Dell Vostro 14–3468

Owner's Manual

Regulatory Model: P76G
Regulatory Type: P76G002

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

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in the reverse order.

WARNING: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface that is grounded to ground yourself before you touch the computer to perform any disassembly tasks.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTE: The color of your computer and certain components may appear differently than shown in this document.

Before working inside your computer

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1 Ensure that you follow the Safety instructions.
2 Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
3 Turn off your computer (see Turning off your computer).
4 If the computer is connected to a docking device (docked), undock it.

CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

5 Disconnect all network cables from the computer.
6 Disconnect your computer and all attached devices from their electrical outlets.
7 Close the display and turn the computer upside-down on a flat work surface.

NOTE: To avoid damaging the system board, you must remove the main battery before you service the computer.

8 Remove the main battery.
9 Turn the computer top-side up.

10 Open the display.

11 Press the power button to ground the system board.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the display.

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

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

Turning off your computer

Turning off your — Windows

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer .

1 Click or tap .

2 Click or tap and then click or tap **Shut down**.

NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

Turning off your computer — Windows 7

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1 Click **Start**.

2 Click **Shut Down**.

NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

After working inside your computer

After you complete any replacement procedure, ensure that you connect 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 Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.

2 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.

3 Connect your computer and all attached devices to their electrical outlets.

4 Turn on your computer.

Disassembly and reassembly

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Small plastic scribe

Screw size list

Table 1. Vostro 14–3468 screw size list

Component	M2L2(Big head 07)	M2L2(Big head 05)	M2L2.5	M2L5	M2L3 (Thin head)	M2.5L2.5 (Big head)	M2.5L8	M3L3
Optical drive		2						
Optical drive bracket					1			
Base Cover				6	1	1	8	
Hard drive					2			
Hard drive bracket								4
System fan				2				
System board					1			
Power connector	1							
Display assembly						3		
Camera								
Display panel					4			
Hinge						6		
Power button board	1	1						
Fingerprint reader			1					

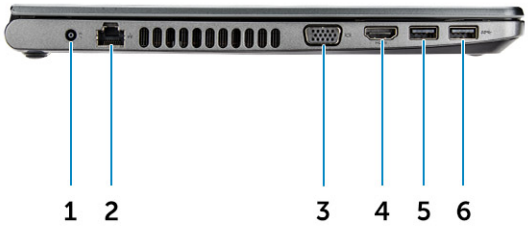
Chassis view

Front open view



1	Camera	2	Camera-status light
3	Microphone	4	LCD panel
5	Power and battery-status light/ Hard-drive activity light		

Left view



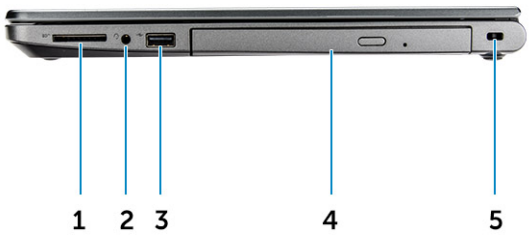
1	Power connector	2	Network connector
3	VGA connector	4	HDMI 1.4 connector
5	USB 3.1 Gen 1 connector	6	USB 3.1 Gen 1 connector

Palm rest view



1	Power button	2	Keyboard
3	Fingerprint reader	4	Palm rest
5	Touchpad		

Right view

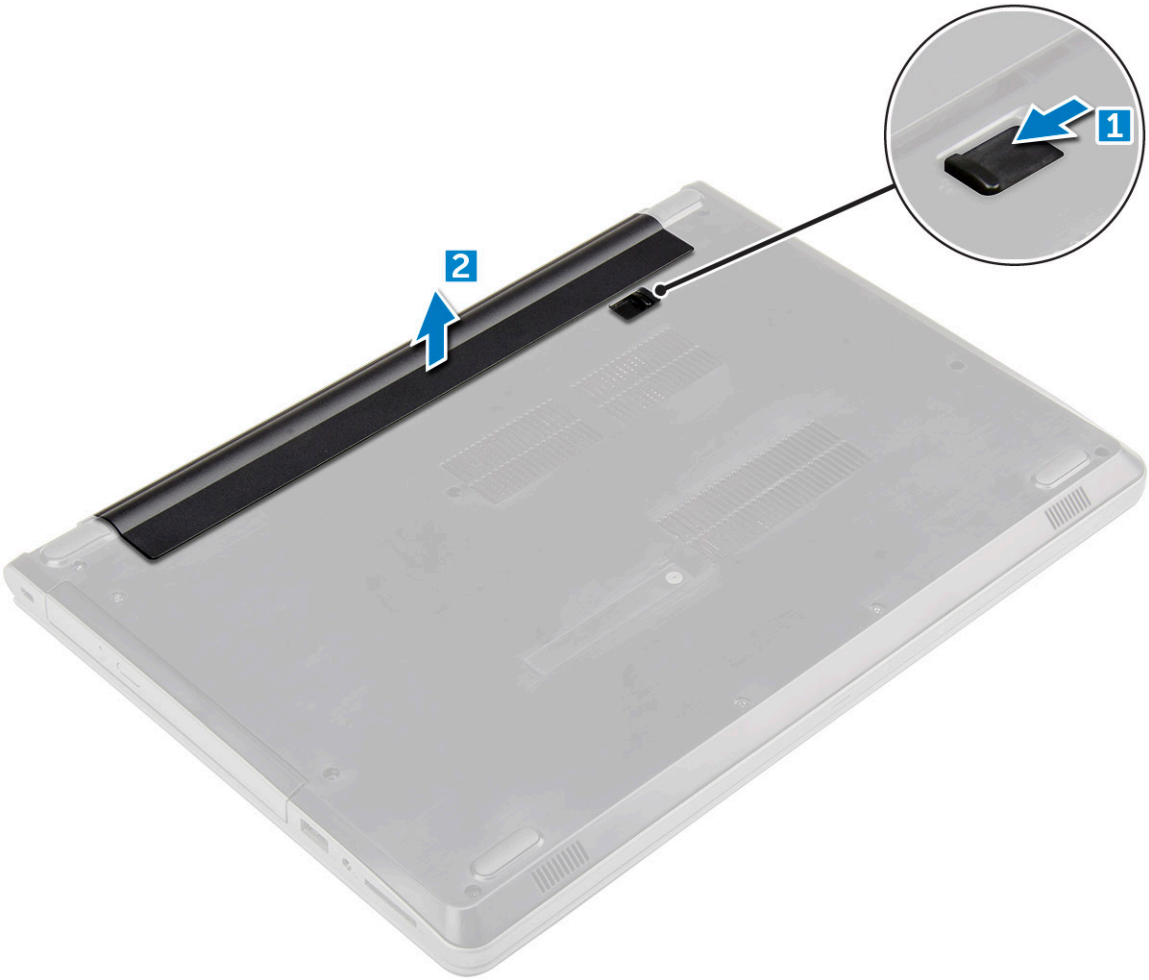


1 SD card reader
2 Universal audio port
3 USB 2.0 connector
4 Optical drive
5 Security cable slot

Battery

Removing the battery

1 Follow the procedure in Before working inside your computer.
2 To remove the battery:
   a Slide the release latch to release the battery [1].
   b Remove the battery from the computer [2].



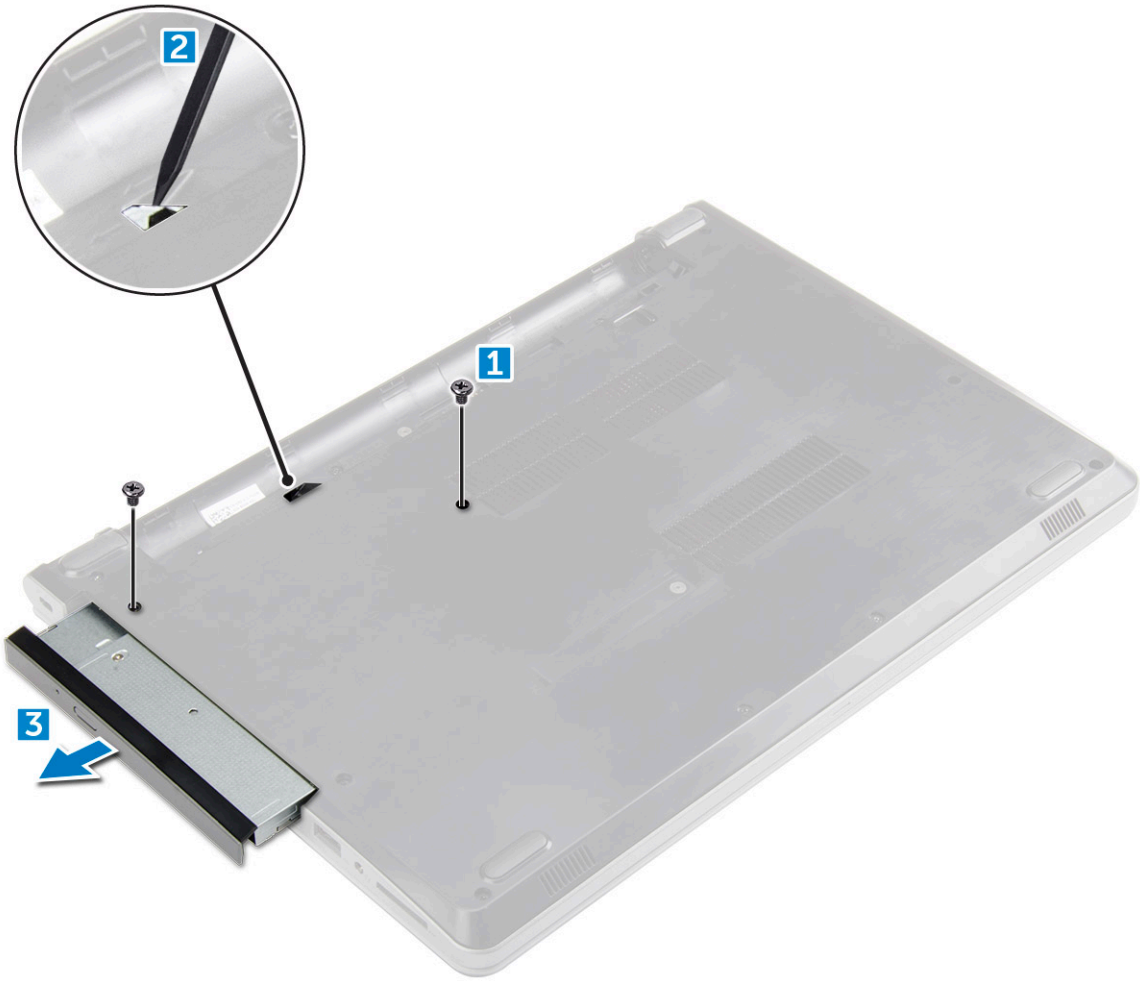
Installing the battery

1 Insert the battery into the slot and press until it clicks into place.
2 Follow the procedures in After working inside your computer.

Optical drive

Removing the optical drive

1 Follow the procedure in Before working inside your computer.
2 Remove the battery.
3 To remove the optical drive:
   a Remove the two M2L3 screws that secure the optical drive to the computer [1].
   b Using a plastic scribe, push the tab in the direction of the arrow indicated on the chassis. [2].
   c Slide the optical drive out of the computer [3].



Removing the optical drive bracket

1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a battery
- b optical drive

3 To remove the optical drive from the bracket:

- a Remove the single M2L2(Big head05) screw that secures the optical drive bracket.
- b Remove the optical drive bracket from the optical drive .



Installing the optical drive bracket

1 Install the optical drive bracket.
2 Tighten the single M2L2(Big head05) screw to secure the optical drive bracket.
3 Install the:
   a optical drive
   b battery
4 Follow the procedure in After working inside your computer.

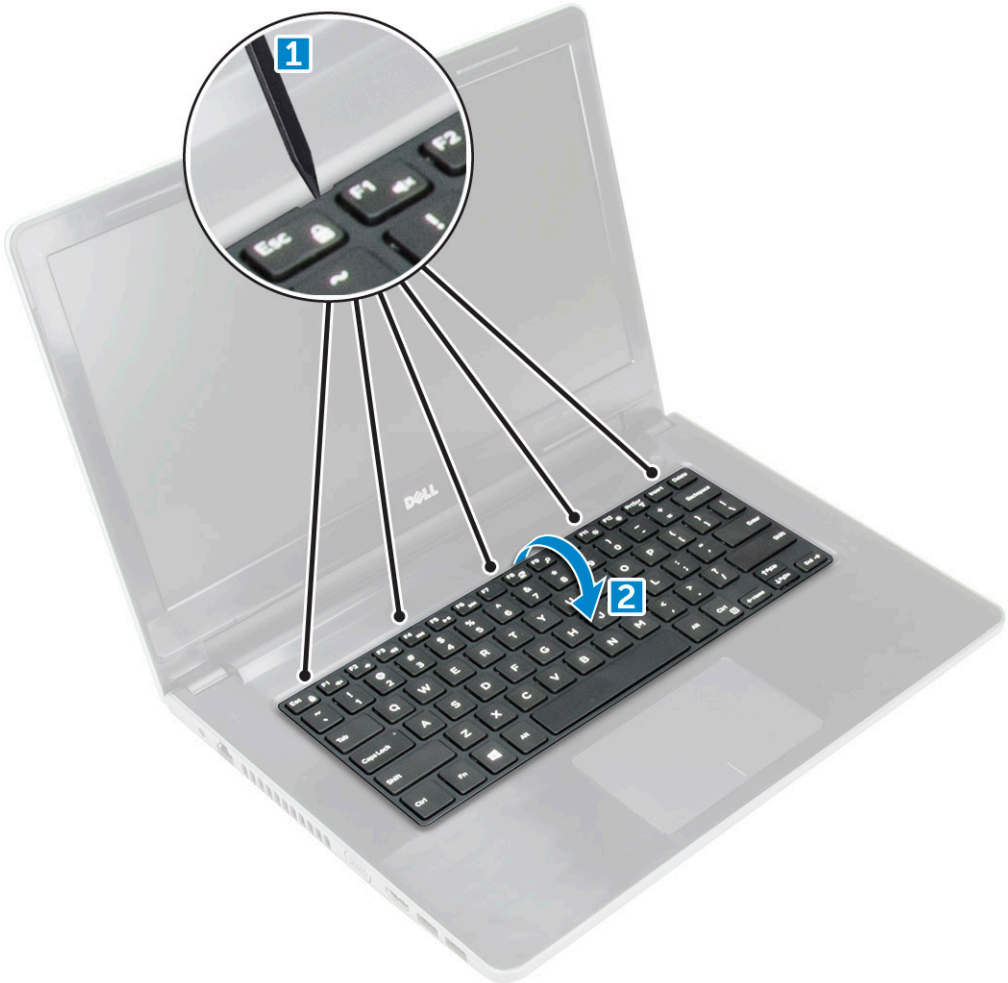
Installing the optical drive

1 Insert the optical drive into the slot until it clicks into place.
2 Tighten the two M2L3 screws to secure the optical drive to the computer.
3 Install the battery.
4 Follow the procedure in After working inside your computer.

Keyboard lattice and Keyboard

Removing the keyboard

1 Follow the procedure in Before working inside your computer.
2 Remove the battery.
3 To remove the keyboard:
   a Using a plastic scribe, release the five tabs from the slots located above the keyboard [1].
   b Flip the keyboard on the palm rest to access the keyboard connector cable under the keyboard [2].



4 To remove the keyboard cable:
   a Disconnect the keyboard cable from the system board.
   b Remove the keyboard from the computer.



Installing the keyboard

1 Connect the keyboard cable to the connector on the system board.
2 Slide the keyboard to align it with the tabs.
3 Press along the top edges to lock the keyboard in place.
4 Install the battery.
5 Follow the procedure in After working inside your computer.

Base cover

Removing the base cover

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
3 To remove the base cover:
   a Disconnect the optical drive connector and lift it to remove it from the system board [1].

b Remove the three M2L5 screws that secure the base cover [2].



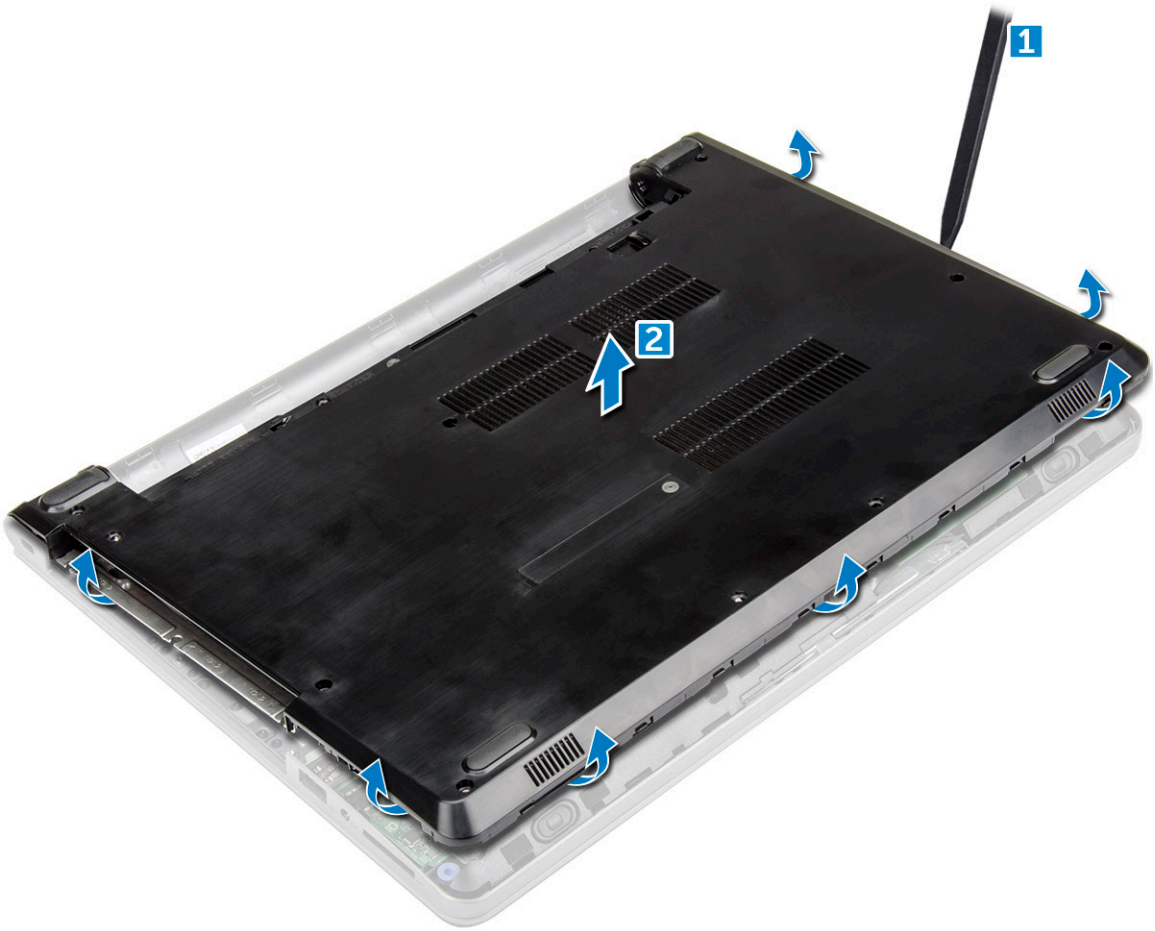
4 Flip the computer and remove the screws (3 screws - M2L2; 2 screws- M2L2; 8 screws - M2.5L8) that secure the base cover to the computer [1, 2, 3].



