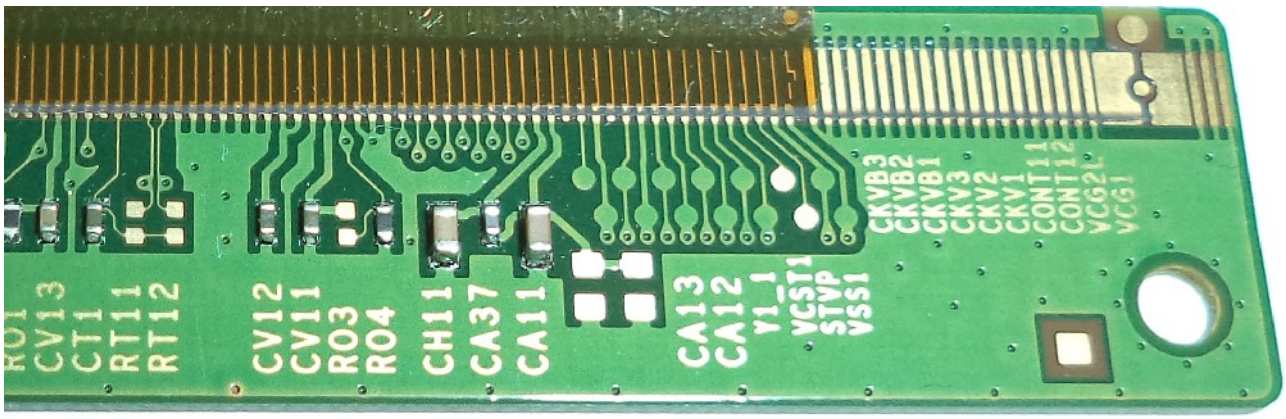
Repair procedure: Disconnect one by one the left/right FFC cable between T-con and left/right PWB and start the tv, this way you can easy check which part is fault. Level shifter IC is connected to left/right gate blocks, thru some zero ohms resistors fitted on T-con, thru left/right FFC cable, thru left/right PWB and extreme left/right flexible data driver circuit.



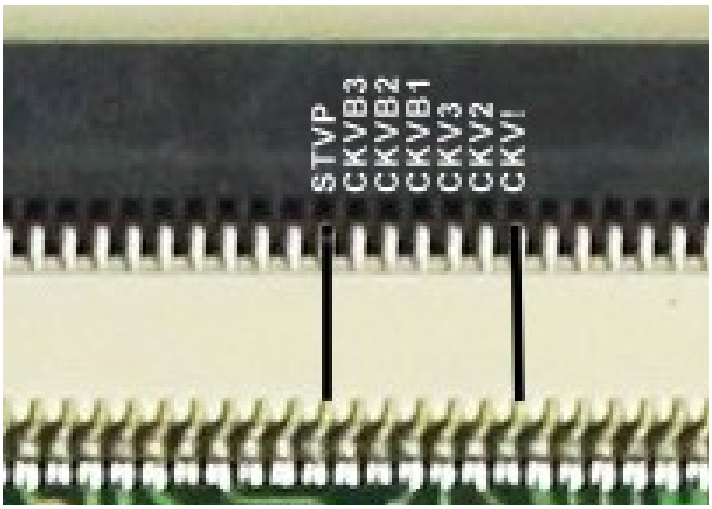
The clock signal pairs CKV1-CKVB1, CKV2-CKVB2, CKV3-CKVB3 and start signal STVP have check points on each side, but they are covered with paint and are very close to PCB's through-holes, so cutting the circuits is an hard operation.
RIGHT PWB:



LEFT PWB:



The easiest way to repair the panel is to cut all 7 signal connectors from FFC cable, only on the side with fault, on TCON side.



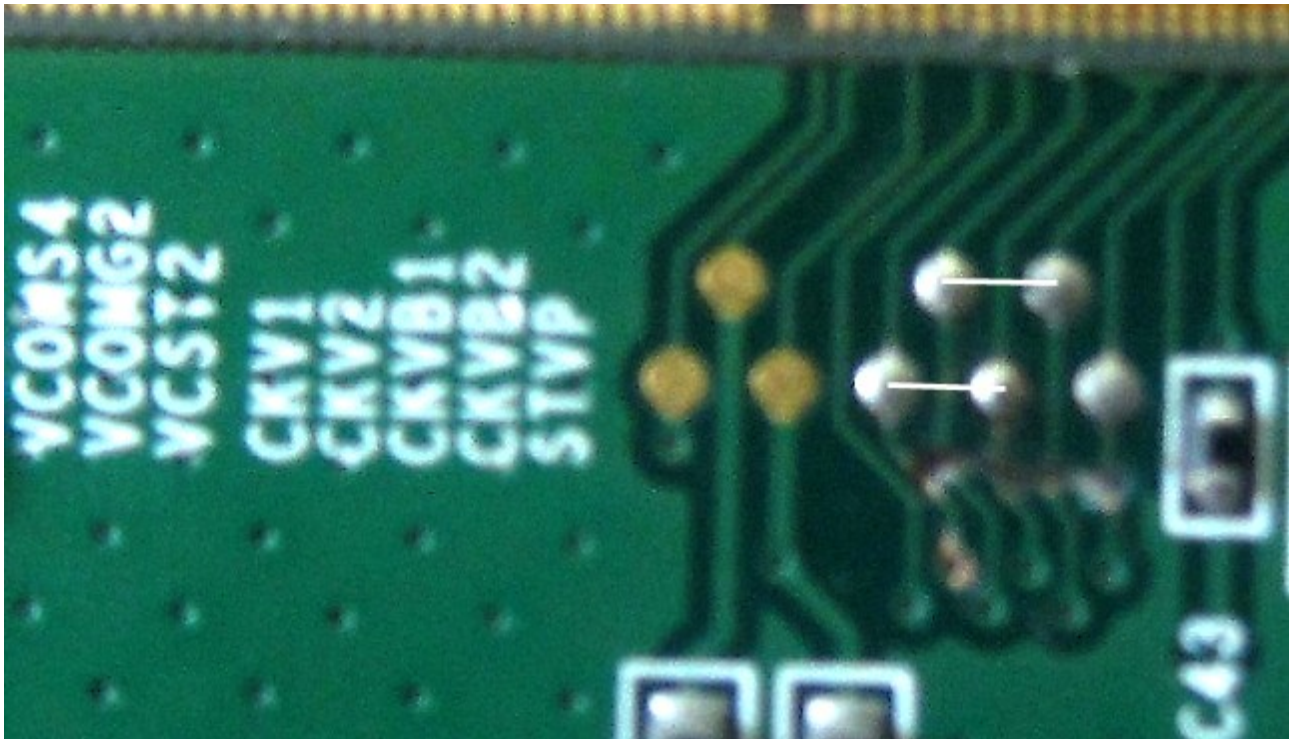
If any horizontal thin lines remains over normal displayed image, clean the paint from check points on PWB side with fault, and strap with a wire the pair check points CKV1- CKVB1, see if lines disappeared. If not, connect the strapped to GND or Voff. Repeat procedure with pairs CKV2-CKVB2, and CKV3-CKVB3 for best results.

PANEL SCREEN LTY320AP04 and LTZ320AP04

TCON:320AP04S4LV1.5 and 320AP04S4LV1.7

FAULT: Image trembling, double vertically, horizontal lines on all/partial screen

T-CON board is not detachable, and signals to left/right gate blocks, is transmitted thru left/right flexible data driver circuits. So, it's almost impossible to check which gate is fault. Usually, the right part faults more often, so you can start to disconnect signals from there. You must cut the connections between PCB's through-holes and check points, so the check points to remain connected to panel, as in picture.



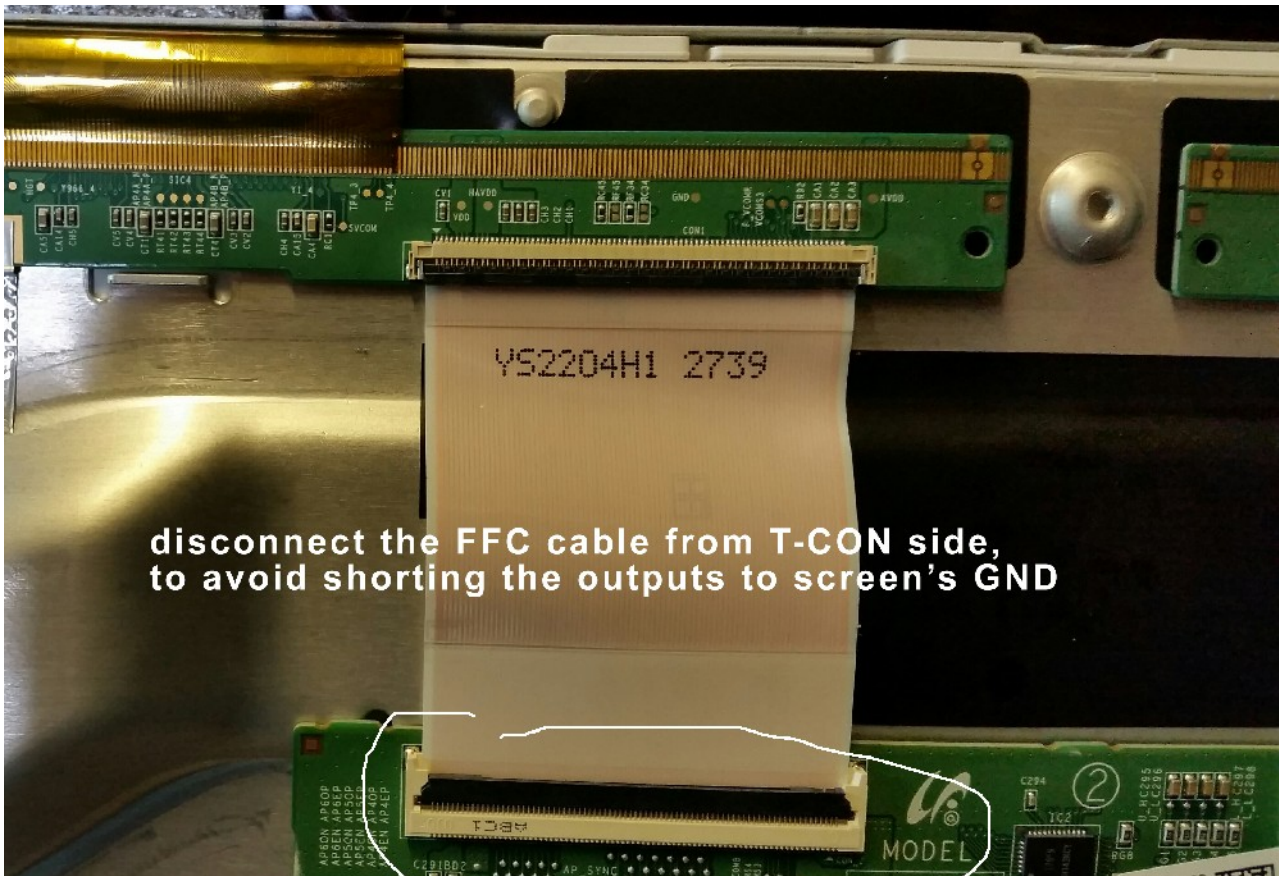
Disconnect first the pair CKV1-CKVB1 and STVP and power the tv and check if any improvement. If not, try to strap CKV1-CKVB1. Check again. Try to connect CKV1-CKVB1 to GND. Disconnect the pair CKV2-CKVB2 and and power the tv and check if clear display. If not, try to strap CKV2-CKVB2. Try to connect CKV2-CKVB2 to GND.
If CKV2-CKVB2 faults, try to rebuild connection for pair CKV1-CKVB1. Your goal is to have best image you can achieve. Sometimes a thin horizontal line will be displayed, even you have a perfect image. You can not eliminate this failing. The line is not noticeable from normal view distance, but it's position depends on the position of faulty SR gate block. On image bellow, the line is very close to lower part of the screen.

