



LED Monitor

Chassis : WVN2

Model : T19C300**

Chassis : WFB2

Model : T22C300**

T24C300**

SERVICE Manual

LED Monitor



LT**C300**

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1. Precautions
2. Product specifications
3. Disassembly and Reassembly
4. Troubleshooting
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3. Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the Monitor.



WARNING



As this monitor has parts that are sensitive to static electricity, be careful when handling them.


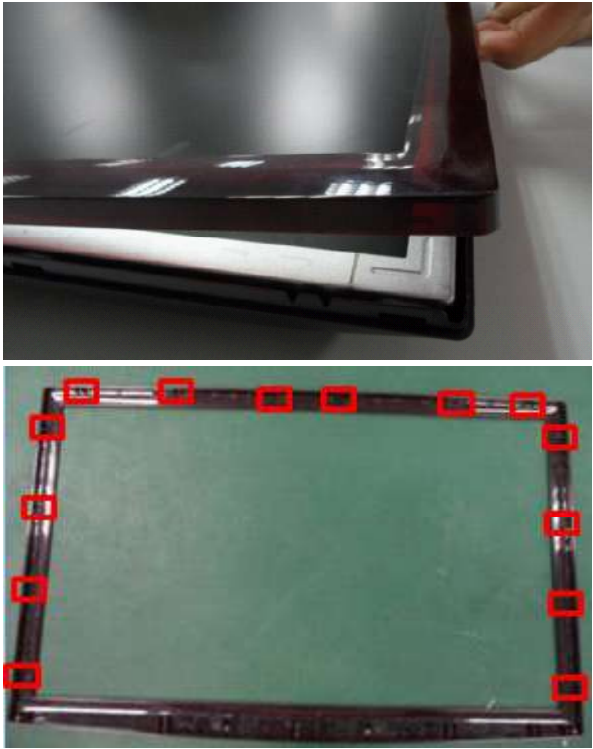

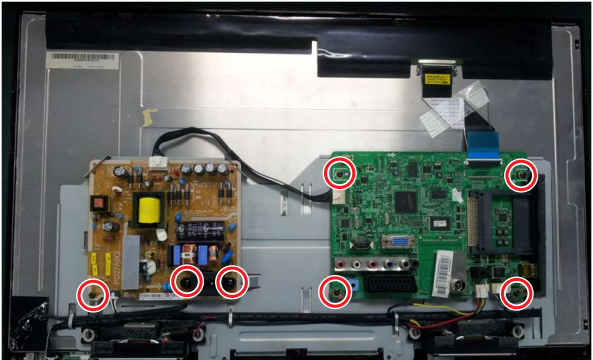

3-1. Disassembly and Reassembly



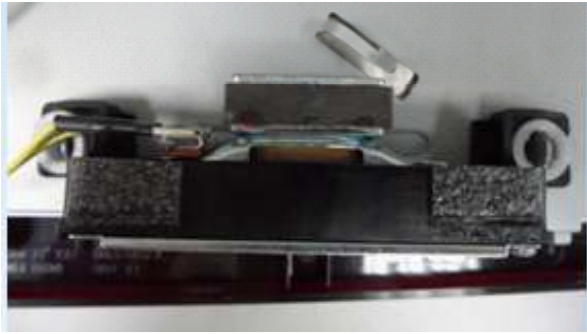

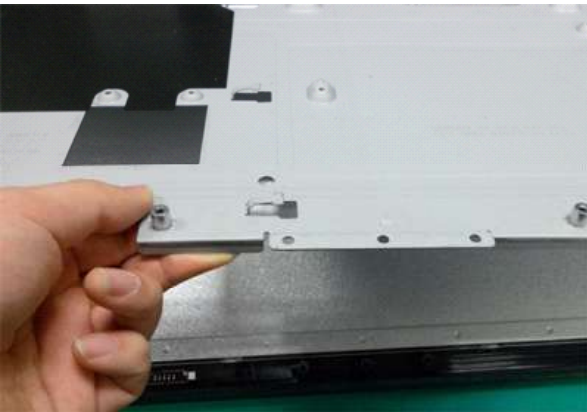
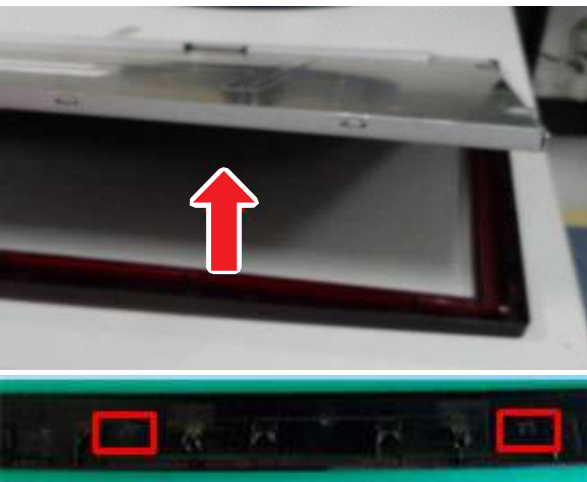
CAUTION

1. Turn the monitor off before beginning the disassembly process.
2. When disassembling the monitor, do not use any metal tools except for the provided jig.
3. Disassemble the monitor carefully as directed in the following procedures.


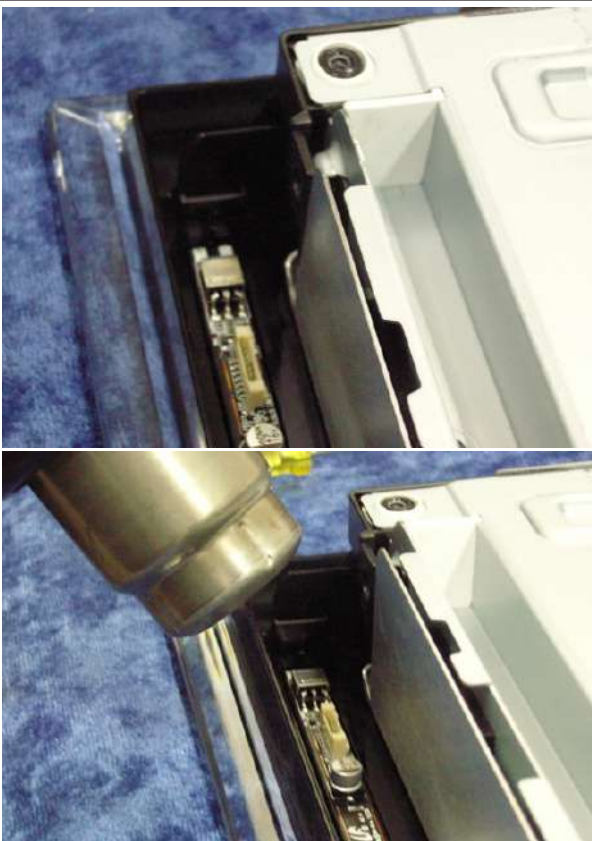
Description	Inch	Picture Description	Screws
<p>1 Place monitor face down on cushioned table.</p>	<p>All</p>		
<p>2 Remove single screw from the stand.</p>	<p>All</p>		

Description	Inch	Picture Description	Screws
<p>5 Detach the front from monitor.  : locking point (14 point)</p>	<p>All</p>		
<p>6 Lift up the rear-cover.</p>	<p>All</p>		
<p>7 Remove the 4 screws of main board and 3 screws SMPS board.</p>	<p>All</p>		 6003-000115

3. Disassembly and Reassemble

Description	Inch	Picture Description	Screws
<p>8 Remove the left and right speaker.</p>	<p>All</p>		
<p>9 Remove the panel bracket.</p>	<p>All</p>		
<p>10 Lift up the panel bracket.</p>	<p>All</p>		
<p>11 Lift up the panel. : locking point</p>	<p>All</p>		

How to disassembly Function & IR ASSY

Description	Inch	Picture Description	Screws
1 There is no clip.	All		
2 Heat the Function Assy by Heat Gun and Lift up the Function Assy.	All		

**NOTE**

Reassembly procedures are in the reverse order of disassembly procedures.

1. Precautions

1-1. Safety Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1-1. Warnings



For continued safety, do not attempt to modify the circuit board.
Disconnect the AC power and DC power jack before servicing.

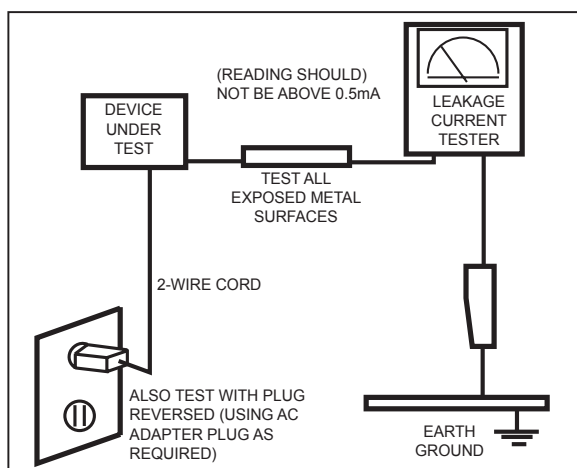
1-1-2. Servicing the LED Monitor

1. When servicing the LED Monitor, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor/capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check:



Do not use an isolation transformer during this test.
Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts.
The current measured should not exceed 0.5 milliamp.
Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4. Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by \triangle on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2. Servicing Precautions



An electrolytic capacitor installed with the wrong polarity might explode.



Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.



If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1. General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
(a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3. Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

**CAUTION**

Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4. Installation Precautions




1. For safety reasons, more than a people are required for carrying the product.
2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (0.4m) between the product and the wall for ventilation purposes. A rise in temperature within the product may cause fire.
8. If an equipment is provided with a replaceable battery, and if replacement by an incorrect type could result in an explosion (for example, with some lithium batteries), the following applies:



RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

2. Product specifications

2-1. Model Comparison

	TC300
Front View	
Detail View	
	
Front Color	Semitransparent Rose Black
Panel Type	TN
Internal Memory	None
DDR	256 Mbyte
Feature	Media Play(MOVIE)

2-2. Feature & Specifications

2-2-1. Feature

- RF, 1-HDMI, 1-Component, 1-A/V, 1-USB2.0, D-SUB
- Brightness: 250cd/m²
- High Contrast Ratio: 1,000
- Response Time: 5ms
- Excellent Picture Quality
- Dynamic Contrast
 - Automatically detects the input visual signal and adjusts to create optimum contrast.
- Monitor Tuner, HDMI, Stereo, SRS Trusurround support
- Convenience
 - The Monitor utilizes the HDMI system to implement perfect digital sound and picture quality.

2-2-2. Specifications

Model Name		T19C300**
Item		Description
LCD Panel		19 inch HD 60Hz
Scanning Frequency		Horizontal: 31 kHz ~ 80 kHz (Automatic) Vertical: 50 Hz ~ 75 Hz (Automatic)
Display Colors		16.7 Million colors
Maximum resolution		Horizontal : 1366 Pixels Vertical : 768 Pixels
Input Signal		Analog 0.7 Vp-p \pm 5% positive at 75 Ω , internally terminated
Input Sync Signal		H/V Separate, TTL, P. or N.
Maximum Pixel Clock rate		85 MHz
Active Display (Horizontal/Vertical)		409.8 (H) x 230.4 (V) (mm) / 16.1 (H) x 9.1 (V) (inches)
AC power voltage & Frequency		AC 90V~240V, 60/50Hz \pm 3Hz
Power Consumption		Under 35 W(Under 0.5 W, Stand by)
Dimensions (WxHxD)	With Stand	444.7 x 356.4 x 187 (mm) / 17.5 x 14.0 x 7.4 (inches)
	Without Stand	444.7 x 278.2 x 48.5 (mm) / 17.5 x 11.0 x 2.0 (inches)
Weight	With Stand	3.2 (kg) / 7.05 (lbs)
	Without Stand	3.05 (kg) / 6.72 (lbs)
TV System	Tuning	Frequency Synthesize
	System	NTSC, PAL
	Sound	NTSC, PAL
Audio Specifications		MAX Internal Audio Output Power : Each 5W(Left/Right) Equalizer : 5band Output Frequency <ul style="list-style-type: none"> • RF : 20 Hz ~ 15.4 kHz • AV/Componet/HDMI : 20 Hz ~ 20 kHz
Environmental considerations	Operating	Operating Temperature : 50°F - 104°F (10°C - 40°C) Humidity : 10% - 80 %
	Storage	Storage Temperature : -4°F - 113°F (-20°C - 45°C) Humidity : 5% - 95%
Note: Dolby Digital +, Game Mode, Film Mode, Energy Saving		



2. Product specifications

Model Name		T22C300**
Item		Description
LCD Panel		21.5 inch FHD 60Hz
Scanning Frequency		Horizontal: 31 kHz ~ 80 kHz (Automatic) Vertical: 50 Hz ~ 75 Hz (Automatic)
Display Colors		16.7 Million colors
Maximum resolution		Horizontal: 1920 Pixels Vertical: 1080 Pixels
Input Signal		Analog 0.7 Vp-p ± 5% positive at 75Ω, internally terminated
Input Sync Signal		H/V Separate, TTL, P. or N.
Maximum Pixel Clock rate		85 MHz
Active Display (Horizontal/Vertical)		476.6 (H) x 268.1 (V) (mm) / 18.8 (H) x 10.6 (V) (inches)
AC power voltage & Frequency		AC 90V~240V, 60/50Hz ± 3Hz
Power Consumption		Under 35 W(Under 0.5 W, Stand by)
Dimensions (WxHxD)	With Stand	509.7 x 396.6 x 195 (mm) / 20.1 x 15.6 x 7.7 (inches)
	Without Stand	509.7 x 318.2 x 47 (mm) / 20.1 x 12.5 x 1.9 (inches)
Weight	With Stand	3.95 (kg) / 8.7 (lbs)
	Without Stand	3.7 (kg) / 8.16 (lbs)
TV System	Tuning	Frequency Synthesize
	System	NTSC, PAL
	Sound	NTSC, PAL
Audio Specifications		MAX Internal Audio Output Power : Each 5W(Left/Right) Equalizer : 5band Output Frequency <ul style="list-style-type: none"> • RF : 20 Hz ~ 15.4 kHz • AV/Componet/HDMI : 20 Hz ~ 20 kHz
Environmental considerations	Operating	Operating Temperature : 50°F - 104°F (10°C - 40°C) Humidity : 10% - 80 %
	Storage	Storage Temperature : -4°F - 113°F (-20°C - 45°C) Humidity : 5% - 95%
Note: Dolby Digital +, Game Mode, Film Mode, Energy Saving		

