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LCD MONITOR TV

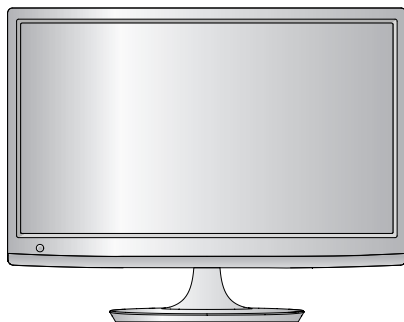
SERVICE MANUAL

CHASSIS : LP92E

MODEL : M2380A M2380A-PMM

CAUTION

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



P/NO : MFL63261609(1007-REV00)


Printed in Korea

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PRECAUTION

WARNING FOR THE SAFETY-RELATED COMPONENT.

- There are some special components used in LCD monitor that are important for safety. **These parts are marked  on the schematic diagram and the Exploded View** It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent electric shock, fire or other hazard.
- Do not modify original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

TAKE CARE DURING HANDLING THE LCD MODULE WITH BACKLIGHT UNIT.

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- The module not be exposed to the direct sunlight.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

CAUTION

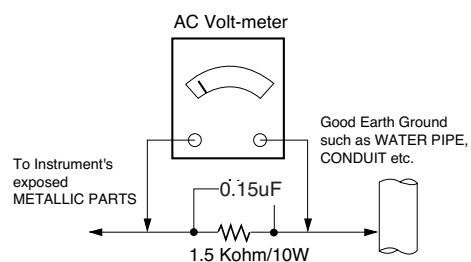
Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

WARNING

BE CAREFUL ELECTRIC SHOCK !

- If you want to replace with the new backlight (CCFL) or inverter circuit, must disconnect the AC adapter because high voltage appears at inverter circuit about 650Vrms.
- Handle with care wires or connectors of the inverter circuit. If the wires are pressed cause short and may burn or take fire.

Leakage Current Hot Check Circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω

*Base on Adjustment standard

• Replaceable batteries

* CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
 - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
 - b. Disconnecting or re-connecting any receiver electrical plug or other electrical connection.
 - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.**CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
CAUTION: This is a flammable mixture.
Unless specified otherwise in this service manual, lubrication of contacts is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

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 static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent 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 type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges 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 sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
 - a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
 - b. Heat the component lead until the solder melts.
 - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
 - a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
 - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
 - c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
 - d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush.
(It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor

Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device

Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor

Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife.
Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

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

1. Application Range.

This spec sheet is applied to the 58 cm(23 inch) LCD Monitor
TV used LP92E chassis.

2. Specification

Each part is tested as below without special appointment

- 2.1 Temperature : 25 °C ± 5 °C (77 °F ± 9 °F),
CST : 40 °C ± 5° C
- 2.2 Relative Humidity : 65 % ±10 %
- 2.3 Power Voltage : Standard input voltage
(100 V - 240 V ~, 50 / 60 Hz)
 - Standard Voltage of each products is marked by models
- 2.4 Specification and performance of each parts are followed
each drawing and specification by part number in
accordance with BOM .
- 2.5 The receiver must be operated for about 5 minutes prior to

the adjustment.

3. Test method

- 3.1 Performance : LGE TV test method followed.
- 3.2 Demanded other specification
 - Safety : CE, IEC specification
 - EMC : CE, IEC

Safety : IEC/EN60065
EMI : EN55013
EMS : EN55020

4. Module Specification

LGD, LM230WF5-TLA3

No	Item	Specification	Unit	Remark
1	Type	TFT Color LCD Module		
2	Diagonal Size	584.2mm (23 inche) diagonal		
3	Active Display area	509.184(H) x 286.416(V)	mm	
4	Outline Dimension	533.2(H) x 312.0(V) x 11.5(D)	mm	Typ.
5	Aspect Ratio	16:9		
6	Pixel Number	1920 x RGB x 1080	pixel	pixel
7	Pixel Pitch	0.265(H) x 0.265(V)	mm	
8	Color arrangement	RGB vertical Stripe		
9	Color Depth	16.7M color (8bit with A-FRC)		
10	Electrical Interface	LVDS 2port		
11	Surface Treatment	Hard coating(3H) & Anti-glare(Haze 25)		
12	Operating Mode	Normally White		
13	Backlight Unit	WHITE LED (2 CHANNEL)		
14	Response Time	Rising Time : 1.3 + Falling Time : 3.7	ms	Typ.
15	Color Gamut	Normal 68% Panel(CIE1931)		

5. General Specification

5.1 TV

No	Item	Specification		Remarks
1	Market	Central and South America		
2	Broadcasting system	NTSC PAL-M PAL-N		
3	Receiving system	BAND	NTSC	
		VHF	2 ~ 13	
		UHF	14 ~ 69	
		CATV	1 ~ 125	
4	Receiving system	Upper Heterodyne		
5	Component Input (1EA)	Y/Cb/Cr Y/Pb/Pr		
6	CVBS Input (1EA)	PAL, SECAM, NTSC		4 System(Rear) :PAL50, SECAM, NTSC, PAL60
7	RGB Input	RGB-PC		Analog(D-SUB 15Pin)
8	HDMI Input (1EA)	HDMI1-DTV/PC		HDMI version 1.3 , Support HDCP
9	Audio Input (3EA)	RGB-PC/ DVI Audio Component CVBS		L/R Input
10	Earphone out (1EA)	Antenna, AV, Component, RGB-PC, HDMI1		

5.2 RGB - PC

No	Item			Specification				Remarks
1	Supported Sync. Type			Separate Sync.(RGB), Digital(DVI)				
2	Operating Frequency			Analog	Horizontal	30 ~ 69kHz		
					Vertical	56 ~ 61 Hz		
				Digital	Horizontal	-		
					Vertical	-		
3	Resolution			Analog	Max.	1600x900 @ 60Hz		M2080A
					Recommend	1600x900 @ 60Hz		
					Max.	1920x1080 @ 60Hz		M2280A / M2380A/ M2380AF
					Recommend	1920x1080 @ 60Hz		
4	Input Voltage			Voltage :100 – 240 Vac, 50 or 60Hz				
5	Inrush Current			Cold Start : 50 A Hot : 120 A				
6	Operating Condition			Sync (H/V)	Video	LED	Wattage	
	Power S/W On	On mode	Typ.	On/On	Active	Blue	48W	M2380A
			Max	On/On	Active	Blue	33W	
			Typ.	On/On	Active	Blue	58W	M2380AF
			Max	On/On	Active	Blue	33W	
		Sleep mode		Off/On	Off	Blanking	1W	RGB
				On/Off				
	Power S/W Off	Off mode		-	Off	Off	0.5W	Just operate power key and remote controller power button
7	MTBF			30,000 HRS with 50% compared to that of initial value at the typical LED current on condition				LED Life Time
8	Using Altitude			5,000 m (for Reliability) 3,000m(for FOS)				
9	Operating Environment			Temp : 10°C ~ 35°C Humidity : 20 % ~ 80 %				
10	Storage Environment			Temp : -10°C~60°C non condensing Humidity : 5 % ~ 90 % non condensing				

6. Chroma & Brightness

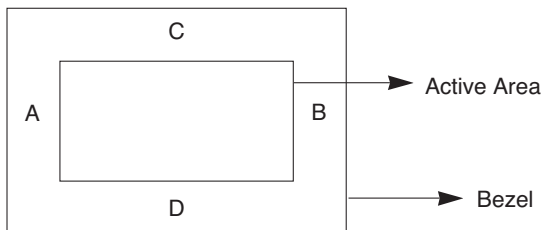
No.	Item	Specification		Min.	Typ.	Max.	Remark
1	Viewing Angle[CR>10]	Right/Left		70/70	85/85	-	CR >10
		Up/Down		60/70	75/85		
2	Luminance	Luminance (cd/m ²)		200	250	-	
		Variation(%)		75			Min/ Max
3	Contrst Ratio	CR		700	1000		Full white/Full black
4	Color Coordinates [CIE1931]	White	W _X	Typ. -0.03	0.313	Typ. +0.03	RGB Vivid, 6500K Full white(100IRE)
			W _Y		0.329		
		RED	R _X		0.628		
			R _Y		0.348		
		Green	G _X		0.345		
			G _Y		0.615		
		Blue	B _X		0.153		
			B _Y		0.057		
5	Response Time(ms)	Rise Time	TrR		1.3	2.6	Condition : DVI or RGB
		Decay Time	TrD		3.7	7.4	Standard, Backlight100

*** Optical Test Condition**

- Surrounding Brightness Level : dark
- Surrounding Temperature : 25 °C ± 5 °C
- warm-up Time : 30 min
- Contrast, Brightness : Outgoing condition
- *Incase of Vivid Mode, high level saturation may be occurred. Check gray linearity at standard mode.

*** Active area**

- Active area of LCD PANEL is in bezel of cabinet.
- Interval between active area and bezel
|A-B|<1.0 mm , |C-D|<1.0 mm
A: Interval between left of active area and bezel
B: Interval between right of active area and bezel
C: Interval between top of active area and bezel
D: Interval between bottom of active area and bezel



7. SET Optical Feature

7.1 PC Mode (Measurement Condition: Full white/ Standard/6500k) ? Measure the black luminance after 30 seconds.)

No	Item	module	Luminance (cd/m ²)			C/R(min)		Remark
			Min	Typ	Max	Min	Typ	
1	20/22/23 inch	LGD	200	230	-	500:1	700:1	RGB DFC 5,000,000:1

7.2 AV Mode

(Measurement Condition: Full white(100IRE)/ Vivid) ? Measure the black luminance after 30 seconds.

No	Item	Luminance(cd/m²)		C/R(min)	Remark
		Typ	Max	RF,AV,COMPONENT,HDMI	
1	20 inch	170	200	500:1	RF, AV, COMPONENT, HDMI
2	22 inch	170	200	500:1	
3	23 inch	170	200	500:1	

7.3 Special feature(DFC)

-DFC Working Condition : Full Black Pattern(All Black, No pattern(MSPG Pattern#2)) signal in D-sub

No	Item	module	Min	Typ	Max	Remark
1	20/22/23 inch		4,000,000:1	5,000,000:1		PC Mode(D-sub) For Checking Black Luminance, wait for over 1 minute.

8. Component Video Input (Y, PB, PR)

No.	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	
1.	720*480	15.73	59.94	13.500	SDTV, DVD 480I(525I)
2.	720*480	15.75	60.00	13.514	SDTV, DVD 480I(525I)
3.	720*576	15.625	50.00	13.500	SDTV, DVD 576I(625I) 50Hz
4.	720*480	31.47	59.94	27.000	SDTV 480P
5.	720*480	31.50	60.00	27.027	SDTV 480P
6.	720*576	31.25	50.00	27.000	SDTV 576P 50Hz
7.	1280*720	44.96	59.94	74.176	HDTV 720P
8.	1280*720	45.00	60.00	74.250	HDTV 720P
9.	1280*720	37.50	50.00	74.25	HDTV 720P 50Hz
10.	1920*1080	33.72	59.94	74.176	HDTV 1080I
11.	1920*1080	33.75	60.00	74.250	HDTV 1080I
12.	1920*1080	28.125	50.00	74.250	HDTV 1080I 50Hz,
13.	1920*1080	56.25	50	148.5	HDTV 1080P
14.	1920*1080	67.432	59.94	148.350	HDTV 1080P
15.	1920*1080	67.5	60.00	148.5	HDTV 1080P

9. RGB Input (PC)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Remark
1	640*480	31.469	59.94	25.175	
2	800*600	37.879	60.317	40.0	
3	1024*768	48.363	60.0	65.0	
4	1152*864	54.34	60.05	80	
5	1280*960	60	60	108.0	
6	1280*1024	63.981	60.02	108.0	
7	1680*1050	64.674	59.883	119.0	
8	1680*1050	65.290	59.954	146.25	
9	1920*1080	67.5	60	148.5	

10. HDMI Input (DTV)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed
1	720*480	15.75	60.00	13.514	SDTV, DVD 480I(525I)
2	720*480	15.73	59.94	13.500	SDTV, DVD 480I(525I)
3	720*576	15.625	50.00	13.500	SDTV, DVD 576I(625I) 50Hz
4	720*480	31.47	59.94	27.000	SDTV 480P
5	720*480	31.50	60.00	27.027	SDTV 480P
6	720*576	31.25	50.00	27.000	SDTV 576P 50Hz
7	1280*720	44.96	59.94	74.176	HDTV 720P
8	1280*720	45.00	60.00	74.250	HDTV 720P
9	1280*720	37.50	50.00	74.25	HDTV 720P 50Hz
10	1920*1080	33.72	59.94	74.176	HDTV 1080I
11	1920*1080	33.75	60.00	74.250	HDTV 1080I
12	1920*1080	28.125	50.00	74.250	HDTV 1080I 50Hz
13	1920*1080	67.432	59.94	148.350	HDTV 1080P
14	1920*1080	67.5	60	148.5	HDTV 1080P
15	1920*1080	56.250	50	148.5	HDTV 1080P 50Hz

11. Mechanical specification

No.	Item		Content				Unit	Remark
1.	Product Dimension		Width(W)	Length(D)	Height(H)		mm	
		Before Packing	560.8	193.2	427		mm	
		After Packing	651	456	161		mm	
2.	Product Weight	Only SET	5.6				Kg	
		With BOX	7.4				Kg	
3.	Container Loading Quantity	Individual or Palletizing	20ft		40ft			
			Indi.	Wooden	Indi.	Wooden		
			630	520	1260	1144		
4.	Stand Assy	Type	Detachable (Base detachable)					
		Size(W x D x H)	271.2x 193.2x 108.4					
		Tilt Degree	-5~15 degree					
		Tilt force	0.8~3.5kgf					
		Swivel Degree Swivel Force	none					
5.	Appearance	General	Refer to Standard of LG(55)G1-1020					*Appearance Gap spec Front: 0.5 mm ↓ Back & Bottom : 1.0 m ↓

ADJUSTMENT INSTRUCTION

1. Application

This document is applied to LP92E chassis LCD Monitor TV which is manufactured in Monitor Factory or is produced on the basis of this data.

2. Designation

- 1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
- 2) Power Adjustment: Free Voltage
- 3) Magnetic Field Condition: Nil.
- 4) Input signal Unit: Product Specification Standard
- 5) Reserve after operation: Above 5 Minutes (Heat Run)
Temperature : at 25 °C ± 5 °C
Relative humidity : 65% ±10 %
Input voltage : 220V, 60Hz
- 6) Adjustment equipment: Color Analyzer (CA-210 or CA-110), Pattern Generator (MSPG-925L or Equivalent), DDC Adjustment Jig equipment, SVC remote controller

3. Adjustment items

PCB assembly adjustment items

- 1) Download the MSTAR main software (IC603, Mstar ISP Utility)
- 2) Auto Color Balance(ADC) - RGB
- 3) Auto Color Balance(ADC) – Component
- 4) Input Tool-Option/Area option.
- 5) Check SW Version.

SET assembly adjustment items

- 1) DDC Data input.
- 2) HDCP data input
- 3) Adjustment of White Balance.
- 4) Preset CH information
- 5) Factoring Option Data input.