PANEL SCREEN LTA400HW03 J

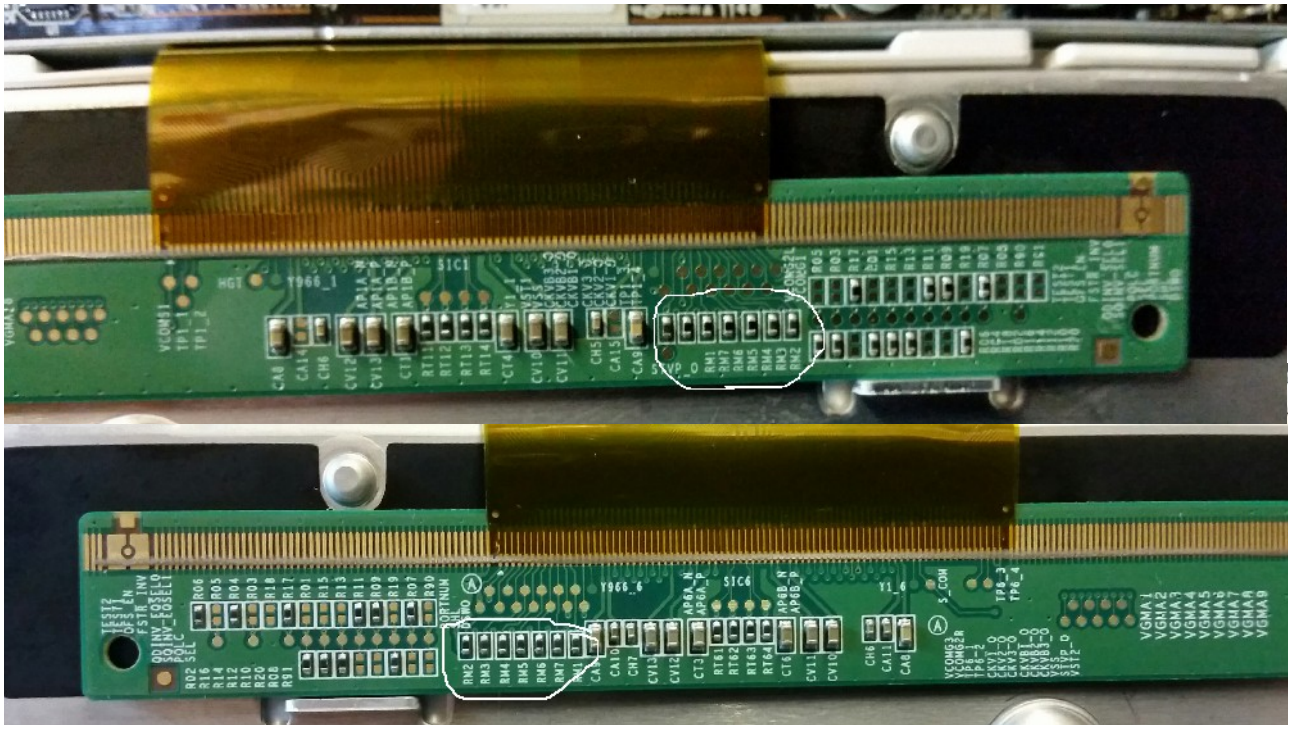
TCON: SH120PMB45V0.3

FAULT: Image trembling, double vertically, horizontal lines on all/partial screen

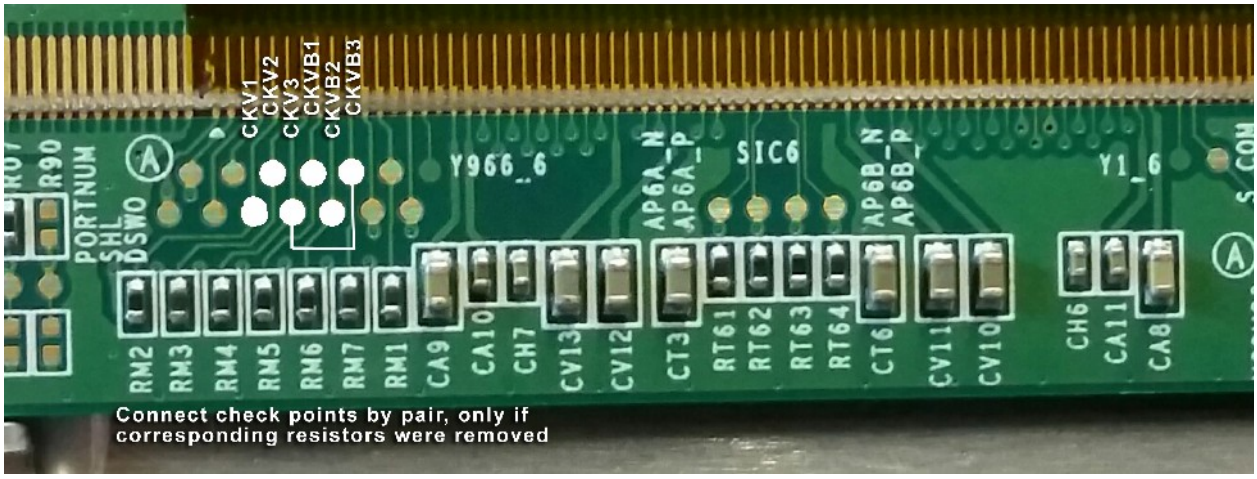
Repair procedure: Disconnect left FFC between T-con and left PWB and power the tv. If you have now on right part of the screen a normal image, means that you have a fault in left side of the cell. If still a fault image, re-connect the left FFC and disconnect right FFC between T-con and left PWB and power the tv. If you have now on left part of the screen a normal image, means that you have a fault in right side of the cell. On upper image, there is a problem in the right side gate screen driver.



On the side with **problems,** remove from PWB the resistors RM1-RM7, in this order: first remove the CKV1 and CKVB1 resistors RM2 and RM5 and see any improvements. If not, remove CKV2 and CKVB2 resistors RM2 and RM6, check if any improvements, and if not, remove CKV3 and CKVB3 resistors RM3 and RM7. If still no improvements, remove STVP resistor, RM1 see picture.

