

# Dell Latitude 7389 2-in-1

## Owner's Manual



## 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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# 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](http://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.

## 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.

## 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 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.

# Removing and installing components

This section provides detailed information on how to remove or install the components from your computer.

Topics:

- [Screw size list](#)
- [Recommended tools](#)
- [Micro Secure Digital \(SD\) Card](#)
- [Subscriber Identity Module \(SIM\) Card](#)
- [Base cover](#)
- [Battery](#)
- [PCIe Solid State Drive \(SSD\)](#)
- [WLAN card](#)
- [WWAN card](#)
- [Power board](#)
- [Speaker](#)
- [LED Board](#)
- [Smart Card Cage](#)
- [Display Assembly](#)
- [Heat Sink](#)
- [System Board](#)
- [Coin cell battery](#)
- [Keyboard](#)
- [Palmrest](#)

## Screw size list

**Table 1. Latitude 7389 - Screw size list**

Component	M 2.5 x 2.5L	M 2.5 x 4.0L	M 2.0 x 3.0L	M 2 x 2L	M 2.0 x 2L	M 2 x 1.7L	M 2 x 4L	M 2.5 x 5
Hinge bracket		4						
Power Board			2					
LED Board			2					
Smart Card					2			
K/B to K/B plate				6				
K/B plate			13					
Base cover								8
System board			6					
Fan			1		1			
Thermal			4					

Battery		4
WLAN	1	
WWAN	1	
EDP Bracket		2
USB Type C		2

## 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

## Micro Secure Digital (SD) Card

### Removing the Micro Secure Digital (SD) Card

**CAUTION:** Removing the Micro SIM card when the computer is on may cause data loss or damage the card. Ensure that the computer is turned off.

**NOTE:** Micro SIM card tray is available only for systems that are shipped with WWAN card.

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Press in on the Micro SD card to release it from the computer.
- 3 Slide the Micro SD card out of the computer.

### Installing the Micro Secure Digital (SD) Card

- 1 Slide the Micro SD into the slot until it clicks into place.
- 2 Follow the procedures in [After working inside your computer](#).

## Subscriber Identity Module (SIM) Card

### Removing the micro SIM card or the micro SIM card tray

**CAUTION:** Removing the micro SIM card when the computer is on may cause data loss or damage the card.

**NOTE:** Micro SIM card tray is available only for systems that are shipped with WWAN card.

- 1 Insert a paperclip or a micro SIM card removal tool into the pinhole on the micro SIM card tray.
- 2 Use a scribe to pull the micro SIM card tray.
- 3 If a micro SIM card is available, remove the micro SIM card from the micro SIM card tray.

## Installing the micro SIM card or micro SIM card tray

- 1 Place the SIM card in the SIM card tray.
- 2 Align and push the SIM tray back into the SIM tray slot.

**NOTE:** Micro SIM card tray is available only for systems that are shipped with WWAN card.

- 3 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 Loosen the M2.5 x 5.0 captive screws that secure the base cover to the computer.



- 3 Use a plastic scribe to pry the base cover starting from the hinges at the top edge of the base cover and lift it from the computer.

**NOTE:** The recesses are located near the hinges at the rear side of the computer.



# Installing the base cover

- 1 Align the base cover tabs to the slots on the edges of the computer.
- 2 Press the edges of the cover until it clicks into place.
- 3 Tighten the M2.5 x 5.0 captive screws to secure the base cover to the computer.
- 4 Follow the procedure in [After working inside your computer](#).

# Battery

## Lithium-ion battery precautions

### ⚠ CAUTION:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery as much as possible before removing it from the system. This can be done by disconnecting the AC adapter from the system to allow the battery to drain.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any kind to pry on or against the battery.
- If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a Lithium-ion battery can be dangerous. In such an instance, the entire system should be replaced. Contact <https://www.dell.com/support> for assistance and further instructions.
- Always purchase genuine batteries from <https://www.dell.com> or authorized Dell partners and re-sellers.

## Removing the battery

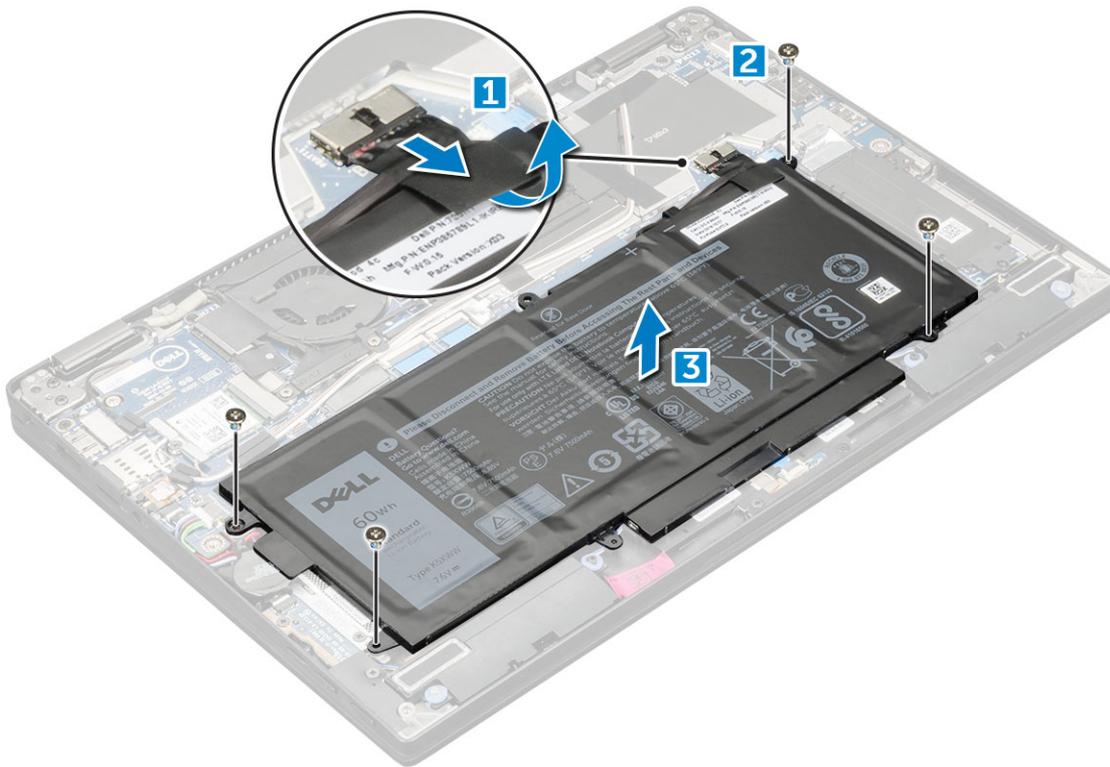
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a [MicroSD card](#)
  - b [SIM card](#)

**ⓘ NOTE: To remove both cards if equipped and no need to remove the blank filler.**

  - c [Base cover](#)
- 3 To remove the battery:
  - a Lift the ribbon, disconnect and remove the battery cable from the connector on the system board [1].

**⚠ CAUTION: Ensure that the battery cable lifts up over the battery and not into the LED cable.**

  - b Remove the M2.0 x 4 L screws that secure the battery to the computer [2].
  - c Lift the battery from the computer [3].



## Installing battery

- 1 Insert the battery into the slot on the computer.
- 2 Connect the battery cable to the connector on the system board.
- 3 Replace the M 2 x 4L screws to secure the battery to the computer.
- 4 Install the:
  - a base cover
  - b SIM card
  - c Micro SD card

**NOTE:** To install both cards if equipped .

- 5 Follow the procedure in [After working inside your computer](#).

## PCIe Solid State Drive (SSD)

### Removing the NVMe SSD card

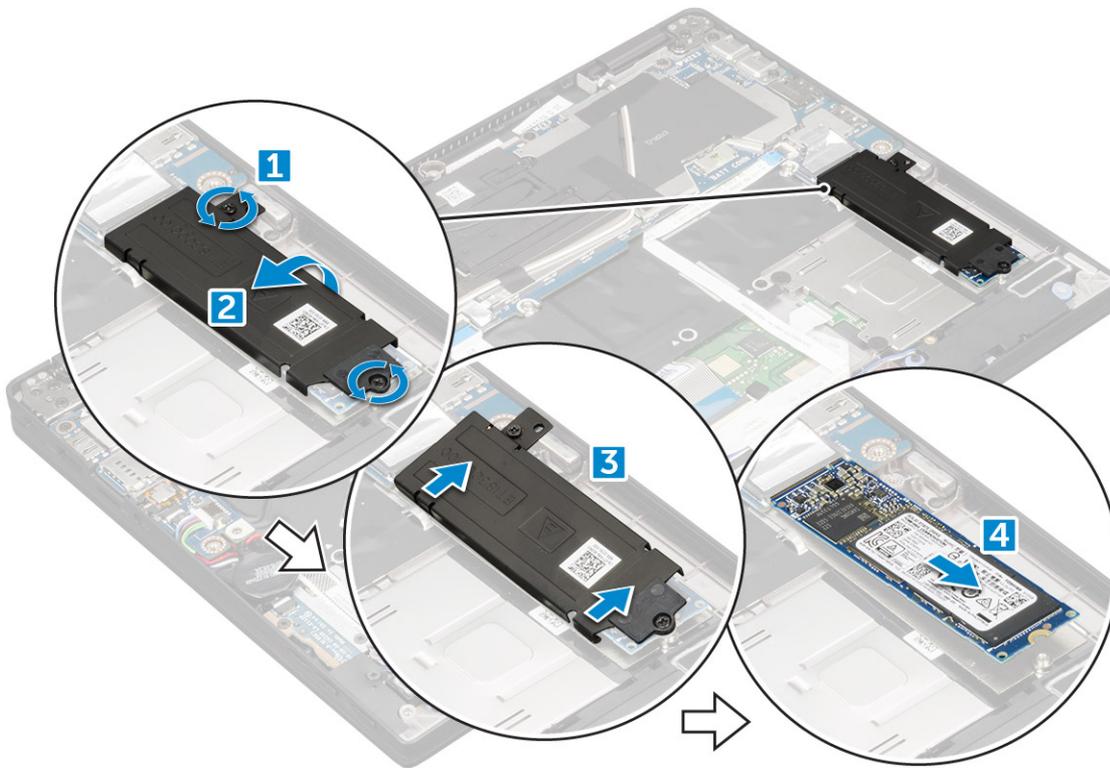
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a MicroSD card
  - b SIM card

**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c base cover
- d battery

**NOTE:** Disconnect the battery cable from the system board and remove the battery.

- 3 To remove the NVMe SSD card:
  - a Loosen the M2.0 x 3.0 screws that secure SSD thermal bracket [1].
  - b Lift the thermal bracket from the SSD card [2,3].
  - c Slide and remove the SSD card from the slot [4].



## Installing the NVMe SSD

- 1 Insert the NVMe SSD card into the connector.
- 2 Install the thermal bracket over the SSD card.
- 3 Tighten the M2.0 x 3.0 screws to secure the SSD thermal bracket.
- 4 Install the:
  - a battery
  - b base cover
  - c MicroSD card
  - d SIM card

**NOTE:** To install both cards if equipped .

- 5 Follow the procedure in [After working inside your computer](#).

## WLAN card

## Removing the WLAN card

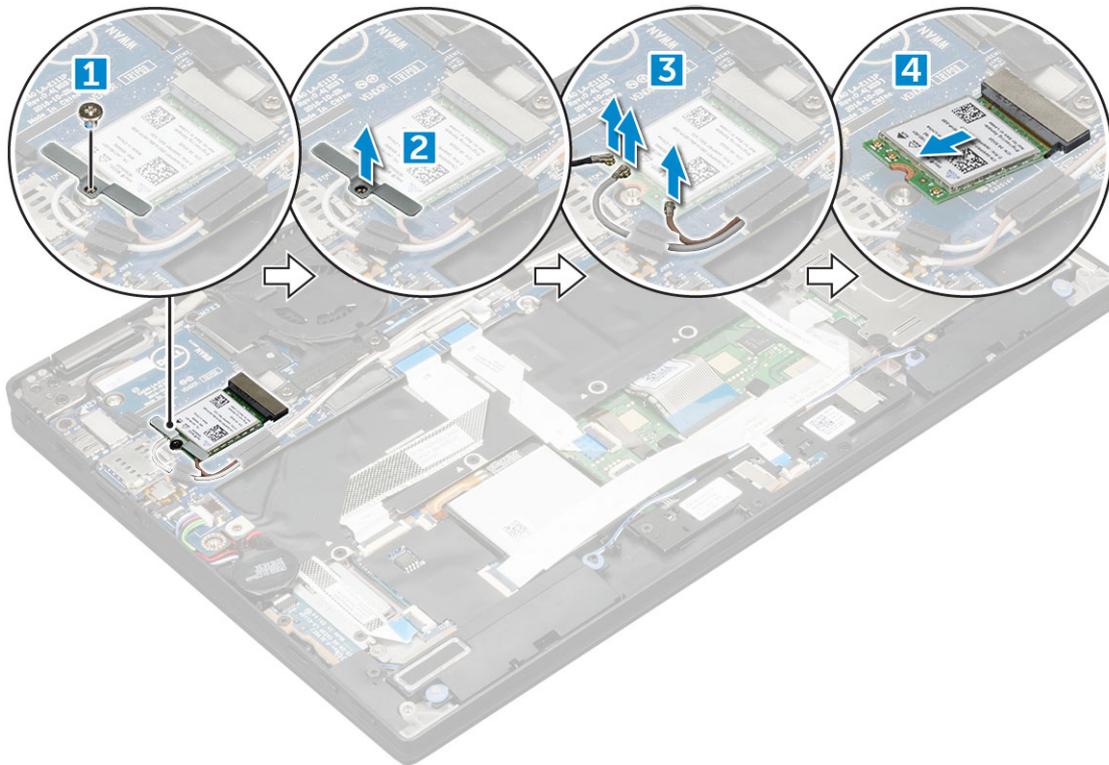
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a MicroSD card
  - b SIM card

**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c base cover
- d battery

**NOTE:** Disconnect and remove the battery from the system board.

- 3 To remove the WLAN card:
  - a Remove the M2.0 x 3.0 screw that secures the metal bracket to the WLAN card [1].
  - b Lift the metal bracket [2].
  - c Disconnect the WLAN cables from the connectors on the WLAN card [3].
  - d Remove the WLAN card [4].



## Installing the WLAN card

- 1 Insert the WLAN card into the connector on the system board.
- 2 Connect the WLAN cables to the connectors on the WLAN card.
- 3 Place the metal bracket and replace the M2.0 x 3.0 screw to secure WLAN card to the computer.
- 4 Install the:
  - a battery
  - b base cover
  - c SIM card
  - d MicroSD card

**NOTE:** To install both cards if equipped.

- 5 Follow the procedure in [After working inside your computer](#).

