Latitude 5290

Owner's Manual

Regulatory Model: P27S
Regulatory Type: P27S002

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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1

Working on your computer

Topics:

Safety precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructions.

Observe the following safety precautions before you perform any installation or break/fix procedures involving disassembly or reassembly:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any notebook to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power are essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing and holding the power button for 15 seconds should discharge residual power in the system board, notebooks

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done through the use of a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

Electrostatic discharge — ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main components: anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should

never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.

- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended that all field service technicians use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical that technicians keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

Before working inside your computer

1 Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2 Turn off your computer.
3 If the computer is connected to a docking device (docked), undock it.
4 Disconnect all network cables from the computer (if available).

> **CAUTION: If your computer has an RJ45 port, disconnect the network cable by first unplugging the cable from your computer.**

5 Disconnect your computer and all attached devices from their electrical outlets.
6 Open the display.
7 Press and hold the power button for few seconds, to ground the system board.

> **CAUTION: To guard against electrical shock unplug your computer from the electrical outlet before performing Step # 8.**

> **CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.**

8 Remove any installed ExpressCards or Smart Cards from the appropriate slots.

After working inside your computer

After you complete any replacement procedure, ensure you connect any external devices, cards, and cables before turning on your computer.

> **CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.**

1 Replace the battery.
2 Replace the base cover.
3 Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
4 Connect any telephone or network cables to your computer.

> **CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.**

5 Connect your computer and all attached devices to their electrical outlets.
6 Turn on your computer.

2

Removing and installing components

Topics:

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe

NOTE: The #0 screw driver is for screws 0-1 and the #1 screw driver is for screws 2-4

Screw size list

Table 1. Latitude 5290 screw size list

Component	M2*3 (Thin head)	M2.5*6.3	M2*6	M2 *5	M3*3	M2*2	M2*5	M2*2.5	M2.5*3	M2x5.4
Base cover		8								
Battery			1							
Heatsink assembly	6									
WLAN	1									
SSD card	1									
Keyboard						5				
Display assembly				4						
Display panel						2				
Power connector port	1									
Palmrest	2			3		2				
LED board	1									
System board	3									
Display hinge cover									2	
Display hinge									6	
Hard drive bracket					4					
Hard drive assembly										4
Chassis frame	2					2	3			
Touchpad panel(button)								2		
Smart card module	2									

Subscriber Identity Module(SIM) board

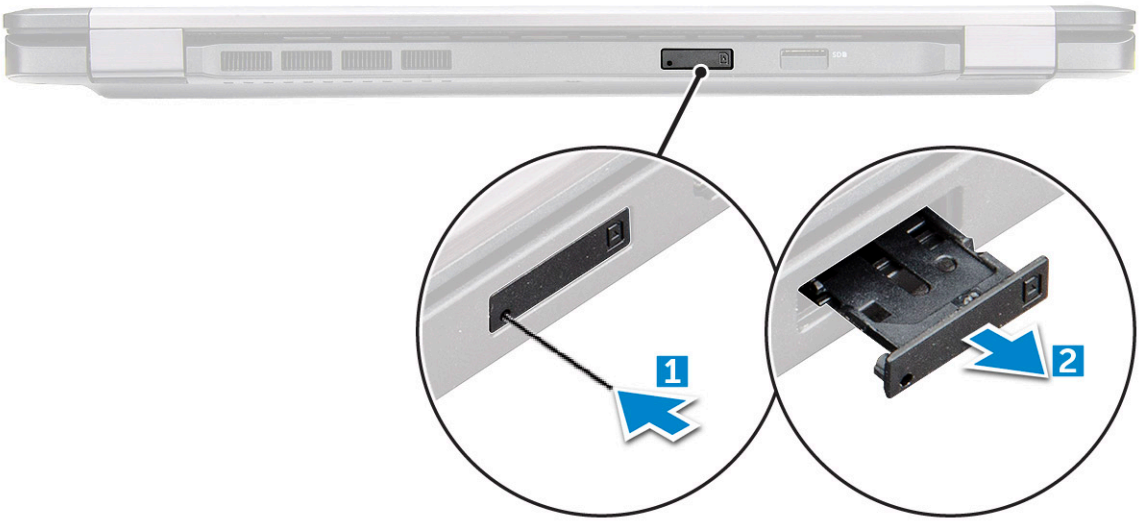
Installing the Subscriber Identification Module card

1 Insert a paperclip or a Subscriber Identification Module (SIM) card removal tool into the pinhole [1].

2 Pull the SIM card tray to remove it [2].

3 Place the SIM on the SIM card tray.

4 Push the SIM card tray into the slot until it clicks into place.



Removing the Subscriber Identification Module card

CAUTION: Removing the Subscriber Identification Module (SIM) card when the computer is on may cause data loss or damage the card. Ensure your computer is turned off or the network connections are disabled.

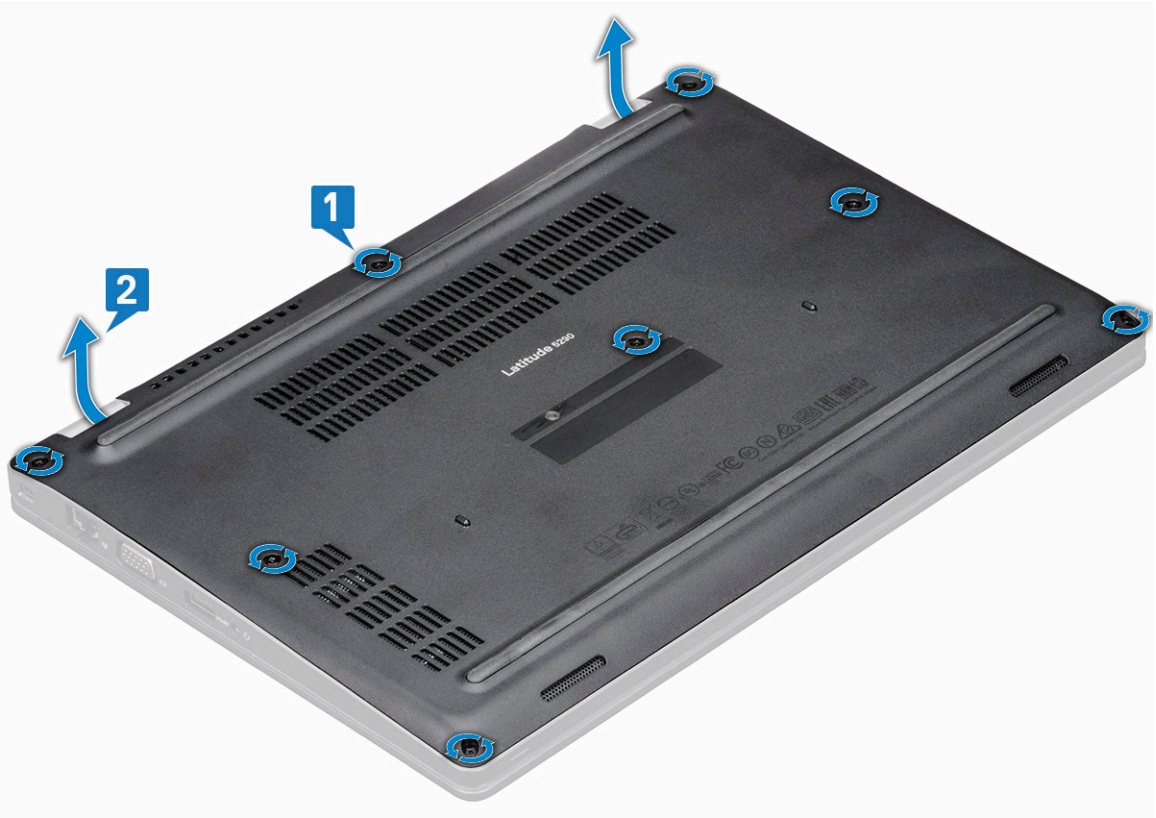
1 Insert a paperclip or a SIM card removal tool into the pinhole on the SIM card tray.
2 Pull the SIM card tray to remove it.
3 Remove the SIM card from the SIM card tray.
4 Push the SIM card tray into the slot until it clicks into place.

Base cover

Removing the base cover

1 Follow the procedure in Before working inside your computer.
2 To remove the base cover:
   a Loosen the 8 (M2.5x6.3) captive screws that secure the base cover to the system [1].
   b Pry the base cover from the edge [2] and lift the base cover away from the system.

NOTE: You may need a plastic scribe to pry the base cover from the edges.



Installing the base cover

1 Place the base cover to align with the screw holders on the system.

2 Tighten the 8 captive screws to secure the base cover to the system.

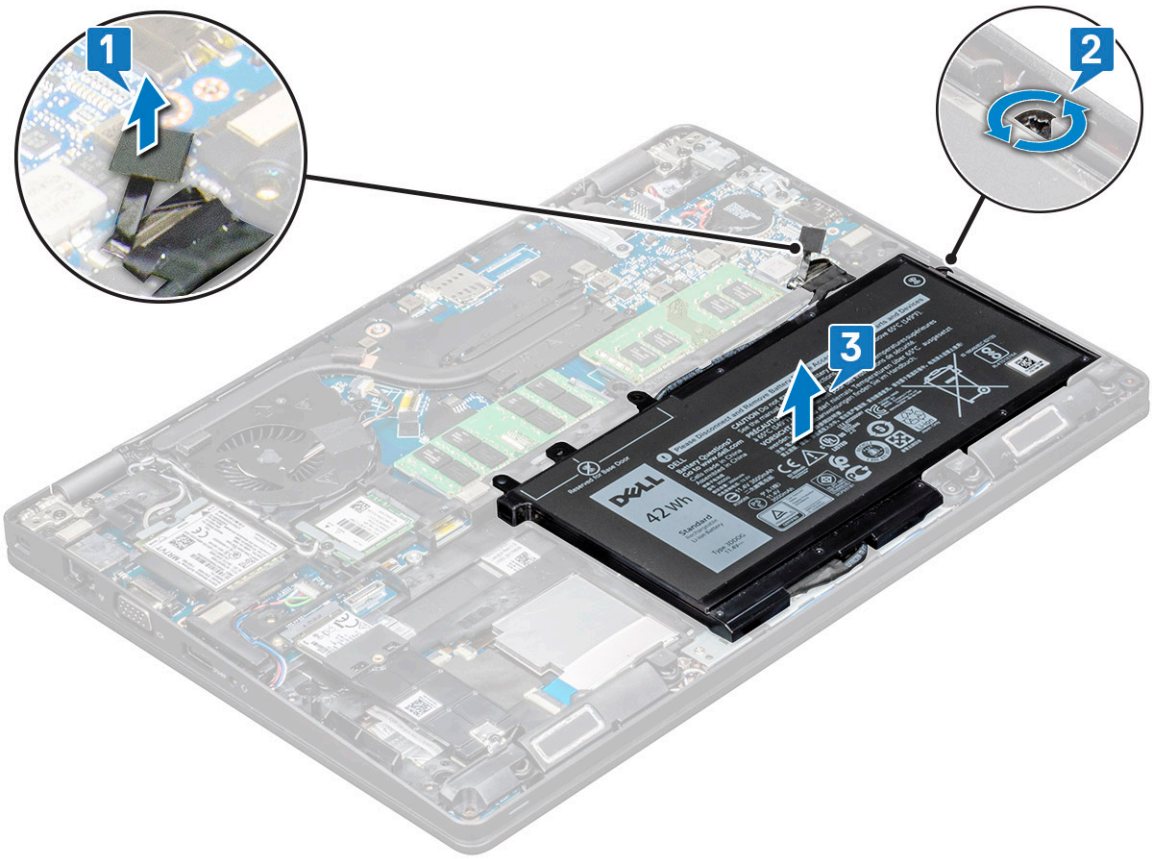
3 Follow the procedure in After working inside your computer.

Battery

Removing the battery

NOTE: 68 WHr battery supports only with the SSD card.

1 Follow the procedure in Before working inside your computer.
2 Remove the base cover.
3 To remove the battery:
   a Disconnect the battery cable from the connector on the system board [1] and unroute the cable from the routing channel.
   b Loosen the single (M2x6) captive screw that secures the battery to the system [2].
   c Lift the battery away from the system [3].



Installing the battery

1 Insert the battery into the slot on the system.
2 Route the battery cable through the routing channel.
3 Tighten the single (M2x6) captive screw to secure the battery to the system.
4 Connect the battery cable to the connector on the system board.
5 Install the base cover.
6 Follow the procedure in After working inside your computer.

Solid state drive

Removing the SSD card

1 Follow the procedure in Before working inside your computer.

2 Remove the :

a base cover

b battery

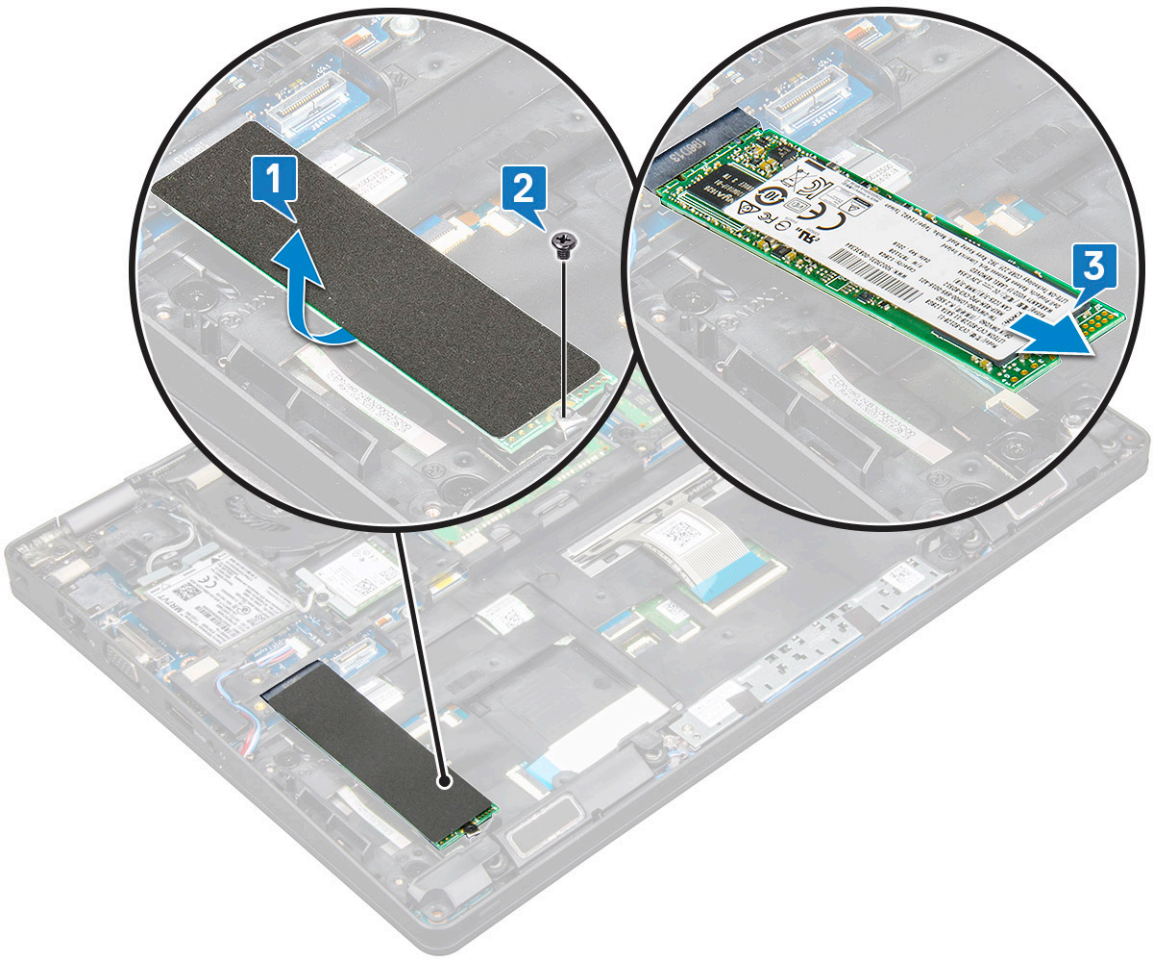
3 To remove the Solid State Drive (SSD) card:

a Peel the adhesive mylar shield that secures the SSD card [1].

NOTE: Need to be removed carefully in order to be reused on the replacement SSD.

b Remove the single (M2*3) screw that secures the SSD to the system [2].

c Slide and lift the SSD from the system [3].



Installing the SSD card

1 Insert the SSD card into the connector on the system.

2 Replace the single (M2*3) screw that secures the SSD card to the system.

3 Place the Mylar shield over the SSD.

4 Install the :

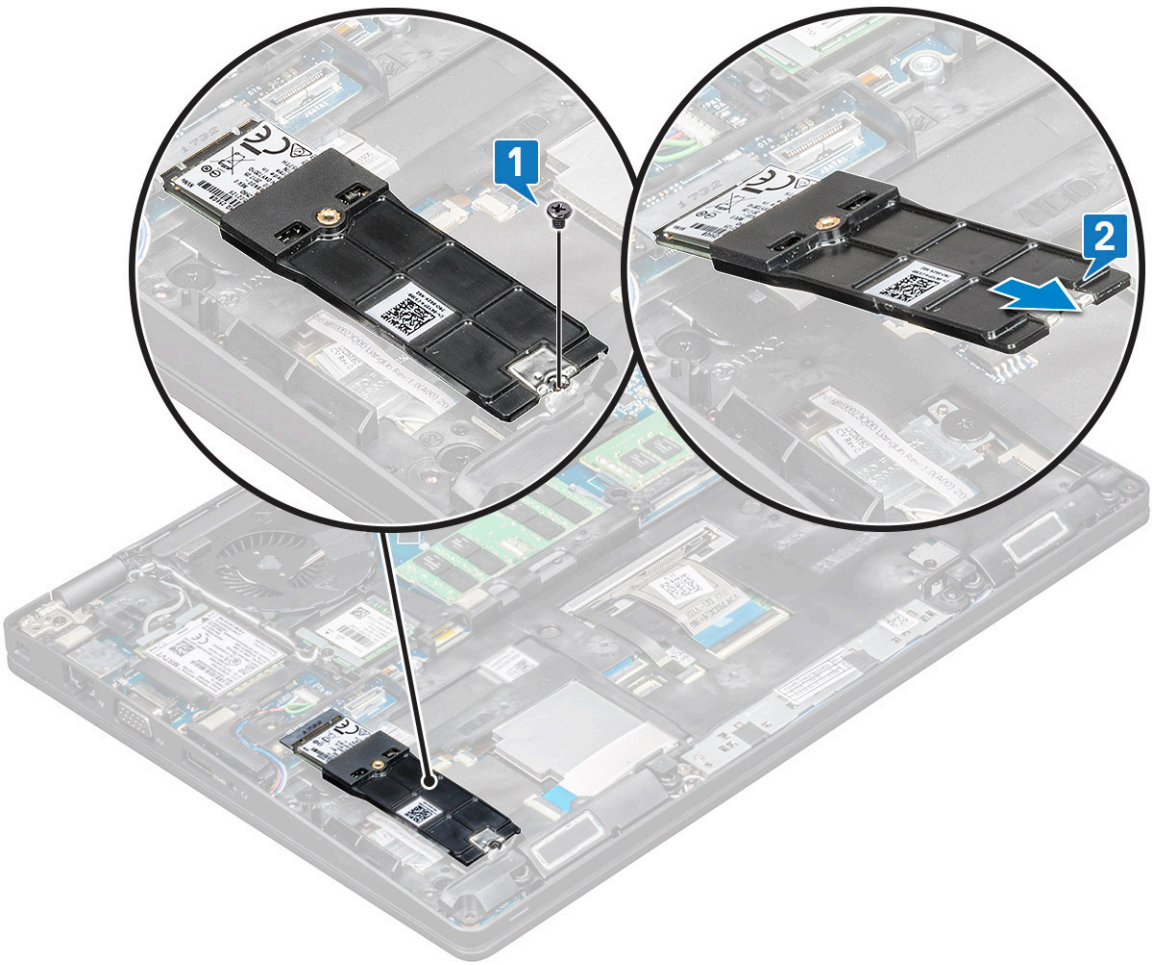
a battery
b base cover

5 Follow the procedure in After working inside your computer.

Removing the SSD with holder

For models shipped with 2230 SSDs, the SSD requires installation of a specific holder over the SSD for securing the SSD in place.

1 Follow the procedure in Before working inside your computer.
2 Remove the :
   a base cover
   b battery
3 To remove the SSD with holder:
   a Remove the single (M2*3) screw that secures the SSD holder to the system [1].
   b Slide and lift the SSD holder with SSD from the system [2].



Installing the SSD with holder

1 Insert the SSD card with holder into the connector on the system.
2 Replace the single (M2*3) screw to secure the SSD holder to the system.
3 Install the :
   a battery

b base cover

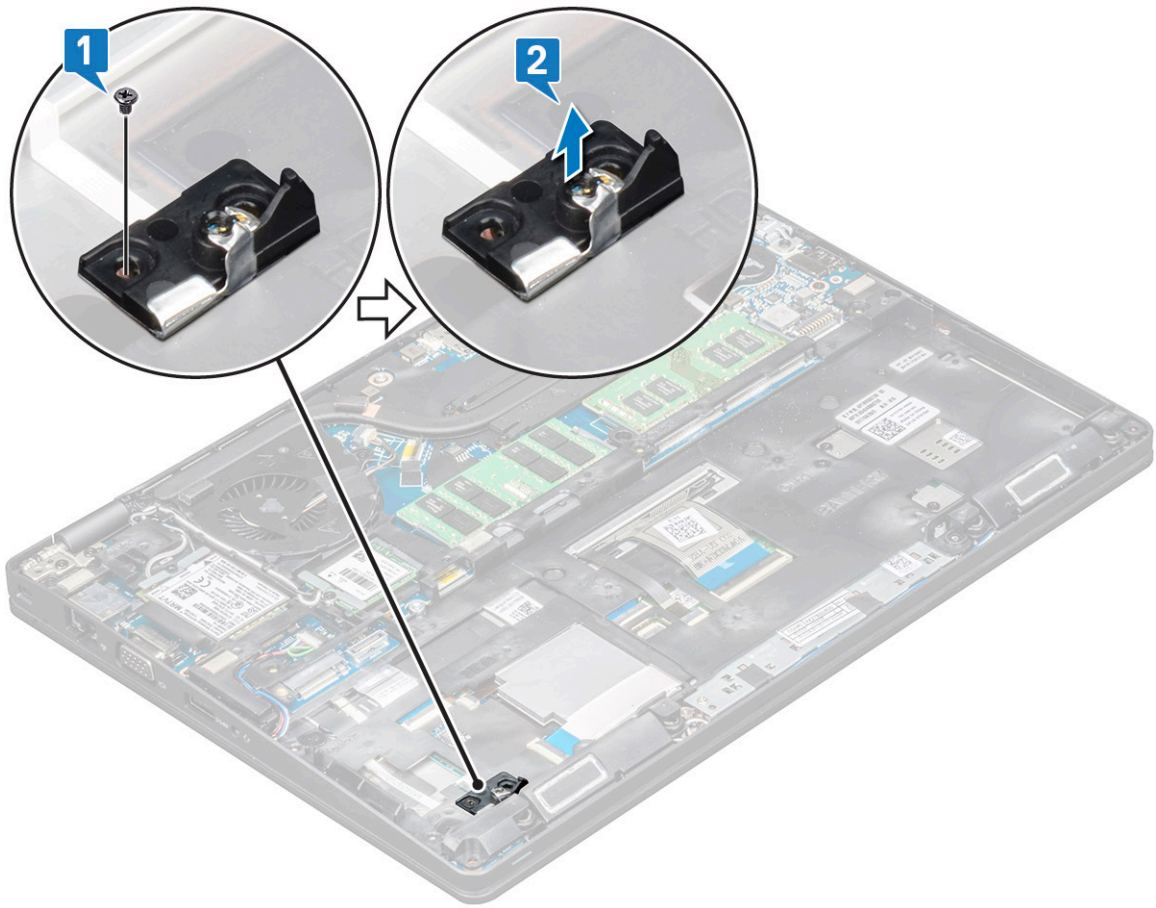
4 Follow the procedure in After working inside your computer.

Removing the SSD frame

1 Follow the procedure in Before working inside your computer.

2 Remove the:
   a base cover
   b battery
   c SSD card

3 To remove the SSD frame:
   a Remove the single (M2*3) screw that secures the SSD frame to the system [1].
   b Lift the SSD frame away from the system [2].



