



LG

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CONFIDENTIAL

UltraFine 5K MONITOR SERVICE MANUAL

CHASSIS : LM8JA

| | |
|------------------------|--------------------|
| MODEL : 27MD5KL | 27MD5KL-BJ |
| 27MD5KL | 27MD5KL-BK |
| 27MD5KLB | 27MD5KLB-BK |

CAUTION

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



P/NO : MFL70041064 (1904-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 \triangle in 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 M Ω and 5.2 M Ω .

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.

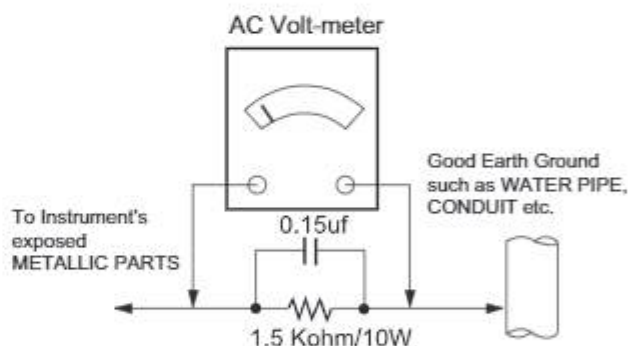
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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

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

1. General Specification

| No | Item | Content | Remark | |
|----|----------------------------|--|---|---|
| 1 | Customer | BRAND | BRAND : LGE Product | |
| 2 | User Model Name | 27MD5KL/27MD5KLB | | |
| 3 | Sale region | Worldwide | | |
| 4 | Feature | 27" LCD MONITOR(5K) | | |
| 5 | Chassis Name | LM8JA | PCB, Product spec., Adjustment spec. | |
| 6 | General Scope | External SW & Adj. | None | No Control PCB |
| | | Function | Thunderbolt3, Power Delivery, USB Audio/Speaker/Mic/ Webcam, Ambient Light Sensor, HDCP2.2 | |
| 7 | Input | Thunderbolt3 | Thunderbolt3 / USB-C input / PD : 94W | *PD ; Power delivery PD Profile : 5V/9V/15V/20V |
| | | USB | USB3.0 / 2.0 communication | |
| | | USB down | USB3.0 Downstream x 3 | |
| | | Audio | USB data format Audio | |
| | | Camera | Full HD Web Camera Module | |
| | | Microphone | 1xDigital MEMS Mic | |
| | | ALS | Ambient Light Sensor | |
| 8 | Power Code | Length : 1.80 ± 0.05 m Weight : 0.17 kg ± 10 % Color: Black | Refer to Suffix standard and power cord table | |
| 9 | Cable | Thunderbolt | Length : 2.0 ± 0.05 m Weight : 0.6 kg ± 10 % Color: Black | |
| | | | Impedance | 1) CABLE : 90 Ω ± 5 Ω 2) CONNECTOR : 90 Ω ± 10 Ω |
| | Type-C | | Length : 1.5 m ± 0.05 m Weight : 0.064 kg ± 10 % Color: Black | |
| | | | Impedance | 1) CABLE : 100 Ω ± 5 Ω 2) CONNECTOR : 100 Ω ± 10 Ω |
| 10 | Power (Adapter / PSU /LPB) | Input: 100 - 240 V~ 50/ 60 Hz 2.5 A Max Output: 19 - 21 V, 9 A Weight : 0.67 kg ± 10 % | | |
| 11 | Power Rating | 100-240V~ 50/60Hz 2.5A | It was checked by HQ Standard. | |
| 12 | Accessory Box | Thunderbolt3 Cable/USB-C Cable/Power Cord/ESG/ VESA Bracket | | |

