Service Manual - P3223QE

Version: 01

Date: 2022/03/28

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.

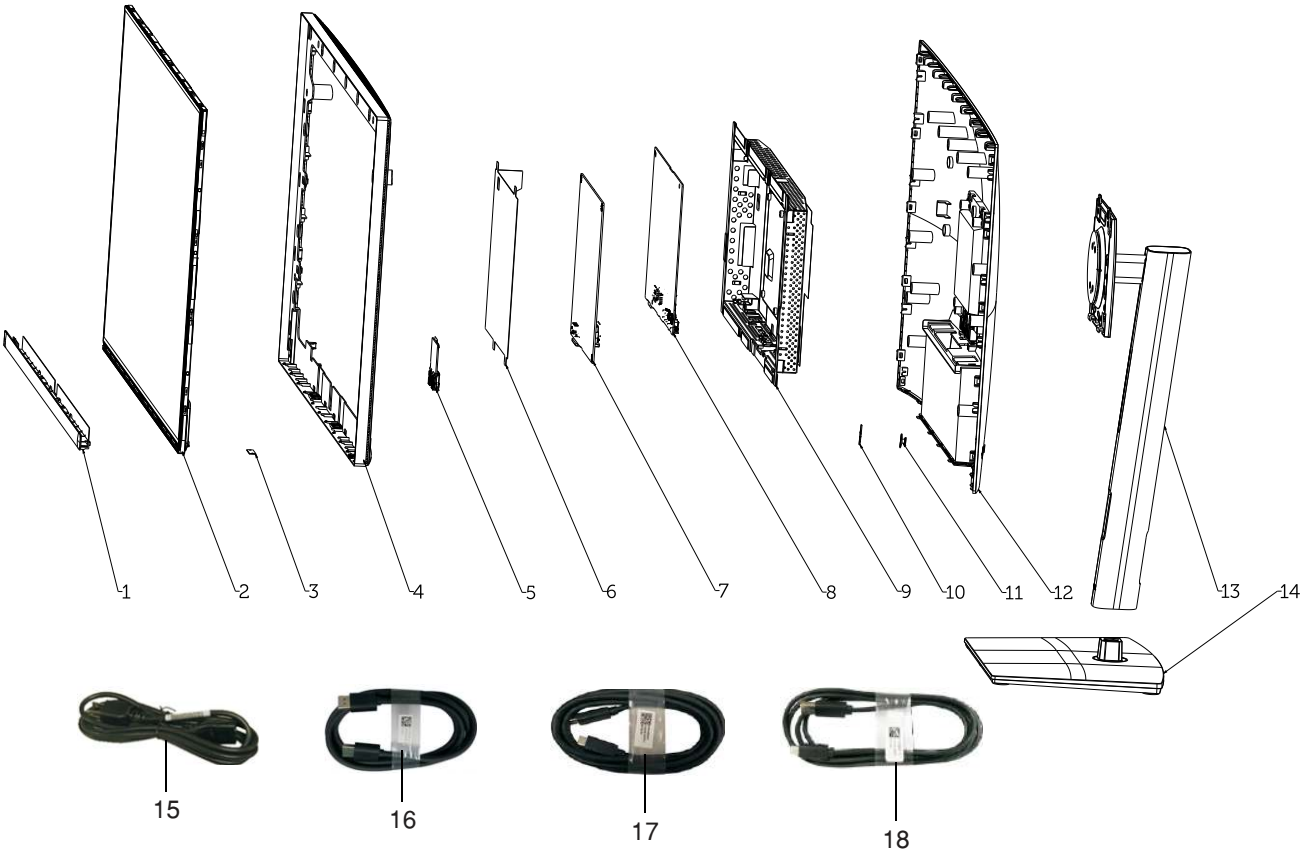
Qualified Repairability:

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 humility 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



