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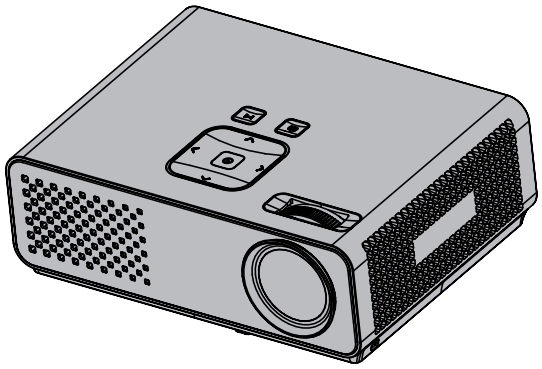
DLP PROJECTOR
SERVICE MANUAL

CHASSIS : FM12A

MODEL : HW300Y HW300Y-JE

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67213602(1105-REV00) Printed in Korea

CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Replacement Parts List.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An Isolation Transformer should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitary that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this monitor is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

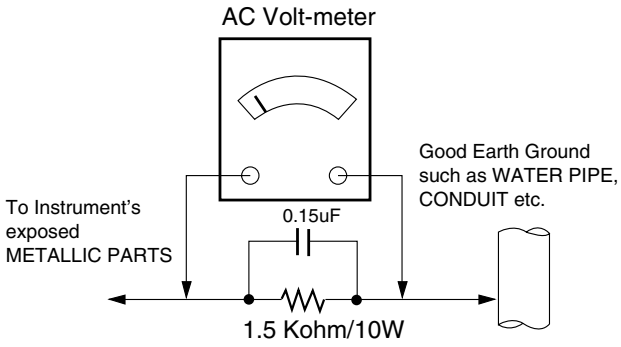
Keep wires away from high voltage or high temperature parts.

Due to high vacuum and large surface area of picture tube, extreme care should be used in handling the Picture Tube. Do not lift the Picture tube by it's Neck.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on positioin, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.
Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each esposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 3.5mA.
In case any measurement is out of the limits sepcified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied all of the DLP Projector FM12A chassis.

2. Requirement for Test

***** Each part is tested as below without special appointment.

(1) Temperature : 25 ºC ± 5 ºC, CST : 40 ºC ± 2 ºC
(2) Relative Humidity : 65 % ± 10 %
(3) Power Voltage : Standard input voltage (100 V - 240 V @ 50 Hz / 60 Hz)
* Standard Voltage of each products is marked by models.
(4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
(5) The receiver must be operated for about 30 minutes prior to the adjustment.

3. Test method

(1) Performance: LGE TV test method followed
(2) Required other specification
- Safety : UL, CSA, IEC, CE specification(EN55022 Class B)
- EMC : FCC, ICES, IEC, CE specification(EN60950-1)

4. General Specification

No.	Item	Specification			Remark
		Min	Max	Unit	3.579545 / 60 Hz
1.	Video input applicable system	1) NTSC M			
2.	Power	Adapter - DC 19.5 V @ 5.64 A (110 W)			
3.	Input Voltage	AC 100 V ~ 240 (± 10 %) V, 50 Hz / 60 Hz			
4.	Market	North America			
5.	Picture size	WXGA (1280 x 800)			
6.	Aspect ratio	16:10			
7.	Operating Temperature	0	40	deg	
8.	Operating Humidity		80	%	
9.	Storage Temperature	-20	60	deg	
10.	Storage Humidity		85	%	

ADJUSTMENT INSTRUCTION

1. Application Object

This instruction is for the application to the DLP Projector (Chassis: FM12A).

2. Notes

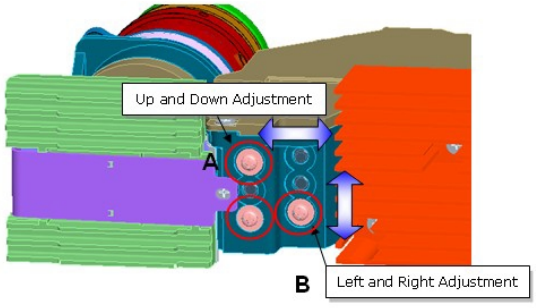
(1) The power source insulation of this DLP Projector is not charging type and you may not use the transformer for insulation. It is advised to use an insulation transform between the power supply cable and power input of the set to protect the test equipment.
(2) The adjustment must be performed under the correct sequence. But, it can be changed within the error boundary of performance, considering the mass productivity.
(3) The adjustment must be performed in the circumstance of 25 °C ± 5 °C of temperature and 65 % ± 10 % of relative humidity.
(4) For the adjustment, the receptor's input voltage shall be maintained at 220 V, 60 Hz.
(5) The set must be on for 5 minutes prior to any adjustment. After receiving possible 100 % White Pattern, it is ready for adjustment. If it is inevitable, it can be regardless of the signal.

3. Composition of Adjustment Mode

(1) Select Default Mode for input source.
(2) The adjustment mode can be entered by pressing ADJ key of the adjustment remote controller, and it also exits by pressing EXIT key.
(3) Preparation for Adjustment
(4) Power is connected in set to be power on.
(5) Do heat run 5minutes.

4. Folding Mirror Adjustment

4-1. Illuminator Adjustment Sequence

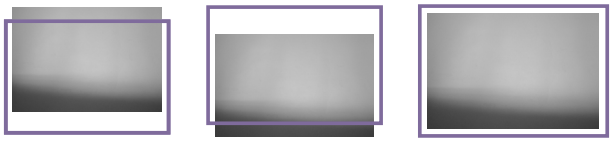


(Fig. 4-1) Check location of the bottom side of the folding mirror

- After putting the optical engine on the jig, check whether the mirror part is fixated vertically. At this time the screen size should be based on 40". With the screen in full white condition, look at the change in screen and brightness of the illuminator to make appropriate adjustments.
- During the adjustment of the lights, adjust for the screws at the three locations to be fully tight. After they were adjusted, if they became loose and changed, tighten the screws at the three locations and complete the adjustment of the lights when they are tightened to the maximum.

(1) Up and Down Adjustment
- Before the adjustment, first adjust the screws to be adequately tightened.

1) Turn screw (A) up / down adjustment to the right and mark where the image is aligned.
2) Turn screw (A) up / down adjustment to the left and mark where the image is aligned.
3) Turn screw (A) up / down adjustment to the right / left and mark where the image is aligned. Fix the adjustment screw in position.



Step 1 Step 2 Step 3

(Fig. 4-1-1) Illuminator Up / Down Adjustment Sequence

(2) Left and Right Adjustment 1
- Before the adjustment, first adjust the screws to be adequately tightened.

1) Turn screw (B)Left / Right adjustment to the right and mark where the image is aligned.
2) Turn screw (B) Left / Right adjustment to the left and mark where the image is aligned.
3) Turn screw (B)Left / Right adjustment to the right / left and mark where the image is aligned. Fix the adjustment screw in position.

Step 1 Step 2 Step 3

(Fig. 4-1-2) Illuminator Left/Right Adjustment Sequence 1

(3) Left and Right Adjustment 2
- Before the adjustment, first adjust the screws to be adequately tightened.

1) Turn screw (C)up / down adjustment to the right and mark where the image is aligned.
2) Turn screw (C) up / down adjustment to the left and mark where the image is aligned.
3) Turn screw (C)up / down adjustment to the right / left and mark where the image is aligned. Fix the adjustment screw in position.

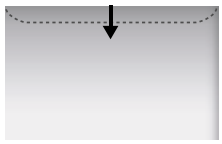
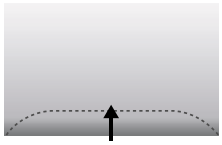
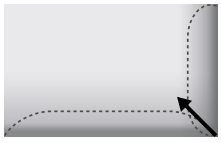
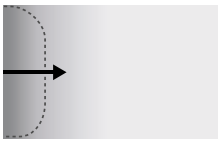
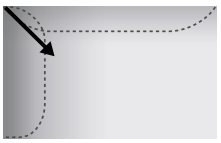
Step 1 Step 2 Step 3

(Fig. 4-1-3) Illuminator Left/Right Adjustment Sequence 2

(4) Final Adjustment

Repeat the adjustments of 1), 2), and 3) 2 times, and verify with a driver if the lights are adjusted in the direction of the screws being tightened to the maximum. Also, find the optimal position of the lights and visually verify if there is any part missing the light system, find the light position with the highest brightness of the light system, measure the brightness of the light system(CL-200), and fix the adjustment screws of the light system after foreign object inspection, focus line width(measurement category: refer to the picture) inspection, and Focus Stopper position inspection.

4-2. Illuminator Phenomenon Adjustment

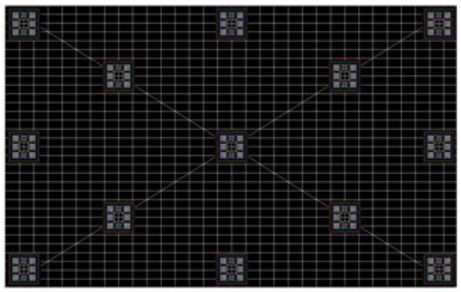
Adjustment part	Screw direction	Screen state		Description
		Initial state	State after adjusting	
Up/down screw A	Right (tighten direction)			At first, upside illuminator goes down and right illuminator also goes down in detail.
	Left (loosen direction)			At first, downside illuminator goes down and left illuminator also goes down.
left/right screw B	Right (tighten direction)			At first, left illuminator goes down and downside illuminator also goes down.
	Left (loosen direction)			At first, right illuminator goes down and upside illuminator also goes down.
left/right screw C	Right (tighten direction)			At first, left illuminator goes down and downside illuminator also goes down.
	Left (loosen direction)			At first, right illuminator goes down and upside illuminator also goes down.

4-3. Focus test method and subject

- Test pattern : Resolution Pattern , White Cross-Hatch Pattern
- Tools : Focus width measurement ruler

(1) Focus adjustment method

1) Set the projection distance of Engine as 1200 mm (40 Inch screen).
2) Pop up the Resolution Pattern among the Test Patterns of Set, and fix the Focus on the part where the Resolution Pattern is classified on each part of screen. (all parts Balancing)
3) Popup the White Cross-Hatch Pattern and measure the width of each Point.
4) Focus judging standard : 3.5 mm or less

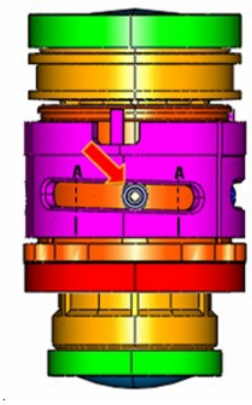


(Fig. 4-3) Resolution Pattern

4-4. Focus Stopper Location Verification (Verification corresponding to screen inch)

(1) Test pattern : White cross-hatch
(2) Visually verify focus after locating a white board 586 mm from the projection lens so that screen is set to 20 inches.
(3) Inspect the location of the stopper after locating a white board 1200 mm from the projection lens so that screen is set to 40 inches
(4) Evaluation criteria for stopper location

Non-defective : Bushing shall be located within A marking.(Fig. 4-4)



(Fig. 4-4) Bushing verification location

5. Caution for DMD (Digital Micro-mirror Device)

5-1. Caution for DMD ESD

(1) Connector the grounding to prevent a damage of ESD (Electrostatic Discharge) when handing the DMD.
(2) Wear a wrist strap to connect the ESD grounding in flesh necessarily.
(3) Connect the ESD ground to workstation and an electric conductor.
(4) Save the DMD after getting rid of a static electricity. Keep it at an exclusive case when moving it When grounding, open the case.
(5) Put on gloves for preventing static electricity.
(6) All work is done at static free location. Attach the tape or remove a dust on the DMD front or DMD back pin

5-2. Caution for DMD Clean

(1) Follow the procedure and caution to prevent the screen from being scratched.
(2) When DMD glass stains with dust, polish the front and back DMD glass with soft cloth. Then, do it again after rotating 180 degree the DMD. If necessary, keep under observation.
(3) Don't clean the DMD with the high pressure. The static electricity and pressure will damage the DMD.

* Attachment)TI Reference :
DMD Handling Specification, DMD Cleaning

6. EDID Data Download

6-1. Used Device

Adjustment remote control

6-2. Adjustment Method

(1) Enter to adjustment mode with selecting "ADJ" on remote control.
(2) Enter to "0. PCM EDID D/L". with pressing right direction key to get in EDID Download adjustment menu (Fig. 6-2-1)
(3) Select "START"
(4) When adjustment is completed, check RGB "OK(PCM)", HDMI1 "0K(PCM)". (Fig. 6-2-2)
When it fails, Reset and check by trying the (3) process again.
(5) To exit, press "ADJ" or "EXIT" of the adjustment remote controller again to exit.
(6) To verify the adjustment result, enter PCM EDID D/L or IN-START and verify.

(Fig.6-2-1) Adjustment Menu when ADJ is selected (Left)
(Fig.6-2-2) Selection Category on ADJ Adjustment Menu (Right)

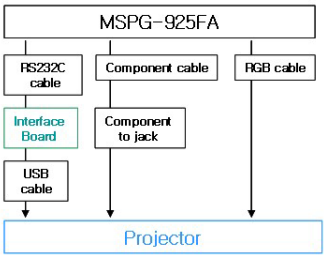
7. ADC Adjustment

7-1. Used Device

- Adjustment remote control
- Master equipment - MSPG-925FA
- RS232C Interface Board 1EA, RS232C Cable 1EA, USB Cable 1EA, component cable 1EA, component to jack cable 1EA, RGB PC cable 1EA

7-2. Adjustment Method

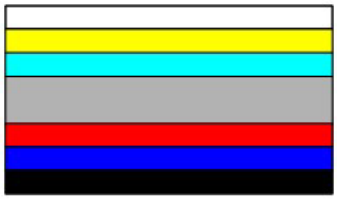
- The installation for the adjustment is as follows. Before the adjustment, compose the remaining connections except USB cable.



(Fig. 7-2-1) Device Setting Diagram

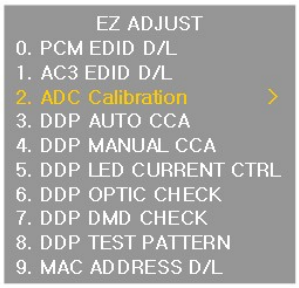
- Adjust Spec.

