

# COLOR MONITOR SERVICE MANUAL

MODEL:L192WS-BNQ/SNQ. A\*\*JQP/ A\*\*QQP

( ) \*\*Same model for Service

## CAUTION

BEFORE SERVICING THE UNIT,  
READ THE **SAFETY PRECAUTIONS** IN THIS MANUAL.



\*To apply the **MSTAR Chip**.

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## SPECIFICATIONS

### 1. LCD CHARACTERISTICS

Type : TFT Color LCD Module  
 Active Display Area : 19 inch  
 Pixel Pitch : 0.285 (H) x 0.285 (V)  
 Color Depth : 16.2M colors

Size : 427.2 (H) x 277.4 (V) x 17 (D)  
 Electrical Interface : LVDS  
 Surface Treatment : Hard-coating(3H), Haze=25%  
 Anti-Glare treatment

Operating Mode : Normally White, Transmissive mode  
 Backlight Unit : Top/Bottom edge side 4-CCFL  
 (Cold Cathode Fluorescent Lamp)

### 2. OPTICAL CHARACTERISTICS

2-1. Viewing Angle by Contrast Ratio  $\geq 10$   
 (a) For InnoLux MT190AW01-V2 panel: Left 80°/Right 80°;Top 80° /Bottom 80° at type CR $\geq 10$   
 (b) For CMO M190A1-L02 panel: Left 85°/Right 85°;Top 80°/Bottom 80° at type CR $\geq 10$

2-2. Luminance  
 (a) For InnoLux MT190AW01-V2 panel: 300cd/m<sup>2</sup> (Typ.)  
 220cd/m<sup>2</sup> (Min.) (6500k); 170 cd/m<sup>2</sup> (Min.)(9300k)  
 (b) For CMO M190A1-L02 panel: 300cd/m<sup>2</sup> (Typ.)  
 220cd/m<sup>2</sup> (Min.) (6500k);170 cd/m<sup>2</sup> (Min.)(9300k)

2-3. Contrast Ratio  
 (a) For InnoLux MT190AW01-V2 panel: 500:1 minimum;  
 700:1 Typical  
 (b) For CMO M190A1-L02 panel: 500:1 minimum; 850:1  
 Typical

### 3. SIGNAL (Refer to the Timing Chart)

3-1. Sync Signal Type :  
 Separate Sync, Composite, SOG (Sync On Green)

#### 3-2. Video Input Signal

1) Type : R, G, B Analog  
 2) Voltage Level : 0~0.71 V  
 a) Color 0, 0 : 0 Vp-p  
 b) Color 7, 0 : 0.467 Vp-p  
 c) Color 15, 0 : 0.714 Vp-p  
 3) Input Impedance : 75  $\Omega$

#### 3-3. Operating Frequency

Horizontal : 30 ~ 83kHz  
 Vertical : 50 ~ 77Hz

### 4. Max. Resolution

D-sub Analog : 1440 x 900@75Hz

### 5. POWER SUPPLY

5-1. Power: AC 90~264V, 50~60Hz , <0.8A  
 5-2. Power Consumption

MODE	H/V SYNC	VIDEO	POWER CONSUMPTION	LED COLOR
POWER ON (TYPICAL)	ON/ON	ACTIVE	34 W TYPICAL	GREEN
SLEEP MODE	OFF/ON	OFF	Less than 1 W	AMBER
	ON/OFF			
	OFF/OFF			
POWER S/W OFF	-	-	Less than 1 W	OFF

### 6. ENVIRONMENT

6-1. Operating Temperature : 0°C~40°C  
 (Ambient)  
 6-2. Relative Humidity : 20%~90%  
 (Non-condensing)  
 6-3. MTBF : 50,000 HRS with 90% Confidence  
 Lamp Life : 50,000 Hours(Min)

### 7. DIMENSIONS (with TILT/SWIVEL)

Width : 434.8 mm  
 Depth : 180 mm  
 Height : 370 mm

### 8. WEIGHT (with TILT/SWIVEL)

Net. Weight : 4.2±0.4 kg  
 Gross Weight : 5.2±0.4 kg

# 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  $\triangle$  on the schematic diagram and the replacement parts list.** 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.

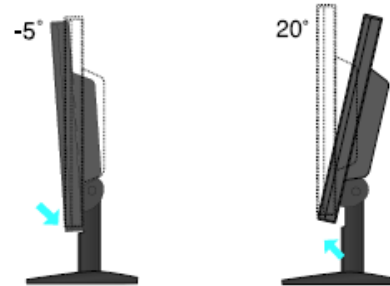
- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.

- 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 softmaterial. (Cleaning with a dirty or rough cloth may damage the panel.)

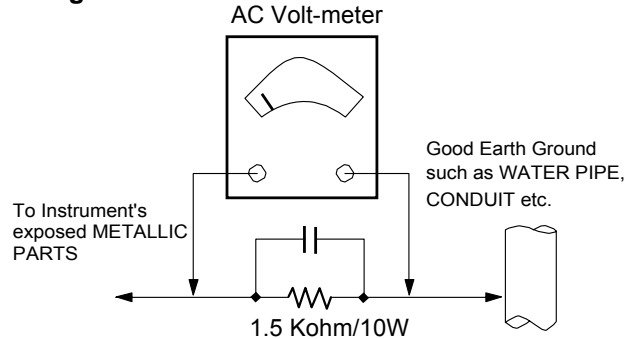
## $\triangle$ WARNING

### 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.
- Be careful while tilting and rotating the monitor to avoid pinching hand(s)



## Leakage Current Hot Check Circuit



## $\triangle$ CAUTION

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

# 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 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.
  - d. Discharging the picture tube anode.
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. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemicals on or near this receiver or any of its assemblies.
5. 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.
6. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
7. 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.
8. 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.

9. 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 500F to 600F.
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 small 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.  
(500F to 600F)
  - 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 circuitboard printed foil.
6. Use the following soldering technique.
  - a. Allow the soldering iron tip to reach a normal temperature (500F to 600F)
  - 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 circuitboard 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**

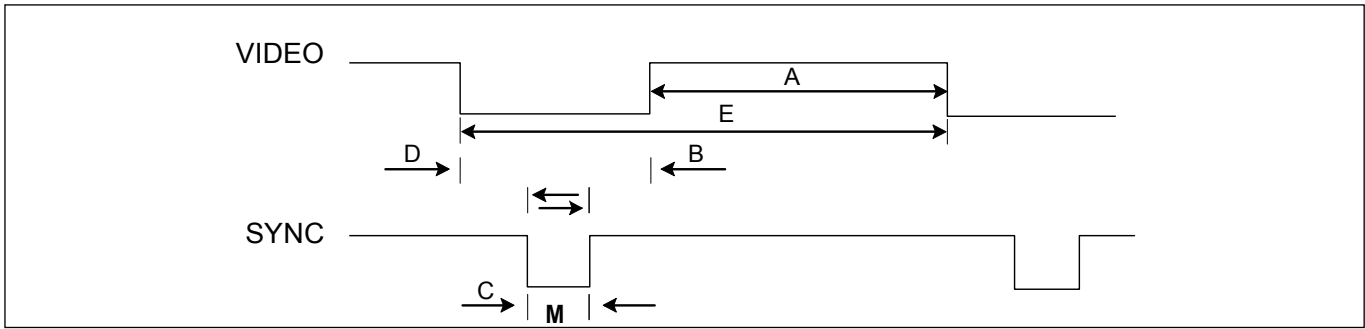
Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

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.

# TIMING CHART



	distinguishment	Polarity	DOT CLOCK [MHz]	Frequency [kHz]/ [Hz]	Total period (E)	Display (A)	Front Porch (D)	Sync. (C)	Back Porch (B)	Resolution
1	H(Pixels)	+	25.175	31.469	800	640	16	96	48	640 x 350
	V(Lines)	-		70.8						
2	H(Pixels)	-	28.321	31.468	900	720	18	108	54	720 X 400
	V(Lines)	+		70.09						
3	H(Pixels)	-	25.175	31.469	800	640	16	96	48	640 x 480
	V(Lines)	-		59.94						
4	H(Pixels)	-	31.5	37.5	840	640	16	64	120	640 x 480
	V(Lines)	-		75						
5	H(Pixels)	+	40.0	37.879	1056	800	40	128	88	800 x 600
	V(Lines)	+		60.317						
6	H(Pixels)	+	49.5	46.875	1056	800	16	80	160	800 x 600
	V(Lines)	+		75.0						
7	H(Pixels)	+/-	57.283	49.725	1152	832	32	64	224	832 x 624
	V(Lines)	+/-		74.55						
8	H(Pixels)	-	65.0	48.363	1344	1024	24	136	160	1024 x 768
	V(Lines)	-		60.0						
9	H(Pixels)	-	78.75	60.123	1312	1024	16	96	176	1024 x 768
	V(Lines)	-		75.029						
10	H(Pixels)	+/-	100.0	68.681	1456	1152	32	128	144	1152 x 870
	V(Lines)	+/-		75.062						
11	H(Pixels)	+/-	92.978	61.805	1504	1152	18	134	200	1152 x 900
	V(Lines)	+/-		65.96						
12	H(Pixels)	+	108.0	63.981	1688	1280	48	112	248	1280 x 1024
	V(Lines)	+		60.02						
13	H(Pixels)	+	135.0	79.976	1688	1280	16	144	248	1280 x 1024
	V(Lines)	+		75.035						
14	H(Pixels)	+	88.750	55.5	1600	1440	48	32	80	1440 x 900
	V(Lines)	-		59.90						
15	H(Pixels)	-	106.500	55.935	1904	1440	80	152	232	1440x 900
	V(Lines)	+		59.887						
16	H(Pixels)	-	136.750	70.635	1936	1440	96	152	248	1440x 900
	V(Lines)	+		74.984						

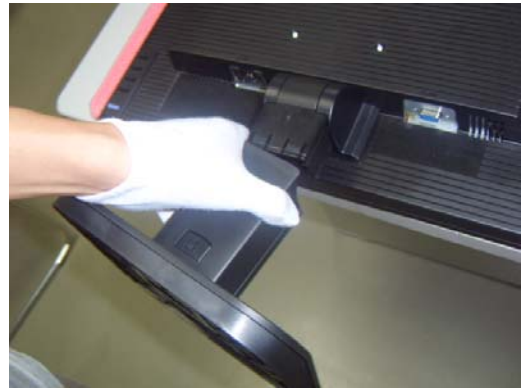
## DISASSEMBLY

#1



Put a soft cushion on the desk and lay the stand on its side so that the base is accessible.

#2



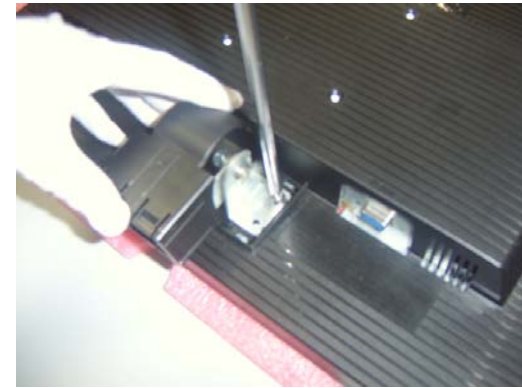
Twist the stand assy until "click", then take out the stand assy into the product in the correct direction as shown in picture.

#3



Pry the hinge cover by flat-tip screw driver or jig and be careful to prevent from scratching the hinge cover.

#4



Unscrew the 4 screws on the hinge to separate the hinge neck ass'y

#5



Pull up the front cover side by side(4 sides) and take away the front cover

#6



Turn over the set and pull up the cabinet to separate the control cable, then take away the back cover



#7



Pull out the lamp wire.

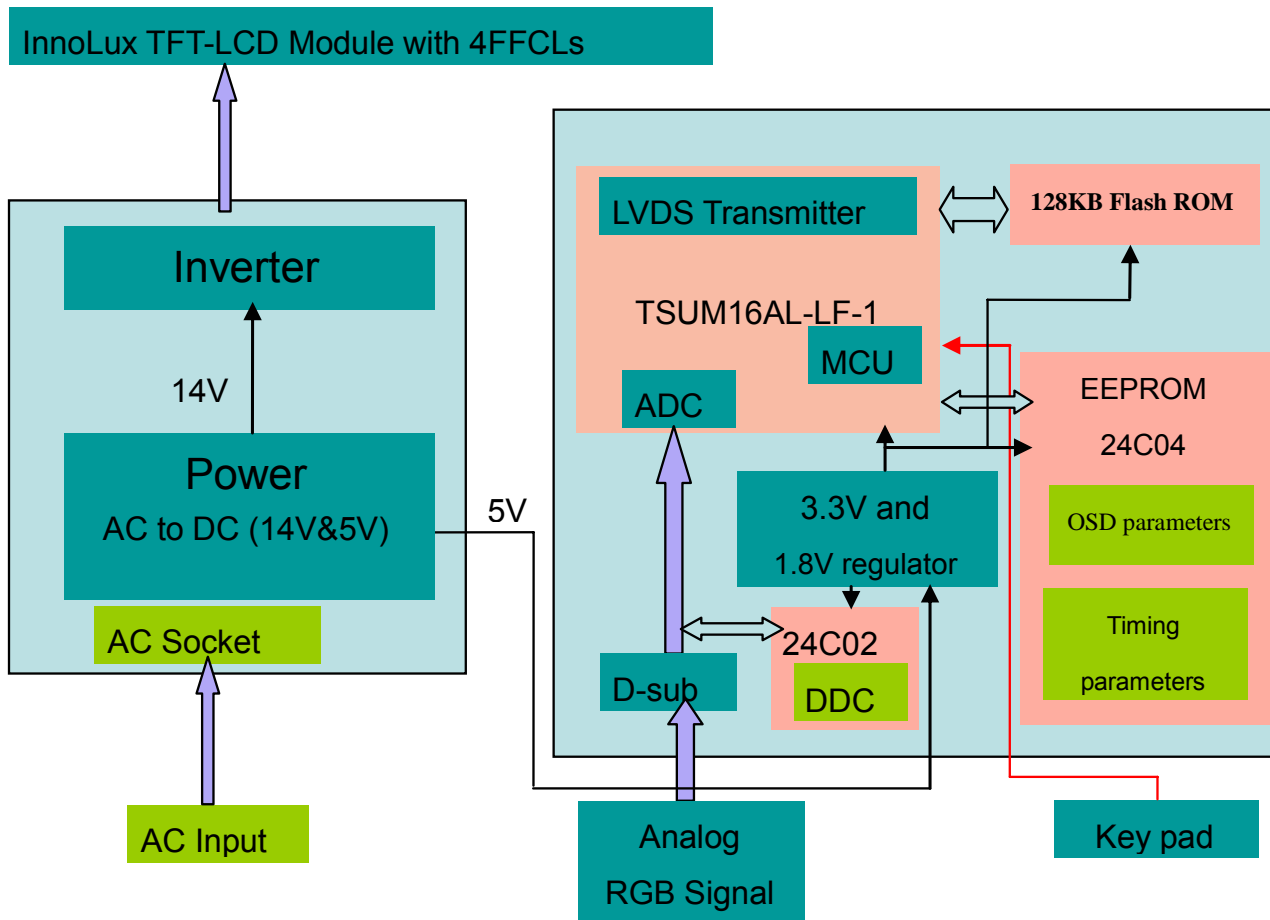
#8



Pull out the LVDS cable

## BLOCK DIAGRAM

L192WS consists of a main body and a stand (base). The main body contains a InnoLux (or CMO) LCD module with 4 CCFL lamps, a power board (includes AC/DC, DC/DC, inverter and panel power source), a control board (key pad) and an interface board. The block diagram is shown as below.



