

# **LCD TV**

# **SERVICE MANUAL**

CHASSIS : AS-MST6M182VG-LE2

MODEL :LED2295

## **CAUTION**

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



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# **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 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 its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver 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.

Before returning the receiver to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

### **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 position, 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  $1M\Omega$  and  $5.2M\Omega$ .

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.

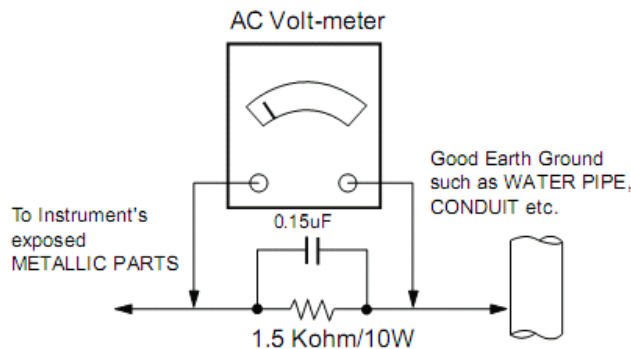
Do not use a line Isolation Transformer during this check. Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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 exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5mA.

In case any measurement is out of the limits specified, 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



## SERVICING PRECAUTIONS

**CAUTION:** Before servicing receivers covered by this service manual and its supplements and addenda, read and follow 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 reconnecting 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 of 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 specification is applied to the LED TV used AS-MST6M182VG-LE2 chassis.

### 2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature :  $25 \pm 5^{\circ}\text{C}$  ( $77 \pm 9^{\circ}\text{F}$ ), CST :  $40 \pm 5^{\circ}\text{C}$

2) Relative Humidity :  $65 \pm 10\%$

3) Power Voltage : Standard input voltage(100-240V~, 50/60Hz)

\* 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 20 minutes prior to the adjustment.

### 3. Test method

1) Performance: LGE TV test method followed

2) Demanded other specification

- Safety: CB specification

- EMC: CISPR 13 specification

### 4. General specification

Item	Specification	Remark
Broadcasting system	PAL-BG	
Available Channel	1) VHF : 00 ~ 12 2) UHF : 20 ~ 75 3) CATV : 02 ~ 44	
Tuner IF	1) PAL : 38.90MHz(Picture) 34.40MHz(Sound)	
Input Voltage	100 - 240V~, 50/60Hz	Mark : 240V, 50Hz
Screen Size	21.6 inch Wide (1366 x 768)	LC216EXN-SCA1
Aspect Ratio	16:9	
Module	LC216EXN-SCA1	LC216EXN-SCA1
Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %	LGE Spec
Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %	

## 5. Chrominance & Luminance Specification

No	Item			Min	Typ	Max	Unit	Remark
1	White peak brightness			200	250		cd/m2	LC216EXN-SCA1
2	Contrast ratio						cd/m2	N/A
3	Brightness uniformity				72		%	Full white
4	Color coordinate	RED	X	Typ.. -0.03	0.622	Typ.. +0.03		LC216EXN-SCA1
			Y		0.344			
		GREEN	X		0.338			
			Y		0.618			
		BLUE	X		0.152			
			Y		0.045			
		WHITE	X		0.279			
			Y		0.292			
5	Color coordinate uniformity							N/A
6	Contrast ratio				1000			LC216EXN-SCA1
7	Color Temperature	Cool		8500			<Test Condition> HDMI input, 85% Full white pattern	
		Medium		7500				
		Warm		6000				
8	Color Distortion, DG					10.0	%	
9	Color Distortion, DP					10.0	deg	
10	Color S/N, AM/FM			43			dB	
11	Color Killer Sensitivity			-80			dBm	

## 6. Component Video Input (Y, PB, PR)

No	Specification			Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	
1	720x480	15.73	59.94	SDTV,DVD 480i
2	720x480	15.75	60	SDTV, DVD 480i
3	720x480	31.47	59.94	SDTV 480p
4	720X480	31.5	60	SDTV 480p
5	720x576	15.625	50	SDTV, DVD 576i
6	720x576	31.25	50	SDTV 576p
7	1280x720	44.96	59.94	HDTV 720p
8	1280x720	45	60.36	HDTV 720p
9	1280x720	37.5	50	HDTV 720p
10	1920x1080	28.125	50	HDTV 1080i
11	1920x1080	33.75	60	HDTV 1080i
12	1920x1080	33.72	59.94	HDTV 1080i
13	1920x1080	56.25	50	HDTV 1080p
14	1920x1080	67.433	59.94	HDTV 1080p
15	1920x1080	67.5	60	HDTV 1080p

