



LED MONITOR

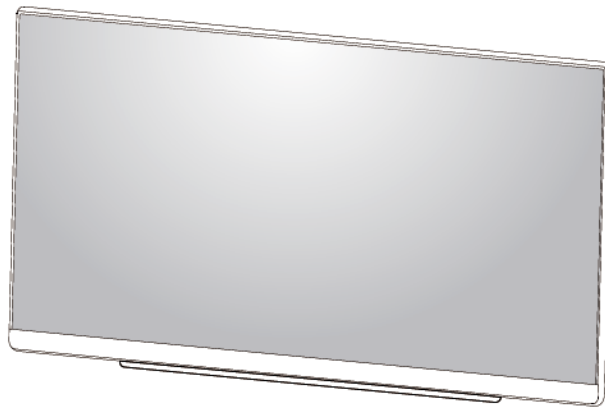
SERVICE MANUAL

CHASSIS : LM33A

MODEL : 27GR93U

CAUTION

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



P/NO : MFL71821322(2305-REV00)

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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 ^Δ in the 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 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 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.

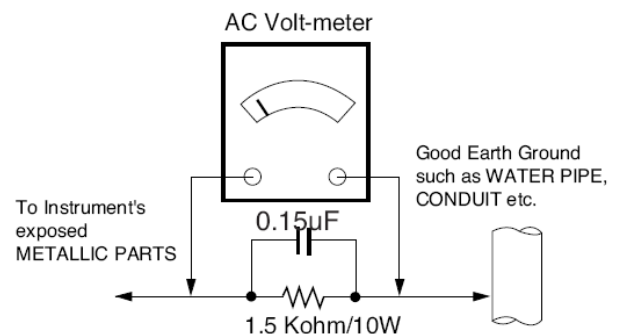
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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 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

1. General Specification

* : Item to write directly.

* : Item you select from the list. (If the selected item is not on the list, ask the person in charge to add it and update the template)

- When adding a derivative model, change the name of the sheet after copying and adding the sheet. ex) 1. General Spec (derivative model name)

No	Category	Item	Data	*Remark
1	General	*Customer	Brand	
		*User Model Name	27GR93U	
		*Sales region	Worldwide	
		*Chassis Name	LM33A	
		*Main PCB P/N	EAX70070301	

No	Category	Item	Data	*Remark
2	Display	*Module List	EAJ65857901	ME270QUM-NF4 / BOE
		*Supply Type	Module	
		*Active Area diagonal Size(inch)	27	
		*Active Area Hor. Size(mm)	596. 736	
		*Active Area Ver. Size(mm)	335. 664	
		*Native Resolution	3840x2160	

	*Refresh Rate(Max)	144Hz	
	*Refresh Rate (Recommended)	144Hz	
	*Variable Refresh Rate Range	48~144Hz	
	*Panel Type.	AH-IPS	
	*Backlight Type	Edge	
	*Backlight Dimming	Global Dimming	
	*Aspect Ratio	16:9	
	*Brightness (Typ.) (cd/m ²)	400	
	*Color Gamut (Typ.)	DCI-P3 95%	
	*Color Depth (Panel)	1.07B	
	*Color Bit (Panel)	10bit	8bit + 2bit FRC
	*Contast Ratio(Typ.)	1200:1	
	*Contast Ratio(Min.)	960:1	
	*Response Time (Off)	5ms	Panel Spec
	*Response Time(ms)	1 / 3 / 4	Faster / Fast / Normal
	*Uniformity	75%	
	*Curved	NO	
	*Multi EDID	NO	
	*PBP	NO	
	*PIP	NO	
	*HDR	DisplayHDR 400	
	*Flicker Free	YES	
	*LBL	NO	
	*VESA ClearMR	NO	