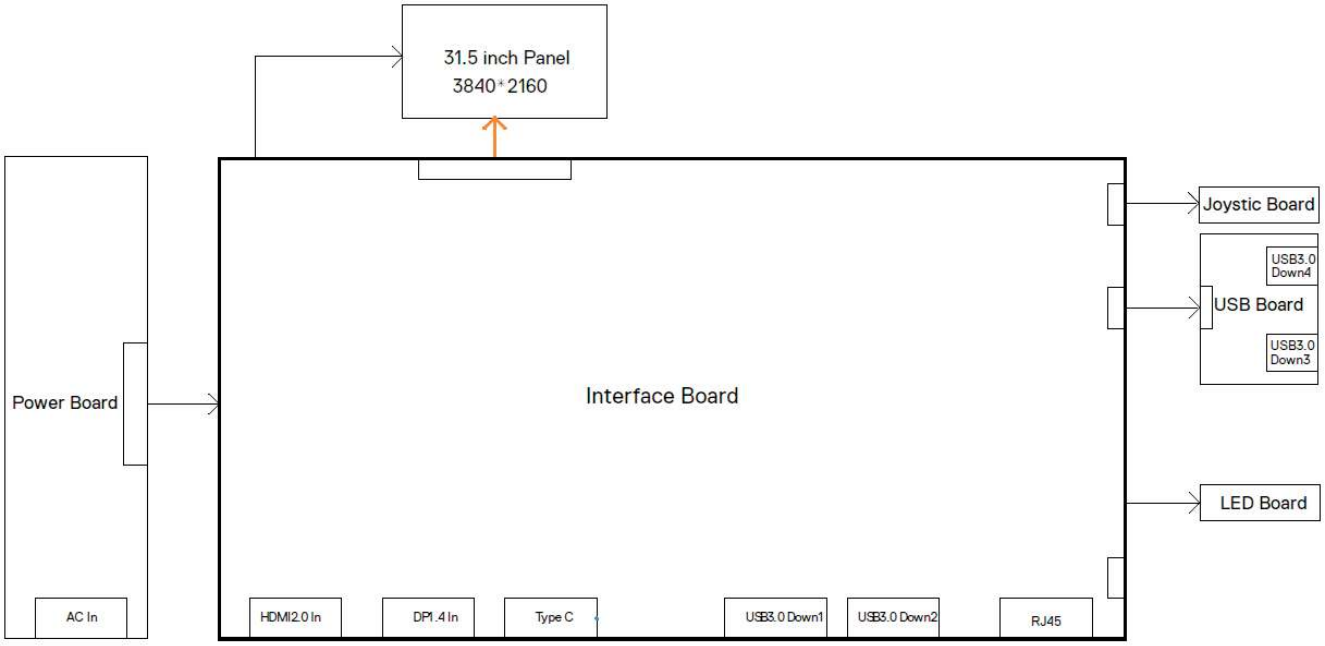
Item	Description	Q'ty	Remark
1	Front trim	1	For EMEA Only, not for other regions
2	Panel	1	
3	LED BD	1	
4	ASSY Middle Frame	1	
5	USB BD	1	
6	Panel Mylar	1	
7	Interface BD	1	
8	Power BD	1	
9	Main bracket	1	
10	Key BD	1	
11	Joystick button	1	
12	Back cover	1	
13	Riser ASSY	1	
14	Base ASSY	1	
15	Power cable	1	See “NOTE”
16	DisplayPort cable	1	See “NOTE”
17	USB Type-C cable(C to C)	1	See “NOTE”
18	USB Type-C cable(A to C)	1	See “NOTE”

NOTE:

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

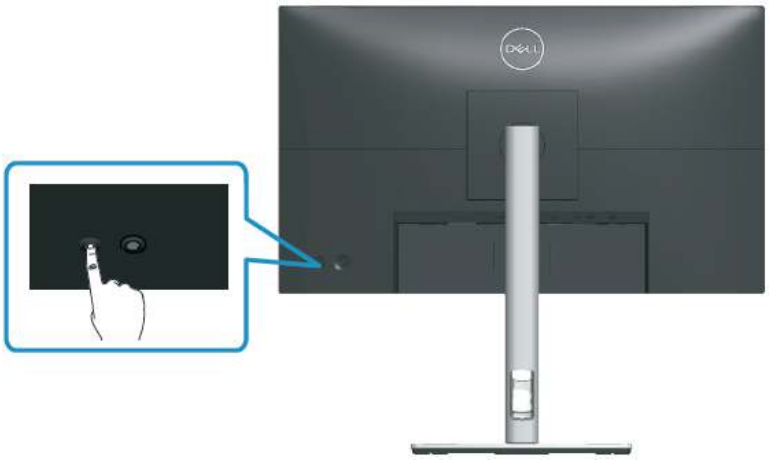
1. Go to https://www.dell.com/support.
2. Verify your country or region in the Choose A Country/Region drop-down menu at the bottom-right corner of the page.
3. Click Contact Us next to the country dropdown.
4. Select the appropriate service or support link based on your need.
5. Choose the method of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

