Panasonic

ORDER NO. MTV1609091CE

Service Manual

LED TV

Model No. **TH-55DX400K**
TH-55DX400S

Destination : K: Malaysia S: Singapore

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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1 Safety Precautions

1.1 General Guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.
4. When conducting repairs and servicing, do not attempt to modify the equipment, its parts or its materials.
5. When wiring units (with cables, flexible cables or lead wires) are supplied as repair parts and only one wire or some of the wires have been broken or disconnected, do not attempt to repair or re-wire the units. Replace the entire wiring unit instead.

6. When conducting repairs and servicing, do not twist the Faston connectors but plug them straight in or unplug them straight out.

1.1.1 Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be 8.5Mohm to 13Mohm. When the exposed metal does not have a return path to the chassis, the reading must be ∞.

1.1.2 Leakage Current Hot Check (See Figure 1 .)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kohm, 10 watts resistor, in parallel with a 0.15µF capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1 .
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

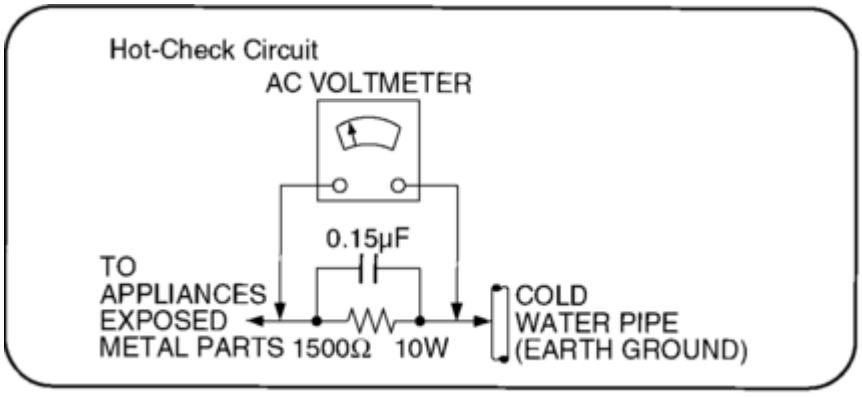


Figure 1

2 Warning

2.1 Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as [anti-static (ESD protected)] can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution

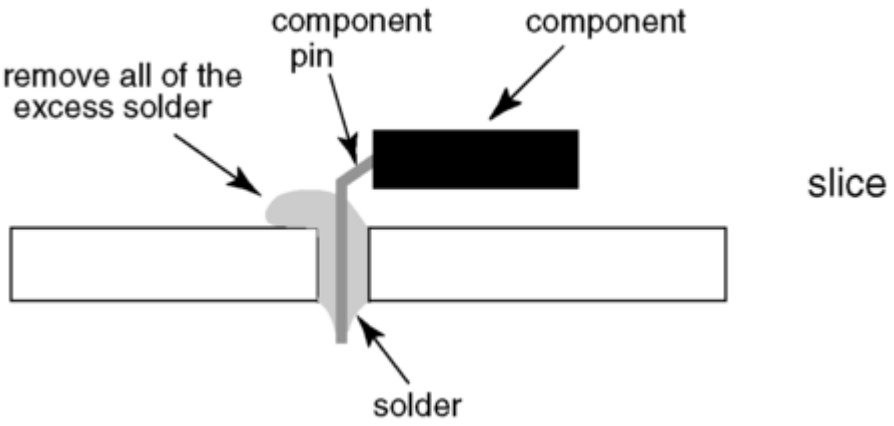
   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

2.2 About lead free solder (PbF)

Note: Lead is listed as (Pb) in the periodic table of elements.
In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.
The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).
That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.
This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.
PCBs manufactured using lead free solder will have the PbF within a leaf Symbol **PbF** stamped on the back of PCB.

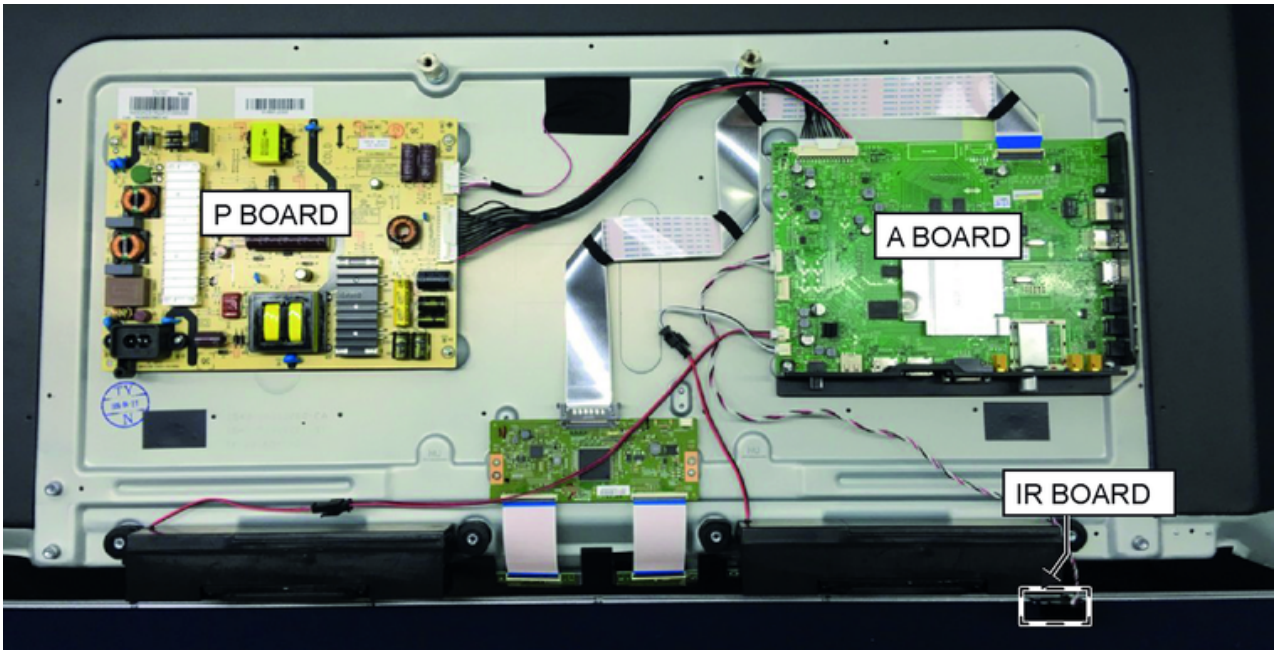
Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30~40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
  If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)


component
pin
component
remove all of the
excess solder
slice
solder

3 Service Navigation

3.1 Service Hint

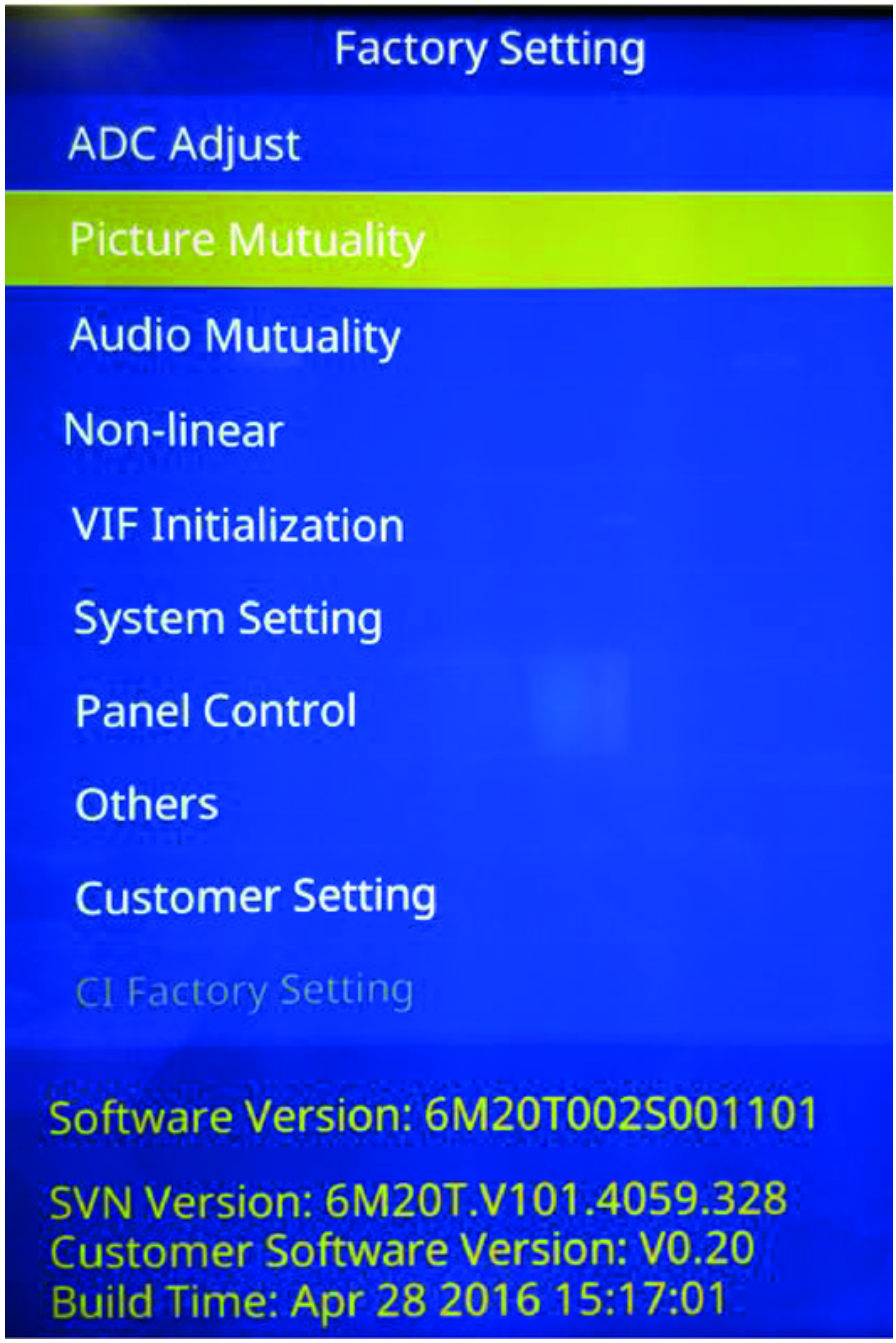


Board Name	Main Device	Remarks
A Board	Main Board	All boards are non-repairable and should be exchanged for service
P BOARD	Power Board	
IR BOARD	Remote, Key	

5 Test and Alignment

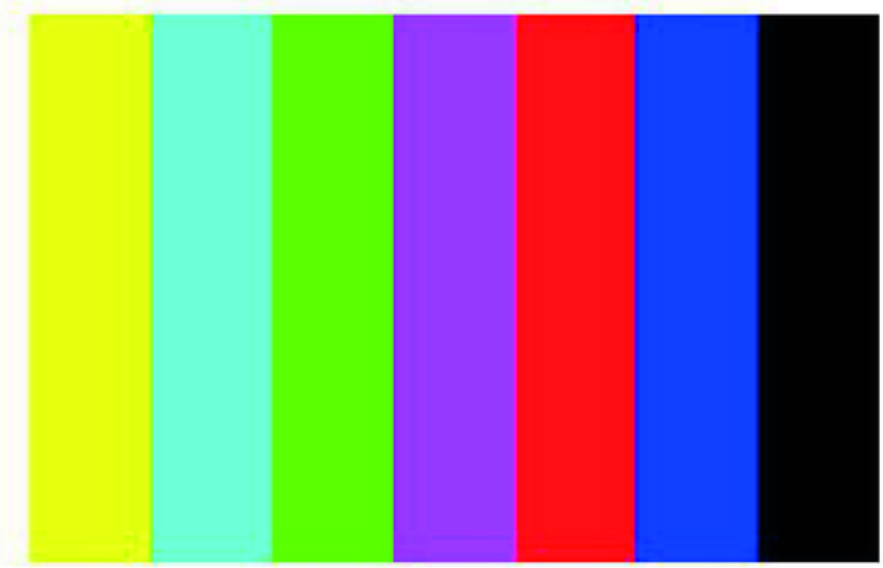
5.1 Factory Setting

- Press AV button and follow with key 3, 1, 9, 5 one by one.



5.1.1 ADC Adjust

- Press ▲/▼button, choose ADC Adjust and press OK button to enter.
  Before adjusting, enter the channel you want to adjust and input adjust signal (YPBPR channel: 576P and 720P with 100% color bar; VGA channel: 1366*768 with tessellated white and black). Select ADC Tune, press ► button to auto adjust the ADC value.



100% color bar

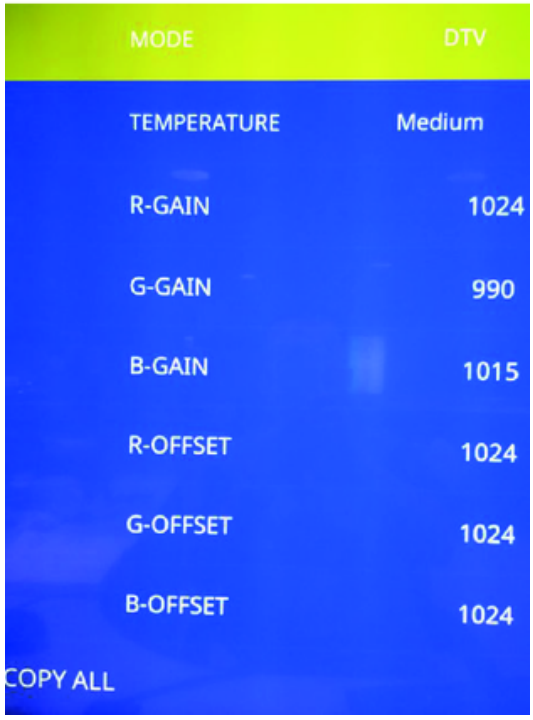
tessellated white and black

Mstar Release C
Mstar Sem

Note:

1. The YPBPR and PC's Auto White Balance adjust (AUTO ADC) must be done on the product line.
2. In YPBPR channel ,must adjust the SD and HD two modes.

5.1.2 Picture Mutuality



No	Item	Description
1	W/B Adjust	Select W/B Adjust , go to the “MODE” item to select the channel which you want to adjust then select TEMPERATURE (Medium, Warm, Cool). Then press ▼button to go to the items you want to adjust:R-GAIN G-GAIN B-GAIN R-OFFSET G-OFFSET B-OFFSET Press◄/►
2	Picture Mode	No adjust.
3	OverScan	Select OverScan , go to the “input source” item to select the channel which you want to adjust. Then press ▼button to go to the items you want to adjust:Left Crop Right Crop Up Crop Down Crop Press◄/► buttons can
4	QMAP Adjust	No adjust.

5.1.3 Audio Mutuality

- No adjust.

5.1.4 Non-Linear

- No adjust Press OK button to choose a backlight, volume, brightness,contrast, saturation,sharpness,hue and so on, press ◄/► buttons to nonlinear adjustment.

No	Item	Description
1	Brightness	Adjust the Brightness Curve.
2	Contrast	Adjust the Contrast Curve.
3	Saturation	Adjust the Saturation Curve.
4	Hue	Adjust the Hue Curve.
5	Sharpness	Adjust the Sharpness Curve.
6	Volume	Adjust the Volume Curve.

7	Backlight	Adjust the Backlight Curve.

5.1.5 VIF Initialization

- No adjust.

5.1.6 System Setting

No	Item	Description
1	HOTKEY	Press ◄/► button to switch factory hotkey on or off. For shipping condition, this item should be off.
2	AGING MODE	Press ◄/► button to switch aging mode on or off. When aging mode is on, press EXIT button to exit this mode.
3	Default Country	No adjust.
4	POWER ON MODE	Press ◄/► button to switch AC power on status. Memory is power on memorized, Seconda is power on standby, Direct On is power on always.
5	Country Setup	No adjust.
6	PQ FILE...update	No adjust.
7	HDCP Key Update	No adjust.
8	CI Plus Key Update	No adjust.
9	IP Enable Mapping	No adjust.
10	Mac Addr Update	No adjust.
11	3D	No adjust.
12	Linux TimeSource	No adjust.
13	Channels	No adjust.
14	SKY factory channel preset	No adjust.
15	Burn MAC	Press OK button from U disk write MAC.
16	Burn HDCP KEY	Press OK button from U disk write HDCP KEY.
17	Burn WIDI KEY	Press OK button from U disk write WIDI KEY.
18	Burn CI KEY	Press OK button from U disk write CI KEY.
19	Burn ALL(MAC HDCPKEY WDID CI KEY)	Press OK button from U disk write MAC ,HDCPKEY, WDID and CI KEY.

5.1.7 Panel Control

No	Item	Description
1	WHITE PATTERN	No adjust. For shipping condition, this item should be off.
2	SSC Setting	Press OK to set the appropriate EMC values.
3	6M30 SSC Setting	No adjust.
4	Gplus Mode	No adjust.