Model Name		T24C300**
Item		Description
LCD Panel		24 inch FHD 60Hz
Scanning Frequency		Horizontal: 31 kHz ~ 80 kHz (Automatic) Vertical: 50 Hz ~ 75 Hz (Automatic)
Display Colors		16.7 Million colors
Maximum resolution		Horizontal: 1920 Pixels Vertical: 1080 Pixels
Input Signal		Analog 0.7 Vp-p \pm 5% positive at 75 Ω , internally terminated
Input Sync Signal		H/V Separate, TTL, P. or N.
Maximum Pixel Clock rate		85 MHz
Active Display (Horizontal/Vertical)		531.36 (H) x 298.89 (V) (mm) / 20.92 (H) x 11.77 (V) (inches)
AC power voltage & Frequency		AC 90V~240V, 60/50Hz \pm 3Hz
Power Consumption		Under 40 W(Under 0.5 W, Stand by)
Dimensions (WxHxD)	With Stand	569.2 x 428 x 195 (mm) / 22.4 x 16.9 x 7.7 (inches)
	Without Stand	569.2 x 349.4 x 49 (mm) / 22.4 x 13.8 x 1.9 (inches)
Weight	With Stand	4.45 (kg) / 9.81 (lbs)
	Without Stand	4.15 (kg) / 9.15 (lbs)
TV System	Tuning	Frequency Synthesize
	System	NTSC, PAL
	Sound	NTSC, PAL
Audio Specifications		MAX Internal Audio Output Power : Each 5W(Left/Right) Equalizer : 5band Output Frequency <ul style="list-style-type: none"> • RF : 20 Hz ~ 15.4 kHz • AV/Componet/HDMI : 20 Hz ~ 20 kHz
Environmental considerations	Operating	Operating Temperature : 50°F - 104°F (10°C - 40°C) Humidity : 10% - 80 %
	Storage	Storage Temperature : -4°F - 113°F (-20°C - 45°C) Humidity : 5% - 95%
Note: Dolby Digital +, Game Mode, Film Mode, Energy Saving		

2-3. Specification Comparison to Old Models

O : application, X : non-application

Model	TC300 (T**C300)	TB300 / TB350 / TB530 / TB531 (T**B300 / T**B350 / T**B530/T**B531)
Design		
Display Type	LCD	LCD
Built-in Tuner	1	1
Resolution	1920 x 1080 (21.5", 24") 1366 x 768 (18.5")	1920 x 1080 (21.5", 23", 23.6", 24", 27") 1366 x 768 (18.5")
LCD Panel	TFT LED PANEL	TFT LED PANEL
Screen Size	19" / 22" / 24"	19" / 22" / 23" / 23.6" / 24" / 27"
Picture ratio	16:9	16:9
Brightness	250 cd/m ²	250 cd/m ²
Contrast Ratio	1,000	1,000
Picture Enhancer	HyperReal Engine (X9)	HyperReal Engine (X9)
Equalizer	5 Band	5 Band
Auto Volume Control	O	O
Surround Sound	Dolby Digital Plus/Pulse	Dolby Digital Plus/Pulse
Speaker Output	5W X 5W	5W X 5W
PIP	O	O
Double Window	O	O
Caption	O	O
Entertainment Mode	X	X
Game Mode	O	O
Energy Saving	O	O
Anynet+	X	X
Antenna	1(Cable/Air)	1(Cable/Air)



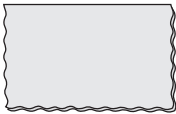
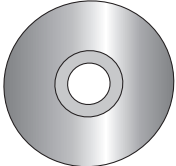
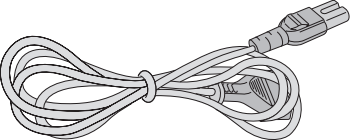
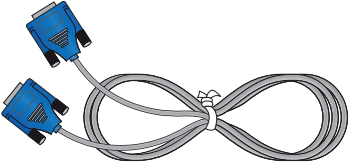
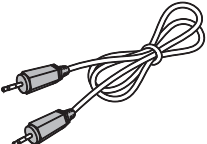
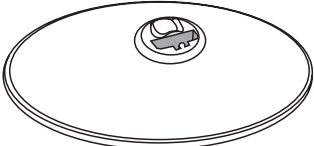

2-4. Detail Factory Option

If you replace the main board with new one, please change the factory option as well.
The options you must change are "Type"

■ TC300

Model Name		T19C300**	T22C300**	T24C300**
Panel	Vendor	AML	CMI	AUO
	CODE	BN07-01043A	BN07-01076A	BN07-00929A
	SPEC	LTM185AT05-V	M215HGE-L21	M240HW01-VB
SMPS	PD Board	BN44-00504A	BN44-00505A	BN44-00505A
Byte	Item			
0	Factory Reset			
1	Type	19A6TH1E	22D6TF0E	24L6TF0E
2	Local Set	EU		
3	Model	TC300		
4	SVC Model	300		
4	Tuner	AUTO/SI_ATC2/SEC_TC/SEC_ISDB/DVB_TCS2/ DVB_T2C/DVB_T2CS2/ECHO_CD/NO_TUNER		
5	Ch Table	NONE		
6	Front Color	NONE		

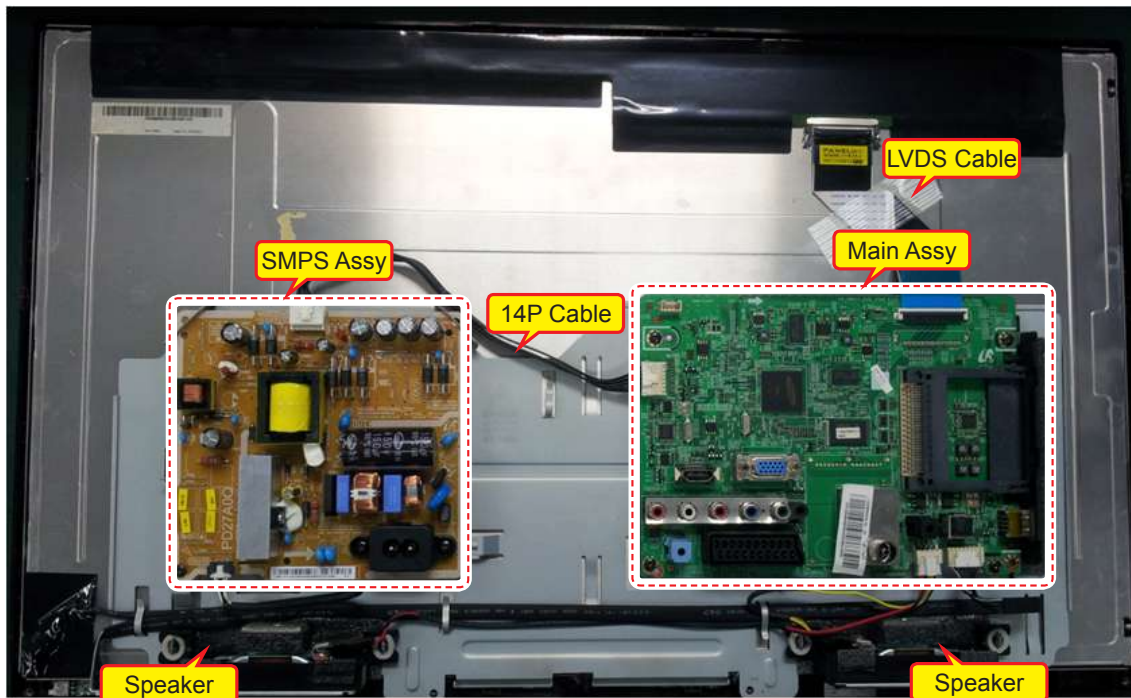
2-5. Accessories

Product	Description	Code. No	Remark
	Remote Control & Batteries (AAA x 2)	AA59-00622A 4301-000121	<p>Samsung Electronics Service Center</p> <p>(The part code for some accessories may differ depending on your region.)</p>
	Quick Setup Guide	BN68-04796A	
	Cloth clean	BN63-01798B	
	Owners Manual	BN46-00319A	
	Power Cord	3903-000525	
	D-Sub Cable	BN39-00244H	
	Stereo Cable	BN39-01286A	
	Stand Base	-	
	Stand Body & Screw (1EA)	-	

4. Troubleshooting

4-1. Previous check

1. Check the various cable connections first.
 - Check to see if there is a burnt or damaged cable.
 - Check to see if there is a disconnected or loose cable connection.
 - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.



Main Assy

1	B5V	8	GND
2	SW_POWER	9	B12VS
3	B5V	10	SW_INVERTER
4	A5V	11	B13V
5	GND	12	NC
6	GND	13	B13V
7	B12VS	14	PWM_DIMM

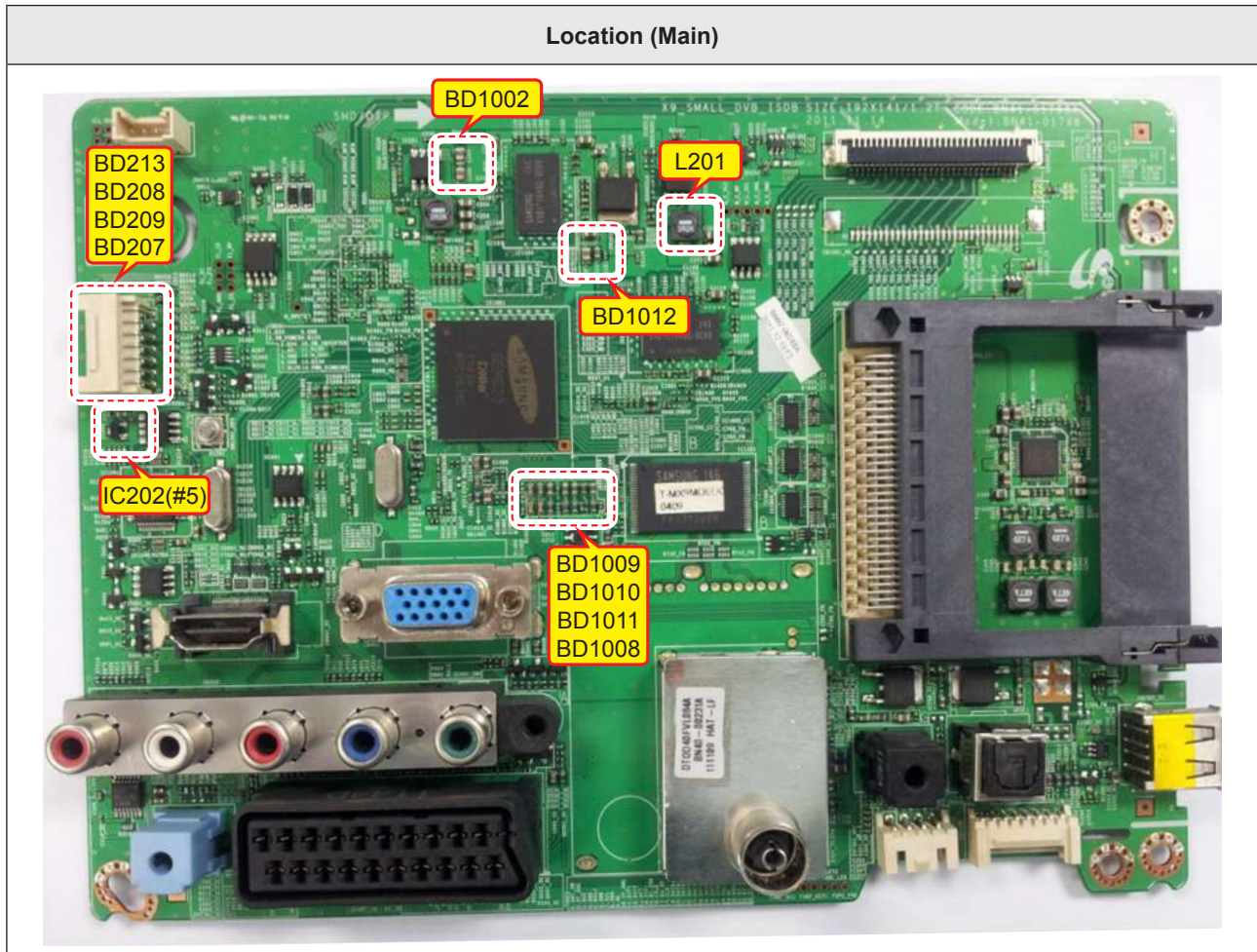
SMPS Assy

1	B13V	8	PWM_DIMM
2	B13V	9	NC
3	Vamp	10	BLU_ON
4	Vamp	11	GND
5	GND	12	GND
6	B5V	13	A5V
7	B5V	14	PS_ON

4-2. How to check fault symptom

4-2-1. No Power

Symptom	The LED on the front panel of the monitor does not work when the power is connected and the Power button is pressed.
Major checkpoints	<ul style="list-style-type: none"> • Check if the Power switch on the rear panel of the monitor has been turned on. • Check the SMPS fuse and output power of power adapter. • Check the power part of the Main Board and check if a similar symptom appears at another output terminal.
Diagnostics	<pre> graph TD Q1[Power indicator LED on?] -- No --> A1[Check an AC power connection.] Q1 -- Yes --> Q2[Check the 14P power cable.] Q2 -- No --> A2[Change 14p power cable and SMPS.] Q2 -- Yes --> Q3[Check the 'Stand-By 5V', DCA5V appear at BD207?] Q3 -- No --> A3[Change SMPS.] Q3 -- Yes --> Q4[Check the 'Power input of Main Ass'y'? DC B13V, B5V appear at BD209(B13V), BD213/208(B5V)?] Q4 -- No --> A3 Q4 -- Yes --> Q5[Check the 'Power input of submicom IC(A3.3V)'? Check the 'Power of nand flash IC(B3.3V)', 'Power of main IC(B2.5V, B1.1V)', 'Power of DDR IC(B1.5V)' appear at IC202(#5), L201 (B3.3V), BD1008/9/10/11 (B2.5V), BD1002 (B1.2V), BD1012 (B1.5V)?] Q5 -- No --> A4[Change the Main Assy.] Q5 -- Yes --> Q6[Check 'Power of LVDS (13V)' appear at LVDS connector Pin #1~5 of T-con board?] Q6 -- No --> A5[Reconnect of Change the LVDS cable.] Q6 -- Yes --> A6([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