4. PCB assembly adjustment method

4.1 Input Tool-Option, Area Option

Option adjustment following BOM (Tool Option 1, Area Option)

- * Required Equipments
 - Remote controller for adjustment
- * Profile : Must be changed the option value because being different with some setting value depend on module maker, inch and market.

Adjustment method

The input methods are same as other chassis.(Use IN-START Key on the Adjust Remocon.)

LW91A	LPL	L22FHD
Main		V1.00
HDCP		0
UTT		XX
Tool Option 1		37000
Tool Option 2		112
Area Option		20

- 1) Push the IN-START key in the Adjust R/C.
- 2) Input the Option Number that was specified in the BOM, into the Shipping area.
- 3) Select "Tool Option/ Area Option" by using ▼/▲(CH+/-) key , and press the number key(0~9) consecutively
ex) If the value of Tool Option1 is 7, input the data using number key "7"
(If not changed the option, the input menu can differ from the model spec.)
* Refer to Job Expression of each main chassis ass'y (EBTxxxxxxx) for Option value

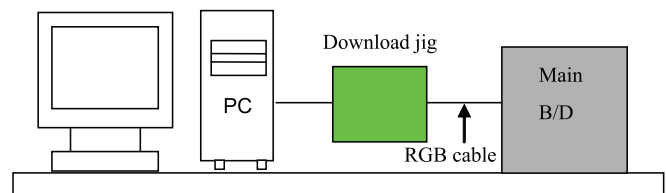
- * Before PCB check, you have to change the Tool option, Areaoption and have to AC off/on (Plug out and in)
(If missing this process, set can operate abnormally)
- * Never push the IN-STOP KEY after completing the function inspection.

4.2 S/W program download (Using MSTAR Download program)

Profile : This is for downloading the s/w to the flash memory of IC603

Equipment

- 1) PC
- 2) ISP_tool program
- 3) Download jig

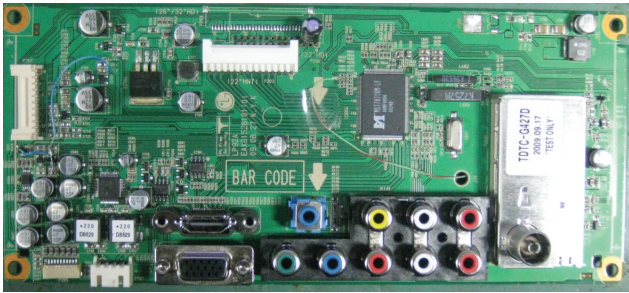


Connection structure

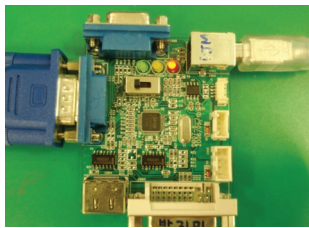
Connection condition

- 1) IC name and circuit number : Flash Memory and IC603
- 2) Use voltage : 3.3V (5 pin)
- 3) SCL : 15 pin
- 4) SDA : 12 pin
- 5) Tact time : about 2min

4.2.1 Preliminary steps



(1) Download method 1 (PCB Assy)



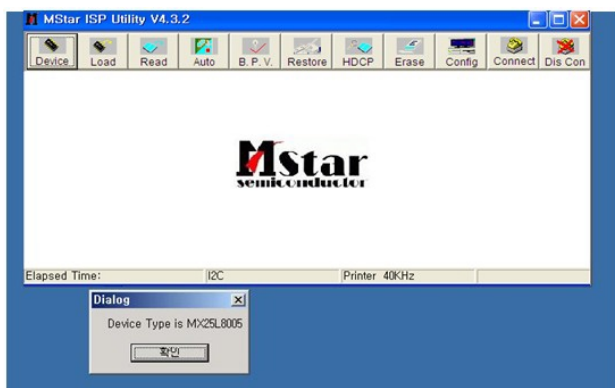
(2) Connect the download jig to D-sub jack

4.2.2 Download Steps

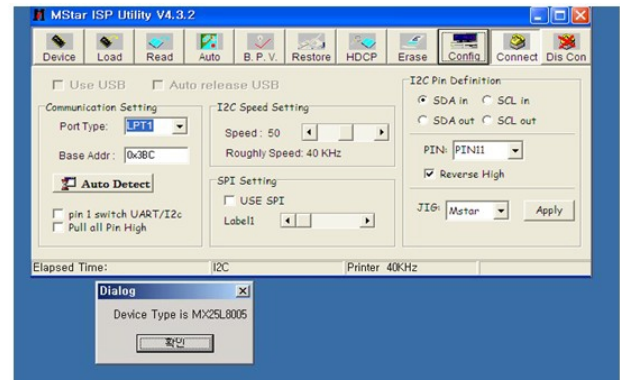
(1) Execute 'ISP Tool' program in PC, then a main window will be opened



(2) Click the connect button and confirm "Dialog Box".

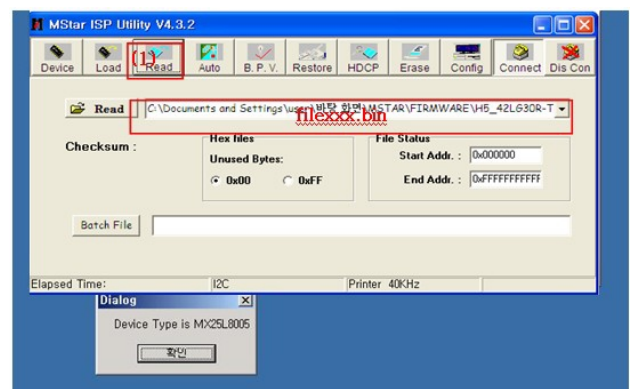


(3) Click the Config button and Change speed E2PROM Device setting : over the 350Khz



(4) Read and write bin file

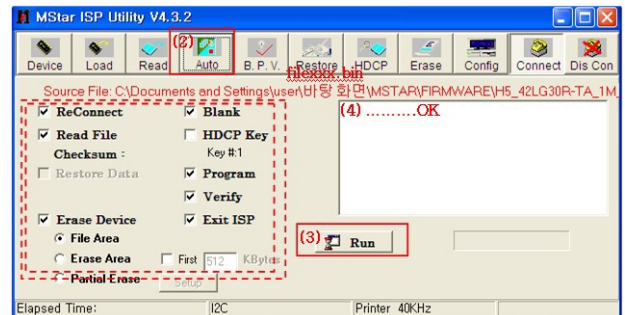
Click "(1)Read" tab, and then load download file(XXXX.bin) by clicking "Read".



(5) Click "Auto(2)" tab and set as below

(6) click "Run(3)".

(7) After downloading, check "OK(4)" message.



4.3. ADC Process

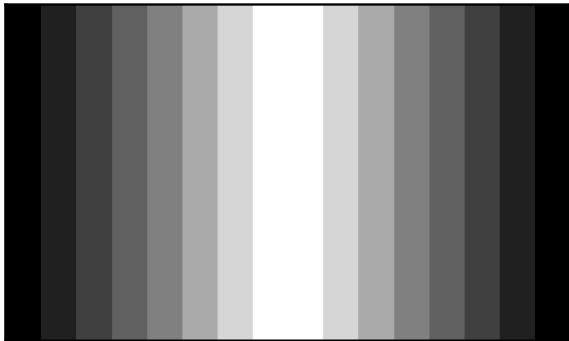
4.3.1 ADC calibration

- * MSPG-925
- Component: series Model : 216 (720P@60Hz)
- RGB: Model : 60(1024X768@60Hz)

4.3.2 PC input ADC

4.3.2.1 Auto RGB Gain/Offset Adjustment

- Convert to PC in Input-source
- Signal equipment displays
Output Voltage: 700 m Vp-p
Impress Resolution XGA (1024 x 768 @ 60Hz)
Model : 60 in Pattern Generator
Pattern : 29 in Pattern Generator (MSPG-925 SERIES)



Adjustment pattern (PC)

- Adjust by commanding AUTO_COLOR_ADJUST.

4.3.2.2 Confirmation

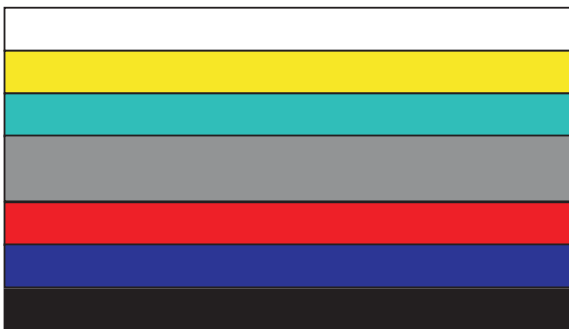
- We confirm to address "0xF1 (offset), 0xF2 (gain)" in page "0x0E" of EEPROM the value is "0xAA" or not.
- If the value is not "0xAA", we adjust once more.
- We can write the ADC values from "0x00~0x05" addresses in a page "0x0E".0

*Manual ADC process using Service Remocon. After enter Service Mode by pushing "ADJ" key, execute "Auto-RGBB" by pushing "▶" key at "Auto-RGB".

4.3.3 COMPONENT input ADC

4.3.3.1 Component Gain/Offset Adjustment

- Convert to Component in Input-source
- Signal equipment displays
Impress Resolution 720p
MODEL : 216 in Pattern Generator(720P/60Hz 100% Color Bar Mode)
PATTERN : 65 in Pattern Generator(MSPG-925 SERISE)



Adjustment pattern (COMPONENT)

- Adjust by commanding AUTO_COLOR_ADJUST.

4.3.3.2 Confirmation

- We confirm to address "0xF3 (offset), 0xF4 (gain)" in page "0x0E" of EEPROM the value is "0xAA" or not.
- If the value is not "xAA", we adjust once more.
- We can write the ADC values from "0x06~0x0B" addresses in a page "0x0E".

*Manual ADC process using Service Remocon. After enter Service Mode by pushing "ADJ" key, execute "Auto-RGB" by pushing "▶" key at "Auto-RGB".

5. EDID writing and Check HDCP key

5.1 writing EDID (RGB, HDMI) 5.2 Equipment

- Select System control 2 in service menu by Remote controller for adjustment.
- Select EDID All (RGB, HDMI) in system control 2 menu
- Check OK at EDID RGB, EDID HDMI list
- if it is not OK, try one more time
- * even though see OK, read EDID data by Adjustment program or MSPG.

- All data are HEXA
- Adjustable Data :
 - ** : week
 - *** : year ex) when year 2008 : input "12"
 - **** : CHECK SUM (deferent along week, year)

5.5 EDID data

No.	Item	content	16bit Data
1	Manufacturer ID	GSM	1E6D
2	ProductID	22509(Analog) 22510(HDMI)	
3	Year	2010	14
4	Version	Analog : 1 Digital : 1	1
5	Revision	Analog : Digital :	3
6	Model Name	M2380A	

5.5.1. RGB EDID Data

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	00	1E	6D	ED	57	01	01	01	01	01
0x01	01	14	01	03	68	33	1C	78	EA	C6	65	A0	59	58	9D	27
0x02	0E	50	54	A1	08	00	B3	00	81	80	81	40	71	40	01	01
0x03	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
0x04	45	00	FD	1E	11	00	00	1E	00	00	00	FD	00	38	3D	1E
0x05	45	0F	00	0A	20	20	20	20	20	20	00	00	00	FC	00	4D
0x06	32	33	38	30	41	0A	20	20	20	20	20	20	00	00	00	FF
0x07	00	0A	20	20	20	20	20	20	20	20	20	20	20	00	00	E3

5.5.2. HDMI EDID Data

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	EE	57	01	01	01	01
10	01	14	01	03	80	33	1C	78	EA	C6	65	A0	59	58	9D	27
20	0E	50	54	A1	08	00	B3	00	81	80	71	40	81	40	01	01
30	01	01	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	FD	1E	11	00	00	1A	02	3A	80	18	71	38	2D	40
50	53	2C	45	00	FD	1E	11	00	00	1E	00	00	00	FD	00	30
60	3D	1C	53	0F	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4D	32	33	38	30	41	0A	20	20	20	20	20	01	11	
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	19	F1	4A	90	04	03	01	14	12	05	1F	10	13	23
10	09	07	07	65	03	0C	00	10	00	02	3A	80	18	71	38	2D
20	40	58	2C	45	00	FD	1E	11	00	00	1A	01	1D	80	18	71
30	1C	16	20	58	2C	25	00	FD	1E	11	00	00	9E	01	1D	00
40	72	51	D0	1E	20	6E	28	55	00	FD	1E	11	00	00	1E	01
50	1D	80	D0	72	1C	16	20	10	2C	25	80	C4	8E	21	00	00
60	9E	02	3A	80	D0	72	38	2D	40	10	2C	45	20	06	44	21
70	00	00	1E	00	00	00	00	00	00	00	00	00	00	00	00	EA

6.Check HDCP key

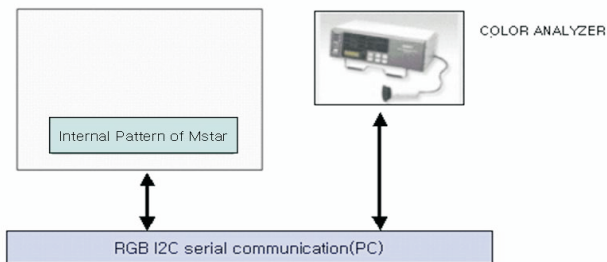
- * This model is applied IC written HDCP. So don't need to write.
- * Read HDCP key by adjustment program

7.Adjustment of White Balance

7.1 Purpose and Principle for adjustment of the color temperature

- Remote controller for adjustment
- Color Analyzer : CA-210
- CH : 09 (LCD MNT, Normal) --> M2080A / M2280A/ M2380A
- Auto W/B adjustment instrument(only for Auto adjustment)
- PC (for communication through RGB)
- Pattern Generator (MSPG-925FS series.)

7.2 Connecting diagram of equipment for measuring (For Automatic Adjustment)



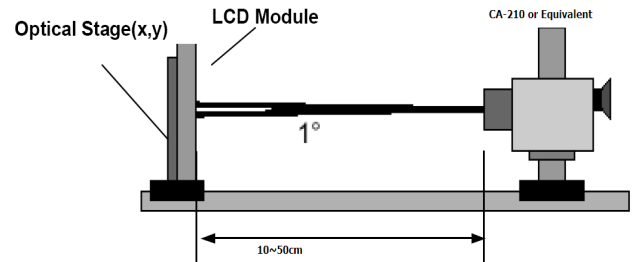
(Standard color coordinate and temperature when using the CA210 equipment)

* Luminance min value is 120cd/m² in the cool/ medium/ warm mode(Typ: 170)

Mode	Color coordinate		Temp
	X	Y	
Cool	0.283±0.003	0.293±0.003	11,000K
Medium	0.295±0.003	0.305±0.003	8,000K
Warm	0.313±0.003	0.329±0.003	6,500K

* Note : x,y coordinates are drifted about 0.007 after 30 mins heat-run. So checking color coordinate within 5-min at total assembly line, consider x,y coordinates might be up to 0.007 than x,y target of each color temperature.