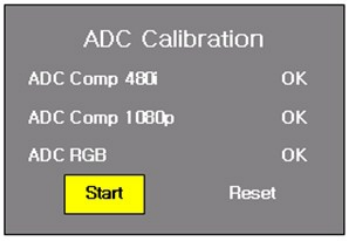
	Pattern No.	Mode No.	Resolution
ADC Comp 480i	65	209	720*480/60i
ADC Comp 1080p		225	1920*1080/60p
ADC RGB		126	1920*1080/60p



(Fig. 7-2-2) Pattern No. 65 Image

(1) Enter to adjustment mode with selecting “ADJ” on remote control.
(2) Enter to “2. ADC CALIBRATION” with pressing right direction key to get in ADC adjustment menu
(3) Connect USB cable to the Projector. (Fig. 7-2-1)
(4) Select “START” . (Fig. 7-2-4)
(5) When the adjustment is completed, Success message is displayed, and if it fails, Fail message is displayed.
(6) While Success message is displayed, release the connection of USB cable, and press “OK” or “EXIT” to make the message disappear.
(7) When exiting from Fig. 7-2-4 state, press “ADJ” or “EXIT” of the adjustment remote controller again to exit.
(8) To verify the adjustment result, enter ADC Calibration or IN-START and verify.(Fig. 7-2-3, Fig. 7-2-4)





(Fig. 7-2-3) Adjustment Menu when ADJ is selected (Left)
(Fig. 7-2-4) Selection Category on ADJ Adjustment Menu (Right)

8. MAC Address Download

8-1. Used Device

- Adjustment remote control
- Play file: keydownload.exe
- Interface Board 1EA, RS232C cable USB Cable 1EA,

8-2. Adjustment Setting

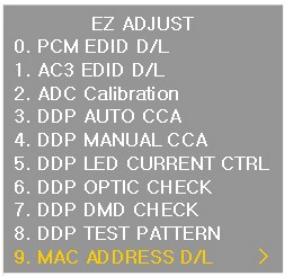
(1) Connect PC and Interface Board with RS232C Cable, and connect to the Set using USB Cable. (Fig. 8-3-1)
(2) Activate Play file:keydownload.exe, and select “MAC_Only” for “INI File NAME” (Fig. 8-3-2, Fig. 8-3-3)

8-3. Adjustment Method

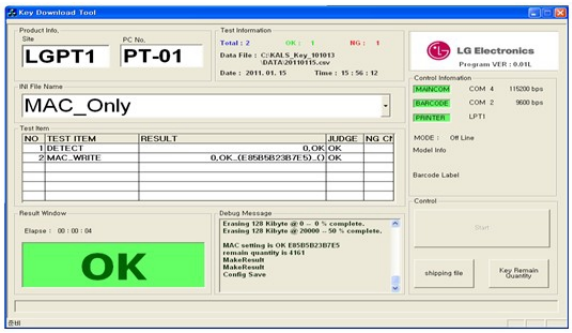
(1) Select “ADJ”of the adjustment remote controller to enter adjustment mode.
(2) Press right direction key of “9. Mac ADDRESS D/L” to enter Mac Address D/L state.
(3) In Fig.6.5 state, click ENTER key of PC.
(4) When the adjustment is completed, OK message is displayed, and if it fails, NG message is displayed. (Fig. 8-3-6)
(5) To exit, press “ADJ” or “EXIT” of the adjustment remote controller again to exit.
(6) To verify the adjustment result, enter IN-START, and verify. (Fig. 9-2)

(Fig. 8-3-1) Device Setting Diagram

(Fig. 8-3-2) Play file: keydownload.exe icon(Left)
(Fig. 8-3-3) Play file: keydownload.exe(Right)



(Fig. 8-3-4) Adjustment Menu when ADJ is selected (Left)
(Fig. 8-3-5) Setting Screen on Mac Address D/L (Right)



(Fig. 8-3-6) Mac Address Download Completed Screen

<Final Assembly Adjustment>
- Enter Power Only Mode

(1) After assembling the SET, during the start of post process, DC on the SET. (use keypad or remote controller)

(2) Press ' P-ONLY ' key of the adjustment remote controller to enter ' Power Only ' mode.
(Full White Screen is displayed)

(3) To enter the next adjustment, press ' EXIT ' key of the remote controller to exit Full white screen, and proceed with the adjustment.

9. EDID/ADC/MAC ADDRESS Verification Adjustments

9-1. Used Device

- Adjustment Remote Controller

9-2. EDID, ADC, MAC Address verification Methode

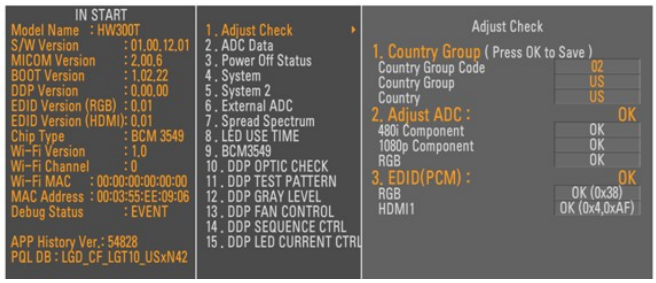
(1) Select " IN-START " of the adjustment remote controller.
(Input ' 0413 ' for password)

(2) Verify RGB " OK " and HDMI1 " 0K " in " 1.Adjust Check " →." 3.EDID(PCM) " category. (Fig.7.1)

(3) Verify ADC Comp 480i " OK ", ADC Comp 1080p " 0K ", and ADC RGB " 0K " in " 1.Adjust Check " →. " 2.Adjust ADC " category

(4) " 1.Adjust Check " → Verify MAC Address downloaded at the bottom left

(5) To exit, press " IN-START " or " EXIT " of the adjustment remote controller again to exit.



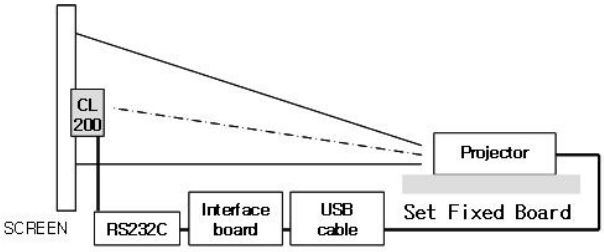
(Fig. 9-2) Adjustment Menu when IN-START is selected

10. White Balance Adjustment

10-1. Used Device

(1) Illuminometer (Model : CL-200) 1EA : Chromaticity measurement from projection screen center
(2) Remote control 1EA
(3) CL200 and SET connection Interface Board 1EA
(4) CL200 Uart Communication Cable 1EA

10-2. Equipment Composition

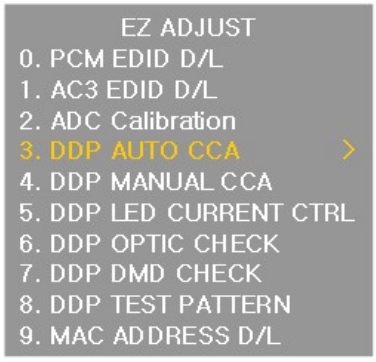


10-3. Adjustment

* Carry out a heat run on the set for 5 minutes before adjustment

(1) Connect as in the equipment composition diagram then enter into adjustment mode by selecting "ADJ" on the remote control.

(2) Execute adjustment by pressing the right direction key on "3. DDP AUTO CCA" (Fig. 10-3-1)



(Fig. 10-3-1) Selection Category on ADJ Adjustment Menu

(3) Message as shown below can be verified after completion of adjustment, and readjust following the (2)(3) step if "Fail" occurs.

"OK" : White Balance Process Successful and Warm, Cool chromaticity diagram is within the target.

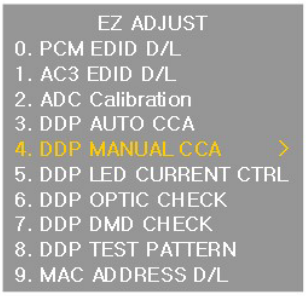
"Fail" : White Balance Process Failure -> Execute readjustment.

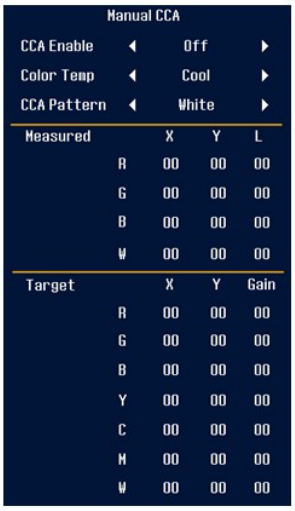
"Warm Fail" : White Balance Process Successful and Warm chromaticity diagram deviated more than 0.005 from the target.

"Cool Fail" : White Balance Process Successful and Cool chromaticity diagram deviated more than 0.005 from the target.

"Warm and Cool Fail" : White Balance Process Successful, and both Warm can Cool chromaticity diagrams deviated more than 0.005 from the target.

(4) For verification of White Balance adjustment results, press ADJ Key and enter "4. DDP Manual CCA". (Fig. 10-3-2)





(Fig. 10-3-2) Selection Category on INSTART Menu (Left)
(Fig. 10-3-3) Menu after entering Manual CCA (Right)

(5) Read the coordinate of CL200 changing the Color Temp Mode to Medium, COOL, Warm for checking the Spec of each mode.

- Warm Mode : x = 0.313 ± 0.004, y = 0.326 ± 0.004
- Cool Mode : x = 0.283 ± 0.004, y = 0.297 ± 0.004

- If it goes over the deviation boundary with the value of 0.005, it has no problem. During Auto CCA, it becomes OK only when it comes within the above deviation boundary. Afterwards, if it goes out of the boundary a little bit when it is checked with a manual CCA, it can be judged as a deviation due to meter/environment. (Only for Warm Mode and Cool Mode)

11. Brightness Inspection

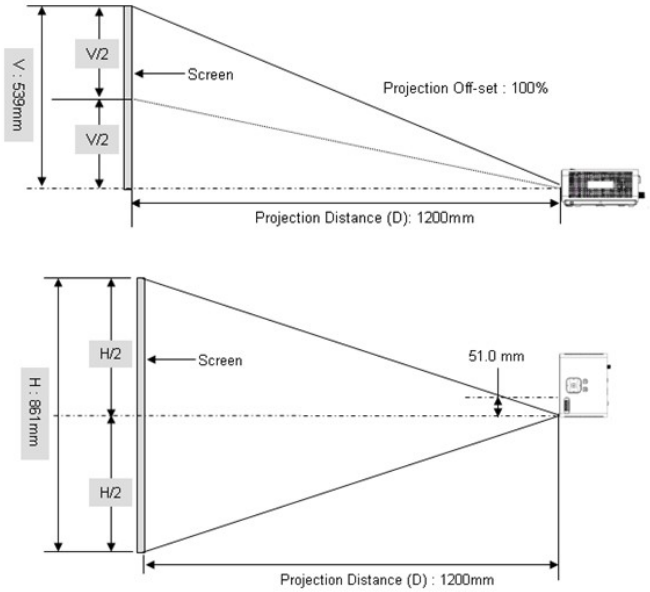
- Measure the subjects below and it should satisfy the spec of product specification.

(1) Brightness(Annsi-Lumen)
(2) Whiteness color coordinate(KAGA measures R,G,B color coordinate)
(3) Color Uniformity
(4) Brightness Uniformity

11-1. Preparation for Adjustment and Device Composition

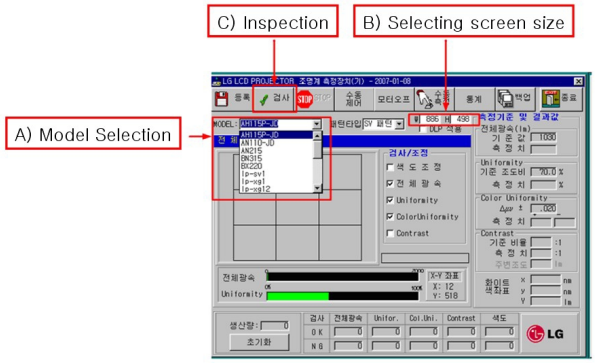
(1) Adjustment Preparation
1) Input source: Default (No need to designate Source)
2) The order of operating the adjustment remote controller buttons
- IN-STAR -> 4. DDP OPTIC CHECK -> Select Full White.

(2) Brightness Measurement Screen Setting



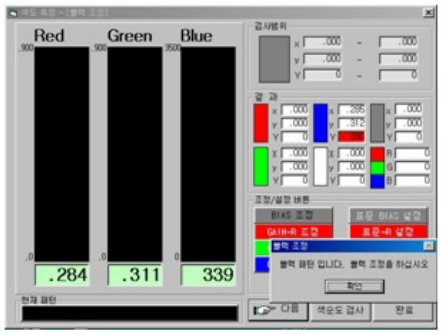
(Fig. 11-1-1)
Brightness Measurement Screen Setting Composition

(3) Projector Brightness Measurement JIG Software Organization
1) Model Selection: HW300
2) Selecting screen size : W: 861 , H : 539

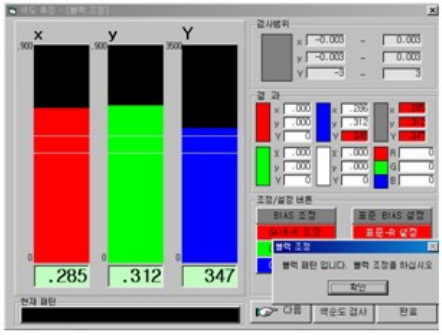


(Fig. 11-1-2)

3) Explanation of R, G, B Inspection and Method

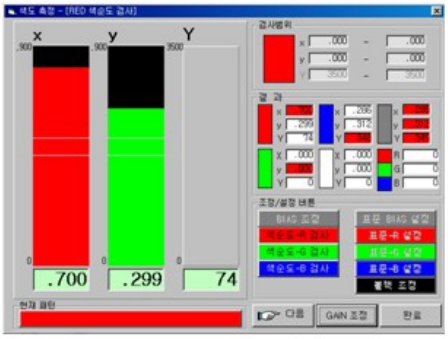


(Fig. 11-1-3)



(Fig. 11-1-4)

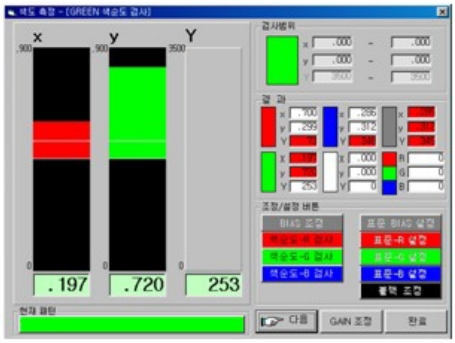
1. Press Black Adjustment Verification Button. (Fig. 11-1-3)
   - The left side of the screen changes from Red/ Green /Blue to Color Coordinate Table Measurement Screen (x.y.Y).
2. Press Color Purity Inspection Button. (Fig. 11-1-4)



(Fig. 11-1-5)

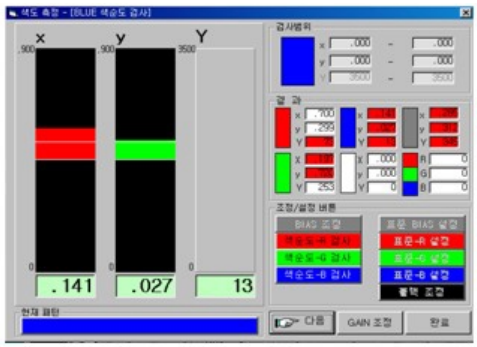
3. The screen (status indication line: Chromaticity Measurement- Red Color Purity Inspection) changes to Red Color Purity Inspection.
   - The color of the inspection boundary at top right of the screen changes to Red.
4. Press the direction key of the adjustment remote controller to change the video of the projector to Red Pattern.
   - After 2~3 seconds, Red Color Coordinate Table Data is transmitted from CL200.
   - In the Result Display Window at right center of the screen, the coordinate of the Red color and the brightness are displayed.

5. Press "Next" button on the screen.



(Fig. 11-1-6)

6. Screen (status indication line: Chromaticity Measurement- Green Color Purity Inspection) changes to Green Color Purity Inspection.
   - The color of the inspection boundary at top right of the screen changes to Green.
7. Press the direction key of the adjustment remote controller to change the video of the projector to Green Pattern.
   - After 2~3 seconds, Green Color Coordinate Table Data is transmitted from CL200.
   - In the Result Display Window at right center of the screen, the coordinate of the Green color and the brightness are displayed.
8. Press "Next" button on the screen.



(Fig. 11-1-7)

9. Screen (status indication line: Chromaticity Measurement- Blue Color Purity Inspection) changes to Blue Color Purity Inspection.
   - The color of the inspection boundary at top right of the screen changes to Blue.
10. Press the direction key of the adjustment remote controller to change the video of the projector to Blue Pattern.
    - After 2~3 seconds, Blue Color Coordinate Table Data is transmitted from CL200.
    - In the Result Display Window at right center of the screen, the coordinate of the Blue color and the brightness are displayed.
11. Press “Finish” button on the screen.

