Internal Use Only

LED MONITOR
SERVICE MANUAL

CHASSIS : LM55D

MODEL : 34UM61

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

P/NO : MFL70139801(1701-REV00)

CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
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 it's 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 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

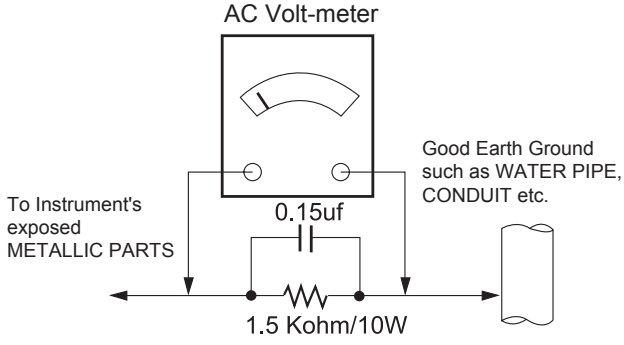
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 1 MΩ and 5.2 MΩ.
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 1.5 K / 10 watt resistor in parallel with a 0.15 uF 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 is corresponds to 0.5 mA.
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



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1
*Base on Adjustment standard

SPECIFICATION

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

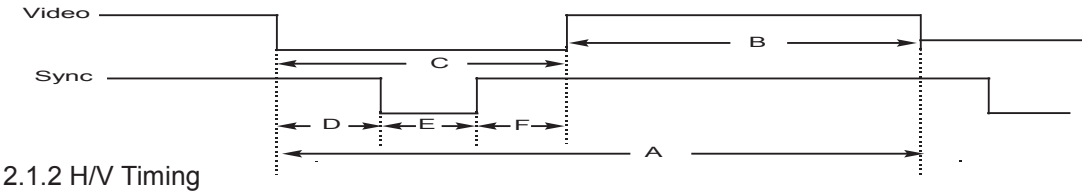
1. General Specification

1) 34UM59(34UM61)

No	Item		Content	Remark
1	Customer		BRAND	
2	User Model Name		34UM59&34UM61	
3	Sale region		Refer to Suffix standard	
4	Feature		34” Wide LCD MONITOR	
5	Chassis Name		LM55D	
6	General Scope	External SW &Adj.	LEFT, RIGHT, UP, DOWN, CENTER	
		Function	Picture Mode Ratio, ECO(Smart Energy Saving), Six Color, Audio Volume(Headphone)	
7	Power Cord		Length : 1.55±0.05 M Shape : D-type Color : Black / White Weight : 130g	Refer to Suffix standard and power cord table
8	Cable	DVI	Length : Shape : Color : Pin :	Do not Support
		HDMI	Length : 1.8m / 1.5m Shape : Detachable Type Color : Black / White Pin:19pin Weight : 100g	Support Black EAD00926103 White EAD00926140
		USB	Length : Shape : Color :	Do not Support
		Audio	Length : Shape : Color:	Do not Support
		TV	Length : ,Shape : ,Color: ,Pin	Do not Support
9	Wall-mount(KR, EU) EAY62850012 Desktop(except KR, EU) EAY63190001 EAY62850503		Input: AC100~240V 50~60Hz, 1.1A Max Output: DC 19V, 2.1A Adapter(desk-top type) Weight : 160g Back cover Input:19V 2.0A	
10	Applying module list		P/No: EAT63403001 EAJ63909701	Specification: LM340WW1-SJC1 CDMS module
11	Etc (accessory)		Manual CD	- / Support

2. Signal Timing(Resolution)

2.1 Signal(Video & Sync)



2.1.2 H/V Timing

mode	section	polarity	DOT CLOCK [MHz]	Frequency [kHz]/[Hz]	Total Period (E)	Display (A)	Front Porch (D)	Sync. (C)	Back Porch (B)	Resolution
1	H(Pixels)	-	28.321	31.468	900	720	18	108	54	720 X 400
	V(Lines)	+		70.08	449	400	12	2	35	
2	H(Pixels)	-	25.175	31.469	800	640	16	96	48	640 x 480
	V(Lines)	-		59.94	525	480	10	2	33	
3	H(Pixels)	-	31.5	37.5	840	640	16	64	120	640 x 480
	V(Lines)	-		75	500	480	1	3	16	
4	H(Pixels)	+	40.0	37.879	1056	800	40	128	88	800 x 600
	V(Lines)	+		60.317	628	600	1	4	23	
5	H(Pixels)	+	49.5	46.875	1056	800	16	80	160	800 x 600
	V(Lines)	+		75.0	625	600	1	3	21	
6	H(Pixels)	-	65.0	48.363	1344	1024	24	136	160	1024 x 768
	V(Lines)	-		60.0	806	768	3	6	29	
7	H(Pixels)	+	78.75	60.123	1312	1024	16	96	176	1024 x 768
	V(Lines)	+		75.029	800	768	1	3	28	
8	H(Pixels)	+	108	67.5	1600	1152	64	128	256	1152 x 864
	V(Lines)	+		75	900	864	1	3	32	
9	H(Pixels)	+	74.25	45	1650	1280	110	40	220	1280x720
	V(Lines)	+		60	750	720	5	5	20	
10	H(Pixels)	+	108	63.981	1688	1280	48	112	248	1280 x 1024
	V(Lines)	+		60.02	1066	1024	1	3	38	
11	H(Pixels)	+	135	79.976	1688	1280	16	144	248	1280 x 1024
	V(Lines)	+		75.025	1066	1024	1	3	38	
12	H(Pixels)	+	108.0	60.00	1800	1600	24	80	96	1600 x 900
	V(Lines)	+		60.00	1000	900	1	3	96	
13	H(Pixels)	-	146.25	65.29	2240	1680	104	176	280	1680 x 1050
	V(Lines)	+		59.954	1089	1050	3	6	30	
14	H(Pixels)	+	148.50	67.50	2200	1920	88	44	148	1920 x 1080
	V(Lines)	-		60	1125	1080	4	5	36	
15	H(Pixels)	-	185.58	66.7	2784	2560	64	64	96	2560 x 1080
	V(Lines)	+		60	1111	1080	3	10	18	

- DVI : DTV Mode is not supported (interlace mode)

2.1.3 HDMI Timing

	Factory support mode	Horizontal frequency	Vertical frequency
	(Preset Mode)	(KHz)	(Hz)
1	480P	31.5	60
2	576P	31.25	50
3	720P	37.5	50
4	720P	45	60
5	1080P	56.25	50
6	1080P	67.5	60

ADJUSTMENT INSTRUCTION

1. Application

1.1 This document is applied to LM55C chassis 34” LCD Monitor which is manufactured in Monitor Factory or is produced on the basis of this data.

1.2 Manufacturing Type : Set

2. Designation

2.1 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.

2.2. Power Adjustment: Free Voltage (100 ~ 240Vac)

2.3. Magnetic Field Condition: Nil.

2.4. Input signal Unit: Product Specification Standard

2.5. Reserve after operation: Above 5 Minutes (Heat Run)

Temperature : at 25℃±5°C

Relative humidity : 65 ±10%

Input voltage : 100 ~ 240V, 50/60Hz

2.6. Adjustment equipments: Color Analyzer (CA-210 or CA-110), DDC Adjustment Jig equipment,

3. Main PCB check process

*** APC - After Manual-Insult, executing APC**

3.1 ADC Process

1) 34UM59 doesn’t need ADC process because it has only digital input like HDMI.

