

# **Service Manual - P3223DE**

**Version: 01**

**Date: 2021/12/30**

## 1. Important Safety Notice

### Product Announcement:

This product is certificated to meet RoHS Directive and Lead-Free produced definition. Using approved critical components only is recommended when the situation to replace defective parts. Vender assumes no liability express or implied, arising out of any unauthorized modification of design or replacing non-RoHS parts. Service providers assume all liability.

### Qualified Repairability:

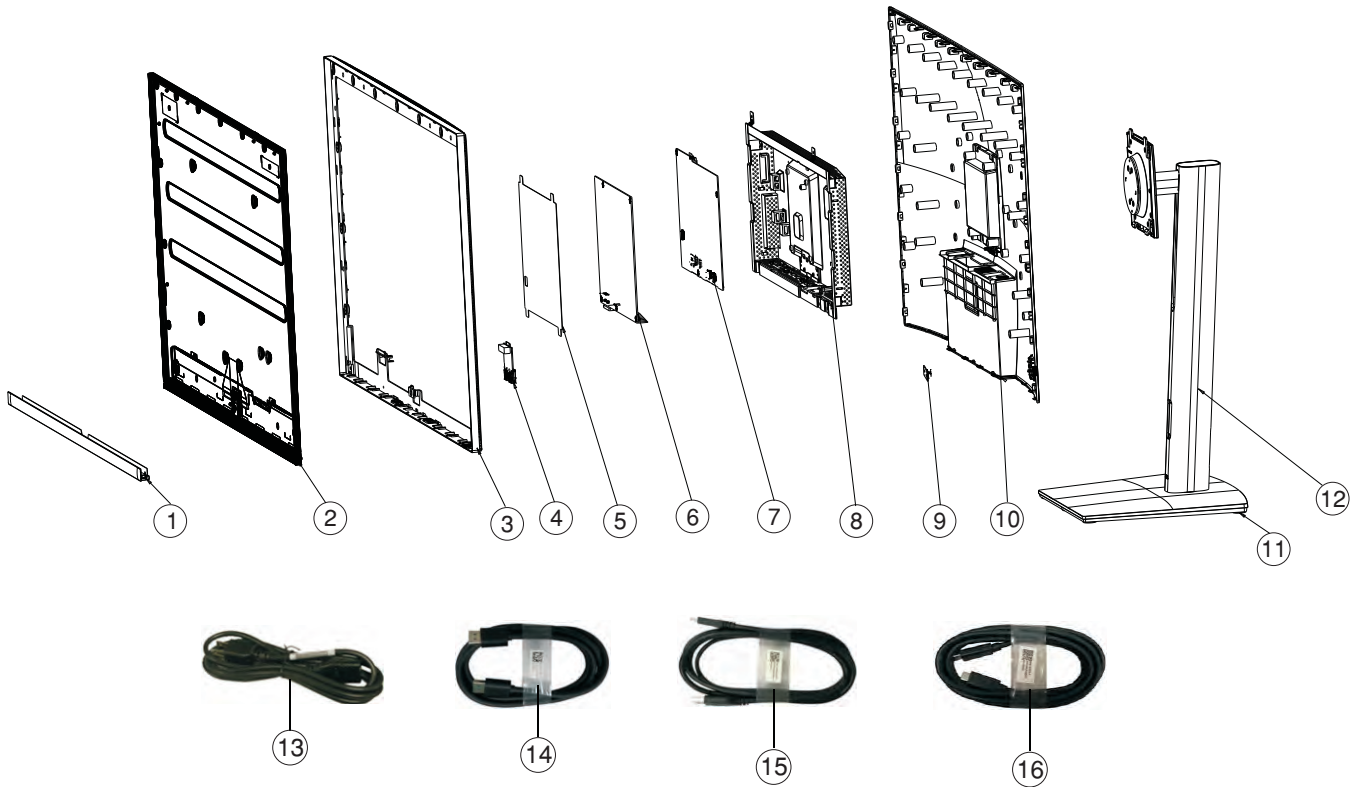
Proper service and repair is important to the safe, reliable operation of all series products. The service providers recommended by vender should be aware of notices listed in this service manual in order to minimize the risk of personal injury when perform service procedures. Furthermore, the possible existed improper repairing method may damage equipment or products. It is recommended that service engineers should have repairing knowledge, experience, as well as appropriate product training per new model before performing the service procedures.

### NOTICE:

- ! To avoid electrical shocks, the products should be connected to an authorized power cord, and turn off the master power switch each time before removing the AC power cord.
- ! To prevent the product away from water or expose in extremely high humidity environment.
- ! To ensure the continued reliability of this product, use only original manufacturer's specified parts.
- ! To ensure following safety repairing behavior, put the replaced part on the components side of PWBA, not solder side.

- ! To ensure using a proper screwdriver, follow the torque and force listed in assembly and disassembly procedures to unscrew screws.
- ! Using Lead-Free solder to well mounted the parts.
- ! The fusion point of Lead-Free solder requested in the degree of 220°C.