4) White Brightness Inspection:
   - Verify if it is at least HW300 Brightness Min Spec 210 ANSI lm.(Type : 255 ANSI-lm)

12. TV Performance Inspection

(1) Channel Scan
1) Connect the signal to RF Jack.
2) Select “TV” by pressing “Input” on the remote control
3) Inspect the channels by carrying out auto scan by selecting Menu-Channel-Auto Channel.
- Make sure to carry out AUTO SCAN on the first production set (Lot)

(2) Analog TV inspection
1) Connect the signal to RF Jack.
2) Select “TV” by pressing “Input” on the remote control.
3) Select CH2, CH4 by changing the channel using “CH+/CH-” on the remote control, then check the display status.

(3) Digital TV Inspection
1) Connect the signal to RF Jack.
2) Check the DTV reception status by selecting DTVCH 31-3

[Reference]

1. EDID Data

1) RGB : BLOCK 0

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	C7	36	01	01	01	01
10	01	15	01	03	68	73	41	78	0A	CF	30	A3	57	4C	B0	23
20	09	50	4E	21	08	00	81	C0	81	00	81	80	90	40	B3	00
30	71	40	01	01	01	01	9E	20	00	90	51	20	1F	30	48	80
40	36	00	90	3F	63	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	00	00	1E	21	39	90	30	62	1A
60	27	40	68	B0	36	00	C0	41	84	00	00	20	00	00	00	FC
70	00	4C	47	20	50	4A	54	52	0A	20	20	20	20	20	00	B8

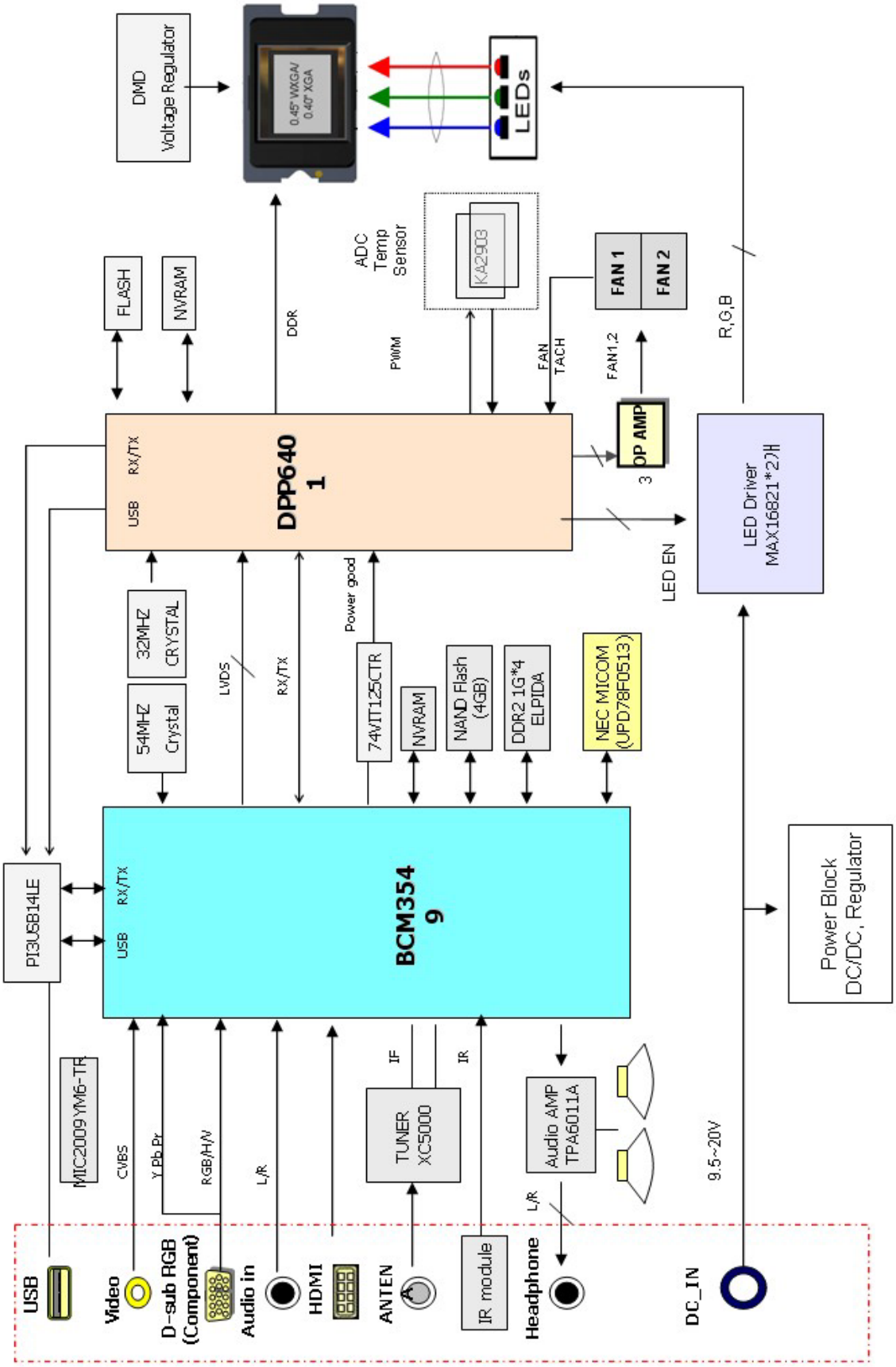
2) HDMI : BLOCK 0

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	C8	36	01	01	01	01
10	01	15	01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	21	08	00	81	C0	81	00	81	80	90	40	B3	00
30	71	40	01	01	01	01	9E	20	00	90	51	20	1F	30	48	80
40	36	00	90	3F	63	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	00	00	1E	21	39	90	30	62	1A
60	27	40	68	B0	36	00	C0	41	84	00	00	00	00	00	00	FC
70	00	4C	47	20	50	4A	54	52	0A	20	20	20	20	20	01	84

3) HDMI : BLOCK 1

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	10	22	20	05	84	03	02	23	09	07	07
10	67	03	0C	00	10	00	B8	2D	9E	20	00	90	51	20	1F	30
20	48	80	36	00	90	3F	63	00	00	1E	01	1D	80	18	71	1C
30	16	20	58	2C	25	00	7E	8A	42	00	00	9E	01	1D	00	72
40	51	D0	1E	20	6E	28	55	00	7E	8A	42	00	00	1E	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	7E	8A	42	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	7E	8A	42	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	AF

BLOCK DIAGRAM

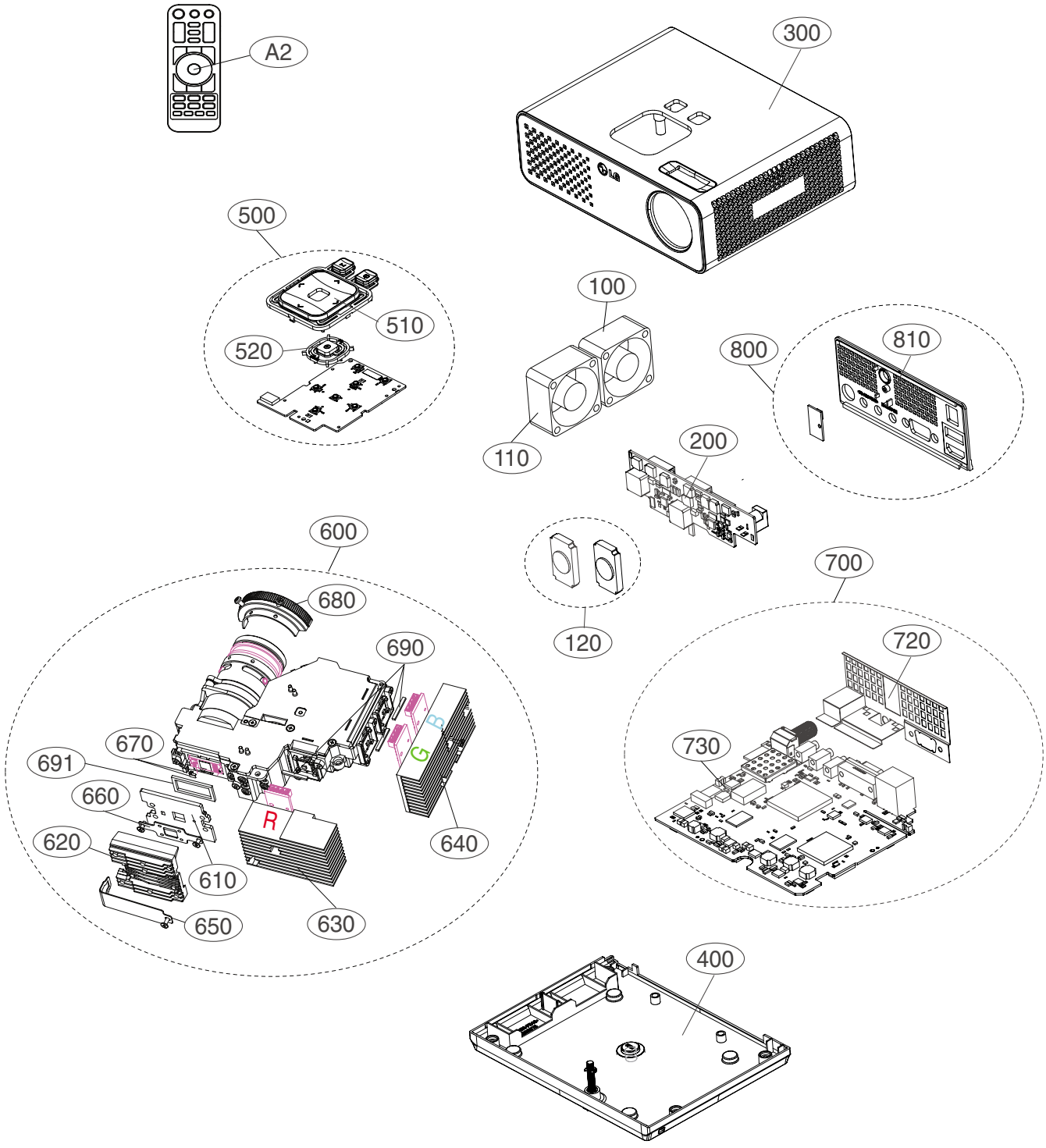


Pease refer to the work order standard for detail product disassembly / assembly.

EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



ATSC Tuner

845 OHM 1%

DO NOT CHANGE ORDER

NEED TO VERY CLOSE TO RF LINE
BECAUSE THIS POINT MAKE ATTENUATOR

Isolation & Impedance 75ohm

IC501
XC5000C
0xC8

TUNER2 I2C Address : 0xC8

Tuner Power

IC502 AZ1117D-3.3TRE1

IC503 AZ1117BM-1.8TRE1

AUDIO AMP

IC1500 74LVC1G126

IC1501 TPA6011A4PWPRG4

IC1502 CS4344-CZZR

IC1503 NLAS83157DFT2G

BCM3549 VIDEO

Close to BCM(for EMI)

IC900
LGE3549XS (LGE3549XS P22 , B2 version)

DEV
EAN60345904

HDMI INPUT

USB SWITCH

S1	S0	PATH
0	0	S6
0	1	DPP DEBUG
1	0	DPP UART(CCA)
1	1	BCM UART

IC1400 PI3USB14LE

USB BLOCK

placed as close to Connector as possible.
Capacitors on VBUSA should be

IC1401 MIC2009YMG-TR

When Low,
current limit

When High,
USB 5V out

RGB IN

Comp IN

A/V IN

Headphone OUT

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LG ELECTRONICS

MODEL		DATE	2010.09.01
BLOCK	GP2_BCM_ATSC	SHEET	

BCM3549 LVDS/AUDIO

IC900
LGE3549XS (LGE3549XS P22 , B2 version)
Place close to BCM

DEV

BCM LVDS

3rd Ovretone Crystal

RESET

BCM AUDIO

AUDIO INCM

Route INCM between associated left and right signals of same channel

The INCM trace ends at the same point where the connector ground connects to the board ground (thru-hole connector pin).

EJTAG

P8102
05004HR-20801S

#CAUTION
Location numer is mixed
100 & 1000

BCM3549 GPIO

#CAUTION
Location numer is mixed
600 & 900 & 1000

NVRAM

IC601
M24M01-HRMN6TP
A8'h
DEV

I2C MAP

* I2C_0: Tuner
* I2C_1: MICOM(52)
* I2C_2: FMT
* I2C_3: NVRAM(A8)/DPP6401 /

IC900
LGE3549XS (LGE3549XS P22 , B2 version)

DEV

IC901-*1
NAN008GW3B2CN6E
DEV
8G
EAN60694001
MAIN_FLASH_8G_NUMONYX

IC901-*2
TC58NVG2S3ETA00
DEV
4G
EAN60997701
MAIN_FLASH_4G_TOSHIBA

IC901-*3
K9F8G08U0M-PCB0
8G
MAIN_FLASH_8G_SAMSUNG

NAND FLASH MEMORY

IC901
NAND04GW3B2N6E
DEV
4G
EAN61009301
MAIN_FLASH_4G_NUMONYX

BCM3549 Boot Strap

Default Res. of all NAND pin is Pull-down

D3.3V

NAND_IO[0] : Flash Select (1)
0 : Boot From Serial Flash
1 : Boot From NAND Flash

NAND_IO[1] : NAND Block 0 Write (DNS)
0 : Enable Block 0 Write
1 : Disable Block 0 Write

NAND_IO[3:2] : NAND ECC (1, DNS)
00 : No ECC
01 : 1 ECC Bit
10 : 4 ECC Bit
11 : 8 ECC Bit

NAND_IO[4] : CPU Endian (0)
0 : Little Endian
1 : Big Endian

NAND_IO[6:5] : Xtal Bias Control (1, DNS)
00 : 1.2mA (Fundmental Recommand)
01 : 1.8mA
10 : 2.4mA (3rd over tune Recommand)
11 : 3.0mA

