

Dell Latitude 3300

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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Welcome - Getting Started

The field service manual enables the support function and the field technicians to accurately and effectively resolve customer inquiries and technical issues with necessary information, to support the new Latitude 5000 and 7000 series system (Latitude **5420 54247424** Rugged Extreme).The document informs the field service technicians of the proper steps for replacing hardware and also gives an overview of the system BIOS, features, and safety precautions.

Table 1. Getting started

RTS date	10/23/2018
Contacting Dell	To contact Dell regarding issues with this reference material, mailto:Educate@dell.com

Welcome - Getting Started

Product overview

The new Dell Latitude 3300 is next in line to the generation of Latitude 3000 series. This series delivers the highest levels of performance, newest technologies, high levels of configurability, and premium industrial design to students that run specific applications as part of their daily activities. It provides a larger screen and more powerful processor (up to Intel Kaby Lake R Core i5) enabling students to create while also providing a low price point that education customers can afford.

Dell Latitude 3300 is a versatile solution that packs the power and performance of a workstation into a class leading portable form factor. The Dell Latitude 3300 is the successor of the Dell Latitude 3380.

The Dell Latitude 3300 is the most powerful and feature-rich rugged notebook, that gives users desktop replacement performance in a mobile form factor. The new Latitude 3300 for education delivers the most versatile solution, with best-in-class durability, empowering students to learn.

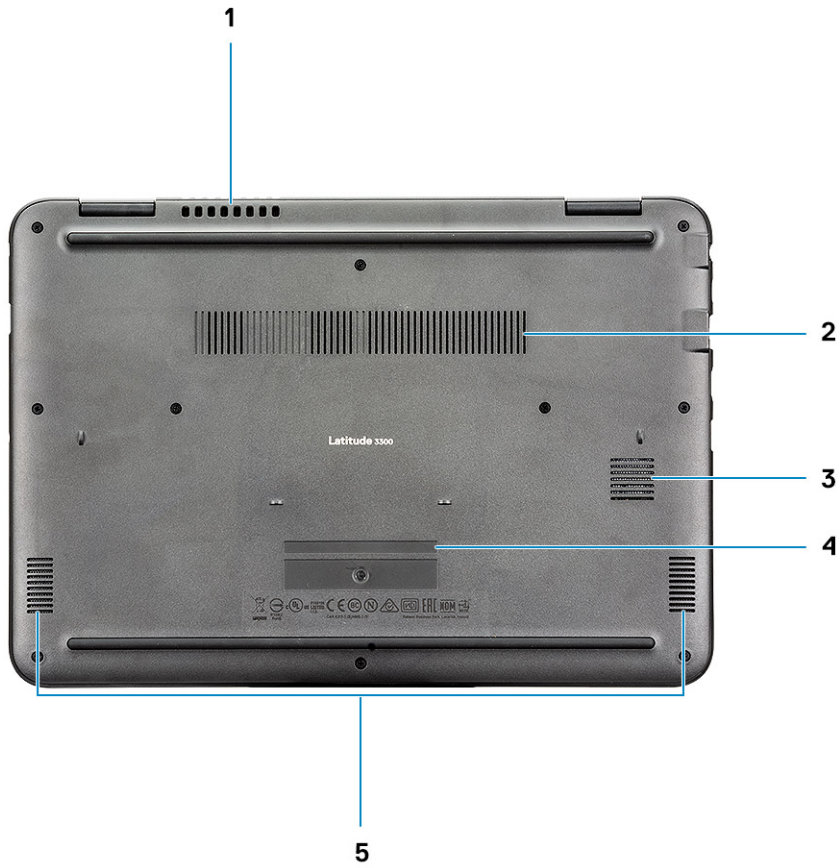
Features:

- Kaby Lake U and Kaby Lake R
- 100% SSD, no spinning Hard Drive
- 13.3" HD/FHD Non-touch/touch displays
- 3-cell 42Whr and 4-cell 56Whr batteries
- I/O: 2xUSB3.0, HDMI, micro SD 3.0, upsell 1xUSB-C
- Type-C port with Power Delivery (Optional with non-celeron base)

Chassis Overview

This chapter consists of the product view features along with technical specifications. The chassis overview features calls out the different ports, connectors, and components available in the computer.

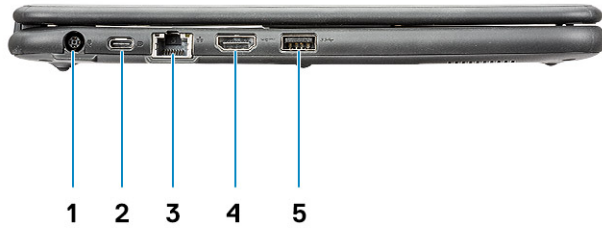
Base view



- 1 System fan vent
- 3 SSD vent
- 5 Speakers

- 2 Heatsink vent
- 4 Service tag

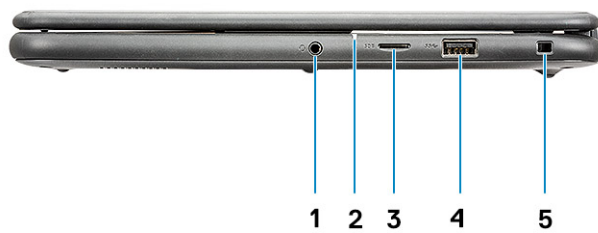
Left view



- 1 Power connector
- 3 Network port
- 5 USB 3.0 port

- 2 USB Type-C port
- 4 HDMI port

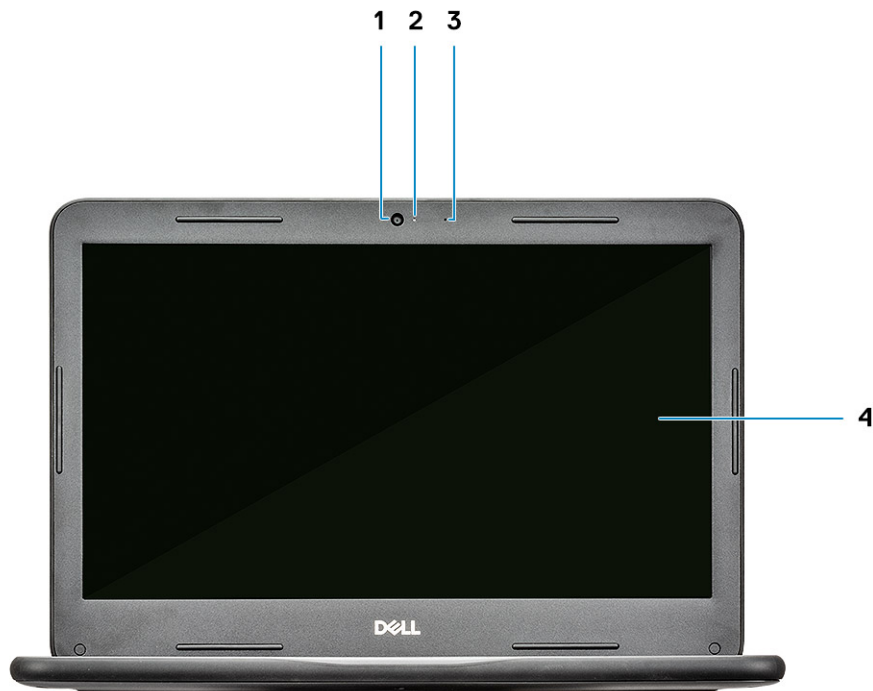
Right view



- 1 Audio port
- 3 microSD port
- 5 Wedge-shaped lock slot

- 2 Battery status light
- 4 USB 3.0 port

Front view



- | | | | |
|---|------------|---|---------------------|
| 1 | Camera | 2 | Camera status light |
| 3 | Microphone | 4 | LCD Panel |

Product Comparison

Table 2. Product comparison with predecessor model

	Latitude 3380	Latitude 3300
Processor	<p>6th Generation (Skylake)</p> <ul style="list-style-type: none"> Intel Core i3-6006U Processor <p>7th Generation (Kaby Lake)</p> <ul style="list-style-type: none"> Intel Celeron Processor 3865U Intel Pentium Processor 4415U Intel Core i5-7200U Processor 	<p>7th Generation (Kaby Lake U)</p> <ul style="list-style-type: none"> Intel Pentium Processor 4415U Intel Celeron Processor 3865U Intel Core i3-7020U <p>8th Generation (Kaby Lake R)</p> <ul style="list-style-type: none"> Intel Core i5-8250U
Chipset	Intel Sky lake and Kaby lake (integrated with processor)	Intel Kaby lake U and R(integrated with processor)

	Latitude 3380	Latitude 3300
Memory	DDR4 2133 MHz; one SoDIMM slots supporting up to 8 GB	One DDR4 SoDIMM slots supporting up to 16 GB <ul style="list-style-type: none"> • KBL-U: 2133 MHz • KBL-R: 2400 MHz
Storage	<ul style="list-style-type: none"> • 500 GB 2.5 HDD 7200 RPM • 128 GB/256 GB SSD 2.5" 7 mm SATA Class 20 	<ul style="list-style-type: none"> • PCIe 2230 M.2 SSD • SATA M.2 2242 M.2 eMMC
Graphics	Integrated Intel HD Graphics	<ul style="list-style-type: none"> • Intel HD Graphics 610 • Intel HD Graphics 620 • Intel UHD Graphics 620
Audio	Realtek ALC3246 Controller	Realtek ALC3246 Controller
Communication	<ul style="list-style-type: none"> • Integrated Intel i219 10/100/1000 Mb/s Ethernet • Wi-Fi 802.11ac with Bluetooth 4.2 • WWAN 4G LTE Full Mini Card (optional) 	<ul style="list-style-type: none"> • Integrated Realtek RTL8111HSD 10/100/1000 Mb/s Ethernet • WiFi Intel Dual Band Wireless-AC 8265 • WiFi Qualcomm® QCA61x4A Card
I/O connectors	<ul style="list-style-type: none"> • Three USB 3.0 ports(One with PowerShare) • HDMI 1.4 • One RJ-45 NIC port • One microphone/stereo headphone/speakers connector • one micro-SIM slot 	<ul style="list-style-type: none"> • Two USB 3.1 Gen 1 Type-A port • One USB 3.1 Gen 1 Type-C port (except Celeron sku) • One RJ-45 NIC connector • Universal audio jack • HDMI 1.4 a
Operating system	<ul style="list-style-type: none"> • Windows 10 Pro 64 bit • Windows 10 Home 64 bit 	<ul style="list-style-type: none"> • Windows 10 Home (64 bit) • Windows 10 Professional (64 bit) • Windows 10 Professional S mode • Windows 10 Professional Embedded (OEM customers only) • Ubuntu 16.04 LTS (64bit)
BIOS	UEFI BIOS	UEFI BIOS
AC adapter	<ul style="list-style-type: none"> • 65 W adapter, 7.4 mm barrel 	<ul style="list-style-type: none"> • 65 W Barrel Type, 7.4 mm barrel • USB Type-C with PD (Optional with non Celeron base)
Battery	<ul style="list-style-type: none"> • 56 Whr (4 cell) Prismatic with ExpressCharge • 56 Whr (4 cell) Long lifecycle Prismatic Battery 	<ul style="list-style-type: none"> • 42 WHr "smart" lithium-ion 3 cell battery • 56 WHr "smart" lithium-ion 4 cell battery
Weight (Pounds/Kilogram)	Starting 3.59 lb (1.62 kg)	Starting 3.52 lb (1.59 kg)

Technical Specifications

Processor

NOTE: Processor numbers are not a measure of performance. Processor availability is subject to change and may vary by region/country.

Table 3. Processor specifications

Type	Type	UMA Graphics
Intel Core i3 - 7020 U (15 W, 3 M cache, 2.3 GHz)	Kaby Lake	Intel HD Graphic 620
Intel Celeron Processor 3865 U (15 W, 2 M cache, 1.80 GHz)		Intel HD Graphic 610
Intel Pentium Processor 4415 U (15 W, 2 M cache, 2.3 GHz)		Intel HD Graphic 610
Intel Core i5-8250 U (15 W, 6 M cache, 1.6 GHz)	Kaby Lake R	Intel UHD Graphic 620

Memory

Table 4. Memory specifications

Memory specification	
Minimum memory configuration	4 GB
Maximum memory configuration	16 GB
Number of slots	1 SODIMM
Maximum memory supported per slot	16 GB
Memory options	<ul style="list-style-type: none"> • 4 GB - 1 x 4 GB • 8 GB- 1 x 8 GB • 16 GB - 1 x 16 GB
Type	DDR4
Speed	<ul style="list-style-type: none"> • KBL-U: 2133 MHz • KBL-R: 2400 MHz

Storage

Table 5. Storage specifications

Type	Form factor	Interface	Capacity
M.2 SSD	2230	PCIe	128 GB/256 GB
M.2 eMMC	2242	SATA	64 GB

System board connectors

Table 6. System board connectors

System board connectors	
M.2 Connectors	Two (2230/2242 Key-M, 2230 Key-A)

Media card-reader

Table 7. Media-card reader specifications

Media card-reader	
Type	microSD card slot
Supported cards	<ul style="list-style-type: none">SDSDHCSDXC

Audio

Table 8. Following are the audio specifications

Audio specifications	
Controller	Realtek ALC3246
Type	Four-channel high-definition audio
Speakers	Two (Directional speakers)
Interface	<ul style="list-style-type: none">Universal audio jackHigh quality speakersSingle microphoneStereo headset/mic combo
Internal speaker amplifier	2 W (RMS) per channel

Integrated graphics

Table 9. Integrated graphics specifications

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
Intel HD Graphics 620	UMA	Intel Core i3 - 7020 U	Integrated	Shared system memory	<ul style="list-style-type: none"> HDMI 1.4 a DisplayPort via Type-C 	4096 × 2304
Intel UHD Graphics 620	UMA	Intel Core i5 - 8250 U	Integrated	Shared system memory	<ul style="list-style-type: none"> HDMI 1.4 a DisplayPort via Type-C 	4096 × 2304
Intel HD Graphics 610	UMA	Intel Celeron 3865 U/ Pentium 4415 U	Integrated	Shared system memory	<ul style="list-style-type: none"> HDMI 1.4 a DisplayPort via Type-C 	4096 × 2304

NOTE: Celeron CPU sku does not have the Type-C port

Camera

Table 10. Camera specifications

Specifications	
Resolution	Camera: <ul style="list-style-type: none"> Still image: 0.92 megapixels Video: 1280 × 720 at 30 fps
Diagonal viewing angle	<ul style="list-style-type: none"> Camera - 78.6 degree (optical FOV) / 83.5 degree (ME FOV)

Communication

Table 11. Communication specifications

Communications specifications	
Network adapter	Integrated Realtek RTL8111HSD 10/100/1000 Mb/s Ethernet (RJ-45)

Wireless

Table 12. Wireless specifications

Wireless specifications

Intel Dual Band Wireless-AC 8265 802.11AC 2 x 2 Wi-Fi + BT 4.2 LE M.2 Wireless Card

Qualcomm® QCA61x4A 802.11ac MU-MIMO Dual Band (2 x 2) Wi-Fi + Bluetooth 4.2 LE M.2 Wireless Card

Ports and connectors

Table 13. Following are ports and connectors specifications

Ports and connectors specifications

Memory card reader	microSD 3.0 memory card reader
USB	<ul style="list-style-type: none">Two USB 3.1 Gen 1 Type-A portOne USB 3.1 Gen 1 Type-C port (except Celeron sku)
Security	Wedge-lock slot
Audio	<ul style="list-style-type: none">Universal audio jackSingle microphone
Video	<ul style="list-style-type: none">HDMI 1.4 aDisplayPort through Type-C port
Network adapter	One RJ-45 connector

Display

Table 14. Following are the display specifications

Display specifications

Type	<ul style="list-style-type: none">13.3-inch FHD WVA (1920 x 1080) True-life (16:9) WLED touch screen13.3 inch-HD (1366 x 768) Anti-glare (16:9) WLED non-touch screen
Height (Active area)	FHD: 165.24 mm HD: 164.97 mm
Width (Active area)	FHD: 293.76 mm HD: 293.42 mm
Diagonal	FHD: 337.044 mm (13.3 inch)

Display specifications

	HD: 336.616 mm (13.3 inch)
Luminance/Brightness (typical)	220 nits
Refresh rate	60 Hz
Horizontal viewing angle (min)	FHD: +/- 80 HD: +/- 40
Vertical viewing angle (min)	FHD: +/- 80 HD: +10/- 40

Keyboard

Table 15. Keyboard specifications

Keyboard specifications

Number of keys	<ul style="list-style-type: none">• 82 Keys (U.S.A.)• 83 Keys (U.K.)• 86 Keys (Japan)• 84 Keys (Brazil)
Size	Compressed <ul style="list-style-type: none">• X= 19.05 mm key pitch• Y= 18.05 mm key pitch
Backlit keyboard	None
Layout	U.S.A./U.K./Japan/Brazil

Touchpad

Table 16. Touchpad specifications

Specifications

Resolution	<ul style="list-style-type: none">• Horizontal: 3220• Vertical: 1952
Dimensions	<ul style="list-style-type: none">• Width: 4.13 inch (105 mm)• Height: 2.56 inch (65 mm)
Multi-touch	Supports up to 5 fingers

 **NOTE: Gesture support is dependent on operating system**

Operating system

Table 17. Operating system

Operating system

Operating systems supported	<ul style="list-style-type: none">• Windows 10 Home (64 bit)• Windows 10 Professional (64 bit)• Windows 10 Professional S mode• Windows 10 Professional Embedded (OEM customers only)• Ubuntu 16.04 LTS (64 bit)
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Battery

Table 18. Battery specifications

Battery specifications

Type	<ul style="list-style-type: none">• 42 WHr "smart" lithium-ion 3 cell battery• 56 WHr "smart" lithium-ion 4 cell battery
Dimension	<ol style="list-style-type: none">1 42 WHr "smart" lithium-ion<ul style="list-style-type: none">• Height: 5.9 mm (0.23 inch)• Width: 97.15 mm (3.82 inch)• Depth: 184.15 mm (7.25 inch)• Weight: 0.2 Kg (0.44 lb)2 56 WHr "smart" lithium-ion<ul style="list-style-type: none">• Height: 5.9 mm (0.23 inch)• Width: 98.20 mm (3.87 inch)• Depth: 233.37 mm (9.19 inch)• Weight: 0.25 Kg (0.55 lb)
Voltage	<ul style="list-style-type: none">• 42 WHr - 11.40 VDC• 56 WHr - 11.40 VDC
Life span	42 WHr-One year warranty for 300 cycles discharge/charge cycles 56 WHr- Three year warranty for 1000 cycles discharge/charge cycles
Charging time when the computer is off (approximate)	Express Charge Mode 0~15 °C : 4 hours 16~45 °C : 2 hours 46~60 °C : 2 hours Standard Mode 0~15 °C : 4 hours 16~60 °C : 3 hours

Battery specifications

Operating time	46~60 °C : 3 hours Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions
Temperature range: Operating	0 °C to 35 °C (32 °F to 95 °F) Charge: 0 °C to 50 °C (32 °F to 122 °F) Discharge: 0 °C to 70 °C (32 °F to 158 °F)
Temperature range: Storage	- 20 °C to 65 °C (- 4 °F to 149 °F)
Coin-cell battery	CR2032

Power adapter

Table 19. Power adapter specifications

The following table lists power adapter specifications

Type	<ul style="list-style-type: none">65 W Barrel TypeUpsell Type-C Adapter
Input Voltage	100 VAC to 240 VAC
Input current (maximum)	2.5 A
Input frequency	50 Hz to 60 Hz
Output current	3.34 A
Rated output voltage	19.5 VDC
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)

Dimensions and weight

Table 20. Dimensions and weight

Dimensions and weight

Height	Front height - 0.88 inch (22.3 mm) Back height - 0.88 inch (22.3 mm)
Width	12.98 inch (329.6 mm)
Depth	9.07 inch (230.45 mm)
Weight	Starting 3.52 lb (1.59 kg)

Computer environment

NOTE: Airborne contaminant level: G1 as defined by ISA-S71.04-1985.

For information on Dell Product Safety, EMC and Environmental Data Sheets, see <https://www.dell.com/learn/us/en/uscorp1/product-info-datasheets-safety-emc-environmental>.

Table 21. Computer environment

Physical conditions	Operating	Storage
Temperature range	0 °C to 35 °C (32 °F to 95 °F)	- 40 °C to 65 °C (- 40 °F to 149 °F)
Relative humidity (maximum)	10% to 90% (non-condensing)	0% to 95% (non-condensing)
	NOTE: Maximum dew point temperature = 26 °C	NOTE: Maximum dew point temperature = 33 °C
Vibration (maximum)	2 Hz to 600 Hz at 0.66 Grms	2 Hz to 600 Hz at 1.33 Grms
Shock (maximum)	160 G†	160 G‡
Altitude (maximum)	3048 m (10,000 ft)	10,668 m (35,000 ft)

* Measured using a random vibration spectrum that simulates user environment.

† Measured using a 2 ms half-sine pulse when the hard drive is in use.

‡ Measured using a 2 ms half-sine pulse when the hard-drive head is in parked position.

Security

Table 22. Security

Security	
Firmware TPM	Yes
Windows Hello Support	Optional
Cable cover	No
Chassis lock slot and loop support	Optional

Security Software

Table 23. Security Software

Security Software	
Dell Endpoint Security Suite Enterprise	Optional
Dell Data Guardian	Optional

Security Software

Dell Encryption (Enterprise or Personal)	Optional
Dell Threat Defense	Optional
RSA SecurID Access	Optional
RSA NetWitness Endpoint	Optional
MozyPro or MozyEnterprise	Optional
Absolute Data & Device Security	Optional

Technology and components

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

Topics:

- Using your computer
- Keyboard shortcuts
- UEFI BIOS
- DDR4
- Graphics options
- Solid state drive (SSD)
- HDMI 1.4a
- Battery Specifications
- USB features
- USB Type-C
- Media Card Readers
- Software and Troubleshooting
- Turning off your computer

Using your computer

Keyboard shortcuts

NOTE: Keyboard characters may differ depending on the keyboard language configuration. Keys that are used for shortcuts remain the same across all language configurations.

Table 24. List of keyboard shortcuts

Keys	Description
Fn + F1	Mute audio
Fn + F2	Decrease volume
Fn + F3	Increase volume
Fn + F4	Mic Mute
Fn + F5	Num Lock
Fn + F6	Scroll Lock
Fn + F7	Launch task view
Fn + F8	Display Toggle (Win + P)
Fn + F9	Search

Keys	Description
Fn + F10	Toggle keyboard back light
Fn + F11	Print Screen
Fn + F12	Insert
Fn + Home	Toggle Wireless On/Off
Fn + End	Sleep
Fn + Ctrl	open application
Fn + Esc	Toggle Fn-key lock
Fn + Up arrow	Increase brightness
Fn + Down arrow	Decrease brightness

UEFI BIOS

UEFI is an acronym for Unified Extensible Firmware Interface. The UEFI specification defines a new model for the interface between personal computer operating systems and platform firmware. The interface consists of data tables that contain platform related information, plus boot and runtime service calls that are available to the operating system and its loader. Together, these provide a standard environment for booting an operating system and running pre-boot applications. One of the main differences between BIOS and UEFI is the way applications are coded. Assembler was used if functions or applications had to be coded for the BIOS while a higher level language code will be used to program the UEFI.

Dell UEFI BIOS implementation will supersede the existing two different sets of BIOS in the portables and desktop products into one single UEFI BIOS moving forward.

Important Information

There is no difference in between the conventional BIOS and the UEFI BIOS unless the UEFI option is checked in the 'Boot List Option' setting in the BIOS page. This will allow the user to create a UEFI boot option list manually without affecting the existing boot priority list. With the implementation of UEFI BIOS, the changes are more related to the manufacturing tools and functionalities with very minimal impact to the customer's usages.

Few things to remember are:

- If customers have a UEFI boot media and ONLY if they have UEFI boot media (either in the optical media or via USB storage), the one-time boot menu will show an additional section listing the UEFI boot options. If they don't have UEFI boot media attached, they will never see this option. Almost all will never get to see this option unless the UEFI boot option is specified manually through the 'Boot Sequence' settings.
- How to change Service Tag/Owner Tag?
When the service technician replaces a system board, he's required to set the service tag upon the system starts up at one time off basis. Failure to set a service tag may result system battery not being able to charge. Therefore, it is very important that the service technician set the correct system service tag. If a wrong service tag is set, there's no way to reset it and the technician will have to place order for another system board replacement.
- How to change Asset tag information?
To change the Asset tag information, we can use one of the following software utilities.

Portables Technology Dell Command Configure toolkit

Customers may also report that after a motherboard replacement, the asset field is already populated in the system BIOS, and needs to be cleared or set. For older systems and all newer systems with the UEFI BIOS platform, customers can download the Dell Command Configure Toolkit (DCC) to customize the BIOS options or even change the ownership or asset tag from within Windows. This technology is described in [Software and Troubleshooting](#) section.

DDR4

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

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

DDR4 Details

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

Key notch difference

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

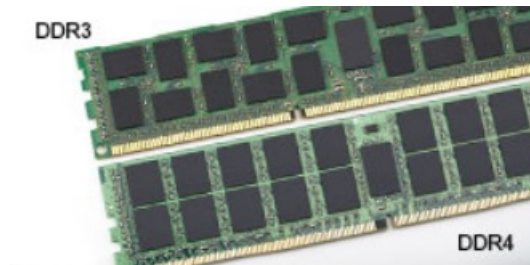


Figure 1. Notch difference

Increased thickness

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

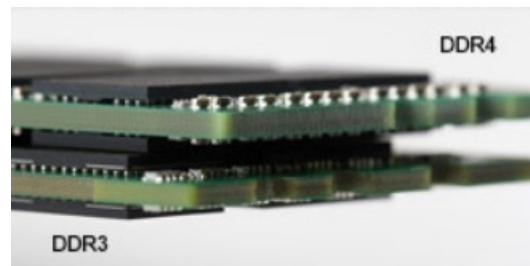


Figure 2. Thickness difference

Curved edge

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



Figure 3. Curved edge

Memory Errors


Memory errors on the system display the new 2 - Amber, 3 - White failure code. If all memory fails, the LCD does not turn on. Troubleshoot for possible memory failure by trying known good memory modules in the memory connectors on the bottom of the system or under the keyboard, as in some portable systems.

Memory features

This laptop supports 4–32 GB DDR4 SDRAM memory, up to 2400 MHz on KabyLake processors and 2133 MHz on SkyLake processors.

Verifying system memory

Windows 10

- 1 Tap the **Windows** button and select **All Settings**  > **System** .
- 2 Under **System**, tap **About**.

Windows 8

- 1 From your desktop, start the **Charms Bar**.
- 2 Select **Control Panel** and then select **System**.

Windows 7

- Click **Start** → **Control Panel** → **System**.

Verifying system memory in system setup BIOS

- 1 Turn on or restart your system.
- 2 Perform the following actions after the Dell logo is displayed
 - With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
- 3 On the left pane, select **Settings** > **General** > **System Information**.
The memory information is displayed on the right pane.

Testing memory using ePSA

- 1 Turn on or restart your system.
- 2 Perform one of the following actions after the Dell logo is displayed:
 - With keyboard — Press **F12**.

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

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

Graphics options

Integrated graphics controller

Table 25. Graphics specification

Integrated graphics controller specifications

Integrated Graphics Controller	Intel HD Graphics
Model	Dell Latitude 3300
Bus Type	Internal PCIe
Memory Interface	Unified Memory Architecture
Basic Graphic frequency	Pentium 4415 U: 300 Mhz Celeron 3865 U: 300 Mhz i3-7020 U : 300 Mhz i5-8250 U : 300 Mhz
Max Graphics dynamic frequency	Pentium 4415 U: 950 Mhz Celeron 3865U : 900 Mhz i3-7020 U : 1.00 GHz i5-8250 U : 1.1 GHz
Graphics Level	Intel Celeron 3865 U: Intel HD Graphic 610 Intel Pentium 4415 U: Intel HD Graphic 610 i3-7020 U : Intel HD Graphic 620 i5-8250 U: Intel UHD Graphic 620
Estimated Maximum Power Consumption (TDP)	15 W (Total SOC power consumption)
Display Support	eDP (internal), HDMI, DisplayPort through Type-C port

Integrated graphics controller specifications

Maximum Color Depth	32 bit
Maximum Vertical Refresh Rate	Up to 85 Hz depending on resolution
Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL 4.4 (except OpenGL4.5 for i3-7020U)
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	eDP: Panel 1366 x 768 @ 60 Hz HDMI: V1.4 @1.65 Gbps DisplayPort (via Type-C): V1.2 (Except Celeron sku)
Numbers of Displays Supported	3 max

Solid state drive (SSD)

128/256 GB M.2 2230 PCIe SSD (Class 35)

Table 26. 128/256 GB M.2 2230 PCIe SSD (Class 35)

Specifications

Capacity (GB)	128 GB/256 GB
Dimensions (W x D x H)	22 x 30 x 2.38 (mm)
Interface type and maximum speed	PCIe Gen 3 8 Gbps (up to 2 lanes)
MTBF	1.4 Mil hours
Logical blocks	250,069,680
Power source	
Power consumption (reference only)	Idle 0.05 W, Active 4.5 W

Environmental Operating Conditions (Non-Condensing)

Temperature range	0 °C to 70 °C
Relative humidity range	10% to 90%
Op shock (@ 2ms)	1,500 G

Environmental Non-Operating Conditions (Non-Condensing)

Temperature range	- 40 °C to 70 °C
Relative humidity range	5% to 95%

64 GB eMMC 5.1 SSD

Table 27. 64 GB eMMC 5.0 SSD specifications

Specifications

Capacity (GB)	64 GB
Dimensions (W x D x H)	0.86 x 1.65 x 0.05 (inch)
Interface type and maximum speed	Upto eMMC 5.1, HS200, 200 Mbps
MTBF	1.4 Mil hours
Logical blocks	500,118,192
Power source	
Power consumption (reference only)	Idle 0.05 W, Active 4.5 W

Environmental Operating Conditions (Non-Condensing)

Temperature range	0 °C to 70 °C
Relative humidity range	5% to 95%

Environmental Non-Operating Conditions (Non-Condensing)

Temperature range	- 40 °C to 70 °C
Relative humidity range	5% to 95%

HDMI 1.4a

This topic explains the HDMI 1.4a 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.

HDMI 1.4a 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

Battery Specifications

What is ExpressCharge ?

For a system advertised as having the ExpressCharge feature, the battery typically will have greater than 80% charge after about an hour of charging with the system off and fully charged in about 2 hours with the system off.

Enabling Expresscharge requires that both the system and the battery that is used on the system be ExpressCharge capable. If any of the above requirements is missing, ExpressCharge will not be enabled.

What is BATTMAN?

BATTMAN is a computer controlled battery manager intended for typical rechargeable batteries. It has the following capabilities:

- Monitors self-discharge
- Measures internal resistance
- Automatically performs repeated discharge/charge cycles to break in new batteries
- Keeps a log of all operations performed, which can be imported
- Connects via parallel port to any PC running Microsoft Windows
- Operating software, complete with source code, is available to download

USB features

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

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

Table 28. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 2.0	480 Mbps	High Speed	2000
USB 3.0/USB 3.1 Gen 1Port	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.

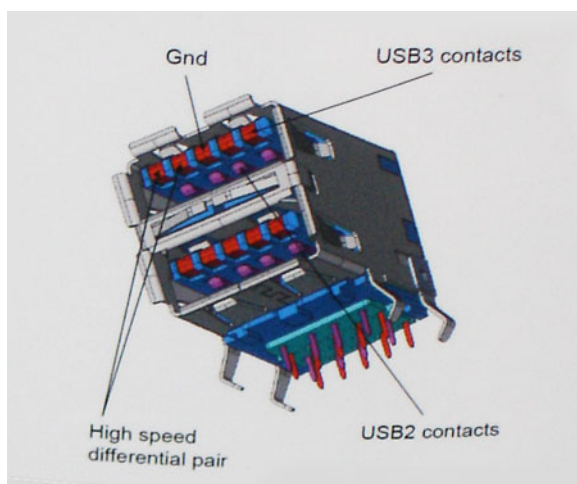


Speed

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.

USB Type-C

USB Type-C is a new, tiny physical connector. The connector itself can support various exciting new USB standards like USB 3.1 and USB power delivery (USB PD).

Alternate Mode

USB Type-C is a new connector standard that is very small. It is about a third the size of an old USB Type-A plug. This is a single connector standard that every device should be able to use. USB Type-C ports can support a variety of different protocols using “alternate modes,” which allows you to have adapters that can output HDMI, VGA, DisplayPort, or other types of connections from that single USB port

USB Power Delivery

The USB PD specification is also closely intertwined with USB Type-C. Currently, smartphones, tablets, and other mobile devices often use a USB connection to charge. A USB 2.0 connection provides up to 2.5 watts of power — that'll charge your phone, but that's about it. A laptop might require up to 60 watts, for example. The USB Power Delivery specification ups this power delivery to 100 watts. It's bi-directional, so a device can either send or receive power. And this power can be transferred at the same time the device is transmitting data across the connection.

This could spell the end of all those proprietary laptop charging cables, with everything charging via a standard USB connection. You could charge your laptop from one of those portable battery packs you charge your smartphones and other portable devices from today. You could plug your laptop into an external display connected to a power cable, and that external display would charge your laptop as you used it as an external display — all via the one little USB Type-C connection. To use this, the device and the cable have to support USB Power Delivery. Just having a USB Type-C connection doesn't necessarily mean they do.

USB Type-C and USB 3.1

USB 3.1 is a new USB standard. USB 3's theoretical bandwidth is 5 Gbps, while USB 3.1's is 10 Gbps. That's double the bandwidth, as fast as a first-generation Thunderbolt connector. USB Type-C isn't the same thing as USB 3.1. USB Type-C is just a connector shape, and the underlying technology could just be USB 2 or USB 3.0. In fact, Nokia's N1 Android tablet uses a USB Type-C connector, but underneath it's all USB 2.0 — not even USB 3.0. However, these technologies are closely related.

Media Card Readers

NOTE: The media card reader is integrated into the system board on portable systems. If there is a hardware failure or the reader malfunctions, replace the system board.

The media card reader expands the usefulness and functionality of portable systems, especially when used with other devices such as digital cameras, portable MP3 players, and handheld devices. All these devices use a form of media card to store information. Media card readers allows for easy transfer of data between these devices.



Several different types of media or memory cards are available today. Below is a list of the different types of cards that work in the media card reader.

SD Card Reader

- | | | | |
|---|-------------------------------------|---|--|
| 1 | Memory Stick | 2 | Secure Digital (SD) |
| 3 | Secure Digital High Capacity (SDHC) | 4 | Secure Digital eXtended Capacity(SDXC) |

Software and Troubleshooting

Downloading Windows drivers

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

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

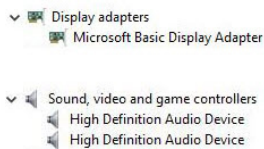
- 4 Click **Drivers and Downloads**.
- 5 Select the operating system installed on your tabletdesktopnotebook.
- 6 Scroll down the page and select the driver to install.
- 7 Click **Download File** to download the driver for your tabletdesktopnotebook.
- 8 After the download is complete, navigate to the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

Intel HD Graphics drivers

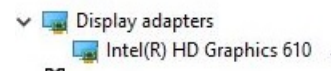
In the **Device Manager**, verify if the Intel HD Graphics drivers are already installed in the laptop.

Table 29. Intel HD Graphics drivers

Before installation



After installation



Chipsets

All laptops or notebook communicate with the CPU through the chipset. This laptop is shipped with the Intel Sky Lake or Kaby Lake chipset.

Downloading the chipset driver


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

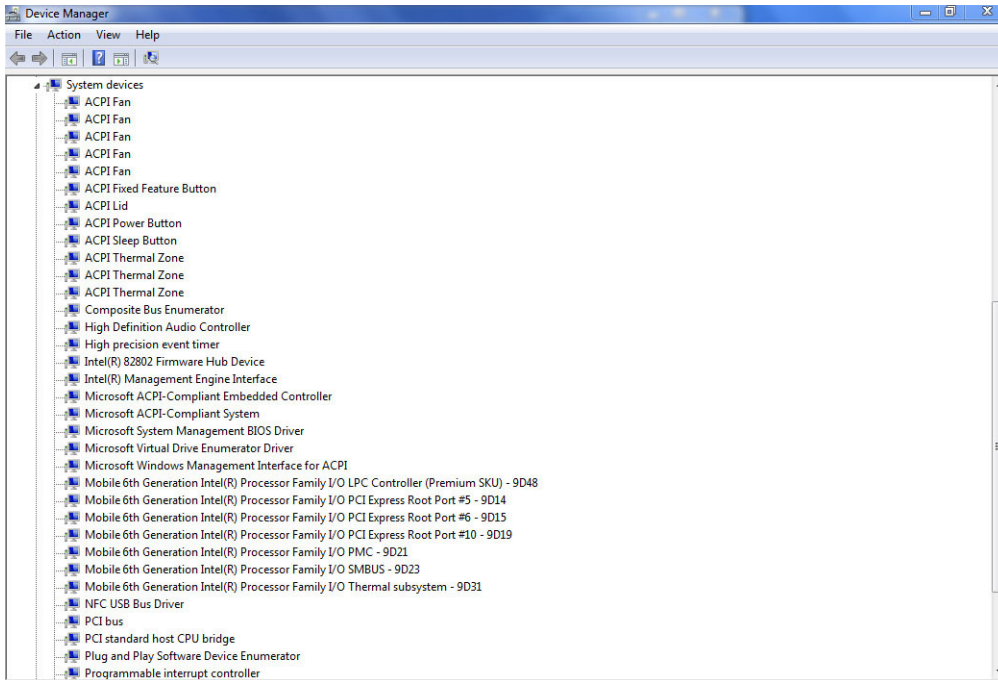
NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.

- 4 Click **Drivers and Downloads**.
- 5 Select the operating system installed in your laptop.
- 6 Scroll down the page, expand **Chipset**, and select your chipset driver.
- 7 Click **Download File** to download the latest version of the chipset driver for your laptop.

- 8 After the download is complete, navigate to the folder where you saved the driver file.
- 9 Double-click the chipset driver file icon and follow the instructions on the screen.

Identifying the chipset in Device Manager on Windows 10

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

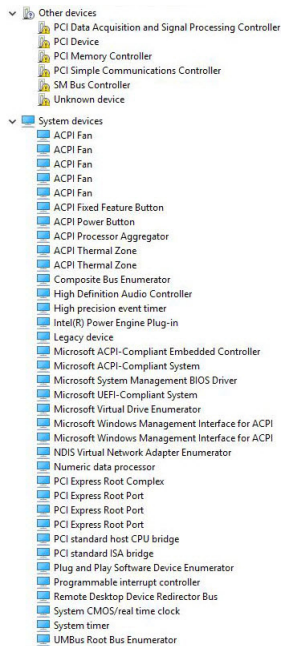


Intel chipset drivers

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

Table 30. Intel chipset drivers

Before installation



After installation



Downloading the chipset driver

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

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

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

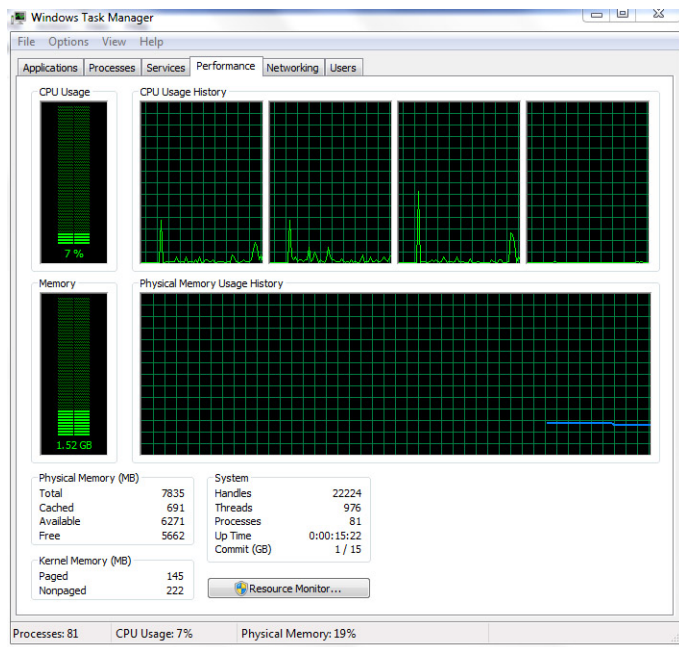
Processor

Identifying processors in Windows 10

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

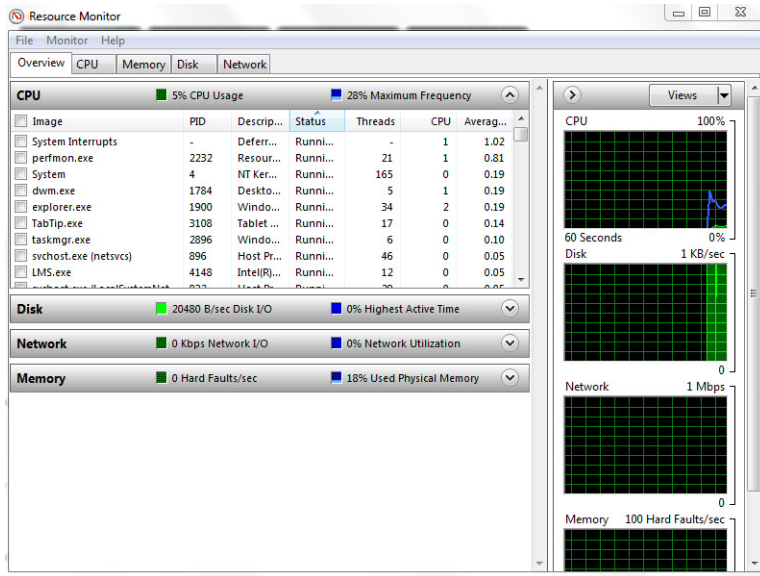
Verifying the processor usage in Task Manager

- 1 Press and hold the taskbar.
- 2 Select **Start Task Manager**.
The **Windows Task Manager** window is displayed.
- 3 Click the **Performance** tab in the **Windows Task Manager** window. The processor performance details are displayed.



Verifying the processor usage in Resource Monitor

- 1 Press and hold the taskbar.
- 2 Select **Start Task Manager**.
The **Windows Task Manager** window is displayed.
- 3 Click the **Performance** tab in the **Windows Task Manager** window.
The processor performance details are displayed.
- 4 Click **Open Resource Monitor**.



Verifying system memory in system setup BIOS

- 1 Turn on or restart your system.
- 2 Perform the following actions after the Dell logo is displayed
 - With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
- 3 On the left pane, select **Settings > General > System Information**.
The memory information is displayed on the right pane.

Testing memory using ePSA

- 1 Turn on or restart your system.
- 2 Perform one of the following actions after the Dell logo is displayed:
 - With keyboard — Press **F12**.

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

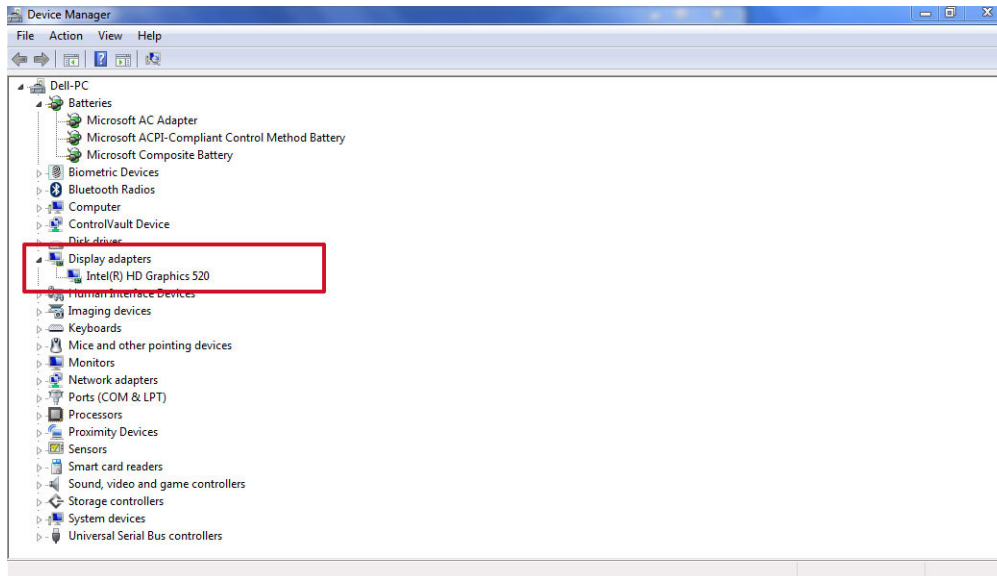
NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Turn off the laptop and try again.