No	Category	Item	*Support	*Range		*Tier / Spec	*Remark
				Min	Max		
3	Gaming Option	AMD FreeSync™	YES	48	144	FreeSync Premium	
		NVIDIA G-Sync®	YES	48	144	G-SYNC® Compatible	
		VESA AdaptiveSync	NO				
		*Motion Blur Reduction	NO				
		Lighting	YES			Hexagonal	

No	Category	Interface	*Support	*Standard Version	*Position	*Port quantity	*Charging Spec (Max)	*Remark
6	USB Support (Peripheral)	USB-A (Downstream)	YES	USB3.2 Gen1	Rear	2	5V/0.9A	5Gbps
			NO					
		USB-B (Upstream)	YES	USB3.2 Gen1	Rear	1		5Gbps
			NO					
		USB-C (Downstream)	NO					
			NO					
		USB-C (Upstream) *w/o MFDIP	NO					

No	Category	Item	*Support	*Position	*Specification		*Remark
					Digital AMP	w/ MIC	
7	Audio	Head Phone	YES	Bottom			
		DTS Headphone:X	YES				
		Speaker	NO				
		RichBass	NO				
		MAXX AUDIO	NO				
		Optical Digital Audio (Out)	NO				

		Line Out	NO		
		Audio In	NO		
8	Local Key	Joystic	YES	Bottom	Up / Down / Left / Right / OK
		Tact	NO		
		Wheel	NO		
		LED Indicator	YES	Bottom	Red
9	KVM	USB-B & USB-C	NO		
10	Auto Pivot	Auto Pivot	NO		

No	Category	Item	*Support	*Applied Type	*Remark
11	Sensor Option	ALS	NO		
		FAN	YES	Internal	
		TEMP	NO		
		IR	NO		
		Webcam	NO		
		Gyro	NO		

No	Category	Item	*Provide	*Color	*Length	*Weight	*P/N	*Remark
12	Accessory	AccessoryBox	NO				EAY65689602	19Vdc 3.42A 50~60Hz KR/EU WALL
		Adapter	YES	Black				
		PSU	NO					
		Power Cord	YES	Black	1.55M		EAD62348835	
		Power Extention	NO					
		DP	YES	Black	1.8M		EAD65185308	Label : 5K

	HDMI	YES	Black	1.8M	EAD65912803	HDMI 2.1 cable
	USB-C to C	NO				
	USB-A to B(2.0)	NO				
	USB-A to B(3.0)	YES	Black	1.8M	EAD65573101	
	Thunderbolt	NO				
	DVI	NO				
	D-Sub	NO				
	Remote Control Receiver	NO				
	Remote Controller	NO				
	Webcam Assembly	NO				
	Color Calibrator	NO				
	USB-C to A Gender	NO				

No	Category	Type	*Support	*Data		*Remark
13	Input Voltage			AC 100-240Vac ~ 50/60Hz		
14	Power Rating	Adapter	YES	19V 3.3A		
		PSU	NO			

No	Category	Item	Data		*Remark
15	Reliability	MTBF	30,000 HRS with 90% confidence level		
		Using Altitude	10,000 feet(3,048m) for Reliability 40,000 feet(12,192m) for Storage / Shipment		
		Environment Condition	Operating	Temperature : 0° C ~ 40° C Humidity : Less than 80%	
			Storage	Temperature : -20° C ~ 60° C Humidity : Less than 85%	

Signal Timing (Resolution)

1, HDMI

No.	Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)	polarity(H/V)	Remark
1	640 x 480	31.469	59.940	-/-	
2	800 x 600	37.879	60.317	+/+	
3	1024 x 768	48.363	60.004	-/-	
4	1280 x 720	45.000	60.000	+/+	
5	1280 x 1024	79.976	75.025	+/+	
6	1920 x 1080	67.500	60.000	+/+	
7	1920 x 1080	66.587	59.934	+/-	
8	3840 x 2160	65.688	29.981	+/-	Recommended Timing - Input Compatibility Version : 1.4