5 To remove the base cover:

a Use a scribe to pry the edges of the base cover [1].

b Lift the base cover and remove it from the computer [2].



Installing the base cover

1 Align the base cover with the screw holders on the computer.
2 Press the edges of the cover until it clicks into place.
3 Tighten the (8 screws - M2.5L8; 3 screws - M2L2; 2 screws- M2L2) screws to secure the base cover to the computer.
4 Flip the computer over.
5 Open the display and connect the optical drive connector to the system board.
6 Tighten the three M2L5 screws to secure the base cover to the palm rest.
7 Install the:
   a keyboard
   b optical drive
   c battery
8 Follow the procedure in After working inside your computer.

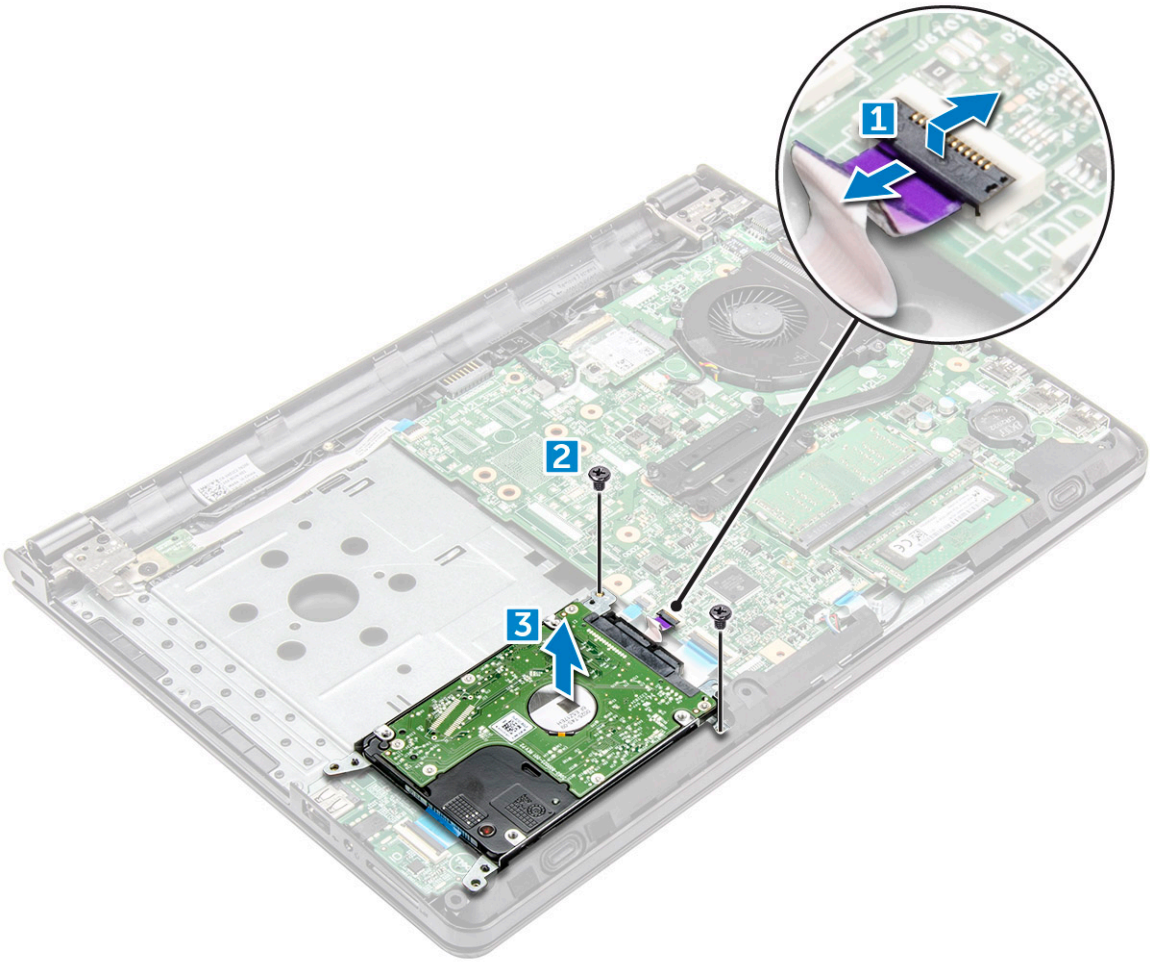
Hard drive

Removing the hard drive assembly

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

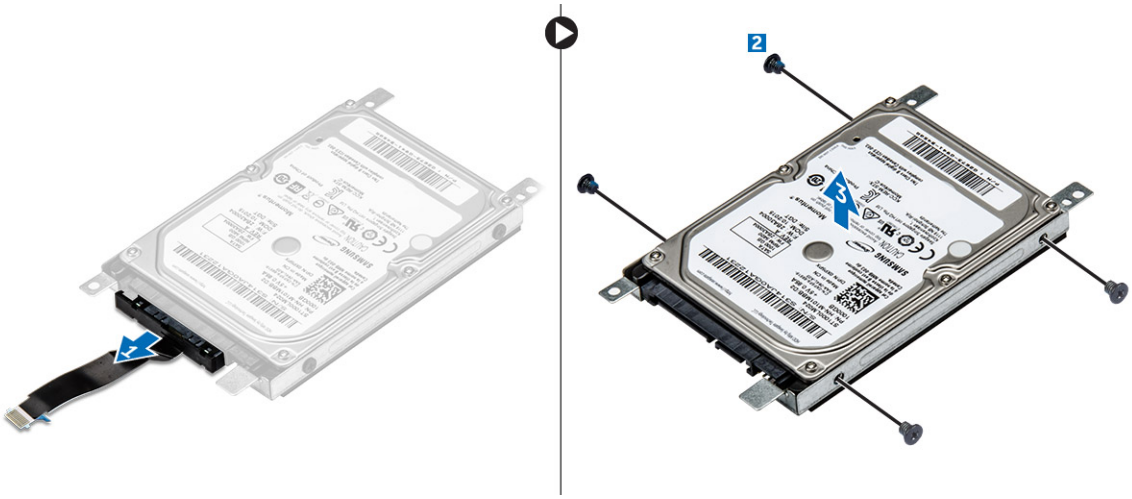
b optical drive
c keyboard
d base cover

3 To remove the hard drive assembly:
a Disconnect the hard drive cable from the connector on the system board [1].
b Remove the two M2L3 screws that secure the hard drive assembly to the computer [2].
c Lift the hard drive assembly away from the computer [3].



Removing the hard drive from the hard drive bracket

1 Follow the procedure in Before working inside your computer.
2 Remove the:
a battery
b optical drive
c keyboard
d base cover
e hard drive assembly
3 To remove the hard drive from the hard drive assembly:
a Pull the hard drive cable connector to remove it from the hard drive [1].
b Remove the four M3L3 screws that secure the hard drive bracket to the hard drive [2].
c Lift the hard drive from the hard drive bracket [3].



Installing the hard drive into the hard drive bracket

1 Align the screw holders and insert the hard drive into the hard drive bracket.
2 Tighten the four M3L3 screws to secure the hard drive to the hard drive bracket.
3 Connect the hard drive cable connector to the hard drive.
4 Install the:
   a hard drive assembly
   b base cover
   c keyboard
   d optical drive
   e battery
5 Follow the procedure in After working inside your computer

Installing the hard drive assembly

1 Insert the hard drive assembly into the slot on the computer.
2 Tighten the two M2L3 screws to secure the hard drive assembly to the computer.
3 Connect the hard drive cable to the connector on the system board.
4 Install the:
   a base cover
   b keyboard
   c optical drive
   d battery
5 Follow the procedures in After working inside your computer.

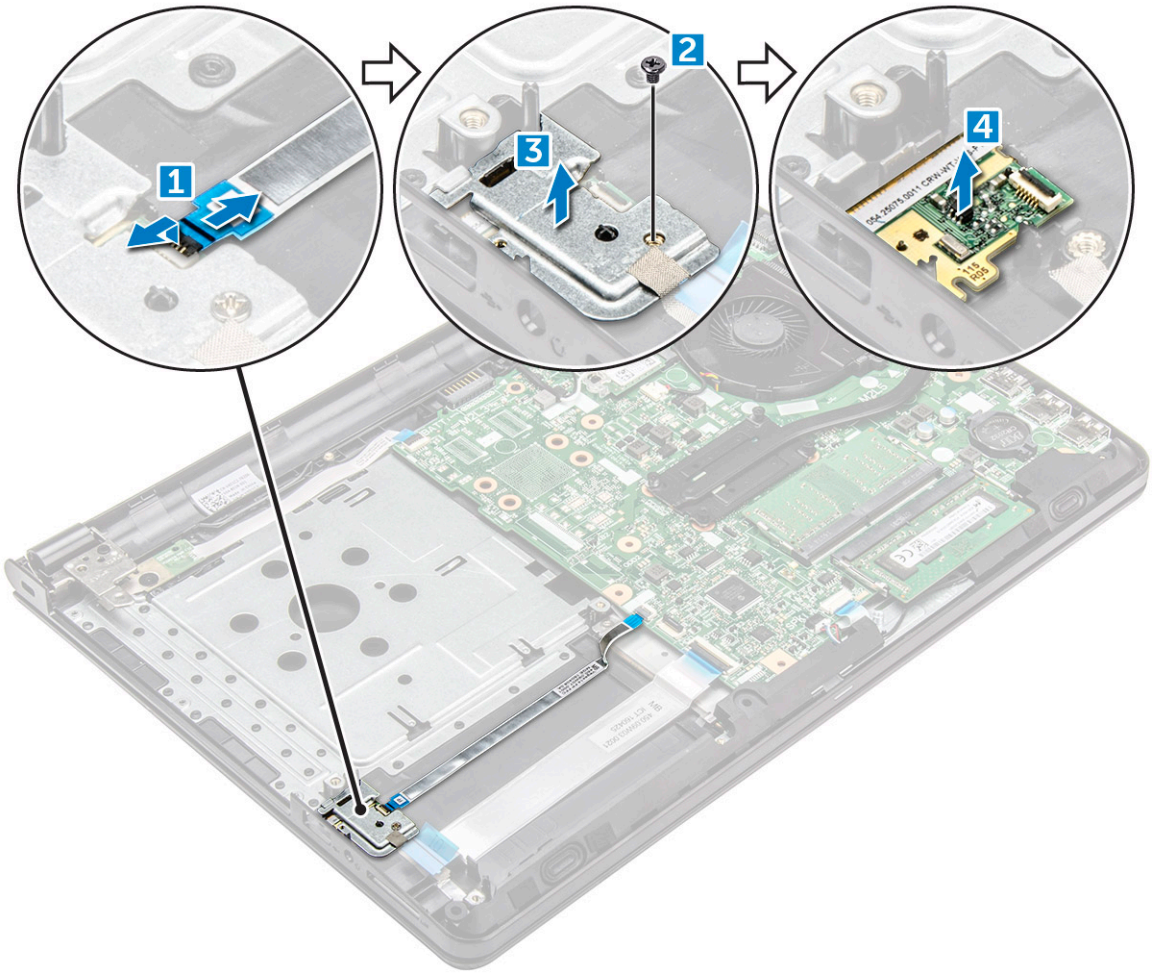
Fingerprint reader

Removing the fingerprint reader

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

c keyboard
d base cover
e hard drive
f I/O board

3 To remove the fingerprint reader:
   a Disconnect the fingerprint reader from the connector on the system board [1].
   b Remove the single M2L2.5 screw that secures the hard drive assembly to the computer [2, 3].
   c Lift the fingerprint reader board away from the computer [4].



Installing the fingerprint reader

1 Place the fingerprint reader board into the slot on the computer.
2 Tighten the single M2L2.5 screw that secures the fingerprint reader to the computer.
3 Connect the fingerprint reader cable to the connector on the system board.
4 Install the:
   a I/O board
   b hard drive
   c base cover
   d keyboard
   e optical drive
   f battery
5 Follow the procedures in After working inside your computer.

WLAN card

Removing the WLAN card

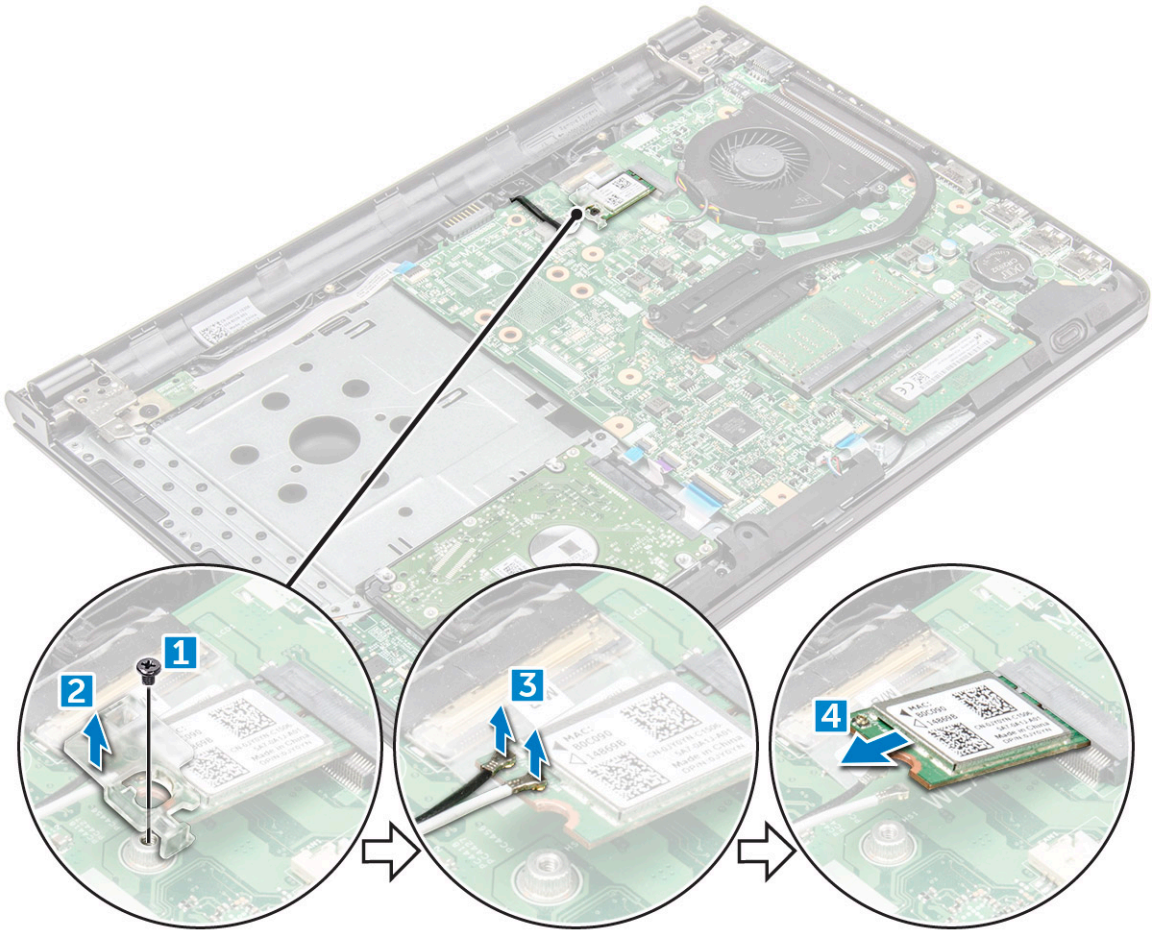
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a battery
- b optical drive
- c keyboard
- d base cover

3 To remove the WLAN card:

- a Remove the single M2L3 screw that secures the tab to the WLAN card [1].
- b Lift the tab that secures the WLAN card [2].
- c Disconnect the WLAN cables from the connectors on the WLAN card [3].
- d Slide the WLAN card from the connector on the system board [4].



Installing the WLAN card

1 Install the WLAN card to the connector on the system board.

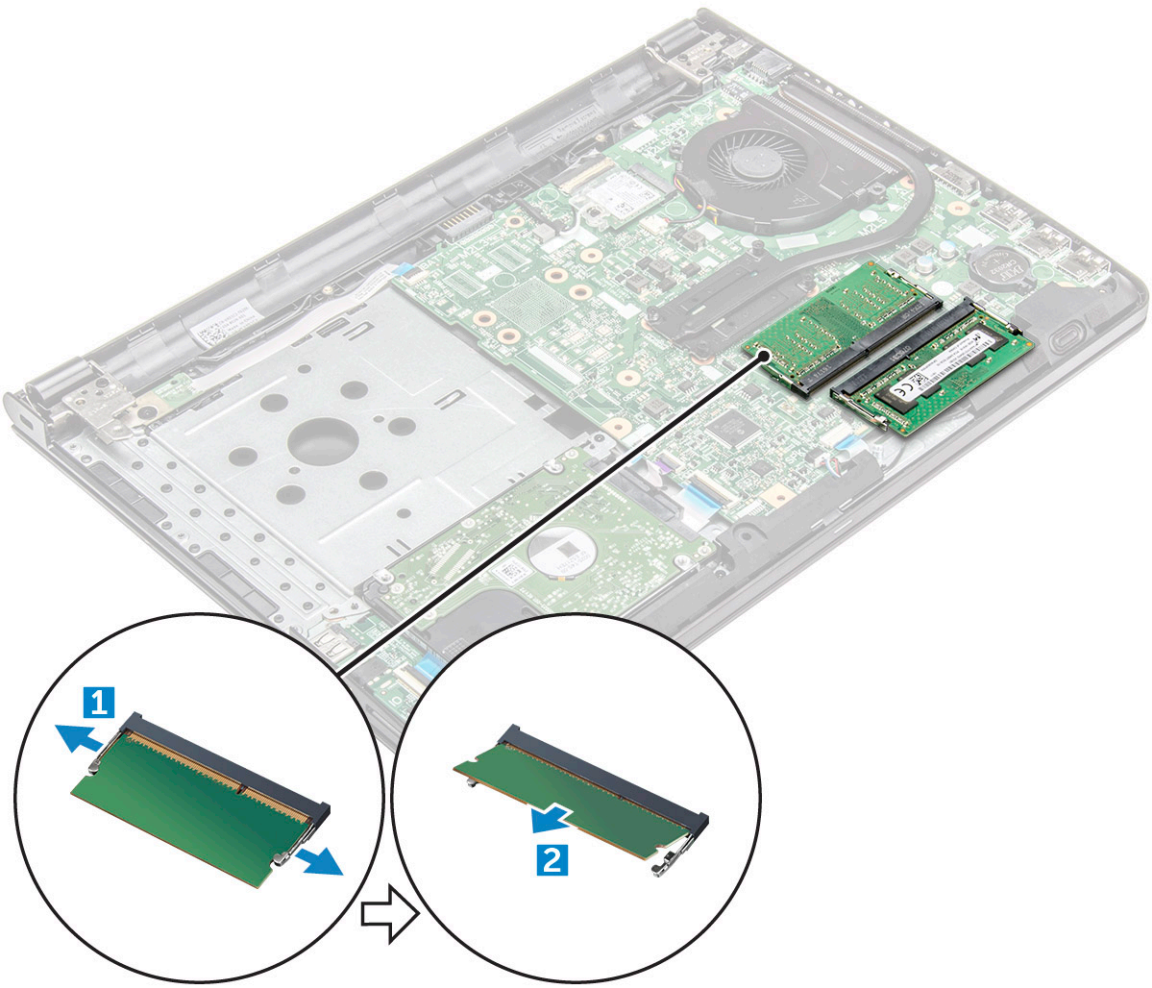
2 Connect the WLAN cables to the connectors on the WLAN card.

