Samsung Home Theater

-Home Theater System – HT-TXQ120

Project : Tarzan / Project Grade : 3

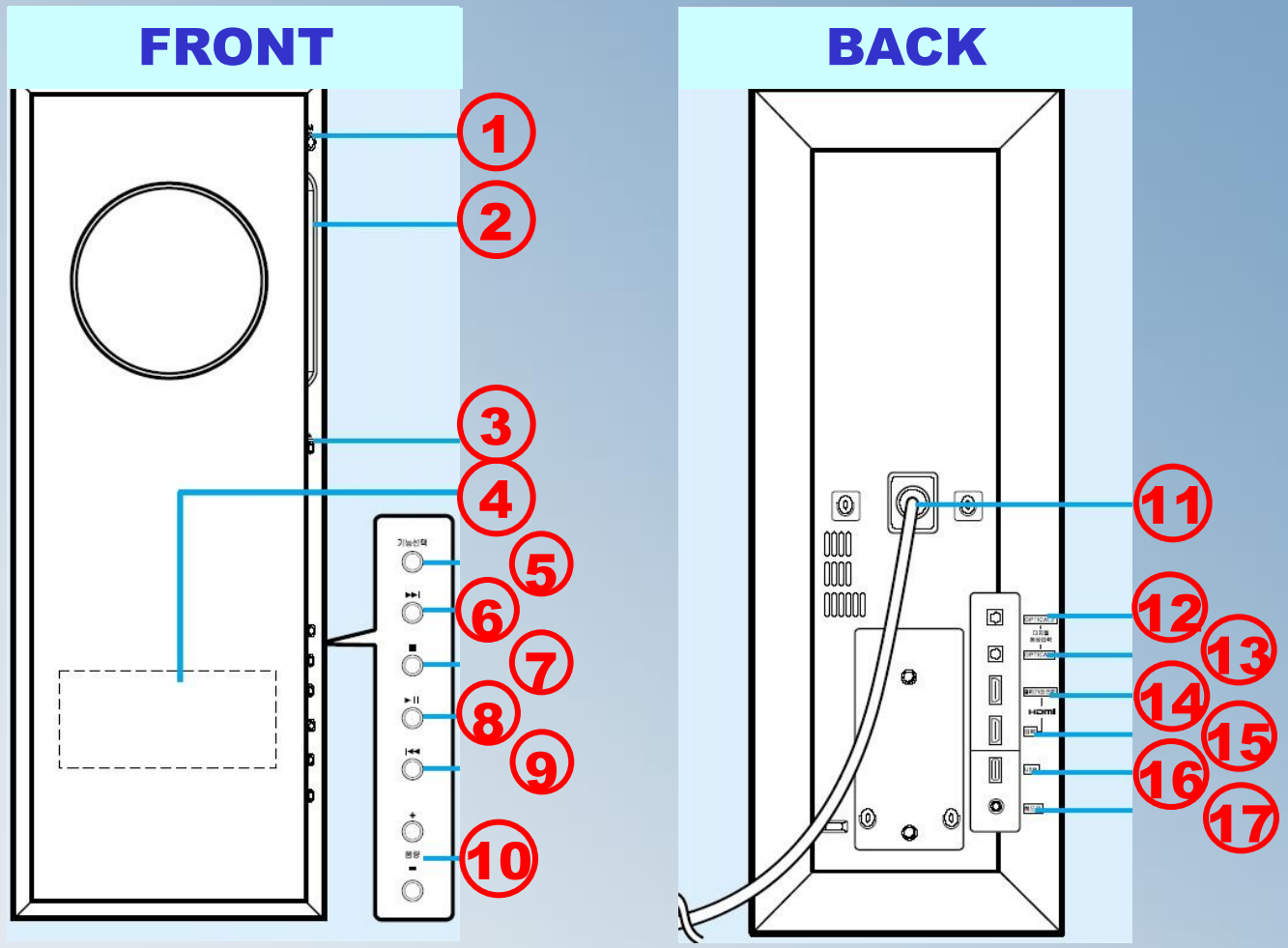
Samsung Electronics Co. LTD
Digital AV Division

List Of Contests

1. General Feature

TOTAL Power	1000W	
DSP	DOLBY Digital, DTS, Dolby Prologic II Surround Decoding	
	DNSe 9.1CH Virtual effect	
Play Back	SACD, DVD Audio / Video, CD, DIVX, MP3, Photo, VCD play back	USA : Can't play VCD Disc
	1disc loading (top loading) – Slot In Mecha	
	FM Radio (RDS for Europe) & Preset	
VIDEO	Progressive Scan (480P-720P-1080i-1080P)	
IN/OUT	USB host (mp3, WMA, WMV, JPG, MPG, DIVX Play back)	
	wireless ready	SWA-3000 Wireless Module is an option.
	AUX (1EA) – Audio L&R	
	Optical Input (2EA)	
	VIDEO Output (Composit) 1EA	
	Component Output	

2.Description Of the MAIN SET



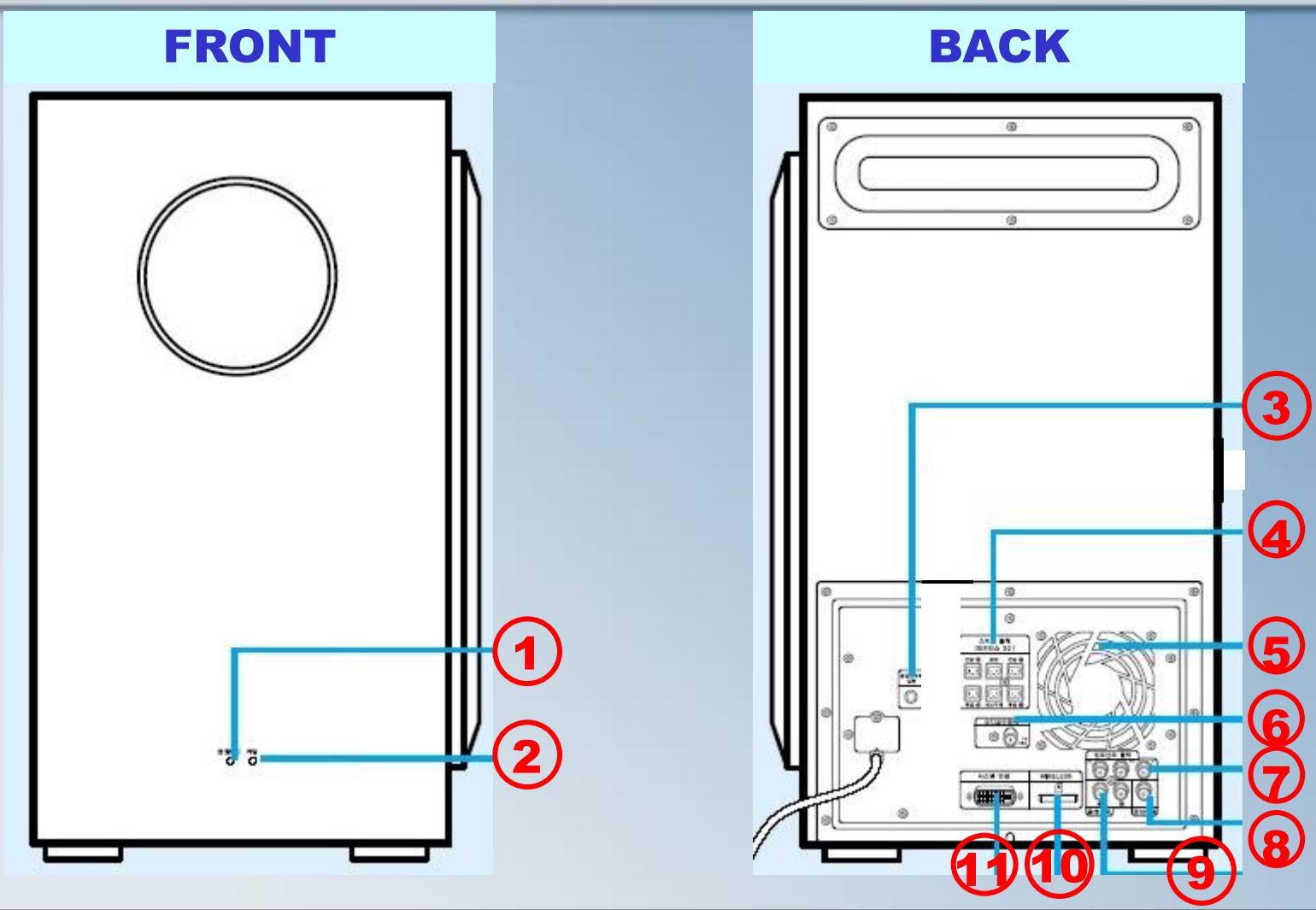
1. Power Button	4. Display LED	7. STOP	10. VOLUME	13. OPTICAL IN 1	16.USB Connection
2. Slot In	5. FUNCTION	8. PLAY/PAUSE	11. SYSTEM CABLE	14. HDMI OUT	17.Head Phone Out
3. Eject	6. B.SKIP	9. F.SKIP	12. OPTICAL IN 2	15. HDMI IN	

2.Description Of the MAIN SET

Function Description

1. Power Button	Power On / Off
2. Disc Slot	Disc Slot in / out
3. Eject Button	Disc Eject Button
4. LED DISPLAY	LED DISPLAY. It display SET mode, DVD play time, etc..
5. Function button	Mode select button. (DVD/USB/FM/HDMI/AUX/D.IN)
6. SKIP button (Back)	Back Skip Button (Disc Play)
7. STOP button	DISC Stop Button
8. Play/Pause button	Disc Play and Pause Button
9. SKIP button (FF)	Forward Skip Button (Disc Play)
10. Volume	Volume control button (0~50)
11. System Cable	Main Set □□ Sub Woofer Set Power/Video/Audio data communication line
12. Optical input 2	Optical Digital audio in 2
13. Optical input 1	Optical Digital audio in 1
14. HDMI OUTPUT	HDMI OUTPUT. Connect HDMI Connector of TV
15. HDMI INPUT	HDMI INPUT. Connect with BD player, Game Controller… which has HDMI Connection
16. USB	For USB Host play Connect your USB player.
17. Head phone	Head phone Out.

2.Description Of the Sub Woofer



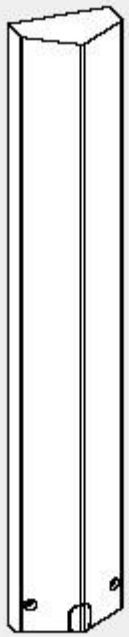
1. STANDBY LED	4.SPAKER OUT	7.COMPONENT OUT	10. Wireless TX Card Slot
2. POWER ON LED	5.FAN	8.COMPOSIT OUT	11. SYSTEM CABLE
3. ASC MIC IN	6.TUNER ANT	9.AUX IN	

2.Description Of the Sub Woofer

Function Description

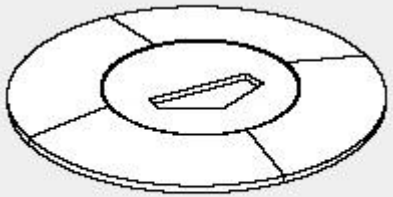
1. Standby LED	Standby LED. (RED)
2. POWER ON LED	POWER ON LED (BLUE)
3. ASC MIC IN	AUTO SOUND CALIBRATION MIC INPUT
4. SPEAKER Jack	5 Chanel (Front L/R, Center, Rear L/R) Speaker Wire Connection
5. FAN	To Control set temperature, Fan is operating
6. FM ANT Jack	FM ANT INPUT JACK
8. COMPONENT JACK	Component (Y/Pb,Pr) Output Jack
9. Composit Jack	Composit Video Output Jack
10. Aux Input	AUX (L/R) Input
11. Wireless TX Card In	SWA-3000 Wireless Module TX card slot
12. System Cable	System Cable Connection

Accessories



STAND

SCREW



STAND

AH39-00725C
AH39-00725B

AUX/VIDEO Cable

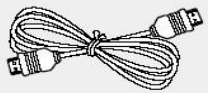
AH59-01183D

ASC MIC

AH42-00018A

FM ANTENA

AH39-00923A



HDMI CABLE

AH39-00925A

OPTICAL CABLE

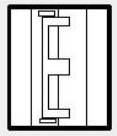
Remote Controller

AH59-01643Z (XAA)
AH59-01662B (EXP)
AH59-01662C (EUR)
AH59-01662V (CIS)

AH68-01959A

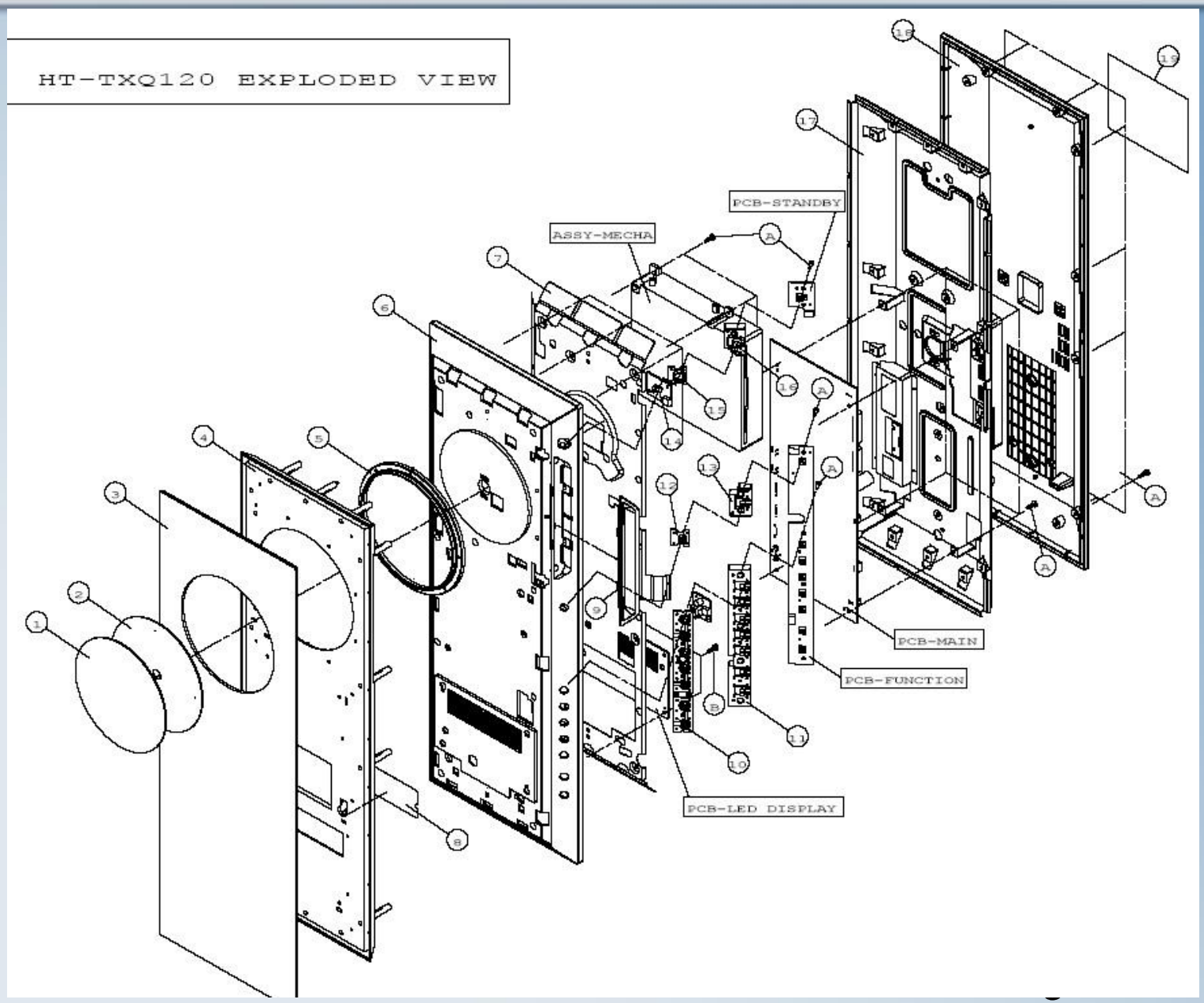
USER MANUAL

3301-000144



FERRITE CORE

3. How to disassemble the MAIN set

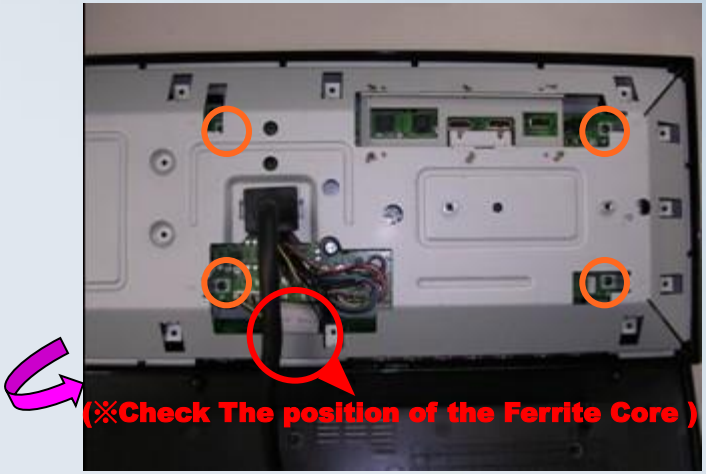


3.How to disassemble the MAIN set

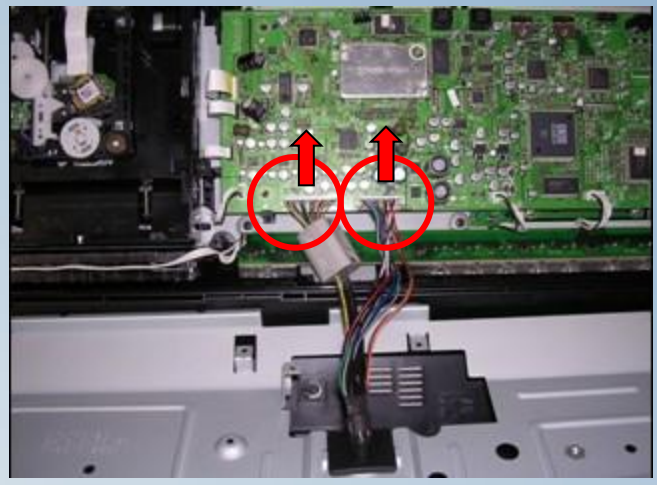
1. Disassemble the Back Cover & SYSTEM CABLE

1. Unfasten 12 screws on side of Back Cover

2.Lift the Back Cover.