NAND_IO[7] : MIPS Frequency (DNS)
0 : 405MHz
1 : 378MHz

NAND_ALE : I2C Level (DNS)
0 : 3.3V Switching
1 : 5V Switching

NAND_CLE
0 : Enable D2CDIFF AC (DNS)
1 : Disabe D2CDIFF AC

EEPROM for Micom
IC18100
M24C16-WMN6T

IC8101
UPD78F0513AGA-GAM-AX
S/W ASSY

10Mhz Crystal

Key Control

To IR B/D

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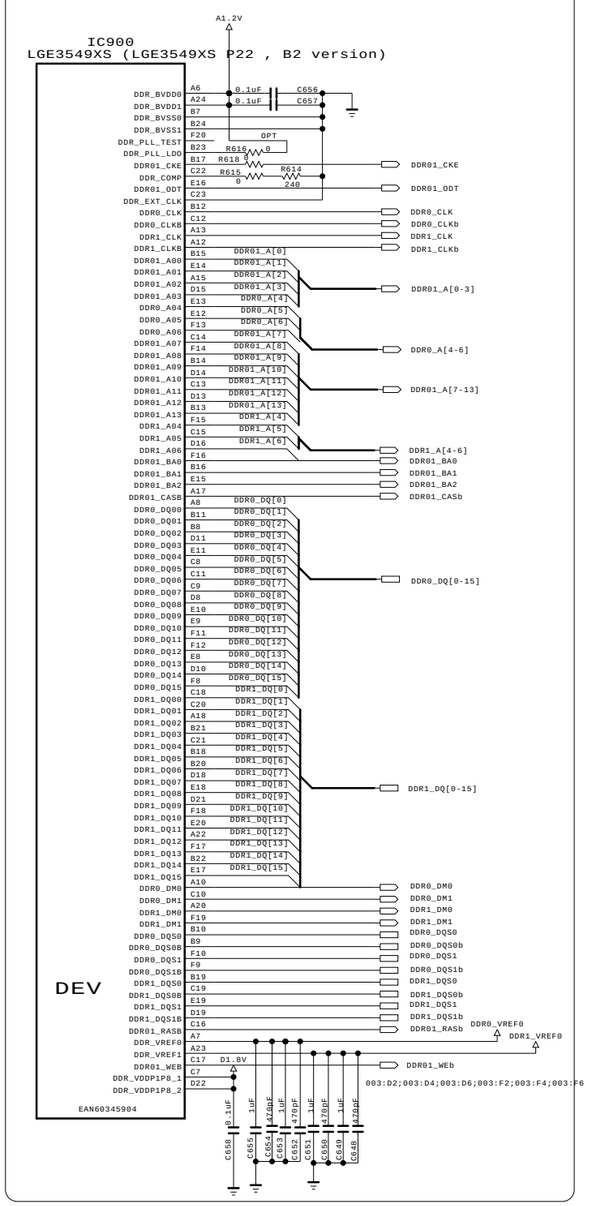
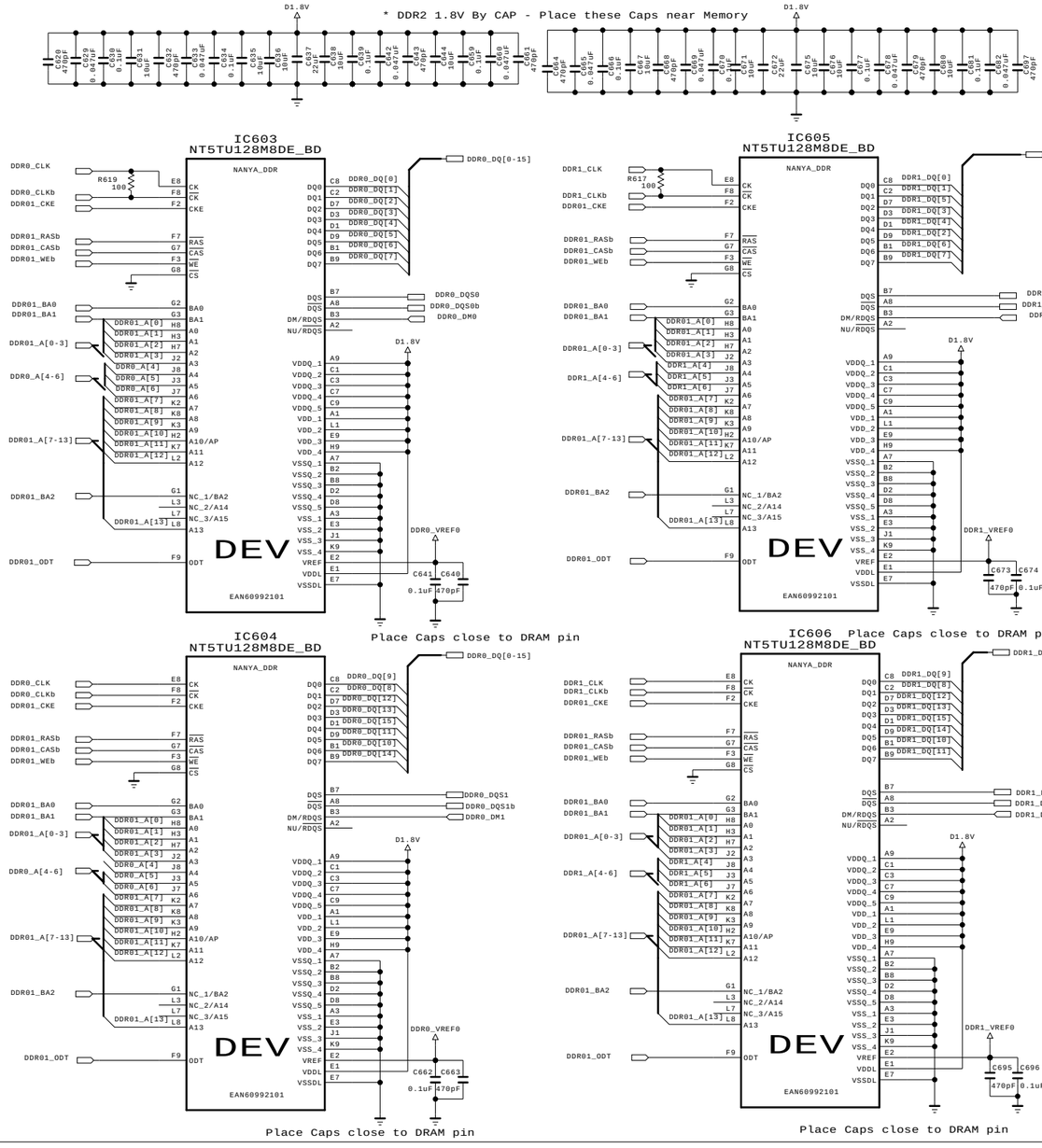
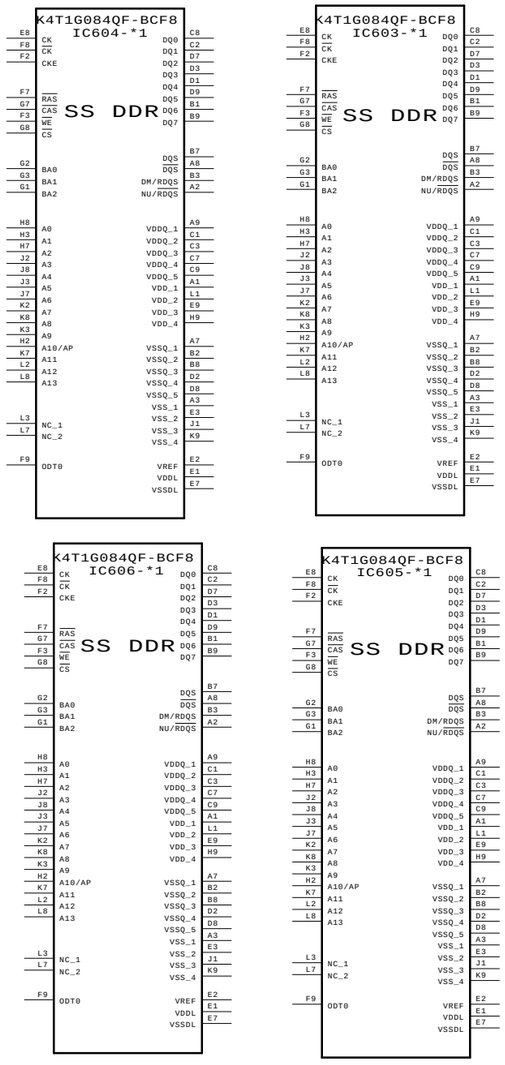
LG ELECTRONICS

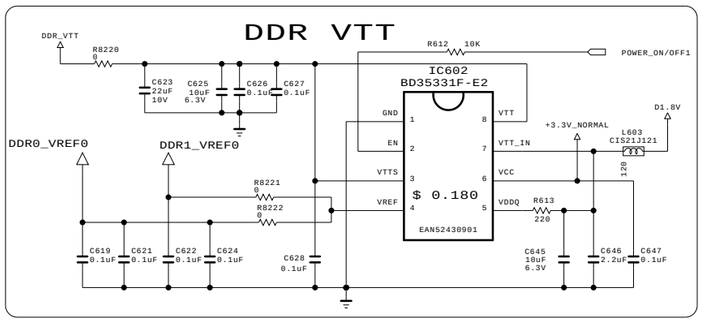
MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	BCM-BOOT/FLASH/GPIO	SHEET	9 / 100

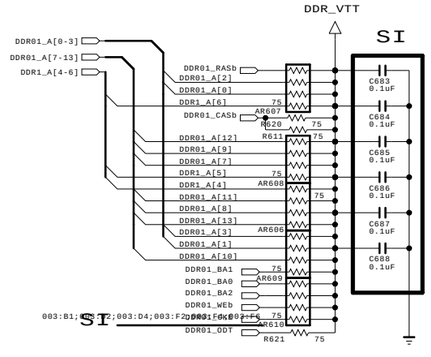
BCM-DDR

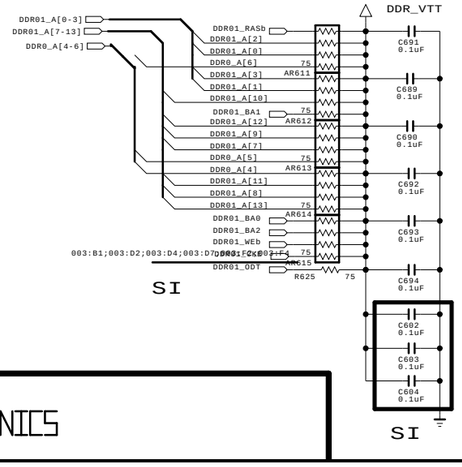












THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

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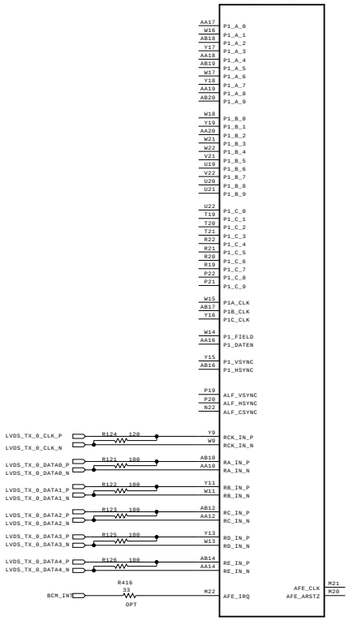
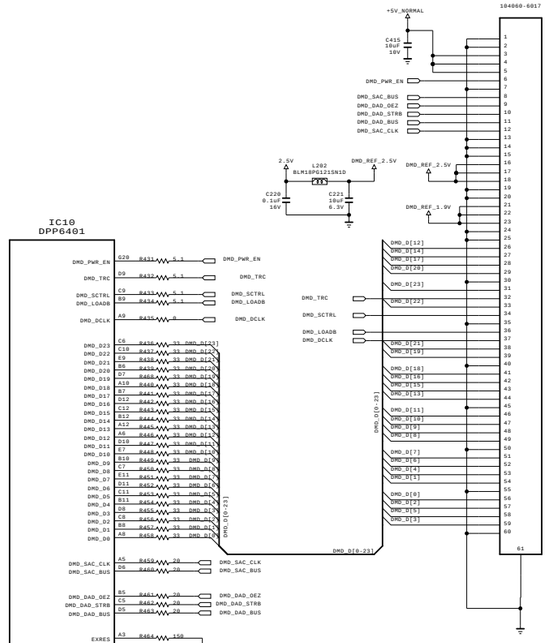
LG ELECTRONICS

MODEL	HW300-JE	DATE	2010.09.01
BLOCK	BCM-DDR	SHEET	3 / 5

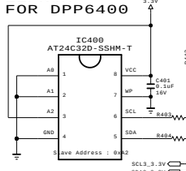
DPP6400 Front End



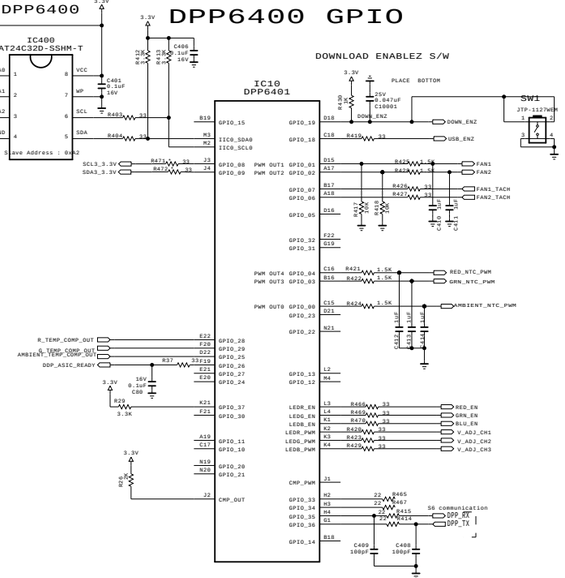
TO DMD BOARD

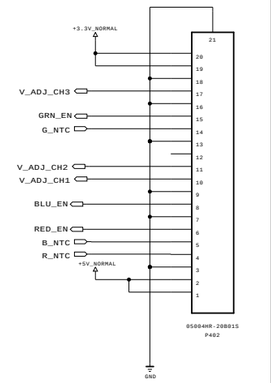


EEPROM FOR DPP6400

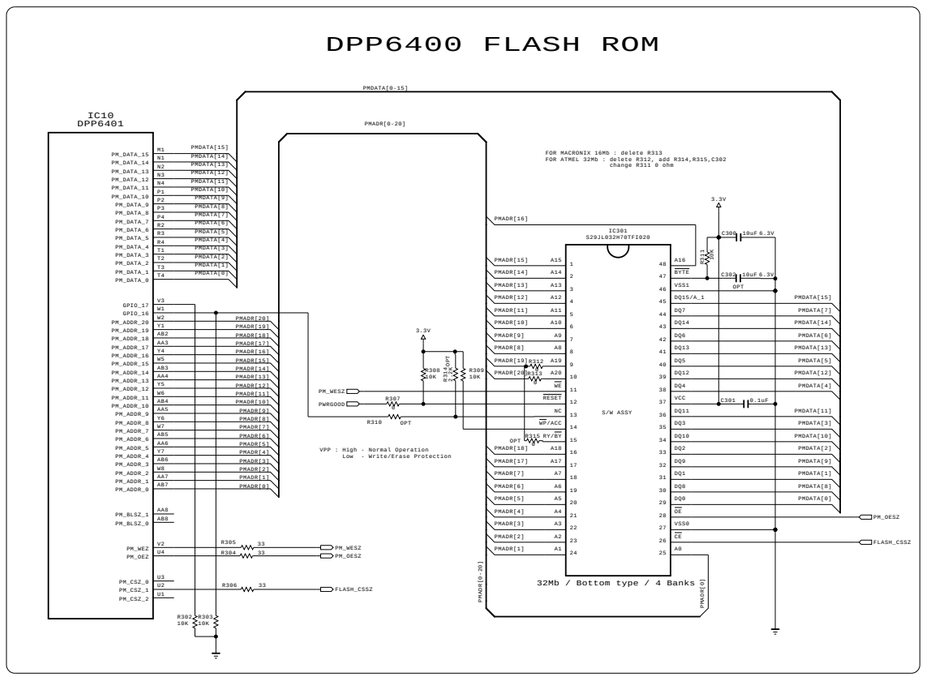


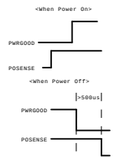
DPP6400 GPIO



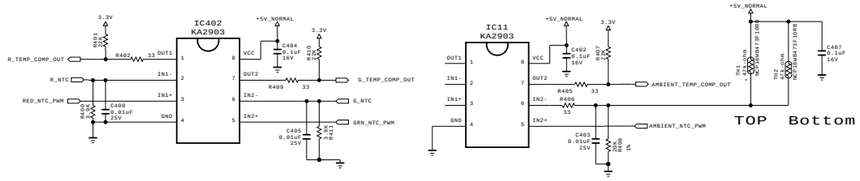


DPP6400 FLASH ROM

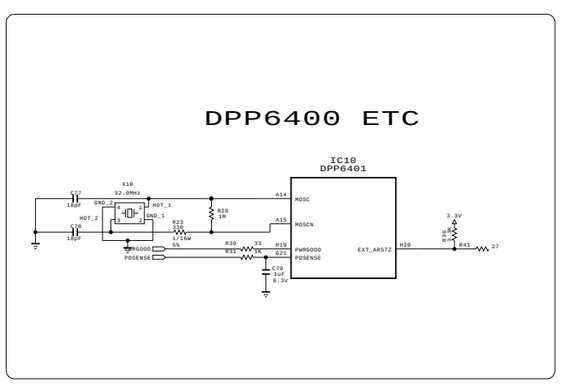


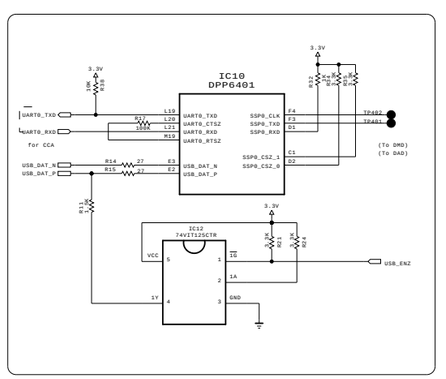


ADC for TEMP Sensor

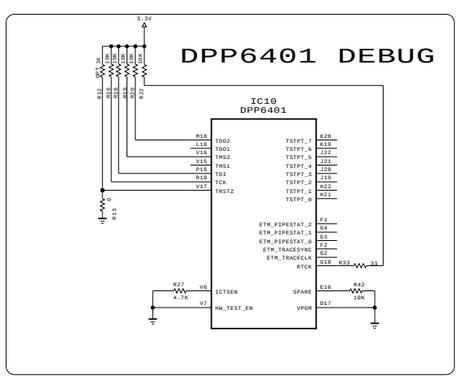


DPP6400 ETC





DPP6401 DEBUG



TO SENSOR BOARD

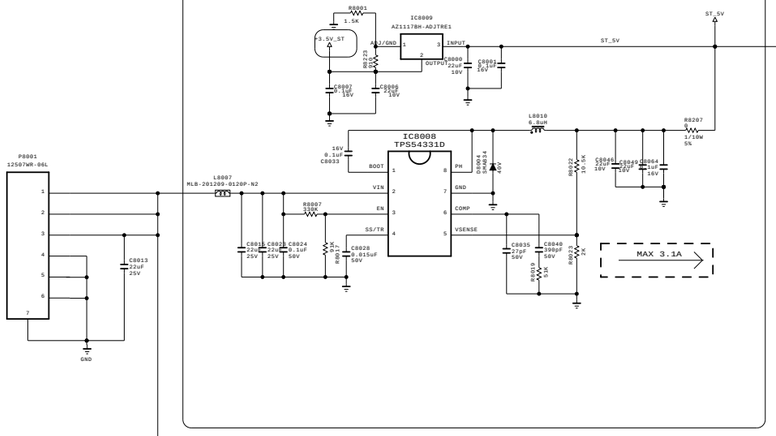
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