## 2. Exploded view diagram with list of items



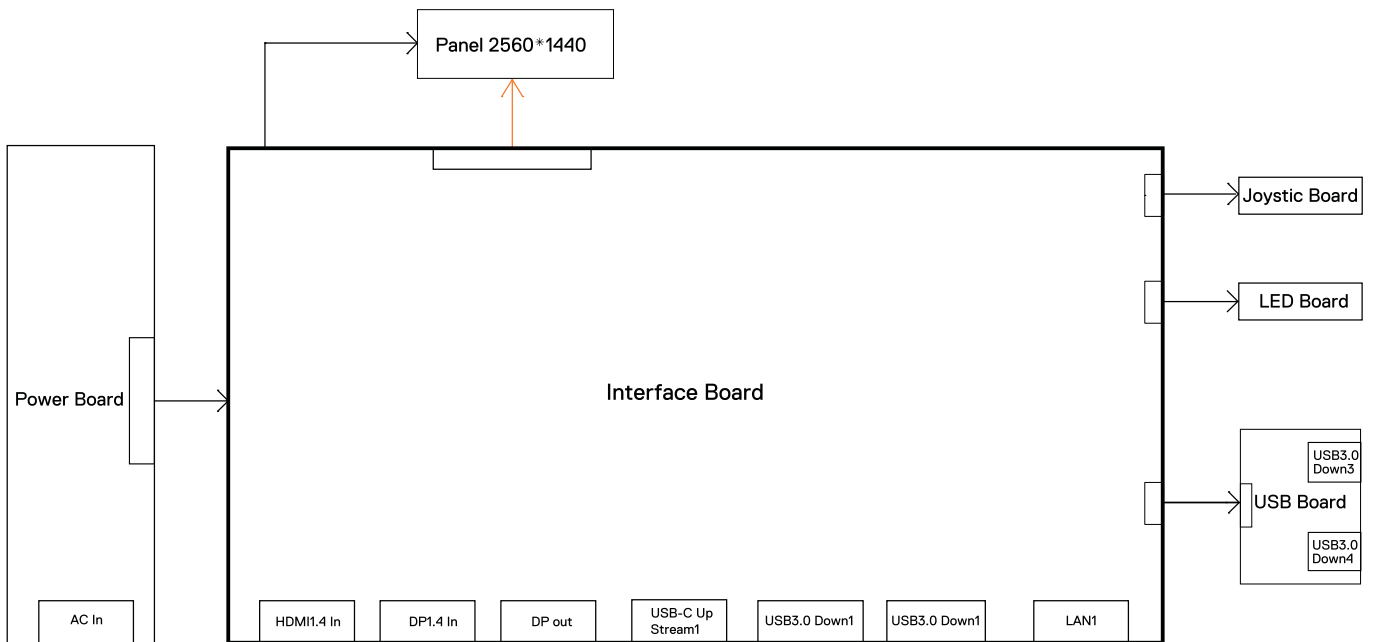
Item	Description	Q'ty	Remark
1	ASSY Front Trim	1	For EMEA Only, not for other regions
2	Panel	1	
3	Assy_mid_frame	1	
4	USB BD	1	
5	Power Safety Mylar	1	
6	Power BD	2	
7	IF BD	2	
8	Main Chassis Assy	1	
9	OSD BD	1	
10	ASSY Rear Cover	1	
11	ASSY BASE	1	
12	ASSY RISSER	1	
13	Power cable	1	See "NOTE"
14	DisplayPort cable	1	See "NOTE"
15	USB-C 1.0 M cable (A to C)	1	See "NOTE"
16	USB-C 1.0 M cable (C to C)	1	See "NOTE"

### NOTE:

For replacement of power cord, connectivity cable and external power supply (if applicable), contact Dell:

1. Go to <https://www.dell.com/support>.
2. Verify your country or region in the Choose A Country/Region drop-down menu at the bottom-right corner of the page.
3. Click Contact Us next to the country dropdown.
4. Select the appropriate service or support link based on your need.
5. Choose the method of contacting Dell that is convenient for you.

### 3. Wiring Connectivity Diagram

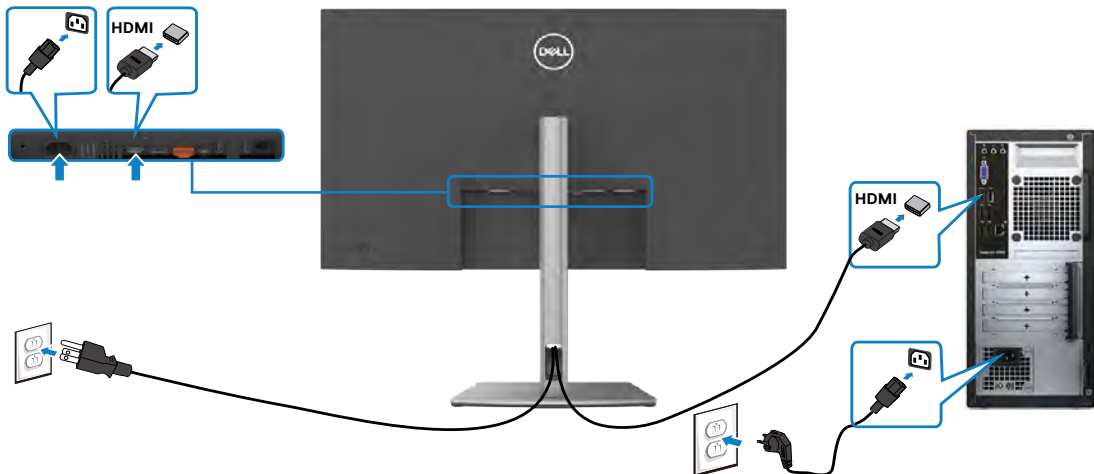


## 4. How to connect and disconnect power cable/ connectivity cable

**WARNING:** To change power cable/ connectivity cable, switch off power before unplugging the cable and replugging in required cable.