*When doing Adjustment, Please make circumstance as below.



8.Function Check

8.1 Check display and sound

* Check Input and Signal items. (cf. work instructions)

1. TV
2. AV (CVBS)
3. COMPONENT (1080i)
4. RGB (PC : 1920 x 1080 @ 60hz)
5. HDMI
6. PC Audio In

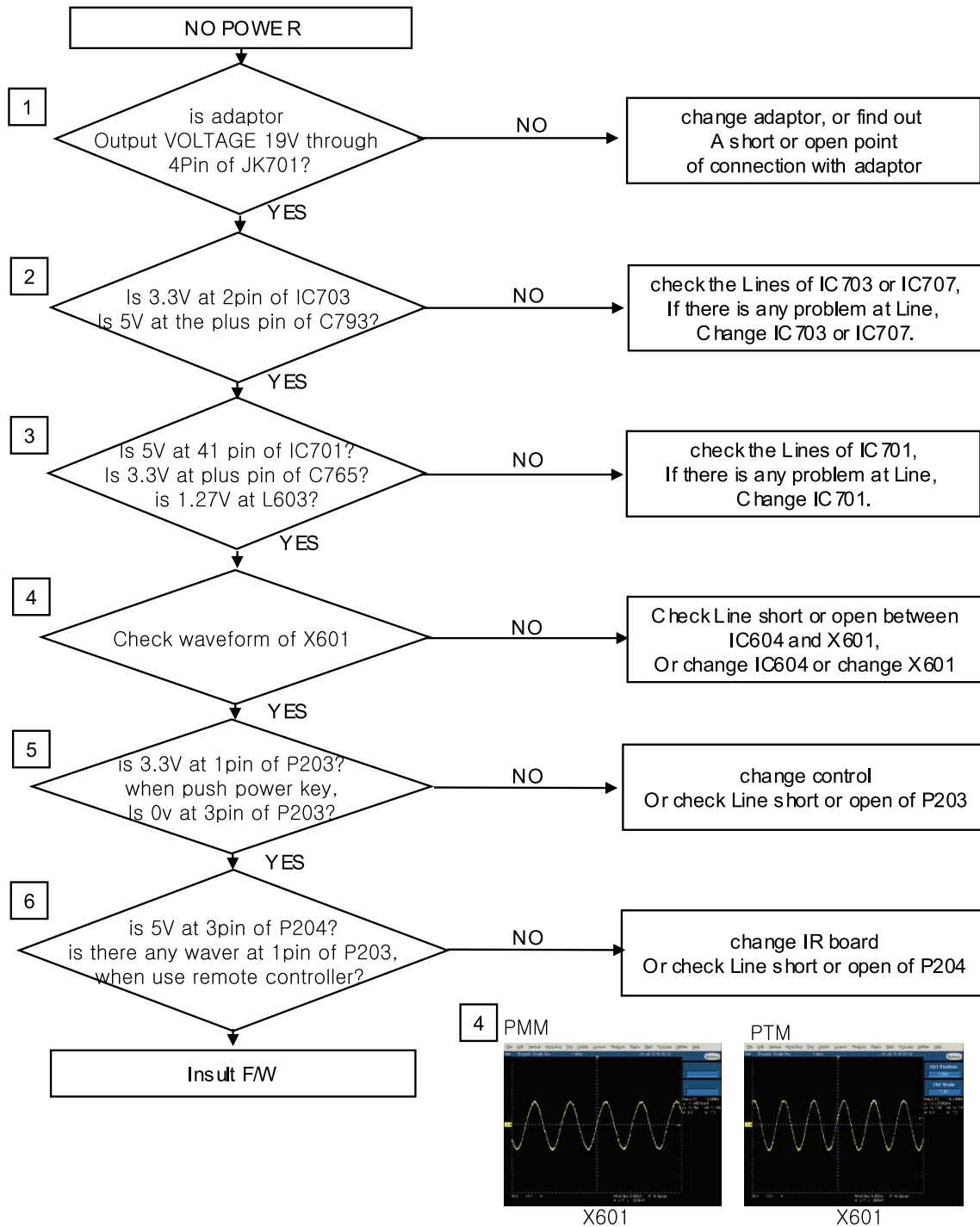
* Display and Sound check is executed by Remote controller.

9. Preset CH write condition

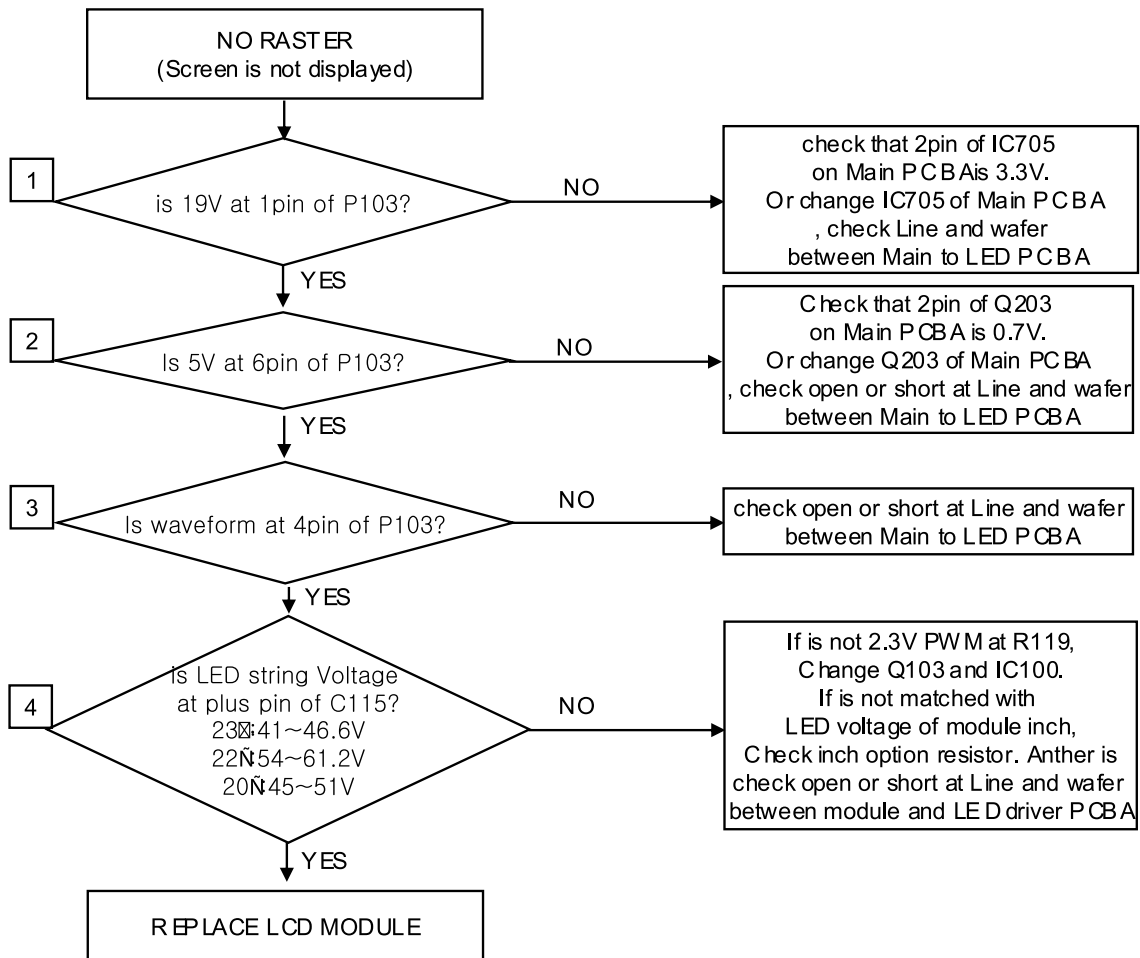
1. AC on time on only one after assembled automatically
2. CH recover on SVC OSD manually

TROUBLESHOOTING

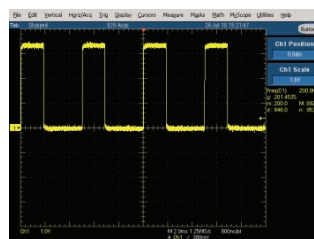
1. NO POWER-MAIN PCBA



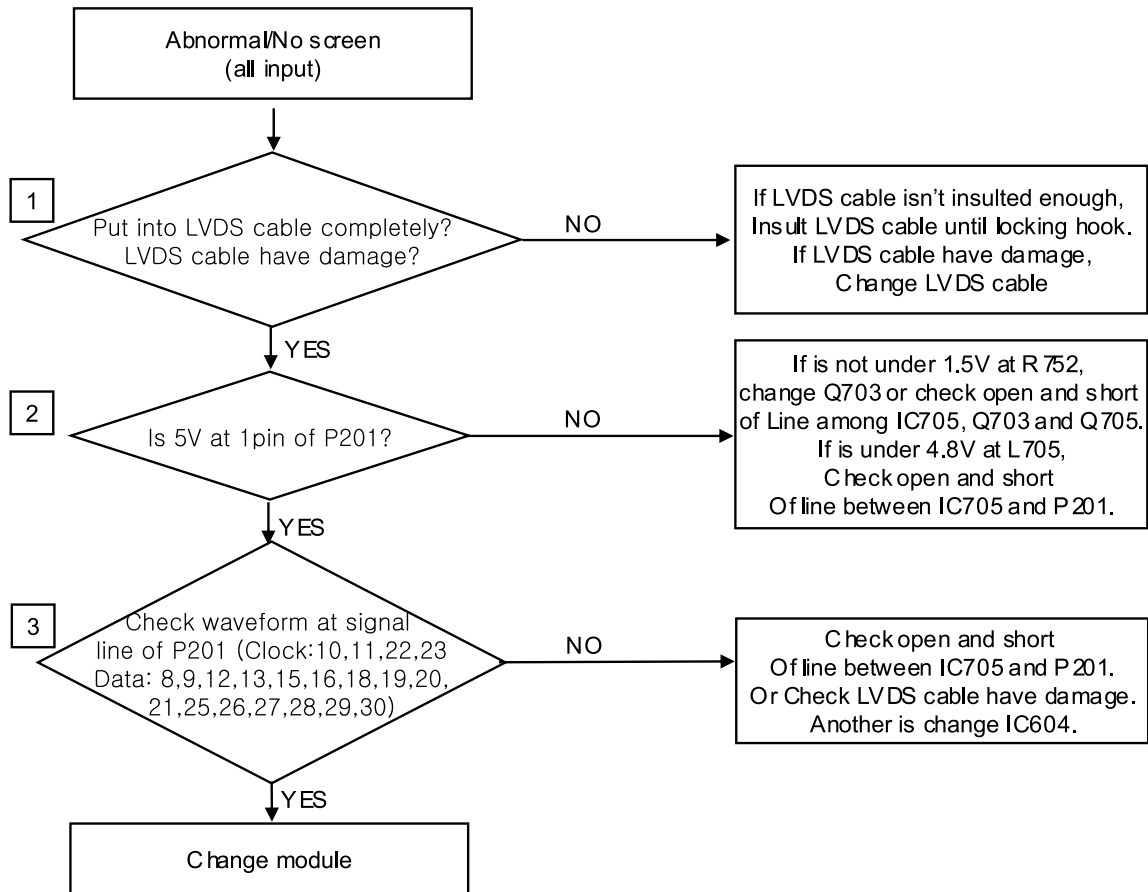
2. No raster(Power LED blue, black screen)-LED driver PCBA



WAVEFORMS

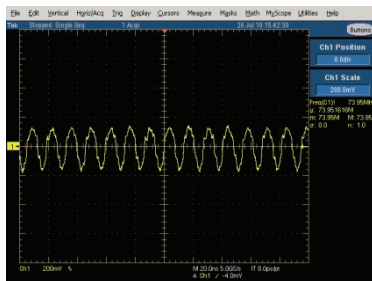


3. Abnormal/No screen (All in put)-Main PCBA

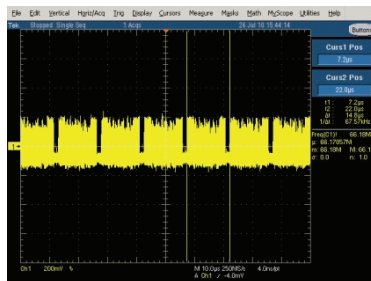


WAVEFORMS

3

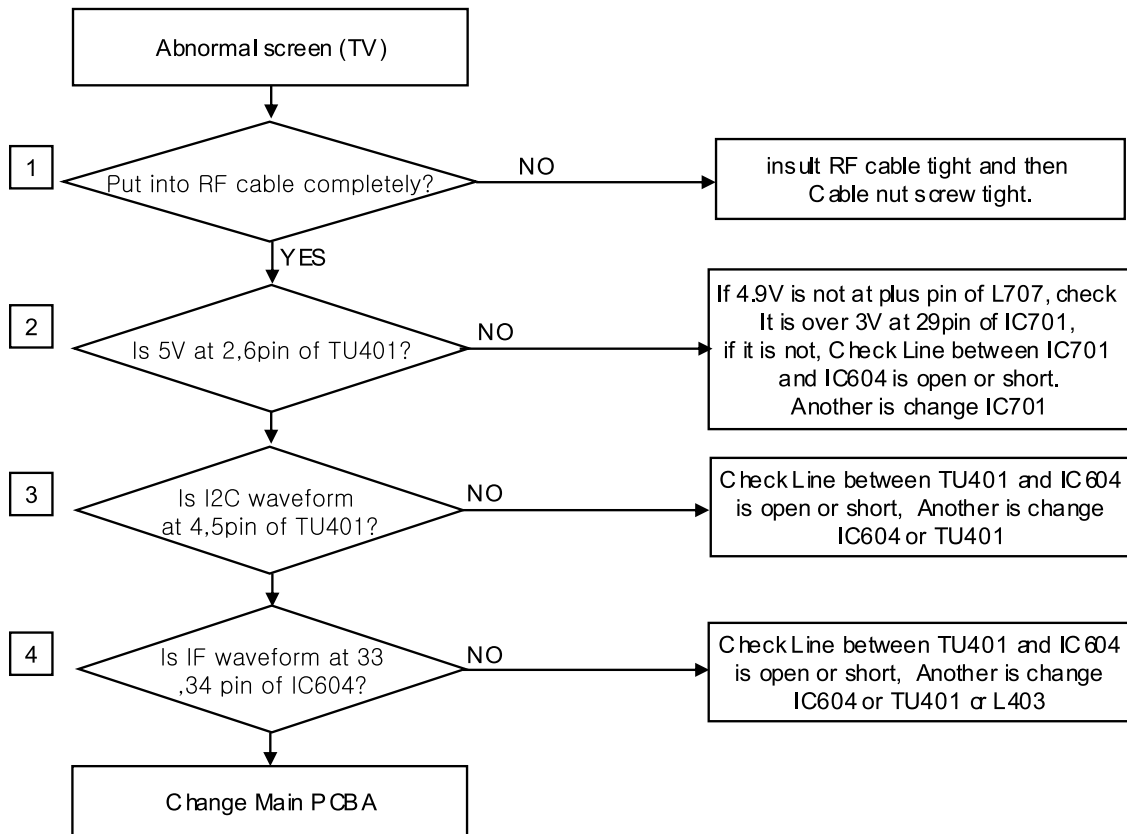


10,11,22,23Pin of P201
(Clock line)