5.1.8 Others

No	Item	Description
1	Uart Enable	Press◄/► button to switch Uart Enable on or off.
2	Uart BUS	Press◄/► button to switch Uart BUS on or off.
3	Uart Msg Setting	No adjust.
4	Restore to Default	Press OK to execute factory reset.
5	AVD PAPAMETER	No adjust.
6	WDT	No adjust.
7	Mount Config	No adjust.
8	Customer Info	No adjust.
9	Unique Key Reencrypt	No adjust.
10	PIP/POP	No adjust.
11	PVR-Record All	No adjust.
12	SECURE WRITE	No adjust.
13	RAM Log	No adjust.
14	SW Information	No adjust.
15	Update Logo	No adjust.
16	Backup Date	No adjust.
17	Restore Date	No adjust.

5.1.9 Customer Setting

No	Item	Description
1	Gamma Table	No adjust.

5.1.10 CI Factory Setting

- No adjust.

5.2 MSD6488 Software Upgrade Instruction

5.2.1 Upgrade bin file

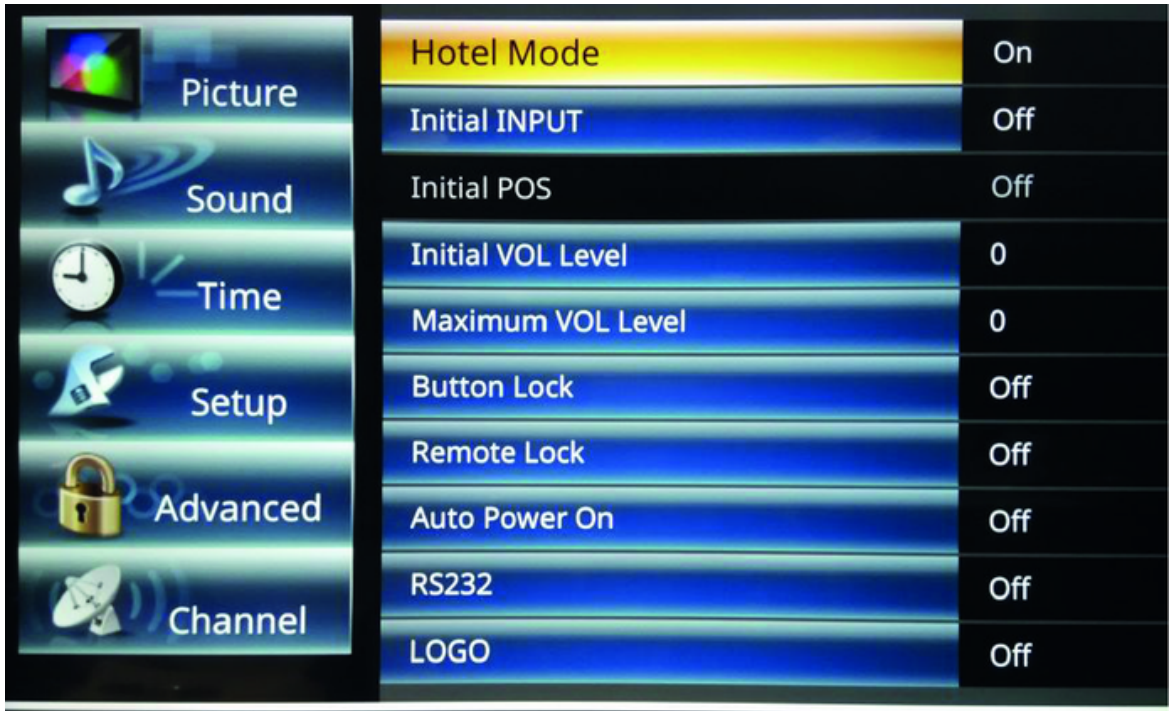
The file name of the upgrade bin is “MstarUpgrade.bin” for USB upgrade.

5.2.2 USB upgrade procedures for TV set

1. Copy the software to the root directory of a USB memory stick. Plug the memory stick to USB port of target TV set.
2. Select ‘Software Update (USB)’ on OSD and press OK button to start software update. TV will reboot automatically when upgrade finishes.
3. If the process stop at 19% and TV reboot, it means the software of both TV set and USB memory stick is the same.

5.3 Hotel Mode

- Enter Hotel Mode: MENU+7906
  Enter Hotel Mode State:



No	Item	Description
1	Hotel Mode	Press◄/► button to turn on or turn off hotel mode.
2	Initial INPUT	Press◄/► button to switch power on source.
3	Initial POS	Only available when Initial INPUT switch to ATV. Press◄/► button to set power on TV channel.
4	Initial VOL Level	Press◄/► button to set power on volume.
5	Maximum VOL	Press◄/► button to set maximum volume user can adjust.

	Level	
6	Button Lock	Press◄/► button to lock or unlock panel buttons.
7	Remote Lock	Press◄/► button to lock or unlock remote control. When on, only hotel mode is available (MENU+7906).
8	Auto Power On	Press◄/► button to set power on status. Last is power on memorized, Off is power on standby, On is power on always.
9	RS232	Press◄/► button to switch RS232 on or off. When RS232 switched to on, TV system need to reboot and Uart BUS in factory menu should be switched to On. For command 'Power ON' which is only available when monitor
10	LOGO	Press◄/► button to switch LOGO on or off.
11	BL A OUT	Press◄/► button to switch BLA OUT on or off.
12	Speaker out	Press◄/► button to switch Speaker out on or off.
13	Ear Out Audio	Press◄/► button to to select the FIX or VAR model.
14	Ten Key/CH Key	Press◄/► button to Ten Key/CH Key on or off.
15	Input Select Mode	Press OK to enter Input Select Mode. User can turn on or turn off input source in input menu.

6 Troubleshooting Guide

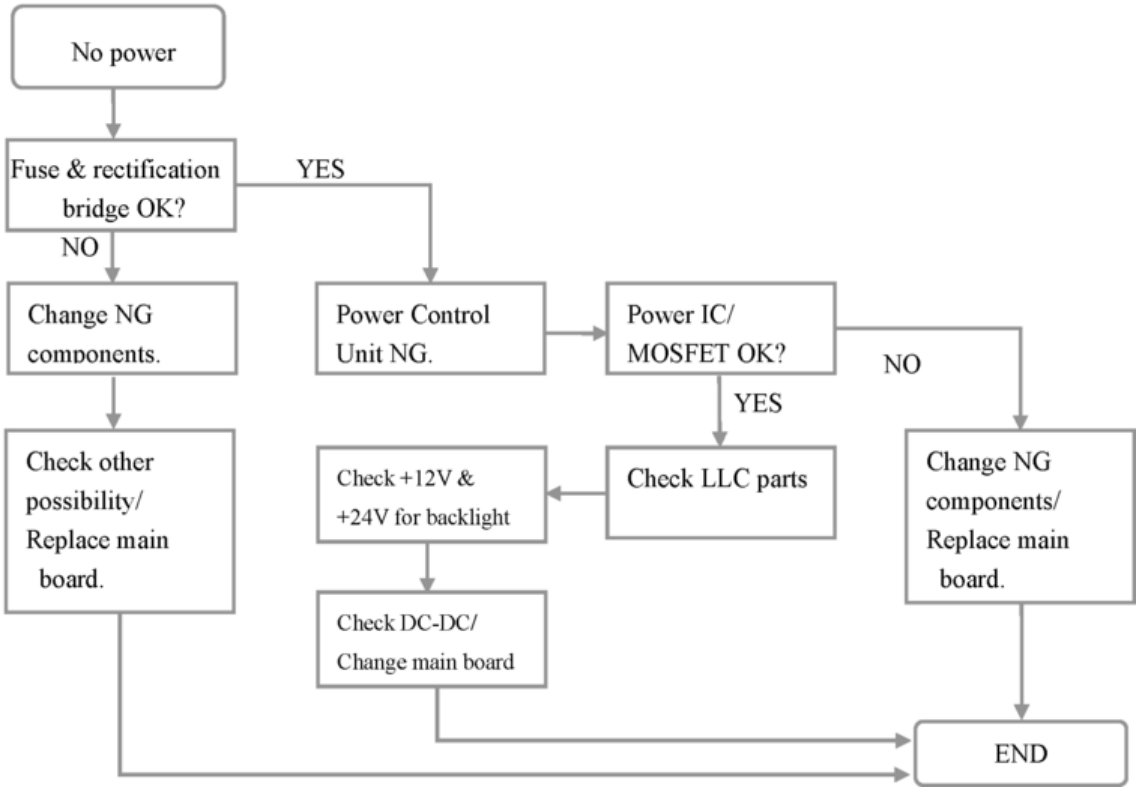
These flow charts may not match every single defeat TV set, but they can give you useful advices when you meet the same defeats described on the titles below.

Terms:

- IR: Infrared Receiver
- RC: Remote Control
- IR logic: IR blink with RC action
- LVDS: Low Voltage Differential Signal, output from processor and input for panel
- O/C: Open Cell, panel with source board
- BL: Back Light,light source for panel module g,g f p
- LB: LED (Light Emitting Diode) Bar, light source for BL module
- VBL: Voltage for Back Light (before Boost)
- VLED: Voltage for LED (after Boost)
- OVP: Over Voltage Protection
- OSD: On Screen Display
- AMP: Amplifier

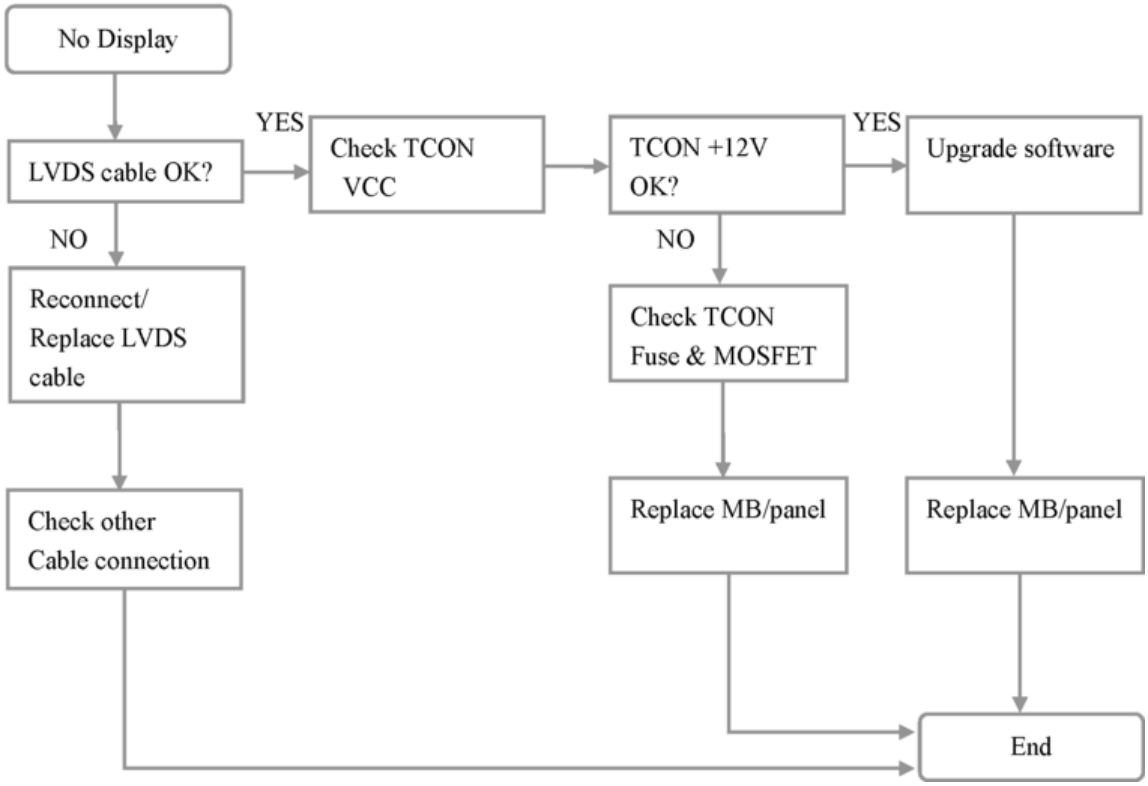
6.1 No Power.

No power LED, RC or Key can not turn on TV. Power LED no light/no change.



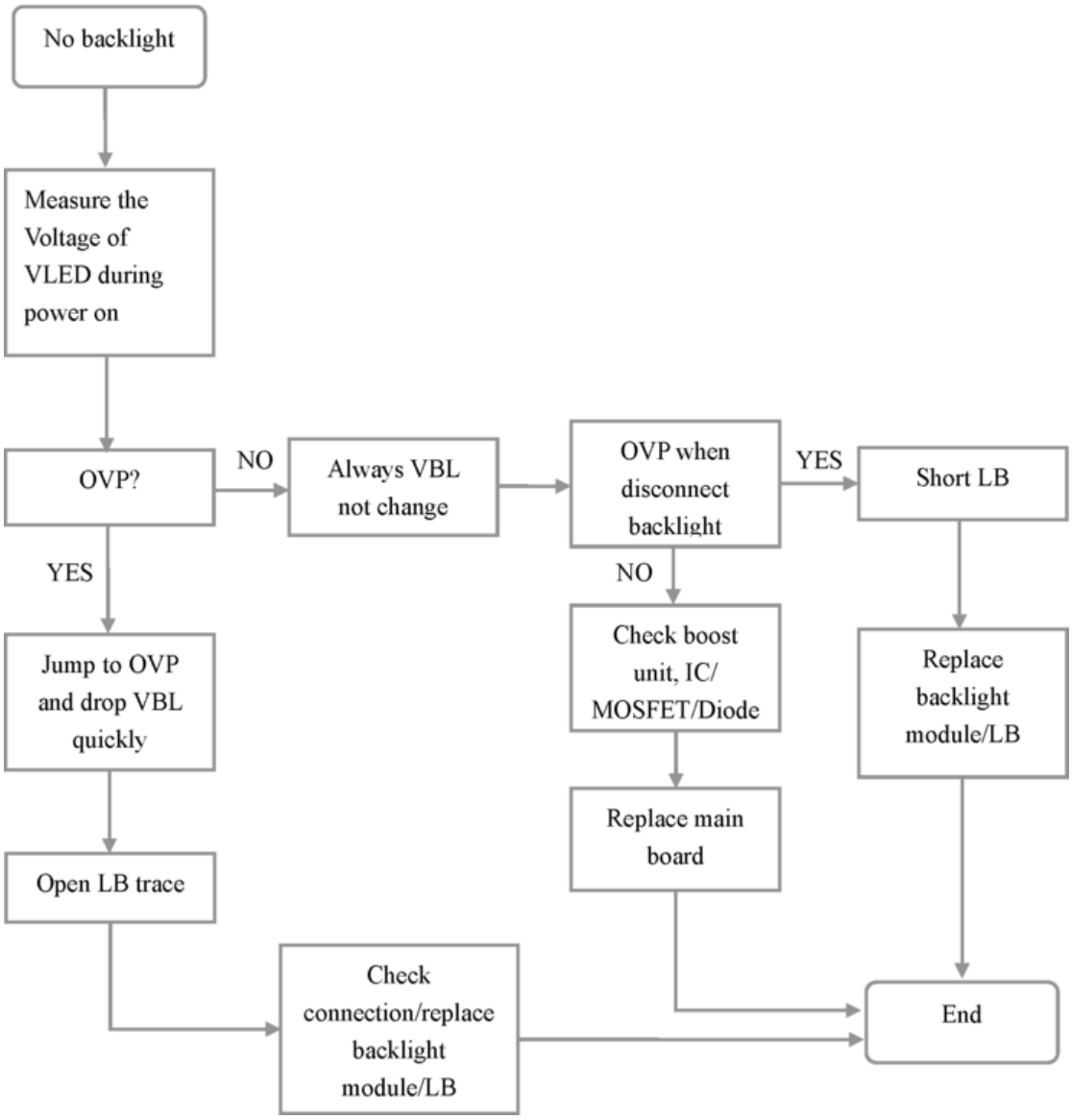
6.2 No Display / Black Panel.

Back light is OK, sound is OK, but no picture.