### Connecting the HDMI Cable

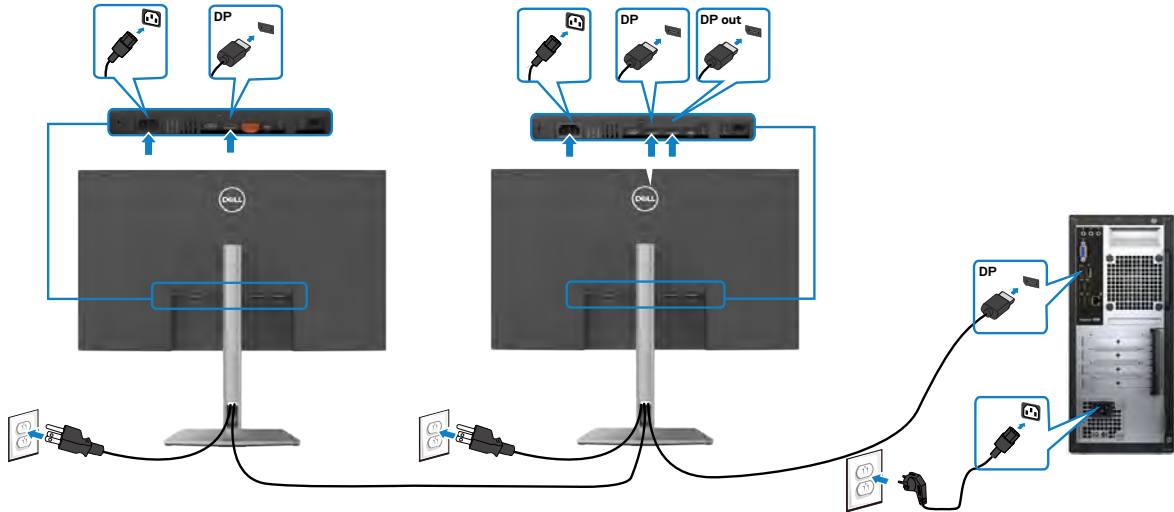


### Connecting the DP Cable

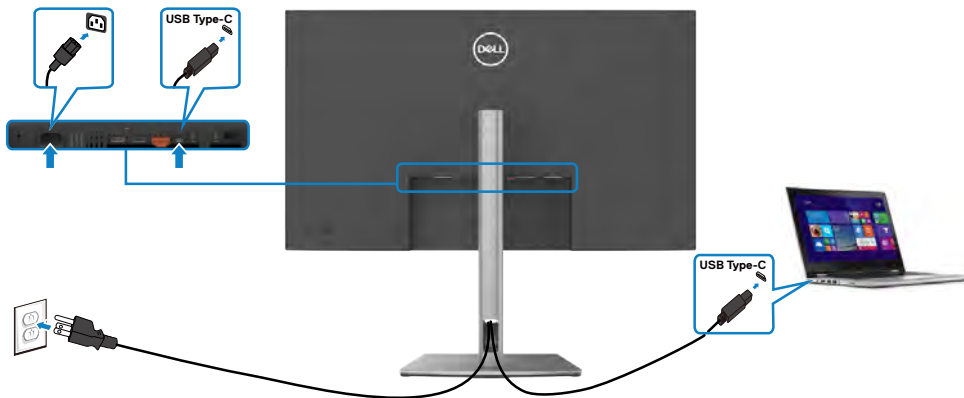


#### 4. How to connect and disconnect power cable/ connectivity cable

##### Connecting the monitor for DP Multi-Stream Transport (MST) function



##### Connecting the USB Type-C® Cable (C to C)



##### Connecting the USB Type-C Cable (A to C)



#### 4. How to connect and disconnect power cable/ connectivity cable

##### Connecting the Monitor for RJ45 Cable (Optional)



## 5. Disassembly and Assembly Procedures

### NOTE:

This “Disassembly and Assembly Procedures” is for EMEA only, not for other regions. Please note that Dell will deem warranty void if any disassembly is done on the monitors.

### Tool Required:

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

### Tool Description:

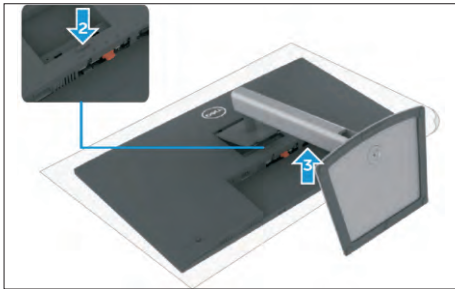
- Screwdriver(Phillip head) #1
- Screwdriver(Phillip head) #2
- Penknife
- Soldering iron and absorber

### 5.1 Disassembly Procedures:

Remove the monitor stand base:

S1

1. Place the monitor on a soft cloth or cushion.
2. Press and hold the stand-release button.
3. Lift the stand up and away from the monitor.



S2

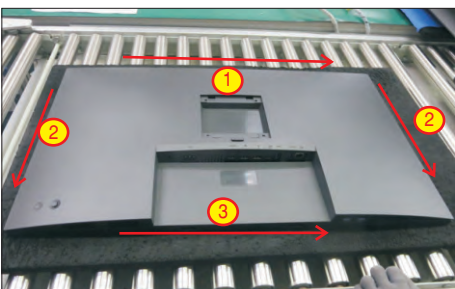
Use a Philips-head screwdriver to remove 4pcs screws for unlocking mechanisms.

(No.1~4 screw size=M4x11; Torque=11±1kgfxcmm)



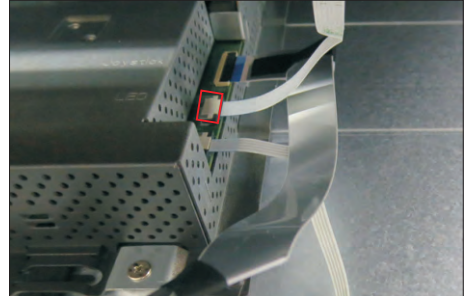
Wedge your fingers between rear cover and the middle bezel on the corners of the top side of the monitor to release the rear cover, then use one hand to press the middle bezel, the other hand to pull up carefully the rear cover in order of arrow preference for unlocking mechanisms of rear cover.

S3



S4

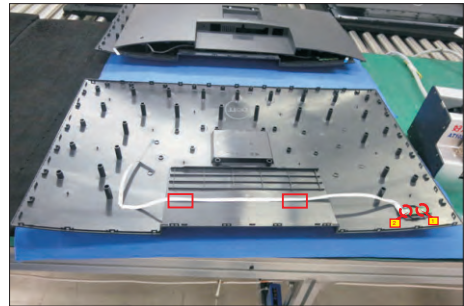
Lift the rear cover up carefully. Disconnect the joystick key cable from the connector of the interface board, and then remove the rear cover and put it aside for later diassembling.



S5

Use a Philips-head screwdriver to remove 2pcs screw for unlocking the key board, then tear off the tapes and release the key board.

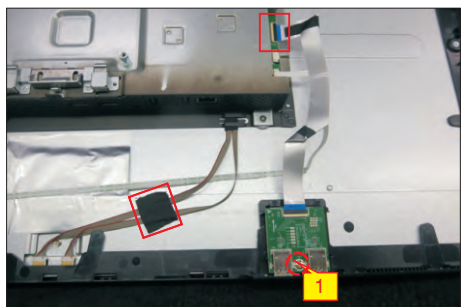
(No.1~2 screw size=M2x2.4, Torque=0.8~1kgfxcmm)



S6

Tear off 1pcs acetate. Use a Philips-head screwdriver to remove one screw for unlocking the USB board, then disconnect the USB FFC cable and remove away the USB board.