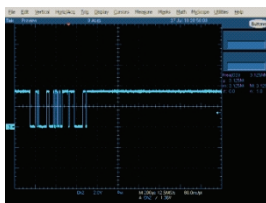
8,9,12,13,15,16,18,19,20,21,
25,26,27,28,29,30Pin of P201
(Data Line)

4. Abnormal screen (TV)-Main PCBA

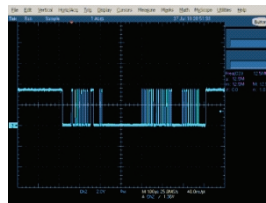


WAVEFORMS

3

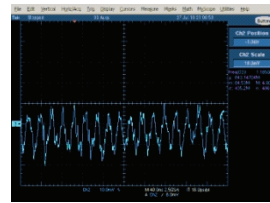


4Pin of TU401 (SCL)



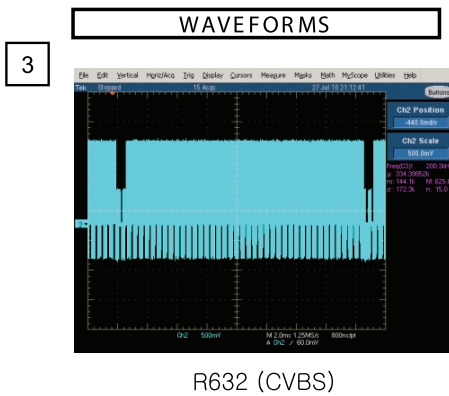
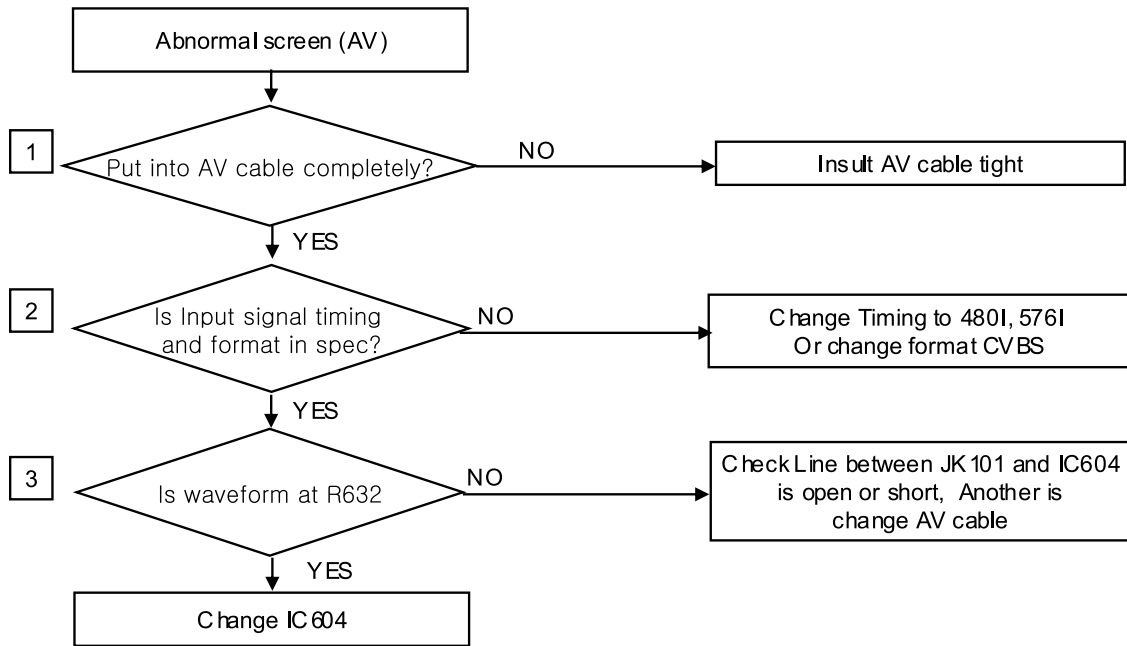
5Pin of TU401 (SDA)

4

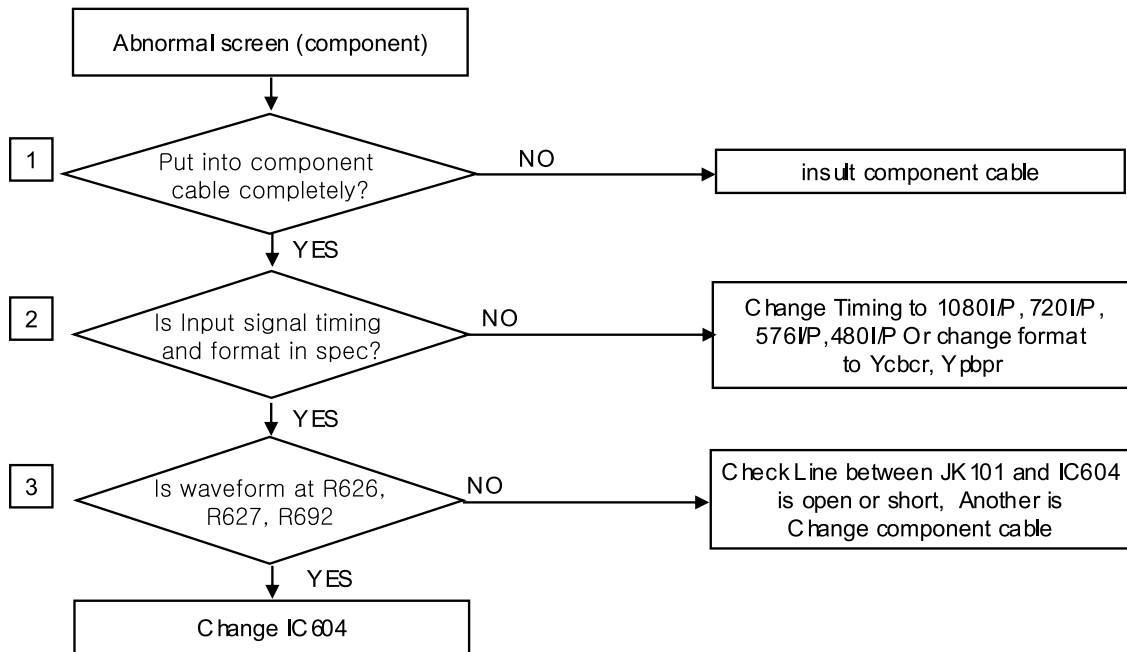


33,34pin of IC604

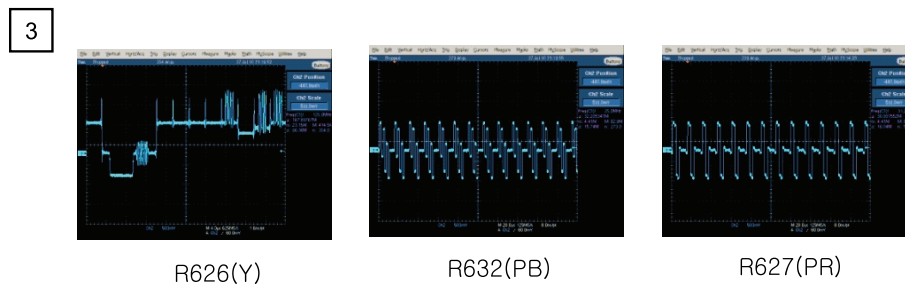
5. Abnormal screen (AV)-Main PCBA



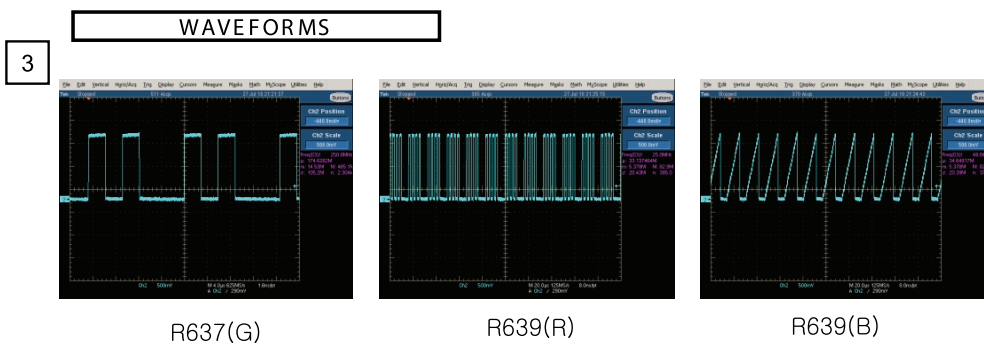
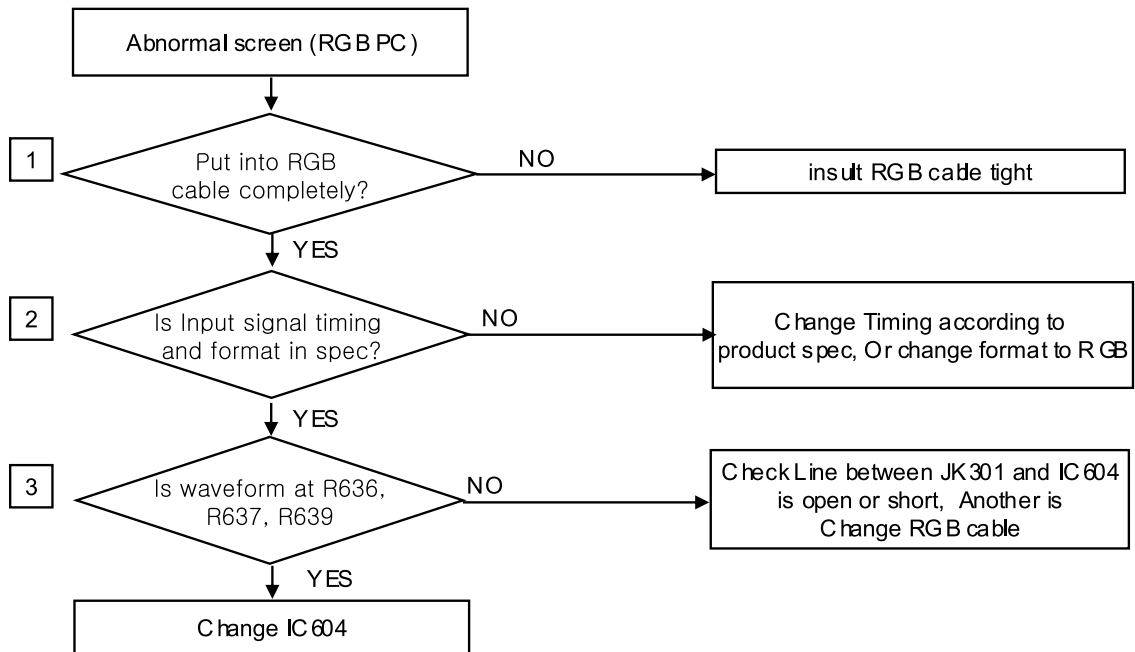
6. Abnormal screen (Component)-Main PCBA