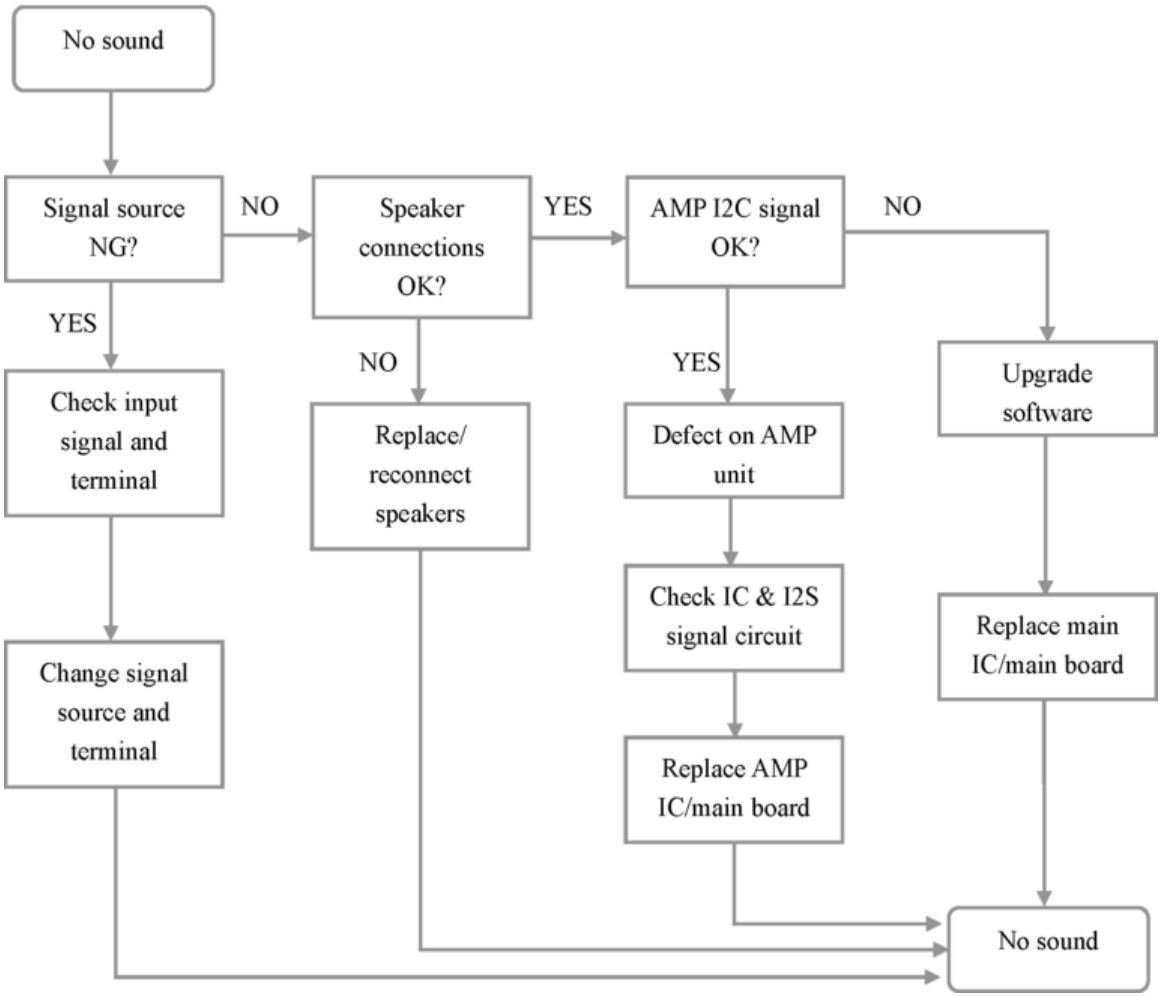
6.3 No Back Light.

Power LED logic OK, sound OK, but no picture(Different from No Display). Power LED logic OK, sound OK, but no picture (Different from No Display).



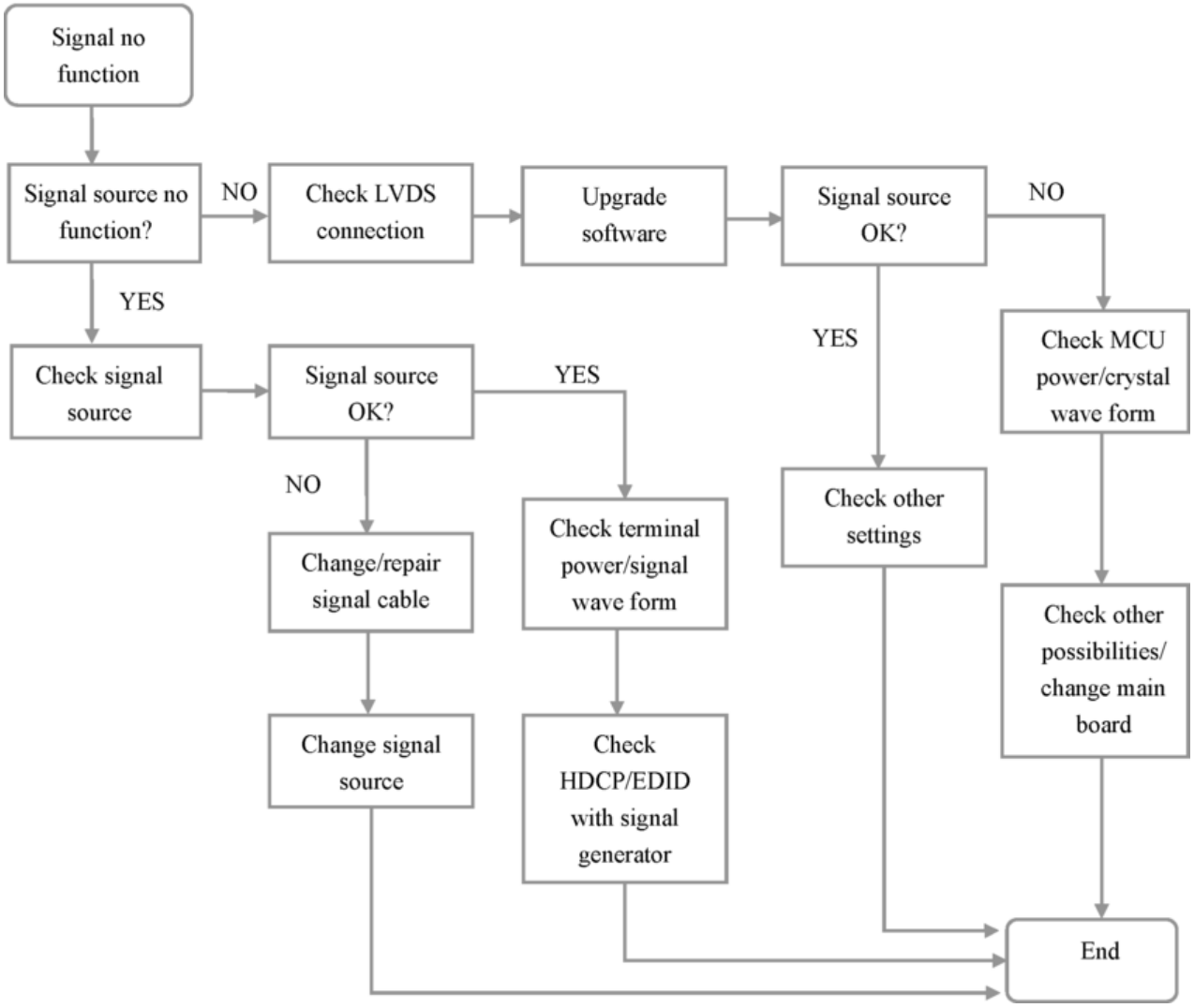
6.4 No Sound.

One or all signal source without sound.



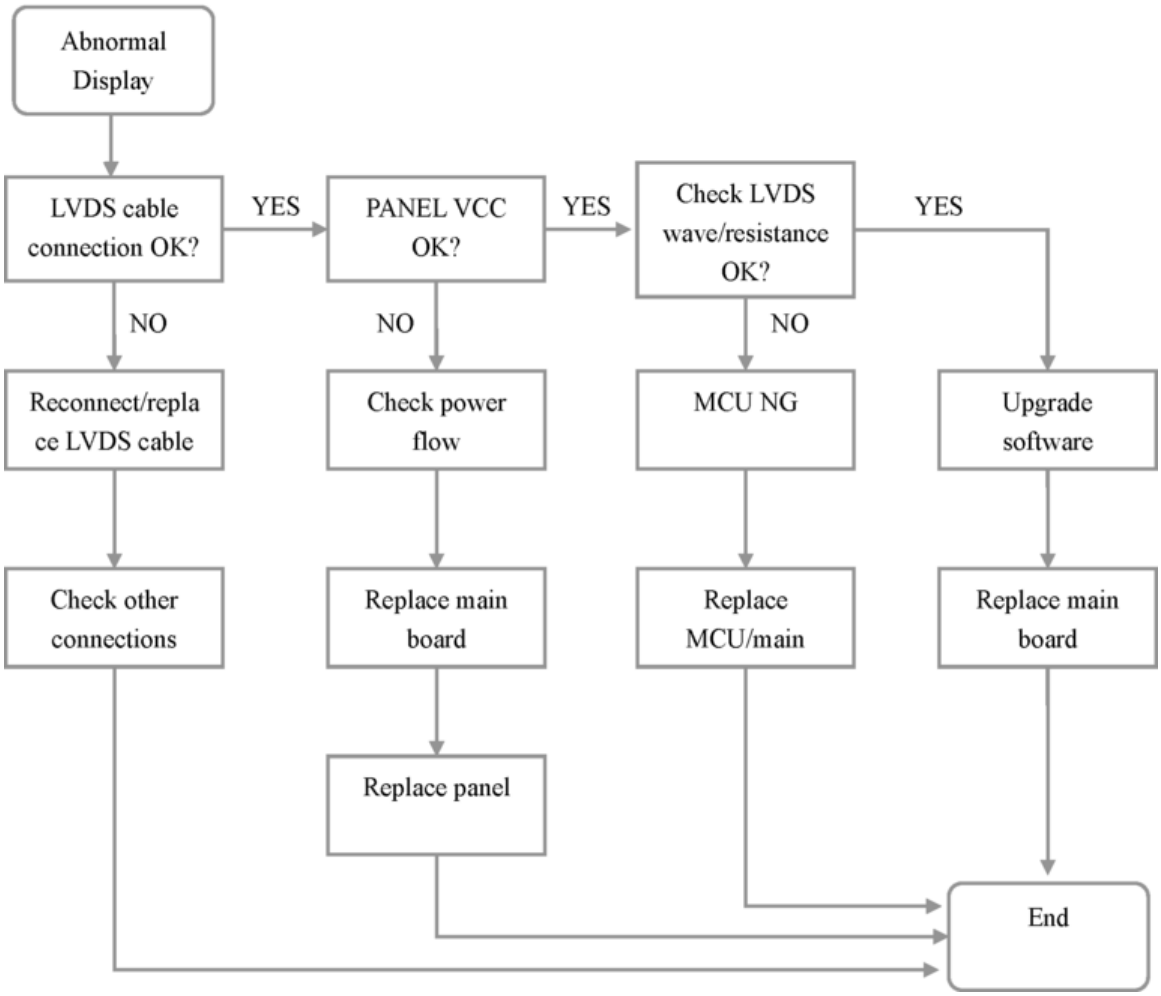
6.5 Signal source no function

One or several source no function.



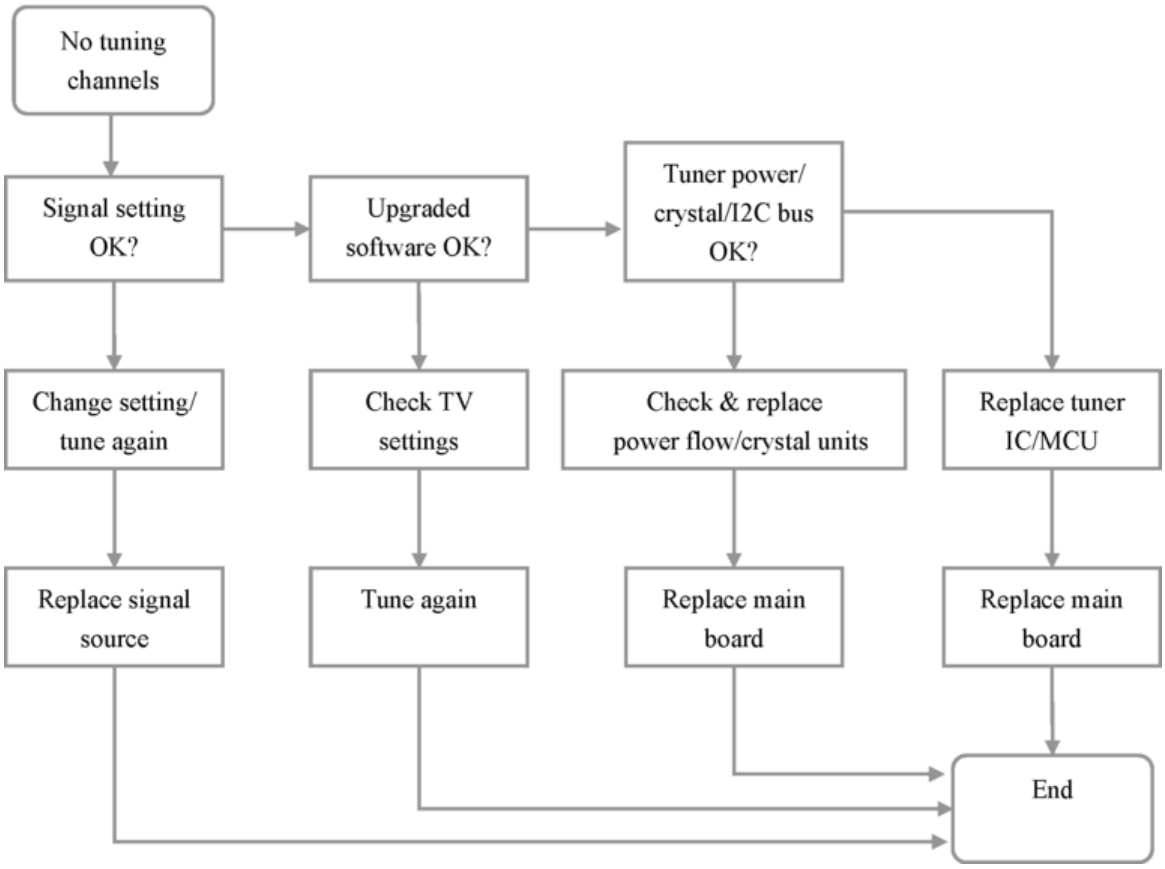
6.6 Abnormal Display

OSD NG or picture NG.



6.7 No Tuning Channels

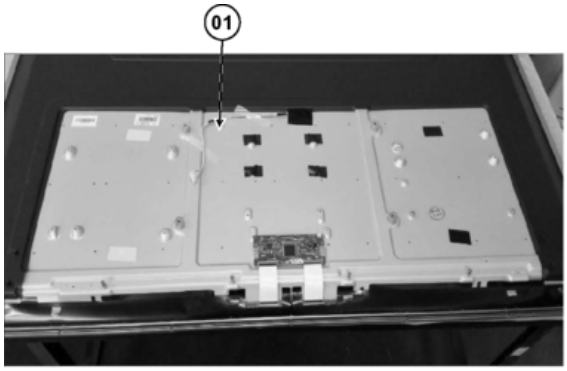
DTV or ATV no Channels.

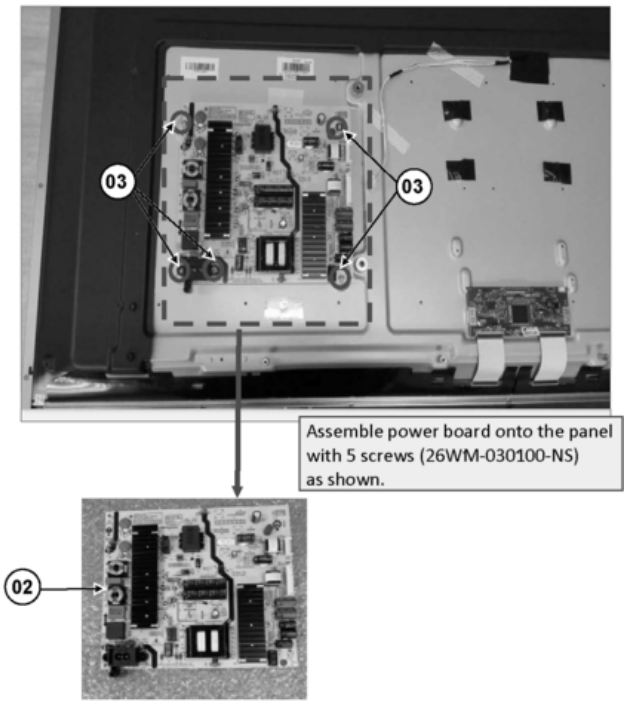


7 Disassembly and Assembly Instructions

7.1 Power Board Assembly

1. Fix Screw to the Panel.
2. Fix Power Board and then screw it.

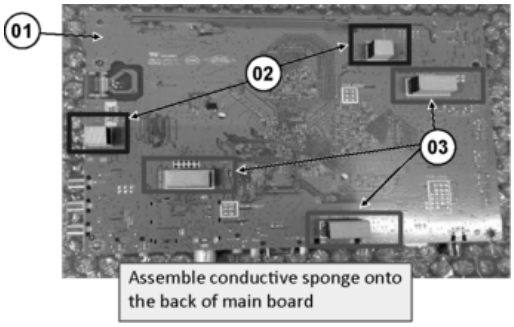


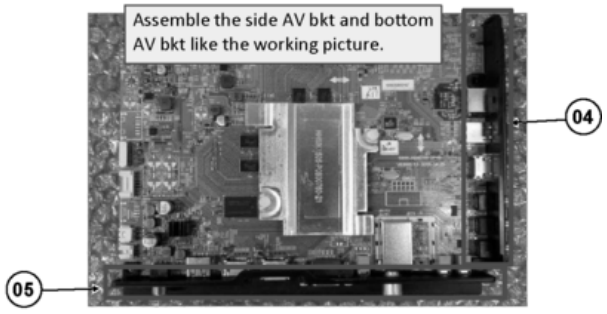


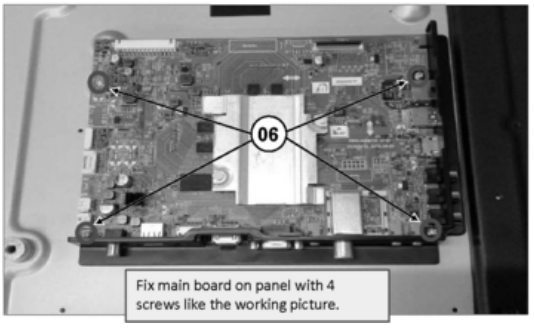
No	Decription	Qty	Remark
01	55" SKY-RGB LCD MNG001 W/Panasonic RDL55	1	
02	(HI) POWER ASS'Y 168P	1	
03	WM 3 X 10 WITH PLAIN	5	6±1 kgf.cm

7.2 Main Board Assembly

1. Stick Conductive Sponge at the Main Board back side following the spec.
2. Insert BTM & SIDE AV Bracket.
3. Fix the board to the panel, and then screw.