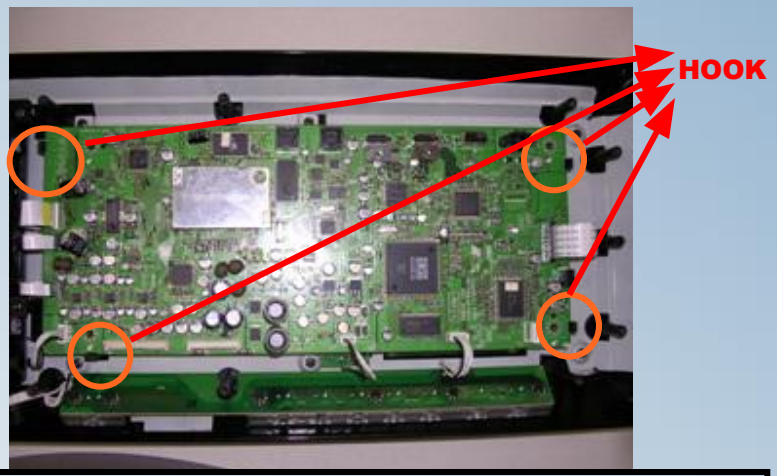
3.Unfasten 4 screws and lift up the cover.



4.Unfasten the System Cable Connector (UDIN1,UDIN2).

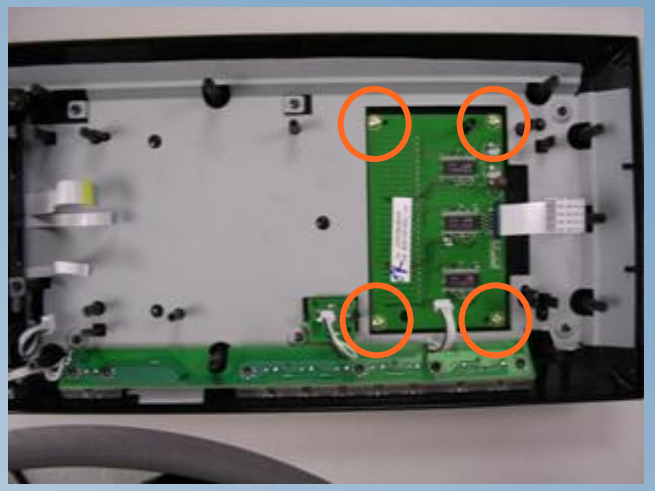
3. How to disassemble the MAIN set

2. MAIN PCB Disassemble



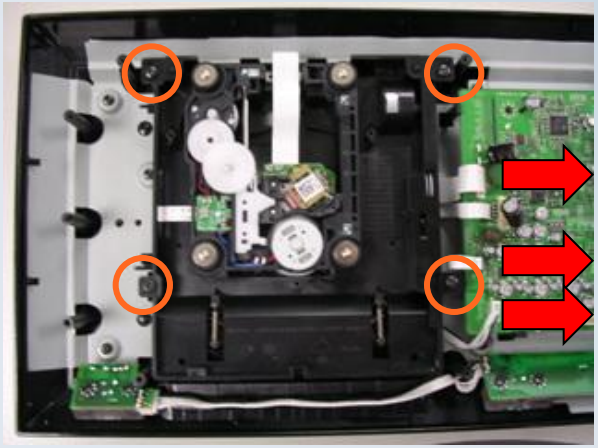
Unfasten the Cables (Flat/Wire Cables),
Push the hook (4 places) and lift up the Main PCB

3. LED PCB Disassemble



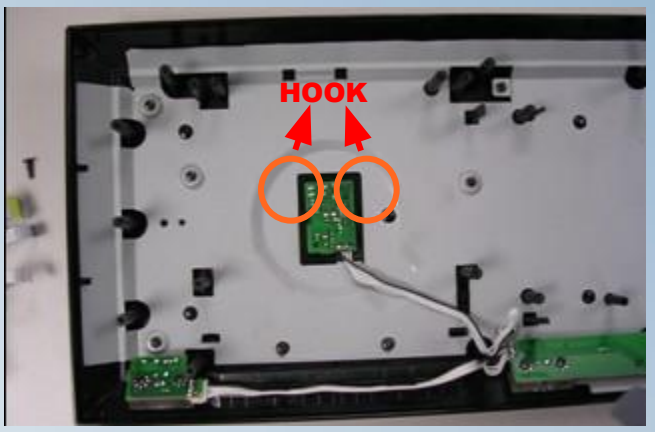
Unfasten 4 Screw

4. DVD-MECHA Disassemble



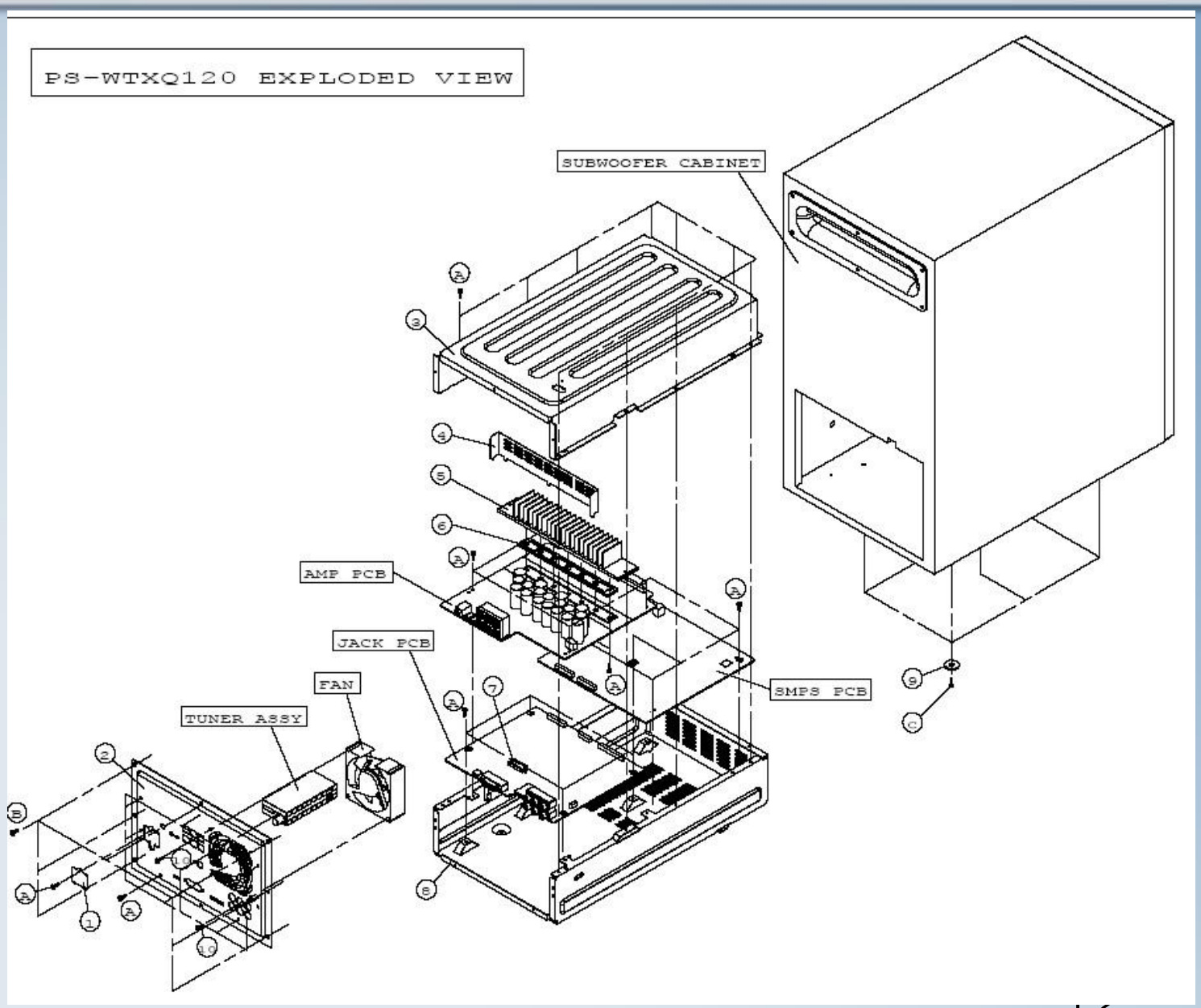
Unfasten the 4 Screw and lift up the DVD-MECHA

5. DECO-LED Disassemble



Push the HOOK(2 places) and Lift up the pcb

4. How to disassemble the Sub Woofer



4. How to disassemble the Sub Woofer

1. Dissemble the Assemble

1. **Unfasten** 4 Screws of the bottom.

2.Unfasten Screw(7 places) of the assembly.

3.Pull the Assy' 10 Cm and disconnect two cables

Caution!
The Connector shod be placed in the rectangle hole.

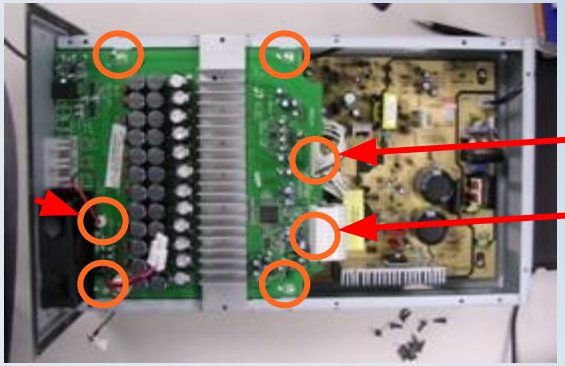
4. How to disassemble the Sub Woofer

2. Lift Up the Cover

1. Unfasten Screw (10places)

2.Unfasten Assy's Screw(3 places)
And Lift Up the Cover

3. Disassemble PCB



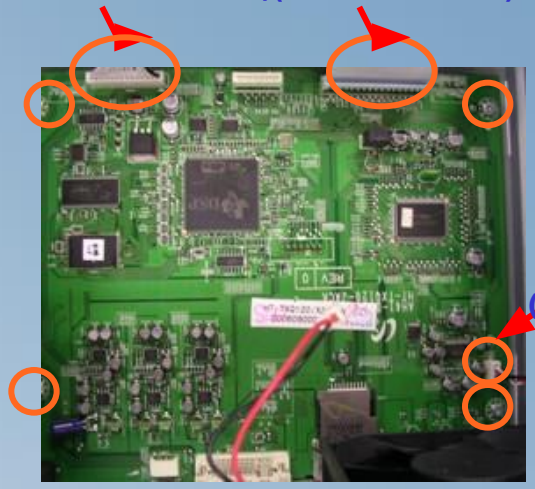
1.Unfasten Screw (4 places) of the AMP PCB and Cables

2.Lift up the AMP PCB

4. How to disassemble the Sub Woofer

5. Disassemble Jack /SMPS PCB

1. Unfasten Tuner Pack Screw(1 place)



2.Unfasten Jack PCB Screw(4places) and other cables

3.Unfasten System Cable Screw(2 places) with (-) driver.
4.Unfasten screw (1 place) of the Jack.

5.Detatche Power Cable.
6.Unfasten Screw(5 places)

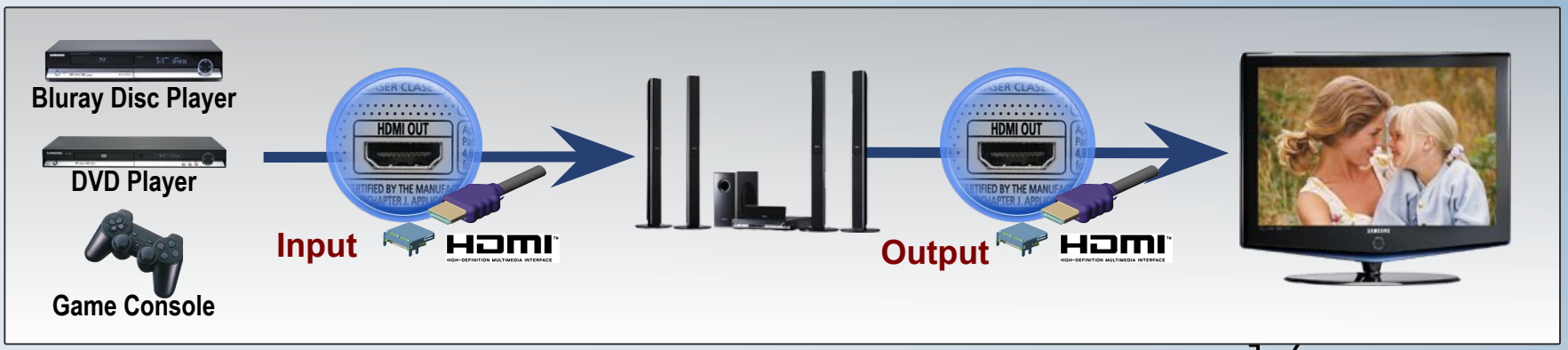
5.Special Feature – World First 1080P HTiB

- HDMI : **High-Definition Multimedia Interface**
- **World First 1080 P Support HTiB**
- **Up Scailling 480P □ 720P □ 1080i □ 1080P**

HDMI (High Definition Multimedia Interface)
- Pure Digital for Perfect Vision

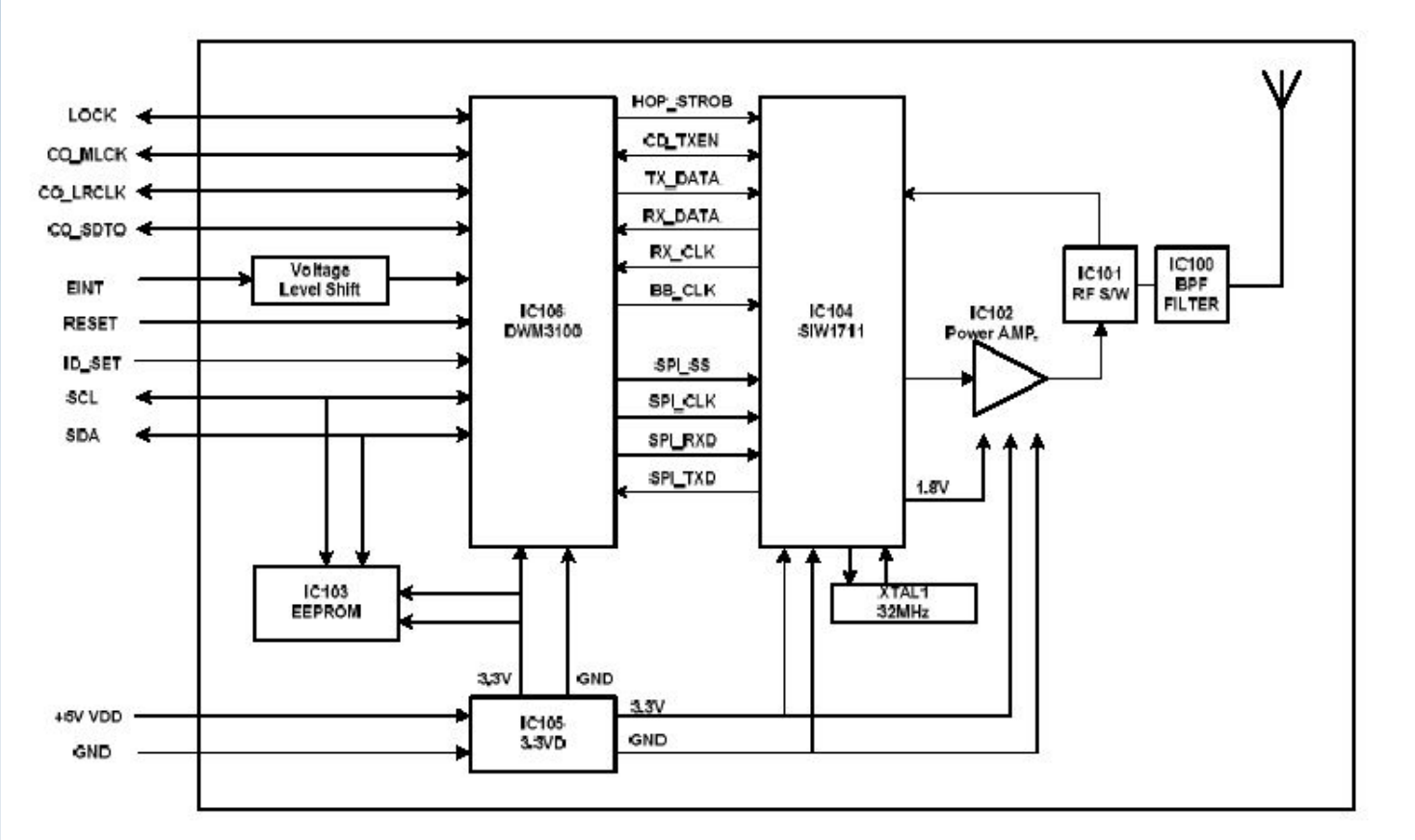
- **HDMI OUTPUT** - High Definition DIGITAL Picture