Installing the SSD frame

1 Place the SSD frame to the slot in the system.

2 Replace the single (M2*3) screw that secures the SSD frame to the system.

3 Install the:
   a SSD card
   b battery
   c base cover

4 Follow the procedure in After working inside your computer.

Hard drive

Removing hard drive

1 Follow the procedure in Before working inside your computer.

2 Remove the :

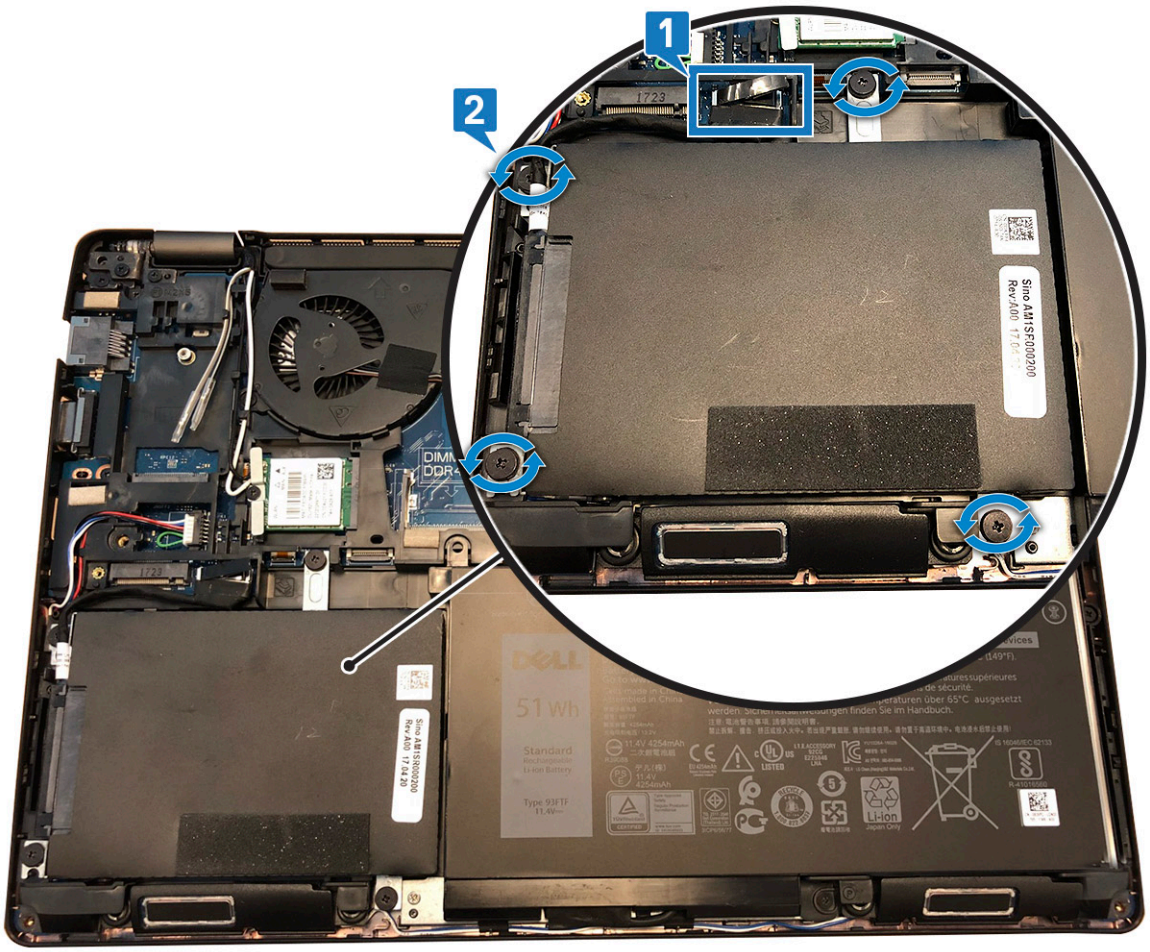
a battery

b base cover

3 To remove the hard drive:

a Disconnect the hard drive cable from the connector on the system board [1].

b Remove the 4 (M2 x 5.4) screws that secure the hard drive assembly to the system [2].



c Remove the hard drive assembly from the system.

d Remove the hard drive cable.

e Remove the 4 (M3x3) screws that secure the hard drive brackets in place.

f Lift the hard drive bracket from the hard drive.

Installing hard drive

1 Insert the hard drive into the hard drive bracket.

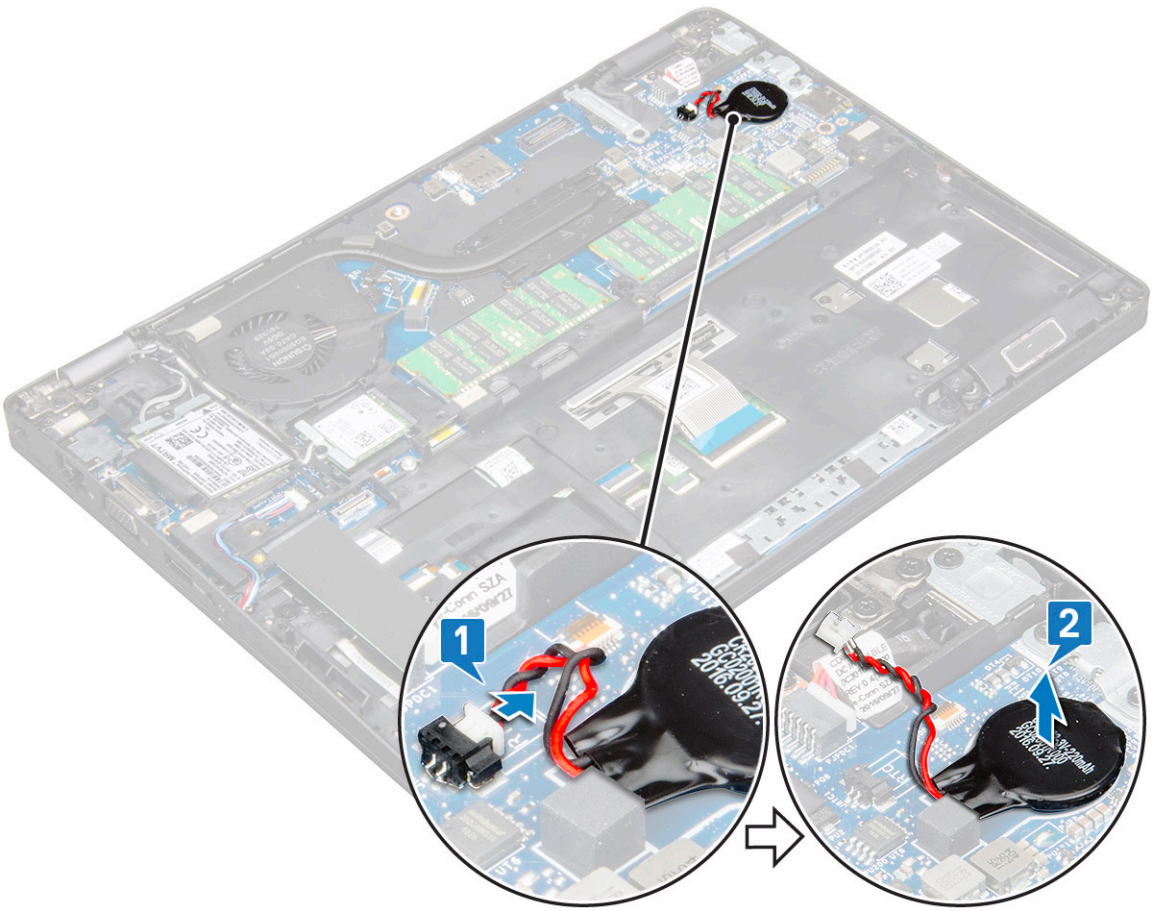
2 Replace the screws to secure the hard drive bracket to the hard drive.

3 Replace the hard drive cable.
4 Replace the screws to secure the hard drive assembly to the system.
5 Connect the hard drive cable to the connector on the system board.
6 Install the :
   a battery
   b base cover
7 Follow the procedures in After working inside your system.

Coin cell battery

Removing the coin cell battery

1 Follow the procedure in Before working inside your computer.
2 Remove the :
   a base cover
   b battery
3 To remove the coin cell battery:
   a Disconnect the coin cell battery cable from the connector on the system board [1].
   b Lift the coin cell battery to release from the adhesive and lift it away from the system board [2].



Installing coin cell battery

1 Affix the coin cell battery on the system board.
2 Connect the coin cell battery cable to the connector on the system board.
3 Install the :
   a battery
   b base cover
4 Follow the procedure in After working inside your computer.

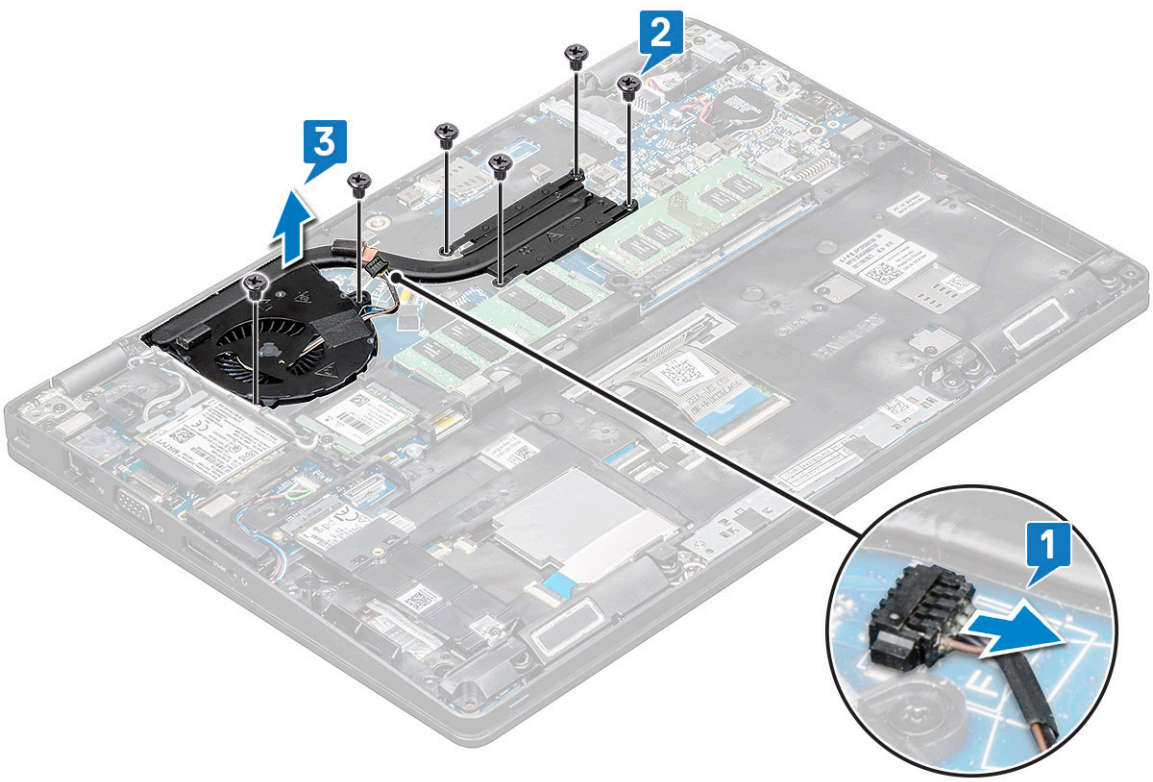
Heat sink assembly

Removing the heat sink assembly

1 Follow the procedure in Before working inside your computer.
2 Remove the :
   a base cover
   b battery
3 To remove the heat sink assembly:
   a Disconnect the system fan cable from the connector on the system board [1].
   b Remove the 2 (M2*3) screws that secure the fan and the 4 (M2x3) screws that secure the heat sink on the system board [2].

   NOTE:
   - Remove the heat sink screws in sequential order as indicated on the heat-sink.
   - The WLAN cables need to be moved aside to access one of the heat sink assembly screws.

   c Lift the heat sink assembly away from the system [3].



Installing the heat sink assembly

1 Place the heat sink assembly on the system board.

2 Replace the 2 (M2*3) screws that secure the fan and the 4 (M2x3) screws that secure the heat sink on the system board.

NOTE:

- Replace the heat sink screws in sequential order as indicated on the heat-sink.
- The WLAN cables need to be moved aside to access one of the heat sink assembly screws.

3 Install the :

a battery

b base cover

4 Follow the procedure in After working inside your computer.

WLAN card

Removing WLAN card

1 Follow the procedure in Before working inside your computer.

2 Remove the :

a base cover

b battery

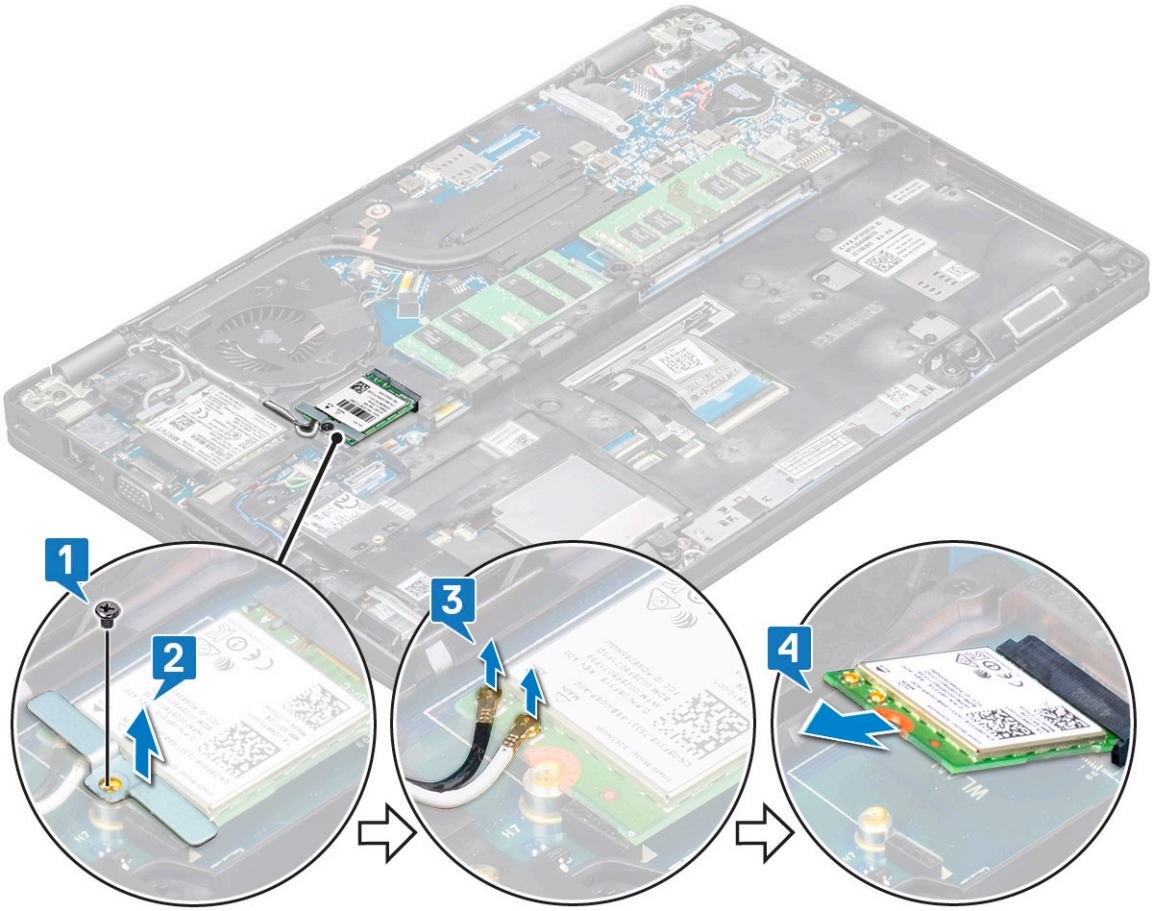
3 To remove the WLAN card:

a Remove the single (M2*3) screw that secures the WLAN card bracket to the system [1].

b Remove the WLAN card bracket that secures the WLAN antenna cables [2].

c Disconnect the WLAN antenna cables from the connectors on the WLAN card [3].

d Lift the WLAN card away from the connector as shown in the figure [4].



Installing WLAN card

1 Insert the WLAN card into the connector on the system board.
2 Connect the WLAN antenna cables to the connectors on the WLAN card.
3 Place the WLAN card bracket to secure the WLAN cables.
4 Replace the single M2*3 screw to secure the WLAN card to the system.
5 Install the :
   a battery
   b base cover
6 Follow the procedure in After working inside your computer.

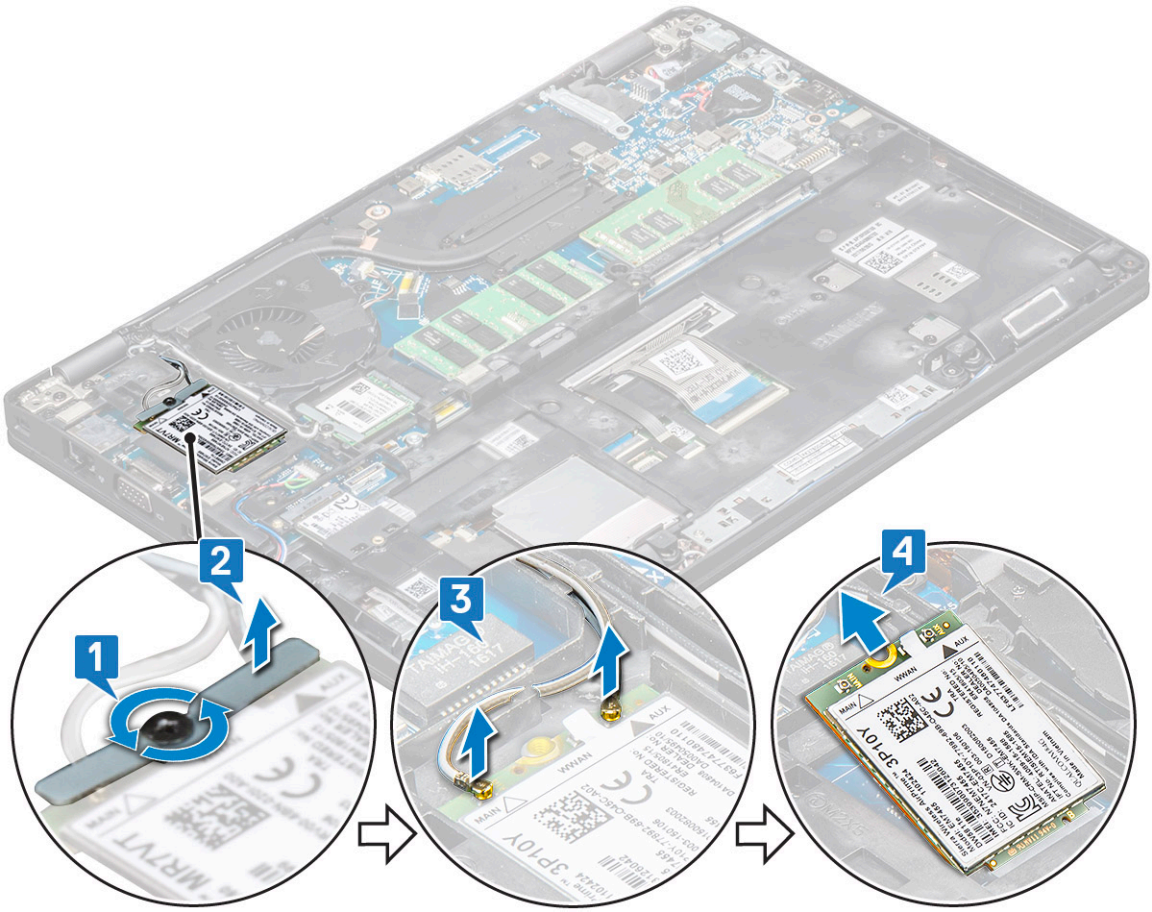
WWAN card – optional

This is optional as the system might not ship with WWAN card.

Removing the WWAN card

1 Follow the procedure in Before working inside your computer.
2 Remove the :
   a base cover
   b battery
3 To remove the WWAN card:

a Remove the single (M2x3) screw that secures the WWAN card bracket [1].
b Remove the metal bracket away from the system [2].
c Disconnect the WWAN antenna cables from the connectors on the WWAN card [3].
d Slide and lift the WWAN card from the system [4].



Installing the WWAN card

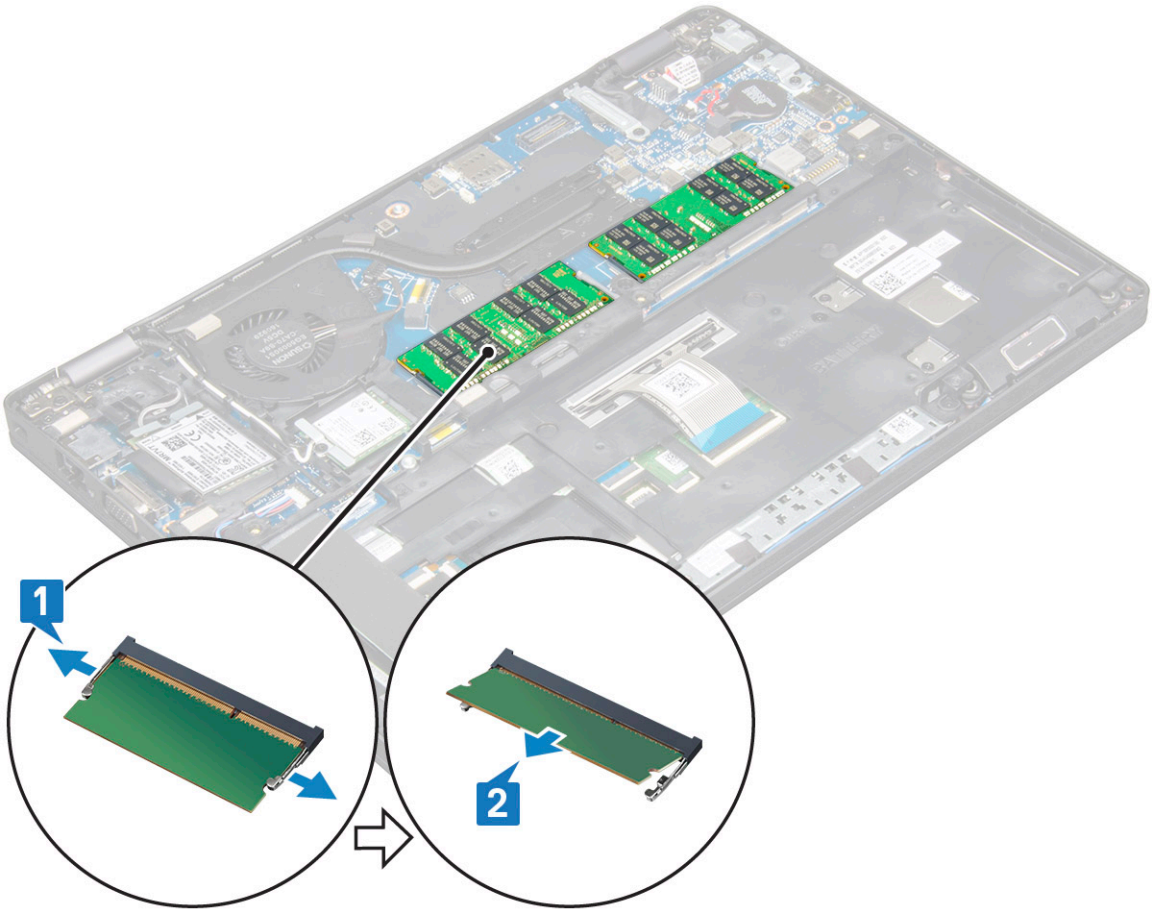
1 Insert the WWAN card into the slot on the system.
2 Connect the WWAN antenna cables to the connectors on the WWAN card.
3 Replace the screw to secure the WWAN card to the computer.
4 Install the :
  a battery
  b base cover
5 Follow the procedure in After working inside your computer.

Memory modules

Removing the memory module

1 Follow the procedure in Before working inside your computer.
2 Remove the :
  a base cover
  b battery

3 To remove the memory module:
   a Pry the clips securing the memory module until the memory module pops-up [1].
   b Lift the memory module away from the connector [2].



Installing the memory module

1 Insert the memory module into the memory connector at a 30 degree angle until the contacts are fully seated into the slot. Then, depress the module until the clips secure the memory module.
2 Install the :
   a battery
   b base cover
3 Follow the procedure in After working inside your computer.