Display

Identifying the display adapter

- 1 Start the **Search Charm** and select **Settings**.
- 2 Type `Device Manager` in the search box and tap **Device Manager** from the left pane.
- 3 Expand **Display adapters**.

The display adapters are displayed.



Identifying the display adapter

- 1 On the taskbar, click or tap the search box, and then type `Device Manager`.
- 2 Click or tap **Device Manager**.
The **Device Manager** window is displayed.
- 3 Expand **Display adapters**.

Figure 4. Display adapters

Downloading drivers


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

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

- 4 Click **Drivers and Downloads**.
- 5 Select the operating system installed on your laptop.
- 6 Scroll down the page and select the driver to install.
- 7 Click **Download File** to download the driver for your laptop.
- 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.

Adjusting brightness in Windows 10

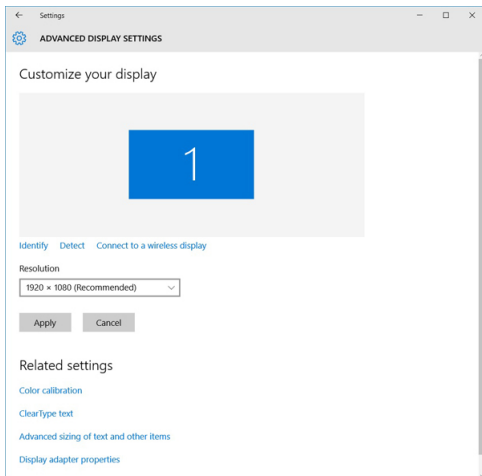
To enable or disable automatic screen brightness adjustment:

- 1 Swipe-in from the right edge of the display to access the Action Center.
- 2 Tap or click **All Settings**  > **System** > **Display**.
- 3 Use the **Adjust my screen brightness automatically** slider to enable or disable automatic-brightness adjustment.

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

Changing the screen resolution

- 1 Press and hold the desktop screen and select **Display Settings**.
- 2 Tap or click **Advanced display settings**.
- 3 Select the required resolution from the drop-down list and tap **Apply**.



Connecting to external display devices

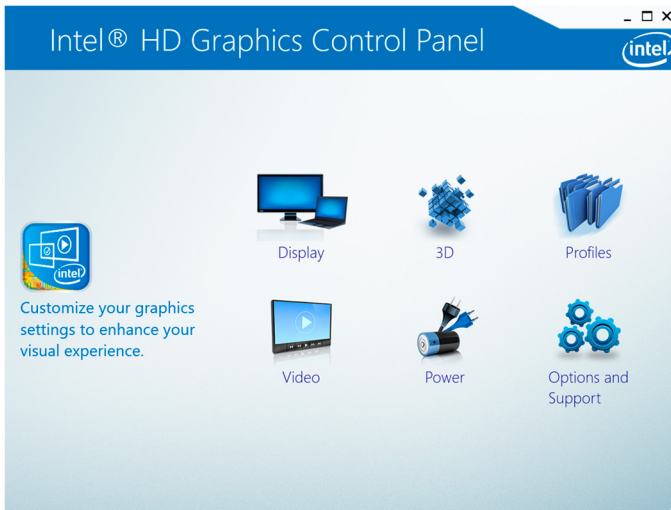
Follow these steps to connect your laptop to an external display device:

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

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

Changing the display settings in Intel HD Graphics Control Panel

- 1 Right-click your desktop and select **Graphics Properties** to launch the **Intel HD Graphics Control Panel**.



- 2 Click **Display**.
- 3 Change the display settings as required.

Using touch screen in Windows 8/ Windows 10

Follow these steps to enable or disable the touch screen:

- 1 Go to the Charms Bar and tap **All Settings** .
- 2 Tap **Control Panel**.
- 3 Tap **Pen and Input Devices** in the **Control Panel**.
- 4 Tap the **Touch** tab.
- 5 Select **Use your finger as an input device** to enable the touch screen. Clear the box to disable the touch screen.

Touchscreen Troubleshooting

If the touchscreen is not able to access items along the edges of the LCD, it may need to be calibrated. To calibrate the touchscreen, complete the following steps:

Touchscreen Calibration

Start > Control Panel > Tablet PC Settings > choose Calibrate...You can choose to calibrate Pen input or Touch input.

Perform the point calibrations that appear on the screen to correct the linearity problems.

Touchscreen Sensitivity

The touch screen may start to lose its sensitivity due to foreign particles (such as sticky notes) that are blocking the touch sensors. To remove these particles:

- Turn off the computer.
- Disconnect the AC adapter cable from the wall outlet.

 **NOTE: Do not use water or a cleaning liquid to wipe the touch screen.**

- Use a clean, lint-free cloth (you may spray mild, non-abrasive cleaner or water on the cloth if needed, but not on the screen) and wipe the surface and sides of the touch screen to remove any dirt or fingerprints.

Application Promise

Consistent experience across form factors is what's necessary - a user can download any application from the Windows Store and it runs great on their machine. There is no application that runs great on one device but not on another. This means developers can target all Windows 8 and this version of Windows touch devices without worrying about the quality of touch devices depending on the type of form factor. For example, all Windows 8 touch devices require supporting a minimum of five simultaneous touches. All touch points require meeting requirements of 25 ms initial touch-down hardware latency and 15 ms subsequent contacts hardware latency. Game developers can design features based on fast and responsive five simultaneous touch points support across all Windows 8 touch devices.

Cleaning the display

- 1 Check for any smudges or areas that must be cleaned.
- 2 Use a microfiber cloth to remove any obvious dust and gently brush off any dust particles.
- 3 Proper cleaning kits should be used to clean and keep your display in a crisp clear pristine condition.

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

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

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

NOTE: Do not leave any liquid on the screen.

- 5 Remove all excess moisture as it may damage your screen.
- 6 Let the display dry thoroughly before you turn it on.
- 7 For stains that are hard to remove, repeat this procedure till the display is clean.

Troubleshooting Touchpad

Most touch pad issues are erratic movement or no movement at all. Since erratic movement is the more common problem, it is covered first.

Erratic Pointer Movement

Here are some easy steps to take to determine the problem with a touch pad demonstrating erratic pointer movement:

- 1 Get the latest driver from Dell support site - Most problems can be corrected with a simple driver download. This should always be one of the first steps when diagnosing any touch pad problem.
- 2 Check for hand and finger placement - The most common cause of random pointer movement is that the touch pad senses a finger or part of the hand near the surface of the device.
 - Have the customer attempt to use the touch pad normally but to pay attention to the location of his or her hands and fingers. Are any straying too close to the touch pad?
 - Adjust the Touch Sensitivity and Touch and check settings in the Touch Pad Settings section of the Dell Touchpad Properties.
- 3 Try an external mouse - Does this problem happen with an external mouse attached?
 - The Device Select section of the Dell Touchpad Properties has options to enable or disable the touch pad or external mouse. Try several combinations of these settings.
 - If the problems only occur when the touch pad is enabled and do not occur any time a mouse or other external device is used, then the issue is related to the touch pad.
- 4 Check for mechanical problems - If the problem cannot be corrected by adjusting the settings mentioned above and only occurs with the touch pad enabled and then this could indicate a mechanical problem.

- Press down on the palm rest on first the left side of the touch pad and then the right. See if the cursor starts moving on its own.
- Run ePSA Diagnostics and try to recreate the problems there. If either of these situations occurs, replace the palm rest.

No Pointer Movement

No pointer movement from the touch pad (or track stick, if available) usually is the result of one of two things: The touch pad has been disabled in the driver interface, or the touch pad cable is damaged or disconnected. Follow the steps below to determine the problem.

- 1 Connect an external mouse - In either situation, an external mouse should still function. If it does not, try booting into Safe Mode and testing both devices again.
- 2 Enable the touch pad in the driver settings - Using the external mouse (or key strokes if no mouse is available), go into the Dell Touchpad Properties. Go to the Device Select section and enable the touch pad. If already enabled, get the latest driver from Dell support site.
- 3 Test the device in Dell ePSA Diagnostics - To eliminate a potential software problem, run the Dell ePSA Diagnostics and test the device here.
- 4 Check for mechanical problems - As a last resort, press down on the palm rest where the touch pad connector is located on the system board. If the pointer reacts in some way, then the cable may just need to be reseated. Otherwise, replace the palm rest.

Realtek HD audio drivers

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

Table 31. Realtek HD audio drivers

Before installation

- Audio inputs and outputs
 - Microphone (High Definition Audio Device)
 - Speakers (High Definition Audio Device)
- Sound, video and game controllers
 - High Definition Audio Device
 - Intel(R) Display Audio

After installation

- Sound, video and game controllers
 - Bluetooth Hands-free Audio
 - Intel(R) Display Audio
 - Realtek High Definition Audio

Troubleshooting audio issues

This topics details the troubleshooting steps in resolving audio related issues specific to IDT92HD87 audio chip

No Audio

Determine if the problem is only on the internal or external speakers or both.

- 1 If the problem is external only, try reseating the speakers or headphones. Also try another set of speakers or headphones if available. Check the speaker connector for damage. If the problem does not happen with different speakers, then the problem is related to the external device. If it persists, then there is a problem with either the audio connector or the audio controller. Confirm this by running Dell Diagnostics.
- 2 If the problem is internal only, try shaking the unit and see if the sound returns or plays intermittently. If it does, then a connection for the speakers is loose and the unit needs service. If there is still no sound at all, then try deleting the hardware profile (if possible) and recreating it. Test the speakers using Dell Diagnostics both internally and externally. If the problem only happens on the internal speakers, then the speakers and possibly the system board need to be replaced.

If there is no audio from either internal or external speakers, then check the following:

- 1 Adjust the volume controls. Some systems also have an external volume control in addition to the one in the Windows® operating system.
- 2 Check Device Manager and ensure the audio driver is installed correctly. Any problems indicated here can normally be resolved by reinstalling the audio driver from the ResourceDVD or from dell.com/support.
- 3 If the audio is installed correctly in Windows but there still is no sound, run Dell Diagnostics on the audio controller. If these fail or no sound is heard, then replace the system board. If audio does play during this test, then the problem is most likely software related.

Poor Sound Quality

- 1 Determine if the problem is related to a specific application or program. If so, the software may not be fully compatible with the audio controller on the system. Check the software manufacturer's website for any updates.
- 2 Update to the latest BIOS and driver from dell.com/support
- 3 Some problems can be caused by issues with the DirectX® API. Try downloading the latest version from Microsoft.
- 4 See if the problem occurs on both internal and external speakers. If isolated to only one of the two, follow the troubleshooting mentioned above. Otherwise, run Dell Diagnostics to test the audio.
- 5 If the problem fails during the audio test, this is a hardware problem and the system needs service. If it does not, then a software problem exists.

Sound from Only One Channel

- 1 The majority of the time, this problem happens only on external speakers. Reseating the speaker connection usually corrects the problem.
- 2 Check the volume control in Windows and make sure the balance slider is not set all the way to one side.
- 3 If this problem is happening only on internal speakers, try shaking the unit to see if sound comes back or if it comes and goes intermittently. If either of these occurs, a loose speaker connection most likely is the problem and the system needs service.
- 4 If this issue is happening only on external speakers and the previous steps did not help, then examine the audio connector for damage. Test the system with Dell Diagnostics. If the problem persists there, then the audio connector needs to be replaced.

Camera features

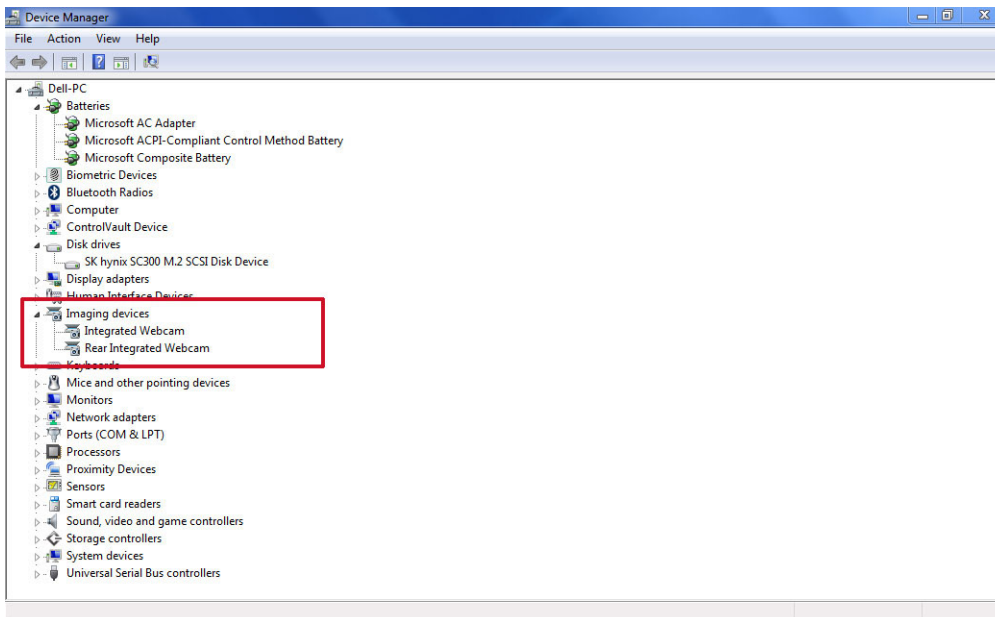
This laptop comes with front-facing camera with the image resolution of 1280 x 720 (maximum).

This laptop also has a back-facing camera.

NOTE: The camera is at the top center of the LCD.

Identifying the camera in Device Manager on Windows 10

- 1 In the **Search** box, type `device manager`, and tap to start it.
- 2 Under **Device Manager**, expand **Imaging devices**.

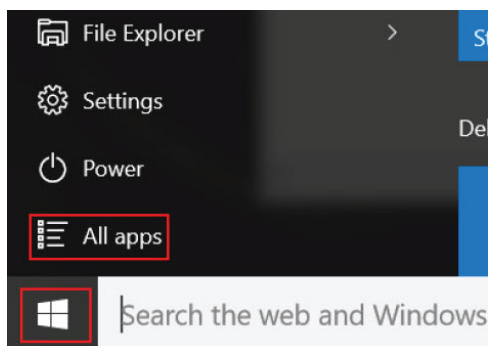


Starting the camera

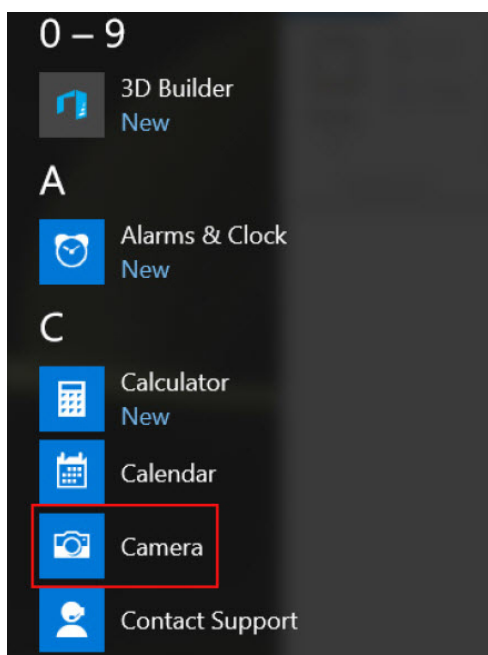
To start the camera, open an application that uses the camera. For instance, if you tap the Skype software that is shipped with the laptop, the camera turns on. Similarly, if you are chatting on the internet and the application requests to access the webcam, the webcam turns on.

Starting the camera application

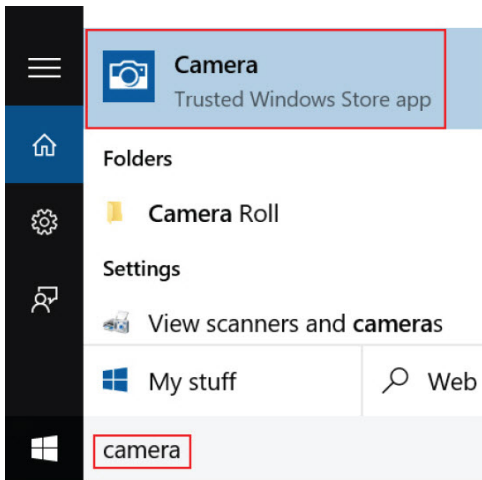
- 1 Tap or click the **Windows** button and select **All apps**.



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



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

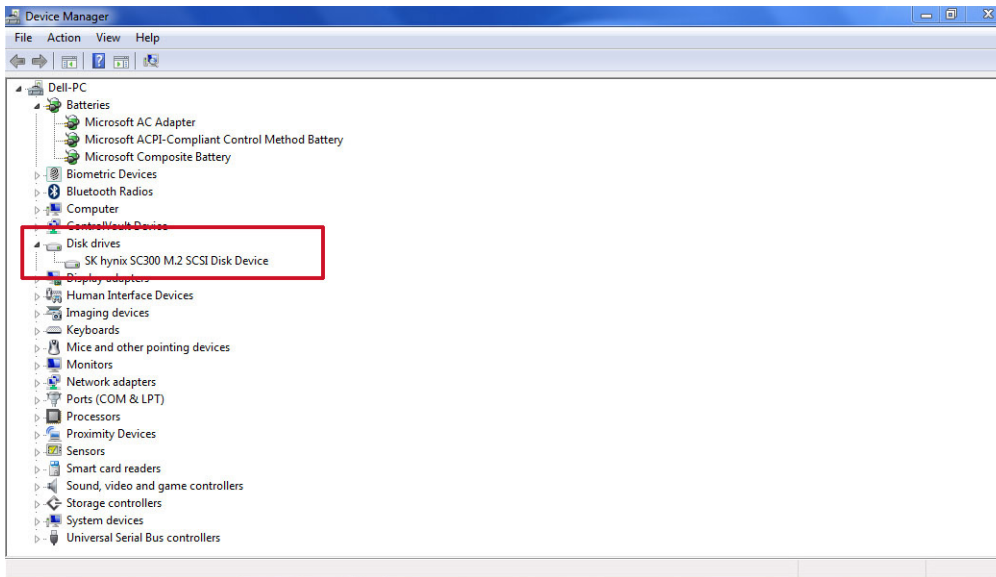


Hard drive options

This laptop supports M.2 SATA drives.

Identifying the hard drive in Windows 10

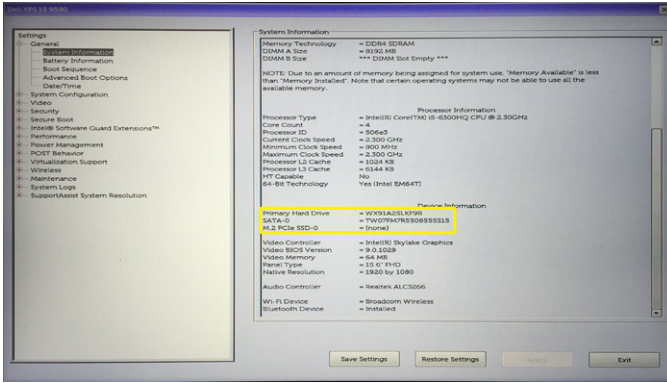
- 1 Tap or click **All Settings**  on the Windows 10 Charms Bar.
- 2 Tap or click **Control Panel**, select **Device Manager**, and expand **Disk drives**.
The hard drive is listed under **Disk drives**.



Identifying the hard drive in the BIOS

- 1 Turn on or restart your system.
- 2 When the Dell logo appears, perform the following action to enter the BIOS setup program:
 - With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.

The hard drive is listed under the **System Information** under the **General** group.



Dell Command Configure

Dell Command | Configure (Command | Configure) is a packaged software offering that provides configuration capability to business client platforms. This product consists of a Command Line Interface (CLI) and Graphical User Interface (GUI) to configure various BIOS features. You can use Command | Configure on Microsoft Windows Pre-installation Environment (Windows PE), Windows 7, Windows 8, and Windows 8.1, Windows 10 operating systems, and Red Hat Enterprise Linux environments.

What's new with Dell Command | Configure

The new features for the Dell Command | Configure includes:

- Dell Client Configuration Toolkit (CCTK) is re-branded as Dell Command | Configure (DCC).
- New User Interface.
- Support for Red Hat Enterprise Linux 7.0 Client version (64-bit) operating system.
- Support for x6 client platforms
- Support for Advanced System Management (ASM) 2.0 on Dell Precision™ Workstations for setting the non-critical upper threshold values for cooling probes.
- Support for additional arguments: **medium_high** and **medium_low** for configuring the fan speed using **--fanspeed** option.
- Support for the following BIOS options:
 - --backcamera.
 - --fnlock
 - --fnlockmode
 - --gpsradio
 - --keyboardbacklightonacpower
 - --rearusb
 - --sideusb
 - --unmanagednic

Platforms Supported

These are the business clients platforms supported:

- Latitude™
- OptiPlex™

- Dell Precision Workstation Mobile
- Dell Precision Workstation

NOTE: Dell Command | Configure will not be pre-loaded for the customer upon purchase. Customers will be able to download the software from the Dell support website.

Command | Configure Graphical User Interface

The **Dell™ Command | Configure** Graphical User Interface (Command | Configure GUI) displays all Basic Input/Output System (BIOS) configurations supported by Command | Configure. Using the GUI, you can perform the following tasks:

- Create BIOS configuration for client systems
- Validate the BIOS configuration against the BIOS configuration of the host system
- Export the customized BIOS configurations as a configuration file (.ini/.cctk), Self-Contained Executable (SCE), shell script, or report

NOTE: To apply the configuration using Command Line Interface (CLI), run the required file (.ini , .cctk, or sce).

Accessing Command | Configure From a Windows System

Click **Start > All Programs > Dell > Command | Configure > Command Configure Command Wizard**.

Command | Configure v 3.0.0

Create Multiplatform Package
Settings for all possible platforms

Create Local System Package
Settings from the current system

Open a Saved Package
Use settings from a previously saved settings

Package History
View history of created packages

Create Multiplatform Package
Configure a generic ini for all systems

View: Basic Validate Edit Enter Text Here

Category	Name	Value to Set	Apply Settings	Description
Advanced System...	advsm	Not Specified	<input type="checkbox"/>	Command Configure advsm displays a
Boot Management	adddevice	Not Specified	<input type="checkbox"/>	Adds the specified device to the boot c
Boot Management	forcepxe	Not Specified	<input type="checkbox"/>	Enables or disables PXE as the first boc
Boot Management	wakeonlanbootovrd	Not Specified	<input type="checkbox"/>	Enables or disables the wake on lan bo
Boot Management	bootorder	Not Specified	<input type="checkbox"/>	Command Configure bootorder or Co
Boot Management	bootseqset	Not Specified	<input type="checkbox"/>	Sets the Initial Program Load (IPL) devi
Configuration	adjcacheprefetch	Not Specified	<input type="checkbox"/>	Enables or disables adjacent cache line
Configuration	propowntag	Not Specified	<input type="checkbox"/>	Sets the property ownership tag to the

REPORT EXPORT CONFIG EXPORT .EXE

Accessing Command | Configure From a Linux System

Navigate to the **/opt/Dell/toolkit/bin** directory.

Files And Folders of Command | Configure

The following table displays the files and folders of Command | Configure on a Windows system.

Table 32. Files And Folders configuration

Files/Folders	Description
Command Configure Command Prompt	Allows access to the Command Configure command prompt.
Configuration Wizard	Allows access to the Command Configure GUI.
Command Configure WINPE	Allows access to the Windows PE scripts to create a bootable image. For more details, see the Dell Command Configure Installation Guide.
Uninstall	Uninstalls Command Configure.
User's Guide Online	Provides access to the Command Configure online documentation.

Launching The Command | Configure GUI

NOTE: The Command | Configure GUI is supported only on systems running the Microsoft® Windows operating system.

To launch the GUI, click **Start > All Programs > Dell > Command Configure > Configuration Wizard** or double-click the **Dell Configuration Wizard** on the desktop. The screen below appears:

The screenshot shows the Dell Command | Configure GUI. The window title is "Command | Configure" with version "v 3.0.0". The main content area is titled "Create Multiplatform Package" and contains a table of configuration items. The table has columns for Category, Name, Value to Set, Apply Settings, and Description. The 'Apply Settings' column contains checkboxes. At the bottom of the window are three buttons: "REPORT", "EXPORT CONFIG", and "EXPORT .EXE".

Category	Name	Value to Set	Apply Settings	Description
Advanced System...	advsm	Not Specified	<input type="checkbox"/>	Command Configure advsm displays a
Boot Management	adddevice	Not Specified	<input type="checkbox"/>	Adds the specified device to the boot c
Boot Management	forcepxe	Not Specified	<input type="checkbox"/>	Enables or disables PXE as the first boc
Boot Management	wakeonlanbootovrd	Not Specified	<input type="checkbox"/>	Enables or disables the wake on lan bo
Boot Management	bootorder	Not Specified	<input type="checkbox"/>	Command Configure bootorder or Co
Boot Management	bootseqset	Not Specified	<input type="checkbox"/>	Sets the Initial Program Load (IPL) devi
Configuration	adjcacheprefetch	Not Specified	<input type="checkbox"/>	Enables or disables adjacent cache line
Configuration	propowntag	Not Specified	<input type="checkbox"/>	Sets the property ownership tag to the

Command Line Interface

This chapter provides a general overview of the Command Line Interface (CLI) utility. It explains how to run the commands and the syntax details of the command line options used to configure BIOS settings for the client systems.

Running Command | Configure Commands

You can run the Command | Configure commands in two ways:

- Using Command Prompt
- Using Bootable Image

Command Prompt

To run Command | Configure commands:

- 1 Click Start → All Program → Dell → Command Configure → Command Configure Command Prompt.

 **NOTE: If you are using Microsoft Windows Vista operating system or later, right-click Command | Configure Command Prompt and select Run as administrator.**

- 2 Navigate to the x86 or x86_64 directory depending on the architecture of the operating system.
- 3 Run the Command | Configure commands.

Bootable Image


To run Command | Configure commands:


- 1 Copy Dell Command | Configure with the International Organization for Standardization (ISO) image to a Compact disc (CD). For more information, see Dell Command | Configure Installation Guide available at <https://Dell.com/Command>.
- 2 Boot the system that you want to configure from the CD.
- 3 Navigate to the Command Configure\x86 or Command Configure\x86_64 directory.
- 4 Run the Command | Configure commands.

Turning off your computer

Turning off your computertablet tablet— Windows

 **CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer or remove the side cover.**

- 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.**

Disassembly and reassembly

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 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](#)
- ⚠ 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 at the same time as touching a connector on the back of the computer.
- ⚠ 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.
- ⚠ CAUTION:** System will shut down if side covers are removed while the system is running. The system will not power on if the side cover is removed.
- ⚠ CAUTION:** System will shut down if side covers are removed while the system is running. The system will not power on if the side cover is removed.
- ⚠ CAUTION:** System will shut down if side covers are removed while the system is running. The system will not power on if the side cover is removed.

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.

Safety Precautions

Follow the safety precautions described in the following sections when you perform an installation or a disassembly/reassembly procedure:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power, and then remove the battery.
- Disconnect all network cables, telephone or telecommunications lines from the system.
- Use a wrist grounding strap and mat when working inside any computer system to avoid electrostatic discharge (ESD) damage.
- After removing a system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to help reduce the risk of being shocked or seriously injured in an electrical accident.

Standby Power

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

After you unplug a system and before you remove components, wait approximately 30 to 45 seconds to allow the charge to drain from the circuits.

Bonding

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

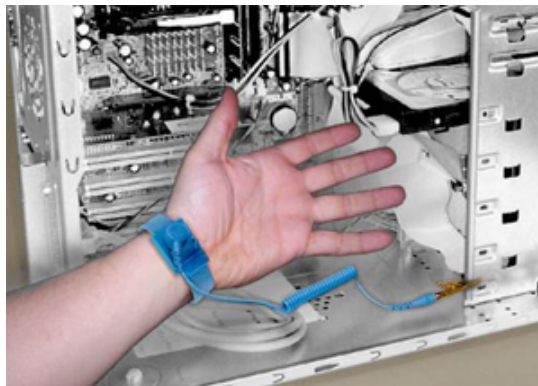


Figure 5. Bonding Properly

Electrostatic Discharge Protection

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

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

There are two recognized types of ESD damage: catastrophic and intermittent failures.

- **Catastrophic** —The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.

NOTE: Catastrophic failures represent approximately 20 percent of ESD-related failures.

- **Intermittent** —The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

NOTE: Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or “walking wounded”) failure. The following image shows an example of intermittent damage to a memory DIMM trace. Although the damage is done, the symptoms may not become an issue or cause permanent failure symptoms for some time after the damage occurs.

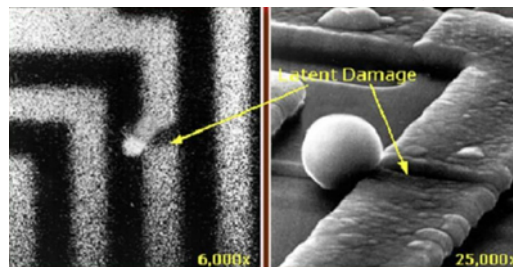


Figure 6. Intermittent (Latent) Damage to a Wiring Trace

Do the following to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded.
The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection.

Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.

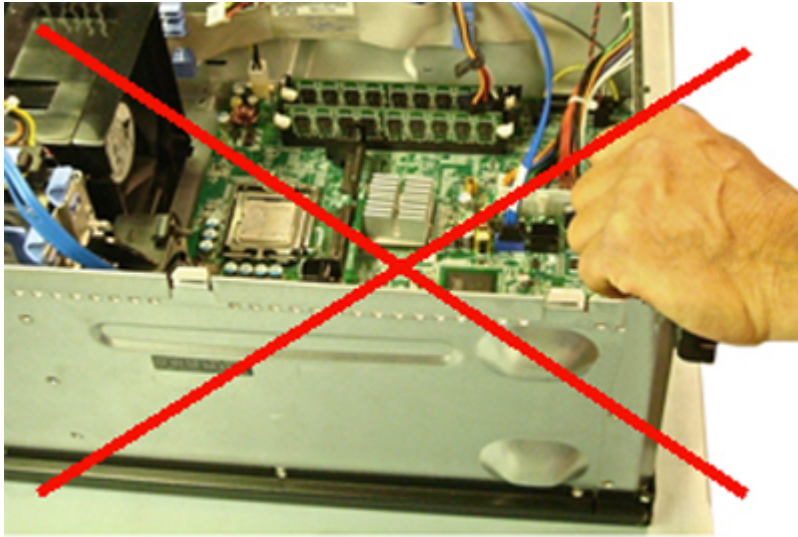


Figure 7. Chassis "Bare Metal" Grounding (Unacceptable)

- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When handling static-sensitive components, grasp them by the sides, not the top. Avoid touching pins and circuit boards.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, be sure to discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

The ESD Field Service Kit

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



Figure 8. ESD Field Service Kit

The anti-static mat is dissipative and should be used to safely place parts on during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to bare-metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. Remember, the only safe place for ESD-sensitive items are in your hand, on the ESD mat, in the system, or inside a bag.



Figure 9. Anti-Static Mat

The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps.

Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire a minimum of once per week.

Table 33. Wrist Straps

Wrist Strap and Bonding Wire



Wireless ESD Strap (Unacceptable)



ESD Wrist Strap Tester

The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.



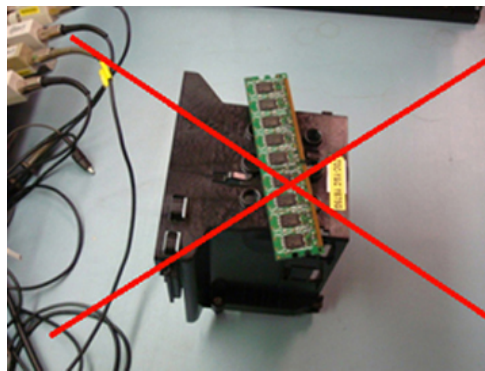
Figure 10. Wrist Strap Tester

Insulator Elements

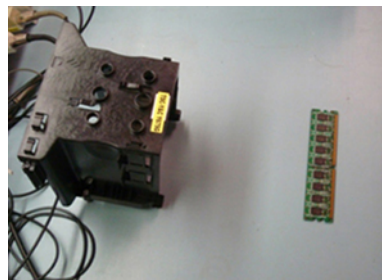
It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.

Table 34. Placement of Insulator Elements

Unacceptable — DIMM lying on an insulator part (plastic heat sink shroud)



Acceptable — DIMM separated from the insulator part



Consider the Working Environment

Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles.

Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components.

ESD Packaging

All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in.

ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.



Figure 11. ESD Packaging

Transporting Sensitive Components

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

ESD Protection Summary

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

Lifting Equipment

⚠ WARNING: Do not lift greater than 50 pounds. Always obtain assistance from another person or persons, or use a mechanical lifting device.

Adhere to the following guidelines when lifting equipment:

- 1 Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.

- 2 Bend your knees. Do not bend at the waist.
- 3 Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
- 4 Lift with your legs, not your back.
- 5 Keep the load close. The closer it is to your spine, the less force it exerts on your back.
- 6 Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
- 7 Follow the same techniques in reverse to set the load down.

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.

Screw List

The following table shows the screw list and the images for Latitude 3300, for different components and locations.

Table 35. Screw Size List

Component	Quantity	Screw type	Image
<ul style="list-style-type: none"> • Touchpad Frame to palmrest • System board to Palmrest • I/O Board to palmrest 	<ul style="list-style-type: none"> • 3 • 2 • 1 	M2.0*2.0	
<ul style="list-style-type: none"> • LCD Panel to back cover • Touchpad Frame to palmrest • Mis trigger Bkt to SSD Bracket 	<ul style="list-style-type: none"> • 4 • 3 • 2 	M2.0*3.0	
Hinges to LCD back cover	4	M2.5*3.5	
Touchpad to Palmrest	3	M2.0*3.0 (large head)	
Hinges to palmrest	6	M2.5*5.0	
<ul style="list-style-type: none"> • LCD Bezel to back Cover • Fan to Palmrest • DC-in Bracket to MB 	<ul style="list-style-type: none"> • 2 • 2 • 1 • 1 	M2.0*4.0	

Component	Quantity	Screw type	Image
<ul style="list-style-type: none"> I/O Board to palmrest System board to Palmrest Mis trigger Bkt to SSD 	<ul style="list-style-type: none"> 1 1 		
Base cover to Palmrest	10	M2.5*8.0	Captive screws (Part of the base cover)

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.



microSD card

Installing the microSD card

Slide the microSD card into its slot until it clicks into place.

Removing the microSD card

- Press in on the microSD card to release it from the computer.



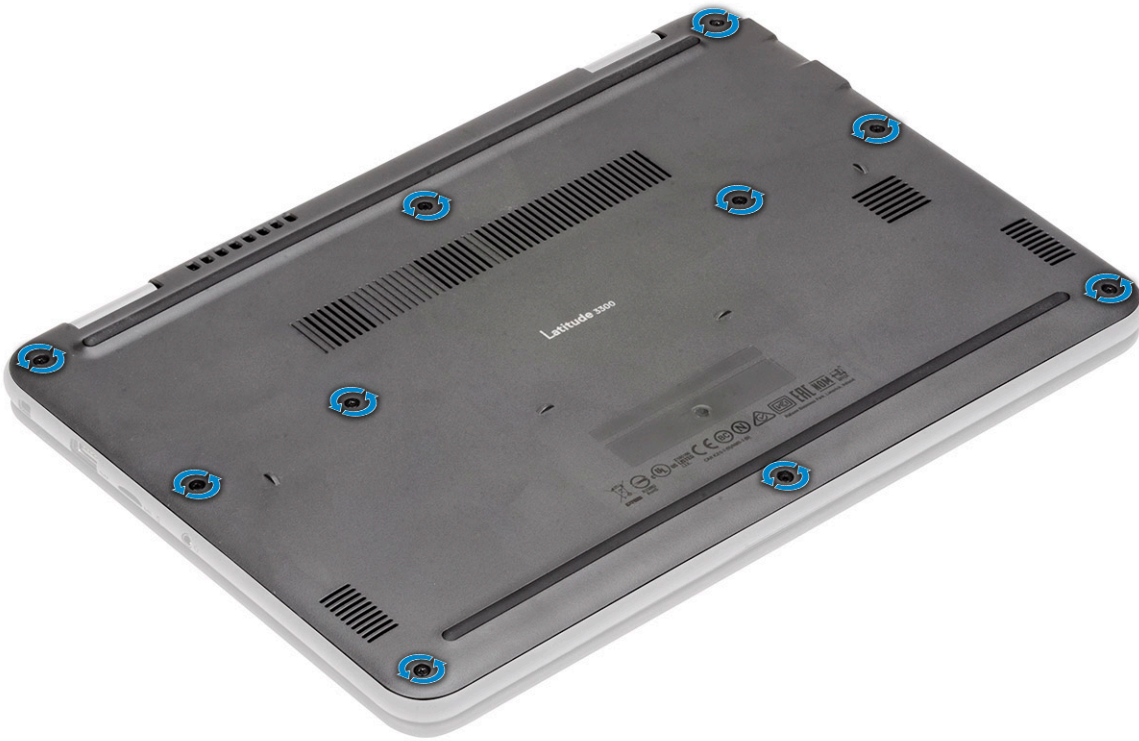
- Remove the microSD card from the computer.

Base Cover

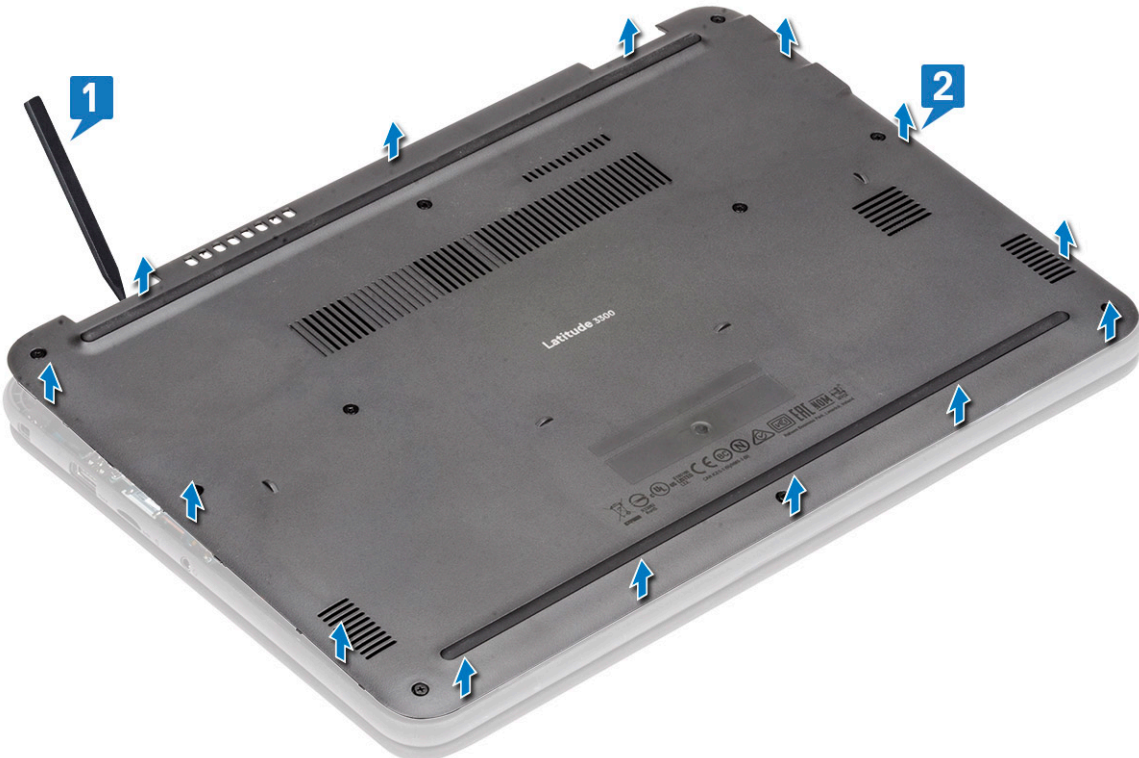
Removing the base cover

- Follow the procedure in [Before working inside your computer](#).
- Remove the:
 - micro-SD card

- 3 Loosen the 10 'M2.5xL8.5' captive screws that secure the base cover to the computer.



- 4 Use a plastic scribe [1] to pry the base cover along the edges [2] to separate the base cover from the computer.

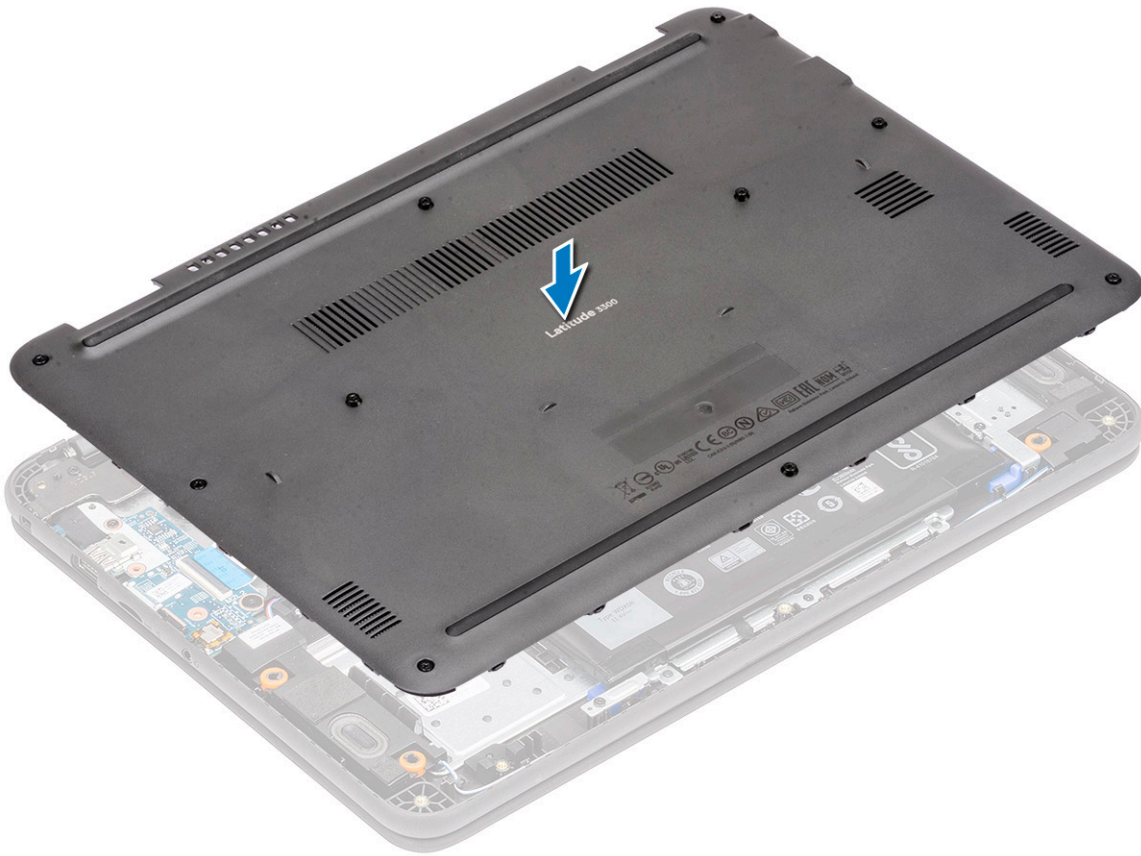


- 5 Lift the base cover up, away from the computer.