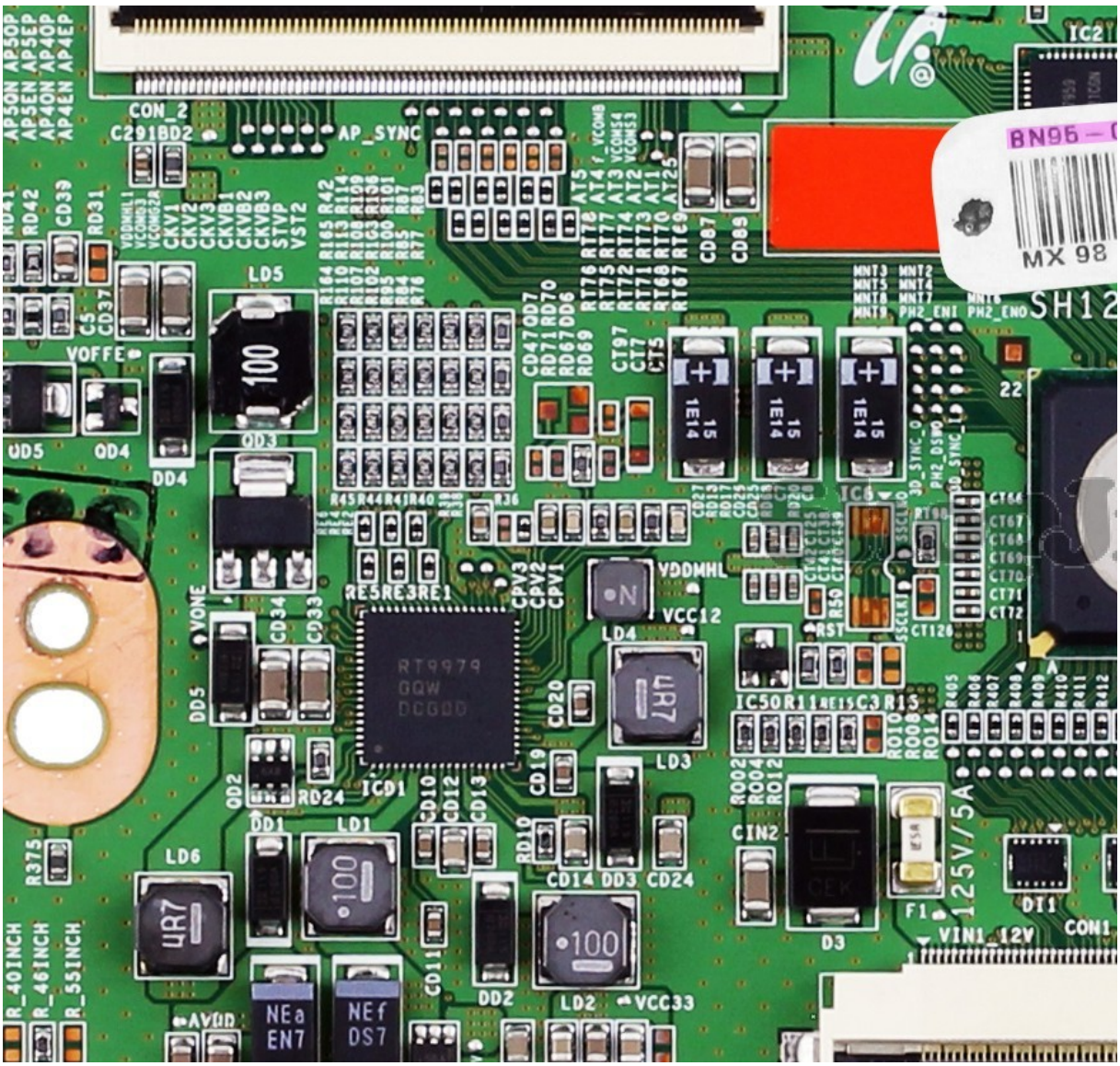


You will have a normal picture now, but sometimes, you will have, on side with problems, a little ODD/EVEN lines distance. Strap with a wire, on check points, CKV1 with CKVB1, see if lines are now correct displayed. If not, strap with a wire, on check points, CKV2 with CKVB2, check, and repeat procedure with CKV3 with CKVB3. In example bellow, the pair CKV3-CKVB3 was strapped Connect check points by pair, but only if corresponding resistors were removed, or else you can burn the LEVEL SHIFTER IC from T-CON



Sometimes, will be better to put back the resistors for the blocks pair that have no problem. For example if only by disconnecting CKV3 and CKVB3 will solve image problem, that means pair 1 and 2 have no problems. Sometimes, if you have a bigger

problem on cell circuit, the image will be correct but a / some thin line (s) will be displayed sometimes on screen, noticeable on lighter/darker images. Try to connect the pair that not work on GND or Voff. You can also raise Voff voltage with 3-5 volts to minus and the line will disappear. You have to do this on T-con Board, by raising the value of the resistor connected between FBN input of BiasPS/Level shifter ICD1 – RT9979 and VOFFE.

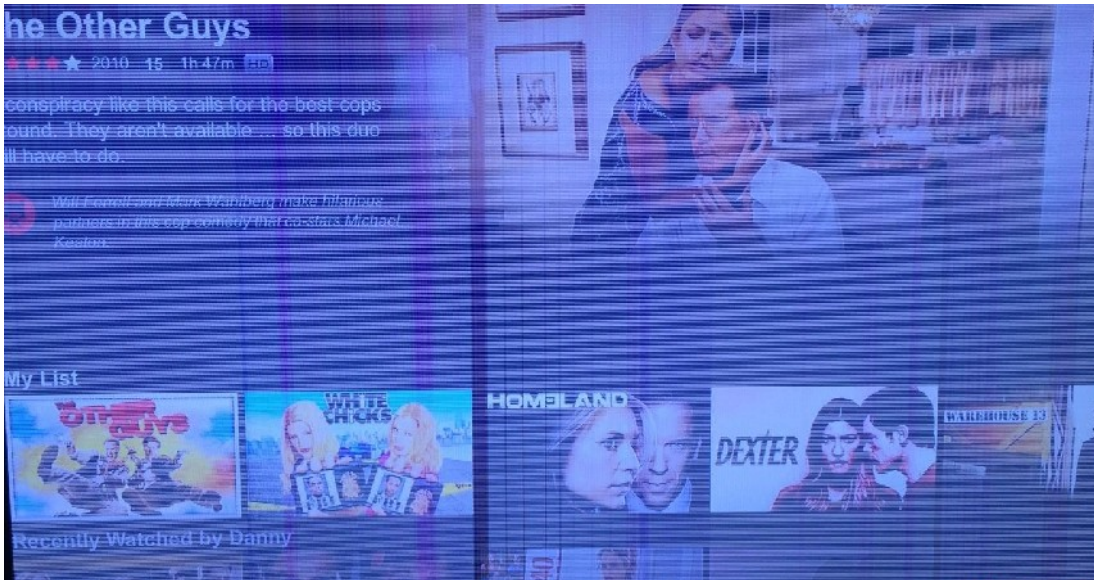


PANEL SCREEN LSY320AN02

TCON: 320KSB_S2LV0.2

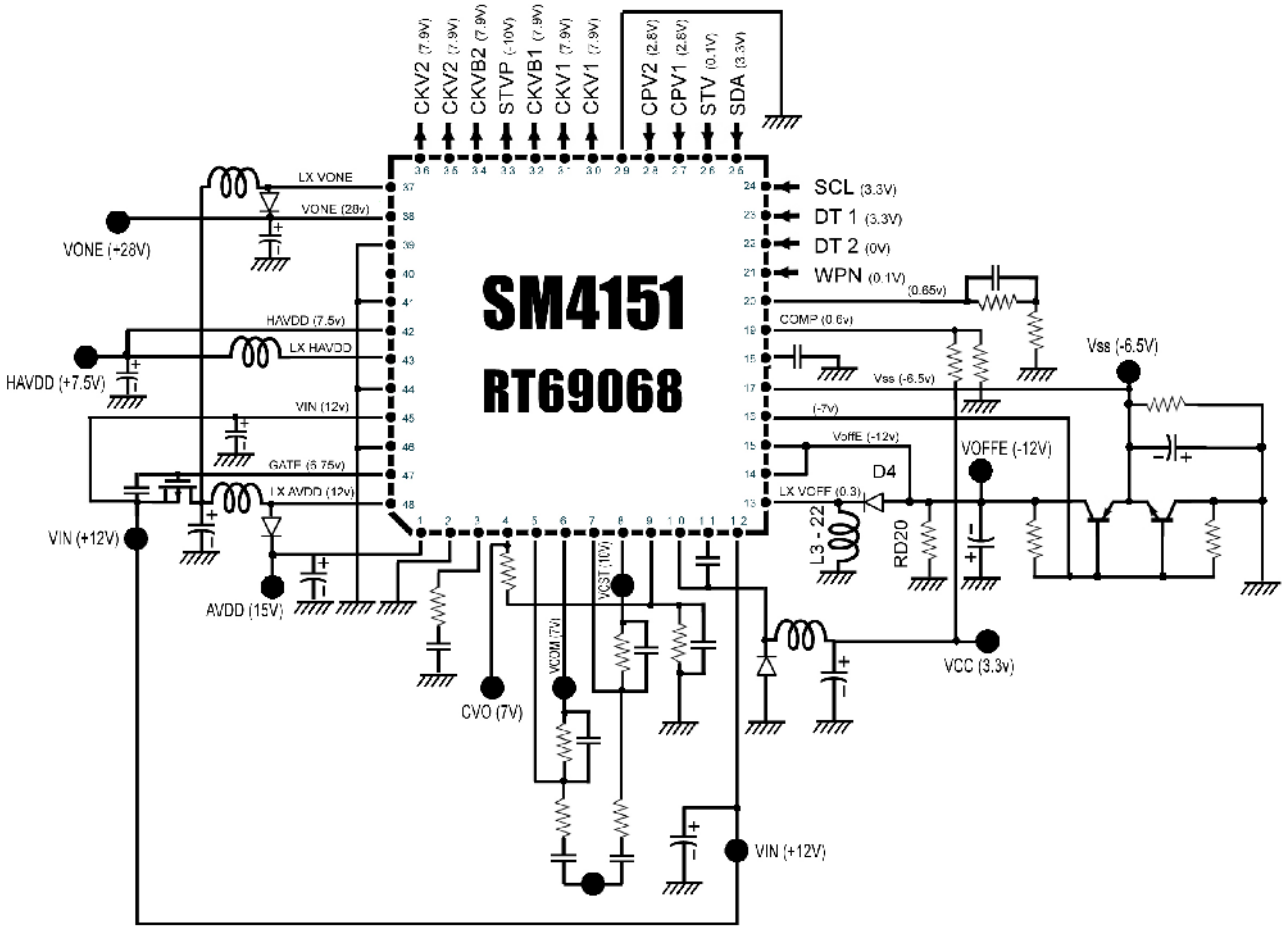
Screen is flickering, have a part/all the screen with doubled image, white ghosting on part / all screen

T-CON board is not detachable, and signals to left/right gate blocks, is transmitted thru extreme left/right flexible data driver circuit. It's only one data driver flexible circuit, so, it's almost impossible to check which gate is fault (left/right).



But sometimes, if you detach and reverse the cell glass, you will see burned circuits on glass, so you can now know which side is fault. There are several connections that you have to cut on fault side: CKV1-CKVB1, CKV2-CKVB2, Vss, Vcom and Vcst

The LEVEL SHIFTER is integrated in DC-DC source drive IC2 – RT69068, or SM4151. The IC's have same configuration, the only difference is the Vreff voltage (pin18) 3,3V or 5v.