## DESCRIPTION OF BLOCK DIAGRAM

### 1. Video Controller Part.

This part amplifies the level of video signal for the digital conversion and converts from the analog video signal to the digital video signal using a pixel clock.

The pixel clock for each mode is generated by the PLL. The range of the pixel clock is from 25MHz to 135MHz.

This part consists of the Scaler, ADC convertor and LVDS transmitter.

The Scaler gets the video signal converted analog to digital, interpolates input to 1440 X 900 resolution signal and outputs 8-bit R, G, B signal to transmitter.

### 2. Power Part.

This part consists of the one 3.3V, and one 1.8V regulators to convert power which is provided 5V in Power board.

14V is provided for inverter, 14V is provided for LCD panel and 5V for micom.

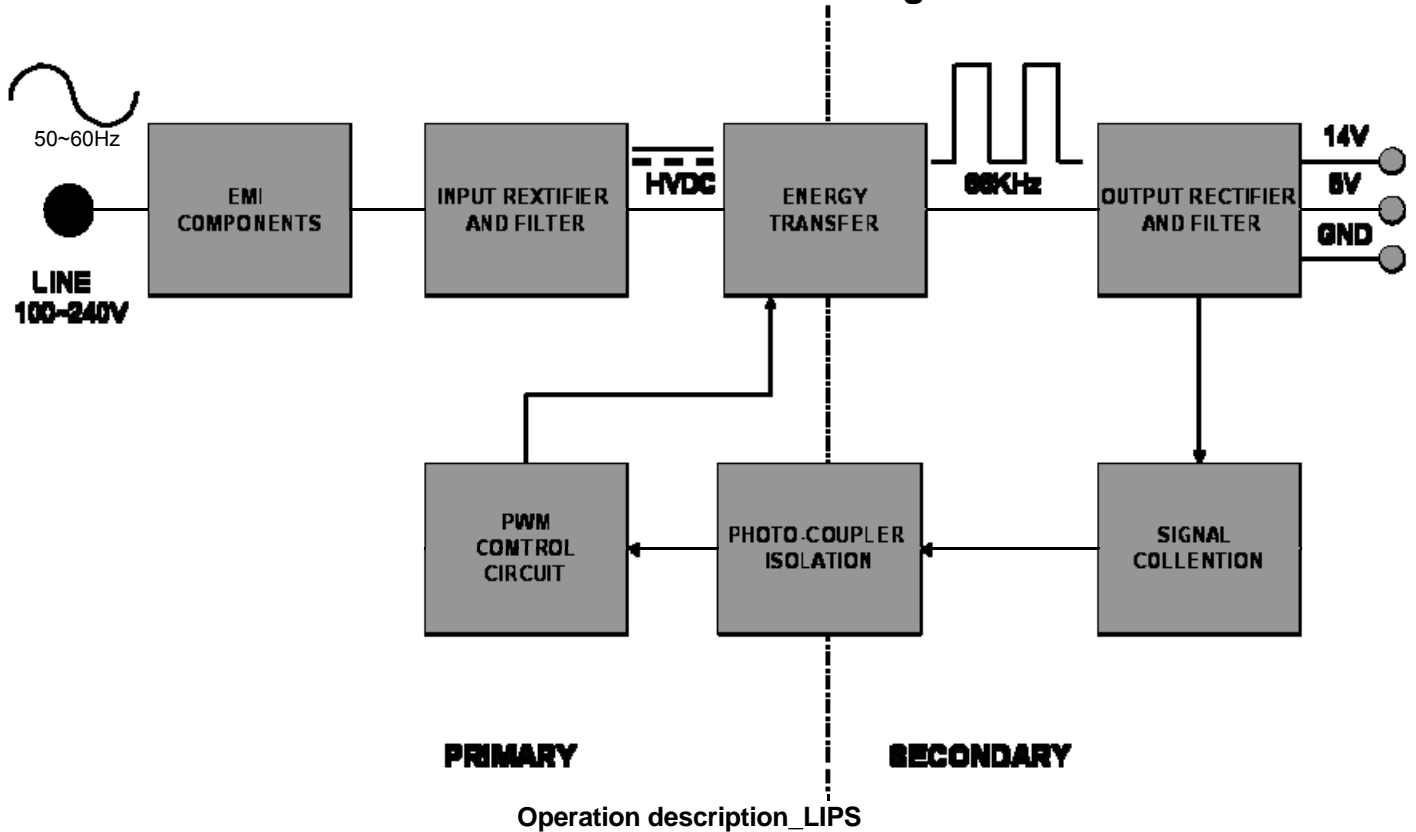
Also, 5V is converted 3.3V and 1.8V by regulator. Converted power is provided for IC in the main board. The inverter converts from DC14V to AC 700Vrms and operates back-light lamps of module.

### 3. MICOM Part.

This part is include video controller part. And this part consists of EEPROM IC which stores control data, and the Micom which imbedded in scaler IC.

The Micom distinguishes polarity and frequency of the H/V sync are supplied from signal cable. The controlled data of each modes is stored in EEPROM.

## LIPS Board Block Diagram



### 1. EMI components.

This part contains of EMI components to comply with global marketing EMI standards like FCC, VCCI CISPR, the circuit included a line-filter, across line capacitor and of course the primary protection fuse.

### 2. Input rectifier and filter.

This part function is for transfer the input AC voltage to a DC voltage through a bridge rectifier and a bulk capacitor.

### 3. Energy Transfer.

This part function is transfer the primary energy to secondary through a power transformer.

### 4. Output rectifier and filter.

This part function is to make a pulse width modulation control and to provide the driver signal to power switch, to adjust the duty cycle during different AC input and output loading condition to achieve the dc output stabilize, and also the over power protection is also monitor by this part.

### 5. Photo-Coupler isolation.

This part function is to feed back the dc output changing status through a photo transistor to primary controller to achieve the stabilized dc output voltage.

### 6. Signal collection.

This part function is to collect the any change from the dc output and feed back to the primary through photo transistor.

# ADJUSTMENT

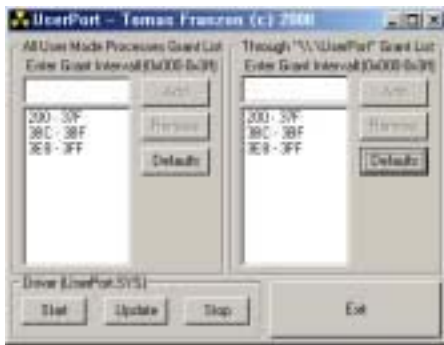
Windows EDID V1.0 User Manual

Operating System: MS Windows 98, 2000, XP  
 Port Setup: Windows 98 => Don't need setup  
 Windows 2000, XP => Need to Port Setup.  
 This program is available to LCD Monitor only.

2. EDID Read & Write
  - 1) Run WinEDID.exe



1. Port Setup
  - a) Copy "UserPort.sys" file to "c:\WINNT\system32\drivers" folder
  - b) Run Userport.exe



- 2) Edit Week of Manufacture, Year of Manufacture, Serial Number
  - a) Input User Info Data
  - b) Click "Update" button
  - c) Click "Write" button

- c) Remove all default number
- d) Add 300-3FF



- e) Click Start button. f) Click Exit button.



## SERVICE OSD

- 1) Turn off the power switch at the front side of the display.
- 2) Wait for about 5 seconds and press MENU, POWER switch with 1 second interval.
- 3) The SVC OSD menu contains additional menus that the User OSD menu as described below.
  - a) Auto Color : W/B balance and Automatically sets the gain and offset value.
  - b) NVRAM INIT : EEPROM initialize.(24C04)
  - c) CLEAR ETI : To initialize using time.
  - d) AGING : Select Aging mode(on/off).
  - e) R/G/B-9300K : Allows you to set the R/G/B-9300K value manually.
  - f) R/G/B-6500K : Allows you to set the R/G/B-6500K value manually.
  - g) R/G/B-Offset : Allows you to set the R/G/B-Offset value manually.(Analog Only)
  - h) R/G/B-Gain : Allows you to set the R/G/B-Gain value manually.(Analog Only)
  - i) MODULE : Show Current module Type
  - j)RS232: Enable/Disable Debug Mode(on/off)

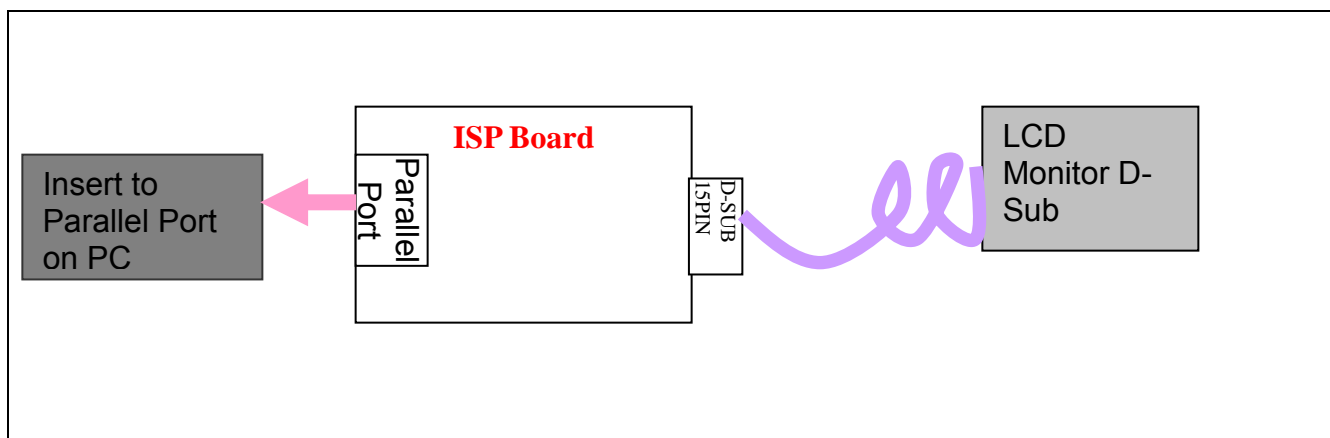
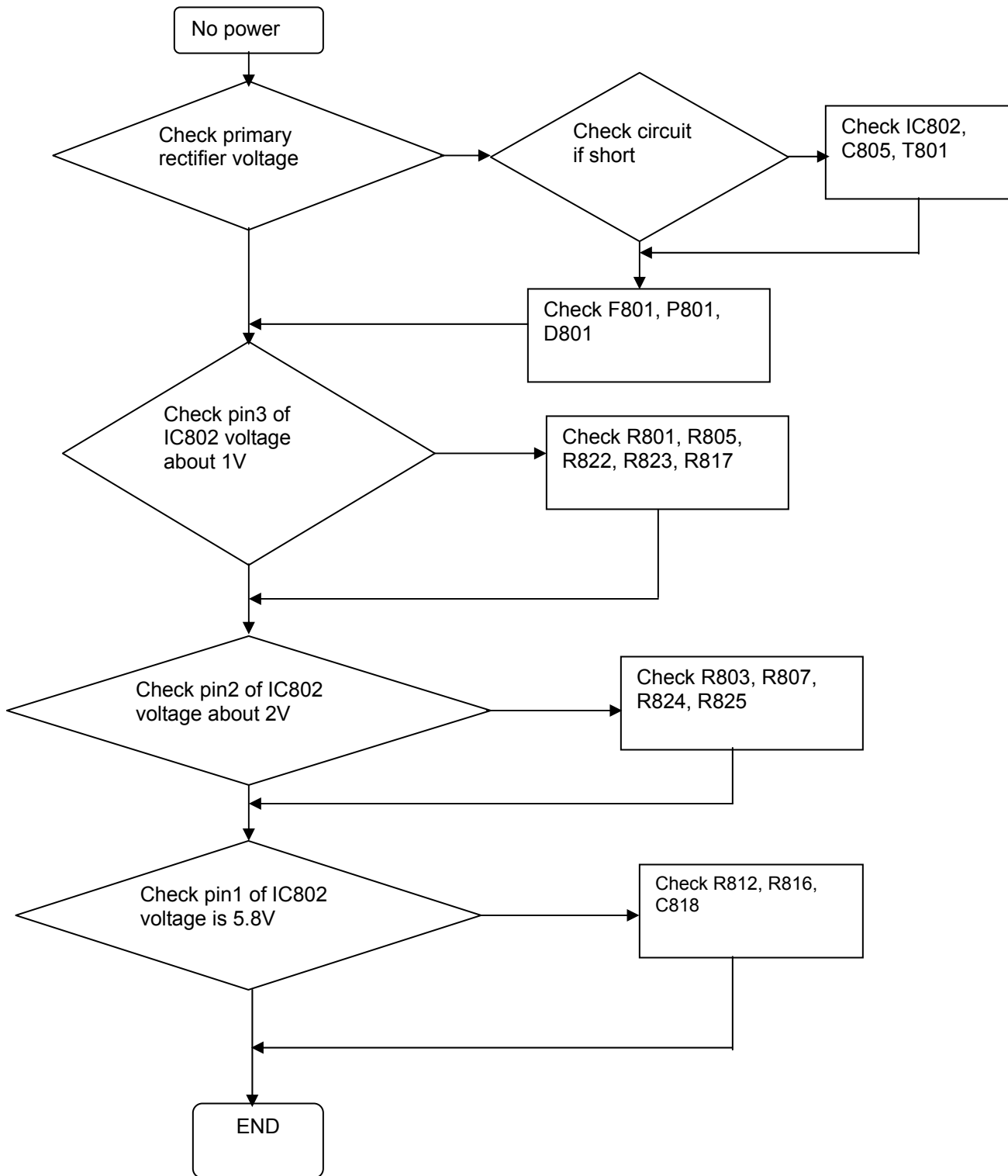