3 Place the securing tab on the WLAN card and tighten the M2L3 screw on the computer.
4 Install the:
   a base cover
   b keyboard
   c optical drive
   d battery
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 battery
   b optical drive
   c keyboard
   d base cover
3 To remove memory module:
   a Pull the clips securing the memory module until the memory module pops up [1].
   b Remove the memory module from the system board [2].



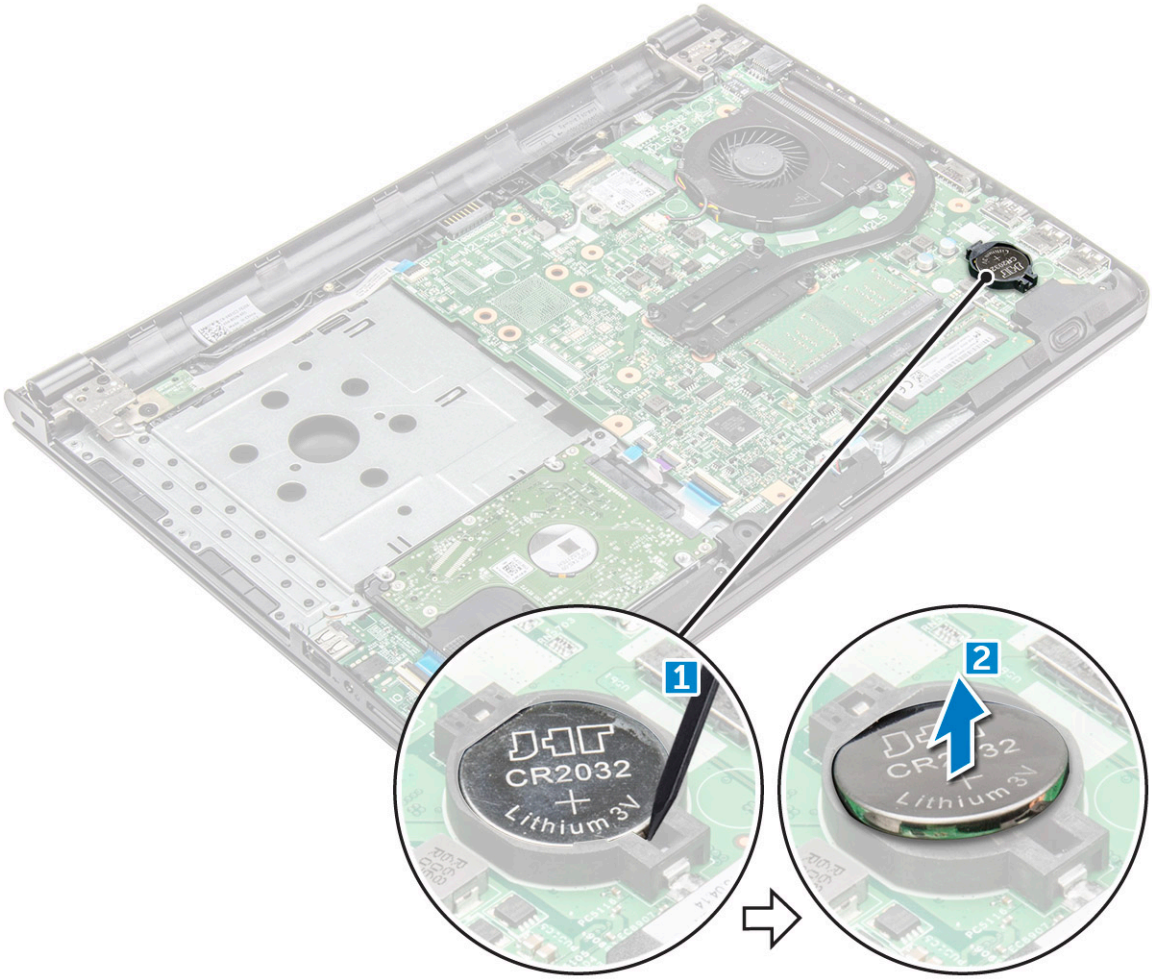
Installing the memory module

1 Insert the memory module into the memory socket.
2 Press the memory module until the clips secure the memory module.
3 Install the:
   a base cover
   b keyboard
   c optical drive
   d battery
4 Follow the procedures in After working inside your computer.

Coin-cell battery

Removing the coin cell battery

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
   d base cover
3 Use a plastic scribe to lift the battery out of the slot [1,2].



Installing the coin cell battery

1 Insert the coin cell battery into the battery slot.
2 Press the battery until it clicks into place.
3 Install the:
   a battery
   b keyboard
   c optical drive
   d battery
4 Follow the procedures in After working inside your computer.

Power button board

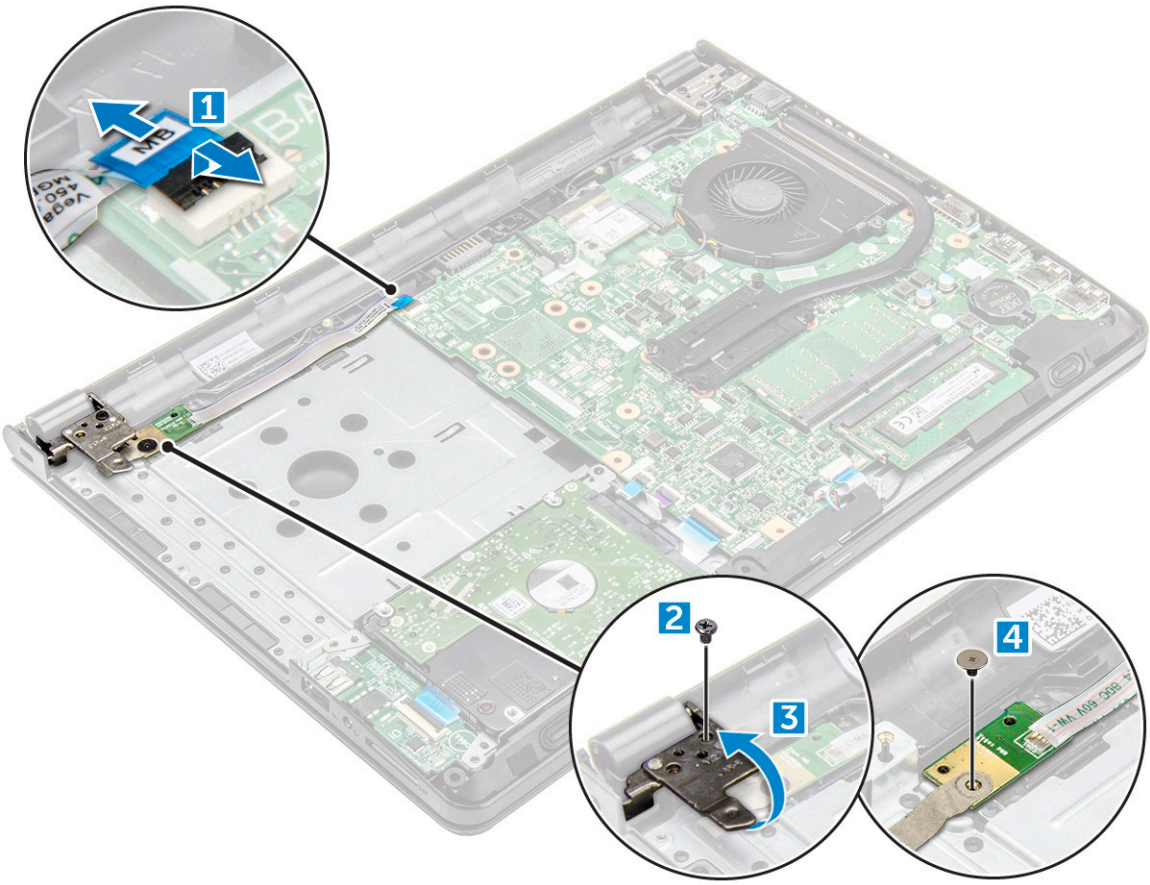
Removing the power button board

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard

d base cover

3 To remove the power button board:

a Disconnect the system board cable from the computer [1].
b Remove the single display hinge screw (M2.5L8) from the computer [2].
c Flip the display hinge to reveal the power button board beneath the hinge [3].
d Remove the single screw [M2L2(Big head07)] that secures the power button board to the chassis [4].
e Peel the system board cable from the chassis and then peel the tape that holds the power button board.
f Slide the Power button board away from the chassis.



Installing the power button board

1 Place the button board on the chassis.
2 Affix the tape that holds the power button board.
3 Affix the system board cable to the chassis.
4 Place the power button board and tighten the single [M2L2(Big head07)] screw.
5 Connect the system board cable to the power button board.
6 Tighten the single (M2.5L8) screw to secure the display hinge to the power button board.
7 Install the:

a base cover
b keyboard
c optical drive
d battery

8 Follow the procedures in After working inside your computer.

Heat sink

Removing the heat sink

1 Follow the procedure in Before working inside your computer.

2 Remove the:

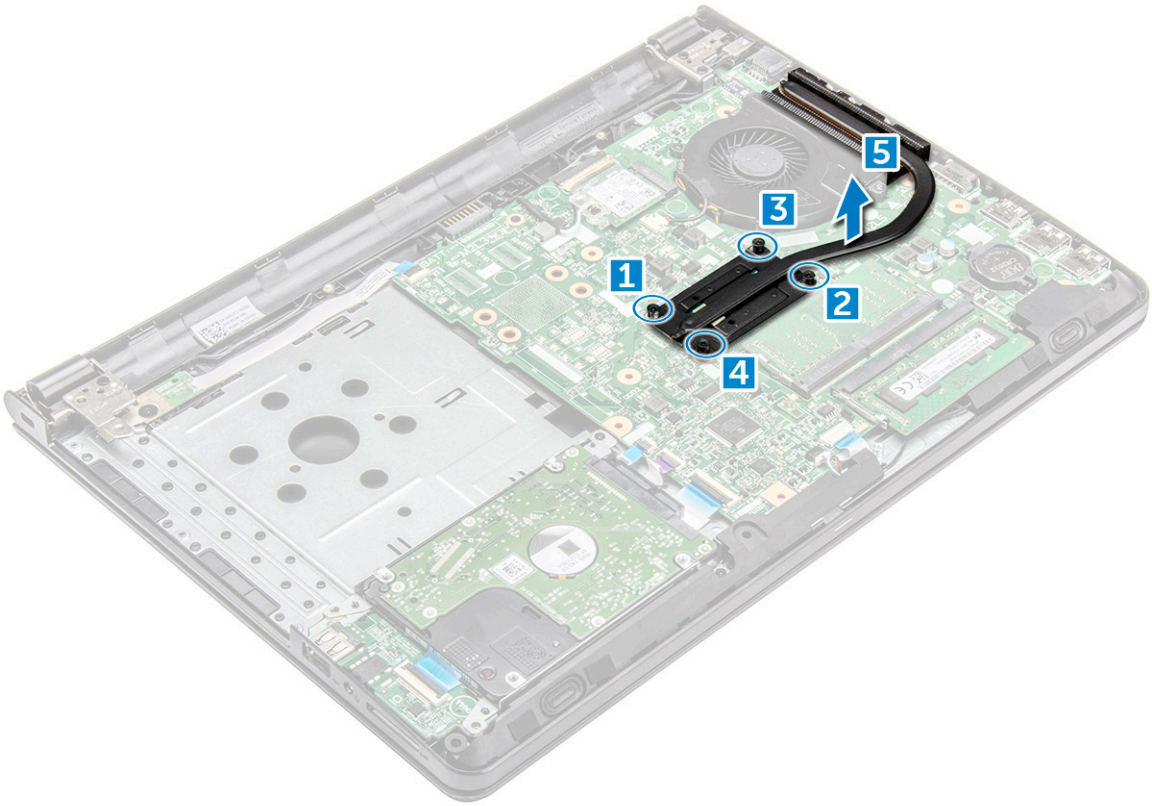
- a battery
- b optical drive
- c keyboard
- d base cover

3 To remove the heat sink:

- a Loosen the four captive screws that secure the heat sink to the system board [1, 2, 3, 4].

  NOTE: Loosen the screws in the order of the callout numbers [1, 2, 3, 4]. These screws are retention screws and cannot be fully removed.

- b Remove the heat sink from the system board [5].



Installing the heat sink

1 Align the screws on the heat sink with the screw holders on the system board.

2 Tighten the four captive screws to secure it to the system board.

NOTE: Secure the screws in the order of the callout numbers [1, 2, 3, 4].

3 Install the:

- a base cover

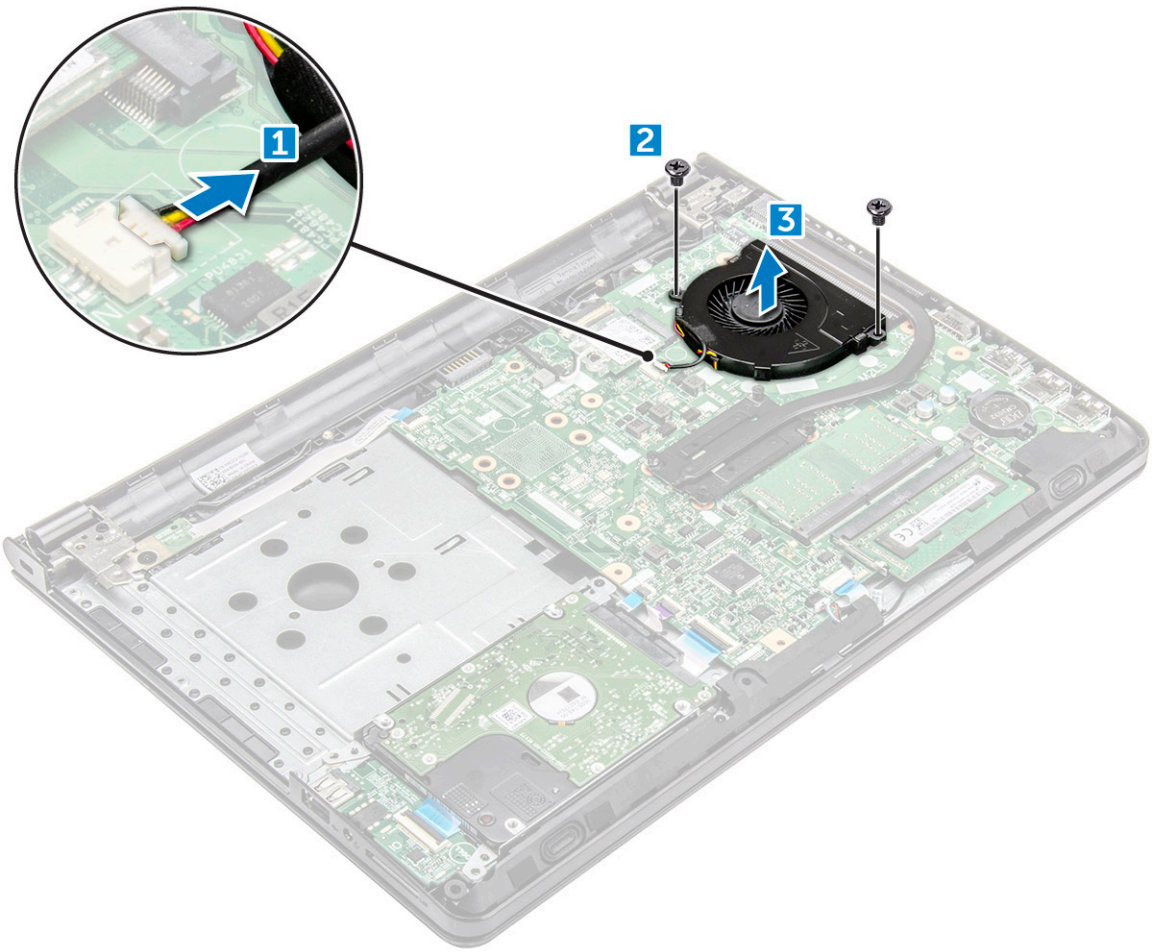
b keyboard
c optical drive
d battery

4 Follow the procedures in After working inside your computer.

System fan

Removing the system fan

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
   d base cover
3 To remove the system fan:
   a Disconnect the system fan connector cable from the system board [1].
   b Remove the two M2L5 screws that secure the system fan to the computer [2].
   c Lift and remove the system fan from the chassis [3].