Keyboard

Removing keyboard lattice

1 Follow the procedure in Before working inside your computer.
2 Pry the keyboard lattice from the edges [1] and lift the lattice away from the system [2].

NOTE: Gently pull or lift keyboard lattice in clockwise or anticlockwise direction to avoid breakage.

Installing keyboard lattice

1 Place the keyboard lattice on the keyboard and press along the edges as well as in between the rows of keys until the lattice clicks in place.

2 Follow the procedure in After working inside your computer.

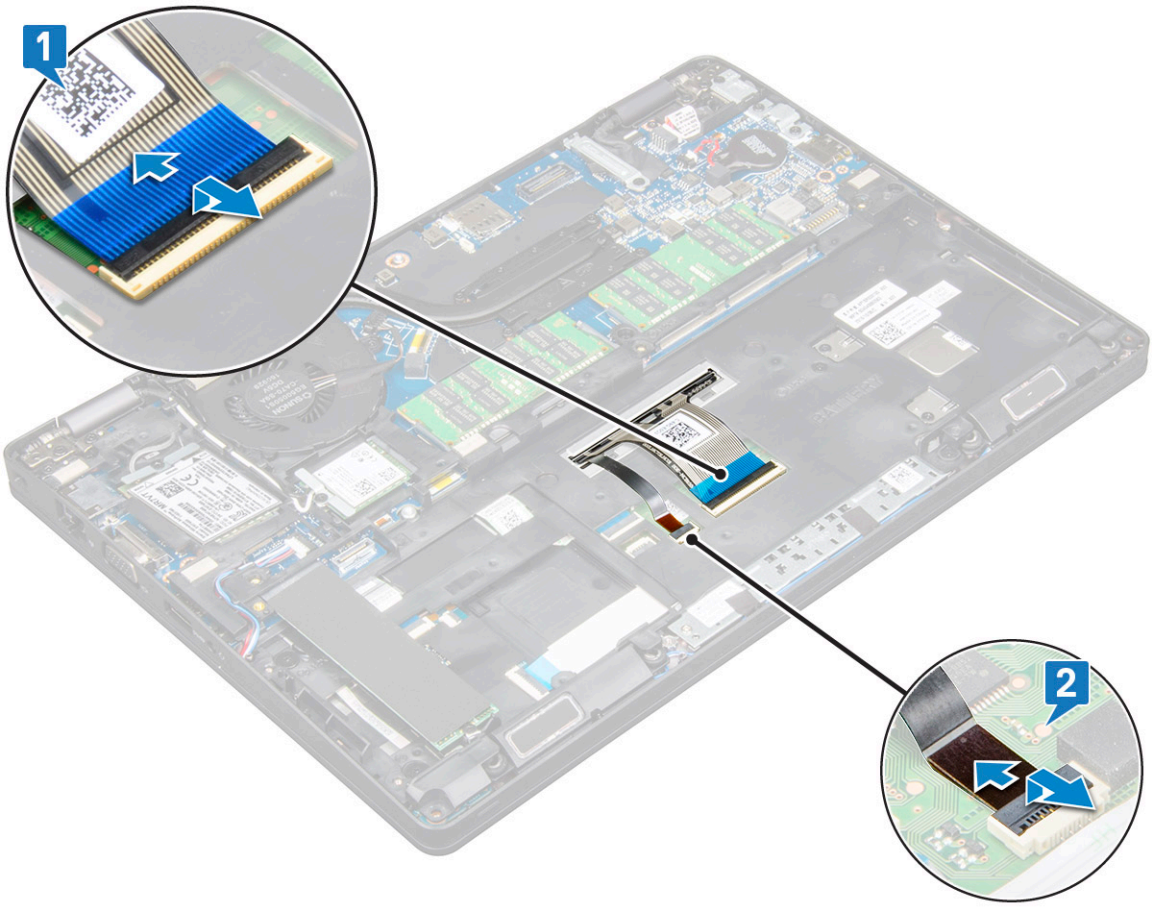
Removing the keyboard

1 Follow the procedure in Before working inside your computer.

2 Remove the:
   a base cover
   b battery
   c keyboard lattice

3 To remove the keyboard:
   a Lift the latch and disconnect the keyboard cable from the connector [1] on the system.
   b Lift the latch and disconnect the keyboard backlight cable from the connector [2] on the system.

   NOTE: Number of cables to disconnect is based on the keyboard type.



c Turn over the system and open the laptop in working mode.

d Remove the 5 (M2*2) screws that secure the keyboard to the system [1].

e Pry the keyboard from the bottom side and lift it away from the system [2] along with the keyboard cable and the keyboard back light cable.

WARNING: Gently pull the keyboard cable and the keyboard back light cable routed under the system to avoid damage to the cables.


1
2

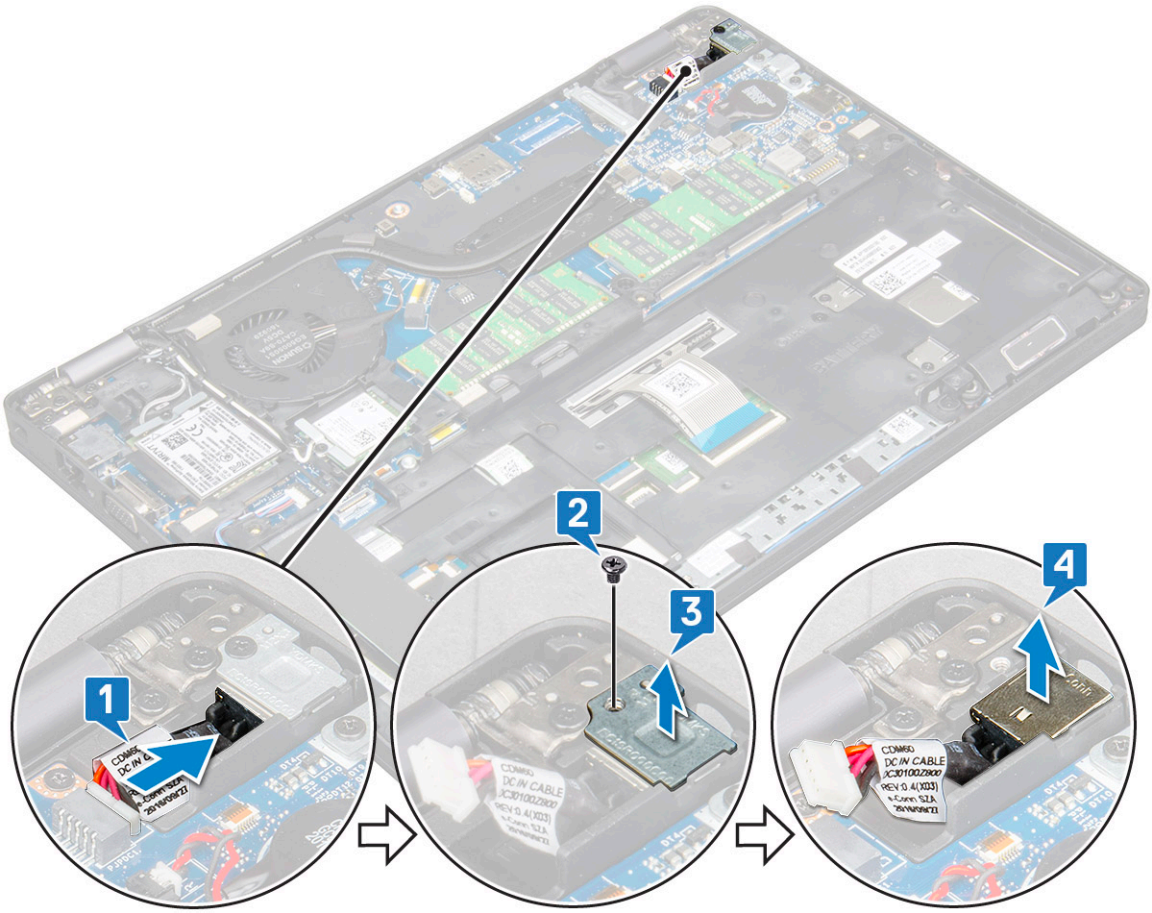
Installing the keyboard

1 Hold the keyboard and route the keyboard cable and the keyboard backlight cable through the palmrest in the system.
2 Align the keyboard with the screw holders on the system.
3 Replace the screws to secure the keyboard to the system.
4 Turn the system and connect the keyboard cable and the keyboard backlight cable to the connector in the system.
5 If you have not removed the battery, you must connect the battery cable to the system board.
6 Install the:
   a keyboard lattice
   b battery
   c base cover
7 Follow the procedure in After working inside your computer.

Power connector port

Removing the power connector port

1 Follow the procedure in Before working inside your computer.
2 Remove the :
   a base cover
   b battery
3 To remove the power connector port:
   a Disconnect the power connector cable from the connector on the system board [1].
   b Remove the single M2x3 screw to release the power connector bracket that secures the power connector port to your system [2].
   c Remove the power connector bracket from the system [3].
   d Pull the power connector port, and lift it away from the system [4].



Installing power connector port

1 Align the power connector port along the grooves on the slot and push it down.
2 Place the metal bracket on the power connector port.
3 Replace the single (M2x3) screw to secure the power connector bracket to the power connector port.
4 Connect the power connector cable to the connector on the system board.
5 Install the :
   a battery
   b base cover
6 Follow the procedure in After working inside your computer.

Chassis frame

Removing the chassis frame

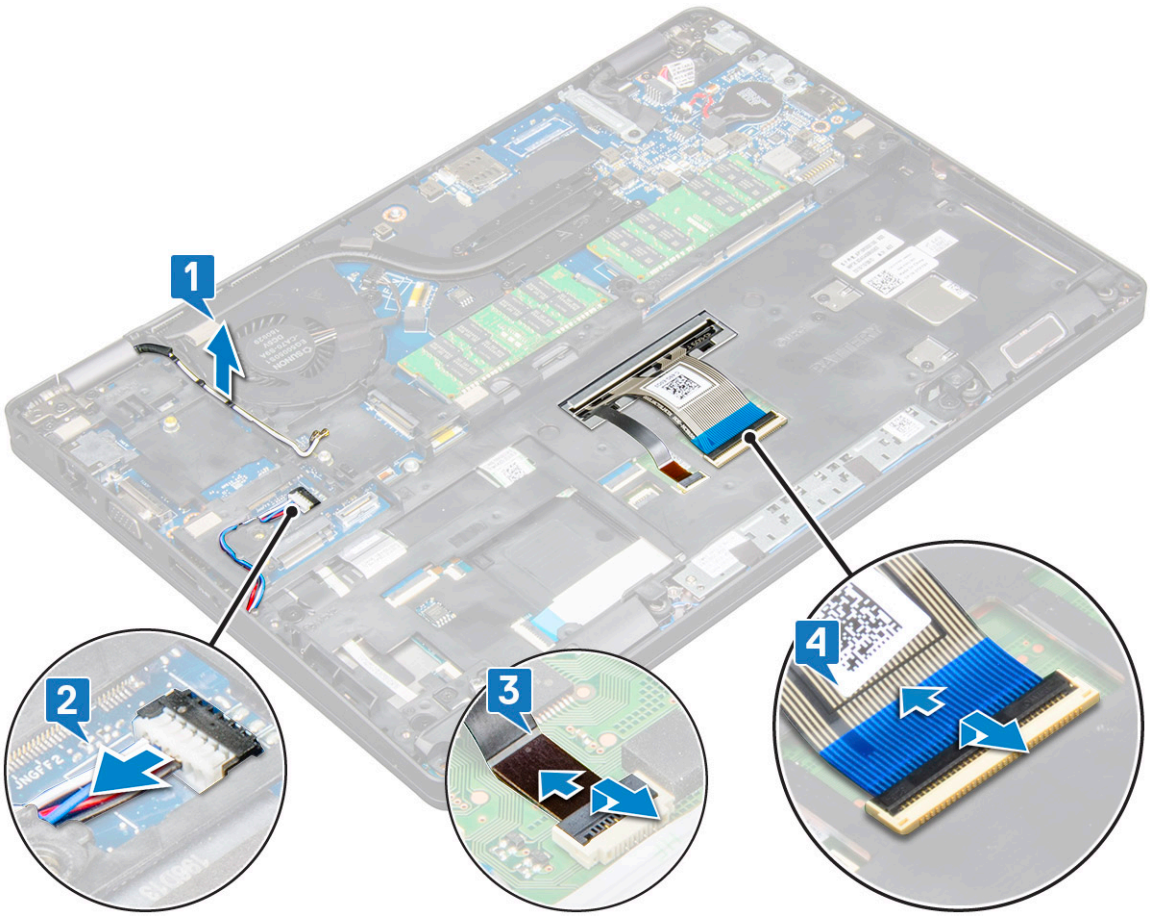
1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a base cover
   b battery
   c memory module
   d hard drive assembly
   e SSD card

f SSD with holder
g SSD frame
h WLAN card
i WWAN card (optional)

3 To release the chassis frame:

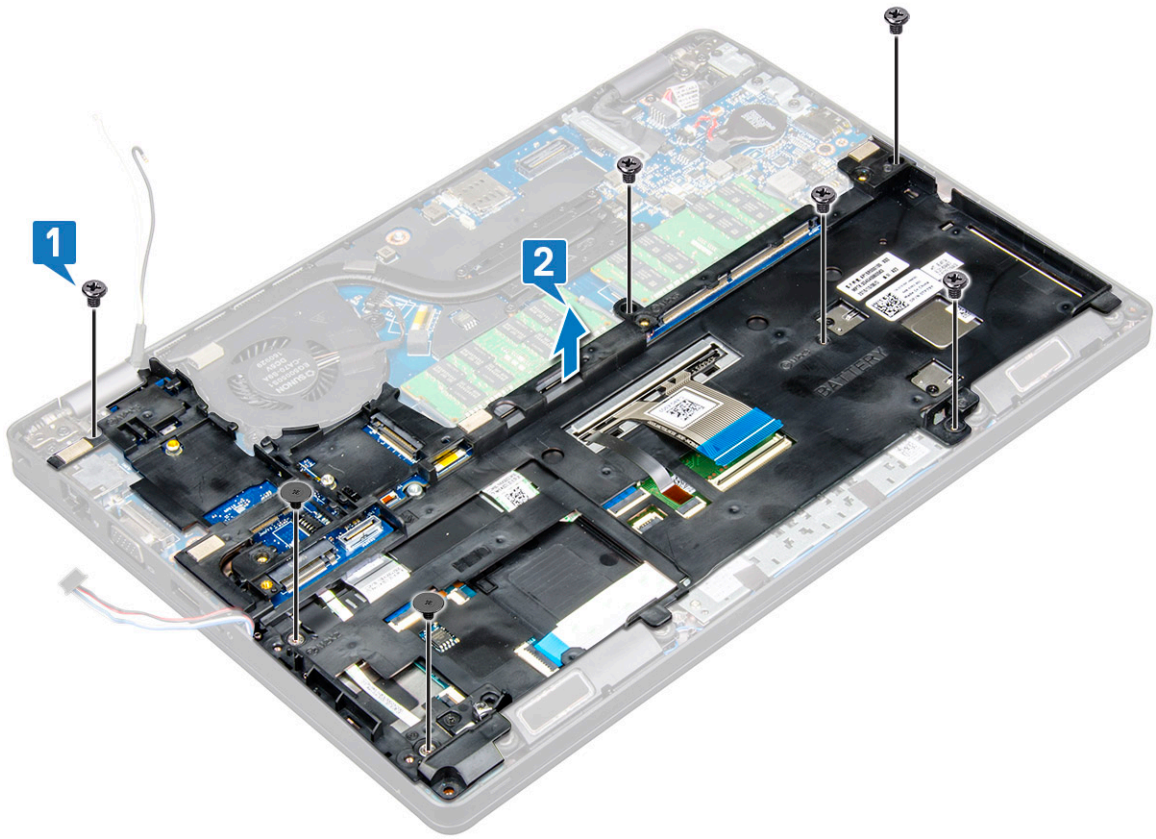
a Release the WLAN and WWAN cables from the routing channels [1].
b Disconnect the speaker cable from the connector on the system board [2].
c Unroute the cable from the routing channel.
d Lift the latch and disconnect the keyboard backlight cable and the keyboard cable from the connector [3, 4] on the system.

NOTE: There may be more than one cable to disconnect based on the keyboard type.



4 To remove the chassis frame:

a Remove the 2 (M2x3) screws, 3 (M2x5) screws and the 2 (M2x2) screws that secure the chassis frame to the system [1].
b Lift the chassis frame away from the system [2].



Installing the chassis frame

1 Place the chassis frame into the slot on the system.

2 Replace the 2 (M2x3) screws, 3 (M2x5) screws and the 2 (M2x2) screws to secure the chassis frame to the system.

3 Connect the keyboard cable and the keyboard backlight cable to the connector on the system.

NOTE: There may be more than one cable to connect based on keyboard types. The keyboard cables need to go through the chassis frame not under it.

4 Route the WLAN and WWAN (optional) cables through the routing channels.

5 Route and connect the speaker cable to the connector in the system board.

6 Install the:

- a WWAN card (optional)
- b WLAN card
- c SSD frame
- d SSD with holder
- e SSD card
- f hard drive assembly
- g memory module
- h battery
- i base cover

7 Follow the procedure in After working inside your system.

SmartCard module

Removing smart card reader board

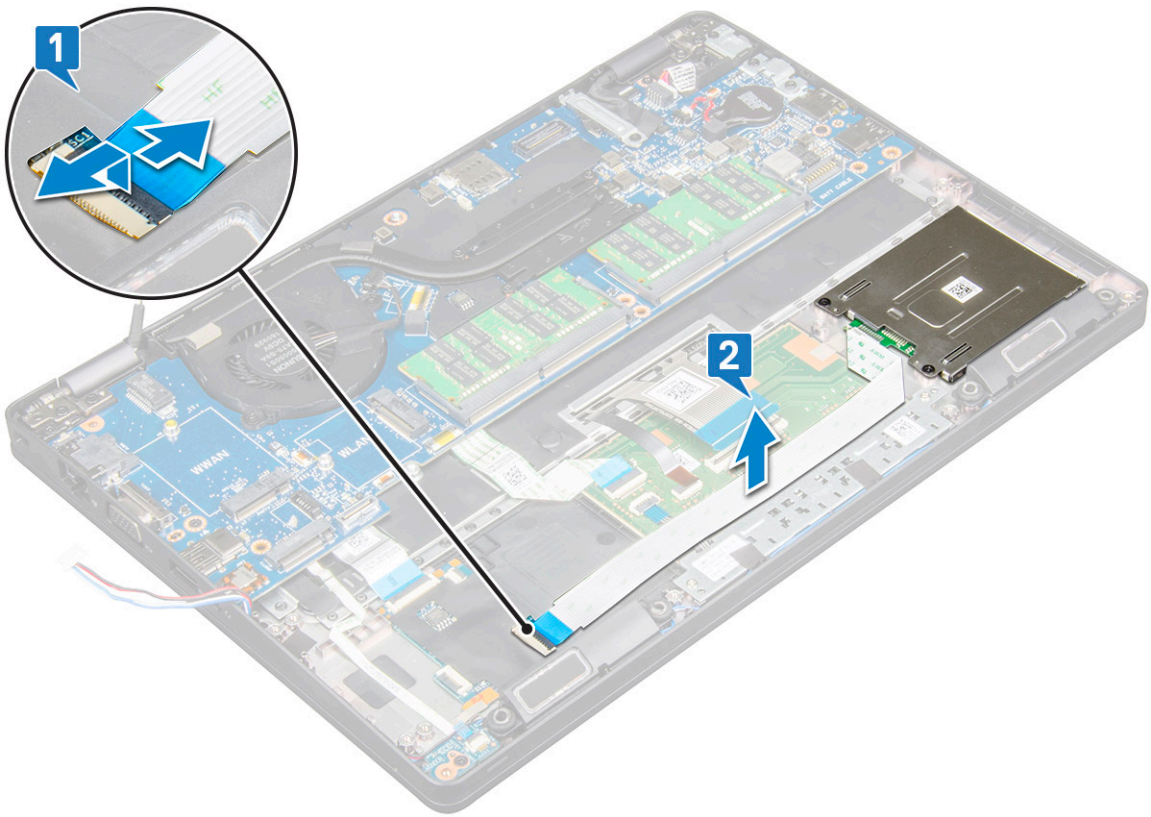
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a base cover
- b battery
- c hard drive assembly
- d SSD card
- e SSD with holder
- f SSD frame
- g WLAN card
- h WWAN card (optional)
- i chassis frame

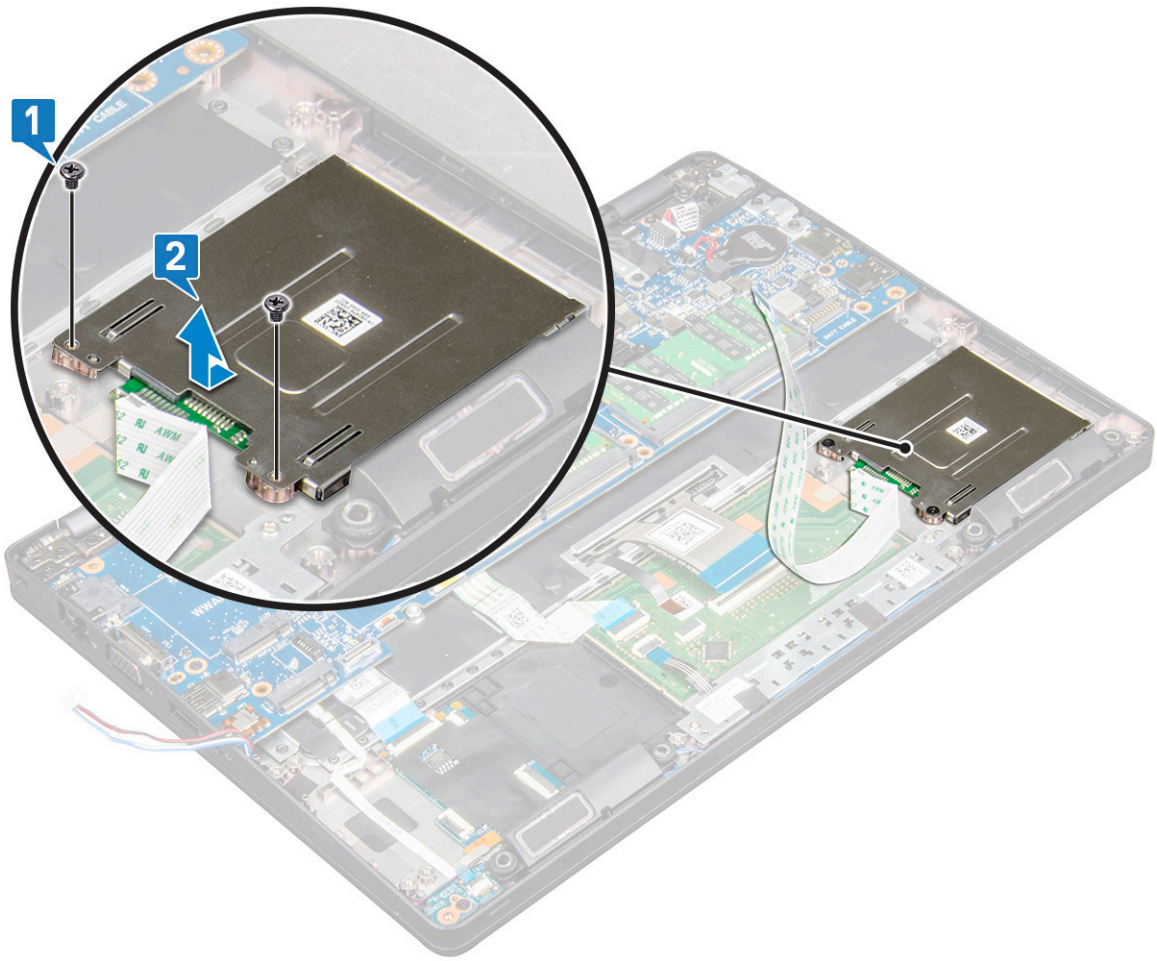
3 To release the smart card reader board:

- a Lift the latch and disconnect the smart card reader board cable from the connector [1].
- b Peel the cable from the palmrest [2].



4 To remove the smart card reader board:

- a Remove the 2 (M2x3) screws that secure the smart card reader board to the palmrest [1].
- b Slide and lift the smart card reader from the slot in the system [2].