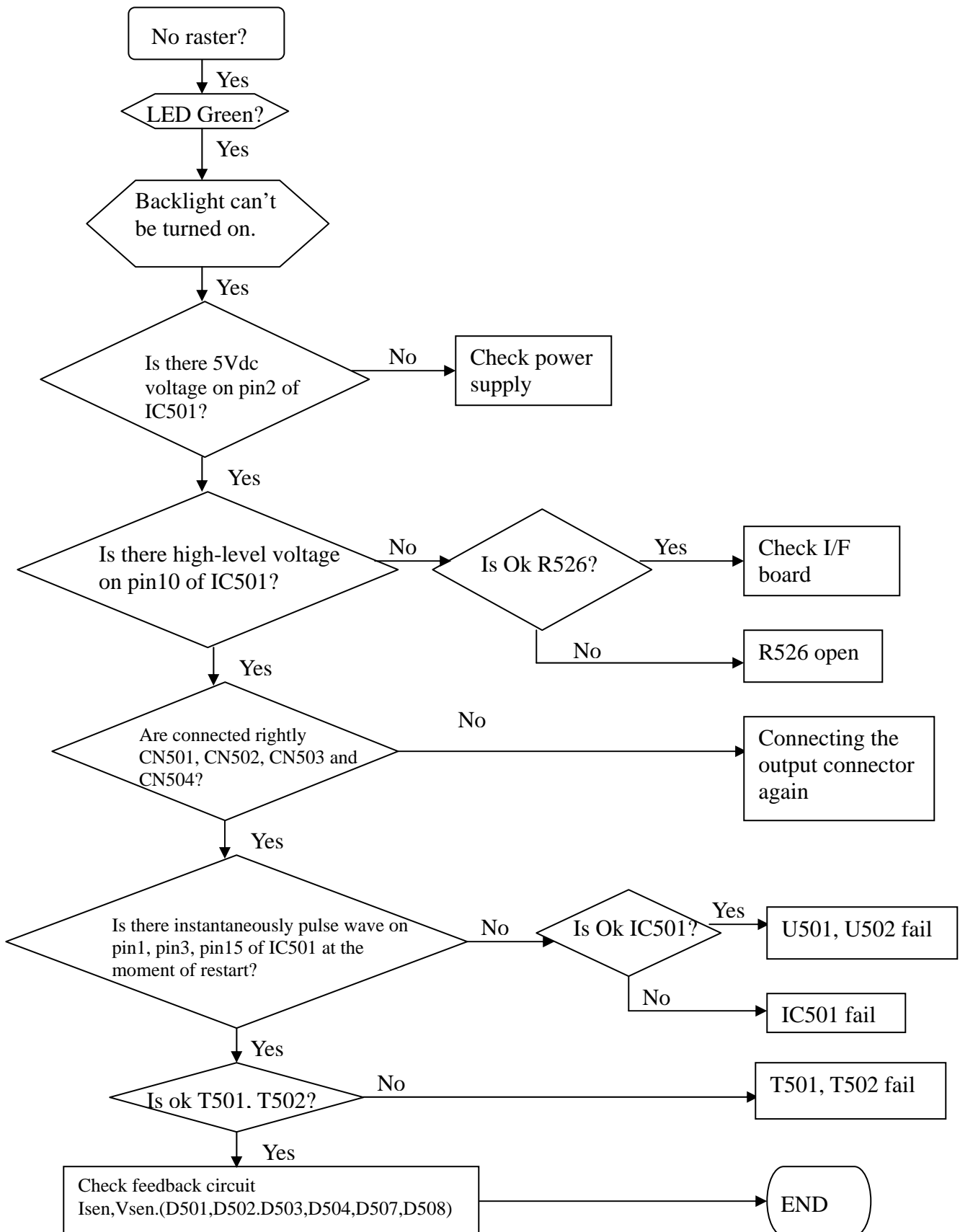
Figure 1.Cable Connection For ISP

# TROUBLESHOOTING GUIDE

## 1. No Power & Power LED Off

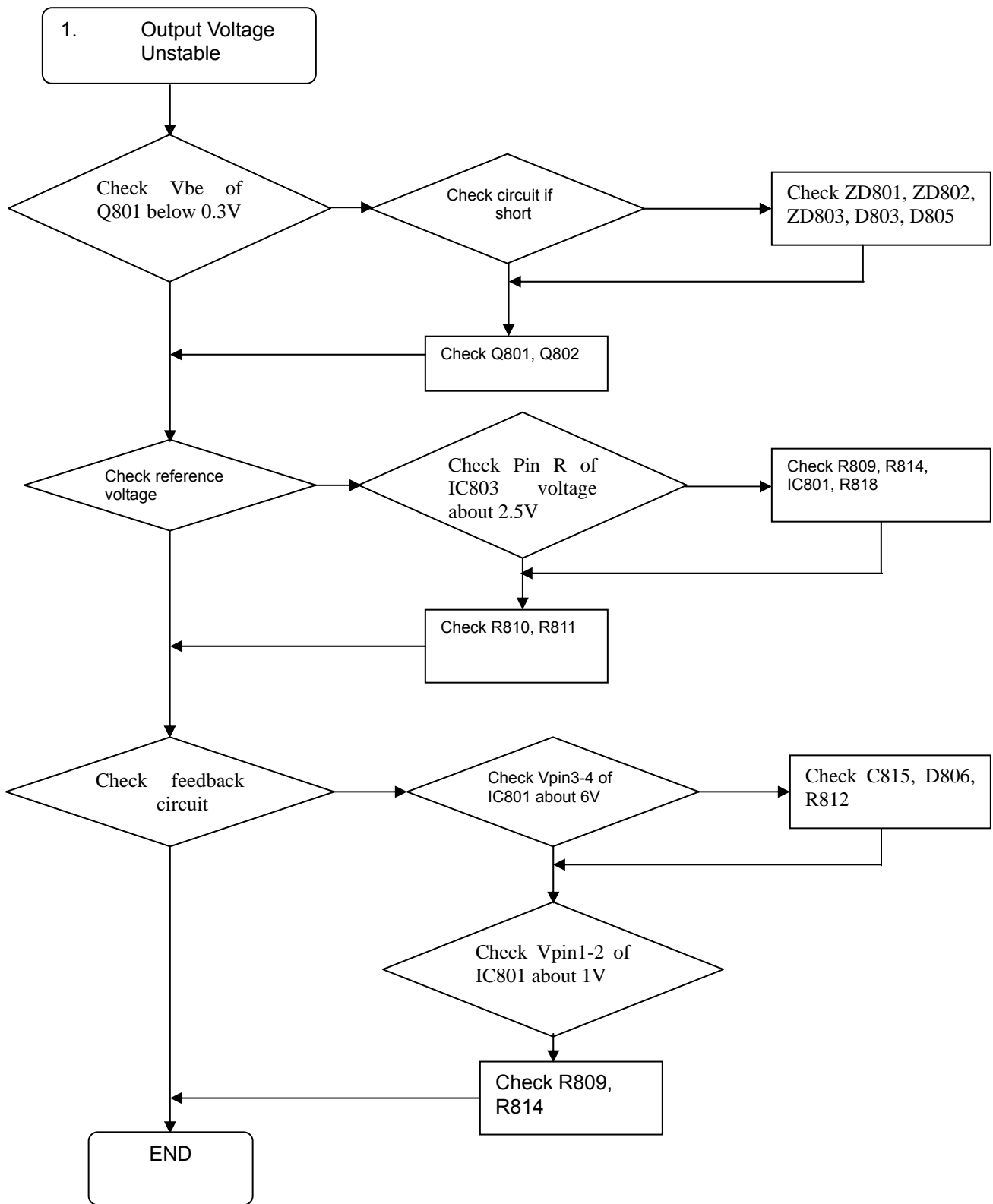


## 2. Backlight can't be turned on

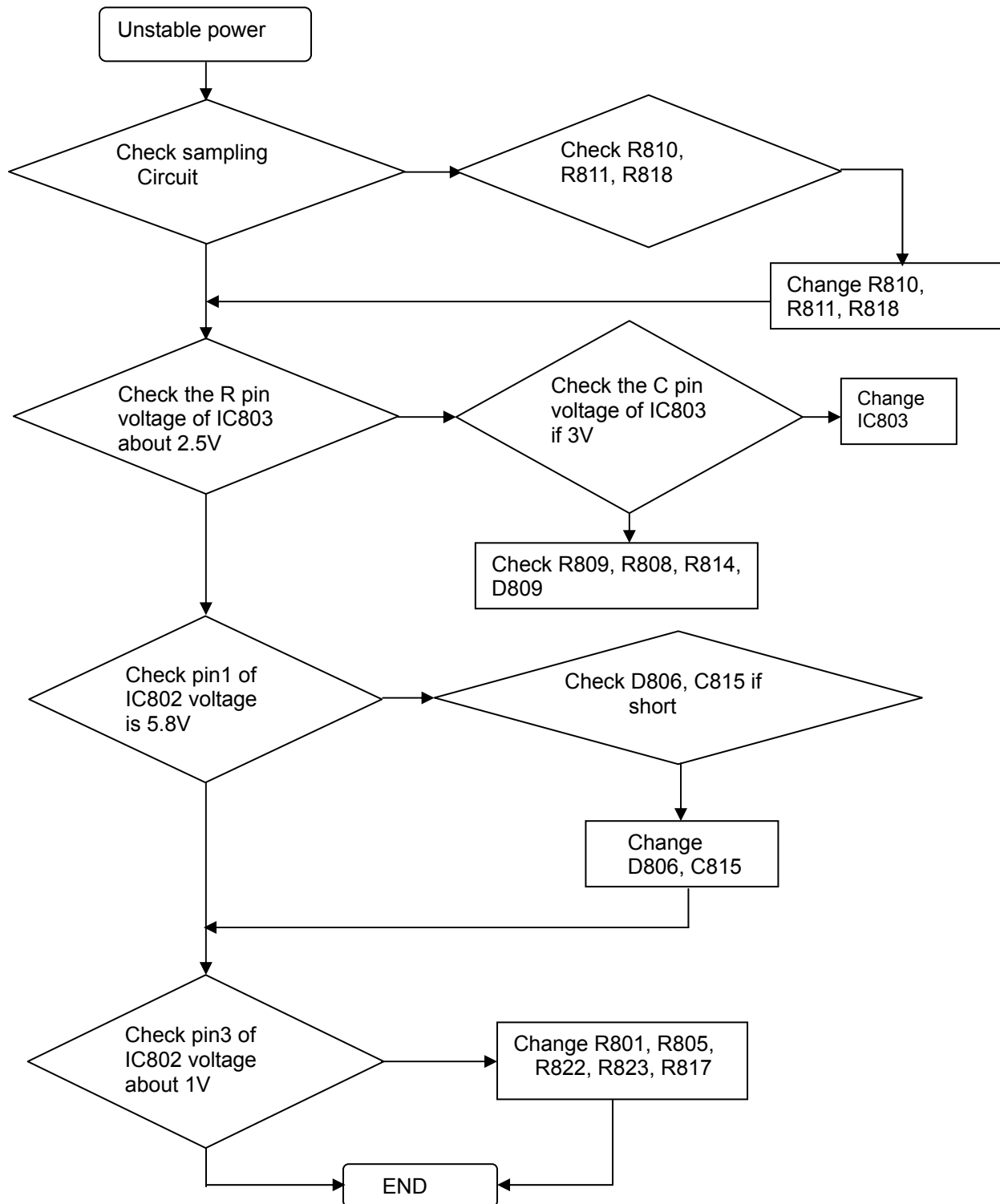




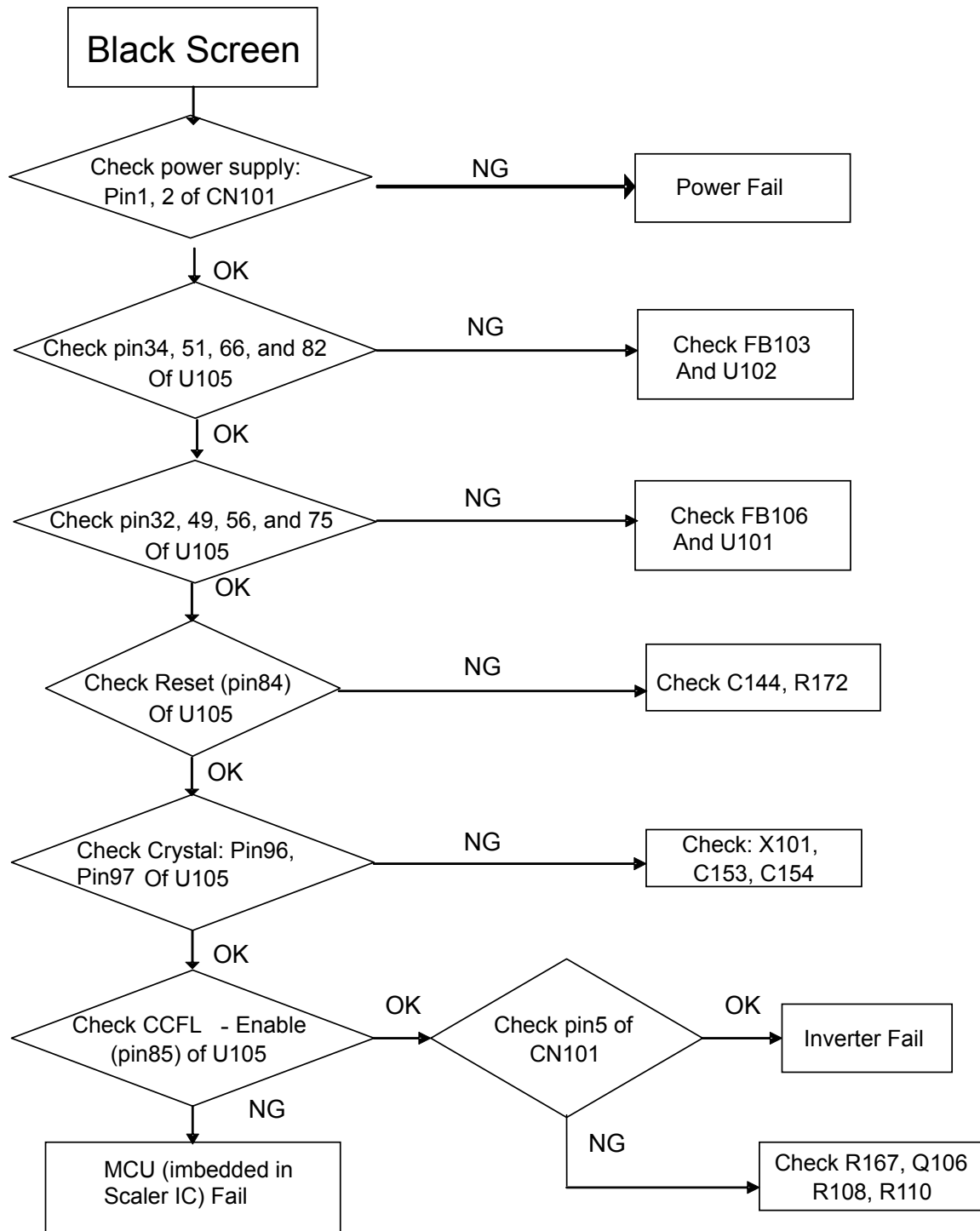
### 3. DC output voltage is unstable



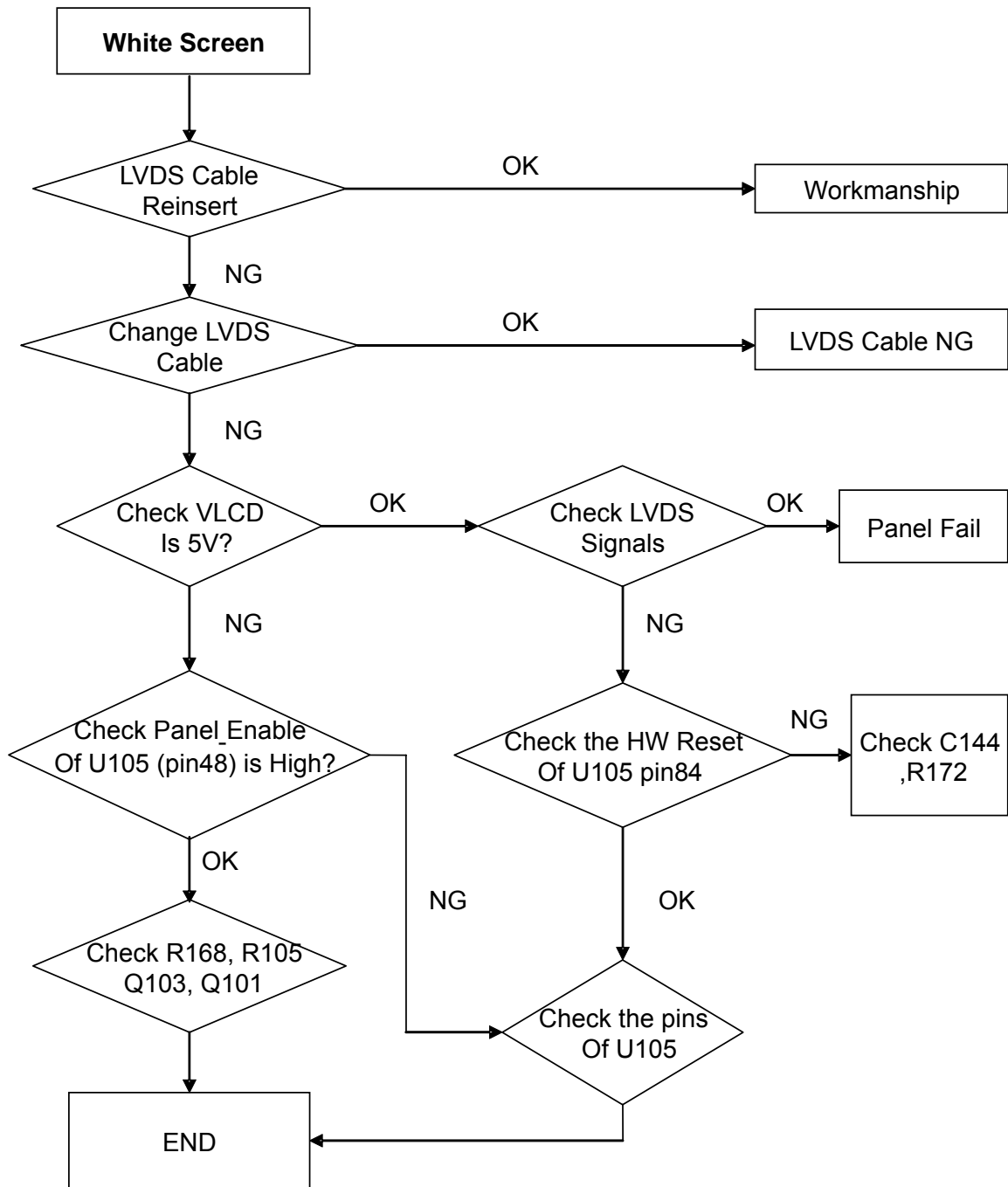
#### 4. Output power is unstable



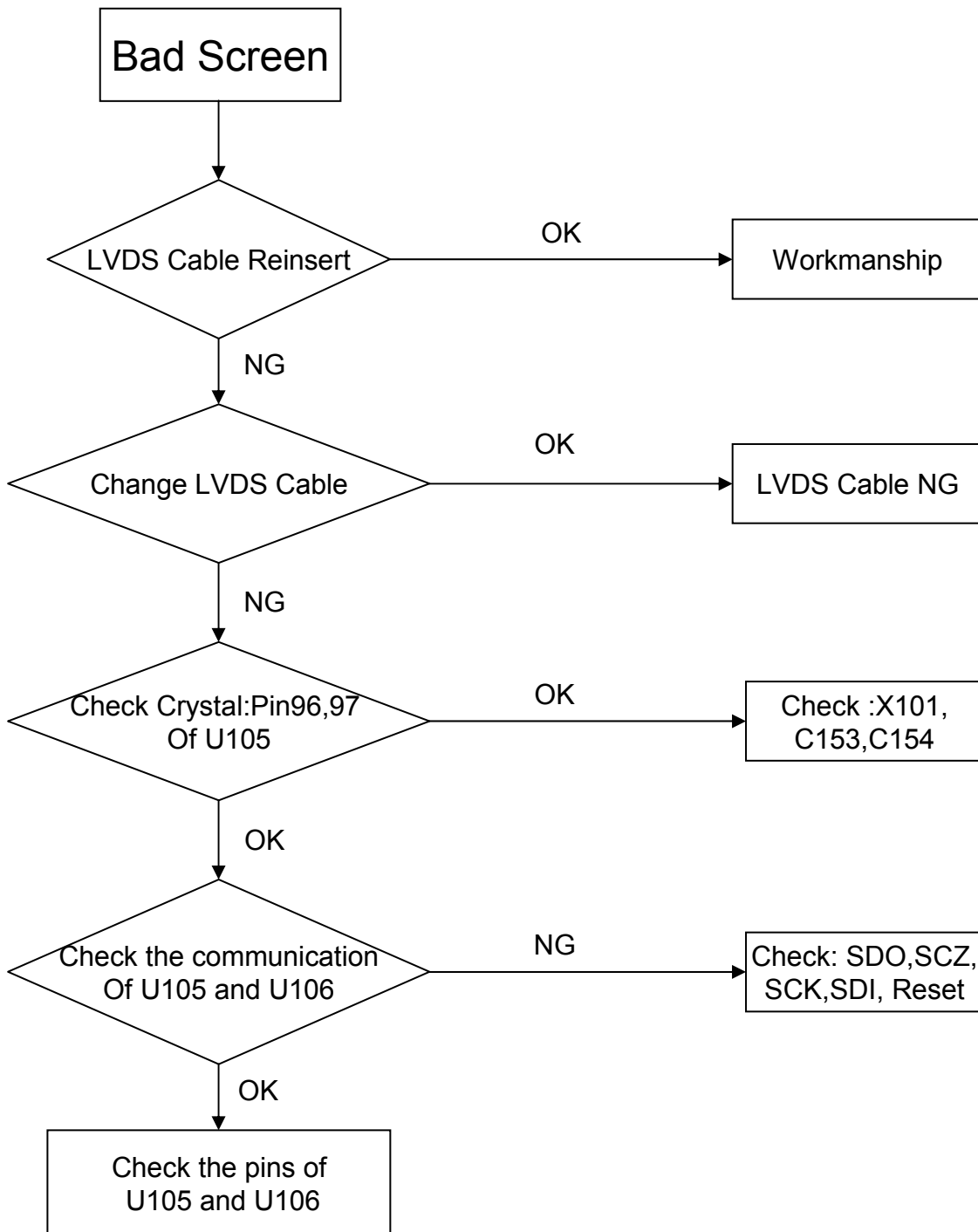
## 5.Black Screen and backlight turn on



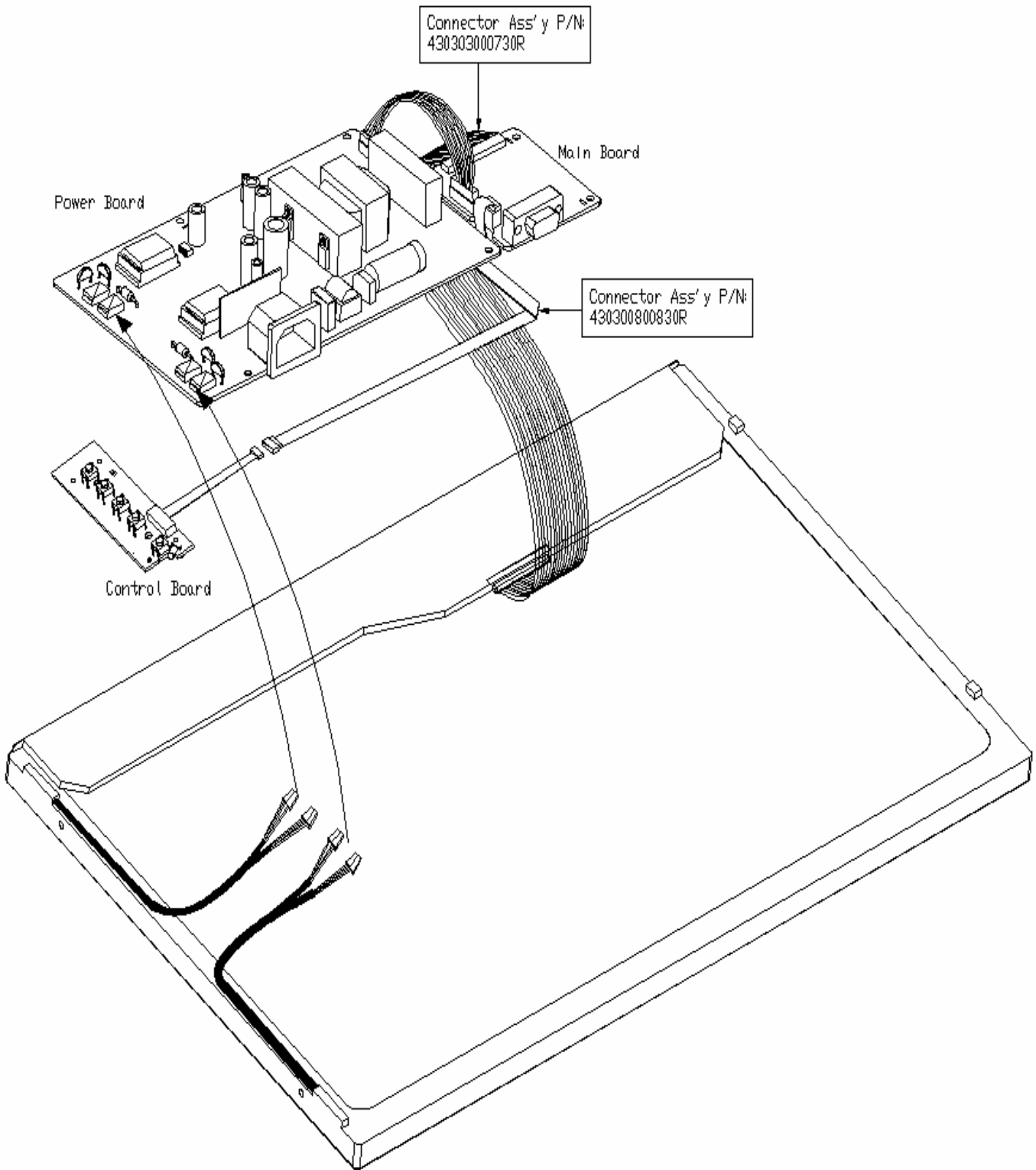
## 6.White Screen



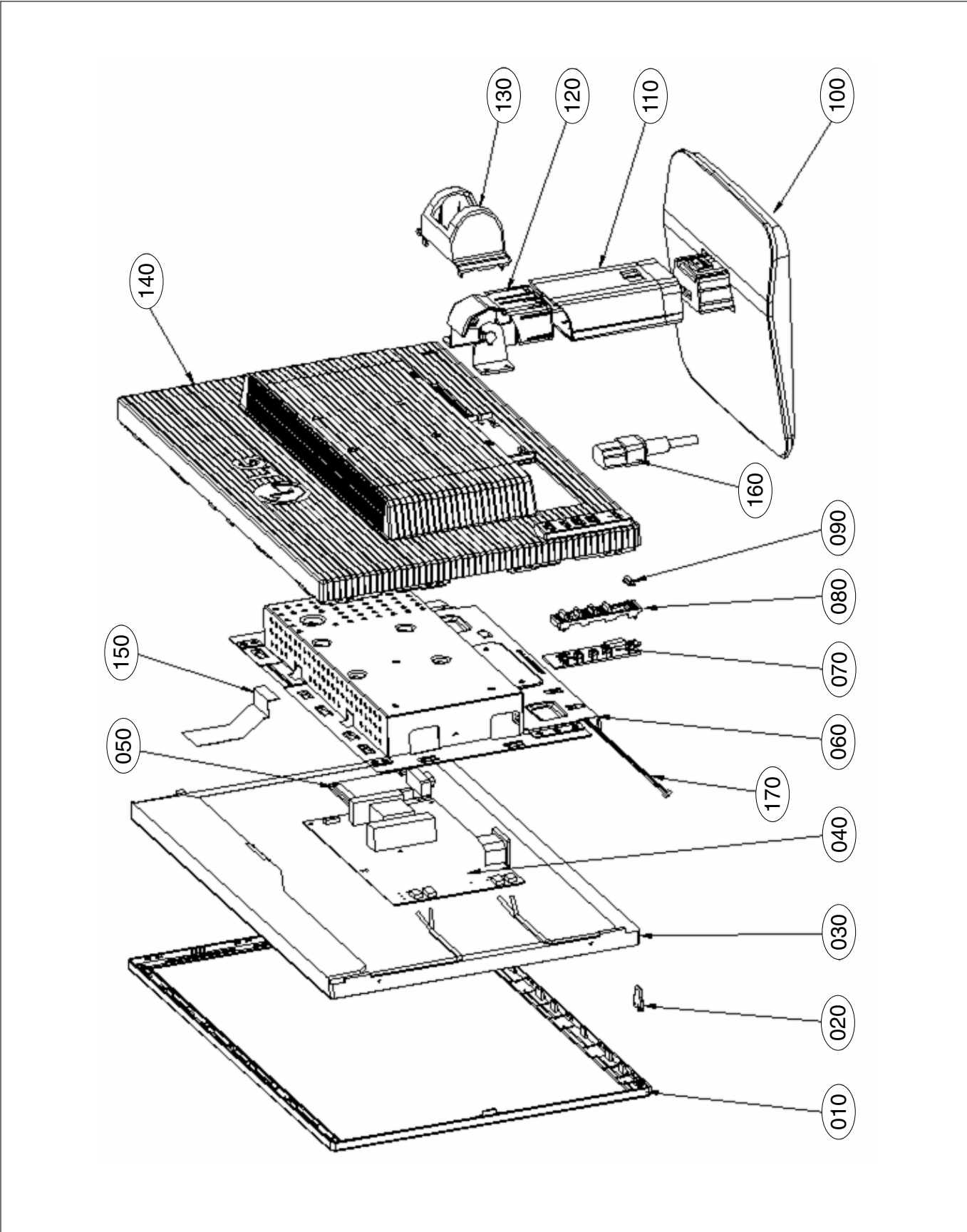
## 7. BAD SCREEN



# WIRING DIAGRAM



**EXPLODED VIEW**



## EXPLODED VIEW PARTS LIST

Ref.No.	LGE Part No.	INL Part No.	Description
10	ABJ32903501	501010209600R	BEZEL,FRONT(S),LE1957
	ABJ32903502	501010209610R	BEZEL,FRONT(B),LE1957
20	MKC37547001	501120105100R	LENS(T),LE1957
30	EBU36594401	631102090821R	LCP 19" MT190AW01-V2- G1,AM1900004201(INL)
	EBU36577201	631102090650R	LCD PANEL 19"M190A1-L02(A)(CMO)ROHS
	COV30007501	631102091401R	LCP 19" MT190AW01-V5- G1,AM1900004511(IN
	COV30013906	631102091080R	LCP 19" LM190WX1-TLC1(A)(LPL)RoHS
	COV30007601	631102091370R	LCP 19" M190MWW1-201(A)(MTDIS)ROHS
40	EBU36576401	790841400600R	PCBA,P/I BOARD,LE1957-610 ROHS
50	EBU36589602	790841300600R	PCBA,I/F BOARD(V2),LE1957-610 ROHS
		790841300500R	PCBA,I/F BOARD,LE1957-510 ROHS
	EBU59474601	790841300601R	Main board L192WS LPL INNOLUX DISPLAY CO.
	EBU59475101	790841300A02R	Main board L192WS LPL INNOLUX DISPLAY CO.
	EBU59474701	790841300E00R	Main board L192WS LPL INNOLUX DISPLAY CO.
60	ADV32904101	701000003000R	ASSY,CHASSIS,LE1957
70	EBU36589701	790841500000R	PCBA,KEYPAD BOARD,LE1957 ROHS
80	MEY37547401	501030205700R	BUTTON,FUNCTION KEY(B),LE1957,ROHS
90	MEY37547601	501030205710R	BUTTON,POWER KEY(B), LE1957 ROHS
100	ACQ32904401	714020008900R	ASSY,BASE(B),LE1957
110	ACQ32904601	714010009300R	ASSY,STAND(B),LE1957
120	ACQ32904701	714010009310R	ASSY,STAND NECK,LE1957
130	MCK37548201	501020212000R	COVER,HINGE(B),LE1957,ROHS
140	MCK37548401	714050009000R	COVER,BACK(B),LE1957,ROHS
150	EBU36589801	430303000730R	HRN LVDS FFC 30P 155mm ACCP30155MU28MY
160	6410TUW008A	453070800150R	PWR CORD 10A/125V BLK 6FT UL/CSA,SVT 3Cx ---US/Mexico/Panama/Canada
	6410TBW004A	453070800720R	PWRCORD 10A/250V BLK 6FT UK,H05VV-F 3Cx0 ---UK/Malaysia/Singapore
	6410TEW003A	453070800730R	PWRCORD 16A/250V BLK 6FT VDE,H05VV-F 3Cx ---Europe/Thailand/Vietnam/Russia/U.A.E
	6410TSW003A	453070800740R	PWRCORD 10A/250V BLK 1850mm SAA,H05W-F 3 ---Australia
	6410TTW001A	453070800750R	PWRCORD 7A/125V BLK 1850mm CNS,VCTF 3Gx0 ---Taiwan
170	EBU36590701	430300800830R	HRN ASS'Y 2*4p to 1*8p 305mm UL1571#28



## REPLACEMENT PARTS LIST

**CAUTION:** BEFORE REPLACING ANY OF THESE COMPONENTS,  
 READ CAREFULLY THE **SAFETY PRECAUTIONS** IN THIS MANUAL.  
 \* NOTE : **S** SAFETY Mark  
**AL** ALTERNATIVE PARTS

### Power and Inverter PCBA Board

Item	Location	P/N	Description
		790841400600R	PCBA,P/I BOARD,LE1957-610 ROHS
10	IC801,	412140002380R	IC LTV817M-PR VDE (LITE-ON) P=10mm RoHS
10	RA	412140001390R	IC EL817M-B(EVERLIGHT)RoHS