(No.1 screw size=M3x4.5, Torque=4±0.5kgfxcmm)

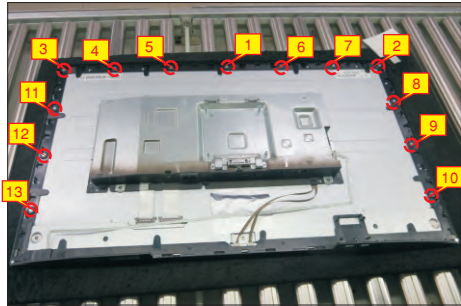




## 5. Disassembly and Assembly Procedures

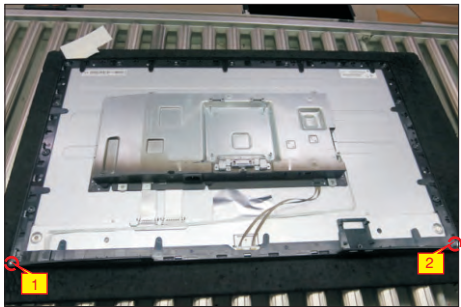
S7

Use a Philips-head screwdriver to remove 13pcs screws for unlocking the middle bezel with the panel.  
(No.1~13 screw size=M3x5, Torque=5±0.5kgfxcM)



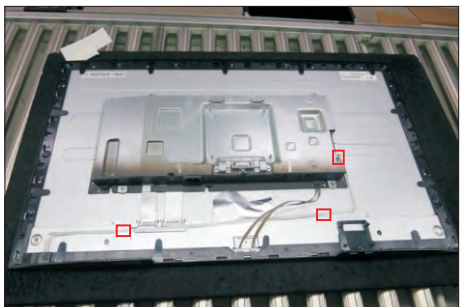
S8

Use a Philips-head screwdriver to remove 2pcs screws for unlocking the middle bezel with the front bezel.  
(No.1~2 screw size=M2x3.3, Torque=0.8~1.2kgfxcM)



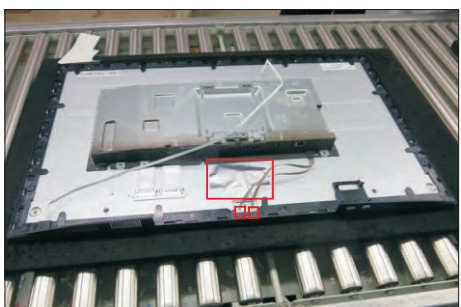
S9

Disconnect the LED cable from the connector of the interface board, then release the LED cable by tearing off the 2pcs tapes.



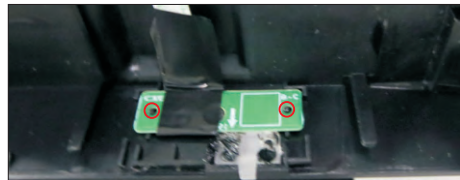
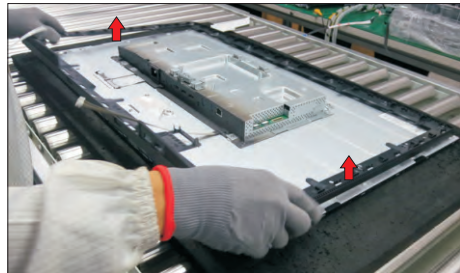
S10

Disconnect the panel lamp cables from the two connectors of the panel module, then tear off 1pcs aluminum foil as the picture below shown.



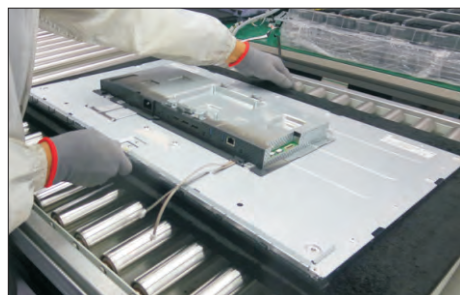
S11

Take away the middle bezel, and put it on a fixture, then tear off the mylar tape, and then release LED board from the hook of the middle bezel.



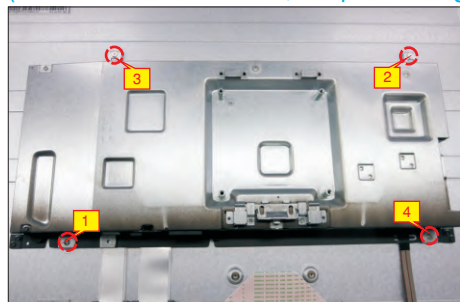
S12

Lift up the panel with bracket for releasing the front bezel away from the panel module.



S13

Use a Philips-head screwdriver to remove 4pcs screws for unlocking the bracket with panel module.  
(No.1~4 screw size=M3x4, Torque=5±0.5kgfxcM)



## 5. Disassembly and Assembly Procedures

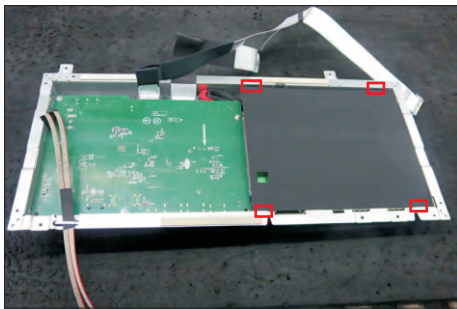
S14

Move up the bracket, then disconnect the LVDS cables away from the connectors of the panel.



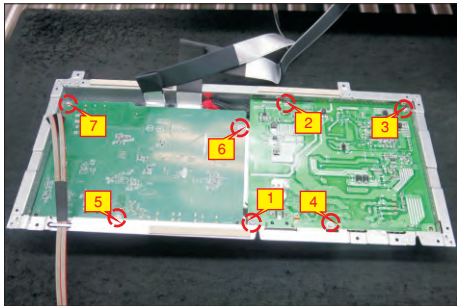
S15

Put the bracket on a protective cushion, then remove the Mylar tape from the hooks of the bracket.



S16

Use a Philips-head screwdriver to remove 7pcs screws for interface board and power board.  
(No.1 screw size=M4x8, Torque=7±1kgfxcM;  
No.2~7 screw size=M3x7.5, Torque=7±1kgfxcM)



S17

Remove the power board and interface board from the bracket chassis module carefully, and then disconnect all of the cables.

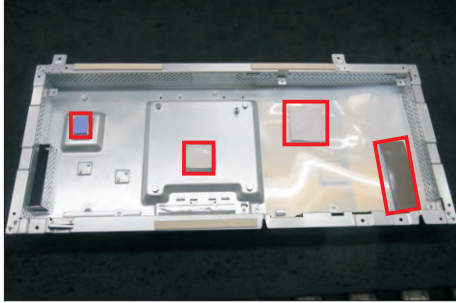


## 5. Disassembly and Assembly Procedures

### 5.2 Assembly Procedures:

S1

Place a bracket chassis base on a protective cushion, then stick 4pcs Silicon sheet on the position as the picture below shown.