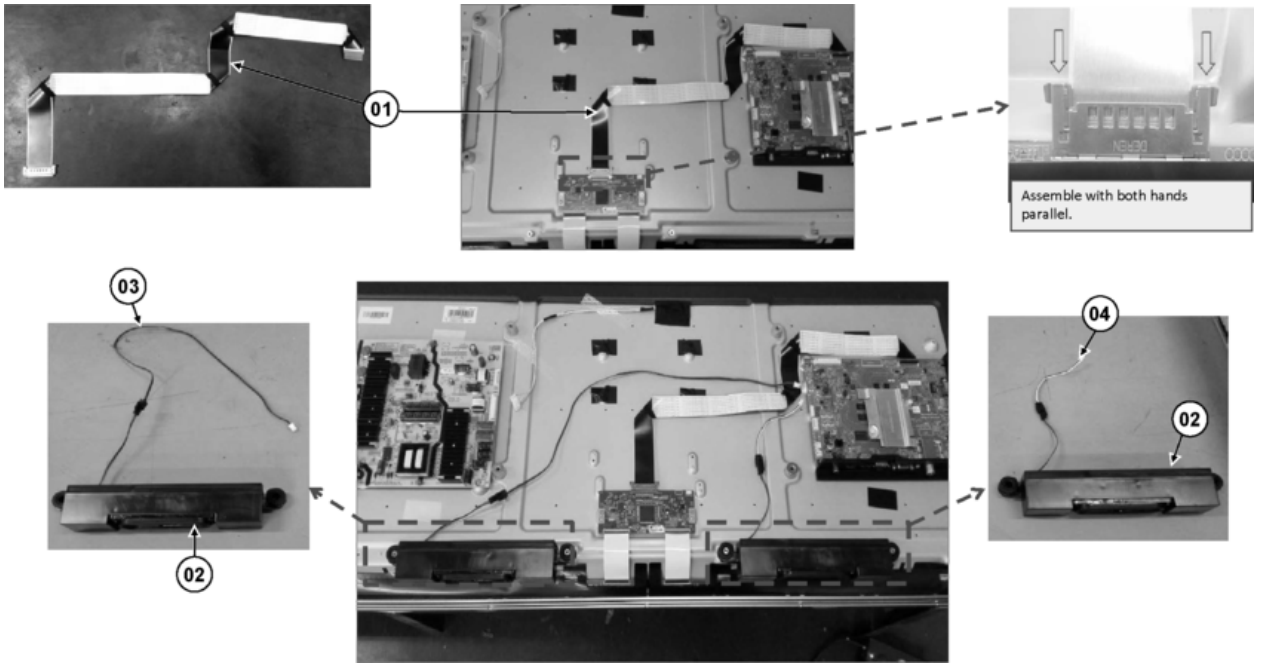




No	Decription	Qty	Remark
01	(HI)MAIN BOARD ASSEMBLE	1	
02	CONDUCTIVE SPONGE	2	
03	CONDUCTIVE SPONGE	3	
04	SIDE AV BKT HIPS	1	
05	BTM AV BKT HIPS	1	
06	SCREW 3 X 10 WITH PLAIN	4	6±1 kgf.cm

7.3 LVDS and Speaker Assy

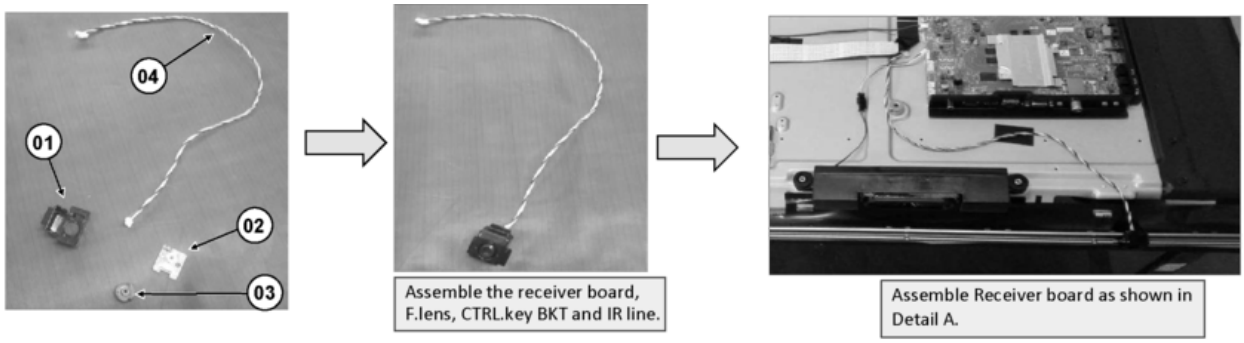
1. Plug LVDS line.
2. Assemble the speaker the fix to position.
3. Fix wire to the board.

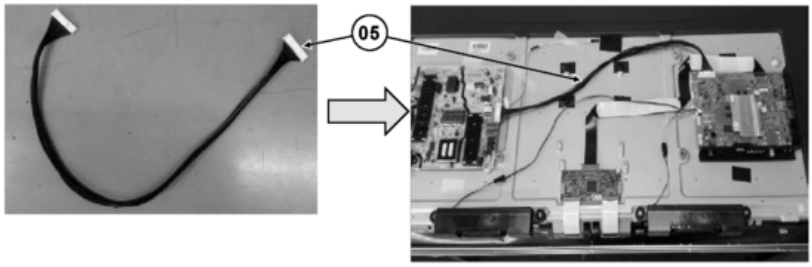


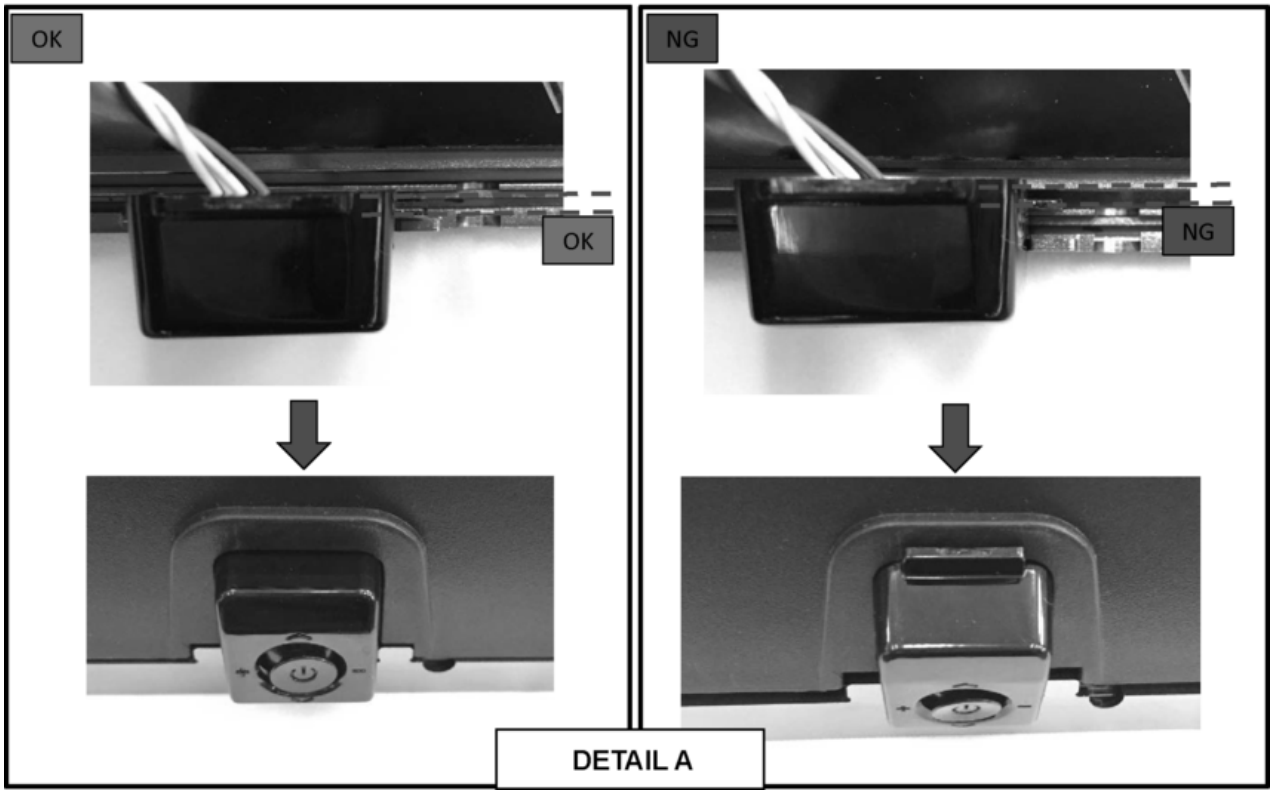
No	Decription	Qty	Remark
01	FFC 51 PINS P=0.5MM	1	
02	SPEAKER BOX	2	
03	HOUSING 02 (2.0 W/BUCKLE)+ HOUSING 02	1	
04	HOUSING 02 (2.5 W/BUCKLE)+ HOUSING 02	1	

7.4 WiFi and Key Button Assembly

1. Assemble the Key Button accordingly.



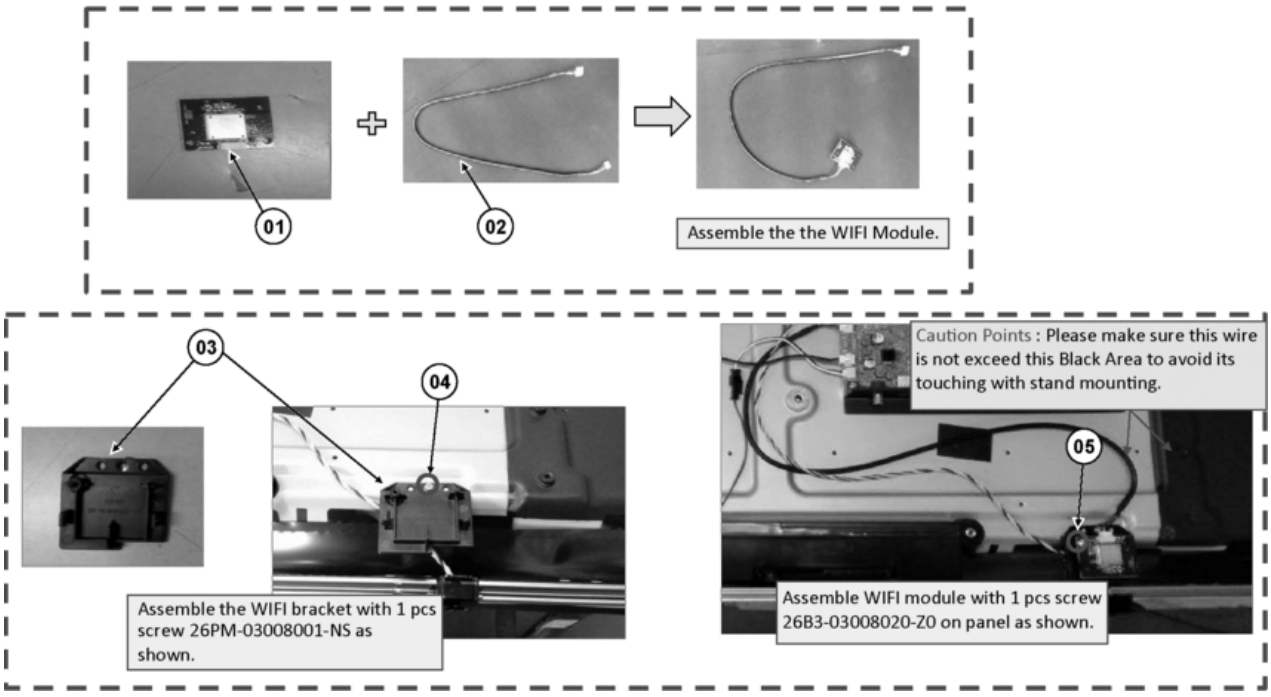




No	Decription	Qty	Remark
01	F.LENS PC TRANSPARENT	1	
02	6M20T-55E560(HI)RECEIVER BOARD ASSEMBLY	1	
03	CTRL.KEY BKT ABS HNB003	1	
04	HOUSING 05 (1.25)	1	
05	HOUSING 14 (2.5)	1	

7.5 WiFi Assy

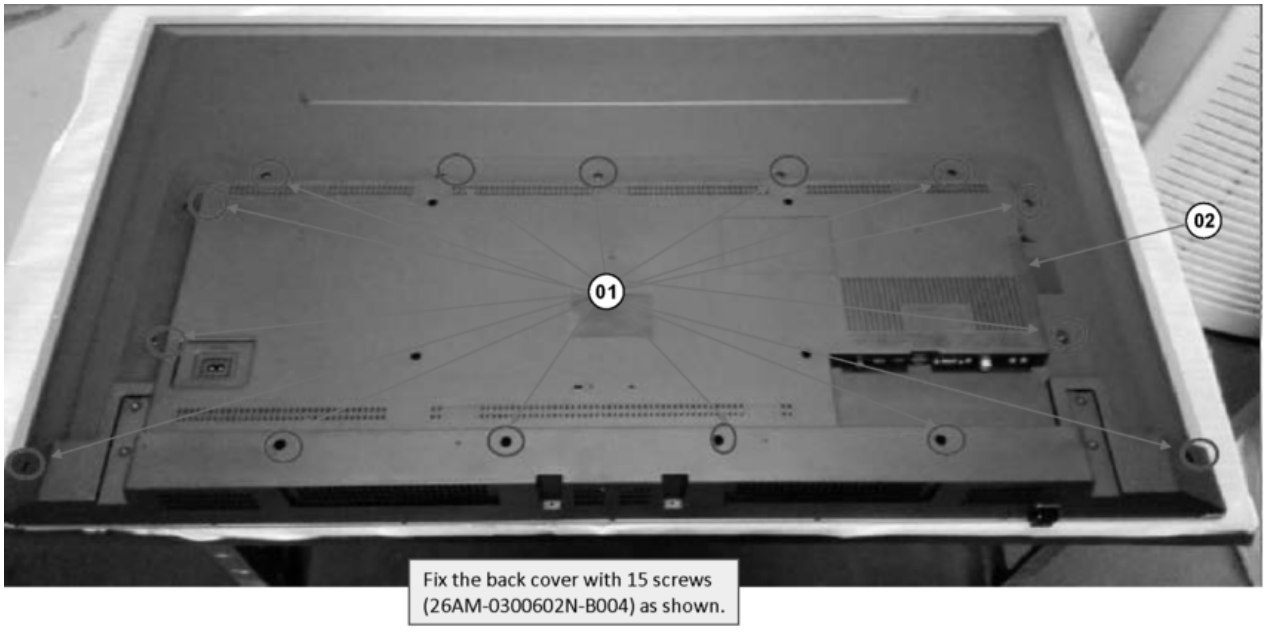
1. Assemble the wifi and fix to position.
2. Fix wire to the board.