# WWAN card

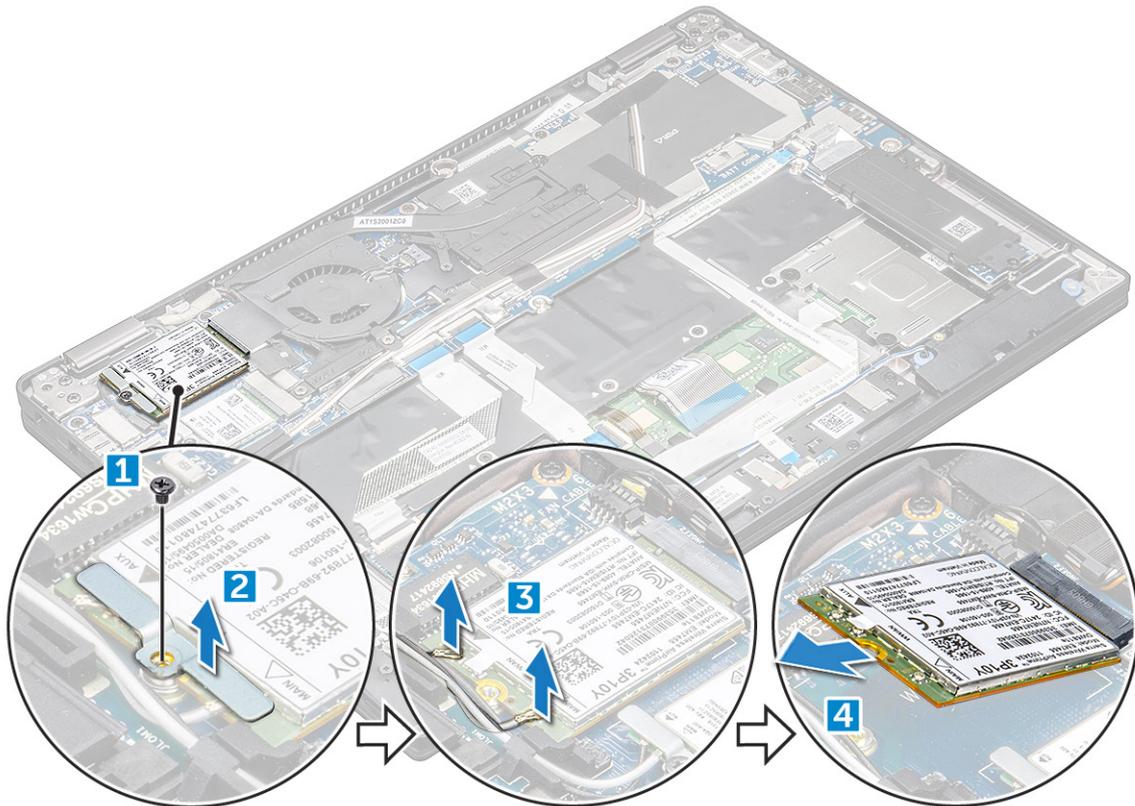
## Removing the WWAN card

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a [MicroSD card](#)
  - b [SIM card](#)

**1** | **NOTE:** To remove both cards if equipped and no need to remove the blank filler.

  - c [base cover](#)
  - d [battery](#)

**1** | **NOTE:** Disconnect and remove the battery from the system board.
- 3 To remove the WWAN card:
  - a Remove the M2.0 x 3.0 screw that secures the metal bracket to the WWAN card .
  - b Lift the metal bracket that secures the WWAN card .
  - c Disconnect the WWAN cables from the connectors on the WWAN card
  - d Lift the WWAN card from the computer.



## Installing the WWAN card

- 1 Insert the WWAN card into the connector on the system board.
- 2 Connect the WWAN cables to the connectors on the WWAN card.
- 3 Place the metal bracket and replace the M2.0 x 3.0 screw to secure the WLAN card to the computer.

- 4 Install the:
  - a battery
  - b base cover
  - c SIM card
  - d MicroSD card

**NOTE:** To install both cards if equipped.

- 5 Follow the procedure in [After working inside your computer](#).

**NOTE:** The IMEI number can also be found on the WWAN card.

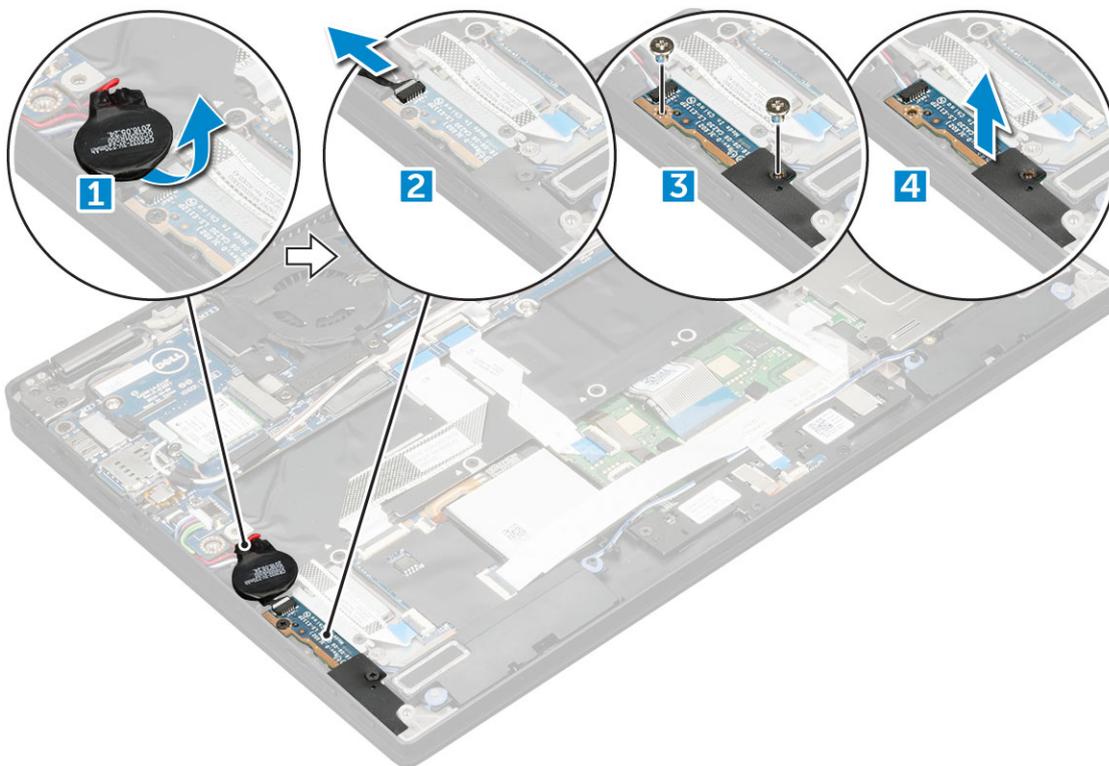
## Power board

### Removing the power board

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a MicroSD card
  - b SIM card tray

**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

  - c base cover
  - d battery
- 3 To remove the power board:
  - a Lift the coin cell battery affixed to the computer [1].
  - b Disconnect the power cable from the power board [2].
  - c Remove the M2.0x3.0 screws to release the power board [3].
  - d Lift the power board from the computer [4].



# Installing the power board

- 1 Insert the power board into the slot.
  - 2 Replace the M2.0x3.0 screws to secure the power board to the computer.
  - 3 Connect the power board cable to the connector on the system board.
  - 4 Affix the coin cell battery in the slot on the computer.
  - 5 Install the:
    - a battery
    - b base cover
    - c SIM card
    - d MicroSD card
-  **NOTE: To install both cards if equipped.**
- 6 Follow the procedure in [After working inside your computer](#).

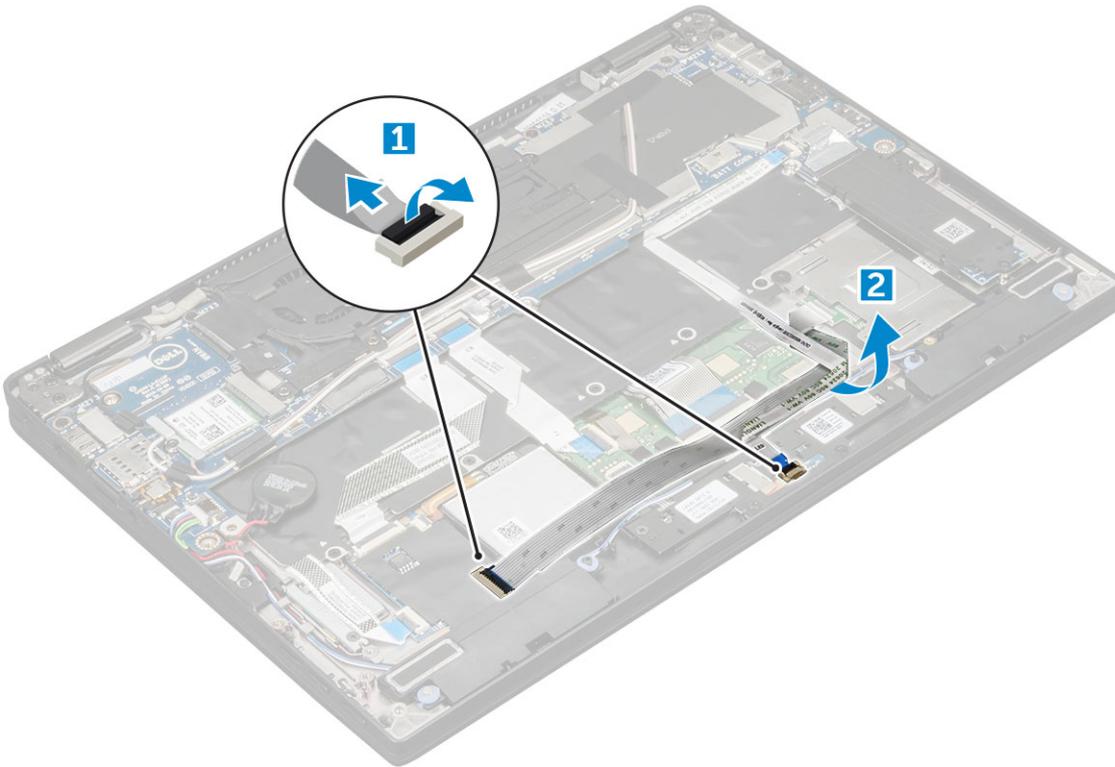
# Speaker

## Removing the speaker module

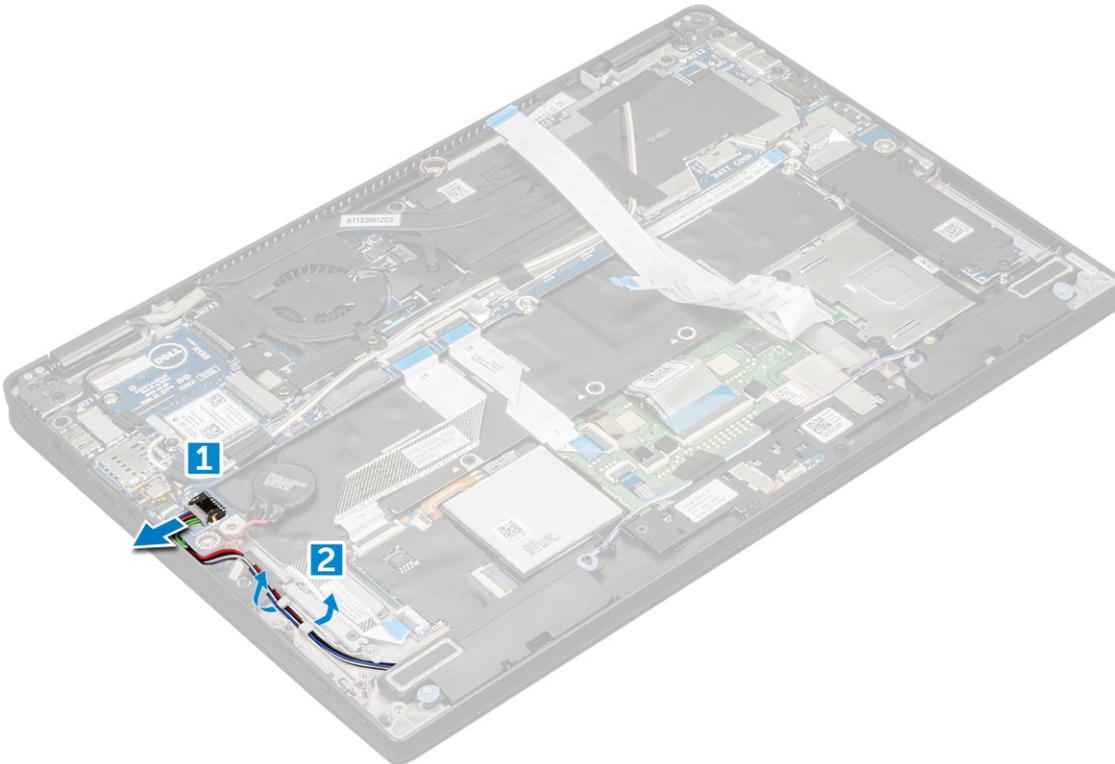
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a MicroSD card
  - b SIM card

 **NOTE: To remove both cards if equipped and no need to remove the blank filler.**

  - c base cover
  - d battery
  - e power board
- 3 To disconnect the cables:
  - a Disconnect the LED board cable and smart card reader cable [1].
  - b Fold back the LED board and smart card reader cable back to allow access to the speaker cable [2].

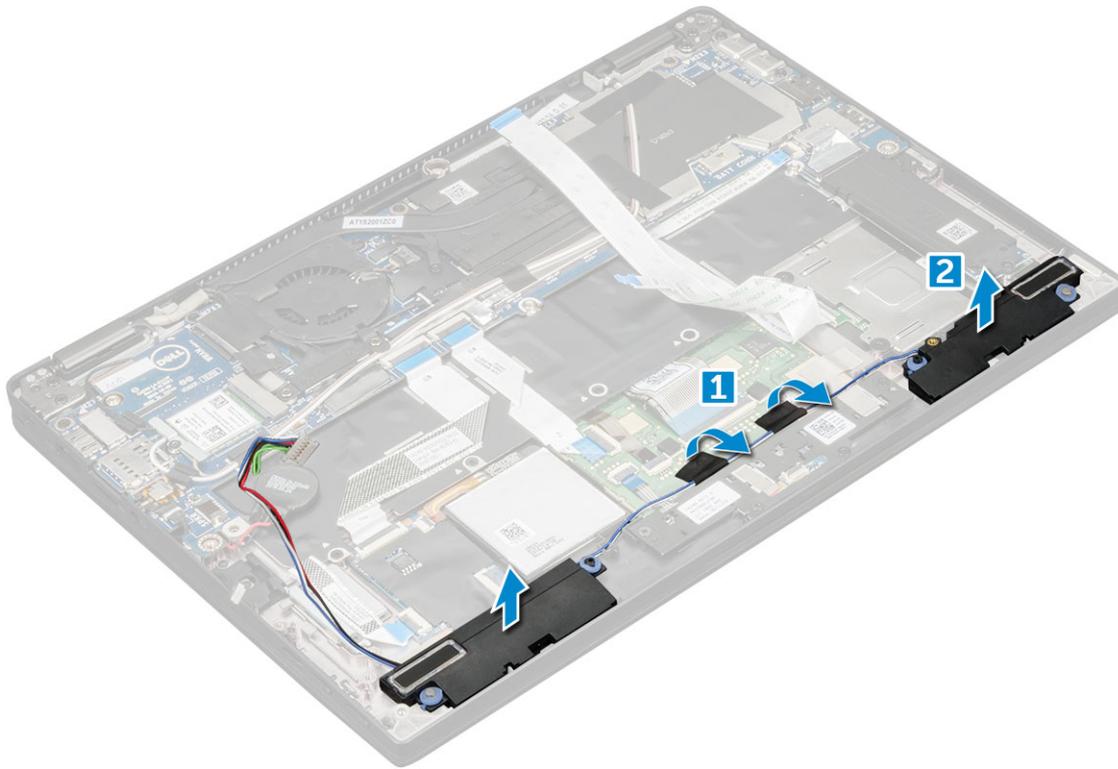


- 4 To release the speaker module:
- a Disconnect the speaker cable from the connector on the system board [1].
  - b Un route the speaker cable from the retention clips and remove the tapes that secure the speaker cable [2].