2. Signal Timing (Resolution)

2.1. Signal (Video & Sync)

2.1.1. H/V Timing

| No. | Section | Pol. | Dot Clock [MHz] | Frequen- cy [kHz]/[Hz] | Total Cycle (E) | Dis- play (A) | Front Porch(B) | Sync. (D) | Back Porch(F) | Resolution |
|-----|-----------|------|-----------------|---------------------------|-----------------|------------------|----------------|-----------|---------------|-----------------|
| 1 | H(Pixels) | - | 25.175 | 31.469 | 800 | 640 | 16 | 96 | 48 | 640 x 480 |
| | V(Lines) | - | | 59.94 | 525 | 480 | 10 | 2 | 33 | |
| 2 | H(Pixels) | + | 522.61 | 133.32 | 3920 | 3840 | 8 | 32 | 40 | 3840 x 2160 |
| | V(Lines) | - | | 60 | 2222 | 2160 | 1 | 8 | 53 | |
| 3 | H(Pixels) | + | 364.47 | 111.12 | 3280 | 3200 | 8 | 32 | 40 | 3200 x 1800 |
| | V(Lines) | - | | 60 | 1852 | 1800 | 1 | 8 | 43 | |
| 4 | H(Pixels) | + | 234.59 | 88.86 | 2640 | 2560 | 8 | 32 | 40 | 2560 x 1440 |
| | V(Lines) | - | | 60 | 1481 | 1440 | 1 | 8 | 32 | |
| 5 | H(Pixels) | + | 966.74 | 177.71 | 5280 | 5120 | 16 | 64 | 240 | 5120 x 2880 (1) |
| | V(Lines) | - | | 60 | 2962 | 2880 | 1 | 8 | 73 | |

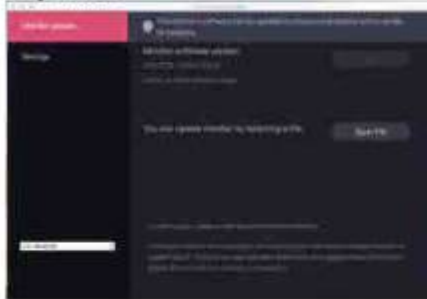
* (1) : Preferred timing.

SOFTWARE UPDATE

1. LG Screen Manager

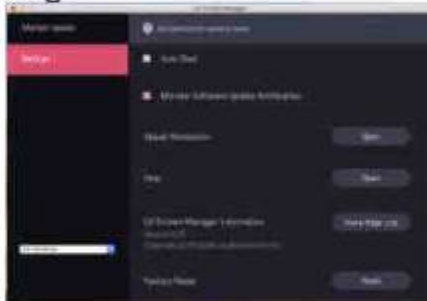
Mac applications that support FW updates on monitors
24MD4KL/27MD5KL (Mac support)

1.1. FW Update



- Supports FW updates for Scala, Audio, NXP, and Hub (24MD4KL)
- Supports FW updates for Scala, CAM, Audio, NXP, and Hub(27MD5KL)
- Support for automatic FW updates through Internet servers
- Manual FW update support using file open
- Enables recovery in case of FW update failure

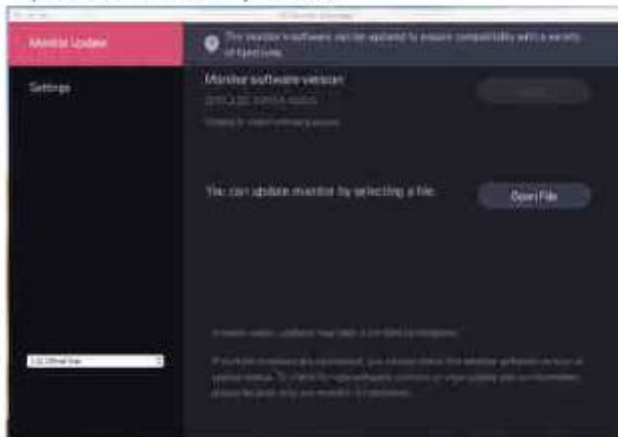
1.2. Setting



- Automatic installation when boot the Macbook.
- Automatic Updates On/Off
- Factory Reset
- Help