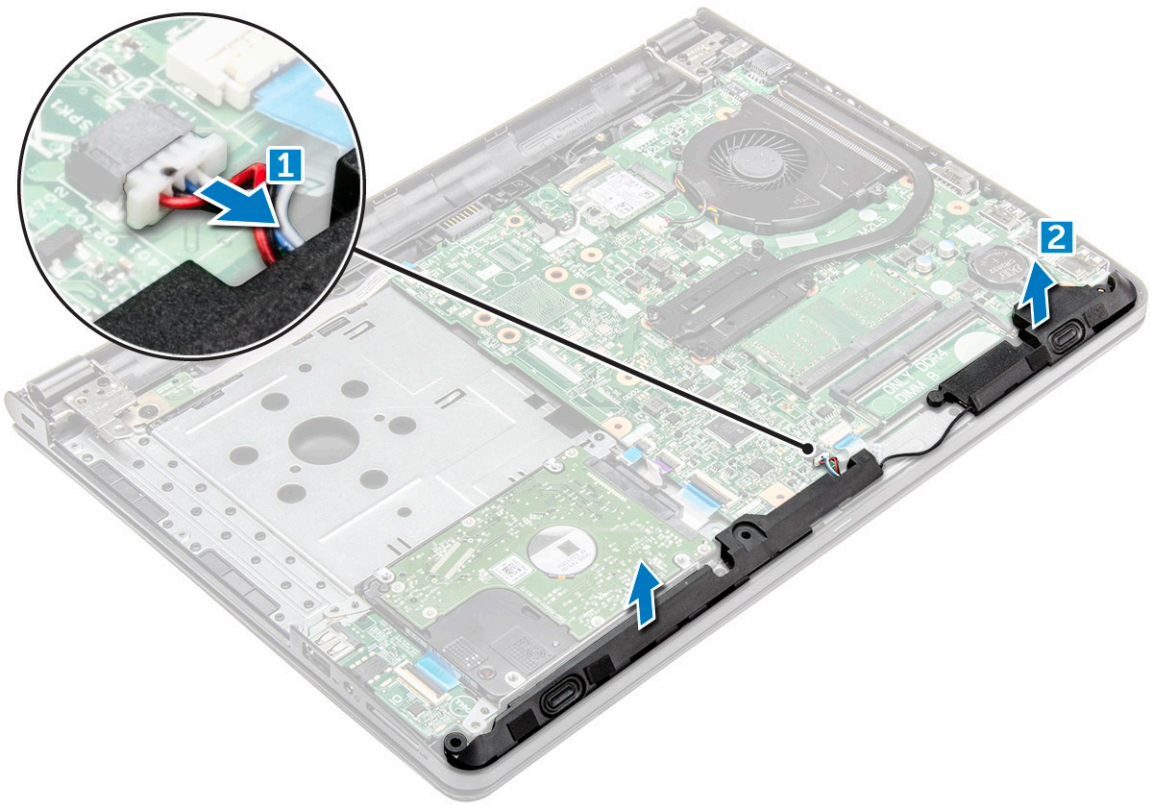
Installing the system fan

1 Align the system fan on the chassis.
2 Secure the system fan to the computer by tightening the two M2L5 screws.
3 Connect the system fan connector cable to the system board connector.
4 Install the:
   a base cover
   b keyboard
   c optical drive
   d battery
5 Follow the procedures in After working inside your computer.

Speaker

Removing the speakers

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
   d base cover
3 To remove the speakers:
   a Disconnect the speaker cable from the computer [1].
   b Remove the speakers from the computer [2].



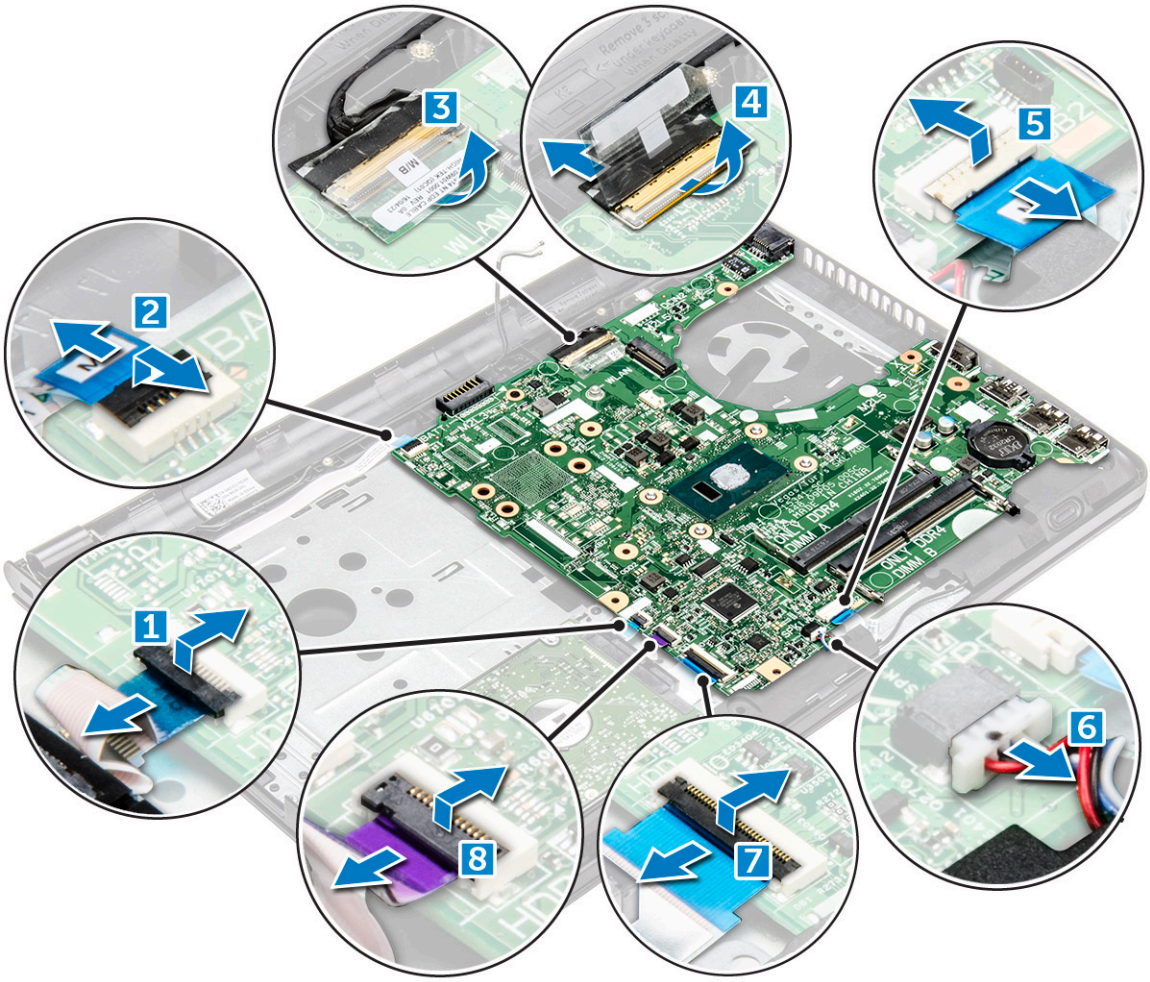
Installing the speakers

1 Place the speakers into the slots on the computer.
2 Connect the speaker cable to the system board.
3 Install the:
   a base cover
   b keyboard
   c optical drive
   d battery
4 Follow the procedure in After working inside your computer

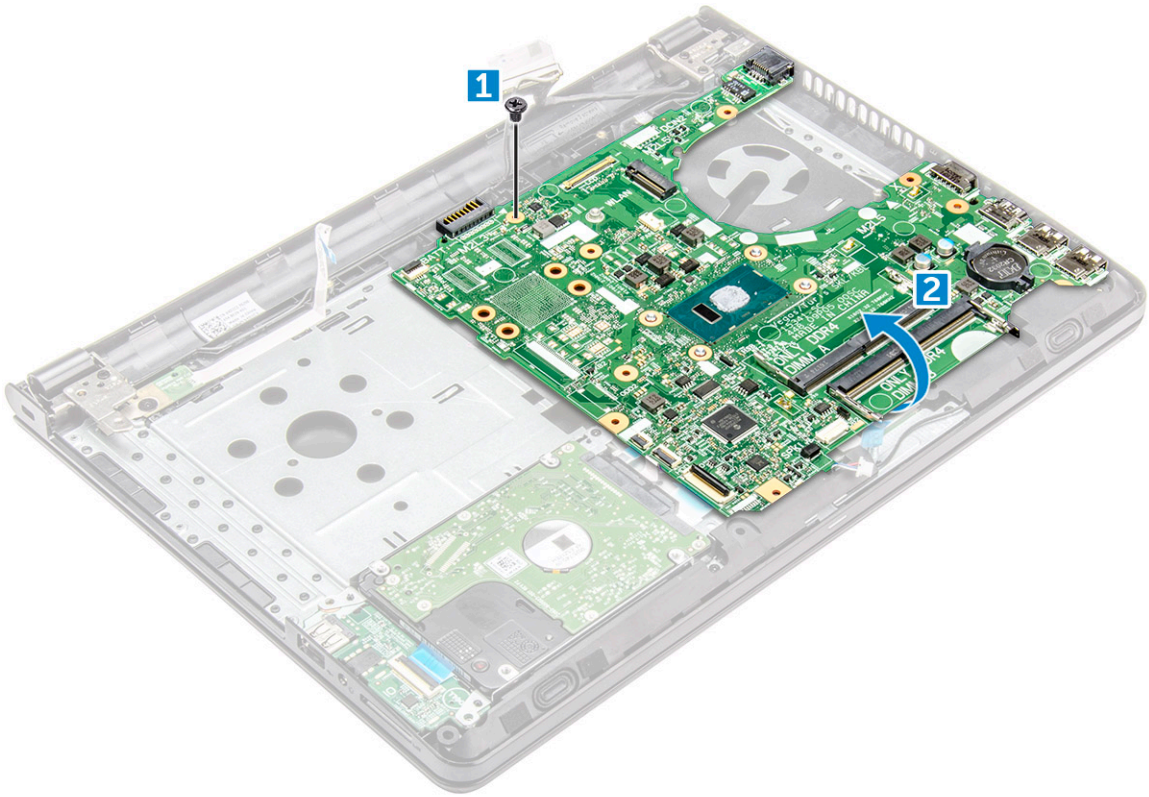
System board

Removing the system board

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
   d base cover
   e WLAN card
   f memory module
   g heat sink
   h system fan
3 Lift the locking tab to disconnect the following cables
   a fingerprint reader connector [1]
   b power button board connector [2]
   c remove the adhesive tape [3]
   d lift the locking tab and disconnect the eDP connector [4]
   e touchpad connector [5]
   f speaker [6]
   g I/O connector [7]
   h hard drive connector [8]



4 Remove the single M2L3 screws that secure the system board to the computer [1] and lift the system board [2].



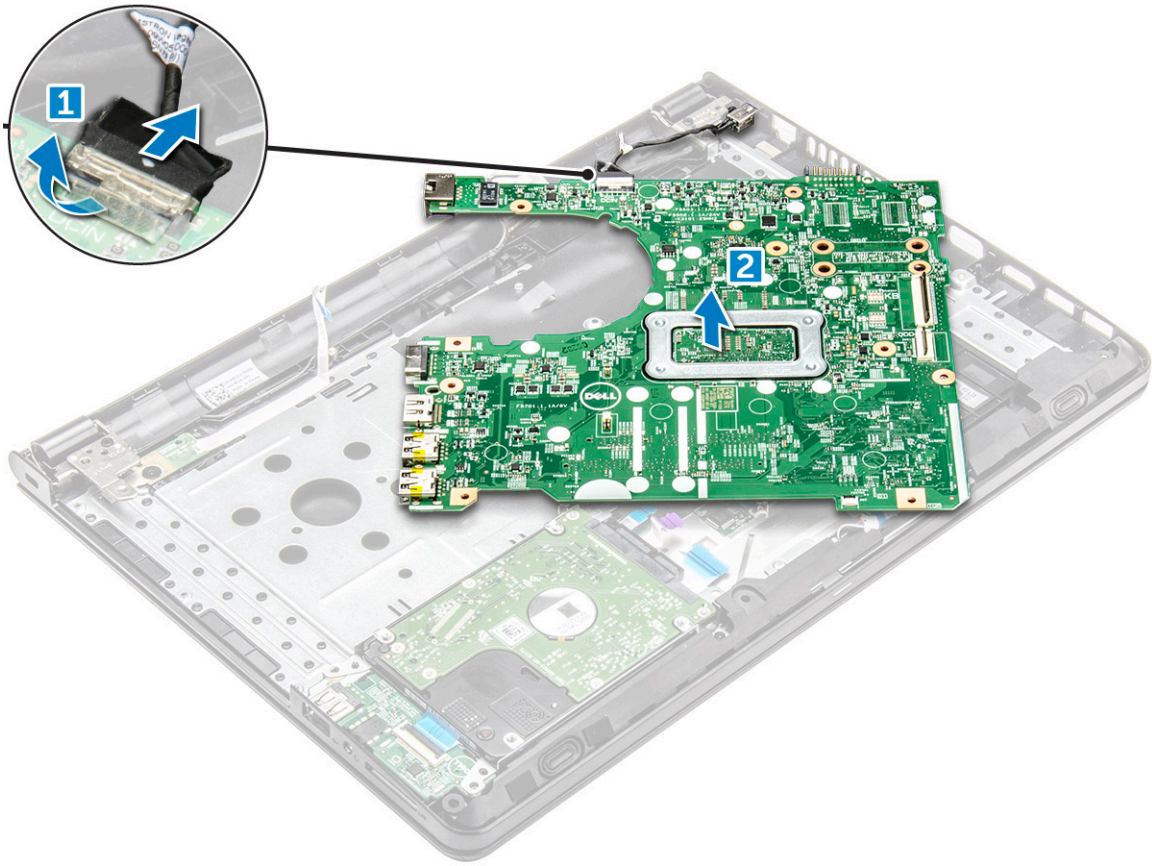
5 Flip the system board.

6 To remove the system board:

a Peel the adhesive tape [1].

b Unlock the tab and disconnect the power cable [2].

c Remove the system board from the computer.



Installing the system board

1 Connect the power cable cable.
2 Affix the adhesive tape.
3 Flip the system board.
4 Align the system board with the screw holders on the computer.
5 Tighten the single M2L3 screw to secure the system board to the computer.
6 Connect the following cables to the system board.
   a hard drive connector
   b touchpad connector
   c speaker connector
   d I/O connector
   e eDP connector
   f power connector
   g fingerprint connector
7 Install the:
   a system fan
   b heat sink
   c memory module
   d WLAN Card
   e base cover
   f keyboard
   g optical drive
   h battery
8 Follow the procedure in After working inside your computer.

Input-Output board

Removing the Input-Output board

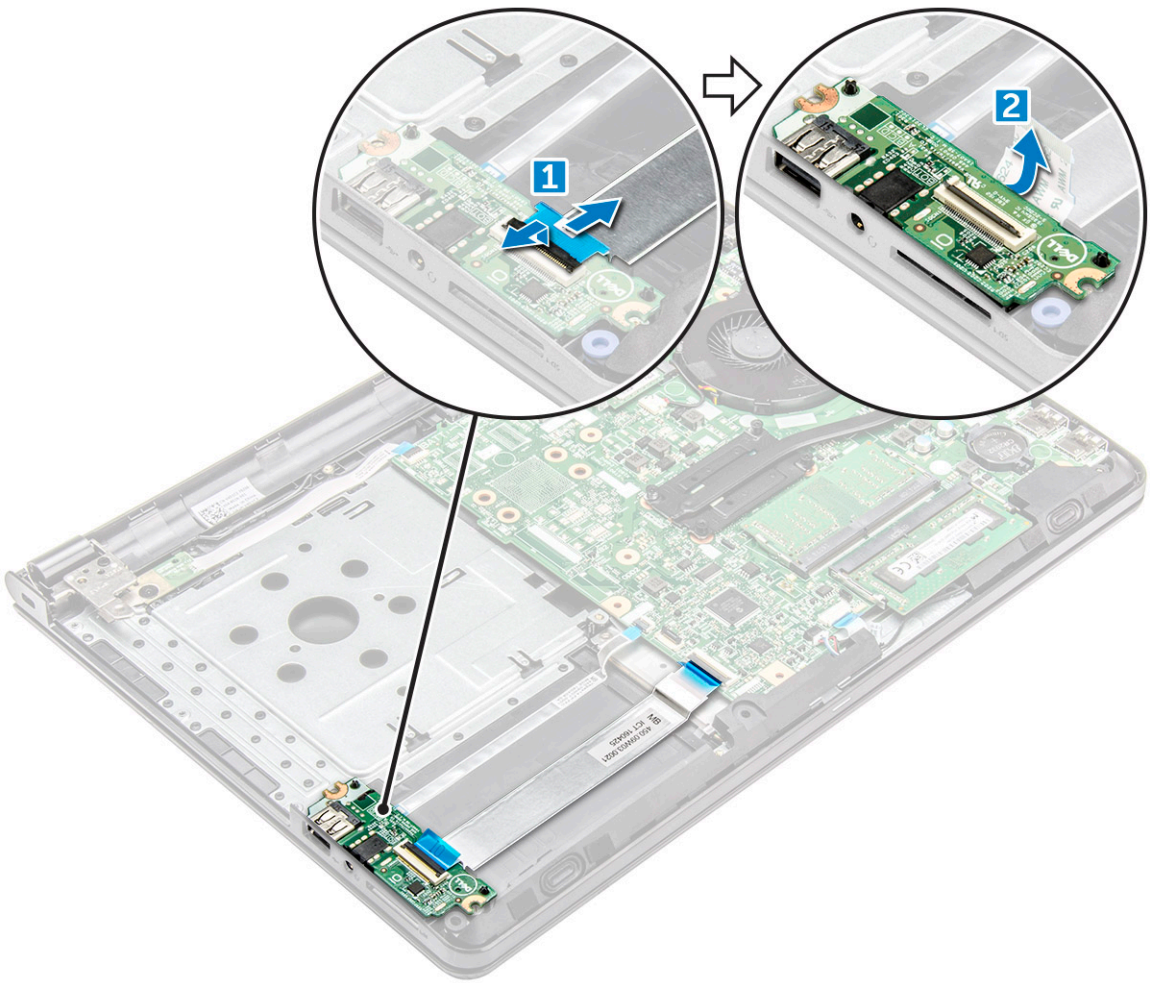
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a battery
- b optical drive
- c keyboard
- d base cover
- e hard drive assembly

3 To remove the Input/Output board (I/O board):

- a Disconnect the I/O board cable [1].
- b Lift and remove the I/O board from the computer [2].