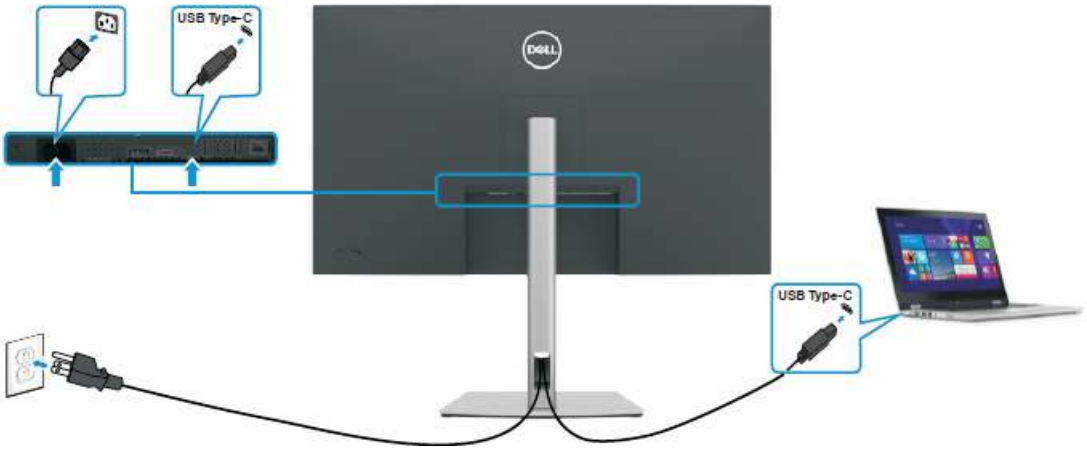


Connecting the DP Cable



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

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



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



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:

S1

Remove the monitor stand base:
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.



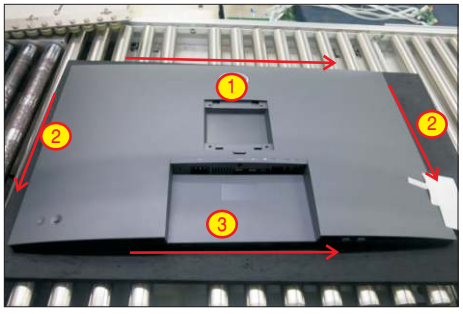
S2

Use a Philips-head screwdriver to remove four screws for unlocking mechanisms.
(No.1~4 screw size=M4x11; Torque=11±1kgfxcm)



S3

Wedge your fingers between the 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.



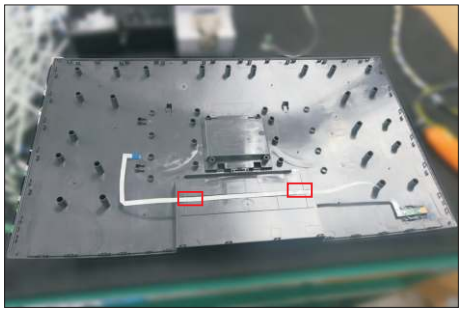
S4

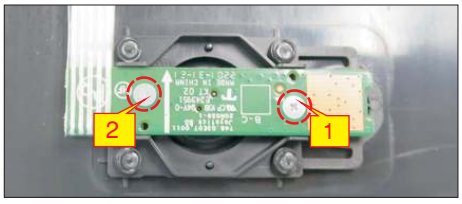
Lift the rear cover up carefully. Disconnect the joystick key cable from the connector of the interface board, and then remove the rear cover and put it aside for later diasassembling.



S5

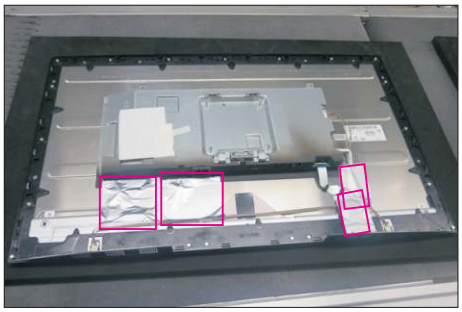
Use a Philips-head screwdriver to remove 2pcs screw for unlocking the key board, then tear off the tapes and release the key board.
(No.1~2 screw size=M2x2.4, Torque=0.8~1kgfxcm)

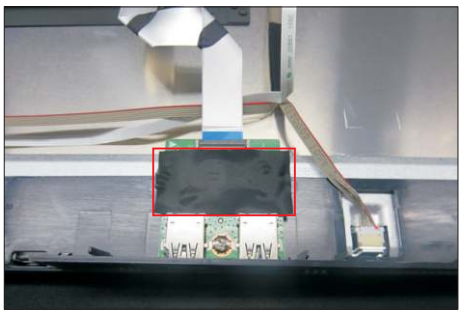




S6

Tear off 4pcs aluminum foil and 1pcs acetate tape as the picture below shown.