3.2 EDID Process

3.2.1 EDID Download

F/W includes default EDID for All input ports, aging on Mode If AC ON, default EDID is automatically loaded to EEPROM.

Use HDMI 1 port to download the EDID and gamma adjust WB adjust .

automatically.

3.3 Function Check

3.3.1 Check Screen

■ Check input and signal items. (cf. work instructions)

1. HDMI1/2 (2560 x 1080 @60Hz)

4. Total Assembly line process

4.1 Write HDCP Key

Write HDCP Key into EEPROM by using DDC2AB protocol & HDCP Adjustment Jig equipment.

If error is occurred, try to write again.

After download HDCP key, send command '0xE6 00 00' for loading RAM memory correctly.

4.2 White balance adjustment

4.2.1 Confirm PRESET WARM(6500K) Color coordinates and PRESET COOL(9300K) Color coordinates .

-. Set as **Aging mode ON**, by commanding AGING_ON/OFF command code.
-. Select Module that is being used in present production by commanding MODULE SELECT.
-. Send SYSTEM RESET command to set Module data.
-. Input Full White Pattern (Video level : 700 mVp-p)
-. Set as COOL(9300K) by commanding COLOR_MODE_CHANGE Command code.

4.2.2 COOL **(9300K) color adjustment**

-. If this TCO spec should be satisfied later, refer to below method

-. Adjust to meet x = 0.283 ± 0.004, y=0.298±0.004, and confirm

-. Save 9300K Color by commanding COLOR SAVE Command code

-. Set as 6500K by commanding COLOR_MODE_CHANGE Command code.

4.2.3 WARM(**6500K) color adjustment**

-. If this TCO spec should be satisfied later, refer to below method

-. Adjust to meet x = 0.313 ± 0.003, y=0.329±0.003, and confirm.

(Option) It's another method for 6500K color adjustment at GUMI & NT

At first, Check ΔUV. If that is under 5, the set is not adjusted

If not, It is adjust to meet u'= 0.198±0.65, v'=0.469±0.65

In case of this model, sRGB Adjustment is not required

4.2.4 Total Assembly line should be check whether the color coordinate(x,y) data refer to below table were meet or not.

Color Temperature	Cool	9,300k	°K	X=0.283 (±0.015) Y=0.298 (±0.015)		<Test Signal> Inner pattern (255gray,100IRE)
	Warm	6,500k	°K	X=0.313 (±0.015) Y=0.329 (±0.015)		
Luminance (cd/㎡)	Cool	Min : 150 ➔120				<Test Signal> Inner pattern (255gray,100IRE)
	Warm	Min : 250 ➔200				

*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. ..

*Note : Manual W/B process

1) Power off => Push the Joystick button: LEFT + LEFT + LEFT + RIGHT => Power on(OK)

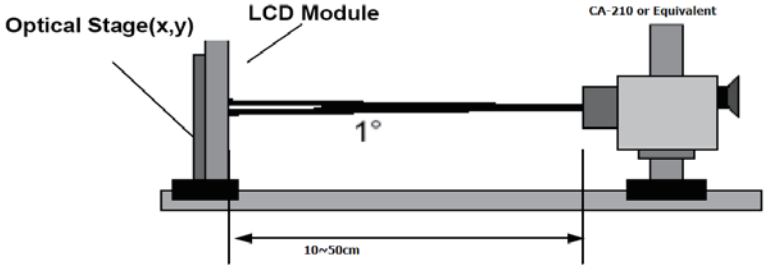
2) Push the Joystick button and then go to “Menu”.

3) In Service Menu.

4) You can control R/G/B Gain Manually.(at 6,500k & 9,300k)

※ When doing Adjustment, Please make circumstance as below.

■Measurement Condition: CA-210 / Ch.: 14 (WLED)



4.3 DPM Operation check

■Measurement Condition: 100~240V@ 50/60Hz

1) Set Input to HDMI1, HDMI2

2) Turn off the source device.

3) Check DPM operation refer to the below table.

Operating Condition	Sync (H/V) or Video	EUT (MSPG6100)	LED(SET)	Wattage(W)
Sleep mode	Off/Off	Off	White blinking	0.5
Off mode	-	-	Off	0.3

5. Shipping condition

<table>
<tr><th>No.</th><th colspan="3">Item</th><th colspan="2">Content& Outgoing Condition</th><th>비고</th></tr>
<tr><td rowspan="18">1</td><td rowspan="18">Outgoing Condition</td><td colspan="2">SOURCE</td><td colspan="2">HDMI(follows final input)</td><td></td></tr>
<tr><td colspan="2">Power S/W</td><td colspan="2">OFF</td><td></td></tr>
<tr><td rowspan="8">Monitor Block</td><td>BRIGHTNESS</td><td colspan="2">100</td><td rowspan="8">English, German, French, Spanish, Italian, Swedish, Finnish, Portuguese, Brazil, Polish, Russian, Greek, Ukrainian, Chinese, Japanese, Korean Traditional Chinese</td></tr>
<tr><td>Ratio</td><td colspan="2">Wide</td></tr>
<tr><td rowspan="2">COLOR TEMP</td><td colspan="2">PRESET</td></tr>
<tr><td>PRESET</td><td>CUSTOM</td></tr>
<tr><td>Black Level</td><td colspan="2">Low
(Black level enable at HDMI input)</td></tr>
<tr><td>CONTRAST</td><td colspan="2">70</td></tr>
<tr><td>LANGUAGE</td><td colspan="2">Depend on the sale region</td></tr>
<tr><td>FACTORY RESET</td><td colspan="2">NO</td></tr>
<tr><td>SES</td><td colspan="2">Low</td></tr>
<tr><td rowspan="10">AV Block</td><td>CONTRAST</td><td colspan="2">-</td><td rowspan="10">N/A</td></tr>
<tr><td>BRIGHTNESS</td><td colspan="2">-</td></tr>
<tr><td>SHARPNESS</td><td colspan="2">-</td></tr>
<tr><td>COLOR</td><td colspan="2">-</td></tr>
<tr><td>TINT</td><td colspan="2">-</td></tr>
<tr><td>BASS</td><td colspan="2">-</td></tr>
<tr><td>TREBLE</td><td colspan="2">-</td></tr>
<tr><td>MUTE</td><td colspan="2">-</td></tr>
<tr><td>LANGUAGE</td><td colspan="2">-</td></tr>
<tr><td>IMAGE SIZE</td><td colspan="2">-</td></tr>
<tr><td colspan="2">OSD POSITION</td><td colspan="2">-</td></tr>
<tr><td colspan="2">TRANSPARENCY</td><td colspan="2">-</td></tr>
<tr><td colspan="2">Operating. Time</td><td colspan="2">Within 2Hours</td><td></td></tr>
</table>

→ **Make sure to do FACTORY RESET at the final process.(Under HDMI 1 input)**

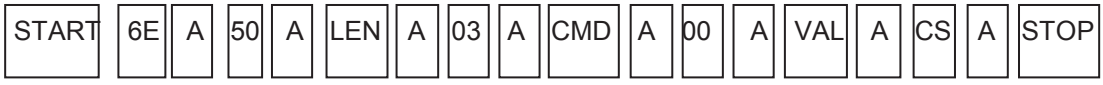
6. Signal composition for adjustment

6.1 I2C (100K BPS)
6.2 COMMUNICATION START

#Until ACK BIT goes LOW, Repeat it.