Installing the Input-Output board

1 Place the I/O board on the computer.

2 Connect the input/output (I/O board) cable to the I/O board.

3 Install the:

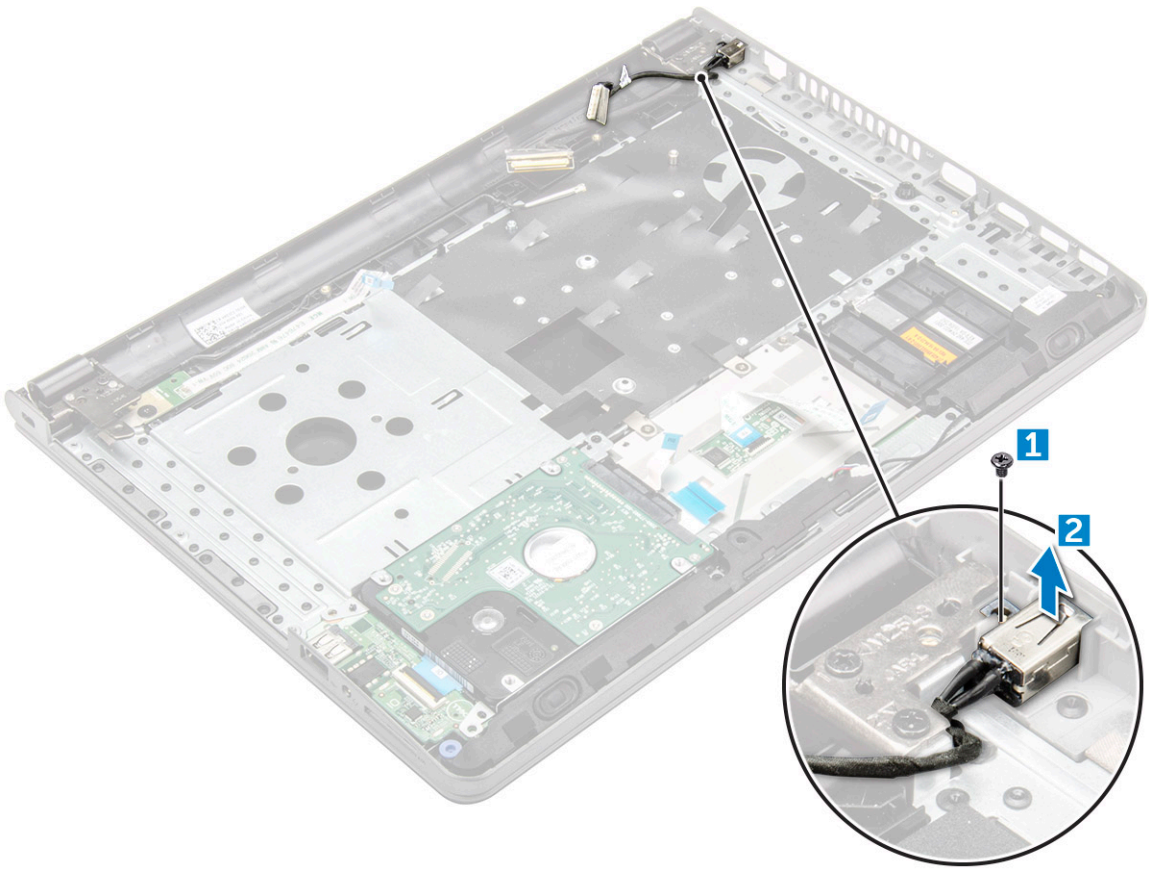
a hard drive assembly
b base cover
c keyboard
d optical drive
e battery

4 Follow the procedure in After working inside your computer.

Power connector port

Removing the power connector

1 Follow the procedure in Before working inside your computer.
2 Remove the:
a battery
b optical drive
c keyboard
d base cover
e hard drive assembly
f WLAN card
g memory module
h heat sink
i system fan
j system board
3 To remove the power connector:
a Remove the single [M2x2 (Big head 07)] screw that secures the power connector to the computer [1].
b Lift the power connector [2].



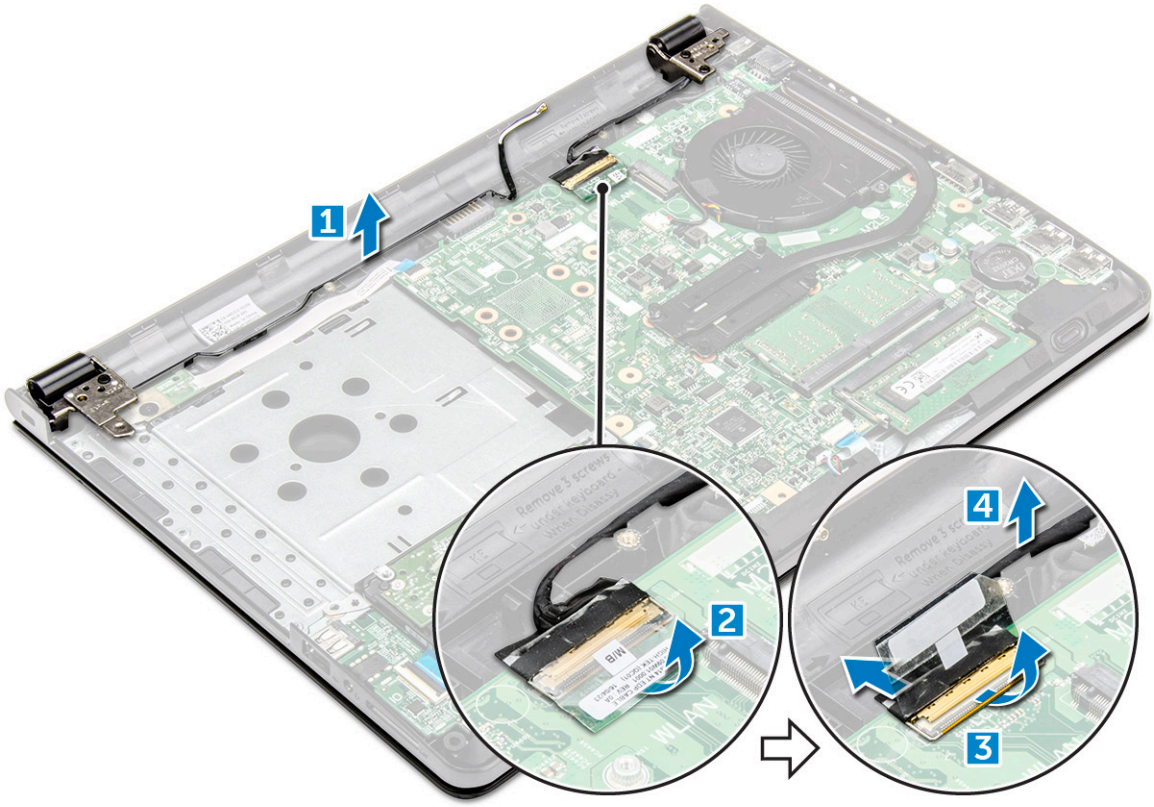
Installing the power connector

1 Insert the power connector into the slot on the computer.
2 Secure the power connector to the computer by using the single [M2x2 (Big head 07)] screw.
3 Install the:
   a system board
   b system fan
   c WLAN Card
   d memory module
   e heat sink
   f hard drive assembly
   g base cover
   h keyboard
   i optical drive
   j battery
4 Follow the procedure in After working inside your computer.

Display assembly

Removing the display assembly

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
   d base cover
   e WLAN card
3 To remove the display assembly:
   a Unroute the WLAN cable [1].
   b Peel the adhesive tape [2].
   c Lift the locking tab [3].
   d Disconnect the eDP cable [4].



4 Flip the computer.



5 To remove the display assembly:

NOTE: Place the chassis on the edge of a table with the display facing down.

a Remove the three M2.5L8 screws that secure the display hinge to the computer [1].

CAUTION: Practice caution when handling the LCD HUD by supporting it with one hand, while working on the hinges.

b Lift and remove the display assembly [2].



Installing the display assembly

1 Align the display assembly with the chassis.
2 Connect the eDP cable to the connector on the system board and lock the locking tab.
3 Affix the adhesive tape to secure the eDP cable.
4 Route the WLAN and display assembly cables through the cable-securing tabs.
5 Tighten the display hinges three M2.5L8 screws to secure the display assembly.
6 Install the:
   a WLAN Card
   b base cover
   c keyboard
   d optical drive
   e battery
7 Follow the procedure in After working inside your computer.

Display bezel

Removing the display bezel

1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a battery
- b optical drive
- c keyboard
- d base cover
- e WLAN card
- f display assembly

3 To disconnect the display bezel:

- a Use a plastic scribe to release the tabs on the edges to release the display bezel from the display assembly.
- b Remove the display bezel display assembly.



Installing the display bezel

1 Place the display bezel on the display assembly.

2 Press the display bezel on the edges until it snaps onto the display assembly.

3 Install the:

- a display assembly
- b WLAN Card
- c base cover
- d keyboard

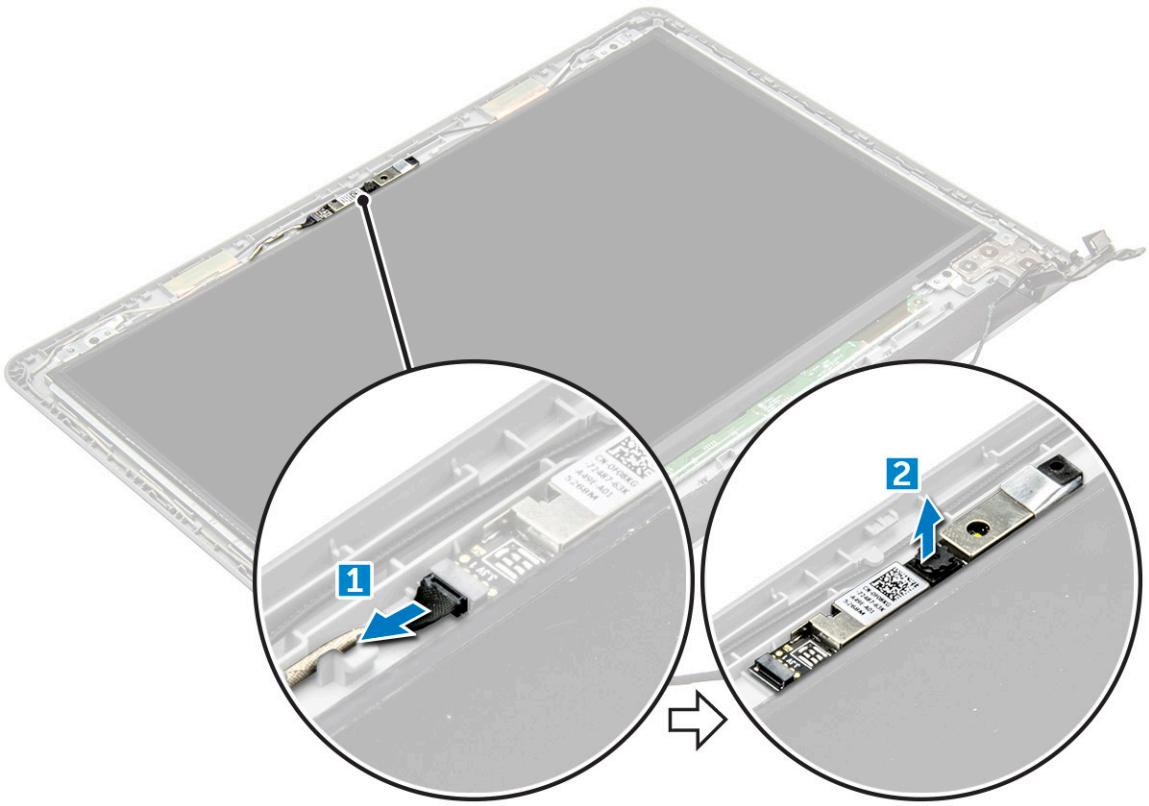
e optical drive
f battery

4 Follow the procedure in After working inside your computer.

Camera

Removing the camera

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b optical drive
   c keyboard
   d base cover
   e WLAN card
   f display assembly
   g display bezel
3 To remove the camera:
   a Disconnect the camera cable from the camera [1].
   b Remove the camera from the display assembly [2].



Installing the camera

1 Install the camera into the slot on the display assembly.
2 Connect the camera cable.
3 Install the:

a display bezel
b display assembly
c WLAN Card
d base cover
e keyboard
f optical drive
g battery

4 Follow the procedure in After working inside your computer.

Display panel

Removing the display panel

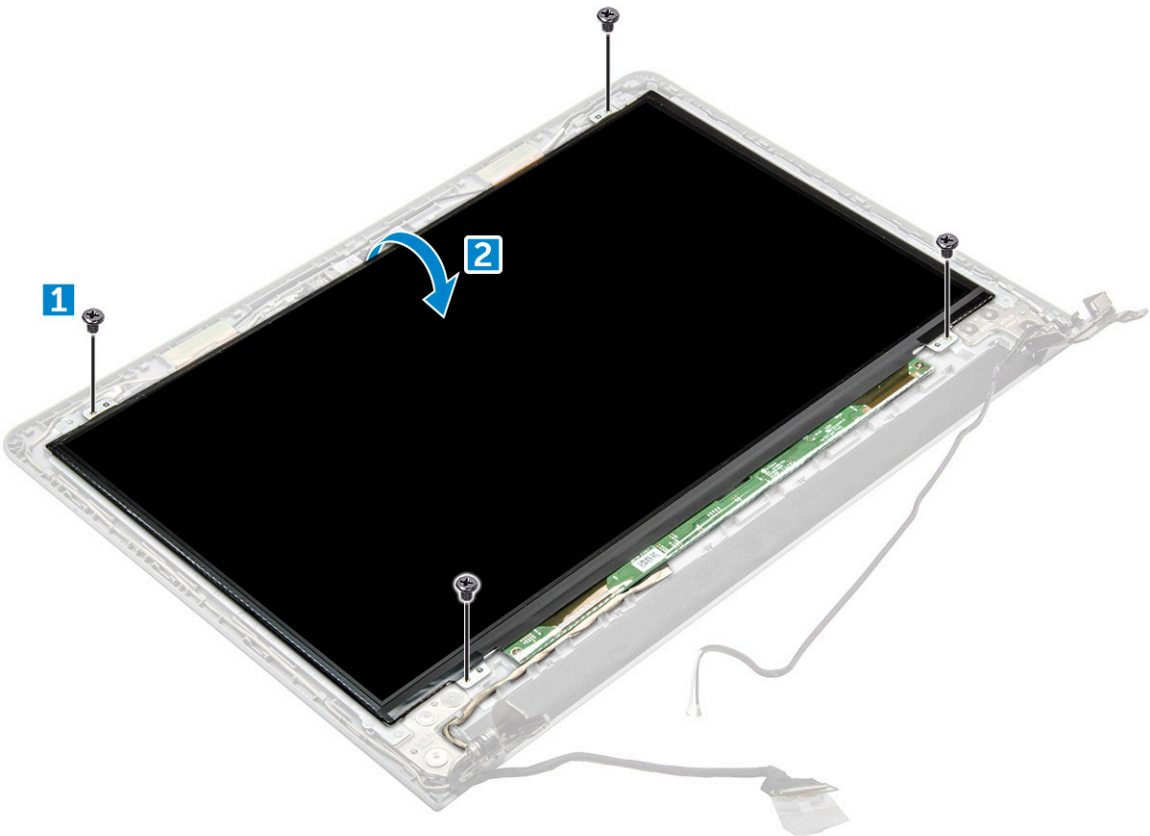
1 Follow the procedure in Before working inside your computer.

2 Remove the:

a battery
b optical drive
c keyboard
d base cover
e WLAN card
f display assembly
g display bezel

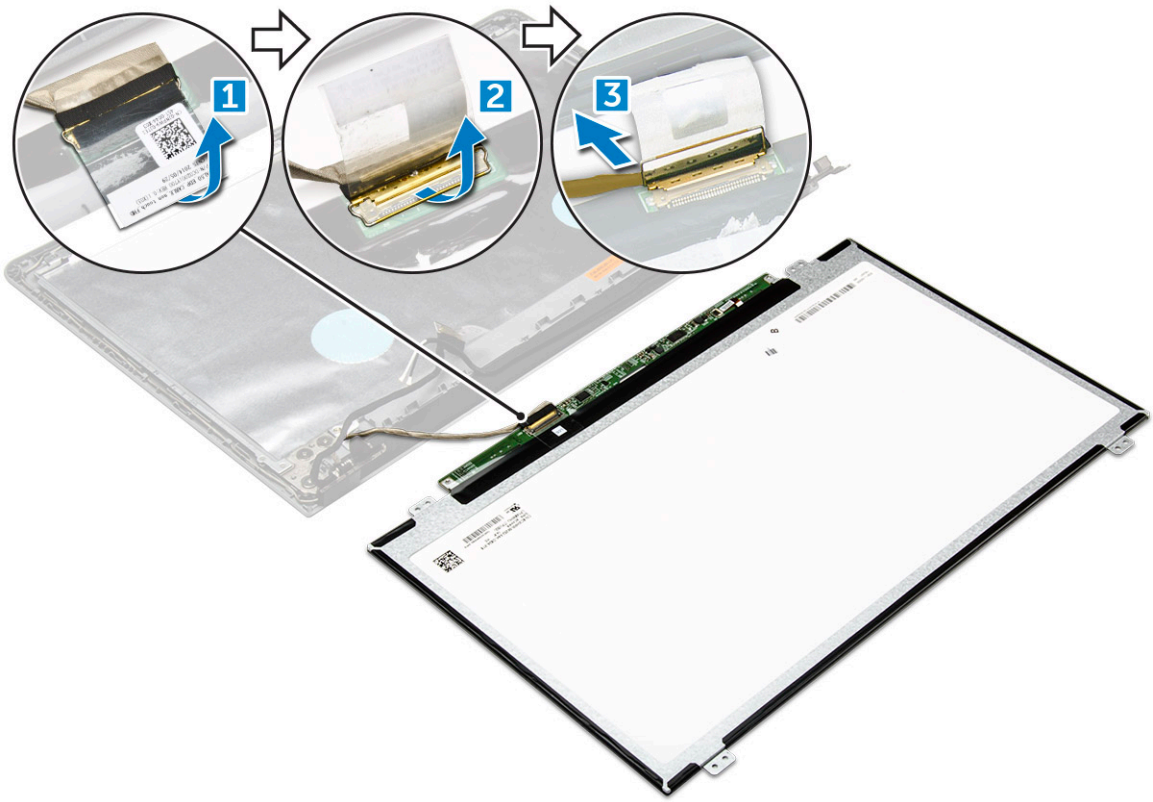
3 To remove the display panel:

a Remove the M2.5L8 screws that secure the display panel to the display assembly [1].
b Lift the display panel to access the cables underneath [2].



4 To disconnect the cable:

a Remove the tape that secures the eDP cable to the display panel [1].
b Lift the locking tab and remove the eDP cable [2].
c Remove the display panel from the computer [3].