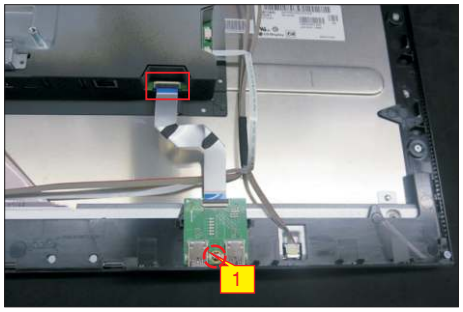




5. Disassembly and Assembly Procedures

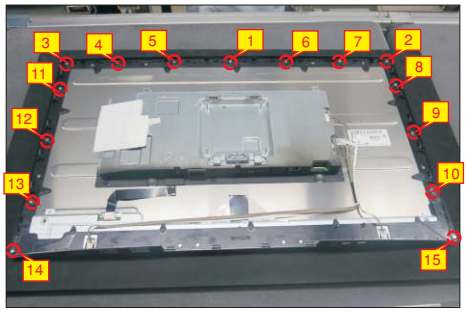
S7

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±0.5kgfxcm)



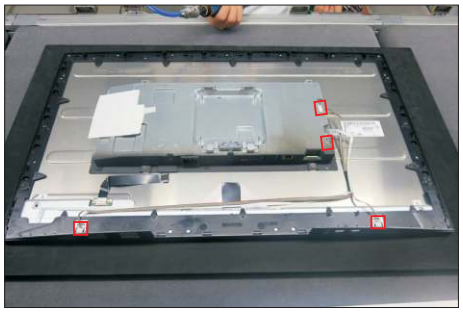
S8

Use a Philips-head screwdriver to remove 15(13+2)pcs screws for unlocking the middle bezel.
(No.1~13 screw size=M3x5, Torque=5±0.5kgfxcm
No.14~15 screw size=M2x3.3, Torque=0.8~1.2kgfxcm)



S9

Disconnect the panel lamp from the connectors of the panel and interface board and then put it aside.
Disconnect the LED cable from the connector of the interface board, then release the LED cable by tearing off the 2pcs tapes.

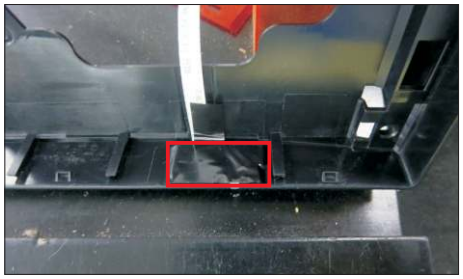




S10

Take away the middle bezel, and put it on a fixture, then tear off the mylar tape for releasing the LED board .

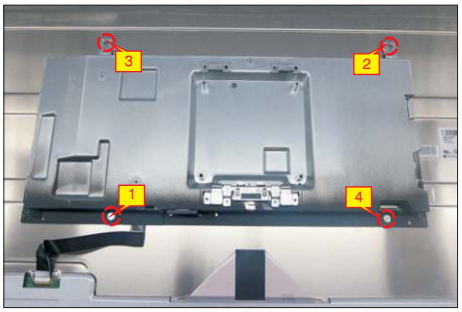






S11

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)



S12

Lift up the panel for releasing the front bezel away from the panel.

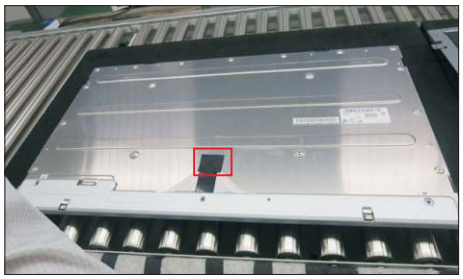


5. Disassembly and Assembly Procedures

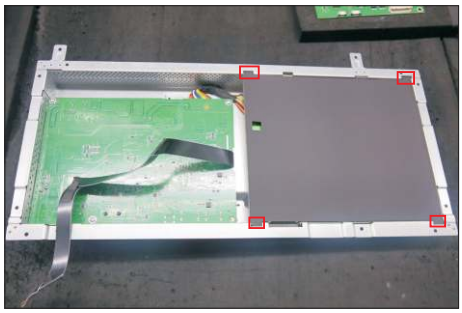
S13 Disconnect the EDP cable away from the connectors of the panel, and then remove the bracket and put it on a cushion. Tear off the acetate tape of the panel.



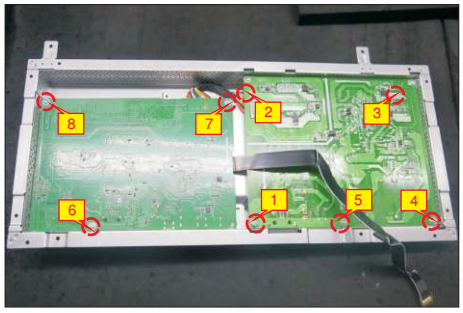




S14 Remove the Mylar tape from the hooks of the bracket.