6.3 Command form.

Command form use DDC2AB standard communication protocol.



a. LEN : DATA BYTE number to send.

b. CMD : Command language that monitor executes.

c. VAL : FOS DATA

d. CS : Dada's CHECHSUM that transmit

e. DELAY : 50MS

f. A : Acknowledge

6.4 Screen adjust command (LENGTH = 84)

No.	Adjustment contents	CMD (hex)	ADR	VAL(hex)	Explanation
1	EEPROM ALL INITIAL	E4	00	00	adjustment Initialization
2	EEPROM READ	E7	Slave add		At EEPROM Read
3	EEPROM WRITE	E8	Slave add	Data	Write data at EEPROM
4	R GAIN	16	00	00-64	Tune Gain
5	G GAIN	18	00	00-64	
6	B GAIN	1A	00	00-64	
7	BRIGHT(Backlight)	10	00	00-64	Tune Analog Bright
8	FACTORY RESET	F0	00	00	Factory reset
9	COLOR_MODE_ CHANGE	F2	00		
				01	WARM(6500K)
				02	COOL(9300K)
10	Elapsed time Clear	E9	00	00	Aging off &Clear elapsed time
11	Aging On/Off	F3	00	FF/00	FF:ON / 00:OFF
12	Input Select	F4	00	~~0xD0~~ 0x90 0x91	~~1:DisplayPort~~ 2:HDMI1 3:HDMI2
13	SYSTEM RESET	F5	00	00	Restart System
14	Select Language	68	00	0x00 ~ 0x0F	00:English, 01: German 02: French 03: Spanish 04: Italian

					05: Swedish, 06:Finnish 07: Portuguese 08: Brazil 09: Polish 0A: Russian 0B: Greek 0C: Ukrainian 0D: Chinese 0E:Japanese 0F: Korean 10: Traditional Chinese
15	EDID SN UPDATE	0x77	0	0	0x00: HDMI2
16	Module select	0XF6	0	0x96	34UM59 PB340WW1SJ
17	APD command	0XF7	00	0X00/ 0X01	0X00: OFF 0X01: ON
18	Model Select	0XF9	00	0X01	0X01: UM59
19 Vcom*	**Only LGD panel biz models need**				
	Internal Pattern ON	A7	00	03	OSD Flicker pattern on
	Vcom Adjustment	A9	00	Value	Range (0x00 ~ 0x7F)
	Save Vcom vlaue	A8	00	00	Save Vcom value in EEROM for SVC OSD
	Internal Pattern Off	A7	00	00	OSD Flicker pattern off

6.5. EEPROM Data Write

6.5.1 Siganl TABLE

START	6E	A	50	A	84+n	A	03	A	CMD	A	ADH	A	ADL	A

Data_1	A	. . .	Data_n	A	CS	A	STOP	Delay 20m

LEN : 84h+Bytes

CMD : E8h

ADH : E^2PROM Slave Address(A0,A2,A4,A6,A8,AA,AC,AE), Not 00h(Reserved by Buffer To EEPROM)

ADL : E^2PROM Sub Address(00~FF)

Data : Write data

Delay : 20ms

6.5.2. Command Set

No.	Adjustment contents	CMD(hex)	LEN	Explanation
1	EEPROM WRITE	E8	94	16-Byte Write
2			(84+n)	n-byte Write

* Use

- FOS Default write :

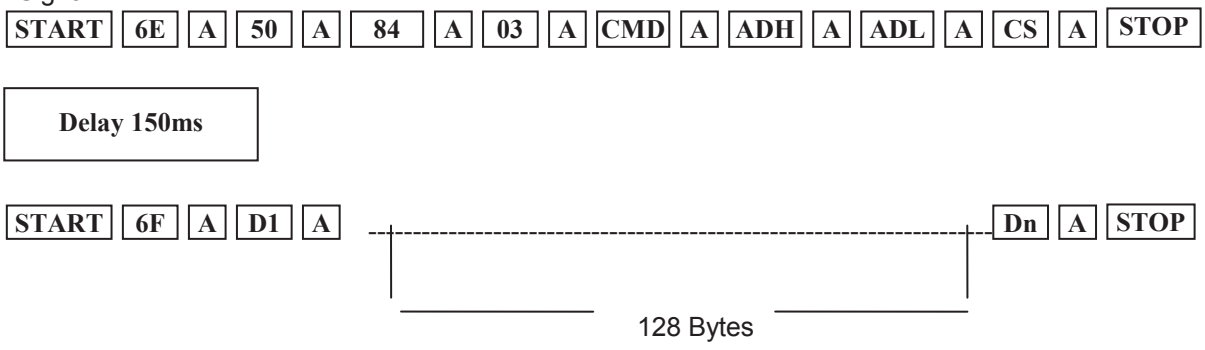
  <14mode data> write

  SyncFlags,HPeriodH, HPeriodL, VtotalH,VtotalL, SrcHTotalH, SrcHTotalL

  SrcHStartH, SrcHStartL, SrcVStartH,SrcVStartL, HsyncPhase
- Temporary Data write: Write to particular address of EEPROM.

6.6 E^2PROM Data Read

6.6.1 Signal TABLE



6.6.2 COMMAND SET

No.	Adjustment contents	CMD(hex)	ADH(hex)	ADL(hex)	Explanation
1	EEPROM READ	E7	A0	0	0-Page 0~7F Read
2				80	0-Page 80~FF Read
3			A2	0	1-Page 0~7F Read
4				80	1-Page 80~FF Read
5			A4	0	2-Page 0~7F Read
6				80	2-Page 80~FF Read
7			A6	0	3-Page 0~7F Read
8				80	3-Page 80~FF Read
9			A8	0	4-Page 0~7F Read
10				80	4-Page 80~FF Read

11			AA	0	5-Page 0~7F Read
12				80	5-Page 80~FF Read
13			AC	0	6-Page 0~7F Read
14				80	6-Page 80~FF Read
15			AE	0	7-Page 0~7F Read
16				80	7-Page 80~FF Read

6.6.3 Use

- Read E^{2}PROM's specific area as unit of 128(80h)-byte. (84h)

6.6.4 EDID Write

EEPROM access by using DDC2AB protocol

- 1-Byte write

START	A0	A	L	A	D	A	STOP

L : 0x00~0x7F

D : data

- 8-byte write

START	A0	A	L	A	Data1	A	….	A	Data8	A	STOP

L : 0x00,0x10,….0x70

6.6.5 EDID Read

DDC2AB Command.(A8)

START	A0	A	00	START	A1	A	Data1	. . .	Data128	A	CS	A	STOP

- 128 Byte transfer of EDID Buffer of MICOM

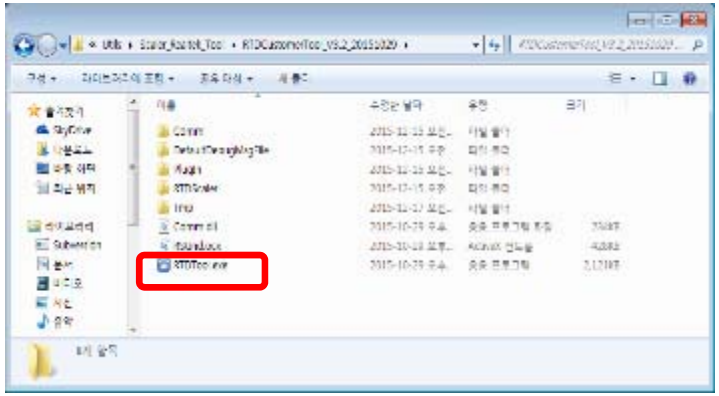
1 JIG connection

Connect the HDMI cable and USB cable on LG JIG like below picture.