## 7. RGB PC INPUT Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	720*400	31.468	70.08	28.321		
2	640*480	31.469	59.94	25.17	VESA	Input 848*480 60Hz,



	852*480	37.684	75.00	31.50		--> 640*480 60Hz Display
3	800*600	37.879	60.31	40.00	VESA	
		46.875	75.00	49.50		
4	1024*768	48.363	60.00	65.00	VESA(XGA)	
		56.470	70.00	75.00		
		60.123	75.029	78.75		
5	1280*768	47.78	59.87	79.5	WXGA	
6	1360*768	47.72	59.8	84.75	WXGA	
7	1366*768	47.56	59.6	84.75	WXGA	

## 8. HDMI Input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
<b>PC</b>						
1	720*400	31.468	70.08	28.321		HDCP
2	640*480	31.469	59.94	25.17	VESA	HDCP
3	800*600	37.879	60.31	40.00	VESA	HDCP
4	1024*768	48.363	60.00	65.00	VESA(XGA)	HDCP
		56.470	70.00	75.00		
5	1280*768	47.78	59.87	79.5	WXGA	HDCP
6	1360*768	47.72	59.8	84.75	WXGA	HDCP
7	1366*768	47.56	59.6	84.75	WXGA	HDCP
8	1280*1024	63.595	60.0	108.875	SXGA	
9	1920*1080	66.647	59.988	138.625	WUXGA	
<b>DTV</b>						
10	720*480	31.47	59.94	27.00	SDTV 480P(4:3)	
11	720*480	31.50	60	27.027	SDTV 480P(4:3)	
12	720*480	31.47	59.94	27.000	SDTV 480P(16:9)	
13	720*480	31.50	60.00	27.027	SDTV 480P(16:9)	
14	720*576	31.25	50.00	27.000	SDTV 576P	
15	1280*720	37.50	50.00	74.176	HDTV 720P	HDCP
16	1280*720	44.96	59.94	74.176	HDTV 720P	HDCP
17	1280*720	45.00	60.00	74.250	HDTV 720P	
18	1920*1080	33.72	59.94	74.176	HDTV 1080I	HDCP
19	1920*1080	33.75	60.00	74.250	HDTV 1080I	HDCP
20	1920*1080	28.125	50.00	74.250	HDTV 1080I 50Hz	HDCP
21	1920*1080	27.000	24.00	74.250	HDTV 1080P 24Hz	HDCP
22	1920*1080	56.250	50	148.500	HDTV 1080P 50Hz	HDCP
23	1920*1080	67.433	59.94	148.352	HDTV 1080P	HDCP
24	1920*1080	67.500	60	148.500	HDTV 1080P	HDCP

## Software upgrade

### 1. Application Range

This specification sheet is applied to all of the LCD TV with AS-MST6M182VG-LE2 chassis.

### 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)

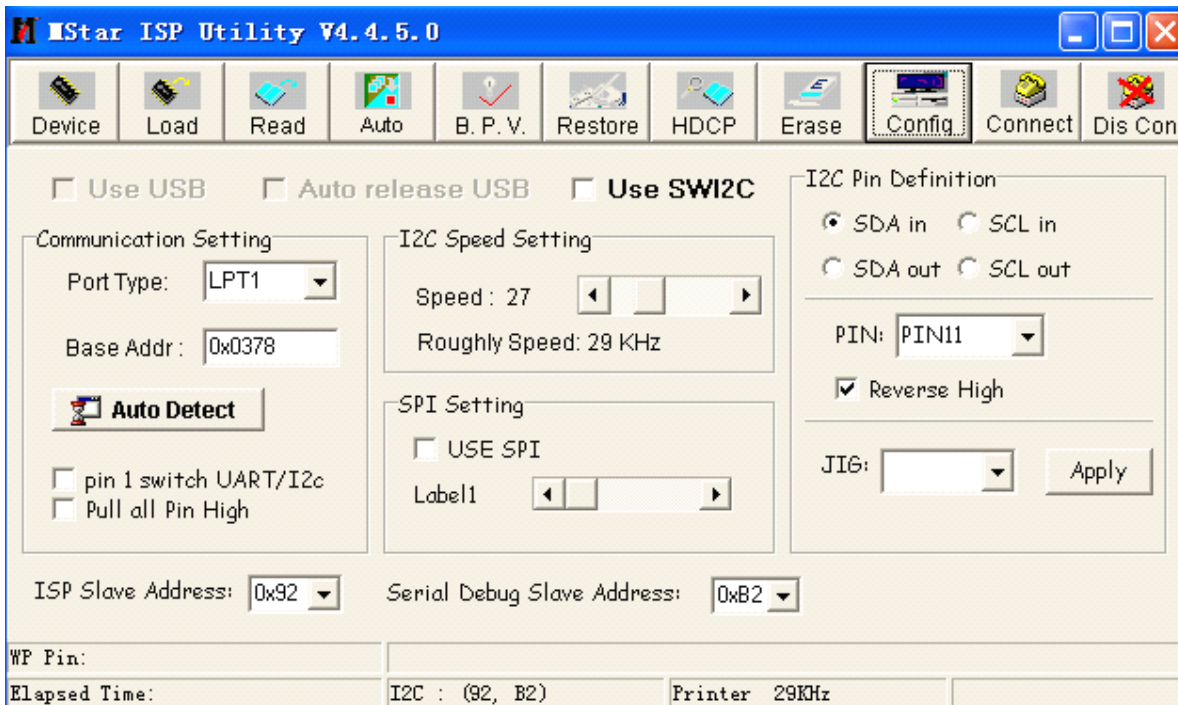
Temperature : at  $25 \pm 5^{\circ}\text{C}$