2. How to FW Update

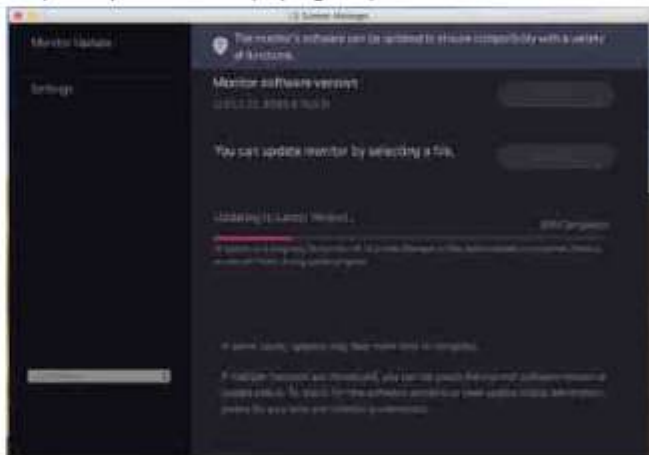
1) Go to the Monitor Update tab



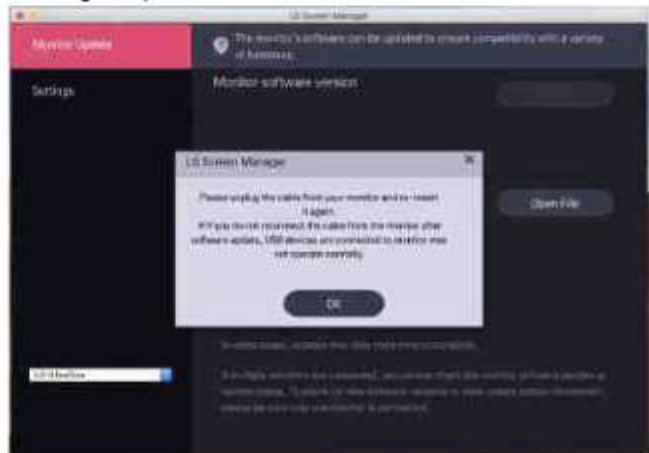
2) Select FW Image ZIP file for update pop-up



3) FW update started (in progress)



4) FW update completed. Cable reconnect notification message output.