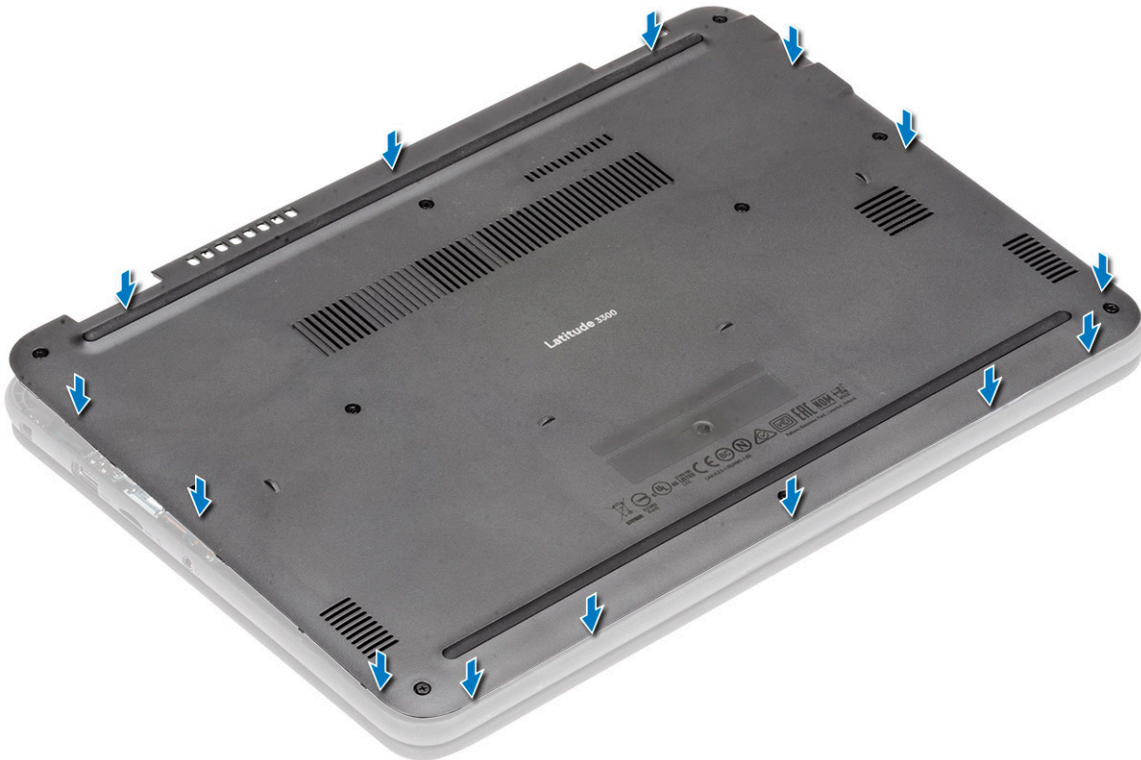


Installing the base cover

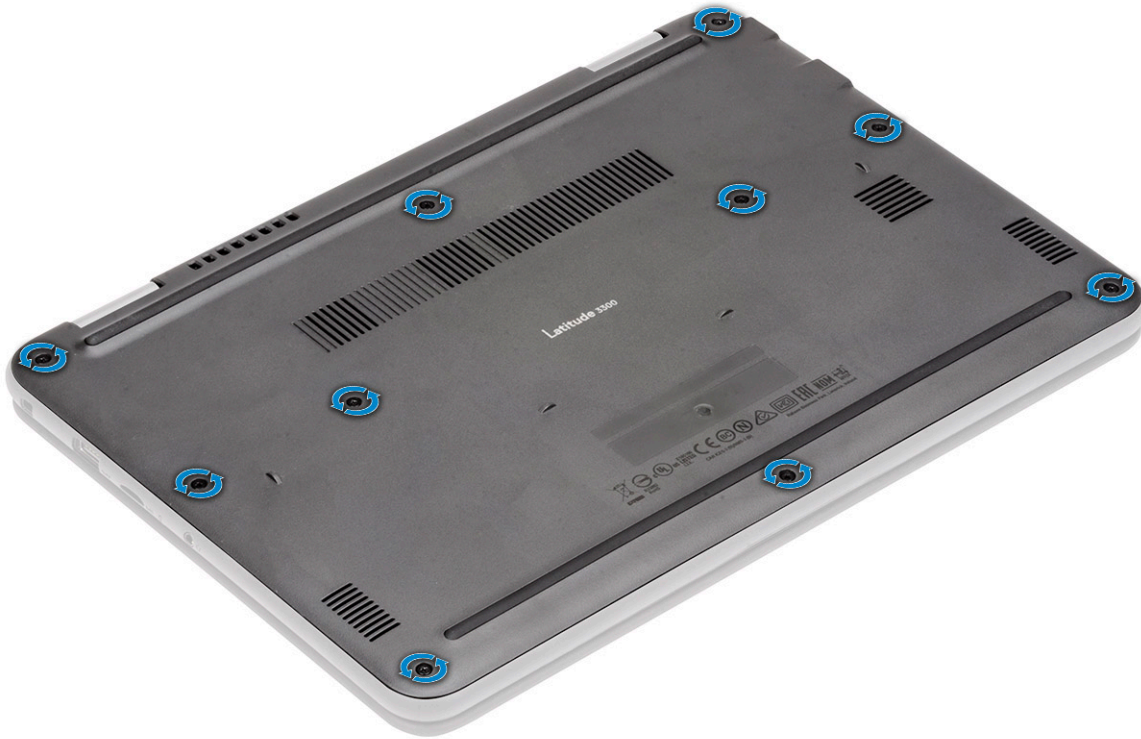
- 1 Align the base cover and place it on the computer.



2 Press down along the edges of the base cover until it clicks into place.



3 Tighten the 10 'M2.5xL8.5' captive screws to secure the base cover to the computer.

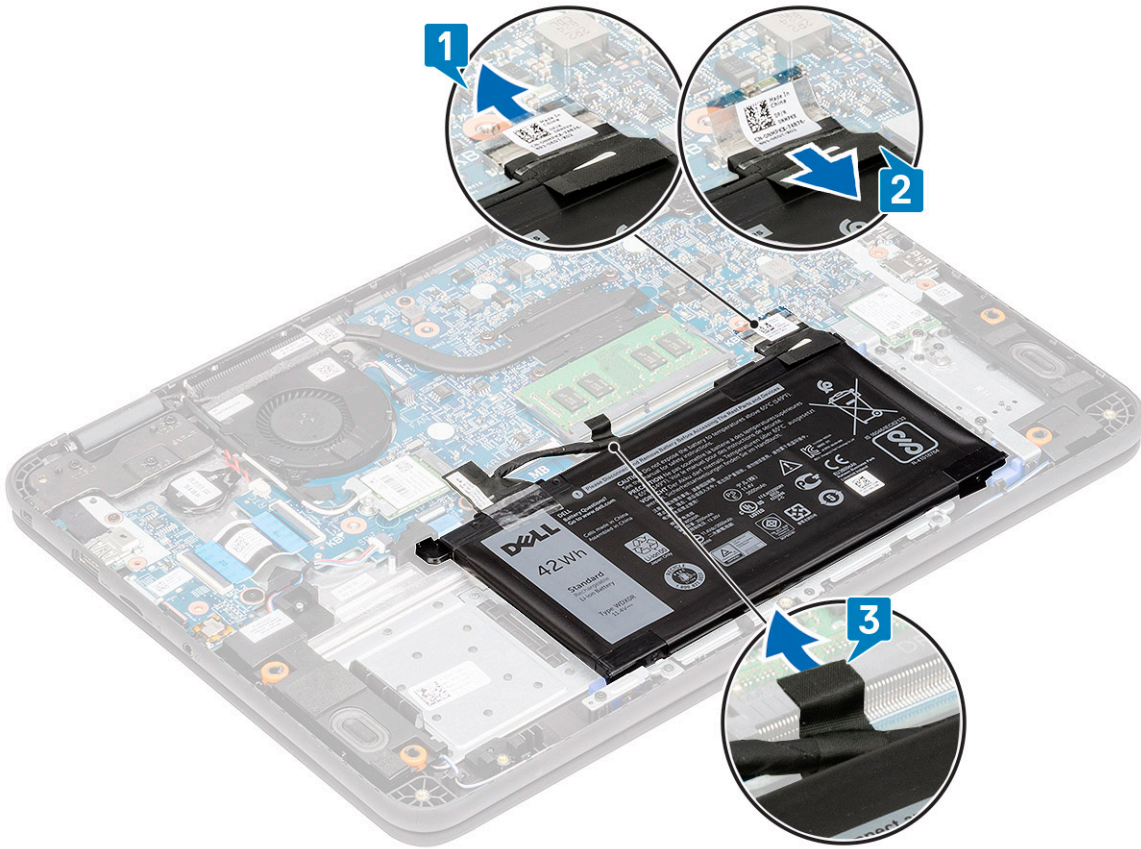


- 4 Install the:
 - a [micro-SD card](#)
- 5 Follow the procedure in [After working inside your computer](#).

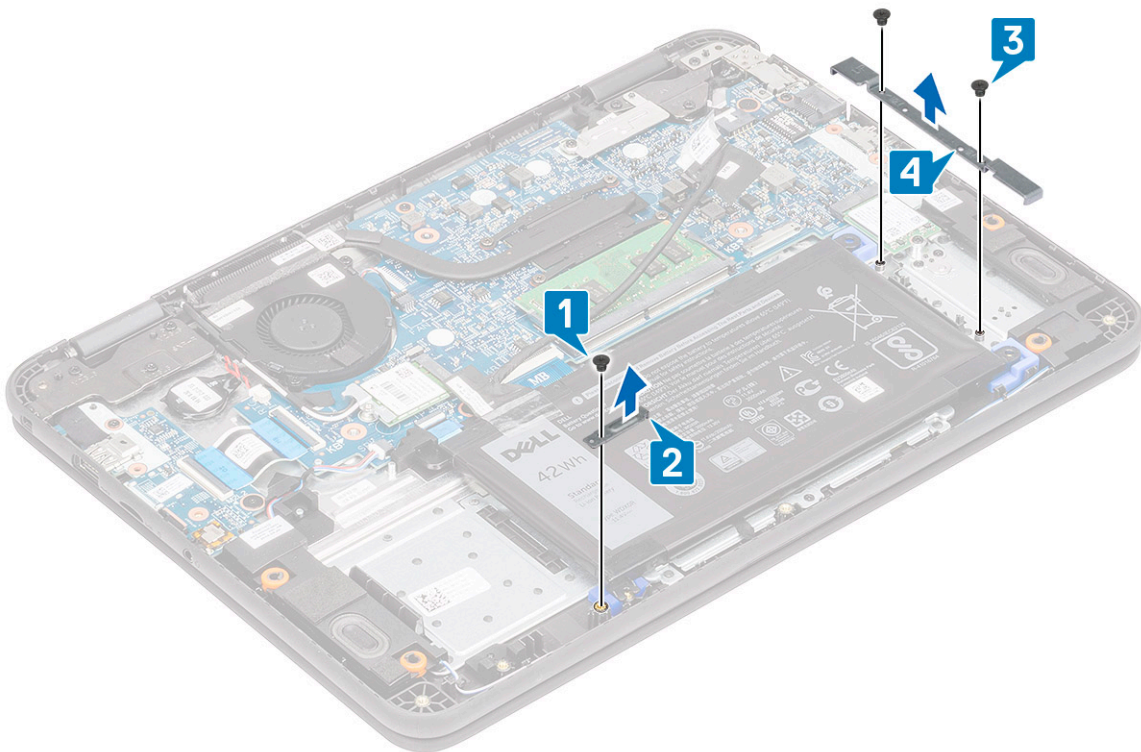
Battery

Removing the battery

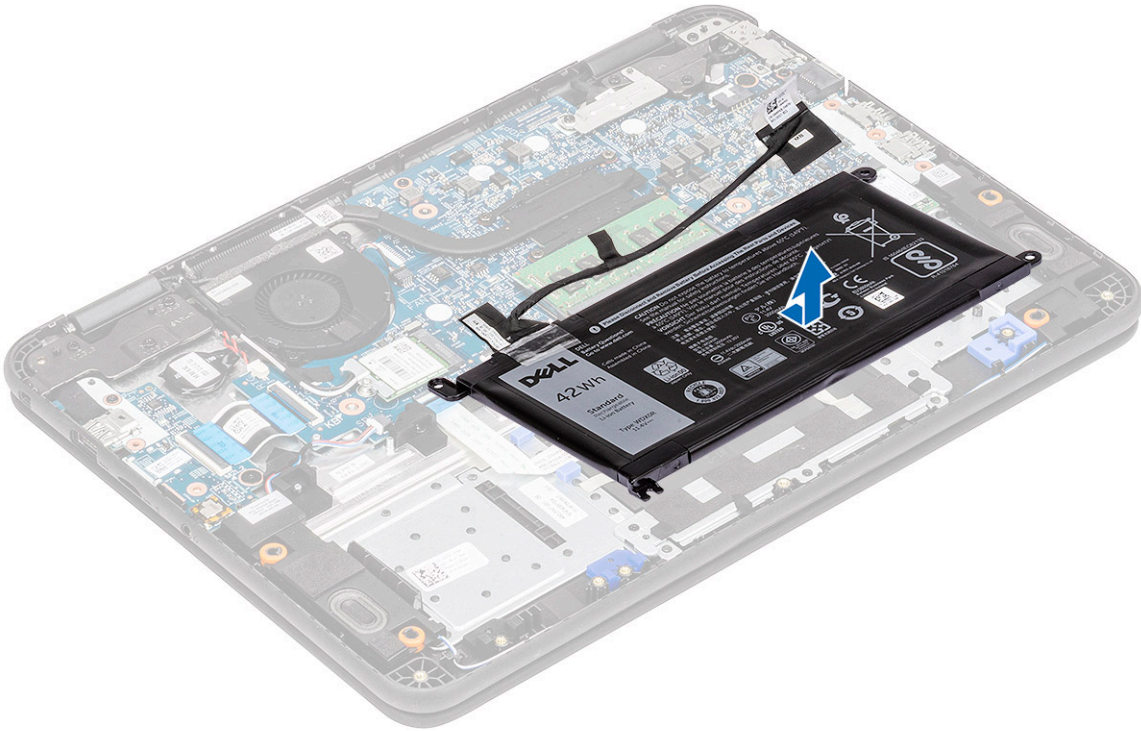
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
- 3 Peel off the tape [1] and disconnect the battery cable from the system board [2].
- 4 Peel off the piece of tape [3] on the memory module bracket and unroute the battery cable.



- 5 Remove the single M2.0x3.0 screw [1] and remove the metallic bracket [2] retaining battery to the palmrest.
- 6 Remove the two M2.0x3.0 screws [3] and separate the battery support bracket [4] from the palmrest.



- 7 Lift the battery away from the computer.



- 8 Peel off the tape [1] and disconnect the battery cable from the battery [2].

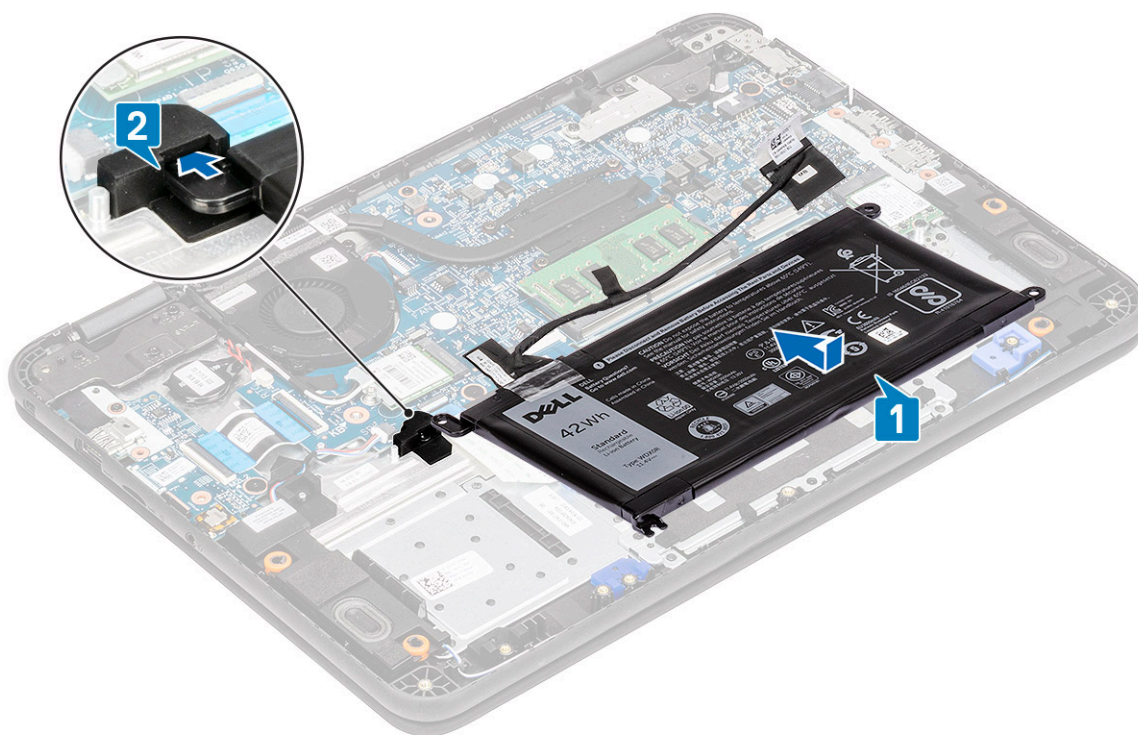


Installing the battery

- 1 Install the battery cable on the battery [1] and secure it using a piece of tape [2].

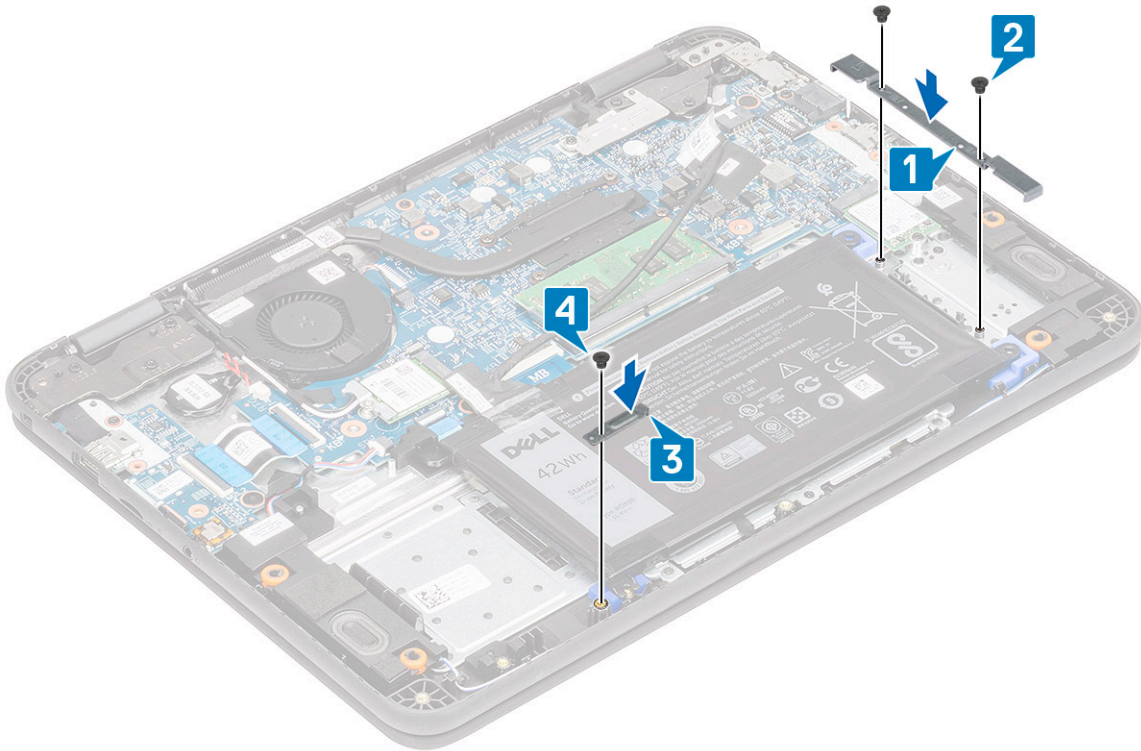


2 Insert the battery into the slot on the computer [1] and align the battery and the screw hole on the palmrest [2].

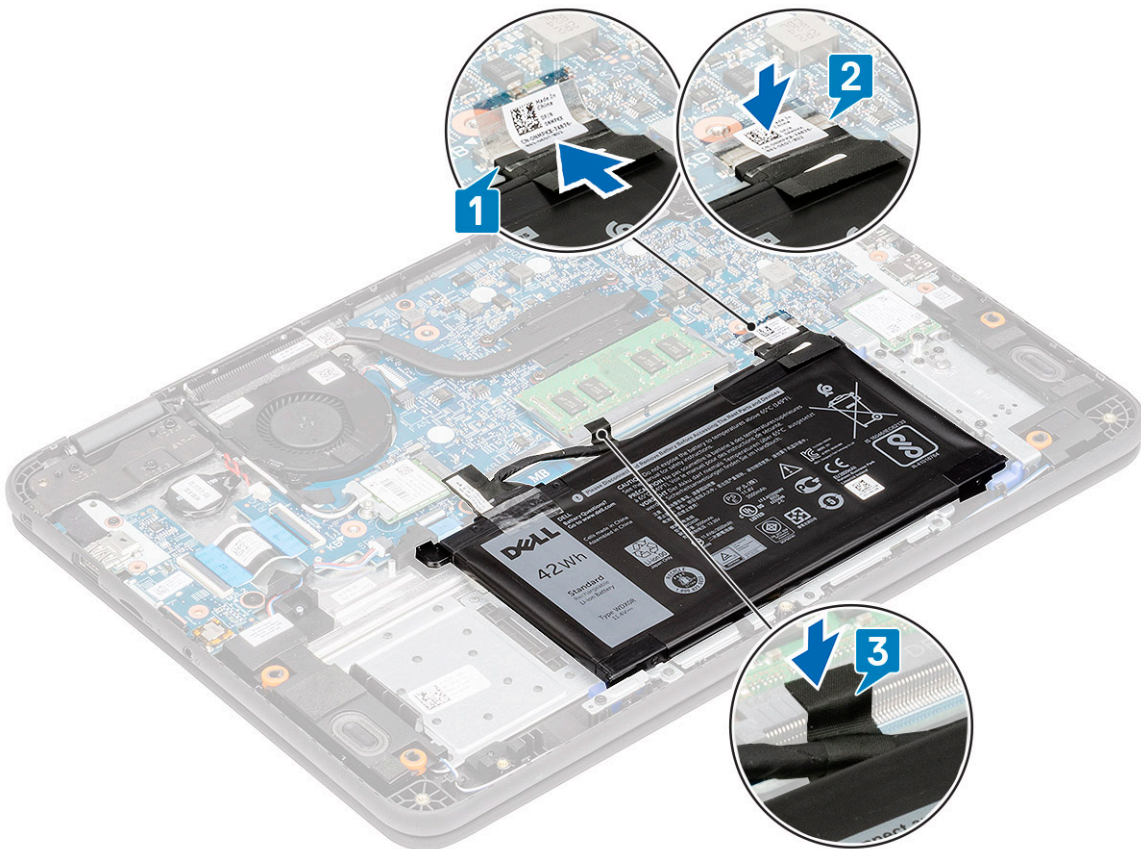


3 Install the battery support bracket [1] and install the two M2.0xL3 securing the battery to the palmrest [2].

4 Install the metallic bracket [3] and the single M2.0xL3 screw to retain the battery [4] to the palmrest.



- 5 Connect the battery cable to the system board [1] and secure it using a piece of tape [2].
- 6 Route the battery cable along the memory module bracket and secure it using a piece of tape [3].



- 7 Install the:
 - a [micro-SD card](#)

b base cover

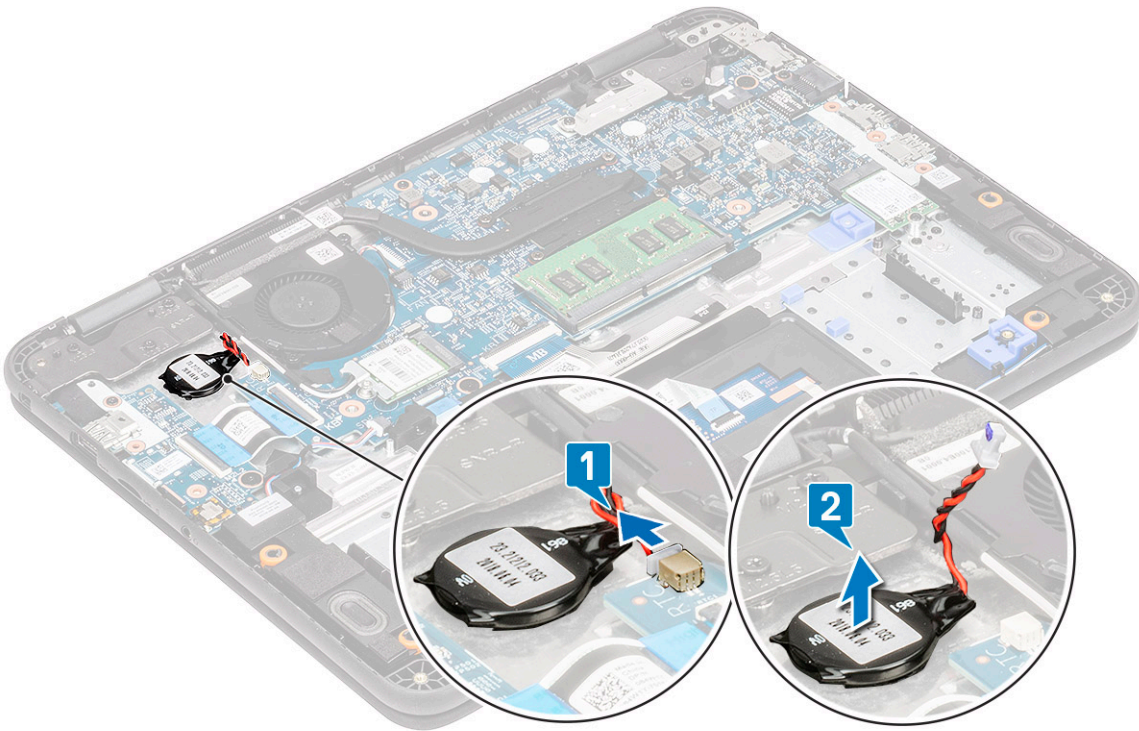
8 Follow the procedure in [After working inside your computer](#).

Coin Cell

Removing the coin cell

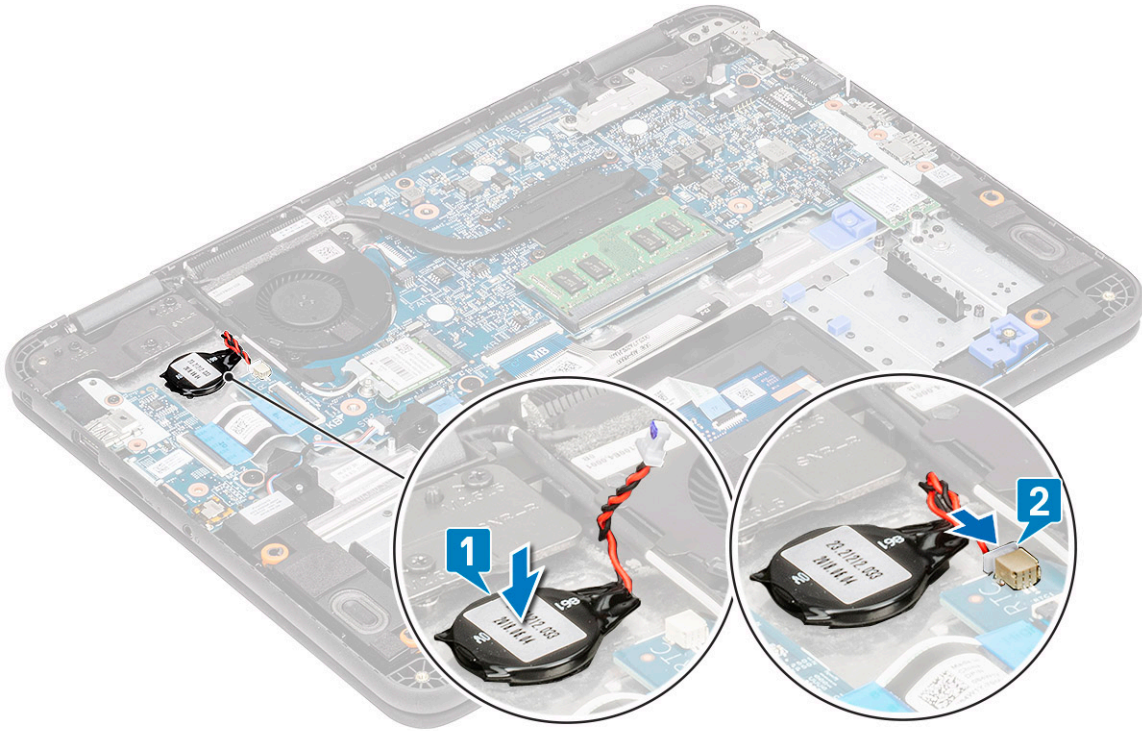
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
- 3 Disconnect the battery cable from its connector on the system board [1].
- 4 Lift and remove the coin cell from the system [2].

NOTE: A strong adhesive is used on the coin cell; a bit of force is needed to peel up the battery from the palmrest.



Installing the coin cell

- 1 Place the coin cell battery into the system.
- 2 Connect the coin cell battery cable to the connector on the system board.

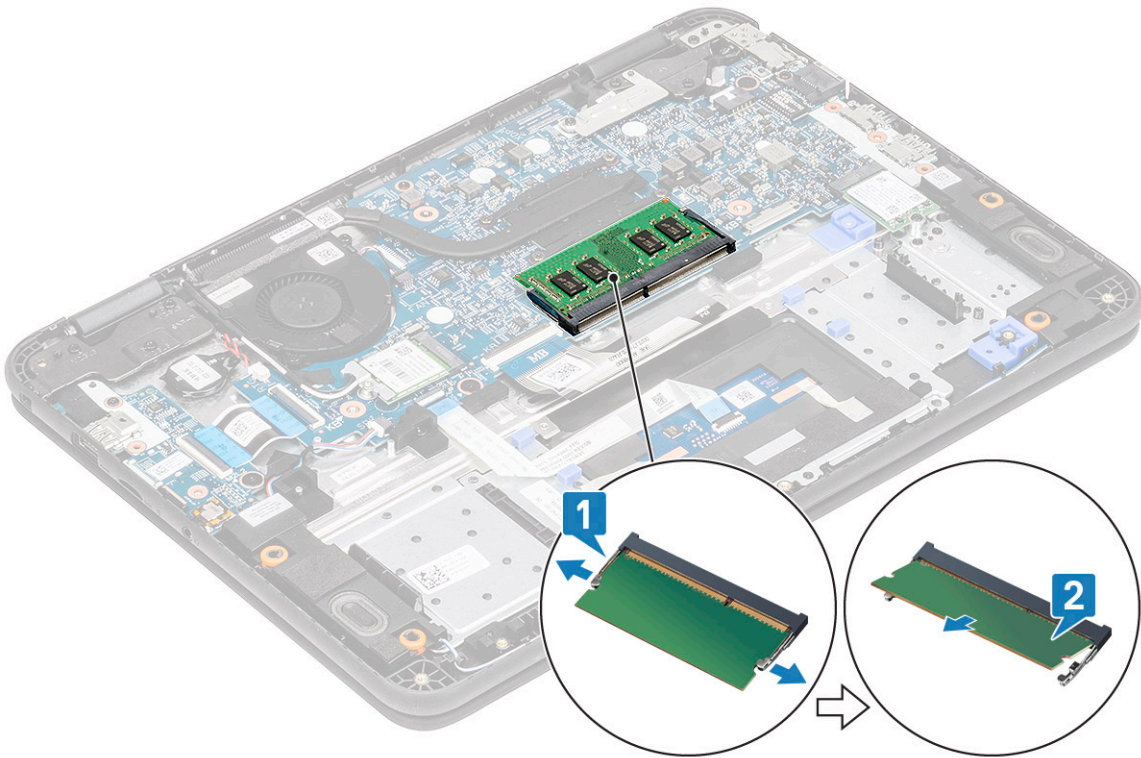


- 3 Install the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 4 Follow the procedure in [After working inside your computer](#).

Memory Module

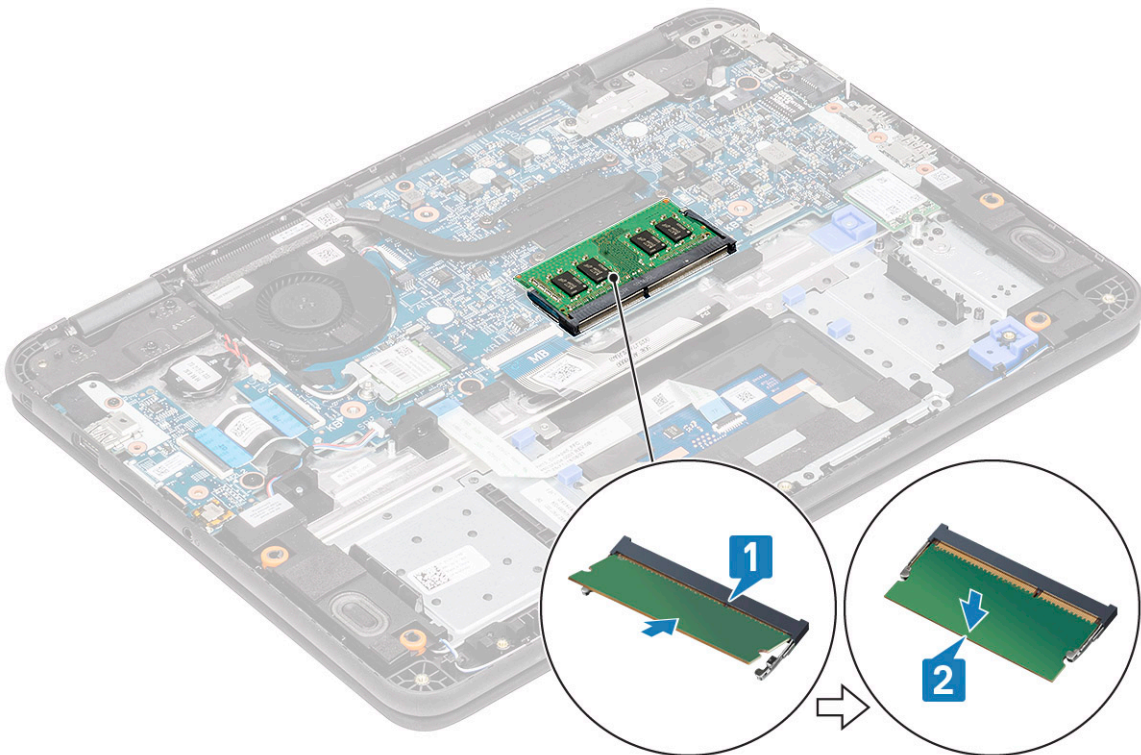
Removing the memory module

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 3 Pry apart the memory module latches [1].
- 4 Lift and remove the memory module from the system board [2].



Installing the memory module

- 1 Insert the memory module at an acute angle into the connector on the system board [1].
- 2 Gently push the memory module until the latches snap it into place [2].



- 3 Install the:

- a micro-SD card
 - b base cover
 - c battery
- 4 Follow the procedure in [After working inside your computer](#).

Solid state drive (SSD)

Removing the SSD

- 1 **NOTE:** This system has option to fit two form factors (M.2 2242 and M.2 2230) SSD / eMMC cards. This is achieved by removing, inverting and, installing the extender to alternate location as marked on the palmrest.

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

- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
- 3 Remove the single M2xL4 screw securing the SSD on the extender [1].
- 4 Remove the SSD from the M.2 slot on the system board [2].

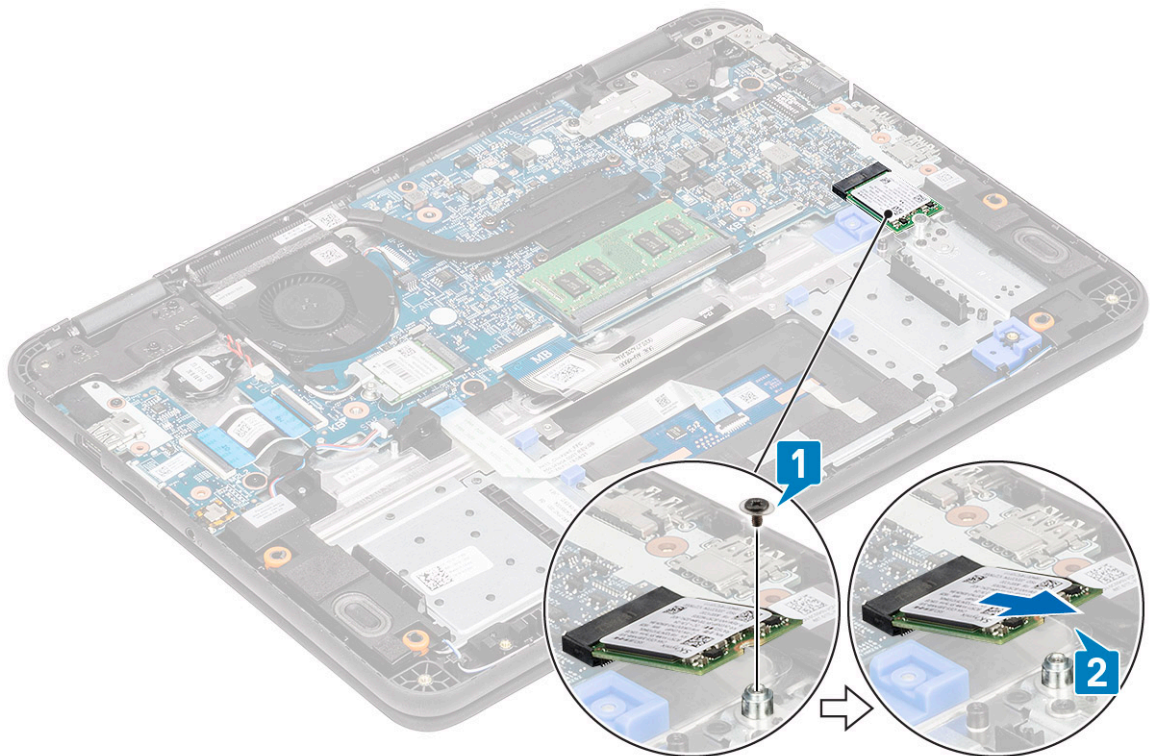


Figure 12. M.2 2230 SSD

Installing the SSD

- 1 Install the SSD in the M.2 bracket [1] and secure it using the single M2xL4 screw [2] securing it to the extender.

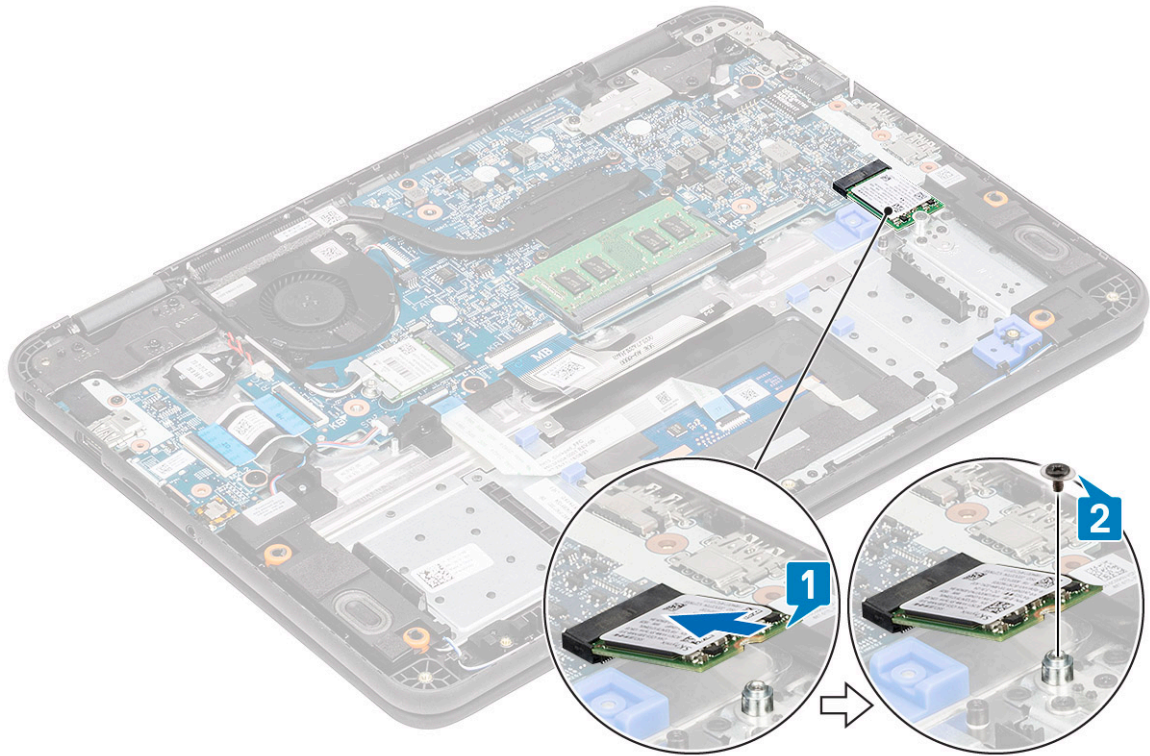



Figure 13. M.2 2230 SSD

- 2 Install the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 3 Follow the procedure in [After working inside your computer](#).

SSD bracket

Removing the SSD bracket

- 1  **NOTE:** This system has option to fit two form factors (M.2 2242 and M.2 2230) SSD / eMMC cards.

Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
 - d [SSD](#)
- 3 Remove the two M2xL3 screw securing the SSD bracket on the palmrest [1].
- 4 Remove the SSD bracket from the palmrest [2].

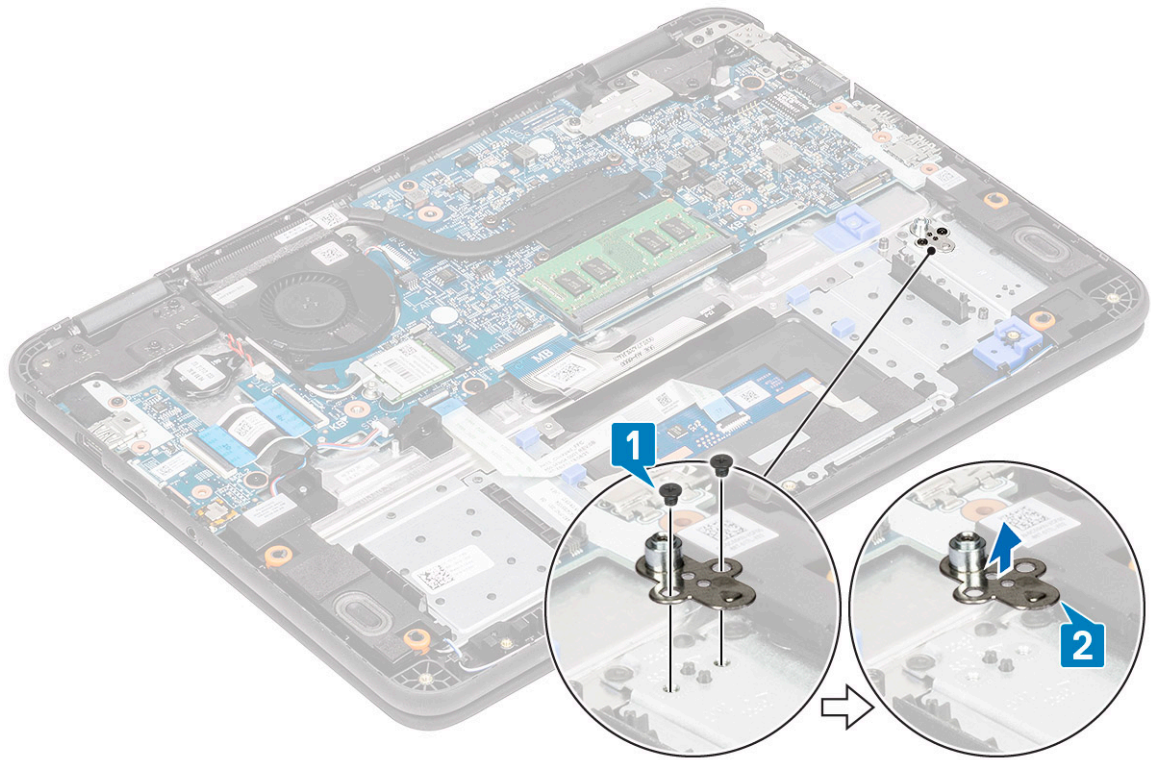


Figure 14. M.2 2230 SSD

Installing the SSD bracket

- 1 Install the SSD bracket in the palmrest [1].
- 2 Install the two M2xL3 screws securing the SSD bracket to the palmrest [2].