Relative humidity :  $65 \pm 10\%$

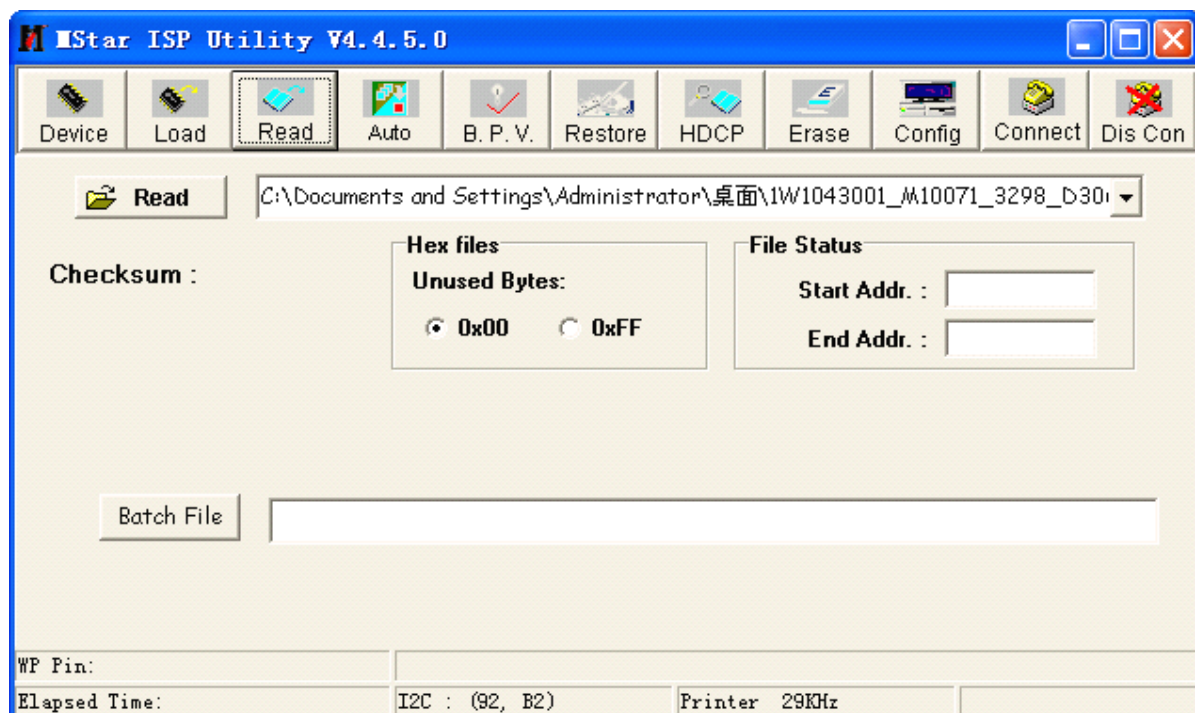
Input voltage : 220V, 60Hz

\* Download

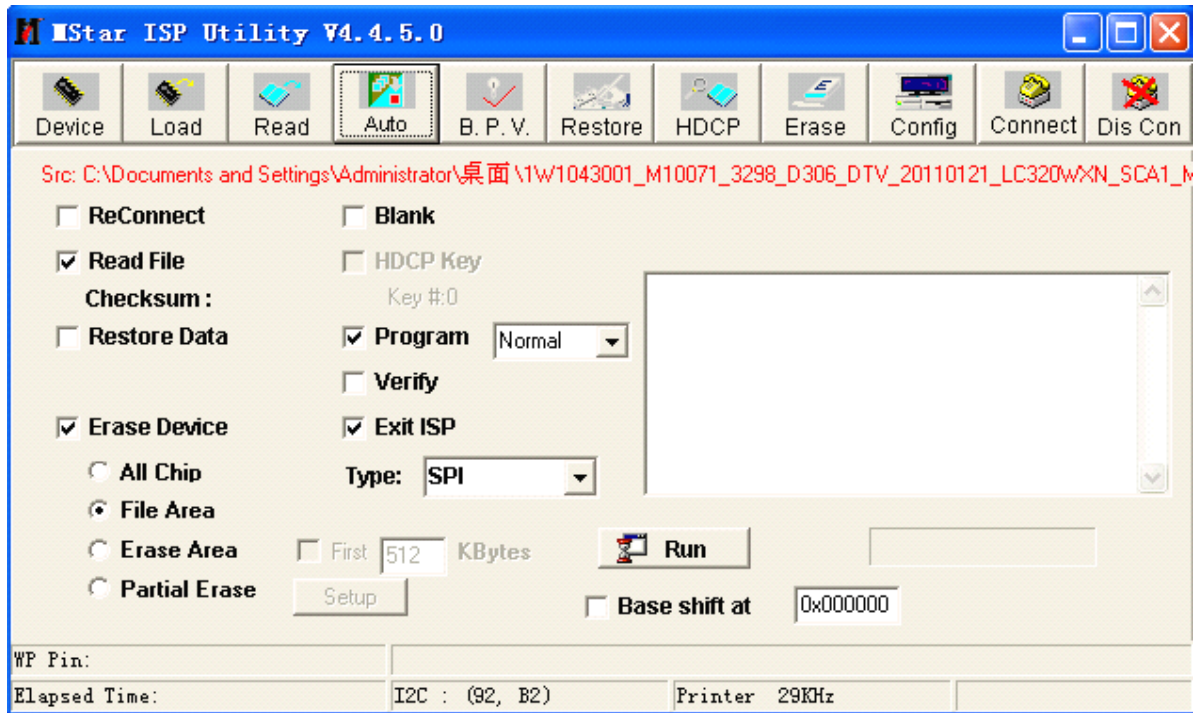
- 1) Execute ISP program “Mstar ISP Utility” and then click “Config” tab.
- 2) Set as below, and then click “Auto Detect” and check “OK” message. If display “Error”, Check connect computer, jig, and set.
- 3) Click “Connect” tab. If display “Can’ t”, Check connect computer, jig, and set.



- 4) Click “Read” tab, and then load download file(XXXX.bin) by clicking “Read”.



5. Click “Auto” tab and set as below
6. Click “Run” .
7. After downloading, check “OK” message.



The image shows the Star ISP Utility V4.4.5.0 software interface. The title bar is blue with the text "Star ISP Utility V4.4.5.0" and standard window controls. Below the title bar is a toolbar with icons for Device, Load, Read, Auto (selected), B. P. V., Restore, HDCP, Erase, Config, Connect, and Dis Con. The main window has a light beige background. At the top, a red text line shows the source path: "Src: C:\Documents and Settings\Administrator\桌面\1W1043001\_M10071\_3298\_D306\_DTV\_20110121\_LC320W\_XN\_SCA1\_M". Below this, there are two columns of checkboxes. The left column includes "ReConnect", "Read File" (checked), "Checksum:", "Restore Data", "Erase Device" (checked), and "All Chip". The right column includes "Blank", "HDCP Key", "Program" (checked), "Verify", "Exit ISP" (checked), and "Type: SPI" (selected in a dropdown). A large empty text area is on the right. At the bottom, there are buttons for "Run" and "Setup", and a "Base shift at" field with the value "0x000000". The bottom status bar shows "WP Pin:", "Elapsed Time:", "I2C : (92, B2)", and "Printer 29KHz".