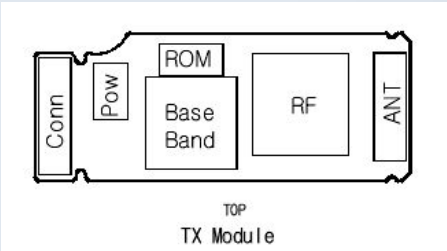
- **HDMI INPUT** – FOR DIGITAL CONNECTION with another Product



5.Special Feature – WIRELESS READY Block Diagram

5. BLOCK DIAGRAM



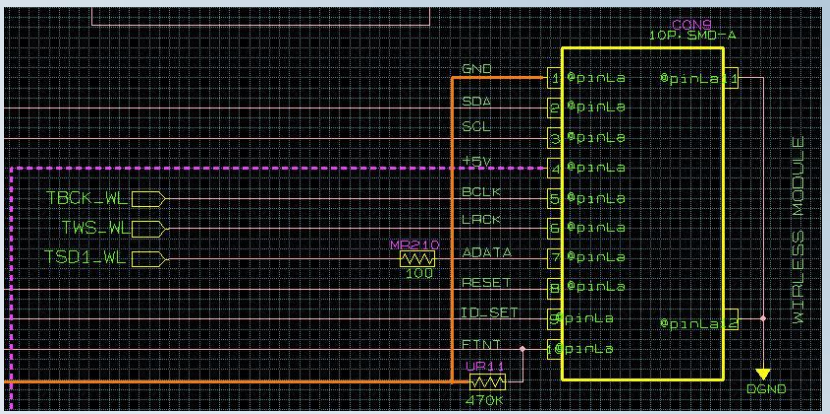


5.Special Feature – Wireless Ready Check

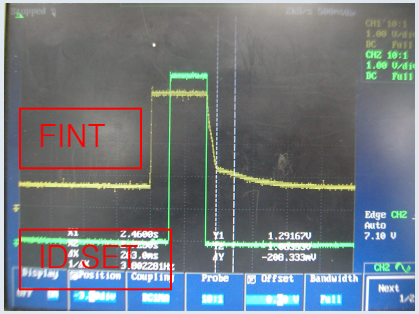
SAMSUNG ELECTRONICS

7. Wireless ready module

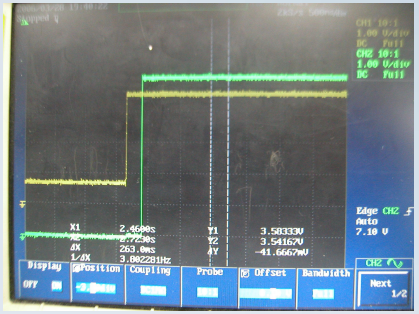
8. Wireless ready port



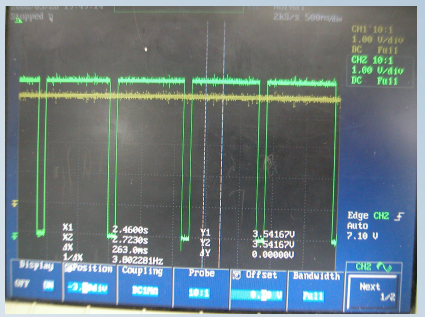
Standby(Time Line)



Power on



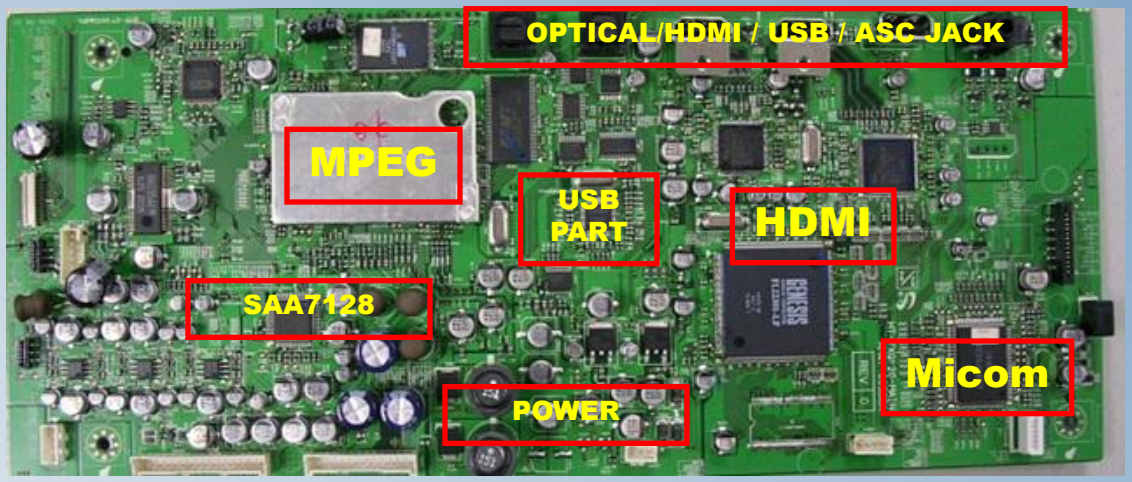
SWA3000 Communication Error



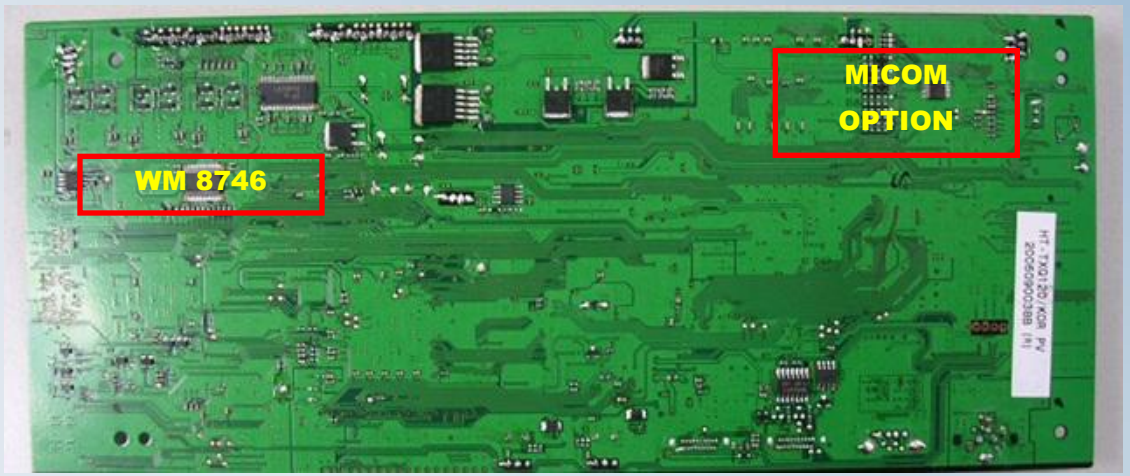
DATA/CLK PORT

6.MAIN PCB Block

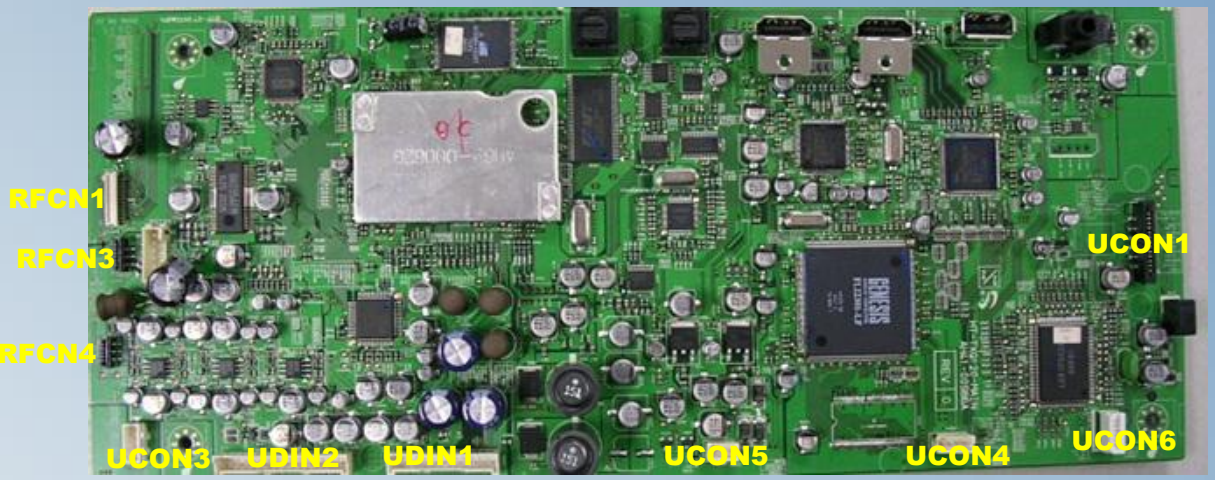
(1)MAIN TOP



(2)MAIN BOTTOM

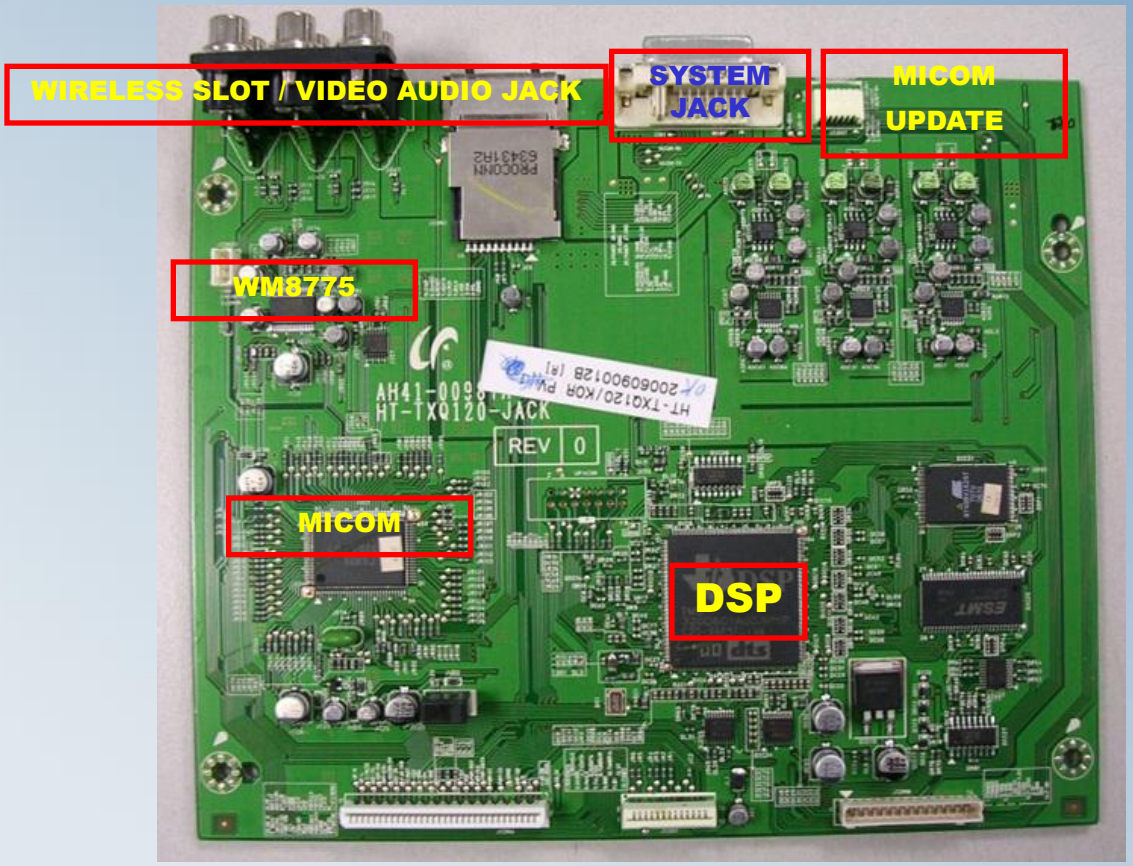


6.MAIN PCB Connectors

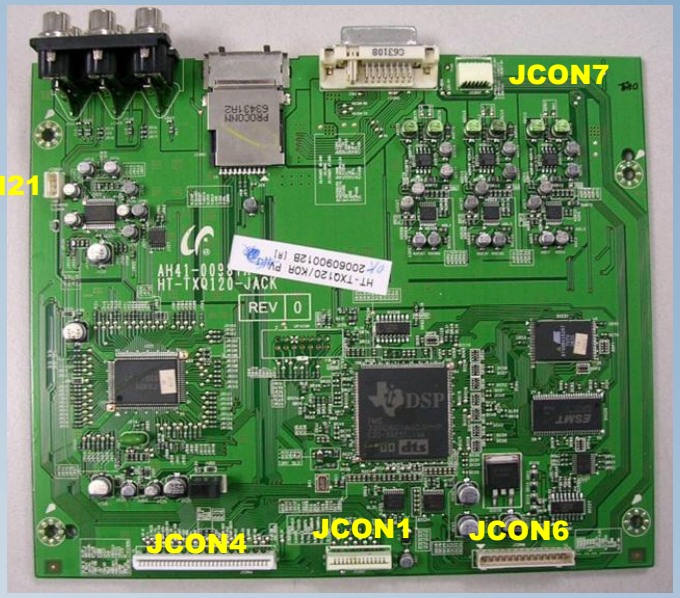


REF. NAME	PIN	CON. ASS'Y	FUNCTION	REF. NAME	PIN	CON. ASS'Y	FUNCTION
RFCN1	24P	MECHA	DVD MECHA CONTROL / DATA LINE (FOCUS / DATA)	UCON5	3P	Remocon PCB	Receive Remocon Data
RFCN3	6P	MECHA	DVD MECHA CONTROL LINE (SP/SL)	UCON4	4P	Key PCB	Front Button (Power.etc..) Input
RFCN4	5P	MECHA	DVD MECHA CONTROL LINE (OPEN/CLOSE)	UCON6	6P	Update Port	To Update the Micom. (For Flash Type Micom Only)
UCON3	4P	Deco Ring LED PCB	Front Round Deco Ring BLUE LED	UCON1	13P	LED Display	LED Power & LED Control
UDIN2	16P	SYSTEM CABLE	ANALOG AUDIO/VIDEO Data				
UDIN1	13P	SYSTEM CABLE	MICOM TX/RX & POWER				