The connections from LEVEL SHIFTER and left/right gate blocks are made thru

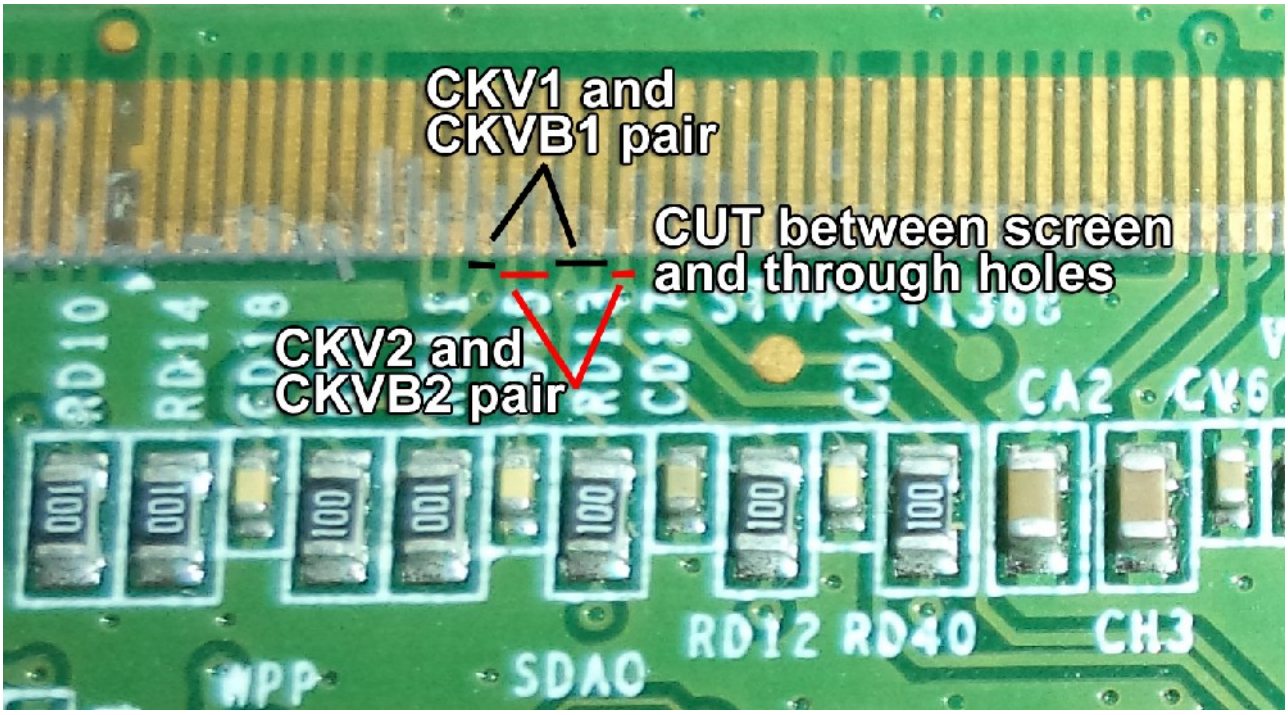
some 10 ohms resistors, RD10, RD14, RD9, RD11, RD13, RD12 and RD40, as in picture. CKV1 and CKV2 have 2 outputs on each side to double the current and to avoid LEVEL SHIFTER overheating.

REPAIR PROCEDURE.

On fault side, you must cut the connections to left/right side, between PCB's through-holes and panel, so the check points to remain connected to working side of the panel, as in picture. PCB's through-holes, connects the other side of the cell with gate signals, so cutting the connections between resistors and through-holes, will cut signals on both sides of the screen.

If no burned circuits on reverse side of the cell, first try to find out which pair creates

problems on screen. First, remove RD10, RD14 and RD,13 and check if CKV1-CKVB1 pair creates problems. If not, solder back the resistors, and remove RD9, RD11 and RD 12, and see if CKV2-CKVB2 pair creates problems. Cut only pair with problems, as in picture:



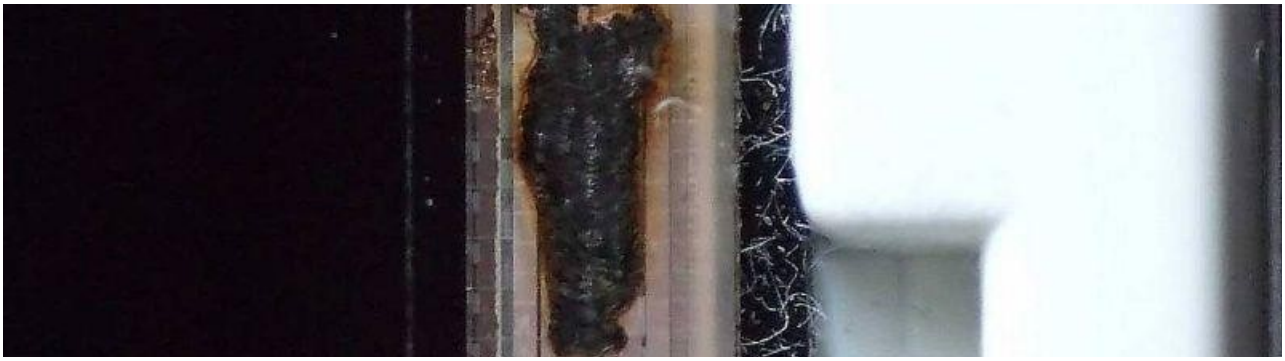
It's a very difficult procedure. Do not try it if you don't have a microscope or a power magnifier lens!

Now you will have a clean and almost perfect image.

PANEL SCREEN: LTJ400HM05

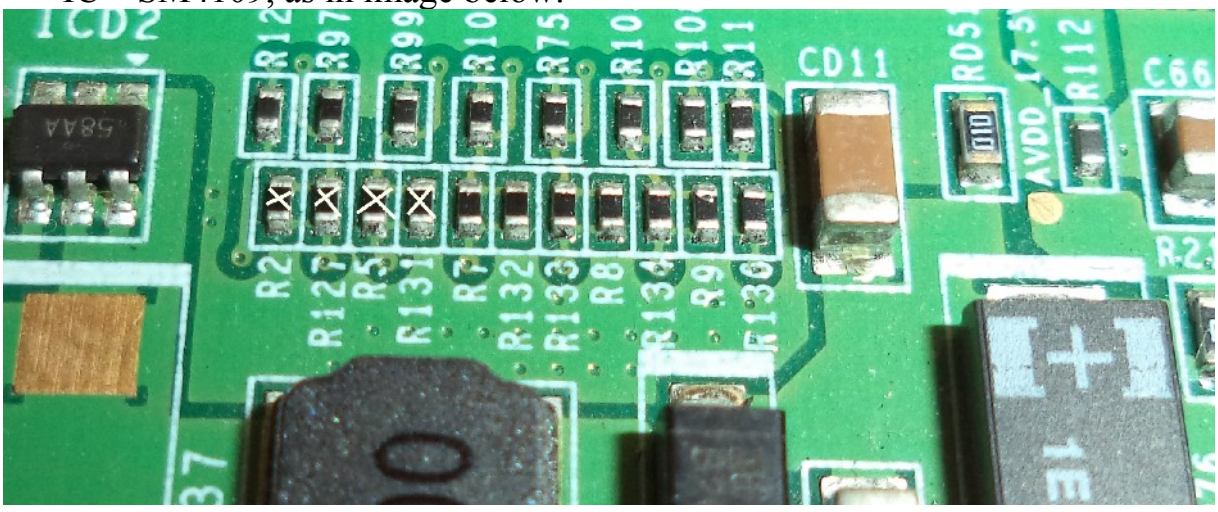
T-Con 400HR42S4LV0A, 400HR42S4LV0B
Screen is flickering, have a part/all the screen with doubled image, upper side is discolored and have visible horizontal lines

First step is to find which part of the screen is fault.
This operation is very hard, the t-con is attached to cell glass thru data drivers. We don't have resistors on CKV-CKVB left-right pair signals, so we have to make a big effort to find out where is the fault. If you have a point where fault starts, you can try to see if a burned SR block can be seen on fault side.
You can detach and reverse the cell glass, you will see burned circuits on glass, so you can now know which side is fault. There are several connections that you have to cut on fault side: CKV1-CKVB1, CKV2-CKVB2, CKV3-CKVB3, STVP



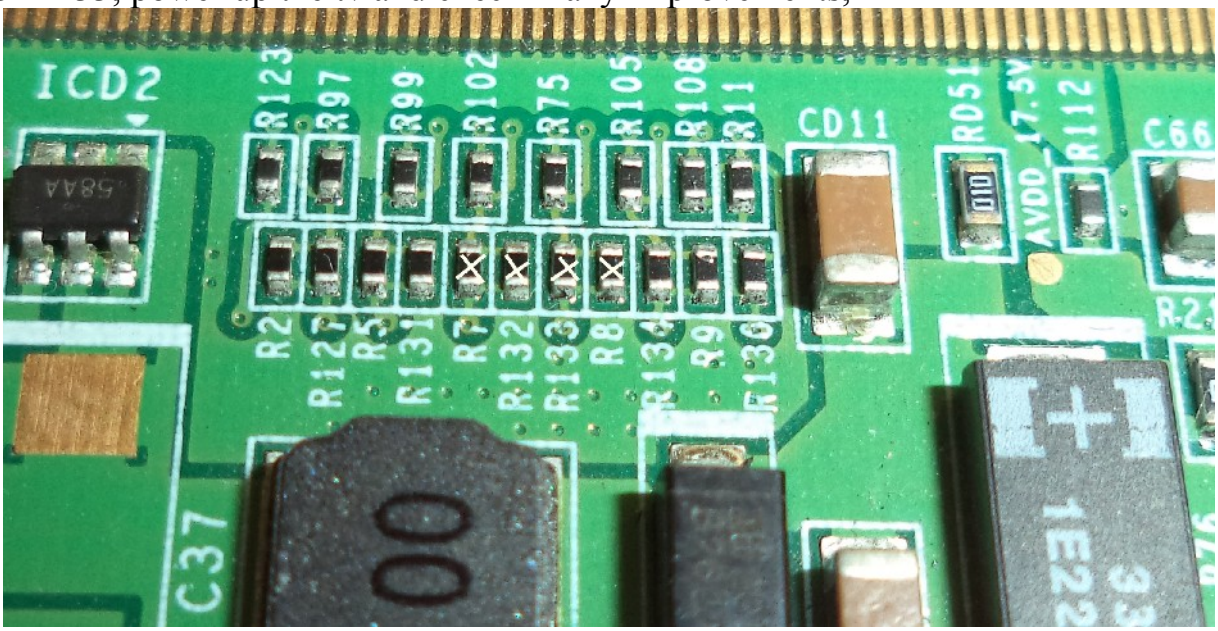
This operation is very hard (the screen is 40 inches), so do not try this if you don't have 2 clean and large tables, covered with some bubble wrap or white paper.
If you cannot see any burned blocks, even with a microscope or magnifier, follow this steps:

1. Remove resistors R2, R127, R5 and R131 (zero ohms) for pair CKV1-CKVB1 that connects LEVEL SHIFTER IC with both left-right SR blocks. R2 and R127 are connected parallel for CKVB1 signal. R5 and R131 are in parallel connection for CKV1. You can find the resistors in the left side of level shifter IC – SM4109, as in image below:

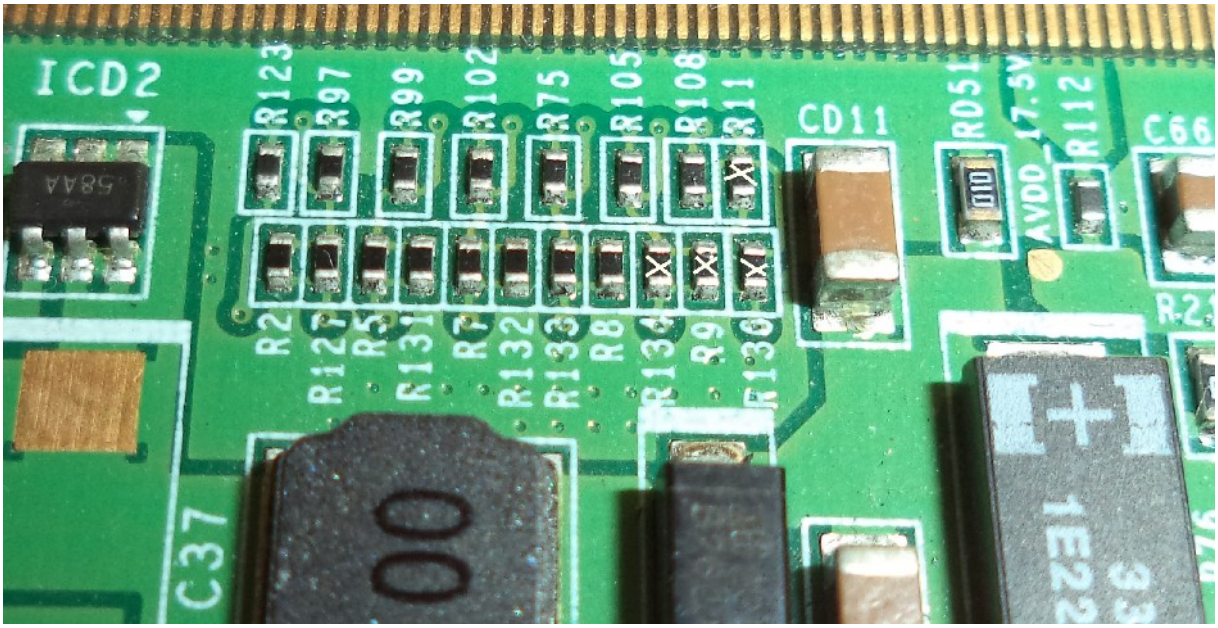


Power the tv and check if any improvements on screen. If not, solder back the

resistors from 1st pair and remove CKV2 and CKVB2 resistors R7+R132 and R8+R133, power up the tv and check if any improvements,

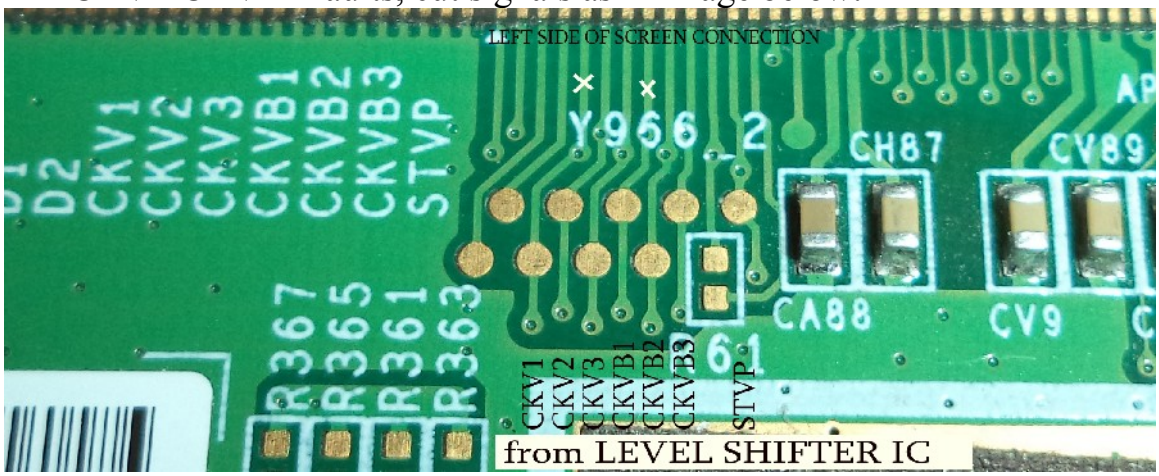


If still no change, solder back the resistors from 2nd pair and remove CKV3 and CKVB3 resistors R9+R134 and R11+R136.

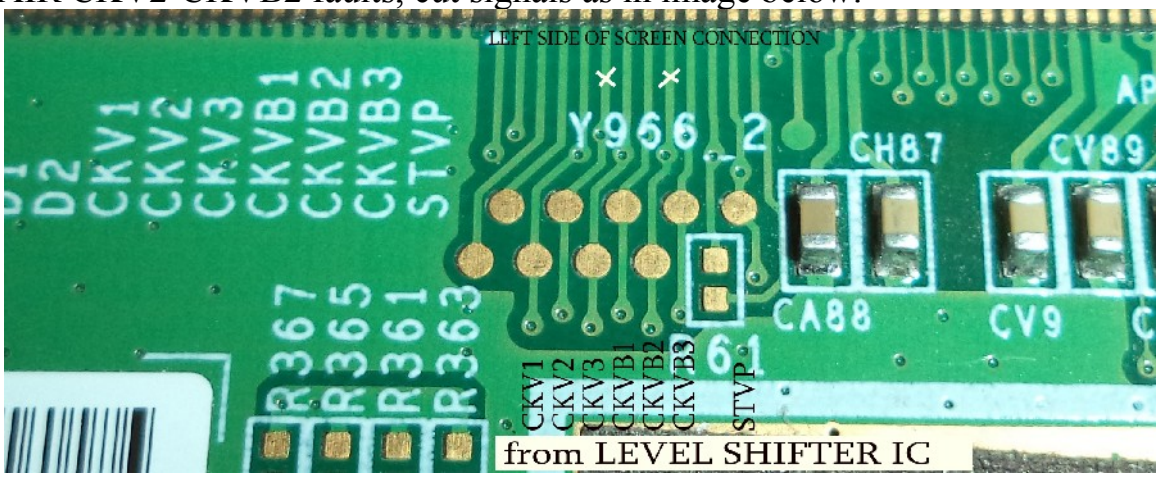


2.We know now which pair creates the fault on screen, solder back all resistors and let's find on what side (left or right) is the defective SR block. If, for example CKV1-CKVB1 pair is fault, we will disconnect the signal from left side of the screen (if you could see with a magnifier where is the fault, cut connections on fault side)
We will disconnect left side because we have more space to re-connect the signals if there is no problem on this side, and the fault is on the right side.
Cut the signals corresponding that goes on left side of the screen:

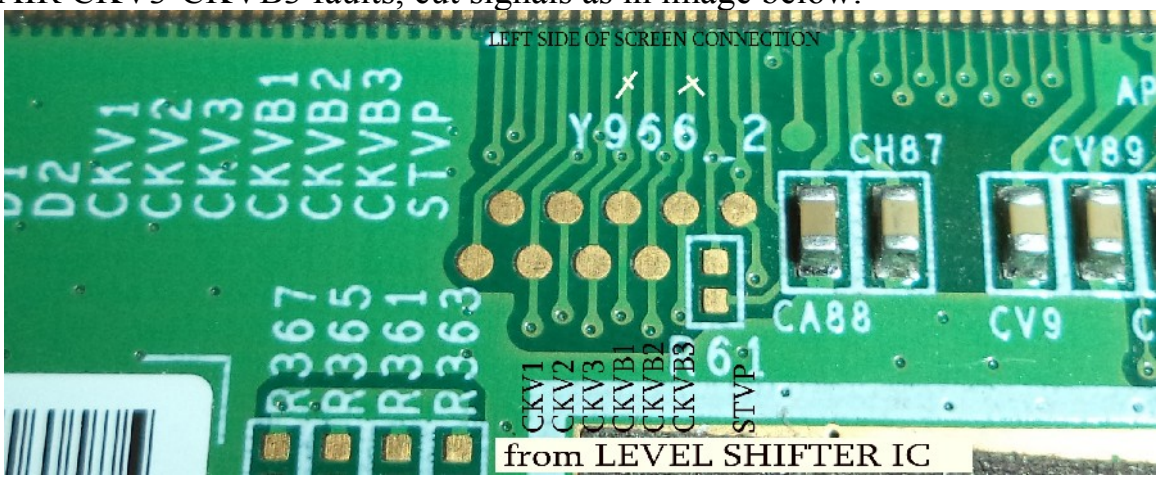
IF PAIR CKV1-CKVB1 faults, cut signals as in image below:



IF PAIR CKV2-CKVB2 faults, cut signals as in image below:



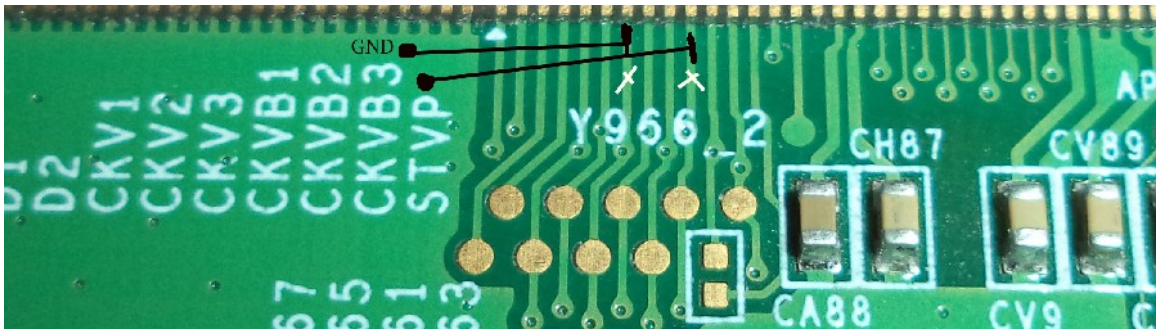
IF PAIR CKV3-CKVB3 faults, cut signals as in image below:



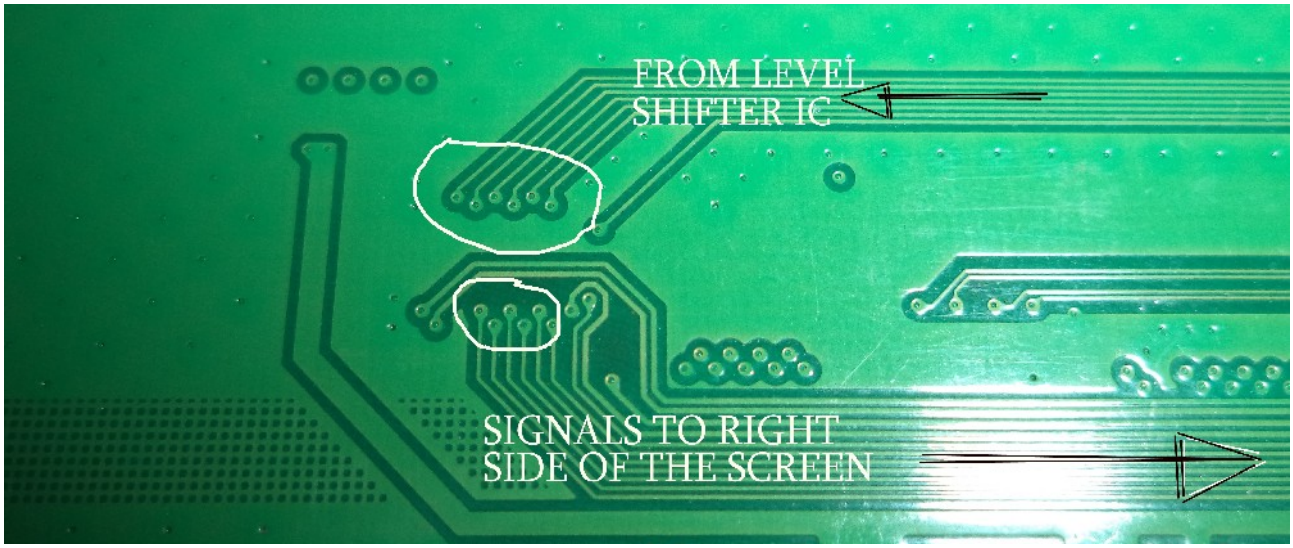
There is a 50 % chance that the left side of the cell to be fault. If the image is ok now, but some thin line (s) will be displayed on screen, noticeable on lighter/darker images, try to connect the pair that not work on GND or Voff.

ATTENTION! Connect the fault screen inputs to GND, only if this inputs were disconnected from LEVEL SHIFTER IC, as in image bellow. Just clean with a cutter

the green paint from upper side that goes in screen and solder a thin wire from GND to both inputs. Now the SR blocks are closed by connecting to GND, the analog gate outputs from fault side will be opened, and the lines will disappear from the image.
Before connecting the power, check with diode measurement instrument for any shorts from outputs of LEVEL SHIFTER IC to GND (check on all re-soldered resistors and GND)

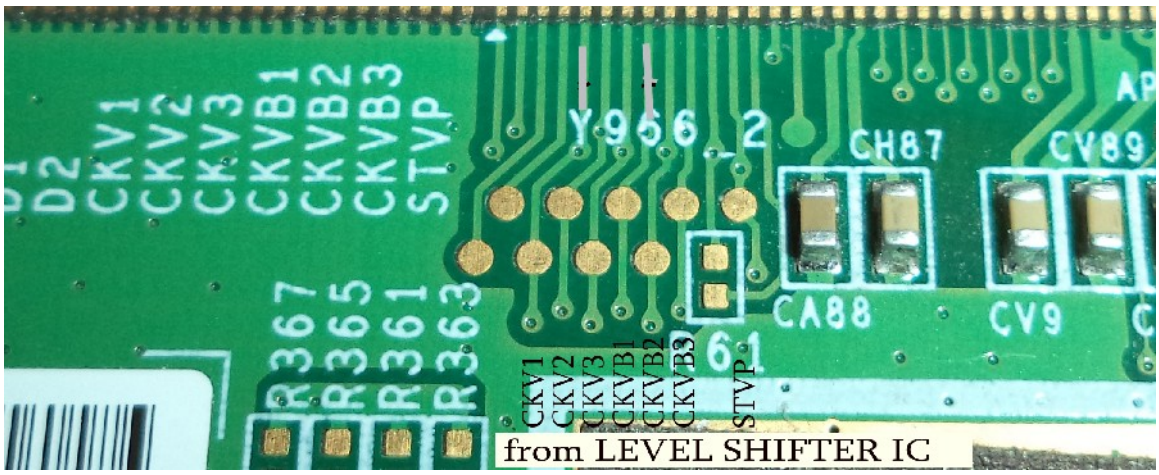


On left side, we have check points for all LEVEL SHIFTER signals CKV-CKVB1-3 signals. Lower PCB's through-holes, are connected with back circuits to LEVEL SHIFTER IC. On upper PCB's through-holes are connected all signals to right side of the cell:

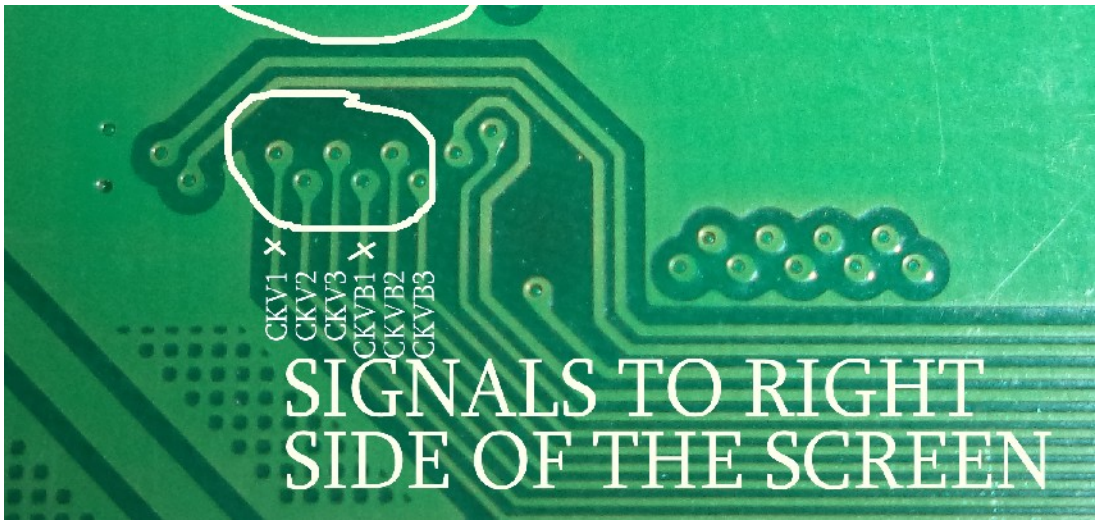


If the right side is fault, we have to re-connect the left inputs of the screen to signals and cut the right side of corresponding pair signals.

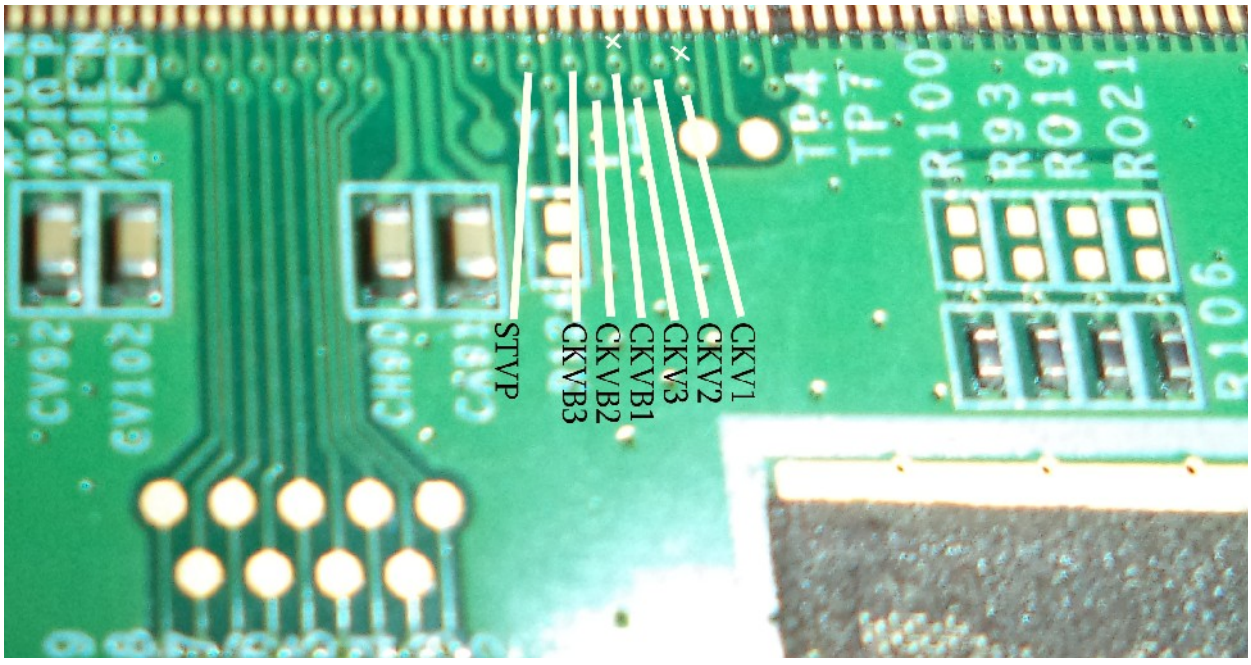
On example below, if CKV1-CKVB1 pair faults, on left side clean with a cutter the paint where initially were cut the signals, add some thermal paste and solder a thin wire.