20	U501,U502,	410500071290R	XSTR AP9971GD,N-CH,PDIP-8(APEC RoHS
20	RA	410500061271R	XSTR AOP802 DUAL N-CH PDIP-8(AOS)RoHS
30	D801,	411050005020R	DIO BRDG BL4-06-BF52-LF 600V/4A(FRONTIER
30	RA	411050007010R	DIO BRDG KBL405G 600V/4A(TSC) RoHS
30	RA	411050005090R	DIO BRDG FL406 600V/4A(PEC)RoH S
40	C804,	416194743011R	CAP MEX 0.47uF 275V K X2,F15 RoHS
50	C820,C801,C806,	416202224610R	CAP MEY 2200pF 400V M Y,F10mm RoHS
60	C812,C809,	420421020102R	CAP EC 1000uF/10V M,105°C N-F 10x16(L-ES
70	C808,	420421020211R	CAP SD 1000uF 25V M,105°C F 13x20 RoHS
80	C805,	420431214580R	CAP SEK 120uF 450V 18*40 M CF 105°C
90	C824,	416204724610R	CAP MEY 4700pF 400V M Y,F10mm RoHS
100	L802,L803,	425000010530R	COIL CHK 5uH 7.8X10 CHK-053 0 181085R0L
110	L801,	426000050070R	CHOKO L-FILTER 12mH LIN-007 ET-20,RoHS
120	T801,	426000090510R	XFMR 750u@1K,+8%,3m,113m,SPW- 051,DIP-1
130	RT801,	432009401300R	NTC 8Ω 4A 13Φ P = 7.5mm F ROHS
140	F801,	430613430290R	FUSE SLOW 3.15,250,Axial Lead,3.6 x10mm
150	P801,	440149000220R	SKT AC 10A/250V U/C/V,G/Y=45mm TU-301-SP
160	CN501,CN502,CN503,CN504,	430637020030R	WFR. 2P P=3.5mm 90°W/LOCK,RoHS
170	CN801,	430300600170R	HRN ASS'Y 6P 90mm UL1007#24, ROHS
180	C525,C527,	418105058010R	CAP CD SL 5pF 3KV K,F7.5 RoHS
190	C803,	418247233020R	CAP CD X7R 4700pF 1KV K,W/O FO RMING,RoH
200	C524,C526,	418110058510R	CAP CD SL 10pF 3KV J,F7.5 RoHS CC45SL3FD
210	T501,T502,	426000090680R	XFMR SW,121.5uH EEL19M DIP SPW-068,RoHS
220	H501,	502040604500R	SHIELD,EMI, LE1915 ROHS
230		735100007120R	ASSY,H/S,SBR10U100CT/U40CT, LE1710
240		735100005900R	ASSY,H/S TOP246Y, LE1X09 ROHS
250		790841440600R	PCBA,P/I BOARD,SMD,LE1957-610 ROHS
260		511130001201R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5(SAC305 VAC

260		511130001200R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5/Ni0.06/Ge0
270		511110000101R	HOT-MELT ADHESIVES (#526)
280		511110000501R	SILICONE RTV RUBBER,UB-511(EURO)
Item	Location	P/N	Description
		735100005900R	ASSY,H/S TOP246Y, LE1X09 ROHS
10	IC802,	412000379270R	IC TOP246YN,TO-220-7C(POWER IN TEGRATION
20		507200003700R	HEATSINK,46x20xt10mm LE1704/05
30		509112306100R	SCREW,P,CROSS,T.T-3*6,ZnROHS
Item	Location	P/N	Description
		735100007120R	ASSY,H/S,SBR10U100CT/U40CT, LE1710
10	D803,	411090009480R	SCHTKY SP10100C 100V/10A ITO220(WILLAS)R
10	RA	411090041010R	SCHTKY SRF10100 100V/10A ITO220AB(TSC)Ro
20	D805,	411090024480R	SCHTKY SP1040C 40V/10A ITO220(WILLAS)RoH
20	RA	411090040010R	SCHTKY SRF1050 50V/10A ITO220AB(TSC)RoHS
20	RA	411090024010R	SCHTKY SRF1040 40V/10A ITO220AB(TSC)RoHS
30		507200003800R	HEATSINK,56x20xt10mm LE1904/05
40		509112306100R	SCREW,P,CROSS,T.T-3*6,ZnROHS
Item	Location	P/N	Description
		790841440600R	PCBA,P/I BOARD,SMD,LE1957-610 ROHS
10	Q801,	410500045210R	XSTR PMBT3904 NPN 200MA,40V SOT23(PHILIP
10	RA	410500045140R	XSTR MMBT3904LT1G NPN 200MA 40V SOT23(ON
10	RA	410500045090R	XSTR MMBT3904 NPN SOT-23(PANJIT)RoHS
20	IC501,	412000455630R	IC OZ9938GN SOIC16(O2 MICRO)RoHS
30	D501,D502,D503,D504,D507,D508,	411020026210R	DIO BAV99 350mW 70V SOT-23(PHI RoHS
30	RA	411020026390R	DIO BAV99,SOT-23(INFINEON)RoHS
30	RA	411020026020R	DIO BAV99-LF 350mW 70V SOT-23 (FEC)RoHS