Connect HDMI cable on the monitor and connect USB cable on the PC

2 Execute Realtek ISP Tool

Execute [RTDtool.Exe] file



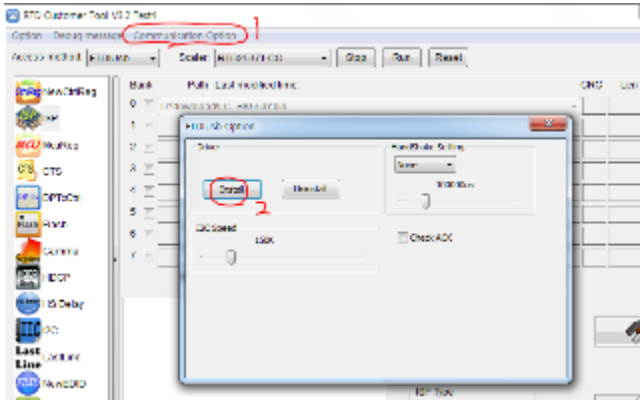
3 Check USB Driver

Check the Composite Device, USB Serial Converter A(B)] on DEVICE Manager

4 Install USB Driver

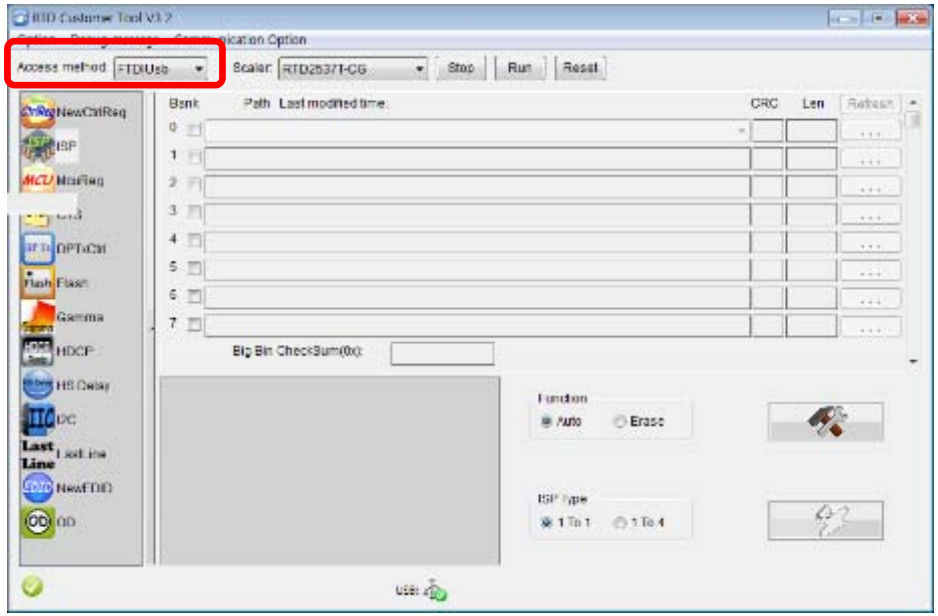
Check Access method as **FTDUsb**

[communication option] → Driver [Install]