9	1920 x 1080	166.668	144.052	+/-	
10	2560 x 1440	182.996	119.998	+/-	
11	3840 x 2160	133.313	59.997	+/-	Recommend Timing - Input Compatibility Version : 2.1 (AV)
12	2560 x 1440	222.268	144.050	+/-	
13	3840 x 2160	333.333	144.050	+/-	Recommend Timing - Input Compatibility Version : 2.1 (PC)

2, DP

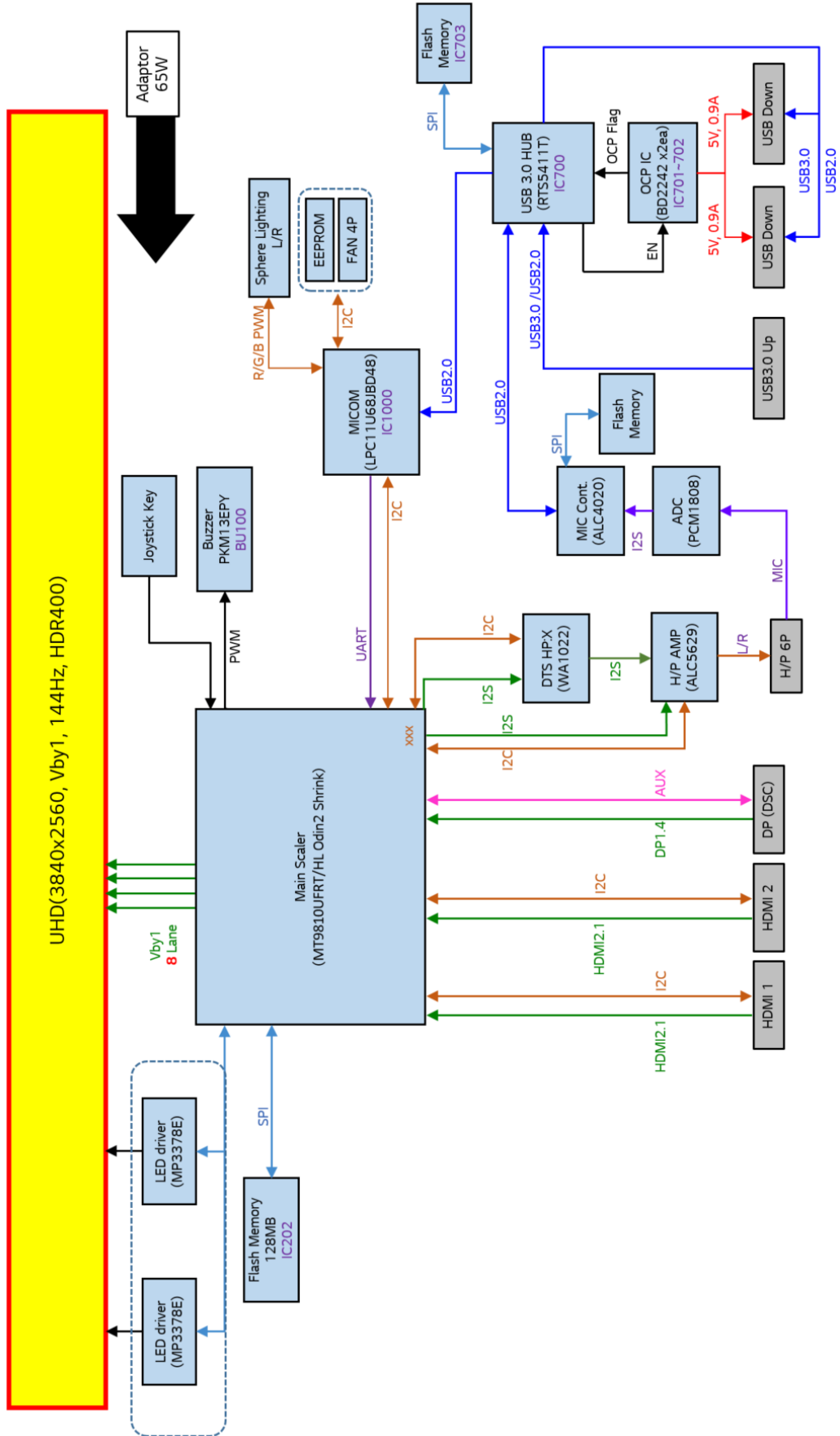
No.	Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	polarity (H/V)	Remark
1	640 x 480	31.469	59.940	-/-	
2	800 x 600	37.879	60.317	+/+	
3	1024 x 768	48.363	60.004	-/-	
4	1280 x 720	45.000	60.000	+/+	