Installing the display panel

1 Connect the eDP cable to the display panel.
2 Affix the tape to secure the display cable.
3 Place the display panel on the display assembly.
4 Tighten the M2.5L8 screws to secure the display panel to the display assembly.
5 Install the:
   a display bezel
   b display assembly
   c WLAN Card
   d base cover
   e keyboard
   f optical drive
   g battery
6 Follow the procedure in After working inside your computer.

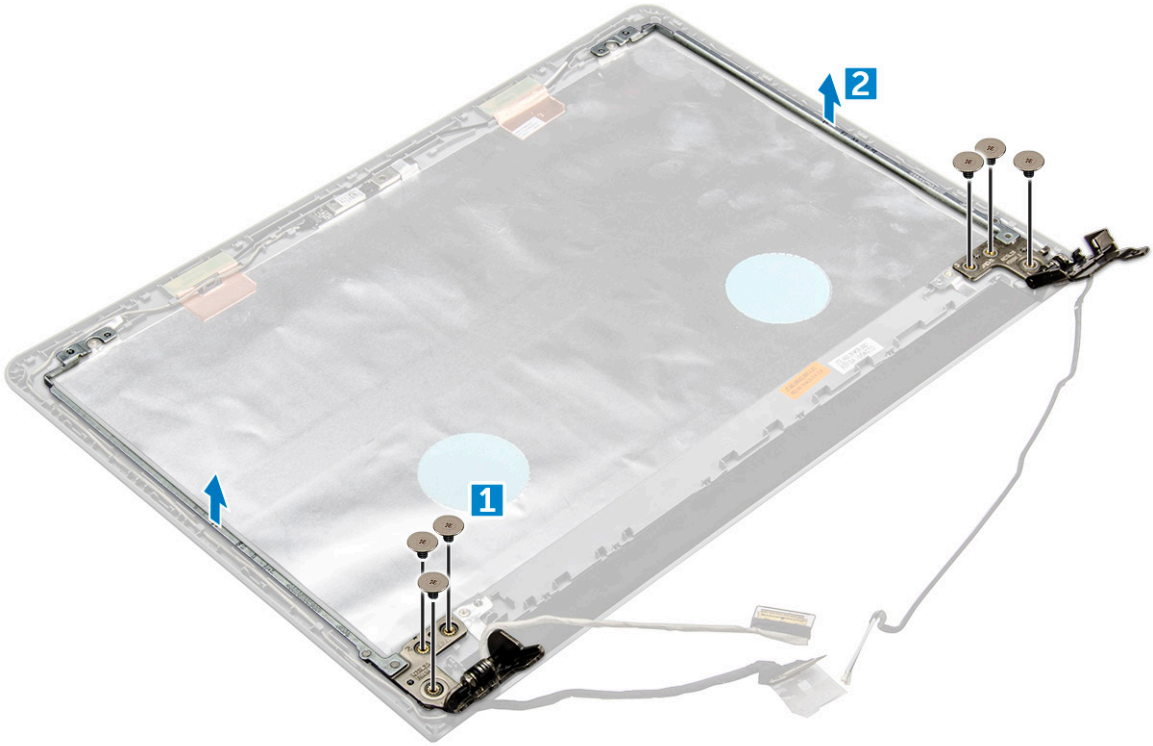
Display hinges

Removing the display hinges

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

a battery
b optical drive
c keyboard
d base cover
e WLAN card
f display assembly
g display bezel
h display panel

3 To remove the hinges:
a Remove the six M2.5L2.5 screws that secure the display hinges to the display assembly [1].
b Remove the display hinges [2].



Installing the display hinges

1 Tighten the six M2.5L2.5 screws to secure the display hinges to the display assembly.
2 Install the:
a display panel
b display bezel
c display assembly
d WLAN Card
e base cover
f keyboard
g optical drive
h battery
3 Follow the procedure in After working inside your computer.

Palm rest

Replacing the palmrest

1 Follow the procedure in Before working inside your computer.

2 Remove the:

a battery
b optical drive
c keyboard
d base cover
e hard drive assembly
f fingerprint reader
g WLAN card
h memory module
i power button board
j heat sink
k system fan
l speaker
m I/O board
n power connector port
o system board
p display assembly

NOTE: The component you are left with is the palmrest.



Installing the palmrest

1 Place the palmrest.

2 Install the:

   a display assembly
   b system board
   c power connector port
   d I/O board
   e speaker
   f system fan
   g heat sink
   h power button board
   i memory module
   j WLAN Card
   k fingerprint reader
   l hard drive assembly
   m base cover
   n keyboard
   o optical drive
   p battery

3 Follow the procedure in After working inside your computer.

3

Technology and components

Processors

This laptop is shipped with Intel 6th generation processor:

- Intel Celeron
- Intel i5 series

NOTE: The clock speed and performance varies depending on the workload and other variables.

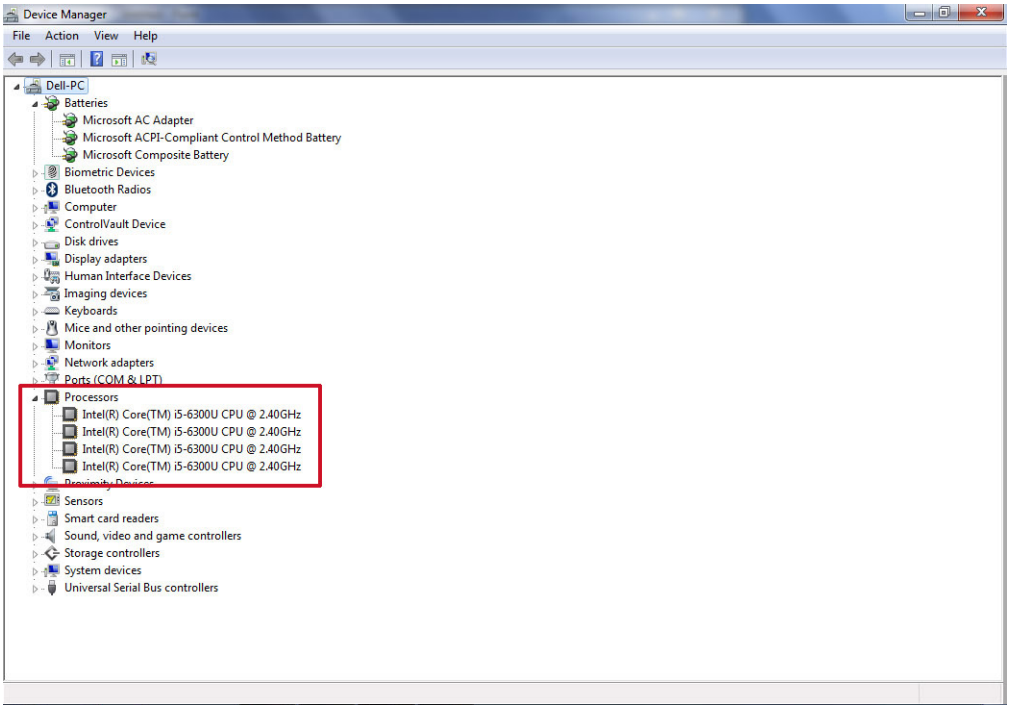
Identifying processors in Windows 10

1 Tap **Search the Web and Windows**.
2 Type `Device Manager`.
3 Tap **Processor**.
The basic information of the processor is displayed.

Identifying processors in Windows 8

1 Tap **Search the Web and Windows**.
2 Type `Device Manager`.
3 Tap **Processor**.

The basic information of the processor is displayed.

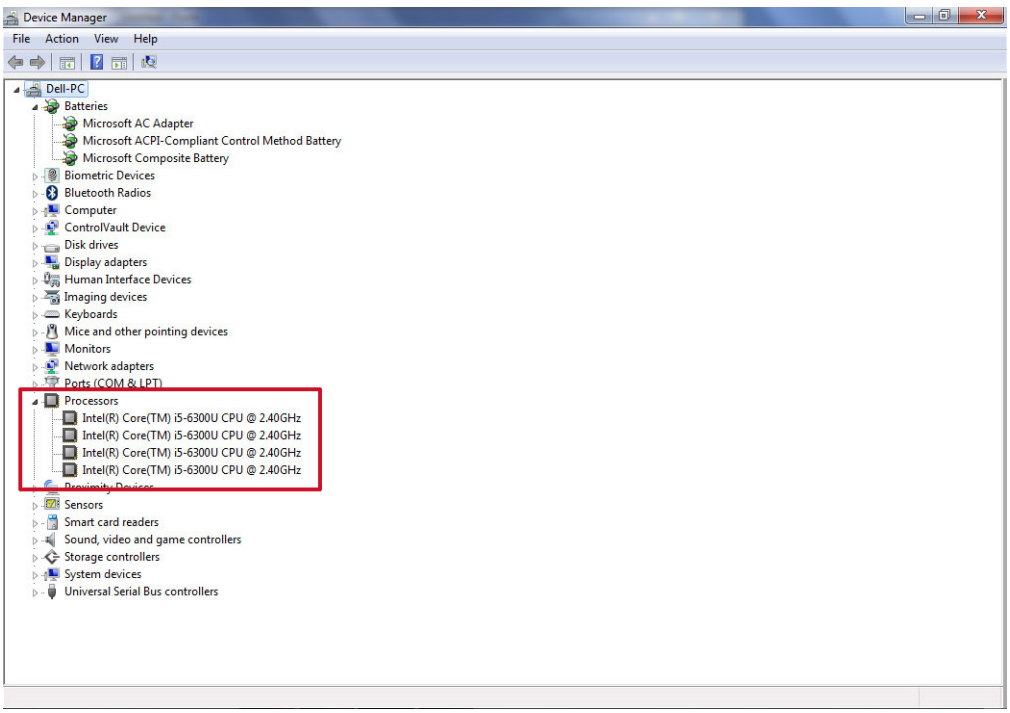


Identifying processors in Windows 7

1 Click **Start** > **Control Panel** > **Device Manager**.

2 Select **Processor**.

The basic information of the processor is displayed.



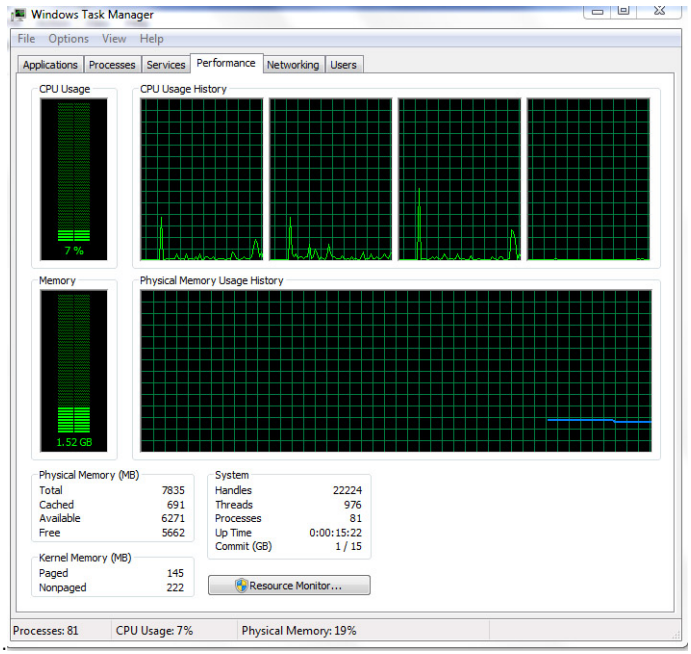
Verifying the processor usage in Task Manager

1 Press and hold the taskbar.

2 Select **Start Task Manager**.

The **Windows Task Manager** window is displayed.

3 Click the **Performance** tab in the **Windows Task Manager** window.



The processor performance details are displayed.

Verifying the processor usage in Resource Monitor

1 Press and hold the taskbar.

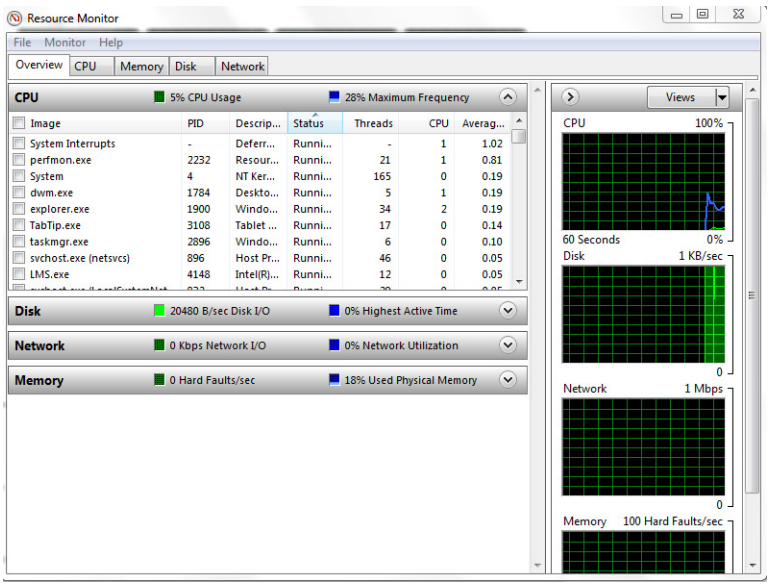
2 Select **Start Task Manager**.

The **Windows Task Manager** window is displayed.

3 Click the **Performance** tab in the **Windows Task Manager** window.

The processor performance details are displayed.

4 Click **Open Resource Monitor**.



Chipsets

All laptops communicate with the CPU through the chipset. This laptop is shipped with the Intel 100 Series chipset.

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.

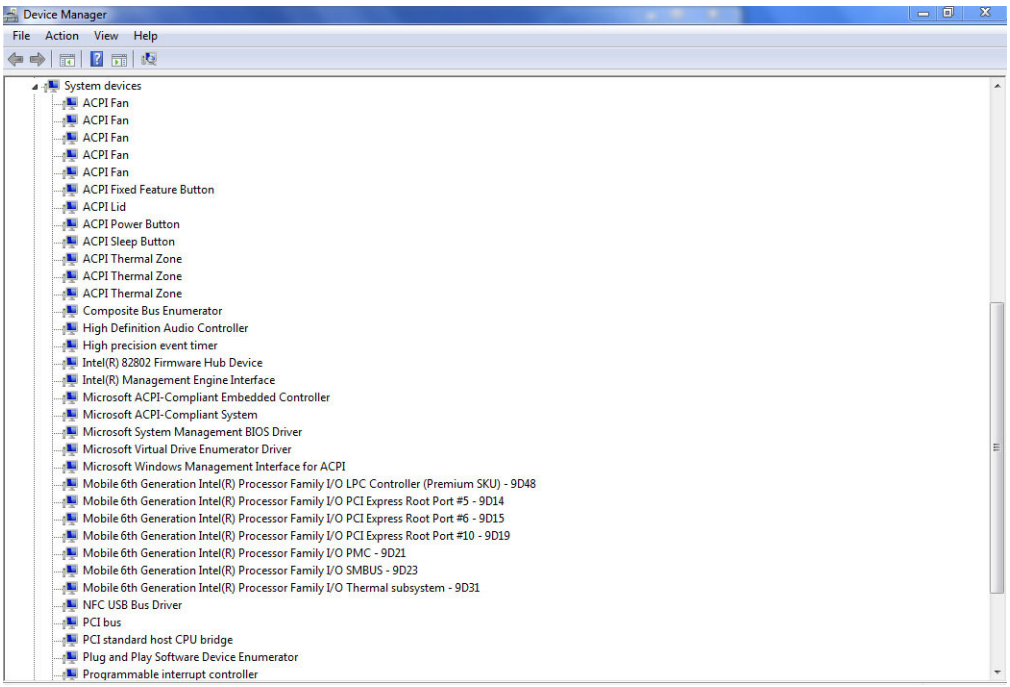
4 Click **Drivers and Downloads**.
5 Select the operating system installed in your laptop.
6 Scroll down the page, expand **Chipset**, and select your chipset driver.
7 Click **Download File** to download the latest version of the chipset driver for your laptop.
8 After the download is complete, navigate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

Identifying the chipset in Device Manager on Windows 10

1 Click **All Settings** on the Windows 10 Charms Bar.
2 From the **Control Panel**, select **Device Manager**.
3 Expand **System Devices** and search for the chipset.

Identifying chipset in Device Manager on Windows 8

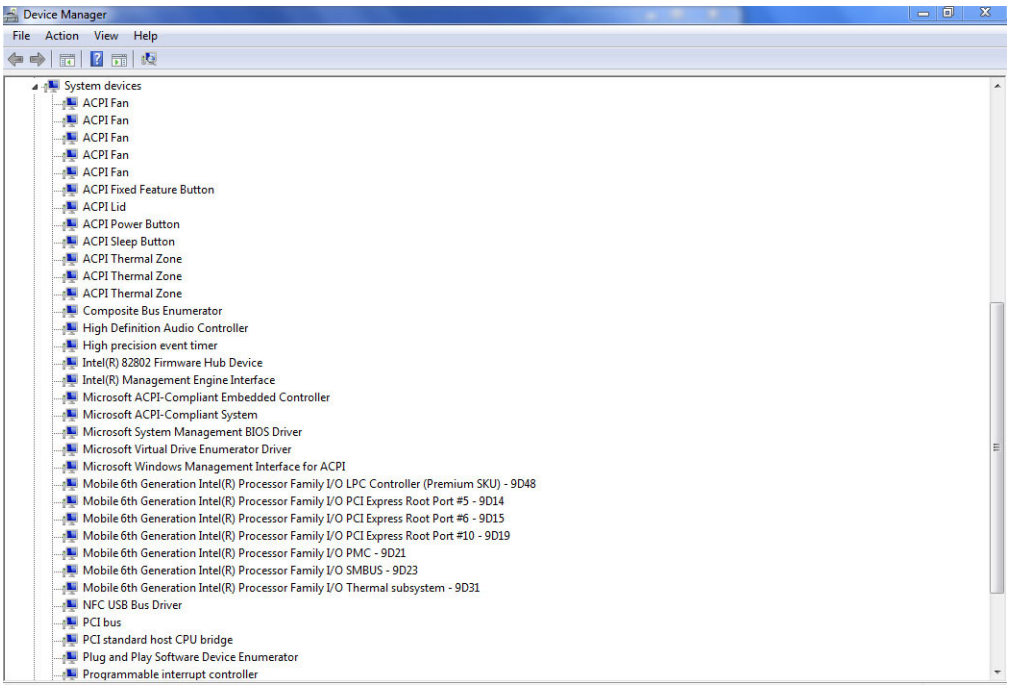
1 Click **Settings** on the Windows 8.1 Charms Bar.
2 From the **Control Panel**, select **Device Manager**.
3 Expand **System Devices** and search for the chipset.