Also, cut the signals from right side from back of the t-con PCB



or near right inputs as in images.

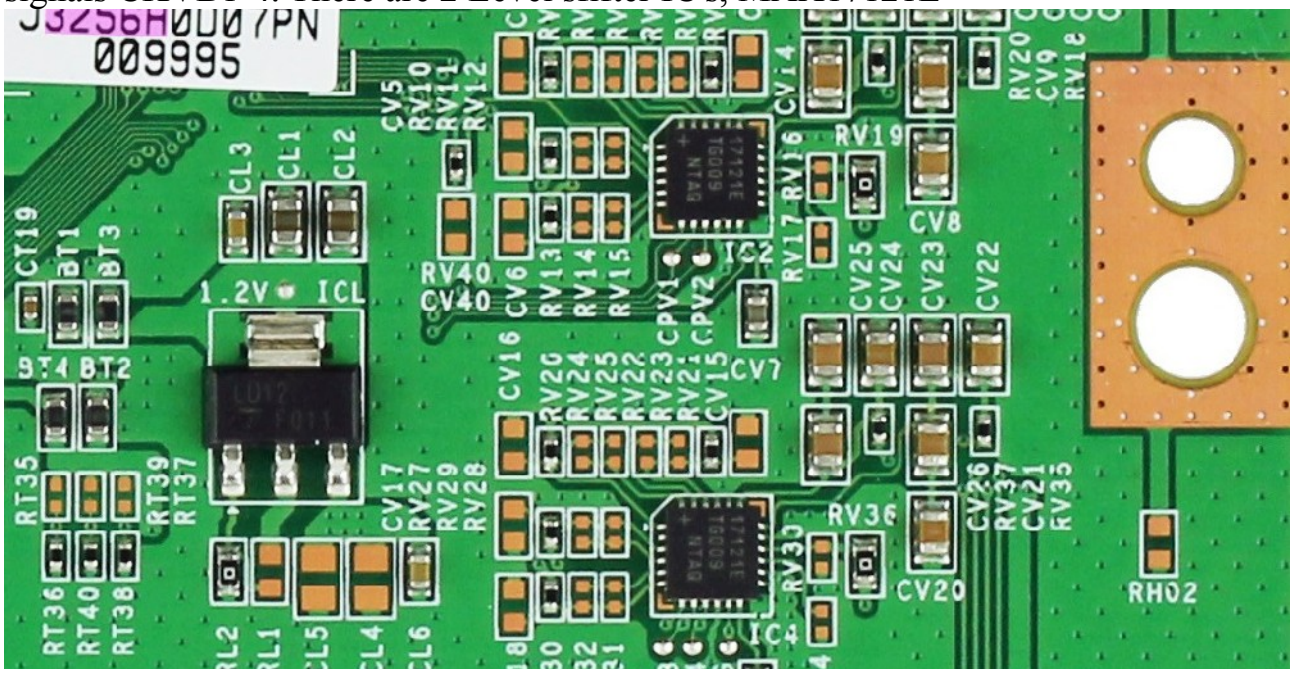


PANEL SCREEN LTF320HM01, LTA320HM03

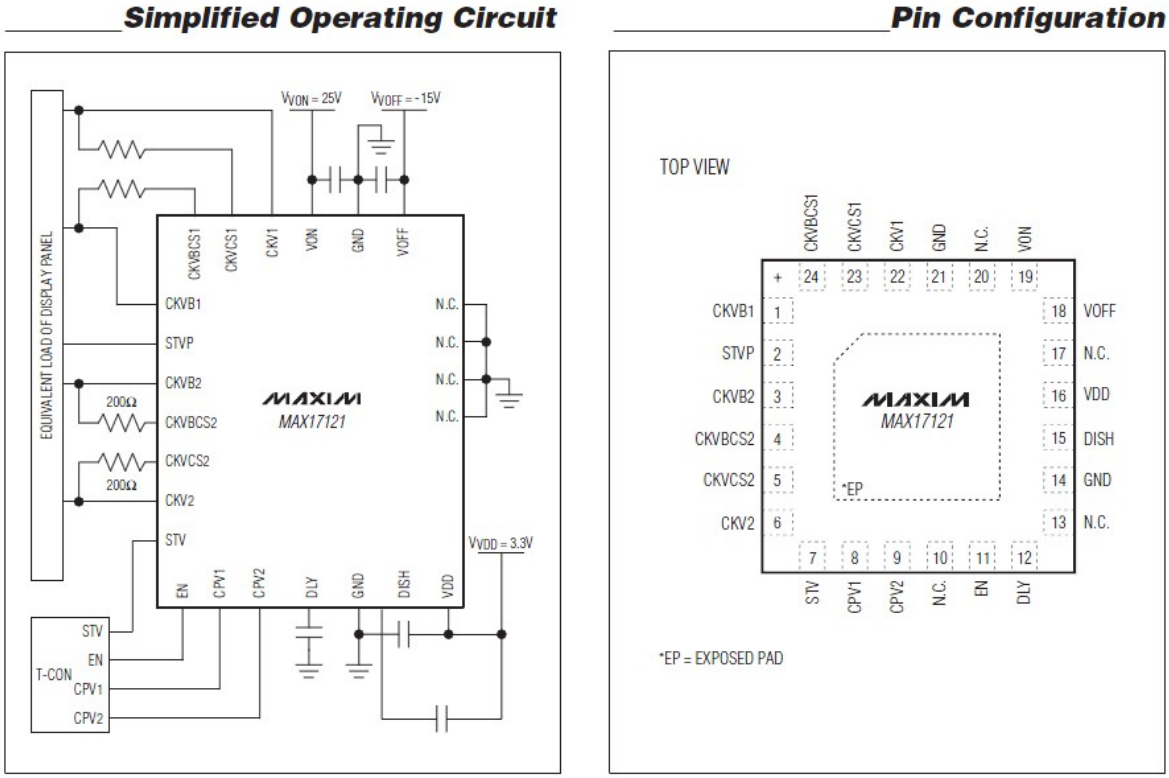
TCON: LJ94-03256H (F60MB4C2LV0.6)

FAULT: Image trembling, flickering, double vertically, horizontal lines on all/partial screen

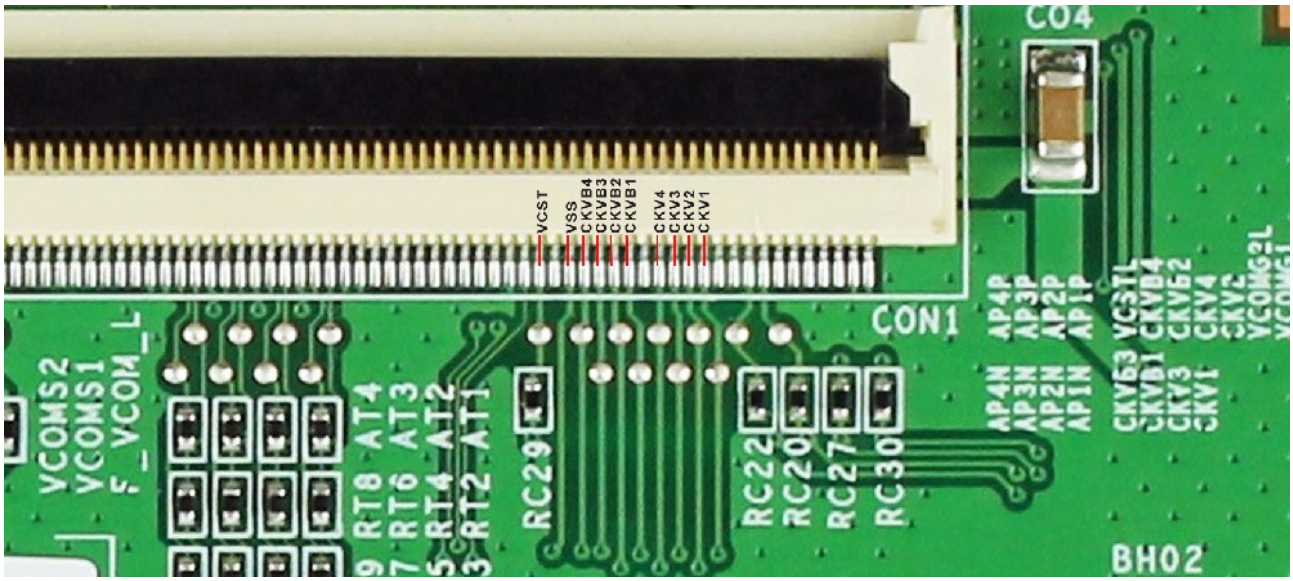
This panel have 4 pairs of high voltage scan drive gate signals : CKV1-4 and inverse signals CKVB1-4. There are 2 Level sfifter IC's, MAX17121E