S15 Use a Philips-head screwdriver to remove 8pcs screws for interface board and power board.
(No.1 screw size=M4x8, Torque=7±1kgfxcm;
No.2~8 screw size=M3x7.5, Torque=7±1kgfxcm)



S16 Remove the power board 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:

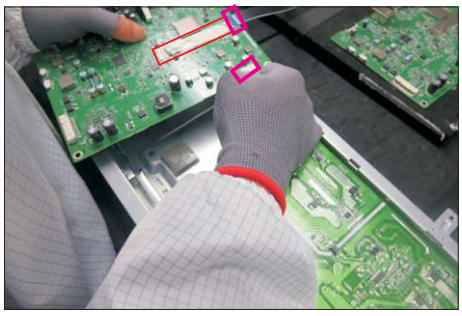
S1 Place a bracket chassis base on a protective cushion, then stick 4pcs Silicon sheet on the position as the picture below shown.

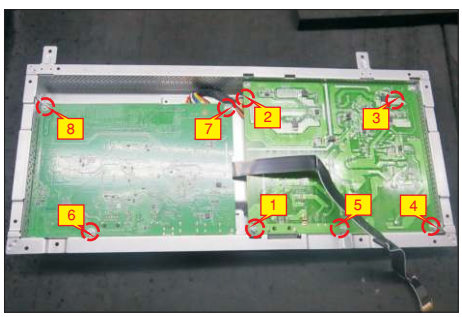


S2 Turn over a power board and put the power board into the bracket chassis.

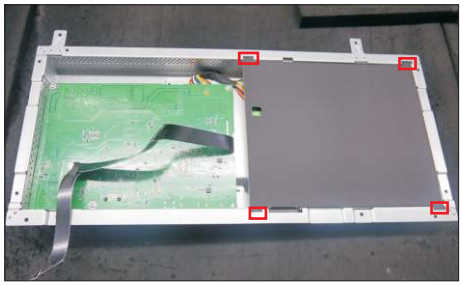


S3 Take a interface board, connect 1pcs EDP cable to the connectors of the interface board, then connect the cable of the power board to the connector of the interface board. Paste 1pcs tape on the board. Turn over the interface board and locate it into the bracket, then locate all the cables into the correct position of the bracket. Use a Philips-head screwdriver to tighten 8pcs screws for locking the circuit board, .
(No.1 screw size=M4x8, Torque=7±1kgfxcm;
No.2~8 screw size=M3x7.5, Torque=7±1kgfxcm)



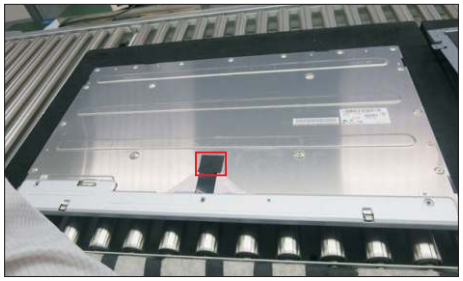


S4 Take a mylar to insert the hooks of the bracket to cover the power board as the following picture shown.

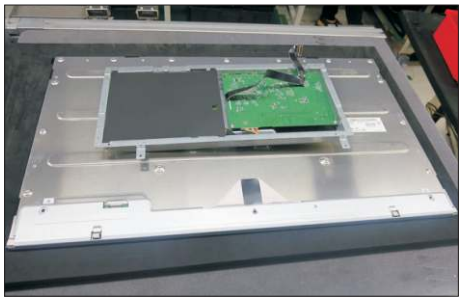


S5 Panel preparation: Take a panel and then examine the panel surface according to inspection criteria. Tear off the protective film of the panel screen, and then turn over the panel to place screen faced down. Paste 1pcs acetate tape on the specific position as the picture below shown.





S6 Put down the bracket on the back of panel, then connect the EDP cable to the connector of the panel.



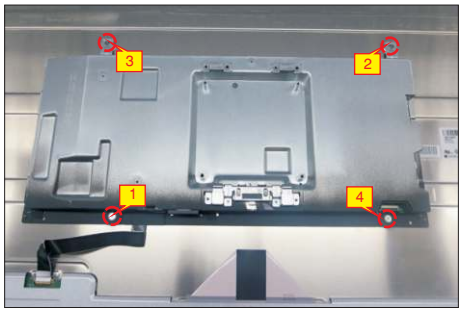


5. Disassembly and Assembly Procedures

S7 Take 1pcs front bezel, then lift up the panel and assemble the front bezel with the panel module.

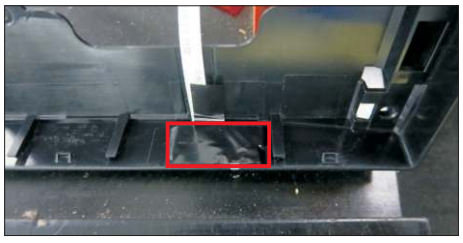


S8 Use a Philips-head screwdriver to tighten 4pcs screws for locking the bracket with panel module. (No.1~4 screw size=M3x4, Torque=5±0.5kgfxcm)



S9 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.