Identifying chipset in Device Manager on Windows 7

1 Click **Start → Control Panel → Device Manager**.

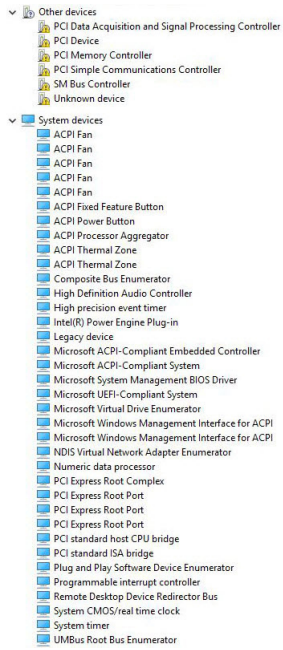
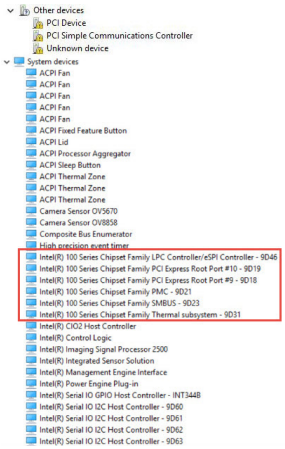
2 Expand **System Devices** and search for the chipset.



Intel chipset drivers

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

Table 2. Intel chipset drivers

Before installation	After installation
	

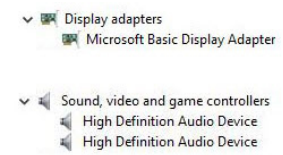
Graphics card

This laptop is shipped with the Intel HD Graphics 520 graphics chipset.

Intel HD Graphics drivers

Verify if the Intel HD Graphics drivers are already installed in the laptop.

Table 3. Intel HD Graphics drivers

Before installation	After installation
	

Intel HD Graphics 520



The Intel HD Graphics 520 (GT2) is an integrated graphics unit, which can be found in various ULV (Ultra Low Voltage) processors of the Skylake generation. This GT2 version of the Skylake GPU offers 24 Execution Units (EUs) clocked at up to 1050 MHz (depending on the CPU model). Due to its lack of dedicated graphics memory or eDRAM cache, the HD 520 has to access the main memory (2x 64-bit DDR3L-1600/DDR4-2133).

Performance

The exact performance of the HD Graphics 520 depends on various factors like L3 cache size, memory configuration (DDR3/DDR4) and maximum clock rate of the specific model. The fastest versions Core i7-6600U should perform similar to a dedicated GeForce 820M and handles modern games (as of 2015) in low settings.

Features

The revised video engine now decodes H.265/HEVC completely in hardware and more efficiently than before. Displays can be connected using a DP 1.2/eDP 1.3 (max. 3840 x 2160 @ 60 Hz), whereas HDMI is limited to the older version 1.4a (max. 3840 x 2160 @ 30 Hz). However, HDMI 2.0 can be added using a DisplayPort converter. Up to three displays can be controlled simultaneously.

Power Consumption

The HD Graphics 520 can be found in mobile processors specified at 15 W TDP and is therefore suited for compact laptops and Ultrabooks.

Key Specifications

The following table contains the key specifications of the Intel HD Graphics 520:

Table 4. Key specifications

Specification	Intel HD Graphics 520
Codename	Skylake GT2
Architecture	Intel Gen 6 (Skylake)

Specification	Intel HD Graphics 520
Pipelines	24 — unified
Core Speed	300 — 1050 (Boost) MHz
Memory Type	DDR3/DDR4
Memory Bus Width	64/128 bit
Shared Memory	Yes
Technology	14 nm
Features	QuickSync
DirectX	DirectX 12 (FL 12_1)
Max. Displays Supported	Up to 3
DP 1.2/eDP 1.3 max. resolution	3840 x 2160 @ 60 Hz
HDMI max. resolution	3840 x 2160 @ 30 Hz

Display options

This laptop has a 14– inch HD with 1366 x 768 pixels resolution (maximum).

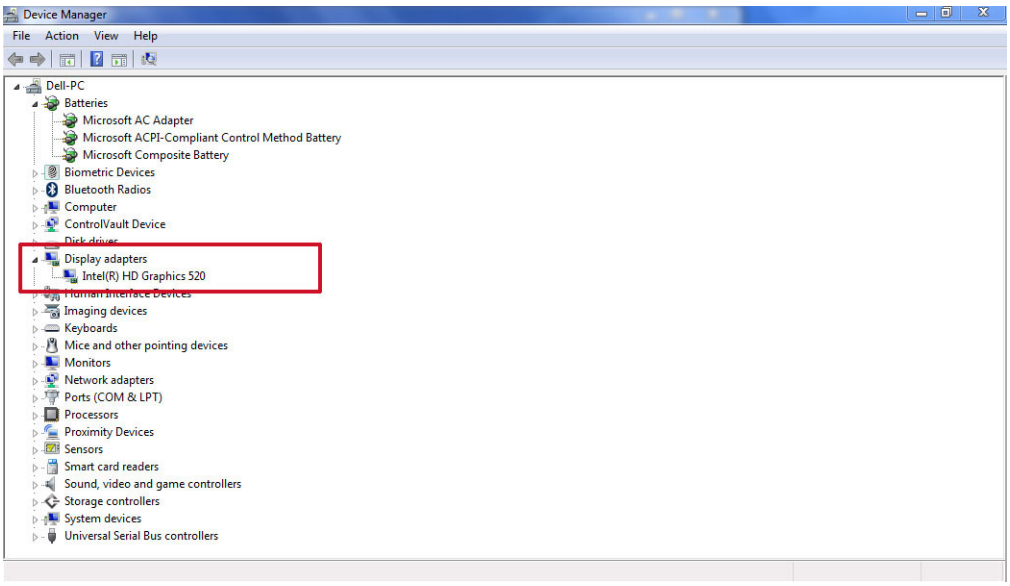
Identifying the display adapter

1 Start the **Search Charm** and select **Settings**.

2 Type `Device Manager` in the search box and tap **Device Manager** from the left pane.

3 Expand **Display adapters**.

The display adapters are displayed.



Rotating the display

1 Press and hold on the desktop screen.

A sub menu is displayed.

2 Select **Graphic Options** > **Rotation** and choose on of the following:

- Rotate to Normal
- Rotate to 90 Degrees
- Rotate to 180 Degrees
- Rotate to 270 Degrees

NOTE: The Display can also be rotated using the following key combinations:

- Ctrl + Alt + Up arrow key (Rotate to normal)
- Right arrow key (Rotate 90 degrees)
- Down arrow key (Rotate 180 degrees)
- Left arrow key (Rotate 270 degrees)

Downloading drivers

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 auto detect 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 and select the graphic driver to install.

7 Click **Download File** to download the graphic driver for your laptop.

8 After the download is complete, navigate to the folder where you saved the graphic driver file.

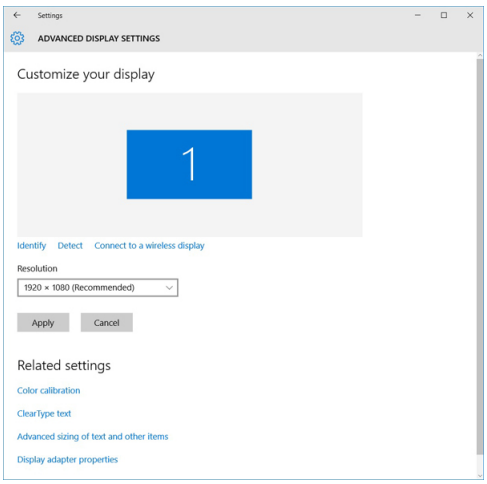
9 Double-click the graphic driver file icon and follow the instructions on the screen.

Changing the screen resolution

1 Press and hold the desktop screen and select **Display Settings**.

2 Tap or click **Advanced display settings**.

3 Select the required resolution from the drop-down list and tap **Apply**.



Adjusting brightness in Windows 10

To enable or disable automatic screen brightness adjustment:

1 Swipe-in from the right edge of the display to access the Action Center.

2 Tap or click **All Settings** → **System** → **Display**.

3 Use the **Adjust my screen brightness automatically** slider to enable or disable automatic-brightness adjustment.

NOTE: You can also use the Brightness level slider to adjust the brightness manually.

Adjusting brightness in Windows 8

To enable or disable automatic screen brightness adjustment:

1 Swipe-in from the right edge of the display to access the Charms menu.

2 Tap or click **Settings** → **Change PC Settings** → **PC and devices**→ **Power and sleep**.

3 Use the **Adjust my screen brightness automatically** slider to enable or disable automatic-brightness adjustment.

Adjusting brightness in Windows 7

To enable or disable automatic screen brightness adjustment:

1 Click **Start → Control Panel → Display.**

2 Use the **Adjust brightness** slider to enable or disable automatic-brightness adjustment.

NOTE: You can also use the Brightness level slider to adjust the brightness manually.

Cleaning the display

1 Check for any smudges or areas that has to be cleaned.

2 Use a microfiber cloth to remove any obvious dust and gently brush off any dirt particles.

3 Proper cleaning kits should be used to clean and keep your display in a crisp, clear, and pristine condition.

NOTE: Never spray any cleaning solutions directly on the screen; spray it to the cleaning cloth.

4 Gently wipe the screen in a circular motion. Do not press hard on the cloth.

NOTE: Do not press hard or touch the screen with your fingers or you may leave oily prints and smears.

NOTE: Do not leave any liquid on the screen.

5 Remove all excess moisture as it may damage your screen.

6 Let the display dry thoroughly before you turn it on.

7 For stains that are hard to remove, repeat this procedure till the display is clean.

Connecting to external display devices

Follow these steps to connect your laptop to an external display device:

1 Ensure that the projector is turned on and plug the projector cable into a video port on your laptop.
2 Press the Windows logo+P key.
3 Select one of the following modes:
   - PC screen only
   - Duplicate
   - Extend
   - Second Screen only

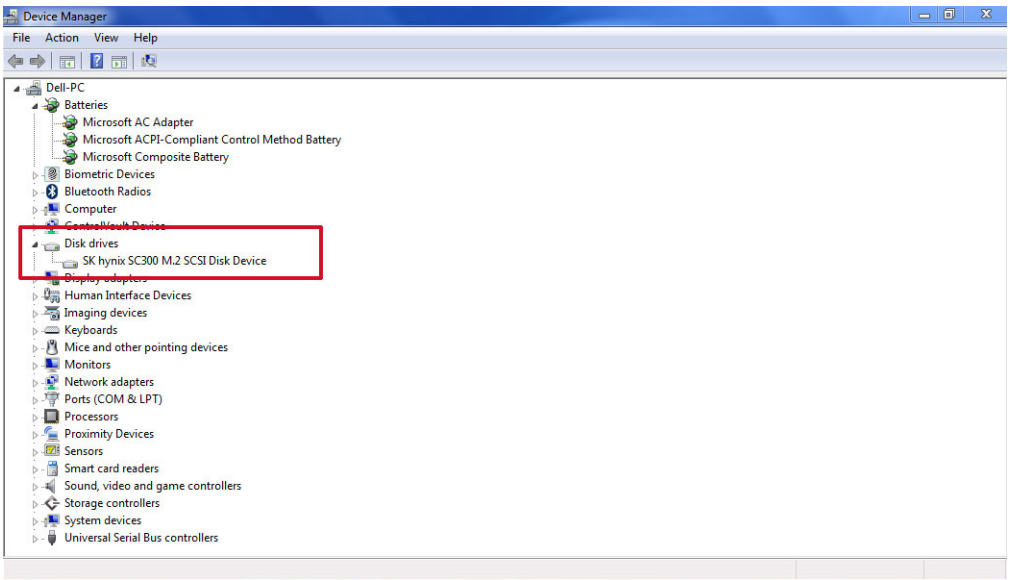
NOTE: For more information, see the document that shipped with your display device.

Hard drive options

This laptop supports SATA drives and SSDs.

Identifying the hard drive in Windows 10

1 Tap or click **All Settings** on the Windows 10 Charms Bar.
2 Tap or click **Control Panel**, select **Device Manager** , and expand **Disk drives**.
The hard drive is listed under **Disk drives**.



Identifying the hard drive in Windows 8

1 Tap or click **Settings** on the Windows 8 Charms Bar.
2 Tap or click **Control Panel**, select **Device Manager**, and expand **Disk drives**.
The hard drive is listed under Disk drives.

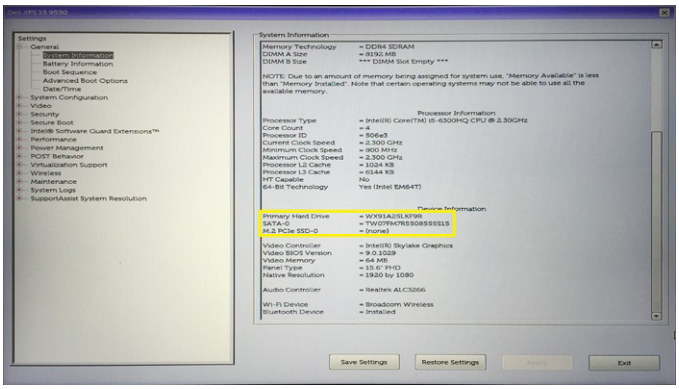
Identifying the hard drive in Windows 7

1 Click **Start** > **Control Panel** > **Device Manager**.
The hard drive is listed under Disk drives.
2 Expand **Disk drives**.

Entering BIOS setup

1 Turn on or restart your laptop.
2 When the Dell logo appears, perform one of the following actions to enter the BIOS setup program:
- With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
- Without keyboard — When the **F12 boot selection** menu is displayed, press the Volume Down button to enter BIOS setup. To enter the Boot selection menu, press the Volume Up button.

Hard drive is listed under the **System Information** under the **General** group.



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 5. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 2.0	480 Mbps	High Speed	2000
USB 3.0/USB 3.1 Gen 1	5 Gbps	Super Speed	2010
USB 3.1 Gen 2	10 Gbps	Super Speed	2013

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

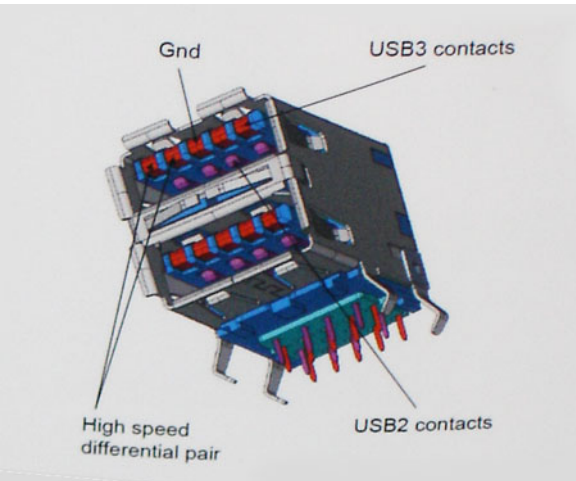
The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

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.

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

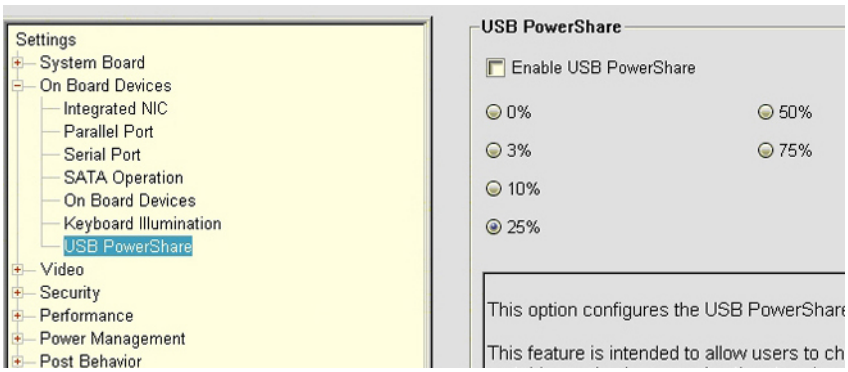
- Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
- Low -cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner
- Audio HDMI supports multiple audio 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 Powershare

USB PowerShare is a feature which allows for external USB devices (i.e. cellular phones, portable music players, etc.) to charge using the portable system's battery.

Only the USB connector with a **SS+USB+Battery**-->  icon, can be used.

This functionality is enabled in the system setup under the **On Board Devices** heading. You can select how much of the battery's charge can be used as well (pictured below). If you set the USB PowerShare to 25%, the external device is allowed to charge until the battery reaches 25% of full capacity (e.g. 75% of the portable's battery charge is used up).



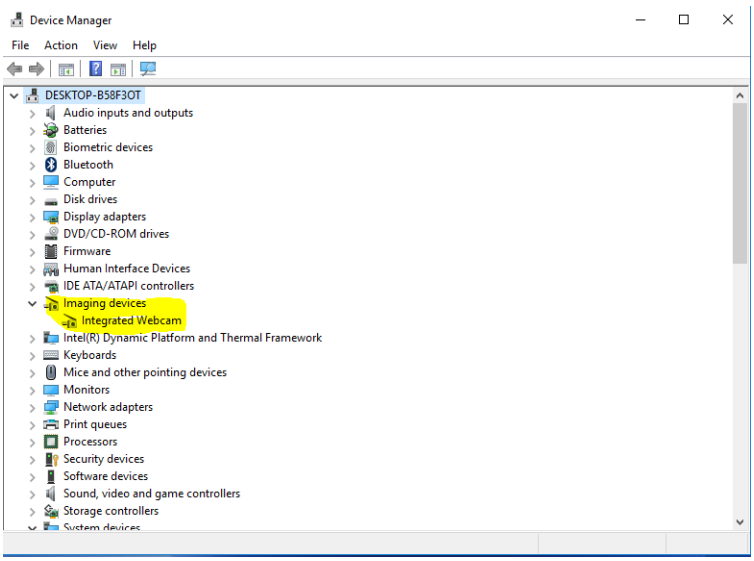
Camera features

This laptop comes with front-facing camera with the image resolution of 1280 x 720 (maximum).