6.JACK PCB Block

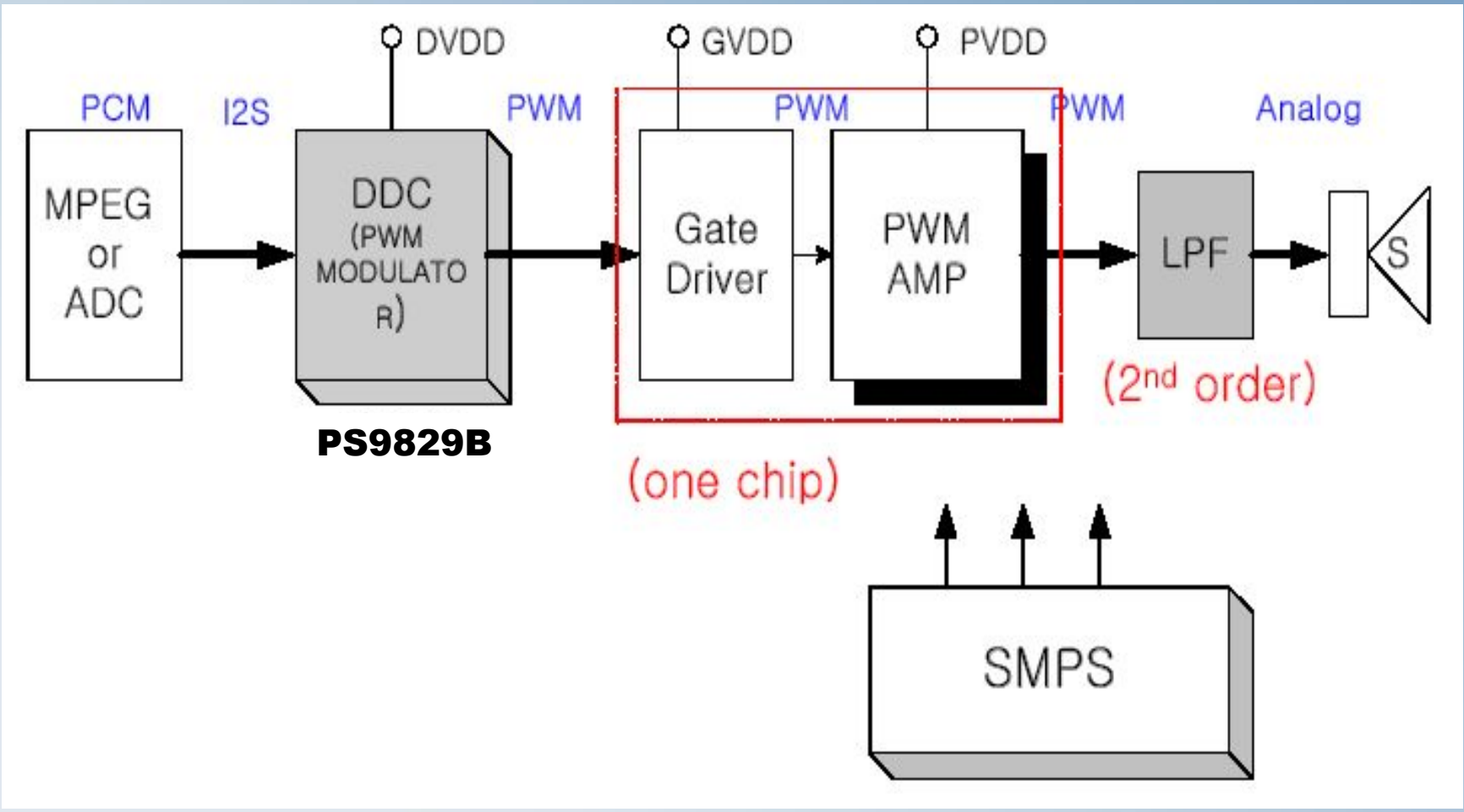


6.JACK PCB Connectors

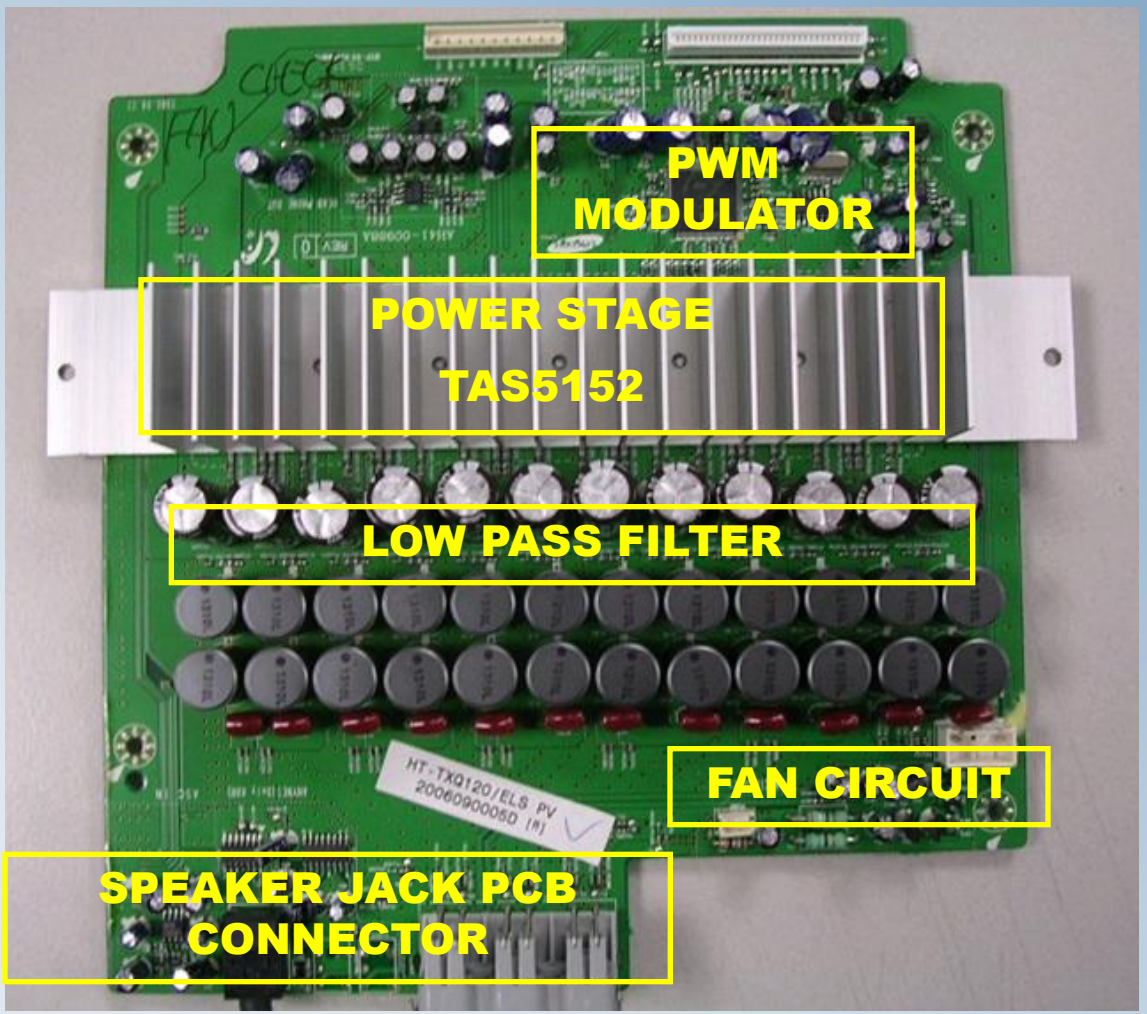


REF. NAME	PIN	CON. ASS'Y	FUNCTION
JCON21	3P	Sub Woofer LED	SUB WOOFER (STANDBY / POWER) LED
JCON4	32P	AMP PCB	+12V/-12V AMP SIGNAL (PWM)
JCON1	13P	TUNER	TUNER SIG / CONTROL SIG
JCON6	14P	SMPS	POWER From SMPS
JCON7	6P	UPDATE	ANALOG AUDIO/VIDEO Data

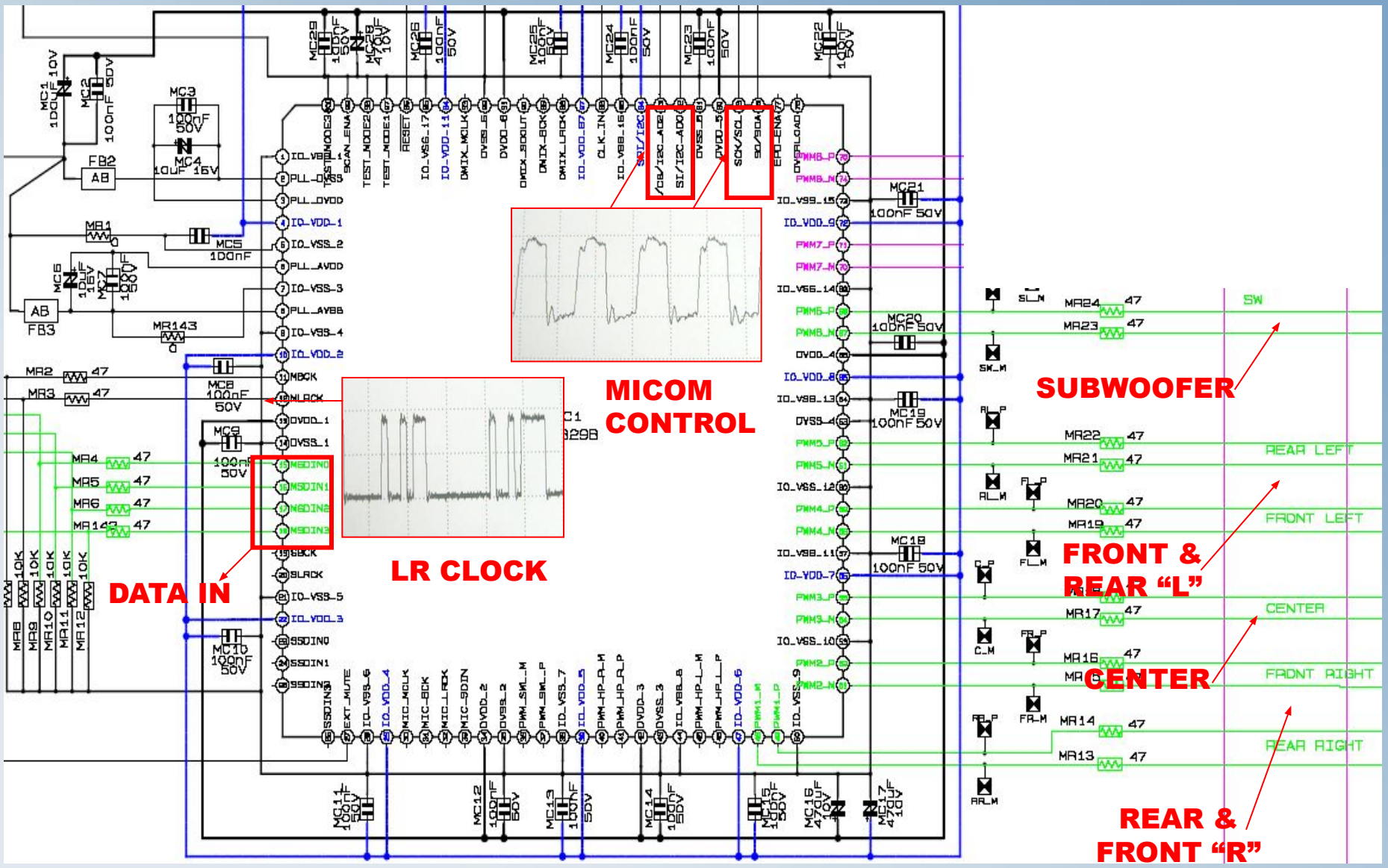
6.Block Diagram (Amp Block)



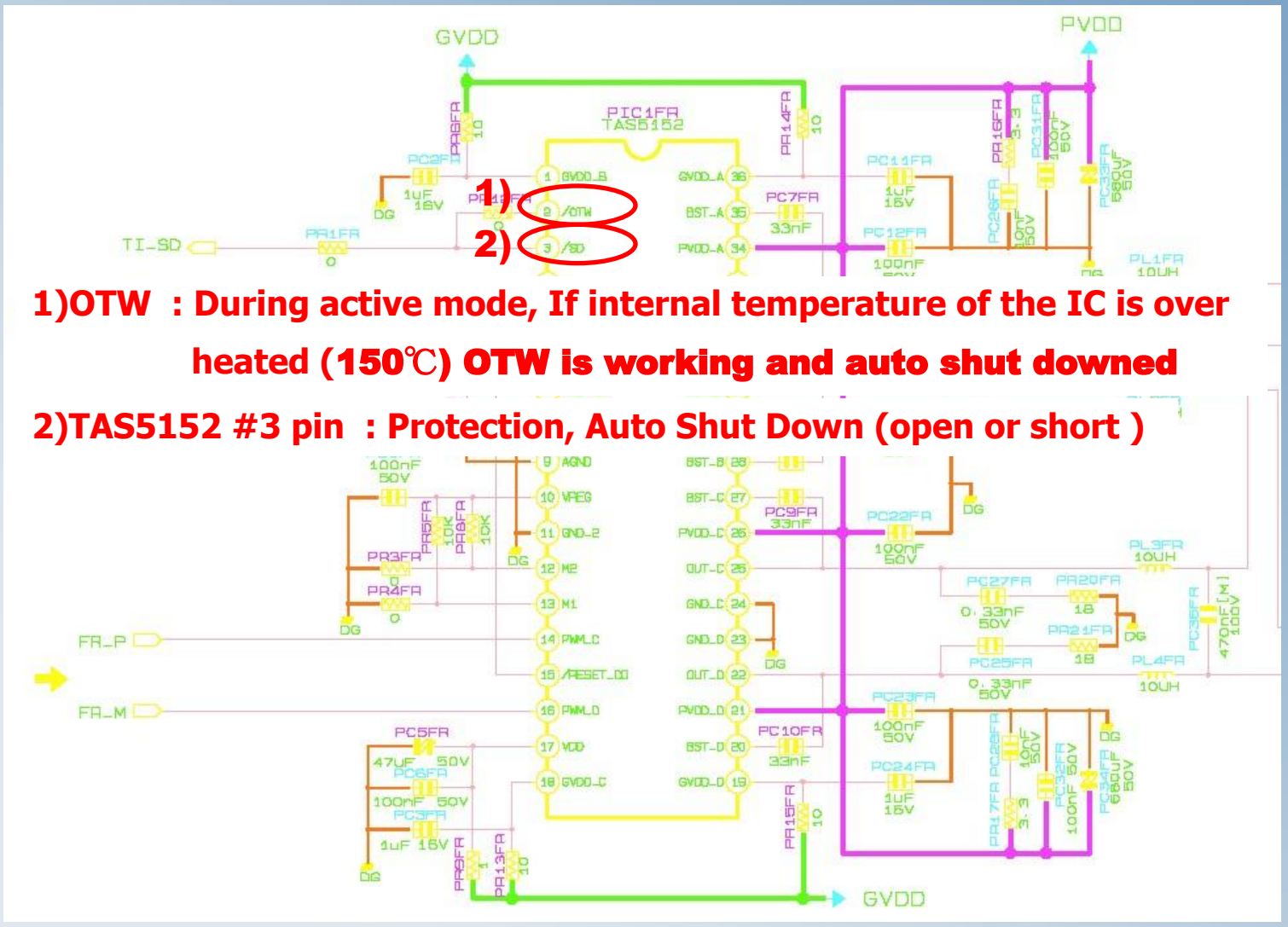
6.AMP PCB


PWM MODULATOR
POWER STAGE
TAS5152
LOW PASS FILTER
FAN CIRCUIT
SPEAKER JACK PCB CONNECTOR

6.AMP Modulator (PS9829B)



6.AMP Power Stage TAS5152



1)OTW : During active mode, If internal temperature of the IC is over heated (150℃) **OTW is working and auto shut downed**

2)TAS5152 #3 pin : Protection, Auto Shut Down (open or short)

6.SMPS Protection

Cases of the SMPS Protection.