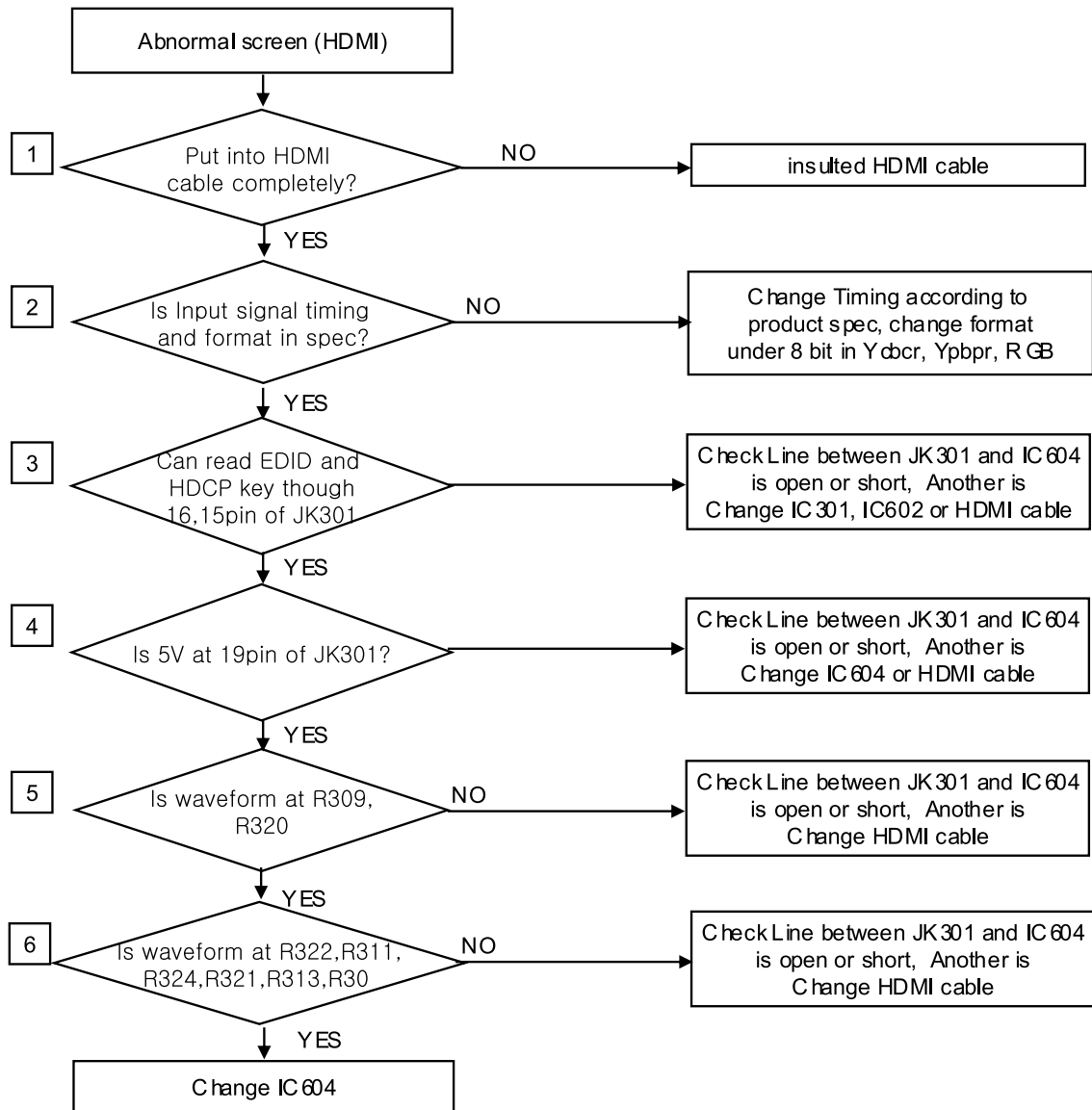
WAVEFORMS



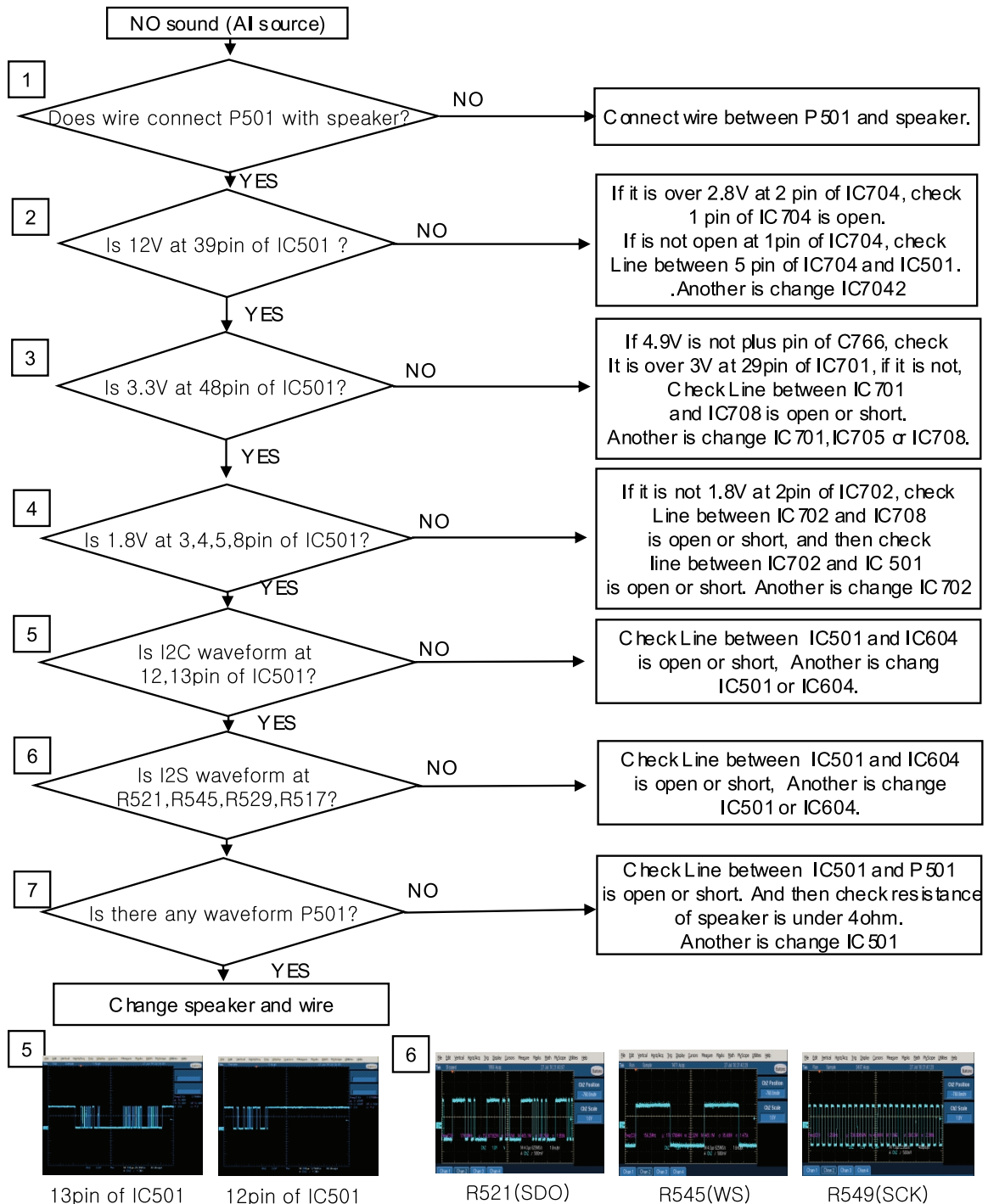
7. Abnormal screen (RGB PC)-Main PCBA



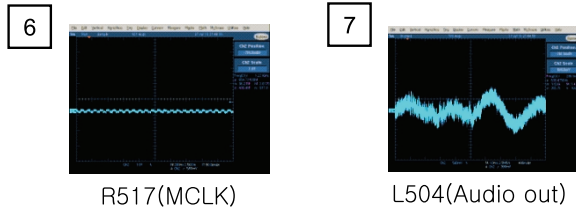
8. Abnormal screen (HDMI)-Main PCBA



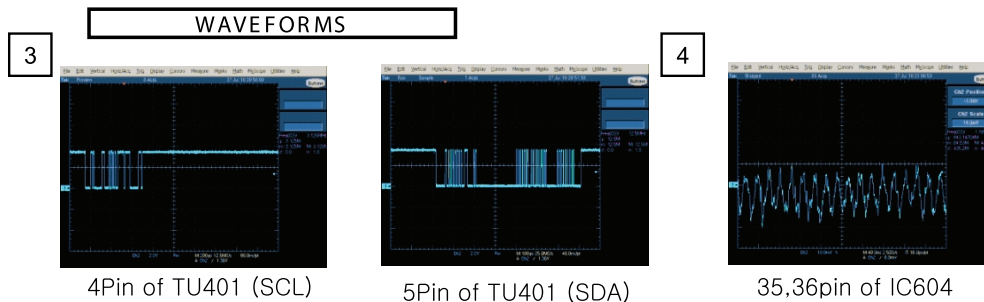
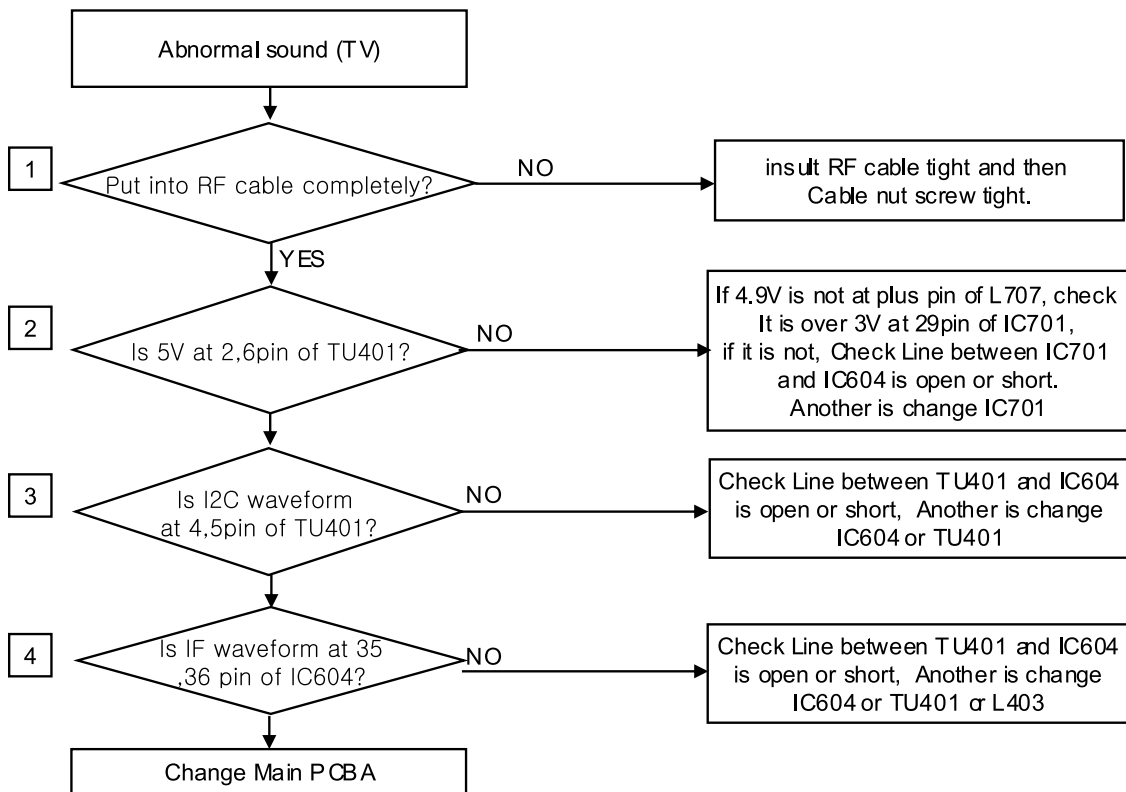
9. No sound (all source)-Main PCBA



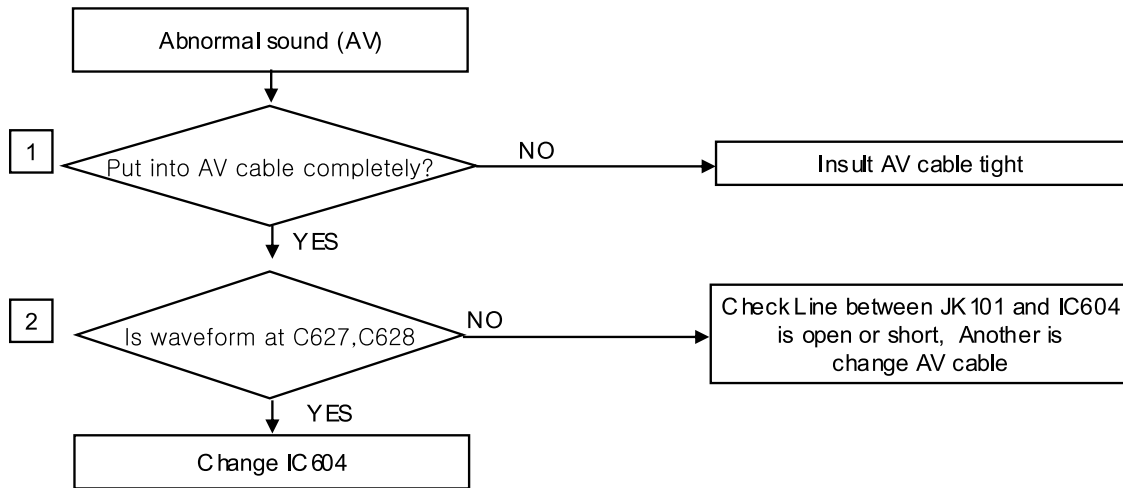
9. No sound (all source)-Main PCBA



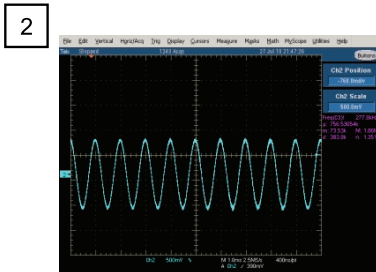
10. Abnormal sound(TV)-Main PCBA



11. Abnormal sound(AV)-Main PCBA

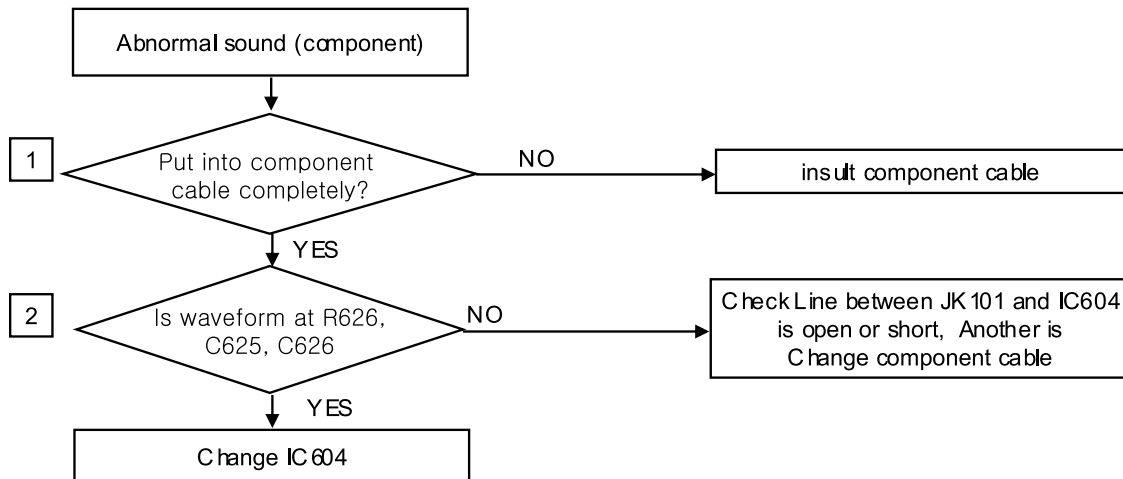


WAVEFORMS



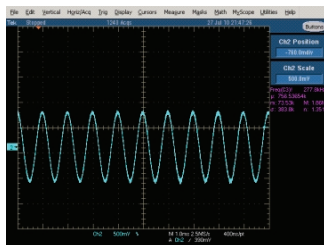
C627,C628 (audio in)

12. Abnormal sound(Component)-Main PCBA



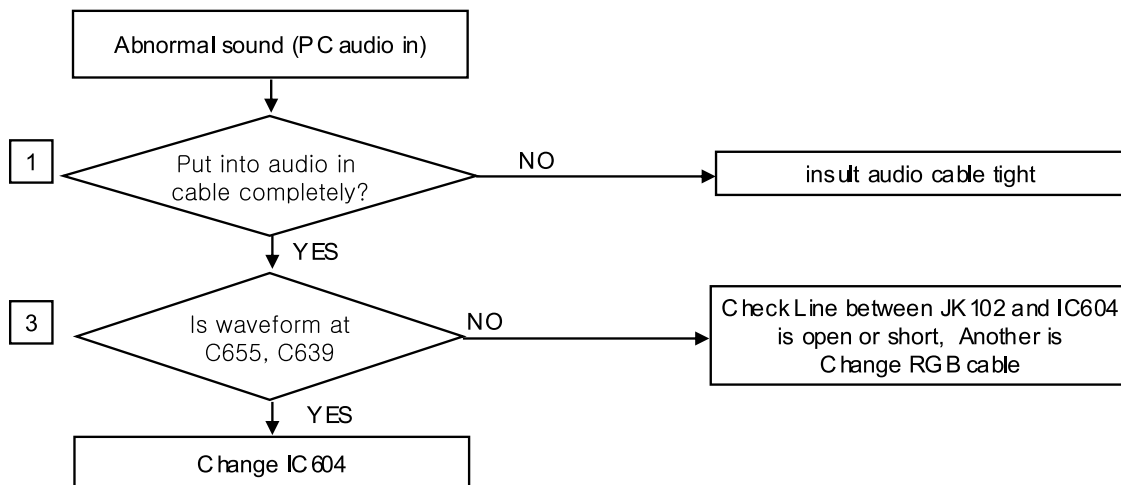
WAVEFORMS

2

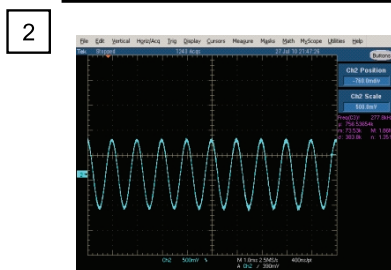


C625, C626 (audio in)