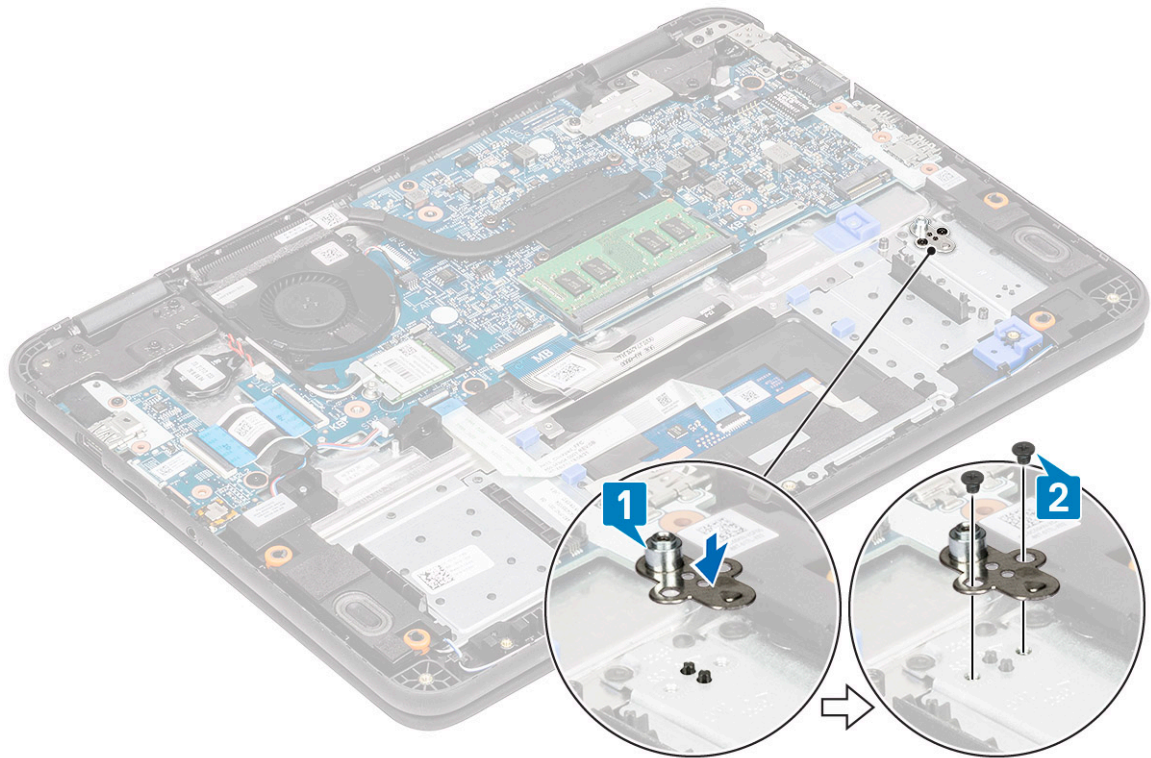


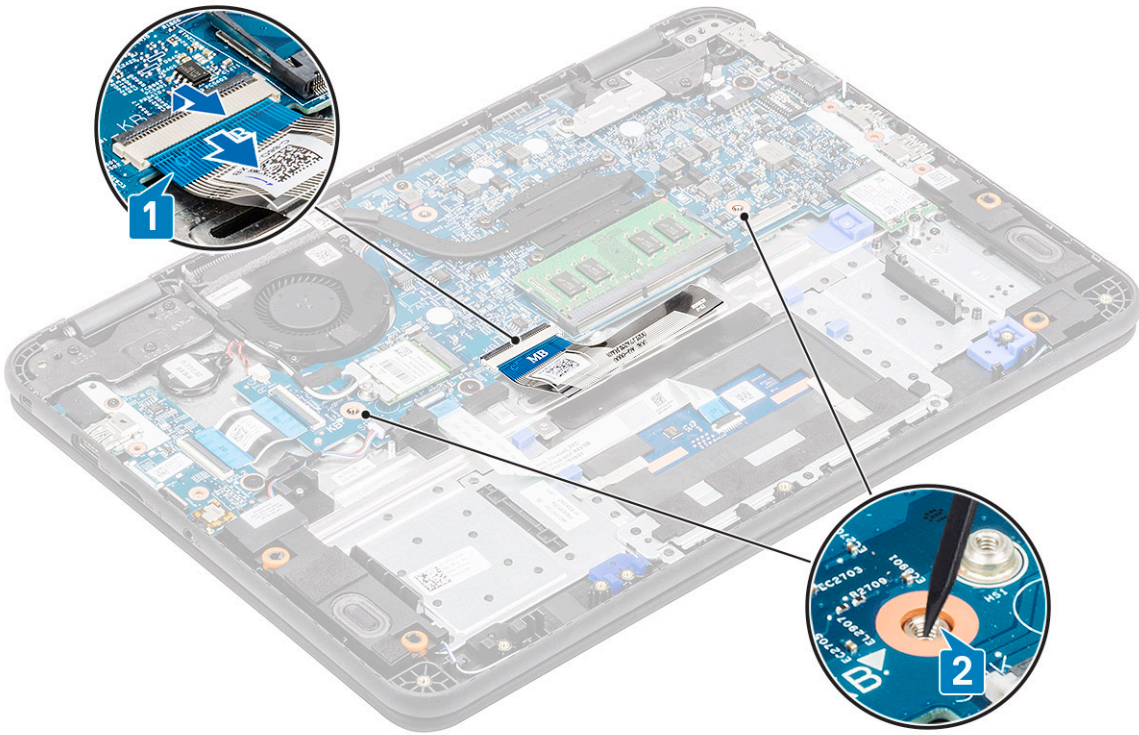
Figure 15. M.2 2230 SSD

- 3 Install the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
 - d [SSD](#)
- 4 Follow the procedure in [After working inside your computer](#).

Keyboard

Removing the keyboard

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 3 Disconnect the keyboard cable from the system board [1].
- 4 Hold the sides of the palm rest securely while pushing into the two release holes using a plastic scribe [2].



① **NOTE:** It takes some force to push out the keyboard through the two release holes. Exercise due caution.

① **NOTE:** Picture for representational purpose to show exact location of keyboard latches. It is not necessary to remove the heat sink, hard drive, or system board to access the keyboard release holes.

5 Gently pry up the lower edge of the keyboard from the computer.



- 6 Gently remove the keyboard cable from underneath the keyboard.



① | NOTE: Unroute the keyboard cable from the touch pad bracket before proceeding.

- 7 Slide the keyboard towards the touch pad [1] and lift it up [2] to remove it from the computer.



Installing the keyboard

- 1 Install the keyboard on the computer [1] and slide in the retention tabs in the holes on the palmrest [2].



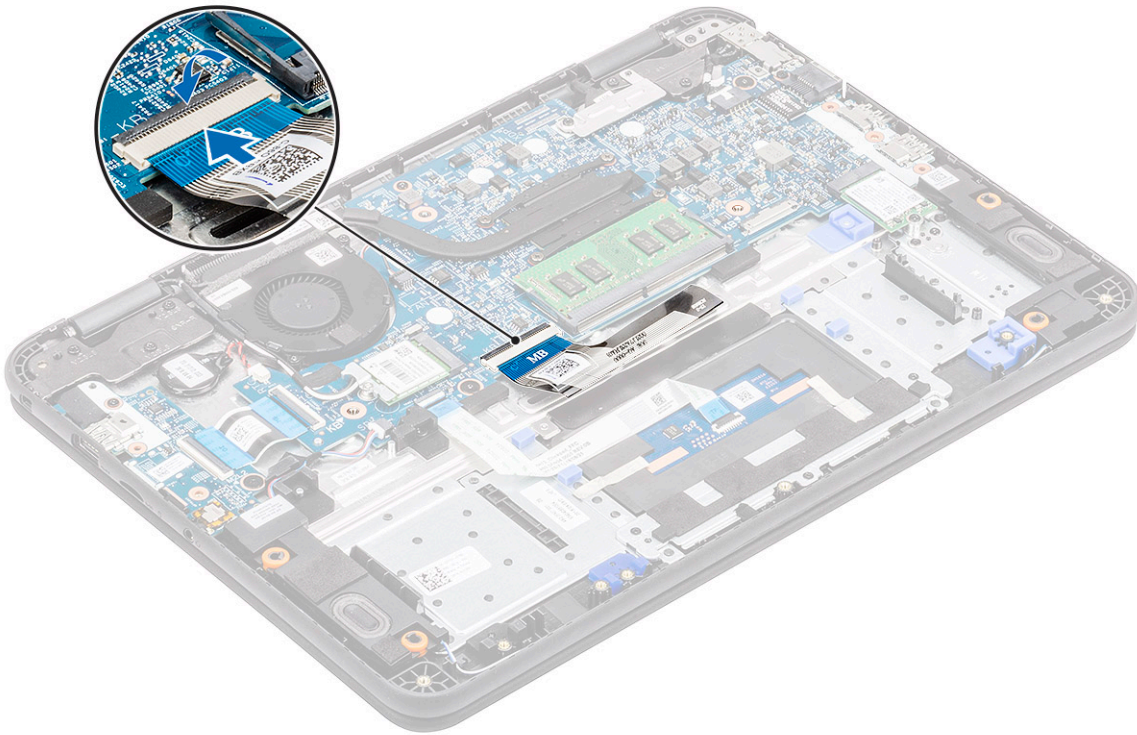
- 2 Tuck in the keyboard cable and route it along the touch pad bracket.



- 3 Press the keyboard until it clicks in place.



- 4 Insert the keyboard cable in its connector on the system board.



① **NOTE:** Keyboard cable must be inserted parallel to the connector.

① **NOTE:** Remove the anti adhesive paper on the keyboard before inserting the cable.

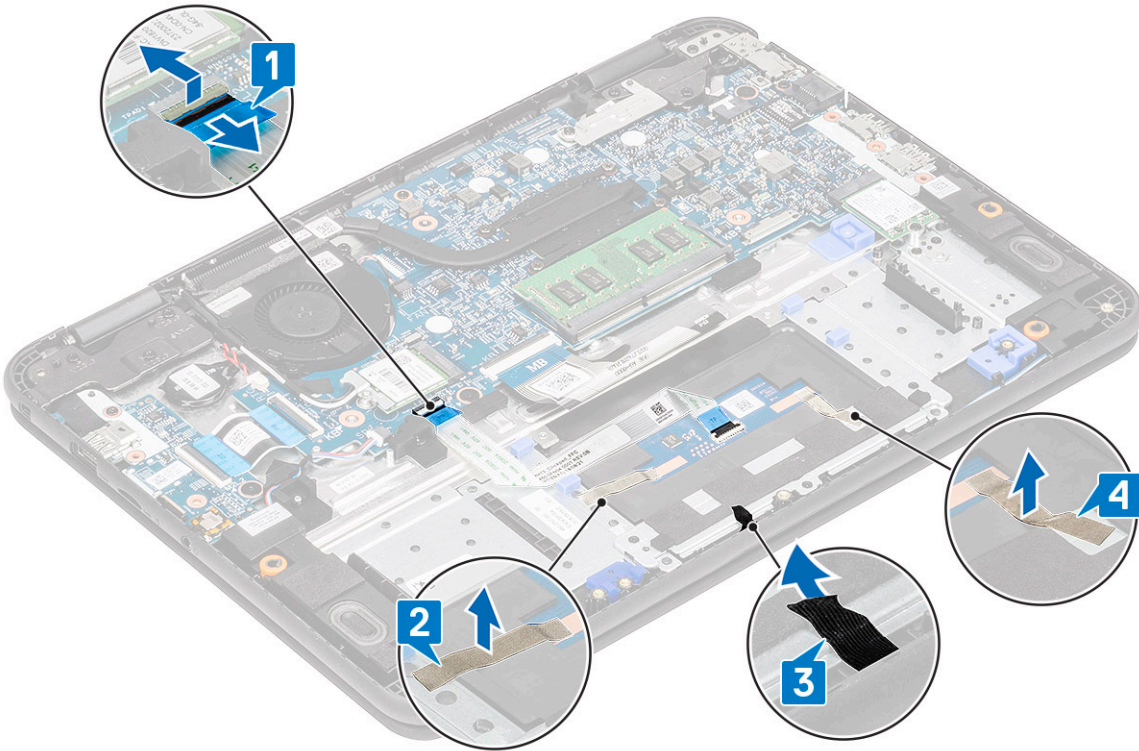
① **NOTE:** After the cable is inserted, the operator must hold the cable with left and press the actuator down by the right hand to avoid cable loosening.

- 5 Install the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 6 Follow the procedure in [After working inside your computer](#).

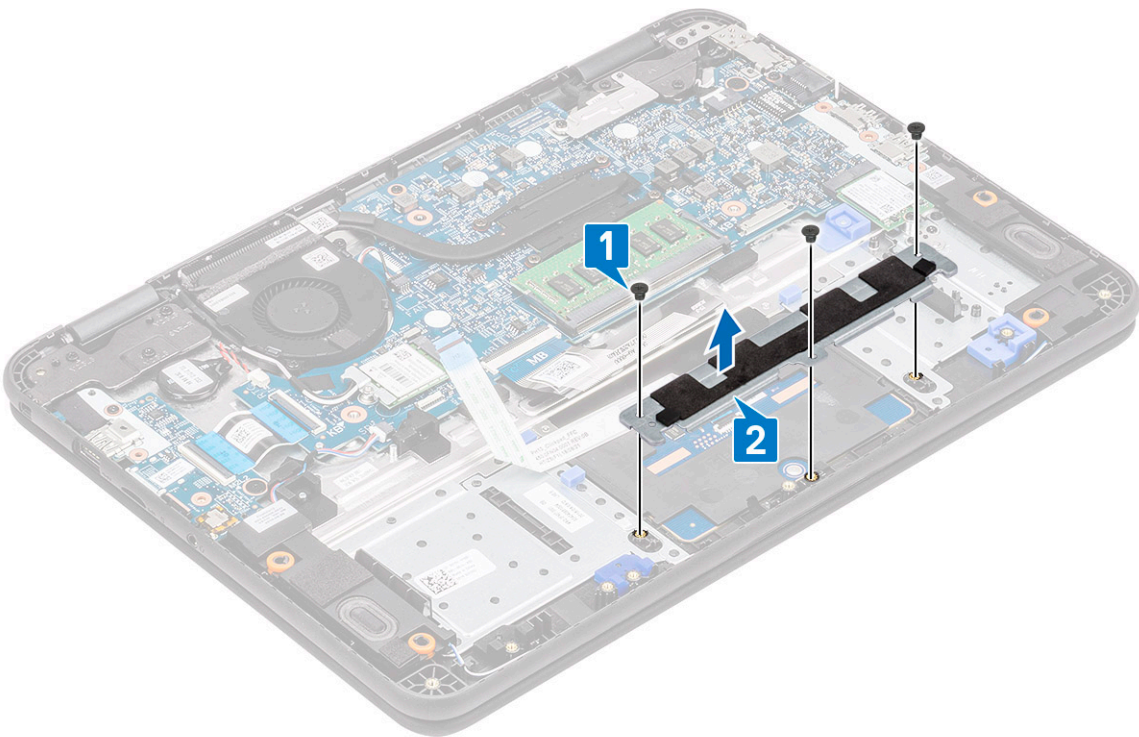
Touch pad

Removing the touch pad

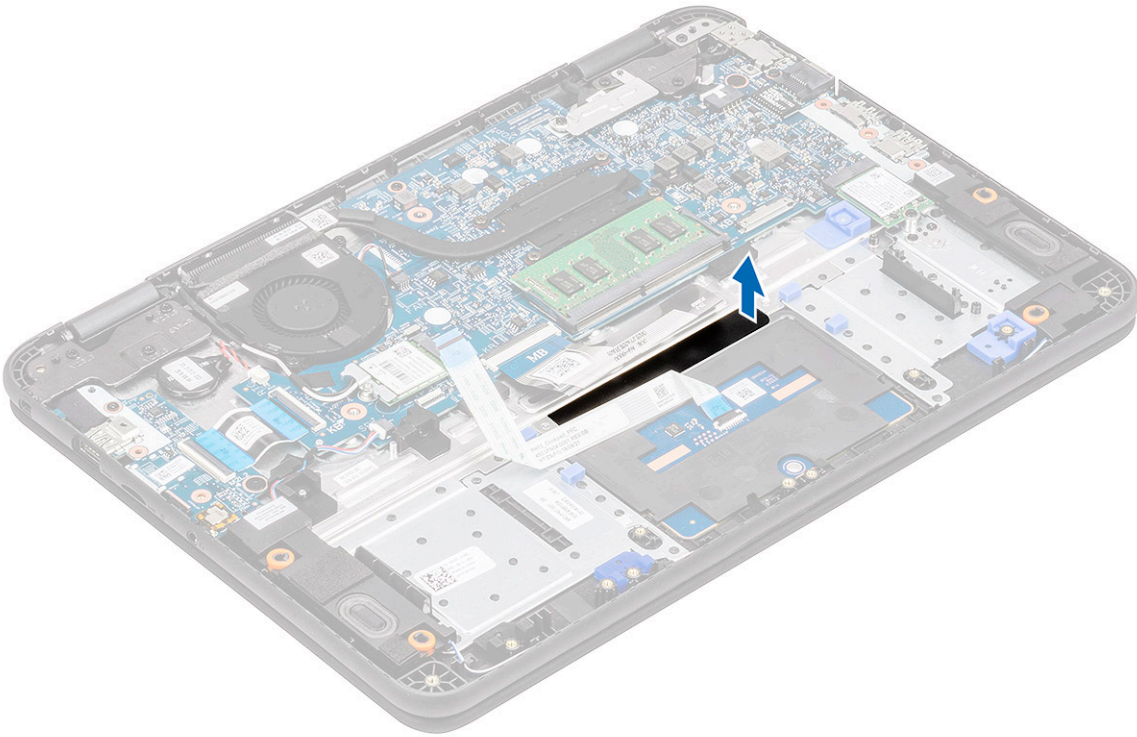
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 3 Lift the actuator and disconnect the touch pad cable from the system board [1].
- 4 Remove the tape [2,3,4] securing the touch pad to the chassis.



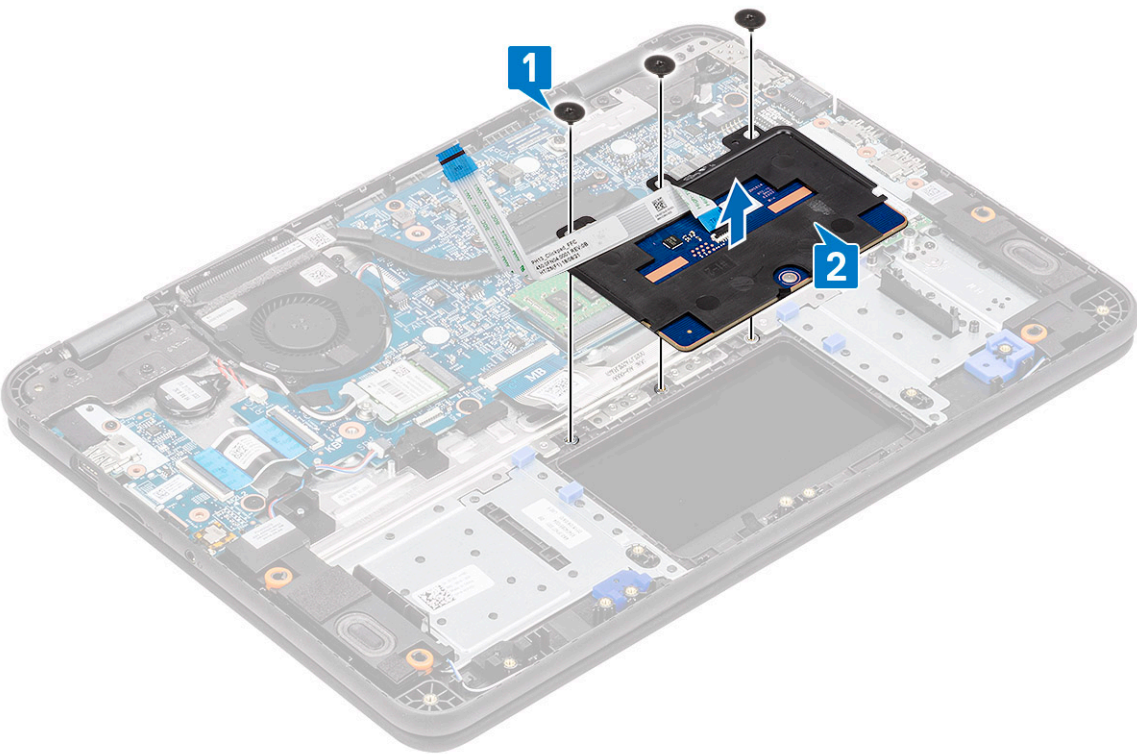
5 Remove the three M2xL3 screws [1] that secure the metal bracket to the touch pad on the computer.



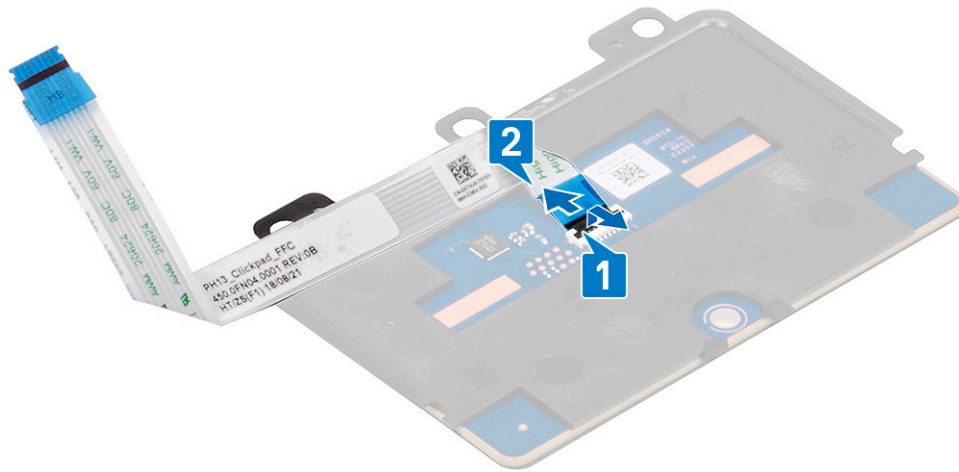
6 Peel off the tape from the touch pad.



- 7 Remove the M2xL3 screws (large head) [1] that secure the touch pad to the system and then lift the touch pad from the system [2].

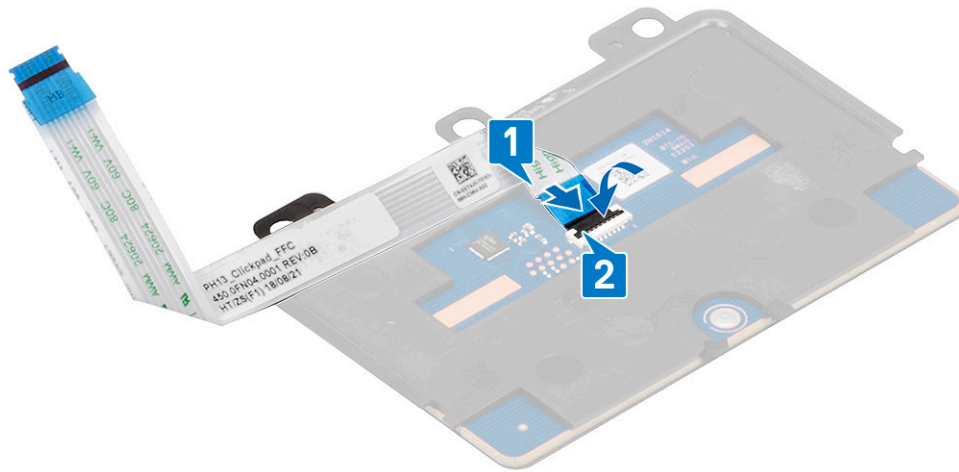


- 8 Lift the actuator [1] and remove the touch pad FFC cable [2] from the module.

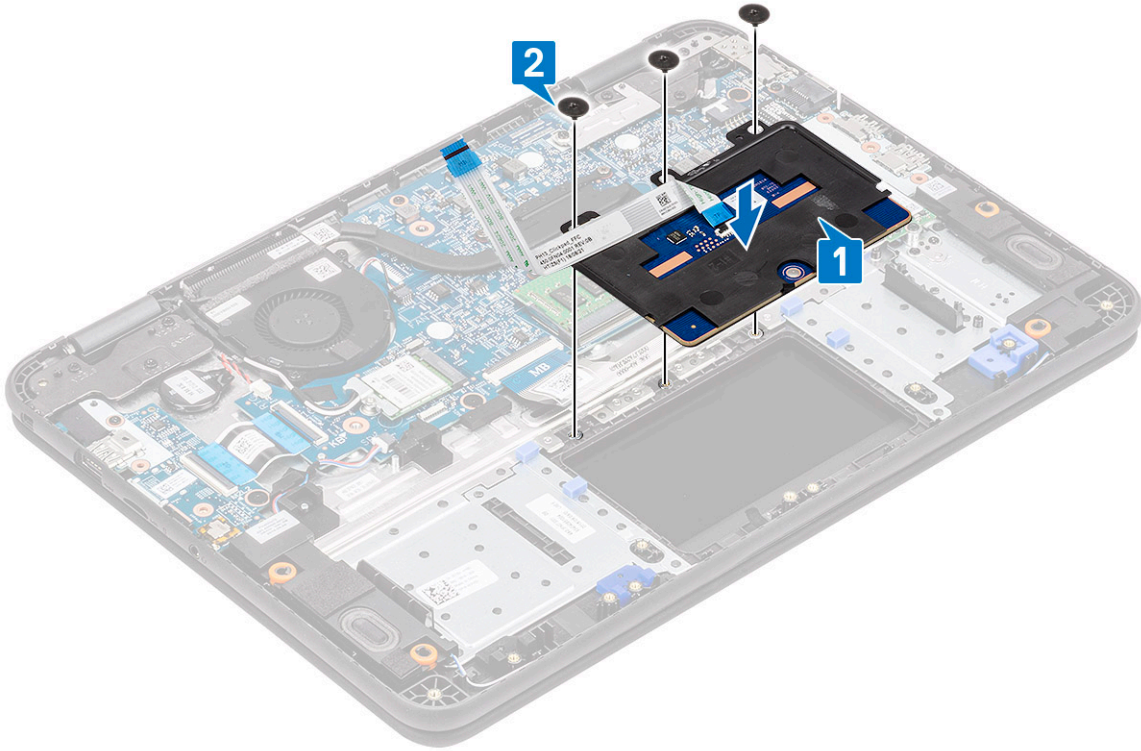


Installing the touch pad

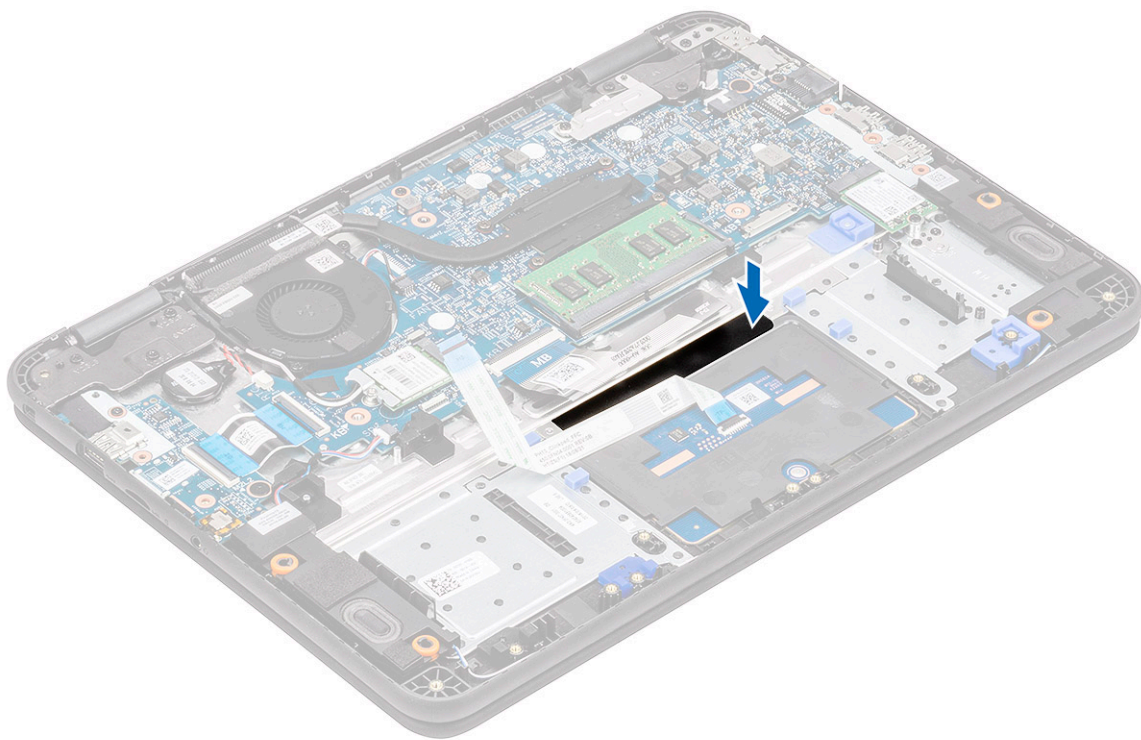
- 1 Install the touch pad FFC cable on its slot on the touch pad module [1] and close the actuator [2] to secure it.



- 2 Place the touch pad into the slots on the computer [1] and tighten the three M2xL3 screws [2] that secure the touch pad to the system.

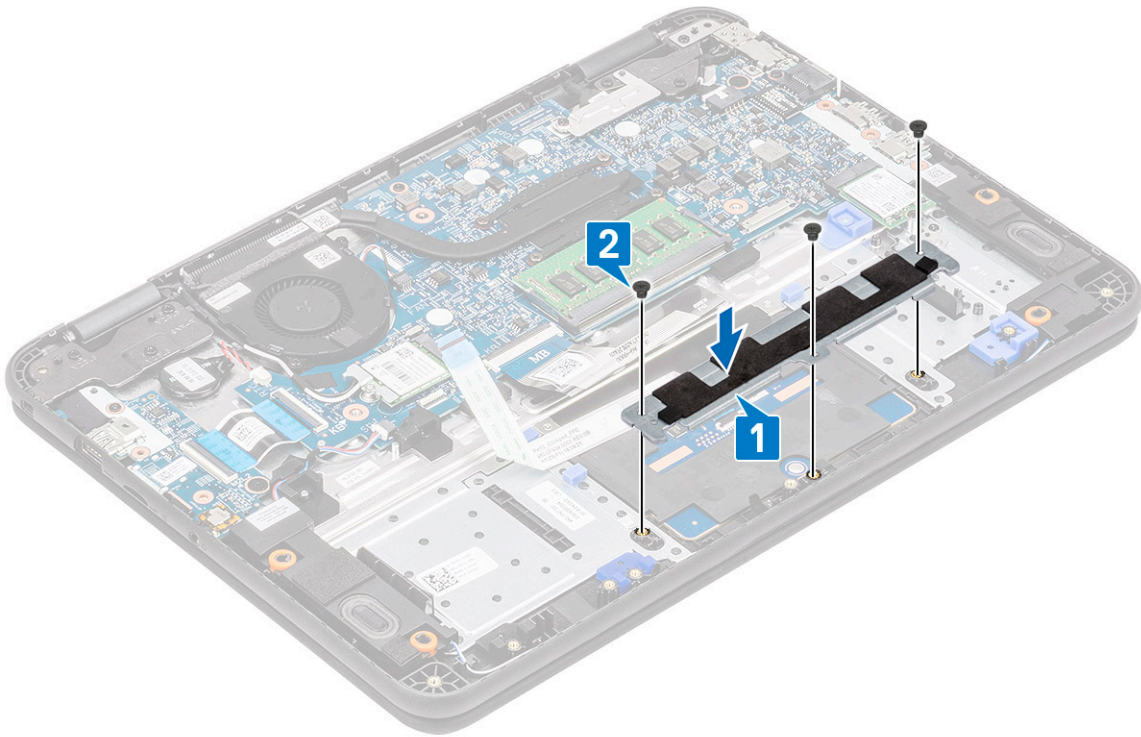


3 Secure the touch pad using a piece of tape.

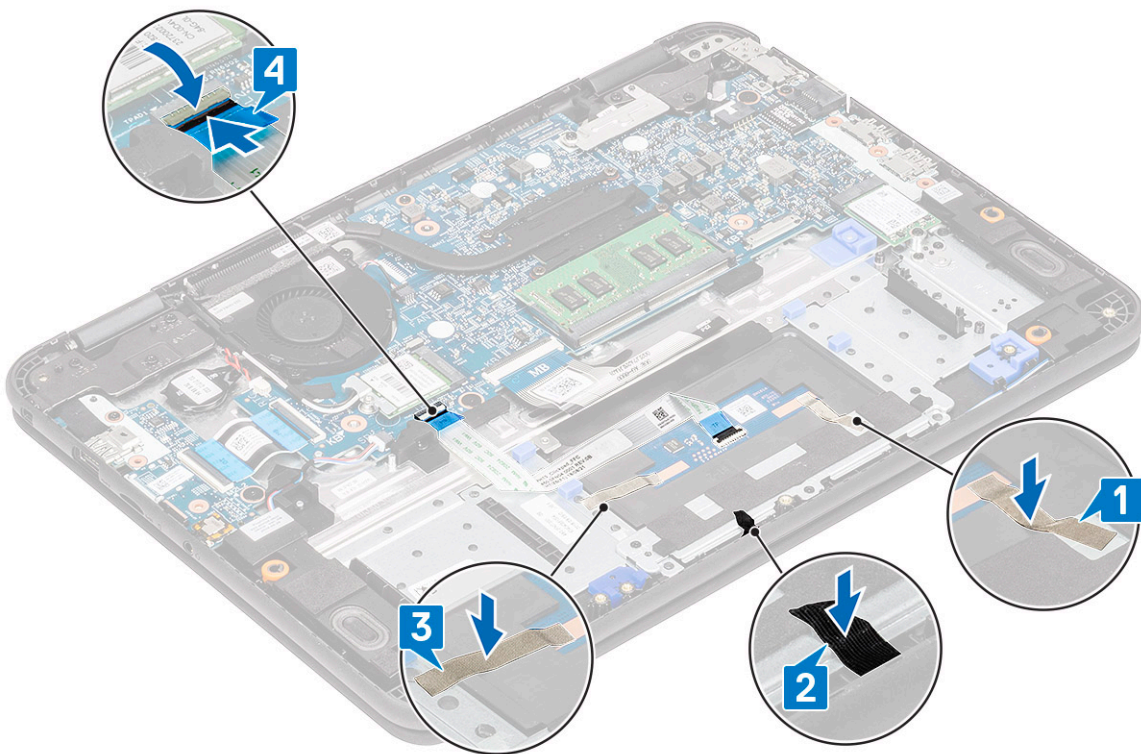


4 Affix the bottom bracket [1] that secures the touch pad to the computer.

5 Install the three M2xL3 screws [2] securing the touch pad to the system.



6 Affix the tapes [1,2,3] on the touch pad and connect the touch pad cable [4] to the connector on the system board.



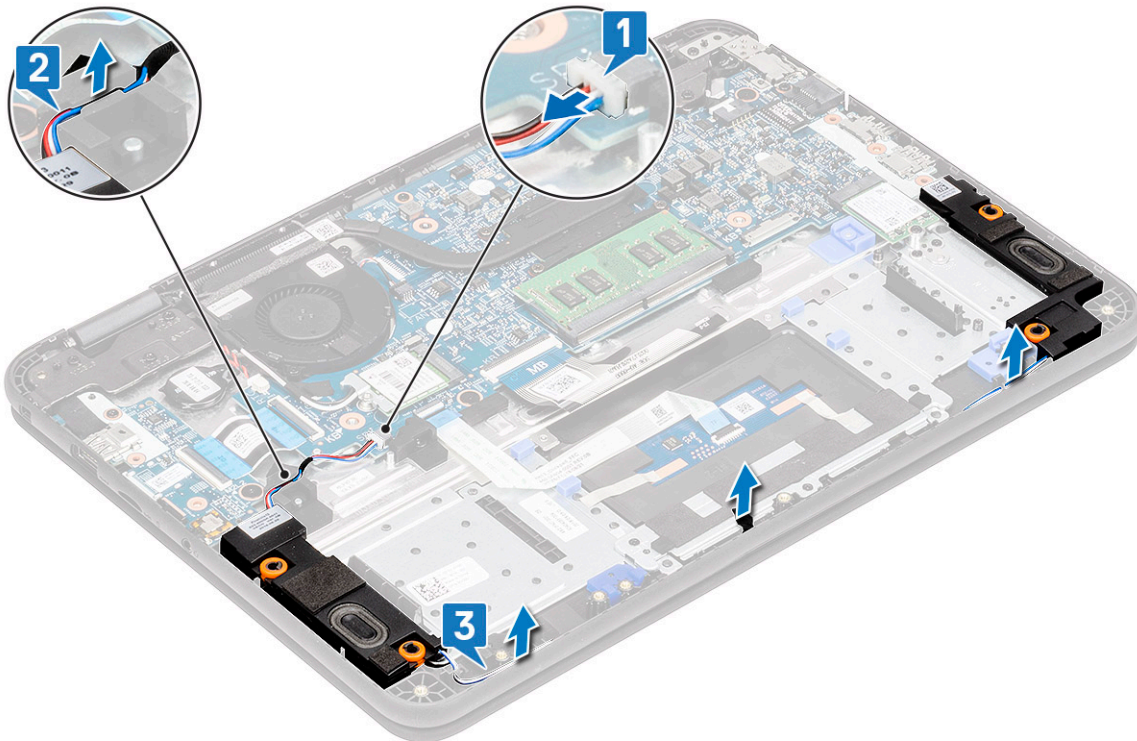
- 7 Install the:
- a battery
 - b base cover
 - c micro-SD card

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

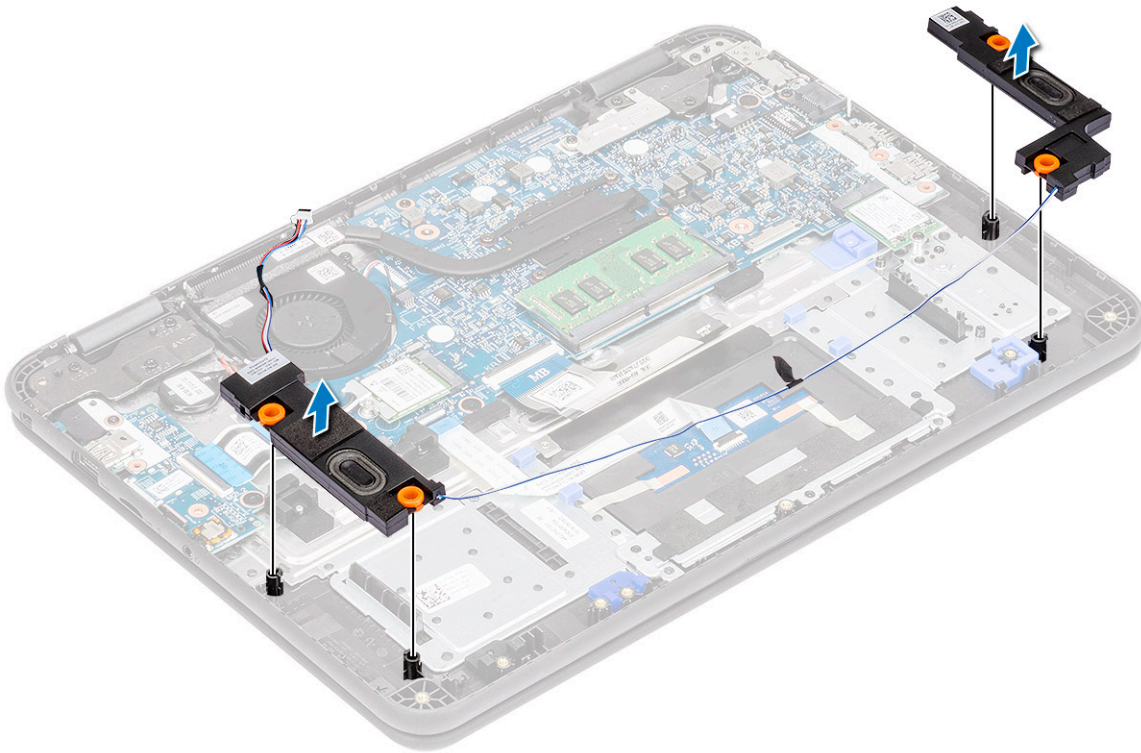
Speakers

Removing the speakers

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 3 Disconnect the speaker cable from the connector on the system board [1] and lift the speaker cable off from the cable guide [2].
- 4 Unroute the speaker cable from the routing channel [3] along the bottom of touch pad on the palmrest.

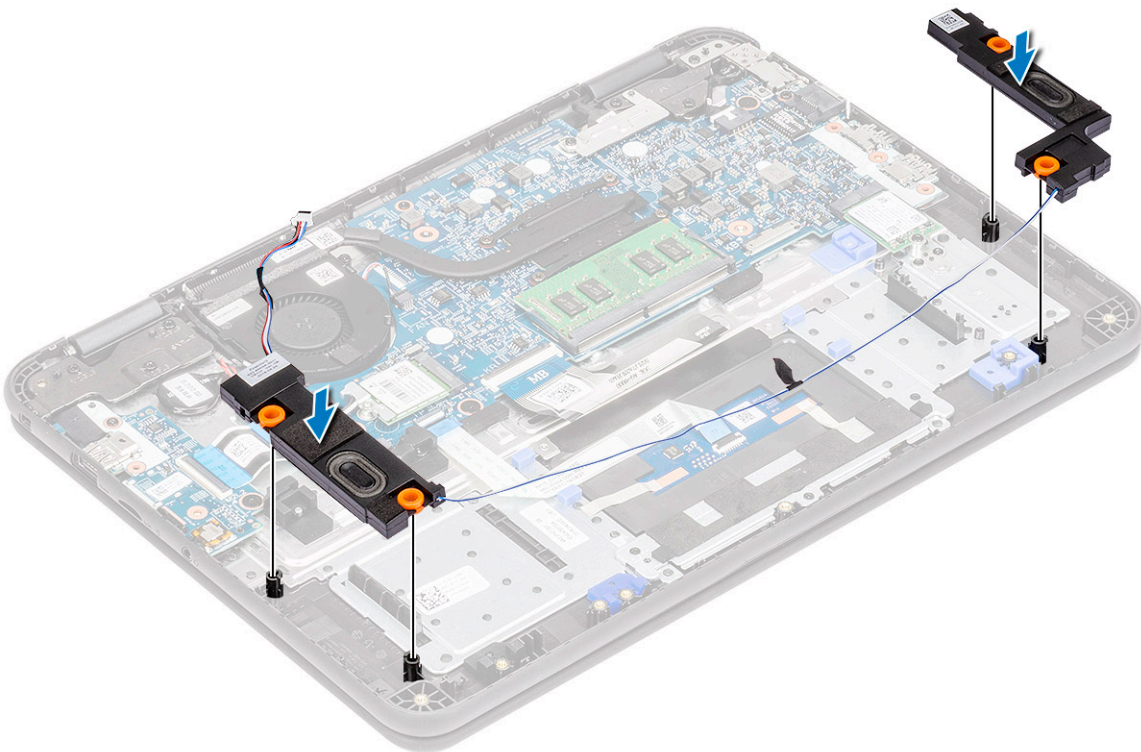


- 5 Remove the speakers along with the cable from the computer.

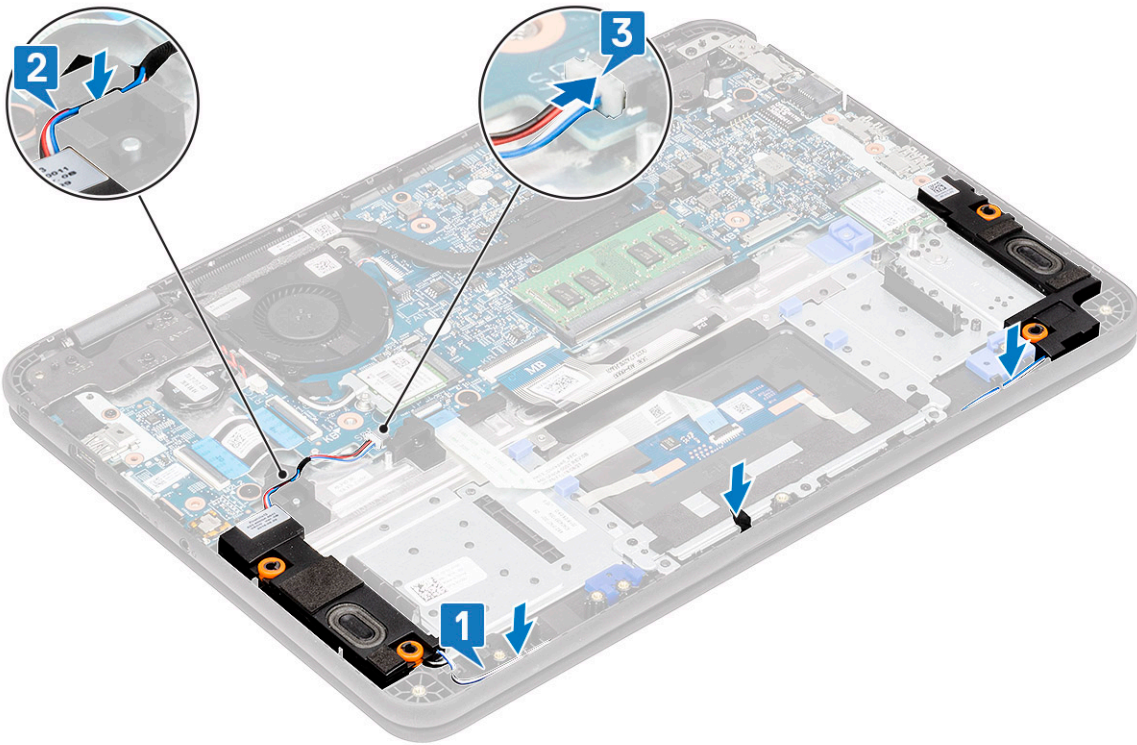


Installing the speakers

- 1 Place the speakers into the slots on the computer.