Star ISP Utility V4.4.5.0

Device Load Read Auto B. P. V. Restore HDCP Erase Config Connect Dis Con

Src: C:\Documents and Settings\Administrator\桌面\1W1043001\_M10071\_3298\_D306\_DTV\_20110121\_LC320W\_XN\_SCA1\_M

☐ ReConnect ☐ Blank

☒ Read File ☐ HDCP Key

Checksum : Key #:0

☐ Restore Data ☒ Program Normal

☐ Verify

☒ Erase Device ☒ Exit ISP

☐ All Chip Type: SPI

☐ File Area

☐ Erase Area

☐ Partial Erase

First 512 KBytes Run

Setup

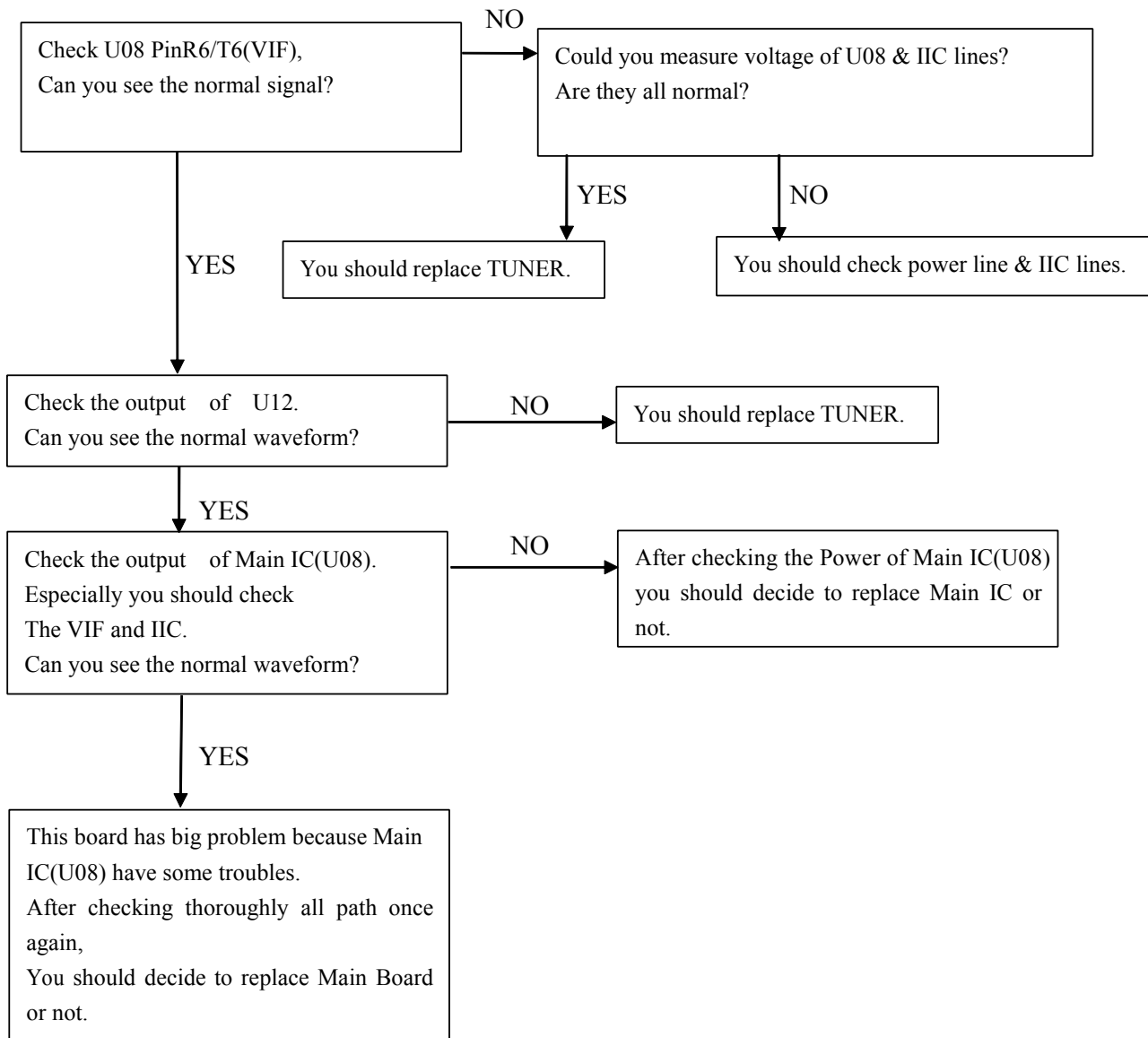
☐ Base shift at 0x000000

WP Pin:

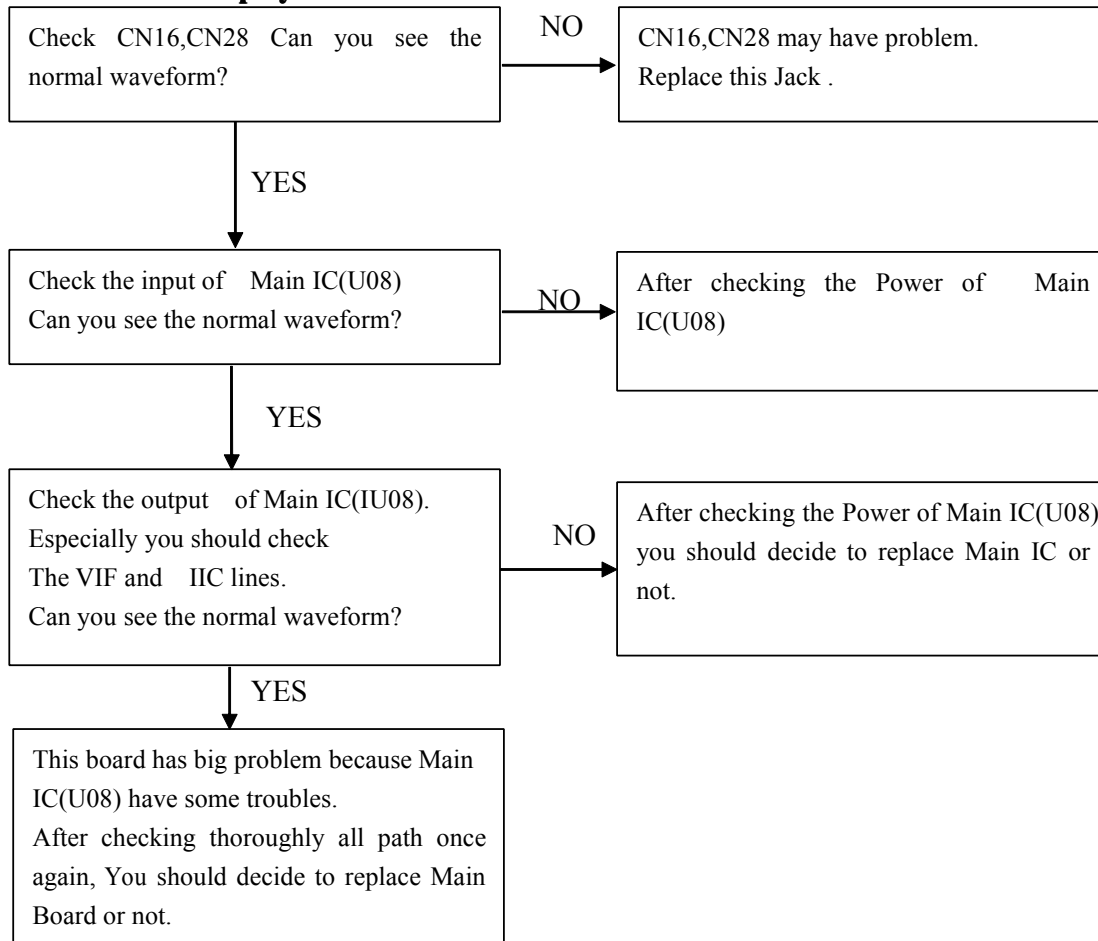
Elapsed Time: I2C : (92, B2) Printer 29KHz