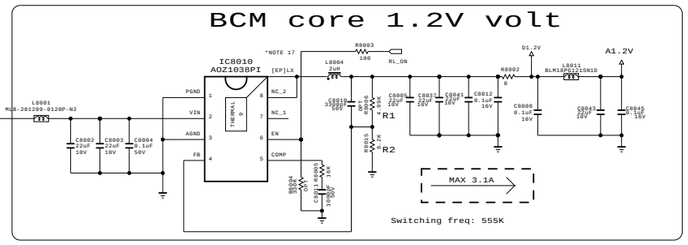
4 LG ELECTRONICS

MODEL	HW300-JE	DATE	2010.09.01
BLOCK		SHEET	4 / 5

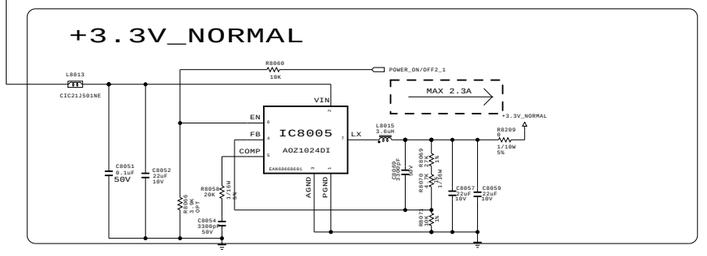
ST_BY Power



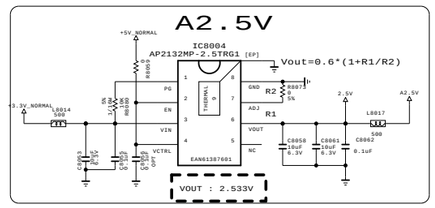
BCM core 1.2V volt



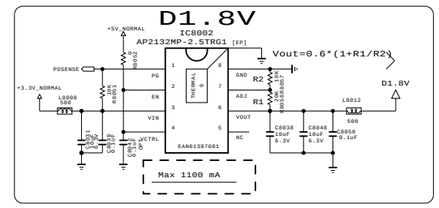
+3.3V_NORMAL



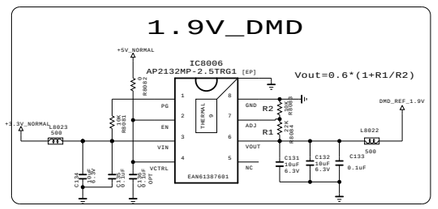
A2.5V



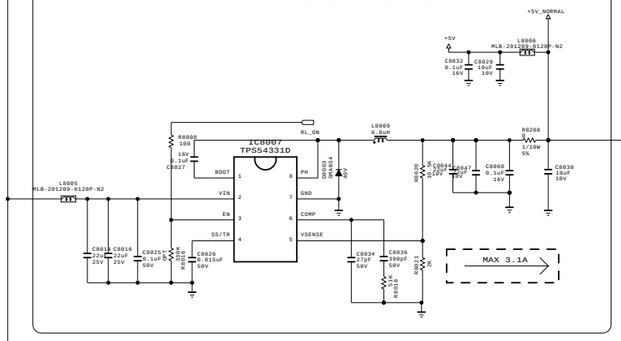
D1.8V



1.9V_DMD

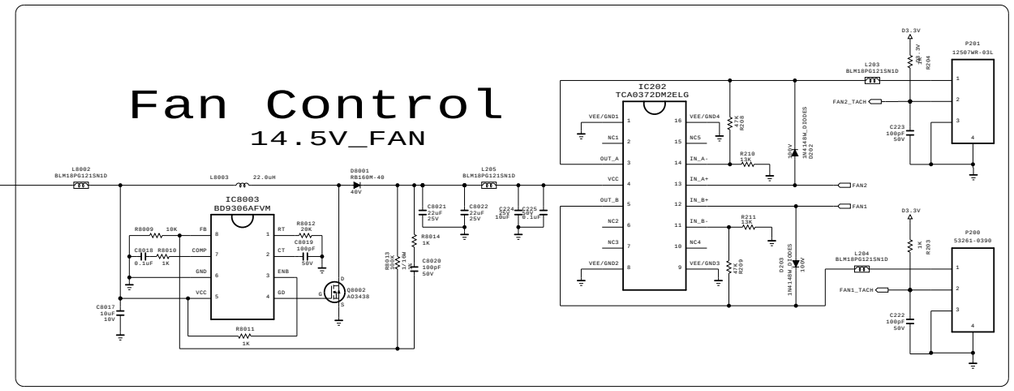


Normal Power

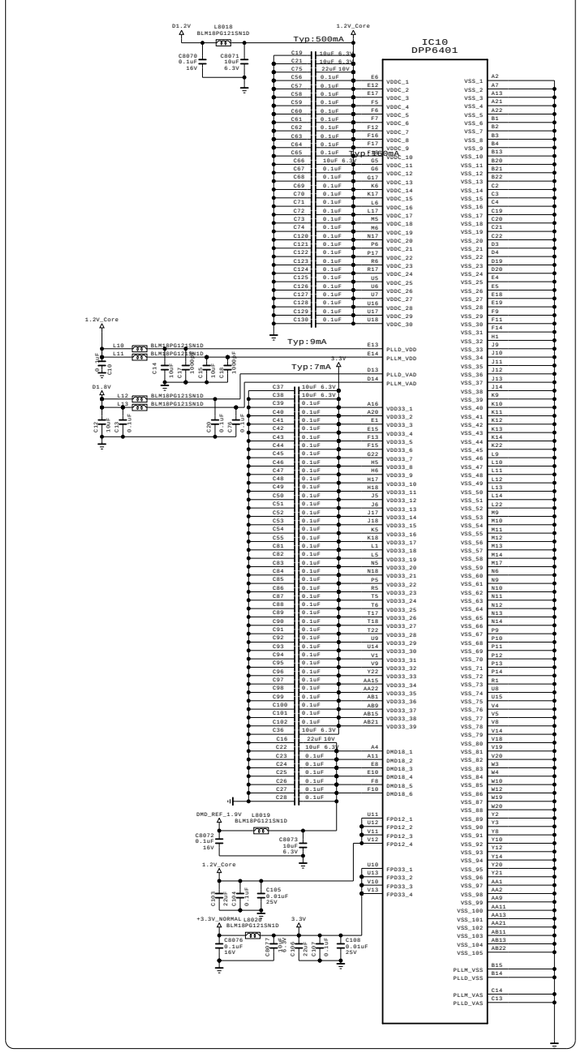


Fan Control

14.5V_FAN

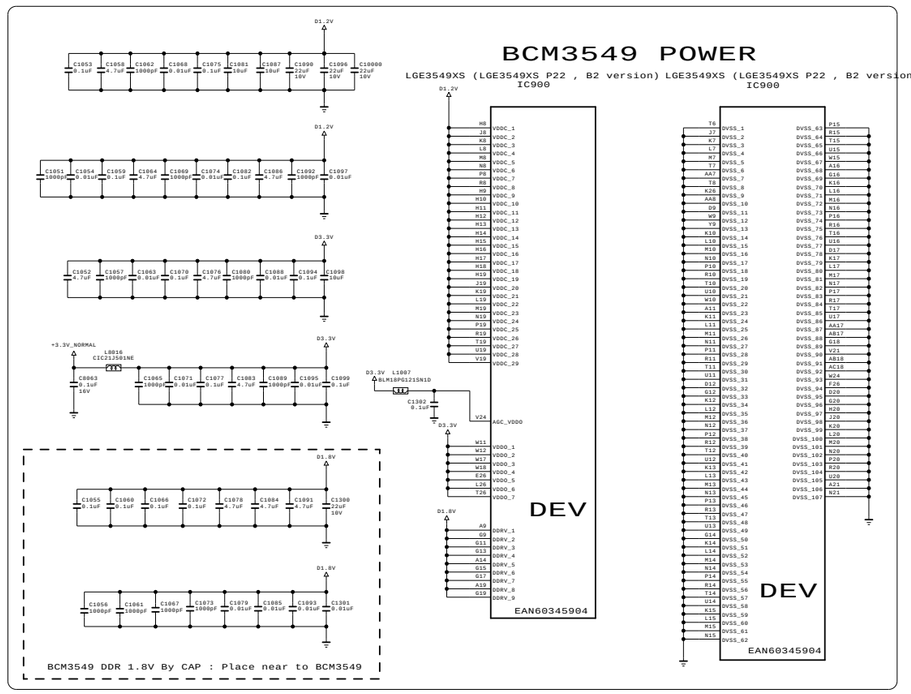


DPP6401 Power



BCM3549 POWER

LGE3549XS (LGE3549XS P22 , B2 version) LGE3549XS (LGE3549XS P22 , B2 version)

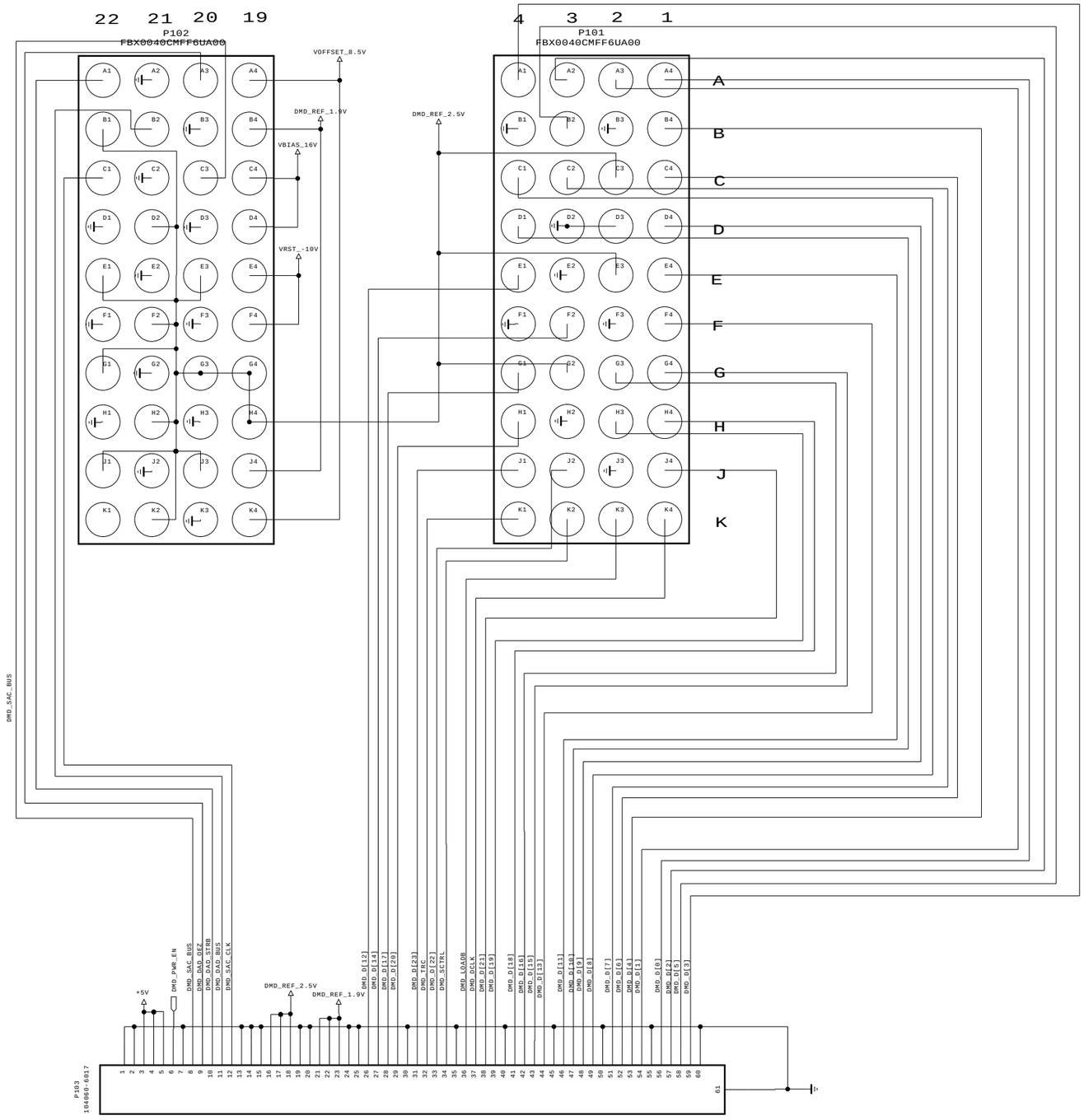


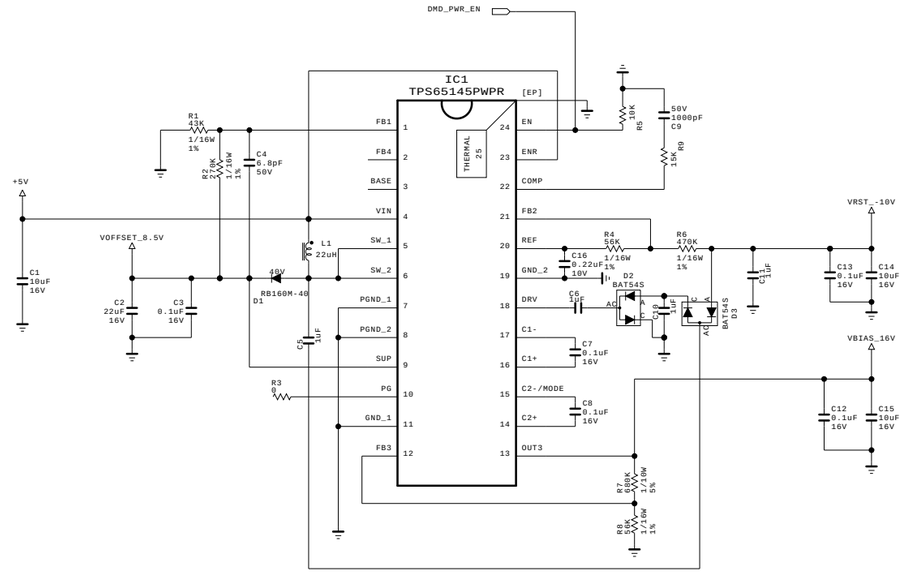
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	HW300-JE	DATE	2010.09.01
BLOCK	Power	SHEET	5 / 5