- 2 Route the speaker cable through the routing channel along the bottom of touch pad on the palmrest [1].
- 3 Route and secure the speaker cable into the cable guide [2] and connect the cable to the connector on the system board [3].

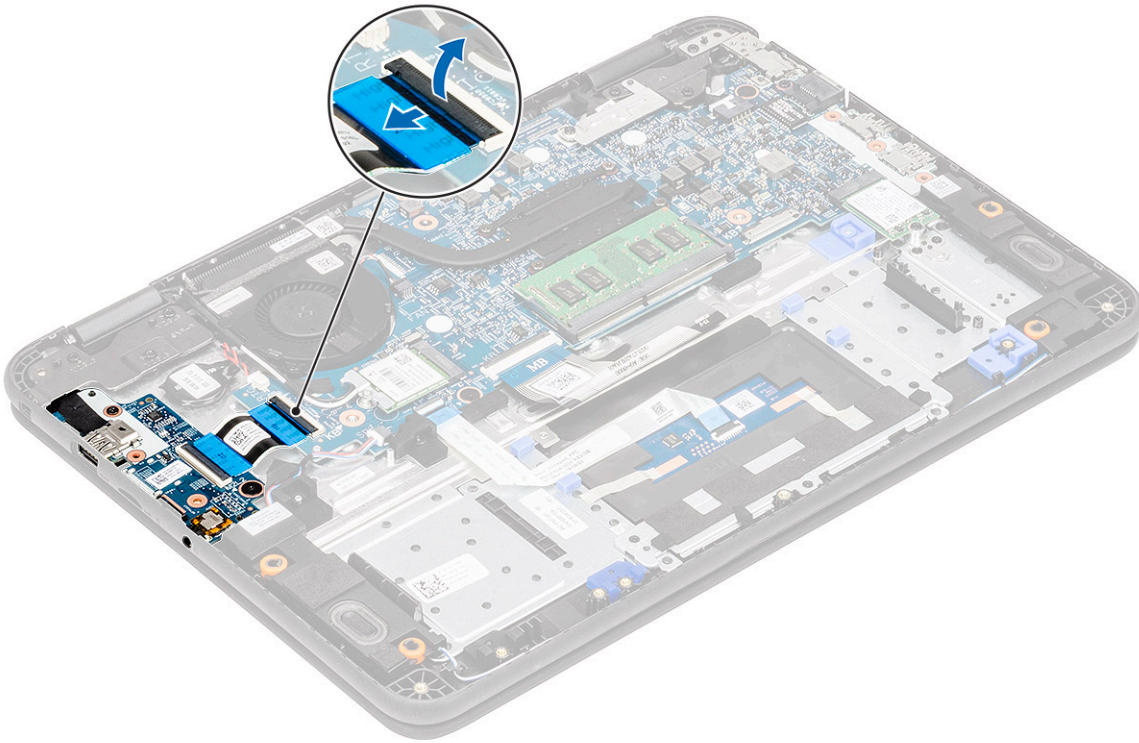


- 4 Install the:
 - a micro-SD card
 - b base cover
 - c battery
- 5 Follow the procedure in [After working inside your computer](#).

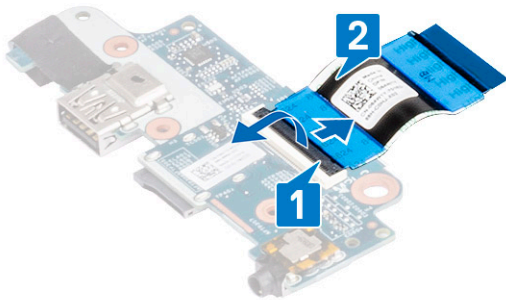
I-O Daughterboard

Removing the I-O daughterboard

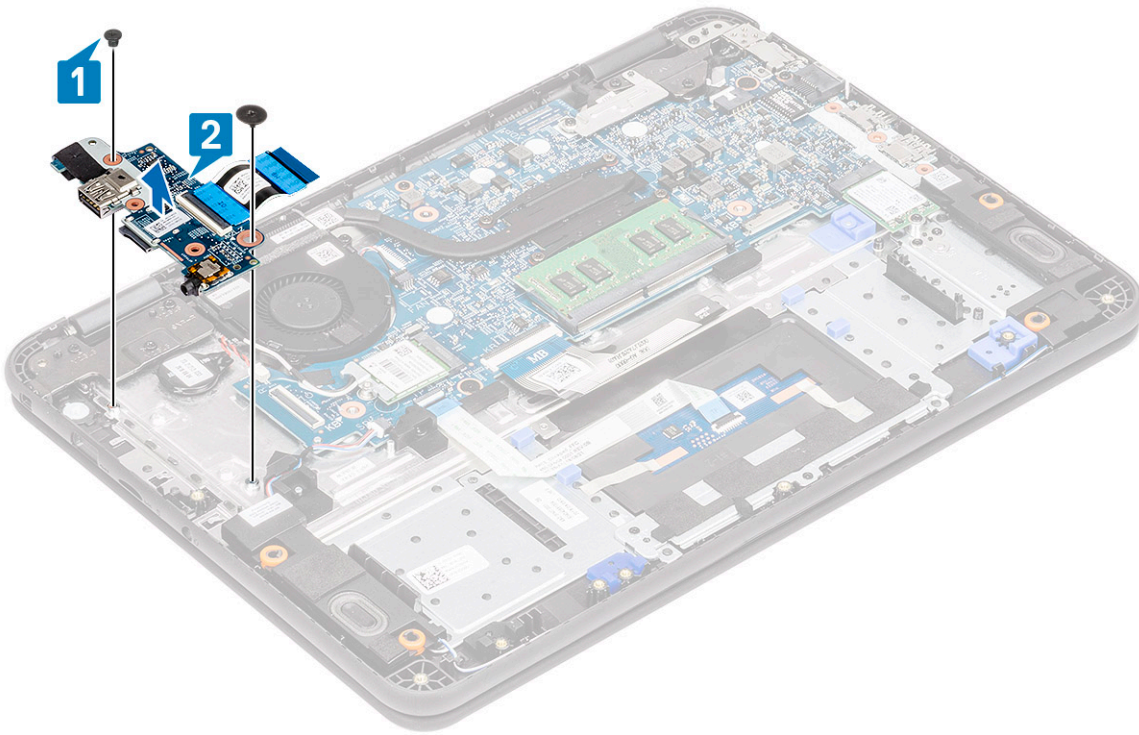
- 1  **NOTE: Power button is located on this PCB.**
Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
- 3 Disconnect the I/O daughterboard cable from its connector on the system board.



- 4 Open the actuator [1] and remove the FFC cable from the I/O board [2].

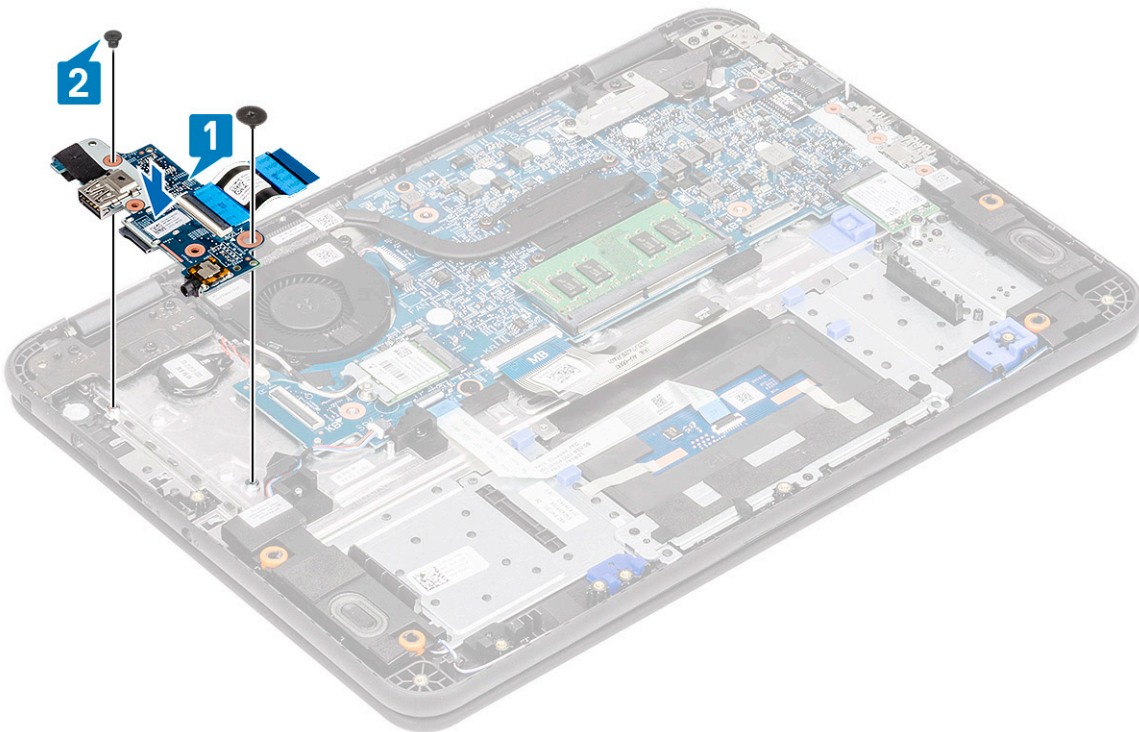


- 5 Remove the two M2xL3 screws that secures the I/O daughterboard to the system board [1].
- 6 Lift and remove the I/O daughterboard from the computer [2].

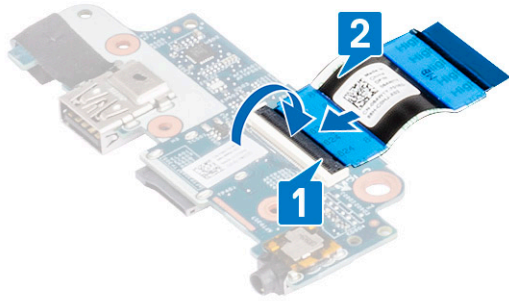


Installing the I-O daughterboard

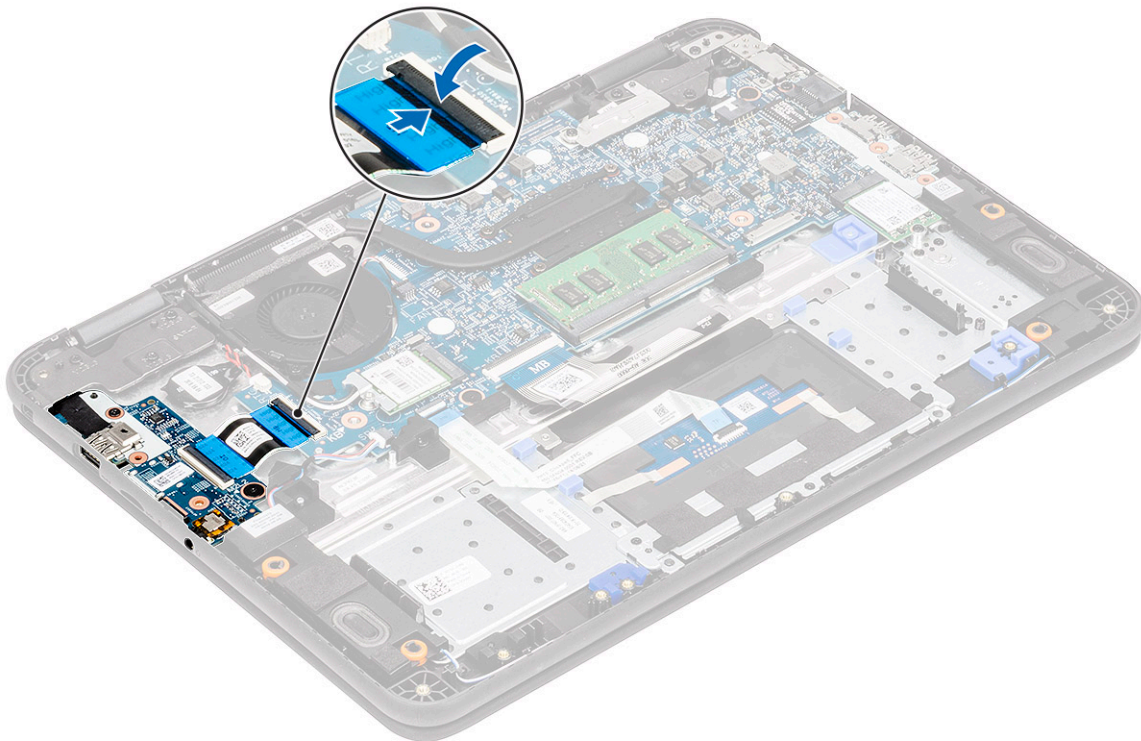
- 1 Place the I/O daughterboard in its place on the computer [1] and tighten the two M2xL3 screws that secures the I/O daughterboard to the system board [2].



- 2 Install the FFC cable in the I/O board [1] and flip close the actuator [2].



- 3 Connect the I/O daughterboard FFC cable to the system board.



- 4 Install the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
- 5 Follow the procedure in [After working inside your computer](#).

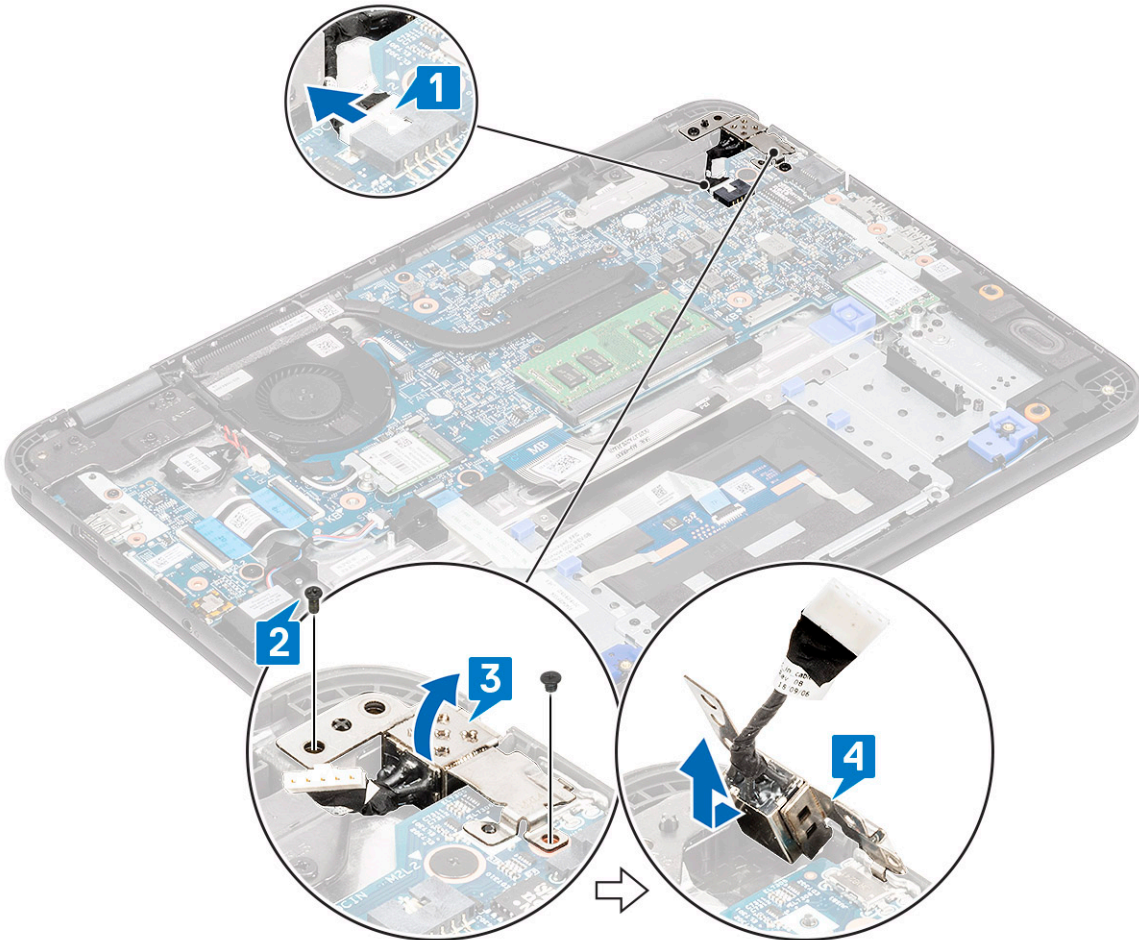
Dc-in cable

Removing the DC-in cable

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

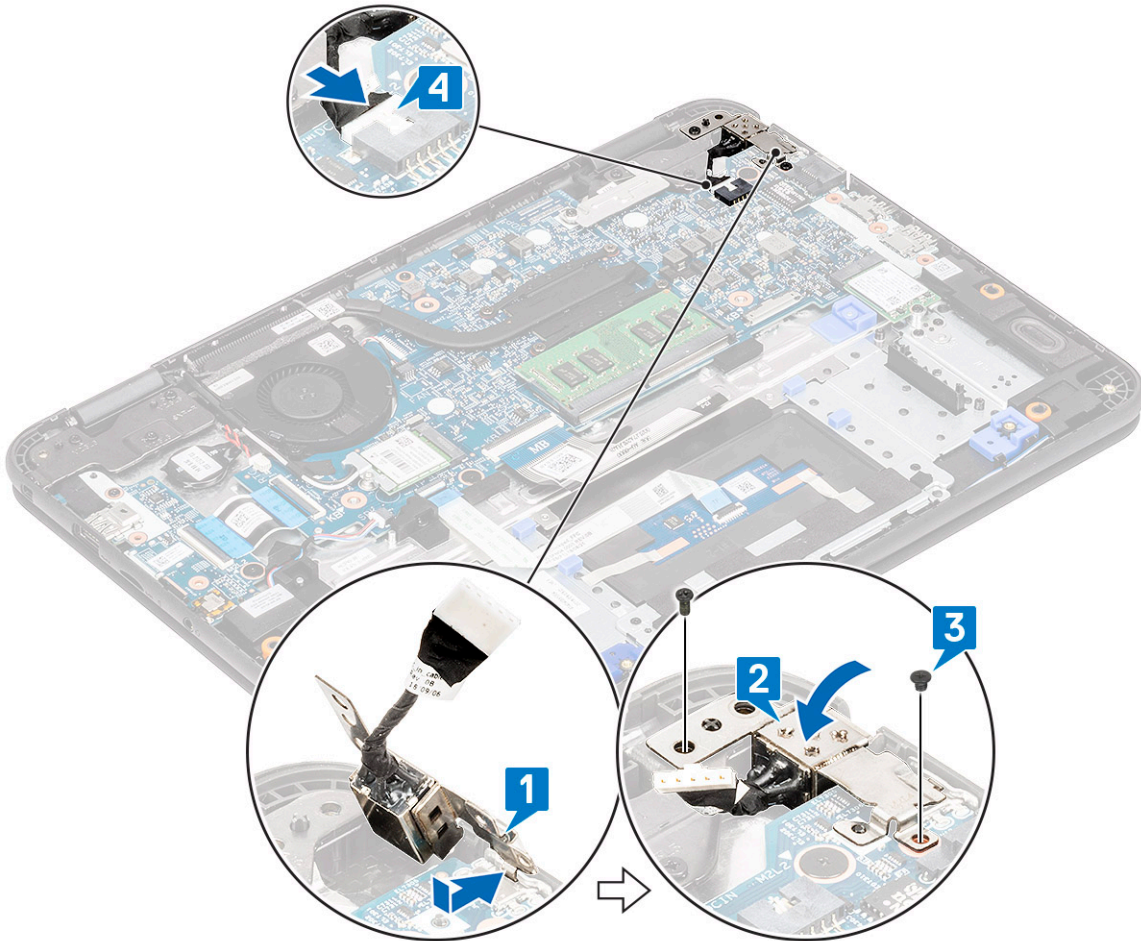
- a micro-SD card
- b base cover
- c battery

- 3 Disconnect the DC-in cable from its connector on the system board [1].
- 4 Remove the two M2L4 screws securing the DC-in port to the palmrest and the system board [2].
- 5 Flip over the metal bracket on the USB Type-C port of the system board [3].
- 6 Lift to remove the DC-in port from the computer [4].



Installing the DC-in cable

- 1 Install the DC-in port in the computer [1] placing the metal bracket on the USB Type-C port of the system board [2].
- 2 Tighten the two M2xL4 screw securing the DC-in to the motherboard and palmrest [3].
- 3 Connect the DC-in cable to the system board [4].

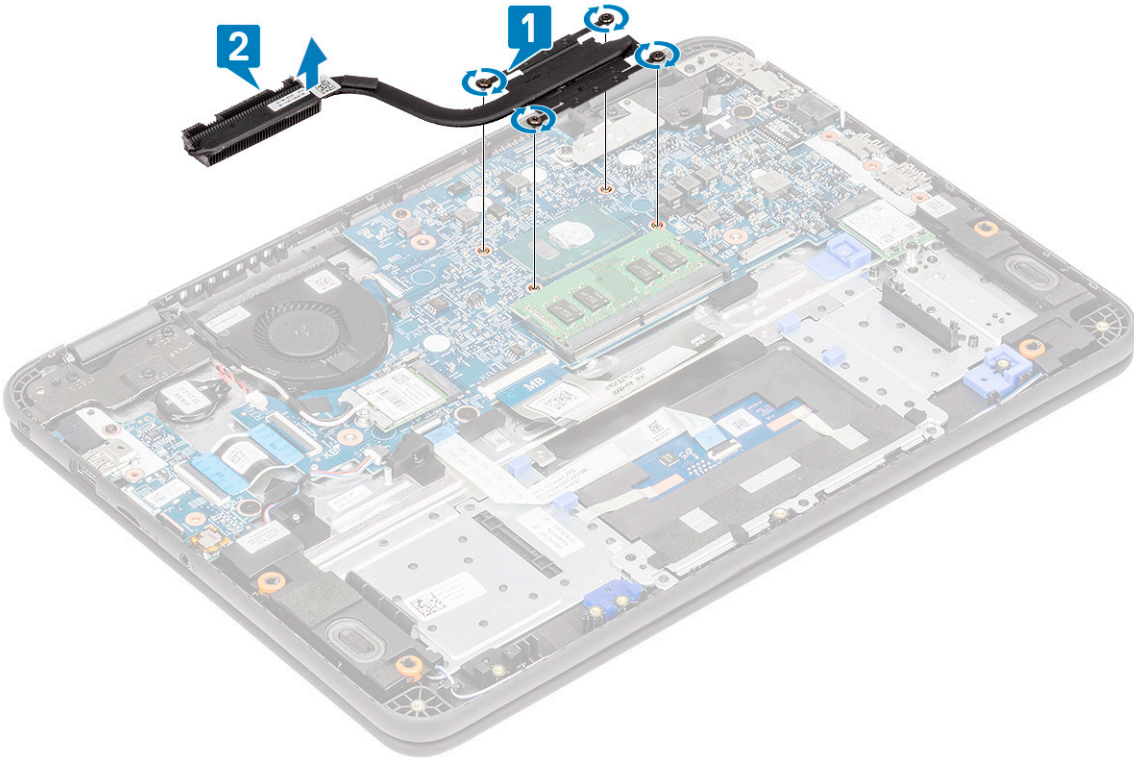


- 4 Install the:
 - a battery
 - b base cover
 - c micro-SD card
- 5 Follow the procedure in [After working inside your computer](#).

Heat sink

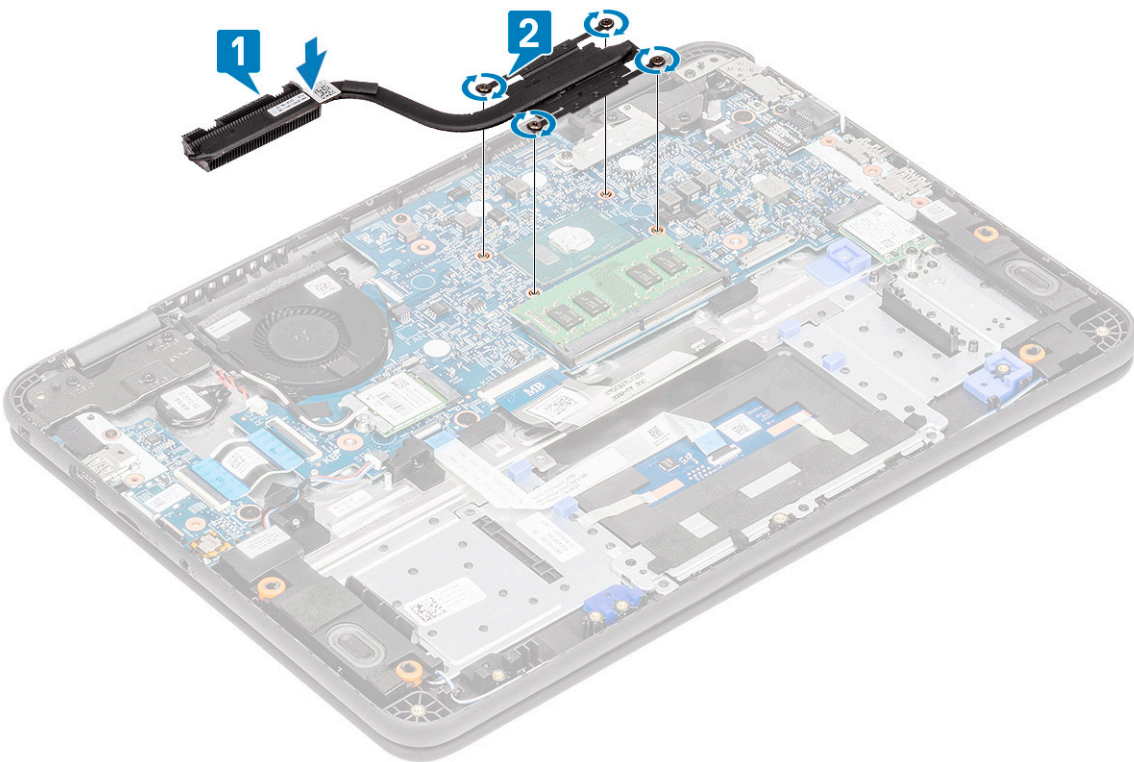
Removing the heatsink

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
- 3 **ⓘ | NOTE: Follow the diagonal pattern to loosen the screws.**
Loosen the four captive M2.5x2.5 screws that secure the heat sink to the computer [1].
- 4 Lift the heatsink away from the computer [2].



Installing the heatsink

- 1 Insert the heatsink into the slot on the computer [1].
- 2 Install the four M2.5x2.5 screws [2] to secure the heatsink to the computer.



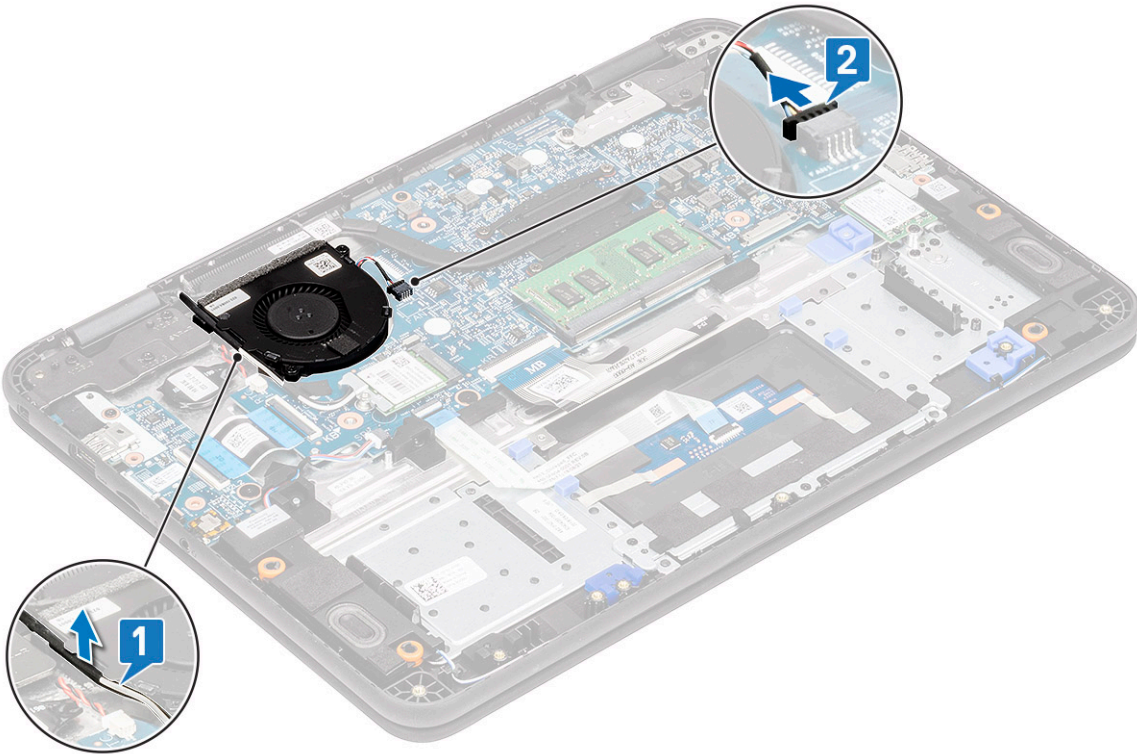
① **NOTE:** Follow the diagonal pattern to tighten the screws, similar to the pattern followed to loosen the screws in "Removing heatsink".

- 3 Install the:
 - a battery
 - b base cover
 - c micro-SD card
- 4 Follow the procedure in [After working inside your computer](#).

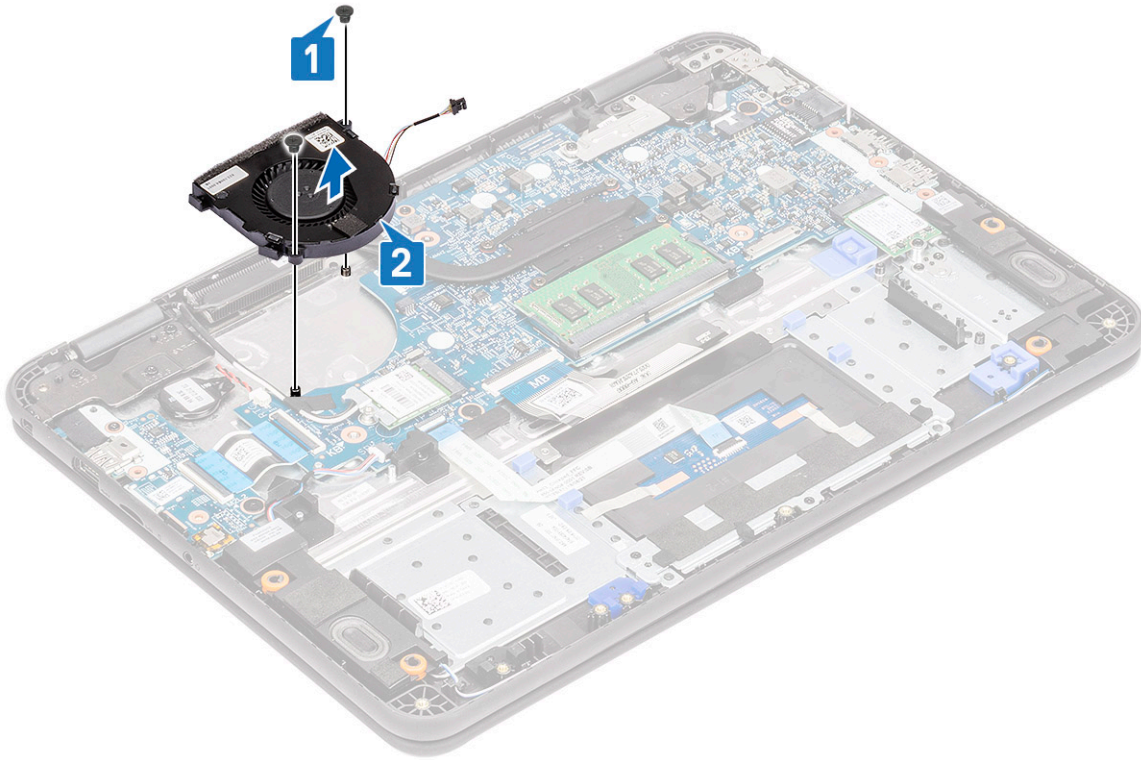
System Fan

Removing the system fan

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
- 3 Unroute and pry out the WLAN antennae cable from the hook near the fan case [1].
- 4 Disconnect the system fan connector from the system board [2].

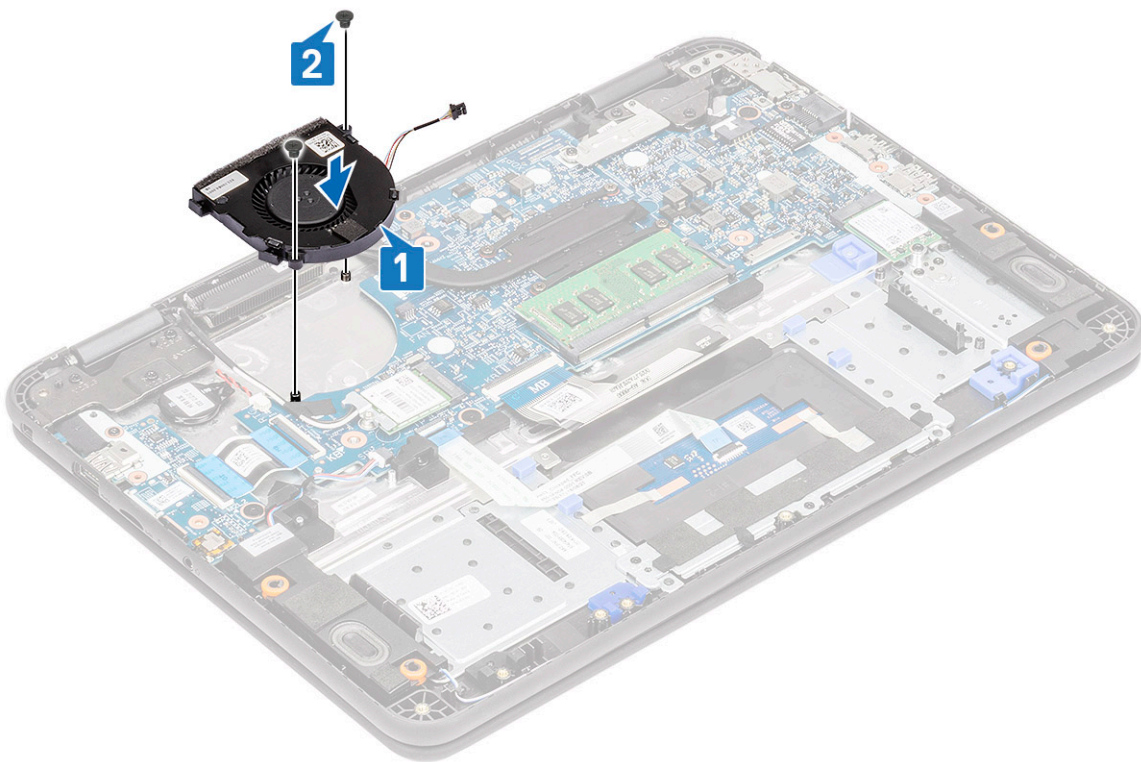


- 5 Remove the two M2xL3 screws [1] that secure the system fan to the palmrest.
- 6 Lift the system fan off from the palmrest [2].



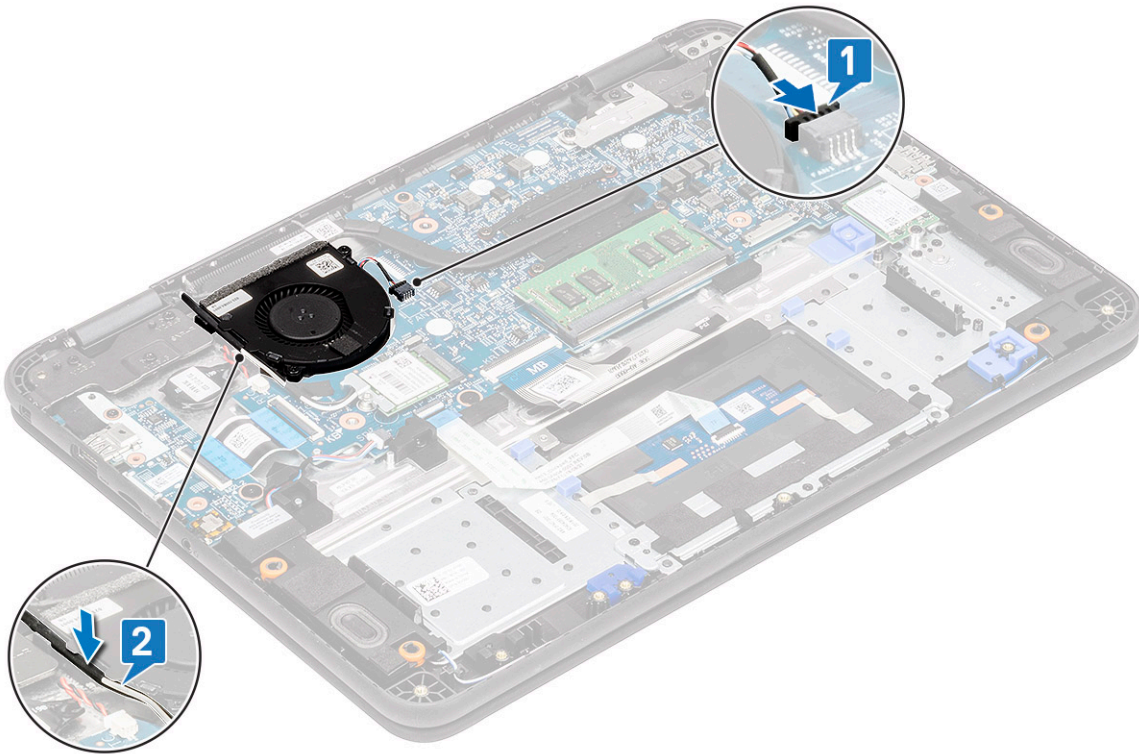
Installing the system fan

- 1 Place the system fan on the palmrest [1].
- 2 Install the two M2xL3 screws [2] to secure the system fan to the palmrest.



- 3 Connect the fan cable to the system board [1].

- 4 Route the WLAN antennae cable along the fan case onto its hook on the system board [2].

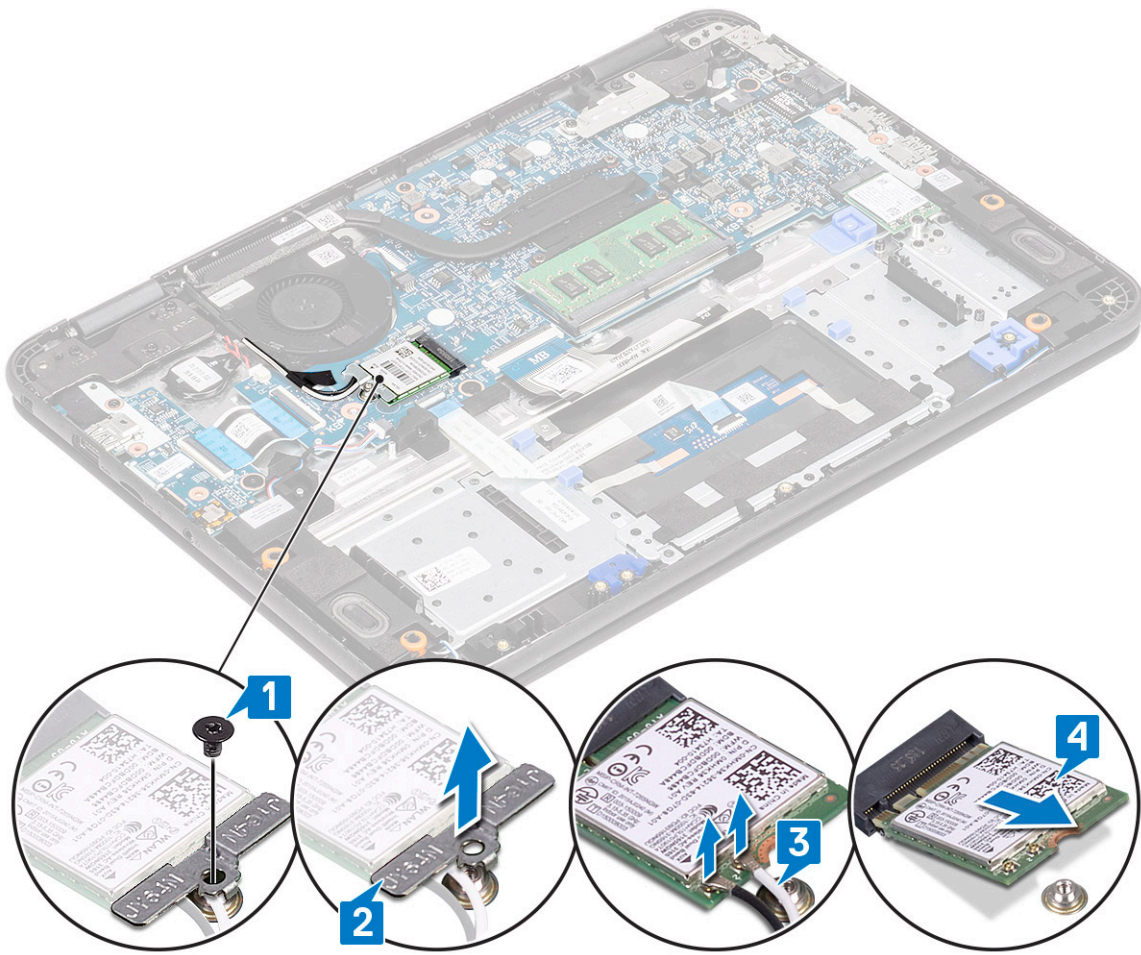


- 5 Install the:
 - a battery
 - b base cover
 - c micro-SD card
- 6 Follow the procedure in [After working inside your computer](#).

WLAN Card

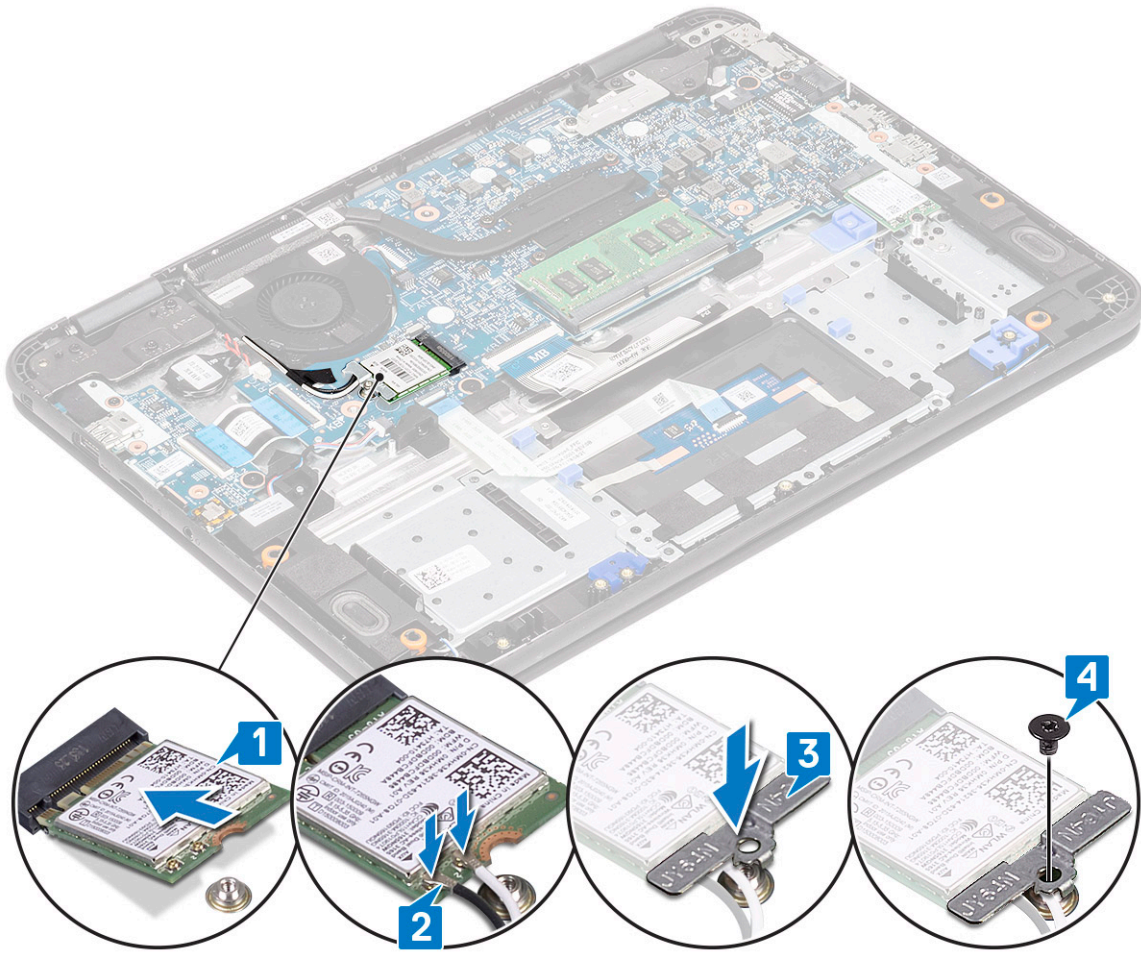
Removing the WLAN card

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
- 3 Remove the single M2xL3 screw that secures the WLAN metal bracket to the computer [1] and lift and remove the metal bracket off the WLAN card [2].
- 4 Disconnect the two antenna cables [3] and remove the WLAN card from M.2 connector on the system board [4].