13. Abnormal sound(PC audio in)-Main PCBA

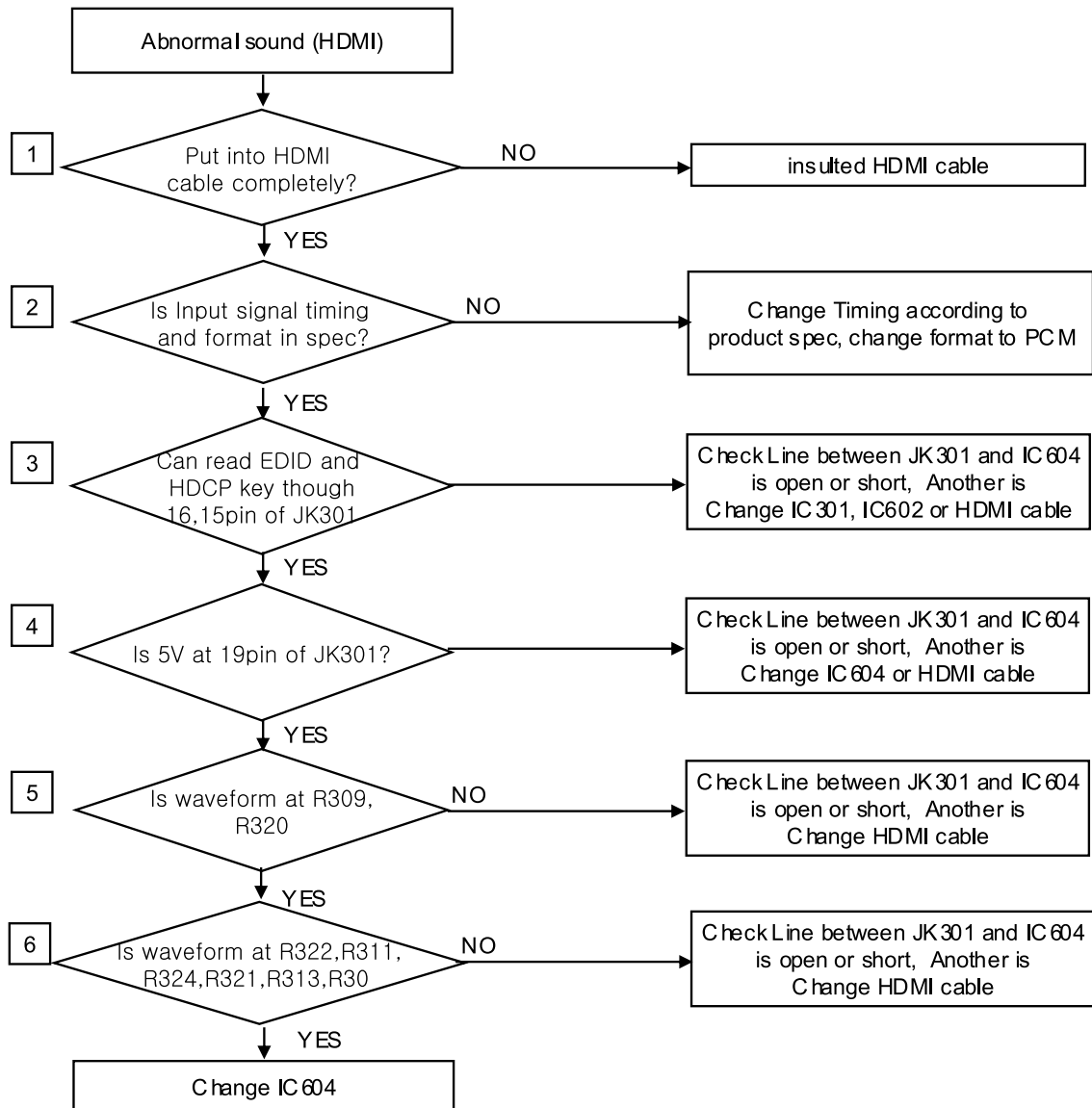


WAVEFORMS

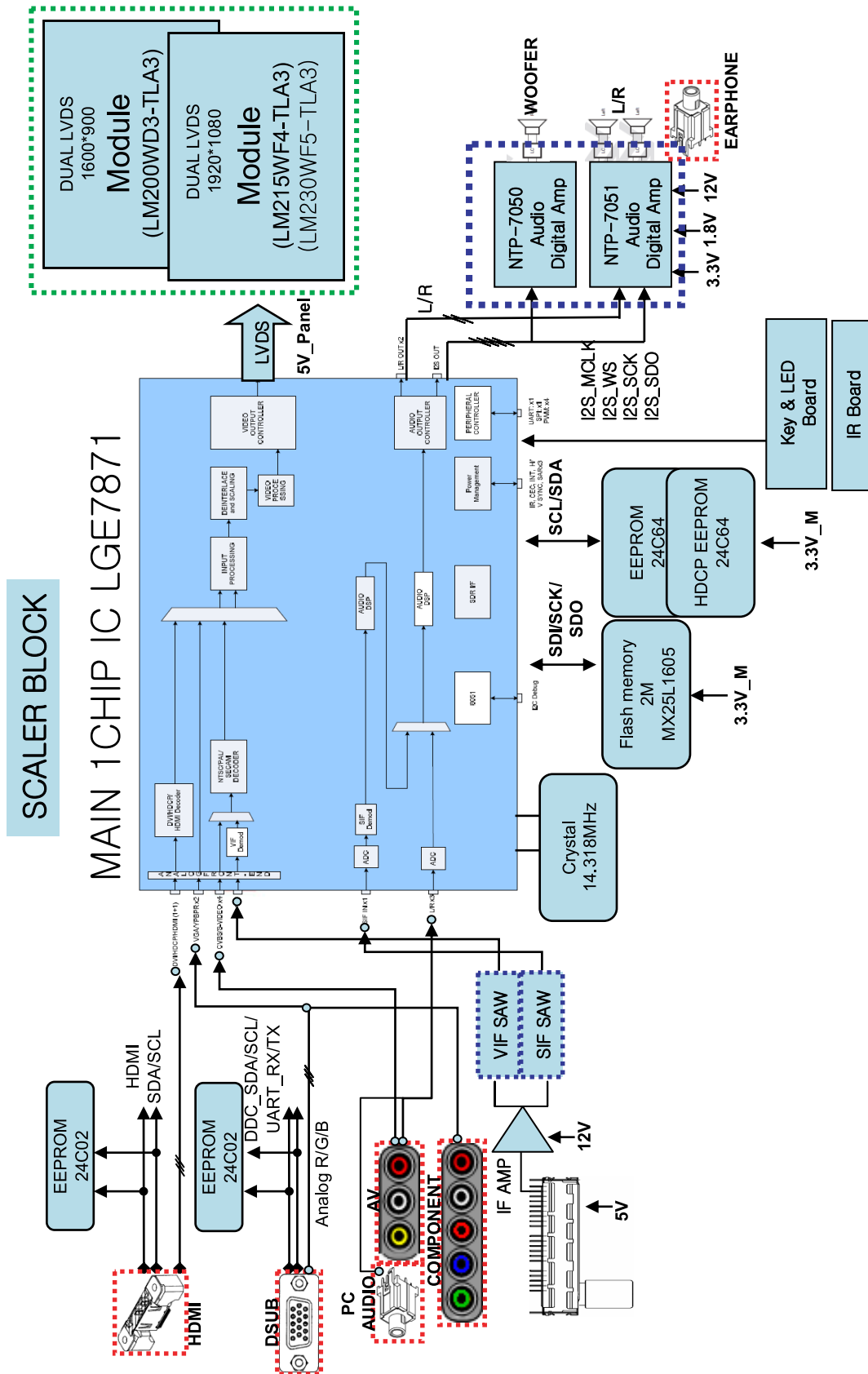


C655,C639 (audio in)

14. Abnormal sound(HDMI)-Main PCBA




BLOCK DIAGRAM



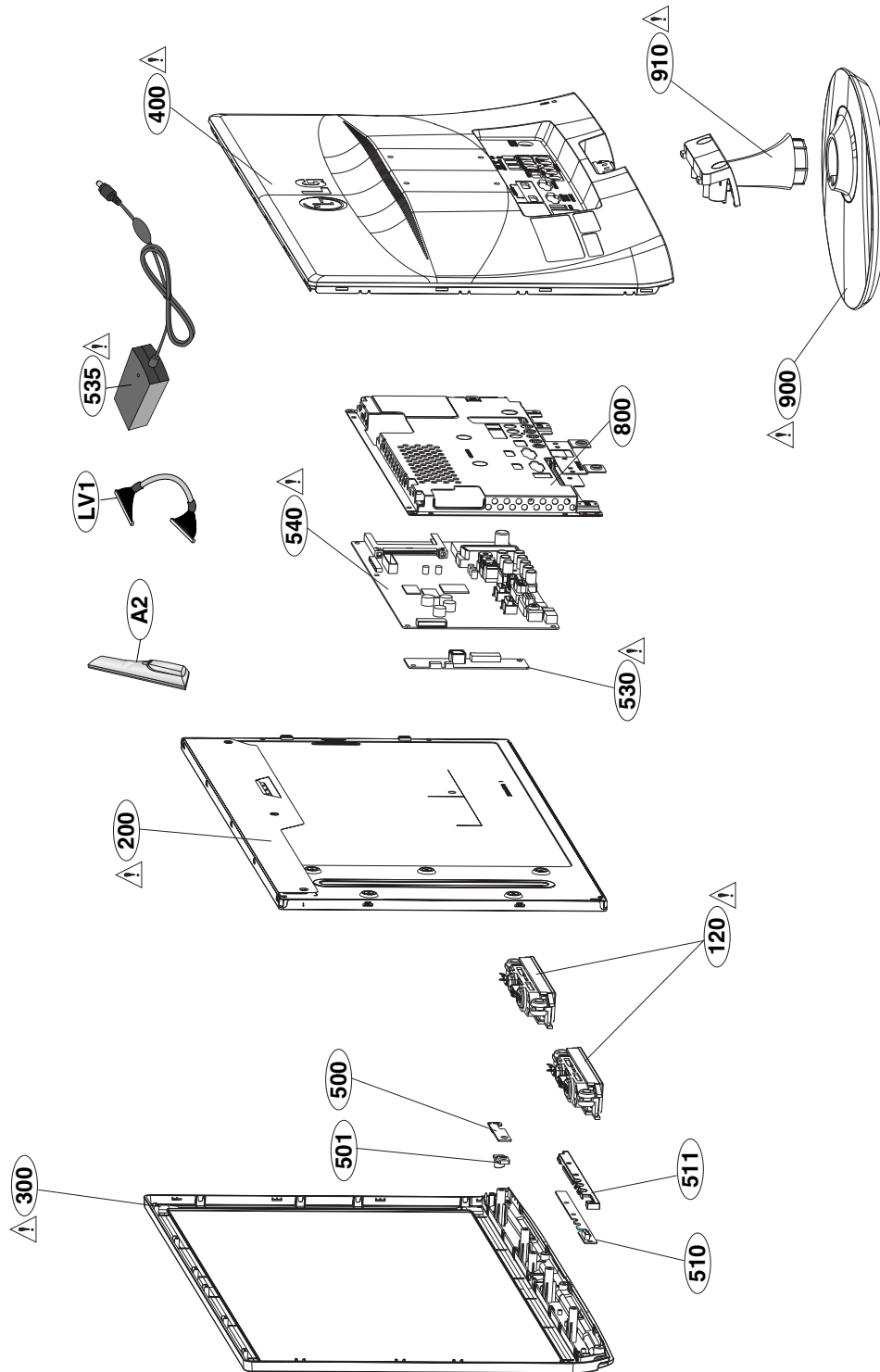
EXPLODED VIEW

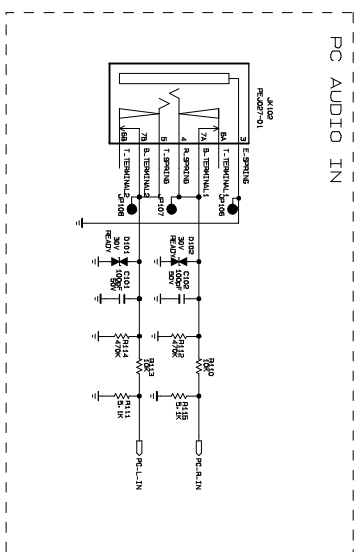
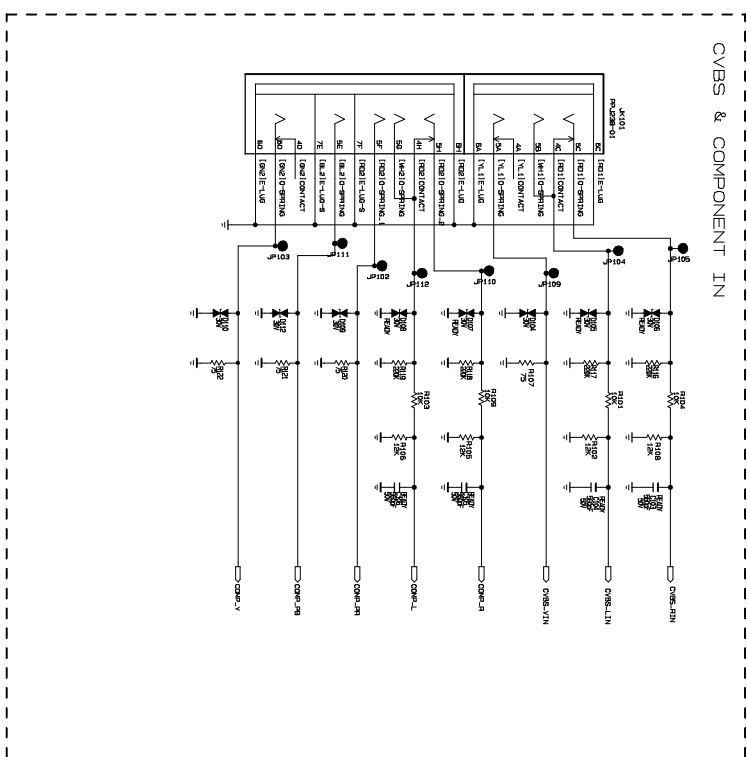
IMPORTANT SAFETY NOTICE

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.





THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILDER AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

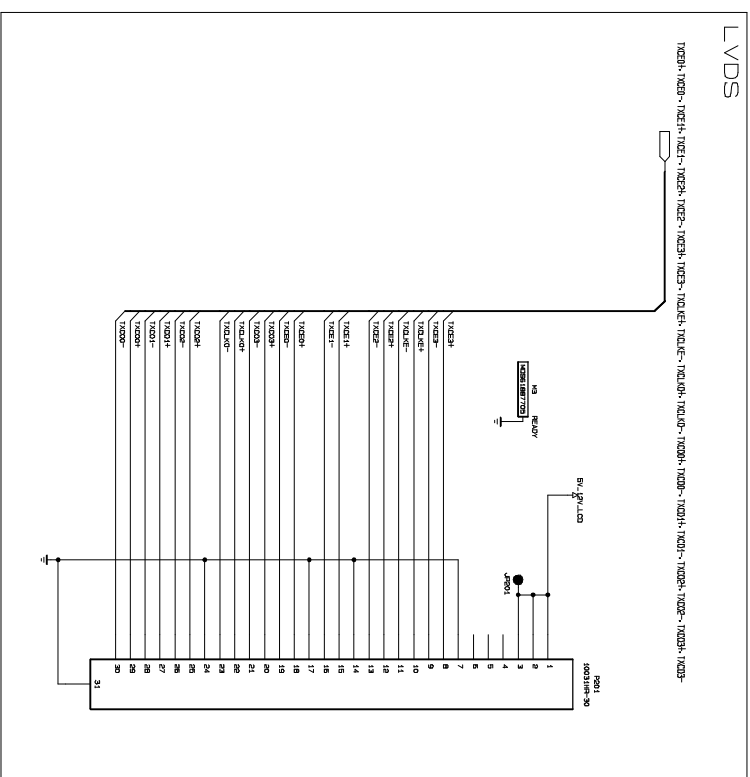
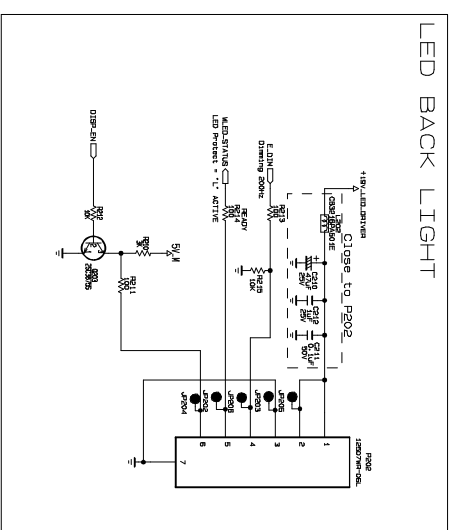
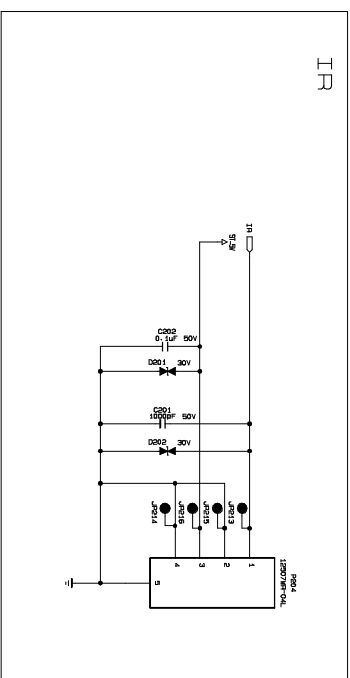
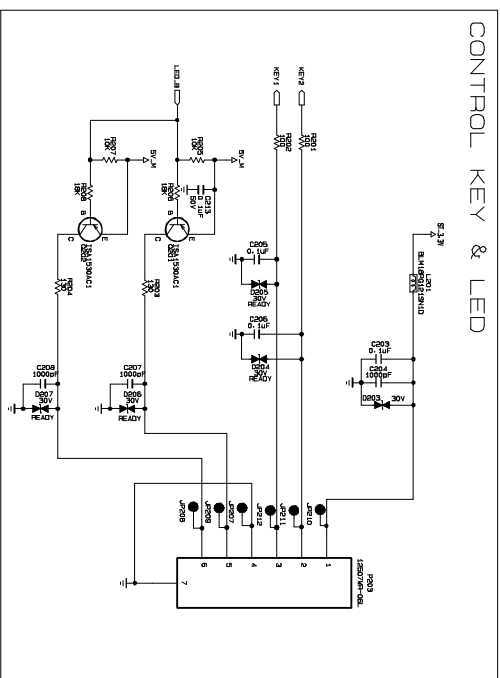
SECRET



LG ELECTRONICS

MODEL	#AX62063301-5	DATE	2010/5/24
BLOCK	INPUT	SHEET	1 / 7

LVDS/IR



THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILM AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET

LGElectronics

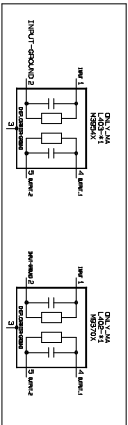
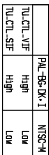


LG ELECTRONICS

MODEL	EAx62063301-5	DATE	2010/5/24
BLOCK	LVDS/IR	SHEET	2/7

BLOCK	LYDS/IN	SHEET	2 / 7
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TUNER



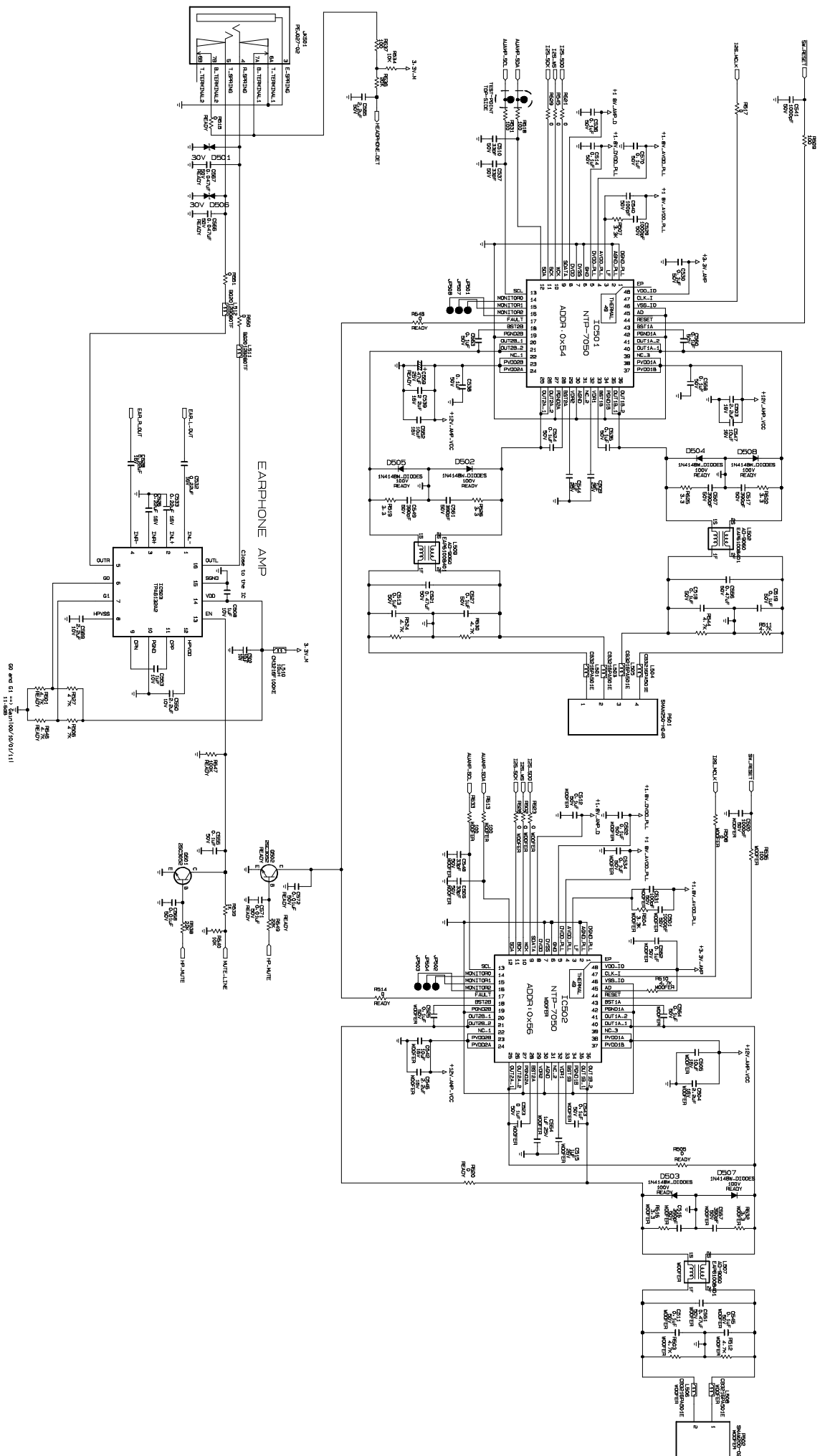
SECRET

LGElectronics

MODEL	EAx62063301-5	DATE	2010/5/24
BLOCK	TUNER	SHEET	4 / 7

AUDIO AMP (FOR SPEAKER)

AUDIO AMP (FOR WOOFER)



THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILM AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING. IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

LGElectronics



MODEL	EAX62063301-5	DATE	2010/5/24
BLOCK	AUDIO	SHEET	5/7

DATE _____

2010/5/24

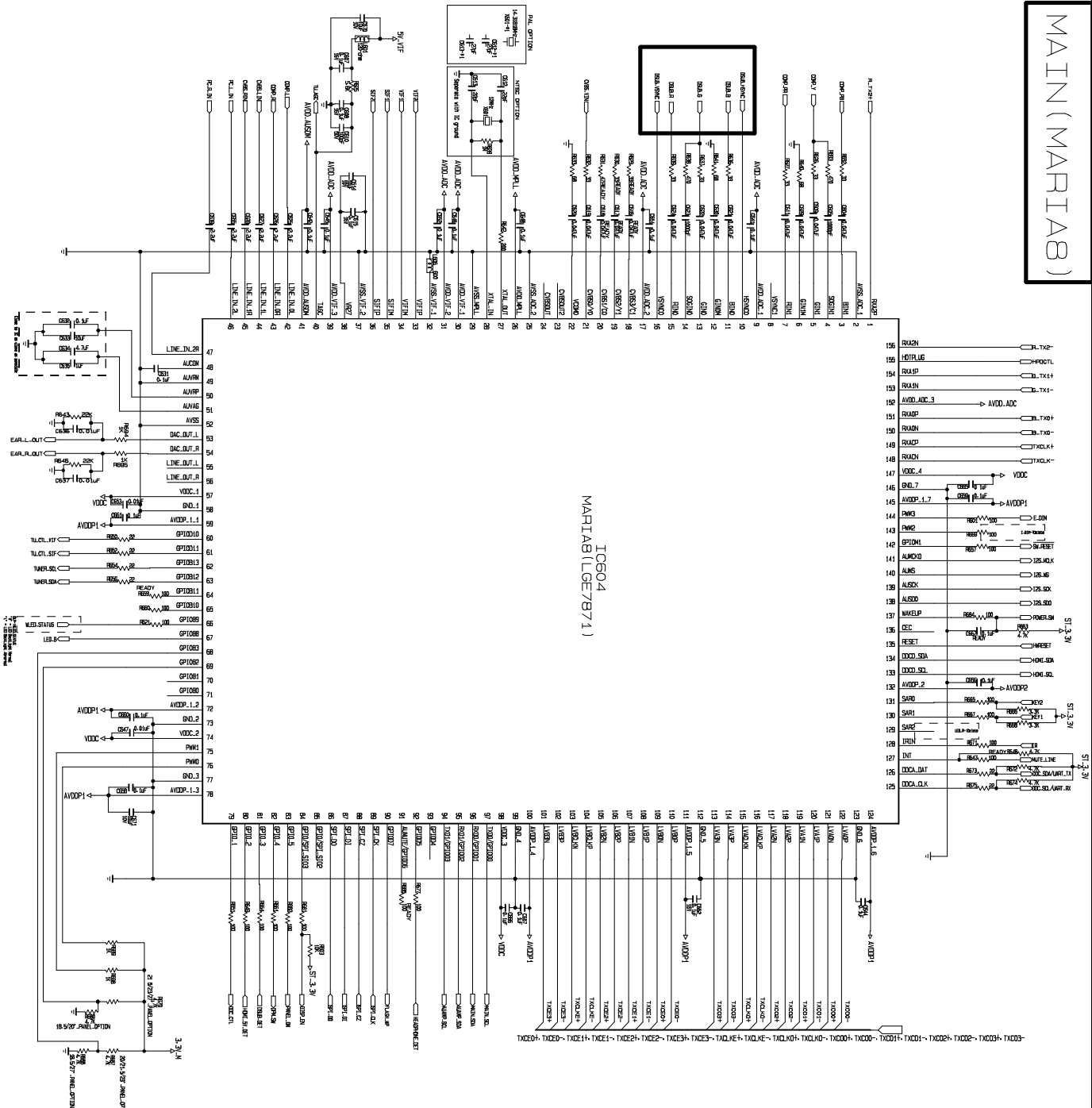
BLANK

AUDIO

SHE

U

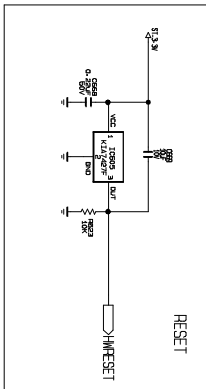
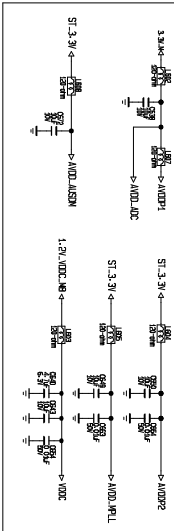
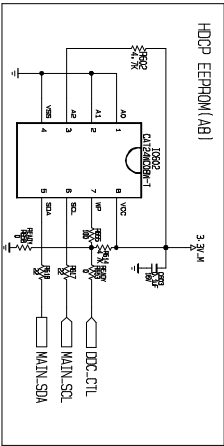
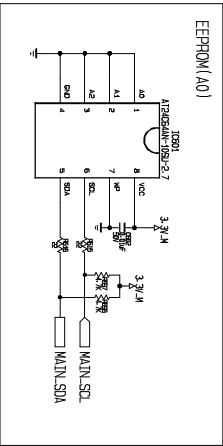
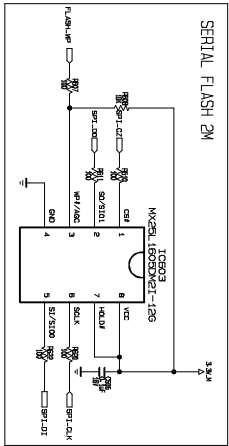
MAIN(MARIA8)