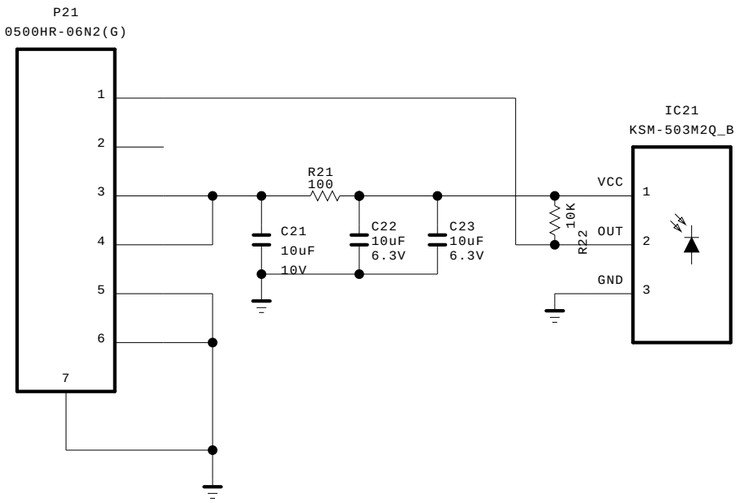


THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

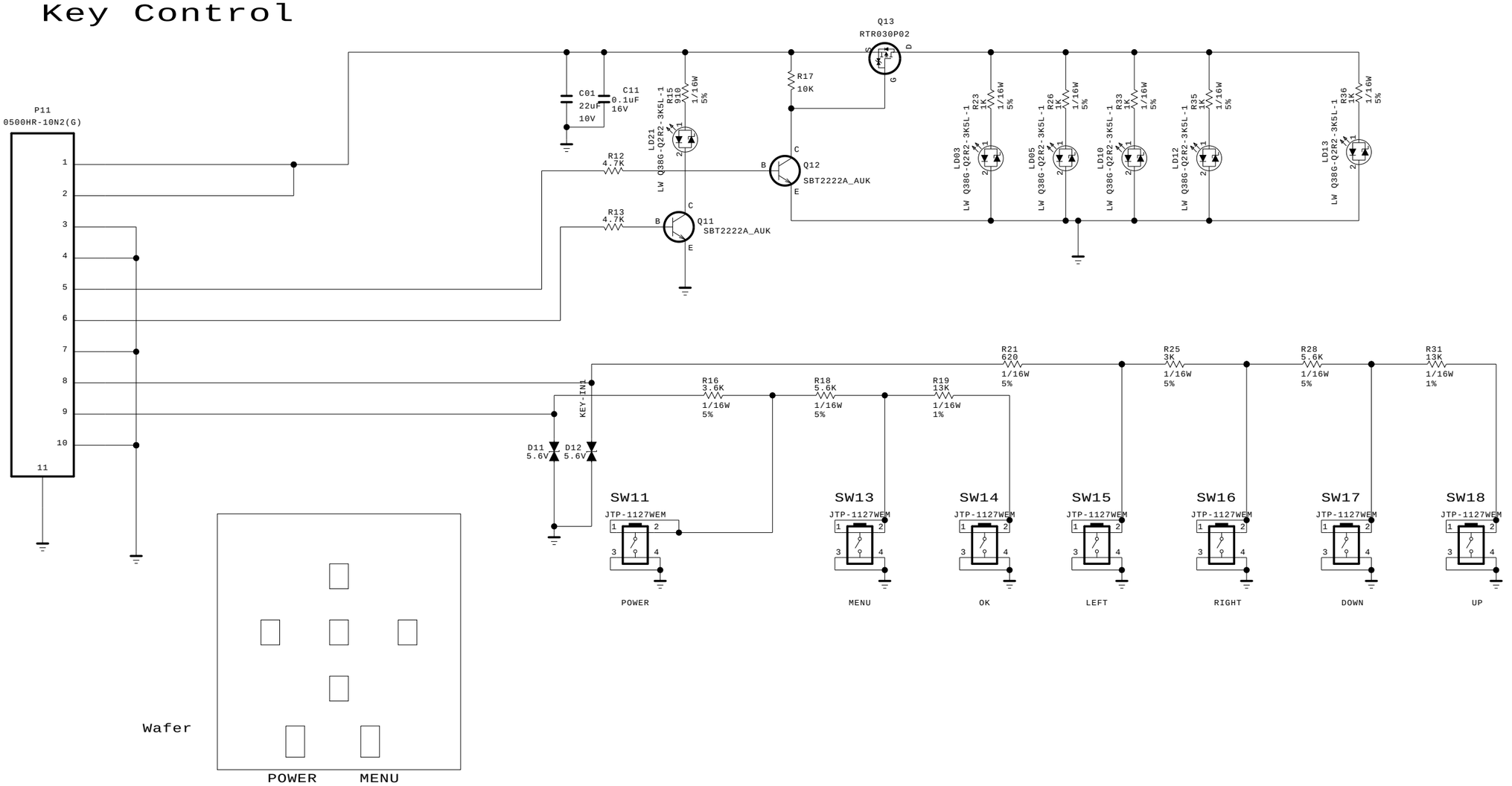
MODEL	HS151 PP	DATE	2008.12.15
BLOCK	DMD	SHEET	/



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET	LG ELECTRONICS	MODEL	HW300
LGElectronics		BLOCK	IR
		DATE	2010.12.20
		SHEET	/

Key Control



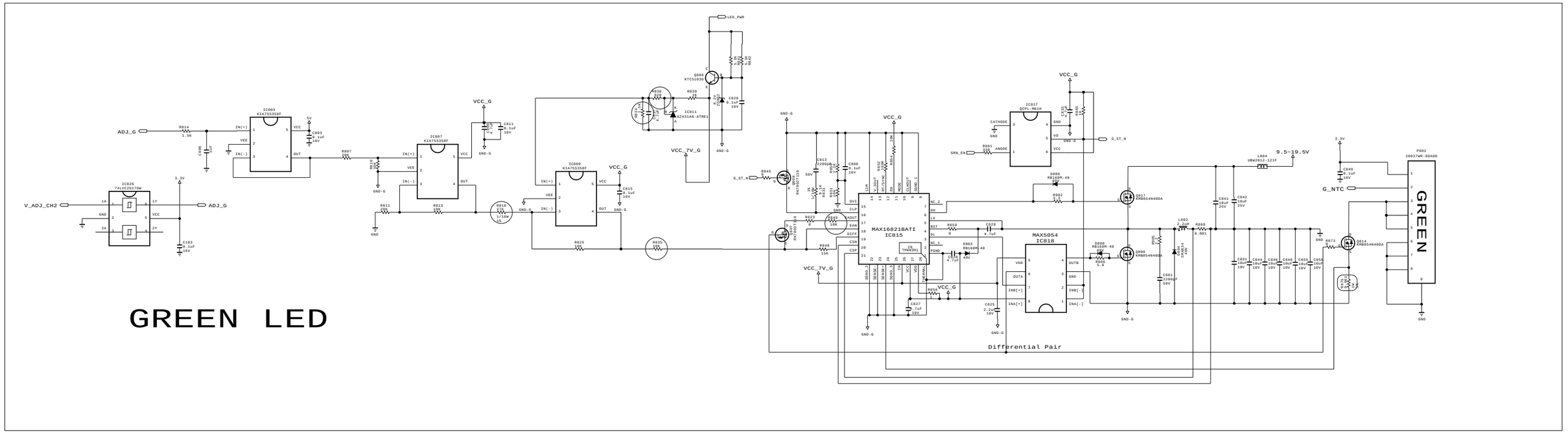
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

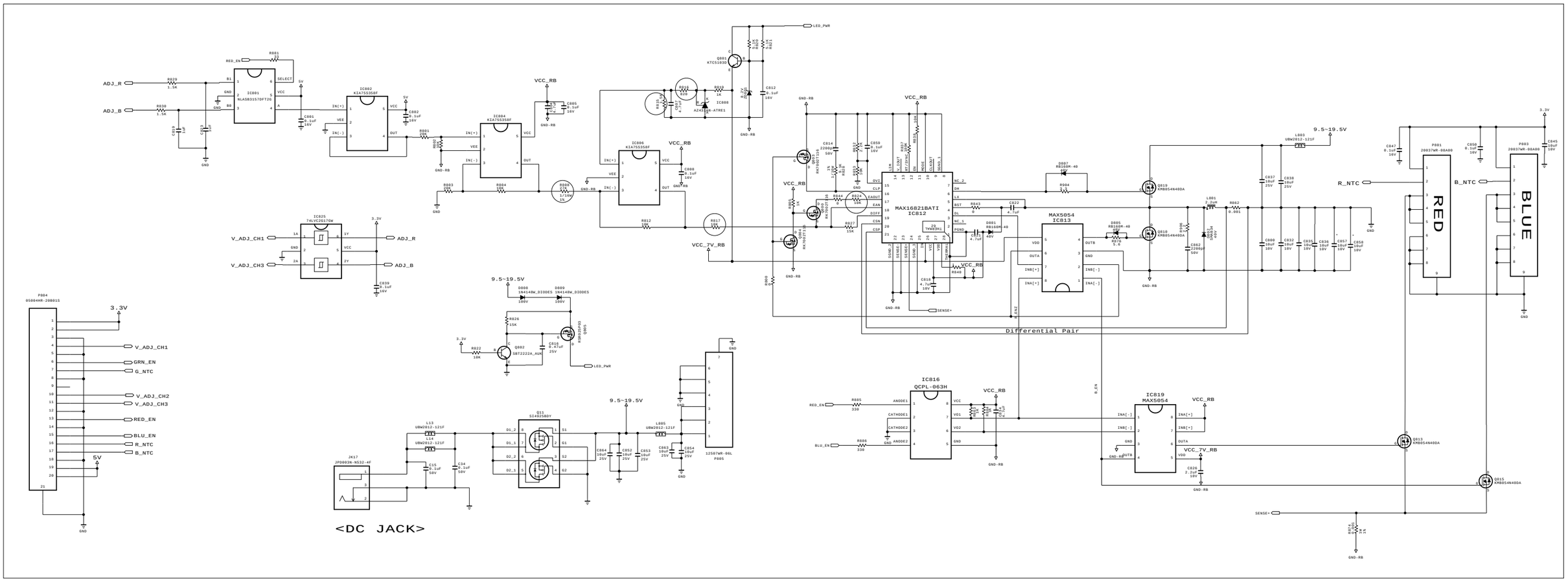
SECRET

LGElectronics

LG ELECTRONICS

MODEL	HW300	DATE	2011.03.14
BLOCK	KEYPAD	SHEET	/





THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	HX300-JE	DATE	10.01.08
BLOCK	LED DRIVER	SHEET	01 / 01

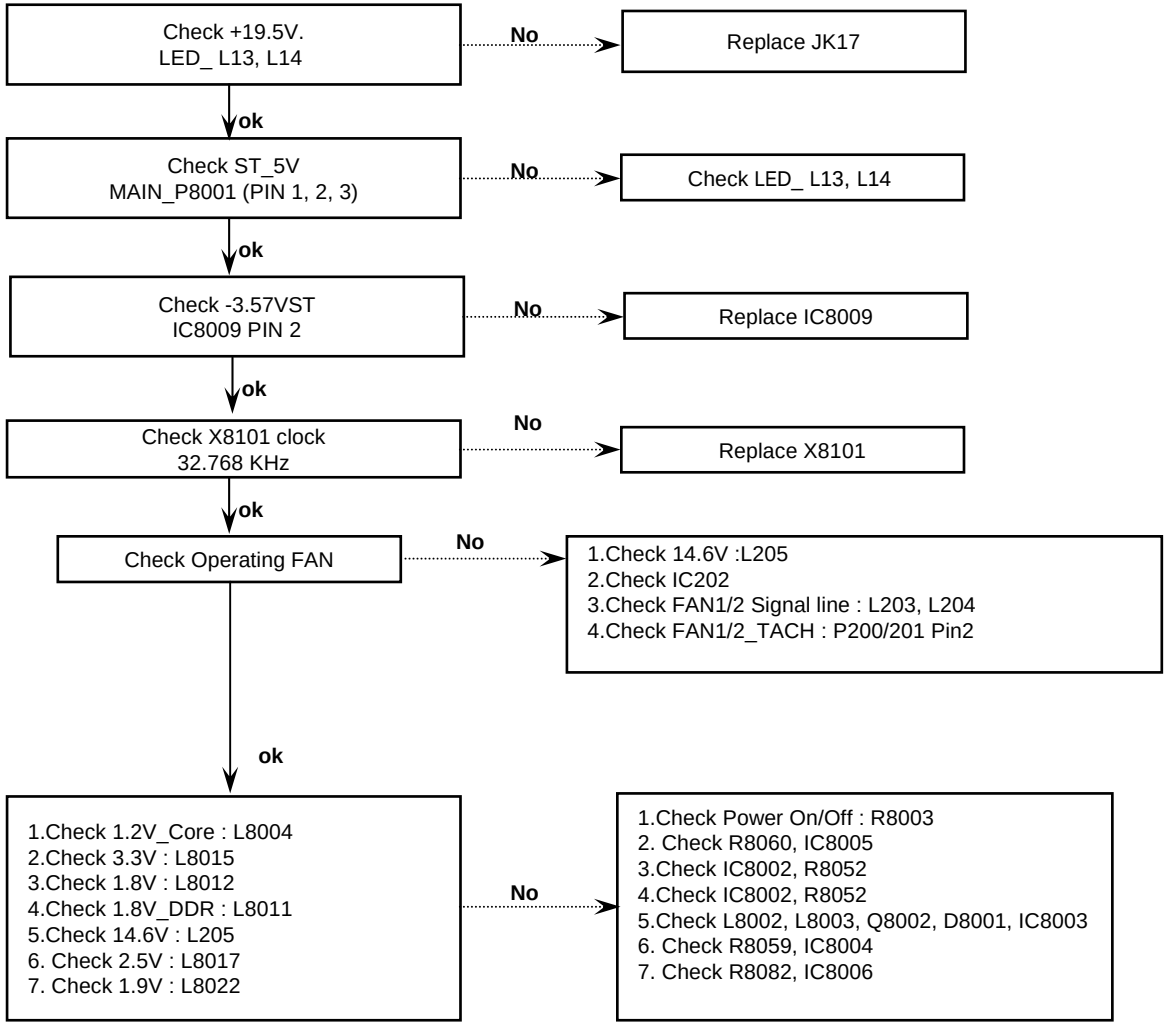

LG Electronics Inc.