Installing smart card reader board

1 Insert the smart card reader board to align with the tabs on the chassis.
2 Replace the 2 (M2x3) screws to secure the smart card reader board to the system.
3 Affix the smart card reader board cable and connect the cable to the connector.
4 Install the:
   a chassis frame
   b WWAN card (optional)
   c WLAN card
   d SSD frame
   e SSD with holder
   f SSD card
   g hard drive assembly
   h battery
   i base cover
5 Follow the procedure in After working inside your computer.

Speaker

Removing the speaker

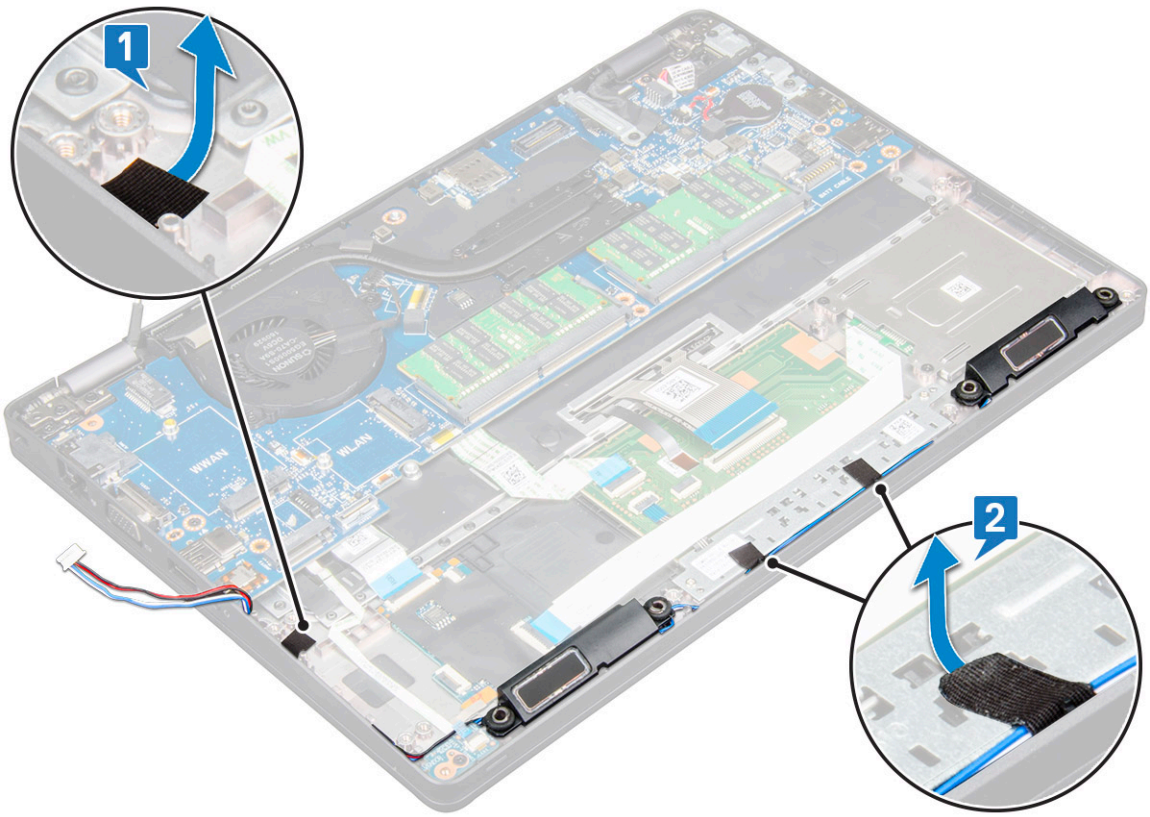
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a base cover
- b battery
- c memory module
- d hard drive assembly
- e SSD card
- f SSD with holder
- g SSD frame
- h WLAN card
- i WWAN card (optional)
- j chassis frame

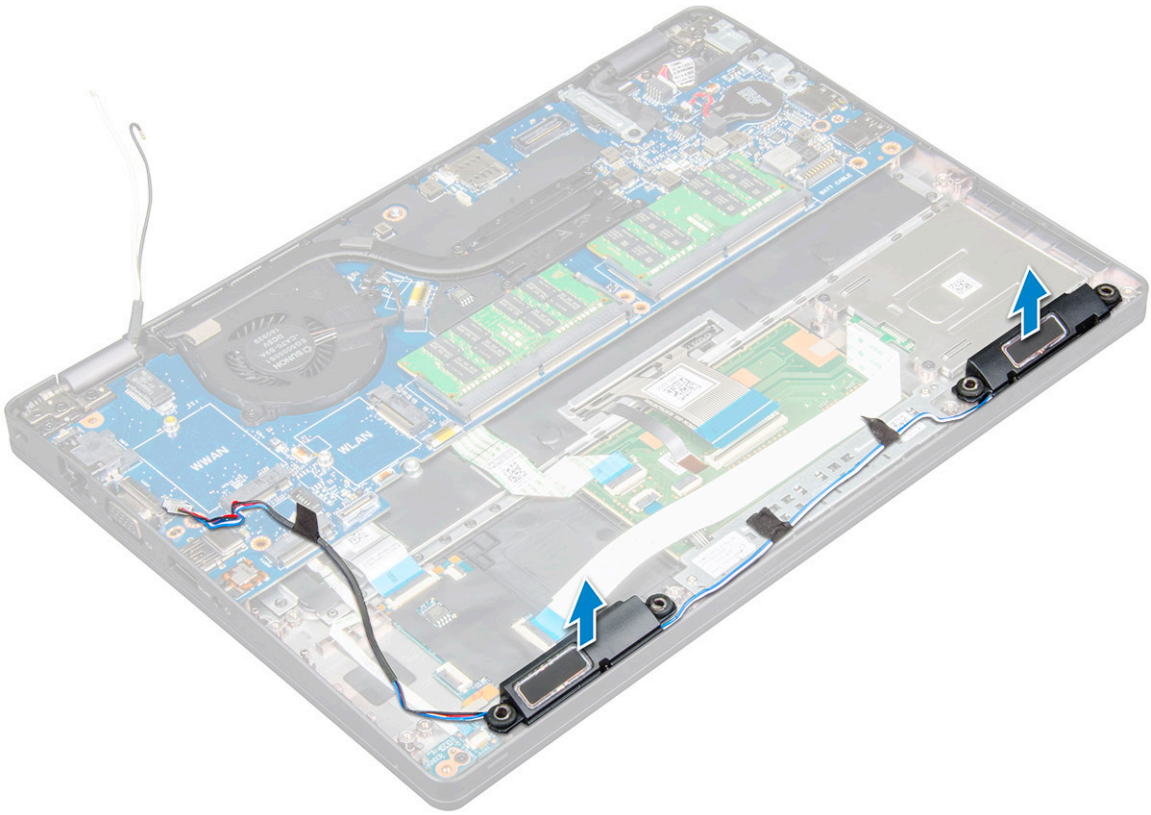
3 To remove the speakers:

a Peel the 3 pieces of adhesive tapes that secure the speaker cables [1] [2].



b Unroute the speaker cables from the routing channels.

c Lift the speaker away from the computer.



Installing the speaker

1 Insert the speaker module aligning it with the nodes on the chassis.
2 Route the speaker cable through the routing channels.
3 Affix the 3 adhesive tapes to secure the speaker cable.
4 Install the:
   a chassis frame
   b WWAN card (optional)
   c WLAN card
   d SSD frame
   e SSD with holder
   f SSD card
   g hard drive assembly
   h memory module
   i battery
   j base cover
5 Follow the procedure in After working inside your computer.

System board

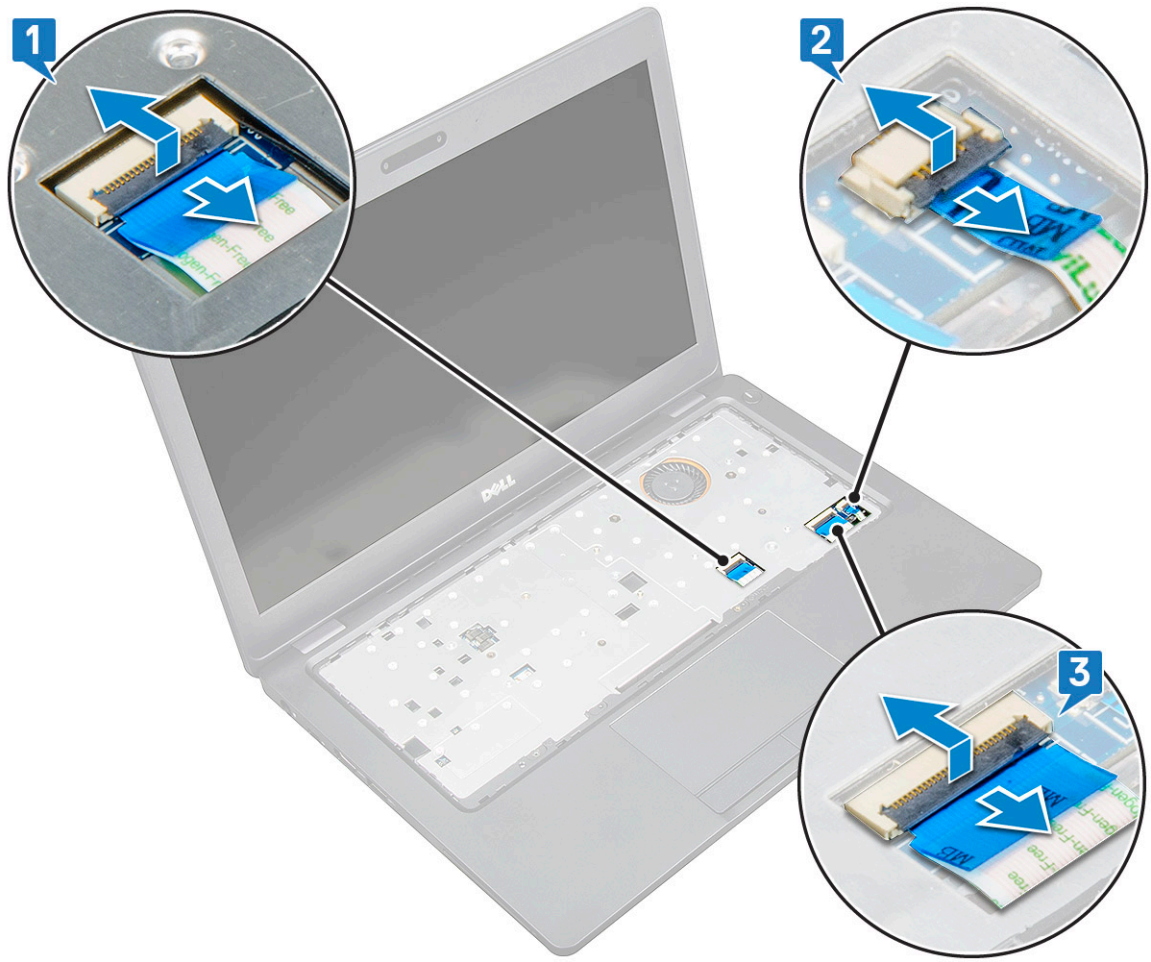
Removing system board

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a SIM card

b base cover
c battery
d memory module
e hard drive assembly
f SSD card
g SSD with holder
h SSD frame
i WLAN card
j WWAN card (optional)
k keyboard lattice
l keyboard
m heat sink assembly
n chassis frame

3 Disconnect the following cables from the system board:

a Touchpad cable [1]
b LED board cable [2]
c USH cable [3]

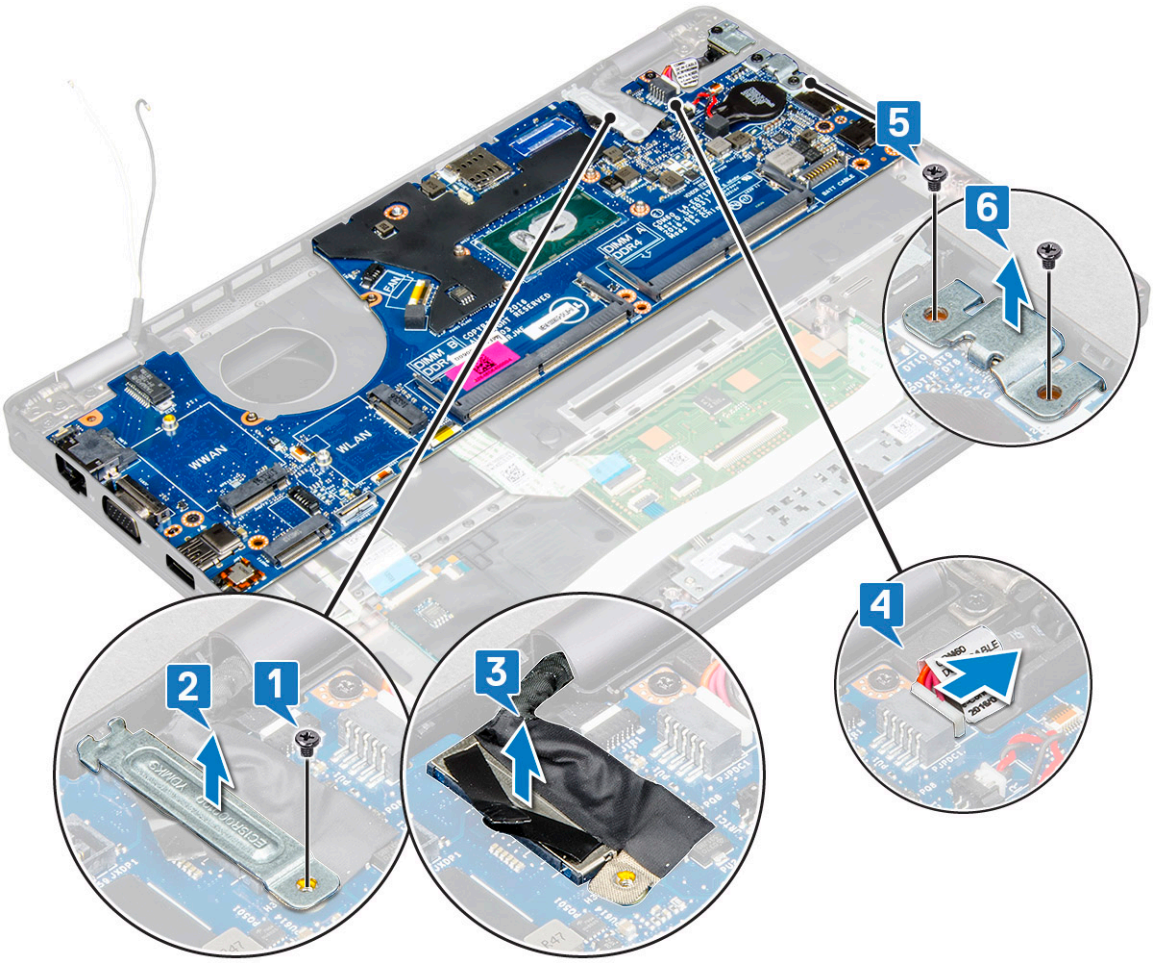


4 To release the system board:

a Flip over the system and remove the single M2*3 screw that secures the display cable bracket in place [1].
b Lift the metal display cable bracket from the system [2].
c Disconnect the display cable from the connectors on the system board [3].
d Disconnect the power connector port cable from the connector on the system board [4].
e Remove the 2 (M2*5) screws that secure the type-C USB bracket in place [5].

NOTE: The metal bracket secures the DisplayPort over USB Type-C.

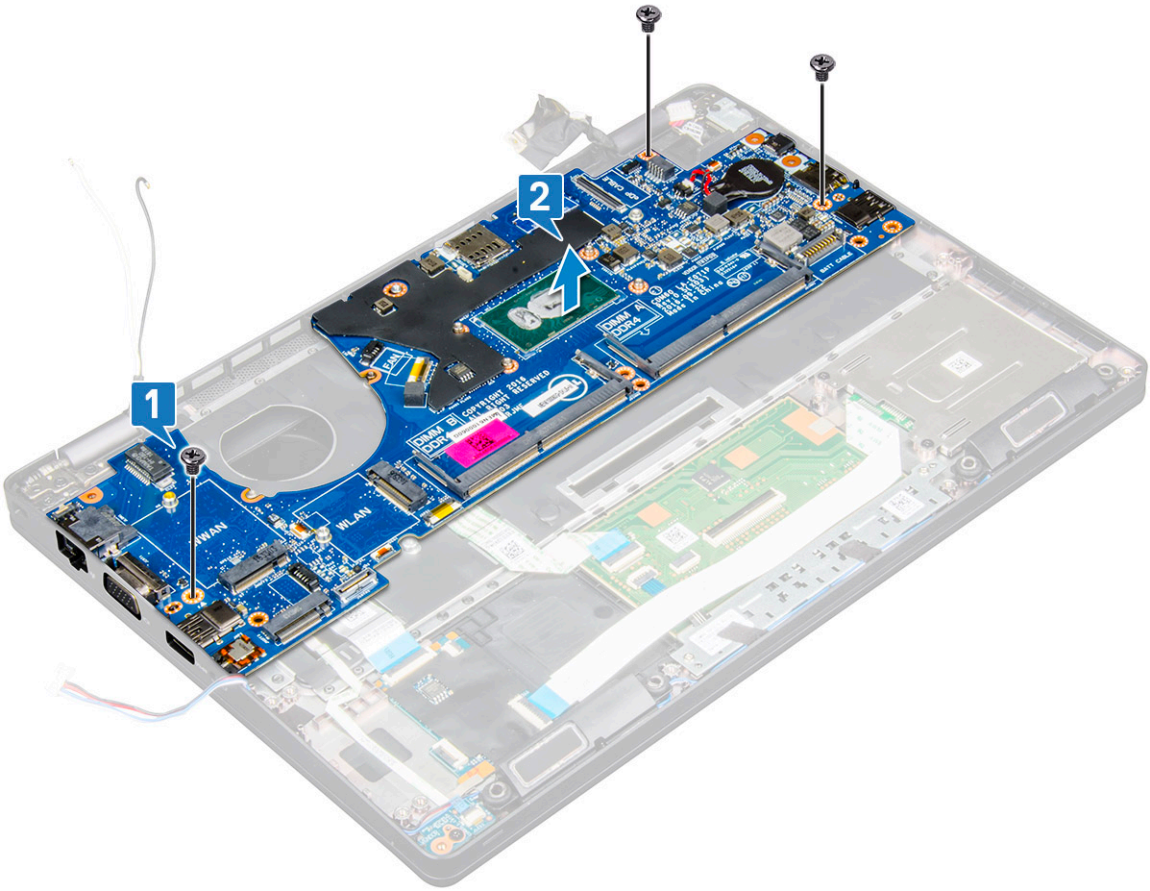
f Lift the metal bracket away from the system [6].



5 To remove the system board:

a Remove the 3 (M2x3) screws that secure the system board in place [1].

b Lift the system board away from the system [2].



Installing system board

1 Align the system board with the screw holders on the computer.
2 Replace the 3 (M2*3) screws to secure the system board to the system.
3 Place the metal bracket to secure the DisplayPort over USB Type-C.
4 Replace the 2 (M2*5) screws to secure the metal bracket on the DisplayPort over USB Type-C.
5 Connect the power connector port cable to the connector on the system board.
6 Connect the display cable to the connector on the system board.
7 Place the display cable metal bracket to its place over the display cable.
8 Replace the single (M2*3) screw to secure the metal bracket.
9 Connect the following cables:
   a Touchpad cable
   b LED board cable
   c USH board cable
10 Install the:
   a chassis frame
   b heat sink assembly
   c keyboard
   d keyboard lattice
   e WWAN card (optional)
   f WLAN card
   g SSD frame
   h SSD with holder
   i SSD card

j hard drive assembly
k memory module
l battery
m base cover
n SIM card

11 Follow the procedure in After working inside your computer.

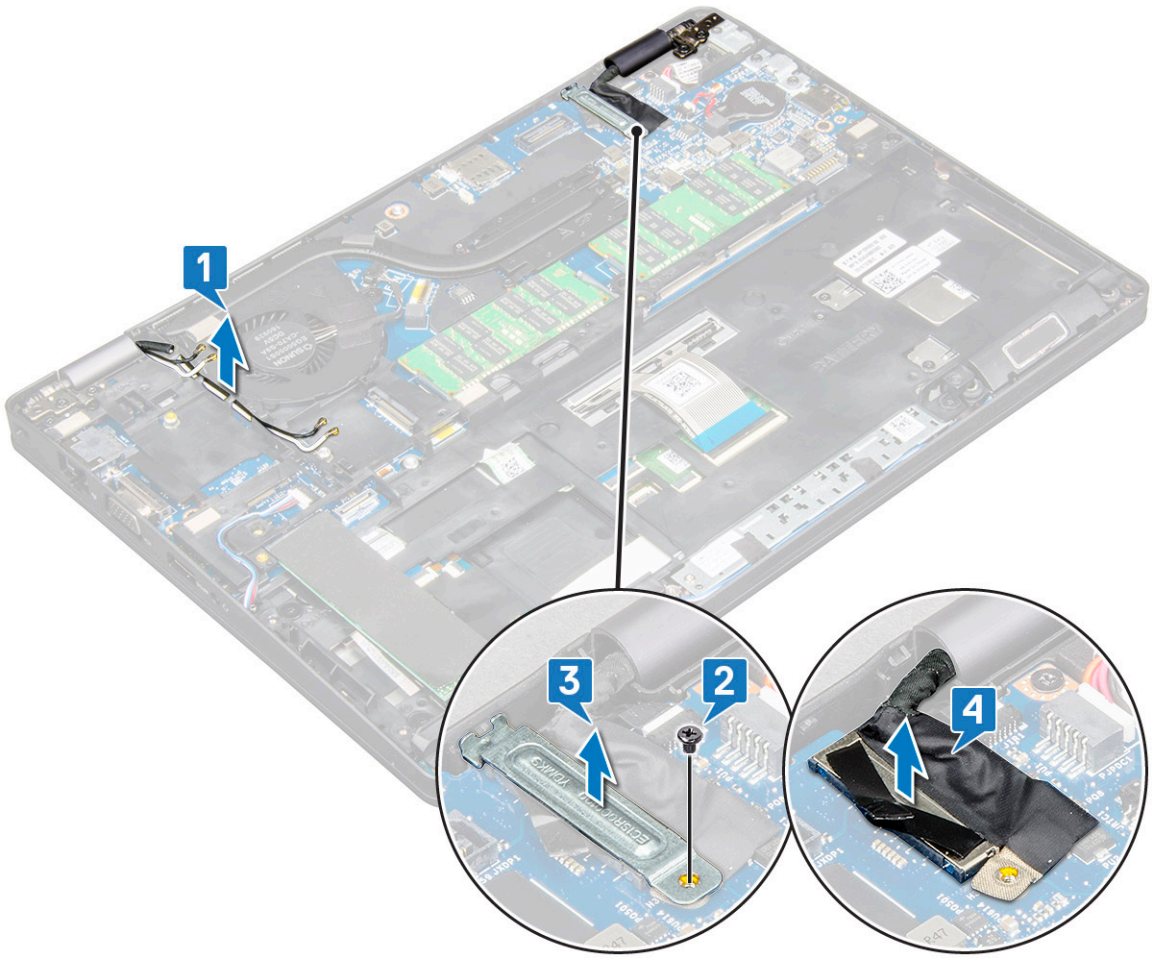
Display assembly

Removing display assembly

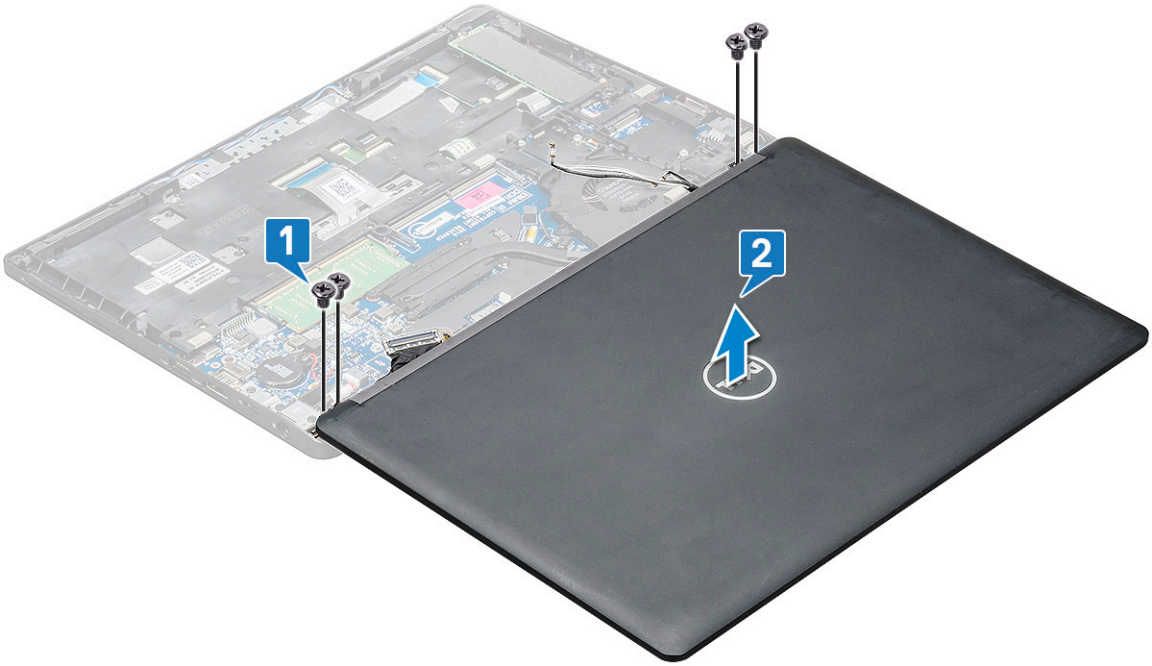
1 Follow the procedure in Before working inside your computer.