# TROUBLESHOOTING

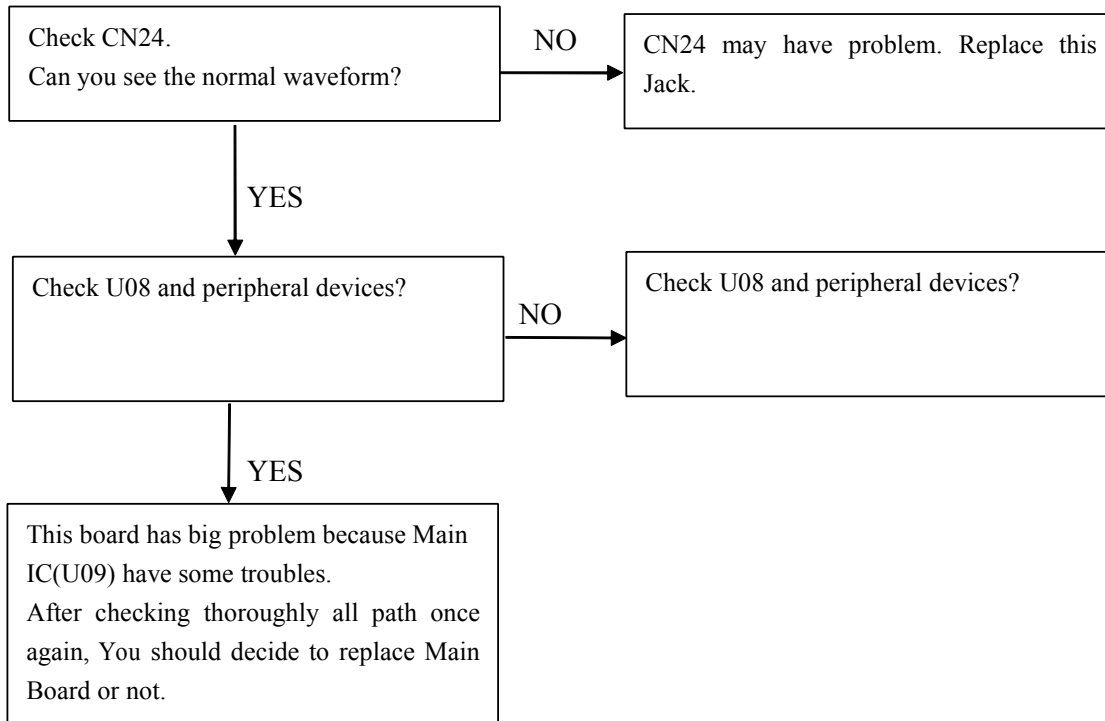
## 1. TV/CATV doesn't display



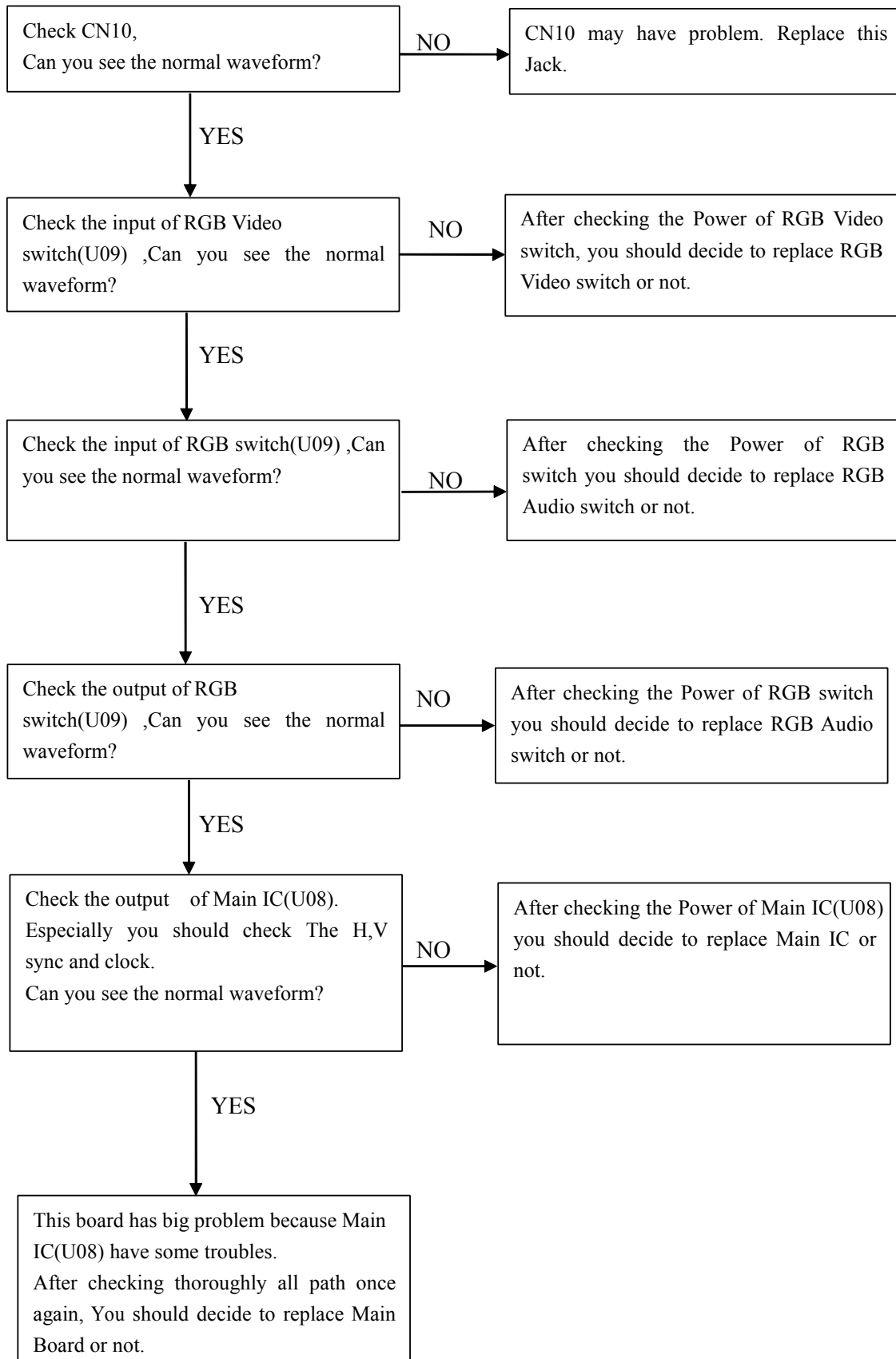
## 2. AV doesn' t display