5	1280 x 1024	79.976	75.025	+/+	
6	1920 x 1080	67.500	60.000	+/+	
7	1920 x 1080	166.587	143.981	+/-	
8	3840 x 2160	133.313	59.997	+/-	Recommended Timing - Input Compatibility Version : 1.2
9	2560 x 1440	222.151	143.973	+/-	
10	3840 x 2160	214.680	95.033	+/-	
11	3840 x 2160	268.438	119.999	+/-	Recommended Timing - Input Compatibility Version : 1.4
12	3840 x 2160	333.333	144.050	+/-	Recommended Timing - Input Compatibility Version : 1.4(DSC)

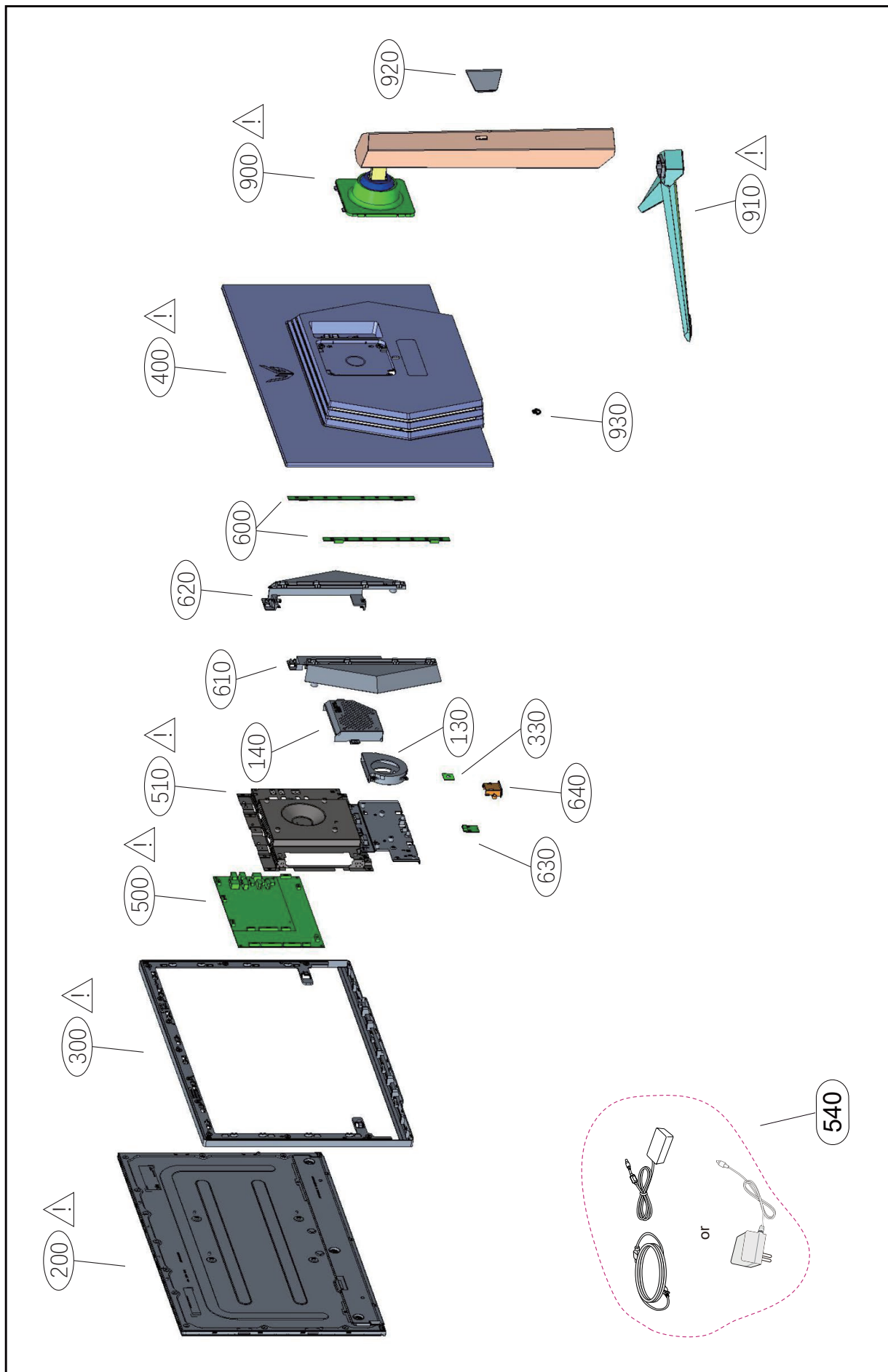
HDMI Video input

No.	Factory support mode (Preset Mode)	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
1	480P	31.5	60
2	720P	45	60
3	1080P	67.5	60
4	1080P	135	120
5	2160P	135	60
6	2160P	255	120

BLOCK DIAGRAM



EXPLODED VIEW



ASSEMBLE AND DISASSEMBLE

Purpose: The document is intended for use by end-of-life recyclers or treatment facilities. It provides the basic instructions for the disassembly of products to remove components and materials requiring selective treatment.

1. Tools Required

List the type and size of the tools that would typically be used to disassemble the product to a point where components and materials requiring selective treatment can be removed.

Tool Description	Tool Size (if applicable)
Screw driver	

2. Product disassembly Process

2.1 List the basic steps that should typically be followed to remove components and materials requiring selective treatment :

2.2 OPTIONAL : Depending upon the complexity of the disassembly process, a graphic depicting the locations of items contained within the product which require selective treatment (with descriptions and arrows identifying locations) can be inserted below:

2.3 How to describe the basic steps to disassembly a components.

- 1) Provide a picture of disassembly process
- 2) All the screws are showed in the picture
- 3) All the PCBAs are showed in the picture
- 4) LCD panel are showed in the picture
- 5) All the accessories like remote controller, batteries, and cables are showed in the picture

Caution: SVC man must check insulation sheet on the module before assembling the set