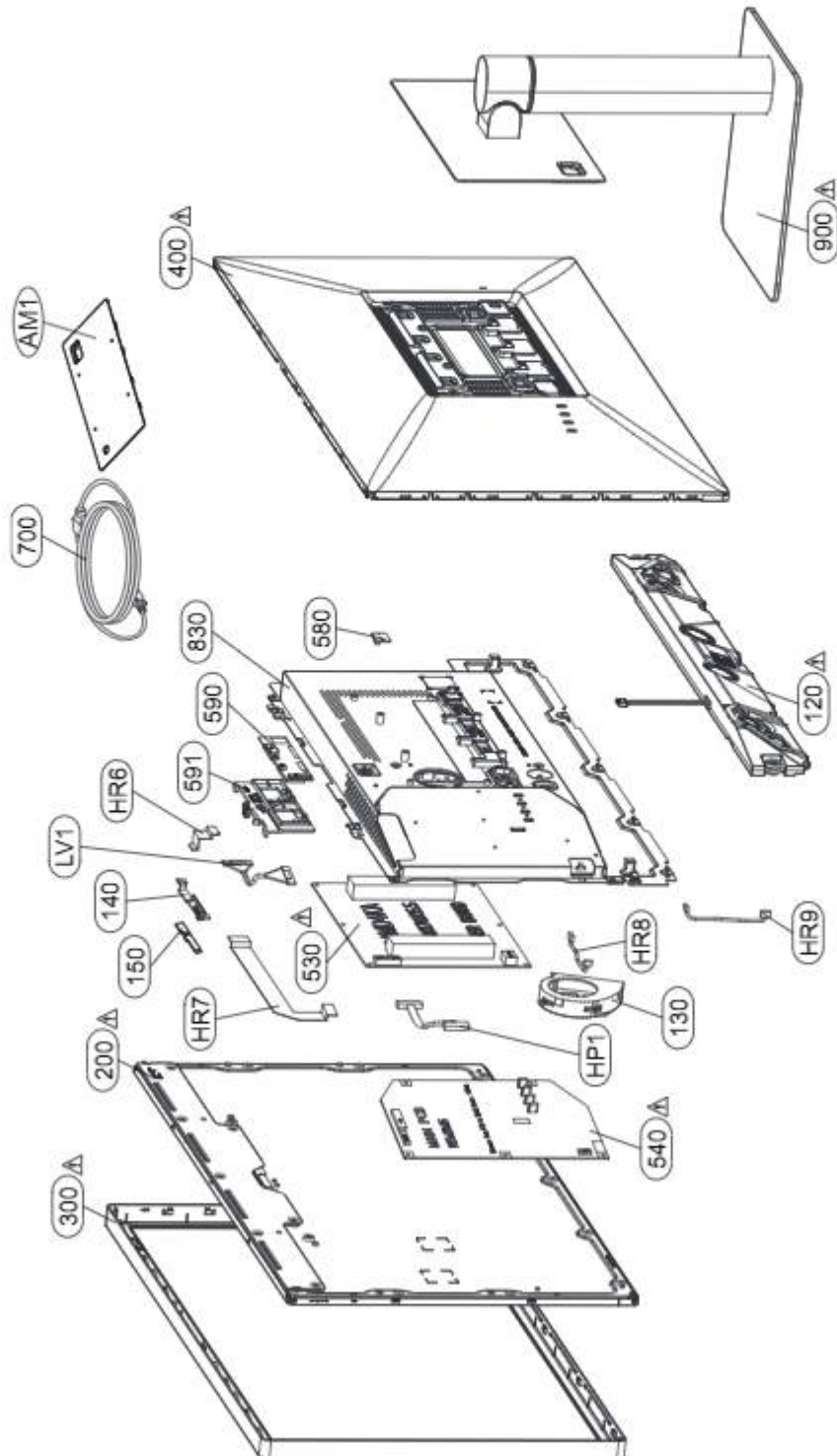
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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