S2

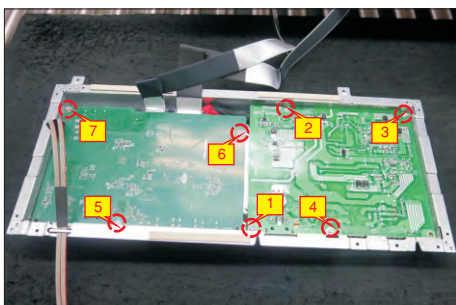
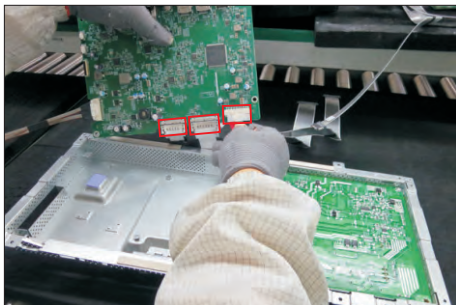
Turn over a power board and put the power board into the bracket chassis.



S3

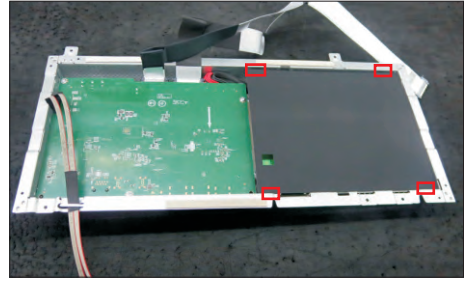
Take a interface board, connect 2pcs LVDS cables and 1pcs panel lamp cable to the connectors of the interface board, then connect the cable of the power board to the connector of the interface board. Turn over the interface board and locate it into the bracket, then locate panel lamp cable into the hook of the bracket. Use a Philips-head screwdriver to tighten 7pcs screws for locking the circuit board, .

(No.1 screw size=M4x8, Torque=7±1kgfxcM;  
No.2~7 screw size=M3x7.5, Torque=7±1kgfxcM)



S4

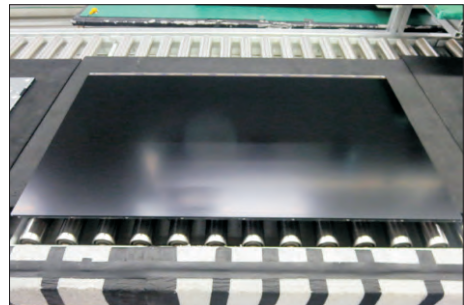
Take a mylar to insert the hooks of the bracket to cover the power board as the following picture shown.



Panel preparation: Take a panel and then examine the panel surface according to inspection criteria.

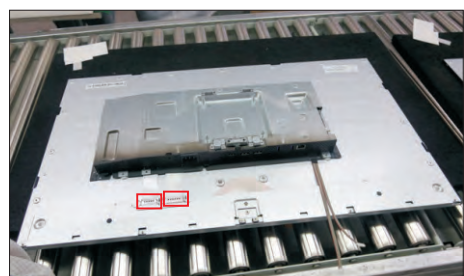
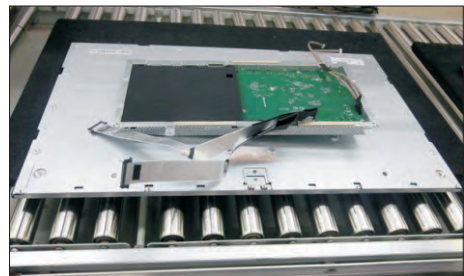
S5

Tear off the protective film of the panel screen, and then turn over the panel to place screen faced down for later assembling.



S6

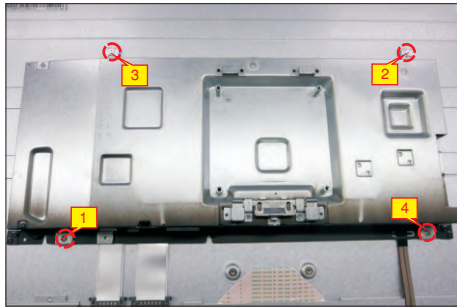
Put down the bracket on the back of panel, then connect the LVDS cables to the two connectors of the panel module.



## 5. Disassembly and Assembly Procedures

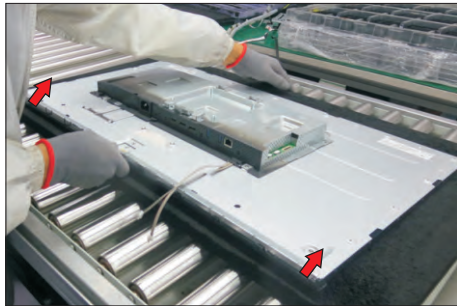
S7

Use a Philips-head screwdriver to tighten 4pcs screws for locking the bracket with panel module. (No.1~4 screw size=M3x4, Torque=5±0.5kgfxcm)



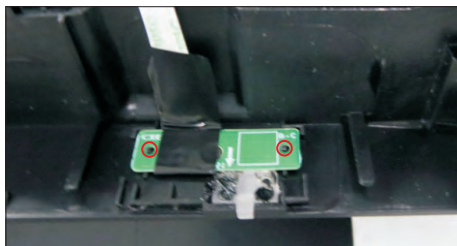
S8

Take 1pcs front bezel, then lift up the panel and assemble the front bezel with the panel module.



Take 1pcs LED board and 1pcs middle bezel, then put the middle bezel into a fixture jip to fix the middle bezel. Tear off the release paper on the back of the board, and then paste the LED board on the correct position of the middle bezel, then paste 1pcs mylar tape to cover the LED board.

S9



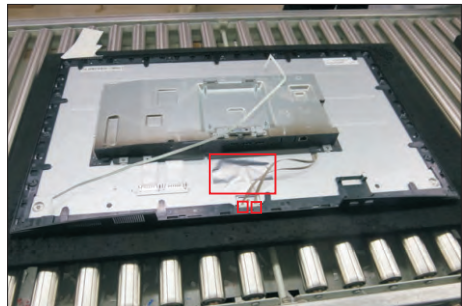
S10

Assemble the middle bezel unit with front bezel and panel module.



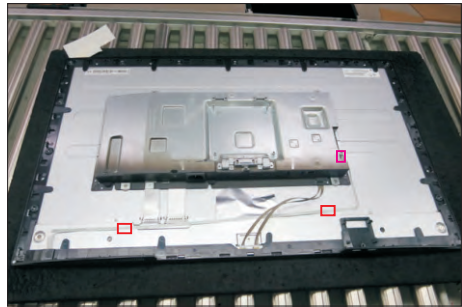
S11

Paste 1pcs aluminum foil to cover the T-con cable, then connect the panel lamp cable to the two connectors of the panel module.