2 Remove the:
- a base cover
- b battery
- c memory module
- d WLAN card
- e WWAN card (optional)

3 To disconnect the display cable:
- a Release the WLAN and WWAN cables from the routing channels [1].
- b Remove the single (M2x3) screw that secures the display cable bracket in place [2].
- c Remove the display cable bracket that secures the display cable from the system [3].
- d Disconnect the display cable from the connector on the system board [4].



4 Place the computer on the edge of a plane surface with the display facing down.
5 To remove the display assembly:
   a Remove the 4 (M2*5) screws that secure the display assembly to the system [1].
   b Lift the display assembly away from the system [2].



Installing display assembly

1 Place the chassis on the edge of a plane surface.
2 Align the display assembly to align with the screw holders on the system.
3 Replace the 4 (M2*5) screws to secure the display assembly to the system.
4 Lift the computer and close the display.
5 Connect the display cable to the connector on the system board.
6 Place the metal bracket to secure the display cable.
7 Replace the single M2*5 screw to secure the metal bracket to the system.
8 Route the WLAN and WWAN cables through the routing channels.
9 Install the:
   a WWAN card (optional)
   b WLAN card
   c hinge cover
   d battery
   e base cover
10 Follow the procedure in After working inside your computer.

Display bezel

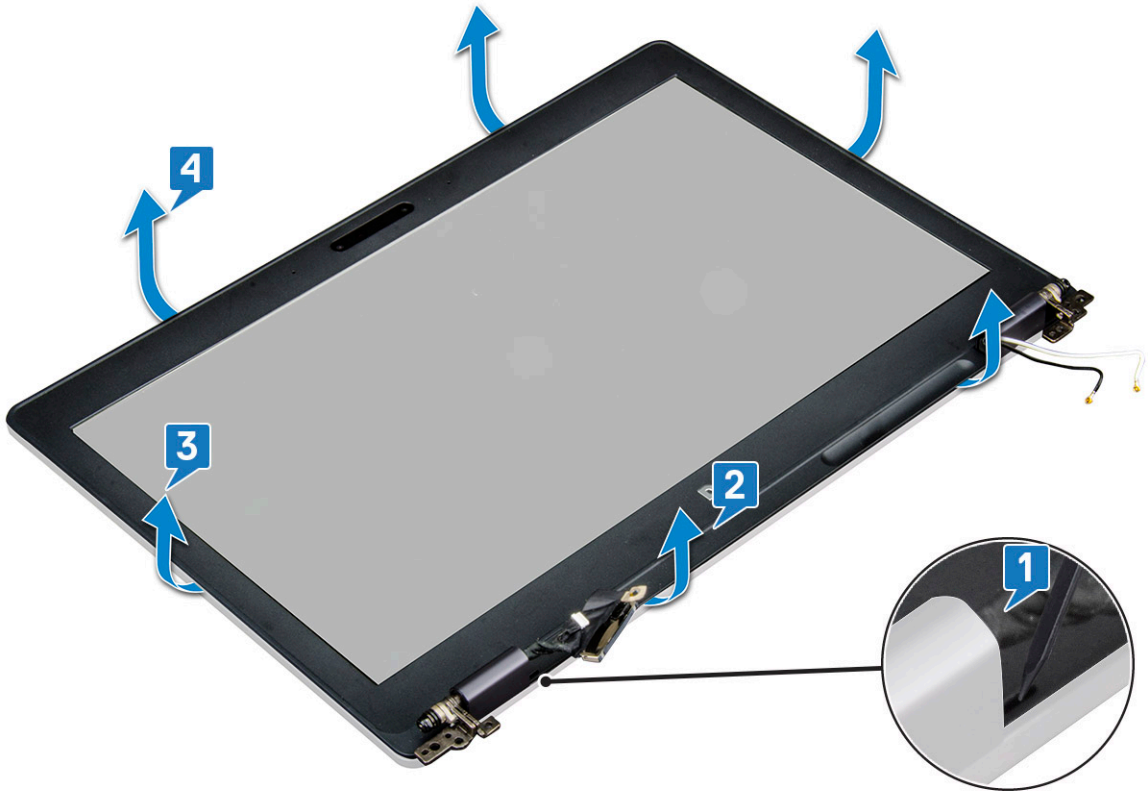
Removing display bezel - non-touch

1 Follow the procedure in Before working inside your computer.
2 Remove the:

a base cover
b battery
c WLAN card
d WWAN card (optional)
e display assembly

3 To remove the display bezel:
a Pry the display bezel at the base of the display [1].
b Lift the display bezel to release it [2].
c Pry the edges on the side of the display to release the display bezel [3, 4].

CAUTION: The adhesive used on the LCD bezel to seal it with the LCD itself, makes it hard to remove the bezel as the adhesive is very strong and tends to stay stuck to the LCD portion and can peel the layers up or crack the glass when trying to pry the two items apart.



Installing display bezel - non-touch

1 Place the display bezel on the display assembly.

NOTE: Remove the protective covering on the adhesive on the LCD bezel before placing on the display assembly.

2 Starting from the top corner, press on the display bezel and work around the entire bezel until it clicks on to the display assembly.
3 Install the:
a display assembly
b WWAN card (optional)
c WLAN card
d battery
e base cover
4 Follow the procedure in After working inside your computer.

Display hinge cover

Removing display hinge cover - non-touch

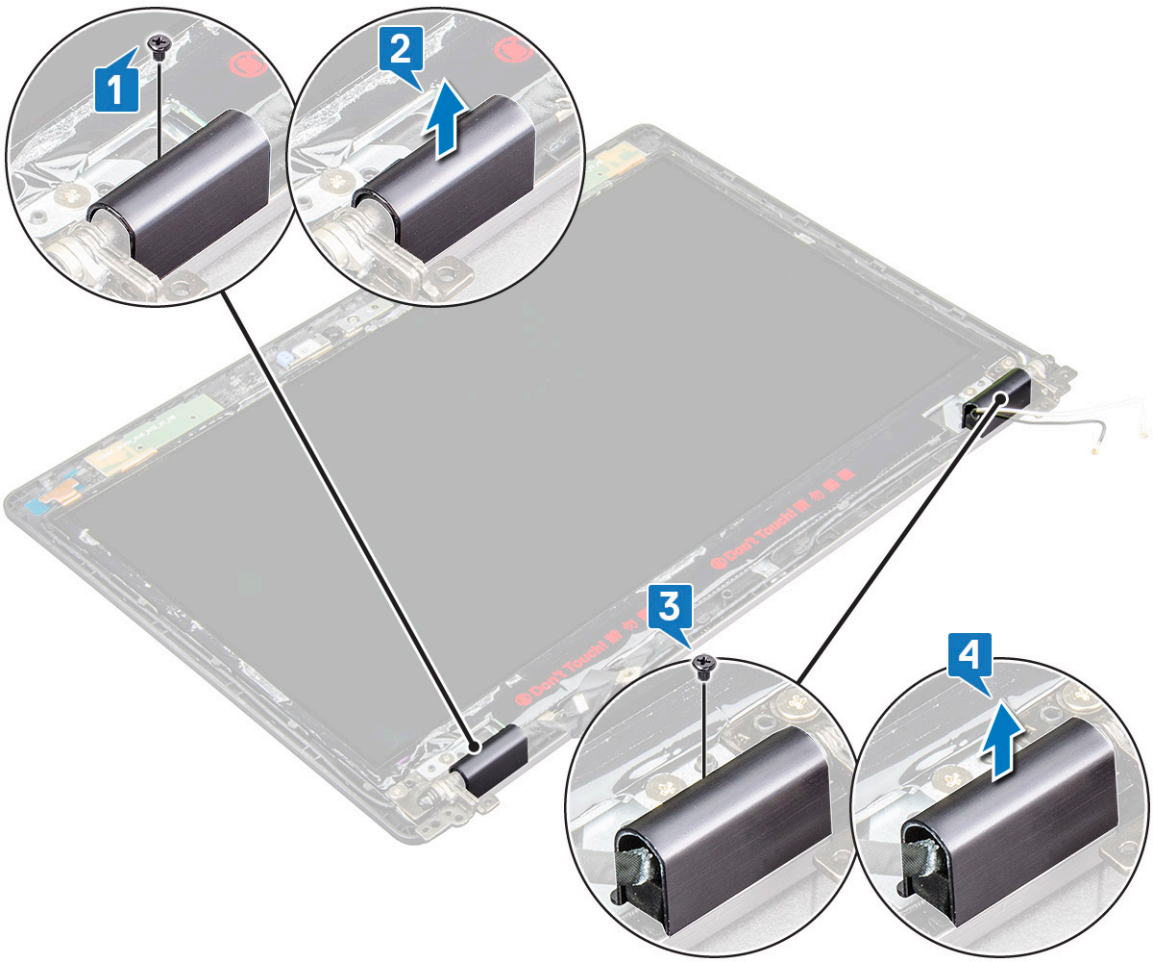
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a base cover
- b battery
- c memory module
- d WLAN card
- e WWAN card (optional)
- f display assembly
- g display bezel

3 To remove the display hinge cover:

- a Remove the single (M2.5*3) screw that secures the display hinge cover to the chassis [1].
- b Lift the display hinge cover away from the display hinge [2].
- c Repeat step a and step b to remove the other display hinge cover [3] [4].



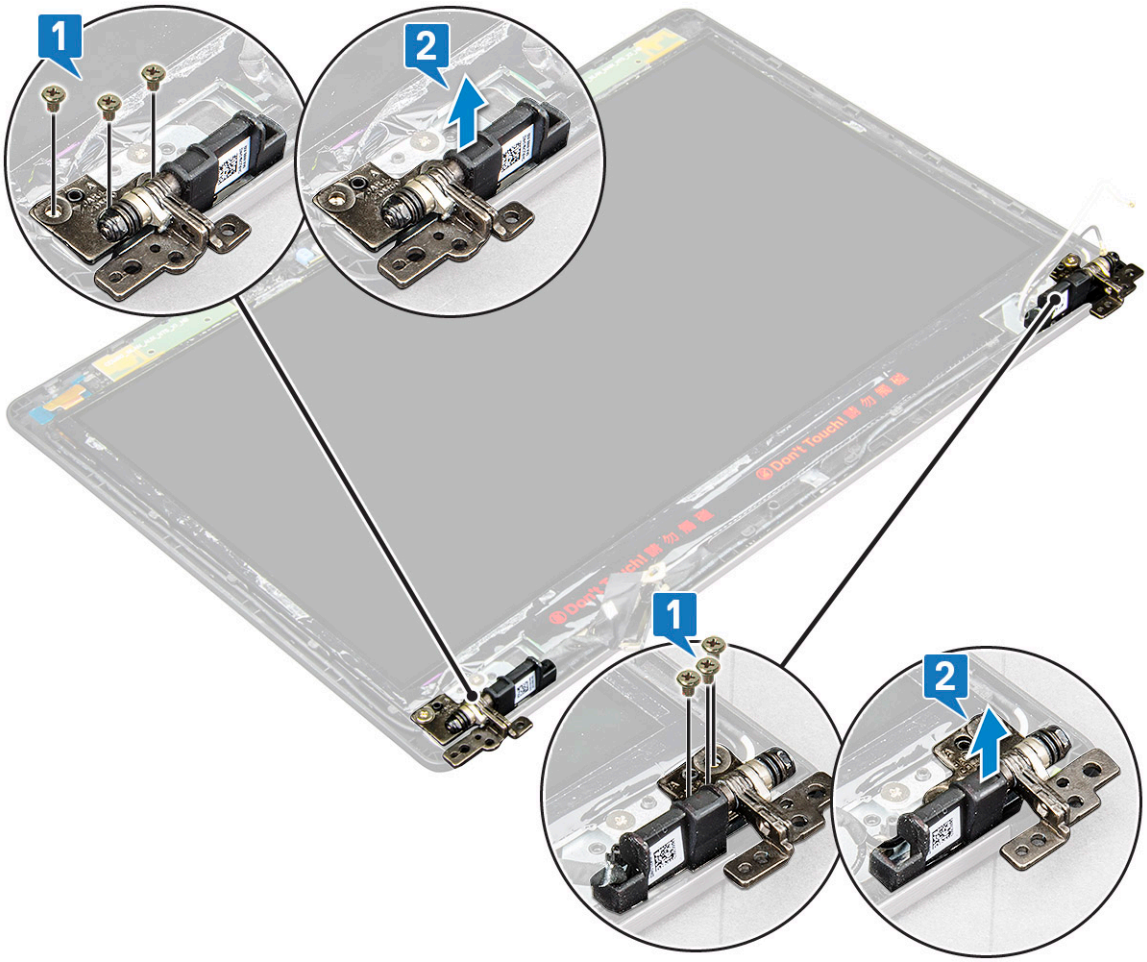
Installing display hinge cover - non-touch

1 Place the display hinge cover on the display hinge.
2 Replace the (M2.5*3) screw to secure the display hinge cover to the display hinge.
3 Repeat step 1 and step 2 to install the other display hinge cover.
4 Install the:
   a display bezel
   b display assembly
   c WLAN card
   d WWAN card (optional)
   e memory module
   f battery
   g base cover
5 Follow the procedure in After working inside your computer.

Display hinges

Removing display hinge - non-touch

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a base cover
   b battery
   c memory module
   d WLAN card
   e WWAN card (optional)
   f display hinge cover
   g display assembly
   h display bezel
3 To remove the display hinge:
   a Remove the 6 (M2.5x3) screws that secure the display hinge to the display assembly [1].
   b Lift the display hinge away from the display assembly [2].
   c Repeat step a and step b to remove the other display hinge.



Installing display hinge - non-touch

1 Place the display hinge on the display assembly.
2 Replace the 6 (M2.5x3) screws to secure the display hinge to the display assembly.
3 Repeat step 1 and step 2 to install the other display hinge.
4 Install the:
   a display bezel
   b display assembly
   c display hinge cover
   d WLAN card
   e WWAN card (optional)
   f memory module
   g battery
   h base cover
5 Follow the procedure in After working inside your computer.

Display panel

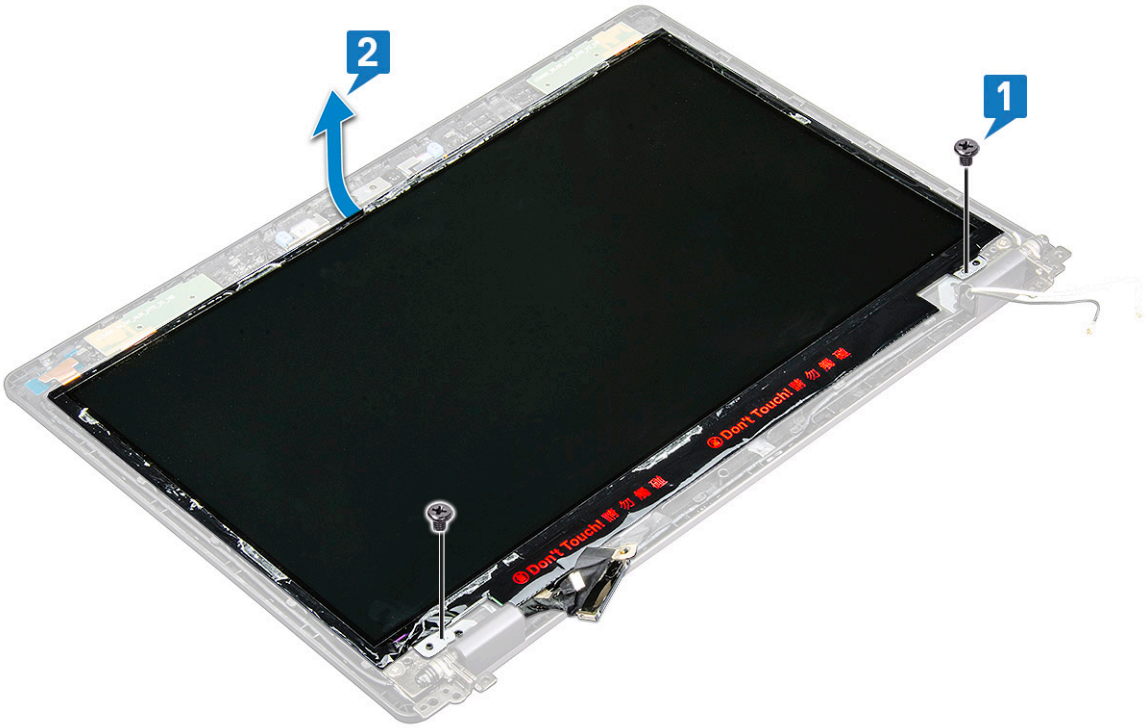
Removing display panel - non-touch

1 Follow the procedure in Before working inside your computer.

2 Remove the:

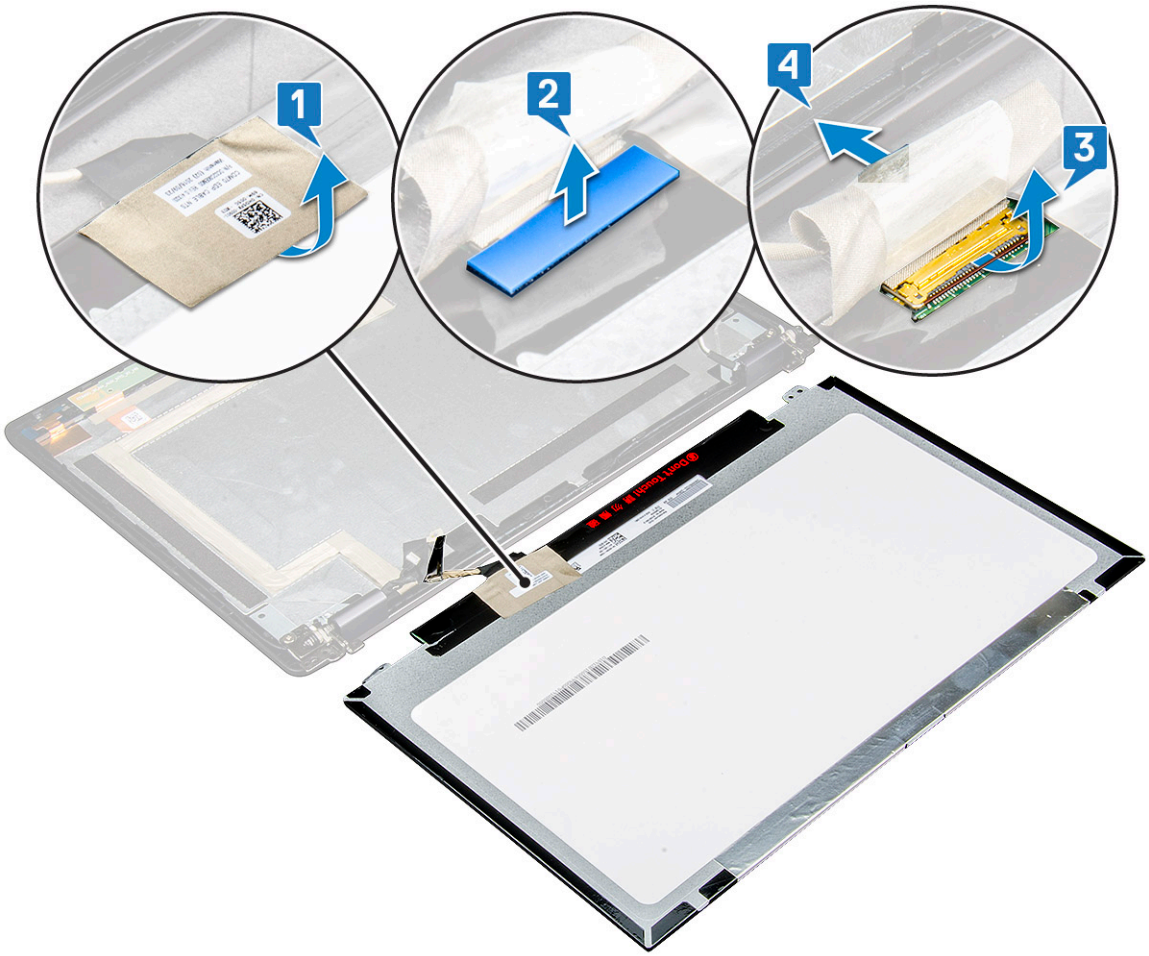
- a base cover
- b battery
- c memory module
- d WLAN card
- e WWAN card (optional)
- f display assembly
- g display bezel

3 Remove the 2 (M2*2) screws that secure the display panel to the display assembly [1] and lift to turn over the display panel to access the display cable [2].



4 To remove the display panel:

- a Peel the conductive tape [1].
- b Remove the adhesive strip that secures the display cable [2].
- c Lift the latch and disconnect the display cable from the connector on the display panel [3] [4].



d Remove the display panel.

Installing display panel - non-touch

1 Connect the display cable to the connector and affix the adhesive strip.
2 Affix the conductive tape to secure the display cable.
3 Replace the display panel to align with the screw holders on the display assembly.
4 Replace the 2 (M2*2) screws to secure the display panel to the display assembly.
5 Install the:
   a display bezel
   b display assembly
   c WLAN card
   d WWAN card (optional)
   e battery
   f base cover
6 Follow the procedure in After working inside your computer.