1> If there is over current at the AMP IC (Speaker Wire Short)

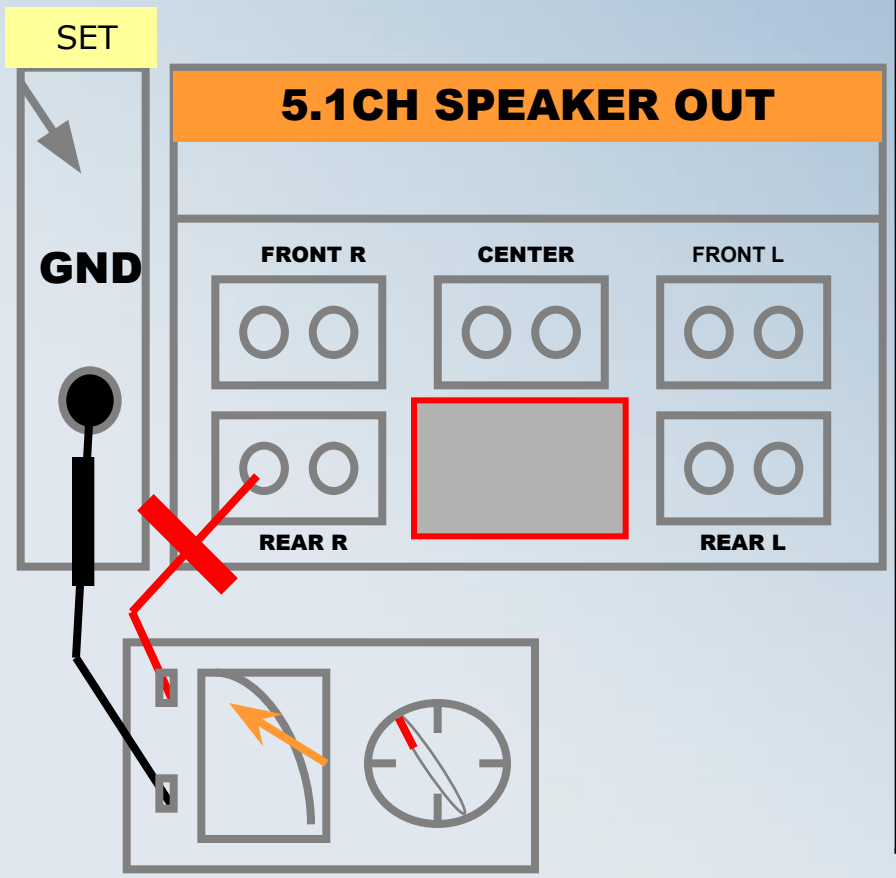
2> If temperature of the Amp Ic is over 150℃

3> There is no power input at GATE DRIVER

	Location	PIN NO.	Protection		NOTE
			OPEN	SHORT	
HT-XQ120 SMPS	CN3	+16V(1~3)	X	X	
		+5.6V (7)	X	X	
		+3.3V (11)	X	X	
		+5V(13)	X	O	
	CN2	PVDD(about 34V) (1~4)	X	X	
		-12V(9)	X	X	
		+12V(11)	O	O	

6. AMP Pre-Inspection relating to Power Protection

If you think, there are problems at the AMP PCB, you can check the pcb without disassemble the set.
(Caution!! : Do not connect the power cord during bellow test!**)**

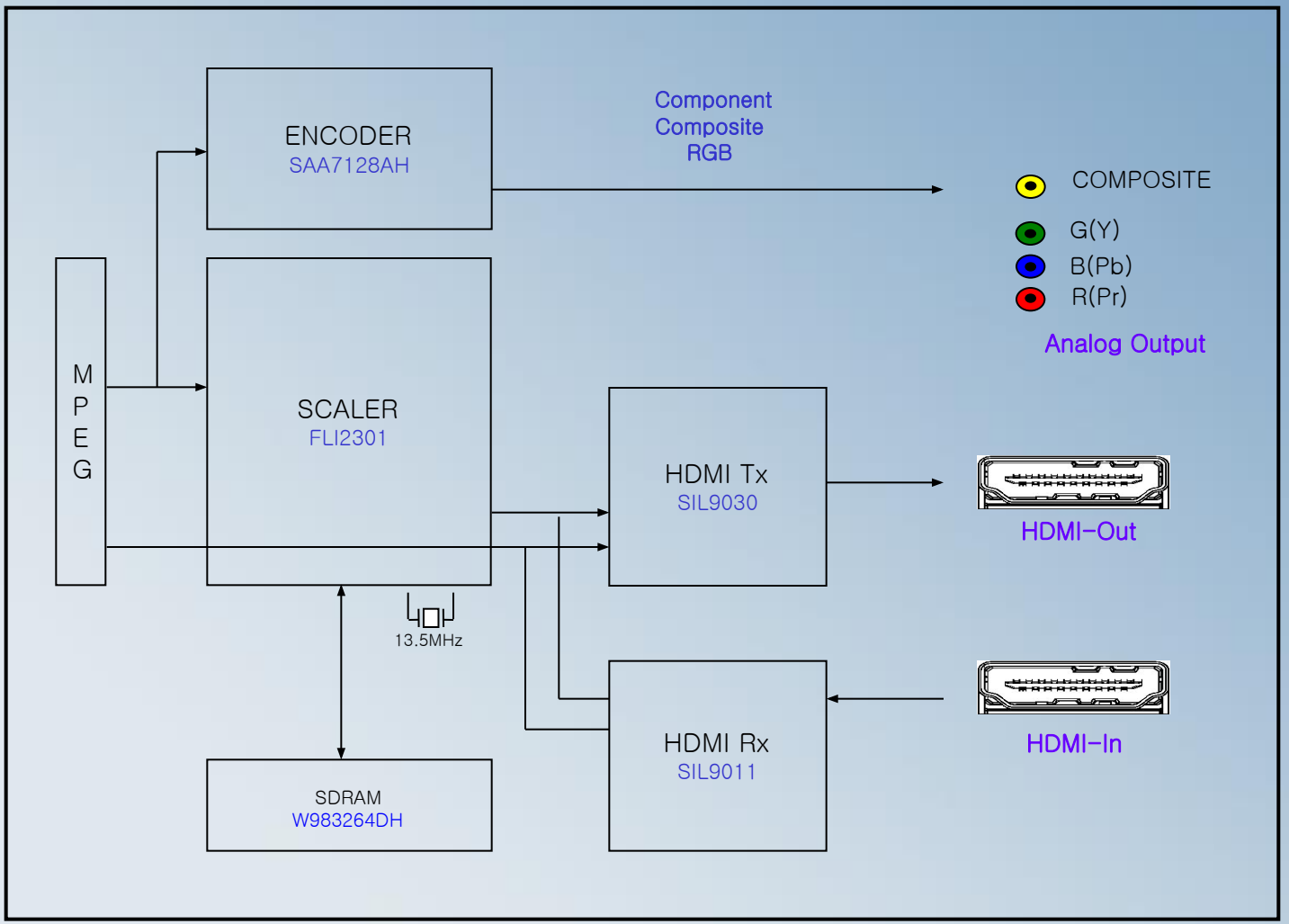


Measurement Resistance using Tester – Approximately –	
CH	**HT-TXQ120**
F/R CH	20kΩ
CENTER	20kΩ
SUBWOOFER	-

If Measured Resistance is very different from above numbers, There is a Problem.

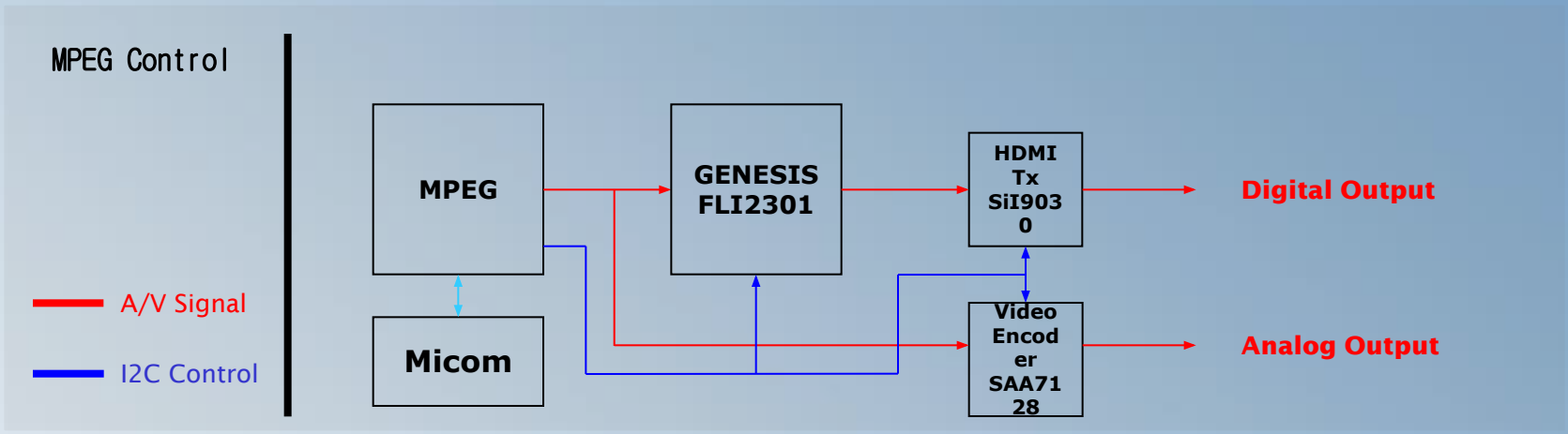
☐ **AMP PCB Problem**

6.Block Diagram in detail (HDMI)

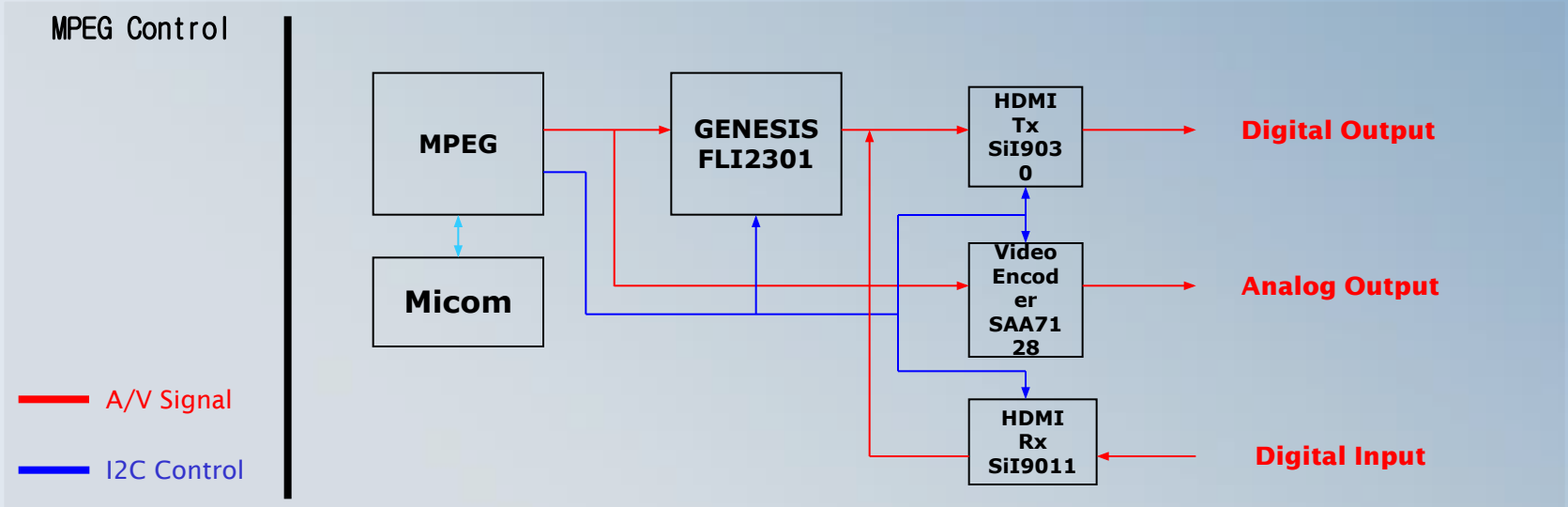


6.HDMI IN & OUT Block

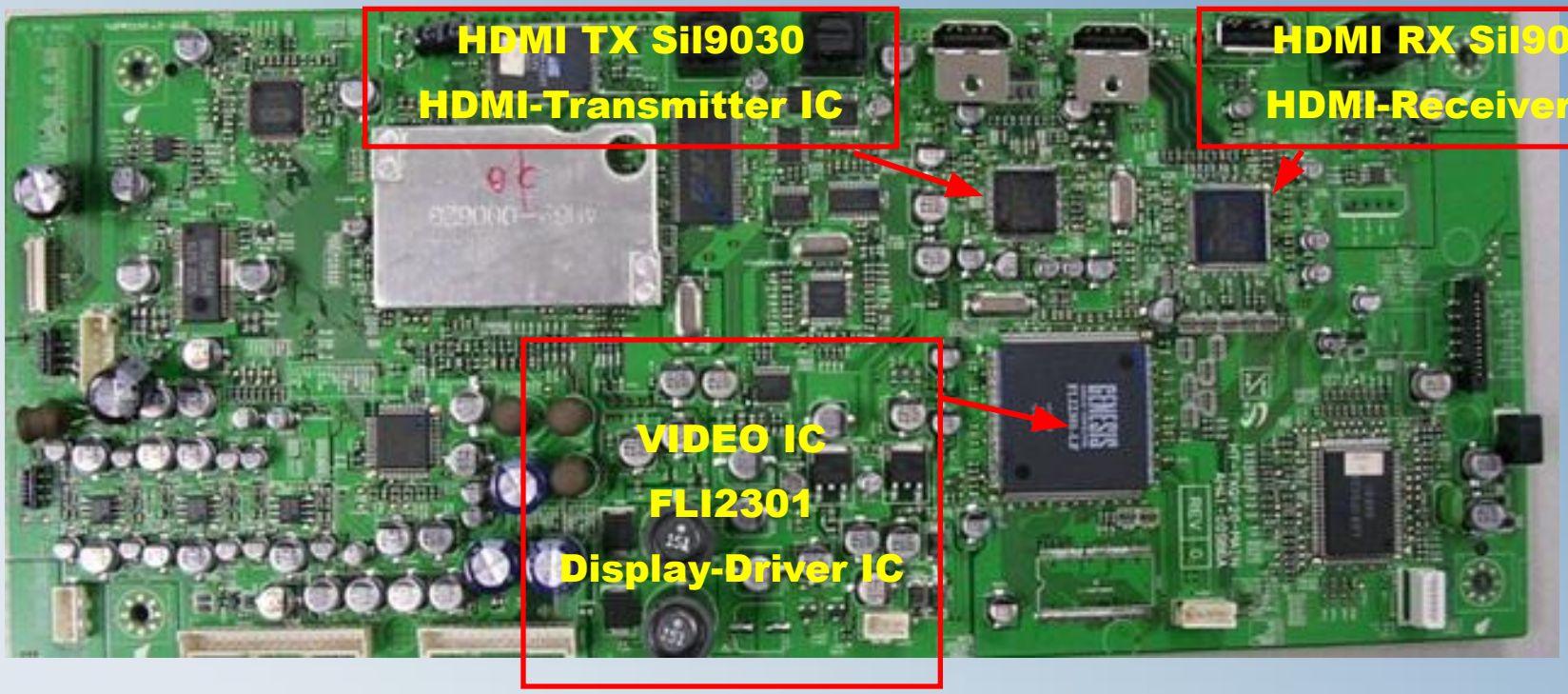
1) HDMI Transmitter



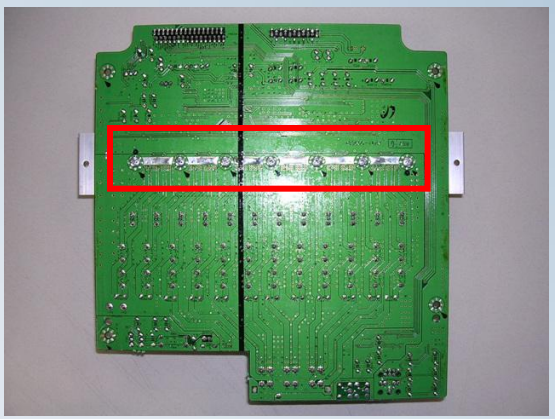
2) HDMI Receiver



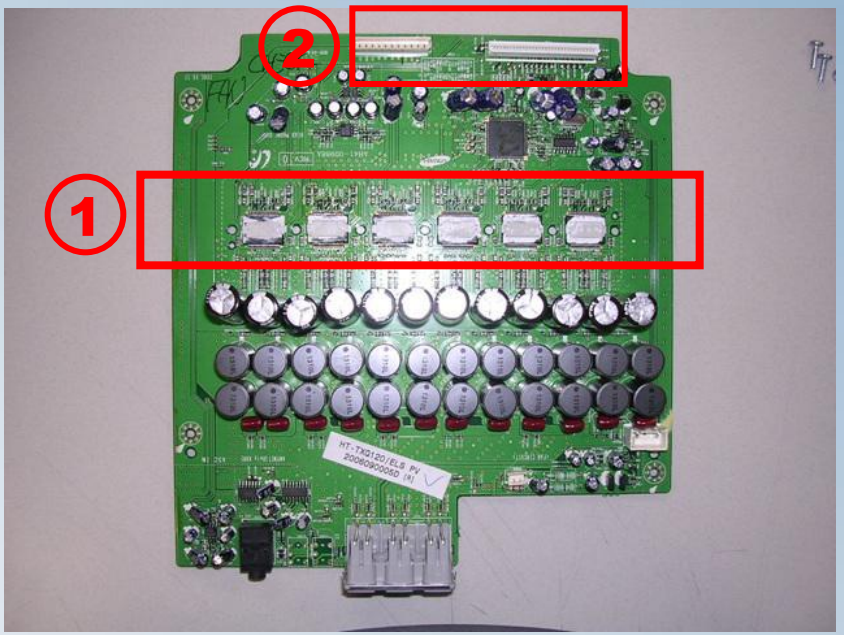
6.MAIN PCB (HDMI)

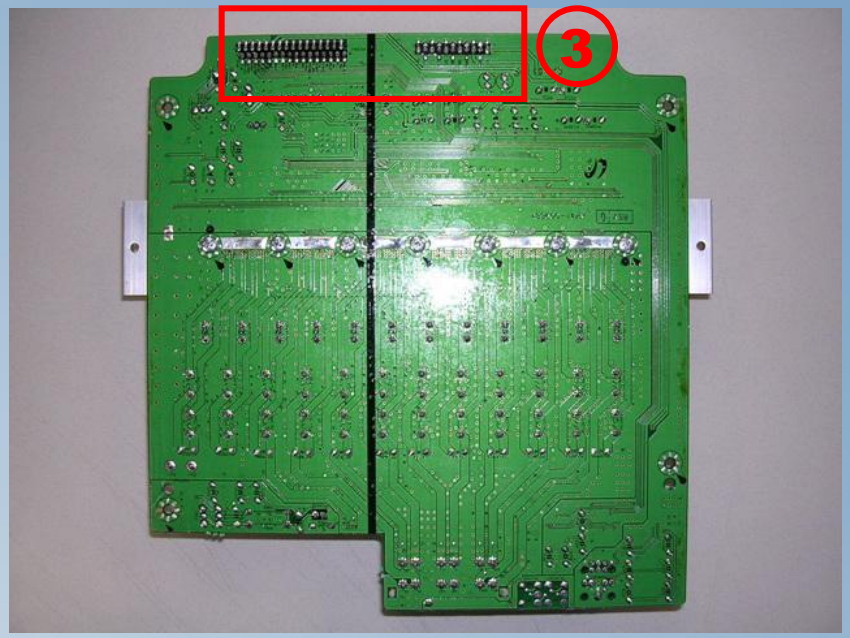


6.Checking out AMP PCB

1.PCB ASS'Y	2.HEAT SINK	3.PCB Short
		
Unfasten 7 Screws	Separate HeatSINK	CHECK Power IC TAS5152.