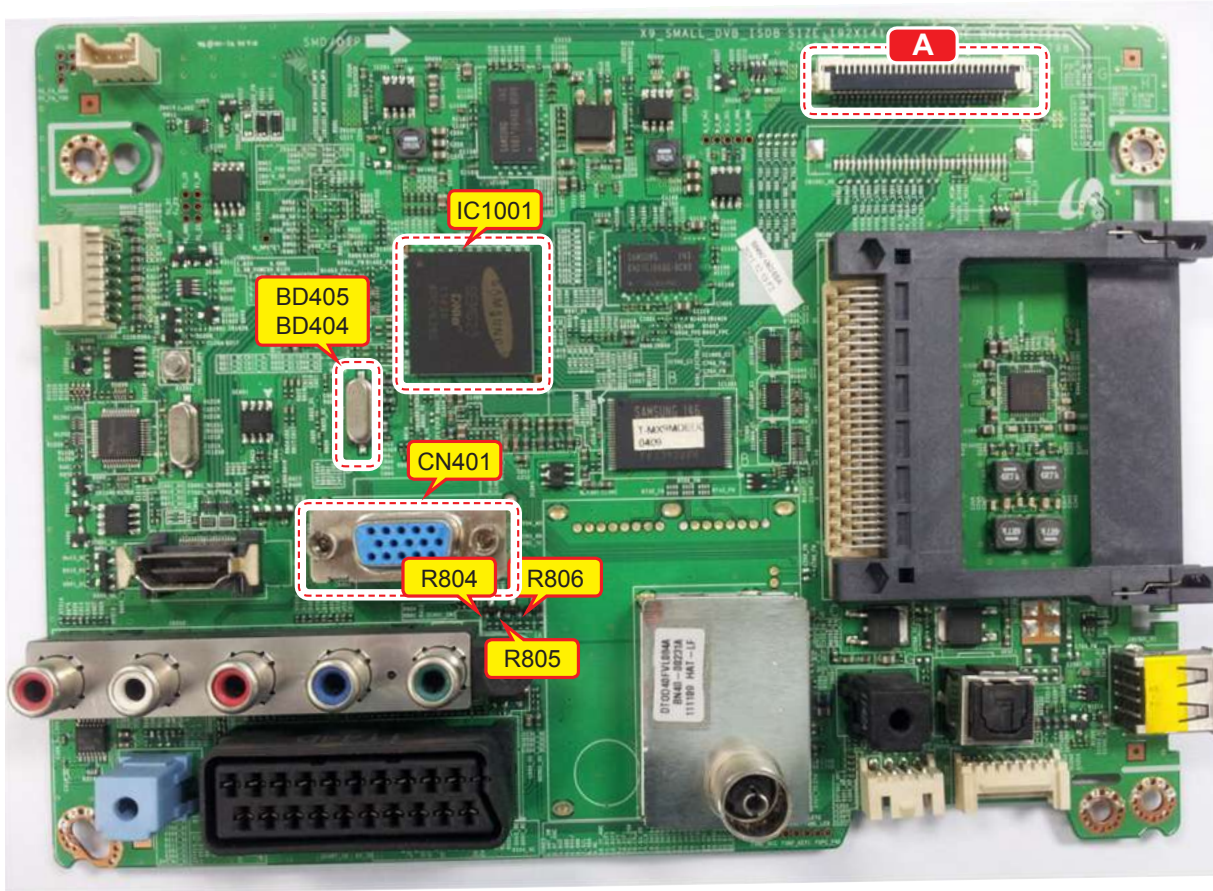
■ Location of Parts

4-2-2. No video (Analog PC signal)

Symptom	Audio is normal but no picture is displayed on the screen.
Major checkpoints	<ul style="list-style-type: none"> • Check the PC source • Check the Arsenal, Check the Main Chipset. • This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	<pre> graph TD A[Power indicator LED is off. Lamp(Backlight) on, no video.] -- No --> B[Check a set in the 'Stand-by mode' or 'DPMS mode'.] A -- Yes --> C[Check the PC source and check the connection of D-SUB.] C -- No --> D[Input the analog PC signal properly] C -- Yes --> E[Check the Self Diagnosis (Support → Self Diagnosis- → Picture Test). Dose the promblem still exist self diagnosis?] E -- No --> F[Input the analog PC signal properly.] E -- Yes --> G[1 Does the signal appear at R804(R), R805(G), R806(B), BD404(H), BD405(V).] G -- No --> H[Check CN401, PC cable. Change the Main Assy.] G -- Yes --> I[2 Does the digital data appear at TP- EVEN_TXCLK+, EVEN_TXCLK- , ODD_TXCLK+, ODD_TXCLK-.] I -- No --> J[Check IC1001 (X9) Change the Main Assy.] I -- Yes --> K[Check the LVDS cable? Check the T-Con Board? Replace the LCD panel?] K -- Yes --> L([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

■ Location of Parts

Location (Main)



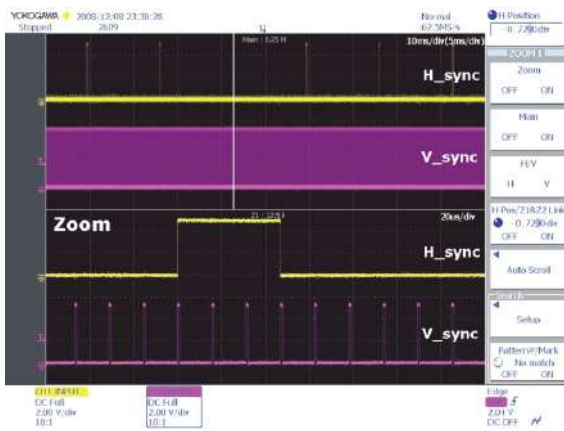
Detail

A

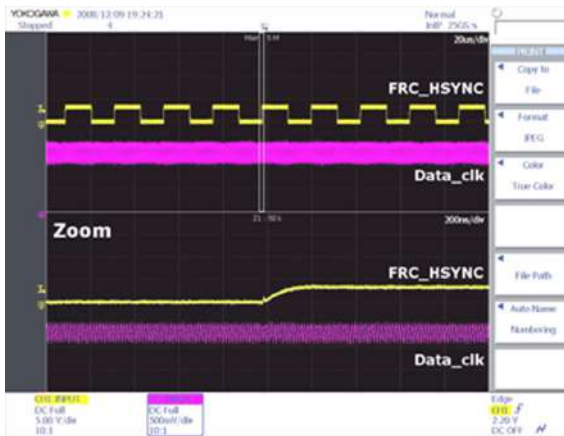


WAVEFORMS

1 PC input (V-sink , H-sink , R/G/B)



2 LVDS output

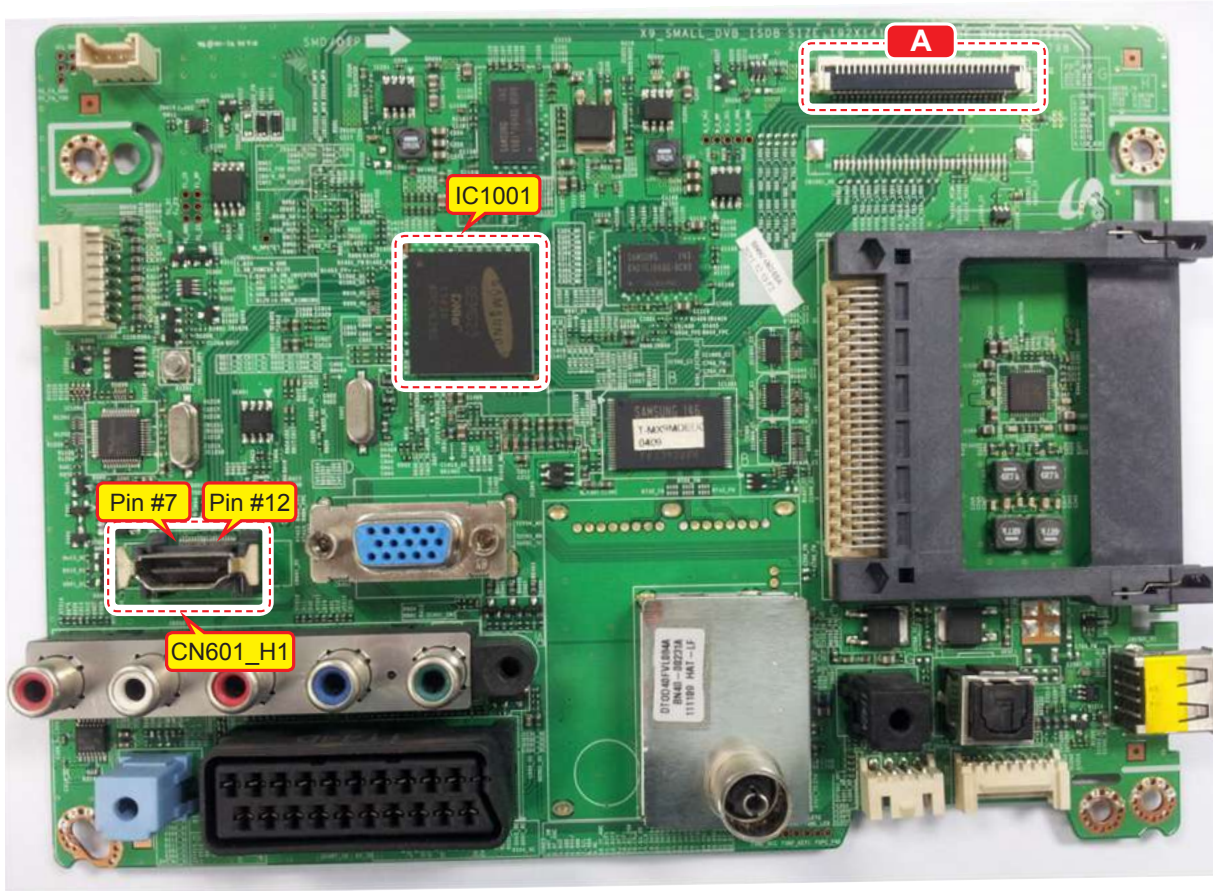


4-2-3. No video (HDMI1 - Digital signal)

Symptom	Audio is normal but no picture is displayed on the screen.
Major checkpoints	<ul style="list-style-type: none"> • Check the HDMI source. • Check the HDMI switch, Check the Chelsea. • This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	<pre> graph TD A[Power indicator LED is off. Lamp(Backlight) on, no video.] -- No --> B[Check a set in the 'Stand-by mode'] A -- Yes --> C[Check the Self Diagnosis (Support -> Self Diagnosis -> Picture Test). Dose the promblem still exist self diagnosis?] C -- No --> D[Check external devices and connections.] C -- Yes --> E[Check the HDMI source and check the connection of HDMI cable.] E -- No --> F[Input the HDMI signal properly.] E -- Yes --> G[Does the signal appear at CN601_H1 (Pin#12 , #7)(HDMI1) (HDMI RX_Clk , RX_Data).] G -- No --> H[Check CN601_H1. Check HDMI cable. Change the Main Assy.] G -- Yes --> I[Does the digital data appear at TP-E_ TXCLK+, E_TXCLK- , O_TXCLK+, O_TXCLK-.] I -- No --> J[Check IC1001 (X9). Change the Main Assy] I -- Yes --> K[Check the LVDS cable? Check the T-Con Board? Replace the LCD panel?] K -- Yes --> L([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

■ Location of Parts

Location (Main)

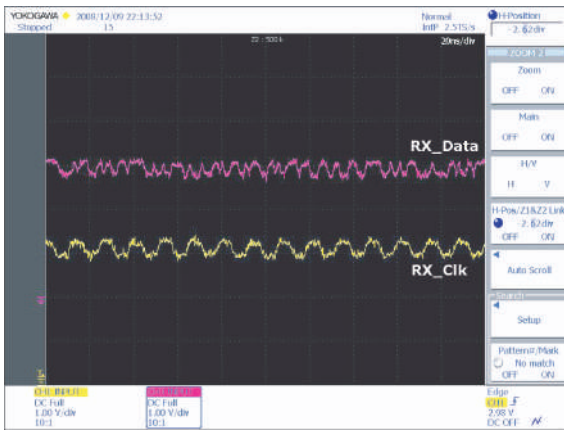


Detail

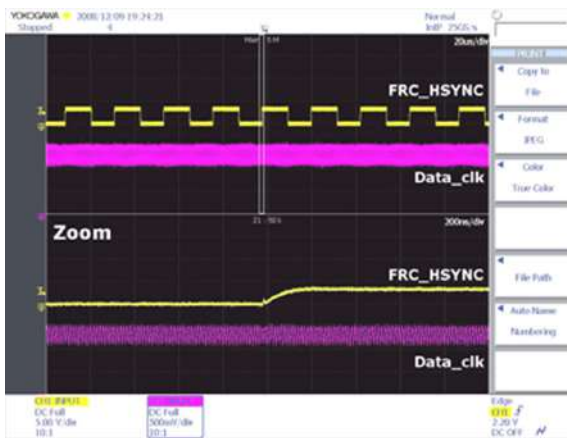


■ WAVEFORMS

1 HDMI input (RX_Data, RX_Clk)



2 LVDS output

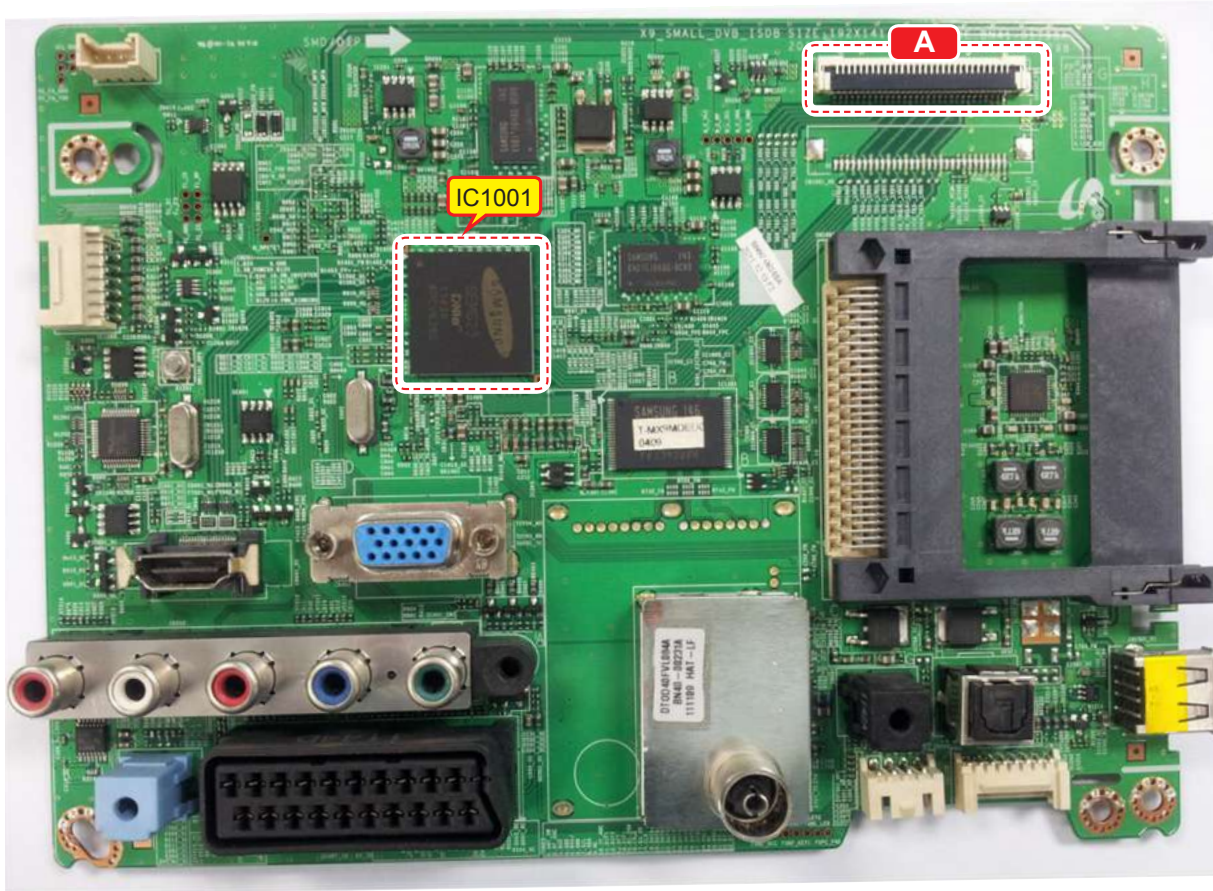


4-2-4. No video (Tuner_CVBS)