Camera

Removing camera

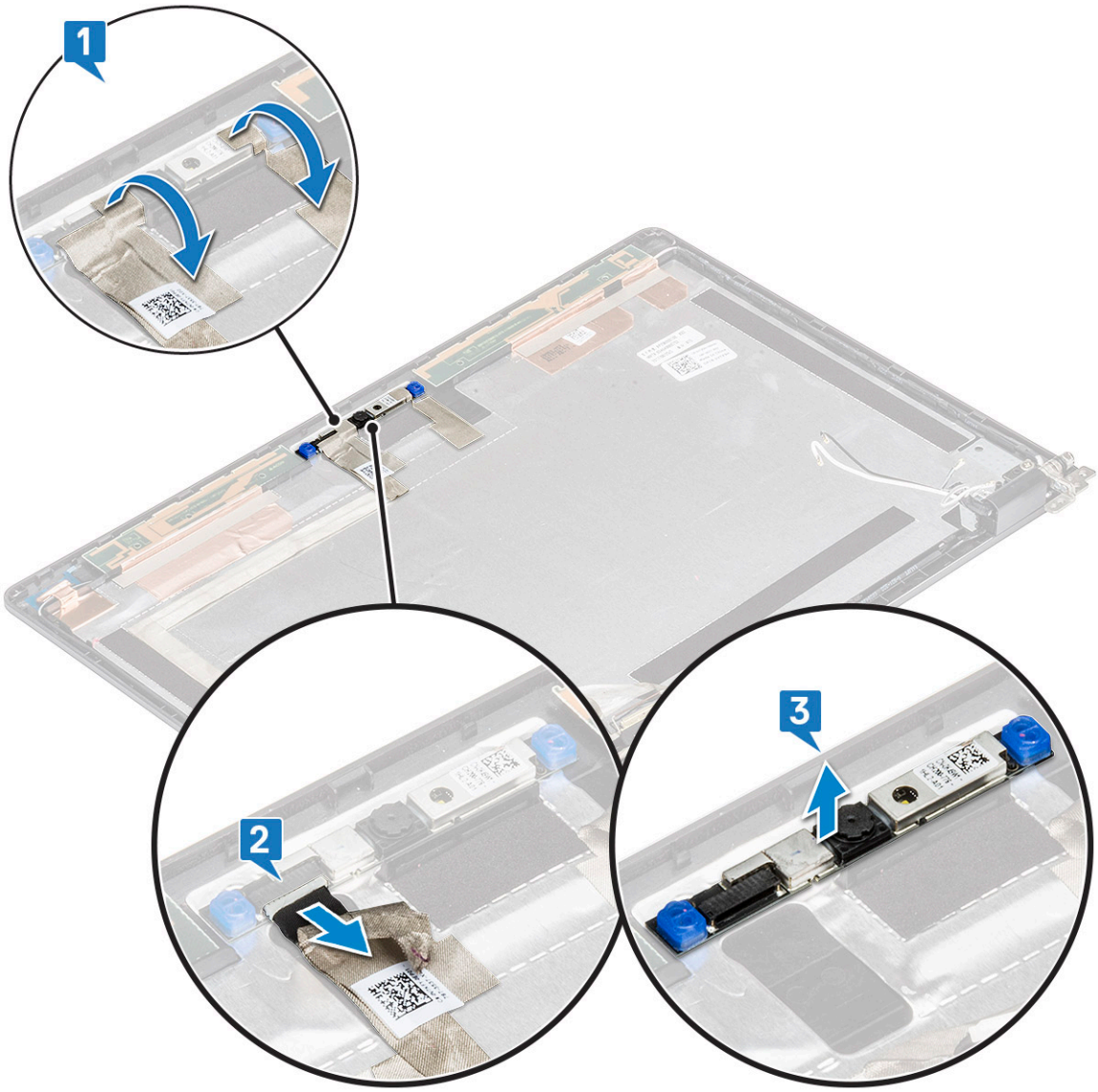
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a base cover
- b battery
- c WLAN card
- d WWAN card (optional)
- e display assembly
- f display bezel
- g display panel

3 To remove the camera:

- a Peel the 2 conductive tape that secures the camera in place [1].
- b Disconnect the camera cable from the connector [2].
- c Carefully pry and remove the camera module from the display back cover [3].



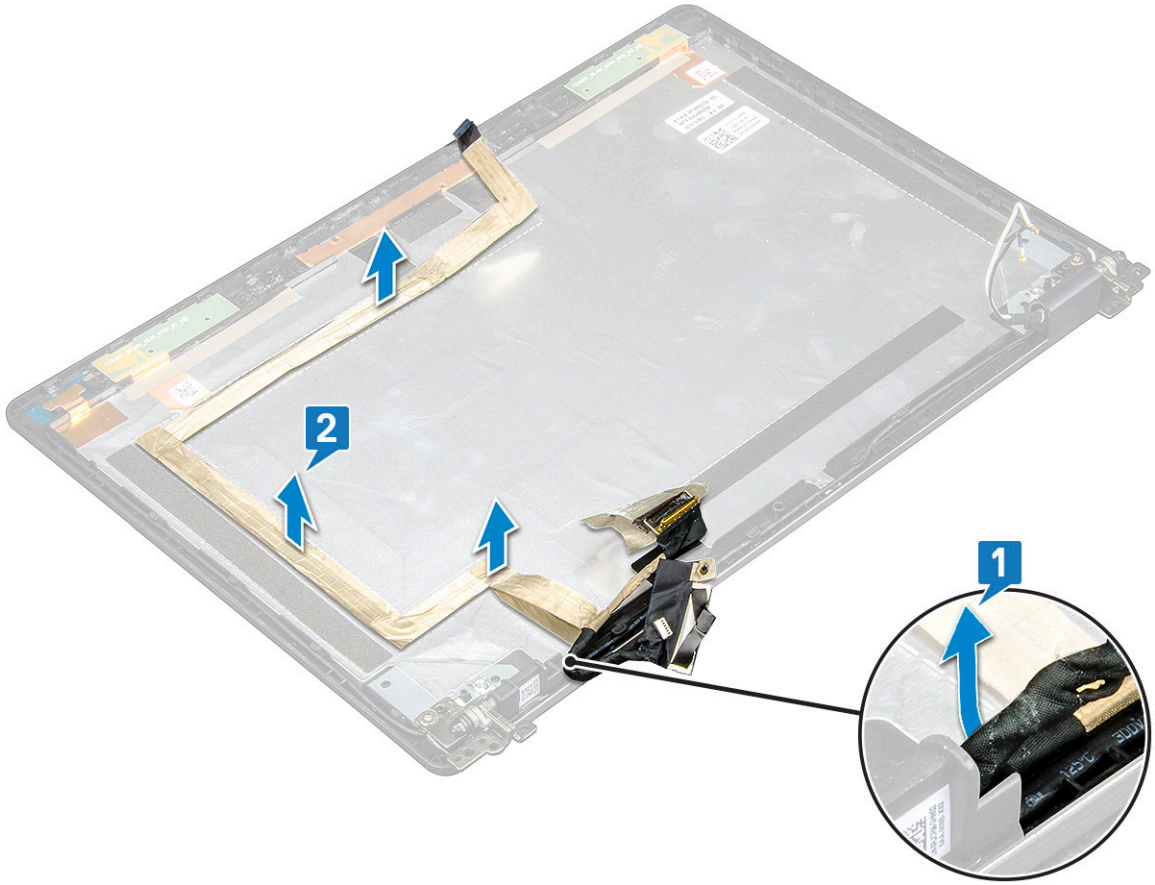
Installing camera

1 Insert the camera into the slot on the display assembly.
2 Connect the display cable to the connector.
3 Affix the two conductive tape above the camera.
4 Install the:
   a display panel
   b display bezel
   c display assembly
   d WLAN card
   e WWAN card (optional)
   f memory module
   g battery
   h base cover
5 Follow the procedure in After working inside your computer.

Display (eDP) cable

Removing display cable - non-touch

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a base cover
   b battery
   c WLAN card
   d WWAN card (optional)
   e display assembly
   f display bezel
   g display hinge cover
   h display panel
   i camera
3 To remove the display cable:
   a Slide the display cable and peel the conductive tape from the cable [1].
   b Peel the display cable and remove it from the display back cover. [2].



Installing display cable - non-touch

1 Affix the display cable to the display back cover.
2 Affix the conductive tape to the display cable.
3 Install the:
   a camera
   b display panel
   c display hinge cover
   d display bezel
   e display assembly
   f WLAN card
   g WWAN card (optional)
   h battery
   i base cover
4 Follow the procedure in After working inside your computer.

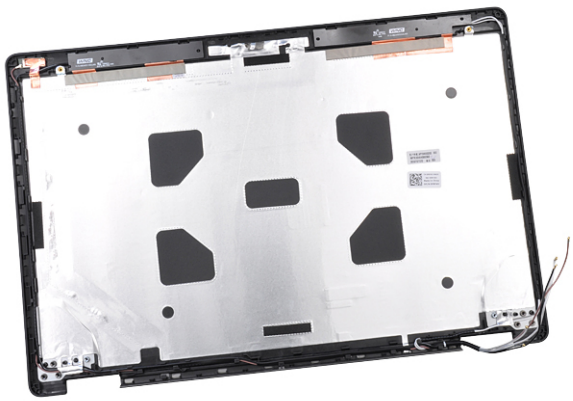
Display back cover assembly

Removing the display back cover assembly - non-touch

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a base cover

b battery
c memory module
d WLAN card
e WWAN card (optional)
f display assembly
g display bezel
h display hinge cover
i display panel
j display hinge
k display cable
l camera

The display back cover assembly is the remaining component, after removing all the components.



Installing the display back cover assembly - non-touch

1 Place the display back cover assembly on a flat surface.
2 Install the:
   a camera
   b display cable
   c display hinge
   d display panel
   e display hinge cover
   f display bezel
   g display assembly
   h WLAN card
   i WWAN card (optional)
   j memory module
   k battery
   l base cover
3 Follow the procedure in After working inside your computer.

Palm rest

Removing palm rest

1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a SIM card
- b base cover
- c battery
- d memory module
- e hard drive
- f SSD card
- g SSD with holder
- h SSD frame
- i WLAN card
- j WWAN card (optional)
- k keyboard lattice
- l keyboard
- m heat sink assembly
- n chassis frame
- o smartcard module
- p speaker
- q system board
- r display assembly
- s display hinge cover

3 The palm rest is the remaining component after removing all the components.

Installing palm rest

1 Place the palm rest on a flat surface.

2 Install the:

   a display hinge cover
   b display assembly
   c system board
   d speaker
   e smartcard module
   f chassis frame
   g heat sink assembly
   h keyboard
   i keyboard lattice
   j WWAN card (optional)
   k WLAN card
   l SSD frame
   m SSD with holder
   n SSD card
   o hard drive assembly
   p memory module
   q battery
   r base cover
   s SIM card

3 Follow the procedure in After working inside your computer.

3

Technology and components

This chapter details the technology and components available in the system.

Topics:

Power adapter

This laptop is shipped with 7.4mm barrel plug on 65 W or 65 W BFR/PVC Halogen Free or 90 W power adapter.

WARNING: When you disconnect the power adapter cable from the laptop, grasp the connector, not the cable itself, and then pull firmly but gently to avoid damaging the cable.

WARNING: The power adapter works with electrical outlets worldwide. However, power connectors and power strips vary among countries. Using an incompatible cable or improperly connecting the cable to the power strip or electrical outlet may cause fire or equipment damage.

DDR4

DDR4 (double data rate fourth generation) memory is a higher-speed successor to the DDR2 and DDR3 technologies and allows up to 512 GB in capacity, compared to the DDR3's maximum of 128 GB per DIMM. DDR4 synchronous dynamic random-access memory is keyed differently from both SDRAM and DDR to prevent the user from installing the wrong type of memory into the system.

DDR4 needs 20 percent less or just 1.2 volts, compared to DDR3 which requires 1.5 volts of electrical power to operate. DDR4 also supports a new, deep power-down mode that allows the host device to go into standby without needing to refresh its memory. Deep power-down mode is expected to reduce standby power consumption by 40 to 50 percent.

DDR4 Details

There are subtle differences between DDR3 and DDR4 memory modules, as listed below.

Key notch difference

The key notch on a DDR4 module is in a different location from the key notch on a DDR3 module. Both notches are on the insertion edge but the notch location on the DDR4 is slightly different, to prevent the module from being installed into an incompatible board or platform.

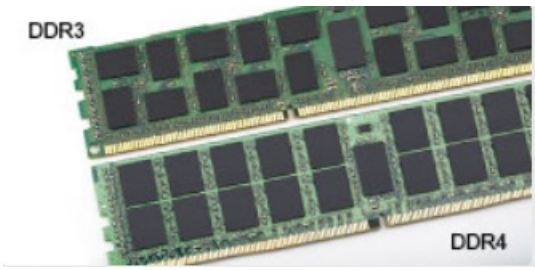


Figure 1. Notch difference

Increased thickness

DDR4 modules are slightly thicker than DDR3, to accommodate more signal layers.

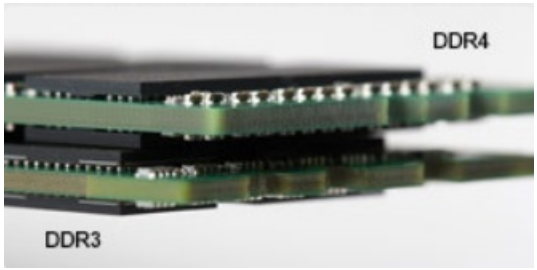


Figure 2. Thickness difference

Curved edge

DDR4 modules feature a curved edge to help with insertion and alleviate stress on the PCB during memory installation.

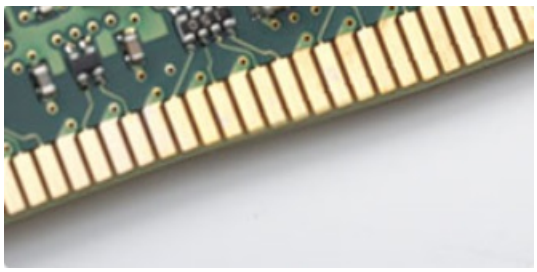


Figure 3. Curved edge

Memory Errors

Memory errors on the system display the new ON-FLASH-FLASH or ON-FLASH-ON failure code. If all memory fails, the LCD does not turn on. Troubleshoot for possible memory failure by trying known good memory modules in the memory connectors on the bottom of the system or under the keyboard, as in some portable systems.

HDMI 1.4

This topic explains the HDMI 1.4 and its features along with the advantages.

HDMI (High-Definition Multimedia Interface) is an industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any compatible digital audio/video source, such as a DVD player, or A/V receiver and a compatible digital audio and/or video monitor, such as a digital TV (DTV). The intended applications for HDMI TVs, and DVD players. The primary advantage is cable reduction and content protection provisions. HDMI supports standard, enhanced, or high-definition video, plus multichannel digital audio on a single cable.

NOTE: The HDMI 1.4 will provide 5.1 channel audio support.

HDMI 1.4 Features

- **HDMI Ethernet Channel** - Adds high-speed networking to an HDMI link, allowing users to take full advantage of their IP-enabled devices without a separate Ethernet cable
- **Audio Return Channel** - Allows an HDMI-connected TV with a built-in tuner to send audio data "upstream" to a surround audio system, eliminating the need for a separate audio cable
- **3D** - Defines input/output protocols for major 3D video formats, paving the way for true 3D gaming and 3D home theater applications
- **Content Type** - Real-time signaling of content types between display and source devices, enabling a TV to optimize picture settings based on content type
- **Additional Color Spaces** - Adds support for additional color models used in digital photography and computer graphics
- **4K Support** - Enables video resolutions far beyond 1080p, supporting next-generation displays that will rival the Digital Cinema systems used in many commercial movie theaters
- **HDMI Micro Connector** - A new, smaller connector for phones and other portable devices, supporting video resolutions up to 1080p
- **Automotive Connection System** - New cables and connectors for automotive video systems, designed to meet the unique demands of the motoring environment while delivering true HD quality

Advantages of HDMI

- Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
- Low -cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner
- Audio HDMI supports multiple audio formats from standard stereo to multichannel surround sound
- HDMI combines video and multichannel audio into a single cable, eliminating the cost, complexity, and confusion of multiple cables currently used in A/V systems
- HDMI supports communication between the video source (such as a DVD player) and the DTV, enabling new functionality

USB features

Universal Serial Bus, or USB, was introduced in 1996. It dramatically simplified the connection between host computers and peripheral devices like mice, keyboards, external drivers, and printers.

Let's take a quick look on the USB evolution referencing to the table below.

Table 2. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 3.0/USB 3.1 Gen 1	5 Gbps	Super Speed	2010
USB 2.0	480 Mbps	High Speed	2000

USB 3.0/USB 3.1 Gen 1 (SuperSpeed USB)

For years, the USB 2.0 has been firmly entrenched as the de facto interface standard in the PC world with about 6 billion devices sold, and yet the need for more speed grows by ever faster computing hardware and ever greater bandwidth demands. The USB 3.0/USB 3.1 Gen 1 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.1 Gen 1 features are as follows:

- Higher transfer rates (up to 5 Gbps)
- Increased maximum bus power and increased device current draw to better accommodate power-hungry devices
- New power management features

- Full-duplex data transfers and support for new transfer types
- Backward USB 2.0 compatibility
- New connectors and cable

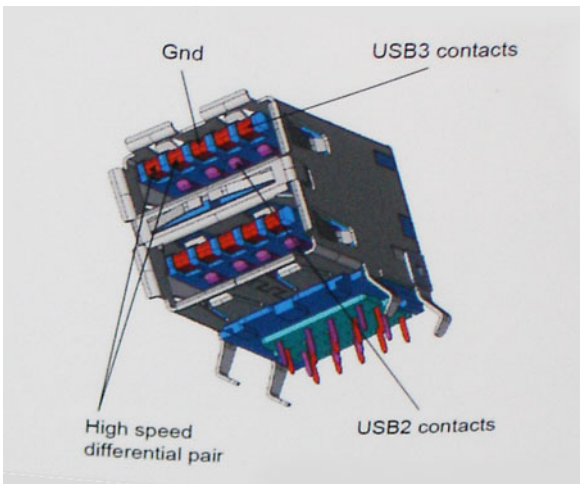
The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

Speed

Currently, there are 3 speed modes defined by the latest USB 3.0/USB 3.1 Gen 1 specification. They are Super-Speed, Hi-Speed and Full-Speed. The new SuperSpeed mode has a transfer rate of 4.8Gbps. While the specification retains Hi-Speed, and Full-Speed USB mode, commonly known as USB 2.0 and 1.1 respectively, the slower modes still operate at 480Mbps and 12Mbps respectively and are kept to maintain backward compatibility.

USB 3.0/USB 3.1 Gen 1 achieves the much higher performance by the technical changes below:

- An additional physical bus that is added in parallel with the existing USB 2.0 bus (refer to the picture below).
- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.0/USB 3.1 Gen 1 adds four more for two pairs of differential signals (receive and transmit) for a combined total of eight connections in the connectors and cabling.
- USB 3.0/USB 3.1 Gen 1 utilizes the bidirectional data interface, rather than USB 2.0's half-duplex arrangement. This gives a 10-fold increase in theoretical bandwidth.



With today's ever increasing demands placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, making data transfer at around 320Mbps (40MB/s) — the actual real-world maximum. Similarly, USB 3.0/USB 3.1 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400MB/s with overheads. At this speed, USB 3.0/USB 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.0/USB 3.1 Gen 1 opens up the laneways and provides more headroom for devices to deliver a better overall experience. Where USB video was barely tolerable previously (both from a maximum resolution, latency, and video compression perspective), it's easy to imagine that with 5-10 times the bandwidth available, USB video solutions should work that much better. Single-link DVI requires almost 2Gbps

throughput. Where 480Mbps was limiting, 5Gbps is more than promising. With its promised 4.8Gbps speed, the standard will find its way into some products that previously weren't USB territory, like external RAID storage systems.

Listed below are some of the available SuperSpeed USB 3.0/USB 3.1 Gen 1 products:

- External Desktop USB 3.0/USB 3.1 Gen 1 Hard Drives
- Portable USB 3.0/USB 3.1 Gen 1 Hard Drives
- USB 3.0/USB 3.1 Gen 1 Drive Docks & Adapters
- USB 3.0/USB 3.1 Gen 1 Flash Drives & Readers
- USB 3.0/USB 3.1 Gen 1 Solid-state Drives
- USB 3.0/USB 3.1 Gen 1 RAIDs
- Optical Media Drives
- Multimedia Devices
- Networking
- USB 3.0/USB 3.1 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0/USB 3.1 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0/USB 3.1 Gen 1 specifies new physical connections and thus new cables to take advantage of the higher speed capability of the new protocol, the connector itself remains the same rectangular shape with the four USB 2.0 contacts in the exact same location as before. Five new connections to carry receive and transmitted data independently are present on USB 3.0/USB 3.1 Gen 1 cables and only come into contact when connected to a proper SuperSpeed USB connection.

Windows 8/10 will be bringing native support for USB 3.1 Gen 1 controllers. This is in contrast to previous versions of Windows, which continue to require separate drivers for USB 3.0/USB 3.1 Gen 1 controllers.

Microsoft announced that Windows 7 would have USB 3.1 Gen 1 support, perhaps not on its immediate release, but in a subsequent Service Pack or update. It is not out of the question to think that following a successful release of USB 3.0/USB 3.1 Gen 1 support in Windows 7, SuperSpeed support would trickle down to Vista. Microsoft has confirmed this by stating that most of their partners share the opinion that Vista should also support USB 3.0/USB 3.1 Gen 1.

Super-Speed support for Windows XP is unknown at this point. Given that XP is a seven-year-old operating system, the likelihood of this happening is remote.

4

System specifications

Topics:

- Technical specifications
- Hot key combinations

Technical specifications

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer in:

- Windows 10, click or tap **Start** > **Settings** > **System** > **About**.

System specifications

Feature	Specification
Processor type	Intel Kaby Lake
System Chipset	Integrated with processor
Total cache	• 3 M Cache - Intel Core i5-7300U (Dual Core, 2.6GHz,15W, vPro) • 3M Cache - Intel Core i3-7130U (Dual Core, 2.7GHz,15W) • 6 M Cache - Intel Core i5-8250U (Quad Core, 1.6GHz,15W) • 6 M Cache - Intel Core i5-8350U (Quad Core, 1.7GHz,15W, vPro) • 8 M Cache - Intel Core i7-8650U (Quad Core, 1.9GHz,15W, vPro)

Processor specification

Feature	Specification
Types	• 8th Gen Intel Core Processors up to i7, U Quad Core • 7th Gen Intel Core Processors up to i3, i5, U Dual Core
i3 series	vPro - N/A
i5 series	• 8th Gen, vPro/non Vpro - 6 MB • 7th Gen, vPro - 3 MB
i7 series	vPro - 8 MB

Feature	Specification
UMA graphics	• 8th Gen - Intel UHD Graphics 620 • 7th Gen - Intel HD Graphics 620

Memory specification

Feature	Specification
Memory connector	Two SODIMM slots
Memory capacity per slot	4 GB, 8 GB, 16 GB and 32 GB
Memory type	DDR4
Speed	• 2133 MHz for 7th Gen Processor • 2400 MHz for 8th Gen Processor
Minimum memory	4 GB
Maximum memory configuration	32 GB

Storage specification

NOTE: Depending on the configuration you order, you will see either a HDD or M.2 PCIe SSD in your system.