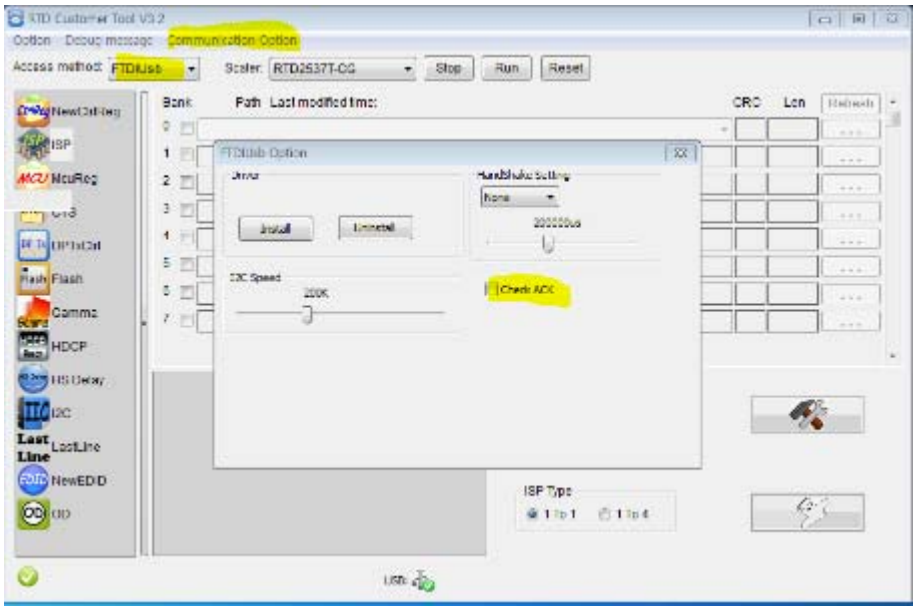
5 Set Access Method

Select [**FTDI USB**] on Access Method



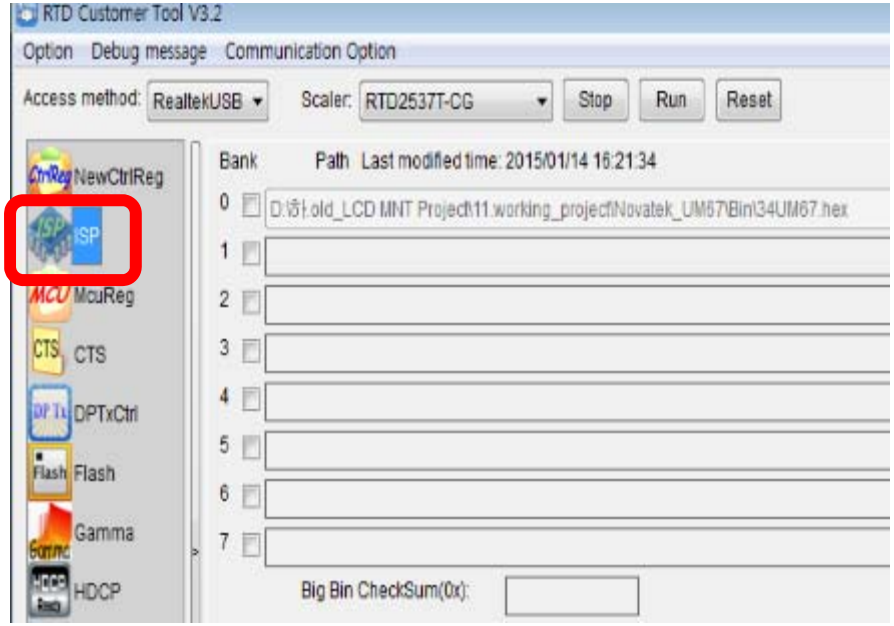
6 Set options

Uncheck the Check ACK checkbox



7 ISP

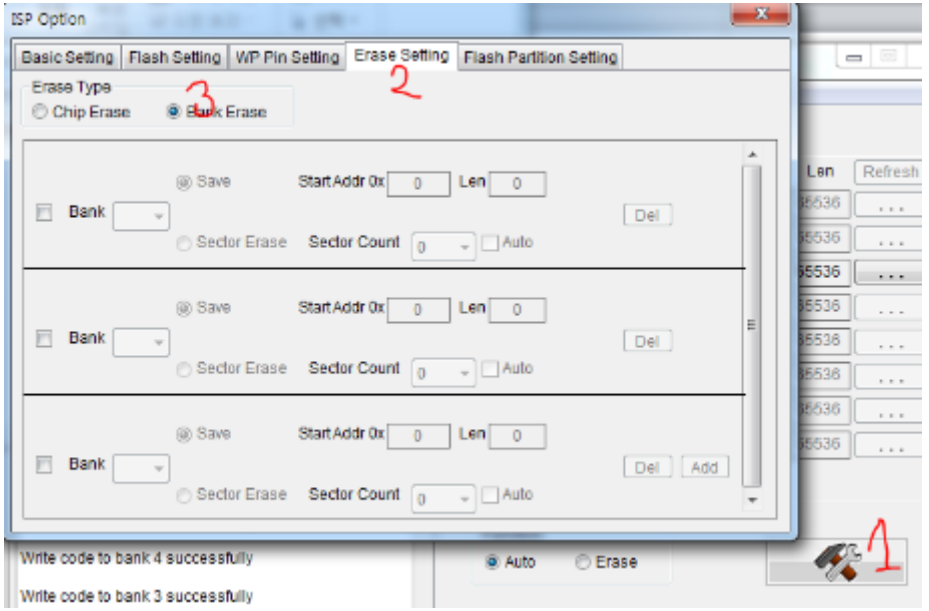
Select [ISP] Icon



8 set Erase Setting

Click the Tool Icon to enter the ISP option window

Select Erase Setting tab and choose Bank Erase



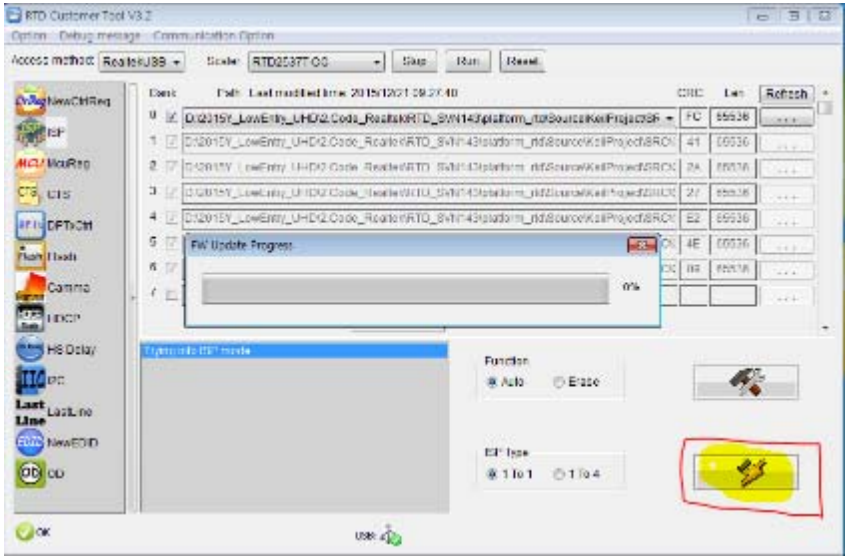
9 Load ISP File

Check the checkbox of Bank 0, and then press [...] button to open the file window, select the ISP file

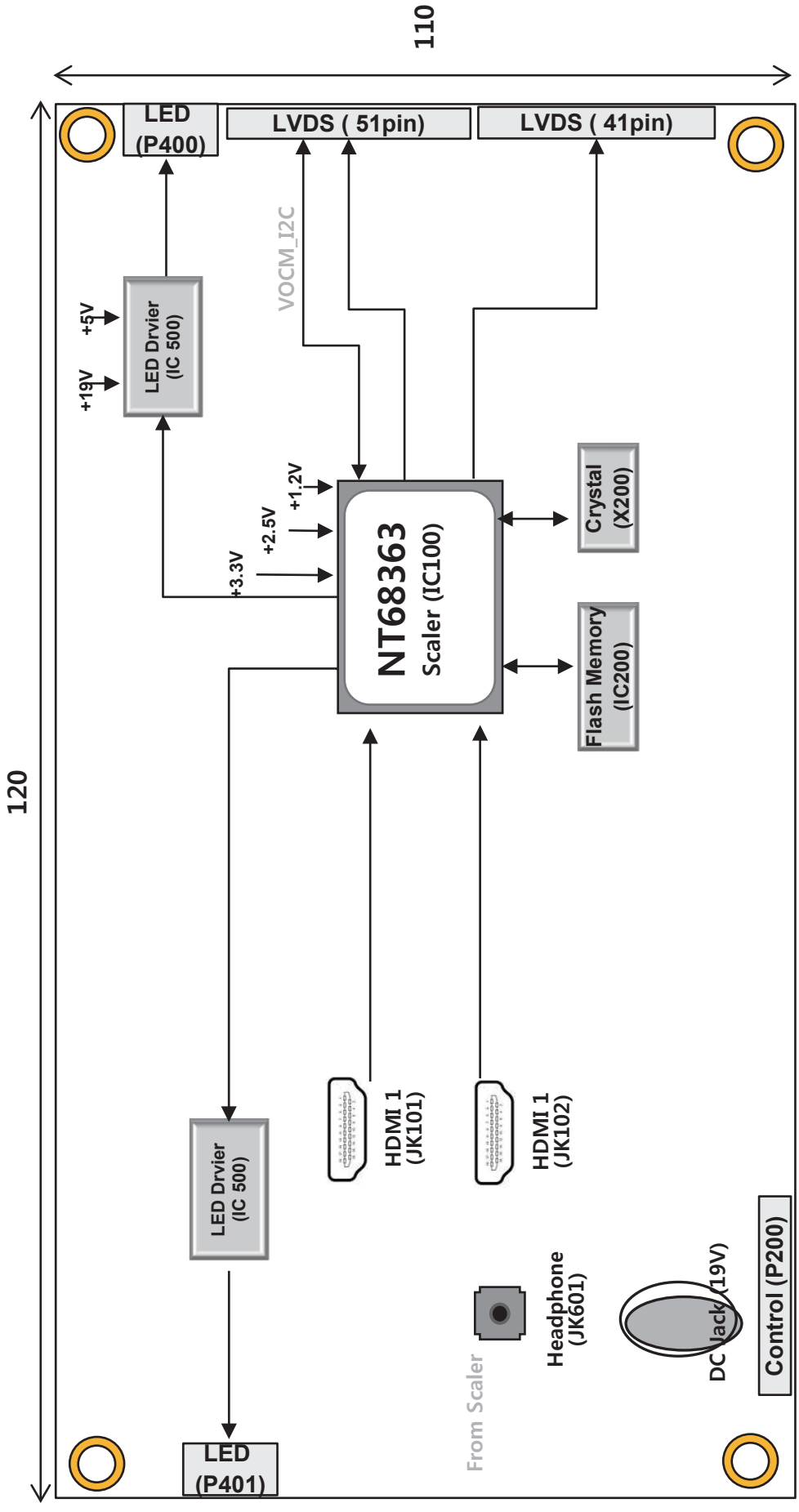
10 Do ISP

Click the thunderbolt icon box to do ISP.