6.AMP PCB Short Check flow





1)Check parts. (short/IC damage/pattern damage)

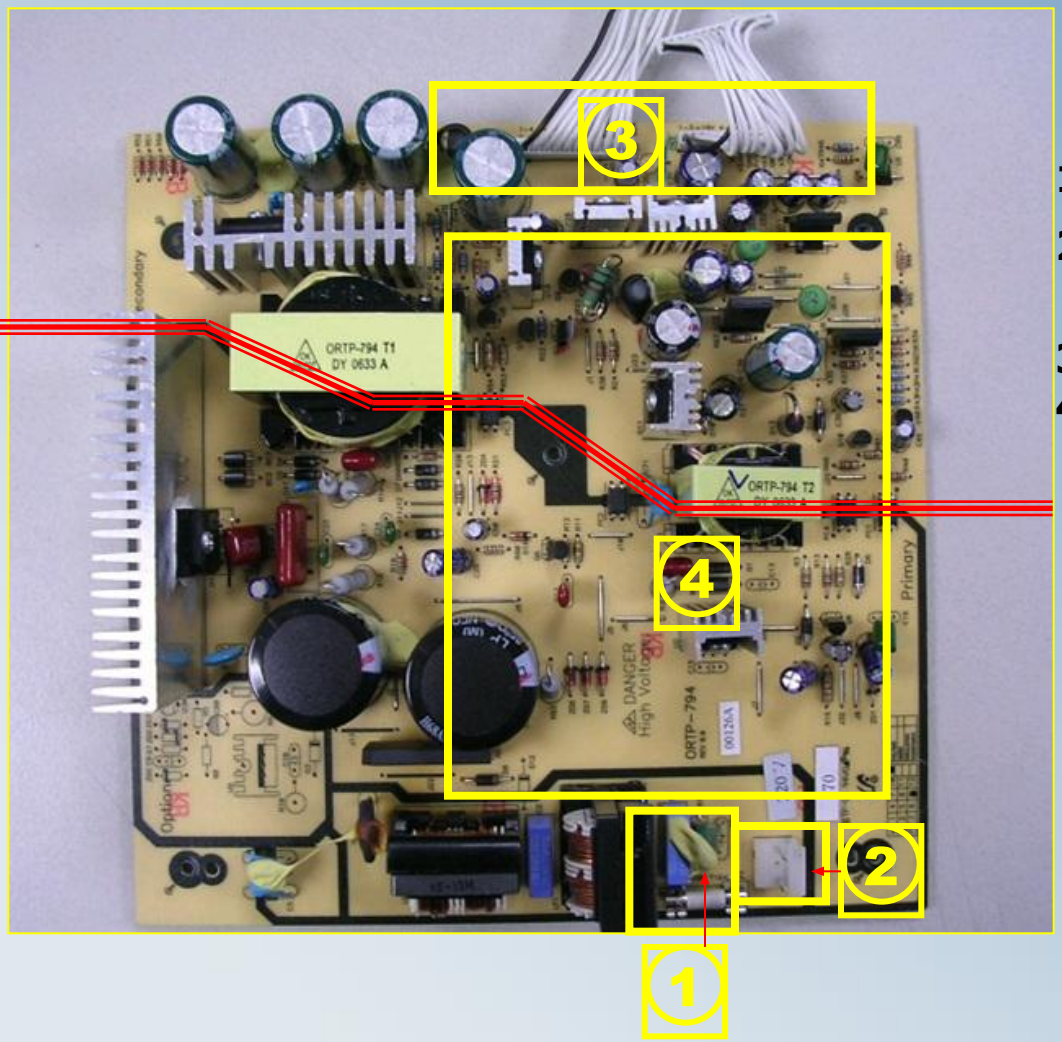
2) Check connectors

3) Short test of the Connectors.

6.SMPS Check Flow

2th

1th



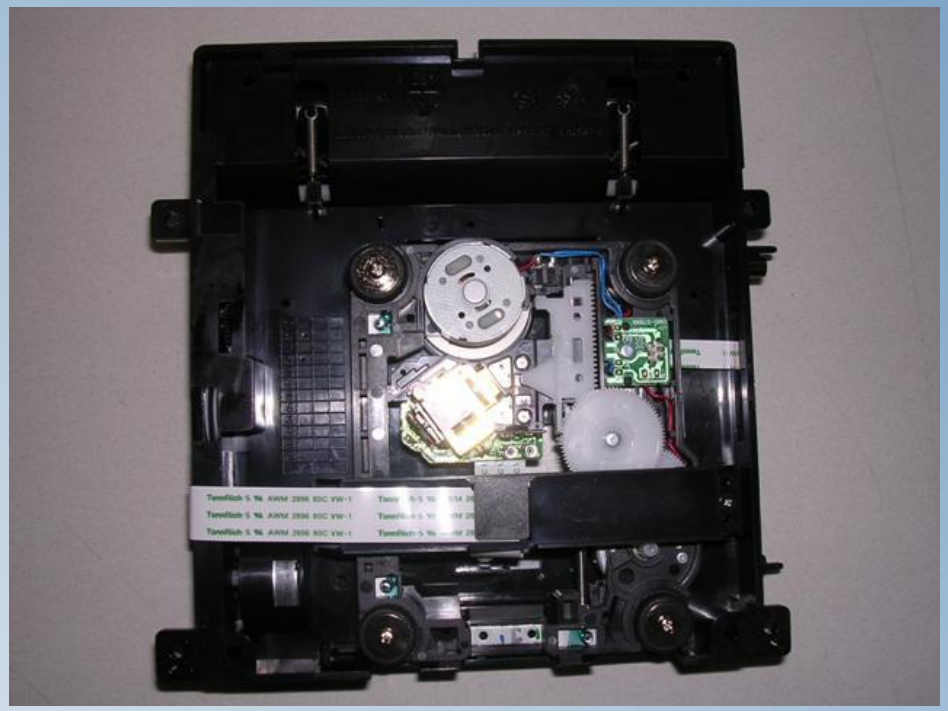
1)Check FUSE & VARISTOR

2)Check the AC Input Cord

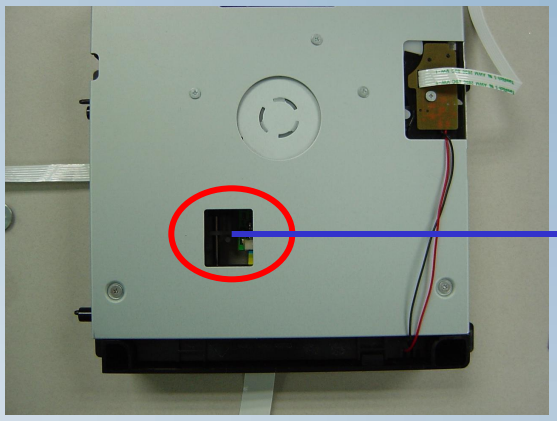
3) Check cables

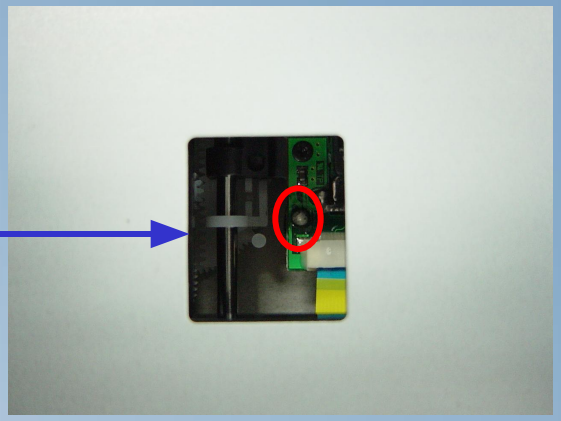
4) Check short or open

7.Deck Assy. AH59-01769A

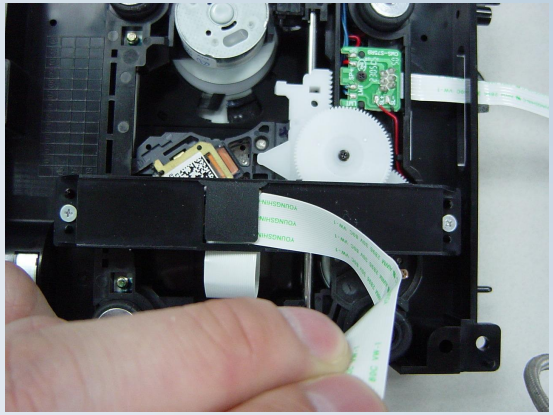


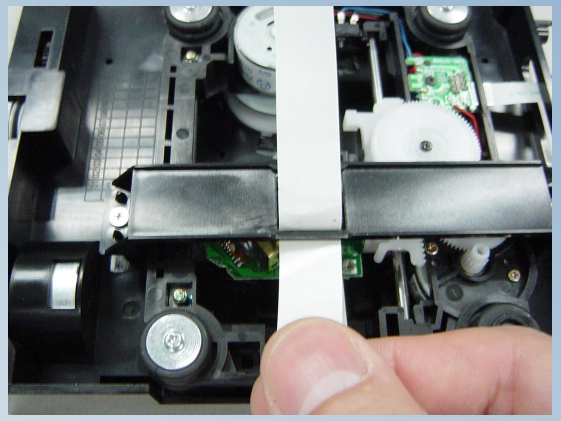
7. Mecha Disassemble (MECHA-DECK)





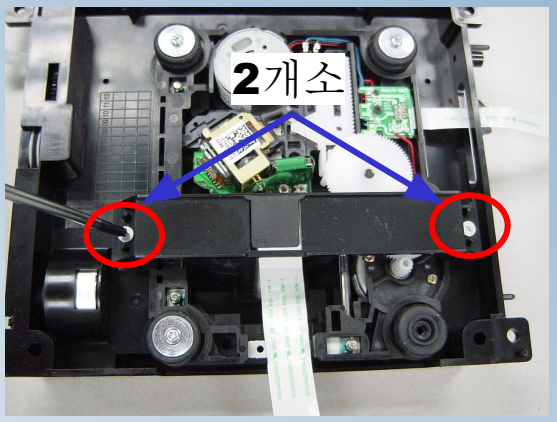
1.To Protect PICK-UP, Before detach Flat Cable that point should be shorted.

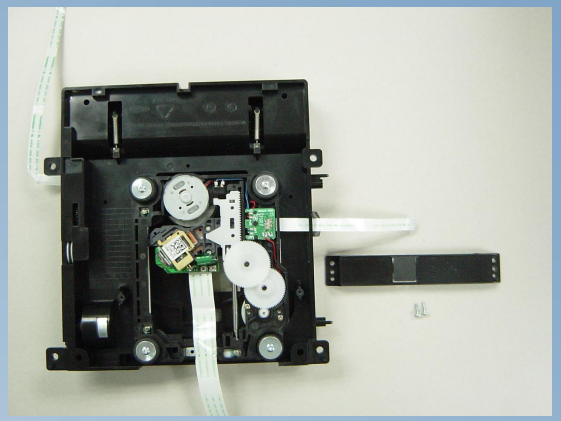




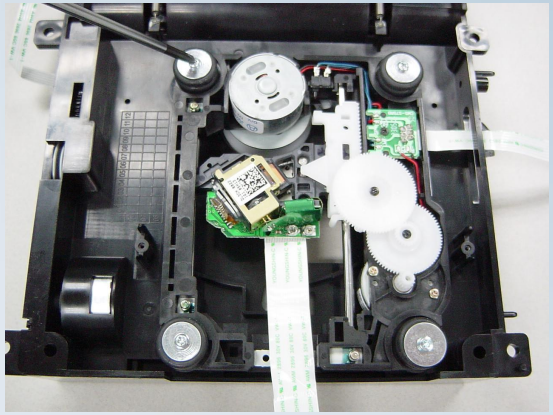
2. Separate Pick-Up Cable from the Holder

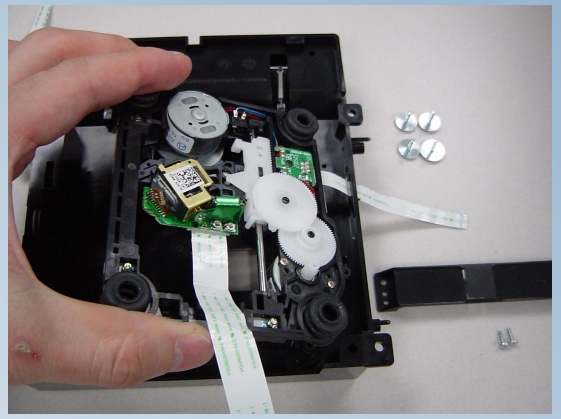
7.Mecha Disassemble (MECHA-DECK)





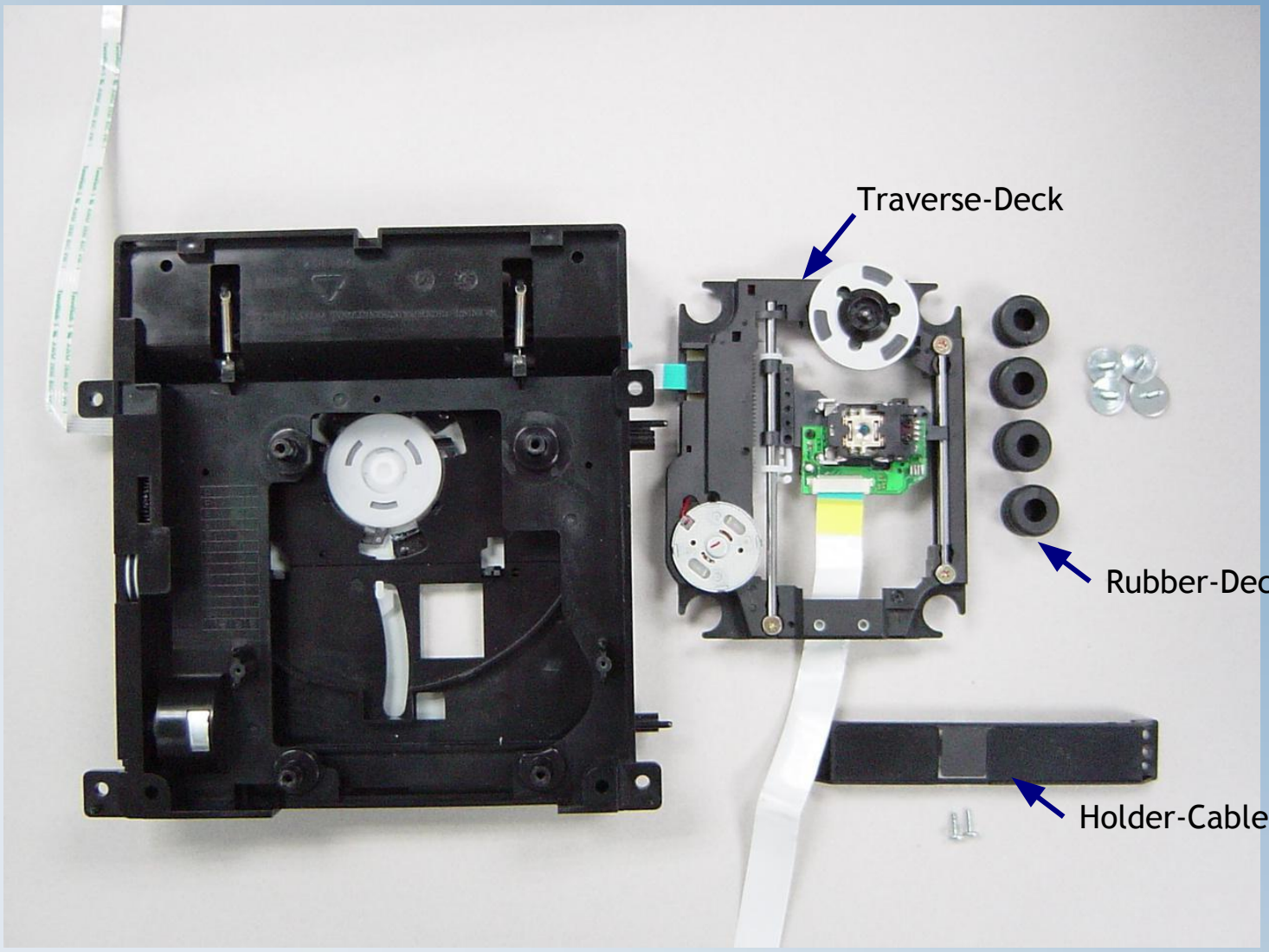
3. Unfasten 2 Screws lift up Holder-Cable





4. Unfasten 4 Screws saparate Traverse-Deck

7.Mecha Disassemble (MECHA-DECK)



8.MICOM Initialization & Update

. Micom Reset

During STANDBY mode , push the 'STOP' button 5 Second. If blue LED blinking, reset is finished.