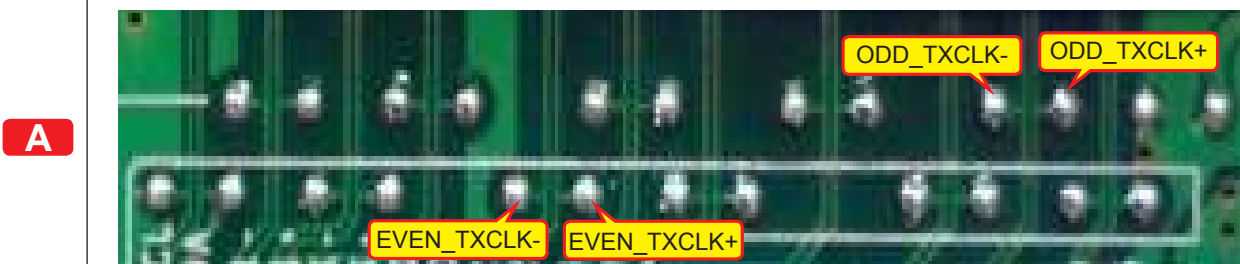
Symptom	Audio is normal but no picture is displayed on the screen.
Major checkpoints	<ul style="list-style-type: none"> • Check the Tuner CVBS source. • Check the Tuner, Check the Chelsea. • This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	<pre> graph TD A[Power indicator LED is off. Lamp(Backlight) on, no video.] -- No --> B[Check a set in the 'Stand-by mode'] A -- Yes --> C[Check the RF source and check the connection of RF cable.] C -- No --> D[Input the RF source properly.] C -- Yes --> E[Check the Self Diagnosis (Support → Self Diagnosis- → Picture Test). Dose the promblem still exist self diagnosis?] E -- No --> F[Check external devices and connections.] E -- Yes --> G[Does the DC B1.8V. B3.3V appear at #3, #5 Pin of Tuner.] G -- No --> H[Change the Main Assy.] G -- Yes --> I[Check the CVBS data at #10 Pin of Tuner.] I -- No --> J[Change the Main Assy.] I -- Yes --> K[Does the digital data appear at TP-E_ TXCLK+, E_TXCLK-, O_TXCLK+, O_TXCLK-.] K -- No --> L[Check IC1001 (X9). Change the Main Assy] K -- Yes --> M[Check the LVDS cable? Check the T-Con Board? Replace the LCD panel?] M -- Yes --> N([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

■ Location of Parts

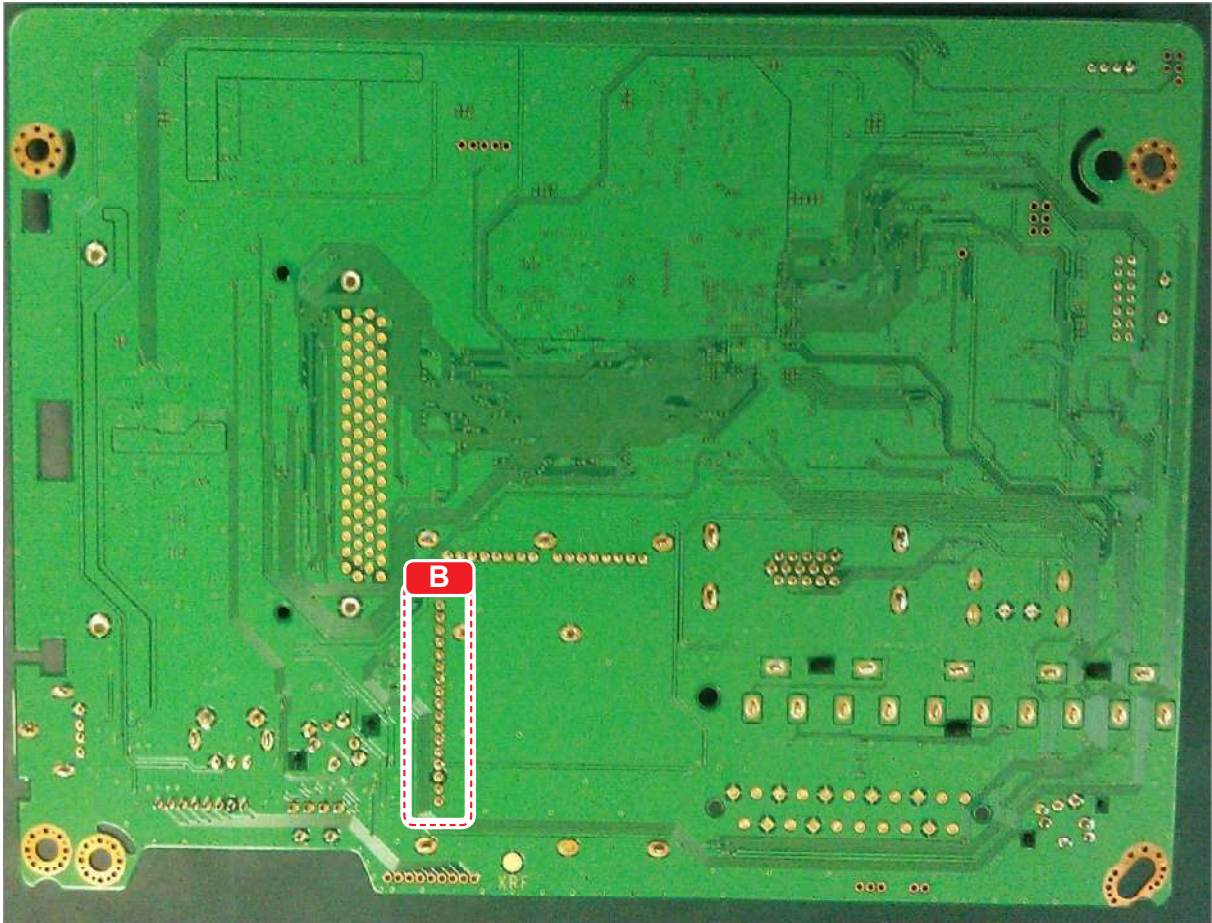
Location (Main) - Top



Detail



Location (Main) - Bottom



Detail

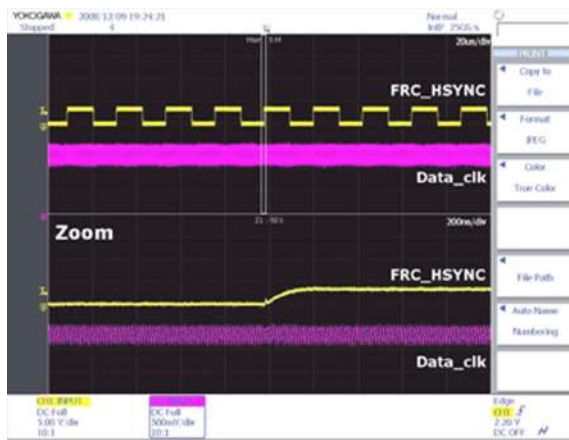
B



■ WAVEFORMS

1

LVDS output

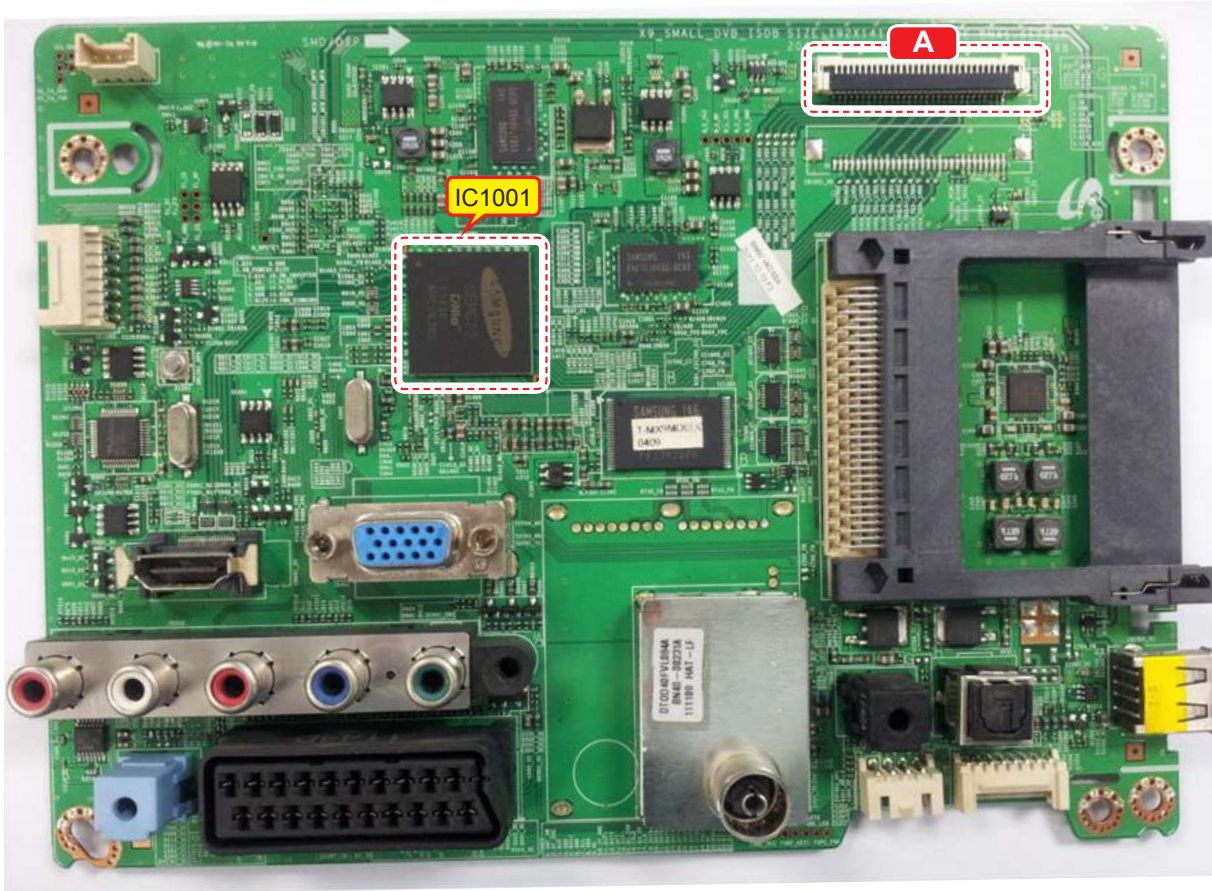


4-2-5. No video (Tuner DTV)

Symptom	Audio is normal but no picture is displayed on the screen.
Major checkpoints	<ul style="list-style-type: none"> • Check the Tuner DTV source • This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	<pre> graph TD A[Power indicator LED is off. Lamp(Backlight) on, no video.] -- No --> B[Check a set in the 'Stand-by mode'] A -- Yes --> C[Check the RF source and check the connection of RF cable.] C -- No --> D[Input the video source properly.] C -- Yes --> E[Check the Self Diagnosis (Support → Self Diagnosis- → Picture Test). Dose the promblem still exist self diagnosis?] E -- No --> F[Check external devices and connections.] E -- Yes --> G[Does the DC B1.8V, B3.3V appear at #3, #5 Pin of Tuner.] G -- No --> H[Change the Main Assy.] G -- Yes --> I[Check the CVBS data at #10 Pin of Tuner.] I -- No --> J[Change the Main Assy.] I -- Yes --> K[Does the digital data appear at TP-E_ TXCLK+, E_TXCLK-, O_TXCLK+, O_TXCLK-.] K -- No --> L[Check IC1001 (X9). Change the Main Assy] K -- Yes --> M[Check the LVDS cable? Check the T-Con Board? Replace the LCD panel?] M -- Yes --> N([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