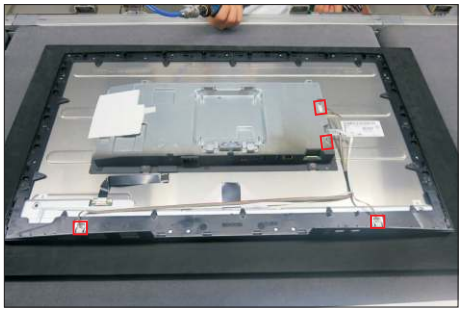


S10 Assemble 1pcs middle bezel which have been assembled with LED board with front bezel and panel module.

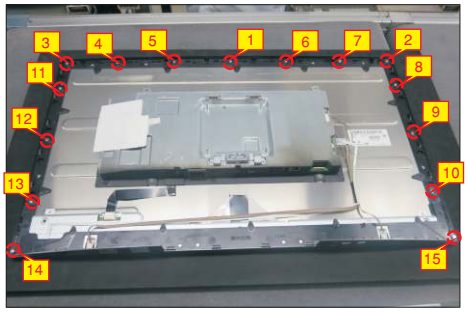


S11 Tear off the papers of the tapes on the back of the LED cable, and then fix the LED cable on the panel with 2pcs tapes, then connect the LED cable with the connector of the board. Take 1pcs panel lamp cable to connect the circuit board with the two connectors of the panel.





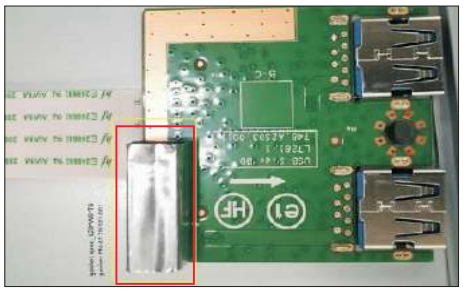
S12 Use a Philips-head screwdriver to tighten 15(13+2)pcs screws for locking the middle bezel with the panel and front bezel. (No.1~13 screw size=M3x5, Torque=5±0.5kgfxcm; No.14~15 screw size=M2x3.3, Torque=0.8~1.2kgfxcm)

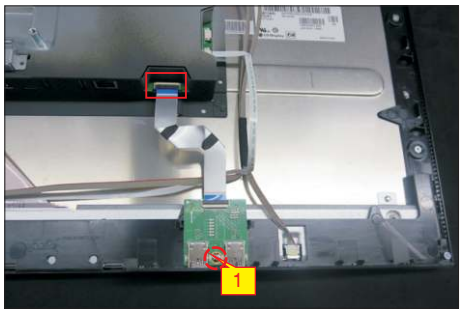


S13

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 cable with assemble unit.

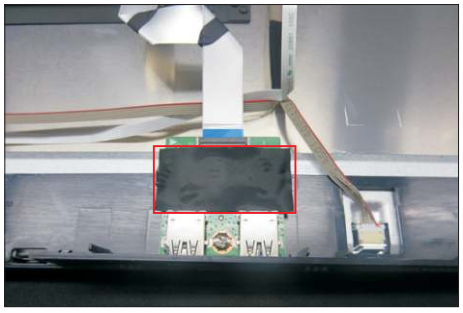
(No.1 screw size=M3x4.5, Torque=4±0.5kgfxcm)

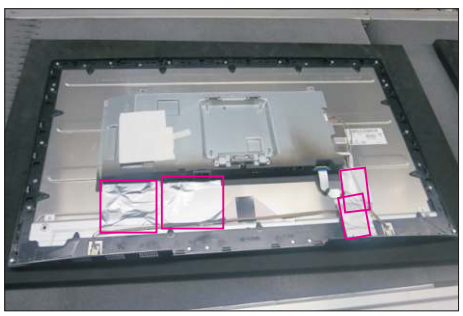




S14

Paste 1pcs acetate tape to cover the USB connector. Paste 1pcs aluminum foil to cover the USB board. Paste 1pcs aluminum foil to cover EDP connector. Paste 1pcs aluminum foil to fix the cables. Paste 1pcs aluminum foil to cover the bracket as the picture below shown.