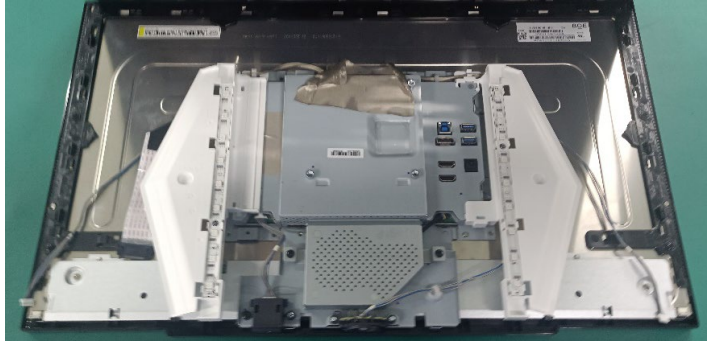
1. Unscrew the stand base by using coin



2. Disassemble the latches of three edges



3. Disassemble the back cover



4. Disassemble screw 7EA and disassemble the PCB

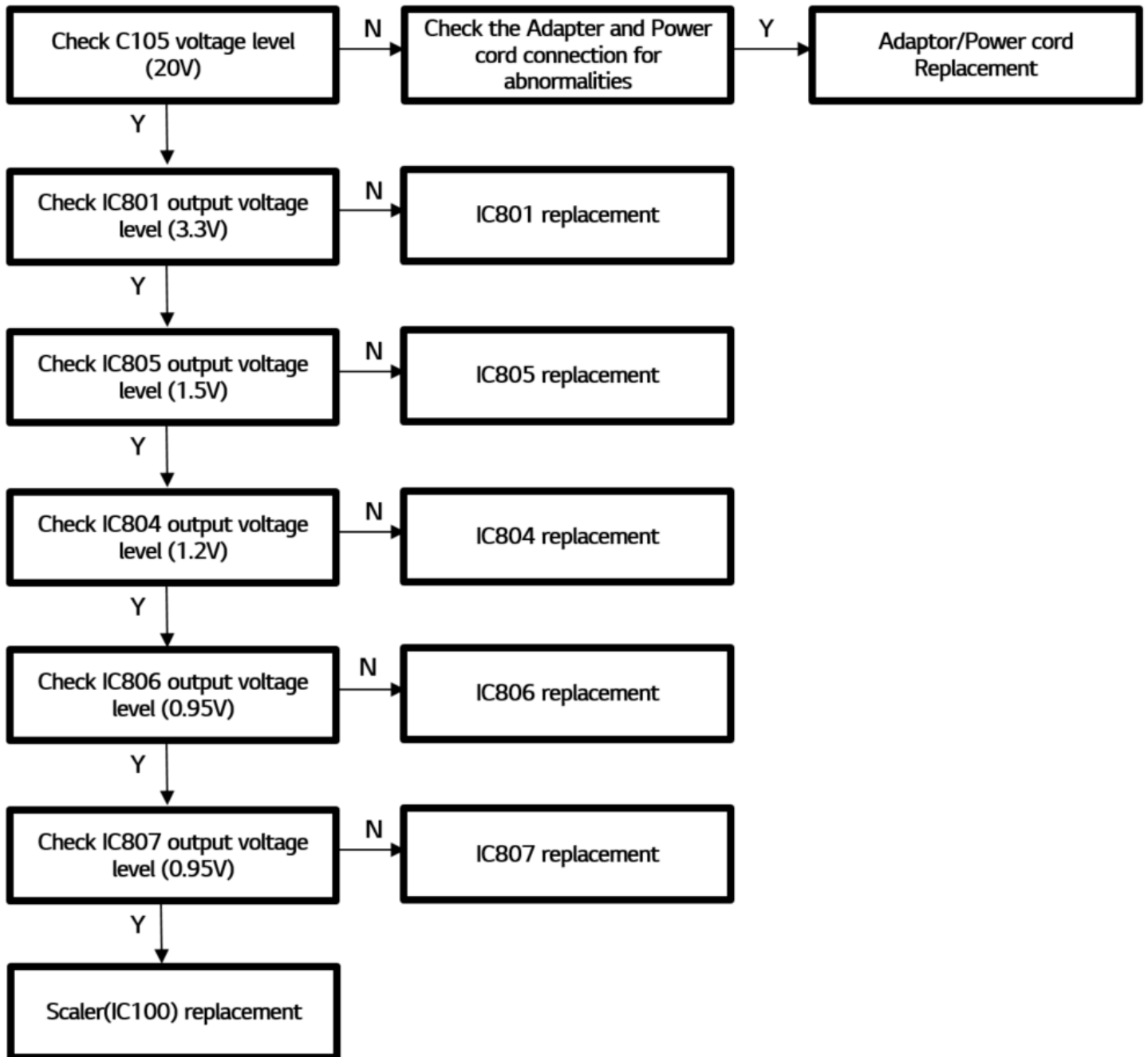


5. LCD Module

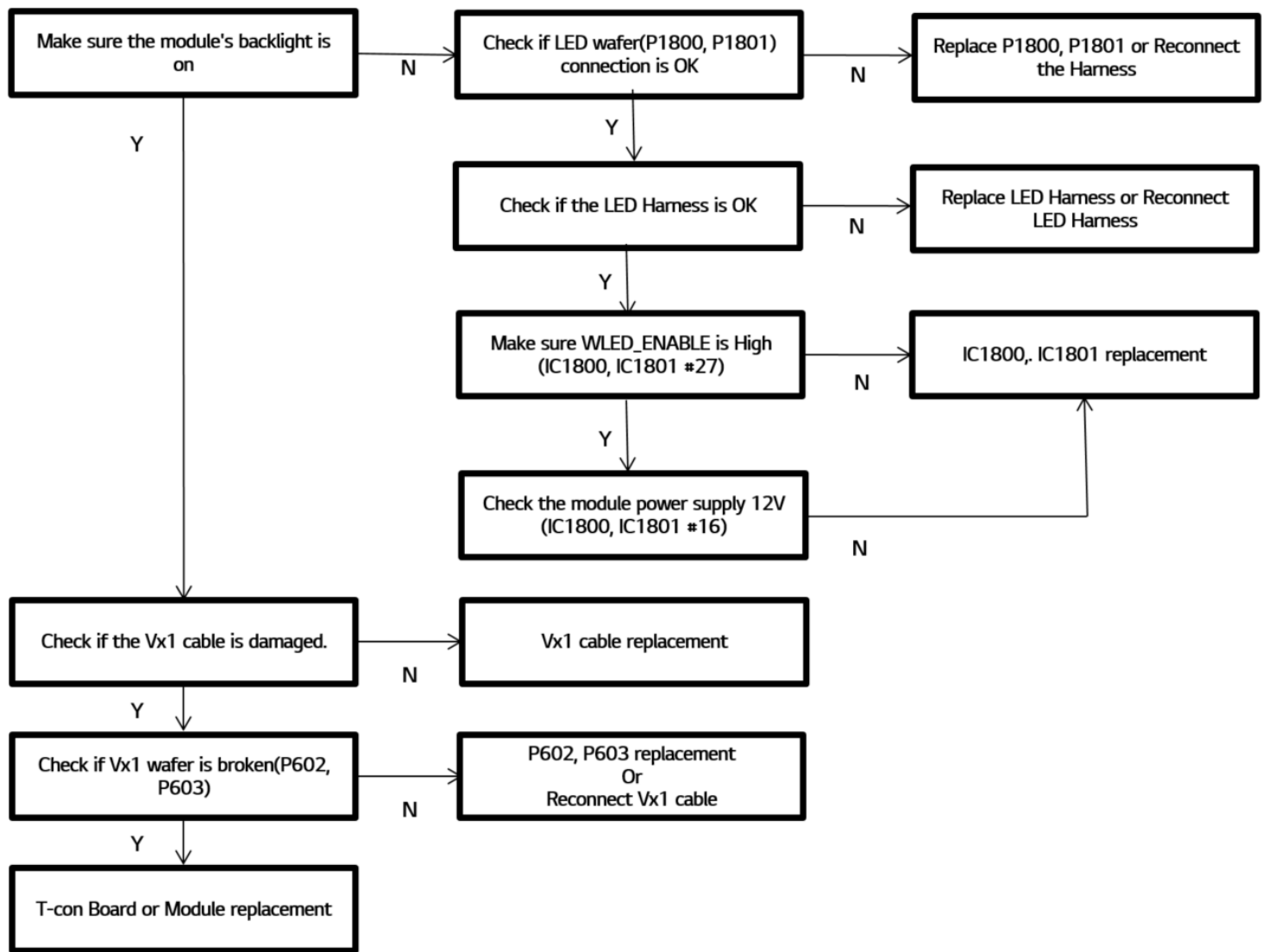