■ Location of Parts

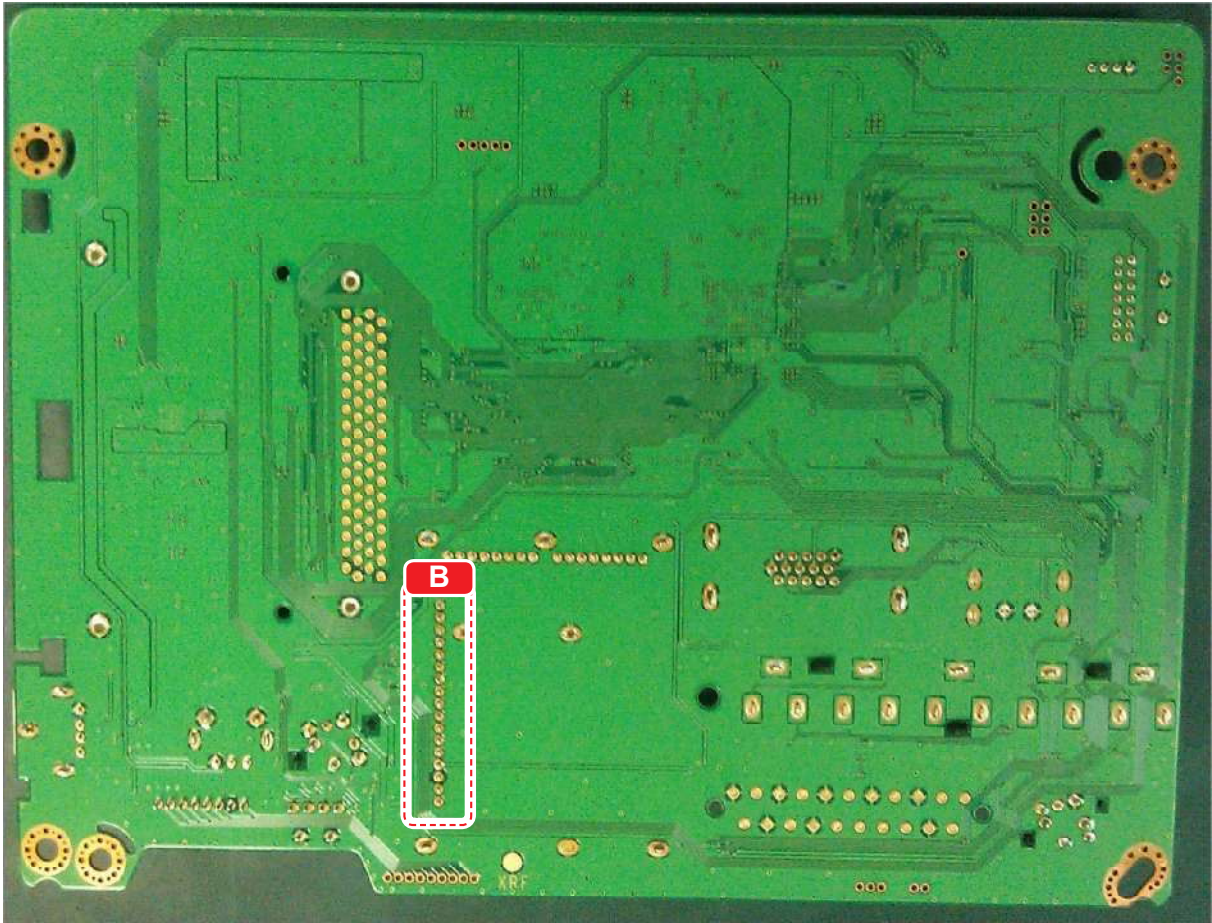
Location (Main) - Top



Detail



Location (Main) - Bottom



Detail

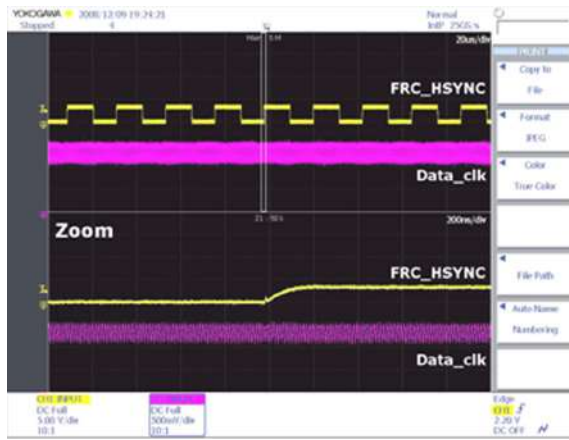
B



■ WAVEFORMS

1

LVDS output

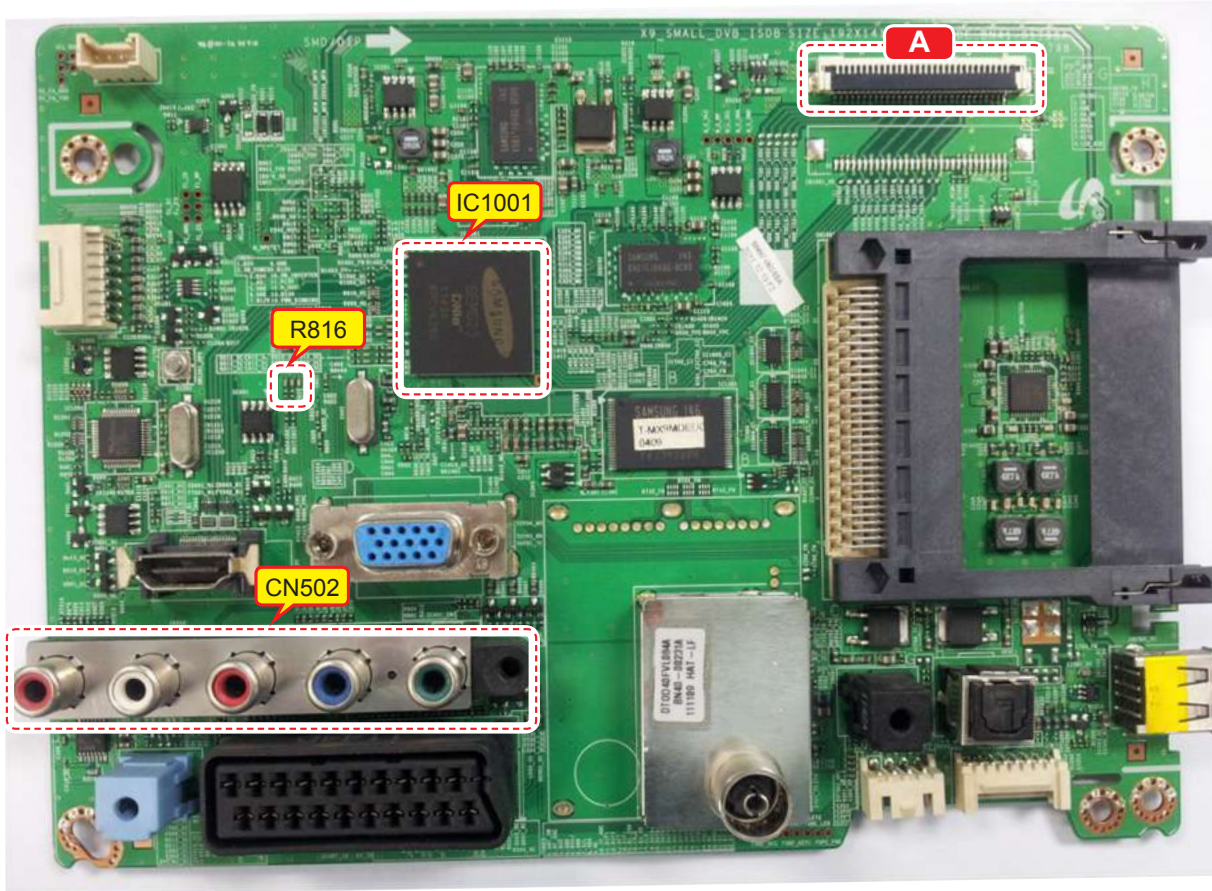


4-2-6. No video (Video CVBS)

Symptom	Audio is normal but no picture is displayed on the screen.
Major checkpoints	<ul style="list-style-type: none"> • Check the Video CVBS source • This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	<pre> graph TD A[Power indicator LED is off. Lamp(Backlight) on, no video.] -- No --> B[Check a set in the 'Stand-by mode'] A -- Yes --> C[Check the video source and check the connection of video cable?] C -- No --> D[Input the video source properly.] C -- Yes --> E[Check the Self Diagnosis (Support → Self Diagnosis- → Picture Test). Dose the promblem still exist self diagnosis?] E -- No --> F[Check external devices and connections.] E -- Yes --> G[1 Does the CVBS data appear at R816(COMP_Y_CVBS).] G -- No --> H[Check CN502. Change the Main Assy.] G -- Yes --> I[2 Does the digital data appear at TP-E_ TXCLK+, E_TXCLK-, O_TXCLK+, O_TXCLK-.] I -- No --> J[Check IC1001 (X9). Change the Main Assy] I -- Yes --> K[Check the LVDS cable? Check the T-Con Board? Replace the LCD panel?] K -- Yes --> L([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

■ Location of Parts

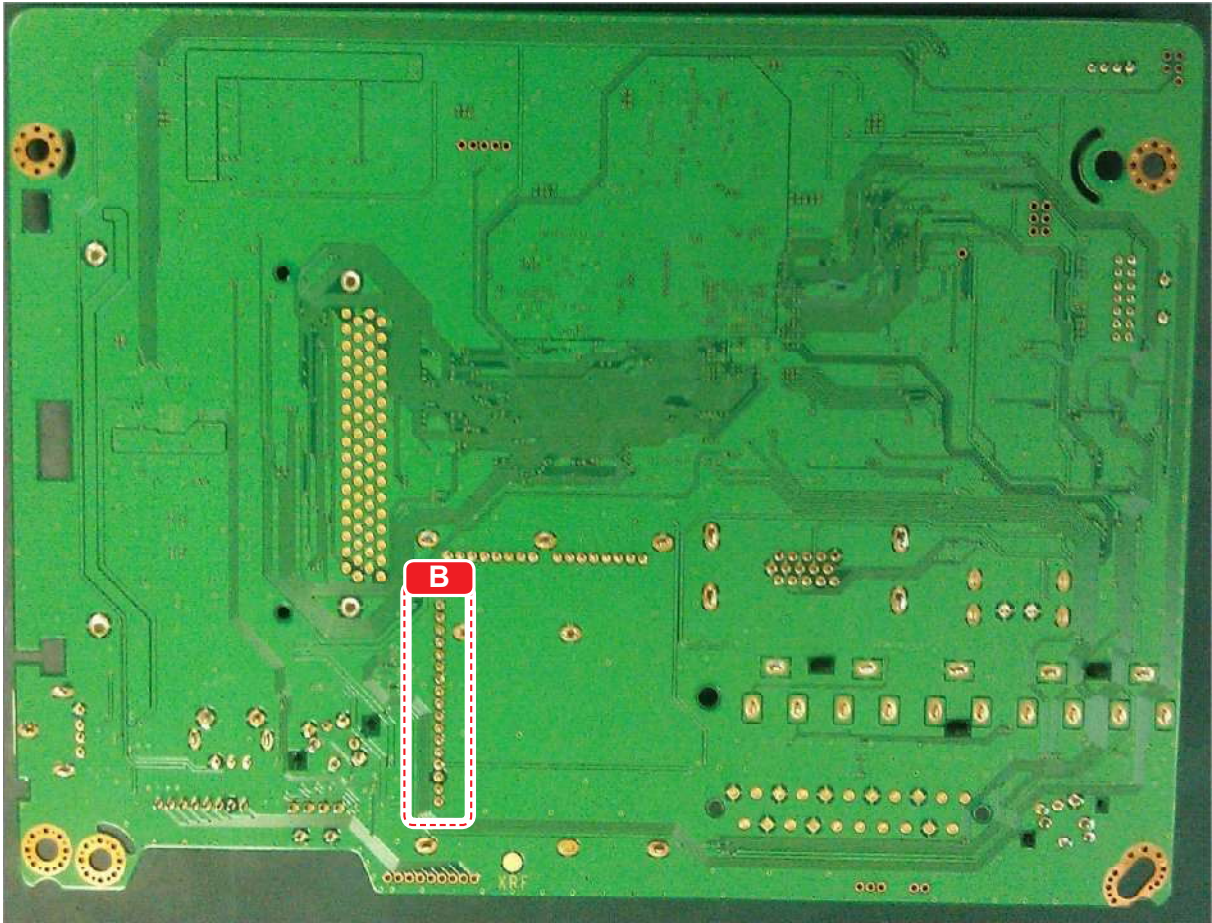
Location (Main) - Top



Detail



Location (Main) - Bottom



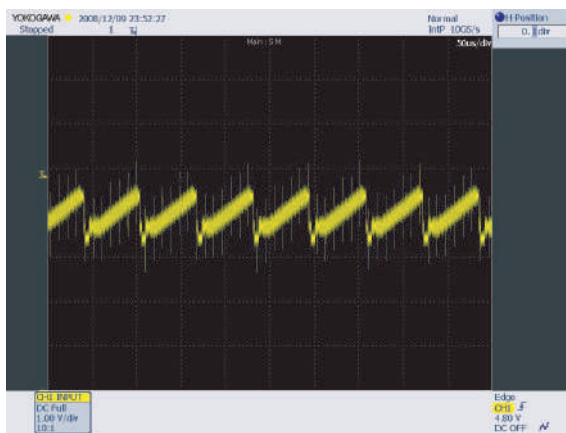
Detail

B

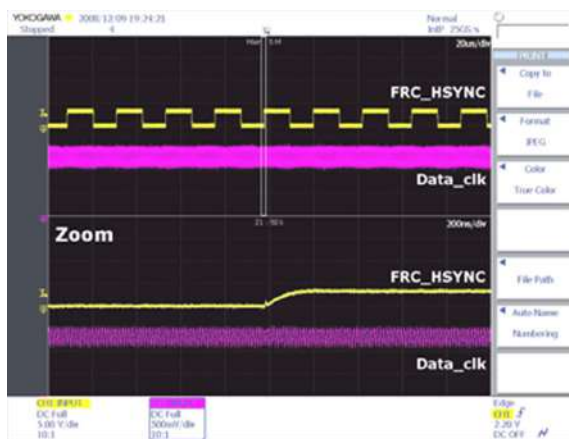


■ WAVEFORMS

1 CVBS OUT (Grey Bar)



2 LVDS output

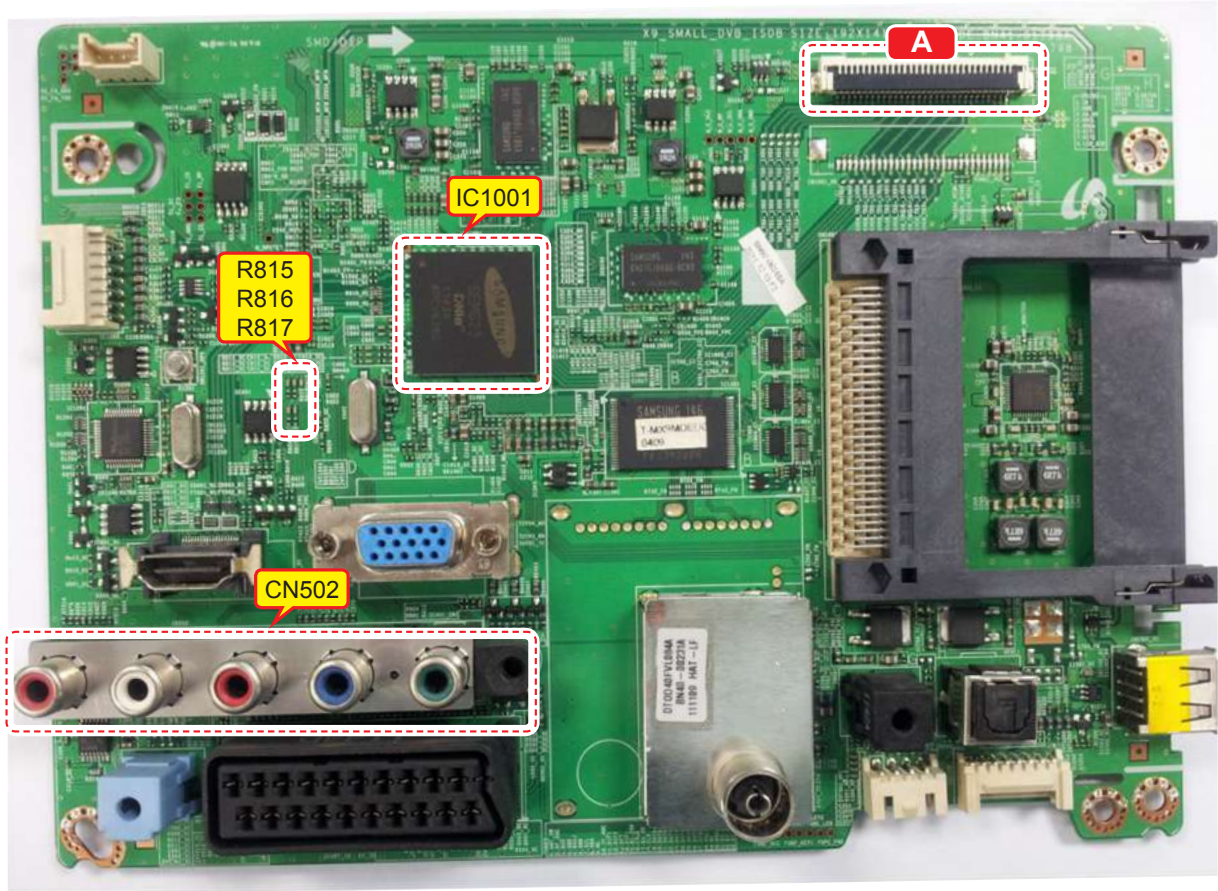


4-2-7. No video (Component)