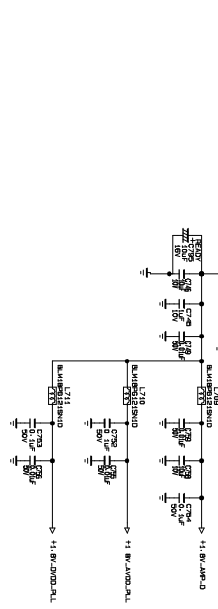
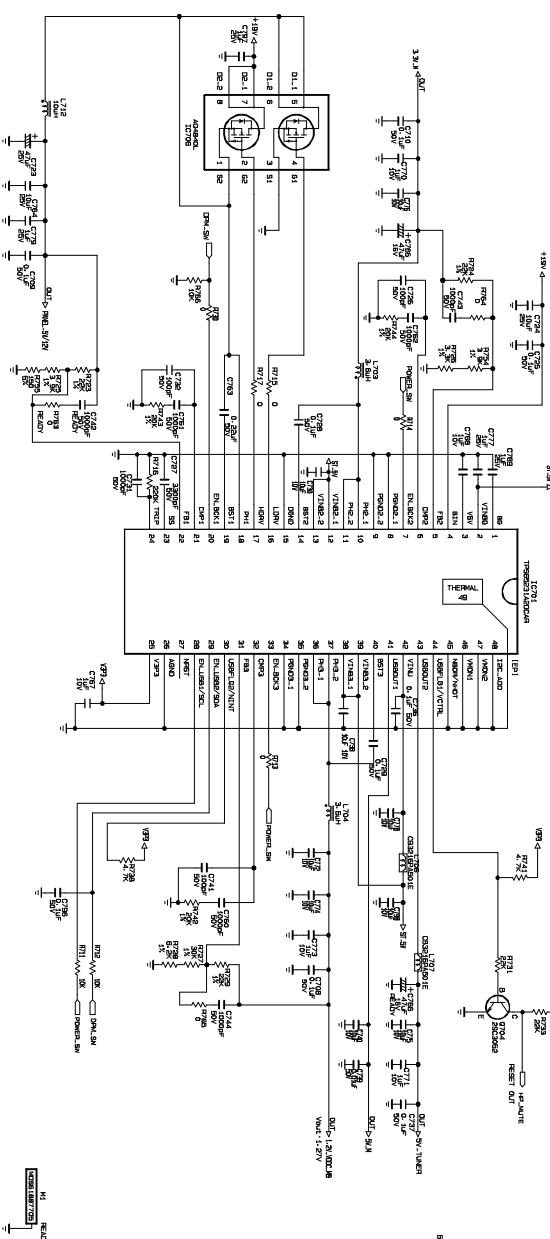
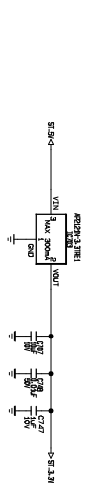
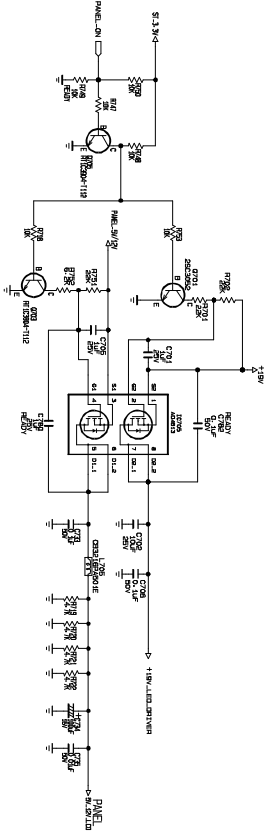
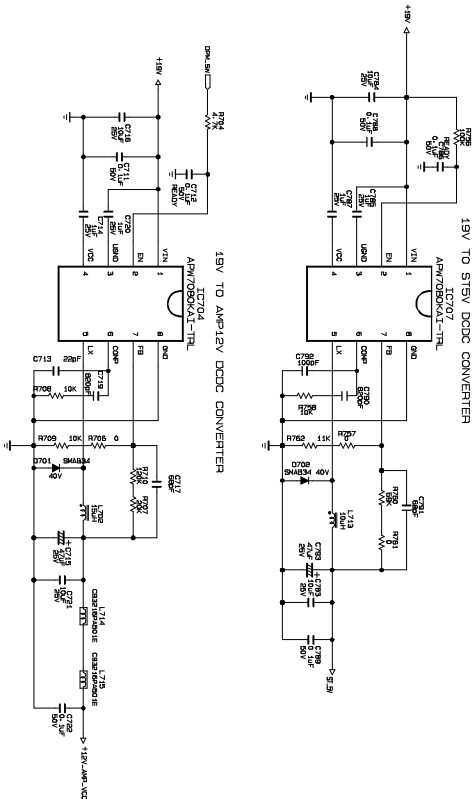
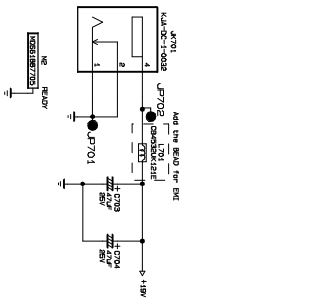
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET

LG ELECTRONICS



MODEL	EAX62063304-B	DATE	2010/5/24
BLOCK	MARIA8	SHEET	5/7

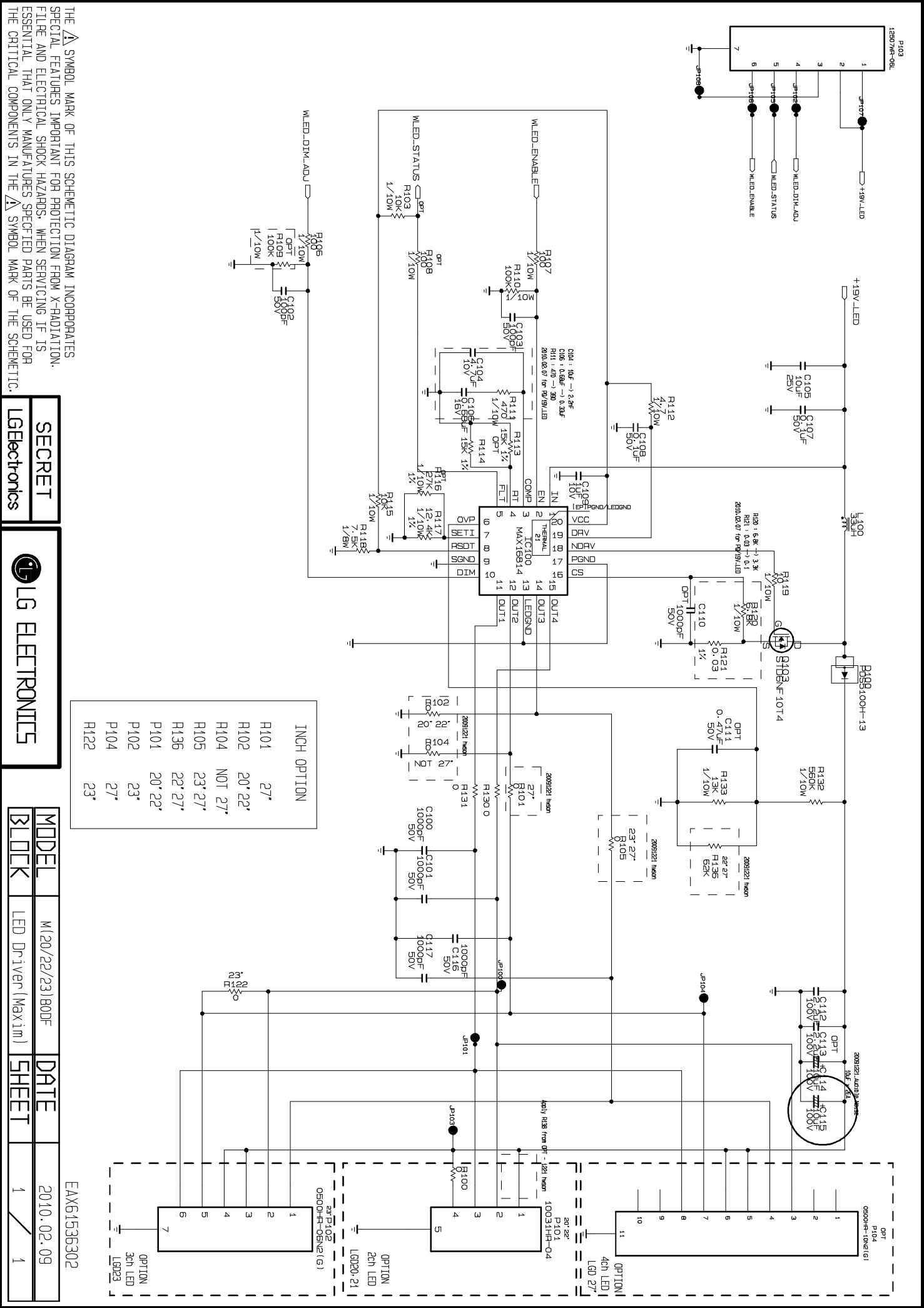


THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET

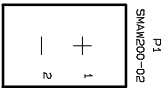
LG ELECTRONICS

MODEL	EAX62063301-B	DATE	2010/5/24
BLOCK	POWER	SHEET	7 / 7

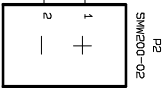


Docking PCB for Woofer ass'y

Angle type



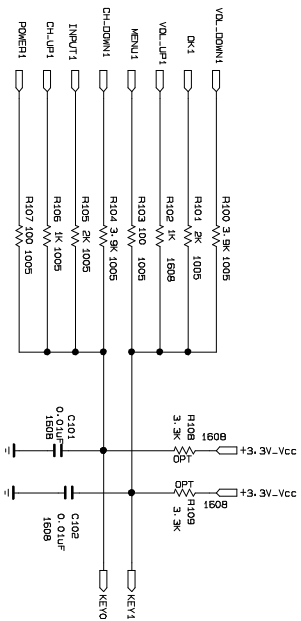
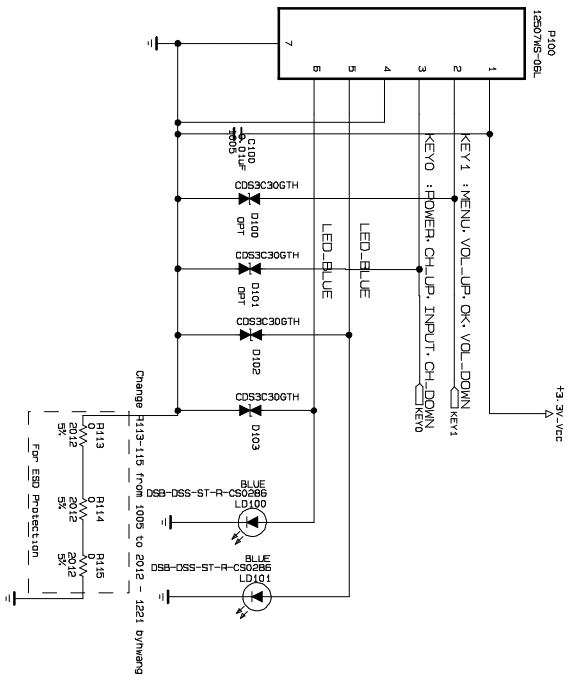
Straight type



PCB P/NO. : TBD

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

Mxx80D/Mxx80DF CONTROL KEY (AD semiconductor)



THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILM AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET

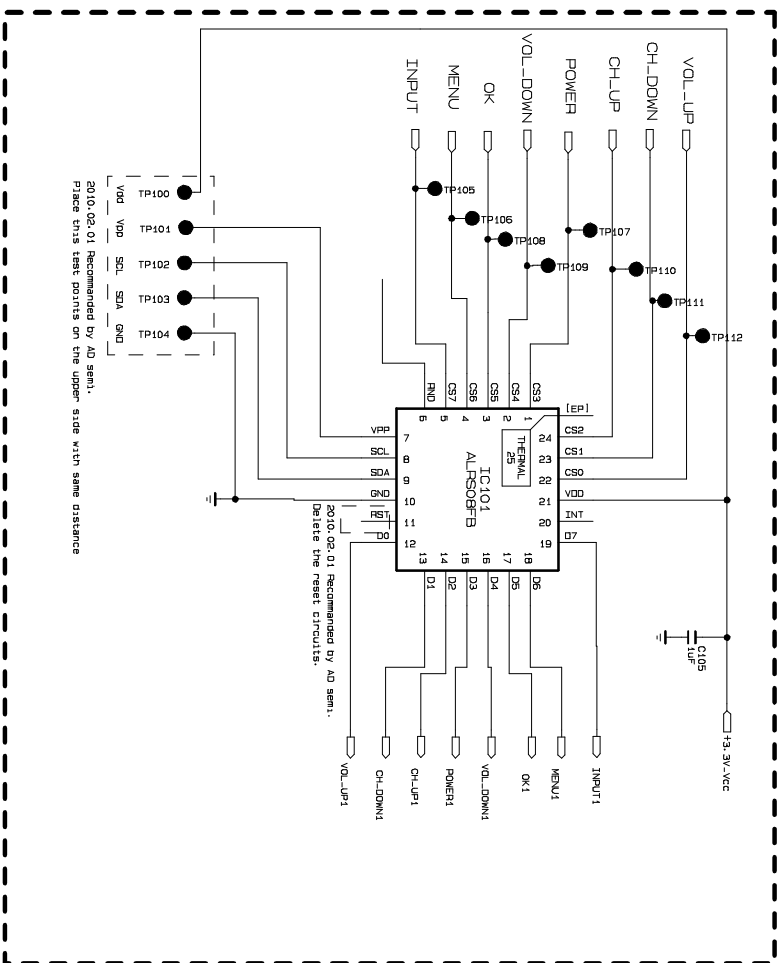
GElectronics



LG ELECTRONICS

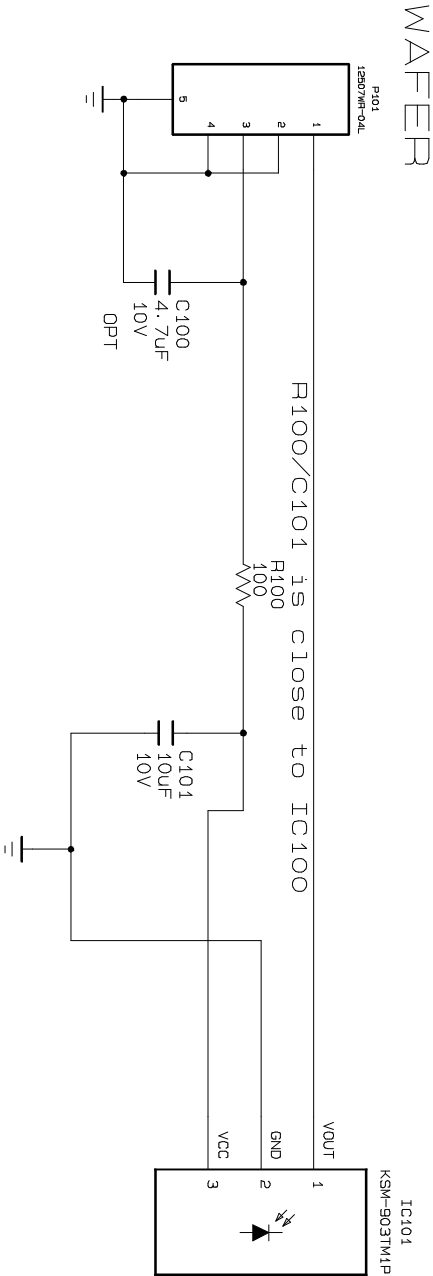
MODEL	Mx80D/Mx80DF	DATE	2009. 11. 19
BLOCK	CONTROL	SHEET	1 / 1

Touch IC



Mxx80D/Mxx80DF

IR Circuit diagram



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 MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMETIC.

SECRET

 LG ELECTRONICS

MODEL	Mx80D/Mx80DF	DATE	2010.01.27
BLOCK	IR	SHEET	1 / 1

EAX61775502