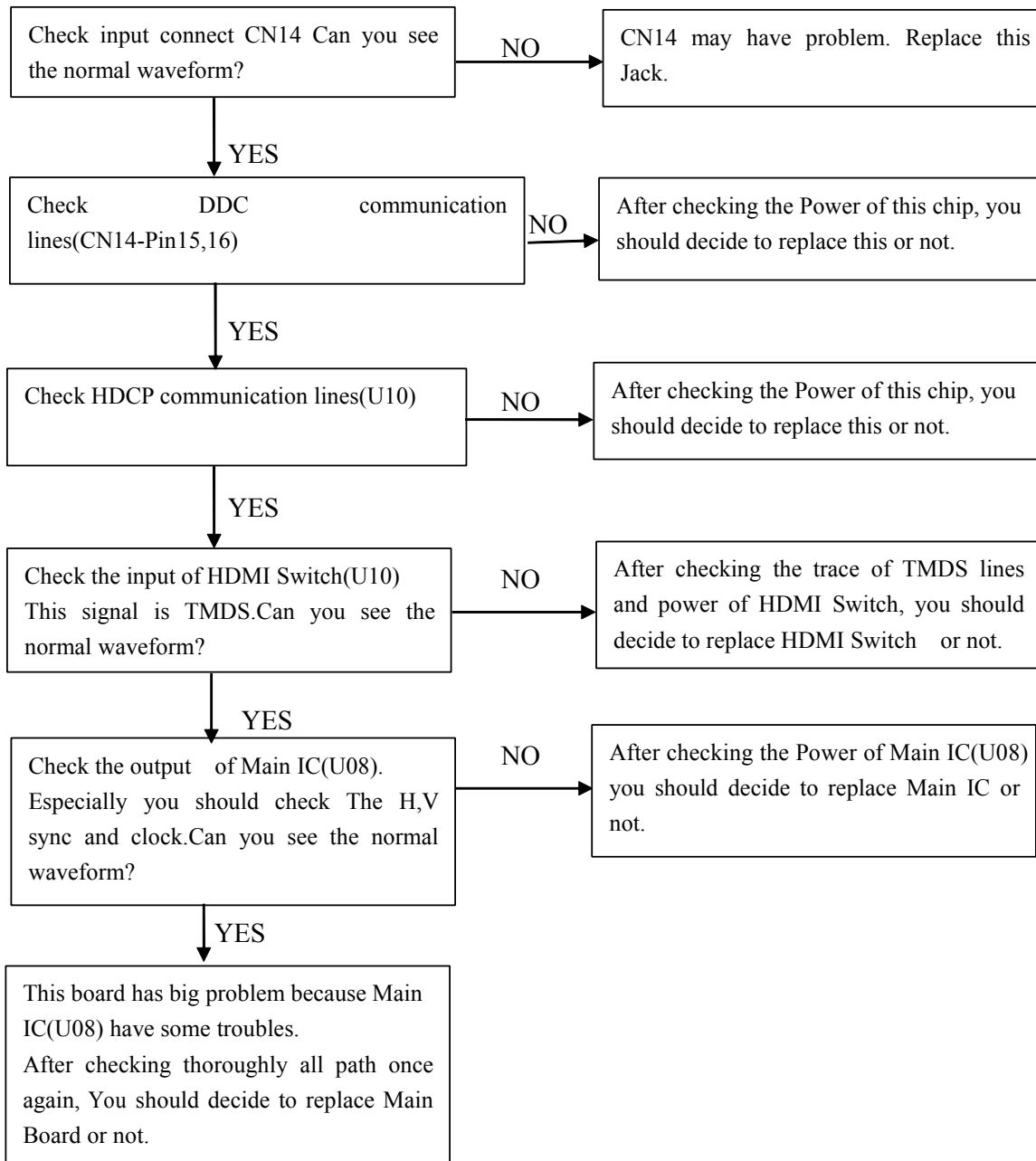
### 3. Component doesn't display



#### 4. RGB PC doesn't display



## 5. HDMI doesn't display





## SCHEMATIC DIAGRAM