After finishing it, you can see [Success] text on the status window



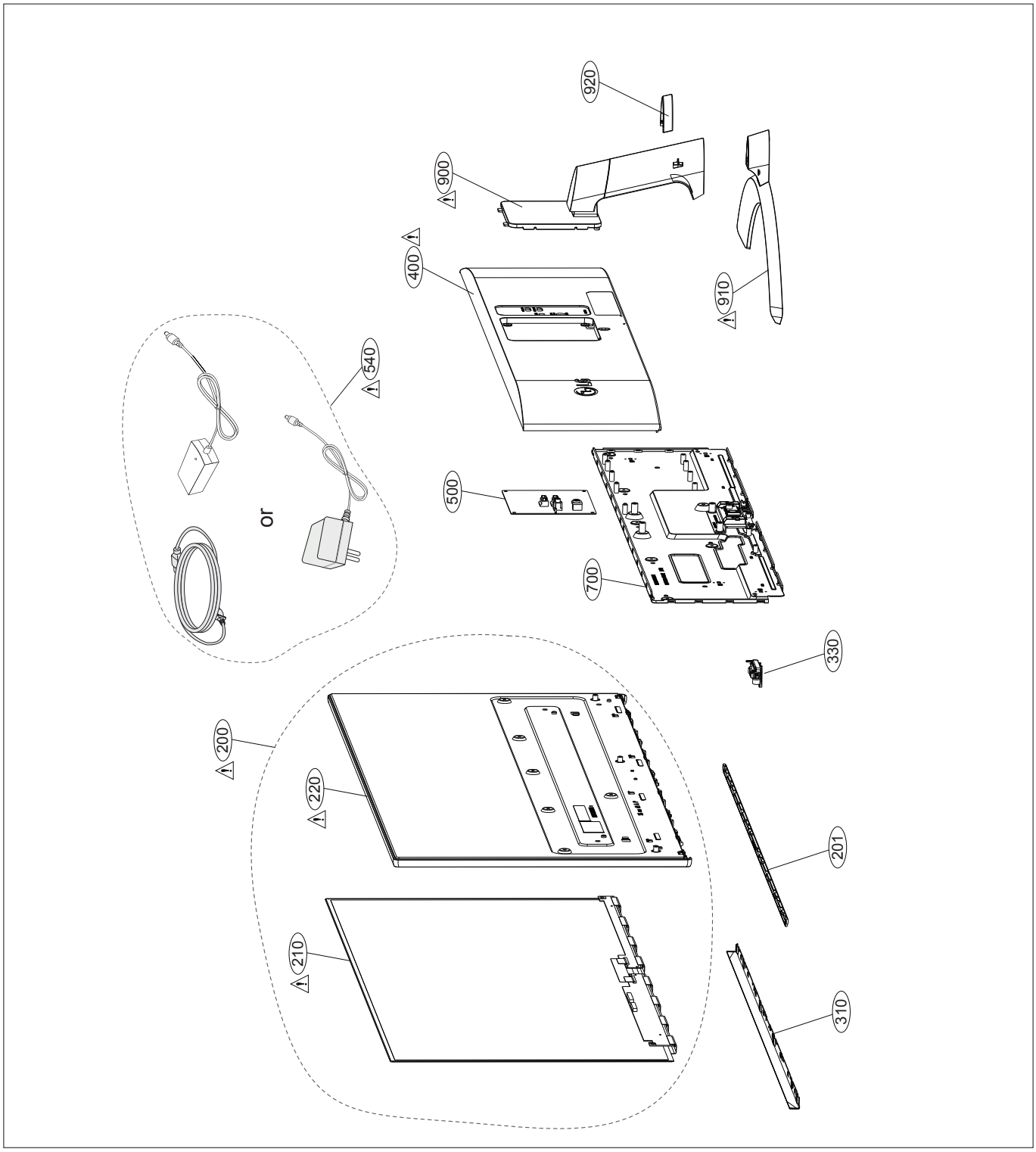
BLOCK DIAGRAM



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 Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



DISASSEMBLY

Fig.1、2 Put the MNT on the clean and flat surface, disassembly the stand assy(press down joy button)

Fig. 3 Remove the Screw(4EA)

Fig 4 Remove the deco

Fig 5 Remove bottom screw(4EA)