30	RA	411020026090R	DIO BAV99 350mW 75V SOT-23(PEC RoHS
40	D505,D506,	411020068020R	DIO BAW56 70V SOT-23(FRONTIER)RoHS
40	RA	411020068090R	DIO BAW56 75V SOT-23(PANJIT)RoHS
40	RA	411020068210R	DIO BAW56 85V SOT-23(PHILIPS)RoHS
50	ZD803,	411100956920R	ZENER 5.6V MMSZ5232A SOD123(PE C)RoHS
50	RA	411131556920R	ZENER 5.6V 0.5W DDZ5V6B-F,SOD1 23(DIODES
50	RA	411131456920R	ZENER 5.6V MMSZ5232A SOD-123(WILLAS)ROHS
60	ZD801,	411100991950R	ZENER 9.1V MMSZ5239B SOD123(PE C)RoHS
60	RA	411131591952R	ZENER 9.1V 0.5W DDZ9V1C-F,SOD1 23(DIODES
60	RA	411131491920R	ZENER 9.1V MMSZ5239A SOD-123(WILLAS)ROHS
70	ZD804,	411100916020R	ZENER 16V MMSZ5246A SOD123(PEC RoHS

70	RA	411131516052R	ZENER 16V 0.5W DDZ16-F,SOD123(DIODES)RoH
70	RA	411131416020R	ZENER 16V MMSZ5246A SOD-123(WILLAS)ROHS
80	ZD805,	411100912020R	ZENER 12V MMSZ5242A SOD123(PEC RoHS
80	RA	411131512052R	ZENER 12V 0.5W DDZ12C-F,SOD123 (DIODES)R
80	RA	411131412020R	ZENER 12V MMSZ5242A SOD-123(WILLAS)ROHS
90	R511,R510,	414916033050R	RES SMD (0603) 33Ω J,RT RoHS REV:A
100	R802,R806,	414904010050R	RES SMD (1206) 10Ω J,RT RoHS
110	R809,	414904100010R	RES SMD (1206) 100Ω F,RT RoHS
120	R813,R814,R815,	414908010250R	RES SMD (0805) 1KΩ J,RT RoHS REV:A
130	R512,R526,	414916010350R	RES SMD (0603) 10KΩ J,RT RoHS
140	R808,R819,R827,	414908010350R	RES SMD (0805) 10KΩ J,RT RoHS REV:A
150	R514,	414916010450R	RES SMD (0603) 100KΩ J,RT REV:A RoHS
160	R513,R529,R530,	414916010550R	RES SMD (0603) 1MΩ J,RT RoHS REV:A
170	R817,	414908120210R	RES SMD (0805) 12K F RT RoHS REV:A
180	R829,	414908020150R	RES SMD (0805) 200Ω J,RT RoHS
190	R534,	414916220110R	RES SMD (0603) 2.2KΩ F,RT RoHS
200	R524,	414916220210R	RES SMD (0603) 22KΩ F,RT RoHS
210	R506,R508,R532,R533,	414908033050R	RES SMD (0805) 33Ω J,RT RoHS
220	R818,R517,R520,	414908330110R	RES SMD (0805) 3.3KΩ F,RT RoHS REV:A
230	R523,	414916330210R	RES SMD (0603) 33KΩ F,RT RoHS
240	R527,	414916330410R	RES SMD (0603) 3.3M F RT RoHS
250	R801,R805,R822,R823,	414908033550R	RES SMD(0805) 3.3MΩ J,RT,RoHS
270	R522,	414916453210R	RES SMD (0603) 45.3KΩ F RT ROHS
280	R509,R539,R540,R541,R542,	414916470010R	RES SMD (0603) 470Ω F,RT RoHS
290	R825,	414908047450R	RES SMD (0805) 470KΩ J,RT RoHS
300	R810,	414908510110R	RES SMD (0805) 5.1KΩ F,RT RoHS
310	R811,	414908510210R	RES SMD (0805) 51KΩ F,RT RoHS
320	R803,R807,R824,	414908051450R	RES SMD (0805) 510KΩ J,RT RoHS
330	R538,	414916604310R	RES SMD (0603) 604KΩ F,RT RoHS
340	R816,	414908068950R	RES SMD (0805) 6.8Ω J RT RoHS
350	R535,	414908075150R	RES SMD (0805) 750Ω J,RT RoHS REV:A
360	C504,	419311020060R	C SMD(0603) X7R 1000PF/50V K RoHS
370	C501,C502,C513,C514,C535,C536,	419311020070R	C SMD(0805) X7R 1000PF/50V K RoHS
380	C505,	419311030060R	C SMD(0603) X7R 0.01uF/50V K RoHS
390	C821,	419311040060R	C SMD(0603) X7R 0.1uF/50V K RoHS
400	C531,	419301810560R	C SMD(0603) NPO 180PF/50V J RoHS REV:A
410	C511,C507,	419342254670R	C SMD(0805) Y5V 2.2uF/16V Z RoHS
420	C529,	419302710560R	C SMD(0603) NPO 270PF/50V J RoHS REV:A
430	C508,C512,C516,	419313333060R	C SMD(0603) X7R 0.033uF/25V K RoHS
450	C506,	419314720060R	C SMD(0603) X7R 4700PF/50V K RoHS