No	Decription	Qty	Remark
01	INSIDE WIFI MODULE	1	
02	HOUSING 06 (1.25)	1	
03	WIFI BRACKET	1	
04	SCREW PM 3 x 8 WITH PLAIN WASHER	1	3±2 kgf.cm
05	SCREW B3 3 x 8 ZINC	1	

7.6 Back Cover Installation

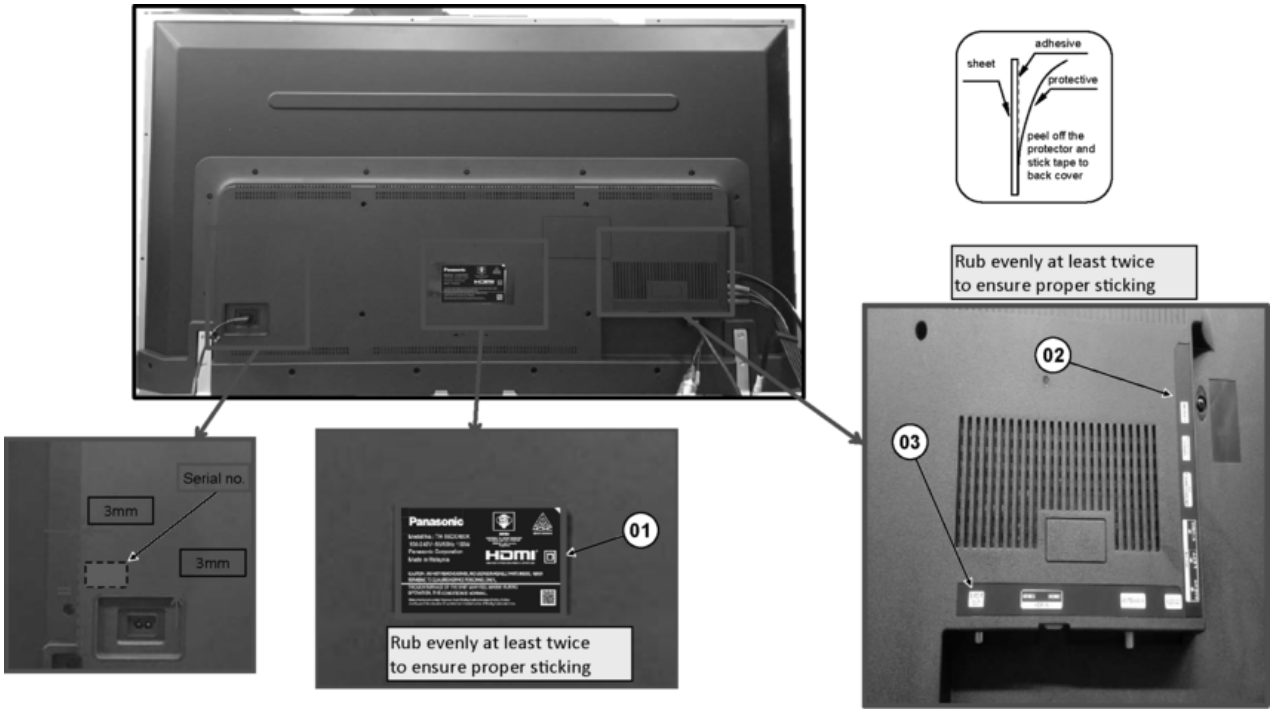
1. Screw the Back Cover following the torque.



No	Decription	Qty	Remark
01	SCREW AM3 x 6 NYLOK BLACK	15	6±1 kgf.cm
02	B.CAB HIPS(94-V0)	1	

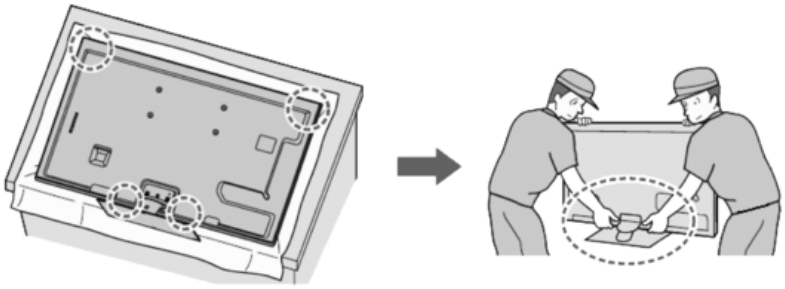
7.7 Label Sticking

1. Stick Model Name Plate, Side AV and Bottom AV Sheet.



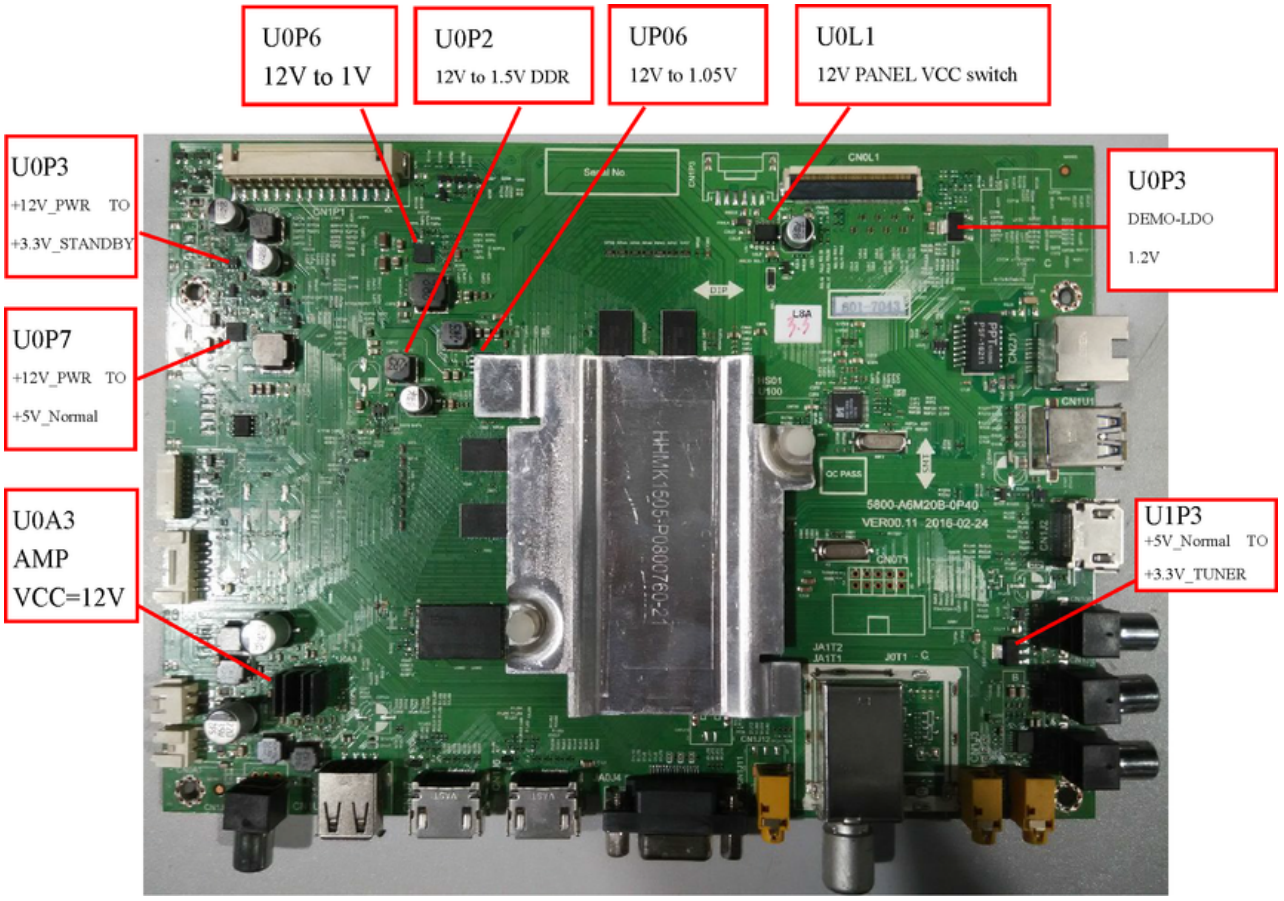
No	Decription	Qty	Remark
01	BACK COVER LABEL	1	
02	INLAY-SIDE AV	1	
03	INLAY-BTM AV	1	

7.8 Handling SPEC

Moving the LCD module
The module should be handle by two people and hold on that top and bottom long side by both hands without module warping. Never handle the module with keeping horizontal position when moving the module
About the work table
When tightening a screw, retention structures are required not to deform the LCD module.
Moving the TV (Case with a stand)
Hold the specified parts as shown to stand the TV up and move it with two people.