Trouble shooting

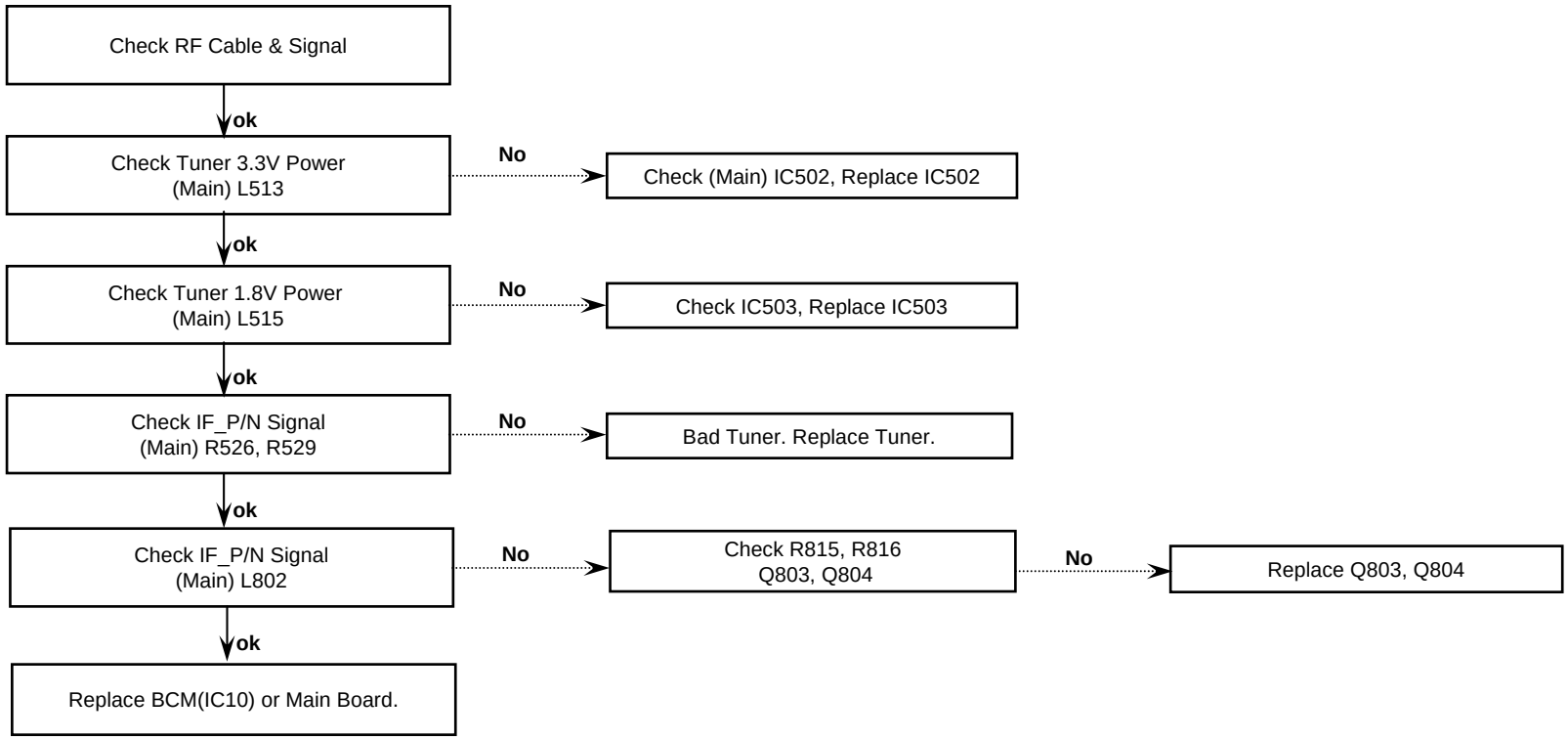
Applied chassis: FM12A/B

LG Electronics/ LCD TV Division
Projector Team PHS Gr.

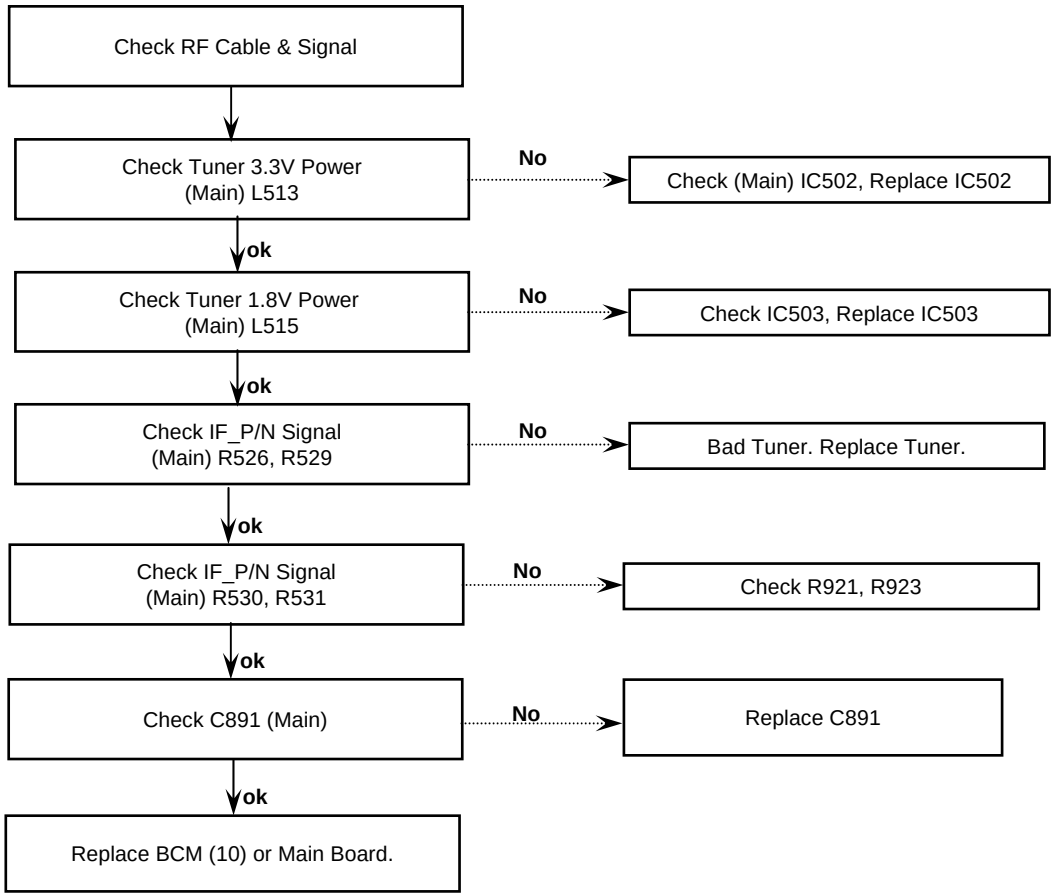
1. Trouble shooting - No power



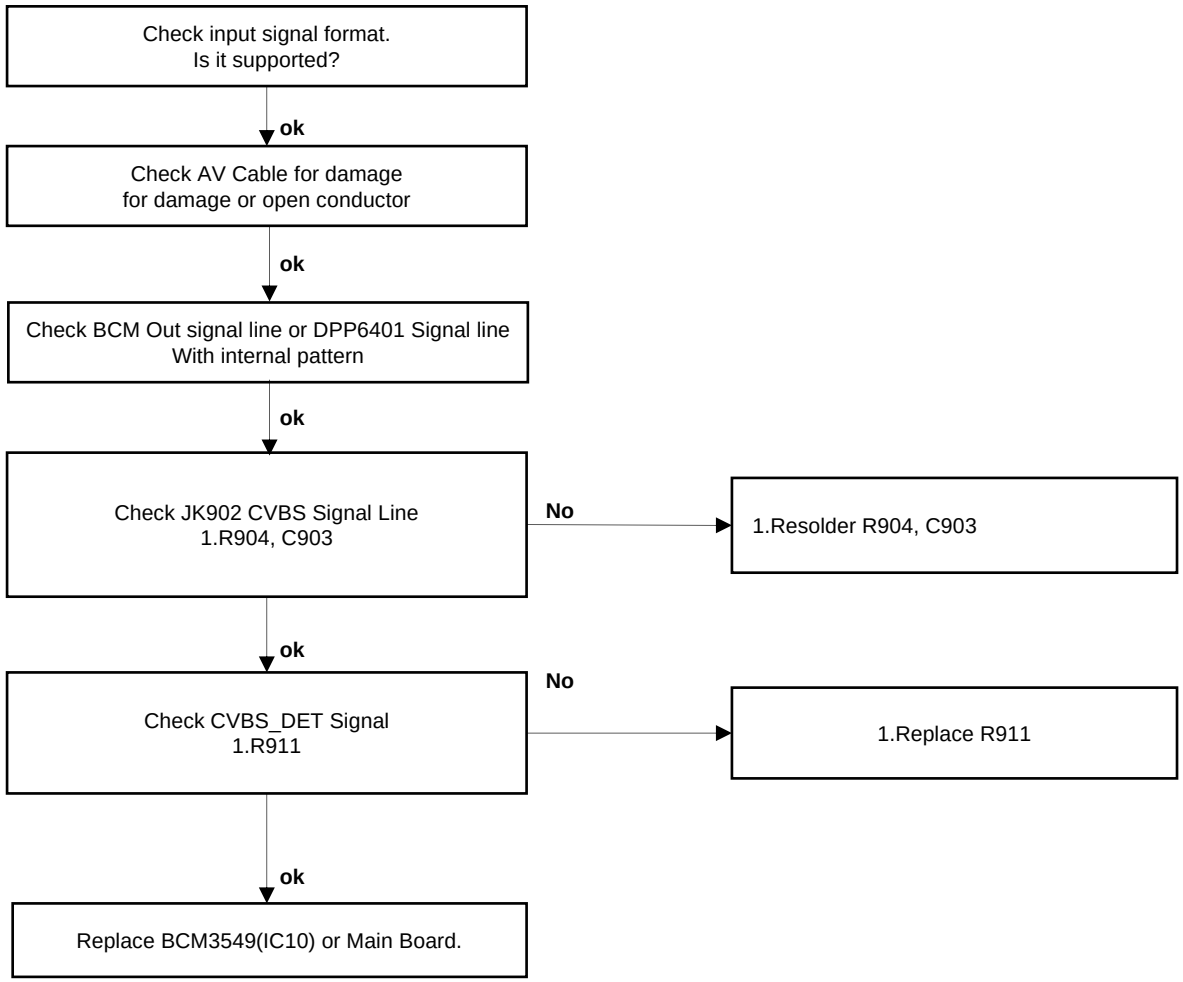
2. Trouble shooting - No video (Digital TV video)



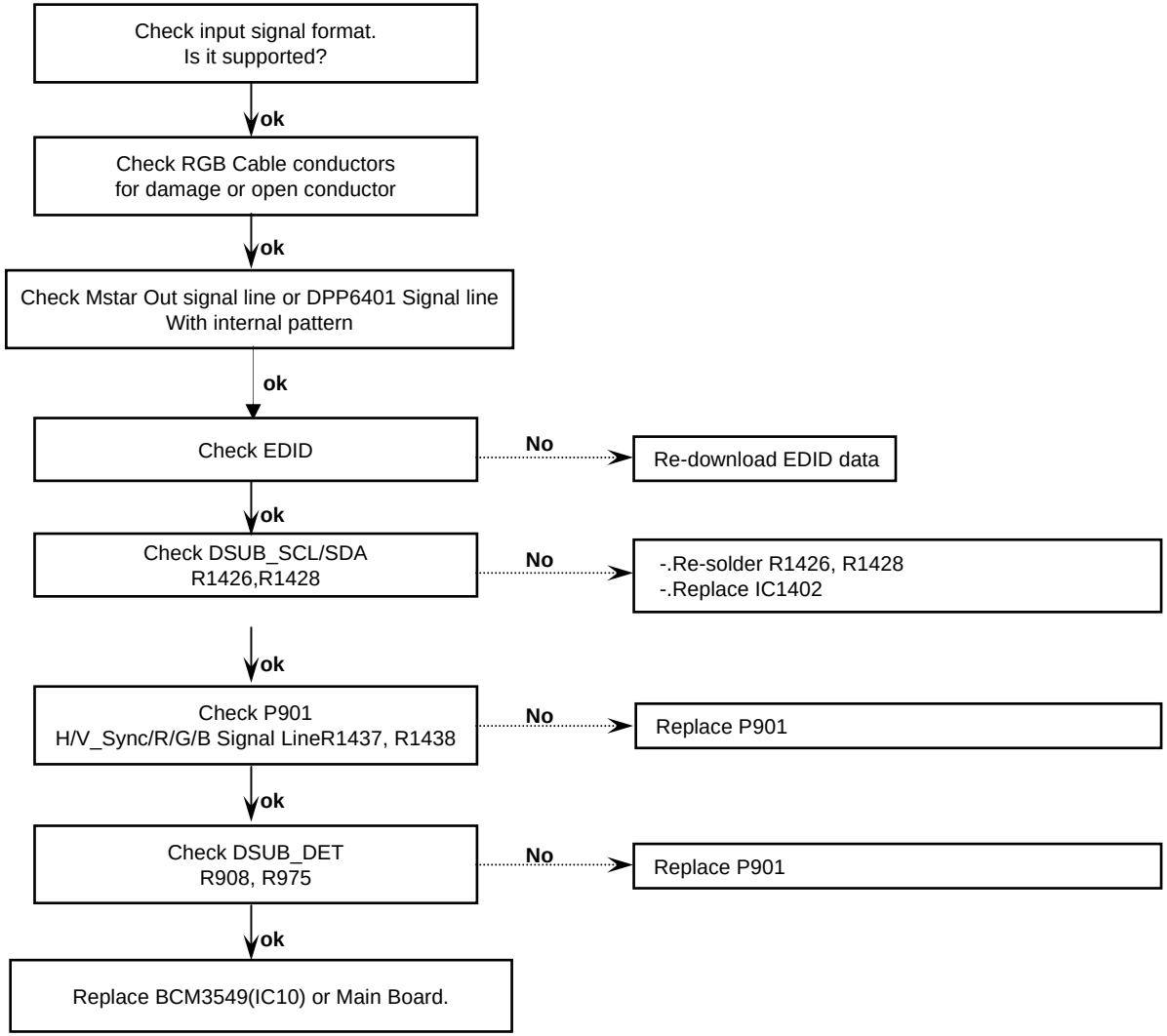
3. Trouble shooting - No video (Analog TV video)