Installing the WLAN card

- 1 Insert the WLAN card into M.2 connector on the system board [1].
- 2 Connect the two antenna cables to the WLAN card [2].
- 3 Replace the metal bracket on the WLAN [3].
- 4 Tighten the M2xL3 screw to secure the WLAN card and bracket to the system board [4].



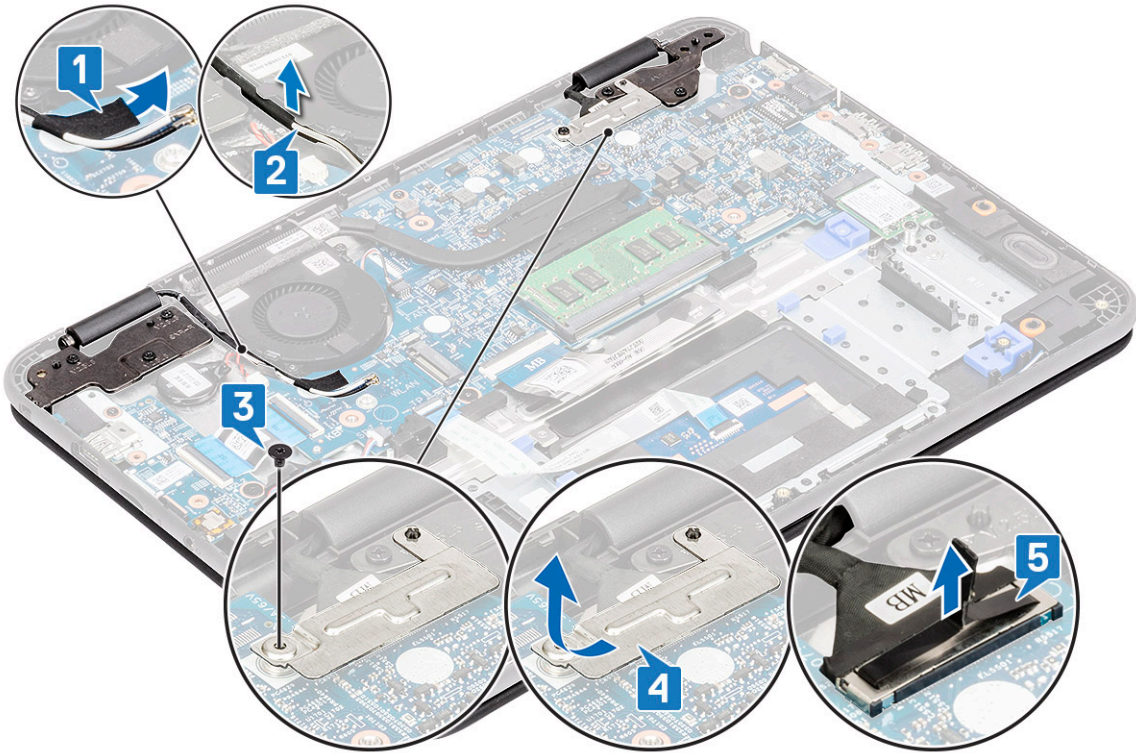
- 5 Install the:
 - a battery
 - b base cover
 - c micro-SD card
- 6 Follow the procedure in [After working inside your computer](#).

Display assembly

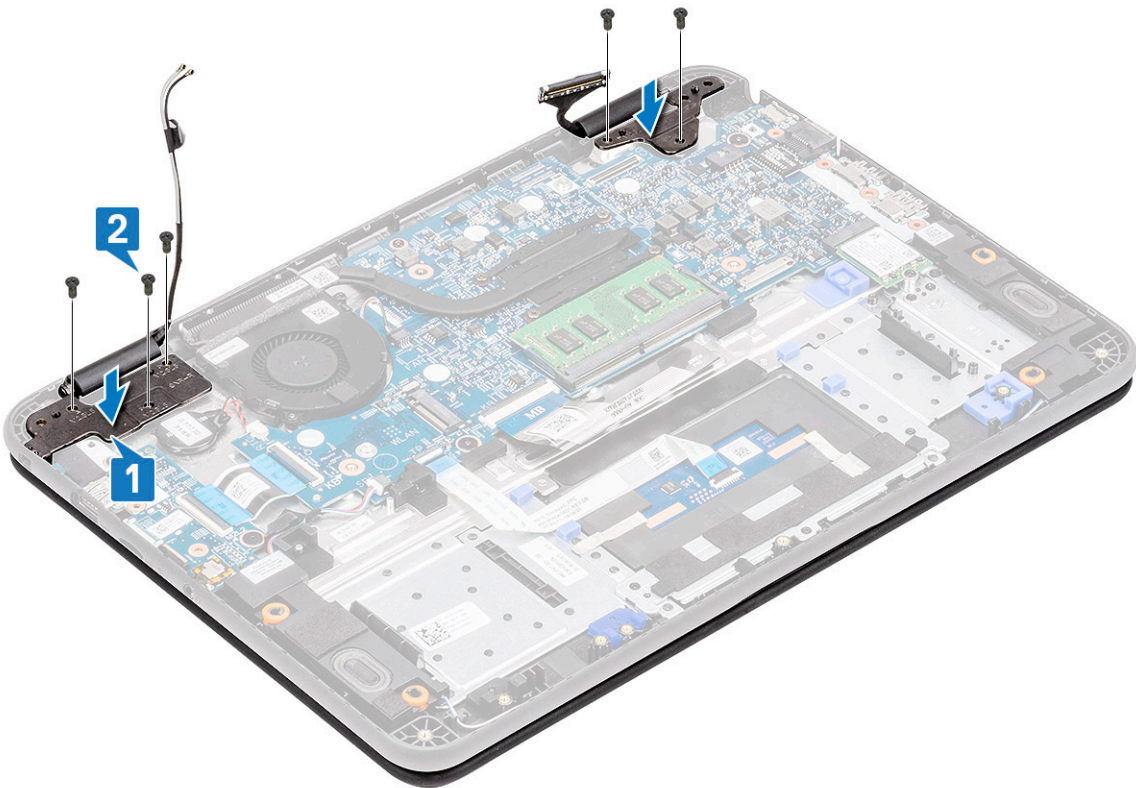
Removing the display assembly

NOTE: This process is for both touch and non-touch LCDs.

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
 - d WLAN card
 - e DC-in cable
- 3 Remove the tape [1] and unroute the antennae cable [2] near the fan case.
- 4 Remove the single screw that secures the EDP bracket [3] and remove it off the EDP connector on the system board [4].
- 5 Disconnect the EDP cable from the system board [5].



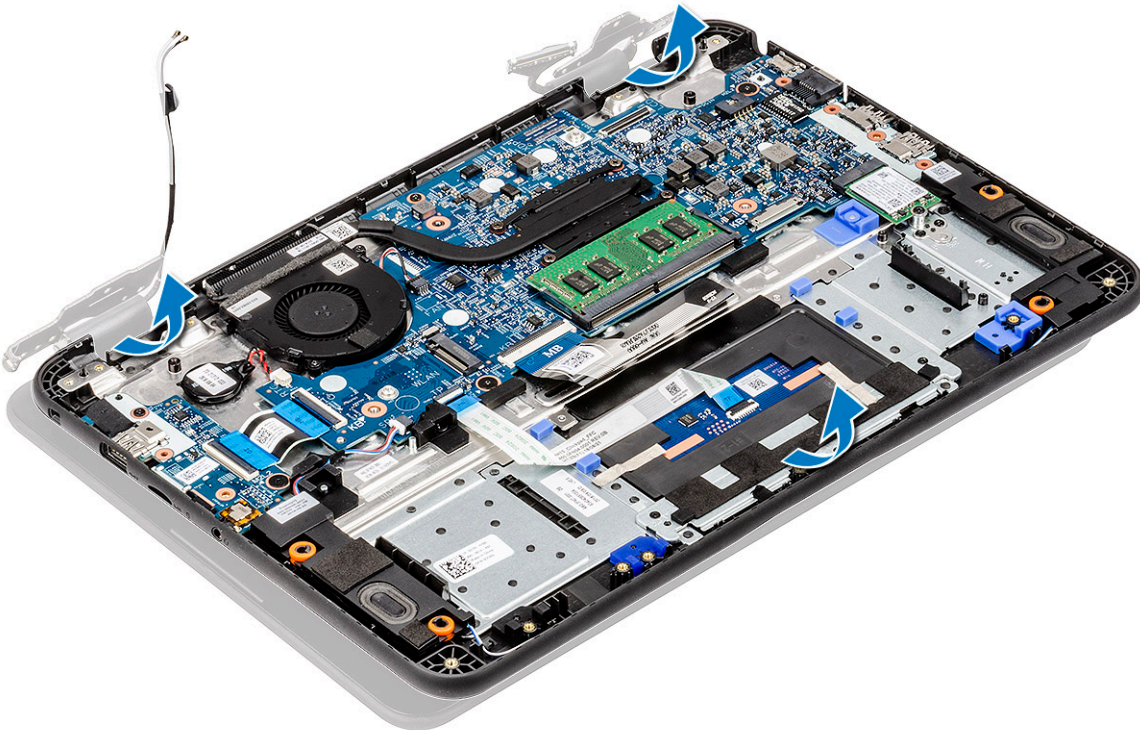
6 Remove the six M1.6xL2 screws securing the LCD hinges to the computer.



7 Open the lid slightly.

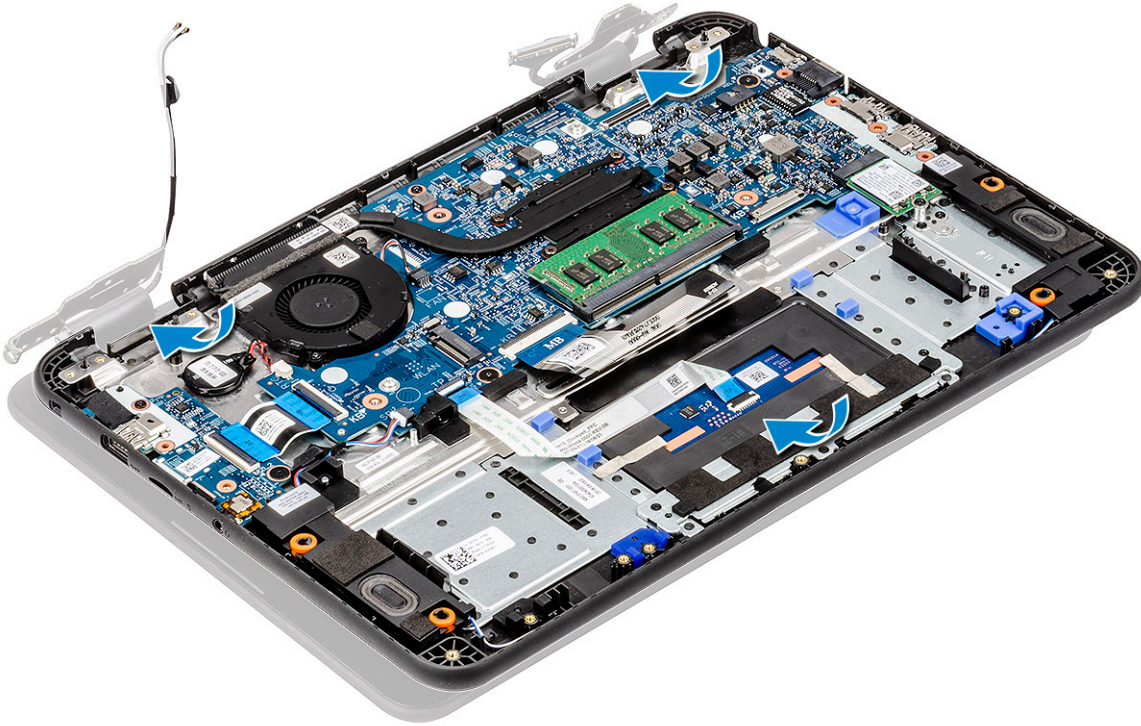


8 Separate the hinges from the palmrest and separate the display assembly from the computer.

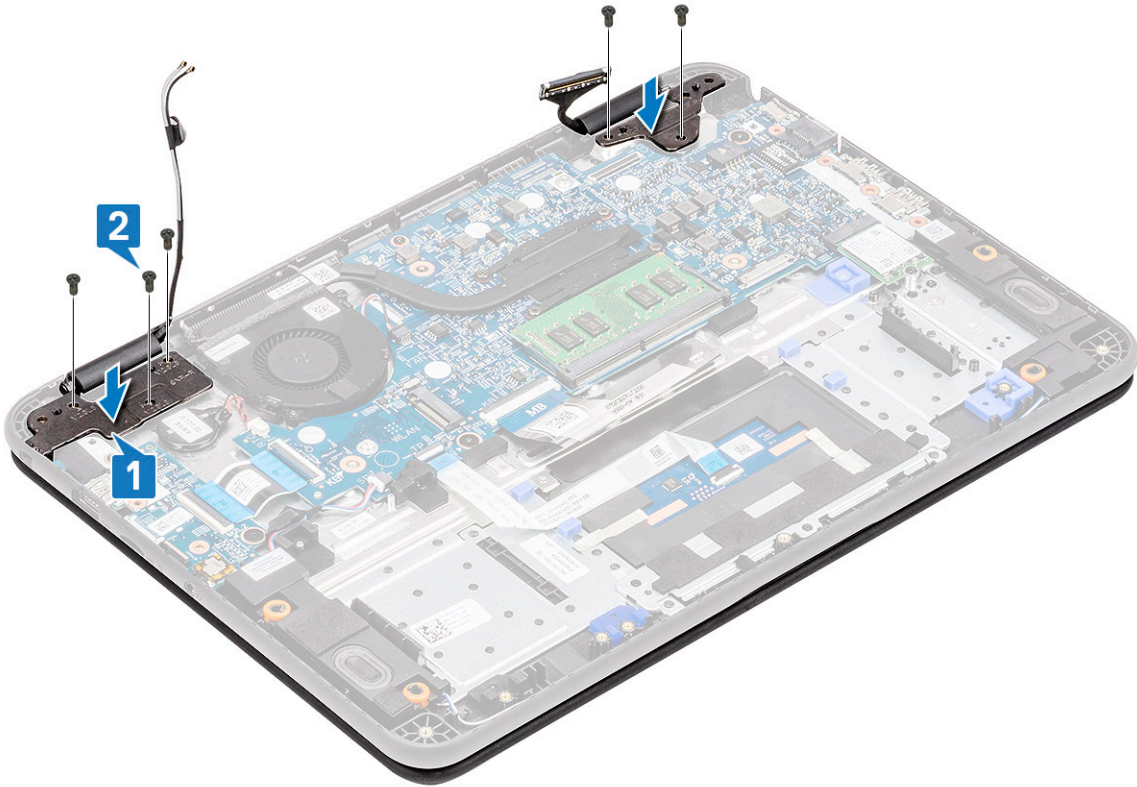


Installing the display assembly

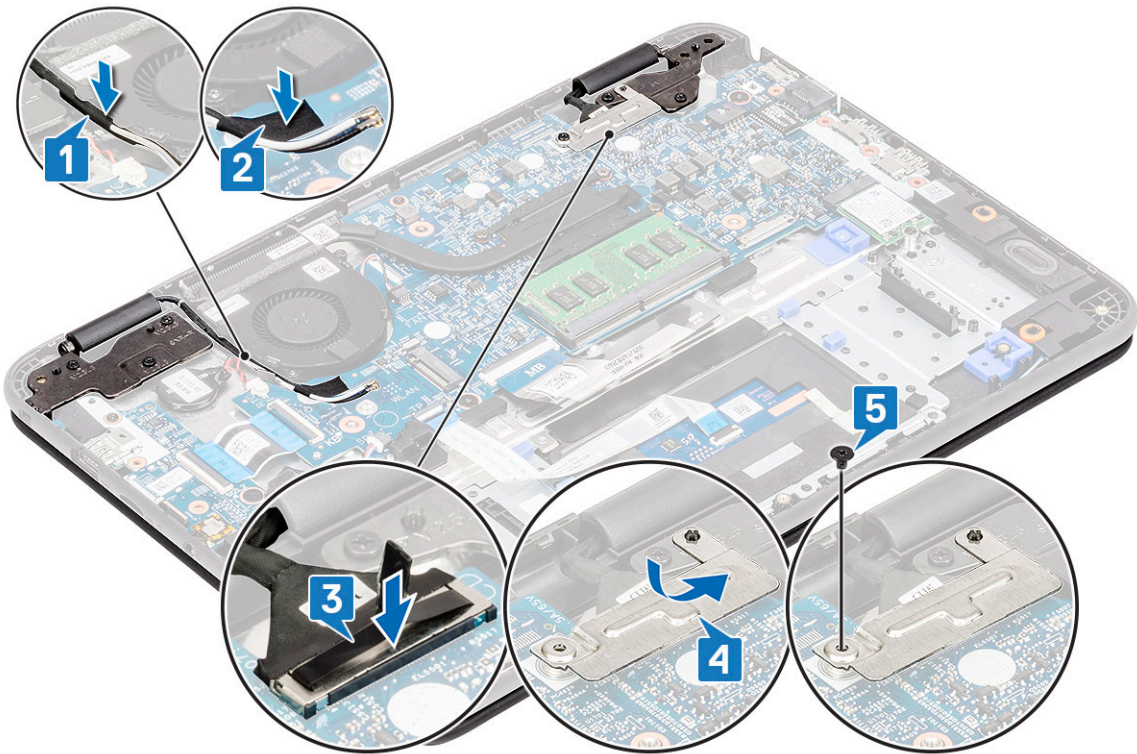
- 1 Install the display assembly aligning the hinges caps on the palmrest.



- 2 Align the hinges to the screw holes on the system board [1] and tighten the six M1.6xL2 screws [2] to secure the display assembly to the computer.



- 3 Route the antennae cable along the edges of the fan case [1] and stick a piece of tape [2] to secure it to the system board.
- 4 Connect the EDP cable [3] and place the EDP bracket on the connector [4] and secure it to system board using the single screw [5].



- 5 Install the:
 - a [DC-in cable](#)
 - b [WLAN card](#)

- c battery
- d base cover
- e micro-SD card

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

Display bezel

Removing the display bezel

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
 - d WLAN card
 - e DC-in cable
 - f display assembly
- 3 Remove the screw protector caps [1] and remove the two M2L4 screws securing the bezel [2] to the back cover.
- 4 Unroute the speaker cable from the routing channel [3]



- 5 Pry from all sides along the LCD panel to separate the LCD bezel from the back cover.



- 6 Lift and remove the display bezel from the display assembly.

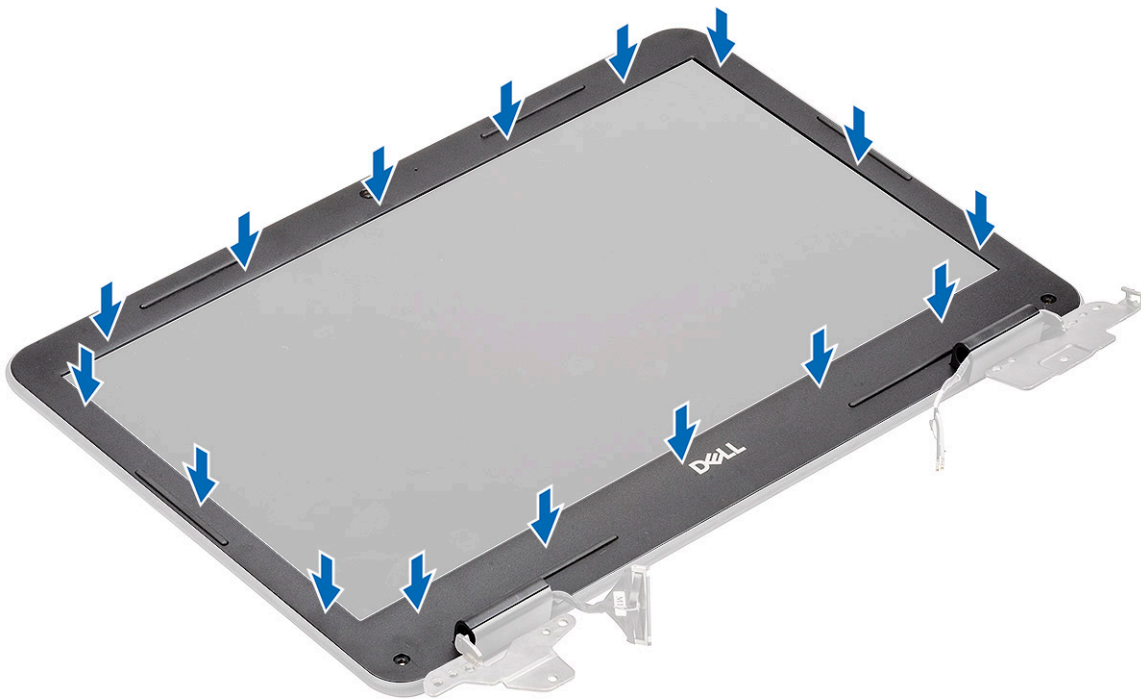


Installing the display bezel

- 1 Place the bezel on the LCD back cover preassembled with LCD panel.



2 Press along the edges of the LCD to clip the LCD back cover to the bezel.



3 Install the two M2L4 screws [1] securing the display bezel to the back cover and install the screw protector caps [2].

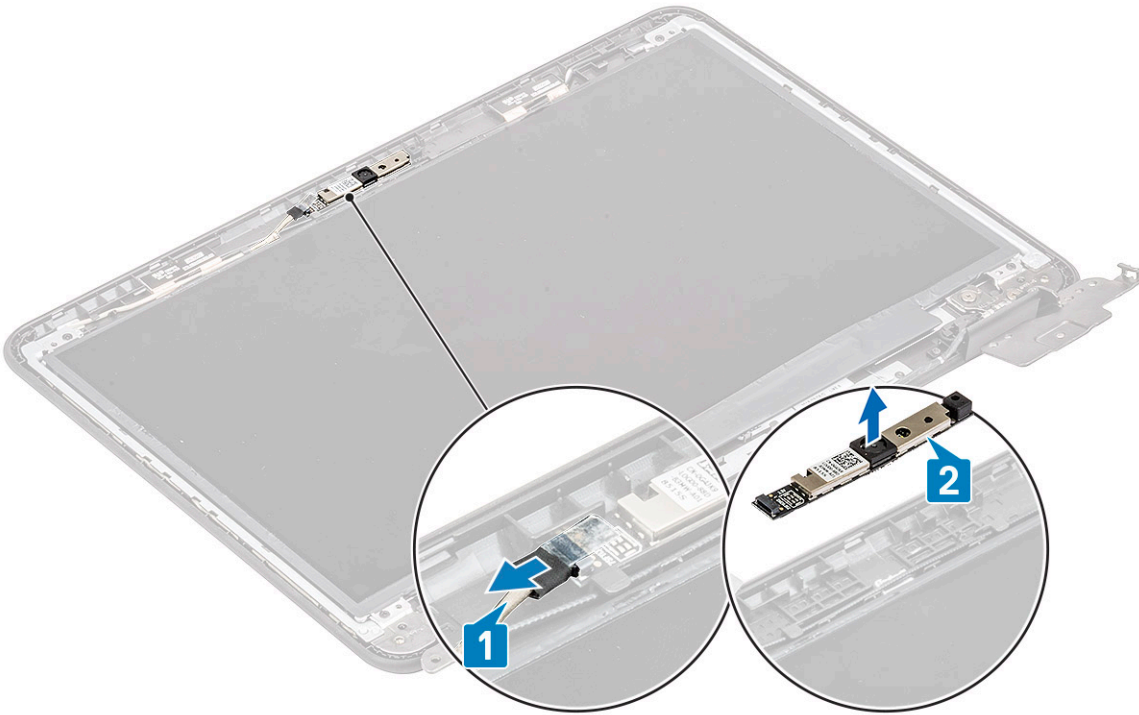


- 4 Install the:
 - a display assembly
 - b DC-in cable
 - c WLAN card
 - d battery
 - e base cover
 - f micro-SD card
- 5 Follow the procedure in [After working inside your computer](#).

Camera microphone module

Removing the camera-microphone module

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
 - d WLAN card
 - e DC-in cable
 - f display assembly
 - g display bezel
- 3 Disconnect the EDP cable from the microphone-camera module [1].
- 4 Lift the microphone-camera module from the display assembly [2].



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

Installing the camera-microphone module

- 1 Align and place the camera-microphone module on the LCD back cover assembly [1].
- 2 Connect the EDP cable to the camera-microphone module [2].



- 3 Install the:
 - a [display bezel](#)

- b display assembly
- c DC-in cable
- d WLAN card
- e battery
- f base cover
- g micro-SD card

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

LCD panel

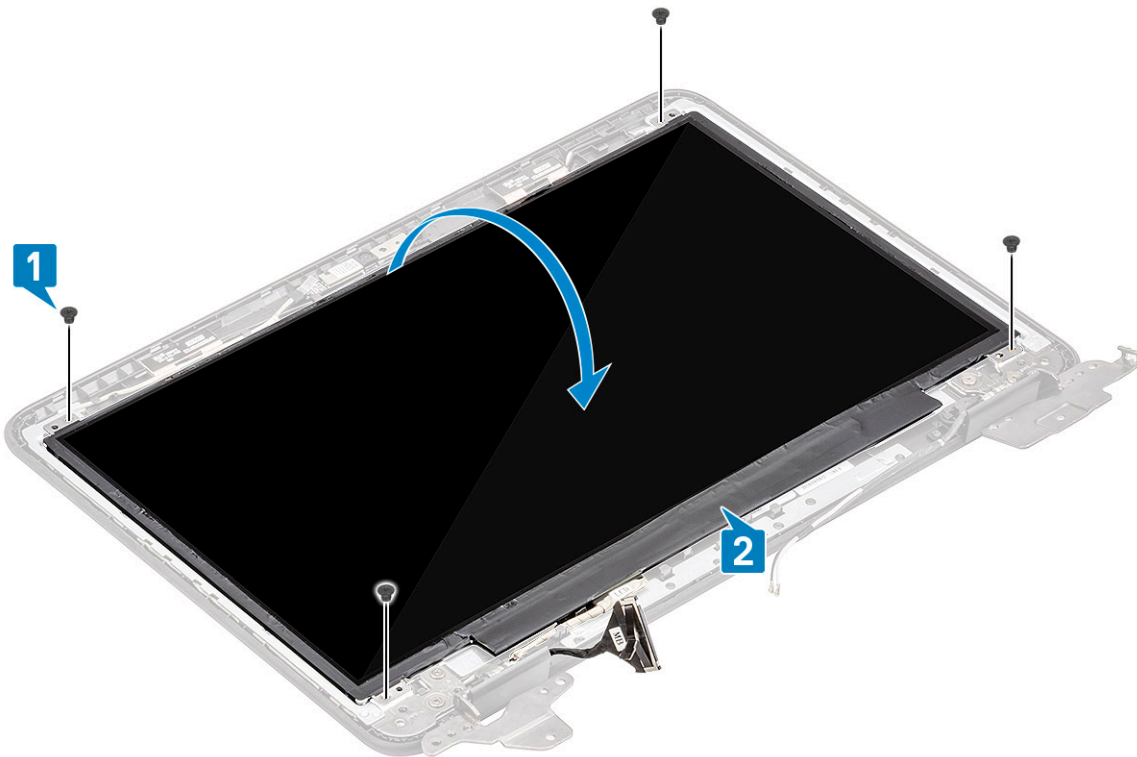
Removing the LCD panel

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

2 Remove the:

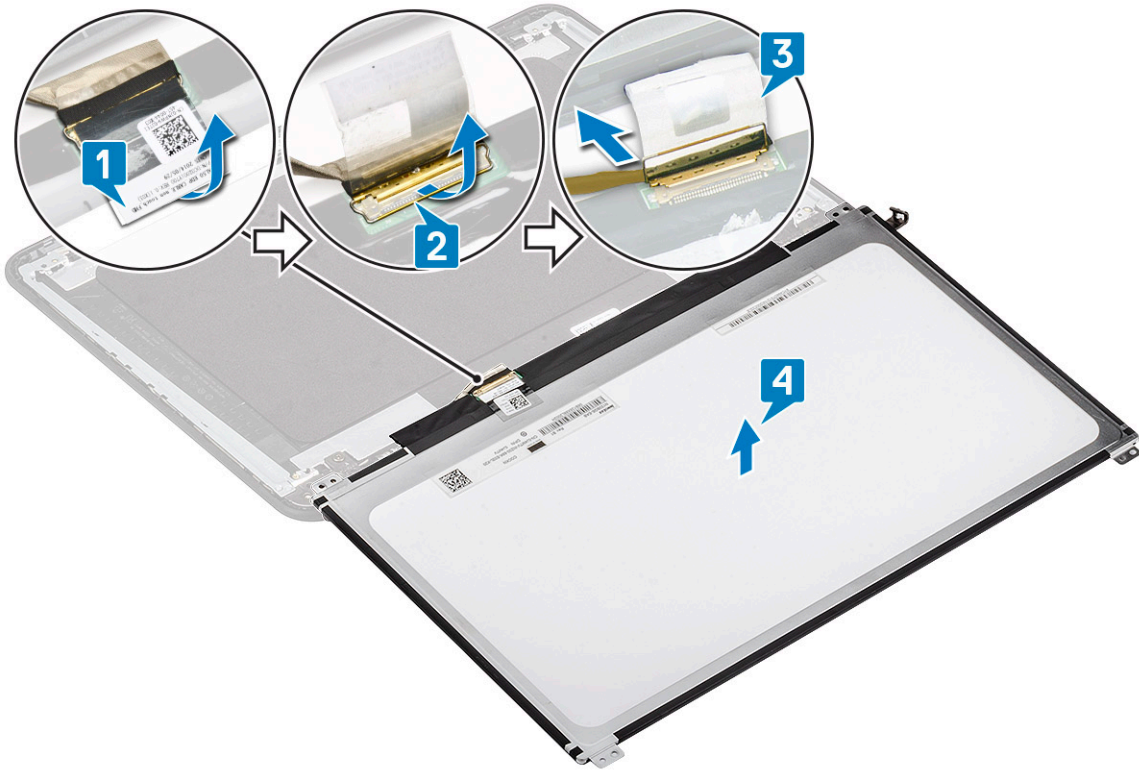
- a micro-SD card
- b base cover
- c battery
- d WLAN card
- e DC-in cable
- f display assembly
- g LCD bezel

3 Remove the four M2L3 screws [1] securing the LCD panel to the LCD back cover and flip it over to rest on the palmrest [2].



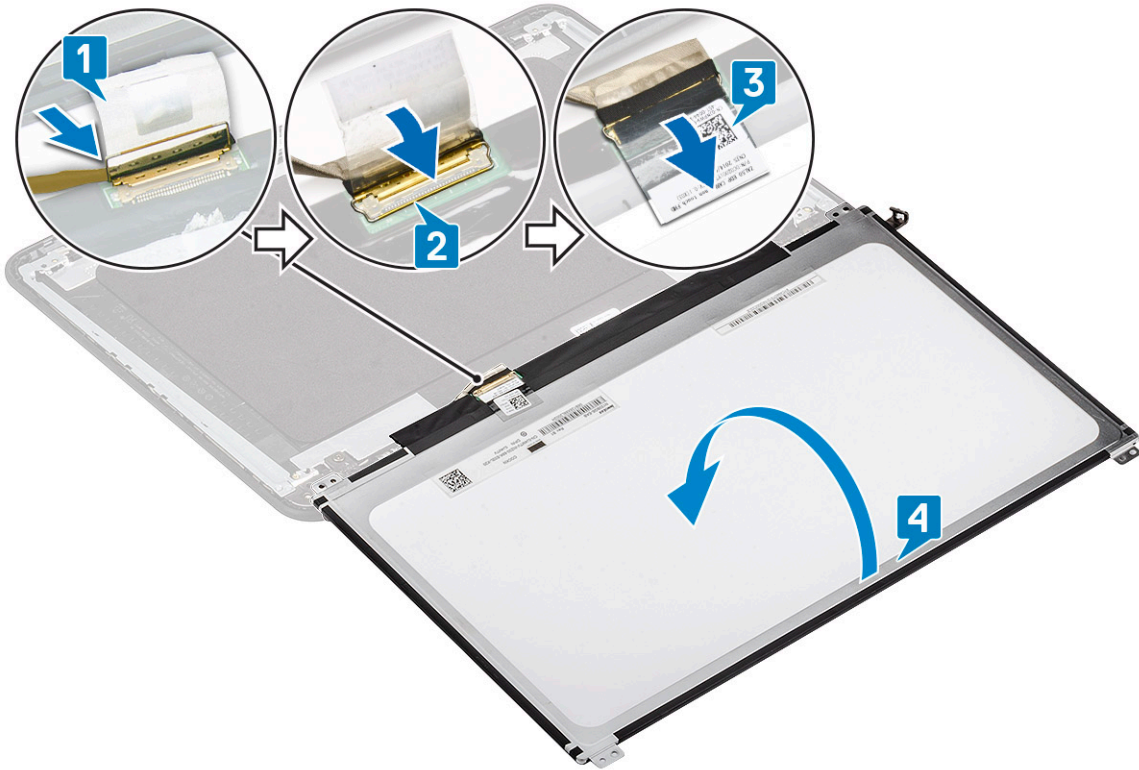
4 Peel off the tape from the EDP connector [1] and open the actuator [2] to disconnect the EDP cable from the system board [3].

5 Lift the LCD panel up and away from the computer [4].

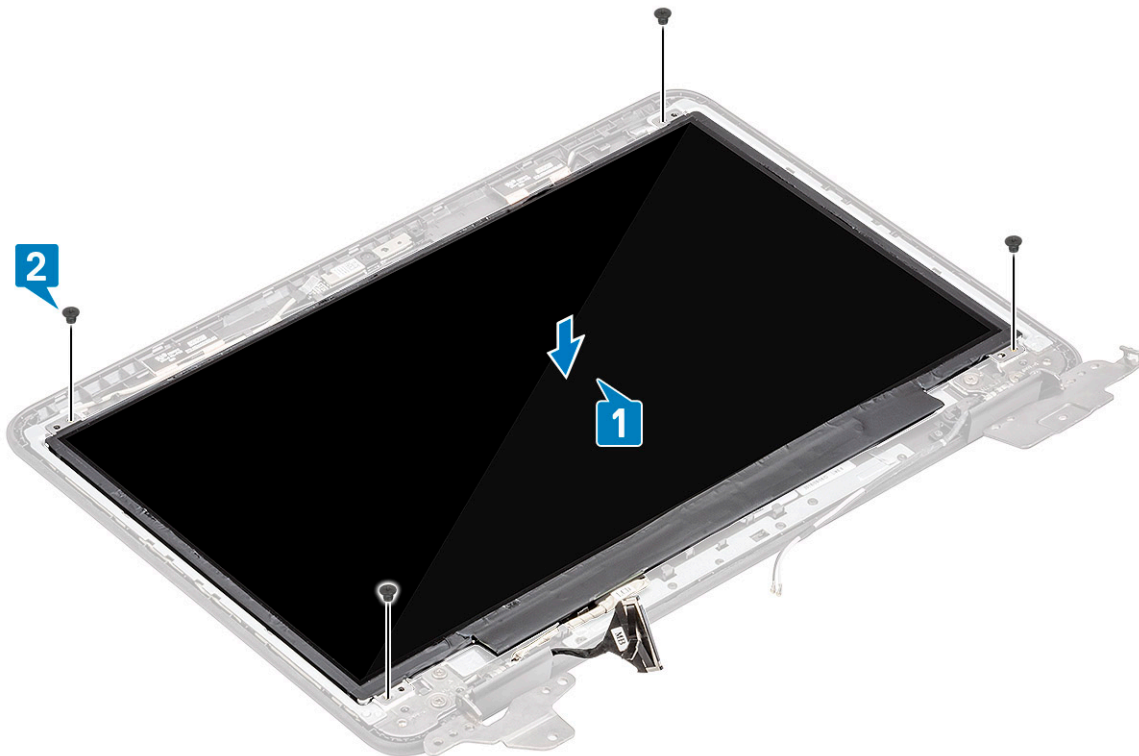


Installing the LCD panel

- 1 Connect the eDP cable to the system board [1] and while holding the cable close the actuator on the connector [2].
- 2 Stick the tape on the connector [3] securing the eDP cable to the LCD panel and flip over the LCD panel to rest on the LCD back cover [4].



3 Align the LCD panel to the back cover [1] and install the four M2L3 screws to secure the LCD panel to the LCD back cover [2].



- 4 Install the:
- a display bezel
 - b display assembly
 - c DC-in cable
 - d WLAN card

- e battery
- f base cover
- g micro-SD card

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

eDP cable

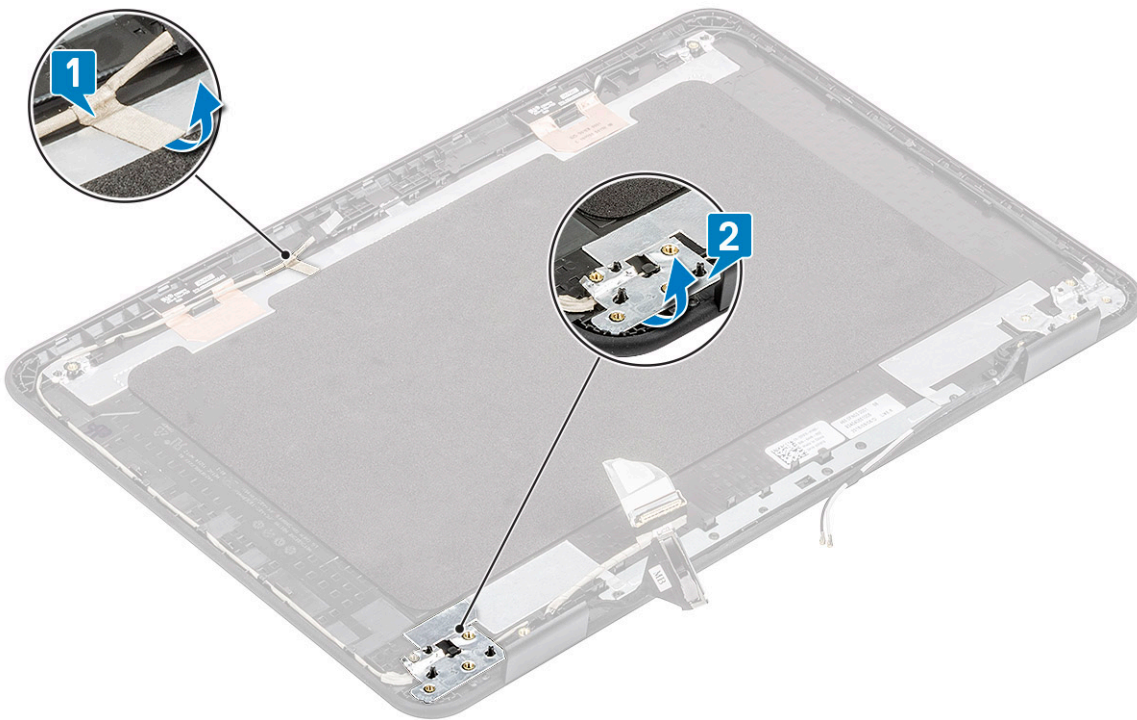
Removing the eDP cable

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

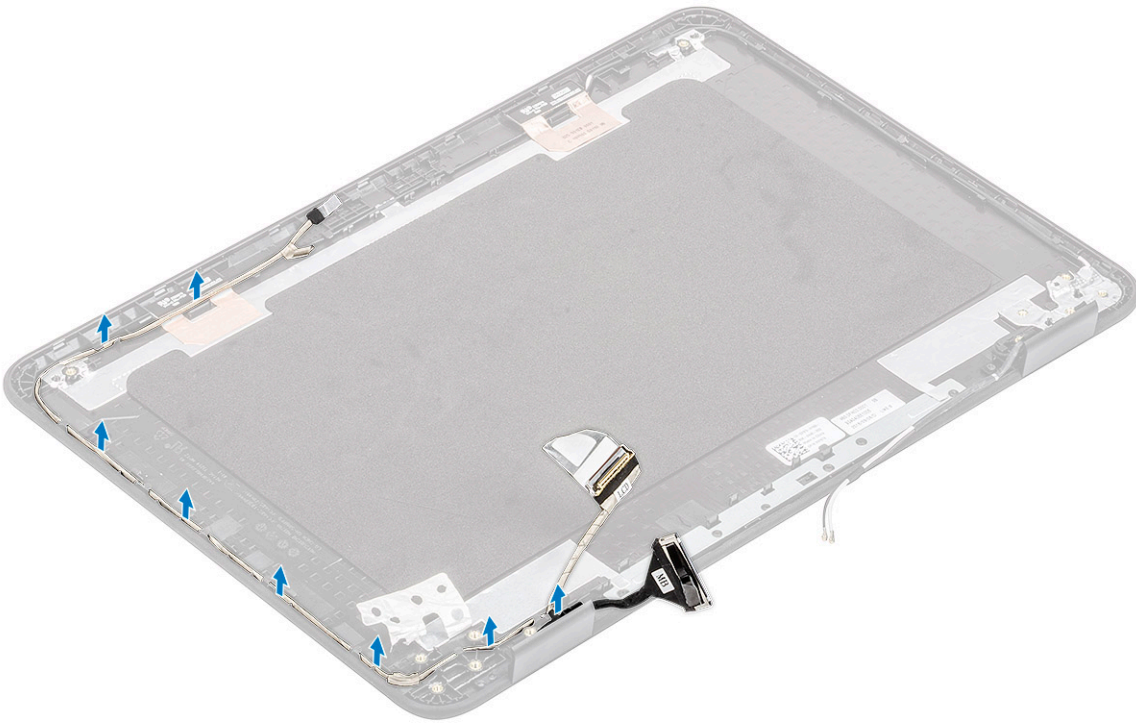
2 Remove the:

- a micro-SD card
- b base cover
- c battery
- d WLAN card
- e DC-in cable
- f display assembly
- g LCD bezel
- h LCD panel

3 Peel off the tape securing the eDP cable to the back cover [1] and remove the metal bracket [2].

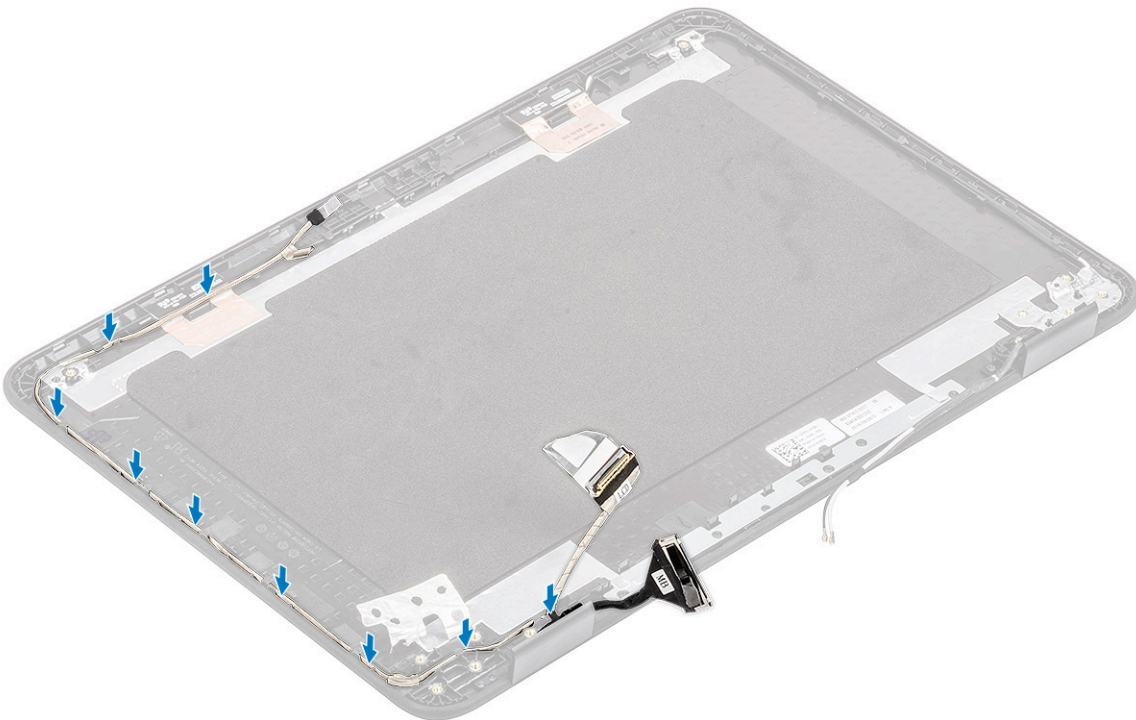


4 Un-route the eDP cable tucked along the back cover and remove the eDP cable from the computer.

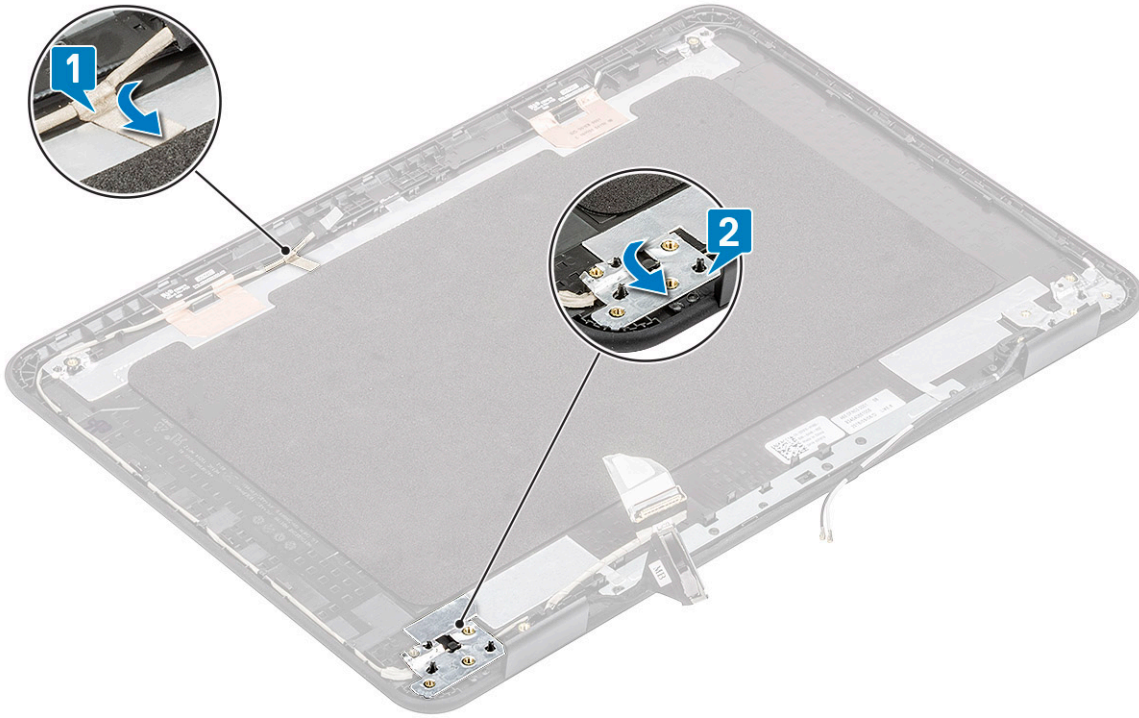


Installing the eDP cable

- 1 Route the eDP cable along the edges of the LCD back cover.