460	C523,C530,	419316820070R	C SMD(0805) X7R 6800PF/50V K RoHS
470	C510,C532,	419316830060R	C SMD (0603) X7R 0.068uF 50V,K RoHS
480		790841410600R	PCBA,P/I BOARD,AI,LE1957-610 ROHS
Item	Location	P/N	Description
		790841410600R	PCBA,P/I BOARD,AI,LE1957-610 ROHS
10		790841450600R	PCBA,P/I BOARD,AI/A,LE1957-610 ROHS
20		790841460600R	PCBA,P/I BOARD,AI/R,LE1957-610 ROHS
Item	Location	P/N	Description
		790841450600R	PCBA,P/I BOARD,AI/A,LE1957-610 ROHS
10	R828,	415340101540R	RES MOF 1W 100Ω J,AT MINI RoHS
20	R820,R821,	415030105540R	RES CF 1/2W 1MΩ J,AT MINI RoHS
30	R503,R501,	414870305540R	RES MG HV 1/2Ws 3MΩ 3KV J,AT RoHS
40	R521,	415020330540R	RES CF 1/4W 33Ω J,AT MINI RoHS
50	R812,	414020689540R	RES FSM 1/4W 6.8Ω J AT MINI,RoHS
60	R804,	415130680540R	RES CF 1/2W 68Ω J,AT RoHS REV:A
70	D806,	411020052020R	DIO A02-LF 200V/1A R1(FEC)RoHS
70	RA	411030003040R	DIO FR103 200V/1A DO-41(MOSPEC RoHS
70	RA	411030065090R	DIO PS102R 200V/1A DO-41(PEC)ROHS
80	D809,	411022003210R	DIO 1N4148 75V/0.2A AT (PHIL) RoHS
80	RA	411022003020R	DIO 1N4148-LF 75V/0.15A AT (FEC)RoHS
80	RA	411020048090R	DIO 1N4148-35 75V/0.15A,DO35(P EC)RoHS
90	D804,	411020053090R	DIO PS1010R 1000V/1A DO-41(PAN JIT)RoHS
90	RA	411032006020R	DIO FR10-10-LF 1000V/1A AT(FRO NTIER)RoH
100	ZD802,	411020050090R	DIO P6KE150A,DO-15,AT(PANJIT)RoHS
100	RA	411020050020R	DIO P6KE150A-LF AT(FRONTIER) RoHS
100	RA	411020050010R	DIO P6KE150A,DO-15AT,(TSC)RoHS
110	F802,	430613040100R	FUSE SLOW PICO II 4A/125V U/C,AT,RoHS
120	J502,J503,J510,J511,J514,J804,J805,J809,	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 7.5MM
120	RA	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 7.5MM
130	J501,J504,J512,J513,J803,J808,	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 10MM
130	RA	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 10MM
140	J506,J509,J810,J812,	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 12.5MM
140	RA	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 12.5MM
150	J507,J508,	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 15MM
150	RA	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 15MM
160	J802,	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 17.5MM
160	RA	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 17.5MM
170	J505,	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 20MM

170	RA	430405000000R	JMPR ROLL/KG D=0.6mm,AT,RoHS 20MM
180		506140005700R	LABEL,BARCODE,BLANK,33x7mm, ROHS,FOR PCB
190		700000000300R	ASSY,PCB&RIVENT,LE1957 ROHS
Item	Location	P/N	Description
		790841460600R	PCBA,P/I BOARD,AI/R,LE1957-610 ROHS
10	C802,C811,	418210227030R	CAP CD X7R 1000pF 500V K VT RoHS
20	C817,C822,	419111040030R	CAP MTL X7R 0.1uF 50V K,VT, RoHS
30	C816,	416231041530R	CAP MEB 0.1uF 100V J,(RSB),VT RSBEC3100D
30	RA	416141041531R	CAP MKT 0.1uF 100V J,VT(ARCO) RoHS,R82EC
40	C522,	420421510330R	CAP SD 150uF 35V M,105°C VT 8x12 RoHS
50	C509,	420422210360R	CAP SD 220uF/35V M 105°C ST,10x13,RoHS
60	C813,	418147038530R	CAP CD NPO 47pF 1KV J,VT RoHS
70	C814,C815,C818,C819,	420264700230R	CAP SH 47uF 25V M,125°C,VT, 6.3x11,RoHS
80	C810,	420424710260R	CAP SD 470uF/25V M 105°C ST 10x16,RoHS
90	Q802,	410072013210R	XSTR 2PC1815GR*1 VT (PHILIPS) RoHS REV:
90	RA	410072013370R	XSTR 2SC1815-GR (T2SPF.T) VT (TOSHIBA)Ro
90	RA	410072013150R	XSTR UTC2SC1815L-GR NPN TO92 (UTC)RoHS
100	IC803,	412022002840R	IC TL431ACLPG TO-92 1%,VT(ON)RoHS
100	RA	412022002240R	IC KA431AZ 1%,VT (FAIRCHILD) RoHS
100	RA	412022002300R	IC AP431VL TO-92 1% VT (ATC) RoHS
100	RA	412022002830R	IC AS431 TO-92 VT(A1SEMI)RoHS
Item	Location	P/N	Description
		700000000300R	ASSY,PCB&RIVENT,LE1957 ROHS
10		490831400100R	PCB,P/I BOARD,LE1957 ROHS
20	M3,M4,M5,M6,M7,M8,	512006000500R	RIVET,Φ 3.0xΦ 1.6x3.0mm
30	M1,M2,	512006000600R	RIVET,Φ 4.1xΦ 2.2x3.0mm

### Control PCBA Board

Item	Location	P/N	Description
		790841500000R	PCBA,KEYPAD BOARD,LE1957 ROHS
10	LED101,	411070089450R	LED Y/G φ 3x5mm HTL-7VYVG4B1F-D12-FB-LC4.
20	SW101,SW102,SW103,SW104,SW105,	430602980120R	SW TACT 160gf 1P,H=4.3mm,DIP SFKHHAL2420
30	CN101,	430300800840R	HRN ASS'Y 8p 65mm UL1571#28
40		490831500100R	PCB,KEYPAD BOARD,LE1957 ROHS
50		511130001201R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5(SAC305 VAC
50		511130001200R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5/Ni0.06/Ge0
60		502110400100R	SPRING SHEET, LE1730

## Main PCBA Board

### For INL Module

Item	Location	P/N	Description
		790841300600R	PCBA,I/F BOARD(V2),LE1957-610 ROHS
10		629030009400R	PROGRAM(V2),LE1957-610 ROHS
20		790841320600R	PCBA,I/F BOARD,MI,LE1957-610 ROHS
30		790841340600R	PCBA,I/F BOARD,SMD,LE1957-610 ROHS
40		511130001201R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5(SAC305 VAC
40	RA	511130001200R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5/Ni0.06/Ge0
50		506440003800R	LABEL,BLANK,YELLOW,10x4mm
Item	Location	P/N	Description
		790841320600R	PCBA,I/F BOARD,MI,LE1957-610 ROHS
10	C111,C144,	420431000260R	CAP EC 10uF 25V M,105°C ST 5x11 RoHS
20	C101,C102,	420431010461R	CAP EC 100uF 16V M,105°C ST 5x11(SK) RoH
30	C130,C133,C142,C145,C105,	420432200460R	CAP EC 22uF 16V M,105°C ST, 5x11,RoHS
40	C108,	420432210460R	CAP EC 220uF 16V M,105°C ST 6.3x11 RoHS
50	CN101,	430631060020R	WAFER 2.0mm 6P 180°,RoHS
60	CN105,	430631080130R	WAFER 2x4P 2.0mm,200PHD-2*4ST RoHS
70	X101,	432008010370R	XTAL 14.31818MHz 16pF HC-49US 30PPM,DIP,
80	CN103,	440819015030R	CON,D-SUB,FEM.15P RA W/O SCREW DZ11AA1-H
Item	Location	P/N	Description
		790841340600R	PCBA,I/F BOARD,SMD,LE1957-610 ROHS
10	Q103,Q106,	410500045210R	XSTR PMBT3904 NPN 200MA,40V SOT23(PHILIP
10	RA	410500045140R	XSTR MMBT3904LT1G NPN 200MA 40V SOT23(ON
10	RA	410500045090R	XSTR MMBT3904 NPN SOT-23(PANJIT)RoHS
20	Q102,Q105,	410500046210R	XSTR PMBT3906 PNP 200MA,40V SOT23(PHILIP
20	RA	410500046180R	XSTR MMBT3906LT1G PNP 200mA 40V SOT23(ON
20	RA	410500046090R	XSTR MMBT3906 PNP SOT-23(PANJIT)RoHS
30	Q101,	410500068290R	XSTR AP2305GN P-CH SOT23(APEC) RoHS
30	RA	410500075270R	XSTR AO3415 P-CH,SOT23(AOS) RoHS
40	Q107,	410500050210R	XSTR 2N7002,N-CH FET SOT-23 (PHILIPS)RoH
40	RA	410500050130R	XSTR SN7002N N-CH SOT-23(INFINEON),RoHS
40	RA	410500050090R	XSTR 2N7002 N-CH SOT-23(PANJIT)RoHS
50	TVS101,TVS102,TVS103,TVS104,	411020026210R	DIO BAV99 350mW 70V SOT-23(PHI RoHS
50	RA	411020026020R	DIO BAV99-LF 350mW 70V SOT-23 (FEC)RoHS
50	RA	411020026390R	DIO BAV99,SOT-23(INFINEON)RoHS
50	RA	411020026090R	DIO BAV99 350mW 75V SOT-23(PEC RoHS
60	D103,	411020047210R	DIO BAV70 85V SOT23 (PHILIPS) RoHS

60	RA	411020047020R	DIO BAV70-LF, 70V SOT-23(FEC) ROHS
60	RA	411020047090R	DIO BAV70, 70V SOT-23(PEC) ROHS
70	ZD101,ZD105,ZD106,ZD107,ZD108,	411100956920R	ZENER 5.6V MMSZ5232A SOD123(PE C)RoHS
70	RA	411131556920R	ZENER 5.6V 0.5W DDZ5V6B-F,SOD1 23(DIODES
70	RA	411131456920R	ZENER 5.6V MMSZ5232A SOD-123(WILLAS)ROHS
80	U108,	412000279480R	IC AT24C04N-10SU-2.7 SOP8 4K(A TMEL)RoHS
80	RA	412000279280R	IC M24C04-WMN6TP4K SOP8 (ST) RoHS
80	RA	412000479990R	IC CAT24C04WI-TE13 SOIC-8(CATALYST)RoHS
90	U102,	412000330830R	IC AS1117L-1.8/TR-LF,SOT223(A1 SEMI)RoHS
90	RA	412000330020R	IC LD1117AL-1.8V-A SOT223(UTC) RoHS
90	RA	412000330070R	IC AZ1117H-1.8 SOT223(AAC)RoHS
100	U101,	412000372830R	IC AS1117L-3.3TR-LF,SOT223(A1S EMI)RoHS
100	RA	412000372020R	IC LD1117AL-3.3V-A SOT-223(UTC RoHS
100	RA	412000372070R	IC AZ1117H-3.3 SOT-223(AAC)RoHS
110	U103,	412000435480R	IC AT24C02BN-10SU-1.8 SOIC8 2K (ATMEL)Ro
110	RA	412000480990R	IC CAT24C02WI-TE13 SOIC-8(CATALYST)RoHS
110	RA	412000480280R	IC M24C02-RMN6TP SO8(ST)RoHS
120	U105,	412000508190R	IC TSUM16AL-LF-1 PQFP100(MSTAR)RoHS
130	U106,	412000373190R	IC SST25VF010A-33-4C-SAE,SOIC- 8(SST)RoH
130	RA	412000486310R	IC PM25LV010A-100SCE SOIC8(PMC)RoHS
130	RA	412000486190R	IC PS25LV010A-100SCE SOIC8(MSTAR)RoHS
140	R190,R170,R171,R103,	414916000050R	RES SMD (0603) 0 $\Omega$ J,RT RoHS
150	R186,R187,	414916010050R	RES SMD (0603) 10 $\Omega$ J,RT RoHS
160	R130,R129,R114,R117,R120, R125,R127,R131,R132,R101, R167,R168,R178,R179,R124,	414916010150R	RES SMD (0603) 100 $\Omega$ J,RT RoHS REV:A
170	R157,R158,R159,R160,R161, R162,R163,	414916010250R	RES SMD (0603) 1K $\Omega$ J,RT RoHS REV:A
180	R106,R172,R180,R181,R191,	414916010350R	RES SMD (0603) 10K $\Omega$ J,RT RoHS
190	R102,	414916010450R	RES SMD (0603) 100K $\Omega$ J,RT REV:A RoHS
200	R105,	414916020350R	RES SMD (0603) 20K $\Omega$ J,RT RoHS REV:A
210	R136,R137,	414916022250R	RES SMD (0603) 2.2K $\Omega$ J,RT RoHS
220	R121,	414916047150R	RES SMD (0603) 470 $\Omega$ J,RT RoHS REV:A
230	R108,R110,R149,R150,R154, R155,R173,R174,R166,R182, R183,R184,R185,R109,R122,	414916047250R	RES SMD (0603) 4.7K $\Omega$ J,RT RoHS
240	R169,	414916390010R	RES SMD (0603) 390 $\Omega$ F,RT RoHS
250	R133,R134,R135,	414916750910R	RES SMD (0603) 75 $\Omega$ F,RT RoHS REV:A
260	RP102,	415751035080R	RP(0612)10K $\Omega$ x4 1/16W J 8P4R RoHS
270	C158,C159,C160,C161,C162, C163,C164,	419301010560R	C SMD(0603) NPO 100PF/50V J RoHS
280	C153,C154,	419302200560R	C SMD(0603) NPO 22PF/50V J RoHS
290	C126,	419302210560R	C SMD(0603) NPO 220PF/50V J RoHS
300	C125,	419303300560R	C SMD(0603) NPO 33PF/50V J RoHS