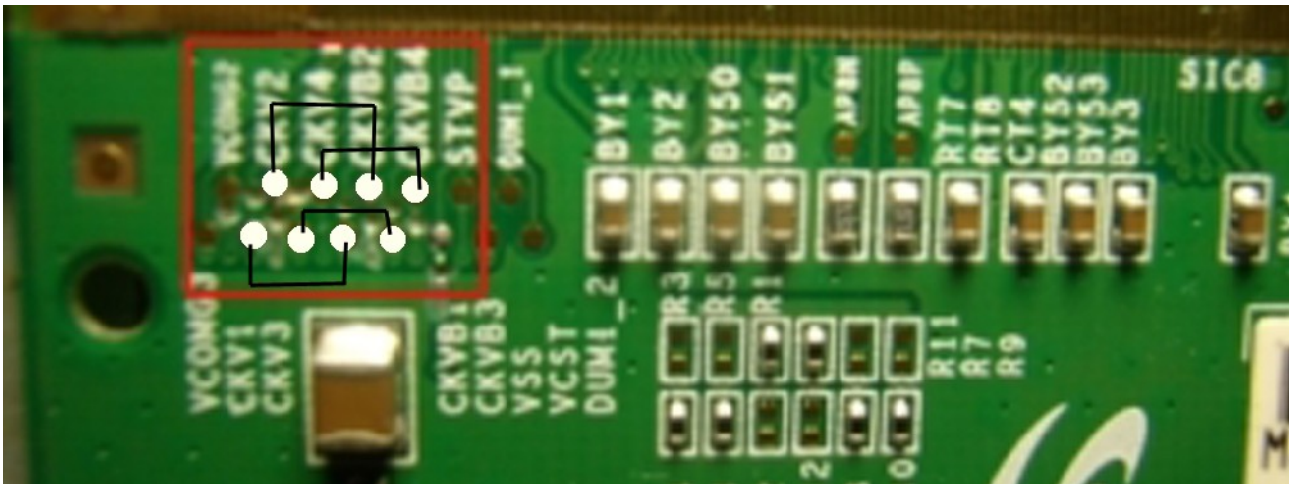
Have below the simplified schematic diagram for MAX17121E and pin configuration



Repair procedure: Disconnect left FFC between T-con and left PWB and power the tv. If you have now on right part of the screen a normal image, means that you have a fault in left side of the cell. If still a fault image, re-connect the left FFC and disconnect right FFC between T-con and left PWB and power the tv. If you have now on left part of the screen a normal image, means that you have a fault in right side of the cell.



There are 4 pairs of signals that commands gain SR Blocks, but you cannot cut the CKV-CKVB signals on T-Con Board. The signals are going from Level Shifter IC's to RIGHT FFC connector CON1, and from right CON1 thru PCB's through-holes and back connections, signals are going to left connector CON2. The easiest way to cut signals, is to cut corresponding FFC terminals, on fault side. For example, if you need to cut signals from CON1, first cut pair 1 of CKVB1-CKVB1, but removing end terminals 12 and 17 from FFC cable, on T-CON side. If still no improvement, cut pair 2 of CKVB2-CKVB2, but removing end terminals 13 and 18 from FFC cable, and so on with pair 3 and 4. Sometimes, some thin lines will appear on area where SR gate block fault and especially when is a TV logo on dark images. Strap on fault side PCB that, the input cell (glass) connections by pair: first CKV1 with CKVB1. Connect this pair to ground or Vss or Voff. Check every time if lines will go. If no improvements, repeat procedure with pair 2, 3 and 4.



PANEL SCREEN LTJ400HV01-J

TCON: SH120PMB4SV0.3

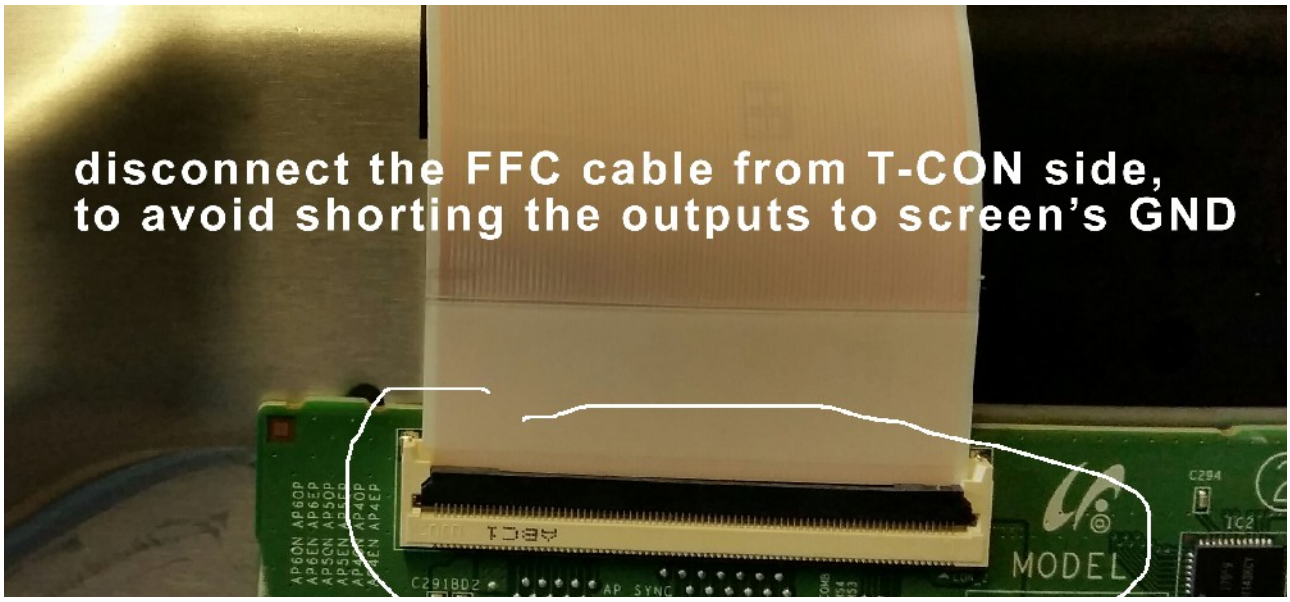
FAULT: Image trembling, double vertically, horizontal lines on all/partial screen

USED ON Samsung 3D TV, D series, Class 6-8 (EX: UE40D6530)

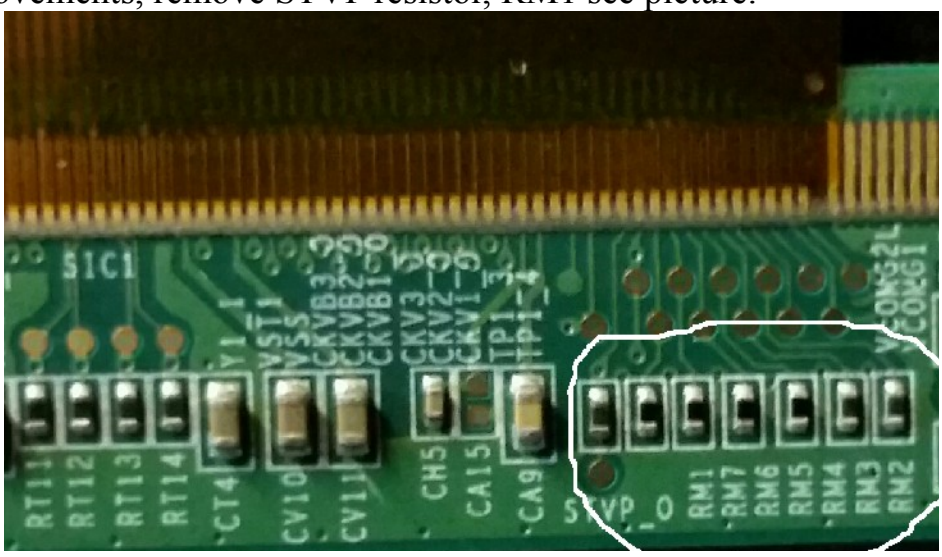
Repair procedure: First step is to find which part of the screen is fault.

Disconnect left FFC between T-con and left PWB and power the tv. If you have now on right part of the screen a normal image, means that you have a fault in left side of the cell. If still a fault image, re-connect the left FFC and disconnect right FFC between T-con and left PWB and power the tv. If you have now on left part of the screen a normal image, means that you have a fault in right side of the cell. On upper image, there is a problem in the right side gate screen driver.

NOW WE KNOW WHICH GATE DRIVER FAULTS (LEFT OR RIGHT), so we will step in with repair, only on fault side



***On the side with* problems,** remove from PWB the resistors RM1-RM7, in this order: first remove the CKV1 and CKVB1 resistors RM2 and RM5 and see any improvements. If not, remove CKV2 and CKVB2 resistors RM2 and RM6, check if any improvements, and if not, remove CKV3 and CKVB3 resistors RM3 and RM7. If still no improvements, remove STVP resistor, RM1 see picture.



You will have a normal picture now, but sometimes, you will have, on side with problems, a little ODD/EVEN lines distance. Strap with a wire, on check points, CKV1 with CKVB1, see if lines are now correct displayed. If not, strap with a wire, on check points, CKV2 with CKVB2, check, and repeat procedure with CKV3 with CKVB3. USUALLY, CKV1-CKVB1 pair faults, so will be enough to remove corresponding resistors, and strap with a wire check points CKV1-CKVB1 to GND.
Connect check points by pair, but only if corresponding resistors were removed, or else you can burn the LEVEL SHIFTER IC from T-CON

Sometimes, will be better to put back the resistors for the blocks pair that have no problems. For example if only by disconnecting CKV3 and CKVB3 will solve image problem, that means pair 1 and 2 have no problems. Sometimes, if you have a bigger problem on cell circuit, the image will be correct but a / some thin line (s) will be displayed sometimes on screen, noticeable on lighter/darker images. Try to connect the pair that not work on GND or Voff. You can also raise Voff voltage with 3-5 volts to minus and the line will disappear. You have to do this on T-con Board, by raising the value of the resistor connected between FBN input of BiasPS/Level shifter ICD1 – RT9979 and VOFFE.