Feature	Specification
Storage:	• HDD: 2.5 inch up to 1 TB, Hybrid, OPAL SED options • SSD M.2 2280 SATA: up to 512 GB, OPAL SED options • SSD M.2 2230 PCIe/NVMe : up to 512GB • SSD M.2 2280 PCIe x2 NVMe: up to 1 TB, OPAL SED options • Dell Fast Response Free Fall Sensor and HDD Isolation (standard feature)

Audio specifications

Feature	Specification
Types	High-definition audio
Controller	Realtek ALC3254
Internal interface	• Universal Audio Jack • High Quality Speakers • Noise reducing array microphones • Volume control buttons, supports hot-key keyboard button

Feature	Specification
External interface	Stereo headset/mic combo
Speakers	Two
Volume controls	Hot keys

Video specification

Feature	Specification
Type	Integrated on system board, hardware accelerated
UMA controller	• Intel HD Graphics 620 • Intel UHD Graphics 620
Data bus	Integrated video
External display support	• Integrated Graphics configurations supports HDMI 1.4 • VGA connector

Camera specification

Feature	Specification
Camera type	HD fixed focus
IR Camera	Optional
Sensor type	CMOS sensor technology
Resolution: Motion video	Up to 1280 X 720 (1 MP)
Resolution: Still image	Up to 1280 X 720 (1 MP)
Imaging rate	Up to 30 frames per second

Communication specification

Features	Specification
Network adapter	10/100/1000 Mb/s Ethernet (RJ-45)
Wireless LAN Options	• Qualcomm QCA61x4A 802.11ac Dual Band (2x2) Wireless Adapter+ Bluetooth 4.1 • Qualcomm QCA6174A Extended Range 802.11ac MU-MIMO Dual Band (2x2) Wi-Fi + Bluetooth 4.1 LE • Intel Dual-Band Wireless-AC 8265 Wi-Fi + BT 4.2 Wireless Card (2x2). Bluetooth Optional
Optional Mobile Broadband Options	• Qualcomm Snapdragon X7 LTE-A (DW5811e) (EMEA/APJ/ROW) • Qualcomm Snapdragon X7 LTE-A (DW5811e) for AT&T, Verizon & Sprint, US

Features	Specification
	• Qualcomm Snapdragon X7 HSPA+ (DW5811e) (Indonesia) • Qualcomm Snapdragon X7 LTE-A (DW5816e) (Japan/ANZ/China/India)

Ports and connector specification

Feature	Specification
Audio	• Universal Audio Jack • High Quality Speakers • Noise reducing array microphones • Volume control buttons, supports hot-key keyboard button
Video	• HDMI 1.4 (UMA) • One VGA connector
Network adapter	One RJ-45 connector
USB	Two USB 3.1 Gen 1 (one with PowerShare)
Memory SD card reader	microSD 4.0 Memory card reader
SmartCard reader	Optional
DisplayPort over USB Type-C	One Display Port over USB Type C
Other docking port	Noble Wedge Lock slot

Contactless smart card

Feature	Specification
Supported Smart Cards/Technologies	FIPS 201 Contacted Smart Card

Display specification

Feature	Specification
Type	HD (1366 x 768) Anti-glare
Size	12.5 inches
Dimension: Height x Weight X Diagonal	155.52 mm x 276.62 mm x 12.5 inches
Luminance/ Brightness (typical)	200 nits
Native Resolution	1366 x 768

Feature	Specification
Refresh Rate	60 Hz
Horizontal Viewing Angle	+/- 40 degrees
Vertical Viewing Angle	+10/- 30 degrees

Keyboard specification

Feature	Specification
Number of keys	• United States: 82 keys • United Kingdom: 83 keys • Japan: 86 keys • Brazil: 84 keys
Size	Full sized • X= 18.05 mm key pitch • Y= 18.05 mm key pitch
Backlit keyboard	Yes (optional)

Touchpad specifications

Feature	Specification
Active Area:	
X-axis	99.5 mm (3.92 inches)
Y-axis	53 mm (2.086 inches)
Multi-Touch	Support 4 fingers

Battery specifications

Feature	Specification
Type	• 42 WHr • 51 WHr • 68 WHr • 4 cell Long Cycle Life Battery
42 Whr	• Length: 181mm (7.126 inch) • Width: 95.9mm (3.78 inch) • Height: 7.05mm (0.28 inch)

Feature	Specification
	• Weight: 210.00 g
51 Whr	• Length: 181mm (7.126 inch) • Width: 95.9mm (3.78 inch) • Height: 7.05mm (0.28 inch) • Weight: 250.00 g
68 Whr	• Length: 233mm (9.17 inch) • Width: 95.9mm (3.78 inch) • Height: 7.05mm (0.28 inch) • Weight: 340.00 g
Voltage	42 WHr 11.4 VDC 51 WHr 11.4 VDC 68 WHr 7.6 VDC
Life span	300 discharge/recharge cycles
Temperature range	
Operating	• Charge: 0°C to 50°C (32°F to 122°F) • Discharge: 0°C to 70°C (32°F to 158°F) • Operating: 0°C to 35°C (32°F to 95°F)
Non-operating	- 20°C to 65°C (- 4°F to 149°F)
Coin cell battery	3 V CR2032 lithium coin cell

AC Adapter specifications

Feature	Specification
Type	• 65 W adapter, 7.4 mm barrel • 65 W BFR/PVC Halogen Free adapter, 7.4 mm barrel • 90 W adapter, 7.4 mm barrel
Input voltage	100 V AC to 240 V AC
Input current (maximum)	• 65 W adapter - 1.7 A • 65 W BFR/PVC Halogen Free adapter - 1.7 A • 90 W adapter - 1.6 A
Adapter size	7.4 mm
Input frequency	50 Hz to 60 Hz
Output current	• 65 W adapter - 3.34 A (continuous)

Feature	Specification
	• 65 W BFR/PVC Halogen Free adapter - 3.34 A (continuous) • 90 W adapter - 4.62 A (continuous)
Rated output voltage	19.5 V DC
Temperature range (Operating)	0°C to 40°C (32°F to 104°F)
Temperature range (Non-Operating)	–40°C to 70°C (–40°F to 158°F)

Physical specification

Feature	Specification
Front height	0.8 inches (21.4 mm)
Width	12.0 inches (305.1 mm)
Depth	8.3 inches (211.3 mm)
Weight	2.99 lbs (1.36 kg)

Environmental specifications

Temperature	Specifications
Operating	0°C to 35°C (32°F to 95°F)
Storage	–40°C to 65°C (–40°F to 149°F)
Relative humidity (maximum)	**Specifications**
Operating	10 % to 90 % (non condensing)
Storage	5 % to 95 % (non condensing)
Altitude (maximum)	**Specifications**
Operating	0 m to 3048 m (0 ft to 10,000 ft)
Non-operating	0 m to 10,668 m (0 ft to 35,000 ft)
Airborne contaminant level	G1 as defined by ISA-71.04–1985

Hot key combinations

Table 3. Hot key combinations

Function key combination	Latitude 7290
Fn+ESC	Fn Toggle
Fn+ F1	Speaker Mute
Fn+ F2	Volume Down
Fn+ F3	Volume Up
Fn+ F4	Mic Mute
Fn+ F5	Num Lock
Fn+ F6	Scroll Lock
Fn+ F7 (optional)	Increase keyboard back light brightness
Fn+ F8	Display Toggle (Win + P)
Fn+ F9	Search
Fn+ F10	Increase keyboard back light brightness
Fn+ F11	Print screen
Fn+ F12	Insert
Fn + Home	WLAN on/off
Fn + End	Sleep
Fn + up arrow	Increase display brightness
Fn + down arrow	Decrease display brightness

5

System Setup

Topics:

Boot menu

Press <F12> when the Dell™ logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not make any changes to the boot order stored in the BIOS.

The options are:

- UEFI Boot:
  - Windows Boot Manager
- Other Options:
  - BIOS Setup
  - BIOS Flash Update
  - Diagnostics
  - Change Boot Mode Settings

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. **NOTE: For the standard graphics browser only.**
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

System setup options

NOTE: Depending on the notebook and its installed devices, the items listed in this section may or may not appear.

General options

Table 4. General

Option	Description
System Information	This section lists the primary hardware features of your computer. The options are: · **System Information** · **Memory Configuration** · **Processor Information** · **PCI Information** · **Device Information**
Battery information	Displays the battery status and the type of AC adapter connected to the computer.
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. **Windows Boot Manager**—Default **Boot List Option** Allows you to change the boot list options. Click one of the following options: · **Legacy** · **UEFI**—Default

Option	Description
Advanced Boot Options	Allows you to Enable Legacy Option ROMs. The options are: · **Enable Legacy Option ROMs**—Default · **Enable Attempt Legacy Boot**
UEFI Boot Path Security	Allows you to control whether the system prompts the user to enter the Admin password when booting to a UEFI boot path. Click one of the following options: · **Always, Except Internal HDD**—Default · **Always** · **Never**
Date/Time	Allows you to set the date and time. The change to the system date and time takes effect immediately.

System configuration

Table 5. System Configuration

Option	Description
Integrated NIC	This option allows pre-OS and early OS networking features to use any enabled NICs. · **Enabled UEFI Network Stack** This options allow you to configure the integrated network controller. Click one of the following options: · **Disabled** · **Enabled** · **Enabled w/PXE**—Default
SATA Operation	Allows you to configure the operating mode of the integrated SATA hard-drive controller. Click one of the following options: · **Disabled** · **AHCI** · **RAID On**—Default **NOTE: SATA is configured to support RAID mode.**
Drives	Allows you to enable or disable various drives on board. The options are: · **SATA-0** · **SATA–1** · **SATA–2** · **M.2 PCIe SSD-0**

Option	Description
	All the options are set by default.
SMART Reporting	This field controls if the hard drive errors for the integrated drives are reported during system startup. This technology is part of the SMART(Self-Monitoring Analysis and Reporting Technology) specification. · **Enable SMART Reporting** This option is not set by default.
USB Configuration	Allows you to enable or disable the internal USB configuration. The options are: · **Enable USB Boot Support** · **Enable External USB Port** All the options are set by default.
Dell Type-C Dock Configuration	Allows you to connect to Dell WD and TB family of docks. **Always Allow Dell Docks** This option is set by default.
USB PowerShare	Allows you to configure the USB PowerShare feature behavior. · **Enable USB PowerShare** This option is not set by default.

Audio	Allows you to enable or disable the integrated audio controller.
	· **Enable Audio**
	  · Enable Microphone
	  · Enable Internal Speaker
	All the options are set by default.

Keyboard Illumination	This field allows to choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 0% to 100%. The options are: · **Disabled** · **Dim** · **Bright**—Default
Keyboard Backlight Timeout on AC	The Keyboard Backlight Timeout dims out with AC option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: · **5 seconds** · **10 seconds**—Default · **15 seconds** · **30 seconds** · **1 minute** · **5 minutes**

Option	Description
	• **15 minutes** • **Never**
Keyboard Backlight Timeout on Battery	The Keyboard Backlight Timeout dims out with Battery option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: • **5 seconds** • **10 seconds**—Default • **15 seconds** • **30 seconds** • **1 minute** • **5 minutes** • **15 minutes** • **Never**
Unobtrusive Mode	This option, when enabled, pressing Fn+F7 turns off all light and sound emissions in the system. To resume normal operation, press Fn+F7 again. • **Enable Unobtrusive Mode** This option is disabled by default.
Miscellaneous devices	Allows you to enable or disable various on board devices. The options are: • **Enable Camera**—Default • **Enable Secure Digital (SD) Card**—Default • **Enable Hard Drive Free Fall Protection**—Default • **Secure Digital (SD) Card Boot**—Default • **Secure Digital (SD) Card Read-Only**

Video

Table 6. Video

Option	Description
LCD Brightness	Allows you to set the panel brightness independently for battery and AC power.

Security

Table 7. Security

Option	Description
Admin Password	Allows you to set, change, or delete the administrator(admin) password.

Option	Description
	The entries to set password are: · **Enter the old password:** · **Enter the new password:** · **Confirm new password:** Click **OK** once you set the password. **NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.**
System Password	Allows you to set, change, or delete the System password. The entries to set password are: · **Enter the old password:** · **Enter the new password:** · **Confirm new password:** Click **OK** once you set the password. **NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.**
Strong Password	Allows you to enforce the option to always set strong password. · **Enable Strong Password** This option is not set by default.
Password Configuration	You can define the length of your password. Min = 4, Max = 32
Password Bypass	Allows you to bypass the System password and the Internal HDD password, when it is set, during a system restart. Click one of the options: · **Disabled**—Default · **Reboot bypass**
Password Change	Allows you to change the System password when the administrator password is set. · **Allow Non-Admin Password Changes** This option is set by default.
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password. · **Allow Wireless Switch Changes** This option is not set by default.
UEFI Capsule Firmware Updates	Allows you to update the system BIOS via UEFI capsule update packages. · **Enable UEFI Capsule Firmware Updates** This option is set by default.

Option	Description
TPM 2.0 Security	Allows you to enable or disable the Trusted Platform Module (TPM) during POST. The options are: · **TPM On**—Default · **Clear** · **PPI Bypass for Enable Commands**—Default · **Attestation Enable**—Default · **PPI Bypass for Disable Commands** · **Key Storage Enable**—Default · **PPI Bypass for Clear Commands** · **SHA-256**—Default Click any one of the following: · **Enabled**—Default · **Disabled**
Computrace (R)	Allows you to activate or disable the optional Computrace software. The options are: · **Deactivate** · **Disable** · **Activate**—Default
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. · **Enable CPU XD Support** This option is set by default.
OROM Keyboard Access	Allows you to determine whether users are able to enter the Option ROM Configuration screens via hotkeys during boot. The options are: Click one of the following options: · **Enabled**—Default · **One Time Enable** · **Disabled**
Admin Setup Lockout	Allows you to prevent users from entering Setup when an administrator password is set. · **Enable Admin Setup Lockout** This option is not set by default.
Master Password Lockout	Allows you to disable master password support. · **Enable Master Password Lockout** This option is not set by default. **NOTE: Hard Disk password should be cleared before the settings can be changed.**
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protection. · **SMM Security Mitigation** This option is not set by default.

Secure boot

Table 8. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable the Secure Boot Feature. Click one of the following options: · **Disabled** · **Enabled**—Default
Expert Key Management	Allows you to enable or disable Expert Key Management. · **Enable Custom Mode** This option is not set by default. The Custom Mode Key Management options are: · **PK**—Default · **KEK** · **db** · **dbx**

Intel Software Guard Extensions

Table 9. Performance

Option	Description
Intel SGX Enable	This fields specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. The options are: · **Disabled** · **Enabled** · **Software Controlled**—Default
Enclave Memory Size	This option sets SGX Enclave Reserve Memory Size. The option are: · **32 MB** · **64 MB** · **128 MB** This option is set by default.

Performance

Table 10. Performance

Option	Description
Multi Core Support	This field specifies whether the processor has one or all cores enabled. The performance of some applications improves with the additional cores. · **All** · **1** · **2** · **3** **NOTE: To enable Trusted Execution mode, all the cores must be enabled.**
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of processor. · **Enable Intel SpeedStep** This option is set by default.
C-States Control	Allows you to enable or disable the additional processor sleep states. · **C states** This option is set by default.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. · **Enable Intel TurboBoost** This option is set by default.
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. · **Disabled** · **Enabled**—Default

Power management

Table 11. Power Management

Option	Description
AC Behaviour	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. · **Wake on AC**

Option	Description
	This option is not set by default.
Enable Intel Speed Shift Technology	Allows you to enable or disable Enable Intel Speed Shift Technology support. · **Enable Intel Speed Shift Technology** This option is set by default.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. Click one of the following options: · **Disabled**—Default · **Every Day** · **Weekdays** · **Select Days**
USB Wake Support	Allows you to enable USB devices to wake the system from standby. · **Enable USB Wake Support** · **Wake on Dell USB-C Dock**—Default
Wireless Radio Control	Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection. · **Control WLAN Radio** · **Control WWAN Radio** This option is not set by default.
Wake on LAN/WLAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC power supply. · **Disabled** - Does not allow the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. · **LAN Only** - Allows the system to be powered on by special LAN signals. · **WLAN** - Allows the system to be powered on by special LAN signals. · **LAN or WLAN** - Allows the system to be powered on by special LAN or wireless LAN signals. Default setting: Disabled
Block Sleep	Allows you to block entering to sleep(S3 state) in OS Environment. This option is not set by default.
Peak Shift	This option enables you to minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached.
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours to improve the battery health. · **Enable Advanced Battery Charge Mode** This option is not set by default.
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: · **Adaptive**—Default · **Standard** · **ExpressCharge**

Option	Description
	• **Primarily AC use** • **ACustomdaptive** If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop. **NOTE:** All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.
Type-C Connector Power	This option lets you set the maximum power that can be drawn from the Type-C connector. • **7.5 Watts**—Default • **15 Watts**

Post behaviour

Table 12. POST Behavior

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. • **Enable Adapter Warnings**—Default
Keypad (Embedded)	Allows you to choose one of two methods to enable the keypad that is embedded in the internal keyboard. • **Fn Key Only**—Default • **By Numlock** **NOTE: When setup is running, this option has no effect. Setup works in Fn Key Only mode.**
Numlock Enable	Allows you to enable the Numlock option when the computer boots. • **Enable Numlock**—Default
Fn Key Emulation	Allows you to set the option where the Scroll Lock key is used to simulate the Fn key feature. • **Enable Fn Key Emulation** This option is set by default.
Fn Lock Options	Allows you to let hot key combinations <Fn> + <Esc> toggle the primary behavior of F1-F12, between their standard and secondary functions. If you disable this option, you cannot toggle dynamically the primary behavior of these keys. • **Fn Lock**—Default Choose any one option: • **Lock Mode Disable/Standard**—Default • **Lock Mode Enable/Secondary**
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: • **Minimal**—Default • **Thorough**

Option	Description
	• **Auto**
Extended BIOS POST Time	Allows you to create an additional preboot delay. The options are: • **0 seconds**—Default • **5 seconds** • **10 seconds**
Full Screen Logo	This option will display full screen logo if your image match screen resolution • **Enable Full Screen Logo** This option is not set by default.
Warnings and Error	This option will cause the boot process to only pause when warnings or errors are detected. • **Prompt on Warnings and Errors** • **Continue on Warnings** • **Continue on Warnings and Errors**

Manageability

Table 13. Manageability

Option	Description
USB Provision	Allows you to provision Intel AMT using the local provisioning file via a USB storage device. • **Enable USB Provision** **NOTE: When disabled, provisioning Intel AMT from a USB storage device is blocked.** This option is not set by default.
MEBx Hotkey	Allows you to specify if the MEBx Hotkey function should be enabled when the system boots • **Enable MEBx Hotkey** This option is set by default.

Virtualization support

Table 14. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by the Intel Virtualization technology. • **Enable Intel Virtualization Technology**

Option	Description
	This option is set by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by the Intel Virtualization technology for direct I/O. · **Enable VT for Direct I/O** This option is set by default.
Trusted Execution	Allows you to specify whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by the Intel Trusted Execution Program. · **Trusted Execution** This option is not set by default.

Wireless screen options

Table 15. Wireless screen options

Option	Description
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: · **WWAN** · **GPS (on WWAN Module)** · **WLAN/WiGi** · **Bluetooth** All the options are set by default.
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. · **WWAN/GPS** · **WLAN** · **Bluetooth** All the options are set by default.

Maintenance

Table 16. Maintenance

Option	Description
Service Tag	Displays the service tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
BIOS Downgrade	Allows you to flash previous revisions of the system firmware. · **Allow BIOS Downgrade** This option is set by default.

Option	Description
Data Wipe	Allows you to securely erase data from all internal storage devices. · **Wipe on Next Boot** This option is not set by default.
Bios Recovery	**BIOS Recovery from Hard Drive**—This option is set by default. Allows you to recover the corrupted BIOS from a recovery file on the HDD or an external USB key. **BIOS Auto-Recovery**— Allows you to recover the BIOS automatically. **NOTE: BIOS Recovery from Hard Drive field should be enabled.** **Always Perform Integrity Check**—Performs integrity check on every boot.

System logs

Table 17. System Logs

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events. · **Clear Log** This option is not set by default.
Thermal Events	Allows you to view and clear the System Setup (Thermal) events · **Clear Log** This option is not set by default.
Power Events	Allows you to view and clear the System Setup (Power) events.s · **Clear Log** This option is not set by default.

SupportAssist system resolution

Table 18. SupportAssit System Resolution

Option	Description
Auto OS Recovery Threshold	The **Auto OS Recovery Threshold** setup option controls the automatic boot flow for Support Assist System Resolution Console and Dell OS Recovery tool. Click one of the following options: · **OFF** · **1** · **2**—Default · **3**

Updating the BIOS in Windows

It is recommended to update your BIOS (System Setup), when you replace the system board or if an update is available. For laptops, ensure that your computer battery is fully charged and connected to a power outlet

NOTE: If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re-enabled after the BIOS update is completed.

1 Restart the computer.
2 Go to **Dell.com/support**.
   - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
   - Click **Detect Product** and follow the instructions on screen.
3 If you are unable to detect or find the Service Tag, click **Choose from all products**.
4 Choose the **Products** category from the list.

   NOTE: Choose the appropriate category to reach the product page
5 Select your computer model and the **Product Support** page of your computer appears.
6 Click **Get drivers** and click **Drivers and Downloads**.
   The Drivers and Downloads section opens.
7 Click **Find it myself**.
8 Click **BIOS** to view the BIOS versions.
9 Identify the latest BIOS file and click **Download**.
10 Select your preferred download method in the **Please select your download method below** window, click **Download File**.
   The **File Download** window appears.
11 Click **Save** to save the file on your computer.
12 Click **Run** to install the updated BIOS settings on your computer.
   Follow the instructions on the screen.

NOTE: It is recommended not to update the BIOS version for more than three revisions. For example: If you want to update the BIOS from 1.0 to 7.0, then install version 4.0 first and then install version 7.0.

Updating BIOS on systems with bitlocker enabled

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: http://www.dell.com/support/article/us/en/19/SLN153694/updating-bios-on-systems-with-bitlocker-enabled

Updating your system BIOS using a USB flash drive

If the system cannot load into Windows but there is still a need to update the BIOS, download the BIOS file using another system and save it to a bootable USB Flash Drive.

NOTE: You will need to use a bootable USB Flash drive. Please refer to the following article for further details: http://www.dell.com/support/article/us/en/19/SLN143196/how-to-create-a-bootable-usb-flash-drive-using-dell-diagnostic-deployment-package--dddp-

1 Download the BIOS update .EXE file to another system.
2 Copy the file e.g. O9010A12.EXE onto the bootable USB Flash drive.
3 Insert the USB Flash drive into the system that requires the BIOS update.
4 Restart the system and press F12 when the Dell Splash logo appears to display the One Time Boot Menu.

5 Using arrow keys, select **USB Storage Device** and click Return.
6 The system will boot to a Diag C:\> prompt.
7 Run the file by typing the full filename e.g. O9010A12.exe and press Return.
8 The BIOS Update Utility will load, follow the instructions on screen.

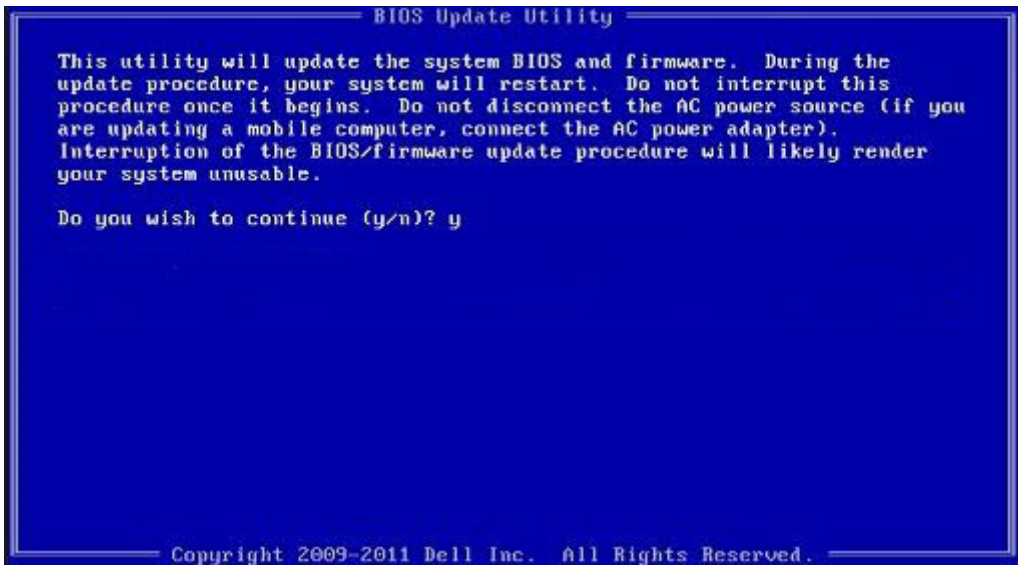


Figure 4. DOS BIOS Update Screen

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment such as Ubuntu, see http://www.dell.com/support/article/us/en/19/SLN171755/updating-the-dell-bios-in-linux-and-ubuntu-environments.

Flashing the BIOS from the F12 One-Time boot menu

Updating your system BIOS using a BIOS update .exe file copied to a FAT32 USB key and booting from the F12 one time boot menu.
BIOS Update
You can run the BIOS update file from Windows using a bootable USB key or you can also update the BIOS from the F12 One-Time boot menu on the system.

Most Dell systems built after 2012 have this capability and you can confirm by booting your system to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your system. If the option is listed, then the BIOS supports this BIOS update option.

NOTE: Only systems with BIOS Flash Update option in the F12 One-Time Boot Menu can use this function.