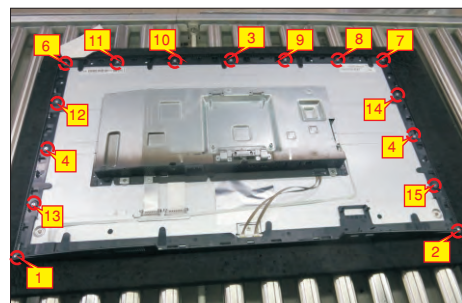
S12

Tear off the papers of the tapes on the back of the LED cable, and then fix the LED cable on the panel with 2pcs tapes, then connect the LED cable with the connector of the board.



S13

Use a Philips-head screwdriver to tighten 2pcs screws for locking the middle bezel with the front bezel. Use a Philips-head screwdriver to tighten 13pcs screws for locking the middle bezel with the panel module. (No.1~2 screw size=M2x3.3, Torque=0.8~1.2kgfxcm; No.3~15 screw size=M3x5, Torque=5±0.5kgfxcm)

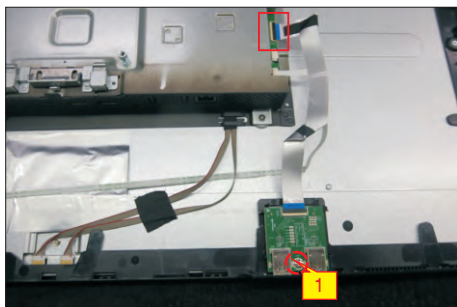
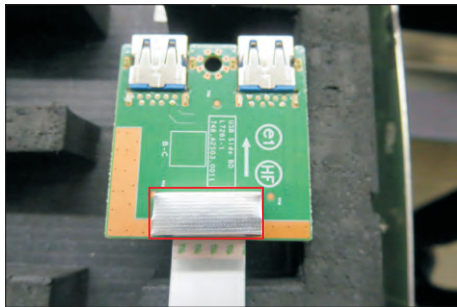
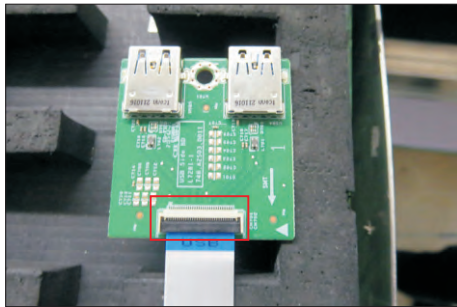


## 5. Disassembly and Assembly Procedures

S14

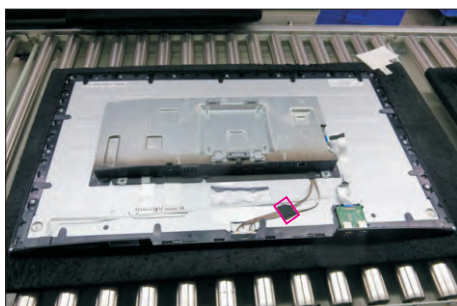
Take 1pcs USB board, 1pcs LVDS cable, 1pcs conductive foam. Connect the LVDS cable to the connector of the USB board, then paste 1pcs conductive foam on the back of the USB board, and then locate the USB board into the correct position of the middle bezel. Use a Philips-head screwdriver to tighten 1pcs screw for locking the USB unit with the middle bezel, then connect the USB connective cable to the connector of the interface board.

(No.1 screw size=M3x4.5, Torque=4±0.5kgfxcM)



S15

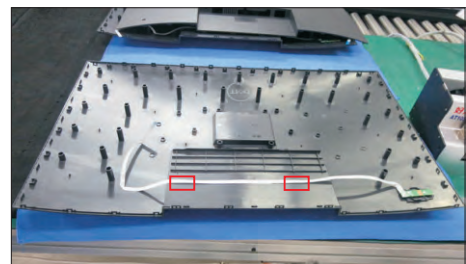
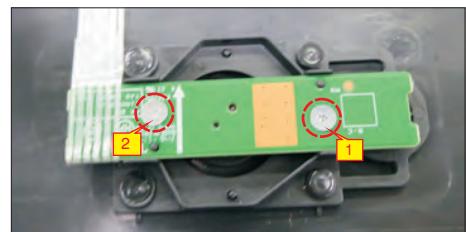
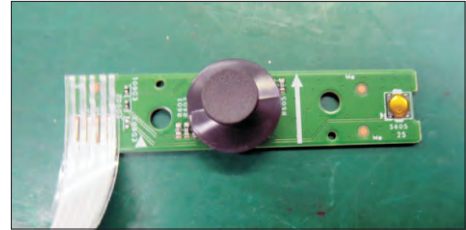
Paste 1pcs acetate tapes to fix the panel lamp cable as the picture below shown.



S16

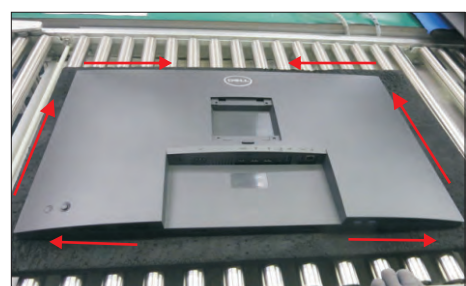
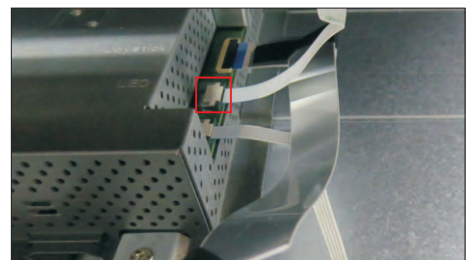
Take 1pcs joystick key and 1pcs OSD board, assemble the joystick key with the OSD board. Locate the board to the correct position of the rear cover, then use a Philips-head screwdriver to tighten 2pcs screws for locking the board with rear cover. Tear off the tape papers on the back of the cable, and then fix the key cable with tapes.

(No.1~2 screw size=M2x2.4, Torque=0.9±0.1kgfxcM)



Move the assembled rear cover close to the panel unit, then connect the key cable to the connector of interface board. Put down the rear cover and push the rear cover on the positions marked as the picture below shown for mechanisms engagement.

S17



## 5. Disassembly and Assembly Procedures

S18

Use a Phillips-head screwdriver to tighten 4pcs screws for locking the rear cover with the assembled unit. Stick 2pcs labels on the specific positions of the rear cover as the picture below shown.

(No.1~4 screw size=M4x11; Torque=11±1kgfxcM)



S19

Take a stand base close to the monitor. Fit the two tabs on the upper part of the stand into the grooves, and then lower the stand so that the monitor mounting area snaps onto the stand.