- 5 To remove the speaker module:
- a Un route the speaker cable by removing the tapes near the palm rest [1].
  - b Lift the speaker module from the computer.

**NOTE:** You can use a plastic scribe to lift the speaker module from the computer.



## Installing the speaker module

- 1 Place the speaker module into the slots on the computer.
- 2 Route the speaker cable through the routing channel and secure it with the tapes.
- 3 Connect the speaker cable to the connector on the system board.
- 4 Connect the smart card reader cable and then the LED board cable to the connector on the palm rest.
- 5 Install the:
  - a power board
  - b battery
  - c base cover
  - d SIM card
  - e Micro SD

**NOTE:** To install both cards if equipped.

- 6 Follow the procedure in [After working inside your computer](#).

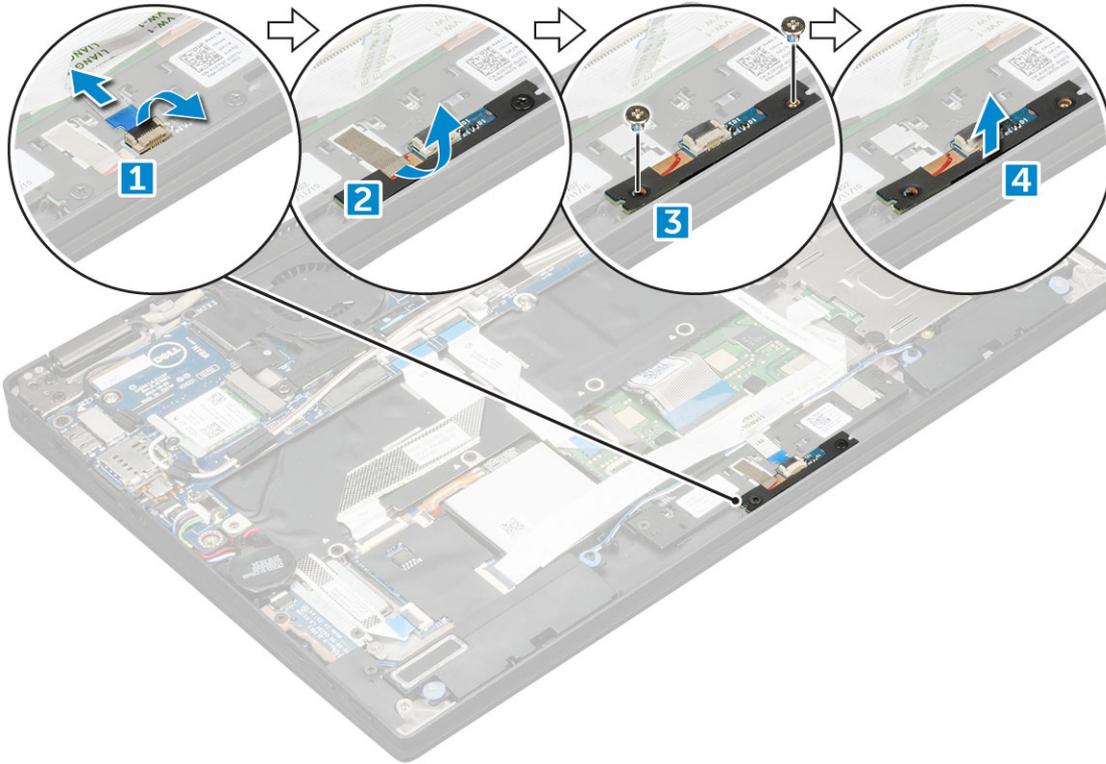
## LED Board

## Removing the LED board

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove:
  - a MicroSD card
  - b SIM card

**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c base cover
  - d battery
- 3 To remove the LED board:
- a Disconnect the LED board cable from the LED board [1].
  - b Remove the tape that secures the LED board to the touchpad panel [2].
  - c Remove the M2 x 3 screws that secure the LED board [3].
  - d Lift the LED board from the computer [4].



## Installing the LED board

- 1 Install the LED board into the slot.
- 2 Replace the M2 x 3 screws to secure the LED board.
- 3 Affix the tape to secure the LED board.
- 4 Connect the LED board cable to the LED board.
- 5 Install the:
  - a battery
  - b base cover
  - c SIM card
  - d MicroSD card

**NOTE:** To install both cards if equipped.

- 6 Follow the procedure in [After working inside your computer](#).

## Smart Card Cage

# Removing the smart card cage

① **NOTE:** Always remove the smart card from the smart card reader.

1 Follow the procedure in [Before working inside your computer](#).

2 Remove:

- a [MicroSD card](#)
- b [SIM card](#)

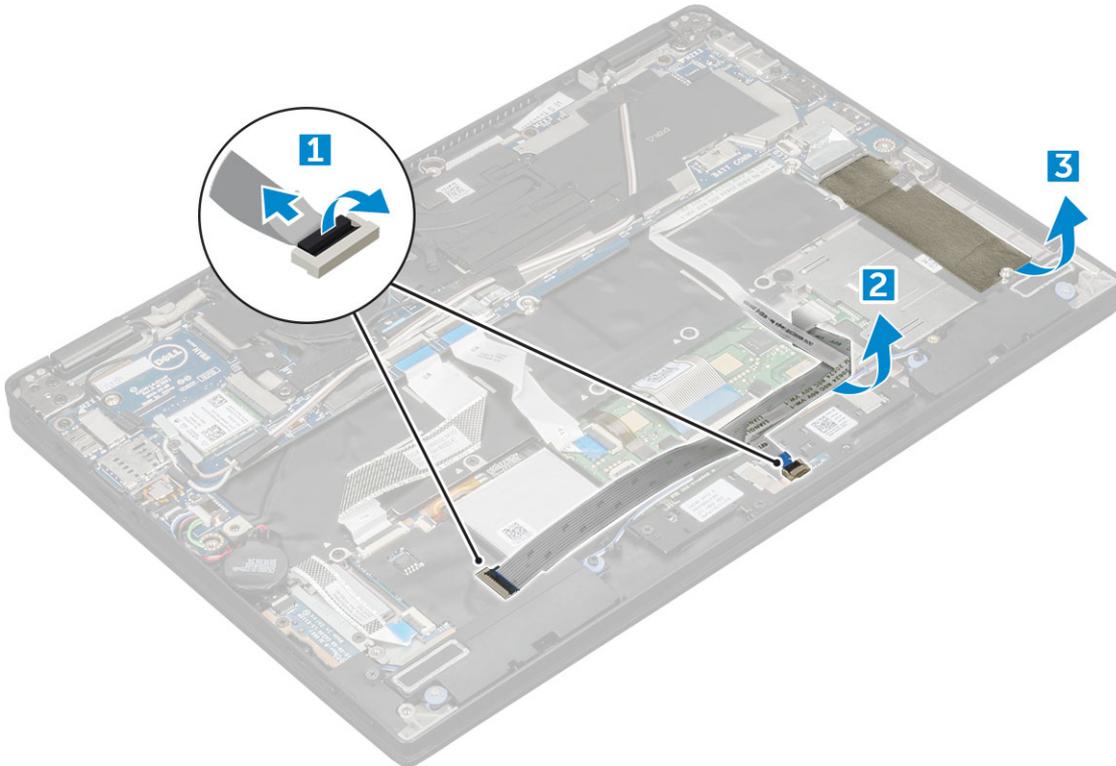
① **NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c [base cover](#)
- d [battery](#)
- e [SSD card](#)

3 To disconnect the cables:

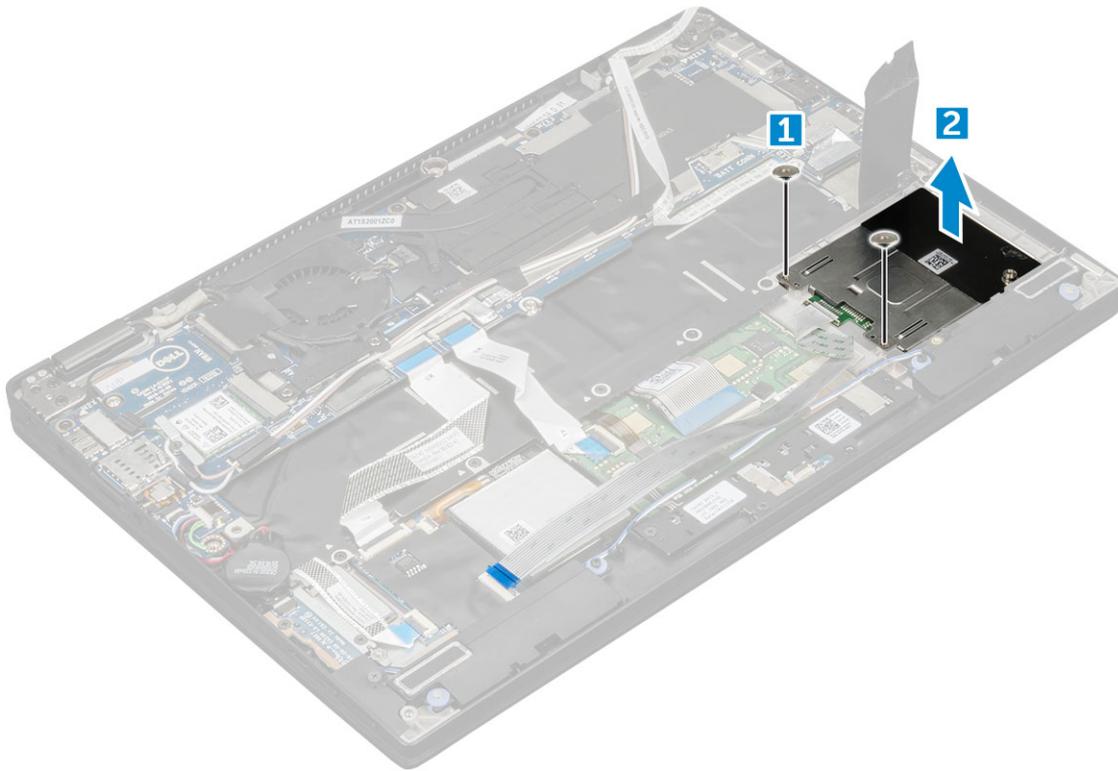
- a Disconnect the LED board cable and smart card reader cable [1].
- b Peel back the previously disconnected LED board & smart card reader cable [2].
- c Peel the SSD thermal pad from the SSD slot [3].

① **NOTE:** You may need to apply force to peel off the SSD thermal pad.



4 To remove the smart card cage:

- a Remove the M2.0 x 1.7 screws that secure the smart card cage to the computer [1].
- b Slightly slide the reader back and lift the smart card cage from the computer [2].



## Installing the smart card cage

- 1 Slide the smart card cage into the slot to align with the screw holders on the computer.
  - 2 Replace the M2.0 x 1.7 screws to secure the smart card cage to the computer.
  - 3 Affix the thermal pad on the SSD slot.
  - 4 Affix the smart card cable and connect it to the USH board on the computer .
  - 5 Affix the LED board cable and connect it to the LED board on the computer .
  - 6 Install the:
    - a SSD card
    - b battery
    - c base cover
    - d SIM card
    - e MicroSD card
- NOTE:** To install both cards if equipped.
- 7 Follow the procedure in [After working inside your computer](#).

## Display Assembly

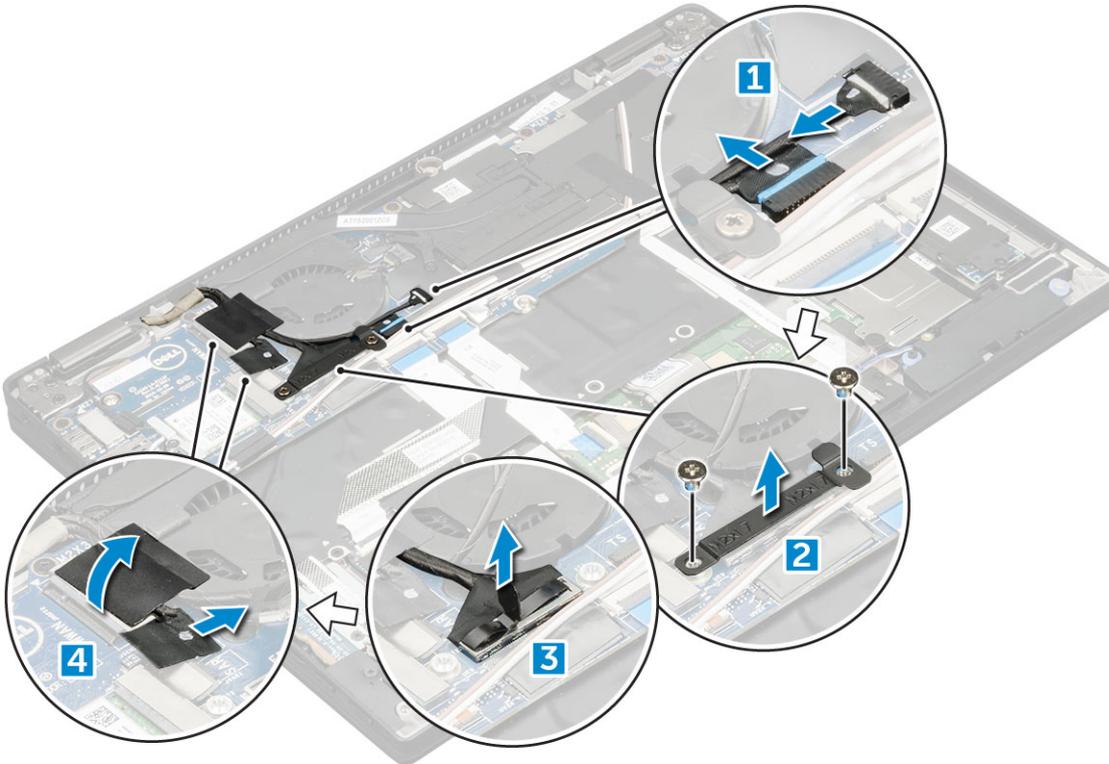
### Removing the display assembly

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
  - a MicroSD card
  - b SIM card