310	C103,C104,C106,C107,C109, C129,C156,C131,C132,C134, C135,C136,C137,C139,C141, C143,C147,C148,C149,C150, C151,C152,C166,	419311040060R	C SMD(0603) X7R 0.1uF/50V K RoHS
320	C140,	419311054070R	C SMD(0805) X7R 1uF/16V K RoHS REV:A
330	C112,C113,C114,C115,C116, C117,C118,	419314730060R	C SMD (0603) X7R 0.047uF 50V,K RoHS
340	FB101,	432002312111R	BEAD CORE SMD(0805)120Ω 300mA RoHS
350	FB102,FB103,FB105,FB106,	432002360012R	BEAD CORE SMD(0805)60Ω 800mA GBK201209T
360	CN104,	444099030030R	CON, SMD 1.0mm 30PIN RoHS AL2309-A0G1Z
370		506140005700R	LABEL,BARCODE,BLANK,33x7mm, ROHS,FOR PCB
380		490831300100R	PCB,I/F BOARD, LE1957-X10
390	R107,	414916022150R	RES SMD (0603) 220Ω J,RT RoHS REV:A
400	R113,R116,R119,	414916560910R	RES SMD (0603) 56Ω F,RT RoHS REV:A
410	FB107,FB108,FB109,	432002360140R	BEAD CORE SMD(0603)60Ω 600mA, GBK160808
420		511130002203R	SOLDER PASTE,Sn96.5/Ag3.0/Cu0.5(SAC305 O
420	RA	511130002200R	SOLDER PASTE,Sn96.5-Ag3.0-Cu0.5 ROHS
420	RA	511130002201R	SOLDER PASTE,Sn96.5%Ag3.0%Cu0.5%

#### For CMO module

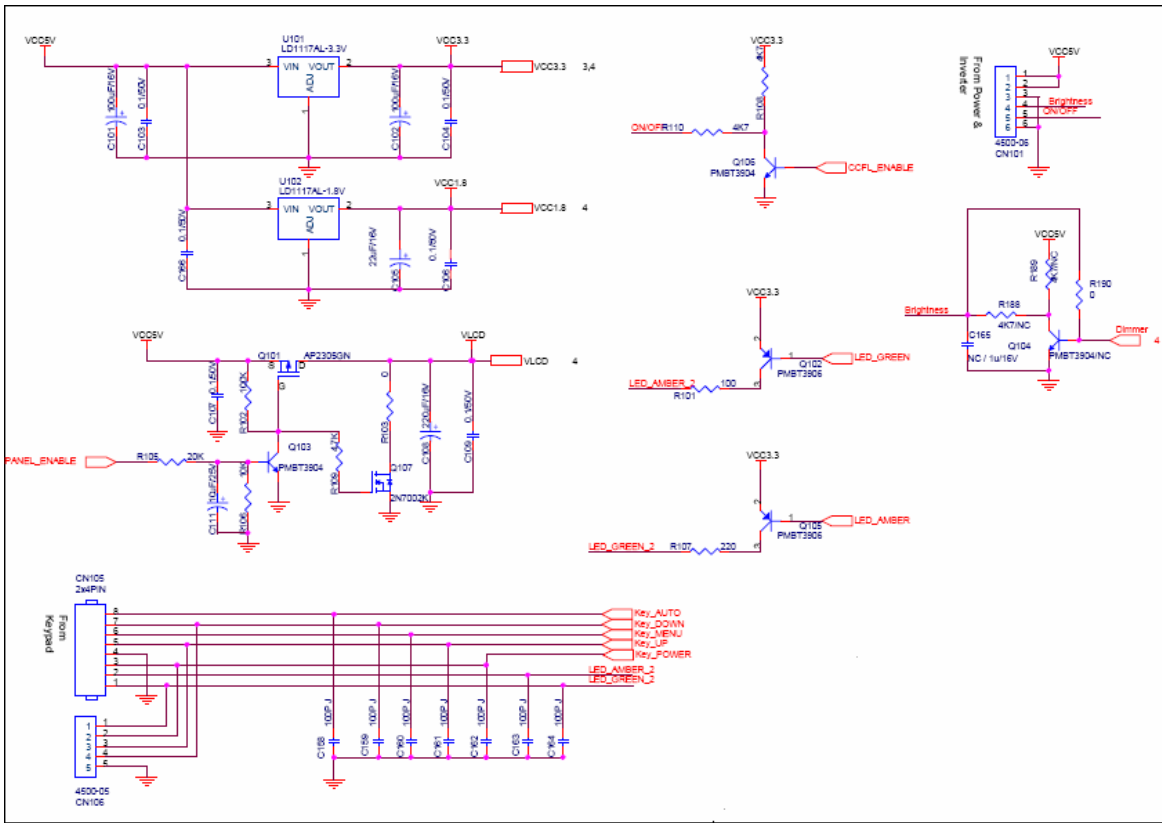
ITEM	Location	P/N	Description
		790841300500R	PCBA,I/F BOARD,LE1957-510 ROHS
10		629030009410R	PROGRAM,LE1957-510 ROHS
20		790841320600R	PCBA,I/F BOARD,MI,LE1957-610 ROHS
30		790841340600R	PCBA,I/F BOARD,SMD,LE1957-610 ROHS
40		511130001201R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5(SAC305 VAC
40	RA	511130001200R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5/Ni0.06/Ge0
50		506440003800R	LABEL,BLANK,YELLOW,10x4mm
ITEM	Location	P/N	Description
		790841320600R	PCBA,I/F BOARD,MI,LE1957-610 ROHS
10	C111,C144,	420431000260R	CAP EC 10uF 25V M,105°C ST 5x11 RoHS
20	C101,C102,	420431010461R	CAP EC 100uF 16V M,105°C ST 5x11(SK) RoH
30	C130,C133,C142,C145,C105,	420432200460R	CAP EC 22uF 16V M,105°C ST, 5x11,RoHS
40	C108,	420432210460R	CAP EC 220uF 16V M,105°C ST 6.3x11 RoHS
50	CN101,	430631060020R	WAFER 2.0mm 6P 180°,RoHS
60	CN105,	430631080130R	WAFER 2x4P 2.0mm,200PHD-2*4ST RoHS
70	X101,	432008010370R	XTAL 14.31818MHz 16pF HC-49US 30PPM,DIP,
80	CN103,	440819015030R	CON,D-SUB,FEM.15P RA W/O SCREW DZ11AA1-H
ITEM	Location	P/N	Description
		790841340600R	PCBA,I/F BOARD,SMD,LE1957-610 ROHS
10	Q103,Q106,	410500045210R	XSTR PMBT3904 NPN 200MA,40V SOT23(PHILIP
10	RA	410500045140R	XSTR MMBT3904LT1G NPN 200MA 40V SOT23(ON
10	RA	410500045090R	XSTR MMBT3904 NPN SOT-23(PANJIT)RoHS
20	Q102,Q105,	410500046210R	XSTR PMBT3906 PNP 200MA,40V SOT23(PHILIP
20	RA	410500046180R	XSTR MMBT3906LT1G PNP 200mA 40V SOT23(ON
20	RA	410500046090R	XSTR MMBT3906 PNP SOT-23(PANJIT)RoHS
30	Q101,	410500068290R	XSTR AP2305GN P-CH SOT23(APEC) RoHS
30	RA	410500075270R	XSTR AO3415 P-CH,SOT23(AOS) RoHS
40	Q107,	410500050210R	XSTR 2N7002,N-CH FET SOT-23 (PHILIPS)RoH
40	RA	410500050130R	XSTR SN7002N N-CH SOT-23(INFINEON),RoHS
40	RA	410500050090R	XSTR 2N7002 N-CH SOT-23(PANJIT)RoHS
50	TVS101,TVS102,TVS103,TVS104,	411020026210R	DIO BAV99 350mW 70V SOT-23(PHI RoHS
50	RA	411020026020R	DIO BAV99-LF 350mW 70V SOT-23 (FEC)RoHS
50	RA	411020026390R	DIO BAV99,SOT-23(INFINEON)RoHS
50	RA	411020026090R	DIO BAV99 350mW 75V SOT-23(PEC RoHS
60	D103,	411020047210R	DIO BAV70 85V SOT23 (PHILIPS) RoHS
60	RA	411020047020R	DIO BAV70-LF, 70V SOT-23(FEC) ROHS
60	RA	411020047090R	DIO BAV70, 70V SOT-23(PEC) ROHS



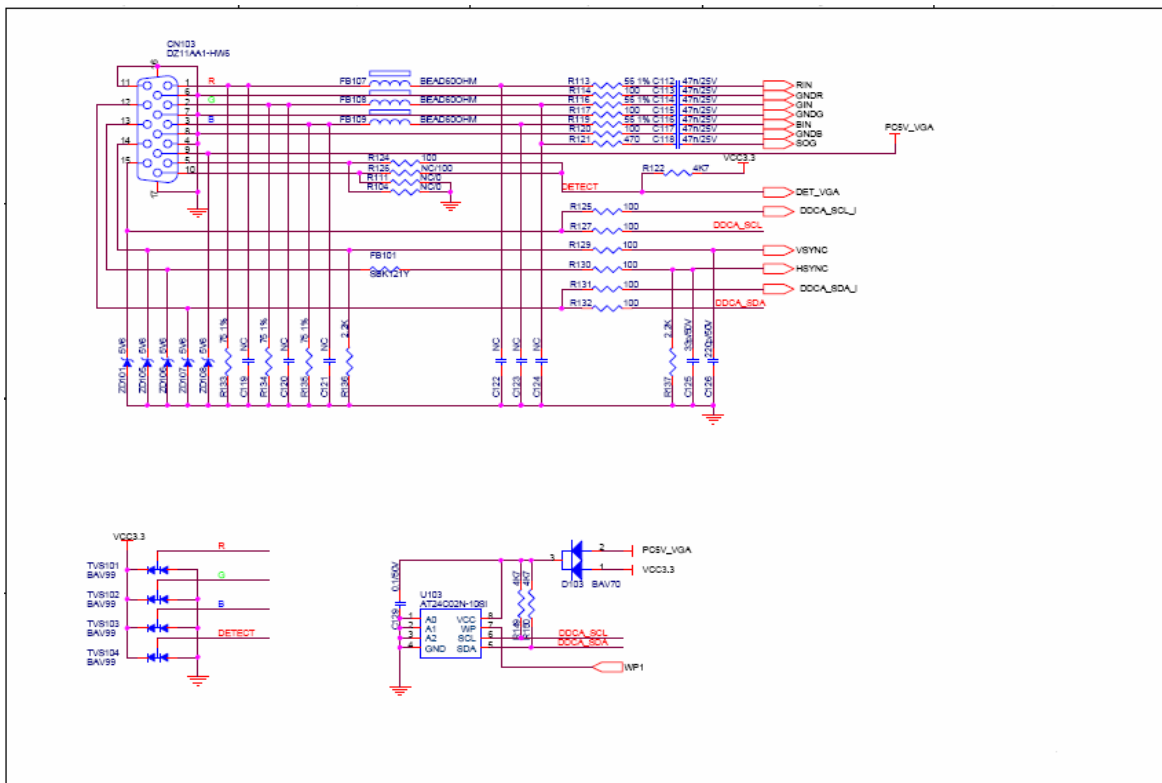
70	ZD101,ZD105,ZD106,ZD107,ZD108,	411100956920R	ZENER 5.6V MMSZ5232A SOD123(PE C)RoHS
70	RA	411131556920R	ZENER 5.6V 0.5W DDZ5V6B-F,SOD1 23(DIODES
70	RA	411131456920R	ZENER 5.6V MMSZ5232A SOD-123(WILLAS)ROHS
80	U108,	412000279480R	IC AT24C04N-10SU-2.7 SOP8 4K(A TMEL)RoHS
80	RA	412000279280R	IC M24C04-WMN6TP4K SOP8 (ST) RoHS
80	RA	412000479990R	IC CAT24C04WI-TE13 SOIC-8(CATALYST)RoHS
90	U102,	412000330830R	IC AS1117L-1.8/TR-LF,SOT223(A1 SEMI)RoHS
90	RA	412000330020R	IC LD1117AL-1.8V-A SOT223(UTC) RoHS
90	RA	412000330070R	IC AZ1117H-1.8 SOT223(AAC)RoHS
100	U101,	412000372830R	IC AS1117L-3.3TR-LF,SOT223(A1S EMI)RoHS
100	RA	412000372020R	IC LD1117AL-3.3V-A SOT-223(UTC) RoHS
100	RA	412000372070R	IC AZ1117H-3.3 SOT-223(AAC)RoHS
110	U103,	412000435480R	IC AT24C02BN-10SU-1.8 SOIC8 2K (ATMEL)Ro
110	RA	412000480990R	IC CAT24C02WI-TE13 SOIC-8(CATALYST)RoHS
110	RA	412000480280R	IC M24C02-RMN6TP SO8(ST)RoHS
120	U105,	412000508190R	IC TSUM16AL-LF-1 PQFP100(MSTAR)RoHS
130	U106,	412000373190R	IC SST25VF010A-33-4C-SAE,SOIC- 8(SST)RoH
130	RA	412000486310R	IC PM25LV010A-100SCE SOIC8(PMC)RoHS
130	RA	412000486190R	IC PS25LV010A-100SCE SOIC8(MSTAR)RoHS
140	R190,R170,R171,R103,	414916000050R	RES SMD (0603) 0 $\Omega$ J,RT RoHS
150	R186,R187,	414916010050R	RES SMD (0603) 10 $\Omega$ J,RT RoHS
160	R130,R129,R114,R117,R120,R125,R127, R131,R132,R101,R167,R168,R178,R179, R124,	414916010150R	RES SMD (0603) 100 $\Omega$ J,RT RoHS REV:A
170	R157,R158,R159,R160,R161,R162,R163,	414916010250R	RES SMD (0603) 1K $\Omega$ J,RT RoHS REV:A
180	R106,R172,R180,R181,R191,	414916010350R	RES SMD (0603) 10K $\Omega$ J,RT RoHS
190	R102,	414916010450R	RES SMD (0603) 100K $\Omega$ J,RT REV:A RoHS
200	R105,	414916020350R	RES SMD (0603) 20K $\Omega$ J,RT RoHS REV:A
210	R136,R137,	414916022250R	RES SMD (0603) 2.2K $\Omega$ J,RT RoHS
220	R121,	414916047150R	RES SMD (0603) 470 $\Omega$ J,RT RoHS REV:A
230	R108,R110,R149,R150,R154,R155,R173, R174,R166,R182,R183,R184,R185,R109, R122,	414916047250R	RES SMD (0603) 4.7K $\Omega$ J,RT RoHS
240	R169,	414916390010R	RES SMD (0603) 390 $\Omega$ F,RT RoHS
250	R133,R134,R135,	414916750910R	RES SMD (0603) 75 $\Omega$ F,RT RoHS REV:A
260	RP102,	415751035080R	RP(0612)10K $\Omega$ x4 1/16W J 8P4R RoHS
270	C158,C159,C160,C161,C162,C163,C164,	419301010560R	C SMD(0603) NPO 100PF/50V J RoHS
280	C153,C154,	419302200560R	C SMD(0603) NPO 22PF/50V J RoHS
290	C126,	419302210560R	C SMD(0603) NPO 220PF/50V J RoHS
300	C125,	419303300560R	C SMD(0603) NPO 33PF/50V J RoHS
310	C103,C104,C106,C107,C109,C129,C156, C131,C132,C134,C135,C136,C137,C139, C141,C143,C147,C148,C149,C150,C151, C152,C166,	419311040060R	C SMD(0603) X7R 0.1uF/50V K RoHS
320	C140,	419311054070R	C SMD(0805) X7R 1uF/16V K RoHS REV:A
330	C112,C113,C114,C115,C116,C117,C118,	419314730060R	C SMD (0603) X7R 0.047uF 50V,K RoHS
340	FB101,	432002312111R	BEAD CORE SMD(0805)120 $\Omega$ 300mA RoHS
350	FB102,FB103,FB105,FB106,	432002360012R	BEAD CORE SMD(0805)60 $\Omega$ 800mA GBK201209T
360	CN104,	444099030030R	CON, SMD 1.0mm 30PIN RoHS AL2309-A0G1Z
370		506140005700R	LABEL,BARCODE,BLANK,33x7mm, ROHS,FOR PCB
380		490831300100R	PCB,I/F BOARD, LE1957-X10
390	R107,	414916022150R	RES SMD (0603) 220 $\Omega$ J,RT RoHS REV:A
400	R113,R116,R119,	414916560910R	RES SMD (0603) 56 $\Omega$ F,RT RoHS REV:A
410	FB107,FB108,FB109,	432002360140R	BEAD CORE SMD(0603)60 $\Omega$ 600mA, GBK160808
420		511130002203R	SOLDER PASTE,Sn96.5/Ag3.0/Cu0.5(SAC305 O
420	RA	511130002200R	SOLDER PASTE,Sn96.5-Ag3.0-Cu0.5 ROHS
420	RA	511130002201R	SOLDER PASTE,Sn96.5%Ag3.0%Cu0.5%