S20

Lift up the monitor to check the gap between the front bezel and the panel, then provide power supply and a video signal to the monitor, then turn on the monitor for functionality check.



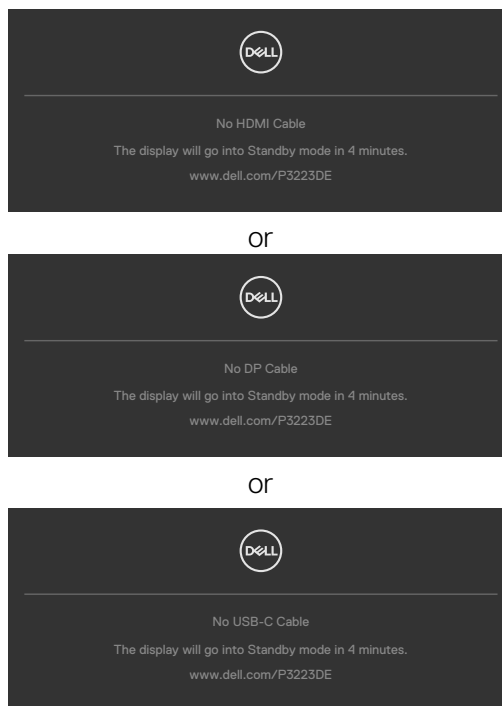
## 6. Trouble Shooting Instructions

### Self-Test

Your monitor provides a self-test feature that allows you to check whether your monitor is functioning properly. If your monitor and computer are properly connected but the monitor screen remains dark, run the monitor self-test by performing the following steps:

1. Turn off both your computer and the monitor.
2. Unplug the video cable from the back of the computer. To ensure proper Self-Test operation, remove all digital and the analog cables from the back of computer.
3. Turn on the monitor.

The floating dialog box should appear on-screen (against a black background), if the monitor cannot sense a video signal and is working correctly. While in self-test mode, the power LED remains white. Also, depending upon the selected input, one of the dialogs shown below will continuously scroll through the screen.



4. This box also appears during normal system operation if the video cable becomes disconnected or damaged.
5. Turn off your monitor and reconnect the video cable; then turn on both your computer and the monitor.

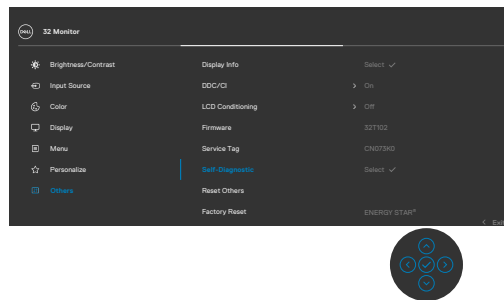
If your monitor screen remains blank after you use the previous procedure, check your video controller and computer, because your monitor is functioning properly.

## 6. Trouble Shooting Instructions

### Built-in Diagnostics

Your monitor has a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with your monitor, or with your computer and video card.

**NOTE:** You can run the built-in diagnostics only when the video cable is unplugged and the monitor is in self-test mode.



To run the built-in diagnostics:

1. Ensure that the screen is clean (no dust particles on the surface of the screen).
2. Select OSD items of Self-Diagnostics in Others feature.
3. Press the joystick button to start the diagnostics. A gray screen is displayed.
4. Observe if the screen has any defects or abnormalities.
5. Toggle the joystick once again until a red screen is displayed.
6. Observe if the screen has any defects or abnormalities.
7. Repeat steps 5 and 6 until the screen displays green, blue, black, and white colors. Note any abnormalities or defects.

The test is complete when the text screen appears. To exit, toggle the joystick control again.

If you do not detect any screen abnormalities upon using the built-in diagnostic tool, the monitor is functioning properly. Check the video card and computer.



## 6. Trouble Shooting Instructions

### Common Problems

The following table contains general information about common monitor problems you might encounter and the possible solutions:

Common Symptoms	What You Experience	Possible Solutions
No Video/ Power LED off	No picture	<ul style="list-style-type: none"><li>· Ensure that the video cable connecting the monitor and the computer is properly connected and secure.</li><li>· Verify that the power outlet is functioning properly using any other electrical equipment.</li><li>· Ensure that the power button is depressed fully.</li><li>· Ensure that the correct input source is selected in the <b>Input Source</b> menu.</li></ul>
No Video/ Power LED on	No picture or no brightness	<ul style="list-style-type: none"><li>· Increase brightness and contrast controls via OSD.</li><li>· Perform monitor self-test feature check.</li><li>· Check for bent or broken pins in the video cable connector.</li><li>· Run the built-in diagnostics.</li><li>· Ensure that the correct input source is selected in the <b>Input Source</b> menu.</li></ul>
Missing Pixels	LCD screen has spots	<ul style="list-style-type: none"><li>· Cycle power on-off.</li><li>· Pixel that is permanently off is a natural defect that can occur in LCD technology.</li><li>· For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <a href="https://www.dell.com/support/monitors">https://www.dell.com/support/monitors</a></li></ul>
Stuck-on Pixels	LCD screen has bright spots	<ul style="list-style-type: none"><li>· Cycle power on-off.</li><li>· Pixel that is permanently off is a natural defect that can occur in LCD technology.</li><li>· For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: <a href="https://www.dell.com/support/monitors">https://www.dell.com/support/monitors</a></li></ul>
Brightness Problems	Picture too dim or too bright	<ul style="list-style-type: none"><li>· Reset the monitor to factory settings.</li><li>· Adjust brightness and contrast controls via OSD.</li></ul>
Safety Related Issues	Visible signs of smoke or sparks	<ul style="list-style-type: none"><li>· Do not perform any troubleshooting steps.</li><li>· Contact Dell immediately.</li></ul>