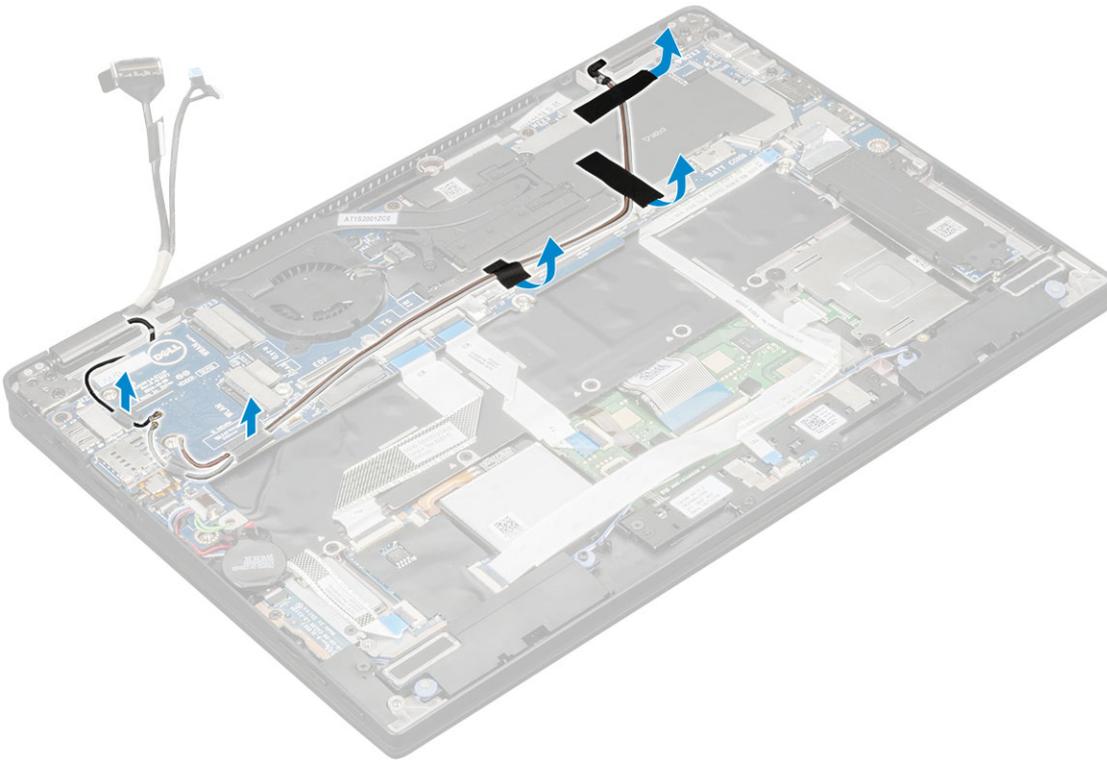
**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c base cover
- d battery
- e WLAN card
- f WWAN card

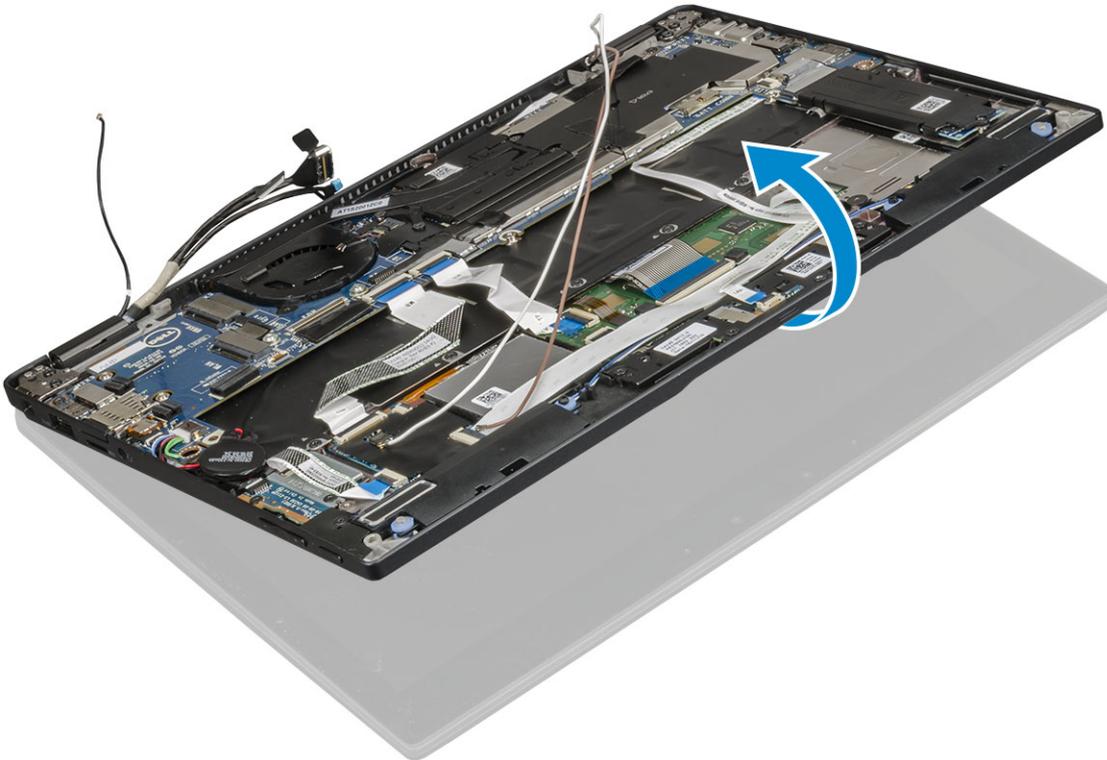
- 3 Disconnect the :
- a IR camera and touchscreen cable [1].
  - b Remove the M 2 x 1.7L screws that secure the eDP bracket and lift it away from the computer [2].
  - c Disconnect the eDP cable from the system board [3].
  - d Disconnect the G-sensor and eDP cables [4].



- 4 Peel the tapes that secure the antenna cables and un route the cables from the routing clips.



5 Lift the base of the computer away from the display assembly.



6 To remove the display assembly:

**NOTE:** Open the Laptop as shown in the illustration above.

a Remove the M2.5 x 4.0 screws that secure the display hinge brackets [1].

**CAUTION:** Hold the LCD assembly in place as the screws are removed, to prevent it from falling over and possible damage.

- b Lift the display assembly away from the computer [2].



## Installing the display assembly

- 1 Place the base of the computer on a flat surface.
- 2 Install the display assembly by aligning it with the display hinge screw holders.
- 3 Replace the M2.5 x 4.0 screws to secure the display assembly.
- 4 Close the display assembly and flip the computer.
- 5 Connect the cables:
  - a G-sensor and eDP cable
  - b Place the eDP bracket on the eDP cable and replace the M 2 x 1.7L screw on the bracket.
  - c IR camera and touch screen cables
- 6 Route the antenna cables through the routing clips
- 7 Affix the tapes to secure the antenna cables to the system board.
- 8 Install the:
  - a WWAN card
  - b WLAN card
  - c battery
  - d base cover
  - e SIM card
  - f MicroSD card

**NOTE:** To install both cards if equipped.

- 9 Follow the procedure in [After working inside your computer](#).

# Heat Sink

## Removing heat sink assembly

1 Follow the procedure in [Before working inside your computer](#).

2 Remove the:

- a [Micro SD](#)
- b [SIM card](#)

**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c [base cover](#)
- d [battery](#)

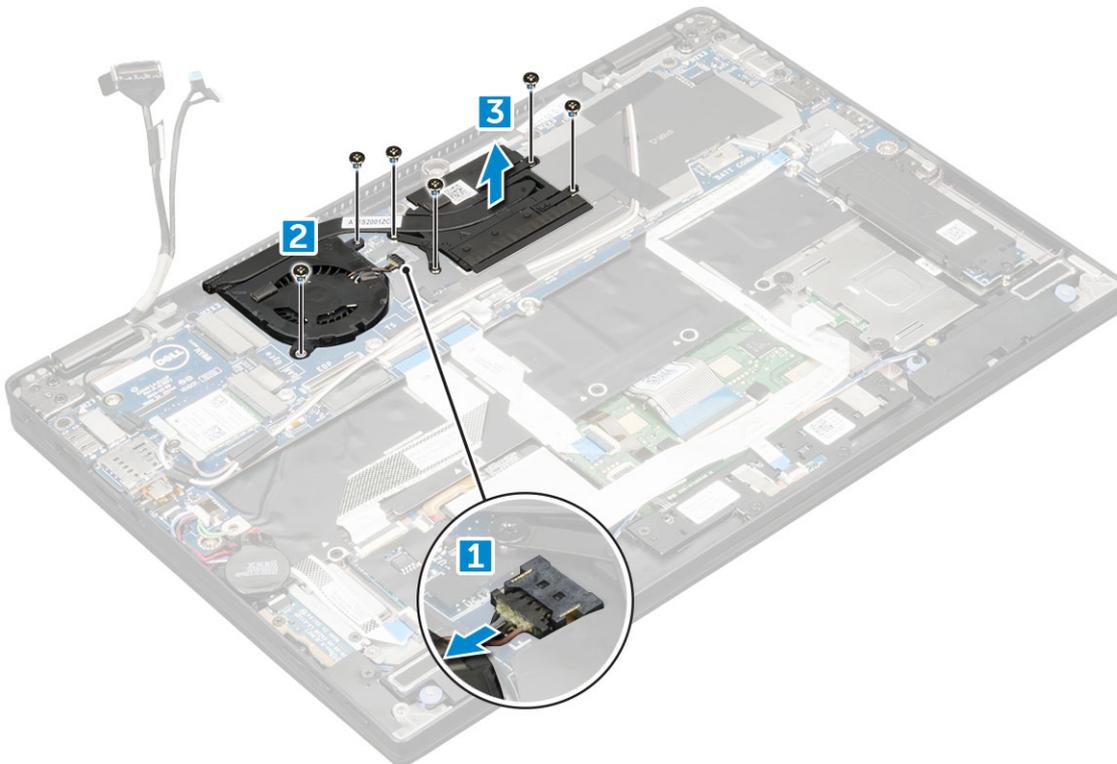
3 To remove the heat sink assembly:

**NOTE:** To remove the eDP cable, refer [LCD assembly](#).

- a Disconnect the fan cable from the system board [1].
- b Disconnect cables from the LCD assembly to gain access to screws[2].
- c Remove the 1 M2.0 x 3.0 screws that secure the fan to the system board[3].
- d Remove the 1 M2.0 x 2.0 screws that secure the heat sink to the system board [4].

**NOTE:** Loosen the screws on the system board in the order of the callout numbers [1, 2, 3, 4] as indicated on the heat sink

- e Lift the heat sink assembly from the system board.



## Installing heat sink assembly

- 1 Align the heat sink assembly with screw holders on the system board.
- 2 Replace the 1 M2.0 x 3.0 screws to secure the heat sink to the system board.

**ⓘ NOTE: Tighten the screws on the system board in the order of the callout numbers [1, 2, 3, 4] as indicated on the heat sink.**

- 3 Replace the 1 M2.0 x 2.0 screws to secure the fan to the system board.
- 4 Connect the LCD assembly cables.
- 5 Connect the fan cable to the connector on the system board.
- 6 Install the:
  - a battery
  - b base cover
  - c SIM card
  - d MicroSD card

**ⓘ NOTE: To install both cards if equipped.**

- 7 Follow the procedure in [After working inside your computer](#).

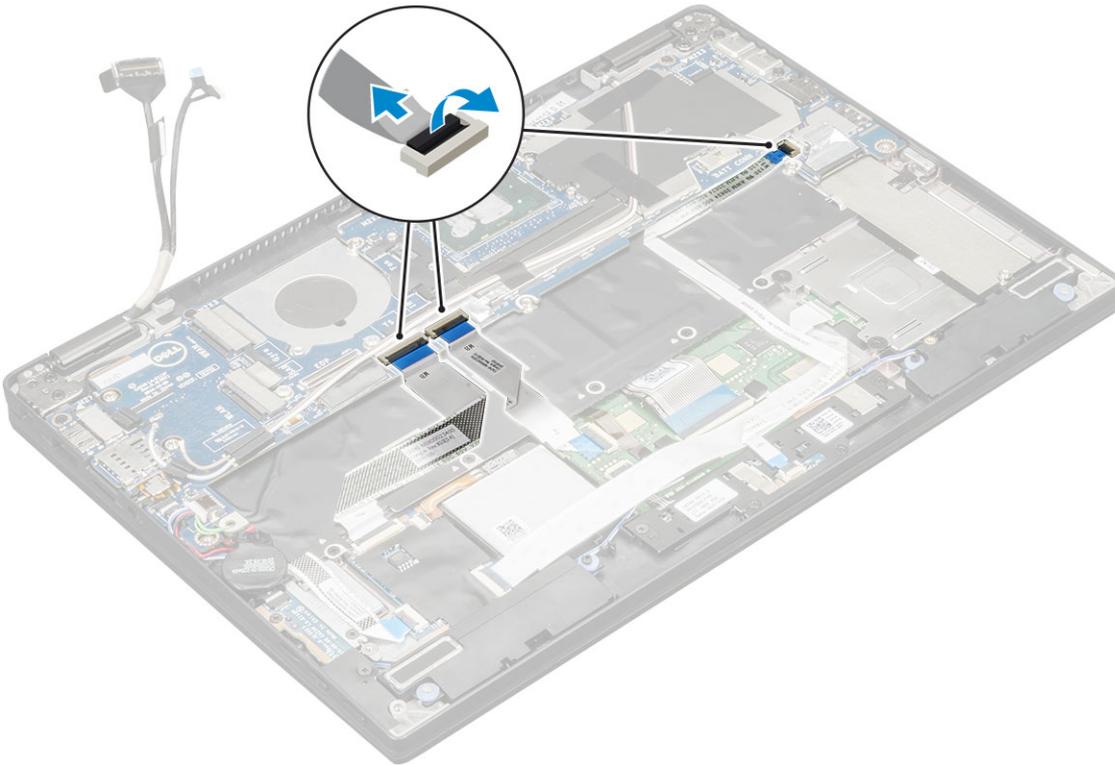
## System Board

### Removing system board

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
  - a Micro SD
  - b SIM card tray
  - c base cover
  - d battery
  - e SSD card
  - f WLAN card
  - g WWAN card
  - h heatsink assembly
- 3 Disconnect the following cables from the system board .