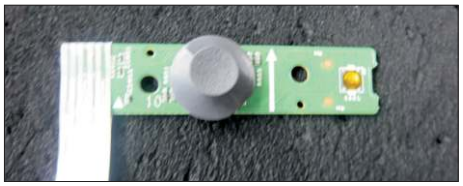


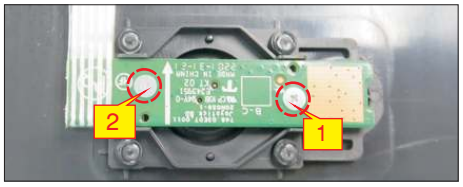


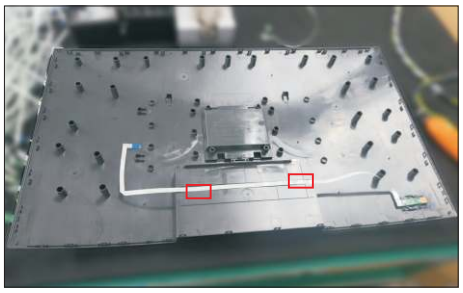
S15

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 screw size=M2x2.4, Torque=0.9±0.1kgfxcm)



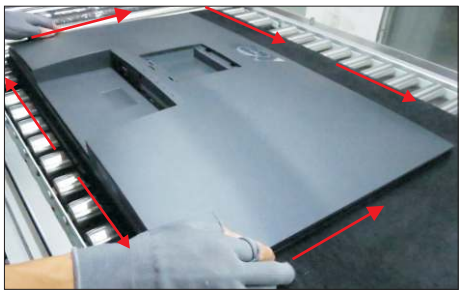




S16

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

Use a Philips-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)



S18

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.



S19

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.



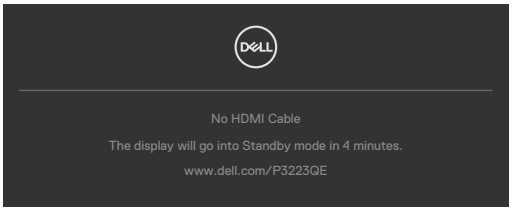
⚠ **WARNING: Before you begin any of the procedures in this section, follow the Safety Instructions.**

Self-Test

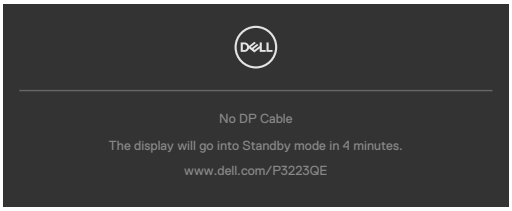
Your monitor provides a self-test feature that allows you to check whether your monitor is functioning properly. If your monitor and computer are properly connected but the monitor screen remains dark, run the monitor self-test by performing the following steps:

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.

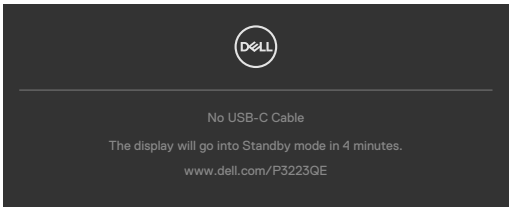
The floating dialog box should appear on-screen (against a black background), if the monitor cannot sense a video signal and is working correctly. While in self-test mode, the power LED remains white. Also, depending upon the selected input, one of the dialogs shown below will continuously scroll through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



or



or



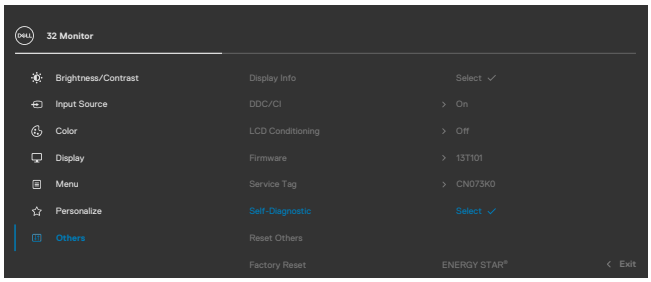
4. This box also appears during normal system operation if the video cable becomes disconnected or damaged.
5. Turn off your monitor and reconnect the video cable; then turn on both your computer and the monitor.

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

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.

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	· Ensure that the video cable connecting the monitor and the computer is properly connected and secure. · Verify that the power outlet is functioning properly using any other electrical equipment. · Ensure that the power button is depressed fully. · Ensure that the correct input source is selected in the **Input Source** menu.
No Video/ Power LED on	No picture or no brightness	· Increase brightness and contrast controls via OSD. · Perform monitor self-test feature check. · Check for bent or broken pins in the video cable connector. · Run the built-in diagnostics. · Ensure that the correct input source is selected in the **Input Source** menu.
Missing Pixels	LCD screen has spots	· Cycle power on-off. · Pixel that is permanently off is a natural defect that can occur in LCD technology. · For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: **https://www.dell.com/support/monitors**
Stuck-on Pixels	LCD screen has bright spots	· Cycle power on-off. · Pixel that is permanently off is a natural defect that can occur in LCD technology. · For more information on Dell Monitor Quality and Pixel Policy, see Dell Support site at: **https://www.dell.com/support/monitors**
Brightness Problems	Picture too dim or too bright	· Reset the monitor to factory settings. · Adjust brightness and contrast controls via OSD.
Safety Related Issues	Visible signs of smoke or sparks	· Do not perform any troubleshooting steps. · Contact Dell immediately.