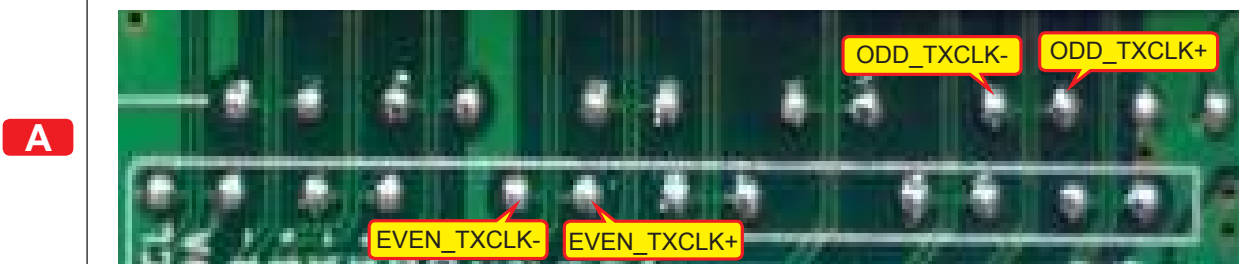
Symptom	Audio is normal but no picture is displayed on the screen.
Major checkpoints	<ul style="list-style-type: none"> • Check the Component source • This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	<pre> graph TD A[Power indicator LED is off. Lamp(Backlight) on, no video.] -- No --> B[Check a set in the 'Stand-by mode'] A -- Yes --> C[Check the component source and check the connection of component cables(Y, Pb, Pr)?] C -- No --> D[Input the component source properly.] C -- Yes --> E[Check the Self Diagnosis (Support → Self Diagnosis → Picture Test). Dose the promblem still exist self diagnosis?] E -- No --> F[Check external devices and connections.] E -- Yes --> G[1 Does the CVBS data appear at R816(COMP_Y_CVBS), R815(COMP_ PB), R817(COMP_PR)?] G -- No --> H[Check CN502. Change the Main Assy.] G -- Yes --> I[2 Does the digital data appear at TP-E_ TXCLK+, E_TXCLK-, O_TXCLK+, O_TXCLK-.] I -- No --> J[Check IC1001 (X9). Change the Main Assy] I -- Yes --> K[Check the LVDS cable? Check the T-Con Board? Replace the LCD panel?] K -- Yes --> L([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

■ Location of Parts

Location (Main) - Top

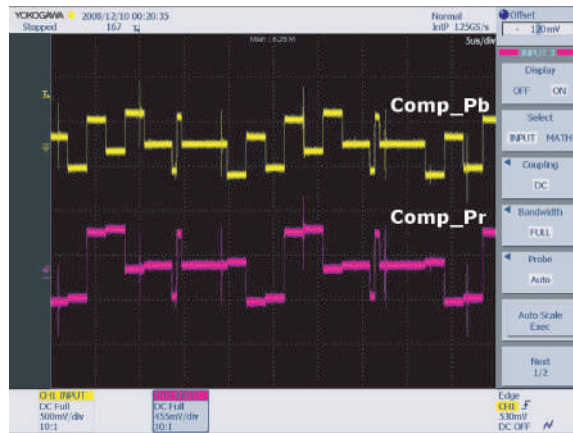
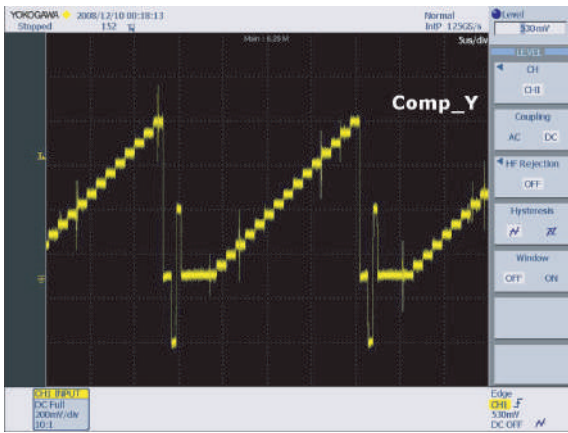


Detail

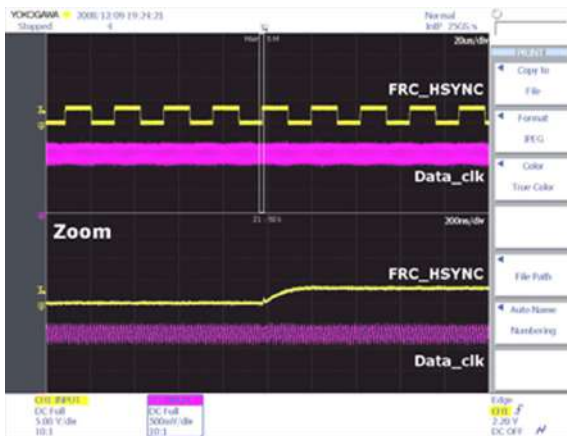


■ WAVEFORMS

1 Component_Y (Gray scale) / Pb / Pr (Color bar)



2 LVDS output

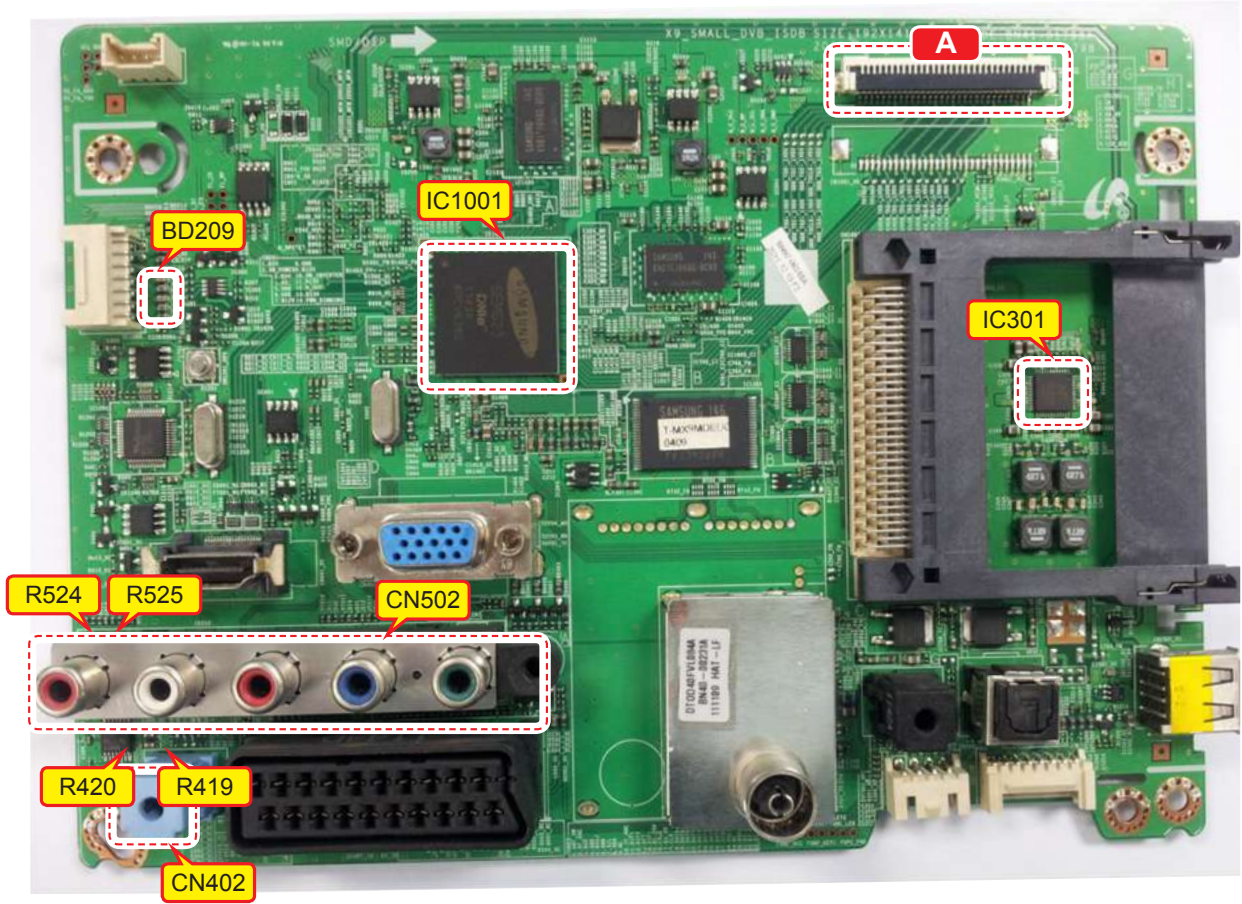


4-2-8. No sound

Symptom	Video is normal but there is no sound.
Major checkpoints	<ul style="list-style-type: none"> • When the speaker connectors are disconnected or damaged. • When the sound processing part of the Main Board is not functioning.
Diagnostics	<pre> graph TD Q1[Check the source and connection of sound cable (Comp/PC/DVI to HDMI)?] -- No --> A1[Input the sound source properly.] Q1 -- Yes --> Q2[Check the Self Diagnosis (Support → Self Diagnosis → Picture Test). Dose the promblem still exist self diagnosis?] Q2 -- No --> A2[Check external devices and connections.] Q2 -- Yes --> Q3[Does the sound data appear at R524/R525 (AV1, COMP1), R419/R420 (PC/DVI)?] Q3 -- No --> A3[Check CN502, CN402. Change the Main Assy.] Q3 -- Yes --> Q4[Does the DC B13V appear at BD209?] Q4 -- No --> A4[Change the Main Assy.] Q4 -- Yes --> Q5[Does the sound waveform appear at L-, L+, R-, R+?] Q5 -- No --> A5[Check IC1001 (X9) Check IC301 (Sound AMP). Change the Main Assy.] Q5 -- Yes --> A6[Replace speaker.] A6 -- Yes --> A7([Please, Contact tech support.]) </pre>
Caution	Make sure to disconnect the power before working on the SMPS board.

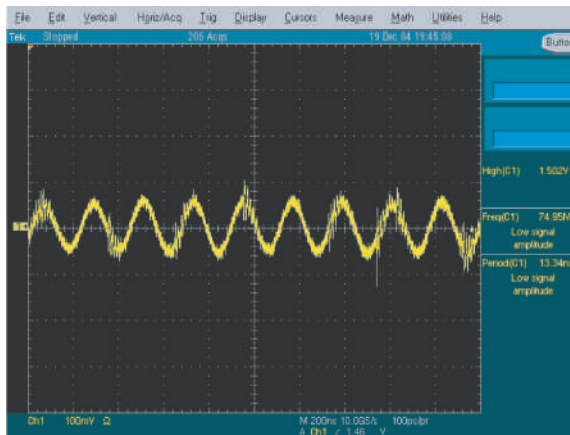
■ Location of Parts

Location (Main) - Top



Detail



■ WAVEFORMS**1****Speaker out**

4-4. Adjustment

4-4-1. Service Instruction

1. Usually, a color TV-VCR needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync.
2. Use the specified test equipment or its equivalent.
3. Correct impedance matching is essential.
4. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test result.
5. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.
6. Do not attempt to connect or disconnect any wire while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.
7. To protect against shock hazard, use an isolation transform.

4-4-2. How to Access Service Mode

■ Entering the Service Mode

To enter "Service Mode" Press the remote -control buttons in this sequence : →

Button Functions

- Channel ▲/▼ Button : Select an option.
- Volume +/-, ◀/▶ Button : Increase or decrease the value for an option.
- Menu button: Save the current settings to EEPROM and return to the previous mode.
- Number (0 ~ 9) buttons: Change the channel.
- TV/AV button: Switch to AV mode.

4-4-3. Service Mode Menu

■ Initial display in service mode

Option	T-MX9MDEUC-XXXX T-MX9MDEUS-XXXX
Control	
SVC	EDID SUCCESS HDCP SUCCESS
Expert	CALIB : AV / COMP / PC / HDMI / Option : 22D6TF0E,EU,300,NONE
ADC/WB	FactoryCS: xxx T-MSXDEUCIP-1000
Advanced	Onboot: =xxx SDAL-XXX RFS : Mstar-X9 XXXX 20XX-XX-XX F-CT1M16S-xxxx TYPE : 22D6TF0E Model: LT22C300 CIP FAIL Factory Data Ver : XXX EERC Version : XXX DTP-AP-COMP-893 DTP-BP-HAL-0343 DTP-BP-0836 POP-PNG-12-0004 Date of purchase : XX/XX/XX

■ Button functions in service mode

- Menu: Full Menu Display/Move to Parent Menu.
- Direction Buttons ▲/▼: Item selection by Moving the Cursor.
- Direction Buttons ◀/▶: Data Increase / Decrease for Selected Item.
- Source: Cycles through the active input source that are connected to the unit.