TROUBLE SHOOTING GUIDE

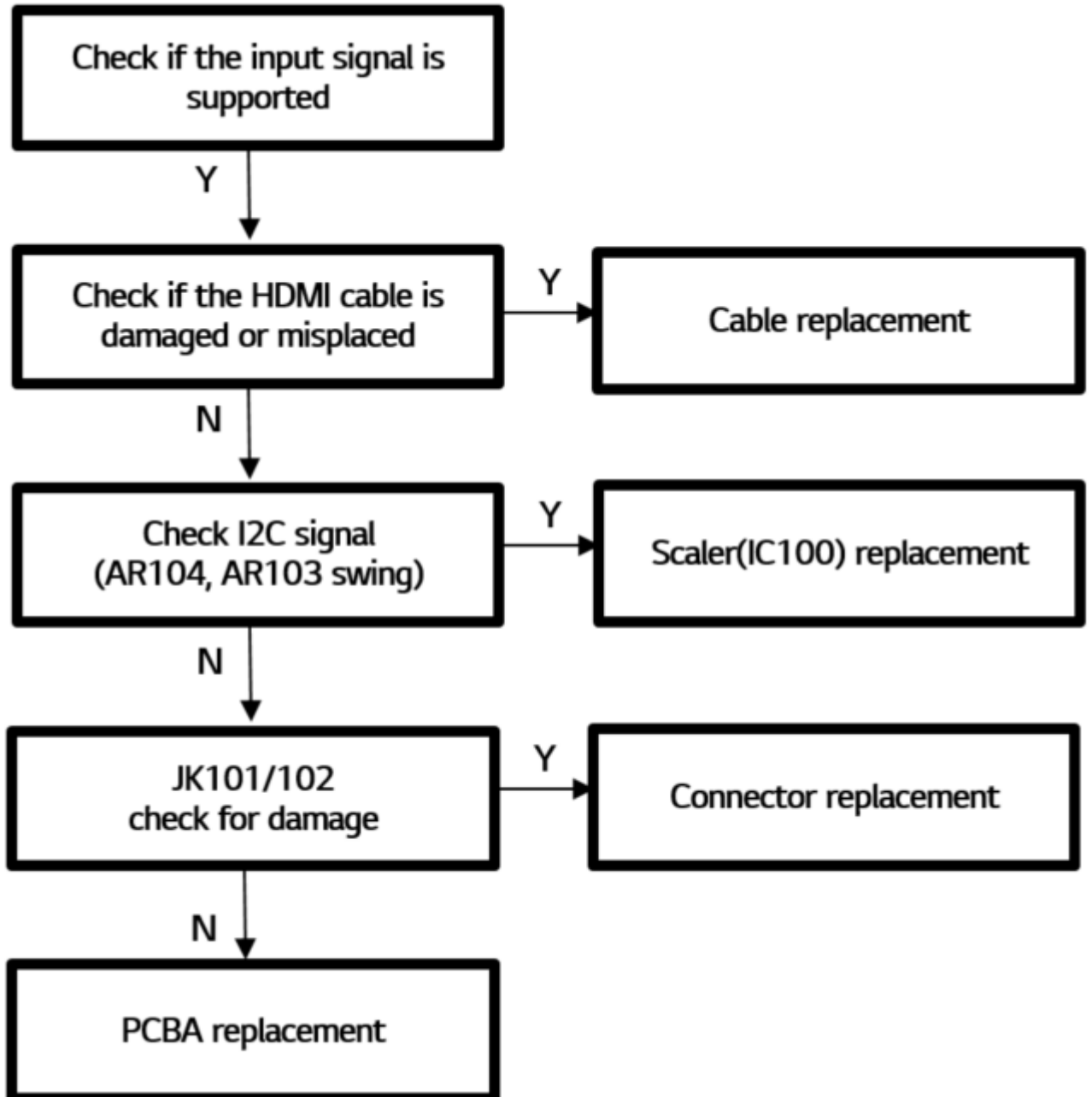
No Power



No Display



No Display-HDMI



No Display-DP