**ⓘ NOTE: To remove the IR camera, touchscreen, eDP, and G-sensor cables, refer [LCD assembly](#).**

- a Touchpad cable
- b USB cable
- c LED board cable

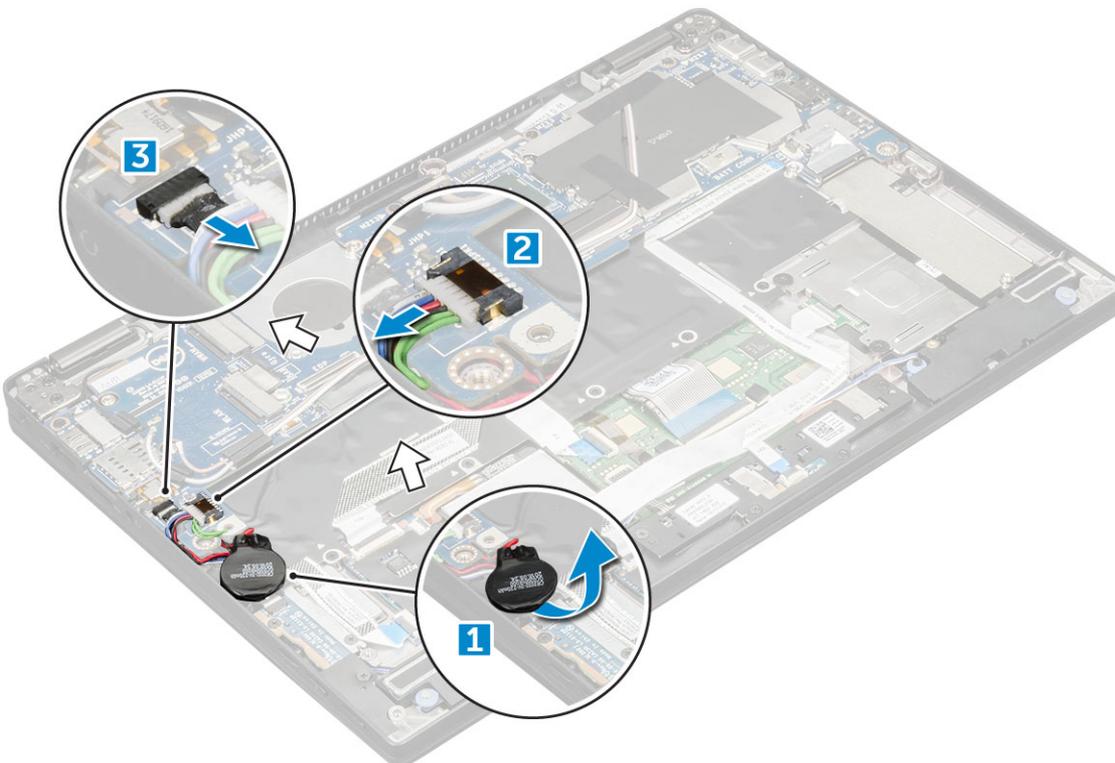


4 Disconnect the eDP cable:

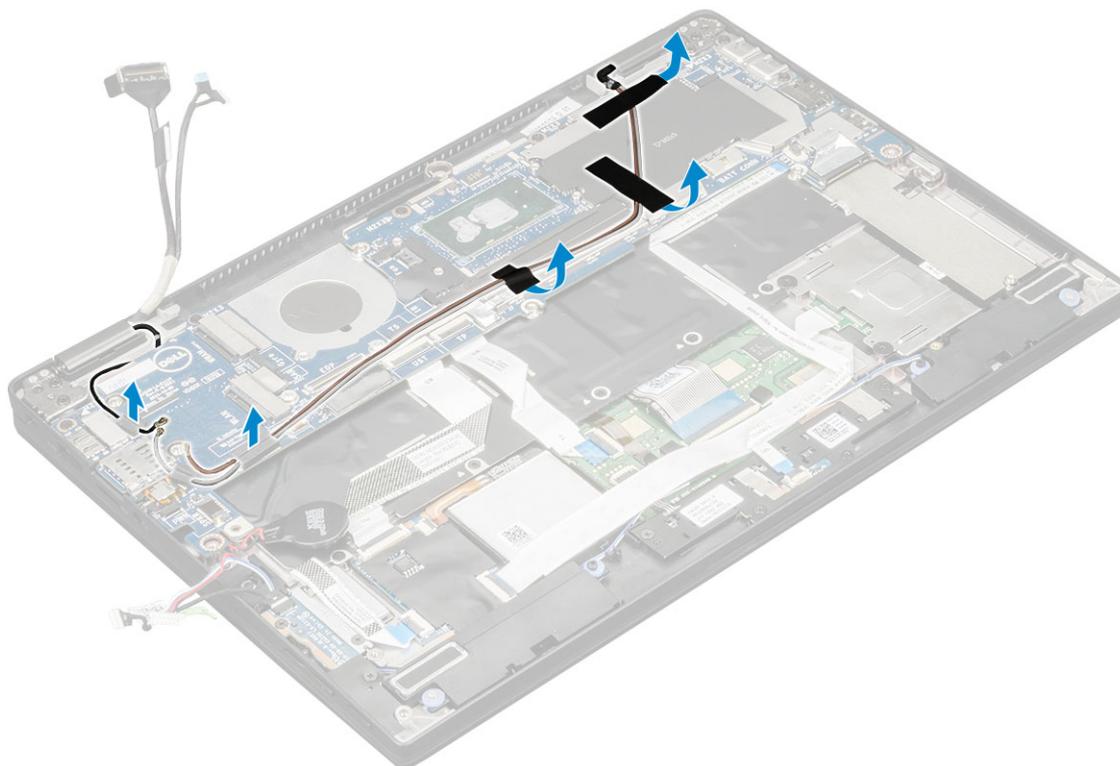
**ⓘ NOTE:** To disconnect the eDP cable, remove the M 2 x 1.7L screws that secure the eDP bracket and lift it away from the computer. Disconnect the eDP cable from the system board.

5 To release the cables:

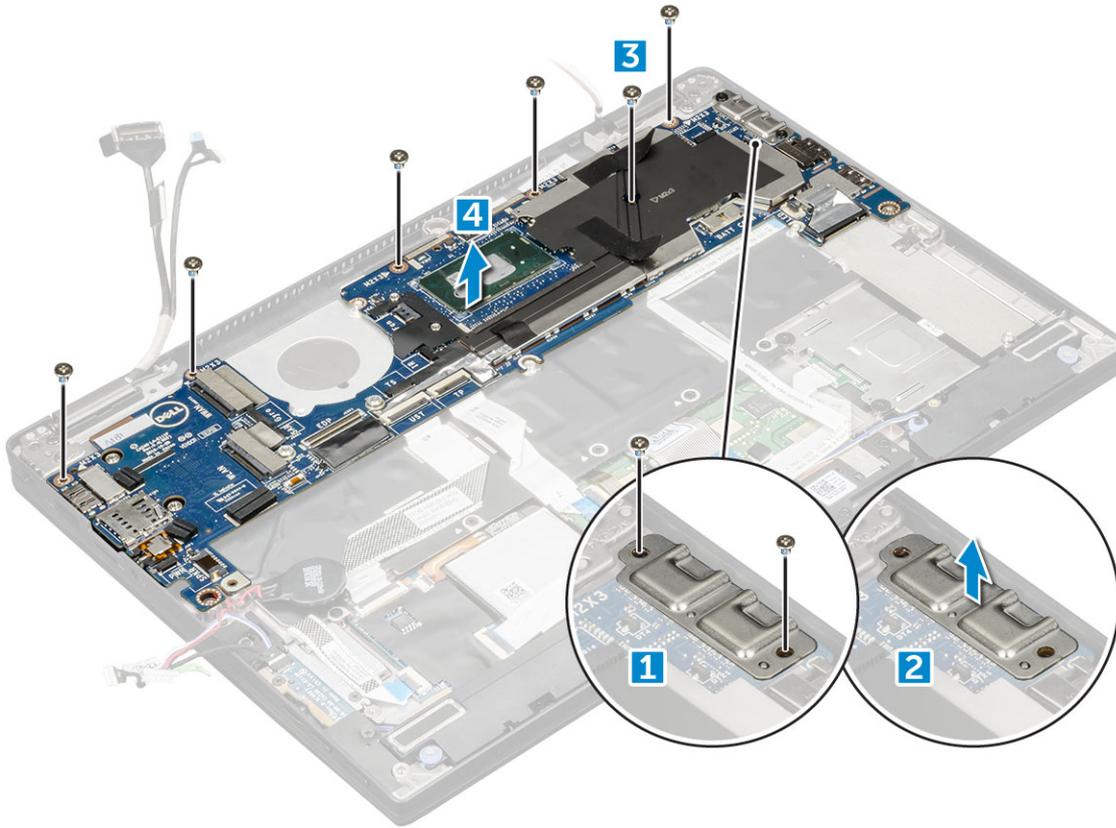
- a Flip the coin cell battery to reveal the speaker cable [1].
- b Disconnect the speaker cable from the system board [2].
- c Disconnect the power board cable from the system board [3].



- 6 Peel the tapes that secure antenna cables and un route the cables from the routing clips.



- 7 To remove the system board:
- Remove the M2.0 x 4L screws from the USB Type-C bracket [1].
  - Lift the USB Type-C bracket from the Type-C module [2].
  - Remove the M2.0 x 3.0 screws that secure the system board to the computer [3].
  - Lift the system board away from the computer [4].



## Installing system board

- 1 Align the system board with the screw holders on the computer.
- 2 Replace the M2.0 x 3.0 screws to secure the system board to the computer.
- 3 Place the USB Type-C bracket on the Type-C module.
- 4 Replace the M 2.0 x 4L screws to secure the USB Type-C bracket to the Type-C module.
- 5 Route the antenna cable through the routing clips and affix the tapes to secure the antenna cables.
- 6 Connect the power board and the speaker cable to the system board.
- 7 Affix the coin cell battery on the speaker cable.
- 8 Connect the USH board, Touchpad board and LED board cables to the system board.

1 ⓘ **NOTE:** If your computer has a WWAN card, then SIM card tray installation is a requirement.

9 Install the:

a [heatsink module](#)

Connect the following cables from the system board

- 1 LED board cable
- 2 USH cable
- 3 Touchpad cable

ⓘ **NOTE:** To reconnect the IR camera, touchscreen, eDP, and G-sensor cables, refer [LCD assembly](#).

- b [WWAN card](#)
- c [WLAN card](#)
- d [SSD card](#)
- e [battery](#)
- f [base cover](#)

- g SIM card tray
- h Micro SD

10 Follow the procedure in [After working inside your computer](#).

## Coin cell battery

### Removing the real time clock (RTC)

1 Follow the procedure in [Before working inside your computer](#).

2 Remove the:

- a Micro SD card
- b SIM card

**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c base cover
- d battery
- e SSD card
- f WLAN card
- g WWAN card
- h heat sink assembly
- i system board

3 Disconnect the RTC cable to release it from the system board.



### Installing real time clock (RTC)

1 Connect the coin cell battery cable to the system board.

2 Install:

- a system board
- b heat sink module
- c WWAN card
- d WLAN card

- e SSD card
- f battery
- g base cover
- h MicroSD card
- i SIM card

**NOTE:** To install both cards if equipped.

- 3 Follow the procedure in [After working inside your computer](#).

## Keyboard

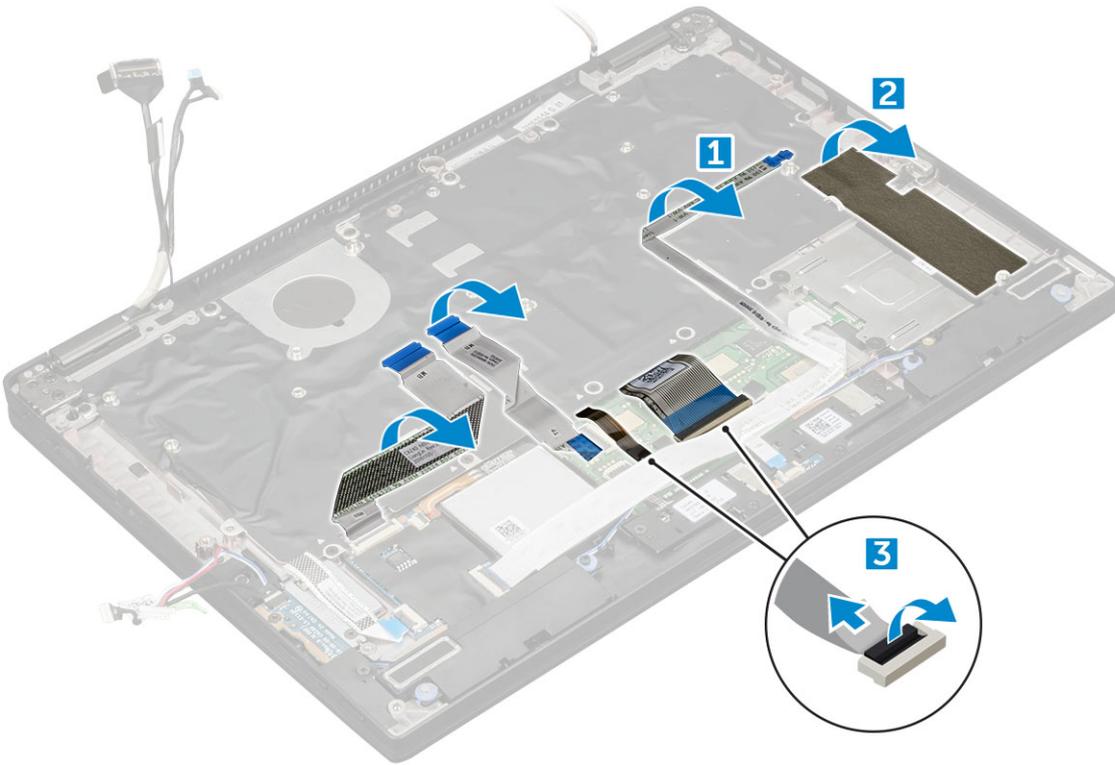
### Removing keyboard assembly

**NOTE:** The keyboard and the keyboard tray together are called the keyboard assembly.

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
  - a Micro SD
  - b SIM card tray

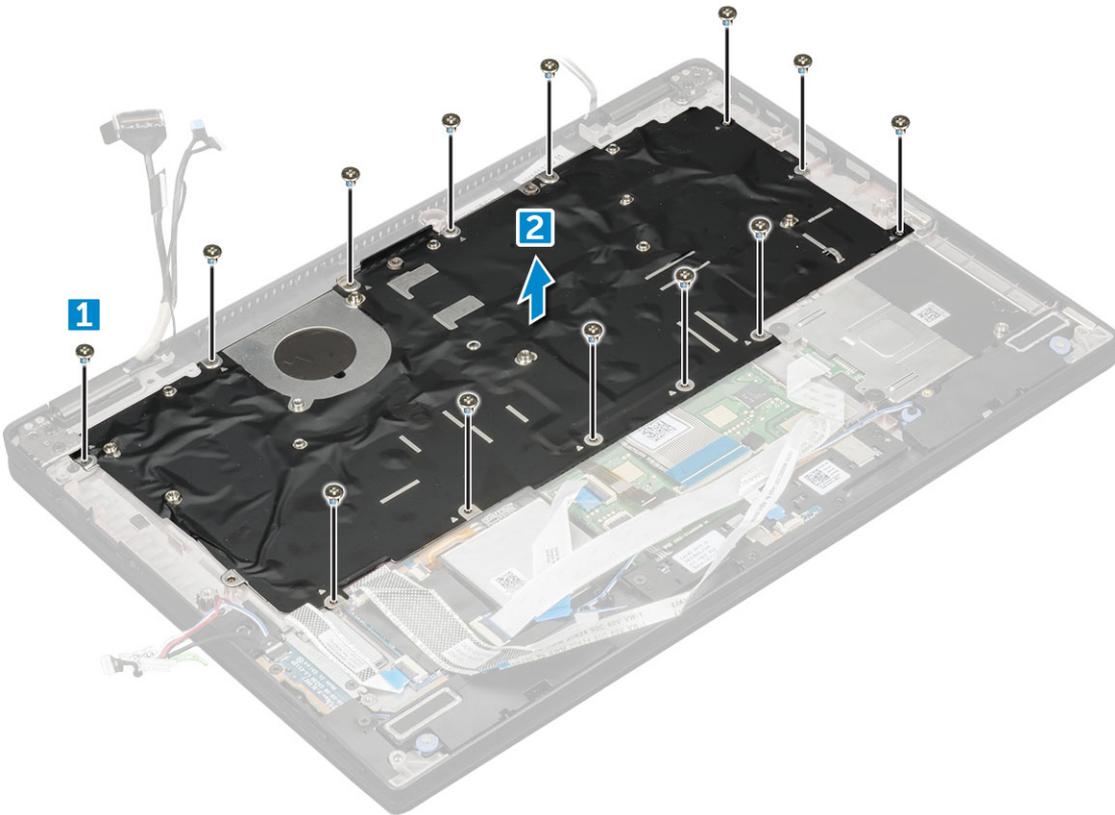
**NOTE:** To remove both cards if equipped and no need to remove the blank filler.