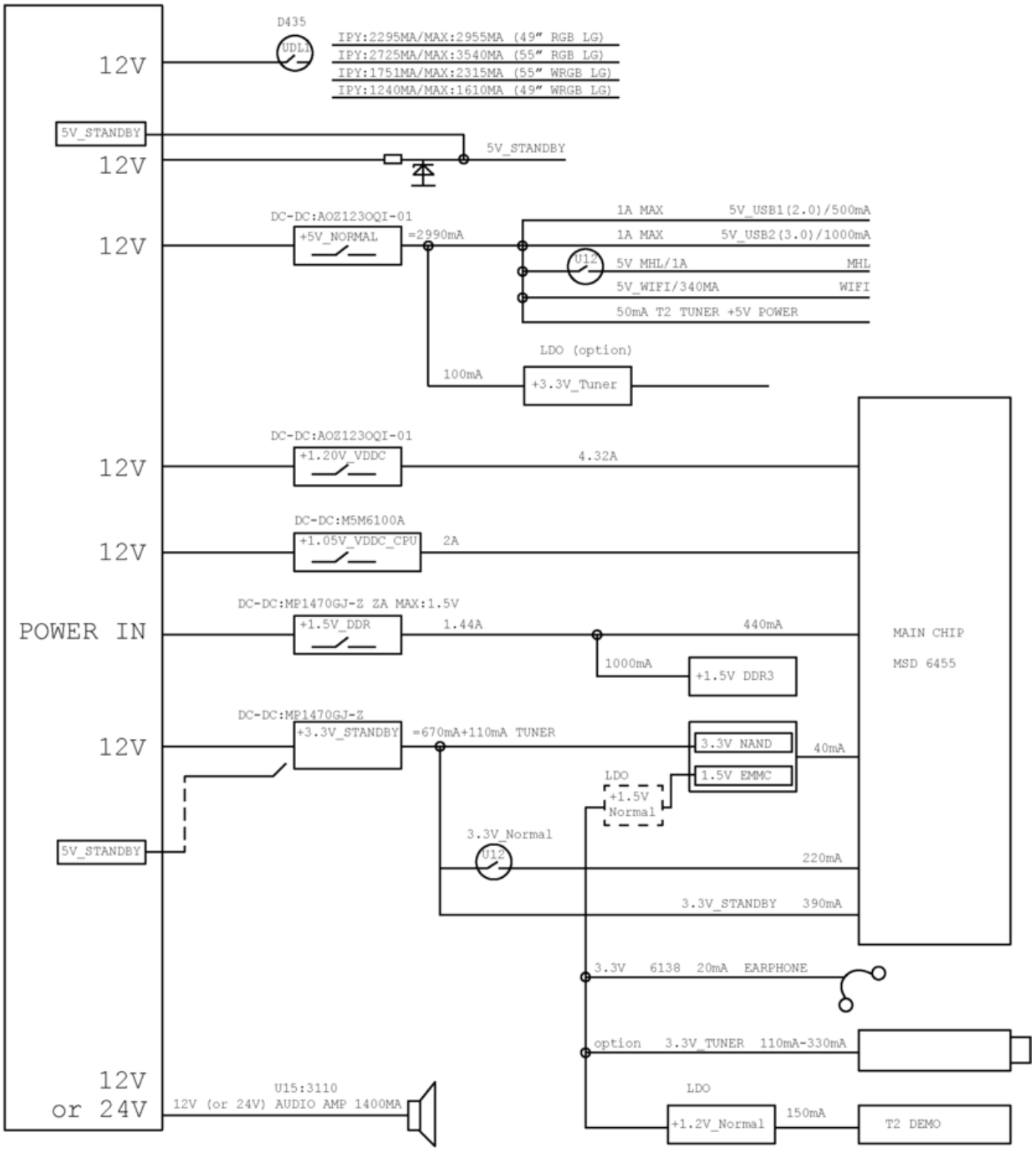
8 Measurements and Adjustments

8.1 Key Check Points



8.2 Power Flow Diagram

Power Tree



MSD6488 SMART TV POWER TREE

Integrated PCB Layout

Integrated LED PANEL

Integrated POWER SUPPLY

TAS5707
IIS Audio Amp

WIFI
MODULE

Integrated Keypad & IR Receiver

NAND FLASH

DDR3x4

EEPROM

MSD6488EVS-8-W2G

4Kx2K 60Hz ENGINE

ISDB-T DECODER

HEVC(H.265) DECODER

ARM ADVANCED MULTI-CORE CPU

ARM ADVANCED MULTI-CORE GPU

Ethernet

USB1

HDMI1

Y / Video

Pb

Pr

Side Terminal

Rear Terminal

SPDIF OUT

USB2

HDMI3

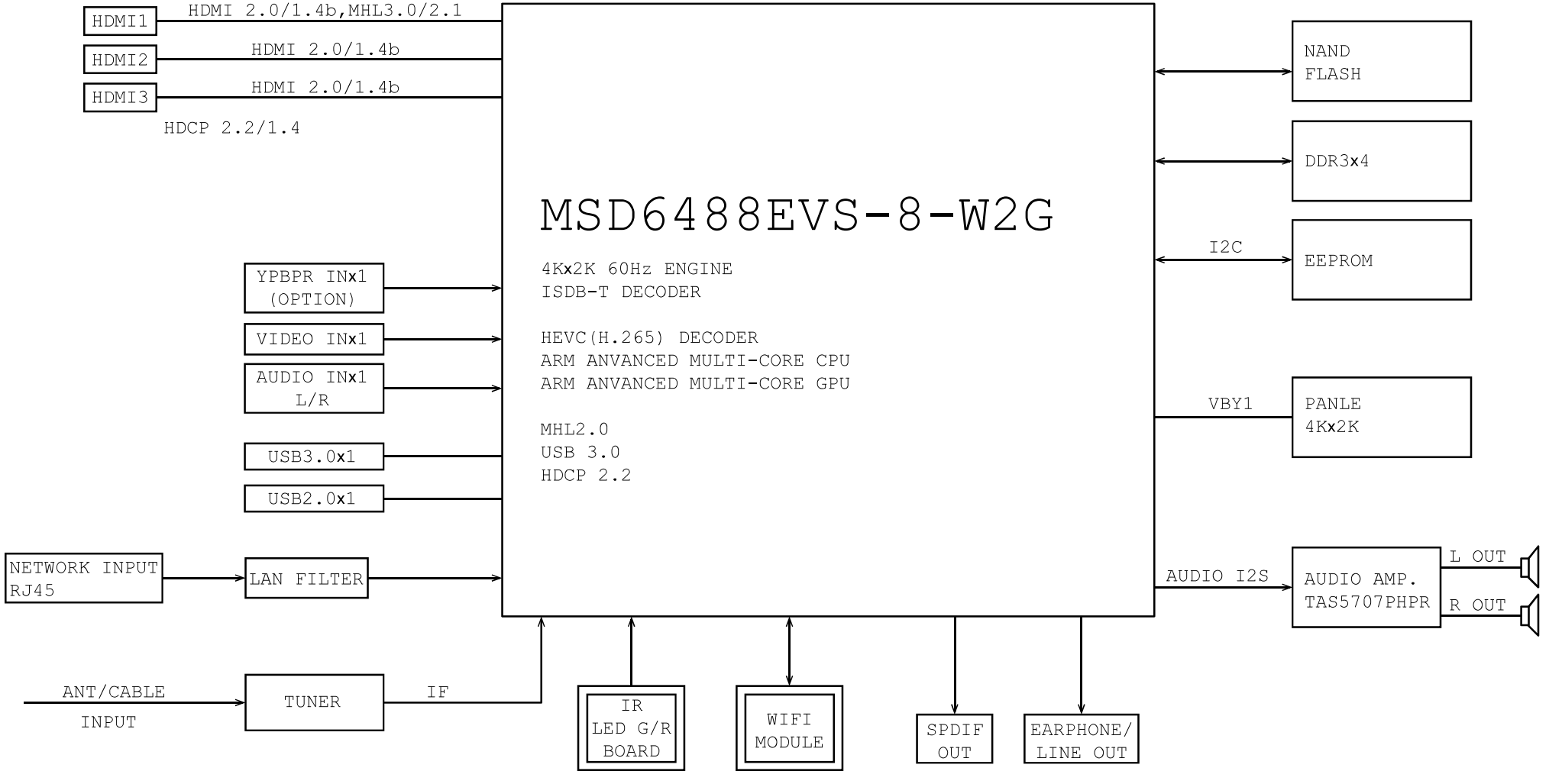
HDMI2 ARC

PC

PC audio in

Antenna IN

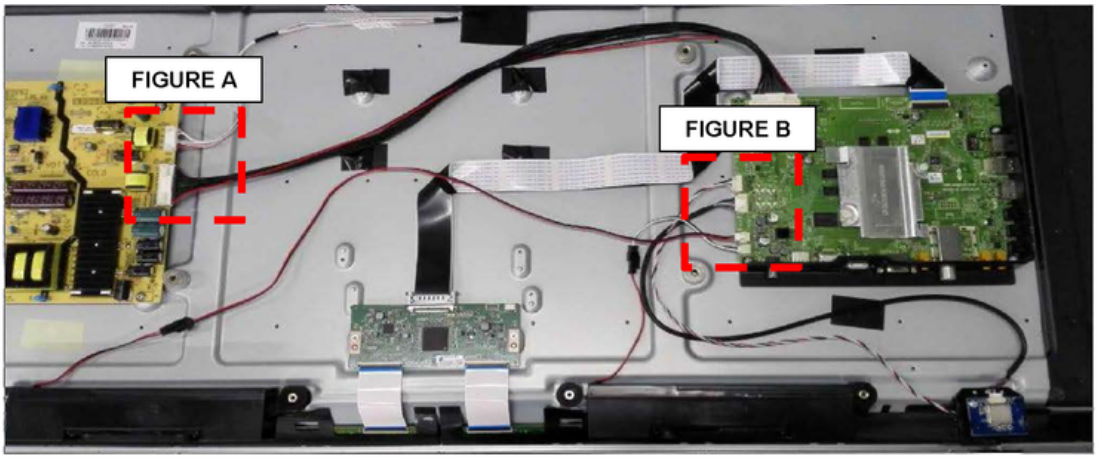
YPbPr Component

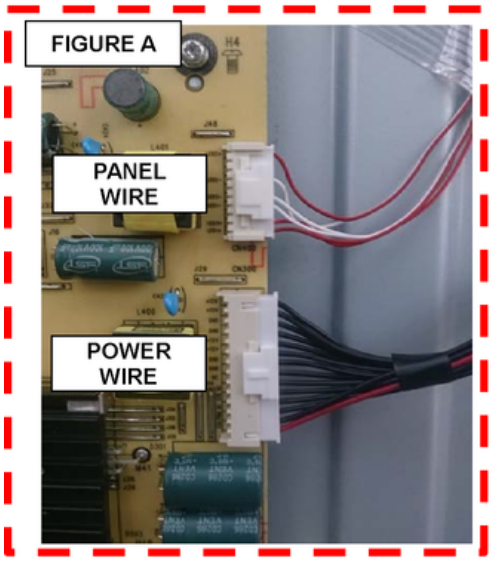

HDMI1
HDMI 2.0/1.4b,MHL3.0/2.1
HDMI2
HDMI 2.0/1.4b
HDMI3
HDMI 2.0/1.4b
HDCP 2.2/1.4
MSD6488EVS-8-W2G
4Kx2K 60Hz ENGINE
ISDB-T DECODER
HEVC(H.265) DECODER
ARM ANVANCED MULTI-CORE CPU
ARM ANVANCED MULTI-CORE GPU
MHL2.0
USB 3.0
HDCP 2.2
NAND FLASH
DDR3x4
I2C
EEPROM
VBY1
PANLE 4Kx2K
AUDIO I2S
AUDIO AMP. TAS5707PHPR
L OUT
R OUT
YPBPR INx1 (OPTION)
VIDEO INx1
AUDIO INx1 L/R
USB3.0x1
USB2.0x1
NETWORK INPUT RJ45
LAN FILTER
ANT/CABLE INPUT
TUNER
IF
IR LED G/R BOARD
WIFI MODULE
SPDIF OUT
EARPHONE/ LINE OUT

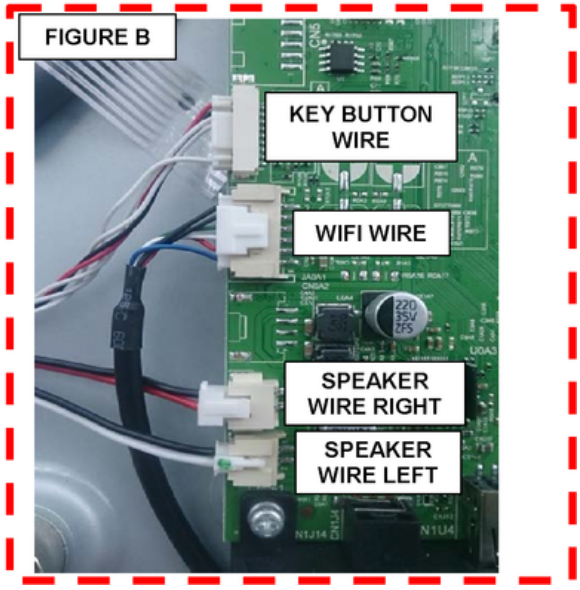
10 Wiring Connection Diagram

10.1 Wire Connection Terminal

- Assemble the wire into their connectors.

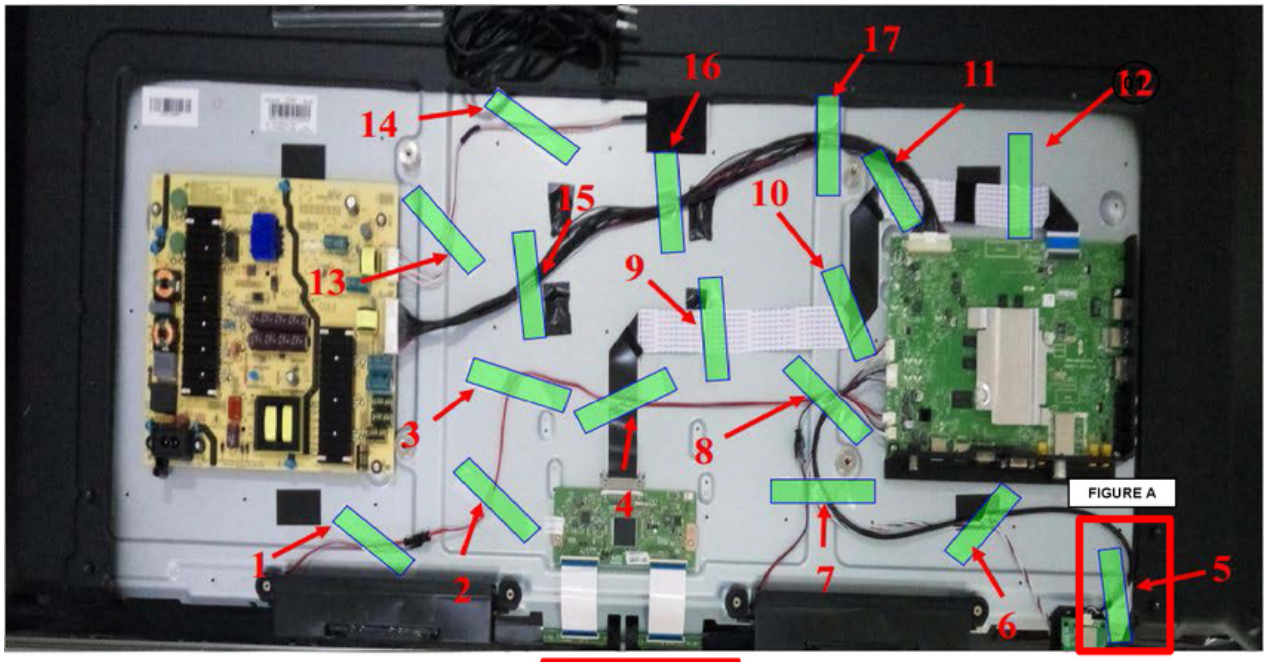




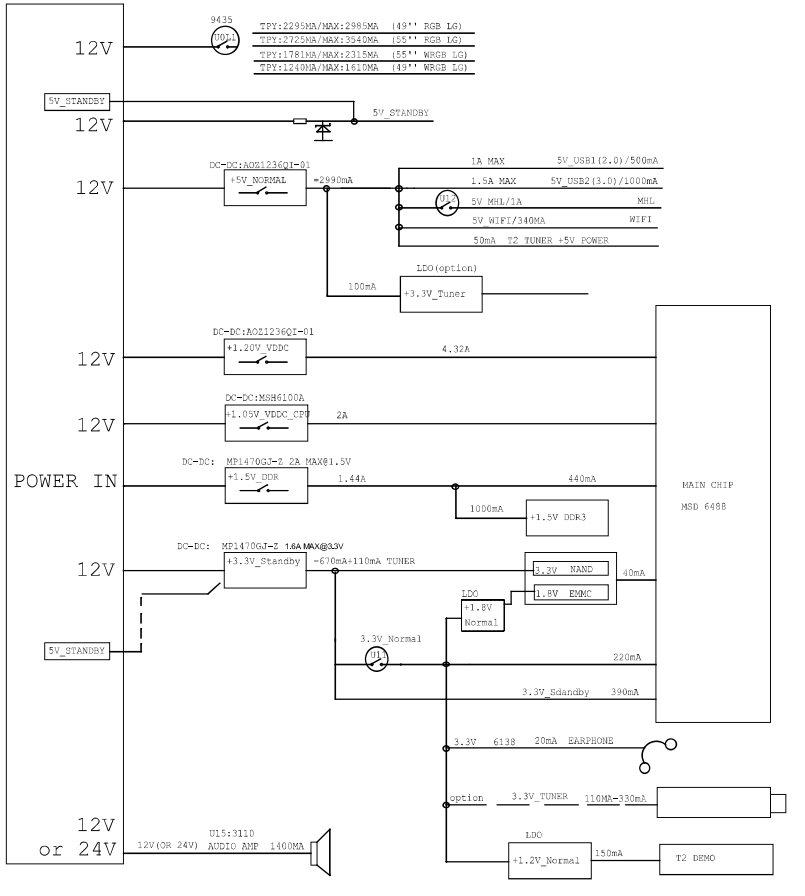


10.2 Wire Dressing

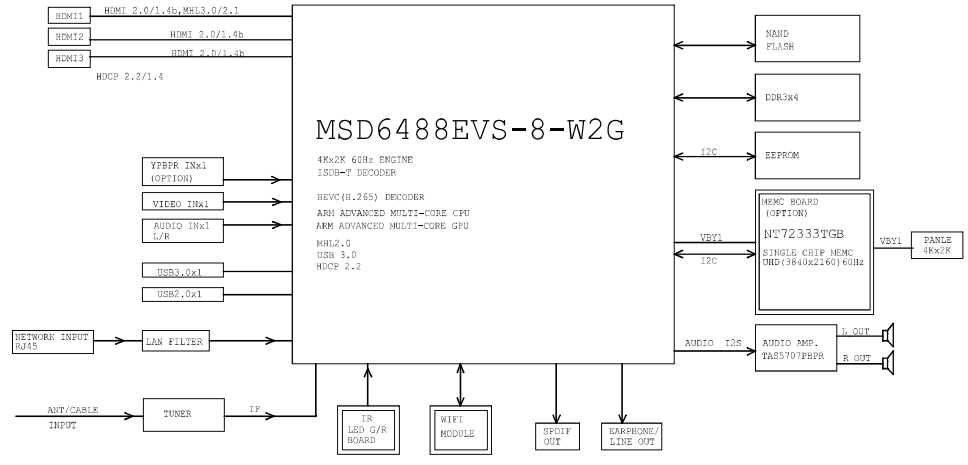
1. Stick the Tape following the specification.
2. Rub the tape twice.



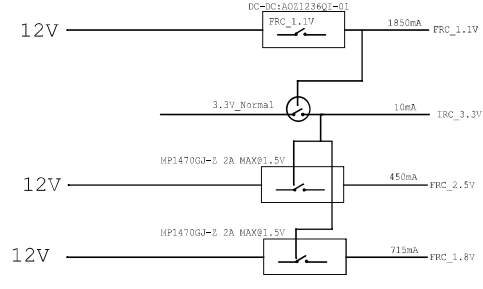
No	Decription	Qty	Remark
01	3M - FILAMENT TAPE	17	18 mm x 55 mm