## 6. Trouble Shooting Instructions

<b>Common Symptoms</b>	<b>What You Experience</b>	<b>Possible Solutions</b>
Intermittent Problems	Monitor malfunctions on & off	<ul style="list-style-type: none"><li>· Ensure that the video cable connecting the monitor to the computer is connected properly and is secure.</li><li>· Reset the monitor to factory settings.</li><li>· Perform monitor self-test feature check to determine if the intermittent problem occurs in self-test mode.</li></ul>
Missing Color	Picture missing color	<ul style="list-style-type: none"><li>· Perform monitor self-test.</li><li>· Ensure that the video cable connecting the monitor to the computer is connected properly and is secure.</li><li>· Check for bent or broken pins in the video cable connector.</li></ul>
Wrong Color	Picture color not good	<ul style="list-style-type: none"><li>· Try different <b>Preset Modes</b> in <b>Color</b> settings OSD.</li><li>· Adjust R/G/B value under <b>Custom Color</b> in <b>Color</b> menu OSD.</li><li>· Change the <b>Input Color Format</b> to <b>RGB</b> or <b>YCbCr</b> in the <b>Color</b> settings OSD.</li><li>· Run the built-in diagnostics.</li></ul>
Image retention from a static image left on the monitor for a long period of time	Faint shadow from the static image displayed appears on the screen	<ul style="list-style-type: none"><li>· Set the screen to turn off after a few minutes of screen idle time. These can be adjusted in Windows Power Options or Mac Energy Saver setting.</li><li>· Alternatively, use a dynamically changing screensaver.</li></ul>

## 6. Trouble Shooting Instructions

### Product Specific Problems

Problem	What you experience	Possible solutions
Screen image is too small	Image is centered on screen, but does not fill entire viewing area	<ul style="list-style-type: none"><li>• Check the <b>Aspect Ratio</b> setting in the <b>Display</b> menu OSD.</li><li>• Reset the monitor to factory settings.</li></ul>
Cannot adjust the monitor with the buttons on the front panel	OSD does not appear on the screen	<ul style="list-style-type: none"><li>• Turn off the monitor, unplug the monitor power cable, plug it back, and then turn on the monitor.</li></ul>
No Input Signal when user controls are pressed	No picture, the LED light is white	<ul style="list-style-type: none"><li>• Check the signal source. Ensure the computer is not in the power saving mode by moving the mouse or pressing any key on the keyboard.</li><li>• Check whether the signal cable is plugged in properly. Connect the signal cable again, if necessary.</li><li>• Reset the computer or video player.</li></ul>
The picture does not fill the entire screen	The picture cannot fill the height or width of the screen	<ul style="list-style-type: none"><li>• Due to different video formats (aspect ratio) of DVDs, the monitor may display in full screen.</li><li>• Run the built-in diagnostics.</li></ul>
No image when using USB-C connection to computer, laptop, and so on	Black screen	<ul style="list-style-type: none"><li>• Verify if the USB-C interface of the device can support DP alternate mode.</li><li>• Verify if the device required more than 90 W power charging.</li><li>• USB-C interface of device cannot support DP alternate mode.</li><li>• Set Windows to Projection mode.</li><li>• Ensure that the USB-C cable is not damaged.</li></ul>

## 6. Trouble Shooting Instructions

<b>Problem</b>	<b>What you experience</b>	<b>Possible solutions</b>
No charging when using USB-C connection to computer, laptop, and so on	No charging	<ul style="list-style-type: none"><li>• Verify if the device can support one of 5 V/9 V/15 V/20 V charging profiles.</li><li>• Verify if the Notebook requires a &gt;90 W power adaptor.</li><li>• If the Notebook requires a &gt;90 W power adaptor, it may not charge with the USB-C connection.</li><li>• Ensure that you use only Dell approved adapter or the adapter that comes with the product.</li><li>• Ensure that the USB-C cable is not damaged.</li></ul>
Intermittent charging when using USB-C connection to computer, laptop, and so on	Intermittent charging	<ul style="list-style-type: none"><li>• Check if the maximum power consumption of device is over 90 W.</li><li>• Ensure that you use only Dell approved adapter or the adapter that comes with the product.</li><li>• Ensure that the USB-C cable is not damaged.</li></ul>
No image when using USB-C MST	Black screen or 2 <sup>nd</sup> DUT is not Prime mode	<ul style="list-style-type: none"><li>• USB-C input, Go to OSD menu, under Display Info check the Link Rate is HBR2 or HBR3, if Link Rate is HBR2, suggest to use USB-C to DP cable to turn on MST.</li></ul>
No network connection	Network dropped or intermittent	<ul style="list-style-type: none"><li>• Do not toggle Off/On the power button when network is connected, keeps the power button On.</li></ul>
The LAN port is not functioning	OS setting or cable connection issue	<ul style="list-style-type: none"><li>• Ensure that the latest BIOS and drivers for your computer are installed on your computer.</li><li>• Ensure that the RealTek Gigabit Ethernet Controller is installed in the Windows Device Manager.</li><li>• If your BIOS Setup has a LAN/GBE Enabled/ Disabled option, make sure it is set to Enabled.</li><li>• Ensure that the Ethernet cable is connected securely on the monitor and the hub/router/ firewall.</li><li>• Check the status LED of the Ethernet cable to confirm connectivity. Re-connect both ends of the Ethernet cable if the LED is not lit.</li><li>• First power off the Computer and unplug the Type-C cable and power cord of the monitor. Then, power on the computer, plug in the monitor power cord the Type-C cable.</li></ul>

## 6. Trouble Shooting Instructions

### Universal Serial Bus (USB) Specific Problems

<b>Specific Symptoms</b>	<b>What You Experience</b>	<b>Possible Solutions</b>
USB interface is not working	USB peripherals are not working	<ul style="list-style-type: none"><li>• Check that your display is turned ON.</li><li>• Reconnect the upstream cable to your computer.</li><li>• Reconnect the USB peripherals (downstream connector).</li><li>• Turn off the monitor and turn it on again.</li><li>• Reboot the computer.</li><li>• Certain USB devices such as portable hard drives require higher power source; connect the drive to the computer directly.</li></ul>
Super speed USB 5Gbps (USB 3.2 Gen1) interface is slow.	USB 3.2 Gen1 peripherals working slowly or not working at all	<ul style="list-style-type: none"><li>• Check that your computer is USB 3.2 Gen1-capable.</li><li>• Some computers have USB 3.2 Gen1, USB 2.0, and USB 1.1 ports. Ensure that the correct USB port is used.</li><li>• Reconnect the upstream cable to your computer.</li><li>• Reconnect the USB peripherals (downstream connector).</li><li>• Reboot the computer.</li></ul>
Wireless USB peripherals stop working when a USB 3.2 Gen1 device is plugged in	Wireless USB peripherals responding slowly or only working as the distance between itself and its receiver decreases	<ul style="list-style-type: none"><li>• Increase the distance between the USB 3.2 Gen1 peripherals and the wireless USB receiver.</li><li>• Position your wireless USB receiver as close as possible to the wireless USB peripherals.</li><li>• Use a USB-extender cable to position the wireless USB receiver as far away as possible from the USB 3.2 Gen1 port.</li></ul>