- c base cover
  - d battery
  - e SSD card
  - f WLAN card
  - g WWAN card
  - h Heatsink assembly
  - i system board
- 3 To Disconnect the cables and thermal pad:
    - a LED board cable [1]
    - b SSD thermal pad [2]
    - c Touchpad and USH board cable [3]
    - d keyboard and keyboard backlight cable [4]



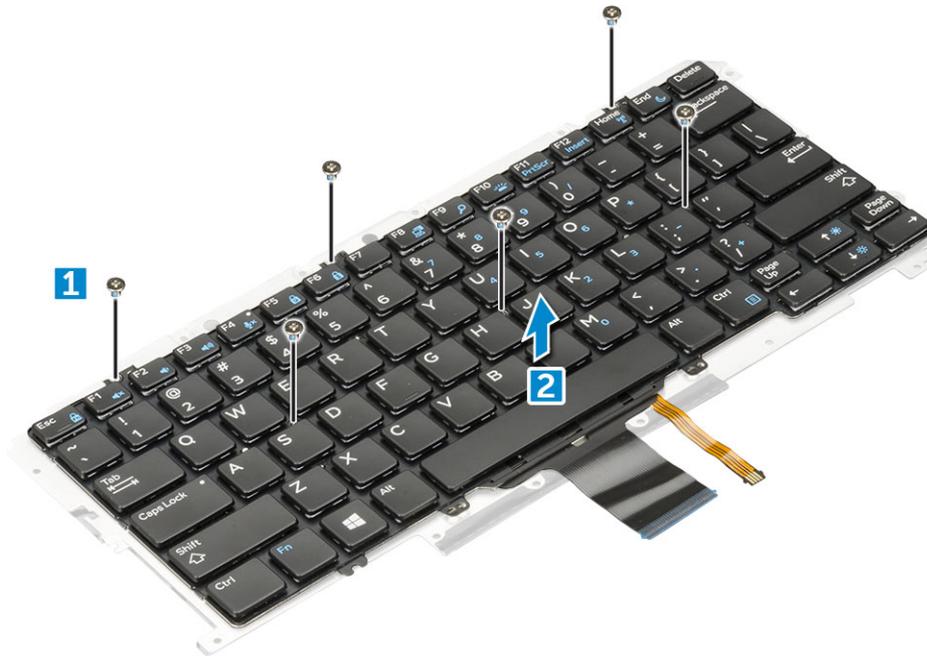
4 To remove the keyboard:

- a Remove the M2.0 x 3.0 screws that secure the keyboard to the chassis [1].
- b Lift the keyboard from the chassis [2].



## Removing keyboard from the keyboard tray

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the [keyboard assembly](#)
- 3 Remove the keyboard from the keyboard support tray:
  - a Remove the M2.0 x 2.0 screws that secure the keyboard to the keyboard assembly [1].
  - b Lift the keyboard away from the keyboard support tray [2].



## Installing keyboard to the keyboard tray

- 1 Align the keyboard with the screw holders on the keyboard tray.
- 2 Tighten the M2.0 x 2.0 screws to secure the keyboard to the keyboard tray.
- 3 Install the [keyboard assembly](#).

## Installing keyboard assembly

**NOTE:** The keyboard and the keyboard tray together are called the keyboard assembly.

- 1 Align the keyboard assembly with the screw holders on the chassis.
- 2 Replace the M2.0 x 3.0 screws that secure the keyboard to the chassis.
- 3 Affix and connect the keyboard and the backlit keyboard cables to the keyboard.
- 4 Affix the LED board cable on the keyboard.
- 5 Affix the SSD thermal pad on the SSD module.
- 6 Install the:
  - a [system board](#)
  - b [heatsink module](#)
  - c [WWAN card](#)
  - d [WLAN card](#)

- e SSD card
- f battery
- g base cover
- h SIM card
- i MicroSD card

**NOTE:** To install both cards if equipped.

- 7 Follow the procedure in [After working inside your computer](#).

## Palmrest

### Replacing palm rest

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
  - a base cover
  - b battery
  - c SSD module
  - d WLAN card
  - e WWAN card
  - f heat sink assembly
  - g speaker
  - h display assembly
  - i system board
  - j keyboard



The component you are left with is the palmrest.

- 3 Replace the palmrest.
- 4 Install the:

- a keyboard assembly
- b system board
- c display assembly
- d speaker
- e heat sink assembly
- f WLAN card
- g WWAN card
- h SSD module
- i battery
- j base cover

5 Follow the procedure in [After working inside your computer](#).

# Technology and components

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

Topics:

- [USB features](#)
- [HDMI 1.4](#)

## 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 drives, 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 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.

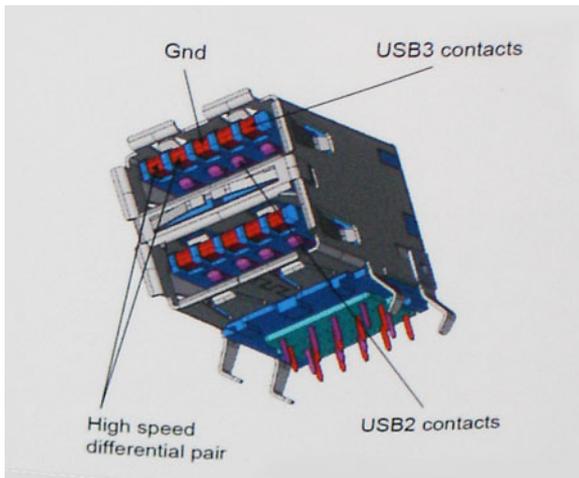


# Speed

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

# System specifications

**NOTE:** Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For more information about the configuration of your computer, go to Help and Support in your Windows operating system and select the option to view information about your computer.

Topics:

- [System specifications](#)
- [Processor specifications](#)
- [Display specifications](#)
- [Memory](#)
- [Video specifications](#)
- [Audio specifications](#)
- [Storage options](#)
- [Communication specifications](#)
- [Near field communication \(NFC\) specifications](#)
- [Fingerprint reader specifications](#)
- [Ports and connector specifications](#)
- [Touchpad specifications](#)
- [Camera specifications](#)
- [IR camera specifications](#)
- [AC adapter specifications](#)
- [Battery specifications](#)
- [Docking Option](#)
- [Device drivers](#)
- [Physical specifications](#)
- [Environmental specifications](#)

## System specifications

Feature	Specification
Chipset	Intel Kaby Lake (integrated with processor)
DRAM bus width	64-bit
Flash EPROM	SPI 128 Mbits
PCIe bus	100 MHz

## Processor specifications

Feature	Specification
Types	<ul style="list-style-type: none"> <li>· Intel Core i3-7100U Processor (Dual Core 2.4GHz, 3M cache, 15W)</li> <li>· Intel Core i5-7200U Processor (Dual Core, 2.5GHz up to 3.1GHz, 3M cache, 15W)</li> </ul>

Feature	Specification
	<ul style="list-style-type: none"> <li>Intel Core i5-7300U Processor (Dual Core, 2.6GHz up to 3.5GHz, 3M cache, 15W), vPro</li> <li>Intel Core i7-7600U Processor (Dual Core, 2.8GHz up to 3.9GHz, 4M cache, 15W), vPro</li> </ul>

## Display specifications

Feature	Specification
Type	13.3-inch Touch with corning gorilla glass 4, active pen support, anti-reflective and anti-smudge
Luminance	FHD 255 nits
Native resolution	FHD 1920x1080
Refresh rate	60 Hz
Maximum viewing angles—horizontal	80/-80 degrees
Maximum viewing angles—vertical	80/-80 degrees
Pixel pitch	FHD 0.144 mm

## Memory

Your computer supports a maximum of 16 GB of memory.

**Table 3. Memory specifications**

Type	LPDDR3 SDRAM (Soldered down memory)
Minimum Memory Configuration	4 GB
Maximum Memory Configuration	16 GB

## Video specifications

**Table 4. Video specifications**

Feature	Specifications
Type	Integrated on system board
UMA controller	Intel HD Graphics 620
External display support	On system – eDP (internal display), HDMI 1.4, Type-C port Optional – Type-C port with VGA, Type-C port with DVI

## Audio specifications

**Table 5. Audio specifications**

Feature	Specification
Types	Four-channel high-definition audio
Controller	Waves MaxxAudio Pro
Stereo conversion	16/20/24-bit—analog-to-digital and digital-to-analog

Feature	Specification
Internal interface	High-definition audio
External interface	Microphone-in, stereo headphones, and universal audio jack
Speakers	Two
Internal speaker amplifier	2 W (RMS) per channel
Volume controls	Volume control buttons and Hot keys

## Storage options

Feature	Specification
Storage options	<ul style="list-style-type: none"> <li>· 256 GB M.2 2280 PCIeSSD</li> <li>· 512 GB M.2 2280 PCIeSSD</li> <li>· 1024 GB M.2 2280 PCIeSSD</li> <li>· 256 GB M.2 2280 SED PCIeSSD</li> <li>· 512 GB M.2 2280 SED PCIeSSD</li> <li>· 128 GB M.2 2280 SATA SSD</li> <li>· 256 GB M.2 2280 SATA SSD</li> </ul>

## Communication specifications

Features	Specification
Wireless	Internal wireless local area network (WLAN), wireless wide area network (WWAN), WiGig <ul style="list-style-type: none"> <li>· Bluetooth 4.1 LE</li> <li>· Bluetooth 4.2 (Intel)- HW ready, SW depends on OS, Windows 10 supports up to 4.1</li> </ul>

## Near field communication (NFC) specifications

Feature	Specification
Type	Broadcom BCM58102 NFC controller
NFC Standard	ISO/IEC 18092, ISO/IEC 21481,ISO/IEC 14443 Type A and B', Japanese Industrial Standard (JIS) (X) 6319-4, and ISO/IEC 15693 standards
Support NFC Card	NFC Forum Type1 / Type 2 / Type 3 / Type 4 ; ISO/IEC 14443-4 stands-based PICC; ISO/IEC 15693 stands-based VICC ; ISO/IEC 18000-3 ; Kovio
Temperature (operating)	0° to 70° C
Humidity	<85% under operation (at operating temperature)

## Fingerprint reader specifications

Feature	Specification
Sensor technology	Active thermal
Sensor resolution	385 dpi

Feature	Specification
Sensor size	11.9 mm x 11.9 mm
Sensor pixel size	180x180 pixels

## Ports and connector specifications

Feature	Specification
Audio	<ul style="list-style-type: none"> <li>Universal audio jack</li> <li>Volume buttons</li> </ul>
Video	HDMI 1.4
USB	<ul style="list-style-type: none"> <li>One USB 3.1 Gen 1</li> <li>One USB 3.1 Gen 1 with PowerShare</li> <li>Two USB 3.1 Gen 1 with Type-C</li> </ul>
Memory card reader	Micro SD 4.0
Universal Subscriber Identity Module (uSIM) card-WWAN	One
Docking port	USB Type-C docking
Express Card	None

## Touchpad specifications

Feature	Specification
Active area	<ul style="list-style-type: none"> <li>X-axis - 90.5 mm (3.56 inches)</li> <li>Y-axis - 50.0 mm (1.97 inches)</li> </ul>
Multi-touch	Configurable single finger and multi-finger gestures

## Camera specifications

Feature	Specification
Type	HD fixed focus
Sensor type	CMOS sensor technology
Imaging rate	Up to 30 frames per second
Video Resolution	1280 x 720 pixels

## IR camera specifications

Feature	Specification
Type	VGA IR camera
Sensor type	CMOS sensor
Resolution: Motion Video	Win Hello Recognition
Imaging Rate	up to 15- fps

# AC adapter specifications

Feature	Specification
Type	45 W, 65 W, 90 W with USB Type-C
Input voltage	100 V AC to 240 V AC
Input current—maximum	1.3 A/1.5 A/1.7 A
Input frequency	50 Hz to 60 Hz
Output current—45 W	<ul style="list-style-type: none"><li>• 20V/2.25A (Continuous)</li><li>• 5.0V/2A (Continuous)</li></ul>
Output current—65 W	<ul style="list-style-type: none"><li>• 20V/3.25A (Continuous)</li><li>• 15V/3A (Continuous)</li><li>• 9V/3A (Continuous)</li><li>• 5V/3A (Continuous)</li></ul>
Output current—90 W	<ul style="list-style-type: none"><li>• 20V/4.5A (Continuous)</li><li>• 15V/3A (Continuous)</li><li>• 9V/3A (Continuous)</li><li>• 5V/3A(Continuous)</li></ul>
Rated output voltage—45 W	20 V DC/5 V DC
Rated output voltage—65 W and 90 W	20 V DC/15 V DC/9 V DC/5 V DC
Weight	<ul style="list-style-type: none"><li>• 45 W—0.17 kg (0.37 lb)</li><li>• 65 W —0.216 kg (0.476 lb)</li><li>• 90 W—0.291 kg (0.641 lb)</li></ul>
Dimensions—45 W	<ul style="list-style-type: none"><li>• Height—22 mm (0.87 inch)</li><li>• Width—55 mm (2.17 inches)</li><li>• Depth—87 mm (3.42 inches)</li></ul>
Dimensions—65 W	<ul style="list-style-type: none"><li>• Height—99 mm (3.90 inches)</li><li>• Width—66 mm (2.60 inches)</li><li>• Depth—22 mm (0.87 inch)</li></ul>
Dimensions—90W	<ul style="list-style-type: none"><li>• Height-130 mm (5.12 inches)</li><li>• Width-66 mm (2.60 inches)</li><li>• Depth-22 mm (0.87 inch)</li></ul>
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)

# Battery specifications

Feature	Specification
Type	<ul style="list-style-type: none"><li>• 45 WHr Polymer Battery with ExpressCharge</li><li>• 60 WHr Polymer Battery with ExpressCharge</li></ul>

Feature	Specification
45 WHr Polymer Battery with ExpressCharge	<ul style="list-style-type: none"> <li>60 WHr Long Life Cycle Polymer Battery</li> <li>Width: 238 mm (9.37 inches)</li> <li>Height: 4.7 mm (0.19 inch)</li> <li>Weight: 220 g (0.48 lb)</li> <li>Voltage: 11.4 VDC</li> <li>Life span: 300 discharge per charge cycles</li> </ul>
60 WHr Polymer Battery with ExpressCharge	<ul style="list-style-type: none"> <li>Width: 238 mm (9.37 inches)</li> <li>Height: 4.7 mm (0.22 inch)</li> <li>Weight: 270 g (0.6 lb)</li> <li>Voltage: 7.6 VDC</li> <li>Life span: 300 discharge per charge cycles</li> </ul>
60 WHr Long Life Cycle Polymer Battery	<ul style="list-style-type: none"> <li>Width: 238 mm (9.37 inches)</li> <li>Height: 4.7 mm (0.22 inch)</li> <li>Weight: 270 g (0.6 lb)</li> <li>Voltage: 7.6 VDC</li> <li>Life span: 300 discharge per charge cycles</li> </ul>
Temperature range (Operating)	<ul style="list-style-type: none"> <li>Charge: 0°C to 50°C (32°F to 122°F)</li> <li>Discharge: 0°C to 70°C (32°F to 158°F)</li> </ul>
Temperature range (Non-Operating)	<ul style="list-style-type: none"> <li>20°C to 65°C ( 4°F to 149°F)</li> </ul>
Coin cell battery	<ul style="list-style-type: none"> <li>3 V CR2032 lithium coin cell</li> </ul>