■ Sub-Page of Service

Option		
Factory Menu Name	Data	Remark
Type	22D6TF0E	
Local Set	EU	
Basic Model	TC300	
SVC Model	300	
Tuner	SI_ATV2	
Ch Table	NONE	
Front Color	NONE	

Control		
Factory Menu Name	Data	Remark
EDID		
EDID ON/OFF	ON	
EDID WRITE ALL	Success	
EDID WRITE PC	Success	
EDID WRITE HDMI	...	
EDID WRITE HDMI1	Success	
EDID WRITE HDMI2	...	
EDID WRITE HDMI3	...	
EDID WRITE HDMI4	...	
EDID VER	HDMI 1.3	
EDID PORT	NONE	
EDID WRITE DVI	...	
Sub Option		
RF Mute Time	600ms	
RS-232 Jack	UART	
Watchdog	ON	
WD Count	0	
Lvds Format	VESA	
Language_Arbic	EU	
TOOLS Support	57	
LNA Support	0	
NETWORK Support	Not support	
IPERF	Stopped	
Info Link Server Type	development	
Info Link Country	None	
TTX List	Flof	
TTX Group	UserOSD	

Control		
Factory Menu Name	Data	Remark
24Px4 Support	OFF	
Power Indicator Support	ON	
BD Wise Support	OFF	
Data Service Support	OFF	
IIC Bus Stop	OFF	
Visual Test	Disable	
Emergency Log Copy		
Checksum	0x0000	
View Log		
Select Log Type	MICOM	
Log View		
Delete Log		
Gemstar On/Off	OFF	
WSS Support	ON	
PVR Support	OFF	
CI Support	ON	
Eeprom Reset		
EER Reset		
NVR All Clear	OFF	
Spread Spectrum		
LVDS Spread	ON	
Period	40K	
Amplitude	1.1	
DDR Spread	1.0% Spread	
Echo-FS LVDS SSC ON/OFF	1	
Echo-FS LVDS SSC MFR	1	
Echo-FS LVDS SSC MRR	10	
Echo-FS DDR SSC ON/OFF	1	
Echo-FS DDR SSC MFR	1	
Echo-FS DDR SSC MRR	15	
NT72312 LVDS SSC ON/OFF	ON	
NT72312 LVDS SSC Period	30k	
NT72312 LVDS SSC Modulat	1.0%	
NT72312 DDR SSC ON/OFF	ON	
NT72312 DDR SSC Period	30K	
NT72312 DDR SSC Modulat	1.0%	
DDR Margin		
A CTRL_OFFSET_0_3	0X0	

4. Troubleshooting

Control		
Factory Menu Name	Data	Remark
A CTRL_OFFSET_D	0X0	
B CTRL_OFFSET_0_3	0X0	
B CTRL_OFFSET_D	0X0	
H.264 Margin	8	
MPEG Margin	1000	
2nd mips	ON	
2nd mips count	0	
Region	PANEURO	
PnP Language	ENG	
PC Auto Ident	Auto	
OTP Lock	Failure	
Auto Power	MEMORY	
KEY SENSITIVITY	128	
OTA Support	General	
FKP Down		
WIFI REGION	E	
e-Pop Default	ON	
OPTION_OTN		
OPTION_MEDIAPLAY		
3D OPTIMIZE VALUE	1	
ECO IC TYPE	NLS1006	
Energy Star Logo	OFF	
Fast USB Booting	ON	
Num of Network Stream	0	
PDP Option		
Hotel Option		
Hospitality Mode	OFF	
Power On	...	
Menu OSD	...	
Operation	...	
Music Mode	...	
External Source	...	
Eco Solution	...	
Cloning	...	
Shop Option		
Shop Mode	OFF	
Exhibition Mode	OFF	
3D Cube	OFF	

Control		
Factory Menu Name	Data	Remark
Asia Option		
TTX	OFF	
China HD	OFF	
NT Conversion	OFF	
Sepco 120Hz	OFF	
Unbalance	OFF	
FMTransmitter Support	OFF	
FMTransmitter Carrier	OFF	
AF Level adjust	3	
TX Power Level	0	
Mono Last Memory	OFF	
H Shaking	OFF	
Sound		
High Devi	OFF	
Carrier_Mute	OFF	
Volume Curve	Type1	
Speaker Delay Normal	10	
Pilot Level High Thld	0xFFFFE0h	
Pilot Level Low Thld	0xFFFFE18h	
FM Prescale	68	
AM Prescale	49	
NICAM Prescale	45	
Amp Volume	0xc7h	
Amp Scale	0x67h	
Amp Check Sum	0x1F6A2A08	
Woofer Type	1	
Woofer Scale	0x8ah	
Woofer Check Sum		
Speaker EQ	ON	
PEQ Test	0	
Amp Model	NTP74412	
Speaker cut-off Freq	4	
SPDIF PCM Gain	-9dB	
FM M Prescale	48	
BTSC Mono Prescale	25	
BTSC stereo Prescale	47	
SAP Prescale	43	
A2 Ident High Thld	31	

4. Troubleshooting

Control		
Factory Menu Name	Data	Remark
A2 Ident Low Thld	2	
Carrier2 Amp High Thld	4	
Carrier2 Amp Low Thld	3	
Carrier2 SNR High THR	16	
Carrier2 SNR Low THR	80	
Audio-IP Test	Ready	
TruBass-CheckSum	0xFFFFFFFF	
PWM Mode	BD	
Mic Scale	0	
SubWoofers Support	0	
India Sound	OFF	
Config Option		
Num of ATV	1	
Num of DTV	1	
Num of AV	1	
Num of SVIDEO	0	
Num of COMP	1	
Num of HDMI	1	
Num of PC	1	
Num of SCART	1	
Num of DVI	0	
Num of OPTICAL Link	0	
Num of MEDIA	1	
Num of PANEL Button	6	
Num of USB Port	1	
Num of HeadPhone	0	
Num of RVU	0	
MFT Offset	62.5	
Select LCD/PDP	LCD	
HDMI/DVI SEL	1	
Indicator Led	OFF	
Wall Mount	OFF	
HV Flip	ON	
Num of Display	2	
DVI/HDMI SOUND	Auto	
HDMI HOT PLUG	Disable	
HOTPLUG SWITCHING	Boot	
HOT PLUG DURATION	1200ms	

Control		
Factory Menu Name	Data	Remark
CLK TERM DURATION	1200ms	
HDMI FLT CNT SIG	100ms	
HDMI FLT CNT LOS	100ms	
UNSTABLE BAN CNT	3500ms	
HDMI Err Cnt	1	
HDMI ROBIN	ON	
HDMI Callback	OFF	
HDMI CTS Thld	8	
HDMI CTS Cnt1	1	
HDMI EQ	AUTO	
HDMI Write Type	Separate	
HDMI Switch	NONE	
DVI SET TIME	300ms	
Type Of PANEL Button	Horizontal	
EcoSensor Support	OFF	
LEDMotionPlus Support	OFF	
Natural Mode Support	OFF	
All Share Support	OFF	
Relax Mode Support	OFF	
BT Support	OFF	
3D Support	OFF	
H Wright		
HDMI Sync	DE	
HeadPhone Port		
FANET	OFF	
Support MultiMedia Button	ON	
Config_AV_PATH		
V_HDMI IDENT TYPE	1234	
V_HDMI PATH TYPE	DBAC	
V_EDID TYPE	21_5_HD	
V_ATV	CVBS_PORT_0	
V_AV1	AV_COMP_G2	
V_AV2	None	
V_COMP1	ADC_PORT_2	
V_COMP2	None	
V_PC	ADC_PORT_0	
V_SCART1_CVBS	CVBS_PORT_3	
V_SCART1_RGB	ADC_PORT_1	

4. Troubleshooting

Control		
Factory Menu Name	Data	Remark
V_SCART2_CVBS	None	
V_SCART2_RGB	None	
A_ATV	SIF	
A_DTV	DECODER	
A_AV1	AUIN2	
A_AV2	None	
A_COMP1	AUIN2	
A_COMP2	None	
A_PC	AUIN0	
A_SCART1	AUIN3	
A_SCART2	None	
A_DVI	AUIN0	
A_HDMI	SPDIF	
A_Media	DECODER	
Num of IPTV	0	
PVR RECORD NUM	0	
Num of RUI	0	
5 WAY Fuction Button	R BOTTOM	
Contents Bar	OFF	
Num Of Tuner	1	

SVC		
Factory Menu Name	Data	Remark
Test Pattern		
Pattern Sel	off	
Logic Pattern Sel	...	
Logic Level Sel	...	
Echo-FS Pre Test Pattern	0	
Echo-FS Post Test Pattern	0	
Echo-FS FRC FDISPLAY ON/OFF	OFF	
Echo-FS 3D FDISPLAY ON/OFF	OFF	
Echo-FS PC Mode ON/OFF	OFF	
NT72312 Pre Test Pattern	0	
NT72313 Post Test Pattern	0	
NT72312 PC mode ON/OFF	OFF	
Panel Display Time	4Hr	
Logic Usb D/L		
Tuner Status		

SVC		
Factory Menu Name	Data	Remark
DVB		
SNR		
BER		
Singal Strength		
Bandwidth		
Frequency		
LNA Status		
FFT		
Modulation		
Code Rate		
GI		
Hier Modulation		
Frequency Offset		
Timing Offset		
AGC		
UCB		
PLL Type		
DEMOD Type		
TPS LOCK		
RS Lock		
SSI		
SQI		
Firmware Version		
ISDB-T		
FFT Size_1		
Guard Interval_1		
Freq. Offset_1		
SNR_1		
IF AGC_1		
TMCC Lock_1		
TS Packet_1		
Master Lock_1		
A_Modulation_1		
A_Code Rate_1		
A_Timer InterLeave_1		
A_Segments Num_1		
A_Ber_1		
B_Modulation_!		

4. Troubleshooting

SVC		
Factory Menu Name	Data	Remark
B_Code Rate_1		
B_Timer InterLeave_1		
B_Segments Num_1		
B_BER_1		
C_Modulation_1		
C_Code Rate_1		
C_Timer InterLeave_1		
C_Segments Num_1		
C_BER_1		
T-CON Usb Download	...	
T-CON Check Sun	Failire	
Tuner Margin	10	
CAM Wait Time		
TS Clock delay	0	
SUBMICOM UPGRADE	off	
BT ADDRESS	0000	
BT UPGRADE	...	
BT FREPAIRING	ON	
SVC Reset		
TOCN_TEMP READ	0.00	
TEMP LAST	60.00	
DCC VERSION	0x0	
DCC CHK SEL	0	
DCC CHECK LOCAL	0x0	
DCC CHECK TOTAL		
Function Upgrade	off	
Smart Hub Reset	off	
WIFI ER COUNT	0	
BT ER COUNT	0	
Debug Log Down	0	
MultitACC Checksum	Error	
SVC Info		
TS Clock delay TC	0	
TS Clock delay S	0	
Delete S/N	Failure	

ADC/WB		
Factory Menu Name	Data	Remark
ADC		
AV Calibration		
Comp Calibration		
PC Calibration		
HDMI Calibration		
ADC Target		
1st_AV_Low	64	
1st_AV_High	880	
1st_AV_Delta	2	
1st_COMP_Y_Low	64	
1st_COMP_Cb_Low	512	
1st_COMP_Cr_Low	512	
1st_COMP_Y_High	940	
1st_COMP_Cb_High	512	
1st_COMP_Cr_High	512	
1st_COMP_Delta	2	
1st_PC_Low	4	
1st_PC_High	1004	
1st_PC_Delta	2	
2nd_ACH_Low	4	
2nd_ACH_High	940	
2nd_PC_Low	4	
2nd_PC_High	940	
2nd_Delta	2	
ADC Result		
1st_Y_GH	0	
1st_Y_GL	...	
1st_Cb_BH	0	
1st_Cb_BL	0	
1st_Cr_RH	0	
1st_Cr_RL	0	
2nd_R_L	134	
2nd_G_L	134	
2nd_B_L	134	
2nd_R_H	49	
2nd_G_H	49	
2nd_B_H	49	
White Balance		

4. Troubleshooting

ADC/WB		
Factory Menu Name	Data	Remark
Sub Brightness	128	
R-Offset	128	
G-Offset	128	
B-Offset	128	
Sub Contrast	128	
R-Gain	128	
G-Gain	128	
B-Gain	128	
Movie R-Offset	...	
Movie B-Offset	...	
Movie R-Gain	...	
Movie B-Gain	...	

■ Control the sensitivity of function key is available in service mode

Option		
Control	Sub Option	KEY SENSITIVITY
SVC		
Expert		
ADC/WB		
Advanced		

Key Sensitivity (Default : 128)

- 1~255 and Not Used
- Raising this value, the sensitivity decreases
- Not Used : Not use sensitivity, use Function default value

4-4-4. White Balance - Calibration

■ Entering the Service Mode

Option		
Control		
SVC		
Expert		
ADC/WB	ADC	AV Calibration
Advanced	ADC Target	Comp Calibration
	ADC Result	PC Calibration
	WB	HDMI Calibration

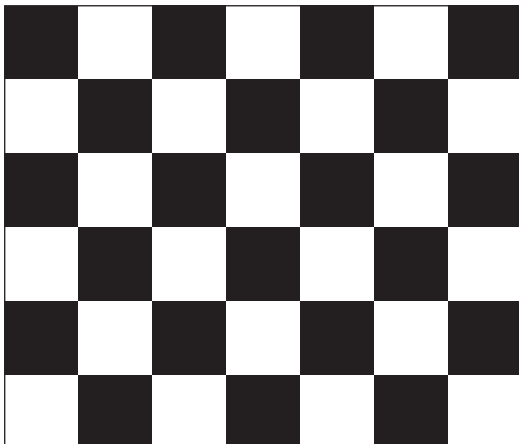
■ Service Adjustment

You must perform Calibration in the Lattice Pattern before adjusting the White Balance.

Color Calibration

Adjust Specification

1. Source: PC
2. Setting Mode: 1080x720@60Hz
3. Pattern: Pattern #24 (Chess Pattern)



4. Use Equipment: CA210 & Master MSPG925 Generator



NOTE

Use other equipment only after comparing the result with that of the Master equipment.

Input mode	Calibration	Pattern
CVBS IN (Model_#1)	Perform in NTSC B&W Pattern #24	Lattice
Component IN (Model_#6)	Perform in 720p B&W Pattern #24	Lattice
PC Analog IN (Model_#21)	Perform in VESA XGA (1024x768) B&W Pattern #24	Lattice
HDMI IN	Perform in 720p B&W Pattern #24	Lattice

Method of Color Calibration (AV)

1. Apply the NTSC Lattice (N0. 3) pattern signal to the AV IN 1 port
2. Press the Source button to switch to “AV1” mode
3. Enter Service mode
4. Select the “ADC” menu
5. Select the “AV Calibration” menu.
6. In “AV Calibration Off” status, press the “▶” button to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “AV Calibration” status from Failure to Success.

Method of Color Calibration (Component)

1. Apply the 720p Lattice (N0. 6) pattern signal to the Component IN 1 port
2. Press the Source button to switch to “Component1” mode
3. Enter Service mode
4. Select the “ADC” menu
5. Select the “Comp Calibration” menu.
6. In “Comp Calibration Off” status, press the “▶” button to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “Comp Calibration” status from Failure to Success.

Method of Color Calibration (PC)

1. Apply the VESA XGA Lattice (N0. 21) pattern signal to the PC IN port
2. Press the Source button to switch to “PC” mode
3. Enter Service mode
4. Select the “ADC” menu
5. Select the “PC Calibration” menu.
6. In “PC Calibration Off” status, press the “▶” button to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “PC Calibration” status from Failure to Success.

Method of Color Calibration (HDMI)

1. Apply the 720p Lattice (N0. 6) pattern signal to the HDMI1/DVI IN port
2. Press the Source button to switch to “HDMI1” mode
3. Enter Service mode
4. Select the “ADC” menu
5. Select the “HDMI Calibration” menu.
6. In “HDMI Calibration Off” status, press the “▶” button to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “HDMI Calibration” status from Failure to Success.

4-4-5. White Balance - Adjustment



NOTE

All White Balance default value for TC300 is set in a factory line already. No need calibration and do White balance again.