6. Trouble Shooting Instructions

Common Symptoms	What You Experience	Possible Solutions
Intermittent Problems	Monitor malfunctions on & off	· Ensure that the video cable connecting the monitor to the computer is connected properly and is secure. · Reset the monitor to factory settings. · Perform monitor self-test feature check to determine if the intermittent problem occurs in self-test mode.
Missing Color	Picture missing color	· Perform monitor self-test. · Ensure that the video cable connecting the monitor to the computer is connected properly and is secure. · Check for bent or broken pins in the video cable connector.
Wrong Color	Picture color not good	· Try different **Preset Modes** in **Color** settings OSD. · Adjust R/G/B value under **Custom Color** in **Color** menu OSD. · Change the **Input Color Format** to **RGB** or **YCbCr** in the **Color** settings OSD. · Run the built-in diagnostics.
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	· 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. · Alternatively, use a dynamically changing screensaver.

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	· Check the **Aspect Ratio** setting in the **Display** menu OSD. · Reset the monitor to factory settings.
Cannot adjust the monitor with the buttons on the front panel	OSD does not appear on the screen	· Turn off the monitor, unplug the monitor power cable, plug it back, and then turn on the monitor.
No Input Signal when user controls are pressed	No picture, the LED light is white	· 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. · Check whether the signal cable is plugged in properly. Connect the signal cable again, if necessary. · Reset the computer or video player.
The picture does not fill the entire screen	The picture cannot fill the height or width of the screen	· Due to different video formats (aspect ratio) of DVDs, the monitor may display in full screen. · Run the built-in diagnostics.
No image when using USB-C connection to computer, laptop, and so on	Black screen	· Verify if the USB-C interface of the device can support DP alternate mode. · Verify if the device required more than 90W power charging. · USB-C interface of device cannot support DP alternate mode. · Set Windows to Projection mode. · Ensure that the USB-C cable is not damaged.

6. Trouble Shooting Instructions

Problem	What you experience	Possible solutions
No charging when using USB-C connection to computer, laptop, and so on	No charging	· Verify if the device can support one of 5V/9V/15V/20V charging profiles. · Verify if the Notebook requires a > 90W power adaptor. · If the Notebook requires a > 90W power adaptor, it may not charge with the USB-C connection. · Ensure that you use only Dell approved adapter or the adapter that comes with the product. · Ensure that the USB-C cable is not damaged.
Intermittent charging when using USB-C connection to computer, laptop, and so on	Intermittent charging	· Check if the maximum power consumption of device is over 90W. · Ensure that you use only Dell approved adapter or the adapter that comes with the product. · Ensure that the USB-C cable is not damaged.
Refresh rate drop to 30 Hz or color bits drop to 6 bits	Refresh rate drop or color bits drop	· The monitor is 2 Lane default for USB-C, it need to switch the USB-C priortizaiotn to high resolution for full performance image for DP 1.2 platform.
No network connection	Network dropped or intermittent	· Do not toggle Off/On the power button when network is connected, keeps the power button On.
The LAN port is not functioning	OS setting or cable connection issue	· Ensure that the latest BIOS and drivers for your computer are installed on your computer. · Ensure that the RealTek Gigabit Ethernet Controller is installed in the Windows Device Manager. · If your BIOS Setup has a LAN/GBE Enabled/ Disabled option, make sure it is set to Enabled. · Ensure that the Ethernet cable is connected securely on the monitor and the hub/router/ firewall. · 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. · 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.

Universal Serial Bus (USB) Specific Problems

Specific Symptoms	What You Experience	Possible Solutions
USB interface is not working	USB peripherals are not working	· Check that your display is turned ON. · Reconnect the upstream cable to your computer. · Reconnect the USB peripherals (downstream connector). · Turn off the monitor and turn it on again. · Reboot the computer. · Certain USB devices such as portable hard drives require higher power source; connect the drive to the computer directly.
Super speed USB 5 Gbps (USB 3.2 Gen1) interface is slow.	USB 3.2 Gen1 peripherals working slowly or not working at all	· Check that your computer is USB 3.2 Gen1-capable. · Some computers have USB 3.2 Gen1, USB 2.0, and USB 1.1 ports. Ensure that the correct USB port is used. · Reconnect the upstream cable to your computer. · Reconnect the USB peripherals (downstream connector). · Reboot the computer.
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	· Increase the distance between the USB 3.2 Gen1 peripherals and the wireless USB receiver. · Position your wireless USB receiver as close as possible to the wireless USB peripherals. · Use a USB-extender cable to position the wireless USB receiver as far away as possible from the USB 3.2 Gen1 port.
USB is not working	No USB functionalities	Refer to input source and USB pairing table.

6. Trouble Shooting Instructions