Identifying the camera in Device Manager on Windows 10

1 In the **Search** box, type `device manager`, and tap to start it.

2 Under **Device Manager**, expand **Imaging devices**.

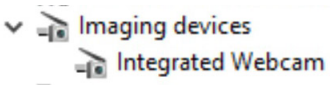


Identifying the camera in Device Manager on Windows 8

1 Start the Charms Bar from the desktop interface.

2 Select **Control Panel**.

3 Select **Device Manager** and expand **Imaging devices**.



Identifying the camera in Device Manager on Windows 7

1 Click **Start** > **Control Panel** > **Device Manager**.

2 Expand **Imaging devices**.

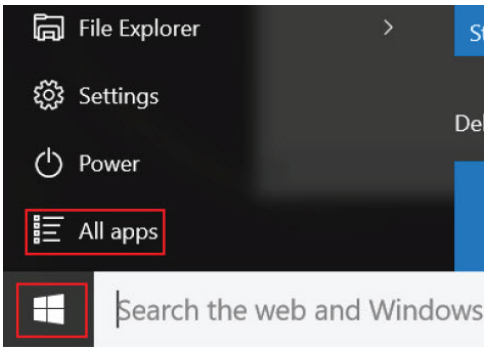


Starting the camera

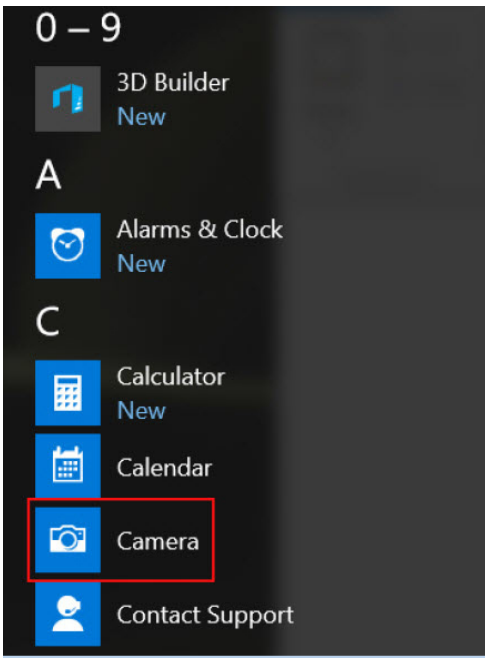
To start the camera, open an application that uses the camera. For instance, if you tap the Dell webcam central software or the Skype software that is shipped with the laptop, the camera turns on. Similarly, if you are chatting on the internet and the application requests to access the webcam, the webcam turns on.

Starting the camera app

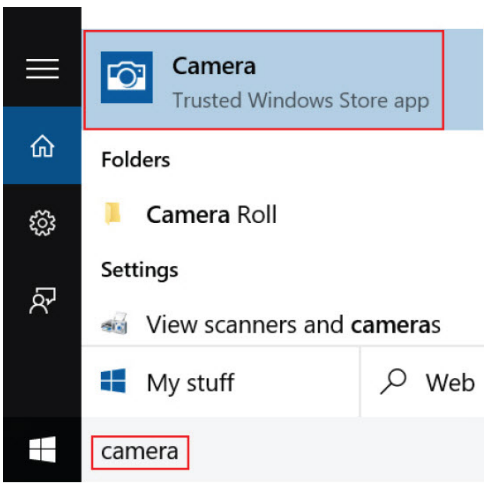
1 Tap or click the **Windows** button and select **All apps**.



2 Select **Camera** from the apps list.



3 If the **Camera** App is not available in the apps list, search for it.



Memory features

This Laptop supports 4 GB to 16 GB, 2400 MHz DDR4 SoDIMM (2 slots)

Verifying system memory

Windows 10

1 Tap the **Windows** button and select **All Settings** > **System** .

2 Under **System**, tap **About**.

Verifying system memory in setup

1 Turn on or restart your laptop.

2 Perform one of the following actions after the Dell logo is displayed:

- With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
- Without keyboard — When the **F12 boot selection** menu is displayed, press the Volume Down button to enter BIOS setup. To enter the Boot selection menu, press the Volume Up button.

3 On the left pane, select **Settings** > **General** > **System Information**,

The memory information is displayed on the right pane.

Testing memory using ePSA

1 Turn on or restart your laptop.

2 Perform one of the following actions after the Dell logo is displayed:

- With keyboard — Press F2.
- Without keyboard — Press and hold the **Volume Up** button when the Dell logo is displayed on the screen. When the F12 boot selection menu is displayed, select **Diagnostics** from the boot menu, and press Enter.

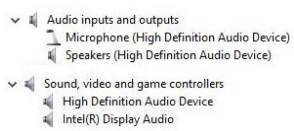
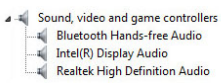
The PreBoot System Assessment (PSA) starts on your laptop.

NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Turn off the laptop and try again.

Audio drivers

Verify if the Realtek audio drivers are already installed in the laptop.

Table 6. Realtek HD audio drivers

Before installation	After installation
	

4

System setup

System setup enables you to manage your hardware and specify BIOS level options. From the System setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

- Boot Sequence
- Navigation keys
- System setup options
- Updating the BIOS in Windows
- System and setup password

Boot Sequence

Boot Sequence allows you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive

  NOTE: XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

  NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.

The boot sequence screen also displays the option to access the System Setup screen.

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.

Keys	Navigation
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 computer and its installed devices, the items listed in this section may or may not appear.

Table 7. General tab

Option	Description	
System Information	This section lists the primary hardware features of your computer. • System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code. • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM A Size, DIMM B Size, • Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit Technology. • Device Information: Displays Primary Hard Drive, ODD Device, LOM MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, Bluetooth Device.	
Battery Information	Displays the battery status and the type of AC adapter connected to the computer.	
Boot Sequence	Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. The option is: • Windows Boot Manager By default, all the options are checked. You can also deselect any option or change the boot order.
	Boot List Option	Allows you to change the boot list option. • Legacy • UEFI
Advanced Boot Options	This option allows you the legacy option ROMs to load. By default, the **Enable Legacy Option ROMs** is disabled.	
Date/Time	Allows you to change the date and time.	

Table 8. System Configuration

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. The options are: • Disabled • Enabled

Option	Description
	• Enabled w/PXE: This option is enabled by default.
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • AHCI: This option is enabled by default.
Drives	Allows you to configure the SATA drives on board. All drives are enabled by default. The options are: • SATA-0: This option is selected by default. • SATA-1: This option is selected by default.
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self-Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. • Enable SMART Reporting
USB Configuration	This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (HDD, memory key, floppy). If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. • Enable Boot Support • Enable External USB Port **NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.**
Audio	This field enables or disables the integrated audio controller. By default, the **Enable Audio** option is selected. The options are: • Enable Microphone • Enable Internal Speaker
Unobtrusive Mode:	This field enables or disables all light and sound emissions in the system. By default option is disabled.
Miscellaneous Devices	Allows you to enable or disable the following devices: • Enable Camera • Enabled Secure Digital (SD) Card **NOTE: All devices are enabled by default.**

Table 9. Video

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source (On Battery and On AC). **NOTE: The Video setting will only be visible when a video card is installed into the system.**

Table 10. Security

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. **NOTE: You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.** **NOTE: Successful password changes take effect immediately.** Default Setting: Not set
System Password	Allows you to set, change or delete the system password. **NOTE: Successful password changes take effect immediately.** Default Setting: Not set
Internal HDD-0 Password	Allows you to set, change or delete the password on the system's internal hard-disk drive. **NOTE: Successful password changes take effect immediately.** Default Setting: Not set
Strong Password	Allows you to enforce the option to always set strong passwords. Default Setting: Enable Strong Password is not selected. **NOTE: If Strong Password is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.**
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Password Bypass	Allows you to enable or disable the permission to bypass the System and the Internal HDD password, when they are set. The options are: · Disabled · Reboot bypass Default Setting: Disabled
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default Setting: Allow Non-Admin Password Changes is selected.
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.
UEFI Capsule Firmware Updates	Allows you to controls whether the system allows BIOS update via UEFI capsule update packages. Default setting: Enable
TPM 2.0 Security	Allows you to enable the Trusted Platform Module (TPM) during POST. The options are: · TPM On (enabled by default) · Clear · PPI Bypass for Enabled Commands · PPI Bypass for Disabled Commands · Attestation Enable (enabled by default) · Key Storage Enable (enabled by default) · SHA-256 (enabled by default) · Disabled

Option	Description
	• Enabled **NOTE: To upgrade or downgrade TPM1.2/2.0, download the TPM wrapper tool (software).**
Computrace	Allows you to activate or disable the optional Computrace software The options are: • Deactivate • Disable • Activate **NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed.** Default setting: Deactivate
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. Enable CPU XD Support (default)
Admin Setup Lockout	Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: Enable Admin Setup Lockout is not selected.

Table 11. Secure Boot

Option	Description
Secure Boot Enable	This option enables or disables the Secure Boot Feature. • Disabled • Enabled Default Setting: The option is disabled.
Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: • PK • KEK • db • dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: • **Save to File**- Saves the key to a user-selected file • **Replace from File**- Replaces the current key with a key from a user-selected file • **Append from File**- Adds a key to the current database from a user-selected file • **Delete**- Deletes the selected key • **Reset All Keys**- Resets to default setting • **Delete All Key**s- Deletes all the keys **NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.**

Table 12. Intel Software Guard Extensions screen options

Option	Description
Intel SGX Enable	This field 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 Default setting: Disabled
Enclave Memory Size	This option sets **SGX Enclave Reserve Memory Size**. The options are: • 32 MB • 64 MB • 128 MB

Table 13. Performance

Option	Description
Multi Core Support	This field specifies whether the process will have one or all cores enabled. The performance of some applications will improve with the additional cores. This option is enabled by default. Allows you to enable or disable multi-core support for the processor. The installed processor supports two cores. If you enable Multi Core Support, two cores will be enabled. If you disable Multi Core Support, one core will be enabled. • Enable Multi Core Support Default Setting: The option is enabled.
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep feature. • Enable Intel SpeedStep Default Setting: The option is enabled.
C States Control	Allows you to enable or disable the additional processor sleep states. • C states Default Setting: The option is enabled.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. • Enable Intel TurboBoost Default Setting: The option is enabled.
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. • Disabled • Enabled Default Setting: The option is enabled.

Table 14. Power Management

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Default Setting: Wake on AC is not selected.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled (default) • Every Day • Weekdays • Select Days
USB Wake Support	Allows you to enable USB devices to wake the system from Standby. **NOTE: This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup will remove power from all of the USB ports to conserve battery power.** • Enable USB Wake Support Default Setting: The option is disabled.
Wake on LAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled: This option is enabled by default • LAN Only
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • Adaptive • Standard — Fully charges your battery at a standard rate. • Primarily AC use • Custom 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.**

Table 15. POST Behavior

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. Default Setting: Enable Adapter Warnings
Fn Lock Option	Allows the hot key combination <Fn> +<Esc> toggle the primary behavior of F1–F12, between the standard and secondary functions. • Lock Mode Disable/Standard. This option is enabled by default. • Lock Mode Enable/Secondary
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are:

Option	Description
	• Minimal • Thorough (default) • Auto
Extended BIOS POST Time	Allows you to create an additional preboot delay. The options are: • 0 seconds. This option is enabled by default. • 5 seconds • 10 seconds

Table 16. Virtualization Support

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. • **Enable Intel Virtualization Technology** (default)
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. **Enable VT for Direct I/O** — enabled by default.

Table 17. Wireless

Option	Description	
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: • WLAN • Bluetooth All the options are enabled by default.	
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. • WLAN • Bluetooth All the options are enabled by default.	

Table 18. 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	This field controls flashing of the system firmware to pervious revisions. Allows BIOS Downgrade (Enabled by default)
Data Wipe	This field enables user to erase data from all internal storage device.

Option	Description
BIOS Recovery	Allows you to recover from certain corrupted BIOS conditions from a recover file on the user primary hard drive or an external USB key. Enabled by default.

Table 19. System Logs

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
Thermal Events	Allows you to view and clear the System Setup (Thermal) POST events.
Power Events	Allows you to view and clear the System Setup (Power) POST events.

Table 20. SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	Allows you to control the automatic boot flow for SupportAssist System. Options are: • Off • 1 • 2 (Enabled by default) • 3
SupportAssist OS Recovery	Allows you to recover the SupportAssist OS Recovery (Disabled by default)

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.

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.

System and setup password

Table 21. System and setup password

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.

You can create a system password and a setup password to secure 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 setup password

You can assign a new **System or Admin 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/Admin 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 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 prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

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 reboot.

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Enhanced Pre-Boot System Assessment — ePSA diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

CAUTION: Use the system diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.

NOTE: Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

Running the ePSA Diagnostics

Invoke diagnostics boot by either of the methods that are suggested below:

1. Power on the computer.
2. As the computer boots, press the F12 key when the Dell logo is displayed.
3. In the boot menu screen, use Up/Down arrow key to select the **Diagnostics** option and then press **Enter**.

   NOTE: The Enhanced Pre-boot System Assessment window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.
4. Press the arrow in the lower-right corner to go to the page listing.

   The detected items are listed and tested.
5. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
6. Select the device from the left pane and click **Run Tests**.
7. If there are any issues, error codes are displayed.

   Note the error code and contact Dell.

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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**.
- Windows 8.1 and Windows 8, from the charms sidebar, click or tap **Settings** > **Change PC settings**. In the **PC Settings** window, select **PC and devices** > **PC Info**.
- Windows 7, click **Start** , right-click **My Computer**, and then select **Properties**.

Table 22. System specifications

Feature	Specification
Chipset	Skylake Celeron/ Intel Kaby Lake
DRAM bus width	64 bits
Flash EPROM	16 MB

Table 23. Processor specifications

Feature	Specification
Processor type	• 7th Generation Intel Core i7-7500U (4M Cache, up to 3.50 GHz, 4 GT/s) • 7th Generation Intel Core i5-7200U (3M Cache, up to 3.10 GHz, 4 GT/s) • 7th Generation Intel Core i3-7100U (3M Cache, up to 2.40 GHz, 4 GT/s) • 6th Generation Intel Core i3-6100U (3M Cache, up to 2.30 GHz, 4 GT/s) • Intel Celeron 3855U
L1 cache	128 KB
L2 cache	512 KB
L3 cache	Up to 4 MB

Table 24. Memory specifications

Feature	Specification
Memory connector	Two internally accessible DDR4 connectors
Memory capacity	4 GB to 16 GB
Memory speed	2400 MHz **NOTE: If product is purchased with Intel® 6th Gen CPUs or 7th Gen CPUs, the maximum memory speed achievable is 2133 MHz**
Minimum memory	4 GB
Maximum memory	8-16 GB

Table 25. Storage specifications

Feature	Specification
SATA HDD	500GB , 1TB 5400RPM and 7200RPM SATA hard drive

Table 26. Audio specifications

Feature	Specification
Type	Two channels high-definition audio
Controller	Realtek ALC3246 with Waves MaxxAudio
Stereo conversion	24-bit (analog-to-digital and digital-to-analog)
Interface	Intel HDA bus
Speakers	2 x 2 W
Volume controls	Program menu and keyboard media-control keys

Table 27. Video specifications

Feature	Specification
Video type	eDP
Video Controller:	
UMA	Intel HD Graphics (shared memory)
Discrete	AMD Radeon R5 M315 (up to 2 GB DDR3)
Data bus:	64 bits
External display support	VGA

Table 28. Camera specifications

Feature	Specification
Camera Resolution	HD resolution
Video Resolution (maximum)	Still image: HD resolution (1280x720) Video: HD resolution (1280x720) at 30 fps (maximum)
Diagonal viewing angle	74°

Table 29. Communication specifications

Feature	Specification
Network adapter	10/100/1000 Mbps Ethernet LAN on Motherboard (LOM)
Wireless	• Wi-Fi 802.11 b/g/n • Bluetooth 4.0

Table 30. Ports and Connectors specifications

Feature	Specification
Audio	One headphone/microphone combo port (headset)
Video	VGA and HDMI out
Network adapter	One RJ-45 port
USB:	• Two USB 3.0 ports • One USB 2.0 port
NOTE: The powered USB 3.0 connector also supports Microsoft Kernel Debugging. The ports are identified in the documentation shipped with your computer.	
Media card reader	One SD slot

Table 31. Display specifications

Feature	Specification
Type	14.0 inches HD (non-touch)
Dimensions:	
Height	320.90 mm (12.63 inches)
Diagonal	355.00 mm (14.00 inches)
Width	205.60 mm (8.09 inches)
Active area (X/Y)	320.90 mm x 205.60 mm (12.63 inches x 8.09 inches)
Maximum resolution	1366 x 768 pixels
Maximum brightness	220 nits
Operating angle	0° (closed) to 135°
Refresh rate	60 Hz
Minimum Viewing angles:	
Horizontal	40° / 40°
Vertical	10° / 30°
Pixel pitch	0.2265 mm

Table 32. Keyboard specifications

Feature	Specification
Number of keys:	US 80, Brazil 82, UK 81, and Japan 84
Backlit keyboard	No
Layout	Qwerty

Table 33. Touchpad specifications

Feature	Specification
Active Area:	
X-axis	105.00 mm (4.13 inches)
Y-axis	65.00 mm (2.50 inches)
Multi-touch	Supports five fingers

Table 34. Battery specifications

Feature	Specification
Type	• 4-cell “smart” lithium ion (40 and 47 WHr)
Dimensions:	
Height	20.00 mm (0.78 inches)
Width	270.00 mm (10.63 inches)
Depth	37.50 mm (1.47 inches)
Weight	0.26 kg (0.56 lb)
Life span	300 discharge/charge cycles
Voltage	14.80 VDC
Temperature range:	
Operating	0 °C to 35 °C (32 °F to 95 °F)
Non-Operating	–40 °C to 65 °C (–40 °F to 149 °F)
Coin-cell battery	3 V CR2032 lithium ion

Table 35. AC Adapter specifications

Feature	Specification
Type	45 W
	65 W
Input voltage	100 V AC to 240 V AC
Input frequency	50 Hz to 60 Hz
Input current (maximum)	
45 W	1.30 A
65 W	1.70 A
Output current	
45 W	2.31 A
65 W	3.34 A
Rated output voltage	19.50 V DC

Feature		Specification
Temperature range:		
	Operating	0 °C to 40 °C (32 °F to 104 °F)
	Non-Operating	–40 °C to 70 °C (–40 °F to 158 °F)

Table 36. Physical specifications

Feature	Specification
Height	23.35 mm (0.91 inch)
Width	345.00 mm (13.58 inches)
Depth	243.00 mm (9.57 inches)
Weight	1.95 kg (4.20 lb)

Table 37. Environmental specifications

Feature		Specification
Temperature:		
	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):		
	Operating	10 % to 90 % (non-condensing)
	Storage	0 % to 95 % (non-condensing)
Altitude (maximum):		
	Operating	–15.2 m to 3048 m (–50 ft to 10,000 ft) 0° to 35°C
	Non-Operating	–15.2 m to 10,668 m (–50 ft to 35,000 ft)
Airborne contaminant level		G1 as defined by ISA-S71.04-1985

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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.