# SCHEMATIC DIAGRAM

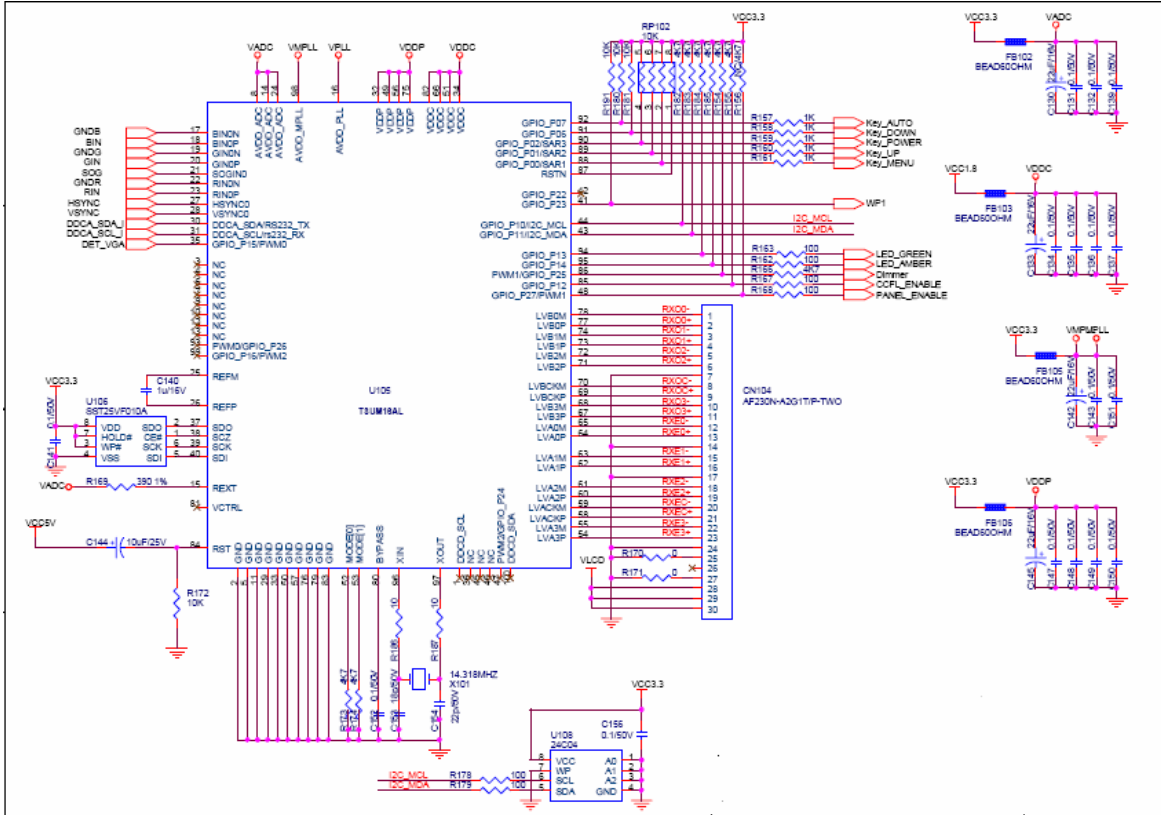
## 1. DC to DC



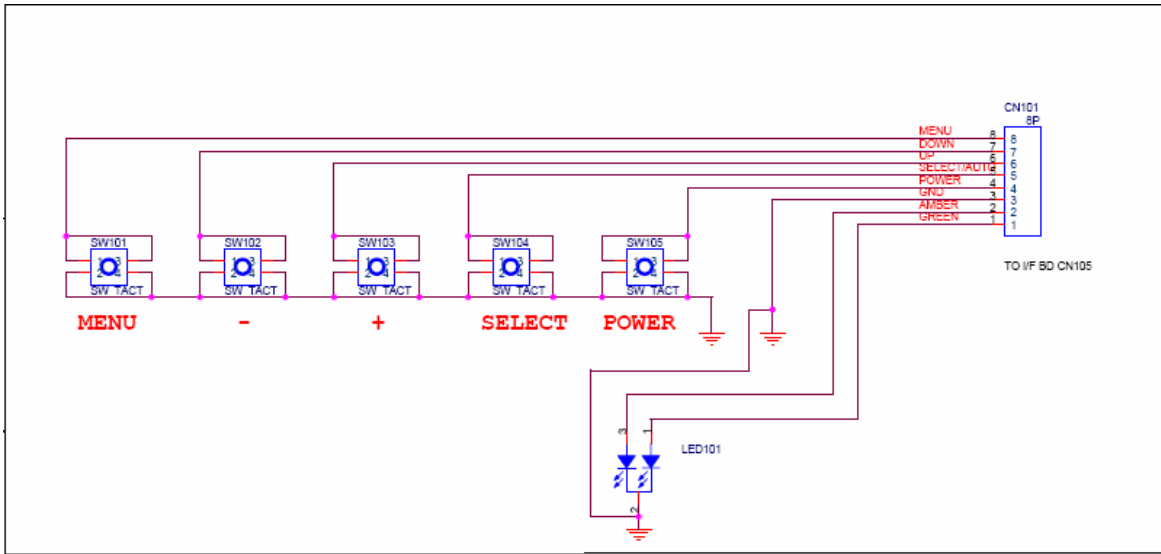
## 2. Input



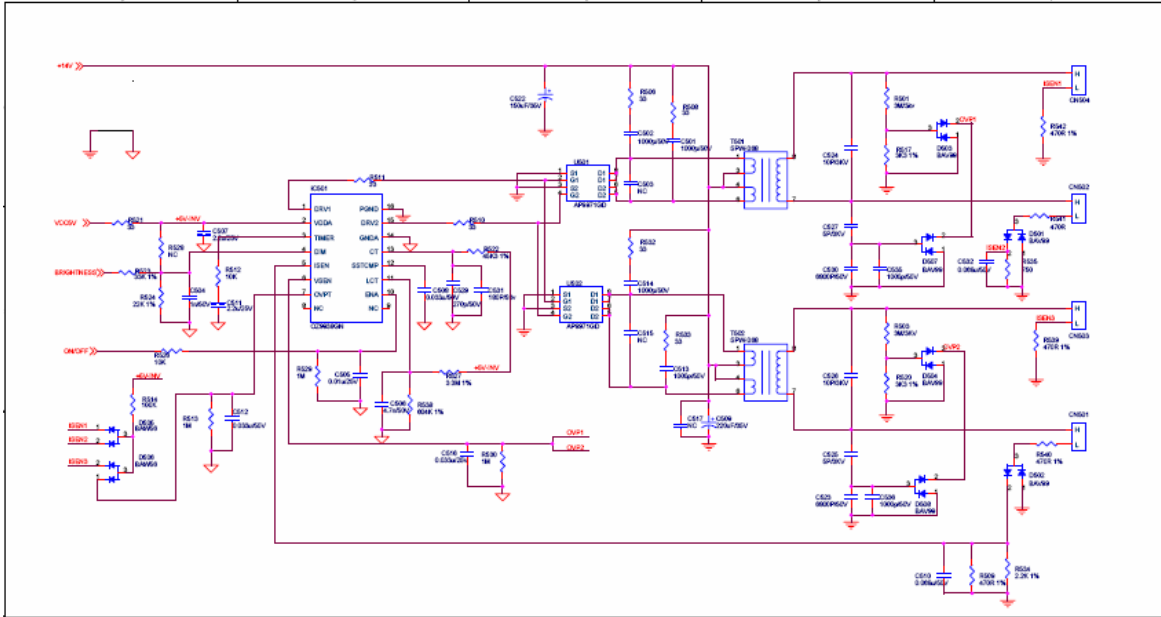
### 3. Scaler\_TSUM16AL



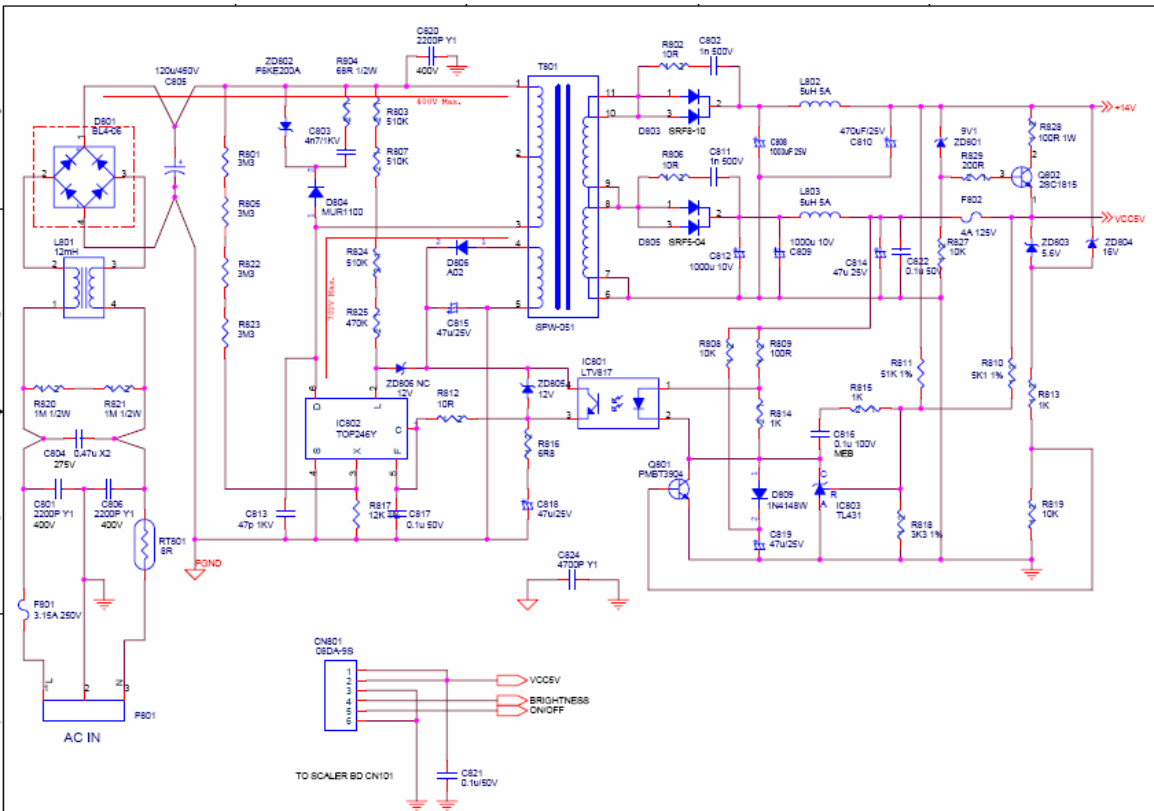
### 4. Key Pad



## 5. Inverter



## 6. Power





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