MSD6488 SMART TV POWER TREE

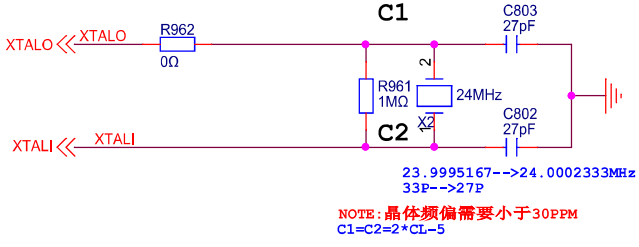


MSD6488 SMART TV MAIN BOARD

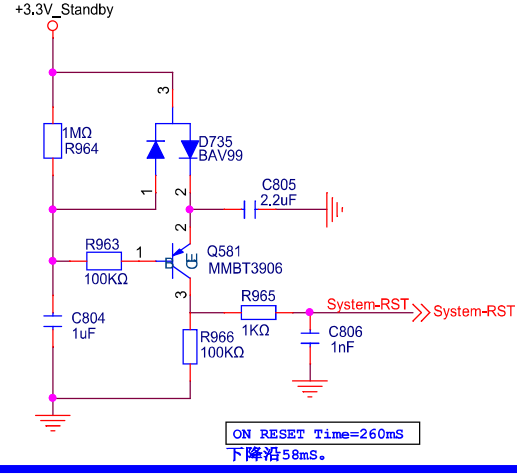


MEMC POWER

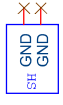
CRYSTAL



RESET

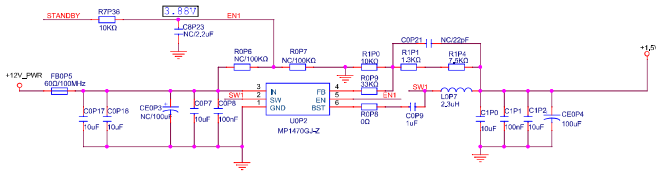


HEAT SINK

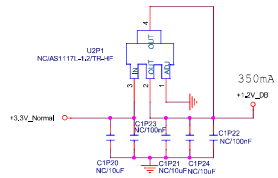


HS01

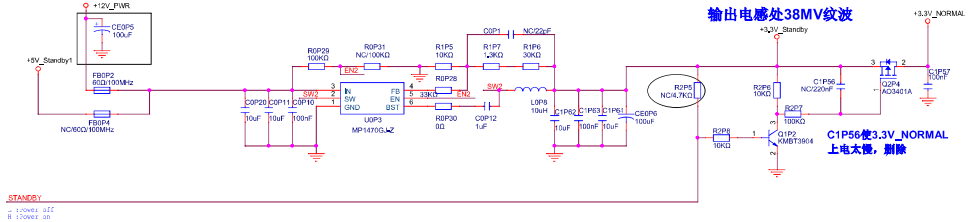
+12V_PWR TO +1.5V_DDR



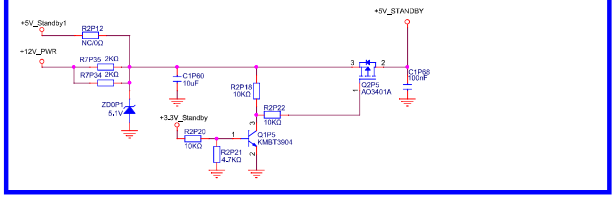
DEMO-LDO



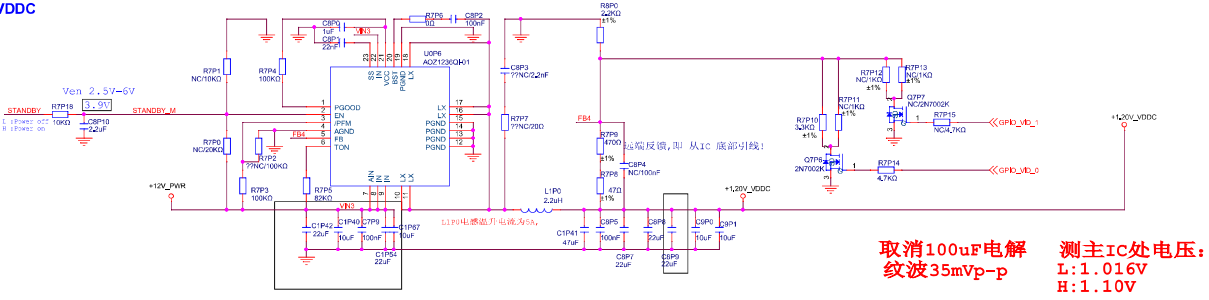
+12V_PWR TO +3.3V_STANDBY



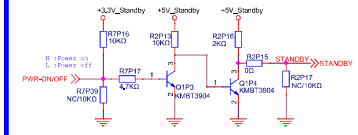
+12V_PWR TO +5V_STANDBY



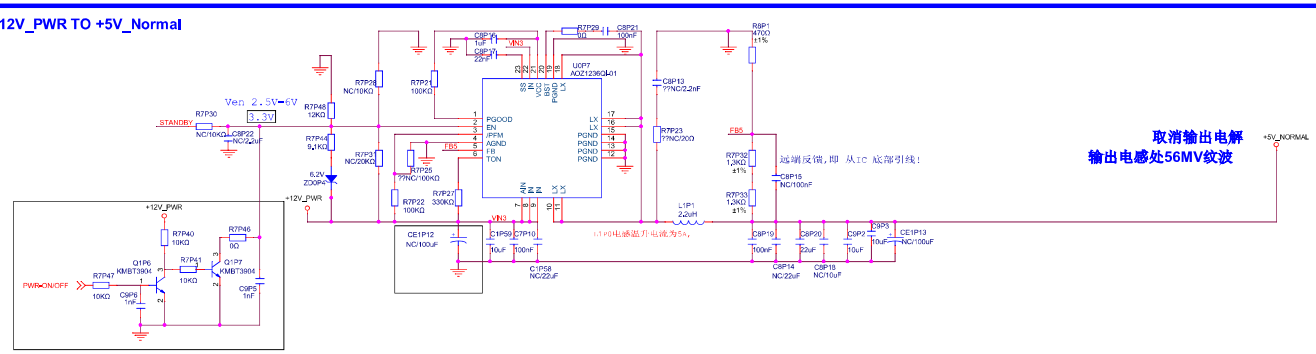
+12V_PWR TO +1.20V_VDDC



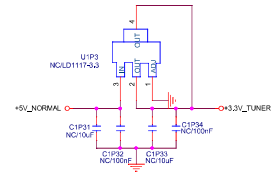
STANDBY CONTROL



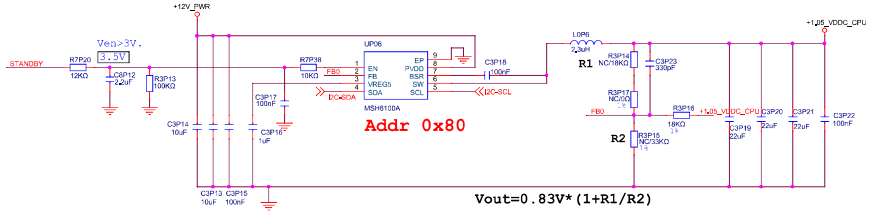
+12V_PWR TO +5V_Normal



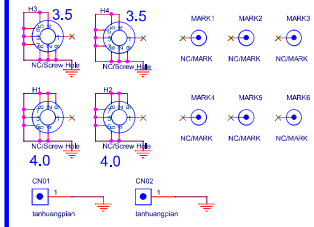
+5V_Normal TO +3.3V_TUNER



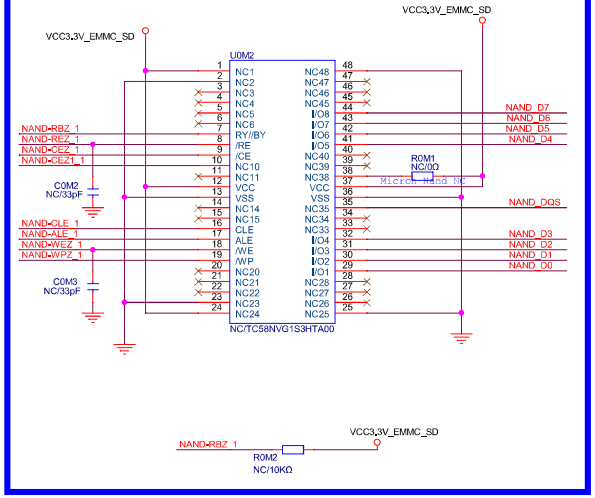
+12V_PWR TO +1.05_VDDC_CPU



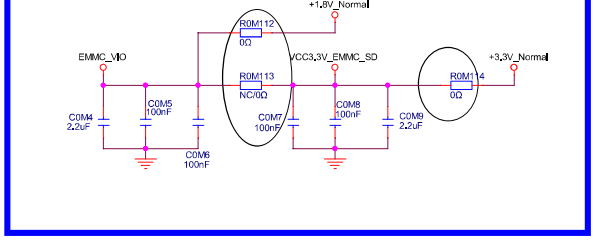
SCREW HOLE & MARK



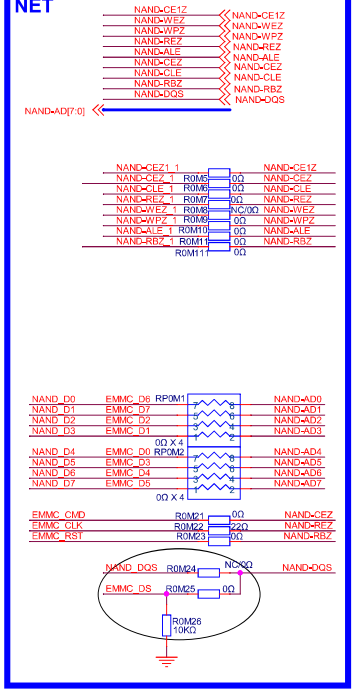
NAND FLASH



EMMC NEED +1.8V

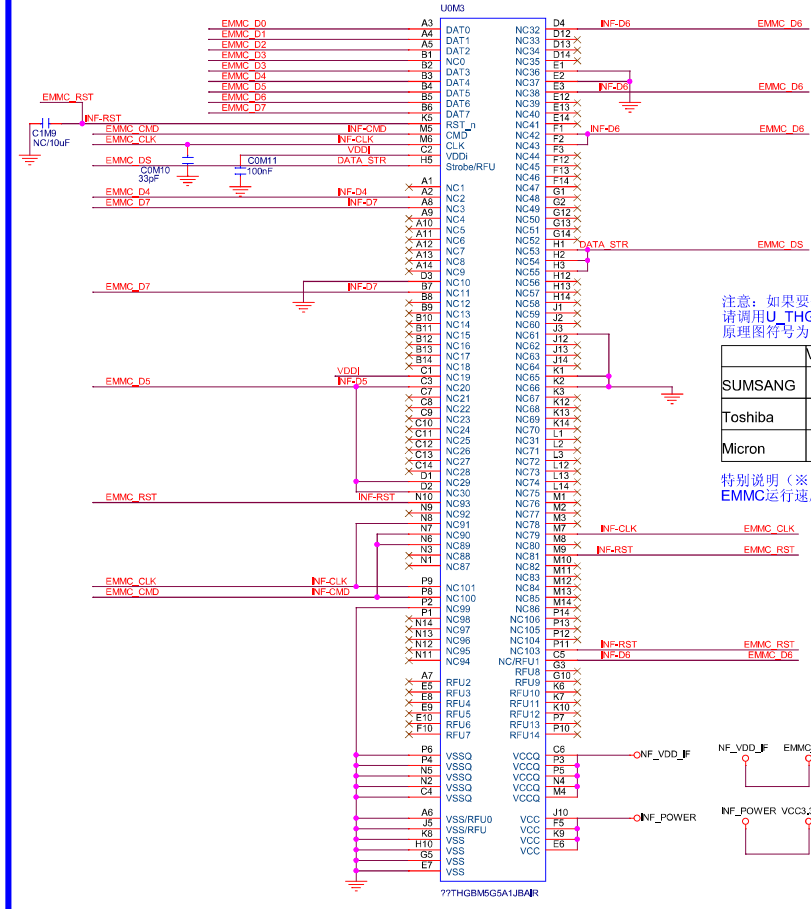


NET



	eMMC	SLC Nand
R0M25 R0M22 R0M112	0R	NC
R0M24 R0M8 R0M113	NC	0R
R0M26	10K	NC
R185	4.7K	NC
R960	NC	4.7K
R1739	NC	0R
R1740	0R	NC
R1741	NC	0R
C401/C137	NC/NC	10uF/100nF

eMMC

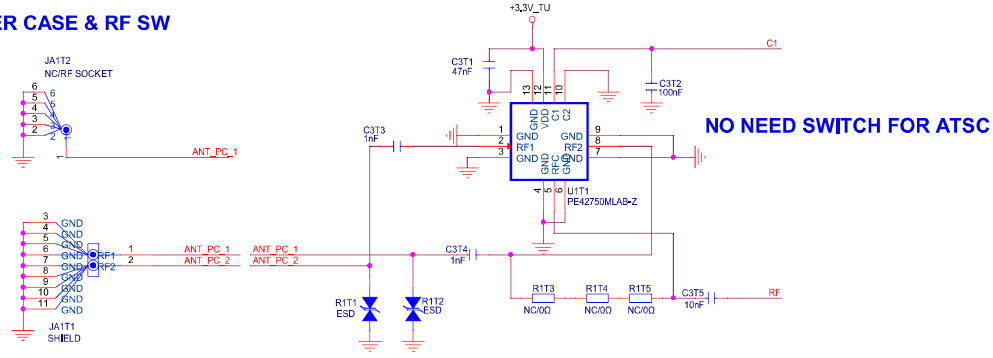


注意：如果要做4.51和5.0的兼容，EMMC的原理图符号请调用U_THGBM5G5A1JBAIR_01,如果不做兼容，原理图符号为U_THGBM5G5A1JBAIR

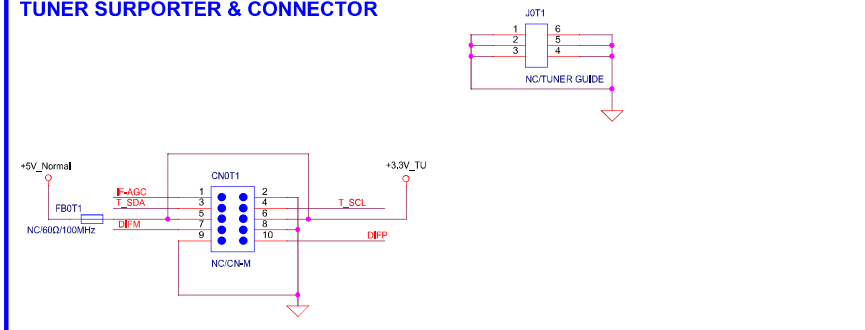
	Ver4.51	Ver 5.0
SUMSANG	√	√
Toshiba	√	※
Micron	√	√

特别说明（※）：东芝的5.0在EMMC运行速度高于200M无法兼容

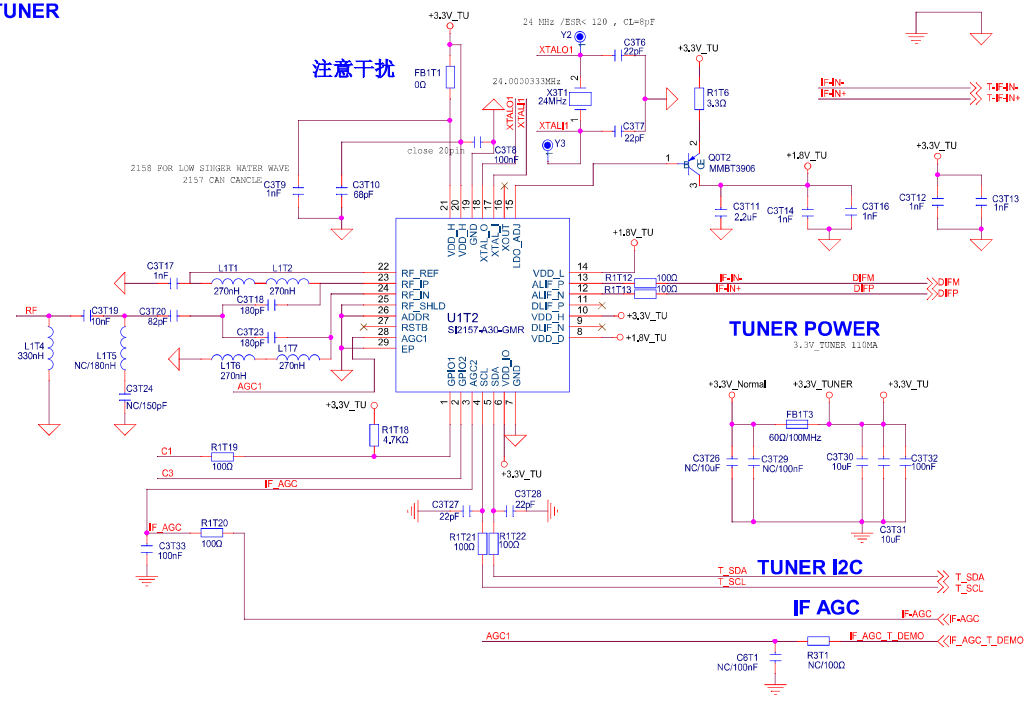
TUNER CASE & RF SW



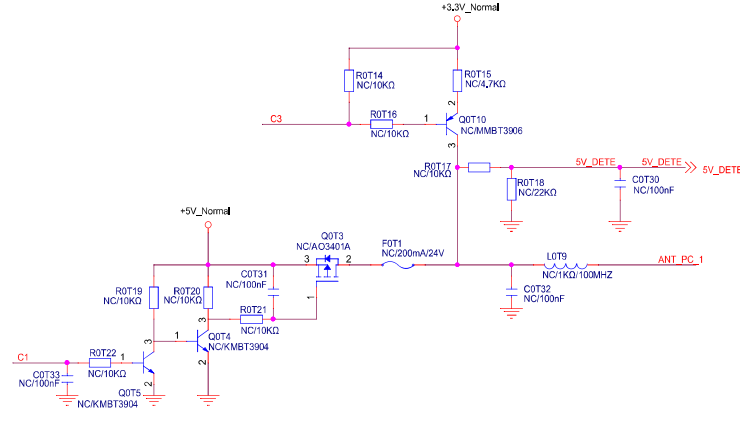
TUNER SURPORTER & CONNECTOR



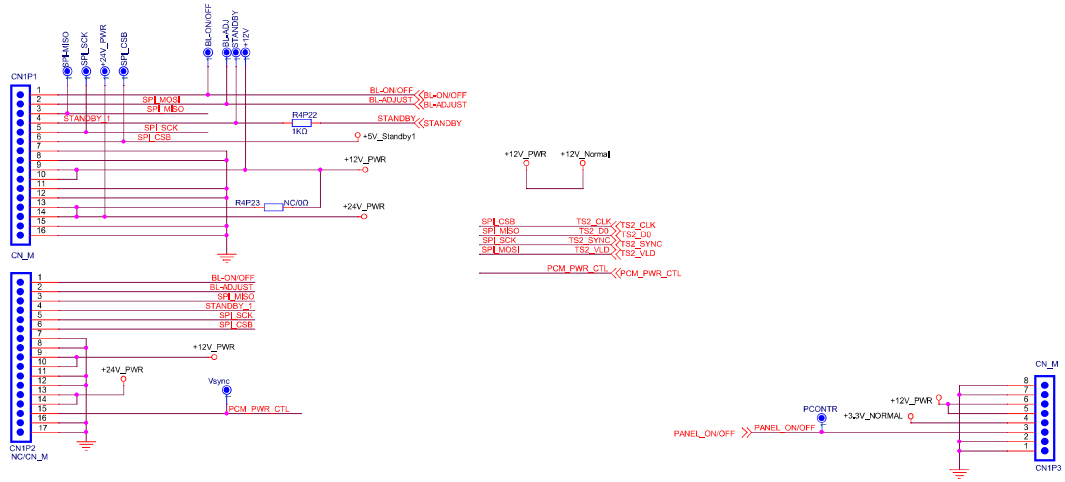
TUNER



DVB_T2 POWER CONTROL

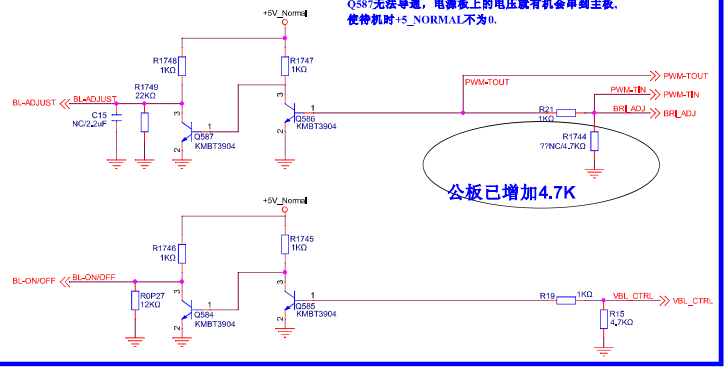


+12V_PWR SUPPLY

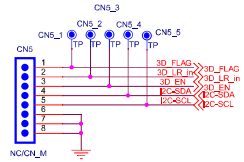


INVERTER CONTROL

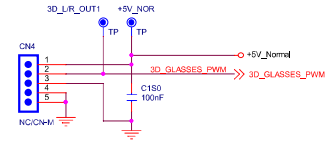
采用+5V_NORMAL供电时，待机状态下无此电压，+5_NORMAL上，Q587无法导通，电源板上的电压就有机会串到主板，使待机时+5_NORMAL不为0.