- 2 Stick the tape securing the eDP cable to the back cover [1] and install the metal bracket to secure the eDP cable to the LCD back cover [2].

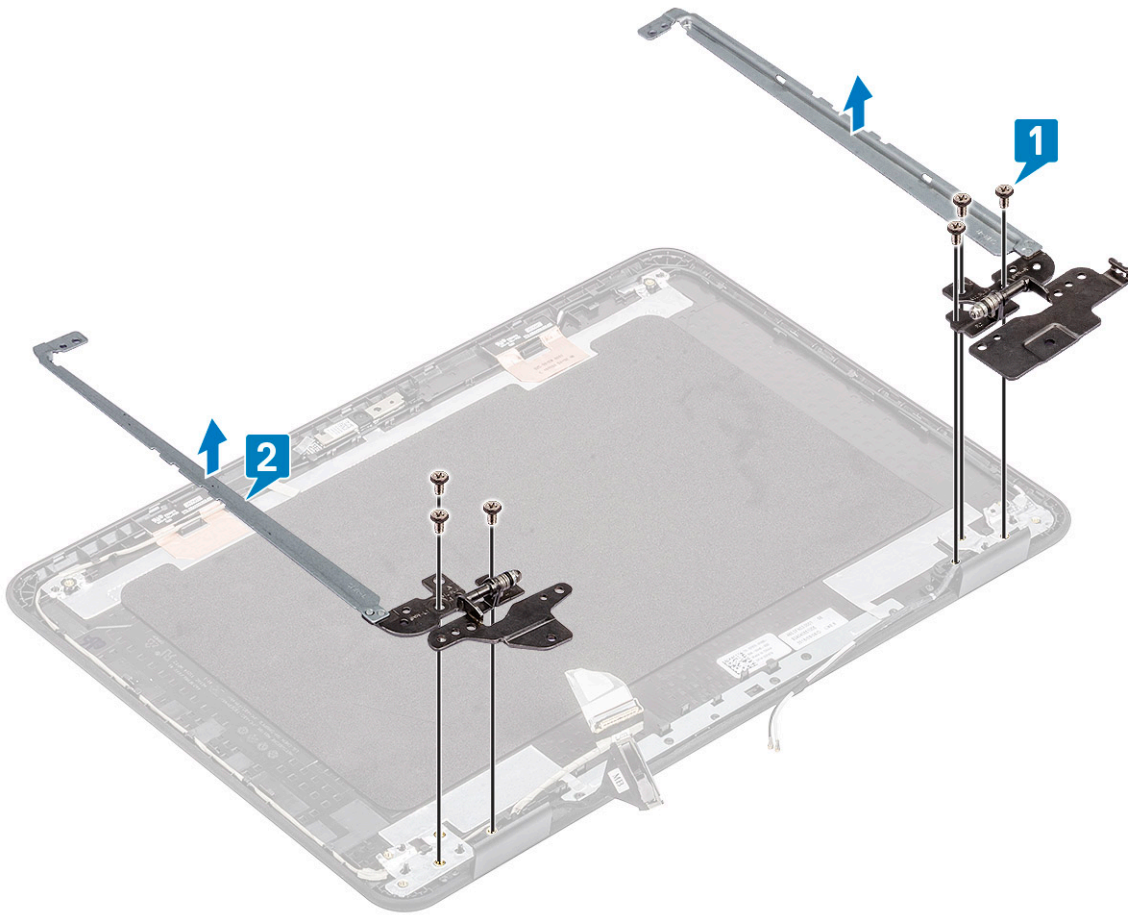


- 3 Install the:
 - a LCD panel
 - b display bezel
 - c display assembly
 - d DC-in cable
 - e WLAN card
 - f battery
 - g base cover
 - h micro-SD card
- 4 Follow the procedure in [After working inside your computer](#).

Display hinges

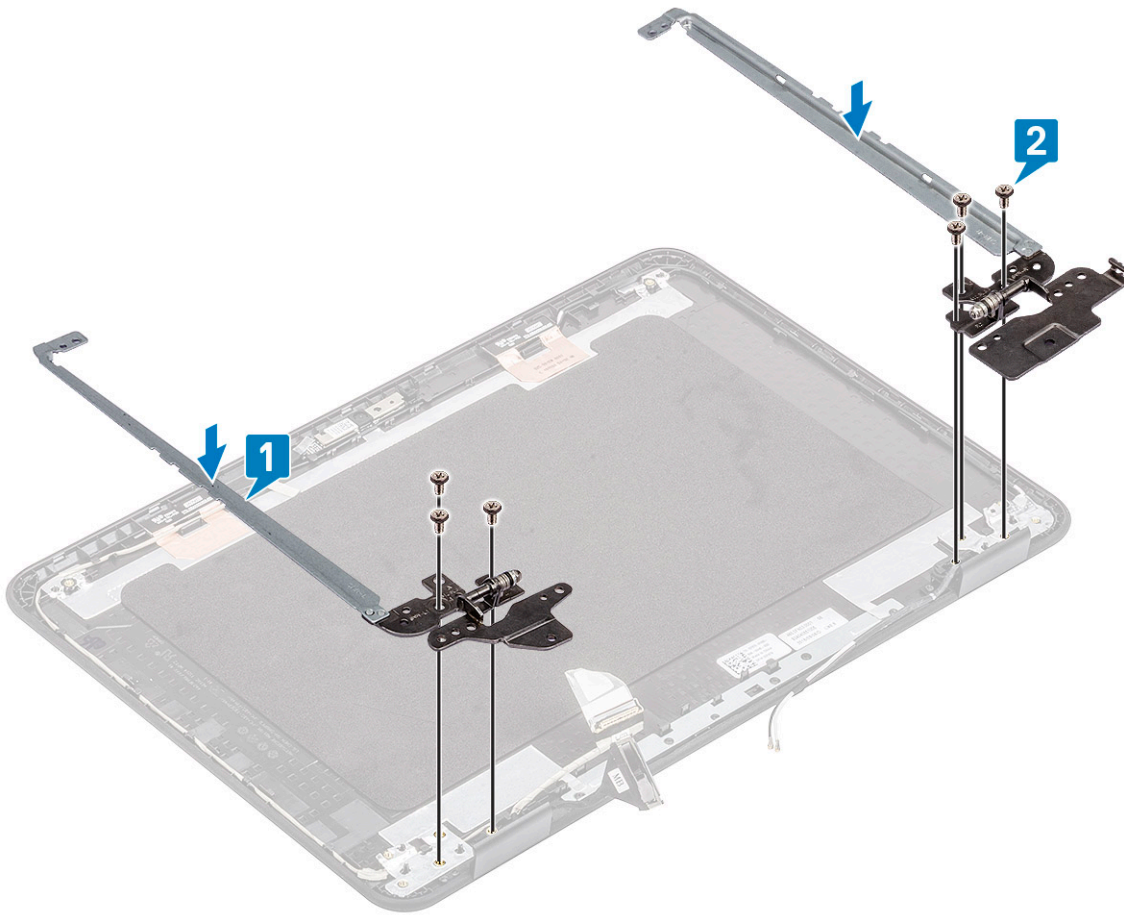
Removing the display hinges

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a micro-SD card
 - b base cover
 - c battery
 - d WLAN card
 - e DC-in cable
 - f display assembly
 - g LCD bezel
 - h LCD panel
- 3 Remove the six M2.5L5 screws on either sides securing the hinges to the back cover [1].
- 4 Lift the hinges up, away from the back cover [2].



Installing the display hinges

- 1 Install the hinges on the LCD back cover [1].
- 2 Install the six M2.5L5 screws securing the hinges to the LCD back cover [2].



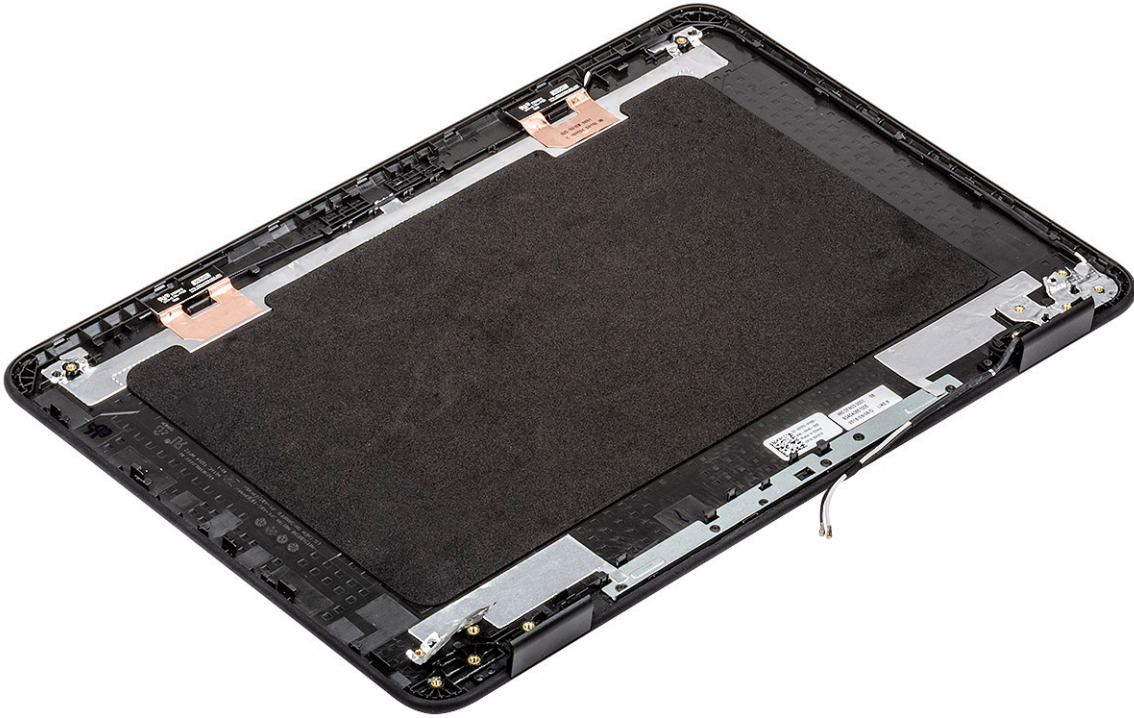
- 3 Install the:
 - a LCD panel
 - b display bezel
 - c display assembly
 - d DC-in cable
 - e WLAN card
 - f battery
 - g base cover
 - h micro-SD card
- 4 Follow the procedure in [After working inside your computer](#).

Display back cover

- 1 **① NOTE:** After disassembling the hinges you are left with Display back cover which is one complete unit along with antennae cables.

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

- 2 Remove the :
 - a micro-SD card
 - b base cover
 - c battery
 - d WLAN card
 - e DC-in cable
 - f display assembly
 - g LCD bezel
 - h LCD panel



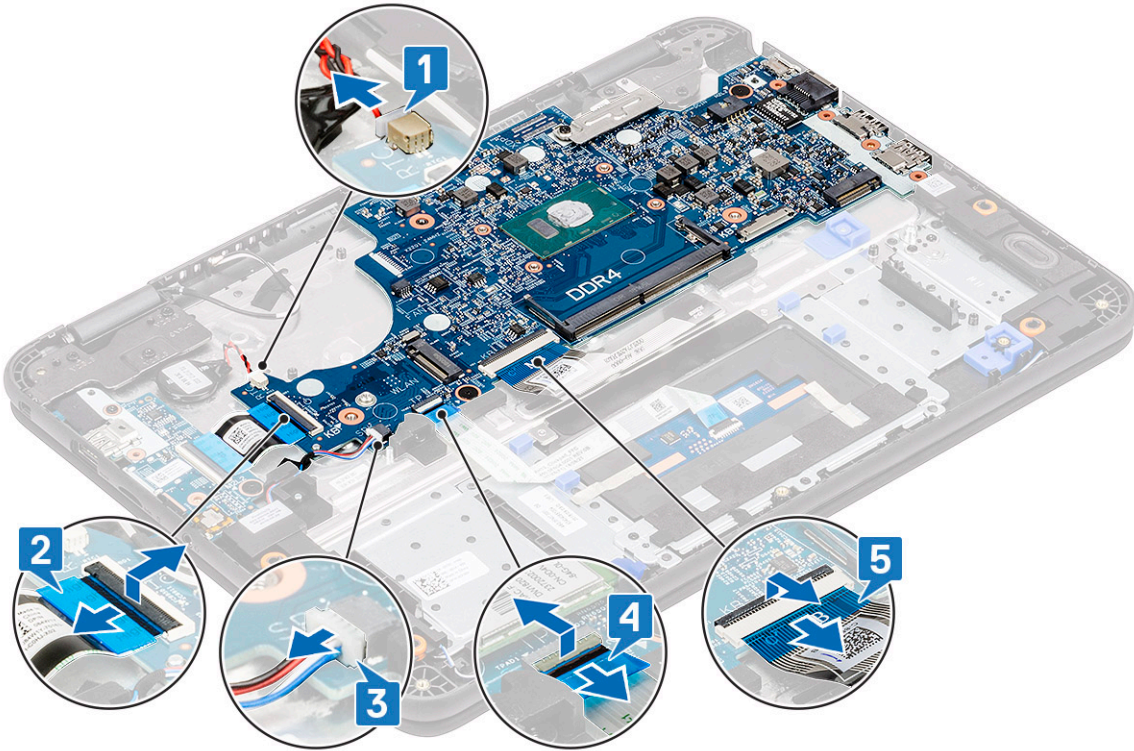
- 3 Install the display back cover assembly.
- 4 Install the:
 - a [LCD panel](#)
 - b [display bezel](#)
 - c [display assembly](#)
 - d [DC-in cable](#)
 - e [WLAN card](#)
 - f [battery](#)
 - g [base cover](#)
 - h [micro-SD card](#)
- 5 Follow the procedure in [After working inside your computer](#).

System board

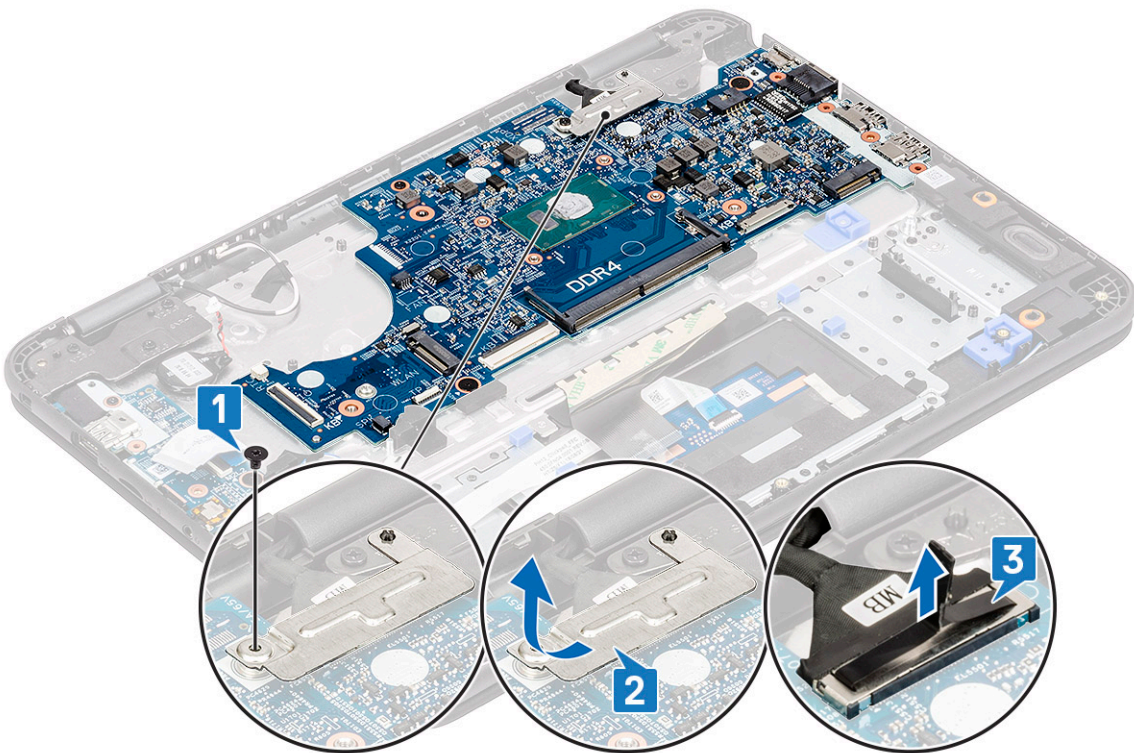
Removing the system board

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [micro-SD card](#)
 - b [base cover](#)
 - c [battery](#)
 - d [WLAN card](#)
 - e [SSD](#)
 - f [memory module](#)
 - g [heat sink](#)
 - h [fan](#)
 - i [DC-in](#)
- 3 Disconnect the following cables and connectors:

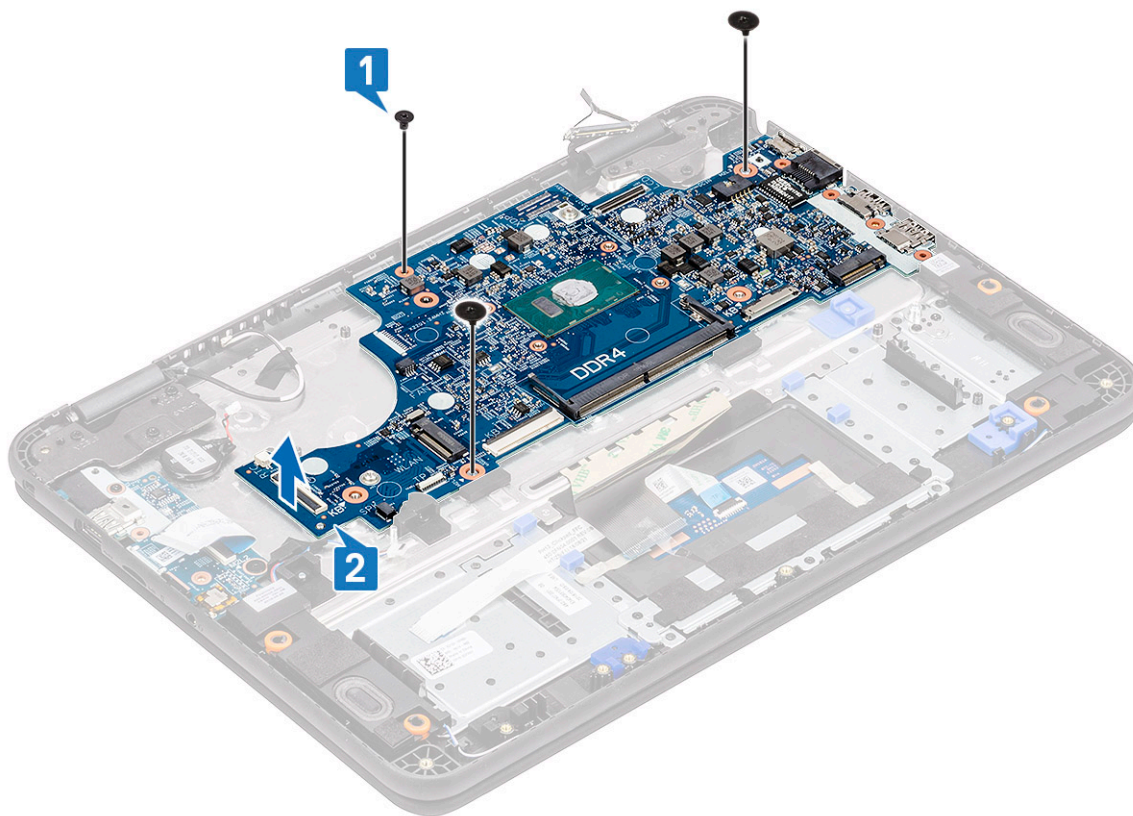
- a Coin cell connector [1]
- b I/O board cable [2]
- c Speaker cable connector [3]
- d Touchpad cable connector [4]
- e Keyboard cable connector [5]



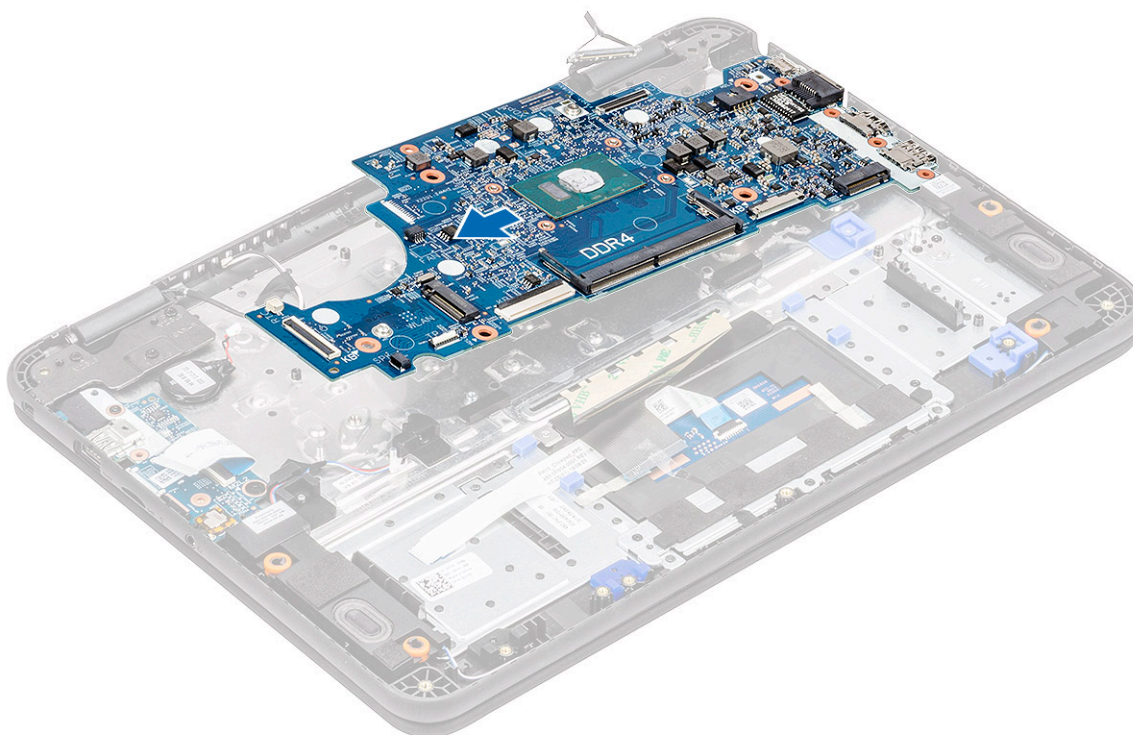
- 4 Remove the single screw [1] securing the EDP bracket on the system board.
- 5 Remove the EDP bracket [2] and disconnect the EDP cable [3] from the system board.



- 6 Remove the single M2xL3 screw and two M2xL2 (large head) screws [1] and lift the system board slightly [2].

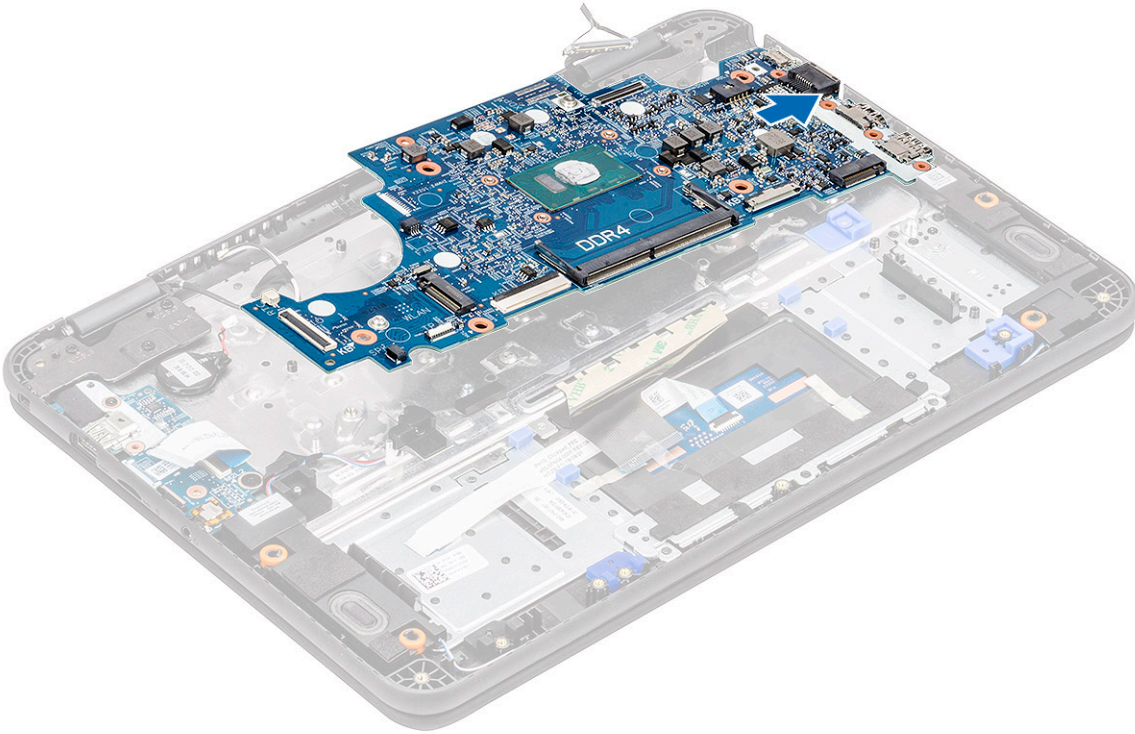


- 7 Incline the system board and remove the system board from the computer.

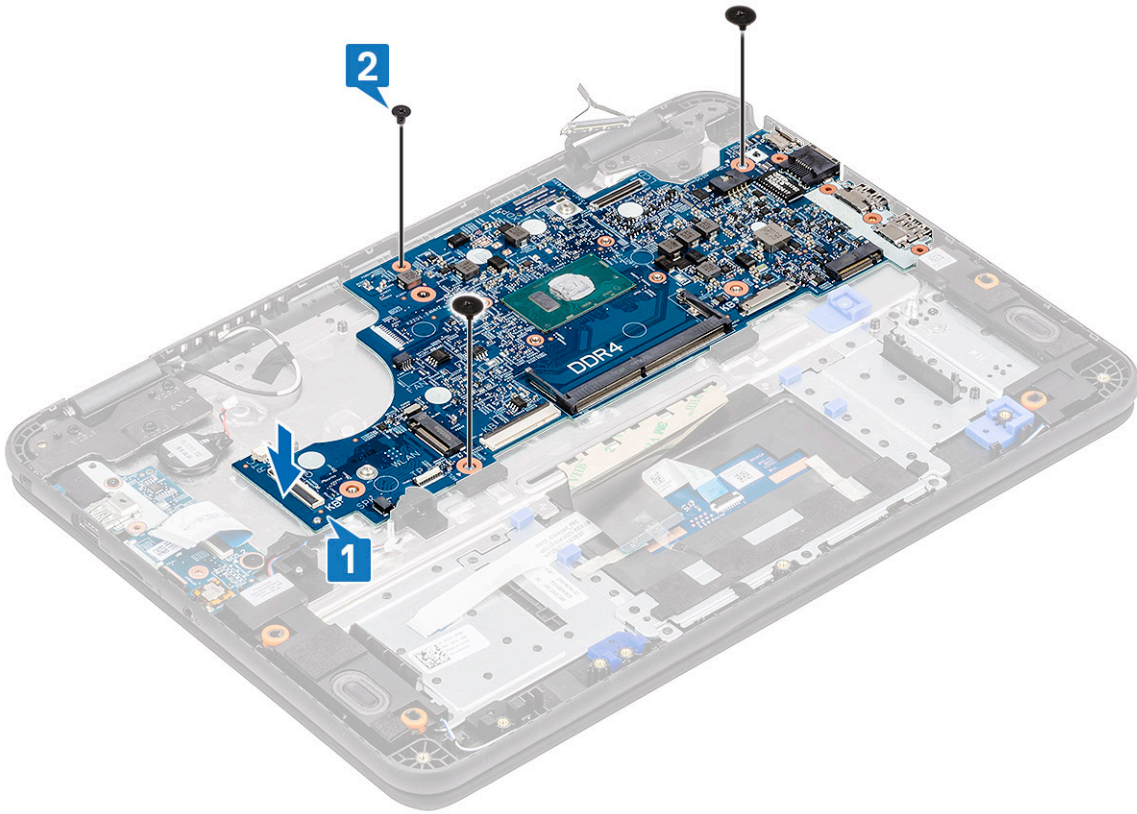


Installing the system board

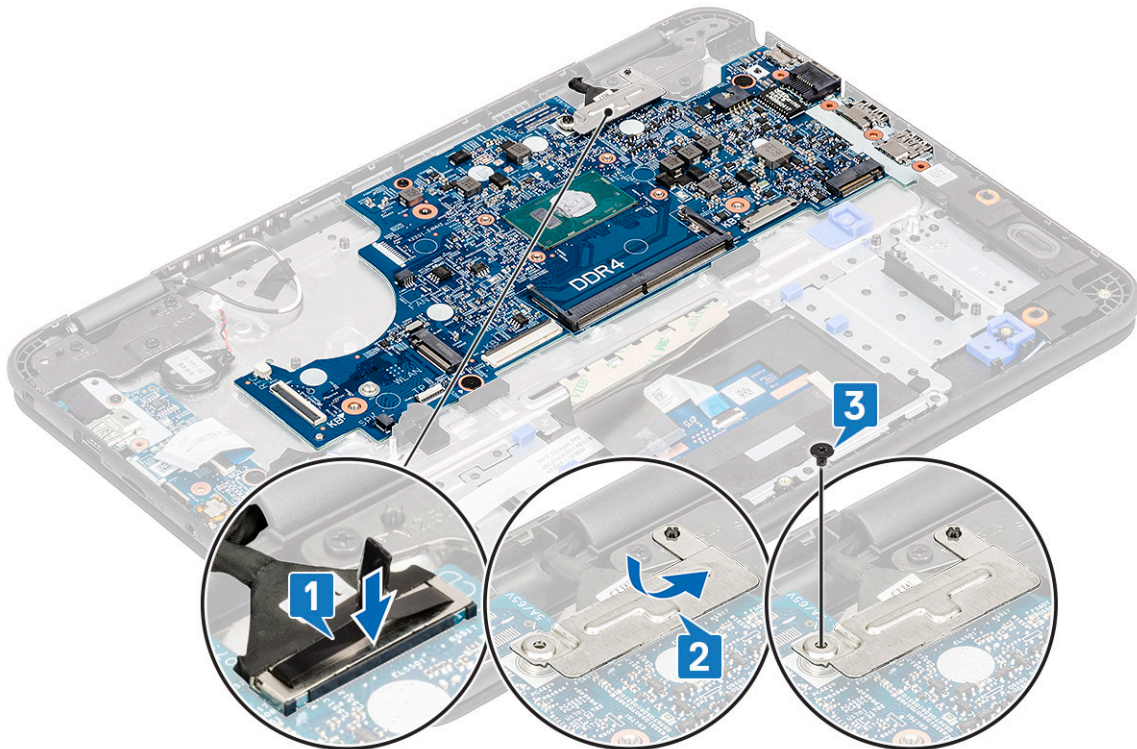
- 1 Incline the system board slightly and install it on the computer.



- 2 Press down the system board [1] to install the single M2xL3 screw and two M2xL2 (large head) screws [2] securing it to the palmrest.

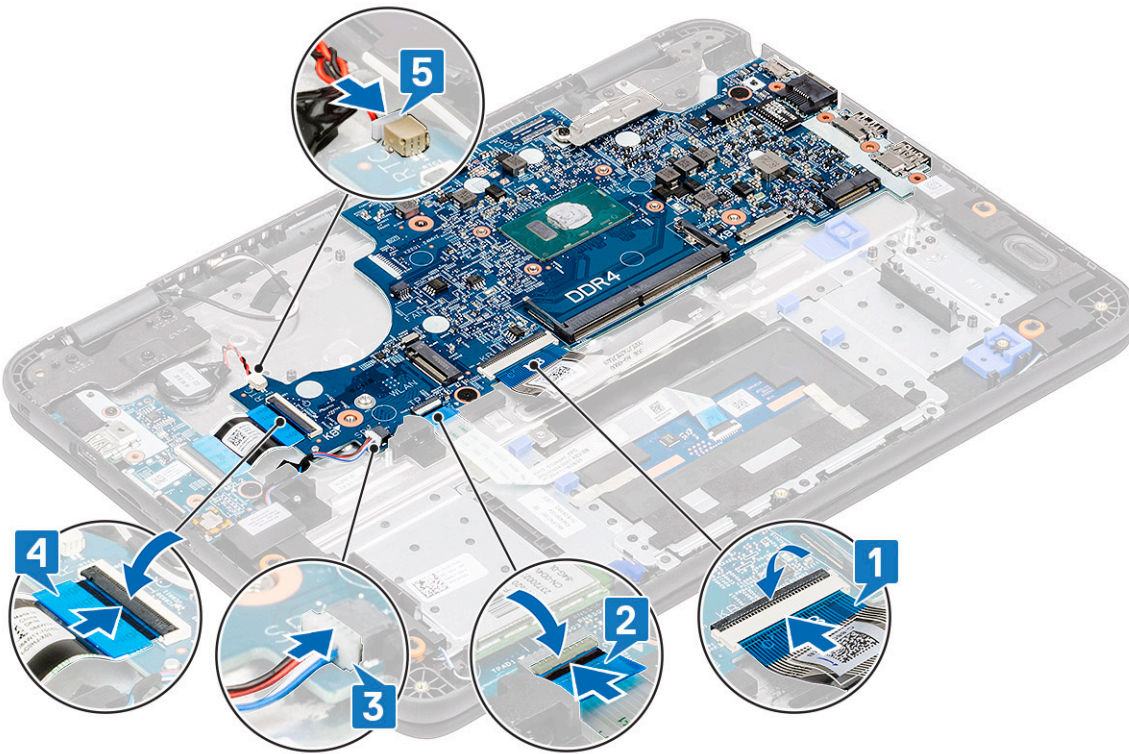


- 3 Connect the EDP cable to the connector on the system board [1].
- 4 Align and place the EDP bracket on the connector [2] and tighten it using the single screw [3] securing the system board to the computer.



- 5 Connect the following cables and connectors:
 - a [Keyboard cable connector](#) [1]

- b Touchpad cable connector [2]
- c Speaker cable connector [3]
- d I/O board cable [4]
- e Coin cell connector [5]



- 6 Install the:
- a DC-in cable
 - b fan
 - c heat sink
 - d memory module
 - e SSD
 - f WLAN card
 - g battery
 - h base cover
 - i micro-SD card

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

Palmrest

- 1 **NOTE:** After disassembling the system board you are left with palmrest which is one complete unit.

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

- 2 Remove the:
- a micro-SD card
 - b base cover
 - c battery
 - d coin cell
 - e WLAN card
 - f SSD
 - g speakers
 - h i-o daughterboard
 - i keyboard

- j touchpad
- k display assembly
- l memory module
- m heat sink
- n fan
- o DC-in
- p system board

3 Install the palmrest.



4 Install the:

- a system board
- b DC-in cable
- c fan
- d heat sink
- e memory module
- f display assembly
- g touchpad
- h keyboard
- i i-o daughterboard
- j speakers
- k SSD
- l WLAN card
- m coin cell
- n battery
- o base cover
- p micro-SD card

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

System setup

CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Topics:

- [Boot menu](#)
- [Navigation keys](#)
- [System setup options](#)
- [Boot Sequence](#)
- [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.

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

General options

Table 36. General

Option	Description
System Information	<p>This section lists the primary hardware features of your computer.</p> <p>The options are:</p> <ul style="list-style-type: none"> • System Information • Memory Configuration • Processor Information • Device Information
Battery Information	<p>Displays the battery status and the type of AC adapter connected to the computer.</p>
Boot Sequence	<p>Allows you to change the order in which the computer attempts to find an operating system.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Windows Boot Manager • Boot List Option: <p>Allows you to change the boot list options.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> – Legacy External Devices – UEFI—Default
Advanced Boot Options	<p>Allows you to Enable Legacy Option ROMs.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Enable Legacy Option ROMs—Default • Enable Attempt Legacy Boot

Option	Description
UEFI Boot Path Security	<p>Allows you to control whether the system prompts the user to enter the Admin password when booting to a UEFI boot path.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Always, Except Internal HDD—Default • Always • Never
Date/Time	<p>Allows you to set the date and time. The change to the system date and time takes effect immediately.</p>

System configuration

Table 37. System Configuration

Option	Description
Integrated NIC	<p>Allows you to configure the integrated network controller.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Disabled • Enabled • Enabled w/PXE—Default
SATA Operation	<p>Allows you to configure the operating mode of the integrated SATA hard-drive controller.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Disabled • AHCI • RAID On—Default <p>NOTE: SATA is configured to support RAID mode.</p>
SMART Reporting	<p>This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the S.M.A.R.T (Self Monitoring Analysis and Reporting Technology) specification. This option is disabled by default.</p> <ul style="list-style-type: none"> • Enable SMART Reporting
Drives	<p>These fields let you enable or disable various drives on board.</p> <p>The options are:</p> <ul style="list-style-type: none"> • SATA-0 • M.2 PCIe SSD-0
SMART Reporting	<p>This field controls whether hard drive errors for integrated drives are reported during startup.</p> <p>The option is disabled by default.</p>

Option	Description
USB Configuration	<p>Allows you to enable or disable the internal/integrated USB configuration.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Enable USB Boot Support • Enable External USB Ports <p>All the options are set by default.</p> <p>NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.</p>
Dell Type-C Dock Configuration	<p>Allows you to connect to Dell WD and TB family of docks(Type-C Docks) independent of USB and thunderbolt adapter configuration.</p> <p>This option is enabled by default.</p>
Audio	<p>Allows you to enable or disable the integrated audio controller. By default, the Enable Audio option is selected.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Enable Microphone • Enable Internal Speaker <p>This option is set by default.</p>
Touchscreen	<p>This option controls whether the touchscreen is enabled or disabled</p> <p>This option is enabled by default.</p>
Miscellaneous devices	<p>Allows you to enable or disable various on board devices.</p> <ul style="list-style-type: none"> • Enable Camera—Default • Enable Secure Digital (SD) Card • Secure Digital (SD) Card Boot - Disabled • Secure Digital Card (SD) Read-Only Mode - Disabled

Video screen options

Table 38. Video


Option	Description
LCD Brightness	Allows you to set the display brightness depending upon the power source. On Battery(50% is default) and On AC (100 % default).