. Micom Update (Only for Flash Micom)

Back of the Set there is a slide hole for update JIG.

To update Micom, it need Computer, Rom Writer, USB Cables

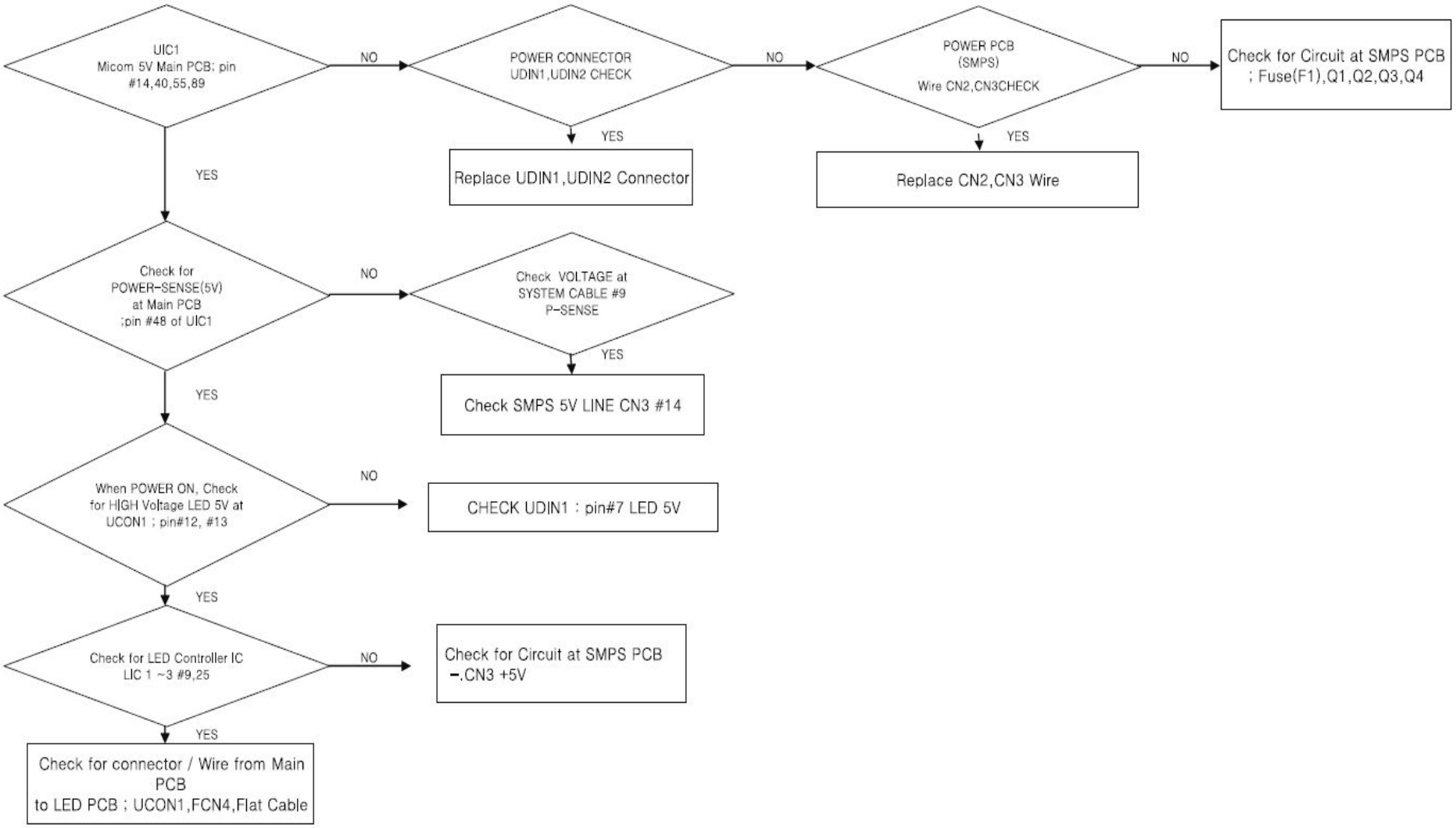
. Micom & MPEG Version Check

1) Play Disc or USB
2) Eject(Open) Disc , Push the Remote Controller "MENU" button.
3) Push the number '8', '9', '5' in order, and push 'Enter' button.
4) Check the display or OSD

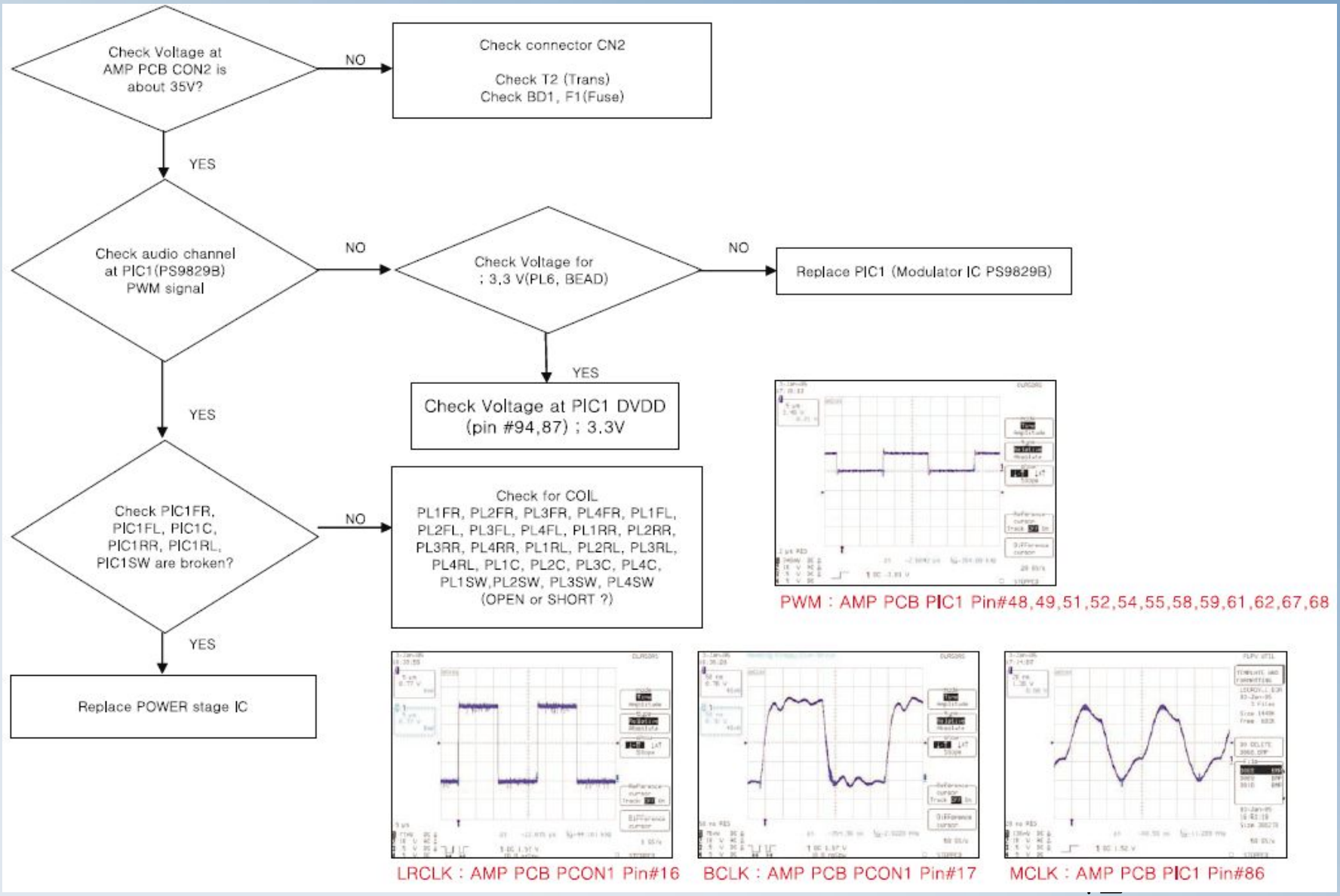
. DVD flash initialize & Update method

1) Prepare HEX file at DISC or USB Memory
2) Insert Disc or USB Memory, and play. 'Updating' will be displayed. Set will be power off □ on
3) The disc is automatically ejected. (If you use USB memory, detach USB memory)
4) During "No Disc" Displayed, push the stop button 5 seconds. After displayed 'INITIALIZE' power off
5) Finished

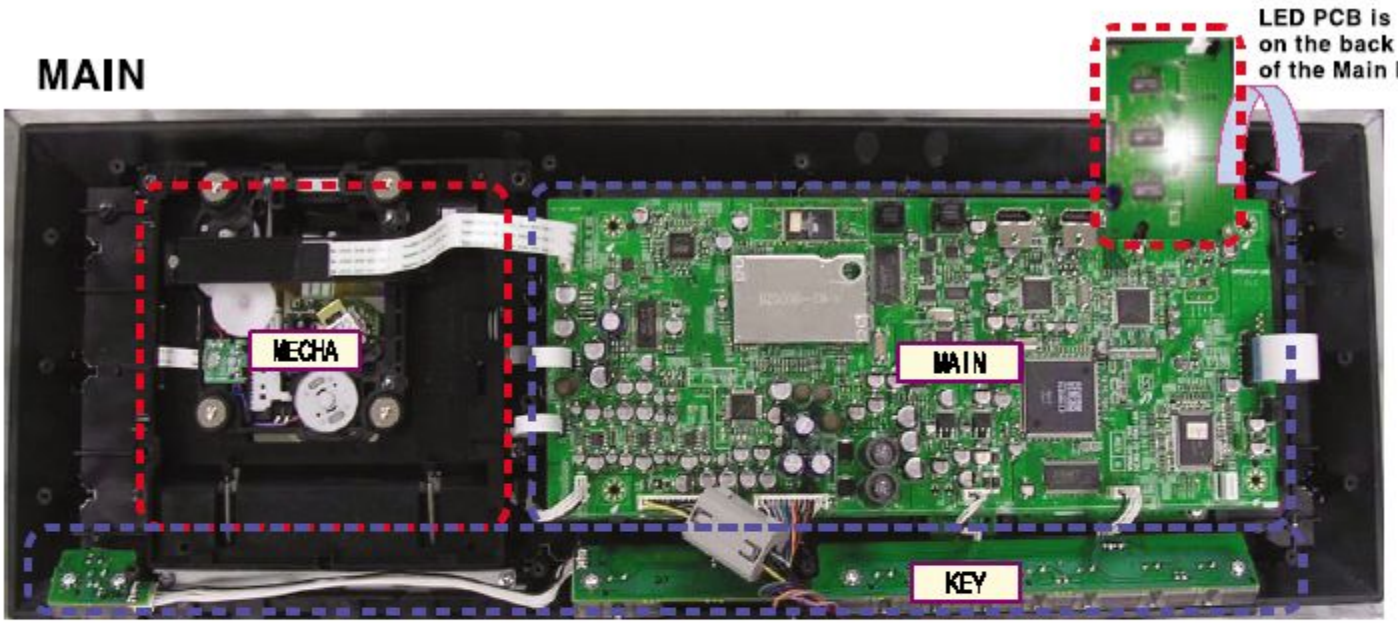
1 . Main


UIC1
Micom 5V Main PCB: pin
#14,40,55,89
NO
POWER CONNECTOR
UDIN1,UDIN2 CHECK
NO
POWER PCB
(SMPS)
Wire CN2,CN3CHECK
NO
Check for Circuit at SMPS PCB
; Fuse(F1),Q1,Q2,Q3,Q4
YES
Replace UDIN1,UDIN2 Connector
YES
Replace CN2,CN3 Wire
YES
Check for
POWER-SENSE(5V)
at Main PCB
;pin #48 of UIC1
NO
Check VOLTAGE at
SYSTEM CABLE #9
P-SENSE
YES
Check SMPS 5V LINE CN3 #14
YES
When POWER ON, Check
for HIGH Voltage LED 5V at
UCON1 ; pin#12, #13
NO
CHECK UDIN1 : pin#7 LED 5V
YES
Check for LED Controller IC
LIC 1 ~3 #9,25
NO
Check for Circuit at SMPS PCB
-.CN3 +5V
YES
Check for connector / Wire from Main
PCB
to LED PCB ; UCON1,FCN4,Flat Cable

2 . Output


Check Voltage at AMP PCB CON2 is about 35V?
NO
Check connector CN2
Check T2 (Trans)
Check BD1, F1(Fuse)
YES
Check audio channel at PIC1(PS9829B) PWM signal
NO
Check Voltage for ; 3,3 V(PL6, BEAD)
NO
Replace PIC1 (Modulator IC PS9829B)
YES
Check Voltage at PIC1 DVDD (pin #94,87) ; 3.3V
YES
Check PIC1FR, PIC1FL, PIC1C, PIC1RR, PIC1RL, PIC1SW are broken?
NO
Check for COIL PL1FR, PL2FR, PL3FR, PL4FR, PL1FL, PL2FL, PL3FL, PL4FL, PL1RR, PL2RR, PL3RR, PL4RR, PL1RL, PL2RL, PL3RL, PL4RL, PL1C, PL2C, PL3C, PL4C, PL1SW,PL2SW, PL3SW, PL4SW (OPEN or SHORT ?)
YES
Replace POWER stage IC
PWM : AMP PCB PIC1 Pin#48,49,51,52,54,55,58,59,61,62,67,68
LRCLK : AMP PCB PCON1 Pin#16
BCLK : AMP PCB PCON1 Pin#17
MCLK : AMP PCB PIC1 Pin#86

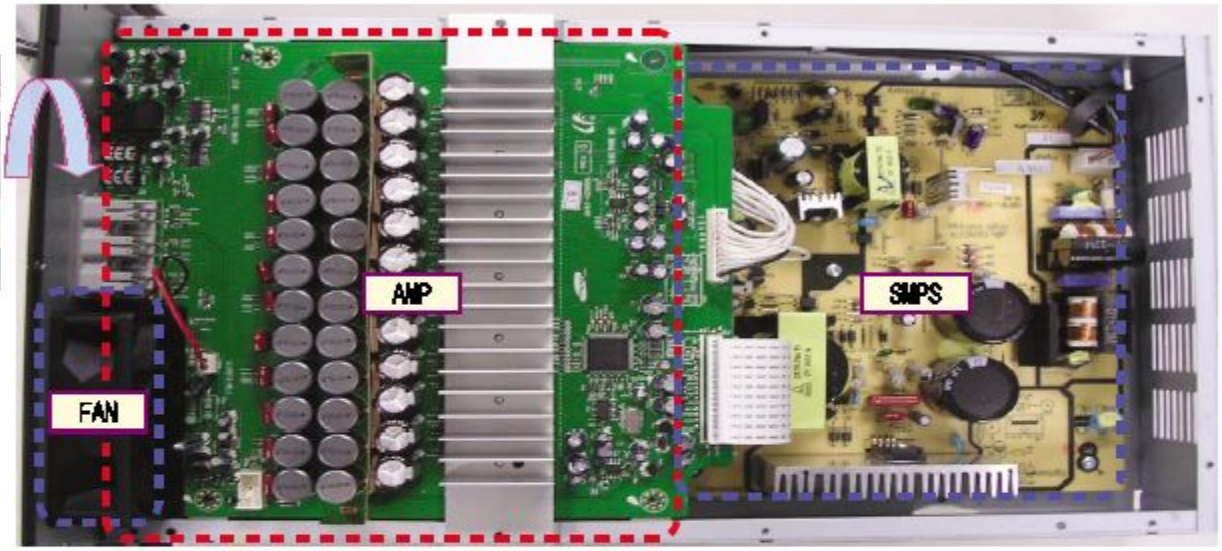
3 . Circuit Board Layout and Functions



Block	Function Description
MECHA	DVD / CD SLOT IN TYPE MECHA
MAIN	Main PCB including Main Micom, MPEG IC and HDMI IC.
KEY	Key PCB for Power, Function and General Operation Keys
LCD	Located at the bottom of Main PCB including LED circuit for front panel display.