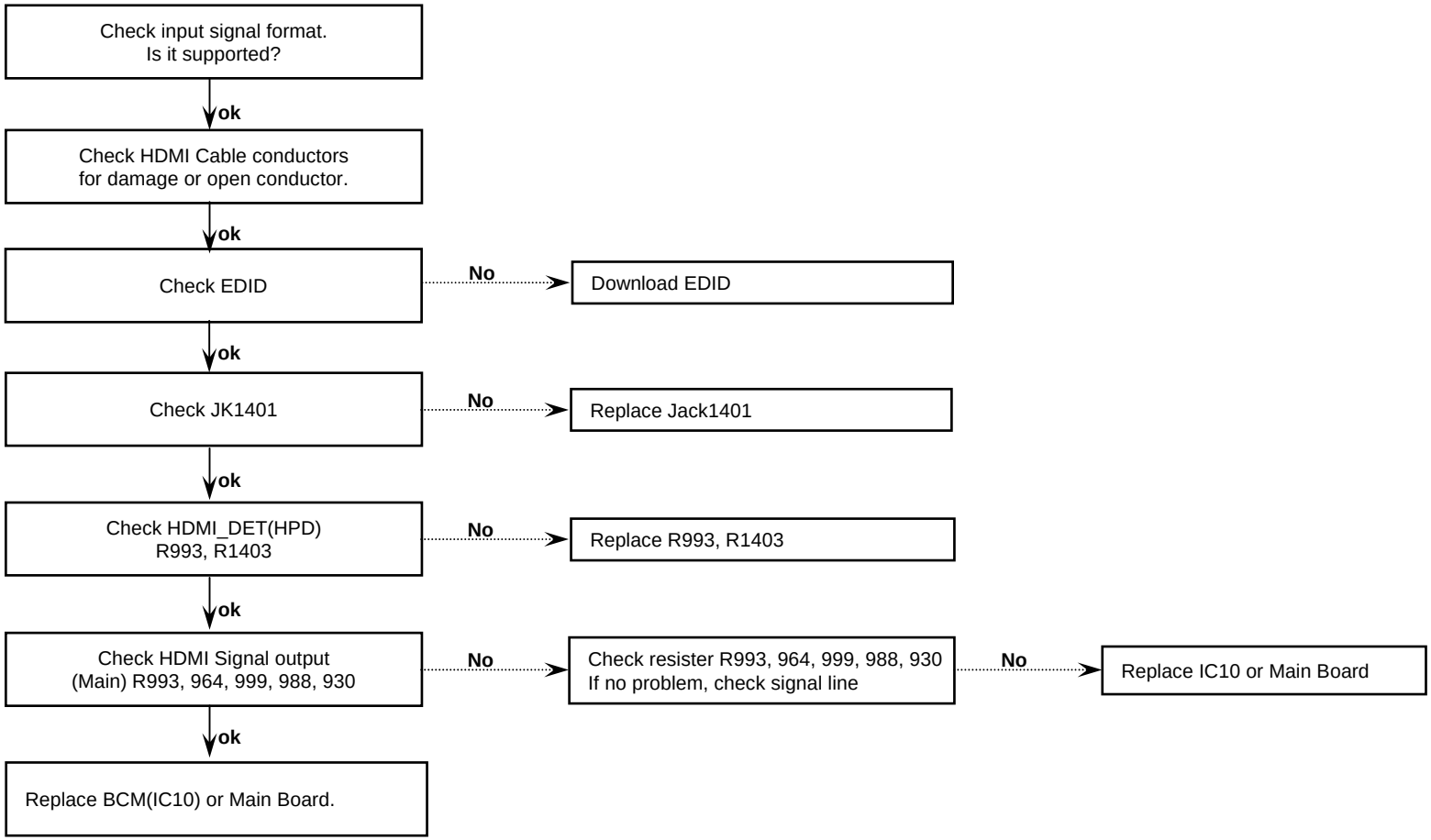
4. Trouble shooting - No video (AV)



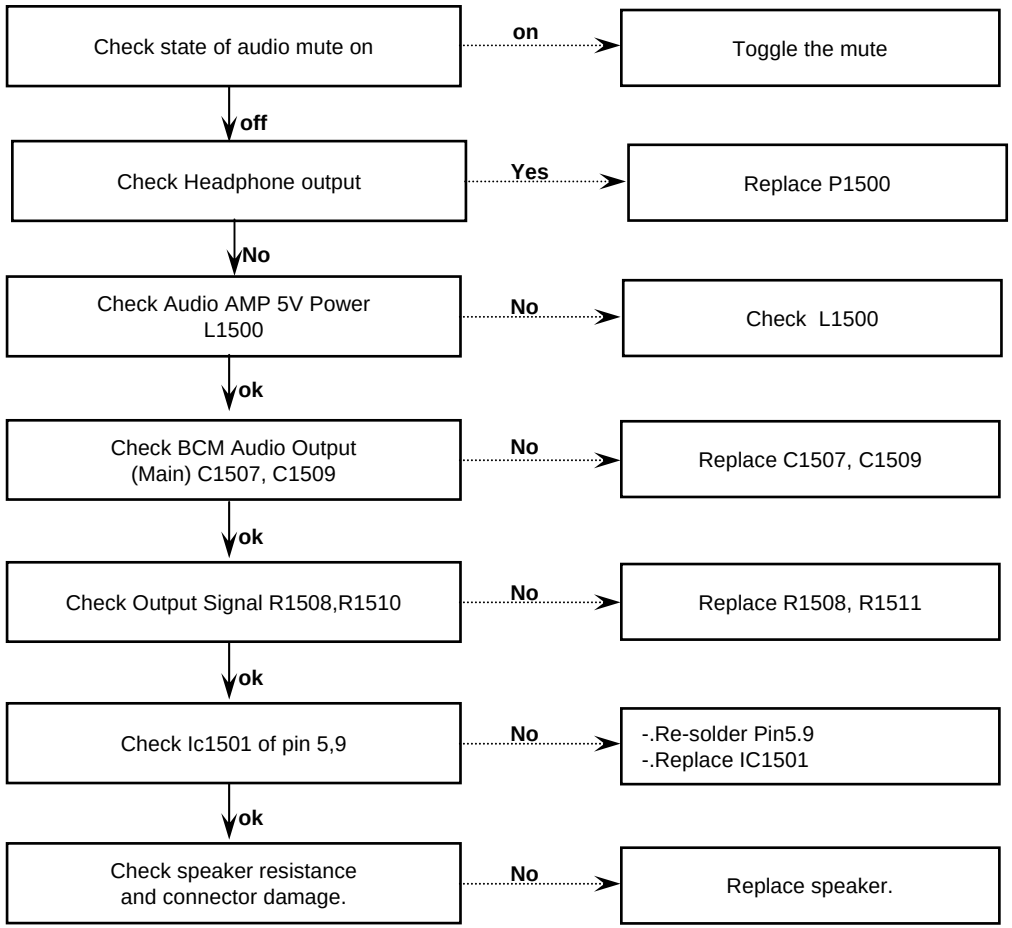
5. Trouble shooting - No video (RGB-PC/Component)



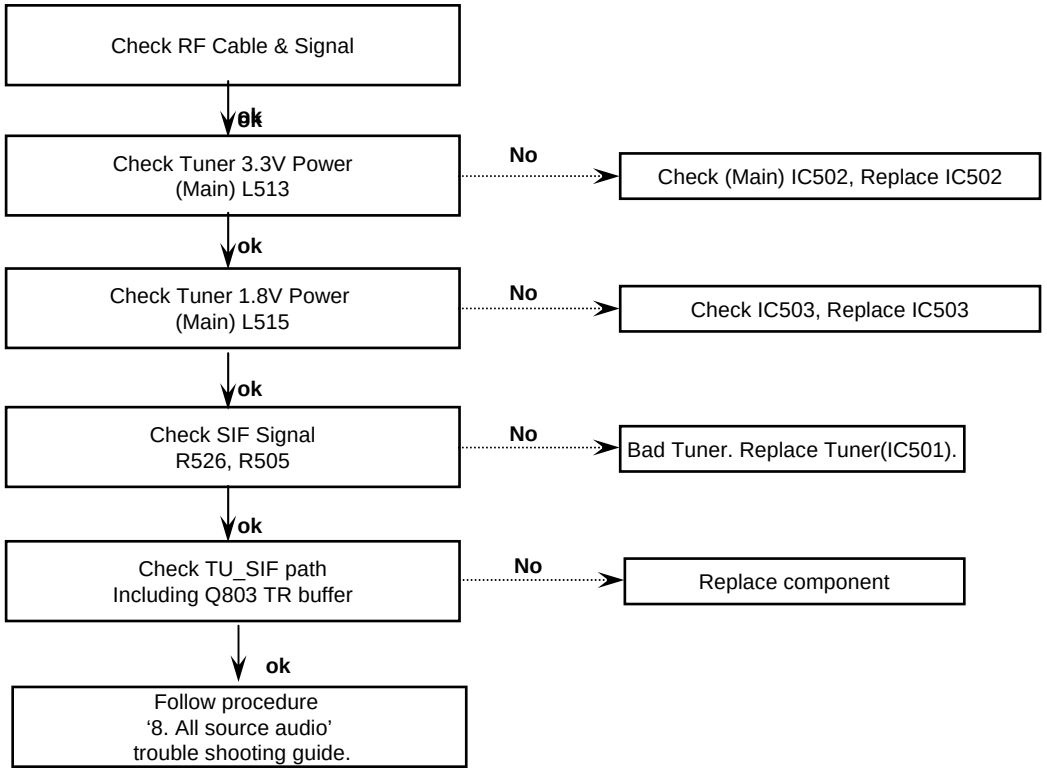
6. Trouble shooting - No video (HDMI)



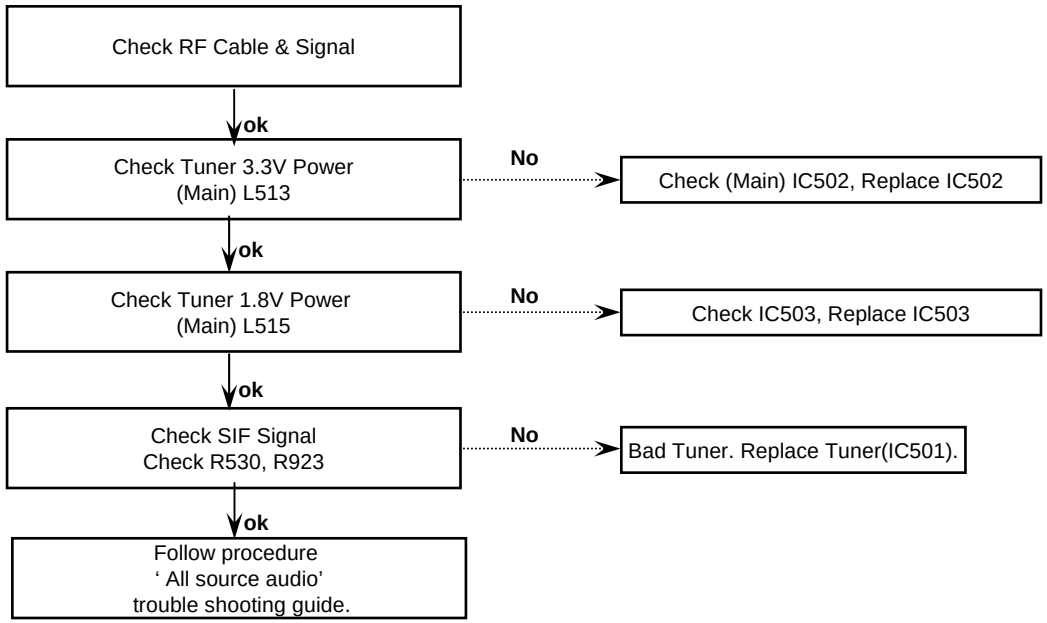
7. Trouble shooting - No Audio out (Speaker, all audio source)



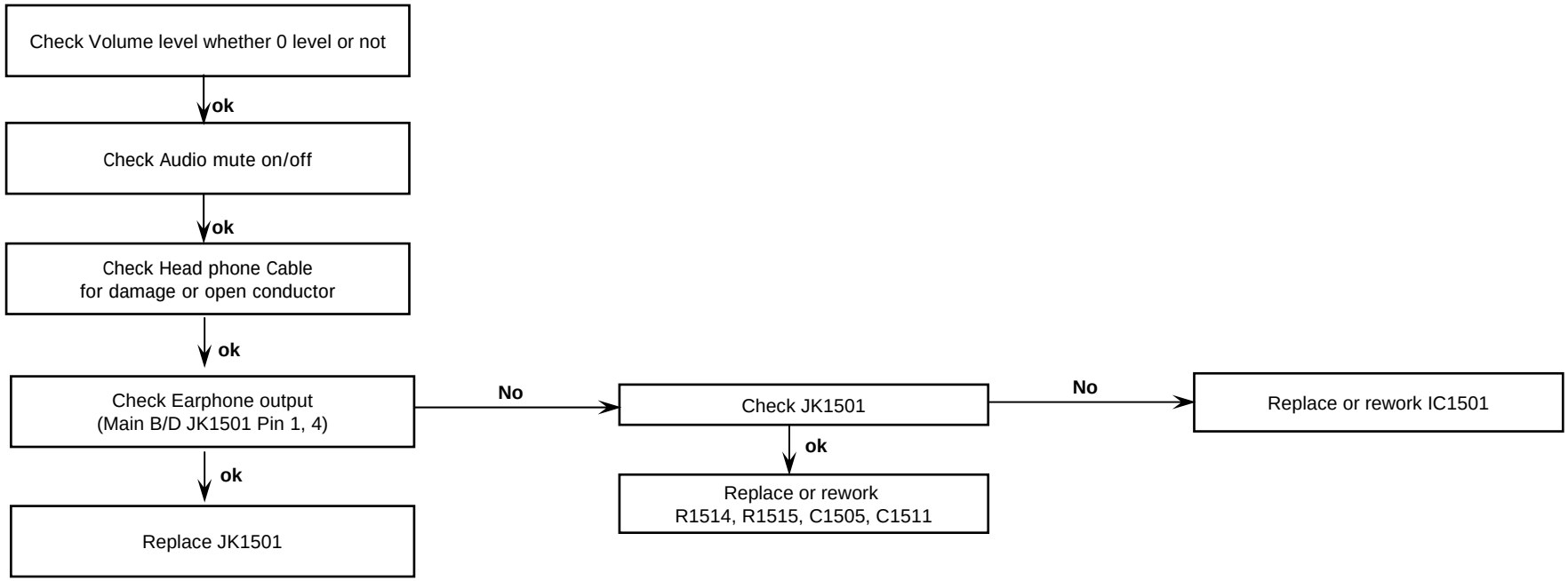
8. Trouble shooting - No audio out (Digital TV audio)



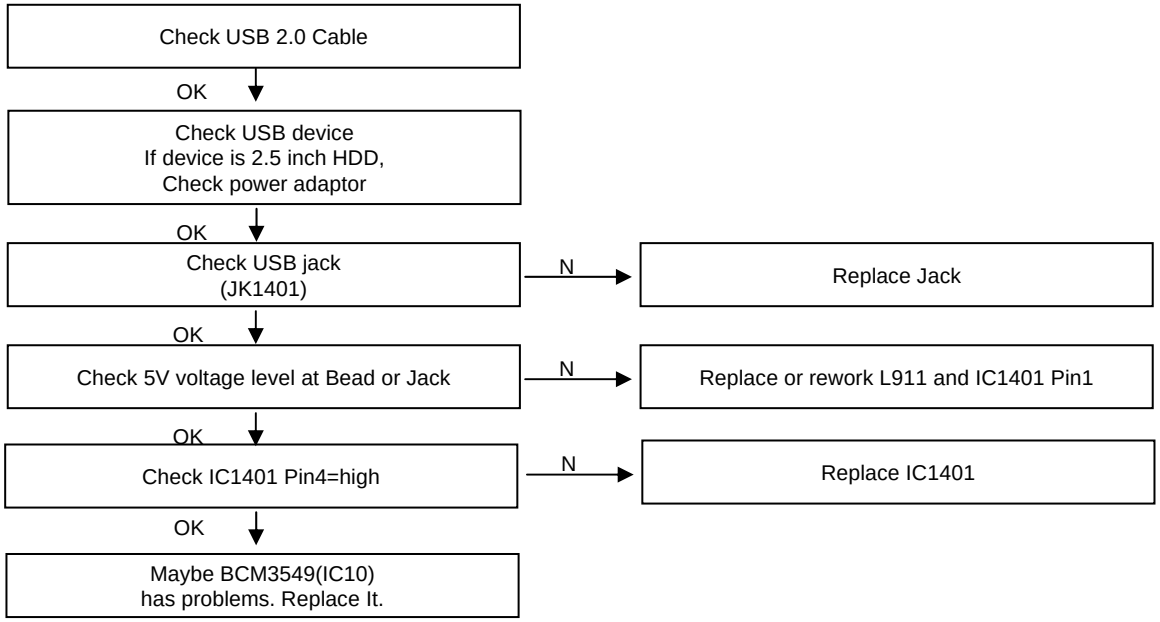
9. Trouble shooting - No audio out (Analog TV audio)



10. Trouble shooting - No audio out (Head phone, all audio source)



11. Trouble shooting - USB connection error



- Exception
  - USB power could be disabled by inrushing current
  - In this case, remove the device and try to reboot the TV (AC power off/on)

12. Trouble shooting - SW download