Fig 6 Disassemble the backcover

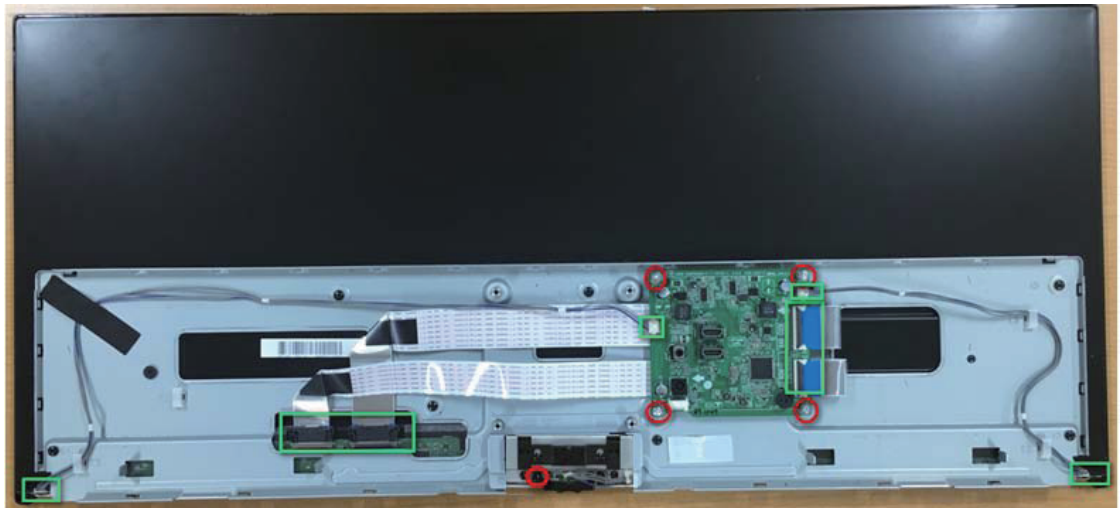


Fig 7 Remove FFC、 control cable and control PCB

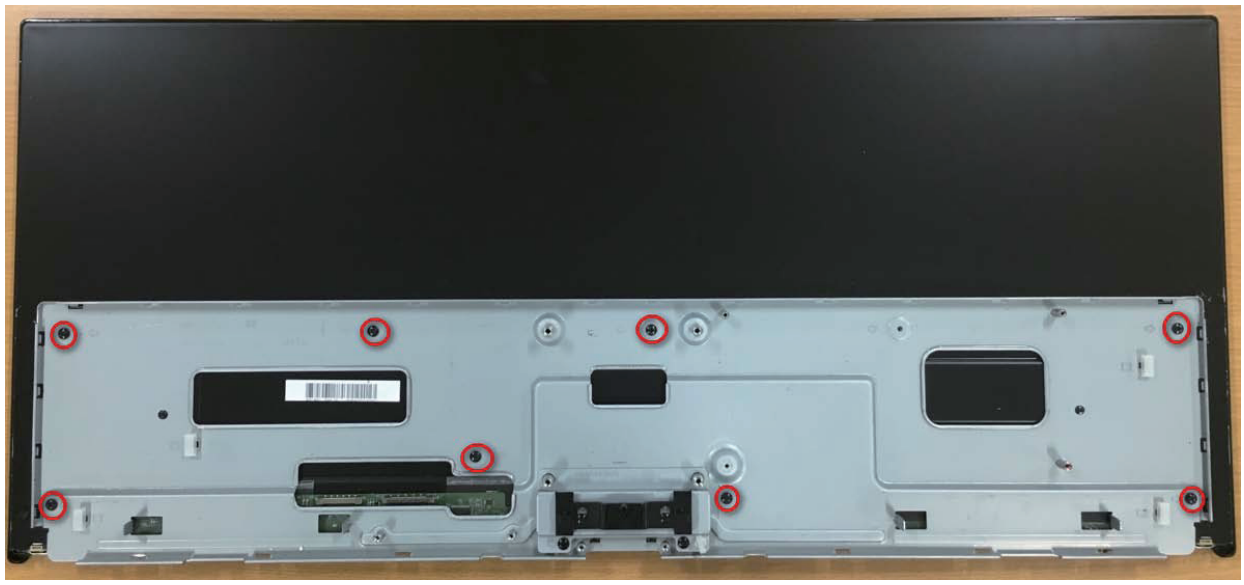


Fig 8 Remove bottom metal bar assy

Fig 9 Remove T-con sheet

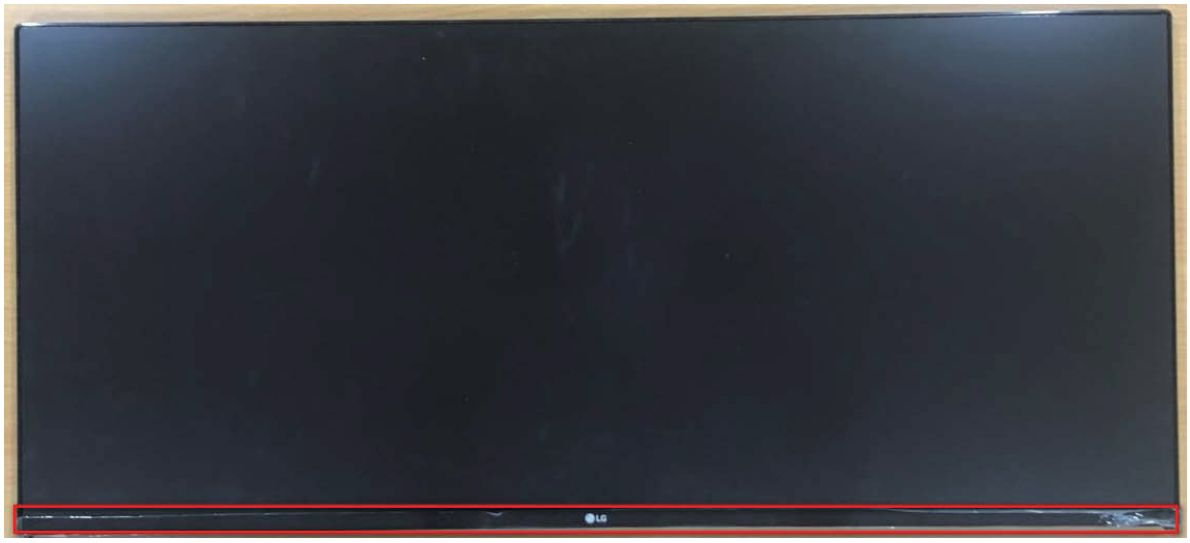
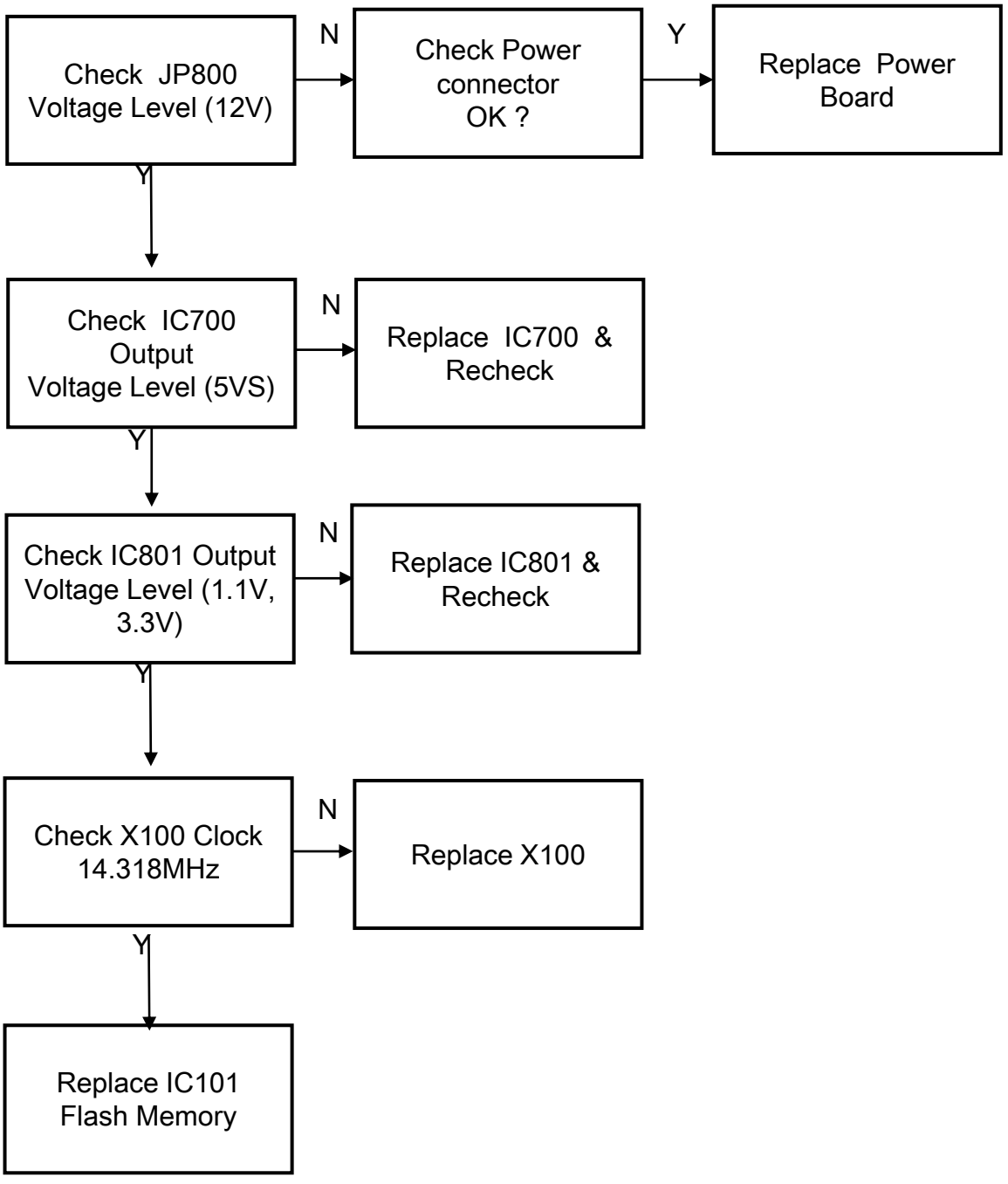