Security

Table 39. Security

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

Option	Description
	<p>The entries to set password are:</p> <ul style="list-style-type: none"> • Enter the old password: • Enter the new password: • Confirm new password: <p>Click OK once you set the password.</p> <p>i NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.</p>
System Password	<p>Allows you to set, change, or delete the System password.</p> <p>The entries to set password are:</p> <ul style="list-style-type: none"> • Enter the old password: • Enter the new password: • Confirm new password: <p>Click OK once you set the password.</p> <p>i NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.</p>
Strong Password	<p>Allows you to enforce the option to always set strong password.</p> <ul style="list-style-type: none"> • Enable Strong Password <p>This option is not set by default.</p>
Password Configuration	<p>You can define the length of your password. Min = 4, Max = 32</p>
Password Bypass	<p>Allows you to bypass the System password and the Internal HDD password, when it is set, during a system restart.</p> <p>Click one of the options:</p> <ul style="list-style-type: none"> • Disabled—Default • Reboot bypass
Password Change	<p>Allows you to change the System password when the administrator password is set.</p> <ul style="list-style-type: none"> • Allow Non-Admin Password Changes <p>This option is set by default.</p>
Non-Admin Setup Changes	<p>Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password.</p> <ul style="list-style-type: none"> • Allow Wireless Switch Changes <p>This option is not set by default.</p>
UEFI Capsule Firmware Updates	<p>Allows you to update the system BIOS via UEFI capsule update packages.</p> <ul style="list-style-type: none"> • Enable UEFI Capsule Firmware Updates <p>This option is set by default.</p>
PTT Security	<p>This option lets you control whether the Platform Trust Technology feature(PTT) is visible to OS.</p>

Option	Description
TPM 2.0 Security	<p>The options are :</p> <ul style="list-style-type: none"> · PTT On (Enabled by Default) · Clear · PPI ByPass for Clear Command
TPM 2.0 Security	<p>Allows you to enable or disable the Trusted Platform Module (TPM) during POST.</p> <p>The options are:</p> <ul style="list-style-type: none"> · TPM On—Default · Clear · PPI Bypass for Enable Command—Default · PPI Bypass for Disable Command · PPI Bypass for Clear Command · Attestation Enable—Default · Key Storage Enable—Default · SHA-256—Default
Computrace (R)	<p>Allows you to activate or disable the optional Computrace software.</p> <p>The options are:</p> <ul style="list-style-type: none"> · Deactivate · Disable · Activate—Default
CPU XD Support	<p>Allows you to enable or disable the Execute Disable mode of the Processor, OS uses this feature to hinder malicious programs that exploits buffer overflow.</p> <ul style="list-style-type: none"> · Enable CPU XD Support—Default
Admin Setup Lockout	<p>Allows you to prevent users from entering Setup when an administrator password is set.</p> <ul style="list-style-type: none"> · Enable Admin Setup Lockout <p>This option is not set by default.</p>
Master Password Lockout	<p>Allows you to disable master password support.</p> <ul style="list-style-type: none"> · Enable Master Password Lockout <p>This option is not set by default.</p>
SMM Security Mitigation	<p>Allows you to enable or disable additional UEFI SMM Security Mitigation protection.</p> <ul style="list-style-type: none"> · SMM Security Mitigation <p>This option is not set by default.</p> <p> NOTE: Hard Disk password should be cleared before the settings can be changed.</p>

Secure boot

Table 40. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable the Secure Boot Feature. <ul style="list-style-type: none">• Secure Boot Enable—Default
Secure Boot Mode	Changes to the Secure Boot operation mode modifies the behaviour of Secure Boot to allow evaluation of UEFI driver signatures. Choose one of the option: <ul style="list-style-type: none">• Deployed Mode—Default• Audit Mode
Expert Key Management	Allows you to enable or disable Expert Key Management. <ul style="list-style-type: none">• Enable Custom Mode This option is not set by default. The Custom Mode Key Management options are: <ul style="list-style-type: none">• PK—Default• KEK• db• dbx

Intel Software Guard Extensions options

Table 41. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	This field specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. Click one of the following options: <ul style="list-style-type: none">• Disabled• Enabled• Software controlled—Default
Enclave Memory Size	This option sets SGX Enclave Reserve Memory Size Click one of the following options: <ul style="list-style-type: none">• 32 MB• 64 MB• 128 MB—Default

Performance

Table 42. Performance

Option	Description
Multi Core Support	<p>This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores.</p> <ul style="list-style-type: none">• All—Default• 1
Intel SpeedStep	<p>Allows you to enable or disable the Intel SpeedStep mode of processor.</p> <ul style="list-style-type: none">• Enable Intel SpeedStep <p>This option is set by default.</p>
C-States Control	<p>Allows you to enable or disable the additional processor sleep states.</p> <ul style="list-style-type: none">• C states <p>This option is set by default.</p>
Hyper-Thread Control	<p>Allows you to enable or disable the HyperThreading in the processor.</p> <ul style="list-style-type: none">• Disabled• Enabled—Default

Power management

Table 43. Power Management

Option	Description
AC Behavior	<p>Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected.</p> <ul style="list-style-type: none">• Wake on AC <p>This option is not set by default.</p>
Enable Intel Speed Shift technology	<p>This option is used to enable/disable Intel Speed Shift Technology.</p> <p>This option is not set by default.</p>
Auto On Time	<p>Allows you to set the time at which the computer must turn on automatically.</p> <p>The options are:</p> <ul style="list-style-type: none">• Disabled—Default• Every Day• Weekdays

Option	Description
	<ul style="list-style-type: none"> • Select Days <p>This option is not set by default.</p>
USB Wake Support	<p>Allows you to enable USB devices to wake the system from standby.</p> <ul style="list-style-type: none"> • Enable USB Wake Support • Wake on Dell USB-C Dock <p>This option is not set by default.</p>
Wireless Radio Control	<p>This option if enabled, will sense the connection of the system to a wired network and subsequently disable the selected wireless radios (WLAN and/or WWAN). Upon disconnection from the wired network the selected wireless radio will be enabled.</p> <ul style="list-style-type: none"> • Control WLAN radio <p>This option is not set by default.</p>
Wake on LAN /WLAN	<p>This option allows the computer to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC power supply.</p> <ul style="list-style-type: none"> • Disabled—Default - Does not allow the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. • LAN or WLAN - Allows the system to be powered on by special LAN or WLAN signals. • LAN Only - Allows the system to be powered on by special LAN signals. • WLAN Only - Allows the system to be powered on by special WLAN signals. • LAN with PXE Boot A wake up packet is sent to the system in either the S4 or S5
Block Sleep	<p>This option lets you to block entering to sleep in OS environment.</p> <p>This option is not set by default.</p>
Peak Shift	<p>Allows you enable or disable the Peak shift feature. This feature when enabled minimizes the AC power usage at times of peak demand. Battery does not charge between the Peak Shift start and end time</p> <p>Peak Shift Start and End Time can be configured for all weekdays</p> <p>This option set the battery threshold value (15 % to 100 %)</p>
Advanced Battery Charge Configuration	<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 non-work hours to improve the battery health.</p> <p>Advanced Battery Charge Mode can be configured for all weekdays</p>
Primary Battery Charge Configuration	<p>Allows you to select the charging mode for the battery.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Adaptive—Default • Standard - Fully charges your battery at a standard rate. • ExpressCharge- The battery charges over a shorter period of time using Dell's fast charging technology. • Primarily AC use • Custom <p>If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.</p>

 | **NOTE: All charging mode may not be available for all the batteries.**

Option	Description
Sleep Mode	<p>This field lets you select which sleep mode will be used by the OS.</p> <p>The options are:</p> <ul style="list-style-type: none"> • OS Automatic Selection— Default. • Forced S3

Post behavior

Table 44. POST Behavior

Option	Description
Adapter Warnings	<p>Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters.</p> <ul style="list-style-type: none"> • Enable Adapter Warnings—Default
Numlock Enable	<p>Allows you to enable or disable the Numlock function when the system boots.</p> <ul style="list-style-type: none"> • Enable Numlock—Default
Fn Lock Options	<p>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.</p> <ul style="list-style-type: none"> • Fn Lock—Default <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Lock Mode Disable/Standard • Lock Mode Enable/Secondary—Default
Fastboot	<p>Allows you to speed up the boot process by bypassing some of the compatibility steps.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Minimal—Default • Thorough • Auto
Extended BIOS POST Time	<p>Allows you to create an additional preboot delay.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • 0 seconds—Default • 5 seconds • 10 seconds
Full Screen Logo	<p>Allows you to display full screen logo, if your image matches screen resolution.</p> <ul style="list-style-type: none"> • Enable Full Screen Logo <p>This option is not set by default.</p>
Warnings and Errors	<p>Allows you to select different options to either stop, prompt and wait for user input, continue when warnings are detected but pause on errors, or continue when either warnings or errors are detected during the POST process.</p>

Option	Description
	<p>Click one of the following options:</p> <ul style="list-style-type: none"> • Prompt on Warnings and Errors—Default • Continue on Warnings • Continue on Warnings and Errors
MAC Address Pass-Through	<p>This feature replaces the external NIC MAC address (in a supported dock or dongle) with selected MAC address from the system.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Passthrough MAC Address—Default • Integrated NIC 1 MAC Address • Disabled

Virtualization support

Table 45. Virtualization Support

Option	Description
Virtualization	<p>This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by the Intel Virtualization technology.</p> <ul style="list-style-type: none"> • Enable Intel Virtualization Technology <p>This option is set by default.</p>
VT for Direct I/O	<p>Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by the Intel Virtualization technology for direct I/O.</p> <ul style="list-style-type: none"> • Enable VT for Direct I/O <p>This option is set by default.</p>

Wireless options


Table 46. Wireless

Option	Description
Wireless Switch	<p>Allows to set the wireless devices that can be controlled by the wireless switch.</p> <p>The options are:</p> <ul style="list-style-type: none"> • WWAN • GPS (on WWAN Module) • WLAN • Bluetooth <p>All the options are enabled by default.</p>
Wireless Device Enable	<p>Allows you to enable or disable the internal wireless devices.</p>

Option	Description
	<p>The options are:</p> <ul style="list-style-type: none"> • WWAN/GPS • WLAN • Bluetooth <p>All the options are enabled by default.</p>

Maintenance

Table 47. Maintenance

Option	Description
Service Tag	Displays the service tag of your computer.
Asset Tag	<p>Allows you to create a system asset tag if an asset tag is not already set.</p> <p>This option is not set by default.</p>
BIOS Downgrade	<p>Allows you to flash previous revisions of the system firmware.</p> <ul style="list-style-type: none"> • Allow BIOS Downgrade <p>This option is set by default.</p>
Data Wipe	<p>Allows you to securely erase data from all internal storage devices.</p> <ul style="list-style-type: none"> • Wipe on Next Boot <p>This option is not set by default.</p>
Bios Recovery	<p>BIOS Recovery from Hard Drive—This option is set by default. Allows you to recover the corrupted BIOS from a recovery file on the HDD or an external USB key.</p> <p>BIOS Auto-Recovery— Allows you to recover the BIOS automatically.</p> <p> NOTE: BIOS Recovery from Hard Drive field should be enabled.</p> <p>Always Perform Integrity Check—Performs integrity check on every boot.</p>

System logs

Table 48. System Logs

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

SupportAssist System Resolution

Table 49. SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	<p>The Auto OS Recovery threshold setup options controls the automatic flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool.</p> <p>The options are:</p> <ul style="list-style-type: none">• 0• 1• 2—Default• 3
SupportAssist OS Recovery	<p>The SupportAssist OS Recovery option will enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors.</p> <p>This option is not set by default.</p>
Fn Lock Options	<p>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.</p> <ul style="list-style-type: none">• Fn Lock—Default <p>Click one of the following options:</p> <ul style="list-style-type: none">• Lock Mode Disable/Standard• Lock Mode Enable/Secondary—Default
Fastboot	<p>Allows you to speed up the boot process by bypassing some of the compatibility steps.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none">• Minimal—Default• Thorough• Auto
Extended BIOS POST Time	<p>Allows you to create an additional preboot delay.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none">• 0 seconds—Default• 5 seconds• 10 seconds
Full Screen Logo	<p>Allows you to display full screen logo, if your image matches screen resolution.</p> <ul style="list-style-type: none">• Enable Full Screen Logo <p>This option is not set by default.</p>
Warnings and Errors	<p>Allows you to select different options to either stop, prompt and wait for user input, continue when warnings are detected but pause on errors, or continue when either warnings or errors are detected during the POST process.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none">• Prompt on Warnings and Errors—Default

Option	Description
	<ul style="list-style-type: none"> • Continue on Warnings • Continue on Warnings and Errors
MAC Address Pass-Through	<p>This feature replaces the external NIC MAC address (in a supported dock or dongle) with selected MAC address from the system.</p> <p>Click one of the following options:</p> <ul style="list-style-type: none"> • Passthrough MAC Address—Default • Integrated NIC 1 MAC Address • Disabled

Boot Sequence

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

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

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

- Removable Drive (if available)
- STXXXX Drive

NOTE: XXX denotes the SATA drive number.

- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

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

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

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.

Updating BIOS on systems with BitLocker enabled

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: <https://www.dell.com/support/article/sln153694>

Updating your system BIOS using a USB flash drive

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

NOTE: You will need to use a bootable USB Flash drive. Please refer to the following article for further details: <https://www.dell.com/support/article/us/en/19/sln143196/>

- 1 Download the BIOS update .EXE file to another system.
- 2 Copy the file e.g. O9010A12.EXE onto the bootable USB Flash drive.
- 3 Insert the USB Flash drive into the system that requires the BIOS update.
- 4 Restart the system and press F12 when the Dell Splash logo appears to display the One Time Boot Menu.
- 5 Using arrow keys, select **USB Storage Device** and click Return.
- 6 The system will boot to a Diag C:\> prompt.
- 7 Run the file by typing the full filename e.g. O9010A12.exe and press Return.
- 8 The BIOS Update Utility will load, follow the instructions on screen.

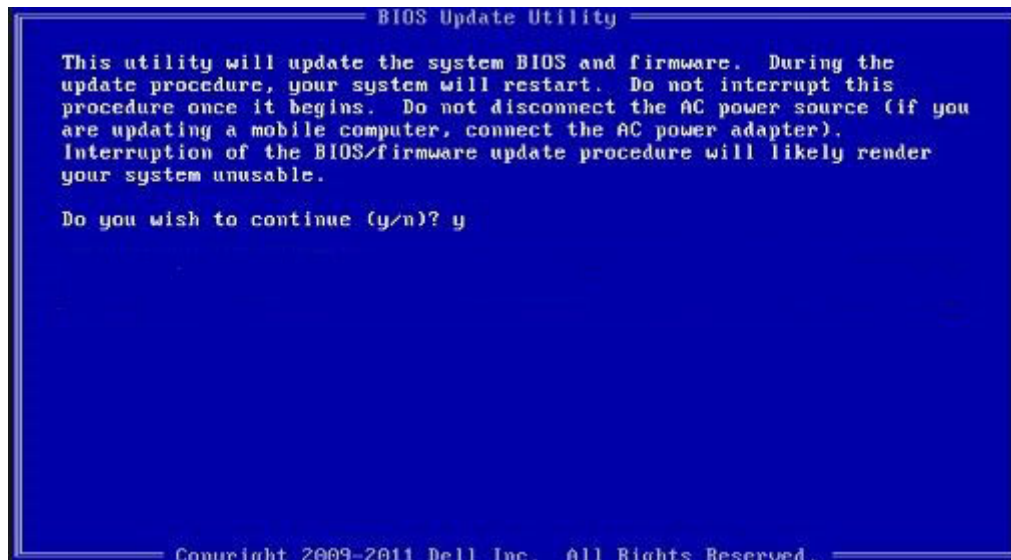


Figure 16. DOS BIOS Update Screen

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment such as Ubuntu, see <https://www.dell.com/support/article/us/en/19/sln171755/>.

System and setup password

Table 50. System and setup password

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

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

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

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

 **NOTE:** System and setup password feature is disabled.

Assigning a system setup password

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

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

- 1 In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
The **Security** screen is displayed.
- 2 Select **System/Admin Password** and create a password in the **Enter the new password** field.
Use the following guidelines to assign the system password:
 - A password can have up to 32 characters.
 - The password can contain the numbers 0 through 9.
 - Only lower case letters are valid, upper case letters are not allowed.
 - Only the following special characters are allowed: space, ("), (+), (.), (-), (.), (/), (:), ([), (\), (]), (`).
- 3 Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
- 4 Press Esc and a message prompts you to save the changes.
- 5 Press Y to save the changes.
The computer reboots.

Deleting or changing an existing system setup password


Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

To enter the System Setup, press F2 immediately after a power-on or reboot.

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

The **System Security** screen is displayed.

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

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

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

The computer reboot.

Diagnostics

This chapter details the built in troubleshooting features to diagnose the Dell systems. It also lists the invoking instructions along with related information for each diagnostics method.

Topics:

- [Battery Status Lights](#)
- [Wi-Fi power cycle](#)
- [Diagnostic LEDs](#)
- [M-BIST](#)
- [Self-Heal](#)
- [BIOS recovery](#)
- [LCD Built-in Self Test](#)
- [ePSA Diagnostics](#)

Battery Status Lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

Alternately blinking amber light and green light	An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
Alternately blinking amber light with steady green light	Temporary battery failure with AC adapter present.
Constantly blinking amber light	Fatal battery failure with AC adapter present.
Light off	Battery in full charge mode with AC adapter present.
green light on	Battery in charge mode with AC adapter present.

Wi-Fi power cycle

If your computer is unable to access the internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

- 1 Turn off your computer.
- 2 Turn off the modem.
- 3 Turn off the wireless router.
- 4 Wait for 30 seconds.
- 5 Turn on the wireless router.
- 6 Turn on the modem.
- 7 Turn on your computer.

Diagnostic LEDs

Instead of beep codes, errors are indicated via the bicolor Battery Charge/Status 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 1.5 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 51. Diagnostic LEDs

Blinking Pattern		Problem Description	Suggested Resolution
Amber	White		
2	1	CPU failure	Replace the system board
2	2	System board failure (included BIOS corruption or ROM error)	Flash latest BIOS version. If problem persists, replace the system board.
2	3	No memory/ RAM detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2	4	Memory/ RAM failure	Replace the memory module.
2	5	Invalid memory installed	Replace the memory module.
2	6	System board/ Chipset error	Replace the system board.
2	7	LCD failure	Replace the LCD module.
2	8	LCD Power rail failure	Replace the system board
3	1	CMOS battery failure	Replace the RTS battery.
3	2	PCI or Video card/ chip failure	Replace the system board.
3	3	BIOS Recovery Image not found	Flash latest BIOS version. If problem persists, replace the system board.
3	4	BIOS Recovery Image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.

TIP: For diagnostics pattern 2-amber, 8-white connect an external monitor to isolate between system board or graphics controller failure.

M-BIST

M-BIST(Built In Self-Test) diagnostics tool, featuring improved accuracy in system board failures.

NOTE: M-BIST can be manually initiated before POST(Power On Self Test).

How to run M-BIST

NOTE: M-BIST must be initiated on the system from a power-off state that is either connected to AC power or with battery only.

- 1 Press and hold both the **M** key on the keyboard and the **power button** to initiate M-BIST.
- 2 With both the **M** key and the **power button** that is held down, the battery indicator LED may exhibit two states:
 - a OFF: No fault detected with the system board
 - b AMBER: Indicates a problem with the system board

Self-Heal

Course Introduction

Self-Heal is an option that helps recover a Dell Latitude system from a No Post, No Power, No Video situation.

Self-Heal Instruction

- 1 Remove the primary battery and the AC adapter.
- 2 Disconnect the CMOS battery.
- 3 Release the flea power. Press and hold the power button down for 10 seconds or leave the system idle for 45 seconds.
- 4 Make sure the CMOS and primary battery are not plugged into the system.
- 5 Plug in the AC adapter. The system will auto power-on when the AC adapter inserted.
- 6 The system will start with a blank screen for a while and will shut down automatically. Watch for the LED lights (power, Wi-Fi, and HDD). It will turn on.
- 7 The system will try to restart twice and will boot on the third attempt.
- 8 Place the CMOS battery and the AC adapter back in the system.
- 9 If self-heal recovers the failure, update the system with the latest BIOS, and perform ePSA to ensure proper functionality of the system.

NOTE:

- During installation or removal of any hardware, always ensure all data is backed up properly.
- For instructions on how to remove or replace parts, visit the [Assembly Disassembly](#).
- Before beginning to work on the computer, follow the [Safety Instructions](#).

Supported Latitude Models

NOTE:

- Before replacing the system board, perform self-heal as a mandatory step.
- Latitude Self-Heal can be avoided when complete system tear-down is required to access the coin-cell battery.
- For the Latitude E7 Series (XX70), BIOS Recovery 2.0 should be performed as the primary step.
- In order to reduce troubleshooting time associated with Self-Heal, there is no mandatory requirement to reassemble the system. Technicians can initiate Self-Heal even with the system board exposed.
- **Do not touch** any of the exposed components or the system board to avoid shorting and static.
- If Self-Heal is unable to recover the failure, proceed with replacing the system board.

NOTE:

Front-line Agent Action: Front-line agents must encourage the customer to perform this step before isolating the issue as a motherboard failure. If the customer is not comfortable performing the Self-Heal procedure, then please document the dispatch being created in 5GL. Advise the onsite engineers to perform the Self-Heal procedure as one of the mandatory initial steps. Advise them that if the Self-Heal procedure is unsuccessful, to continue with the regular troubleshooting before part replacement.

Onsite Engineer Action: The Latitude Self-Heal procedure has to be a mandatory initial step. If the Self-Heal procedure is unsuccessful, continue with the regular troubleshooting before part replacement. Document Self-Heal results in the call closure log (Self-Heal Pass or Fail).

BIOS recovery

The BIOS recovery is designed to fix the main BIOS, and cannot work if the boot is damaged. The BIOS recovery will not work in the event of EC corruption, ME corruption, or a hardware related issue. The BIOS recovery image should be available on the unencrypted partition on the drive for BIOS recovery feature.

Rollback BIOS feature

Two versions of the BIOS recovery image are saved on the hard drive:

- Current running BIOS (old)
- To-be-updated BIOS (new)

The old version is already stored on the hard drive. The BIOS adds new version to the hard drive, maintains the old version, and deletes other existing versions. For example, A00 and A02 versions are already on the hard drive, A02 is the running BIOS. The BIOS adds A04, maintains A02, and deletes A00. Having two BIOS version enables the Rollback BIOS feature.

If the recovery file cannot be stored (hard drive is out of space), the BIOS sets a flag to indicate this condition. The flag is reset in the event it later becomes possible to store the recovery file. The BIOS notifies the user during POST and in BIOS Setup, the BIOS recovery is degraded. BIOS recovery through hard drive may not be possible, however BIOS recovery through USB flash drive is still possible.

For USB key: root directory or "\"

BIOS_IMG.rcv: the recovery image stored on the USB key.

BIOS recovery using hard drive

NOTE: Ensure that you have the previous version and the latest version of the BIOS from the Dell support site available to use.

NOTE: Ensure that you have the file type extensions visible in the operating system (OS).

- 1 Browse to the location of the BIOS update executable (.exe) files.
- 2 Rename the BIOS executable files to **BIOS_PRE.rcv** for the earlier version of the BIOS and **BIOS_CUR.rcv** for the latest version of the BIOS.

For example, if the latest version's file name is **PowerEdge_T30_1.0.0.exe**, rename it to **BIOS_CUR.rcv** and if the previous version's file name is **PowerEdge_T30_0.0.9.exe**, rename it to **BIOS_PRE.rcv**

NOTE:

- a If the hard drive is new, there will be no OS installed.
- b If the hard drive has been partitioned at the Dell factory, there will be a **Recovery Partition** available.

- 3 Disconnect the hard drive and install the hard drive into another system that has a full operational OS.
- 4 Start up the system and in the Microsoft Windows OS environment follow these steps to copy the BIOS recovery file to the **Recovery Partition**.

- a Open a Windows Command Prompt window.
- b At the prompt, type **diskpart** to start the **Microsoft DiskPart**.
- c At the prompt, type **list disk** to list out the available hard drives.
Select the hard drive that was installed in Step 3.
- d At the prompt, type **list partition** to view the available partitions on this hard drive.
- e Select **Partition 1** which is the **Recovery Partition**. The size of the partition will be 39 MB.
- f At the prompt, type **set id=07** to set the partition ID.

NOTE: The partition will be visible to the OS as **Local Disk (E)** to read and write data.

- g Create the following folders in **Local Disk (E)**, **E:\EFI\Dell\BIOS\Recovery**.
- h Copy both the BIOS files **BIOS_CUR.rcv** and **BIOS_PRE.rcv** to the recovery folder on **Local Disk (E)**.
- i In the **Command Prompt** window, at the **DISKPART** prompt, type **set id=DE**.

After the executing this command, the partition **Local Disk (E)** will not be accessible by the OS.

- 5 Shut the system down and remove the hard drive and install the hard drive into the original system.
- 6 Start the system up and boot to System Setup, in the **Maintenance** section ensure that **BIOS Recovery from Hard Drive** is enabled in the **BIOS Recovery** section of the setup.
- 7 Press the power button to shut the system down.
- 8 Holding the **Ctrl and Esc** keys, press the power button to start the system up. Keep holding the **Ctrl and Esc** keys until the **BIOS Recovery Menu** page is displayed.

Ensure that the **Recover BIOS** radio button is selected and click **Continue** to start the BIOS recovery.

BIOS recovery using USB key

NOTE: Ensure that you have the file type extensions visible in the operating system.

NOTE: Ensure that you have downloaded the latest BIOS from the Dell support site and save it on your system.

- 1 Browse to the location of the downloaded BIOS update executable (.exe) file.
- 2 Rename the file to **BIOS_IMG.rcv**.
For example, if the file name is **PowerEdge_T30_0.0.5.exe**, rename it to **BIOS_IMG.rcv**
- 3 Copy the **BIOS_IMG.rcv** file to the root directory of the USB key.
- 4 If not plugged in, plug in the USB key, restart the system, press **F2** to enter the System Setup, and then press power button to shut down the system.
- 5 Start the system.
- 6 While the system is starting up, press the **Ctrl+Esc** keys while holding the power button until the **BIOS Recovery Menu** dialog box is displayed.
- 7 Click **Continue** to start the BIOS recovery process.

NOTE: Ensure that the **Recovery BIOS** option is selected in the **BIOS Recovery Menu** dialog box.

- 8 Select the path on the USB drive where BIOS recovery file is stored(root directory or "\") and follow the on-screen instructions.

LCD Built-in Self Test

Overview : LCD Built-in Self Test (BIST)

Dell laptop PCs have a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with the LCD (screen) of the Dell laptop PC or with the video card (GPU) and PC settings .

When you notice screen abnormalities like flickering, distortion, clarity issues, fuzzy or blurry image, horizontal or vertical lines, color fade etc., it is always a good practice to isolate the LCD (screen) by running the built-in self test (BIST).

How to invoke LCD BIST Test

- 1 Power off the Dell laptop PC.
- 2 Disconnect any peripherals connected to the PC. Connect only the AC adapter (charger) to the PC.
- 3 Make sure that the LCD (screen) is clean (no dust particles on the surface of the screen).
- 4 Press and hold **D** key and **Power on** the PC to enter LCD built-in self test (BIST) mode. Continue to hold the D key, until you see color bars on the LCD (screen).
- 5 The screen will display multiple color bars and change colors on the entire screen to red, green and blue.
- 6 Carefully inspect the screen for abnormalities.
- 7 Press Esc key to exit.

NOTE: Dell ePSA upon launch, initiates a LCD BIST first, expecting an user intervention confirm functionality of the LCD.

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

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.

Running ePSA diagnostics

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

- Tap **F12** key on keyboard, as the Dell splash screen appears, until you get message **Diagnostic Boot Selected**.
 - On the one time boot menu screen, use Up/Down arrow key to select the **Diagnostics** option and then press **<Return>**.
- Press and Hold **Function(Fn)** key on the keyboard and Press the **Power button** to power on the system.

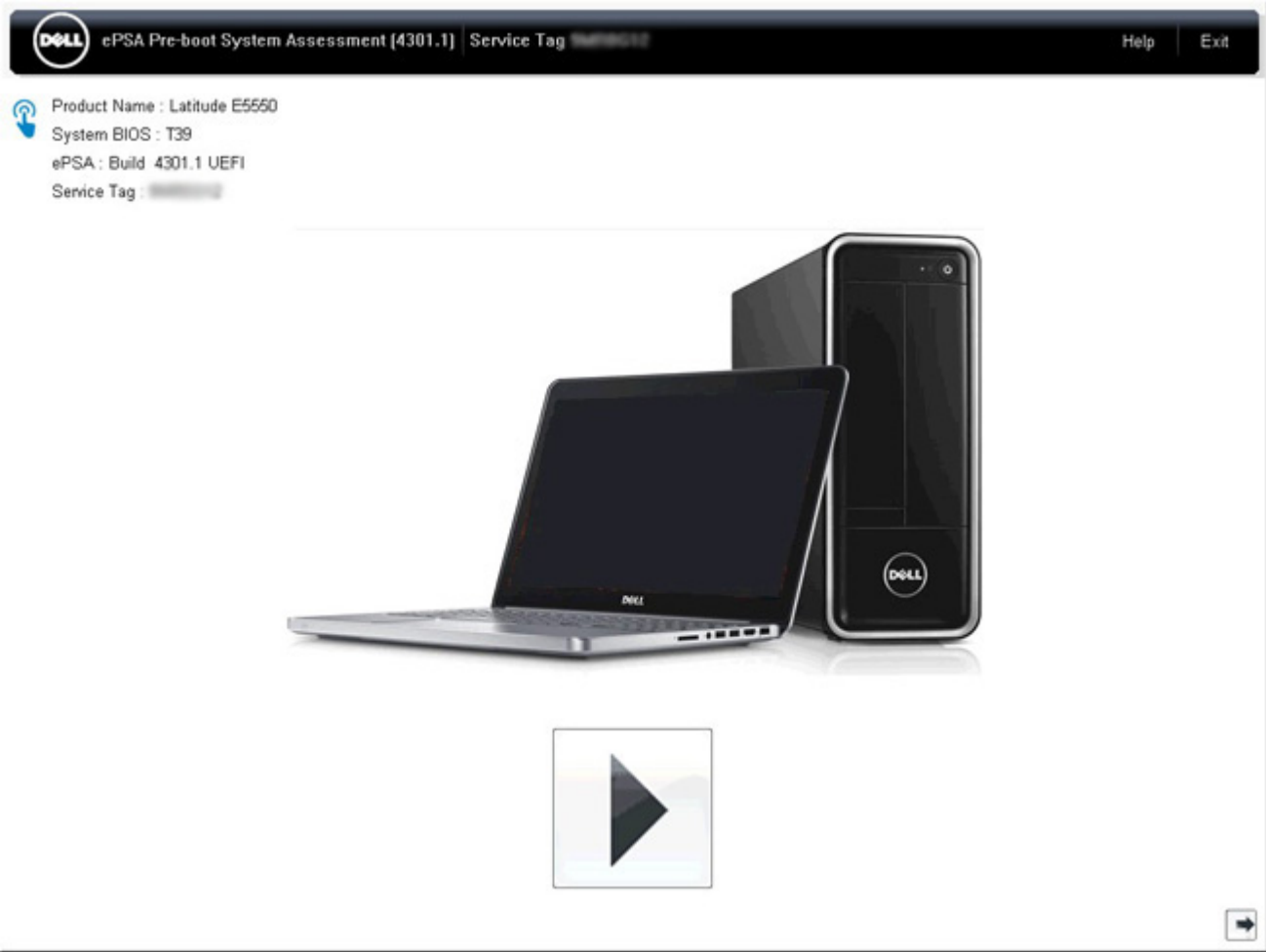
ePSA User Interface

This section contains information on ePSA 3.0's Basic and Advanced Screen.

ePSA opens basic screen on start. You can switch to advanced screen using the arrow icon on the bottom. Advanced screen shows detected devices on the left column. Specific test can be included or excluded only in the interactive mode.

ePSA Basic Screen

The Basic Screen has minimal controls which allows easy navigation for user to start or stop the diagnostic.



ePSA Advanced Screen

The advanced screen allows more directed testing and contains more detail information about the overall health of the system. The user can get to this screen by simply swiping your finger to the left on touchscreen systems or clicking the next page button on the lower right hand side of the basic screen.

DELL ePSA Pre-boot System Assessment [4301.1] Service Tag XXXXXXXXXX Help Exit

Configuration | Results | **System Health** | Event Log

Cables

PCIe Bus

LCD/Display Panel

Test Speaker

Hard Drive 0

OS Boot Path 0

USB Devices

Integrated Webcam

Video Card

Primary Battery

Charger

Processor Fan

Battery and AC Adapter			
Sensor	Current	High	Low
Primary Battery Charge	96%	96%	89%
Primary Battery Health	80%	80%	80%
Primary Battery Voltage	8455 mV	8455 mV	8390 mV
Primary Battery Current Flow	935 mA	2247 mA	935 mA
Primary Battery Charging State	Charging	n/a	n/a
AC adapter	65 watt adapter	n/a	n/a

Fans			
Sensor	Current	High	Low
Processor Fan	2704 RPM	3352 RPM	0 RPM

Thermals			
Sensor	Current	High	Low
Hard Drive 0	34 C	36 C	34 C
Primary Battery Thermistor	31 C	32 C	31 C
CPU Thermistor	58 C	61 C	57 C
Ambient Thermistor	49 C	50 C	48 C
SODIMM Thermistor	43 C	44 C	43 C
Other Thermistor	36 C	36 C	35 C
Video Thermistor	53 C	57 C	53 C

Thorough Test Mode [Advanced Options](#)

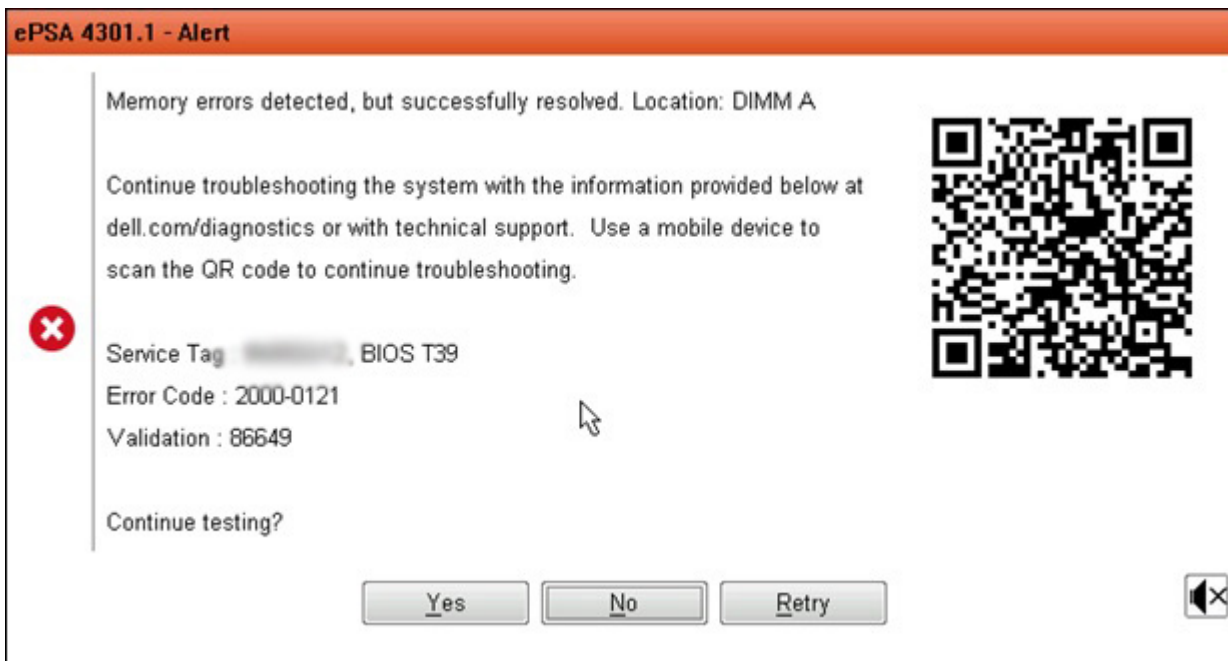
← 0% ▶

To run test on specific device or run a specific test

- 1 To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
- 2 Select the device from the left pane and click **Run Tests** or use **Advanced Option** to include or exclude any Test.

ePSA Error Messages

When the Dell ePSA Diagnostic detects an error while running, it will pause the test and then popup a window as shown below :



- By responding to **Yes**, the diagnostic will continue testing the next device and the error details will be available in the summary report.
- By responding to **No**, the diagnostic will stop testing the remaining untested device.
- By responding to **Retry**, the diagnostic will ignore the error and rerun the last test.

Capture the error code with Validation code or Scan QR code and [Contact Dell](#)

NOTE: As part of the new feature, user can now mute the beeping sound code when there is an error , by pressing on  at the bottom right side of the error window.

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.

Validation Tools

This section contains information on how to validate the ePSA error code.

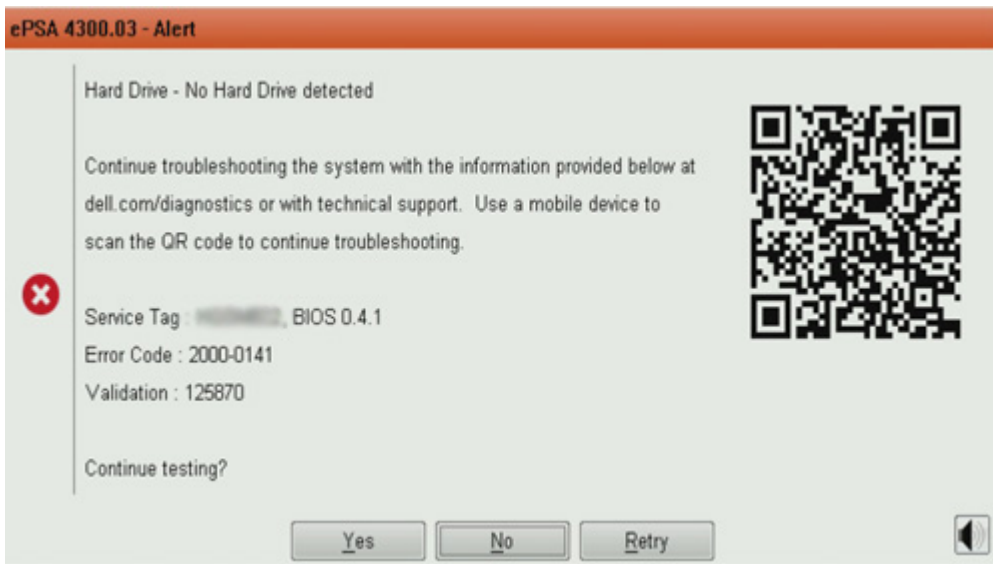
Error code verification can be done using below two methods :

- [Online Enhanced Preboot System Assessment Validation Tool](#).
- [QR scanning using QR APP on Smart Phone](#).

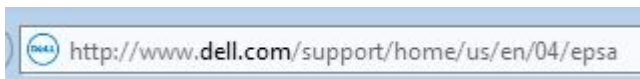
Online ePSA Validation Tool

Usage Guide

- 1 User to obtain information from ePSA error windows.




- 2 Navigate to [Online ePSA Validation Tool](http://www.dell.com/support/home/us/en/04/epsa).



- 3 Enter error code, validation code, and service tag. Part serial number is optional.

Error Code (without 2000-prefix) *

Validation Code *

Service Tag  *

Part Serial # (optional)


[View System Requirements and Privacy And Legal Information](#)

 **NOTE:** For error code, use only the last 3 or 4 digits of the code. (user can enter 0142 or 142 instead of 2000-0142.)

- 4 Click on **Submit** once all the necessary information is entered.

Error Code (without 2000-prefix) *

Validation Code *


Service Tag  *

Part Serial # (optional)

[Submit](#)

[View System Requirements and Privacy And Legal Information](#)

Valid Error Code Example



19.5"

Vostro 20 All-in-One 3055

Service Tag: XXXXXXXXXX | Express Service Code: 38625486410

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 Your system is currently Out of Warranty. Please contact Dell Technical Support for further assistance.

Result: Issues Found.

Your result requires attention. Review the affected hardware below and follow the instructions to troubleshoot problems or you may be presented with a request to replace parts.

[Clear results](#)

 **Needs Attention: System maintenance** —


Needs Attention

A potential error has been found. [Click here](#) to view a list of steps that can help resolve your issue.

See full scan results.

Diagnostics Completed —

Hardware

Diagnostic Name	Error Code	Serial #	Result
EP5A	I41		 Failed

After entering the correct information, the online tools will direct user to above screen which contains information of :

- Confirmation of the error code and result outcome.
- Suggested Part Replacement.
- If customer is still covered under Dell Warranty.
- Case reference number if there is an open case under the service tag .


Invalid Error Code Example

Error Code (without 2000-prefix) *

Validation Code *

Service Tag ⓘ *

Part Serial # (optional)

 You have entered an invalid ePSA request, please check your details and try again.

Submit

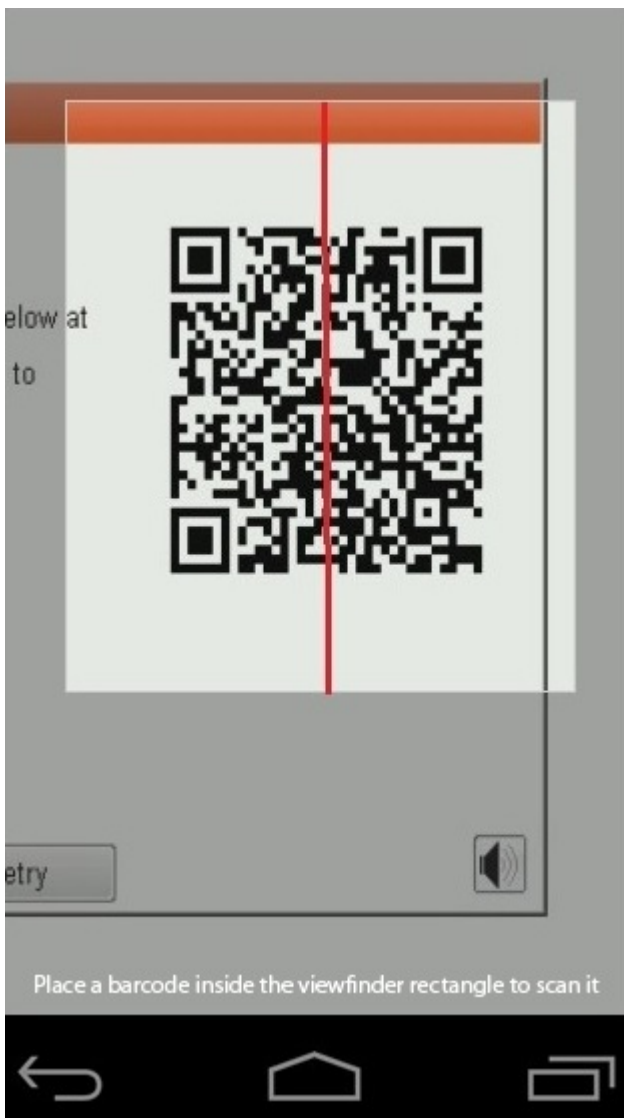
QR APP Validation Tool

Besides using the online tool, customer can also validate the error code by scanning the QR code with a QR APP on smart phone.

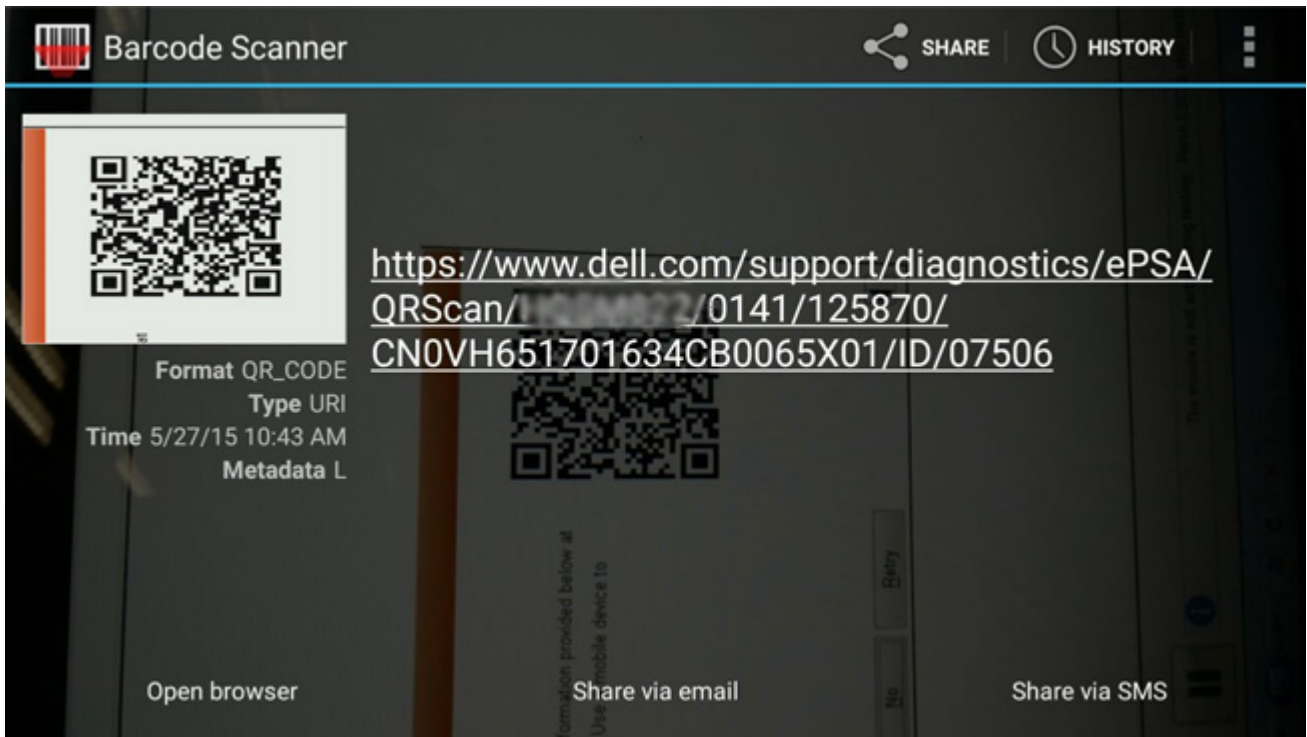
- 1 User to obtain the QR code from ePSA error Windows.



2 User can use any QR code scanner application via smart phone to scan the QR code.



3 QR code scanner application will scan the code and automatically generate the link out. Click on the link to proceed.



The link generated will navigate customer to Dell Support website which contains information of :

- Confirmation of the error code and result outcome.
- Suggested Part Replacement.
- If customer is still covered under Dell Warranty.
- Case reference number if there is an open case under the service tag.



Vostro 20 All-in-One 3055

Service Tag: [REDACTED] | Express Service Code: 38625486410

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Your system is currently Out of Warranty. Please contact Dell Technical Support for further assistance.

Result: Issues Found.

Your result requires attention. Review the affected hardware below and follow the instructions to troubleshoot problems or you may be presented with a request to replace parts.

[Clear results](#)

Needs Attention: System maintenance

Needs Attention

A potential error has been found. [Click here](#) to view a list of steps that can help resolve your issue.

See full scan results.

Diagnostics Completed

Hardware

Diagnostic Name	Error Code	Serial #	Result
EP5A	141		Failed

Getting help

Contacting Dell

① **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.