## Docking Option

Table 6. Docking options

Feature	Specifications
Type	Dell Dock WD15 Dell Wireless dock D6000

## Device drivers

Feature	Specification
Type	Wacom PCAP technology

## Physical specifications

Feature	Specification
Front height	0.46 inch (11.79 mm)

Feature	Specification
Back height	0.70 inch (Narrow border 18.75mm) (Standard border 19.83 mm)
Width	12.00 inches (305.1 mm)
Depth	8.26 inches (Narrow border 210.0 mm) (Standard border 211.0 mm)
Weight	3.11 lbs (1.41 kg)

## Environmental specifications

**Table 7. Environmental specifications**

Environmental specification	
Temperature range	<ul style="list-style-type: none"> <li>Operating: 0 °C to 35°C (32 °F to 104 °F)</li> <li>Storage: -40 °C to 65 °C (-40 °F to 149 °F)</li> </ul>
Relative humidity	<ul style="list-style-type: none"> <li>Operating : 10 % to 90 % (non-condensing)</li> <li>Storage: 0% to 95% (non-condensing)</li> </ul>
Altitude (maximum)	<ul style="list-style-type: none"> <li>Operating : 0 m to 3048 m (0 to 10,000 ft);</li> <li>Non-Operating : 0 m to 10668 m (0 to 35,000 ft);</li> <li>Storage: 0 m to 10668 m (0 to 35,000 ft)</li> </ul>
Airborne contaminant level	G1 or lower as defined by ISA S71.04–1985

# System setup

System setup enables you to manage your notebook 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 menu](#)
- [Navigation keys](#)
- [System setup options](#)
- [General screen options](#)
- [System Configuration screen options](#)
- [Video](#)
- [Secure Boot screen options](#)
- [Intel software guard extensions screen options](#)
- [Performance screen options](#)
- [Power management screen options](#)
- [POST behavior screen options](#)
- [Manageability](#)
- [Virtualization support screen options](#)
- [Wireless screen options](#)
- [Maintenance screen](#)
- [System logs](#)
- [Updating the BIOS in Windows](#)
- [System and setup password](#)

## 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 screen options

This section lists the primary hardware features of your computer.

Option	Description
<b>System Information</b>	<p>This section lists the primary hardware features of your computer.</p> <ul style="list-style-type: none"> <li>• System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, Express Service Code, the Signed Firmware update—enabled by default</li> <li>• Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM A Size, DIMM B Size,</li> <li>• 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</li> <li>• Device Information: Displays M.2 SATA, M.2 PCIe SSD-0, LOM MAC Address, Passthrough MAC address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, WiGig Device, Cellular Device, Bluetooth Device</li> </ul>
<b>Battery Information</b>	Displays the battery status health and whether the AC adapter is installed.
<b>Boot Sequence</b>	<p>Allows you to change the order in which the computer attempts to find an operating system.</p> <ul style="list-style-type: none"> <li>• Diskette Drive</li> <li>• Internal HDD</li> <li>• USB Storage Device</li> <li>• CD/DVD/CD-RW Drive</li> <li>• Onboard NIC</li> </ul>

Option	Description
<b>Boot sequence options</b>	<ul style="list-style-type: none"> <li>· Windows boot manager</li> <li>· WindowsIns</li> </ul>
<b>Boot list options</b>	<ul style="list-style-type: none"> <li>· Legacy</li> <li>· UEFI—selected by default</li> </ul>
<b>Advanced Boot Options</b>	This option allows you the legacy option ROMs to load. By default, the <b>Enable Legacy Option ROMs</b> is disabled. Enable Attempt Legacy Boot is disabled by default.
<b>UEFI boot path security</b>	<ul style="list-style-type: none"> <li>· Always, except internal HDD</li> <li>· Always</li> <li>· Never</li> </ul>
<b>Date/Time</b>	Allows you to change the date and time.

## System Configuration screen options

Option	Description
<b>SATA Operation</b>	<p>Allows you to configure the internal SATA hard-drive controller. The options are:</p> <ul style="list-style-type: none"> <li>· Disabled</li> <li>· AHCI</li> <li>· RAID On: This option is enabled by default.</li> </ul>
<b>Drives</b>	<p>Allows you to configure the SATA drives on board. All drives are enabled by default. The options are:</p> <ul style="list-style-type: none"> <li>· SATA-2 — enabled by default</li> <li>· M.2 PCIe SSD-0 — enabled by default</li> <li>· M.2 PCIe SSD-1 — enabled by default</li> </ul>
<b>SMART Reporting</b>	<p>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.</p> <ul style="list-style-type: none"> <li>· Enable SMART Reporting</li> </ul>
<b>USB Configuration</b>	<p>This is an optional feature.</p> <p>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.</p> <p>If USB port is enabled, device attached to this port is enabled and available for OS.</p> <p>If USB port is disabled, the OS cannot see any device attached to this port.</p> <p>The options are:</p> <ul style="list-style-type: none"> <li>· Enable USB Boot Support—enabled by default</li> <li>· Enable External USB Port—enabled by default</li> </ul>

Option	Description
Dell Type-C Dock Configuration	<p data-bbox="339 149 1469 205">  <b>NOTE:</b> If the Fastboot option is set to "Minimal", the "Enable USB Boot support " setting is ignored and the system will not boot from any Pre-boot USB devices.         </p> <p data-bbox="339 226 1469 283">  <b>NOTE:</b> A USB Keyboard and/or mouse connected to the platform's USB ports will continue to function within BIOS Setup if the "Enable External USB Port" option is disabled.         </p> <p data-bbox="331 323 1442 380">This section allows connection to the Dell WD and TB family of docks (Type-C docks) independent of USB and Thunderbolt Adapter configuration settings.</p> <ul data-bbox="331 415 719 443" style="list-style-type: none"> <li>• Always Allow Dell Docks is disabled</li> </ul>
Thunderbolt Adapter Configuration	<p data-bbox="331 491 884 518">This section allows Thunderbolt Adapter Configuration.</p> <ul data-bbox="331 548 970 835" style="list-style-type: none"> <li>• Enable Thunderbolt Technology Support—is disabled</li> <li>• Enable Thunderbolt Adapter Boot Support—is disabled</li> <li>• Enable Thunderbolt Adapter Pre-boot Modules—is disabled</li> <li>• Enable Thunderbolt (and PCIE behind TBT) Preboot</li> <li>• Security level-No security—enabled by default</li> <li>• Security level-User configuration—is disabled</li> <li>• Security level-Secure connect—is disabled</li> <li>• Security level- Display port only—is disabled</li> </ul>
USB PowerShare	<p data-bbox="331 877 1485 934">This field configures the USB PowerShare feature behavior. This option allows you to charge external devices using the stored system battery power through the USB PowerShare port. This option is disabled by default</p>
Audio	<p data-bbox="331 955 1461 1012">This field enables or disables the integrated audio controller. By default, the <b>Enable Audio</b> option is selected. The options are:</p> <ul data-bbox="331 1041 818 1108" style="list-style-type: none"> <li>• Enable Microphone—enabled by default</li> <li>• Enable Internal Speaker—enabled by default</li> </ul>
Keyboard Illumination	<p data-bbox="331 1150 1461 1207">This field lets you choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 0% to 100%. The options are:</p> <ul data-bbox="331 1236 644 1339" style="list-style-type: none"> <li>• Disabled</li> <li>• Dim</li> <li>• Bright—enabled by default</li> </ul>
Keyboard Backlight Timeout on AC	<p data-bbox="331 1381 1461 1465">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:</p> <ul data-bbox="331 1495 644 1776" style="list-style-type: none"> <li>• 5 sec</li> <li>• 10 sec—enabled by default</li> <li>• 15 sec</li> <li>• 30 sec</li> <li>• 1 min</li> <li>• 5 min</li> <li>• 15 min</li> <li>• Never</li> </ul>

Option	Description
<b>Keyboard Backlight Timeout on Battery</b>	<p>The Keyboard Backlight Timeout dims out with the 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:</p> <ul style="list-style-type: none"> <li>· 5 sec</li> <li>· 10 sec—enabled by default</li> <li>· 15 sec</li> <li>· 30 sec</li> <li>· 1 min</li> <li>· 5 min</li> <li>· 15 min</li> <li>· Never</li> </ul>
<b>Keyboard Backlight Timeout on AC</b>	<p>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:</p> <ul style="list-style-type: none"> <li>· 5 sec</li> <li>· 10 sec—enabled by default</li> <li>· 15 sec</li> <li>· 30 sec</li> <li>· 1 min</li> <li>· 5 min</li> <li>· 15 min</li> <li>· Never</li> </ul>
<b>Touchscreen</b>	It controls whether the screen is enabled or disabled. This option is enabled by default.
<b>Unobtrusive Mode</b>	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. This option is disabled by default.
<b>Miscellaneous Devices</b>	<p>Allows you to enable or disable the following devices:</p> <ul style="list-style-type: none"> <li>· Enable Camera—enabled by default</li> <li>· Enable Secure Digital (SD) Card—enabled by default</li> <li>· Secure Digital (SD) Card Boot—enabled by default</li> <li>· Secure Digital (SD) Card Read-Only-Mode</li> </ul>

## Video

Option	Description
<b>LCD Brightness</b>	Allows you to set the display brightness depending up on the power source—On Battery and On AC. The LCD brightness is independent for battery and AC adapter. It can be set using the slider.

**NOTE:** The video setting is visible only when a video card is installed into the system.

## Secure Boot screen options

Option	Description
<b>Secure Boot Enable</b>	This option enables or disables the <b>Secure Boot Enable</b> feature.

Option	Description
	<ul style="list-style-type: none"> <li>· Disabled</li> <li>· Enabled</li> </ul> <p>Default setting: Enabled.</p>
<b>Expert Key management</b>	<p>This option enables or disables the <b>Expert Key management</b> feature.</p> <ul style="list-style-type: none"> <li>· PK—enabled by default</li> <li>· KEK</li> <li>· db</li> <li>· dbx</li> </ul> <p>Default setting: Enabled</p>

## Intel software guard extensions screen options

Option	Description
<b>Intel SGX Enable</b>	<p>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:</p> <ul style="list-style-type: none"> <li>· Disabled</li> <li>· Enabled</li> <li>· Software controlled</li> </ul> <p>Default setting: Software controlled</p>
<b>Enclave Memory Size</b>	<p>This option allows you to set the <b>SGX Enclave Reserve Memory Size</b>. The options are:</p> <ul style="list-style-type: none"> <li>· 32 MB</li> <li>· 64 MB</li> <li>· 128 MB—enabled by default</li> </ul>

## Performance screen options

Option	Description
<b>Multi-Core Support</b>	<p>This field specifies whether the process has one or all cores enabled. The performance of some applications improves 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 are enabled. If you disable Multi-Core Support, one core is enabled.</p> <ul style="list-style-type: none"> <li>· Enable Multi-Core Support</li> </ul> <p>Default setting: The option is enabled.</p>
<b>Intel SpeedStep</b>	<p>Allows you to enable or disable the Intel SpeedStep feature.</p> <ul style="list-style-type: none"> <li>· Enable Intel SpeedStep</li> </ul> <p>Default setting: The option is enabled.</p>
<b>C-States Control</b>	<p>Allows you to enable or disable the additional processor sleep states.</p>

Option	Description
	<ul style="list-style-type: none"> <li>· C states</li> </ul> <p>Default setting: The option is enabled.</p>
<b>Intel TurboBoost</b>	<p>Allows you to enable or disable the Intel TurboBoost mode of the processor.</p> <ul style="list-style-type: none"> <li>· Enable Intel TurboBoost</li> </ul> <p>Default setting: The option is enabled.</p>
<b>HyperThread Control</b>	<p>Allows you to enable or disable the Hyper-Threading in the processor.</p> <ul style="list-style-type: none"> <li>· Disabled</li> <li>· Enabled</li> </ul> <p>Default setting: Enabled is selected.</p>

## Power management screen options

Option	Description
<b>AC Behavior</b>	<p>Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected.</p> <p>Default setting: Wake on AC is not selected.</p>
<b>Auto On Time</b>	<p>Allows you to set the time at which the computer must turn on automatically. The options are:</p> <ul style="list-style-type: none"> <li>· Disabled</li> <li>· Every Day</li> <li>· Weekdays</li> <li>· Select Days</li> </ul> <p>Default setting: Disabled</p>
<b>USB Wake Support</b>	<p>Allows you to enable USB devices to wake the system from Standby.</p> <p><b>NOTE:</b> This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup removes power from all the USB ports to conserve battery power.</p> <ul style="list-style-type: none"> <li>· Enable USB Wake Support</li> <li>· Wake on Dell USB-C dock</li> </ul> <p>Default setting: The option is disabled.</p>
<b>Wake on WLAN</b>	<p>Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal.</p> <ul style="list-style-type: none"> <li>· Disabled</li> <li>· WLAN</li> </ul> <p>Default setting: Disabled</p>
<b>Block Sleep</b>	<p>This option lets you block entering to sleep (S3 state) in operating system environment.</p> <p>Block Sleep (S3 state)</p>

<b>Option</b>	<b>Description</b>
	Default setting: This option is disabled
<b>Peak Shift</b>	<p>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.</p> <ul style="list-style-type: none"> <li>· Enable peak shift—is disabled</li> <li>· Set battery threshold (15% to 100%) - 15 % (enabled by default)</li> </ul>
<b>Advanced Battery Charge Configuration</b>	<p>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 nonwork hours to improve the battery health.</p> <p>Disabled</p> <p>Default setting: Disabled</p>
<b>Primary Battery Charge Configuration</b>	<p>Allows you to select the charging mode for the battery. The options are:</p> <ul style="list-style-type: none"> <li>· Adaptive—enabled by default</li> <li>· Standard—Fully charges your battery at a standard rate.</li> <li>· ExpressCharge—The battery charges over a shorter time using Dell’s fast charging technology This option is enabled by default.</li> <li>· Primarily AC use</li> <li>· Custom</li> </ul> <p>If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.</p> <p><b>NOTE:</b> All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.</p>
<b>Sleep mode</b>	<ul style="list-style-type: none"> <li>· OS Automatic selection—enabled by default</li> </ul> <p>Force S3</p>
<b>Type-C connector power</b>	<ul style="list-style-type: none"> <li>· 7.5 Watts</li> <li>· 15 Watts—enabled by default</li> </ul>