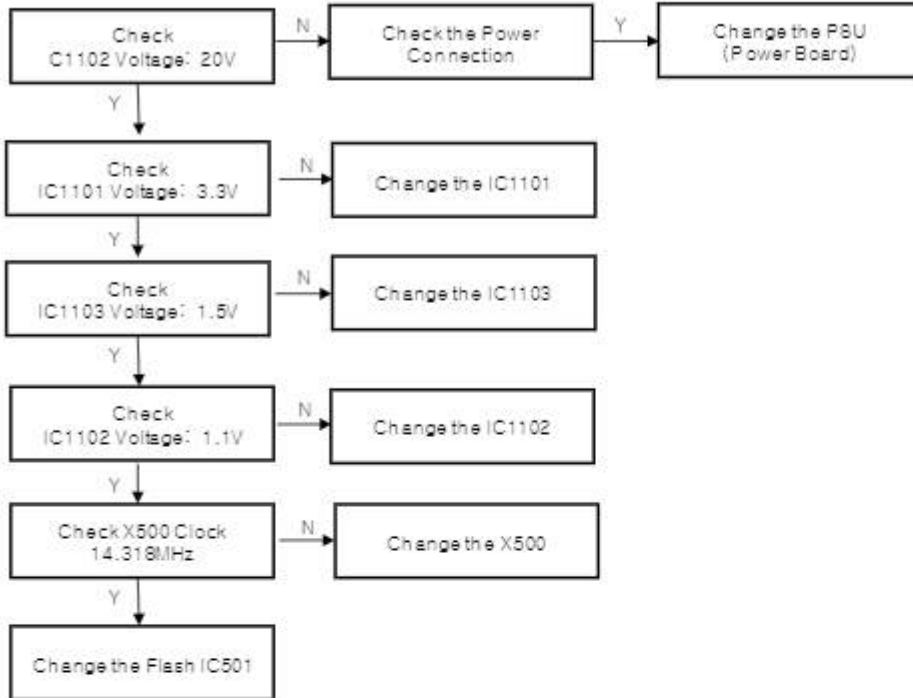
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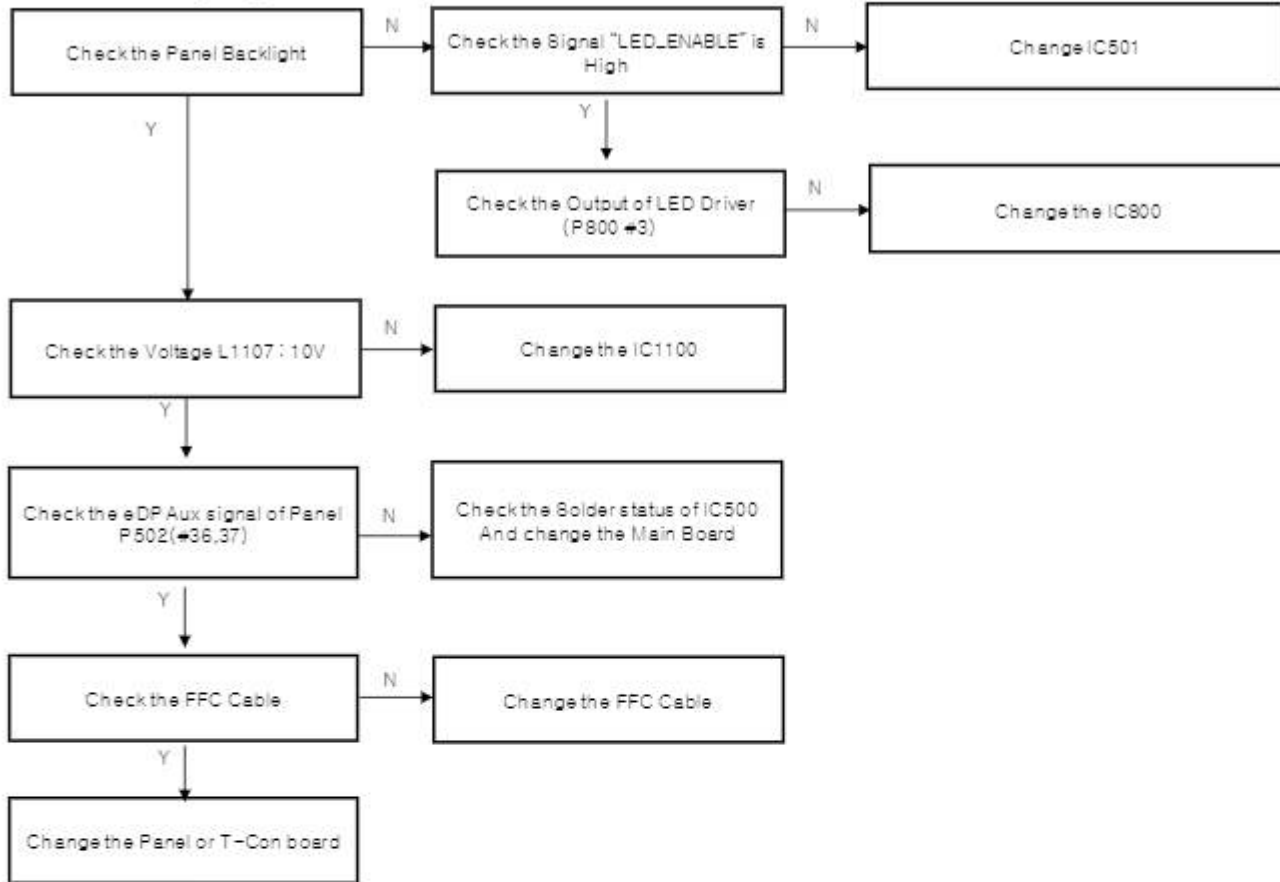