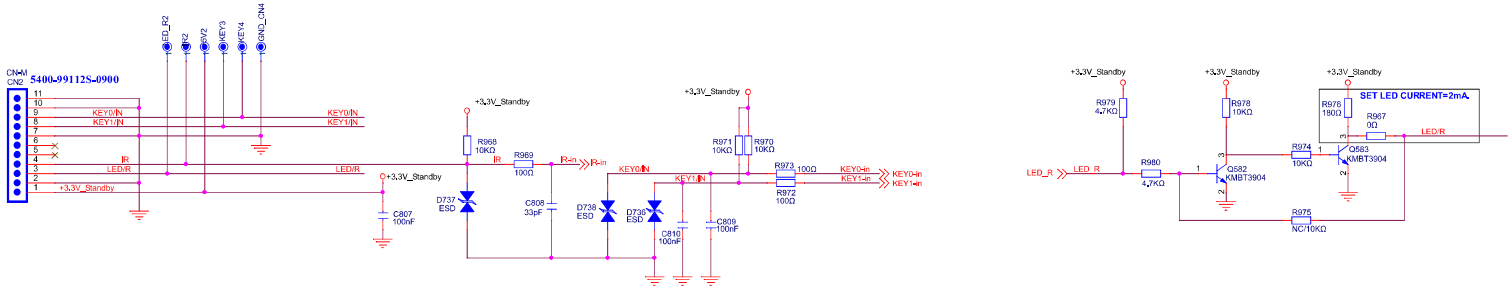
3D INTERFACE



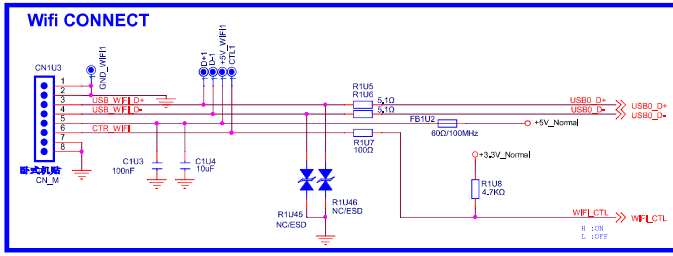
3D GLASS LAUNCH

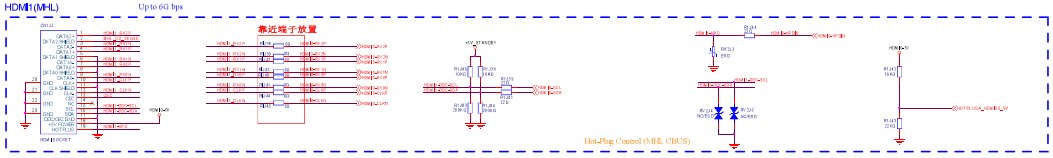


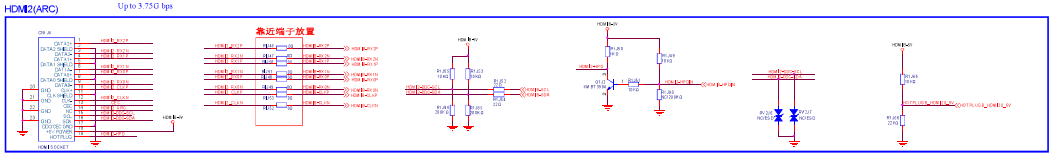
IR&KEY CONNECTOR

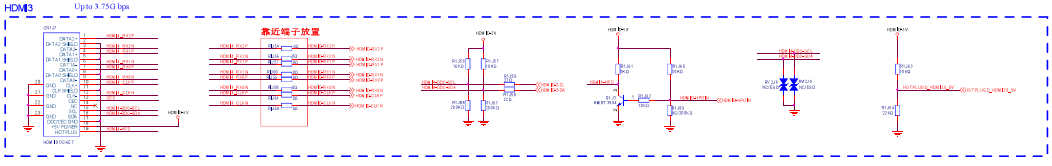


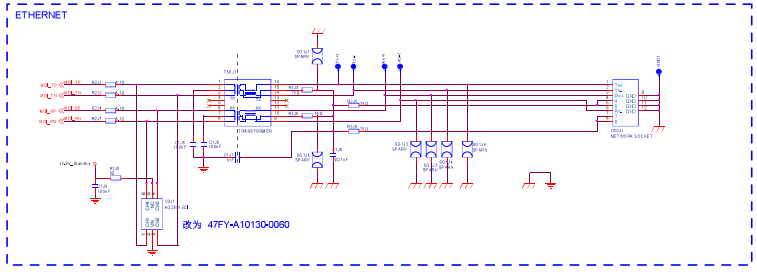
Wifi CONNECT

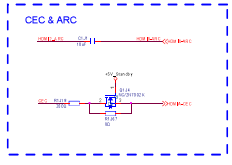


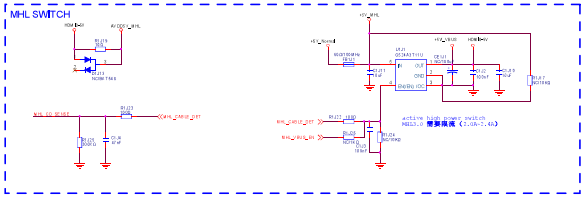

HDMI1(MHL)
Up to 6G bps
靠近端子放置
Hot-Plug Control (MHL CBUS)

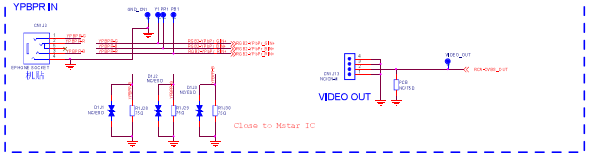

HDMI2(ARC)
Up to 3.75G bps
靠近端子放置

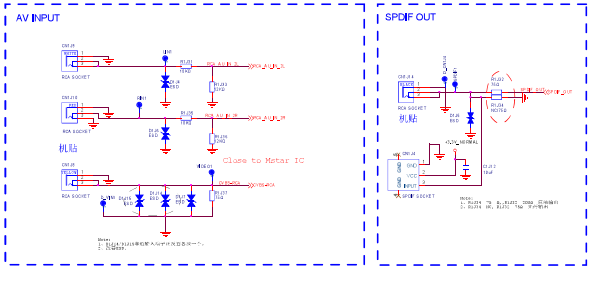

HDMI3
Up to 3.75G bps
靠近端子放置


ETHERNET
改为 47FY-A10130-0080

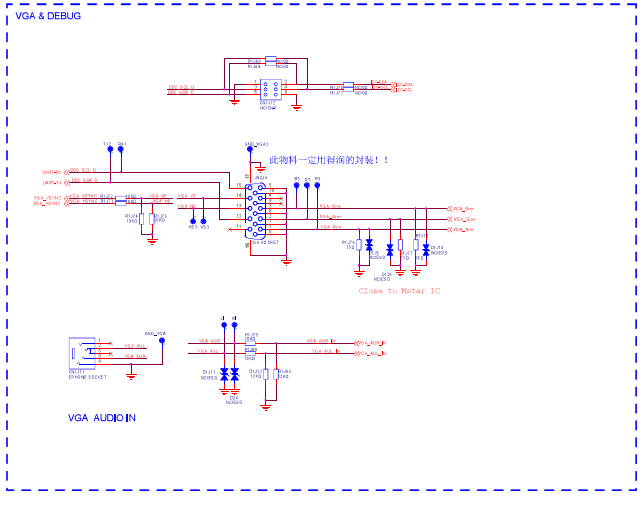

CEC & ARC

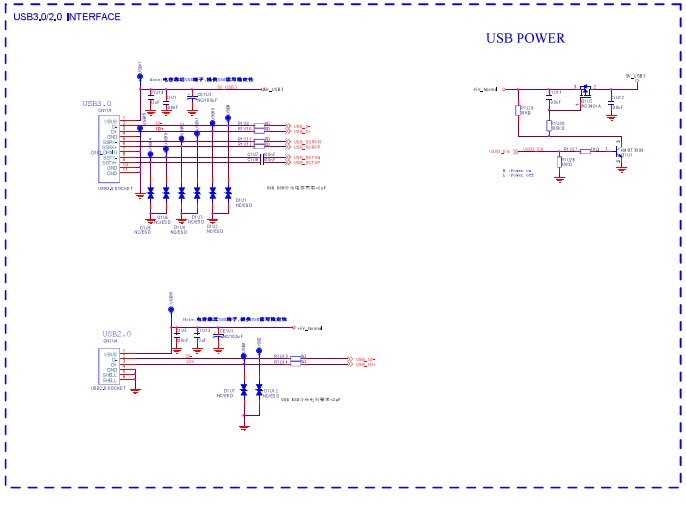

MHL SWITCH


YPBPR IN
机贴
VIDEO OUT
Close to Mstar IC


AV INPUT
机贴
Close to Mstar IC

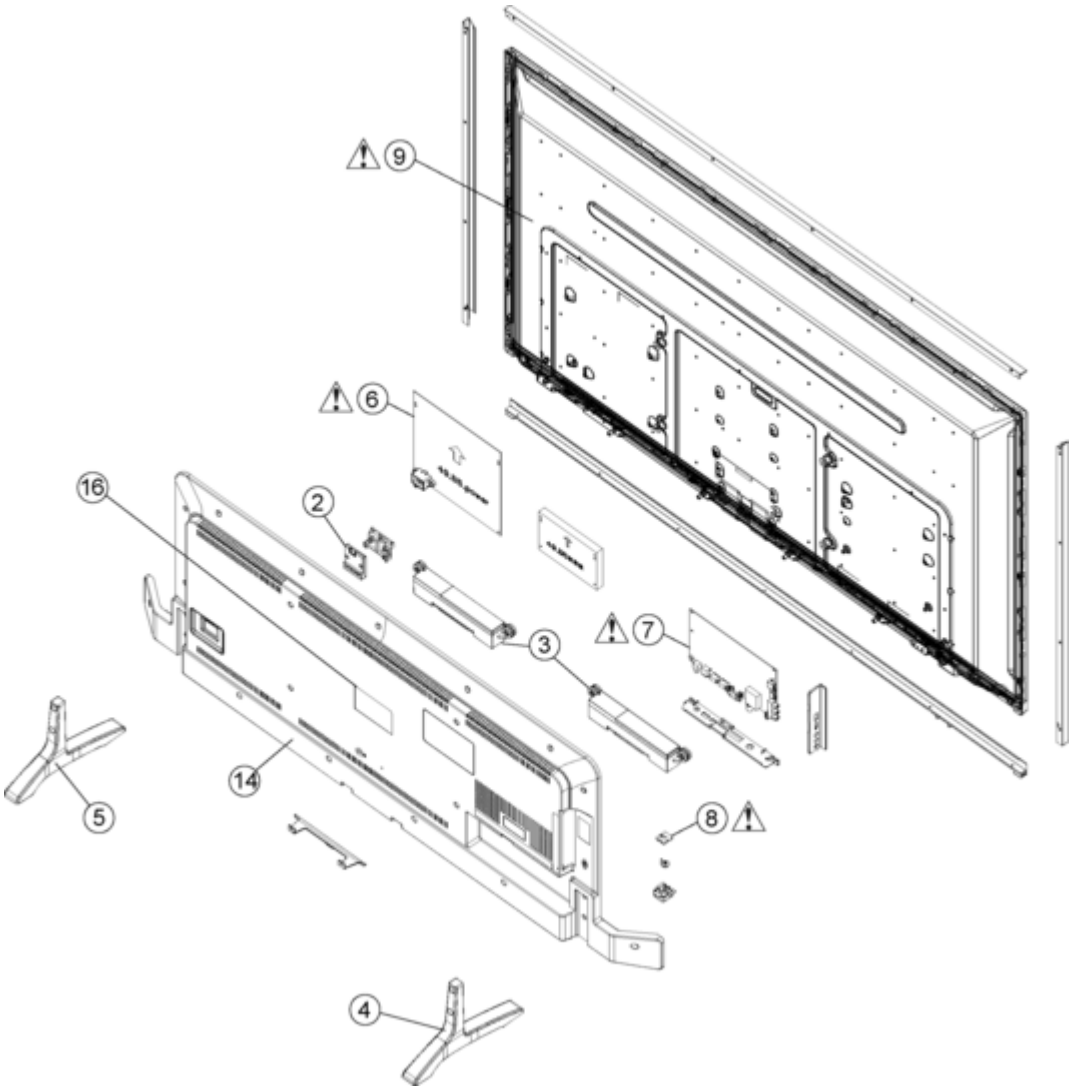
SPDIF OUT
机贴


VGA & DEBUG
此物料一定用耐高的封装！！
Close to Mstar IC
VGA AUDIO IN

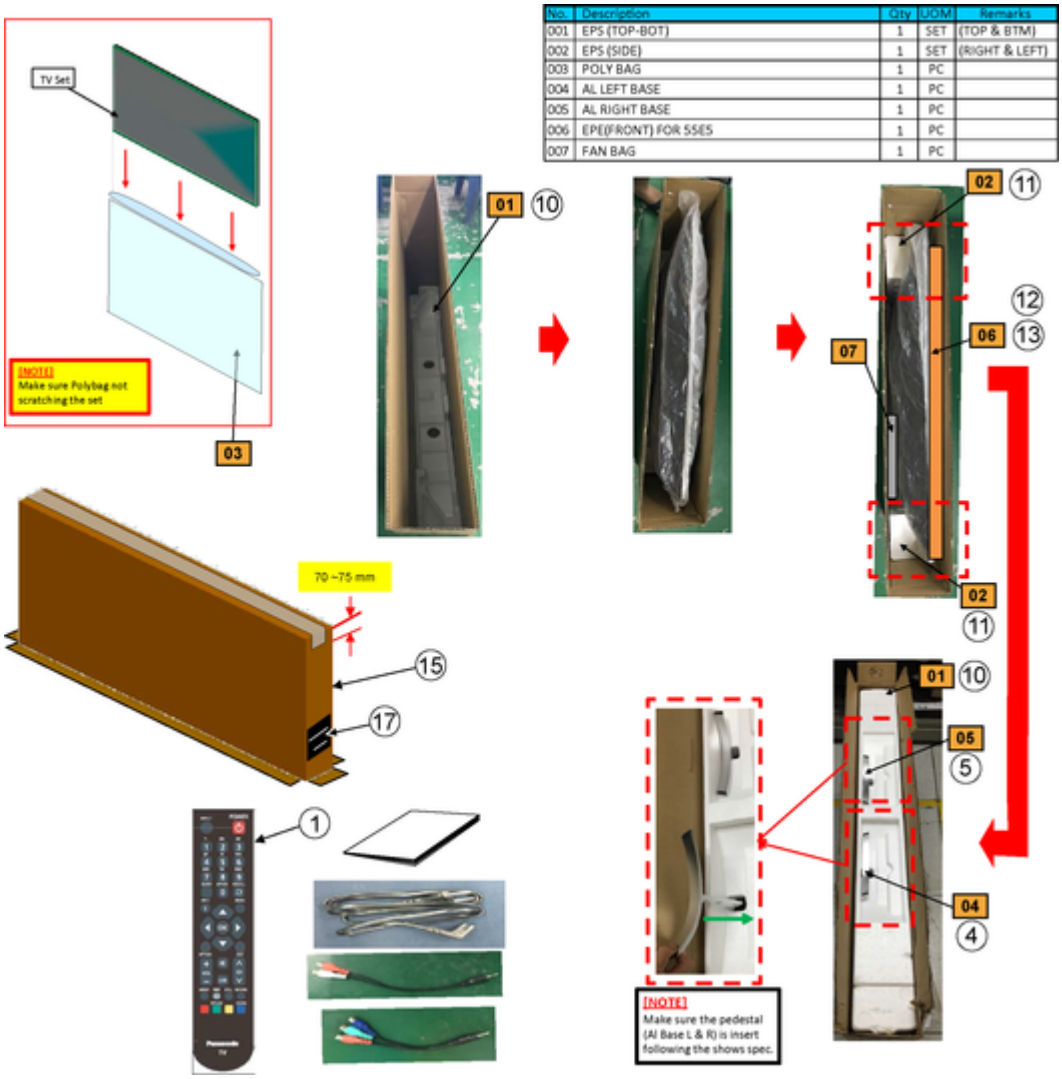

USB3.0/2.0 INTERFACE
USB POWER
USB3.0
USB2.0

12 Exploded View and Replacement Parts List

12.1 Parts Location



12.2 Packing Instruction



12.3 Replacement Partlist

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	1	N2QAYB000934	REMOTE TRANSMITTER		
	2	TZZ00002125A	WIFI MODULE (534L-36NTUD-2230)		
	3	TZZ00002126A	SPEAKER BOX (53D3-39E390-0000)		
	4	TZZ00002161A	AL LEFT BASE (1539-HE200BL0-01)		
	5	TZZ00002162A	AL RIGHT BASE (1539-HE200BR0-01)		
⚠	6	TZZ00002167A	POWER BOARD (168P-L5L01C-HCW0S)		
⚠	7	TZZ00002168A	MAIN BOARD ASS'Y (6M20T-01H55E560-S4)		
⚠	8	TZZ00002169A	IR BOARD ASS'Y (6M20T-18H55E560-06)		
		TZZ00002170A	FFC CABLE (5900-F64130-5110)		
⚠	9	TZZ00002171A	LCD PANEL (7626-T5500L-Y600R2)		
	10	TZZ00002172A	TOP & BOTTOM CUSHION (0301-HB200010-21)		
	11	TZZ00002173A	LEFT & RIGHT CUSHION (0301-HB200S10-21)		
	12	TZZ00002174A	FOAM (FRONT) (0201-55E50F00-01)		
	13	TZZ00002175A	FOAM BOTTOM (0201-HE560000-01)		
	14	TZZ00002176A	BACK COVER (1002-HB200001-21)		
	15	TZZ00002177A	PACKING CASE (0100-HE560000-03)		
	16	TZZ00002187A	BACK COVER LABEL (0601-HB200000-P9)		For TH-55DX400K Only
	16	TZZ00002189A	BACK COVER LABEL (0601-HB200001-P9)		For TH-55DX400S Only
	17	TZZ00002188A	CARTON BOX LABEL (0612-HB200003-P9)		For TH-55DX400K Only
	17	TZZ00002190A	CARTON BOX LABEL (0612-HB200002-P9)		For TH-55DX400S Only