## POST behavior screen options

<b>Option</b>	<b>Description</b>
<b>Adapter Warnings</b>	<p>Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters.</p> <p>Default setting: Enable Adapter Warnings</p>
<b>Keypad (Embedded)</b>	<p>Allows you to choose one of two methods to enable the keypad that is embedded in the internal keyboard.</p> <ul style="list-style-type: none"> <li>· Fn Key Only—default.</li> <li>· By Numlock</li> </ul> <p><b>NOTE:</b> When setup is running, this option has no effect. Setup works in Fn Key Only mode.</p>
<b>Mouse/Touchpad</b>	<p>Allows you to define how the system handles mouse and touch pad input. The options are:</p> <ul style="list-style-type: none"> <li>· Serial Mouse</li> </ul>

Option	Description
	<ul style="list-style-type: none"> <li>PS2 Mouse</li> <li>Touchpad/PS-2 Mouse: This option is enabled by default.</li> </ul>
<b>Numlock Enable</b>	Allows you to enable the Numlock option when the computer boots. Enable Network. This option is enabled by default.
<b>Fn Key Emulation</b>	Allows you to set the option where the Scroll Lock key is used to simulate the Fn key feature. Enable Fn Key Emulation (default)
<b>Fn Lock Options</b>	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. The available options are: <ul style="list-style-type: none"> <li>Fn Lock—enabled by default</li> <li>Lock Mode Disable/Standard—enabled by default</li> <li>Lock Mode Enable/Secondary</li> </ul>
<b>Fastboot</b>	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: <ul style="list-style-type: none"> <li>Minimal—enabled by default</li> <li>Thorough</li> <li>Auto</li> </ul>
<b>Extended BIOS POST Time</b>	Allows you to create an extra preboot delay. The options are: <ul style="list-style-type: none"> <li>0 seconds—enabled by default.</li> <li>5 seconds</li> <li>10 seconds</li> </ul>
<b>Full Screen Log</b>	<ul style="list-style-type: none"> <li>Enable Full Screen Logo—not enabled</li> </ul>
<b>Warnings and errors</b>	<ul style="list-style-type: none"> <li>Prompt on warnings and errors—enabled by default</li> <li>Continue on warnings</li> <li>Continue on warnings and errors</li> </ul>

## Manageability

Option	Description
<b>USB provision</b>	Enable USB provision is not selected by default
<b>MEBX Hotkey — enabled by default</b>	Allows you to specify whether the MEBx Hotkey function should enable, during the system boot. <ul style="list-style-type: none"> <li>Disabled</li> <li>Enabled</li> </ul> Default setting: Disabled

# Virtualization support screen options

Option	Description
<b>Virtualization</b>	This field specifies whether a virtual Machine Monitor (VMM) can utilize the conditional hardware capabilities provided by Intel Virtualization Technology. Enable Intel Virtualization Technology—enabled by default.
<b>VT for Direct I/O</b>	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.
<b>Trusted Execution</b>	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology, the TPM Virtualization Technology, and the Virtualization technology for direct I/O must be enabled to use this feature. Trusted Execution - disabled by default.

# Wireless screen options

Option	Description
<b>Wireless Switch</b>	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: <ul style="list-style-type: none"><li>· WWAN</li><li>· GPS (on WWAN Module)</li><li>· WLAN/WiGig</li><li>· Bluetooth</li></ul> All the options are enabled by default. <b>NOTE:</b> For WLAN and WiGig enable or disable controls are tied together and they cannot be enabled or disabled independently.
<b>Wireless Device Enable</b>	Allows you to enable or disable the internal wireless devices. <ul style="list-style-type: none"><li>· WWAN/GPS</li><li>· WLAN/WiGig</li><li>· Bluetooth</li></ul> All the options are enabled by default.

**NOTE:** IMEI number for WWAN can be found on the outer box or the WWAN card.

# Maintenance screen

Option	Description
<b>Service Tag</b>	Displays the Service Tag of your computer.
<b>Asset Tag</b>	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
<b>BIOS Downgrade</b>	This controls flashing of the system firmware to previous revisions. Option 'Allow BIOS downgrade' is enabled by default.

Option	Description
<b>Data Wipe</b>	<p>This field allows users to erase the data securely from all internal storage devices. Option 'Wipe on Next boot' is not enabled by default. The following is list of devices affected:</p> <ul style="list-style-type: none"> <li>· Internal SATA HDD/SSD</li> <li>· Internal M.2 SATA SDD</li> <li>· Internal M.2 PCIe SSD</li> <li>· Internal eMMC</li> </ul>
<b>BIOS Recovery</b>	<p>This field allows you to recover from certain corrupted BIOS conditions from a recover file on the user primary hard drive or an external USB key.</p> <ul style="list-style-type: none"> <li>· BIOS Recovery from Hard Drive—enabled by default</li> <li>· Always perform integrity check—disabled by default</li> </ul>

## System logs

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

## 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.

# System and setup password

Table 8. 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.

**ℹ 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.

**ℹ 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 reboot.

# Software

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

Topics:

- Supported operating systems
- Downloading drivers
- Chipset driver
- Intel HID Event Filter
- Intel Dynamic Platform and Thermal Framework
- Intel Management Engine
- Realtek PCI-E Memory Card
- Serial IO driver
- Chipset device software
- Graphics controller driver
- Network drivers
- Realtek Audio
- Serial ATA drivers
- Security drivers

## Supported operating systems

**Table 9. Supported operating systems**

Supported operating systems	Description
Windows 10	<ul style="list-style-type: none"> <li>• Microsoft Windows 10 Pro 64-bit</li> <li>• Microsoft Windows 10 Home 64-bit</li> </ul>

## 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.

# Chipset driver

The chipset driver helps the system identify the components and install necessary drivers accurately. Verify that the chipset was installed in the system by checking the below controllers. Many of the common devices are visible under Other Devices if no drivers are installed. The unknown devices disappear once you install the chipset driver.

Make sure to install the following drivers, some of them may exist by default.

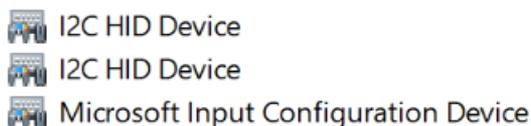
- Intel HID Event Filter Driver
- Intel Dynamic Platform and Thermal Framework Driver
- Intel Thunderbolt(TM) Controller driver (Optional)
- Management Engine
- Realtek PCI-E memory card
- Intel serial IO driver

## Intel HID Event Filter

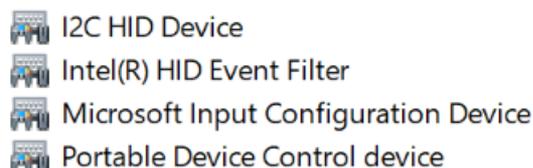
Verify if the Intel HID event filter is already installed in the computer.

**Table 10. Intel HID Event Filter**

Before Installation



After Installation

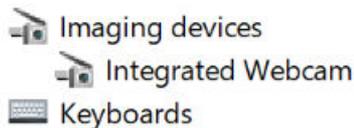


## Intel Dynamic Platform and Thermal Framework

Verify if the Intel dynamic platform and thermal framework is already installed in the computer.

**Table 11. Intel Dynamic Platform and Thermal Framework**

Before Installation



After Installation



# Intel Management Engine

Verify if the Intel Management Engine is already installed in the computer.

**Table 12. Intel Management Engine**

Before Installation

-  High precision event timer
-  Intel(R) Integrated Sensor Solution
-  Intel(R) Power Engine Plug-in

After Installation

-  Intel(R) Integrated Sensor Solution
-  Intel(R) Management Engine Interface
-  Intel(R) Power Engine Plug-in
-  Intel(R) Serial IO I2C Host Controller - 9D60

# Realtek PCI-E Memory Card

Verify if the Realtek PCI-E Memory Card is already installed in the computer.

**Table 13. Realtek PCI-E memory card**

Before Installation

## Universal Serial Bus controllers

-  Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
-  USB Composite Device
-  USB Composite Device

After Installation

## Universal Serial Bus controllers

-  Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
-  Realtek USB 3.0 Card Reader
-  USB Composite Device

# Serial IO driver

Verify if the drivers for Touchpad are installed.

-  Human Interface Devices
-  GPIO Dock Mode Indicator Driver
-  GPIO Laptop or Slate Indicator Driver
-  HID PCI Minidriver for ISS

-  Converted Portable Device Control device
-  Dell Touchpad
-  GPIO Dock Mode Indicator Driver
-  GPIO Laptop or Slate Indicator Driver

**Figure 1. Serial IO driver**

# Chipset device software

Verify if the chipset device software is already installed in the computer.

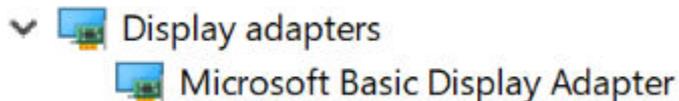
- System devices
  - ACPI Fixed Feature Button
  - ACPI Lid
  - ACPI Processor Aggregator
  - ACPI Sleep Button
  - ACPI Thermal Zone
  - Charge Arbitration Driver
  - Composite Bus Enumerator
  - Dell Diag Control Device
  - Dell System Analyzer Control Device
  - High Definition Audio Controller
  - High precision event timer
  - Intel(R) Integrated Sensor Solution
  - Intel(R) Management Engine Interface
  - Intel(R) Power Engine Plug-in
  - Intel(R) Serial IO I2C Host Controller - 9D60
  - Intel(R) Serial IO I2C Host Controller - 9D61
  - Intel(R) Serial IO I2C Host Controller - 9D62
  - Intel(R) Serial IO I2C Host Controller - 9D64
  - Intel(R) Virtual Buttons
  - Intel(R) Xeon(R) E3 - 1200 v6/7th Gen Intel(R) Core(TM) Host Bridge/DRAM Registers - 590
  - ISS Dynamic Bus Enumerator
  - Legacy device
  - Microsoft ACPI-Compliant Embedded Controller
  - Microsoft ACPI-Compliant System
  - Microsoft System Management BIOS Driver
  - Microsoft UEFI-Compliant System
  - Microsoft System Management BIOS Driver
  - Microsoft UEFI-Compliant System
  - Microsoft Virtual Drive Enumerator
  - Microsoft Windows Management Interface for ACPI
  - Microsoft Windows Management Interface for ACPI
  - Mobile 6th/7th Generation Intel(R) Processor Family I/O PCI Express Root Port #7 - 9D16
  - Mobile 6th/7th Generation Intel(R) Processor Family I/O PCI Express Root Port #8 - 9D17
  - Mobile 6th/7th Generation Intel(R) Processor Family I/O PMC - 9D21
  - Mobile 6th/7th Generation Intel(R) Processor Family I/O SMBUS - 9D23
  - Mobile 6th/7th Generation Intel(R) Processor Family I/O Thermal subsystem - 9D31
  - Mobile 7th Generation Intel(R) Processor Family I/O LPC Controller (U with iHDPC2.2 Premium) - 9D4E
  - NDIS Virtual Network Adapter Enumerator
  - NFC USB Bus Driver
  - PCI Express Root Complex
  - Plug and Play Software Device Enumerator
  - Programmable interrupt controller
  - Remote Desktop Device Redirector Bus
  - System CMOS/real time clock
  - System timer
  - UMBus Root Bus Enumerator

# Graphics controller driver

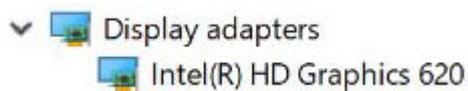
Verify if the graphics controller driver is already installed in the computer.

**Table 14. Graphics controller driver**

Before Installation



After Installation

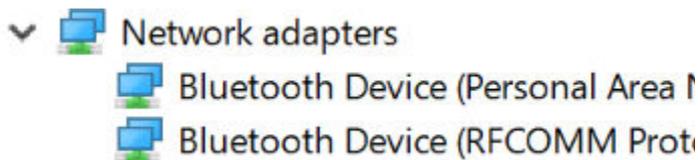


# Network drivers

Install the WLAN and Bluetooth drivers from the Dell support site.

**Table 15. Network drivers**

Before installation



After installation

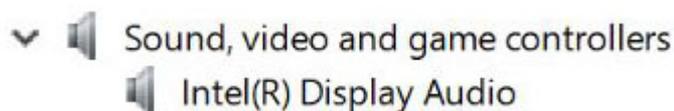


# Realtek Audio

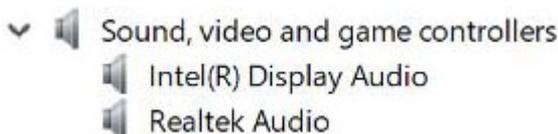
Verify if audio drivers are already installed in the computer.

**Table 16. Realtek audio**

Before Installation



After Installation



## Serial ATA drivers

Install the latest Intel Rapid Storage driver for best performance. Using the default Windows storage drivers is not recommended. Verify if the default serial ATA drivers are installed in the computer.

- ▼  Storage controllers
  -  Intel Chipset SATA RAID Controller
  -  Microsoft Storage Spaces Controller

## Security drivers

This section lists the security devices in the Device Manager.

### Security device drivers

Verify if the security device drivers are installed in the computer.

- ▼  Security devices
  -  Trusted Platform Module 2.0

### Fingerprint sensor drivers

Verify if the Fingerprint sensor drivers are installed in the computer.

- ▼  ControlVault Device
  -  Dell ControlVault w/o Fingerprint Sensor

# Troubleshooting

## 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.  
or
- 8 Shut down the computer.
- 9 Press and hold the Fn key, while pressing the power button, and then release both.
- 10 Repeat steps 3–7 above.

# Diagnostic LED

This section details the diagnostic features of the battery LED in a notebook.

Instead of beep codes errors are indicated via the bicolor Battery Charge LED. A specific blink pattern is followed by flashing a pattern of flashes in amber, followed by white. The pattern then repeats.

**NOTE:** The diagnostic pattern will consist of a two digit number being represented by a first group of LED blinks (1 through 9) in amber, followed by a 1.5 second pause with the LED off, and then a second group of LED blinks (1 through 9) in white. This is then followed by a three second pause, with the LED off, before repeating over again. Each LED blink takes 0.5 seconds.

The system will not shutdown when displaying the Diagnostic Error Codes. Diagnostic Error Codes will always supersede any other use of the LED. For instance, on Notebooks, battery codes for Low Battery or Battery Failure situations will not be displayed when Diagnostic Error Codes are being displayed:

Table 17. LED pattern

Blinking pattern		Problem Description	Suggested Resolution
Amber	White		
2	1	processor	processor failure
2	2	system board, BIOS ROM	system board, covers BIOS corruption or ROM error
2	3	memory	no memory/no RAM detected
2	4	memory	memory failure/RAM failure
2	5	memory	invalid memory installed
2	6	system board; chipset	system board/ chipset error
2	7	display	display failure
3	1	RTC power failure	coin-cell battery failure
3	2	PCI/Video	PCI/Video card/chip failure
3	3	BIOS recovery 1	recovery image nor found
3	4	BIOS recovery 2	recovery image found but invalid

## Real Time Clock reset

The Real Time Clock (RTC) reset function allows you to recover your Dell system from **No POST/No Boot/No Power** situations. To initiate the RTC reset on the system make sure system is in a power-off state and is connected to power source . Press and hold the power button for 25 seconds and then release the power button. Go to [how to reset real time clock](#).

**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

- TPM on and Active
- 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

# 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.