Updating from the One-Time Boot Menu
To update your BIOS from the F12 One-Time boot menu, you will need:

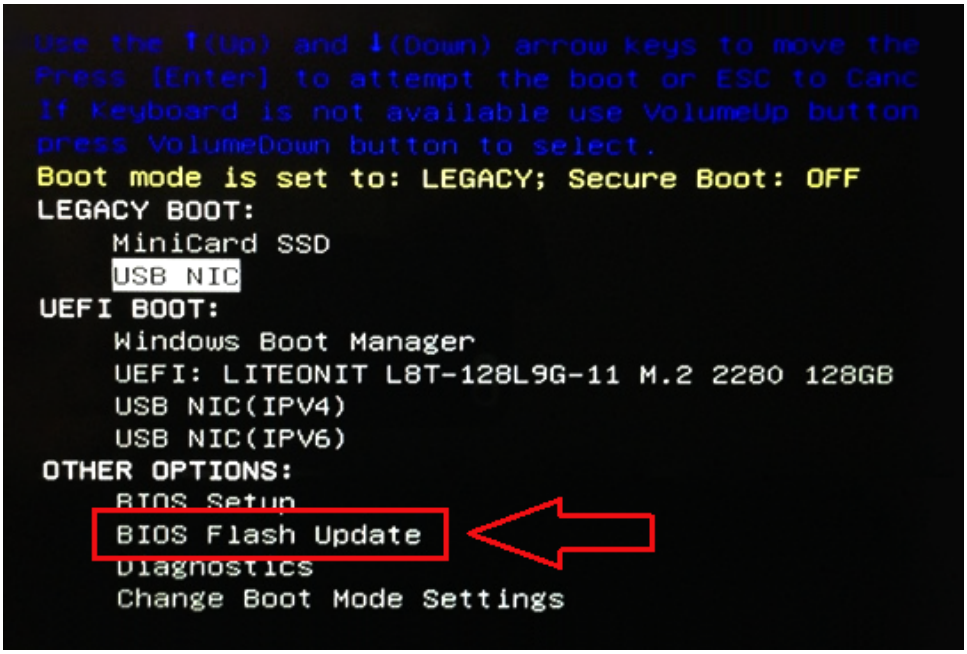
- USB key formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB key
- AC power adapter connected to the system
- Functional system battery to flash the BIOS

Perform the following steps to execute the BIOS update flash process from the F12 menu:

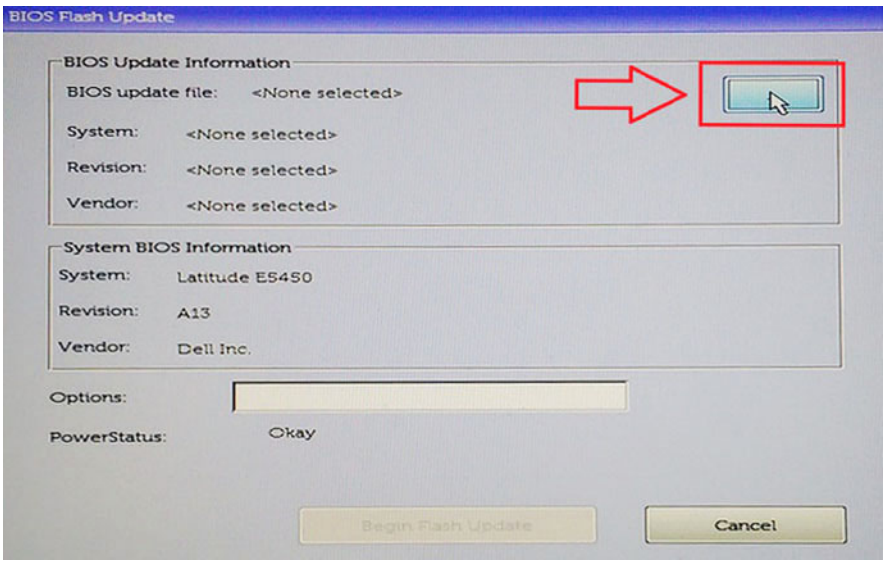
CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.

1 From a power off state, insert the USB key where you copied the flash into a USB port of the system .

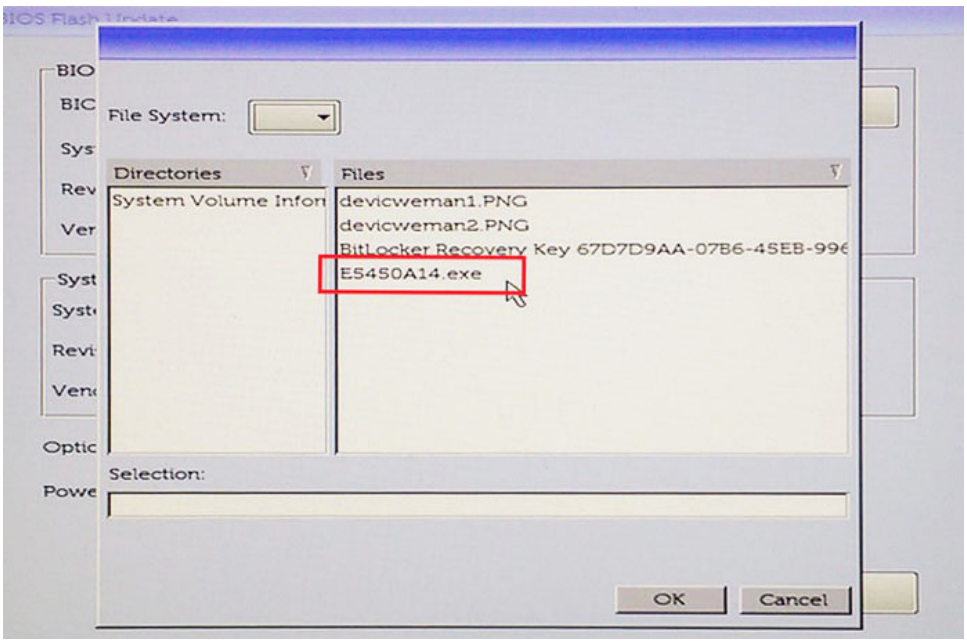
2 Power on the system and press the F12 key to access the One-Time Boot Menu, Highlight BIOS Flash Update using the arrow keys then press **Enter**.



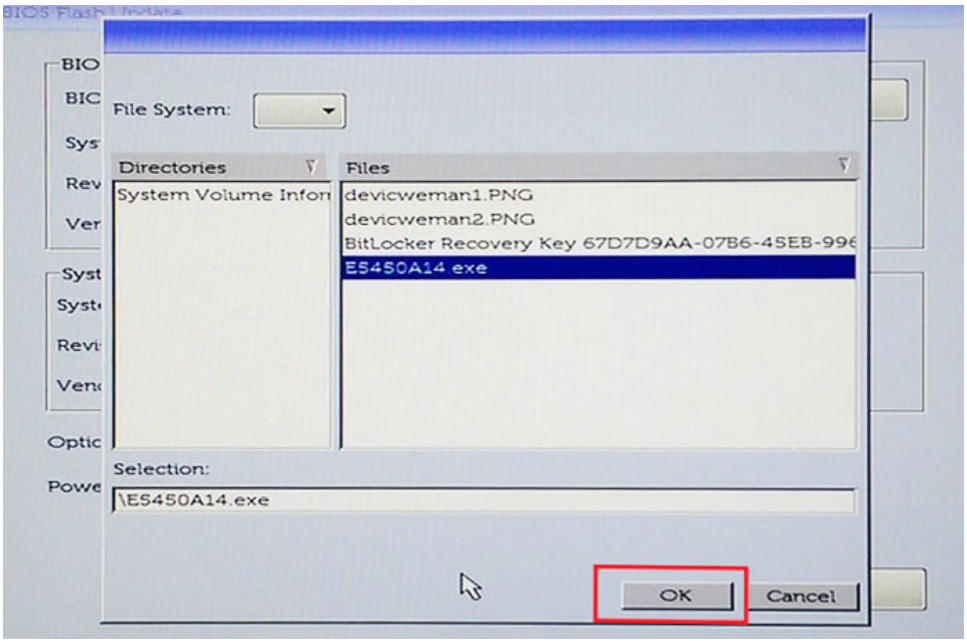
3 The Bios flash menu will open then click the browse button.



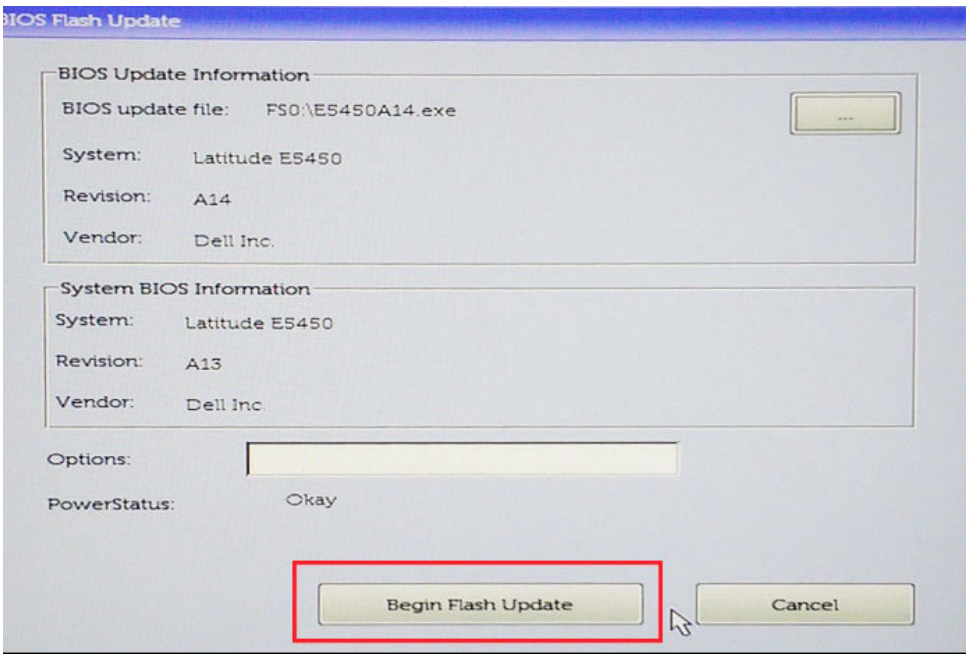
4 The E5450A14.exe file is shown as an example in the following screenshot. The actual file name may vary.



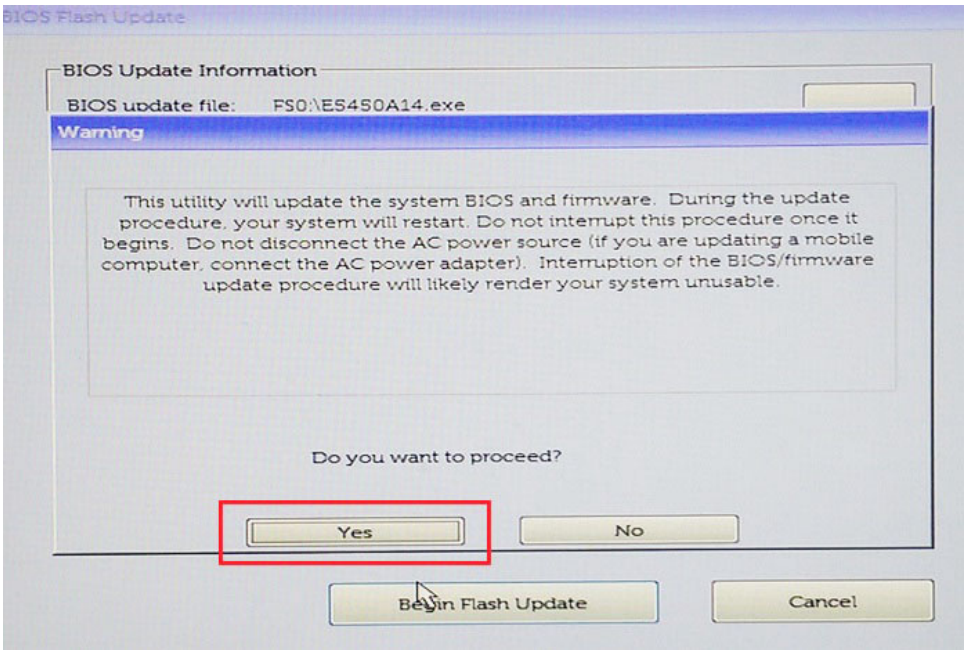
5 Once the file is selected, it will show in the file selection box and you can click the OK button to continue.



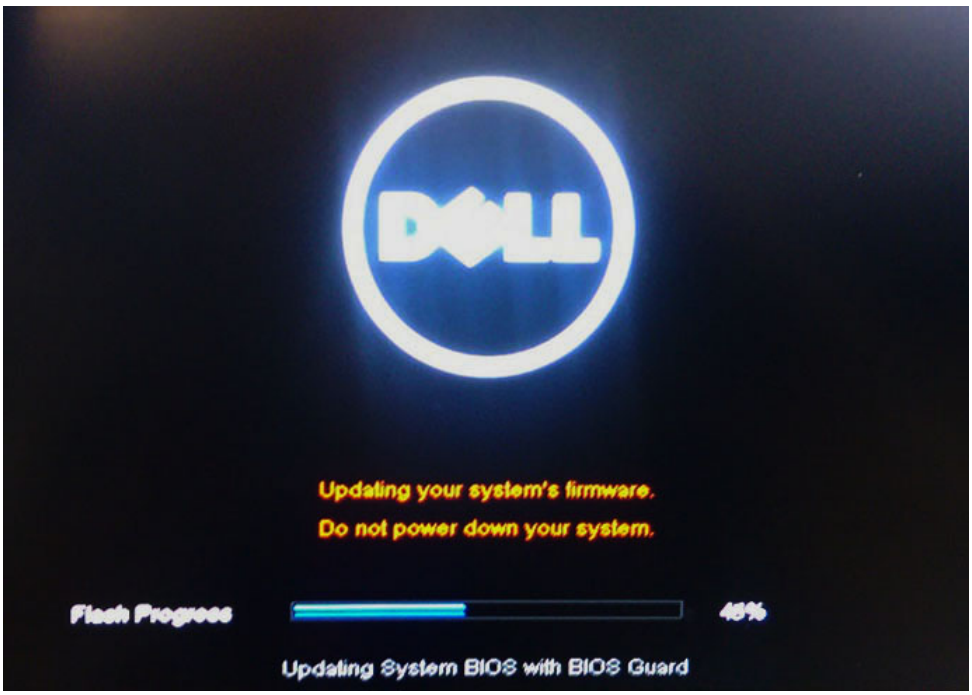
6 Click the **Begin Flash Update** button.



7 A warning box is displayed asking you if you want to proceed. Click the Yes button to begin the flash.



8 At this point the BIOS flash will execute, the system will reboot and then the BIOS flash will start and a progress bar will show the progress of the flash. Depending on the changes included in the update, the progress bar may go from zero to 100 multiple times and the flash process could take as long as 10 minutes. Generally this process takes two to three minutes.



9 Once complete, the system will reboot and the BIOS update process is completed.

System and setup password

You can create a system password and a setup password to secure your computer.

Password type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data stored on your computer if it is not locked and left unattended.

NOTE: System and setup password feature is disabled.

Assigning a system password and setup password

You can assign a new **System Password** only when the status is in **Not Set**.

To enter the system setup, press F2 immediately after a power-on or re-boot.

1 In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
The **Security** screen is displayed.

2 Select **System Password** and create a password in the **Enter the new password** field.
Use the following guidelines to assign the system password:
- A password can have up to 32 characters.
- The password can contain the numbers 0 through 9.
- Only lower case letters are valid, upper case letters are not allowed.
- Only the following special characters are allowed: space, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

3 Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.

4 Press Esc and a message prompts you to save the changes.

5 Press Y to save the changes.
The computer reboots.

Deleting or changing an existing system and or setup password

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.
To enter the System Setup, press F2 immediately after a power-on or reboot.

1 In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
The **System Security** screen is displayed.
2 In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3 Select **System Password**, alter or delete the existing system password and press Enter or Tab.
4 Select **Setup Password**, alter or delete the existing setup password and press Enter or Tab.

> **NOTE: If you change the System and/or Setup password, re-enter the new password when promoted. If you delete the System and/or Setup password, confirm the deletion when promoted.**

5 Press Esc and a message prompts you to save the changes.
6 Press Y to save the changes and exit from System Setup.
The computer reboots.

6

Software

This chapter details the supported operating systems along with instructions on how to install the drivers.

Topics:

Supported operating systems

The topic lists the operating systems supported for .

Table 19. Supported operating systems

Supported operating systems	Description
Windows 10	• Microsoft Windows 10 Pro 64-bit • Microsoft Windows 10 Home 64-bit
Other	• Ubuntu 16.04 LTS SP1 64-bit • NeoKylin v6.0 64-bit

Downloading drivers

1 Turn on the notebook.
2 Go to **Dell.com/support**.
3 Click **Product Support**, enter the Service Tag of your notebook, and then click **Submit**.

NOTE: If you do not have the Service Tag, use the auto detect feature or manually browse for your notebook model.

4 Click **Drivers and Downloads**.
5 Select the operating system installed on your notebook.
6 Scroll down the page and select the driver to install.
7 Click **Download File** to download the driver for your notebook.
8 After the download is complete, navigate to the folder where you saved the driver file.
9 Double-click the driver file icon and follow the instructions on the screen.

Downloading the chipset driver

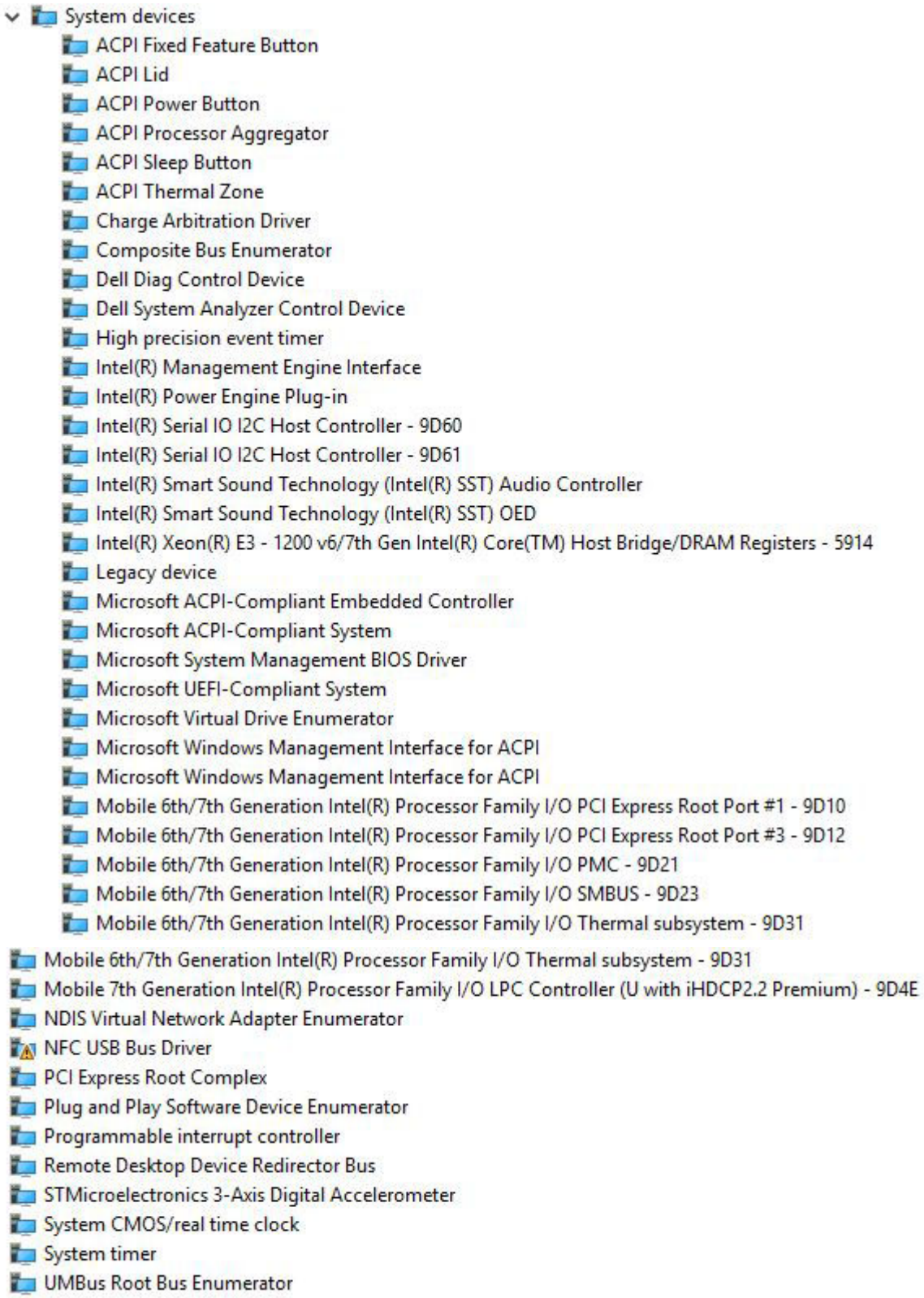
1 Turn on the laptop.
2 Go to **Dell.com/support**.
3 Click **Product Support**, enter the Service Tag of your laptop, and then click **Submit**.

NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your laptop model.

4 Click **Drivers and Downloads**.
5 Select the operating system installed on your laptop.
6 Scroll down the page, expand **Chipset**, and select your chipset driver.
7 Click **Download File** to download the latest version of the chipset driver for your laptop.
8 After the download is complete, navigate to the folder where you saved the driver file.
9 Double-click the chipset driver file icon and follow the instructions on the screen.

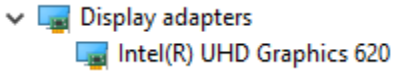
Intel chipset drivers

Verify if the Intel chipset drivers are already installed in the laptop.



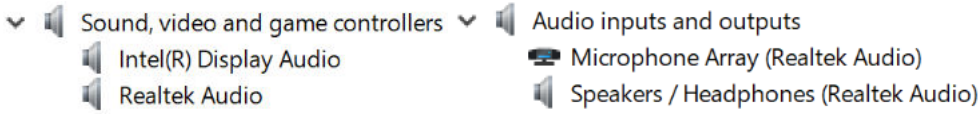
Video driver

Verify if the video driver is already installed in the system.



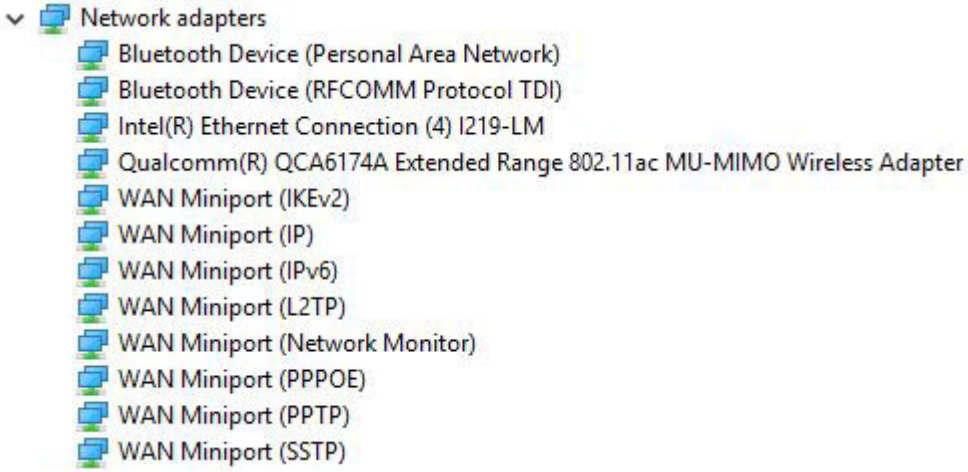
Audio driver

Verify if audio drivers is already installed in the system.



Network drivers

This system comes with both LAN and WiFi drivers and is able to detect the LAN and WiFi without going through the drivers installation.



USB driver

Verify if the USB drivers are already installed in the system.

Storage driver

Verify if the storage controller drivers are installed in the system.

Other drivers

This section lists driver details for all the other components in the Device Manager.

Security device driver

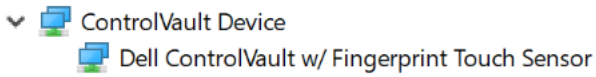
Verify if the security device driver is installed in the system.

HID

Verify if the HID driver is installed in the system.

Control Vault Device

Verify if the control vault device driver is installed in the system.



Smart card reader

Verify if the smart card reader drivers are installed in the system.

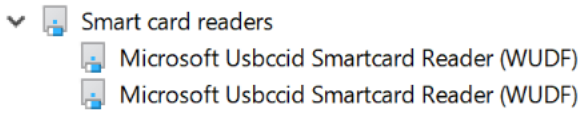
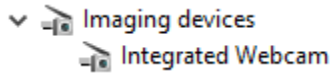


Image device driver

Verify if the image device driver is installed in the system.



7

Troubleshooting

Dell Enhanced Pre-Boot System Assessment — ePSA diagnostic 3.0

You can invoke the ePSA diagnostics by performing either of the following steps:

- Press the F12 key when the system boots and choosing **Diagnostics** option.
- Press Fn+PWR when the system boots.

For more details, see Dell EPSA Diagnostic 3.0.

Real Time Clock reset

The Real Time Clock (RTC) reset function allows you or the service technician to recover the recently launched model Dell Latitude and Precision systems from select **No POST/No Boot/No Power** situations. You can initiate the RTC reset on the system from a power off state only if it is connected to AC power. Press and hold the power button for 25 seconds. The system RTC reset occurs after you release the power button.

NOTE: If AC power is disconnected from the system during the process or the power button is held longer than 40 seconds, the RTC reset process is aborted.

The RTC reset will reset the BIOS to Defaults, un-provision Intel vPro and reset the system date and time. The following items are unaffected by the RTC reset:

- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password
- System Password
- HDD Password
- Key Databases
- System Logs

The following items may or may not reset based on your custom BIOS setting selections:

- The Boot List
- Enable Legacy OROMs
- Secure Boot Enable
- Allow BIOS Downgrade

8

Contacting Dell

NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1 Go to **Dell.com/support.**
2 Select your support category.
3 Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4 Select the appropriate service or support link based on your need.