■ Entering the Service Mode

Option		
Control		
SVC		
Expert		
ADC/WB	ADC	
Advanced	ADC Target	
	ADC Result	
	White Balance	Sub Brightness
		R_Offset
		G_Offset
		B_Offset
		Sub Contrast
		R_Gain
		G_Gain
		B_Gain
		Movie R Offset
		Movie B Offset
		Movie R Gain
		Movie B Gain

■ White Ratio (Balance) Adjustment

1. You can adjust the white ratio in factory mode (1:Calibration, 3:White-Balance).
2. Since the adjustment value and the data value vary depending on the input source, you have to adjust these in AV, Component and HDMI modes.
 - The optimal values for each mode are configured by default. It varies with Panel's size and Specification.
 - Equipment : CA210
 - Pattern: MIK K-7256 #92 "Flat W/B Pattern" as standard
 - Use other equipment only after comparing the result with that of the Master equipment.
 - Set Aging time : 60min



Calibration and Manual setting for WB adjustment.

- HDMI : Calibration at #24 Chessboard Pattern → Manual adjustment #92 pattern (720p)
- COMP: Calibration at #24 Chessboard Pattern → Manual adjustment at #92 pattern (720p)
- AV: Calibration at #24 Chessboard Pattern → Manual adjustment at #92 pattern (NTSC)



NOTE

- If finishing in HDMI mode, adjustment coordinate is almost same in AV/COMP mode.

White Balance Manual Adjustment

P-Mode	Adjustment Coordinate				
		x	y	Y(Luminance)	T(K) + MPCD
[Dynamic Cool1] HDMI Comp CVBS	H/L	281	288	R-Gain : 132 B-Gain : 179 Sub_CT : 128	10,000 (+/- 0)
	L/L	-	-	(Sub_Brt:128 Fix) R-Offset, B-Offset : 128	-
[Movie Warm2] HDMI Comp CVBS	H/L	-	-	(M-Sub_CT:128 Fix) appiled Movie W2 R/B-gain	-
	L/L	-	-	(M-Sub_Brt:128 Fix) appiled Movie W2 R/B-gain	-

Adjustment Specification

- White Balance : High light (± 2), Low light (± 3)
- Luminance : High light (Don't care), Low light (± 0.2 Ft/L)

4-5. Software Upgrade

Software Upgrade can be performed by downloading the latest firmware from samsung.com to a USB memory device.

4-5-1. How to check the SW version

■ Use the main menu

1. Click the MENU button in remote controller.
2. Select "Support" menu.
3. Locate the menu cursor "Software Upgrade" menu.



4. Click the INFO button.
5. Check the Main SW and Micom version.

■ Use the factory mode

Access the factory mode.

Option	T-MX9MDEUC-XXXX T-MX9MDEUS-XXXX
Control	
SVC	EDID SUCCESS HDCP SUCCESS
Expert	CALIB : AV / COMP / PC / HDMI / Option : 22D6TF0E,EU,300,NONE
ADC/WB	FactoryCS: xxx T-MSXDEUCIP-1000
Advanced	Onboot: =xxx SDAL-XXX RFS : Mstar-X9 XXXX 20XX-XX-XX F-CT1M16S-xxxx TYPE : 22D6TF0E Model: LT22C300 CIP FAIL Factory Data Ver : XXX EERC Version : XXX DTP-AP-COMP-893 DTP-BP-HAL-0343 DTP-BP-0836 POP-PNG-12-0004 Date of purchase : XX/XX/XX

4-5-2. How to Upgrade SW and Micom

Insert a USB drive containing the firmware upgrade downloaded from samsung.com into the TV.

Please be careful to not disconnect the power or remove the USB drive while upgrades are being applied. The TV will turn off and turn on automatically after completing the firmware upgrade. Please check the firmware version after the upgrades are complete (the new version will have a higher number than the older version). When software is upgraded, video and audio settings you have. When software is upgraded, video and audio settings you have you write down your settings so that you can easily reset them after the upgrade.

■ Main SW upgrade

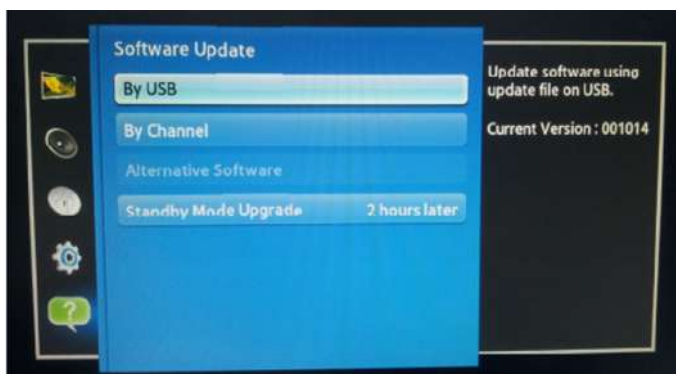
1. Store the sw program named "T-MX9MDEUC"(FHD) in USB memory stick.
2. Connect the USB.



3. Click the MENU button in remote controller.
4. Select "Support" menu.
5. Locate the menu cursor "Software Upgrade" menu.

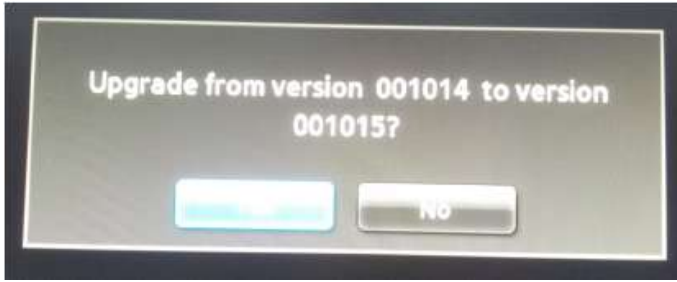


6. Click the ENTER button.
7. You can upgrade by USB.

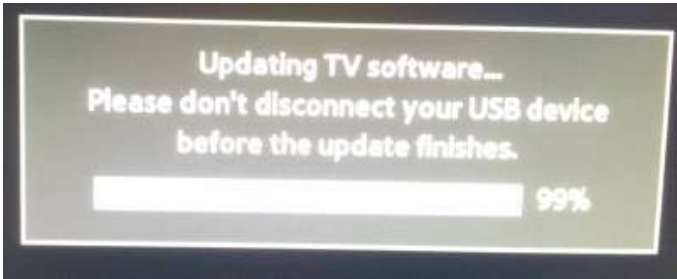


4. Troubleshooting

8. Click the ENTER button.



9. Click the ENTER button.



10. Wait for upgrade complete.

11. Check the SW version.

■ Sub micom upgrade

You can upgrade sub micom in factory mode without DDC program. But it take long time about 5 minutes.

1. Enter the Factory Mode and select the “**SVC**” menu.

Option
Control
SVC
Expert
ADC/WB
Advanced

2. Select the “**SUBMICOM UPGRADE**” menu.

Test Pattern	
Panel Display Time	4Hr
Logic Usb D/L	...
Tuner Status	
T-CON Usb Download	...
T-CON Check Sun	Failire
Tuner Margin	10
CAM Wait Time	
TS Clock delay	0
SUBMICOM UPGRADE	off
BT ADDRESS	0
BT UPGRADE	
BT FREEPAIRING	ON
SVC Reset	
TCON_TEMP READ	0.00

3. Press the “▶” button on the remocon and wait the completion of upgrade. The system will be reset after upgrade.

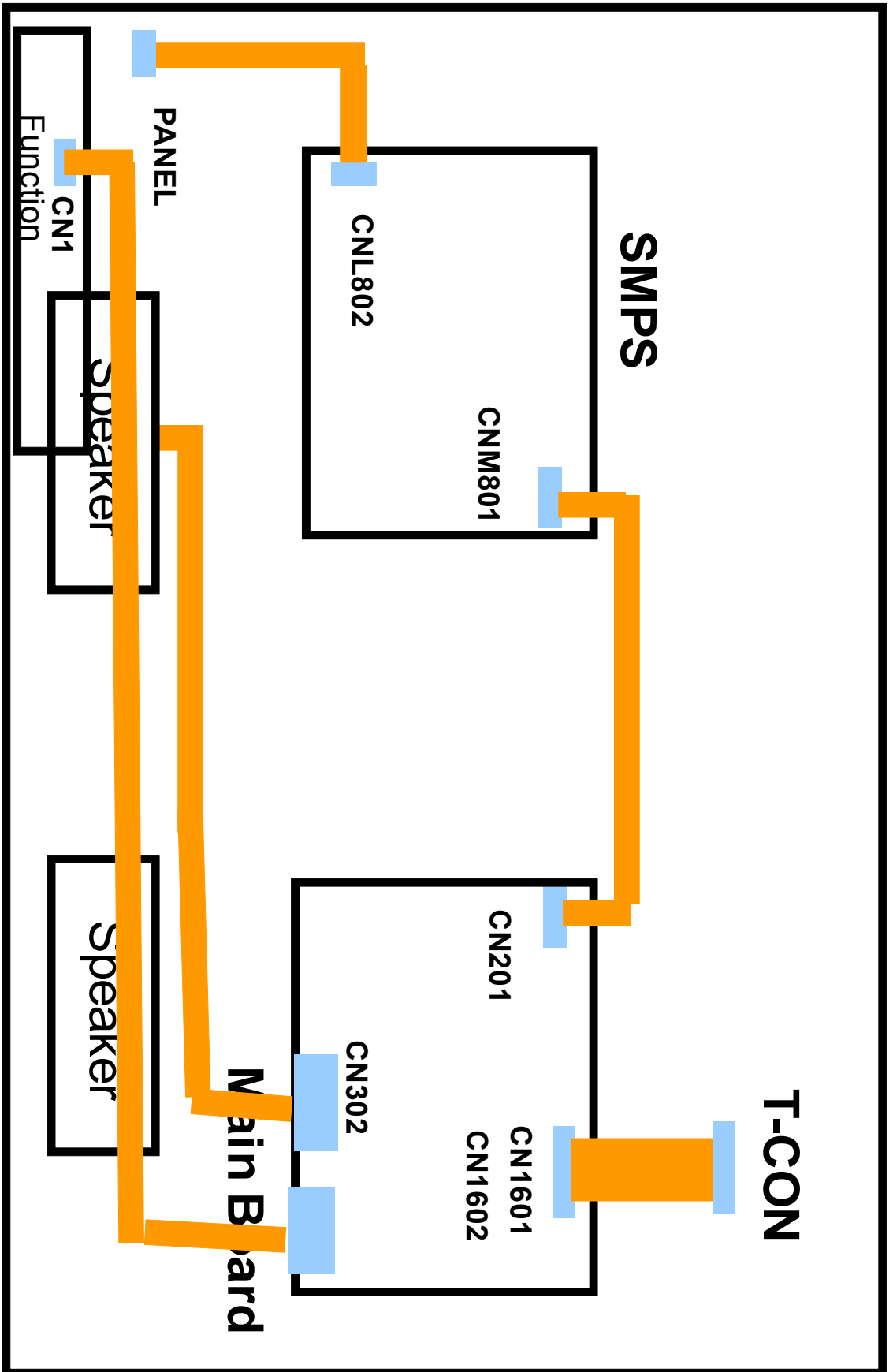
SUBMICOM UPGRADE	Wait
-------------------------	------

WARNING

Don't turn off the monitor until the upgrade is completed.

5. Wiring Diagram

5-1. Wiring Diagram



5-2. Board Connection



① CN201 (to Powr board)			
1	B5V	8	GND
2	SW_POWER	9	B12VS
3	B5V	10	SW_INVERTER
4	A5V	11	B13V
5	GND	12	NC
6	GND	13	B13V
7	B12VS	14	PWM_DIMM

② CN1601_FHD (to Panel) - 22", 24"			
1	Panel_VCC	16	EVEN[1]-
2	Panel_VCC	17	GND
3	Panel_VCC	18	EVEN[0]+
4	NC	19	EVEN[0]-
5	NC	20	ODD[3]+
6	NC	21	ODD[3]-
7	GND	22	ODD[CLK]+
8	EVEN[3]+	23	ODD[CLK]-
9	EVEN[3]-	24	GND
10	EVEN[CLK]+	25	ODD[2]+
11	EVEN[CLK]-	26	ODD[2]-
12	EVNE[2]+	27	ODD[1]+
13	EVEN[2]-	28	ODD[1]-
14	GND	29	ODD[0]+
15	EVEN[1]+	30	ODD[0]-

2 CN1602_HD (to Panel) - 19"			
1	Panel_VCC	16	ODD[CLK]+
2	Panel_VCC	17	ODD[CLK]-
3	Panel_VCC	18	GND
4	Panel_VCC	19	ODD[2]+
5	Panel_VCC	20	ODD[2]-
6	GND	21	GND
7	GND	22	ODD[1]+
8	GND	23	ODD[1]-
9	TCON_WP	24	GND
10	FORMAT	25	ODD[0]+
11	NC	26	ODD[0]-
12	GND	27	GND
13	ODD[3]+	28	SDA_TCON
14	ODD[3]-	29	SCL_TCON
15	GND	30	NC

3 CN302 (SPEAKER)			
1	R+	3	L+
2	R-	4	L-

4 CN1201(FUNCTION)			
1	IR	5	MSDA
2	GND	6	FUNC_INTR
3	A3.3V	7	LED_STB
4	MSCL	8	NC

5 CN301 (Headphone)			
1	GND	4	GND
2	SL_OUT	5	IDENT
3	SR_OUT	6	NC

6 CN503 (COMPONENT)			
1	GND	6	GND
2	Y	7	IDENT COMP
3	PB	8	SL
4	IDENT AV	9	SR
5	PR		

7 CN401 (PC)			
1	PC_RED	9	PC_5V
2	PC_GREEN	10	IDENT_PC
3	PC_BLUE	11	R_FANET
4	T_FANET	12	SDA_DOWN
5	GND	13	PC_HS
6	GND	14	PC_VS
7	GND	15	SCL_DOWN
8	GND		

8 CN402(PC/DIV SOUND)			
1	GND	4	NC
2	PC_SL_IN	5	NC
3	PC_SR_IN		

9 CN1501 (USB)			
1	USB_VCC	3	USB_DP
2	USB_DM	4	GND

10 CN601_H1 (HDMI)			
1	HDMI_RX2+	11	GND
2	GND	12	HDMI_RXCLK-
3	HDMI_RX2-	13	HDMI_CEC
4	HDMI_RX1+	14	GND
5	GND	15	SCL
6	HDMI_RX1-	16	SDA
7	HDMI_RX0+	17	GND
8	GND	18	5V
9	HDMI_RX0-	19	HPD
10	HDMI_RXCLK+		

5-3. Connector Functions

Connector	Functions
CN1601_HD/CN1602_T-CON	The LVDS signal transferred from Main Board to Panel .
CN301 ↔ SMPS	Supply main power and dimming signal from IP board to Main Board.
SMPS ↔ PANEL	Supply power from IP board to Driver Board.

5-4. Cables

Use	LVDS (Main - TCON)	LEAD (Main-IP 14P)	LEAD (IP-PANEL 6P/4P)
Code	18.5": BN96-020521M 21.5": BN96-21835L 24": BN96-21835J	18.5": BN39-01449V 21.5": BN39-01449L 24": BN39-01449W	18.5": BN39-01465D 21.5": BN39-01476L 24": NO USE
Photo	