TROUBLE SHOOTING GUIDE

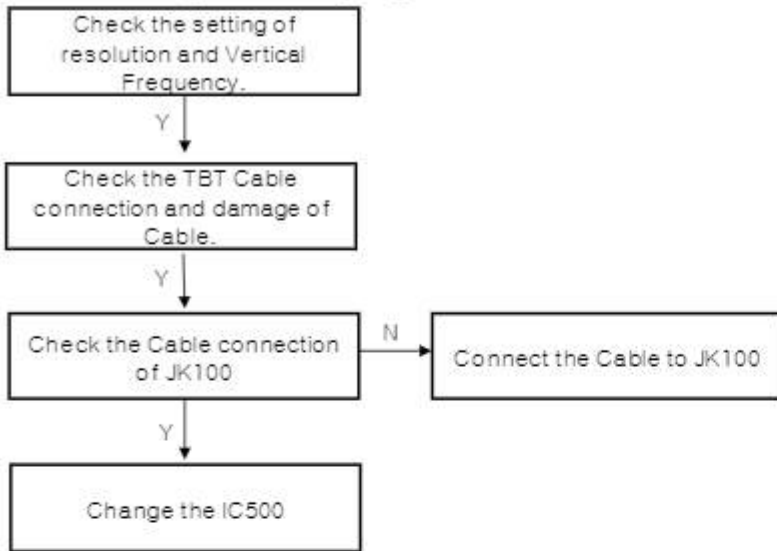
1. No Power



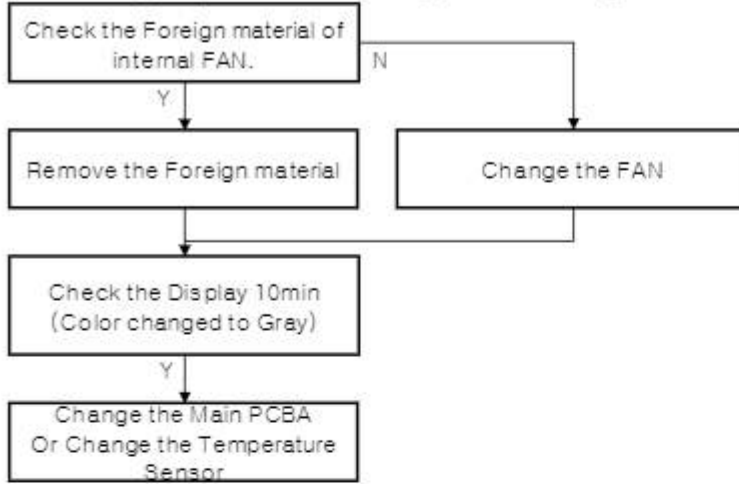
2. No Display



3. TBT Up No Display



4. Display Color changed to Gray



TRAINING MANUAL

Purpose

How to adjust the Audio Output and Brightness


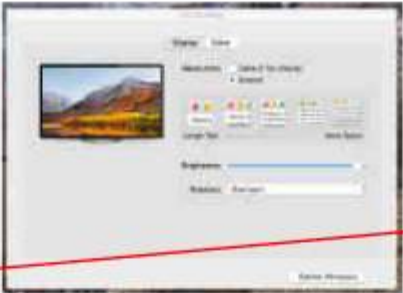


Applied model

24MD4KL/27MD5KL

Contents and Guidance

[Guidance]

1. Symptom : can't adjust the Audio Output and Brightness in Monitor OSD.
2. CIC Guidance
 - 1) Check PC Spec: MacBook or Windows PC
 - 2) Customer Guide : Please guide the method according to PC as below..

| | Brightness | Audio output |
|---|--|---|
| <p>Mac</p>  <p>Apple Logo -> System Preferences</p> |  <p>Display → adjust Brightness in the Monitor * PC Brightness can be adjusted with PC setting</p> |  <p>Sound → Select LG UltraFine Display Audio and can adjust Output Volume in bottom side</p> |
| <p>Windows</p> | <p>impossible.</p> |  <p>Select the Speaker Icon in Windows Tray, and then select LG UltraFine Display Audio for adjusting the Volume</p> |

Purpose

To Guide the compatibility issue with TBT 2 to 3 Adapter.