SUB WOOFER

The Jack PCB is on the back of the Amp PCB.



Block	Function Description
AMP	Amp PCB including modulator IC and amplifier IC for 1100W output.
FAN	Fan circuit for cooling internal unit temperature.
JACK	Jack PCB including the circuit for communication with Main Micom as well as the DSP, the Video, the Audio and the Wireless Ready circuits.
SMPS	SMPS PCB that receives AC 220V and supplies power to the circuit blocks.

4 . Troubleshooting when Protection is activated

▣ Finding the PBA that is causing Protection to be activated

1. Protection Conditions
   1) When the SMPS PVDD (CN2) voltage is not equal to normal (34V)
      (You need to check the PCON2 of the Amp in the same manner.)
   2) When the Power Stage is over-current (Over-output and SPK short)
   3) When the Power Stage temperature is equal to or higher than 150°C (Thermal Protection)
   4) When the secondary side voltage terminal is abnormal; the circuit is short or open.

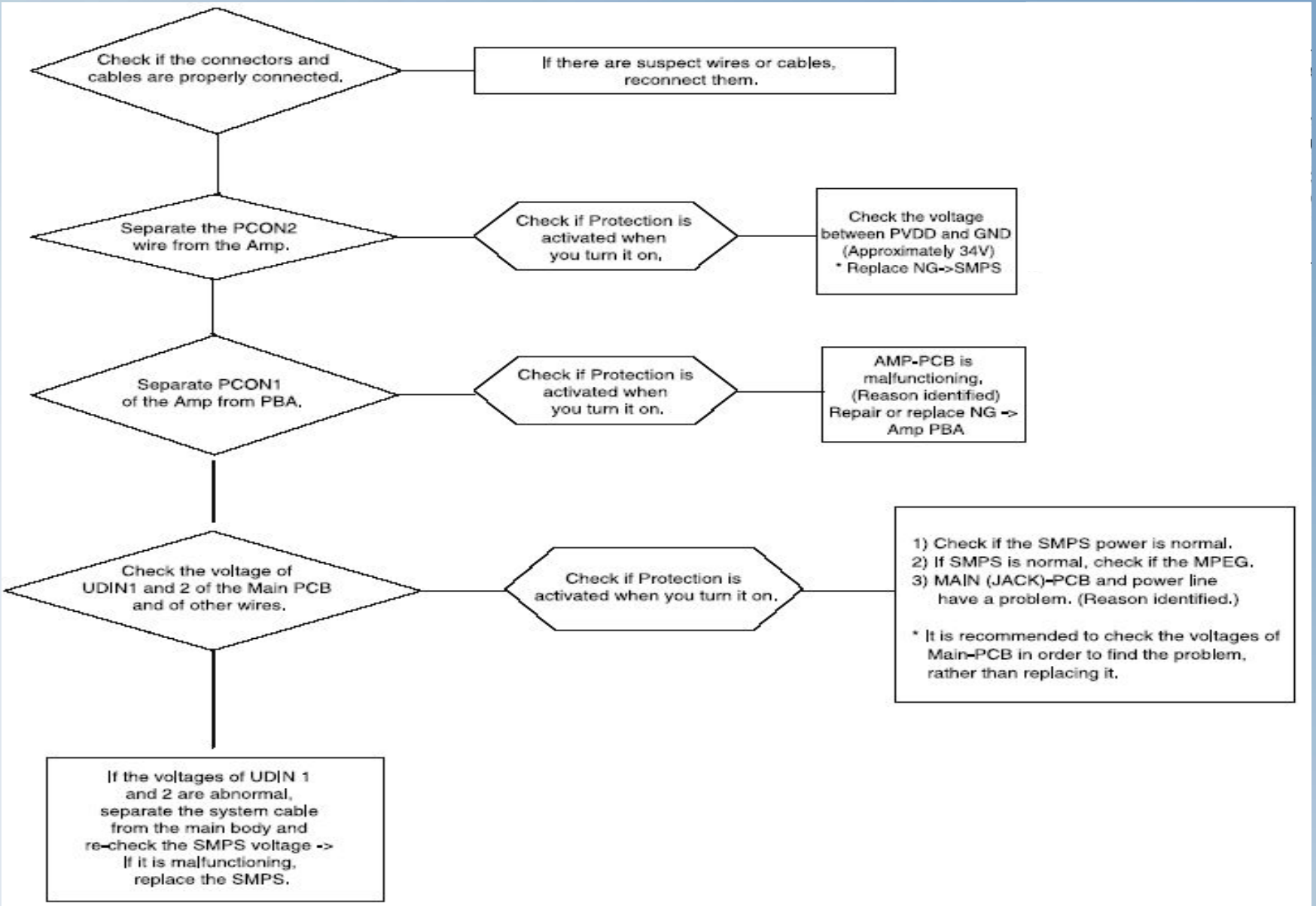
2. Finding the Protection Point
   1) You should first check that the Amp is working properly
      before disassembling the main body.
      (Do not plug the AC cord into the wall outlet) –
      Measure the resistance of the speaker jack.
   2) Finding it after disassembly

☞ Measure the resistance with a Tester.

◆ HT-TXQ120
Approximately 20kΩ for all channels
(Sub-woofer is not connected.)

※ The measured resistance is much smaller than the resistance given above when AMP-PCB is malfunctioning.

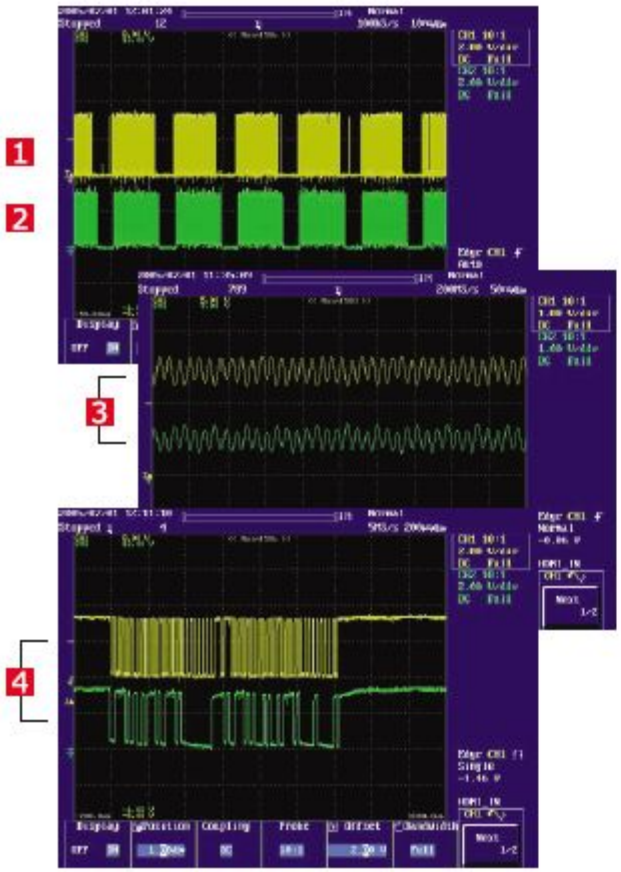
9. Troubleshooting

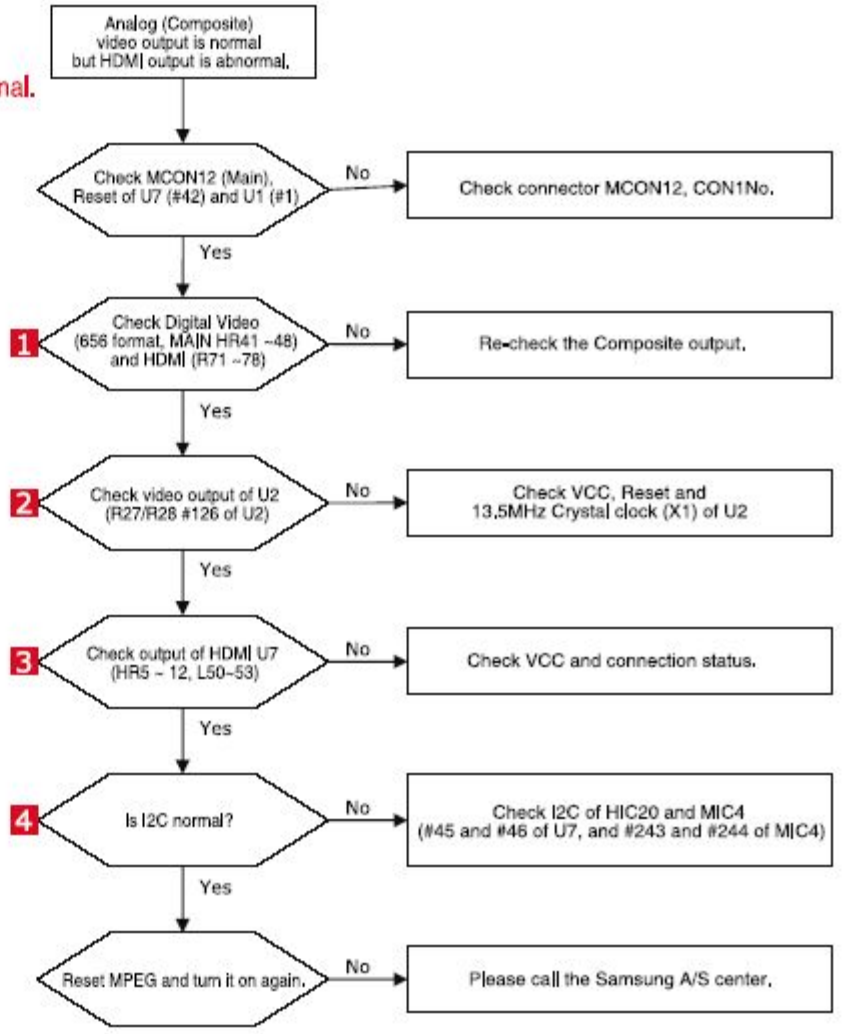


5 . Troubleshooting HDMI

◆ HDMI -"DVD" Mode

When analog output is normal but HDMI output is abnormal.
Troubleshooting Procedures





6 . Troubleshooting Main Set and Sub Woofer

HT-TXQ120's Main and Sub Woofer are controlled independently by their own Micom.
The Micoms communicate with each other and exchange video and audio data through the system cable.
Therefore you have to check the system cable connectivity before judging that there is a different problem.

1. Troubleshooting Main

1. The power is turned on but DVD play fails -> Check the MECHA.
2. The power is turned on but the LED is not lit (no action) -> Check the LED PCB.
3. The power is turned on but the HDMI input or output is abnormal -> Check the Main PCB.
4. The power is turned on but the Optical Audio input is abnormal -> Check the Main PCB.

2. Troubleshooting the Sub Woofer

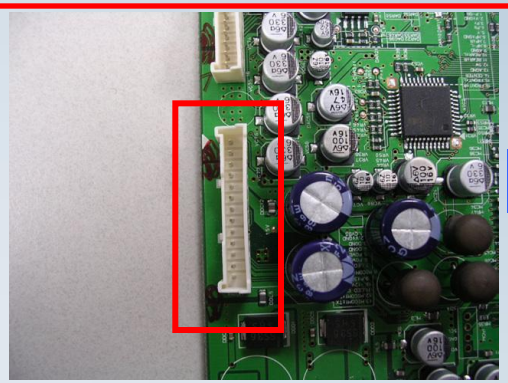
1. The power is turned on but you cannot hear any sound.
2. The power is turned on but the radio does not work properly in FM mode.
3. The power is turned on but the external input, Component output or Composite output is abnormal.
4. A wireless TX card has been inserted and communication has been reconfigured, but communication fails.
5. When the fan does not work properly -> Check the Amp PCB.
6. When the power is not turned on.

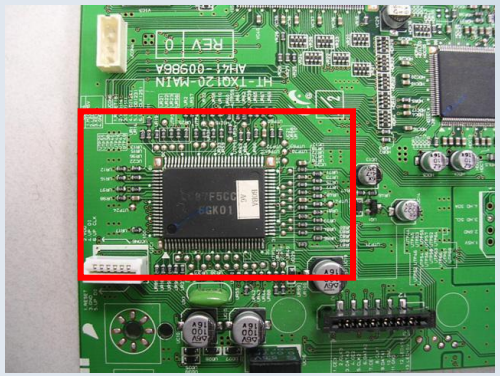
Before conducting the troubleshooting procedures above, reset the unit first.

7 . Communication Failure

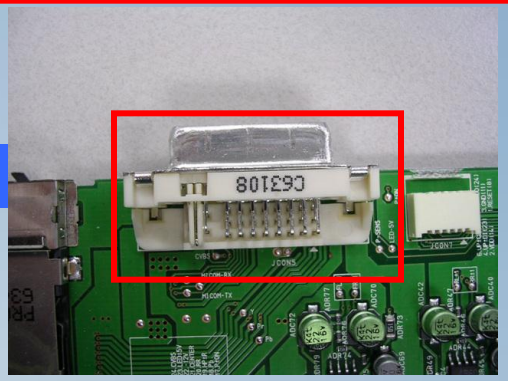
	Sympton	Cause	Check Point
1	MAIN Working / No Sound	MICOM-MICOM Communication Line open or short	1.SET Reset (MICOM Initialization & Update Page) 2.Check Bellow Points

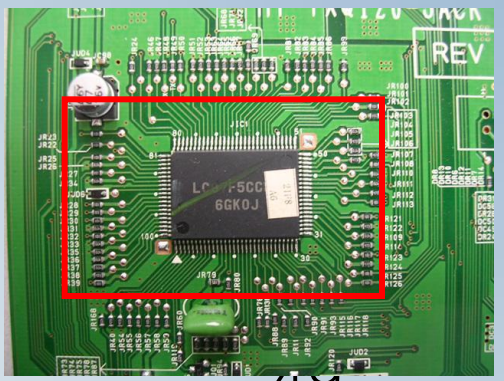
MAIN PCB





JACK PCB





Pin #12,#13 **Pin #7,#8**

TX/RX

TXD: #75
RXD: #76

TXD: #75
RXD: #76

	Symptom	Cause	Check Point
2	SET is not working.	Reset Line problem	Reset Line (MICOM#79,MPEG#252)

SYSTEM RESET

MICOM PART

MAIN PCB

JACK PCB

RESET Insecure : It should be 3V after power ON

8 . Troubleshooting when a Fan Error Occurs

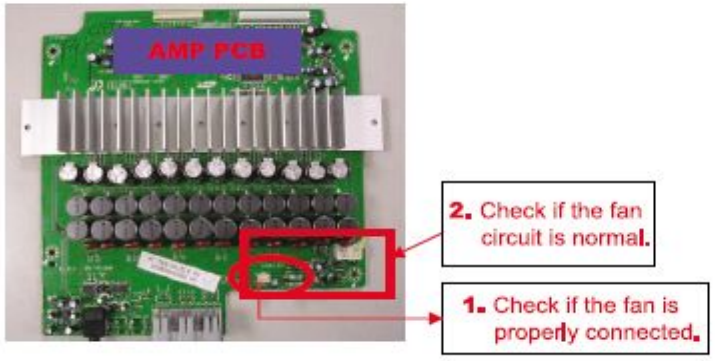
HT-TXQ120's sub-woofer has a built-in fan for temperature control.
The fan automatically operates in about 30 seconds since the power-on sound.
If it fails to start, the power is automatically turned off to protect the internal circuitry after displaying the "FAN CHK" message 7 times.

1. Symptom

1. The "FAN CHK" message appears on the display and the power is automatically turned off in approximately 1 minute.

2. Countermeasures

1. Check if the fan connector is properly connected -> PCON3 of the Amp PCB.
2. Check if there are any alien substances in the fan.
3. Check the circuit around the fan
(Check if there is a short or open circuit related to the fan on the Amp PCB.)
4. If the "FAN CHK" message appears even though the fan is working,
check the fan circuit of the Amp PCB and replace the Amp PCB if necessary.
-> The software of products manufactured in 2006 has been improved so that the fan circuit is checked 7 times at 30 second interval before the power is forcibly turned off.
(This prevents the possibility of malfunction.)



10. HT-TXQ120 Block / Schematic Diagram

BLOCK Diagram

BLOCK DIAGRAM

MAIN SET

- MAIN MICOM
- MAIN RF
- MAIN VIDEO
- FRONT
- MAIN MPEG
- MAIN HDMI
- DISPLAY LED
- DAC Schematic

SUB WOOFER SET

- JACK ADC
- AMP
- JACK DSP
- AMP SUB
- JACK MICOM

*** CLICK each of the PDF document.**