Fig 10 Remove case top assy

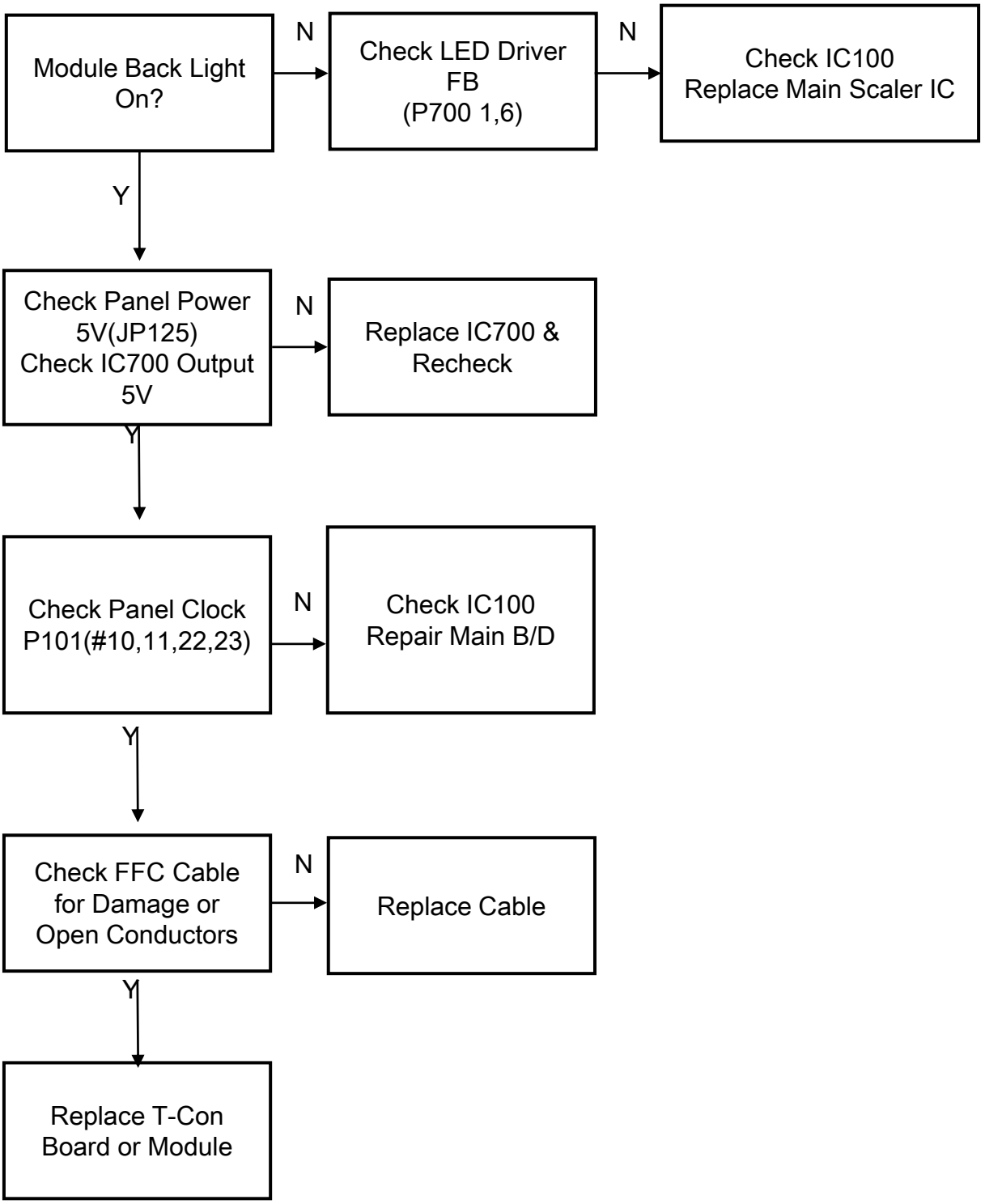
Fig 11 module picture

TROUBLESHOOTING GUIDE

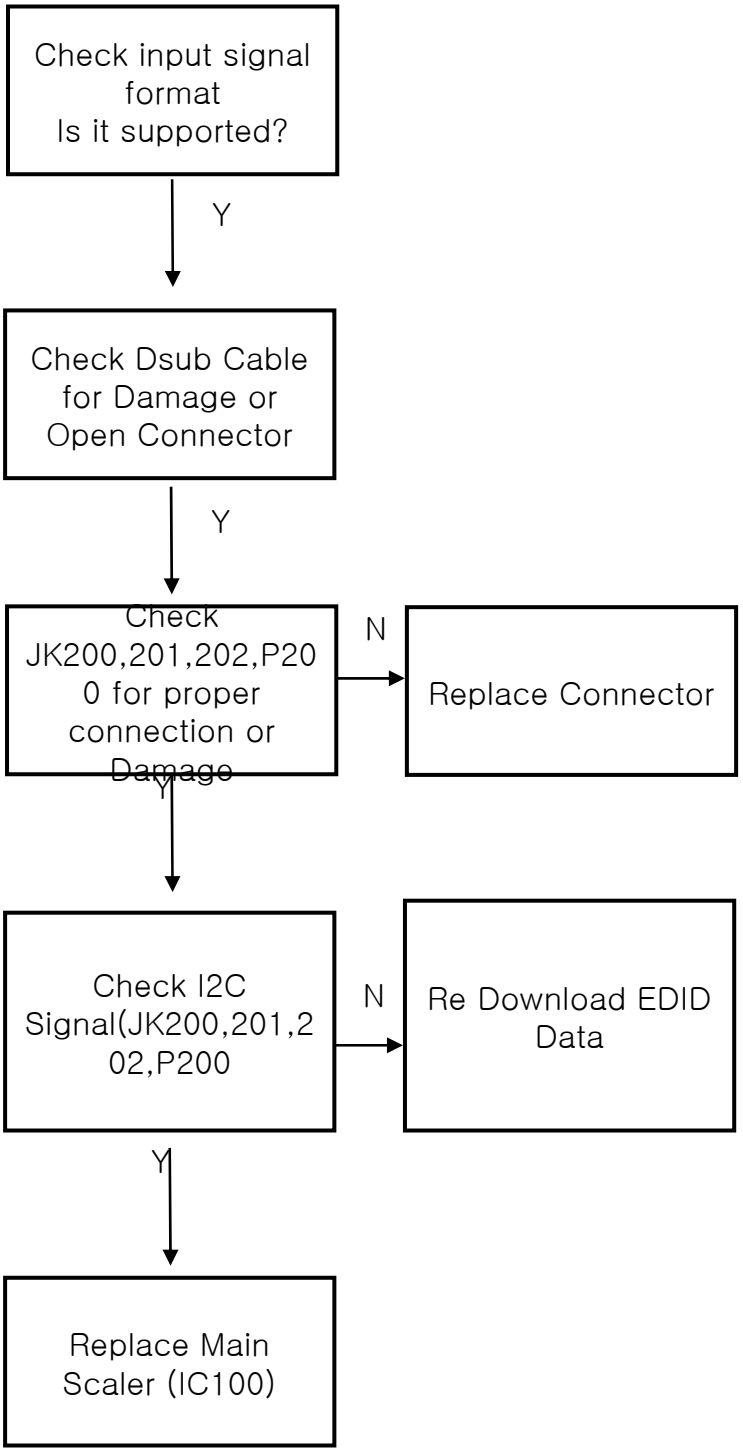
1. NO POWER



2. NO SCREEN ON



3. No Video

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