Applied model

24MD4KL/27MD5KL

Contents and Guidance.

[Guidance]

1. Symptom : it can be occurred the compatibility issue such as No display or No sound etc, with TBT 2 to 3 Adapter.
2. Root-Cause : Apple Device or Adapter Limitation
3. Guidance
 - 1) Checking the symptom: To guide the customer that they need to check the Apple Device List in Apple website. And it may caused by TBT2 to 3 Adapter or Apple Devices.



3840 x 2160 @ 60Hz

With the [Apple Thunderbolt 3 \(USB-C\) to Thunderbolt 2 Adapter](#) and a [Thunderbolt cable](#), you can use the LG UltraFine 5K Display at 4K and lower resolutions with these Mac models:

- Mac Pro (Late 2013)
macOS 10.12.4 or later is recommended.
- MacBook Pro (Retina, 15-inch, Mid 2014) and later
- MacBook Pro (Retina, 13-inch, Mid 2014) and later
- iMac (Retina, 27-inch, Late 2014) and later
- iMac (Retina, 21.5-inch, Late 2015)
- iMac (21.5-inch, Late 2015)
- MacBook Air (13-inch, Early 2015)
- MacBook Air (11-inch, Early 2015)

3200 x 1800 @ 60Hz

You can use the LG UltraFine 5K Display at a resolution of 3200 x 1800 @ 60Hz with this Mac model:

- Mac mini (Late 2014)
macOS 10.12.4 or later is recommended.

[Learn how to adjust your display's resolution.](#)

Purpose

Check the customer's PC environment and inform user guide regarding not recognizing USB devices (or USB HUB).

Applied model

24MD4KL/27MD5KL

Contents and Guidance

[Guidance]

1. Symptom : Unrecognized problem when connecting a USB device (or USB HUB) to a monitor.
2. Root-Cause : Compatibility Issues with PCs
3. Guidance
 - 1) Checking the symptom : Check the manufacturer/model name of the PC used by the customer (If Mac or Windows or etc.)
 - 2) Customer Guide : Inform customer sequentially of the following.
 - a) Reminding that the SF model is a Mac-only monitor, you need to ask if customer is using a Windows PC.
 - b) Especially for Windows PCs with Razor Blade RZ09 2015 PCs, we recommend connecting the USB device to PC because It is a PC problem. (It is already verified)
 - c) For Windows PCs, You can check Thunderbolt Version in the following order.

#Reference : For Razor Blade RZ09 2015 PCs, NVM version is14 and for Razor Blade PC 2018, NVM version is 33.
Because the 2015 PC has a low NVM version, it may cause compatibility problems with monitors.



From the desktop icon tray,
Right-click above ICON and select "Settings"



Bottom left, select "information"



< 2015 Razer Blade >



< 2018 Razer Blade >

Purpose

To guide customers how to use the USB device exactly (or USB HUB) regarding not recognizing USB devices.

Applied model

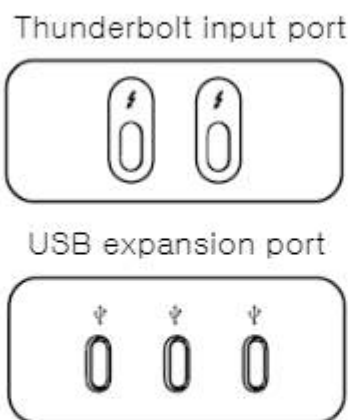
24MD4KL/27MD5KL

Contents and Guidance

[Guidance]

1. Symptom : Unrecognized problem when connecting a USB device (or USB HUB) to the Thunderbolt input port on the monitor.
2. Root-Cause : Problem caused by lack of understanding of connection ports
3. Guidance
 - 1) Checking the symptom : If USB unrecognized problems occur, check the following.
 - a) Check which port the USB device (or USB HUB) is connected to.
 - 2) Customer Guide : Port configuration can be divided into Host input port and USB expansion port, the USB device (or USB HUB) must be connected to the USB expansion port for normal operation,

<24MD4KL>



<27MD5KL>

